1995
Mazda MX-3
Workshop
Manual

PRINTED IN THE U.S.A. AUG. '94
FORM NO. 1472-10-94H
PART NO. 9999-95-056B-95

WARNING

Servicing a vehicle can be dangerous. If you have not received service-related training, the risks of injury and property damage increase. The recommended servicing procedures for the vehicle in this workshop manual were developed with Mazda-trained technicians in mind. This manual may be useful to non-Mazda trained technicians, but a technician with our service-related training and experience will be at less risk when performing servicing operations. However, all users of this manual are expected to know general safety procedures.

This manual contains "Warnings" and "Cautions" applicable to risks not normally encountered in a general technician's experience. They should be followed to reduce the risk of injury and the risk that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that the "Warnings" and "Cautions" are not exhaustive. It is impossible to warn of all the hazardous consequences that might result from failure to follow the procedures.

The procedures recommended and described in this manual are effective methods of performing service and repair. Some require tools specifically designed for a specific purpose. Nonrecommended procedures and tools should include consideration for safety of the technician and continued safe operation of the vehicle.

Parts should be replaced with genuine Mazda replacement parts, not parts of lesser quality. Use of a nonrecommended replacement part should include consideration for safety of the technician and continued safe operation of the vehicle.

1995 Mazda MX-3 Workshop Manual

FOREWORD

For proper repair and maintenance, a thorough familiarization with this manual is important, and it should always be kept in a handy place for quick and easy reference.

All the contents of this manual, including drawings and specifications, are the latest available at the time of printing. As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Mazda dealers. This manual should be kept up-to-date.

Mazda Motor Corporation reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

WARRANTY

The manufacturer's warranty on Mazda vehicles and engines can be voided if improper service or repairs are performed by persons other than those at an Authorized Mazda Dealer.

Mazda Motor Corporation
HIROSHIMA, JAPAN

APPLICATION:
This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN) shown on the following page.

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* Refer to the 1995 MX-3 Body Electrical Troubleshooting Manual (Form No. 1474–10–94H, Part No. 9999-95-086F-95) for servicing of the body electrical components.

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Form No. 1472–10–94H
Part No. 9999-95-056B-95

VEHICLE IDENTIFICATION NUMBERS (VIN)

JM1 EC433 * S0 400001 —
JM1 EC434 * S0 400001 —

PRE-DELIVERY INSPECTION AND SCHEDULED MAINTENANCE

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PRE-DELIVERY INSPECTION

PRE-DELIVERY INSPECTION TABLE

The following items may be done at any time prior to delivery to your customer.

EXTERIOR

INSPECT and **ADJUST**, if necessary, the following items to specification:
- ☐ Glass, exterior bright metal, and paint for damage
- ☐ Wheel lug nuts and locks (if equipped)
  89–117 N·m {9–12 kgf·m, 66–86 ft·lbf}
- ☐ All weatherstrips for damage or detachment
- ☐ Operation of hood release and lock
- ☐ Operation of rear hatch, and fuel lid opener
- ☐ With trunk open, check for spare jack, tire, tools, and fasteners securing these items in place.
- ☐ Door operation and alignment
- ☐ Headlight aim

INSTALL the following parts:
- ☐ Wheel caps or rings (if equipped)

UNDER HOOD-ENGINE OFF

INSPECT and **ADJUST**, if necessary, the following items to specification:
- ☐ Fuel, coolant and hydraulic lines, fittings, connections, and components for leaks
- ☐ Engine oil level
- ☐ Power steering fluid level
- ☐ Brake and clutch master cylinder fluid level
- ☐ Windshield washer reservoir fluid level
- ☐ Radiator coolant level
- ☐ Tightness of battery terminals
- ☐ Manual transaxle oil level

INTERIOR

INSTALL the following parts:
- ☐ Rubber stopper for rearview mirror

CHECK operation of the following items:
- ☐ Seat controls (slide and recline) and headrests
- ☐ Folding rear seat
- ☐ Door locks
- ☐ Seat belts and warning system
- ☐ Ignition switch and steering lock
- ☐ Transaxle range switch (ATX only)
- ☐ Starter interlock switch (clutch pedal, MTX only)
- ☐ All lights, including warning and indicator lights
- ☐ Sound warning system
- ☐ Horn, wipers, and washers (front and rear, if equipped)
- ☐ Audio system (if equipped)
- ☐ Cigarette lighter and clock
- ☐ Sliding sunroof (if equipped)
- ☐ Power door lock (if equipped)
- ☐ Power outside mirrors (if equipped)
- ☐ Power windows (if equipped)
- ☐ Heater, defroster, and air conditioner at various mode selections (if equipped)

CHECK the following items:
- ☐ Presence of spare fuses
- ☐ Upholstery and interior finish

CHECK and **ADJUST**, if necessary, the following items:
- ☐ Pedal height and free play of brake and clutch pedal

	Pedal height mm {in}	Free play mm {in}
Clutch pedal	199–204 {7.83–8.03} (With carpet)	5–16 {0.19–0.63}
Brake pedal	193–196 {7.60–7.72}	4–7 {0.16–0.28}

- ☐ Parking brake
  5–7 notches/98 N {10 kgf, 22 lbf}

UNDER HOOD-ENGINE RUNNING AT OPERATING TEMPERATURE

CHECK the following items:
- ☐ Automatic transaxle fluid level

ON HOIST

CHECK the following items:
- ☐ Underside fuel, coolant and hydraulic lines, fittings, connections, and components for leaks
- ☐ Tires for cuts or bruises
- ☐ Steering linkage, suspension, exhaust system, and all underside hardware for looseness or damage

ROAD TEST

CHECK the following items:
- ☐ Brake operation
- ☐ Clutch operation
- ☐ Steering control
- ☐ Operation of gauges
- ☐ Squeaks, rattles or unusual noises
- ☐ Emergency locking retractors
- ☐ Cruise control system (if equipped)

AFTER ROAD TEST

CHECK for owner information materials.

The following items must be done just before delivery to your customer.

- ☐ Load test battery and charge if necessary
- ☐ Adjust tire pressure to specification (Refer to door label)
- ☐ Clean outside of vehicle

Volts
Load test result

- ☐ Install fuses for accessories
- ☐ Remove seat and cabin carpet protective covers
- ☐ Vacuum and clean interior of vehicle
- ☐ Inspect installation of optional parts

SCHEDULED MAINTENANCE

SCHEDULED MAINTENANCE TABLE (EXCEPT CANADA)

Schedule 1 (Normal driving conditions)
The vehicle is mainly operated where none of the "unique driving conditions" apply.

Schedule 2 (Unique driving conditions)
- Repeated short-distance driving.
- Driving in dusty conditions.
- Driving with extended use of brakes.
- Driving in areas where road salt or other corrosive materials are used.
- Driving on rough or muddy roads.
- Extended periods of idling or low-speed operation.
- Driving for long prolonged periods in cold temperatures or extremely humid climates.

Schedule 1 (Normal driving conditions)

Maintenance Interval / Maintenance Item		Number of months or miles {kilometers}, whichever comes first							
Months		6	12	18	24	30	36	42	48
×1,000	Kilometers	12	24	36	48	60	72	84	96
	Miles	7.5	15	22.5	30	37.5	45	52.5	60
Engine									
Engine oil		R	R	R	R	R	R	R	R
Oil filter		R	R	R	R	R	R	R	R
Tension of all drive belts					I				I
Engine timing belt		Replace every 60,000 miles {96,000 km}							
Engine timing belt (California)		Inspect at 60,000 miles {96,000 km} and again at 90,000 miles {144,000 km} *2							
		Replace every 105,000 miles {168,000 km}							
Hose and tube for emission									I*2
Air cleaner									
Air cleaner element					R				R
Ignition system									
Spark plugs					R				R
Fuel system									
Idle speed					I*2				I*1
Fuel filter									R*1
Fuel lines and hoses					I*2				I*1
Fuel hoses (California)		Inspect every 105,000 miles {168,000 km}							
Cooling system									
Cooling system					I				I
Engine coolant					R				R
Chassis and body									
Brake lines, hoses, and connections					I				I
Drum brakes					I				I
Disc brakes					I				I
Steering operation and linkages					I				I
Front suspension ball joints					I				I
Drive shaft dust boots					I				I
Bolts and nuts on chassis and body					I				I
Exhaust system heat shields					I				I
All locks and hinges		L	L	L	L	L	L	L	L
Air conditioner system (if equipped)									
Refrigerant amount			I		I		I		I
A/C compressor operation			I		I		I		I

Chart symbols:
I : Inspect and repair, clean, or replace if necessary.
R: Replace
L: Lubricate

Remarks:
After 48 months or 60,000 miles {96,000 km}, continue to follow the described maintenance at the recommended intervals.
*1 This maintenance is required for all states except California. However, we recommend that it also be performed on California vehicles.
*2 This maintenance is recommended by Mazda. However, it is not necessary for emission warranty coverage or manufacturer recall liability.

Schedule 2 (Unique driving conditions)

Maintenance Interval / Maintenance Item			Number of months or miles {kilometers}, whichever comes first											
	Months		4	8	12	16	20	24	28	32	36	40	44	48
	×1,000	Kilometers	8	16	24	32	40	48	56	64	72	80	88	96
		Miles	5	10	15	20	25	30	35	40	45	50	55	60
Engine														
Engine oil			R	R	R	R	R	R	R	R	R	R	R	R
Engine oil {Puerto Rico}			Replace every 3,000 miles {4,800 km} or 3 months											
Oil filter			R	R	R	R	R	R	R	R	R	R	R	R
Tension of all drive belts								I						I
Engine timing belt			Replace every 60,000 miles {96,000 km}											
Engine timing belt {California}			Inspect at 60,000 miles {96,000 km} and again at 90,000 miles {144,000 km}*2											
			Replace every 105,000 miles {168,000 km}											
Hose and tube for emission														I*2
Air cleaner														
Air cleaner element				I*2				R			I*2			R
Ignition system														
Spark plugs								R						R
Fuel system														
Idle speed								I*2						I*1
Fuel filter														R*1
Fuel lines and hoses								I*2						I*1
Fuel hoses (California)			Inspect every 105,000 miles {168,000 km}											
Cooling system														
Cooling system								I						I
Engine coolant								R						R
Chassis and body														
Brake lines, hoses, and connections								I						I
Drum brakes								I						I
Disc brakes				I				I			I			I
Steering operation and linkages								I						I
Front suspension ball joints								I						I
Drive shaft dust boots								I						I
Bolts and nuts on chassis and body				I				I			I			I
Exhaust system heat shields								I						I
All locks and hinges	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Air conditioner system (if equipped)														
Refrigerant amount				I				I			I			I
A/C compressor operation				I				I			I			I

Chart symbols:

I : Inspect and repair, clean, or replace if necessary.
(Inspect, and if necessary replace·····Air cleaner element only)
R: Replace
L: Lubricate

Remarks:

After 48 months or 60,000 miles {96,000 km}, continue to follow the described maintenance at the recommended intervals.

*1 This maintenance is required for all states except California. However, we recommend that it also be performed on California vehicles.

*2 This maintenance is recommended by Mazda. However, it is not necessary for emission warranty coverage or manufacturer recall liability.

SCHEDULED MAINTENANCE TABLE (CANADA)

Maintenance interval / Maintenance item		Number of months or miles {kilometers}, whichever comes first											
	Months		5	10	15	20	25	30	35	40	45	50	55	60
	×1,000 Kilometers		8	16	24	32	40	48	56	64	72	80	88	96
	×1,000 Miles		5	10	15	20	25	30	35	40	45	50	55	60
Engine														
Engine oil			R	R	R	R	R	R	R	R	R	R	R	R
Oil filter			R	R	R	R	R	R	R	R	R	R	R	R
Tension of all drive belts			I	I	I	I	I	I	I	I	I	I	I	I
Engine timing belt														R*1
Air cleaner														
Air cleaner element					I			R			I			R
Ignition system														
Spark plugs								R						R
Cooling system														
Engine coolant level and strength			I	I	I	I	I	I	I	I	I	I	I	I
Cooling system for leaks					I			I			I			I
Engine coolant								R						R
Fuel system														
Idle speed					I			I			I			I
Fuel lines and hoses								I*2						I
Fuel filter								R						R
PCV valve														I*2
Emission hoses and tubes														I
Chassis and body														
Automatic transaxle fluid level			I	I	I	I	I	I	I	I	I	I	I	I
Transaxle oil (MTX and ATX)								R						R
Drive shaft dust boots								I						I
Brake lines and hoses								I						I
Brake and clutch fluid level			I	I	I	I	I	I	I	I	I	I	I	I
Brake fluid								R*3						R*3
Disc brakes (front and rear)					I			I			I			I
Rear drum brakes								I						I
Tire inflation pressure and tire wear			I	I	I	I	I	I	I	I	I	I	I	I
Tires					Rt			Rt			Rt			Rt
Power steering fluid level			I	I	I	I	I	I	I	I	I	I	I	I
Steering operation and linkage (includes four wheel alignment)								I						I
Front and rear suspension components								I						I
All chassis and body nuts and bolts					I			I			I			I
Exhaust system heat shields								I						I
All locks and hinges			L	L	L	L	L	L	L	L	L	L	L	L
Washer fluid level			I	I	I	I	I	I	I	I	I	I	I	I
Function of all lights			I	I	I	I	I	I	I	I	I	I	I	I
Air conditioner system (if equipped)														
Refrigerant amount				I		I		I		I		I		I
A/C compressor operation				I		I		I		I		I		I

Chart symbols:
I : Inspect and repair, clean, or replace if necessary.
(Inspect, and if necessary replace.....Air cleaner element only)
R: Replace
L : Lubricate
Rt : Rotation (tires)

Remarks:
After 60 months or 60,000 miles {96,000 km}, continue to follow the described maintenance at the recommended intervals.
*1 Replacement of the timing belt is required every 60,000 miles {96,000 km}. Failure to replace this belt may result in damage to the engine.
*2 This maintenance is recommended by Mazda. However, it is not necessary for emission warranty coverage or manufacturer recall liability.
*3 This maintenance is recommended by Mazda.

Before beginning any service procedure, refer to the 1995 MX–3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

ENGINE (K8)

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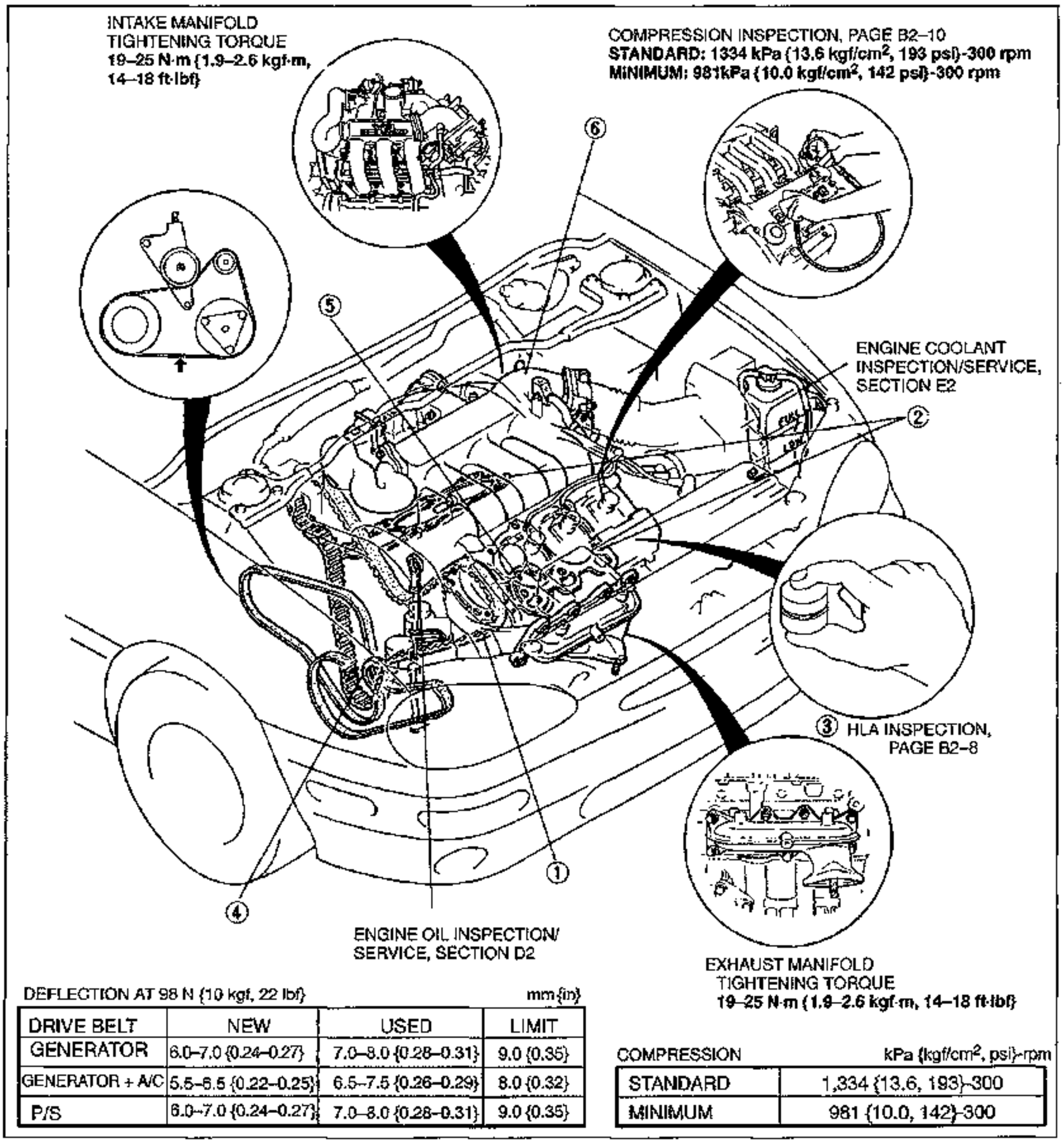

DEFLECTION AT 98 N {10 kgf, 22 lbf} mm{in}

DRIVE BELT	NEW	USED	LIMIT
GENERATOR	6.0–7.0 {0.24–0.27}	7.0–8.0 {0.28–0.31}	9.0 {0.35}
GENERATOR + A/C	5.5–6.5 {0.22–0.25}	6.5–7.5 {0.26–0.29}	8.0 {0.32}
P/S	6.0–7.0 {0.24–0.27}	7.0–8.0 {0.28–0.31}	9.0 {0.35}

COMPRESSION kPa {kgf/cm², psi}-rpm

STANDARD	1,334 {13.6, 193}-300
MINIMUM	981 {10.0, 142}-300

1. Timing belt
Removal / Inspection / Installation ..... page B2–13
2. Cylinder head gasket
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3. HLA
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4. Front oil seal
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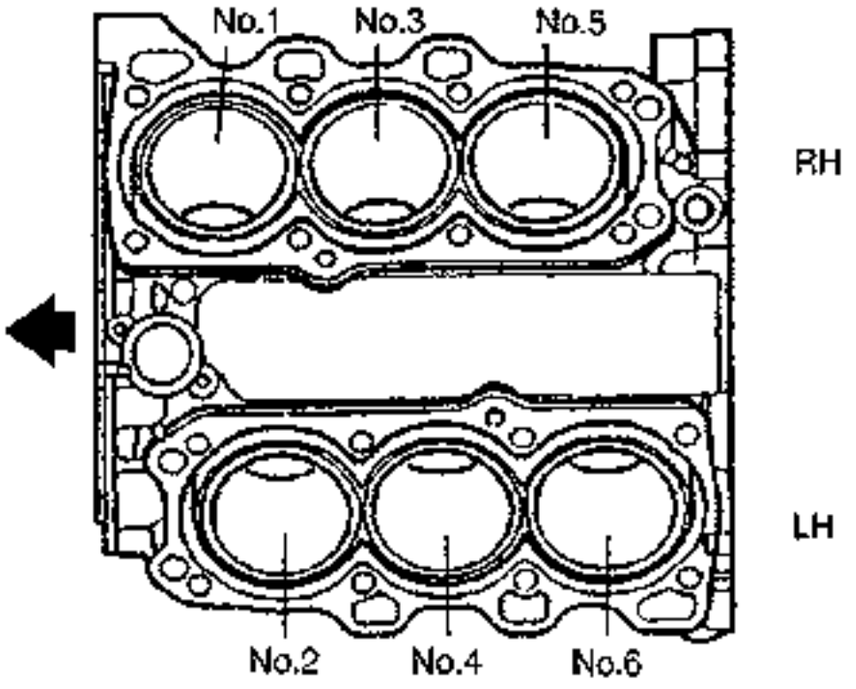
OUTLINE

SPECIFICATIONS

Item \ Engine				K8 DOHC
Type				Gasoline, 4-cycle
Cylinder arrangement and number				60°-V configuration, 6 cylinders
Combustion chamber				Pentroof
Valve system				DOHC, belt-driven, 24 valves
Displacement			mℓ {cc, cu in}	1,844 {1,844, 112.4}
Bore stroke			mm {in}	75 × 69.6 {2.95 × 2.74}
Compression ratio				9.2
Compression pressure			kPa {kgf/cm², psi}-rpm	1,334 {13.6, 193}-300
Valve timing	IN	Open	BTDC	6°
		Close	ABDC	37°
	EX	Open	BBDC	49°
		Close	ATDC	6°
Valve clearance		IN	mm {in}	0 {0} : Maintenance-free
		EX	mm {in}	0 {0} : Maintenance-free
Firing order				1–2–3–4–5–6

Cylinder Arrangement



TROUBLESHOOTING GUIDE

Problem	Possible Cause	Action	Page
Difficult starting	**Malfunction of engine–related components**		
	Burned valve	Replace	B2–74
	Worn piston, piston ring, or cylinder	Replace or repair	B2–82
	Damaged cylinder head gasket	Replace	B2–23
	Malfunction of fuel system	Refer to section F2	
	Malfunction of electrical system	Refer to section G	
Poor idling	**Malfunction of engine-related components**		
	Malfunction of HLA	Replace	B2–37
	Poor valve-to-valve seat contact	Repair or replace	B2–76
	Damaged cylinder head gasket	Replace	
	Malfunction of fuel system	Refer to section F2	

*Tappet noise may occur if the engine has not been started for an extended period of time. The noise should stop after the engine reaches normal operating temperature. (HLA troubleshooting: Refer to page B2–8.)

Problem	Possible Cause	Action	Page
Insufficient power	**Insufficient compression**		
	Malfunction of HLA	Replace	B2–37
	Compression leakage from valve seat	Repair	B2–76
	Stuck valve	Replace	B2–74
	Weak or broken valve spring	Replace	B2–77
	Damaged cylinder head gasket	Replace	B2–23
	Cracked or distorted cylinder head	Replace	B2–73
	Stuck, damaged, or worn piston ring	Replace	B2–82
	Cracked or worn piston	Replace	B2–82
	Malfunction of fuel system	Refer to section F2	
	Others		
	Dragging brake	Refer to section P	
	Wrong size tires	Refer to section Q	
Abnormal combustion	**Malfunction of engine-related components**		
	Malfunction of HLA	Replace	B2–37
	Stuck or burned valve	Replace	B2–74
	Weak or broken valve spring	Replace	B2–77
	Carbon accumulation in combustion chamber	Eliminate carbon	
	Malfunction of fuel system	Refer to section F2	
Excessive oil consumption	**Oil working up**		
	Worn piston ring groove or stuck piston ring	Replace	B2–82
	Worn piston or cylinder	Replace or repair	B2–81,82
	Oil working down		
	Worn valve seal	Replace	B2–65
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	Connecting rod bearing heat-damaged	Replace	B2–84
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	Malfunction of friction gear	Replace	B2–76
	Malfunction of cooling system	Refer to section E2	
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	Others		
	Malfunction of water pump bearing	Replace	—
	Improper drive belt tension	Adjust	B2–5
	Malfunction of generator bearing	Replace	—
	Exhaust gas leakage	Repair	—

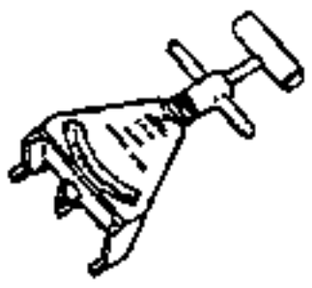
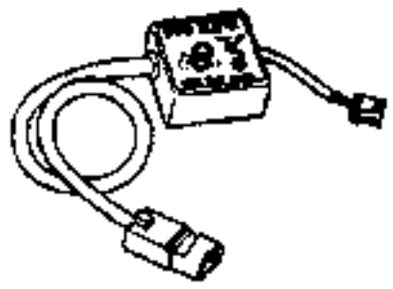
* Tappet noise may occur if the engine has not been started for an extended period of time. The noise should stop after the engine reaches normal operating temperature. (HLA troubleshooting: Refer to page B2–3.)

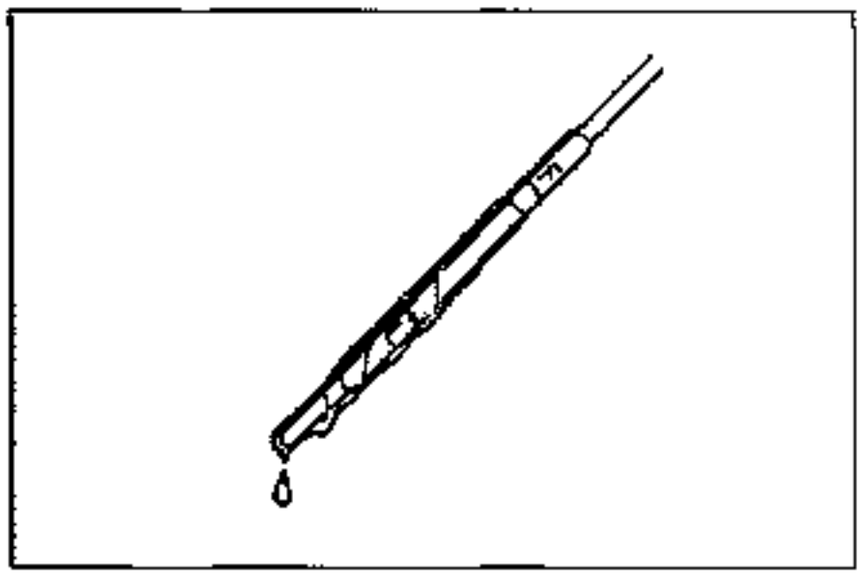
Warning

- **Continuous exposure with USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after this work.**

ENGINE TUNE-UP

PREPARATION
SST

49 9200 020A V-ribbed belt tension gauge		For inspection of drive belt tension	49 B019 9A0 System selector		For inspection of ignition timing and idle speed

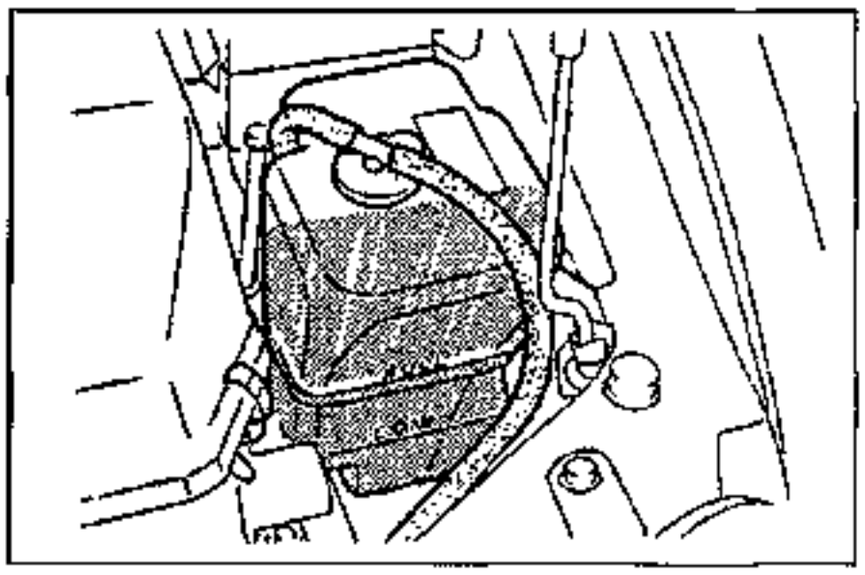


ENGINE OIL
Inspection
1. Be sure the vehicle is on level ground.
2. Warm up the engine to normal operating temperature and stop it.
3. Wait for five minutes.
4. Remove the dipstick and check the oil level and condition.
5. Add or replace oil if necessary.

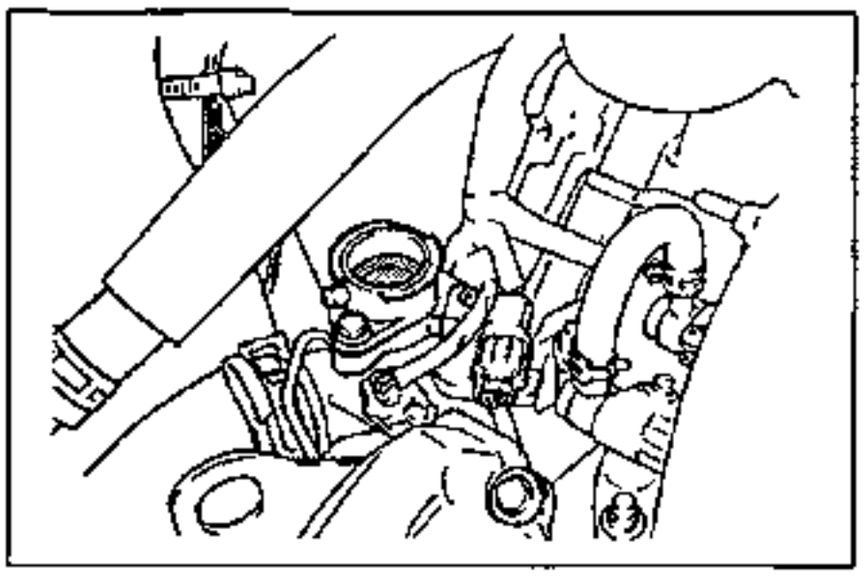
Note
- The distance between the L and F marks on the dipstick represents 1.0 L {1.1 US qt, 0.9 Imp qt}.

ENGINE COOLANT
Inspection
Coolant level (engine cold)

Warning
- **Removing the radiator cap or the coolant filler cap while the engine is running, or when the engine and radiator are hot is dangerous. Scalding coolant and steam can shoot out and cause serious injury. It can also damage the engine and cooling system. Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counter-clockwise to the first stop. Step back while the pressure escapes. When you're sure all the pressure is gone, press down on the cap – still using a cloth – turn it, and remove it.**

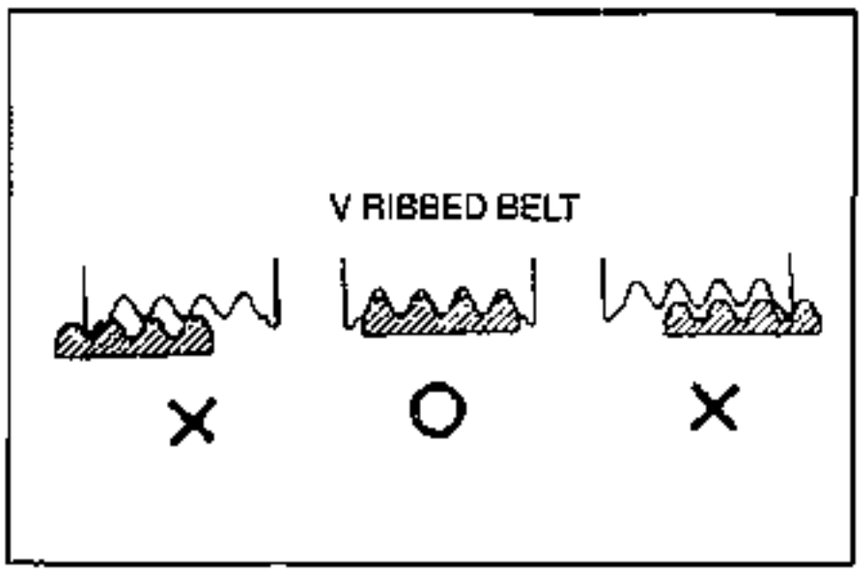


1. Verify that the coolant level is near the filler neck.
2. Verify that the coolant level in the coolant reservoir is between the FULL and LOW marks.
3. Add coolant if necessary.



Coolant quality

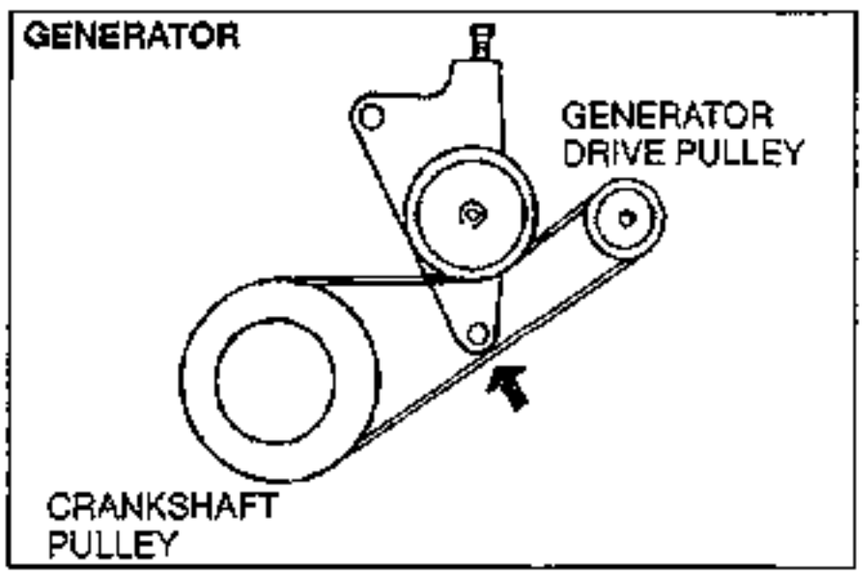
1. Verify that there is no buildup of rust or scale around the radiator cap, filler cap, or filler neck.
2. Verify that the coolant is free of oil.
3. Replace the coolant if necessary.



DRIVE BELT

Inspection

1. Check the drive belts for wear, cracks, and fraying. Replace if necessary.
2. Verify that the drive belts are correctly mounted on the pulleys.



3. Check the drive belt deflection when the engine is cold, or at least 30 minutes after the engine has stopped. Apply moderate pressure **98 N {10kgf, 22 lbf}** midway between the specified pulleys.

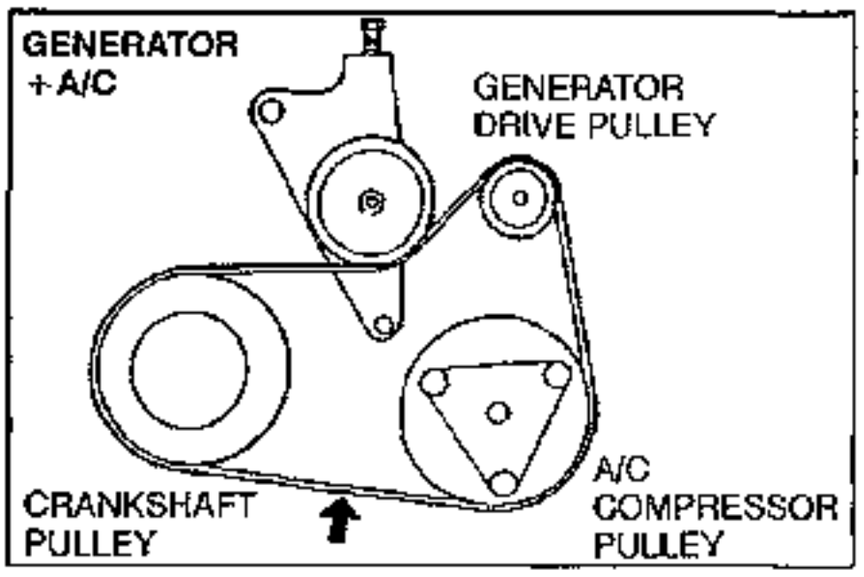
Deflection

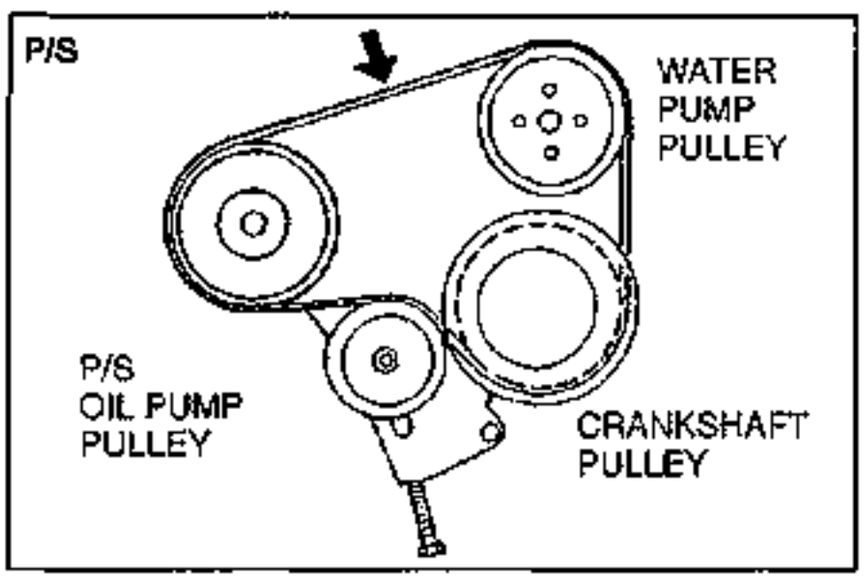
mm {in}

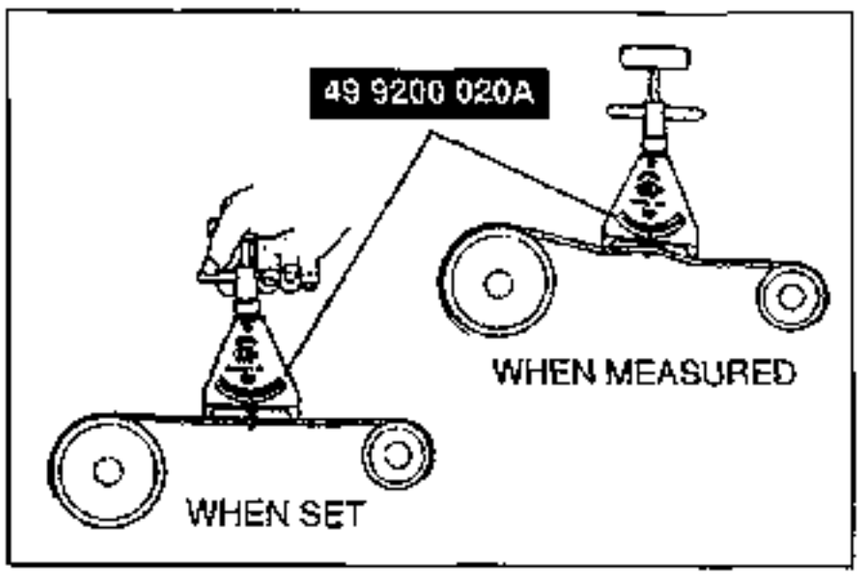
Drive belt	New *	Used	Limit
Generator	6.0–7.0 {0.24–0.27}	7.0–8.0 {0.28–0.31}	9.0 {0.35}
Generator + A/C	5.5–6.5 {0.22–0.25}	6.5–7.5 {0.26–0.29}	8.0 {0.32}
P/S	6.0–7.0 {0.24–0.27}	7.0–8.0 {0.28–0.31}	9.0 {0.35}

* A belt that has been on a running engine for less than five minutes.

4. If the deflection is not within the specification, adjust it. (Refer to page B2–7.)







Drive belt tension check

Belt tension can be checked in place of belt deflection.

1. Check the drive belt tension when the engine is cold, or at least 30 minutes after the engine has stopped. Using the **SST**, check the belt tension between any two pulleys.

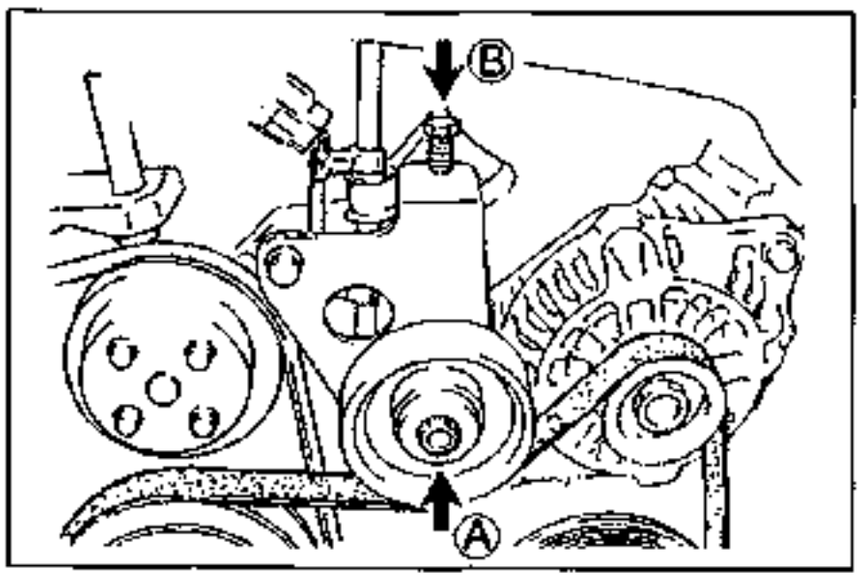
Tension

N {kgf, lbf}

Drive belt	New *	Used	Limit
Generator	690–880 {70–90, 160–190}	500–680 {50–70, 110–150}	440 {45,99}
Generator + A/C	690–880 {70–90,160–190}	500–680 {50–70,110–150}	440 {45,99}
P/S	540–680 {55–70,130–150}	400–530 {40–55, 90–120}	340 {35,77}

* A belt that has been on a running engine for less than five minutes.

2. If the tension is not within the specification, adjust it. (Refer to below.)



Adjustment

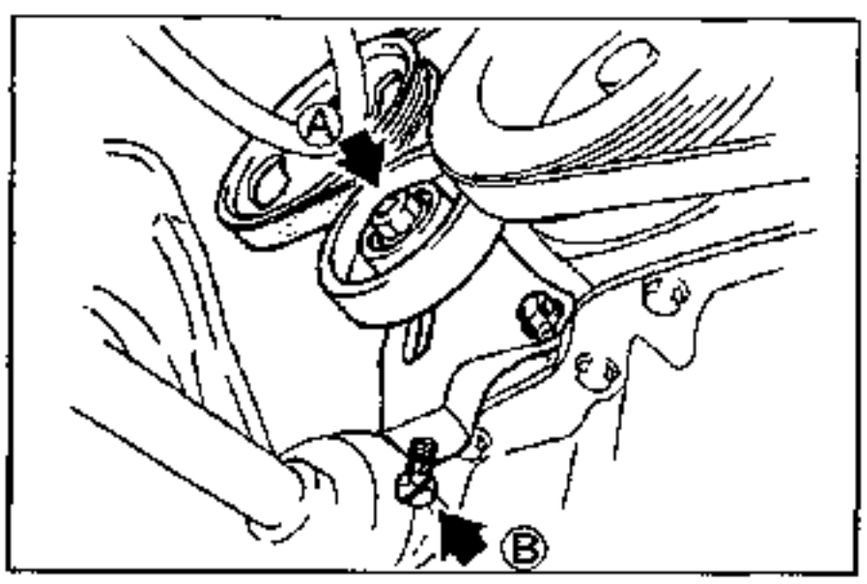
Generator + A/C, Generator

1. Loosen idler pulley locknut Ⓐ.
2. Adjust the belt deflection by turning adjusting bolt Ⓑ.

Deflection
(Generator + A/C)
New : 5.5–6.5mm {0.22–0.25 in}
Used: 6.5–7.5mm {0.26–0.29 in}
(Generator)
New: 6.0–7.0 mm {0.24–0.27 In}
Used: 7.0–8.0 mm {0.28–0.31 in}

3. Tighten pulley locknut Ⓐ.

Tightening torque:
32–46 N·m {3.2–4.7 kgf·m, 24–33 ft·lbf}



P/S

1. Loosen idler pulley locknut Ⓐ.
2. Adjust the belt deflection by turning adjusting bolt Ⓑ.

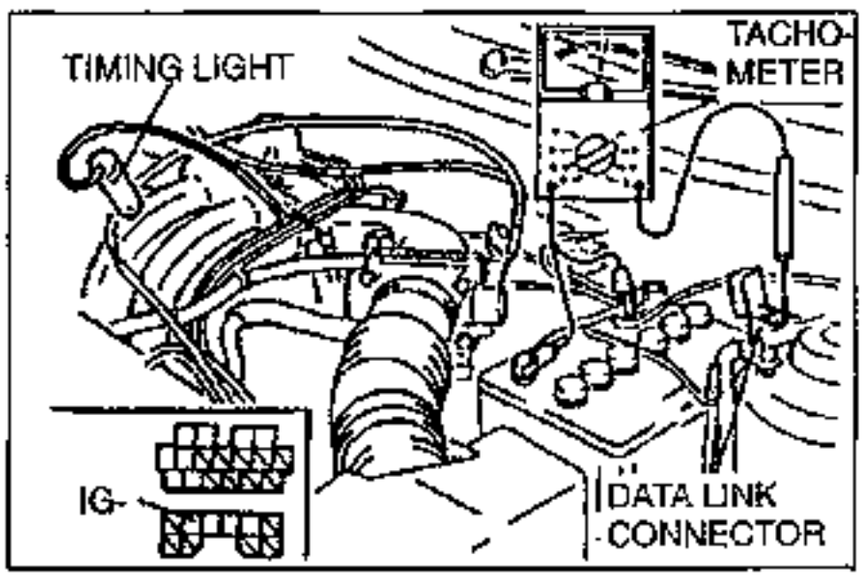
Deflection
New : 6.0–7.0mm {0.24–0.27 in}
Used: 7.0–8.0mm {0.28–0.31in}

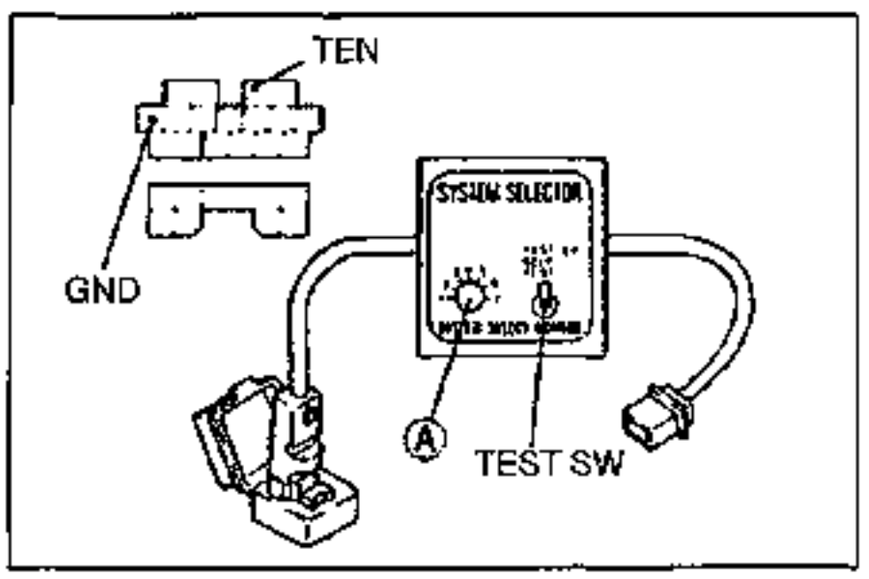
3. Tighten pulley locknut Ⓐ.

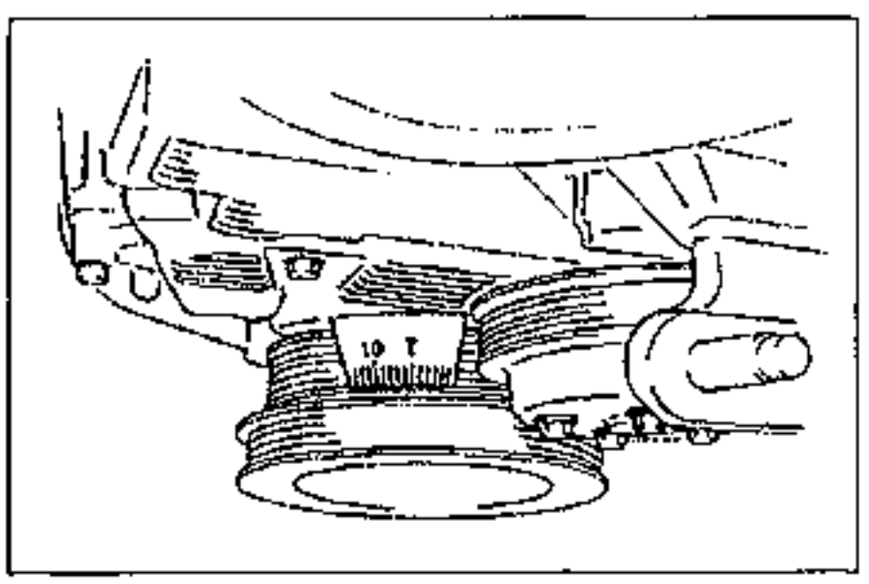
Tightening torque:
32–46 N·m {3.2–4.7 kgf·m, 24–33 ft·lbf}

HLA TROUBLESHOOTING GUIDE

Problem	Possible Cause	Action
1. Noise when engine is first started after oil is changed. 2. Noise when engine is started after setting approx. one day.	Insufficient oil in HLA Oil leakage from HLA	Run engine at 2,000–3,000 rpm. If noise stops after 2 seconds–10 minutes,* HLA is normal. If not, replace HLA. * Time required for engine oil to circulate within engine includes tolerance for engine oil condition and ambient temperature.
3. Noise when engine is started after cranking for 3 seconds or more. 4. Noise when engine is started after new HLA is installed.		
5. Noise continues more than 10 minutes.	Insufficient oil pressure	Check oil pressure. If lower than specification, check for cause. **Oil pressure: 334–490 kPa {3.4–5.0 kgf/cm², 49–71 psi}-3,000 rpm**
	Faulty HLA	(Refer to page B2–79.) Press down HLA by hand. If it does not move, HLA is normal. If it moves, replace HLA. Measure valve clearance. If more than 0mm {0 in}, replace HLA.
6. Noise during idle after high speed running.	Incorrect oil amount	Check oil level. Drain or add oil as necessary.
	Deteriorated oil	Check oil quality. If deteriorated, replace with specified type and amount of oil.







IGNITION TIMING, IDLE SPEED

Preparation

1. Warm up the engine to normal operating temperature.
2. Turn all electric loads off.
   - Headlight switch
   - Blower switch
   - Rear window defroster switch
3. Connect the **SST** to the data link connector.
4. Connect a timing light.
5. Connect a tachometer to the data link connector terminal **IG-**.

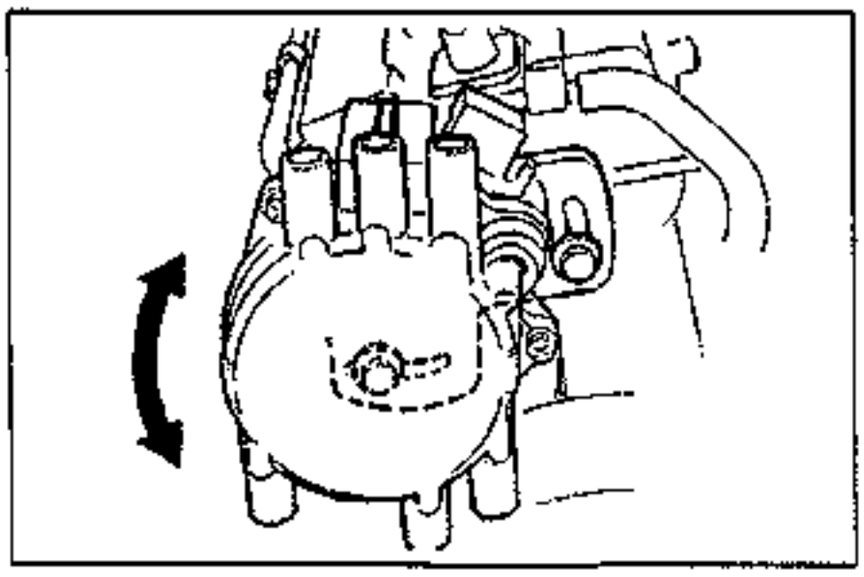
Ignition timing

1. Perform "Preparation." (Refer to above.)
2. Make sure the idle speed is within the specification. If not, adjust the idle speed.

Idle speed (MTX in Neutral, ATX in P range) :650–710 rpm

3. Set switch Ⓐ to position 1.
4. Set TEST SW to SELF-TEST.
5. If the **SST** is not used, jump across the TEN and GND terminals of the data link connector.
6. Make sure the timing mark (yellow) on the crankshaft pulley and the mark on the timing belt cover are aligned.

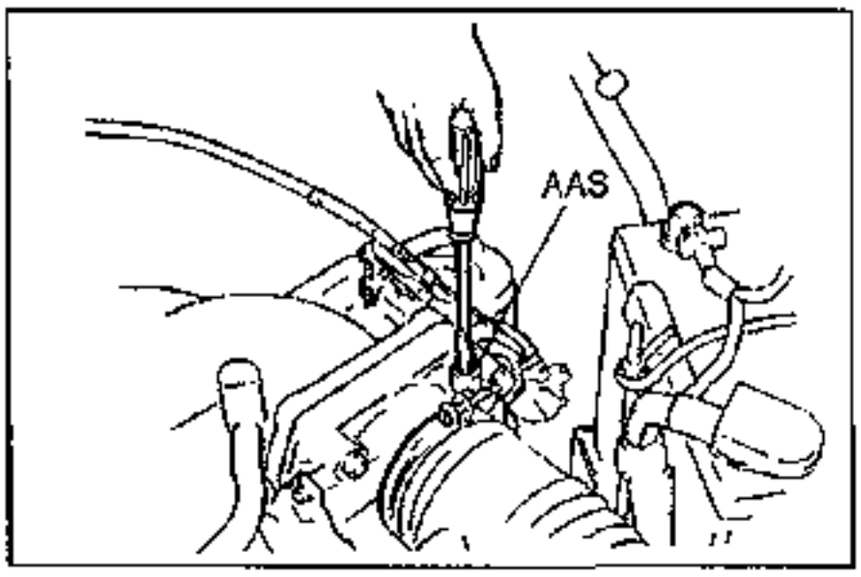
Ignition timing: 9–11° BTDC



7. If the marks are not aligned, loosen the distributor mounting bolts and turn the distributor to make the adjustment.
8. Tighten the distributor bolts to the specified torque.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

9. Disconnect the jumper wire or the **SST**.



Idle Speed

1. Apply parking brake.
2. Perform "Preparation." (Refer to page B2–8.)
3. With the coolant fan off, verify that the idle speed is within the specification.

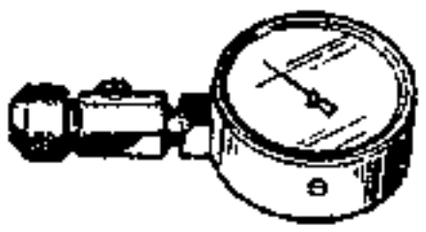
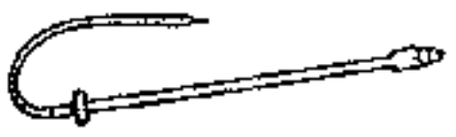
Idle speed (Neutral or P range) : 640–700 rpm

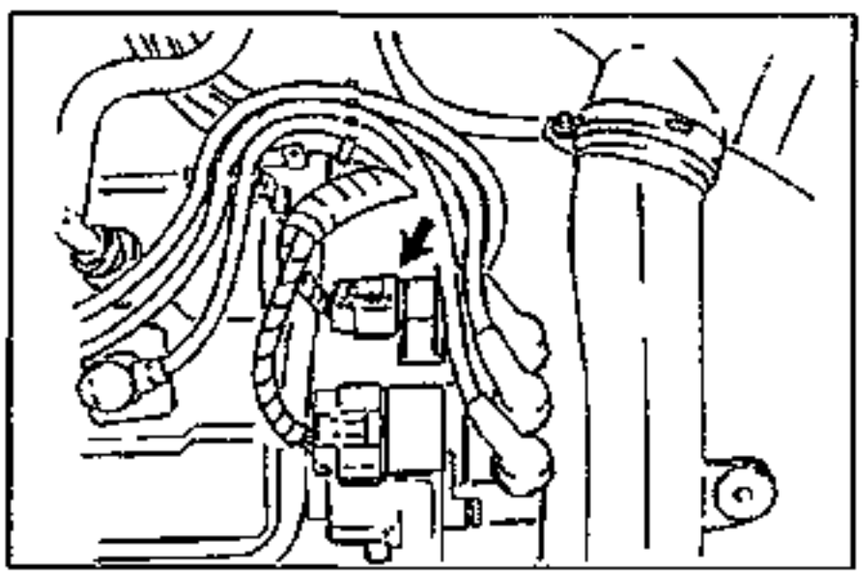
4. If not, adjust the idle speed by turning the air adjusting screw (AAS).
5. Disconnect the jumper wire or the **SST**.

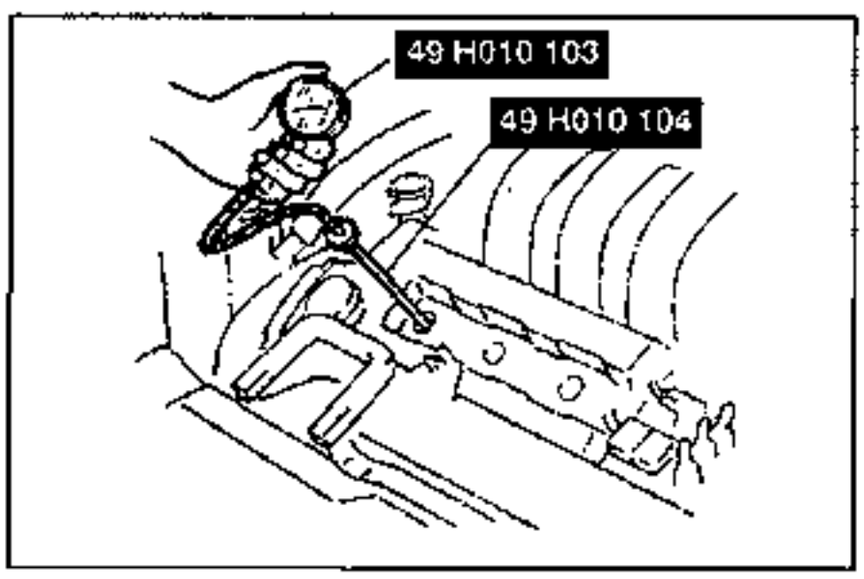
COMPRESSION

If the engine exhibits low power, poor fuel economy, or poor idle, check the following:
1. Ignition system (Refer to section G.)
2. Compression (Refer to below.)
3. Fuel system (Refer to section F2.)

PREPARATION
SST

49 H010 103 Compression gauge		For Inspection of compression	49 H010 104 Adaptor 	For Inspection of compression





INSPECTION
1. Verify that the battery is fully charged. Recharge it if necessary.
2. Warm up the engine to the normal operating temperature.
3. Stop the engine and allow it to cool for about 10 munutes.
4. Remove the all spark plugs.
5. Disconnect the distributor connector.
6. Install **SST** into the No.1 spark plug hole.
7. Fully depress the accelerator pedal and crank the engine.
8. Note the maximum gauge reading.
9. Check each cylinder as above.

Compression

kPa {kgf/cm^2, psi}-rpm

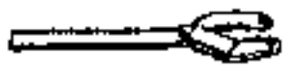
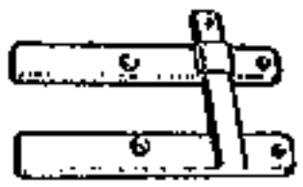
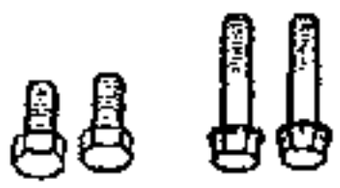
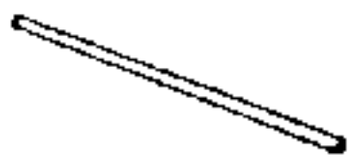
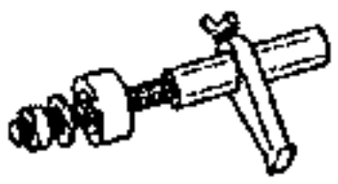
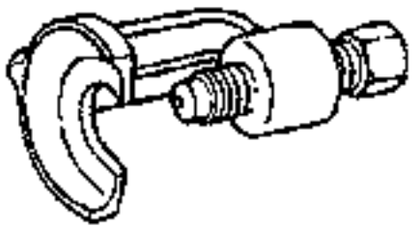
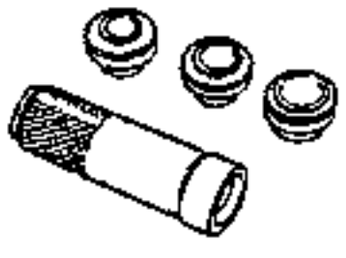
Standard	1,334 {13.6,193}-300
Minimum	981 {10.0, 142}-300
Maximum difference between cylinders	196 {2.0, 28}

10. If the compression in one or more cylinders is low, pour a small amount of clean engine oil into the cylinder and recheck the compression.
    (1) If the compression increases, the piston, piston rings, or cylinder wall may be worn.
    (2) If the compression stays low, the valve may be stuck or improperly seated.
    (3) If the compression in adjacent cylinders stays low, the cylinder head gasket may be damaged or the cylinder head distorted.
11. Remove the **SST**.
12. Connect the distributor connector.
13. Install all spark plugs.

Tightening torque:
15–22 N·m {1.5–2.3 kgf·m, 11–16 ft·lbf}

ON-VEHICLE MAINTENANCE

PREPARATION
SST

49 S120 710 Holder, coupling flange 	For prevention of crankshaft rotation	49 E011 1A1 Set, holder 	For prevention of crankshaft rotation
49 E011 101 Holder (Part of 49 E011 1A1) 	For prevention of crankshaft rotation	49 E011 102 Bolts (Part of 49 E011 1A1) 	For prevention of crankshaft rotation
49 G017 5A0 Support, engine 	For support of engine	49 G017 501 Bar (Part of 49 G017 5A0) 	For support of engine
49 G017 502 Support (Part of 49 G017 5A0) 	For support of engine	49 G017 503 Hook (Part of 49 G017 5A0) 	For support of engine
49 E011 1A0 Brake set, ring gear 	For prevention of crankshaft rotation	49 E011 103 Shaft (Part of 49 E011 1A0) 	For prevention of crankshaft rotation
49 E011 104 Collar (Part of 49 E011 1A0) 	For prevention of crankshaft rotation	49 E011 105 Stopper (Part of 49 E011 1A0) 	For prevention of crankshaft rotation
49 0116 850C Puller, ball joint 	For removal of tie rod end ball joint	49 G019 017 Installer, oil seal 	For installation of rear oil seal
49 F401 330B Installer set, bearing 	For installation of camshaft oil seals	49 F401 337A Attachment C (Part of 49 F401 330B) 	For installation of camshaft oil seals

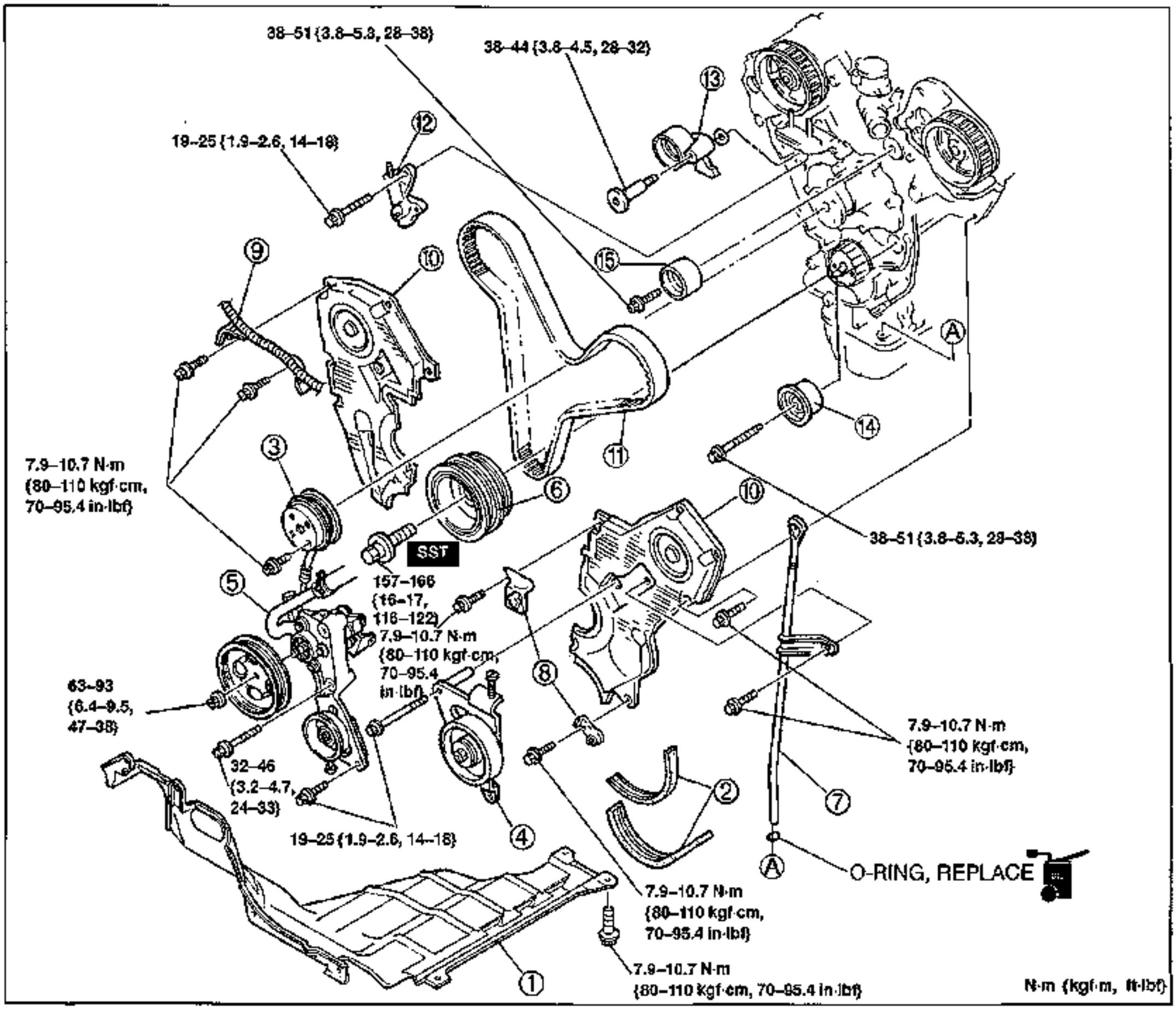
Warning

- **Continuous exposure with USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after this work.**

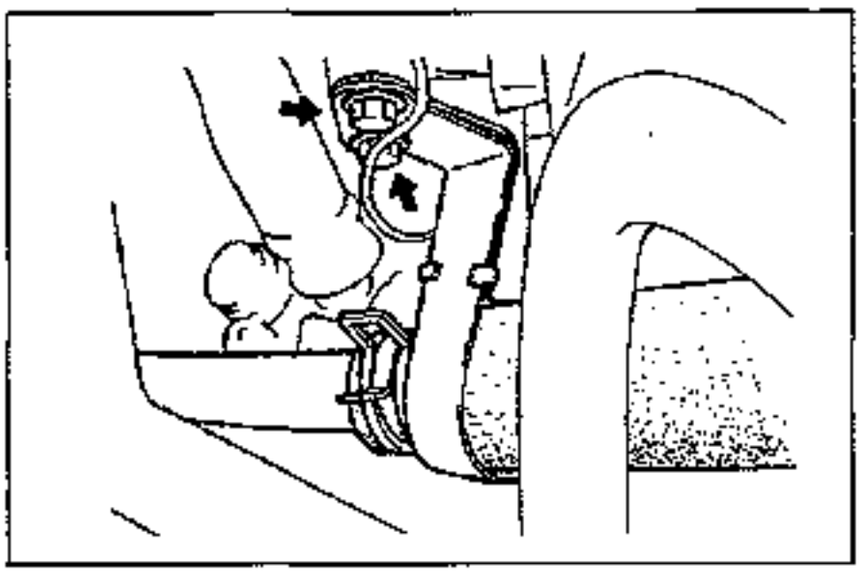
TIMING BELT

Removal / Inspection / Installation

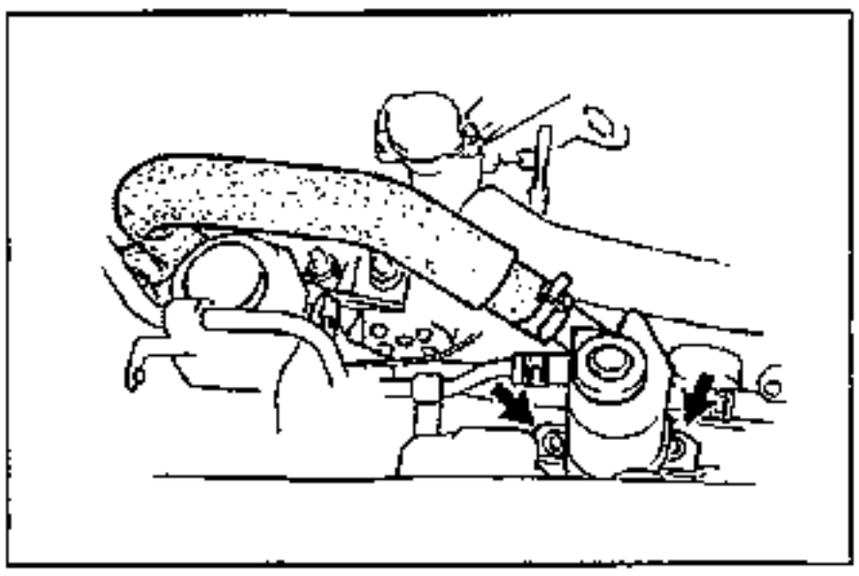
1. Disconnect the negative battery cable.
2. Remove the right front wheel.
3. Remove in the order shown in the figure, referring to **Removal Note.**
4. Install in the reverse order of removal, referring to **Installation Note.**



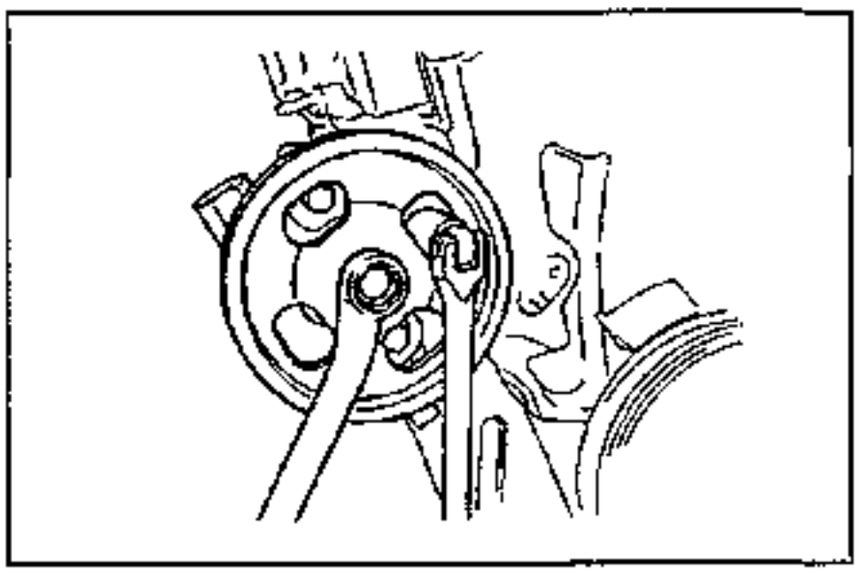
1. Splash shield (RH)
2. Drive belt
   Removal / Installation ..... page B2– 6
3. Water pump pulley
4. Idler pulley and bracket
5. P/S oil pump
   Removal Note ..... page B2–14
   Installation Note ..... page B2–21
6. Crankshaft pulley
   Removal Note ..... page B2–15
   Installation Note ..... page B2–21
7. Dipstick and pipe
   Removal Note ..... page B2–15
   Installation Note ..... page B2–20
8. Crankshaft position sensor harness bracket
9. Engine harness bracket
10. Timing belt cover
    Removal Note ..... page B2–15
    Installation Note ..... page B2–19
11. Timing belt
    Removal Note ..... page B2–16
    Inspection ..... page B2–85
    Installation Note ..... page B2–17
12. Timing belt auto tensioner
    Inspection ..... page B2–85
    Installation Note ..... page B2–17
13. Tensioner pulley
14. No.2 idler pulley
15. No.1 idler pulley



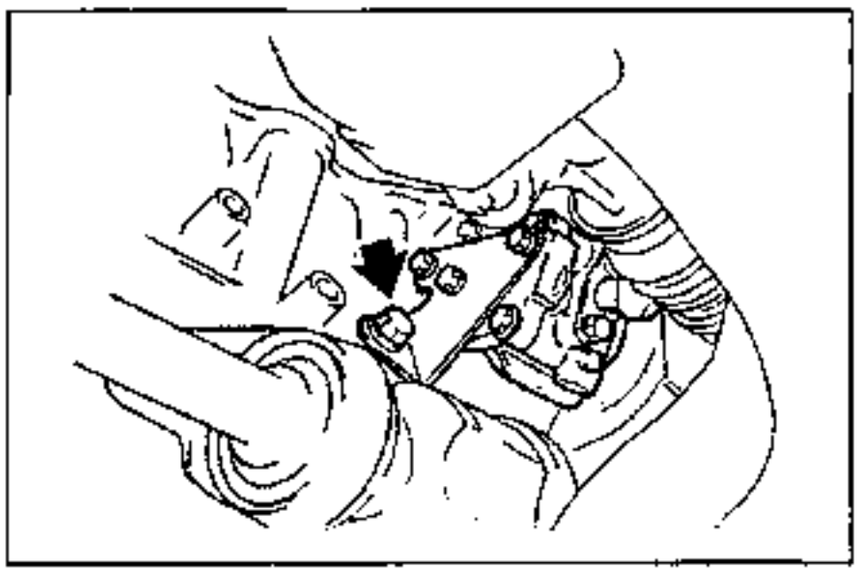
Removal Note
P/S oil pump
1. Disconnect the P/S oil pump hose from the engine.
2. Disconnect the steering pressure sensor connector.



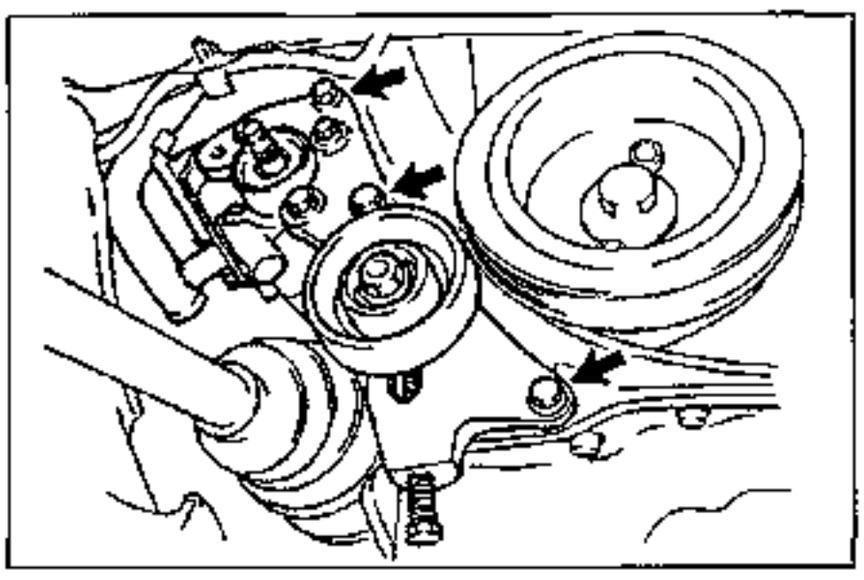
3. Remove the bolts shown in the figure and secure the P/S oil reservoir away from the engine.



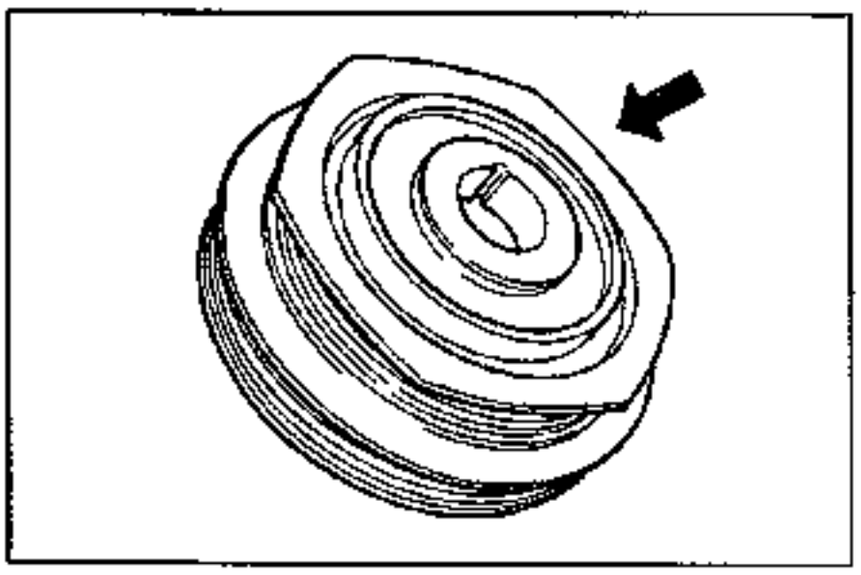
4. Loosen the pulley nut as shown.
5. Remove the pulley.



6. Remove the bolt shown.

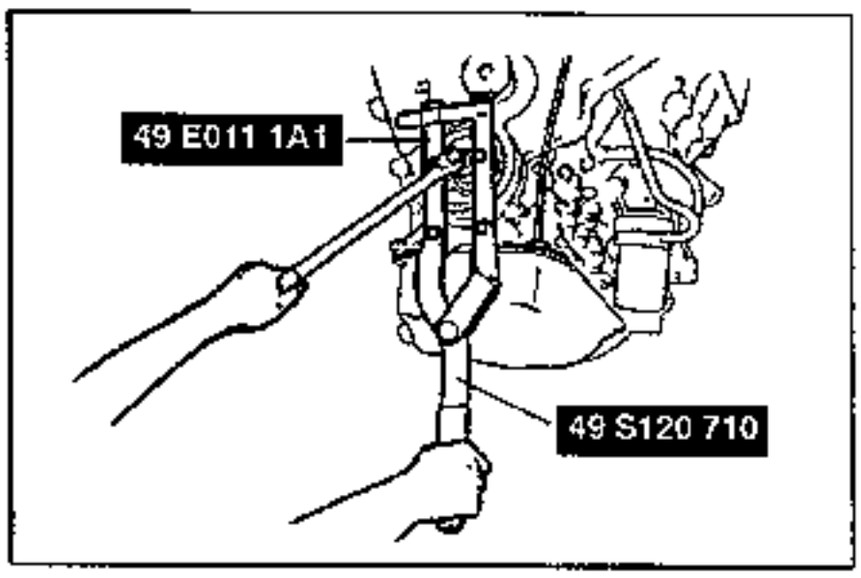


7. Remove the bolts shown in the figure and remove the P/S oil pump.
8. Position the P/S oil pump away from the engine and secure it with wire.

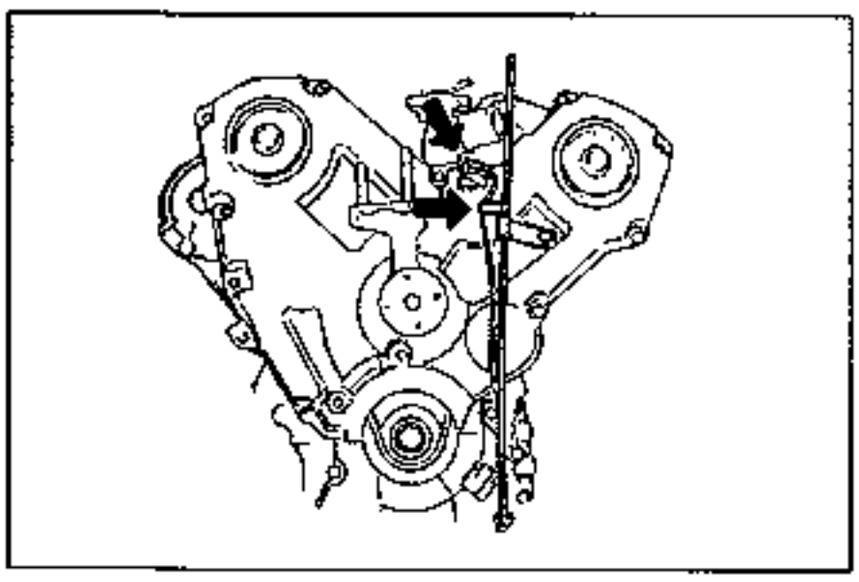


Crankshaft pulley

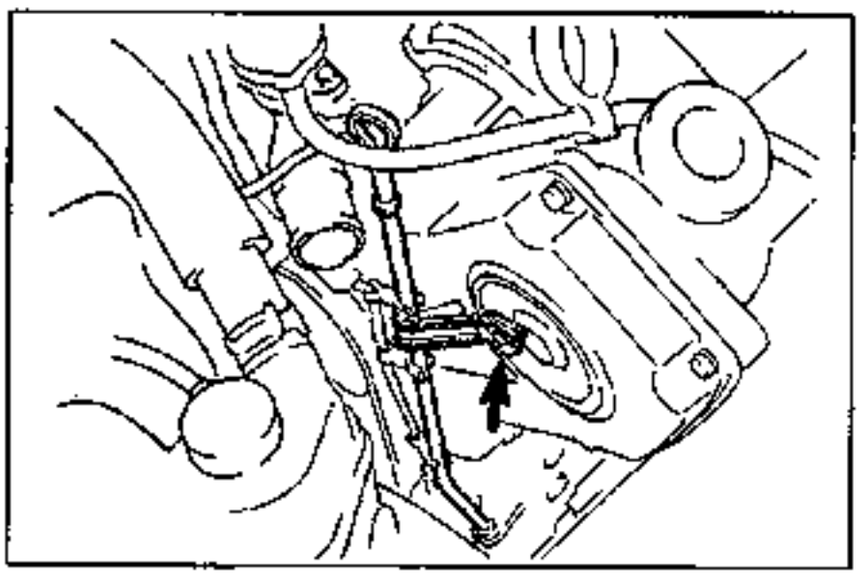
Caution
- **The crankshaft position sensor rotor is on the rear of the pulley, and can be damaged easily.**



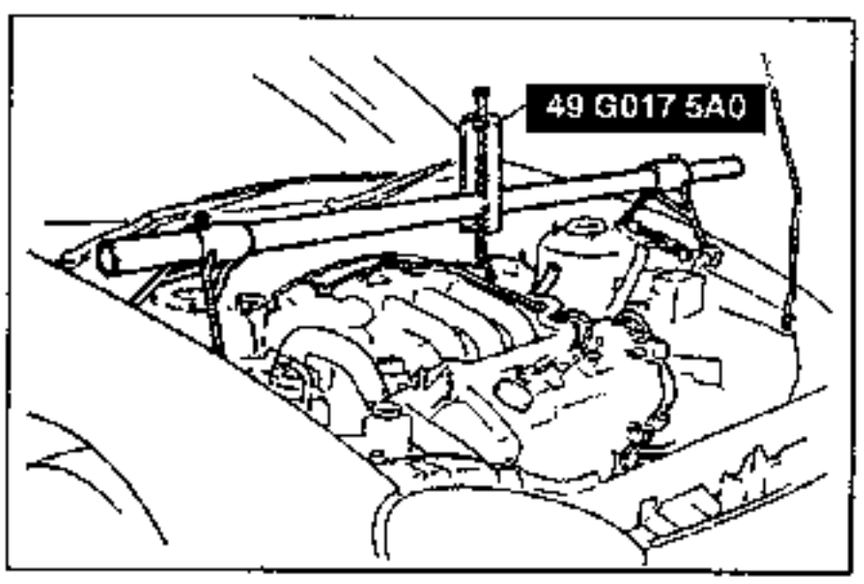
1. Install the **SST** to the crankshaft pulley with bolts (M10 X 1.25).
2. Remove the crankshaft pulley bolt and the pulley.



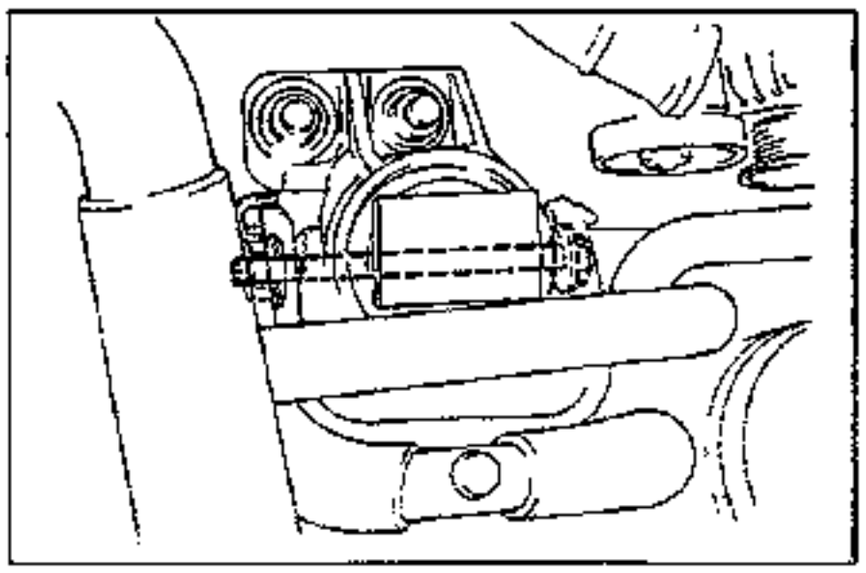
Dipstick and pipe
1. Disconnect the crankshaft position sensor connector.
2. Remove the clip from the dipstick pipe.



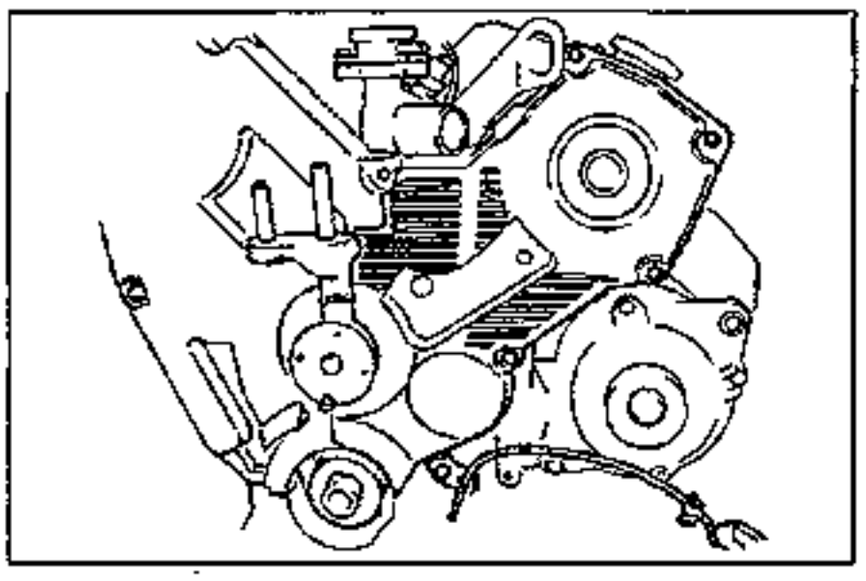
3. Remove the dipstick and pipe.
4. Plug the hole in the engine after removing the pipe.



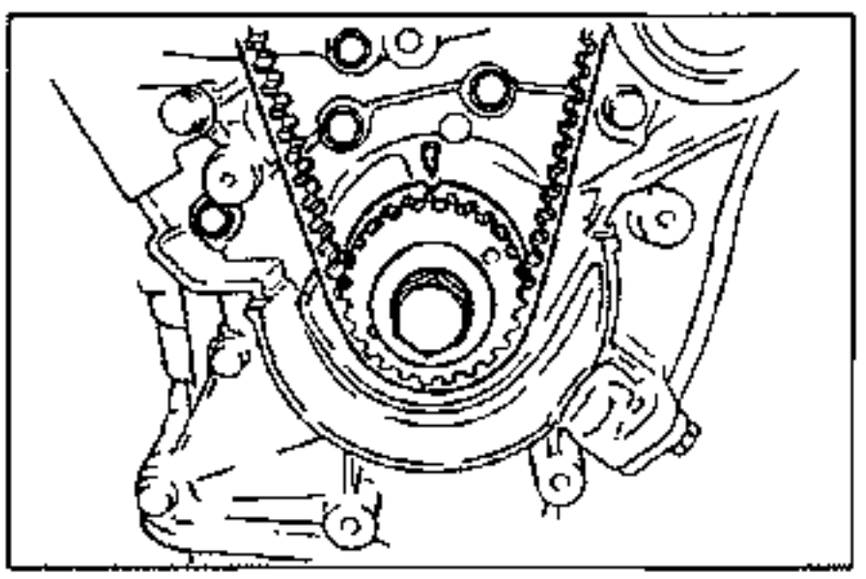
Timing belt cover
1. Support the engine by using the **SST** (engine support).



2. Remove the No.3 engine mount.

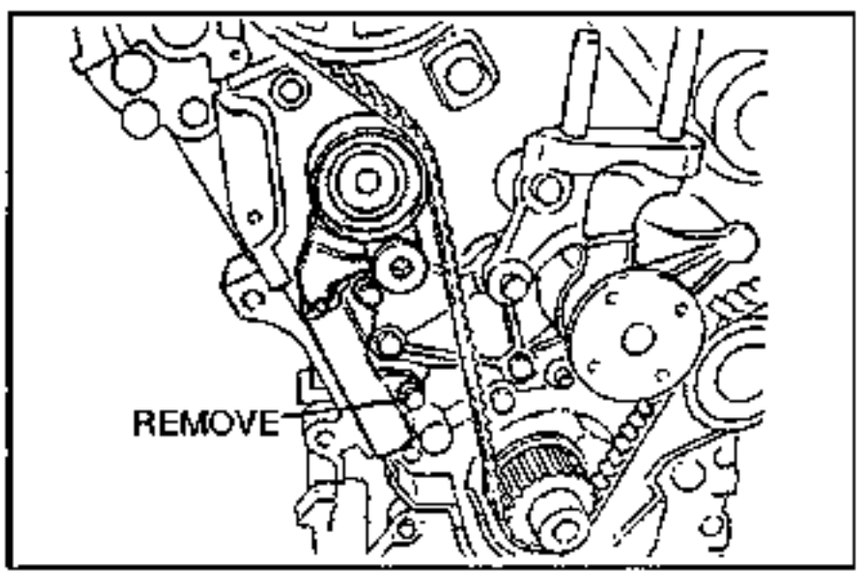


3. Remove the right and left timing belt covers.



Timing belt

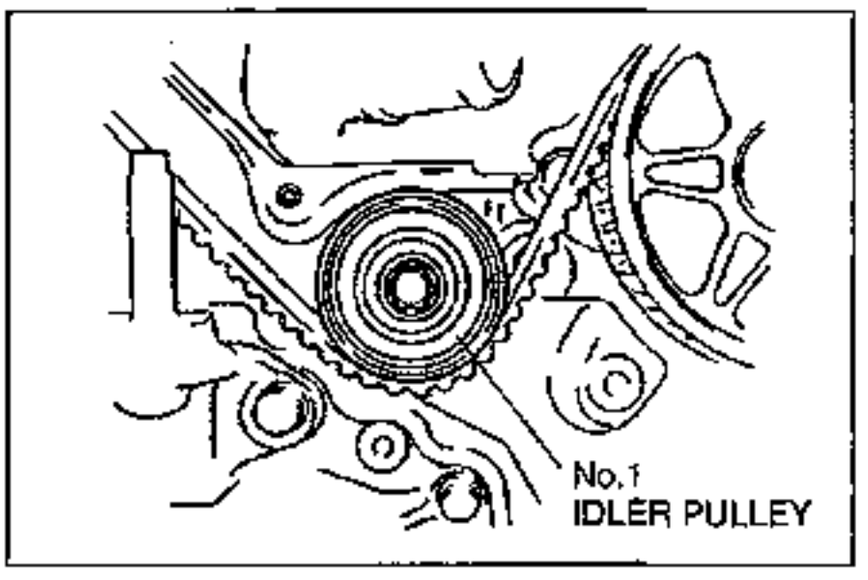
1. Install the crankshaft pulley bolt into the crankshaft.
2. Turn the crankshaft clockwise and align the timing marks. (No.1 piston is at TDC of the compression stroke.)
3. Mark the timing belt rotation on the belt for proper reinstallation.



4. Loosen the auto tensioner bolts and remove the lower bolt.

Caution

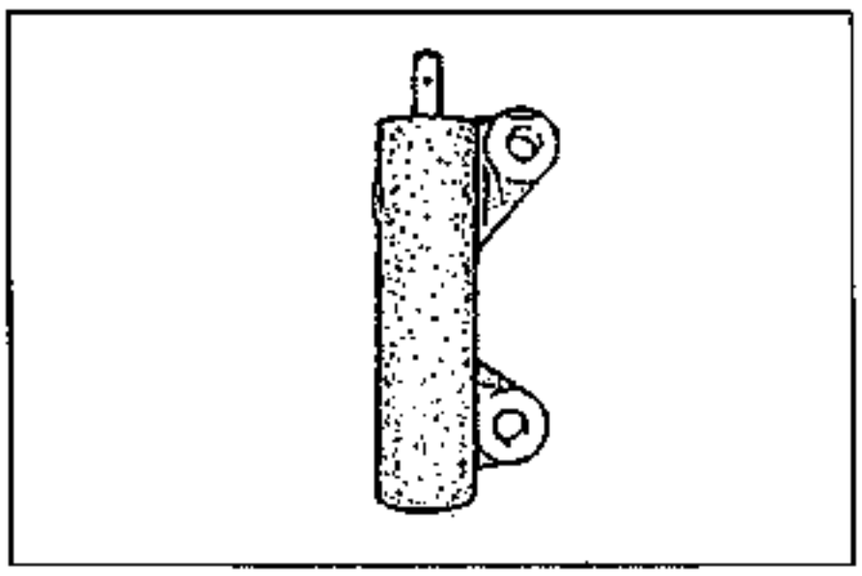
- **When removing the bolt, hold the tensioner so that the bolt holes are aligned, otherwise the threads can be damaged.**



5. Remove the No.1 idler pulley and remove the timing belt.

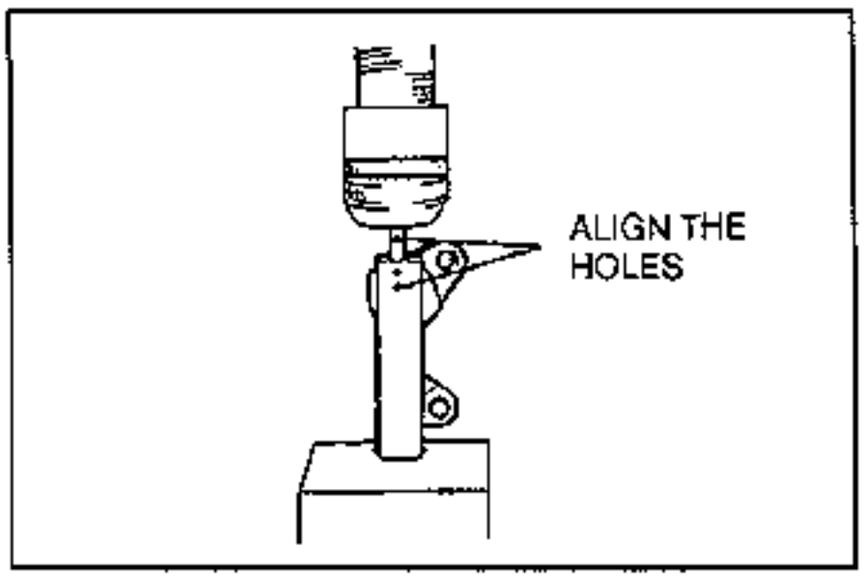
Caution

- **When removing the pulley bolt, hold the pulley so that the bolt holes are aligned, otherwise the threads can be damaged.**
- **The following will damage the belt and shorten its life; Forcefully twisting it, turning it inside out, bending it, or allowing oil or grease on it.**



Inspection

Inspect the following and repair or replace as necessary.
(1) Timing belt (Refer to page B2–85.)
(2) Timing belt auto tensioner (Refer to page B2–85.)
(3) Timing belt pulley (Refer to page B2–85.)
(4) Camshaft pulleys (Refer to page B2–85.)

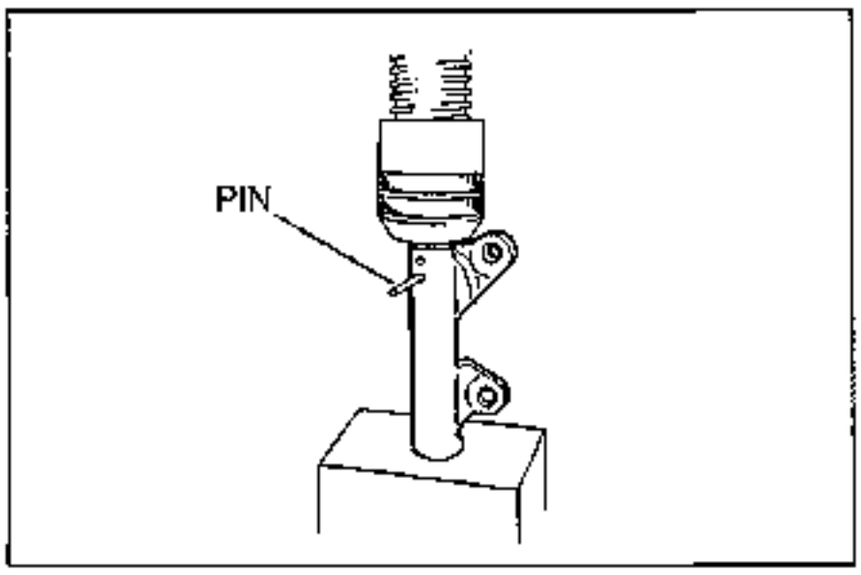


Installation Note
Timing belt auto tensioner

1. Slowly press the tensioner rod into the tensioner body by using a press.

Caution

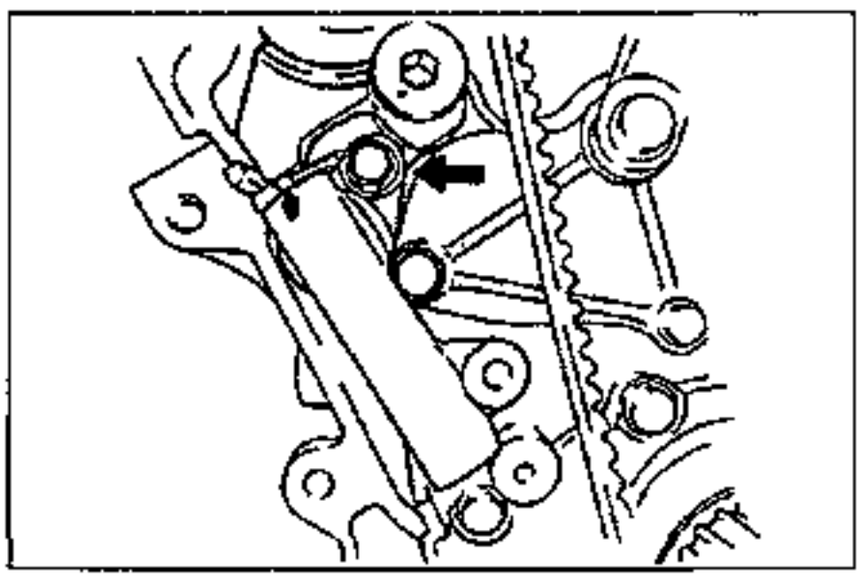
- **Applying pressure of more than 9,807 N {1,000 kgf, 2,200 lbf} can damage the tensioner.**



2. Insert a pin into the second hole in the body as shown to hold the tensioner rod.

Note

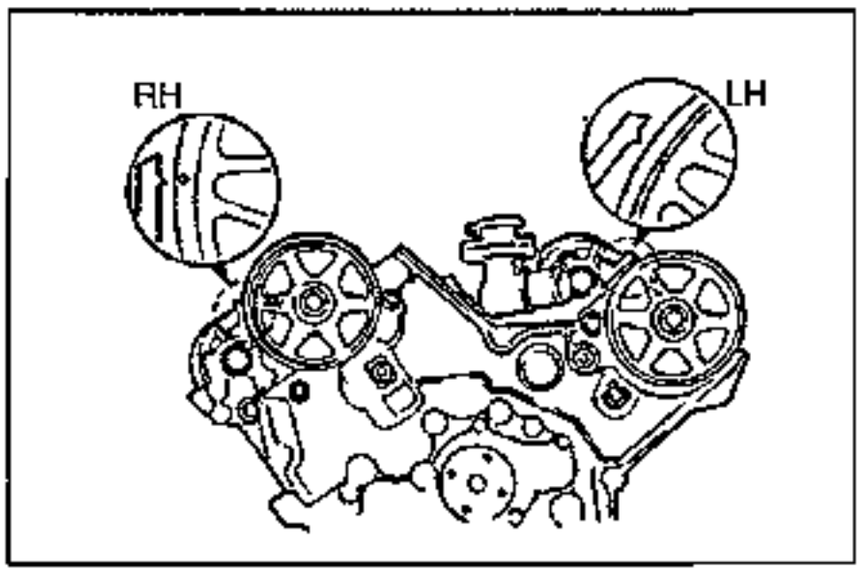
- Pin diameter: 1.6mm {0.063 in}



3. Set the tensioner in place and snugly tighten the tensioner upper bolt.

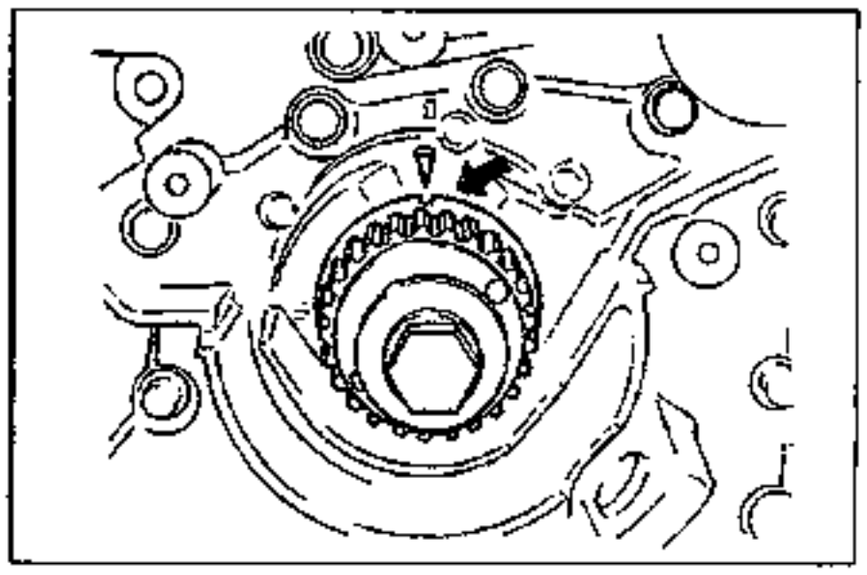
Note

- This must be done to reduce the timing belt resistance when the idler pulley is installed.

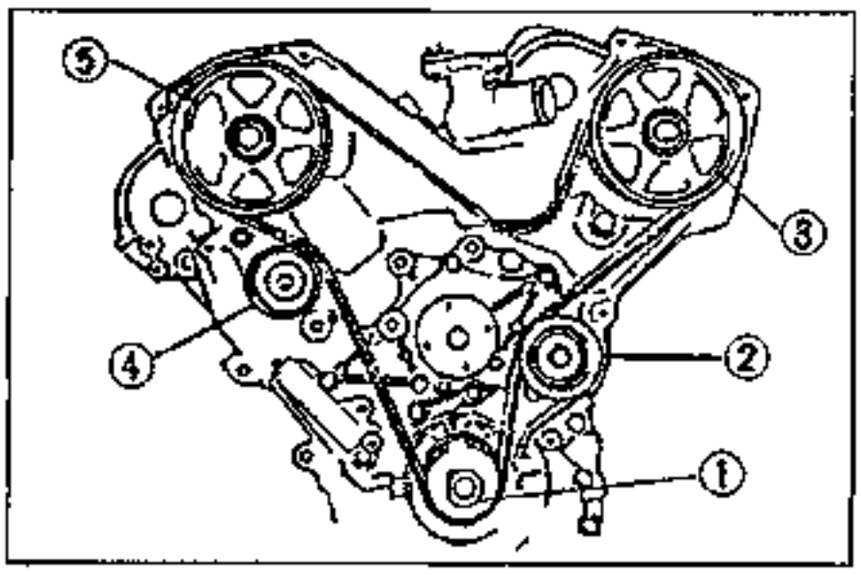


Timing belt

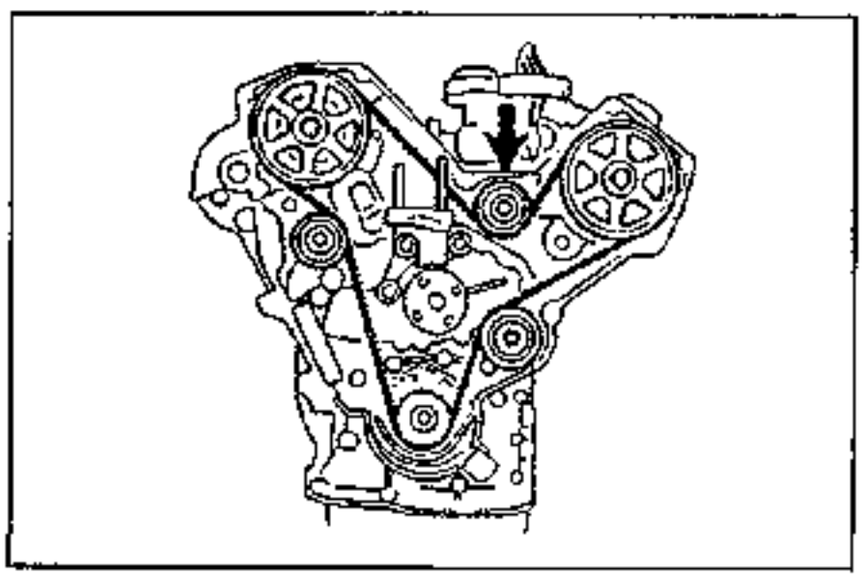
1. Turn the camshaft pulleys clockwise and align the timing marks.



2. Using the crankshaft bolt, turn the crankshaft clockwise and align the timing marks of the timing belt pulley and the oil pump.

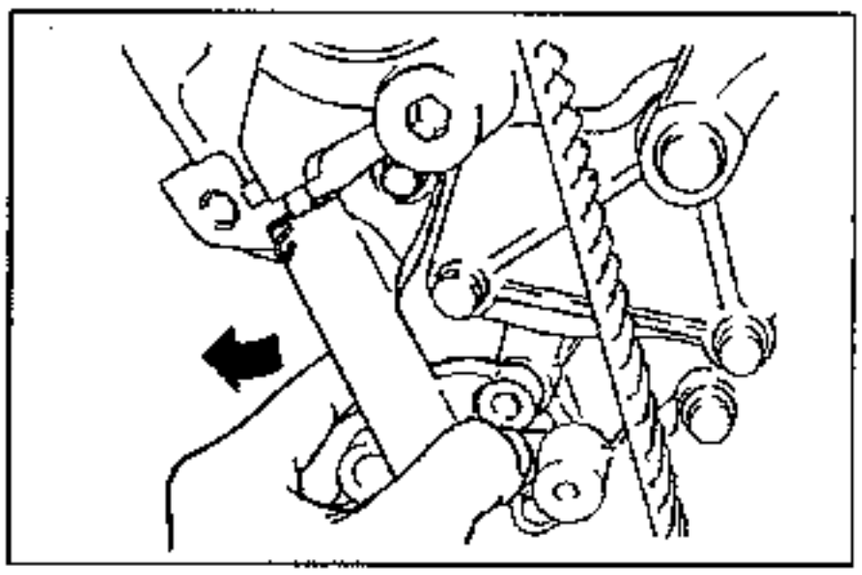


3. Install the timing belt on the pulleys in the order shown below.
   ① Timing belt pulley
   ② No.2 idler pulley
   ③ LH camshaft pulley
   ④ Tensioner pulley
   ⑤ RH camshaft pulley



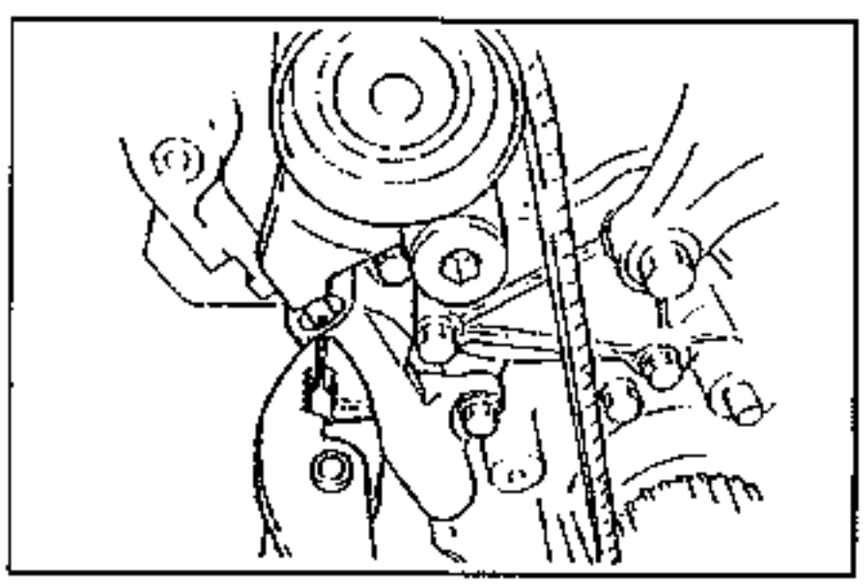
4. Verify that there is tension between pulleys ③ and ①, and between pulleys ① and ⑥.
5. Install the No.1 idler pulley while applying pressure on the timing belt.

   Tightening torque:
   38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}

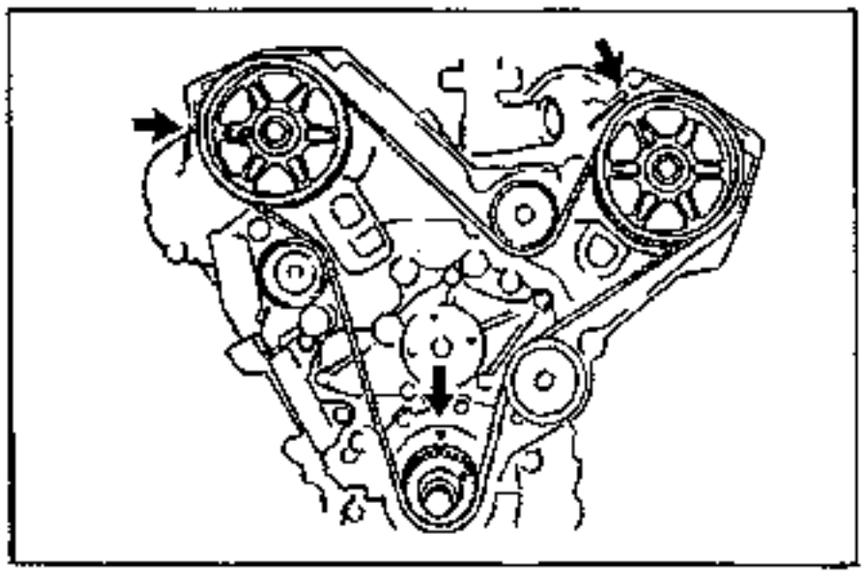


6. Push the auto tensioner in the direction of the arrow and tighten the bolts.

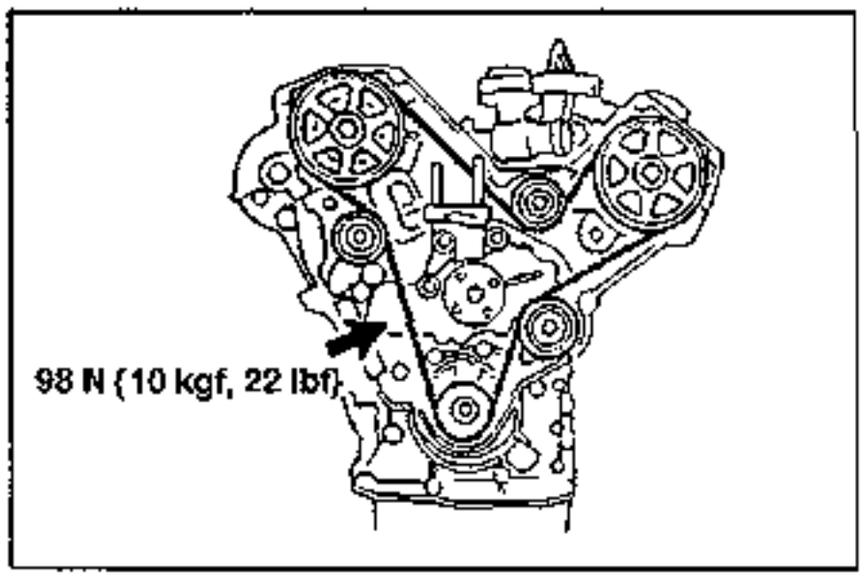
   Tightening torque:
   19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}



7. Remove the pin from the auto tensioner to apply tension to the belt.

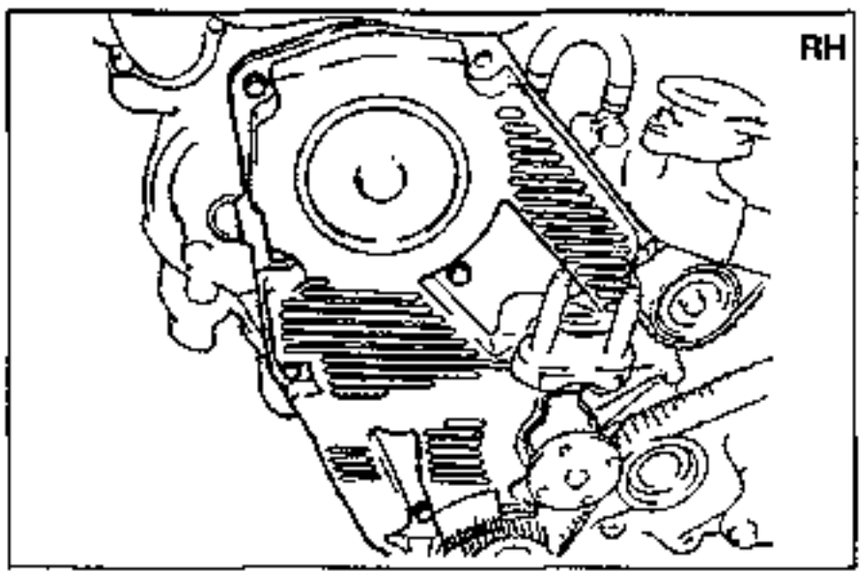


8. Turn the crankshaft clockwise twice, and align the timing marks.
9. Verify that all timing marks are correctly aligned. If necessary, repeat the procedure beginning from installation of the timing belt auto tensioner.



10. Check the timing belt deflection by applying moderate pressure **98 N {10 kgf, 22 lbf}** midway between the crankshaft pulley and the auto tensioner. If not correct, replace the auto tensioner.

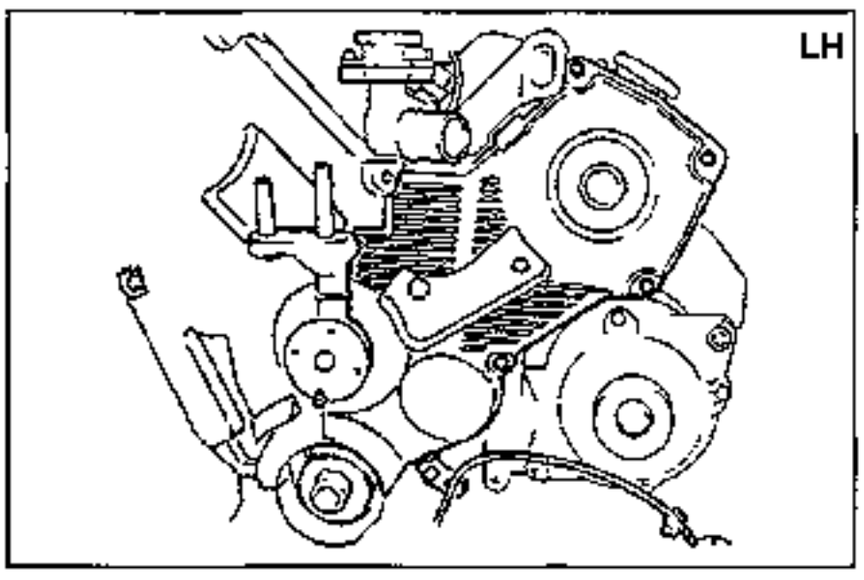
Deflection: 6.0–8.0mm {0.24–0.31in}



Timing belt cover

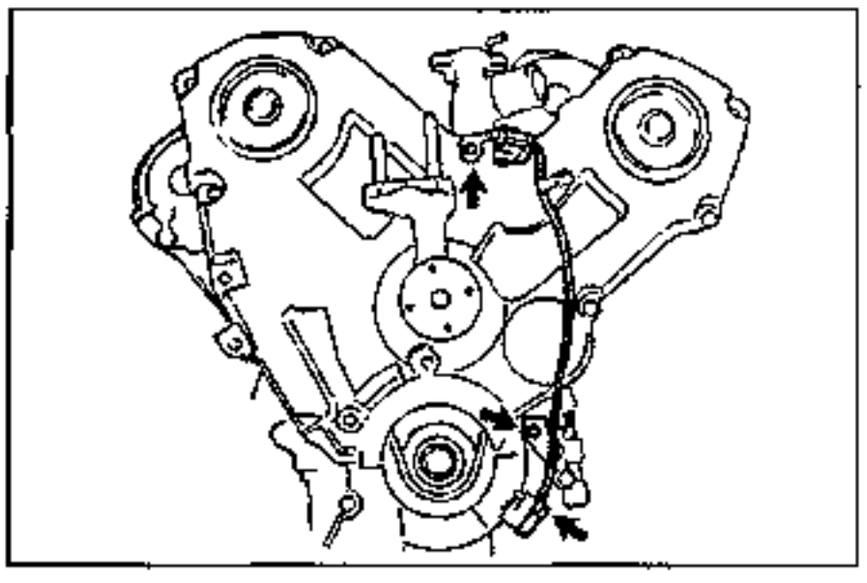
1. Install the right timing belt cover.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



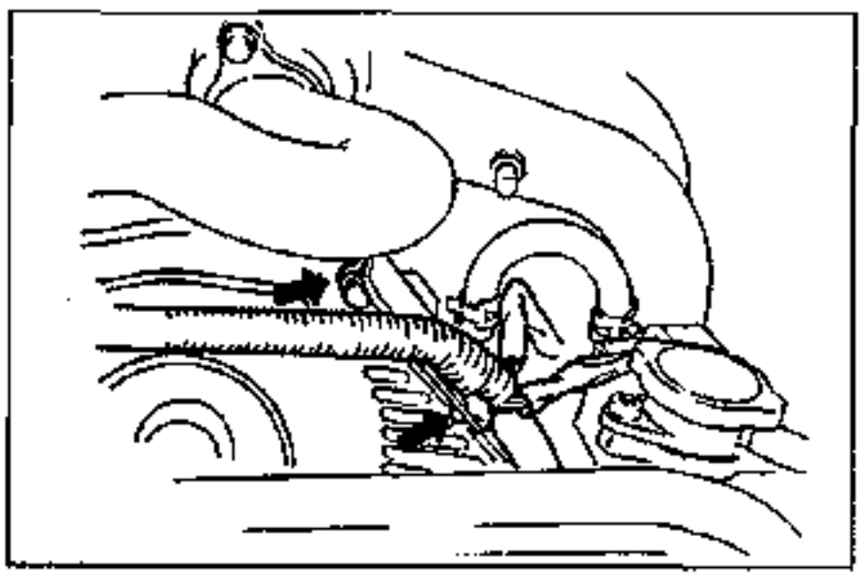
2. Install the left timing belt cover.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



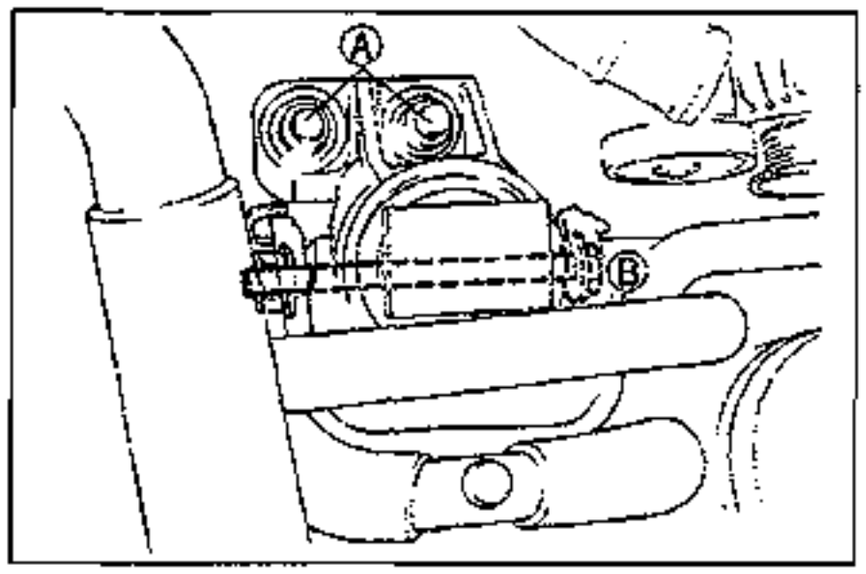
3. Install the crankshaft position sensor connector bracket on the left timing belt cover.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



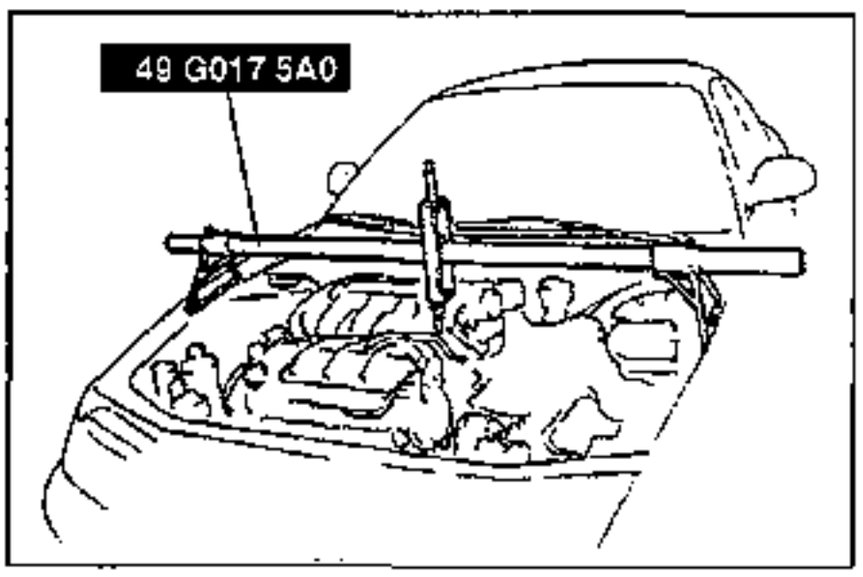
4. Install the harness bracket on the right timing belt cover.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 In·lbf}

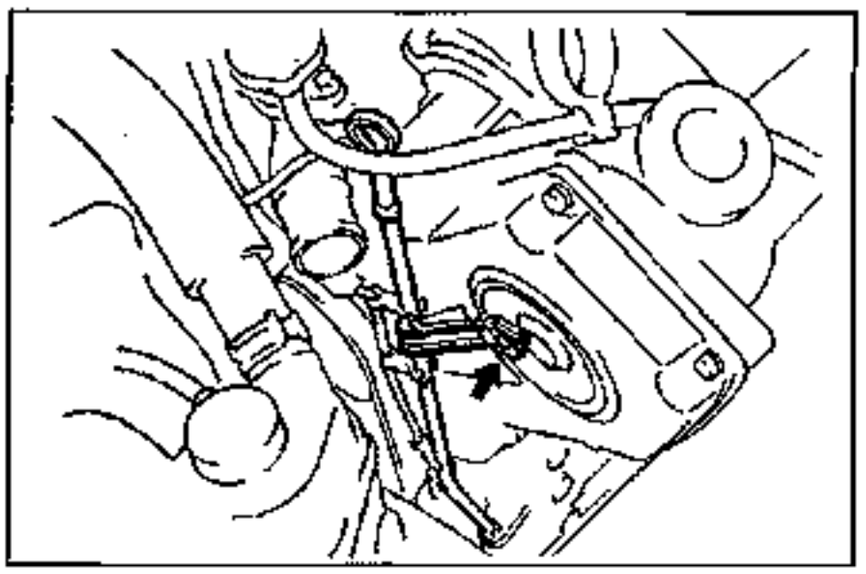


5. Install the No.3 engine mount.

Tightening torque
Ⓐ : 74–102 N·m {7.5–10.5 kgf·m, 55–75.9 ft·lbf}
Ⓑ : 86–116 N·m {8.7–11.9 kgf·m, 63–86.0 ft·lbf}



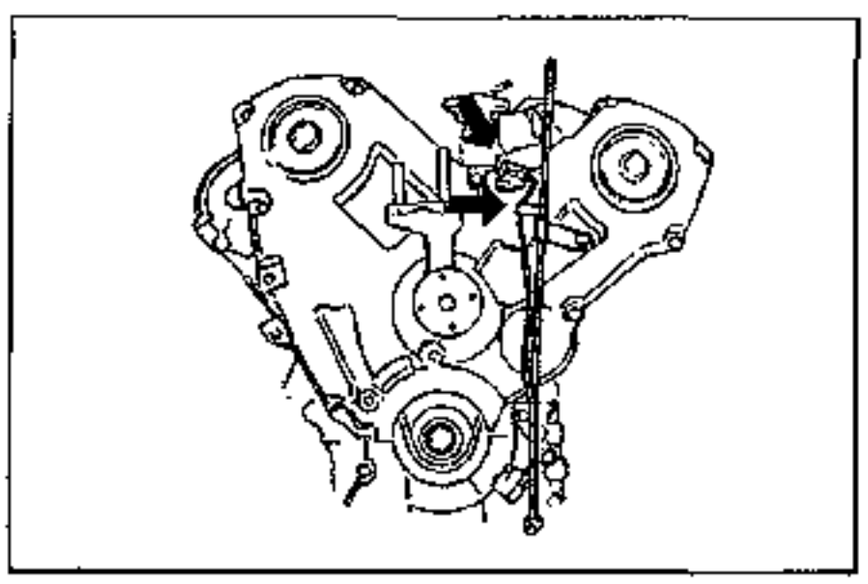
6. Remove the **SST** (engine support).



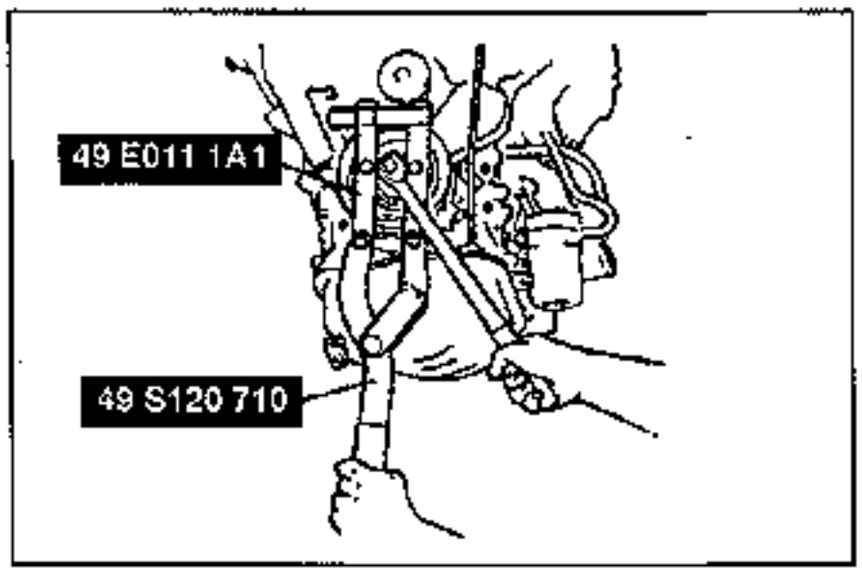
Dipstick and pipe
1. Apply clean engine oil to a new O-ring, and install it on the pipe.
2. Remove the plug from the engine and install the pipe.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}

3. Install the dipstick.



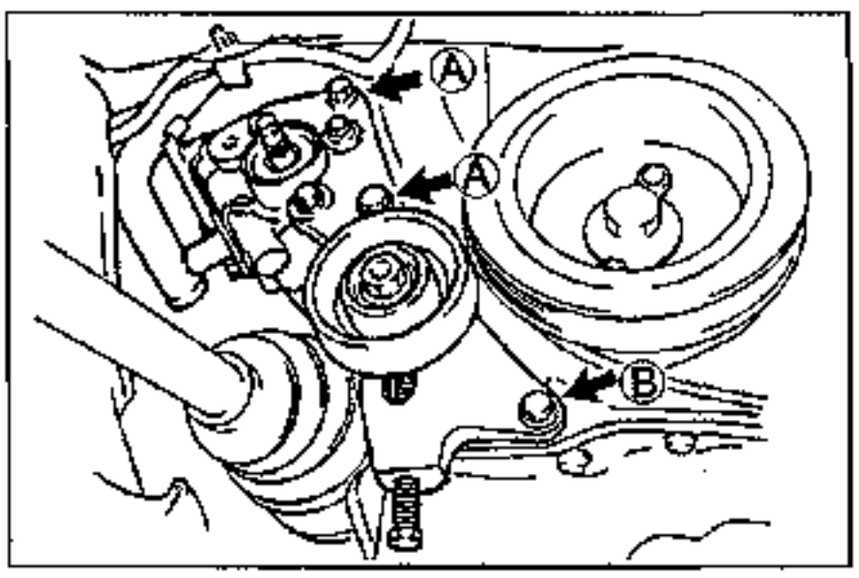
4. Install the crankshaft position sensor harness and clip to the dipstick pipe.
5. Connect the connector.



Crankshaft pulley

1. Remove the crankshaft pulley bolt.
2. Install the crankshaft pulley and hand tighten the bolt.
3. Mount the **SST** on the crankshaft pulley to hold the crankshaft.
4. Tighten the crankshaft pulley bolt.

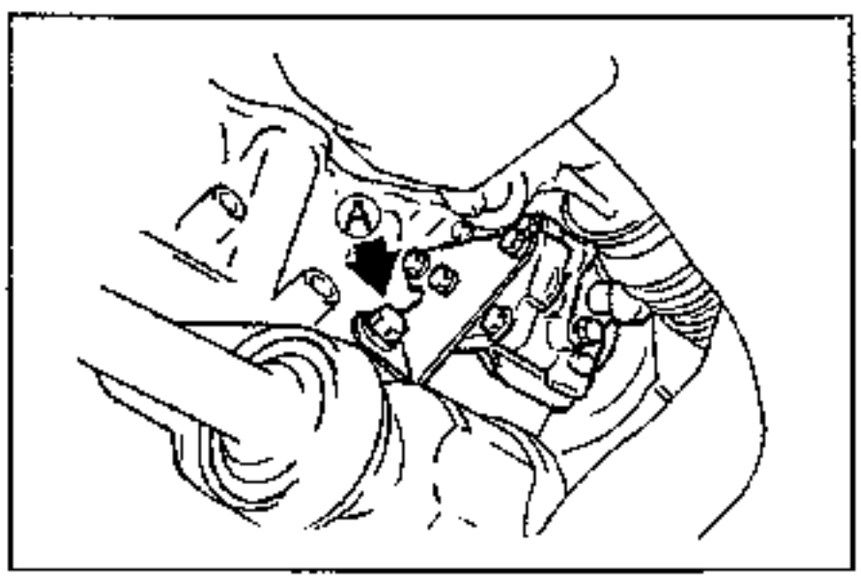
Tightening torque:
157–166 N·m {16.0–17.0 kgf·m, 116–122 ft·lbf}

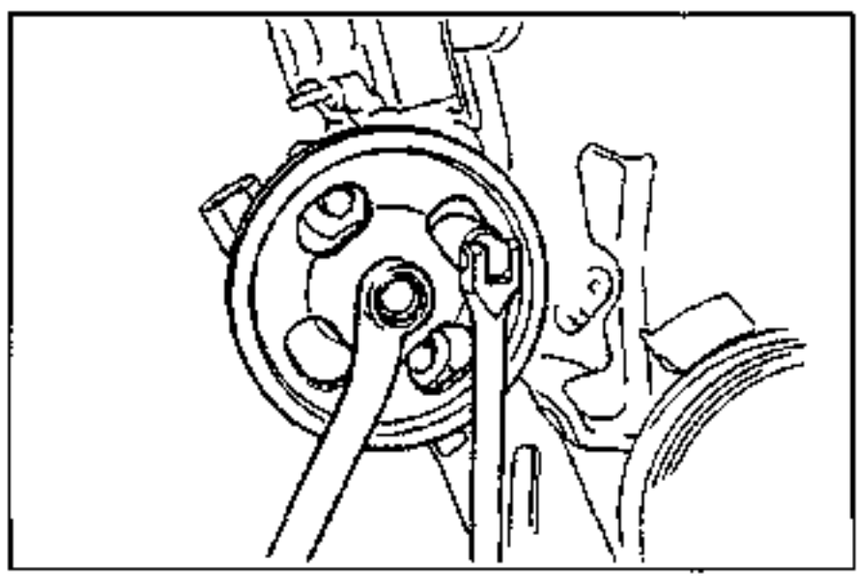


P/S oil pump

1. Install the P/S oil pump.

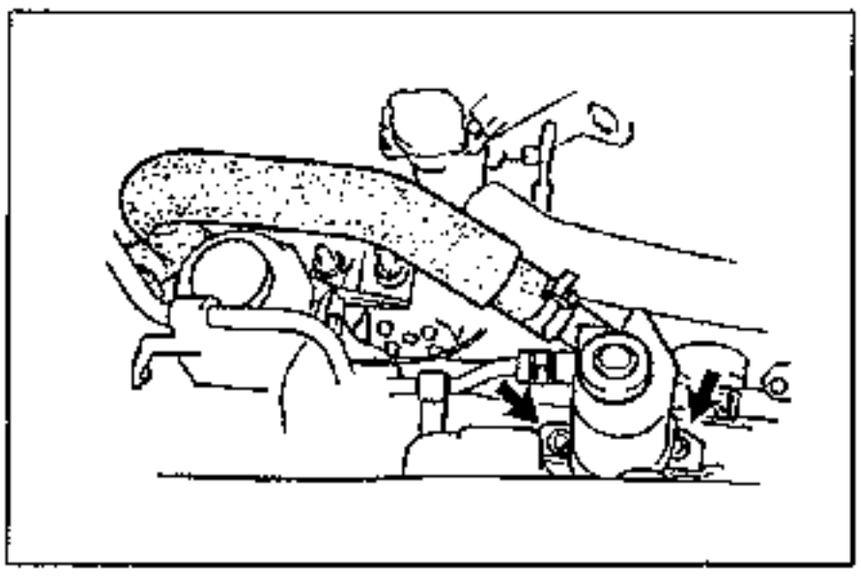
Tightening torque
Ⓐ : 32–46 N·m {3.2–4.7 kgf·m, 24–33 ft·lbf}
Ⓑ : 19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}





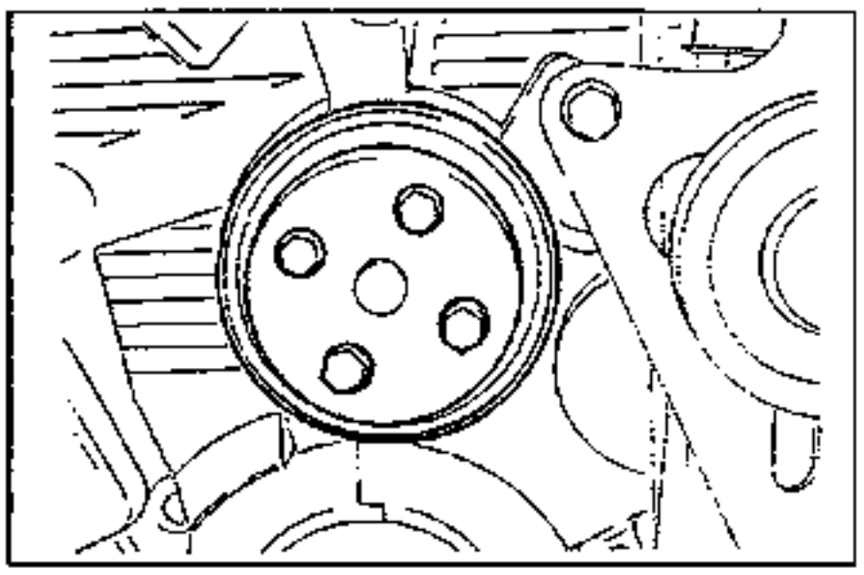
2. Install the P/S oil pump pulley and hand tighten the pulley nut.
3. Tighten the pulley nut by using a **12mm {0.47 in}** socket on the P/S oil pump mount bolts.

Tightening torque:
63–93 N·m {6.4–9.5 kgf·m, 46–69 ft·lbf}



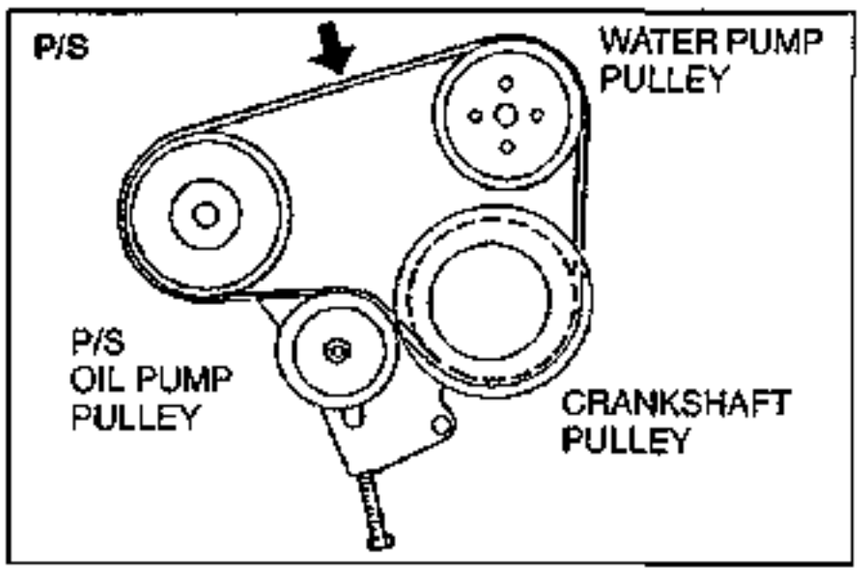
4. Install the P/S oil reservoir.

Tightening torque:
6.9–9.8 N·m {70–100 kgf·cm, 61–86.8 in·lbf}



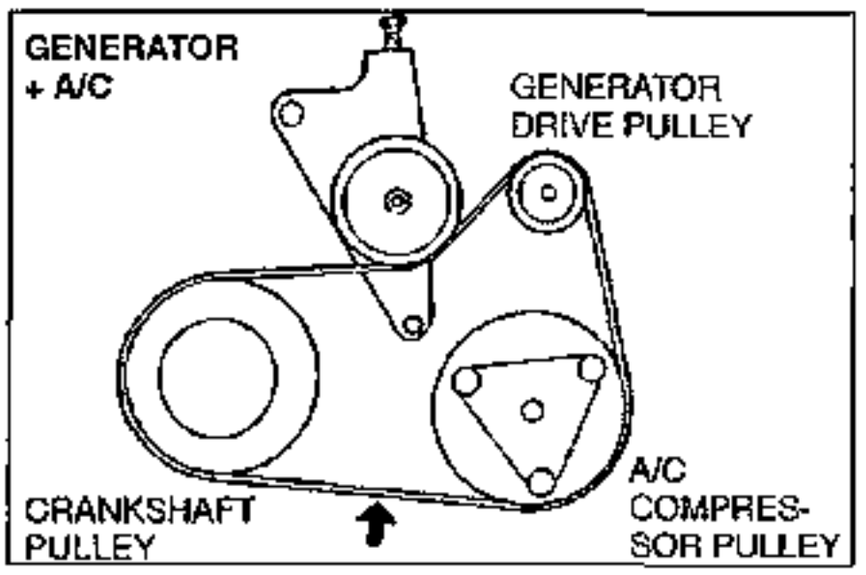
Drive belt

1. Install the water pump pulley and hand tighten the bolts.



2. Install the P/S oil pump and water pump drive belt on the pulleys.
3. Adjust the drive belt deflection. (Refer to page B2–6.)
4. Tighten the water pump pulley.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



5. Install the A/C compressor drive belt on the pulleys, and adjust the belt deflection. (Refer to page B2–6.)

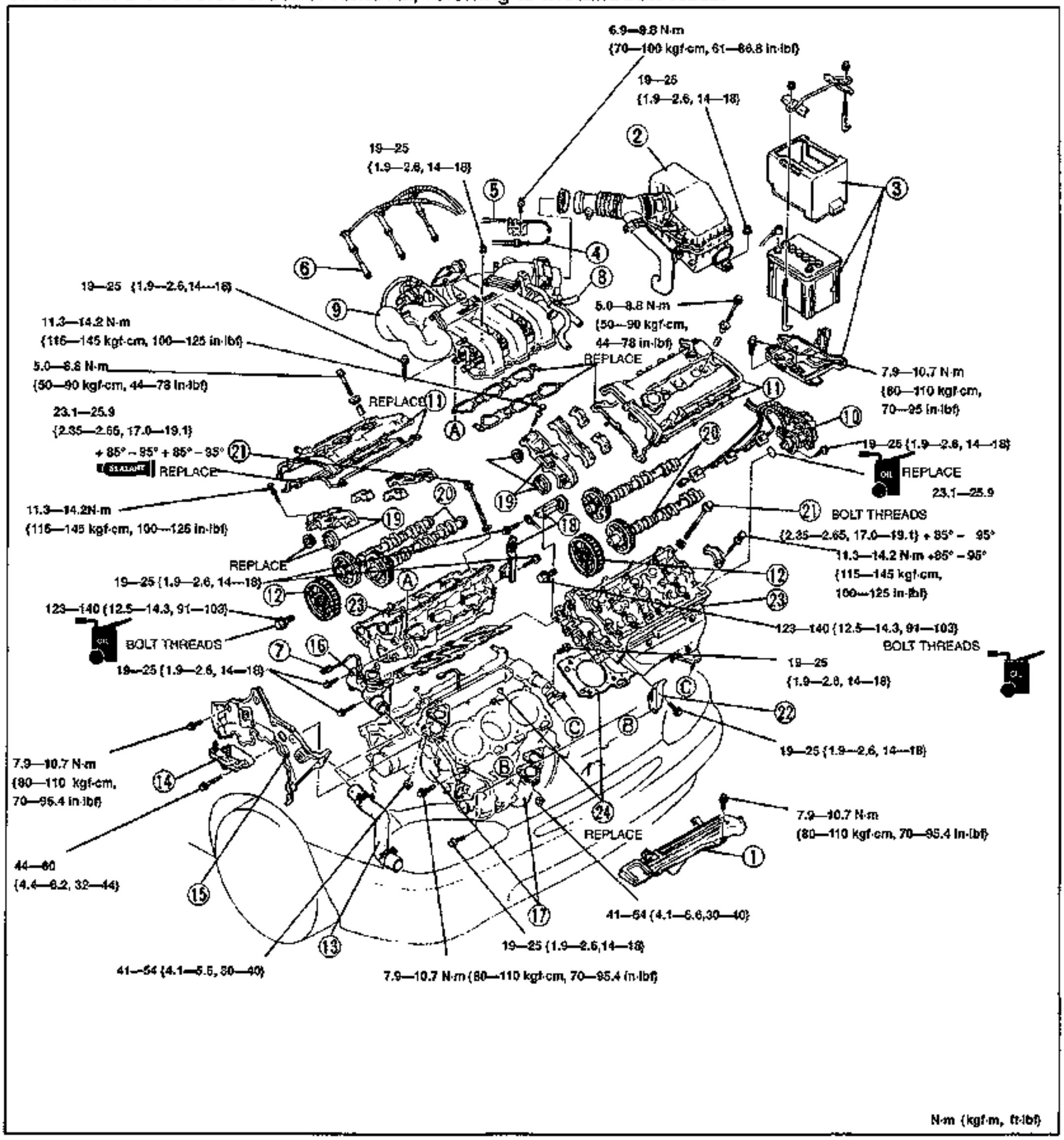
Steps After Installation

1. Install the right front wheel.
2. Fill the radiator and coolant reservoir with the specified amount and type of engine coolant.
3. Perform the necessary engine adjustments. (Refer to ENGINE TUNE-UP, page B2–5.)

CYLINDER HEAD GASKET
Replacement

Warning
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on section F2.**

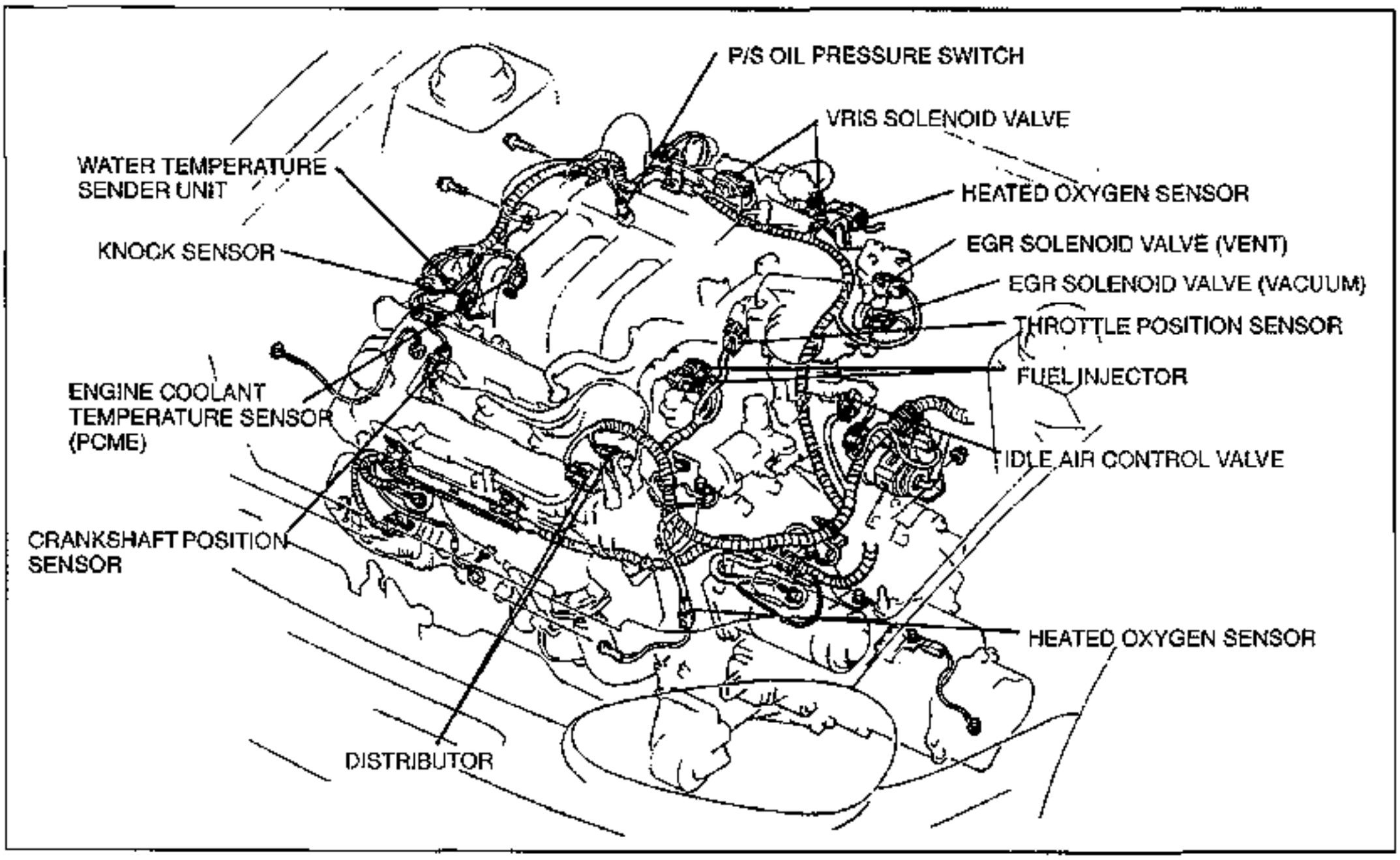
1. Disconnect the negative battery cable.
2. Drain the engine coolant. (Refer to section E2.)
3. Remove the timing belt. (Refer to page B2–12.)
4. Remove in the order shown in the figure, referring to **Removal Note.**
5. Install in the reverse order of removal, referring to **Installation Note.**



.1. Fresh-air duct
2. Air cleaner assembly
3. Battery and carrier
4. Accelerator cable
   Installation Note
   ..... page B2–36
5. Throttle cable (ATX)
   Installation/
   Adjustment ..... section K
6. High-tension lead
7. Harness
   Removal Note page B2–25
   Installation Note
   ..... page B2–36
8. Hoses
   Removal Note page B2–25
   Installation Note
   ..... page B2–35
9. Intake manifold assembly
   Removal Note page B2–26
   Installation Note
   ..... page B2–34
10. Distributor
   Installation Note
   ..... page B2–33
11. Cylinder head cover
   Removal Note page B2–26
   Installation Note
   ..... page B2–33
12. Camshaft pulley
   Removal Note page B2–27
   Installation Note
   ..... page B2–32
13. Radiator hose, upper
14. No. 3 engine mount bracket
   Removal Note page B2–27
   Installation Note
   ..... page B2–31
15. Seal plate
16. Water outlet
17. Exhaust pipe
18. Engine hanger
19. Camshaft cap and oil seal
   Removal Note page B2–27
   Installation Note
   ..... page B2–30
20. Camshaft
   Installation Note
   ..... page B2–30
21. Cylinder head bolt
   Removal Note page B2–28
22. Generator strap
23. Cylinder head
   Installation Note
   ..... page B2–29
24. Cylinder head gasket and O-ring

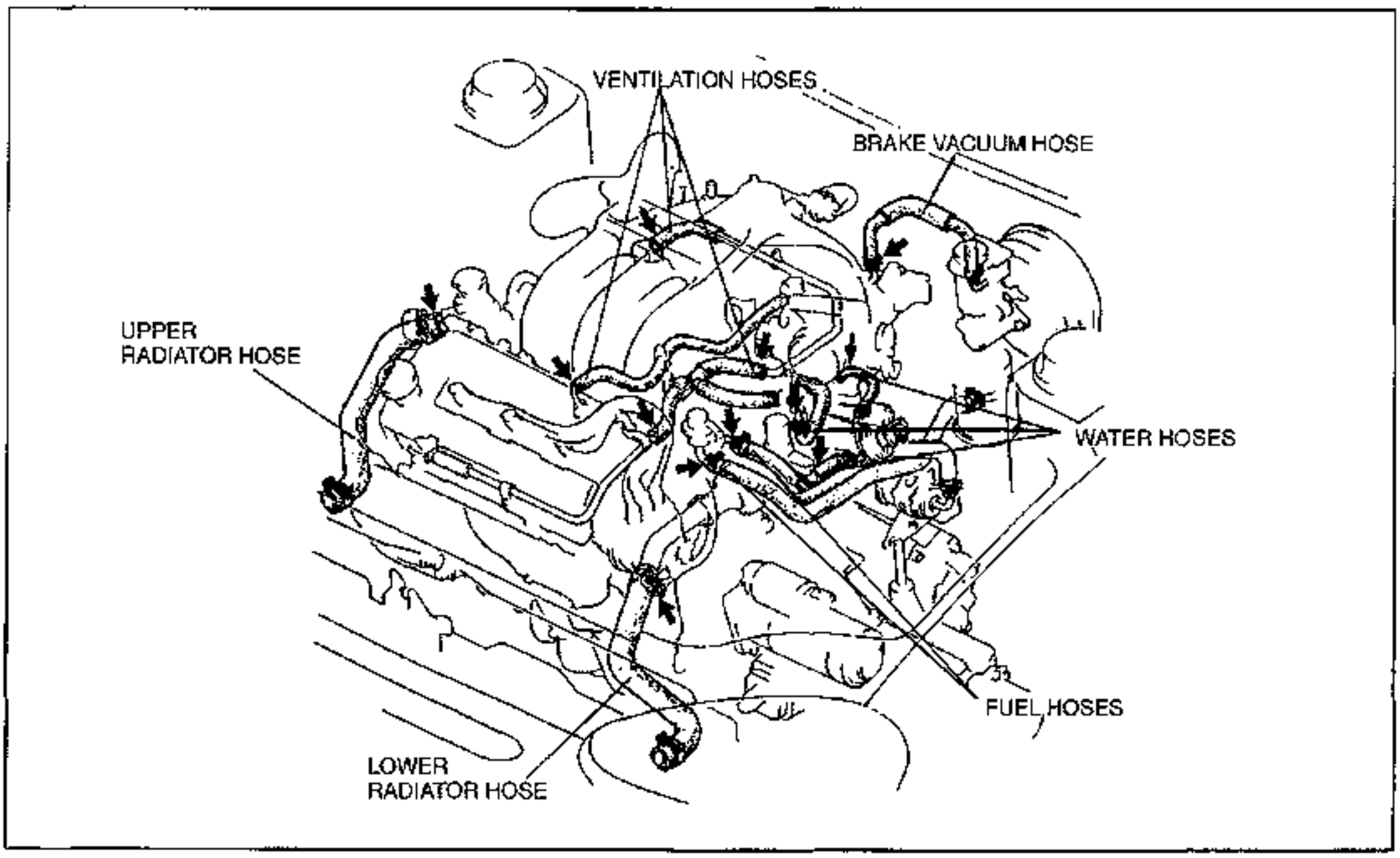
Removal Note
Harness

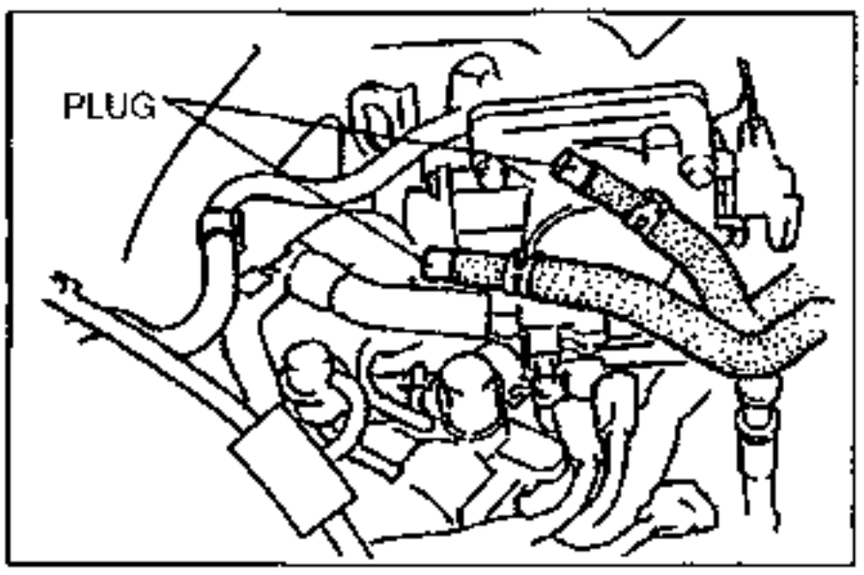
Disconnect the harness connectors shown.



Hoses

Disconnect the hoses shown.



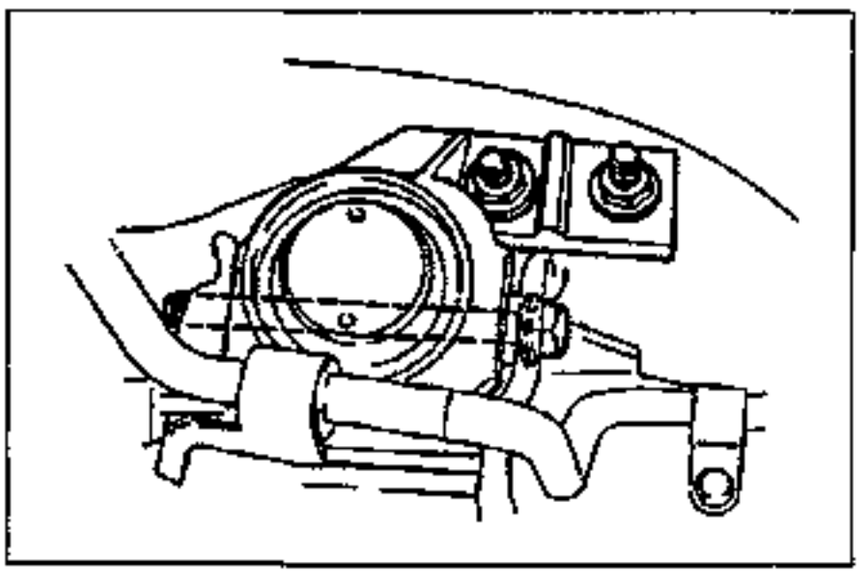


Fuel hose

Warning

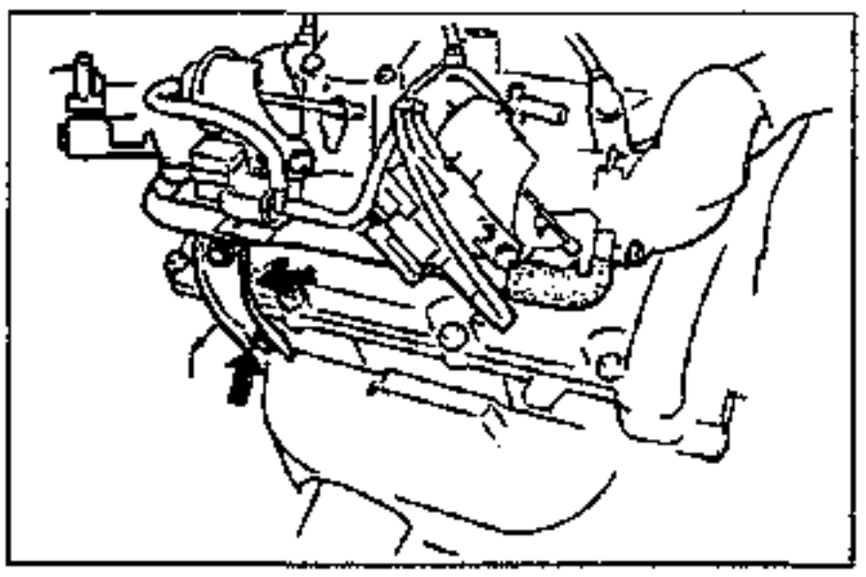
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on section F2.**

Plug the disconnected hoses to avoid fuel leakage.

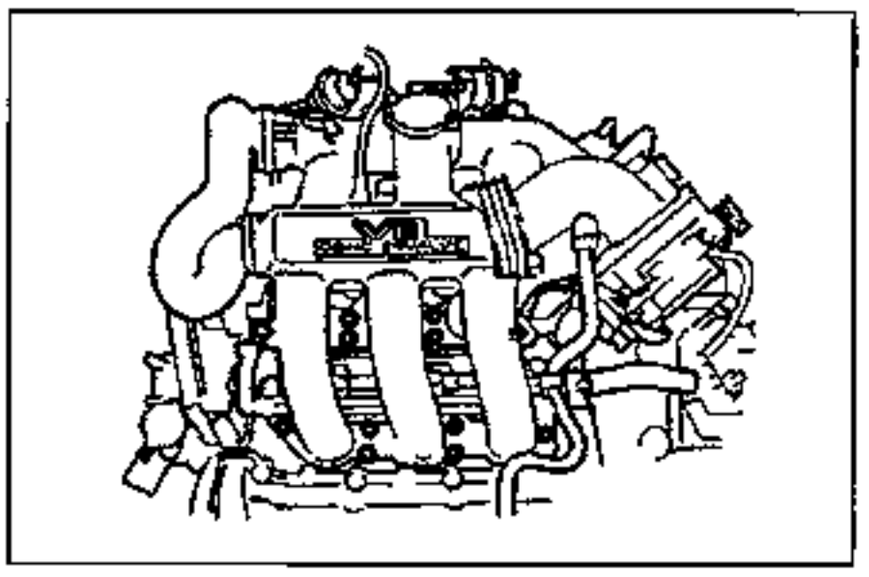


Intake manifold assembly

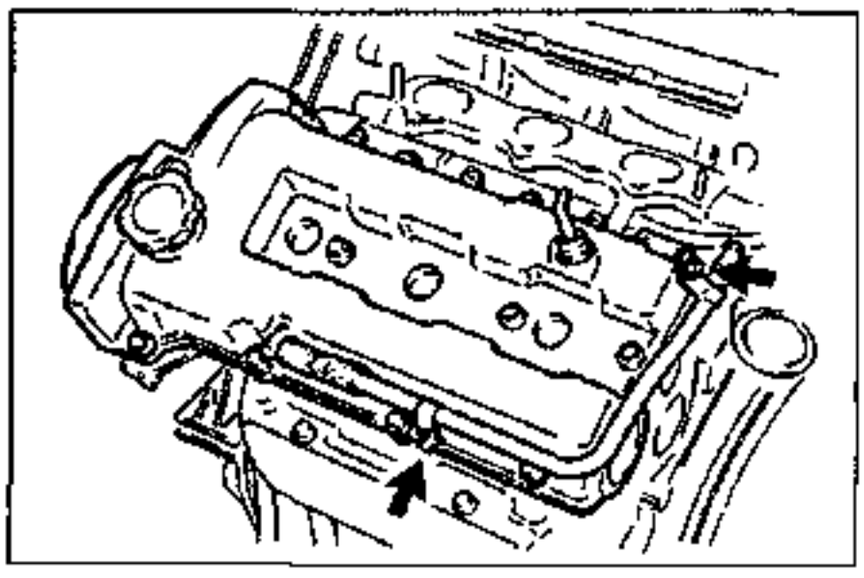
1. Temporarily install the No.3 engine mount bracket to support the engine.
2. Remove the **SST** installed for the timing belt removal.



3. Remove the intake manifold stay.

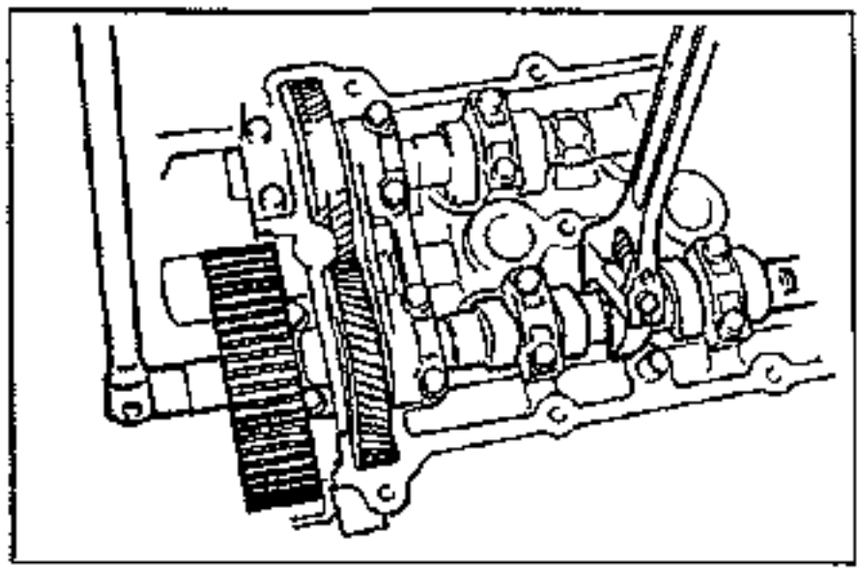


4. Loosen the mounting bolts in two or three steps.

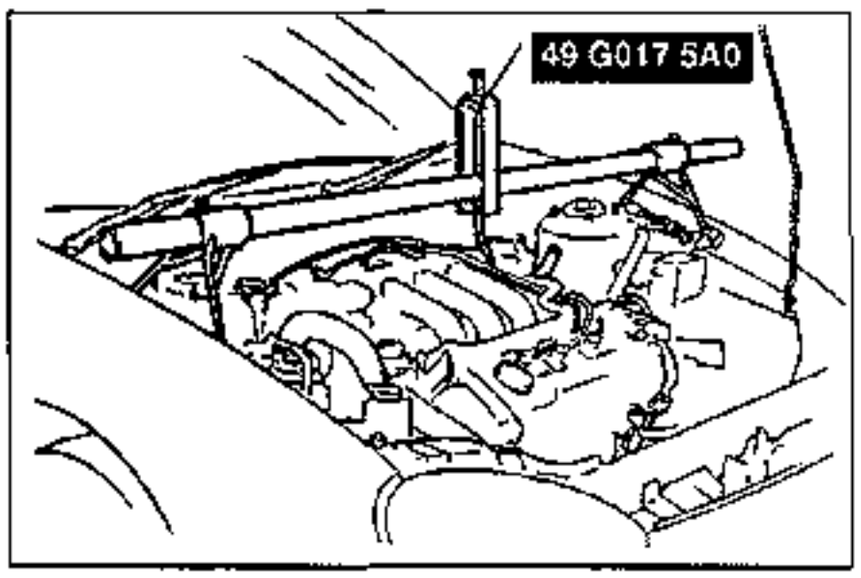


Cylinder head cover

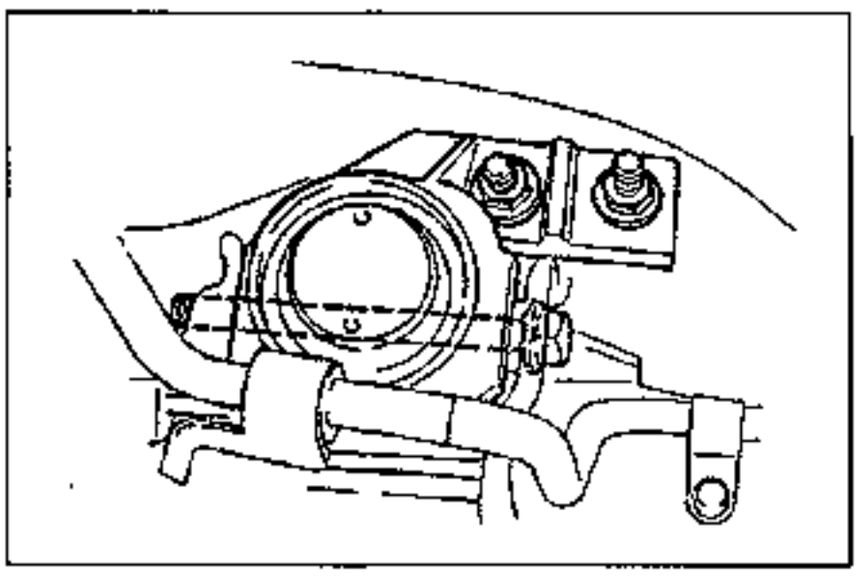
1. Remove the cylinder head cover bolts.
2. Disconnect the ventilation pipe (left cylinder head).
3. Remove the cylinder head cover.



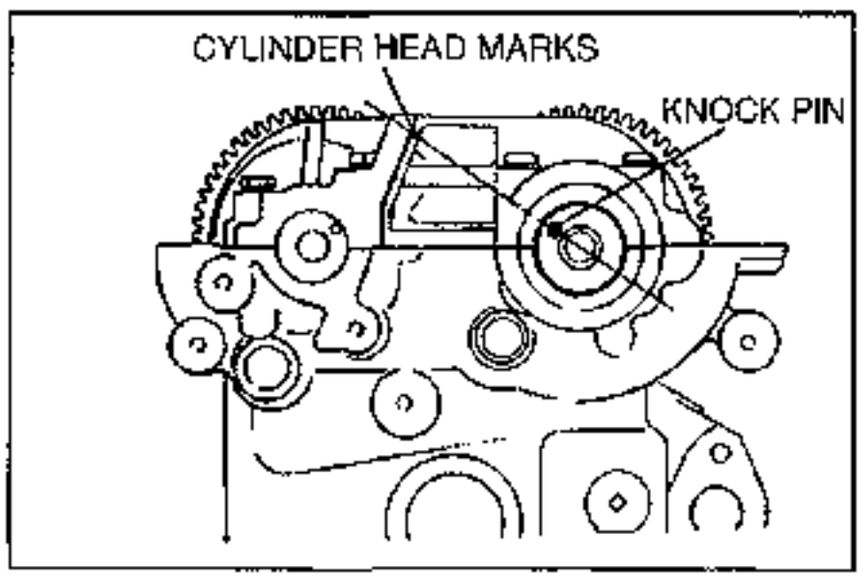
Camshaft pulley
1. Hold the camshaft by using a wrench on the cast hexagon as shown, and loosen the camshaft pulley lock bolts.
2. Remove the camshaft pulleys.



No.3 engine mount bracket
1. Install the **SST** and support the engine.



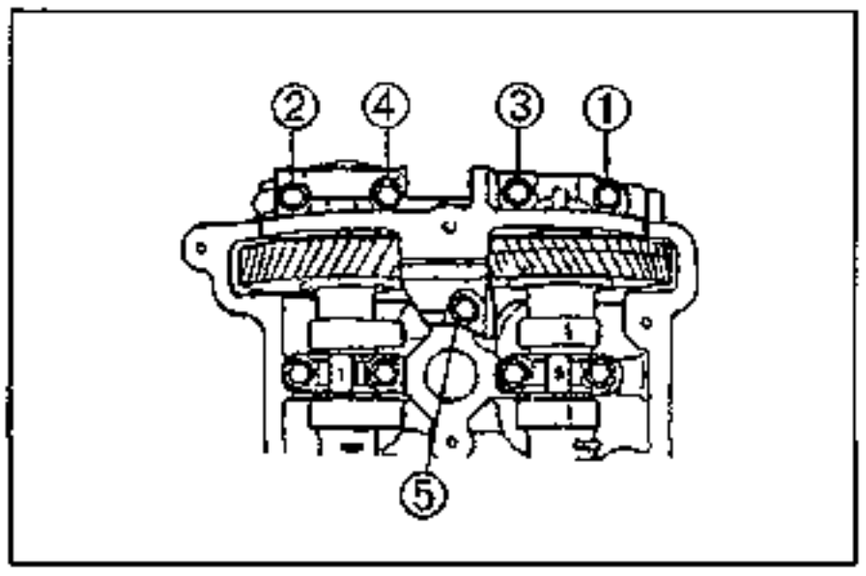
2. Disconnect the No.3 engine mount bracket from the engine mount rubber.
3. Remove the No.3 engine mount bracket from the engine.



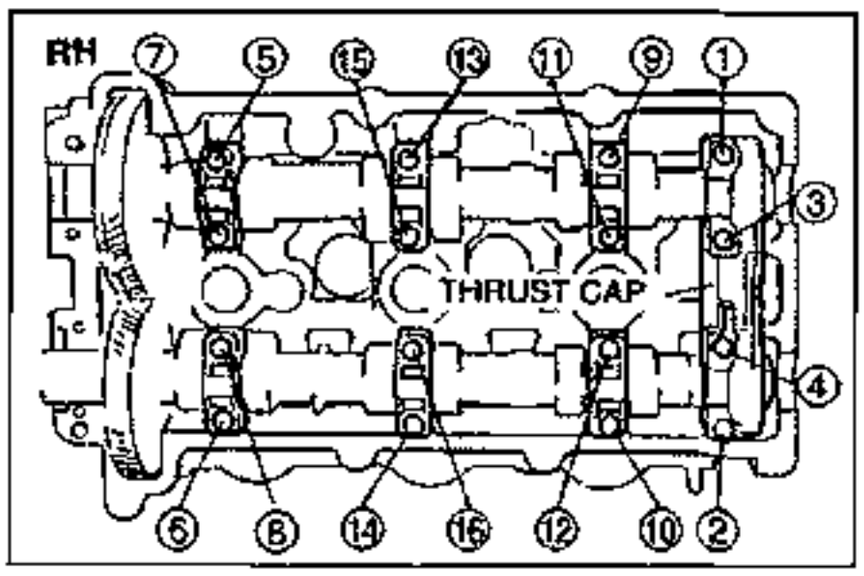
Camshaft cap and oil seal

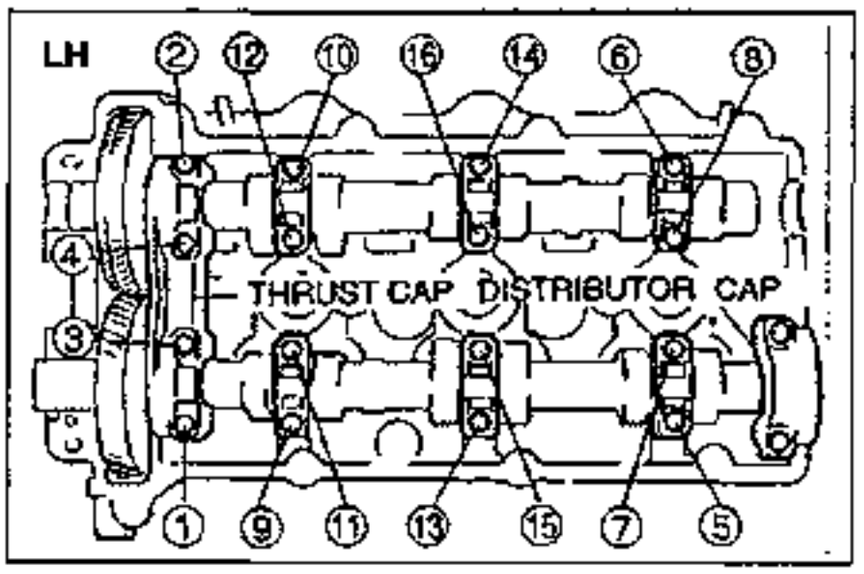
Caution
- **When the front camshaft lobe is pressing on the HLA, removing the camshaft caps can damage the cylinder head thrust journal support.**

Perform this same procedure for the right and left cylinder heads.
1. Turn the camshaft clockwise by using a wrench on the cast hexagon and align the camshaft knock pin and cylinder head marks as shown.
2. Loosen the front camshaft cap bolts in five or six steps in the order shown.
3. Remove the front camshaft cap.



Note
- Bolt ⑤ fits only for right cylinder head.

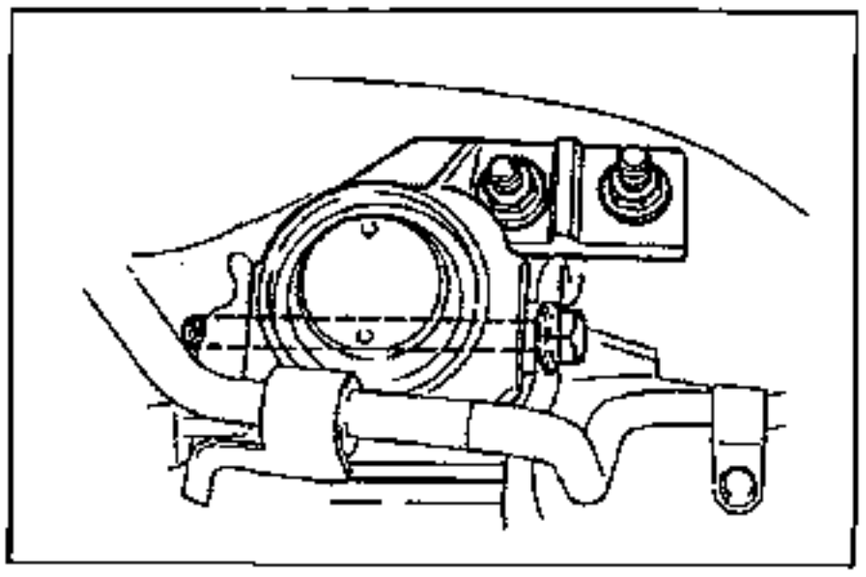




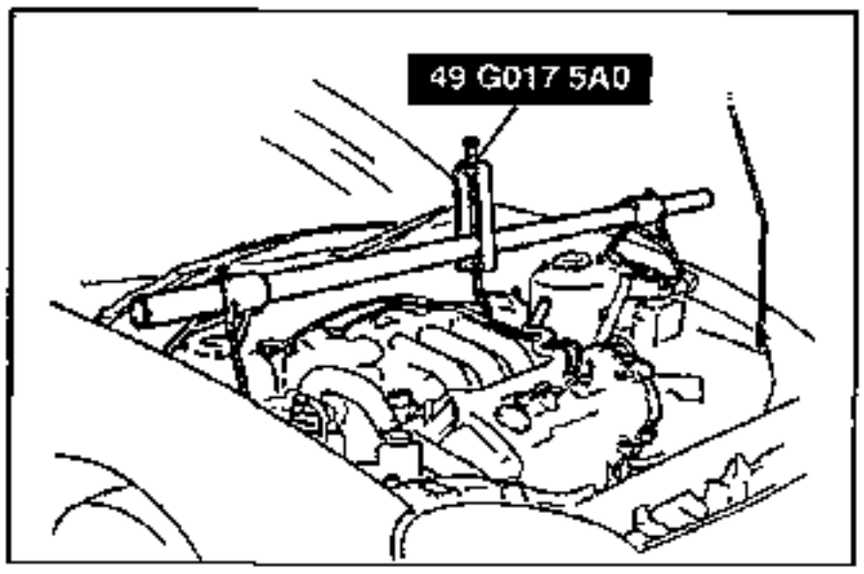
Note
- Before removing the camshaft caps, note their locations.

4. Loosen the camshaft cap bolts in five or six steps in the order shown.
5. Remove the camshaft caps.

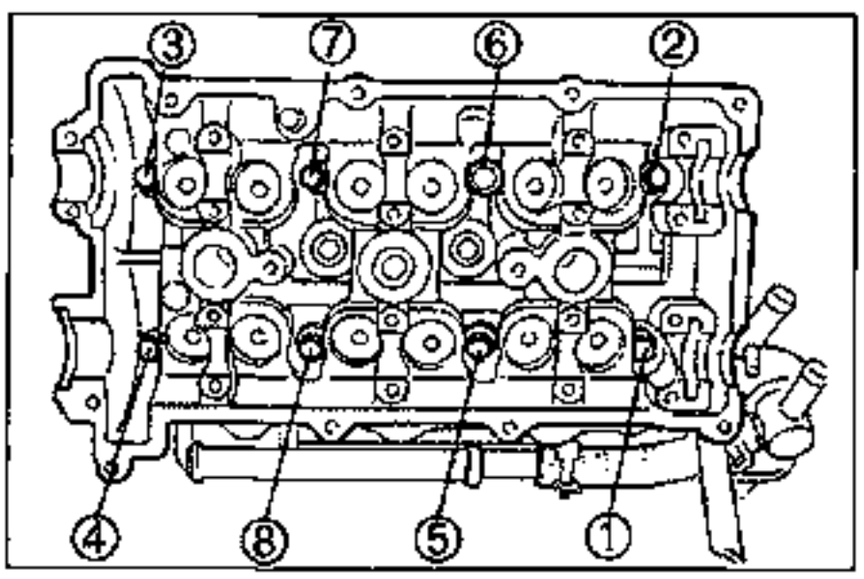
Caution
- **Remove the thrust cap only after removing all camshaft caps. Otherwise, the thrust cap can be damaged.**



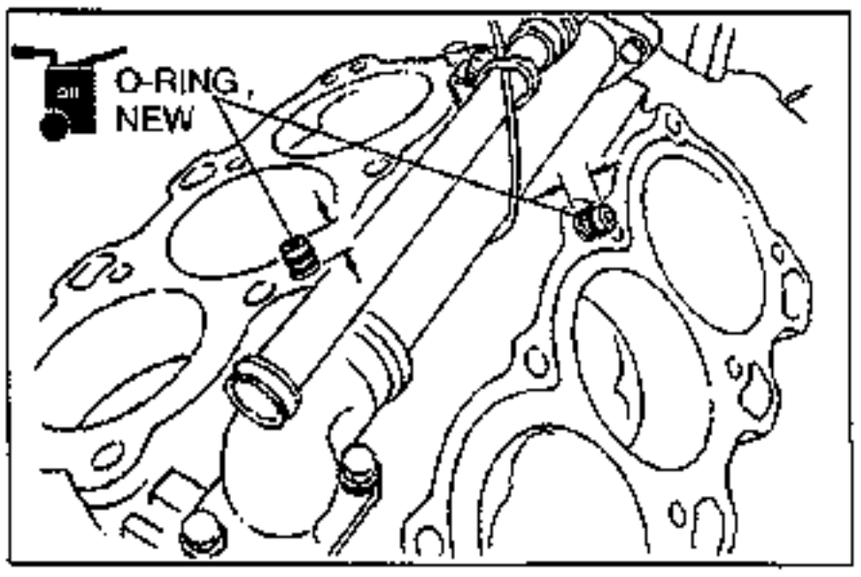
Cylinder head bolt
1. Temporarily install the No.3 engine mount bracket to support the engine.



2. Remove the **SST.**



3. Loosen the cylinder head bolts in two or three steps in the order shown.
4. Remove the cylinder head bolts.

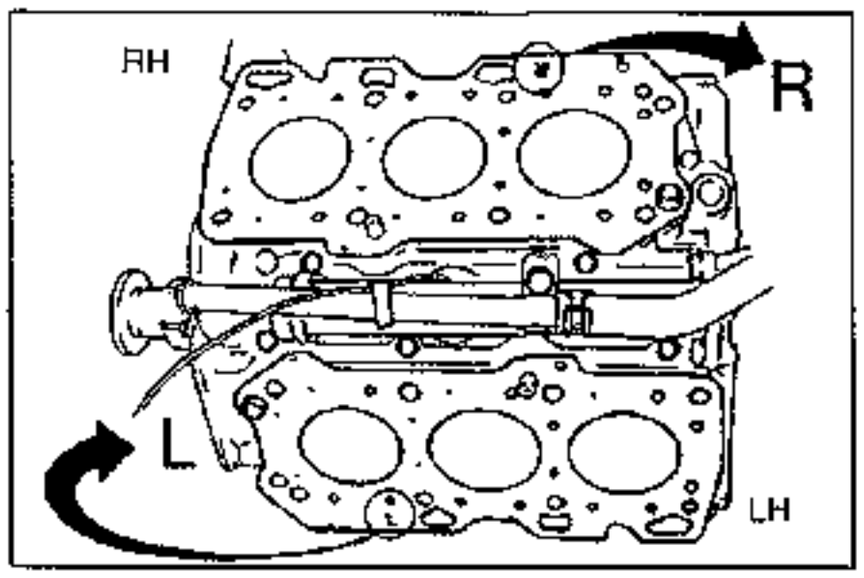


Installation Note
Cylinder head

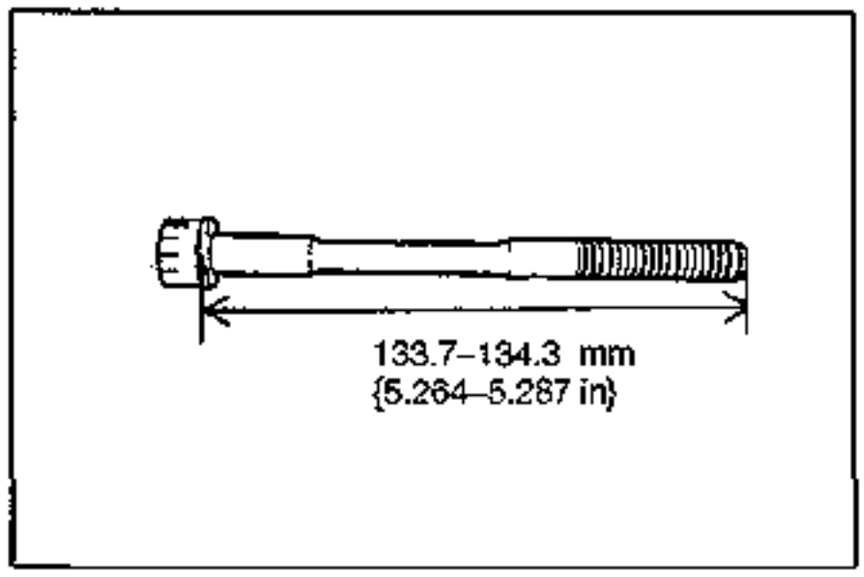
1. Measure the amount of oil control plug projection from the deck of the cylinder block.

   Projection: 8.0–9.0 mm {0.315–0.354 in}

2. Apply clean engine oil to new O-rings and install them to the oil control plugs.

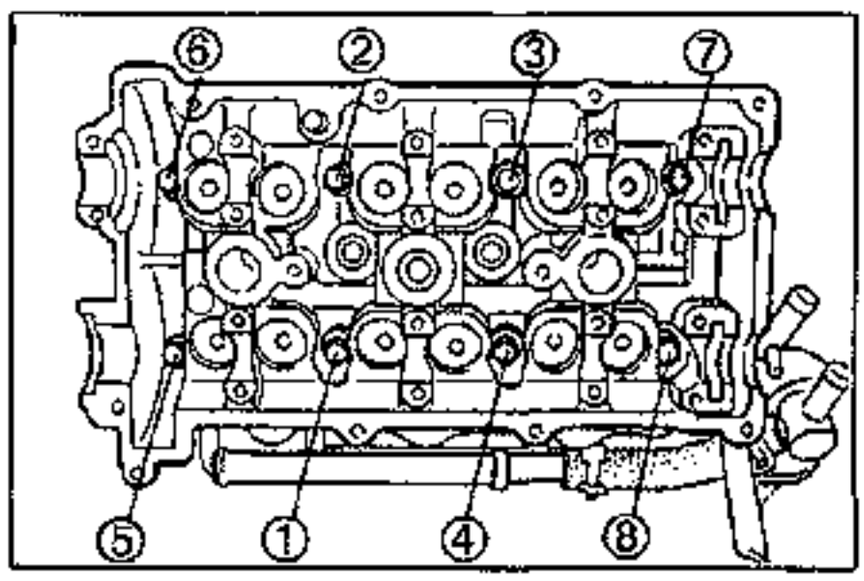


3. Thoroughly remove all dirt, oil, and other material from the decks of the cylinder block.
4. Turn the crankshaft clockwise and apply engine oil to the cylinder walls.
5. Place a new cylinder head gasket (marked L) on the left bank.
6. Place a new cylinder head gasket (marked R) on the right bank.



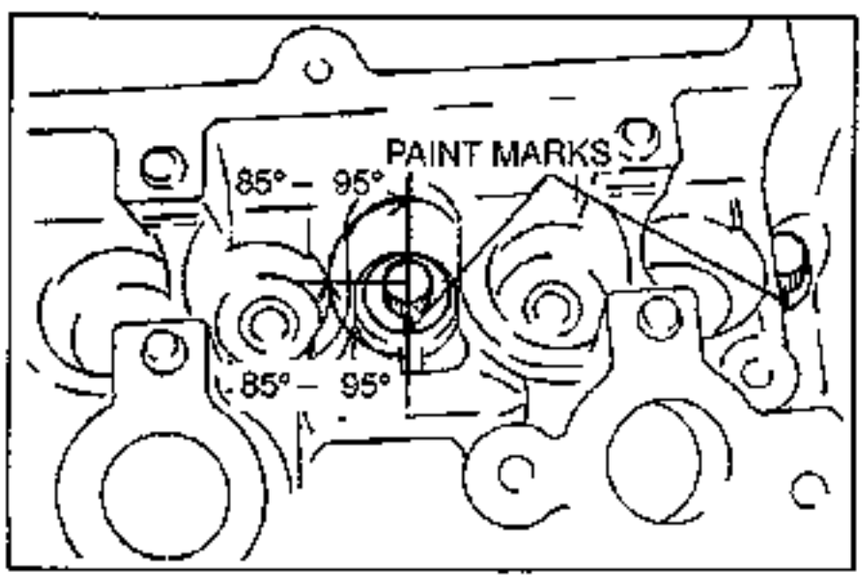
7. Install the cylinder heads to the cylinder block.
8. Tighten the cylinder head bolts as described below.
   (1) Before installation, measure the length of each bolt. Replace the bolt if it exceeds the maximum length.

   Length : 133.7–134.3 mm {5.264–5.287 in}
   Maximum: 135.0 mm {5.315 in}

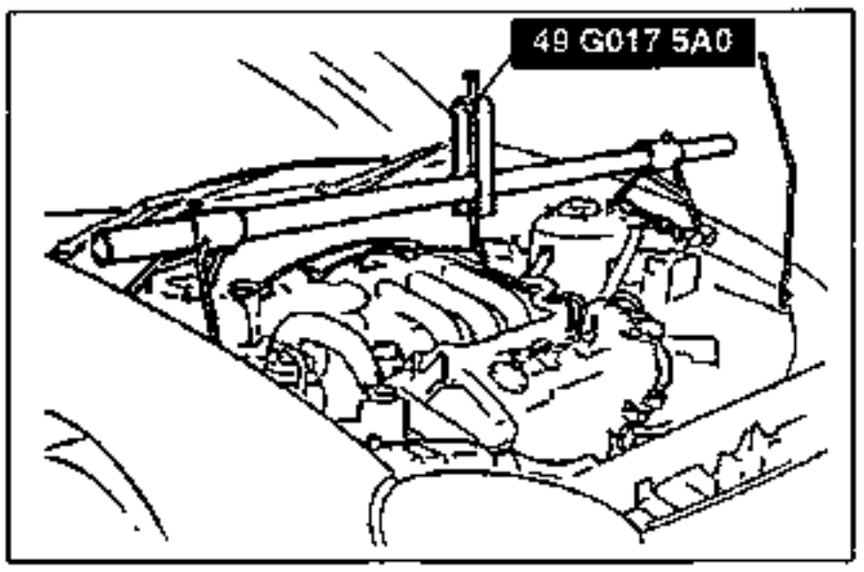


   (2) Apply clean engine oil to the threads and the seat face of each bolt, and install them and the washers.
   (3) Tighten the bolts in two or three steps in the order shown.

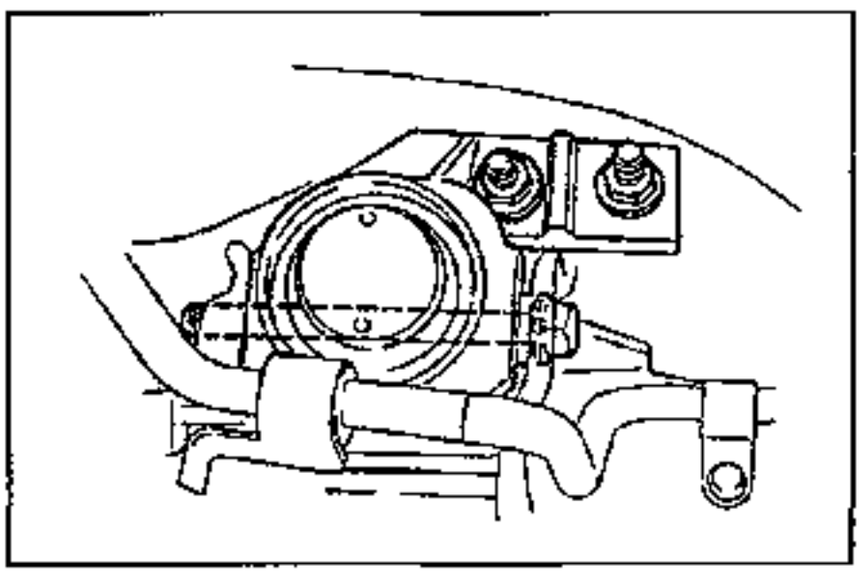
   Tightening torque:
   23.1–25.9 N·m {2.35–2.65 kgf·m, 17.0–19.1ft·lbf}



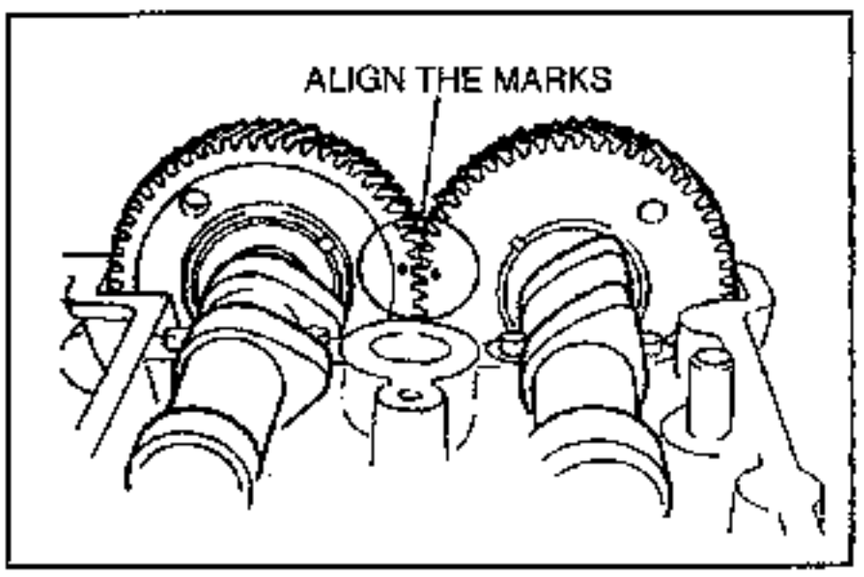
   (4) Put a paint mark on each bolt head.
   (5) Using the marks as a reference, tighten the bolts by turning each **85°–95°** in the sequence shown.
   (6) Further tighten each bolt by turning another **85°–95°**.



9. Support the engine by using the **SST**.



10. Disconnect the No.3 engine mount bracket.
11. Remove the No.3 engine mount bracket from the engine.

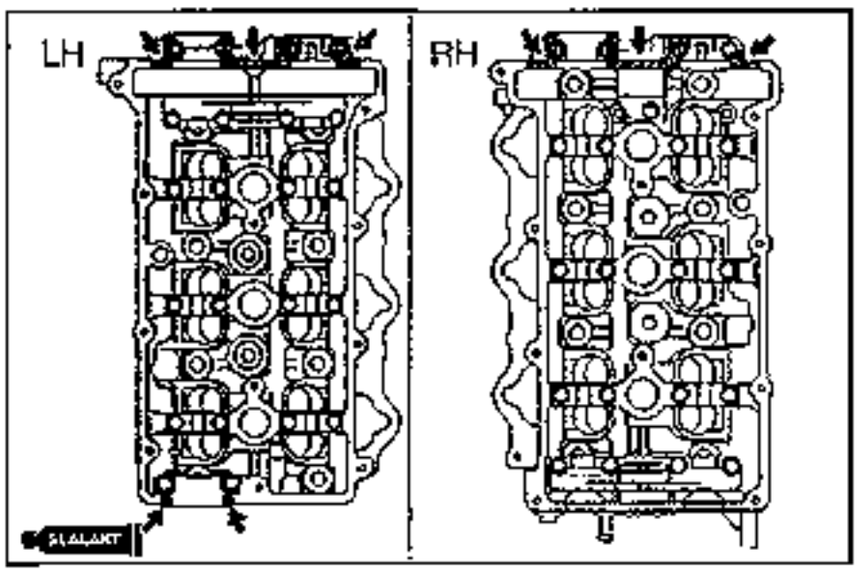


Camshaft

Caution
- **Camshafts must be assembled in the following procedure. Otherwise, camshaft can be broken or damaged because there is little camshaft thrust clearance.**

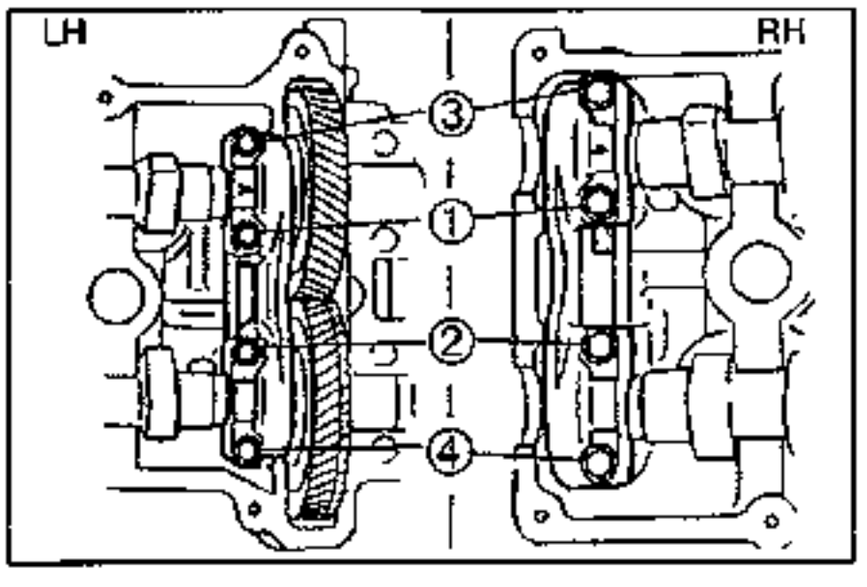
1. Apply a liberal amount of clean engine oil to the journals, cam lobes, and camshaft gears.
2. Align the timing marks of intake camshaft and exhaust camshaft.
3. Install the camshafts on the cylinder head.

Note
- The thrust plate positions for the right and left cylinder head camshafts are different.



Camshaft cap and oil seal

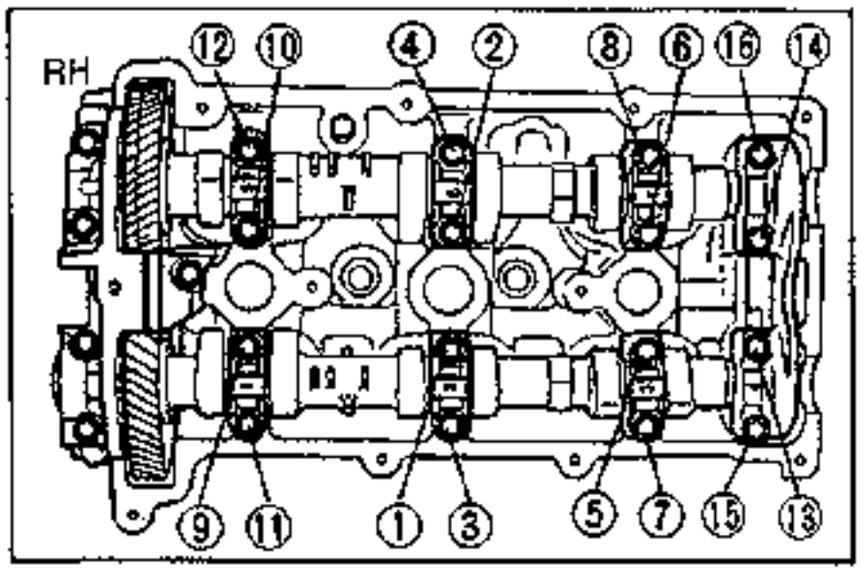
1. Remove the oil, dirt and other foreign material from the mating surfaces between the front camshaft cap and the cylinder head, and degrease.



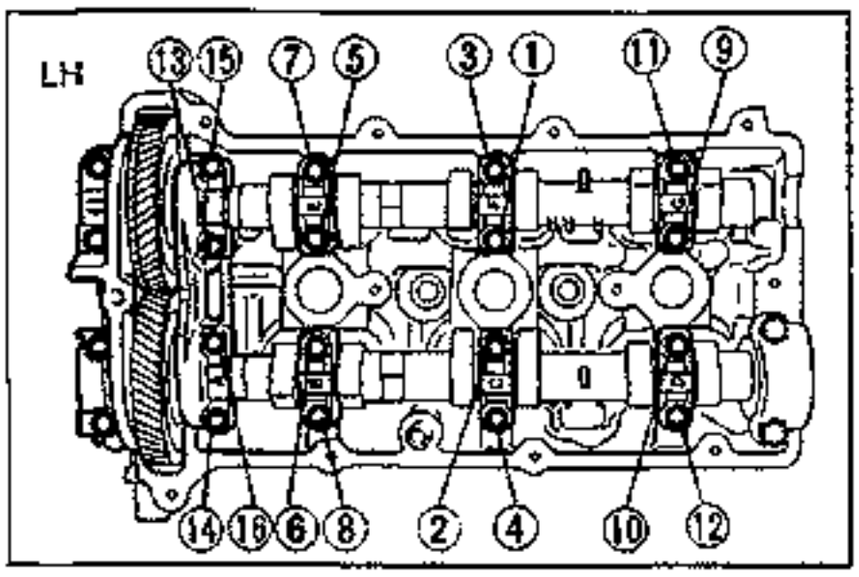
2. Apply silicone sealant to the shaded areas shown.

Caution
- **Install the thrust caps first. Otherwise, camshaft can be broken or damaged.**

3. Install the thrust caps onto the cylinder heads. Hand tighten the bolts in five or six steps in the order shown, until the camshaft caps fully seated on the cylinder head.



4. Install the camshaft caps, and hand tighten the camshaft cap bolts.

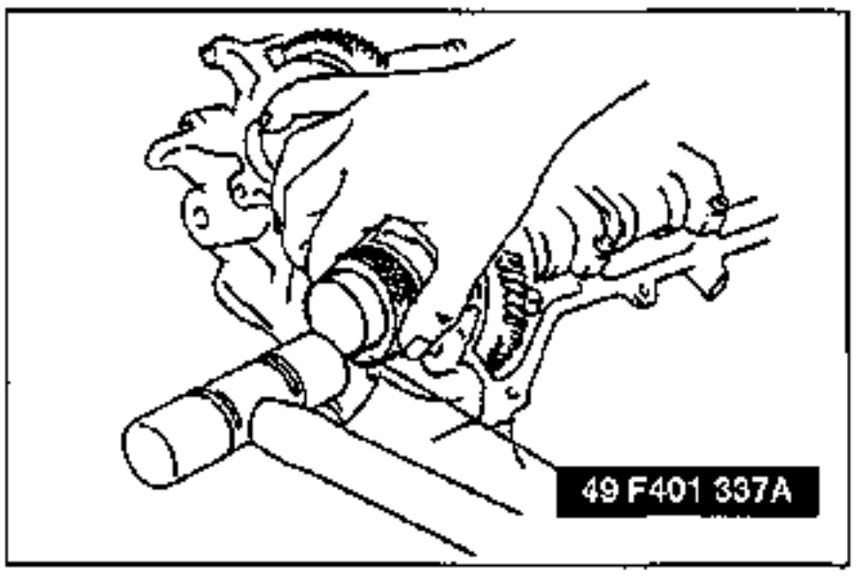


5. Tighten the camshaft cap bolts gradually in five or six steps in the order shown.

Tightening torque:
11.3–14.2 N·m {115–145 kgf·cm, 100–125 in·lbf}

6. Retighten the bolts in the order shown.

Tightening torque:
11.3–14.2 N·m {115–145 kgf·cm, 100–125 in·lbf}

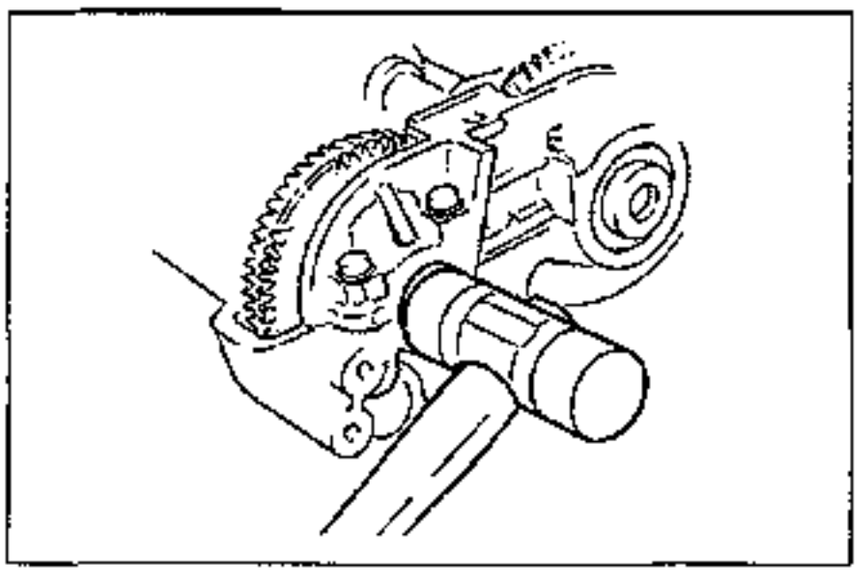


7. Install the distributor cap. (LH cylinder head)

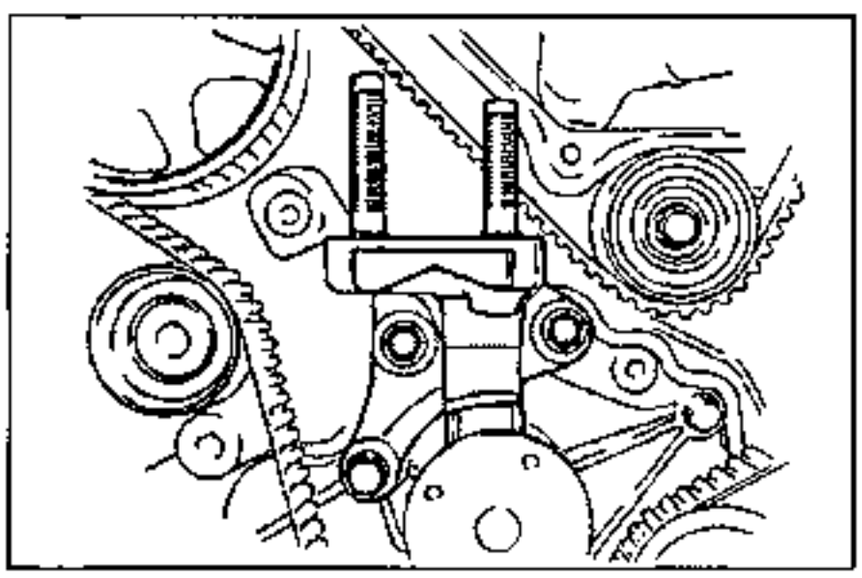
Tightening torque:
11.3–14.2 N·m {115–145 kgf·cm, 100–125 in·lbf}

8. Apply a light coat of clean engine oil to the new oil seal and the cylinder head.
9. Tap the camshaft oil seal into the cylinder head by using a **SST** and a hammer.

Protrusion: 0–0.5mm {0–0.019 in}

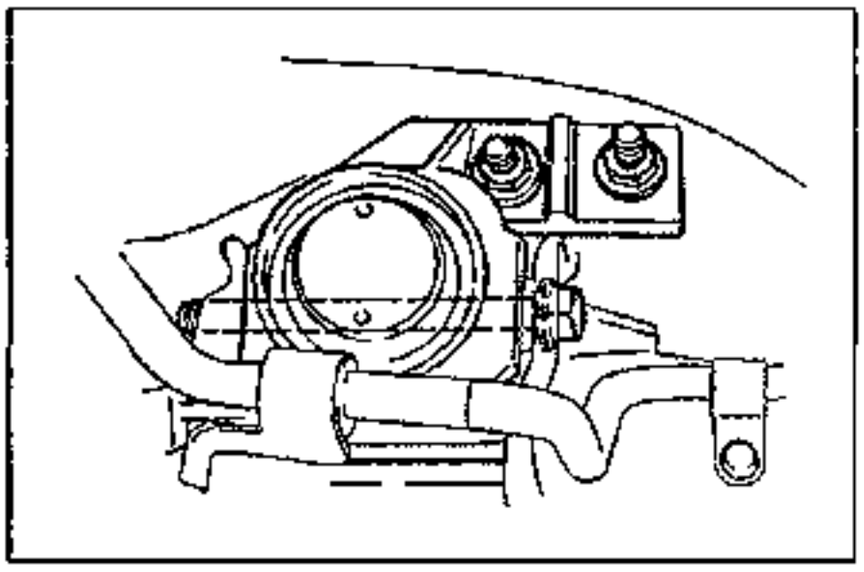


10. Tap in the new blind cap by using a plastic hammer.

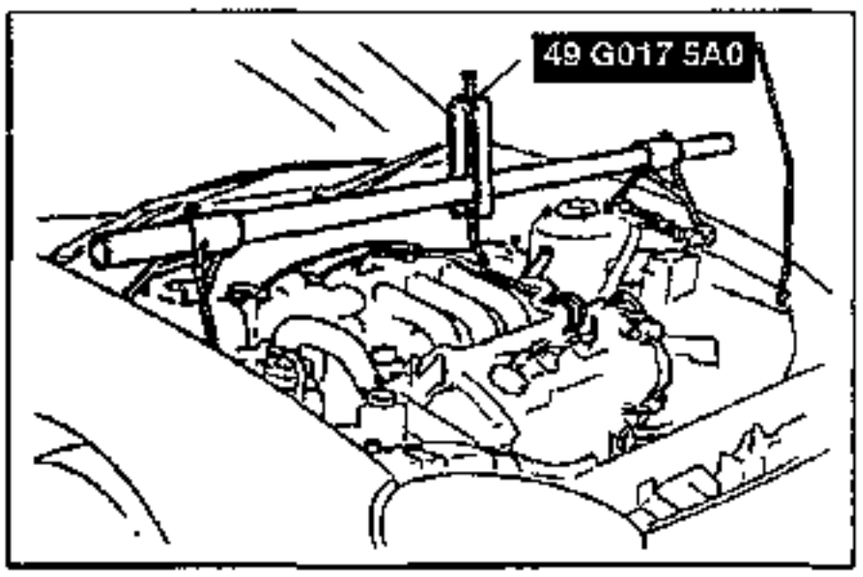


No.3 engine mount bracket
1. Install the No.3 engine mount bracket to the engine.

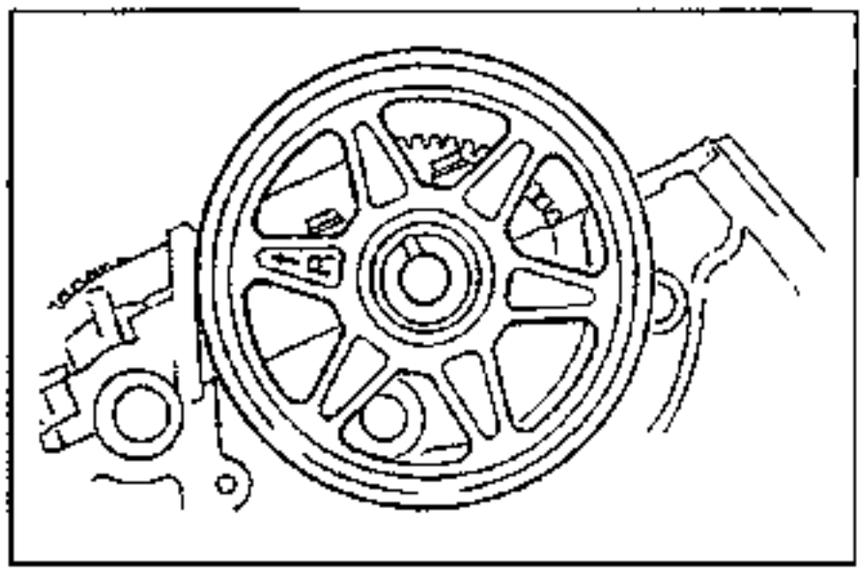
Tightening torque:
44–60 N·m {4.4–6.2 kgf·m, 32–44 ft·lbf}



2. Temporarily install the No.3 engine mount bracket to the engine mount rubber.

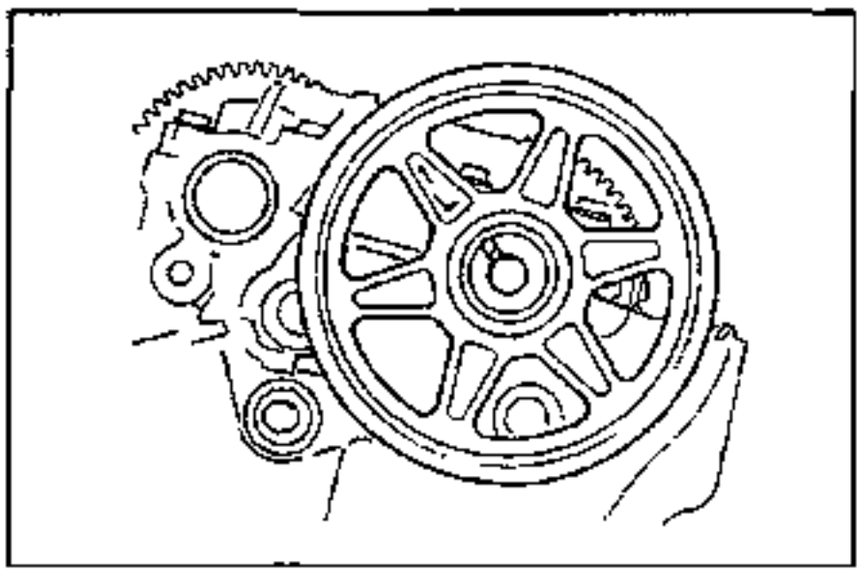


3. Remove the **SST**.

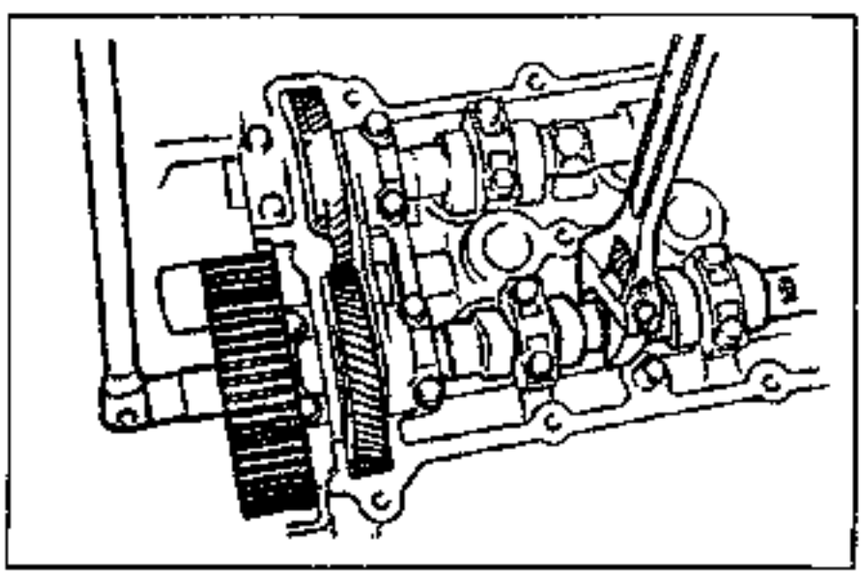


Camshaft pulley

1. Install the RH camshaft pulley so that the "R" mark can be seen and the timing mark aligns with the camshaft knock pin.

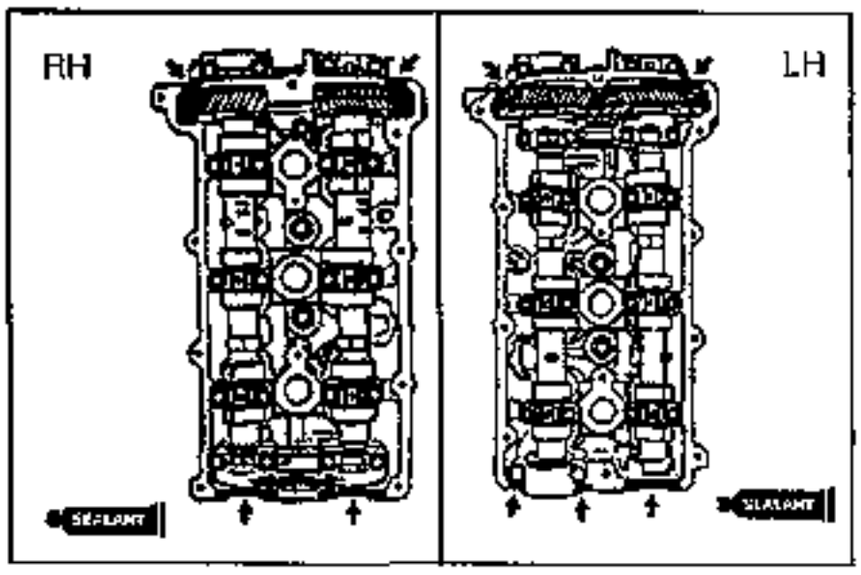


2. Install the LH camshaft pulley so that the "L" mark can be seen and the timing mark aligns with the camshaft knock pin.



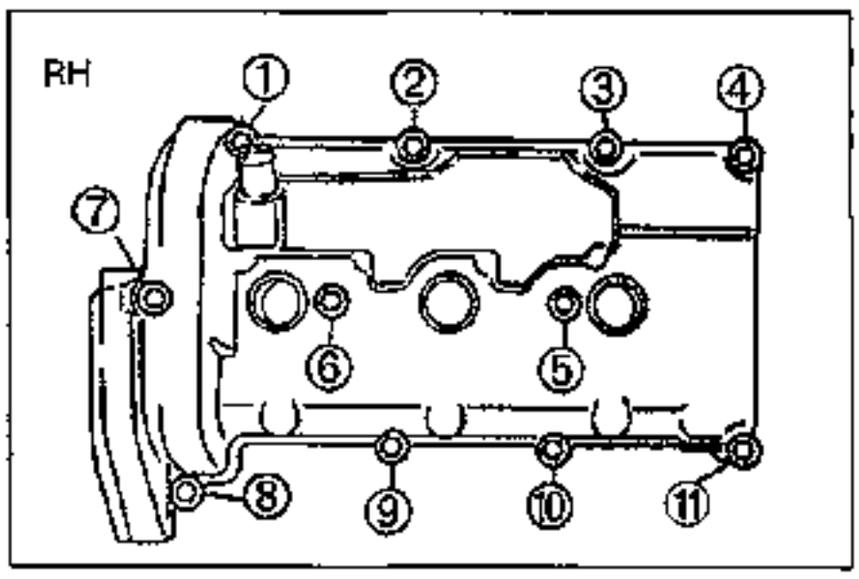
3. Apply clean engine oil to the lock bolt threads and temporarily tighten the camshaft pulley lock bolts.
4. Hold the camshaft by using a wrench on the cast hexagon as shown, and tighten the camshaft pulley lock bolts.

Tightening torque:
123–140 N·m {12.5–14.3 kgf·m, 91–103 ft·lbf}



Cylinder head cover

1. Remove all old silicone sealant from the cylinder head and cover.
2. Apply silicone sealant to the cylinder head cover as shown.
3. Remove all dirt and other material from the cylinder head, and apply sealant as shown.

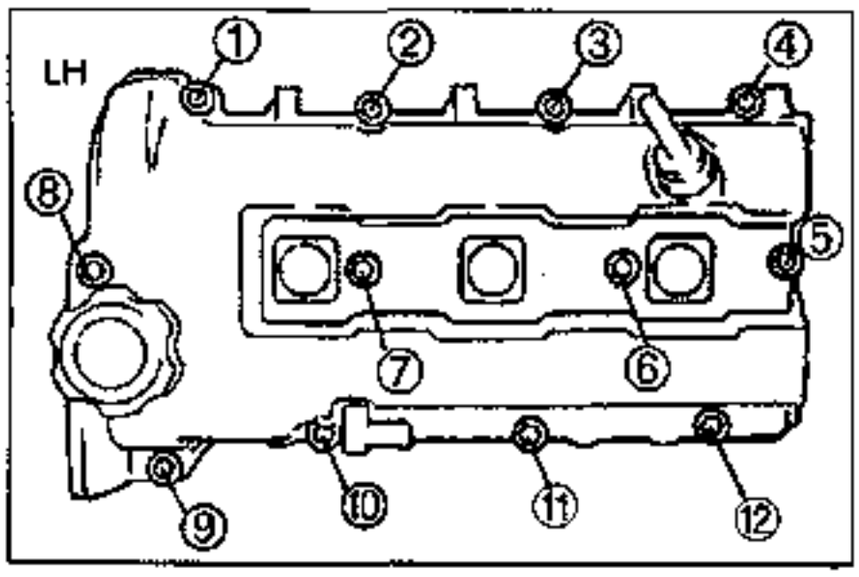


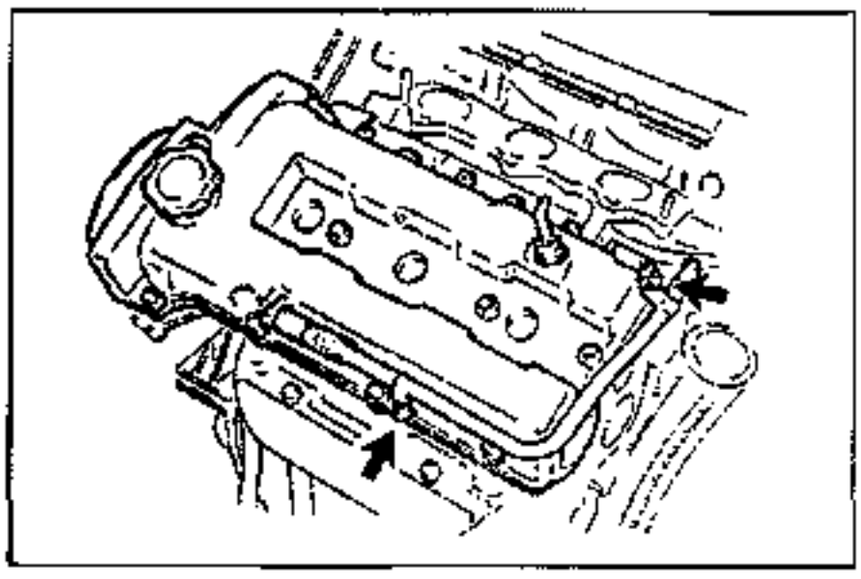
4. Install the cylinder head cover and tighten the bolts in two or three steps in the order shown.

Tightening torque:
5.0–8.8 N·m {50–90 kgf·cm, 44–78 in. lbf}

5. Retighten the bolts. (RH ⑤ ⑥, LH ⑥ ⑦)

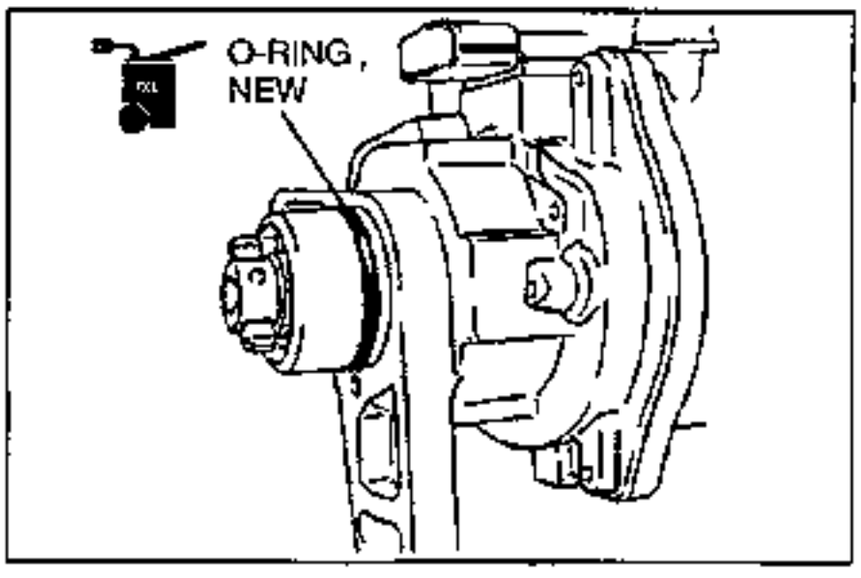
Tightening torque:
5.0–8.8 N·m {50–90 kgf·cm, 44–78 in·lbf}





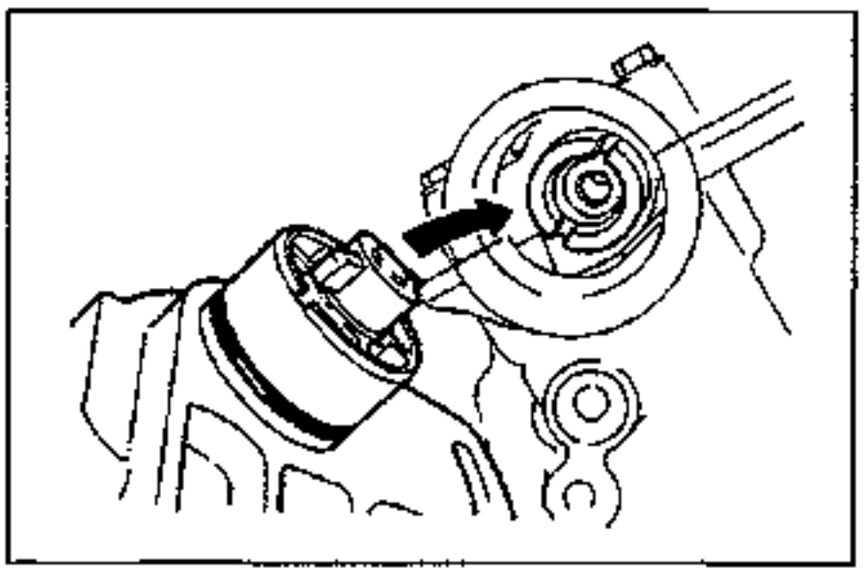
6. Install the ventilation pipe to the left cylinder head cover.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}

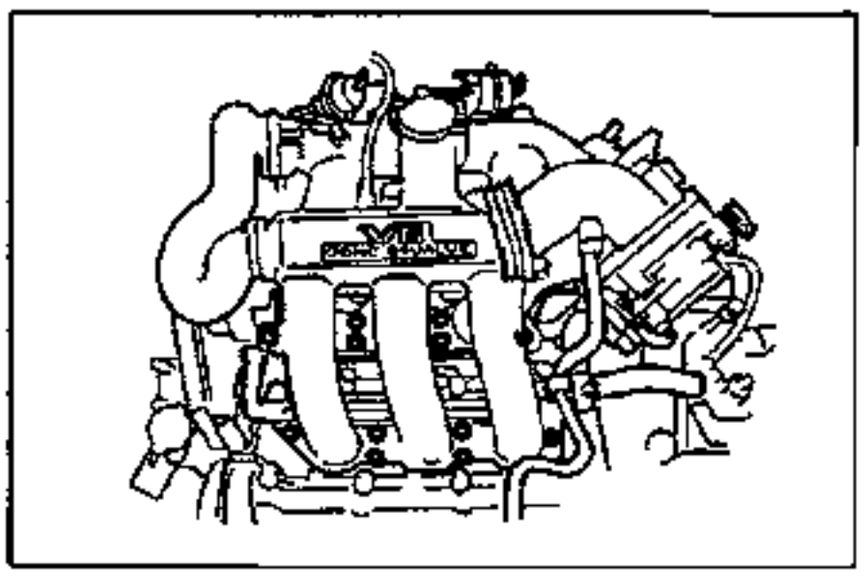


Distributor

1. Apply clean engine oil to a new O-ring and position it on the distributor.
2. Apply clean engine oil to the drive blade.
3. Align the matching marks on the distributor body and the camshaft gear.

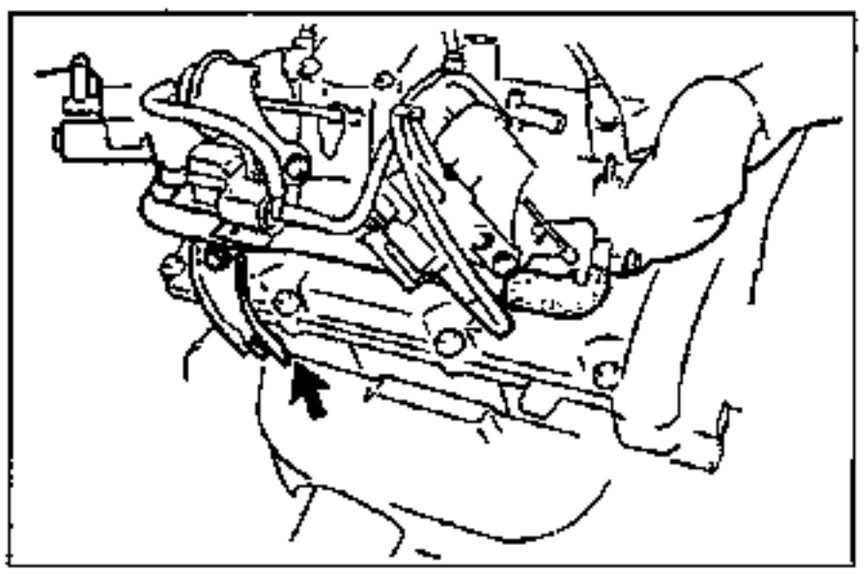


4. Install the distributor with the blade fit into the camshaft groove.
5. Hand tighten the distributor mounting bolt.



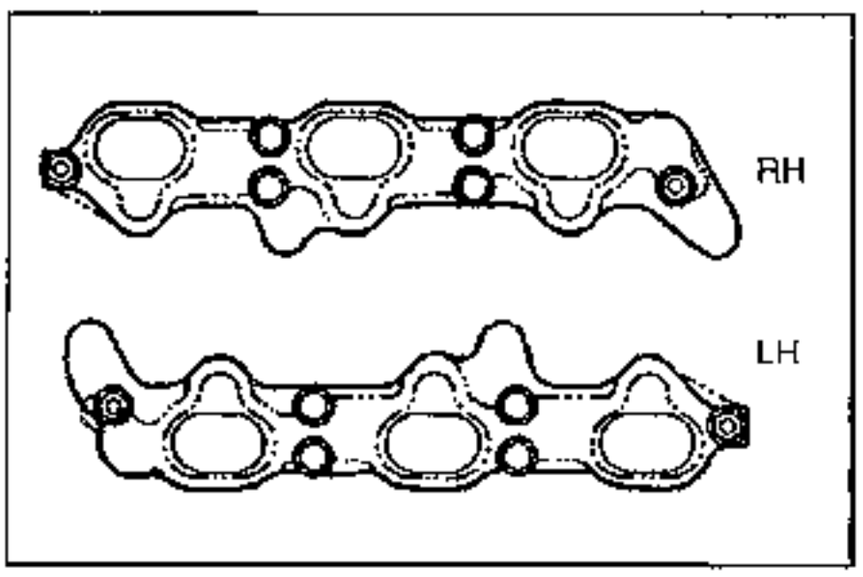
Intake manifold assembly

1. Install a new gasket and the intake manifold. Hand tighten the bolts and nuts.



2. Install the intake manifold stay.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

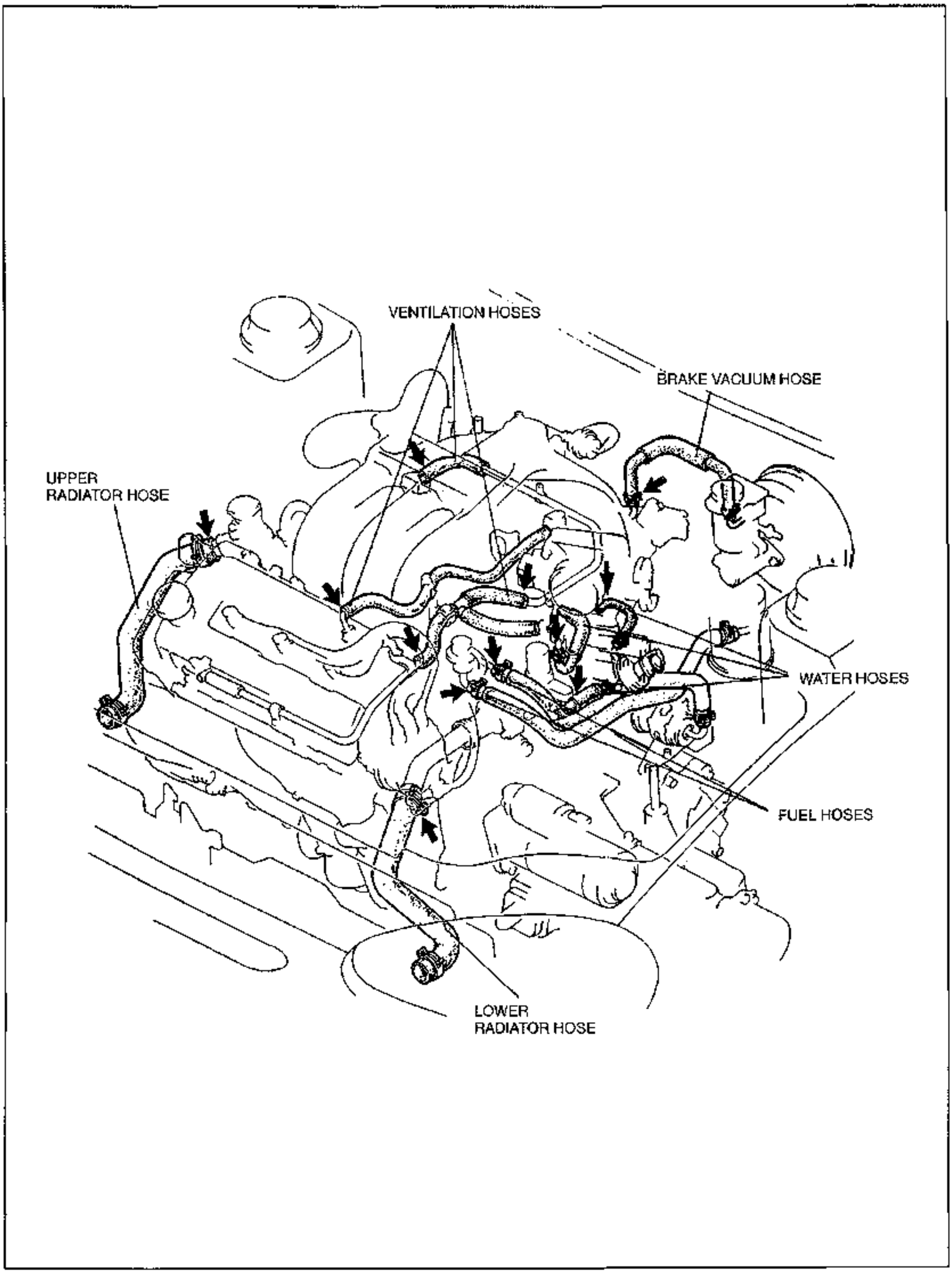


3. Tighten the bolts and nuts in two or three steps.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

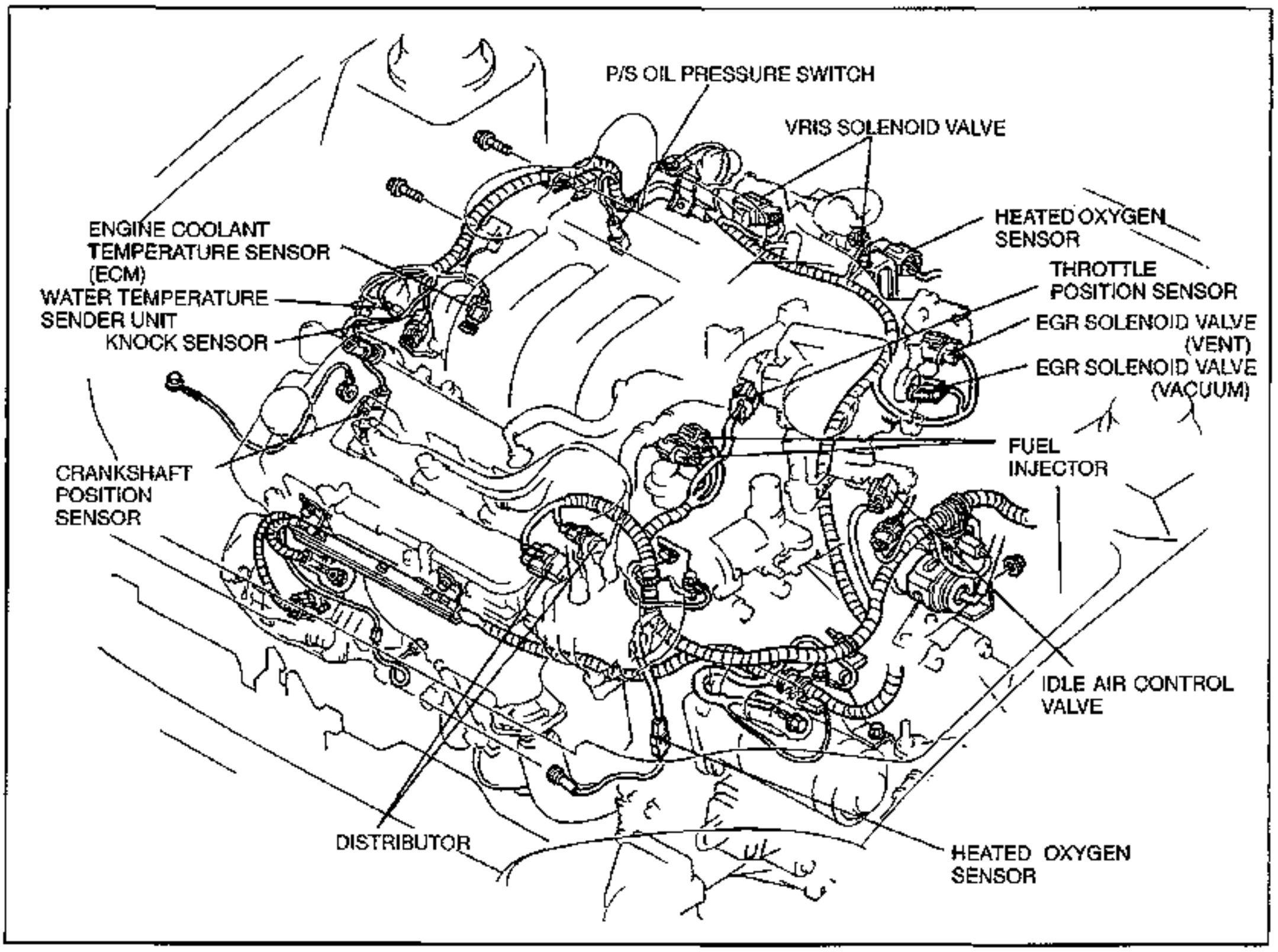
Hoses

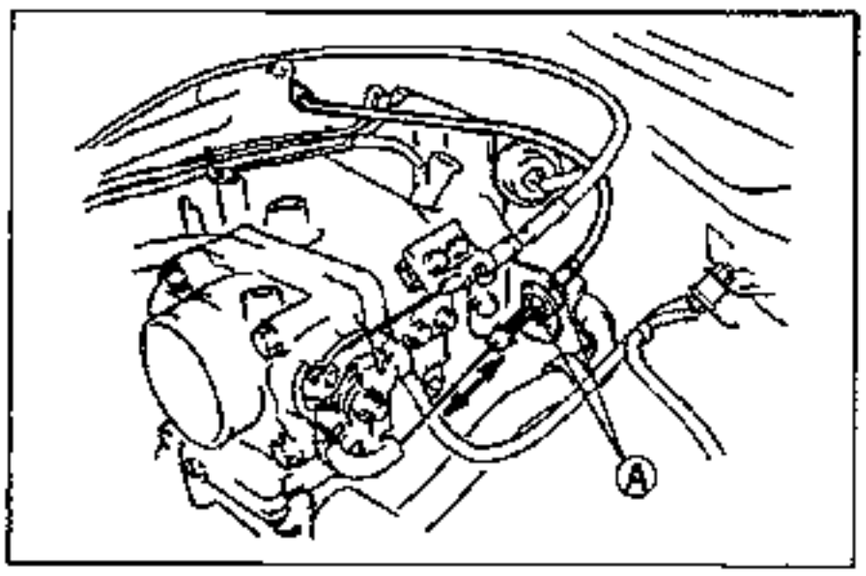
Connect the hoses shown.



Harness

Connect the harness connectors shown.





Accelerator cable

1. Install the accelerator cable.
2. Adjust the cable deflection by turning nuts Ⓐ.

Free play: 1–3mm {0.04–0.11in}

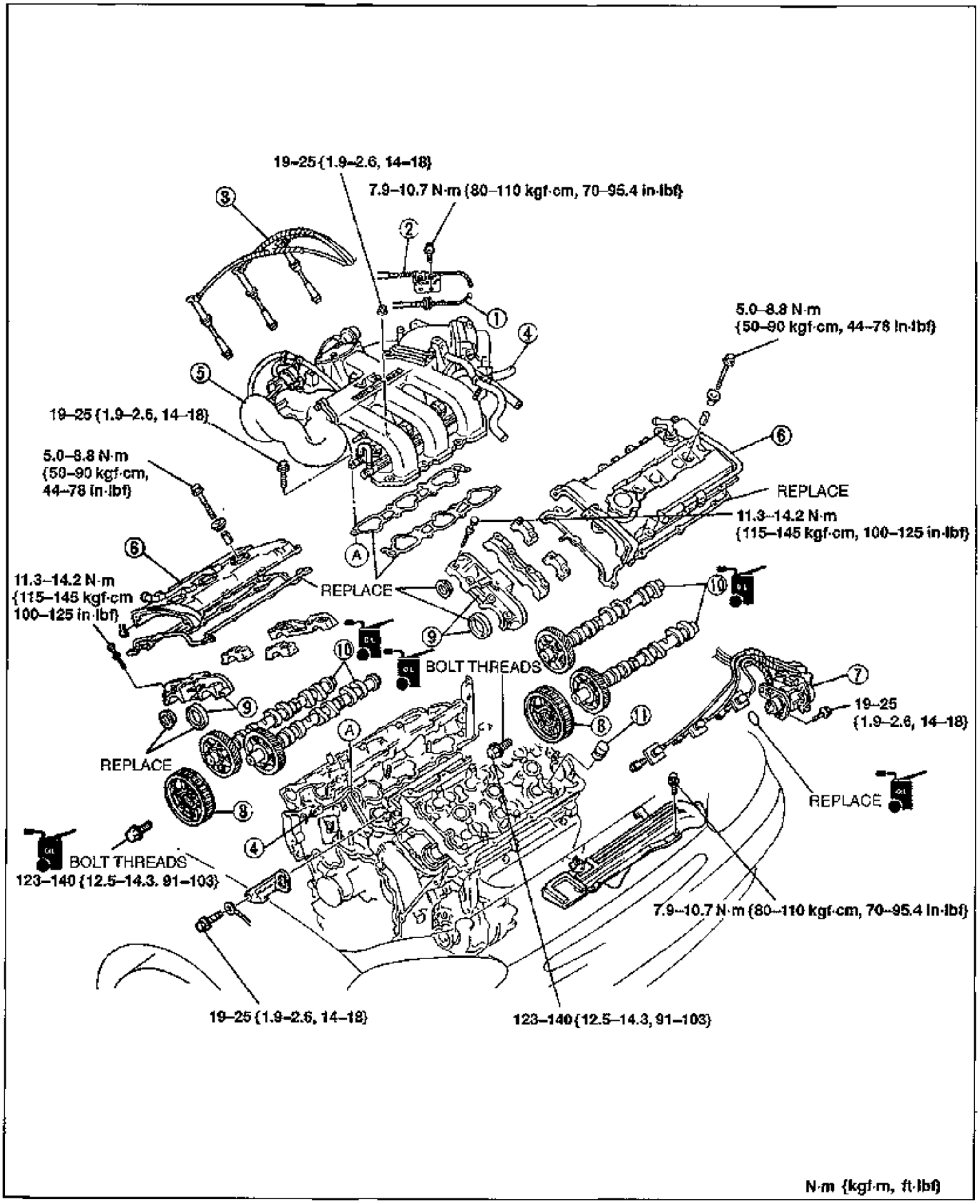
Steps After Installation

1. Install the timing belt. (Refer to page B2–13.)
2. Fill the radiator with the specified amount and type of engine coolant. (Refer to section E2.)
3. Start the engine and
   (1) check the engine oil and engine coolant leakage.
   (2) check the ignition timing and idle speed. (Refer to pages B2–8,9.)
   (3) check the operation of the emission control system. (Refer to section F2.)
4. Recheck the engine coolant and oil levels.

HLA

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove the timing belt. (Refer to page B2–12.)
3. Remove in the order shown in the figure, referring to **Removal Note.**
4. Install in the reverse order of removal, referring to **Installation Note.**

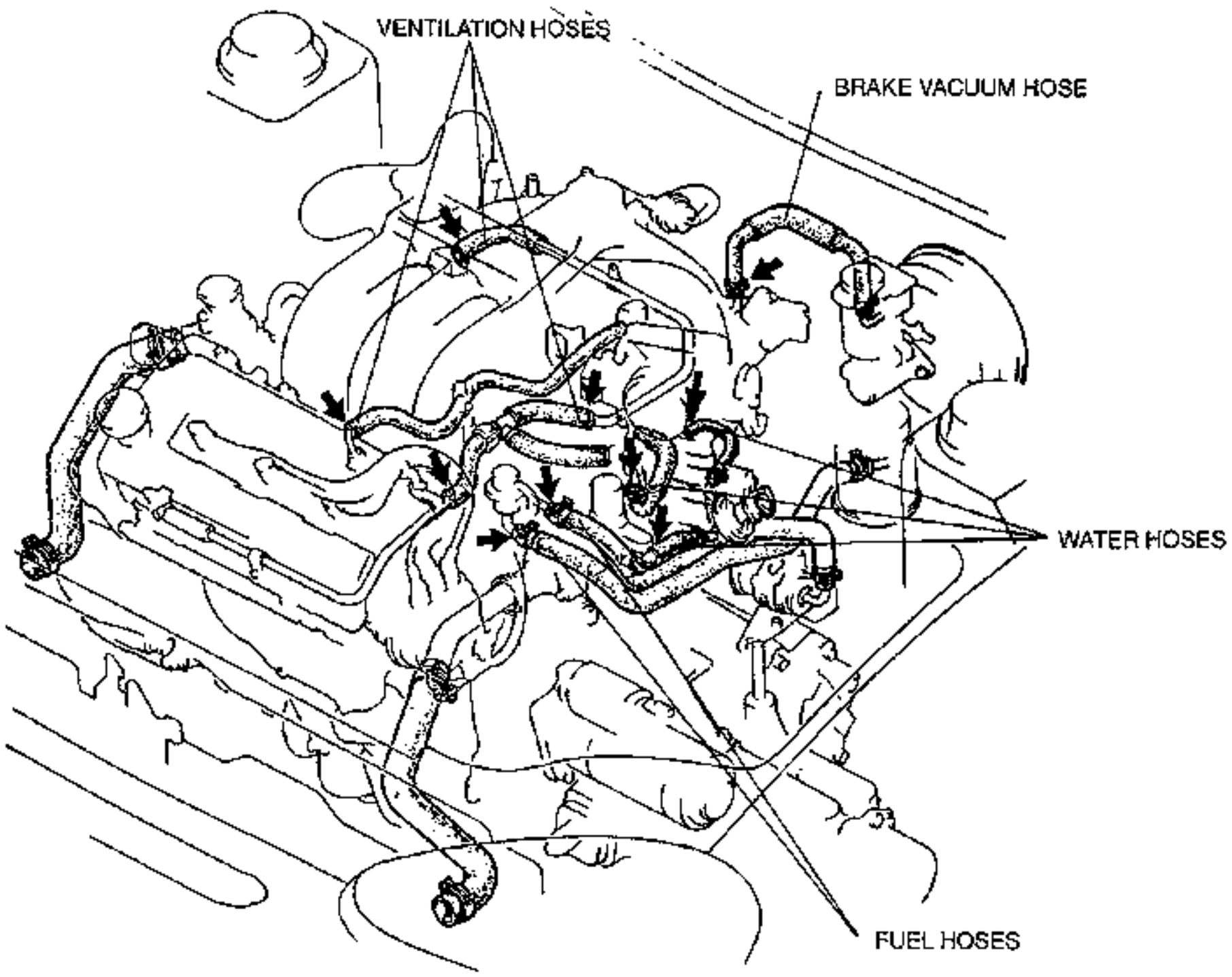


1. Accelerator cable
   Installation Note ..... page B2–36
2. Throttle cable (ATX)
   Adjustment ..... section K
3. High-tension leads
4. Harness and hoses
   Removal / Installation Note ..... below
5. Intake manifold assembly
   Removal Note ..... page B2–26
   Installation Note ..... page B2–34
6. Cylinder head cover
   Removal Note ..... page B2–26
   Installation Note ..... page B2–33
7. Distributor
   Installation Note ..... page B2–33
8. Camshaft pulley
   Removal Note ..... page B2–27
   Installation Note ..... page B2–32
9. Camshaft cap and oil seal
   Removal Note ..... page B2–27
   Installation Note ..... page B2–30
10. Camshaft
    Installation Note ..... page B2–30
11. HLA
    Inspection ..... page B2–80

Removal / Installation Note
Harness and hoses
1. Disconnect the harness connectors and hoses shown.
2. Connect the harness connectors and hoses in the reverse order of disconnection.

HARNESS

HOSES

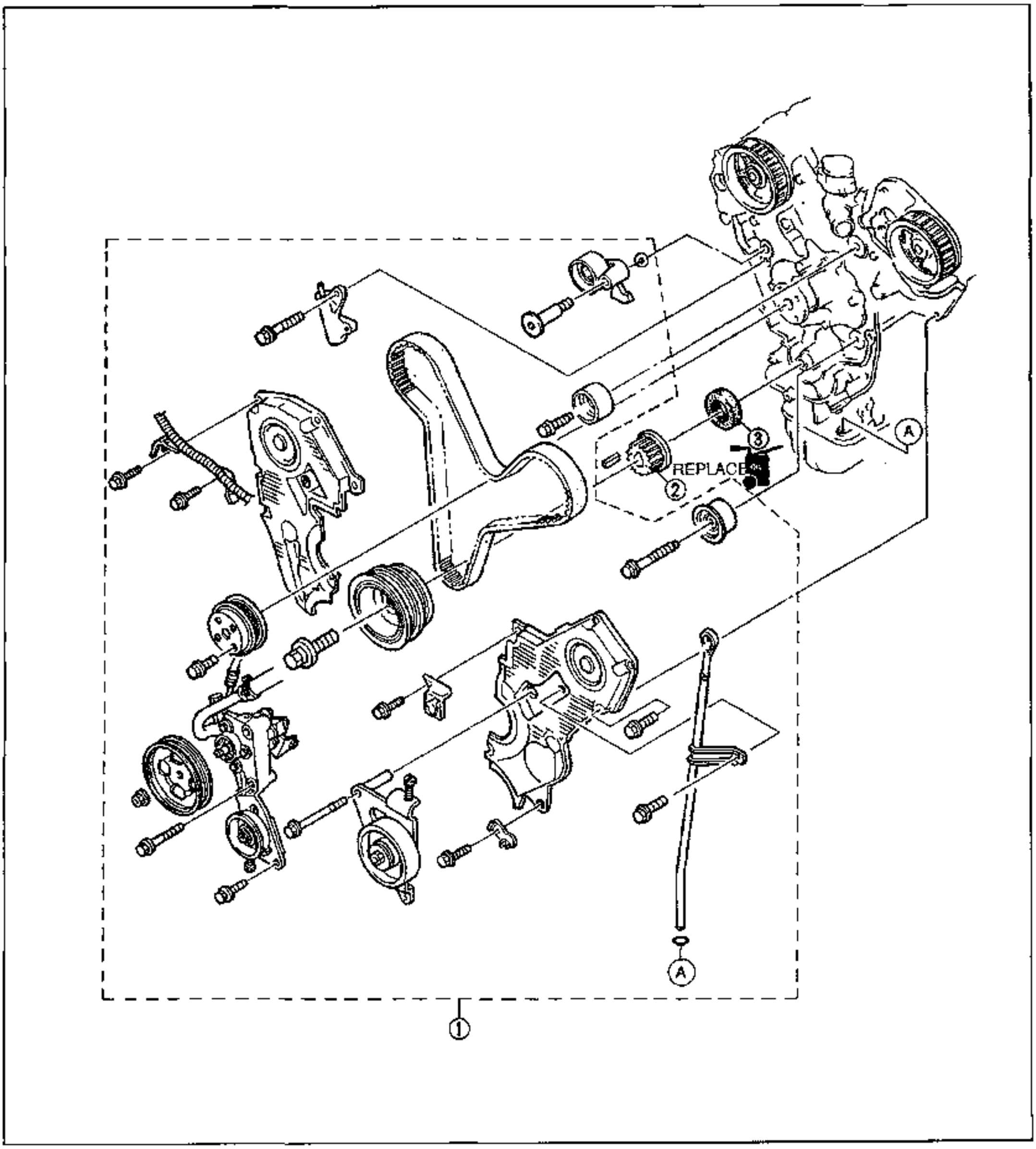


Steps After Installation
1. Install the timing belt. (Refer to page B2–13.)
2. Fill the radiator with the specified amount and type of engine coolant. (Refer to section E2.)
3. Start the engine and
   (1) check the engine oil and engine coolant leakage.
   (2) check the ignition timing and idle speed. (Refer to pages B2–8, 9.)
   (3) check the operation of the emission control system. (Refer to section F2.)
4. Recheck the engine coolant and oil levels.

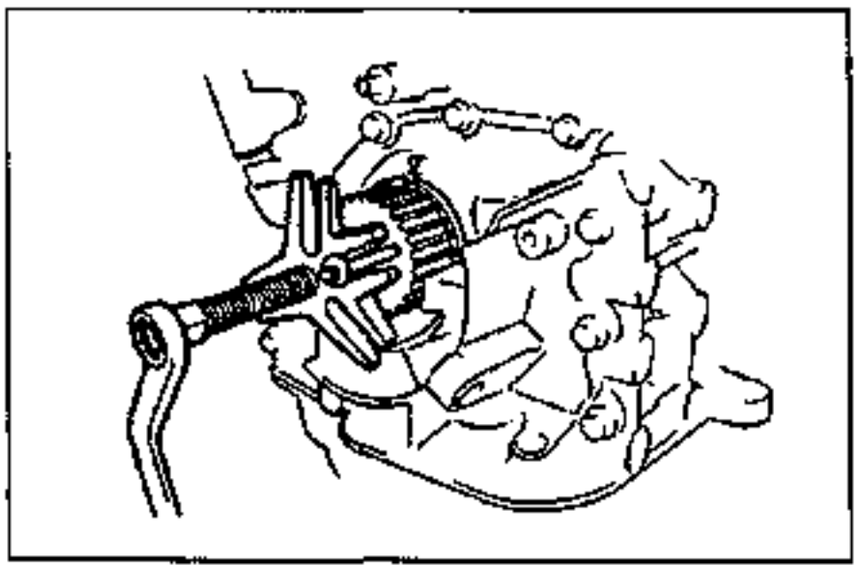
FRONT OIL SEAL

Replacement

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.



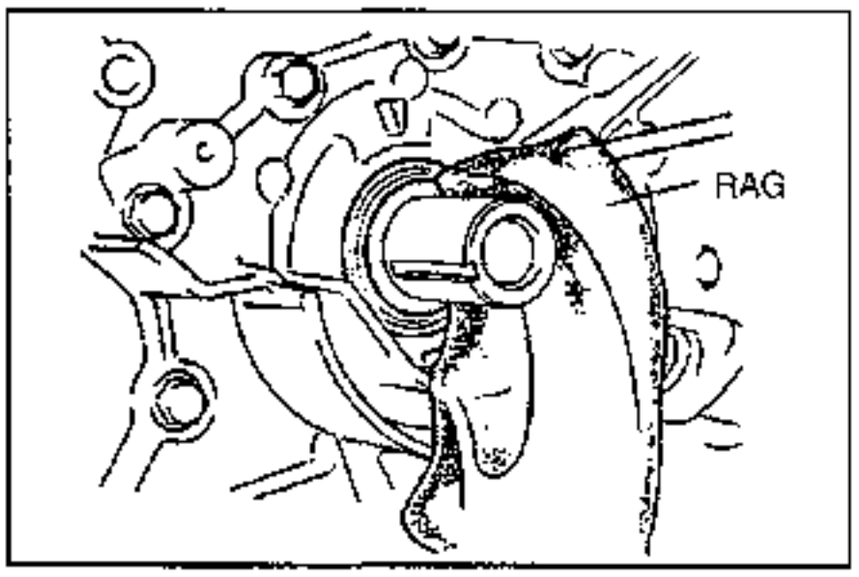
1. Timing belt
   Removal / Installation ..... page B2–13
2. Timing belt pulley
   Removal Note ..... page B2–41
   Installation Note ..... page B2–41
3. Oil seal
   Removal Note ..... page B2–41
   Installation Note ..... page B2–41



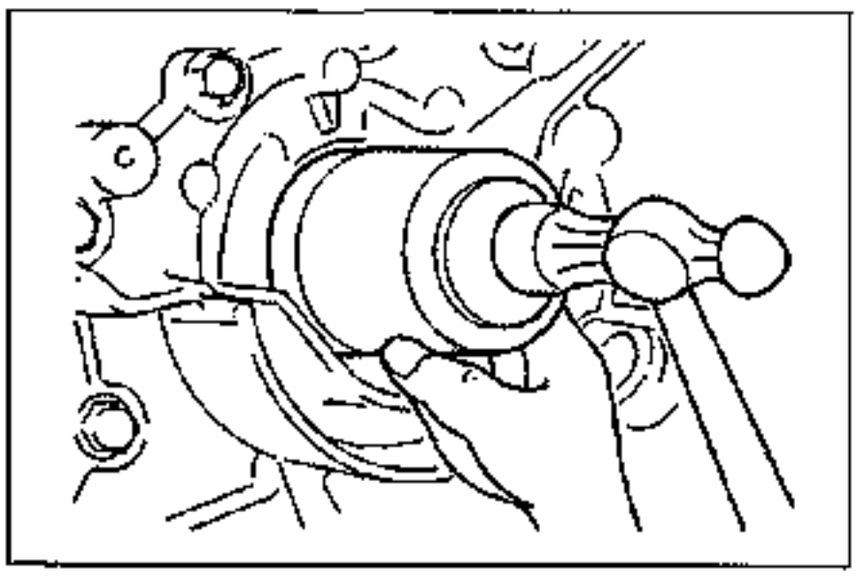
Removal Note
Timing belt pulley

Note
- If necessary, remove the pulley with a steering wheel puller.

1. Remove the timing belt pulley.
2. Remove the crankshaft key.



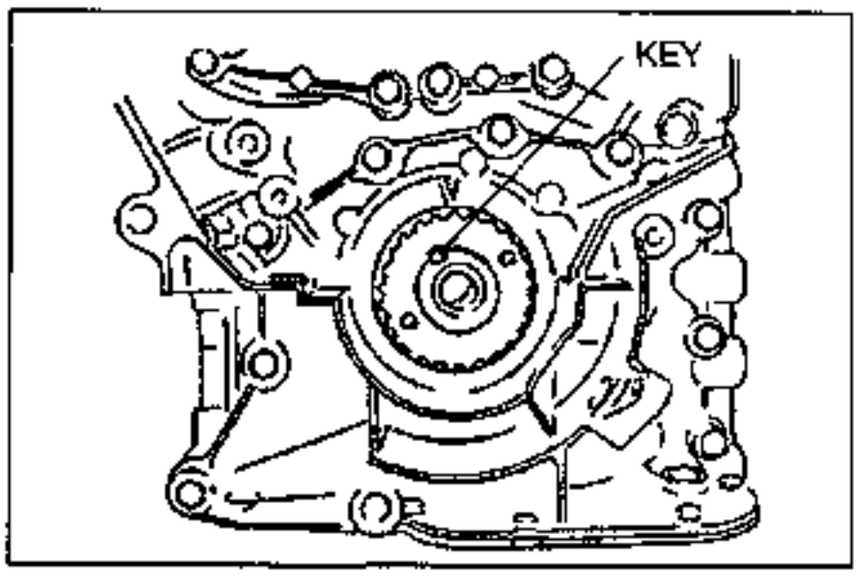
Oil seal
1. Cut the oil seal lip with a razor knife.
2. Remove the oil seal by using a screwdriver protected with a rag.



Installation Note
Oil seal
1. Apply clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.
3. Tap the oil seal in evenly with a pipe and a hammer.

Protrusion: 0–0.5mm {0–0.019 in}

Note
- Oil seal outer diameter: 48.0 mm {1.89 in}
- Oil seal inner diameter: 34.0 mm {1.34 in}



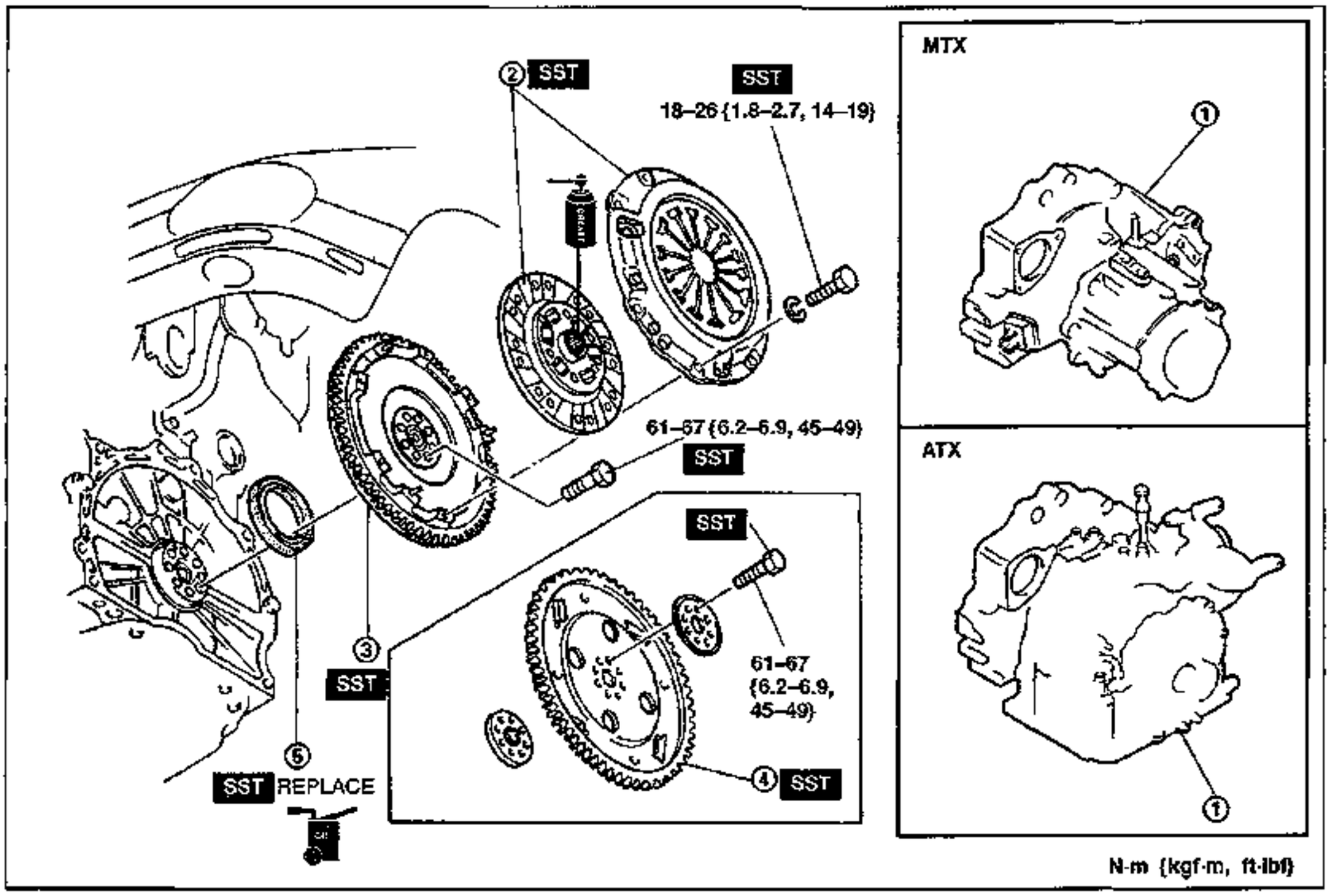
Timing belt pulley
1. Install the timing belt pulley.
2. Install the crankshaft key with the tapered side toward the oil pump body.

Steps After Installation
Start the engine and check the following.
- Ignition timing (Refer to page B2–8.)

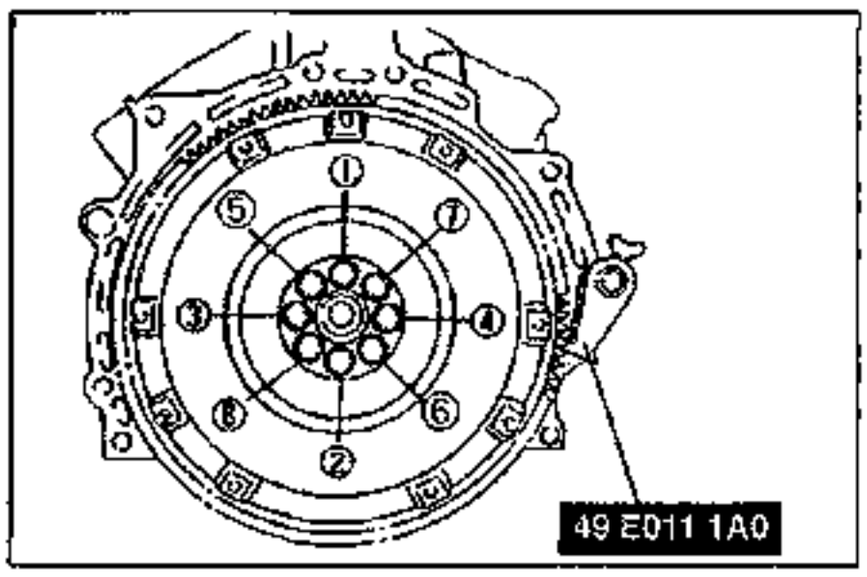
REAR OIL SEAL

Replacement

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note.**
3. Install in the reverse order of removal, referring to **Installation Note.**



1. Transaxle
   MTX
   Removal / Installation ..... section J2
   ATX
   Removel / Installation ..... section K
2. Clutch cover, clutch disc (MTX)
   Service ..... section H
3. Flywheel (MTX)
   Removal Note ..... below
   Installation Note ..... page B2–43
4. Drive plate, backing plate, adapter (ATX)
   Removal Note ..... below
   Installation Note ..... page B2–43
5. Oil seal
   Removal Note ..... page B2–43
   Installation Note ..... page B2–43



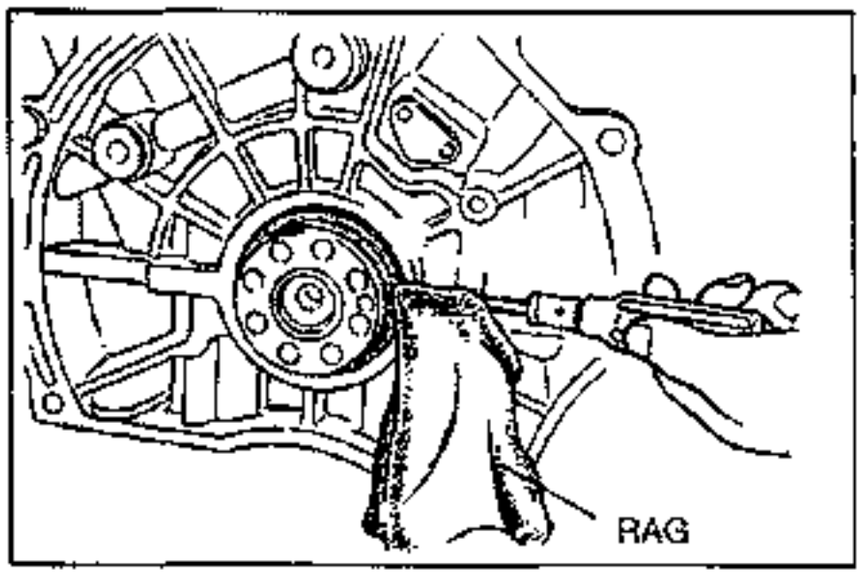
Removal Note

Flywheel (MTX)

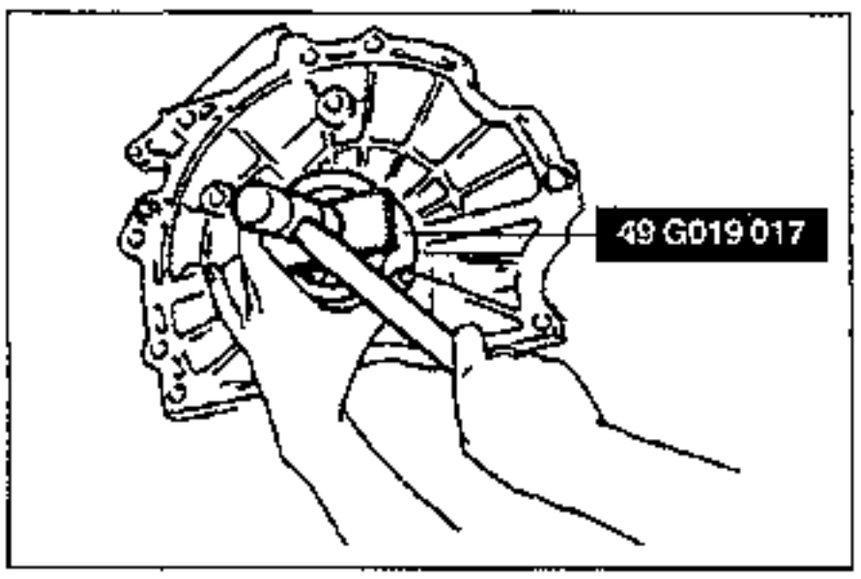
1. Hold the flywheel by using the **SST.**
2. Remove the flywheel mounting bolts.
3. Remove the flywheel.

Drive plate (ATX)

1. Hold the drive plate by using the **SST.**
2. Remove the lock bolts.
3. Remove the backing plate, drive plate, and adapter.

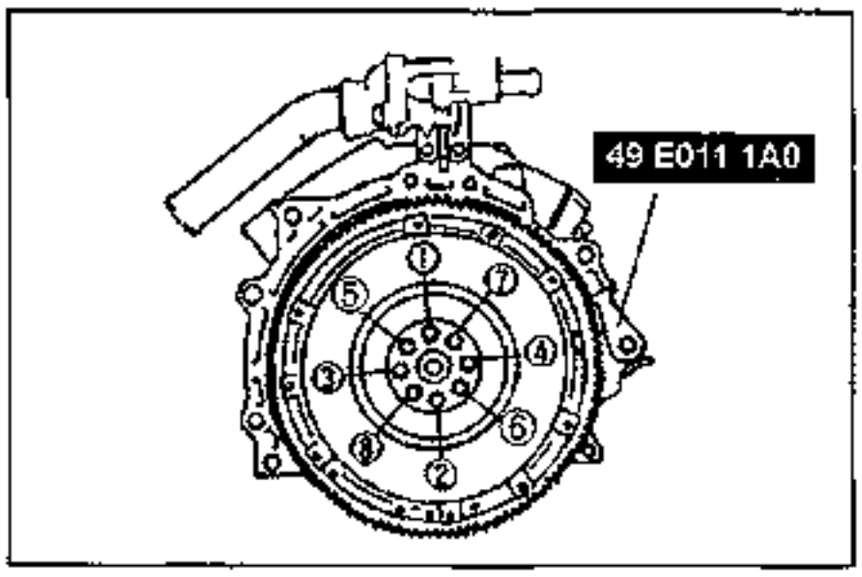


Oil seal
1. Cut the oil seal lip with a razor knife.
2. Remove the oil seal by using a screwdriver protected with a rag.



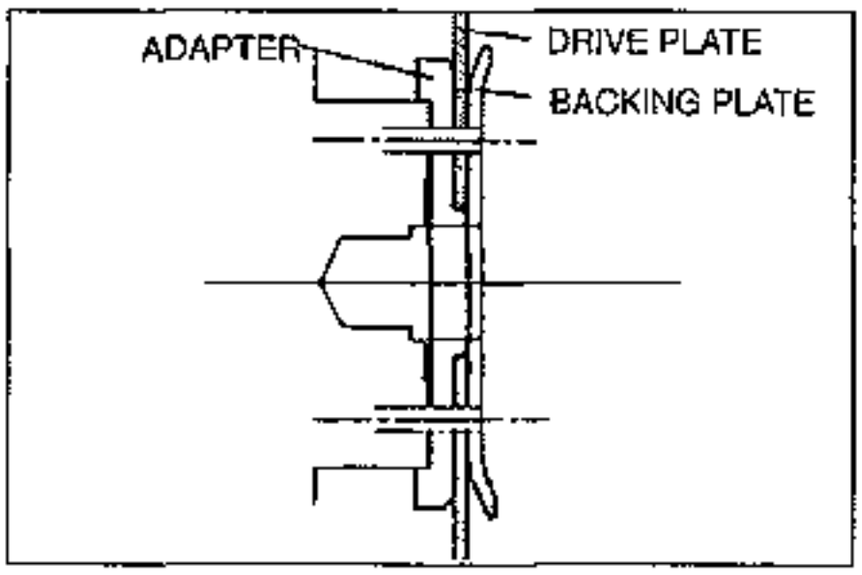
Installation Note
Oil seal
1. Apply clean engine oil to the lip of the new oil seal.
2. Push the oil seal slightly in by hand.
3. Tap the oil seal in evenly with the **SST** and a hammer.

Protrusion: 0–0.7mm {0–0.03 in}

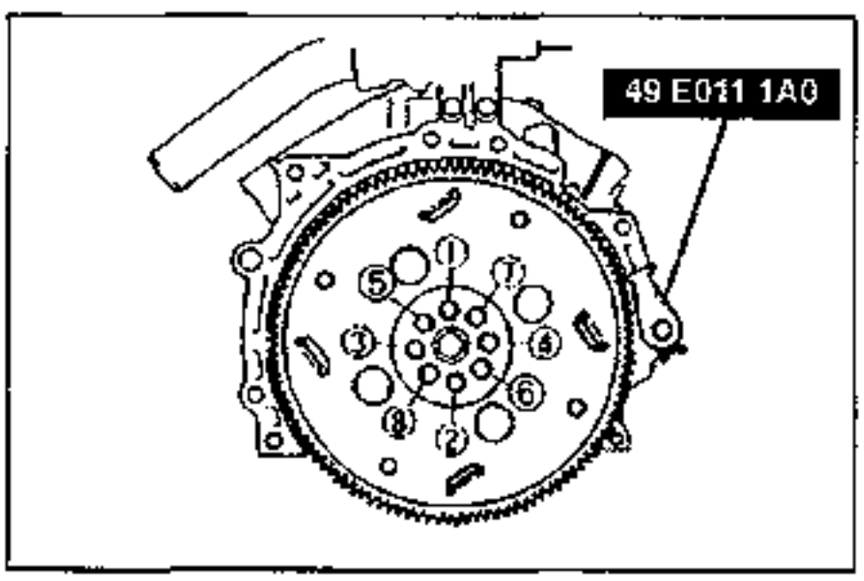


Flywheel (MTX)
1. Set the flywheel onto the crankshaft.
2. Hand tighten the lock bolts.
3. Hold the flywheel by using the **SST**.
4. Tighten the bolts in two or three steps in the order shown.

Tightening torque:
61–87 N·m {6.2–8.9 kgf·m, 45–49 ft·lbf}



Drive plate (ATX)
1. Install the adapter, drive plate and backing plate as shown and hand tighten the lock bolts.



2. Hold the drive plate by using the **SST**.
3. Tighten the bolts in two or three steps in the order shown.

Tightening torque:
61–87 N·m {6.2–8.9 kgf·m, 45–49 ft·lbf}

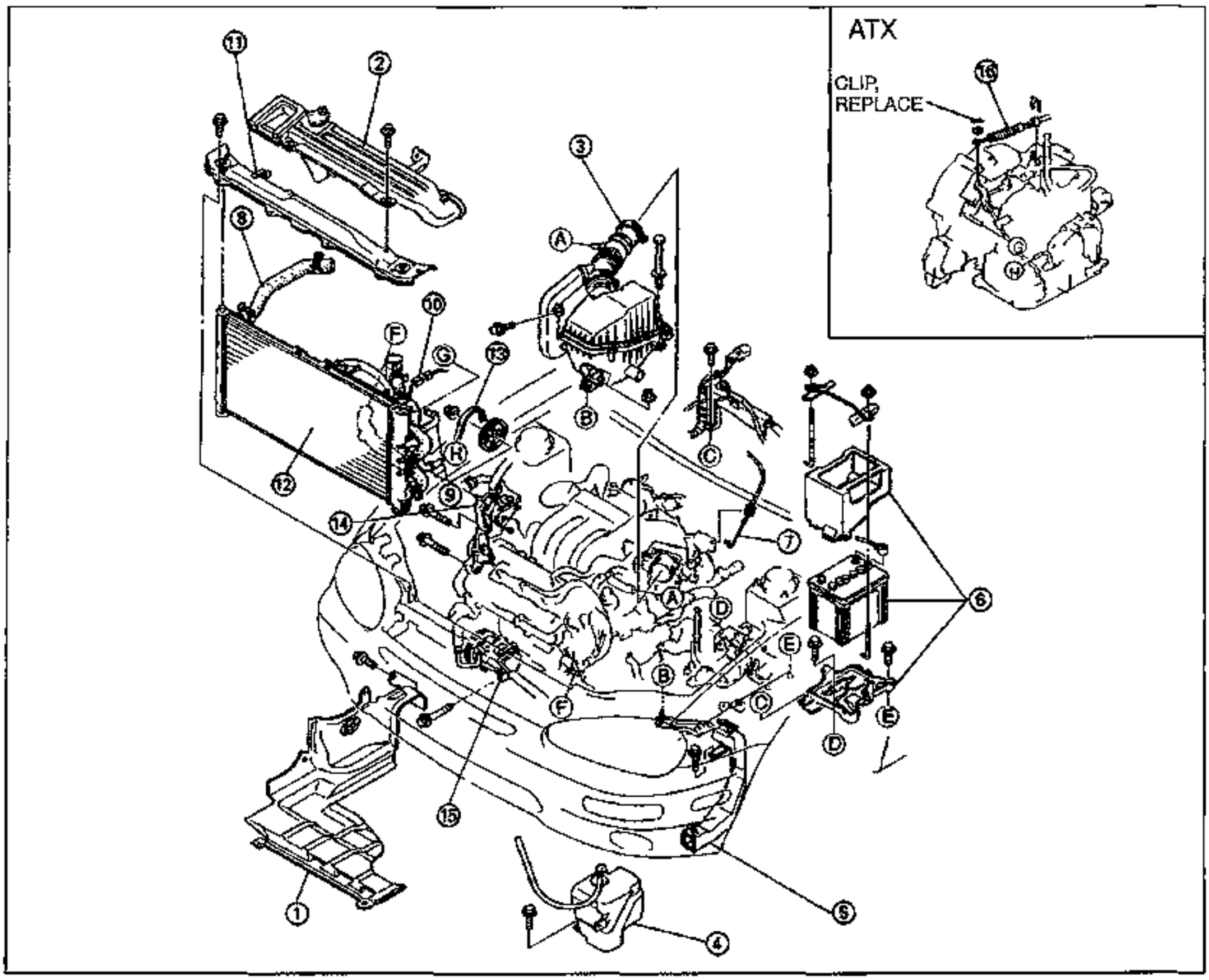
Steps After Installation
Start the engine and perform engine adjustments as necessary.

REMOVAL

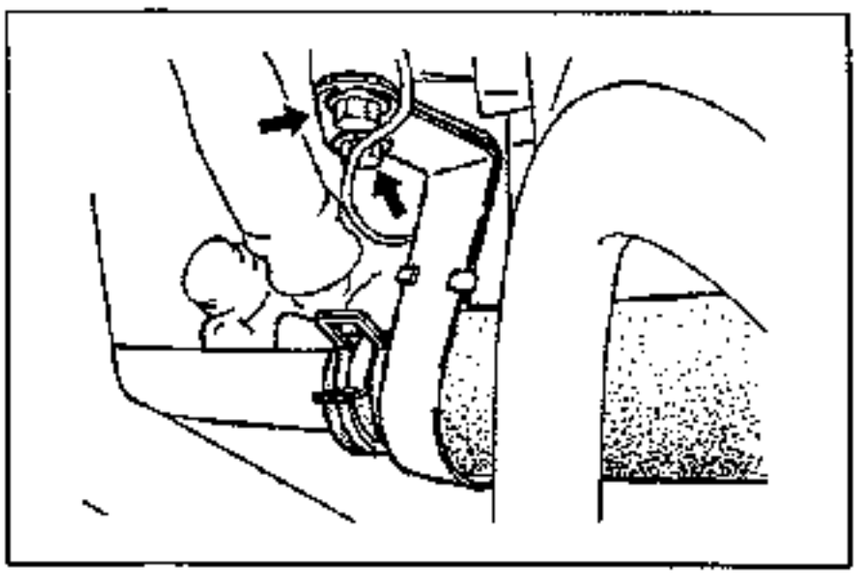
Warning
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on section F2.**

PROCEDURE
1. Disconnect the negative battery cable.
2. Drain the engine coolant and transaxle oil.
3. Remove the hood and front wheels.
4. Remove in the order shown in the figure, referring to **Removal Note.**

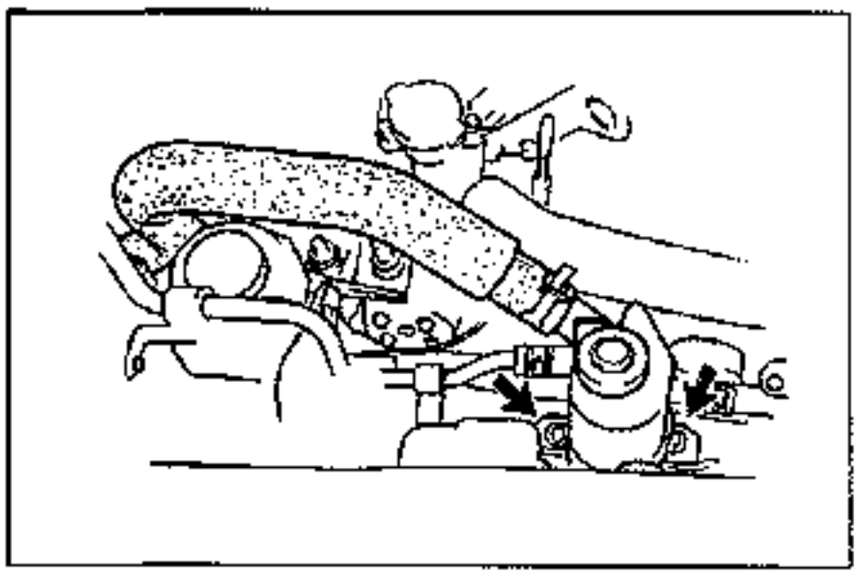
Step 1



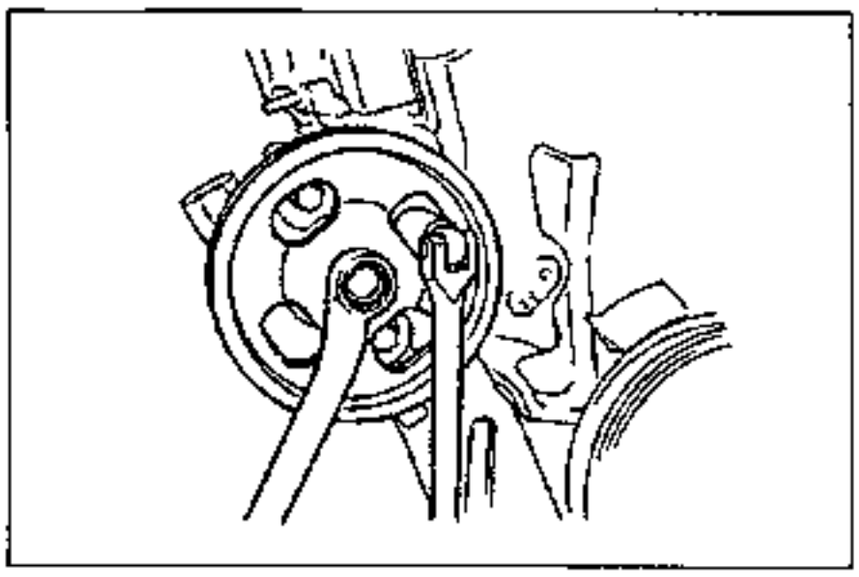
1. Splash shield
2. Fresh-air duct
3. Air cleaner assembly
4. Coolant reservoir
5. Battery duct
6. Battery and carrier
7. Accelerator cable
8. Radiator hose
9. Oil cooler hose (ATX)
10. Coolant fan motor connector
11. Shroud upper panel
12. Radiator and coolant fan assembly
13. Drive belt
    Removal ..... page B2– 7
14. P/S oil pump
    Removal Note ..... page B2–45
15. A/C compressor (if equipped)
    Removal Note ..... page B2–46
16. Control cable (ATX)



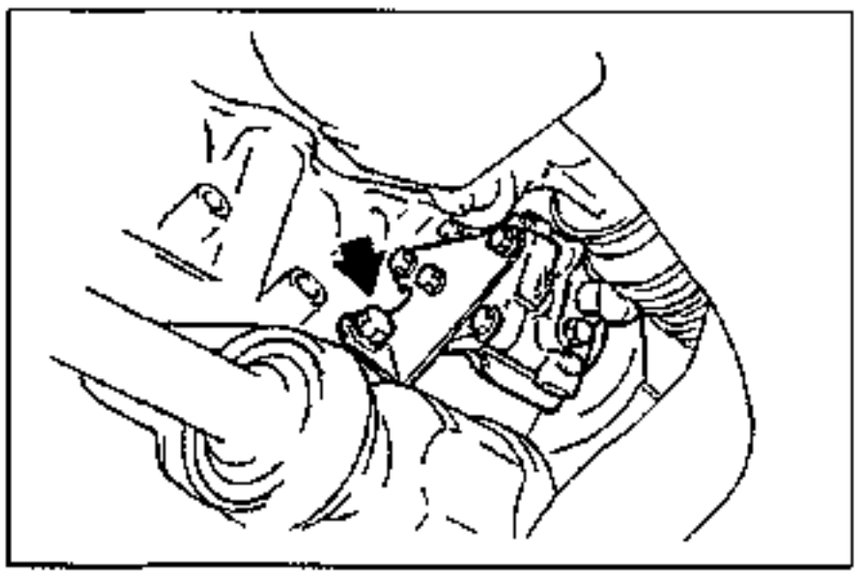
Removal Note
P/S oil pump
1. Disconnect the P/S oil pump hose from the engine.
2. Disconnect the steering pressure sensor connector.



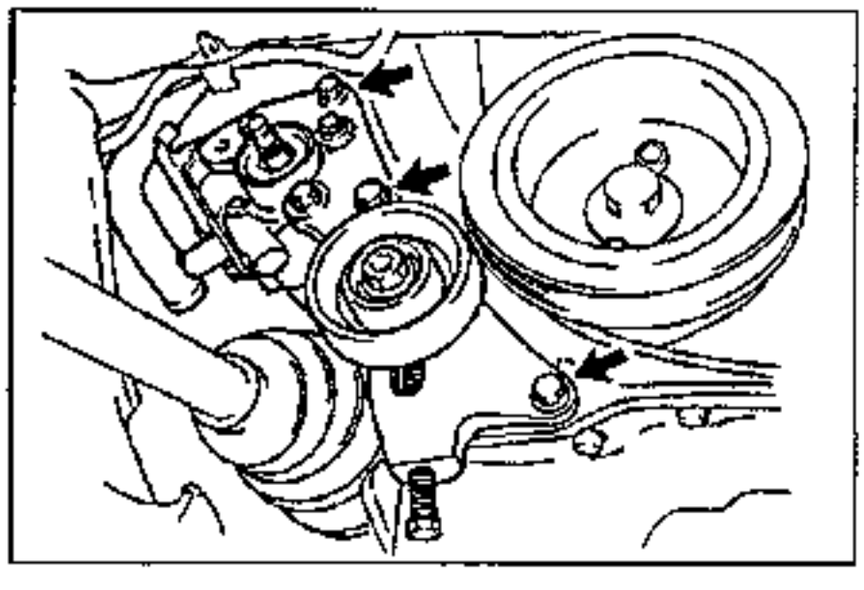
3. Remove the bolts shown and secure the P/S oil reservoir away from the engine.



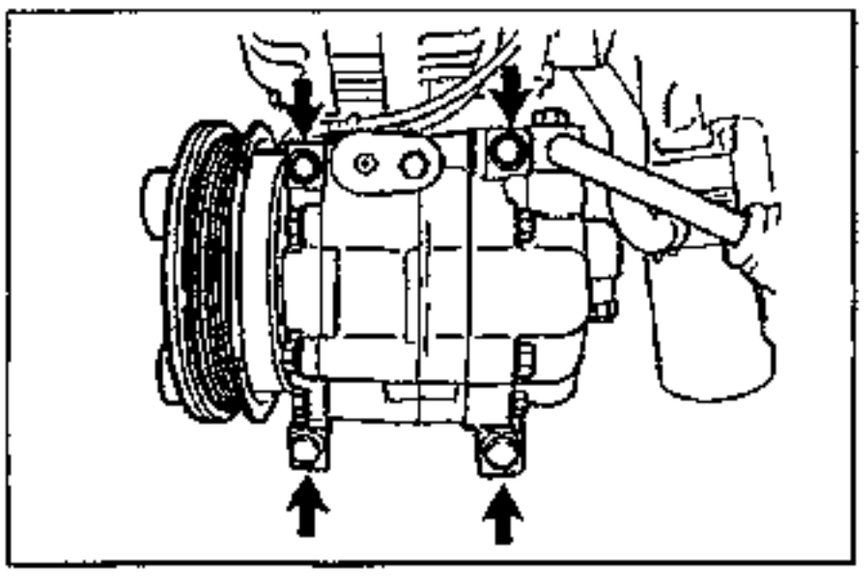
4. Loosen the pulley nut as shown.
5. Remove the pulley.



6. Remove the bolt shown.



7. Remove the bolts shown and remove the P/S oil pump.
8. Position the P/S oil pump away from the engine and secure it with wire.

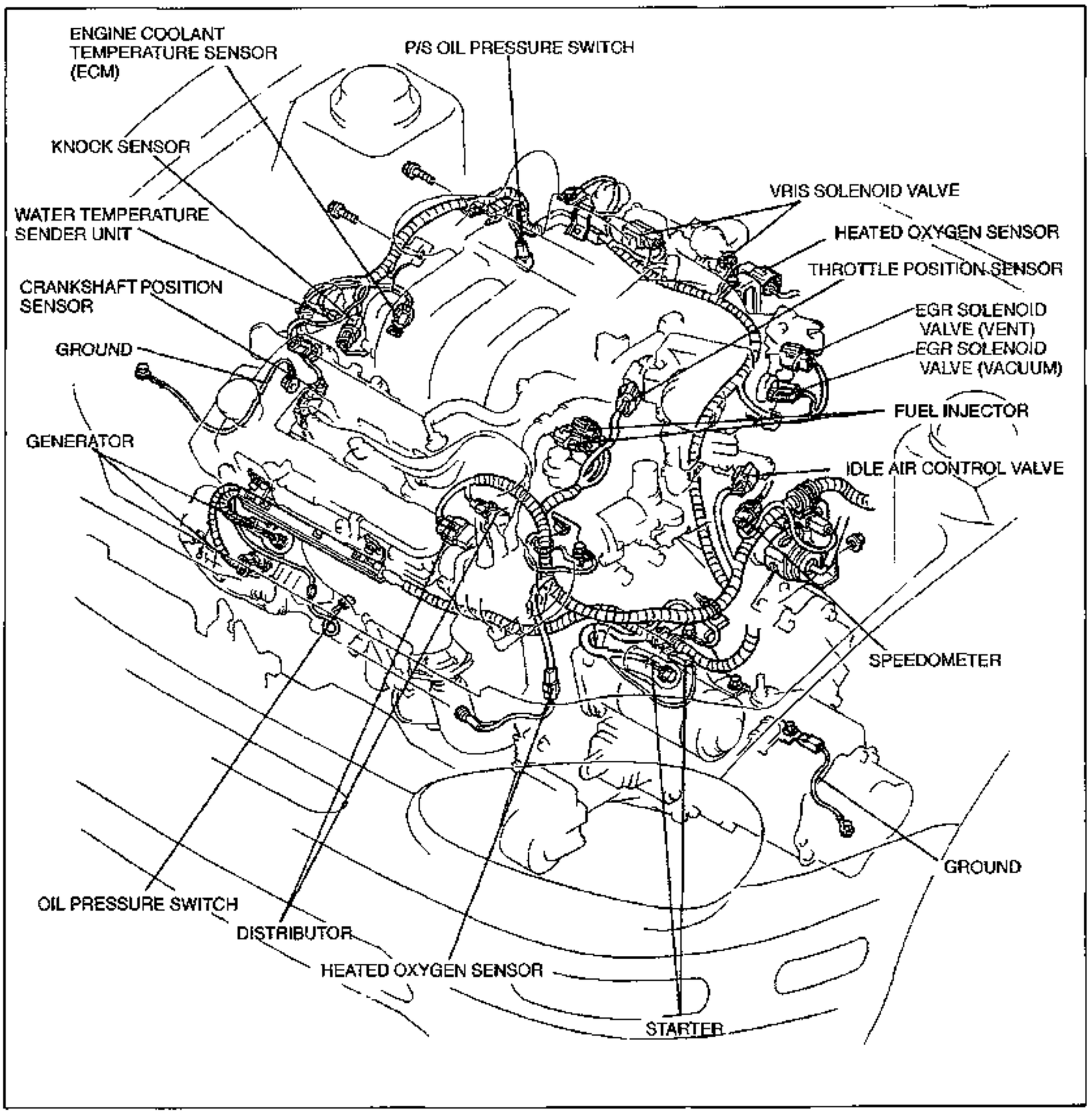


A/C compressor

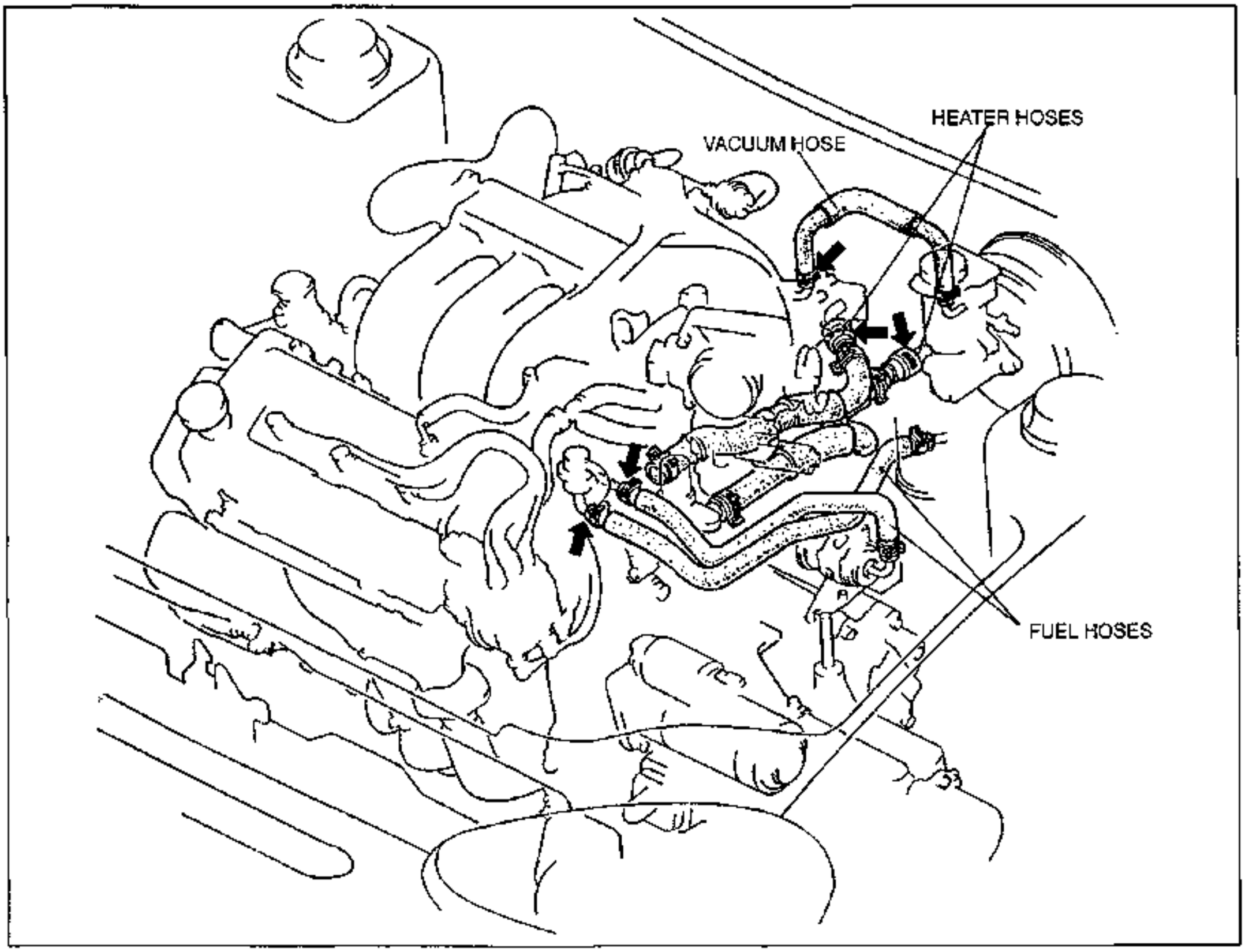
1. Remove the A/C compressor with the hoses still connected.
2. Position the compressor away from the engine and secure it with wire.

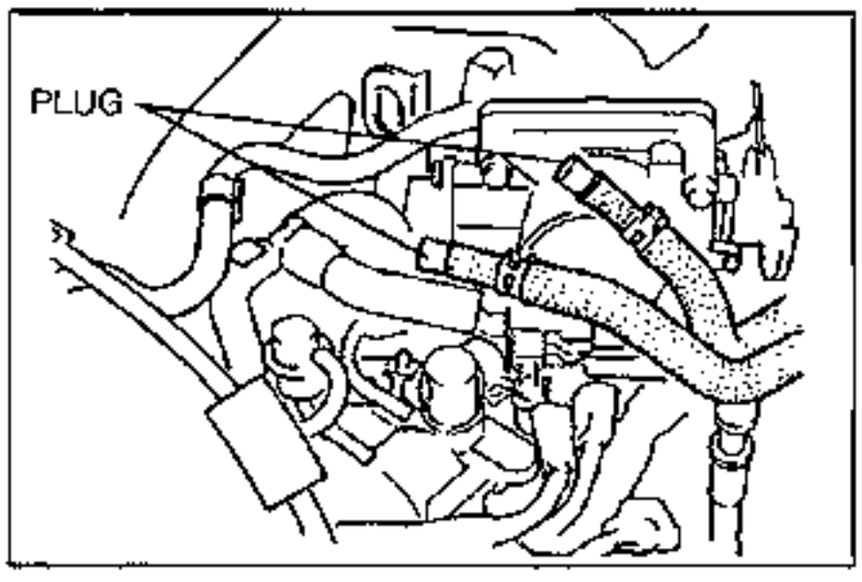
Step 2

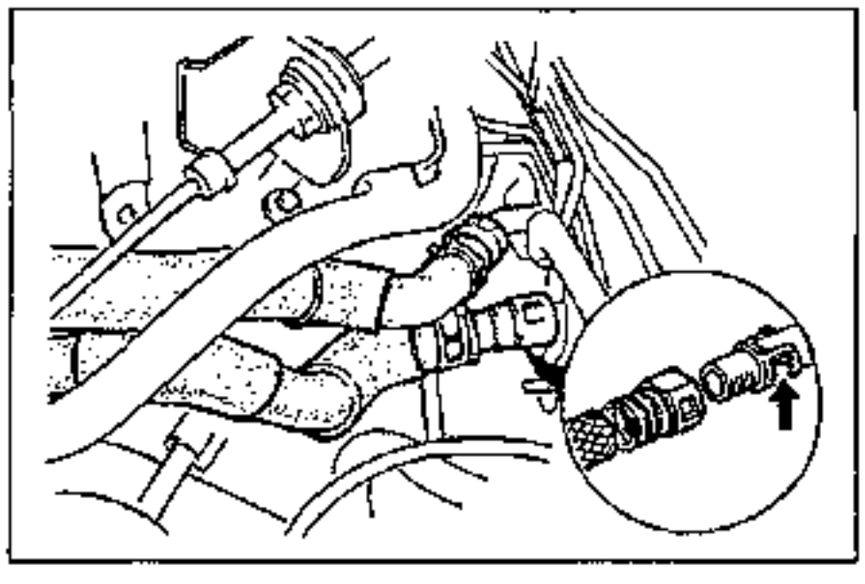
Disconnect the harness connectors shown.



Step 3
Disconnect the hoses shown.







Removal Note
Fuel hose

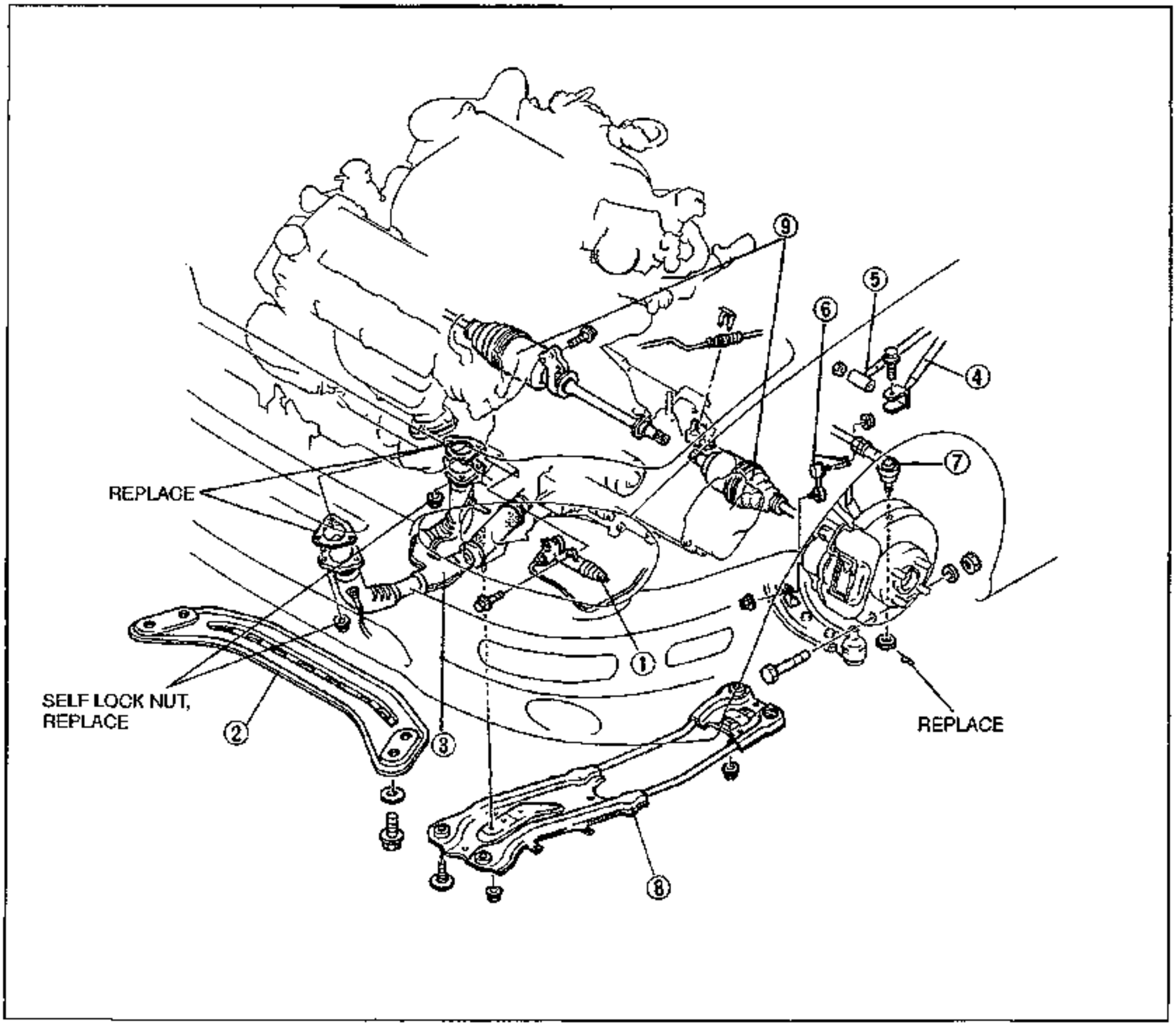
Warning
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on section F2.**

Disconnect the fuel hoses.

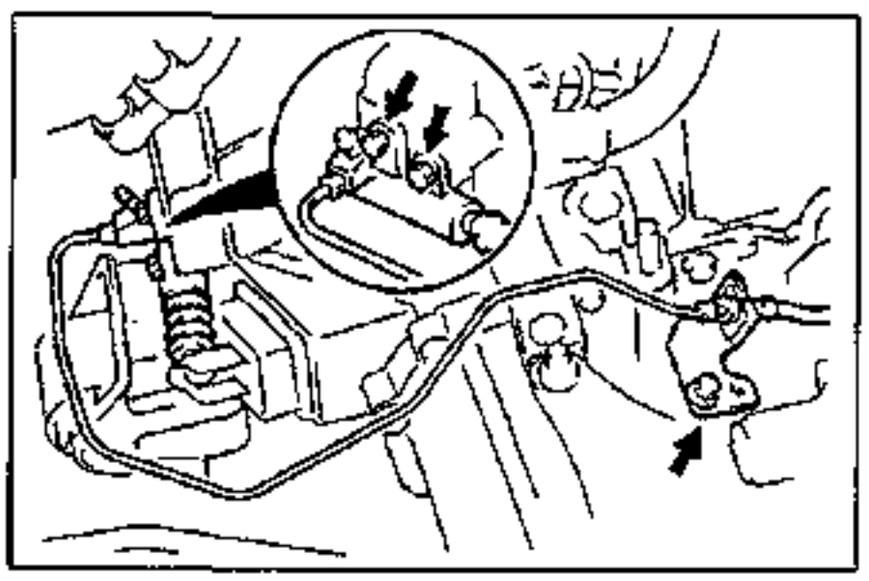
Heater hose

Press the heater hose retainer tabs and remove the heater hoses.

Step 4



1. Clutch release cylinder (MTX)
   Removal Note ..... below
2. Transverse member
3. Exhaust front pipe
4. Shift control rod (MTX)
5. Extension bar (MTX)
6. Stabilizer control link
7. Tie-rod end ball joint
   Removal Note ..... page B2–49
8. Engine mount member
   Removal Note ..... page B2–49
9. Drive shaft
   Removal Note ..... page B2–49

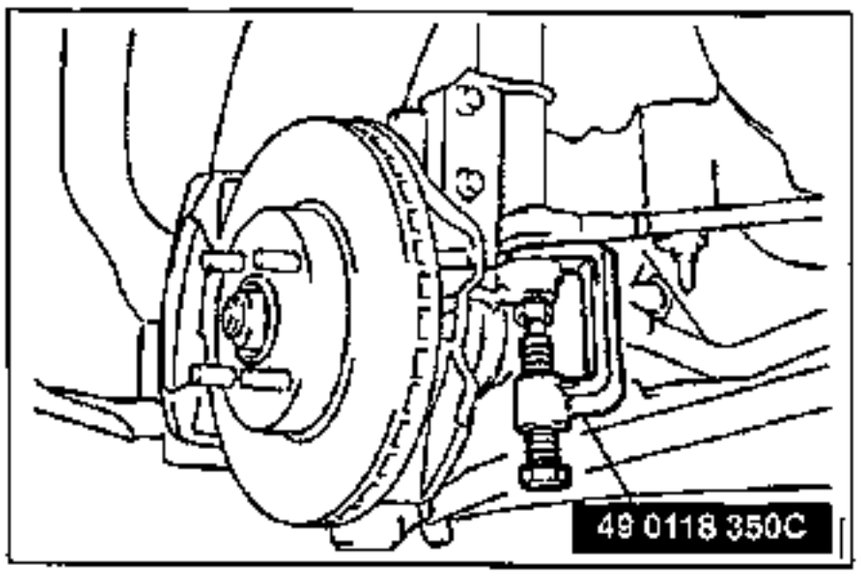


Removal Note
Clutch release cylinder (MTX)

1. Unbolt the release cylinder pipe brackets from the transaxle.

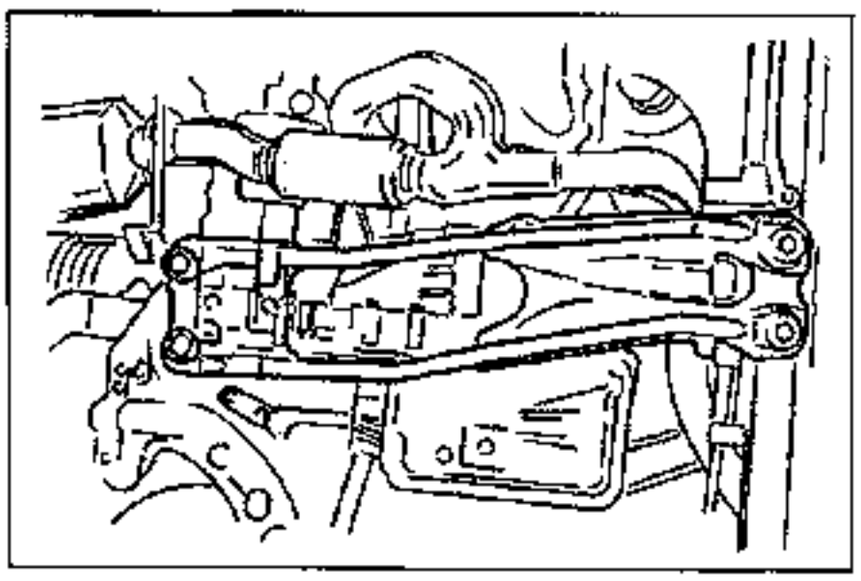
   Caution
   - **Bending the pipe can cause kinks or cracks.**

2. Remove the release cylinder and position it away from the transaxle with the hose still connected.



Tie-rod end ball joint

1. Remove the cotter pin and loosen the nut so that it is flush with the end of the ball joint stud.
2. Separate the knuckle arm and ball joint by using the **SST**.

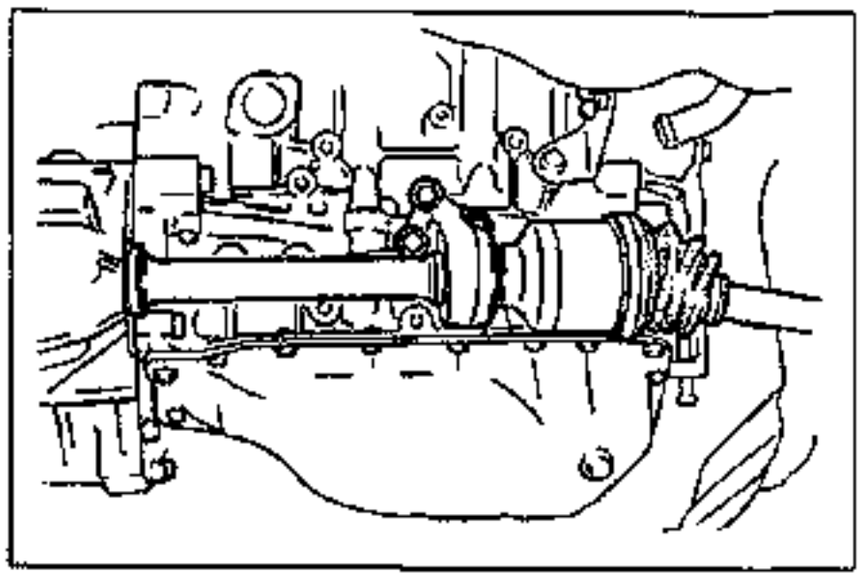


Engine mount member

Warning

- **Removing the member without first suspending the engine can cause the engine to tilt or fall and cause injury. Suspend the engine properly before removing the member.**

1. Suspend the engine by using a chain block.
2. Remove the No.1 and No.2 engine mount nuts.
3. Remove the engine mount member bolts and nuts and remove the engine mount member.



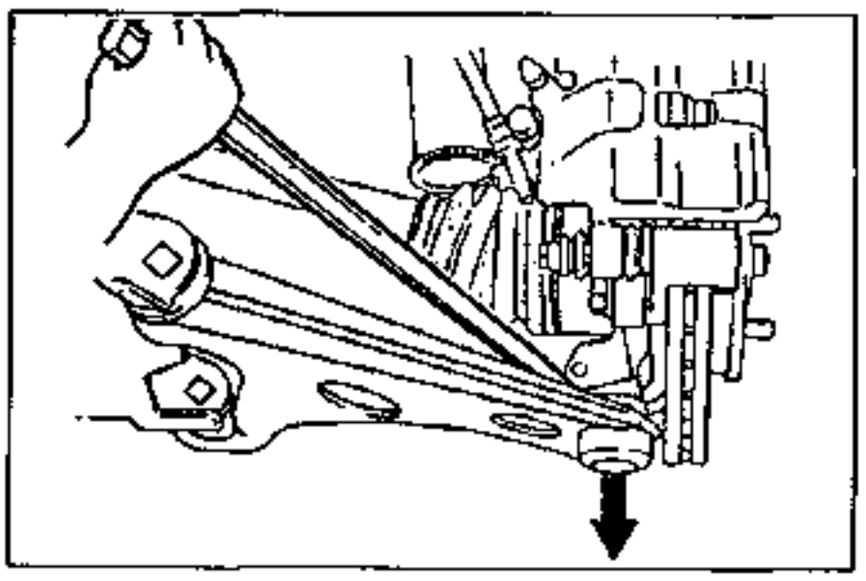
Drive shaft

1. Remove the bolts and nuts at the left and right lower arm ball joint.

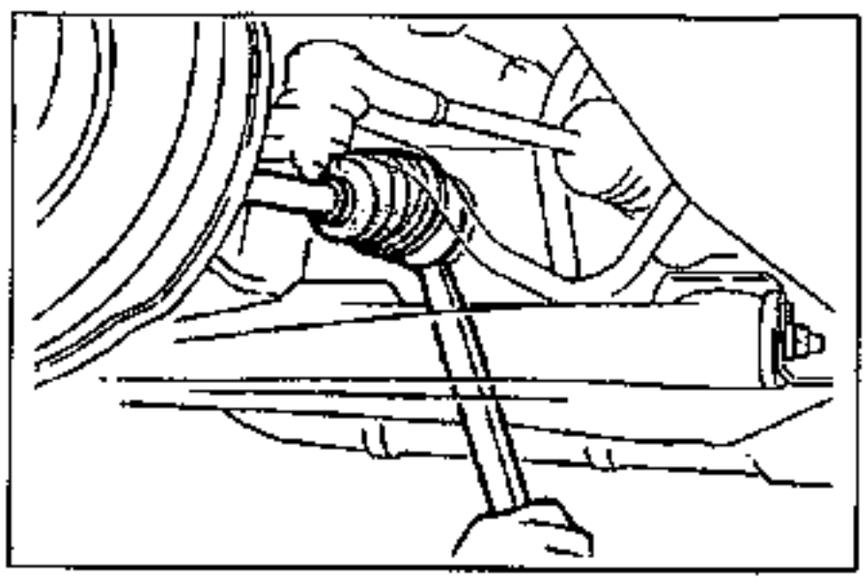
Caution

- **The ball joint dust boots and oil seals are damaged easily if this procedure is not done correctly.**

2. Remove the joint shaft.

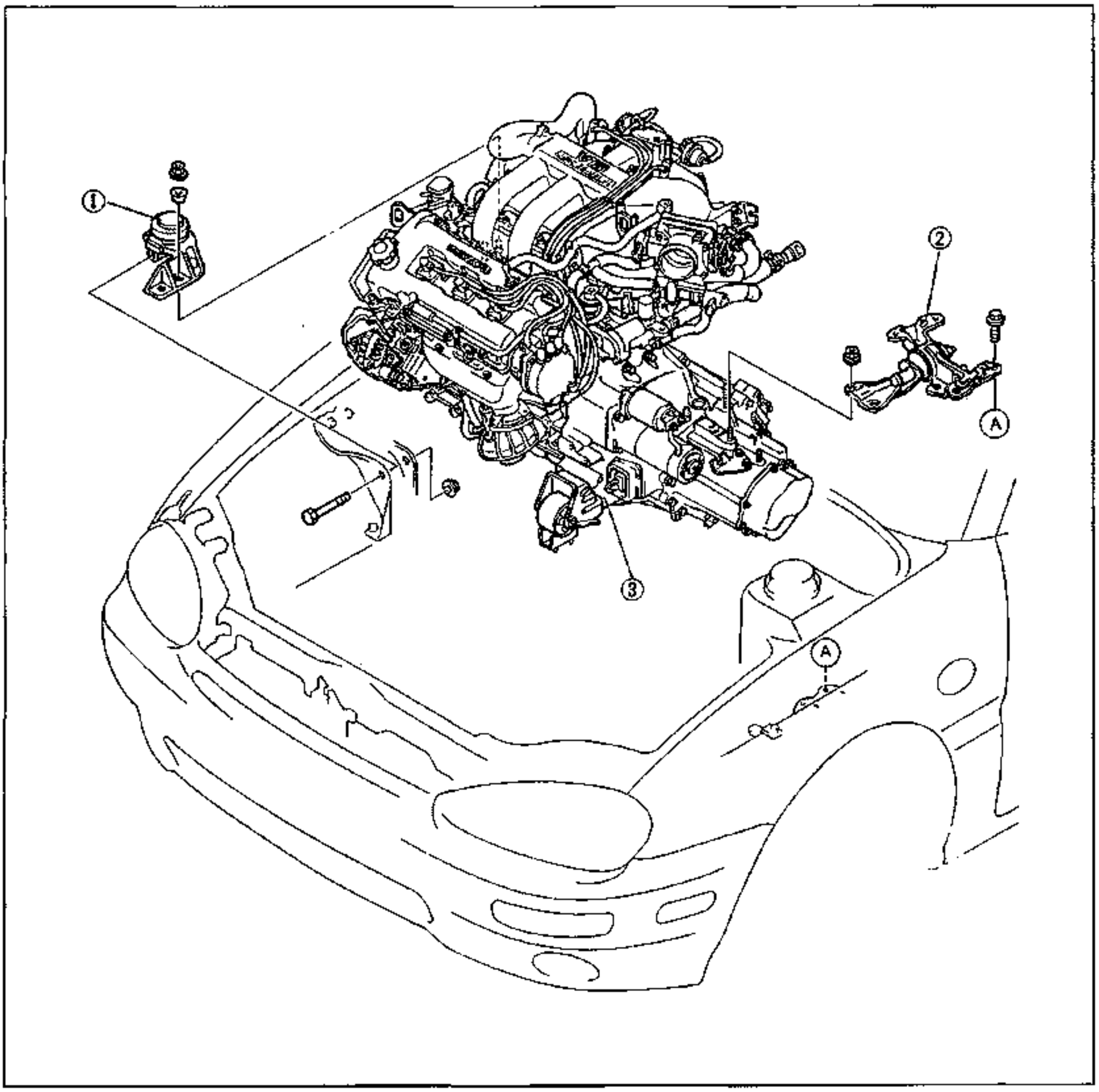


3. Pry the lower arms downward to separate them from the knuckles.

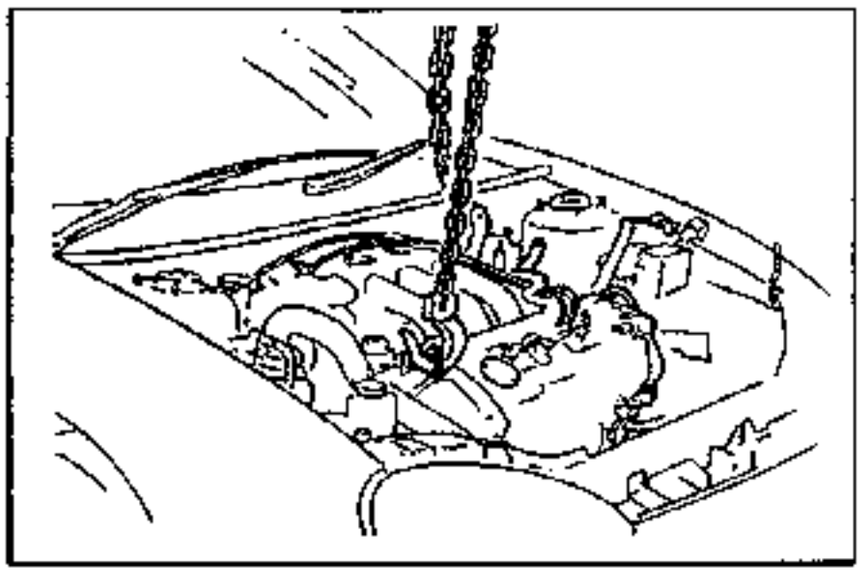


4. Separate the drive shafts from the transaxle by prying with a bar inserted between the shaft and the case.

Step 5

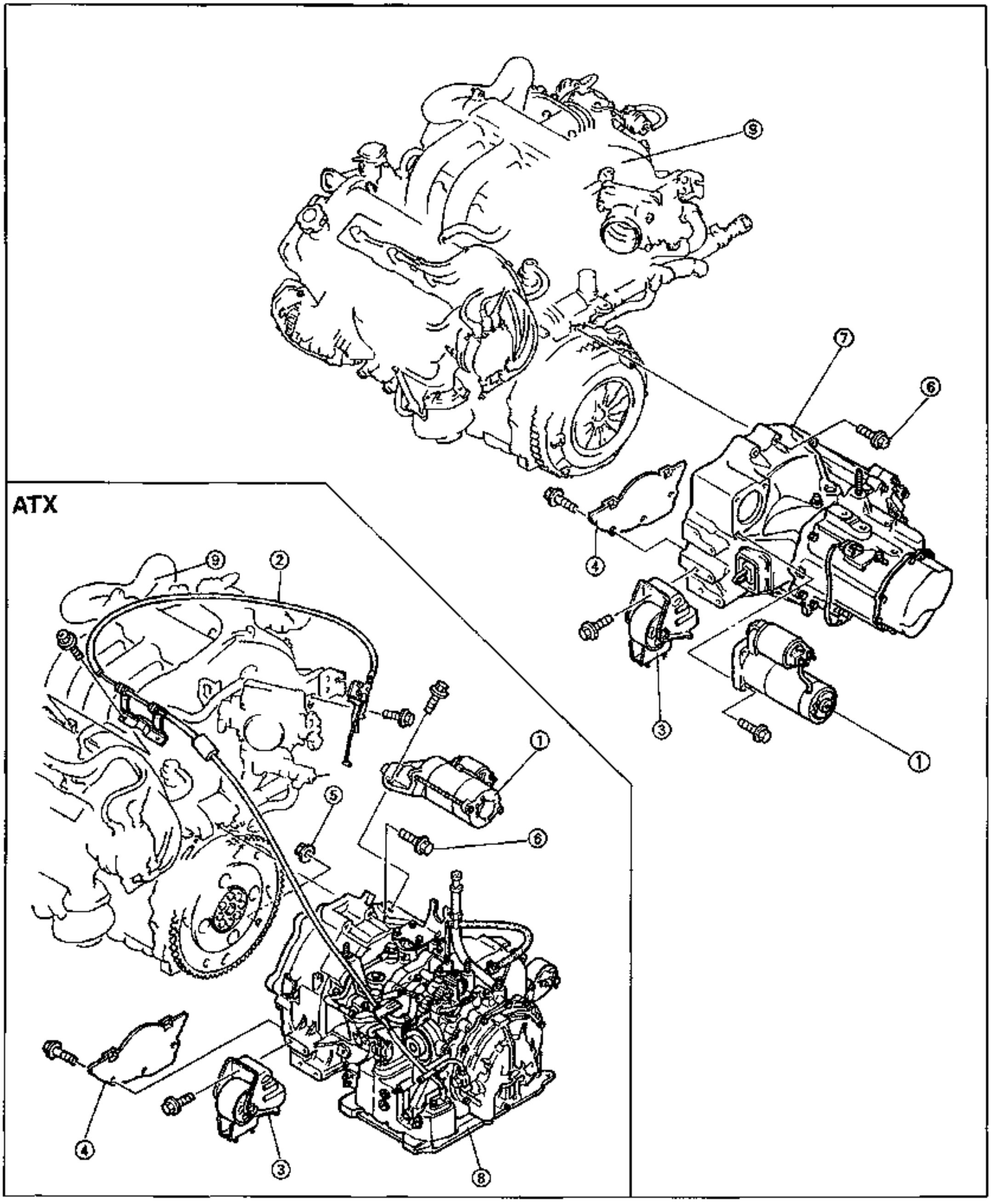


1. No.3 engine mount rubber
2. No.4 engine mount rubber and bracket
3. Engine and transaxle assembly
   Removal Note ..... below



Removal Note
Engine and transaxle assembly
Slowly lift the engine and transaxle assembly as a unit. Keep the engine from swinging or bumping into components in the engine compartment.
Lift the engine and transaxle assembly out as a unit.

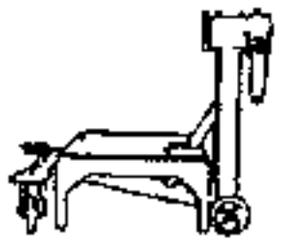
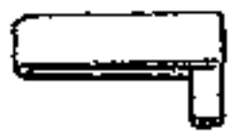
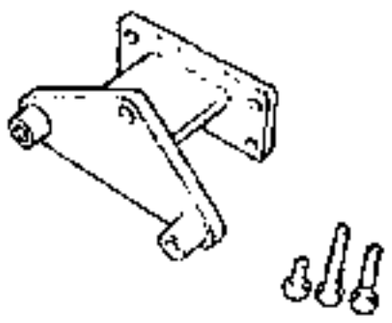
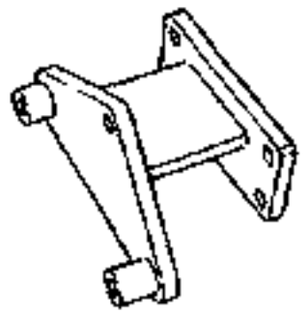
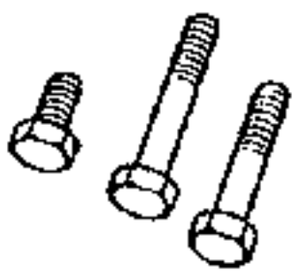
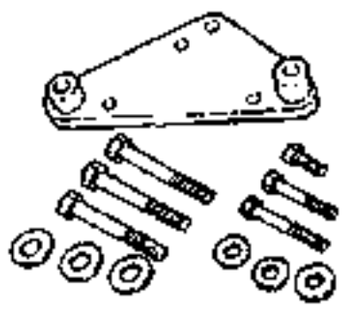
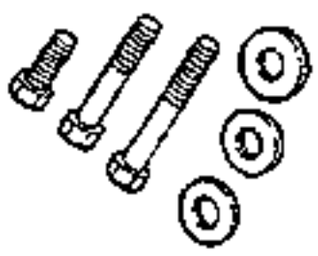
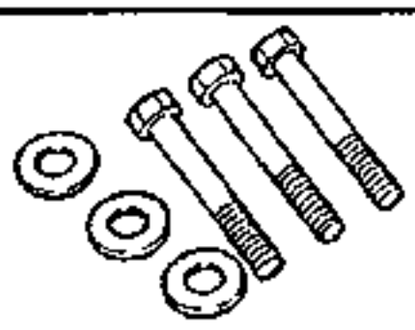
Step 6

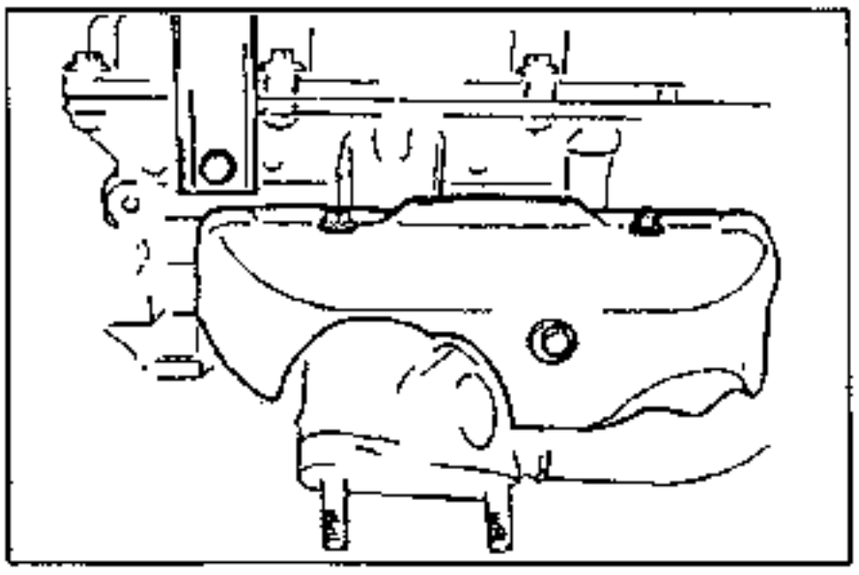


1. Starter
2. Throttle cable (ATX)
3. No.2 engine mount rubber and bracket
4. Seal plate
5. Torque converter nuts (ATX)
6. Transaxle mounting bolts
7. Manual transaxle (MTX)
8. Automatic transaxle (ATX)
9. Engine assembly

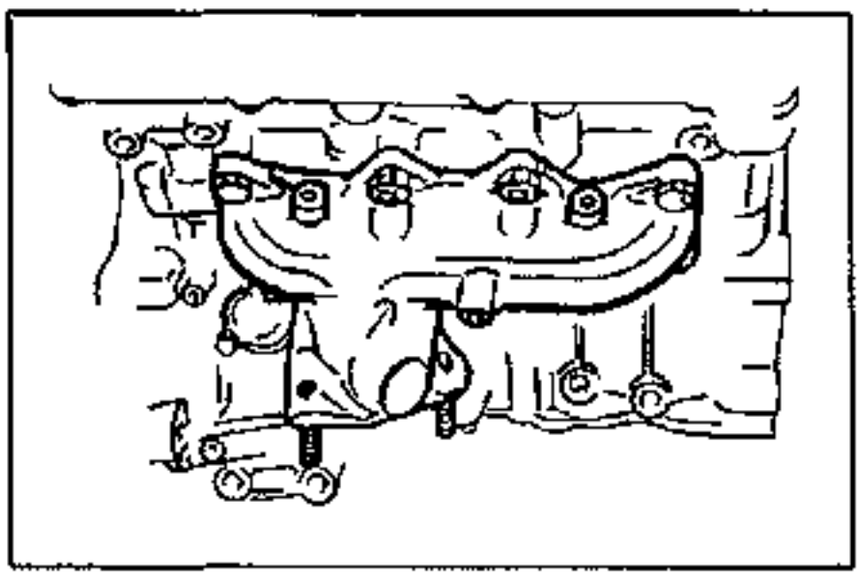
ENGINE STAND MOUNTING

PREPARATION
SST

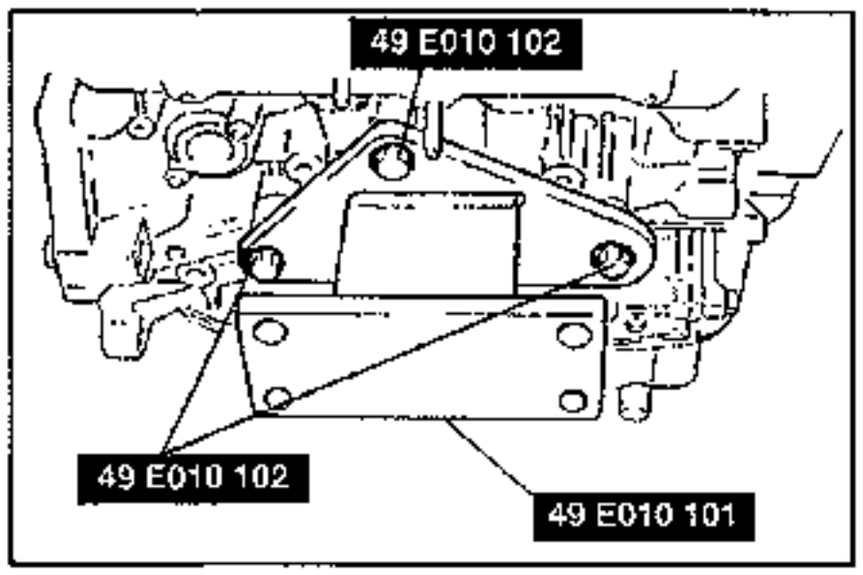
49 0107 680A Engine stand		For disassembly and assembly of engine	
49 L011 101 Plate (Part of 49 L010 1A0)		For disassembly and assembly of engine	
49 L010 1A0 Hanger set, engine		For disassembly and assembly of engine	
49 L010 102 Arm (Part of 49 L010 1A0)		For disassembly and assembly of engine	
49 L010 103 Hook (Part of 49 L010 1A0)		For disassembly and assembly of engine	
49 L010 104 Nut (Part of 49 L010 1A0)		For disassembly and assembly of engine	
49 L010 105 Bolt (Part of 49 L010 1A0)		For disassembly and assembly of engine	
49 L010 106 Bolt (Part of 49 L010 1A0)		For disassembly and assembly of engine	
49 E010 1A0 Hanger set, engine		For disassembly and assembly of engine	
49 E010 101 Body (Part of 49 E010 1A0)		For disassembly and assembly of engine	
49 E010 102 Bolt (Part of 49 E010 1A0)		For disassembly and assembly of engine	
49 E010 1A1 Hanger set, engine		For disassembly and assembly of engine	
49 E010 103 Hanger (Part of 49 E010 1A1)		For disassembly and assembly of engine	
49 E010 102 Bolt (Part of 49 E010 1A1)		For disassembly and assembly of engine	
49 E010 104 Bolt (Part of 49 E010 1A1)		For disassembly and assembly of engine	



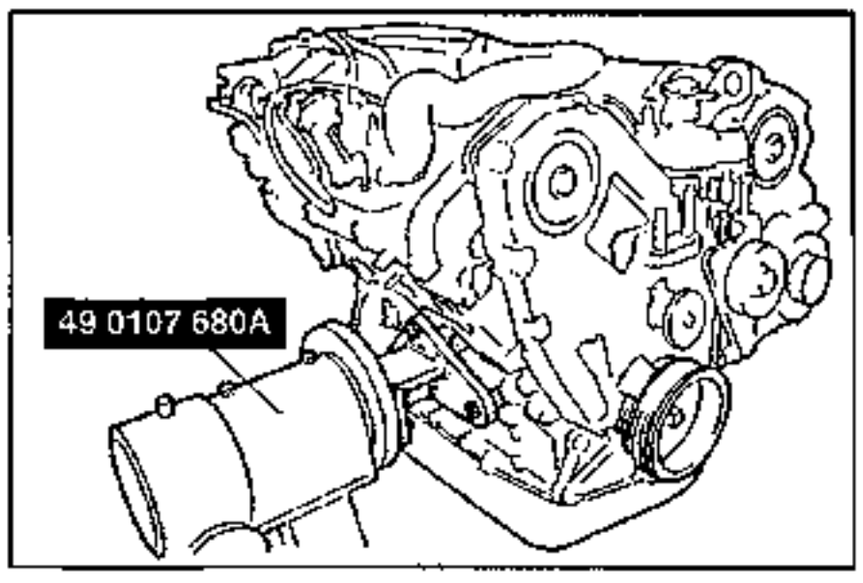
PROCEDURE
When using 49 E010 1A0
1. Remove the right exhaust manifold insulator.
2. Remove the EGR valve bolts.



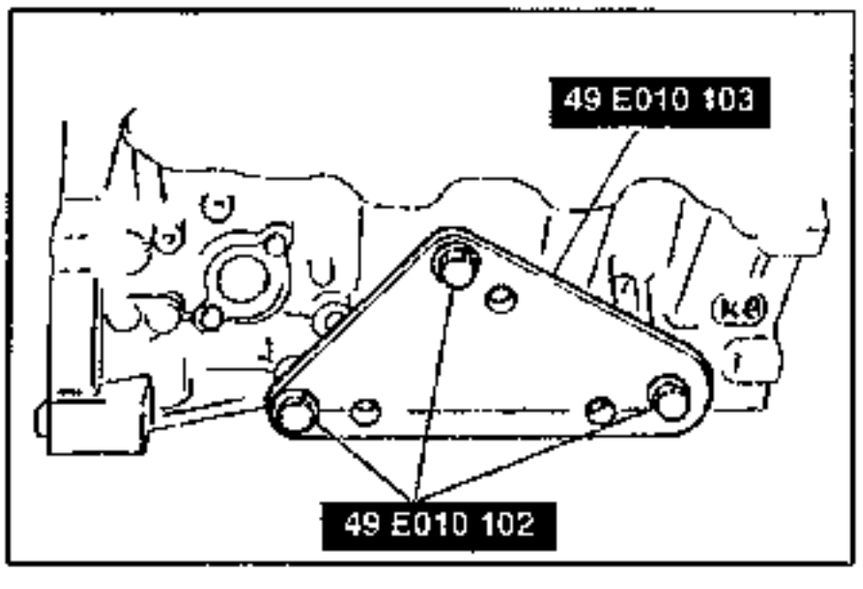
3. Remove the right exhaust manifold and gasket together with the EGR valve and pipe.



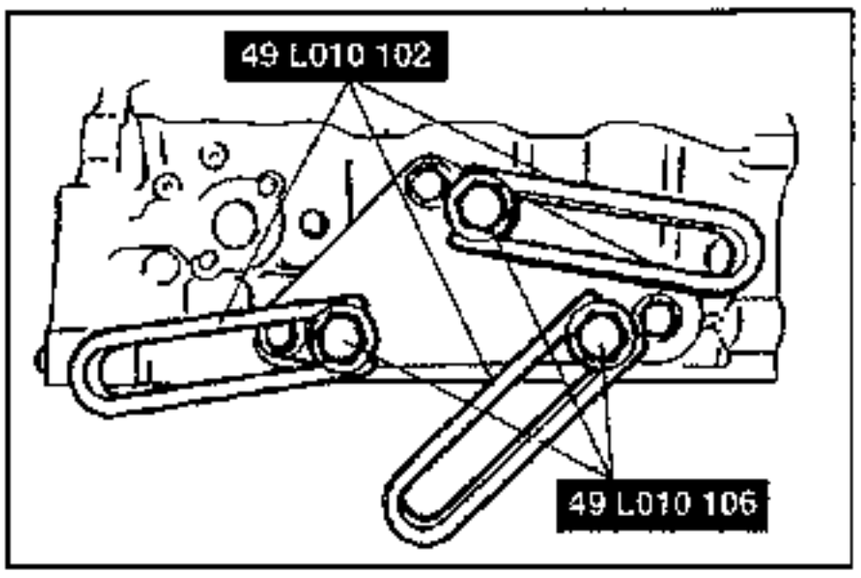
4. Install the **SST** at the positions shown.



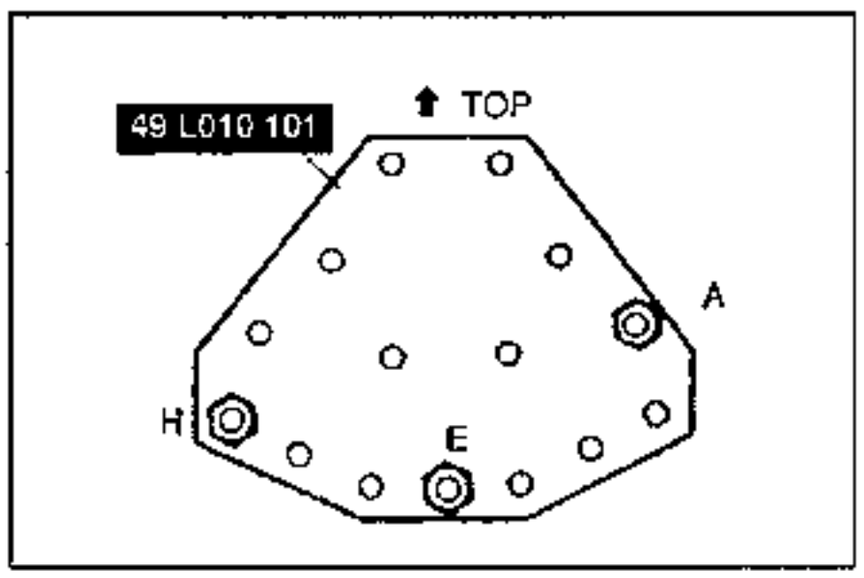
5. Mount the engine on the **SST**.



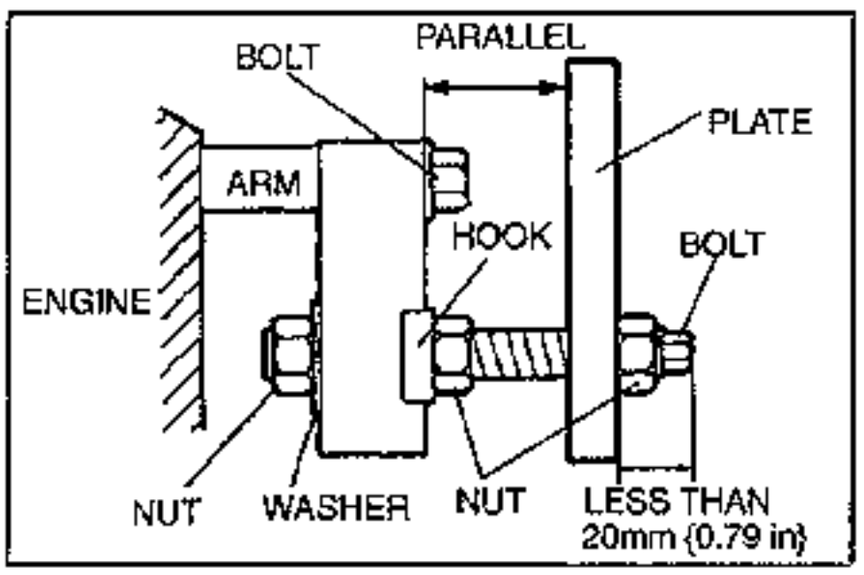
When using 49 E010 1A1 and 49 L010 1A0
1. Remove the right exhaust manifold insulator.
2. Remove the right exhaust manifold and gasket.
3. Install the **SST** as shown.



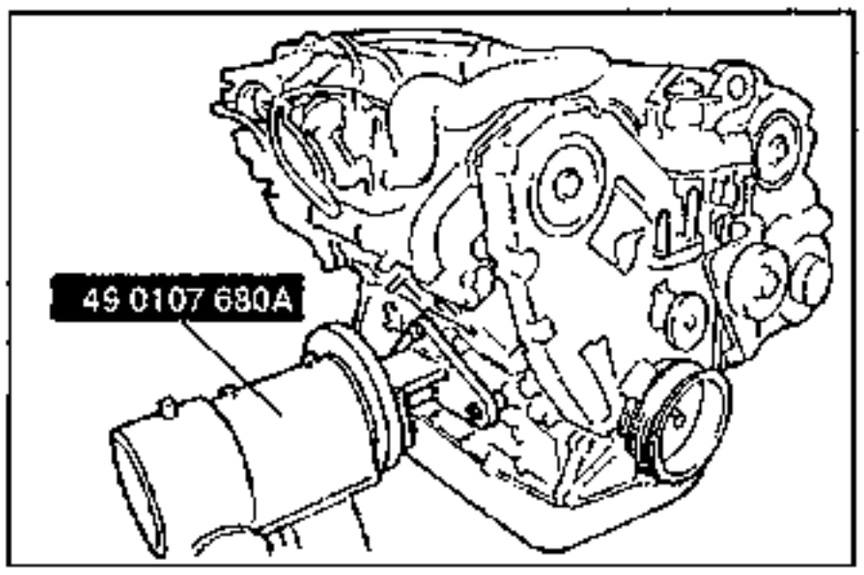
4. Install the **SST** (arms) to the holes as shown, and hand tighten the **SST** (bolts).



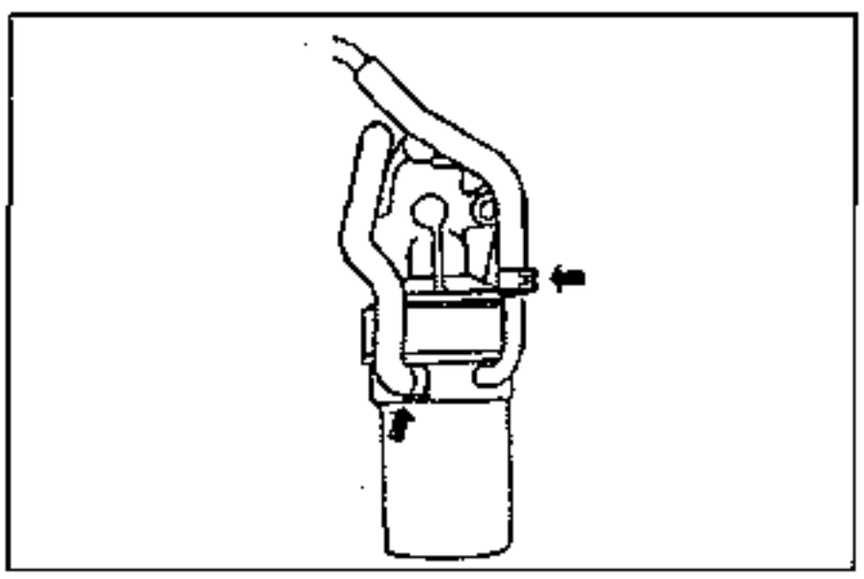
5. Assemble the **SST** (bolts, nuts and plate) as shown in the figure.



6. Install the **SST** assembled in step 5 to the **SST** installed in step 4.
7. Adjust the **SST** (bolts) so that less than 20mm {0.79 in} of thread is exposed.
8. Make the **SST** (plate and arms) parallel by adjusting the **SST** (bolts and nuts).
9. Tighten the **SST** (bolts and nuts) to affix the **SST** firmly.

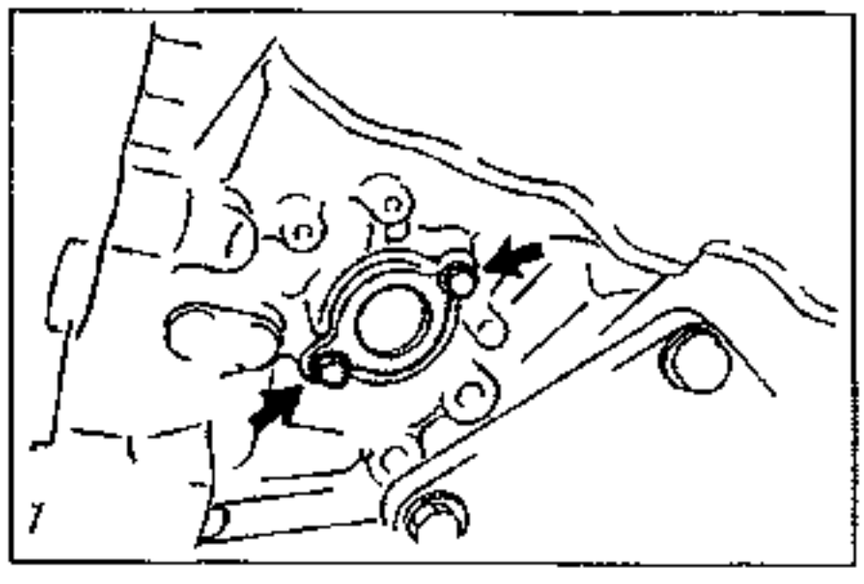


10. Mount the engine on the **SST**.



Coolant Draining

1. After installing the engine to the engine stand, disconnect the oil cooler hoses as shown in the figure (left cylinder head).

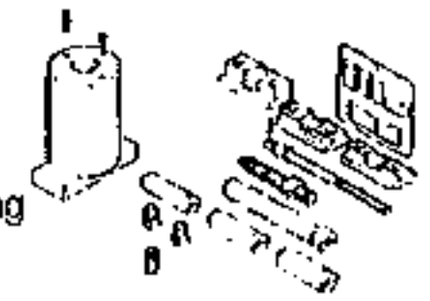
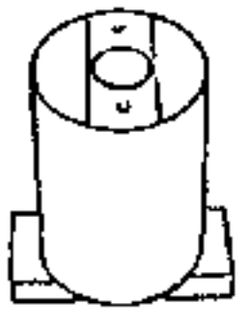
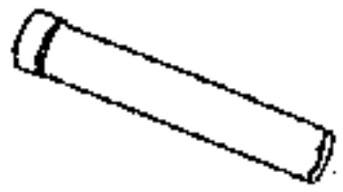
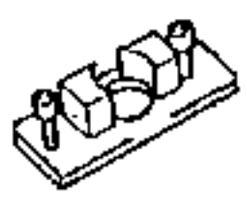
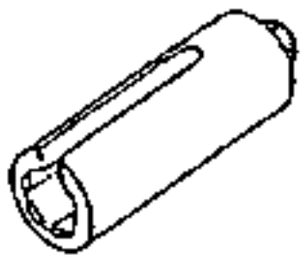
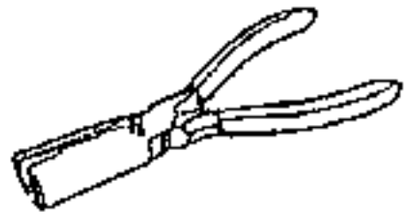
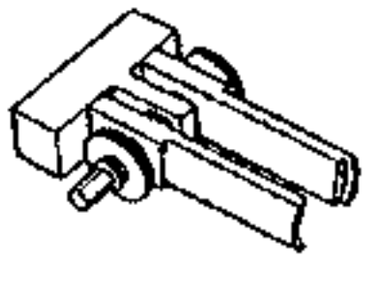
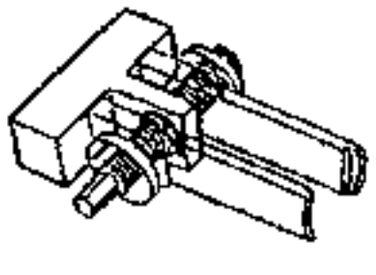


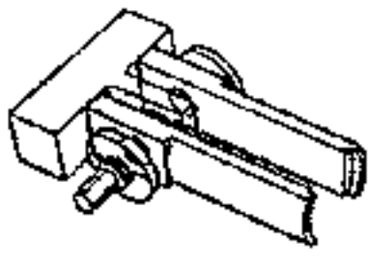
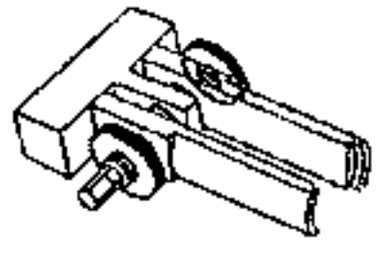
2. Remove the blind cover and drain the engine coolant.
3. After draining the coolant, install a new O-ring to the blind cover.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

DISASSEMBLY

PREPARATION
SST

49 0636100B Arm, valve spring lifter 	For removal / installation of valves	49 L011 0A0B Tool set, piston pin setting 	For removal / installation of piston pins
49 L011 001 Body, support block (Part of 49 L011 0A0B) 	For removal / installation of piston pins	49 L011 006 Installer, piston pin (Part of 49 L011 0A0B) 	For removal / installation of piston pins
49 E011 002 Screw 	For removal / installation of piston pins	49 D011 002B Head, support block (Part of 49 L011 0A0 B) 	For removal / installation of piston pins
49 E011 001 Guide, piston pin 	For removal / installation of piston pins	49 G014 001 Wrench, oil filter 	For removal / installation of oil filter
49 H018 001 Wrench, knock sensor 	For removal / installation of knock sensor	49 S120 170 Remover, valve seal 	For removal of valve seals
49 E011 1A0 Brake set, ring gear 	For prevention of crankshaft rotation	49 E011 103 Shaft (Part of 49 E011 1A0) 	For prevention of crankshaft rotation
49 E011 104 Collar (Part of 49 E011 1A0) 	For prevention of crankshaft rotation	49 E011 105 Stopper (Part of 49 E011 1A0) 	For prevention of crankshaft rotation
49 B012 0A2 Pivot 	For removal / installation of valves	49 B012 012 Body (Part of 49 B012 0A2) 	For removal / installation of valves

49 B012 013 Foot (Part of 49 B012 0A2)		For removal / installation of valves	49 B012 014 Locknut (Part of 49 B012 0A2)		For removal / installation of valves

1. Code or arrange all identical parts (such as HLA, pistons, piston rings, connecting rods, and valve springs) so that they can be reinstalled in the cylinder from which they were removed.
2. Clean the parts by using a steam cleaner. Blow dry with compressed air.

Warning

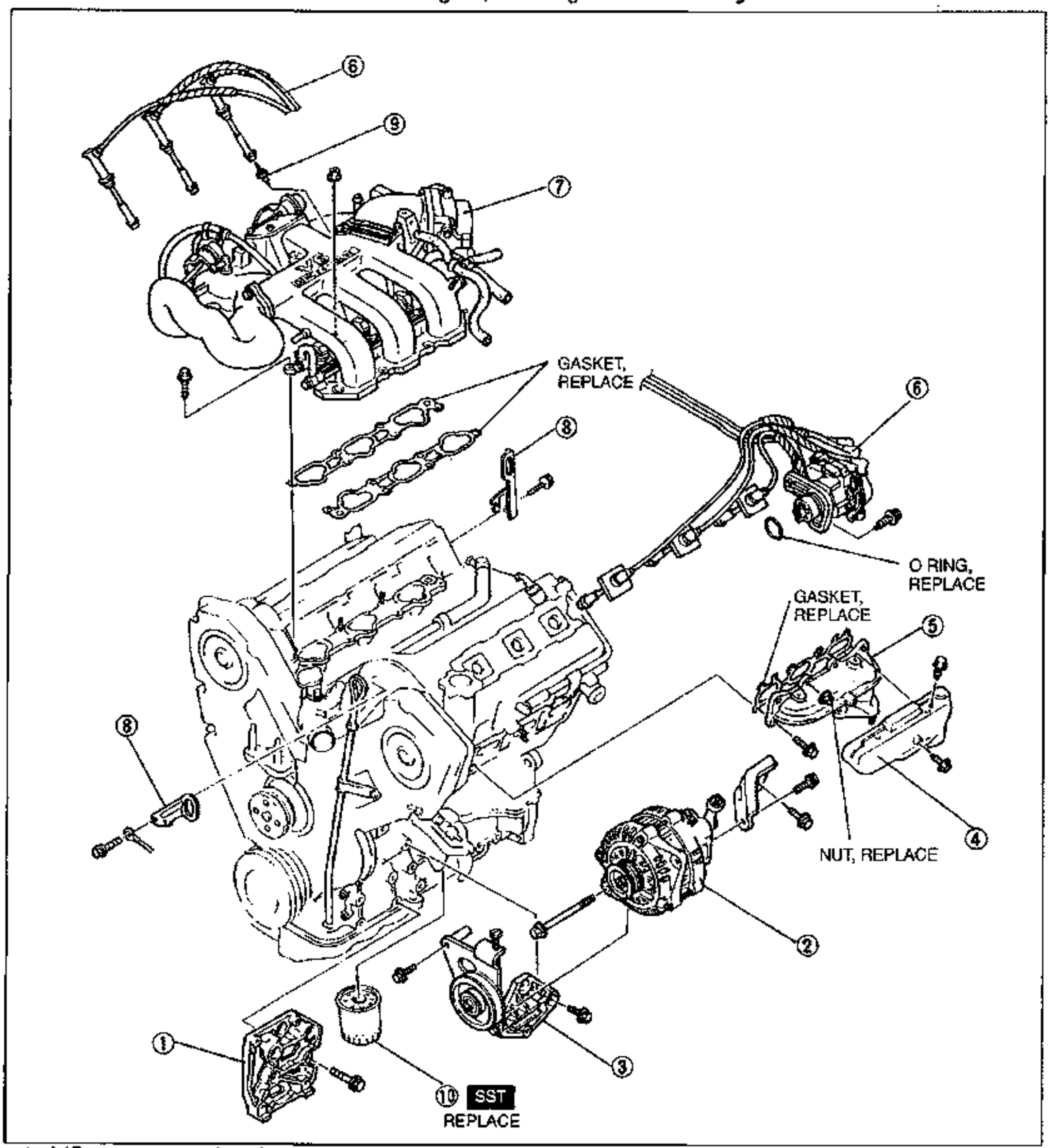
- **Continuous exposure with USED engine oil has caused skin cancer in laboratory mice. Protect your skin by wasing with soap and water immediately after this work.**

AUXILIARY PARTS

1. Remove the oil drain plug and drain the engine oil. After draining the engine oil, install the oil drain plug.

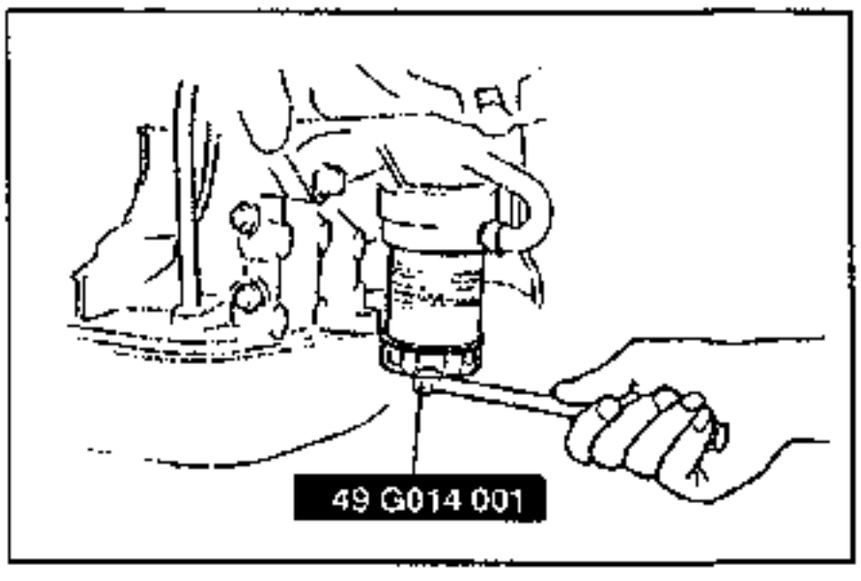
Tightening torque: 30–41 N·m {3.0–4.2 kgf·m, 22–30 ft·lbf}

2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



1. A/C compressor bracket
2. Genarator
3. Bracket and tensioner
4. Exhaust manifold insulator(LH)
5. Exhaust manifold(LH)
6. Distributor and high-tension lead
7. Intake manifold assembly
8. Engine hanger
9. Spark plug
10. Oil filter

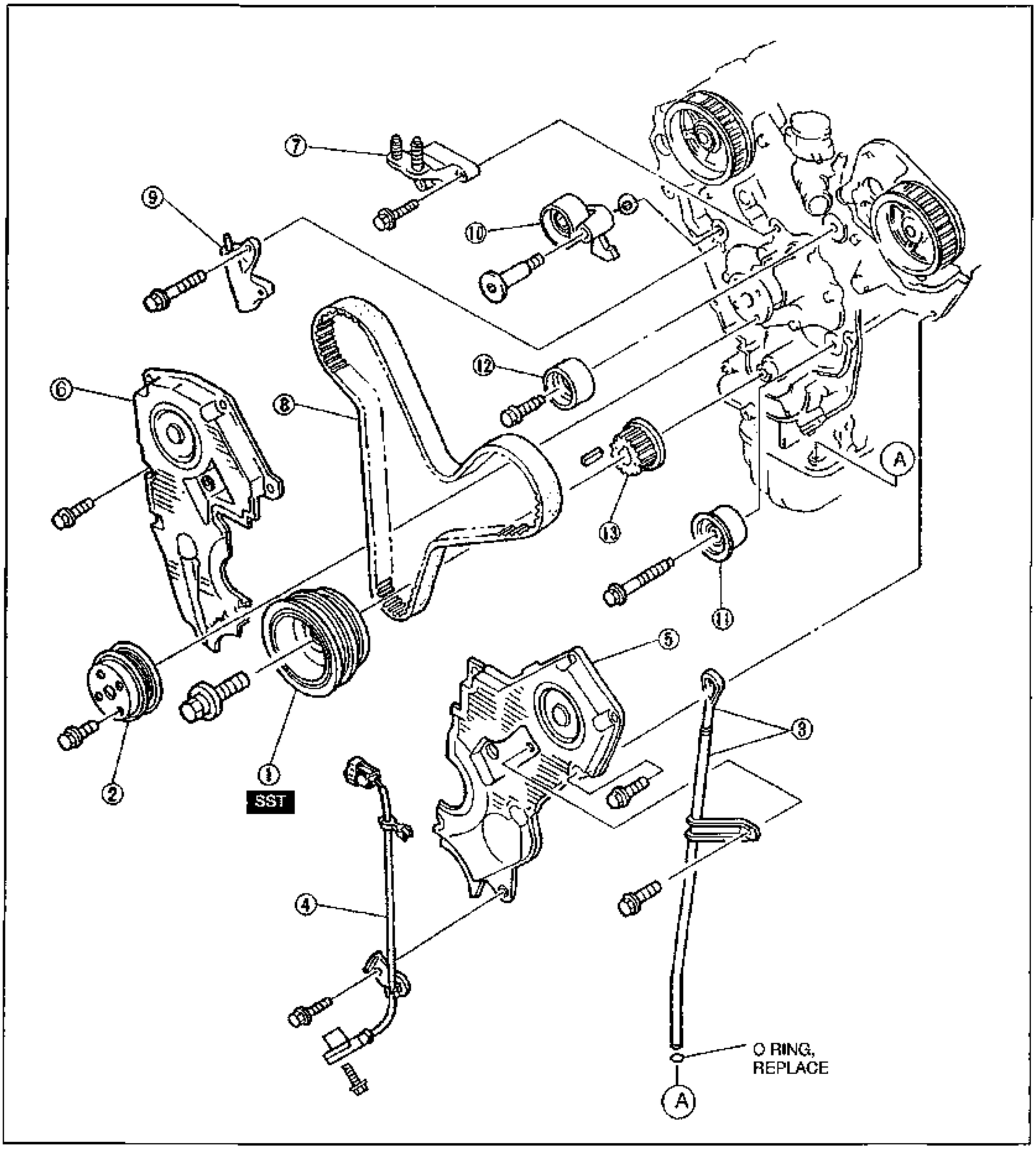
Disassembly Note ..... page B2–59



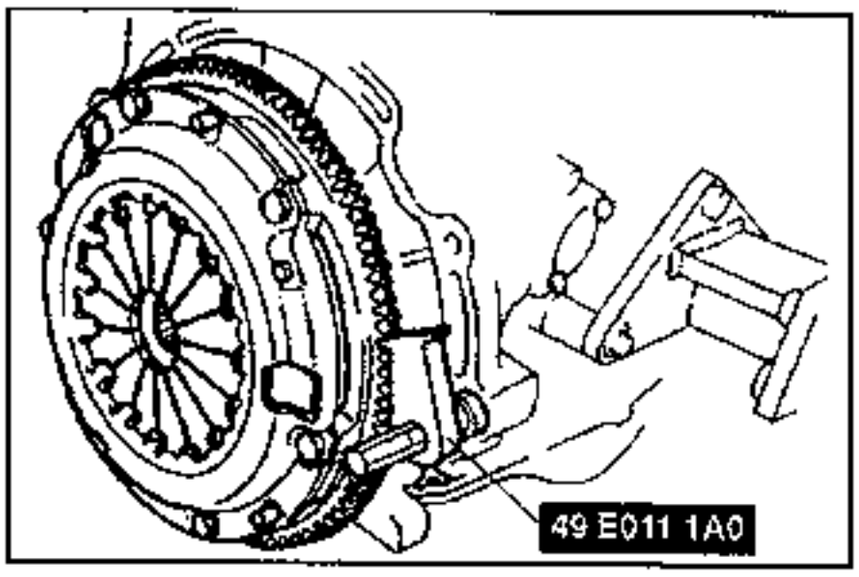
Disassembly Note
Oil filter
Remove the oil filter by using the **SST**.

TIMING BELT

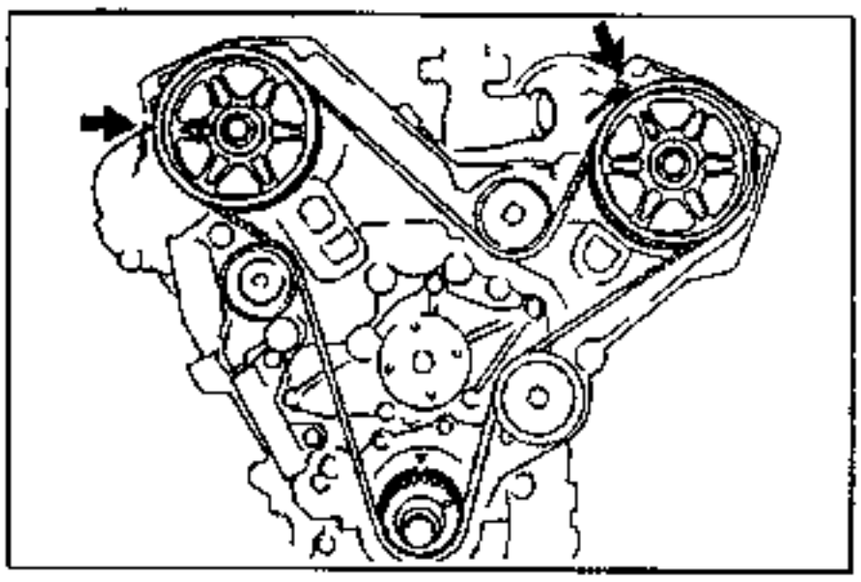
Disassemble in the order shown in the figure, referring to **Disassembly Note.**



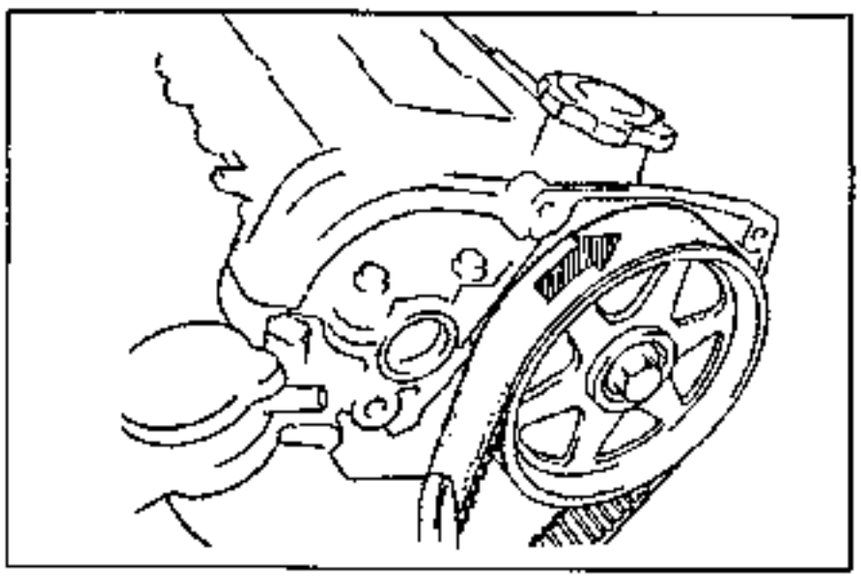
1. Crankshaft pulley
   Disassembly Note ..... page B2–61
2. Water pump pulley
3. Dipstick and pipe
4. Crankshaft position sensor
5. Timing belt cover (LH)
6. Timing belt cover (RH)
7. No.3 engine mount bracket
8. Timing belt
   Disassembly Note ..... page B2–61
9. Timing belt auto tensioner
10. Tensioner pulley
11. No.2 idler pulley
12. No.1 idler pulley
13. Timing belt pulley
    Disassembly Note ..... page B2–61



Disassembly Note
Crankshaft pulley
1. Hold the flywheel (MTX) or drive plate (ATX) by using the **SST.**
2. Remove the pulley bolt.
3. Remove the crankshaft pulley.

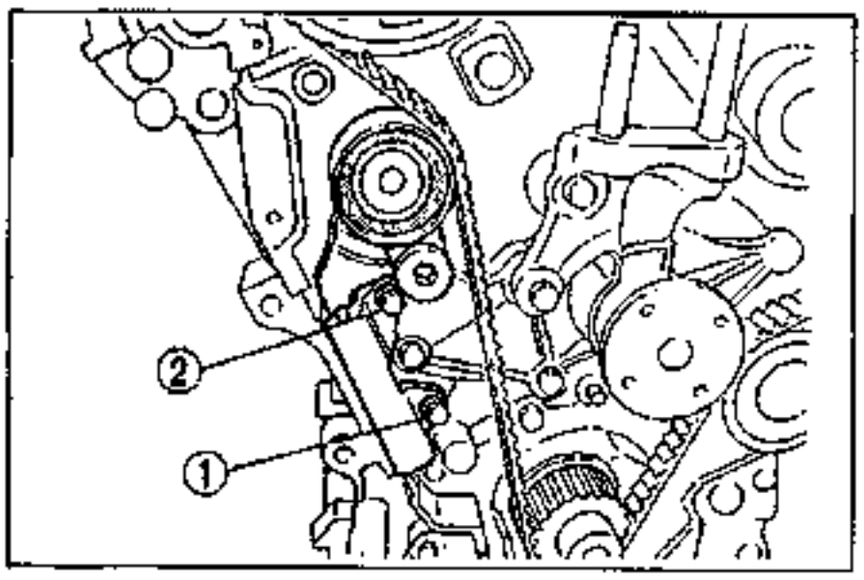


Timing belt
1. Temporarily install the crankshaft pulley bolt.
2. Turn the crankshaft clockwise to align the timing marks of the pulleys.



3. Mark the timing belt rotation for proper reinstallation.

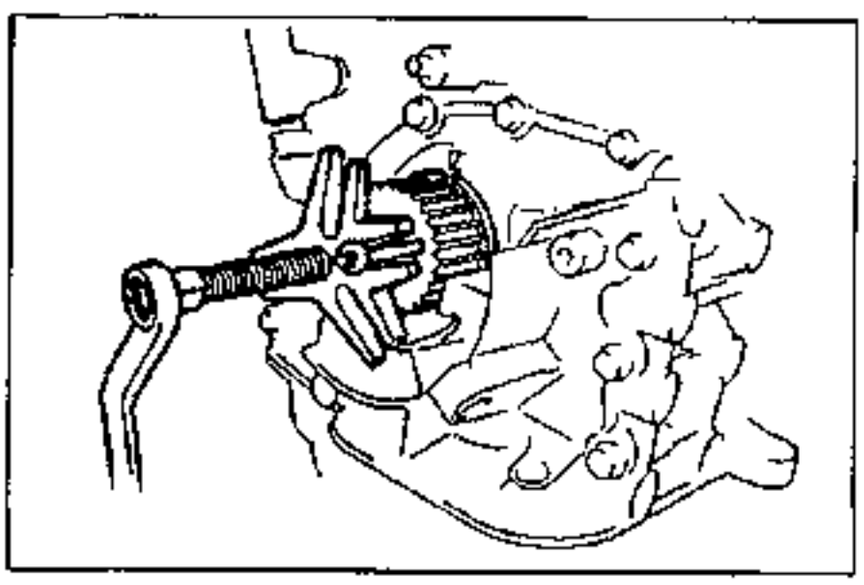
Caution
- **When removing the bolt, hold the tensioner so that the bolt holes are aligned, otherwise the threads can be damaged.**



4. Remove the auto tensioner bolts gradually in five or six steps in the order shown.

Caution
- **The following will damage the belt and shorten its life; Forcefully twisting it, turning it inside out, bending it, or allowing oil or grease on it.**

5. Remove the timing belt.

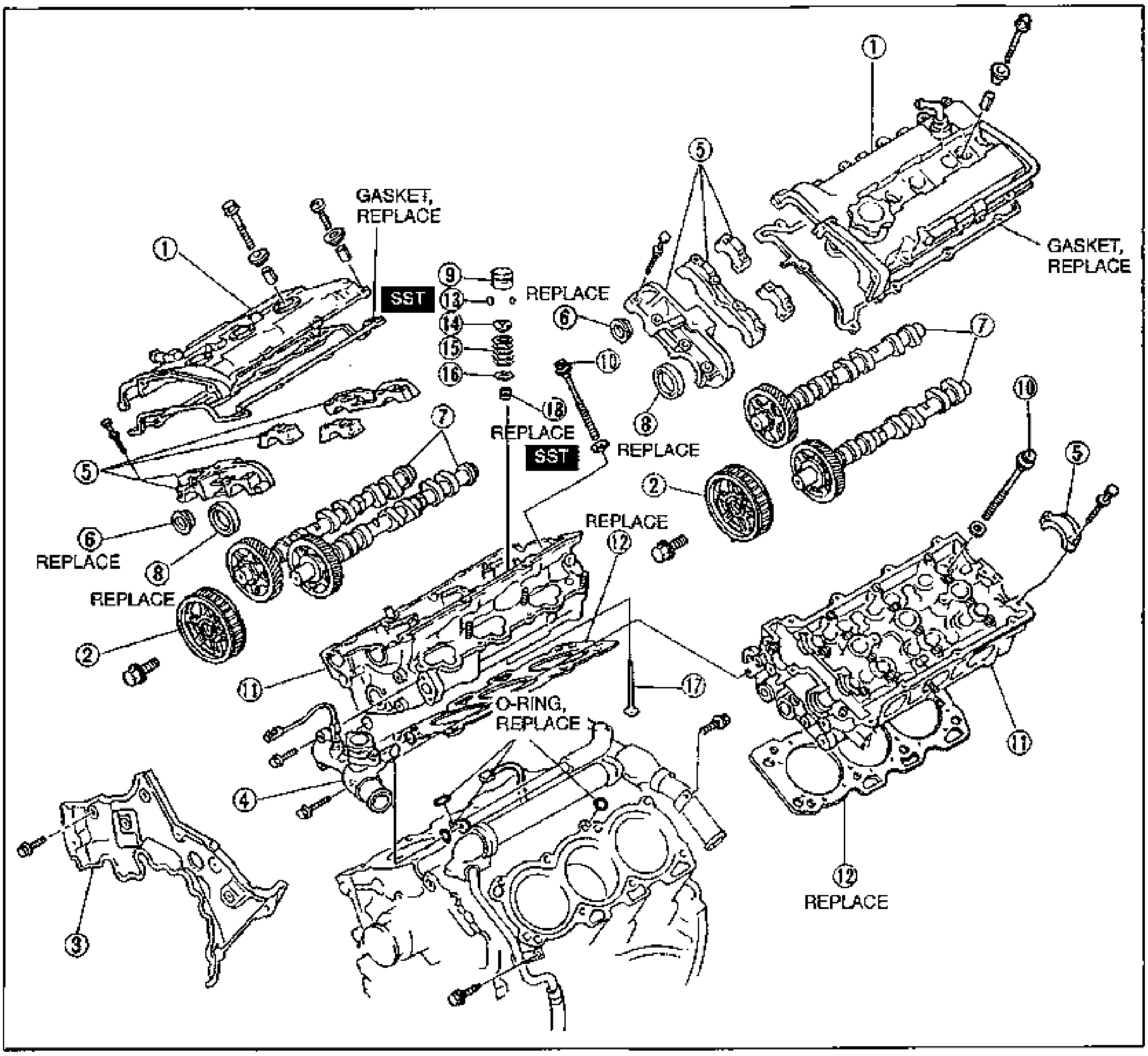


Timing belt pulley
1. Remove the timing belt pulley.
2. Remove the crankshaft key.

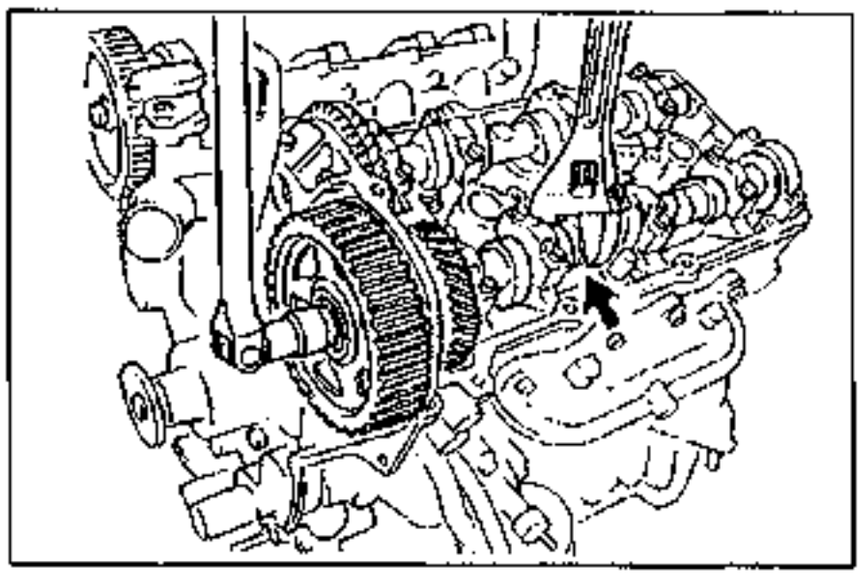
Note
- If necessary, remove the pulley with a steering wheel puller.

CYLINDER HEAD

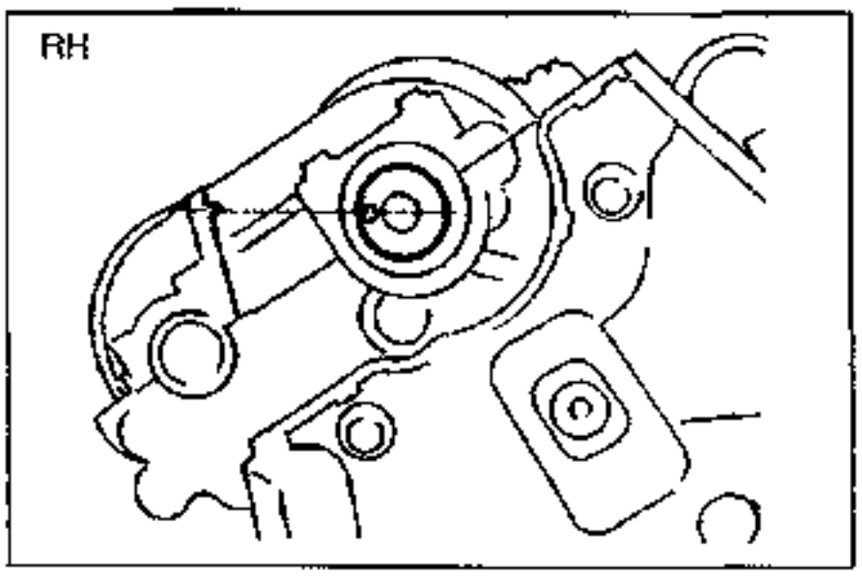
Disassemble in the order shown in the figure, referring to **Disassembly Note**.



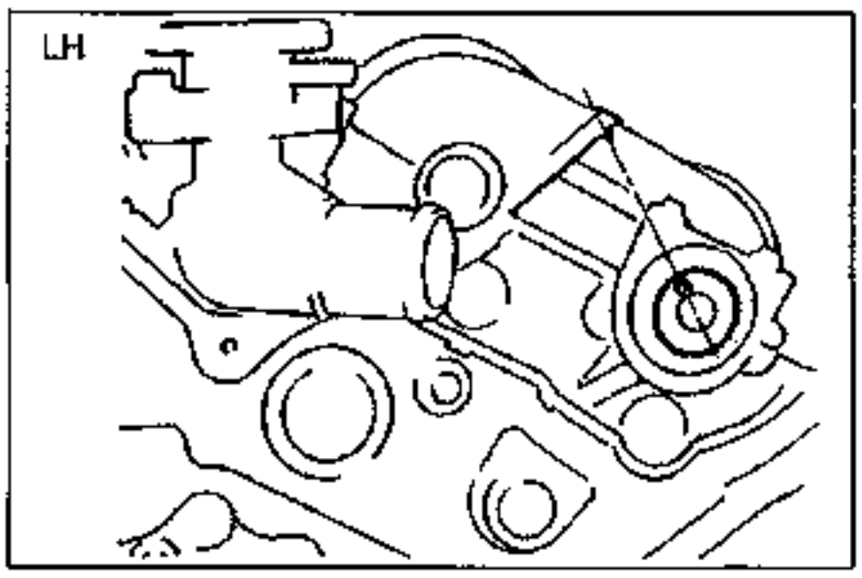
1. Cylinder head cover
2. Camshaft pulley
   Disassembly Note ..... page B2–63
   Inspection ..... page B2–85
3. Seal plate
4. Water outlet
5. Camshaft cap
   Disassembly Note ..... page B2–63
6. Blind cap
7. Camshaft
   Inspection ..... page B2–64
8. Camshaft oil seal
9. HLA
   Disassembly Note ..... page B2–64
   Inspection ..... page B2–80
10. Cylinder head bolt
    Disassembly Note ..... page B2–64
11. Cylinder head
    Inspection ..... page B2–73
12. Cylinder head gasket
13. Valve keeper
    Disassembly Note ..... page B2–64
14. Upper valve spring seat
15. Valve spring
    Inspection ..... page B2–77
16. Lower valve spring seat
17. Valve
    Inspection ..... page B2–74
18. Valve seal
    Disassembly Note ..... page B2–65



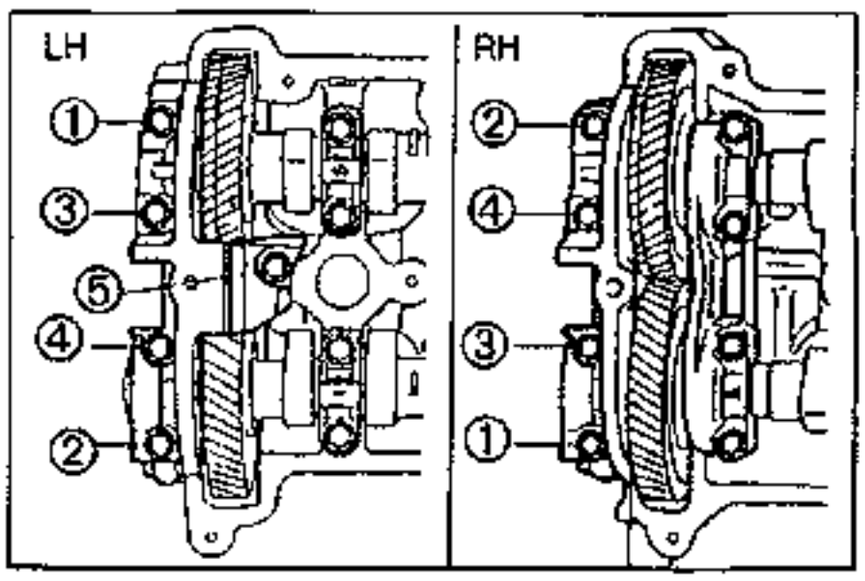
Disassembly Note
Camshaft pulley
1. Hold the camshaft by using a wrench on the cast hexagon.
2. Remove the camshaft pulley bolts.
3. Remove the camshaft pulleys.



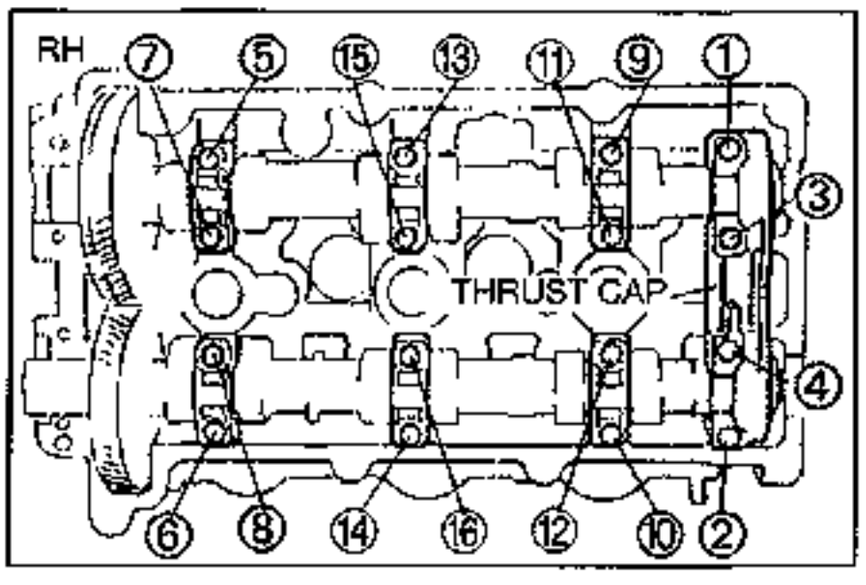
Camshaft cap
1. Align the camshaft knock pin as shown to reduce the pressure of the HLA.



Caution
- **When the front camshaft lobe is pressing on the HLA, removing the camshaft caps can damage the cylinder head thrust journal support.**



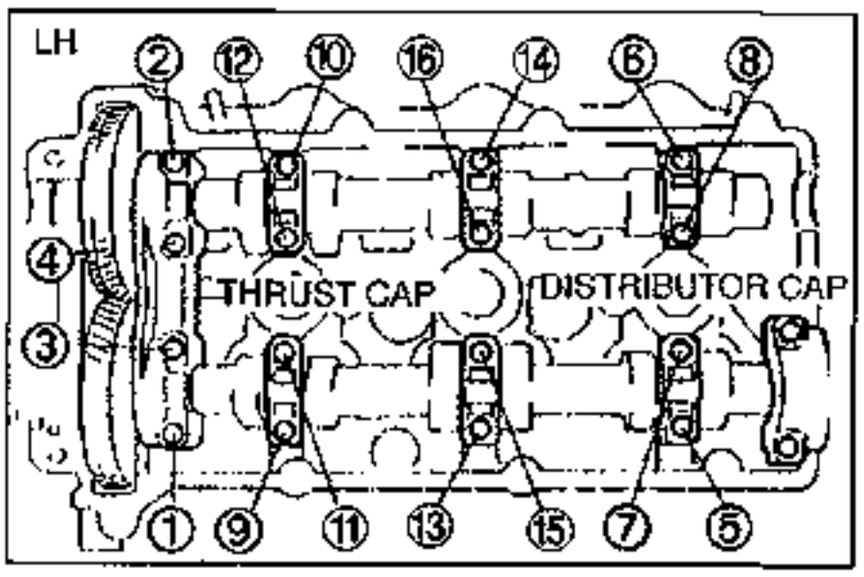
2. Loosen the front camshaft cap bolts in five or six steps in the order shown.
3. Remove the front camshaft cap.



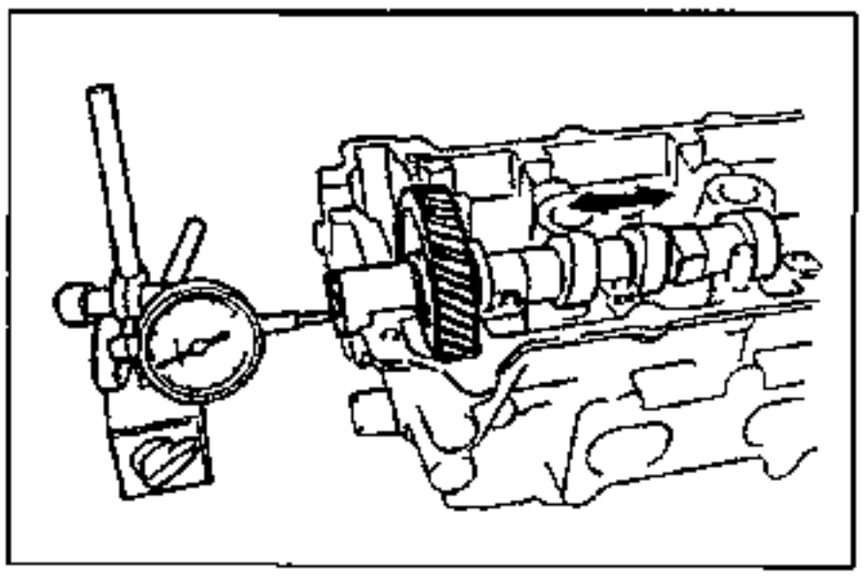
4. Loosen the camshaft cap bolts in five or six steps in the order shown.

Caution
- **Remove the thrust cap only after removing all camshaft caps. Otherwise, the thrust cap can be damaged.**

5. Remove the camshaft caps.



Note
- Before removing the camshaft caps, note their locations. They are identified as follows;
  Right head: numbers
  Left head: letters



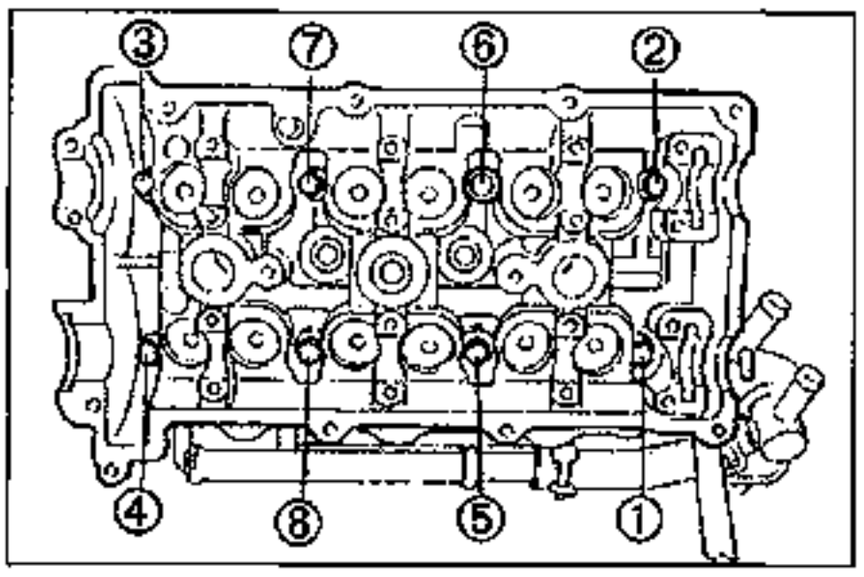
Camshaft
Inspect the following when removing the camshaft.
1. Camshaft end play (Refer to page B2–79.)
2. Camshaft journal oil clearance (Refer to page B2–79.)

HLA

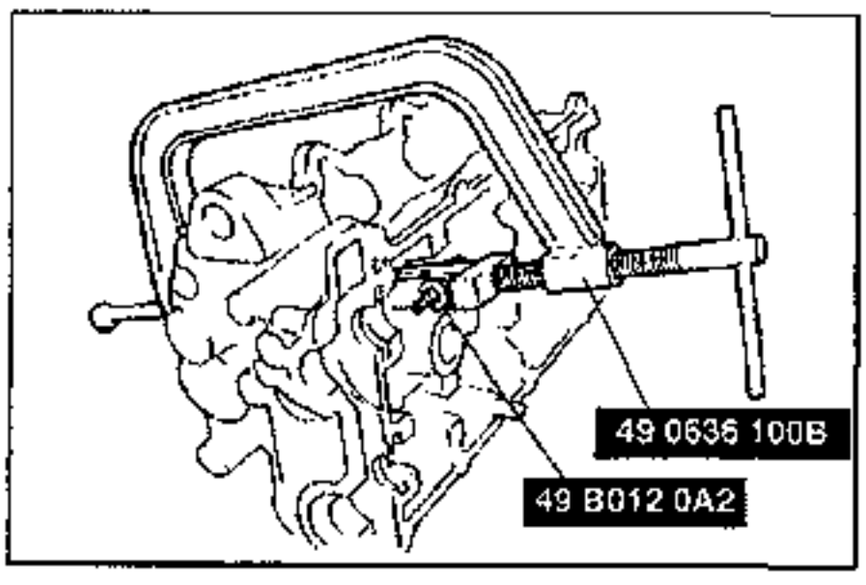
Caution
- **The HLA must be reinstalled in the same positions from which they were removed. If they are not, it can cause premature and uneven wear.**

Note
- Mark the HLA to show their original positions.

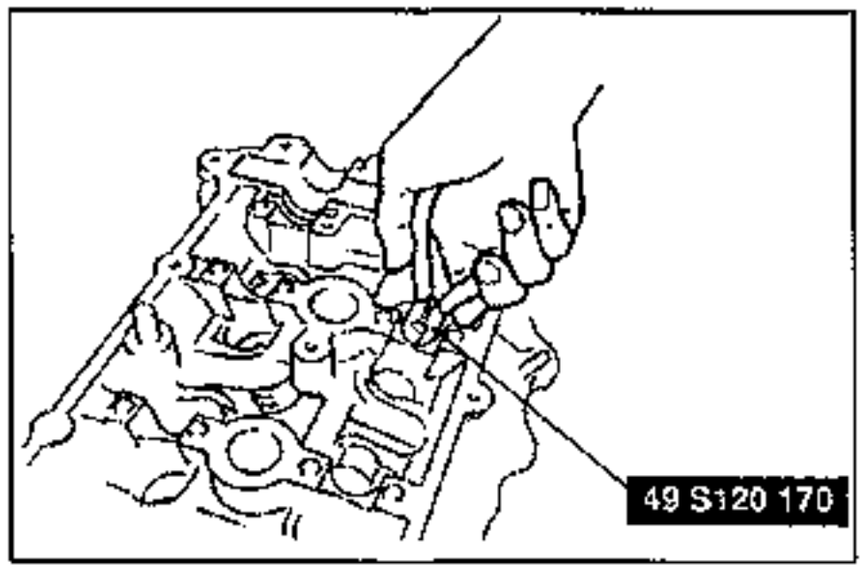
1. Remove the HLA from the cylinder head.
2. Store the HLA upside down in an oil-filled container.



Cylinder head bolt
1. Loosen the cylinder head bolts in two or three steps in the order shown in the figure.
2. Remove the cylinder head bolts.



Valve keeper
1. Set the **SST** against the upper valve spring seat as shown.
2. Compress the spring and remove the valve keepers.

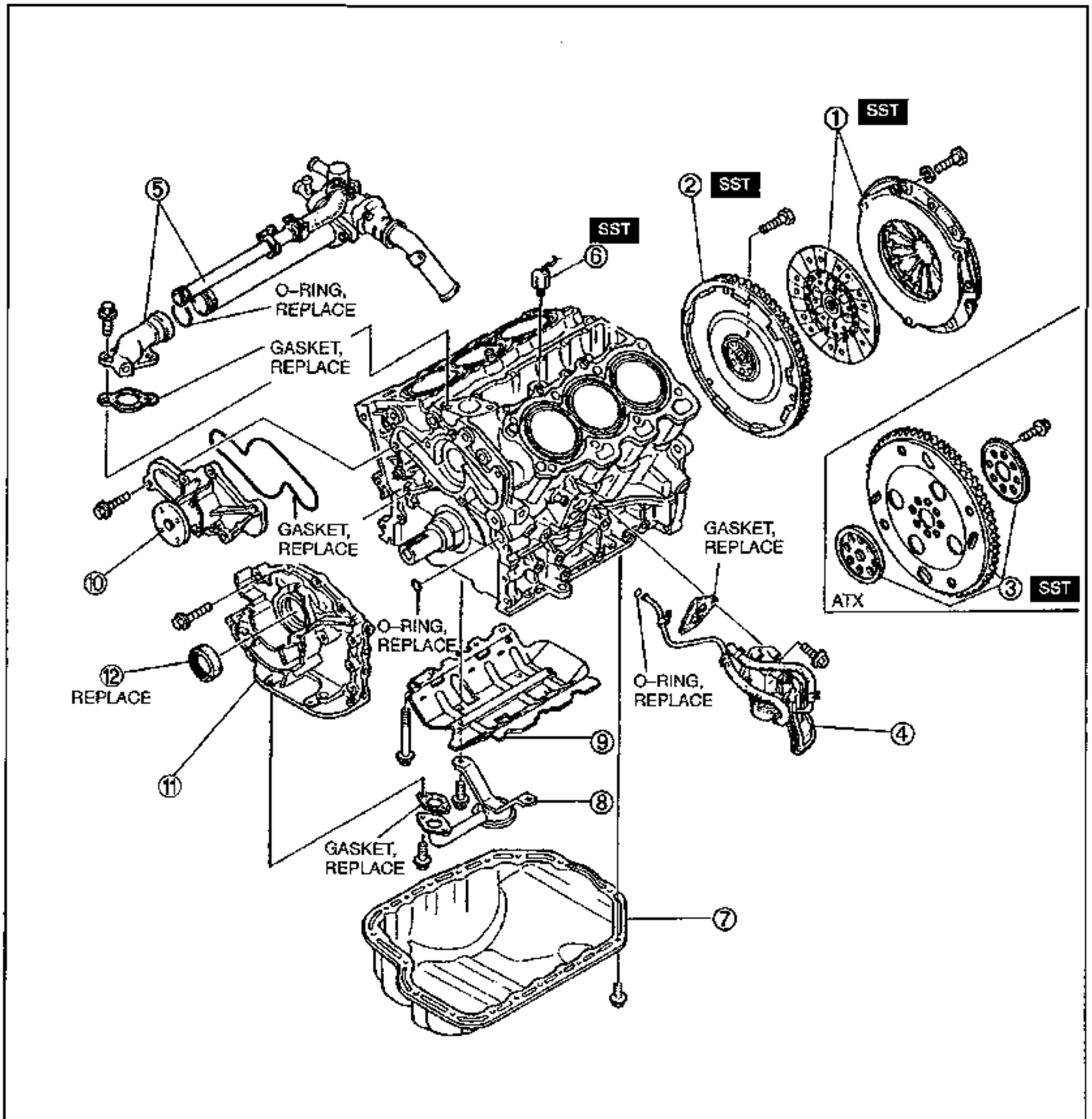


Valve seal

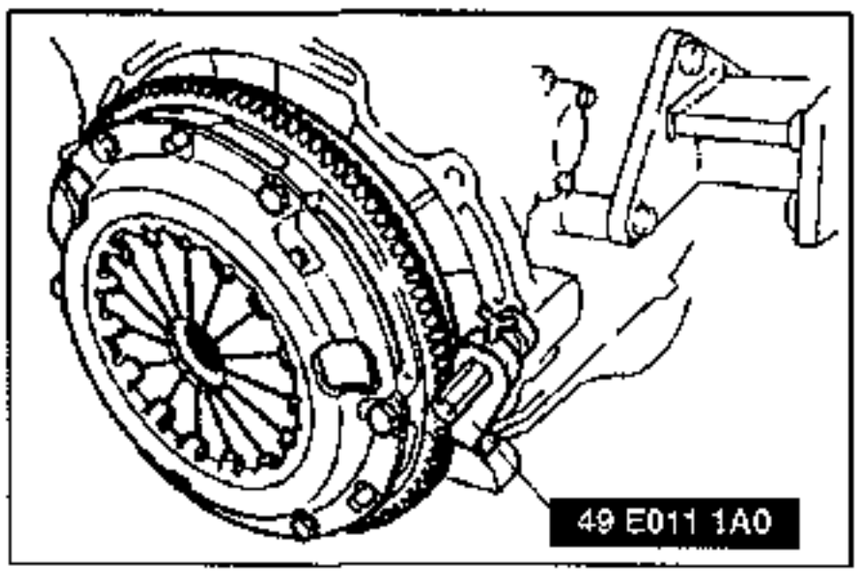
Using the **SST,** remove and discard the valve seal.

CYLINDER BLOCK (EXTERNAL PARTS)

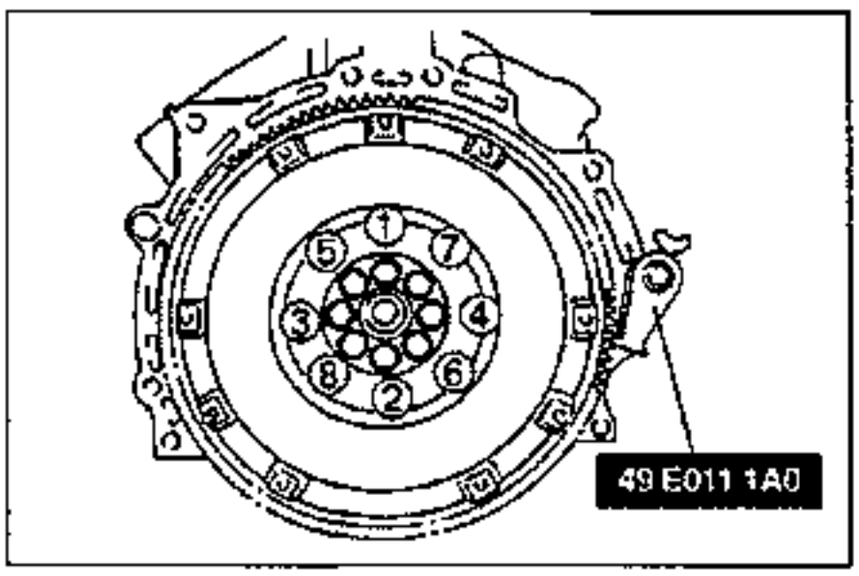
Disassemble in the order shown in the figure, referring to **Disassembly Note.**



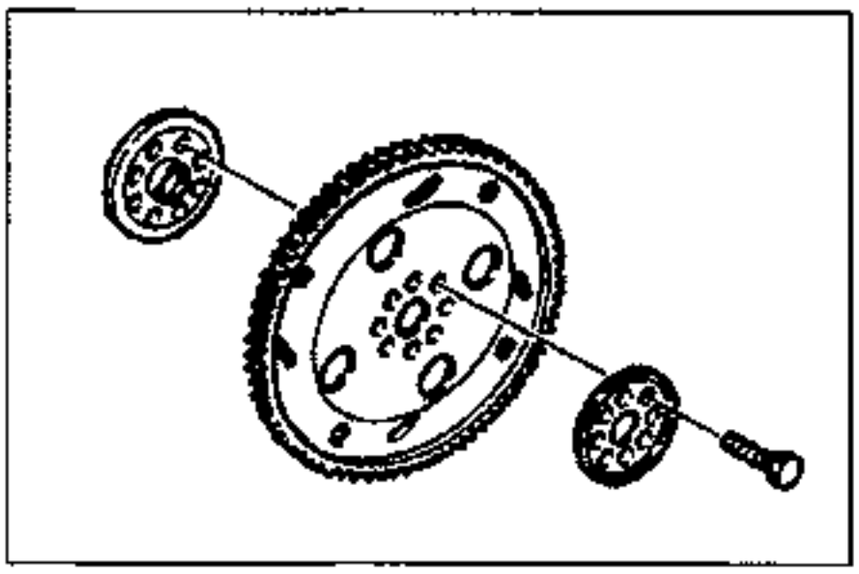
1. Clutch cover, clutch disc (MTX)
   Disassembly Note ..... page B2–67
2. Flywheel (MTX)
   Disassembly Note ..... page B2–67
3. Backing plate, drive plate, and adapter (ATX)
   Disassembly Note ..... page B2–67
4. Oil cooler and oil filter body
5. Water pipe and thermostat housing
   Disassembly Note ..... page B2–67
6. Knock sensor
   Disassembly Note ..... page B2–68
7. Oil pan
   Disassembly Note ..... page B2–68
8. Oil strainer
9. Oil baffle
10. Water pump
11. Oil pump
12. Front oil seal
    Disassembly Note ..... page B2–68



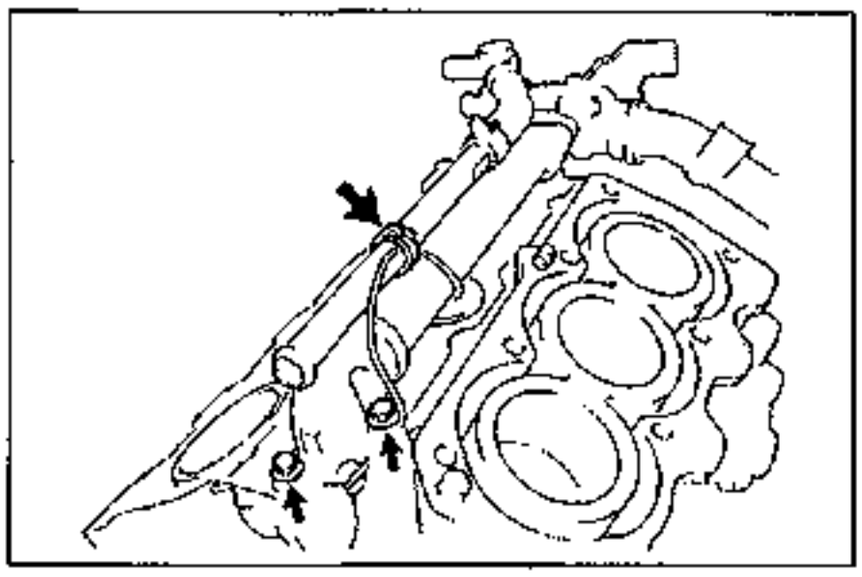
Disassembly Note
Clutch cover, clutch disc (MTX)
1. Hold the flywheel by using the **SST**.
2. Remove the clutch cover bolts in two or three steps.
3. Remove the clutch cover.
4. Remove the clutch cover and disc.



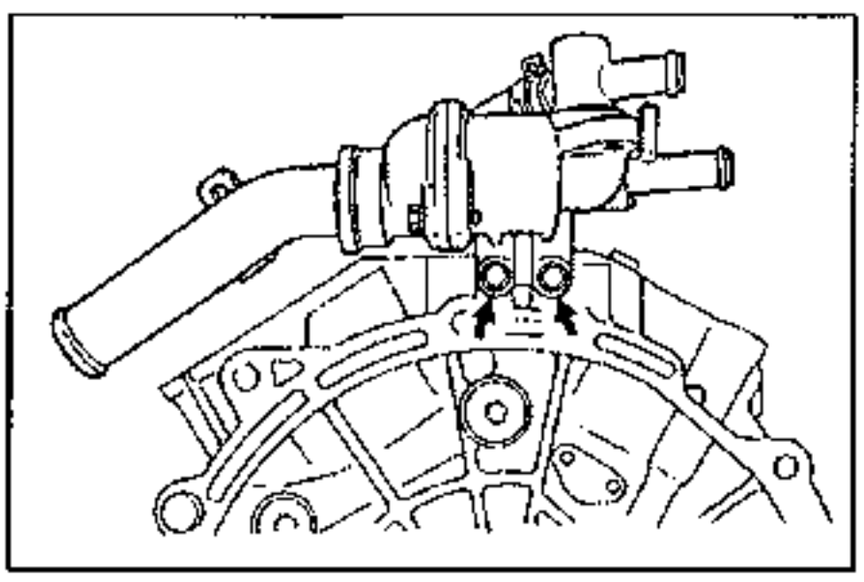
Flywheel (MTX)
1. Hold the flywheel by using the **SST**.
2. Remove the flywheel bolts in two or three steps in the order shown.
3. Remove the flywheel.
4. Remove the **SST**.



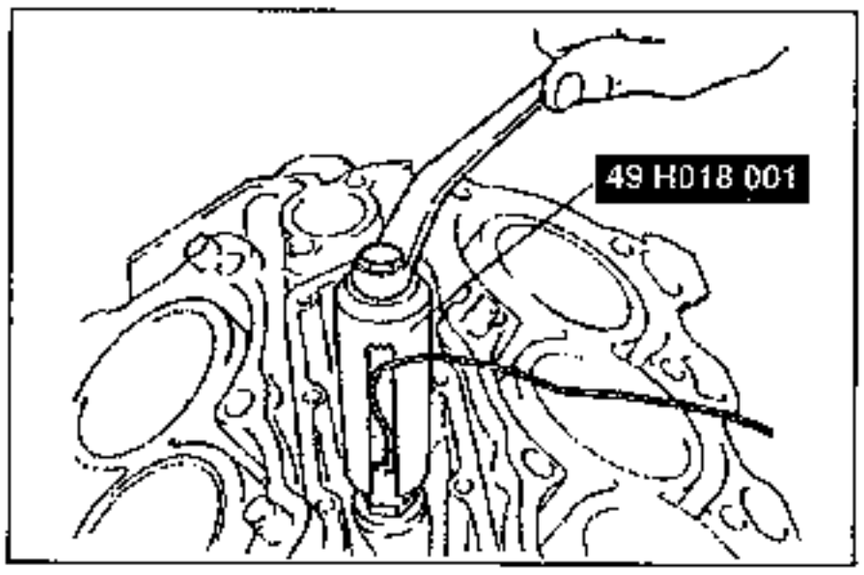
Backing plate, drive plate, and adapter (ATX)
1. Hold the drive plate by using the **SST**.
2. Remove the drive plate bolts in two or three steps. (Refer to above.)
3. Remove the backing plate, drive plate, and adapter.
4. Remove the **SST**.



Water pipe and thermostat housing
1. Disconnect the clip and separate the knock sensor harness from the water pipe.

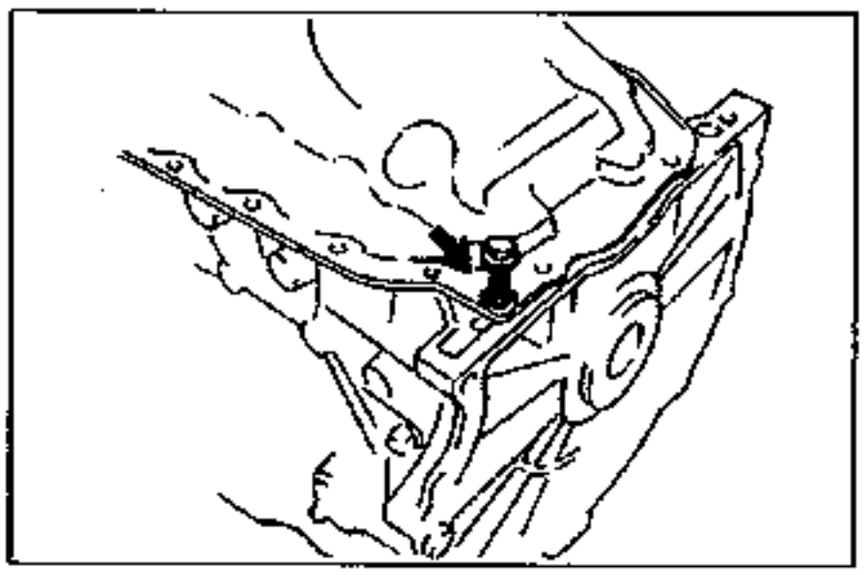


2. Remove the water pipe and thermostat housing as an assembly.



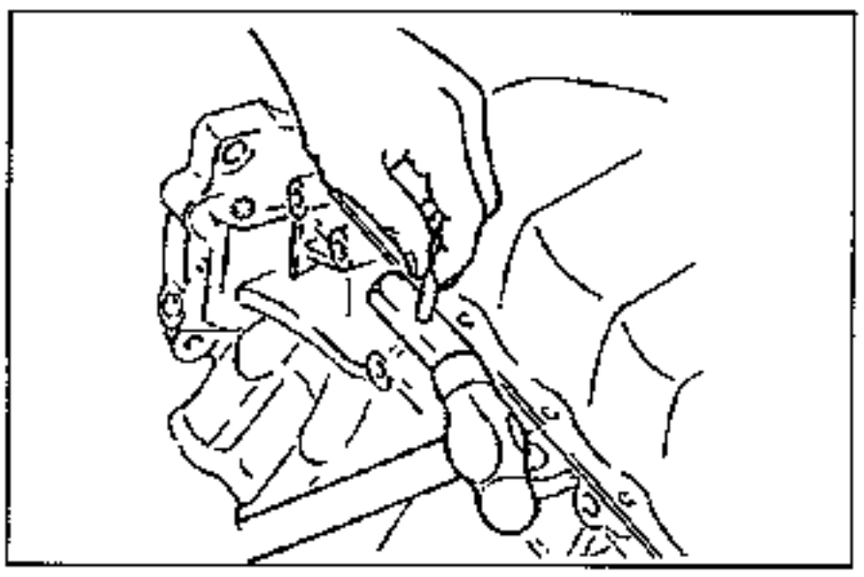
Knock sensor

Remove the knock sensor by using the **SST.**

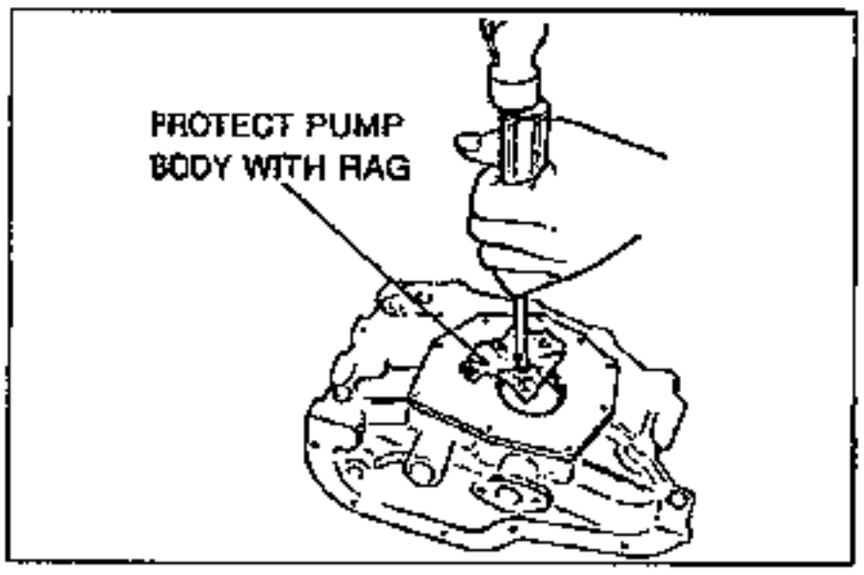


Oil pan

1. Remove the oil pan mounting bolts.
2. Remove the old sealant from the bolt threads.
3. Turn a bolt into the bolt hole as shown to make a small gap between the oil pan and the lower cylinder block.



4. Separate the oil pan from the lower cylinder block by using a screw driver or suitable tool.

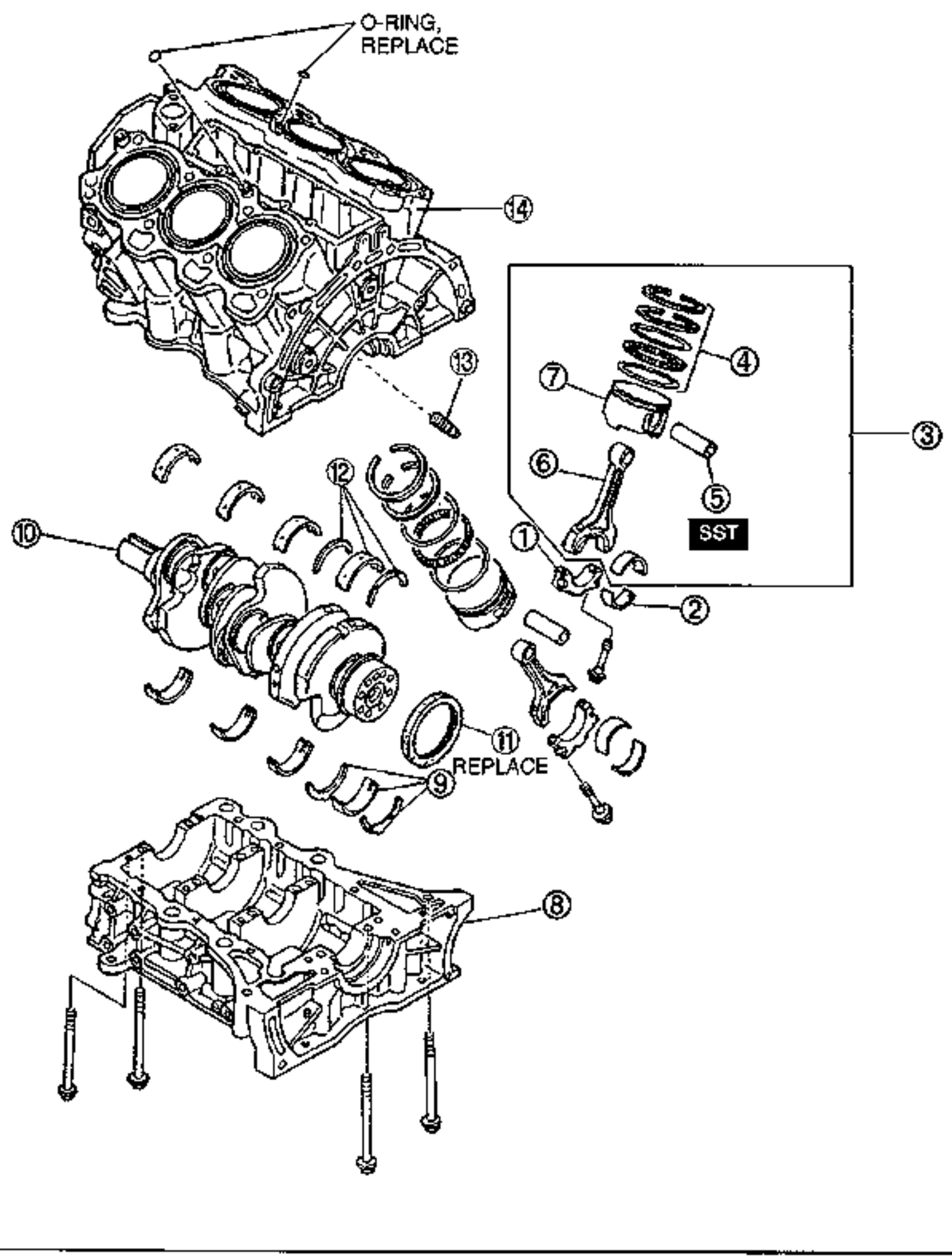


Front oil seal

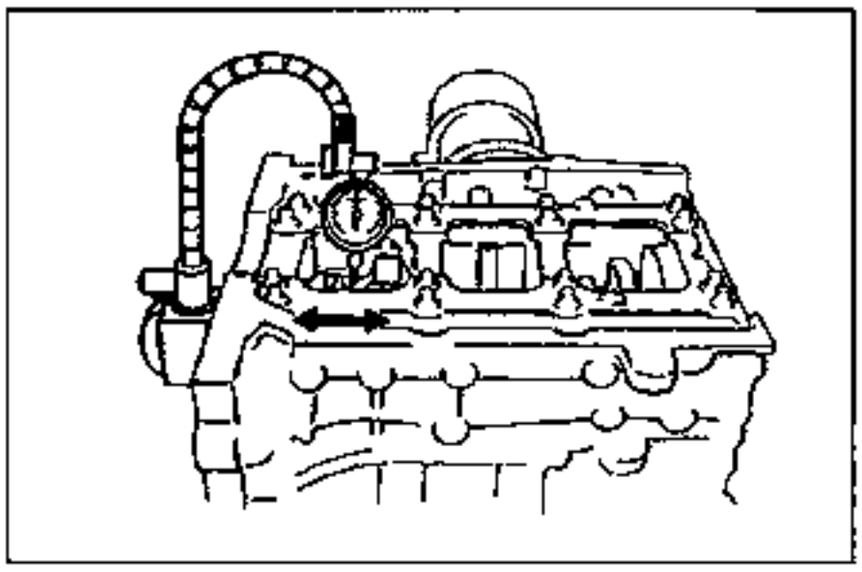
Remove the oil seal by using a screwdriver protected with a rag.

CYLINDER BLOCK (INTERNAL PARTS)

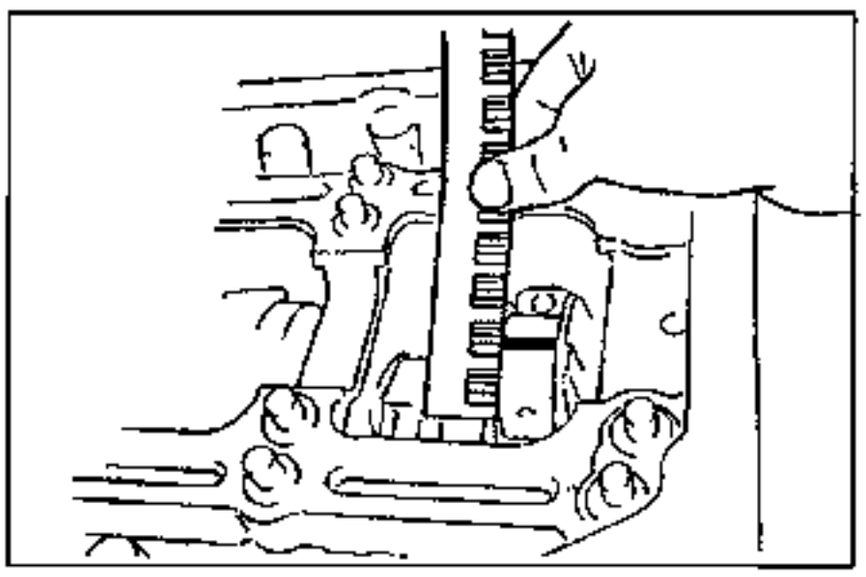
Disassemble in the order shown in the figure, referring to **Disassembly Note.**



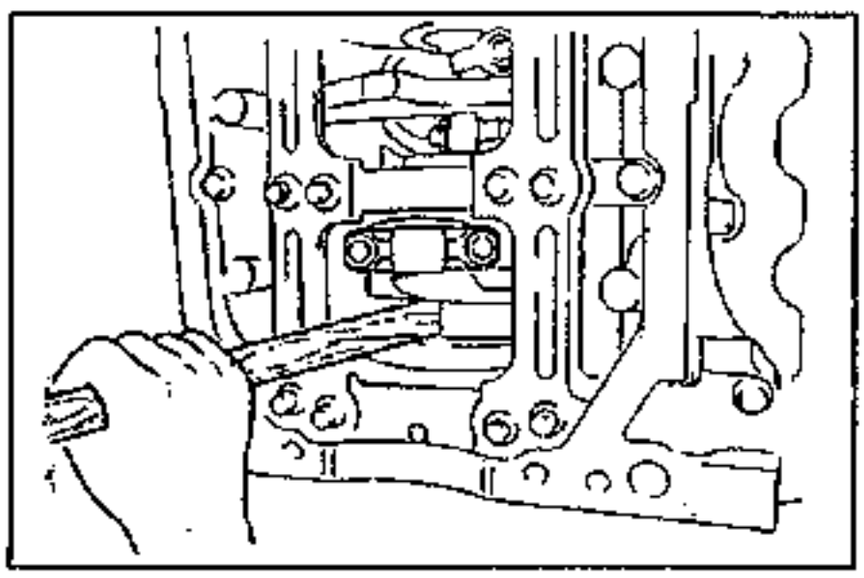
1. Connecting rod cap
   Disassembly Note ..... page B2–70
2. Lower connecting rod bearing
   Inspection ..... page B2–84
3. Piston and connecting rod assembly
   Disassembly Note ..... page B2–70
4. Piston ring
   Disassembly Note ..... page B2–70
   Inspection ..... page B2–82
5. Piston pin
   Disassembly Note ..... page B2–70
   Inspection ..... page B2–82
6. Connecting rod
   Disassembly Note ..... page B2–70
   Inspection ..... page B2–83
7. Piston
   Inspection ..... page B2–81
8. Lower cylinder block
   Disassembly Note ..... page B2–71
9. Lower main bearing and thrust bearing
10. Crankshaft
    Inspection page B2–83
11. Rear oil seal
12. Upper main bearing and thrust bearing
13. Oil jet
    Inspection ..... page B2–84
14. Cylinder block
    Inspection ..... page B2–81



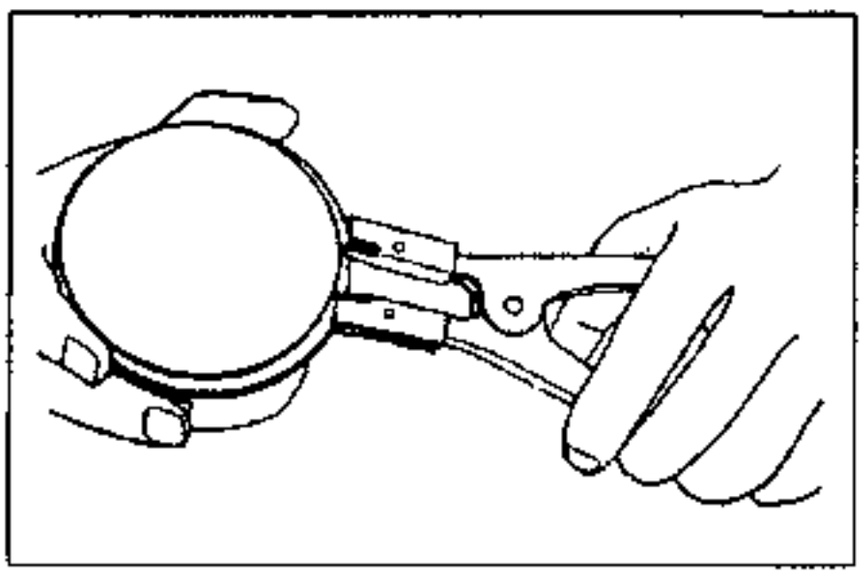
Disassembly Note
Connecting rod cap
Before removing the connecting rod caps, measure the connecting rod side clearance. (Refer to page B2–95.)



Piston and connecting rod assembly
1. Before removing the piston and connecting rod assembly, measure the connecting rod bearing oil clearance by using Plastigage. (Refer to page B2–94.)



2. Remove the Plastigage from the crank pin journals.
3. Use the handle of a hammer to push the piston and connecting rod assembly through the top of the cylinder block.

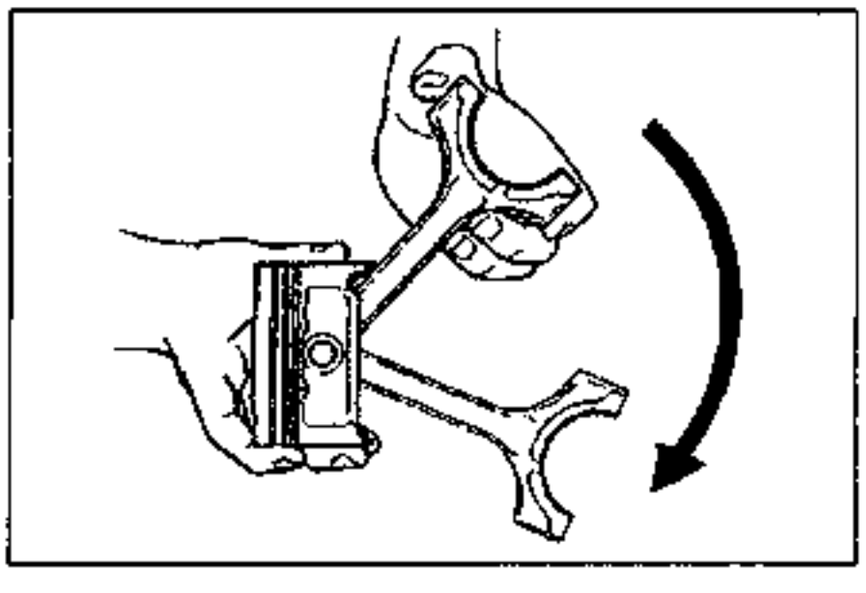


Piston ring
Remove the piston rings by using a piston ring expander.

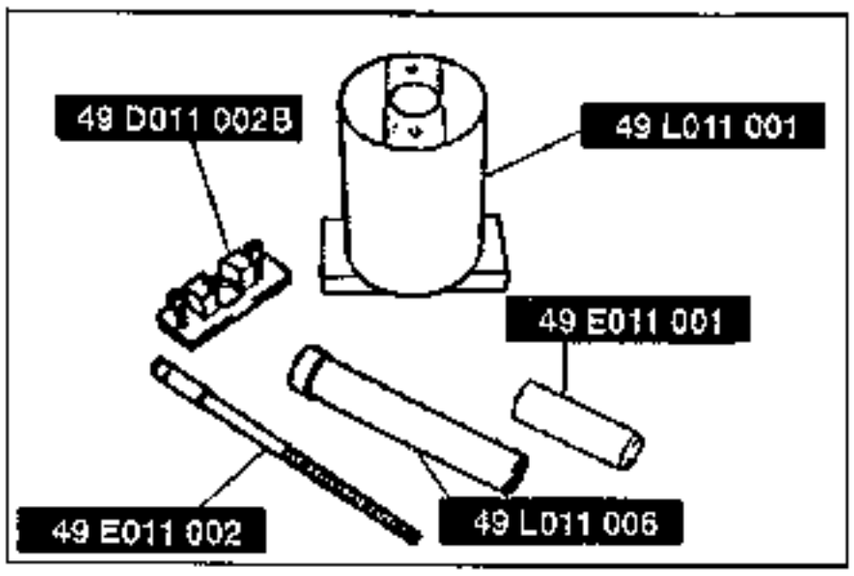
Piston pin

Caution
- **The connecting rods must be reinstalled in the same positions from which they were removed. If they are not, it can cause premature and uneven wear.**

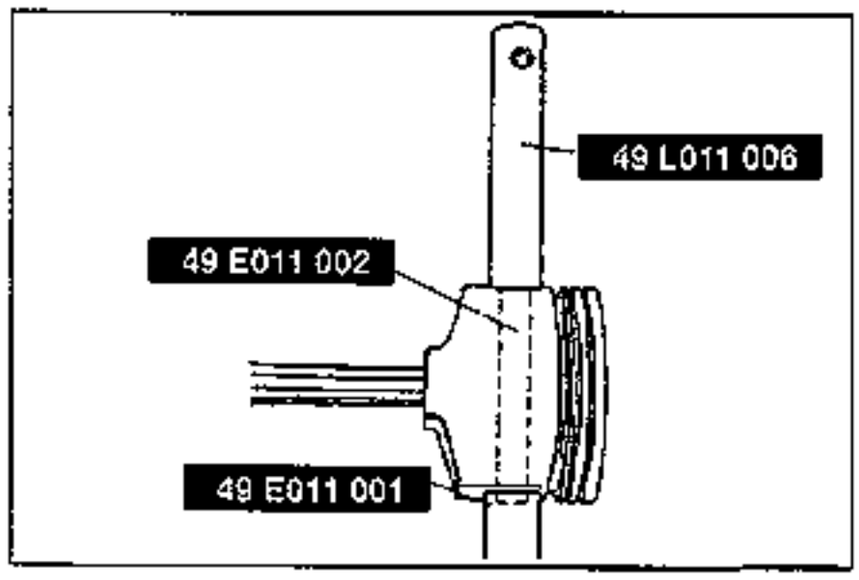
Note
- Mark the connecting rods to show their original positions.



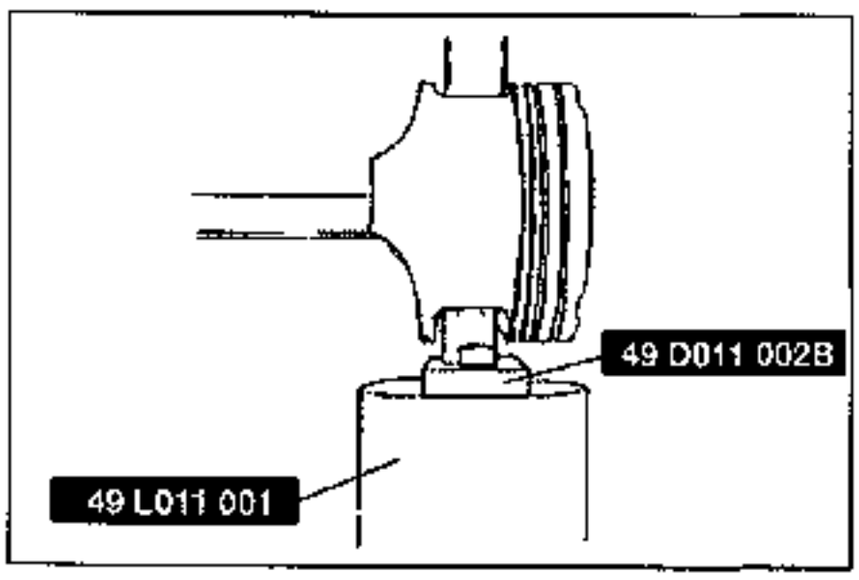
1. Before disassembling the piston and connecting rod, check the oscillation torque as shown.
If the large end does not drop by its own weight, replace the piston or the piston pin.



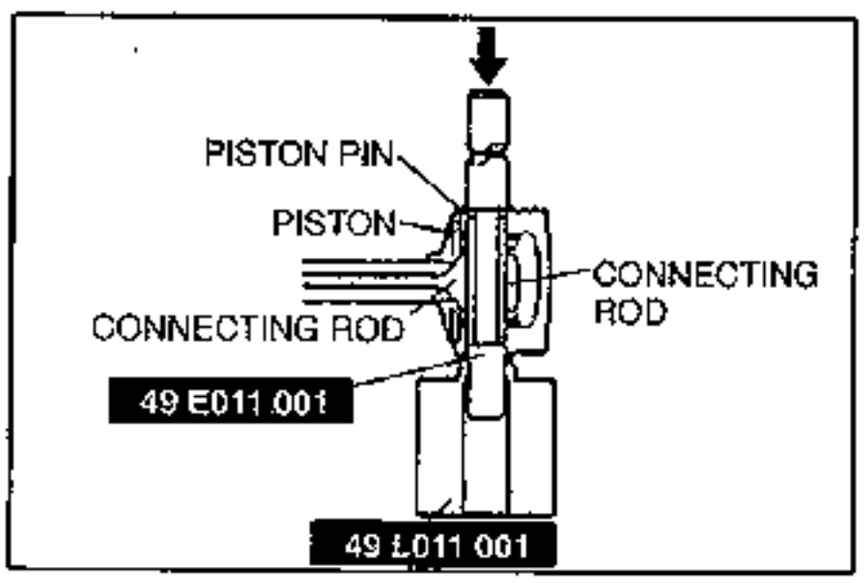
2. Use the following **SSTs** shown in the figure and a press.



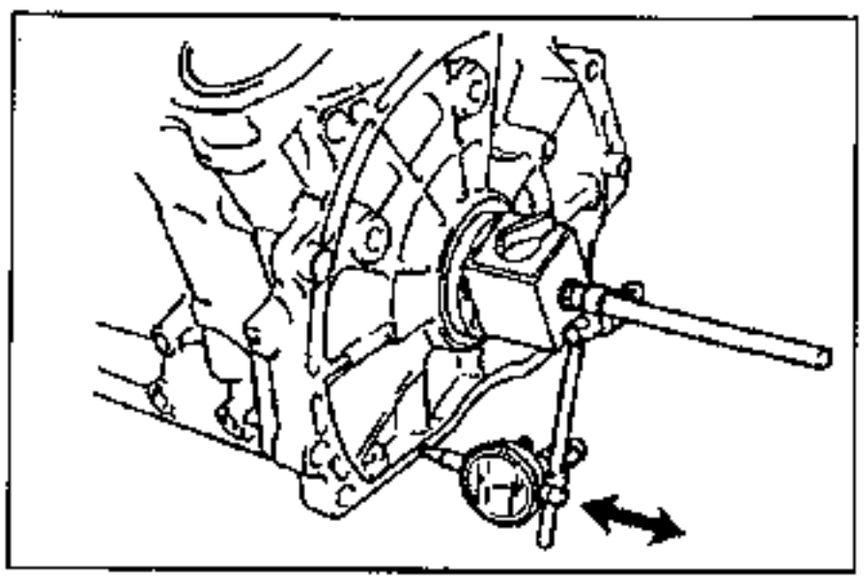
3. Insert the **SST** into the piston pin as shown.



4. Verify that the **SST** fits squarely into the piston before pressing.

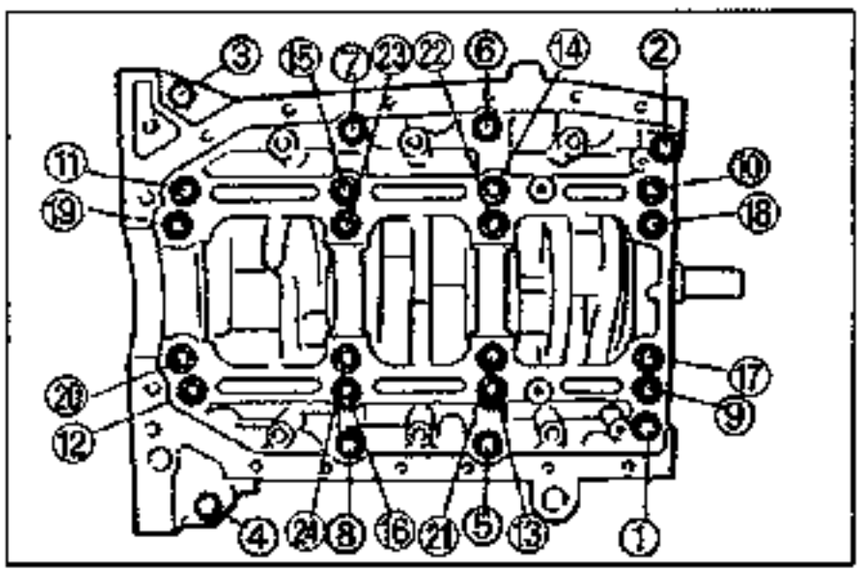


5. Set the piston and connecting rod on the **SST** as shown.
6. Press out the piston pin.
   While removing the piston pin, check the pressure. If it is lower than **4,903 N {500 kgf, 1,100 lbf}**, replace the piston pin or connecting rod.

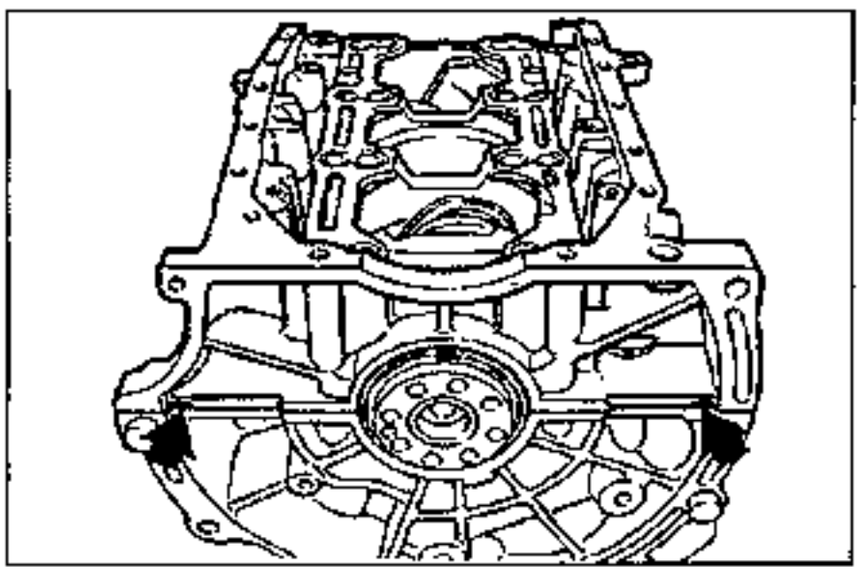


Lower cylinder block

1. Before removing the lower cylinder block, measure the crankshaft end play. (Refer to page B2–92.)



2. Loosen the cylinder block bolts and crankshaft cap bolts in two or three steps in the order shown in the figure.



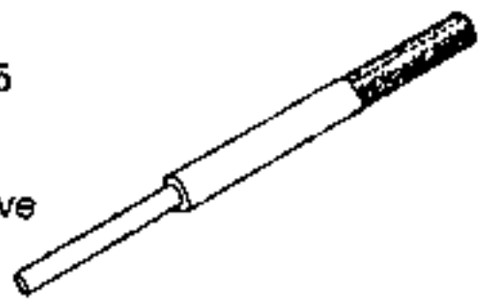
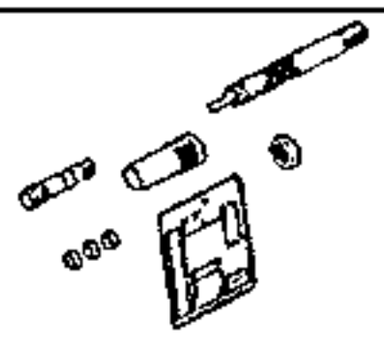
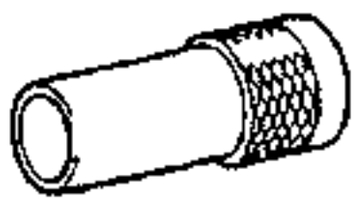
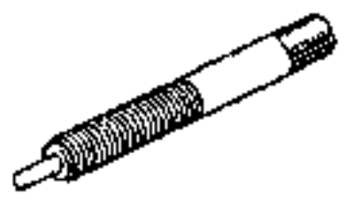
3. Insert a screwdriver only at the points shown and pry loose the lower cylinder block.

Caution
- **Do not use a scraper to separate the cylinder block sections. It can easily scratch the contact surfaces.**

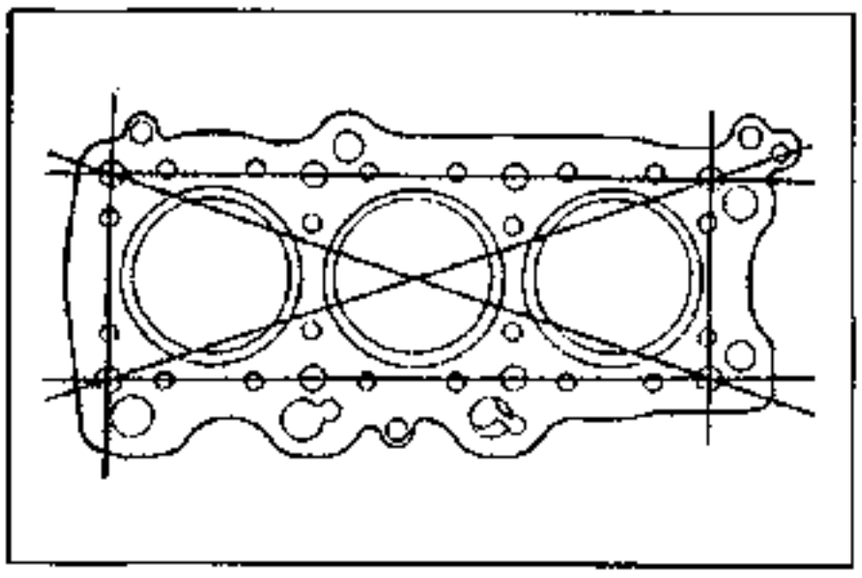
4. Tap the lower cylinder block with a plastic hammer.

INSPECTION / REPAIR

PREPARATION
SST

49 B012 005 Remover & installer, valve guide 	For removal / installation of valve guides	49 L012 0A0 Installer set, valve seal & valve guide 	For installation of valve guides
49 L012 002 Body (Part of 49 L012 0A0) 	For installation of valve guides	49 L012 003 Installer (Part of 49 L012 0A0) 	For installation of valve guides
49 L012 004 Nut (Part of 49 L012 0A0) 	For installation of valve guides		

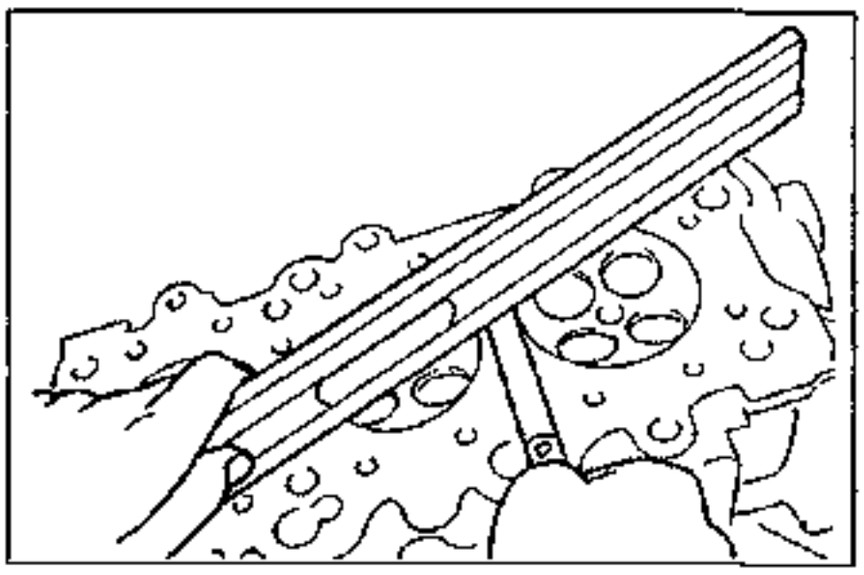
1. Clean all parts, being sure to remove all gasket fragments, dirt, oil, etc.
2. Perform the inspections and repairs in the order specified.

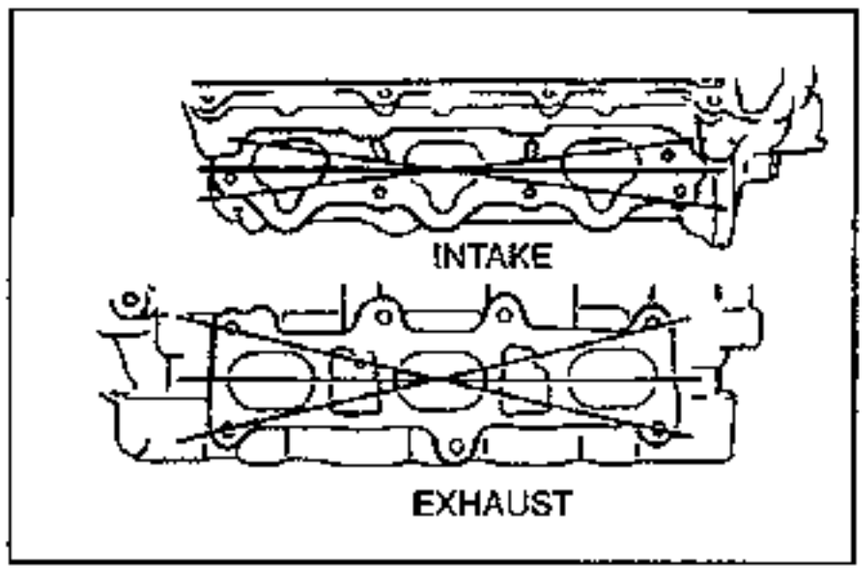


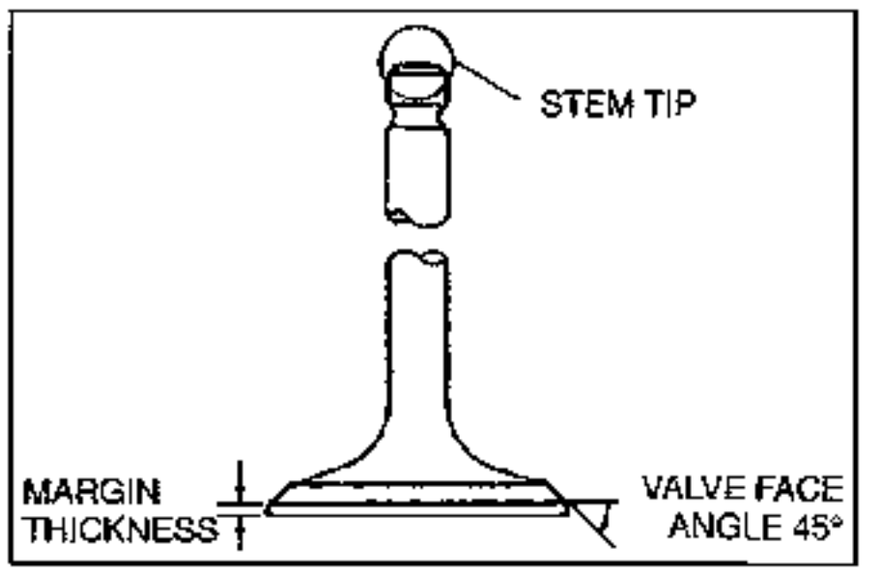
CYLINDER HEAD

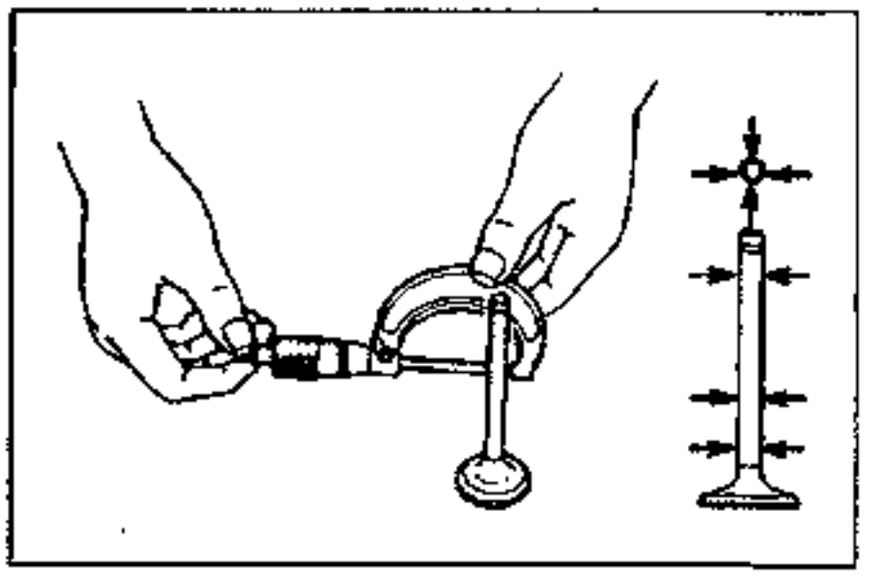
1. Inspect the cylinder head for damage, cracks, and leakage of water and oil. Replace if necessary.
2. Measure the cylinder head for distortion in the six directions shown.

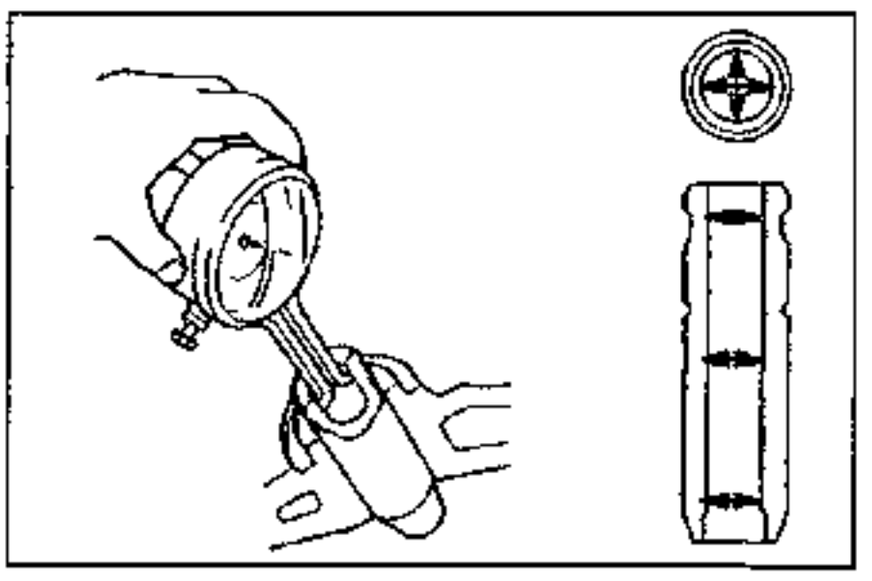
Distortion: 0.10mm {0.004 in} max.











3. Inspect for the following and repair or replace the cylinder head if necessary.
   (1) Sunken valve seats
   (2) Damaged intake and exhaust manifold contact surfaces
   (3) Excessive camshaft oil clearances and end play
4. If the cylinder head distortion exceeds the specification, replace the cylinder head or grind the cylinder head surface.

   Grinding: 0.15mm {0.006 in} max.

5. If the cylinder head height is not within the specification, replace it.

   Height: 133.4–133.6mm {5.252–5.259 in}

6. Measure the intake and exhaust manifold contact surfaces for distortion in the six directions as shown.

   Distortion: 0.10mm {0.004 in} max.

7. If distortion exceeds the specification, grind the surface or replace the cylinder head.

VALVE MECHANISM

Valve and Valve Guide

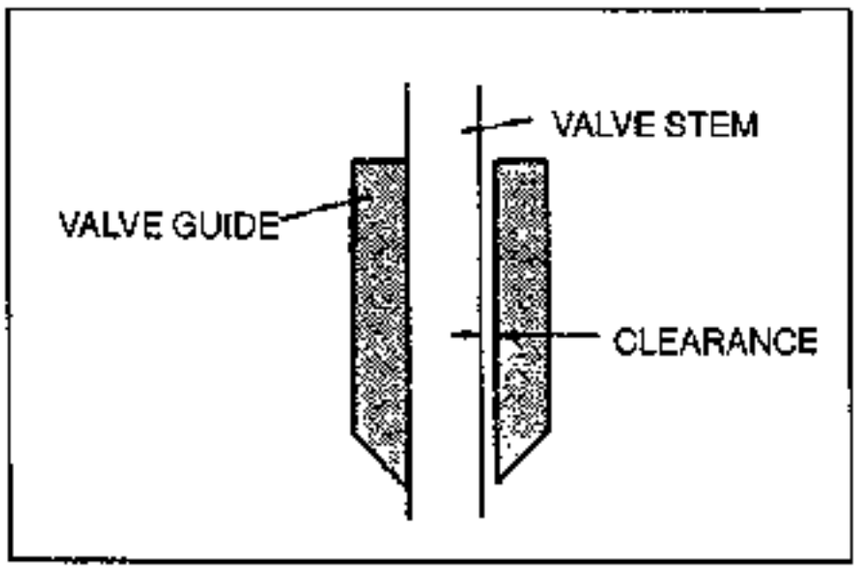
1. Inspect each valve for the following. Replace or resurface the valve as necessary.
   (1) Damaged or bent stem
   (2) Rough or damaged face
   (3) Damaged or unevenly worn stem tip
2. Measure the valve head margin thickness. Replace the valve if necessary.

   Margin thickness
   IN: 0.9mm {0.035 in} min.
   EX: 1.0mm {0.039 in} min.
3. Measure the valve length. Replace the valve if necessary.

   Length
   Standard IN: 94.11 mm {3.7051 in}
   EX: 95.19mm {3.7476 in}
   Minimum IN: 93.61 mm {3.6854 in}
   EX: 94.69mm {3.7279 in}
4. Measure the valve stem diameter. Replace the valve if necessary.

   Diameter
   Standard
   IN: 5.970–5.985mm {0.2351–0.2356 in}
   EX: 5.965–5.980mm {0.2349–0.2354 in}
   Minimum IN: 5.920mm {0.2331 in}
   EX: 5.915mm {0.2329 in}
5. Measure the valve guide inner diameter. Replace the guide if necessary.

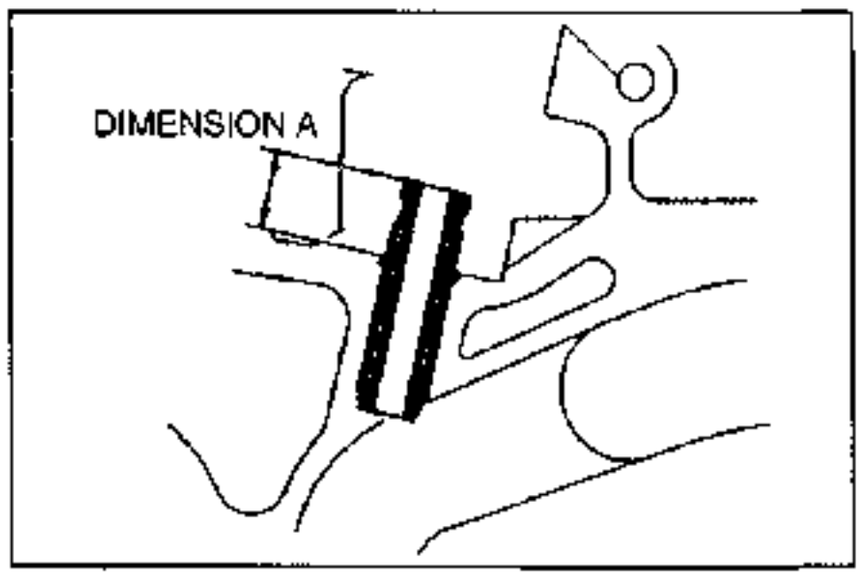
   Inner diameter
   IN: 6.01–6.03mm {0.2367–0.2374 in}
   EX: 6.01–6.03mm {0.2367–0.2374 in}



6. Calculate the valve stem-to-guide clearance.
   Subtract the outer diameter of the valve stem from the inner diameter of the corresponding valve guide.

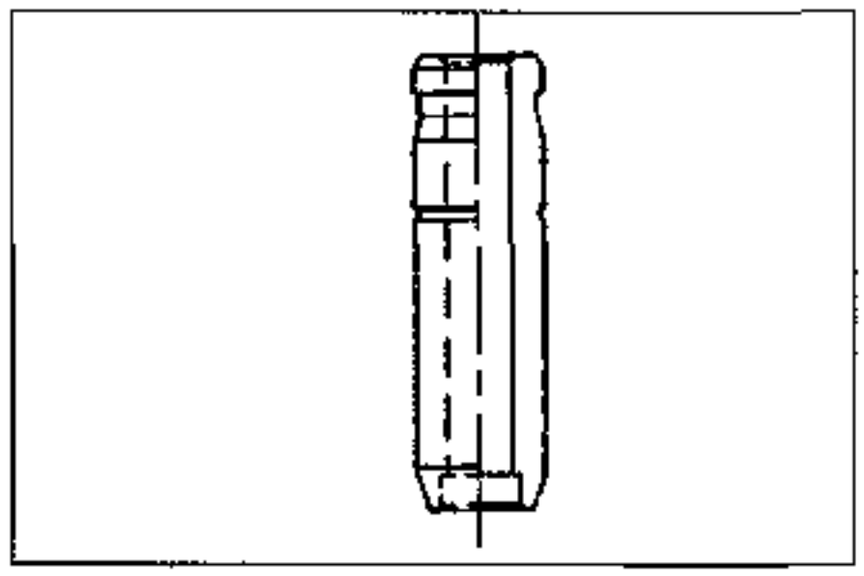
   Clearance
   IN: 0.025–0.060mm {0.0010–0.0023 in}
   EX: 0.030–0.065mm {0.0012–0.0025 in}
   Maximum: 0.20mm {0.008 in}

7. If the clearance exceeds the maximum, replace the valve and/or valve guide.



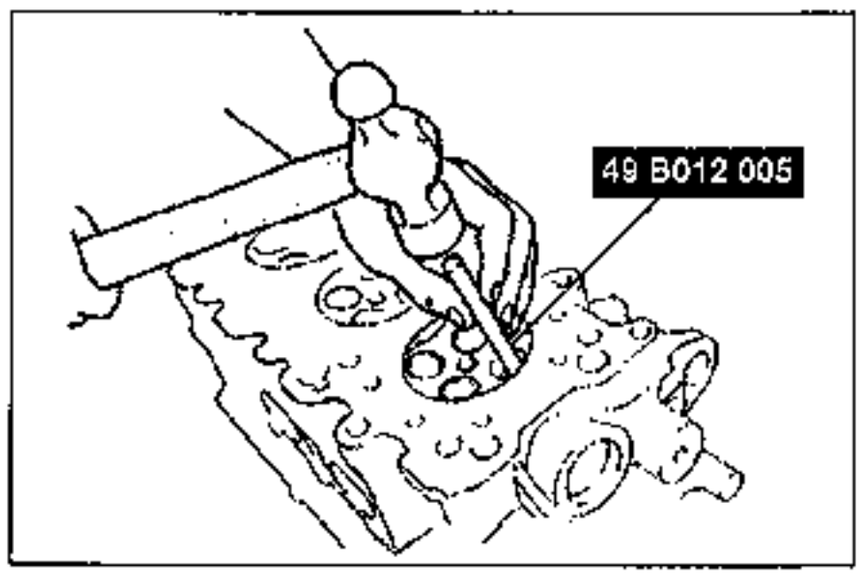
8. Measure the valve guide projection height (dimension A). Replace the guide if necessary.

   Height A
   IN: 14.7–15.3mm {0.579–0.602 in}
   EX: 12.2–12.8mm {0.481–0.503 in}

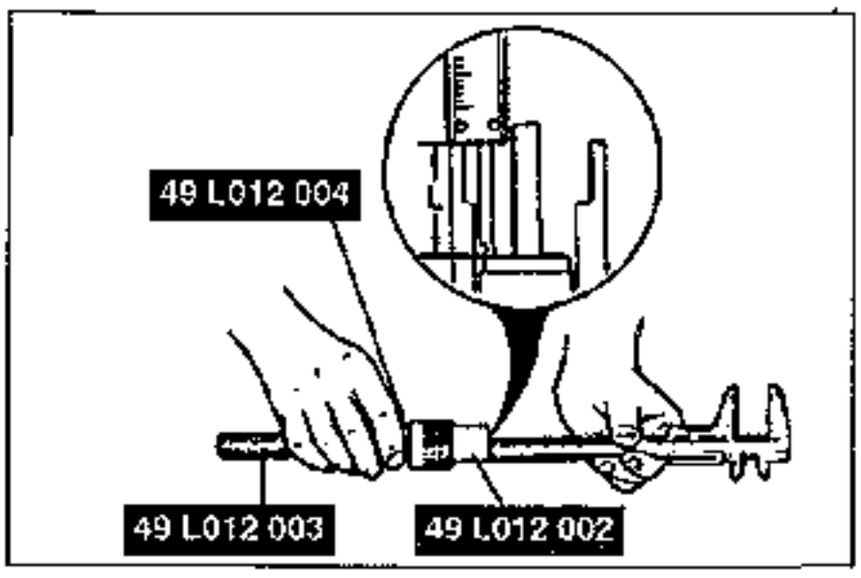


Replacement of valve guide

Note
- The intake and exhaust valve guides are the same.



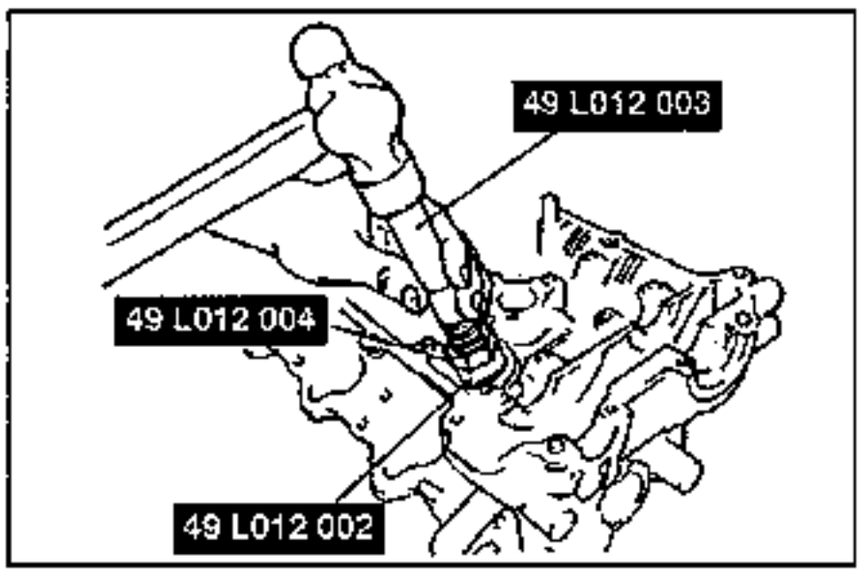
1. Remove the valve guide from the combustion chamber side by using the **SST**.



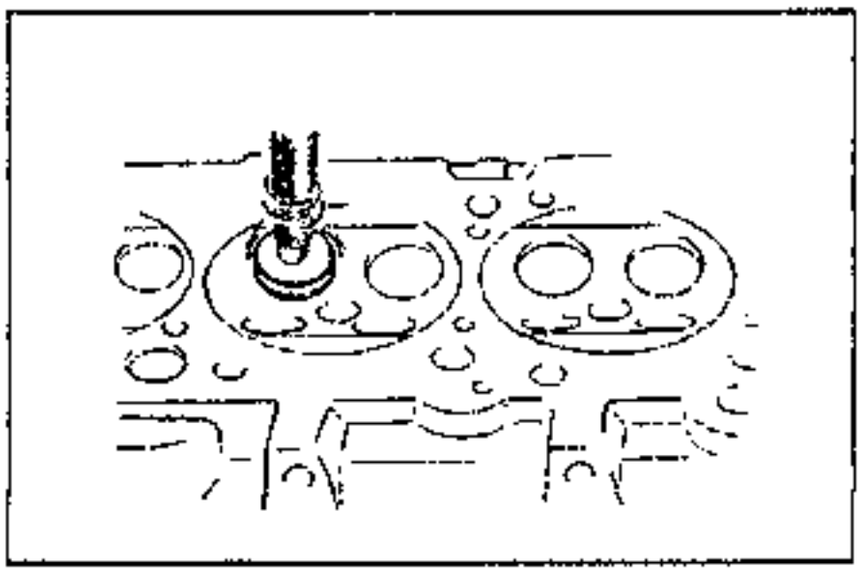
2. Assemble the **SST** so that depth L is as specified.

   Depth L
   IN: 14.7–15.3mm {0.579–0.602 in}
   EX: 12.2–12.8mm {0.481–0.503 in}

3. Tighten the nut.

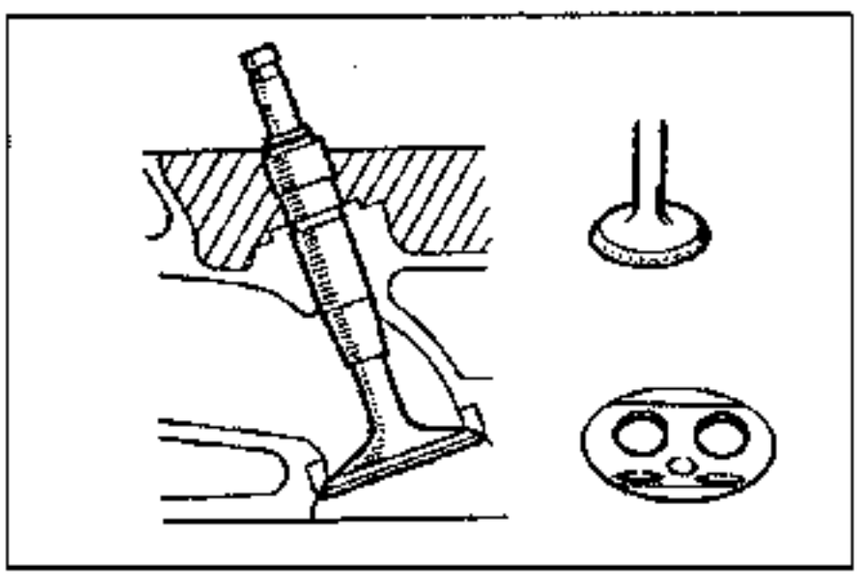


4. Tap the valve guide in from the side opposite the combustion chamber until the **SST** contacts the cylinder head.
5. Verify that the valve guide projection height is within the specification. (Refer to page B2–75.)
6. If not, repeat steps 2–4.

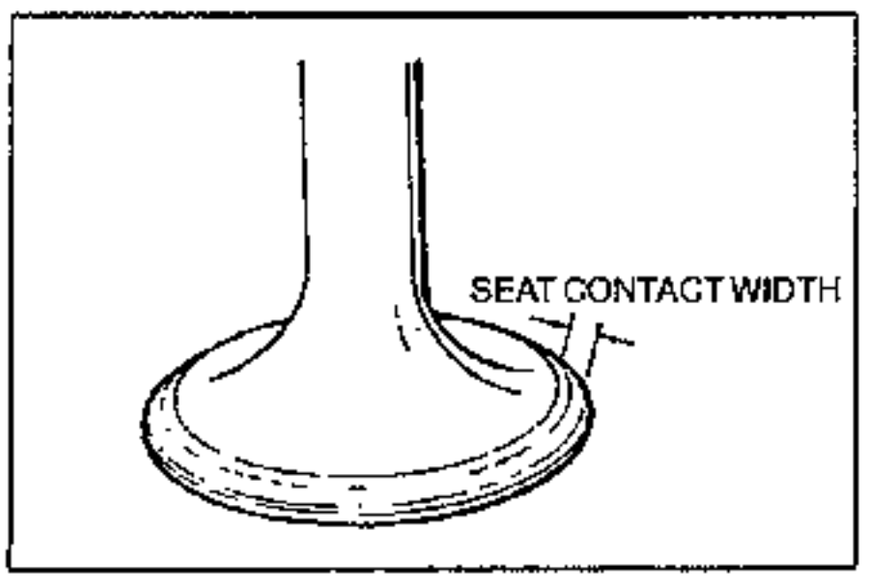


Valve Seat

1. Inspect the contact surface of each valve seat and valve face for the following:
   (1) Roughness
   (2) Damage
2. If necessary, resurface the valve seat by using a **45°** valve seat cutter and/or resurface the valve face.

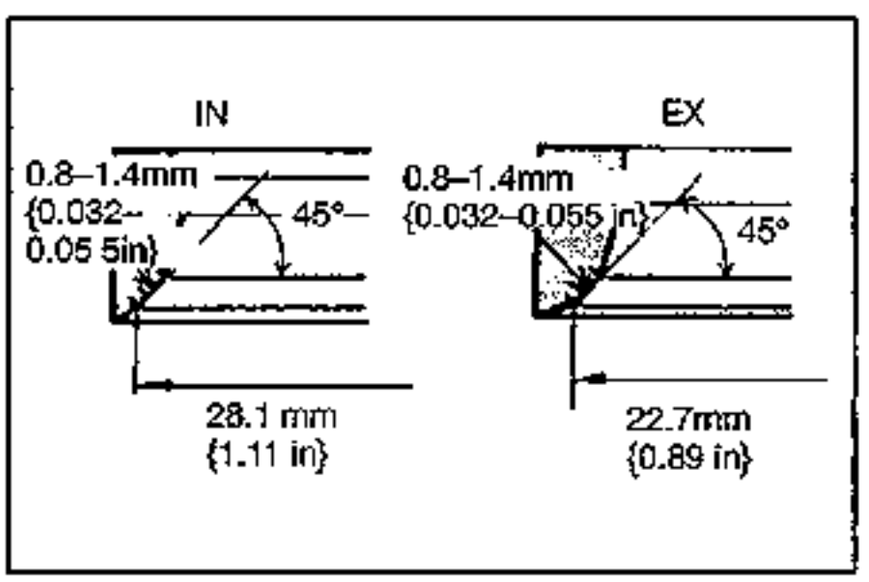


3. Apply a thin coat of Prussian blue to the valve face.
4. Check the valve seating by pressing the valve against the seat.
   (1) If blue does not appear 360° around the valve face, replace the valve.
   (2) If blue does not appear 360° around the valve seat, resurface the seat.

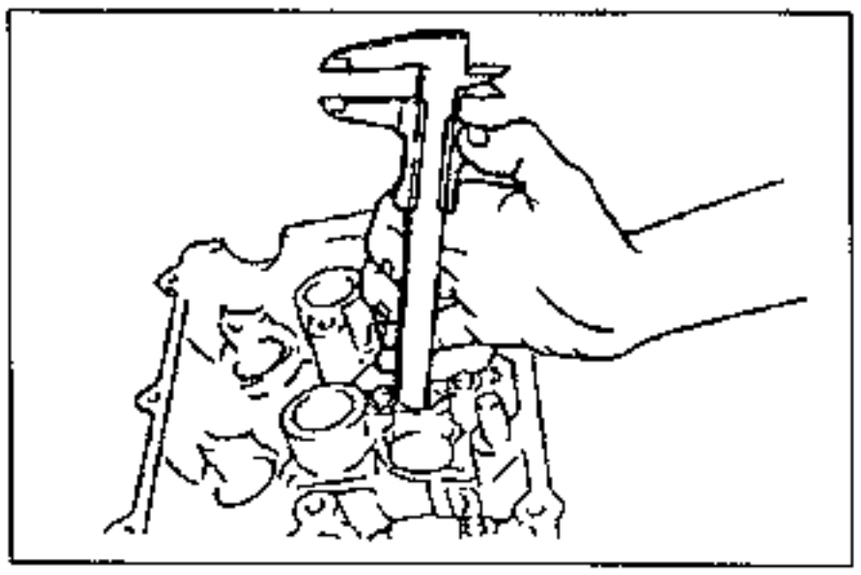


5. Measure the seat contact width.

Width: 0.8–1.4mm {0.032–0.055 in}



6. Verify that the valve seating position is at the center of the valve face.
   (1) If the seating position is too high, correct the valve seat with a **75°** cutter.
   (2) If the seating position is too low, correct the valve seat with a **45°** cutter.
7. Seat the valve to the valve seat by using lapping compound.

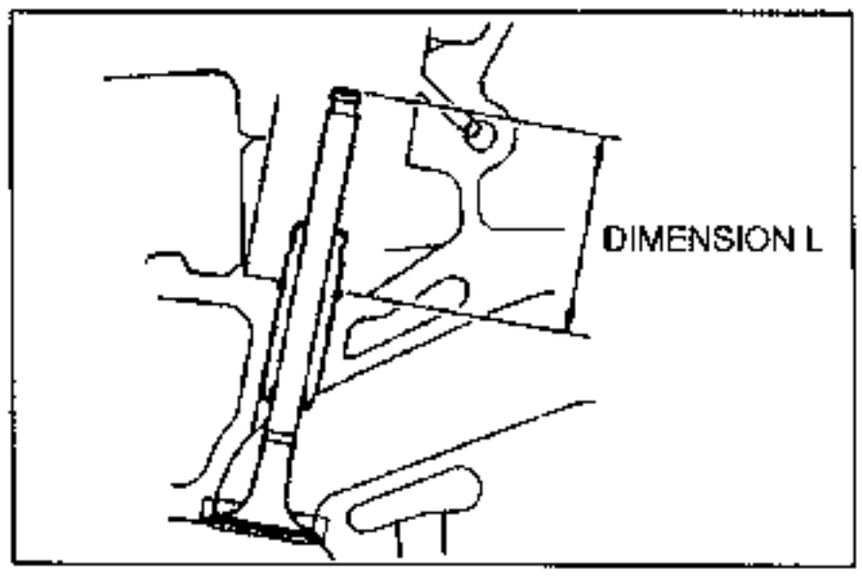


7. Check the sinking of the valve seat.
Measure the protruding length (dimension L) of the valve stem.

Dimension L: 41.5mm {1.634 in}

(1) If **L** is as below, it can be used as it is.

41.5–42.0mm {1.634–1.653 in}

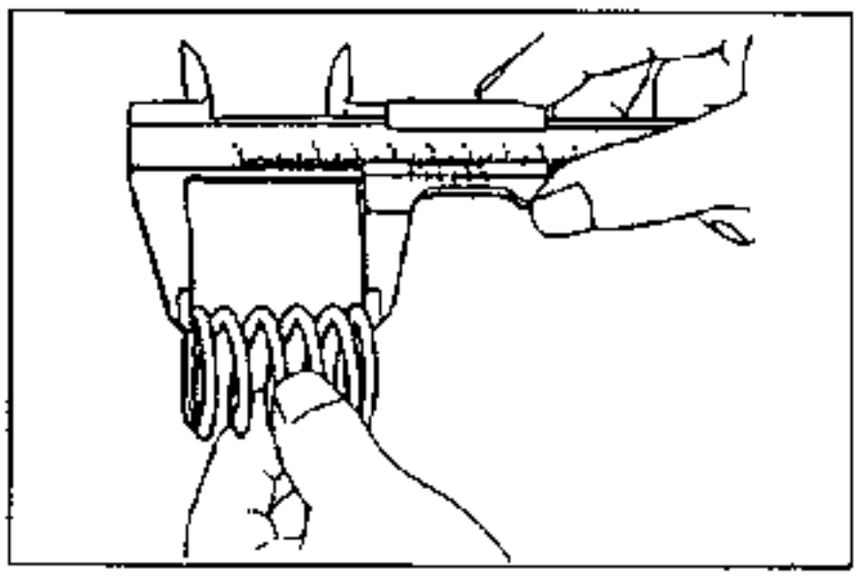


(2) If **L** is as below, insert a washer onto the spring seat area so that **L** will be as specified.

42.1–43.0mm {1.658–1.692 in}

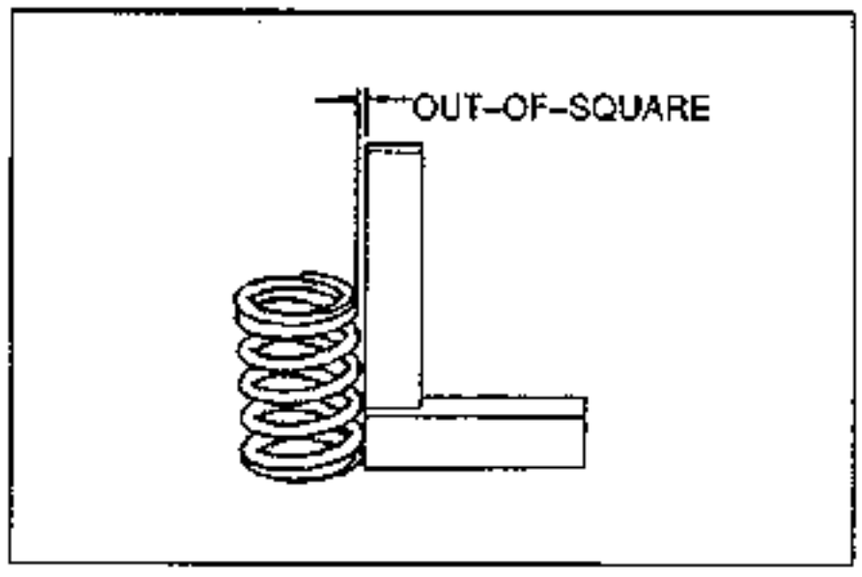
(3) If **L** is as below or more, replace the cylinder head.

43.1mm {1.697 in}



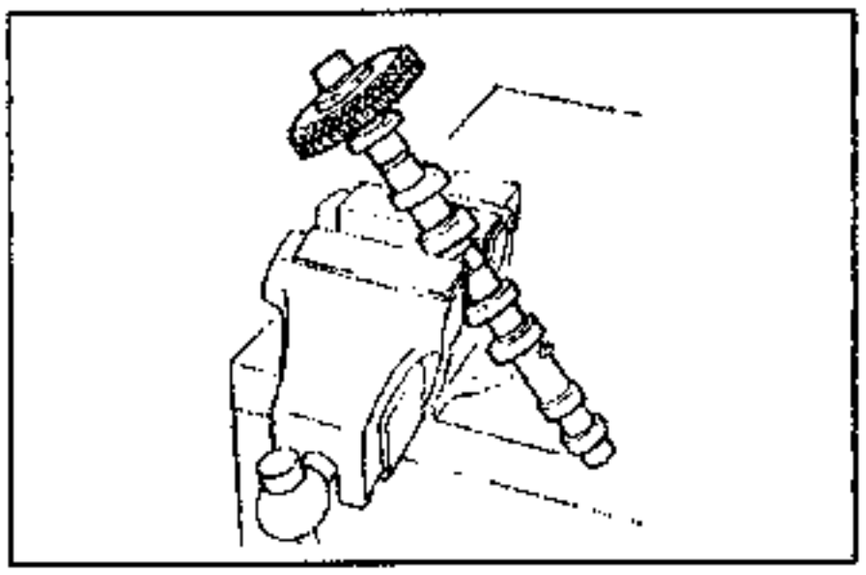
Valve Spring
1. Inspect the valve springs for cracks and damage.
2. Check the free length of each spring.

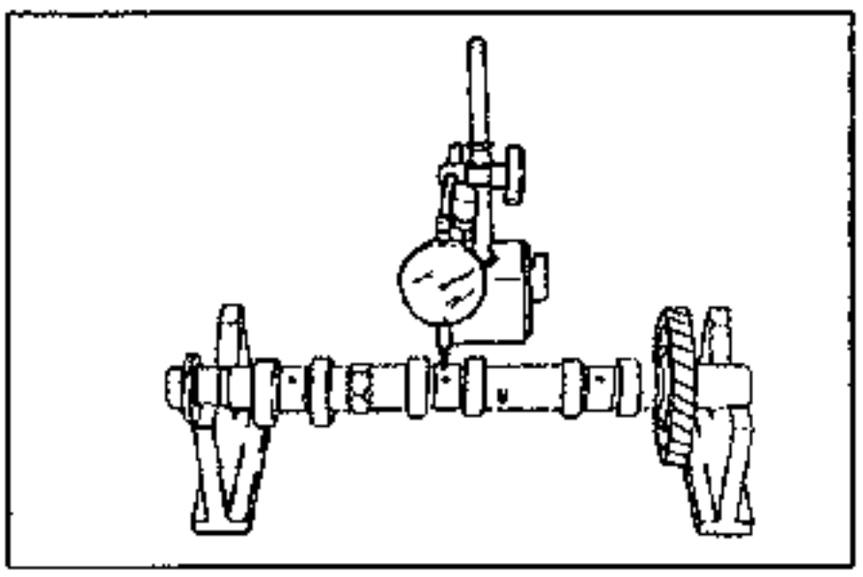
Free length
Standard: 46.92mm {1.847 in}
Minimum: 38.7mm {1.524 in}
with a set load of 233.0–263.6 N {23.75–26.88 kgf, 52.25–59.14 lbf}

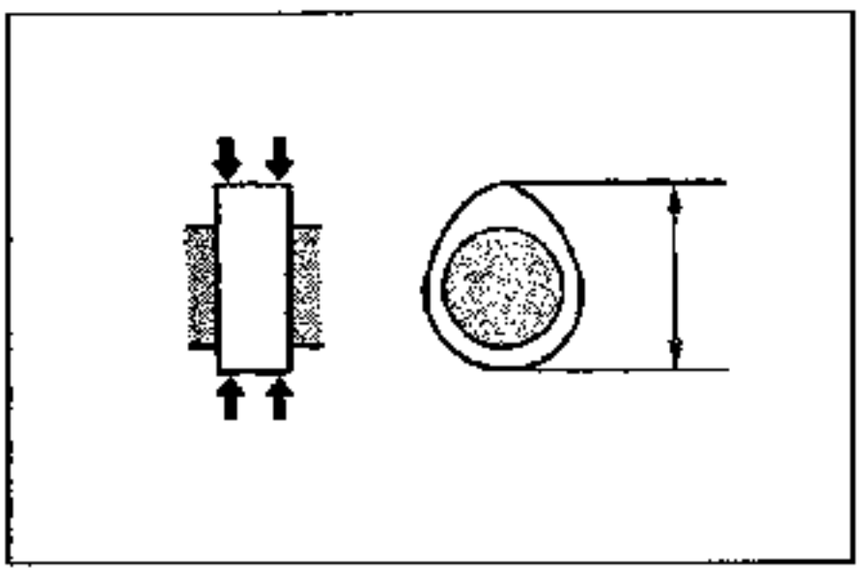


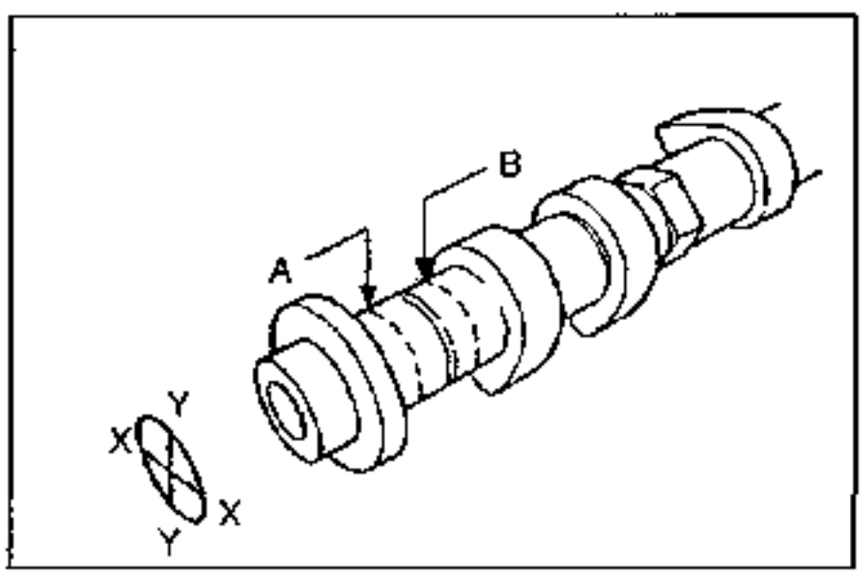
3. Measure spring pressure when the spring length is compressed to **35.5mm {1.398 in}**. Replace if necessary.
4. Check the out-of-square of the springs. Replace as necessary.

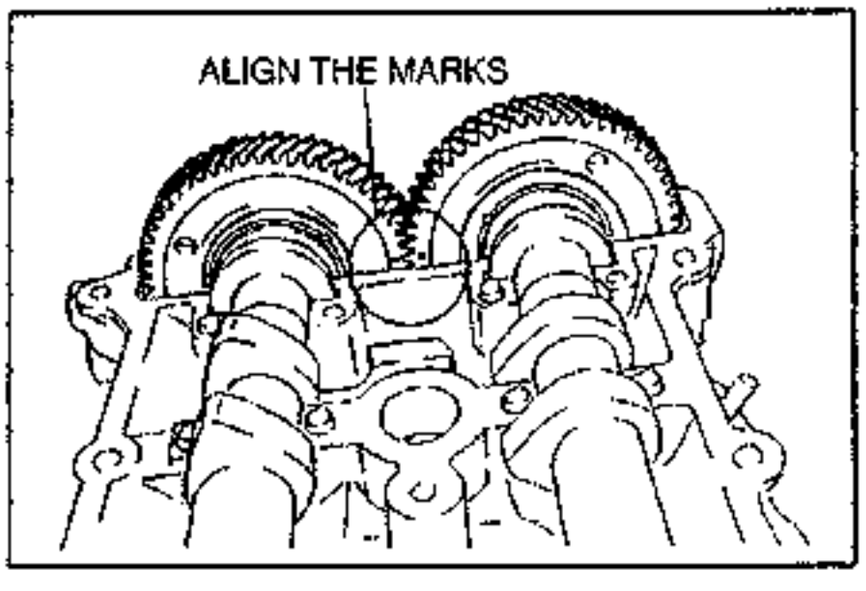
Out-of-square: 1.63mm {0.064 in} max.











CAMSHAFT

1. Visually inspect the helical gears and the friction gear. Replace the camshaft assembly if a problem is found with the helical gear. Replace the friction gear if a problem is found with it.
2. Secure the camshaft cast hexagon in a vise protected with aluminum plates.
3. Loosen the locknut and remove the friction gear.
4. Assemble the friction gear so that the matching marks align.

   Tightening torque:
   69–78 N·m {7.0–8.0 kgf·m, 51–57 ft·lbf}

5. Set the No.1 and No.5 journals on V-blocks.
   Measure the camshaft runout. Replace the camshaft if necessary.

   Runout: 0.02mm {0.0008 in} max.

6. Check the camshaft for wear and damage. Replace it if necessary.
7. Measure the camshaft lobe height at the two points as shown. Replace the camshaft if necessary.

   Height
   IN: 42.665mm {1.6797 in)
   EX: 43.516mm {1.7132 in}
   Minimum
   IN: 42.465mm {1.6718 in}
   EX: 43.316mm {1.7054 in}

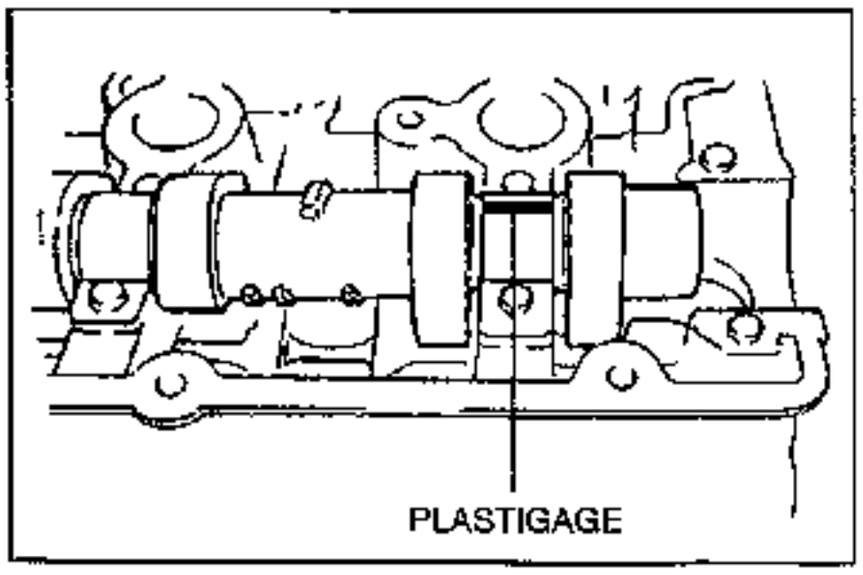
8. Measure the journal diameters in X and Y directions at the two points (A and B) as shown. Replace the camshaft if necessary.

Journal diameter

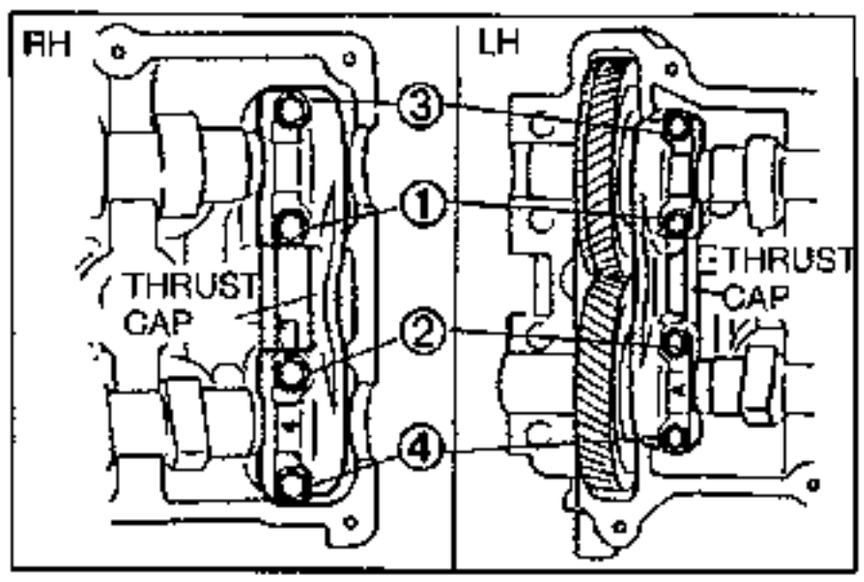
mm {in}

Journals	Standard	Minimum
No.1 (RH EX, LH IN) and No.5	25.940–25.960 {1.0213–1.0220}	25.890 {1.0193}
No.3 (RH IN, LH EX)	29.975–29.995 {1.1802–1.1809}	29.925 {1.1781}
No.2–No.4	25.910–25.930 {1.0201–1.0208}	25.860 {1.0181}

9. Measure the camshaft journal oil clearances with the HLA removed.
   (1) Remove all foreign material and oil from the journals and the camshaft saddles.
   (2) Install the camshafts on the cylinder head.

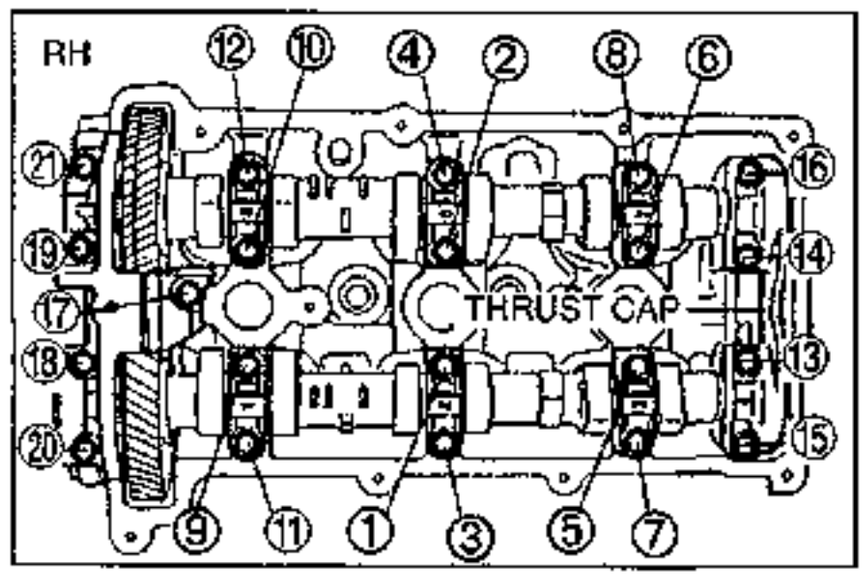


(3) Position Plastigage atop each journal in the journal axial direction.
(4) Do not rotate the camshaft when measuring the oil clearances.



Caution
- **Install the thrust caps (RH is 「4」 mark, LH is 「A」 mark) first. Otherwise, camshaft can be broken or damaged.**

(5) Install the thrust caps onto the cylinder heads. Hand tigten the bolts in five or six steps in the order shown, until the thrust caps fully seated on the cylinder heads.

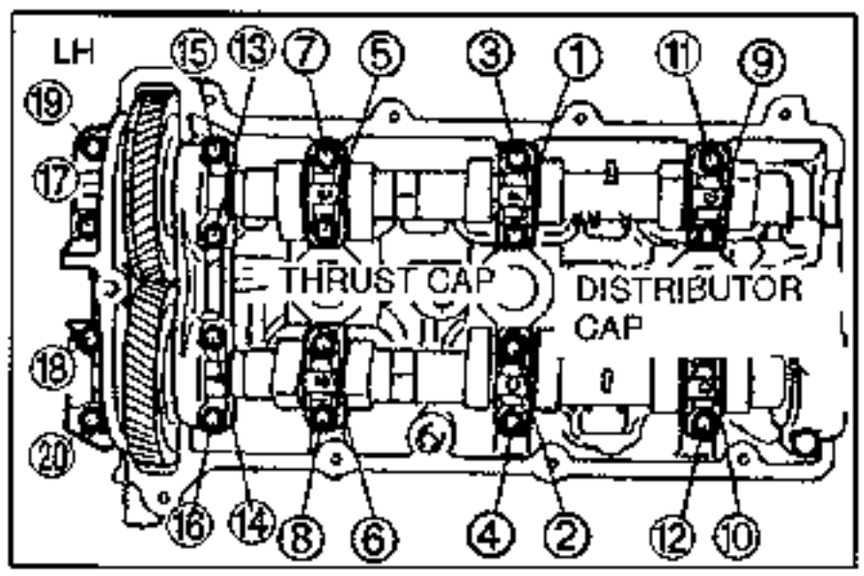


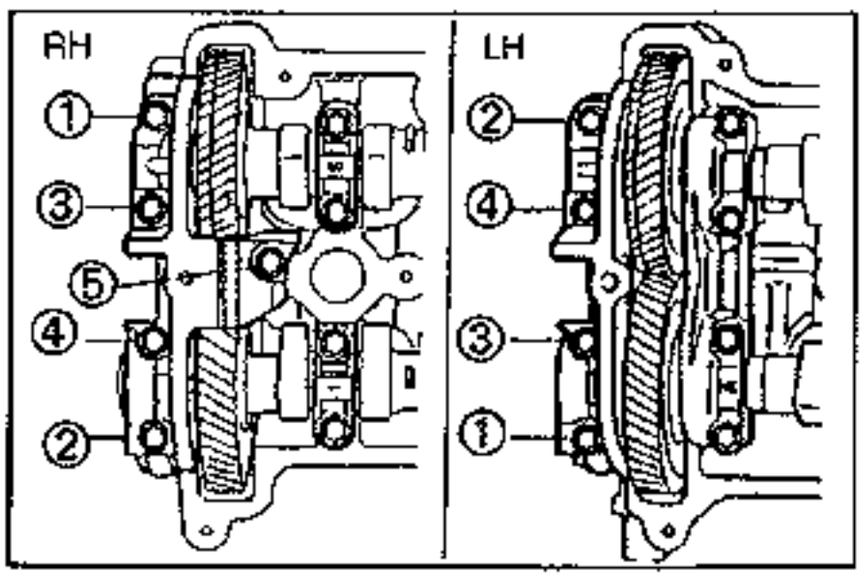
(6) Install the camshaft caps onto the cylinder heads. Hand tighten the bolts in five or six steps in the order shown, until the camshaft caps fully seated in the cylinder heads.
(7) Tighten the bolts in the order shown.

Tightening torque:
11.3–14.2 N·m {115–145 kgf·cm, 100–125 in·lbf}

(8) Retighten the bolts in the order shown.

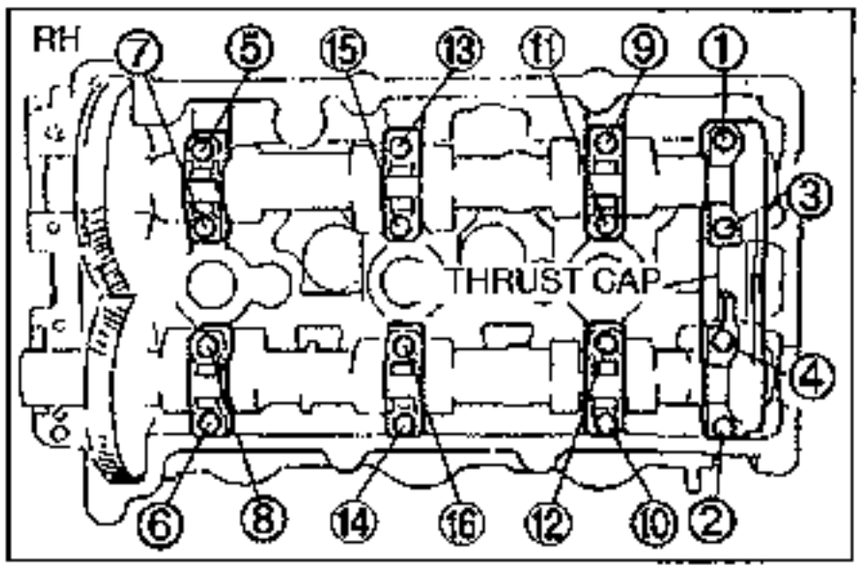
Tightening torque:
11.3–14.2 N·m {115–145 kgf·cm, 100–125 in·lbf}

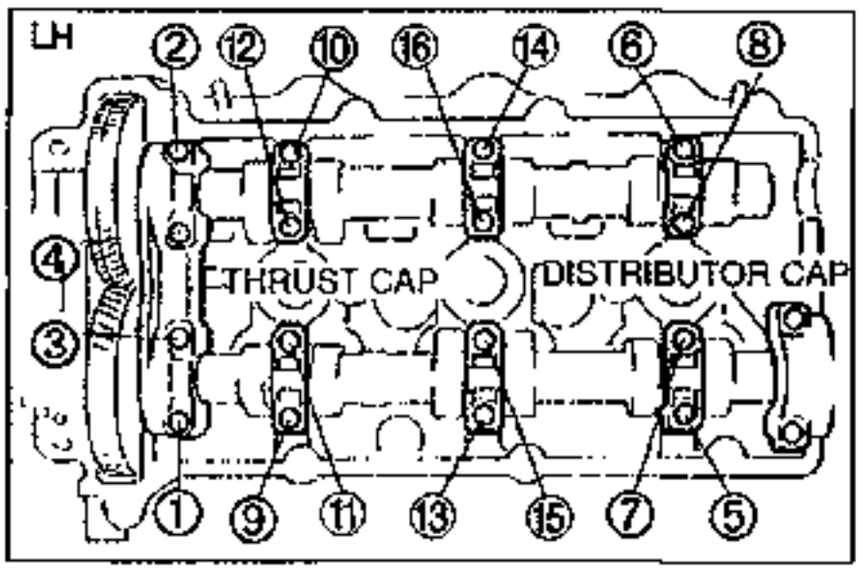




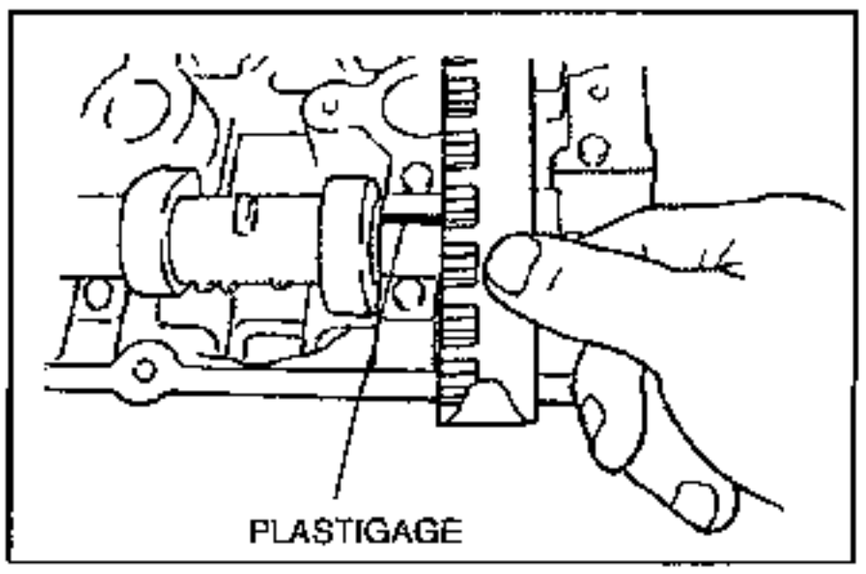
Caution
- **Remove the thrust cap only after removing all camshaft caps. Otherwise, the thrust cap can be damaged.**

(9) Loosen the camshaft cap bolts in five or six steps in the order shown.





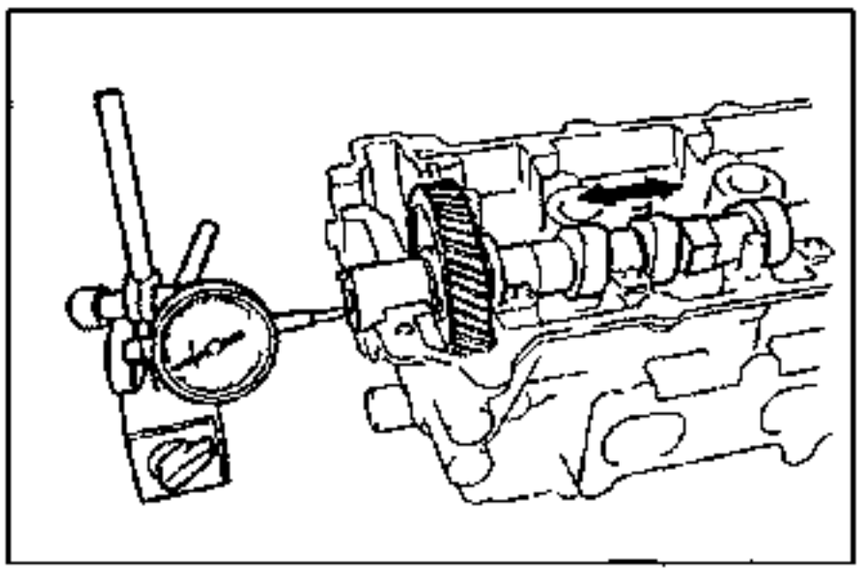
(10) Loosen the camshaft cap bolts in five or six steps in the order shown.



(11) Measure the oil clearance.

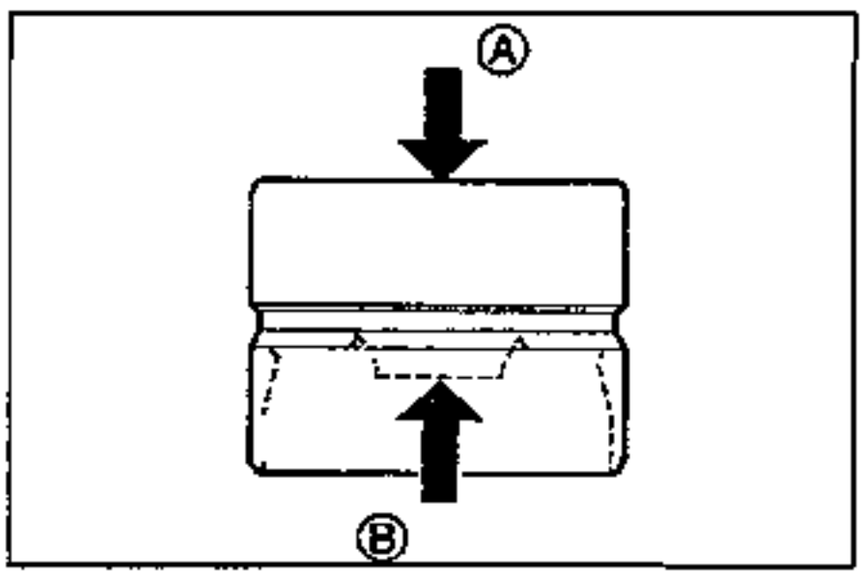
Oil clearance
No.1, No.5: 0.040–0.081mm {0.0016–0.0031 in}
No.2–No.4: 0.070–0.111 mm {0.0028–0.0043 in}
Maximum
No.1, No.5: 0.120mm {0.0047 in}
No.2–No.4: 0.150mm {0.0059 in}

(12) If the oil clearance exceeds the maximum, replace the camshaft or the cylinder head.



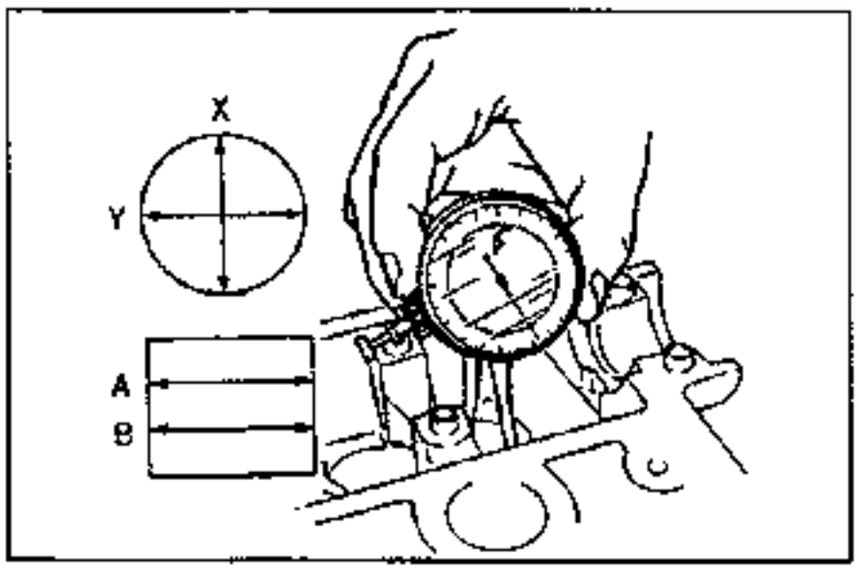
10. Measure the camshaft end play. If it exceeds the maximum, replace the camshaft or the cylinder head.

End play: 0.05–0.10mm {0.0020–0.0039in}
Maximum: 0.14mm {0.0055 in}



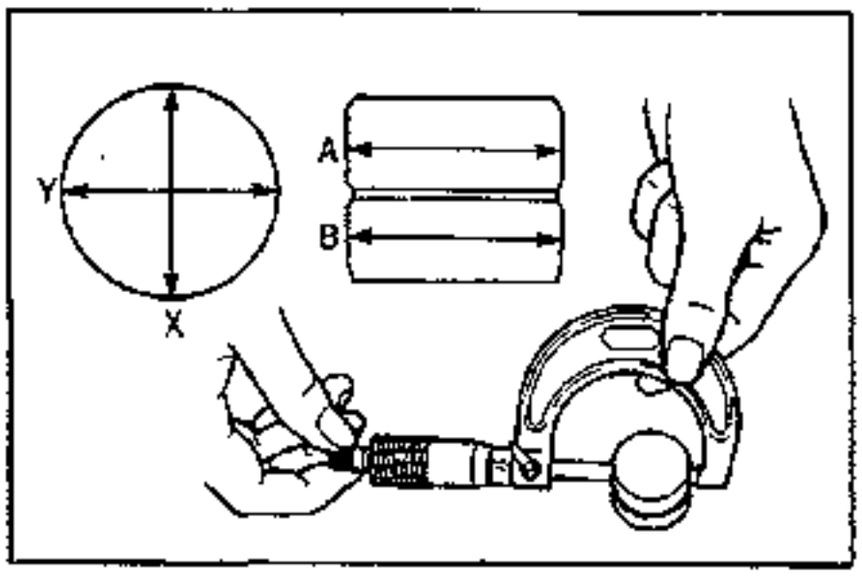
HLA

1. With the HLA filled with engine oil, hold Ⓐ and press Ⓑ by hand. If Ⓑ moves, replace the HLA—do not attempt to repair it.



2.Measure the HLA bures in X and Y directions at two points (A and B) as shown.

Distortion: 30.000–30.025mm {1.1811–1.1820 in}



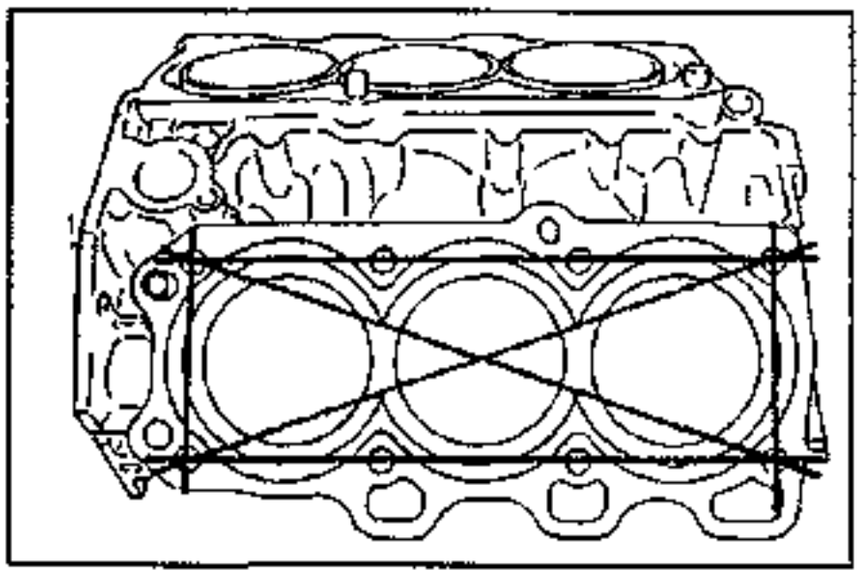
3.Measure the HLA diameters in X and Y directions at two points (A and B) as shown.

Diameter: 29.959–29.975mm {1.1795–1.1801 in}

4.Calculate the clearrance between the HLA diameter and the related HLA bore. Replace the HLA and / or cylinder head if necessary.

Clearance: 0.025–0.066mm {0.00099–0.00259 in}

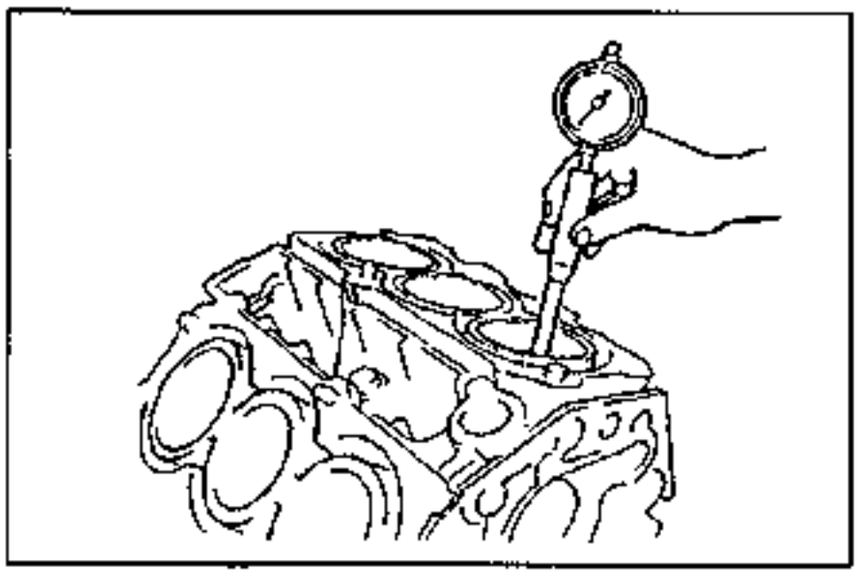
Maximum: 0.180mm {0.0071 in}



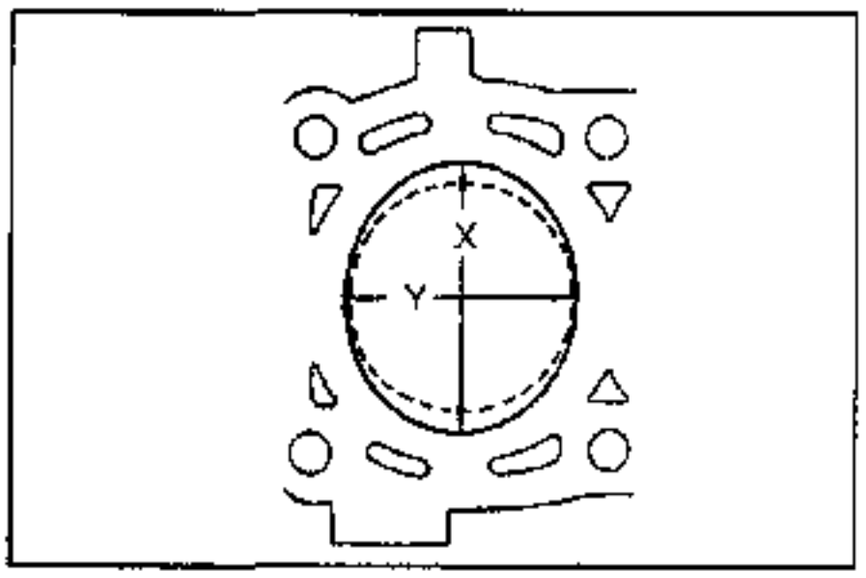
CYLINDER BLOCK

1. Check the cylinder block for the following and repair or replace as necessary.
   (1) Leakage damage
   (2) Cracks
   (3) Scoring of wall
2. Using a straightedge, measure the cylinder block decks for distortion in six directions as shown.

Distortion: 0.15mm {0.006 in} max.



3. If the distortion exceeds the specification, replace the cylinder block.
4. Measure the cylinder bores in X and Y directions at three points (A, B, and C) as shown.



Cylinder bore

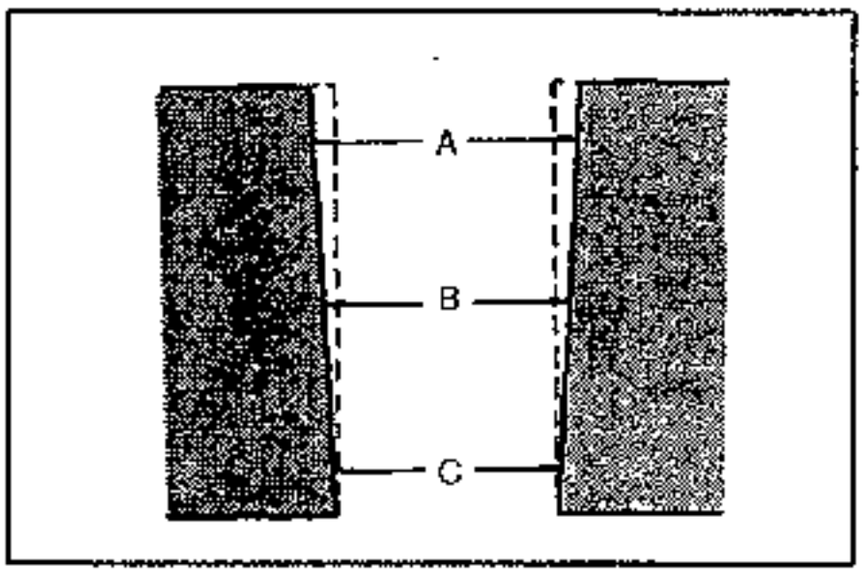
Base the boring diameter on the diameter of an oversize piston. All cylinders must be of the same diameter.

mm {in}

Bore / Size	Diameter
Standard	75.000–75.022 {2.9528–2.9536}
0.25 {0.01} oversize	75.250–75.272 {2.9628–2.9634}
0.50 {0.02} oversize	75.500–75.522 {2.9725–2.9733}

(1) If the cylinder bore exceeds the standard, replace the cylinder block or rebore the cylinder to oversize.
(2) If the difference between measurements A and C exceeds the maximum taper, replace the cylinder block or rebore the cylinder to oversize.

Taper: 0.022mm {0.0009 in} max.



(3) If the difference between measurements X and Y exceeds the maximum out-of-round, rebore the cylinder to oversize.

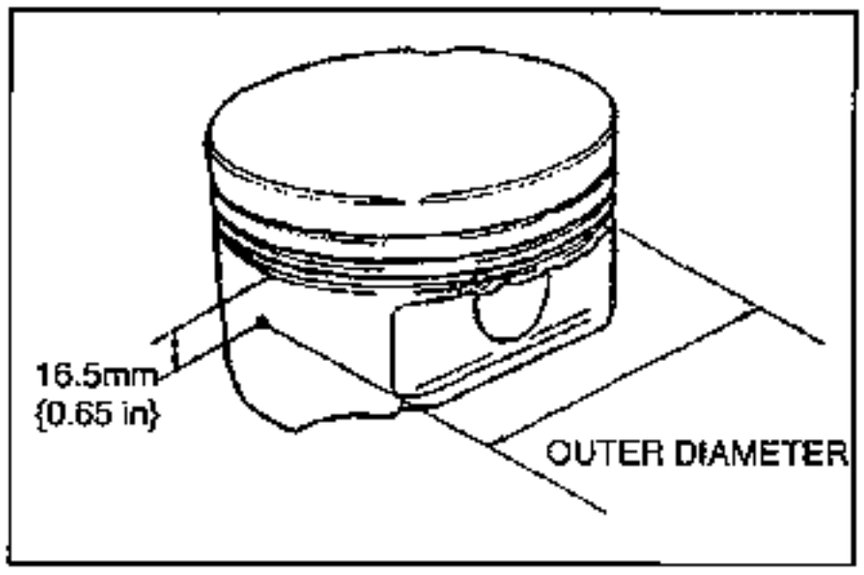
Out-of-round: 0.020mm {0.0009 in} max.

5. If the upper part of a cylinder wall shows uneven wear, remove the ridge with a ridge reamer.

PISTON, PISTON RING, AND PISTON PIN

Piston

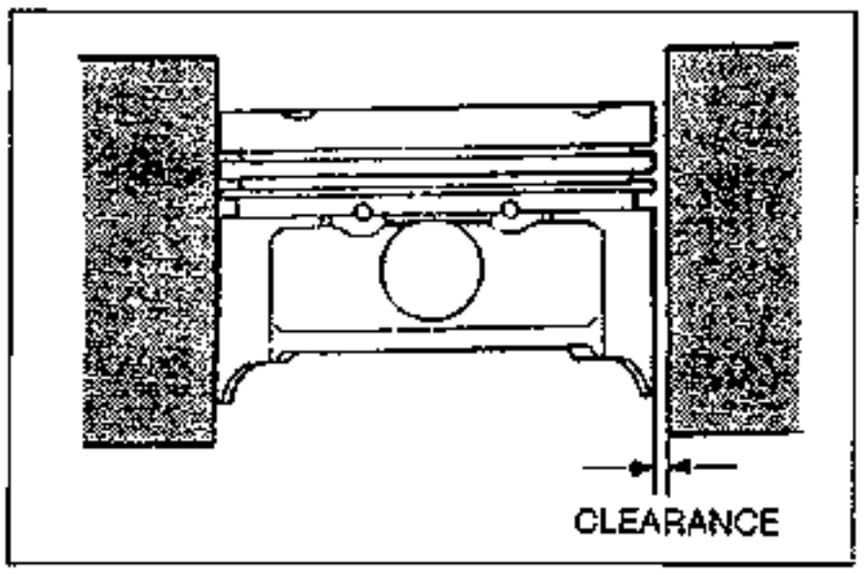
1. Inspect the outer circumferences of all pistons for seizing and scoring. Replace as necessary.
2. Measure the outer diameter of each piston at a right angle **(90°)** to the piston pin, **16.5mm {0.65 in}** below the oil ring land lower edge.



Piston diameter

mm {in}

Size \ Bore	Diameter
Standard	74.953–74.985 {2.9509–2.9521}
0.25 {0.01} oversize	75.203–75.235 {2.9608–2.9620}
0.50 {0.02} oversize	75.453–75.485 {2.9706–2.9718}



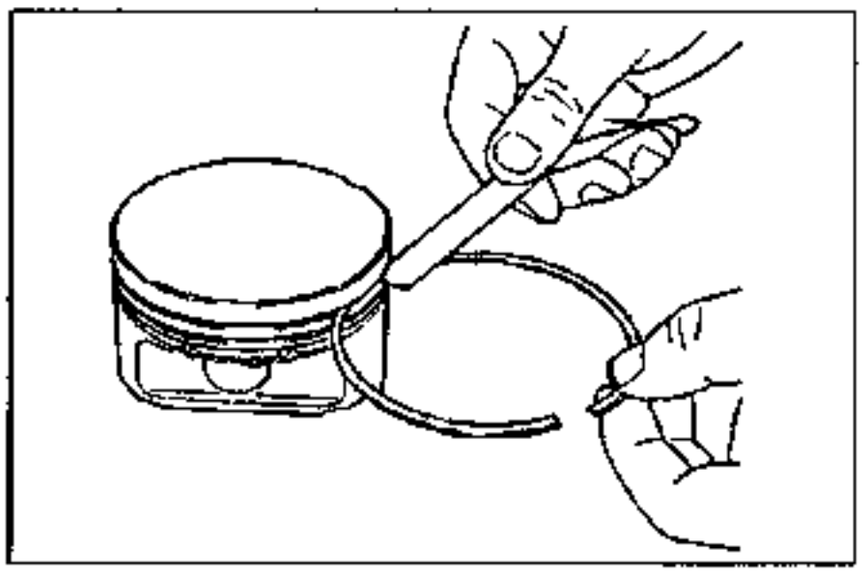
3. Measure the piston-to-cylinder clearance.

Clearance: 0.028–0.056mm {0.0011–0.0022 in}
Maximum: 0.13mm {0.005 in}

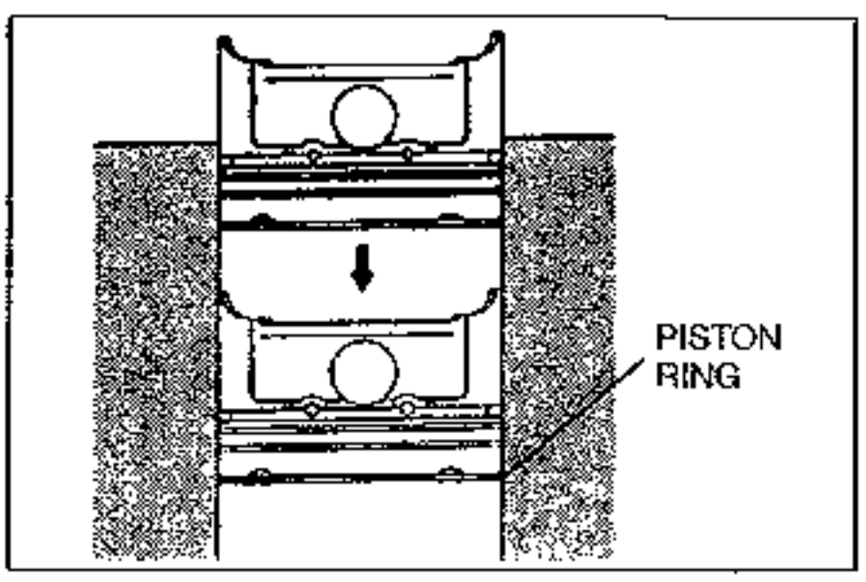
4. If the clearance exceeds the maximum, replace the piston or rebore the cylinders to fit oversize pistons.
5. If the piston is replaced, the piston rings must also be replaced.

Piston and Piston Rings

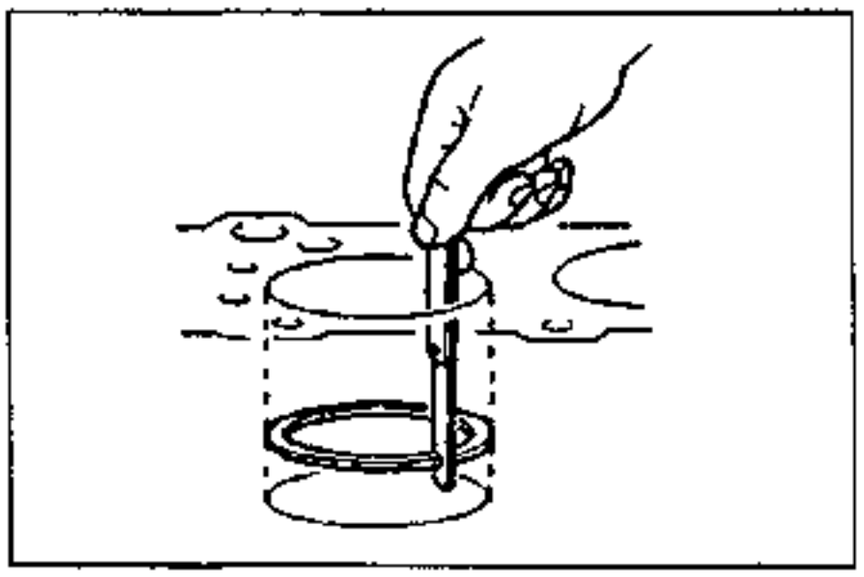
1. Measure the piston ring-to-ring land clearance around the entire circumference by using a new piston ring.



Clearance:
0.020–0.065mm {0.0008–0.0025 in} (Top)
0.030–0.065mm {0.0012–0.0025 in} (Second)
0.025–0.052mm {0.0010–0.0020 in} (Oil)
Maximum: 0.15mm {0.006 in}

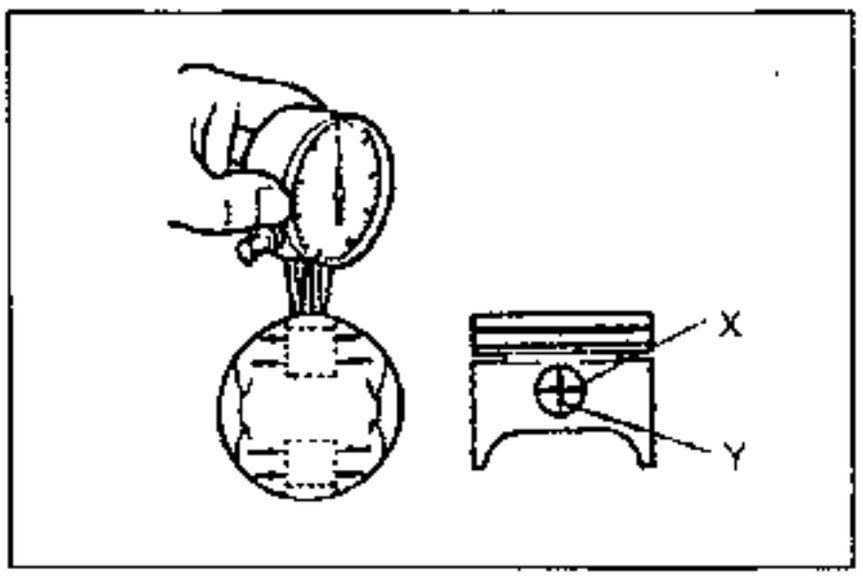


2. If the clearance exceeds the maximum, replace the piston.
3. Inspect the piston rings for damage, abnormal wear, and breakage. Replace the piston ring if necessary.
4. Insert the piston ring into the cylinder by hand and use the piston to push it to the bottom of the ring travel.



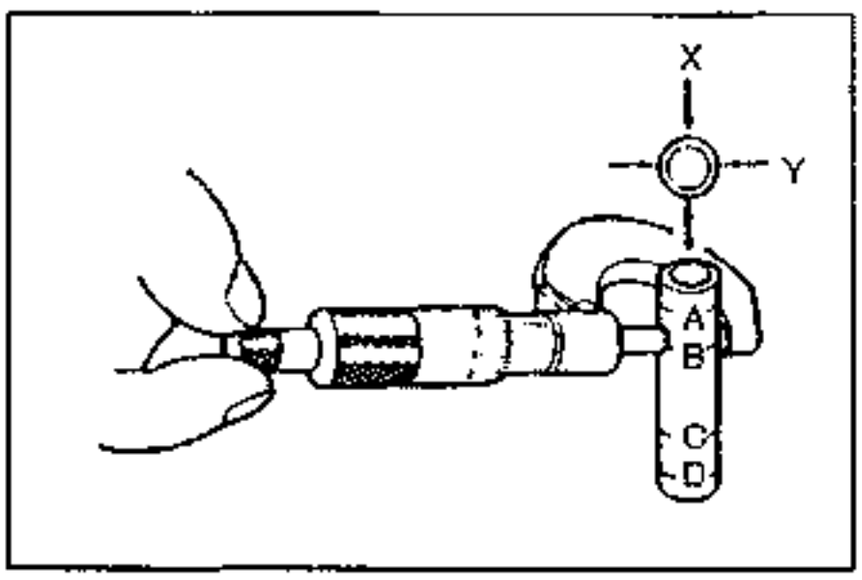
5. Measure each piston ring end gap by using a feeler gauge. Replace the piston ring if necessary.

End gap
Top: 0.15–0.28mm {0.006–0.011 in}
Second: 0.25–0.38mm {0.010–0.014 in}
Oil rail: 0.20–0.70mm {0.008–0.027 in}
Maximum: 1.0mm {0.039 in}



Piston and Piston Pin
1. Measure the piston pin bore diameter in X and Y directions at four points.

Diameter: 18.988–19.000mm {0.7476–0.7480 in}



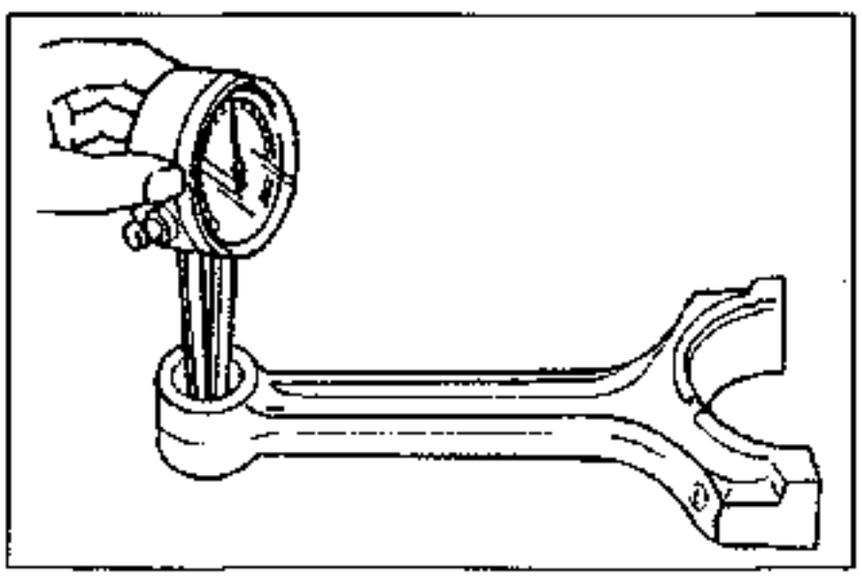
2. Measure the piston pin diameter in X and Y directions at four points.

Diameter: 18.974–18.980mm {0.7470–0.7472 in}

3. Calculate the piston pin-to-piston clearance.

Clearance: 0.008–0.026mm {0.0004–0.0010 in}

4. If the clearance exceeds the specification, replace the piston and/or piston pin.

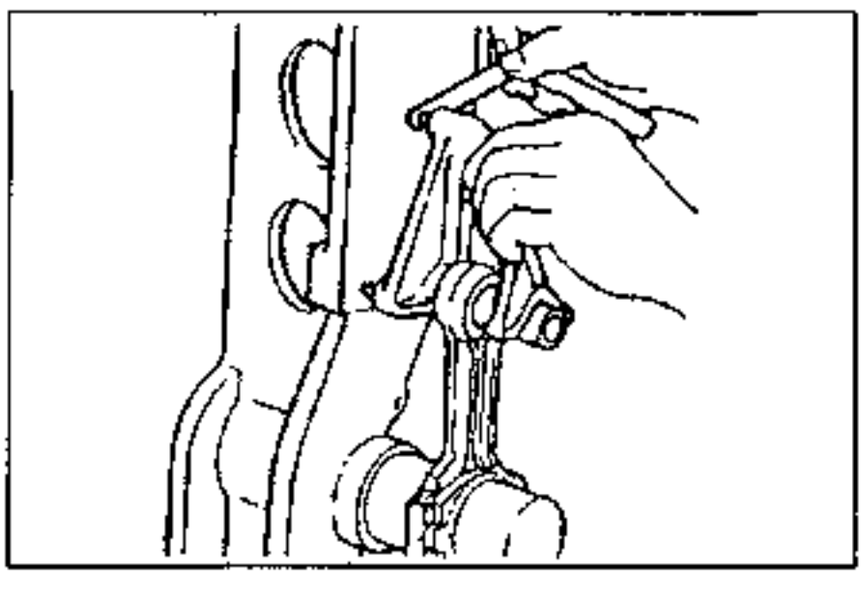


CONNECTING ROD
1. Measure each connecting rod small end bore.

Diameter: 18.943–18.961 mm {0.7458–0.7464 in}

2. Calculate the interference between the small end bore and piston pin.

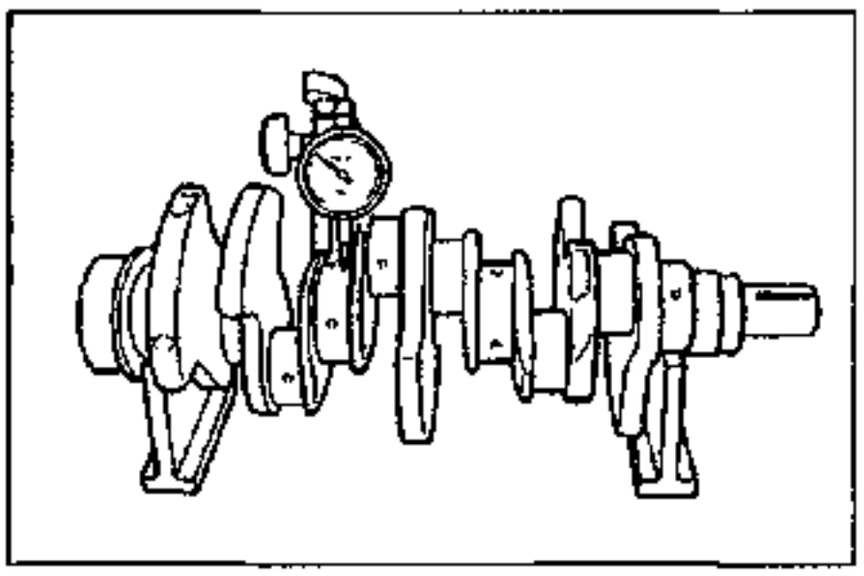
Interference: 0.013–0.037mm {0.0006–0.0014 in}



3. Check each connecting rod for bending. Replace the connecting rod if necessary.

Bending: 0.05mm {0.0020 in}/50mm {1.969 in} max.

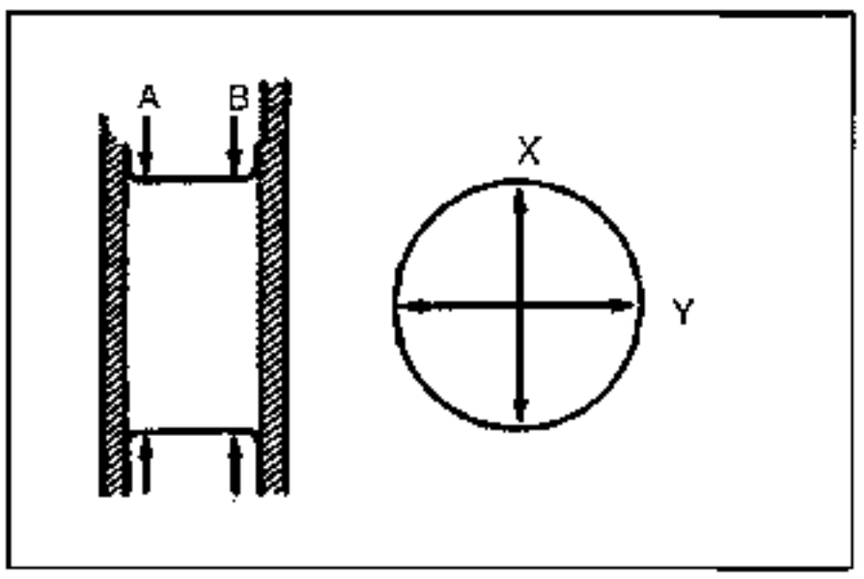
If the connecting rod is replaced, the connecting rod cap, bolts,and nuts must also be replaced because they are a matched set.



CRANKSHAFT

1. Check the journals and pins for damage, scoring, and oil hole clogging.
2. Set the crankshaft No.1 and No.4 main journals on V-blocks.
3. Measure the crankshaft runout at No.2 and No.4 journals. Replace the crankshaft if necessary.

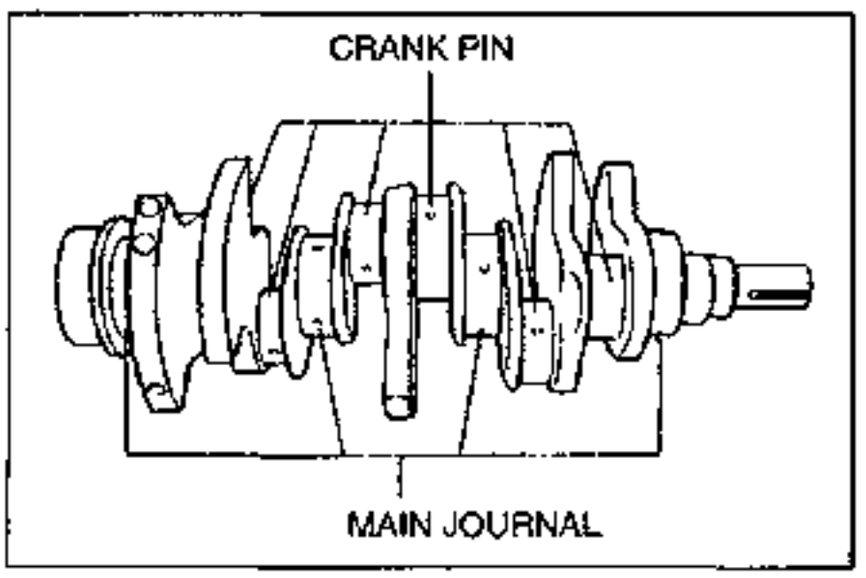
Runout: 0.015mm {0.0006 in} max.



4. Measure each journal diameter in X and Y directions at two points (A and B) as shown.

Main journal
Diameter: 61.955mm {2.4385–2.4391 in}
Out-of-round: 0.05mm {0.0020 in} max.

Crank pin journal
Diameter: 47.940–47.955mm {1.8874–1.879 in}
Out-of-round: 0.05mm {0.0020 in} max.



5. If the diameter is less than the specification, grind the journals to match undersize bearings.

Undersize bearing: 0.25mm {0.01 in}

Undersize main journal diameter

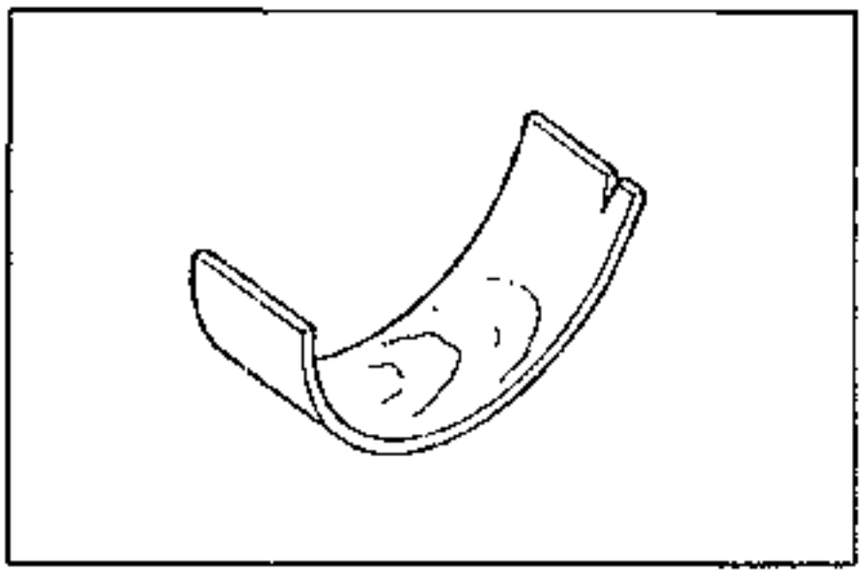
mm {in}

Bearing size	Journal diameter
0.25 {0.01} undersize	61.688–61.705 {2.4287–2.4293}

Undersize crank pin journal diameter

mm {in}

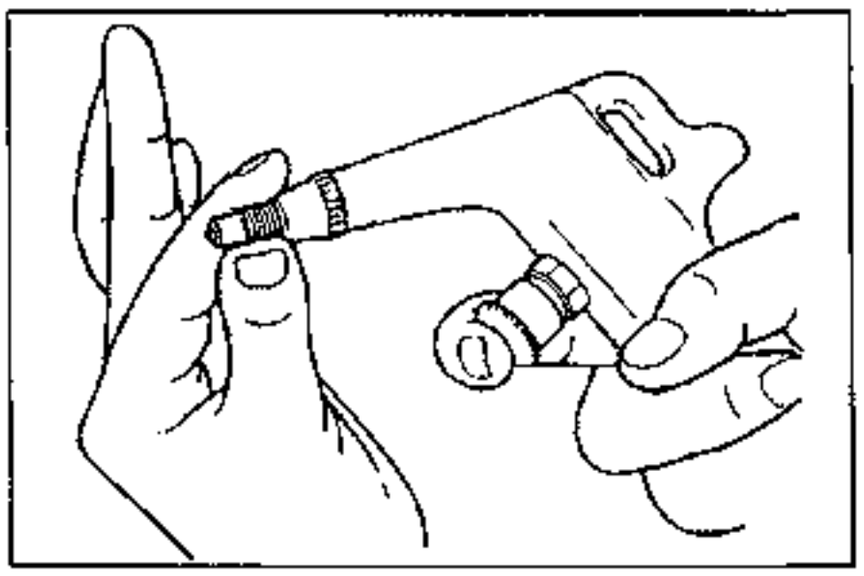
Bearing size	Journal diameter
0.25 {0.01} undersize	47.690–47.705 {1.8776–1.8781}



BEARING

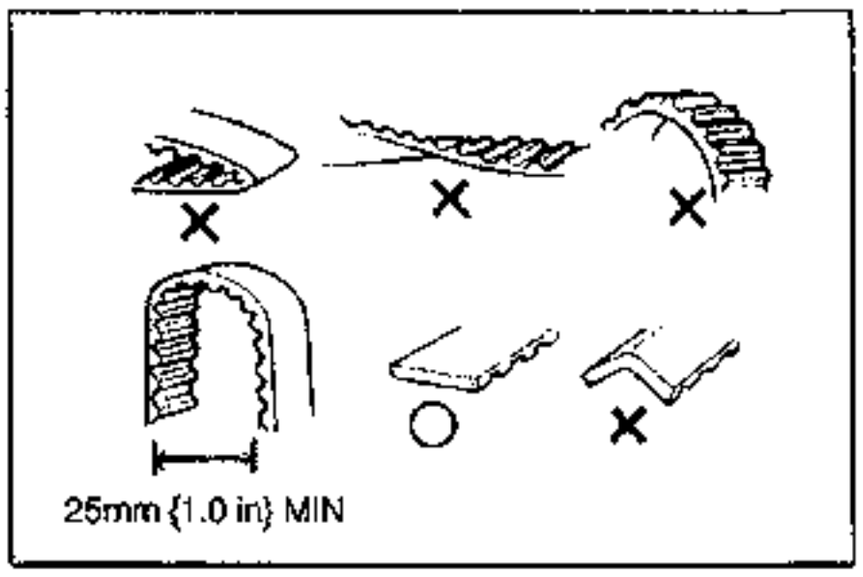
Main Bearing and Connecting Rod Bearing

Check the main bearings and the connecting rod bearings for peeling, scoring, and other damage.



OIL JET

Check the oil jets for clogging by applying compressed air. Replace if necessary.

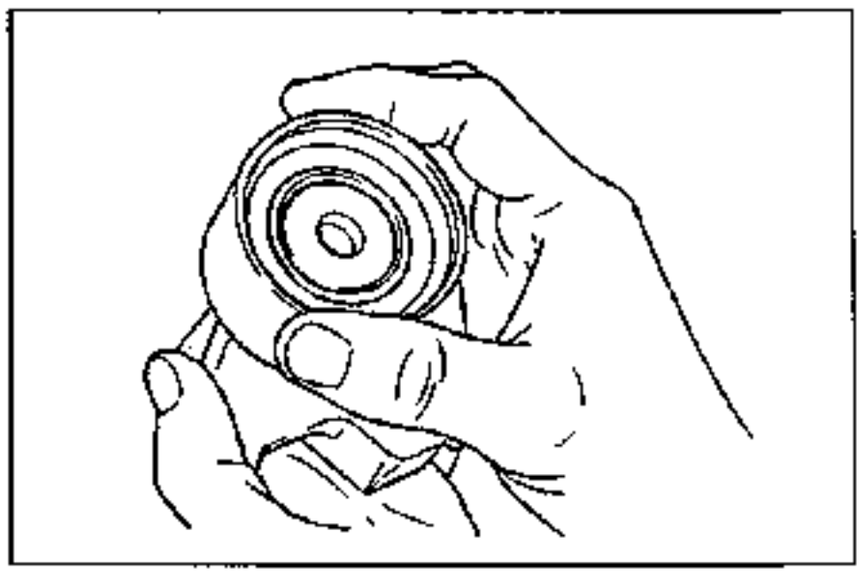


TIMING BELT

1. Replace the timing belt if there is any oil or grease on it.
2. Check the timing belt for damage, wear, peeling, cracks, and hardening. Replace the timing belt if necessary.

Caution

- **The following will damage the belt and shorten its life; Forcefully twisting it, turning it inside out, bending it, or allowing oil or grease on it.**

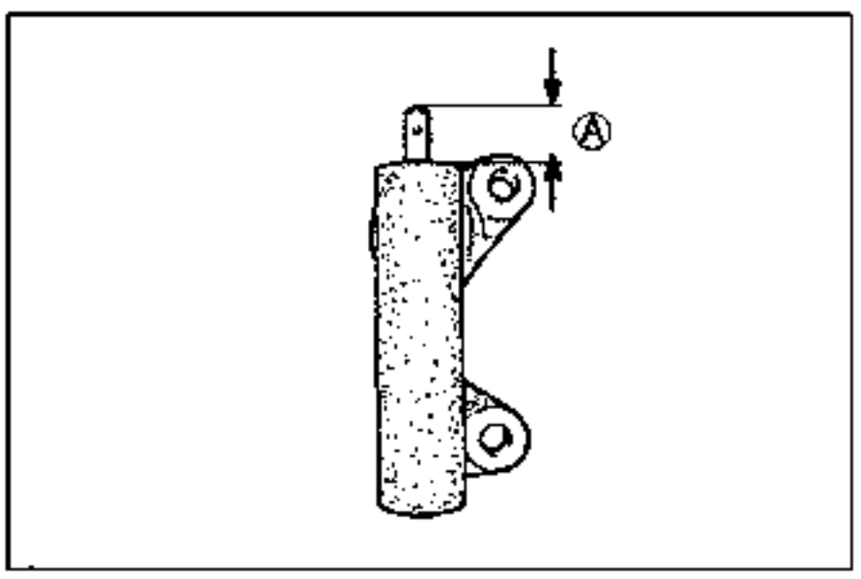


TIMING BELT AUTO TENSIONER, IDLER

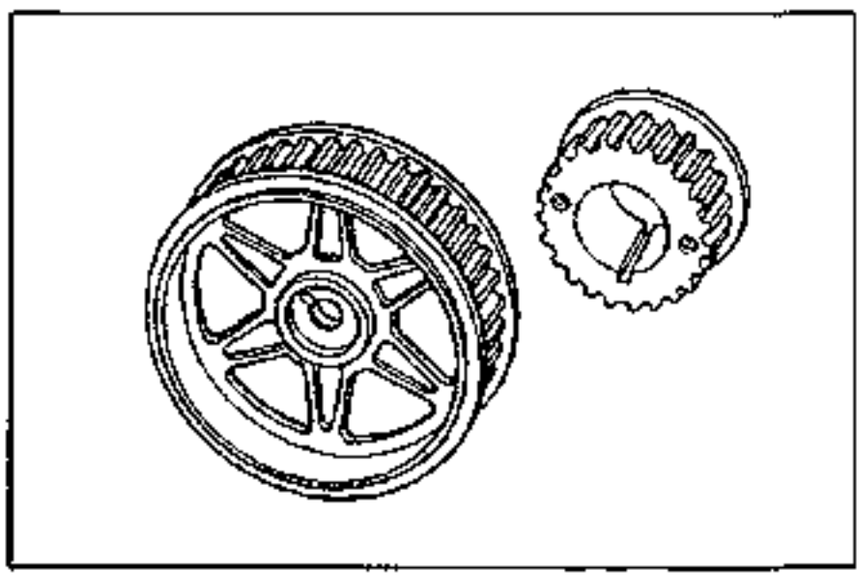
Caution

- **Using cleaning fluids or a steam cleaner to clean the tensioner can dissolve the grease in its sealed bearing.**

1. Use a clean, soft rag to wipe the tensioner or idler contact surface.
2. If the tensioner or idler does not rotate smoothly, replace it.
3. If there are silicone oil leaks, scratches or abnormal noise when turning the tensioner or idler, replace it.
4. Check the tensioner pulley for rough rotation and abnormal noise. Replace it if necessary.
5. Check the auto tensioner for oil leakage. Replace it if necessary.
6. Check the tensioner rod projection Ⓐ. Replace the auto tensioner if necessary.



Projection Ⓐ (free length): 14–16 mm {0.56–0.62 in}



PULLEY

Timing Belt Pulley and Camshaft Pulley

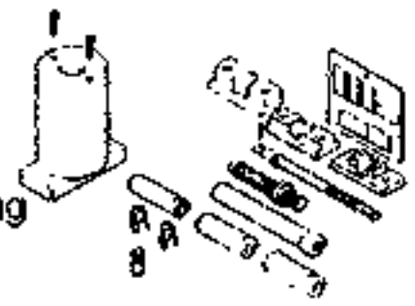
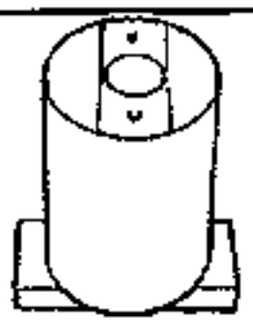
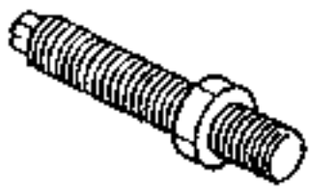
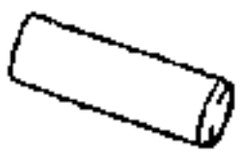
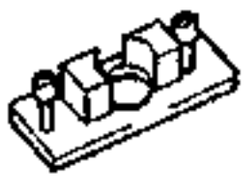
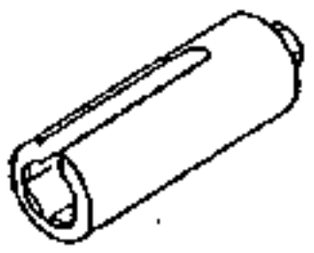
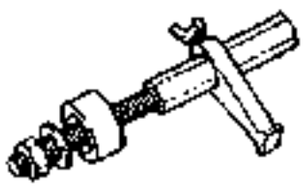
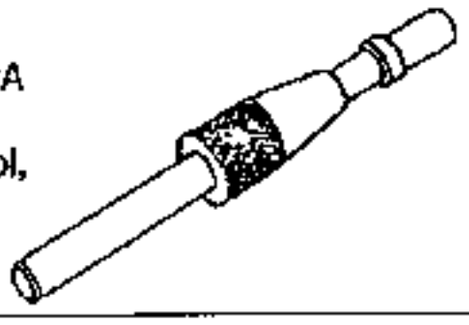
Inspect the teeth of each pulley for wear, deformation, and other damage. Replace if necessary.

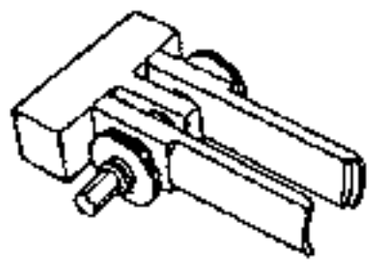
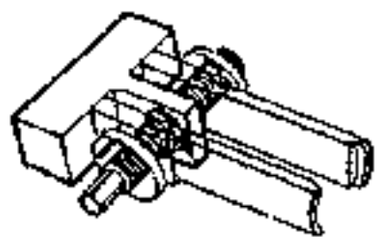
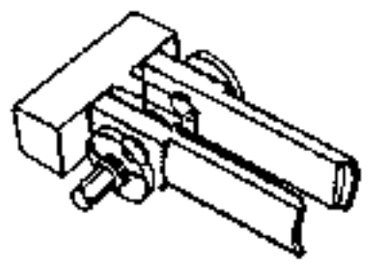
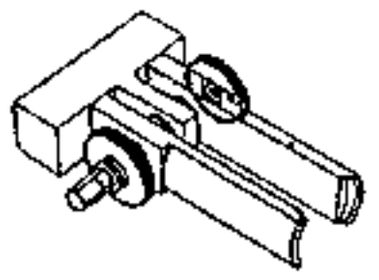
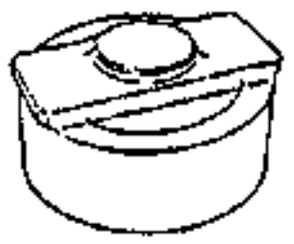
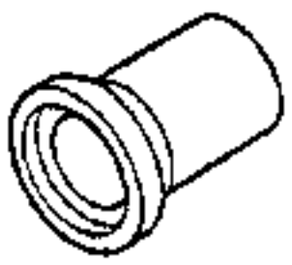
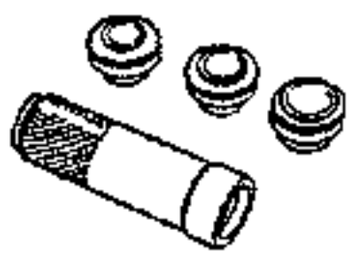
TIMING BELT COVER

Inspect the timing belt covers for damage and cracks. Replace if necessary.

ASSEMBLY

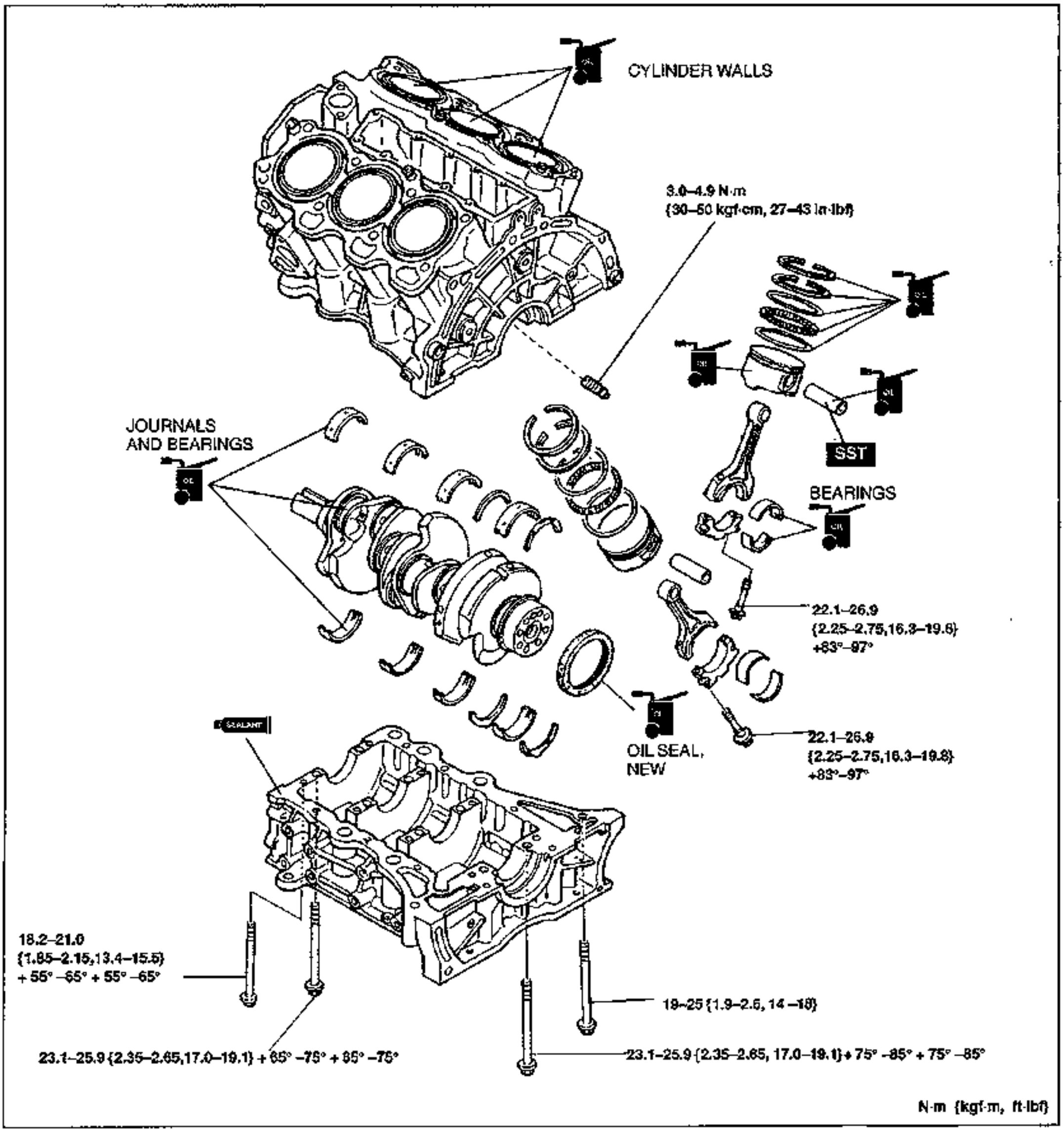
PREPARATION
SST

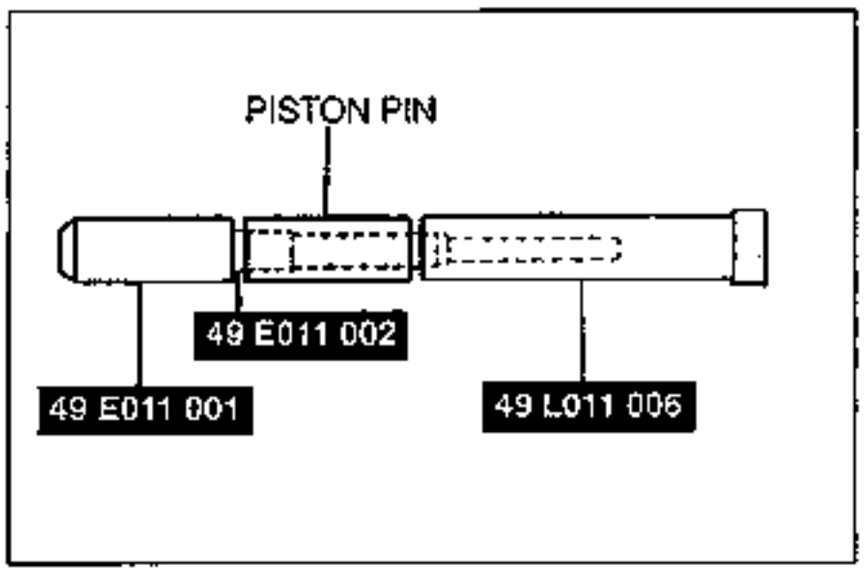
49 L011 0A0B Tool set, piston pin setting 	For removal / installation of piston pins	49 L011 001 Body, support block (Part of 49 L011 0A0B) 	For removal / Installation of piston pins
49 L011 005 Bolt, stopper (Part of 49 L011 0A0B) 	For removal / installation of piston pins	49 L011 006 Puller & installer (Part of 49 L011 0A0B) 	For removal / installation of piston pins
49 E011 001 Guide (Part of 49 L011 0A0B) 	For removal / installation of piston pins	49 E011 002 Screw 	For removal / installation of piston pins
49 D011 001B Head, support block (part of 49 L011 0A0B) 	For removal / installation of piston pins	49 H018 001 Wrench, knock sensor 	For removal / installation of knock sensor
49 E011 1A0 Brake set, ring gear 	For prevention of engine rotation	49 E011 103 Shaft (Part of 49 E011 1A0) 	For prevention of engine rotation
49 E011 104 Collar (Part of 49 E011 1A0) 	For prevention of engine rotation	49 E011 105 Stopper (Part of 49 E011 1A0) 	For prevention of engine rotation
49 L012 0A0 Installer set, valve seal & valve guide 	For installation of valve seals	49 SE01 310A Centering tool, clutch disc 	For installation of clutch disc
49 L012 001 Installer (Part of 49 L012 0A0) 	For installation of valve seals	49 L012 002 Body (Part of 49 L012 0A0) 	For installation of valve seals

49 L012 005 Spacer (Part of 49 L012 0A0) 	For installation of valve seals	49 0636 100B Arm, valve spring lifter 	For removal / installation of valves
49 B012 0A2 Pivot 	For removal / installation of valves	49 B012 012 Body (Part of 49 B012 0A2) 	For removal / installation of valves
49 B012 013 Foot (Part of 49 B012 0A2) 	For removal / installation of valves	49 B012 014 Locknut (Part of 49 B012 0A2) 	For removal / installation of valves
49 G014 001 Wrench, oil filter 	For removal / installation of oil filter	49 G019 017 Installer, oil seal 	For installation of rear oil seal
49 H010 401 Installer, oil seal 	For installation of front oil seal	49 F401 330B Installer set, bearing 	For installation of camshaft oil seals
49 F401 331 Body (Part of 49 F401 330B) 	For installation of camshaft oil seals	49 F401 337A Attachment C (Part of 49 F401 330B) 	For installation of camshaft oil seals

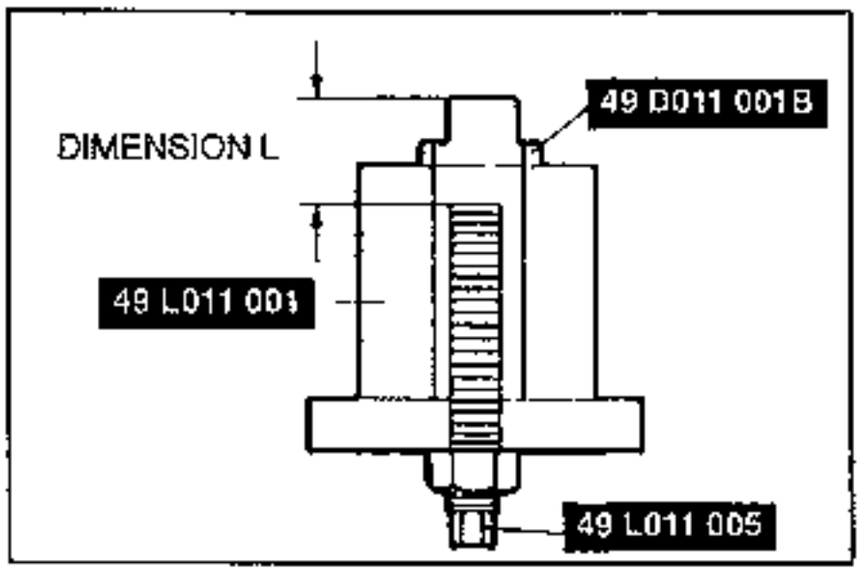
1. Do not reuse gaskets or oil seals.
2. Clean all parts before reinstallation.
3. Apply clean engine oil to all sliding and rotating parts.
4. Replace plain bearings if they are peeled, burned, or otherwise damaged.
5. Tighten all bolts and nuts to the specified torque.

CYLINDER BLOCK (INTERNAL PARTS)
Torque Specifications





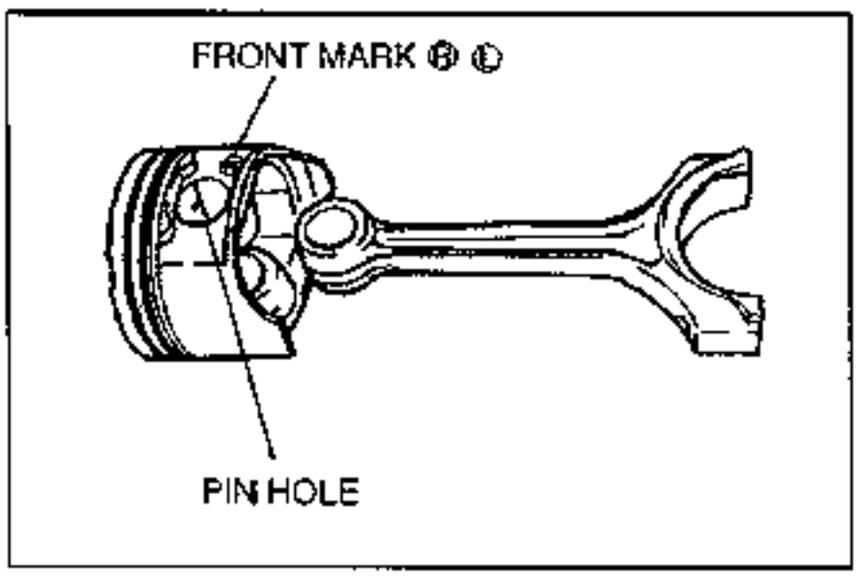
Connecting Rod
1. Assemble the **SSTs** (tool set, piston pin setting) to the piston pin.
2. Apply clean engine oil to the piston pin.



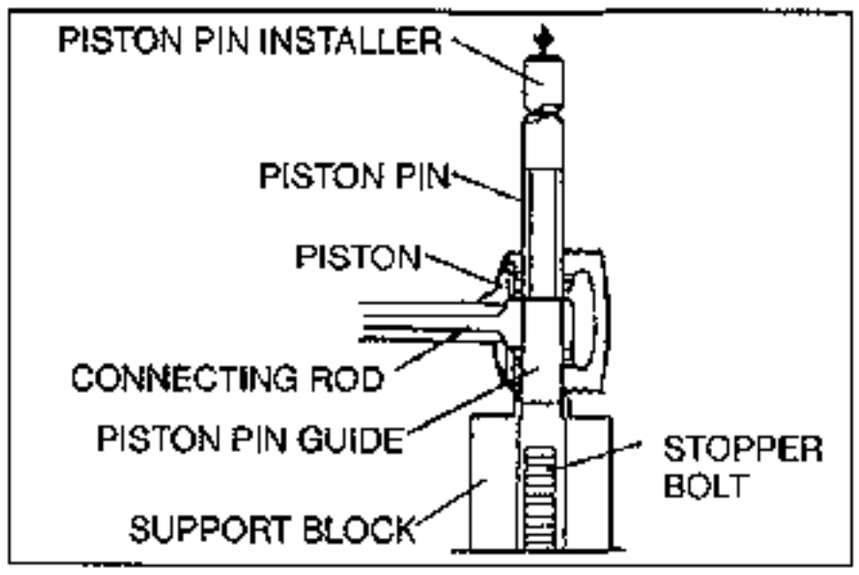
3. Set the **SST** (stopper bolt) so that the depth L is as specified.

   Depth L: 61.4mm {2.42 in}

4. Tighten the locknut.

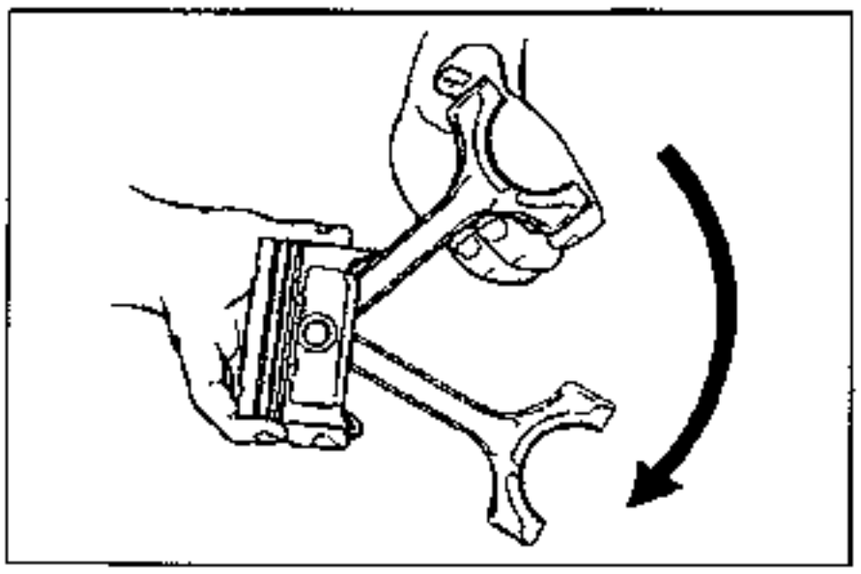


5. Assemble the piston and the connecting rod.
6. Insert the **SSTs** (tool set, piston pin setting) assembled in step 1 into the piston pin hole.
7. Mount the piston and connecting rod onto the **SST** (Support block).



8. Verify that the **SSTs** fits squarely into the piston before pressing.
9. Press the piston pin into the piston and connecting rod until the **SST** (piston pin guide) contacts the stopper bolt.
10. While inserting the piston pin, check the pressing force. If it is less than specified, replace the piston pin and/or the connecting rod.

    Pressing force:
    3,924–12,753 N {400–1,300 kgf, 880–2,860 lbf}

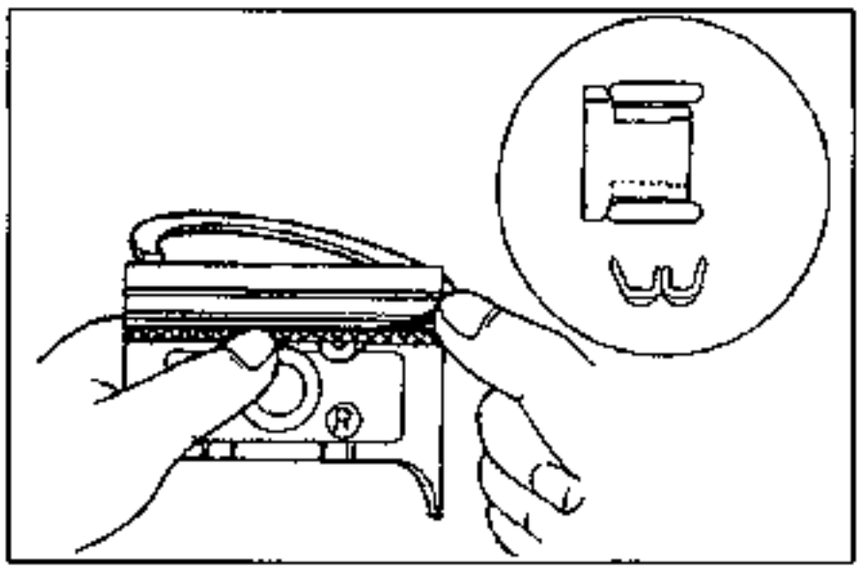


11. Check the connecting rod oscillation torque.
    (Refer to page B2–69.)

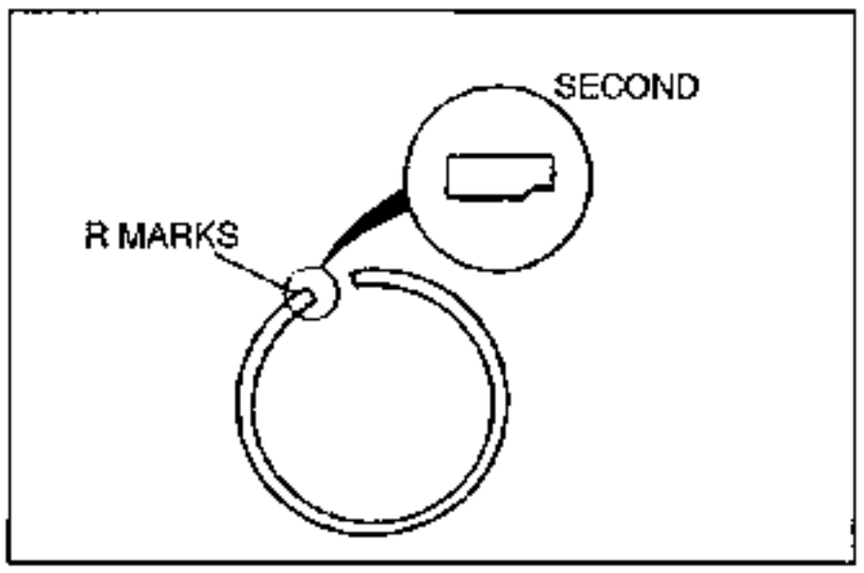
Piston Ring

Caution
- **If reusing an oil ring, it must be reinstalled in the same place and face the same direction as when removed. If this is not done, it can cause premature and uneven wear.**

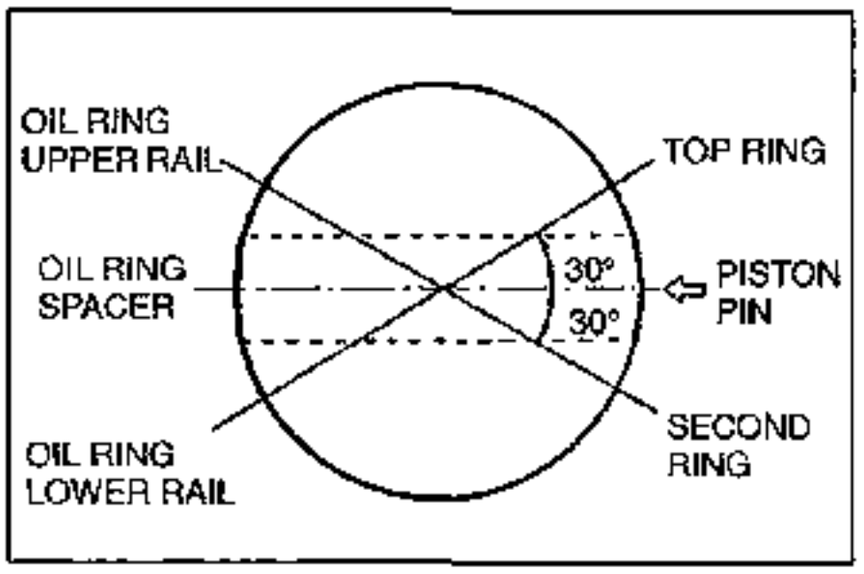
Note
- The upper and lower rails are the same. They can be installed with either face upward.



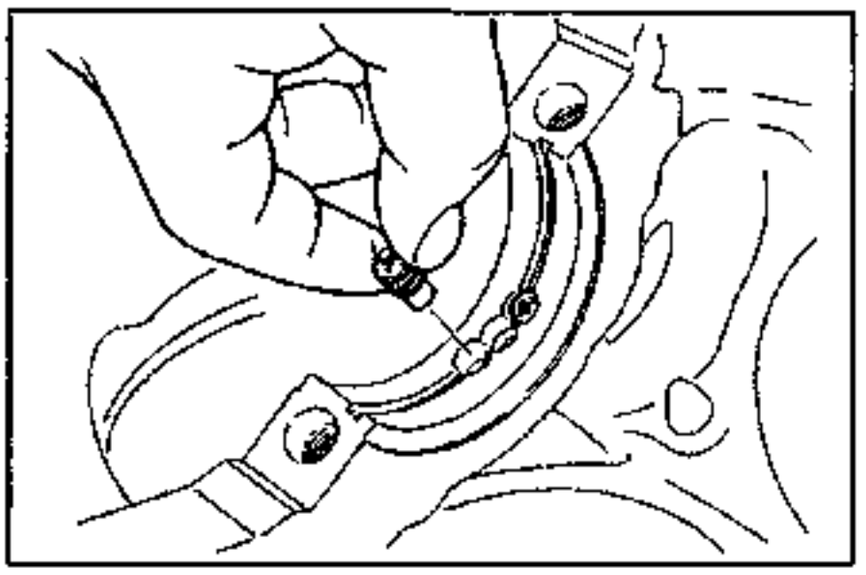
1. Install the three-piece oil rings on the pistons.
   (1) Apply clean engine oil to the oil ring spacer and rails.
   (2) Install the oil ring spacer so that the opening faces upward.
   (3) Install the upper rail and lower rail.



2. Verify that the spacer tang separates the rails, and that the rails turn smoothly in both directions.
3. Install the rings with the R marks upward.
4. Using a piston ring expander, install the second ring with the scraper face downward.
5. Using a piston ring expander, install the top ring.



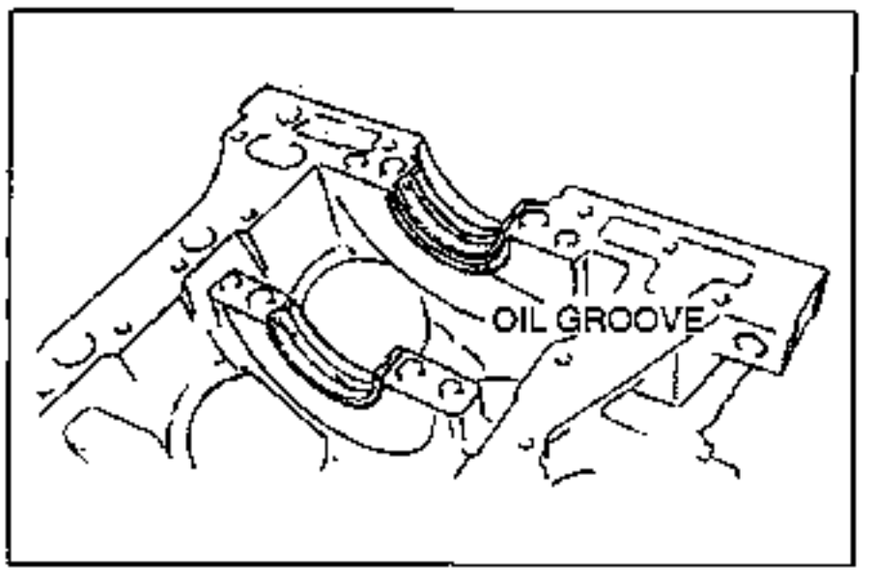
6. Apply a liberal amount of clean engine oil to the piston rings.
7. Position the end gap of each ring as shown.



Oil jet

1. Apply thread locking compound to the oil jet threads.
2. Install the oil jets into the upper cylinder block.

Tightening torque:
3.0–4.9 N·m {30–50 kgf·cm, 27–43 in·lbf}



Crankshaft

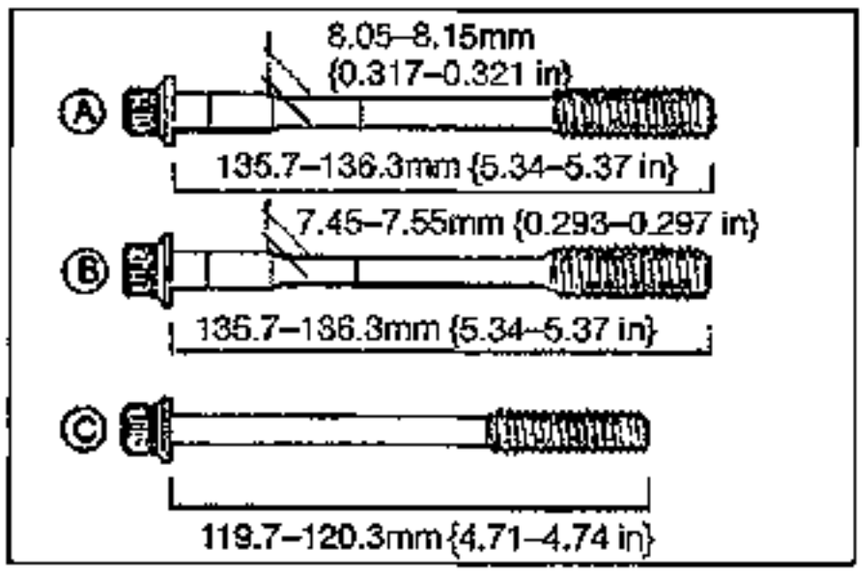
1. Measure the main bearing oil clearances as described below.

Oil clearance inspection

(1) Remove any foreign material and oil from the journals and bearings.
(2) Install the upper main bearings (with oil groove) and the upper thrust bearings.

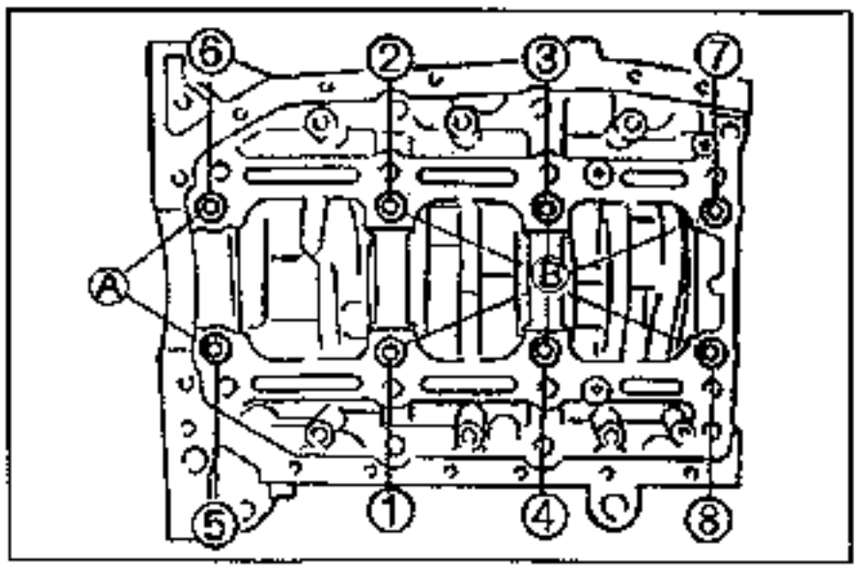
Note
- No.4 bearing is wider than other bearings.

(3) Install the lower cylinder block along with the lower main bearings and thrust bearings.



(4) Measure the length of lower cylinder block bolt. Replace it if the length exceeds the maximum.

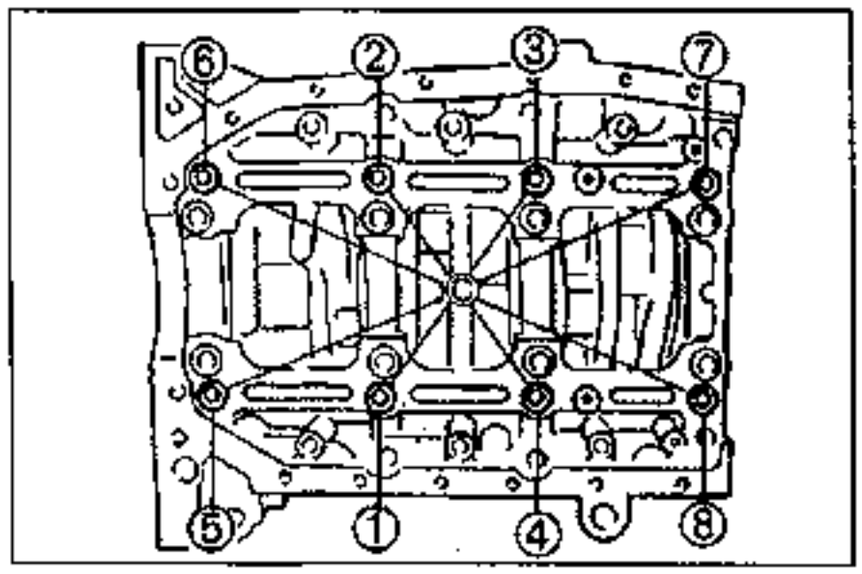
Bolt Ⓐ and Ⓑ
Length : 135.7–136.3mm {5.343–5.361 in}
Maximum: 138.5mm {5.453 in}
Bolt ©
Length : 119.7–120.3mm {4.713–4.736 in}
Maximum: 121.0mm {4.764 in}

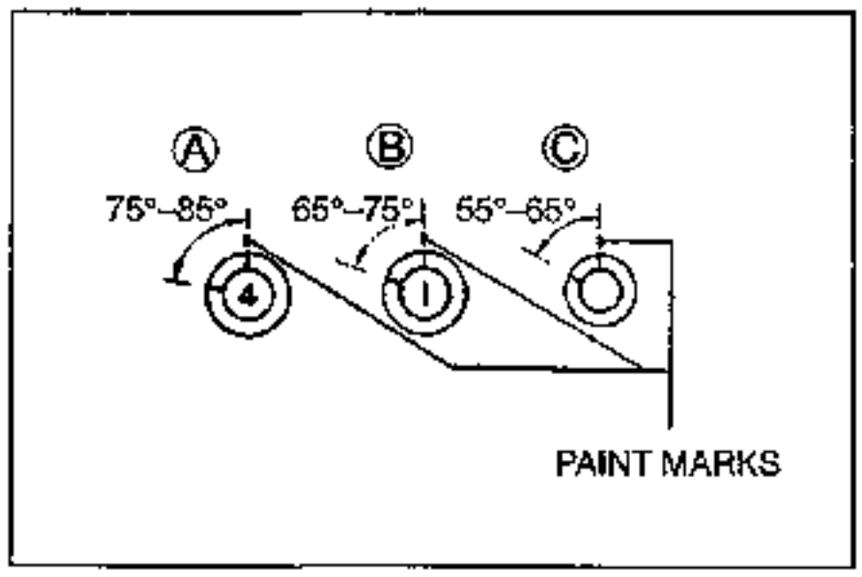


(5) Apply clean engine oil to the bolt threads and seat faces of the lower cylinder block bolts.
(6) Tighten the bolts in two or three steps in the order shown.

Tightening torque
Bolt Ⓐ and Ⓑ : 23.1–25.9 N·m
{2.35–2.65 kgf·m, 17.0–19.1 ft·lbf}
Bolt Ⓒ : 18.2–21.0 N·m
{1.85–2.15 kgf·m, 13.4–15.5 ft·lbf}

Note
- Bolts Ⓐ have a mark "4" on each bolt head.
- Bolts Ⓑ have a mark "1" on each bolt head.



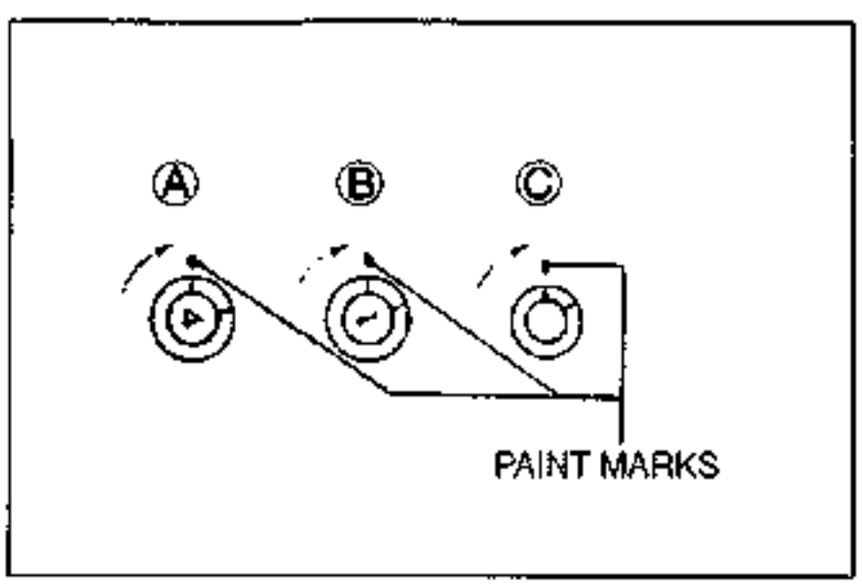


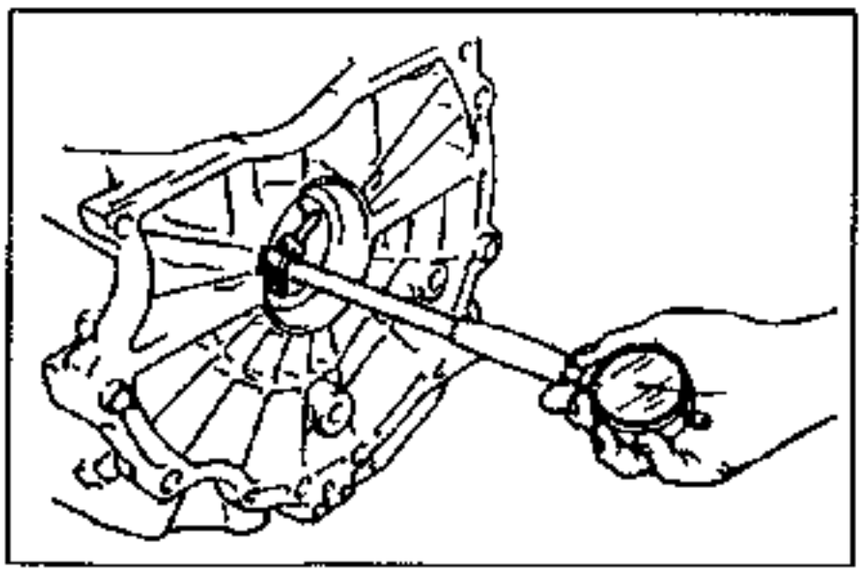
(7) Put paint marks to the lower cylinder block which fit the Ⓐ, Ⓑ, Ⓒ bolt flange marks as shown.
(8) Using the marks as a reference, further tighten the bolts Ⓐ, Ⓑ, and Ⓒ in the order shown.

Main bolt Ⓐ (No.4 journals): 75° –85°
Main bolt Ⓑ (No.1–No.3 journals): 65° –75°
Sub bolt Ⓒ : 55° –65°

(9) Tighten the bolts until the mark on each bolt flange aligns with the corresponding paint mark.

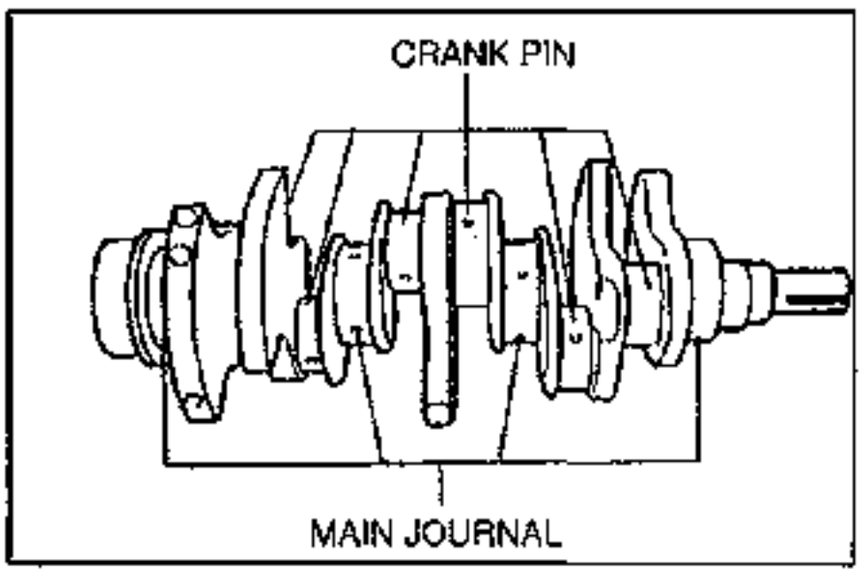
(10) Further tighten each bolt by performing steps (7), (8).



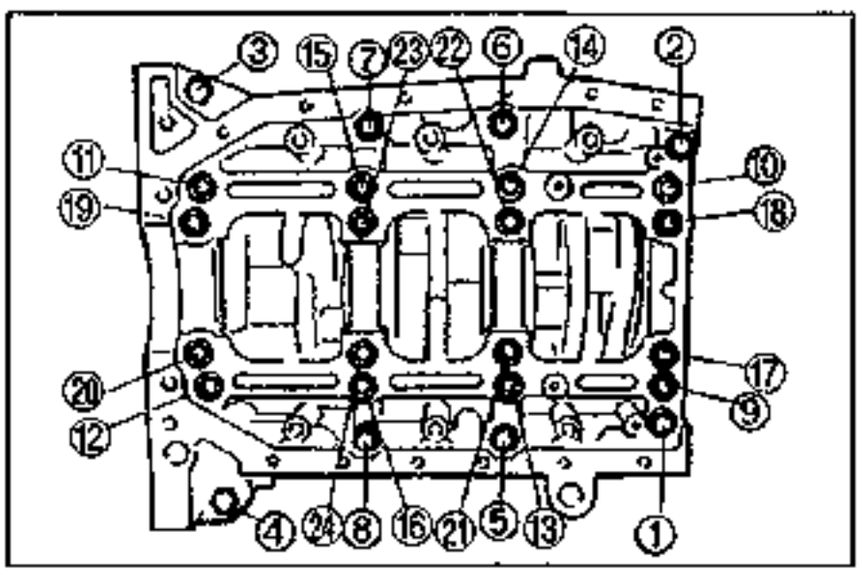


(11) After tightening, measure the cylinder block No.1–No.4 journal bore diameters.
(12) Subtract the crankshaft journal diameter from the bore diameter.
(13) If the oil clearance exceeds the maximum, replace the bearing or grind the crankshaft and install the undersize main bearings. (Refer to page B2–84.)

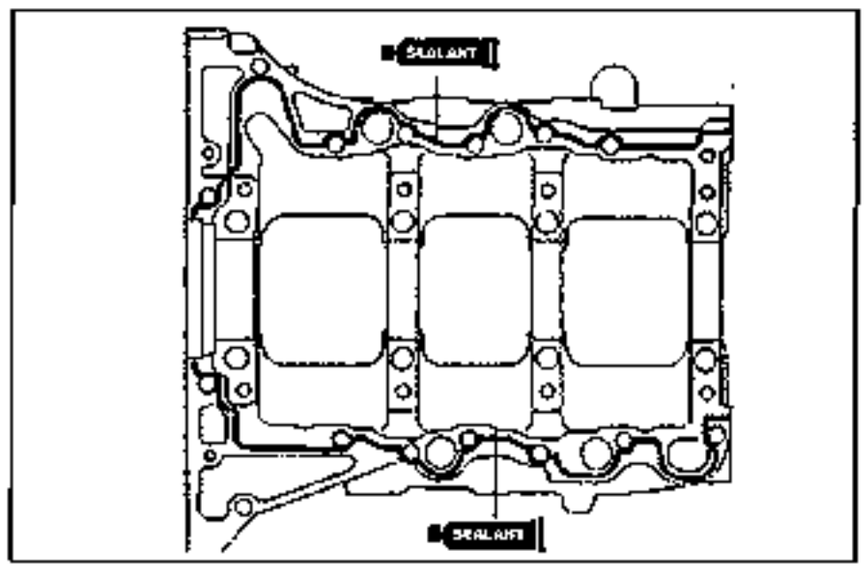
Oil clearance: 0.037–0.057mm {0.0015–0.0022 in}
Maximum: 0.064mm {0.0025 in}



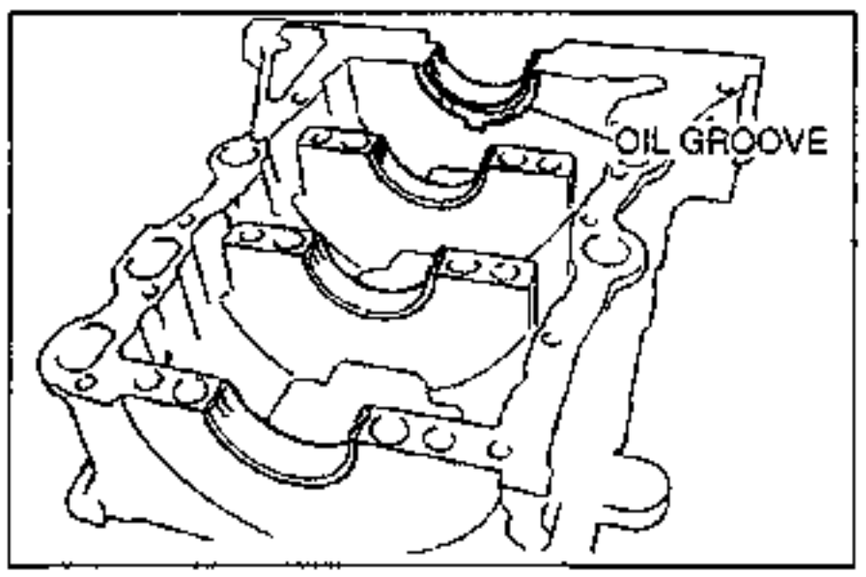
Main journal diameter
Standard:
61.938–61.955mm {2.4385–2.4391 in}
0.25mm {0.01 in} undersize:
61.688–61.705mm {2.4287–2.4293 in}



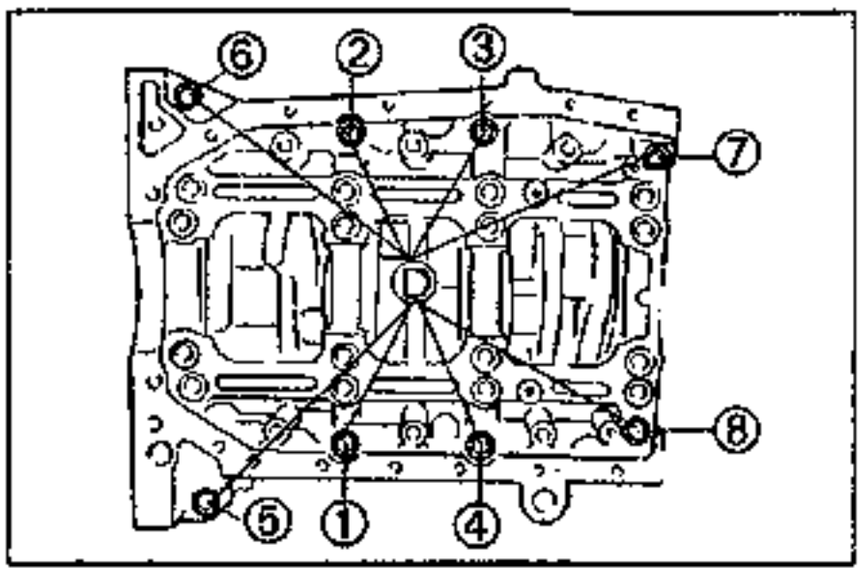
(14) Loosen the lower cylinder block bolts in two or three steps in the order shown.



2. Install the lower cylinder block as follows:
   (1) Install the upper thrust bearings in the upper cylinder block.
   (2) Apply clean engine oil to the main bearings, thrust bearings, and main journals.
   (3) Install the crankshaft in the upper cylinder block.
   (4) Remove any foreign material, oil, and sealant from the contact surfaces of the upper cylinder block and lower cylinder block.
   (5) Apply a continuous bead of silicone sealant to the contact surface as shown.

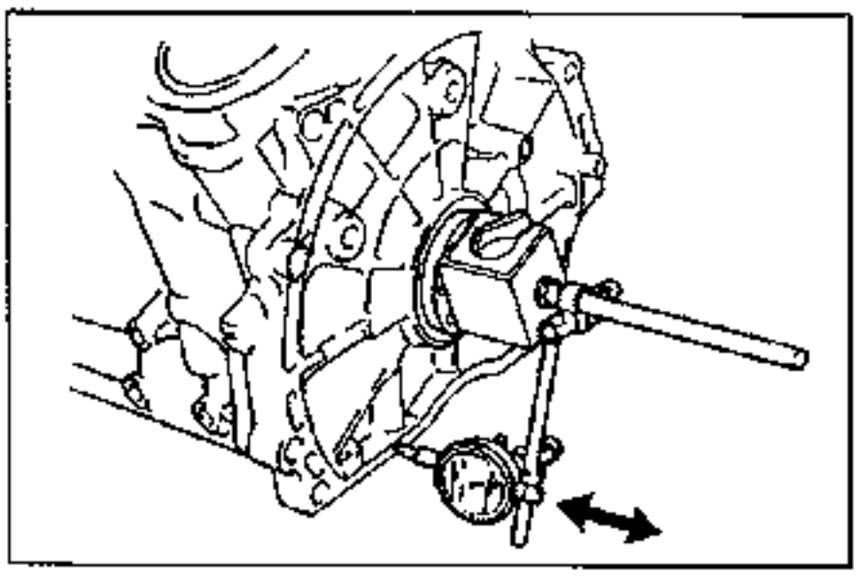


   (6) Install the lower cylinder block, lower main bearings, and lower thrust bearings within five minutes of applying the silicone sealant.
   (7) Install the lower cylinder block along with the lower main bearings and lower thrust bearings.
   (8) Apply clean engine oil to the threads and seat faces of the bearing cap bolts.
   (9) Tighten the main bolts Ⓐ, Ⓑ and sub bolts Ⓒ as in step 1–(6) through 1–(10).



(10) Tighten the lower cylinder block bolts Ⓓ in the order shown.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

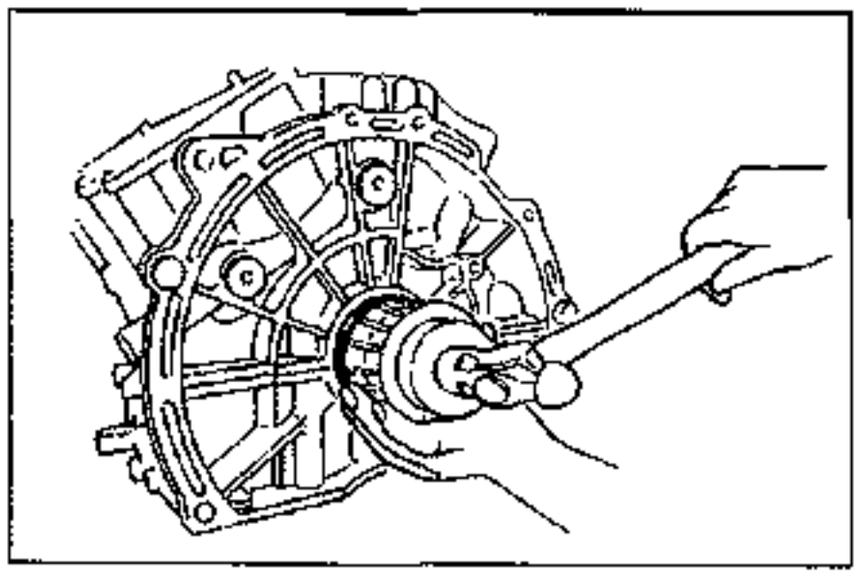


3. Measure the crankshaft end play.

End play: 0.080–0.282mm {0.0032–0.0111 in}
Maximum: 0.32mm {0.013 in}

4. If the end play exceeds the maximum, grind the crankshaft and install oversize thrust bearings or replace the crankshaft and thrust bearing.

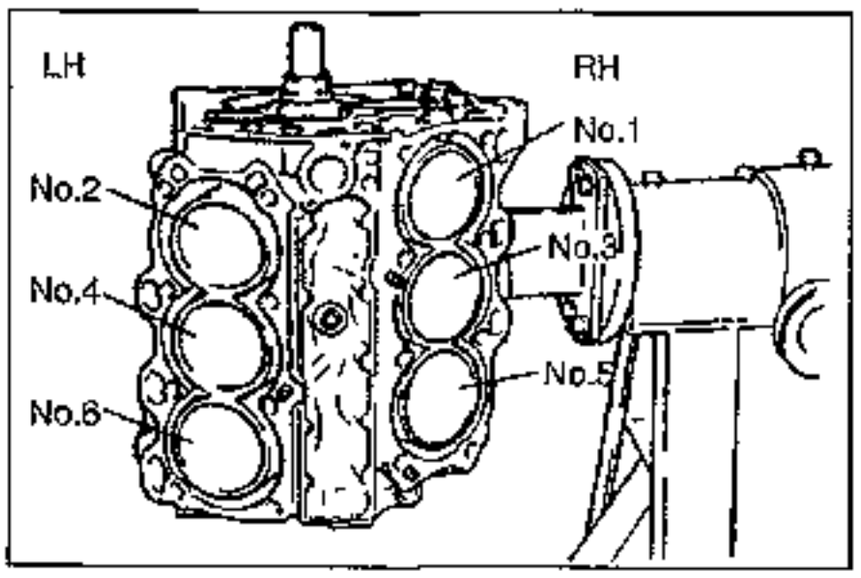
Thrust bearing width
Standard:
2.000–2.050mm {0.0788–0.0807 In}
0.25mm {0.01 in} oversize:
2.1 75mm {0.0837–0.0856 in}
0.50mm {0.02 in} oversize:
2.250–2.300mm {0.0886–0.0905 in}



5. Apply a small amount of clean engine oil to the lip of a new rear oil seal.
6. Push the rear oil seal slightly in by hand.
7. Tap the oil seal in evenly by using the **SST** and a hammer.

Protrusion: 0–0.7mm {0–0.021 in}

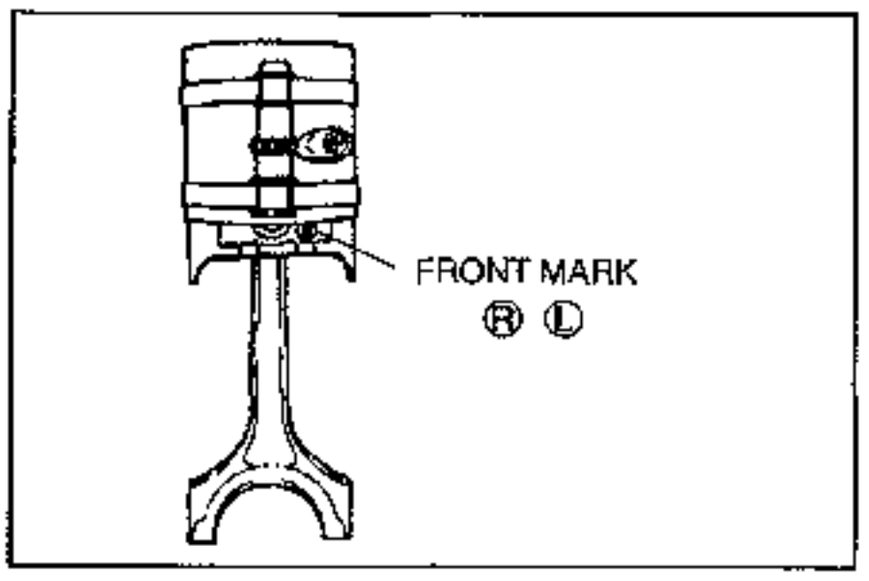
Note
- Oil seal outer diameter: 93mm {3.66 in}
- Oil seal inner diameter: 75mm {2.87 in}



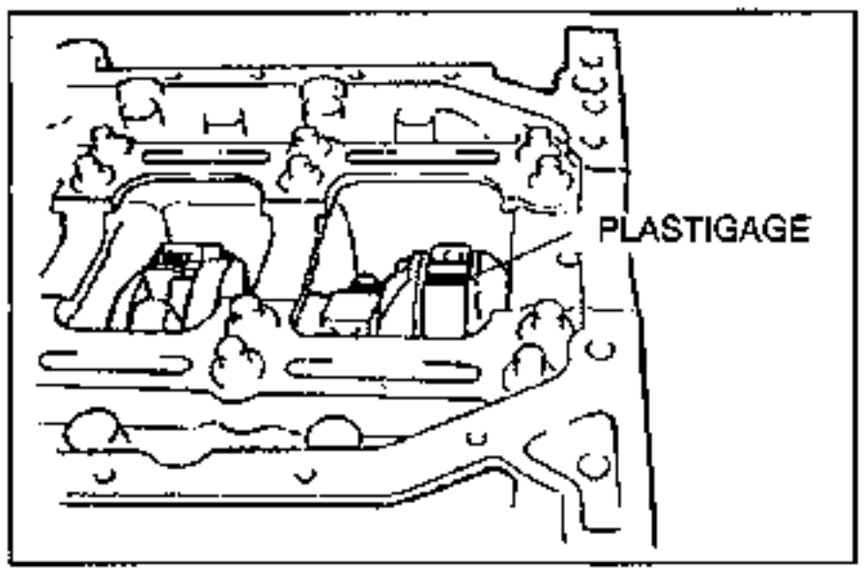
Piston and Connecting Rod Assembly
1. Rotate the engine as shown.

Note
- Assembly is easier if the pistons are installed with the crankpin at the BDC position.

2. Remove any foreign material and oil from the connecting rod journals and bearings.
3. Install the upper connecting rod bearings in the connecting rods.
4. Apply a liberal amount of clean engine oil to the cylinder walls, pistons, piston rings and connecting rod cap bolts.

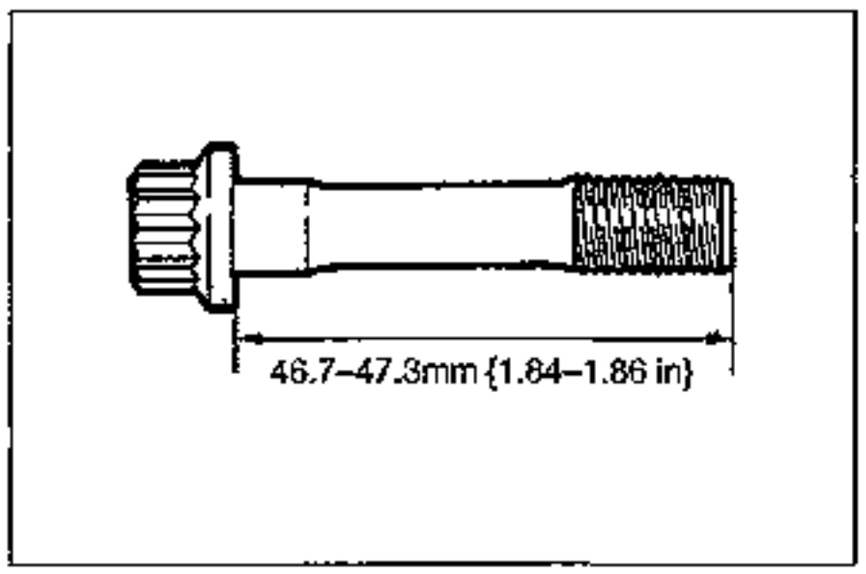


5. Check the piston rings for proper end gap positioning.
6. Insert the piston and connecting rod assembly into the cylinder block with the L mark (left bank) and the R mark (right bank) facing the front of the engine. Use a piston installer tool to install.



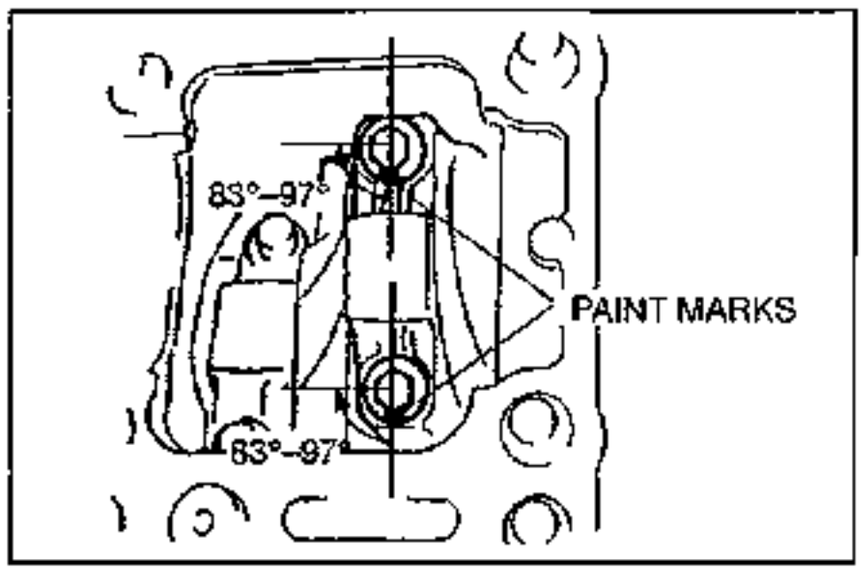
Connecting Rod Cap

1. Measure the connecting rod bearing oil clearances as follows.
   (1) Measure the oil clearance with the connecting rod in BDC position.
   (2) Do not rotate the crankshaft when measuring the oil clearances.



   (3) Position Plastigage atop the journals in the axial direction.
   (4) Remove any foreign material and oil from the lower connecting rod bearing and connecting rod cap.
   (5) Install the lower connecting rod bearing to the cap.
   (6) Measure the length of connecting rod cap bolt. Replace it if the length exceeds the maximum.

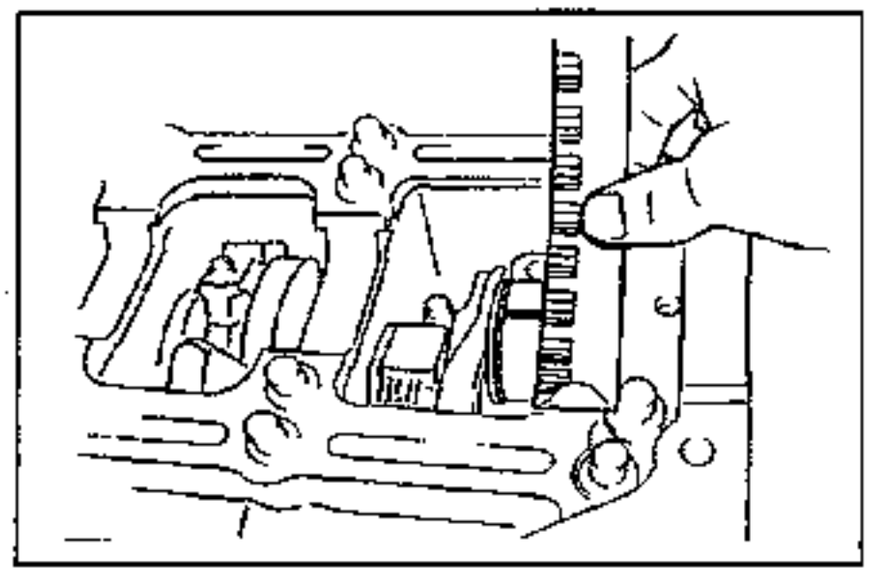
Length: 46.7–47.3mm {1.84–1.86 in}
Maximum: 48.0mm {1.89 in}



   (7) Apply clean engine oil to the threads and seat faces of the connecting rod cap bolts.
   (8) Install the connecting rod caps.
   (9) Tighten the connecting rod cap bolts.

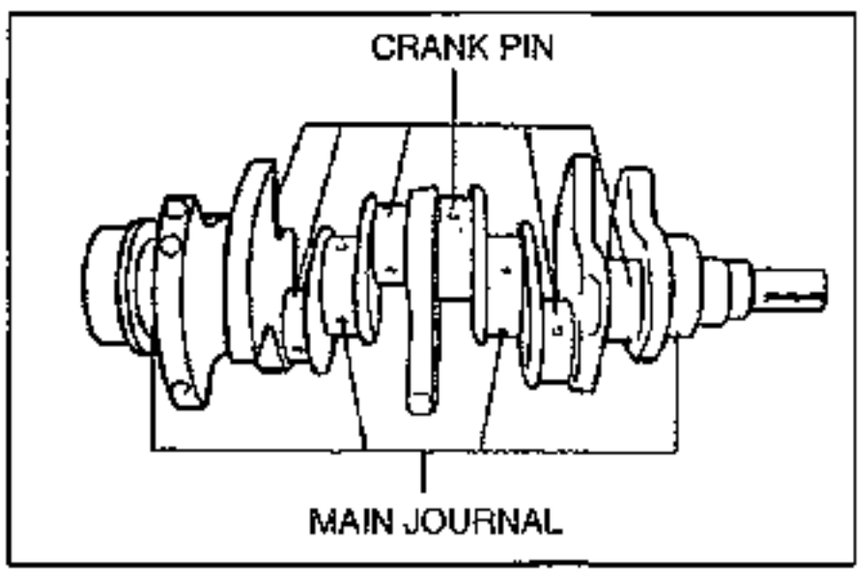
Tightening torque:
22.1–26.9 N·m {2.25–2.75 kgf·m, 16.3–19.8 ft·lbf}

   (10) Put a paint mark on each bolt head.
   (11) Using this mark as a reference, tighten the bolts 83°–97°.
   (12) Remove the connecting rod caps.

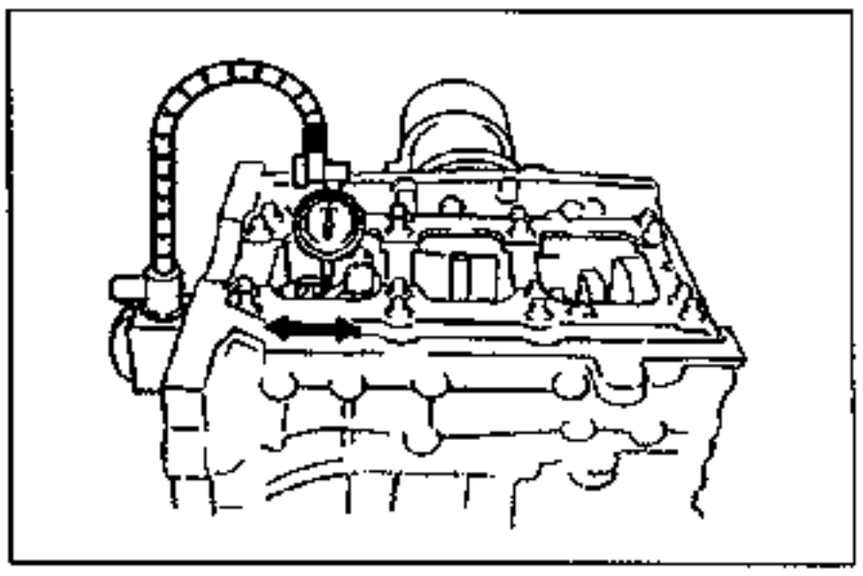


   (13) Measure the Plastigage at each journal at the widest point for the smallest clearance, and the narrowest point for the largest clearance.

Oil clearance: 0.023–0.43mm {0.0009–0.0016 in}
Maximum: 0.08mm {0.003 in}



   (14) If the oil clearance exceeds the maximum, grind the crankshaft and install undersize bearings. (Refer to page B2–84.)



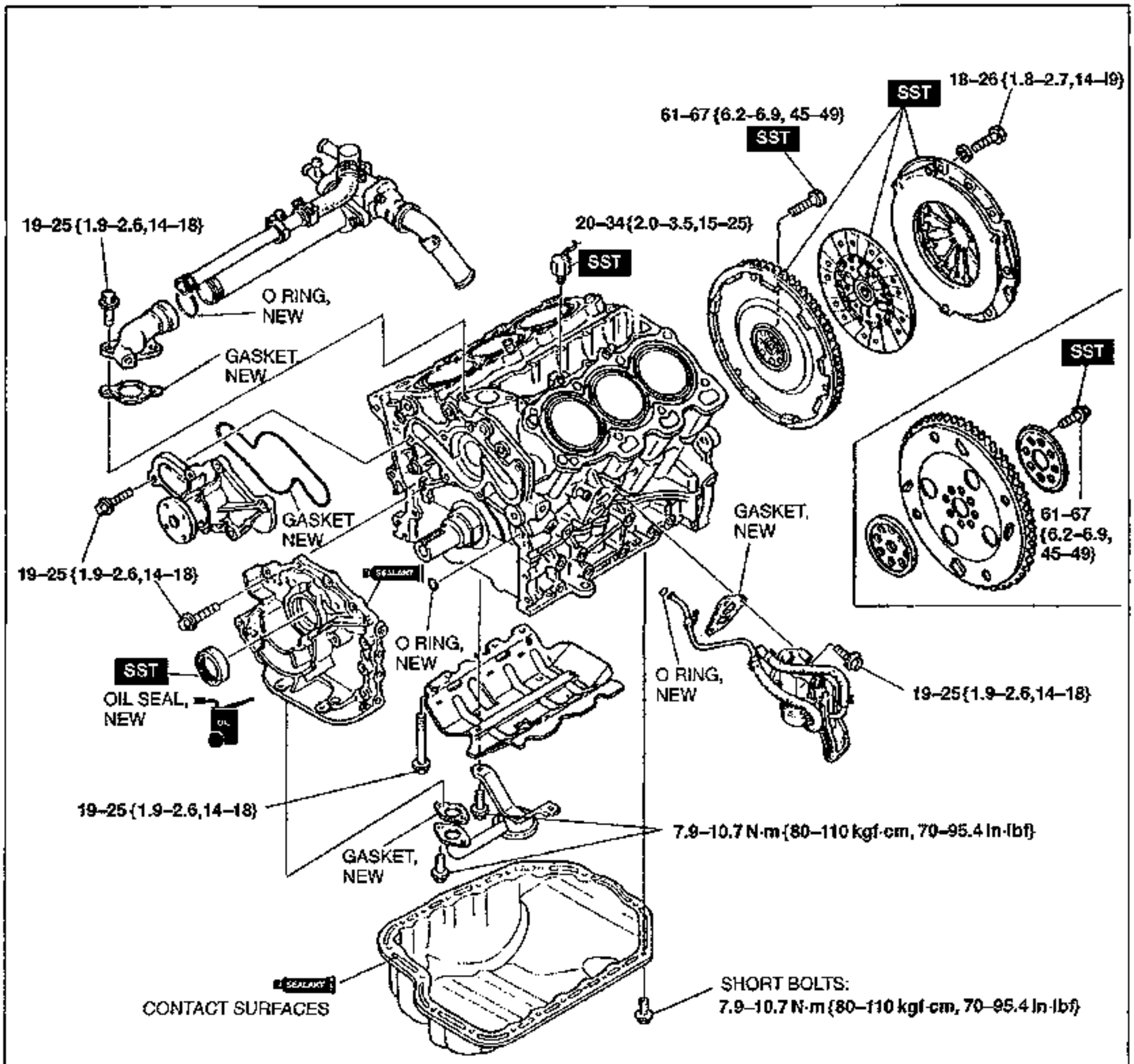
2. Install the connecting rod caps as follows.
   (1) Remove the Plastigage from the journals and bearings.
   (2) Apply clean engine oil to the connecting rod bearings.
   (3) Install the connecting rod bearings and caps.
   (4) Apply engine oil to the threads and seat faces of the cap bolts and tighten them as in step 1.
   (5) Verify that the crankshaft rotates smoothly by hand.

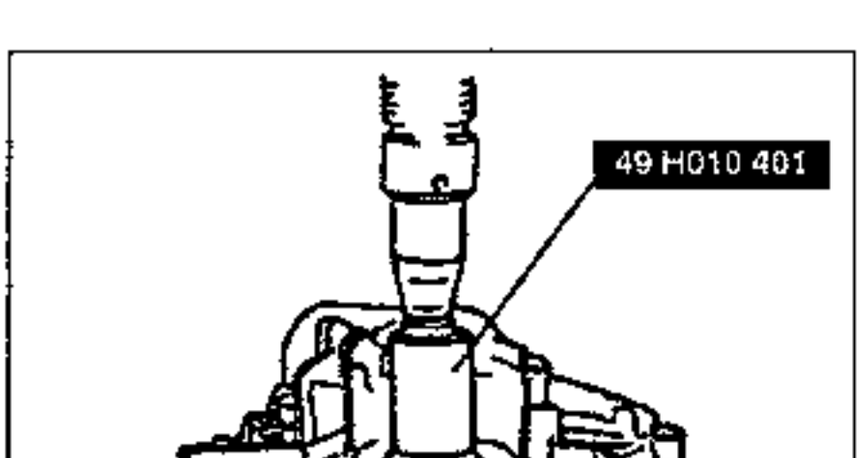
3. Measure the connecting rod side clearances.
   (1) Measure each connecting rod side clearance.

   Side clearance: 0.178–0.330mm {0.0070–0.0129 in}
   Maximum: 0.40mm {0.016 in}

   (2) If the clearance exceeds the maximum, replace the connecting rod and cap assembly.

CYLINDER BLOCK (EXTERNAL PARTS)
Torque Specifications

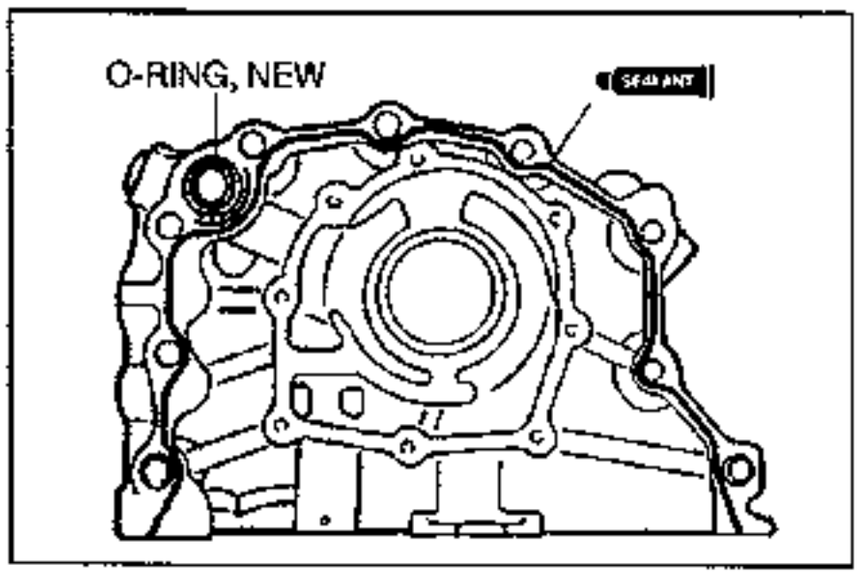




Oil Pump

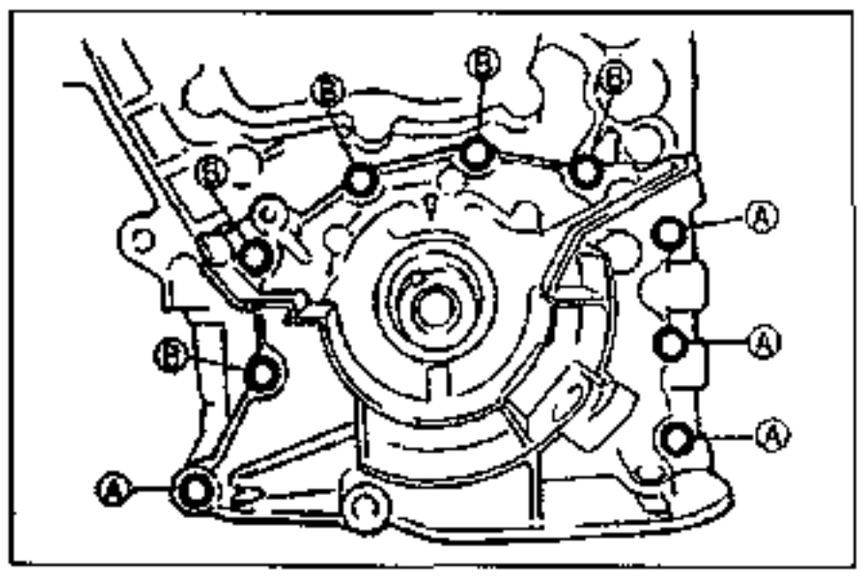
1. Apply clean engine oil to the new oil seal.
2. Install the il seal into the oil pump body by hand.
3. Press the oil seal into the oil pump body by using the **SST.**

Protrusion: 0–0.7mm {0–0.03 in}



4. Remove any dirt or other material from the contact surfaces.
5. Apply a continuous bead of silicone sealant to the contact surface of the oil pump.
6. Apply clean engine oil to a new O-ring and install it into the pump body.

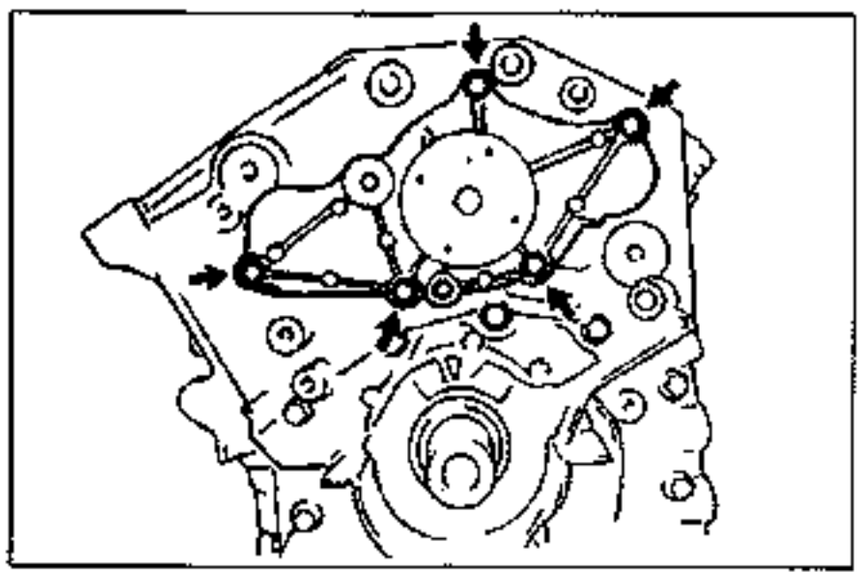
Caution
- **Keep the oil hole free of sealant to prevent engine damage.**



7. Apply clean engine oil to the oil seal lip.
8. Install the oil pump within five minutes of applying the sealant, making sure that the O-ring does not come out.

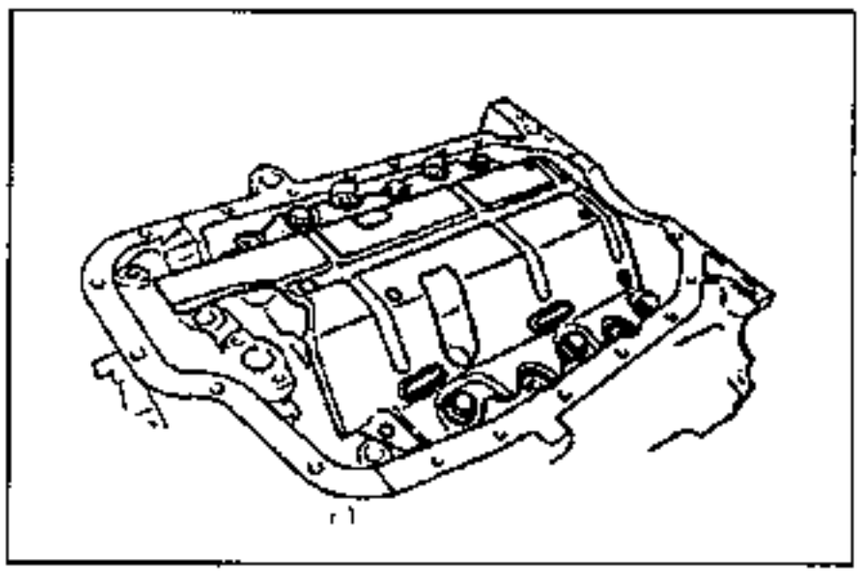
Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}
Bolt Ⓐ:40mm {1.57 in}
Bolt Ⓑ:25mm {0.98 in}

9. Cut away the portion of the sylicone sealant that projects toward the oil pan.



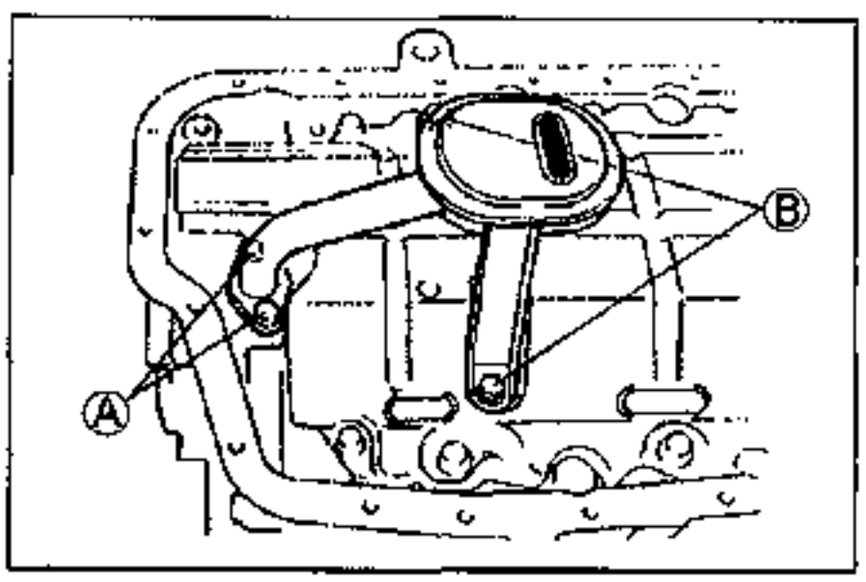
Water Pump
1. Remove all dirt, grease, and other material from the water pump mounting surface.
2. Install a new rubber gasket and the water pump.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}



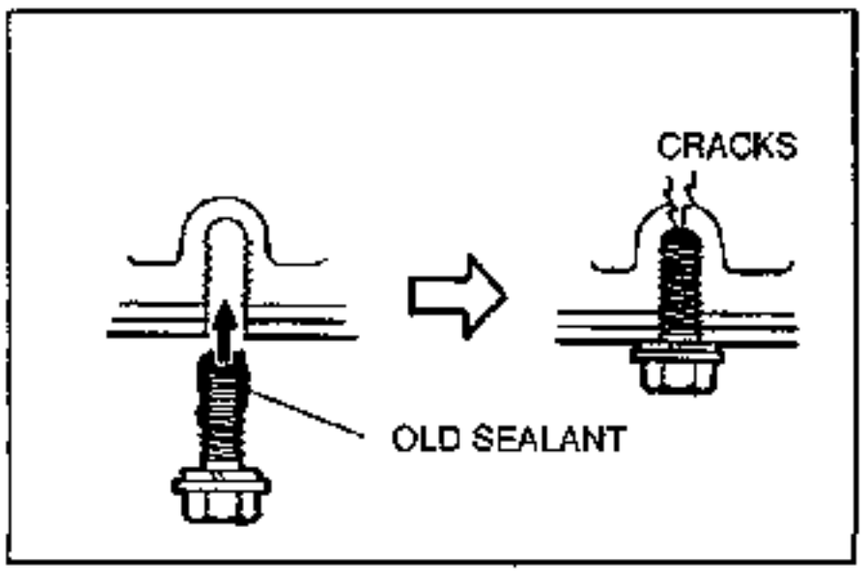
Oil baffle
1. Remove any dirt or other material from the oil baffle.
2. Install the oil baffle.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m,14–18 ft·lbf}



Oil Strainer
1. Install a new gasket and the oil strainer onto the oil pump body.
2. Tighten bolts Ⓐ, then tighten bolts Ⓑ.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}

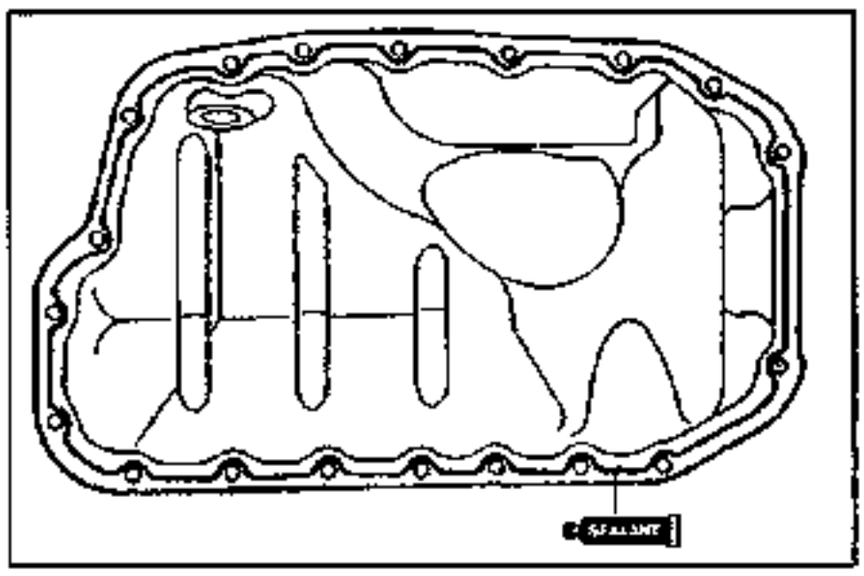


Oil Pan

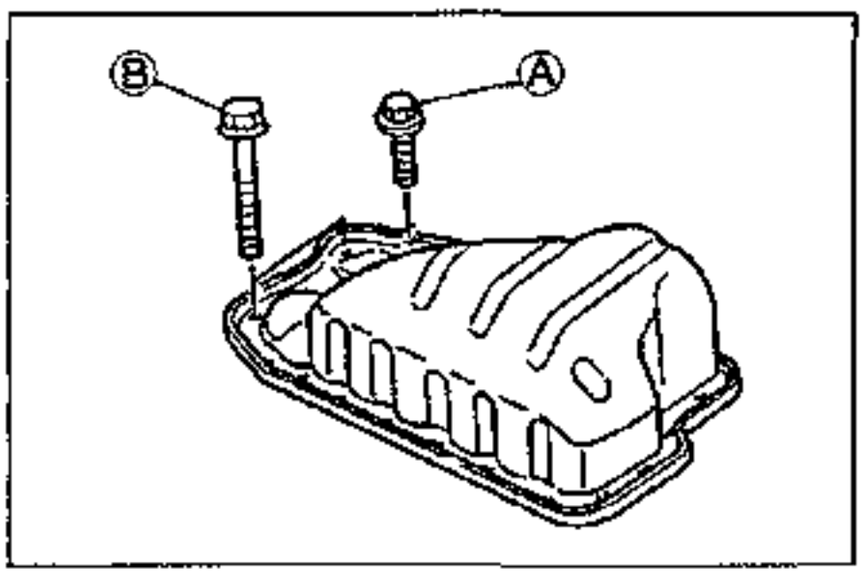
1. Remove the sealant from the oil pan bolts and bolt holes in the lower cylinder block.

Caution

- **If the bolts are reused, remove the old sealant from the bolt threads. Tightening the bolt that has old sealant on it can cause thread damage.**



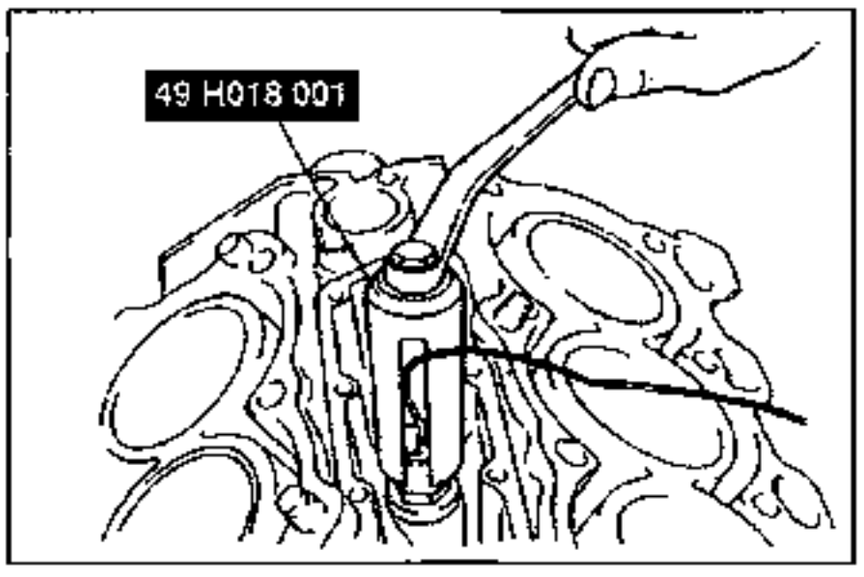
2. Remove any dirt or oil from the contact surfaces.
3. Apply a continuous bead of silicone sealant to the oil pan along the inside of the bolt holes, and overlap the ends.



4. Install the oil pan within five minutes of applying the sealant.

Tightening torque

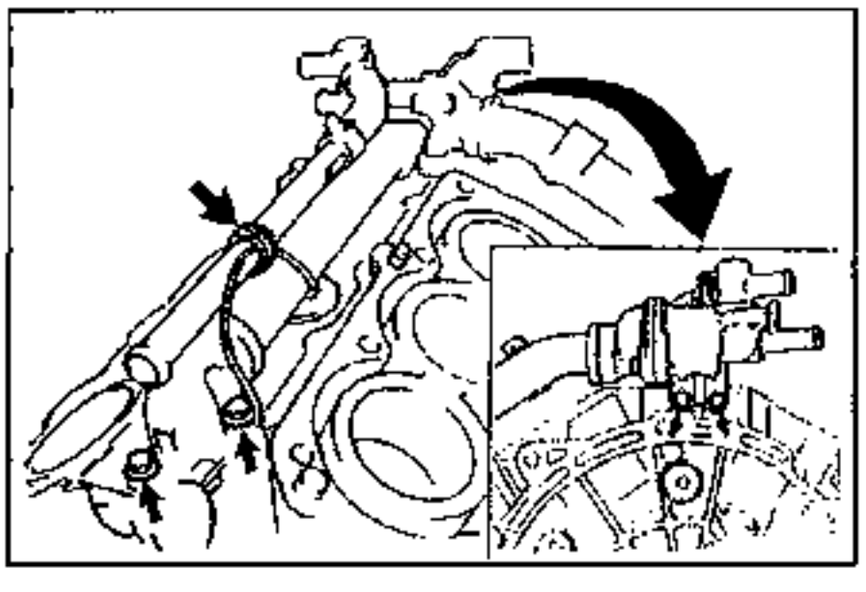
Ⓐ : 19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}
Ⓑ : 7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



Knock Sensor

Install the knock sensor by using the **SST.**

Tightening torque:
20–34 N·m {2.0–3.5 kgf·m, 15–25 ft·lbf}

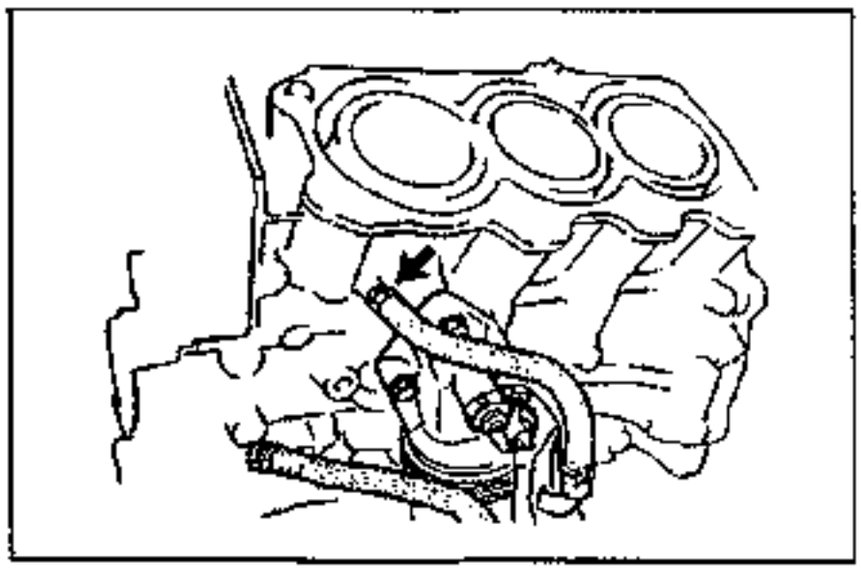


Water Pipe and Thermostat Housing

1. Install a new gasket and install the water pipe and thermostat housing as an assembly.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

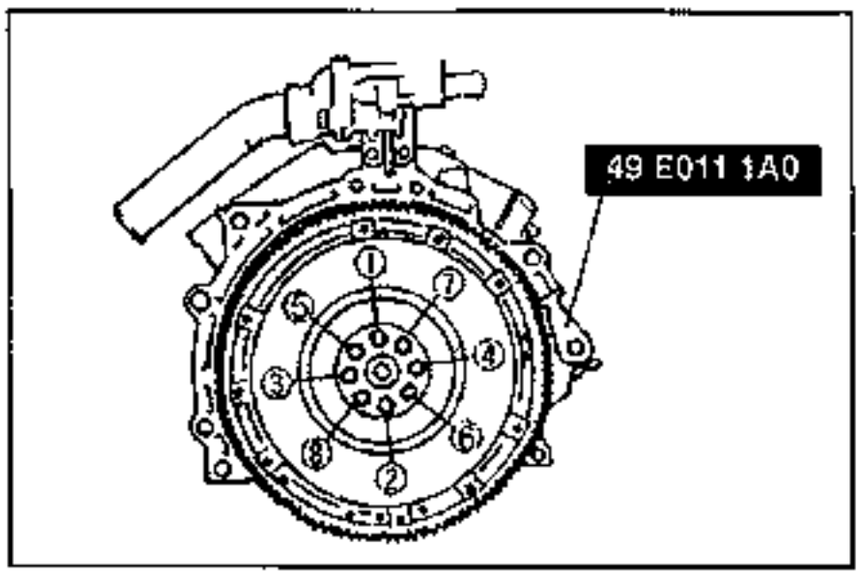
2. Secure the knock sensor harness to the water pipe with the clip as shown.



Oil cooler and oil cooler body
1. Install a new gasket and the oil cooler body.

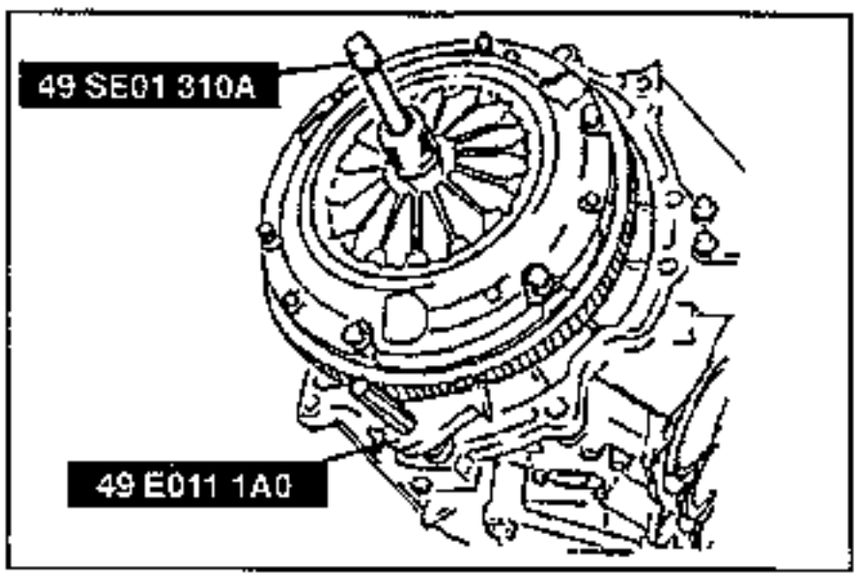
Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

2. Connect the water hoses.



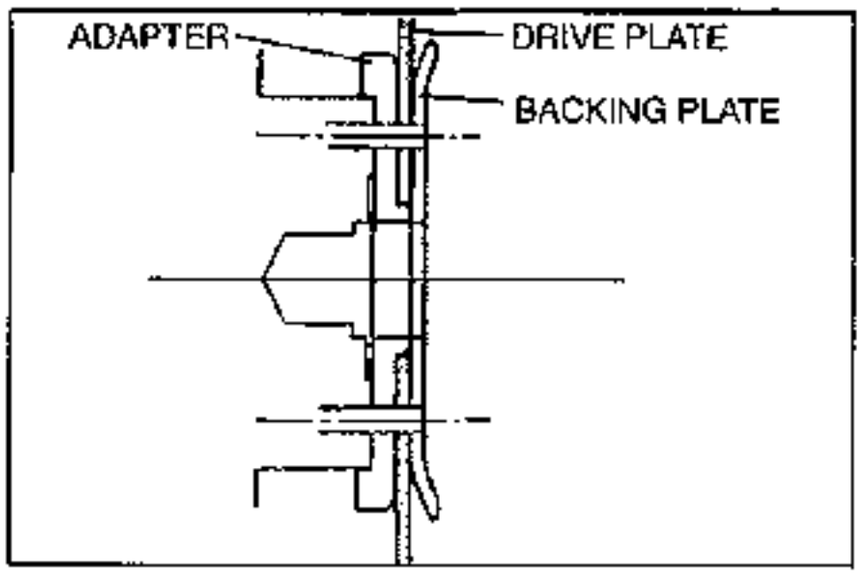
Flywheel (MTX)
1. Set the flywheel onto the crankshaft.
2. Hold the flywheel by using the **SST**.
3. Tighten the bolts in two or three steps in the order shown.

Tightening torque:
61–87 N·m {6.2–8.9 kgf·m, 45–49 ft·lbf}



Cluch Disk and Clutch Cover (MTX)
Install the clutch disk and clutch cover by using the **SST**. (Refer to section H.)

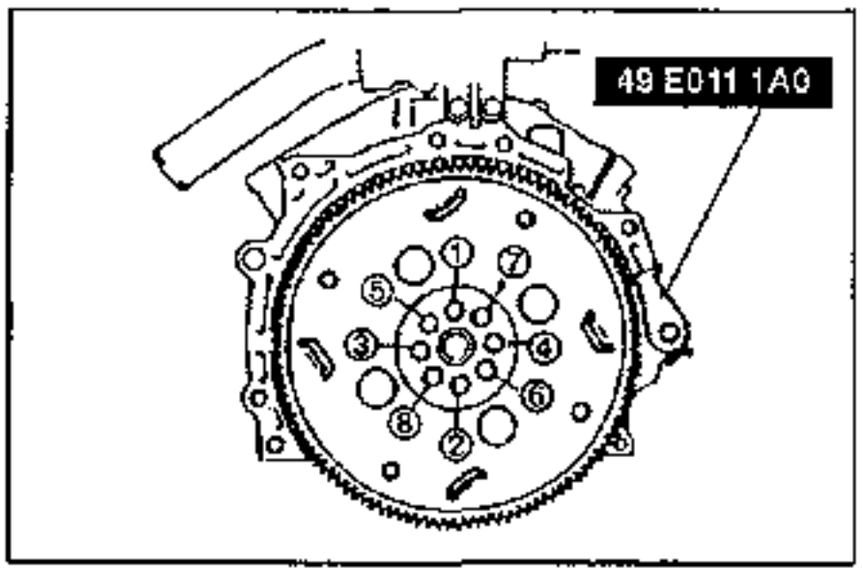
Tightening torque:
18–26 N·m {1.8–2.7 kgf·m, 14–19 ft·lbf}



Drive plate (ATX)

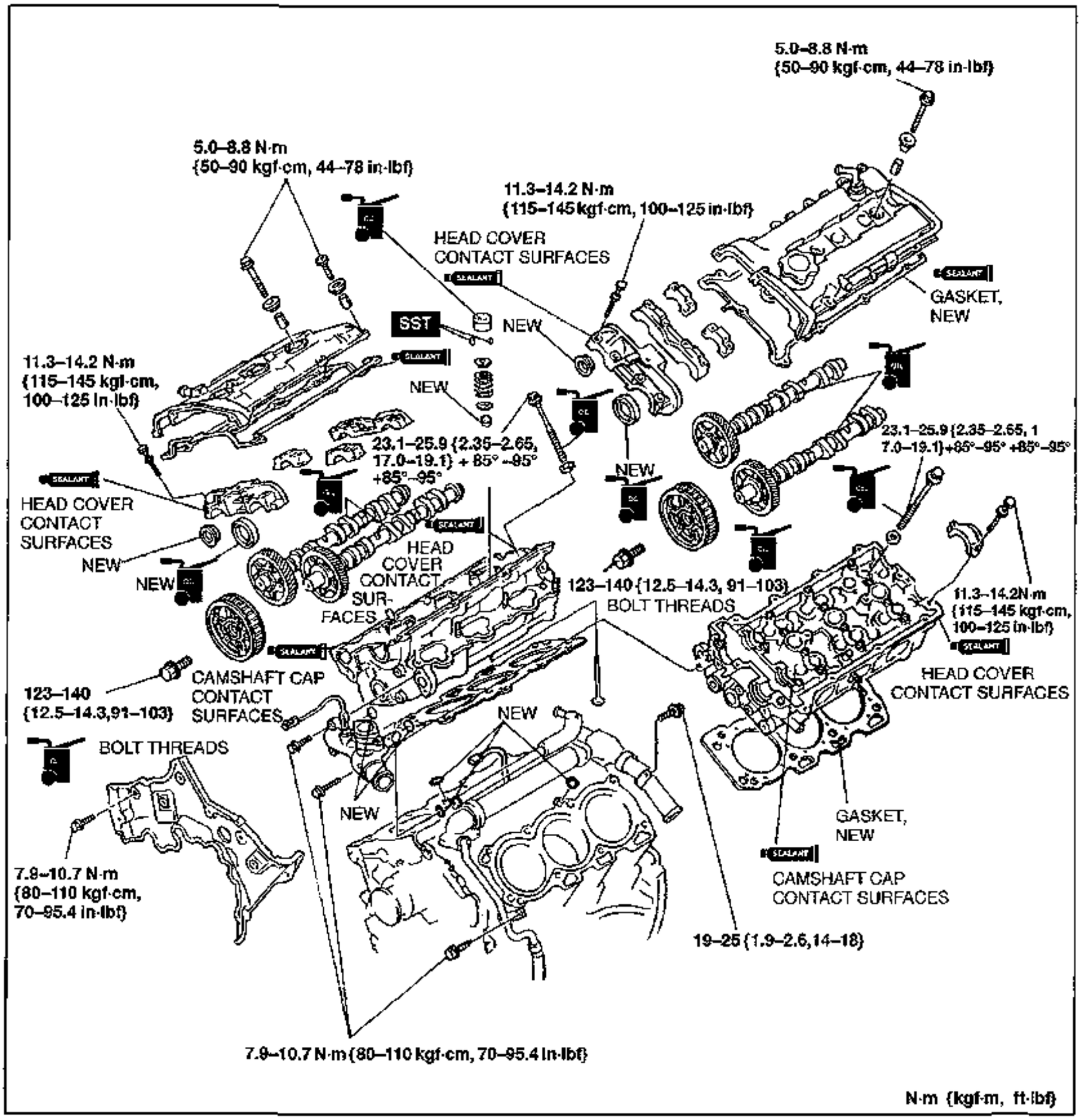
Caution
- **Verify that the adapter and the backing plate are mounted in the directions shown. Incorrect mounting can damage the engine and transaxle.**

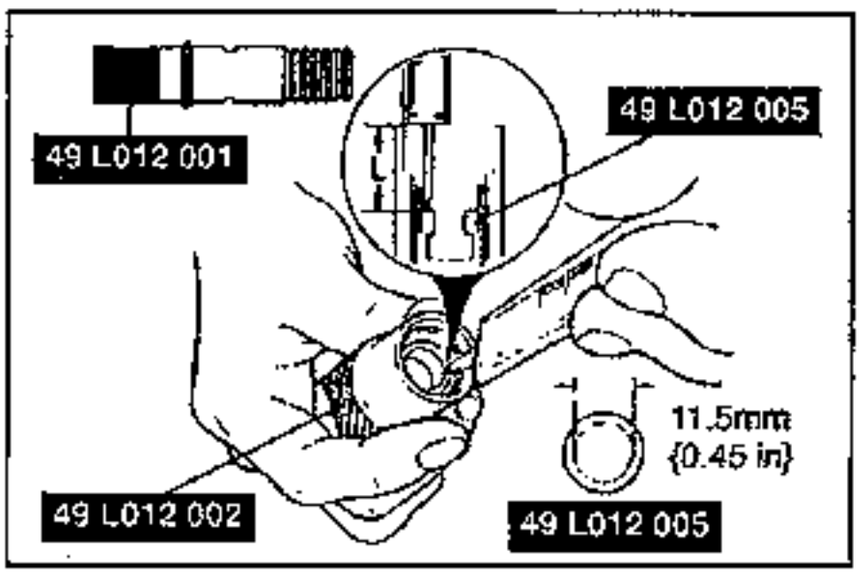
1. Install the following parts to the crankshaft.
   (1) Adapter
   (2) Drive plate
   (3) Backing plate
2. Hand tighten the lock bolts..
3. Hold the drive plate by using the **SST**.
4. Tighten the bolts in two or three steps in the order shown.



Tightening torque:
61–87 N·m {6.2–8.9 kgf·m, 45–49 ft·lbf}

CYLINDER HEAD
Torque Specifications

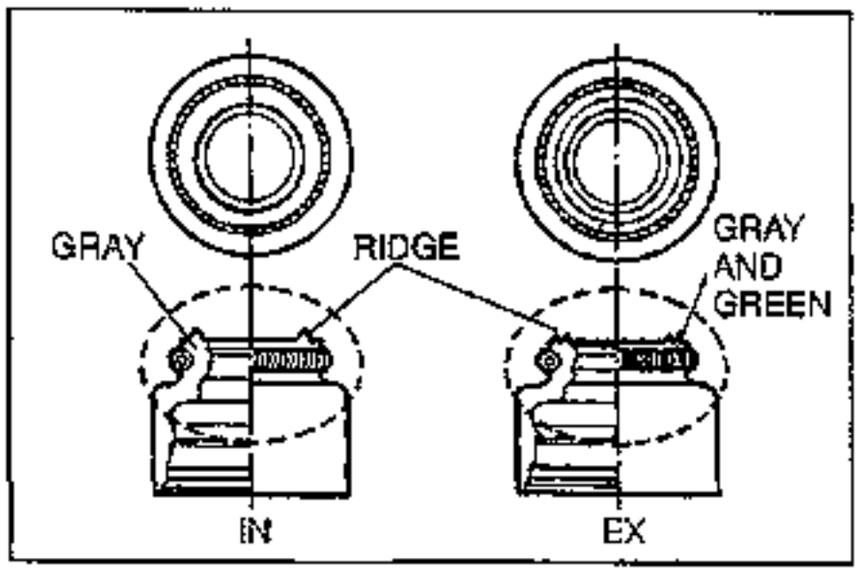




Valve Seal

1. Assemble the **SST** so that depth L is as specified.

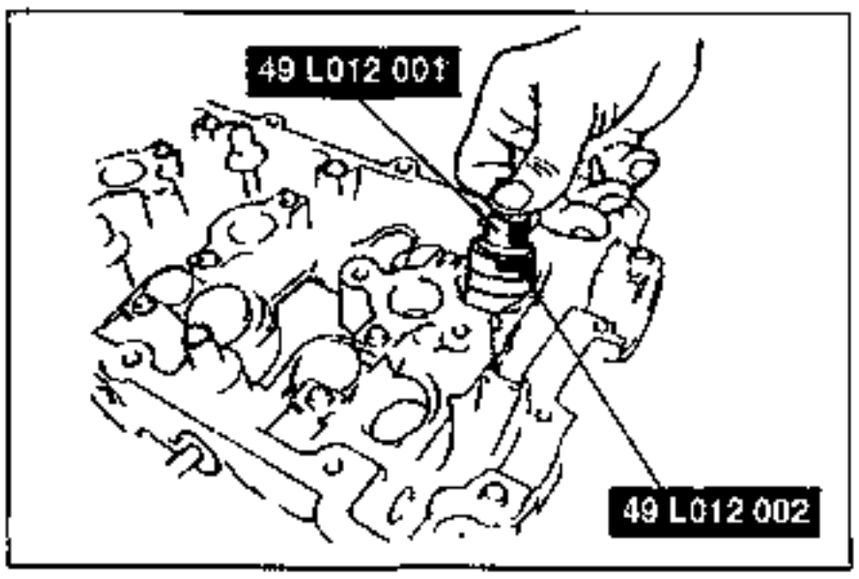
Depth L
IN: 16.3mm {0.641 in}
EX: 13.8mm {0.54 in}



2. Slide the valve seal onto the valve guide with the **SST**.

Caution
- **The intake and exhaust valve seals are different as shown.**

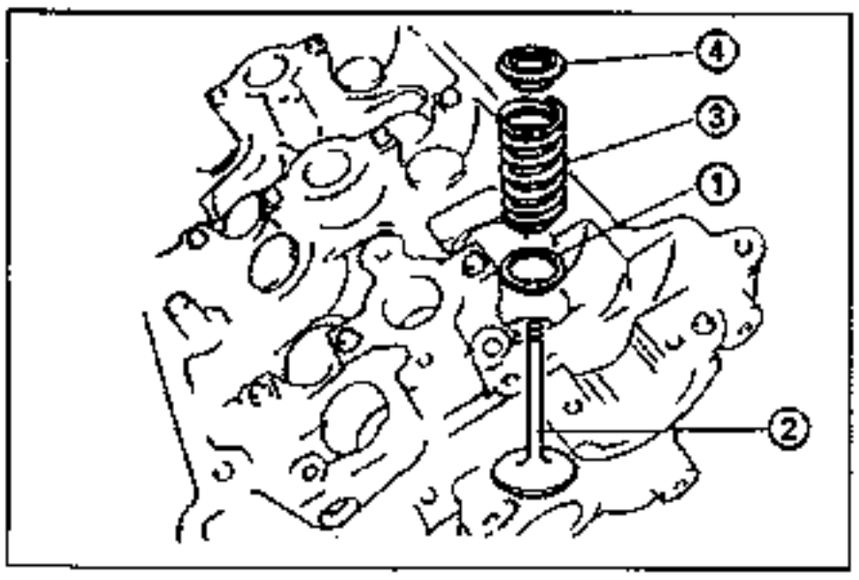
	Ridge	Color
Intake	No or One	Gray
Exhaust	Two	Gray or Green



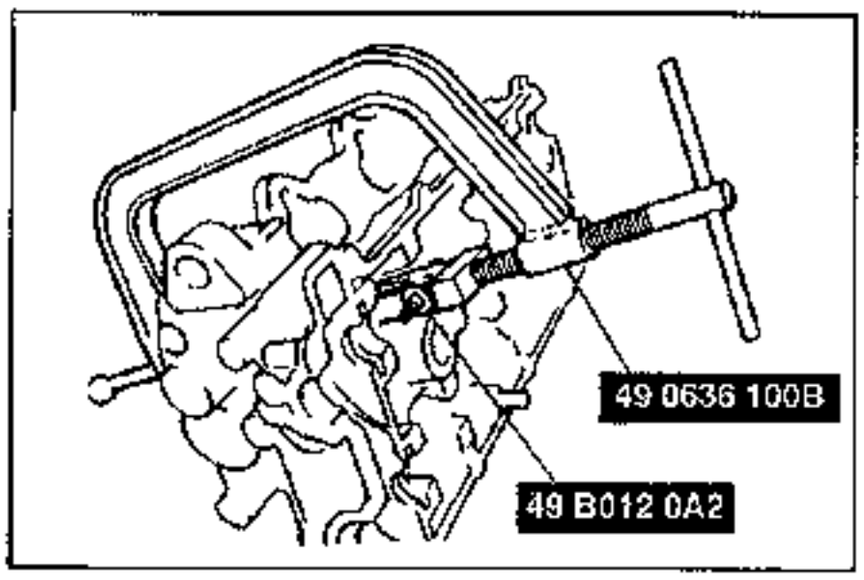
3. Set the **SST** against the valve seal.

Caution
- **Using a hammer will damage the valve seal.**

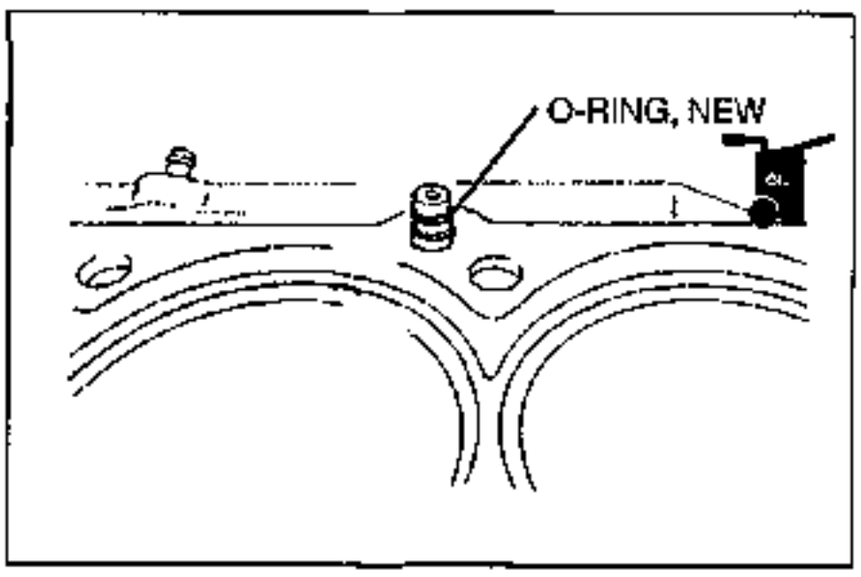
4. Using the **SST**, press the valve seal on by hand until the **SST** contacts the cylinder head.



Valve and Valve Spring
1. Install the lower spring seat.
2. Install the valve.
3. Install the spring with the closer pitch toward the cylinder head.
4. Install the upper spring seat.



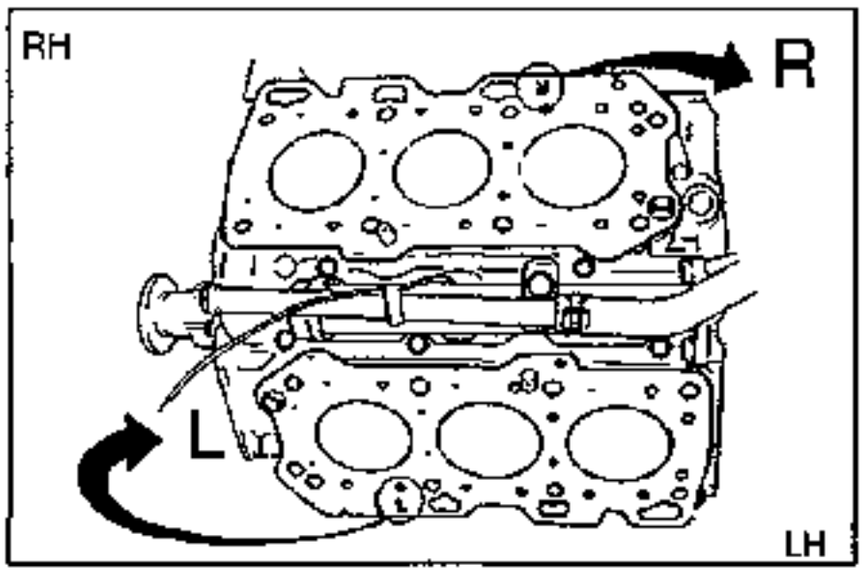
5. Compress the valve spring with the **SST**, and install the valve keepers.
6. Remove the **SST**.
7. Tap the end of the valve stem lightly two or three times with a plastic hammer to verify that the keepers are fully seated.



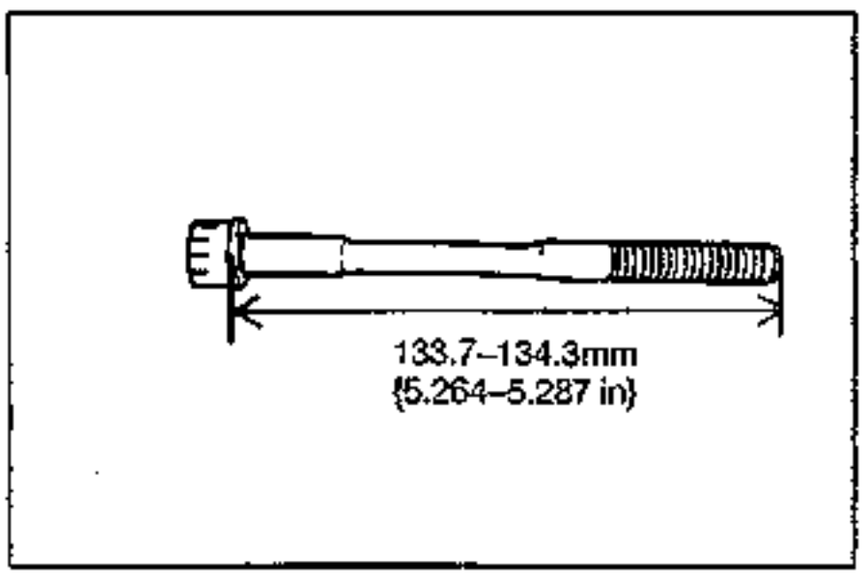
Cylinder Head
1. Measure the amount of oil control plug projection from the deck of the cylinder block.

Projection Ⓐ: 8.0–9.0mm {0.31 5–0.354 in}

2. Apply clean engine oil to new O-rings and install them to the oil control plugs.

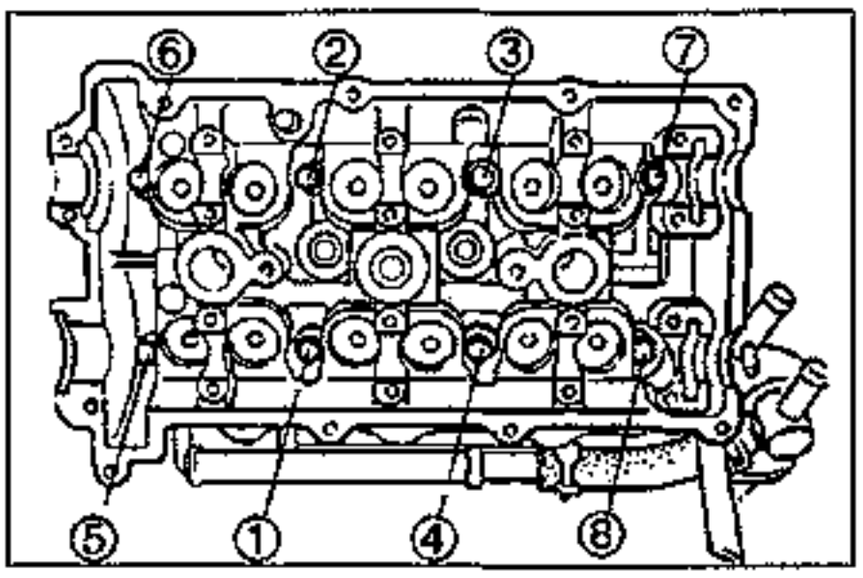


3. Thoroughly remove all dirt, oil, and other material from the decks of the cylinder block.
4. Turn the crankshaft clockwise and apply engine oil to the cylinder walls.
5. Place the new cylinder head gaskets on the cylinder block.



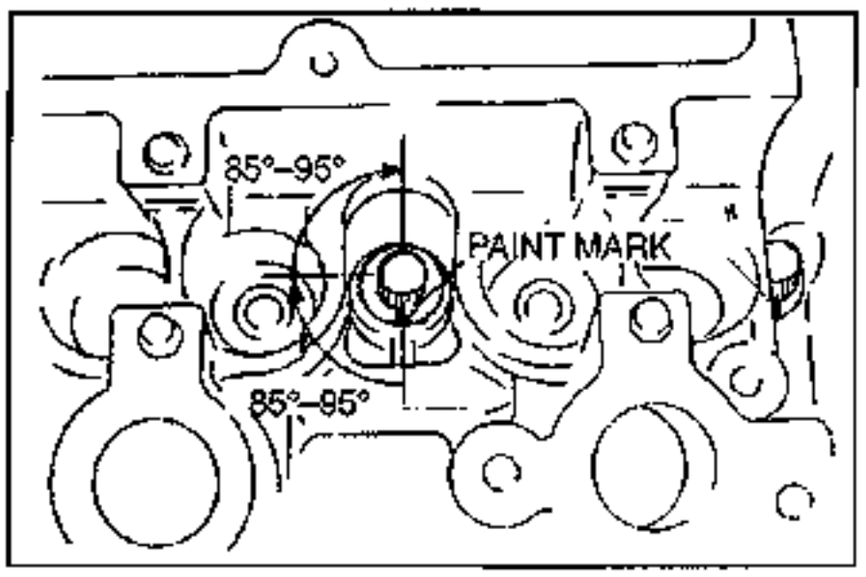
6. Install the cylinder heads to the cylinder block.
7. Tighten the cylinder head bolts as described below.
   (1) Before installation, measure the length of each bolt. Replace a bolt if it exceeds the maximum length.

   Length: 133.7–134.3mm {5.264–5.287 in}
   Maximum: 135mm {5.31 in}

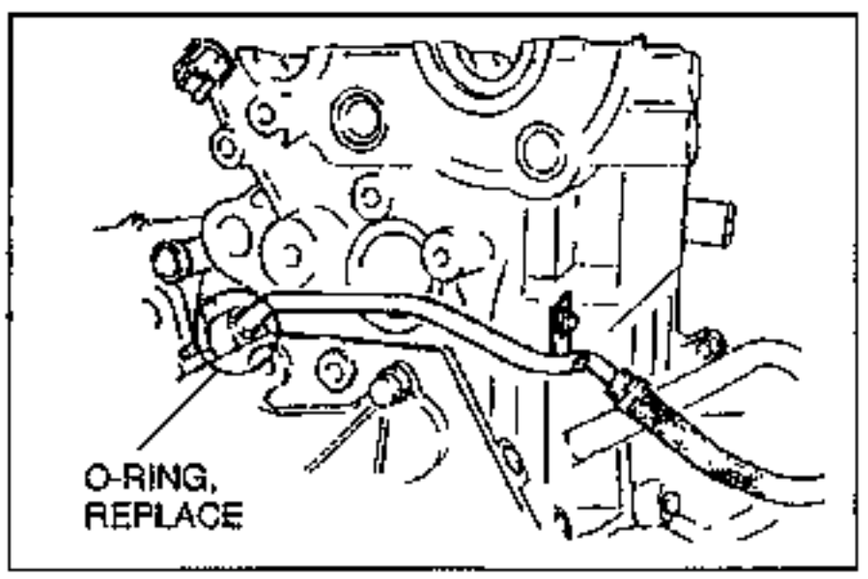


   (2) Apply clean engine oil to the threads and the seat face of each bolt and install them and new washers.
   (3) Tighten the bolts in two or three steps in the order shown.

   Tightening torque:
   23.1–25.9 N·m {2.35–2.65 kgf·m, 17.0–19.1 ft·lbf}

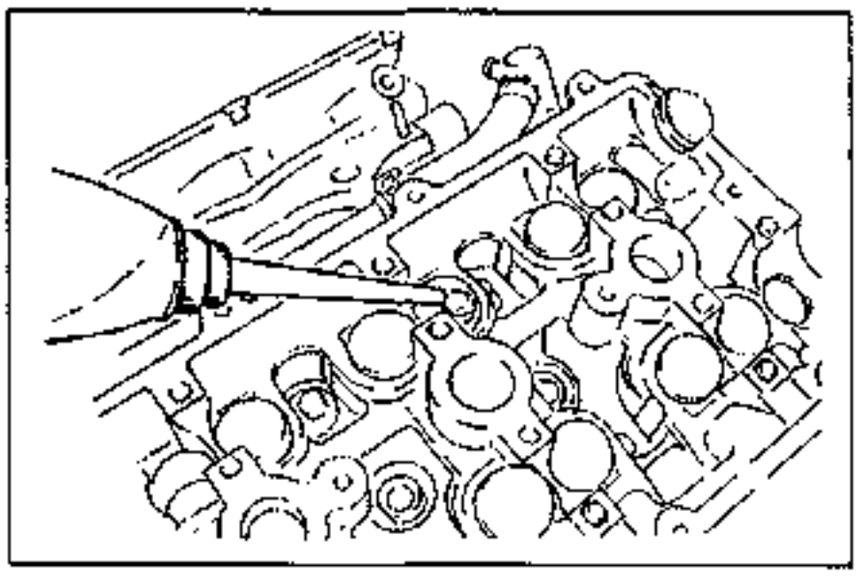


   (4) Put a paint mark on each bolt head.
   (5) Using the marks as a reference, tighten the bolts by turning each **85°–95°** in the sequence shown.
   (6) Further tighten each bolt by turning another **85°–95°**.



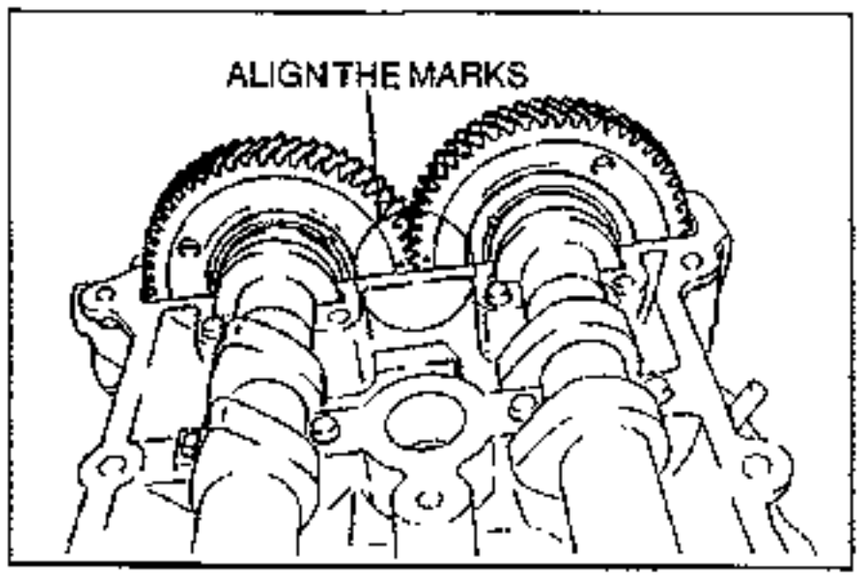
8. Connect the water pipe to the water pipe elbow and secure to the cylinder head.

   Tightening torque:
   7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



HLA

1. Apply clean engine oil to the friction surfaces.
2. If the HLA are being reused, install them in the positions from which they were removed.
3. Verify that the HLA move smoothly in their bores.

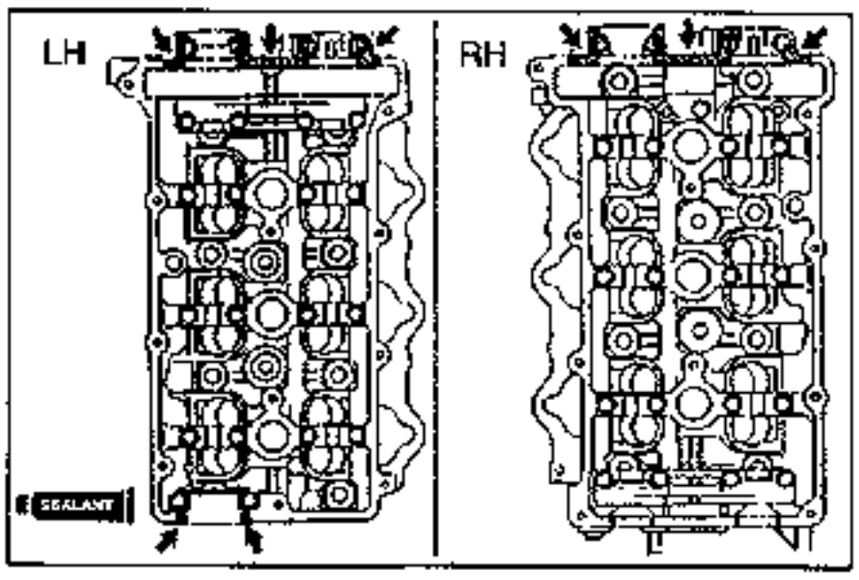


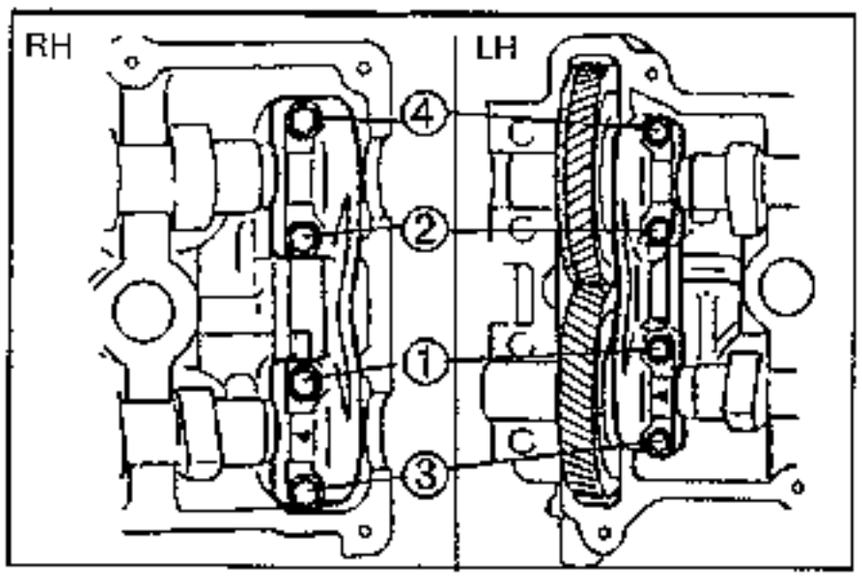
Camshaft

Caution

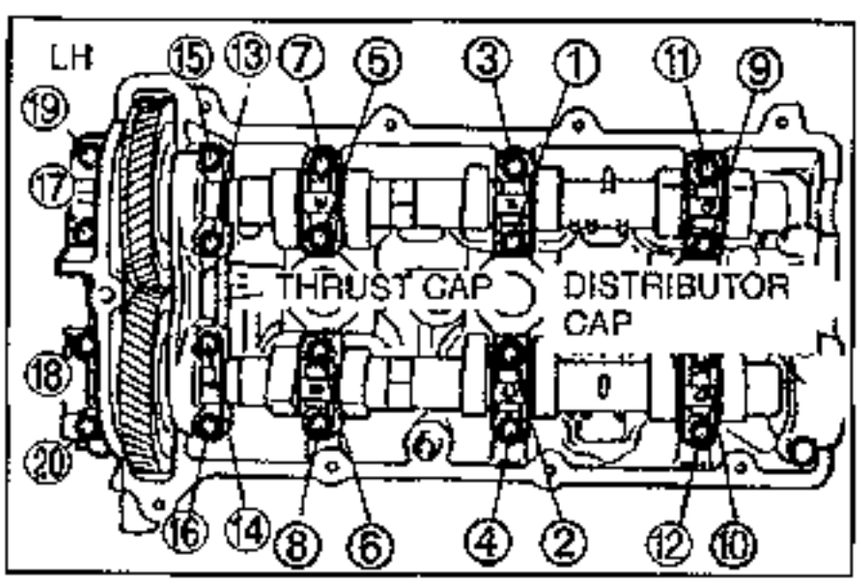
- **Camshafts must be assembled in the following procedure. Otherwise, camshaft can be broken or damaged because there is little camshaft thrust clearance.**

1. Apply clean engine oil to the camshaft journals and the supports.
2. Install the camshafts so that the intake camshaft gear mark and exhaust camshaft gear mark align.
3. Remove the oil, dirt from the mating surfaces between the front camshaft cap and the cylinder head, and degrease.
4. Apply a light coat of silicone sealant to the shaded areas as shown.





5. Install the thrust caps onto the cylinder heads. Hand tighten the bolts in five or six steps in the order shown, until the thrust caps fully seated on the cylinder heads.

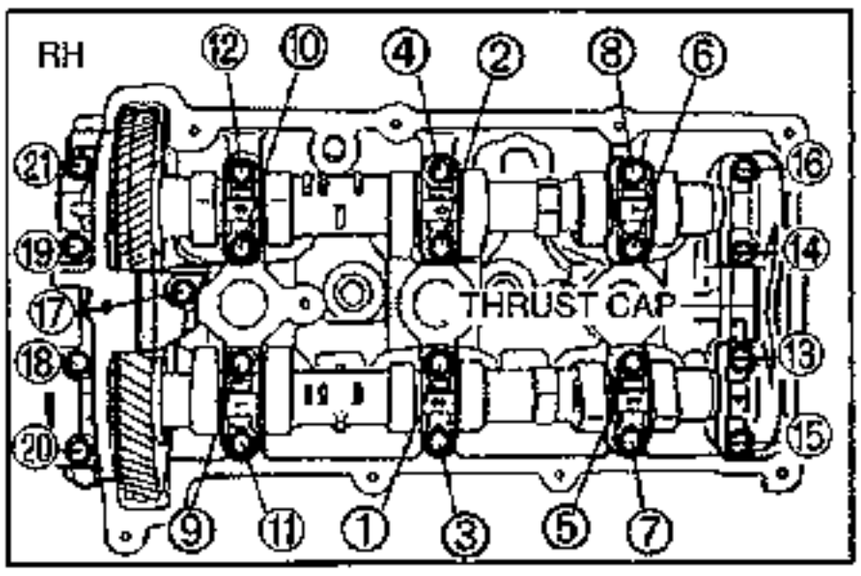


6. Install the camshaft caps and hand tighten the bolts.
7. Tighten the camshaft cap bolts in five or six steps in the order shown.

   Tightening torque:
   11.3–14.2 N·m {115–145 kgf·cm, 100–125 in·lbf}

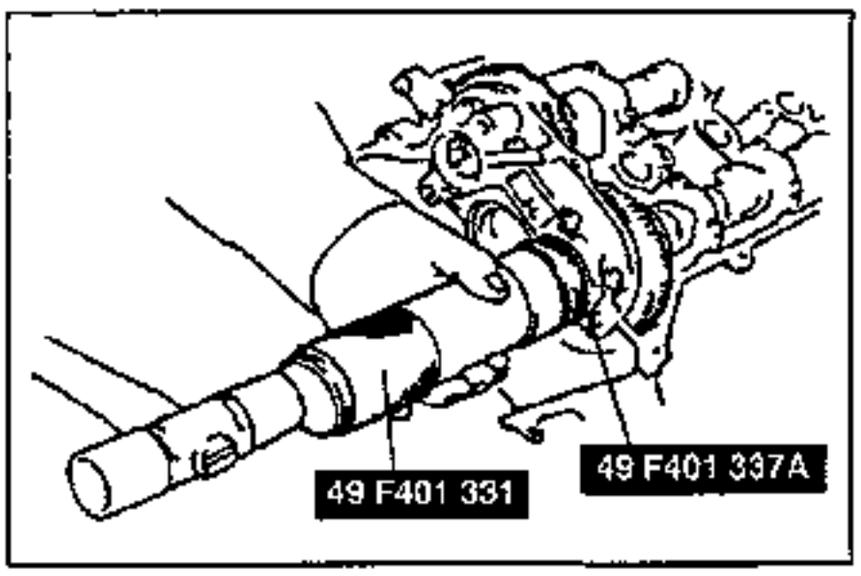
8. Retighten the bolts in the order shown.

   Tightening torque: 11.3–14.2 N·m
   {115–145 kgf·cm, 99.9–125 in·lbf}



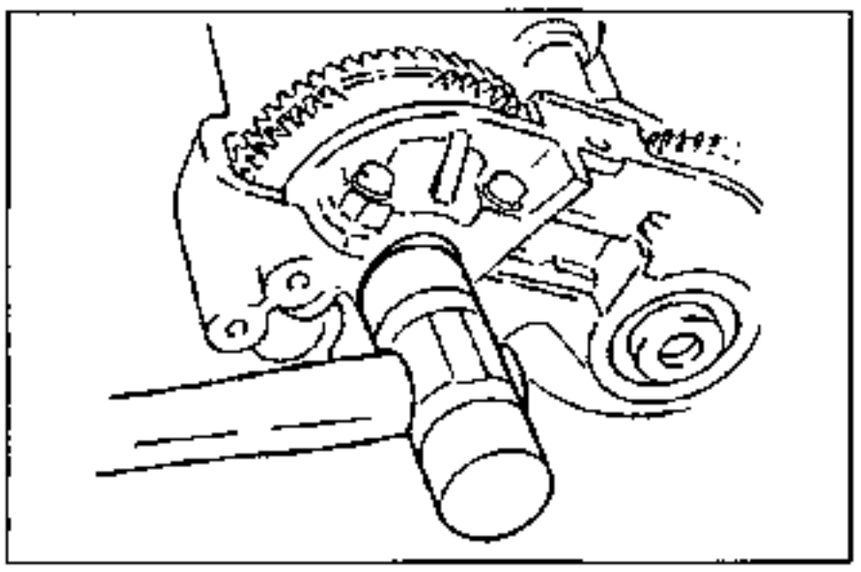
9. Install the distributor cap. (LH cylinder head)

Tightening torque:
11.3–14.2 N·m {115–145 kgf·cm, 100–125 in·lbf}

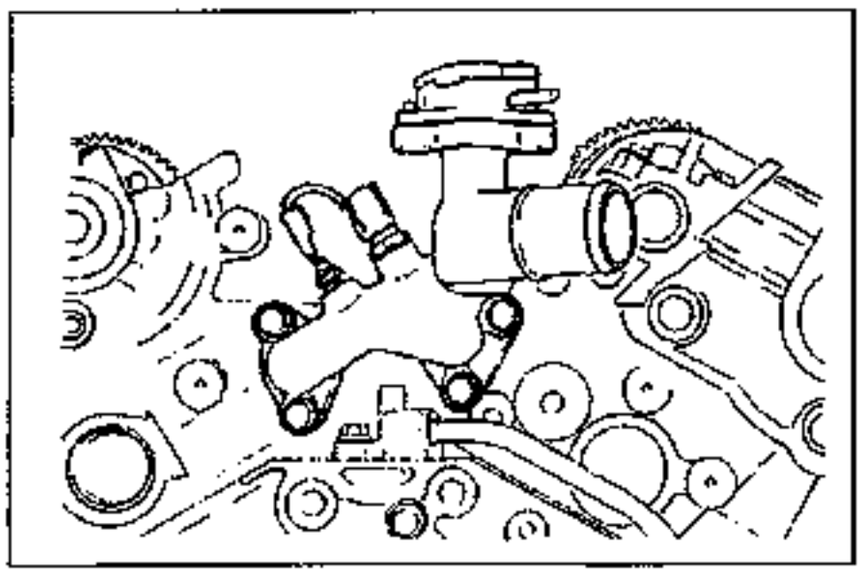


10. Apply clean engine oil to the lip of the new camshaft oil seal.
11. Push the oil seal slightly in by hand.
12. Tap the camshaft oil seal in evenly by using the **SST** and a hammer.

Protrusion: 0–0.5mm {0–0.020 in}

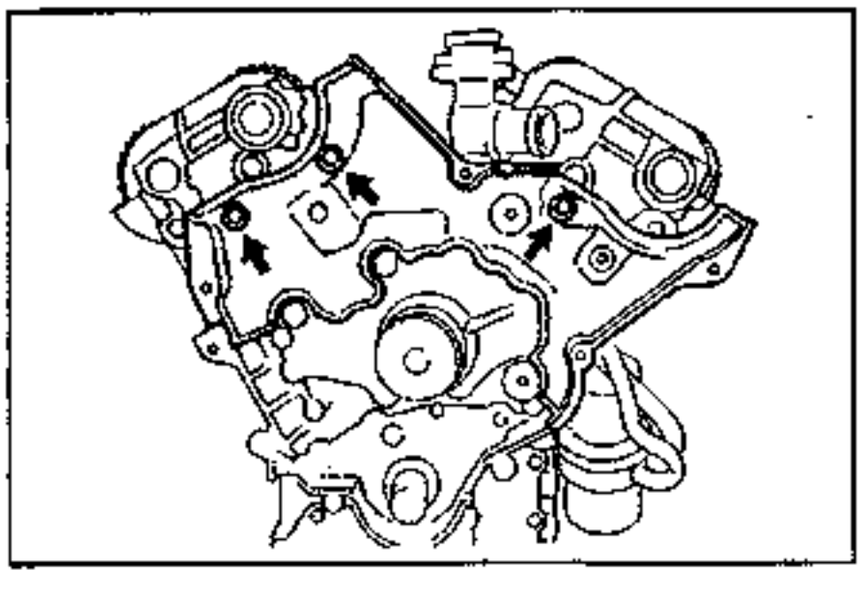


11. Tap in the new blind cap by using a plastic hammer.



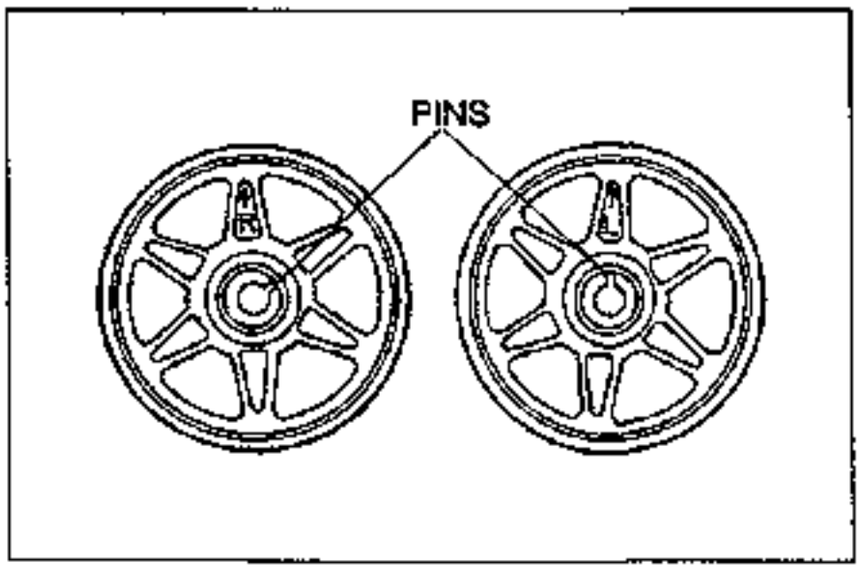
Water outlet
Install the water outlet with new O-rings.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}



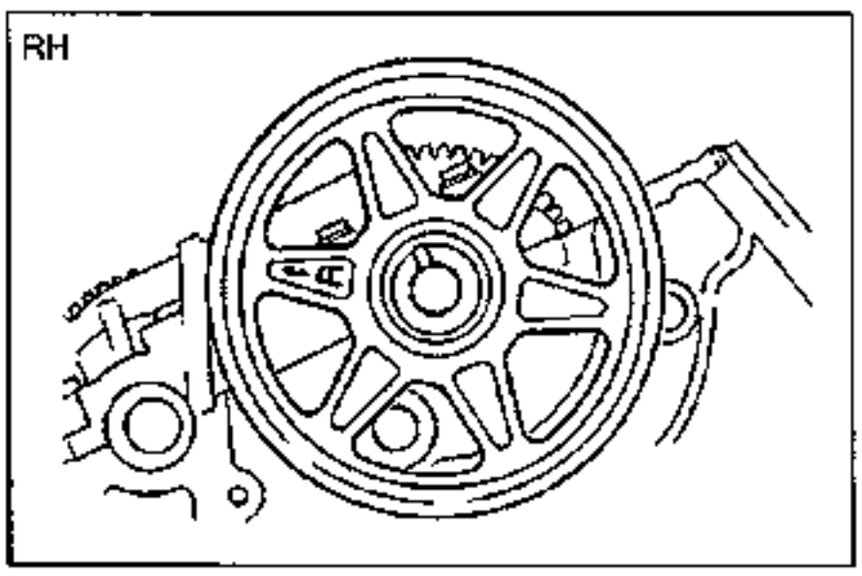
Seal Plate
Install the seal plate.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}

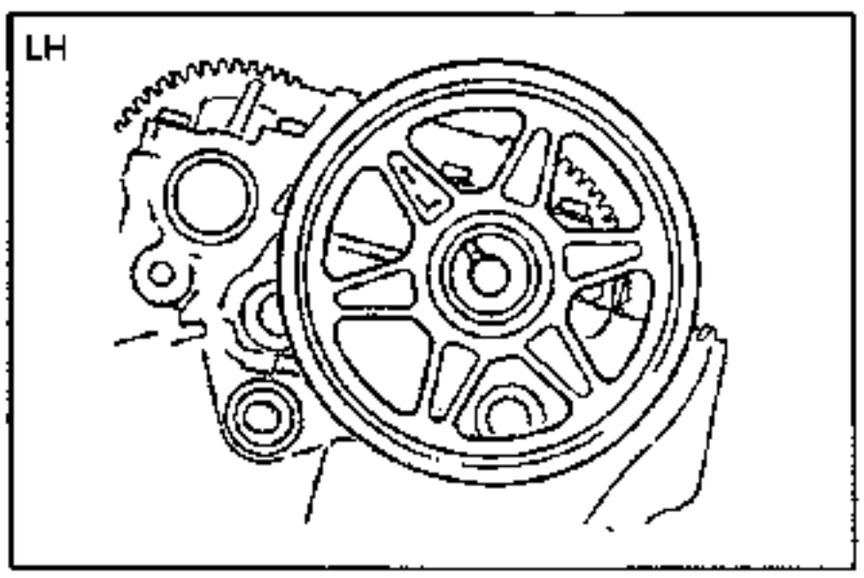


Camshaft Pulley

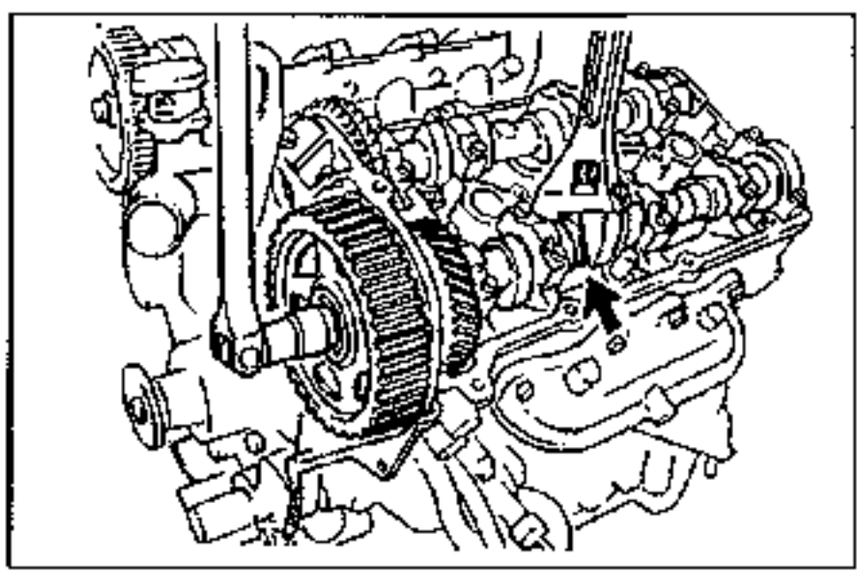
1. The right and left pulleys are different and must be installed on the same head that they were removed from.



2. Install the camshaft pulley so that the "R" mark can be seen and the timing mark aligns with the camshaft knock pin.



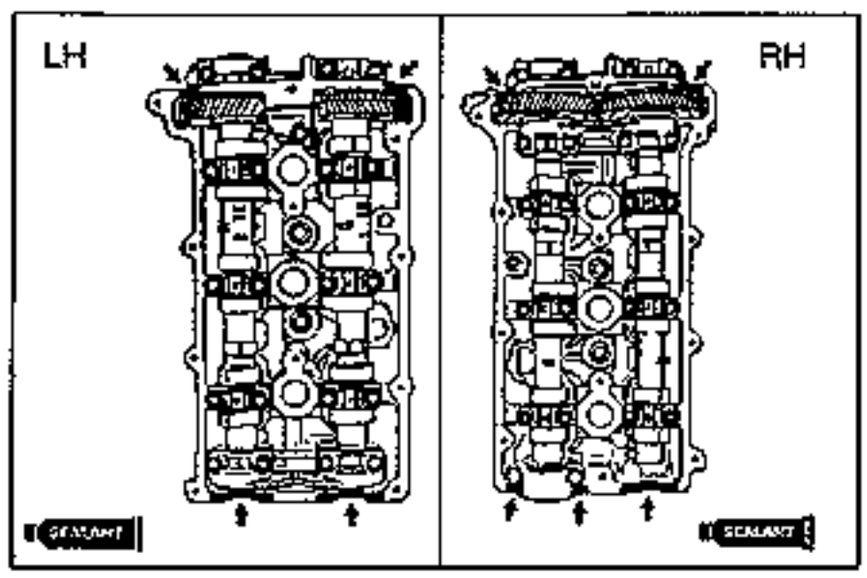
3. Install the camshaft pulley so that the "L" mark can be seen and the timing mark aligns with the camshaft knock pin.



Camshaft Pulley Lock bolt

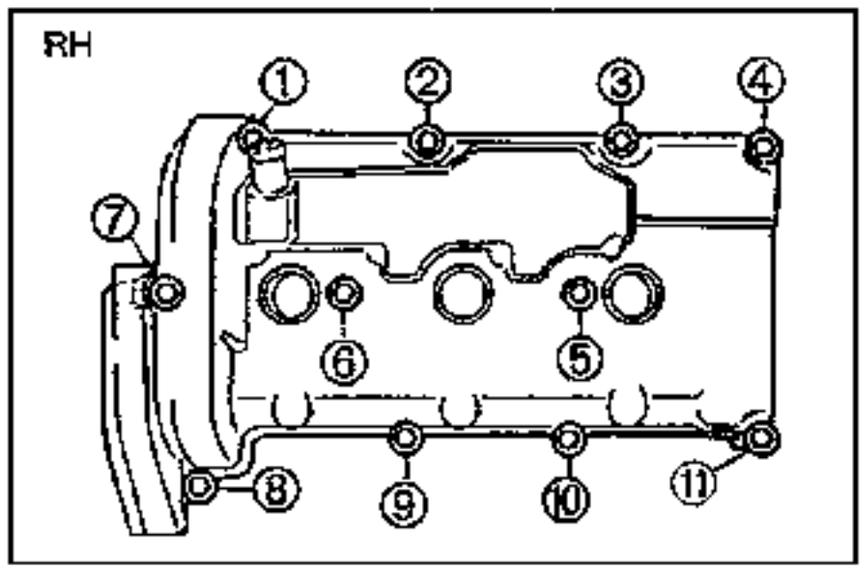
1. Apply clean engine oil to the lock bolt threads.
2. Hold the camshaft by using a wrench on the cast hexagon as shown, and tighten the bolt.

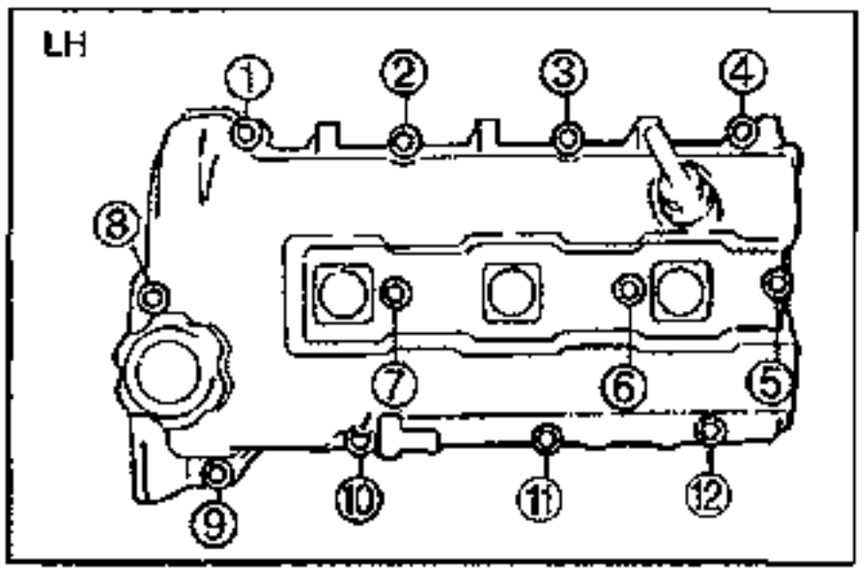
Tightening torque:
123–140 N·m {12.5–14.3 kgf·m, 91–103 ft·lbf}



Cylinder Head Cover

1. Remove all old silicone sealant from the cylinder head and cover.
2. Apply silicone sealant to the cylinder head cover as shown in the figure.
3. Install the new cylinder head cover gasket into the cylinder head cover.





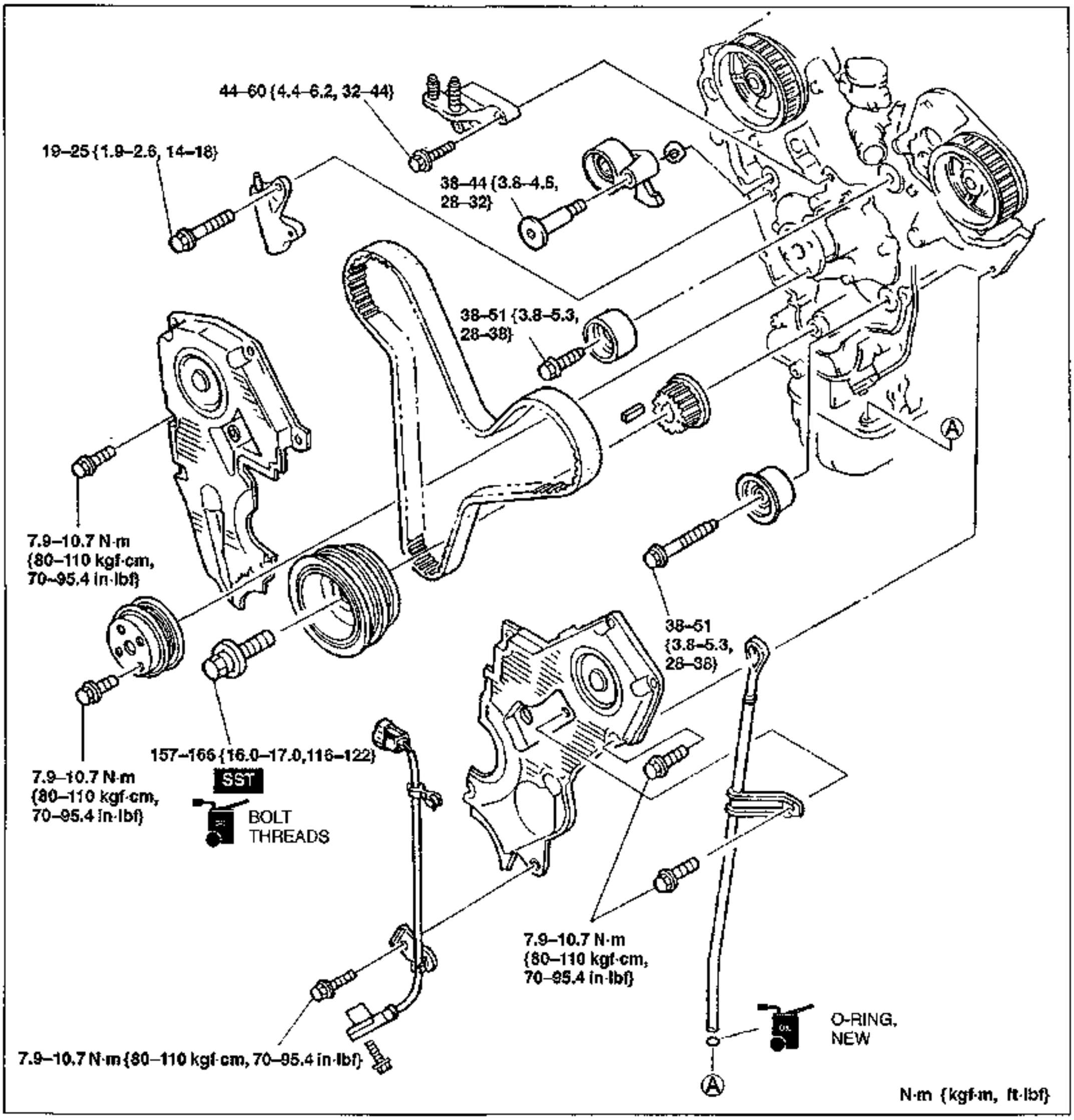
4. Install the cylinder head cover and tighten the bolts in two or three steps in the order shown.

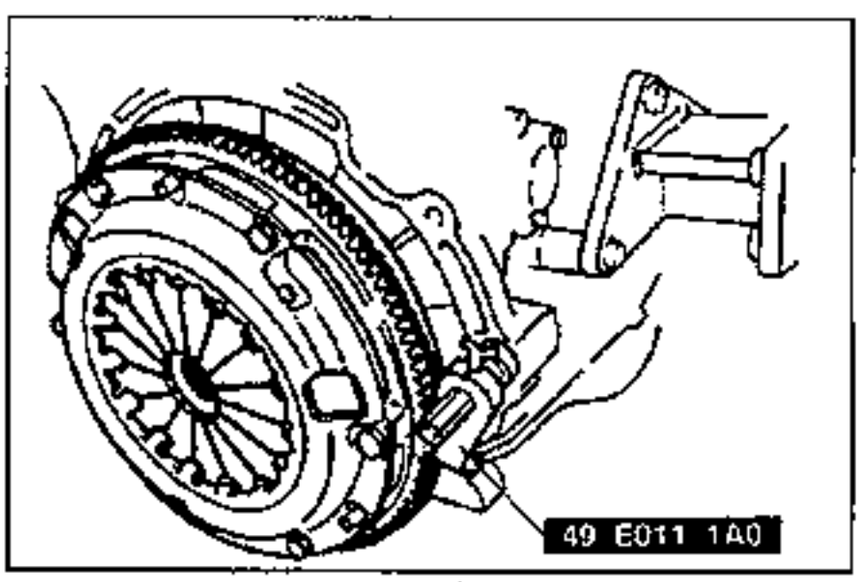
   Tightening torque:
   5.0–8.8 N·m {50–90 kgf·cm, 44–78 in·lbf}

5. Retighten cylinder head cover bolts. RH ⑤ ⑥ and LH ⑥ ⑦

   Tightening torque:
   5.0–8.8 N·m {50–90 kgf·cm, 44–78 in·lbf}

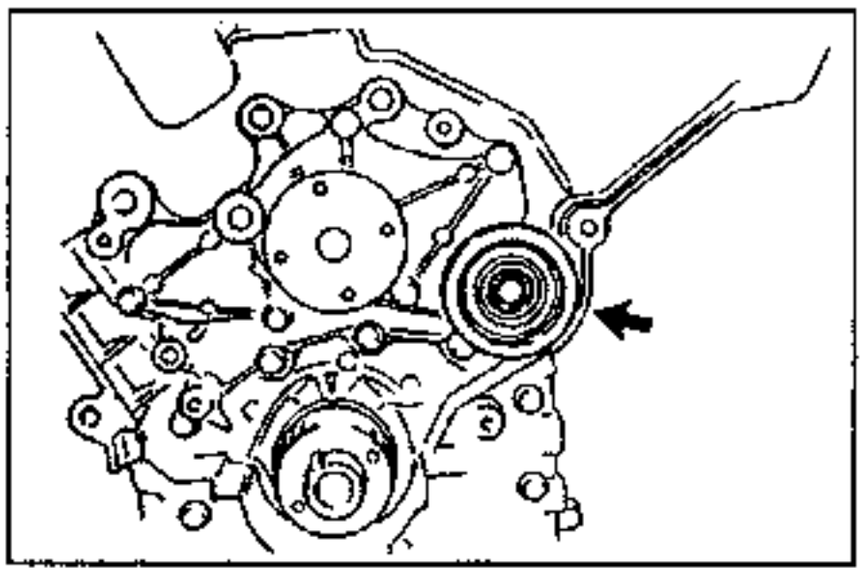
TIMING BELT
Torque Specification





Timing Belt Pulley

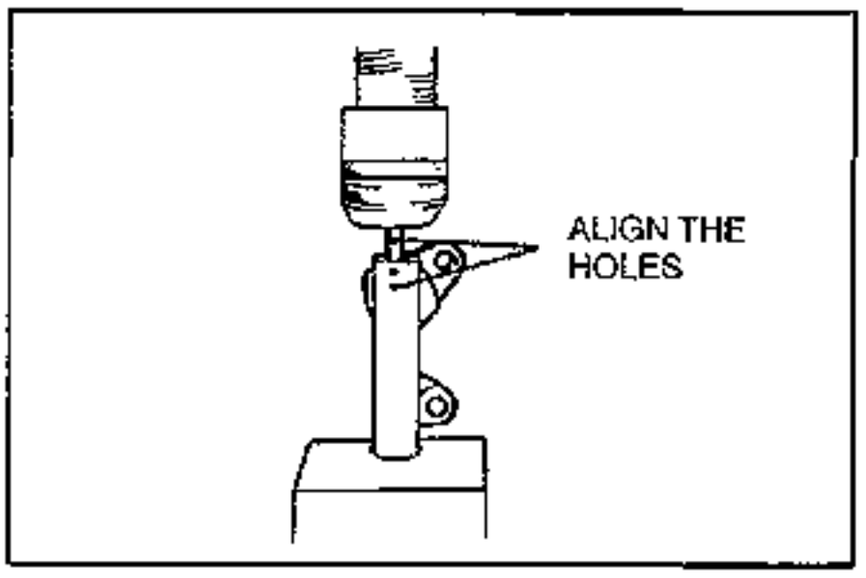
1. Hold the flywheel (MTX) or drive plate (ATX) by using the **SST**.
2. Install the crankshaft key and the timing belt pulley on the crankshaft.
3. Temporarily tighten the timing belt pulley bolt.



No.2 Idler Pulley

Install the No.2 idler pulley to the cylinder block.

Tightening torque:
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}

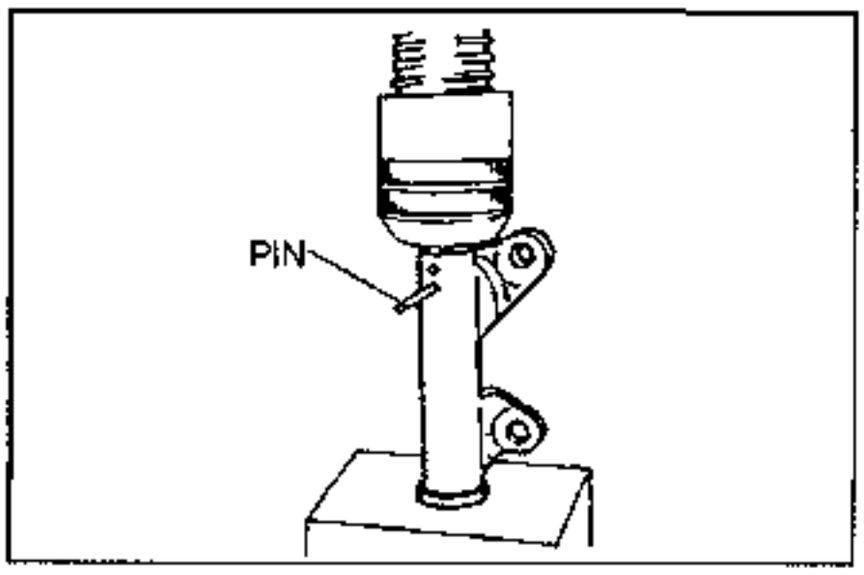


Timing Belt Auto Tensioner

1. Press in the tensioner rod slowly, using a press.

Caution

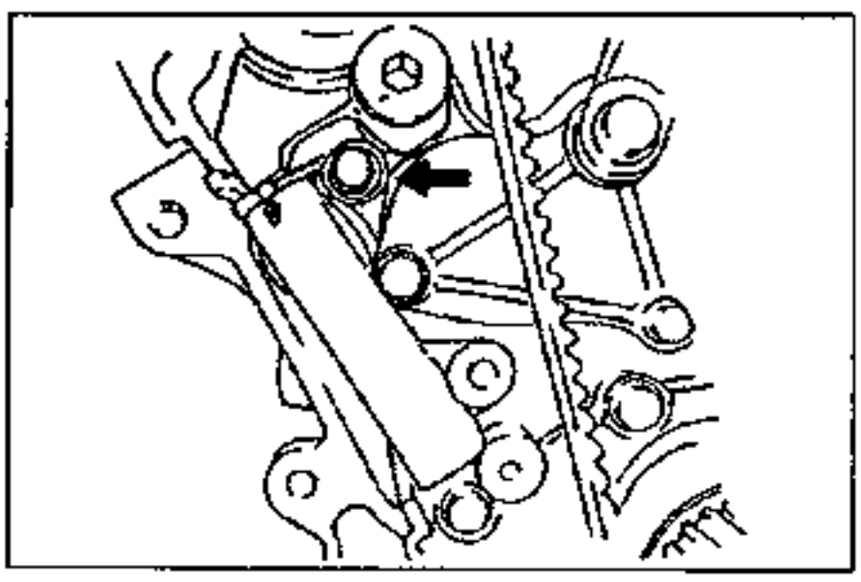
- **Do not press the tensioner rod to more than 9,810 N {1,000 kgf, 2,200 lbf}. It will damage the tensioner.**



2. Insert a pin into the second hole in the body as shown to hold the tensioner rod.

Note

- Pin diameter: 1.6 mm {0.063 in}



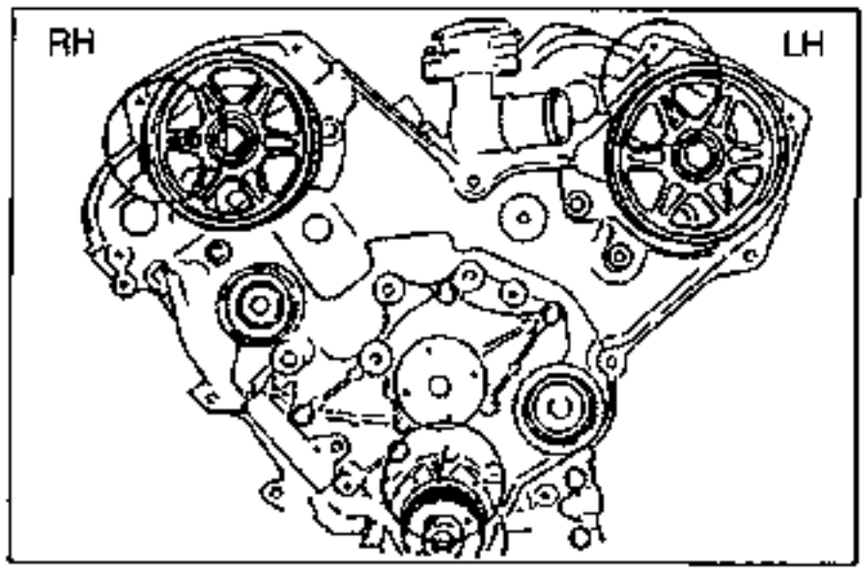
3. Set the tensioner inplace and snugly tighten the tensioner upper bolt.

Note

- This must be done to reduce the timing belt resistance when the idler pulley is installed.

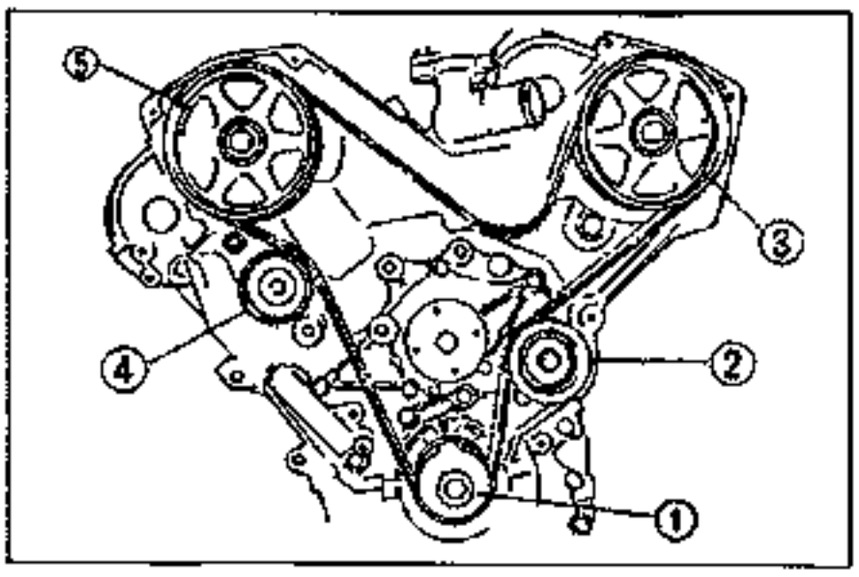
4. Install the tensioner pulley.

Tightening torque:
38–44 N·m {3.8–4.5 kgf·m, 28–32 ft·lbf}

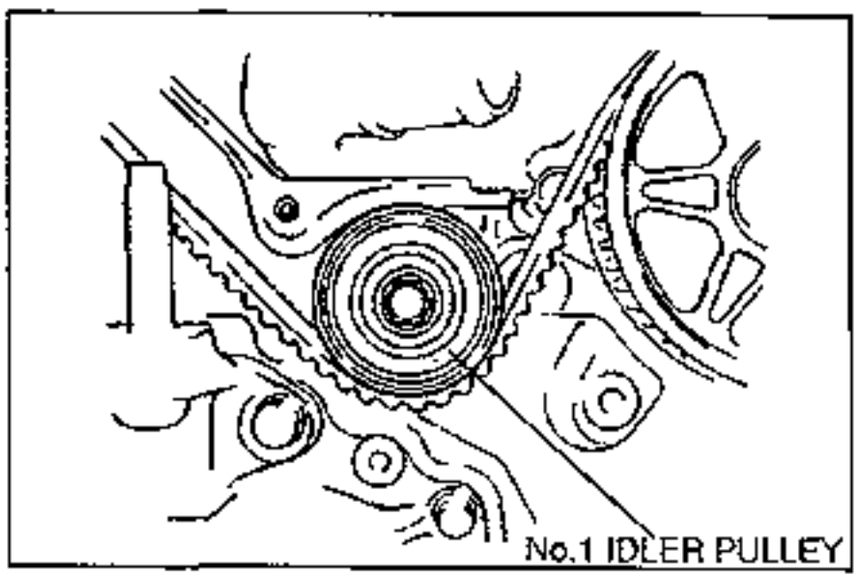


Timing Belt

1. Turn the pulleys clockwise, and align the timing marks.

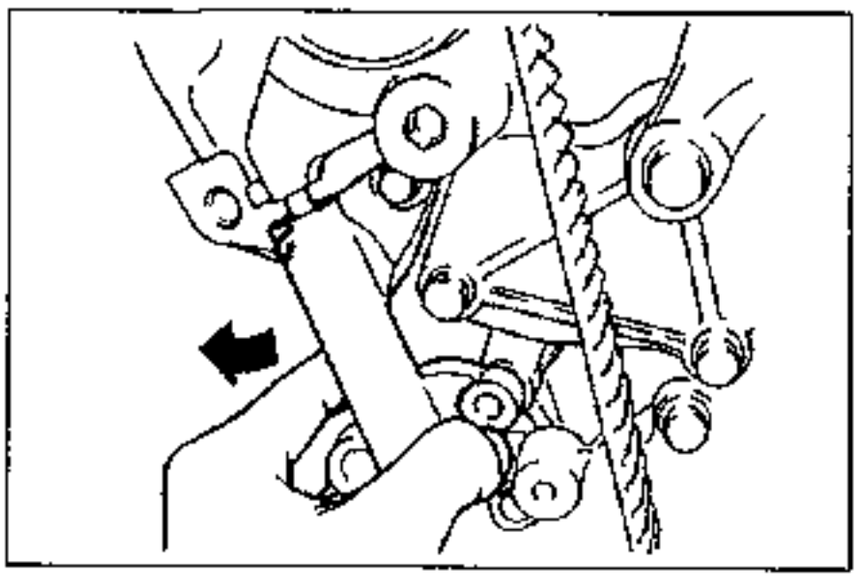


2. Install the timing belt on the pulleys in the order described below.
   ① Timing belt pulley
   ② No.2 Idler pulley
   ③ LH camshaft pulley
   ④ Tensioner pulley
   ⑤ RH camshaft pulley



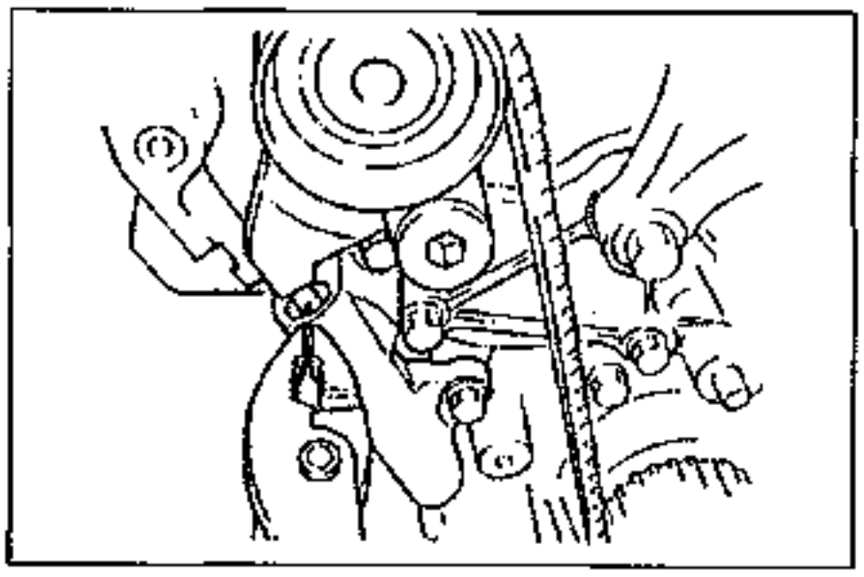
3. Verify that the belt has no looseness at the tension side.
4. Install the No.1 idler pulley while applying the pressure on the timing belt.

   Tightening torque:
   38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}



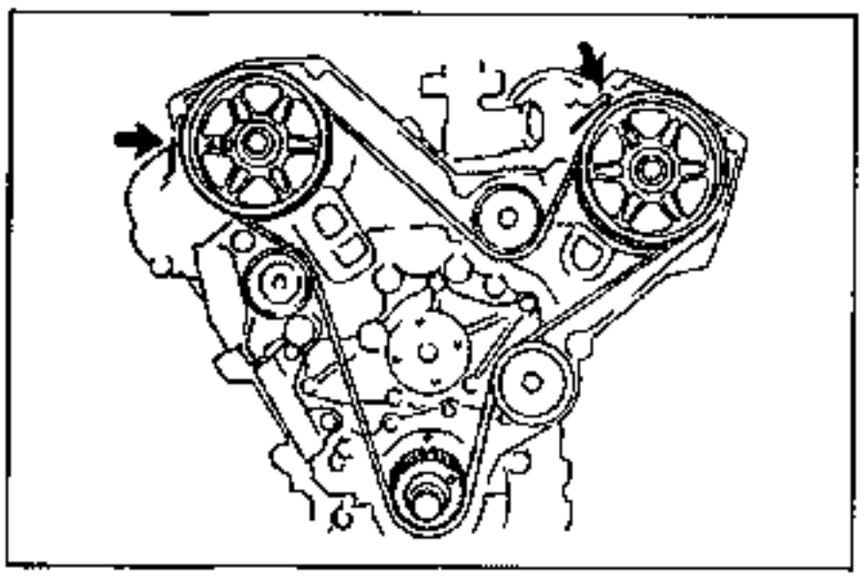
5. Push the auto tensioner in the direction of the arrow and install the lower bolt.
6. Tighten the upper and lower tensioner bolts to the specified torque.

   Tightening torque:
   19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

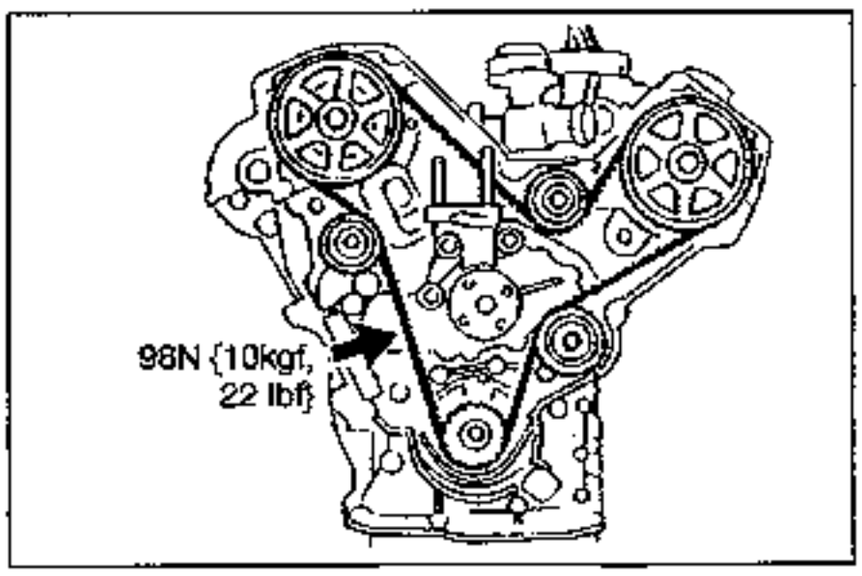


7. Remove the pin from the auto tensioner, and apply tension to the belt.
8. Tighten the tensioner pulley.

   Tightening torque:
   38–44 N·m {3.8–4.5 kgf·m, 28–32 ft·lbf}

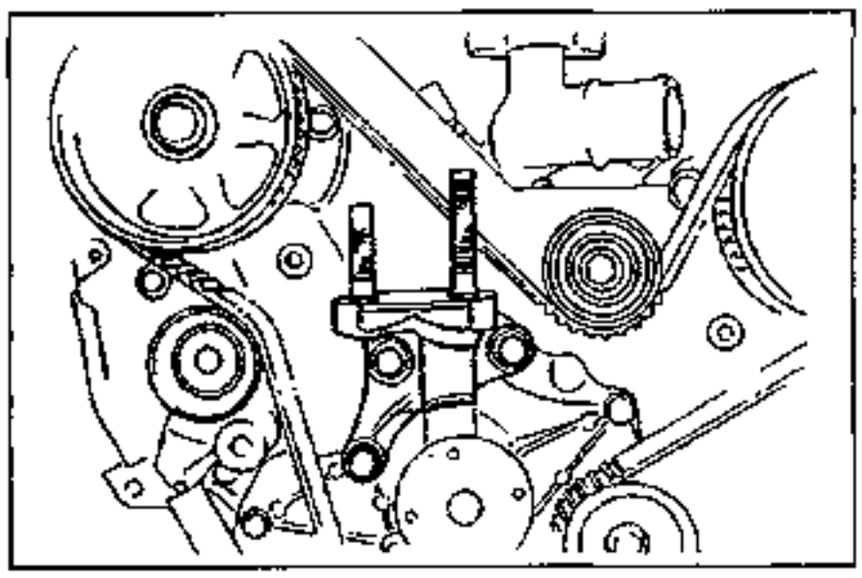


9. Turn the crankshaft clockwise twice in the direction of rotation, and align the timing marks.
10. Verify that the timing marks are correctly aligned. If not, repeat the procedure from **"Timing Belt Auto Tensioner"**. (Refer to page B2–108.)



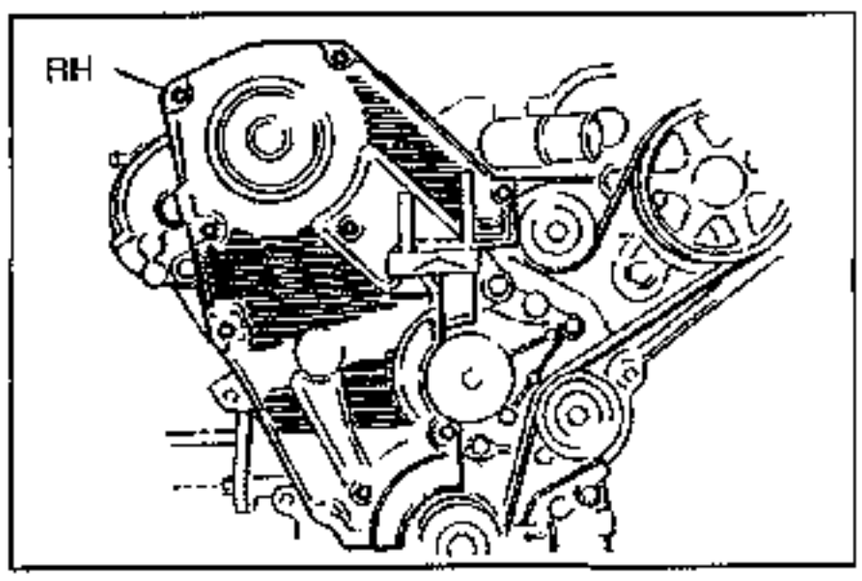
11. Check the timing belt deflection. If it is incorrect, replace the auto tensioner.

Deflection: 6–8mm {0.24–0.31 in}



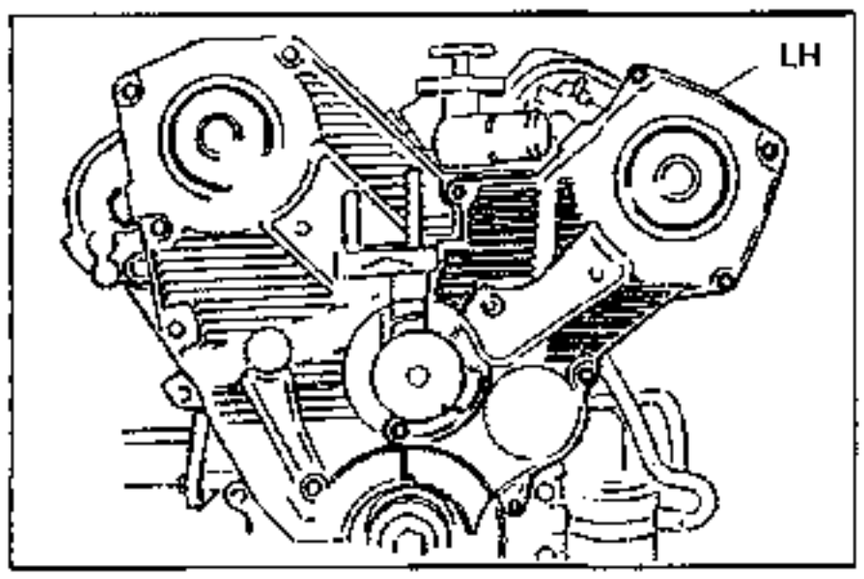
No.3 Engine Mount Bracket
Install the No.3 engine mount bracket.

Tightening torque:
44–60 N·m {4.4–6.2 kgf·m, 32–44 ft·lbf}



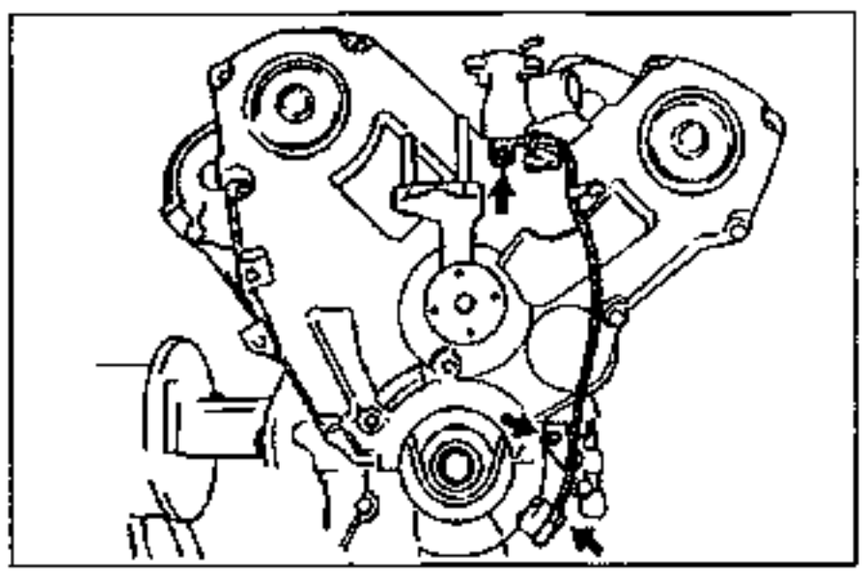
Timing Belt Cover
1. Install the right timing belt cover.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



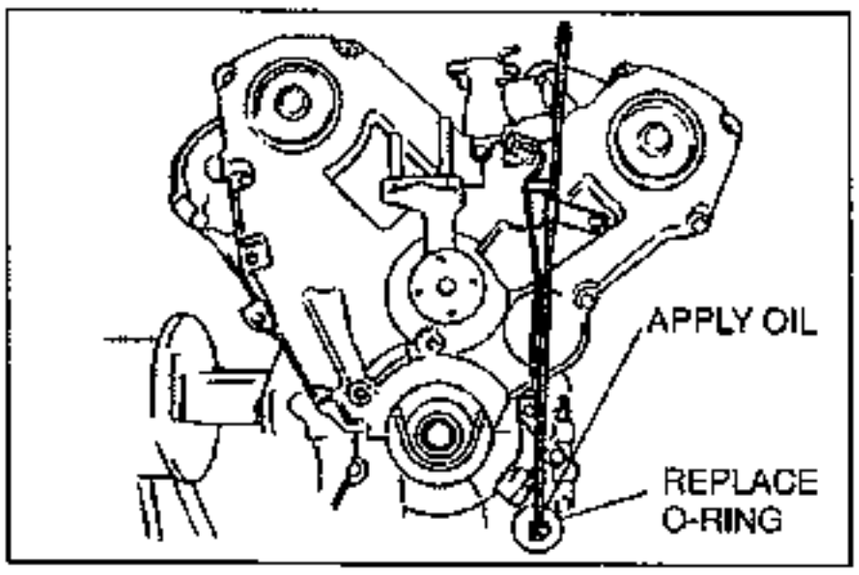
2. Install the left timing belt cover.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



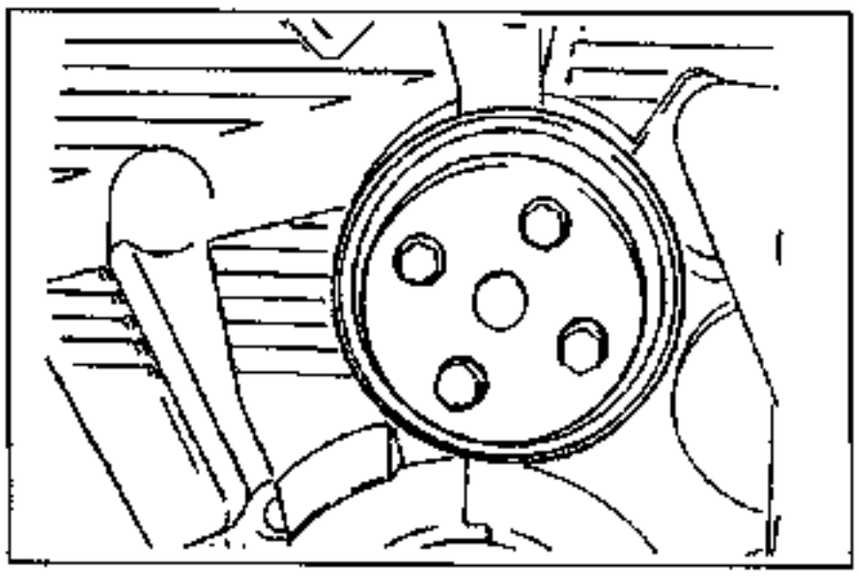
Crankshaft Position Sensor
Install the crankshaft position sensor.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



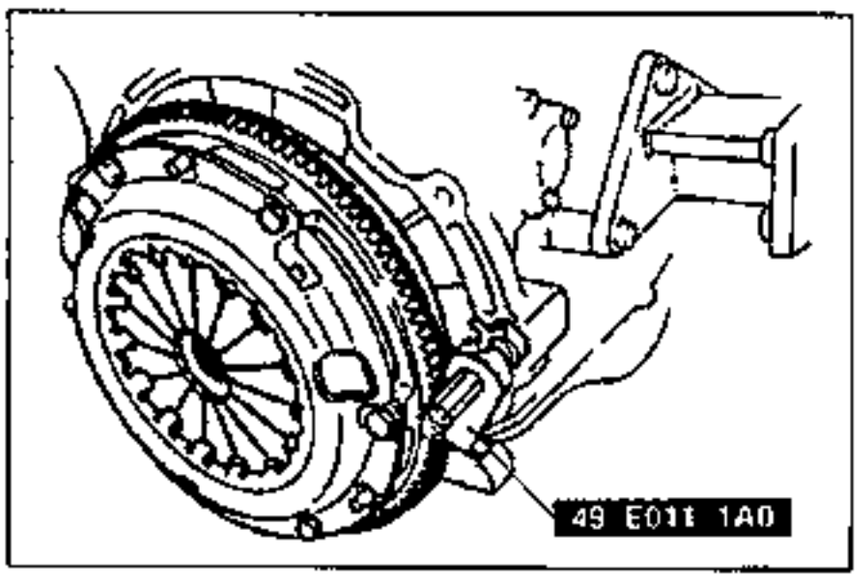
Dipstick and Pipe
Install the dipstick and pipe with the clip.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



Water Pump Pulley
Install the water pump pulley.

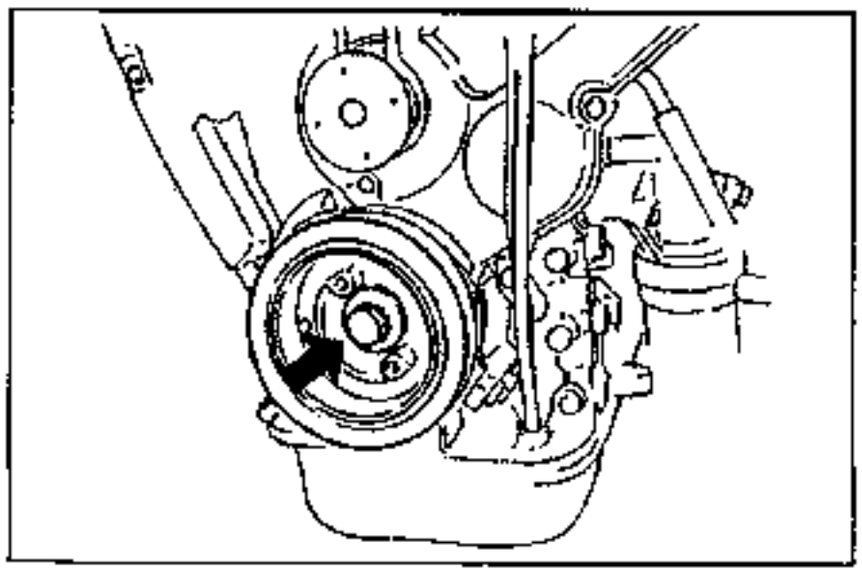
Tightening torque:
7.9–10.7 N·m {80–110 kgf·m, 70–95.4 in·lbf}



Crankshaft Pulley
1. Hold the flywheel (MTX) or drive plate (ATX) by using the **SST**.
2. Remove the crankshaft pulley bolt.

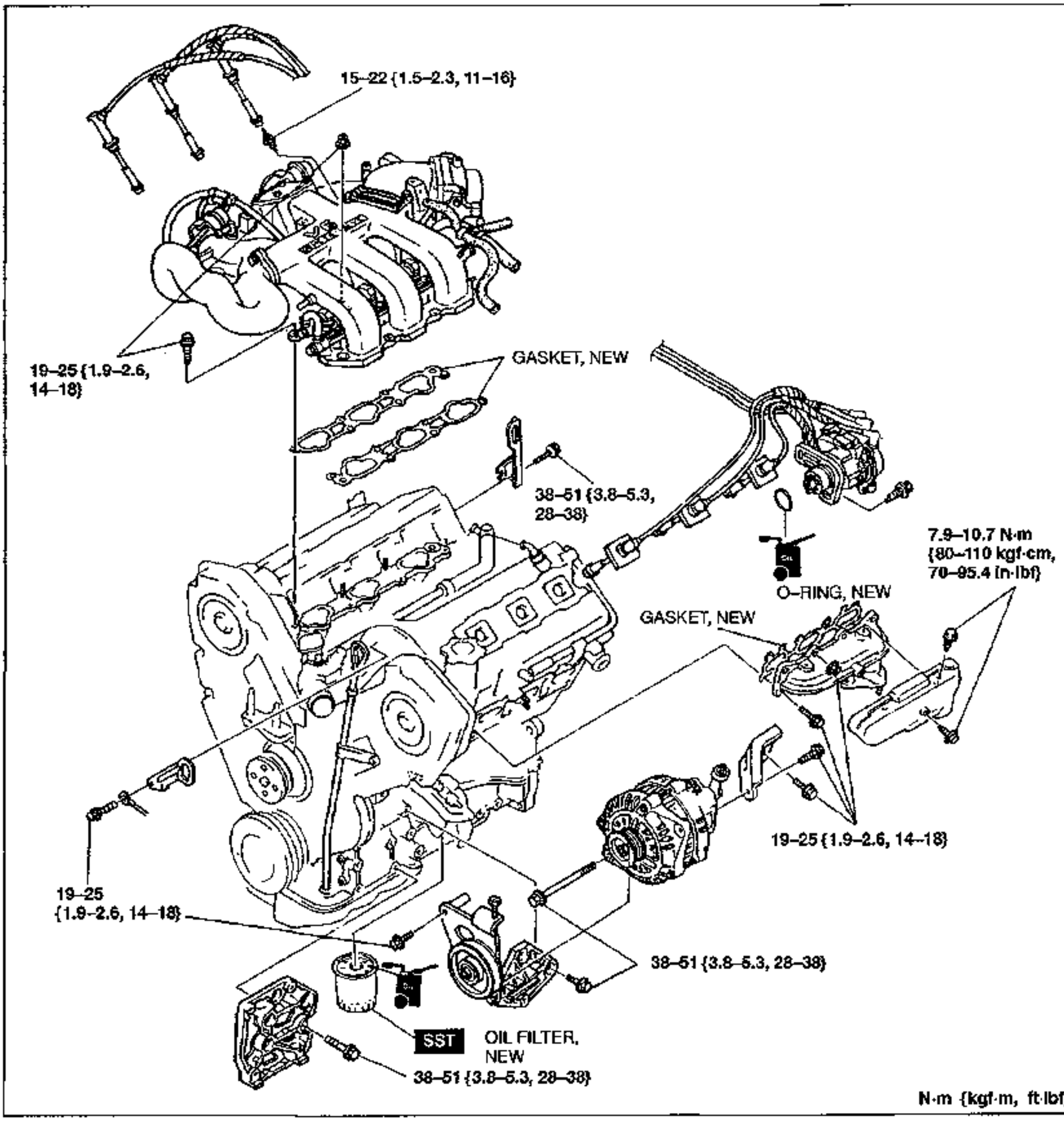
Caution
- **Install the crankshaft pulley carefully. The crankshaft position sensor rotor is on the rear of the pulley, and can be damaged easily.**

3. Install the crankshaft pulley onto the crankshaft.
4. Apply clean engine oil to the bolt threads.
5. Tighten the crankshaft pulley.

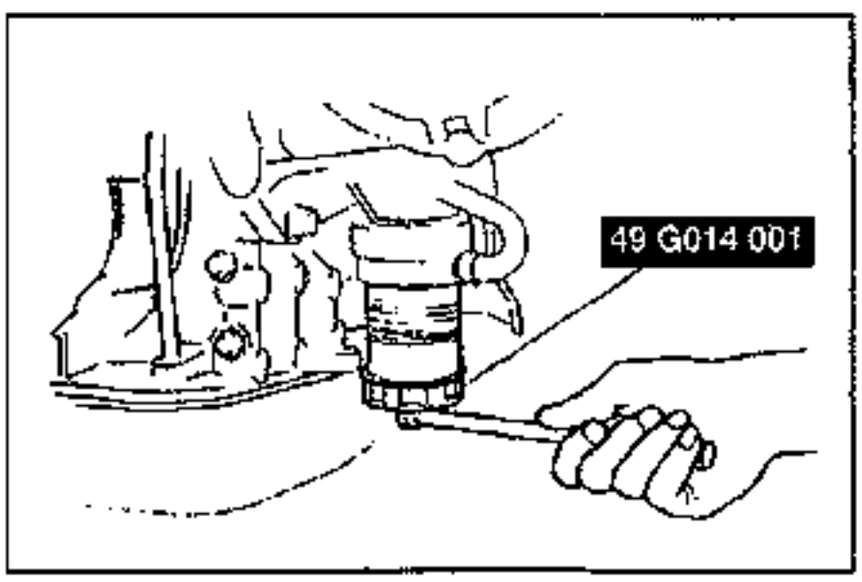


Tightening torque:
157–166 N·m {16.0–17.0 kgf·m, 116–122 ft·lbf}

AUXILIARY PARTS
Torque Specifications

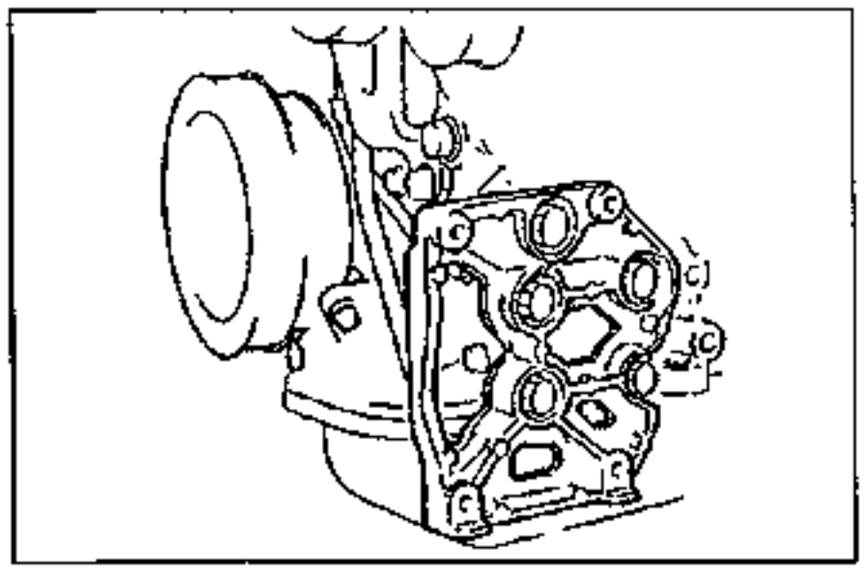


N·m {kgf·m, ft·lbf}



Oil Filter

1. Apply a small amount of clean engine oil to the rubber seal of the new oil filter.
2. Install the filter and tighten it by hand until the rubber seal contacts the mounting base.
3. Tighten the filter 1~1/6 turns by using the **SST**.

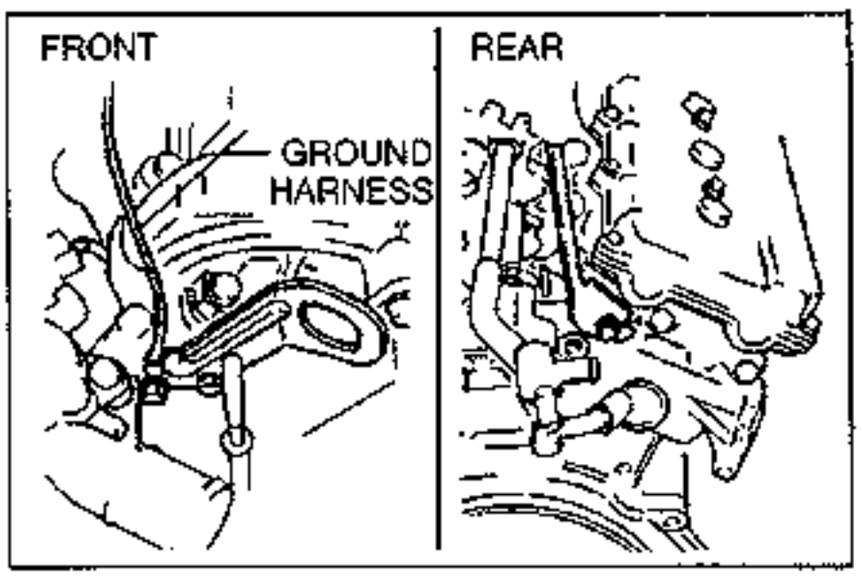


Spark Plug
Install the spark plugs.

Tightening torque:
15–22 N·m {1.5–2.3 kgf·m, 11–16 ft·lbf}

A/C Compressor Bracket (If equipped)
Install the A/C compressor bracket.

Tightening torque:
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}

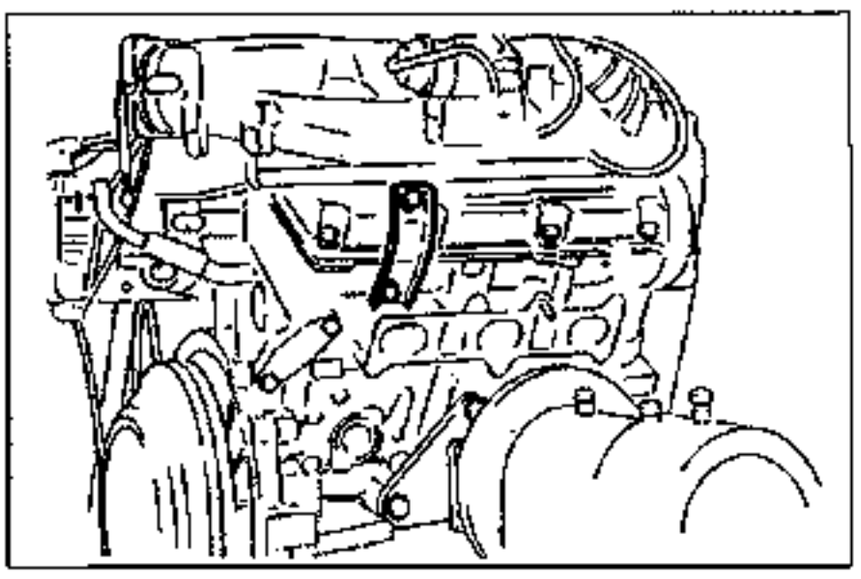


Engine Hanger
1. Install the front engine hanger and the ground harness.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

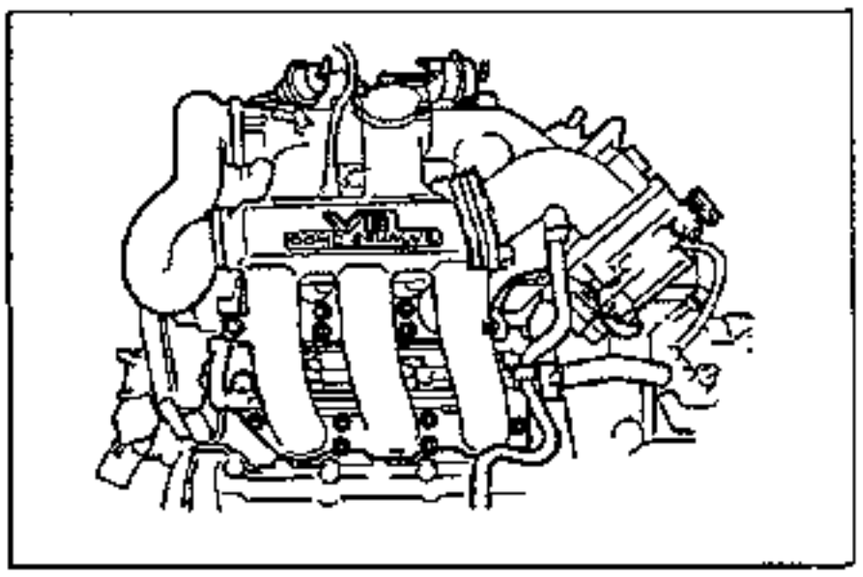
2. Install the rear engine hanger.

Tightening torque:
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}



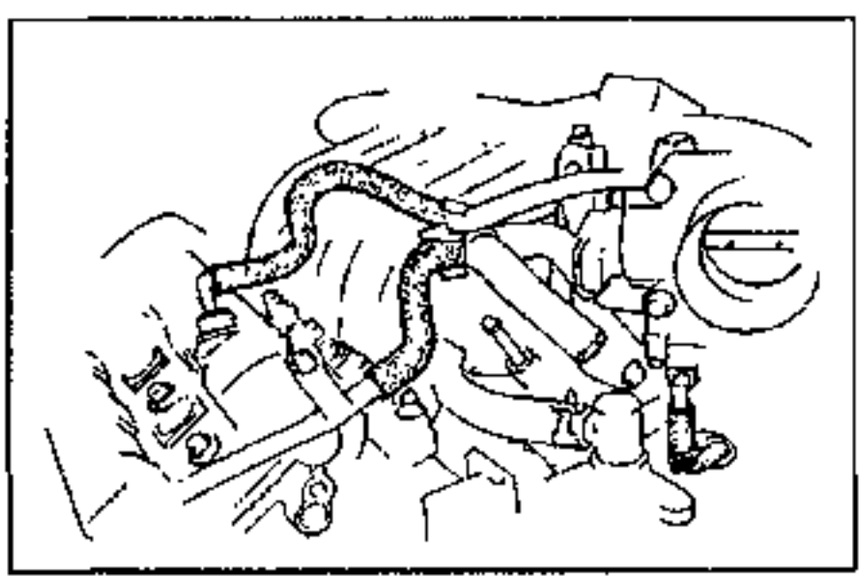
Intake Manifold Assembly
1. Install new gaskets and the intake manifold assembly. Hand tighten the bolts and nuts.
2. Install the intake manifold bracket.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

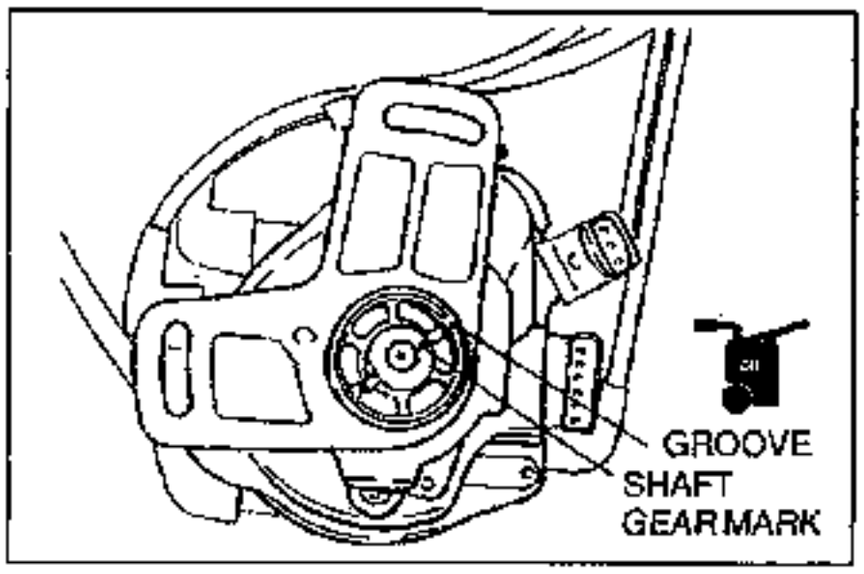


3. Tighten the intake manifold bolts and nuts in two or three steps.

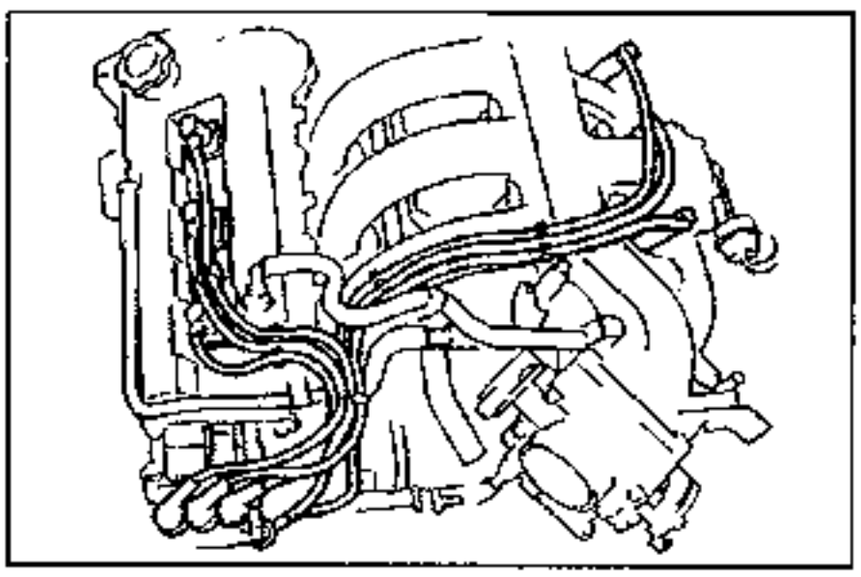
Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}



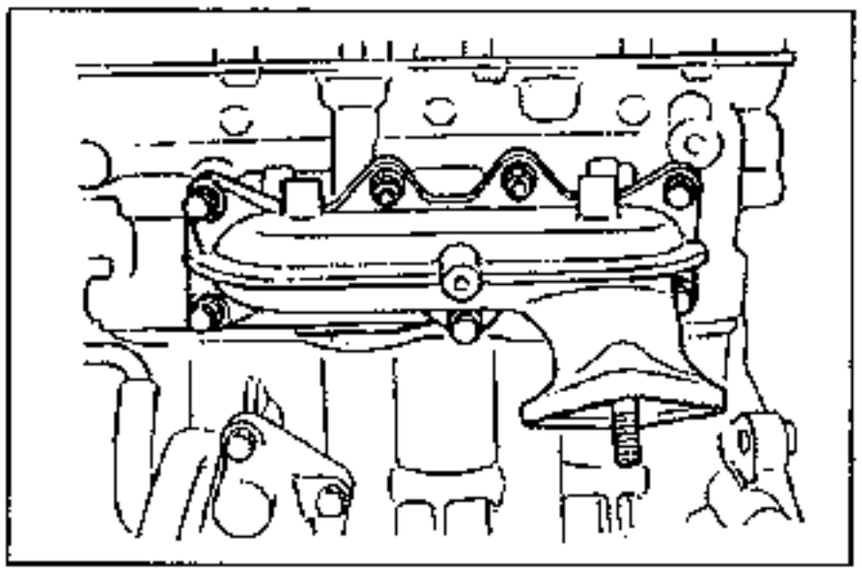
4. Connect the hoses.



Distributor
1. Apply clean engine oil to a new O-ring and position it on the distributor.
2. Apply engine oil to the drive blade.
3. Align the groove of the distributor body and shaft gear mark.
4. Install the distributor with the blade fit into the camshaft groove.

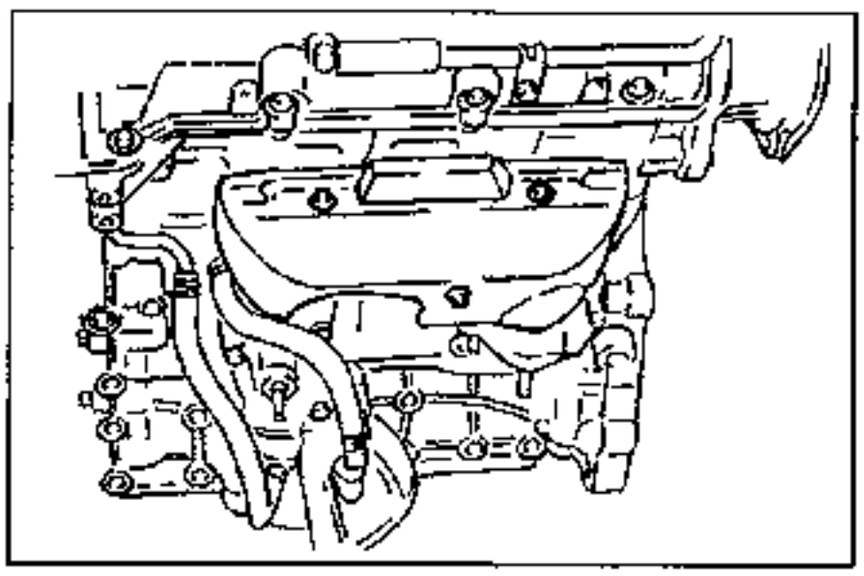


5. Hand tighten the distributor mounting bolts.
6. Connect the high-tension leads.



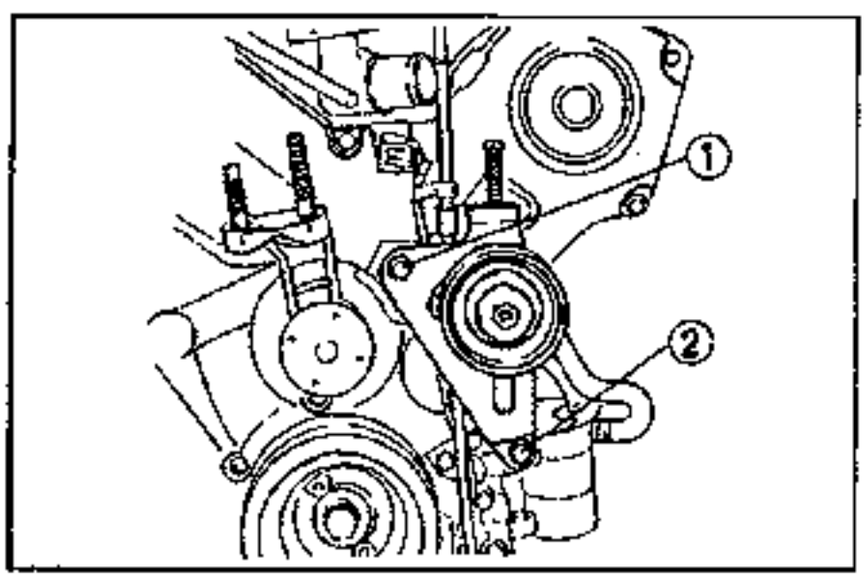
Exhaust Manifold Assembly (LH)
1. Place a new gasket in position.
2. Install the left exhaust manifold.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}



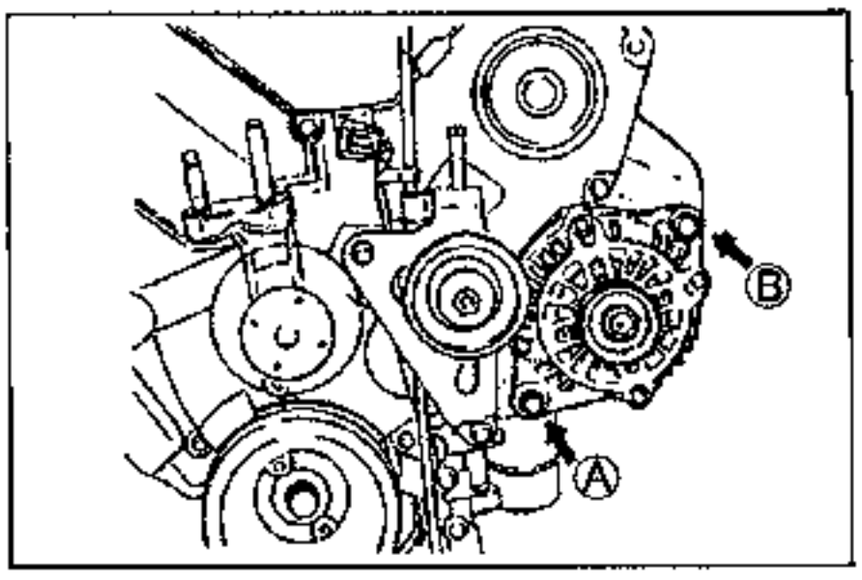
Exhaust Manifold Insulator (LH)
Install the left exhaust manifold insulator.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



Bracket and Tensioner
1. Install the bracket and tensioner.
2. Hand tighten the bolt ①, then bolt ②.
3. Tighten the bolt ②, then bolt ① to the specified torque.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}



Generator

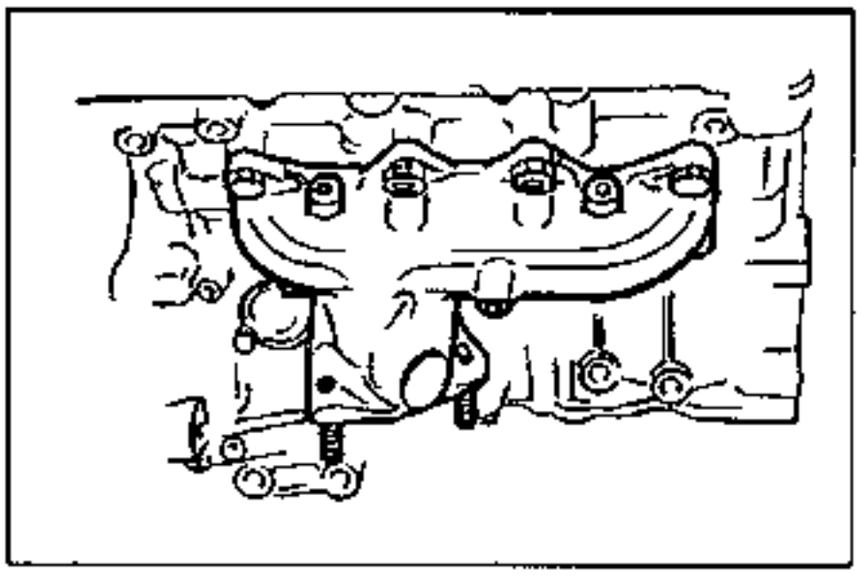
Install the generator and the bracket.

Tightening torque:
Ⓐ: 38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}
Ⓑ: 19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

ENGINE STAND DISMOUNTING

PROCEDURE

1. Remove the engine from the **SST** (Engine stand).
2. Remove the **SST** (Engine hanger) from the engine in the reverse order of installation.
(Refer to page B2–53.)

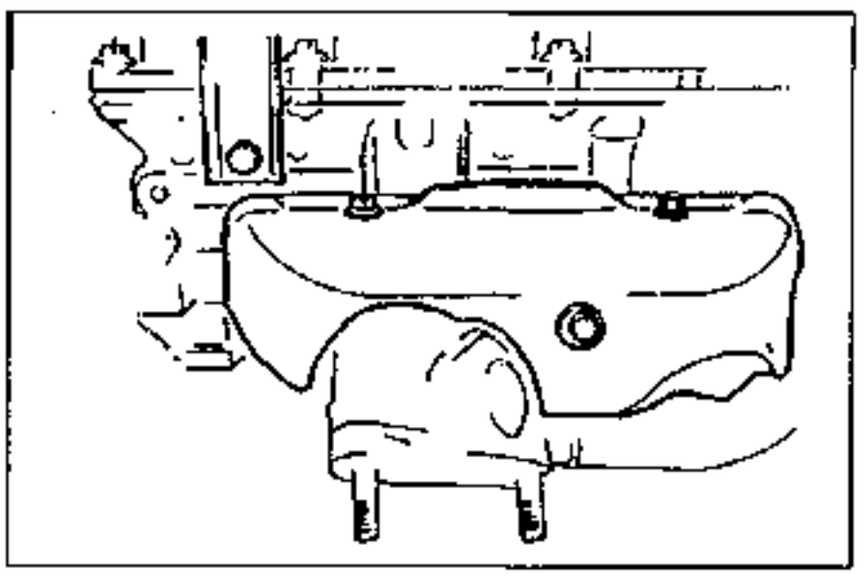


3. Install a new gasket and the right exhaust manifold (RH) together with the EGR pipe.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

4. Tighten the EGR pipe.

Tightening torque:
54–68 N·m {5.5–7.0 kgf·m, 40–50 ft·lbf}



5. Install the right exhaust manifold insulator (RH).

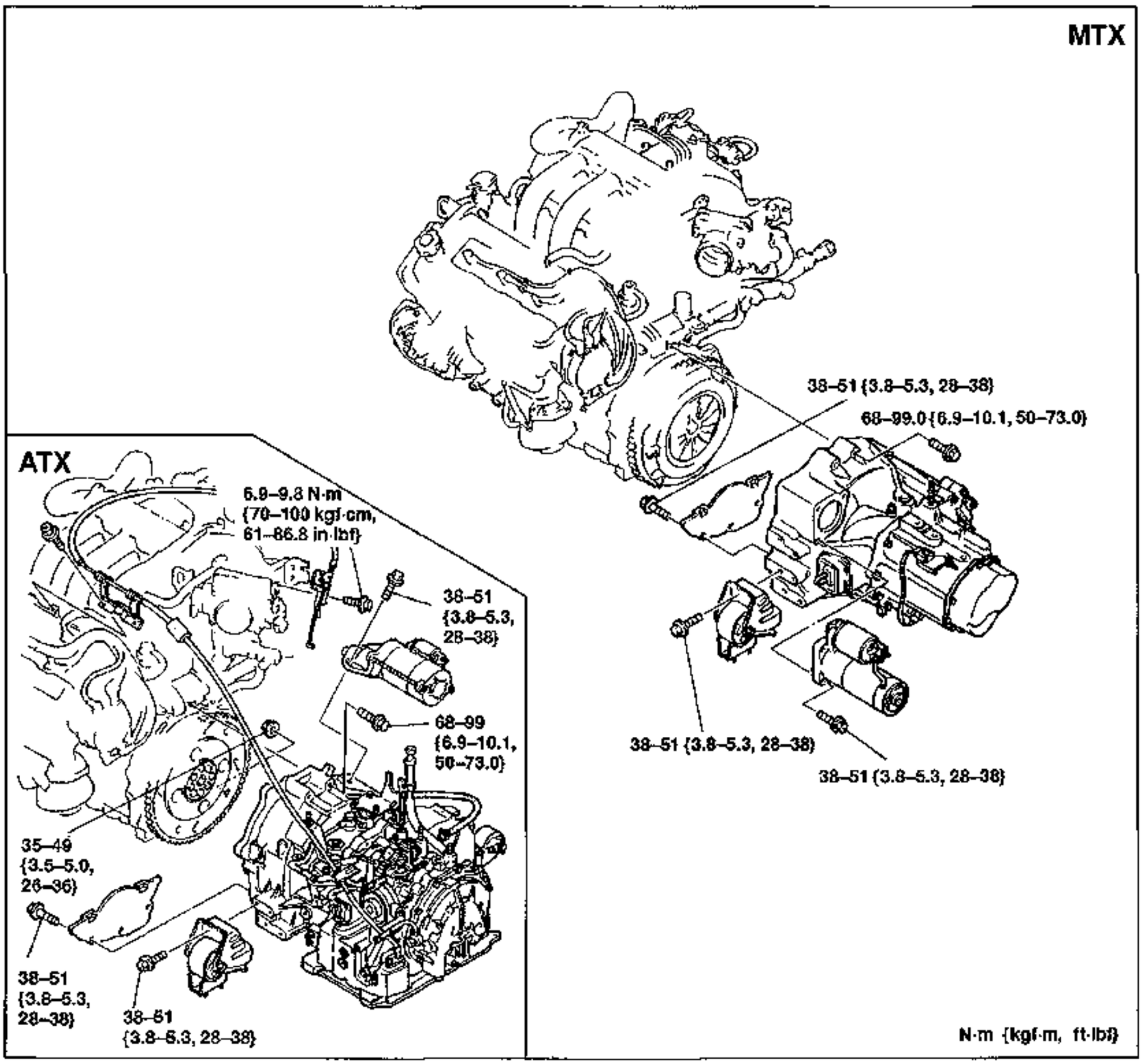
Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}

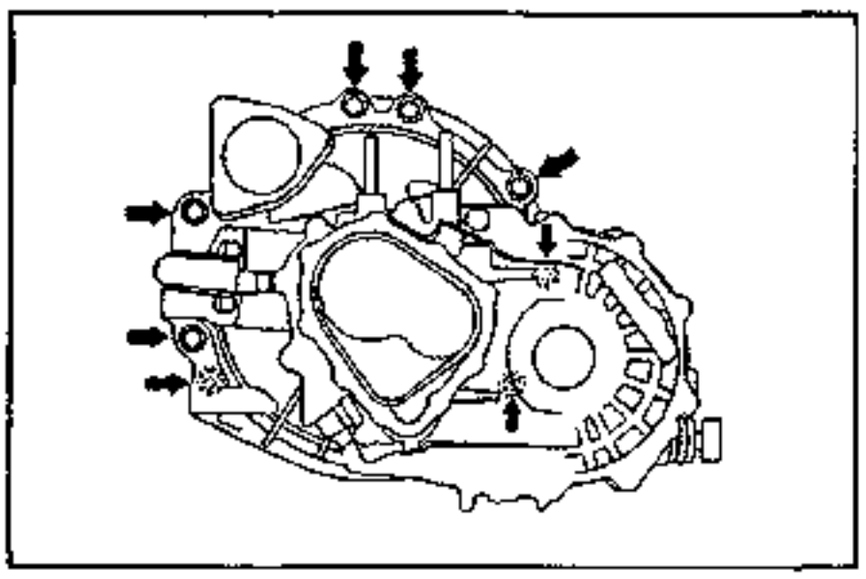
INSTALLATION

PROCEDURE

Tighten all bolts and nuts to the specified torques.

Step 1
Torque Specifications

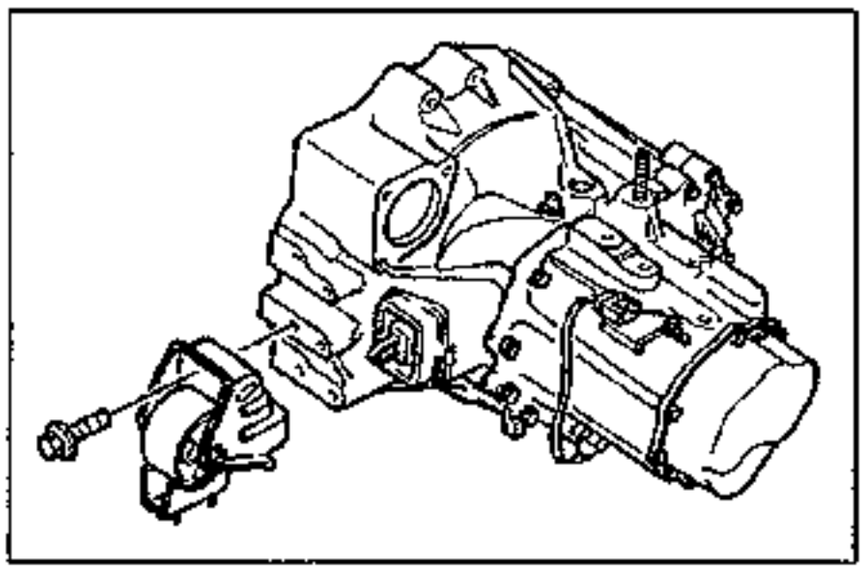




Transaxle

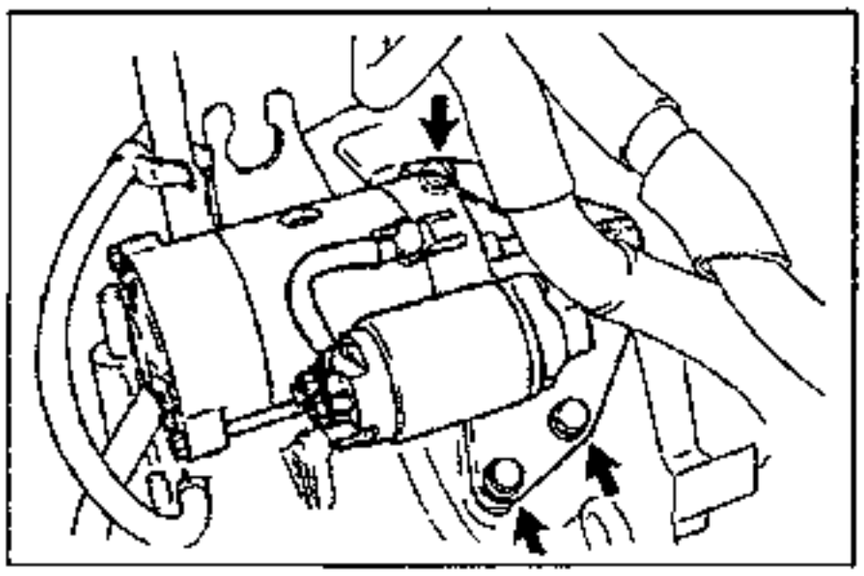
1. Join the engine and transaxle.
2. Install the transaxle mounting bolts.
3. Tighten the bolts shown.

Tightening torque:
68–99.0 N·m {6.9–10.1 kgf·m, 50–73.0 ft·lbf}



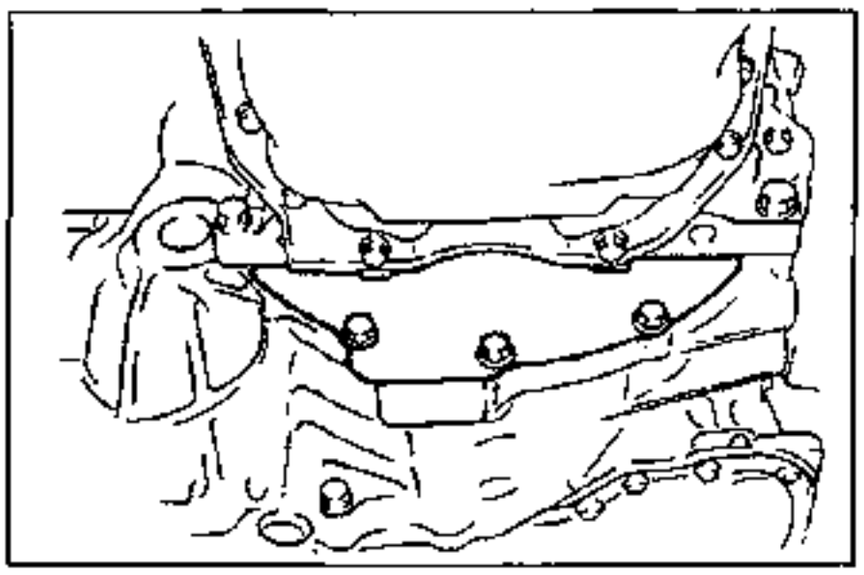
No.2 engine mount rubber and bracket
Install the mount rubber and bracket.

Tightening torque:
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}



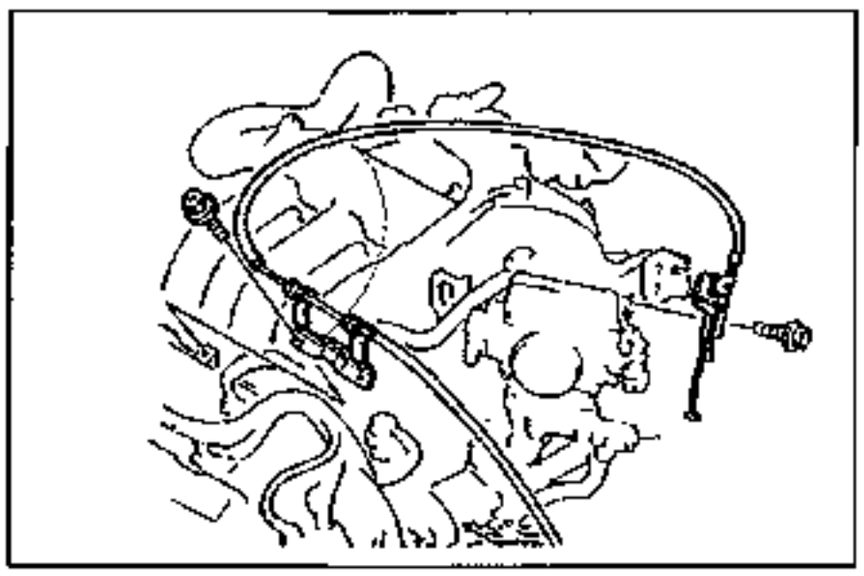
Starter
Install the starter to the transaxle housing.

Tightening torque:
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}



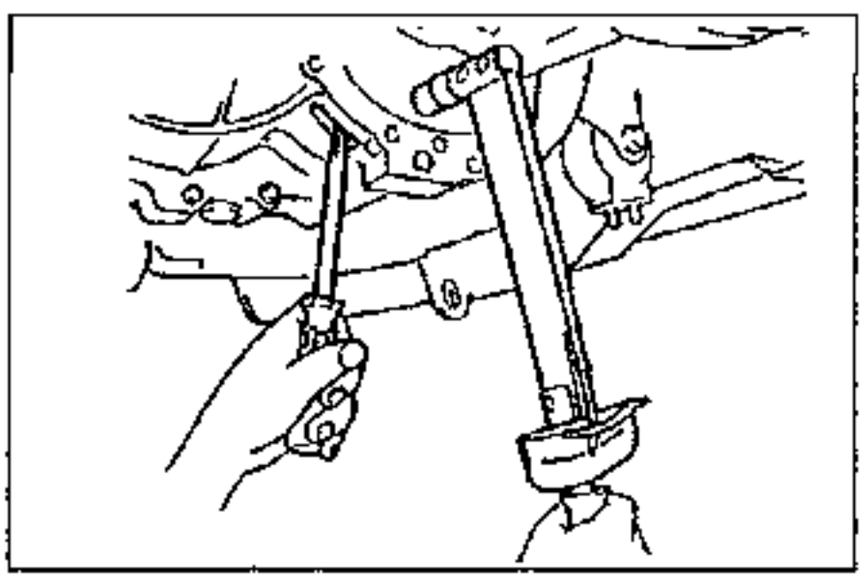
Seal plate
Install the seal plate.

Tightening torque:
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}



Throttle cable (ATX)
Install the throttle cable.

Tightening torque:
6.9–9.8 N·m {70–100 kgf·cm, 61–86.8 in·lbf}



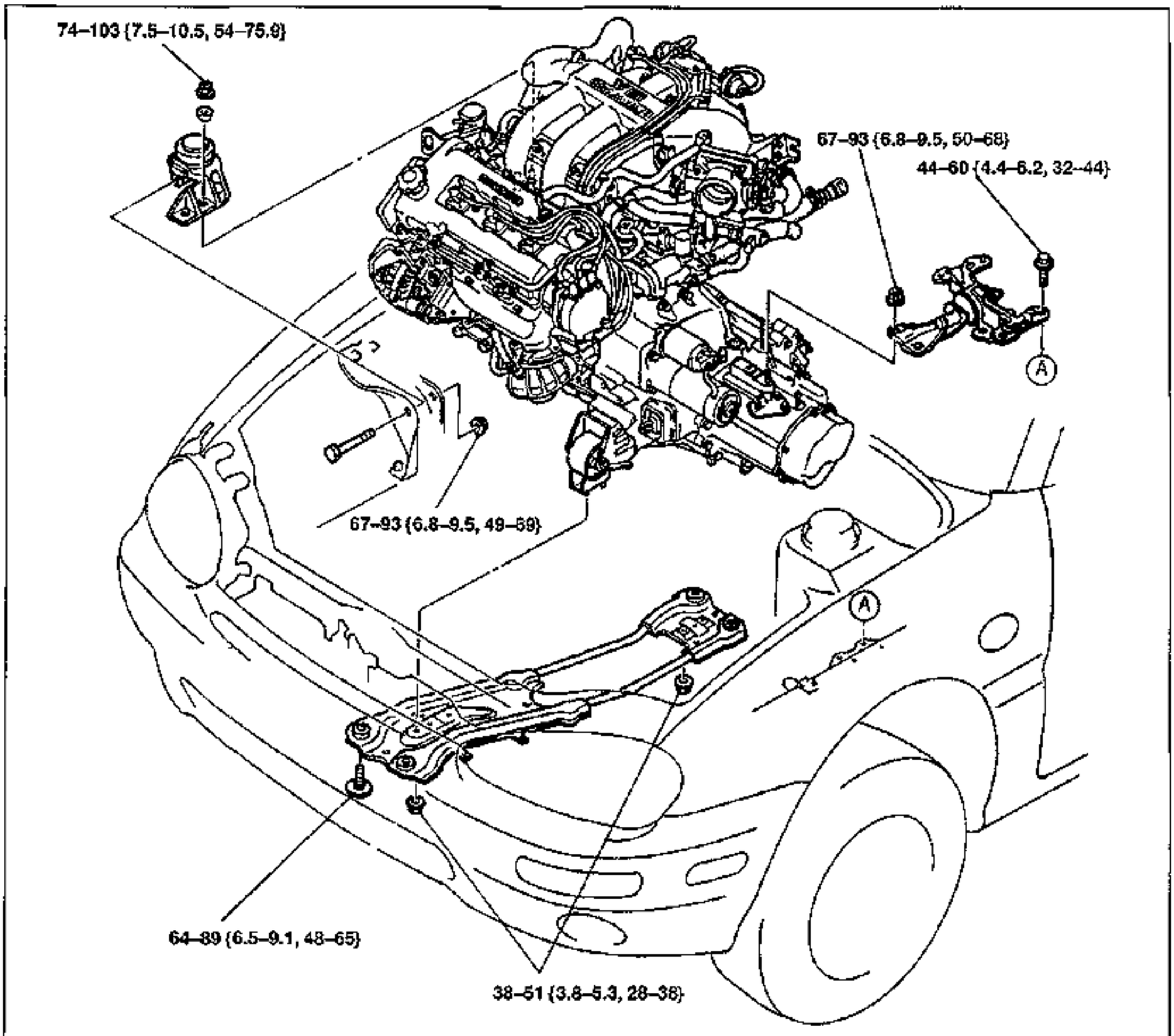
Torque converter nut (ATX)
1. Hold the drive plate by using a screwdriver inserted through the service hole from the converter housing side.
2. Insert a torque wrench through the service hole from the oil pan side. Tighten the nuts evenly and gradually.

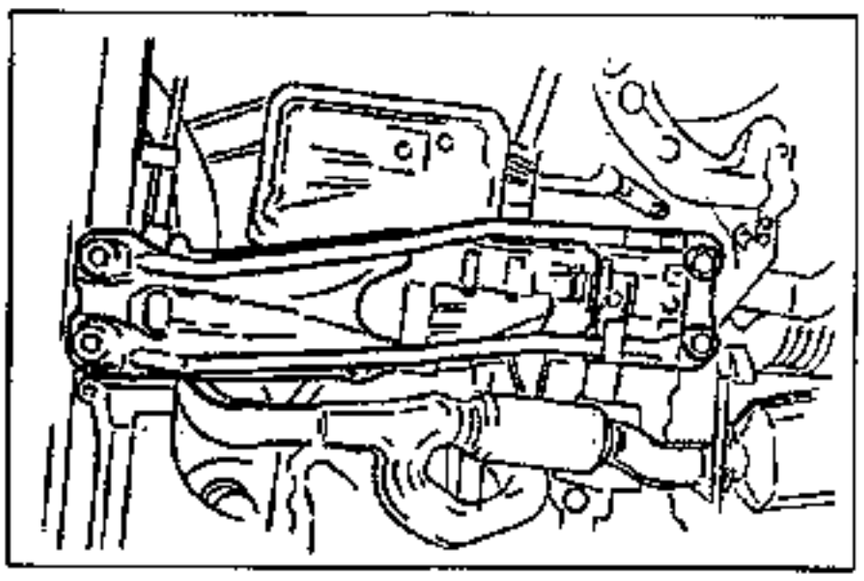
Tightening torque:
35–49 N·m {3.5–5.0 kgf·m, 26–36 ft·lbf}

Step 2

Warning
- A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.

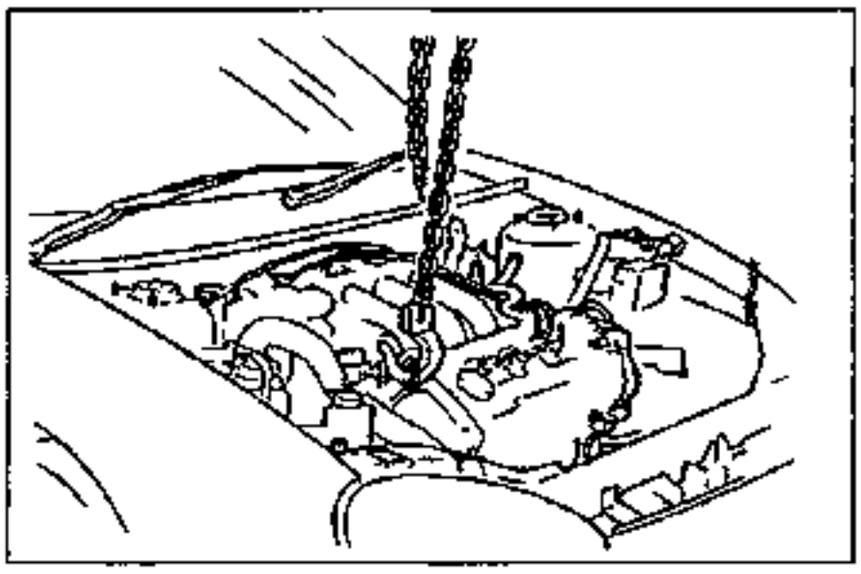
Torque Specifications





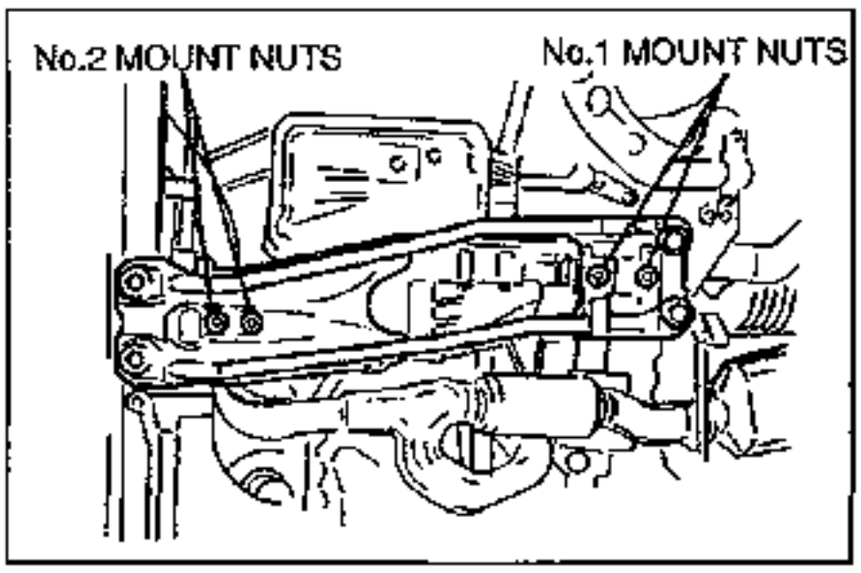
Engine mount member
Install the engine mount member.

Tightening torque:
64–89 N·m {6.5–9.1 kgf·m, 48–65 ft·lbf}



Engine and transaxle assembly

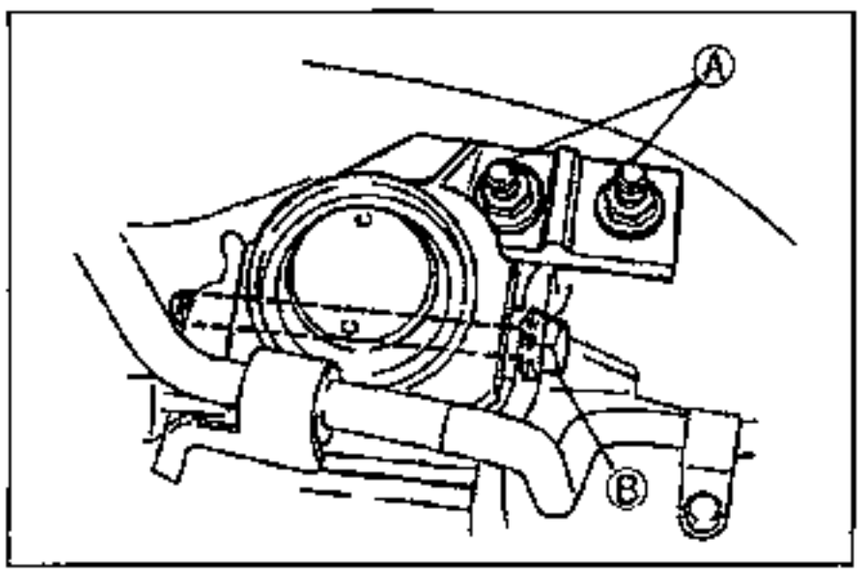
1. Suspend the engine and transaxle assembly.
2. Slowly lower the engine and transaxle assembly as a unit. Keep the engine from swinging or bumping into components in the engine compartment.
3. Install the engine and transaxle assembly in the engine compartment.
4. Align the engine mounts with the engine mount member mounting holes.



Engine mount

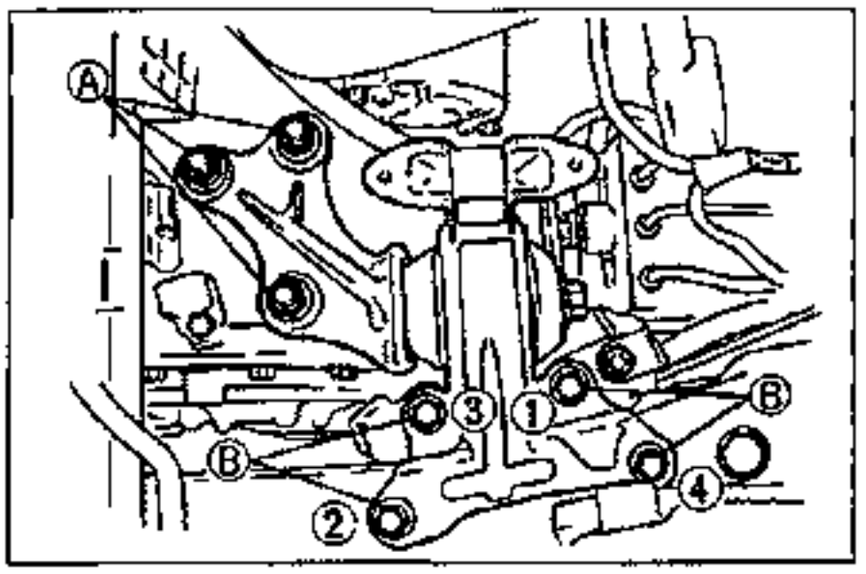
1. Install and tighten the engine mount nuts of the No.1 and No.2 mounts.

Tightening torque:
38–52 N·m {3.8–5.3 kgf·m, 27–38 ft·lbf}



2. Install the No.3 engine mount rubber.

Tightening torque:
Ⓐ: 74–103 N·m {7.5–10.5 kgf·m, 54–75.9 ft·lbf}
Ⓑ: 67–93 N·m {6.8–9.5 kgf·m, 49–68 ft·lbf}



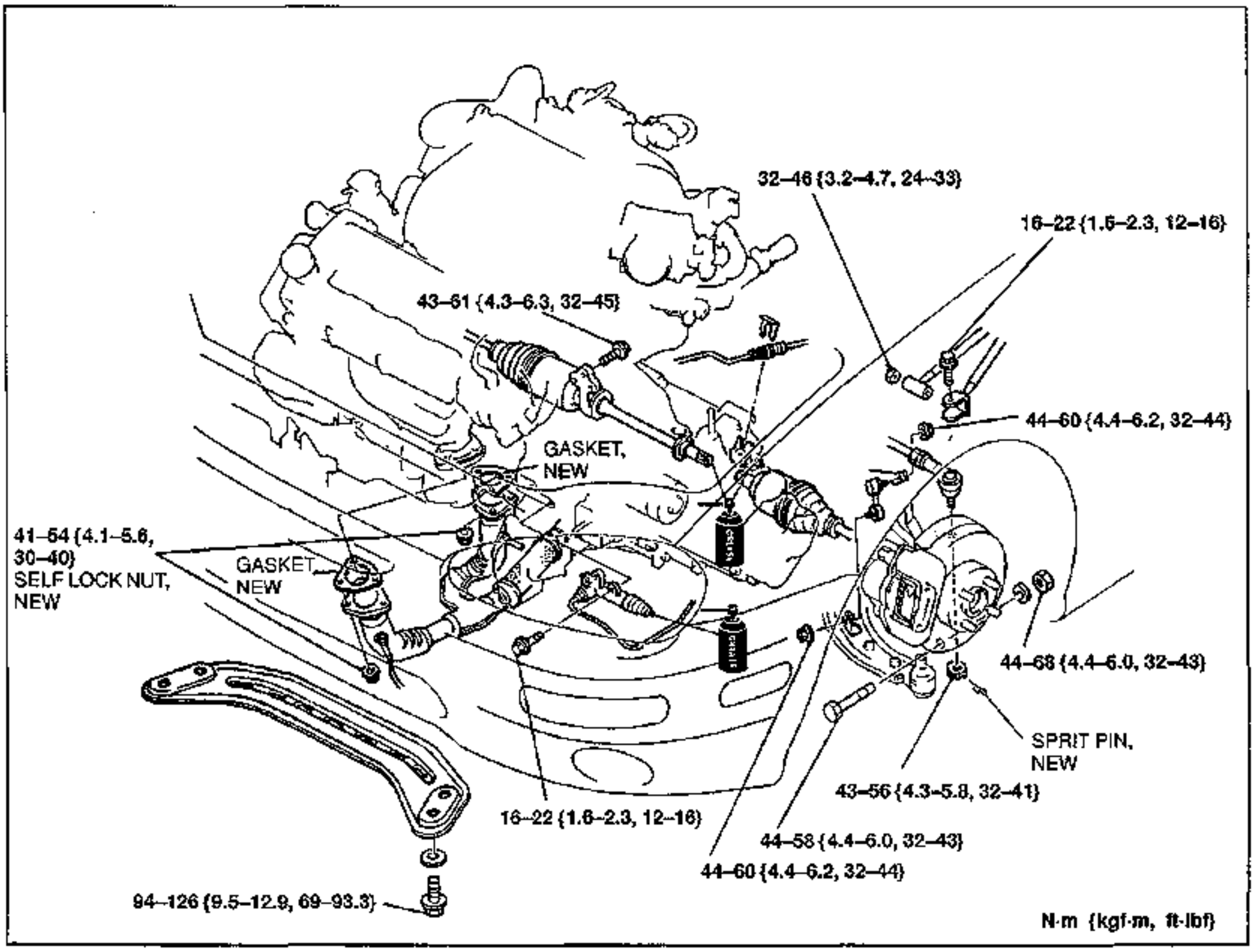
3. Install the No.4 engine mount rubber and bracket, and hand tighten nuts Ⓐ.
4. Install bolts Ⓑ and tighten them in two or three steps in the order shown.

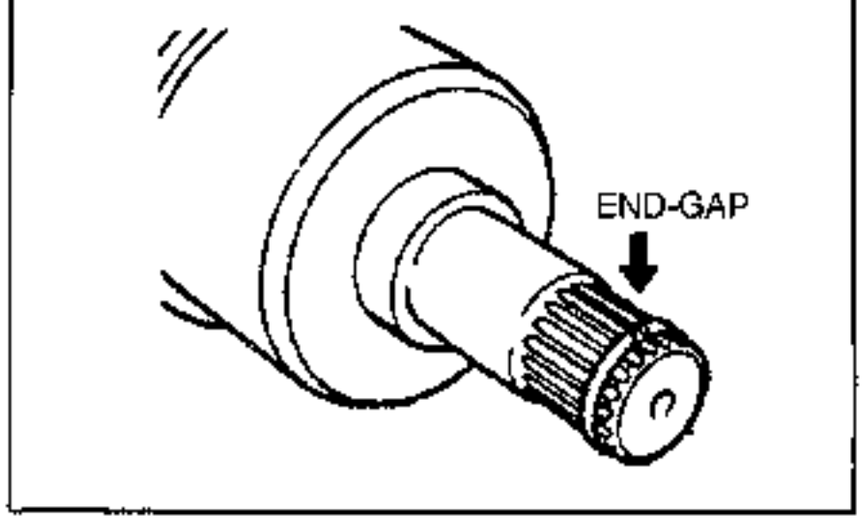
Tightening torque:
44–60 N·m {4.4–8.2 kgf·m, 32–44 ft·lbf}

5. Tighten nuts Ⓐ.

Tightening torque:
67–93 N·m {6.8–9.5 kgf·m, 49–68 ft·lbf}

Step 3
Torque specifications



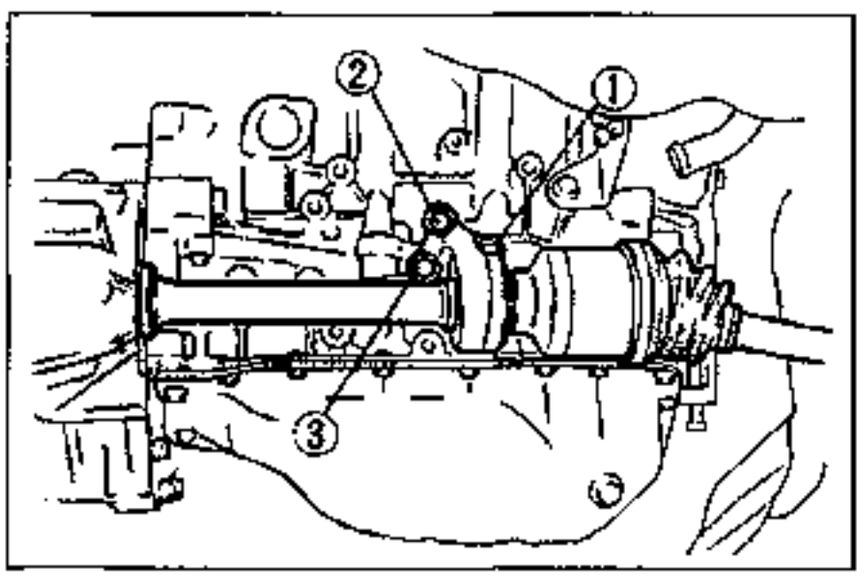


Drive shaft

1. Apply grease to the end of the drive shafts.

Caution
- **The oil seals are damaged easily if this procedure is not done correctly.**

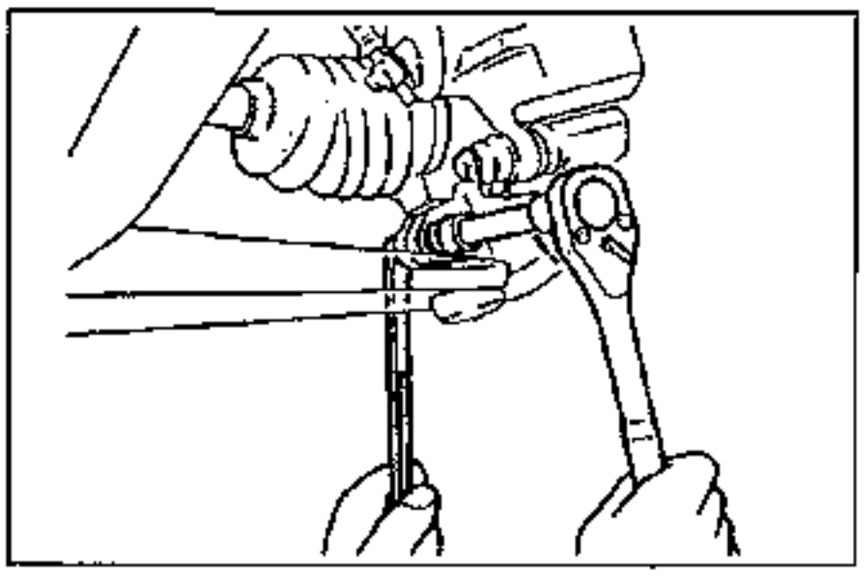
2. Install a new clip with the end gap facing upward.
3. Install the drive shaft.
4. Push the drive shaft into the joint shaft.
5. Install the joint shaft.



6. Tighten the bolts in the order shown.

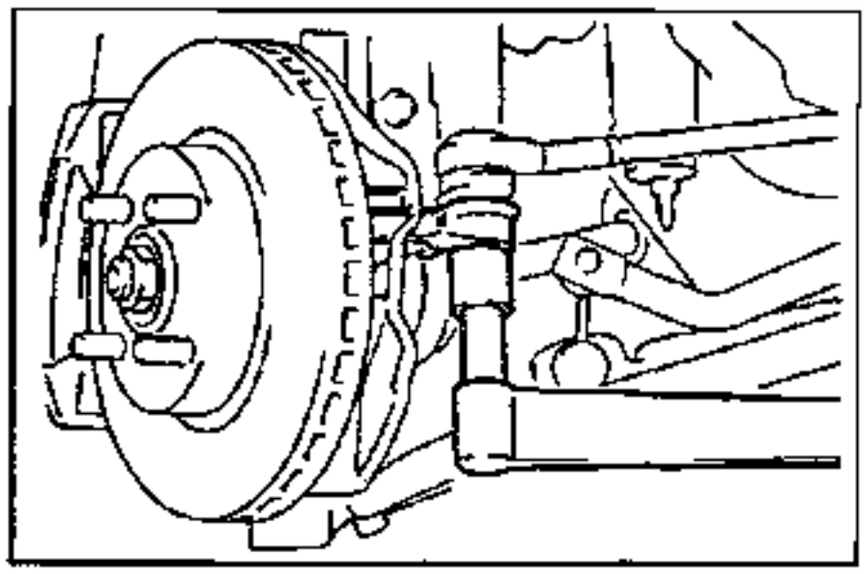
Tightening torque:
43–61 N·m {4.3–6.3 kgf·m, 32–45 ft·lbf}

7. After installation, pull the front hub outward to confirm that the drive shaft is securely held by the clip.



8. Install the lower arm ball joint to the knuckle and tighten the through bolt.

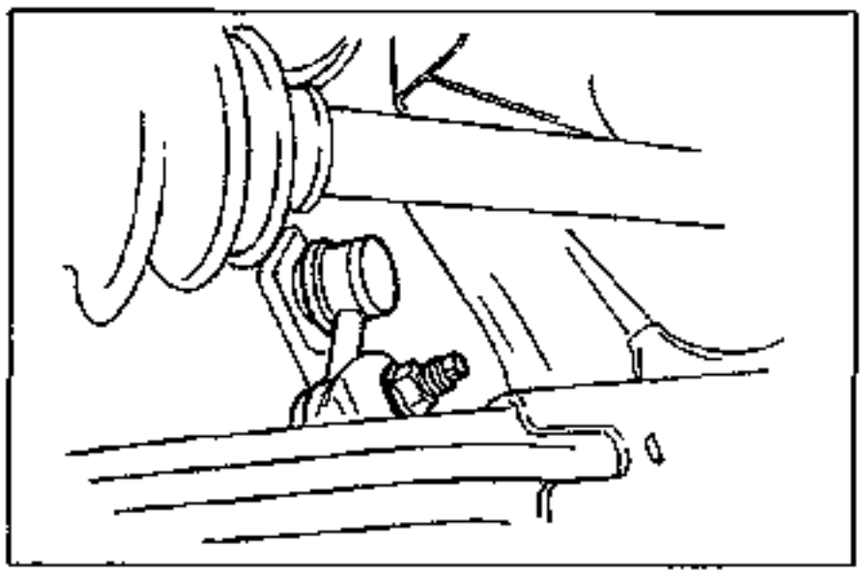
Tightening torque:
44–58 N·m {4.4–6.0 kgf·m, 32–43 ft·lbf}



Tie-rod end ball joint
1. Install the tie-rod ends to the knuckles and tighten.

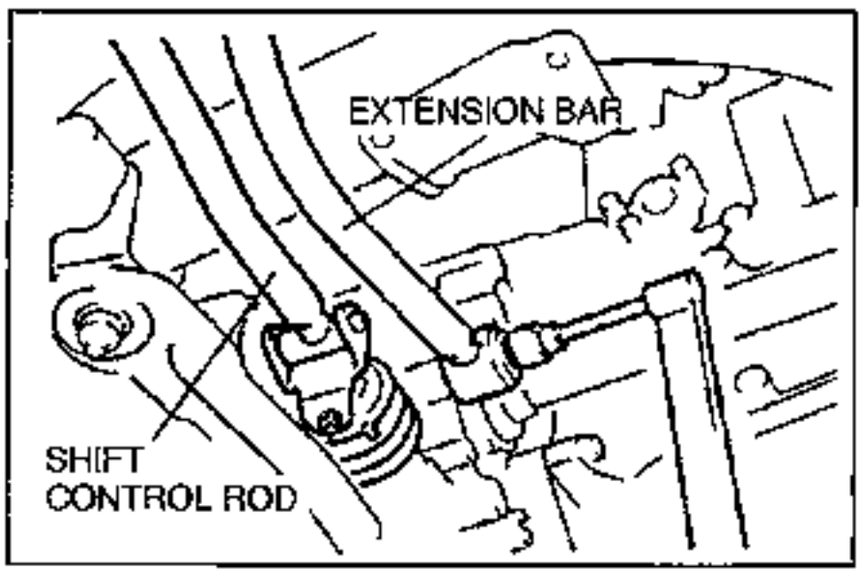
Tightening torque:
43–56 N·m {4.3–5.8 kgf·m, 32–41 ft·lbf}

2. Install new cotter pins.



Stabilizer control link
Install the stabilizer control link.

Tightening torque:
44–60 N·m (4.4–6.2 kgf·m, 32–44 ft·lbf}

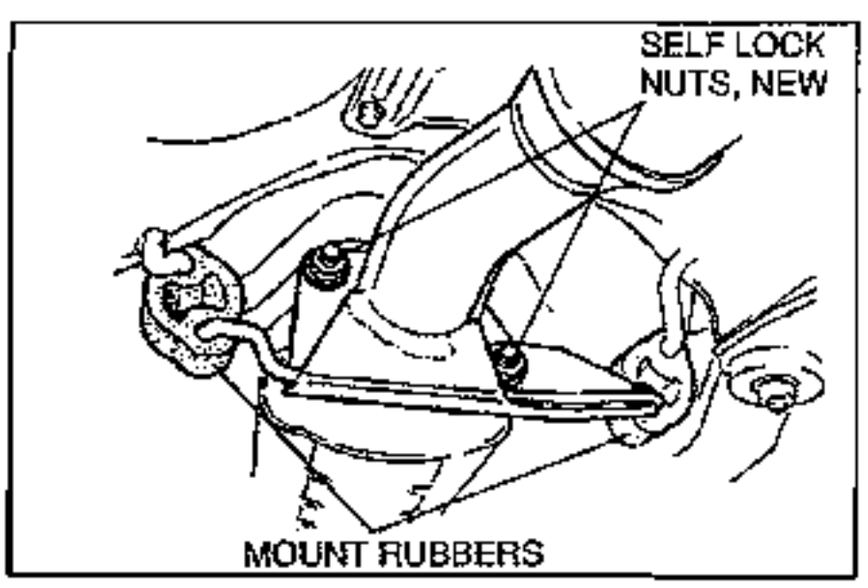


Extension bar (MTX)
Install the extension bar to the transaxle.

Tightening torque:
32–46 N·m {3.2–4.7 kgf·m, 24–33 ft·lbf}

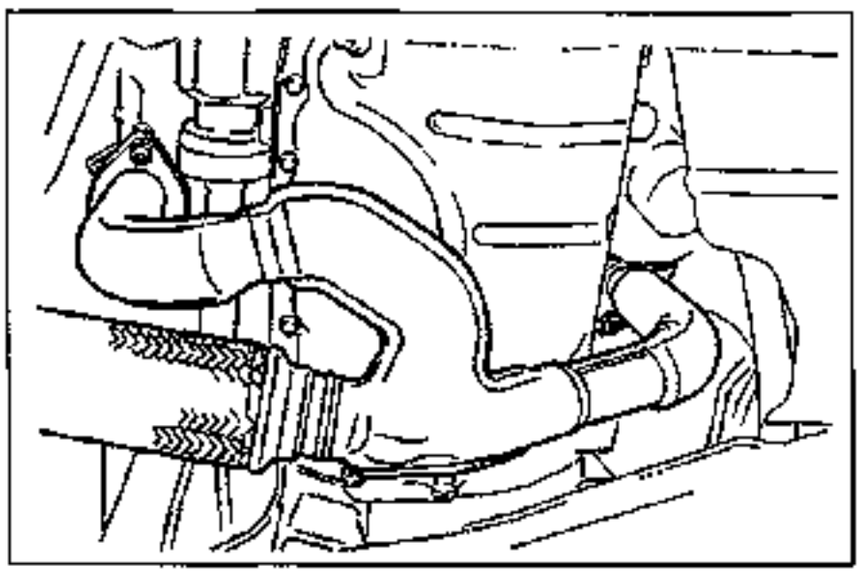
Shift control rod (MTX)
Install the shift control rod to the transaxle.

Tightening torque:
16–22 N·m {1.6–2.3 kgf·m, 12–16 ft·lbf}



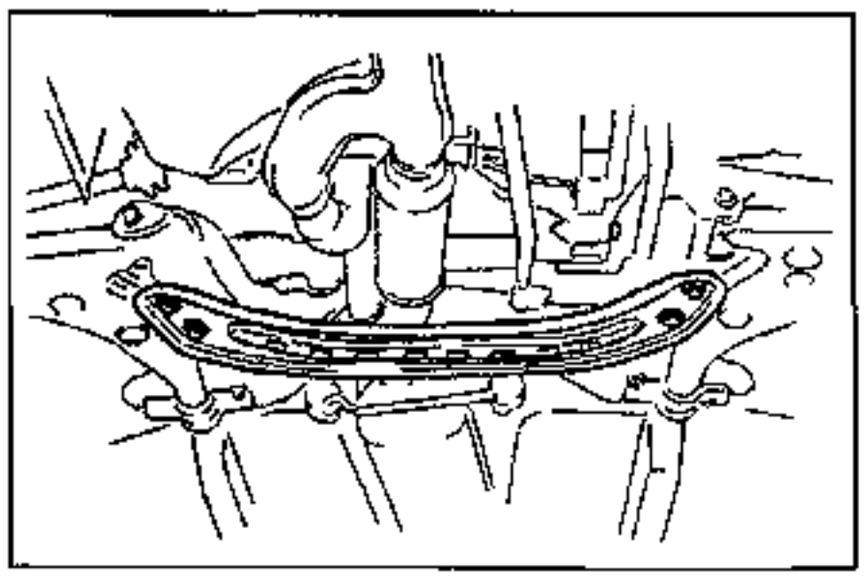
Front exhaust pipe
1. Connect the front exhaust pipe to the exhaust pipe with a new gasket. Hand tighten new nuts.
2. Tighten the nuts.

Tightening torque:
64–89 N·m {6.5–9.1 kgf·m, 48–65 ft·lbf}



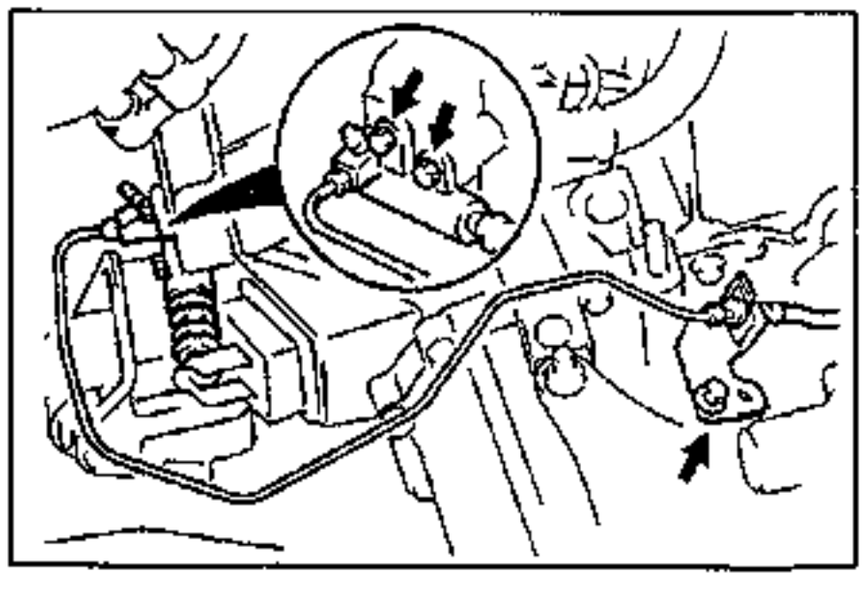
4. Install the front exhaust pipe with new gaskets.
5. Tighten new nuts.

Tightening torque:
41–54 N·m {4.1–5.6 kgf·m, 30–40 ft·lbf}



Transverse member
Install the transverse member.

Tightening torque:
94–126 N·m {9.5–12.9 kgf·m, 69–93.3 ft·lbf}



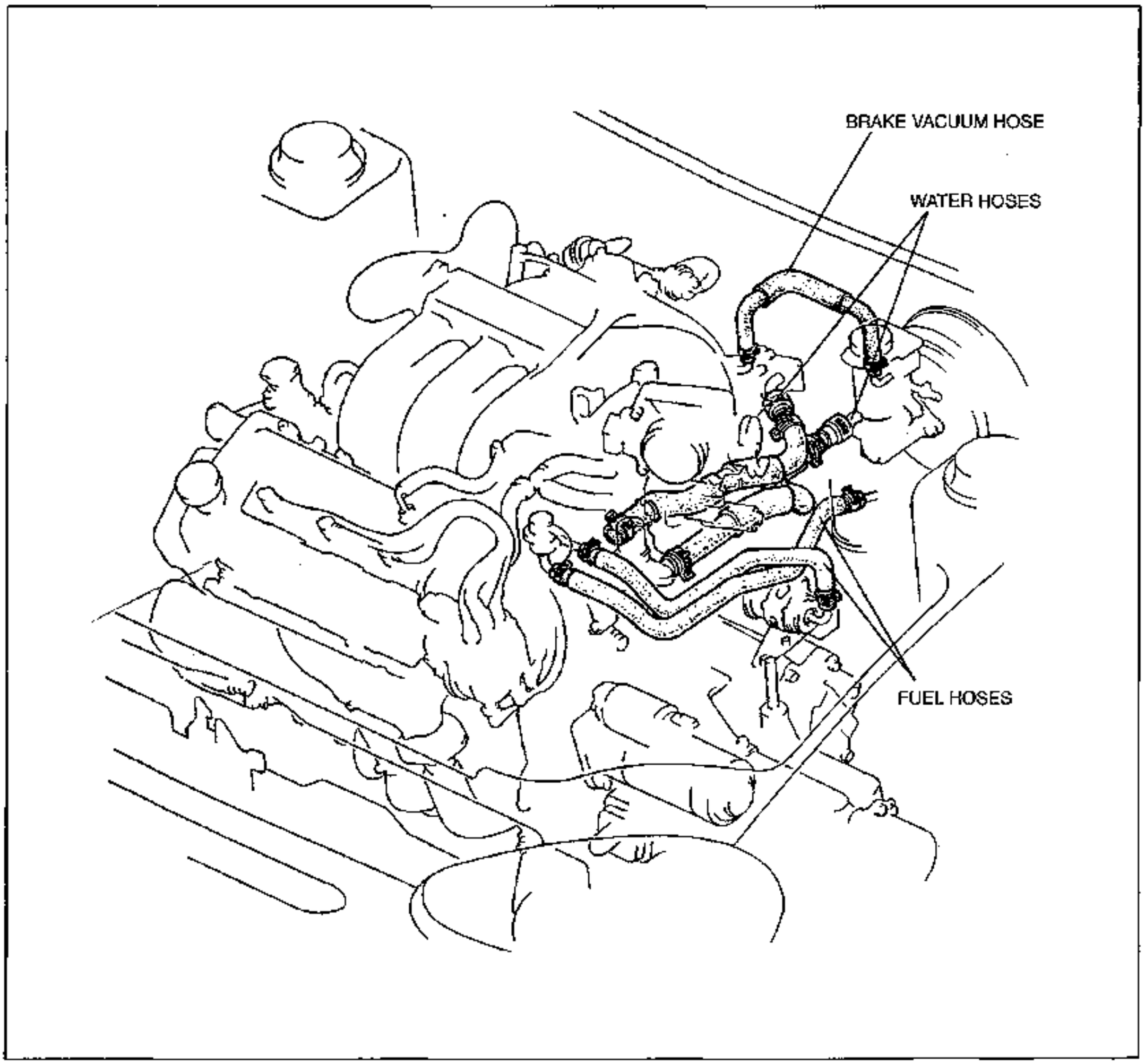
Clutch release Cylinder (MTX)
1. Install the clutch release cylinder.

Tightening torque:
16–22 N·m {1.6–2.3 kgf·m, 12–16 ft·lbf}

2. Mount the pipe brackets in position.

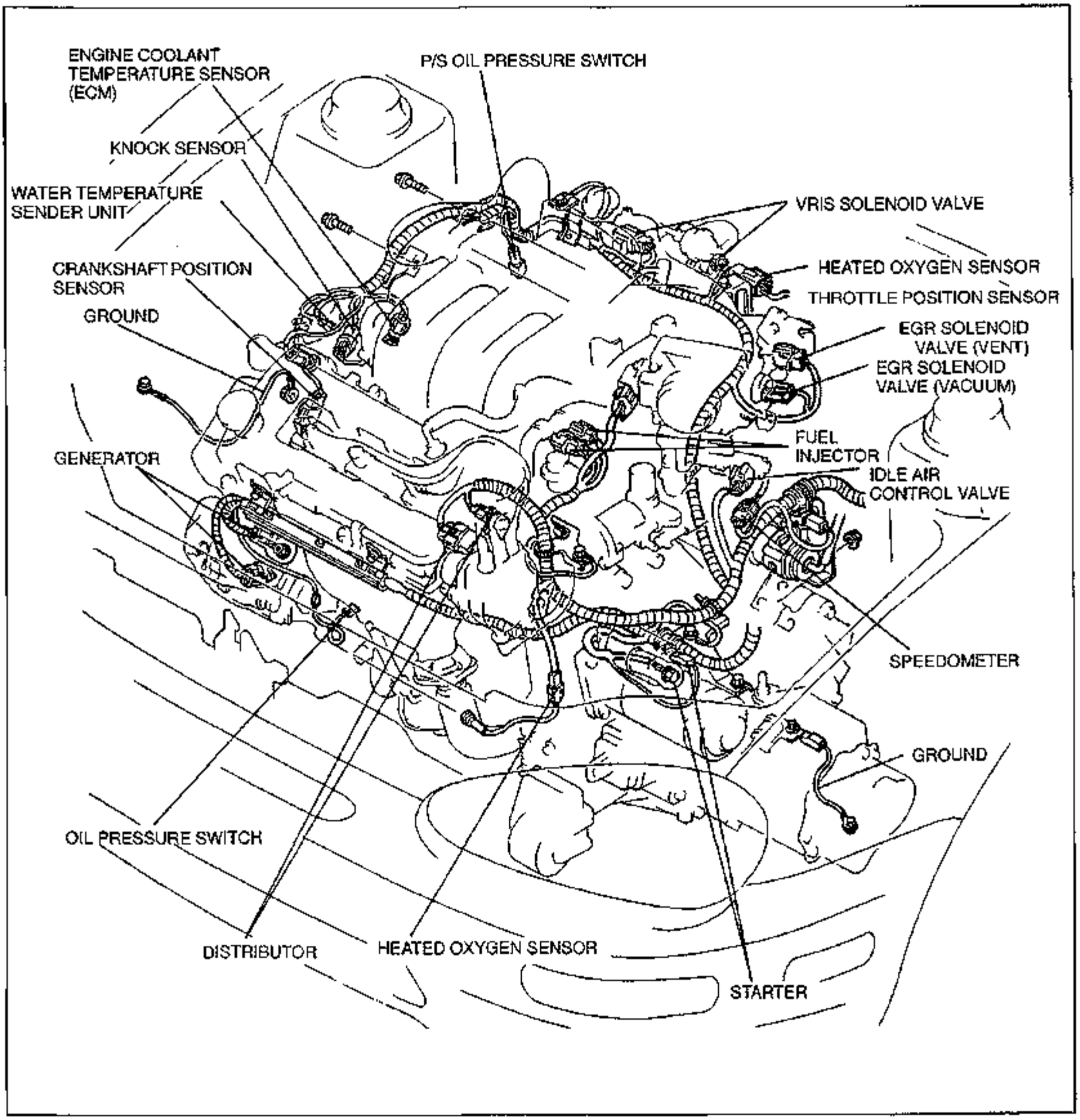
Tightening torque:
16–22 N·m {1.6–2.3 kgf·m, 12–16 ft·lbf}

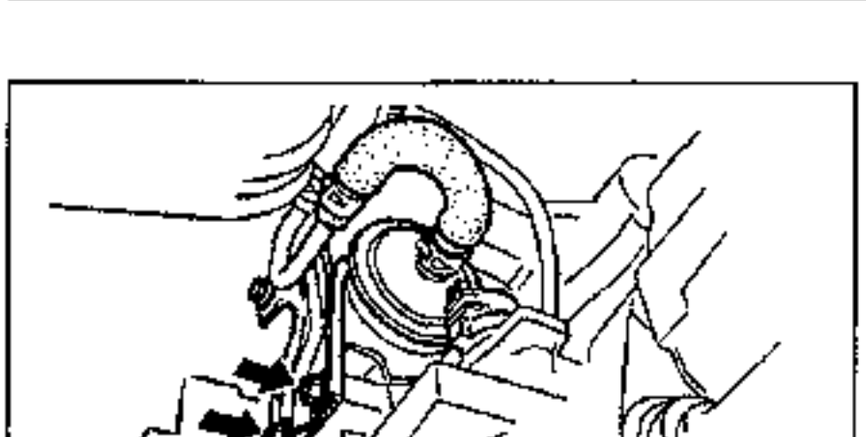
Step 4
Connect the hoses shown.



Step 5

1. Connect the harness connectors shown.

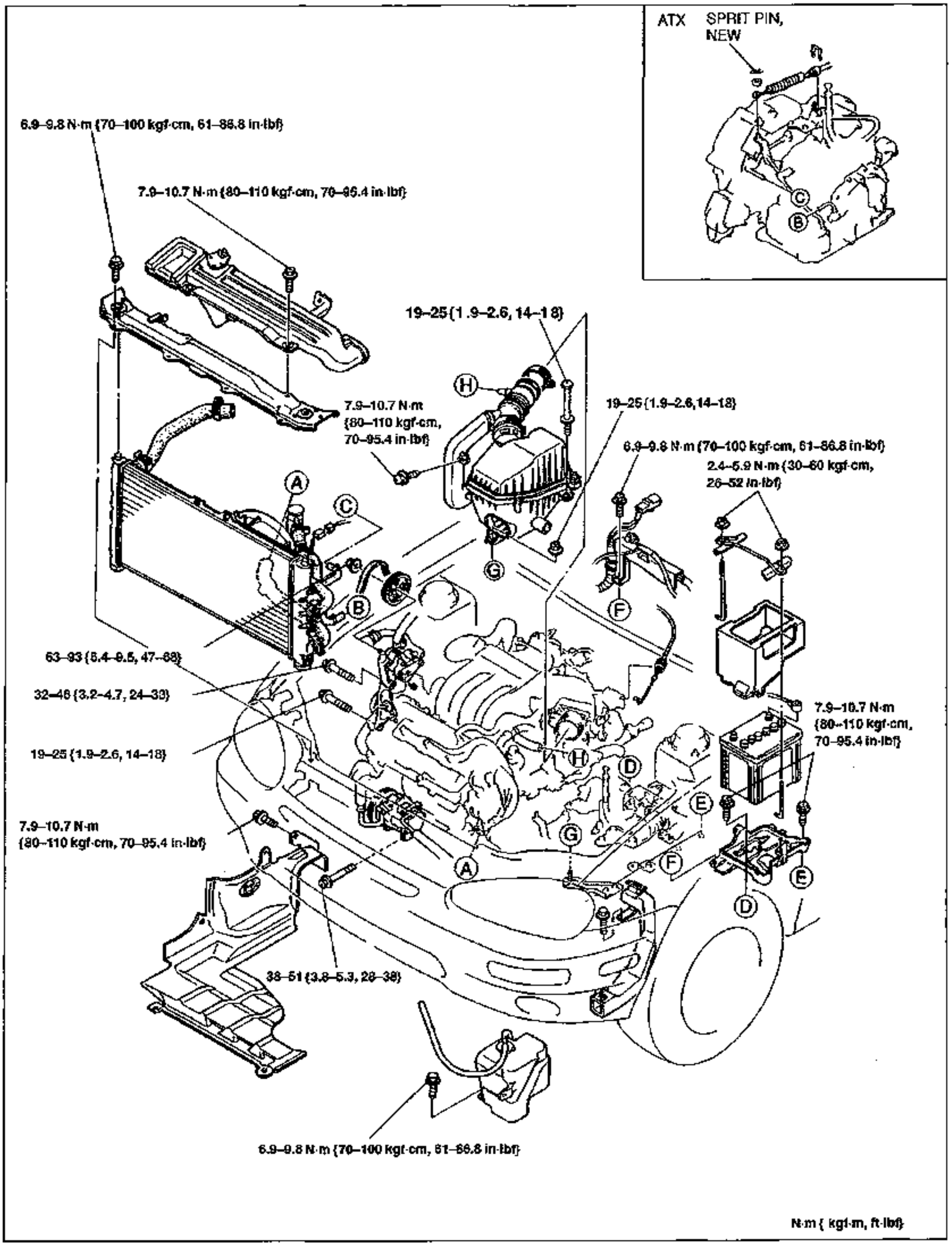




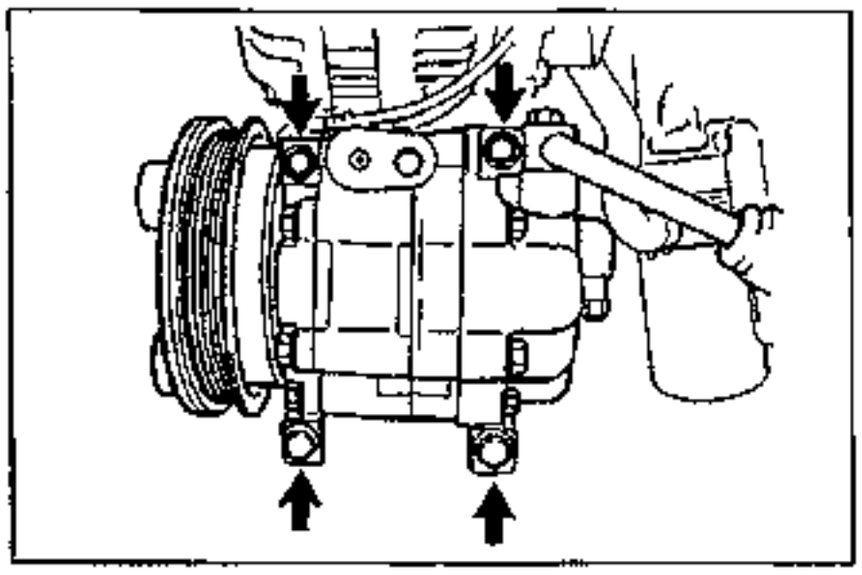
2. Install the harness bracket and the fuel filter.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}

Step 6
Torque Specifications

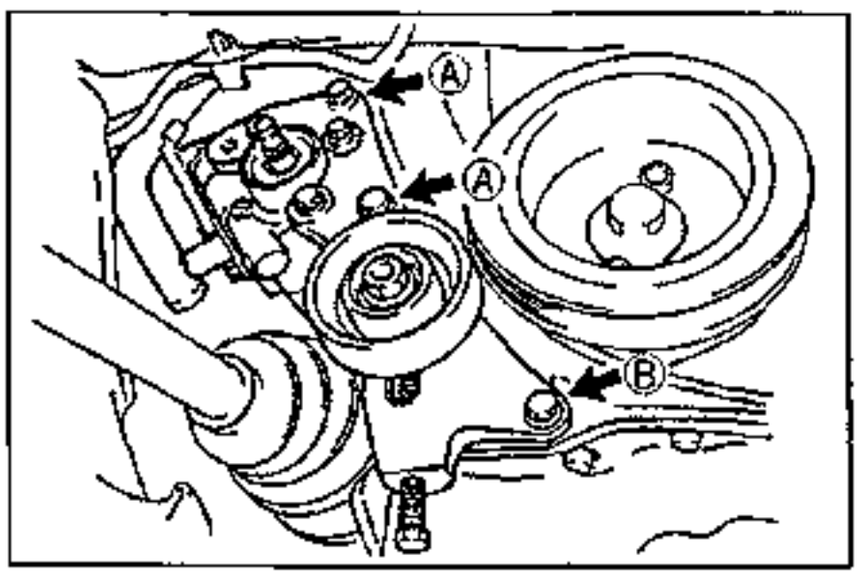


N·m { kgf·m, ft·lbf}



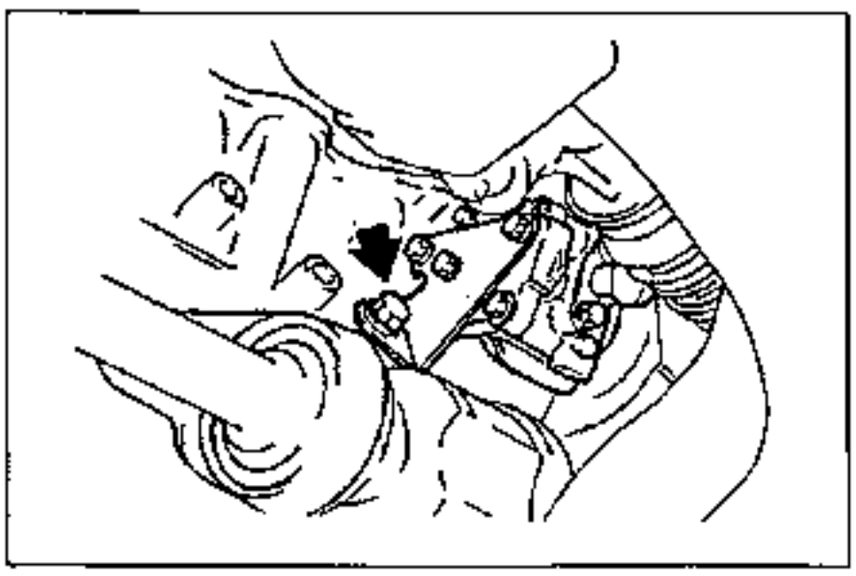
A/C compressor
Install the A/C compressor to the bracket.

Tightening torque:
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}



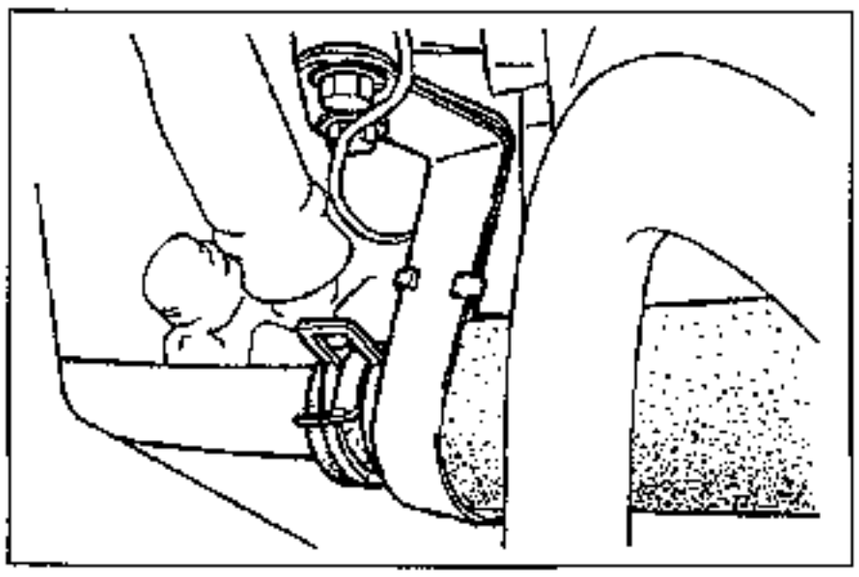
P/S oil pump and bracket
1. Install the P/S oil pump.

Tightening torque:
Ⓐ: 32–46 N·m {3.2–4.7 kgf·m, 24–33 ft·lbf}
Ⓑ: 19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}



2. Tighten the bolt shown.

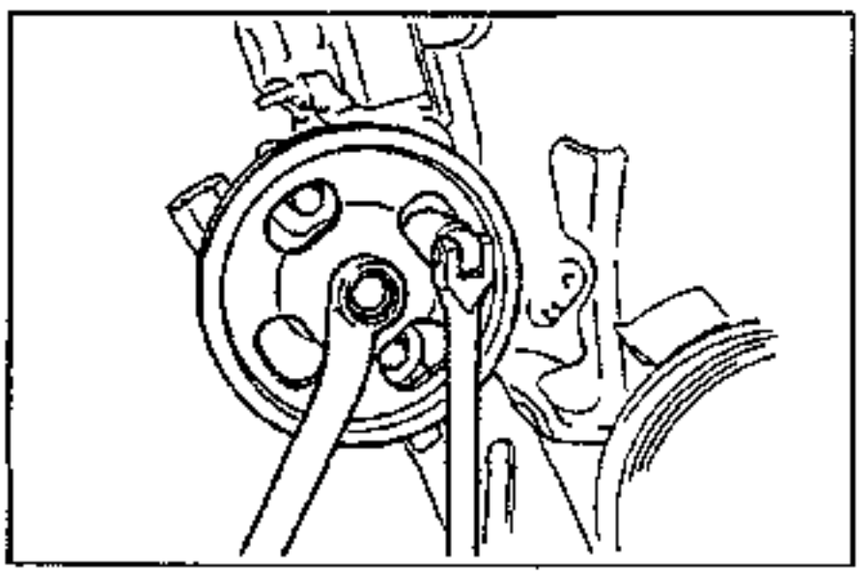
Tightening torque:
32–46 N·m {3.2–4.7 kgf·m, 24–33 ft·lbf}



3.Install the P/S oil hose to the engine.

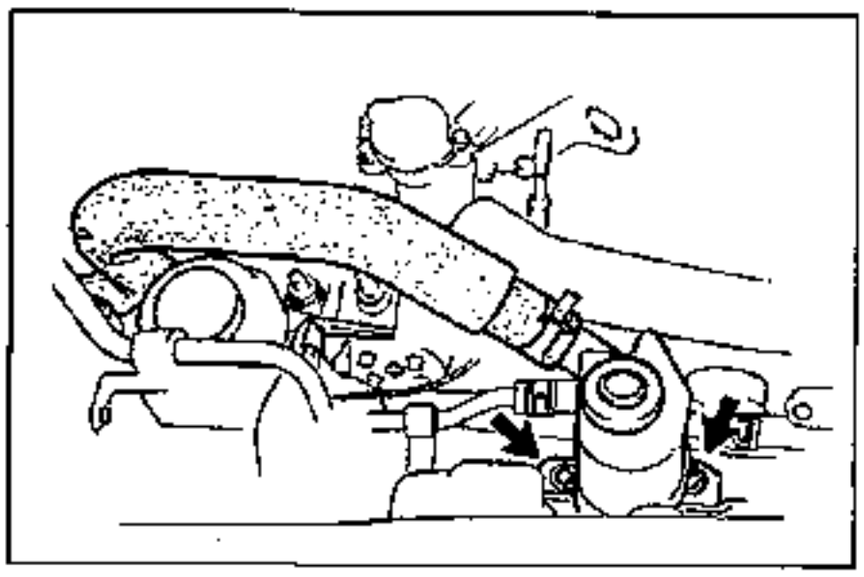
Tightening torque:
7.8–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}

4. Connect the steering pressure sensor connector.



5. Install the P/S oil pump pulley to the pump body and hand tighten the nut.
6. Hold the pulley by using a 12mm (0.47 in) socket wrench through the pulley hole, and tighten the pulley nut.

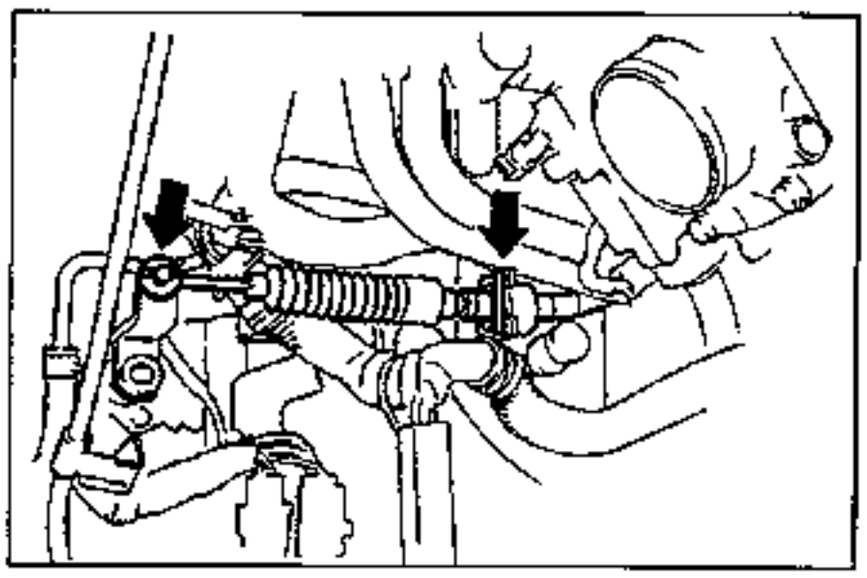
Tightening torque:
63–93 N·m {6.4–9.5 kgf·m, 47–68 ft·lbf}



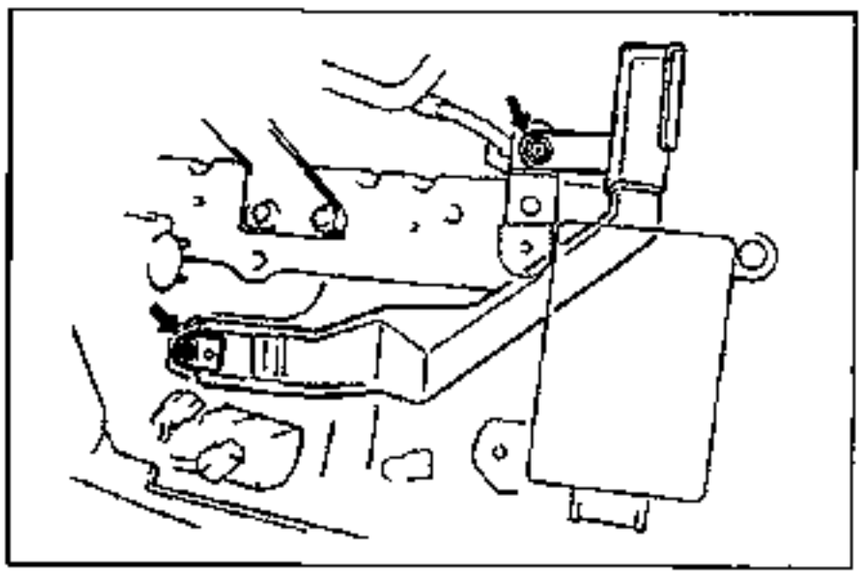
7. Install the P/S oil reservoir and the engine ground.

Tightening torque:
6.9–9.8 N·m {70–100 kgf·cm, 61–86.8 in·lbf}

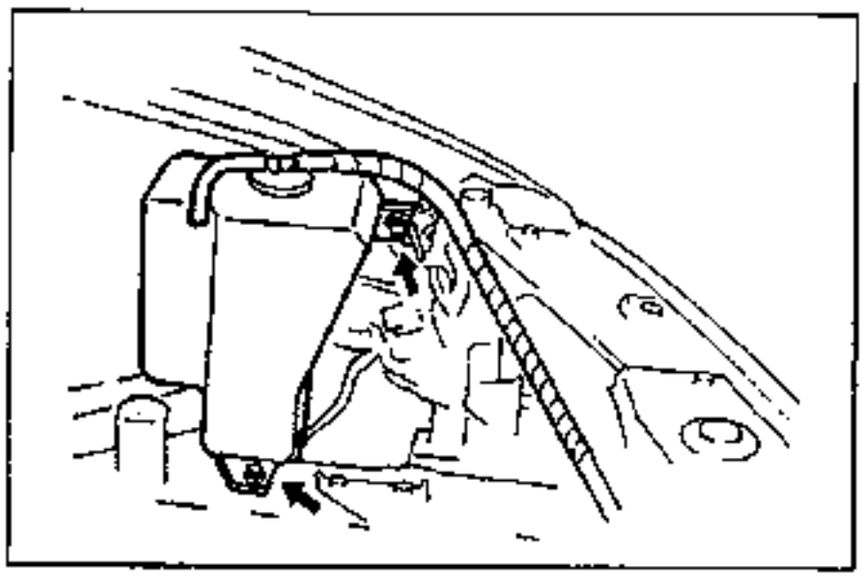
Drive belt
1. Install the P/S and/or A/C drive belt.
2. Install the generator drive belt.
3. Adjust the drive belt deflection. (Refer to page B2–7.)



Control cable (ATX)
Install the control cable.

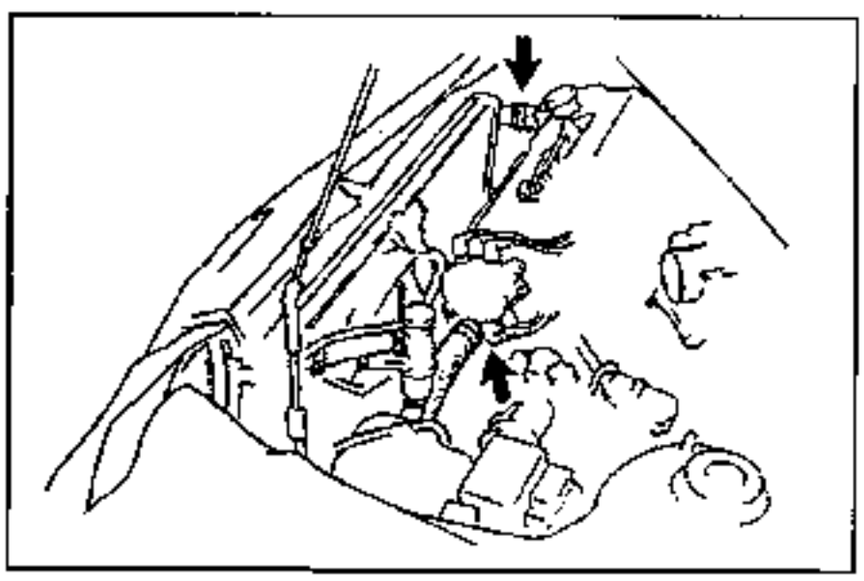


Battery duct
Install the battery duct.



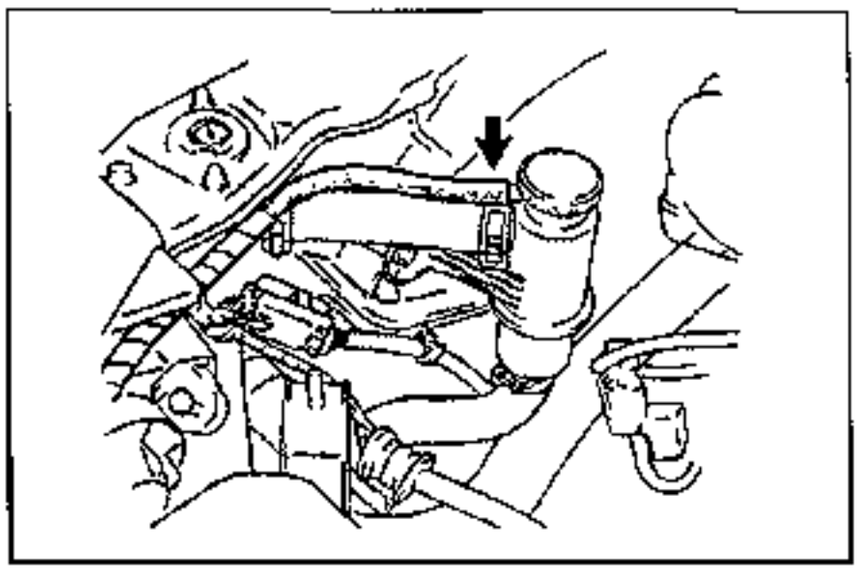
Coolant reservoir
Install the coolant reservoir.

Tightening torque:
6.9–9.8 N·m {70–100 kgf·cm, 61–86.8 in·lbf}

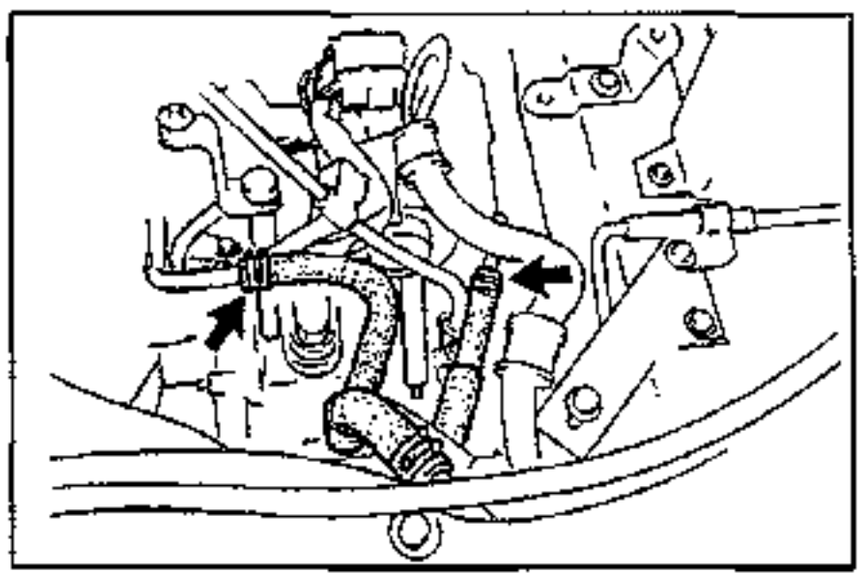


Radiator and coolant fan assembly
1. Install the radiator and coolant fan assembly. Secure the shroud upper panel.

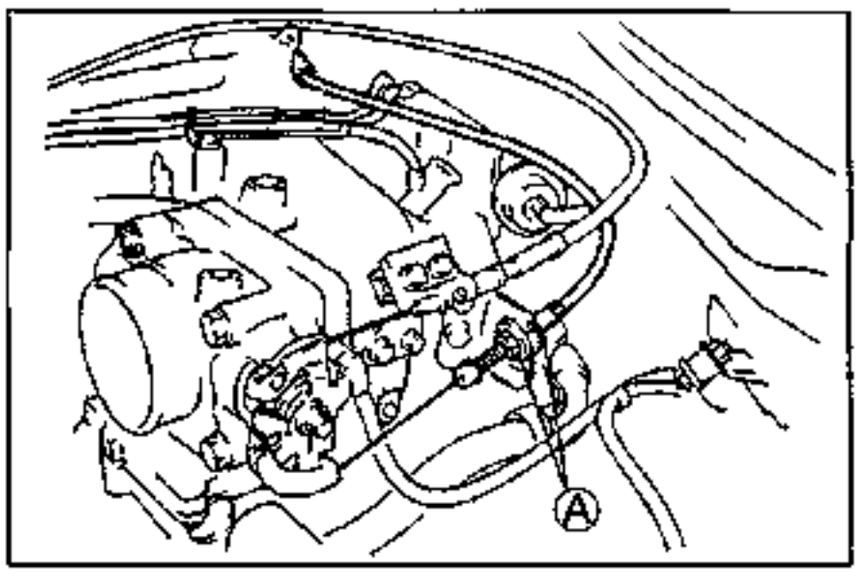
Tightening torque:
6.9–9.8 N·m {70–100 kgf·cm, 61–86.8 in·lbf}



2. Connect the upper and lower radiator hoses.
3. Connect the coolant reservoir hose.
4. Connect the coolant fan motor connector.

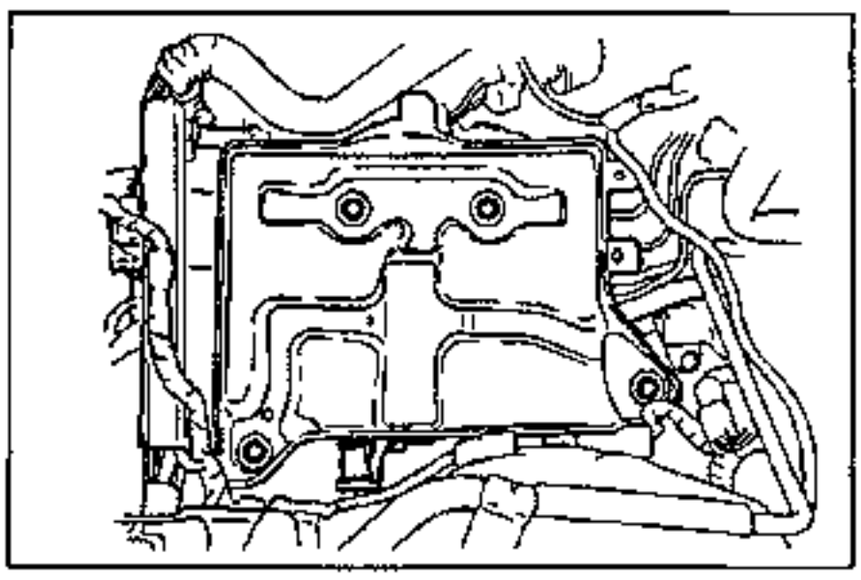


5. Connect the oil cooler hoses (ATX).



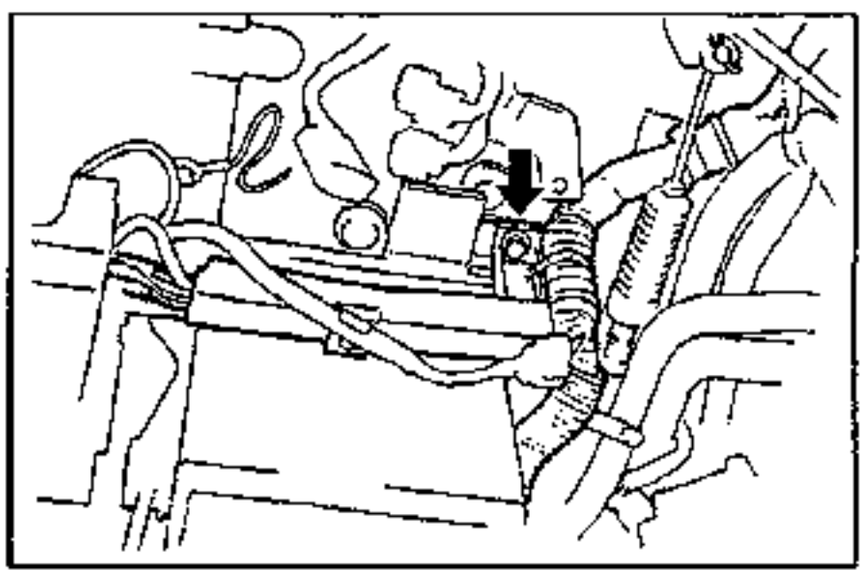
Accelerator cable
1. Install the accelerator cable.
2. Adjust the cable deflection by turning nuts Ⓐ.

Deflection: 1–3mm {0.04–0.11 in}

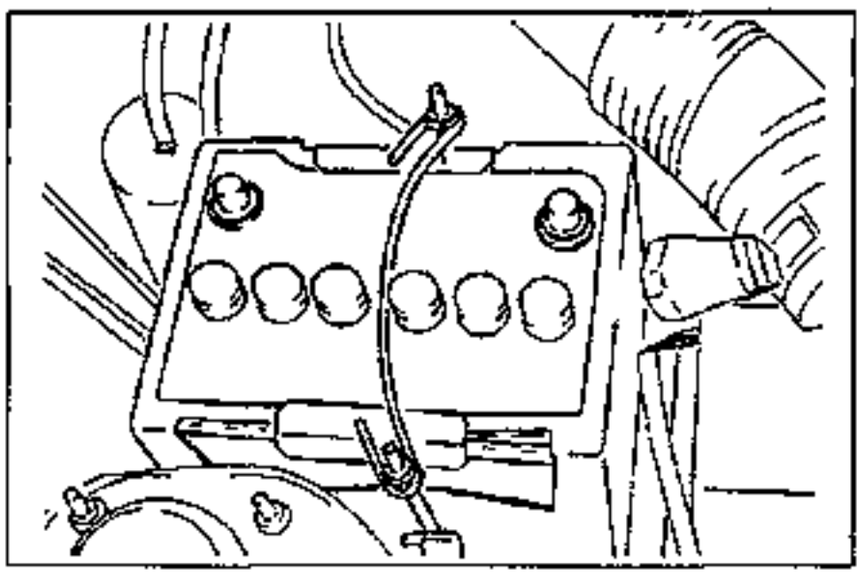


Battery and carrier
1. Install the battery carrier.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



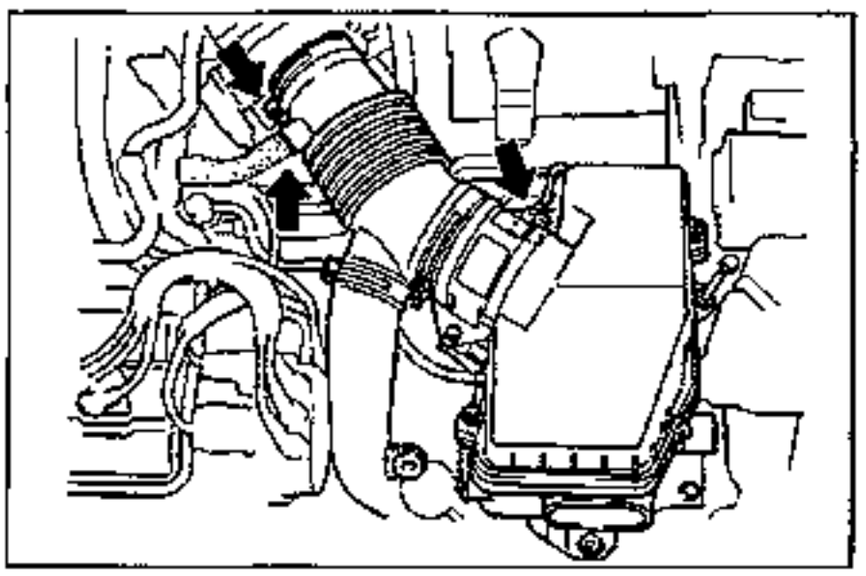
2. Install the engine harness to the carrier.



3. Install the battery.

Tightening torque:
2.4–5.9 N·m {30–60 kgf·cm, 26–52 in·lbf}

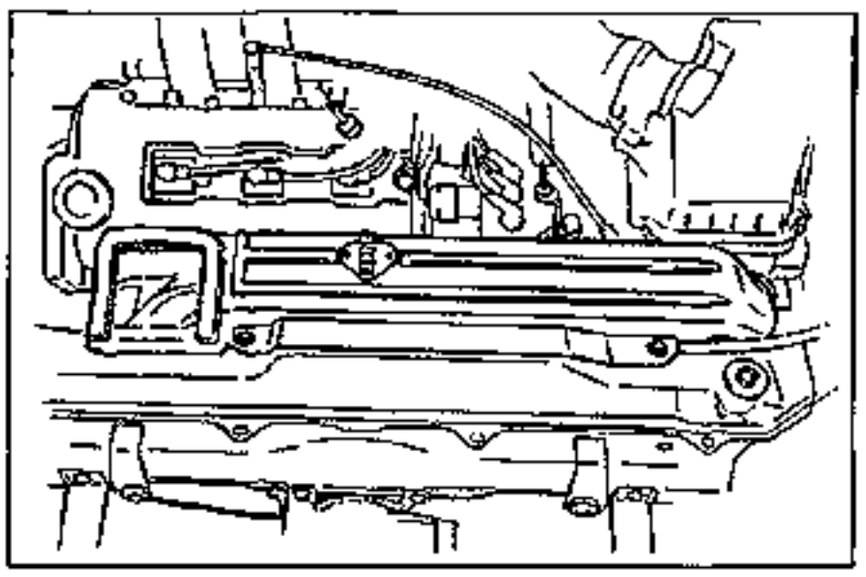
4. Connect the positive battery terminal.



Air cleaner assembly
1. Install the air cleaner assembly.
2. Connect the hoses.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

3. Connect the mass air flow sensor connector.



Fresh-air duct
Install the fresh-air duct.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}

Splash shield
Install the splash shield.

Steps After Installation
1. Fill the engine with the specified amount and type of engine oil. (Refer to section D2.)
2. Fill the radiator with the specified amount and type of engine coolant. (Refer to section E2.)
3. If the transaxle oil was drained, fill it with the specified amount and type of transaxle oil. (Refer to section J2, K.)
4. Install the front wheels.
5. Start the engine and
   (1) check the engine oil, transmission oil, and engine coolant leakage.
   (2) check the ignition timing and idle speed. (Refer to section F2.)
   (3) check the operation of the emission control system. (Refer to section F2.)
6. Turn off the engine and check drive belt deflection. (Refer to page B2–6.)
7. Perform a road test.
8. Recheck the oil and coolant levels.

Before beginning any service procedure, refer to the 1995 MX–3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

LUBRICATION SYSTEM (K8)

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DISASSEMBLY / ASSEMBLY D2–11
INSPECTION D2–12

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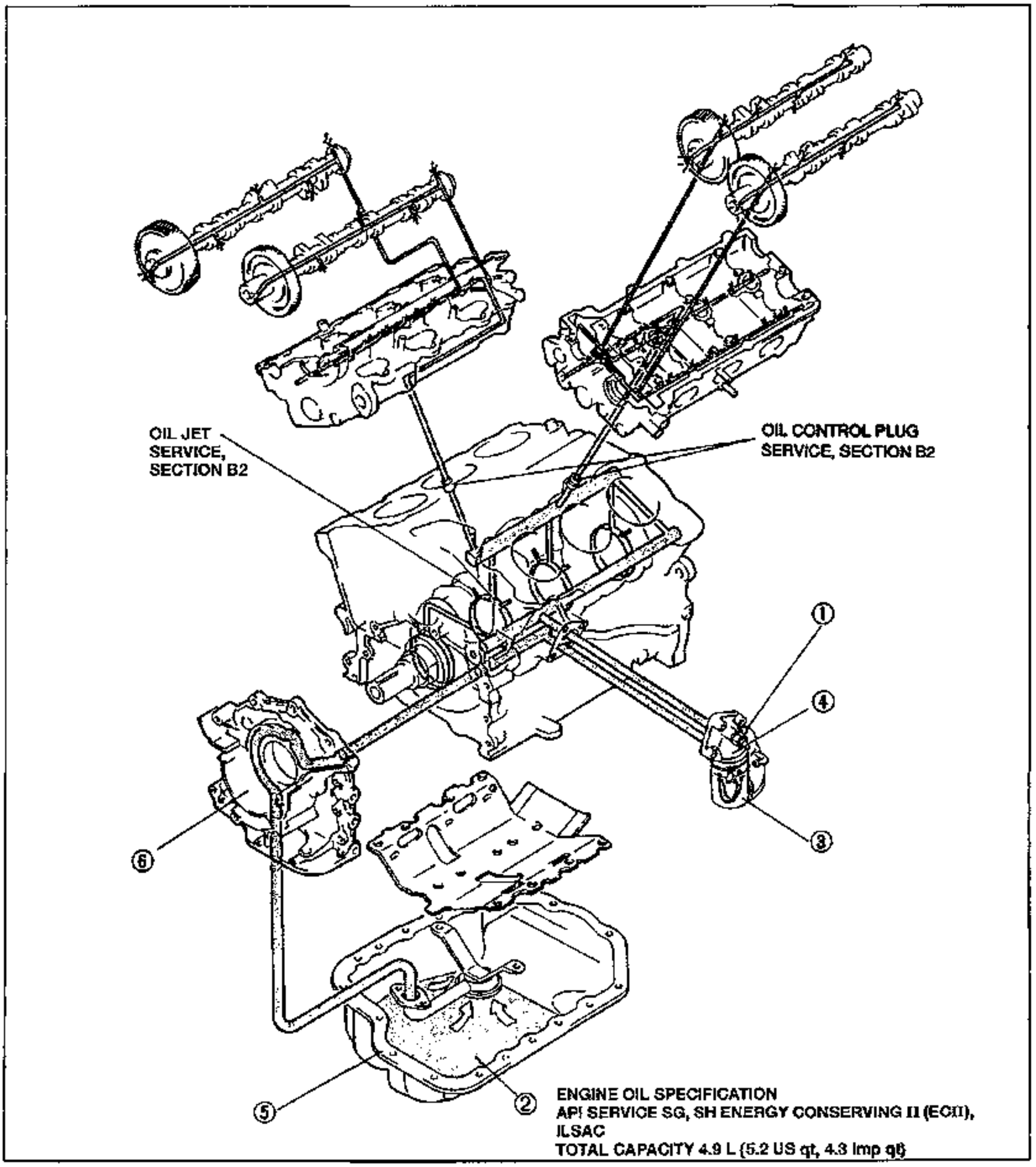

1. Oil pressure
Inspection ..... page D2– 4
2. Engine oil
Inspection ..... page D2– 5
Replacement ..... page D2– 5
3. Oil filter
Replacement ..... page D2– 6
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5. Oil pan
Removal / Installation ..... page D2– 8
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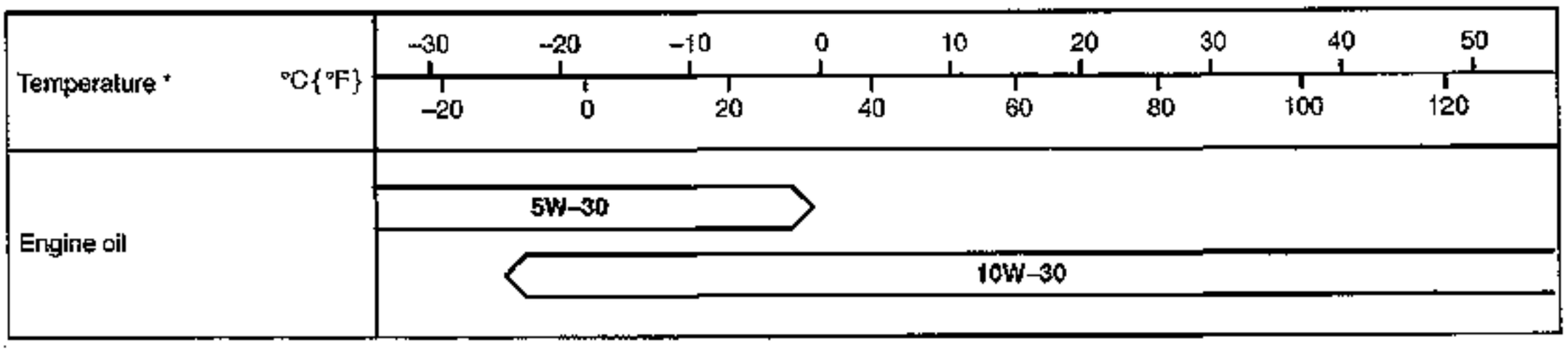
6. Oil pump
Disassembly / Assembly ..... page D2–11
Inspection ..... page D2–12

OUTLINE

SPECIFICATIONS

Item \ Engine			K8 DOHC
Lubrication system			Force-fed type
Oil pump	Type		Trochoid gear
	Relief pressure	kPa{kgf/cm², psi}	491–588 {5.0–6.0, 72–85}
Oil filter	Type		Full-flow, paper element
	Relief pressure differential	kPa{kgf/cm², psi}	79–117 {0.8–1.2, 12–17}
Oil capacity	Total (dry engine)	L {US qt, Imp qt}	4.9 {5.2, 4.3}
	Engine oil replacement	L {US qt, Imp qt}	3.7 {3.9, 3.3}
	Engine oil + oil filter replacement	L {US qt, Imp qt}	4.0 {4.2, 3.5}
Engine oil			API SG, SH Energy Conserving II (ECII) ILSAC

Recommended SAE Viscosity



* Anticipated ambient temperature range before succeeding oil change.

TROUBLESHOOTING GUIDE

Problem	Possible cause	Remedy	Page
Engine hard starting	Improper engine oil	Replace	D2– 5
	Insufficient engine oil	Add oil	D2– 5
Excessive oil consumption	Oil working up or down in cylinder	Refer to section B1	
	Oil leakage	Repair	—
Oil pressure drop	Insufficient oil	Add oil	D2– 5
	Oil leakage	Repair	—
	Worn and/or damaged oil pump rotor	Replace	D2–11, 12
	Worn plunger (inside oil pump) or weak spring	Replace	D2–11, 12
	Clogged oil strainer	Clean	—
	Excessive main bearing or connecting rod bearing clearance	Refer to section B2	
Warning light illuminates while engine is running	Oil pressure drop	As described above	—
	Malfunction of oil pressure switch	Refer to section C2*	
	Malfunction of electrical system	Refer to section C2*	

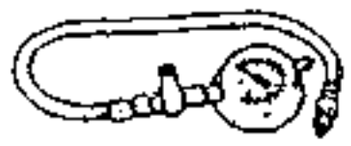
* 1995 MX-3 Body Electrical Troubleshooting Manual

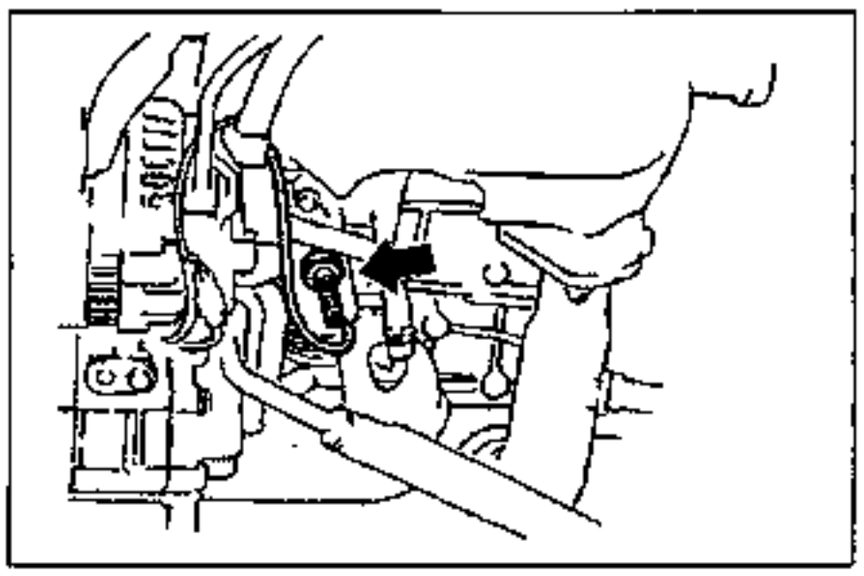
Warning

- **Continuous exposure with USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after this work.**

OIL PRESSURE

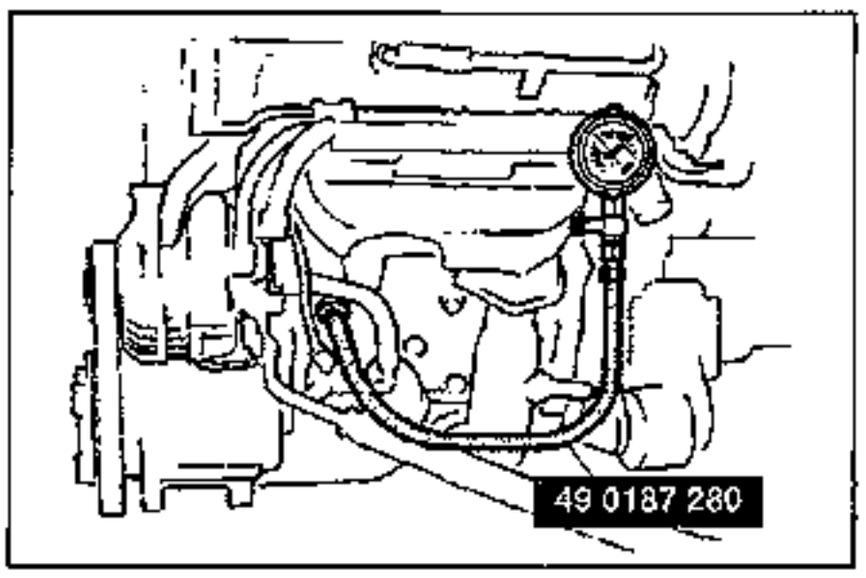
PREPARATION
SST

49 0187 280 Gauge, oil pressure		For inspection of oil pressure



INSPECTION

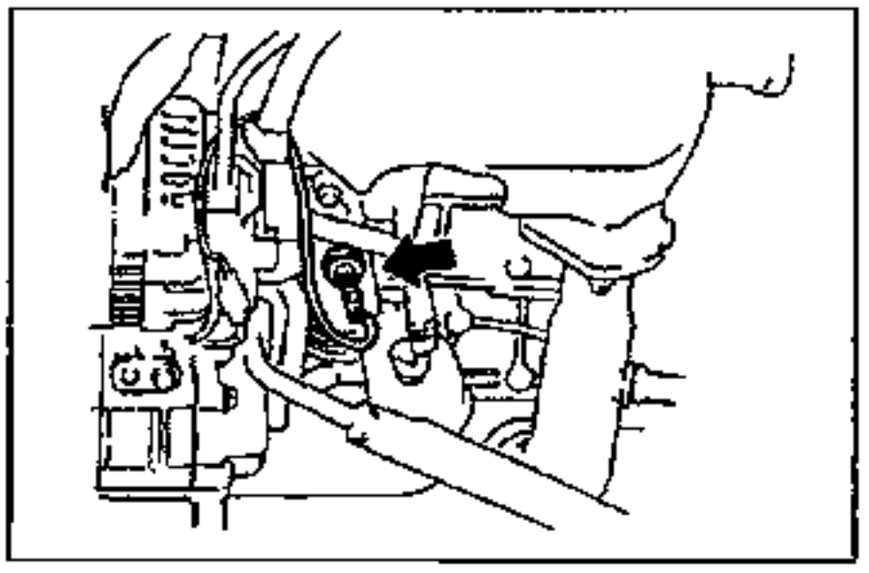
1. Remove the oil pressure switch.



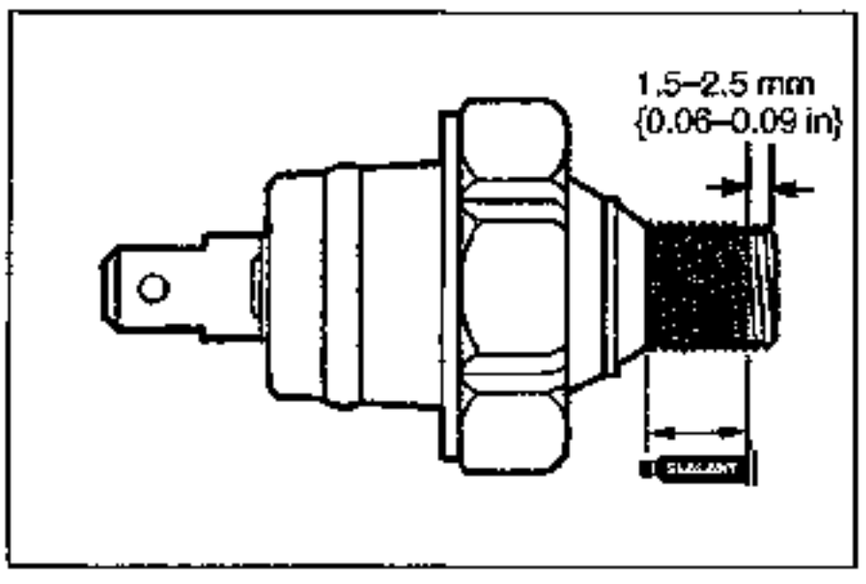
2. Screw the **SST** into the oil pressure switch installation hole.
3. Warm up the engine to normal operating temperature.
4. Run the engine at 1,000 rpm and 3,000 rpm, and note the gauge reading.

Oil pressure
1,000 rpm: 196 kPa {2.0 kgf/cm^2, 28 psi}
3,000 rpm: 334–490 kPa
{3.4–5.0 kgf/cm^2, 49–71 psi}

Note
- Oil pressure varies with oil viscosity and temperature.



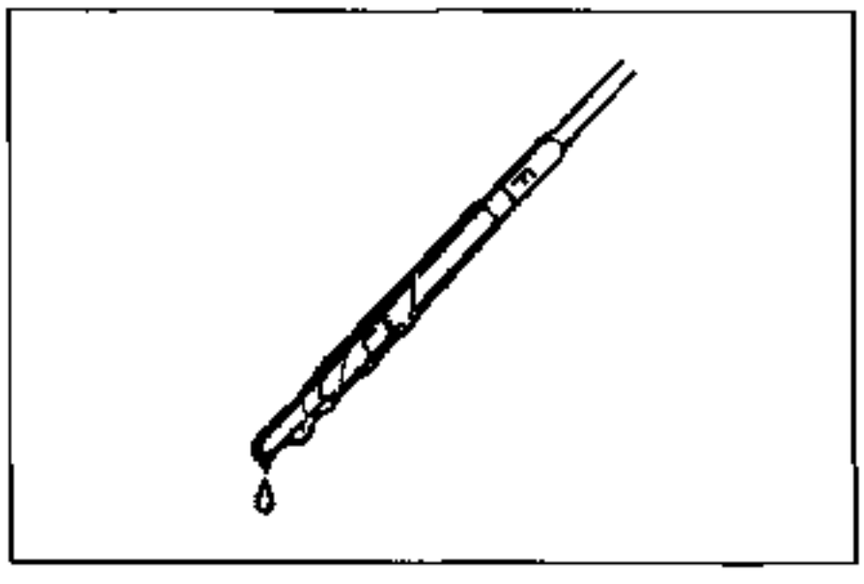
5. If the pressure is not as specified, check for the cause and repair. (Refer to Troubleshooting Guide, page D2–3.)



6. Apply sealant to the oil pressure switch threads.
7. Remove the **SST** and install the oil pressure switch.

Tightening torque:
11.8–17.6 N·m {120–180 kgf·cm, 105–156 in·lbf}

8. Start the engine and check for oil leaks.



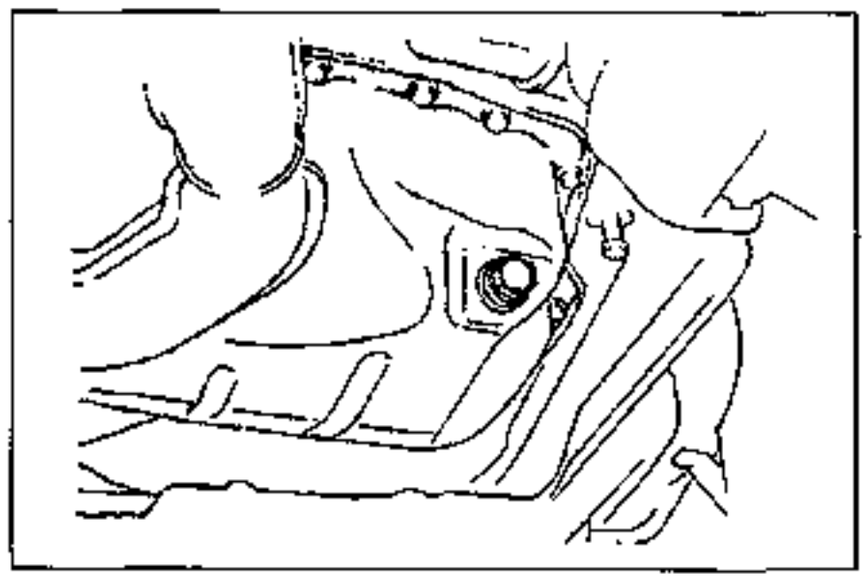
ENGINE OIL

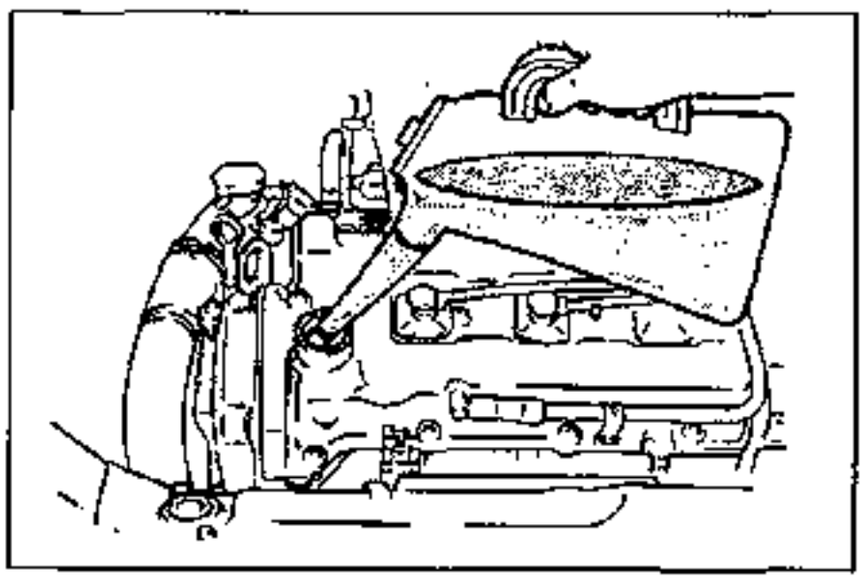
INSPECTION

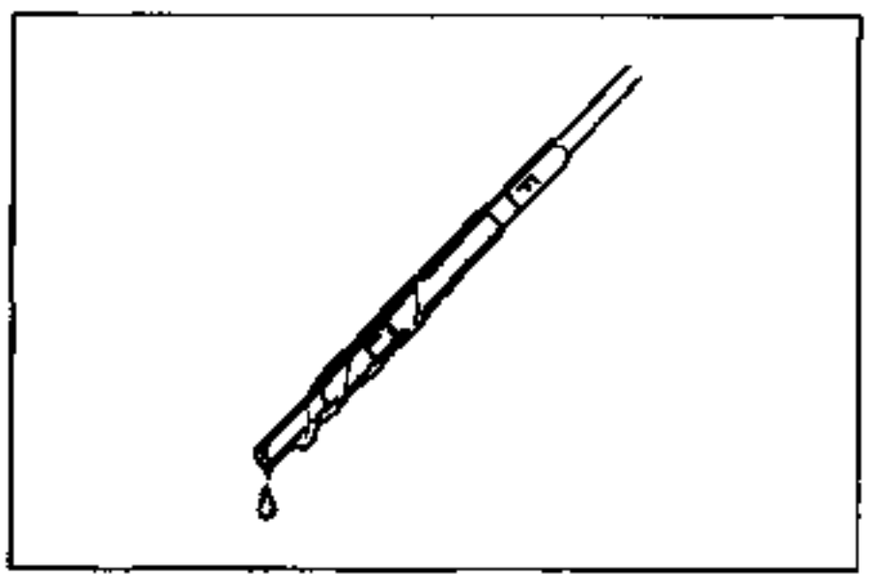
1. Be sure the vehicle is on level ground.
2. Warm up the engine to normal operating temperature and stop it.
3. Wait for five minutes.
4. Remove the dipstick and check the oil level and condition.
5. Add or replace oil as necessary.

Note

- The distance between the L and F marks on the dipstick represents 1.0 L {1.1 US qt, 0.90 Imp qt}.







REPLACEMENT

Warning

- **When the engine and the oil are hot, they can badly burn. Don't burn yourself with either.**

1. Warm up the engine to normal operating temperature and stop it.
2. Remove the oil filler cap and the oil pan drain plug.
3. Drain the oil into a container.
4. Install a new gasket and the drain plug.

Tightening torque:
30–41 N·m {3.0–4.2 kgf·m, 22–30 ft·lbf}

5. Refill the engine with the specified type and amount of engine oil.

Oil capacity

L {US qt, Imp qt}

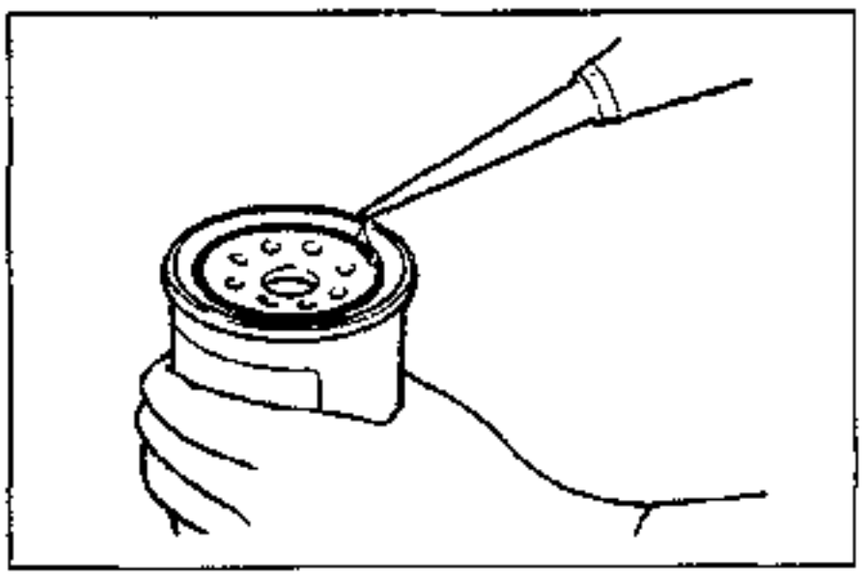
Total (dry engine)	4.9 {5.2, 4.3}
Engine oil replacement	3.7 {3.9, 3.3}
Engine oil + oil filter replacement	4.0 {4.2, 3.5}

6. Refit the oil filler cap.
7. Run the engine and check for leaks.
8. Check the oil level and add oil if necessary.

OIL FILTER

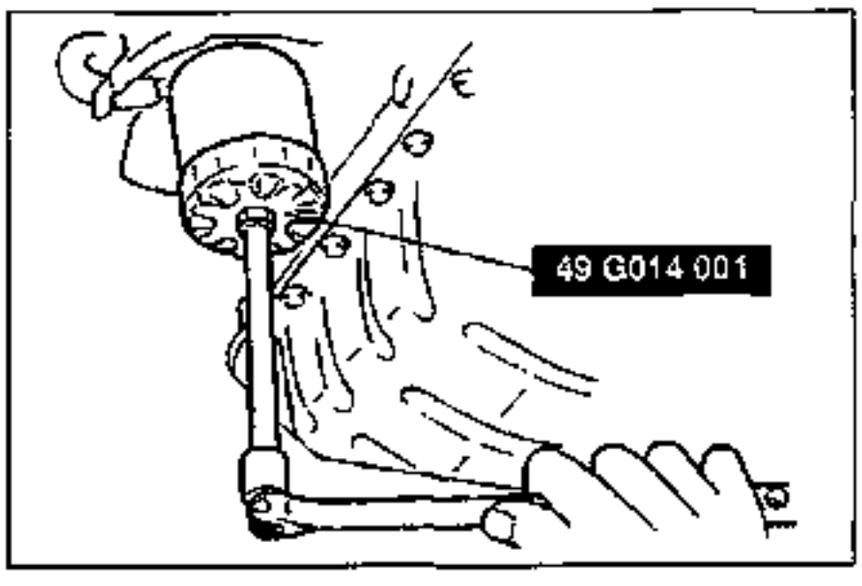
PREPARATION
SST

49 G014 001 Oil filter wrench		For replacement of oil filter



REPLACEMENT

1. Remove the oil filter by using the **SST.**
2. Use a clean rag to wipe off the mounting surface on the oil cooler base.
3. Apply a small amount of clean engine oil to the O-ring of the new filter.



4. Install the oil filter and tighten it by hand until the O-ring contacts the oil cooler base.
5. Tighten the filter 1 and 1/6 turns by using the **SST.**

   Tightening torque:
   13.8–17.6 N·m {140–180 kgf·cm, 122–156 in·lbf}

6. Start the engine and check for leaks.
7. Check the oil level and add oil if necessary.

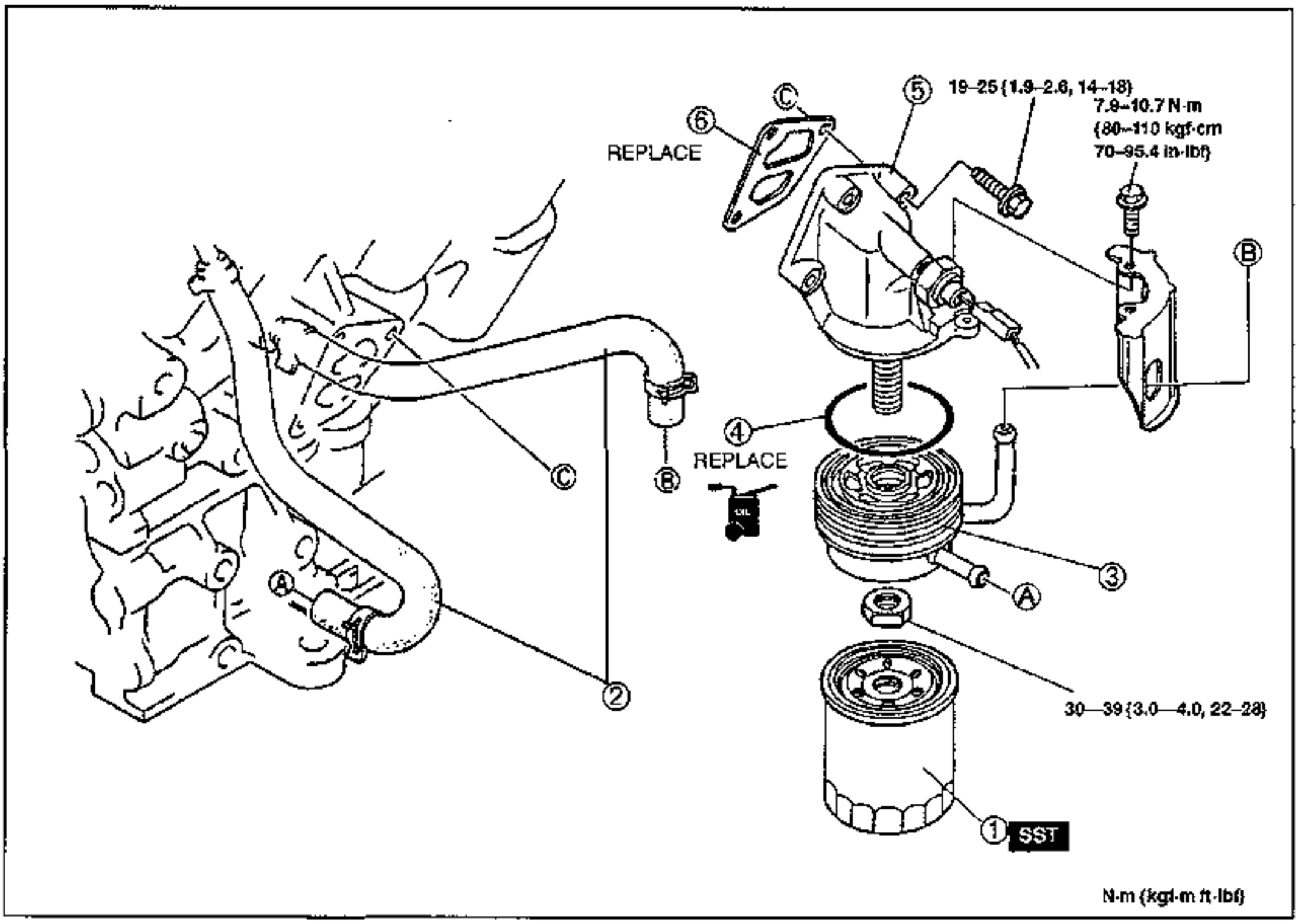
   Oil filter capacity: 0.3 L {0.32 US qt, 0.26 Imp qt}

OIL COOLER

PREPARATION
SST

49 G014 001 Oil filter wrench		For removal and installation of oil filter

REMOVAL / INSTALLATION
1. Disconnect the negative battery cable.
2. Drain the engine coolant. (Refer to section E2.)
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.



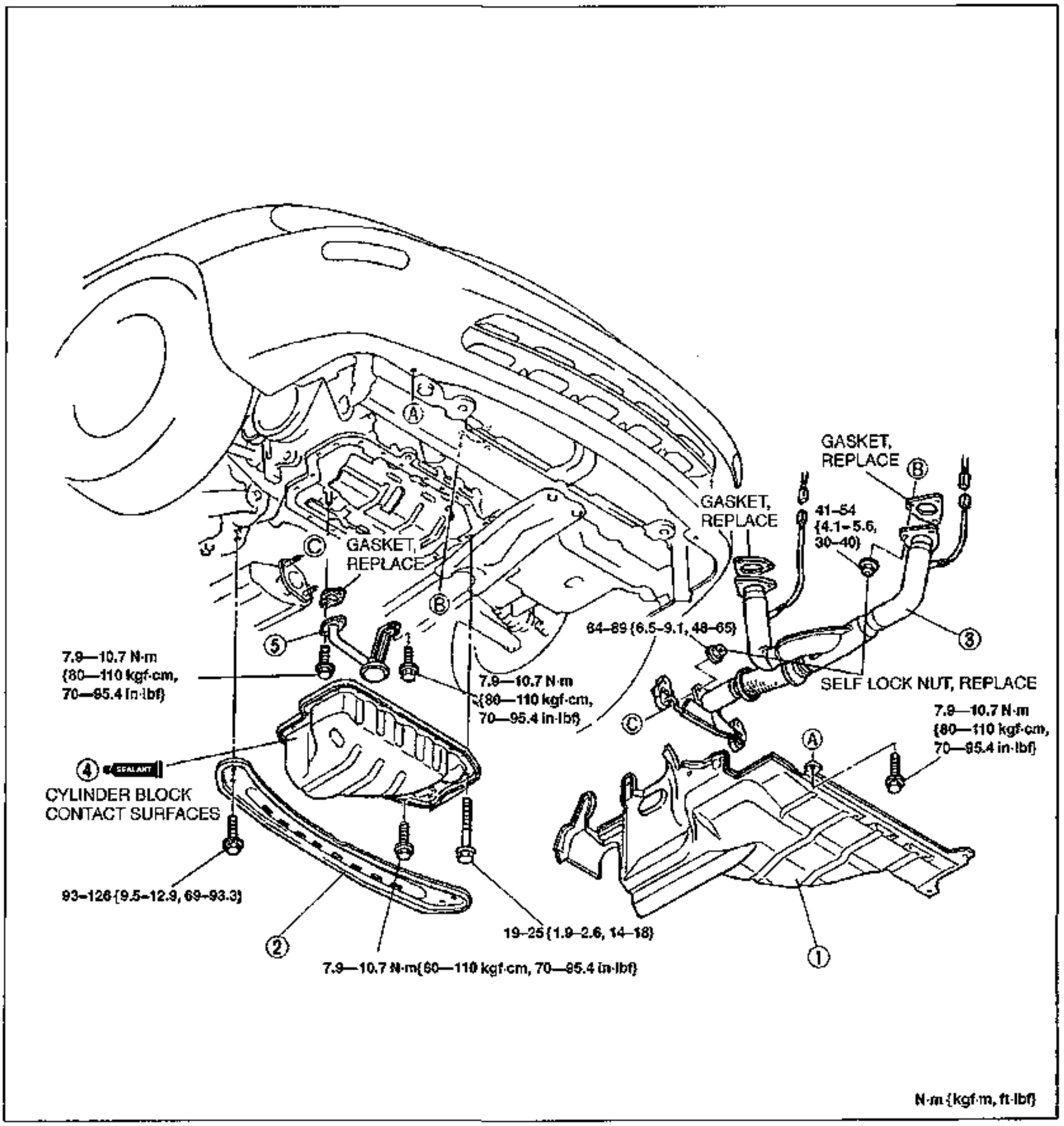
1. Oil filter
   Replacement ..... page D2–6
2. Oil cooler hoses
3. Oil cooler
4. O-ring
5. Oil filter body
6. Gasket

Steps After Installation
1. Fill with the specified amount and type of engine coolant. (Refer to section E2.)
2. Start the engine and check for leaks.

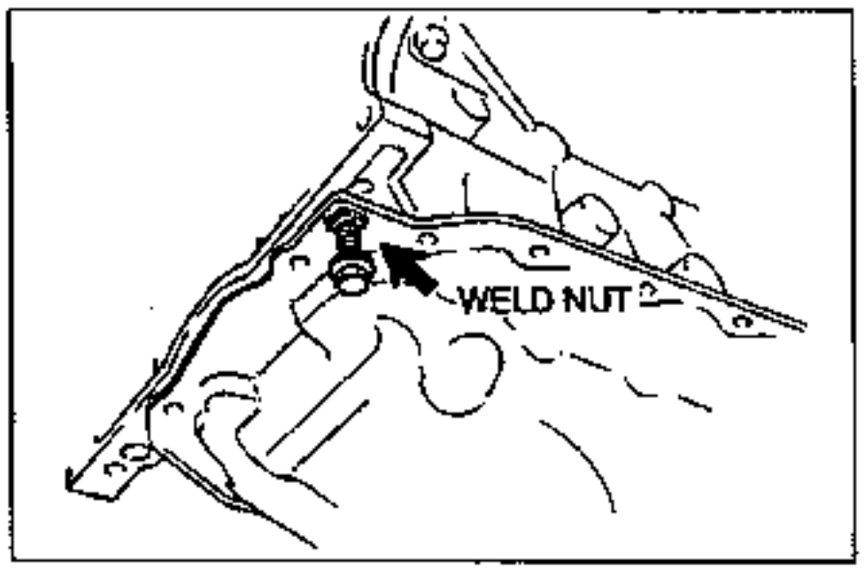
OIL PAN

REMOVAL / INSTALLATION

1. Disconnect the negative battery cable.
2. Drain the engine oil. (Refer to page D2–5.)
3. Remove in the order shown in the figure, referring to **Removal Note.**
4. Install in the reverse order of removal, referring to **Installation Note.**

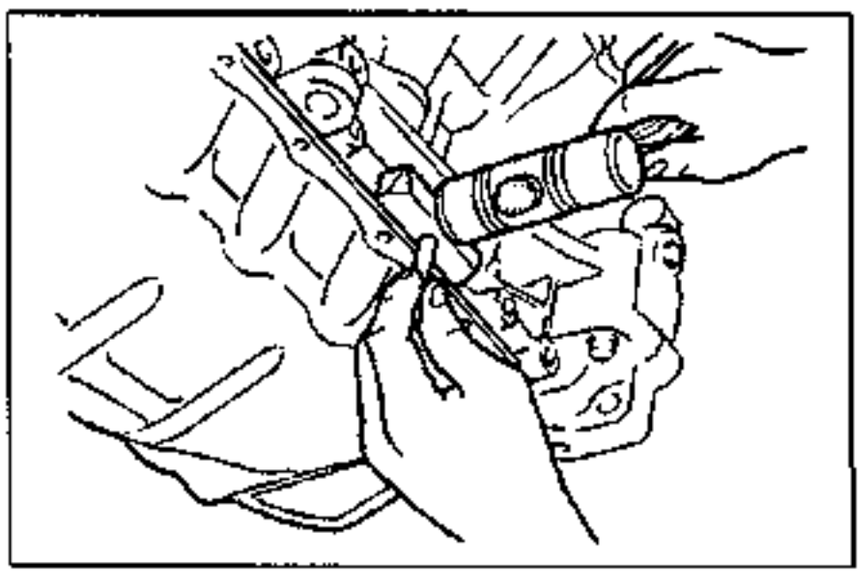


1. Splash shield
2. Transverse member
3. Front exhaust pipe
4. Oil pan
   - Removal Note ..... page D2–9
   - Inspection ..... page D2–9
   - Installation Note ..... page D2–9
5. Oil strainer

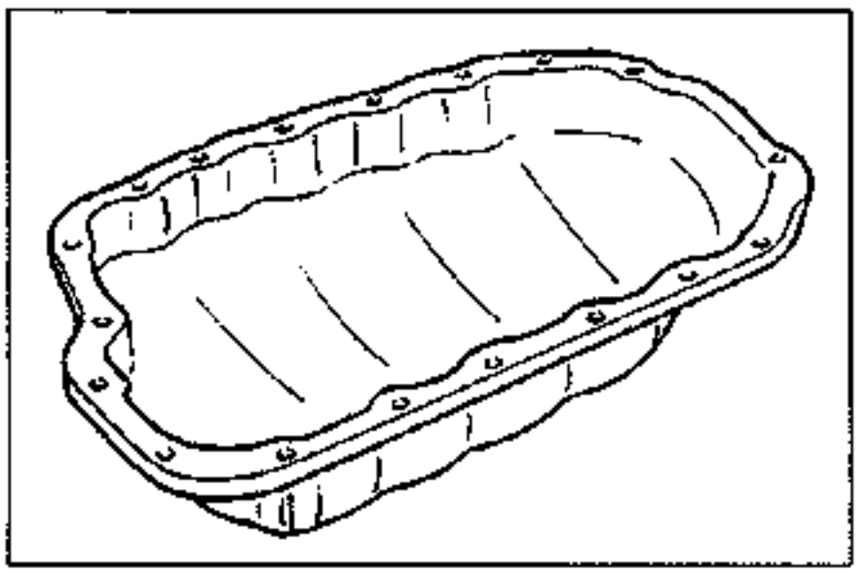


Removal Note
Oil pan
1. Remove the oil pan mounting bolts.

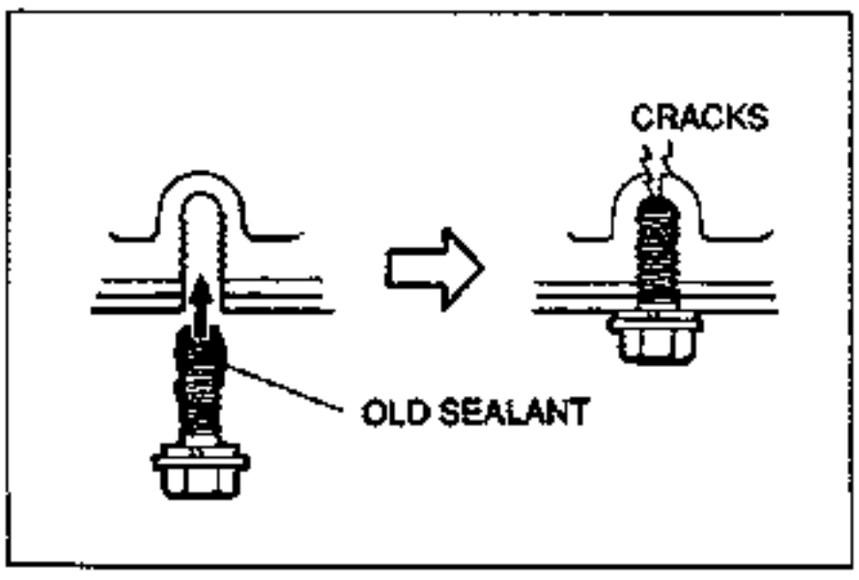
Caution
- **Pry tools can easily scratch the lower cylinder block and oil pan contact surfaces. Prying off the oil pan can also easily bend the oil pan flange. Refer to the following instructions before removing the oil pan.**



2. Remove the sealant on the bolt threads.
   Screw a bolt into the weld nut to make a gap between the block and oil pan.
3. Insert a screwdriver or a suitable tool.
4. Remove the oil pan.

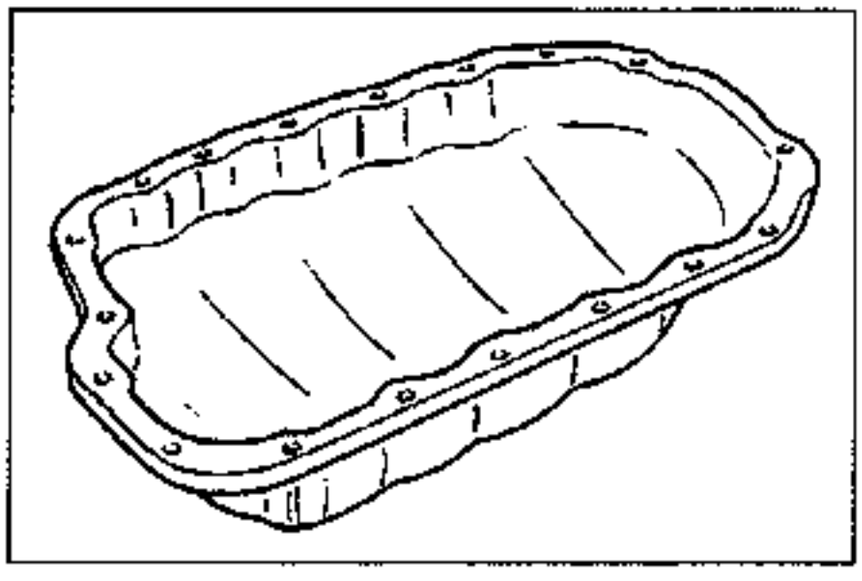


INSPECTION
Oil Pan
Visually check for cracks, deformation and damage. Repair or replace if necessary.

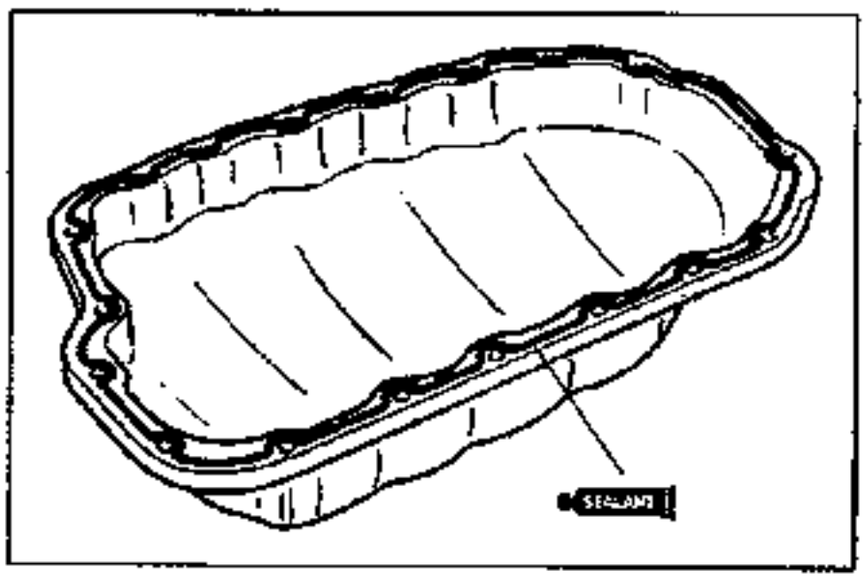


Installation Note
Oil pan

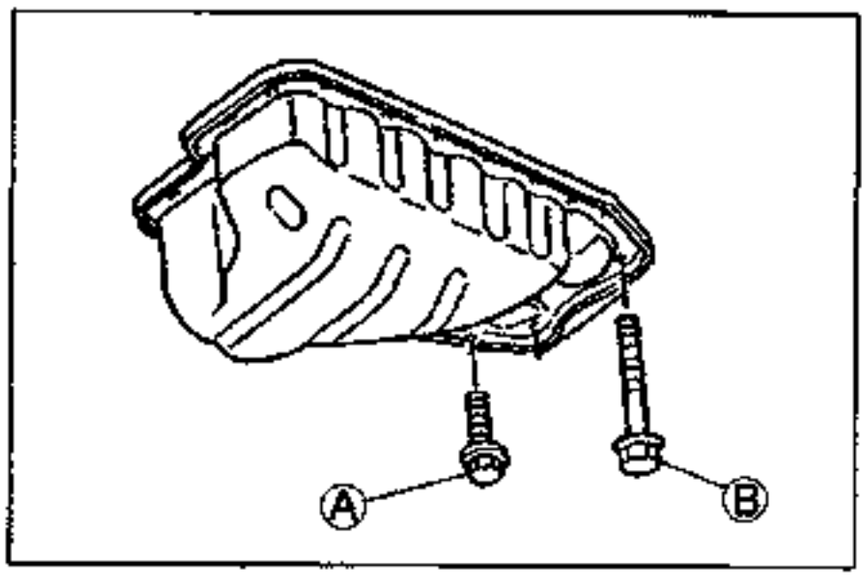
Caution
- **If the bolts are reused, remove the old sealant from the bolt threads. Tightening a bolt that has old sealant on it can cause thread damage.**



1. Remove all foreign material from the contact surfaces.



2. Apply silicone sealant to the contact surfaces of oil pan as shown in the figure.



3. Install the oil pan within five minutes of applying the sealant.

Tightening torque
Ⓐ: 7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}
Ⓑ: 19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

Steps After Installation
1. Fill with the specified amount and type of engine oil. (Refer to page D2–5.)
2. Start the engine and check for leaks.
3. Check the oil level and add oil if necessary.

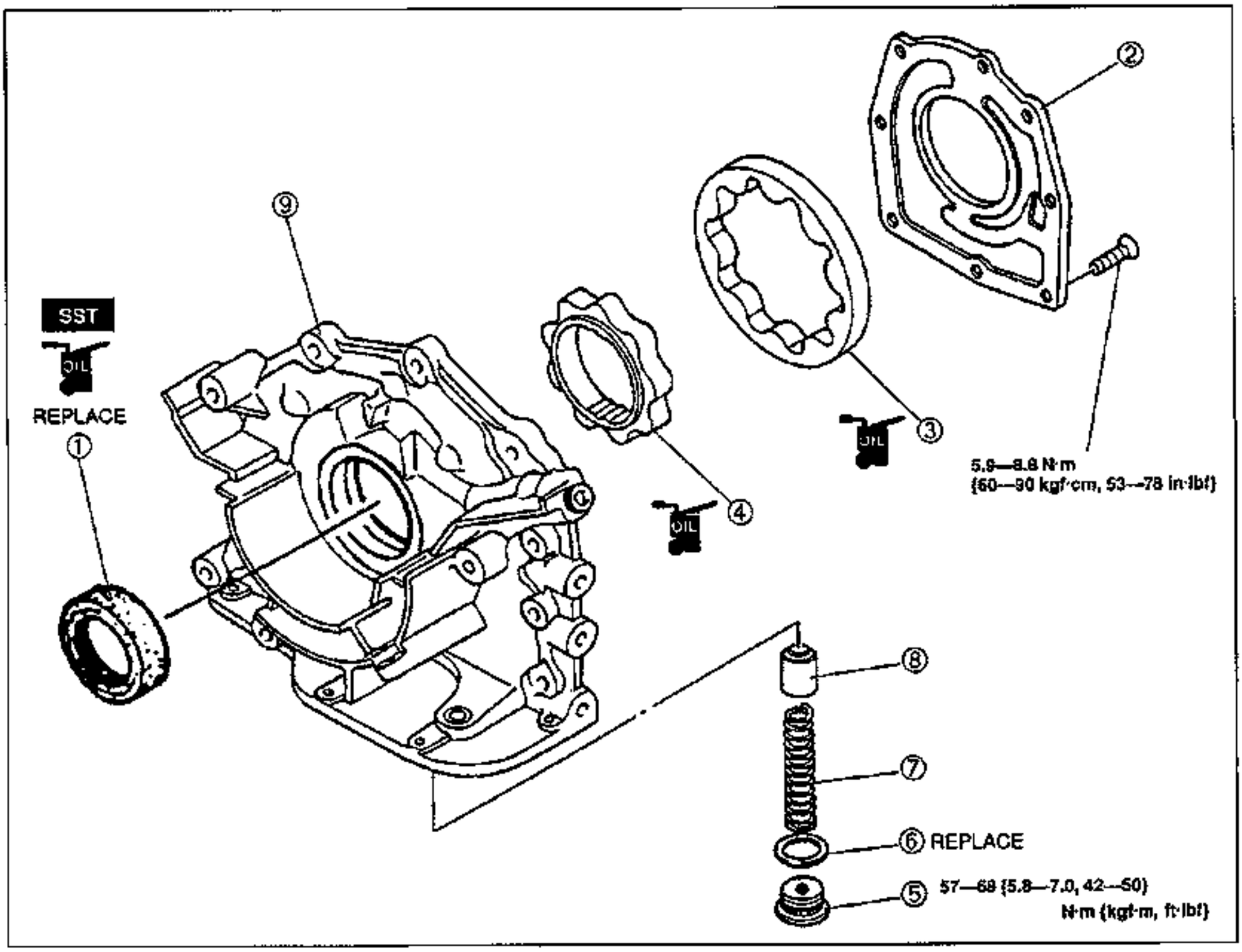
OIL PUMP

PREPARATION
SST

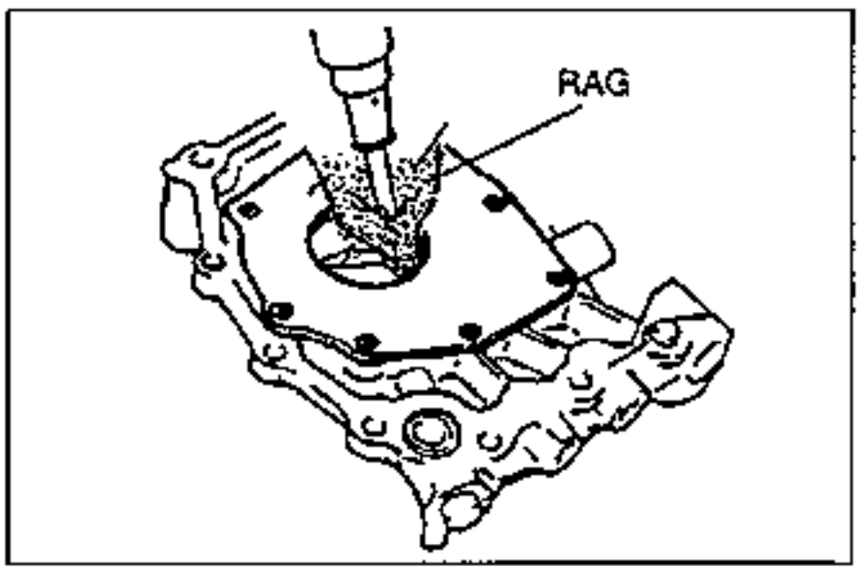
49 H010 401 Installer, oil seal		For installation of front oil seal

DISASSEMBLY / ASSEMBLY

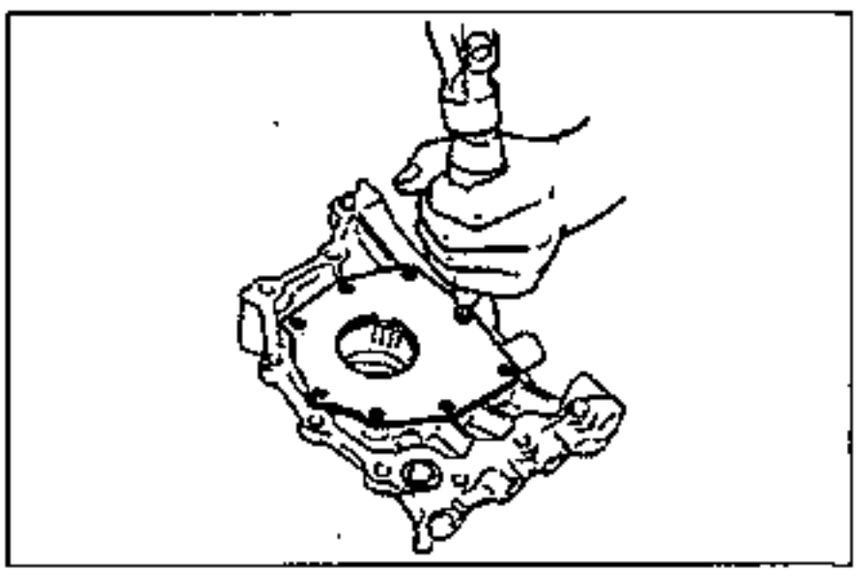
1. Disassemble in the order shown in the figure, referring to **Disassembly Note.**
2. Assemble in the reverse order of disassembly, referring to **Assembly Note.**



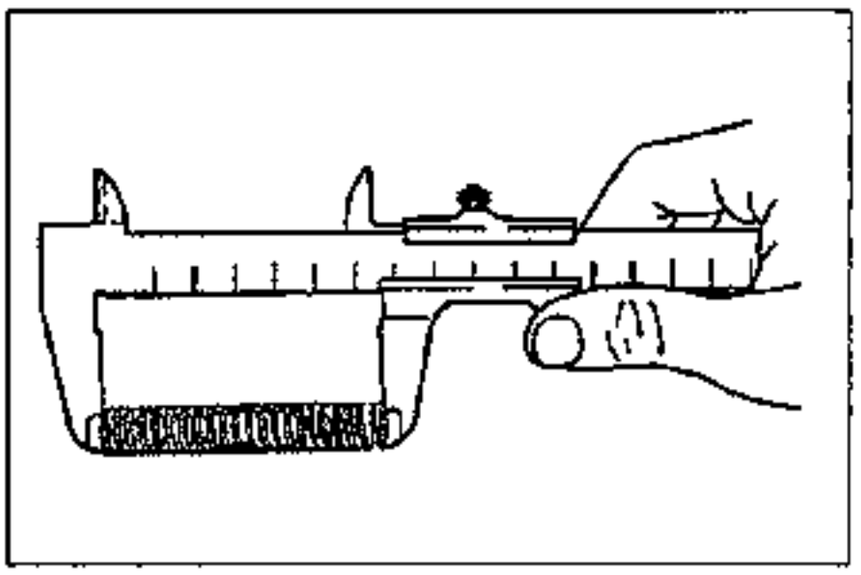
1. Oil seal
   - Disassembly Note ..... page D2–12
   - Assembly Note ..... page D2–13
2. Pump cover
   - Disassembly Note ..... page D2–12
   - Assembly Note ..... page D2–13
3. Outer rotor
   - Inspection ..... page D2–12
   - Assembly Note ..... page D2–13
4. Inner rotor
   - Inspection ..... page D2–12
   - Assembly Note ..... page D2–13
5. Blind plug
6. Spring seat
7. Pressure spring
   - Inspection ..... page D2–12
8. Control plunger
9. Pump body



Disassembly Note
Oil seal
Remove the oil seal with a screwdriver protected with a rag.

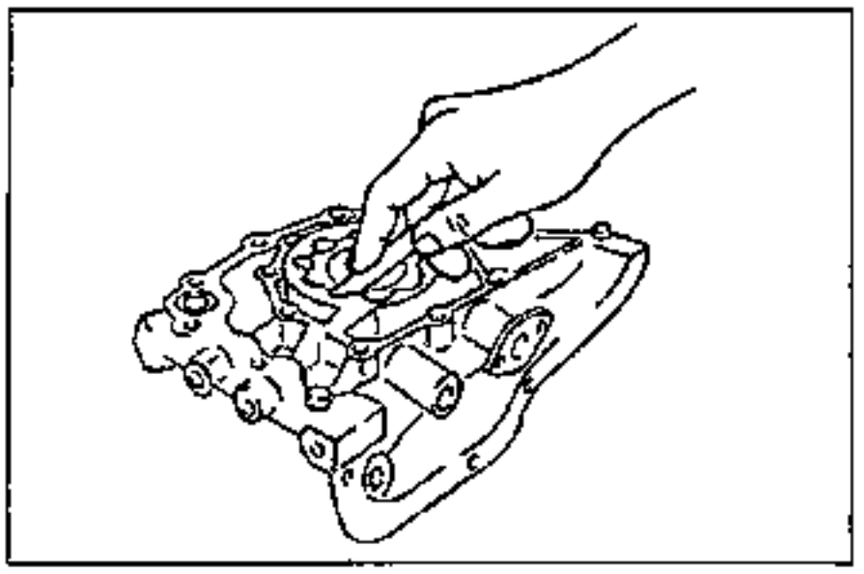


Pump cover
1. Remove the pump cover mounting bolts with an impact screwdriver.
2. Remove the pump cover.



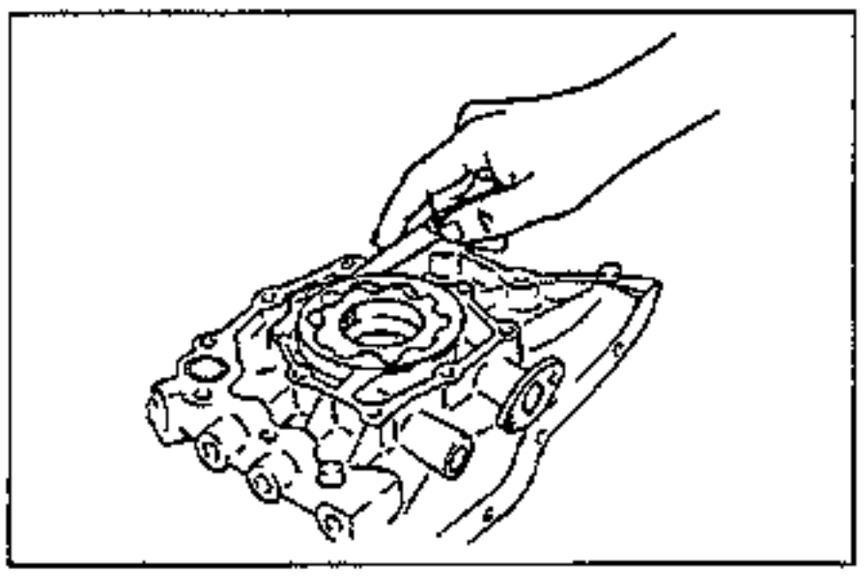
INSPECTION
Pressure Spring
1. Inspect the spring for weakness and damage.
2. Measure the spring free length. Replace the spring if necessary.

Free length: 46.79 mm {1.842 in}

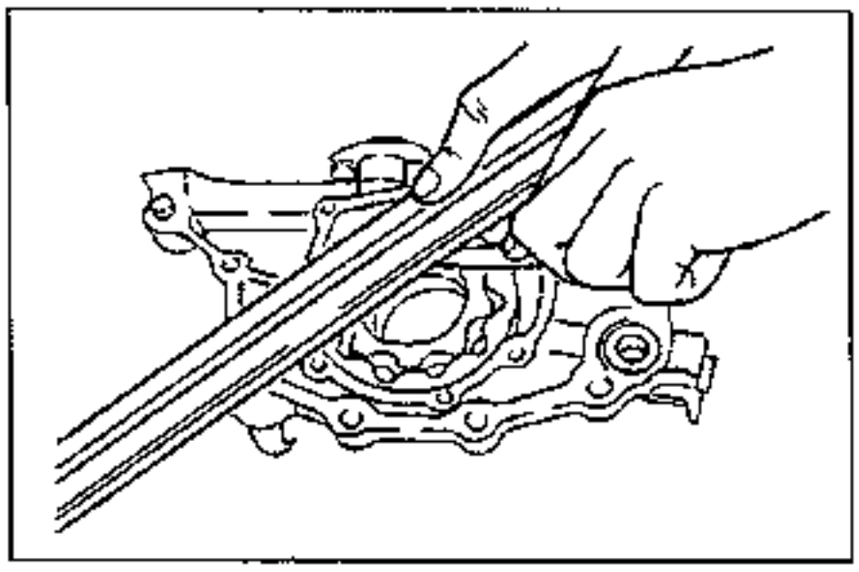


Rotor Clearance
Measure the following clearances. Replace the rotor if necessary.

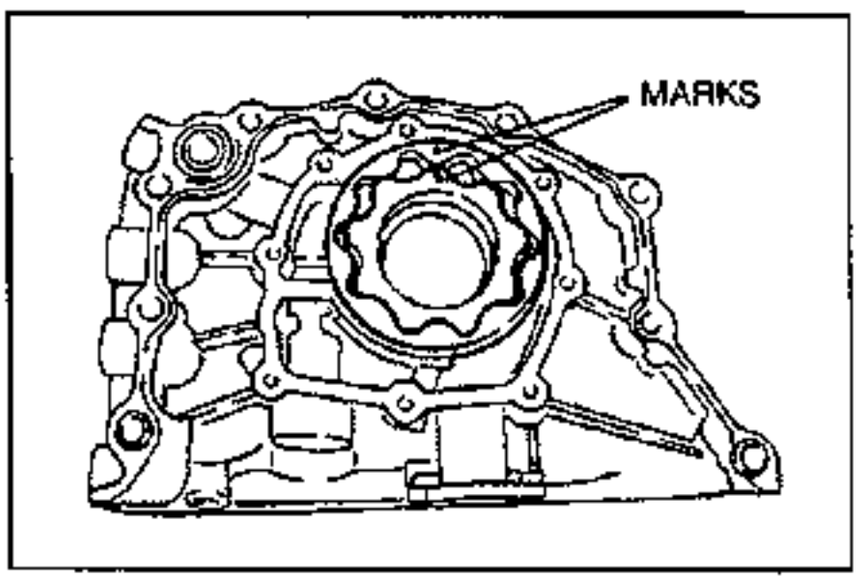
Tooth tip clearance:
0.02–0.18 mm {0.0008–0.0070 in}
Maximum: 0.22 mm {0.0087 in}



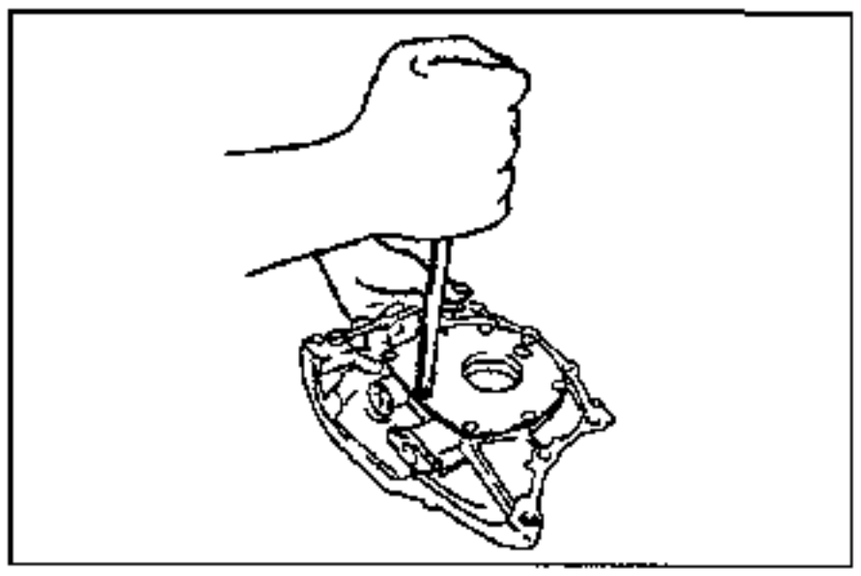
Outer rotor-to-pump body clearance:
0.113–0.186 mm {0.0045–0.0073 in}
Maximum: 0.20 mm {0.0078 in}



Side clearance: 0.03–0.09 mm {0.0012–0.0035 in}
Maximum: 0.13 mm {0.0051 in}



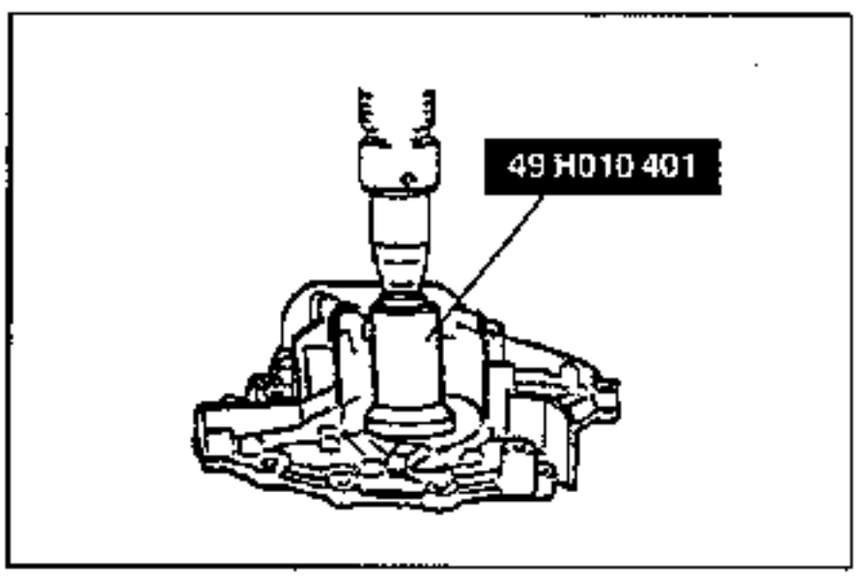
Assembly Note
Inner and outer rotor
1. Apply clean engine oil to the friction surface of the pump body and the rotors.
2. Install the inner and outer rotors into the oil pump boby with the marks aligned as shown.



Pump cover
1. Install the pump cover.

Tightening torque:
5.9–8.8 N·m {60–90 kgf·cm, 53–78 in·lbf}

2. Verify that the oil pump rotates smoothly when turned by hand.



Oil seal
1. Apply clean engine oil to the new oil seal.
2. Install the oil seal into the oil pump body by hand.
3. Press the oil seal into the oil pump body by using a **SST.**

Protrusion: 0–0.7 mm {0–0.03 in}

Before beginning any service procedure, refer to the 1995 MX–3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

COOLING SYSTEM (K8)

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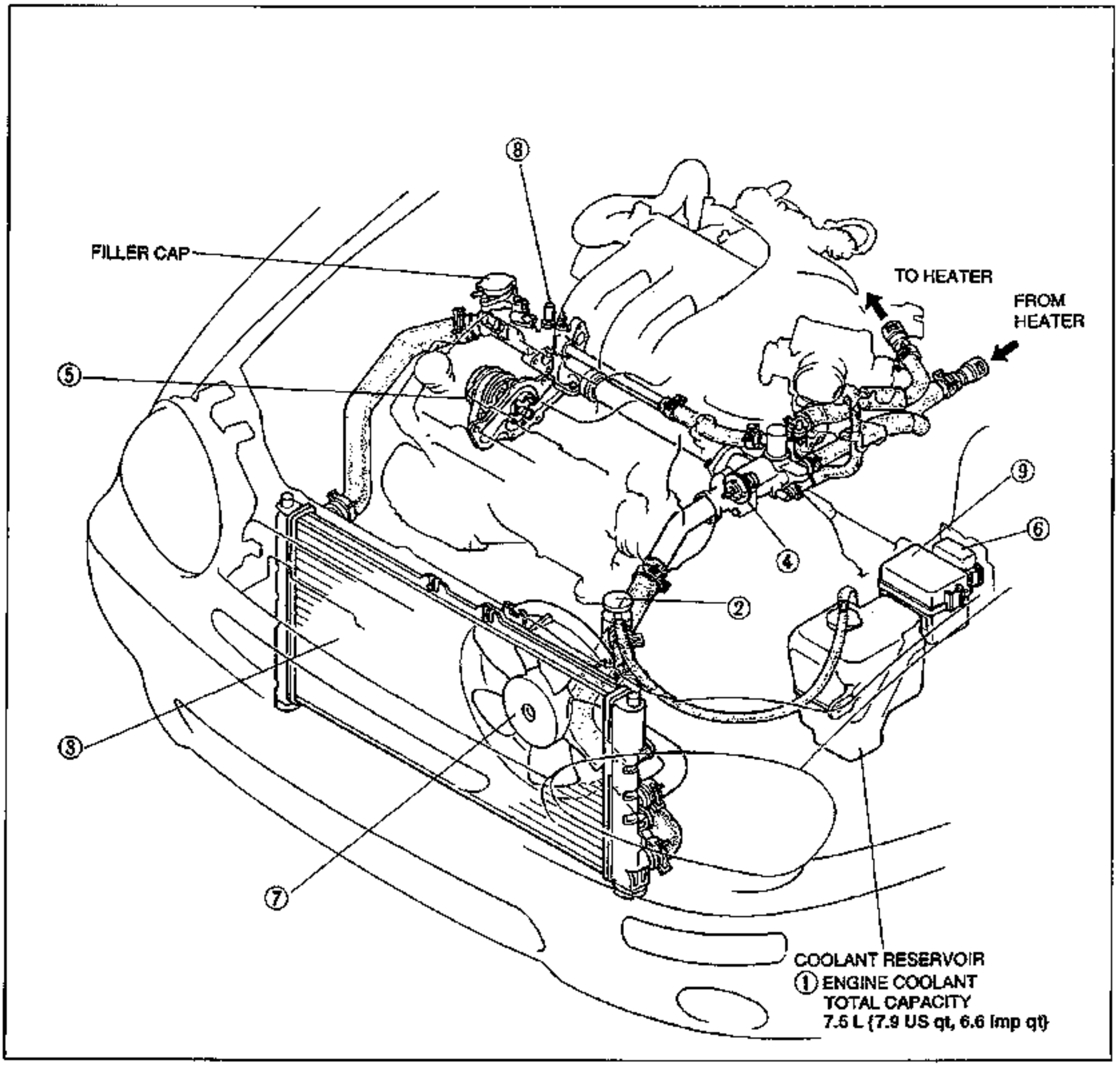

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2. Radiator cap
Inspection ..... page E2– 6
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4. Thermostat
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6. Coolant fan system
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7. Coolant fan motor
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9. Coolant fan relay
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OUTLINE

SPECIFICATIONS

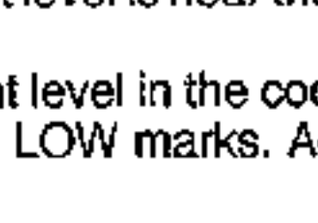
Item \ Engine				MTX	ATX	
Cooling system				Water-cooled, forced circulation		
Coolant capacity			L {US qt, Imp qt}	7.5 {7.9, 6.6}		
Water pump	Type			Centrifugal		
	Water seal			Unified mechanical seal		
Thermostat	Type			Wax, bottom-bypass		
	Opening temperature		°C {°F}	80–84 {176–183}		
	Full-open temperature		°C {°F}	95 {203}		
	Full-open lift		mm {in}	8.5 {0.33}		
Radiator	Type			Corrugated fin		
	Cap valve opening pressure		kPa {kgf/cm^2, psi}	73.5–102 {0.75–1.05, 10.7–14.9}		
	Core size mm {in}	Width		690 {27.2}	647 {25.5}	
		Height		350 {13.8}	390 {15.4}	
		Depth		25 {0.98}		
	Fin pitch		mm {in}	1.3 {0.051}		
Coolant fan	Type			Electric		
	Blade	Outer diameter	mm {in}	340 {13.39}		
		Number		5		
	Motor	Fan speed		—	Low	High
		Current	A	11.0	12.0	16.8
		Speed	rpm	1,750	1,650	2,060

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Action	Page
Overheating	Coolant level insufficient	Add	E2– 5
	Coolant leakage	Repair	—
	Radiator fins clogged	Repair	E2– 7
	Radiator cap malfunction	Replace	E2– 6
	Coolant fan malfunction	Replace	E2–11
	Thermostat malfunction	Replace	E2– 9
	Water passage clogged	Clean	E2– 5
	Water pump malfunction	Replace	E2–10
Corrosion	Impurities in coolant	Replace	E2– 5

ENGINE COOLANT

PREPARATION
SST

49 9200 145 Adapter set, radiator cap tester		For inspection of cooling system pressure	49 9200 146 Adapter A (Part of 49 9200 145)		For inspection of cooling system pressure

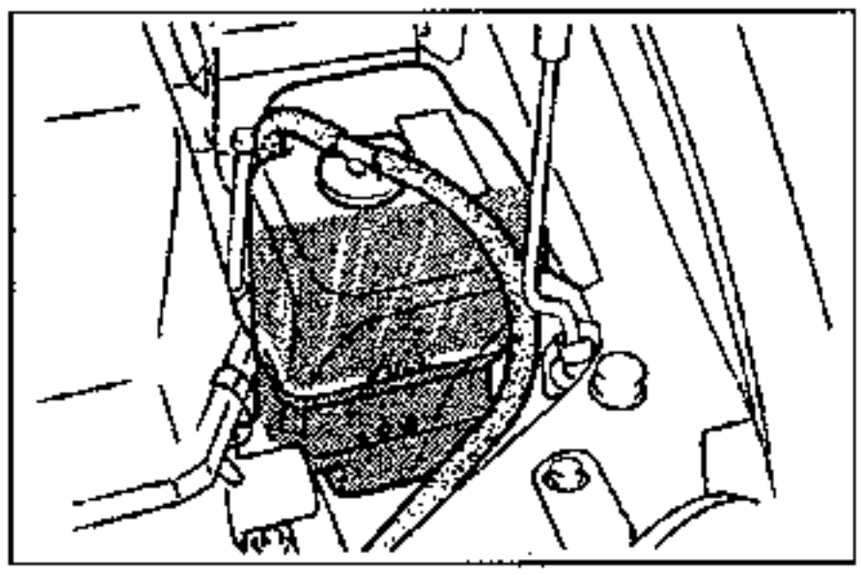
INSPECTION

Warning

- **Removing the radiator cap or the coolant filler cap while the engine is running, or when the engine and radiator are hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**

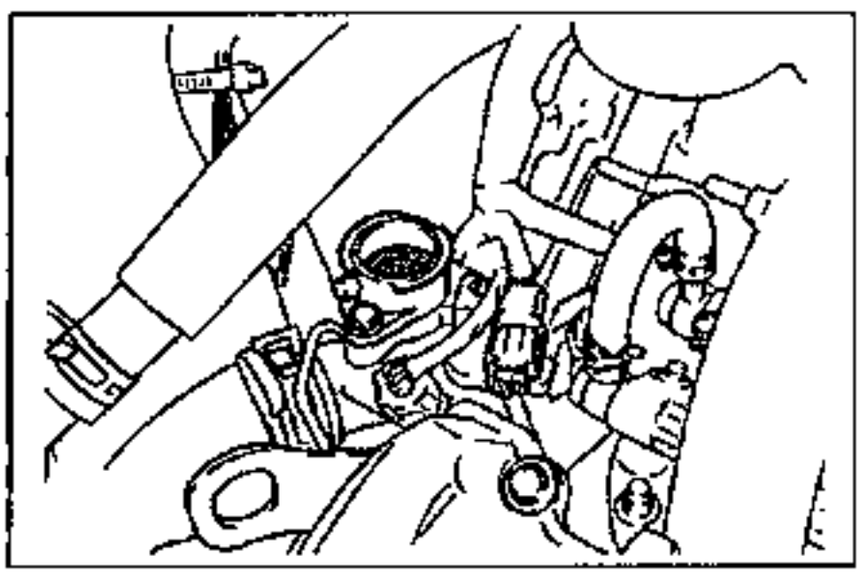
Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.

When you're sure all the pressure is gone, press down on the cap – still using a cloth – turn it, and remove it.



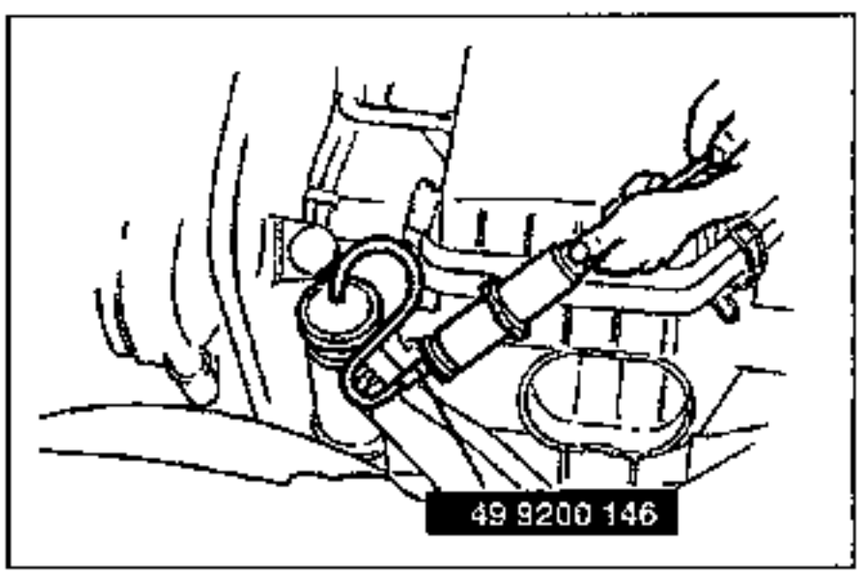
Coolant Level (Engine Cold)

1. Verify that the coolant level is near the filler neck of the radiator..
2. Verify that the coolant level in the coolant reservoir is between the FULL and LOW marks. Add coolant if necessary.



Coolant Quality

1. Verify that there is no buildup of rust or scale around the filler cap and filler neck.
2. Verify that the coolant is free of oil. Replace the coolant if necessary.

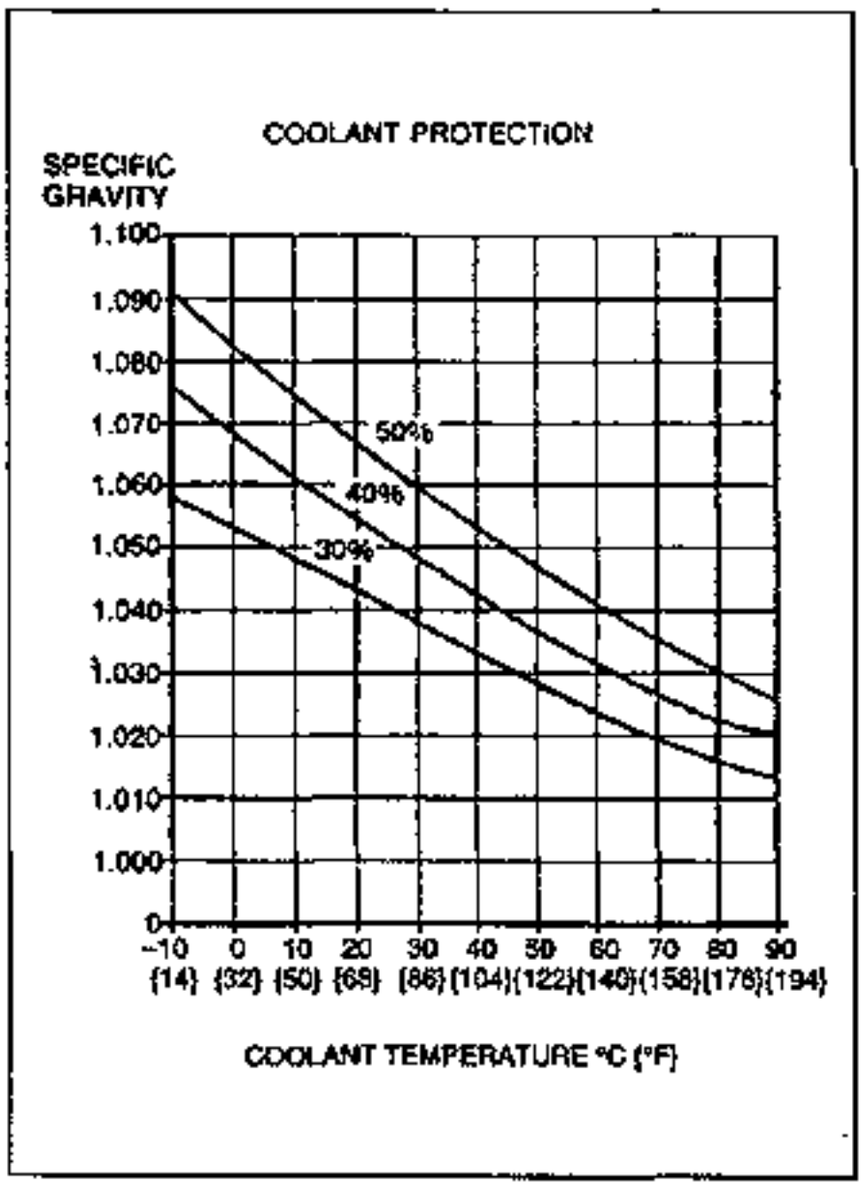


Coolant Leakage

1. Remove the fresh-air duct.
2. Connect a radiator tester and the **SST** to the radiator filler neck.
3. Apply **103 kPa{1.05 kgf/cm^2, 15 psi}** pressure to the system.
4. Verify that the pressure is held. If not, check for coolant leakage.

Caution

- **Applying more than 103 kPa {1.05 kgf/cm^2, 15 psi} can damage the hoses, fittings and other components, and cause leaks.**



Coolant Protection

Caution

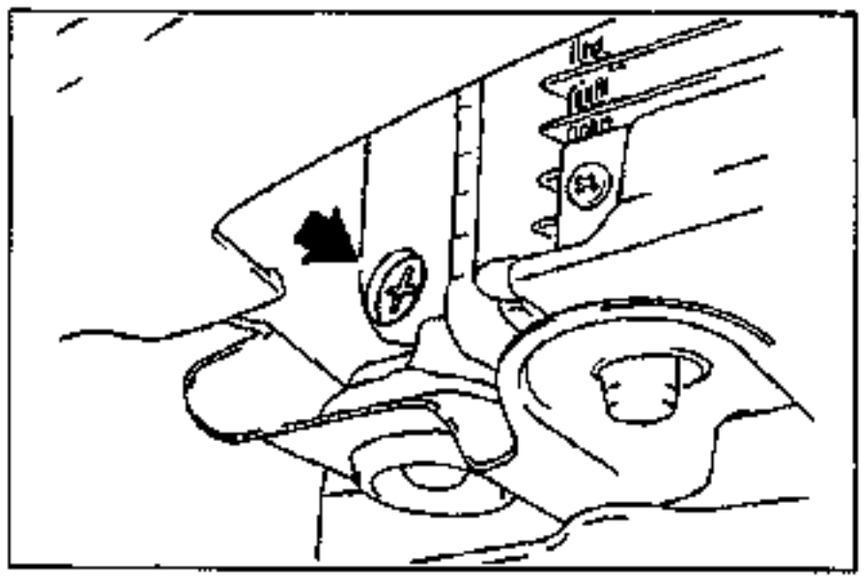
- **The engine has aluminum parts that can be damaged by alcohol or methanol antifreeze. Do not use alcohol or methanol in the cooling system. Use only ethylene-glycol-based coolant.**
- **Use only soft (demineralized) water in the coolant mixture. Water that contains minerals will cut down on the coolant's effectiveness.**

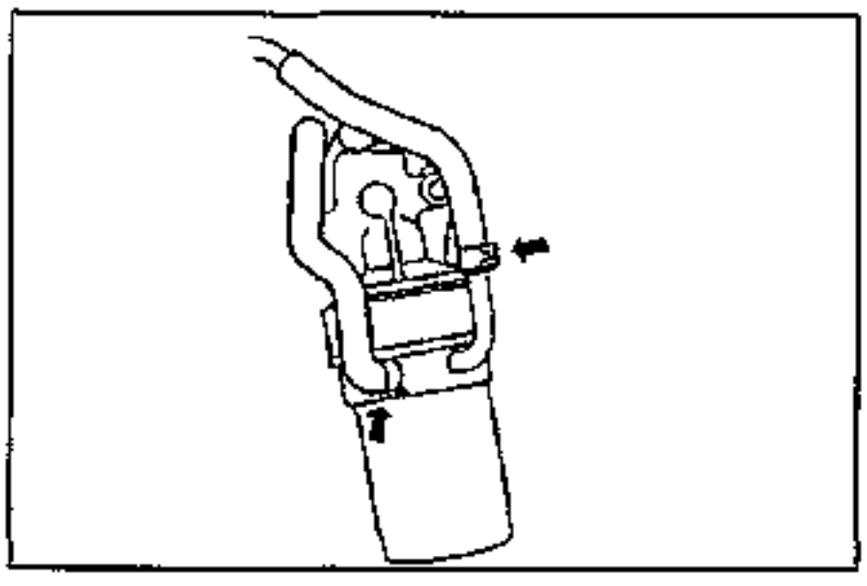
1. Measure the coolant temperature and specific gravity with a thermometer and a hydrometer.
2. Determine the coolant protection by referring to the graph shown.
3. If the coolant protection is not proper, add water or coolant as necessary.

E2

Antifreeze solution mixture percentage

Coolant protection	Volume percentage		Gravity at 20°C {68°F}
	Water	Coolant	
Above –16°C {3°F}	65	35	1.054
Above –26°C {–15°F}	55	45	1.066
Above –40°C {–40°F}	45	55	1.078





REPLACEMENT
Draining

Warning

- **Removing the radiator cap or the coolant filler cap while the engine is running, or when the engine and radiator are hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**
- **Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.**
- **When you're sure all the pressure is gone, press down on the cap – still using a cloth – turn it, and remove it.**

1. Remove the coolant filler cap, radiator cap and loosen the radiator drain plug.
2. Disconnect the oil cooler hoses.
3. Drain the coolant into a container.
4. Flush the cooling system with water until all traces of color are gone.
5. Let the system drain completely.
6. Tighten the drain plug and connect the oil cooler hoses.

Refilling

Use the proper amount and mixture of ethylene-glycol based coolant. (Refer to Coolant Protection, page E2–5.)

1. Slowly pour the coolant into the radiator up to the coolant filler port.

   Filling pace:
   1.0 L {1.1 US qt, 0.9 Imp qt}/min. max.

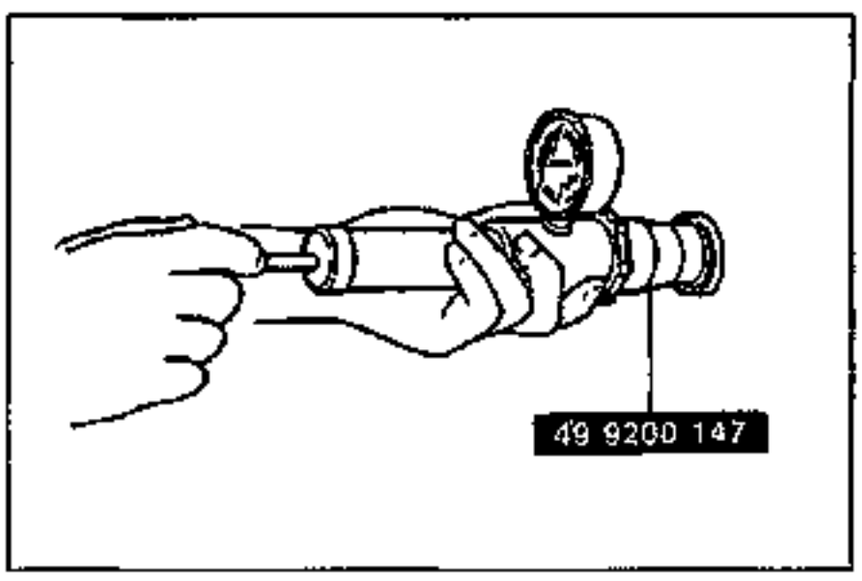
2. Fill the coolant reservoir up to the FULL mark.
3. Fully install the coolant filler cap.
4. Start the engine and let it idle until it warms up.
5. If the temperature increases beyond normal, there is excessive air in the system. Stop the engine and allow it to cool; then repeat steps 1–3.
6. Run the engine at 2,200—2,800 rpm for five minutes.
7. Stop the engine and allow it to cool.
8. Repeat steps 1–7; then go to step 9.
9. Remove the filler cap and verify that the engine coolant level is near the filler neck. If not, repeat steps 1–8.
10. Fill the reservoir up to the FULL mark.

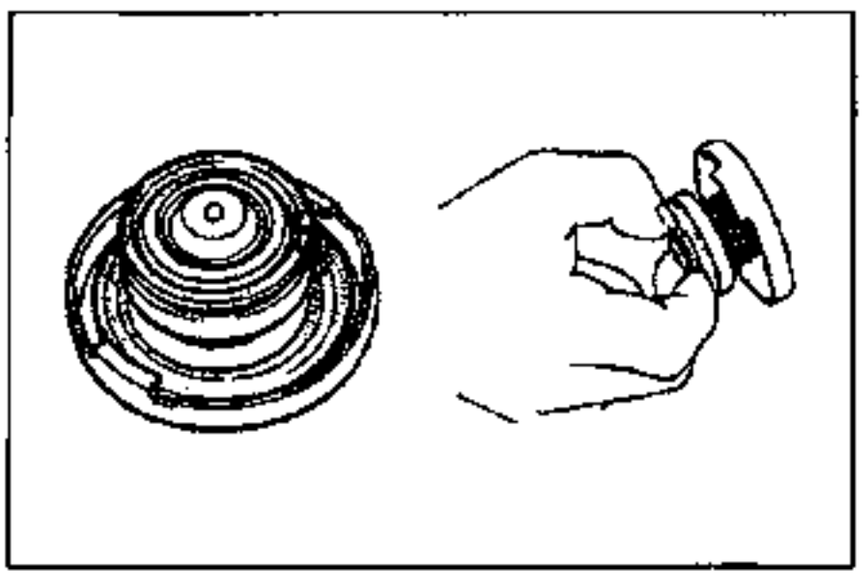
RADIATOR CAP

PREPARATION

SST

49 9200 145 Adapter set, radiator cap tester		For inspection of radiator cap valve	49 9200 147 Adapter B (Part of 49 9200 145)		For inspection of radiator cap valve





INSPECTION

Radiator Cap Valve

1. Remove foreign material (such as water residue) from between the radiator cap valve and the valve seat.
2. Attach the radiator cap to a radiator cap tester with the **SST.** Apply pressure gradually to **73.5–102 kPa {0.75–1.05 kgf/cm², 10.7– 14.9 psi}.**
3. Wait about **10 seconds.** Verify that the pressure has not decreased.

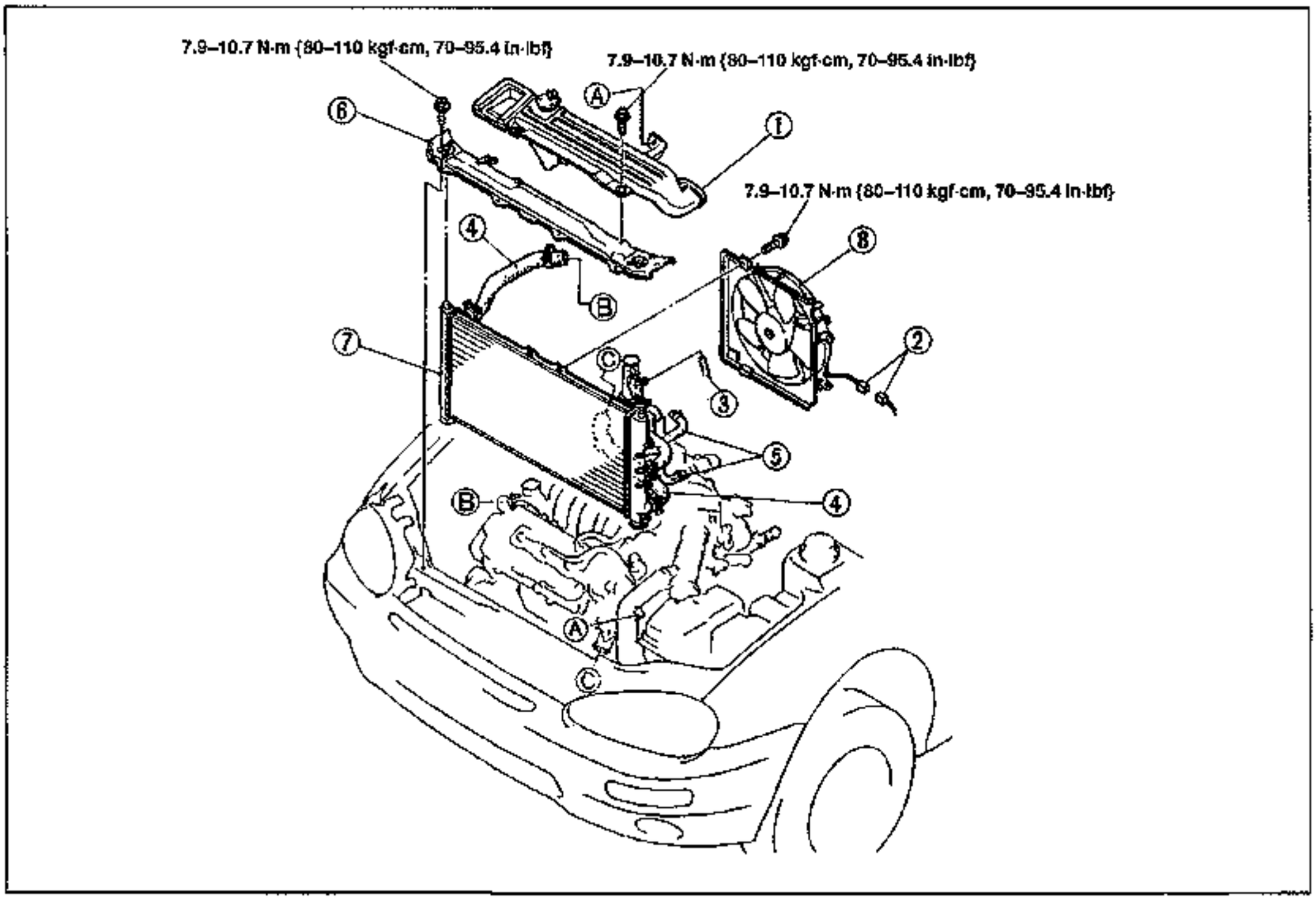
Negative Pressure Valve

1. Pull the negative pressure valve to open it. Verify that it closes completely when released.
2. Check for damage on the contact surfaces and for cracked or deformed seal packing.
3. Replace the radiator cap if necessary.

RADIATOR

REMOVAL / INSTALLATION

1. Disconnect the negative battery cable.
2. Drain the engine coolant. (Refer to page E2–5.)
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.



1. Fresh-air duct
2. Coolant fan connector
3. Coolant *reservoir* hose
4. Upper and lower radiator hoses
5. Oil cooler hoses (ATX)
6. Shroud upper panel
7. Radiator
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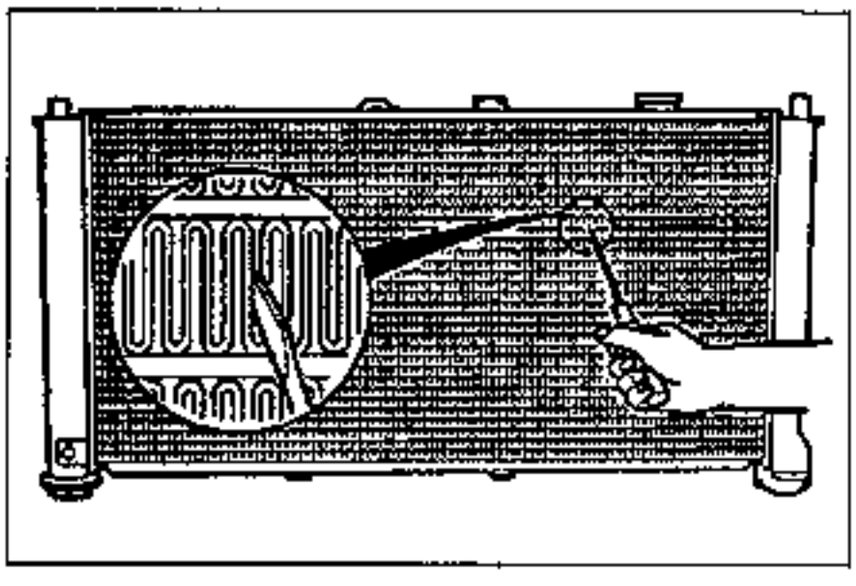
8. Coolant fan and radiator cowling assembly



INSPECTION

Check for the following and repair or replace if necessary.

1. Cracks, damage, and water leakage.
2. Bent fins (Repair with a screwdriver).
3. Distorted or bent radiator inlet.

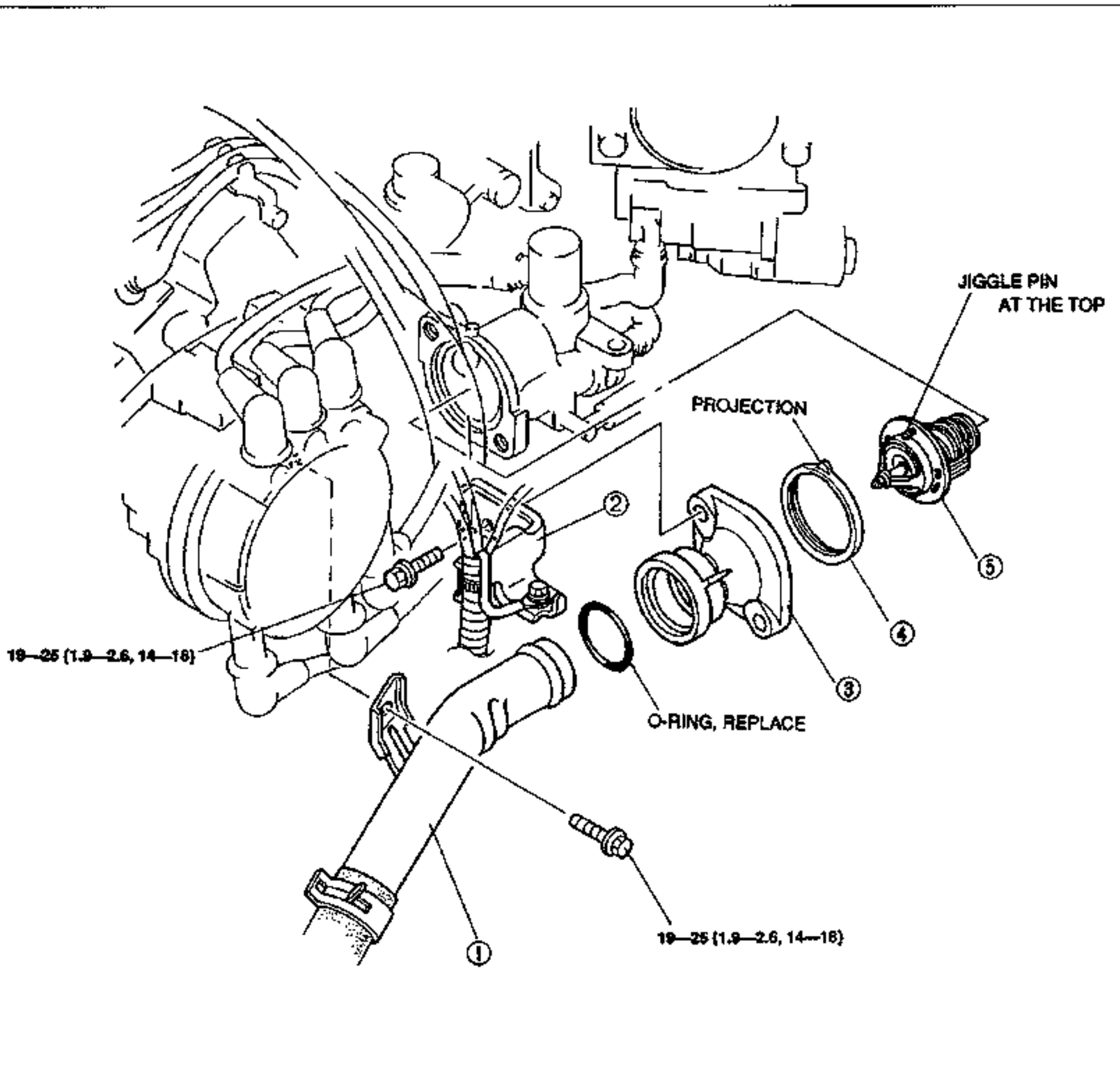
Steps After Installation

1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E2–6.)
2. Connect the negative battery cable.
3. Start the engine and check for leaks.

THERMOSTAT

REMOVAL / INSTALLATION

1. Disconnect the negative battery cable.
2. Drain the engine coolant. (Refer to page E2–5.)
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal, referring to **Installation Note**.



1. Water inlet pipe
2. Engine harness bracket
3. Thermostat cover
4. Thermostat gasket
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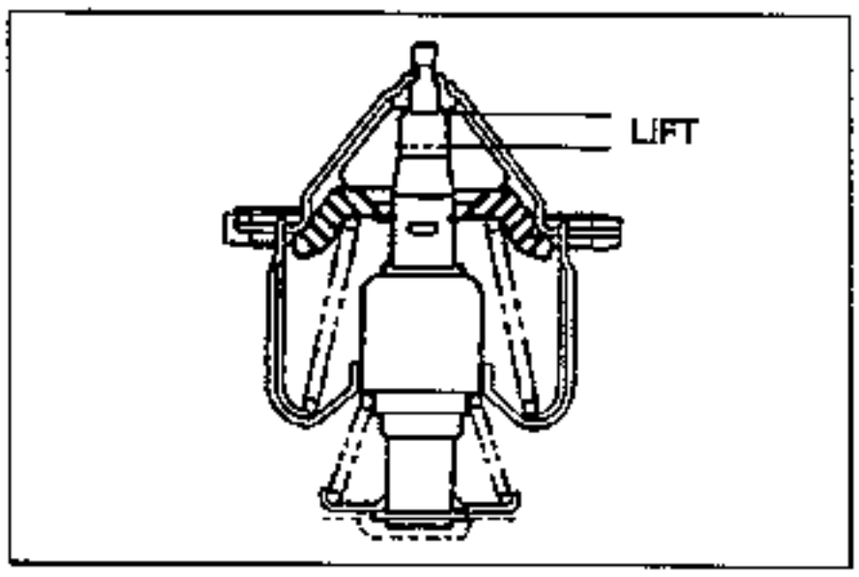
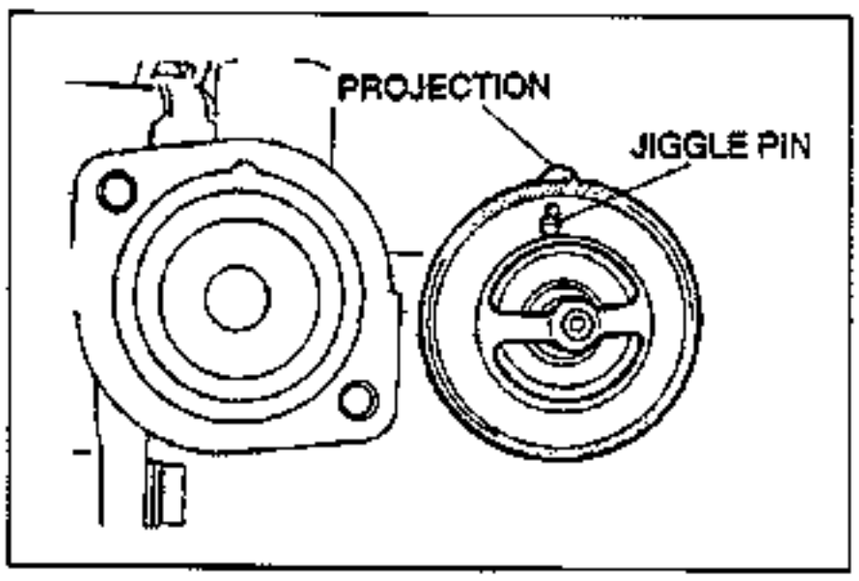
   Inspection ..... page E2–9
   Installation Note ..... page E2–9





INSPECTION

1. Visually check that the thermostat valve is airtight.
2. Place the thermostat and a thermometer in water.
3. Heat the water and check the following.

Initial-opening temperature:
80–84°C {176–183°F}
Full-open temperature: 95°C {203°F}
Full-open lift: 8.5mm {0.33 in} min.

4. Check the thermostat gasket. If damaged, replace the thermostat assembly.

Installation Note

Thermostat

Install the thermostat into the cylinder head with the jiggle pin at the top.

Thermostat gasket

Install a gasket with the projection facing the same direction as the jiggle pin.

Steps After Installation

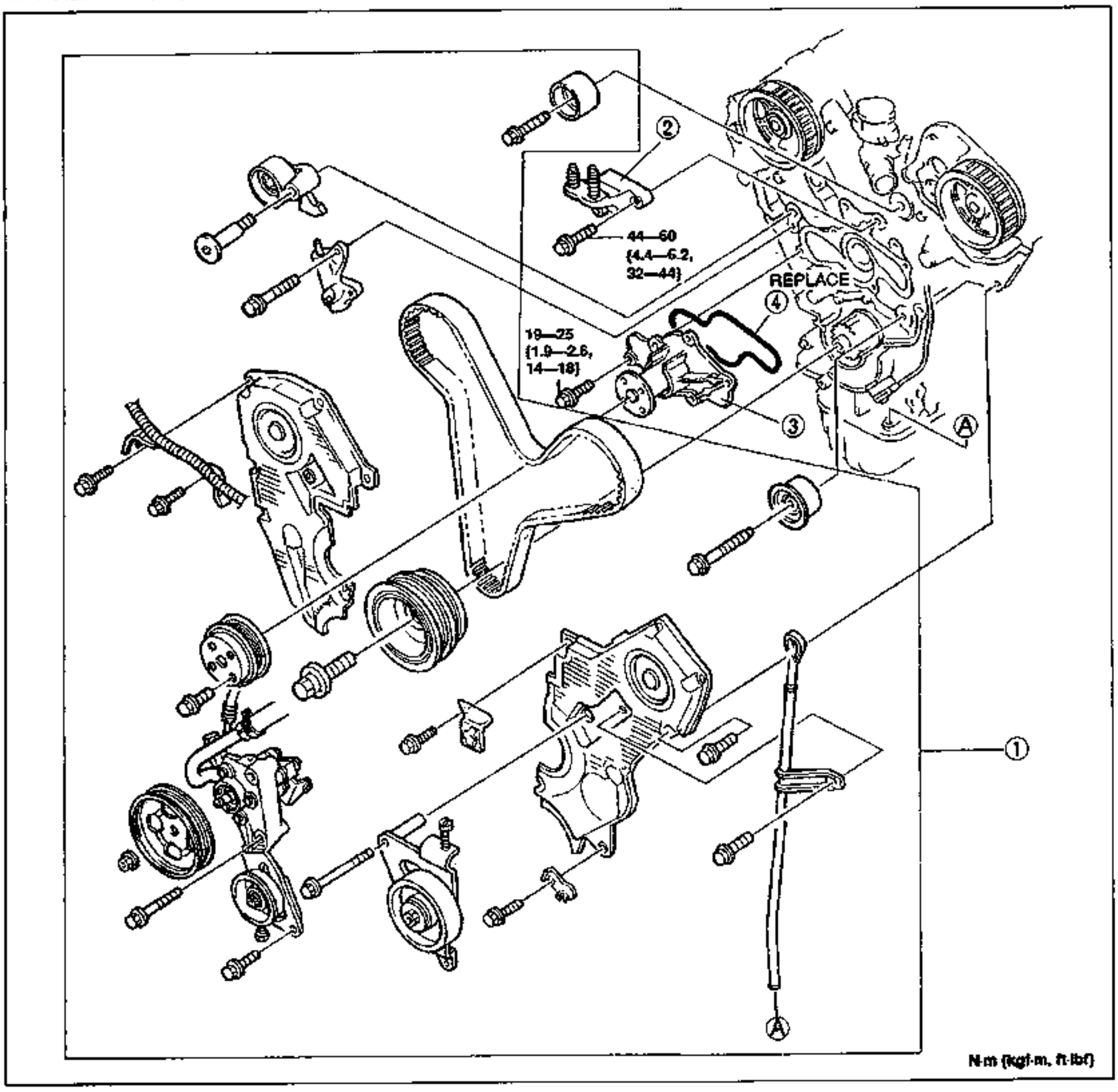
1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E2–6.)
2. Start the engine and check for leaks.

WATER PUMP

REMOVAL / INSTALLATION

Caution
- **Applying oil to the water pump rubber seal will damage it.**

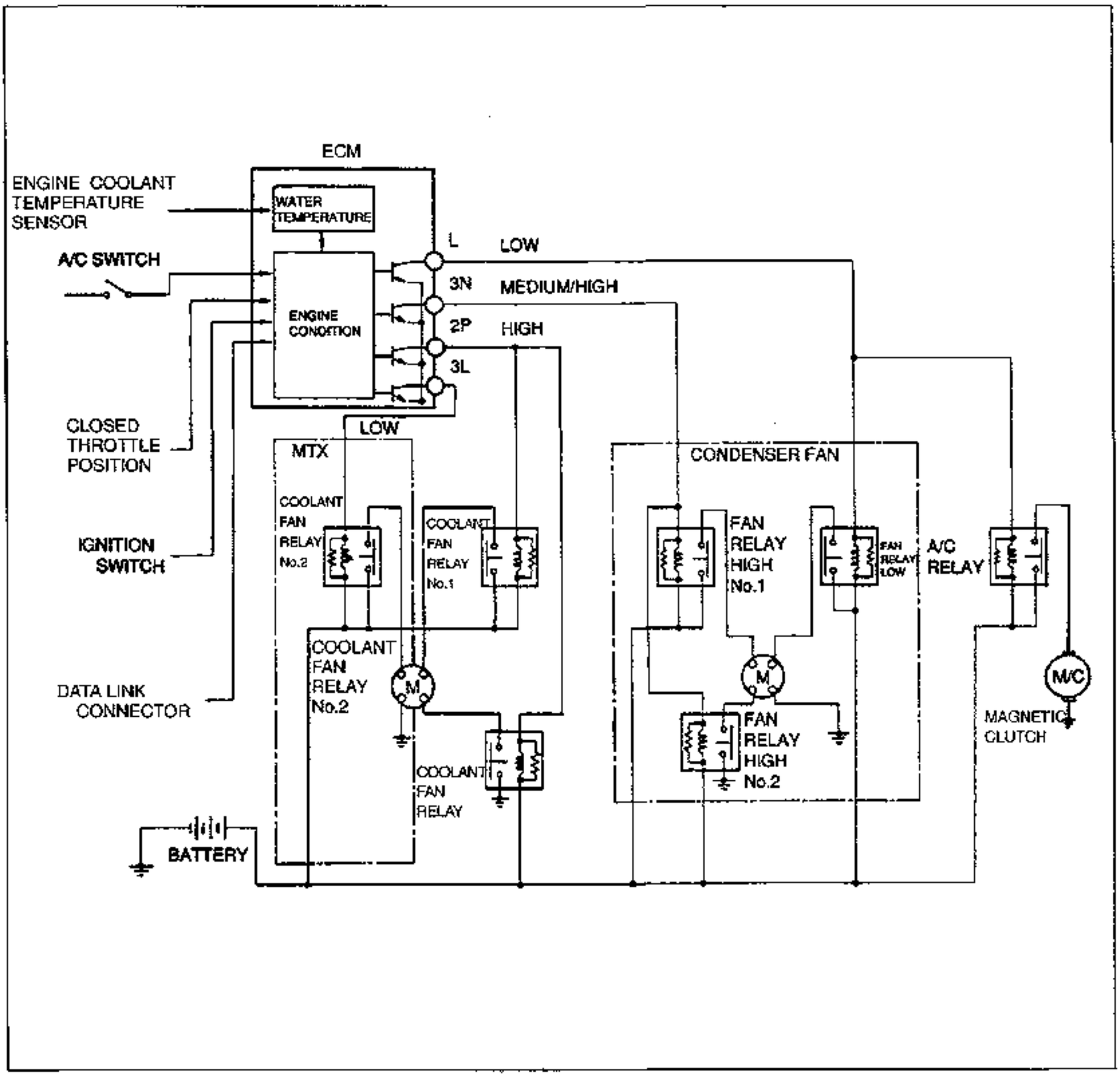
1. Disconnect the negative battery cable.
2. Drain the engine coolant. (Refer to page E2–5.)
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.

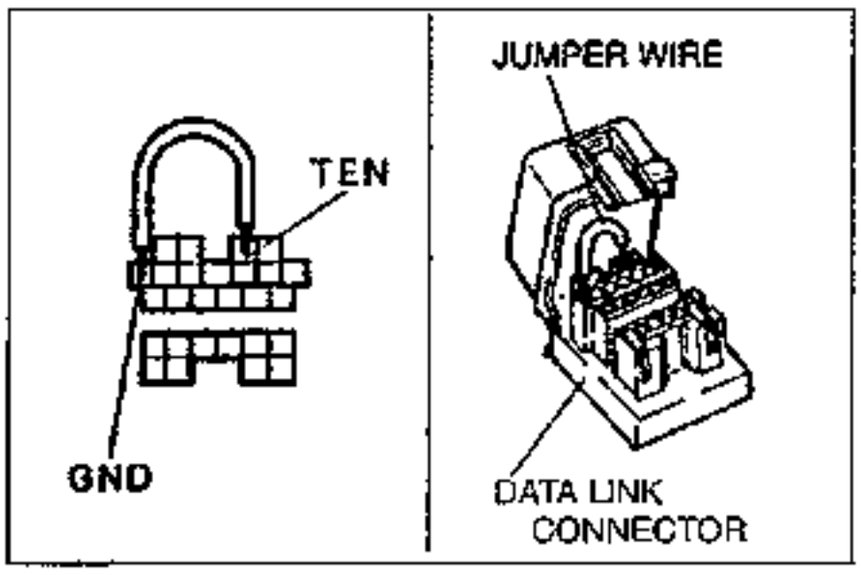


1. Timing belt
   Removal/Installation ..... section B2
2. No.3 engine mount bracket
3. Water pump assembly
   Inspect for cracks, damaged mounting surface, bearing condition, and leakage. If the water pump is damaged, replace it. Do not repair it.
4. Water pump rubber seal

COOLANT FAN SYSTEM

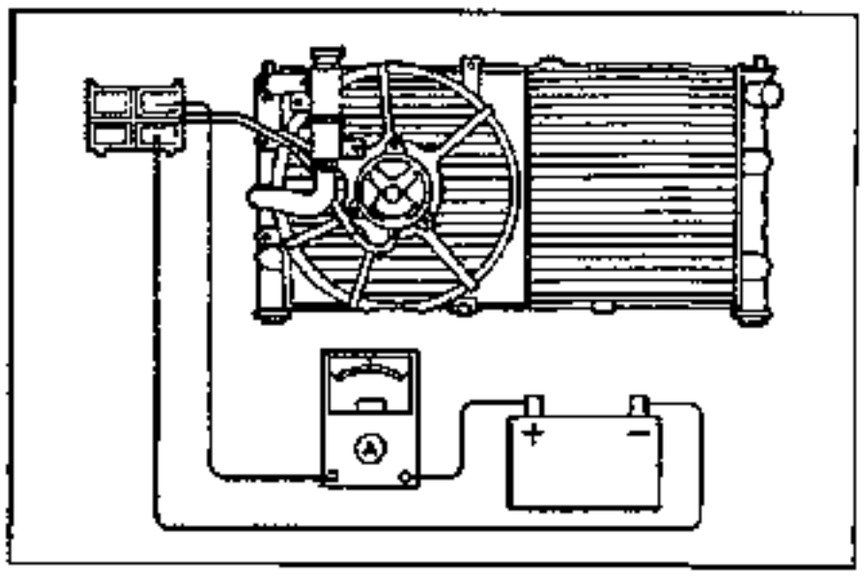
SYSTEM CIRCUIT





SYSTEM INSPECTION

1. Turn the ignition switch to OFF.
2. Ground the TEN terminal of the data link connector and open the throttle slightly.
3. Turn the ignition switch on and verify that the fan operates.
4. If the fan does not operate, inspect the coolant fan system components and wire harness.
5. Remove the filler cap and place a thermometer in the filler neck.
6. Start the engine.
7. Verify that the fan operates when the coolant temperature reaches **approx. 100°C {212°F}**.
8. If it does, check the engine coolant temperature sensor. (Refer to page E2–14.)



COOLANT FAN MOTOR

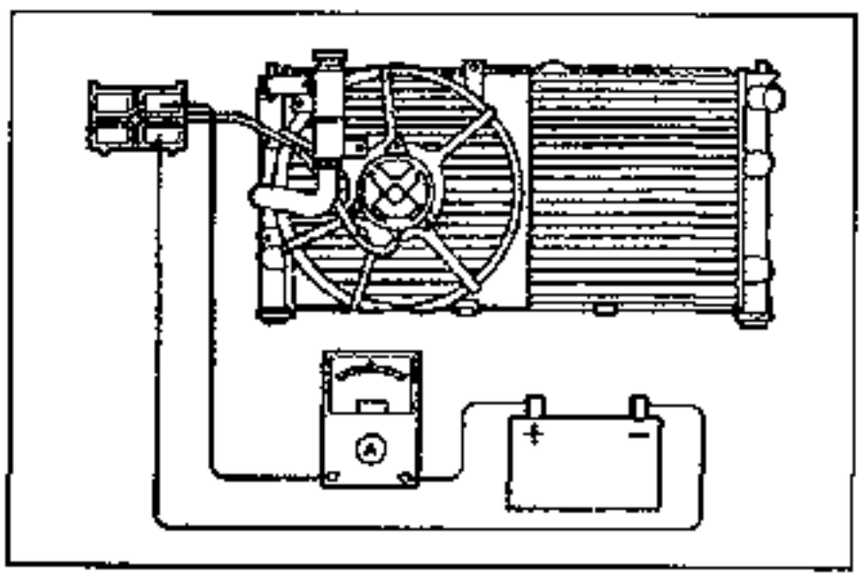
INSPECTION

MTX (Single-speed type)

1. Check that the battery is fully charged.
2. Disconnect the coolant fan motor connector.
3. Connect the battery and an ammeter to the fan motor connector.
4. Verify that the fan motor operates smoothly at the standard current.

   Current: 11.0 A

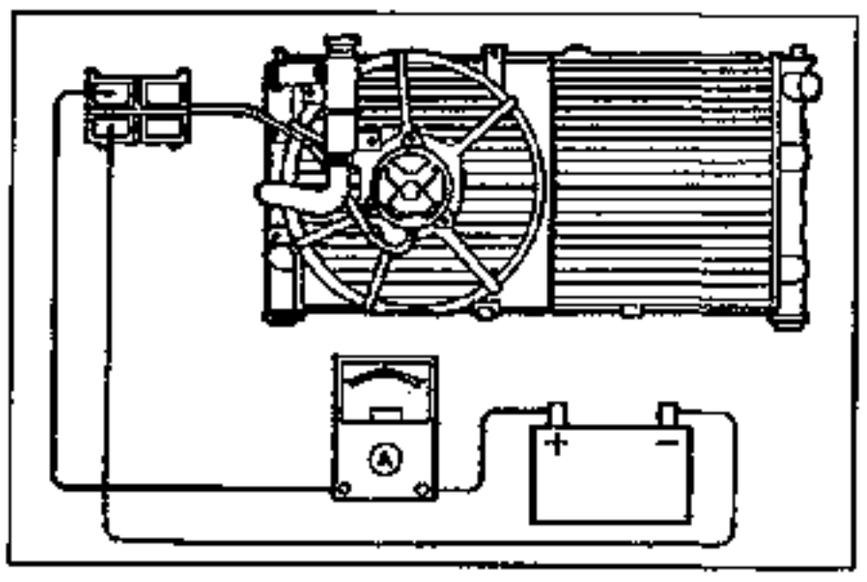
5. If the fan motor is faulty, replace the fan motor.



ATX (Two-Speed Type)

1. Check that the battery is fully charged.
2. Disconnect the coolant fan motor connector.
3. Connect the battery and an ammeter to the fan motor connector for low-speed inspection.
4. Verify that the fan motor operates smoothly at the standard current.

   Current: 12.0 A



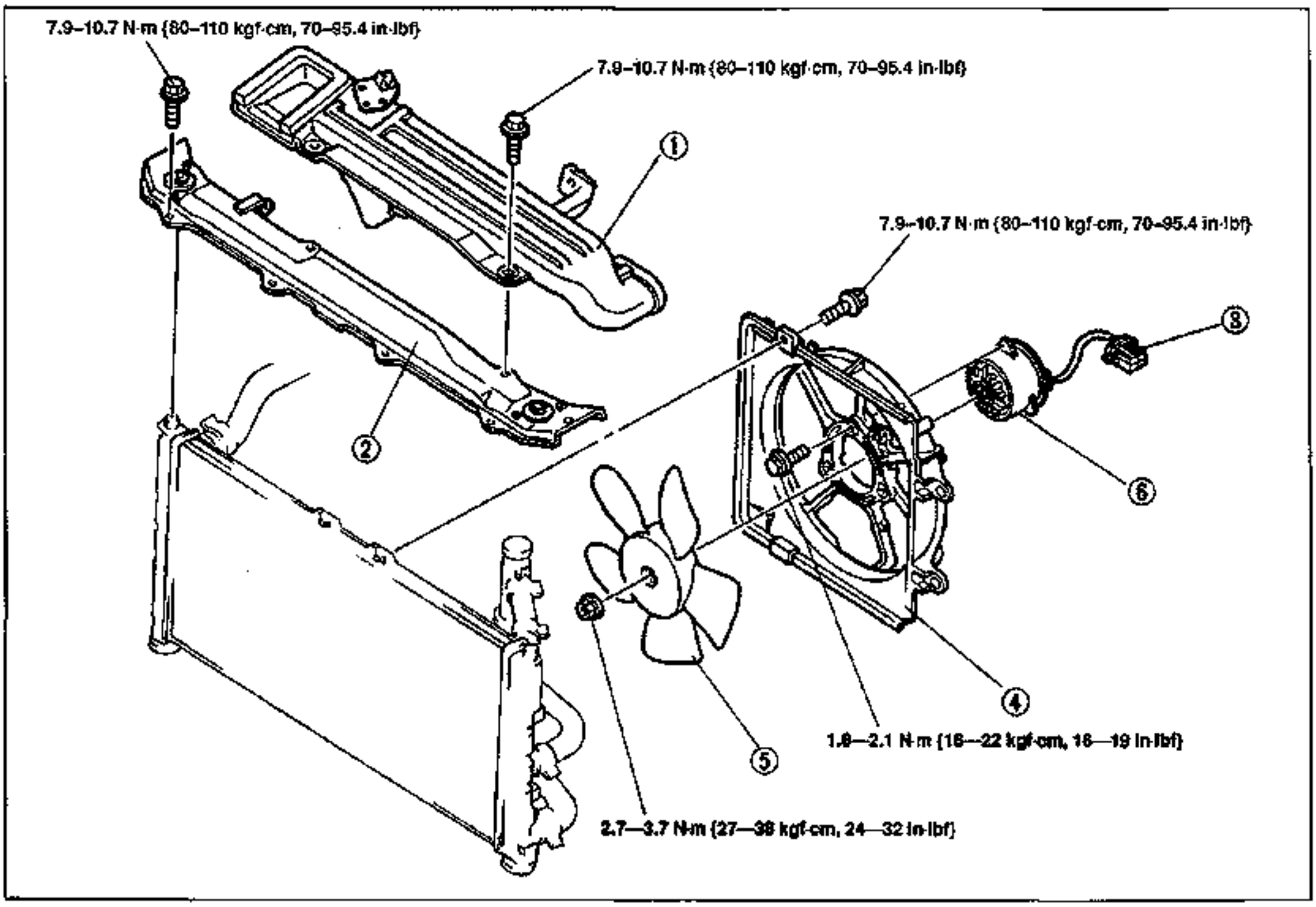
5. Connect the battery and an ammeter to the fan motor connector for high-speed inspection.
6. Verify that the fan motor operates smoothly at the standard current.

   Current: 16.8 A

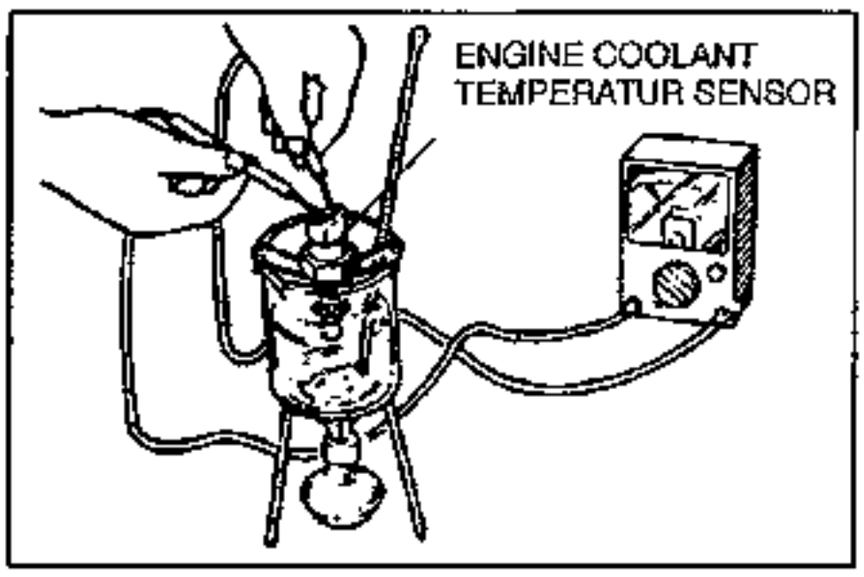
7. If the fan motor is faulty, replace the fan motor.

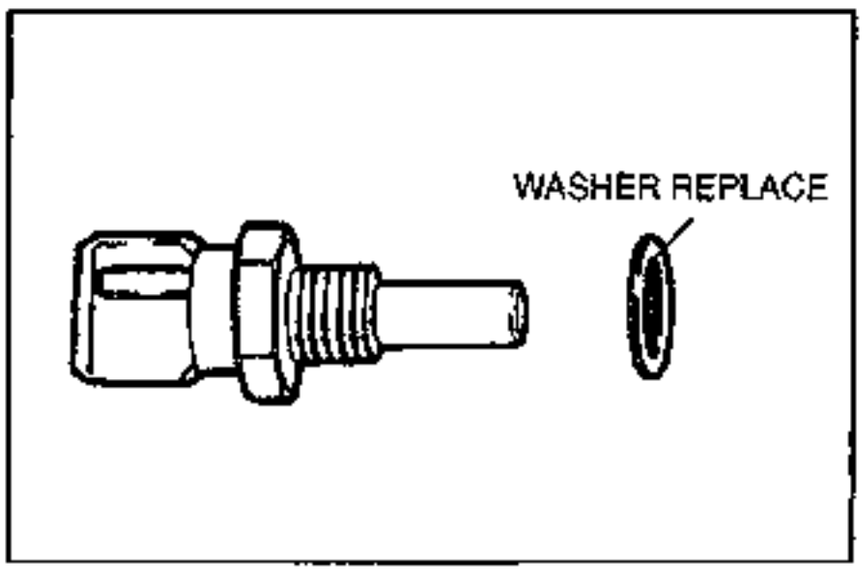
REPLACEMENT

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.



1. Fresh-air duct
2. Shroud upper panel
3. Coolant fan connector
4. Radiator cowling
5. Coolant fan
6. Coolant fan motor





ENGINE COOLANT TEMPERATURE SENSOR

REMOVAL
1. Disconnect the engine coolant temperature sensor connector.
2. Remove the engine coolant temperature sensor.

INSPECTION
1. Place the sensor in water with a thermometer and heat the water gradually.
2. Measure resistance of the sensor with an ohmmeter.

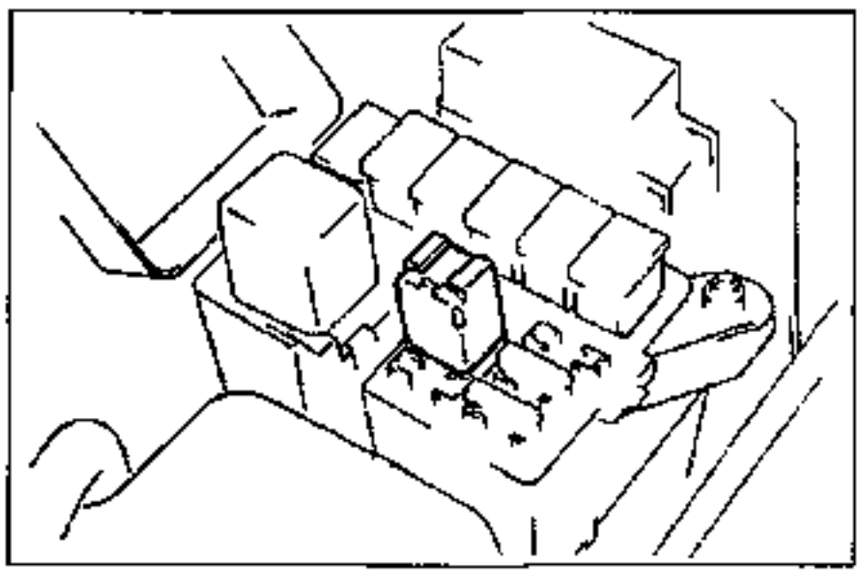
Coolant	Resistance kΩ
91°C {96°F}	1.70–1.84
97°C {207°F}	1.42–1.53
108°C {226°F}	1.03–1.11

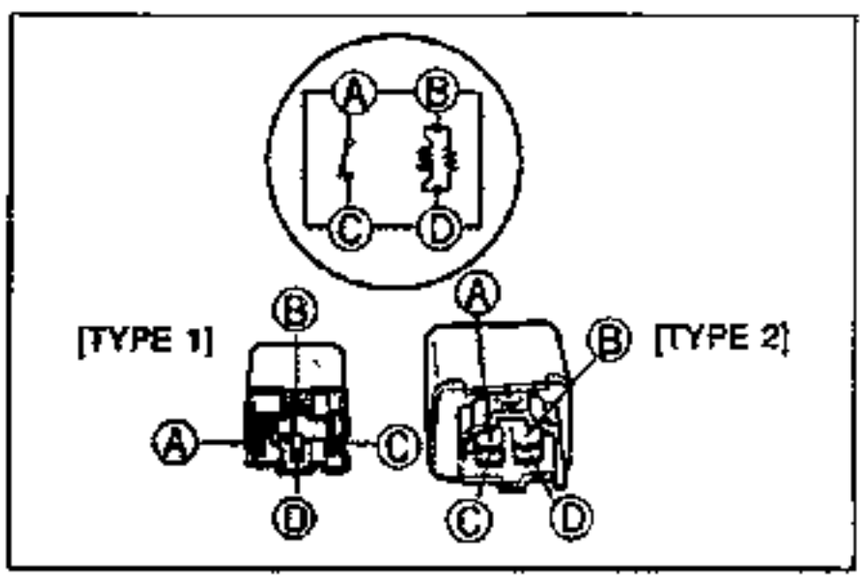
3. If not as specified, replace the engine coolant temperature sensor.

INSTALLATION
1. Install the engine coolant temperature sensor and a new washer.

   Tightening torque:
   16–23 N·m {1.6–2.4 kgf·m, 12–17 ft·lbf}

2. Connect the engine coolant temperature sensor connector.





COOLANT FAN RELAY

REMOVAL
1. Disconnect the negative battery cable.
2. Remove the coolant fan relay.

INSPECTION
1. Check continuity of the coolant fan relay as shown.

Terminal	Continuity
A–C	No
B–D	Yes

2. Apply battery positive voltage between terminals B and D. Check for continuity between terminals A and C.
3. If not as specified, replace the coolant fan relay.

Before beginning any service procedure, refer to the 1995 MX–3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

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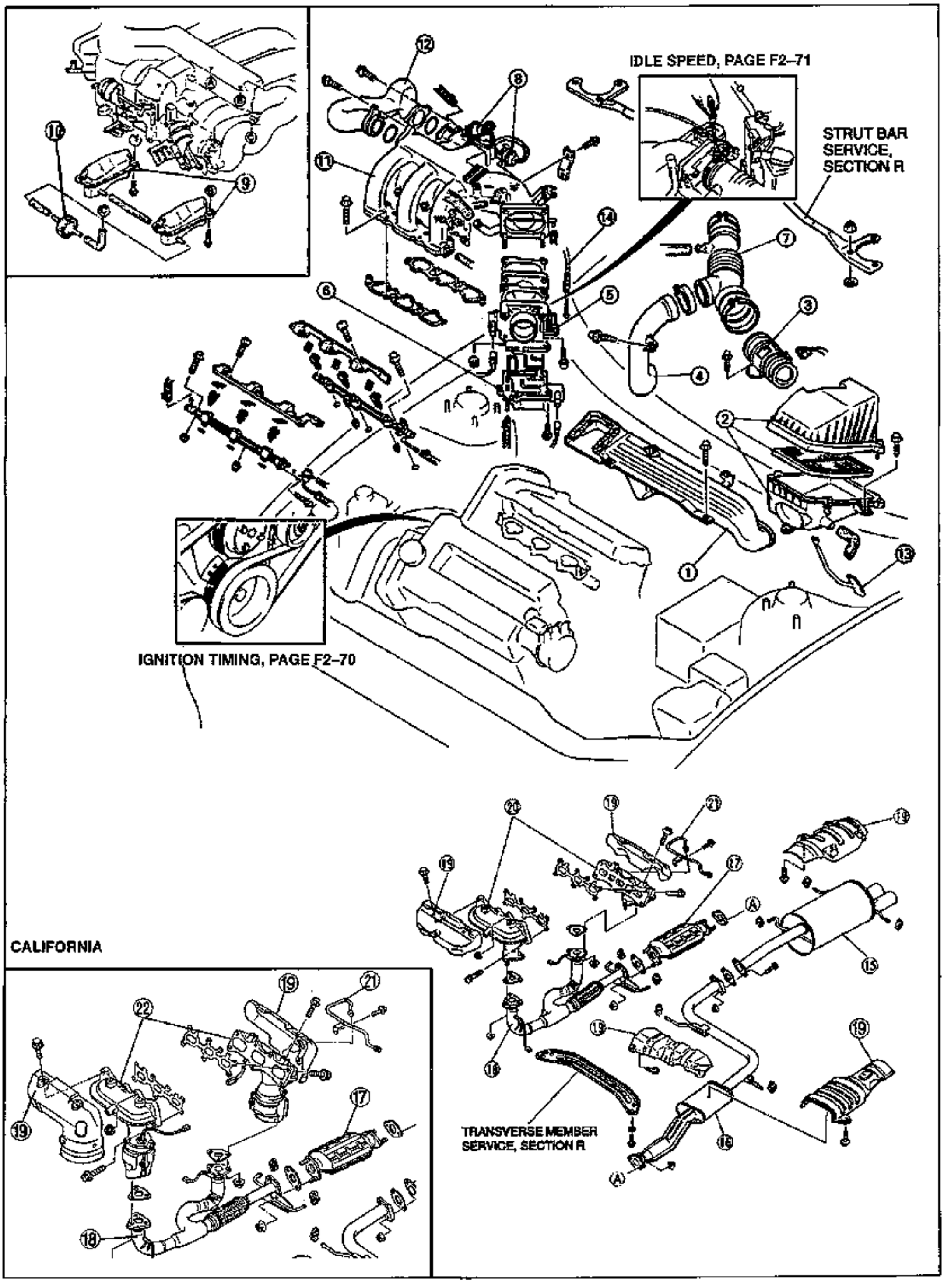
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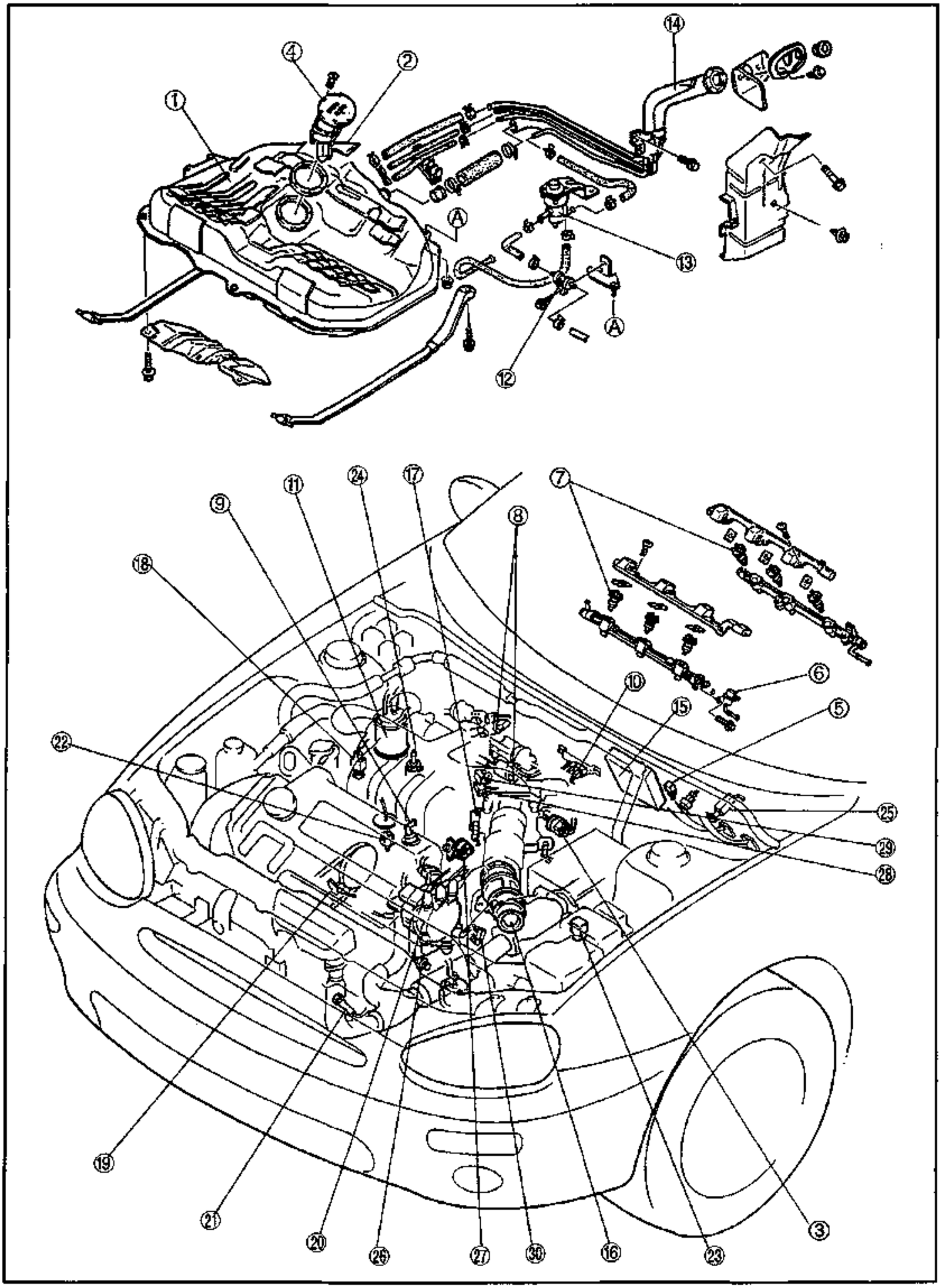
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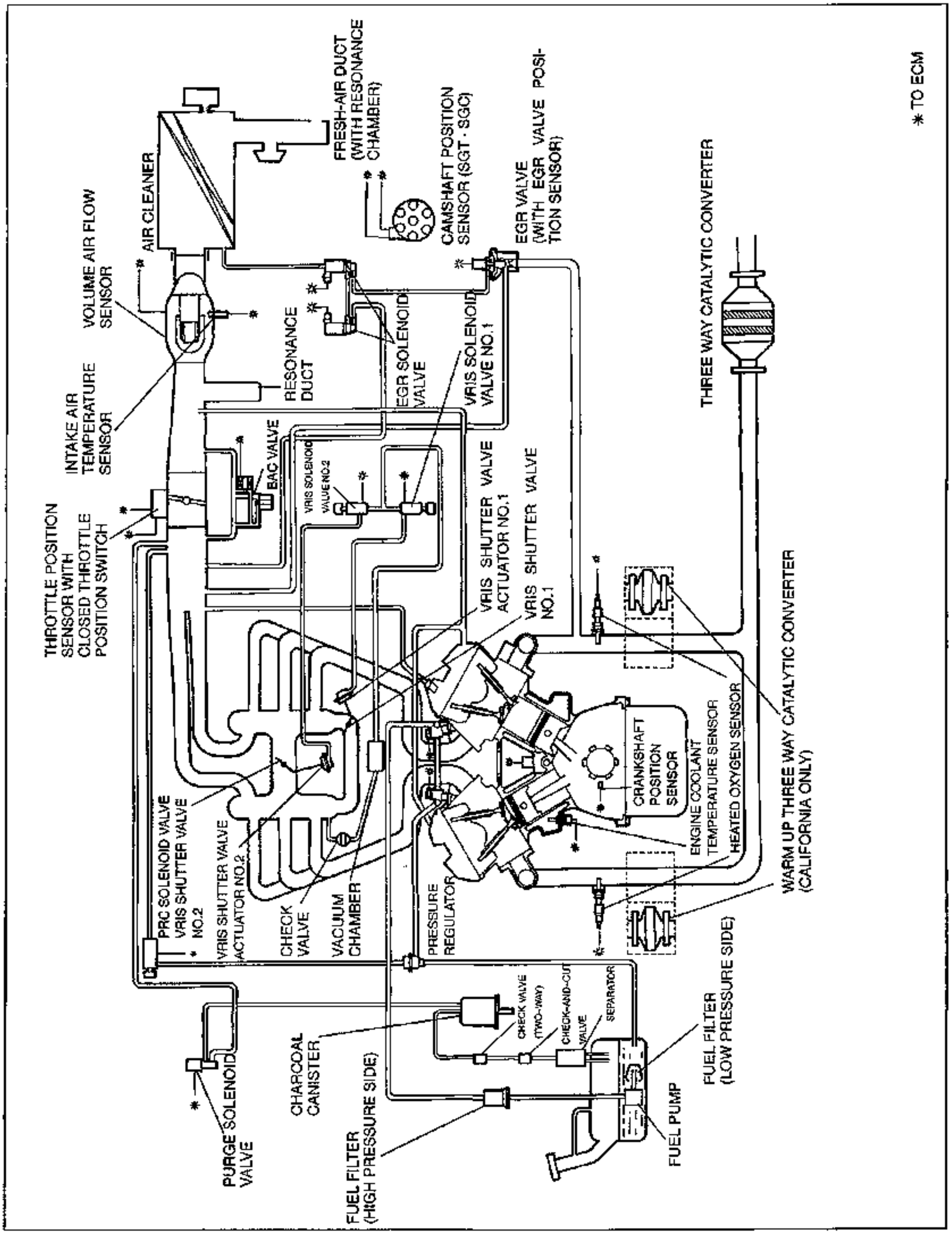
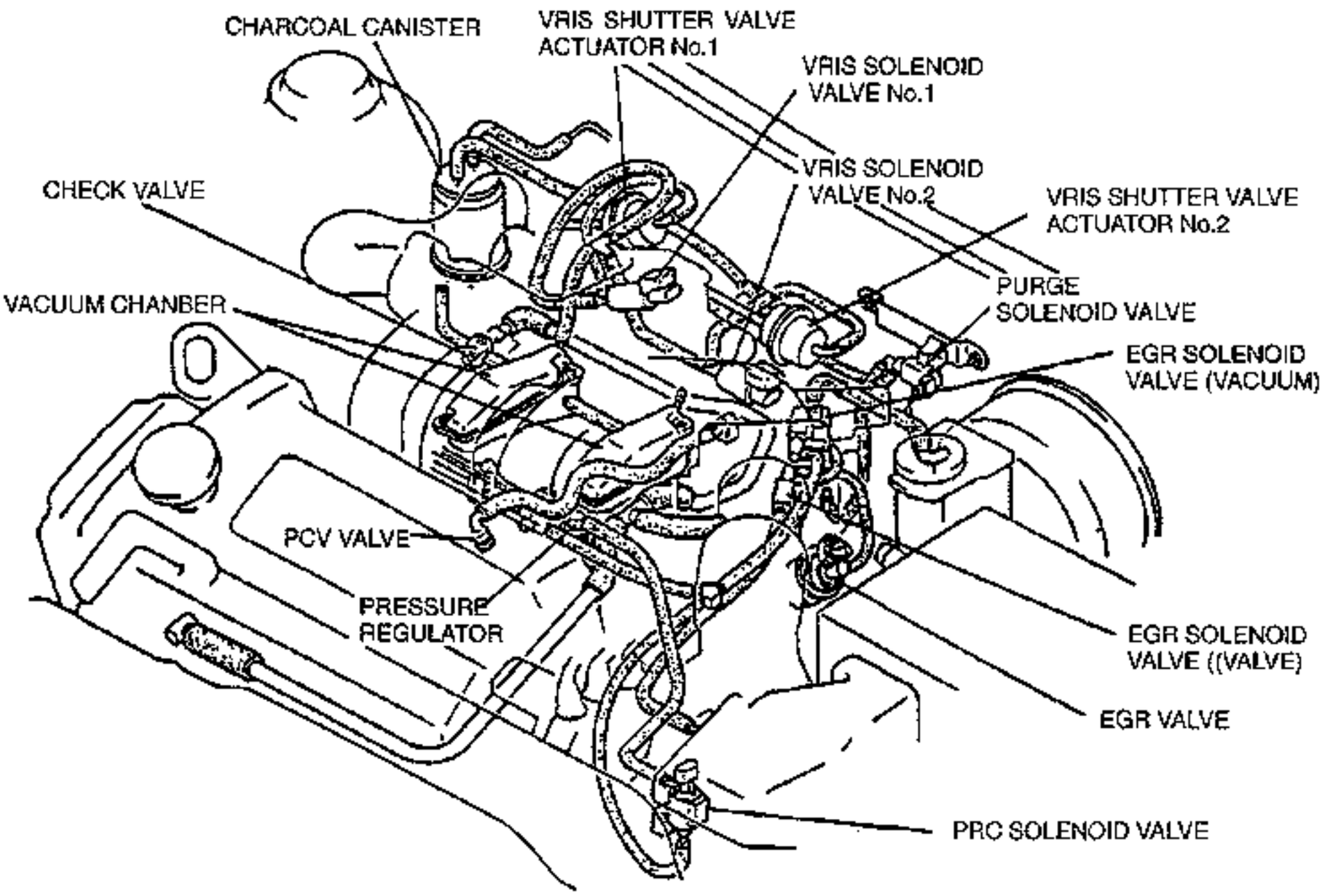
OUTLINE

SYSTEM DIAGRAM



VACUUM HOSE ROUTING DIAGRAM



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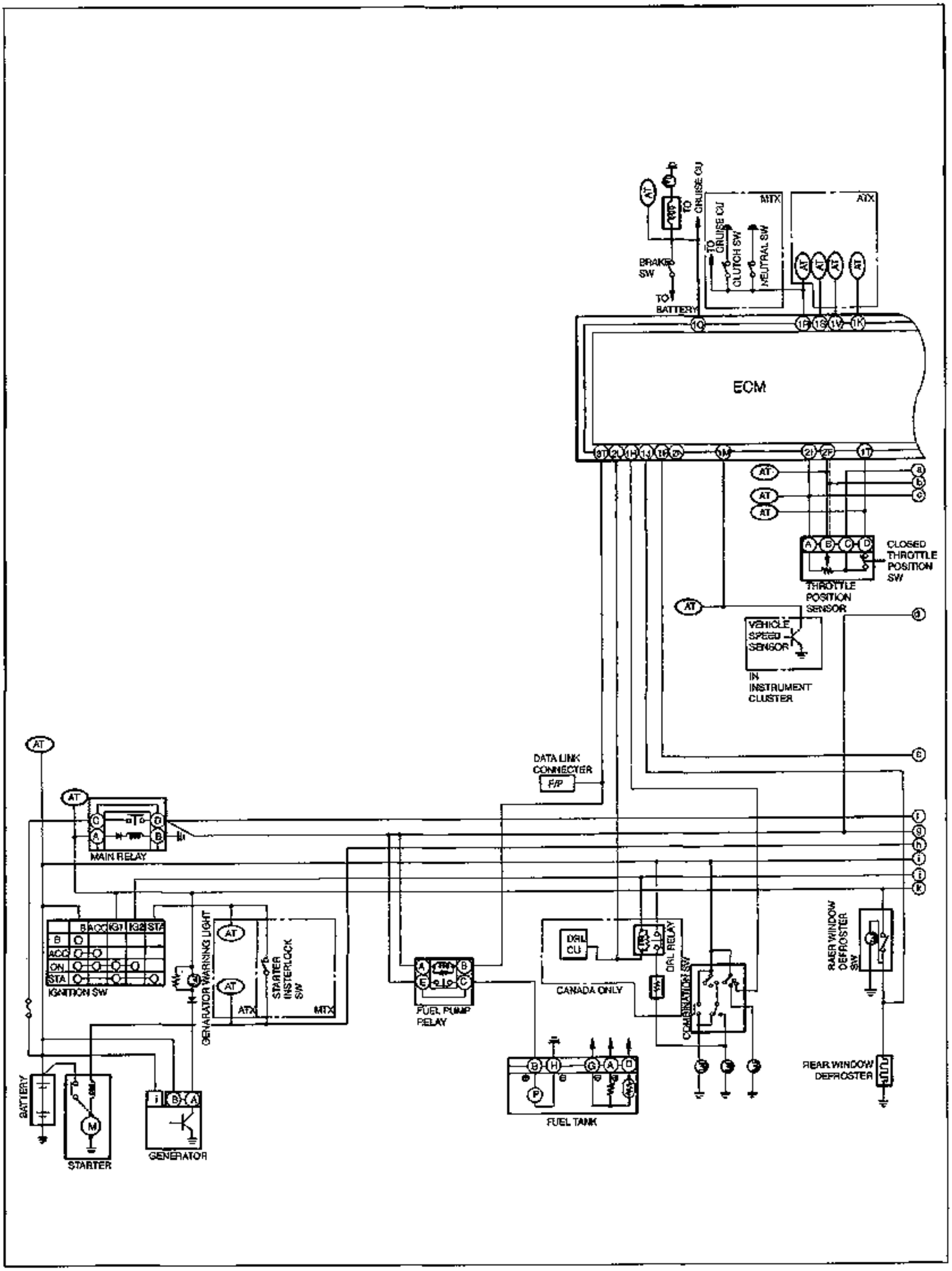
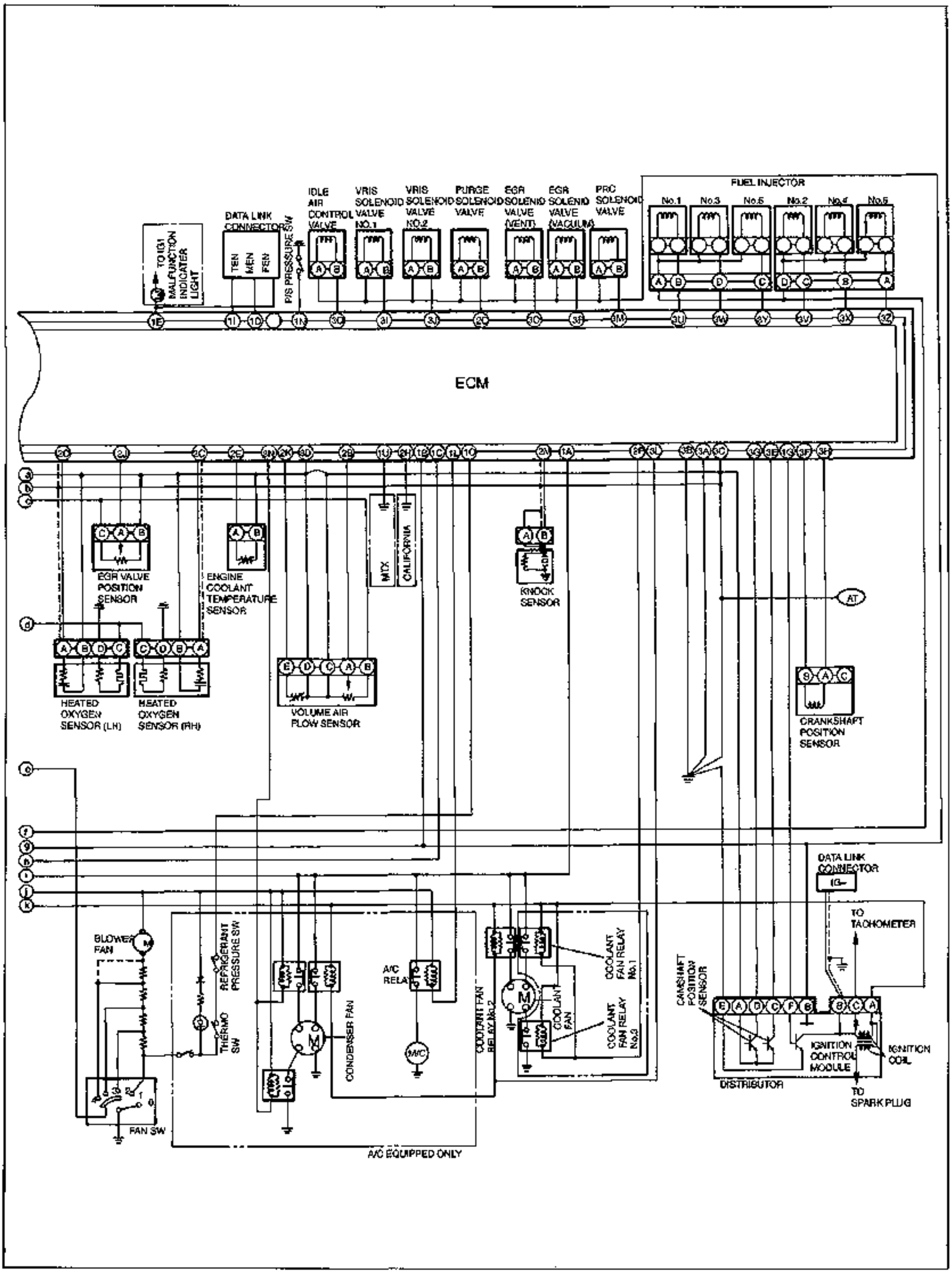


WIRING DIAGRAM



SPECIFICATIONS

Item \ Engine			K8 DOHC
Idle speed *		rpm	670
Ignition timing *		BTDC	10
Throttle body			
Type			Horizontal draft
Throat diameter		mm {in}	55 {2.2}
Fuel pump			
Type			Impeller (in-tank)
Output pressure		kPa {kgf/cm^2, psi}	630 {6.5, 92}
Fuel filter			
Type	Low pressure side		Nylon element (in fuel pump)
	High pressure side		Paper element
Pressure regulator			
Type			Diaphragm
Regulating pressure		kPa {k f/cm^2, psi}	280 {2.9, 42}
Fuel injector			
Type			High-ohmic, side feed
Type of drive			Voltage
Resistance	Ω	20 °C {68°F}	12–16
Idle air control valve			
Solenoid resistance	Ω	20 °C {68°F}	10.7–12.3
Purge solenoid valve			
Solenoid resistance	Ω	20 °C {68°F}	23–27
Camshaft position sensor (SGT, SGC signal)			
Type			Hall element
Volume air flow sensor			
Type			Measuring core type
Resistance	Ω	$E_2 \leftrightarrow$ Vs, Closed throttle position 20°C {68°F}	200–1,000
		$E_2 \leftrightarrow$ Vs, Wide open throttle 20°C {68°F}	20–800
		$E_2 \leftrightarrow$ Vc	200–400
		$E_2 \leftrightarrow$ THA (Intake air temperature sensor), 20°C {68°F}	2,000–3,000
		$E_2 \leftrightarrow$ THA (Intake air temperature sensor), 60°C {140°F}	400–700
Engine coolant temperature sensor			
Resistance	kΩ	20°C {68°F}	2.2–2.7
		80°C {176°F}	0.29–0.35
Fuel Tank			
Capacity		liters {US gal, Imp gal}	50 {13.2,11.0}
Air cleaner			
Element type			Oil permeated
Accelerator cable			
Free play		mm {in}	1.0–3.0 {0.04–0.12}
Fuel			
Specification			Unleaded –(R+M) / 2 method 87 or higher

* TEN terminal of data link connector grounded.

COMPONENT DESCRIPTIONS

Component	Function	Remarks
A/C relay	Controls A/C compressor magnetic clutch	—
Air cleaner	Filters air entering throttle body	—
Air valve	Supplies bypass air into intake manifold (engine cold)	• Engine speed increased to shorten warm-up period • Thermowax type • Installed in BAC valve
Barometric pressure sensor	Detects barometric pressure; sends signal to ECM	In ECM
Brake switch	Detects braking; sends signal to ECM	—
Bypass air control (BAC) valve	Supplies bypass air into intake manifold	Consist of air valve and idle air control valve
Camshaft position sensor (In distributor) SGC signal SGT signal	Detects No.1 cylinder TDC; sends signal to ECM (SGC signal) Detects crank angle at 60° intervals; sends signal to ECM (SGT signal)	Installed in distributor
Charcoal canister	Stores fuel tank fumes (engine stopped)	—
Check-and-cut valve	Prevents fuel from flowing into charcoal canister	
Check valve (two-way)	Controls pressure in fuel tank	Two-way type
Crankshaft position sensor NE signal	Detects crank angle 60° intervals; sends signal to ECM	Installed at crankshaft pulley
Data link connector	**Concentrated service connector terminals;** 1. CIS self-diagnosis 2. Initial set 3. Fuel pump check 4. Switch and heated oxygen sensor monitor 5. Engine speed output 6. Supply battery positive voltage 7. Ground	**25-pin (located near left suspension mounting block)** 1. FEN terminal 2. TEN terminal 3. F/P terminal 4. MEN terminal 5. IG terminal 6. +B terminal 7. GND terminal
EGR solenoid value (vent)	Controls vacuum to EGR control value (Open air side)	Controlled by duty signal from ECM
EGR solenoid value (vacuum)	Controls vacuum to EGR control value (Vacuum side)	Controlled by duty signal form ECM
Engine control module (ECM)	**Controls operation of following:** 1. A/C (Cut-off) 2. On-board diagnostic function 3. Fuel injection system 4. Idle air control 5. Ignition system (Electronic spark advance) 6. Monitor function 7. Purge control system 8. VRIS control system 9. EGR control system 10. Pressure regulator control system 11. Coolant fan control system 12. Condenser fan control system	 1. A/C relay 2. Self-diagnosis Checker 3. Fuel injector 4. Idle air control valve 5. Ignition control module 6. Monitor lamp (Self-Diagnosis Checker) 7. Purge solenoid valve 8. VRIS solenoid valve 9. EGR solenoid valve 10. PRC solenoid valve 11. Coolant fan relay 12. Condenser fan relay

Component	Function	Remarks
Engine control module (ECM)	**Detects following:** 1. A/C operation 2. Air/fuel ratio (oxygen concentration) 3. Atmospheric pressure 4. Braking signal 5. Cranking signal 6. E/L operation 7. Engine coolant temperature 8. Engine speed 9. Ignition ON signal 10. In-gear condition 11. Intake air amount 12. Intake air temperature 13. EGR valve position 14. No.1 piston TDC 15. P/S operation 16. Test mode signal (ignition timing, idle speed, diagnotic trouble code No.) 17. Throttle valve opening angle 18. Closed throttle position 19. Vehicle speed 20. Knocking	1. A/C switch 2. Heated oxygen sensor 3. Barometric pressure sensor 4. Brake switch 5. Ignition switch (START position) 6. Blower motor switch, coolant fan relay, headlight switch, and rear window defroster switch 7. Engine coolant temperature sensor 8. Crankshaft position sensor (NE signal) 9. Ignition switch 10. Neutral / clutch switch (MTX) Transaxle range switch (ATX) 11. Volume air flow sensor 12. Intake air temperature sensor (in volume air flow sensor) 13. EGR valve position sensor 14. Camshaft position sensor (SGC signal) 15. P/S pressure switch 16. Data link connector (TEN terminal) 17. Throttle position sensor 18. Closed throttle position switch (in throttle position sensor) 19. Vehicle speed sensor 20. Knock sensor
Engine coolant temperature sensor	Detects engine coolant temperature; sends signal to ECM	Installed on engine
Fuel filter	Filters particles from fuel	—
Fuel injector	Injects fuel into intake port	Controlled by signals from ECM (side-feed type)
Fuel pump	Provides fuel to fuel injectors	• Operates while engine running • Installed in fuel tank
Fuel pump relay	Voltage for fuel pump while engine running	—
Heated oxygen sensor	Detects oxygen concentration; sends signal to ECM	• Zirconium and platinum coating • With heater
Idle air control valve	Supplies bypass air into intake manifold	• Controlled by duty signal from ECM • Installed in BAC valve
Ignition control module	Receives spark signal from ECM and gener ates high voltage in ignition coil	Installed in distributor
Ignition switch (START position)	Sends engine cranking signal to ECM	—
Intake air temperature sensor	Detects intake air temperature; sends signal to ECM	Installed in volume air flow sensor
Intake manifold	Supplies intake air to all cylinders	
Knock sensor	Detects knocking; sends signal to ECM	—
Main relay	Supplies current to output devices and ECM	
Neutral/clutch switch (MTX)	Detects in-gear condition; sends signal to ECM	Switch ON in Neutral
One-way check valve	Prevents misoperation of VRIS shutter valve No.1 and No.2 and EGR valve during heavy-load operations	For VRIS and EGR
PCV valve	Controls blowby gas introduced into engine	
PRC solenoid valve	Controls vacuum to pressure regulator	—
Pressure regulator	Adjusts fuel pressure supplied to fuel injec-tors	—
P/S pressure switch	Detects P/S operation	P/S ON when steering wheel turned
Purge solenoid valve	Controls evaporative fumes from charcoal canister to intake manifold	Controlled by duty signal from ECM

Component	Function	Remarks
Resonance chamber	Reduces intake air noise	—
Separator	Prevents fuel from flowing into charcoal canister	—
Three-way catalytic converter	Reduces HC, CO, and NOx by chemical reaction	Monolith type
Throttle body	Controls intake air amount	—
Transaxle range switch (ATX)	Detects in-gear condition; send signal to ECM	Switch ON in Park or Neutral position
Vehicle speed sensor	Detects vehicle speed; sends signal to ECM	Installed on instrument cluster
Volume air flow sensor	Detects intake air amount; sends signal to ECM	Intake air temperature sensor included
VRIS shutter valve actuator No.1 and No.2	Closes/opens VRIS shutter valve No.1 and No.2 to improve torque characteristics	For variable resonance induction system (VRIS)
VRIS solenoid valve No.1 and No.2	Controls vacuum to VRIS shutter valve actuator No.1 and No.2	—

TROUBLESHOOTING GUIDE

OUTPUT DEVICES AND ENGINE CONDITION

OUTPUT DEVICE \ ENGINE CONDITION		CRANKING (COLD ENGINE)	WARMING UP (DURING IDLE)	MEDIUM LOAD		ACCELERATION	HEAVY LOAD	DECELERATION	IDLE	IG: ON (ENGINE NOT RUNNING)	REMARK
				COLD	WARM						
FUEL INJECTOR	FUEL INJECTION AMOUNT	Rich			Normal	Rich		Fuel cut*	Normal	No injection	* Engine speed: Above 1,500 rpm (ATX) /1,200 rpm (MTX)
FUEL PUMP RELAY		ON								OFF	
IGNITION CONTROL MODULE		Fixed at BTDC 7°	Advanced: depends on engine condition							OFF	
SOLENOID VALVE	PURGE CONTROL	OFF			ON (Purge)			OFF			
	EGR VENT	OFF			ON			OFF			System operates: Amount of EGR changes
	EGR VACUUM										
	PRC	OFF (Vacuum to pressure regulator)							ON*	OFF	* During hot start only
	VRIS No. 1	OFF				ON*				OFF	* Engine speed: 1,900–2,600 rpm 3,900–6,300 rpm
	VRIS No. 2	OFF				ON*				OFF	* Engine speed: 1,900–2,600 rpm 4,700–6,300 rpm
BAC VALVE	IDLE AIR CONTROL VALVE	ON (Closed loop duty)		ON (Fixed duty)				ON (Closed loop duty)		OFF	
	AIR VALVE	OPEN				CLOSED				—	
A/C RELAY		OFF (A/C cut)	ON			OFF (A/C cut)	ON			OFF	A/C operating

RELATIONSHIP CHART

INPUT DEVICE \ OUTPUT DEVICE		FUEL INJECTOR	FUEL PUMP RELAY	IGNITION CONTROL MODULE	A/C RELAY (A/C CUT-OFF) AND CONDENSER FAN LOW RELAY	BAC VALVE (IDLE AIR CONTROL VALVE)	ELECTRIC COOLANT FAN RELAY	CONDENSER FAN HIGH RELAY NO.1 AND NO.2	SOLENOID VALVE				TCM (TORQUE REDUCTION EXECUTED SIGNAL/ ENGINE COOLANT TEMPERATURE SIGNAL)	SELF-DIAGNOSIS CHECKER (DIAGNOSTIC TROUBLE CODE)	SELF-DIAGNOSIS CHECKER (MONITOR LAMP)
									PURGE CONTROL	VRIS (NO.1 AND NO.2) CONTROL	EGR CONTROL	PRESSURE REGULATOR CONTROL			
CAMSHAFT POSITION SENSOR	SGT SIGNAL	○	○	○										○	
	SGC SIGNAL			○										○	
CRANKSHAFT POSITION SENSOR (NE SIGNAL)		○	○	○		○			○	○	○	○		○	
THROTTLE POSITION SENSOR	CLOSED THROTTLE POSITION SWITCH	○		○		○	○		○		○				○
	THROTTLE POSITION SENSOR	○		○	○	○				○	○	○	○	○	
ENGINE COOLANT TEMPERATURE SENSOR		○		○	○	○	○	○	○		○	○	○	○	
INTAKE AIR TEMPERATURE SENSOR		○				○			○			○		○	
HEATED OXYGEN SENSOR		○							○					○	○
KNOCK SENSOR				○									○	○	
A/C AMPLIFIER					○	○	○								○
P/S PRESSURE SWITCH					○	○									
IGNITION SWITCH (START SIGNAL)		○	○	○	○	○	○	○				○			
BRAKE SWITCH		○								○					○
E/L*						○									○
NEUTRAL / CLUTCH SWITCH		○		○	○	○			○			○			○
DATA LINK CONNECTOR (TERMINAL TEN)				○		○	○					○		○	○
EGR VALVE POSITION SENSOR				○							○			○	
BAROMETRIC PRESSURE SENSOR		○				○			○					○	
VEHICLE SPEED SENSOR						○				○					
VOLUME AIR FLOW SENSOR		○		○					○		○		○	○	
PARK / NEUTRAL POSITION SIGNAL (TCM)		○		○	○				○			○			○
TORQUE REDUCTION REQUEST SIGNAL 1,2 (TCM)		○		○									○		

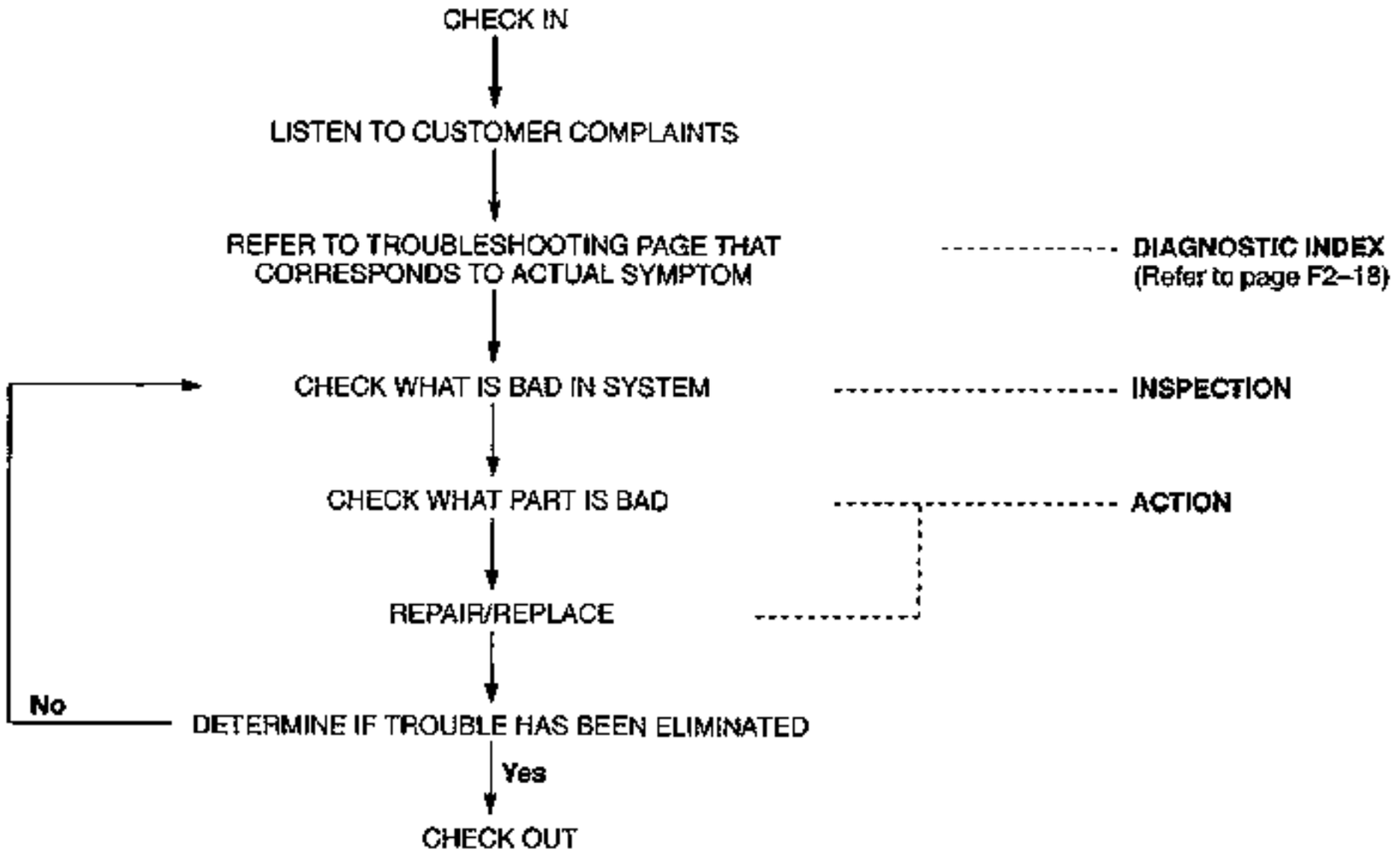
* E/L: Fan switch ON at 2nd position or higher, headlights ON, fog lights ON, or rear window defroster switch ON.

USING THIS SECTION

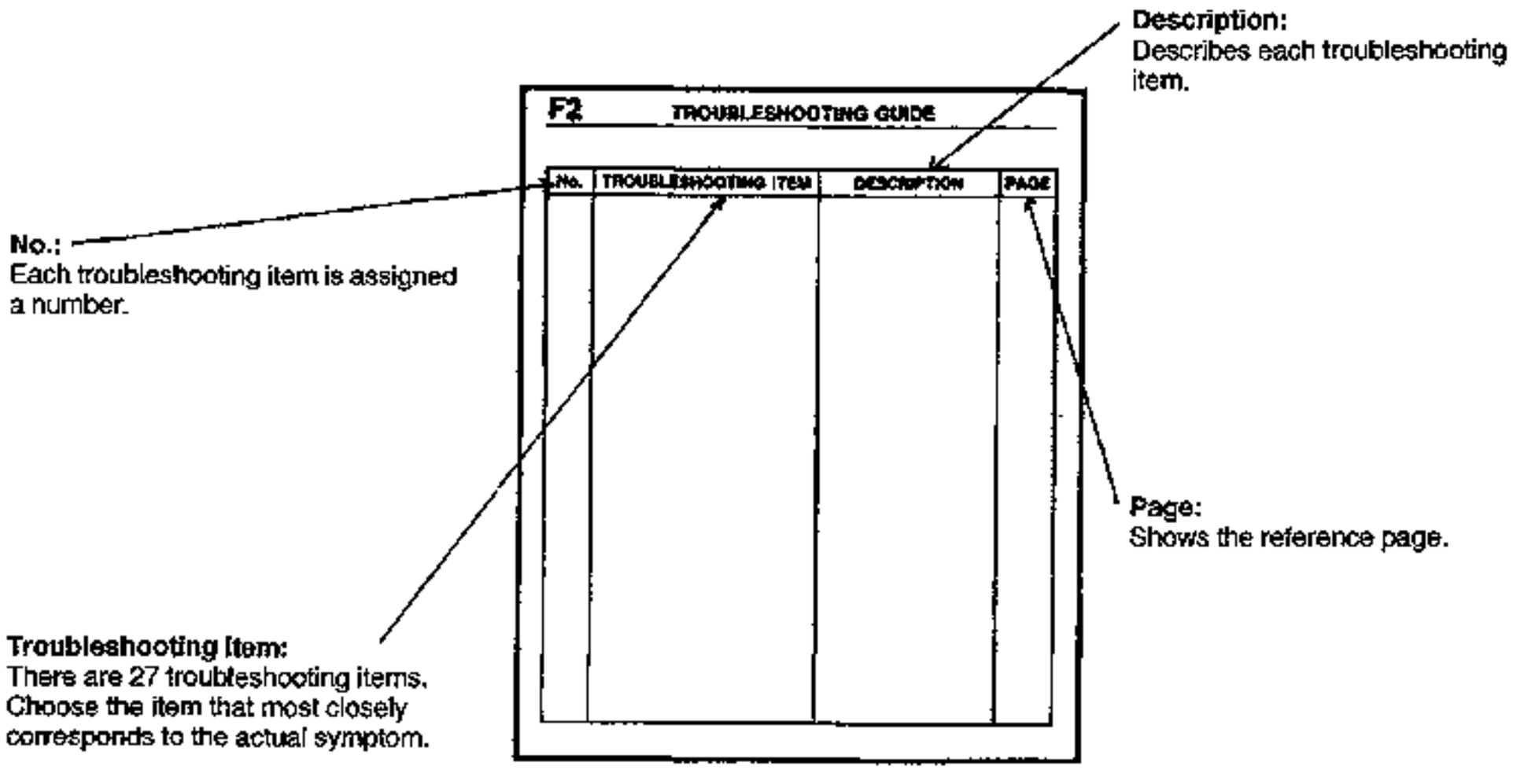
Introduction

Most of the fuel and emission control systems are electrically controlled, often making it difficult to diagnose problems, especially intermittent problems. Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a drivabilitiy complaint. The customer is often a good source of information on such problems, especially the intermittent ones. Through a talk with the customer, you will usually find out what the symptoms are and under what conditions they occur.

Work flow

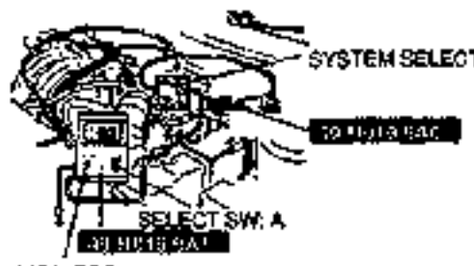


Diagnostic index



Troubleshooting chart

TROUBLESHOOTING GUIDE F2

6	CRANKS NORMALLY BUT HARD TO START — WHEN ENGINE COLD		
DESCRIPTION	• Engine cranks at normal speed but requires excessive cranking time before starting • Battery in normal condition • Restarts OK after warm-up • Engine runs normally at idle (If idle condition is not OK, refer to "Rough idle" [Nos. 8–12])		
[TROUBLESHOOTING HINTS] ① Air/Fuel mixture too rich • Volume airflow sensor stuck • Air cleaner housing element clogged • Idle-speed control malfunction ② Air/Fuel mixture too lean • Fuel injection control malfunction (correction for coolant temperature) ③ Poor atomization			
STEP	INSPECTION		ACTION
1	Is "00" displayed on Self-Diagnosis Checker ignition switch ON? ☞page F2–73 SELF-DIAGNOSIS CHECKER  	Yes	Go to next step
		No	Diagnostic trouble Code No. displayed Check for cause (Refer to specified check sequence) ☞page F2–74
2	Are PCME terminal voltages OK? 1C-Starter signal 1F-Engine coolant temperature sensor 1E-Power ground ☞page F2–141	Yes	Go to next step
		No	

DESCRIPTION:
Further describes the system. Confirm that the chart addresses the actual symptom before beginning troubleshooting.

TROUBLESHOOTING HINTS:
This describes the possible point of malfunction.

STEP:
This shows the order of troubleshooting. Proceed with troubleshooting as indicated.

INSPECTION:
This describes an inspection to quickly determine the malfunction of parts. If a detailed procedure is necessary to perform the INSPECTION, refer to the page specified by the "☞" mark.

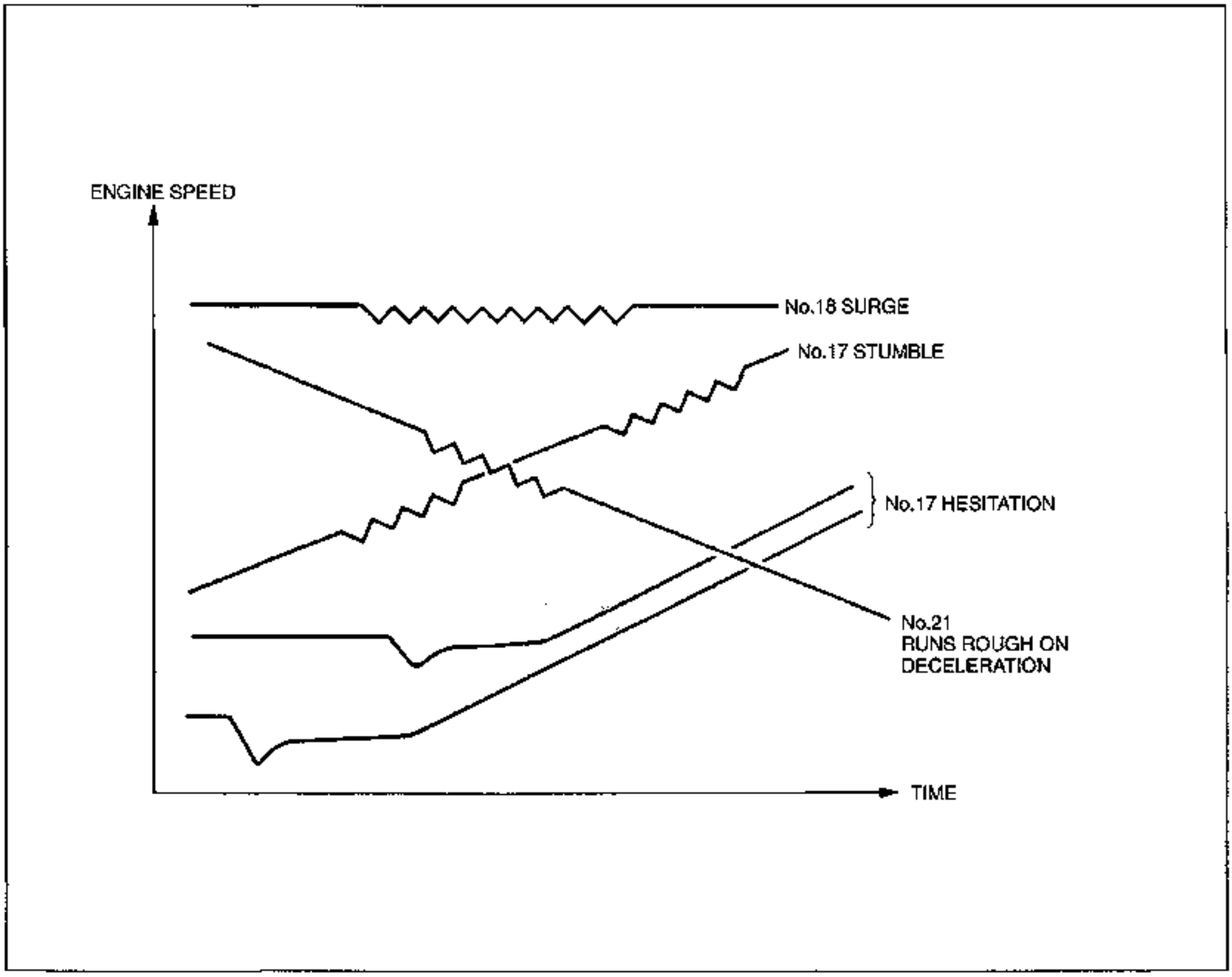
ACTION:
This recommends the appropriate action to take as a result (Yes/No) of the INSPECTION. How to perform the ACTION is described on the reference page specified by the "☞" mark.

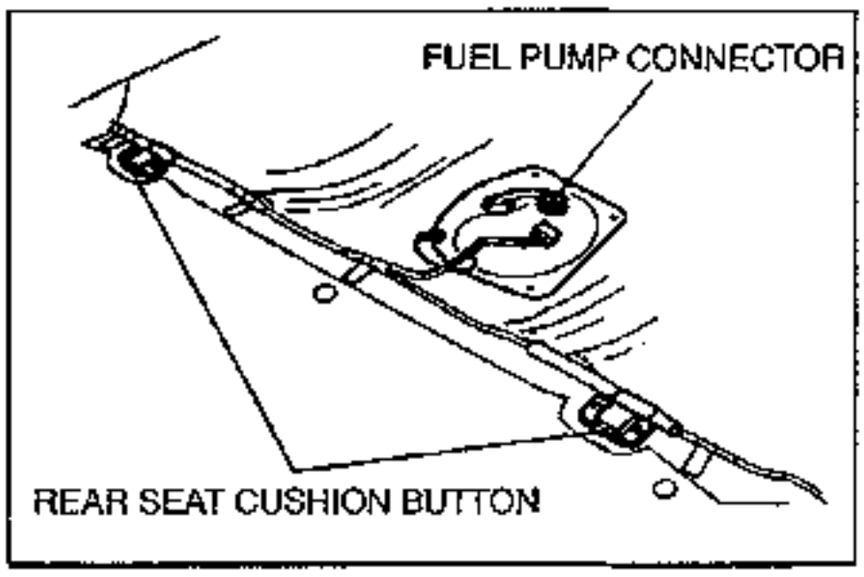
DIAGNOSTIC INDEX

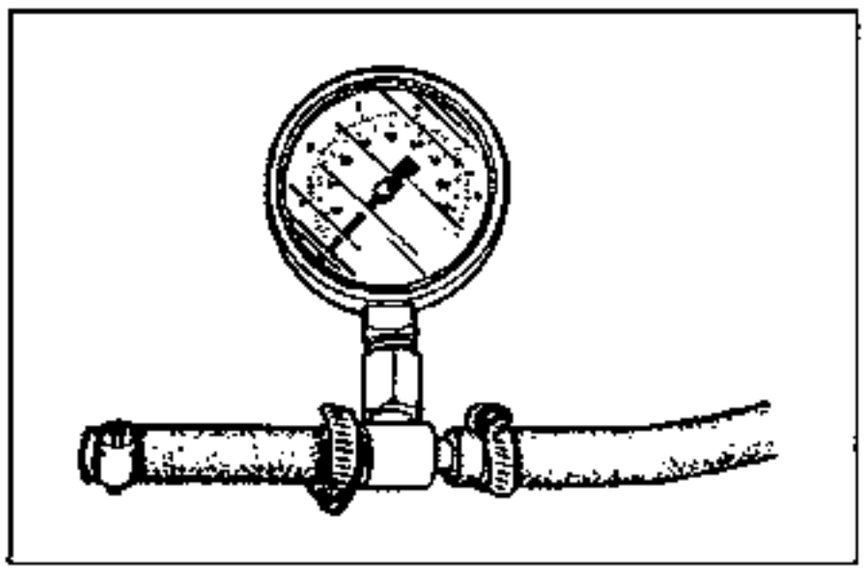
NO.	TROUBLESHOOTING ITEM		DESCRIPTION	PAGE
1	Will not crank or cranks slowly		Refer to Engine Electrical System	section G
2	Cranks normally but will not start	(No combustion)	Engine cranks at normal speed but shows no sign of firing	F2–21
3		(Partial combustion) – When engine cold	Engine cranks at normal speed but shows only partial combustion and will not continue to run	F2–23
4		(Partial combustion) – After warm-up	Engine starts normally when cold but will not start after running and being hot soaked	F2–25
5	Cranks normally but hard to start	Always	Engine cranks at normal speed but requires excessive cranking time before starting	F2–27
6		When engine cold	Same condition as No.5 when engine cold Restarts normally after warm-up	F2–29
7		After warm-up	Same condition as No.5 after running and being hot soaked Starts normally when cold	F2–31
8	Rough idle/ Low idle speed/ Engine stalls at idle	Always	Engine stalls or vibrates excessively at idle	F2–33
9		Before warm-up	Engine stalls or vibrates excessively at idle during warm-up	F2–35
10		After warm-up	Engine runs normally at idle during warm-up but stalls or vibrates excessively after warm-up	F2–37
11		When A/C, P/S, or E/L ON	Engine stalls or vibrates excessively at idle when A/C, P/S, or E/L ON	F2–39
12	Rough idle/Engine stalls just after starting		Engine stalls or vibrates excessively just after starting (acceleration from idle)	F2–40
13	High idle speed after warm-up		Idle speed excessively high after warm-up	F2–41
14	Idle moves up and down/idle hunting		Engine speeds up and down at idle	F2–43
15	Engine stalls on deceleration		Engine unexpectedly stops running during or after deceleration	F2–45
16	Engine stalls suddenly (Intermittent)		Engine intermittently stops running	F2–47
17	Hesitates/Stumbles on acceleration		Flat spot occurs just after accelerator is depressed, or mild jerking occurs during acceleration	F2–48
18	Surges while cruising		Unexpected change in engine speed that is usually repetitive	F2–50
19	Lack of power		Engine performance poor under load when throttle valve is fully open Maximum speed reduced	F2–52
20	Poor acceleration		Engine performance poor during acceleration	F2–56
21	Runs rough during deceleration/Backfire		Engine runs rough during deceleration, and abnormal combustion occurs in exhaust system	F2–60
22	Knocking		Abnormal combustion accompanied by audible "pinging" noise	F2–62
23	Fuel odor		Gasoline odor in cabin	F2–64
24	Exhaust sulfur odor		Exhaust gas has unusual odor	F2–65
25	High oil consumption		Oil consumption excessive	F2–65
26	Poor fuel economy		Fuel economy unsatisfactory	F2–66
27	A/C does not work		Blower fan operates, but magnetic clutch does not	F2–68

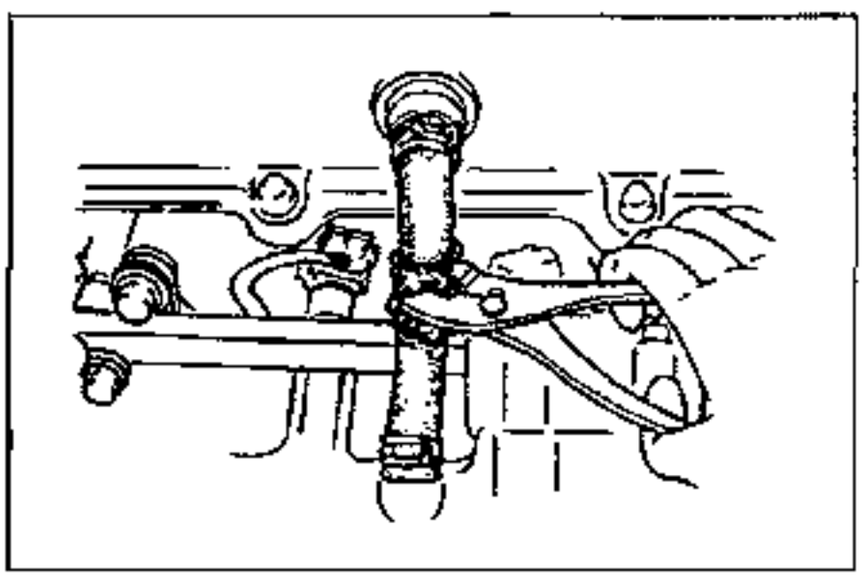
Description of Drivability

STUMBLE : Mild jerking during acceleration.
HESITATION : Flat spot occurring just after the accelerator pedal is depressed.
SURGE : Continuous soft jerking during cruise.









Fuel Pressure and Servicing Fuel System

Warning
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**

Fuel in the fuel system is under high pressure when the engine is not running.

Warning
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the following "Fuel Line Safety Procedures".**

Fuel Line Safety Procedures

A. Release the fuel pressure before disconnecting a fuel line.
   1. Start the engine.
   2. Remove the fuel pump relay.
   3. After the engine stalls, turn the ignition switch to OFF.
   4. Install the fuel pump relay.

B. Avoid leakage.
   1. When disconnecting a fuel line hose, wrap a rag around it to protect against fuel leakage.
   2. Plug the hose after removal.

C. Install hose clamps to secure the fuel pressure gauge to the fuel filter and the main hose.

Pinching Hose

When pinching an air hose or a fuel hose with pliers, wrap the hose with a rag to prevent damage.

SYMPTOM TROUBLESHOOTING

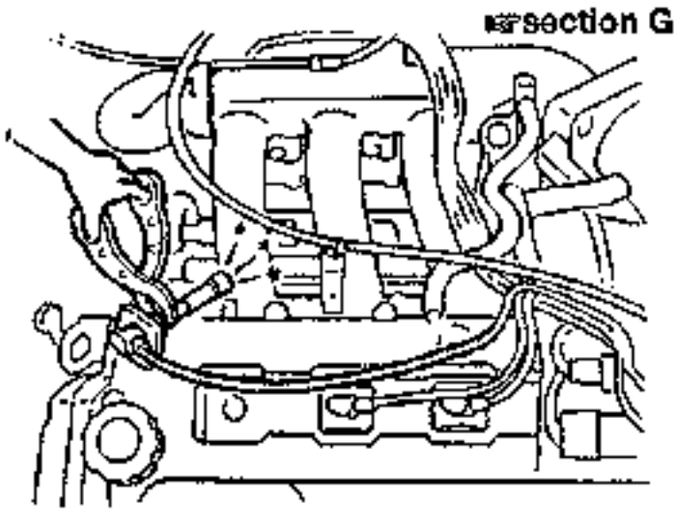
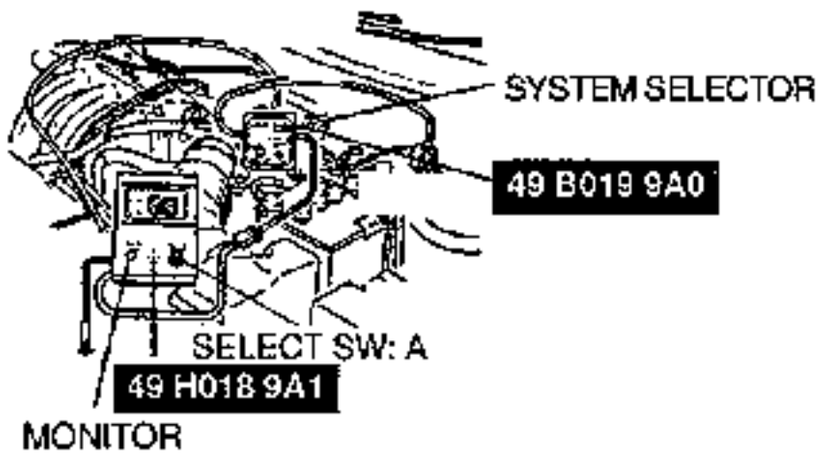
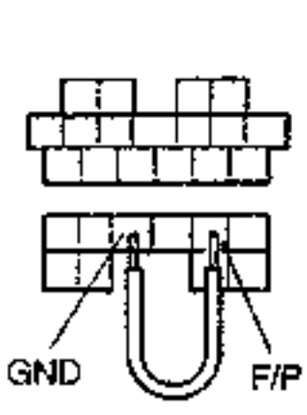
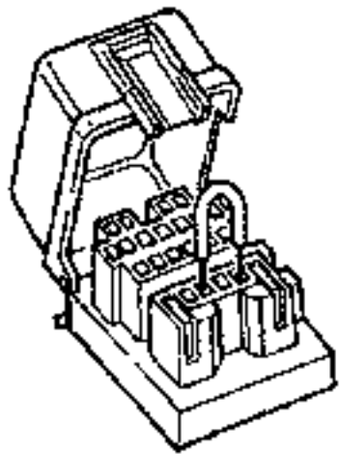
2	CRANKS NORMALLY BUT WILL NOT START (NO COMBUSTION)
DESCRIP-TION	• Engine cranks at normal speed but shows no sign of firing • Battery in normal condition • Throttle valve not held fully open while cranking (dechoke system not operating) • Fuel in tank

[TROUBLESHOOTING HINTS]
Because of no combustion, possibly no fuel is injected to engine or no ignition at all cylinders

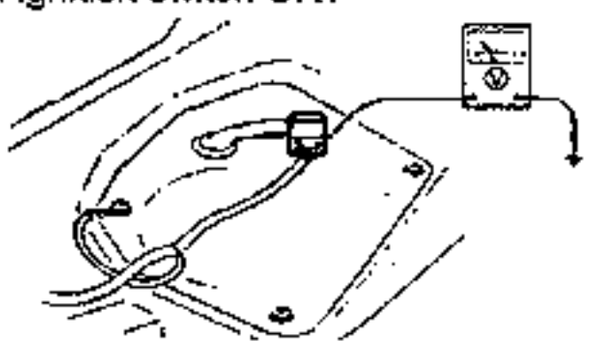
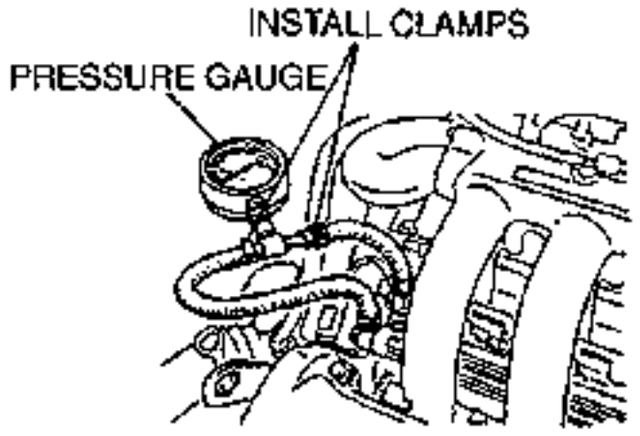
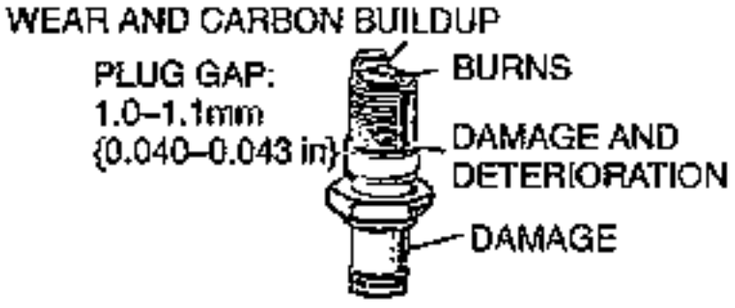
①No spark
- Ignition control malfunction
- Ignition system component malfunction

②No fuel injection
- Fuel pump inoperative
- Fuel injectors inoperative

③Low fuel line pressure
④Low engine compression
⑤ECM power supply circuit open
⑥ECM ground circuit open
⑦No NE and SGC signals
⑧Main relay malfunction

STEP	INSPECTION		ACTION
1	Is strong blue spark visible at disconnected high-tension lead? ☞section G 	Yes	Go to step 3
		No	Go to next step
2	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73 SELF–DIAGNOSIS CHECKER 	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble Code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
3	Connect data link connector terminals F/P and GND by using jumper wire; Is fuel pump operating sound head with ignition switch ON?  	Yes	Does engine start in this condition? ⇨If it does, check fuel pump ☞page F2–110 ⇨If it does not, go to step 5
		No	Go to next step

B+: Battery positive voltage

STEP	INSPECTION		ACTION
4	Does B+ exist at fuel pump connector terminal with ignition switch ON? 	Yes	Check continuity of fuel pump ☞page F2–110
		No	Check fuel pump relay ☞page F2–113
5	Is there fuel injector operating sound while engine is being cranked?	Yes	Go to step 7
		No	Go to next step
6	Does B+ exist at fuel injector connector with ignition switch ON?	Yes	Check ECM fuel injector terminals 3U, 3V, 3W, 3X, 3Y and 3Z voltages ☞page F2–141
		No	Check for open circuit in wiring between main relay (FUEL INJ rely) and fuel injector ☞page F2–8
7	Connect data link connector terminals F/P and GND by using jumper wire; Is fuel line pressure correct with the ignition switch ON? ☞page F2–107 **Fuel line pressure:** **260–310 kPa {2.6–3.2 kgf/cm², 37–45 psi}** 	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ☞page F2–113 ⇨If pressure **quickly** increases, check pressure regulator ⇨If pressure **gradually** increase, check for clogging between fuel pump and pressure regulator If hose is not clogged, check fuel pump maximum pressure ☞page F2–110
			High pressure Is fuel return hose clogged or restricted? ⇨If it is not, replace pressure regulator ☞page F2–115 ⇨If it is, repair or replace it
8	Is engine compression correct? **Engine compression:** **981 kPa {10.0 kgf/cm², 142 psi}-300 rpm**	Yes	Go to next step
		No	Check engine condition • Worn piston, piston rings, or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve stuck in guide
9	Are all spark plugs OK? ☞section G 	Yes	Go to next step
		No	Clean or replace spark plug ☞section G
10	Try a known good ECM; and check if condition improves ☞page F2–141		

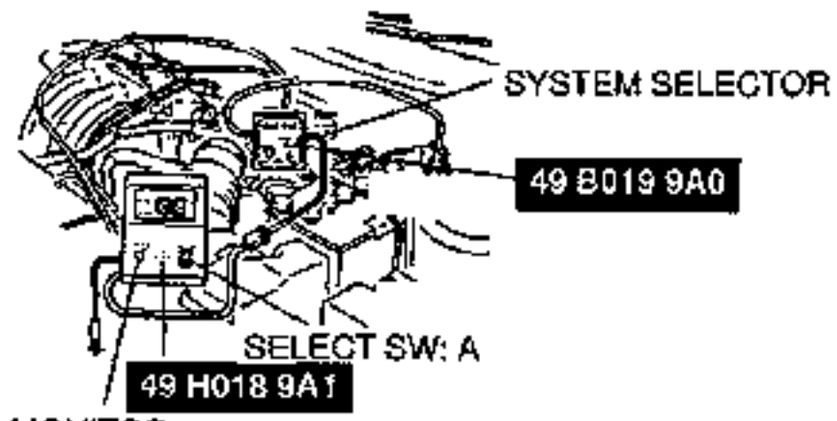
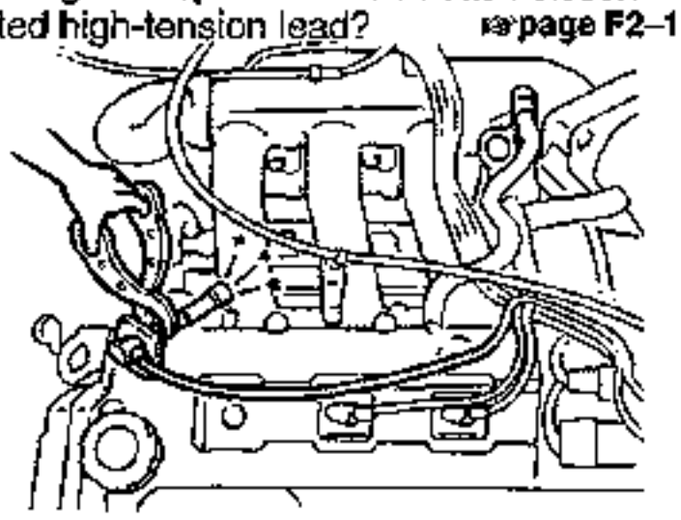
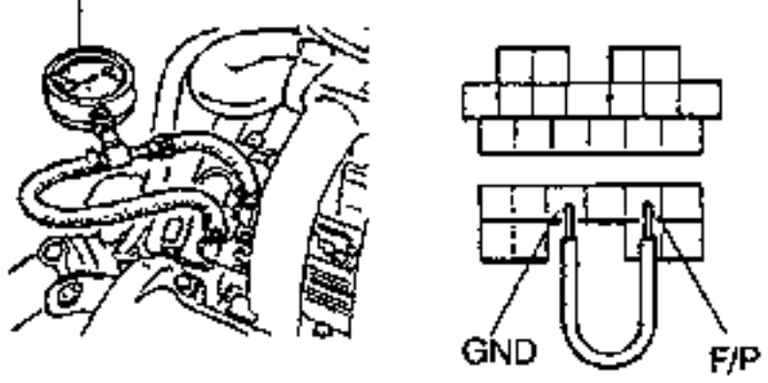
3	CRANKS NORMALLY BUT WILL NOT START (PARTIAL COMBUSTION) — WHEN ENGINE COLD
DESCRIPTION	• Engine cranks at normal speed but shows only partial combustion and will not continue to run • Battery in normal condition • Fuel in tank

[TROUBLESHOOTING HINTS]

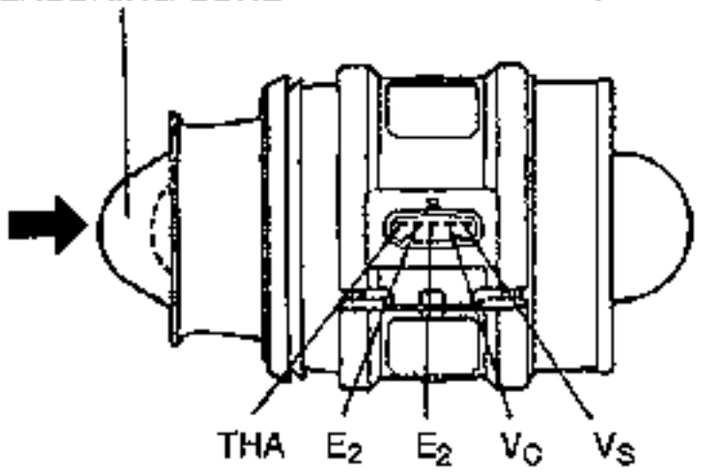
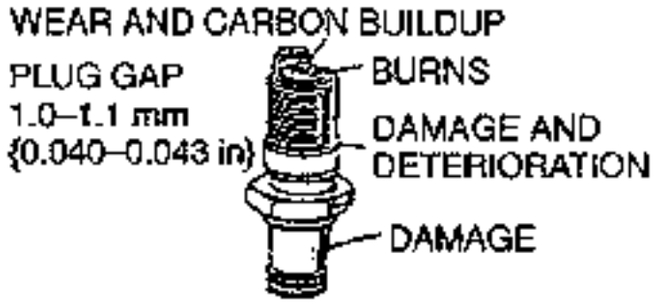
①Air/fuel mixture too rich
- Air cleaner element clogged
- Volume air flow sensor stuck

②Air/fuel mixture too lean
- Fuel injection control malfunction (correction for coolant temperature)
- Low fuel line pressure
- Air leakage of intake-air system

③Low engine compression

STEP	INSPECTION		ACTION
1	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73 SELF-DIAGNOSIS CHECKER 	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble Code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
2	Is strong blue spark visible at each disconnected high-tension lead? ☞page F2–113 	Yes	Go to next step
		No	Check distributor cap and rotor ☞section G
3	Connect data link connector terminals F/P and GND by using jumper wire; is fuel line pressure correct with ignition switch ON? ☞page F2–107 **Fuel line pressure:** **260–310 kPa {2.6–3.2 kgf/cm², 37–45 psi}** PRESSURE GAUGE 	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨If pressure **quickly** increases, check pressure regulator ☞page F2–113 ⇨If pressure **gradually** increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞page F2–110
			High pressure Is fuel return hose clogged or restricted? ⇨If it is not, replace pressure regulator ☞page F2–115 ⇨If it is, repair or replace it

B+: Battery positive voltage

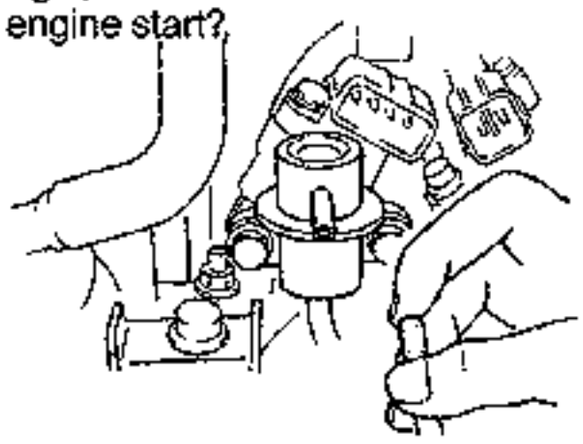
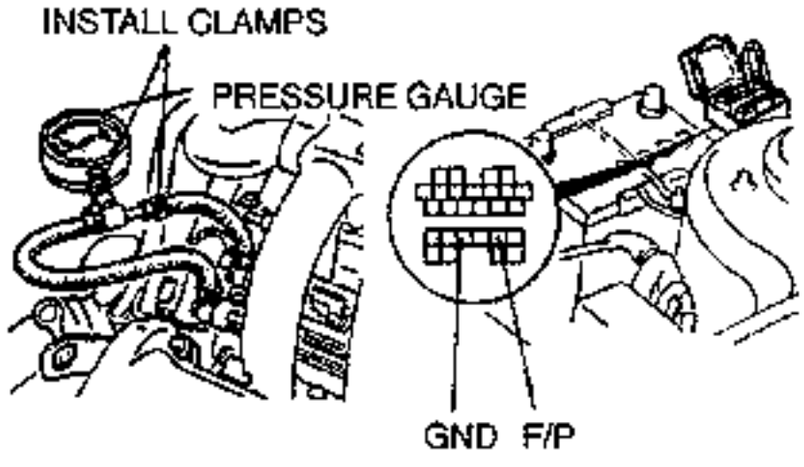
STEP	INSPECTION		ACTION
4	Are ECM terminal voltages OK? ☞page F2–141 • 1C (Start signal)	Yes	Go to next step
		No	Check for cause ☞page F2–141
5	Is there air leakage of intake-air system components?	Yes	Repair or replace
		No	Go to next step
6	Does engine start when engine coolant temperature sensor is disconnected?	Yes	Check engine coolant temperature sensor ☞page F2–152
		No	Go to next step
7	Does volume air flow sensor move smoothly from fully closed to fully open? ☞page F2–150 MEASURING CORE  	Yes	Go to next step
		No	Repair or replace volume air flow sensor
8	Is engine compression correct? **Engine compression (Minimum): 981 kPa {10.0 kgf/cm², 142 psi}-300 rpm**	Yes	Go to next step
		No	Check engine condition • Worn piston, piston rings, or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve stuck in guide
9	Are spark plugs OK? ☞section G  	Yes	Go to next step
		No	Clean or replace spark plug ☞section G
10	Try a known good ECM: and check if condition improves ☞page F2–141		

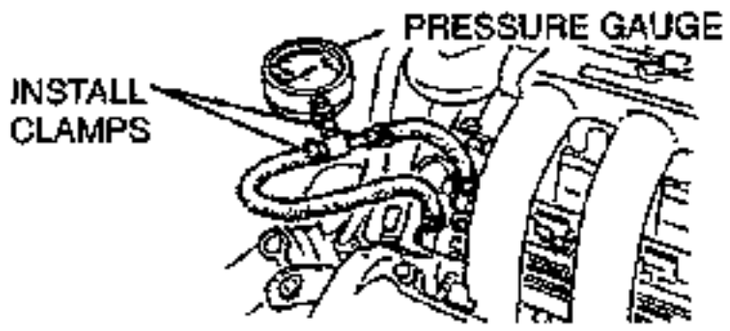
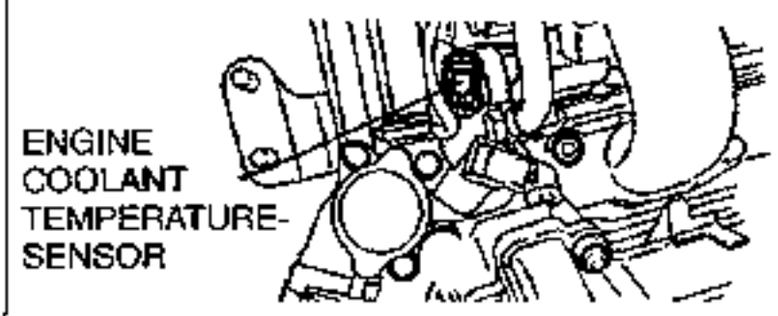
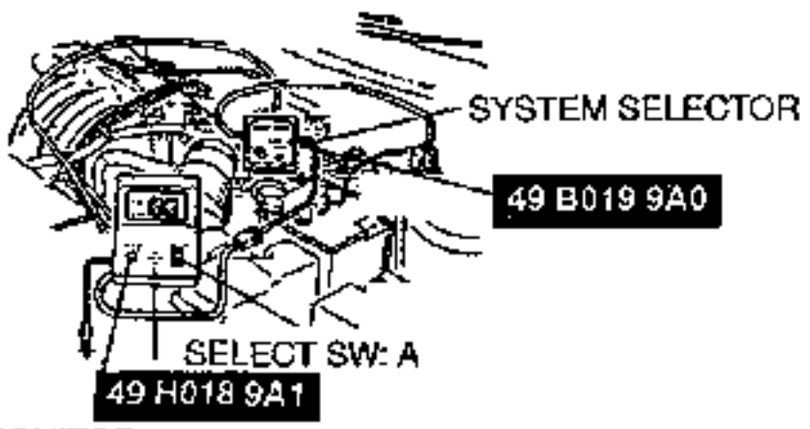
4	CRANKS NORMALLY BUT WILL NOT START (PARTIAL COMBUSTION) — AFTER WARM-UP
DESCRIPTION	• Engine cranks at normal speed and shows partial combustion but will not start after running and being hot soaked • Battery is in normal condition • Engine starts normally when cold

[TROUBLESHOOTING HINTS]

① Air/fuel mixture too rich
- Insufficient fuel injection control (correction for coolant temperature)
- Fuel Injector fuel leakage

② Vapor lock
- Fuel pressure is not held in fuel line after engine stopped
- Pressure regulator control system malfunction

STEP	INSPECTION		ACTION
1	Warm up engine to normal operating temperature and stop it Connect data link connector terminals F/P and GND by using jumper wire for 3 minutes with ignition switch ON. Does engine starts?  	Yes	Change to another brand of fuel
		No	Go to next step
2	Remove vacuum hose from pressure regulator and plug it; Does engine start? 	Yes	Check pressure regulator control system ☞page F2–120
		No	Go to next step
3	Connect data link connector terminals F/P and GND with jumper wire; is fuel line pressure correct by using ignition switch ON? ☞page F2–107 **Fuel line pressure:** **260–310 kPa {2.6–3.2 kgf/cm², 37–45 psi}** INSTALL CLAMPS PRESSURE GAUGE  	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨If pressure **quickly** increases, check pressure regulator ☞page F2–113 ⇨If pressure **gradually** increases, check fuel line and filter for clogging If hose is not clogged, check fuel pump maximum pressure ☞page F2–110
			High pressure Is fuel return hose clogged or restricted? ☞page F2–115 ⇨If it is not, replace pressure regulator ⇨If it is, repair or replace it
4	In the same condition as step 2, is fuel line pressure held after ignition switch is turned OFF? ☞page F2–107 **Fuel line pressure: More than 150 kPa {1.5 kgf/cm², 21 psi} for 5 min.**	Yes	Go to step 6
		No	Go to next step

STEP	INSPECTION		ACTION
5	Pinch fuel delivery hose:is fuel line pressure held after ignition switch is turned OFF? ☞page F2–114 **Fuel line pressure:** **More then 150 kPa (1.5 kgf/cm², 21 psi) for 5 min.**  	Yes	Replace pressure regulator ☞page F2–115
		No	Check fuel pump hold pressure ☞page F2–111 ⇨If OK, check fuel injector for fuel leakage ☞page F2–116 ⇨If not OK, replace fuel pump ☞page F2–112
6	Disconnect engine coolant temperature sensor connector; does engine start?  	Yes	Check engine coolant temperature sensor ☞page F2–152 ⇨If OK, check connectors of engine coolant temperature sensor and ECM 2E terminal ☞page F2–141 ⇨If not OK, replace engine coolant temperature sensor
		No	Go to next step
7	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73 SELF-DIAGNOSIS CHECKER  MONITOR LIGHT	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble Code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
8	Are ECM terminal voltages OK? 1B-Main relay 2B-Volume air flow sensor 2E-Engine coolant temperature sensor ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141
9	Try a known good ECM; does condition improve? ☞page F2–141	Yes	Replace ECM ☞page F2–141
		No	Change to another brand of fuel

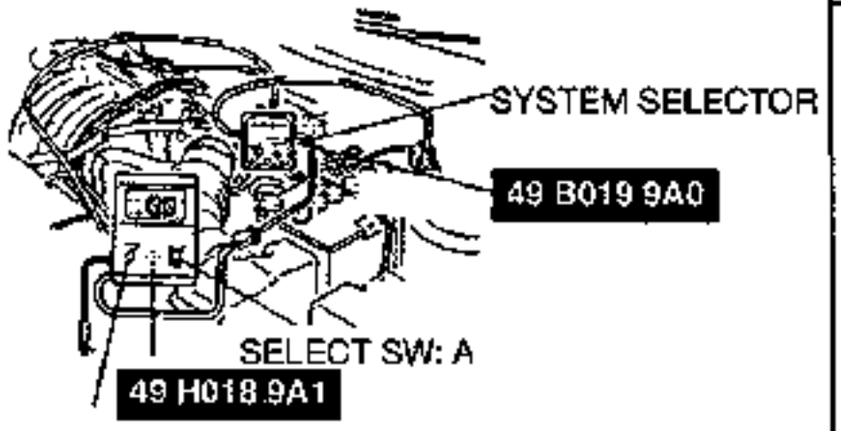
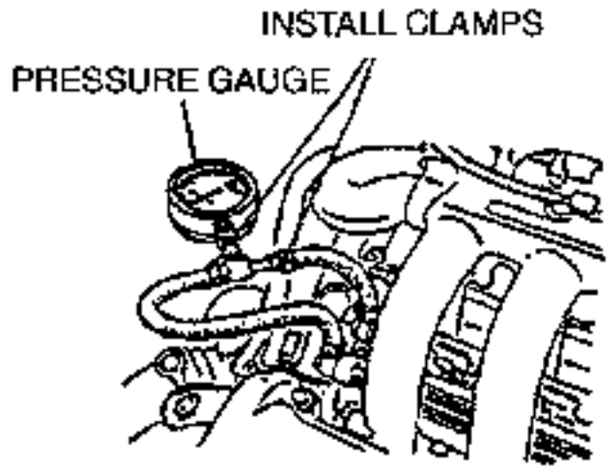
5	CRANKS NORMALLY BUT HARD TO START — ALWAYS
DESCRIPTION	• Engine cranks at normal speed but requires excessive cranking time before starting • Battery is in normal condition • Engine runs normally at idle (If idle condition not OK, refer to "Rough Idle" [No. 8–1])

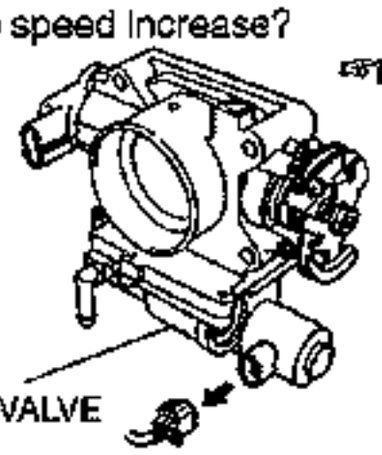
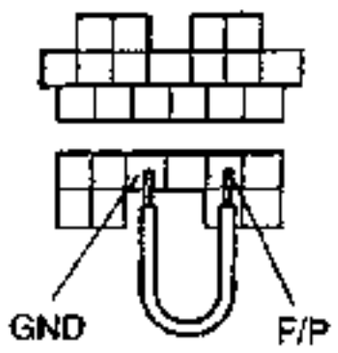
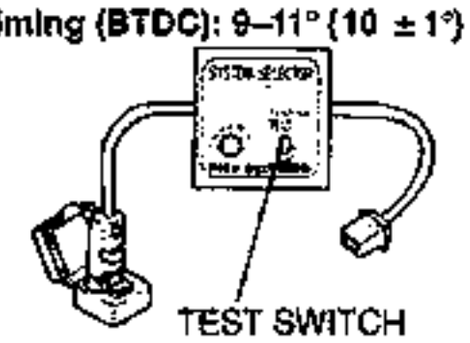
[TROUBLESHOOTING HINTS]

①Air/Fuel mixture too lean
- Fuel injection control malfunction (correct for coolant temperature)
- Low fuel line pressure
- Air leakage

②Air/Fuel mixture too rich
- Air cleaner housing element clogged
- Volume air flow sensor stuck

③Poor ignition speak

STEP	INSPECTION		ACTION
1	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73 SELF-DIAGNOSIS CHECKER  	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble Code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
2	Is intake manifold vacuum at idle? **Vacuum: More than 450 mmHg {17.7 inHg}**	Yes	Go to next step
		No	Check for air leakage of intake-air system components
3	Is air cleaner element clean? ☞page F2–70	Yes	Go to next step
		No	Replace air cleaner element
4	Does engine start easily when throttle valve is quarterly open?	Yes	Check throttle valve for carbon deposit then go to step 6
		No	Go to next step
5	Is fuel line pressure at idle correct? ☞page F2–113 **Fuel line pressure:** **260–310 kPa {2.6–3.2 kgf/cm², 37–45 psi}** **(Vacuum hose to pressure regulator disconnected)**  	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨If pressure **quickly** increases, check pressure regulator ☞page F2–113 ⇨If pressure **gradually** increases, check for clogging between fuel pump and pressure regulator If hose is not clogged, check fuel pump maximum pressure ☞page F2–110

STEP	INSPECTION		ACTION
6	Disconnect idle air control valve connector at idle: Does engine speed increase? ☞page F2–99  	Yes	Go to next step
		No	Replace idle air control value ☞page F2–95
7	Are ECM terminal voltages OK? 1C-Starter signal 2E-Engine coolant temperature sensor 3D-Sensor ground ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141
8	Connect data link connector terminals F/P and GND by using jumper wire; does engine start normally?  	Yes	Check fuel pump relay ☞page F2–113 ⇨If OK, repair or replace wire harness ⇨If not OK, replace relay
		No	Go to next step
9	Connect System Selector to data link connector and set Test Switch to "SELF TEST"; is ignition timing at idle correct after warm-up? ☞page F2–70 **Ignition timing (BTDC): 9–11° (10 ± 1°)**  	Yes	Go to next step
		No	Adjust ignition timing ☞page F2–70
10	Is engine compression correct? **Engine compression (Minimum):** **981 kPa {10.0 kgf/cm², 142 psi}-300 rpm**	Yes	Go to next step
		No	Check engine condition • Worn piston, piston rings, or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide
11	Try a known good ECM and check if condition improves ☞page F2–141		

6 CRANKS NORMALLY BUT HARD TO START — WHEN ENGINE COLD

DESCRIPTION

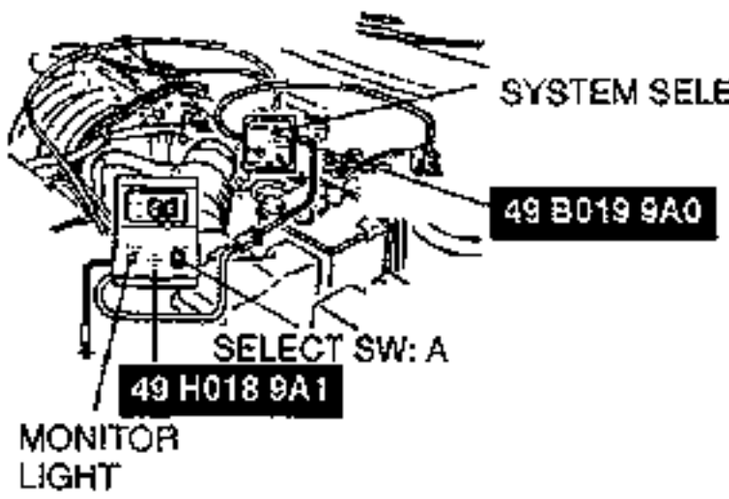
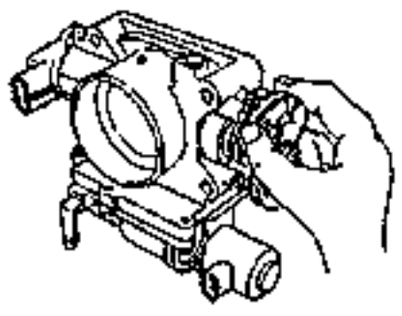
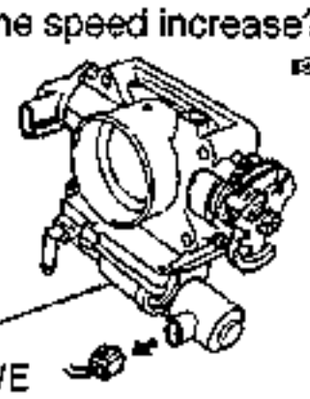
- Engine cranks at normal speed but requires excessive cranking time before starting
- Battery in normal condition
- Restarts OK after warm-up
- Engine runs normally at idle (If idle condition is not OK, refer to "Rough idle" [Nos. 8–12])

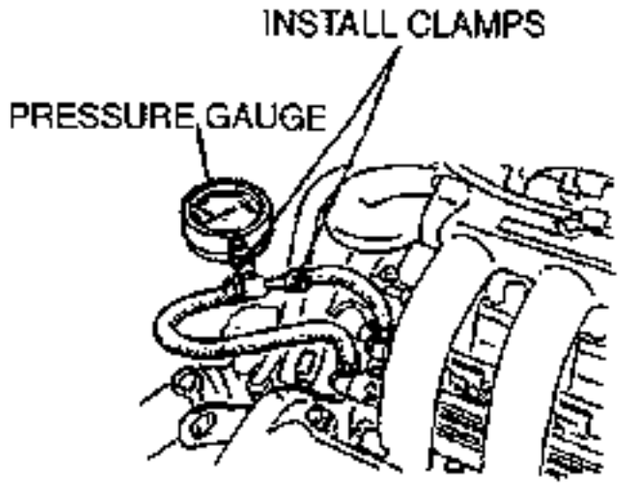
[TROUBLESHOOTING HINTS]

① Air/Fuel mixture too rich
- Volume air flow sensor stuck
- Air cleaner element clogged
- Idle air control malfunction

② Air/Fuel mixture too lean
- Fuel injection control malfunction (correction for coolant temperature)

③ Poor atomization

STEP	INSPECTION		ACTION
1	Is "00" displayed on Self-Diagnosis Checker ignition switch ON? ☞page F2–73 SELF-DIAGNOSIS CHECKER  	Yes	Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
2	Are ECM terminal voltages OK? 1C-Starter signal 2E-Engine coolant temperature sensor 3D-Sensor ground ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141
3	Does engine start easily when throttle valve is quarterly open? 	Yes	Is idle air control valve OK? ☞page F2–99 ⇨If it is, check air valve ☞page F2–99 ⇨If it is not, replace idle air control valve ☞page F2–95
		No	Go to next step
4	Is intake manifold vacuum correct at idle? **Vacuum: More than 450 mmHg {17.7 inHg}**	Yes	Go to next step
		No	Check for air leakage of intake-air system components
5	Is air cleaner element clean? ☞page F2–70	Yes	Go to next step
		No	Replace air cleaner element
6	Disconnect idle air control valve connector at idle. Does engine speed increase? ☞page F2–99  	Yes	Go to next step
		No	Replace idle air control valve ☞page F2–99

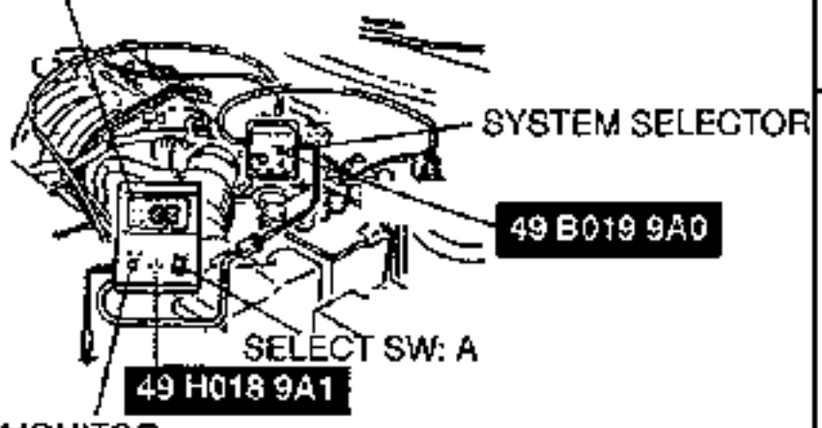
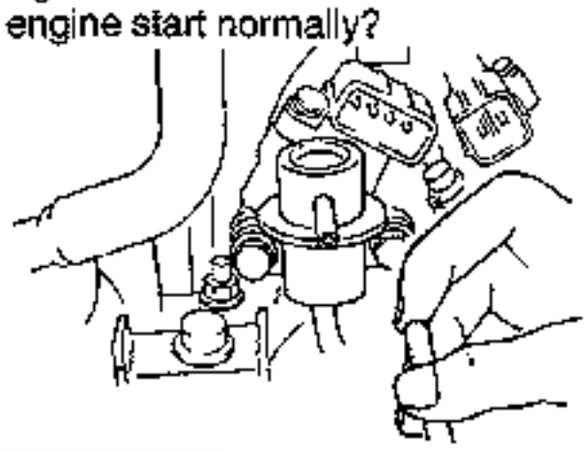
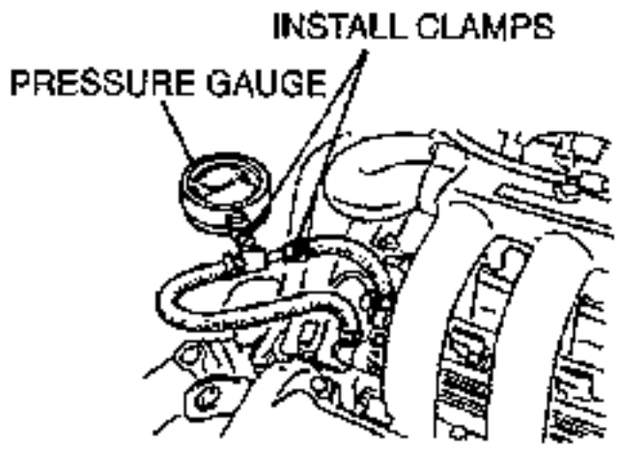
STEP	INSPECTION		ACTION
7	Connect data link connector terminals F/P and GND by using jumper wire; is fuel line pressure correct with ignition switch ON? ☞page F2–107 **Fuel line pressure:** **260–310 kPa {2.6–3.2 kgf/cm², 37–45 psi}**  	Yes	Go to next stop
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨If pressure **quickly** increases, check pressure regulator ☞page F2–113 ⇨If pressure **gradually** increases, check fuel line for clogging between fuel pump and pressure regulator If hose is not clogged, check fuel pump maximum pressure ☞page F2–110
			High pressure Is fuel return hose clogged or restricted? ⇨If it is not, replace pressure regulator ☞page F2–115 ⇨If it is, repair or replace it
8	Try a known good ECM; does condition improve? ☞page F2–141	Yes	Replace ECM ☞page F2–141
		No	Change to another brand of fuel

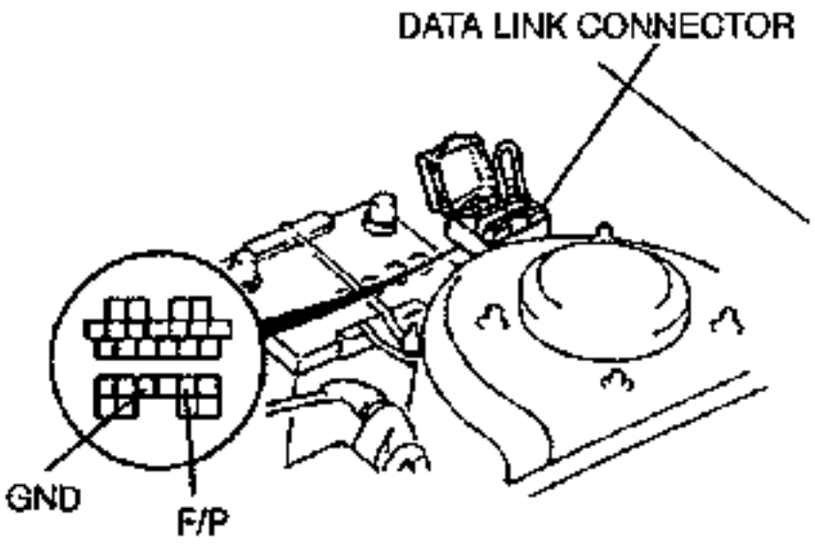
7	CRANKS NORMALLY BUT HARD TO START — AFTER WARM-UP
DESCRIP-TION	• Engine cranks at normal speed but requires excessive cranking time before starting after running and being hot soaked • Battery in normal condition • Engine starts normally when cold • Engine runs normally at idle (If idle condition is not OK, refer to "Rough Idle" [No. 8–12])

[TROUBLESHOOTING HINTS]

① Air/fuel mixture too rich
- Fuel injection control malfunction
- Fuel injector fuel leakage

② Vapor lock
- Fuel pressure not held in fuel line after engine stopped
- Pressure regulator control system malfunction

STEP	INSPECTION		ACTION
1	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73 SELF-DIAGNOSIS CHECKER  	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
2	Remove vacuum hose from pressure regulator and plug it. Does engine start normally? 	Yes	Check pressure regulator control system ☞page F2–113
		No	Go to next step
3	Are ECM terminal voltages OK? 1C-Starter signal 2E-Engine coolant temperature sensor 3D-Sensor ground ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141
4	Run engine at idle; does fuel line pressure held after ignition switch is turned OFF? **Fuel line pressure: More than 150 kPa {1.5 kgf/cm², 21 psi} for 5 min.**  	Yes	Go to next step
		No	Plug outlet of pressure regulator outlet; is fuel line pressure held after ignition switch is turned OFF? ☞page F2–108 ⇨If it does, replace pressure regulator ☞page F2–115 ⇨If it does not, check fuel pump hold pressure ☞page F2–111 If fuel pump is OK, check fuel injectors for fuel leakage ☞page F2–116

STEP	INSPECTION		ACTION
5	Warm up engine to normal operating temperature and stop it Connect data link connector terminals F/P and GND by using jumper wire for 3 minutes with ignition switch ON; does engine start easily?  	Yes	Change to another brand of fuel
		No	Go to next step
6	Try a known good ECM; does condition improve? ☞page F2–141	Yes	Replace ECM ☞page F2–141
		No	Change to another brand of fuel

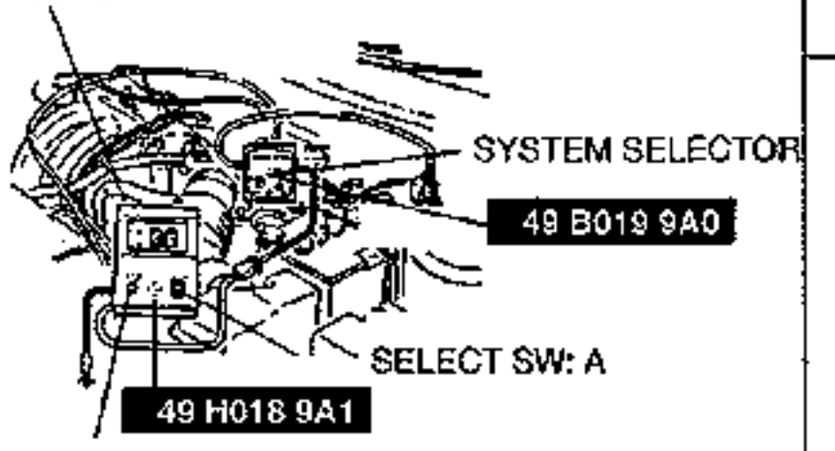
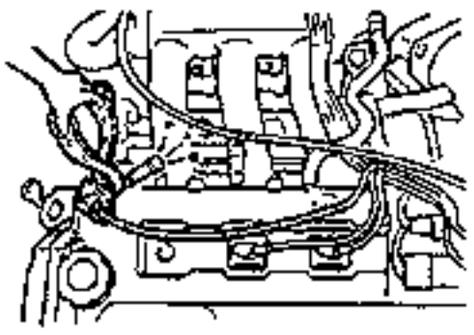
8	ROUGH IDLE/ENGINE STALLS AT IDLE — ALWAYS
DESCRIPTION	• Engine starts normally but stalls or vibrates excessively at idle in every condition

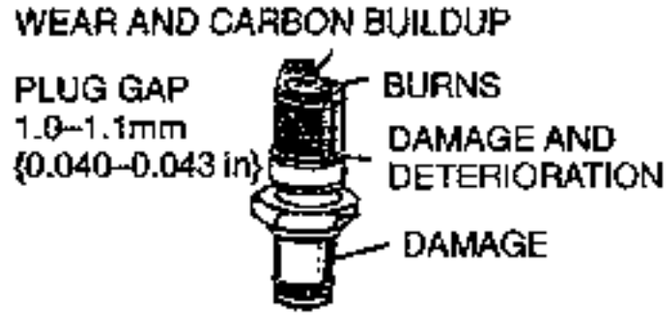
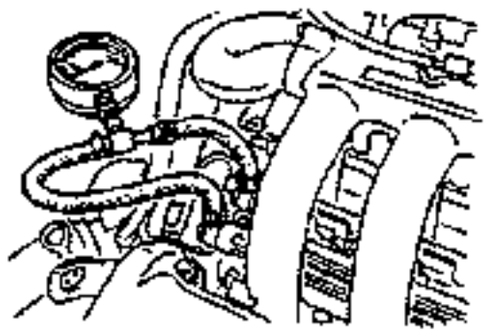
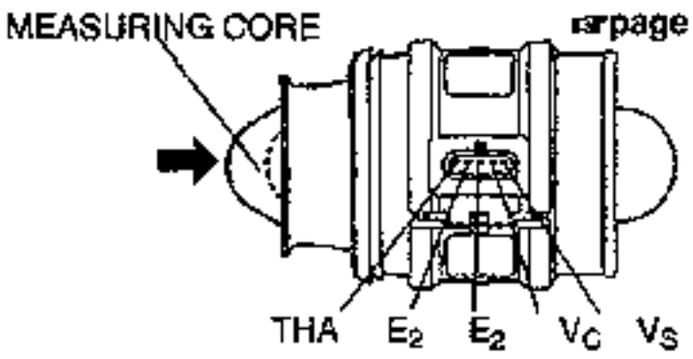
[TROUBLESHOOTING HINTS]

①Air/fuel mixture too lean
- Air leakage
- Fuel injection control malfunction
- Low fuel line pressure

②One or more fuel injectors clogged or not operating
③Low intake air amount
④Incorrect idle speed
- Idle speed misadjustment
- Idel air control malfunction

⑤One or more spark plugs not firing
⑥Low engine compression
⑦Volume air flow sensor stuck

STEP	INSPECTION		ACTION
1	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73 	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
2	Are ECM terminal voltage OK? 1C-Starter signal 2E-Engine coolant temperature sensor 3D-Sensor ground ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141
3	Disconnect high-tension lead at idle; does engine speed decreases equally at each cylinder?	Yes	Go to step 8
		No	Go to next step
4	Is there fuel injector operating sound at idle?	Yes	Go to step 6
		No	Go to next step
5	Does battery positive voltage exist at fuel injector connector terminal A wire?	Yes	Is fuel injector resistance OK? ☞page F2–117 **Resistance: 12–16 Ω [20°C (68°F)]** ⇨If it is, check wiring between ECM and fuel injector ⇨If it is not, replace fuel injector ☞page F2–115
		No	Check wiring between ECM and fuel injector
6	Is strong blue spark visible at disconnected high-tension lead? ☞section G 	Yes	Go to next step
		No	Check high-tension lead ☞section G ⇨If OK, check distributor cap and rotor ⇨If not OK, replace high-tenston lead

STEP	INSPECTION		ACTION
7	Are spark plugs OK? 	Yes	Is engine compression correct? ☞**section B2** ⇨If OK, replace fuel injector ☞**page F2–115** ⇨If not OK, check for cause ☞**section B2**
		No	Clean or replace spark plug ☞**section G**
8	Is fuel line pressure correct at idle? ☞**page F2–113** **Fuel line pressure:** **260–310 kPa {2.6–3.2 kgf/cm², 37–48 psi}** **(Vacuum hose to pressure regulator disconnected)** 	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨If pressure **quickly** increases, check pressure regulator ☞**page F2–113** ⇨If pressure **gradually** increases, check for clogging between fuel pump and pressure regulator ⇨If hose is not clogged, check fuel pump maximum pressure ☞**page F2–110**
9	Does volume air flow sensor move smoothly from closed throttle position to wide open throttle?  ☞**page F2–149**	Yes	Go to next step
		No	Repair or replace volume air flow sensor
10	Is there air leakage at intake-air system components?	Yes	Repair or replace
		No	Go to next step
11	Is engine compression correct? ☞**section B2** **Engine compression (Minimum):** **981 kPa {10.0 kgf/cm², 142 psi}-300 rpm**	Yes	Go to next step
		No	Check for cause ☞**section B2**
12	Connect System Selector to data link connector and set Test Switch to "SELF TEST"; is ignition timing correct at idle after warm-up? ☞**page F2–71** **Ignition Timing (BTDC): 9–11° {10 ± 1°}**	Yes	Try a known good ECM and check if condition improves ☞**page F2–141**
		No	Adjust ignition timing ☞**page F2–71**

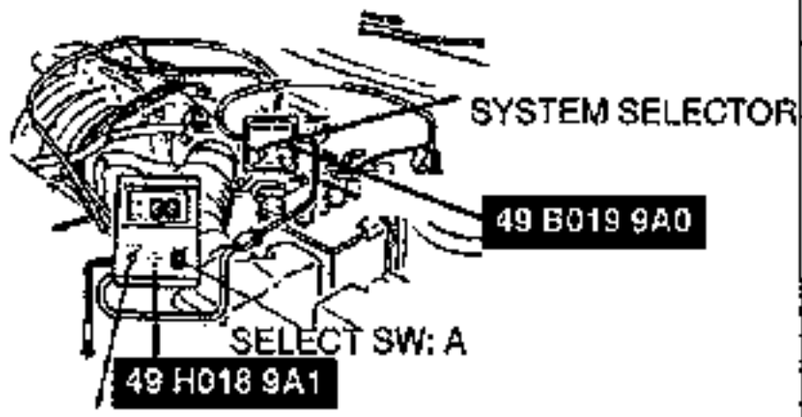
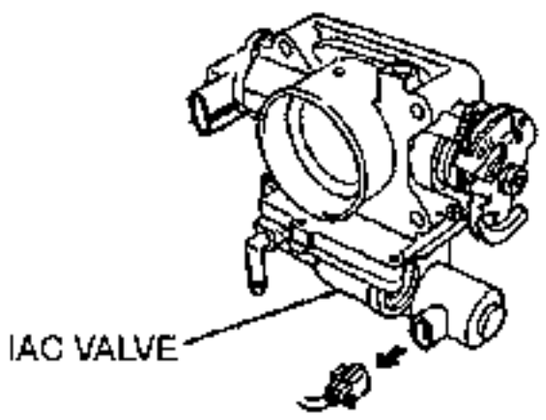
9	ROUGH IDLE/ENGINE STALLS AT IDLE — BEFORE WARM-UP
DESCRIPTION	• Engine speed low or engine stalls or vibrates excessively at idle during warm-up

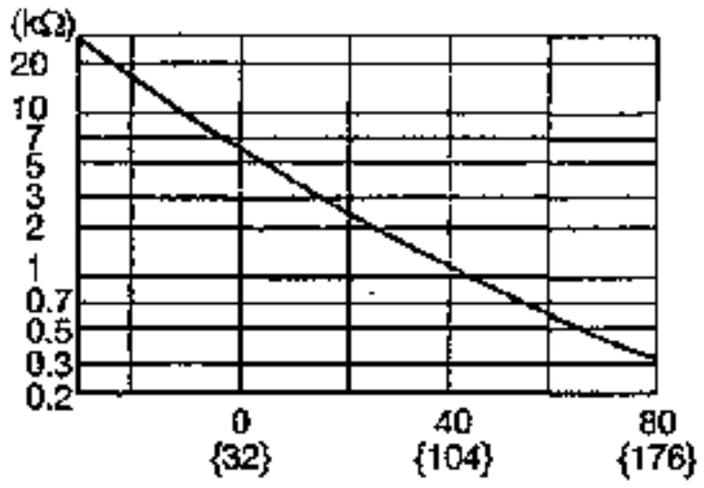
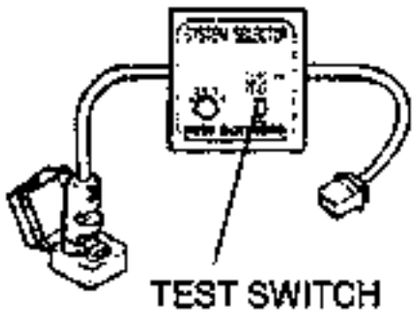
[TROUBLESHOOTING HINTS]

① Low intake air amount
- Volume air flow sensor stuck
- Air cleaner element clogged
- Air valve

② Low fuel injection control
- Fuel injection control malfunction (Correction for coolant temperature)

③ Poor atomization

STEP	INSPECTION		ACTION
1	Is "00" displayed on SST with ignition switch ON? ☞page F2–73 SELF-DIAGNOSIS CHECKER  	Yes	"00" displayed Go to next step
		No	Diagnostic trouble code No. displayed Check for cause (Refer to specified check sequence) ☞page F2–74
2	Is intake manifold vacuum correct at idle after warm-up? **Vacuum: More than 450 mmHg {17.7 inHg}**	Yes	Go to next step
		No	Check for air leakage of intake-air system components
3	Is air cleaner element clean? ☞page F2–70	Yes	Go to next step
		No	Replace air cleaner housing element
4	Are ECM terminal voltages OK? 1C-Starter signal 2E-Engine coolant temperature sensor 3D-Sensor ground ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141
5	Disconnect idle air control valve connector Does engine speed increase after warm-up?  	Yes	Go to next step
		No	Replace IAC valve ☞page F2–95

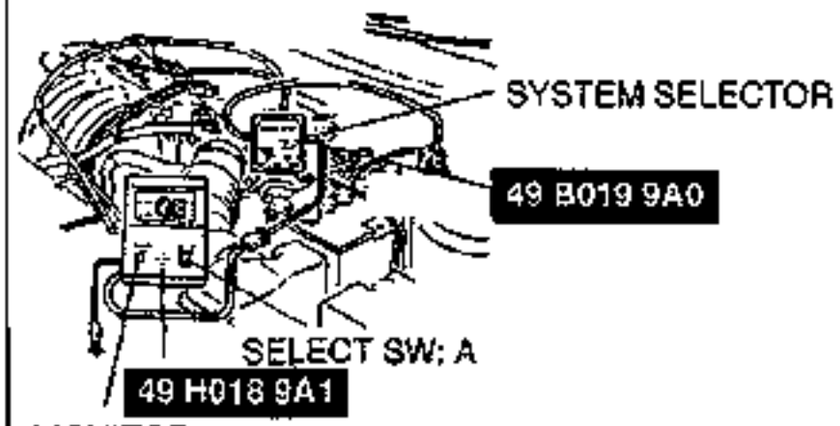
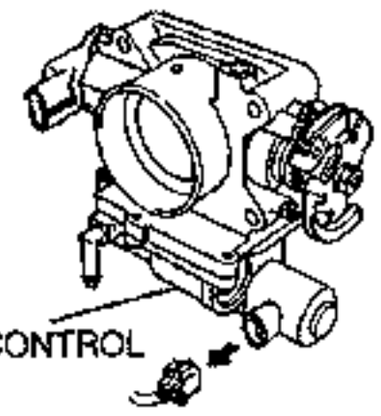
STEP	INSPECTION		ACTION
6	Is engine coolant temperature sensor resistance correct? RESISTANCE ☞page F2–152  	Yes	Go to next step
		No	Replace engine coolant temperature sensor
7	Connect System Selector to data link connector and set Test Switch to "SELF TEST" when engine is cold. Does engine speed decrease as engine warms up?	Yes	Go to next step
		No	Check air valve ☞page F2–99
8	Connect System Selector to data link connector and set Test Switch to "SELF TEST"; is ignition timing at idle correct after warm-up? ☞page F2–70 **Ignition timing (BTDC): 9–11° {10 ± 1°}**  	Yes	Go to next step
		No	Adjust ignition timing ☞page F2–70
9	Try a known good ECM; does condition improve? ☞page F2–141	Yes	Replace ECM ☞page F2–141
		No	Change to another brand of fuel

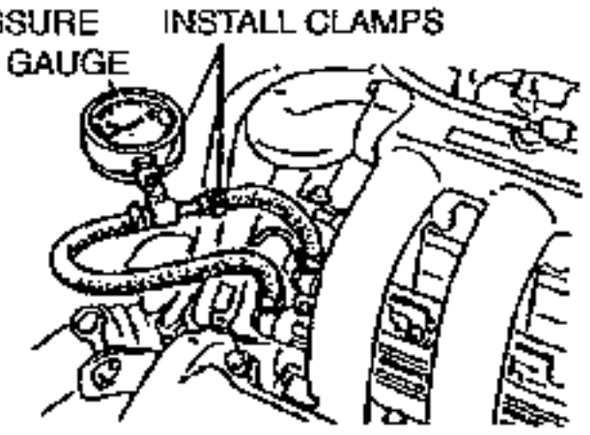
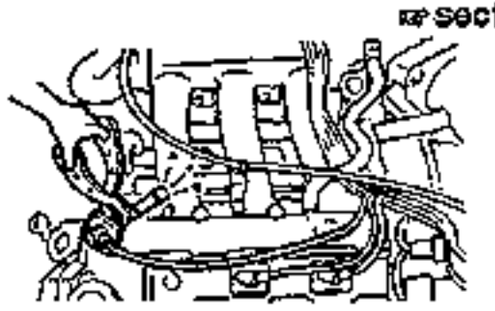
10	ROUGH IDLE/ENGINE STALLS AT IDLE — AFTER WARM-UP
DESCRIPTION	• Engine runs normally at idle during warm-up but stalls or vibrates excessively after warm-up

[TROUBLESHOOTING HINTS]
① Idle-speed control system malfunction
② Air/fuel mixture too lean
- Air leakage
- Low fuel line pressure

③ Air/fuel mixture too rich
- Fuel injection control malfunction (Correction for coolant temperature)

④ Poor ignition
⑤ Low engine compression

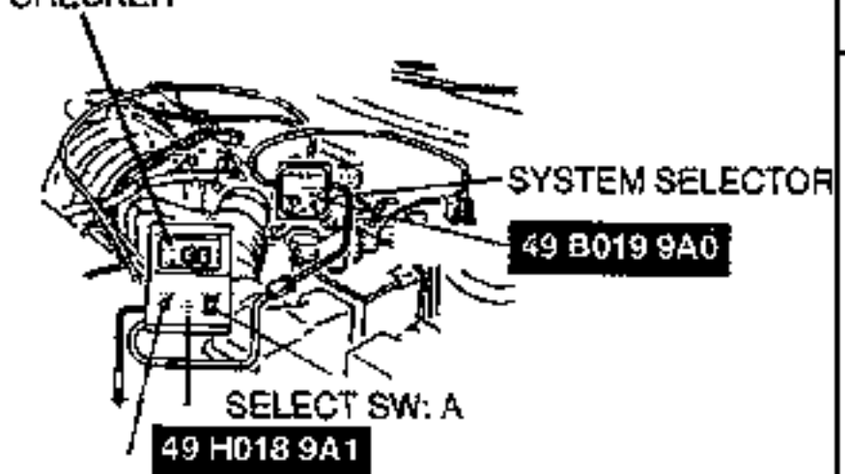
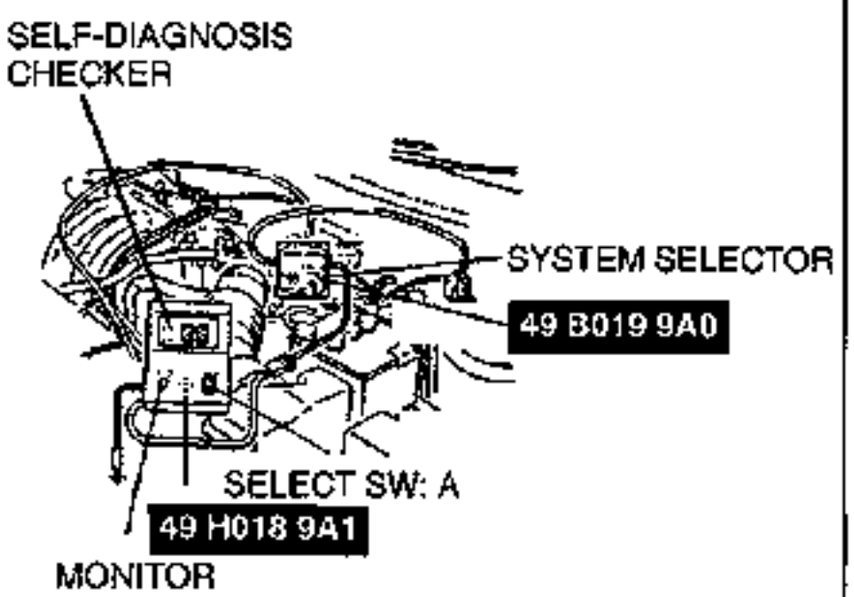
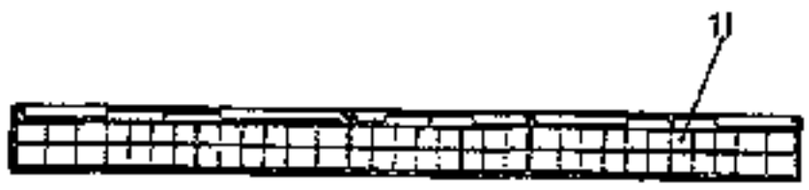
STEP	INSPECTION		ACTION
1	Is "00" displayed on SST with ignition switch ON? ☞page F2–73 SELF-DIAGNOSIS CHECKER  	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
2	Are ECM terminal voltages OK? 1C-Starter signal 2E-Engine coolant temperature sensor 3D-Sensor ground ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141
3	Disconnect high-tension lead at idle; does engine speed decrease equally at all cylinders?	Yes	Go to next step
		No	Go to step 9
4	Is intake manifold vacuum at idle correct? **Vacuum: More than 450 mmHg {17.7 inHg}**	Yes	Go to next step
		No	Check for air leakage of intake-air system components ☞page F2–95
5	Is air cleaner element clean? ☞page F2–70	Yes	Go to next step
		No	Replace air cleaner element
6	Disconnect idle air control valve connector at idle: does engine speed increase?  	Yes	Go to next step
		No	Replace idle air control valve ☞page F2–95

STEP	INSPECTION		ACTION
7	Is fuel line pressure correct at idle? ☞page F2–113 **Fuel line pressure:** **260–310 kPa {2.6–3.2 kgf/cm², 37–45 psi}** **(Vacuum hose to pressure regulator disconnected)** PRESSURE GAUGE INSTALL CLAMPS 	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨If pressure **quickly** increases, check pressure regulator ☞page F2–113 ⇨If pressure **gradually** increases, check for clogging between fuel pump and pressure regulator ⇨If hose is not clogged, check fuel pump maximum pressure ☞page F2–110
8	Connect System Selector to data link connector and set Test Switch to "SELF TEST"; is ignition timing at idle correct after warm-up? ☞page F2–70 **Ignition timing (BTDC): 9–11° {10 ± 1°}**	Yes	Go to next step
		No	Adjust ignition timing ☞page F2–70
9	Disconnect engine coolant temperature sensor connector; does engine condition improve?	Yes	Replace engine coolant temperature sensor
		No	Try a known good ECM; and check if condition improves ☞page F2–141
10	Is there fuel injector operating sound at idle? 	Yes	Go to next step
		No	Is fuel injector resistance OK? ☞page F2–117 **Resistance: 12–16 Ω [20°C {68°F}]** ⇨If it is, check wiring between ECM and fuel injector ⇨If it is not, replace fuel injector ☞page F2–115
11	Is engine compression correct? ☞section B2 **Engine compression (Minimum):** **981 kPa {10.0 kgf/cm², 142 psi)-300 rpm**	Yes	Go to next step
		No	Check engine ☞section B2
12	Is strong blue spark visible at disconnected high-tension lead? ☞section G 	Yes	Go to next step
		No	Check high-tension lead ☞section G ⇨If OK, check distributor cap and rotor ⇨If not OK, replace high-tension lead
13	Are spark plugs OK? ☞section G	Yes	Try a known good ECM; and check if condition improves ☞page F2–141
		No	Repair or replace spark plug ☞section G

B+: Battery positive voltage

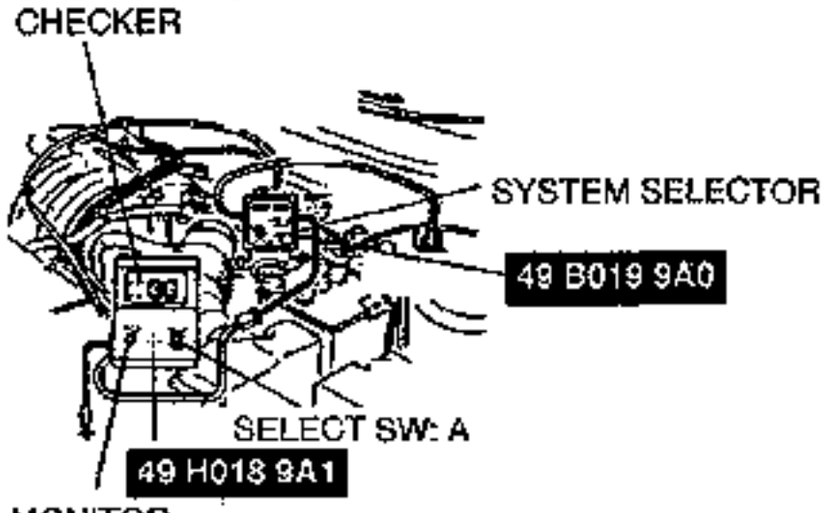
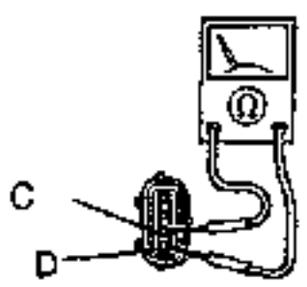
11	ROUGH IDLE/ENGINE STALLS AT IDLE — WHEN A/C, P/S, OR E/L ON
DESCRIPTION	• Engine stalls or vibrates excessively at idle when A/C, P/S, or E/L ON • A/C, P/S, headlights, blower fan, and electric coolant fan operate normally • Idle condition is normal when A/C, P/S, and E/L are OFF

[TROUBLESHOOTING HINTS]
① Idle air control system malfunction

STEP	INSPECTION		ACTION
1	Is "00" displayed on **SST** with ignition switch ON? ☞**page F2–73**  	Yes	**00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞**page F2–74**
2	Does **SST** Monitor Light show that switches operate correctly with ignition switch ON? ☞**page F2–92**  	Yes	Go to next step
		No	**Light does not turn ON or OFF with specified switch** Check for cause (Refer to specified check sequence) ☞**page F2–93**
			Light always ON Check wiring between ECM terminal 1D and **SST**
3	Is ECM terminal 1I voltage OK? ☞**page F2–141** **Voltage: Battery positive voltage (at idle)**  	Yes	Try known good ECM; and check if condition improves ☞**page F2–141**
		No	Check for short circuit in wiring between data link connector terminal TEN and ground

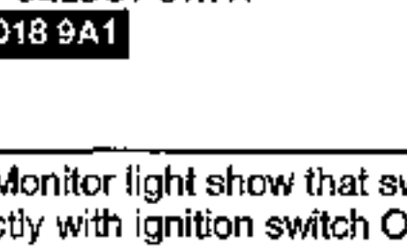
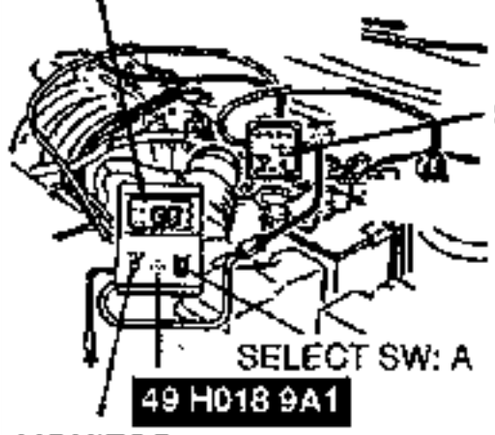
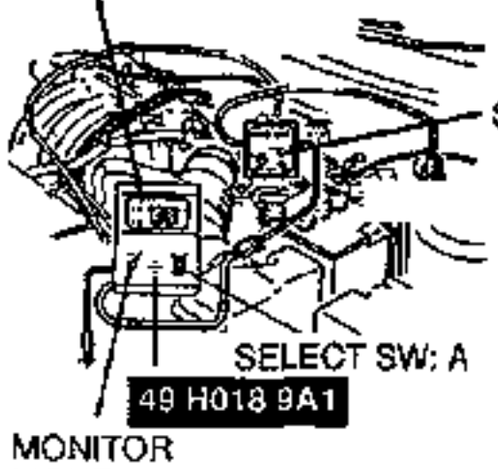
12	ROUGH IDLE/ENGINE STALLS JUST AFTER STARTING
DESCRIP-TION	• Engine starts normally, but vibrates excessively or stalls just after starting (acceleration from idle) • Idle conditions are normal in the other conditions

[TROUBLESHOOTING HINTS]
① Fuel injection control system
• Start signal not input to ECM
② Ignition timing misadjustment

STEP	INSPECTION		ACTION
1	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73  	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
2	Are ECM terminal voltages OK (especially 2B)? ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141
3	Connect System Selector to data link connector and set Test Switch to "SELF TEST"; is ignition timing at idle correct after warm-up? ☞page F2–70 **Ignition timing (BTDC): 9–11° {10 ±1°}**	Yes	In same condition as step 3 inspection and apply parking brake. Is idle speed correct? ☞page F2–71 **Idle speed: 640–700 {670 ±30} rpm** ⇨If OK, go to next step ⇨If not OK, adjust idle speed ☞page F2–71
		No	Adjust ignition timing ☞page F2–70
4	Check for continuity between throttle position sensor terminals C and D ☞page F2–150  **Clearance between throttle lever and stopper** / **Continuity** 0.15 mm {0.006 in} / Yes 0.50 mm {0.020 in} / No	Yes	Go to next step
		No	Adjust throttle position sensor ☞page F2–151
5	Try a known good ECM; and check if condition improves ☞page F2–141		

13	HIGH IDLE SPEED AFTER WARM-UP
DESCRIPTION	• Idle speed excessively high after warm-up

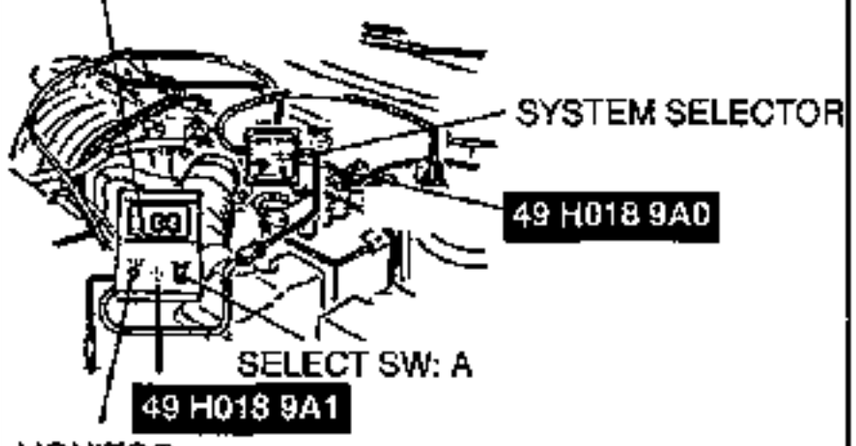
[TROUBLESHOOTING HINTS]
Excessive intake air supplied to engine
① Throttle valve not fully closed
② Idle-air control malfunction
- All valve not closed
- Idle air control valve stuck
- A/C, E/L signal sent to ECM
- P/S pressure switch always ON

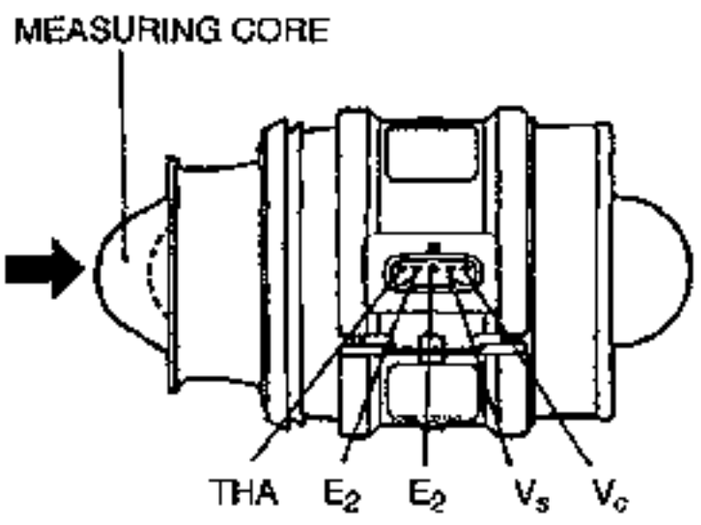
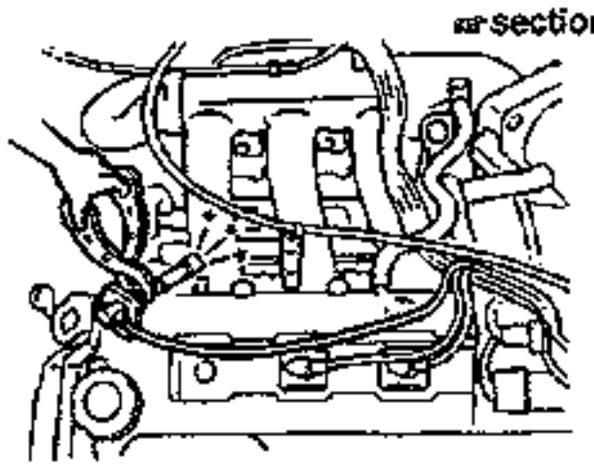
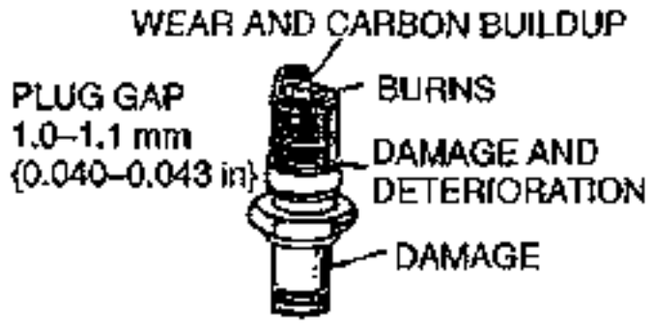
STEP	INSPECTION		ACTION
1	Is throttle valve fully closed when accelerator is released? 	Yes	Go to step 3
		No	Is throttle linkage correctly installed and does it operate freely? ☞**page F2–96** ⇨If OK, go to next step ⇨If not OK, clean, adjust, or replace linkage ☞**page F2–96**
2	Is "00" displayed on **SST** with ignition switch ON? ☞**page F2–73** SELF-DIAGNOSIS CHECKER 	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞**page F2–74**
3	Does **SST** Monitor light show that switches operate correctly with ignition switch ON? ☞**page F2–92** SELF-DIAGNOSIS CHECKER 	Yes	Go to next step
		No	**Light does not turn ON or OFF with specified switch** Check for cause (Refer to specified check sequence) ☞**page F2–93**
			Light always ON Check wiring between ECM terminal 1D and Self-Diagnosis Checker
4	Are ECM terminal voltages OK (especially 2E)? ☞**page F2–141**	Yes	Go to next step
		No	Check for cause

STEP	INSPECTION		ACTION
5	Does engine speed decrease as engine warms up?	Yes	Go to next step
		No	Check air valve ☞page F2–99
6	Is idle air control valve OK? ☞page F2–99	Yes	Go to next step
		No	Repair or replace
7	Pinch PCV hose with pliers; does engine speed decrease?	Yes	Check PCV valve ☞page F2–124
		No	Go to next step
8	Are ECM terminal voltages OK? 1C-Starter signal 2E-Engine coolant temperature sensor 3D-Sensor ground ☞page F2–141	Yes	Try a known good ECM and check if condition improves ☞page F2–141
		No	Check for cause ☞page F2–141

14	IDLE MOVES UP AND DOWN/IDLE HUNTING
DESCRIPTION	• Engine speeds up and down at idle

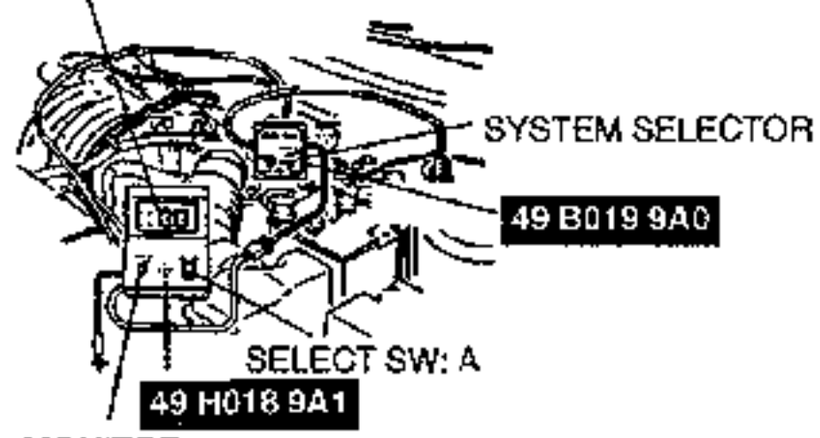
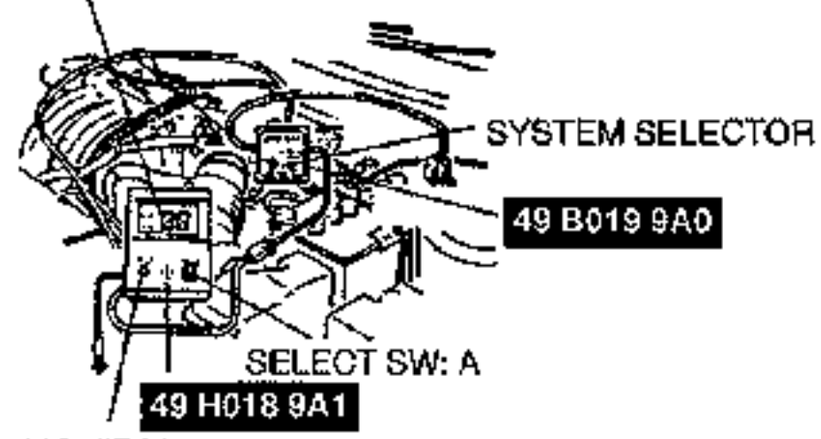
[TROUBLESHOOTING HINTS]
① Closed throttle position switch (built-in throttle position sensor) OFF at idle
② Air leakage
③ Fuel injection amount inconstant
• Poor contact point inside volume air flow sensor
④ Poor ignition

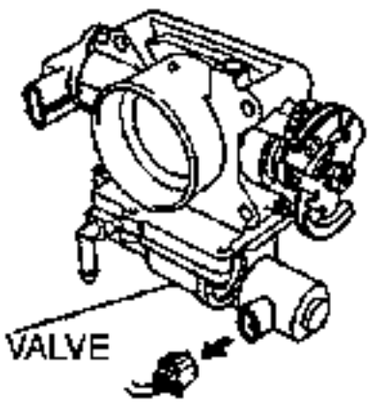
STEP	INSPECTION		ACTION
1	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73 SELF-DIAGNOSIS CHECKER  	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
2	Is intake manifold vacuum correct at idle? **Intake manifold vacuum:** **More than 450 mmHg {17.7 inHg}**	Yes	Go to next step
		No	**Low vacuum** Check for air leakage of intake-air system components
3	Is air cleaner element clean? ☞page F2–70	Yes	Go to next step
		No	Replace air cleaner element
4	Disconnect high-tension lead at idle; does engine speed decrease equally at each cylinder?	Yes	Go to next step
		No	Go to step 8
5	Are ECM terminal voltage OK? 1C-Starter signal 2E-Engine coolant temperature sensor 3D-Sensor ground ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141
6	Connect System Selector to data link connector and set Test Switch to "SELF TEST"; is ignition timing at idle correct after warm-up? ☞page F2–70 **Ignition timing (BTDC): 9–11° {10 ± 1°}**	Yes	Go to next step
		No	Adjust ignition timing ☞page F2–70

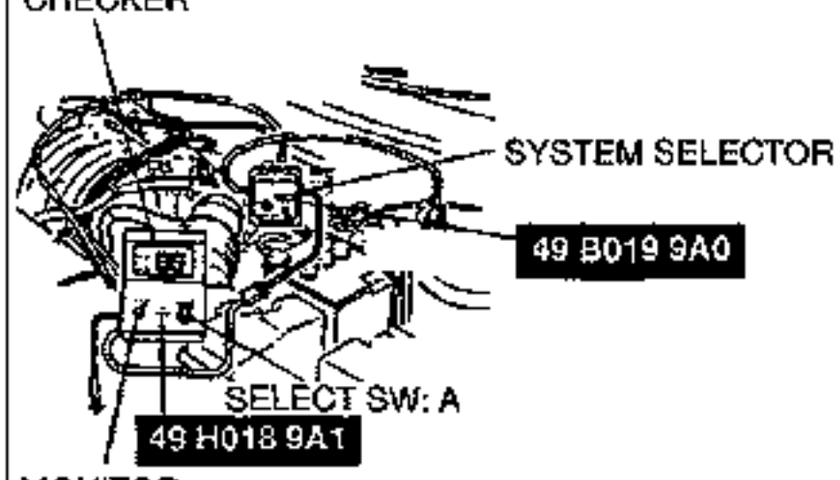
STEP	INSPECTION		ACTION
7	Is volume air flow sensor OK? ☞page F2–150 	Yes	Go to step 13
		No	Replace volume air flow sensor
8	Is there fuel injector operating sound at idle?	Yes	Go to step 10
		No	Go to next step
9	Does battery positive voltage exist at fuel distributor (RH) terminal A? Does battery positive voltage exist at fuel distributor (LH) terminal D?	Yes	Is fuel injector resistance OK? ☞page F2–117 **Resistance: 12–16 Ω [20°C {68°F}]** ⇨If it is, check wiring between ECM and fuel injector ⇨If it is not, replace fuel injector ☞page F2–115
		No	Check wiring between ECM and fuel injector
10	Is strong blue spark visible at disconnected high-tension lead? ☞section G 	Yes	Go to next step
		No	Check high-tension lead ⇨If OK, check distributor cap and rotor ☞section G ⇨If not OK, replace high-tension lead
11	Are spark plugs OK? ☞section G 	Yes	Is engine compression correct? ☞section B2 **Compression (Minimum):** ***981 kPa {10.0 kgf/cm², 142 psi}-300 rpm*** ⇨If OK, go to next step ⇨If not OK, check for cause
		No	Clean or replace spark plug ☞section G
12	Check for fuel injector leakage ☞page F2–116	Yes	Replace fuel injector ☞page F2–115
		No	Go to next step
13	Try a known good ECM and check if condition improves ☞page F2–140		

15	ENGINE/STALLS ON DECELERATION
DESCRIPTION	• Engine unexpectedly stops running during or after deceleration • Idle condition normal

[TROUBLESHOOTING HINTS]
Engine speed drops too much when accelerator is released because of a poor connector connection that has been disconnected by the force of deceleration
① Idle speed misadjustment
② Fuel cut control malfunction

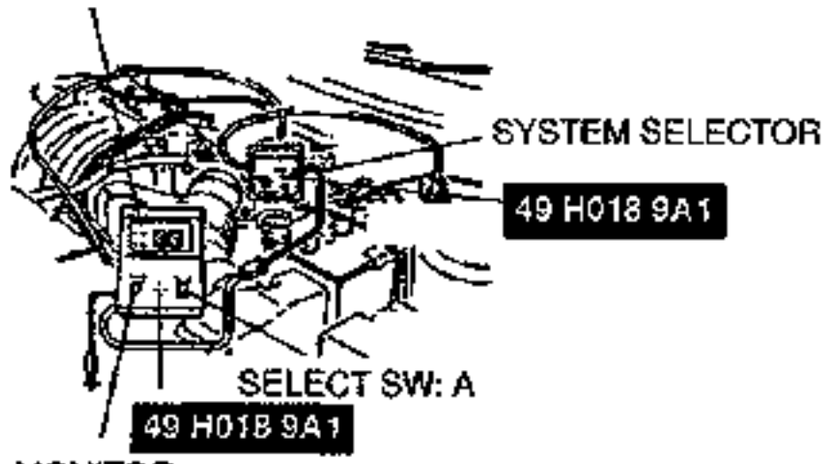
STEP	INSPECTION		ACTION
1	Is idle condition normal? **Idle speed: 640–700 rpm {670 ±30} rpm**	Yes	Go to next step
		No	Adjust or perform troubleshooting No. 8–11 "ROUGH IDLE" ☞page F2–33
2	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73 SELF-DIAGNOSIS CHECKER  	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
3	Does SST Monitor Light show that switches operate correctly with ignition switch ON? ☞page F2–92 SELF-DIAGNOSIS CHECKER  	Yes	Go to next step
		No	**Light not ON or OFF with specified switch** Check for cause (Refer to specified check sequence) ☞page F2–93
			Light always ON Check wiring between ECM terminal 1D and Self-Diagnosis Checker
4	Are ECM terminal voltages OK (especially 1 R, 2B, 3D, 3U, 3V, 3W, 3X, 3Y, and 3Z)? ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141
5	Check for poor connection of the following parts • Ignition coil • Ignition control module • Distributor • High-tension lead • Fuel injector • Fuel pump relay • ECM	Yes	Repair or replace
		No	Go to next step

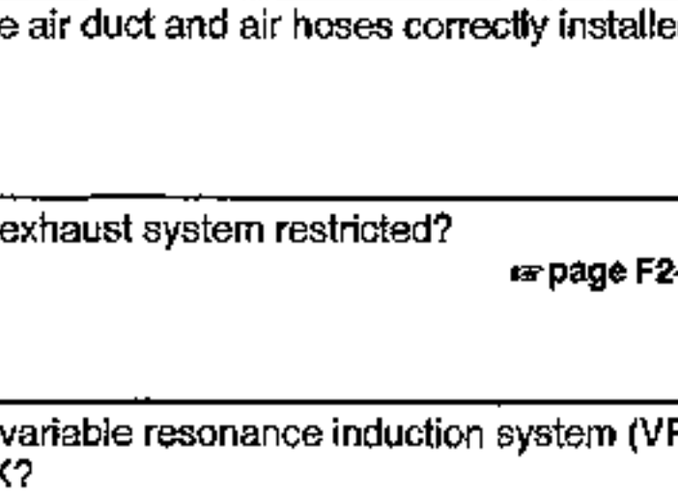
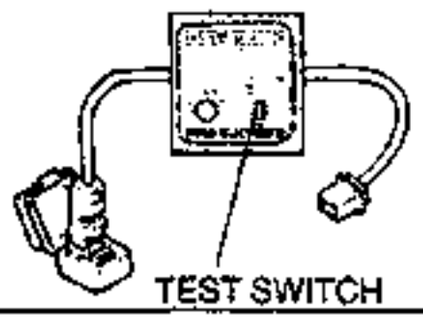
STEP	INSPECTION		ACTION
6	Disconnect idle air control valve connector at idle: dose engine speed increase?  	Yes	Go to next step
		No	Replace idle air control valve ☞page F2–95
7	Try a known good ECM and check if condition improves ☞page F2–141		

16	ENGINE STALLS SUDDENLY (INTERMITTENT)		
DESCRIPTION	• Engine intermittently stops running • Before stalling, engine condition is OK		
[TROUBLESHOOTING HINTS] ① Intermittently no spark or no fuel injection caused by vehicle vibration, acceleration, or deceleration • Poor connection in wire harness			
STEP	**INSPECTION**		**ACTION**
1	Is "00" displayed on **SST** with ignition switch ON? ☞**page F2–73**  	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞**page F2–74**
2	Check for poor connection of the following parts • Ignition coil • Ignition control module • Distributor • High-tension lead • Fuel injector • Fuel pump relay • ECM	Yes	Repair or replace
		No	Go to next step
3	Are ECM terminal voltages OK (especially 1 B, 3A, 3B, and 3C)? ☞**page F2–141** **Note** • When checking voltages, tap, move, and wiggle harness and connector to recreate problem	Yes	Go to Troubleshooting No.2: "CRANKS NORMALLY BUT WILL NOT START (NO COMBUSTION)" ☞**page F2–21**
		No	Check for cause ☞**page F2–141**

17	HESITATES/STUMBLES ON ACCELERATION
DESCRIPTION	• Flat spot occurs just after accelerator is depressed, of mild jerking occurs during acceleration

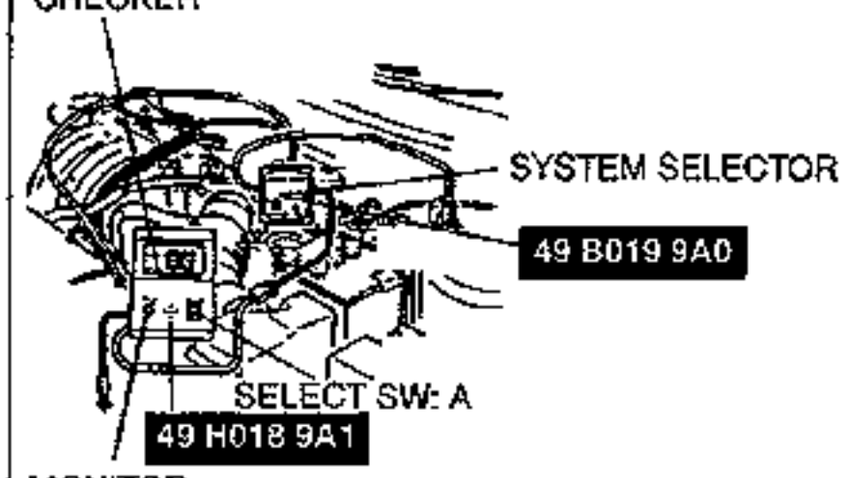
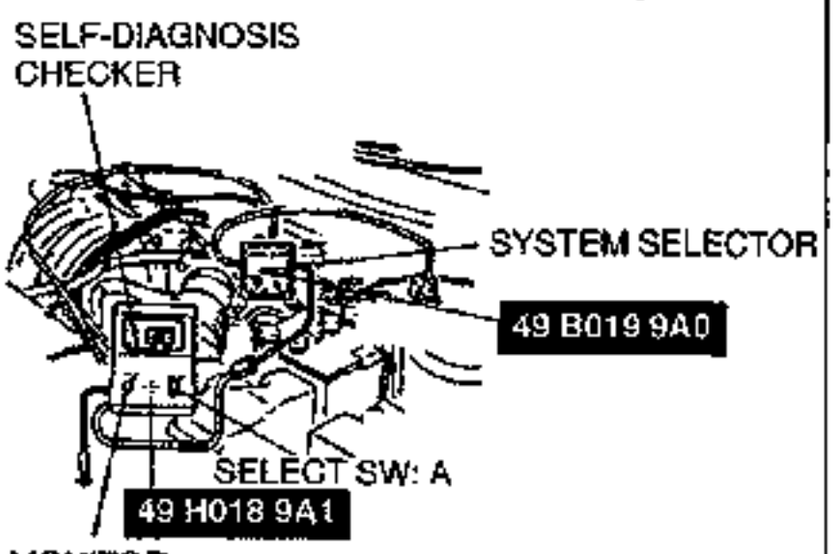
[TROUBLESHOOTING HINTS]
① Air/fuel mixture becomes lean when depressing accelerator
- Fuel injection control malfunction (Correction for accelerating condition)
- Air leakage
- Fuel line pressure decreases
- Spark advance control malfunction

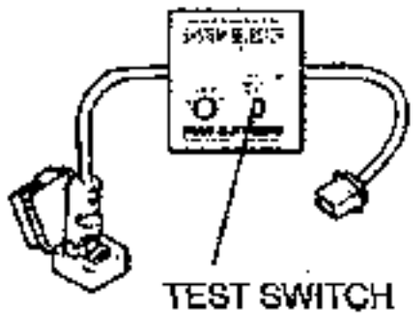
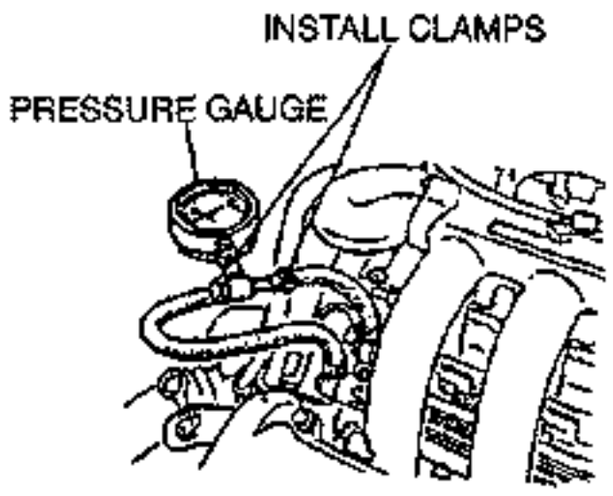
STEP	INSPECTION		ACTION
1	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73 SELF-DIAGNOSIS CHECKER  	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
2	Is intake manifold vacuum correct at idle? **Vacuum: More than 450 mmHg {17.7 inHg}**	Yes	Go to next step
		No	Check for air leakage of intake-air system components
3	Is air cleaner element clean? ☞page F2–70	Yes	Go to next step
		No	Replace air cleaner element
4	Are ECM terminal voltages OK (especially 2F, 2I)? ☞page F2–141	Yes	Go to next step ☞page F2–141
		No	Check for cause
5	Is throttle linkage correctly installed and does it operate freely?	Yes	Go to next step
		No	As required, correct, clean, or replace any binding or damaged linkage, and adjust cable deflection at throttle body
6	Check for continuity between throttle position sensor terminals C and D ☞page F2–150 **Clearance between throttle lever and stopper** / **Continuity** 0.15 mm {0.006 in} / Yes 0.50 mm {0.020 in} / No	Yes	Go to next step
		No	Adjust throttle position sensor ☞page F2–151

STEP	INSPECTION		ACTION
7	Is fuel line pressure correct at idle? ☞page F2–113 **Fuel line pressure:** **260–310 kPa {2.6–3.2 kgf/cm², 37–45 psi}** **(Vacuum hose to pressure regulator disconnected)**  	Yes	Does fuel line pressure decrease quickly acceleration? ⇨If it does, check fuel line and filter for clogging ⇨If it does not, go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨If pressure **quickly** increases, check pressure regulator ☞page F2–113 ⇨If pressure **gradually** increases, check for clogging between fuel pump and pressure regulator If hose is not clogged, check fuel pump maximum pressure ☞page F2–110
8	Connect System Selector to data link connector and set test switch to "SELF TEST"; is ignition timing at idle correct after warm-up? ☞page F2–70 **Ignition timing (BTDC):** **9–11° {10 ± 1°}**  	Yes	Does ignition timing advance during acceleration? ⇨If it does, go to next step ⇨If not, replace ECM ☞page F2–141
		No	Adjust ignition timing ☞page F2–70
9	Are air duct and air hoses correctly installed?	Yes	Go to next step
		No	Repair
10	Is exhaust system restricted? ☞page F2–120	Yes	Repair or replace
		No	Go to next step
11	Is variable resonance induction system (VRIS) OK? ☞page F2–102	Yes	Go to next step
		No	Repair or replace
12	Try a known good ECM and check if condition improves ☞page F2–141		

18	SURGES WHILE CRUISING
DESCRIPTION	• Unexpected change in engine speed that is usually repetitive

[TROUBLESHOOTING HINTS]
① Air/fuel mixture too lean
② Misfire
③ Poor connection in wiring harness

STEP	INSPECTION		ACTION
1	Is "00" displayed on **SST** with ignition switch ON? ☞**page F2–73**  	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞**page F2–74**
2	Does **SST** Monitor Light show that switches operate correctly with ignition switch ON? ☞**page F2–92**  	Yes	Go to next step
		No	**Light does not turn ON or OFF with specified input switch** Check for cause (Refer to specified check sequence) ☞**page F2–93**
			Light always ON Check ECM terminal 1D voltage ☞**page F2–141**
3	Is throttle position sensor OK? ☞**page F2–150**	Yes	Go to next step
		No	Adjust ☞**page F2–151**
4	Disconnect heated oxygen sensor connector; does condition improve?	Yes	Check heated oxygen sensor ☞**page F2–154**
		No	Go to next step
5	Are ECM terminal 2C and 2D voltages OK? ☞**page F2–141**	Yes	Go to next step
		No	Check for cause ☞**page F2–141**

STEP	INSPECTION		ACTION
6	Is throttle linkage correctly installed and does it operate freely? ☞page F2–96	Yes	Go to next step
		No	As required, correct, clean, or replace any binding or damaged linkage, and adjust cable deflection at throttle body ☞page F2–96
7	Is intake manifold vacuum correct at idle? **Vacuum: More than 450 mmHg {17.7 inHg}**	Yes	Go to next step
		No	Check for air leakage of intake air system components
8	Is air cleaner element clean? ☞page F2–70	Yes	Go to next step
		No	Replace air cleaner element
9	Connect System Selector to data link connector and set Test Switch to "SELF TEST"; is ignition timing at idle correct after warm-up? ☞page F2–70 **Ignition timing (BTDC): 9–11° {10 ±1°}**  TEST SWITCH	Yes	Does ignition timing advance during acceleration? ⇨If it does, go to next step ⇨If it does not, replace ECM ☞page F2–141
		No	Adjust ignition timing ☞page F2–70
10	Is fuel line pressure correct at idle? ☞page F2–113 **Fuel line pressure:** **260–310 kPa {2.6–3.2kgf/cm², 37–45 psi}** **(vacuum hose to pressure regulator disconnected)**  INSTALL CLAMPS PRESSURE GAUGE	Yes	Does fuel line pressure decrease during quick acceleration? ⇨If it does, check for fuel pump maximum pressure If pressure is OK, check fuel line and filter for clogging ☞page F2–110 ⇨If it does not, go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨If pressure **quickly** increases, check pressure regulator ☞page F2–113 ⇨If pressure **gradually** increases, check for clogging between fuel pump and pressure regulator If hose is not clogged, check fuel pump maximum pressure ☞page F2–110
			High pressure Is fuel return line clogged? ⇨If it is not, replace pressure regulator ☞page F2–115 ⇨If it is, replace it
11	Check if exhaust system is restricted ☞page F2–121	Yes	Repair or replace
		No	Go to next step
12	Try a known good ECM and check if condition improves ☞page F2–141		

19	LACK OF POWER
DESCRIPTION	• Performance poor under load when throttle valve is fully open • Reduced maximum speed • Idle condition normal

[TROUBLESHOOTING HINTS]

① Factors other than engine malfunction
- Clutch slipping
- Brake dragging
- Low tire pressure
- Incorrect tire size
- Over-loaded

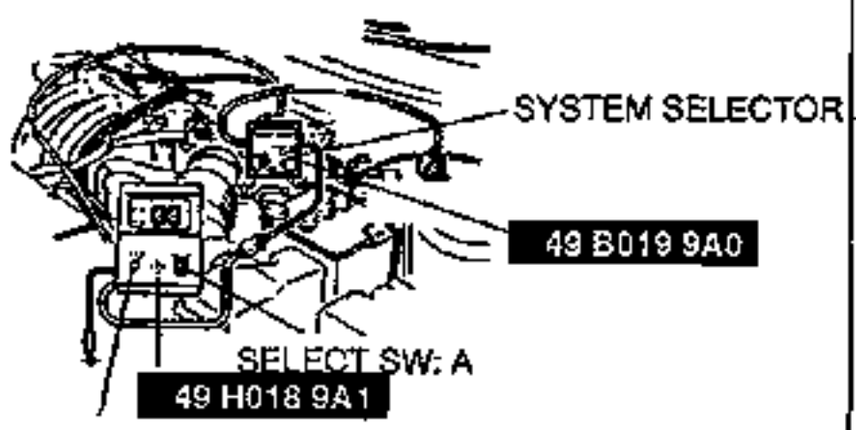
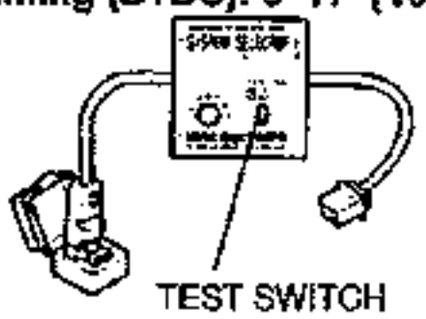
② Low intake air amount
- Throttle valve not open fully
- Clogged intake-air system

③ Air/fuel mixture too lean
- Fuel line pressure decreases
- Fuel injection malfunction

④ Poor ignition

④ Low engine compression

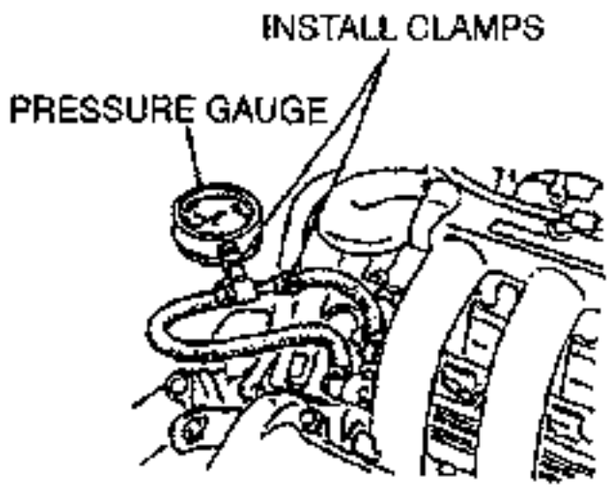
④ Alcohol-blended fuel used

STEP	INSPECTION		ACTION
1	Check factors other than engine • Clutch slipping • Brake dragging • Low tire pressure • Incorrect tire size	Yes	Go to next step
		No	Repair or replace
2	Is throttle valve fully opened when accelerator is fully depressed?	Yes	Go to next step
		No	Is accelerator cable correctly installed? ☞**page F2–97** ⇨If it is, check throttle body ☞**page F2–96** ⇨If it is *not*, install it correctly ☞**page F2–97**
3	Is "00" displayed on **SST** with ignition switch ON? ☞**page F2–73** SELF-DIAGNOSIS CHECKER  MONITOR LIGHT	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞**page F2–74**
4	Connect System Selector to data link connector and set Test Switch to "SELF TEST"; is ignition timing at idle correct after warm-up? ☞**page F2–70** **Ignition timing (BTDC): 9–11° {10 ± 1°}**  	Yes	Ignition timing advances when accelerating ⇨If advances, go to next step ⇨If not advances, check ECM terminal voltages ☞**page F2–141**
		No	Adjust ignition timing ☞**page F2–70**
5	Are ECM terminal voltages OK? ☞**page F2–141** (Especially 2F)	Yes	Go to next step
		No	Check for cause ☞**page F2–141**

<table>
<tr><th>STEP</th><th>INSPECTION</th><th></th><th>ACTION</th></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Is intake manifold vacuum correct at idle?

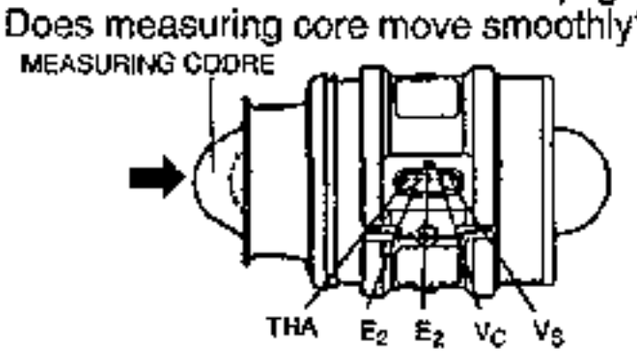
Intake manifold vacuum:
More than 450 mmHg (17.7 inHg)</td><td>Yes</td><td>Go to next step</td></tr>
<tr><td>No</td><td>Check for air leakage of intake air system components</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Is air cleaner element clean?
☞page F2–70</td><td>Yes</td><td>Go to next step</td></tr>
<tr><td>No</td><td>Replace air cleaner element</td></tr>
<tr><td rowspan="3">8</td><td rowspan="3">Is fuel line pressure correct at idle?
☞page F2–113

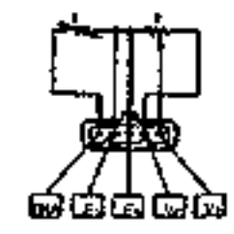
Fuel line pressure:
260–310 kPa (2.6–3.2kgf/cm², 37–45 psi)
(Vacuum hose to pressure regulator disconnected)

 
</td><td>Yes</td><td>Does fuel line pressure decrease during quick acceleration?

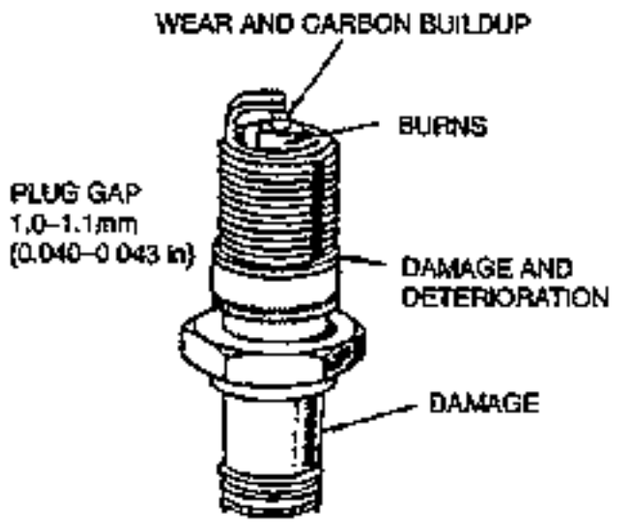
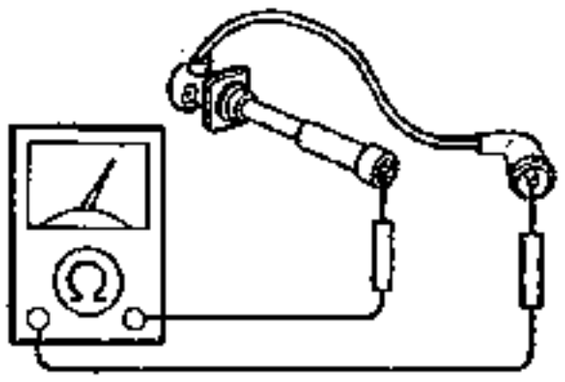
➪If it does, check fuel pump maximum pressure ☞page F2–110
➪If pressure is OK, check fuel line and filter for clogging
➪If it does not, go to next step</td></tr>
<tr><td>No</td><td>Low pressure
Check fuel line pressure while pinching fuel return hose

➪If pressure quickly increases, check pressure regulator ☞page F2–113
➪If pressure gradually increases, check for clogging between fuel pump and pressure regulator
If hose is not clogged, check fuel pump maximum pressure ☞page F2–110</td></tr>
<tr><td>High pressure
Is fuel return line clogged?

➪If it is not, replace pressure regulator ☞page F2–115
➪If it is, replace it</td></tr>
<tr><td rowspan="3">9</td><td rowspan="3">Is volume air flow sensor OK?
☞page F2–150
I. Does measuring core move smoothly?
 

II. Check resistance
 

<table><tr><th rowspan="2">Terminal</th><th colspan="2">Resistance (Ω)</th></tr><tr><th>Closed throttle position</th><th>Wide open throttle</th></tr><tr><td>E2 ↔ VS</td><td>200–1000</td><td>20–800</td></tr><tr><td>E2 ↔ VC</td><td colspan="2">200–400</td></tr></table></td><td>Yes</td><td>Go to next step</td></tr>
<tr><td>No</td><td>Repair or replace volume air flow sensor</td></tr>
</table>

STEP	INSPECTION		ACTION
10	Are spark plugs OK? ☞section G  	Yes	Go to next step
		No	Clean or replace spark plug
11	Is resistance of high-tension leads OK? **Resistance: 16 kΩ per 1 m (3.28 ft)** 	Yes	Go to next step
		No	Replace high tension lead
12	Is resistance of ignition coil OK? ☞section G **Resistance [at 20°C (68°F)]:** **Primary coil winding ..... 0.49–0.73 Ω** **Secondary coil winding ..... 20–31 kΩ**	Yes	Go to next step
		No	Replace distributor ☞section G
13	Is engine compression correct? ☞section B2 **Engine compression:** **981 kPa {10.0 kgf/cm², 142 psi}-300 rpm**	Yes	Go to next step
		No	Check engine condition ☞section B2 • Worn piston, piston rings, or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve stuck in guide
14	Change to another brand of fuel; does condition improve?	Yes	Change to another brand of fuel
		No	Go to next step

STEP	INSPECTION		ACTION
15	Is variable resonance induction system (VRIS) OK? ☞page F2–101	Yes	Go to next step
		No	Repair or replace
16	Try a known good ECM and check if condition improves ☞page F2–141		

20 POOR ACCELERATION

DESCRIPTION
- Performance poor during acceleration
- Idle condition normal

[TROUBLESHOOTING HINTS]

①Factors other than engine malfunction
- Clutch slipping
- Brake dragging
- Low tire pressure
- Incorrect tire size
- Over-loaded

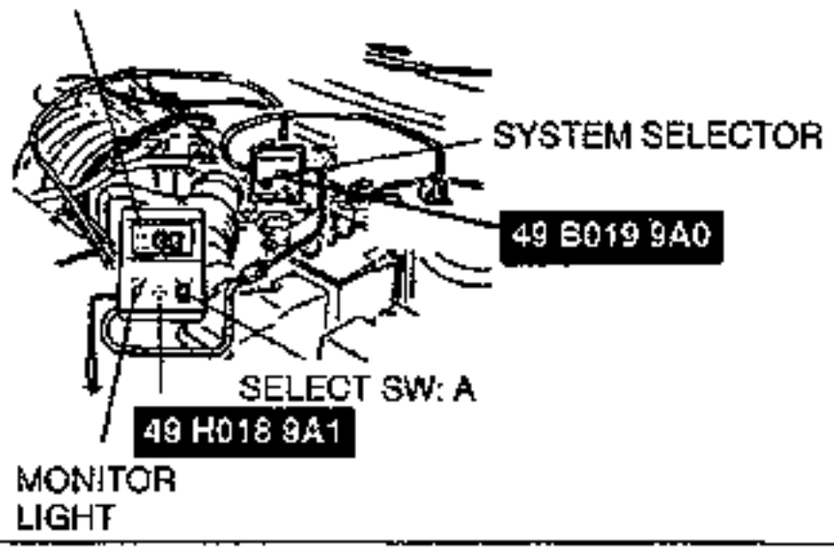
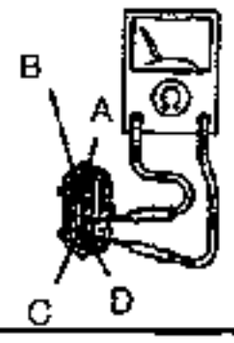
②Low intake air amount
- Throttle valve not open fully
- Clogged intake-air system

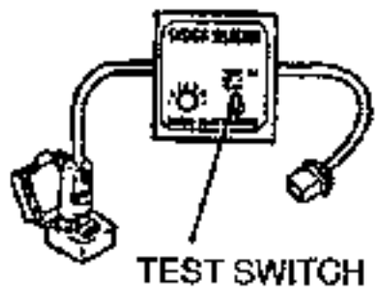
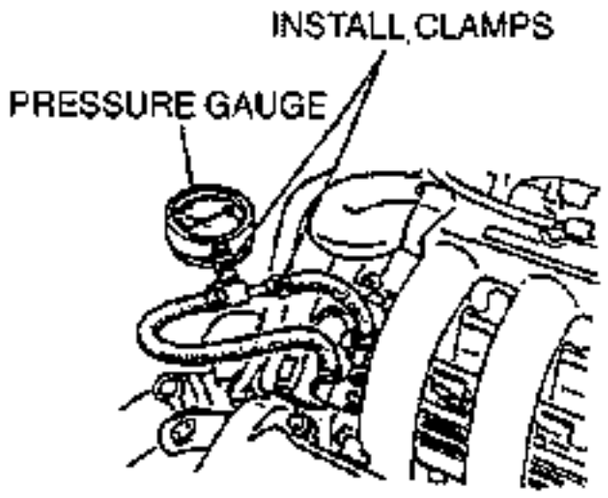
③Air/fuel mixture too lean
- Fuel line pressure decreases
- Fuel injection malfunction

④Poor ignition

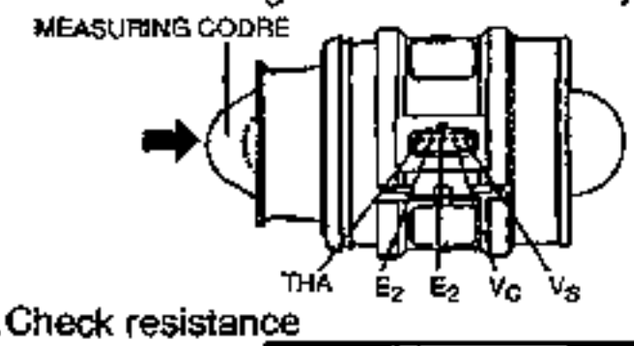
④Low engine compression

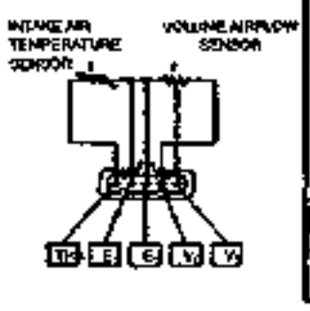
④Alcohol-blended fuel used

STEP	INSPECTION		ACTION
1	Check factors other than engine • Clutch slipping • Brake dragging • Low tire pressure • Incorrect tire size	Yes	Go to next step
		No	Repair
2	Does throttle valve fully open when accelerator is fully depressed?	Yes	Go to next step
		No	Is accelerator cable correctly installed? ☞**page F2–97** ⇨If it is, check throttle body ☞**page F2–96** ⇨If it is not, install it correctly
3	Is "00" displayed on **SST** with ignition switch ON? ☞**page F2–73** 	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞**page F2–74**
4	Check continuity between throttle position sensor terminals C and D ☞**page F2–149**  **Clearance between throttle lever and stopper** / **Continuity** 0.15 mm {0.006 in} / Yes 0.50 mm {0.020 in} / No	Yes	Go to next step
		No	Adjust throttle position sensor ☞**page F2–151**

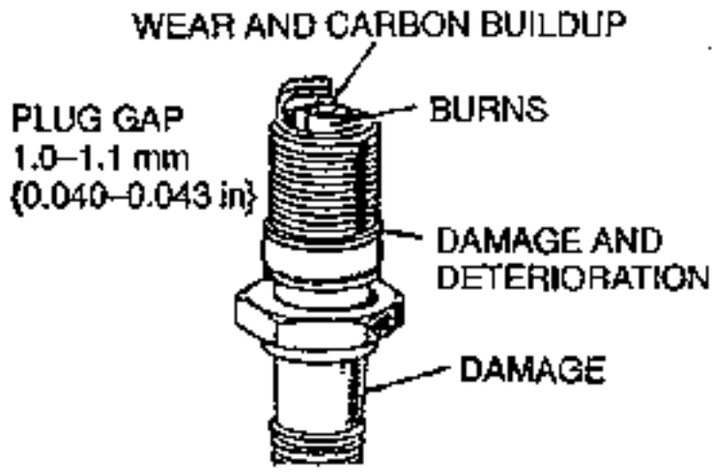
STEP	INSPECTION		ACTION
5	Connect System Selector to data link connector and set Test Switch to "SELF TEST" Is ignition timing at idle correct after warm-up? ☞page F2–70 **Ignition timing (BTDC): 9–11° {10 ±1°}**  TEST SWITCH	Yes	Does ignition timing advance during acceleration? ⇨If it does, go to next step ⇨if it does not, check ECM terminal voltages ☞page F2–141
		No	Adjust ignition timing ☞page F2–70
6	Are ECM terminal voltages OK? 1C-Starter signal 2E-Engine coolant temperature sensor 3D-Sensor ground ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141
7	Is intake manifold vacuum correct at idle? **Intake manifold vacuum:** **More than 450 mmHg {17.7 inHg}**	Yes	Go to next step
		No	Check for air leakage of intake-air system components
8	Is fuel line pressure correct at idle? ☞page F2–113 **Fuel line pressure:** **260–310 kPa {2.6–3.2kgf/cm², 37–45 psi}** **(vacuum hose to pressure regulator disconnected)**  INSTALL CLAMPS PRESSURE GAUGE	Yes	Does fuel line pressure decrease during quick acceleration? ⇨If it does, check fuel pump maximum pressure ☞page F2–110 ⇨If pressure is OK, check fuel line and filter for clogging ⇨If it does not decrease, go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨If pressure **quickly** increases, check pressure regulator ☞page F2–113 ⇨If pressure **gradually** increases, check for clogging between fuel pump and pressure regulator If hose is not clogged, check fuel pump maximum pressure ☞page F2–110
			High pressure Is fuel line clogged? ⇨If it is not, replace pressure regulator ☞page F2–115 ⇨If it is, replace fuel line

<table>
<tr><th>STEP</th><th>INSPECTION</th><th></th><th>ACTION</th></tr>
<tr><td>9</td><td>Is volume air flow sensor OK?
☞page F2–150

I. Does measuring core move smoothly?
 

II. Check resistance
 

<table><tr><th rowspan="2">Terminal</th><th colspan="2">Resistance (Ω)</th></tr><tr><th>Cloosed throttle position</th><th>Wide open throttle</th></tr><tr><td>E2 ↔ VS</td><td>200–1000</td><td>20–800</td></tr><tr><td>E2 ↔ VC</td><td colspan="2">200–400</td></tr></table></td><td>No</td><td>Repair or replace volume air flow sensor</td></tr>
<tr><td>10</td><td>Are spark plugs OK?
☞section G

 
</td><td>Yes</td><td>Go to next step</td></tr>
<tr><td></td><td></td><td>No</td><td>Clean or replace spark plug</td></tr>
<tr><td>11</td><td>Is resistance of ignition coil OK?
☞section G

Resistance [at 20°C (68°F)] :
Primary coil winding ..... 0.49–0.73 Ω
Secondary coil winding ..... 20–31 kΩ</td><td>Yes</td><td>Go to next step</td></tr>
<tr><td></td><td></td><td>No</td><td>Replace distributor</td></tr>
<tr><td>12</td><td>Is engine compression correct?
☞section B2

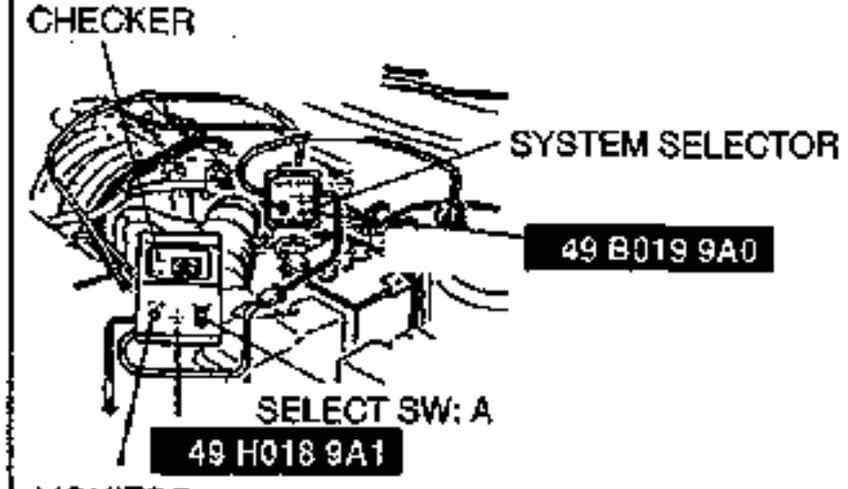
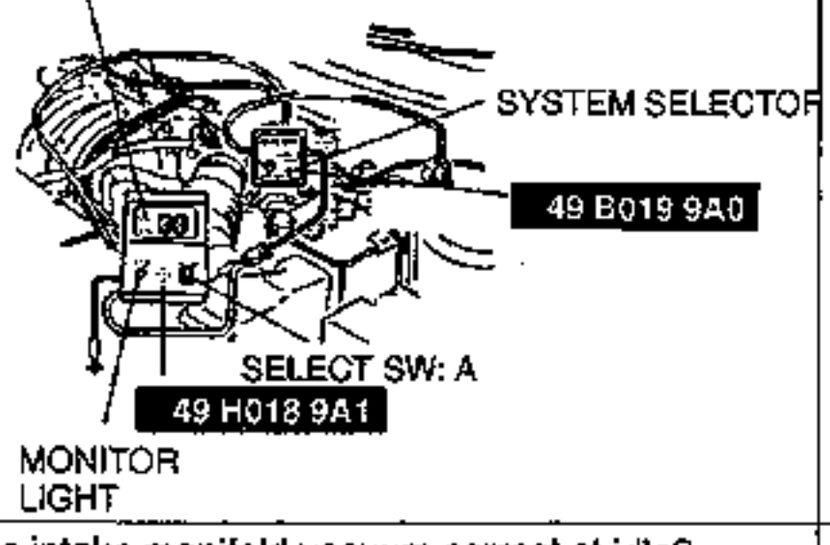
Engine compression (minimum):
981 kPa {10.0 kgf/cm^2, 142 psi}-300 rpm</td><td>Yes</td><td>Go to next step</td></tr>
<tr><td></td><td></td><td>No</td><td>Check engine condition ☞section B2
• Worn piston, piston rings, or cylinder wall
• Defective cylinder head gasket
• Distorted cylinder head
• Improper valve seating
• Valve stuck in guide</td></tr>
</table>

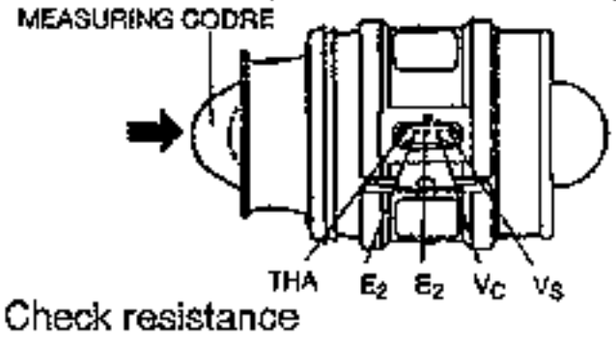
STEP	INSPECTION		ACTION
13	Change to another brand of fuel; does condition improve?	Yes	Change to another brand of fuel
		No	Go to next step
14	Is A/C cut-off control system OK? ☞page F2–135	Yes	Go to next step
		No	Repair or replace
15	Is variable resonance induction system (VRIS) OK? ☞page F2–101	Yes	Go to next step
		No	Repair or replace
16	Try a known good ECM and check if condition improves ☞page F2–141		

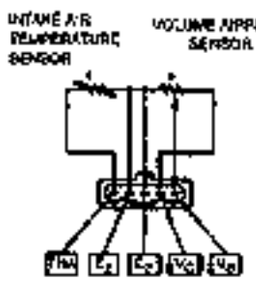
21	RUNS ROUGH DURING DECELERATION/BACKFIRE
DESCRIPTION	• Engine runs rough during deceleration, and abnormal combustion occurs in exhaust system • Transaxle in normal condition

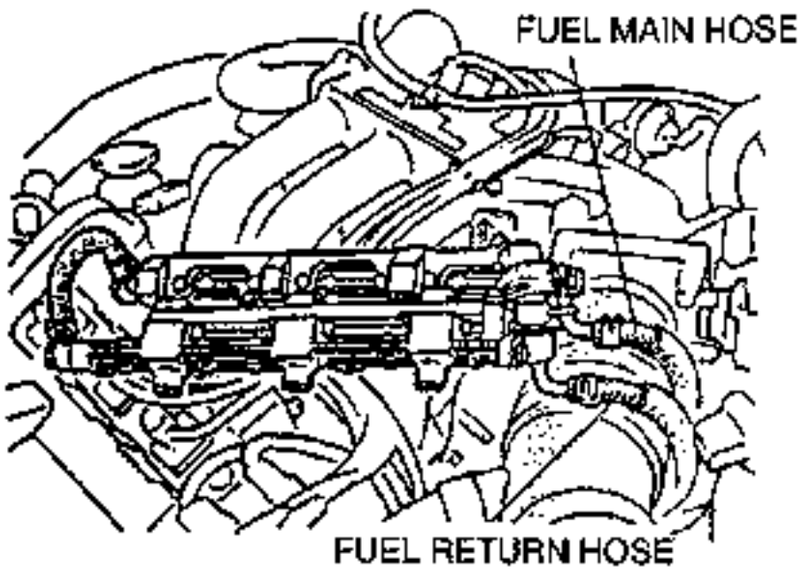
[TROUBLESHOOTING HINTS]
① Air/fuel mixture too rich
- Air cleaner element clogged
- Fuel injection control malfunction (Fuel-cut control)
- Fuel injector fuel leakage

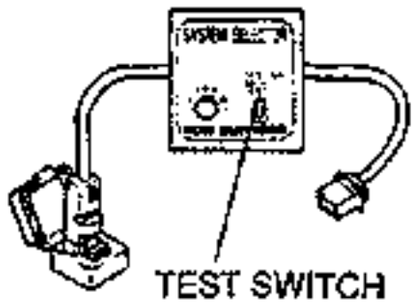
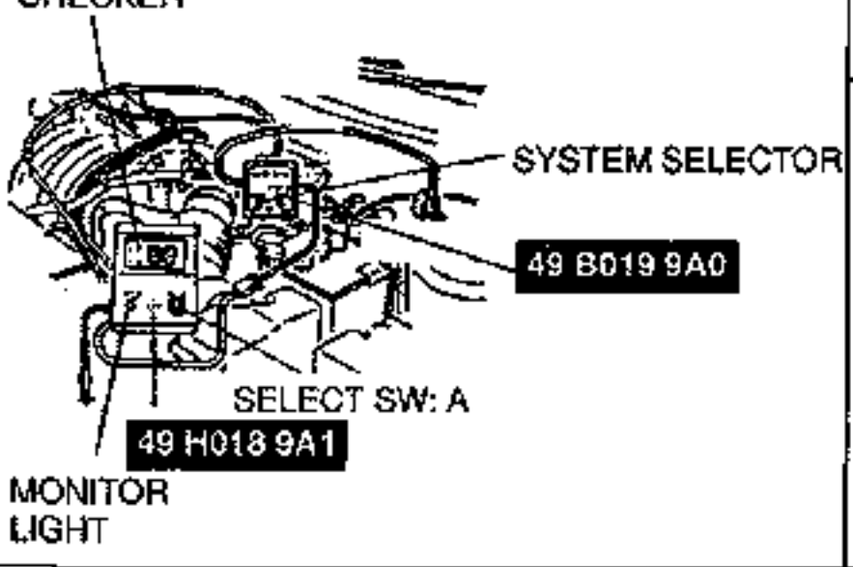
② Throttle position sensor (terminal IDL) malfunction

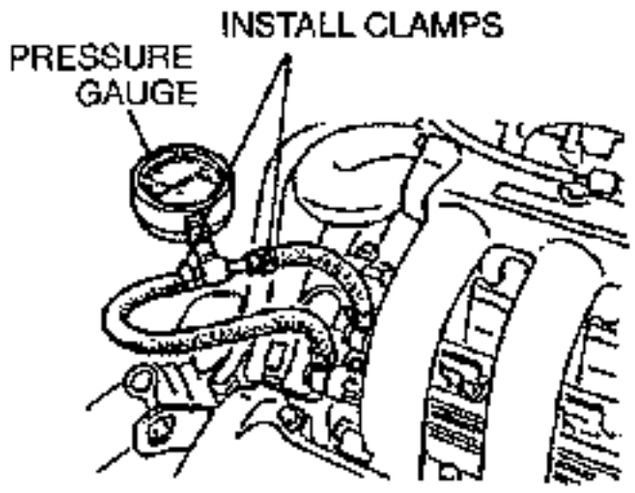
STEP	INSPECTION		ACTION
1	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73 	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
2	Does Self-Diagnosis Checker Monitor Light show that switches operate correctly with ignition switch ON? ☞page F2–92 	Yes	Go to next step
		No	**Light not turn ON or OFF with specified switch** Check for cause (Refer to specified check sequence) ☞page F2–93
			Light always ON Check wiring between ECM terminal 1D and Self-Diagnosis Checker
3	Is intake manifold vacuum correct at idle? **Vacuum: More than 450 mmHg {17.7 inHg}**	Yes	Go to next step
		No	Check for air leakage of intake-air system components
4	Is air cleaner element clean? ☞page F2–70	Yes	Go to next step
		No	Replace air cleaner element
5	Are ECM terminal voltages OK (especially 2F, 3A, 3U, 3V, 3W, 3X, 3Y and 3Z)? ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141

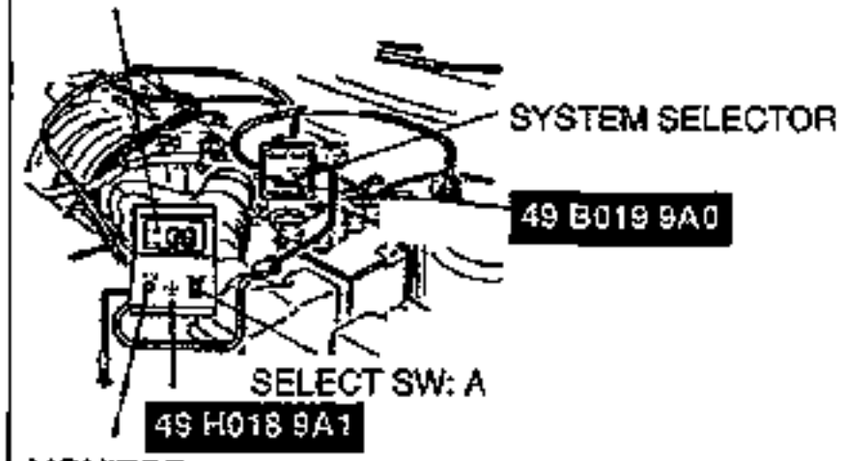
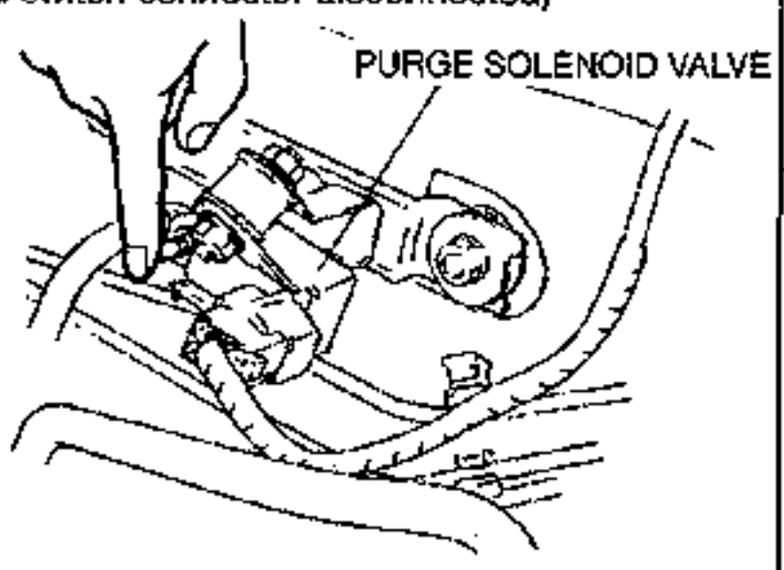
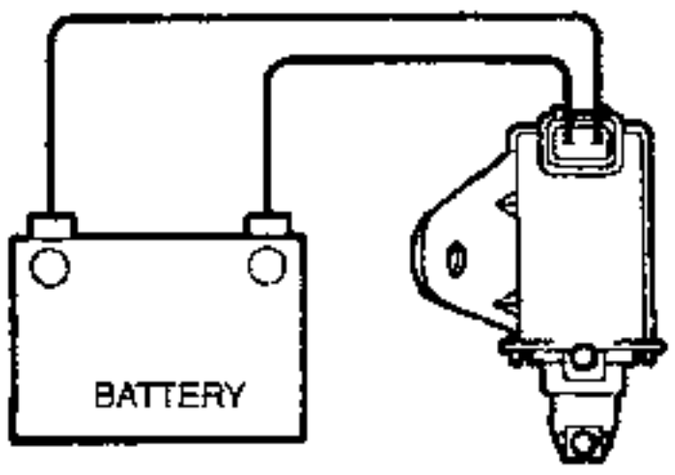
<table>
<tr><th>STEP</th><th>INSPECTION</th><th></th><th>ACTION</th></tr>
<tr><td>6</td><td>Is fuel cut operation OK?
☞page F2–131</td><td>Yes</td><td>Go to next step</td></tr>
<tr><td></td><td></td><td>No</td><td>Try a known good ECM and check if condition improves
☞page F2–141</td></tr>
<tr><td>7</td><td>Is volume air flow sensor OK?
☞page F2–150
I. Does measuring core move smoothly?
 

II. Check resistance
 

<table>
<tr><th rowspan="2">Terminal</th><th colspan="2">Resistance (Ω)</th></tr>
<tr><th>Closed throttle position</th><th>Wide open throttle</th></tr>
<tr><td>$E_2 \leftrightarrow V_S$</td><td>200–1000</td><td>20–800</td></tr>
<tr><td>$E_2 \leftrightarrow V_C$</td><td colspan="2">200–400</td></tr>
</table></td><td>Yes</td><td>Go to next step</td></tr>
<tr><td></td><td></td><td>No</td><td>Repair or replace volume air flow sensor</td></tr>
<tr><td>8</td><td>Check continuity betwen throttle position sensor terminals C and D
☞page F2–150</td><td>Yes</td><td>Go to next step</td></tr>
<tr><td></td><td></td><td>No</td><td>Adjust throttle position sensor
☞page F2–151</td></tr>
<tr><td>9</td><td>Check fuel injector for fuel leakage
☞page F2–117
 
</td><td>Yes</td><td>Replace fuel injector</td></tr>
<tr><td></td><td></td><td>No</td><td>Go to next step</td></tr>
<tr><td>10</td><td>Try a known good ECM and check if condition improves
☞page F2–141</td><td colspan="2"></td></tr>
</table>

22	KNOCKING		
DESCRIPTION	• Abnormal combustion accompanied by audible "pinging" noise		
[TROUBLESHOOTING HINTS] ① Incorrect ignition timing (Too advanced) ② Carbon deposits in cylinder ③ Overheating ④ Air/Fuel mixture too lean • Fuel injection amount not correct • Fuel line pressure decreases during acceleration			
STEP	**INSPECTION**		**ACTION**
1	Connect System Selector to data link connector and set Test Switch to "SELF TEST"; is ignition timing at idle correct after warm-up? ☞page F2–70 **Ignition timing (BTDC): 9–11° {10 ± 1°}**  	Yes	Go to next step
		No	Adjust ignition timing ☞page F2–70
2	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73  	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
3	Is intake manifold vacuum correct at idle? **Vacuum: More than 450 mmHg {17.7 inHg}**	Yes	Go to next step
		No	Check for air leakage of intake air system components
4	Is engine compression correct? ☞section B2 **Engine compression (minimum): 981 kPa {10.0 kgf/cm², 142 psi}–300 rpm**	Yes	Go to next step
		No	High compression Check engine condition ☞section B2 • Carbon deposits

STEP	INSPECTION		ACTION
5	Is fuel line pressure correct at idle? ☞page F2–113 **Fuel line pressure:** **260–310 kPa (2.5–3.2 kgf/cm², 37–45 psi)** **(Vacuum hose disconnected from pressure regulator)**  	Yes	Does fuel line pressure decrease during quick acceleration? ⇨If it does, check for clogging between fuel pump and pressure regulator ⇨If it does not, go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨If pressure **quickly** increases, check pressure regulator ☞page F2–113 ⇨If pressure **gradually** increases, check for clogging between fuel pump and pressure regulator If hose is not clogged, check fuel pump maximum pressure ☞page F2–110
6	Is cooling system OK?	Yes	Go to next step
		No	Repair or replace • Thermostat ☞section E • Electric coolant fan • Radiator
7	Try a known good ECM; does condition improve? ☞page F2–141	Yes	Replace ECM ☞page F2–141
		No	Change to another brand of fuel or use a higher-octane fuel

23	FUEL ODOR		
DESCRIPTION	• Gasoline odor in cabin		
[TROUBLESHOOTING HINTS] ①Poor connection or damaged fuel system ②Charcoal canister overflow due to evapolative emission control system malfunction			
STEP	**INSPECTION**		**ACTION**
1	Is there fuel leakage or damage of fuel system and evapolative emission control system?	Yes	Repair or replace
		No	Go to next step
2	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73 SELF-DIAGNOSIS CHECKER  	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
3	Is vacuum felt at purge solenoid valve with engine running and throttle valve opened? (Neutral switch connector disconnected)  	Yes	Go to step 5
		No	Check for solenoid valve operating sound ⇨If OK, check vacuum hoses for clogging ⇨If not OK, go to next step
4	Apply battery positive voltage and ground to purge solenoid valve Is vacuum felt at solenoid valve at idle?  	Yes	Check ECM terminal voltages ☞page F2–141
		No	Replace purge solenoid valve
5	Try a known good ECM and check if condition improves ☞page F2–141		

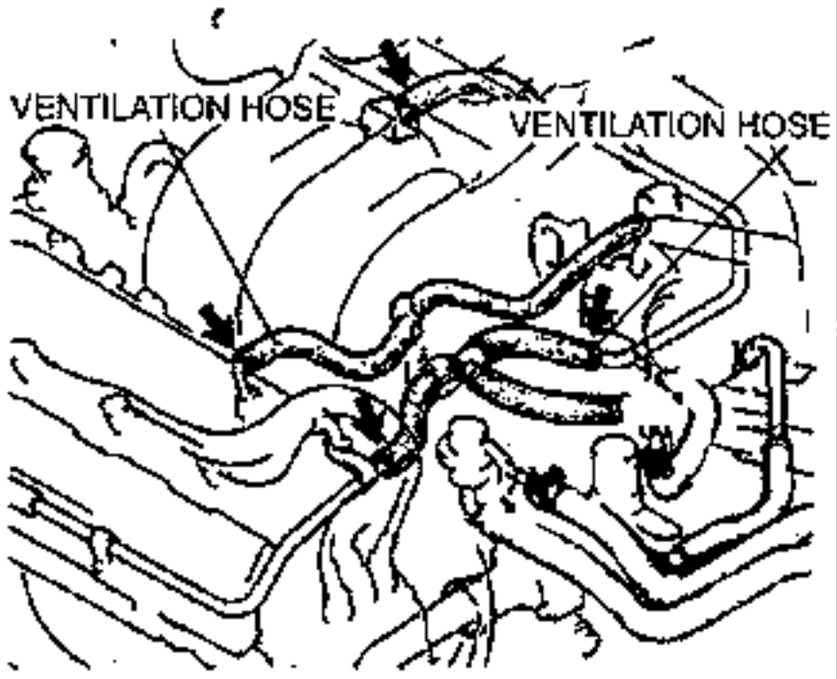
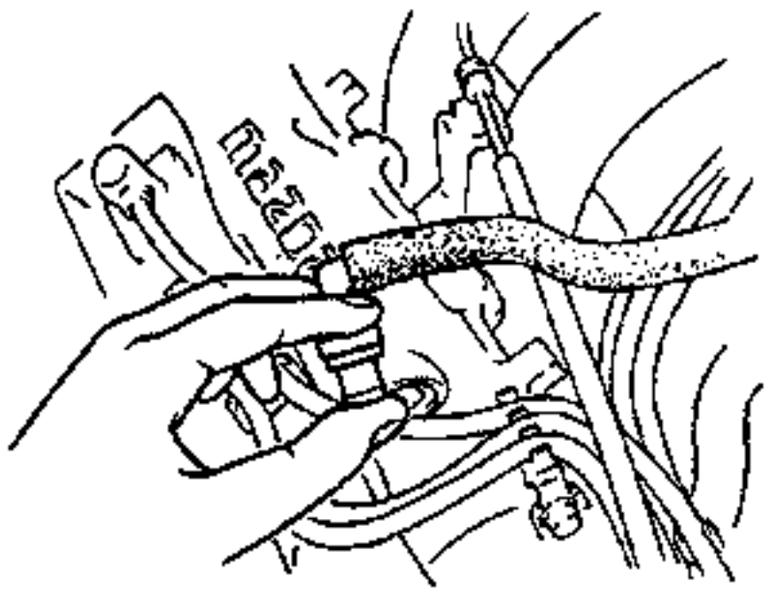
24	EXHAUST SULFUR ODOR
DESCRIP-TION	• Exhaust gas has unusual odor

[TROUBLESHOOTING HINTS]
High sulfur content fuel used

STEP	INSPECTION	ACTION
1	Change to another brand of fuel	

25	HIGH OIL CONSUMPTION
DESCRIP-TION	• Oil consumption excessive

[TROUBLESHOOTING HINTS]
① PCV system malfunction
① Engine malfunction (Oil working up, working down, or leaking)

STEP	INSPECTION		ACTION
1	Is PCV hose, ventilation hose, or attaching nipples separated, damaged, clogged, or restricted? ☞page F2–124	Yes	Repair or replace
		No	Go to next step
2	Is there air pressure or oil at ventilation hoses? 	Yes	Go to next step
		No	Check engine condition ☞section B2 • Oil leakage • Worn valve seal • Worn valve stem • Worn valve guide
3	Is vacuum felt at PCV valve at idle? ☞page F2–124 	Yes	Check engine condition ☞section B2 • Worn piston ring groove • Stuck piston rings • Worn piston or cylinder
		No	Replace PCV valve

26	POOR FUEL ECONOMY
DESCRIPTION	• Fuel economy unsatisfactory

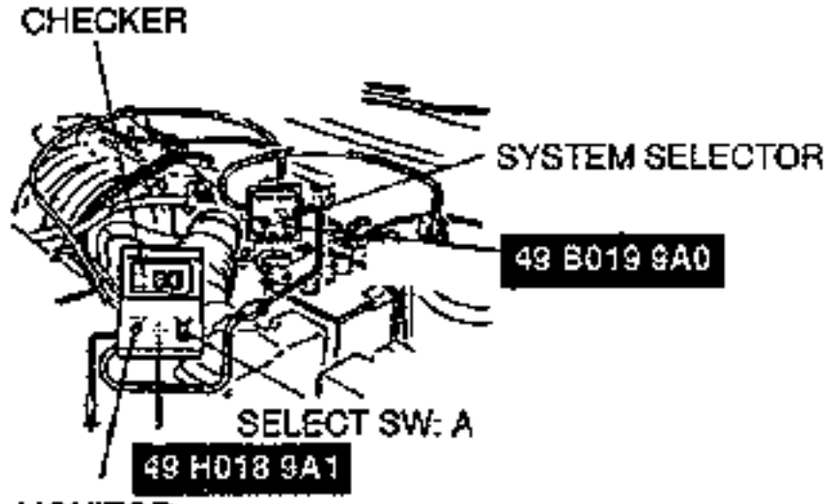
[TROUBLESHOOTING HINTS]
Although fuel consumption is drastically increased by such operation as city driving, short-runs, stop-and-go driving, and extended winter warm-up periods, as opposed to "trip" mileage, an attempt should be made to determine if any of these factors were an influence when confronted with "poor mileage". However, since the operator and driving conditions are not always at fault, the following suggestions are offered as possible other reasons for poor mileage.

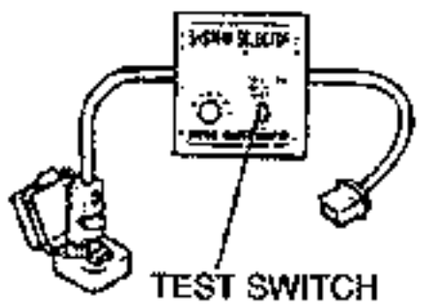
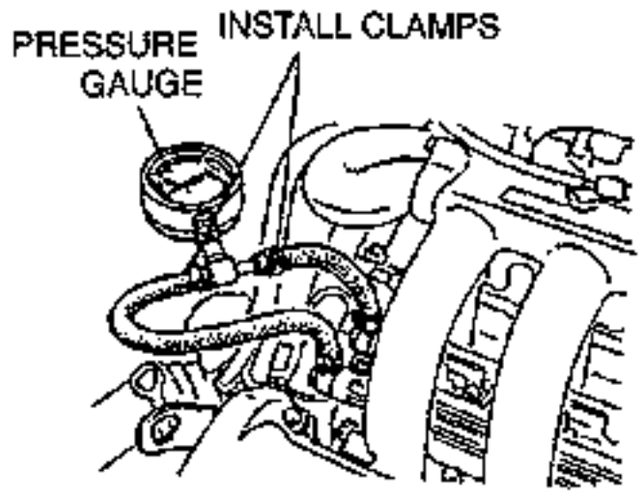
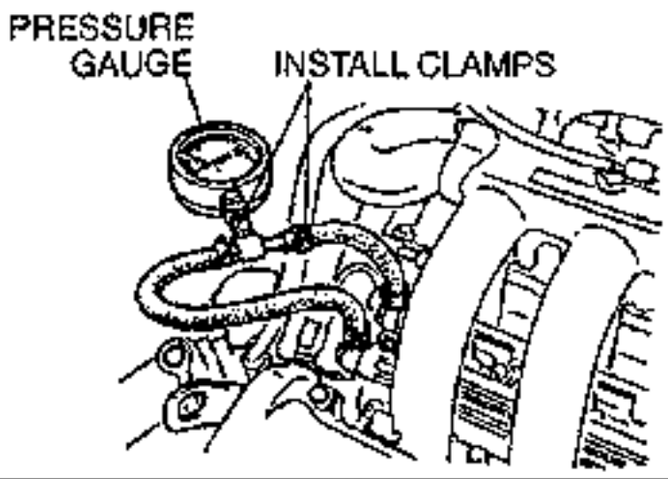
① Operator depressing accelerator pedal more than usual because of low engine power
- Poor ignition
- Low intake air amount
- Electronic spark advance control system malfunction
- Clutch slipping
- Exhaust component restricted

② Air/fuel mixture too rich
- High fuel line pressure

③ Alcohol-blended fuel used

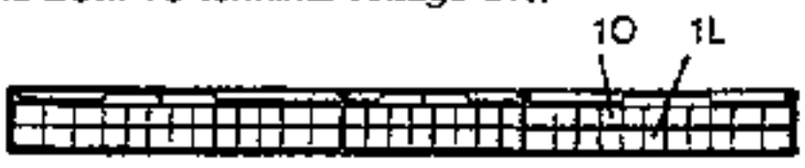
④ High vehicle load
- Low tire pressure
- Incorrect tire size
- Brake dragging

STEP	INSPECTION		ACTION
1	Check factors other than engine • Low tire pressure • Unrecommended tire size • Clutch slipping • Brake dragging • Exhaust component restricted	Yes	Go to next step
		No	Repair or replace
2	Are air hoses connected correctly? ☞page F2–95	Yes	Go to next step
		No	Repair
3	Is "00" displayed on **SST** with ignition switch ON? ☞page F2–73 	Yes	**"00" displayed** Go to next step
		No	**Diagnostic trouble code No. displayed** Check for cause (Refer to specified check sequence) ☞page F2–74
4	Is intake manifold vacuum correct? **Vacuum: More than 450 mmHg {17.7 inHg}**	Yes	Go to next step
		No	Check for air leakage of intake-air system components
5	Is air cleaner element clean? ☞page F2–70	Yes	Go to next step
		No	Replace air cleaner element

STEP	INSPECTION		ACTION
6	Are ECM terminal voltages OK? (especially 2B, 2C, 2D 2E, 3U, 3V, 3W, 3X, 3Y, and 3Z) ☞page F2–141	Yes	Go to next step
		No	Check for cause ☞page F2–141
7	Connect System Selection to data link connector and set Test Switch to "SELF-TEST"; is ignition timing at idle correct after warm-up? ☞page F2–70 **Ignition timing (BTDC): 9–11° {10 ± 1°}**  	Yes	Go to next step
		No	Adjust ignition timing ☞page F2–70
8	Is fuel line pressure correct at idle? ☞page F2–107 **Fuel line pressure: 210–260 kPa {2.1–2.7 kgf/cm², 30–38 psi}**  	Yes	Go to next step
		No	**High pressure** Is vacuum hose to pressure regulator damaged or poorly connected? ⇨If it is not, replace pressure regulator ☞page F2–115 ⇨If it is, repair or replace vacuum hose
9	Run engine at idle; does fuel line pressure held after ignition switch is turned off? ☞page F2–107 **Fuel line pressure: More than 150 kPa {1.5 kgf/cm², 21 psi} for 5 min.**  	Yes	Go to next step
		No	Check fuel injectors for fuel leakage ☞page F2–116
10	Change to another brand of fuel		

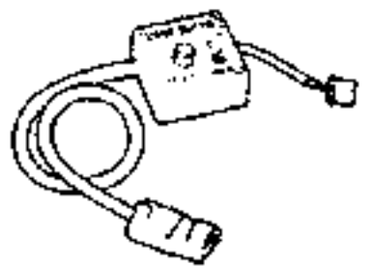
27	A/C DOES NOT WORK
DESCRIPTION	• Blower fan operates, but magnetic clutch does not

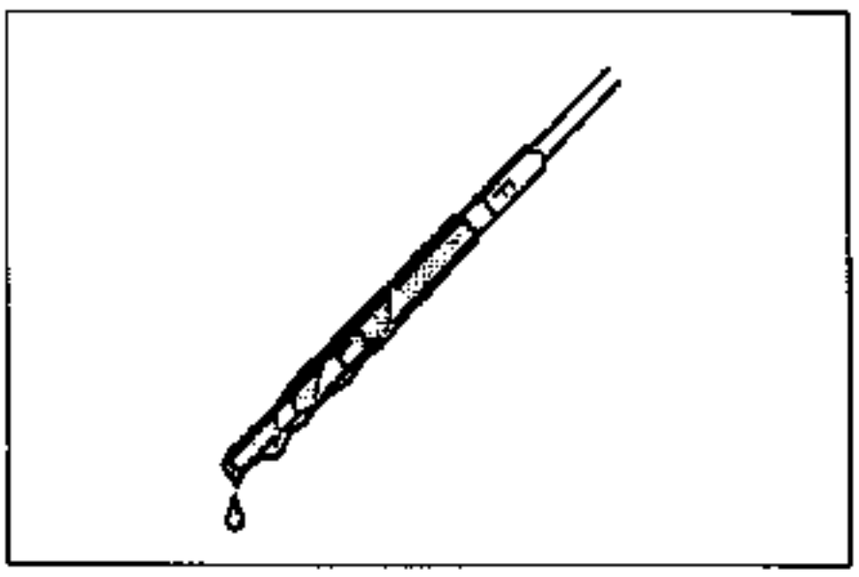
[TROUBLESHOOTING HINTS]
- Open or short circuit in wiring harness
- A/C relay, A/C switch, or magnetic clutch malfunction
- ECM malfunction

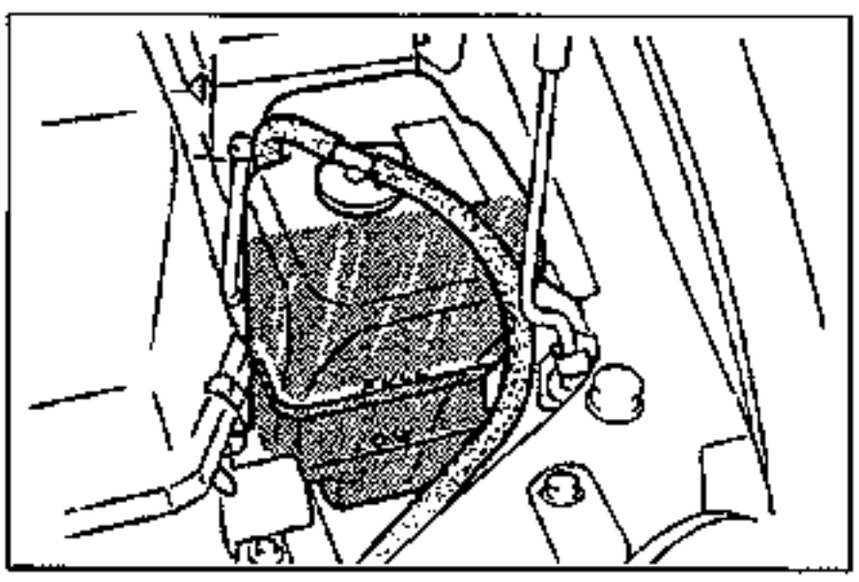
STEP	INSPECTION		ACTION	
1	Is ECM 1O terminal voltage OK?  	Yes	Is ECM 1 L terminal voltage OK? ⇨If it is, check A/C system ⇨If it is not, replace ECM	☞page F2–141 ☞'95 MX-3 BETM ☞page F2–141
		No	Check for cause	☞page F2–141

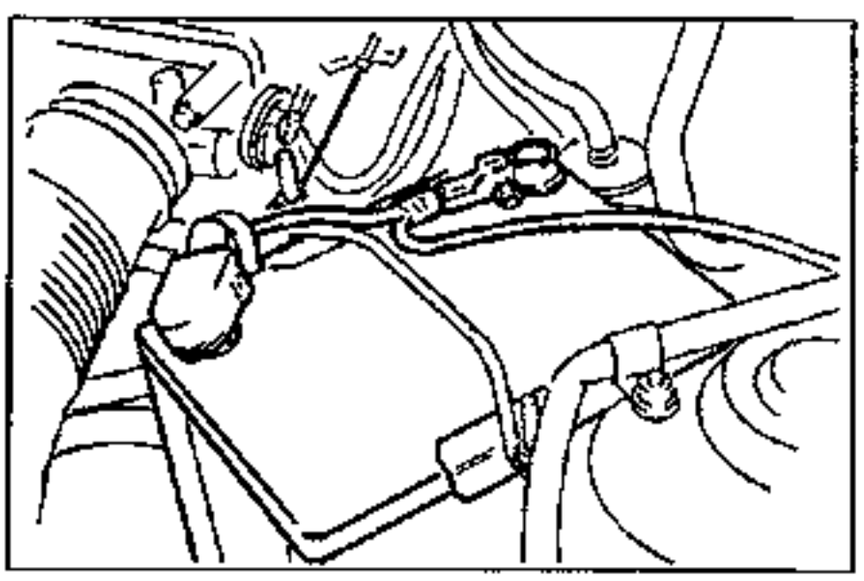
ENGINE TUNE-UP

PREPARATION
SST

49 B019 9A0 System Selector		For Inspection of ignition timing and idle speed







BASIC INSPECTION
Engine Oil
1. Remove the dipstick and check the engine oil level and condition.
2. Add or change oil as necessary.

Coolant (engine cold)

Warning

- **Removing the radiator cap or the coolant filler cap while the engine is running, or when the engine and radiator are hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.**

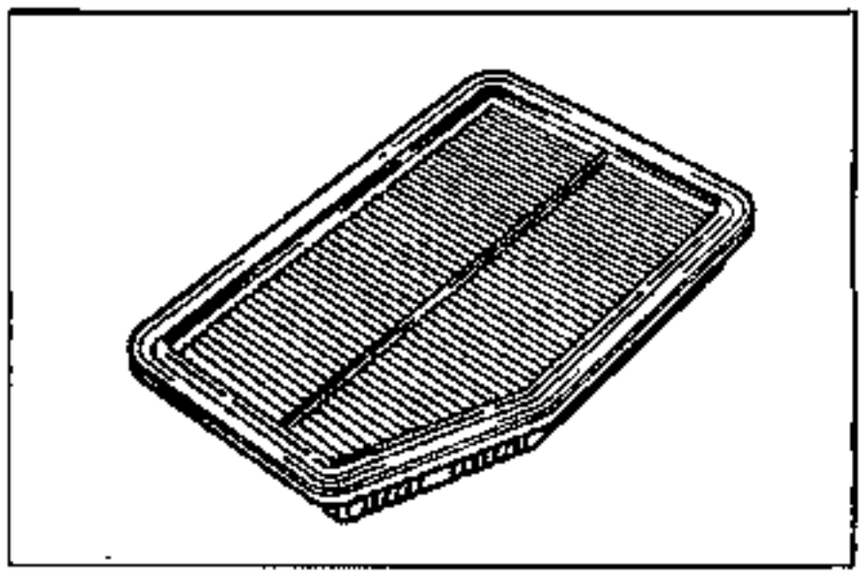
  Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.

  When you're sure all the pressure is gone, press down on the cap–still using a cloth–turn it, and remove it.

1. Verify that the coolant level is near the radiator filler neck.
2. Verify that the coolant level in the coolant reservior is between the FULL and LOW marks.
3. Add coolant if necessary.

Battery
Removing the label on the top of the battery or removing the vent caps will void the battery's warranty.
1. Remove any corrosion on the clamps or battery posts.
2. Verify that the battery top is clean. If necessary, clean with baking soda and water.
3. Verify that cables are in good condition and not frayed or corroded. Repair or replace if necessary.
4. Verify that cable clamps are tight.

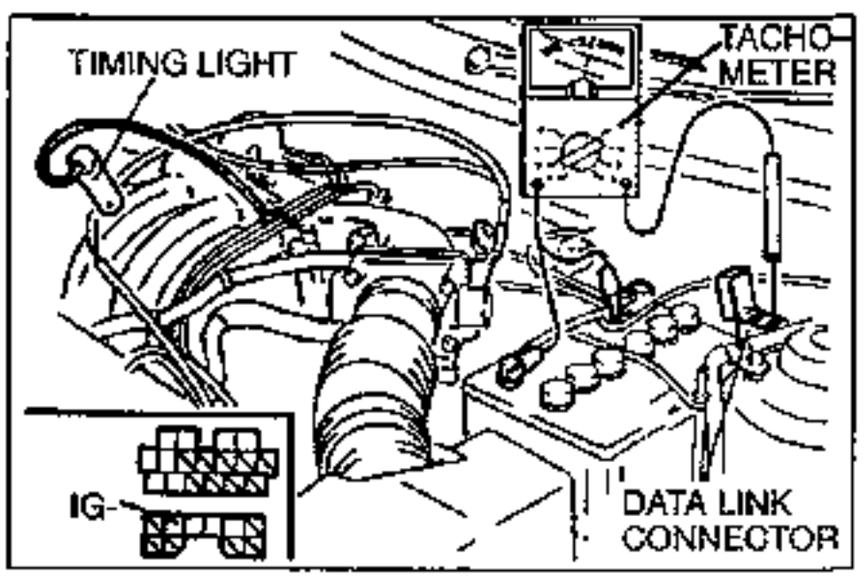
Note
- Because this is a maintenance-free battery, it is not necessary to check the fluid level.



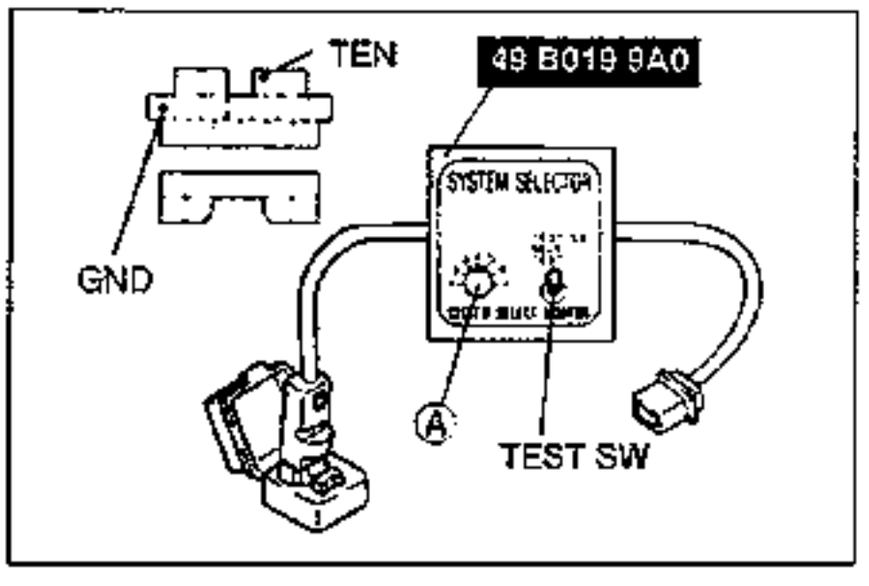
Air Cleaner Element
Inspection
1. Check the air cleaner element for excessive dirt and for oil and damage.

Caution
- **Cleaning the element with compressed air will reduce the element's ability to filter the air. Don't use compressed air to clean the element.**

2. Replace the element if necessary.



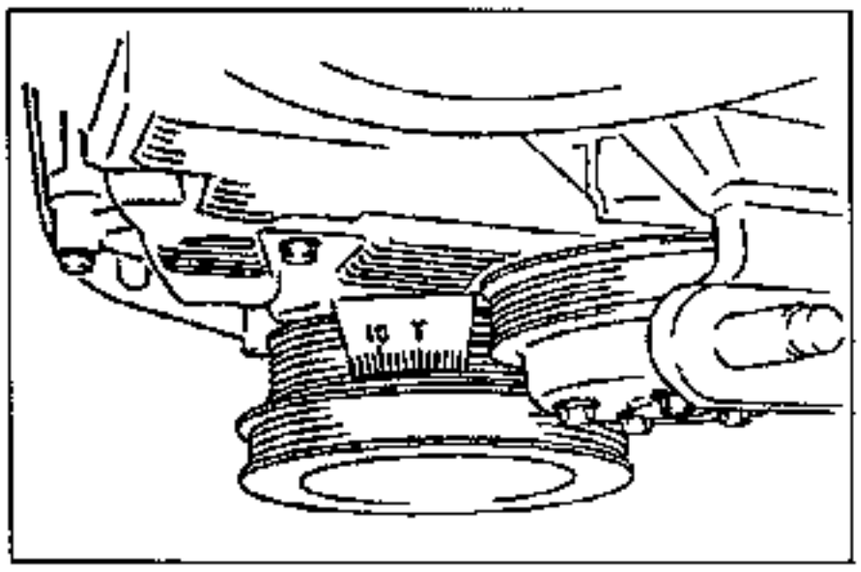
ADJUSTMENT
Preparation
1. Warm up the engine to normal operating temperature.
2. Turn all electrical loads off.
   - Headlight switch
   - Blower switch
   - Rear window defroster switch
   - P/S
   - A/C
3. Connect the **SST** to the data link connector.
4. Connect a timing light.
5. Connect a tachometer to the data link connector terminal **IG-** as shown.

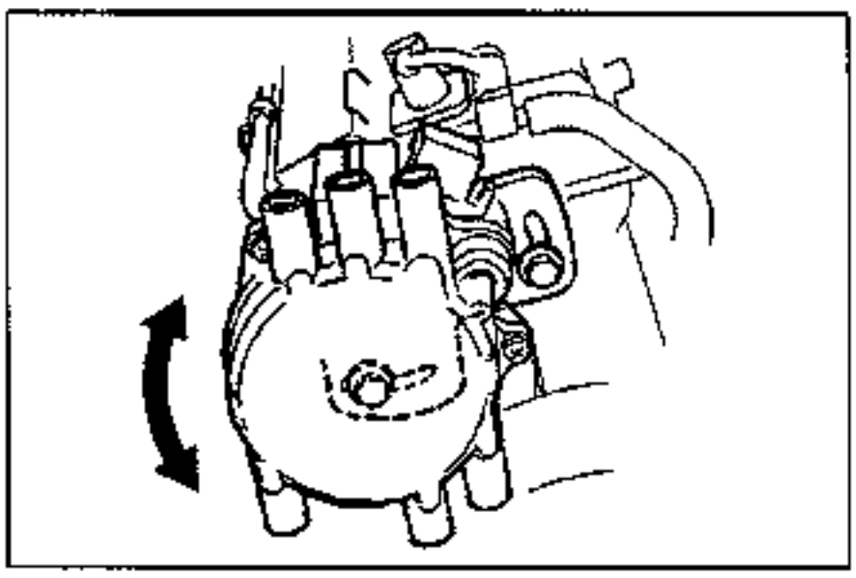


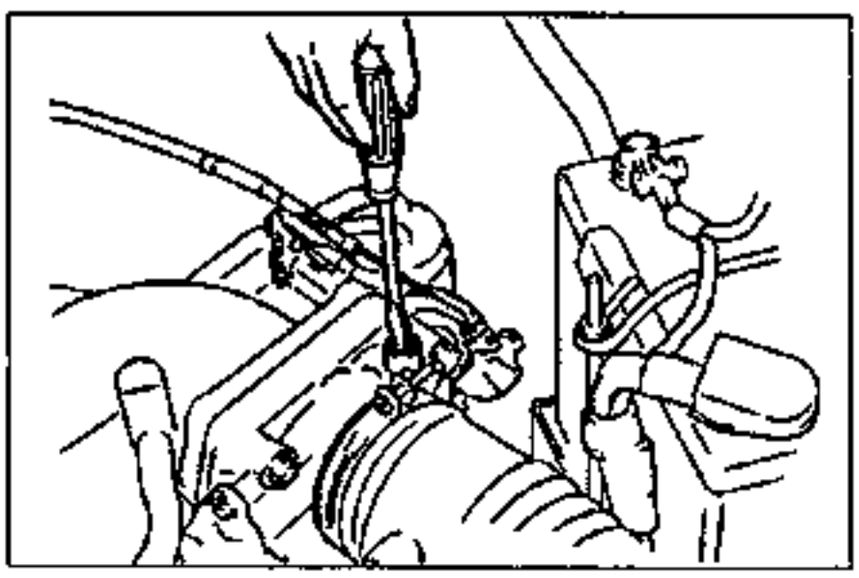
Ignition Timing
1. Perform " Preparation" . (Refer to above.)
2. Verify that the coolant fan does not operate.
3. Make sure the idle speed is within the specification. If not, adjust the idle speed (Refer to page F2–71).

Idle speed (Neutral or P range):
550–950 rpm {750±200 rpm}

4. Set switch A to position 1.
5. Set TEST SW to SELF TEST







Note
- If the SST is not used, connect a jumper wire between the terminal TEN and the terminal GND of the data link connector.

6. Make sure the timing mark (yellow) on the crankshaft pulley and the mark on the timing belt cover are aligned.

   Ignition timing: BTDC 9–11° {10 ±1°}

7. If the marks are not aligned, loosen the distributor lock bolts and turn the distributor to make the adjustment.
8. Tighten the distributor lock bolts to the specified torque.

   Tightening torque:
   19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

9. Disconnect the **SST**.
10. Check if the timing mark (yellow) on the crankshaft pulley and the mark on the timing belt cover are aligned.

    Ignition Timing: BTDC 6–18°

Idle Speed
1. Perform "Preparation". (Refer to page F2–70.)
2. With the coolant fan off, verify that the idle speed is within the specification.

   Idle speed: 640–700 rpm {670 ±30 rpm}

3. If not within the specification, adjust the idle speed by turning the air adjusting screw.

ON BOARD DIAGNOSTIC SYSTEM

DESCRIPTION

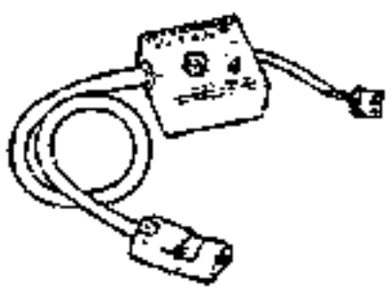
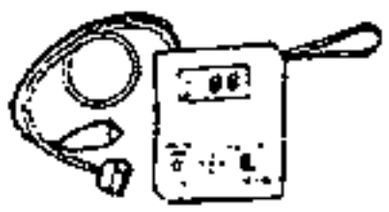
When trouble occurs in the main input or output devices, check for the cause by using the **SST.** Failures of each input and output device are indicated and retrieved from the engine control module (ECM) as diagnostic trouble code numbers.

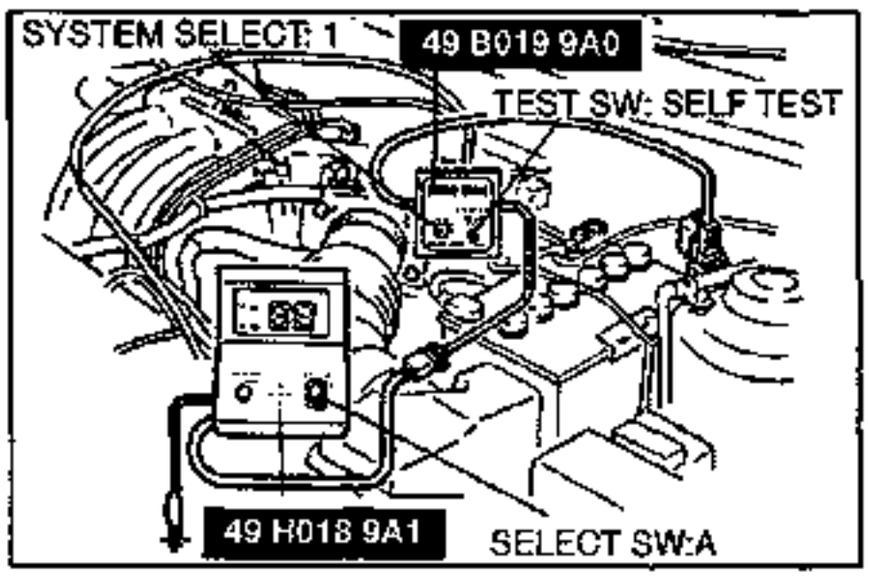
Note

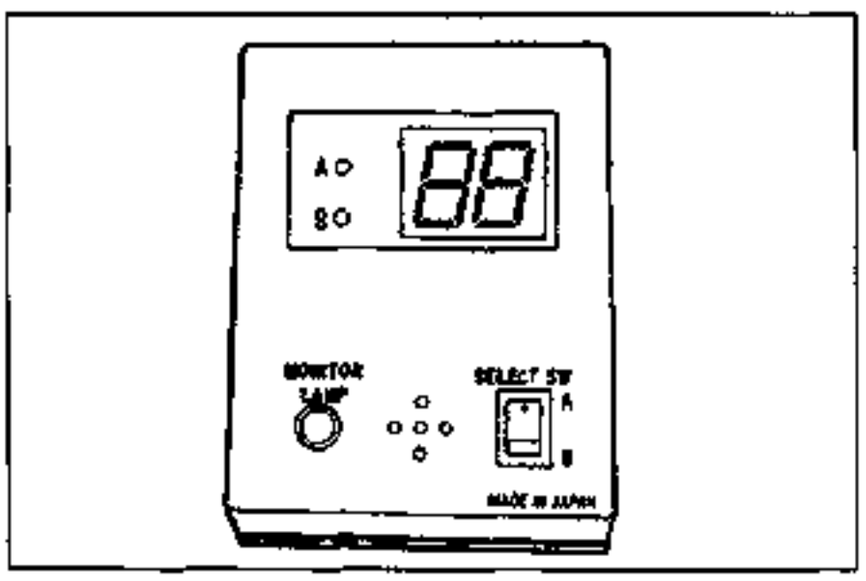
- For input devices, the ECM continuously checks for malfunctions. For output devices, it checks for malfunctions only in a three-second period after the ignition switch is turned to ON, or the terminal TEN of the data link connector is grounded.

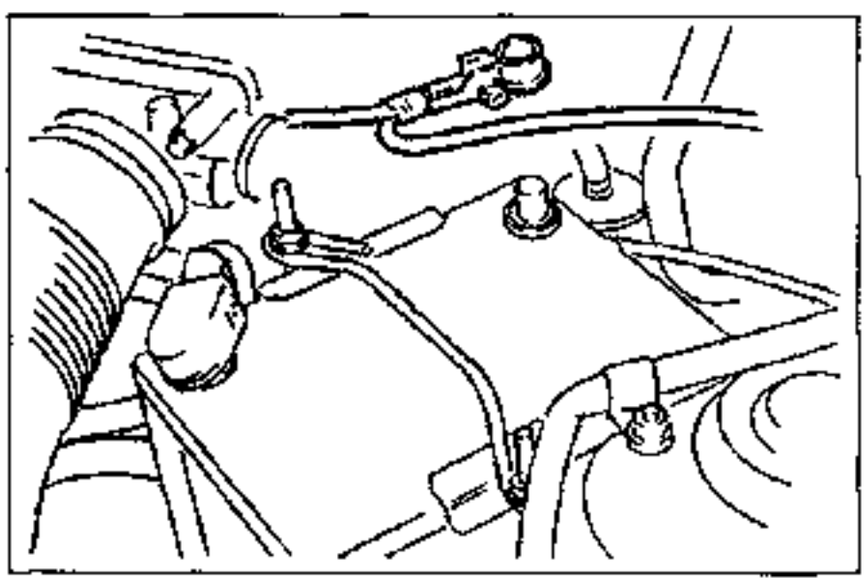
PREPARATION

SST

49 B019 9A0 System Selector 	For diagnosis	49 H018 9A1 Self-Diagnosis Checker 	For diagnosis







DIAGNOSTIC TROUBLE CODE NUMBER

Inspection Procedure

1. Connect the **SST** to the data link connector.
2. Set switch A to position **1**.
3. Set TEST SW to SELF TEST.
4. Connect the **SST** to the System Selector and a ground.
5. Set the select switch to position A.
6. Turn the ignition switch to ON.
7. Verify that 88 flashes on the digital display and the buzzer sounds for **3 sec.** after turning the ignition switch ON.
8. If 88 does not flash, check the main relay (FUEL INJ relay) (Refer to page F2–157), power supply circuit, and data link connector wiring.
9. If 88 flashes and the buzzer sounds continuously for more than **20 sec.**, check for a short circuit between the engine control module terminal 1E and the data link connector. Replace the engine control module if necessary, and perform steps 3–7 again.
10. Note any code numbers and check for the causes by referring to the check sequences shown on pages **F2–74** through **F2–91**. Repair as necessary.
11. After repairs, cancel the code numbers by performing the "After-repair procedure". (Refer to page F2–92.)

Diagnostic Trouble Code Numbers

No.	Indicator flashing pattern	Diagnosed circuit	Condition	Point	Memorized	Page
02	ON / OFF 	NE signal crankshaft position sensor	No NE signal	• Crankshaft position sensor connector • Wiring from crankshaft position sensor to ECM • Crankshaft position sensor	Yes	F2–76
03	ON / OFF 	SGC signal camshaft position sensor	No SGC signal Input while a specified number of SGT or NE signal pulses are input	• Distributor connector • Wiring from main relay to distributor • Wiring from distributor to ECM • Camshaft position sensor	Yes	F2–77
04	ON / OFF 	SGT signal camshaft position sensor	No SGT signal		Yes	F2–78
05	ON / OFF 	Knock sensor	Open or short circuit	• Knock sensor connector • Wiring from knock sensor to ECM • Knock sensor	Yes	F2–79
08	ON / OFF 	Volume air flow sensor		• Volume air flow sensor connector • Wiring from volume air flow sensor to ECM • Volume air flow sensor	Yes	F2–80
09	ON / OFF 	Engine coolant temperature sensor		• Engine coolant temperature sensor connector • Wiring from engine coolant temperature sensor to ECM • Engine coolant temperature sensor resistance	Yes	F2–81
10	ON / OFF 	Intake air temperature sensor		• Volume air flow sensor connector • Wiring from volume air flow sensor to ECM • Intake air temperature sensor resistance	Yes	F2–82
12	ON / OFF 	Throttle position sensor		• Throttle position sensor connector • Wiring from throttle position sensor to ECM • Throttle position sensor	Yes	F2–83
14	ON / OFF 	Barometric pressure sensor		• ECM	Yes	F2–84
15	ON / OFF 	Heated oxygen sensor (Left side)	Sensor output continues less than 0.55V 100 sec. after engine speed exceeds 1,500 rpm	• Heated oxygen sensor connector • Wiring from heated oxygen sensor to ECM • Heated oxygen sensor	Yes	F2–84
16	ON / OFF 	EGR valve position sensor	Open or short circuit	• EGR valve position sensor connector • Wiring from EGR valve position sensor to ECM • EGR valve position sensor	Yes	F2–85
17	ON / OFF 	Closed loop system (Left side)	Sensor output not changed 50 sec. after engine speed exceeds 1,500 rpm	• Fuel pressure • Injection fuel leakage • Ignition system • Air leakage • ECM	Yes	F2–86

No.	Indicator flashing pattern	Diagnosed circuit	Condition	Point	Memorized	Page
23	ON / OFF 	Heated oxygen sensor (Right side)	Sensor output continues less than 0.55V 100 sec. after engine speed exceeds 1,500 rpm	• Heated oxygen sensor connector • Wiring from heated oxygen sensor to ECM • Heated oxygen sensor	Yes	F2–86
24	ON / OFF 	Closed loop system (Right side)	Sensor output not changed 50 sec. after engine speed exceeds 1,500 rpm	• Fuel pressure • Injection fuel leakage • Ignition system • Air leakage • ECM	Yes	F2–86
25	ON / OFF 	PRC solenoid valve (pressure regulator control)	Open circuit	• Solenoid valve connection • Wiring from solenoid valve to ECM • Solenoid valve continuity	No	F2–88
26	ON / OFF 	Purge solenoid valve (purge control)		• Solenoid valve connection • Wiring from solenoid valve to ECM • Solenoid valve continuity	No	F2–88
28	ON / OFF 	EGR solenoid valve (vacuum)		• Solenoid valve connection • Wiring from solenoid valve to ECM • Solenoid valve continuity	No	F2–89
29	ON / OFF 	EGR solenoid valve (vent)		• Solenoid valve connection • Wiring from solenoid valve to ECM • Solenoid valve continuity	No	F2–89
34	ON / OFF 	Idle air control valve		• Idle air control valve connector • Wiring from idle air control valve to ECM • Idle air control valve continuity	No	F2–90
41	ON / OFF 	VRIS solenoid valve No.1		• Solenoid valve connection • Wiring from solenoid valve to ECM • Solenoid valve continuity	No	F2–91
46	ON / OFF 	VRIS solenoid valve No.2		• Solenoid valve connection • Wiring from solenoid valve to ECM • Solenoid valve continuity	No	F2–91

Note
- If more than one failure is present, the code numbers will be indicated in numerical order.

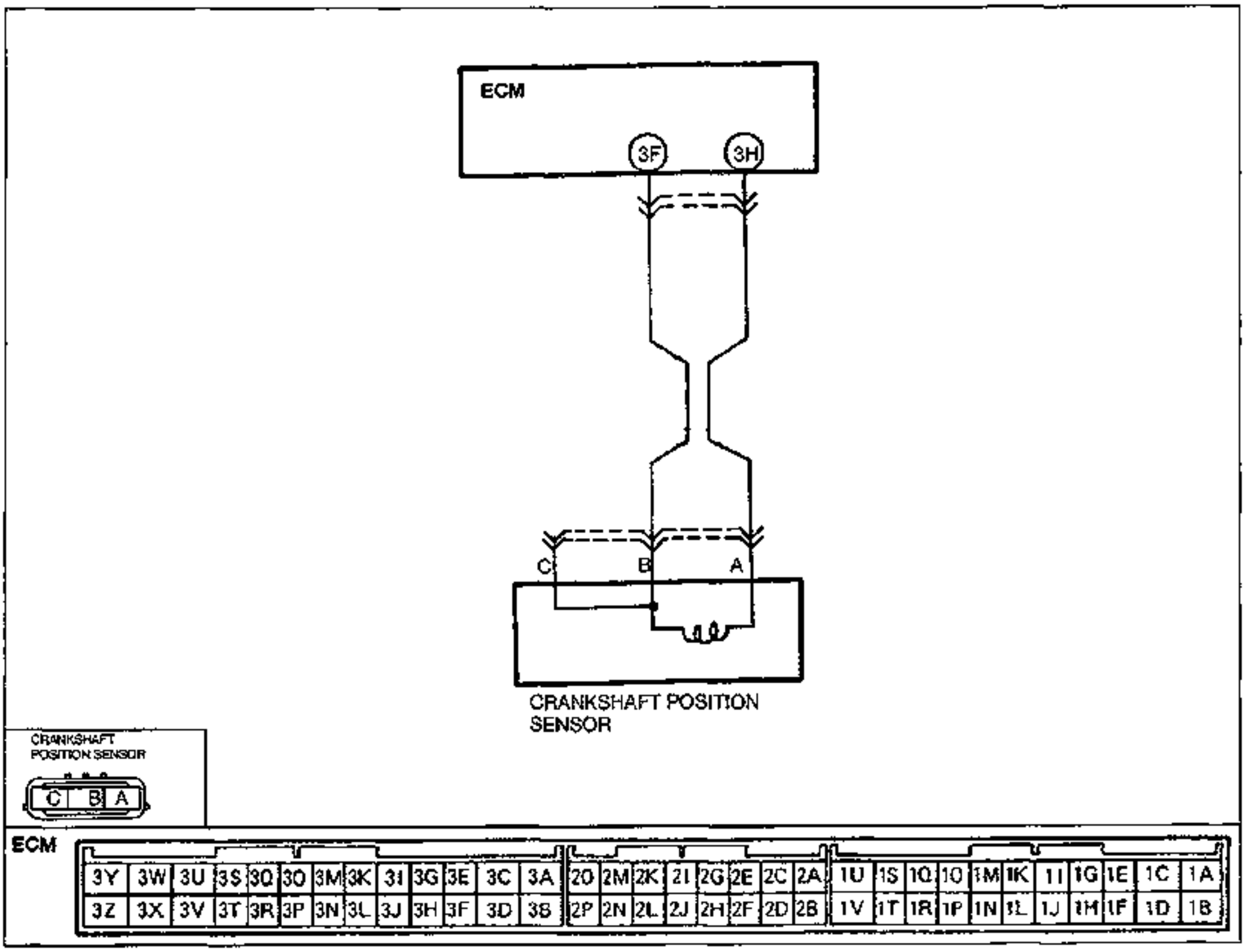
After repairs, cancel the code numbers by performing the "After-repair procedure". (Refer to page F2-92.)

Troubleshooting

If a diagnostic trouble code number is shown on the SST, check for the cause by using the chart related to the code number shown.

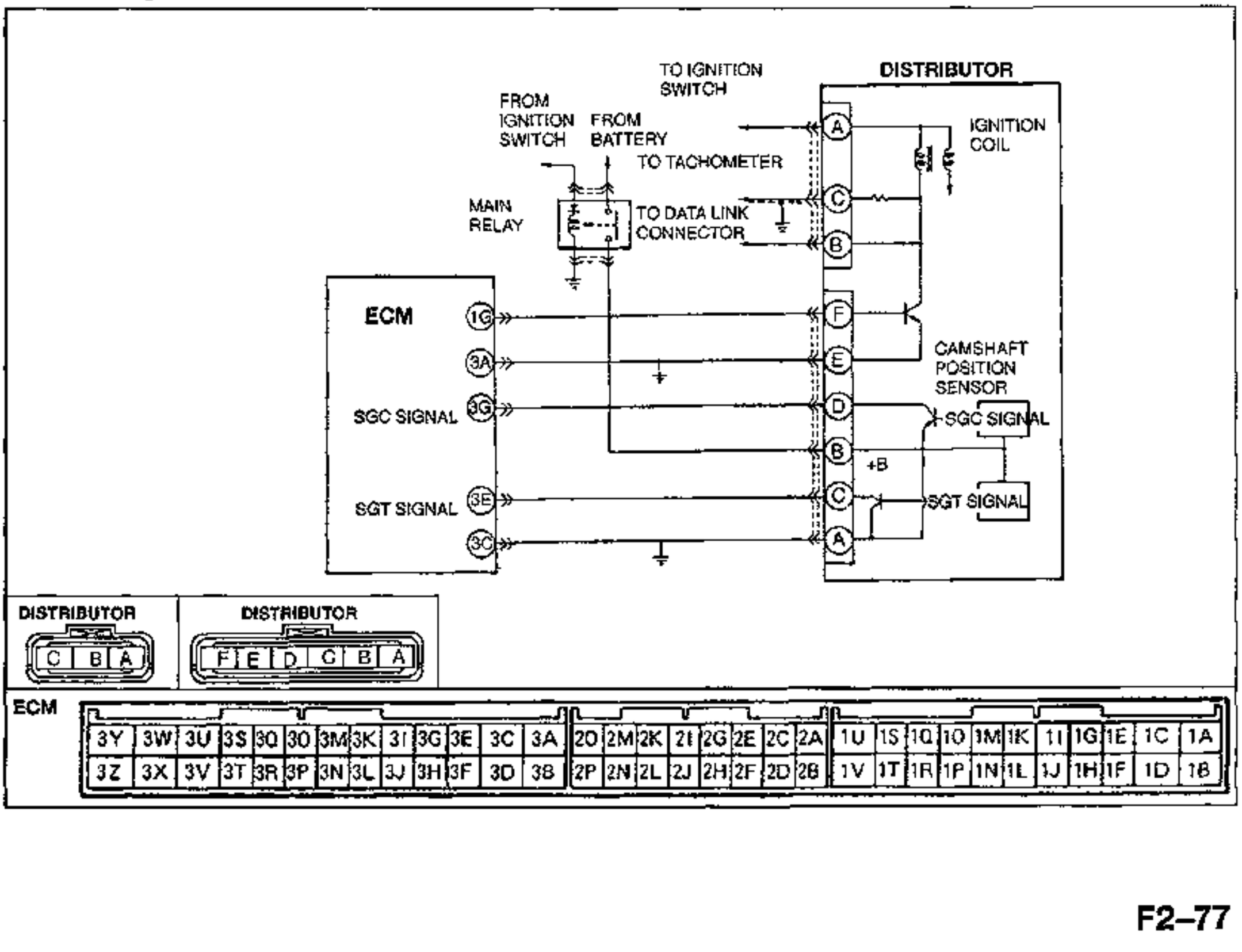
CODE No.	02 (CRANKSHAFT POSITION SENSOR NE SIGNAL)		
STEP	**INSPECTION**		**ACTION**
1	Is there poor connection in crankshaft position sensor circuit?	Yes	Repair or replace
		No	Go to next step
2	Disconnect connector from ECM; Is resistance of connector between terminals 3F and 3H OK? **Resistance: 520–580 Ω**	Yes	Go to next step
		No	Go to step 4
3	Is there continuity between terminal 3F or 3H of connector and ground (At harness side) ?	Yes	Check for short circuit in wiring from camshaft position sensor to terminal 3F or 3H
		No	Replace ECM
4	Is resistance of camshaft position sensor OK? **Resistance: 520–580 Ω**	Yes	Check for open circuit in wiring from ECM to crankshaft position sensor
		No	Replace crankshaft position sensor

Circuit Diagram



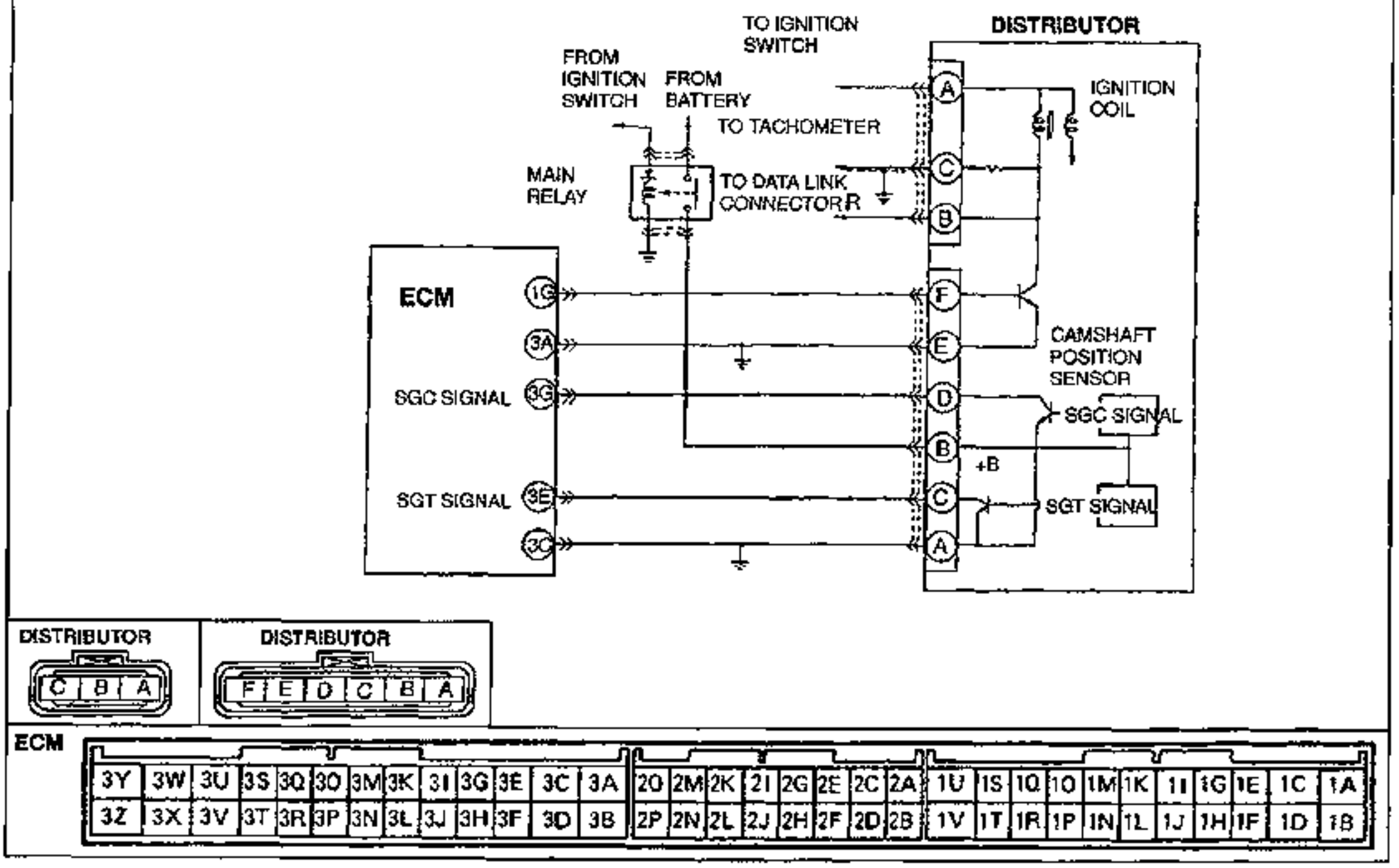
CODE No.	03 (CAMSHAFT POSITION SENSOR SGC SIGNAL)		
STEP	**INSPECTION**		**ACTION**
1	Is there poor connection in distributor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is code No. 04 also present?	Yes	Go to next step
		No	Go to step 5
3	Is there continuity between distributor terminal A (6-pin) and ground?	Yes	Go to next step
		No	Check for open circuit in wiring from distributor to ground
4	Is there battery positive voltage at distributor terminal B (6-pin)?	Yes	Go to next step
		No	Check for open circuit in wiring from distributor to main relay
5	Is there approx. 5V at distributor harness-side connector terminal B (3-pin)? (With distributor connector disconnected)	Yes	Replace distributor
		No	Go to next step
6	Is there approx. 5V at ECM terminal 3G? (With distributor connector disconnected)	Yes	Check for short or open circuit in wiring from distributor to ECM terminal 3G
		No	Replace ECM

Circuit Diagram



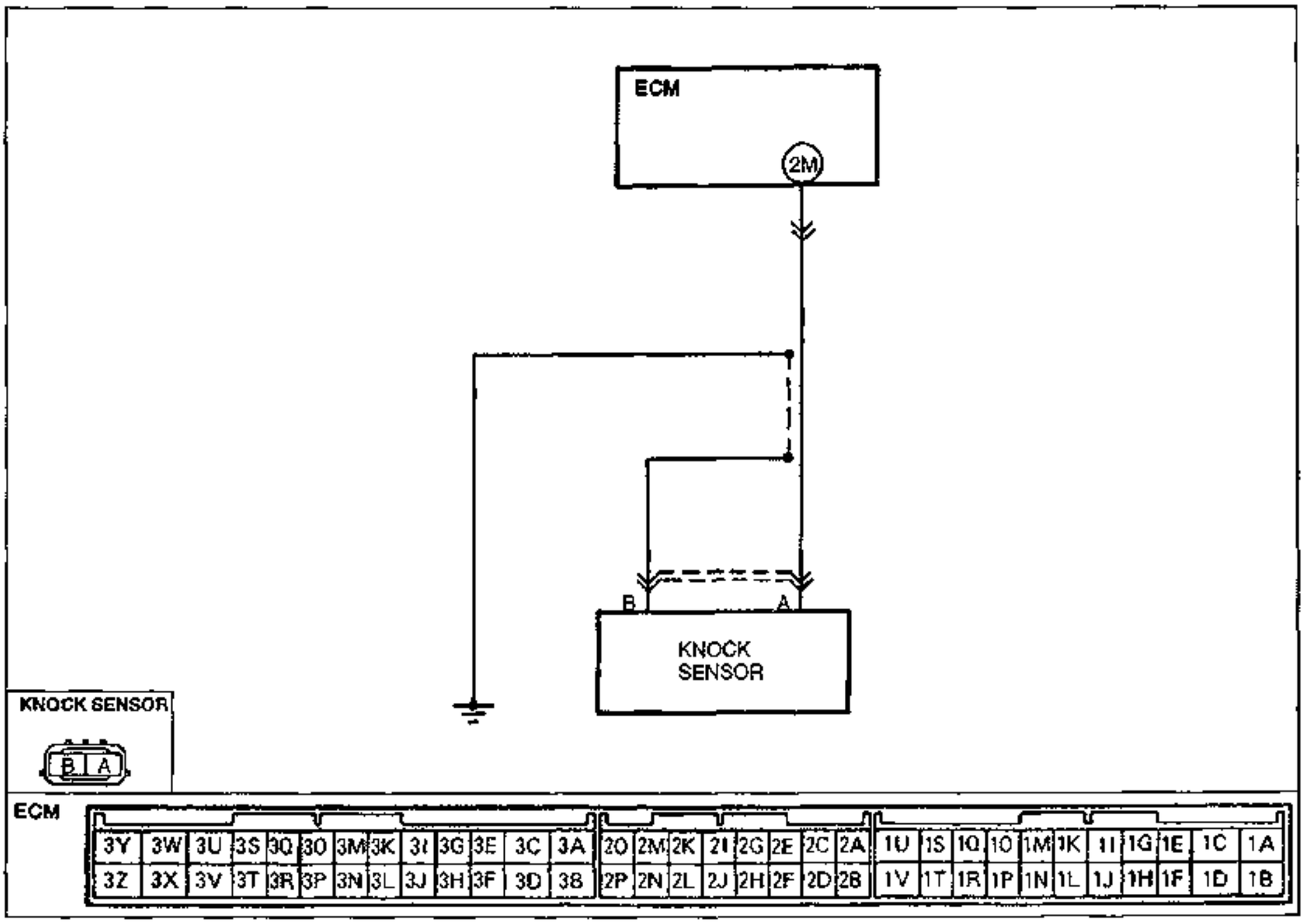
CODE No.	04 (CAMSHAFT POSITION SENSOR SGT SIGNAL)		
STEP	INSPECTION		ACTION
1	Is there poor connection in distributor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is code No. 03 also present?	Yes	Go to next step
		No	Go to step 5
3	Is there continuity between distributor terminal A (6-pin) and ground?	Yes	Go to next step
		No	Check for open circuit in wiring from distributor to ground
4	Is there battery positive voltage at distributor terminal B (6-pin)?	Yes	Go to next step
		No	Check for open circuit in wiring from distributor to main relay
5	Is there approx. 5V at distributor harness-side connector terminal B (3-pin)? (With distributor connector disconnected)	Yes	Replace distributor
		No	Go to next step
6	Is there approx. 5V at ECM terminal 3E? (With distributor connector disconnected)	Yes	Check for short or open circuit in wiring from distributor to ECM terminal 3E
		No	Replace ECM

Circuit Diagram



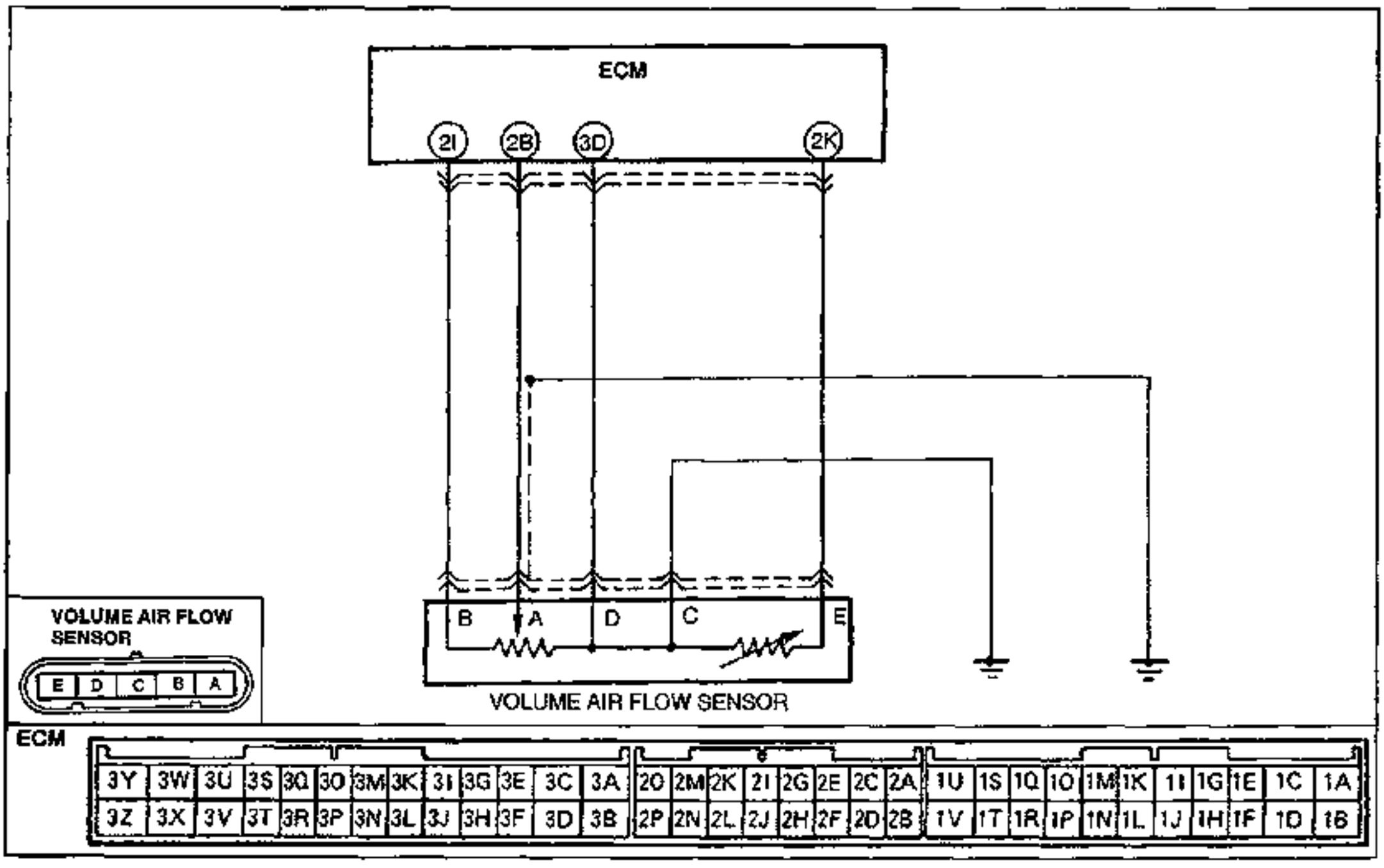
CODE No.	05 (KNOCK SENSOR)		
STEP	INSPECTION		ACTION
1	Does knock sensor circuit have a poor connection?	Yes	Repair or replace connector
		No	Go to next step
2	Does wire harness between knock sensor and ECM have a continuity?	Yes	Repair or replace harness
		No	Check continuity between ECM terminal 2M and ground ⇨If continuity, repair or replace harness ⇨If no continuity, go to next step
3	Try known good knock sensor. Does same code No. present?	Yes	Replace ECM
		No	Replace knock sensor

Circuit Diagram



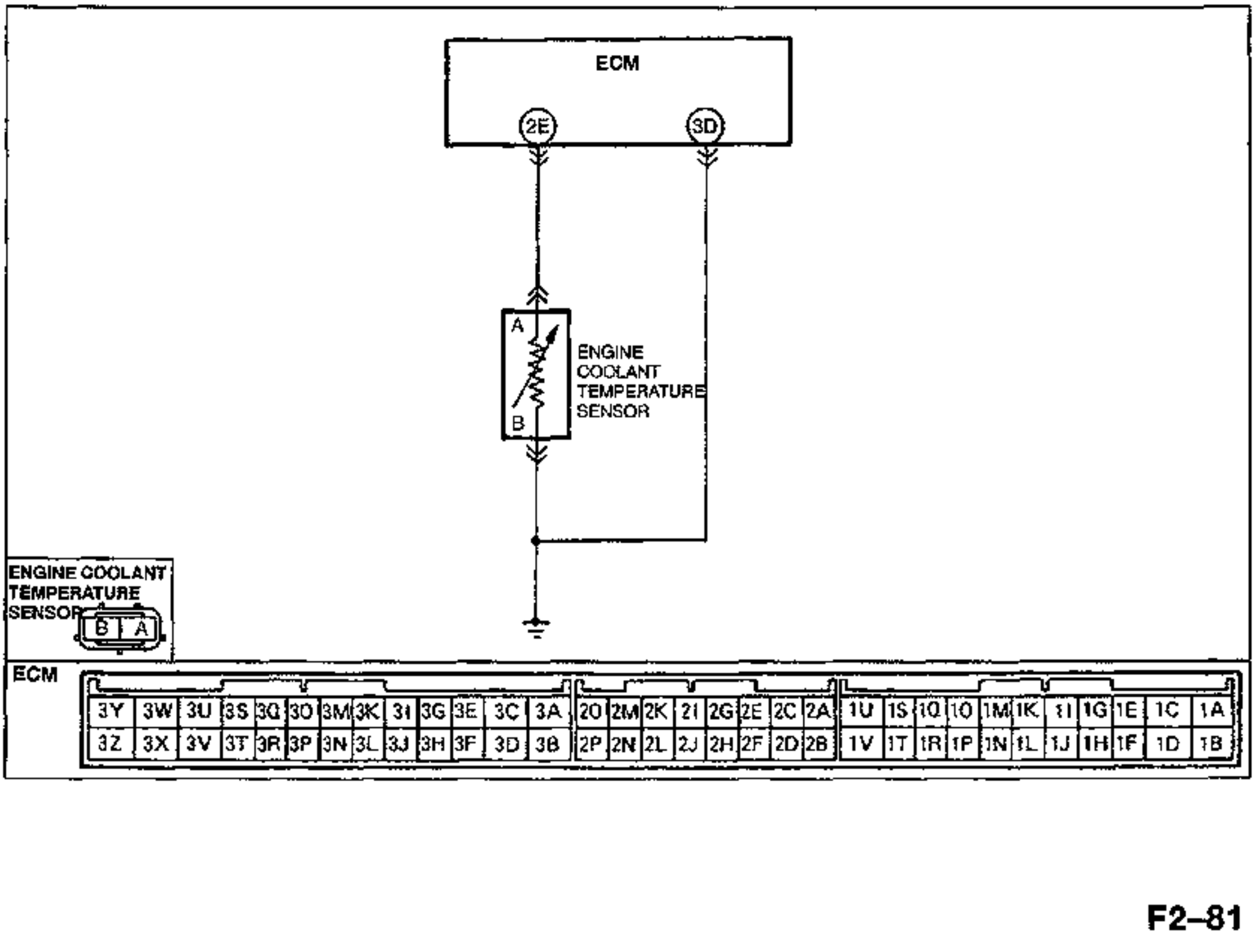
CODE No.	08 (VOLUME AIR FLOW SENSOR)		
STEP	**INSPECTION**		**ACTION**
1	Does volume air flow sensor circuit have a poor connection?	Yes	Repair or replace connector
		No	Go to next step
2	Is Code No. 10 also present?	Yes	Check for open circuit in wiring from volume air flow sensor terminal C to ground
		No	Go to next step
3	Is resistance of volume air flow sensor OK? **Volume air flow sensor** / **Closed throttle position (Ω)** / **Wide open throttle (Ω)** B–A / 200–1000 / 20–800 B–D / 200–400	Yes	Go to next step
		No	Replace volume air flow sensor
4	Does wire harness between volume air flow sensor and ECM have continuity? **Volume air flow sensor** / **ECM** B / 2I A / 2B	Yes	Go to next step
		No	Repair or replace wire harness
5	Are ECM terminal 3D, 2I, and 2B voltages OK? ☞ page F2–141	Yes	Replace ECM ☞page F2–140
		No	Check for a short circuit in wiring from volume air flow sensor to ECM

Circuit Diagram



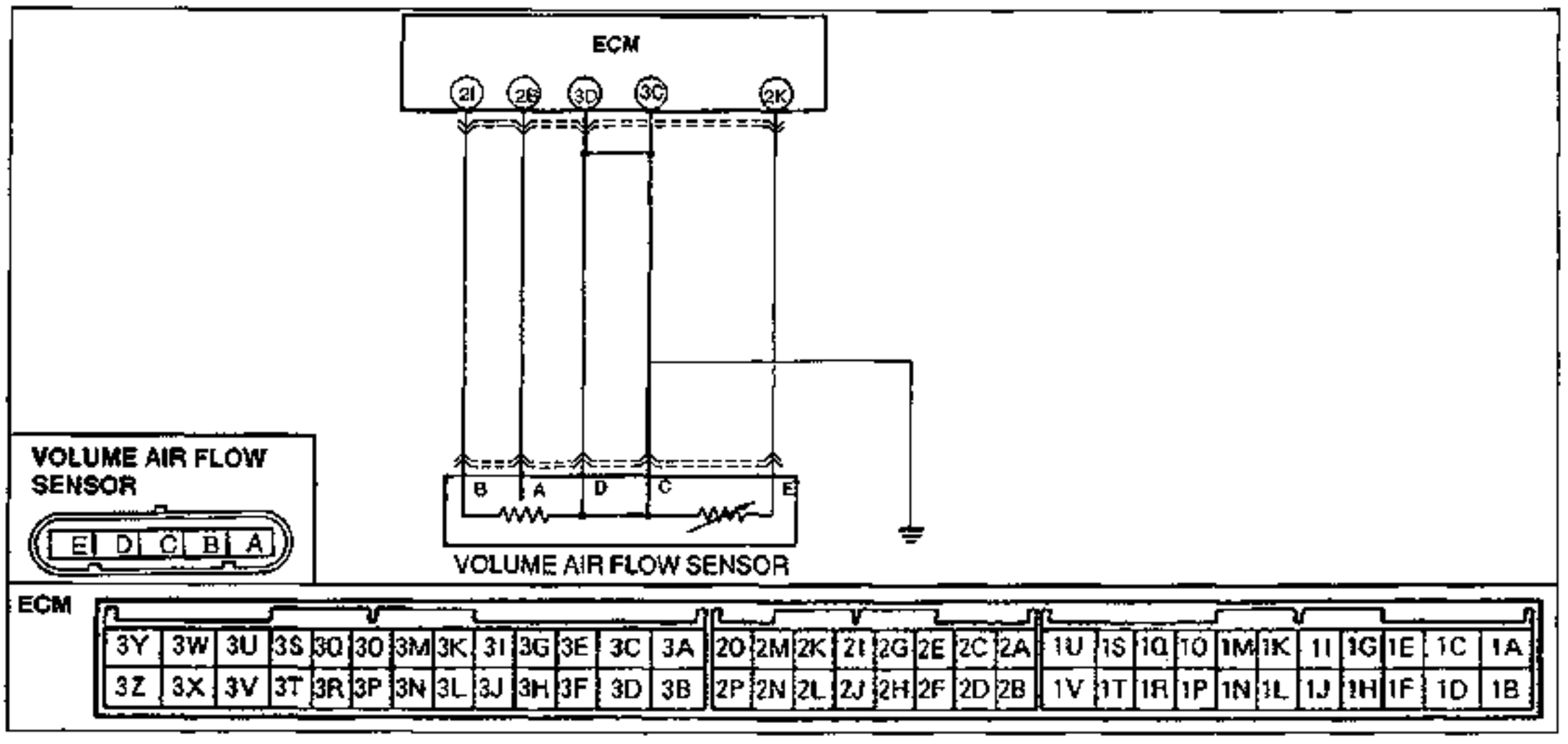
CODE No.	09 (ENGINE COOLANT TEMPERATURE SENSOR)		
STEP	**INSPECTION**		**ACTION**
1	Does engine coolant temperature sensor circuit have a poor connection?	Yes	Repair or replace connector
		No	Go to next step
2	Does wire harness between engine coolant temperature sensor and ECM have continuity? **Engine coolant temperature sensor** – **ECM** A – 2E B – 3D	Yes	Go to next step
		No	Repair or replace
3	Is resistance of engine coolant temperature sensor OK? **Coolant temperature** – **Resistance (kΩ)** 20°C (68°F) – 2.2–2.7 80°C (176°F) – 0.29–0.35	Yes	Go to next step
		No	Replace engine coolant temperature sensor
4	Is same code No. present following "After-repair procedure" ? ☞ page F2–94	Yes	Go to next step
		No	Engine coolant temperature sensor and circuit OK
5	Are ECM terminal 2E and 3D voltages OK? ☞ page F2–141	Yes	Replace ECM ☞page F2–140
		No	Check for a short circuit in wiring from engine coolant temperature sensor to ECM

Circuit Diagram



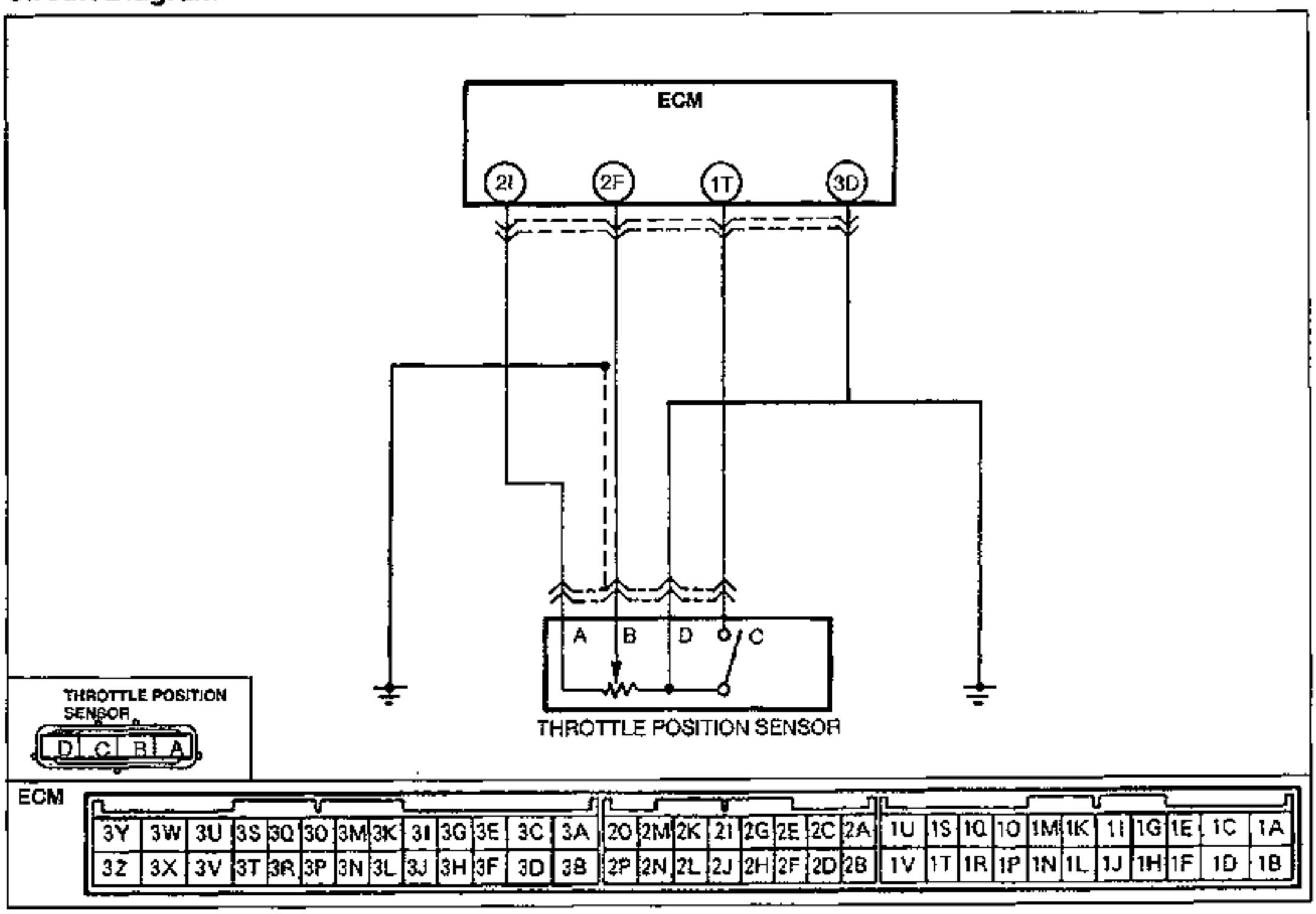
CODE No.	10 (INTAKE AIR TEMPERATURE SENSOR — IN VOLUME AIR FLOW SENSOR)		
STEP	**INSPECTION**		**ACTION**
1	Does intake air temperature sensor circuit have a poor connection?	Yes	Repair or replace connector
		No	Go to next step
2	Is code No. 08 also present?	Yes	Check for an open circuit in wiring from volume air flow sensor terminal C or D to ground
		No	Go to next step
3	Does wire harness between intake air temperature sensor and ECM have continuity? **Intake air temperature sensor (In volume air flow sensor) — ECM** D — 3D E — 2K	Yes	Go to next step
		No	Repair or replace
4	Is resistance of volume air flow sensor between terminals C and G OK? **Temperature — Resistance (Ω)** 20°C (68° F) — 2,000–3,000 60°C (68° F) — 400–700	Yes	Go to next step
		No	Replace volume air flow sensor
5	Is same code No. present following "After-repair procedure"? ☞ page F2–92	Yes	Replace ECM
		No	Intake air temperature sensor and circuit OK
6	Are ECM terminal 2K and 3D voltages OK? ☞ page F2–141	Yes	Replace ECM ☞page F2–141
		No	Look for a short circuit in wiring from intake air temperature sensor to ECM

Circuit Diagram



CODE No.	No. 12 (THROTTLE POSITION SENSOR)		
STEP	**INSPECTION**		**ACTION**
1	Does throttle position sensor circuit have a poor connection?	Yes	Repair or replace connector
2	Is ECM terminal 2F voltage OK? ☞page F2–37	Yes	Go to next step
		No	Go to step 4
3	Is voltage increase linear according to the throttle valve opening angle?	Yes	Go to step 7
		No	Replace throttle position sensor
4	Disconnect throttle position sensor connector. Turn ignition switch to ON. Is there 5V at connector terminal A?	Yes	Go to next step
		No	Check for open or short circuit in wiring harness. (ECM terminal 2I–throttle sensor terminal A)
5	Is there continuity between connector terminal D and ECM terminal 2F?	Yes	Go to next step
		No	Replace or replace wiring harness
6	Is there continuity between connector terminal D and ECM terminal 3D?	Yes	Replace throttle position sensor
		No	Repair or replace wiring harness
7	Do throttle position sensor connector and ECM connector have poor connection?	Yes	Replace ECM ☞page F2–141
		No	Intermittent poor connection of harness or connector (Repair connector and / or harness)

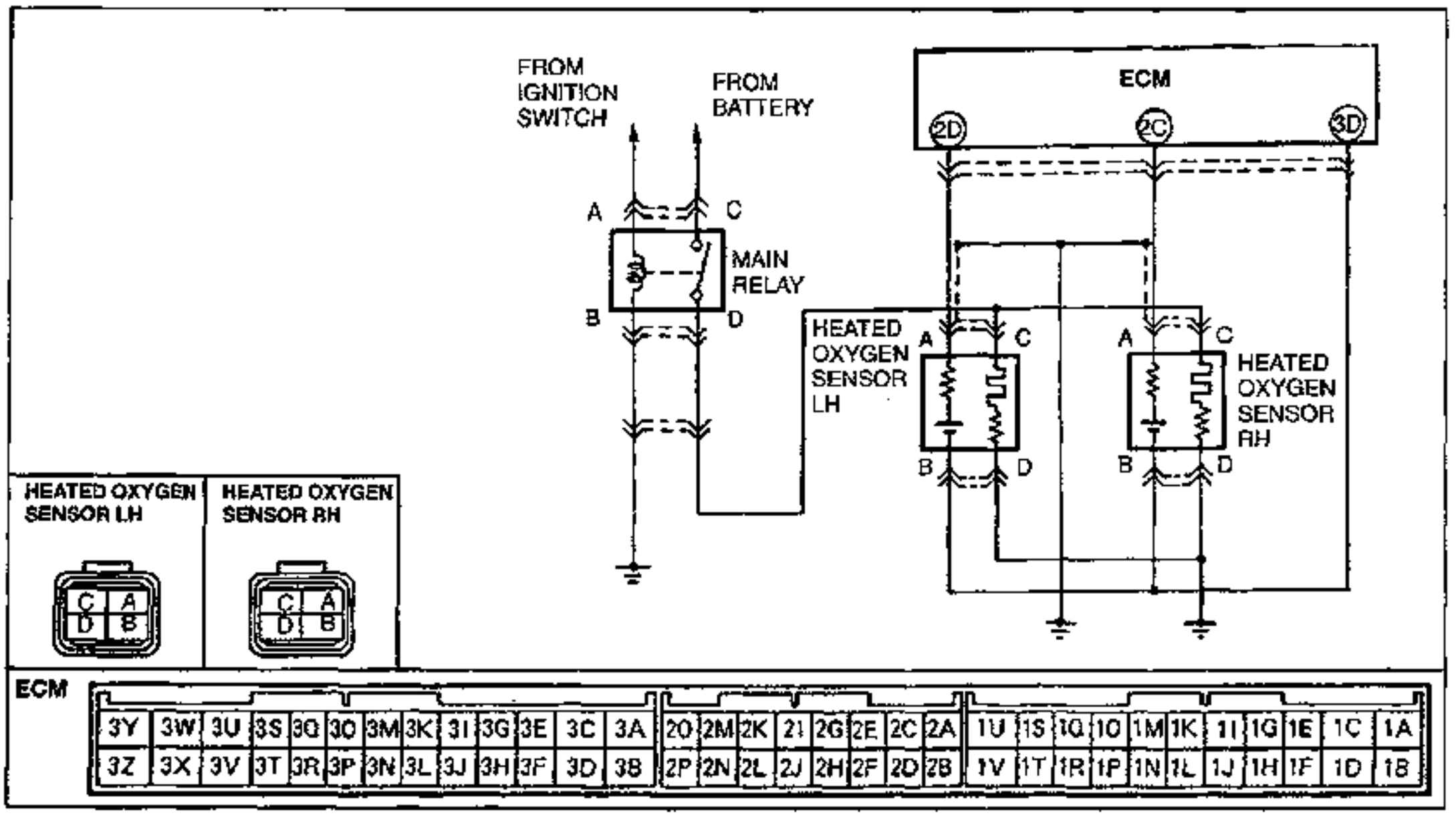
Circuit Diagram



CODE No.	14 (BAROMETRIC PRESSURE SENSOR — IN ECM)
STEP	**ACTION**
1	Replace ECM ☞page F2–140

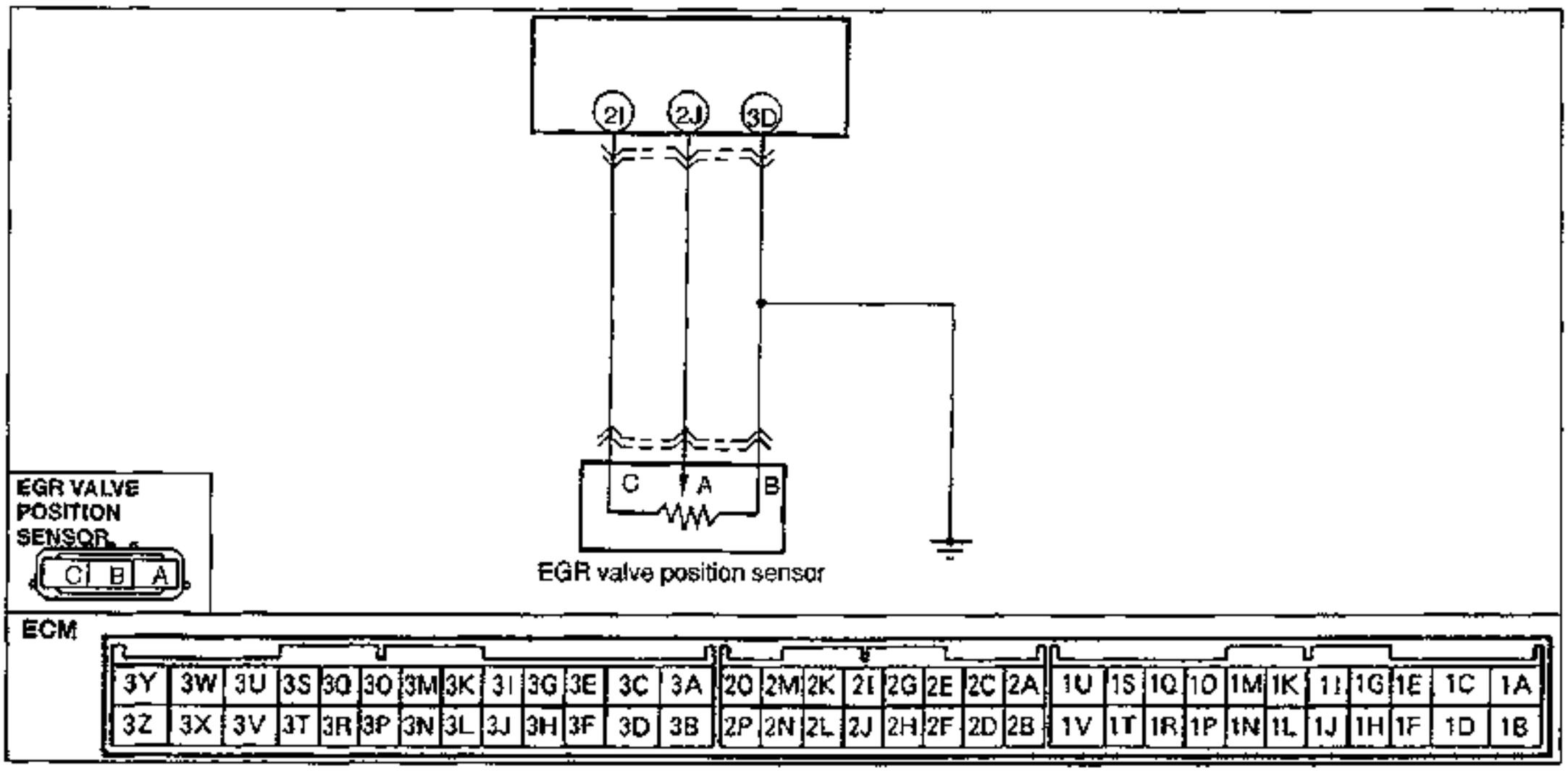
CODE No.	15 and/or 23 (HEATED OXYGEN SENSOR-INACTIVATED)		
Note • **If code No. 15 and 17 are both present, first perform the checking procedure for code No. 17.**			
STEP	**INSPECTION**		**ACTION**
1	Does heated oxygen sensor circuit have a poor connection?	Yes	Repair or replace connector
		No	Go to next step
2	Is heated oxygen sensor output voltage OK?	Yes	Go to next step
		No	Replace heated oxygen sensor
3	Does wire harness between heated oxygen sensor and ECM terminal (left bank 2D, right bank 2C) have continuity?	Yes	Go to next step
		No	Repair or replace
4	Is ECM terminal (left bank 2D, right bank 2d) voltage OK? ☞page F2–141	Yes	Go to next step
		No	Check for a short circuit in wiring from heated oxygen sensor to ECM
5	Is sensitivity of heated oxygen sensor OK? ☞page F2–154	Yes	Replace ECM ☞page F2–141
		No	Try a known good heated oxygen sensor and check if condition improves ☞page F2–154

Circuit Diagram



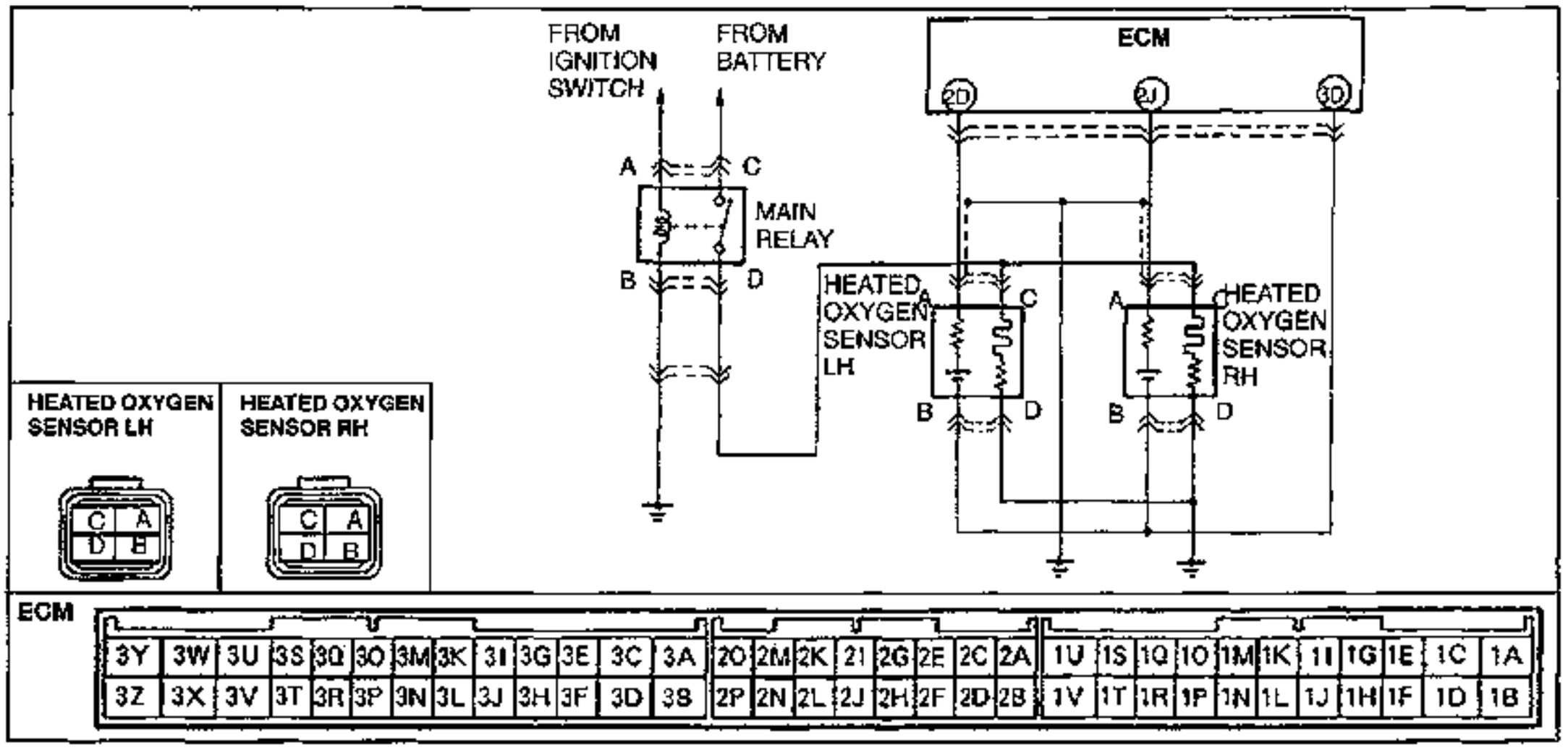
CODE No.	16 (EGR VALVE POSITION SENSOR)		
STEP	**INSPECTION**		**ACTION**
1	Does EGR valve position sensor circuit have a poor connection?	Yes	Repair or replace connector
		No	Go to next step
2	Is EGR valve OK? ☞page F2–126	Yes	Go to next step
		No	Replace EGR valve
3	Is resistance of EGR valve position sensor OK? ☞page F2–158	Yes	Go to next step
		No	Replace EGR valve
4	Is there continuity between EGR valve position sensor and ECM? **EGR valve position sensor** / **ECM** A / 2J B / 3D C / 2I	Yes	Go to next step
		No	Check for open circuit in wiring from EGR valve position sensor to ECM
5	Is there 4.5–5.5V at EGR valve position sensor connector terminal C? ☞page F2–158	Yes	Go to next step
		No	Check for short circuit in wiring from EGR valve position sensor terminal C to ECM
6	Is ECM terminal 2J voltage OK?	Yes	Replace ECM
		No	Check for short circuit in wiring harness EGR valve position sensor terminal A to ECM

Circuit Diagram



CODE No.	17 and/or 24 (CLOSED LOOP SYSTEM)		
STEP	**INSPECTION**		**ACTION**
1	Is same code No. present following "After-repair procedure"? ☞page F2-92	Yes	Go to next step
		No	Does heated oxygen sensor circuit have a poor connection? ⇨If not, perform troubleshooting for code No. 15
2	Does Self-Diagnosis Checker monitor lamp illuminate at idle after engine has been warmed up to **2,500–3,000 rpm** for **3 min.**	Yes	Go to next step **Note** • A/F mixture is rich
		No	Go to step 5 **Note** • A/F mixture is lean or misfire is occurring
3	Is fuel line pressure correct at idle? ☞page F2-113 **Fuel line pressure:** **260–310 kPa {2.5–3.2 kgf/cm², 37–45 psi}** **(Vacuum hose to pressure regulator disconnected)**	Yes	Go to next step
		No	**High pressure** Is fuel return hose clogged or restricted? ⇨If not, replace pressure regulator ☞page F2-115
4	Check fuel injector for fuel leakage Is leakage observed? ☞page F2-116	Yes	Replace fuel injector
		No	Is engine coolant temperature sensor OK? ☞page F2-152 ⇨If it is, replace ECM ⇨If not, replace engine coolant temperature sensor
5	Disconnect each high-tension lead at idle; does engine speed decrease equally at each cylinder?	Yes	Go to next step
		No	Go to step 8

Circuit Diagram

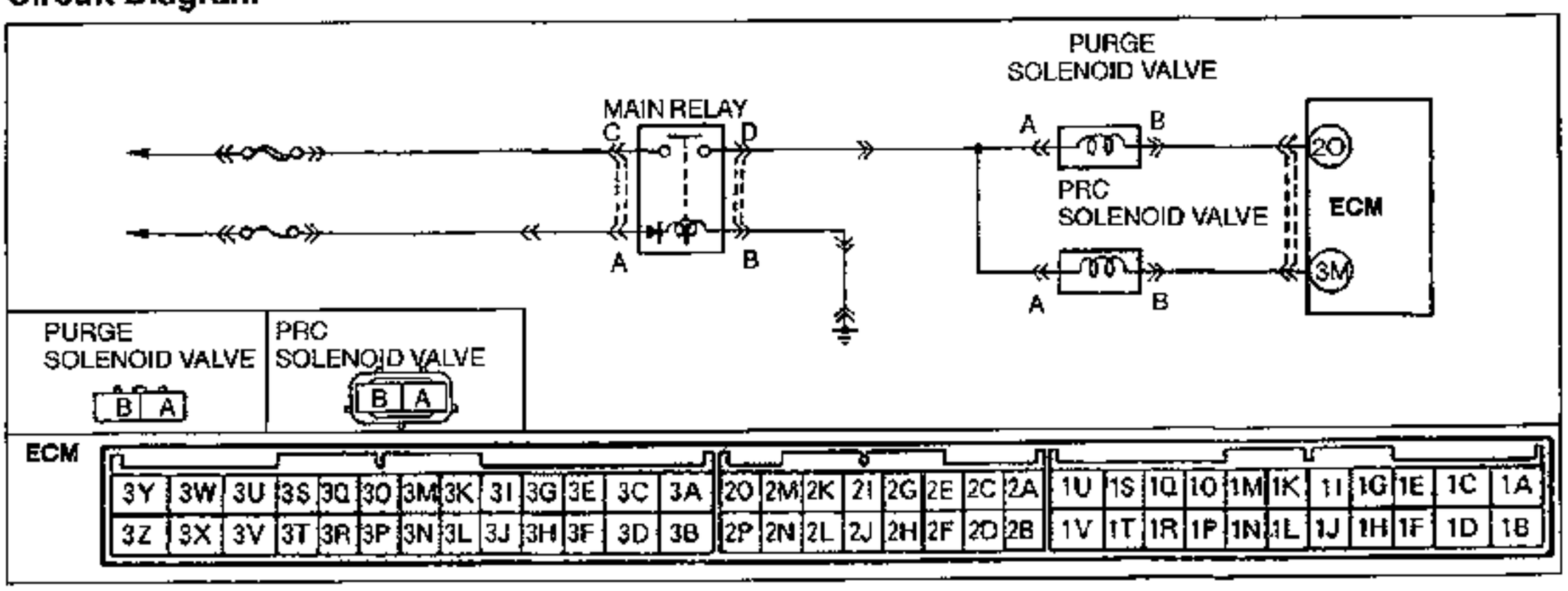


STEP	INSPECTION		ACTION
6	Is fuel line pressure correct at idle? ☞page F2–113 **Fuel line pressure:** **260–310 kPa {2.6–3.2kgf/cm², 37–45 psi}** **(Vacuum hose from pressure regulator disconnected)**	Yes	Go to next step
		No	**Low pressure** Check fuel line pressure while pinching fuel return hose ⇨If pressure **quickly** increases, check pressure regulator ☞page F2–113 ⇨If pressure **gradually** increases, check for clogging between fuel pump and pressure regulator If hose is not clogged, check fuel pump maximum pressure ☞page F2–110
7	Check intake-air system components for air leakage Is leakage observed?	Yes	Go to step 11
		No	Replace
8	Is there a misfire or a dead cylinder found in inspection step 5?	Yes	Repair or replace ignition system
		No	Go to next step
9	Is fuel injector operating sound heard at dead cylinder during idle in inspection step 5?	Yes	Go to next step
		No	Is there battery positive voltage at fuel injector connector? ⇨If there is, replace fuel injector ⇨If there is not, look for a short or open circuit in wire harness
10	Replace fuel injector at dead cylinder found in inspection step 5 Is same code No. present following "After-repair procedure"? ☞page F2–82	Yes	Go to next step
		No	Removed fuel injector at fault
11	Try a known good ECM and check if condition improves ☞page F2–141		

CODE No.	25 (PRC SOLENOID VALVE)		
STEP	**INSPECTION**		**ACTION**
1	Disconnect connector from ECM; is battery positive voltage at ECM terminal 3M with ignition switch ON?	Yes	Does ECM terminal connector have a poor connection? ⇨If not, repair or replace ECM ☞page F2–141 ⇨If it does, repair or replace connector
		No	Go to next step
2	In same condition as step 1, is there battery positive voltage at PRC solenoid valve connector terminal wire?	Yes	Repair or replace wire
		No	Go to next step
3	Is PRC solenoid valve OK? ☞page F2–120	Yes	Look for a short or open circuit in wiring from main relay (FUEL INJ relay) to solenoid valve
		No	Replace PRC solenoid valve

CODE No.	26 (PURGE SOLENOID VALVE)		
STEP	**INSPECTION**		**ACTION**
1	Disconnect connector from ECM. Is there battery positive voltage at ECM terminal 2O with ignition switch ON?	Yes	Does ECM terminal connector have a poor connection? ⇨If not, replace ECM ☞page F2–141 ⇨If it does, repair or replace connector
		No	Go to next step
2	In same condition as step 1; Is there battery positive voltage at purge solenoid valve connector terminal wire?	Yes	Repair or replace wire
		No	Go to next step
3	Is purge solenoid valve OK? ☞page F2–128	Yes	Look for a short or open circuit in wiring from the main relay (FUEL INJ relay) to the solenoid valve
		No	Replace purge solenoid valve

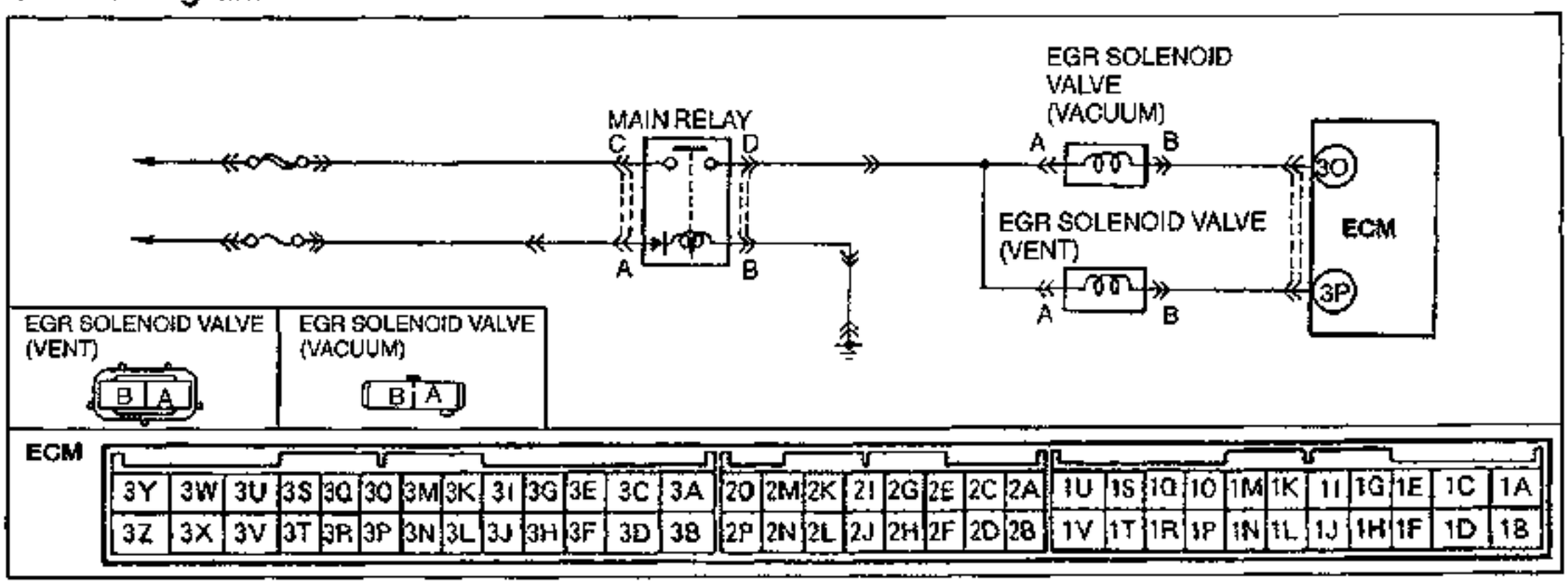
Circuit Diagram



CODE No.	28 (EGR SOLENOID VALVE — VACUUM)		
STEP	**INSPECTION**		**ACTION**
1	Disconnect connector from ECM; is there battery positive voltage at ECM terminal 3O with ignition switch ON?	Yes	Does ECM terminal connector have a poor connection? ⇨If not, replace ECM ☞page F2–141 ⇨If it does, repair or replace the connector
		No	Go to next step
2	In same condition as step 1, is there battery positive voltage at EGR solenoid valve (vacuum) connector terminal?	Yes	Repair or replace wire
		No	Go to next step
3	Is EGR solenoid valve (vacuum) OK? ☞page F2–126	Yes	Look for a short or open circuit in wiring from main relay (FUEL INJ relay) to solenoid valve
		No	Replace EGR solenoid valve (vacuum)

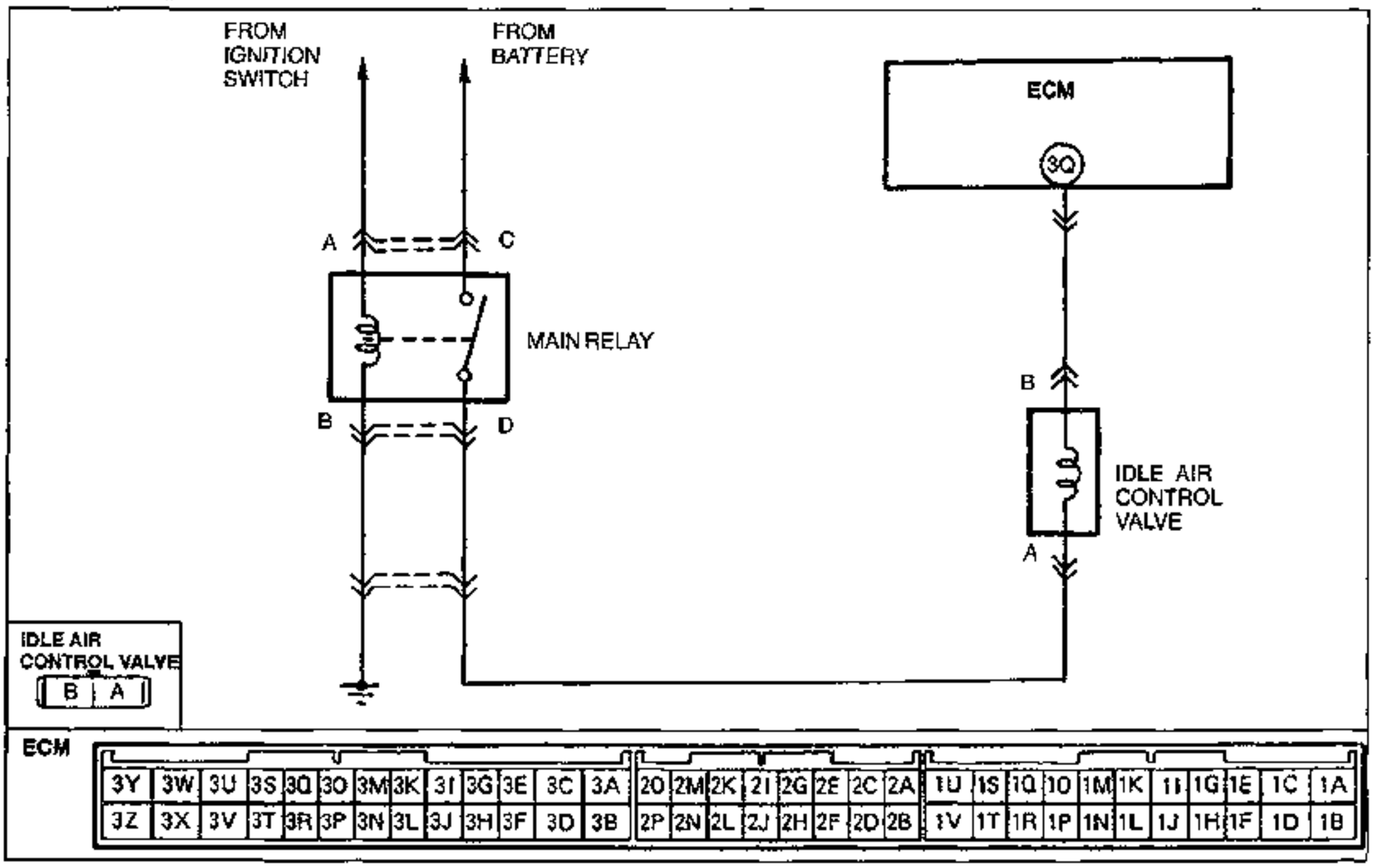
CODE No.	29 (EGR SOLENOID VALVE — VENT)		
STEP	**INSPECTION**		**ACTION**
1	Disconnect connector from ECM; is there battery positive voltage at ECM terminal 3P with ignition switch ON?	Yes	Does ECM terminal have a poor connection? ⇨If not, replace ECM ☞page F2–141 ⇨If it does, repair or replace the connector
		No	Go to next step
2	In same condition as step 1, is there battery positive voltage at EGR solenoid valve (vent) connector terminal wire?	Yes	Repair or replace wire No Go to next step
		No	Go to next step
3	Is EGR solenoid valve (vent) OK? ☞page F2–126	Yes	Look for a short or open circuit in wiring from main relay (FUEL INJ relay) to solenoid valve
		No	Replace EGR solenoid valve(vent)

Circuit Diagram



CODE No.	34 (IDLE AIR CONTROL VALVE)		
STEP	**INSPECTION**		**ACTION**
1	Disconnect connector from ECM; is there battery positive voltage at ECM terminal 3Q with ignition switch ON?	Yes	Check ECM terminal for poor connection ⇨If OK, replace ECM ☞page F2–141 ⇨If not OK, repair or replace connector
		No	Go to next step
2	In same condition as step 1, is there battery positive voltage at idle-up solenoid valve connector terminal?	Yes	Repair or replace wire
		No	Go to next step
3	Does idle air control valve have correct resistance? ☞page F2–99 **Resistance: 10.7–12.3 Ω [at 20°C {68°F}]**	Yes	Look for a short or open circuit in wiring from main relay (FUEL INJ relay) to idle air control valve
		No	Replace idle air control valve

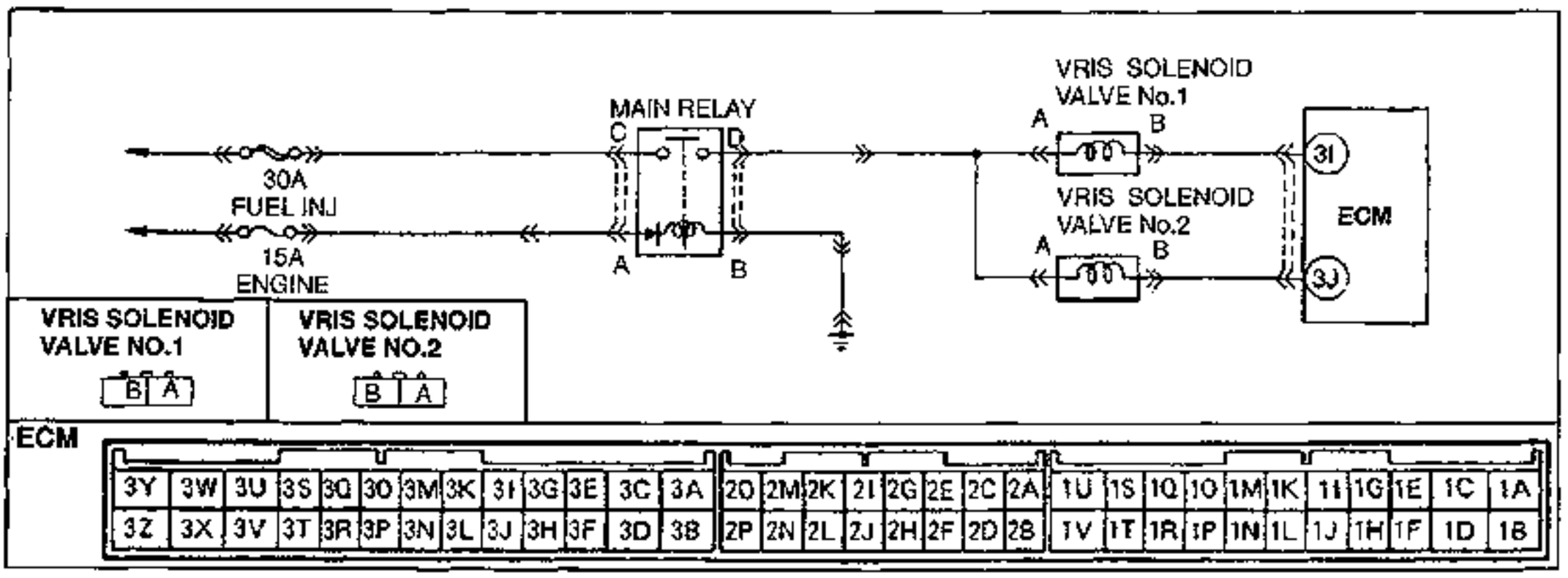
Circuit Diagram

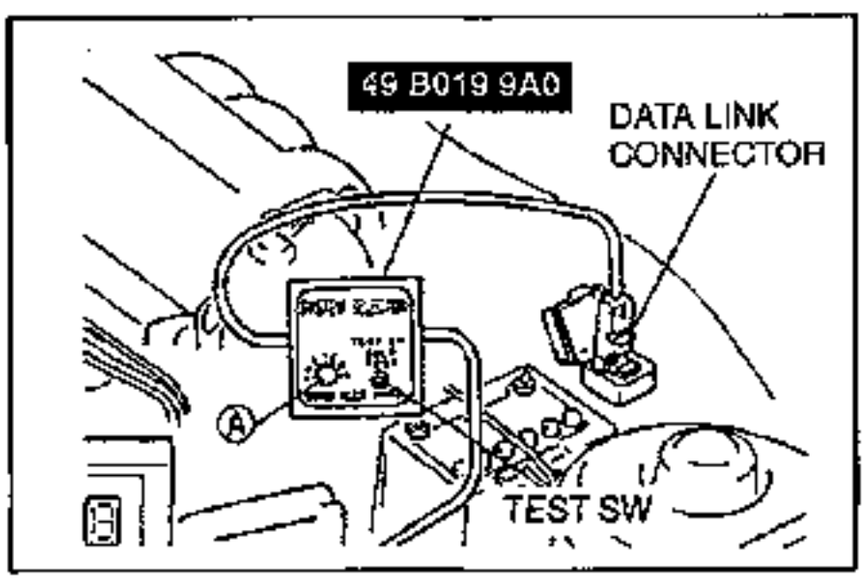


CODE No.	41 (VRIS SOLENOID VALVE No.1)		
STEP	**INSPECTION**		**ACTION**
1	Disconnect connector from ECM; is there battery positive voltage at ECM terminal 3I with ignition switch ON?	Yes	Check ECM terminal connector for poor connection ⇨If OK, replace ECM ☞page F2–141 ⇨If not OK, repair or replace connector
		No	Go to next step
2	In same condition as step 1, is there battery positive voltage at VRIS solenoid valve No.1 connector terminal A?	Yes	Repair or replace wire
		No	Go to next step
3	Is VRIS solenoid valve No.1 OK? ☞page F2–103	Yes	Look for a short or open circuit in wiring from main relay to solenoid valve
		No	Replace VRIS solenoid valve No.1

CODE No.	46 (VRIS SOLENOID VALVE No.2)		
STEP	**INSPECTION**		**ACTION**
1	Disconnect connector from ECM; is there battery positive voltage at ECM terminal 3J with ignition switch ON?	Yes	Check ECM terminal connector for poor connection ⇨If OK, replace ECM ☞page F2–141 ⇨If not OK, repair or replace connector
		No	Go to next step
2	In same condition as step 1, is there battery positive voltage at VRIS solenoid valve No.2 connector terminal A?	Yes	Repair or replace wire
		No	Go to next step
3	Is VRIS solenoid valve No.2 OK? ☞page F2–103	Yes	Look for a short or open circuit in wiring from main relay (FUEL INJ relay) to solenoid valve
		No	Replace VRIS solenoid valve No.2

Circuit Diagram





AFTER–REPAIR PROCEDURE

1. Cancel the memory of diagnostic trouble code number by disconnecting the negative battery cable and depressing the brake pedal for **at least 20 seconds.** Reconnect the negative battery cable.
2. Connect the **SST** to the data link connector.
3. Verify that no diagnostic trouble code numbers are displayed.

SWITCH MONITOR FUNCTION

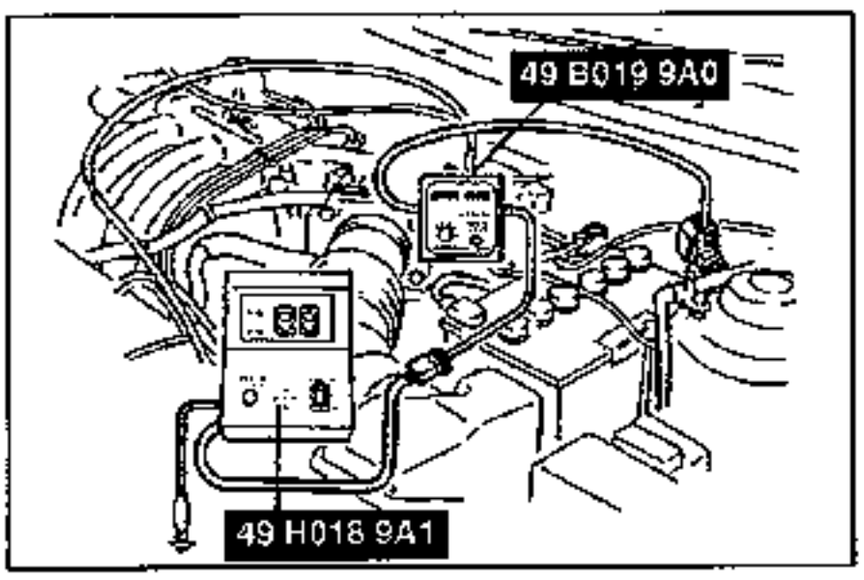
Individual switches can be inspected by using the **SST** (Self-Diagnosis Checker).

Preparation

Ground the data link connector terminal TEN and turn the ignition switch to ON (engine off). If any switch remains activated, the monitor light will be illuminated.

Switch	Self-Diagnosis Checker (Monitor light)		Remarks
	Light ON	Light OFF	
Clutch switch (MTX)	Clutch pedal released	Clutch pedal depressed	In gear
Neutral switch (MTX)	In gear	Neutral	Clutch pedal released
Transaxle range switch (ATX)	ON	OFF	—
Closed throttle position switch	Accelerator pedal depressed	Accelerator pedal released	—
Brake switch	Brake pedal depressed	Brake pedal released	—
Headlight switch	ON	OFF	Headlight ON
DRL (CANADA)	ON	OFF	ON: parking lever released
Fan switch	ON	OFF	At 2nd or higher position
A/C switch (if equipped)	ON	OFF	Blower switch at 1st position
Rear window defroster switch	ON	OFF	—

Inspection Procedure



1. Connect the **SST** (System Selector) to the data link connector.
2. Set switch A to position 1.
3. Set TEST SW to SELF TEST.
4. Connect the **SST** (Self-Diagnosis Checker) to the System Selector and a ground.
5. Set the select switch of the Self-Diagnosis Checker to position A.
6. Turn the ignition switch to ON.
7. Pull the parking brake lever.
8. Verify that the monitor light illuminates when each switch is made to function as described.

Procedure

Set conditions to deactivate each switch
- All accessories OFF
- Transaxle in neutral
- All pedals released

Does monitor light fail to illuminate?

NO →
Check each switch and related wire harness
- Clutch and neutral switch (MTX) ☞page F2–157
- Transaxle range switch ☞section K
- Closed throttle position switch ☞page F2–151
- Brake switch ☞'95 MX–3 BETM
- Headlight switch ☞'95 MX–3 BETM
- Rear window defroster switch ☞'95 MX–3 BETM
- Blower switch ☞'95 MX–3 BETM
- A/C switch ☞'95 MX–3 BETM
- Fog light switch ☞'95 MX–3 BETM

YES ↓

Check each switch as described

Neutral and Clutch switches (MTX)

Shift transaxle into gear
Does monitor light illuminate with clutch pedal released?

NO →
PC:
- Neutral switch malfunction ☞page F2–158
- Clutch switch malfunction ☞page F2–157
- Open circuit in related wire harness
- ECM terminal 1R voltage incorrect ☞page F2–141
- ECM malfunction

YES ↓

Depress clutch pedal
Does monitor light fail to illuminate?
Return transmission to neutral

NO →
PC: • Clutch switch malfunction ☞page F2–157

Transaxle range switch (ATX)

Shift transaxle into except P and N range
Does monitor light illuminate?

NO →
- Transaxle range switch malfunction (Refer to section K)
- Open or short circuit in related wire harness
- ECM terminal 1R malfunction (Refer to page F2–141)

YES ↓

Transaxle range switch OK
Shift into P or N range

Closed throttle position switch (In throttle position sensor)

Depress accelerator pedal
Does monitor light illuminate?

NO →
- Closed throttle position switch malfunction (Refer to page F2–151)
- Open or short circuit in wire harness from throttle position sensor to ECM
- ECM terminal 1T or 2I voltage incorrect (Refer to page F2–141)

YES ↓

Closed throttle position switch OK
Release accelerator pedal

Brake switch

Depress brake pedal
Does monitor light illuminate?

NO →
PC:
- Brake switch malfunction ☞'94 MX–3 BETM
- Open circuit in wire harness from brake switch to ECM
- ECM terminal 1Q voltage incorrect ☞page F2–141
- ECM malfunction

YES ↓

Brake switch OK
Release brake pedal

Headlight switch

Turn headlight switch ON
Does monitor light illuminate?

NO → PC: ● Headlight switch malfunction ☞'95 MX–3 BETM
● Open circuit in wire harness from headlight switch to ECM
● ECM terminal 1H voltage incorrect ☞page F2–141
● ECM malfunction

YES ↓

Headlight switch OK
Turn headlight switch OFF

DRL (CANADA)

Release parking brake
Does monitor light illuminate?

NO → PC: ● DRL system malfunction ☞'95 MX–3 BETM
● Open circuit in wire harness from DRL relay to ECM
● ECM terminal 2L voltage incorrect ☞page F2–141
● ECM malfunction

YES ↓

DRL system OK
Pull parking brake

Fan switch

Turn blower switch to 2nd or higher position
Does monitor light illuminate?

NO → PC: ● Fan switch malfunction ☞'95 MX–3 BETM
● Open circuit in wire harness from blower switch to ECM
● ECM terminal 1P voltage incorrect ☞page F2–141
● ECM malfunction

YES ↓

Fan switch OK

A/C switch

Turn A/C switch to 1st position
Turn A/C switch ON
Does monitor light illuminate?

NO → PC: ● A/C switch malfunction ☞'95 MX–3 BETM
● Open circuit in wire harness from A/C switch to blower switch
● ECM terminal 1O voltage incorrect ☞page F2–141
● ECM malfunction

YES ↓

A/C switch OK

Rear window defroster switch

Turn rear window defroster switch ON
Does monitor light illuminate?

NO → PC: ● Rear window defroster switch malfunction ☞'95 MX–3 BETM
● Open circuit in wire harness from rear window defroster switch to ECM
● ECM terminal 1J voltage incorrect ☞page F2–141
● ECM malfunction

YES ↓

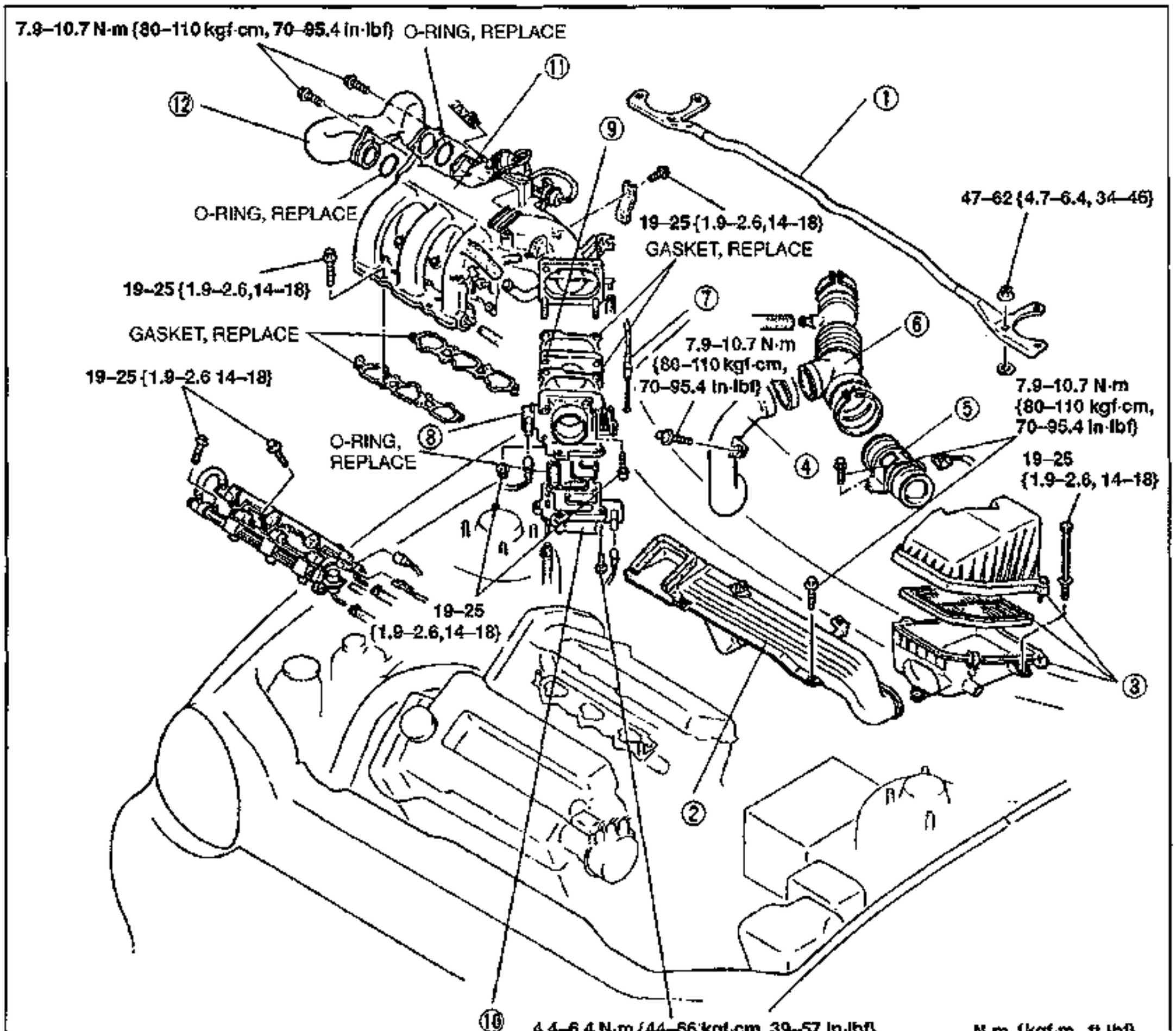
Rear window defroster switch OK
Turn rear window defroster switch OFF

INTAKE-AIR SYSTEM

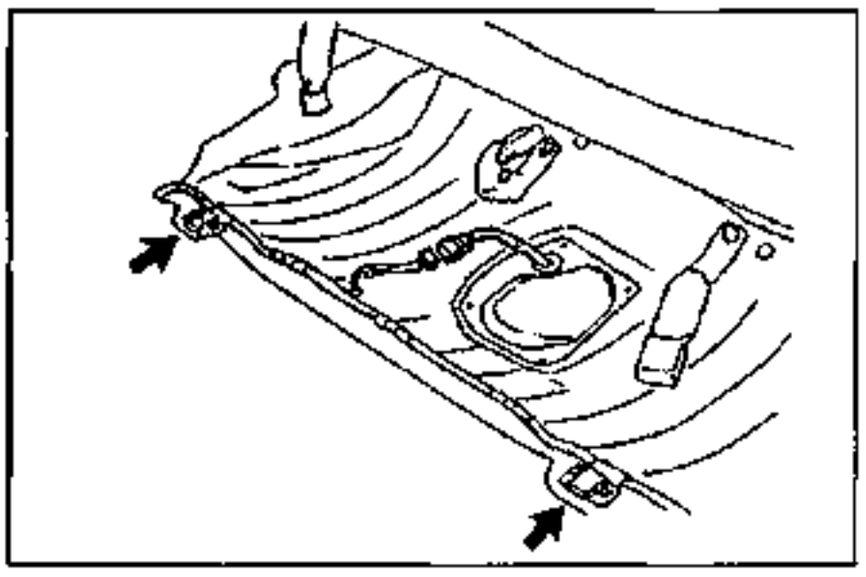
COMPONENTS

Removal / Inspection / Installation

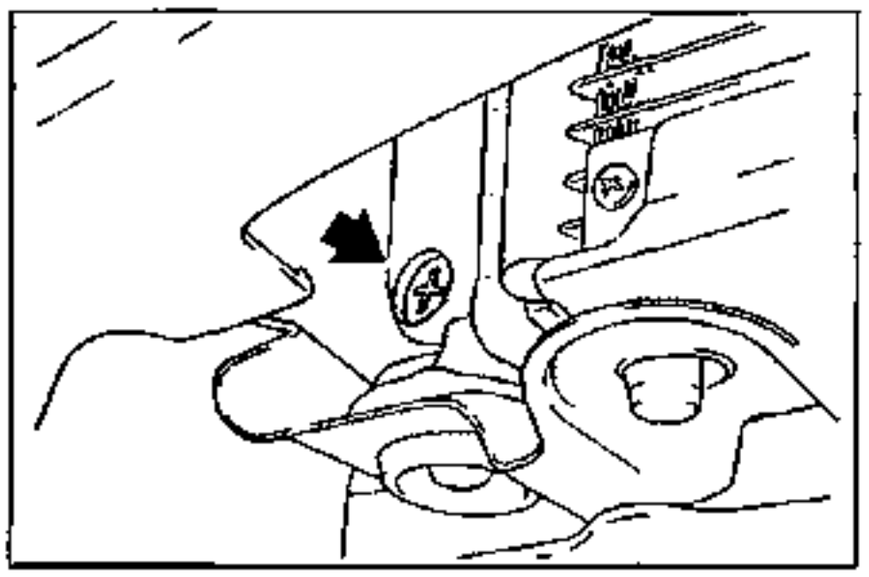
1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Check the components for damage and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note.**



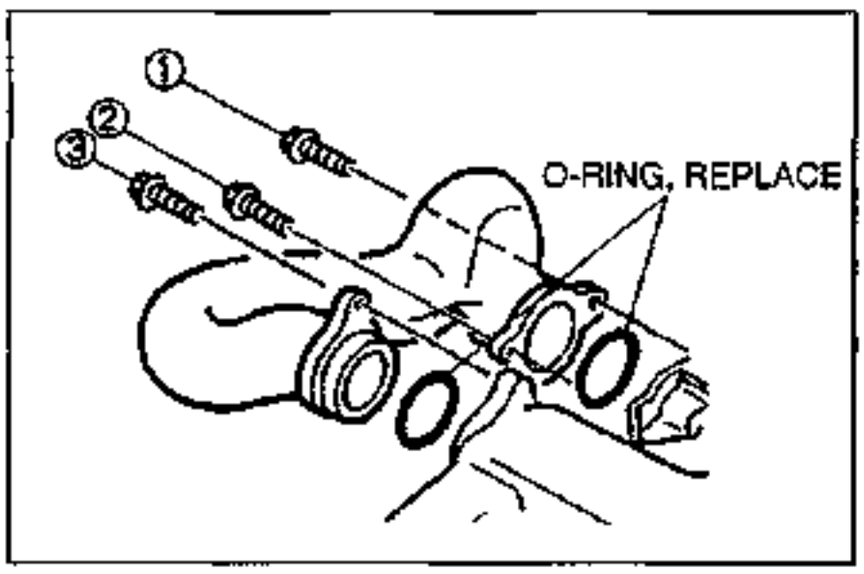
1. Strut bar
2. Fresh–air duct
   Inspect for damage or cracks
3. Air cleaner
   Inspection ..... page F2– 70
4. Resonance duct
   Inspect for damage or cracks
5. Volume air flow sensor
   Inspection ..... page F2–150
6. Air intake hose
   Inspect for damage
7. Accelerator cable
   Inspection / Adjustment ..... page F2–97
8. Throttle body
   Inspection ..... page F2–96
9. Spacer
   Inspect for damage
10. BAC valve
    Inspection ..... page F2–99
11. Intake manifold
    Inspection ..... page F2–96
12. Air intake pipe
    Inspection ..... page F2–96



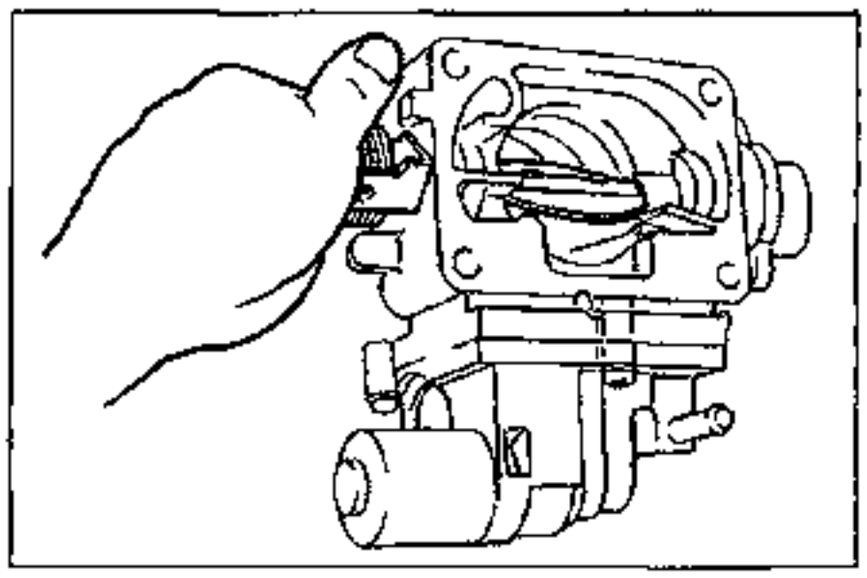
Removal Note
Fuel hose
Before disconnecting the delivery pipe, release the fuel pressure from the fuel system to reduce the possibility of injury or fire.
(Refer to page F2–106)



Water hose
1. Before disconnecting the water hose from BAC valve, drain the coolant from the drain plug as shown in figure.
2. After installing the throttle body, fill up the coolant to the radiator.

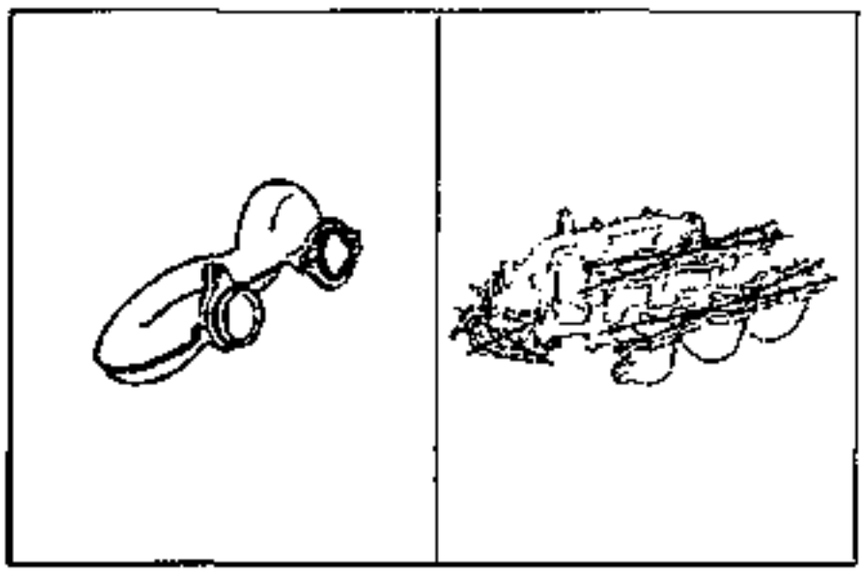


Installation Note
Air intake pipe
1. Apply small amount of clean engine oil to O-rings.
2. Install the air intake pipe carefully without damaging the O-rings.
3. Tighten the bolts in the order shown in the figure.



THROTTLE BODY
Inspection
1. Check the throttle body for wear, coolant leakage, and deposit.
2. Verify that the throttle valve moves smoothly when the throttle lever is moved from fully closed to fully open.
3. Replace the throttle body if necessary.

Removal / Installation
(Refer to page F2–95.)

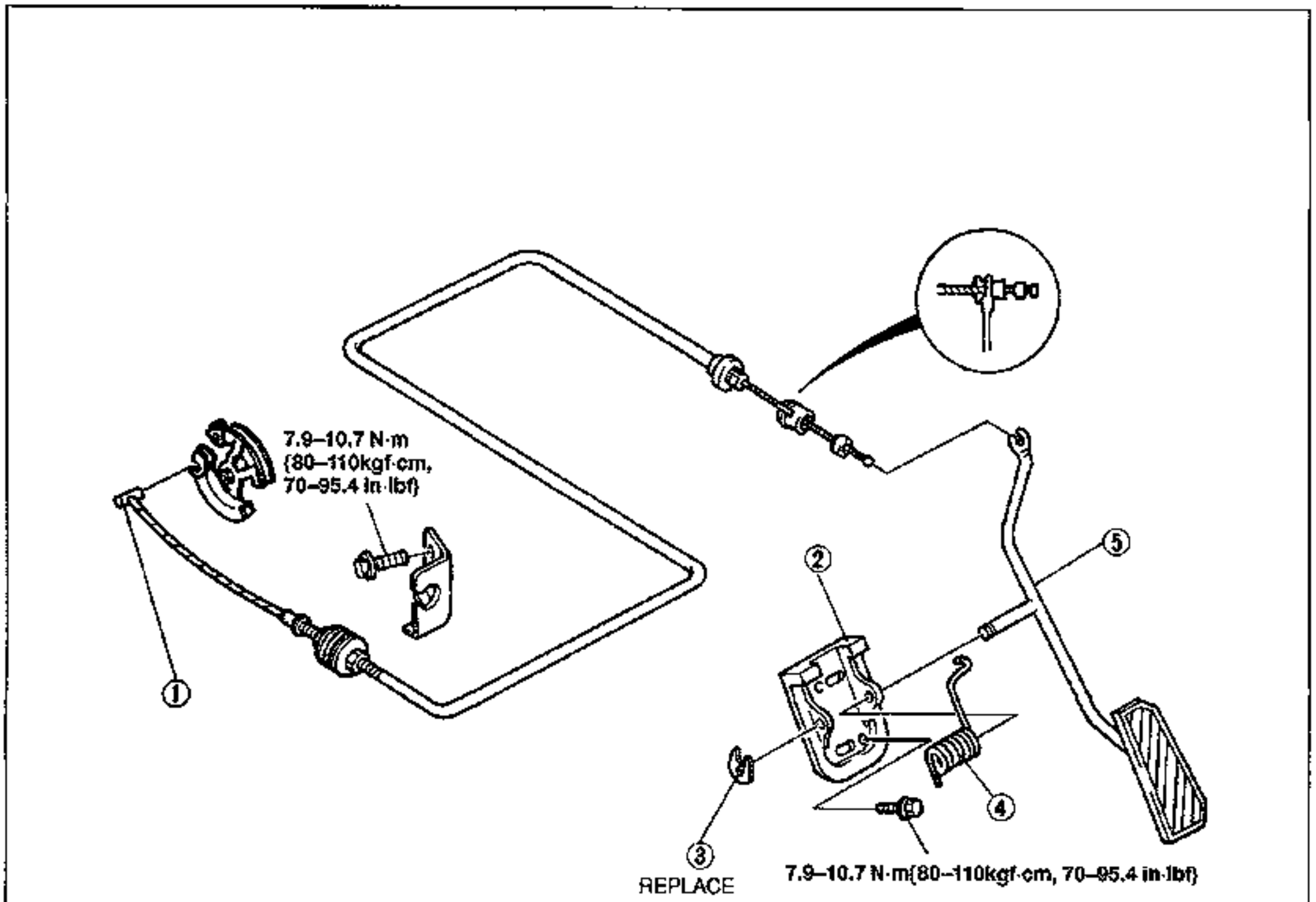


AIR INTAKE PIPE / INTAKE MANIFOLD
Inspection
1. Check for damage and cracks.
2. Check the air intake pipe and intake manifold contact surface for distortion as shown in the figure.
3. Replace the air intake pipe/intake manifold if necessary.

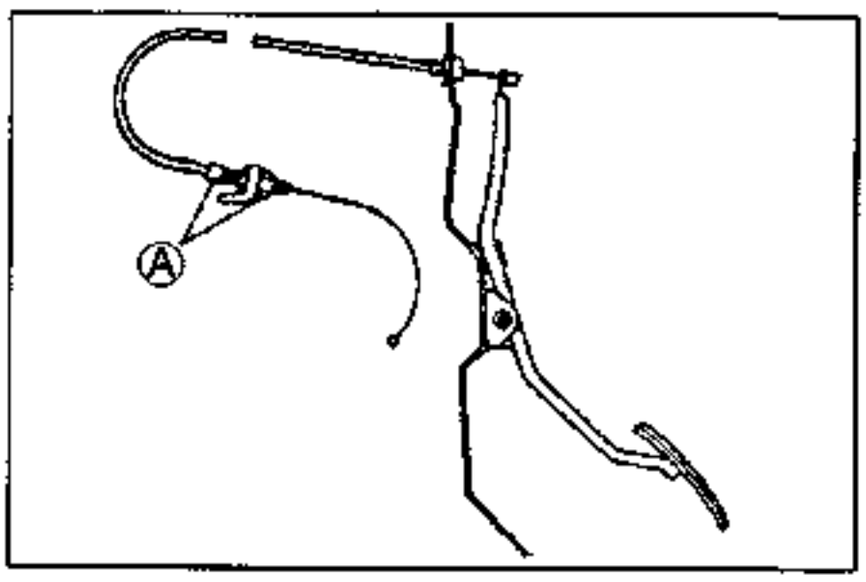
ACCELERATOR PEDAL

Removal / Inspection / Installation

1. Remove in the order shown in figure.
2. Visually check the accelerator pedal and retainer for cracks and damage. Repair or replace as necessary.
3. Install in the reverse order of removal.



1. Accelerator cable
   Inspection / Adjustment ..... below
2. Retainer
3. Clip
4. Return spring
5. Accelerator pedal
   Inspect for damage



ACCELERATOR CABLE

Installation / Adjustment

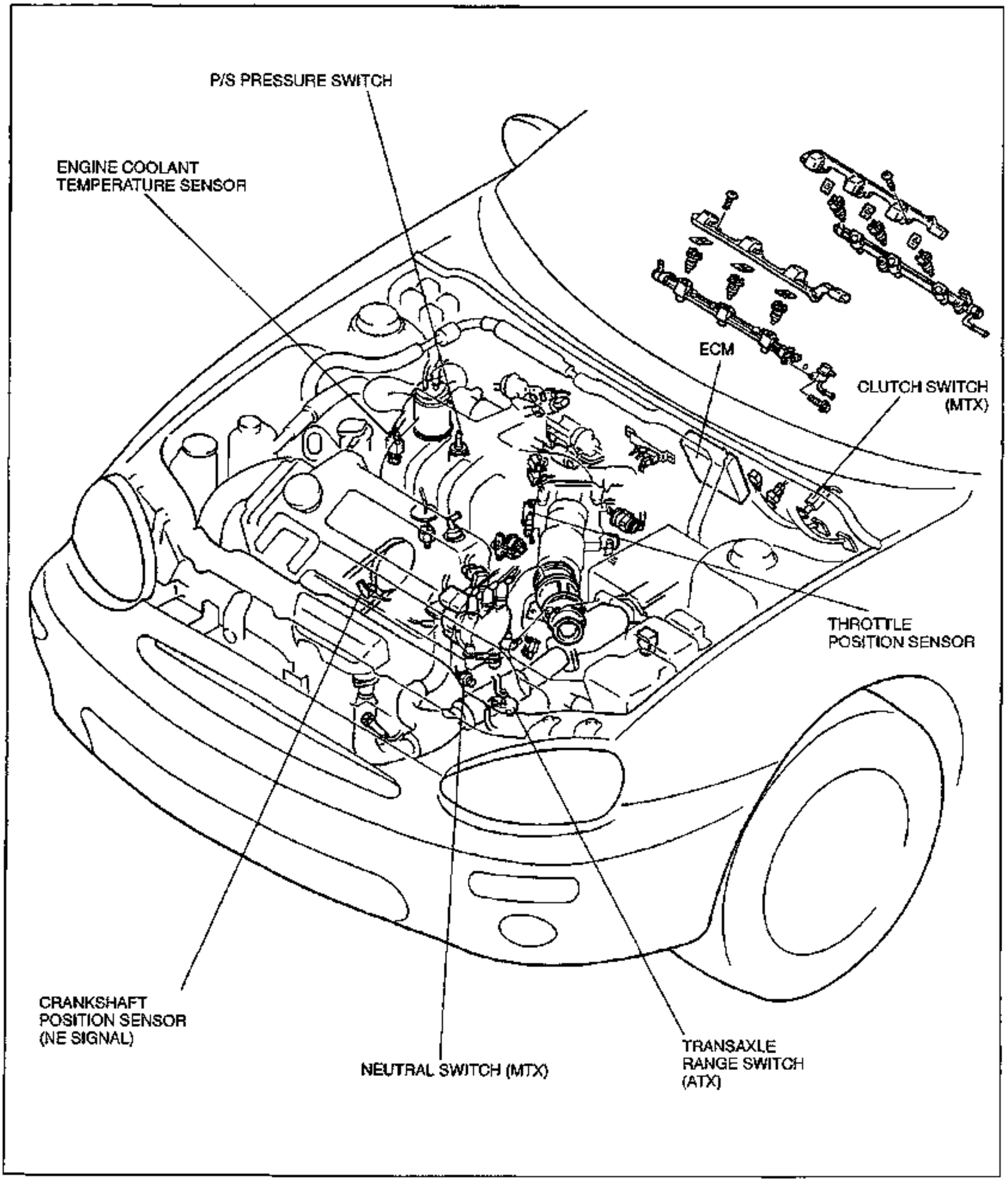
1. Depress the accelerator pedal fully. Check if the throttle valve is fully opened.
2. Inspect the accelerator cable play.

   Play 1.0–3.0 mm {0.04–0.11in}.

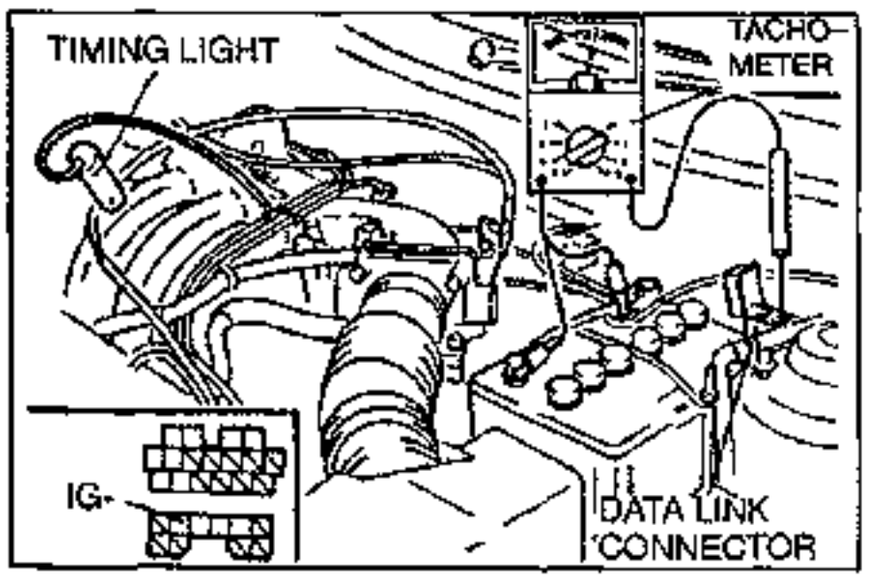
3. Loosen nut Ⓐ to adjust the play if necessary.

IDLE AIR CONTROL SYSTEM

DESCRIPTION



Idle air control system controls the bypass air amount that passes through the throttle body and improve stability, quick warm-up, idle stability and drivability. This system consists of the idle air control valve, air valve, ECM, and input devices.



SYSTEM OPERATION

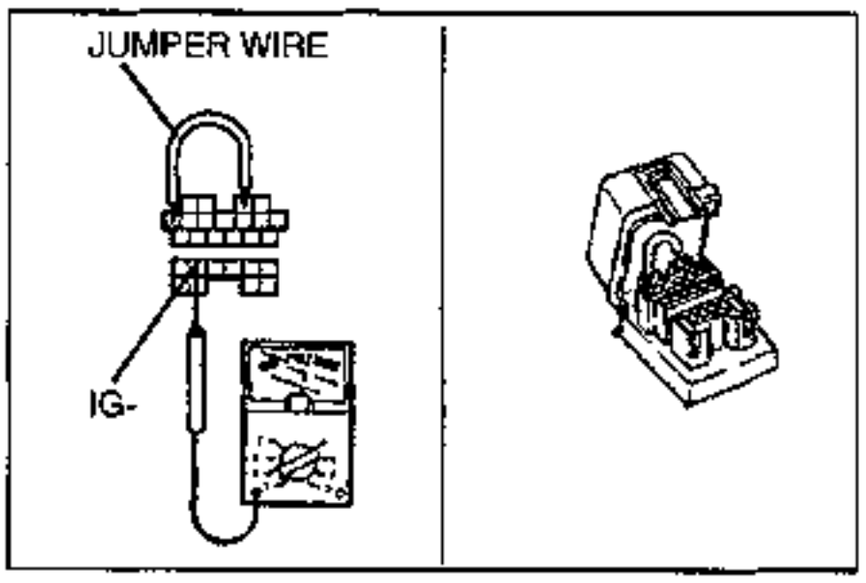
1. Warm up the engine to normal operating temperature.
2. Shift the selector lever to neutral (MTX) or P (ATX).
3. Turn all electric loads OFF.
4. Connect a tachometer to the data link connector terminal **IG-** as shown.
5. Verify that the coolant fan is turned off.
6. Verify that the idle speed is within the specification.

Idle speed (Neutral or P range)
:640–700 rpm {670 ± 30 rpm}

7. If not within the specification, adjust the idle speed. (Refer to page F2–71.)
8. Verify that the idle speed is within the specification under the conditions below.

Condition	Idle speed {rpm}
No load	640–700
Electrical load ON	640–700
Air Conditioner ON	720–760
P/S operating	640–700

9. If not as specified, check the related wiring harness, switches and sensors.

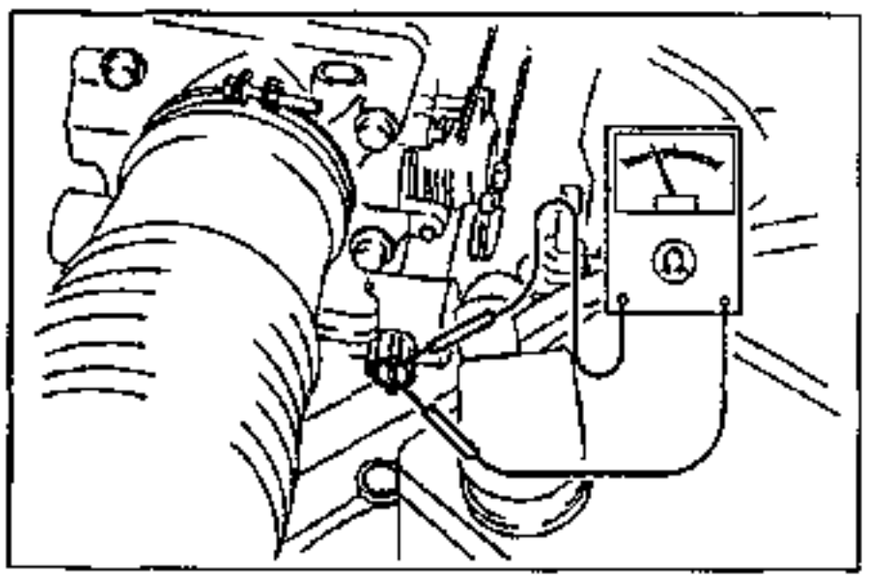


BAC VALVE

Inspection

Air valve

1. Connect the data link connector terminals **TEN** and **GND** with a jumper wire.
2. Connect a tachometer to the data link connector terminal **IG-**.
3. Start the engine.
4. The idle speed should decrease gradually as the engine warms up.



Idle air control valve

1. Disconnect the idle air control valve connector.
2. Measure the resistance of the idle air control valve with an ohmmeter.

Resistance: 10.7–12.3Ω (at 20°C {68°F})

3. If not as specified, replace the idle air control valve.

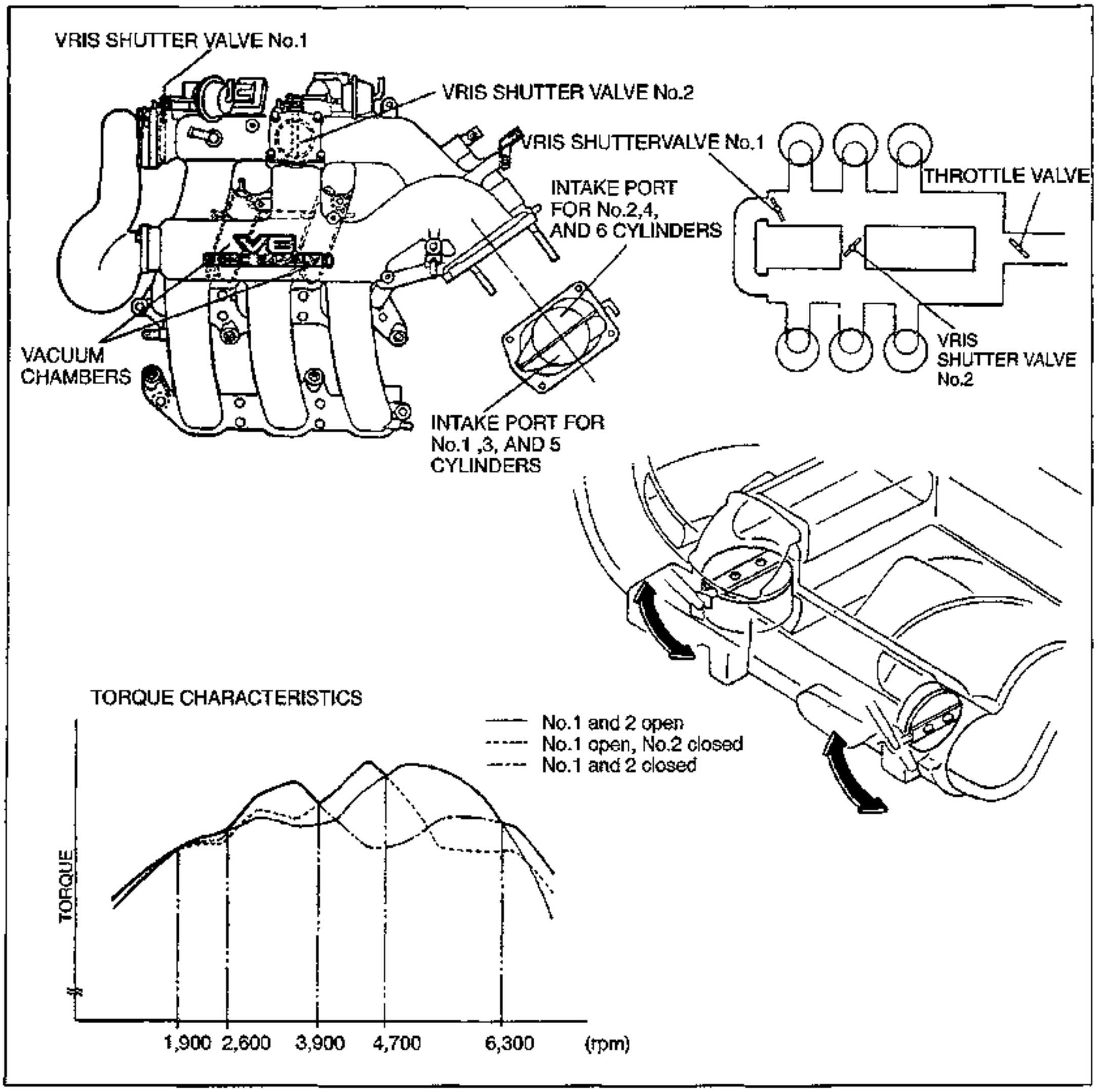
Removal / Installation

(Refer to page F2–95.)

VARIABLE RESONANCE INDUCTION SYSTEM (VRIS)

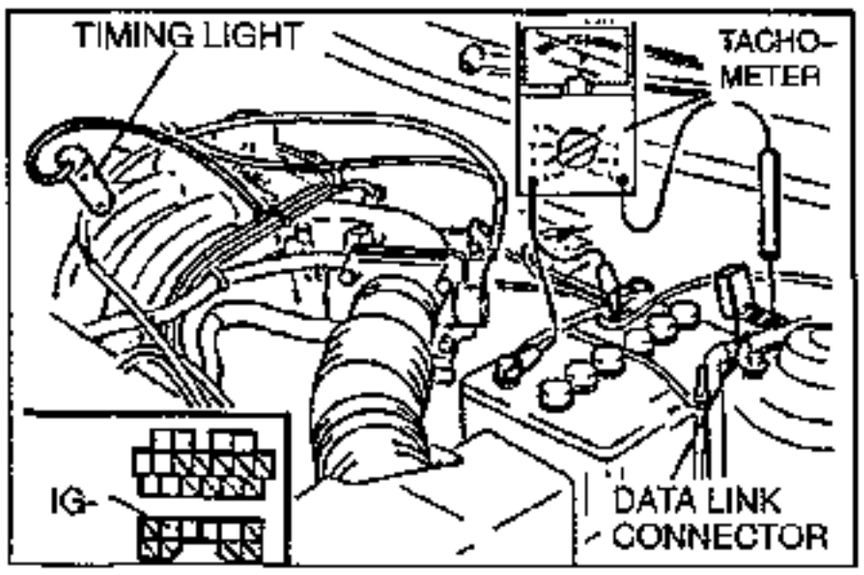
DESCRIPTION

The inside of the dynamic chamber is divided into two, and two shutter valves are equipped on the connecting pipes for variable resonance induction system.
This system opens and closes the shutter valves according to the engine speed to improve the charging efficiency by utilizing the pressure waves of the intake air.
There are two vacuum chambers under the left bank of the intake manifold in order to supply constant vacuum to the VRIS shutter valve actuators during wide-open throttle operation and other low-vacuum, low-speed situations.



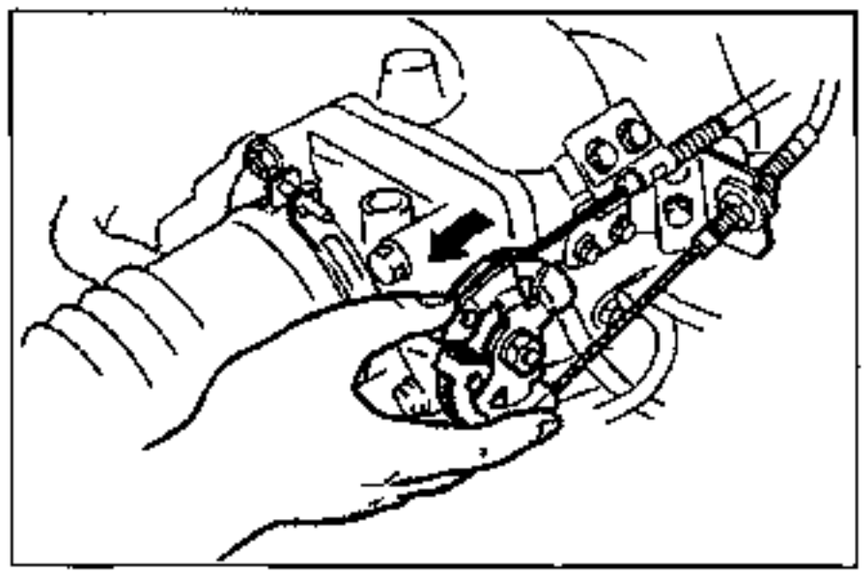
Operation

Engine speed (rpm)	–1,900	1,900–2,600	2,600–3,900	3,900–4,700	4,700–6,300	6,300–
VRIS shutter valve No.1	closed	open	closed	open	open	closed
VRIS shutter valve No.2	closed	open	closed	closed	open	closed

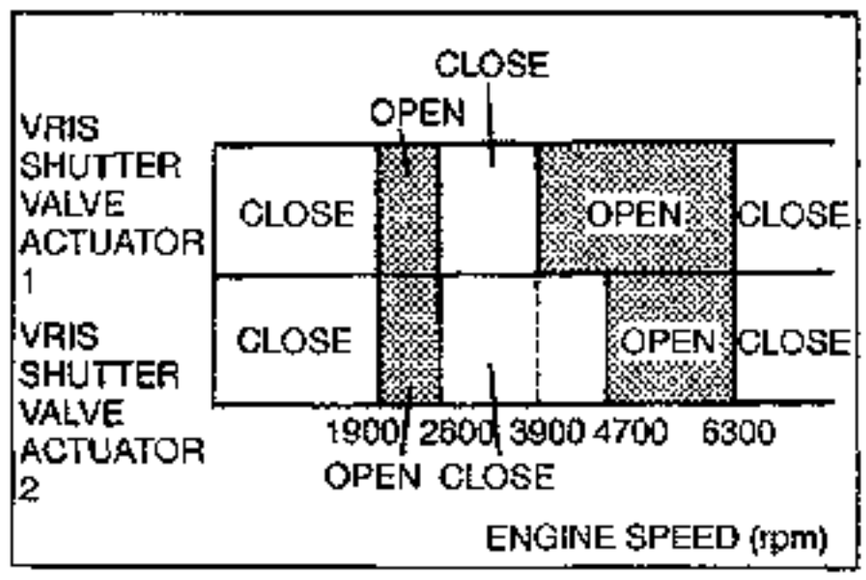


SYSTEM OPERATION

1. Start the engine and run it at idle.
2. Connect a tachometer to the data link connector IG- terminal as shown.



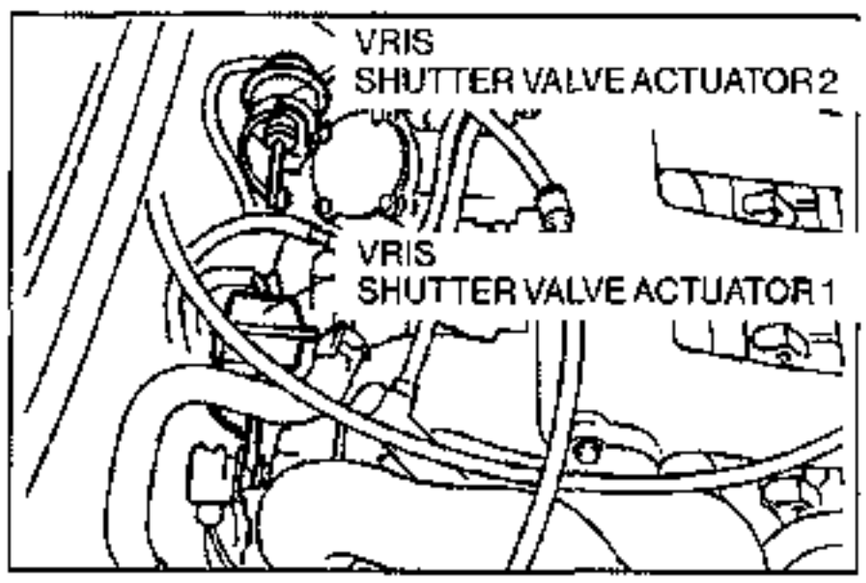
3. Open the throttle valve.



4. Verify that the rod is pulled into the shutter valve actuator 1 and 2 when the engine speed is as shown.

Note

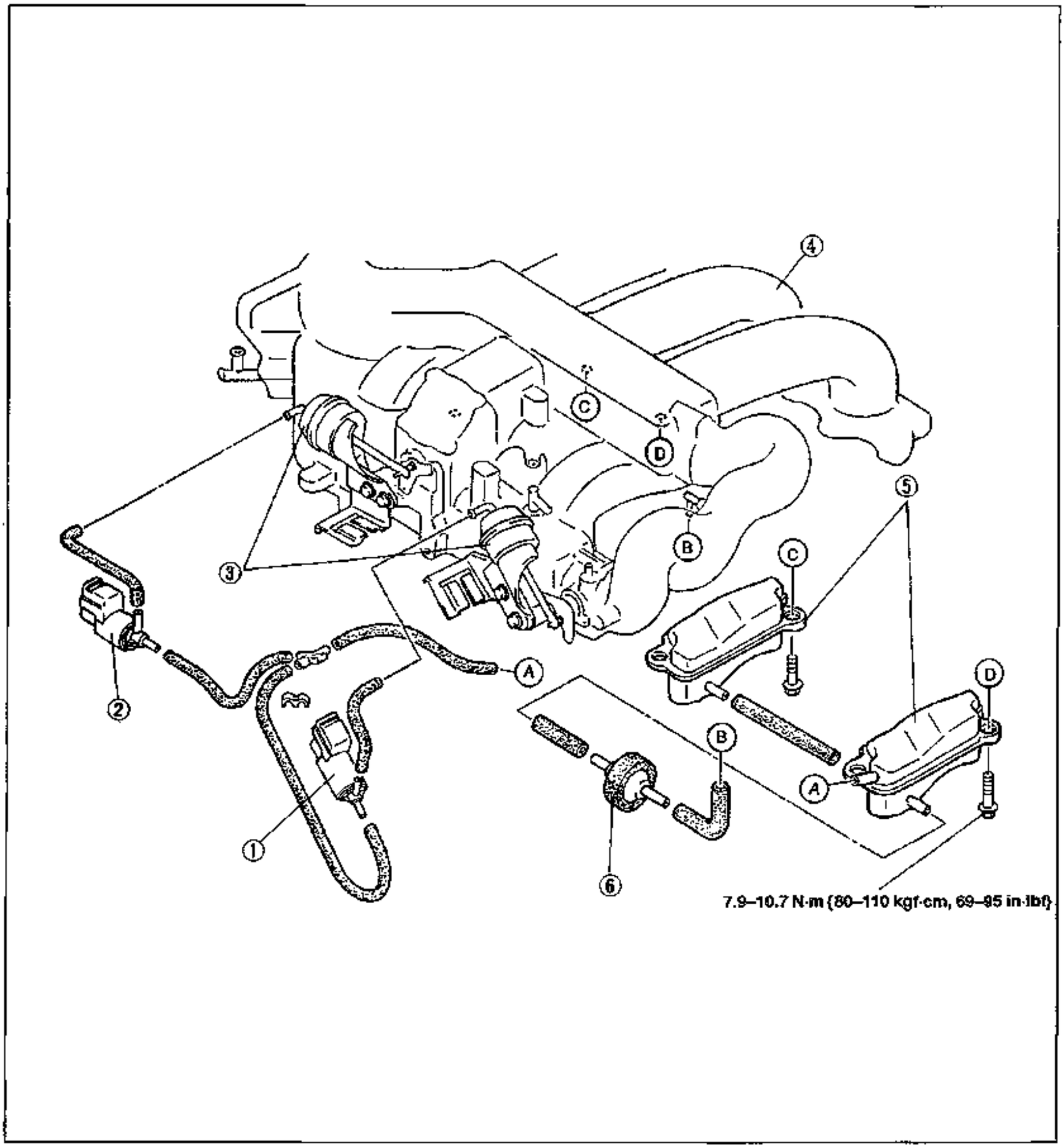
- The operation of the shutter value actuator cannot be checked unless load condition while the engine speed is within 1,900–2,600 rpm as shown in the figure.



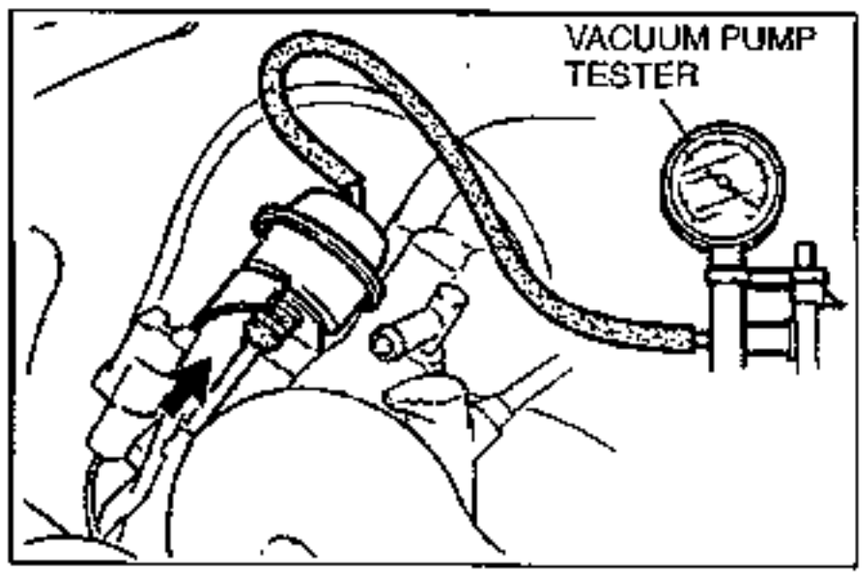
COMPONENTS

Removal / Inspection / Installation

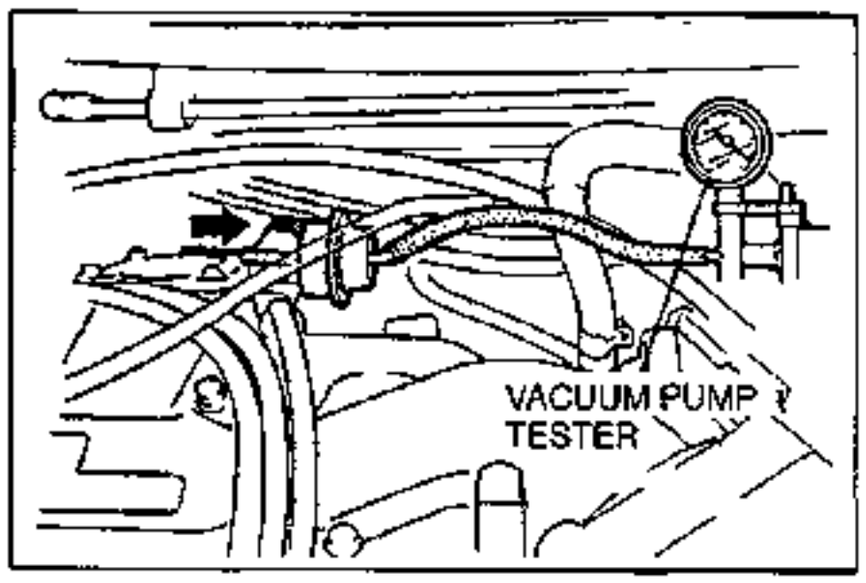
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.

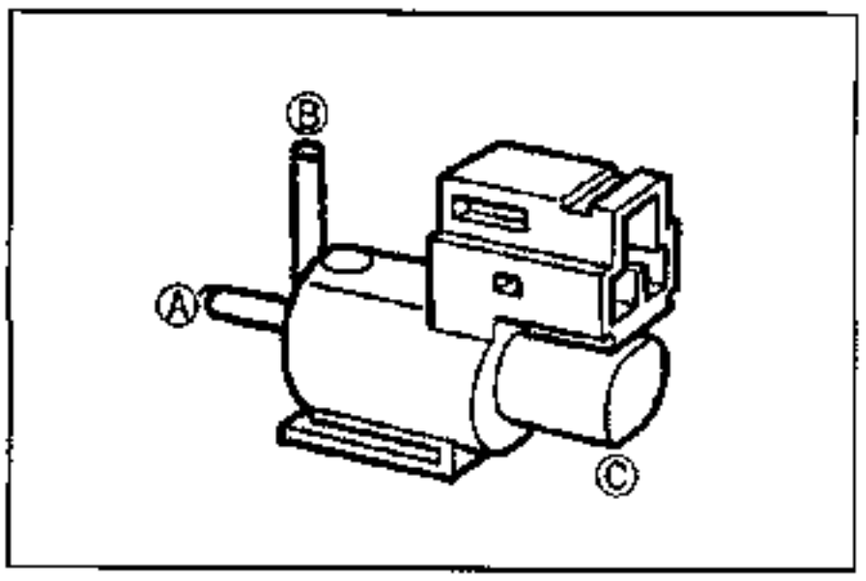


1. VRIS solenoid valve No.1
   Inspection ..... page F2–103
2. VRIS solenoid valve No.2
   Inspection ..... page F2–103
3. VRIS shutter valve actuator No.1 and No.2
   Inspection ..... page F2–103
4. Intake manifold
   Removal/ Inspection
   Installation ..... page F2– 95
5. Vacuum chamber
   Inspection ..... page F2–104
6. Check valve
   Inspection ..... page F2–103



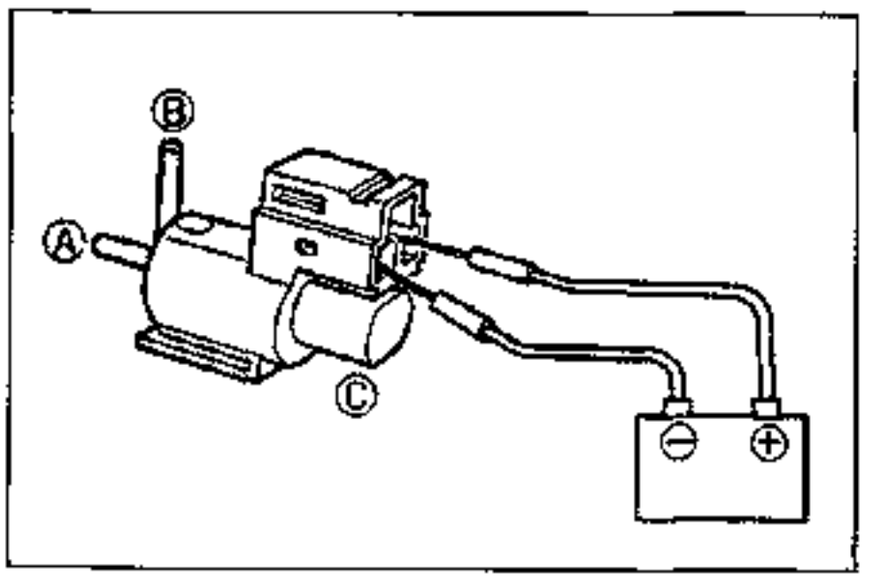
VRIS SHUTTER VALVE ACTUATOR No.1 AND No.2
Inspection
1. Disconnect the vacuum hose from the shutter valve actuator.
2. Connect a vacuum pump tester to the actuator.
3. Apply vacuum and verify that the rod is pulled into the actuator.





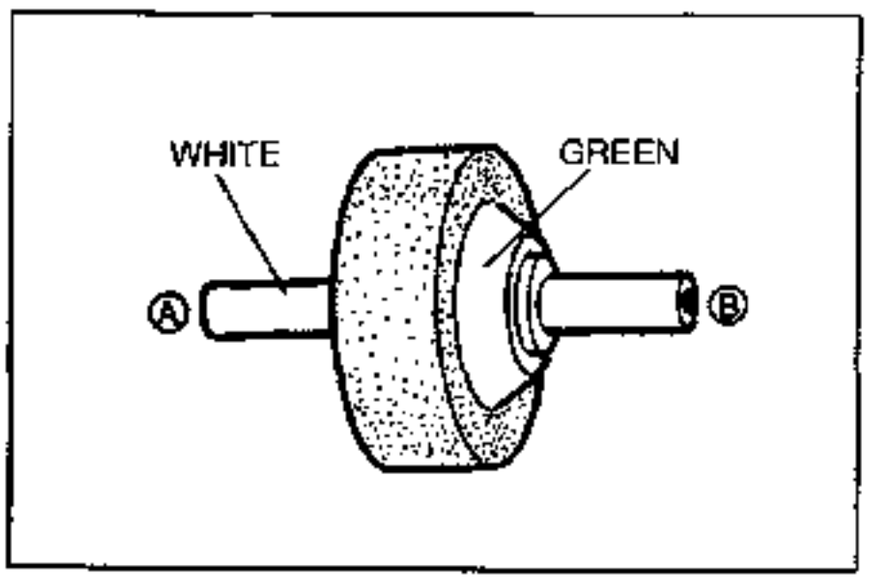
VRIS SOLENOID VALVE No.1 AND No.2
Inspection
1. Disconnect the solenoid valve.
2. Verify that air flows between each port as below.

Port	Airflow
A–B	No
A–C	No
B–C	Yes

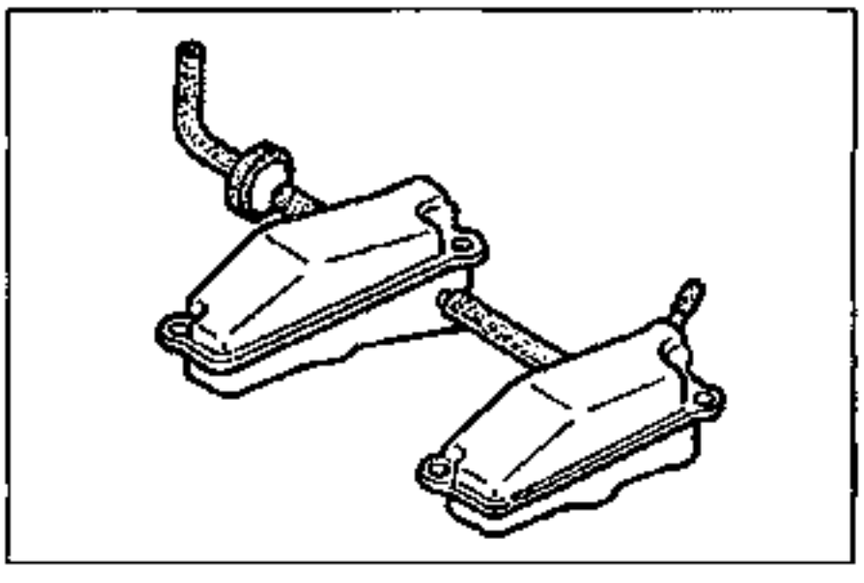


3. Connect battery positive voltage and a ground to the terminals of the solenoid valve.
4. Verify that air flows between each port as below.

Port	Airflow
A–B	Yes
A–C	No
B–C	No



CHECK VALVE
Inspection
1. Remove the check valve.
2. Blow through Ⓐ and verify that air flows from Ⓑ.
3. Blow through Ⓑ and verify that air does not flow from Ⓐ.



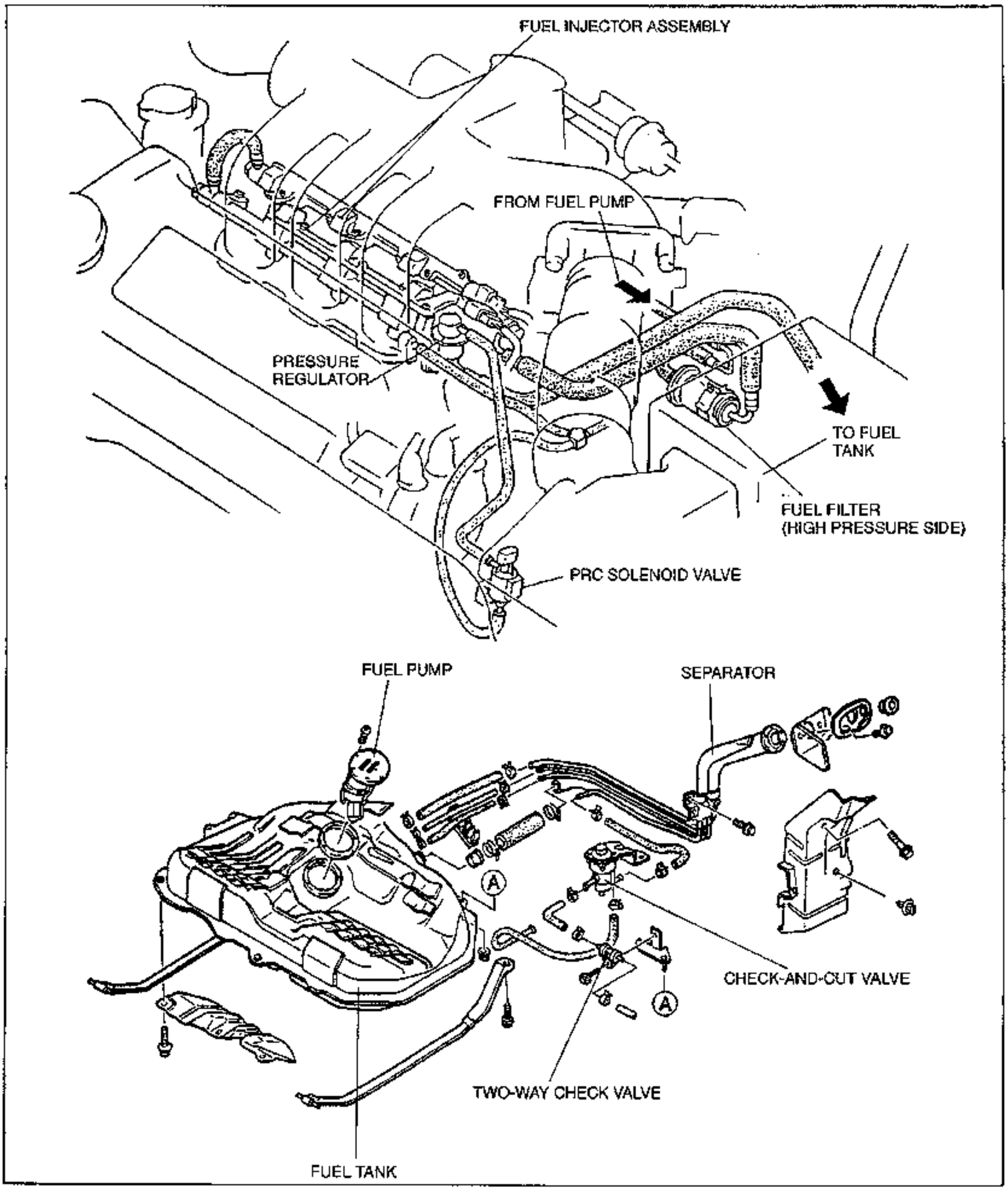
VACUUM CHAMBER

Inspection

1. Visually check the vacuum chamber for clogging, damage, or cracks.
2. Replace if necessary.

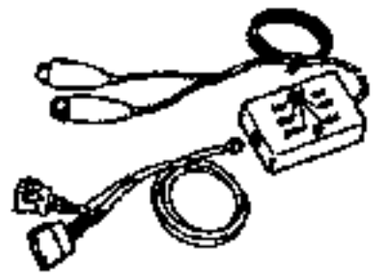
FUEL SYSTEM

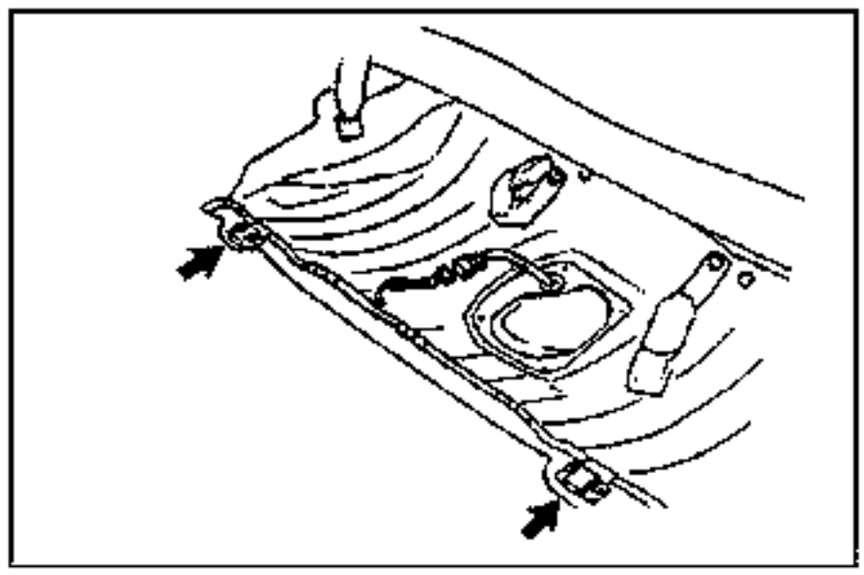
DESCRIPTION

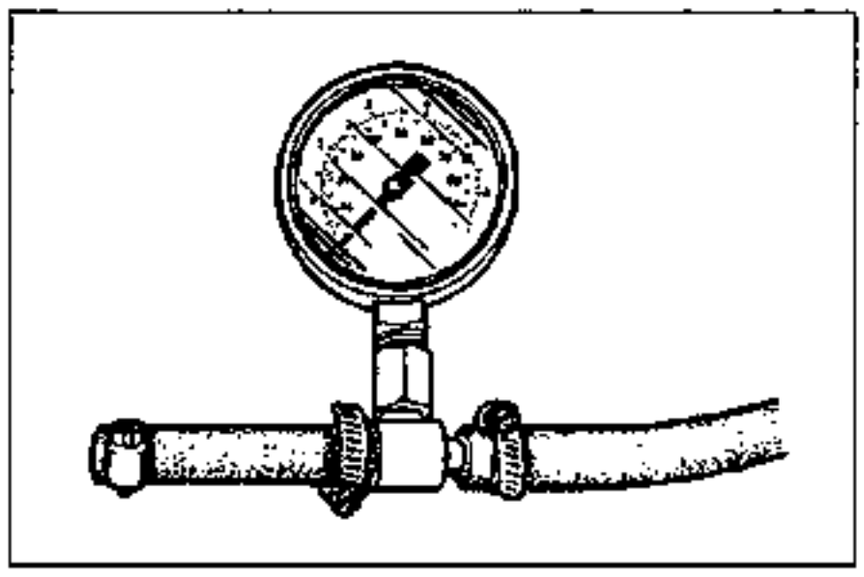


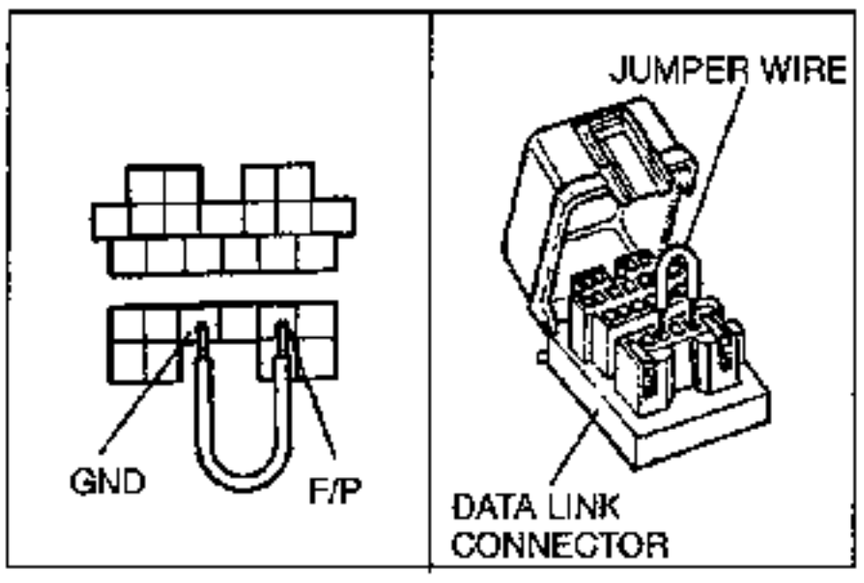
This system supplies the necessary fuel to the fuel injectors for combustion at a constant pressure. Fuel is metered and injected into the engine intake ports according to injection control signals from the engine control module. The system consists of the fuel tank, fuel pump, fuel filters, fuel distributor, pressure regulator, fuel injectors, and fuel pump relay.

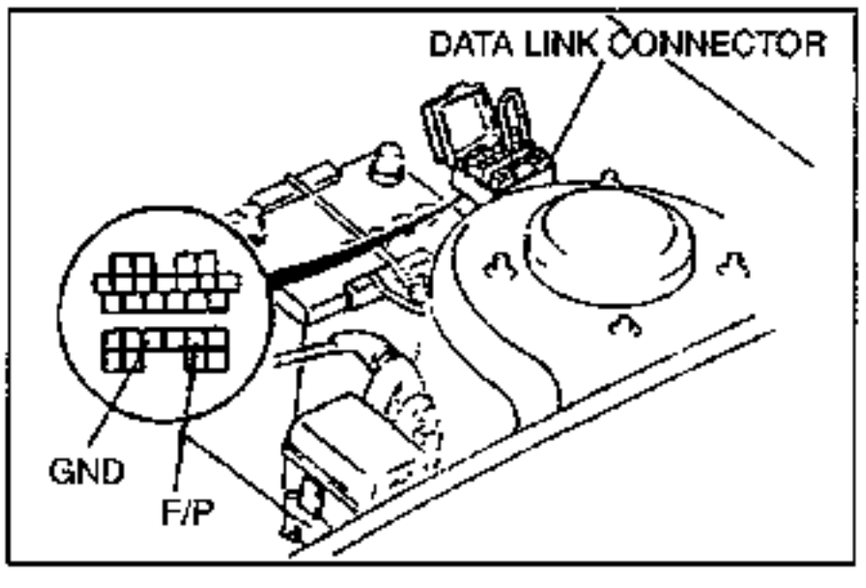
PREPARATION
SST

49 E018 9A0 Injector checker		For inspection of fuel injector









Fuel Pressure and Servicing Fuel System

Warning
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**

Fuel in the fuel system is under high pressure when the engine is not running.

Warning
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the following "Fuel Line Safety Procedures".**

Fuel Line Safety Procedures

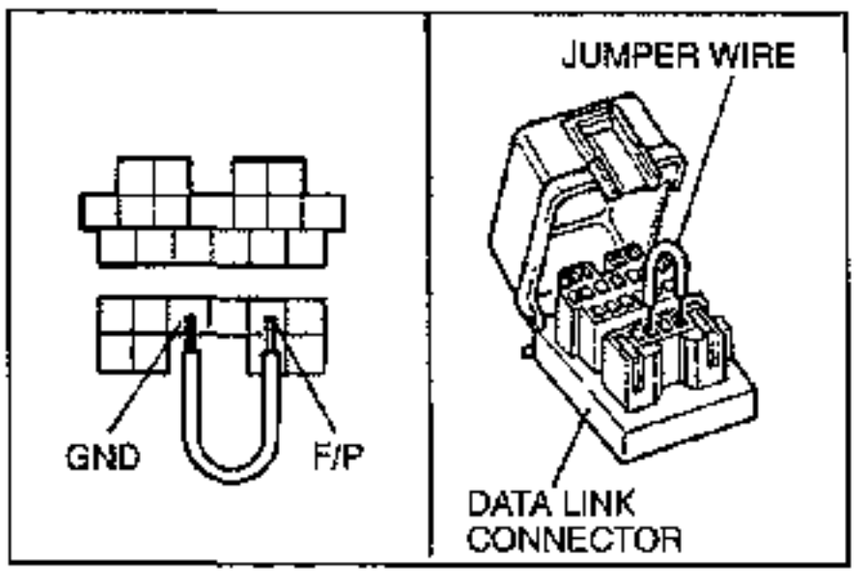
A. Release the fuel pressure before disconnecting a fuel line.
1. Start the engine.
2. Remove the fuel pump relay.
3. After the engine stalls, turn the ignition switch to OFF.
4. Install the fuel pump relay.

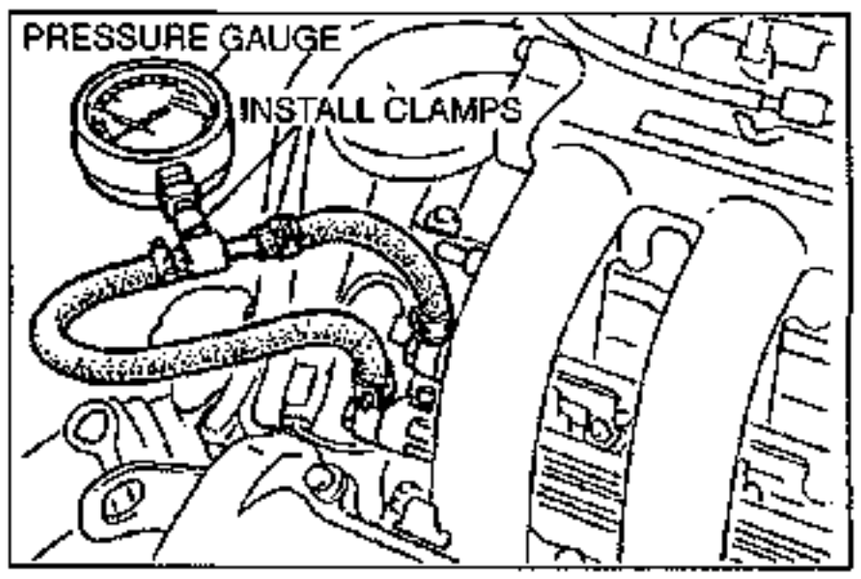
B. Avoid leakage.
1. When disconnecting a fuel line hose, wrap a rag around it to protect against fuel leakage.
2. Plug the hose after removal.

C. Install hose clamps to secure the fuel pressure gauge to the fuel filter and the main hose.

Priming Fuel System

After the fuel pressure has been released for repairs or inspection, the system must be primed to avoid excessive cranking when the engine is first started. Follow the steps below.
1. Connect the data link connector terminals F/P and GND by using a jumper wire.
2. Turn the ignition switch to ON for **approximately 10 sec.** and check for fuel leaks.
3. Turn the ignition switch to OFF and remove the jumper wire.





SYSTEM OPERATION

Fuel Pressure Hold Inspection

Warning

- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on page F2–106.**

1. Disconnect the negative battery cable.
2. Install a fuel pressure gauge as shown in the figure.
3. Connect the negative battery cable.
4. Connect the data link connector terminals F/P and GND by using a jumper wire.
5. Turn the ignition switch to ON for **10 sec.** to operate the fuel pump.
6. Turn the ignition switch to OFF and disconnect the jumper wire.
7. Observe the fuel pressure **after 5 min.**

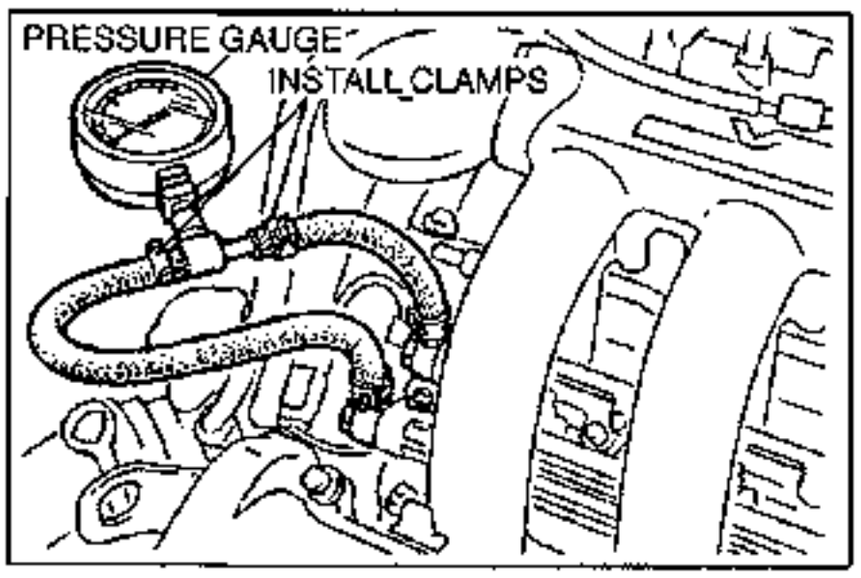
Fuel pressure:
More than 150 kPa {1.5 kgf/cm², 21 psi}

8. If not as specified, perform the following inspections.
   - Fuel pump hold pressure (Refer to page F2–111.)
   - Pressure regulator hold pressure (Refer to page F2–114.)
   - Fuel injector fuel leakage (Refer to page F2–116.)

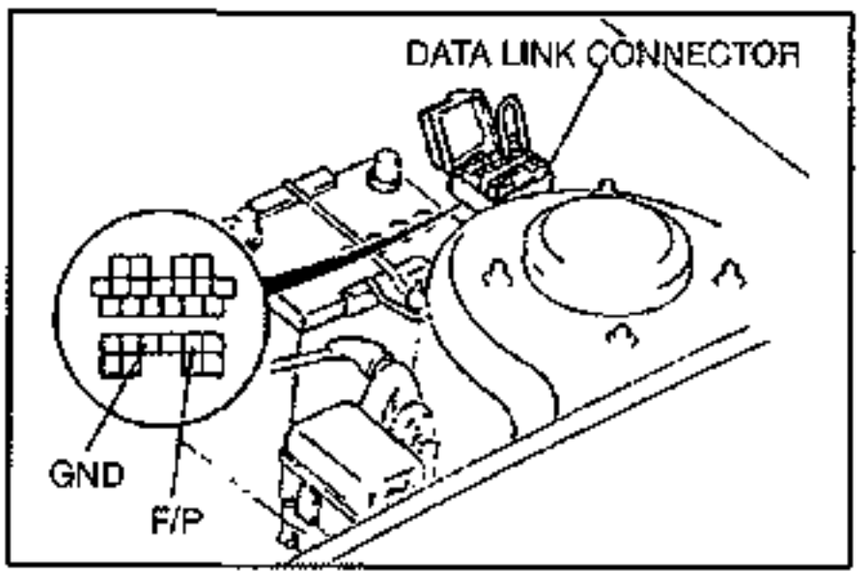
Fuel Line Pressure Inspection

Warning

- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on page F2–106.**



1. Disconnect the negative battery cable.
2. Install a fuel pressure gauge as shown in the figure.
3. Connect the negative battery cable.



4. Connect data link connector terminals F/P and GND by using a jumper wire.
5. Turn the ignition switch to ON.
6. Measure the fuel line pressure.

Fuel line pressure:
260–310 kPa {2.6–3.2 kgf/cm², 37–45 psi}

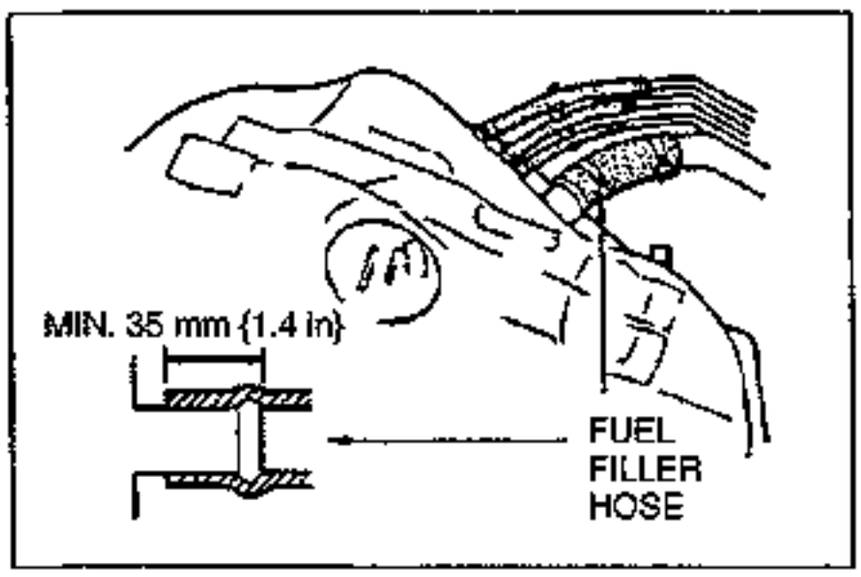
Pressure low – Measure fuel pump maximum pressure. (Refer to Page F2–110.) If as specified, the fuel line or fuel filter might be clogged or restricted.
Pressure high – Replace the pressure regulator.

FUEL TANK
Removal / Inspection / Installation

Warning
- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on page F2–106.**
- **Repairing a fuel tank that has not been properly steam cleaned can be dangerous. Explosion or fire may cause death or serious injury. Always properly steam clean a fuel tank before repairing it.**

1. Remove in the order shown in the figure.
2. Inspect the fuel tank components visually and repair or replace if necessary.
3. Install in the reverse order of removal, referring to **Installation Note**.

1. Rear seat cushion
2. Fuel pump cover
3. Fuel pump connector
4. Fuel hose
   Installation Note ..... page F2–109
5. Evaporative hose
   Installation Note ..... page F2–109
6. Insulator
7. Fuel tank strap
8. Fuel tank
   Inspect for cracks and corrosion
9. Protector
10. Separator
    Inspect for cracks and corrosion



Installation Note

1. Push the ends of the main fuel hose, fuel return hose, and evaporative hoses onto the fuel tank fittings **at least 25 mm {1.0 in}**.
2. Push the fuel filler hose onto the fuel tank pipe and filler pipe **at least 35 mm {1.4 in}**.

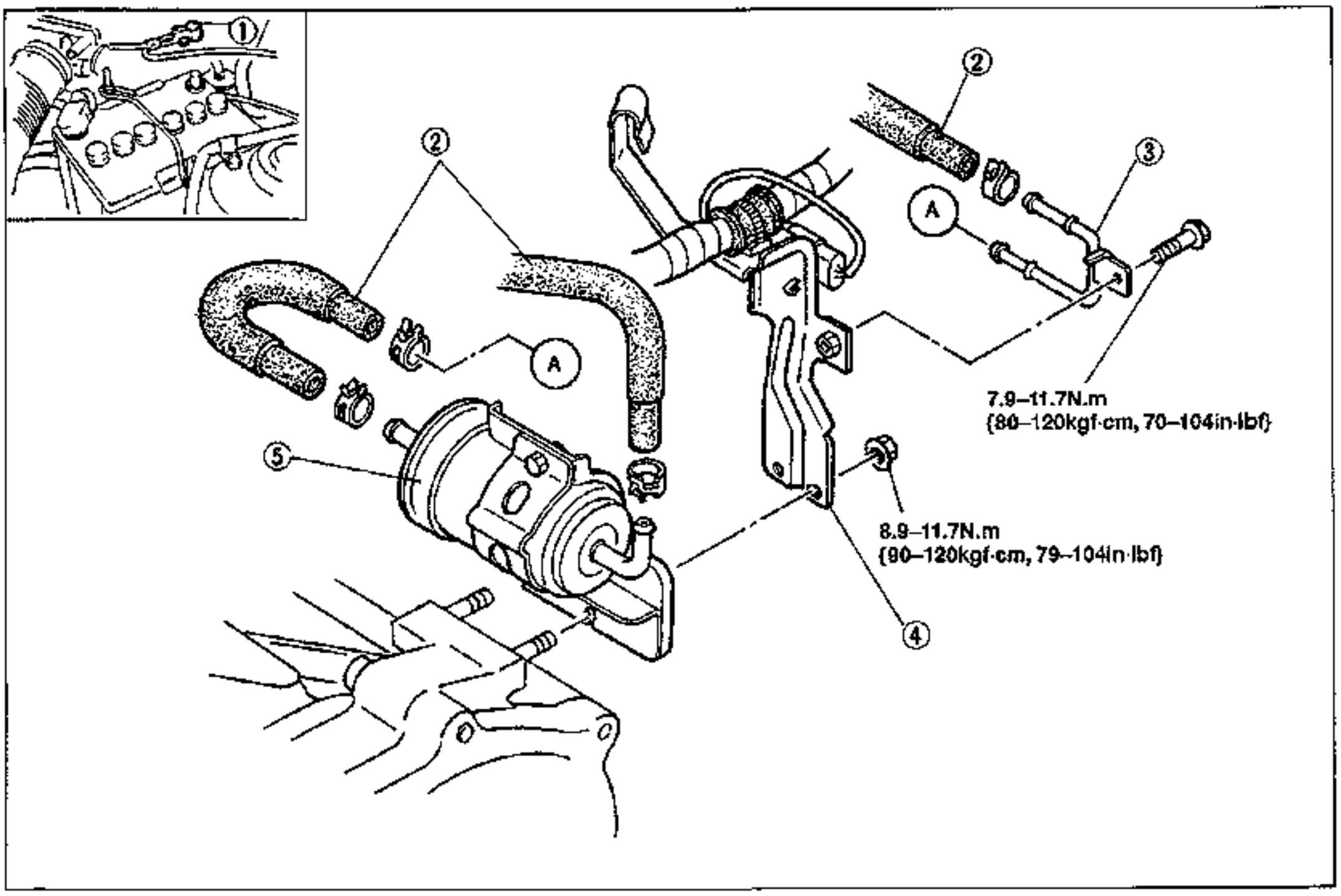
FUEL FILTER

Replacement

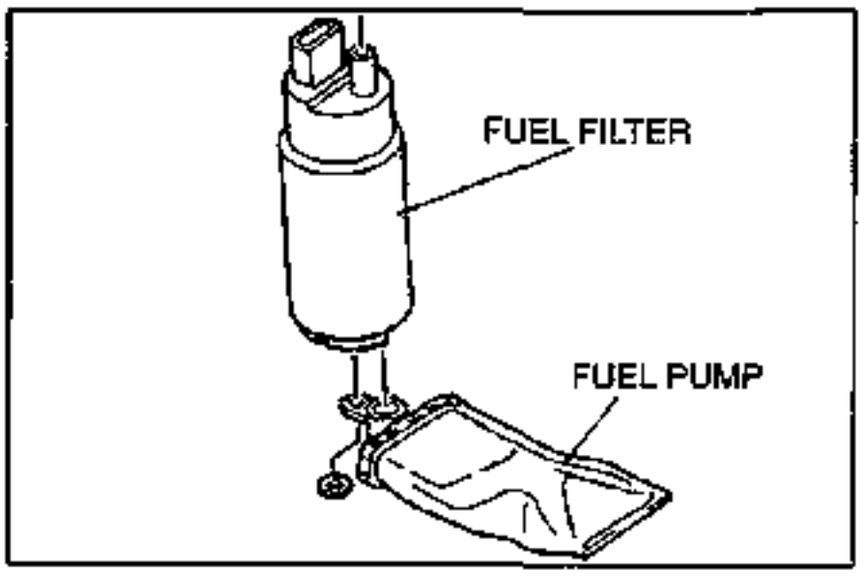
High pressure side

The fuel filter must be replaced at the intervals outlined in the maintenance schedule.

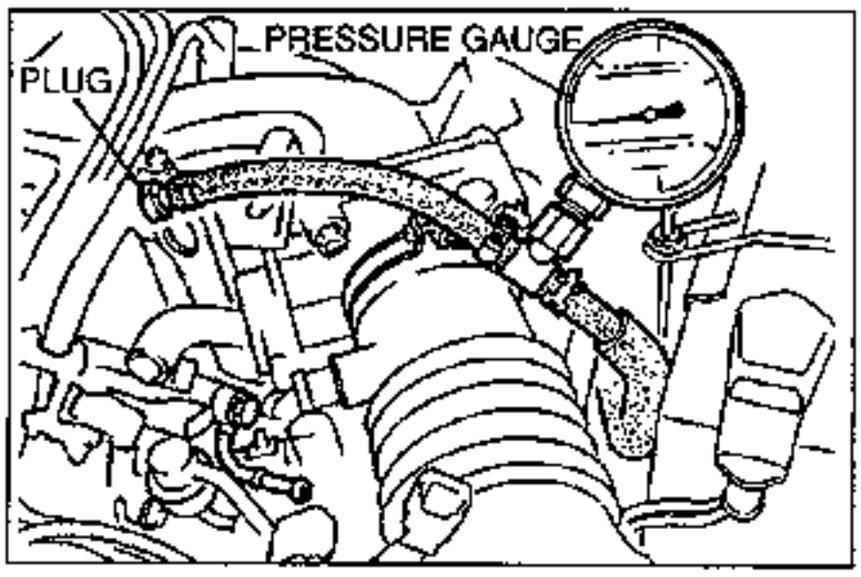
1. Before removing the fuel filter, release the fuel pressure from the fuel system.
2. Remove in the order shown in figure.
3. Install in the reverse order of removal.
4. Verify that the fuel hoses are pushed fully onto the fuel filter nozzles.



1. Negative battery cable
2. Fuel hose
3. Fuel pipe
4. Bracket
5. Fuel filter (High pressure side)



Low pressure side (In-tank filter)
(Refer to page F2–112.)



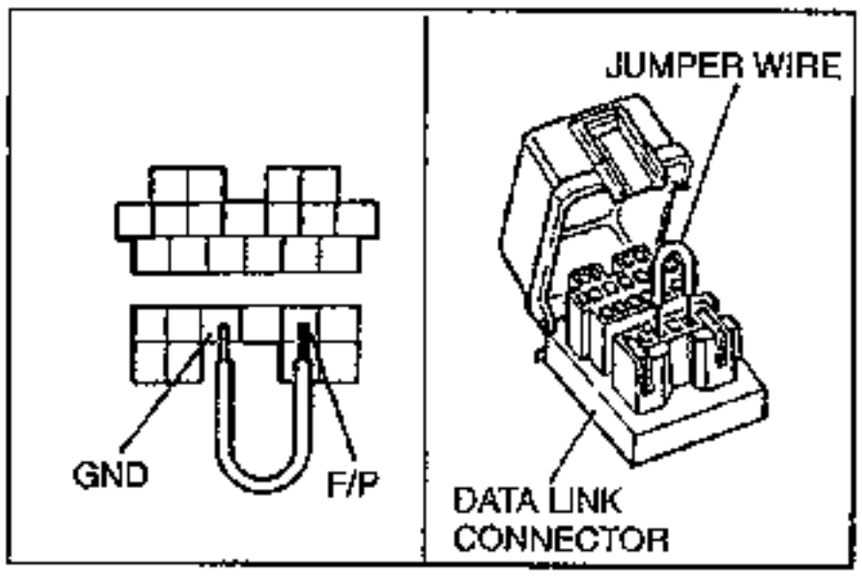
FUEL PUMP

Inspection

Fuel pump maximum pressure

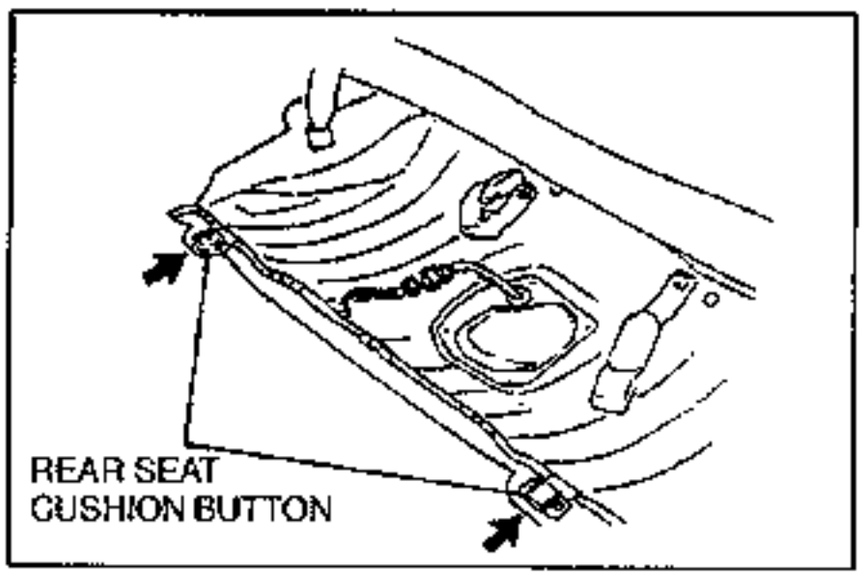
Warning

- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on page F2–106.**



1. Disconnect the negative battery cable.
2. Connect a fuel pressure gauge to the fuel main pipe and plug the outlet of the gauge as shown. (Install clamps as shown.)
3. Connect the negative battery cable.
4. Connect data link connector terminals F/P and GND by using a jumper wire.
5. Turn the ignition switch to ON to operate the fuel pump.
6. Measure the fuel pump maximum pressure.

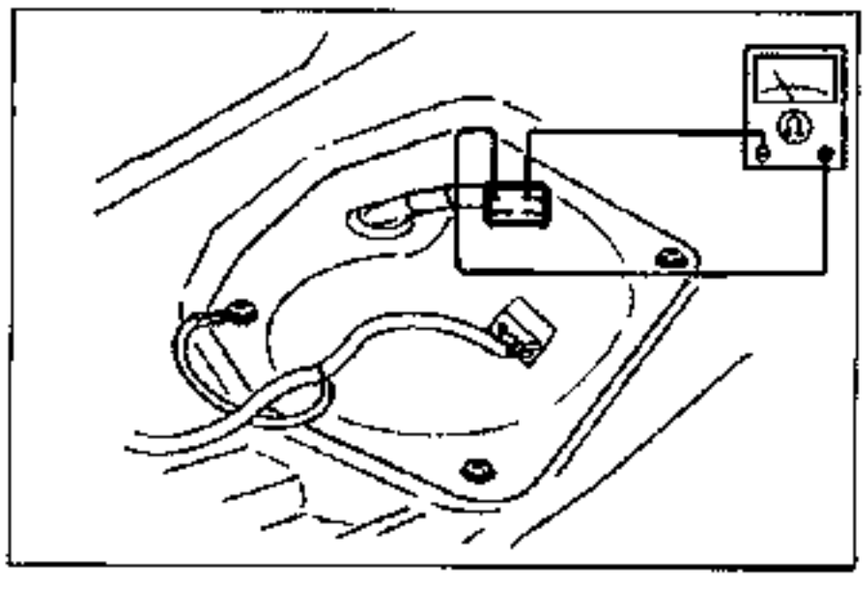
Fuel pump maximum pressure:
500–630 kPa {5.0–6.5 kgf/cm², 72–92 psi}



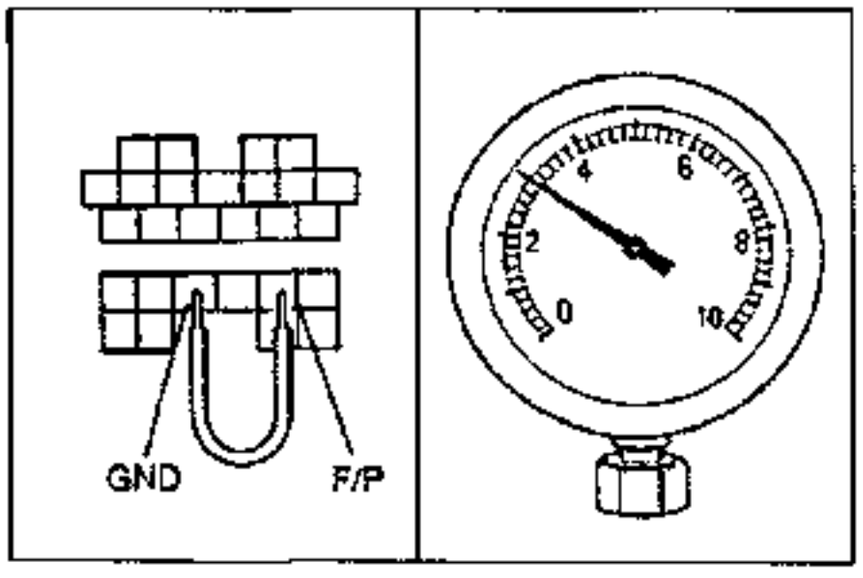
7. Turn the ignition switch to OFF and disconnect the jumper wire.
8. If not as specified, replace the fuel pump.

Continuity

1. Remove the rear seat cushion.
2. Disconnect the fuel pump connector.



3. Check for continuity between the fuel pump connector terminals B and H.
4. If there is none, replace the fuel pump.



Fuel pump fuel pressure hold inspection

Warning
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on page F2–106.**

1. Disconnect the negative battery cable.
2. Connect a fuel pressure gauge between the fuel filter and main hose.
3. Connect the negative battery cable.
4. Connect the data link connector terminals F/P and GND by using a jumper wire.
5. Turn the ignition switch to ON for approx. **10 sec.** to operate the fuel pump.
6. Turn off the ignition switch. Wait for **5 min.**, and observe the fuel pressure.

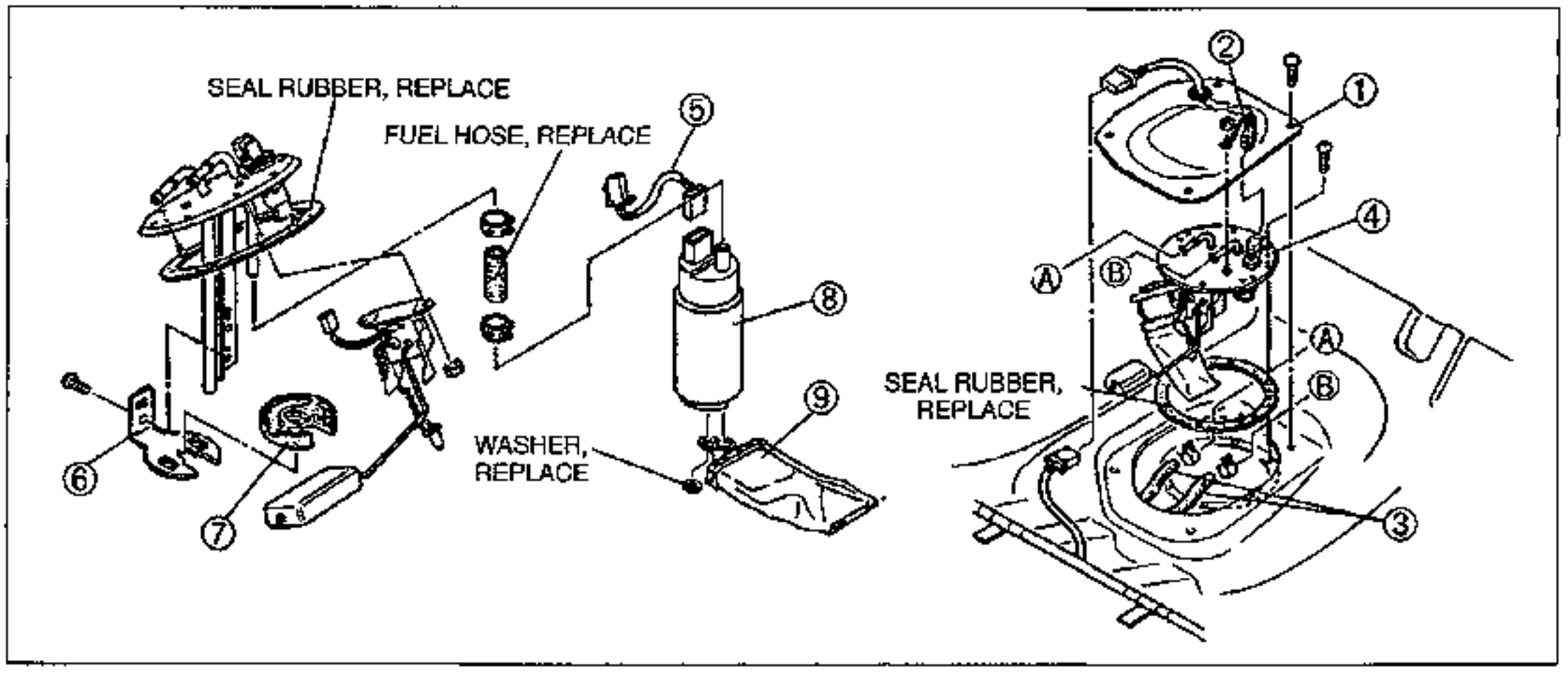
   Specification:
   More than 150 kPa {1.5 kgf/cm^2, 21 psi}

7. If not as specified, replace the fuel pump. (Refer to page F2–112.)

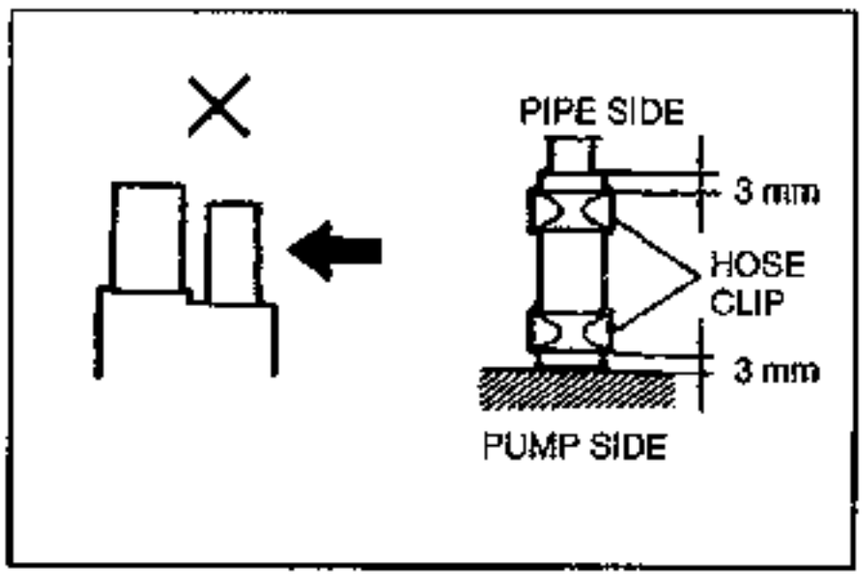
Disassembly / Assembly

Warning
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on page F–106.**

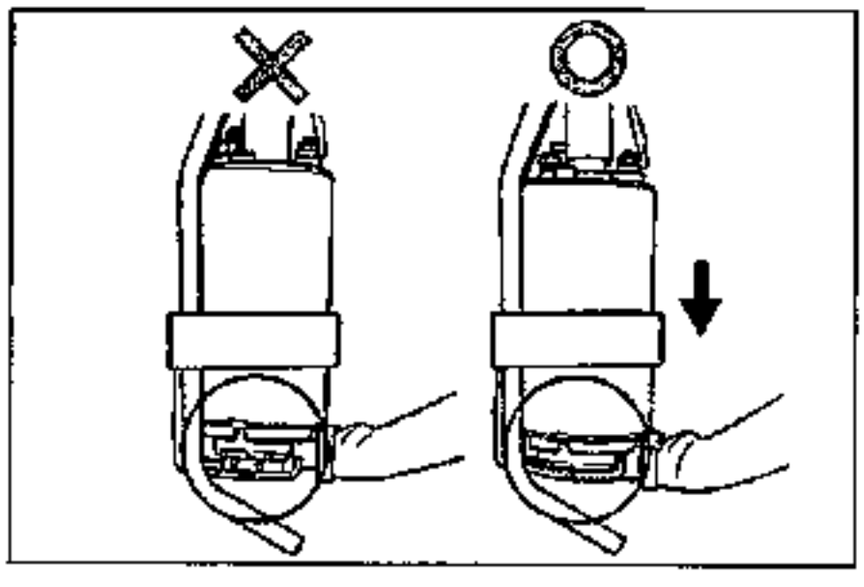
1. Remove the rear seat cushion.
2. Disassemble in the order shown in the figure.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note.**



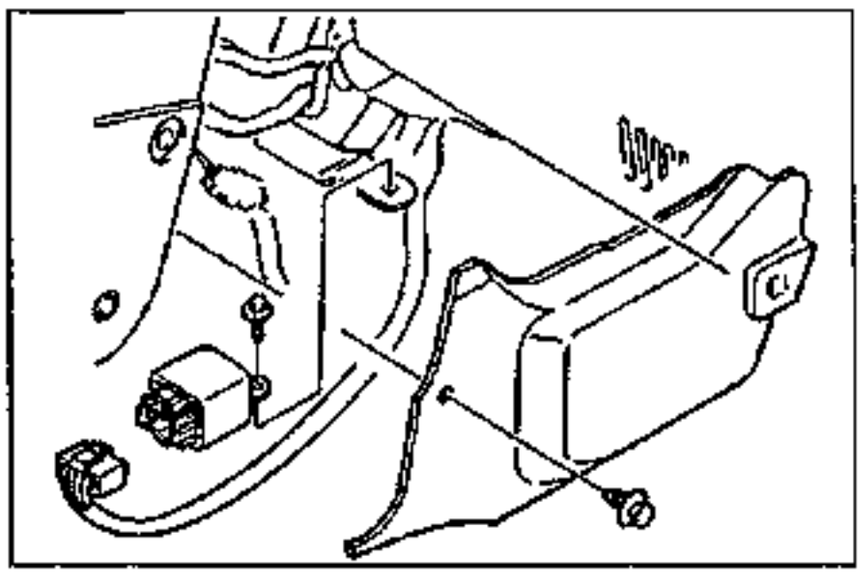
1. Fuel pump cover
2. Fuel gauge sender unit connector
3. Fuel hose
4. Fuel gauge
5. Fuel pump connector
6. Bracket
7. Rubber mount
8. Fuel pump
9. Fuel filter (Low pressure side)



Assembly Note
1. Do not apply excessive side force when pushing the fuel hose onto the fuel pump nipple.
2. Install the cramps as shown.



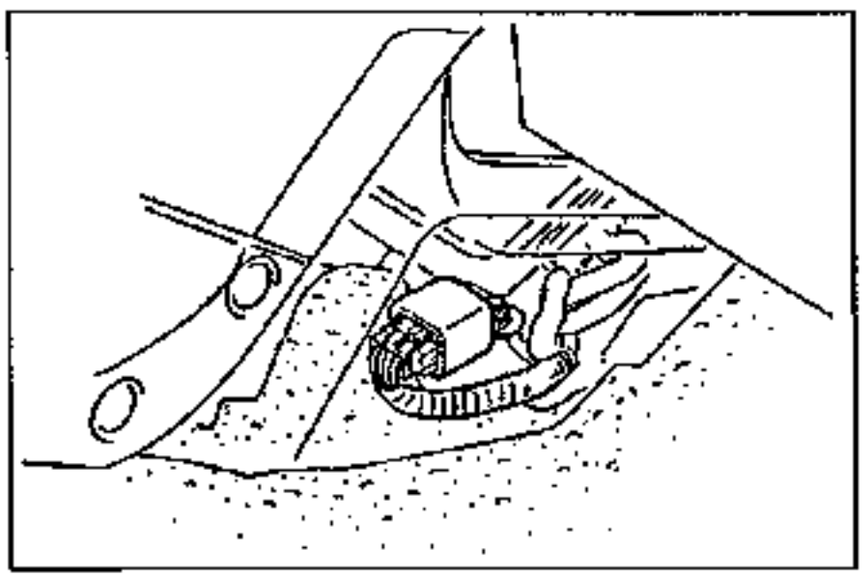
FUEL PUMP
1. After installing the fuel pump to the bracket, pull the pump down so that it is tight against the bracket.



FUEL PUMP RELAY

Replacement

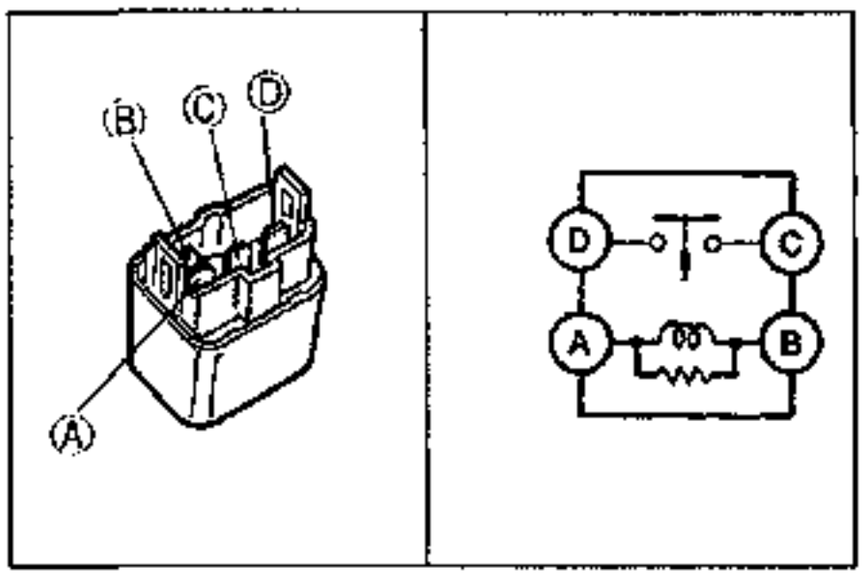
1. Remove the passenger side wall.
2. Disconnect the relay connector.
3. Remove the relay from the ECM bracket.
4. Install in the reverse order of removal.



Inspection

Operation check

Listen for operational sound of the fuel pump relay while the starter operating.

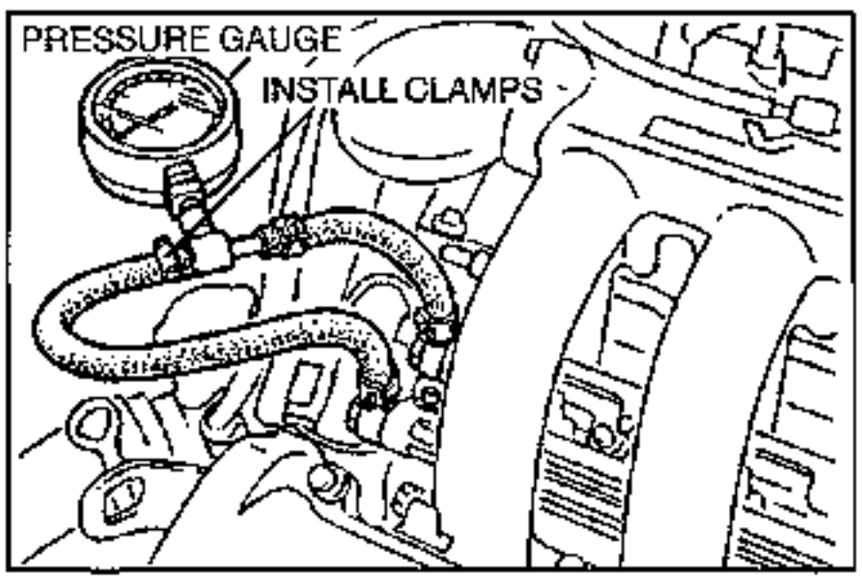


Continuity

1. Check continuity between the terminals of the relay by using an ohmmeter.

B+: Battery positive voltage

Terminal A–B	Terminal C–D
Apply B+	Continuity
Not apply B+	No continuity



PRESSURE REGULATOR

Inspection

Fuel line pressure

Warning

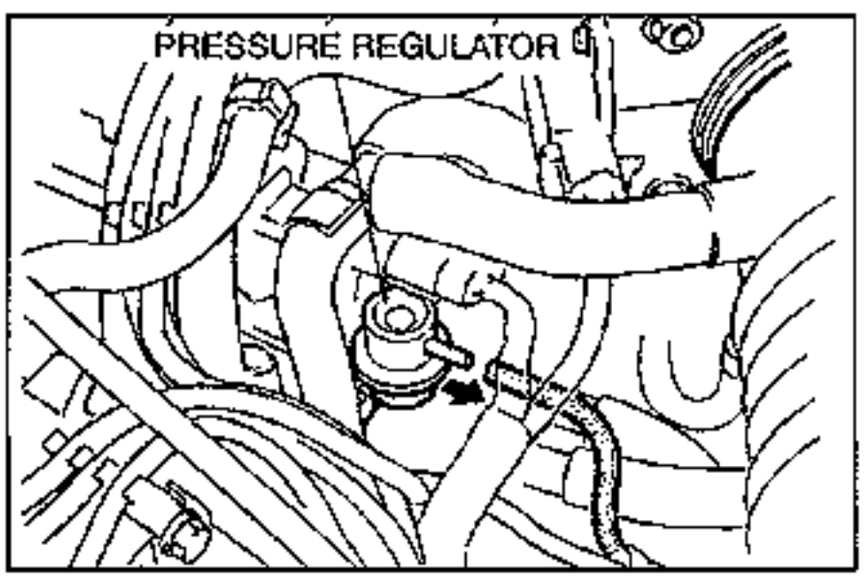
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on page F2–106.**

1. Disconnect the negative battery cable.
2. Connect a fuel pressure gauge between the fuel filter and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery cable.
4. Start the engine and run it at idle.
5. Measure the fuel line pressure.

Fuel line pressure:
210–260 kPa {2.1–2.7 kgf/cm², 30–38 psi}

6. Disconnect the vacuum hose from the pressure regulator and measure the fuel line pressure.

Fuel line pressure:
260–310 kPa {2.6–3.2 kgf/cm², 37–45 psi}

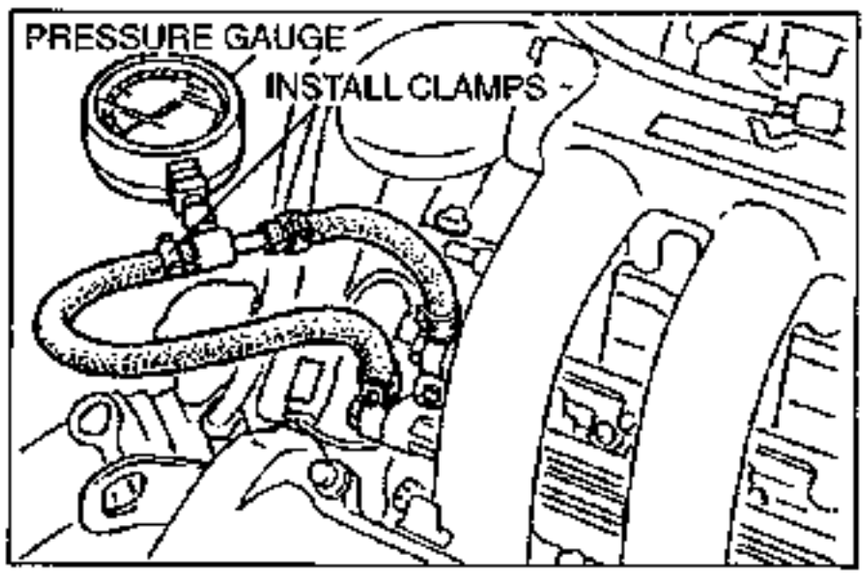


Hold pressure

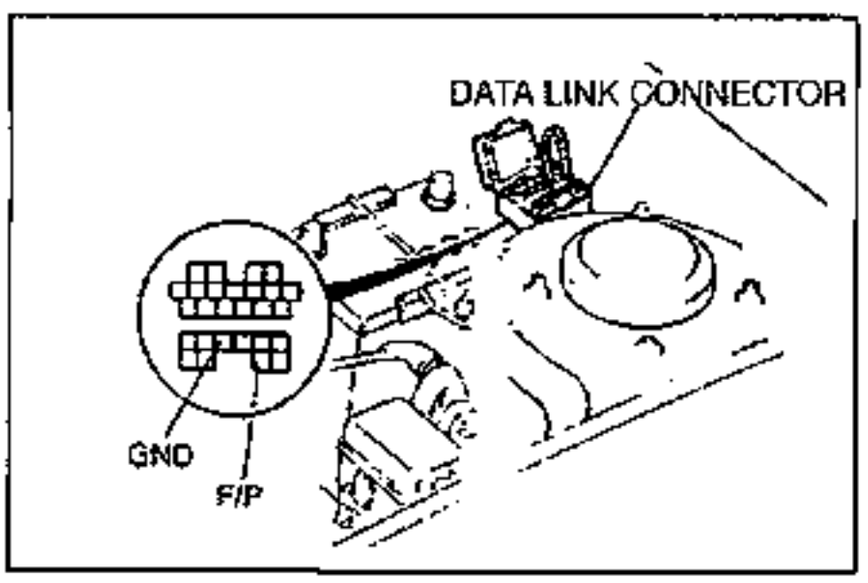
Perform this inspection if the fuel pressure hold inspection is not as specified. (Refer to page F2–107.)

Warning

- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on page F2–106.**



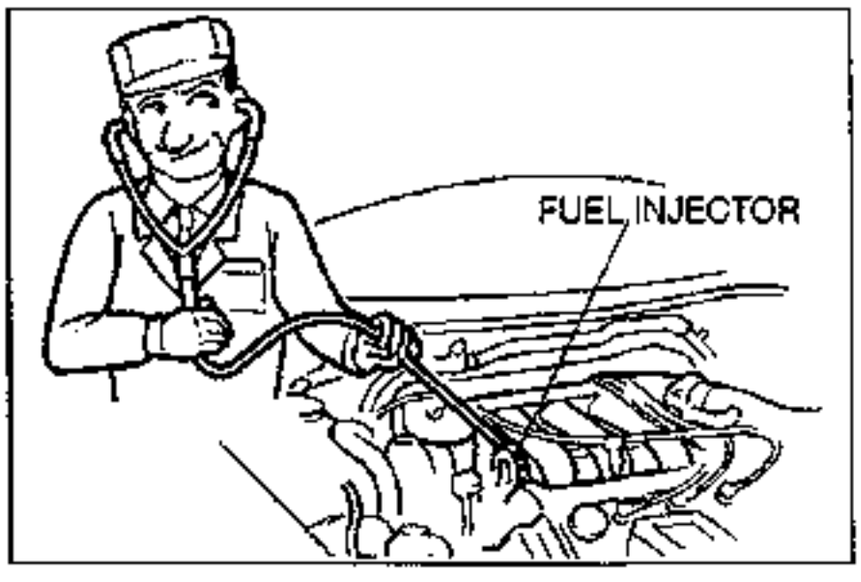
1. Disconnect the negative battery cable.
2. Connect a fuel pressure gauge between the fuel filter and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery cable.



4. Connect the data link connector terminals F/P and GND by using a jumper wire.
5. Turn the ignition switch to ON **for 10 sec.** to operate the fuel pump.
6. Turn the ignition switch to OFF and disconnect the jumper wire.
7. Pinch the fuel delivery hose with pliers.
8. Observe the fuel pressure **for 5 min.**

   Fuel pressure:
   More than 150 kPa {1.5 kgf/cm^2, 21 psi}

9. If not as specified, replace the pressure regulator.



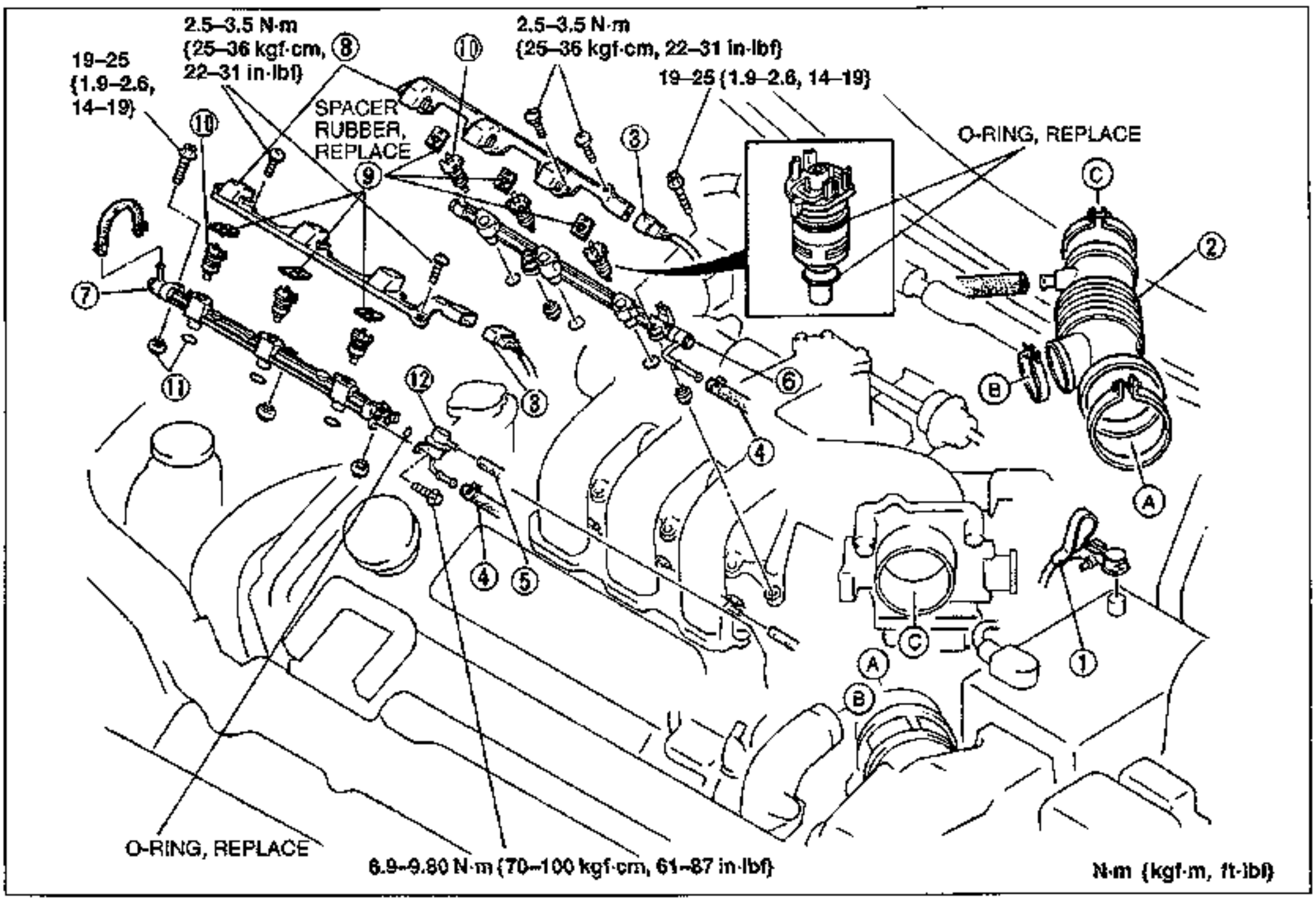
FUEL INJECTOR
Inspection (On-vehicle)
1. Warm up the engine and run it at idle.
2. Listen for the operational sound of each fuel injector by using a screwdriver or a soundscope.

Note:
- The best way to judge the performance of a fuel injector is to compare its sound with the sound of other fuel injectors.

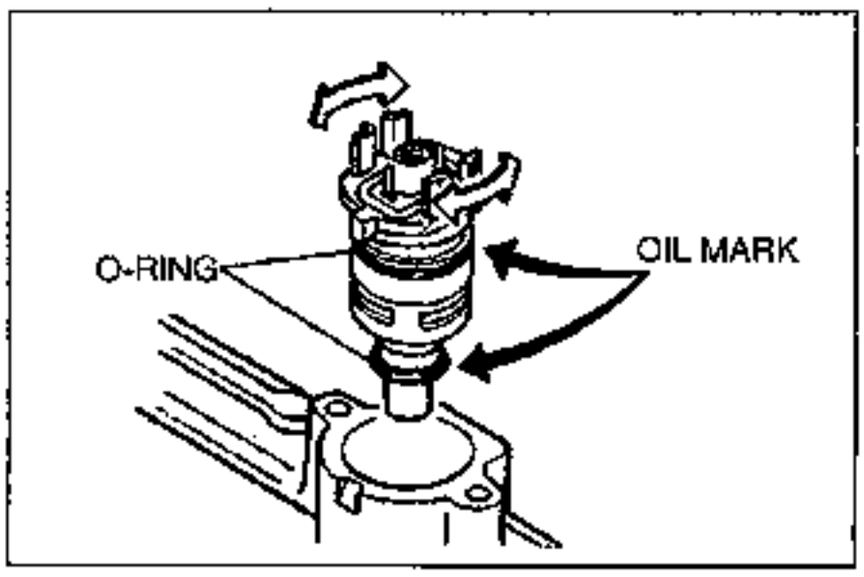
Removal / Installation

Warning
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on page F2–106.**

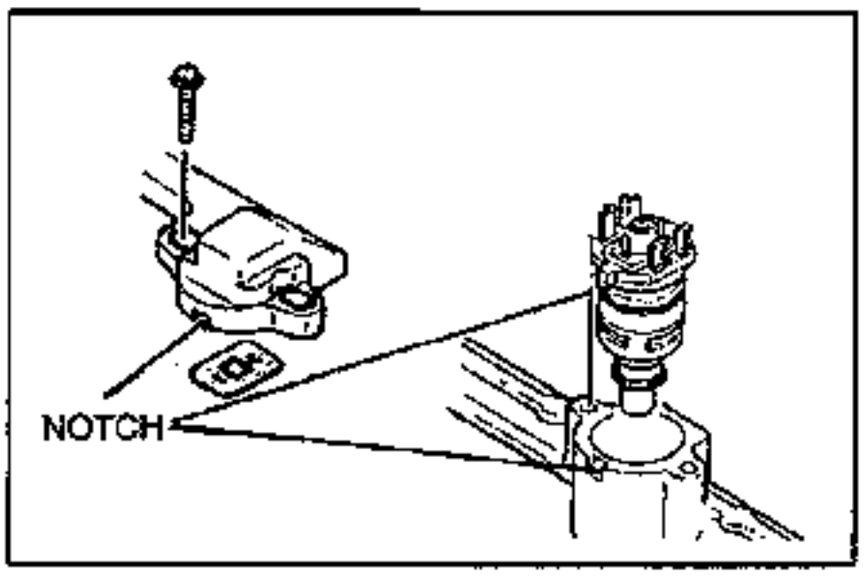
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal, referring to **Installation Note.**

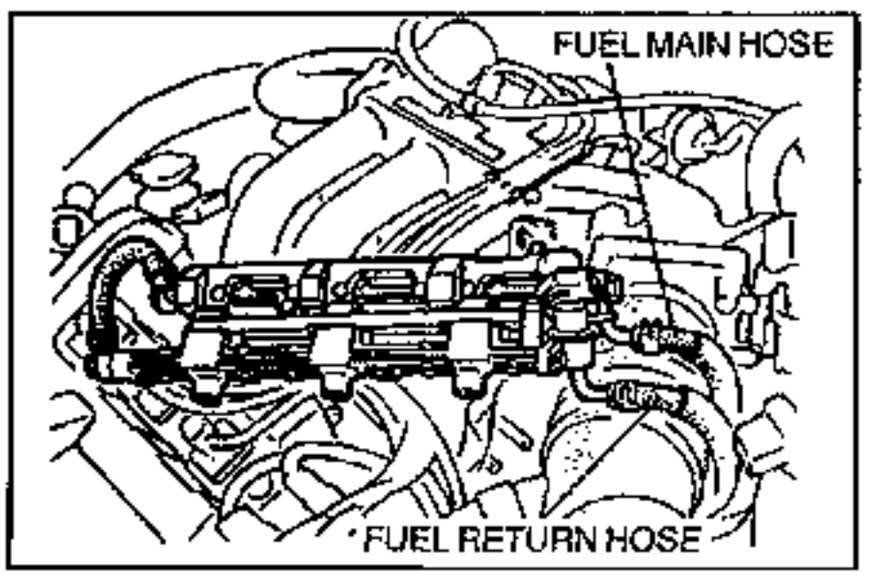


1. Negative battery cable
2. Air intake hose
3. Fuel injector connector
4. Fuel hose
5. Vacuum hose
6. Fuel distributor (Right bank)
7. Fuel distributor (Left bank)
8. Harness
9. Spacer
10. Fuel injector
11. Insulator
12. Pressure regulator
    Inspection ..... page F2–114

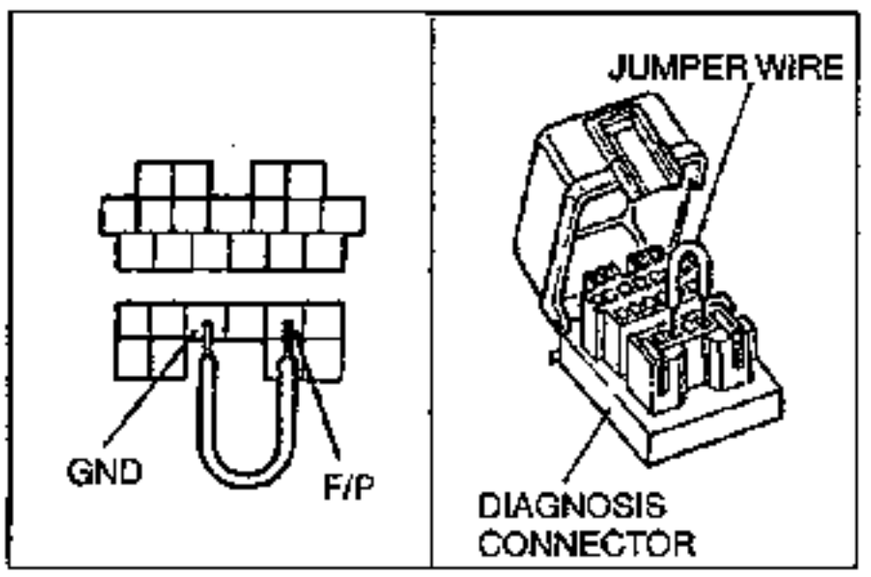


Installation Note
Fuel injector
1. Use new O-rings.
2. Apply a small amount of clean engine oil to the O-rings before installing them.
3. Check the inside of the fuel distributors for fuel deposits, and clean them with gasoline if necessary.
4. Fit the fuel injector squarely into the fuel distributor, and gradually screw and install it.
5. Fit the injector tab into the fuel distributor notch.
6. Install the harness in the reverse order of removal.

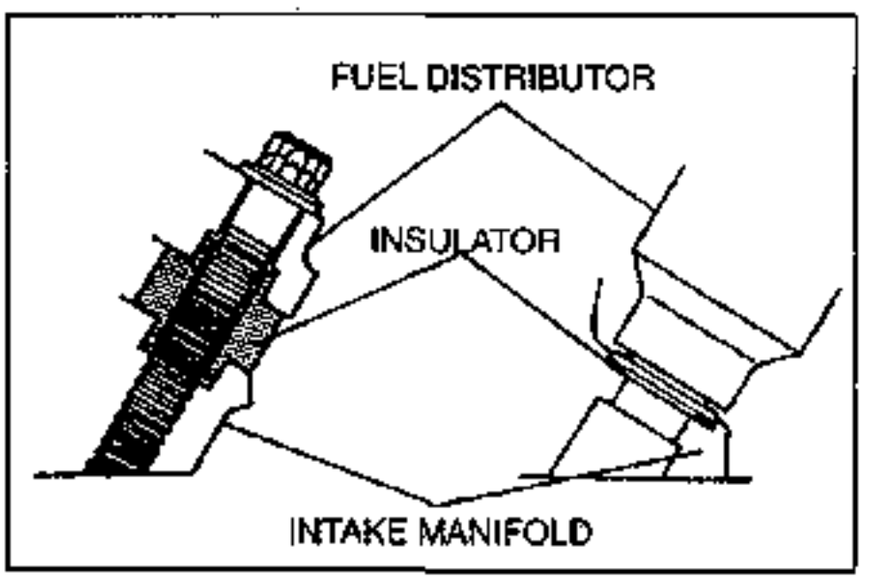




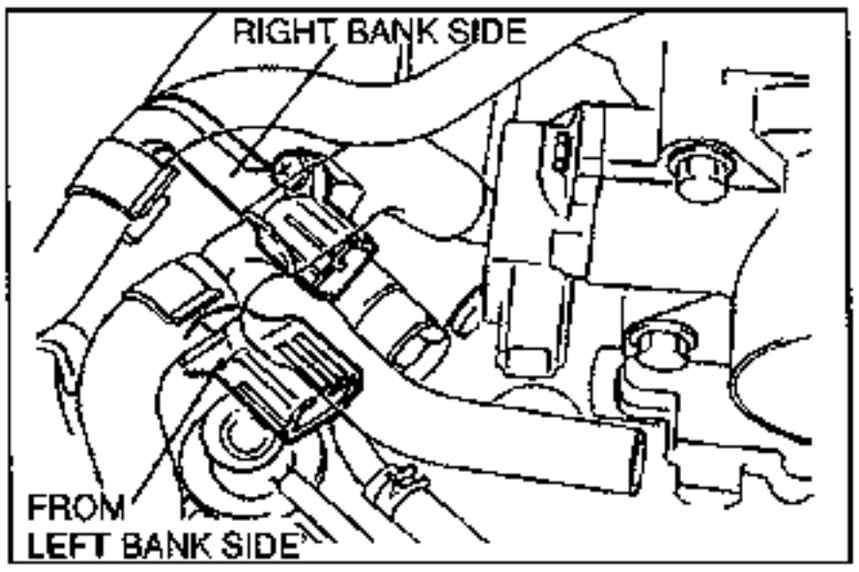
Fuel leakage test
1. Install the fuel hoses shown in the figure.

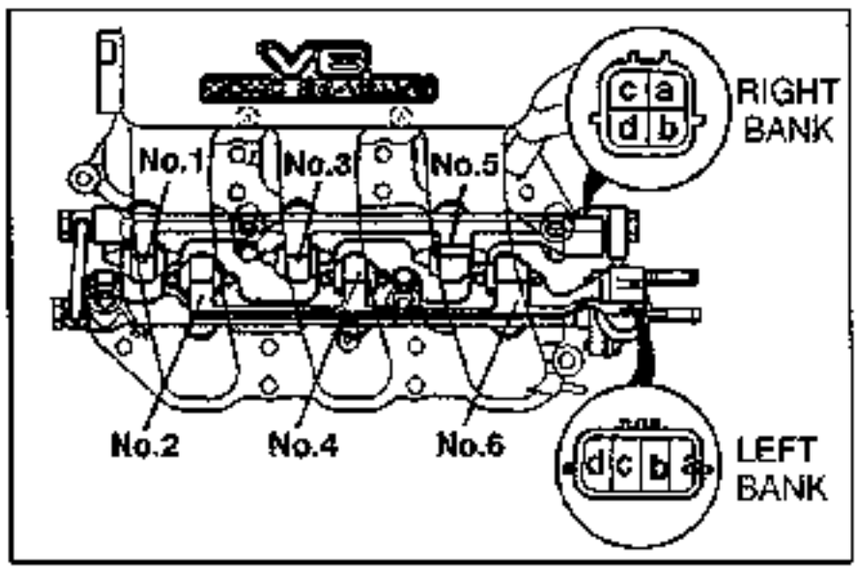


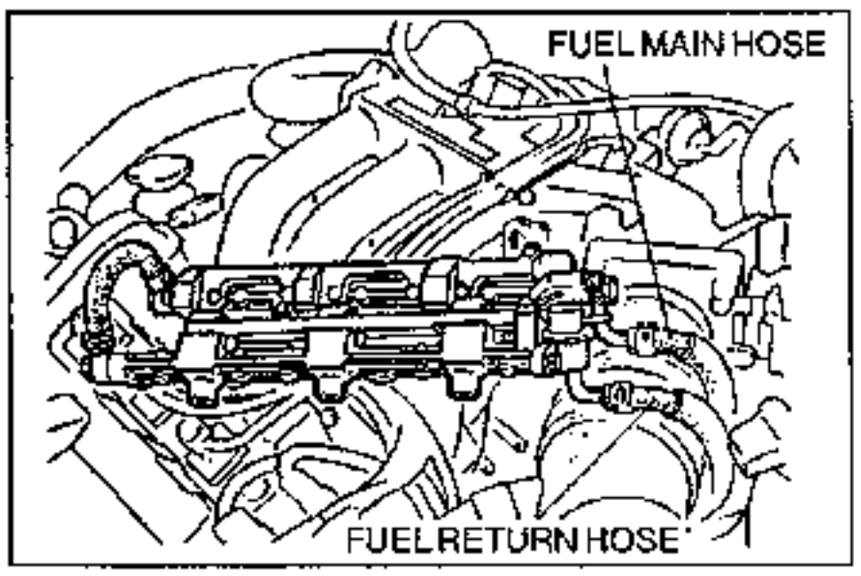
2. Connect the data link connector terminals F/P and GND by using a jumper wire.
3. Turn the ignition switch to ON and check for fuel leaks from the fuel distributor.
4. If fuel leaks, check the fuel injector O-ring and fuel distributor.

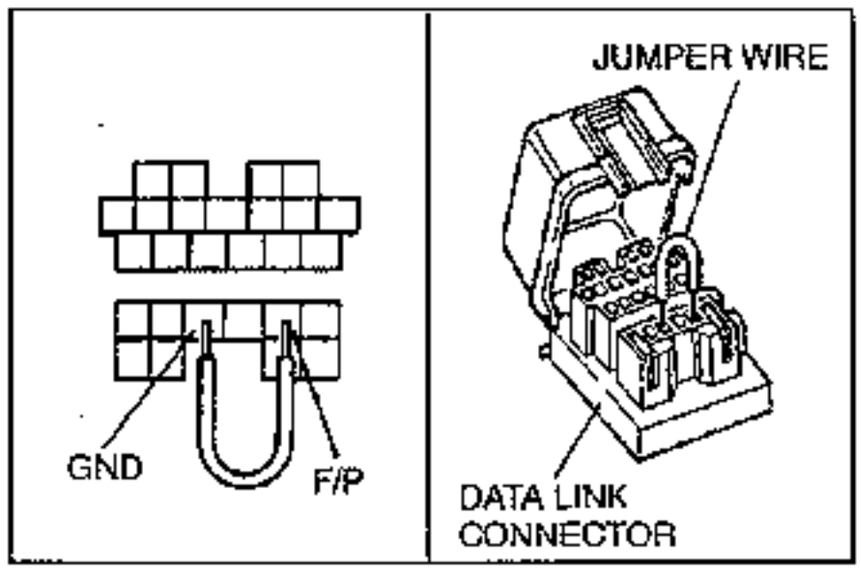


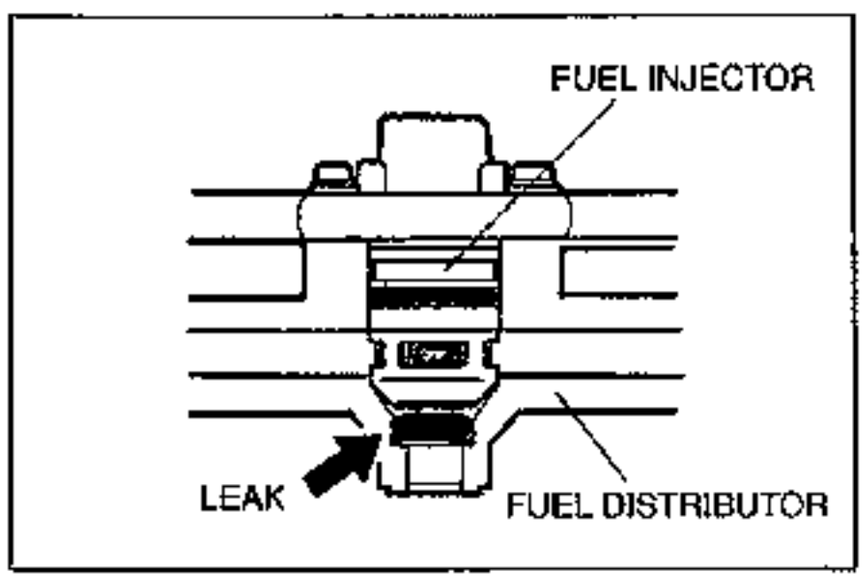
Fuel distributor
1. Use new injector insulators.
2. Install the insulators, making sure that each is pressed in fully, and that it is not twisted or bent. Incorrectly installed insulators can cause rough idle.











Inspection

Note
- It is not necessary to remove the fuel injectors to perform the following procedures.

Fuel injector resistance

1. Disconnect the fuel injector connectors as shown in the figure.
2. Measure the resistance of the fuel injector with an ohmmeter.

Harness	Terminal	Injector No.
Right bank	a–b	1
	a–c	5
	a–d	3
Left bank	d–c	2
	d–b	4
	d–a	6

Resistance: 12–16 Ω [20°C {68°F}]

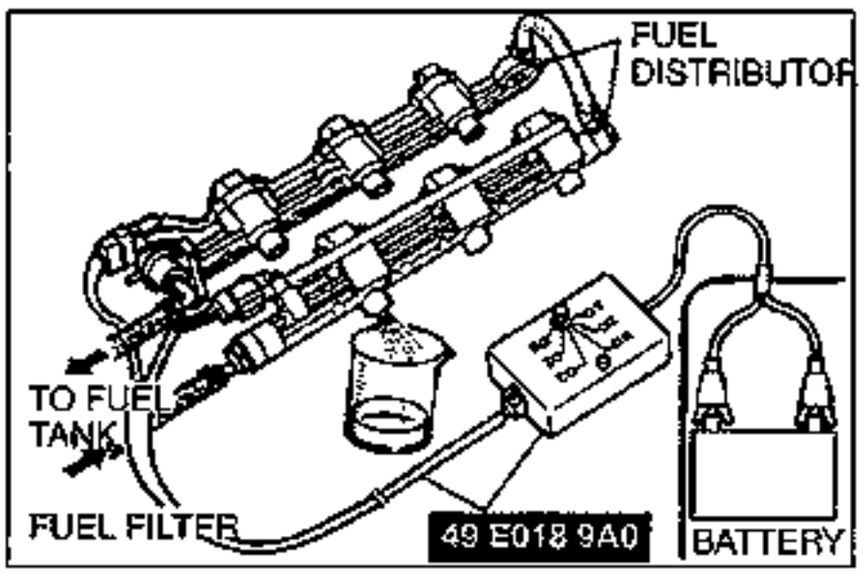
3. If not as specified, check the connectors for continuity and poor connection.
4. If the harness is OK, replace the fuel injector.

Fuel leakage test

1. Remove the fuel injector together with fuel distributor from intake manifold as shown in figure.
2. Connect the fuel hose and fuel return hose.
3. Connect the data link connector terminals F/P and GND by using a jumper wire.
4. Turn the ignition switch to ON and check for fuel leaks from the fuel injector.

Fuel leakage: Less than 1 drop/2 min.

5. If not as specified, check the fuel injector O-ring and fuel distributor contact face.
6. Install the fuel injector.
7. Turn the ignition switch to ON and check for fuel leaks from the fuel injector.
8. If not as specified, replace the fuel injector.

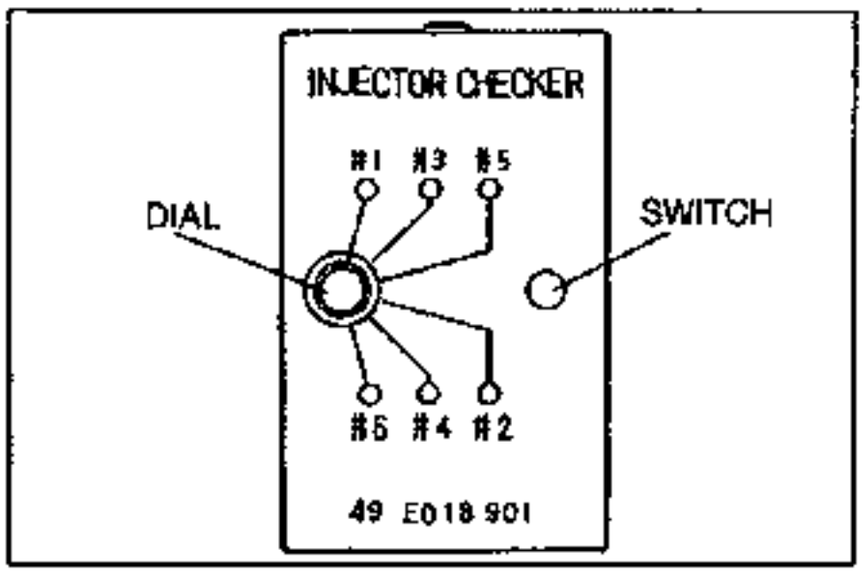


Volume Test

1. Remove the fuel injectors together with the fuel distributor.
2. Connect the **SST** as shown in figure.

Warning

- **Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**



3. Check the injection volume with a graduated container.

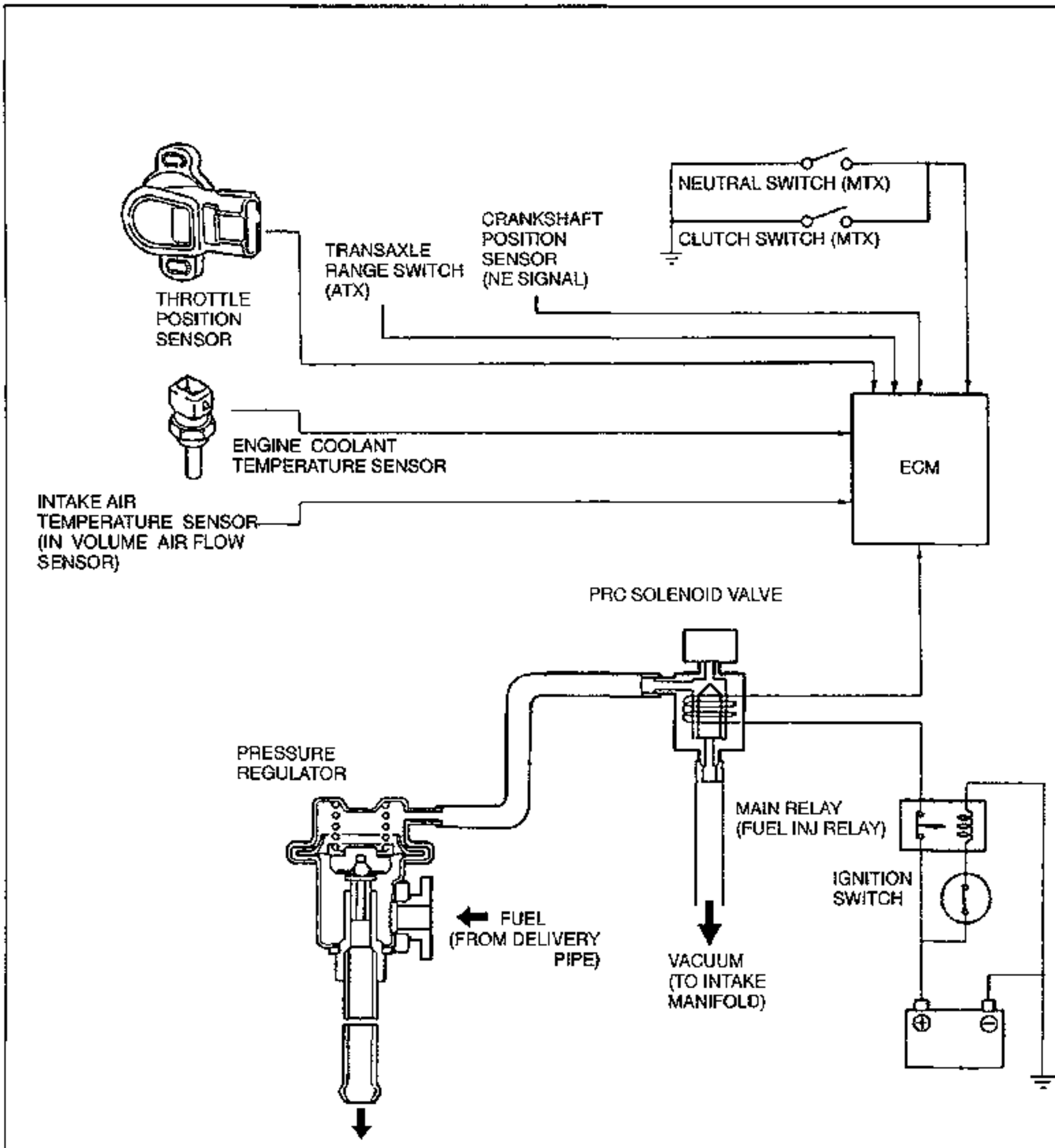
Injection volume
32–40 cc {1.95–2.44 cu. in} / 15 sec.

4. If not as specified, replace the fuel injector.

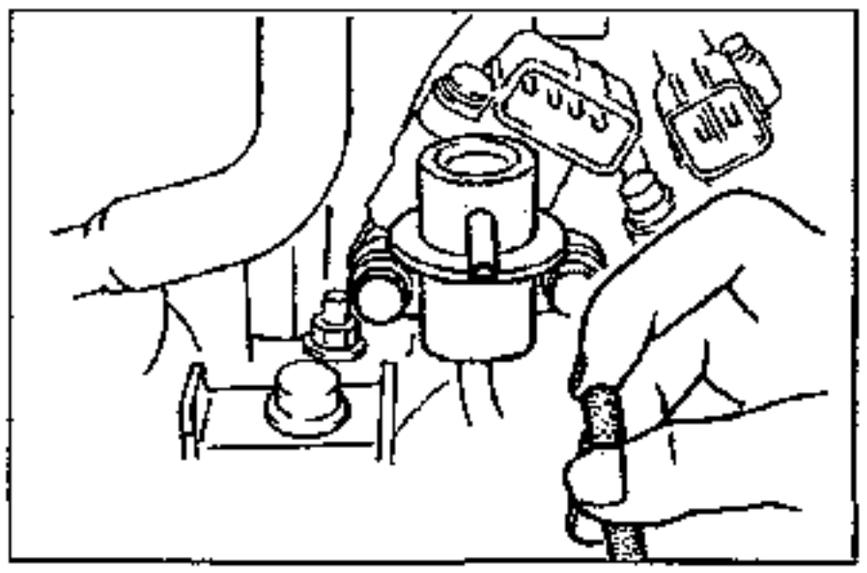
PRESSURE REGULATOR CONTROL SYSTEM

DESCRIPTION

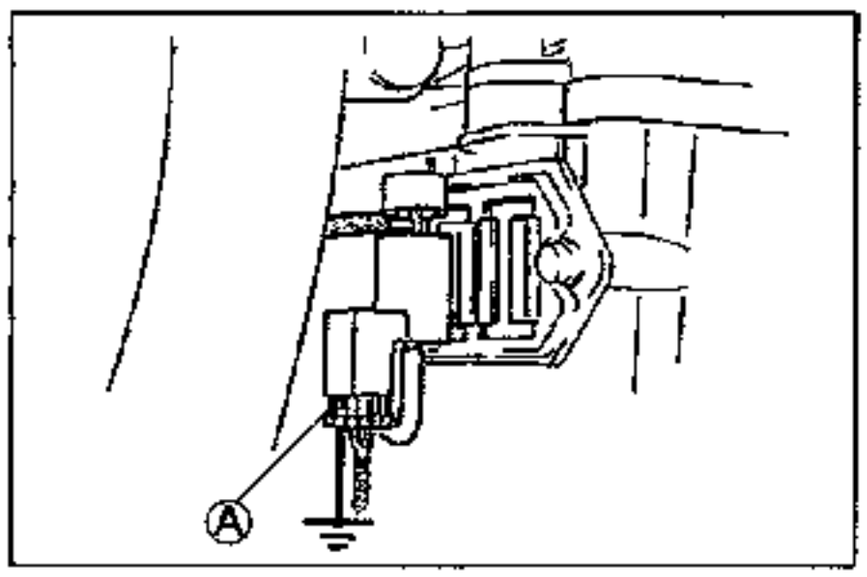
To prevent percolation of the fuel during hot restart idle, vacuum to the pressure regulator is momentarily cut and the fuel injection pressure is increased to slightly more than **284 kPa {2.9 kgf/cm2, 41.2 psi}**. Pressure in the fuel line at idle is **approx. 226 kPa {2.3 kgf/cm2, 32.7 psi}**.



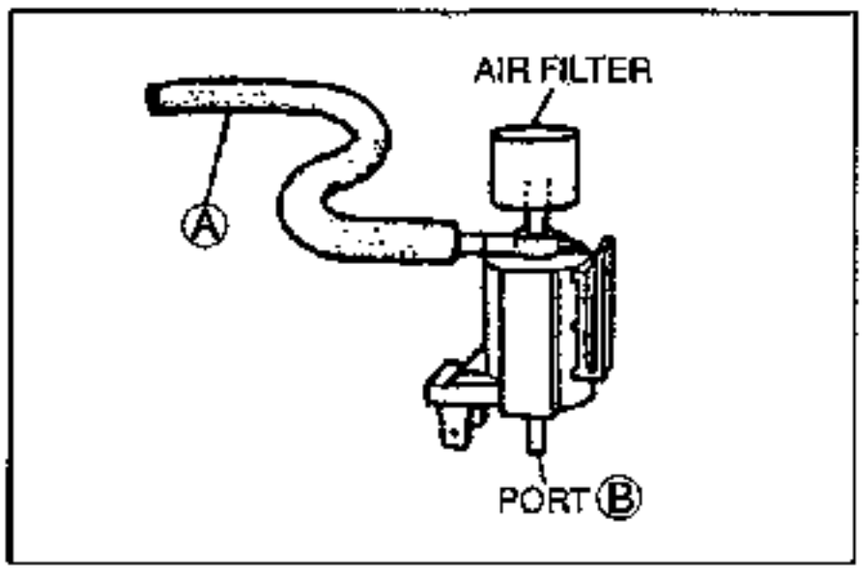
Operating condition			Operating time (sec)
Coolant temperature	Intake air temperature	Engine condition	
Above 70°C {158°F}	Above 75°C {167°F}	Engine speed lower than 1,500 rpm	Approx. 120



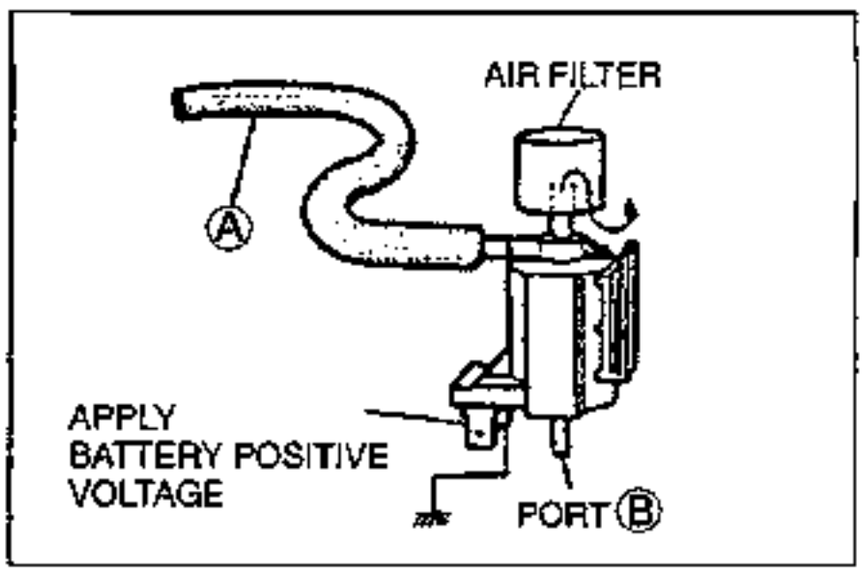
PRC SOLENOID VALVE
Inspection
On-vehicle
1. Start the engine and run it at idle.
2. Disconnect the vacuum hose from the pressure regulator. Verify that vacuum is felt.



3. Ground the PRC solenoid valve terminal A with a jumper wire. Verify that no vacuum is felt.
4. If vacuum exists, check the PRC solenoid valve.



Solenoid valve
1. Disconnect the vacuum hose from the PRC solenoid valve and vacuum pipe.
2. Blow through the PRC solenoid valve from port A.
3. Verify that air flows from port B.



4. Disconnect the PRC solenoid valve connector.
5. Connect battery positive voltage and a ground to the terminals of the PRC solenoid valve.
6. Blow through the PRC solenoid valve from port A.
7. Verify that air flows from the valve air filter.
8. If not as specified, replace the PRC solenoid valve.

EXHAUST SYSTEM

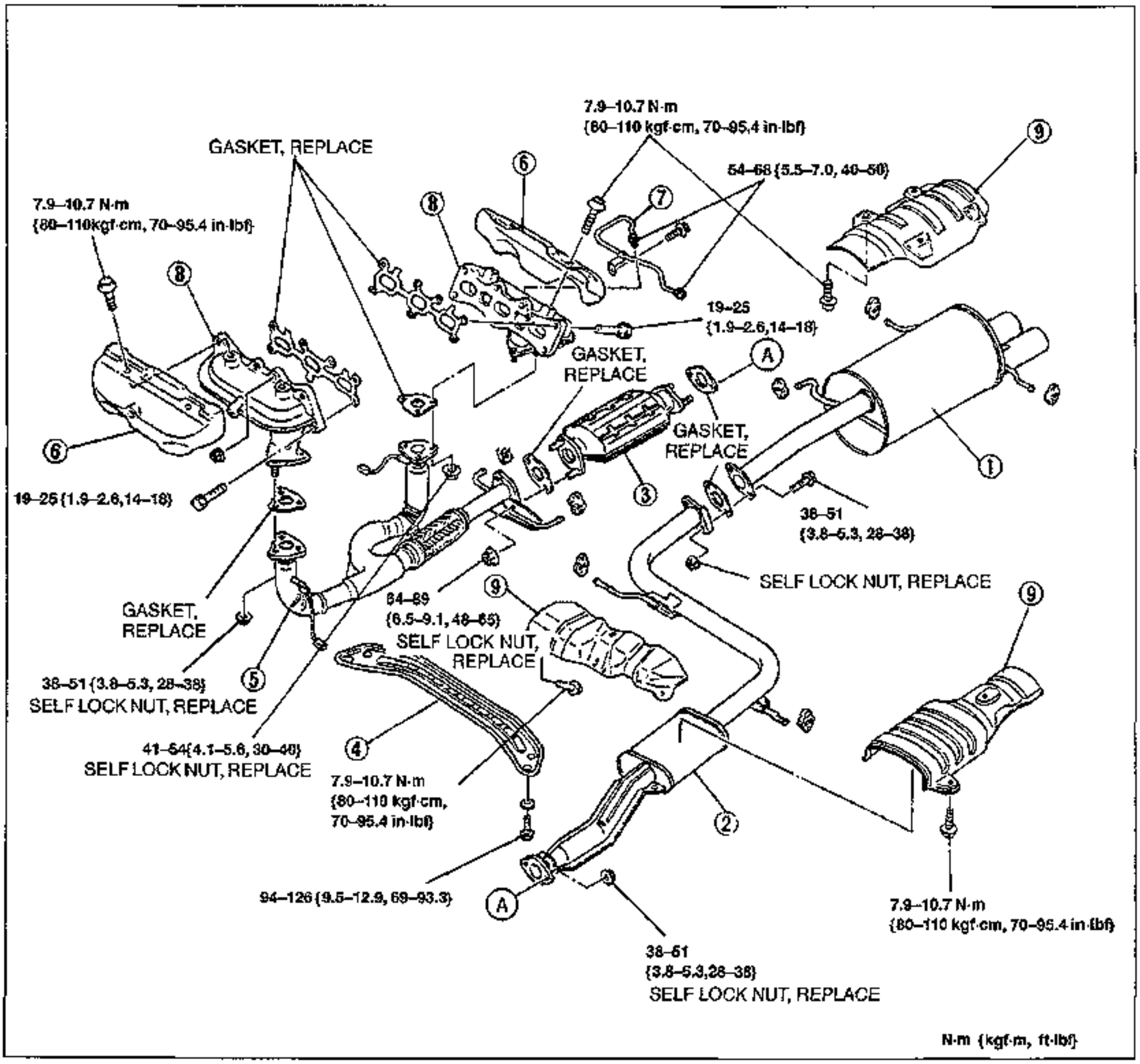
COMPONENT PARTS

Inspection (On-vehicle)

Start the engine and verify that there is no exhaust gas leakage from the exhaust system components.

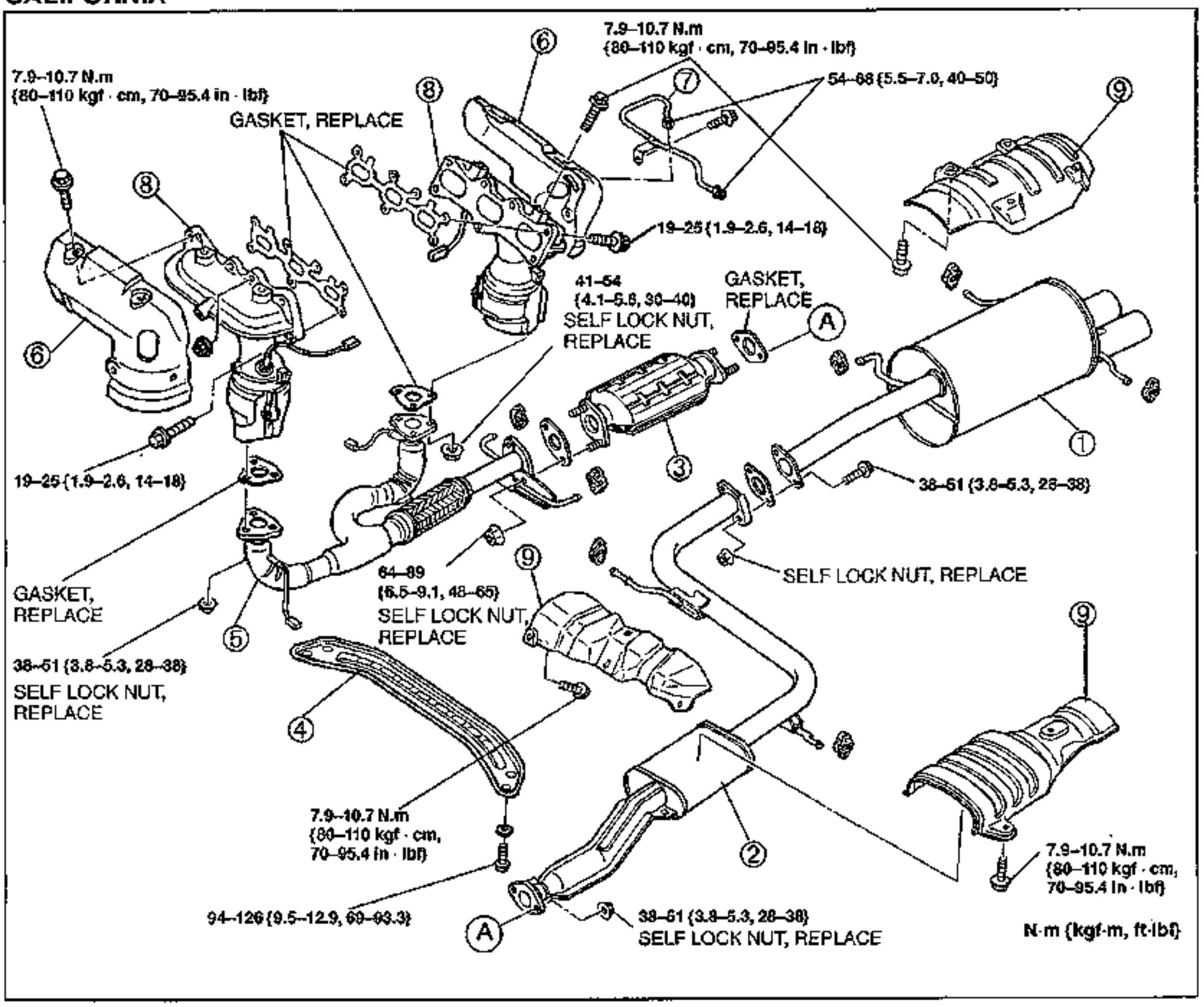
Removal / Inspection / Installation

1. Remove in the order shown in the figure.
2. Check the exhaust component parts and repair or replace as necessary.
3. Install in the reverse order of removal.



1. Main silencer
   Inspect for deterioration and restriction
2. Presilencer
   Inspect for deterioration and restriction
3. Three way catalytic converter
   Inspect for deterioration and restriction
4. Transverse member
5. Front pipe
   Inspect for deterioration and cracks
6. Exhaust manifold insulator
7. EGR pipe
   Inspect for deterioration and cracks
8. Exhaust manifold
   Inspect for deterioration and cracks
9. Insulator

CALIFORNIA

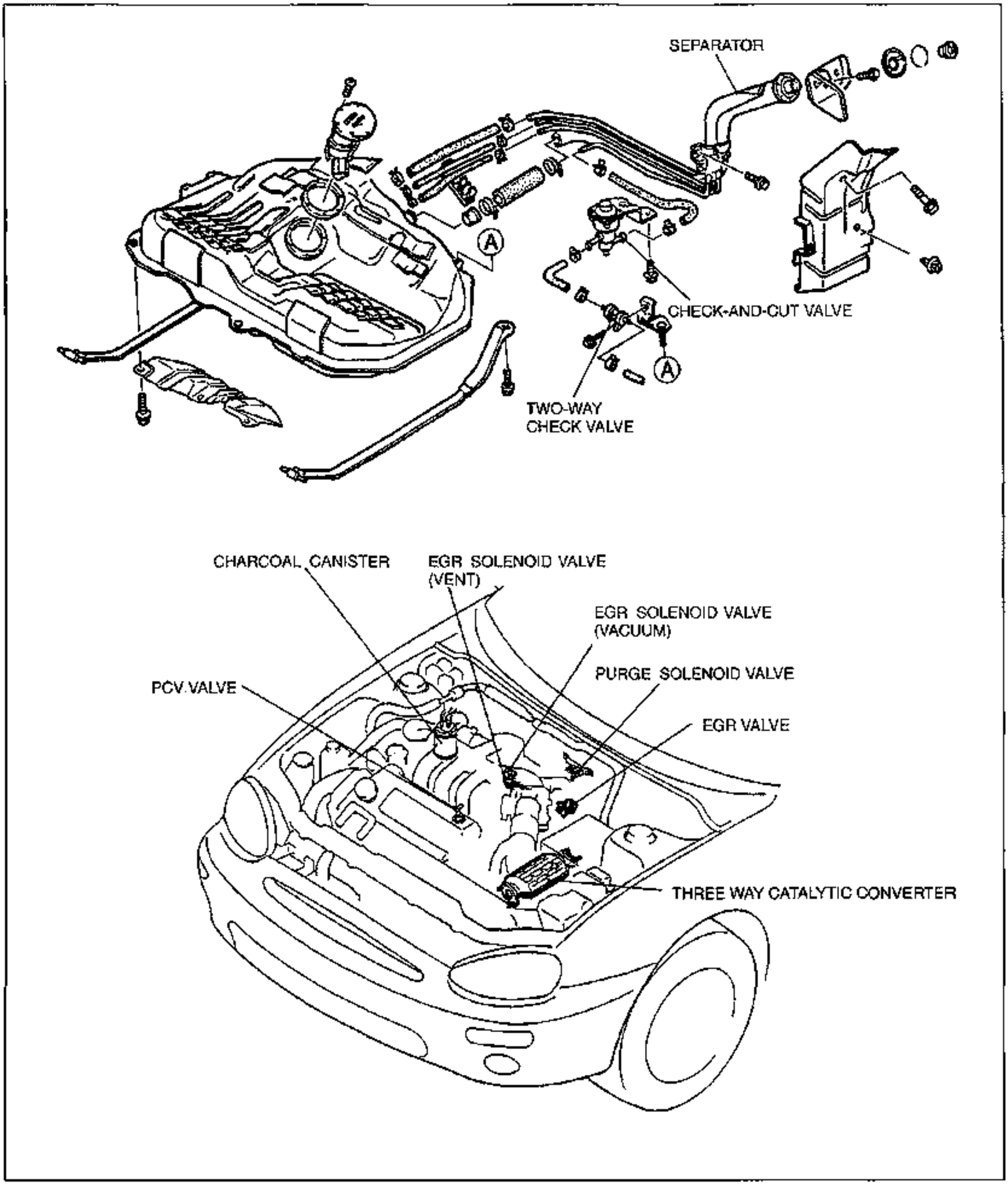


1. Main silencer
   Inspect for deterioration and restriction
2. Presilencer
   Inspect for deterioration and restriction
3. Three way catalytic converter
   Inspect for deterioration and restriction
4. Transverse member
5. Front pipe
   Inspect for deterioration and cracks
6. Exhaust manifold insulator
7. EGR pipe
   Inspect for deterioration and cracks
8. Warm up three way catalytic converter
   Inspect for deterioration and cracks
9. Insulator

OUTLINE OF EMISSION CONTROL SYSTEM

DESCRIPTION

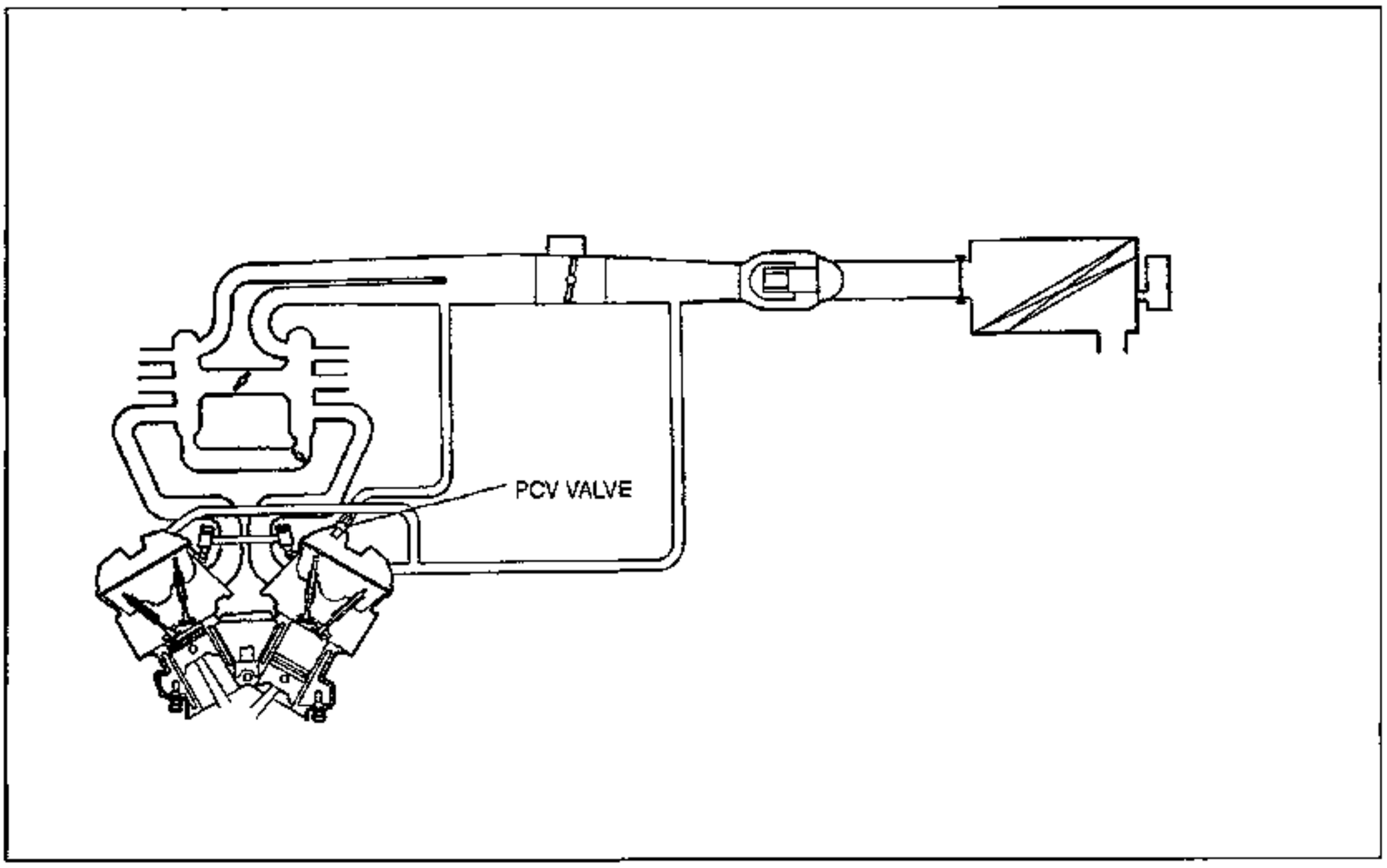
To reduce HC (hydrocarbon) emission, the positive crankcase ventilation (PCV) system and evaporative system are adopted.
This system consists of the deceleration control system, evaporative emission control system, EGR control system, and PCV system.
The purpose of these system is to reduce CO, HC and NOx emissions.

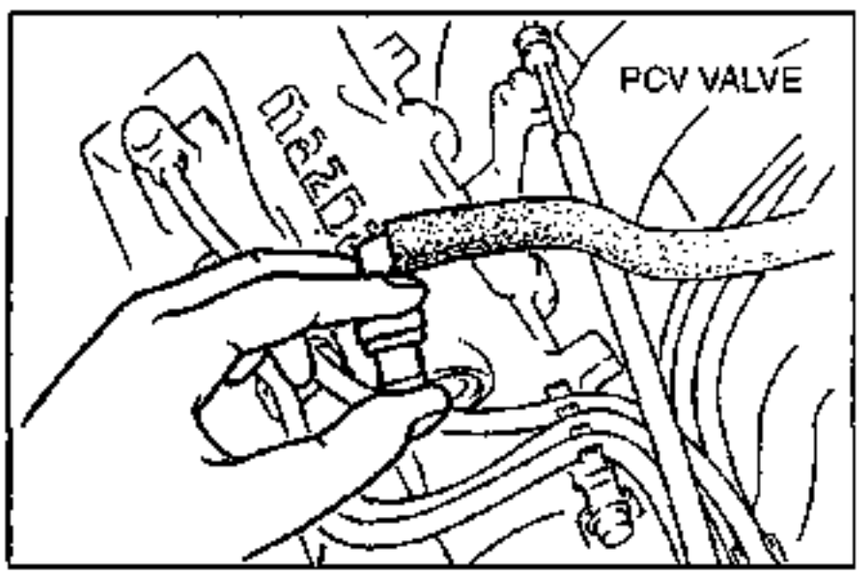


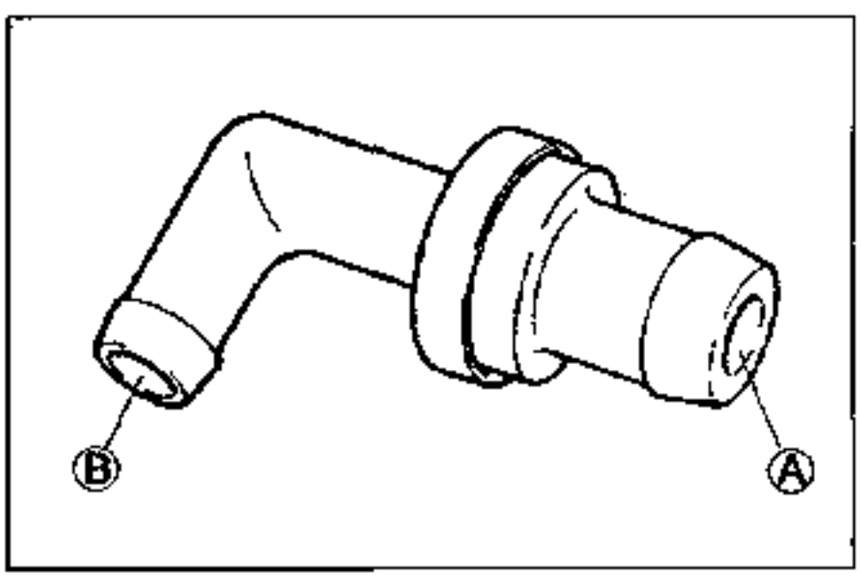
POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM

DESCRIPTION

The PCV valve is operated by the intake manifold vacuum.
When the engine is running at idle, the PCV valve is slightly open and a small amount of blowby gas is drawn into the dynamic chamber to be burned.
As the engine speed rises, the PCV valve is opened further, allowing a larger amount of blowby gas to be drawn into the dynamic chamber.







PCV VALVE

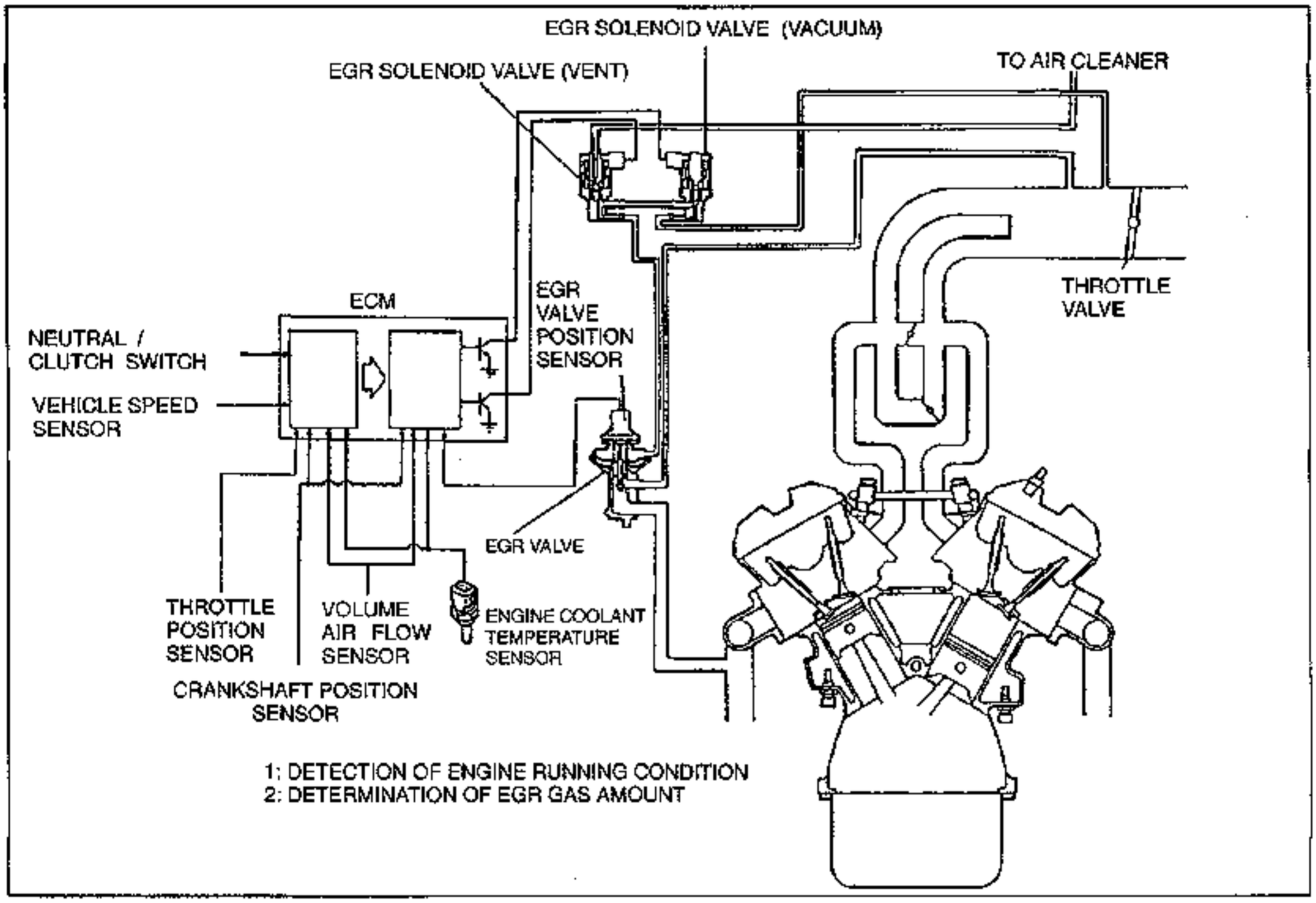
Inspection

1. Start the engine and let it idle.
2. Disconnect the PCV valve together with the ventilation hose from the cylinder head cover.
3. Block the PCV valve opening.
4. Verify that vacuum is felt.
5. Remove the PCV valve.
6. Blow through the valve from port Ⓐ and verify that air comes out from port Ⓑ.
7. Blow through the valve from port Ⓑ and verify that no air comes out from port Ⓐ.
8. Replace the PCV valve if not as specified.

EXHAUST GAS RECIRCULATION (EGR) CONTROL SYSTEM

DESCRIPTION

This system recirculates a small amount of exhaust gas into the intake manifold to reduce the combustion temperature, and reduce the NOx emissions.
This system consist of the EGR valve, EGR valve position sensor, two solenoid valves, engine control module (ECM), and input devices.



OPERATION

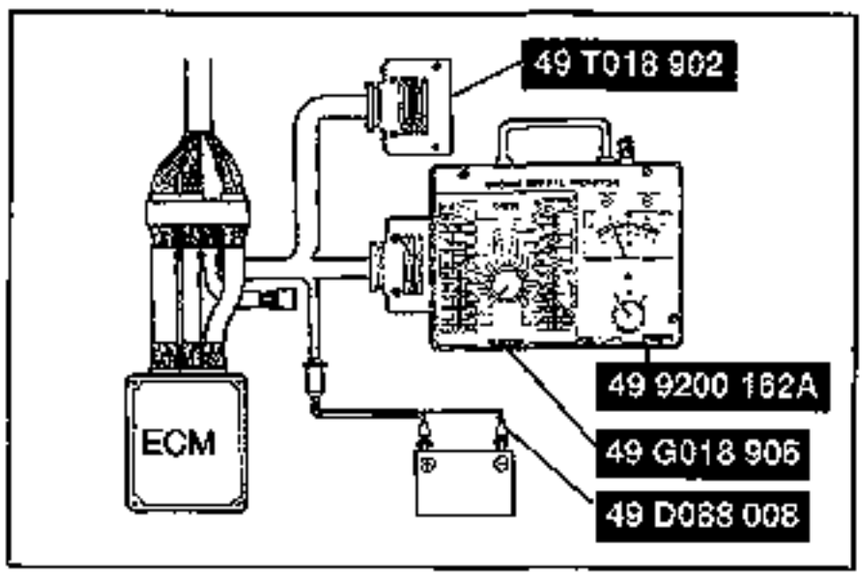
Cold Engine (Coolant temperature: below 75°C {167°F})

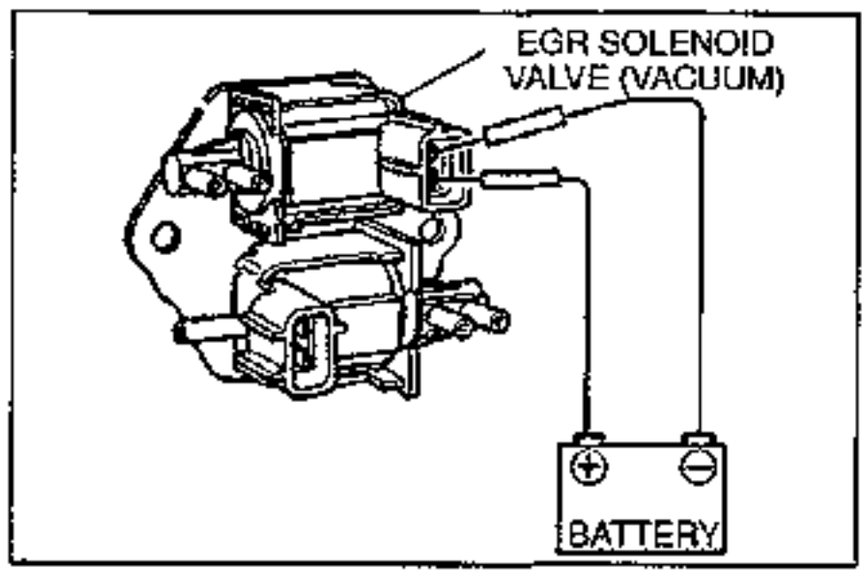
EGR operation is stopped to improve drivability when the engine temperature is low.

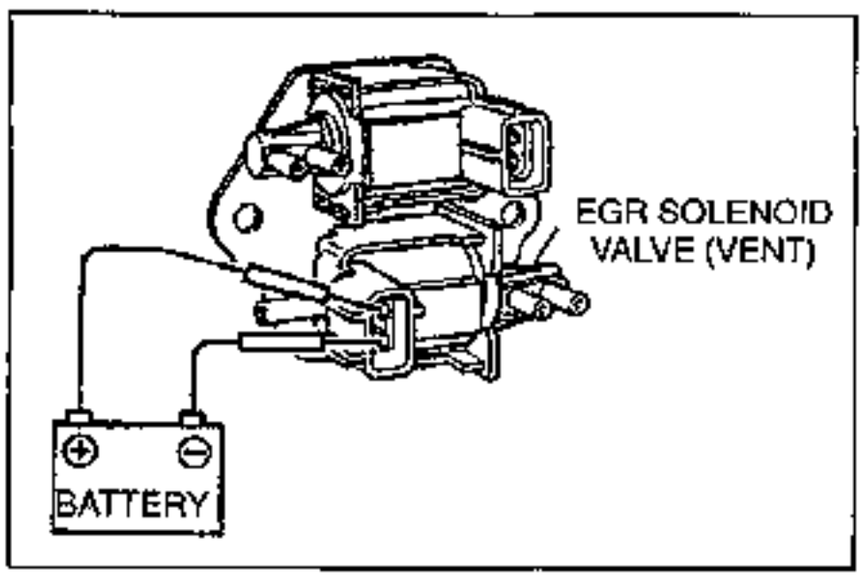
Warm Engine

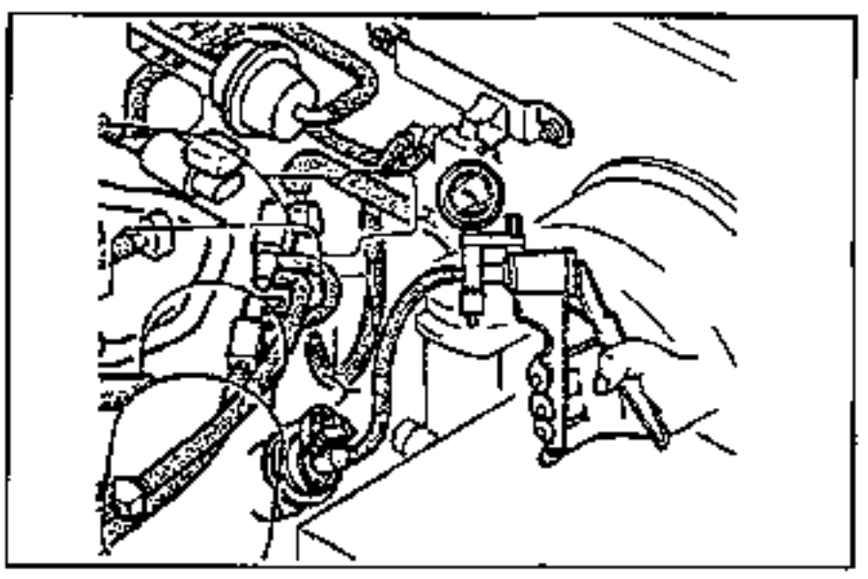
The engine control module controls the solenoid valves (vacuum side and vent side) to supply EGR gases as described below.

Operating condition	EGR operation	Remark
Idle	Stopped	Closed throttle position switch: ON
Heavy load		
EGR valve position sensor fail		—
High speed		
Acceleration	Increases EGR gas amount	Above 5500 rpm
		Coolant temperature: Between 75°C {167°F} and 80°C {176°F}
Others	Controls supplied EGR gas amount by using signal from EGR valve position sensor	Coolant temperature: Above 75°C {167°F}









SYSTEM INSPECTION

1. Connect the **SSTs** (Engine Signal Monitor and Adaptor Harness) to the ECM as shown (Refer to page F2–141.)
2. Start the engine.
3. Accelerate the engine and verify that ECM terminal 3O and 3P voltages are battery positive voltage while the engine is still cold.
4. Warm up the engine to normal operating temperature.
5. Drive the vehicle and verify that Engine Signal Monitor green and red lights flash at ECM terminals 3O and 3P.
6. Disconnect the EGR solenoid valve (Vacuum) connector.
7. Apply battery positive voltage and a ground to the solenoid valve as shown.
8. Verify that the engine runs roughly or stalls at idle.

EGR SOLENOID VALVE (VACUUM)

Inspection

1. Disconnect the vacuum hoses.
2. Blow through the vacuum hose and verify that air does not flow.
3. Disconnect the solenoid valve connector.
4. Apply battery positive voltage and a ground to the solenoid valve as shown.
5. Below through the vacuum hose and verify that air flows.
6. If not as specified, replace the solenoid valves.

EGR SOLENOID VALVE (VENT)

Inspection

1. Disconnect the vacuum hoses.
2. Blow through the vacuum hose and verify that air flows.
3. Disconnect the solenoid valve connector.
4. Apply battery positive voltage and a ground to the solenoid valve as shown.
5. Blow through the vacuum hose and verify that air does not flow.
6. If not as specified, replace the solenoid valves.

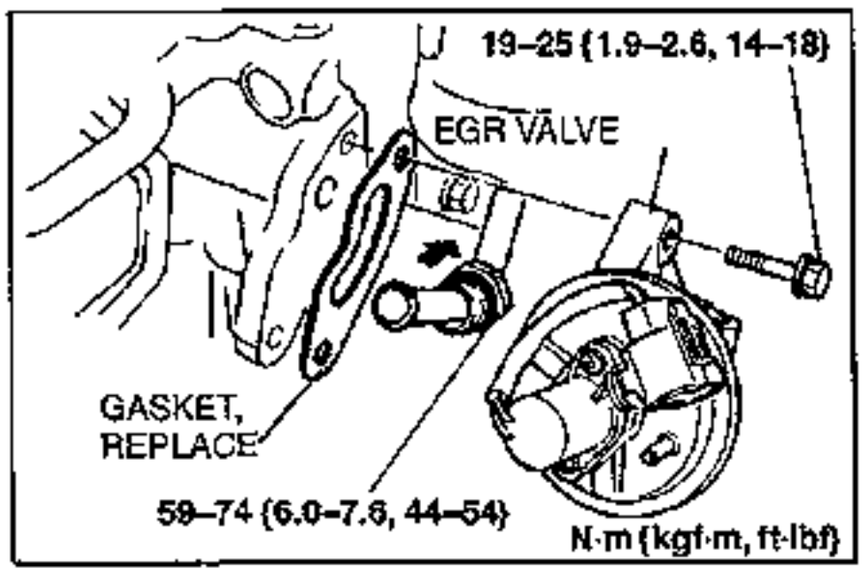
EGR VALVE

Inspection

1. Start the engine and run it at idle.
2. Connect a vacuum pump as shown and apply vacuum.
3. Verify that the engine runs roughly or stalls at more than the specified vacuum.

   Specification: 40–60 mmHg {1.6–2.4 inHg}

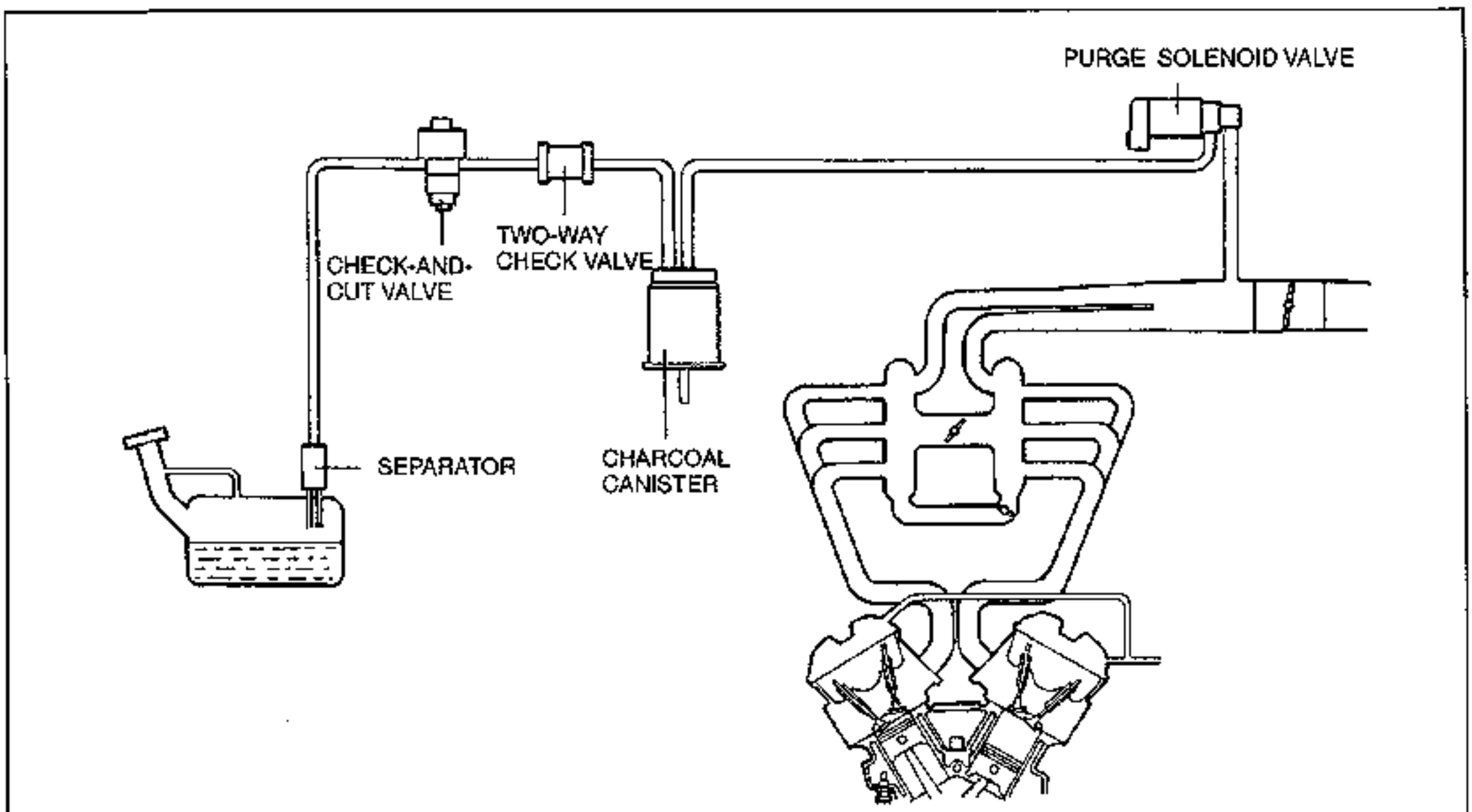
4. If not as specified, replace the EGR valve.



Replacement
Plug the water hoses after disconnecting them.
1. Remove the EGR control valve in the order shown below.
   (1) Battery and battery tray
   (2) EGR hoses
   (3) Vacuum hose
   (4) EGR valve position sensor connector
   (5) EGR valve and gasket
2. Install a new gasket, and then install the EGR valve in the revere order of removal.

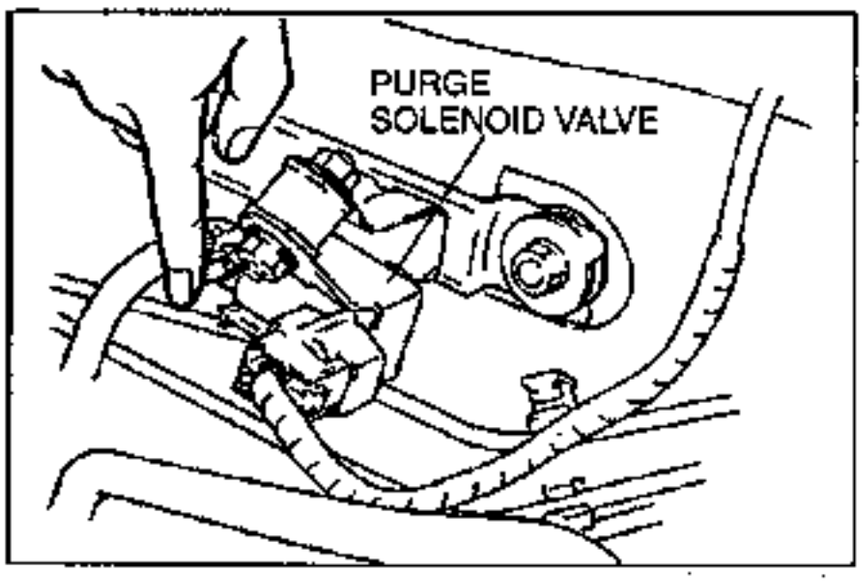
EVAPORATIVE EMISSION CONTROL SYSTEM

DESCRIPTION



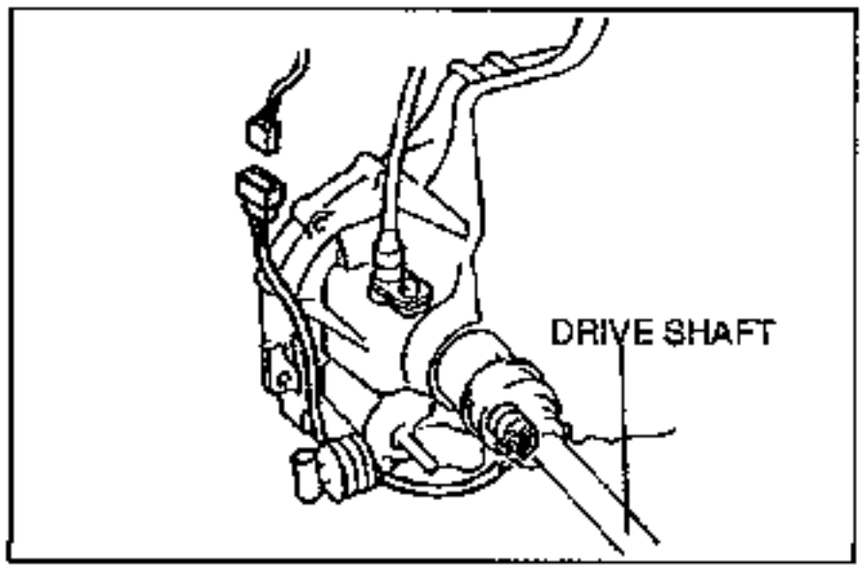
The evaporative emission control system consists of the separator, check-and-cut valve, two-way check valve, charcoal canister, purge solenoid valve, engine control module (ECM), and input devices. The amount of evaporative fumes introduced into the engine and burned is controlled by the solenoid valve to correspond to the engine's operating conditions. To maintain best engine performance, the solenoid valve is controlled by the ECM.

Operation
The purge solenoid valve is controlled by duty signals from the ECM to perform purging of the charcoal canister. Purging is done when these conditions are met:
(1) After warm-up
(2) Driving in gear
(3) Accelerator pedal depressed (closed throttle position switch OFF)
(4) Heated oxygen sensor functioning normally

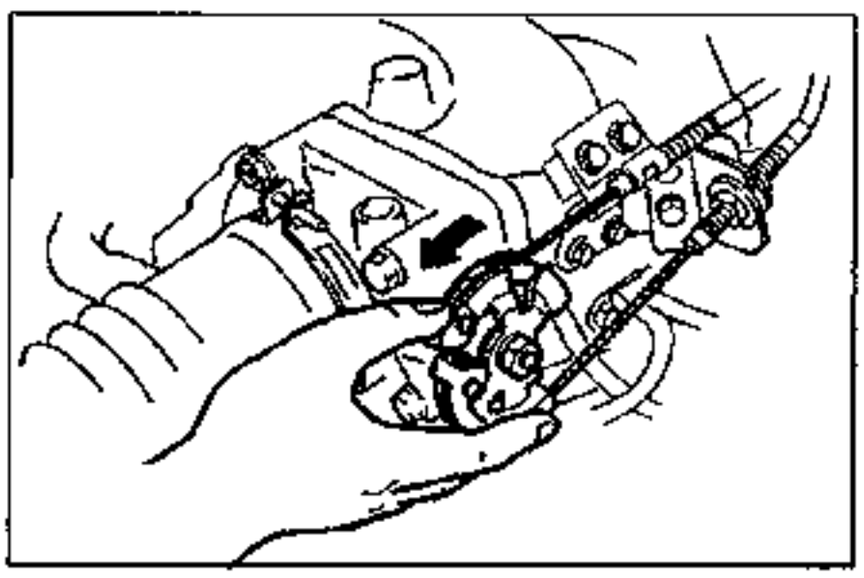


SYSTEM OPERATION

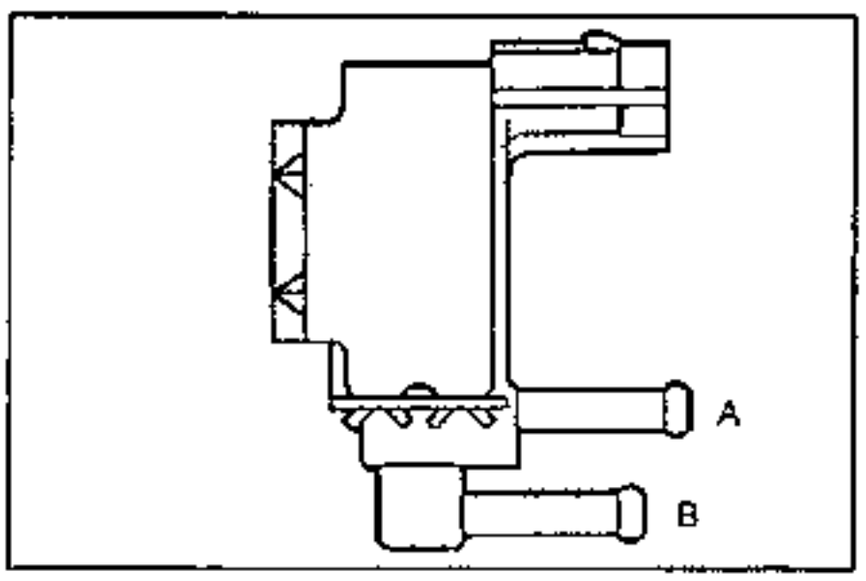
1. Warm up the engine to normal operation temperature.
2. Run the engine at idle.
3. Disconnect the vacuum hose from the purge solenoid valve.
4. Check that no vacuum's felt.



5. Disconnect the neutral switch connector. (MTX)
   Position the vehicle on the chassis roller and shift the selector lever to D (ATX).



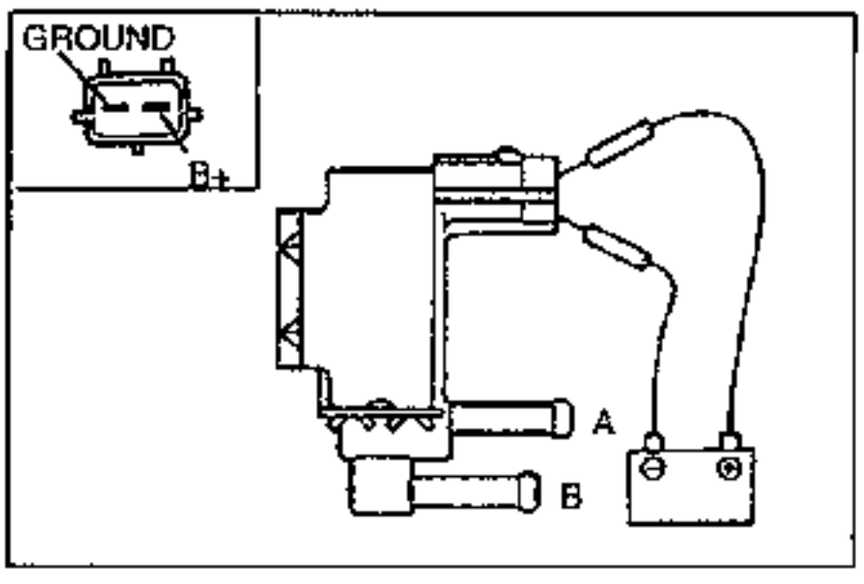
6. Connect a tachometer and increase the engine speed to **1200 rpm.**
7. Check that vacuum is felt **approx. 10 sec.** after.



PURGE SOLENOID VALVE

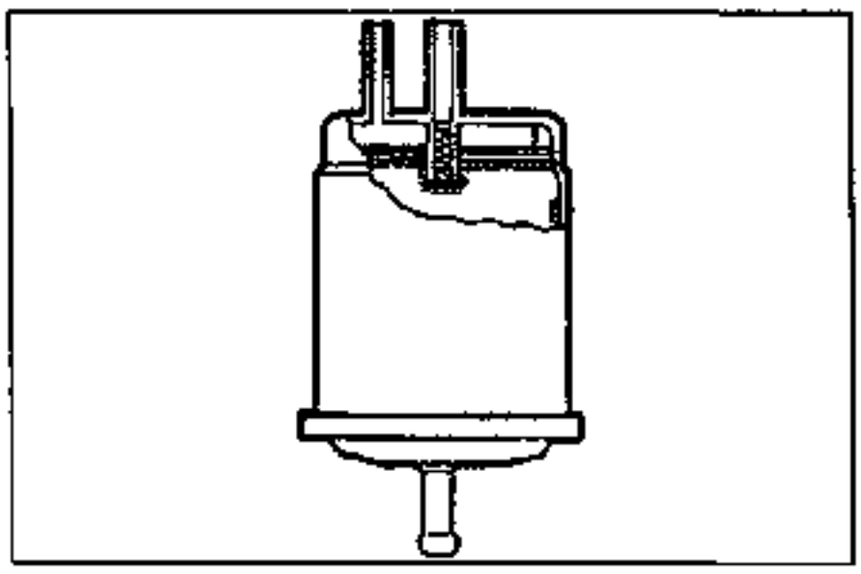
Inspection

1. Remove the solenoid valve.
2. Blow through the solenoid valve from hose A and check that air dose not flow from B.

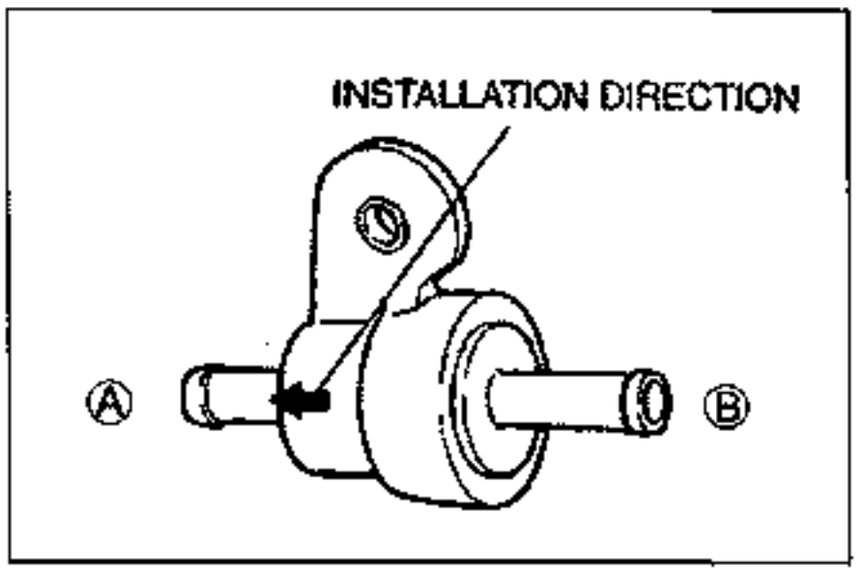


3. Apply battery positive voltage to solenoid valve and check that air dose flow from hose A to B.
4. If not as specified, measure the resistance of the solenoid valve.

Resistance: 23–27 Ω [20°C {68°F}]



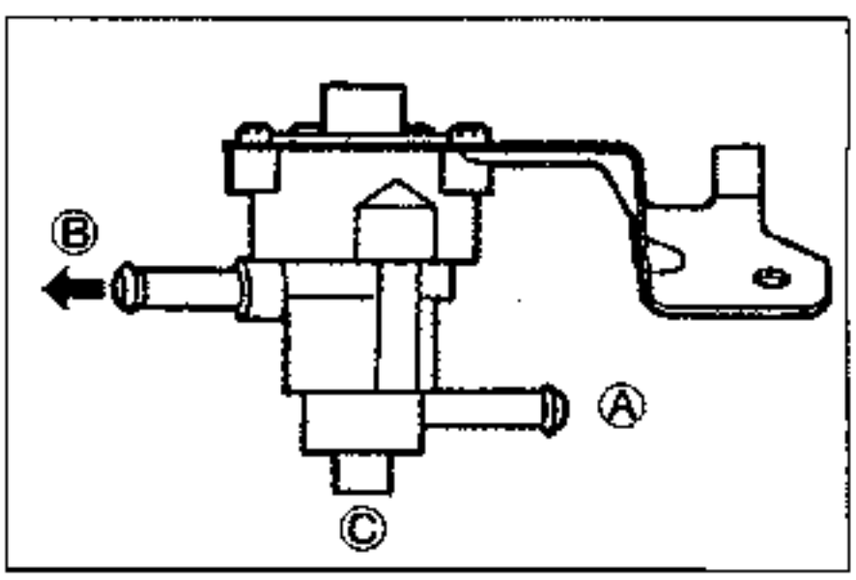
CHARCOAL CANISTER
Inspection
1. Remove the charcoal canister.
2. Visually check the charcoal canister for damage or crack.
3. Blow through each port and check that air flows.



TWO-WAY CHECK VALVE
Inspection
1. Remove the valve.
2. Check the operation of the valve by using a vacuum pump.

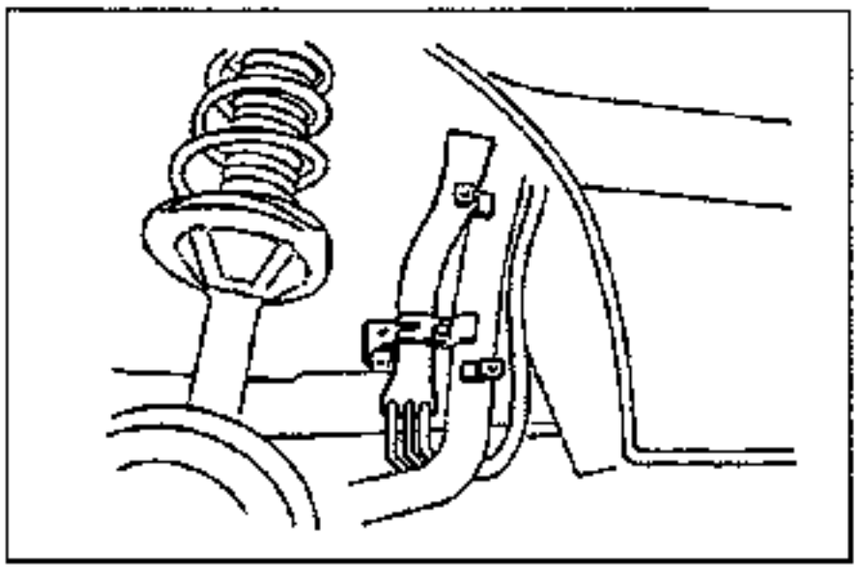
Apply approx. 2.0kPa {1.5 mmHg, 0.6 in Hg} vacuum at port A	Airflow
Apply approx. 5.9kPa {4.4 mmHg, 1.7 in Hg} vacuum at port B	Airflow

3. If not as specified, replace the two-way check valve.



CHECK-AND-CUT VALVE
Inspection
1. Remove the valve and plug port C.
2. Check operation of the valve by using a vacuum pump.

Apply approx. 1.0—4.90 kPa {7.4—36.7 mmHg, 0.3—1.44 in Hg} vacuum at port A	Airflow
Apply approx. 6.4—8.3 kPa {48—62mmHg, 1.9—2.4 in Hg} vacuum at port B	Airflow

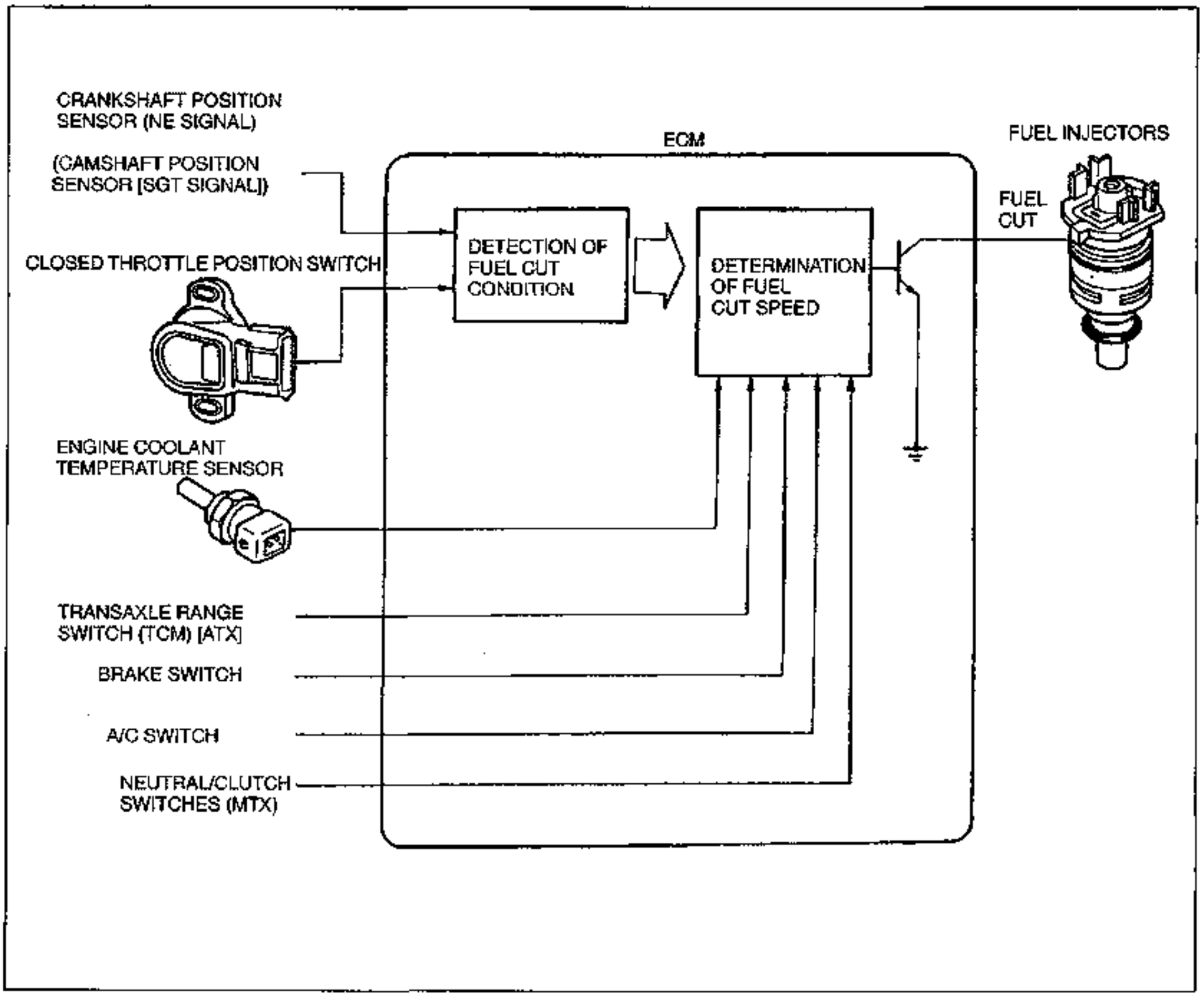


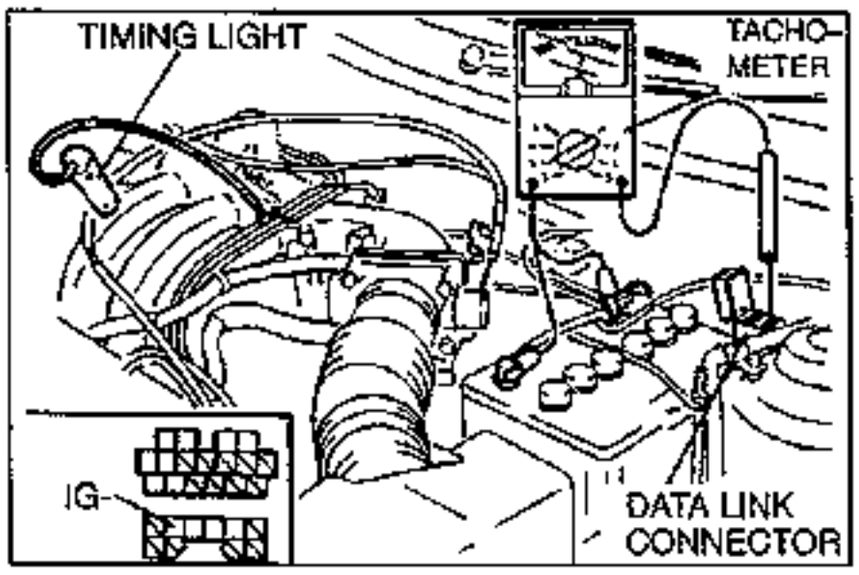
SEPARATOR
Inspection
1. Remove the left side trim.
2. Remove the separator.
3. Visually check the separator for damage. Replace it if necessary.

FUEL-CUT CONTROL SYSTEM

DESCRIPTION

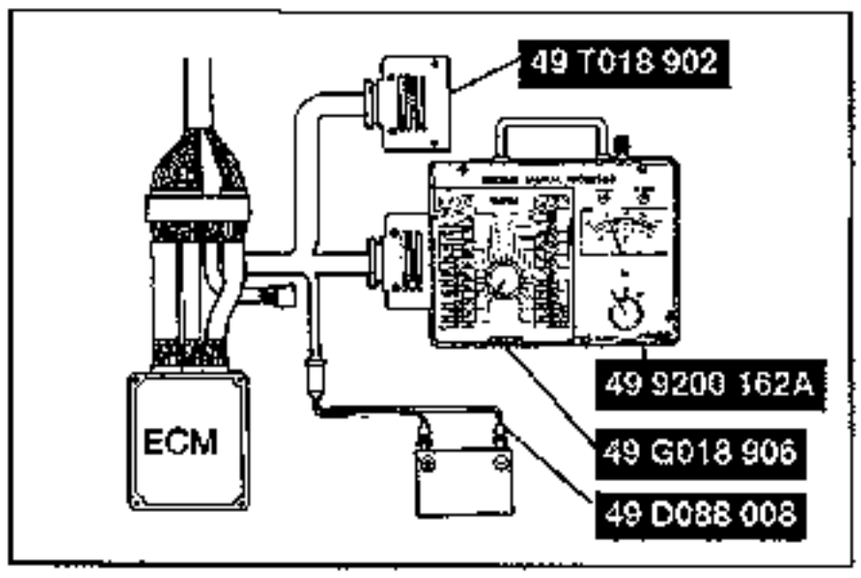
This system is used to improve fuel economy, to prevent engine bucking during deceleration, and to protect the engine from overspeeding.



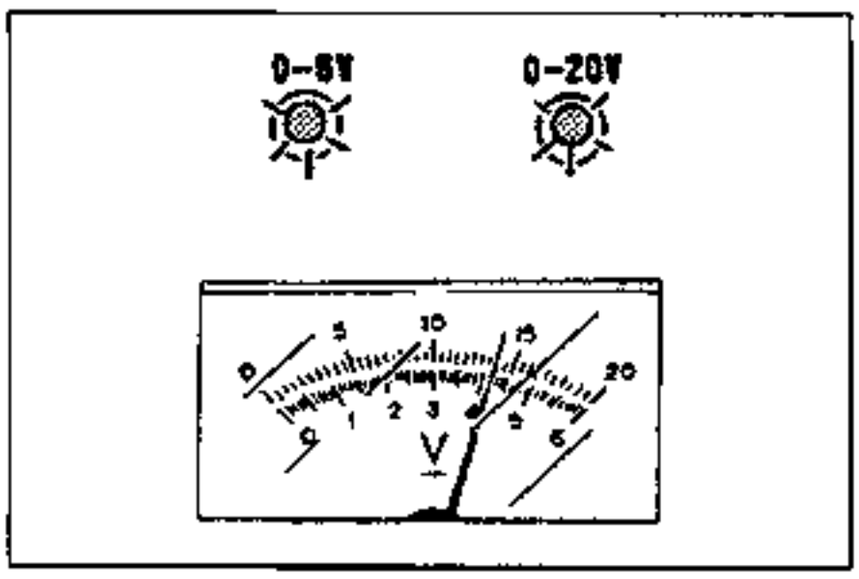


SYSTEM OPERATION

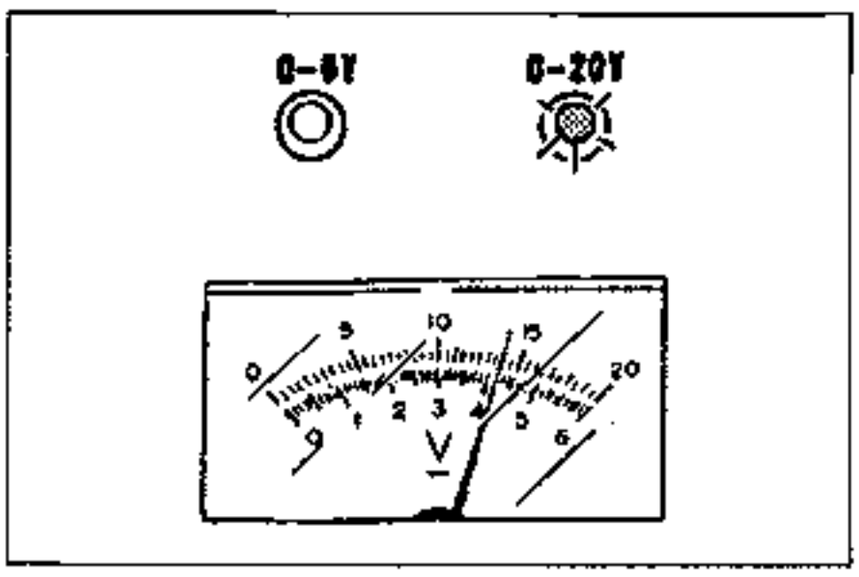
1. Connect a tachometer to the data link connector **IG-** terminal.



2. Connect the **SSTs** (Engine Signal Monitor and Adapter) to the ECM (Refer to page F2–141.)
3. Warm-up the engine to normal operating temperature and run it at idle.



4. Set the **SST** to terminal 3U to 3Z and make sure the green and red lights flash alternately.



5. Increase the engine speed to **4,000 rpm**; then suddenly release the throttle.
6. Verify that the red indicator light illuminates while the engine speed is above approximately **1,200 rpm (MTX), 1,500 rpm (ATX)** on deceleration.
7. Increase the engine speed and verify that the maximum rpm does not exceed specification.

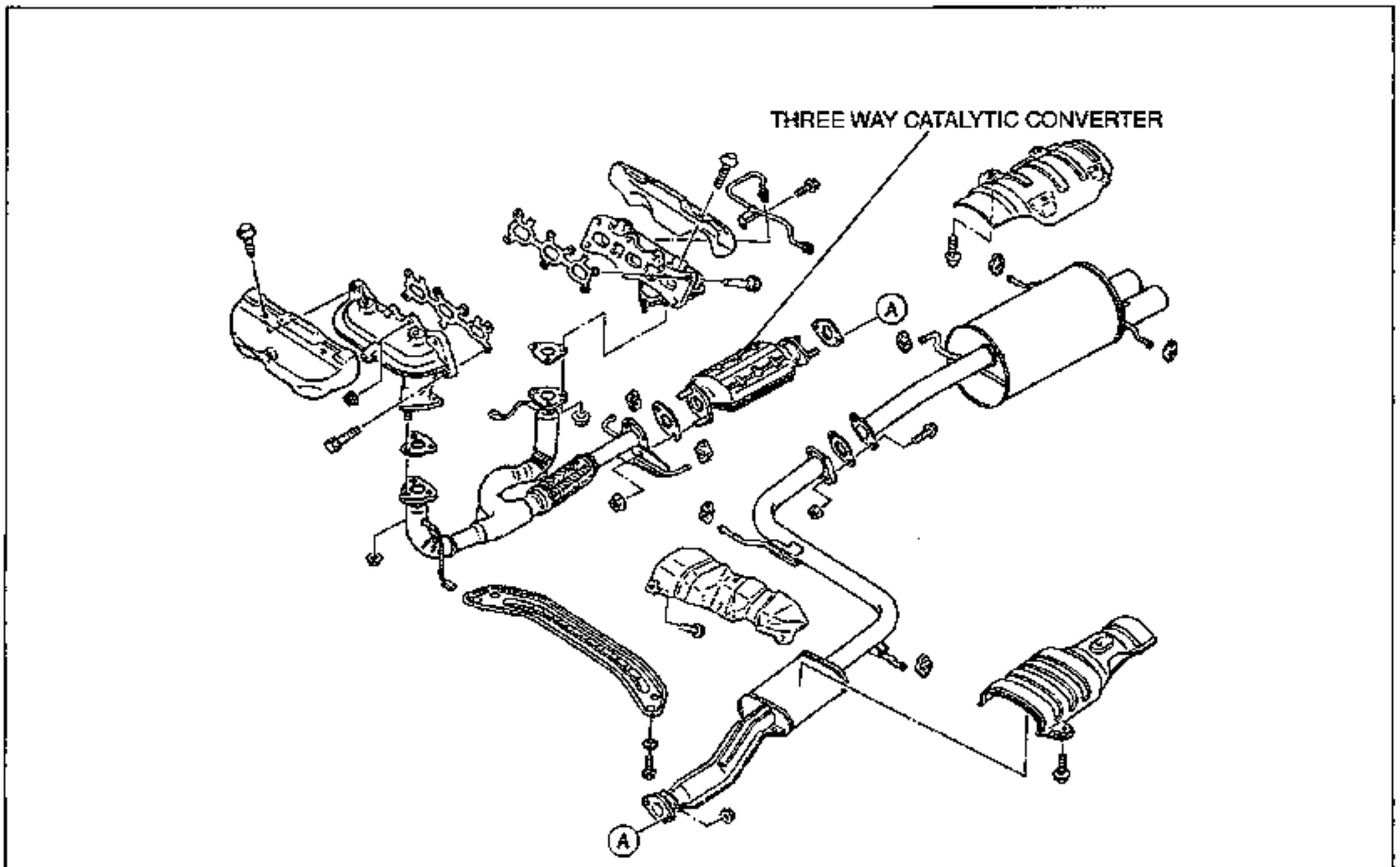
Specifications: Approx. 7,500 rpm

Caution
- **Holding the maximum rpm for more than 3 seconds can damage the engine.**

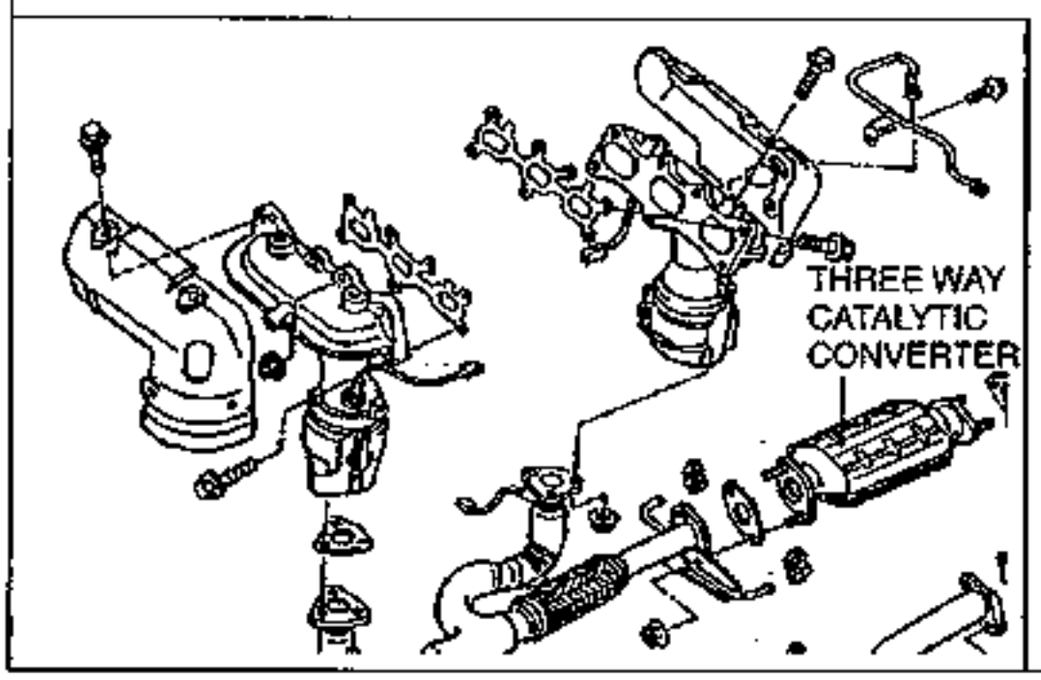
CATALYTIC CONVERTER SYSTEM

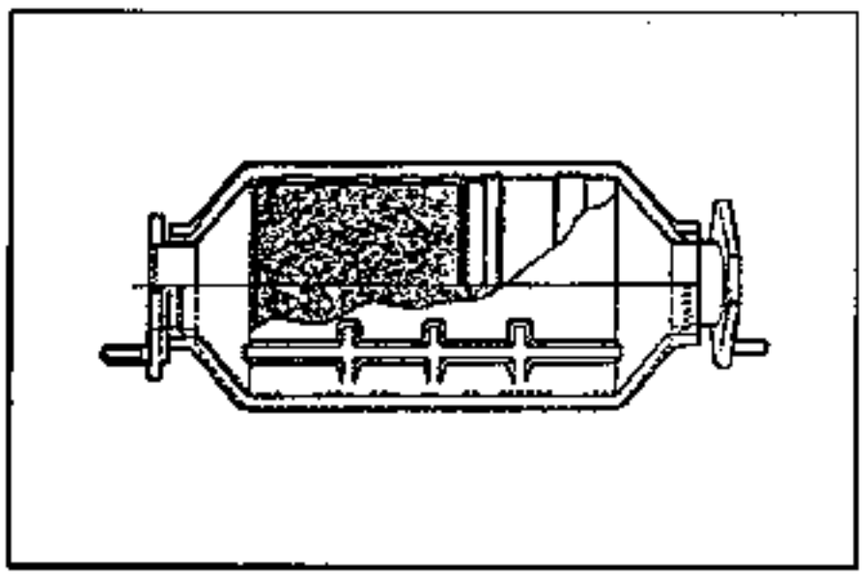
DESCRIPTION

The three way catalytic converter reduces CO, HC and NOx by chemical reaction. The catalytic converter contains platinum and rhodium compounds.



CALIFORNIA





THREE WAY CATALYTIC CONVERTER
Inspection

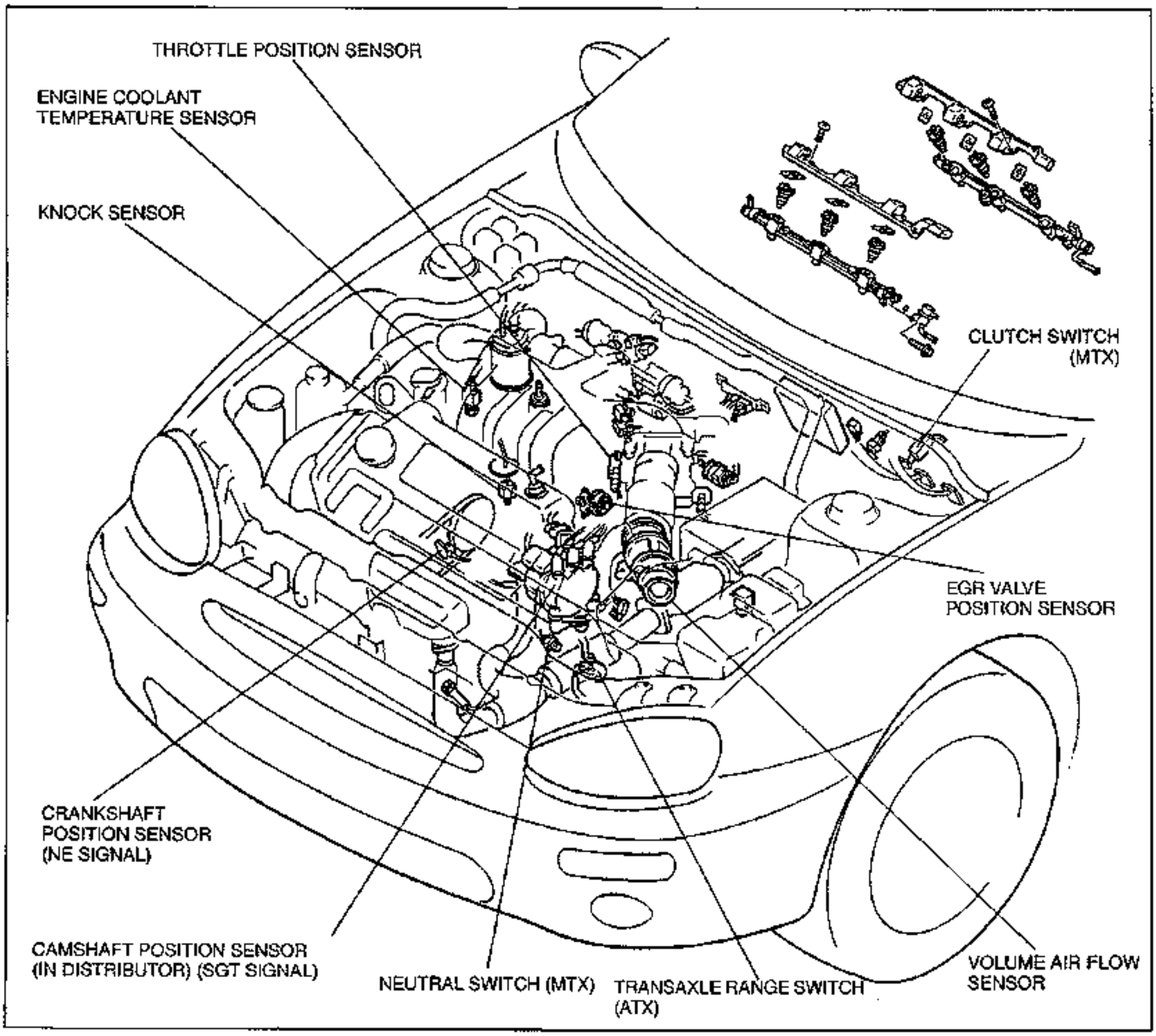
Note
- The insulator cannot be removed.

Remove the three way catalytic converter and visually check for deterioration and cracks.

ELECTRONIC SPARK ADVANCE (ESA) CONTROL SYSTEM

DESCRIPTION

The ignition timing is determined and set within ECM by signals from the various sensors and switches to obtain the best engine performance.



CONTROL SYSTEM

The ECM provides the most suitable ignition timing according to data sent from various sensors and switches.

The ignition timing is separated into two types, thd basic ignition timing and the changeable ignition timing.

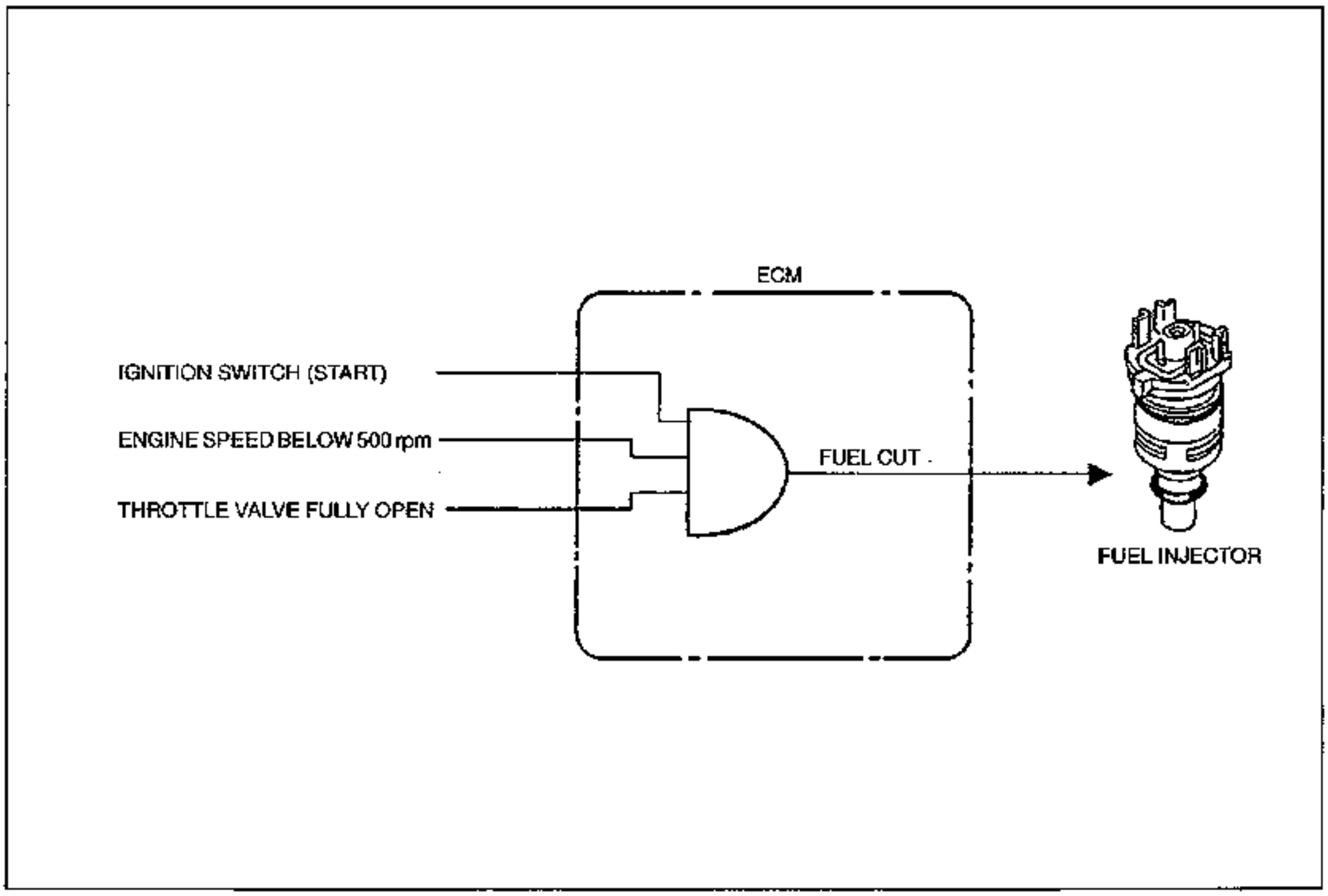
Ignition timing

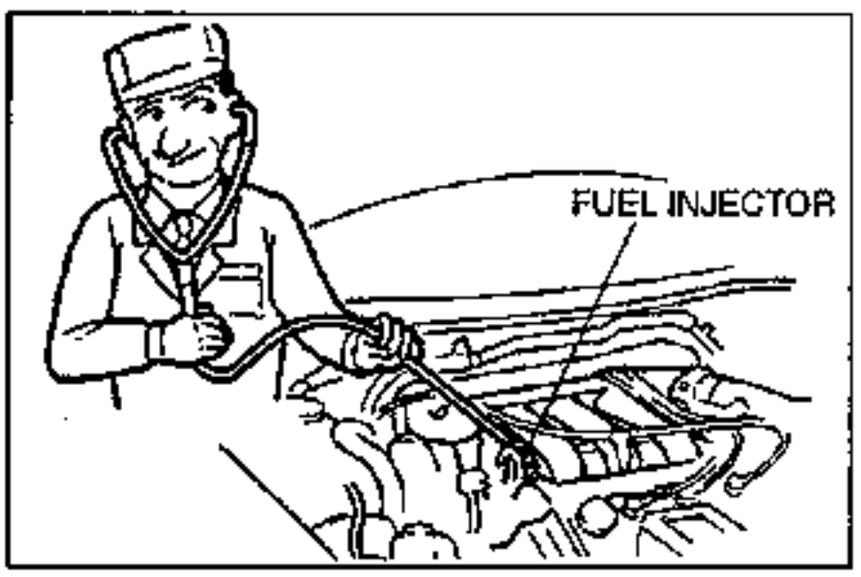
Engine condition	Ignition timing (BTDC)
Cranking	6–8°
Idling	9–11° {10 ± 1°}
Driving	Ignition timing advanced according to engine speed and intake manifold vacuum (calculated by engine speed and intake air amount) .

DECHOKE CONTROL SYSTEM

DESCRIPTION

To facilitate starting the engine when the spark plugs become fouled, such as when the engine is flooded, fuel injection is cut if the throttle valve is held fully open during cranking and engine coolant temperature is 0°C {32°F} or below. This allows the spark plugs to dry and purges excess fuel from the cylinders.





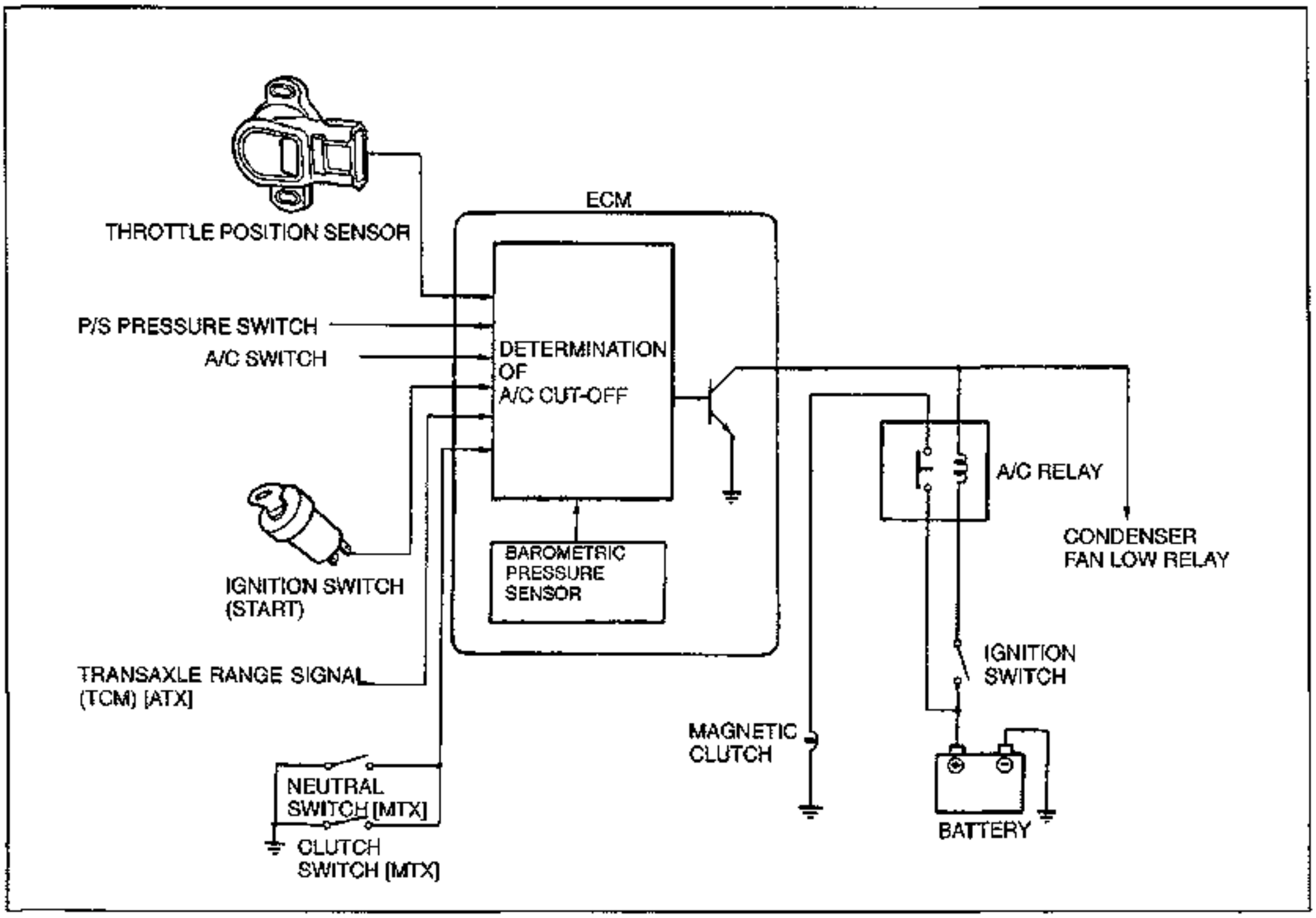
SYSTEM OPERATION

1. Turn the ignition switch to START and verify that the fuel injector operating sound is heard.
2. Depress the accelerator pedal fully and turn the ignition switch to START. Verify that no fuel injector operating sound is heard.
3. If fuel injector operating sound is heard, check ECM terminal 1C and 2F voltages (Refer to page F2–141, 149).

A/C CUTOFF CONTROL SYSTEM

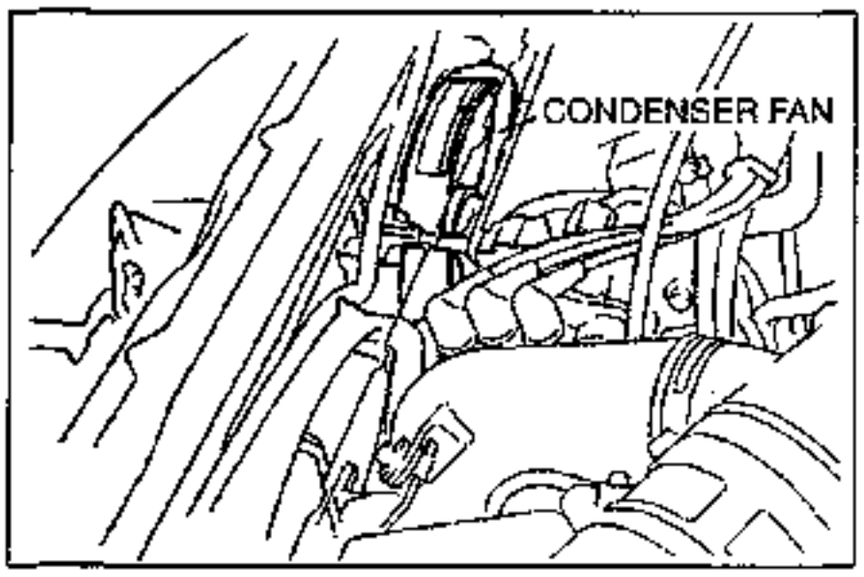
DESCRIPTION

An A/C cut-off control system is used to improve idle smoothness just after starting the engine and to improve acceleration performance.



OPERATION

Engine condition	Purpose	Cut-off period
After engine started	Improved idle smoothness	Approx. 5 sec.
Throttle valve fully open	Improved drivability	Approx. 5 sec.
Engine coolant temperature over 113°C {235°F}	Prevents engine from overheating	Cycled ON/OFF (10sec.) until engine coolant temperature reduced to 107°C {225°F}



SYSTEM OPERATION

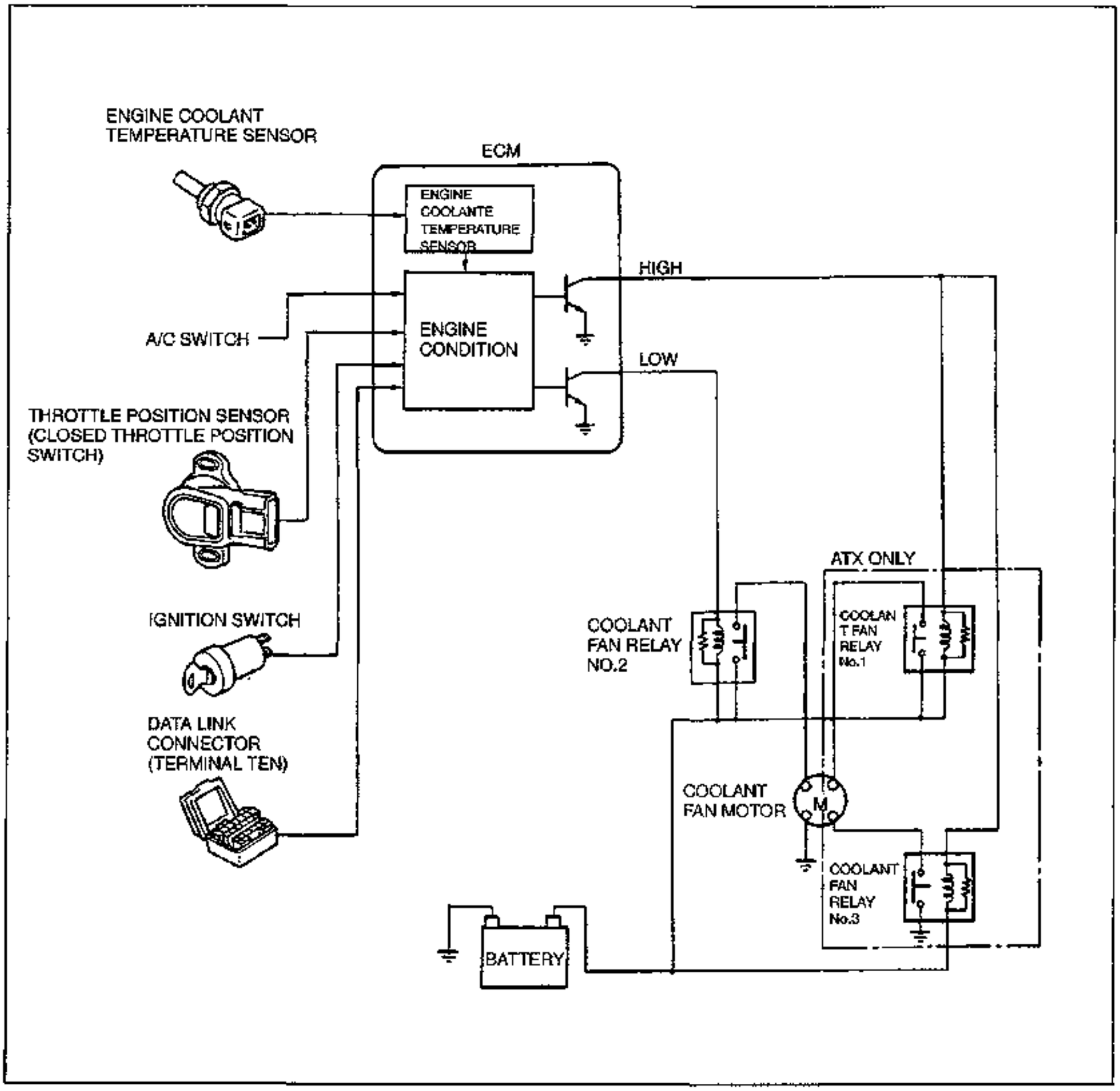
1. Turn the ignition switch to ON.
2. Turn the blower switch and A/C switch ON.
3. Verify that the condenser fan stops.
4. Turn the ignition switch to START and verify that the condenser fan stops for **approx. 5 sec.**

Note

- The magnetic clutch and the additional fan operate together.

ELECTRICAL COOLANT FAN AND CONDENSER FAN CONTROL SYSTEM

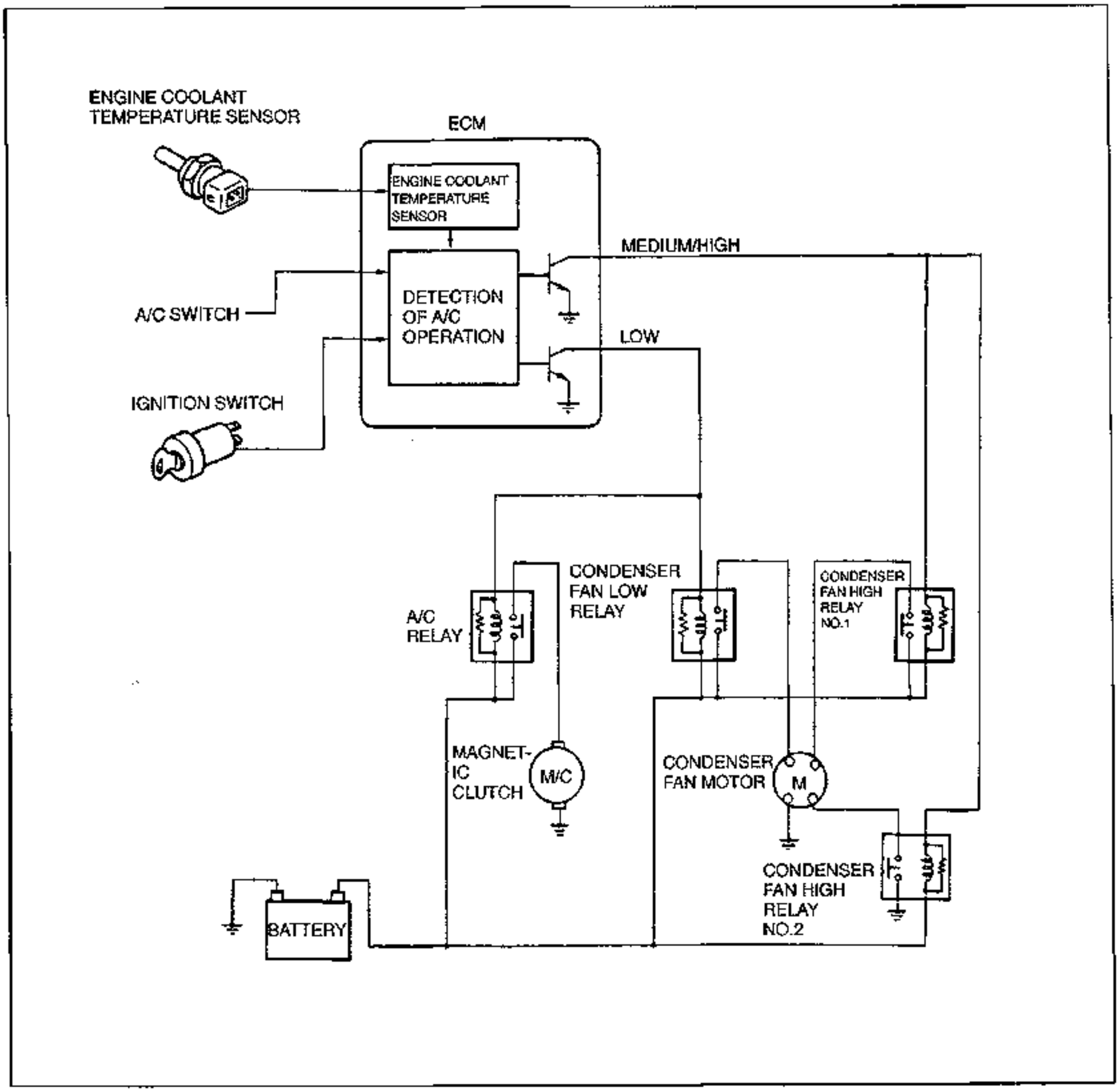
ELECTRICAL COOLANT FAN CONTROL



To improve engine reliability, the electric coolant fan is controlled by ECM. MX-3 models employ a LOW/HIGH control of the coolant fan. These controls operation under the conditions below.

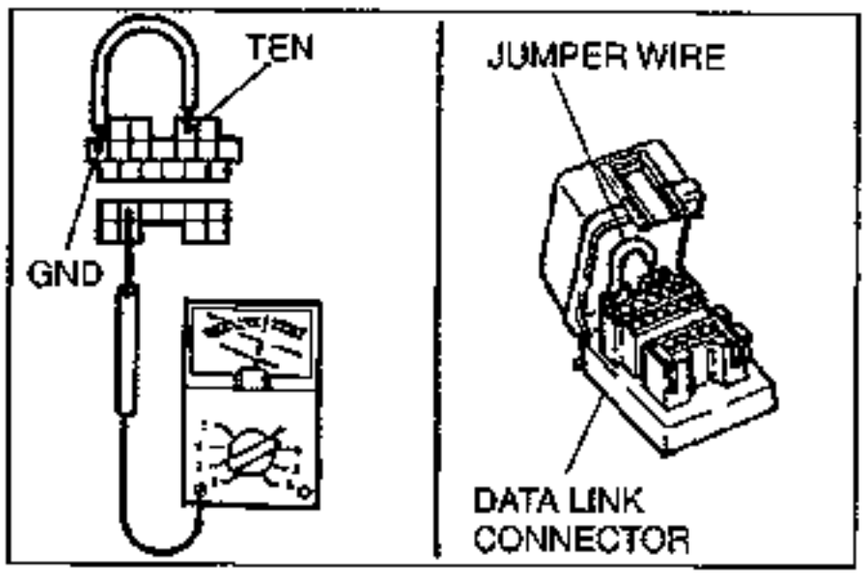
Engine condition	Fan relay No.1	Fan relay No.2	Fan relay No.3	LOW/HIGH operation
Engine coolant temperature above 100°C {212°F}	OFF	ON	OFF	LOW
A/C switch ON	OFF	ON	OFF	LOW
TEN terminal grounded and closed throttle position switch OFF	ON	ON	ON	HIGH
Engine coolant temperature above 108°C {226°F}	ON	ON	ON	HIGH
Engine coolant temperature sensor malfunction	ON	ON	ON	HIGH

CONDENSER FAN CONTROL (A/C EQUIPPED ONLY)



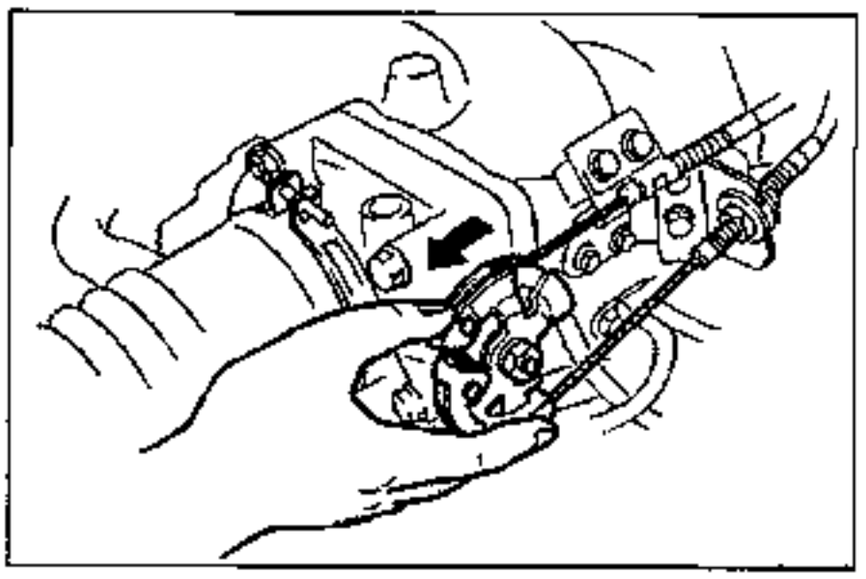
To improve A/C efficieny, the condenser fan is operated at three speeds: low, medium and high. There are three relays (High No.1, No.2 and low) which control the condenser fan operation. These controls operation under the conditions below.

Engine condition	A/C operation	A/C relay	Condenser fan low relay	Condenser fan high relay No.1	Condenser fan high relay No.2	Fan control operation
Engine coolant temperature below 108°C {226°F}	YES	ON	ON	OFF	OFF	LOW
Engine coolant temperature above 108°C {226°F}	NO	OFF	OFF	ON	ON	MEDIUM
Engine coolant temperature above 108°C {226°F}	YES	ON	ON	ON	ON	HIGH
Engine coolant temperature sensor malfunction	NO	OFF	OFF	ON	ON	MEDIUM
Engine coolant temperature sensor malfunction	YES	ON	ON	ON	ON	HIGH



SYSTEM OPERATION

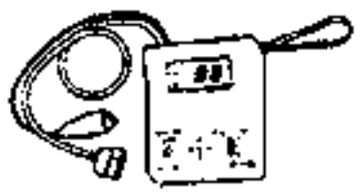
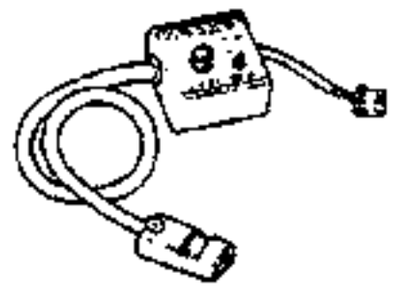
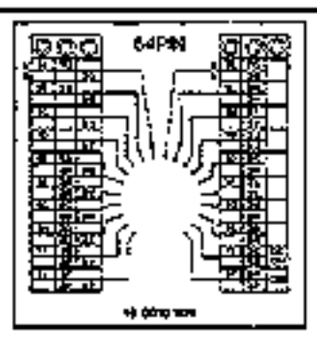
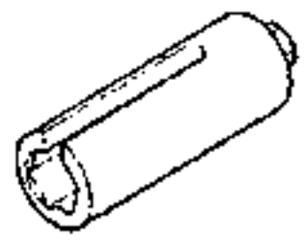
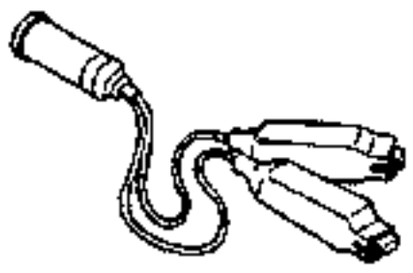
1. Connect the data link connector terminals TEN and GND by using a jumper wire.
2. Turn the ignition switch to ON.



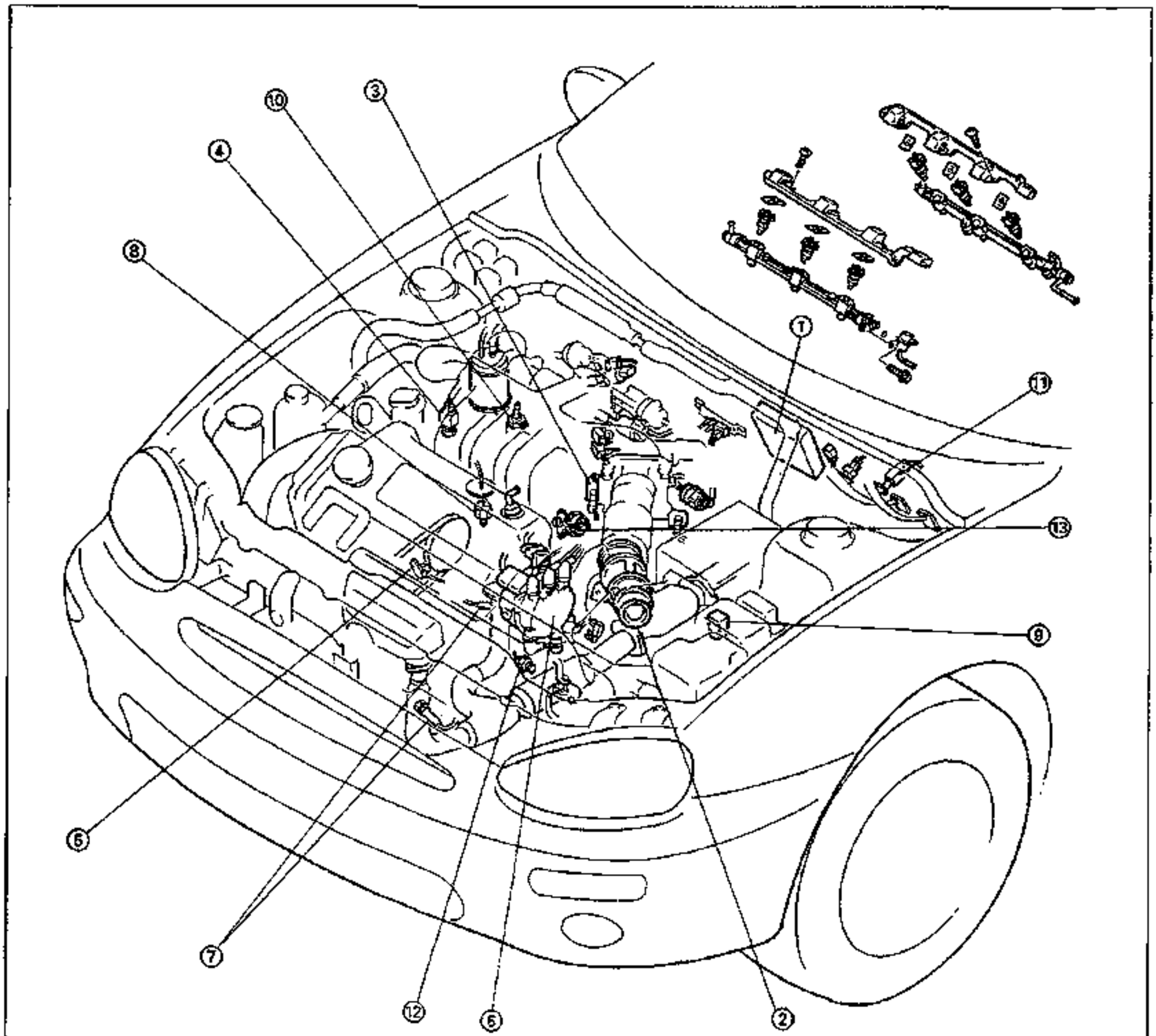
4. Rotate the throttle link by hand and verify that the coolant fan operates.

CONTROL SYSTEM

PREPARATION
SST

49 9200 162A Engine Signal Monitor 	For inspection of ECM	49 T018 902 Adapter harness 	For inspection of ECM
49 H018 9A1 Self-Diagnosis Checker 	For inspection of heated oxygen sensor	49 B019 9A0 System Selector 	For inspection of heated oxygen sensor
49 G018 906 Sheet, 64 pin 	For inspection of ECM	49 H018 001 Wrench, knock sensor 	For replacement of knock sensor
49 D088 008 Harness adapter, Power 	For inspection of ECM		

COMPONENTS

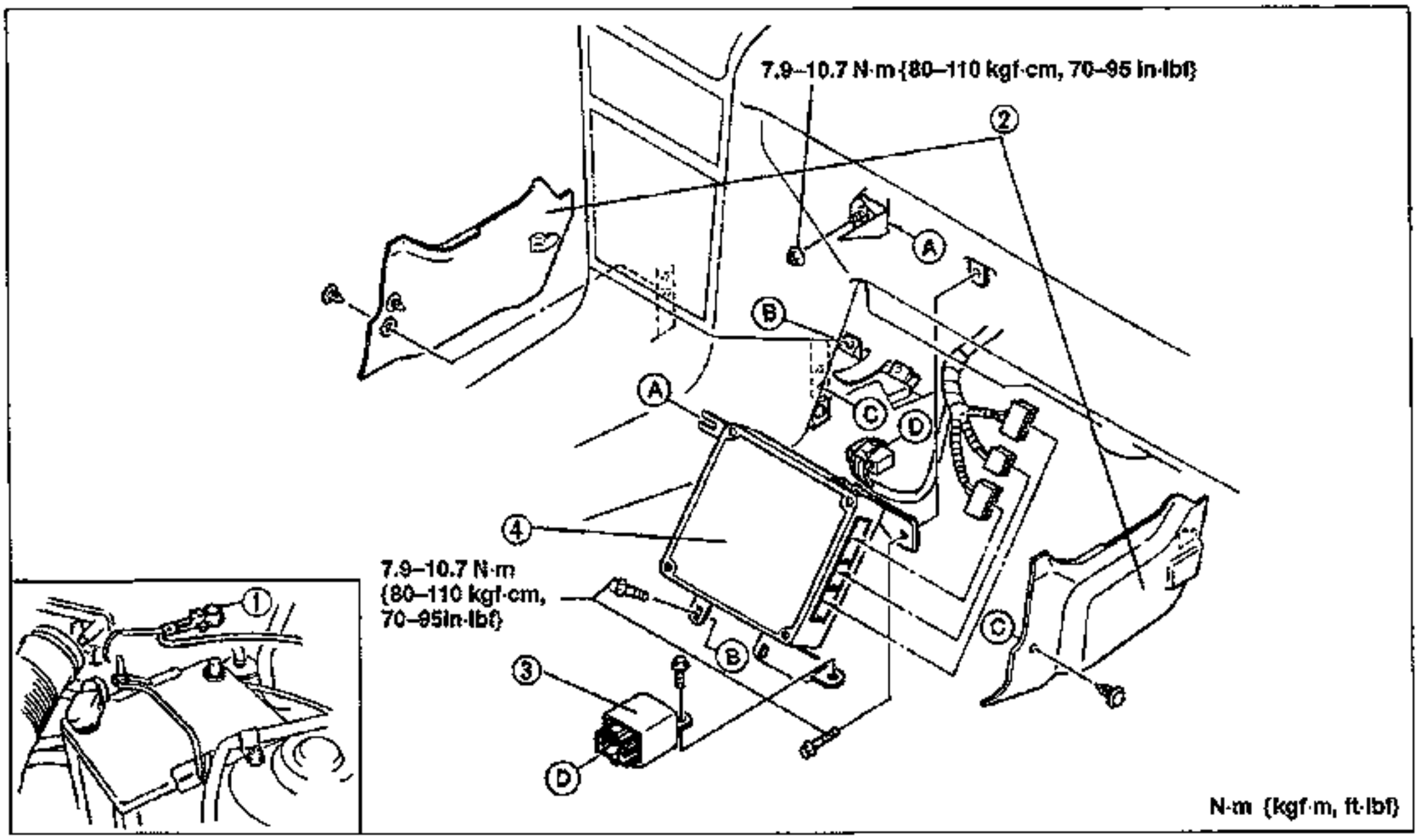


1. Engine control module (ECM)
   - Removal / Installation ..... page F2–141
   - Inspection ..... page F2–141
2. Volume air flow sensor
   - Inspection ..... page F2–150
3. Throttle position sensor
   - Inspection ..... page F2–150
   - Replacement ..... page F2–151
4. Engine coolant temperature sensor
   - Removal / Installation ..... page F2–152
   - Inspection ..... page F2–152
5. Crankshaft position sensor
   - Inspection ..... page F2–153
   - Removal / Installation ..... page F2–153
6. Camshaft position sensor
   - Inspection ..... page F2–153
7. Heated oxygen sensor
   - Inspection ..... page F2–154
   - Removal / Installation ..... page F2–154
8. Knock sensor
   - Removal / Installation ..... page F2–156
9. Main relay
   - Inspection ..... page F2–157
10. P/S pressure switch
    - Inspection ..... page F2–157
11. Clutch switch
    - Inspection ..... page F2–157
    - Replacement ..... page F2–157
12. Neutral switch
    - Inspection ..... page F2–158
    - Replacement ..... page F2–158
13. EGR valve position sensor ... page F2–158

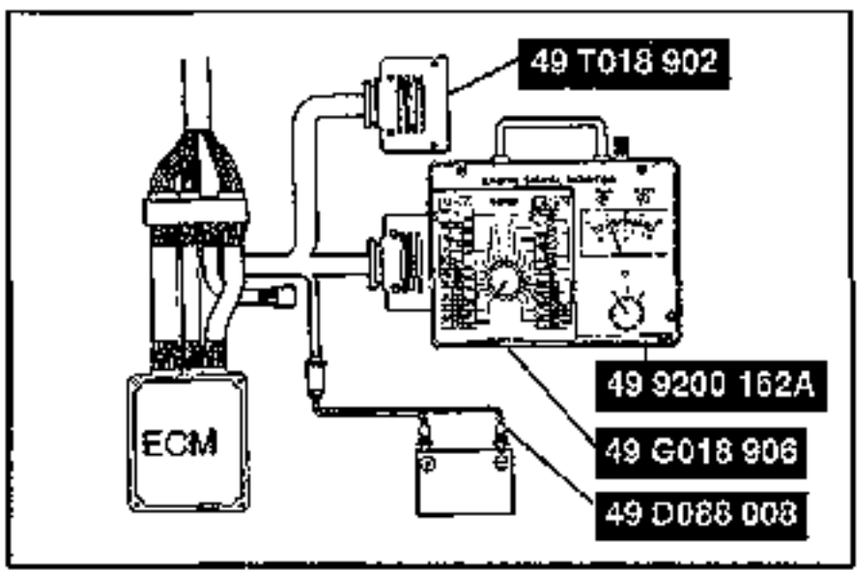
ENGINE CONTROL MODULE (ECM)

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.

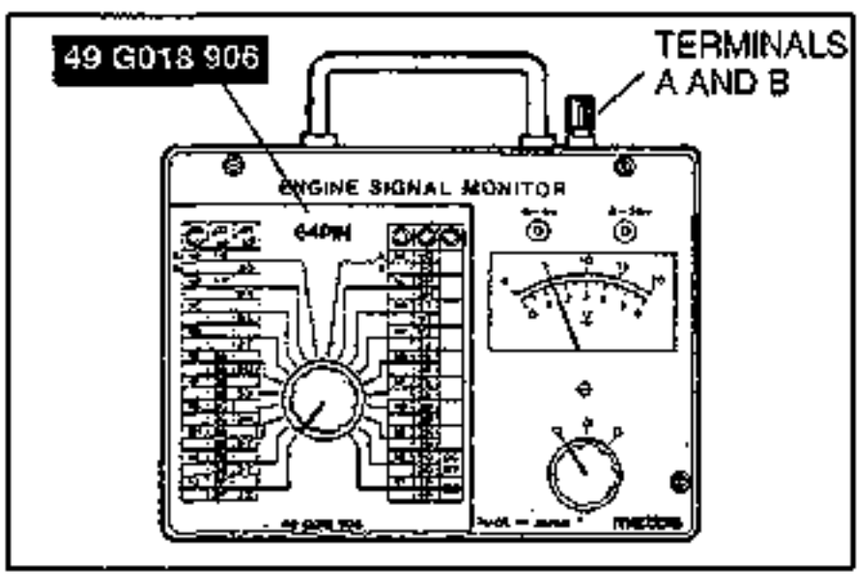


1. Negative battery cable
2. Side wall
3. Fuel pump relay
4. ECM



Inspection

1. Disconnect the ECM connector.
2. Connect the **SSTs** (Engine Signal Monitor and Adapter) to the ECM as shown.
   Use connector A of the Adaptor to check the voltages at terminals 1A through 1V and at terminals 3A through 3Z.
   Use connector B to check the voltages at terminals 2A though 2P.



3. Place the **SST** (Sheet) on the Engine Signal Monitor.
4. Measure the voltage at each terminal.
   (Refer to pages F2–142 through F2–149.)
5. If any ECM terminal voltage is incorrect, check the related input or output devices and wiring. If no problem is found, replace the ECM.

Terminal Voltage

B+: Battery positive voltage

Terminal	Input	Output	Connection to	Test condition		Correct voltage	Remarks
1A	○		Battery	Constant		B+	For backup
1B	○		Main relay (FUEL INJ relay)	Ignition switch	OFF	0V	—
					ON	B+	
1C	○		Ignition switch (START)	While cranking		10V	—
				Ignition switch ON		Below 1.0V	
1D		○	Data link connector (MEN terminal)	Test switch at "SELF-TEST" Light illuminated for 3 sec. after ignition switch OFF→ ON		4.5–5.5V	With Self-Diagnosis Checker and System Selector
				Light not illuminated after 3 sec.		B+	
				Test switch at "O2 MONITOR" at idle Monitor light illuminated		4.5–5.5V	
				Test switch at "O2 MONITOR" at idle Monitor light not illuminated		B+	
1E		○	Malfunction indicator lamp (MIL)	Lamp illuminated for 3 sec. after ignition switch OFF→ON		Below 2.5V	With System Selector test switch at "SELF-TEST"
				Lampnot illuminated after 3 sec.		B+	
				Lamp illuminated		Below 2.5V	
				Lamp not illuminated		B+	
			Data link connector (FEN terminal)	Buzzer sounded for 3 sec. after ignition switch OFF→ON		Below 2.5V	• With Self-Diagnosis Checker and System Selector • With System Selector test switch at "SELF-TEST"
				Buzzer not sounded after 3 sec.		B+	
				Buzzer sounded		Below 2.5V	
				Buzzer not sounded		B+	
1F	—	—	—	—		—	—
1G		○	Ignition control module	Ignition switch ON		Approx. 0V	—
				Idle		Approx. 0.6	
1H	○		Headlight switch	Head light ON		B+	—
				Head light OFF		0V	
1I	○		Data link connector (TEN terminal)	System Selector test switch at "O_2 MONITOR"		B+	• With Self-Diagnosis Checker and System Selector • Ignition switch ON
				System Selector test switch at "SELF-TEST"		Below 1.0V	
1J	○		Rear window defroster relay	Rear window defroster switch OFF		B+	Ignition switch ON
				Rear window defroster switch ON		Below 1.5V	
1K		○	TCM	Engine coolant temperature below 60°C {140°F}		Below 1.0V	Ignition switch ON
				Engine coolant temperature above 60°C {140°F}		B+	
1L		○	A/C relay	A/C switch ON		Below 2.5V	Ignition switch ON
				A/C switch OFF		B+	

B+: Battery positive voltage

Terminal	Incorrect voltage		Possible cause
1A	Always 0V		• Open circuit in wiring from Battery to ECM terminal 1A
1B	Always 0V		• Main relay malfunction (Refer to page F2–157) • Open or short circuit in wiring from main relay to ECM terminal 1B • ROOM 15A fuse burned
1C	Always 0V (starter turns)		• Open or short circuit in wiring from ignition switch to ECM terminal 1C
1D	Always 0V		• Main relay (FUEL INJ relay) malfunction (Refer to page F2–157) • Open circuit in wiring from ignition switch to data link connector terminal +B • Open or short circuit in wiring from data link connector terminal MEN to ECM terminal 1D
	Always approx. B+		• Poor connection at ECM connector • ECM malfunction
	Always approx. 5V		• ECM malfunction
1E	Always below 2.5V	MIL always ON	• Short circuit in wiring from instrument cluster to ECM terminal 1E • ECM malfunction
		MIL never ON	• Open circuit in wiring from instrument cluster to ECM terminal 1E
	Always approx. B+		• Poor connection at ECM connector • ECM malfunction
	Always below 2.5V	No display on Self-Diagnosis Checker	• Main relay (FUEL INJ relay) malfunction (Refer to page F2–157) • Open circuit in wiring from ignition switch to data link connector terminal +B
		"88" displayed and buzzer sounds continuously	• Open or short circuit in wiring from data link connector terminal FEN to ECM terminal 1E
	Always approx. B+		• Poor connection at ECM connector • ECM malfunction
1F	—		—
1G	Always 0V		• Short circuit in wiring from ignition control module to ECM terminal 1G
1H	Always below 1.0 (Headlights OK)		• Open or short circuit in wiring from headlight relay to ECM terminal 1H
1I	Always below 1.0V		• Short circuit in wiring from data link connector terminal TEN to ECM terminal 1I
	Always approx. B+		• Open circuit in wiring from data link connector terminal TEN to ECM terminal 1I • Open circuit in wiring from data link connector terminal GND to ground
1J	Always 0V		• Short circuit in wiring from rear window defroster switch to ECM terminal 1J
	Always B+		• Open circuit in wiring from rear window defroster switch to ECM terminal 1J
1K	Always below 1.0V		• Open or short circuit in wiring from ECM terminal 1K to TCM terminal 1N
1L	Always below 2.5V	A/C does not operate	• A/C relay malfunction • Open circuit in wiring from ignition switch to A/C relay • Open circuit in wiring from A/C relay to ECM terminal 1L
		A/C switch OFF but A/C operates	• Short circuit in wiring from A/C relay to ECM terminal 1L • ECM malfunction
	Always B+		• Poor connection at ECM connector • ECM malfunction

B+: Battery positive voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remarks
1M	○		Vehicle speed sensor	Ignition switch ON	0V or approx. 5.0V	—
				Driving	Approx. 2.5V	
1N	○		P/S pressure switch	Ignition switch ON	B+	—
				P/S ON at idle	Below 1.0V	
				P/S OFF at idle	B+	
1O	○		A/C switch	A/C switch ON	1.5–3.5V	Ignition switch ON and blower motor ON
				A/C switch OFF	4.5–5.5V	
1P	○		Fan switch	Fan speed control 2nd–4th position	Below 1.0V	Ignition switch ON and blower motor ON
				Fan speed control 1st position or fan switch OFF	B+	
1Q	○		Brake switch	Brake pedal released	Below 1.0v	—
				Brake pedal depressed	B+	
1R	○		Neutral/Clutch switch (MTX)	Neutral position or clutch pedal depressed	Below 1.0V	Ignition switch ON
				Others	B+	
			TCM (ATX)	N or P range	Below 1.0V	—
				Others	B+	
1S	○		TCM (ATX)	At shifting	Approx. 2.5V	—
				Others	B+	
1T	○		Throttle position sensor (Closed throttle position switch)	Accelerator pedal released	Below 1.0V	Ignition switch ON
				Accelerator pedal depressed	B+	
1U	○		Ground (MTX)	Constant	0V	—
1V	○		TCM	At shifting	0V	—
				Others	B+	
2A	—	—	—	—	—	—
2B	○		Volume air flow sensor	Ignition switch ON	Approx. 4V	—
				Idle	Approx. 2.6V	
2C	○		Heated oxygen sensor (RH)	Ignition switch ON	0V	—
				Idle (After warm-up)	0–1.0V	
2D	○		Heated oxygen sensor (LH)	Acceleration (After warm-up)	0.5–1.0V	
				Deceleration	0–0.4V	
2E	○		Engine coolant temperature sensor	Engine coolant temperature 20°C {68°F}	Approx. 3.1V	Ignition switch ON
				After warm-up	Approx. 0.9V	
2F	○		Throttle position sensor	Closed throttle position	0.1—1.1V	Ignition switch ON
				Wide open throttle	2.8—4.5V	

B+: Battery positive voltage

Terminal	Incorrect voltage	Possible cause
1M	Always 0V	• Open or short circuit in wiring from speedometer to ECM terminal 1M
1N	Always below 1.0V	• P/S pressure switch malfunction (Refer to page F2–157) • Short circuit in wiring from P/S pressure switch to ECM terminal 1N • ECM malfunction
	Always B+	• P/S pressure switch malfunction (Refer to page F2–157) • Open circuit in wiring from P/S pressure switch to ECM terminal 1N • Open circuit in wiring from P/S pressure switch to ground
1O	Always below 1.5V	• Short circuit in wiring from A/C amplifier to ECM terminal 1O • A/C amplifier malfunction • ECM malfunction
	Always 4.5–5.5V	• Open circuit in wiring from A/C amplifier to ECM terminal 1O • A/C amplifier malfunction
1P	Always below 1.0V	• Short circuit in wiring from A/C amplifier to ECM terminal 1P • A/C amplifier malfunction • ECM malfunction
	Always B+	• Open circuit in wiring from A/C amplifier to ECM terminal 1P • A/C amplifier malfunction
1Q	Always below 1.0V (Stoplight OK)	• Open circuit in wiring from brake switch to ECM terminal 1Q
1R	Always below 1.0V (Neutral/clutch switch OK)	• Short circuit in wiring from neutral/clutch switch to ECM terminal 1R
	Always B+	• Open circuit in wiring from neutral/clutch switch to ECM terminal 1R
	Always below 1.0V (Transaxle range switch OK)	• Short circuit in wiring from ECM terminal 1R to TCM terminal 1D
	Always B+	• Open circuit in wiring from ECM terminal 1R to TCM terminal 1D
1S	Always 0V	• Open or short circuit in wiring from ECM terminal 1S to TCM terminal 2M
1T	Always below 1.0 V	• Short circuit in wiring from throttle position sensor to ECM terminal 1T • ECM malfunction • Throttle position sensor misadjusted
	Always B+	• Open circuit in wiring from throttle position sensor to ECM terminal 1T • ECM malfunction
1U	—	—
1V	Always B+	• Open circuit in wiring from ECM terminal 1V to TCM terminal 1A
	Always 0V	• Short circuit in wiring from ECM terminal IV to TCM terminal IA
2A	—	—
2B	Always below 2.0 V or Approx. 4V	• Refer to code No. 08 Troubleshooting (Refer to page F2–80)
2C	0V after warm-up	• Refer to code No. 23 Troubleshooting (Refer to page F2–84)
	Always approx. 1V after warm-up	• Refer to code No. 24 Troubleshooting (Refer to page F2–86)
2D	0V after warm-up	• Refer to code No. 15 Troubleshooting (Refer to page F2–84)
	Always approx. 1V after warm-up	• Refer to code No. 17 Troubleshooting (Refer to page F2–86)
2E	Always approx. 0V or approx. 5V	• Refer to code No. 09 Troubleshooting (Refer to page F2–81)
2F	Always constant	• Open circuit in wiring from ECM terminal to throttle position sensor
	Always above IV	• Throttle position sensor misadjusted

B+: Battery positive voltage

Terminal	Input	Output	Connection to	Test condition		Correct voltage	Remarks
2H	○		—	Constant		Approx. 5V	—
			Ground (California)	Constant		0V	—
2I		○	Throttle position sensor Volume airflow sensor EGR valve position sensor TCM	Ignition switch ON		5V	
2J	○		EGR valve position sensor	Ignition switch ON		Approx. 0.8V	—
				Engine running		Approx. 0.8–4.5V	
2K	○		Intake air temperature sensor (Volume air flow sensor)	Ambient air temperature 20°C {68°F}		Approx. 2.5V	Ignition switch ON
2L	○		DRL relay (Canada)	Parking brake pulled with ignition switch ON (DRL OFF)		B+	DRL: Daytime Running Lights
				Idle (DRL ON)		Below 2.5V	
2M*	○		Knock sensor	Ignition switch ON		Approx. 0.7V	—
				Idle		Approx. 0.7V	
2N	—	—	—	—		—	—
2O		○	Purge solenoid valve	Ignition switch ON or idle		B+	
2P		○	Coolant fan relay (ATX)	Engine coolant temp. 108°C {226°F}		Below 2V	—
				Others		B+	
3A	—	—	Ground (Output)	Constant		0V	—
3B	—	—	Ground (Fuel injector)	Constant		0V	—
3C	—	—	Ground (CPU)	Constant		0V	—
3D	—	—	Ground (Input)	Constant		0V	—
3E	○		Camshaft position sensor(in distributor) (SGT signal)	Ignition switch ON		Approx. 0V or 5V	—
				Idle		Approx. 2.5 V	
3F	○		Crankshaft position sensor(Crankshaft pulley) (Ground)	Constant		0V	—
3G	○		Camshaft position sensor (in distributor) (SGC signal)	Ignition switch ON		Approx. 0V or 5V	—
				Idle		Approx. 2.5V	
3H	○		Crankshaft position sensor (Crankshaft pulley) (NE signal)	Ignition switch ON		0V	
				Idle		Approx. 0V	
3I		○	VRIS solenoid valve No.1	Engine speed 3,900–6,300 rpm		Approx. 1.2V	—
				Others		B+	
3J		○	VRIS solenoid valve No.2	Engine speed 4,700–6,300 rpm		Approx. 1.2V	—
				Others		B+	
3K	—	—	—	—		—	—
3L		○	Coolant fan relay	Engine coolant temp. 100°C {212°F}		Below 1.0V	—
				Others		B+	
3M		○	PRC solenoid valve	Hot condition: Engine coolant temp. above 70°C {158°F} and intake air temp. above 75°C {158°F} for 120 sec. after engine starting		Approx. 1.2V	—
				Others		B+	
3N		○	Condenser fan relay	Ignition switch ON		B+	—
				Idle	Engine coolant temp. 108°C {226°F}	Below 2.0V	
					Others	B+	

*: Diagnostic trouble code No. 05 may be memorized by ECM when the Engine Signal Monitor is set to position 2M.

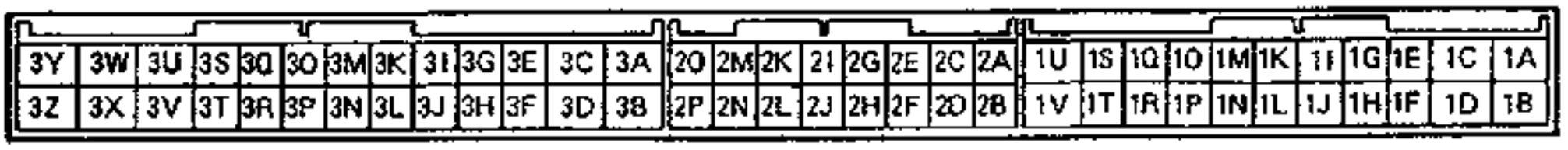
B+: Battery positive voltage

Terminal	Incorrect voltage	Possible cause
2H	—	—
2I	Always approx. 0V	• Short circuit in wiring from ECM
2J	Always approx. 0V or approx. 5V	• Refer to code No. 16 Troubleshooting (Refer to page F2–85)
2k	Always 0V	• Refer to code No. 10 Troubleshooting (Refer to page F2–82)
2L	Always 0V (DRL system OK)	• Open or short circuit in wiring from DRL relay to ECM terminal 2L
2M	Always 0V or B+	• Refer to code No. 05 Troubleshooting (Refer to page F2–79)
2N	—	—
2O	Always 0V or approx. 5V	• Refer to code No. 26 Troubleshooting (Refer to page F2–88)
2P	Always below 2V or B+	• Open or short circuit in wiring from coolant fan relay to ECM terminal 2P • ECM malfunction
3A 3B 3C 3D	Above 0V	• Poor connection at ground terminal • Open circuit in wiring from ECM
3E	Always approx. 0V or approx. 5V	• Refer to code No. 04 Troubleshooting (Refer to page F2–78)
3F	Above 0V	• Poor connection at ground terminal • Open circuit in wiring from ECM
3G	Always approx. 0V or approx. 5V	• Refer to code No. 03 Troubleshooting (Refer to page F2–77)
3H	0V	• Refer to code No. 02 Troubleshooting (Refer to page F2–76)
3I	Always approx. 0V or B+	• Refer to code No. 41 Troubleshooting (Refer to page F2–91)
3J	Always approx. 0V or B+	• Refer to code No. 46 Troubleshooting (Refer to page F2–91)
3K	—	—
3L	Always below 1.0V or B+	• Open or short circuit in wiring from coolant fan relay to ECM terminal 3L • ECM malfunction
3M	Always below 1.0V or B+	• Refer to code No. 26 Troubleshooting (Refer to page F2–88)
3N	Always below 2.0V	• Open or short circuit in wiring from condenser fan relay to ECM terminal 3N • ECM malfunction

B+: Battery positive voltage

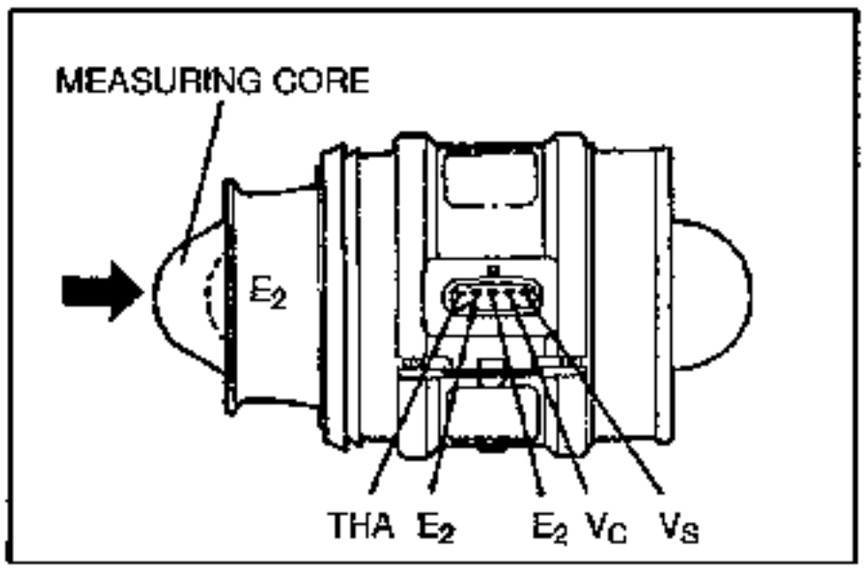
Terminal	Input	Out-put	Connection to	Test condition	Correct voltage	Remarks
3O		O	EGR solenoid valve (vent)	Idle	B+	* Engine Signal Monitor: Green and red light flash
				Initial acceleration *	B+	
3P		O	EGR solenoid valve (vacuum)	Idle	B+	
				Initial acceleration*	B+	
3Q		O	Idle air control valve	Ignition switch ON	Approx. 7V	—
				Idle	Approx. 9V	
3R	—	—	—	—	—	—
3S	—	—	—	—	—	—
3T		O	Fuel pump relay	Ignition switch ON	B+	—
				Idle	Below 1.0V	
3U		O	Fuel injector No.1	Ignition switch ON or Idle*	B+	* Engine Signal Monitor: Green and red lights flash
3V		O	Fuel injector No.2			
3W		O	Fuel injector No.3			
3X		O	Fuel injector No.4			
3Y		O	Fuel injector No.5			
3Z		O	Fuel injector No.6			

Control Unit Connector (Control Unit Side)



B+: Battery positive voltage

Terminal	Incorrect voltage	Possible cause
3O	Always 0V	• Refer to code No. 28 Troubleshooting (Refer to page F2–89)
3P	Always 0V	• Refer to code No. 29 Troubleshooting (Refer to page F2–89)
3Q	Always approx. 0V or B+	• Refer to code No. 34 Troubleshooting (Refer to page F2–90)
3R	—	—
3S	—	—
3T	Always below 1.0V	• Open or short circuit in wiring from fuel pump relay to ECM terminal 3T
3U 3V 3W 3X 3Y 3Z	Always 0V	• Open or short circuit in wiring from fuel injector to ECM terminal 3U, 3V, 3W, 3X, 3Y or 3Z • Main relay malfunction (Refer to page F2–157)



VOLUME AIR FLOW SENSOR

Inspection

1. Check the volume air flow sensor body for cracks or damage.
2. Verify that the measuring core opens smoothly.
3. Measure the resistance of the sensor by using a circuit tester.

Terminal	Resistance (Ω)
$E_2 \leftrightarrow V_S$	200–1,000 (Closed; 20°C {68°F}) 20–800 (Open; 20°C {68°F})
$E_2 \leftrightarrow V_C$	200–400 (Closed ↔ Open; 20°C {68°F})
$E_2 \leftrightarrow$ THA (Intake air temperature sensor)	20°C {68°F}: 2,000–3,000 60°C {140°F}: 400–700

Removal / Installation

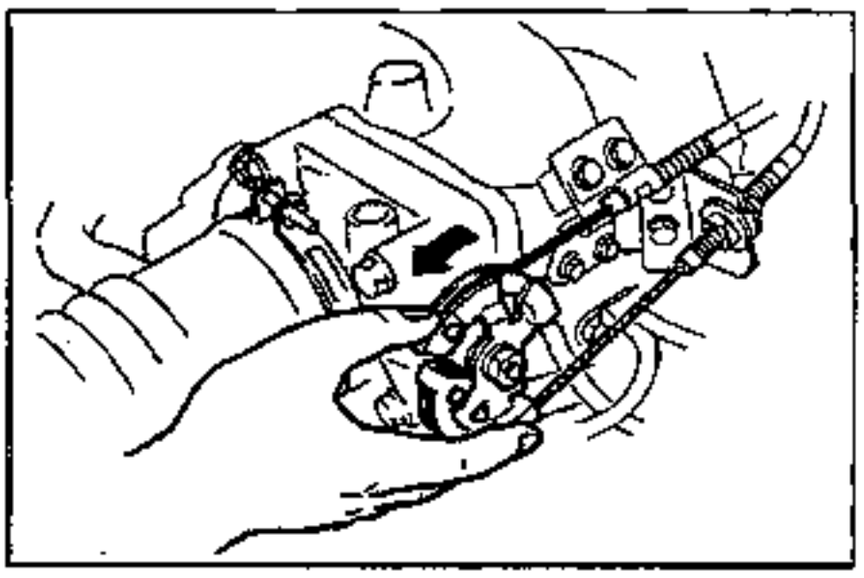
(Refer to page F2–95.)

THROTTLE POSITION SENSOR

Inspection

Idle switch

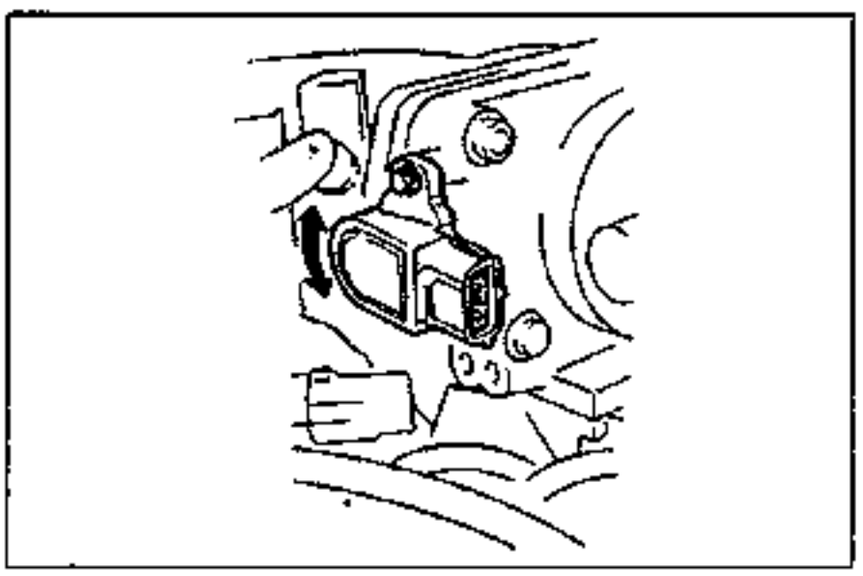
1. Turn the ignition switch to OFF and the throttle valve to the closed throttle position.
2. Disconnect the throttle position sensor connector.
3. Check continuity between the throttle position sensor terminals C and D.



Specification

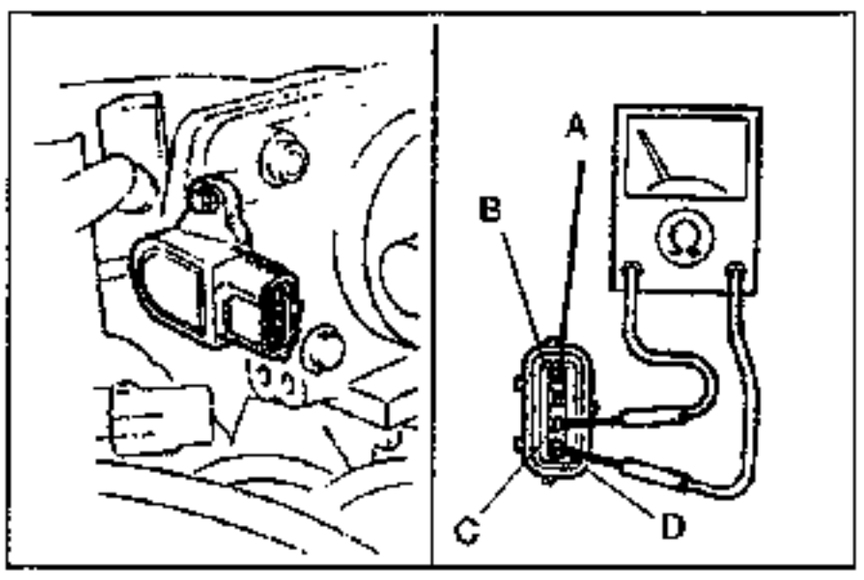
Terminals	Throttle valve closed throttle position
C—D	Continuity

4. If no continuity, adjust the throttle position sensor. (Refer to page F2–151.)
5. Insert a feeler gauge of 0.5 mm {0.020 in} between the stopper and the throttle lever.
6. Verify that there is no continuity between the throttle position sensor terminals C and D.
7. If continuity, adjust the throttle position sensor. (Refer to page F2–151.)



Variable resister

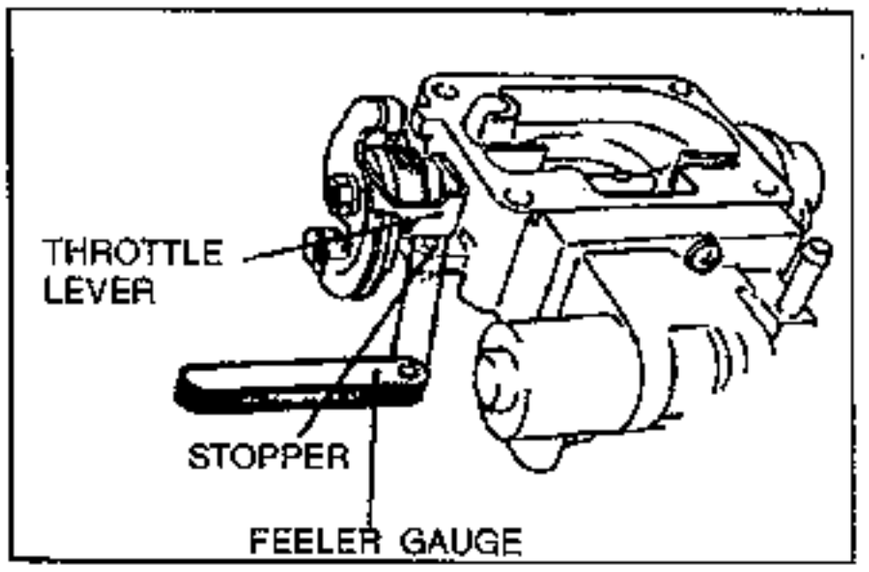
1. Remove the ECM. (Refer to page F2–141.)
2. Connect the **SSTs** (Engine Signal Monitor and Adapter Harness) to the ECM.
3. Set the SST (Engine Signal Monitor) to position 2F.
4. Turn the ignition switch to ON.
5. Rotate the throttle link by hand and verify that voltage is within the specification.

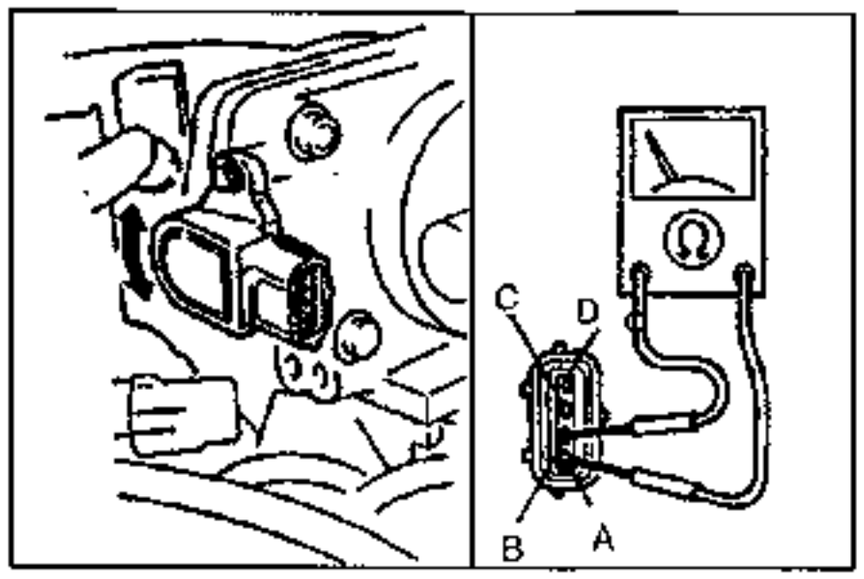


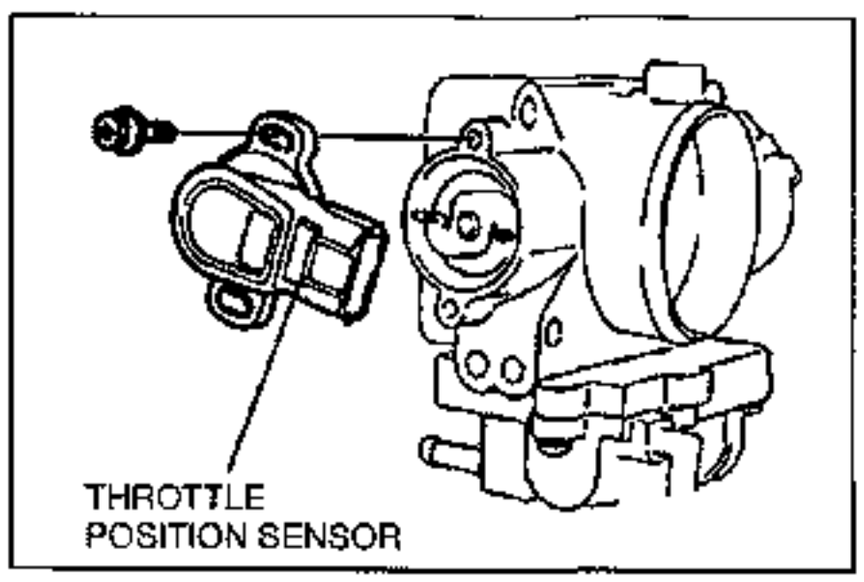
Specification

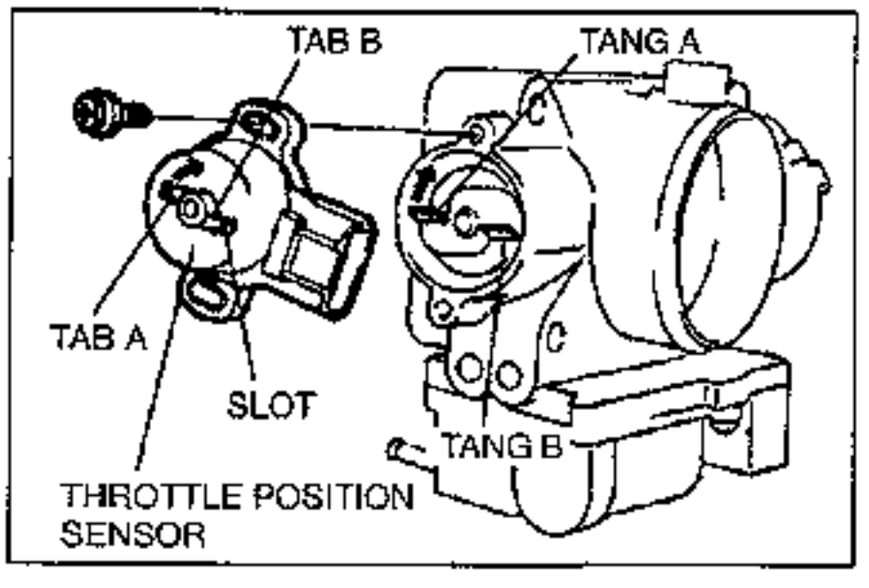
ECM terminal	Throttle valve position	
	Closed throttle position	Wide open throttle
2F	0.1—1.1V	2.8—4.5V

6. If not as specified, adjust the throttle position sensor. (Refer to page F2–151.)









Adjustment

Note
- The throttle adjusting screw is set at the factory and must not be adjusted.
  Any adjustment will negatively effect the engine performance.

Closed throttle position switch
1. Turn the ignition switch to OFF and the throttle valve to the closed throttle position.
2. Disconnect the throttle position sensor connector.
3. Loosen the throttle position sensor screws.
4. Rotate the throttle position sensor and adjust continuity between the sensor terminals C and D as shown.

Specification

Clearance	Continuity
0.15 mm {0.006 in}	Yes
0.50 mm {0.020 in}	No

5. Tighten the throttle position sensor screws.

Tightening torque:
1.6—2.3 N·m {16—24 kgf·cm, 14—20 in·lbf}

Variable resister
1. Remove the ECM. (Refer to page F2–141.)
2. Connect the **SSTs** to the ECM connector as shown.
3. Verify that the throttle valve is at the closed throttle position.
4. Loosen the attaching screws.
5. Turn the ignition switch to ON.
6. Measure the ECM terminal 2F voltage.
7. Adjust the voltage to the specification.

Specification
Closed throttle position: 0.1—1.1V
Wide open throttle: 2.8—4.5V
(Verify that the voltage increase is directly proportioned to the throttle valve opening angle.)

8. Tighten the attaching screws.

Tightening torque:
1.6—2.3 N·m {16—24 kgf·cm, 14—20 in·lbf}

9. If not adjusted, replace the throttle position sensor.

Replacement
1. Disconnect the throttle position sensor connector.
2. Remove the attaching screws.
3. Remove the throttle position sensor.
4. Verify that the throttle valve is at the closed throttle position.

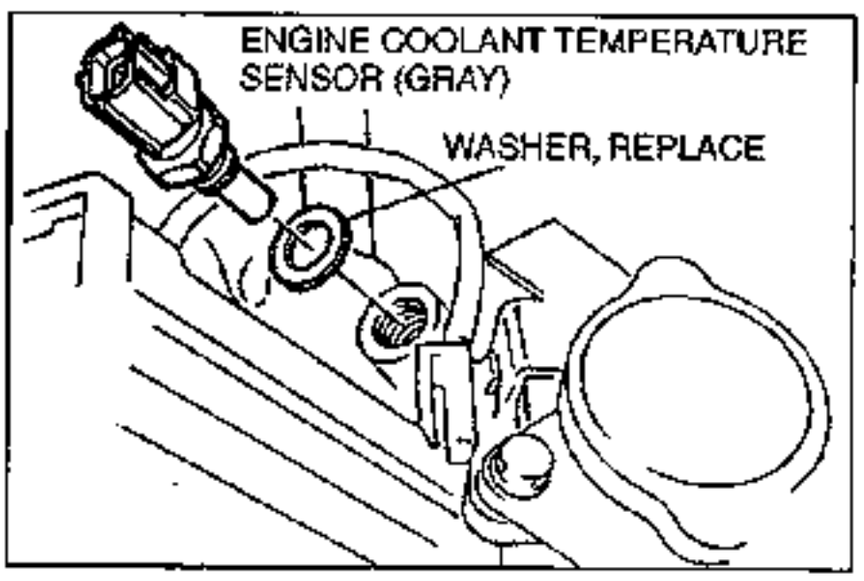
5. Open the throttle valve slightly and catch the tang of the throttle body on tne throttle position sensor plastic tabs. Adjust tang A on the throttle body with tab A on the throttle position sensor. Note tangs on the throttle body mate with the tab on the throttle position sensor on the side of the tab without a slot.
6. Position the throttle position sensor on the throttle body so that the mounting holes aligh.
7. Install and hand tighten the attaching screws.
8. Release the thrittle.
9. Adfust the throttle position sensor output voltage and closed throttle position switch.

Replacement
1. Turn the ignition switch OFF.
2. Remove the throttle position sensor screws.
3. Remove the throttle position sensor.
4. Replace a new throttle position sensor and adjust it. (Refer to page F2–151.)
5. Tighten the throttle position sensor screws.

Tightening torque:
1.6—2.3 N·m {16—24 kgf·cm, 14—20 in ·lbf}

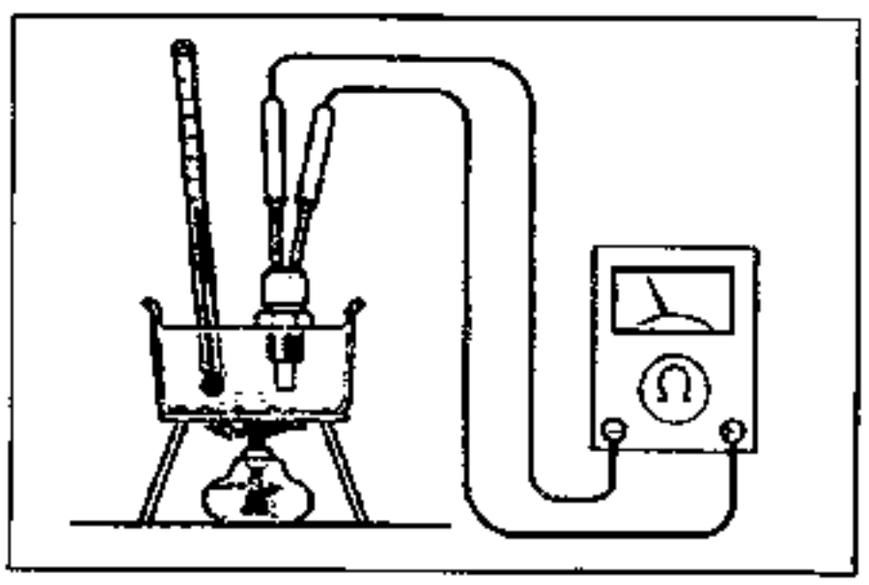
ENGINE COOLANT TEMPERATURE SENSOR
Removal / Installation

Warning
- **Removing the radiator cap or the coolant filler cap while the engine is running, or when the engine and radiator are hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system. Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.**
  When you're sure all the pressure is gone, press down on the cap – still using a cloth – turn it, and remove it.



1. Remove the radiator cap.
2. Disconnect the engine coolant temperature sensor connector.
3. Remove the engine coolant temperature sensor.
4. Install in the reverse order of removal.

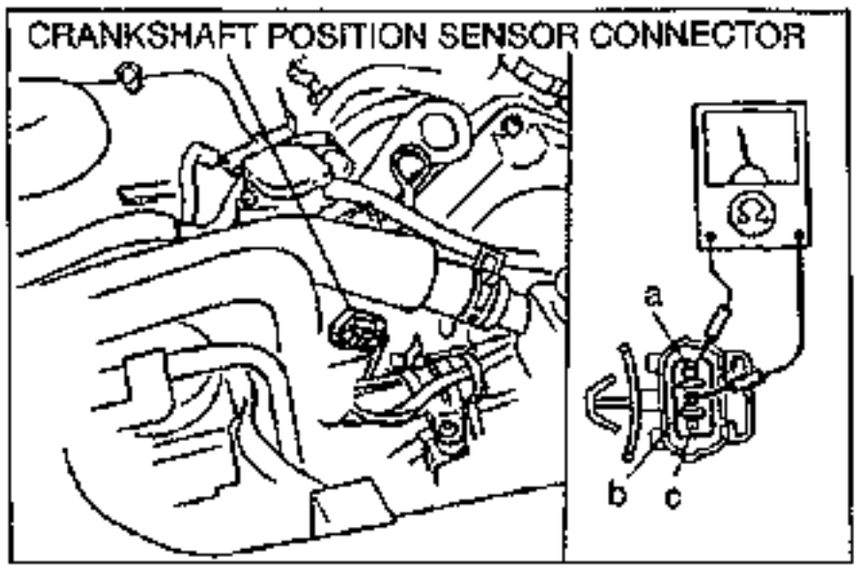
Tighting torque:
16–23 N·m {1.6–2.4 kgf·m, 12–17 ft·lbf}



Inspection
1. Place the sensor in water with a thermometer and heat the water gradually.
2. Measure resistance of the sensor by using an ohmmeter.

Coolant temperature	Resistance (kΩ)
20°C {68°F}	2.2–2.7
80°C {176°F}	0.29–0.35

3. If not as specified, replace the engine coolant temperature sensor.



CRANKSHAFT POSITION SENSOR

Inspection

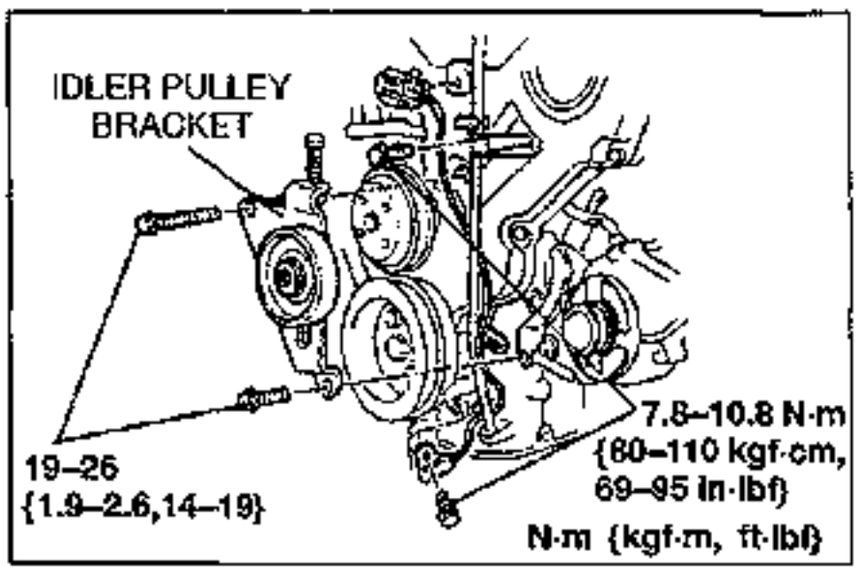
1. Disconnect the crankshaft position sensor connector.
2. Measure the resistance between terminals A and B.

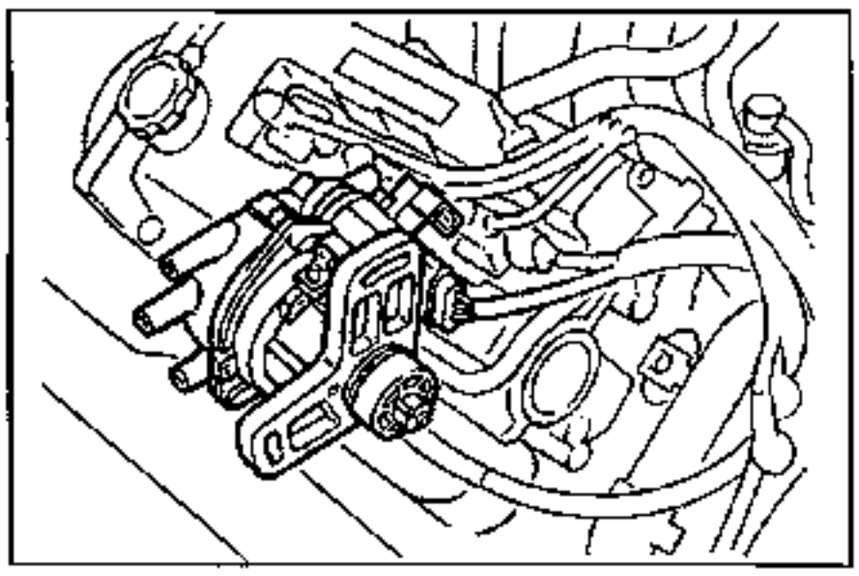
Resistance: 520–580 Ω [20°C {68°F}]

3. Replace the crankshaft position sensor if not as specified.

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove the idler pulley bracket.
3. Remove the dipstick pipe.
4. Remove the crankshaft position sensor.
5. Install in the reverse order of removal.
6. Adjust the drive belt deflection. (Refer to section B2.)

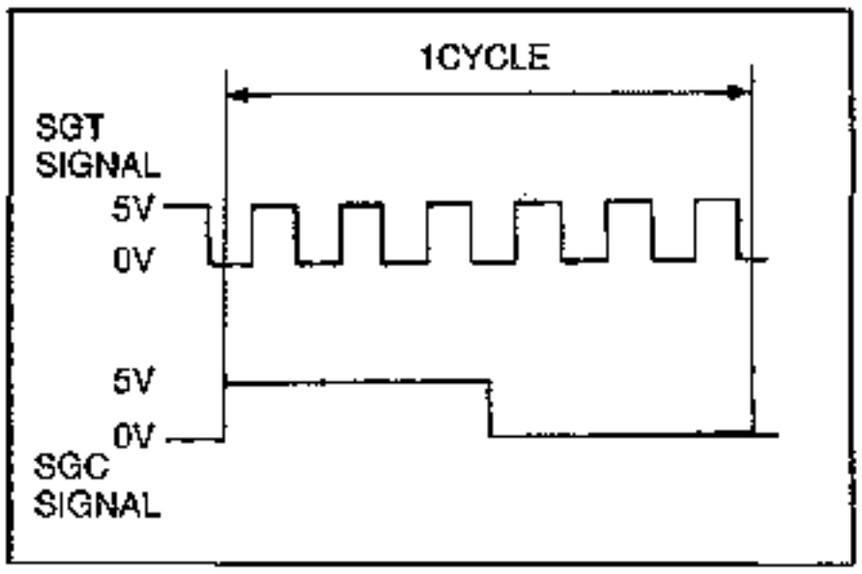




CAMSHAFT POSITION SENSOR (IN DISTRIBUTOR)

Inspection

1. Remove the distributor. (Refer to section G.)
2. Verify that the distributor connectir (3-pin) is disconnected.
3. Connect the distributor connector (6-pin) as shown in the figure.
4. Disconnect the fuel injector connector.
5. Turn the ignition switch ON.
6. Connect the **SSTs** (Engine Signal Monitor and Adapter Harness) to the ECM.
7. Rotate the distributor drive by hand and measure the output voltage.



Specification

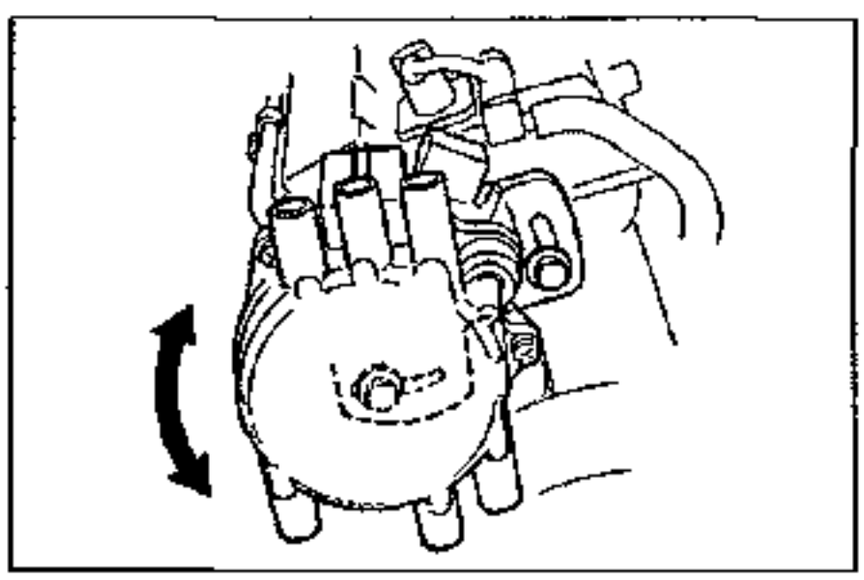
Terminal	Voltage
3E (SGT signal)	Approx. 5V (6 pulses)
3G (SGC signal)	Approx. 5V (1 pulse)

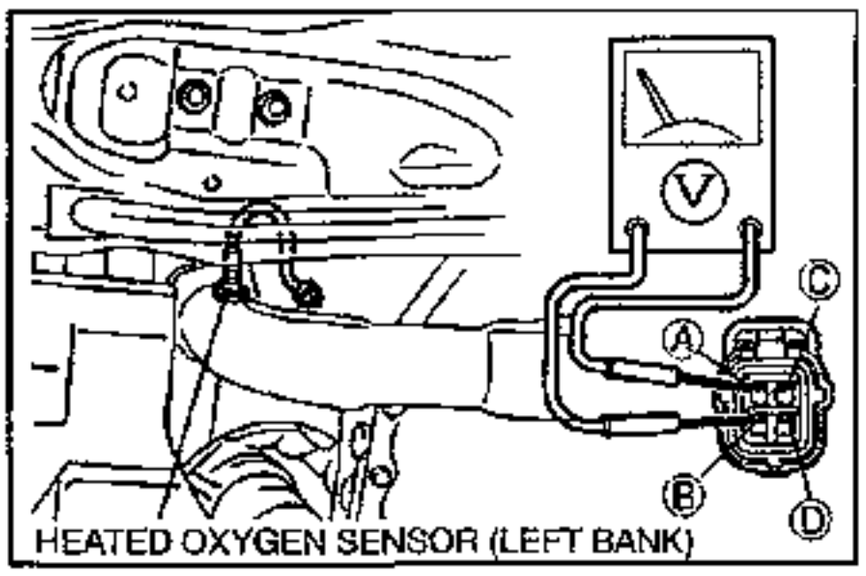
8. After the inspection, install the distributor. (Refer to section G.)
9. Start the engine and adjust the ignition timing. (Refer to page F2–70.)

Ignition timing: BTDC 9–11° {10 ± 1°}

10. Tighten the distributor lock bolts to the specified torque.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}





HEATED OXYGEN SENSOR (LEFT BANK)

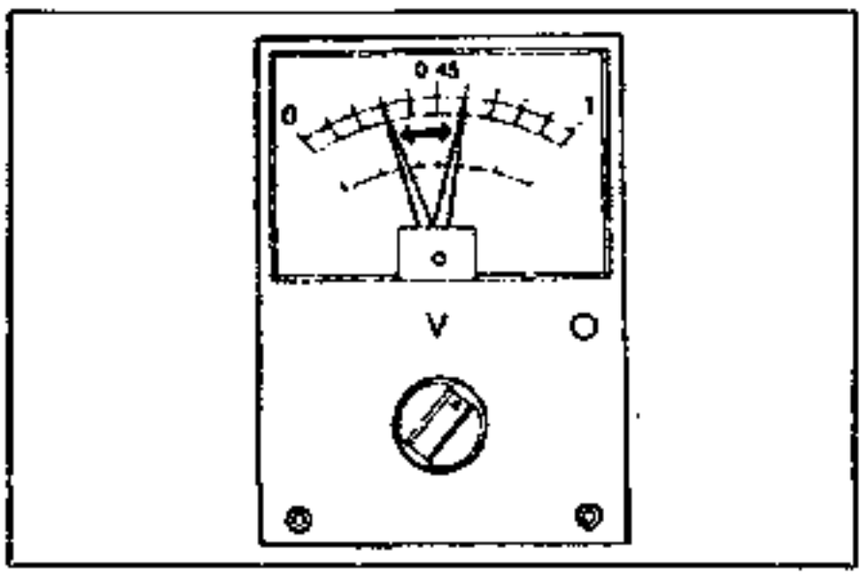
HEATED OXYGEN SENSOR (Right bank, Left bank)

Inspection

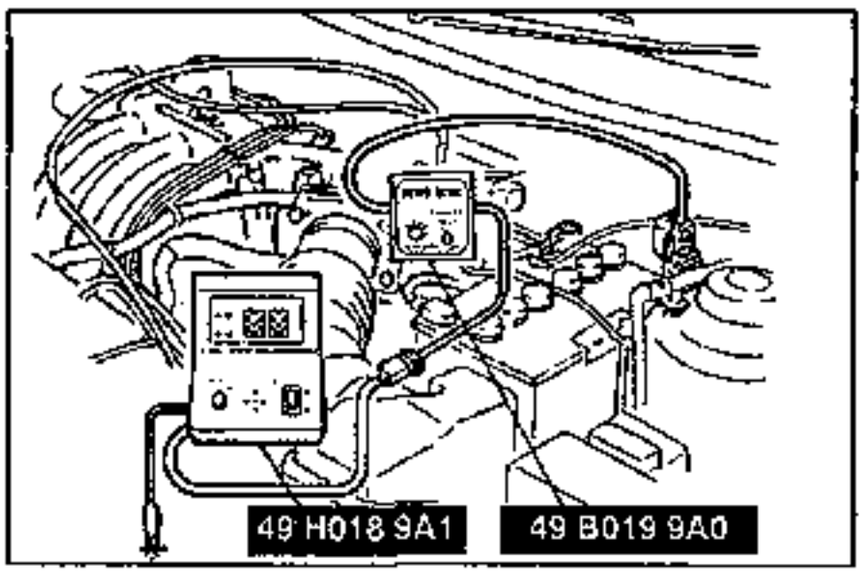
1. Warm up the engine to normal operating temperature and run it at idle.
2. Disconnect the heated oxygen sensor connector.
3. Connect a voltmeter between the heated oxygen sensor and a ground.
4. Run the engine at 4,500 rpm until voltmeter indicates approx. 0.7V.
5. Measure the voltage while increasing and decreasing the engine speed suddenly several times.

Specification

Engine condition	Voltage (V)
While deceleration	Below 0.4
While acceleration	Above 0.5



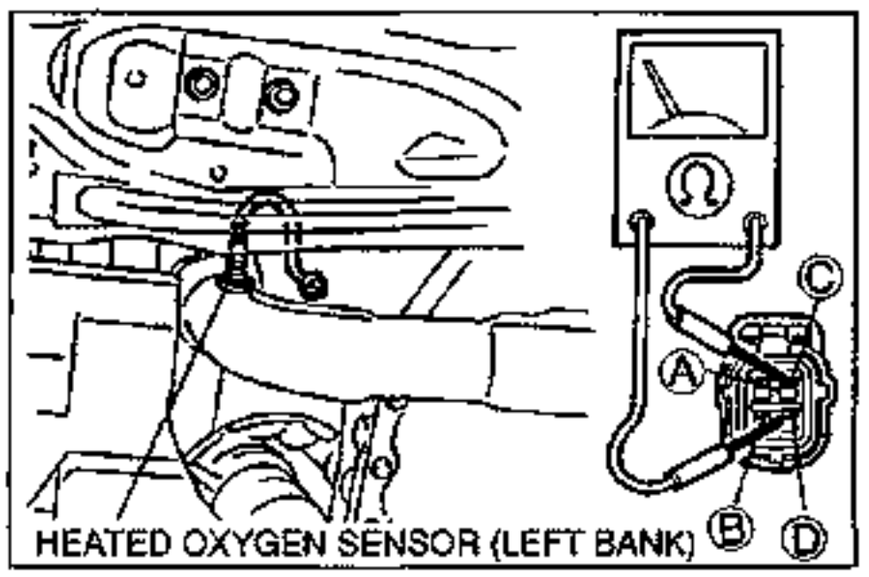
6. Connect the **SSTs** (System Selector and Self-Diagnosis Checker) to the data link connector as shown.
7. Set switch A to position 1.
8. Set TEST SW to O_2 MONITOR.



Note

- With the brake pedal depressed, the monitor lamp shows operation of the right heated heated oxygen sensor.
- With the brake pedal released, the monitor lamp shows operation of the left heated oxygen sensor.

9. Increase the engine speed to **2,000–3,000 rpm**, and verify that the monitor light flashes for **10 sec.** If not as specified, replace the heated oxygen sensor.



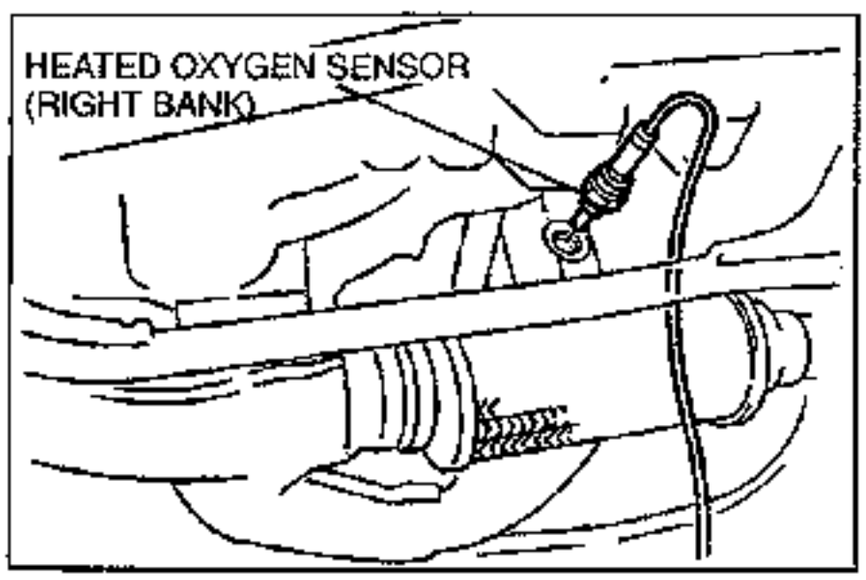
HEATED OXYGEN SENSOR (LEFT BANK)

Heater

1. Measure resistance between terminals C and D of the heater connector.

Resistance: Approx. 13 Ω [20°C {68°F}].

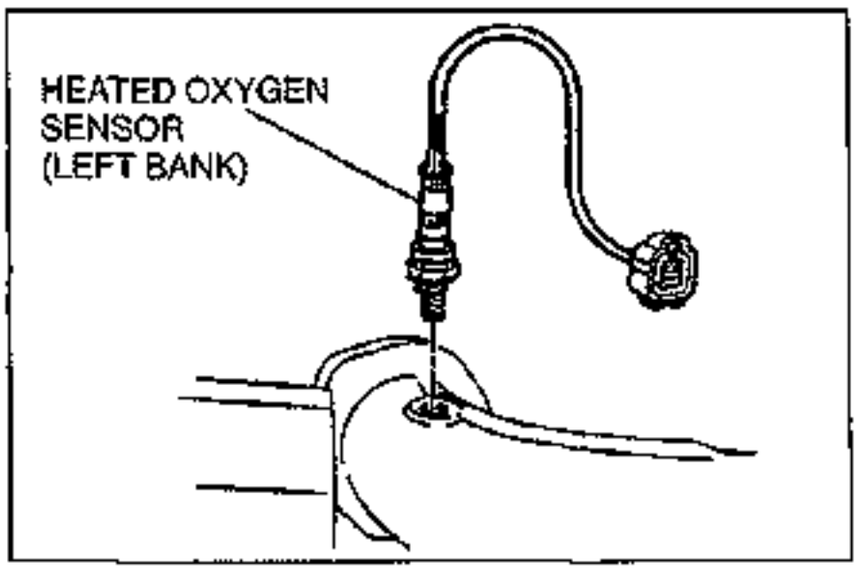
2. Replace the heater if not as specified.



Replacement

1. Disconnect the heated oxygen sensor connector.
2. Remove the heated oxygen sensor.
3. Install in the reverse order of removal.

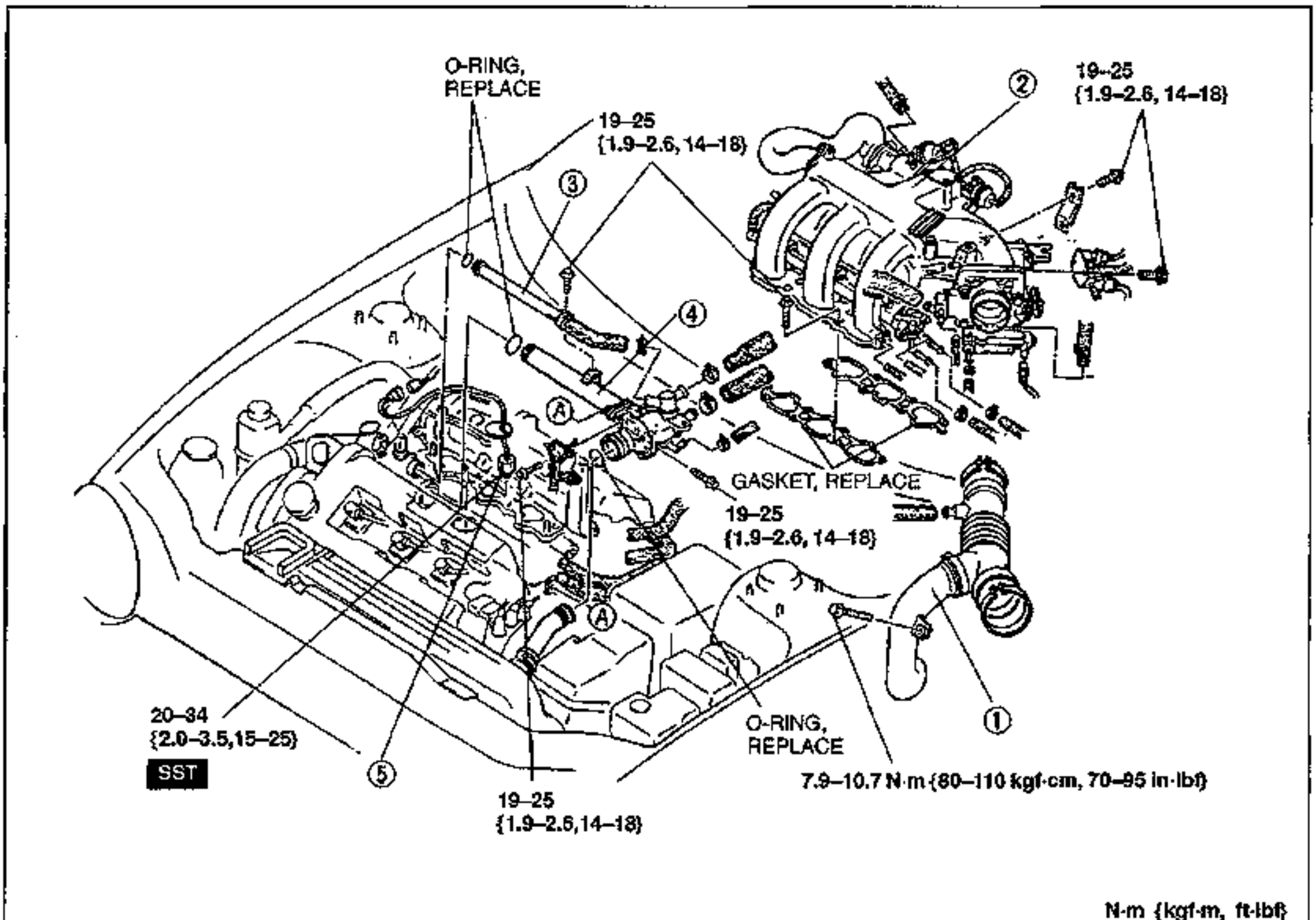
Tightening torque:
30–49 N·m {3.0–5.0 kgf·m, 22–36 ft·lbf}


HEATED OXYGEN
SENSOR
(LEFT BANK)

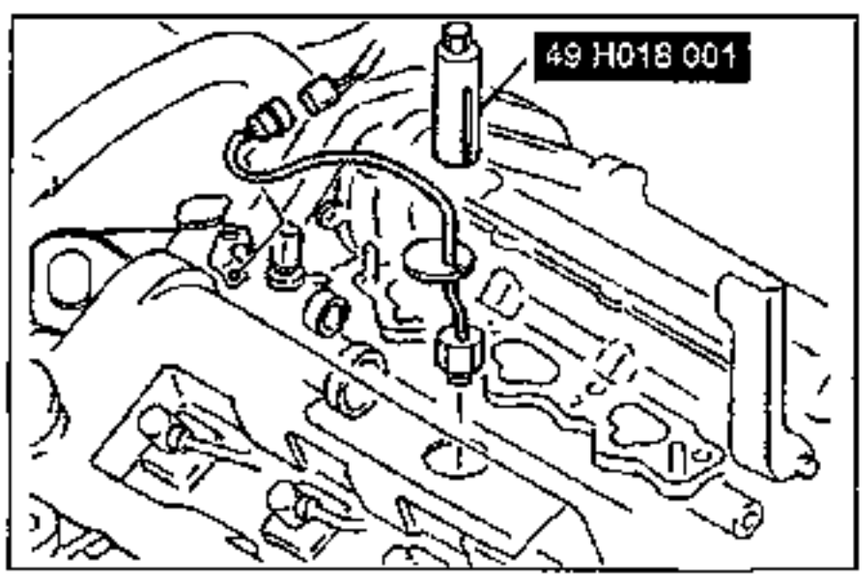
KNOCK SENSOR
Removal / Installation

Warning
- **Fuel line spills and leaks are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedures" on page F2–106.**

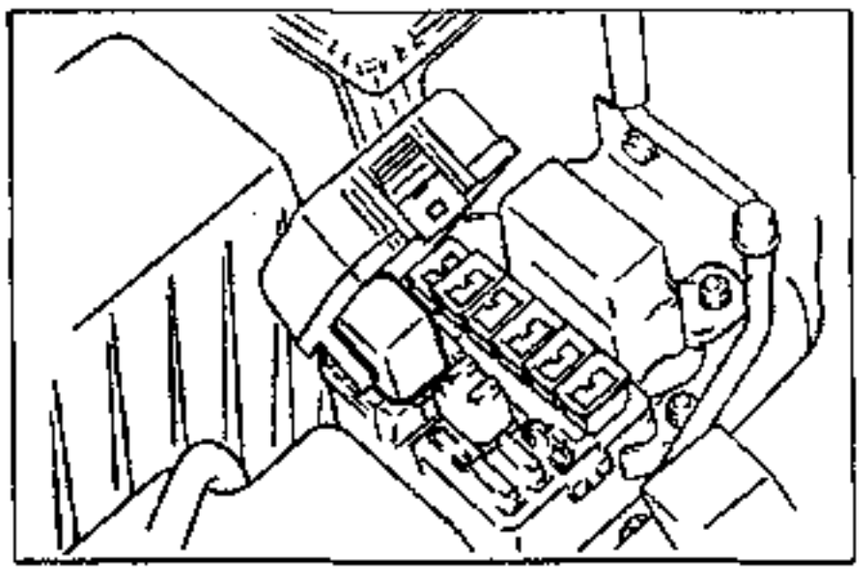
1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Inspect the fuel tank components visually and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note.**



1.Air hose
2.Intake manifold
3.Bypass pipe
4.Water pipe
5.Knock sensor



Removal / Installation Note
Engine coolant
1. Drain the engine coolant into a container before removing the intake manifold.
2. Use the **SST** to remove / install the knock sensor.

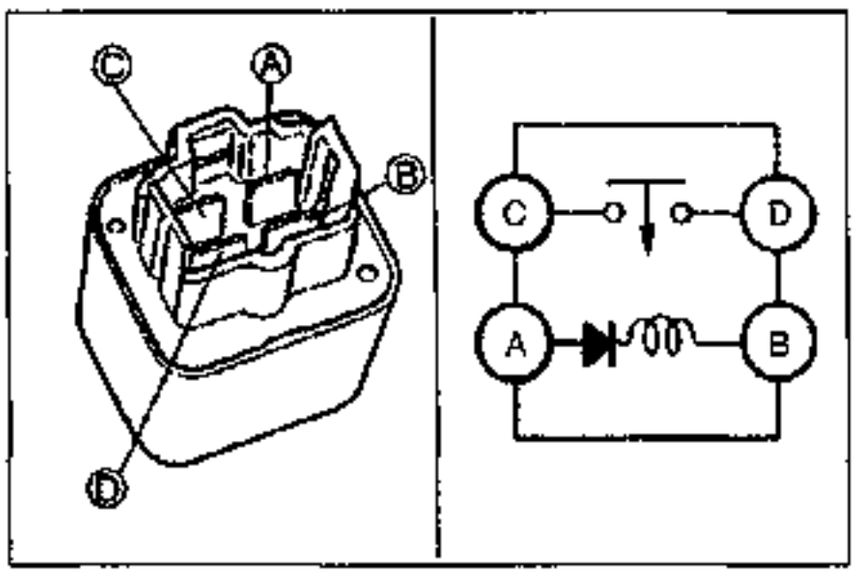


MAIN RELAY

Inspection

Operation check

Listen for operational sound of the fuel pump relay while starter operating.



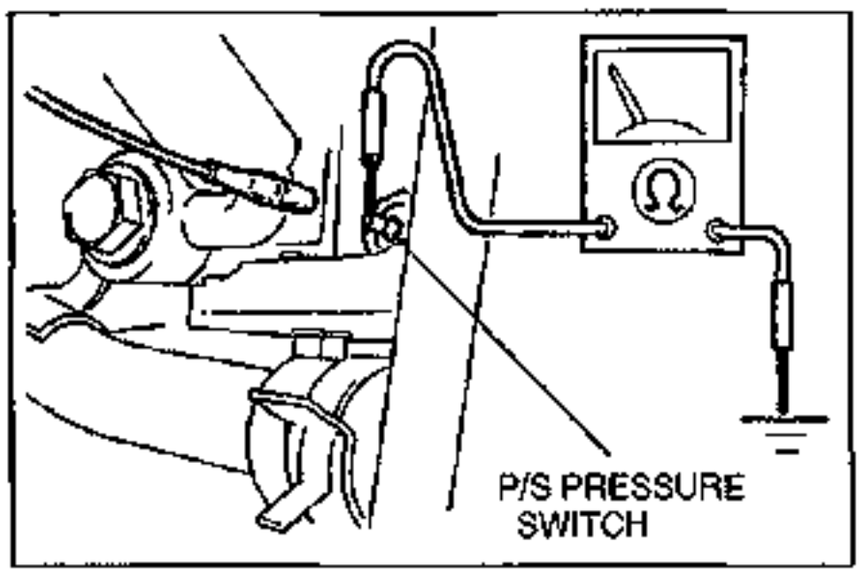
Continuity inspection

1. Check continuity between the terminals by using an ohmmeter.

B+: Battery positive voltage

Terminal A–B	Terminal C–D
Apply B+	Continuity
No Apply B+	No continuity

2. Replace the main relay if necessary.



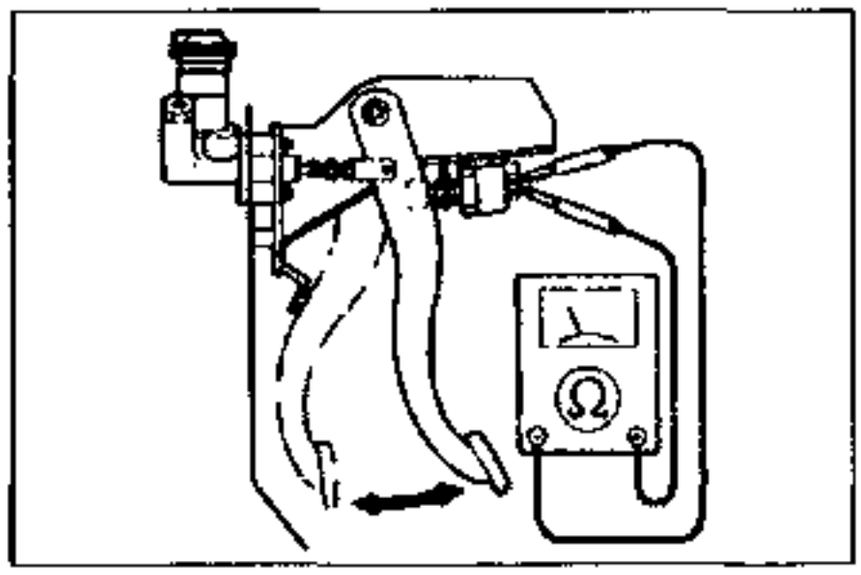
P/S PRESSURE SWITCH

Inspection

1. Disconnect the P/S pressure switch connector.
2. Start the engine, and check continuity of the switch by using an ohmmeter.

Steering wheel	Continuity
Turned	Yes
Straight ahead	No

3. Replace the P/S pressure switch if not as specified.



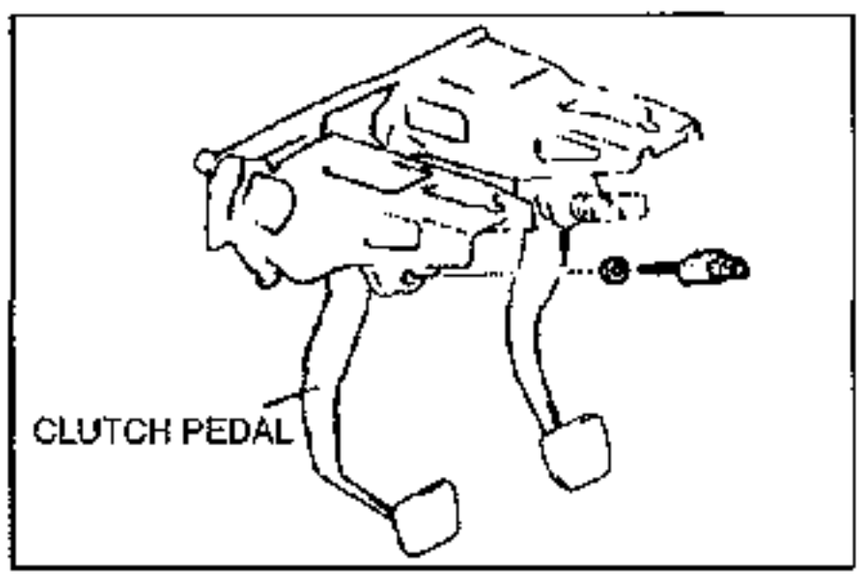
CLUTCH SWITCH

Inspection

1. Disconnect the clutch switch connector.
2. Connect the ohmmeter to the switch.
3. Check continuity of the switch.

Pedal	Continuity
Depressed	Yes
Released	No

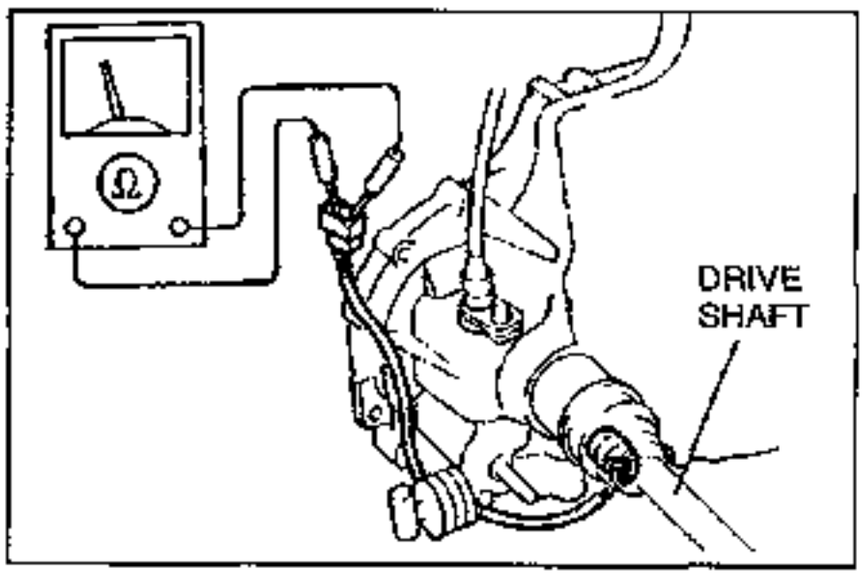
4. If not as specified, replace the clutch switch.



Replacement

1. Loosen the nuts and remove the clutch switch.
2. Install the clutch switch.
3. Adjust the clutch pedal height. (Refer to section H.)
4. Tighten the nuts to the specified torque.

Tightening torque:
14–17 N·m {1.4–1.8 kgf·m, 11–13 ft·lbf}



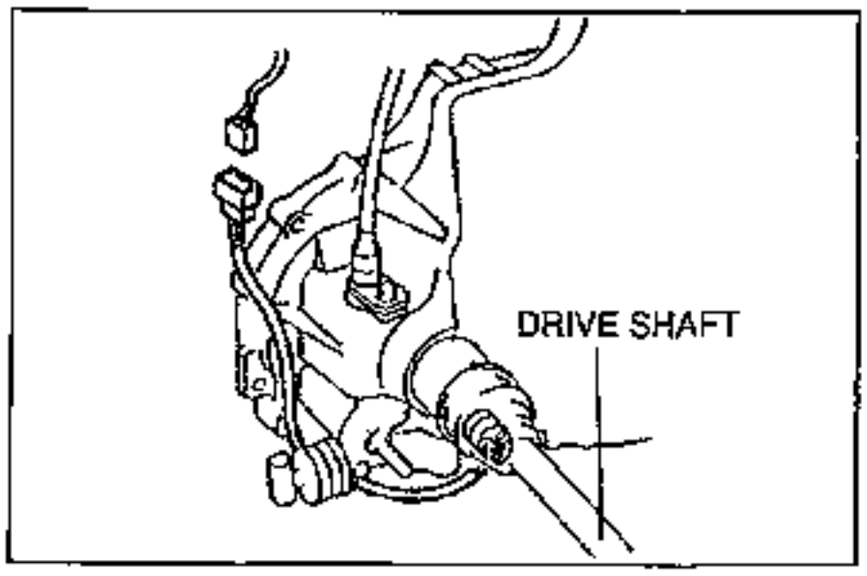
NEUTRAL SWITCH

Inspection

1. Disconnect the neutral switch connector shown in the figure.
2. Connect an ohmmeter to the switch.
3. Check continuity of the switch.

Transaxle	Continuity
Neutral	Yes
Other ranges	No

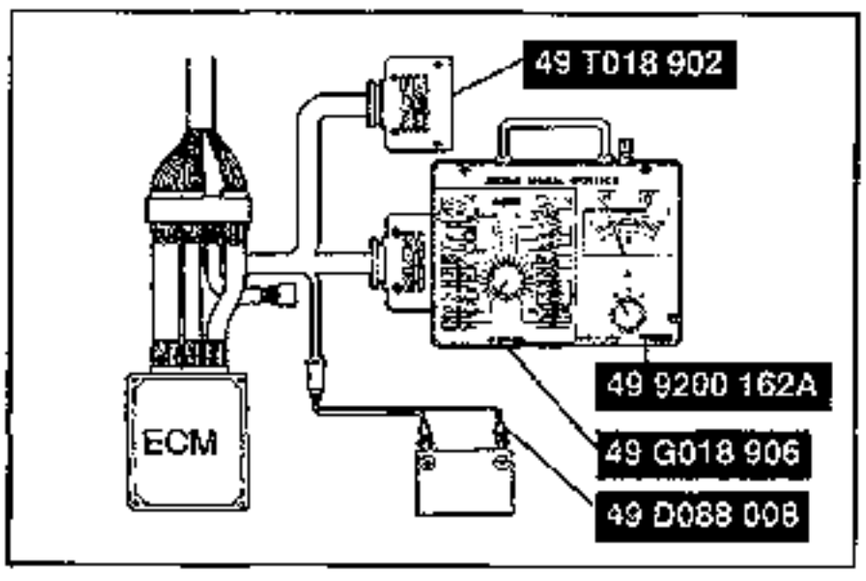
4. If not as specified, replace the neutral switch.



Replacement

1. Disconnect the neutral switch connector.
2. Remove the bracket.
3. Remove the neutral switch.
4. Install in the reverse order of removal.

Tightening torque:
20–29 N·m {2.0–3.0 kgf·m, 15–21 ft·lbf}



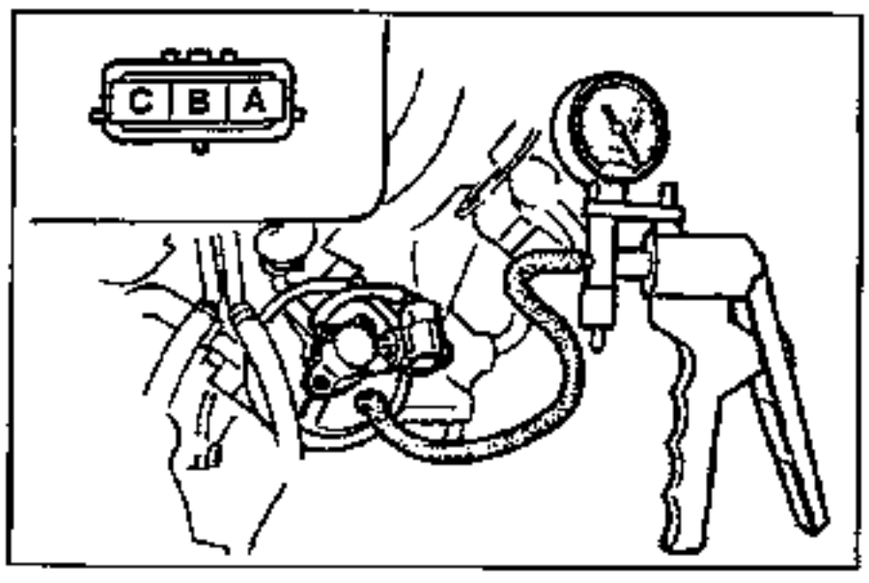
EGR VALVE POSITION SENSOR

Inspection of Output Voltage

1. Disconnect the ECM connector.
2. Connect the **SSTs** (Engine Signal Monitor and Adapter) to the ECM as shown and connect a vacuum pump.
3. Turn the ignition switch to ON.
4. Measure voltage at the terminals as shown in the table.

Terminal	ECM	Vacuum	
		0 mmHg {0 inHg}	150 mmHg {5.9 inHg}
C	2I	4.5–5.5V	
B	3D	Below 1.5V	
A	2J	Approx. 0.7V	Approx. 4.7V

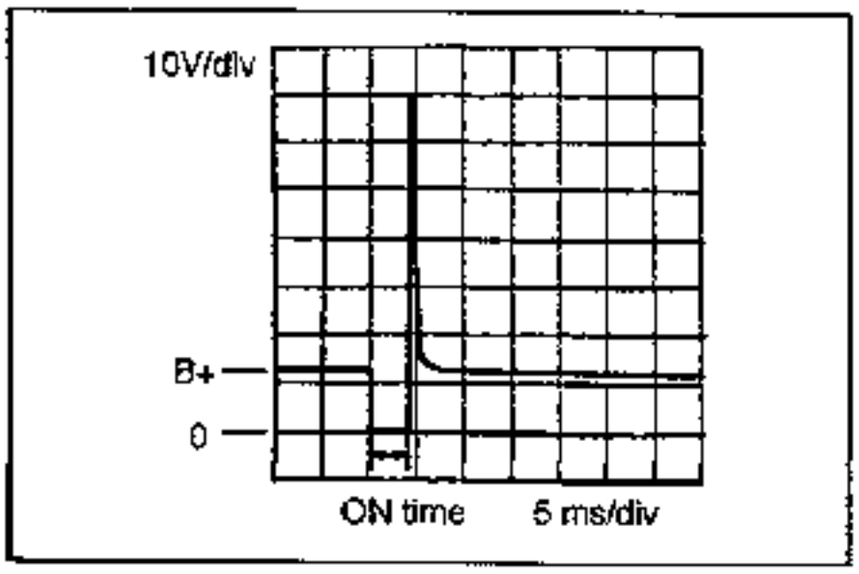
5. If not correct at terminals A and B, check the wiring harness and terminals 2I and 3D of the ECM.
6. If not correct at terminal C, measure the sensor resistance, then the wiring harness and terminal 2F of the ECM.



Inspection of Resistance

1. Disconnect the EGR valve position sensor connector, and connect an ohmmeter.
2. Disconnect the vacuum hose from the EGR valve, and connect a vacuum pump.
3. Measure the resistance between terminals as shown in the table.

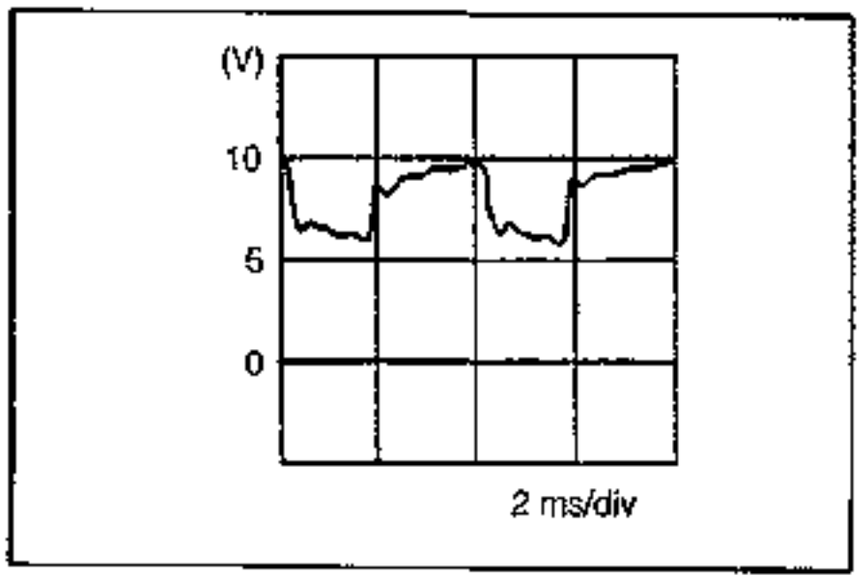
Terminal	ECM	Vacuum	
		0 mmHg {0inHg}	150 mmHg {5.9 inHg}
C–B	2I–3D	4.6 KΩ	
A–B	2J–3D	Approx. 2.3 KΩ	Approx. 5.8 KΩ
A–C	2J–2I	Approx. 5.3 KΩ	Approx. 1.2 KΩ



OSCILLOSCOPE SIGNAL PATTERN
Fuel Injector Control Signal

Condition: At Idle after warm-up

Fuel injector ON time increases during warm-up, acceleration, and heavy load condition to supply fuel in relation to the engine requirement.



Idle Air Control Valve Signal

Condition: At idle after warm-up

Signal pattern changes depends on load condition.

Before beginning any service procedure, refer to the 1995 MX–3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

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SPARK PLUG G–25
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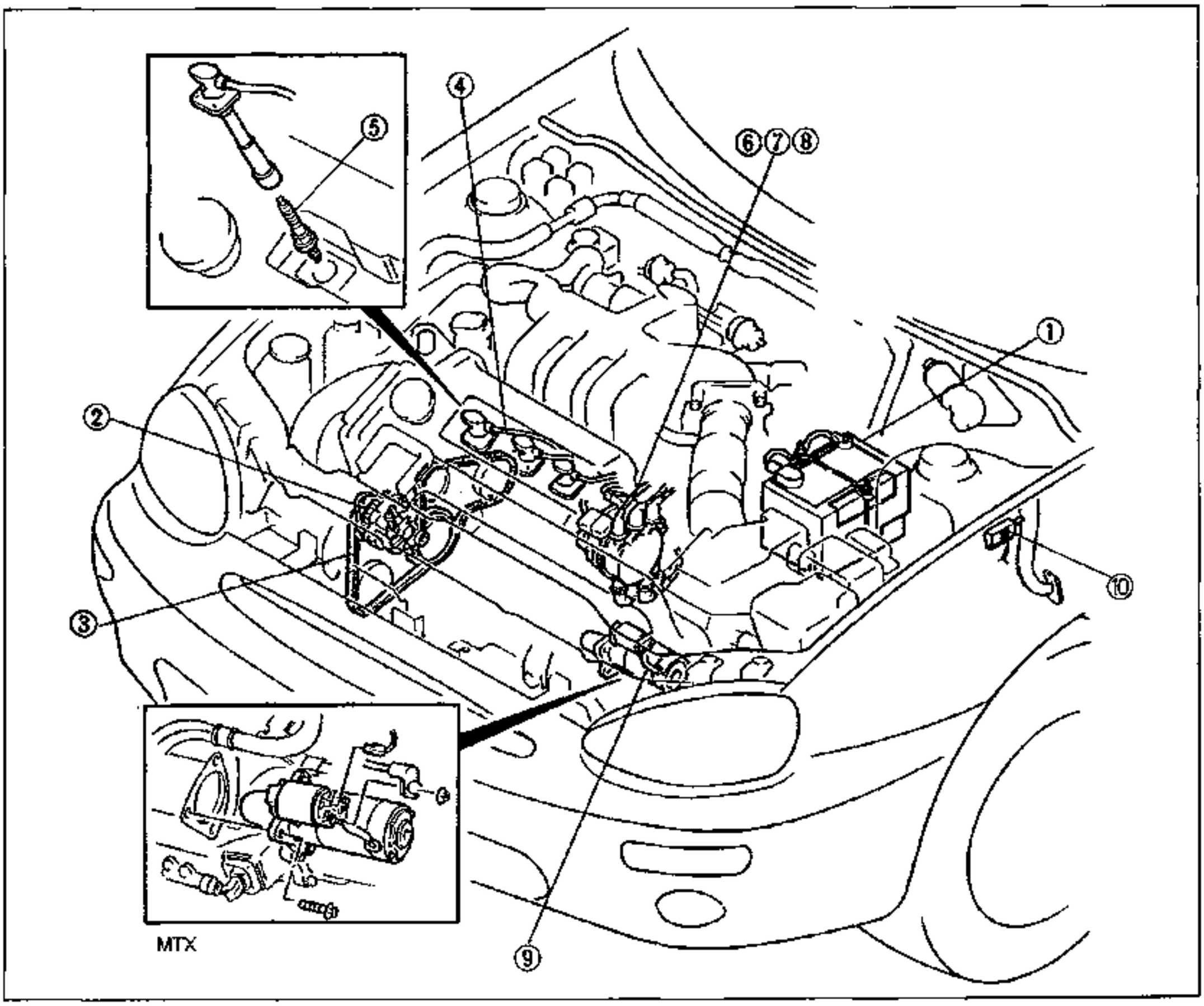
K8 DOHC



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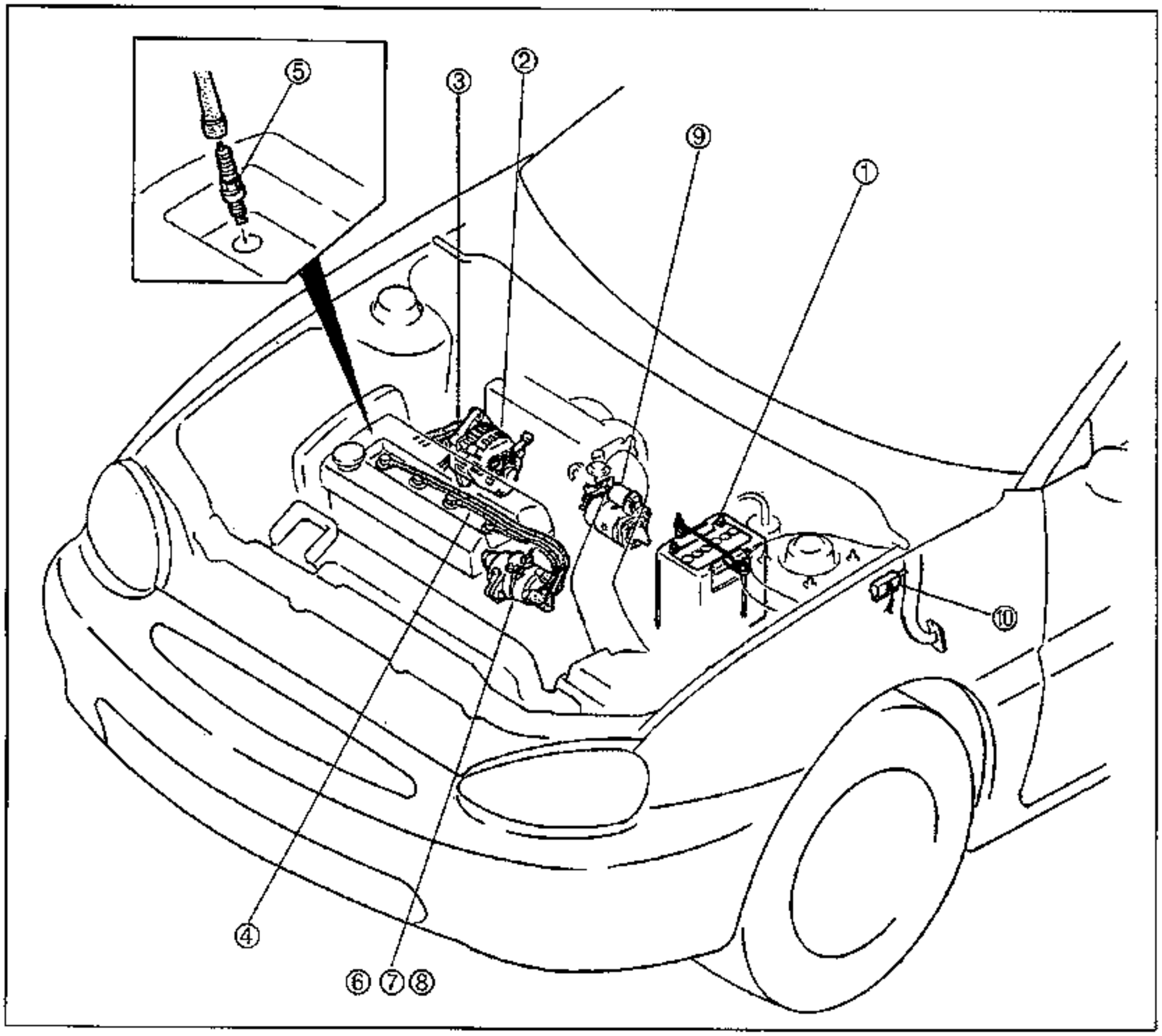
B6 DOHC



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OUTLINE

SPECIFICATIONS

Item \ Engine / Transaxle			B6 DOHC		K8 DOHC	
			MTX	ATX	MTX	ATX
Battery	Voltage V		12			
	Type and capacity (5-hour rate A·h)		55D23L (48) 50D20L (40)		65D23L (43) 50D20L (40)	
Dark current *1 mA			20 or less			
Generator	Type		A.C.			
	Output V–A		12–70		12–90	
	Regulator type		Transistorized (built-in voltage regulator)			
	Regulated voltage V		14.1–14.7			
	Brush length mm {in}	Standard	20.0 {0.79}		21.5 {0.85}	
		Minimum	5.0 {0.20}		8.0 {0.32}	
	Drive belt deflection mm {in}/9.8N {1kgf, 2.2lbf}	New	5.5–7.0 {0.22–0.27}		5.5–6.5 {0.22–0.25} (with A/C) 6.0–7.0 {0.24–0.27} (without A/C)	
		Used	6.0–7.5 {0.24–0.29}		6.5–7.5 {0.26–0.29} (with A/C) 7.0–8.0 {0.28–0.31} (without A/C)	
Starter	Type		Direct		Coaxial reduction	Eccentric reducation
	Output V–kW		12–0.8		12–1.4 12–1.7*3	12–1.4 12–1.6*3
	Brush length mm {in}	Standard	16 {0.7}		17.5 {0.69}	17.0 {0.67}
		Minimum	10 {0.4}		12 {0.5}	11.5 {0.46}
Distributor	Spark advance type		Electronic spark advance (ESA)			
Ignition timing (TEN terminal of data link connector grounded) BTDC			10°			
Ignition coil	Resistance [at 20°C {68°F}]	Primary coil winding Ω	0.49–0.73			
		Secondary coil winding kΩ	20–31			
Spark plug	Type	NGK	BKR5E-11 *2 BKR6E-11			
		NIPPON-DENSO	K16PR-U11 *2 K20PR-U11			
	Plug gap mm {in}		1.0–1.1 {0.040–0.043}			
Firing order			1–3–4–2		1–2–3–4–5–6	

*1 Dark current is the constant flow of current present when the ignition switch is OFF (i.e., audio unit, clock, etc.).
*2 Standard plug
*3 Cold area

TROUBLESHOOTING GUIDE

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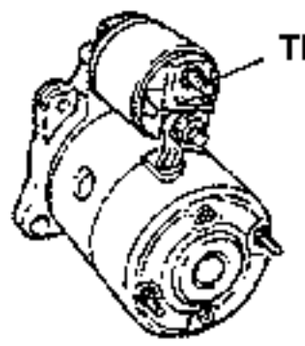
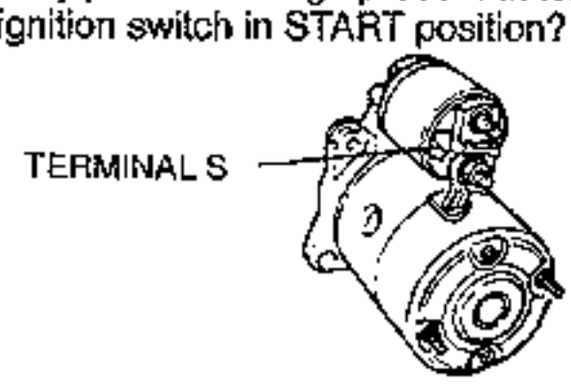
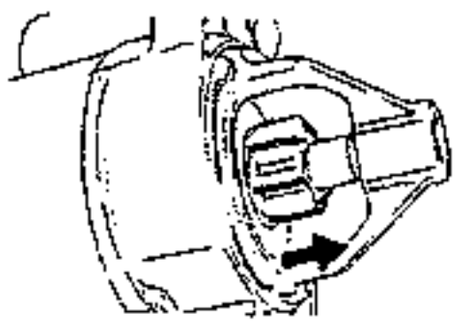
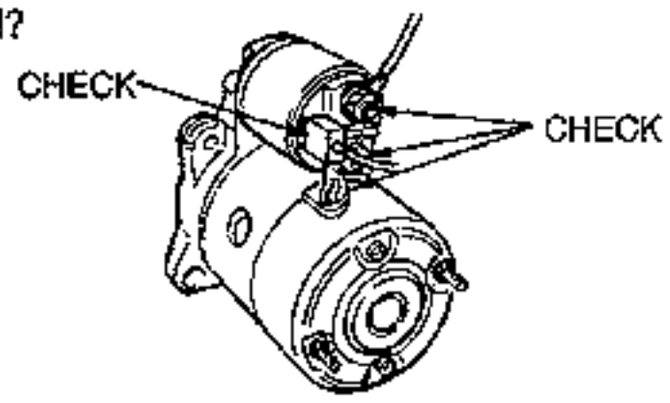
1	Will not crank—starter motor does not operate	below
2	Will not crank—starter motor spins	below
3	Cranks slowly	G–6
4	Generator warning light illuminates while engine running	G–6
5	Discharged battery	G–6
6	Misfire	G–7

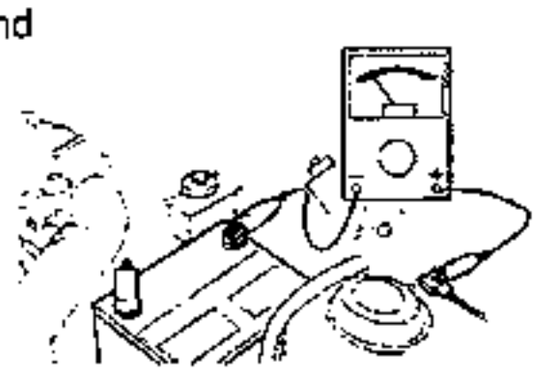
SYMPTOM TROUBLESHOOTING

1	Will not crank—starter motor does not operate		
STEP	**INSPECTION**		**ACTION**
1	Does engine crank with fully charged battery?	Yes	Check charging system ☞page G–9
		No	Go to next step
2	Starter interlock switch OK? (MTX)	Yes	Go to next step
		No	Check starter interlock switch ☞page G–43
3	Is battery positive voltage present at terminal B?  	Yes	Go to next step
		No	Check wiring harness
4	Is battery positive voltage present at terminal S with ignition switch in START position?  	Yes	• Check magnetic switch ☞page G–40 • Check yoke ☞page G–41 • Check armature ☞page G–41
		No	• Check transaxle range switch (ATX) ☞section K • Check ignition switch • Check wiring harness

2	Will not crank—starter motor spins		
STEP	**INSPECTION**		**ACTION**
1	Is drive pinion pushed out while cranking (click is heard when pushed out) ? 	Yes	Remove starter and check flywheel ring gear teeth and starter drive pinion teeth
		No	• Check magnetic switch ☞page G–40 • Check yoke ☞page G–41

3	Cranks slowly		
STEP	INSPECTION		ACTION
1	Does engine crank normally with fully charged battery?	Yes	Check charging system ☞page G–9
		No	Go to next step
2	Are starter cable connections loose or corroded? 	Yes	Repair or replace connection
		No	Check starter for binding (brush, armature, etc.)

4	Generator warning light illuminates while engine running		
STEP	INSPECTION		ACTION
1	Is battery positive voltage correct at idle? **Specification: 14.1–14.7V**	Yes	Check wiring harness between generator terminal L and generator warning light
		No	Check charging system ☞page G–9

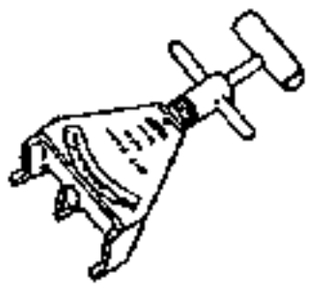
5	Discharged battery		
STEP	INSPECTION		ACTION
1	Check charging system; is it OK? ☞page G–9	Yes	Turn ignition switch off and measure dark current as shown  **Dark current: Below 20mA**
		No	Repair or replace parts as necessary

B+: Battery positive voltage

6	Misfire		
STEP	INSPECTION		ACTION
1	Disconnect high-tension lead from each spark plug. Does strong blue spark occur while cranking?	Yes	Check spark plugs ☞page G–26
		No	Go to next step
2	Are resistance of high-tension leads OK? **Specification: 16 kΩ per 1 m (3.28 ft) [at 20°C (68°F)]** ☞page G–24	Yes	Go to next step
		No	Replace high-tension leads
3	Are there corrosion, damage, or cracks on the distributor cap and rotor? ☞page G–31	Yes	Replace cap or rotor
		No	Go to next step
4	Is ignition coil normal? ☞page G–26	Yes	Go to next step
		No	Replace distributor
5	Are distributor connector and PCM or ECM connector connected?	Yes	Go to next step
		No	Connect connectors
6	Measure voltage at terminal A (3-pin) of distributor (harness side connector); is it correct? **Voltage: B+ (ignition switch ON)**	Yes	Go to next step
		No	Check main fuse, ignition switch and wiring harness
7	Is PCM or ECM normal?	Yes	Replace distributor
		No	Replace PCM or ECM

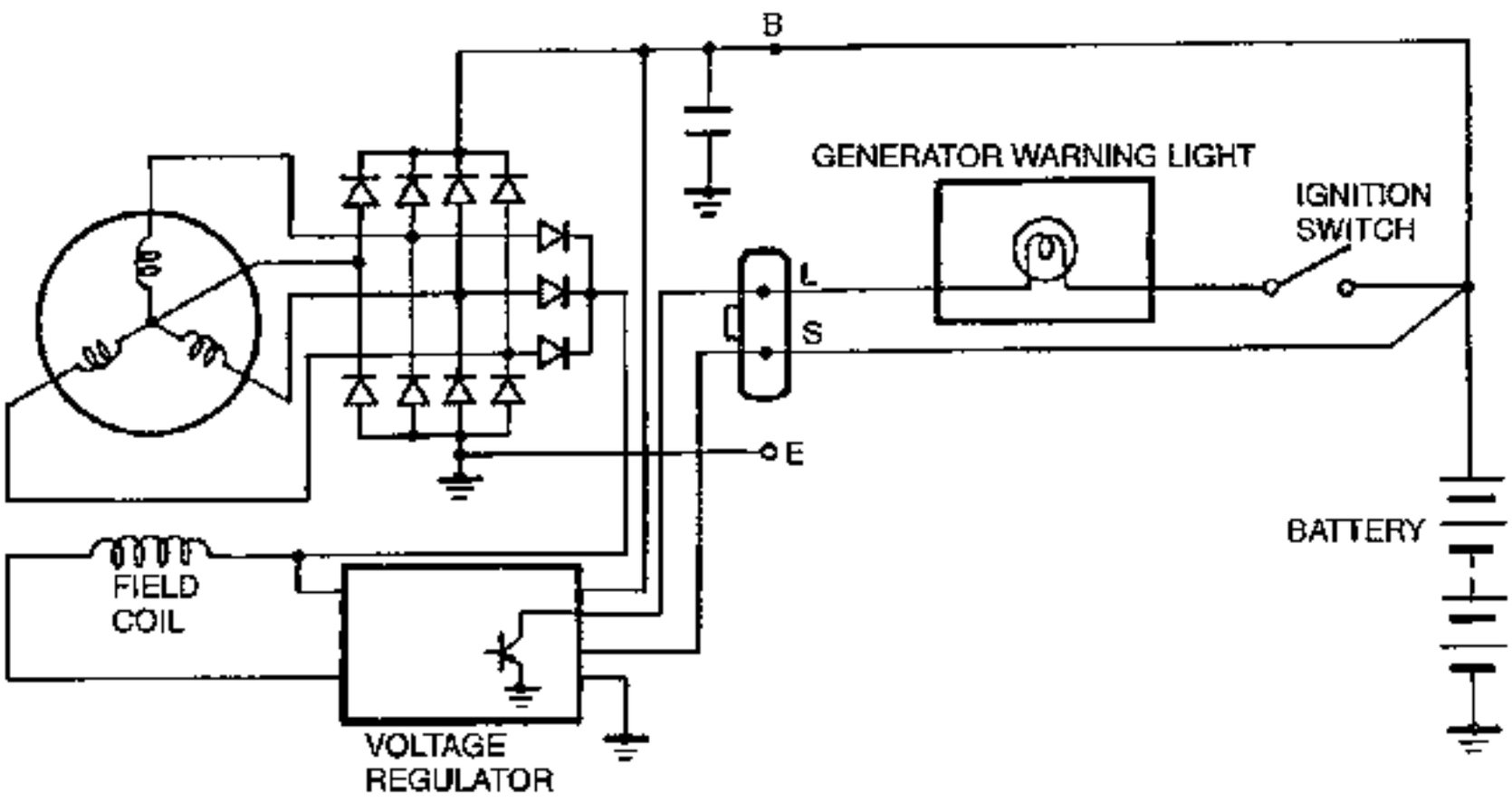
CHARGING SYSTEM

PREPARATION
SST

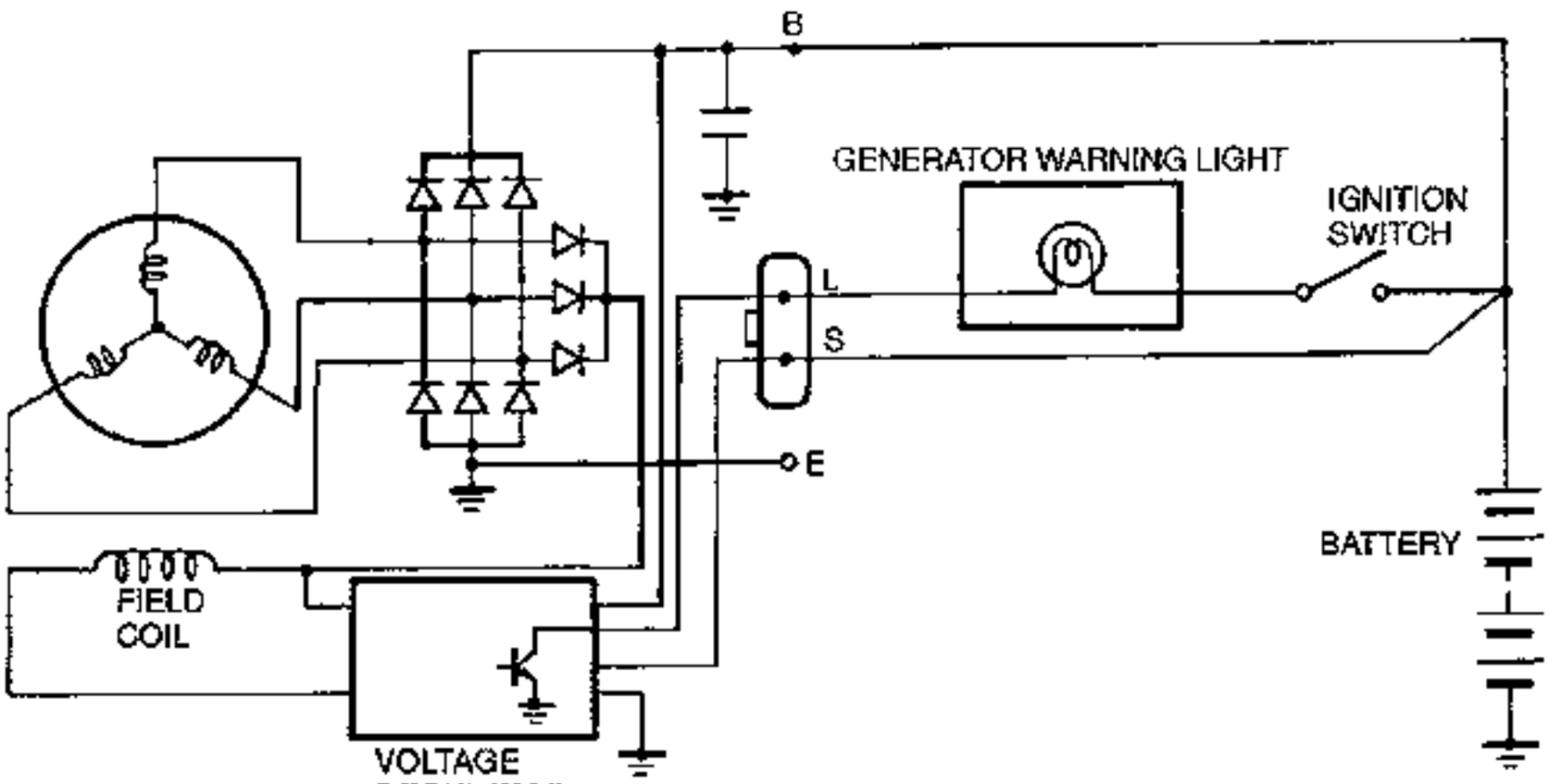
49 9200 020A Tension gauge, V-ribbed belt		For inspection of drive belt tension

CIRCUIT DIAGRAM

(K8–DOHC)



(B6–DOHC)



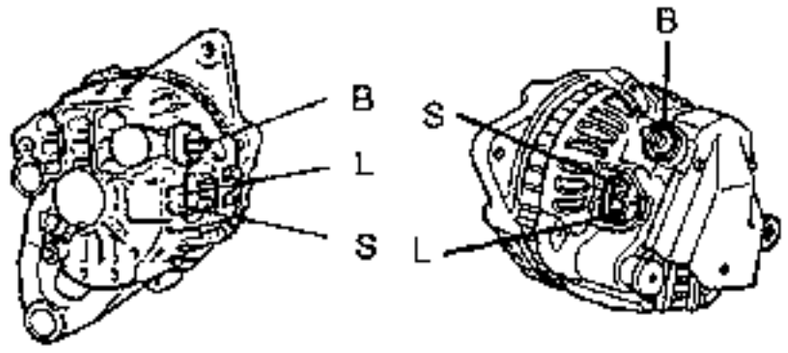
The generator has a self-diagnostic function to warn the operator of the following problems in the charging system. If a problem arises, the generator warning light illuminates.
1. Terminal S circuit open
2. No voltage output
3. Field coil circuit open
4. Terminal B circuit open
5. Voltage output too high

SYSTEM INSPECTION

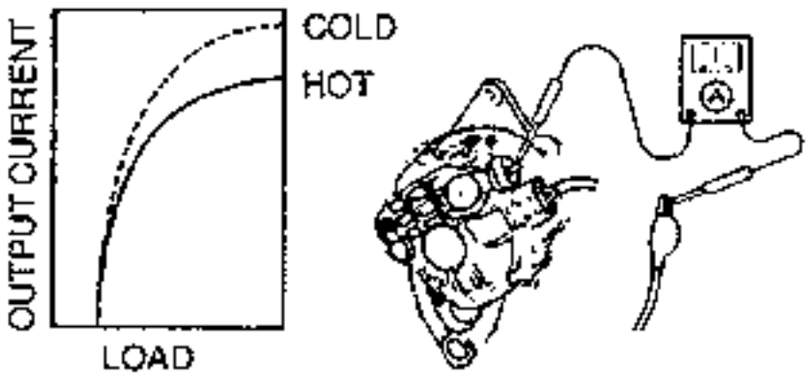
B+: Battery positive voltage

<table>
<tr><th>STEP</th><th>INSPECTION</th><th></th><th>ACTION</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Check battery positive voltage; is it correct?

Specification: Above 12.4V</td><td>Yes</td><td>Go to next step</td></tr>
<tr><td>No</td><td>Check battery ☞page G–10</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Turn ignition switch on; does generator warning light illuminate?</td><td>Yes</td><td>Go to step 3</td></tr>
<tr><td>No</td><td>Check generator warning light bulb and wiring harness between warning light and terminal L</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Start engine; does generator warning light go out?</td><td>Yes</td><td>Go to step 5</td></tr>
<tr><td>No</td><td>Go to next step</td></tr>
<tr><td rowspan="2">4</td><td>Is voltage at generator terminals correct?

Specification:
<table>
<tr><th>Terminal</th><th>Ign : ON (V)</th><th>Idle (V)</th></tr>
<tr><td>B</td><td>B+</td><td>14.1–14.7</td></tr>
<tr><td>L</td><td>Approx. 1</td><td>14.1–14.7</td></tr>
<tr><td>S</td><td>B+</td><td>14.1–14.7</td></tr>
</table>


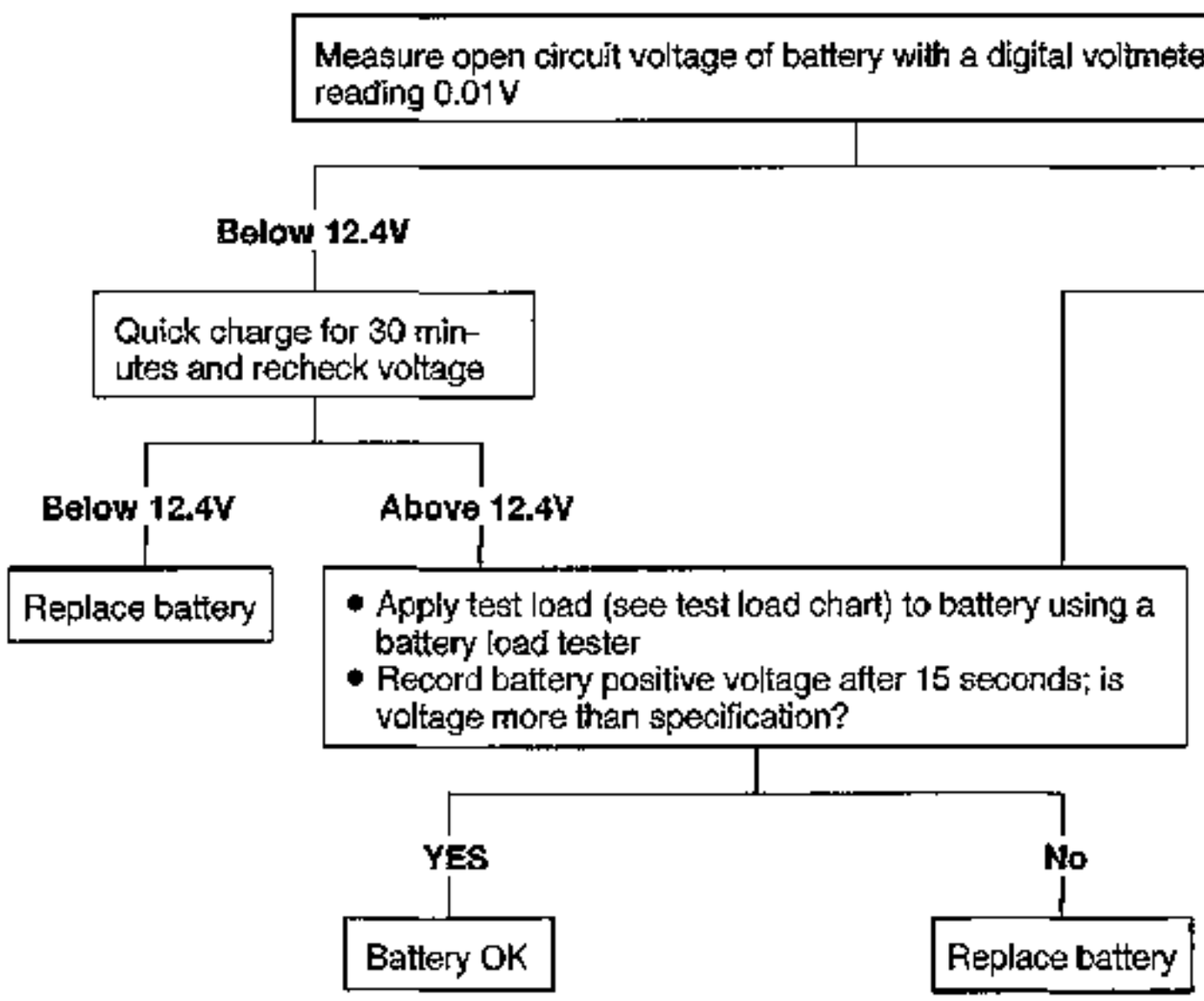
B6 DOHC K8 DOHC</td><td>Yes</td><td>Check wiring harness between battery and terminal B</td></tr>
<tr><td>No</td><td>• Check wiring harness
• Replace generator ☞page G–12</td></tr>
<tr><td rowspan="3">5</td><td rowspan="3">1. Connect an ammeter (90A min.) between terminal B and harness
2. Start engine and turn all electrical loads OFF.
3. Hold engine speed at 2,500–3,000 rpm.
4. Does output current increase when electrical loads are applied?

Caution
• Grounding terminal B can damage generator internal circuit
 
</td><td>Yes</td><td>Charging system normal</td></tr>
<tr><td>No</td><td>Go to next step</td></tr>
<tr><td>6</td><td>Is drive belt tension OK? ☞page G–18</td><td>Yes</td><td>Replace generator ☞page G–12</td></tr>
<tr><td></td><td></td><td>No</td><td>• Adjust drive belt tension
• Replace drive belt</td></tr>
</table>

BATTERY
Inspection
Battery discharge test

Warning
- **Hydrogen gas is produced during normal battery operation. A battery-related explosion can cause serious injury. Keep all flames (including cigarettes), heat, and sparks away from the top and surrounding area of open battery cells.**

Caution
- **To prevent damage to electrical components or the battery, turn all accessories off and stop the engine before performing maintenance or recharging the battery.**

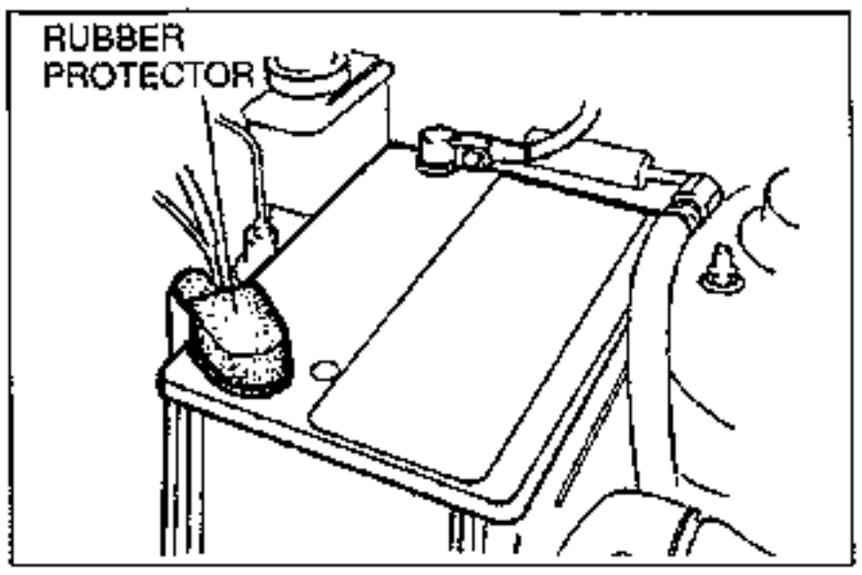


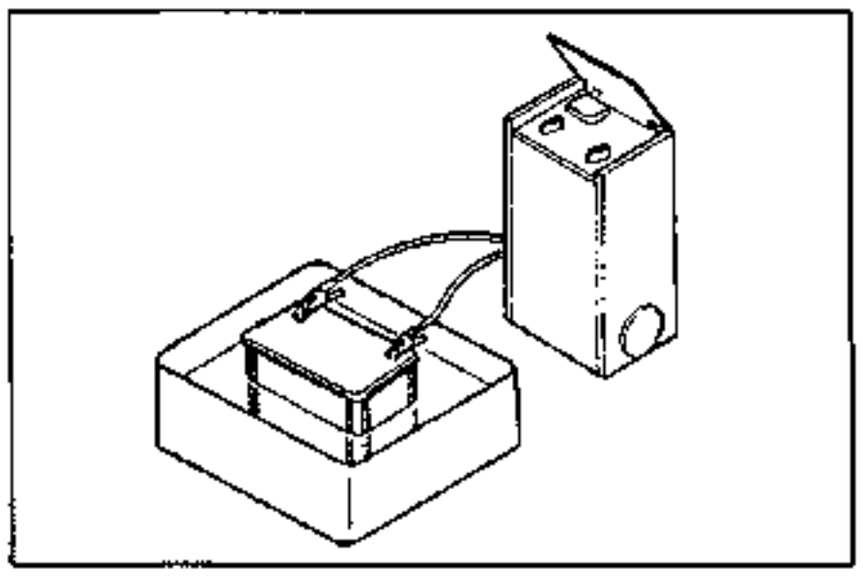
Test load

Battery	Load (A)
50D20L	150
55D23L	180
65D23L	165

Battery positive voltage with load

Approximate battery temp.	Minimum voltage (V)
21°C {70°F}	9.6
15°C {60°F}	9.5
10°C {50°F}	9.4
4°C {40°F}	9.3
−1°C {30°F}	9.1
−7°C {20°F}	8.9
−12°C {10°F}	8.7
−18°C { 0°F}	8.5





Terminal and cable

1. Check the tightness of the terminals to ensure good electrical connections.
2. Check for corroded or frayed battery cables.
3. Check the rubber protector on the positive terminal for proper coverage.
4. Clean the terminals if necessary, and coat them with grease.

Recharging

Warning

- **Hydrogen gas is produced during normal battery operation. A battery-related explosion can cause serious injury. Keep all flames (including cigarettes), heat, and sparks away from the top and surrounding area of open battery cells.**

Caution

- **To prevent damage to electrical components or the battery, turn all accessories off and stop the engine before performing maintenance or recharging the battery.**
- **When disconnecting the battery, remove the negative cable first and install it last to prevent damage to electrical components or the battery.**
- **Do not quick charge for over 30 minutes. It will damage the battery.**

Battery	Slow charge (A)	Quick charge (A)
50D20L	4.0–5.0	25
55D23L	4.5–5.5	30
65D23L		

Slow charging

It is not necessary to remove the vent caps to perform a slow charge.

Quick charging

Remove the battery from the vehicle and remove the vent caps to perform a quick charge.
Place the battery in a pan of water to prevent it from overheating. The water level should come up about halfway on the battery. Keep water off of the top of the battery.

GENERATOR
Removal / Installation

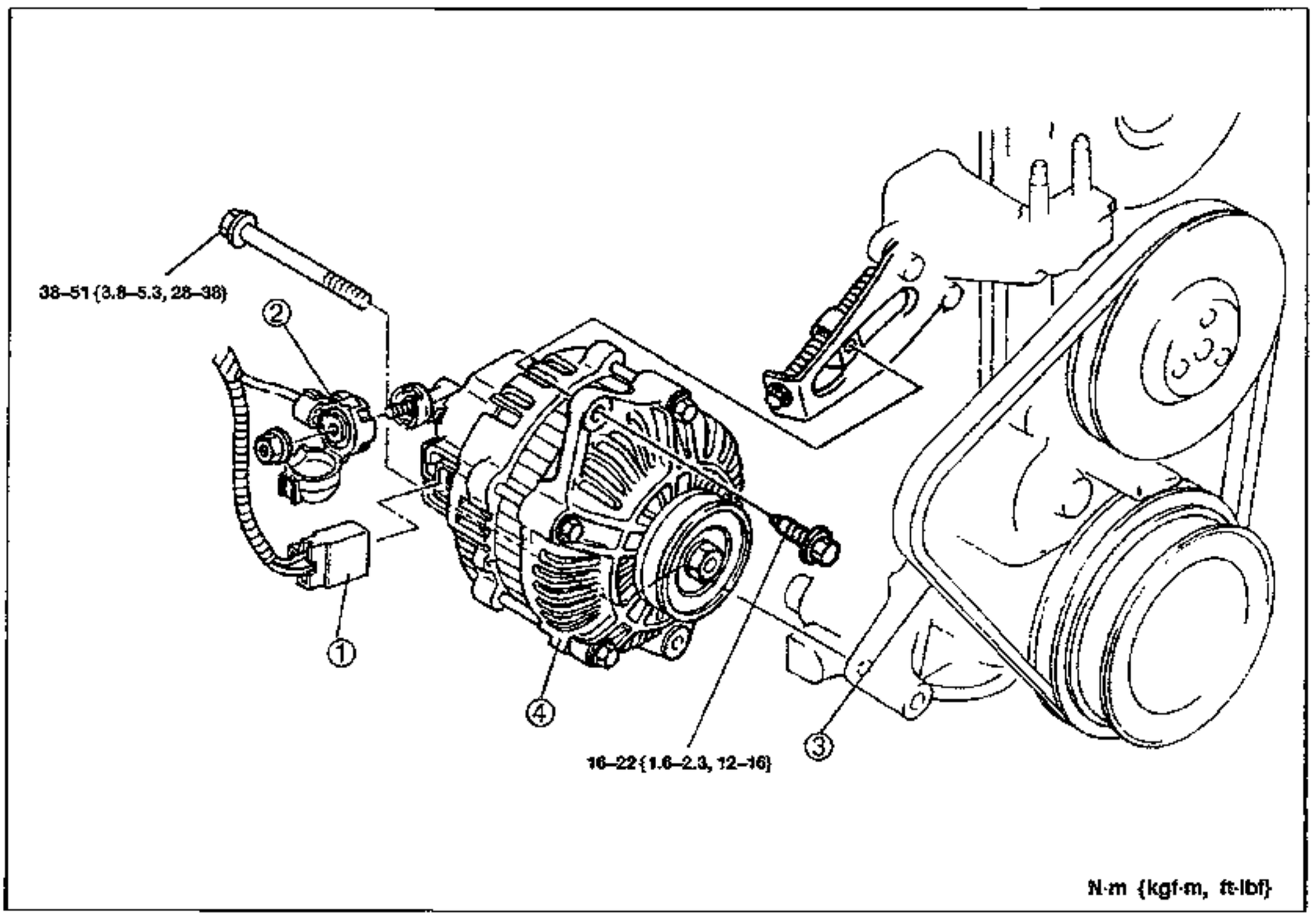
Warning
- **When the battery cables are connected, touching the vehicle body with generator terminal B will generate sparks. This can cause personal injury, fire, and damage to the electrical components. Always disconnect the battery before performing the following operation.**

Caution
- **Reversing the battery connections or using high-voltage testers will damage the rectifier.**
- **Do not start the engine while the connector is disconnected from terminals L and S. It can damage the generator.**

Note
- Battery positive voltage is always present at generator terminal B when the battery is connected.

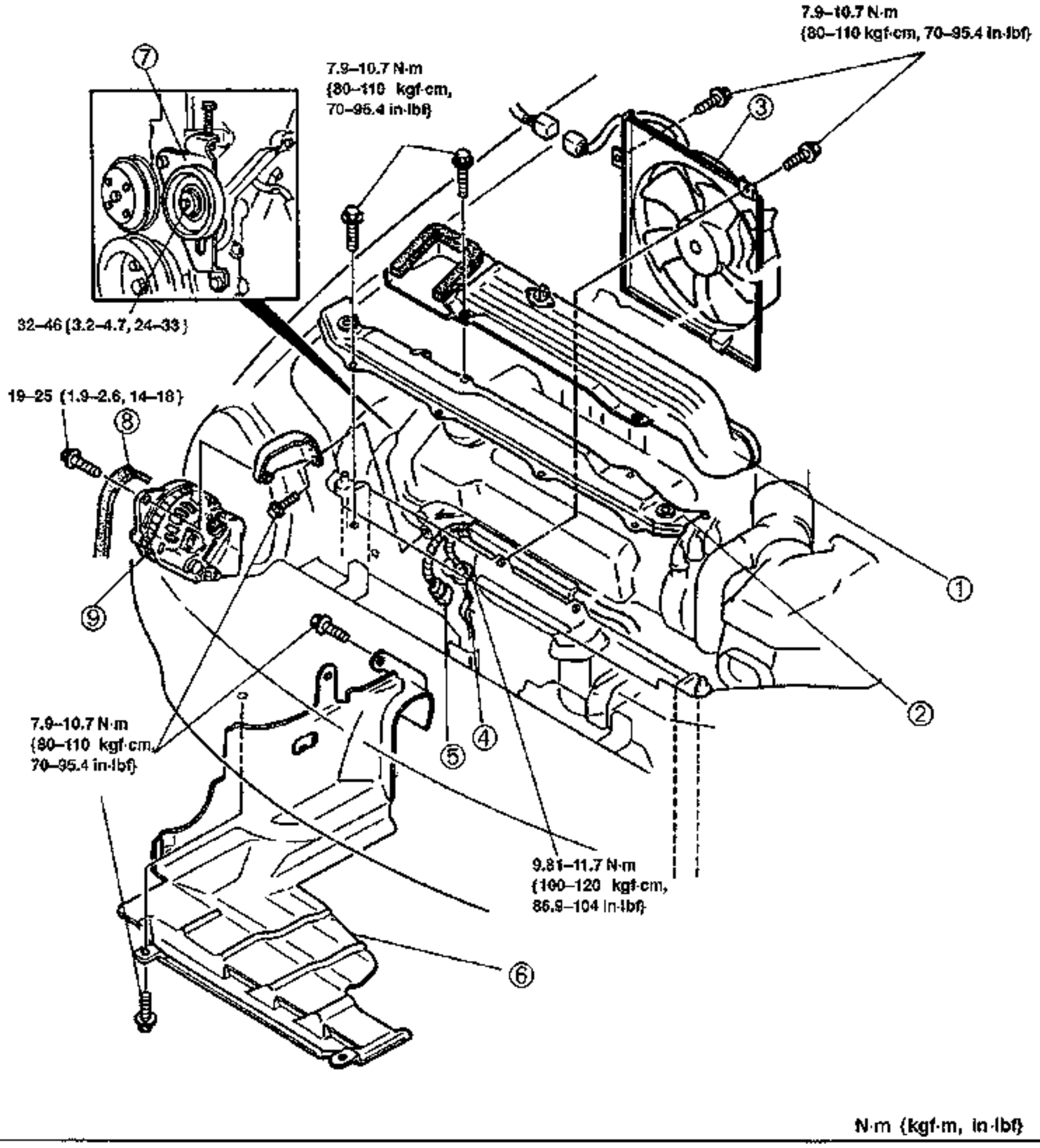
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Inspect all parts and repair or replace as necessary.
4. Install in the reverse order of removal.

B6 DOHC



1. Connector
2. Generator terminal B wire
   Inspect for damage and corrosion
3. Drive belt
   Inspection ..... page G–18
   Adjustment ..... page G–19
   Replacement ..... section B1
4. Generator
   Disassembly / Assembly ..... page G–14
   Inspection ..... page G–16

K8 DOHC

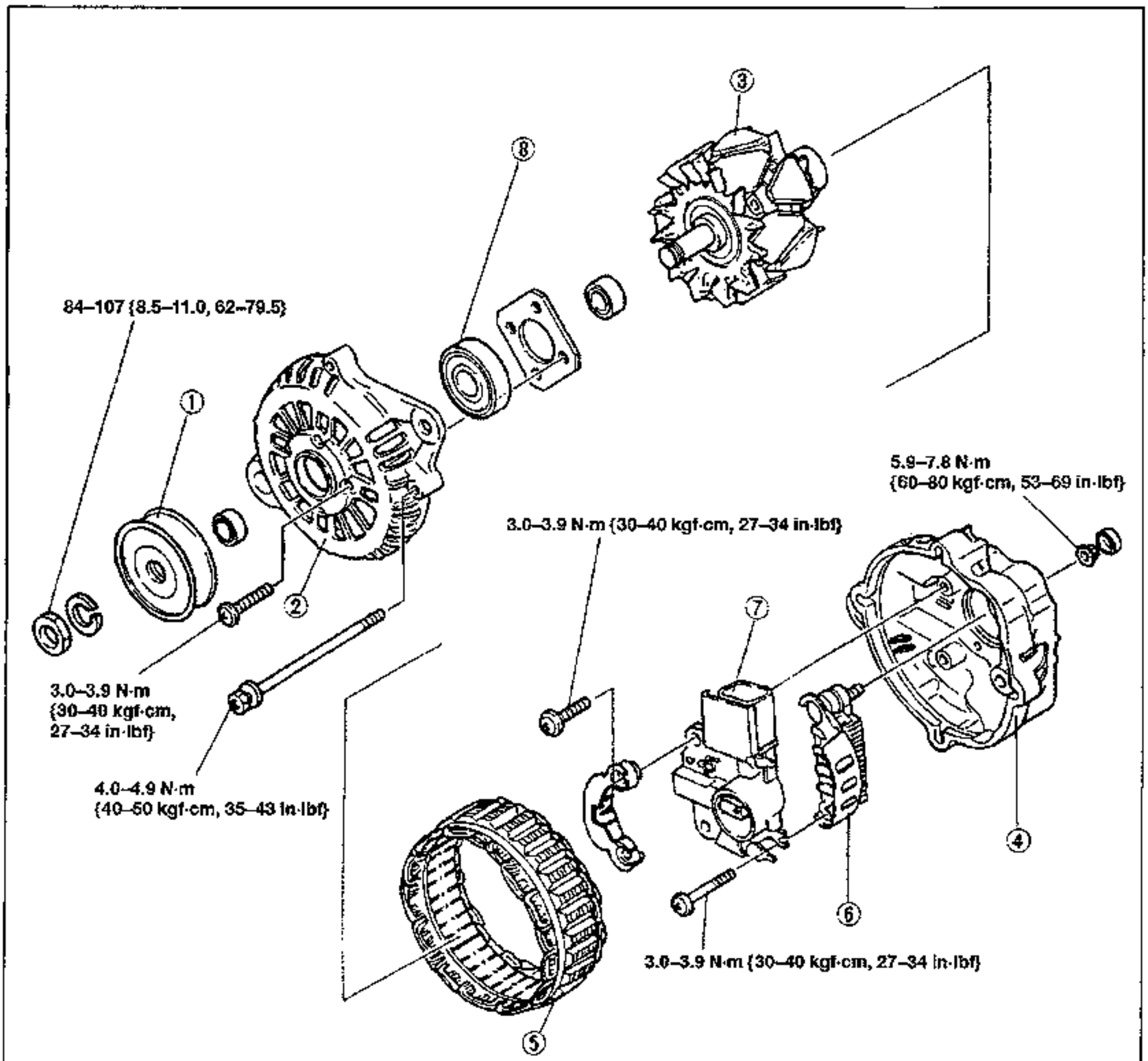


1. Fresh-air duct
2. Radiator upper bracket
3. Condenser fan (if equipped)
4. Generator terminal B wire
   Inspect for damage and corrosion
5. Connector
6. Splash shield
7. Belt tensioner
8. Drive belt
   Inspection ..... page G–18
   Adjustment ..... page G–19
   Replacement ..... section B2
9. Generator
   Disassembly / Assembly ..... page G–15
   Inspection ..... page G–16

Disassembly / Assembly

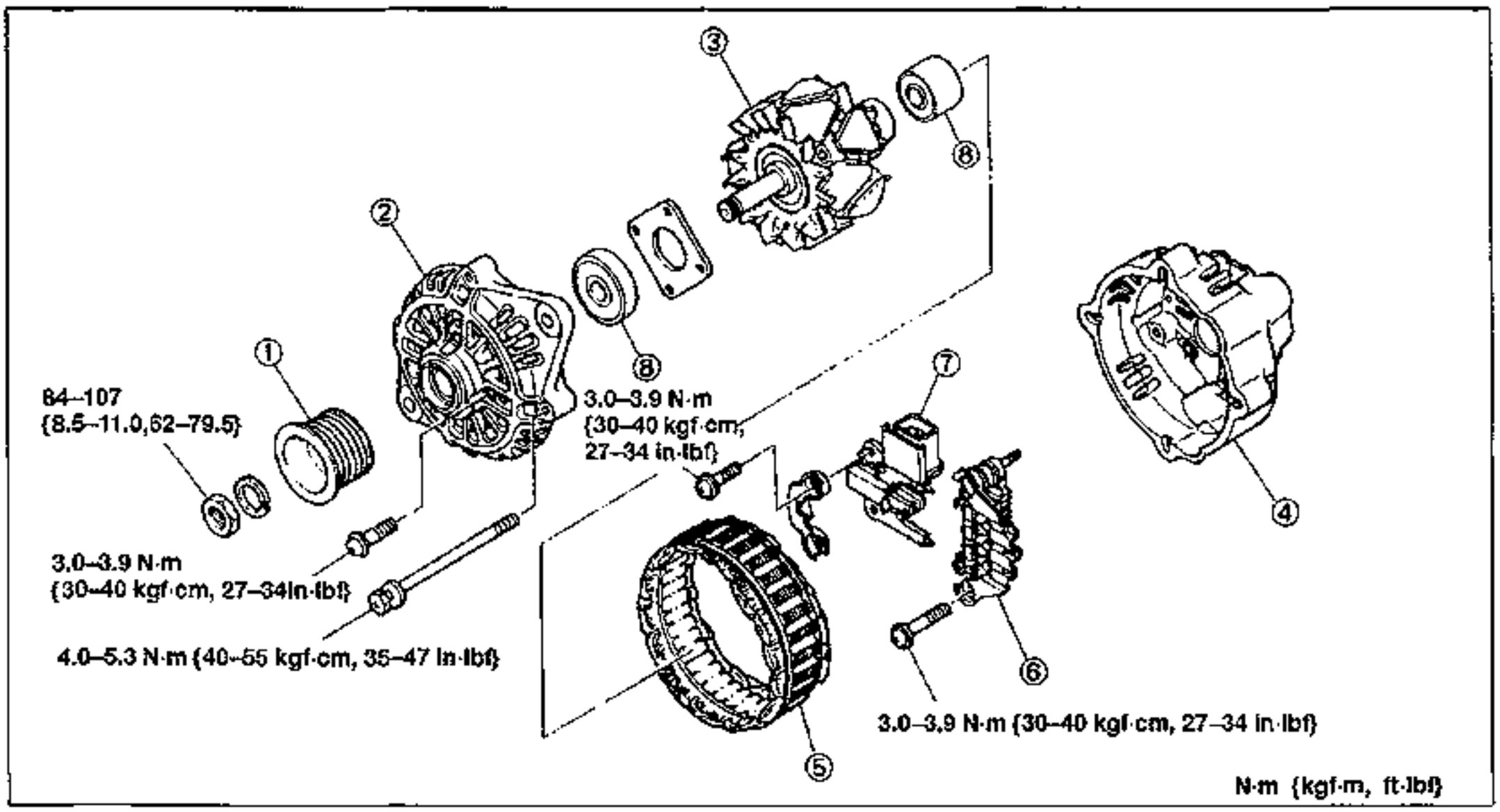
1. Disassemble in the order shown in the figure, referring to **Disassembly / Assembly Note.**
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Disassembly / Assembly Note.**

B6 DOHC

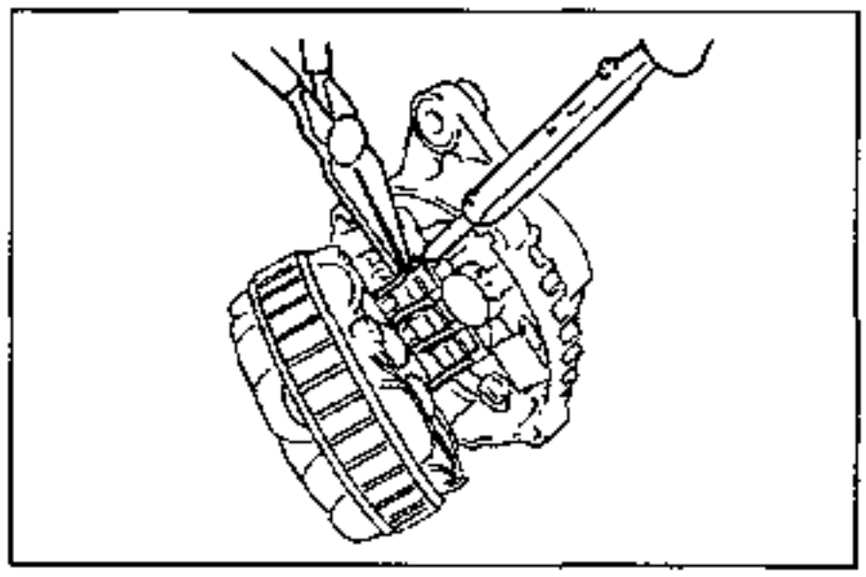


1. Pulley
2. Front bracket
3. Rotor
   Inspection ..... page G–16
4. Rear bracket
   Disassembly / Assembly Note . page G–15
5. Stator
   Disassembly / Assembly Note . page G–15
   Inspection ..... page G–16
6. Rectifier
   Disassembly / Assembly Note . page G–15
   Inspection ..... page G–17
7. Brush holder assembly
   Disassembly / Assembly Note . page G–15
   Inspection
   (Brush and brush spring) ..... page G–17
8. Bearing
   Inspection ..... page G–16

K8 DOHC

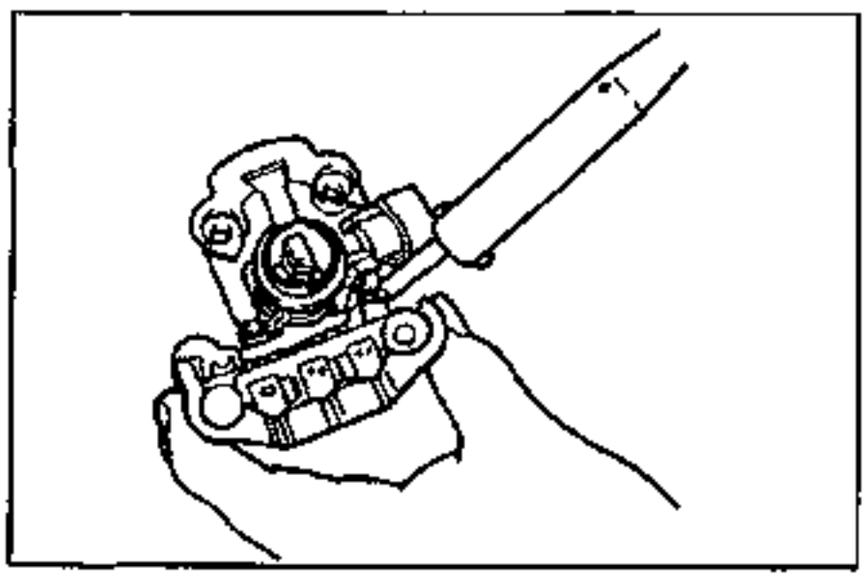


1. Pulley
2. Front bracket
3. Rotor
   Inspection ..... page G–16
4. Rear bracket
   Assembly / Disassembly Note ..... below
5. Stator
   Assembly / Disassembly Note ..... below
   Inspection ..... page G–16
6. Rectifire
   Assembly / Disassembly Note ..... below
   Inspection ..... page G–17
7. Brush holder assembly
   Assembly / Disassembly Note ..... below
   Inspection
   (Brush and brush spring) ..... page G–17
8. Bearing
   Inspection ..... page G–16



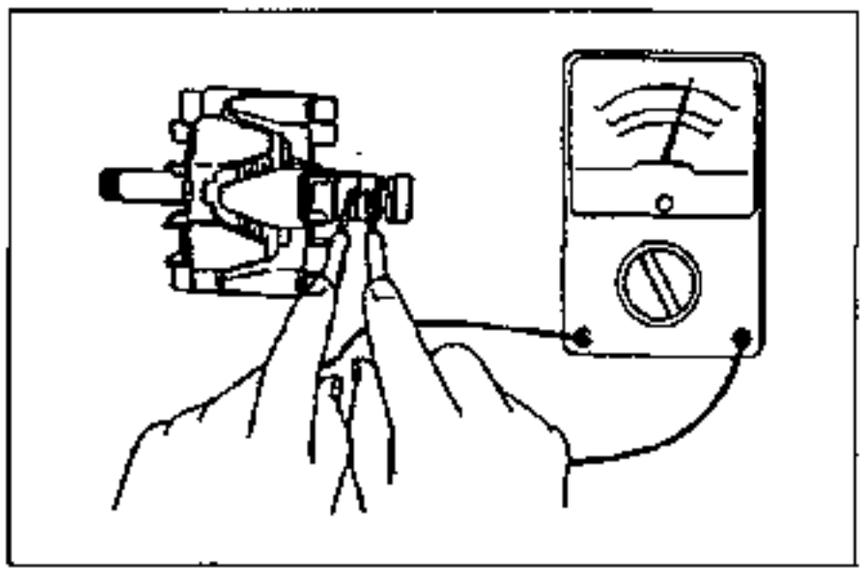
Disassembly / Assembly Note
Rear bracket, Stator lead wire
Use a soldering iron to remove the solder from the rear bracket and the stator lead wire.

Caution
- **The rectifier can be damaged when overheated. Do not hold the soldering gun to the rectifier contact for more than 5 seconds.**

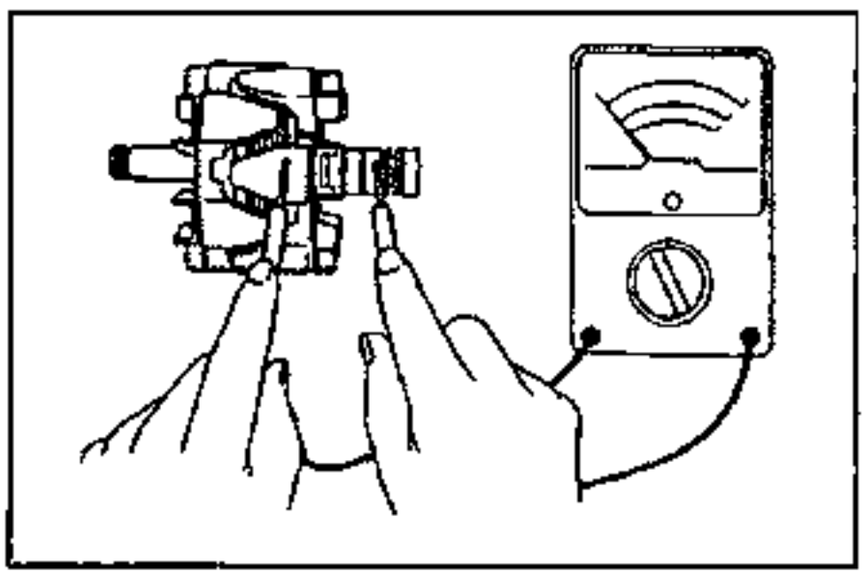


Brush holder
Use a soldering iron to remove the solder from the brush holder.

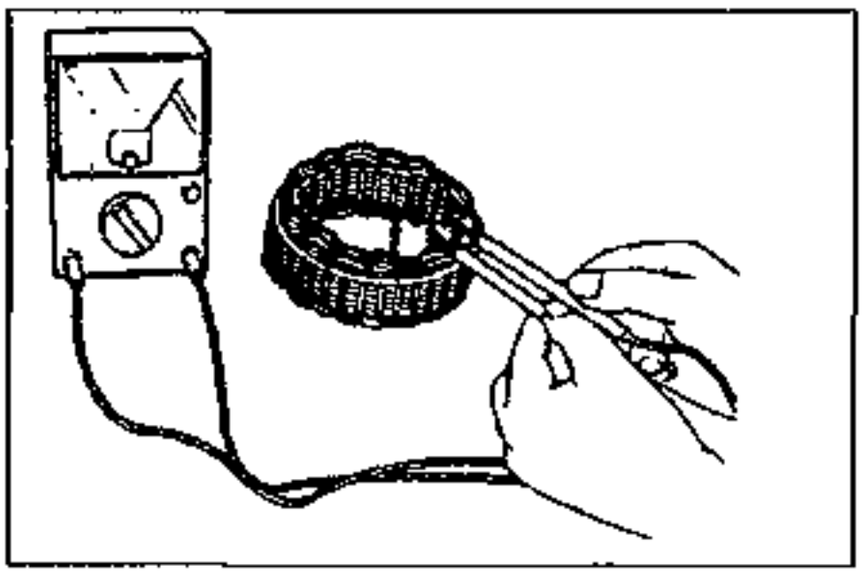
Caution
- **The rectifier can be damaged when overheated. Do not hold the soldering gun to the rectifier contact for more than 5 seconds.**



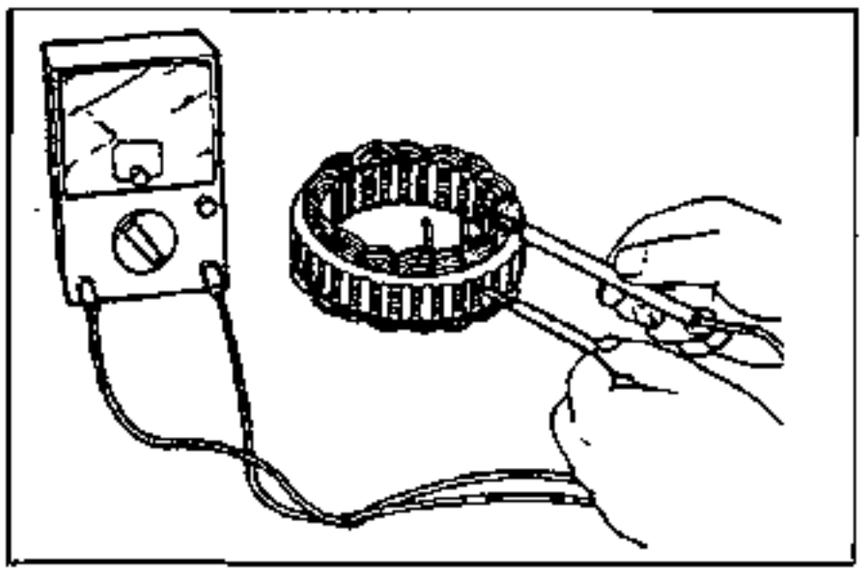
Inspection
Rotor
1. Check continuity between the slip rings with an ohmmeter.
2. Replace the rotor if there is no continuity.



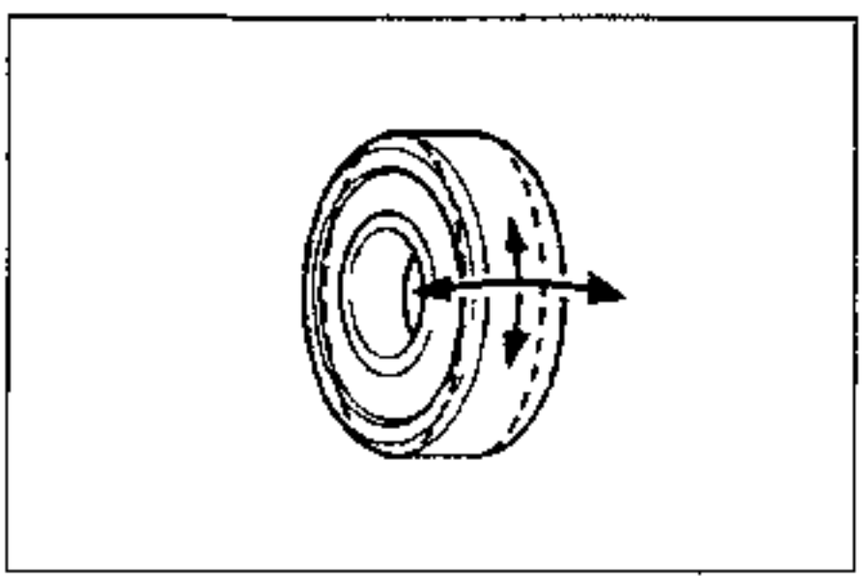
3. (1) Check continuity between each slip ring and the core with an ohmmeter.
   (2) Replace the rotor if there is continuity.
4. Check if the slip ring surface is rough. Use fine sandpaper to repair it if necessary.



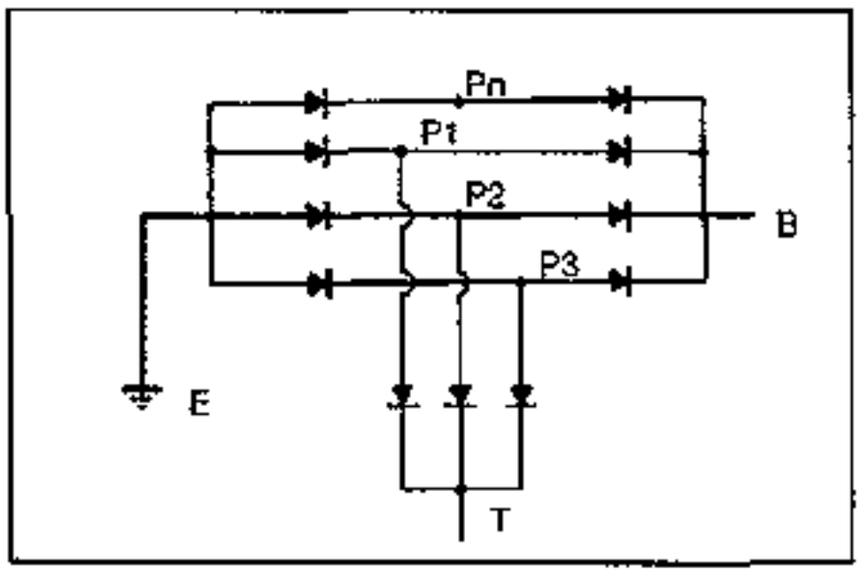
Stator
1. Check continuity between the stator coil leads with an ohmmeter.
2. Replace the stator if there is no continuity.



3. Check continuity between the stator coil leads and the core with an ohmmeter.
4. Replace the stator if there is continuity.



Bearing
1. Check for abnormal noise, looseness, and sticking.
2. Replace the bearing(s) if necessary.

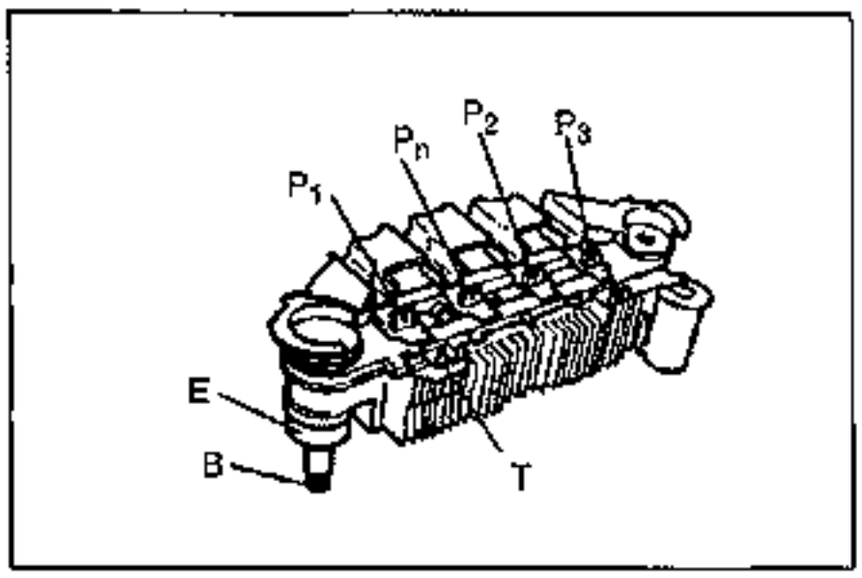


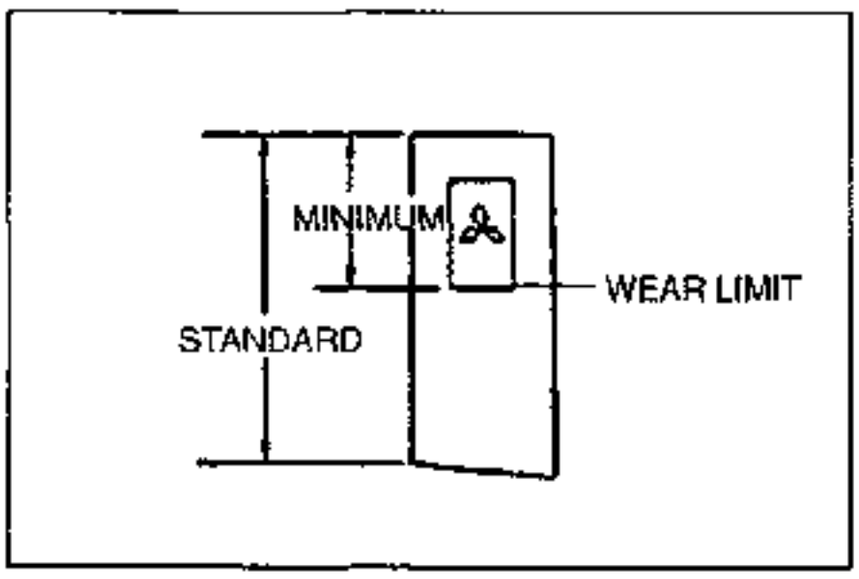
Rectifier

1. Check continuity of the diodes with an ohmmeter.

Negative	Positive	Continuity
E	Pn, P1, P2, P3	Yes
B		No
T		No
Pn, P1, P2, P3	E	No
	B	Yes
P1, P2, P3	T	Yes
Pn		No

2. Replace the rectifier if not as specified.

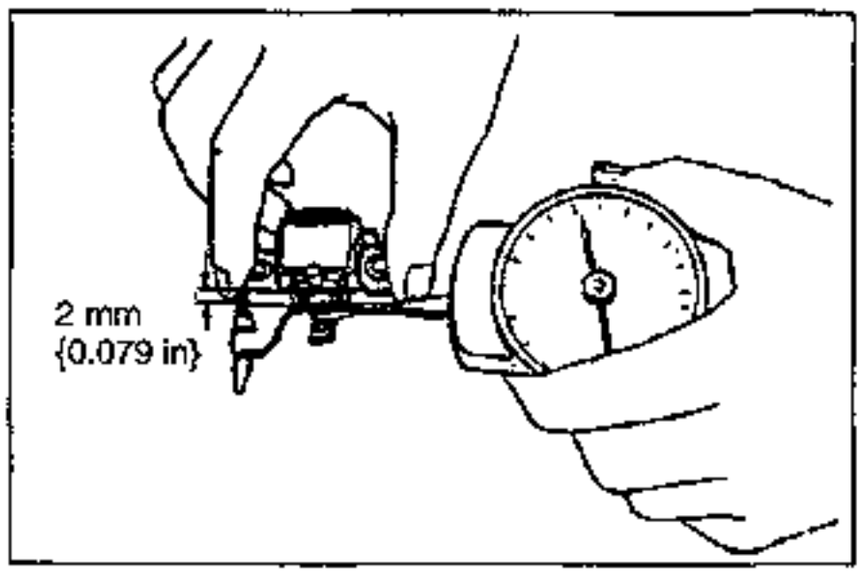




Brush

If a brush is worn almost to or beyond the limit, repface all the brushes.

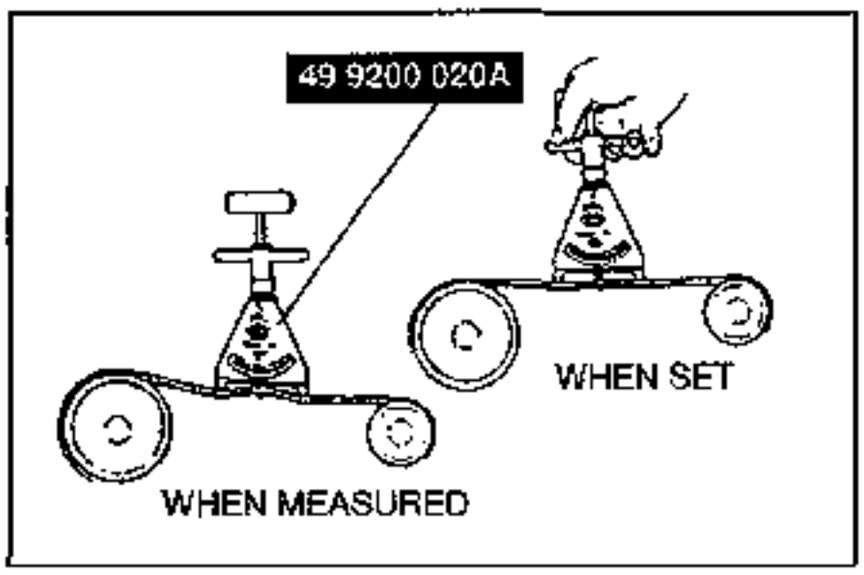
Standard: 21.5 mm {0.85 in} (K8 DOHC)
20.0 mm {0.79 in} (B6 DOHC)
Minimum: 8.0 mm {0.32 in} (K8 DOHC)
5.0 mm {0.20 in} (B6 DOHC)

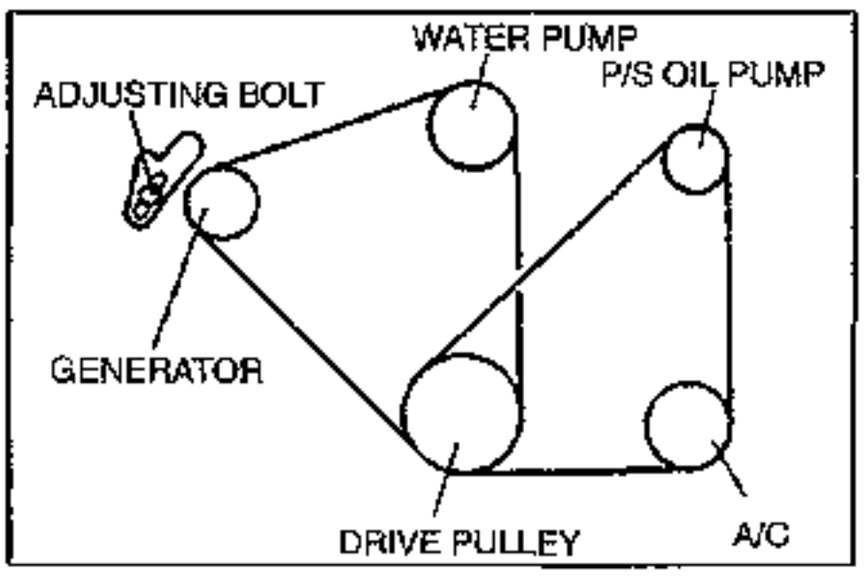


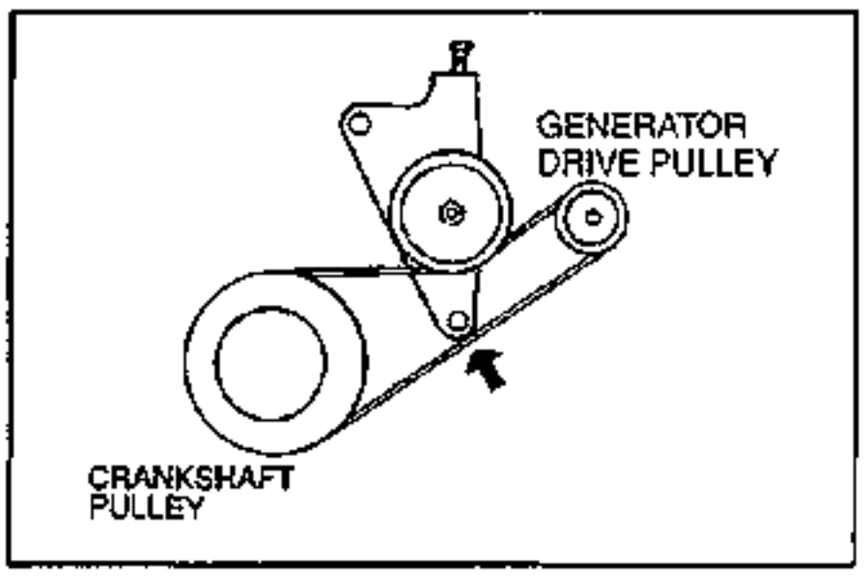
Brush spring

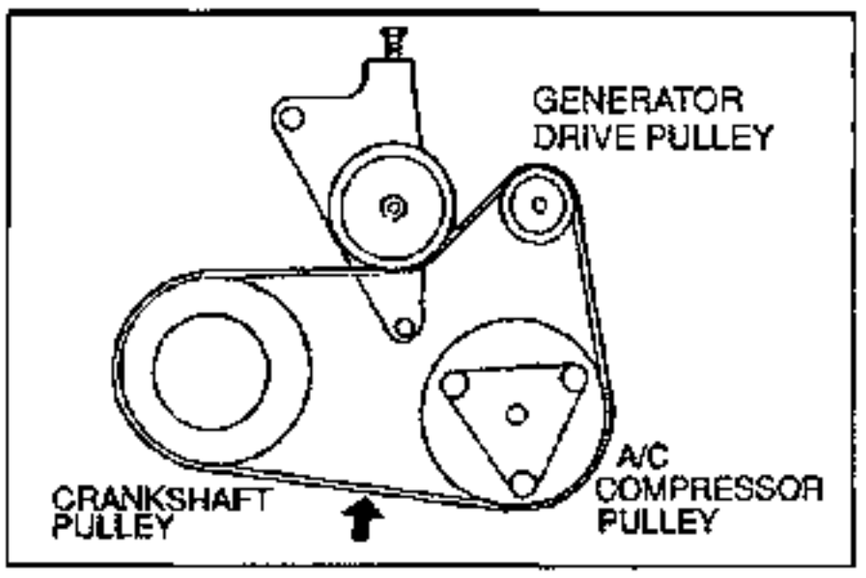
1. Using a spring pressure gauge, measure the brush spring pressure with the brush tip projecting 2 mm {0.079 in}.
2. Replace the spring if necessary.

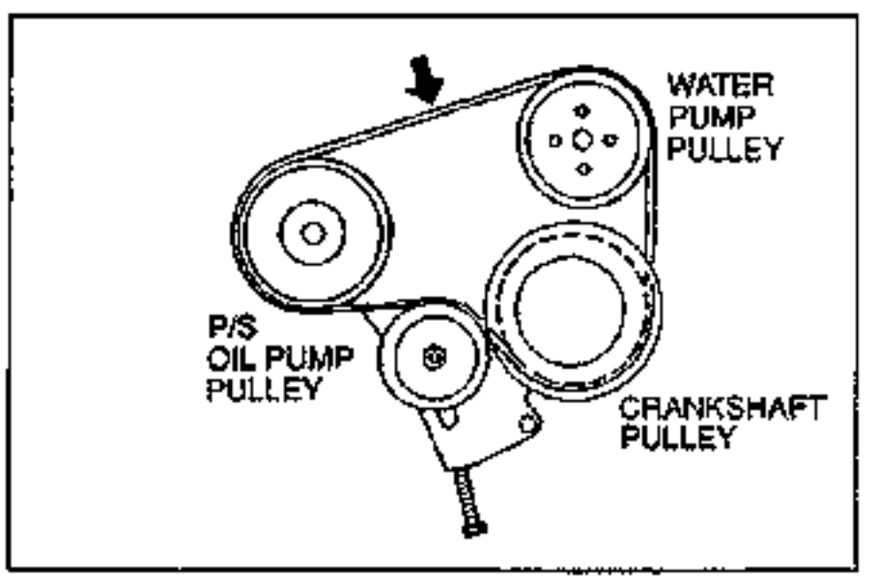
Standard force:
3.2–4.3 N {0.32–0.44 kgf, 0.71–0.96 lbf} (K8 DOHC)
4.7–5.8 N {0.47–0.60 kgf, 1.04–1.29 lbf} (B6 DOHC)
Minimum:
1.6–2.3 N {0.16–0.24 kgf, 0.36–0.52 lbf} (K8 DOHC)
2.4–3.1 N {0.24–0.32 kgf, 0.53–0.70 lbf} (B6 DOHC)











DRIVE BELT

Inspection

1. Check the drive belts and pulleys for wear, cracks, and fraying. Replace if necessary.
2. Measure the drive belt tension with a **SST**, and measure the deflection by applying moderate pressure 98 N {10 kgf, 22 lbf} midway between the pulleys. Adjust the belt if necessary.

Tension (B6 DOHC)

N {kgf, lbf}

Drive belt	New*	Used	Limit
Generator	500–740 {50–76, 110–160}	500–700 {50–72, 110–150}	340 {35, 77}
P/S, P/S + A/C	500–580 {50–60, 110–130}	430–490 {43–50, 95–110}	250 {25, 55}
A/C	500–580 {50–60, 110–130}	430–490 {43–50, 95–110}	250 {25, 55}

Deflection (B6 DOHC)

mm {in}

Drive belt	New*	Used	Limit
Generator	5.5–7.0 {0.22–0.27}	6.0–7.5 {0.24–0.29}	8.0 {0.31}
P/S, P/S + A/C	8.0–9.0 {0.32–0.35}	9.0–10.0 {0.36–0.39}	11.5 {0.45}
A/C	8.0–9.0 {0.32–0.35}	9.0–10.0 {0.36–0.39}	11.5 {0.45}

Tension (K8 DOHC)

N {kgf, lbf}

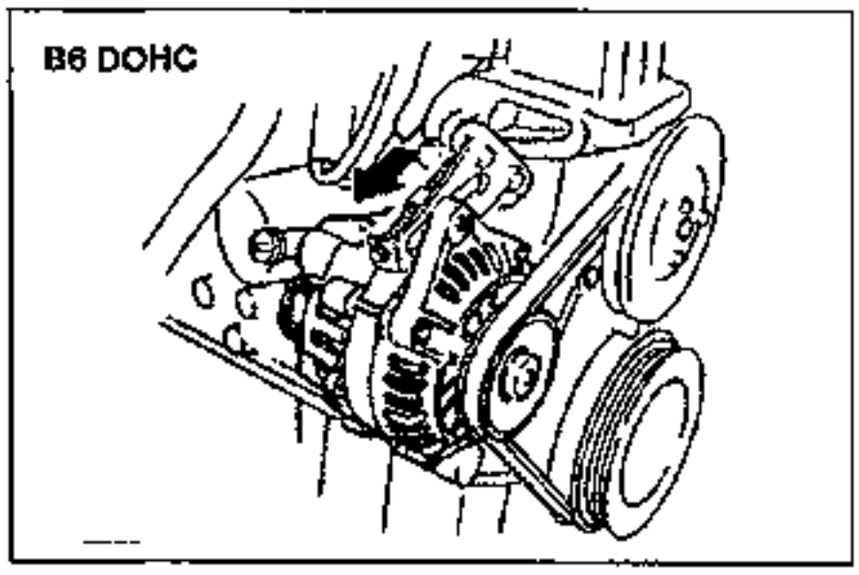
Drive belt	New*	Used	Limit
Generator	690–880 {70–90, 160–190}	500–680 {50–70, 110–150}	440 {45, 99}
Generator + A/C	690–880 {70–90, 160–190}	500–680 {50–70, 110–150}	440 {45, 99}
P/S	540–680 {55–70,130–150}	400–540 {40–55, 88–120}	340 {35, 77}

Deflection (K8 DOHC)

mm {in}

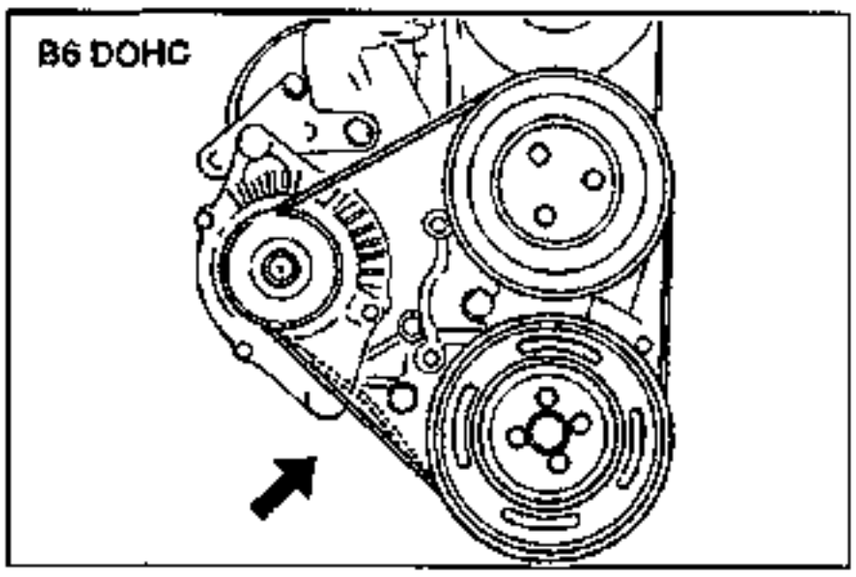
Drive belt	New*	Used	Limit
Generator	6.0–7.0 {0.24–0.27}	7.0–8.0 {0.28–0.31}	9.0 {0.35}
Generator + A/C	5.5–6.5 {0.22–0.25}	6.5–7.5 {0.26–0.29}	8.0 {0.32}
P/S	6.0–7.0 {0.24–0.27}	7.0–8.0 {0.28–0.31}	9.0 {0.35}

*: A belt that has been on a running engine for less than five minutes.

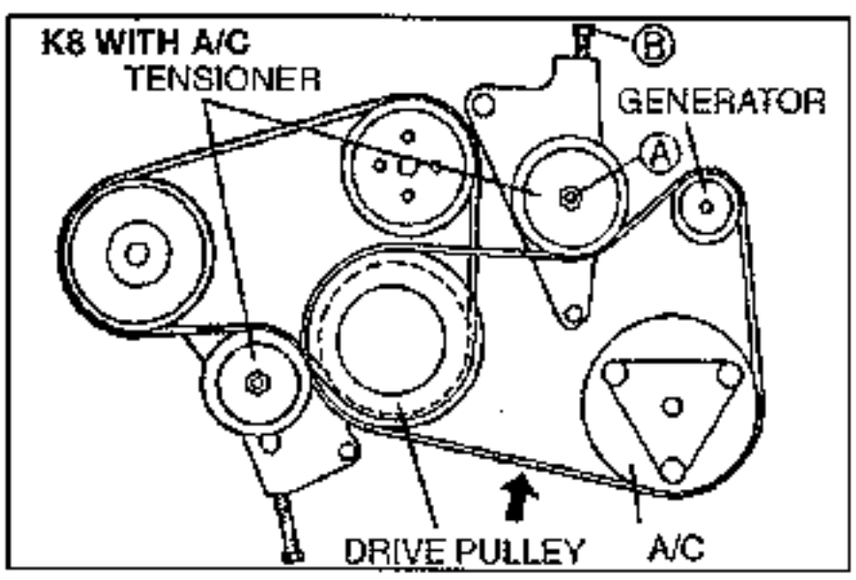


Adjustment
B6 DOHC
1. Loosen the generator mounting bolt and adjusting bolt.
2. Tighten the generator adjusting bolt.
3. Tighten the generator mounting bolts and recheck the tension.

Tightening torque
Mounting bolt:
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}



4. If adjustment is not possible, replace the drive belt. (Refer to section B1.)



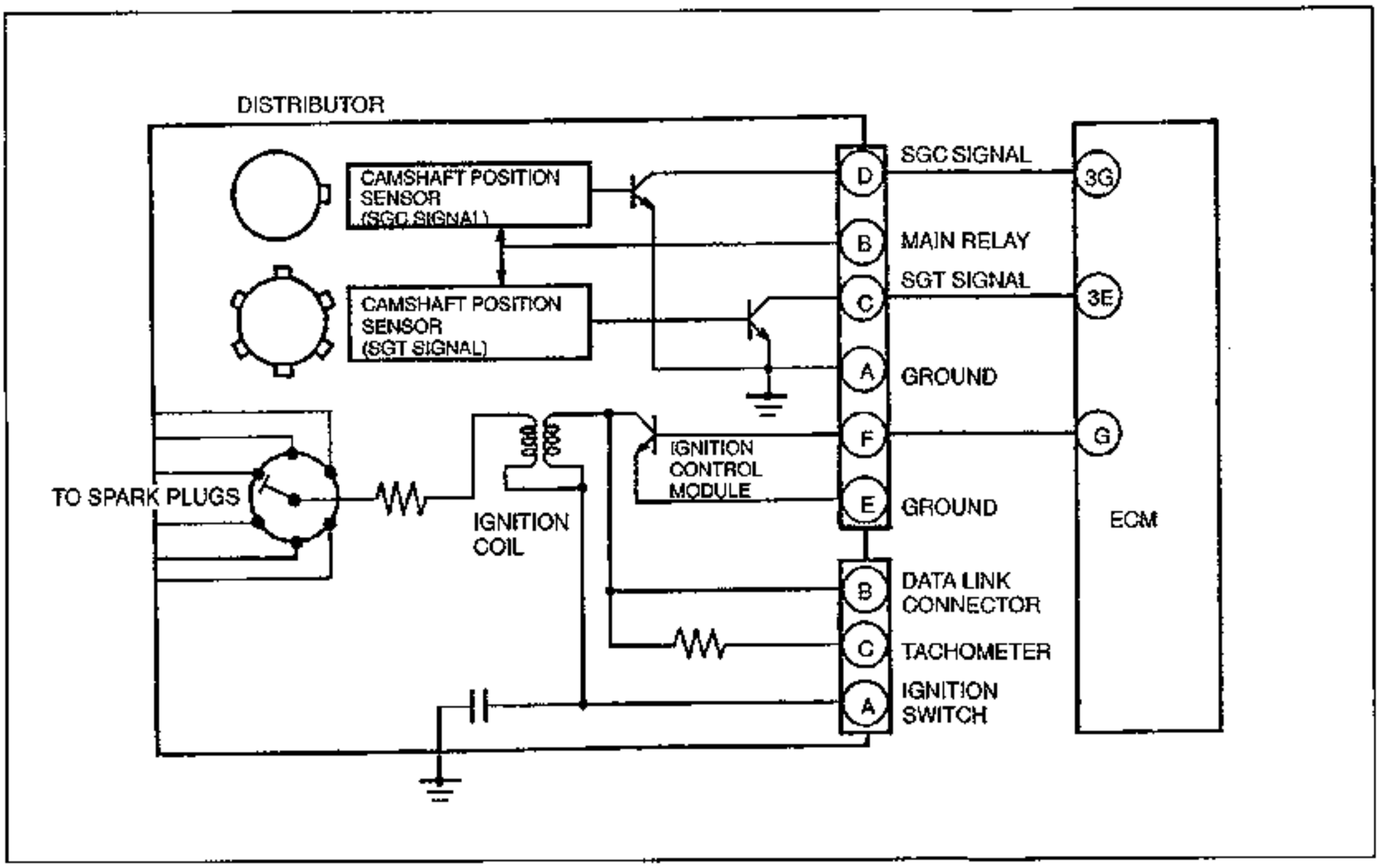
K8 DOHC
1. Loosen tensioner lock nut Ⓐ.
2. Tighten adjuster bolt Ⓑ.
3. Tighten tensioner lock nut Ⓐ.

Tightening torque
Ⓐ:32–46 N·m {3.2–4.7 kgf·m, 24–33 ft·lbf}

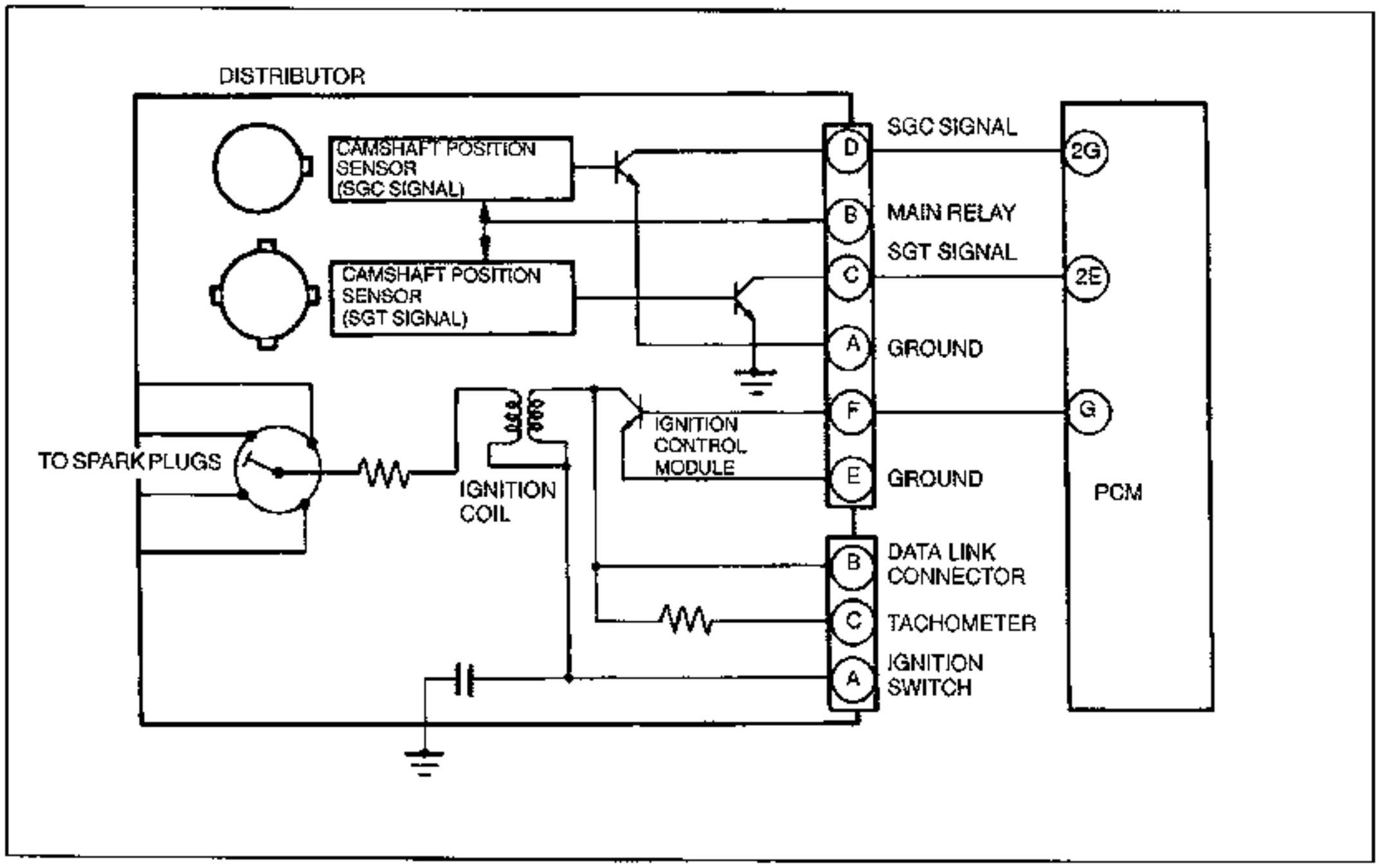
4. If adjustment is not possible, replace the drive belt. (Refer to section B2.)

IGNITION SYSTEM

CIRCUIT DIAGRAM
K8 DOHC

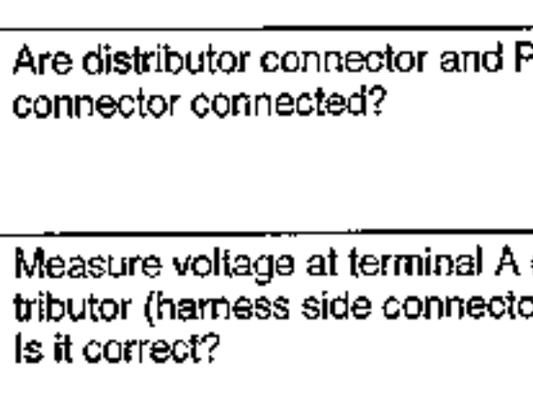
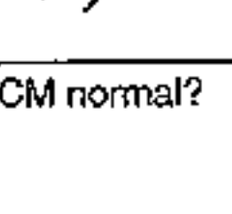


B6 DOHC


DISTRIBUTOR
CAMSHAFT POSITION SENSOR (SGC SIGNAL)
CAMSHAFT POSITION SENSOR (SGT SIGNAL)
TO SPARK PLUGS
IGNITION COIL
IGNITION CONTROL MODULE
SGC SIGNAL
MAIN RELAY
SGT SIGNAL
GROUND
GROUND
DATA LINK CONNECTOR
TACHOMETER
IGNITION SWITCH
D
B
C
A
F
E
B
C
A
2G
2E
G
PCM

SYSTEM INSPECTION

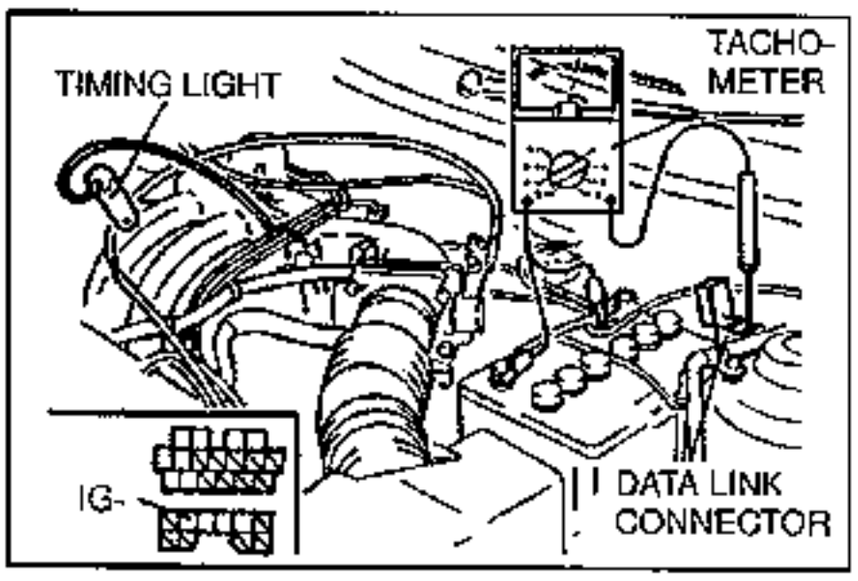
B+: Battery positive voltage

STEP	INSPECTION		ACTION
1	Disconnect high-tension lead from each spark plug. Does strong blue spark occur while cranking engine? ☞page G–25 	Yes	• Check spark plugs ☞page G–25 ⇨Ignition system normal
		No	Go to next step
2	Are resistance of high-tension leads OK? ☞page G–24 **Specification: 16 kΩ per 1 m {3.28 ft} [at 20°C {68°F}]**	Yes	Go to next step
		No	Replace high-tension leads
3	Are there corrosion, damage or cracks on distributor cap and rotor? ☞page G–31	Yes	Replace cap and rotor
		No	Go to next step
4	Is ignition coil OK? ☞page G–26	Yes	Go to next step
		No	Replace distributor
5	Are distributor connector and PCM or ECM connector connected?	Yes	Go to next step
		No	Connect connectors
6	Measure voltage at terminal A (3-pin) of distributor (harness side connector) Is it correct? **Voltage: B+ (Ignition switch ON)** 	Yes	Go to next step
		No	Check main fuse, ignition switch and wiring harness
7	Is PCM or ECM normal?	Yes	Replace distributor
		No	Replace PCM or ECM

IGNITION TIMING

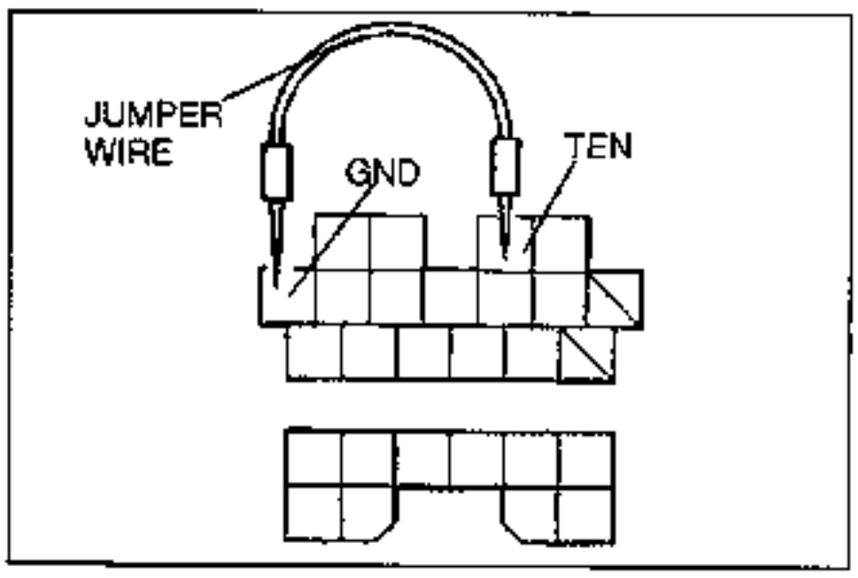
Adjustment

1. Warm up the engine to normal operating temperature and run it at idle (P range [ATX] or neutral [MTX]).
2. Turn all electrical loads OFF.
3. Turn the A/C switch OFF.
4. Verify that the coolant fan does not operate.

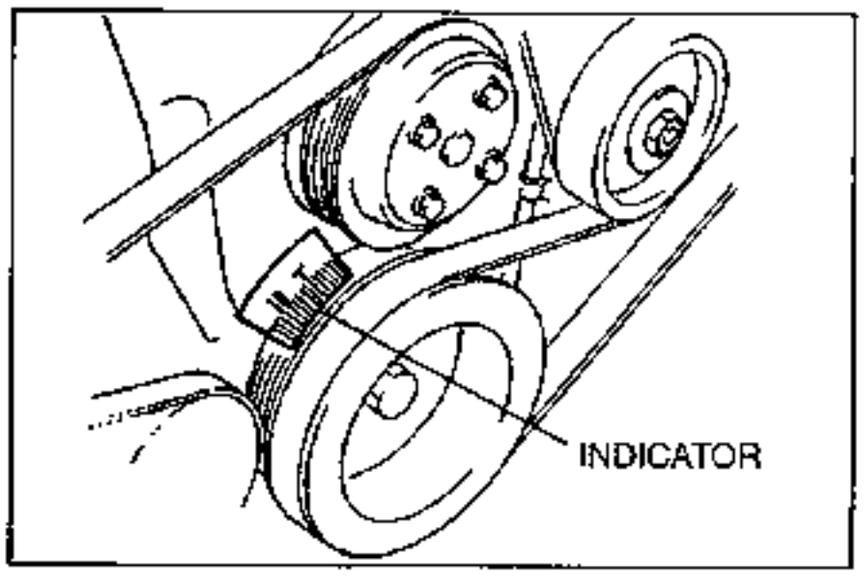


K8 DOHC

1. Connect a tachometer to the data link connector terminal IG-. Connect a timing light as shown.



2. Connect the data link connector terminals TEN and GND with a jumper wire.



3. Check the idle speed.

   Specification: 550–950 rpm

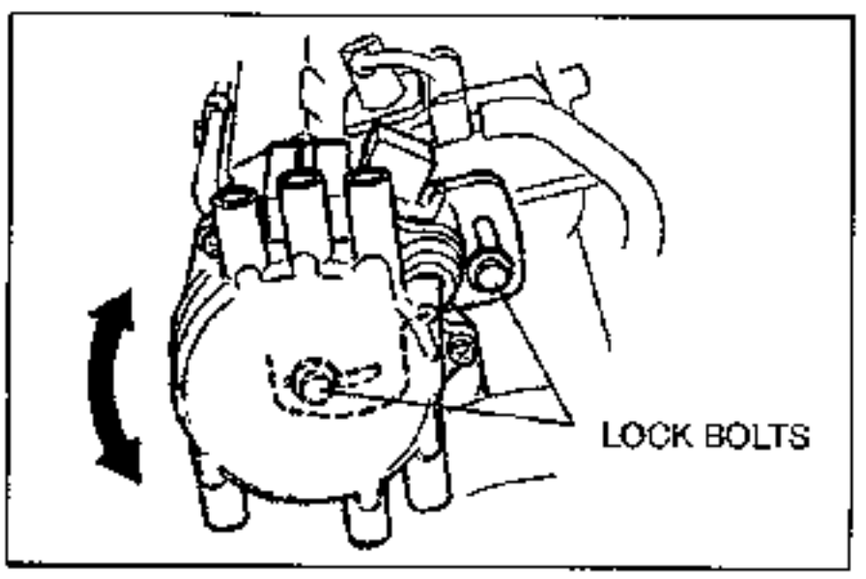
4. If necessary, adjust the idle speed. (Refer to section F2.)

5. Check the ignition timing.

   Ignition timing: BTDC 9–11° (10 ± 1°)

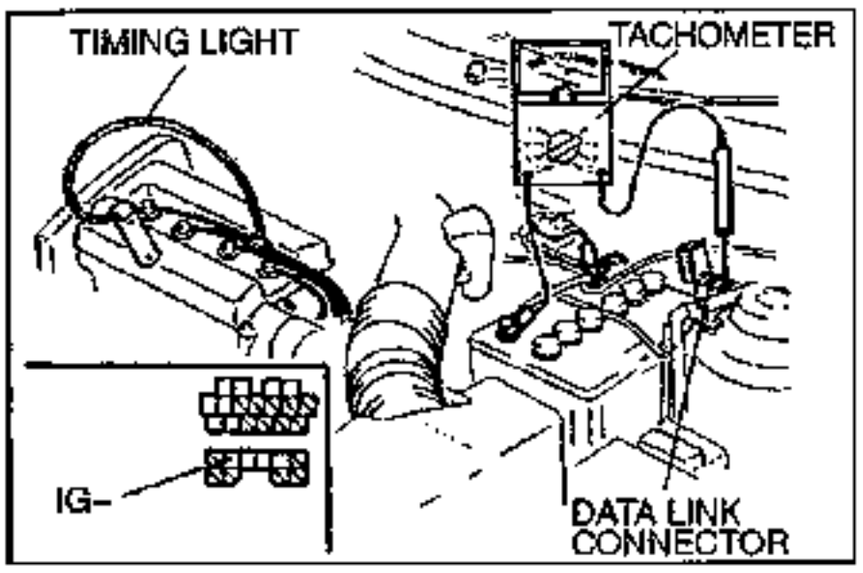
6. If the ignition timing is not as specified, loosen the distributor lock bolts and turn the distributor to make the adjustment.
7. Tighten the distributor lock bolts to the specified torque.

   Tightening torque:
   19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}



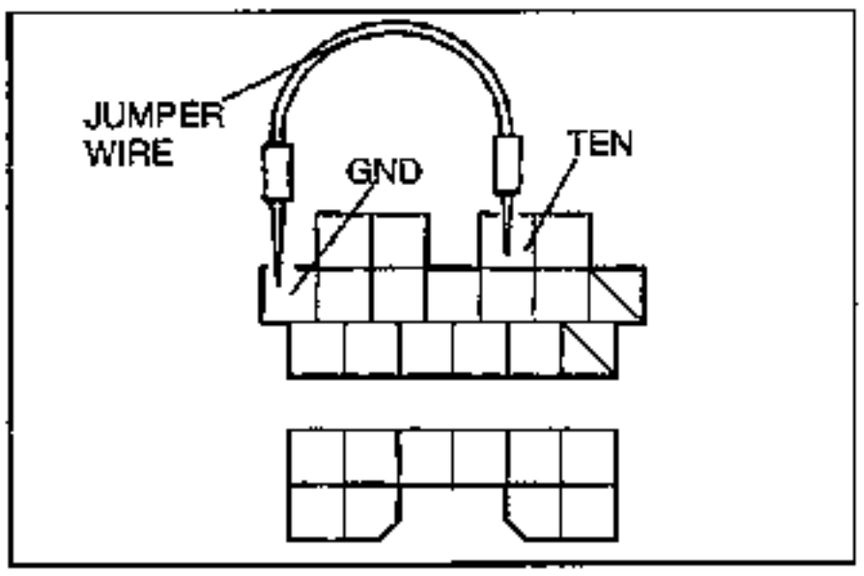
8. Disconnect a jumper wire.
9. Check if the timing mark (yellow) on the crankshaft pulley and the mark on the timing belt cover are aligned.

   Ignition timing: BTDC 6–18°



B6 DOHC

1. Connect a tachometer to the data link connector terminal IG-. Connect a timing light as shown.

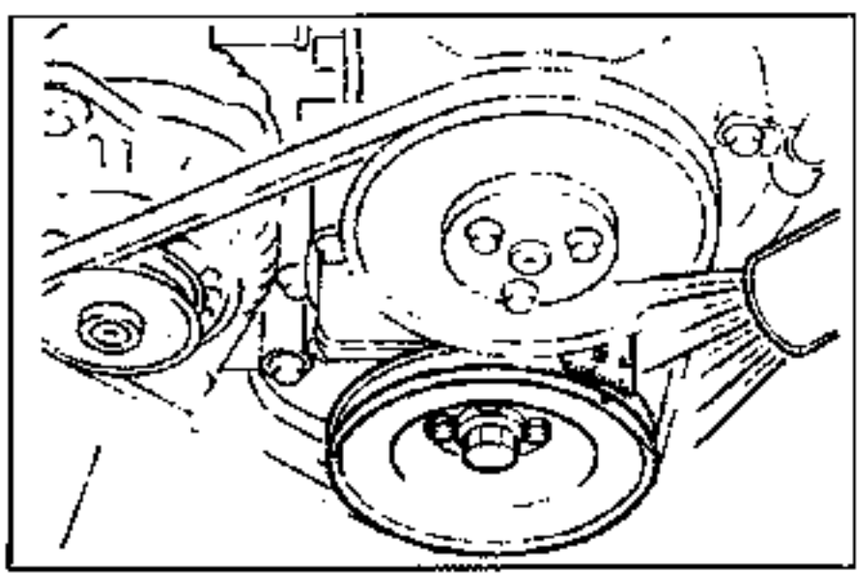


2. Connect the data link connector terminals TEN and GND with a jumper wire.
3. Check the idle speed.

Specifications (Neutral): 650–750 (700 ± 50) rpm[MTX]
(P range): 700–800 (750 ± 50) rpm[ATX]

4. If necessary, adjust the idle speed. (Refer to section F1.)
5. Check the ignition timing.

Ignition timing: BTDC 9–11° (10 ± 1°)

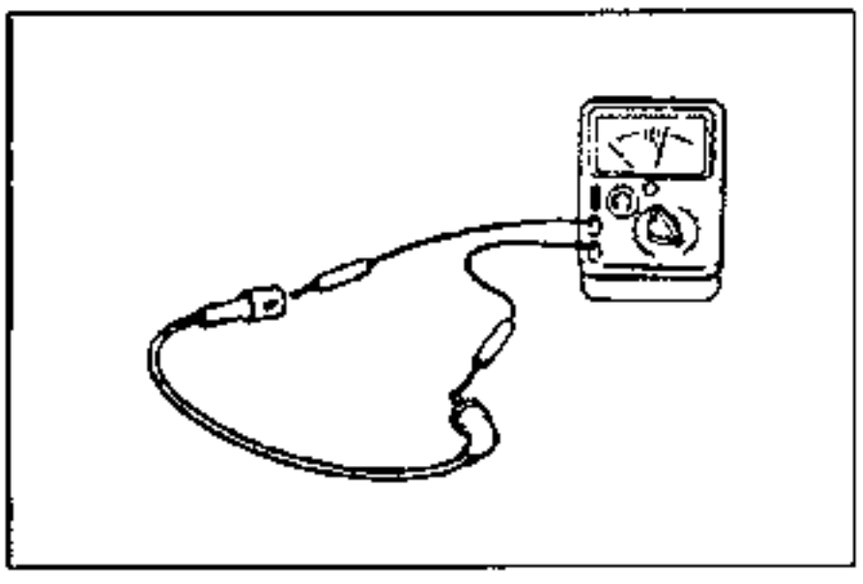


6. If the ignition timing is not as specified, loosen the distributor lock bolts and turn the distributor to make the adjustment.
7. Tighten the distributor lock bolts to the specified torque.

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

8. Disconnect a jumper wire.
9. Check if the timing mark (yellow) on the crankshaft pulley and the mark on the timing belt cover are aligned.

Ignition timing: 6–18°



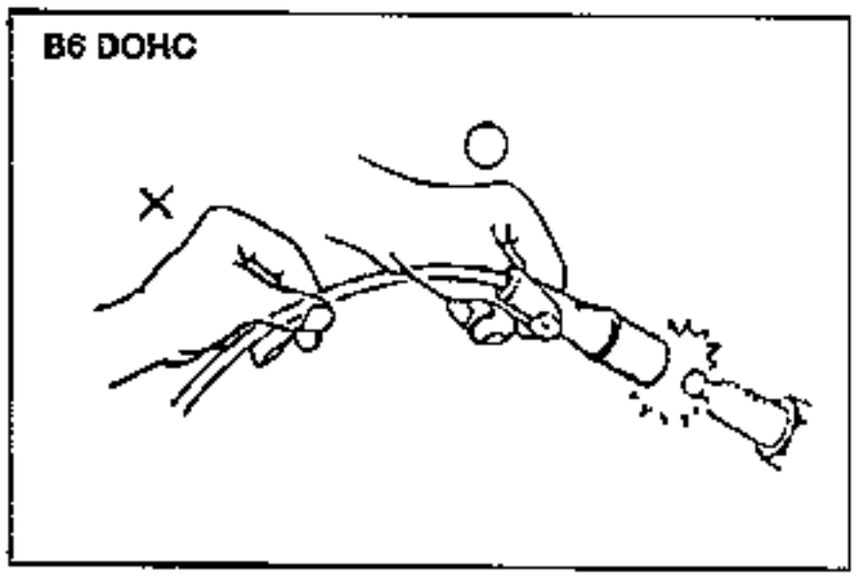
HIGH-TENSION LEAD
Removal / Installation

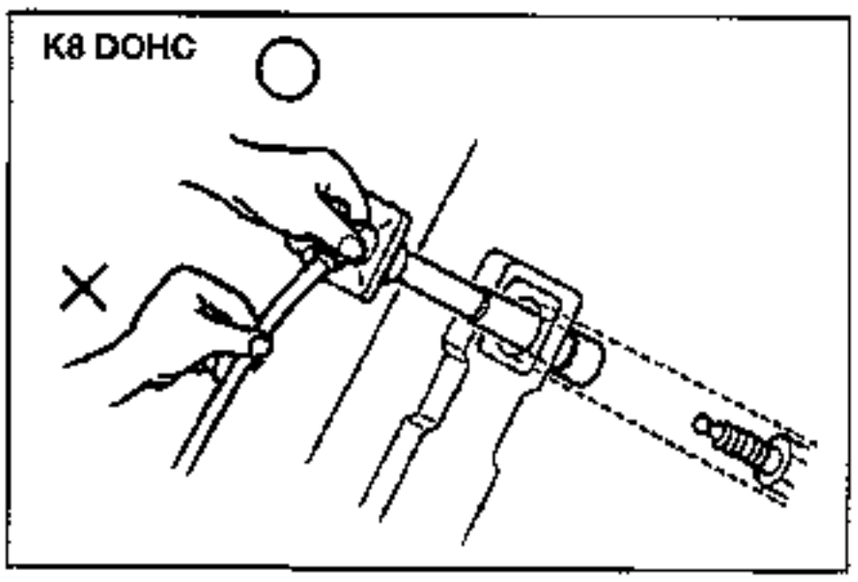
Caution
- **Reinstall the high-tension leads to their original positions. Incorrect installation can damage the leads and cause power loss, and negatively effect electronic components.**

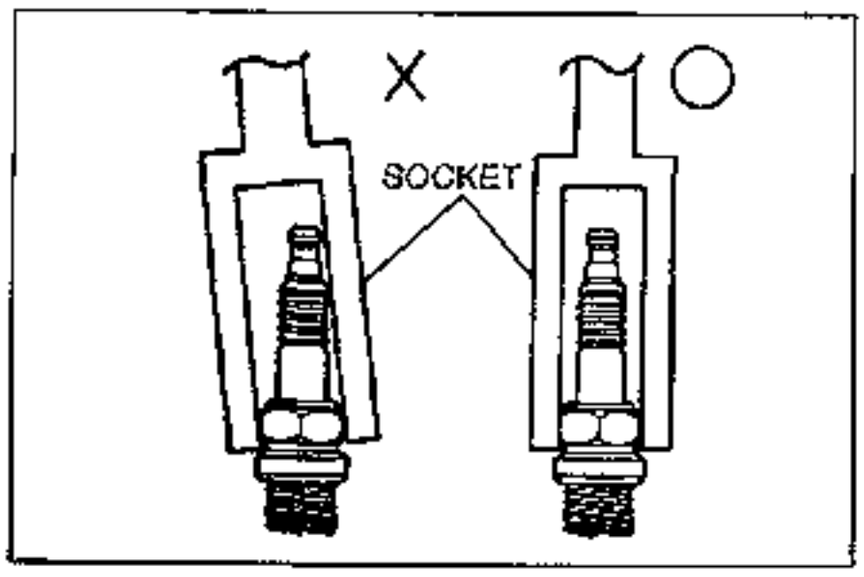
Inspection
1. Measure resistance of the high-tension leads.

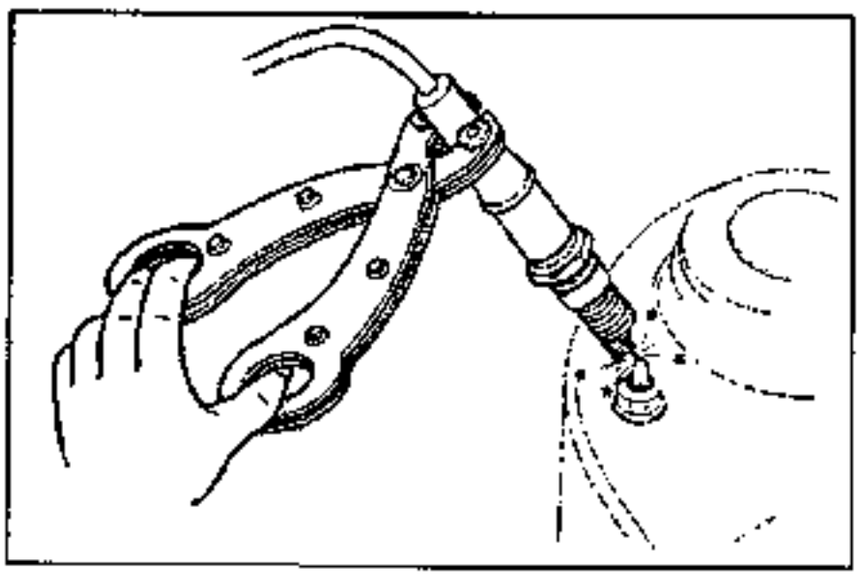
Specification: 16 kΩ per 1 m {3.28 ft} [at 20°C {68°F}]

2. If not as specified, replace the high-tension lead.









SPARK PLUG

Removal / Installation

1. Remove and install the high-tension leads carefully.

Caution
- **Pulling on the wire part of the spark plug lead may break it. To remove the lead, pull only on the boot.**

2. Remove and install the spark plug with a plug socket.

Caution
- **To avoid breaking the spark plug, be sure to fit the socket squarely over it.**

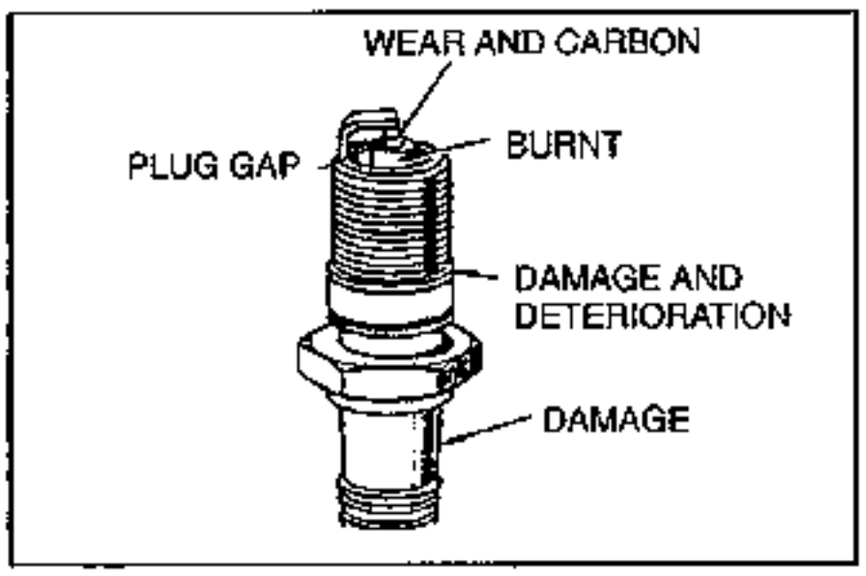
3. Apply anti-seize compound or molybdenum-based lubricant to the spark plug threads.
4. Tighten the spark plug to the specified torque.

Tightening torque:
15–22 N·m {1.5–2.3 kgf·m, 11–16 ft·lbf}

Spark Test

Warning
- **High voltage in the ignition device system can cause strong electrical shock. Avoid direct contact to the vehicle body during the following spark test.**

1. Remove the spark plug.
2. Connect the spark plug to a high-tension lead.
3. Hold the high-tension lead with insulated pliers **5–10 mm {0.20–0.39 in}** from a ground.
4. Crank the engine and verify that there is a strong blue spark. If not, replace the spark plug or high-tension lead as necessary.

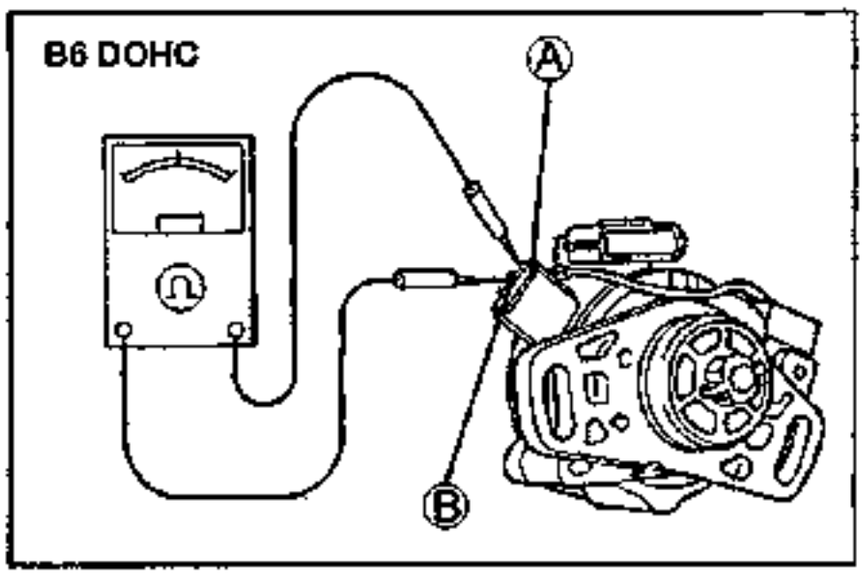


Inspection

Check the following points. If a problem is found, replace the spark plug.

- Damaged insulation
- Worn electrodes
- Carbon deposits
  If cleaning is necessary, use a plug cleaner or a wire brush. Clean the upper insulator also.
- Damaged gasket
- Burnt condition

Plug gap: 1.0–1.1 mm {0.040–0.043 in}



IGNITION COIL

Inspection

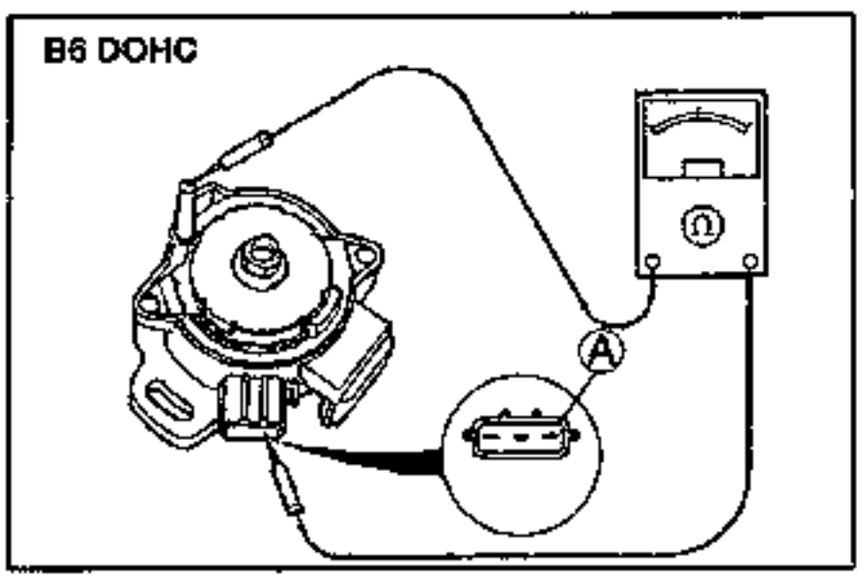
(B6 DOHC)

Primary coil winding

1. Disconnect the 3-pin connector from the distributor.
2. Use an ohmmeter and measure resistance of the primary coil winding.

   Specification: 0.49–0.73 Ω [at 20°C {68°F}]

3. If not within the specification, replace the distributor.



Secondary coil winding

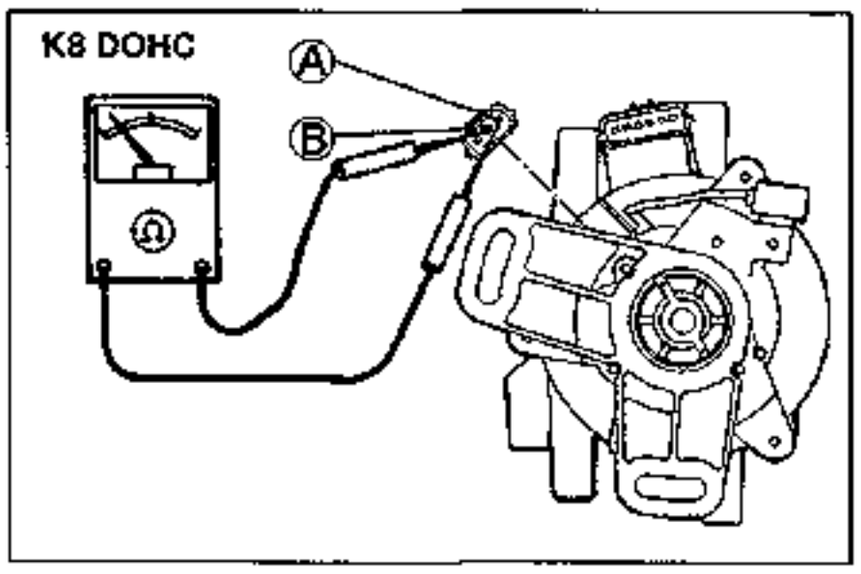
1. Disconnect the 3-pin connector from the distributor.
2. Remove the distributor cap.
3. Use an ohmmeter and measure resistance of the secondary coil winding.

   Specification: 20–31 kΩ [at 20°C {68°F}]

4. If not within the specification, replace the distributor.

Replacement

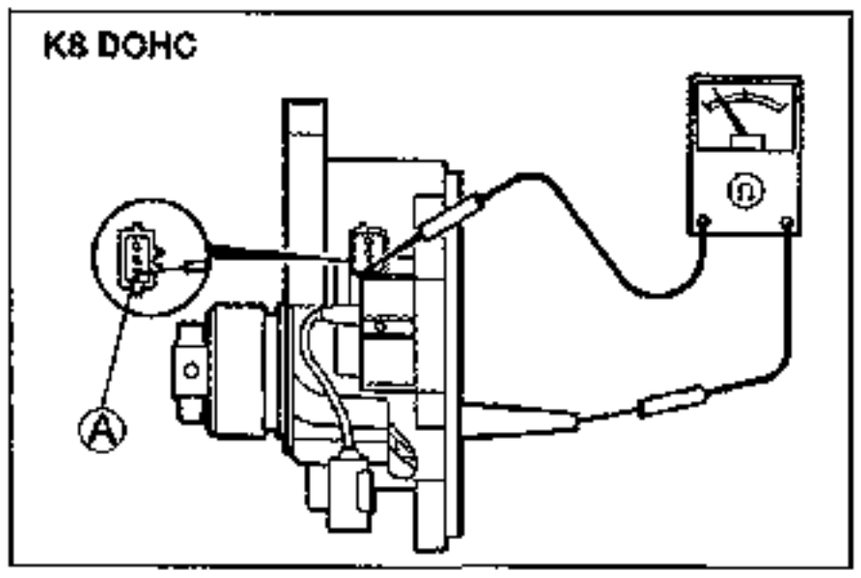
1. Replace the distributor. (Refer to page G–29.)
2. Adjust the ignition timing. (Refer to page G–24.)



(K8 DOHC)
Primary coil winding
1. Disconnect the 3-pin connector from the distributor.
2. Use an ohmmeter and measure resistance of the primary coil winding.

   Specification: 0.49–0.73 Ω [at 20°C {68°F}]

3. If not within the specification, replace the distributor.

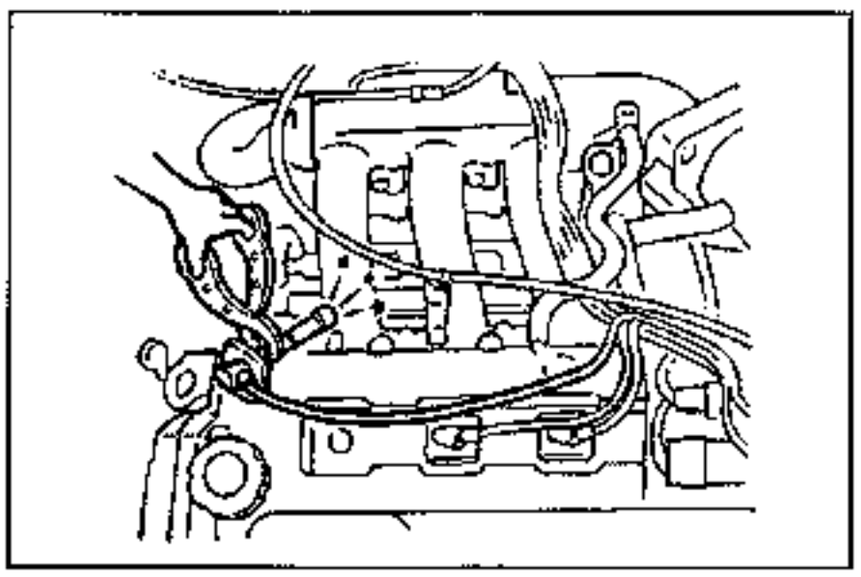


Secondary coil winding
1. Disconnect the 3-pin connector from the distributor.
2. Remove the distributor cap.
3. Use an ohmmeter and measure resistance of the secondary coil winding.

   Specification: 20–31 kΩ [at 20°C {68°F}]

4. If not within the specification, replace the distributor.

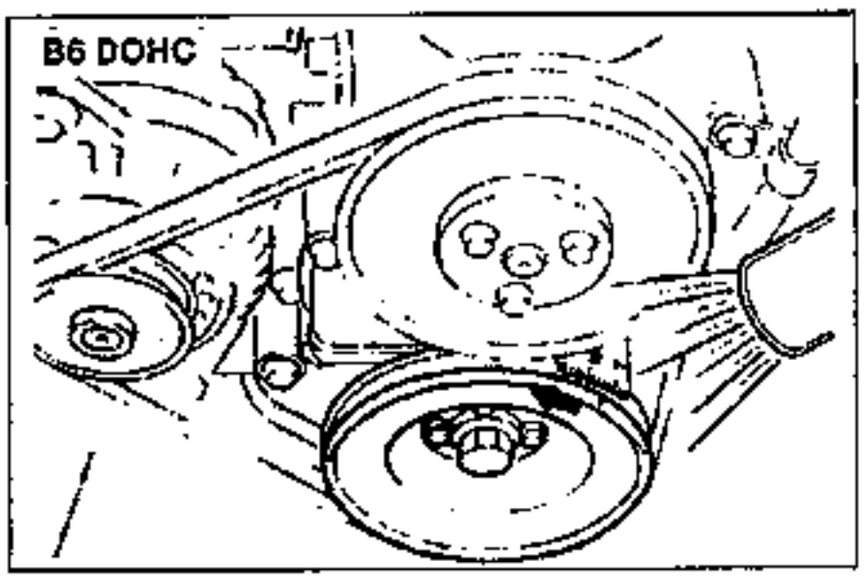
Replacement
1. Replace the distributor. (Refer to page G–29.)
2. Adjust the ignition timing. (Refer to page G–23.)

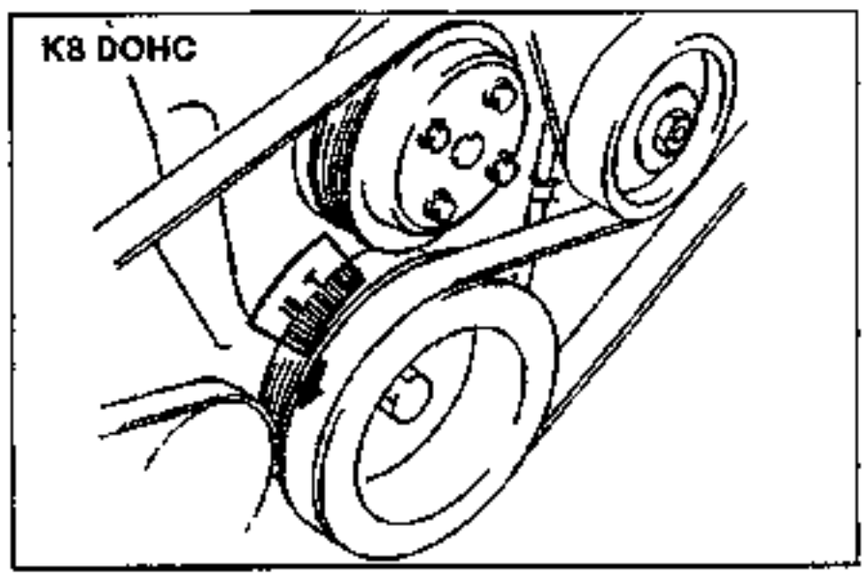


DISTRIBUTOR
Spark Test

Warning
- **High voltage in the ignition device system can cause strong electrical shock. Avoid direct contact to the vehicle body during the following spark test.**

1. Disconnect the high-tension lead from a spark plug.
2. Hold the lead with insulated pliers **5–10 mm {0.20–0.39 in}** from a ground.
3. Crank the engine and verify that a strong blue spark is visible.



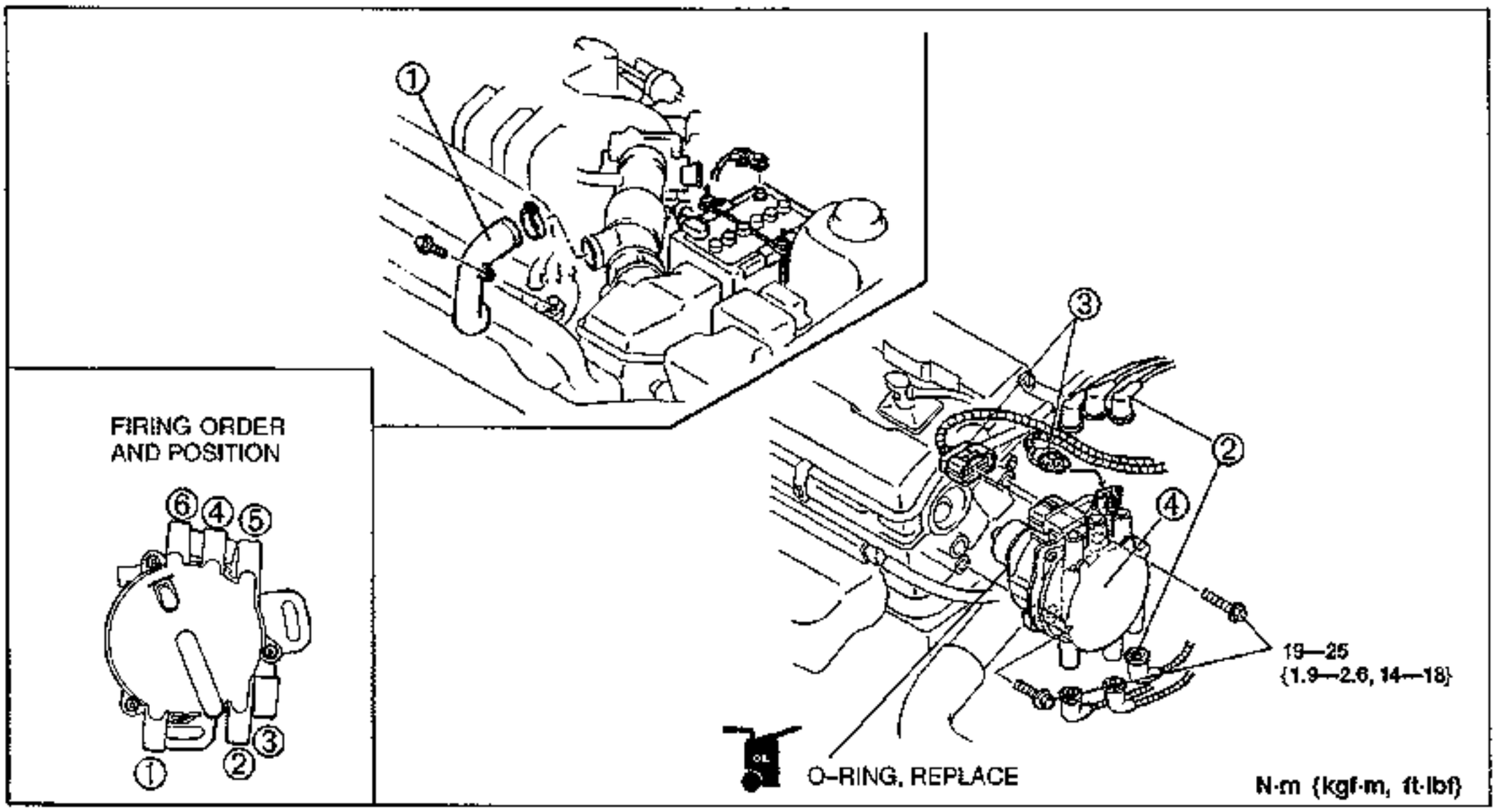


Electronic Spark Advance Inspection

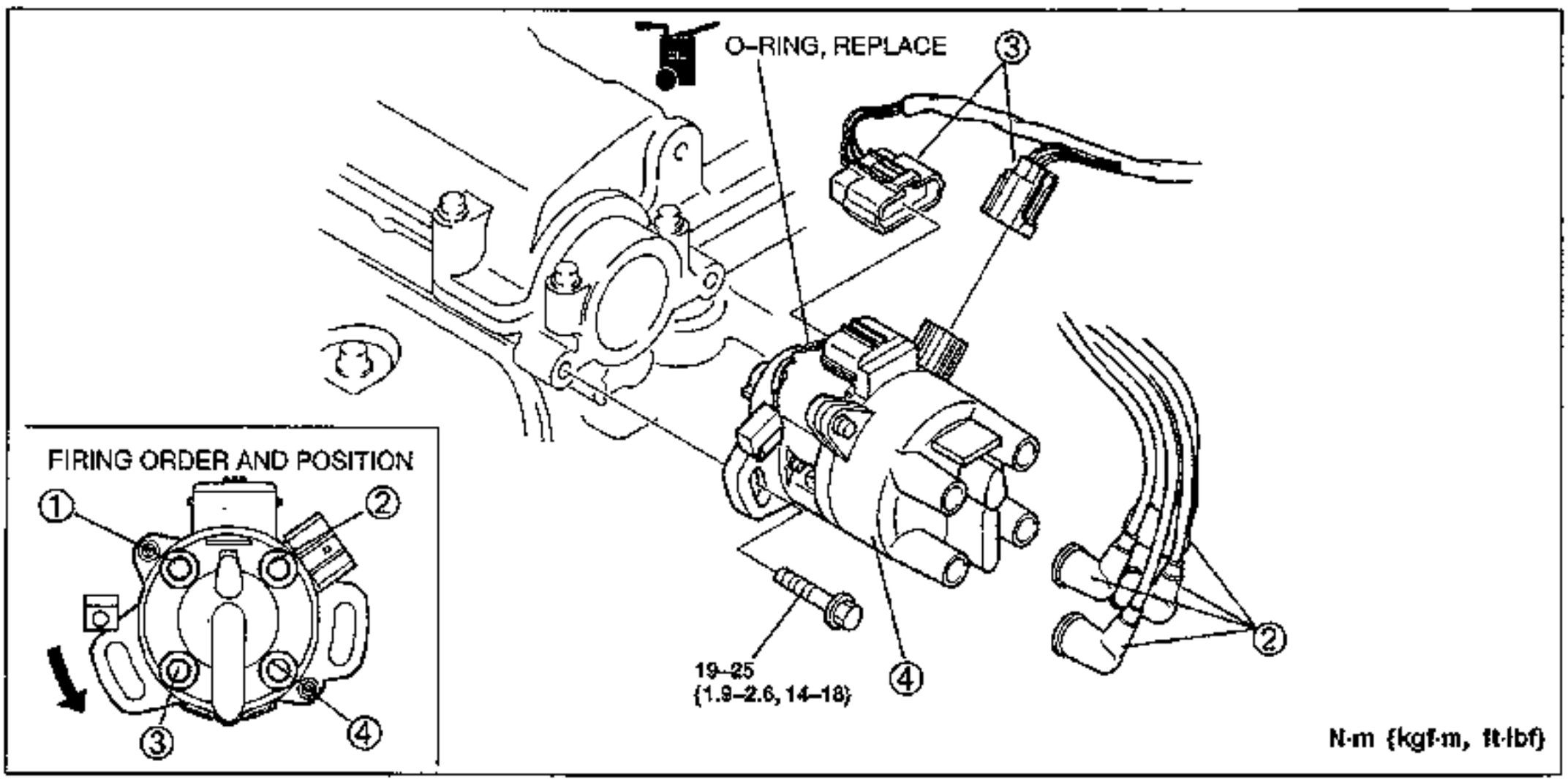
Verify that the ignition timing advances with engine acceleration.

Removal / Installation
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.
4. Adjust the ignition timing. (Refer to page G-23.)

K8 DOHC



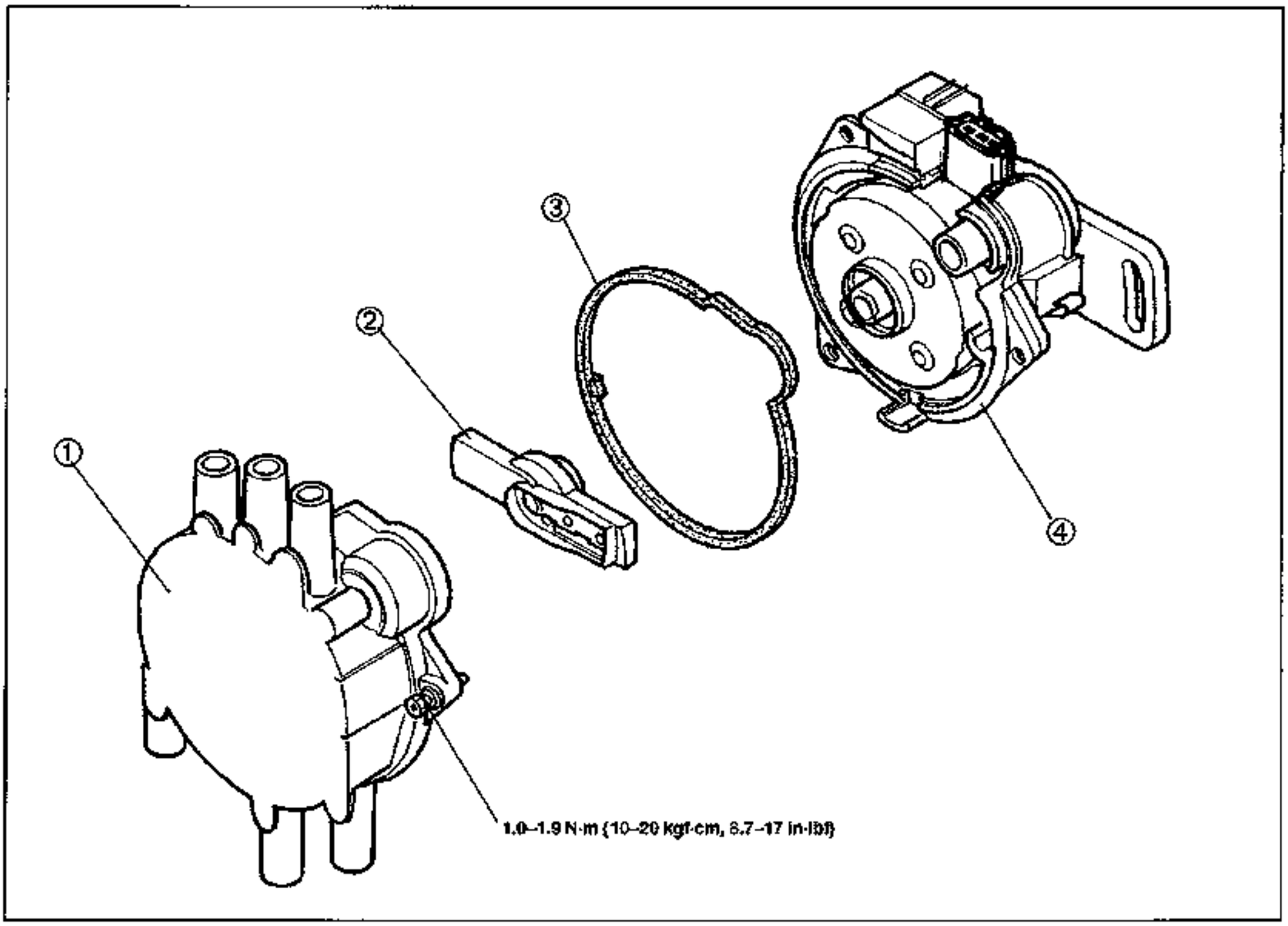
B6 DOHC



1. Resonance duct (K8)
2. High-tension lead
   Inspection ..... page G–24
3. Connector
4. Distributor
   Disassembly / Assembly ..... page G–30
   Inspection ..... page G–31

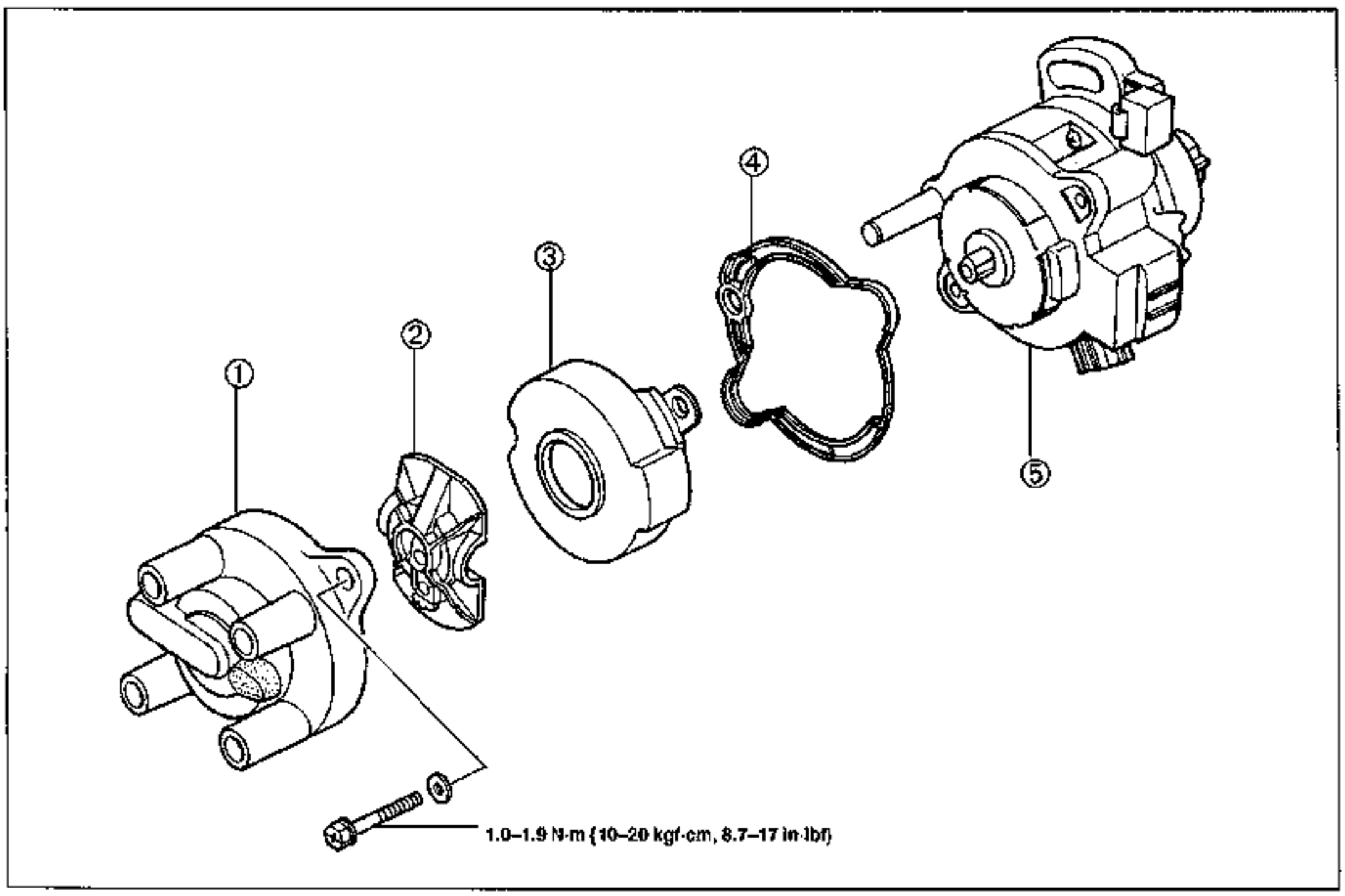
Disassembly / Assembly
1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.

K8 DOHC

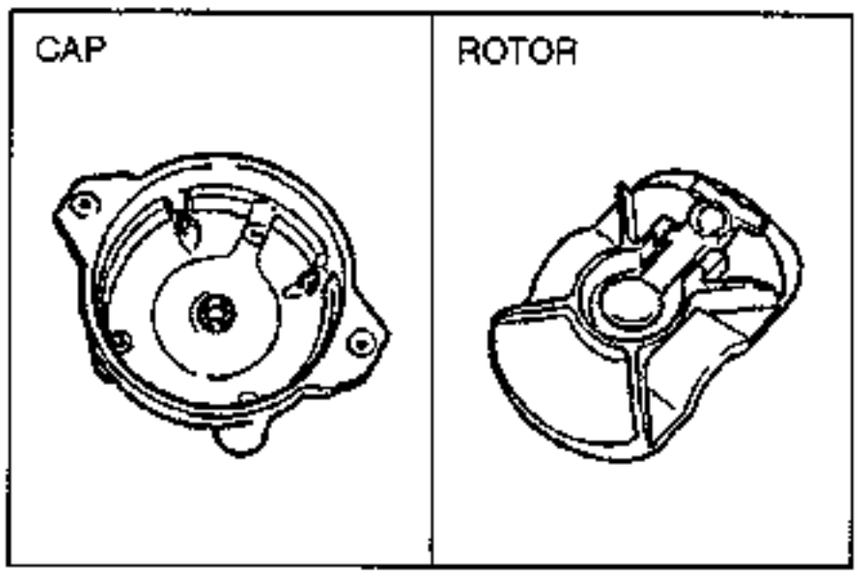


1. Cap
   Inspection ..... page G–31
2. Rotor
   Inspection ..... page G–31
3. Packing
4. Distributor

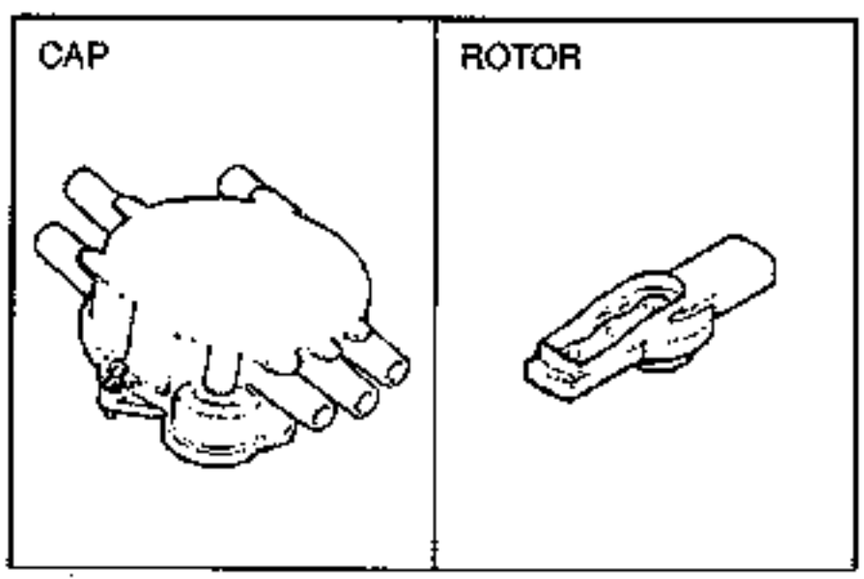
B6 DOHC



1. Cap
   Inspection ..... below
2. Rotor
   Inspection ..... below
3. Cover
4. Packing
5. Distributor



Inspection
Cap and rotor
B6 DOHC
1. Check for corrosion, damage, and cracks.
2. Replace if necessary.



K8 DOHC
1. Check for corrosion, damage, and cracks.
2. Replace if necessary.

IGNITION CONTROL MODULE

Inspection

1. Check the PCM or ECM. (Refer to sections F1, F2.)
2. Check the condition of the connector, distributor, ignition coil, and high-tension leads.
3. If all are normal but misfire still occurs, replace the distributor.

Replacement

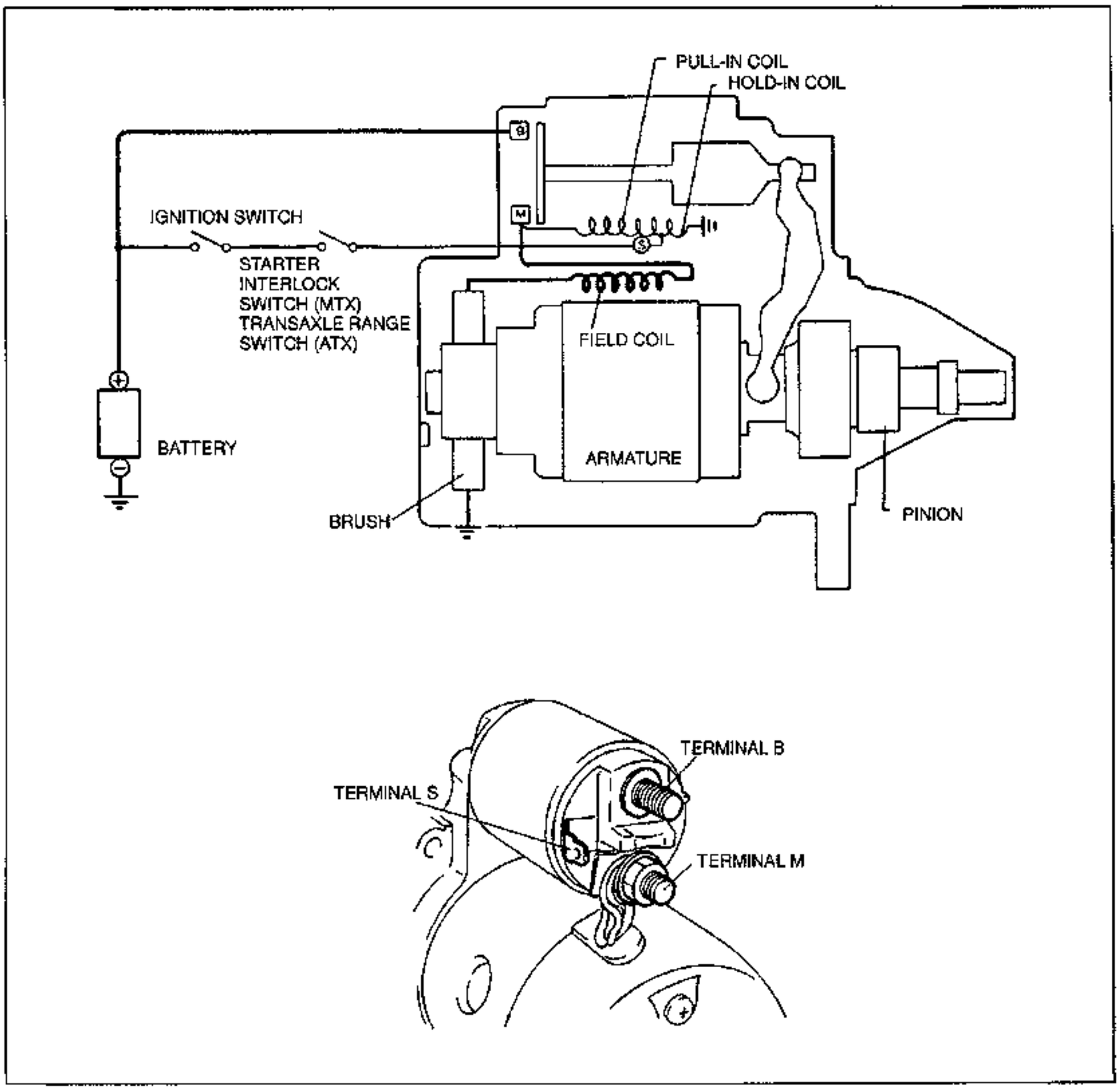
1. Replace the distributor. (Refer to page G–29.)
2. Adjust the ignition timing. (Refer to page G–23.)

STARTING SYSTEM

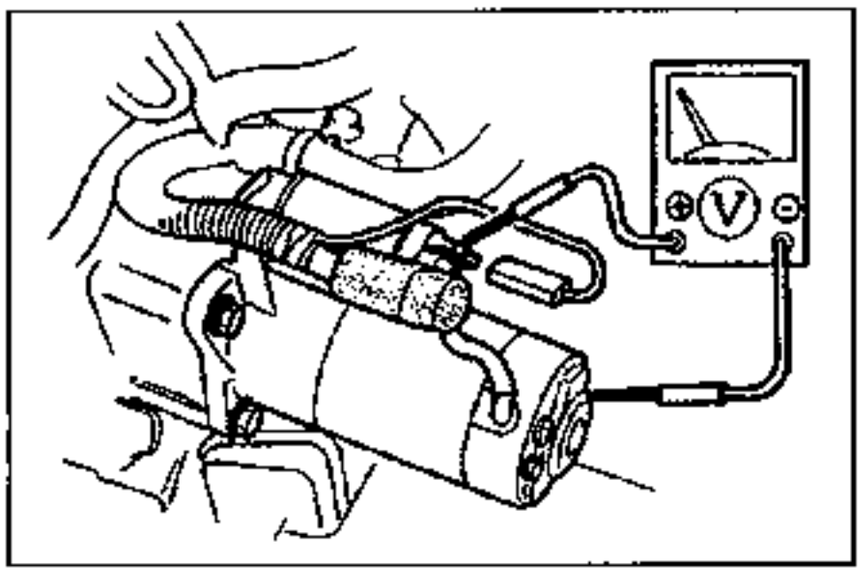
PREPARATION
SST

49 E301 144 Removing plate		For installation of overrunning clutch

CIRCUIT DIAGRAM



Note
- K8 DOHC uses a reduction starter.



STARTER

Inspection (On-vehicle)

1. Measure the battery positive voltage.

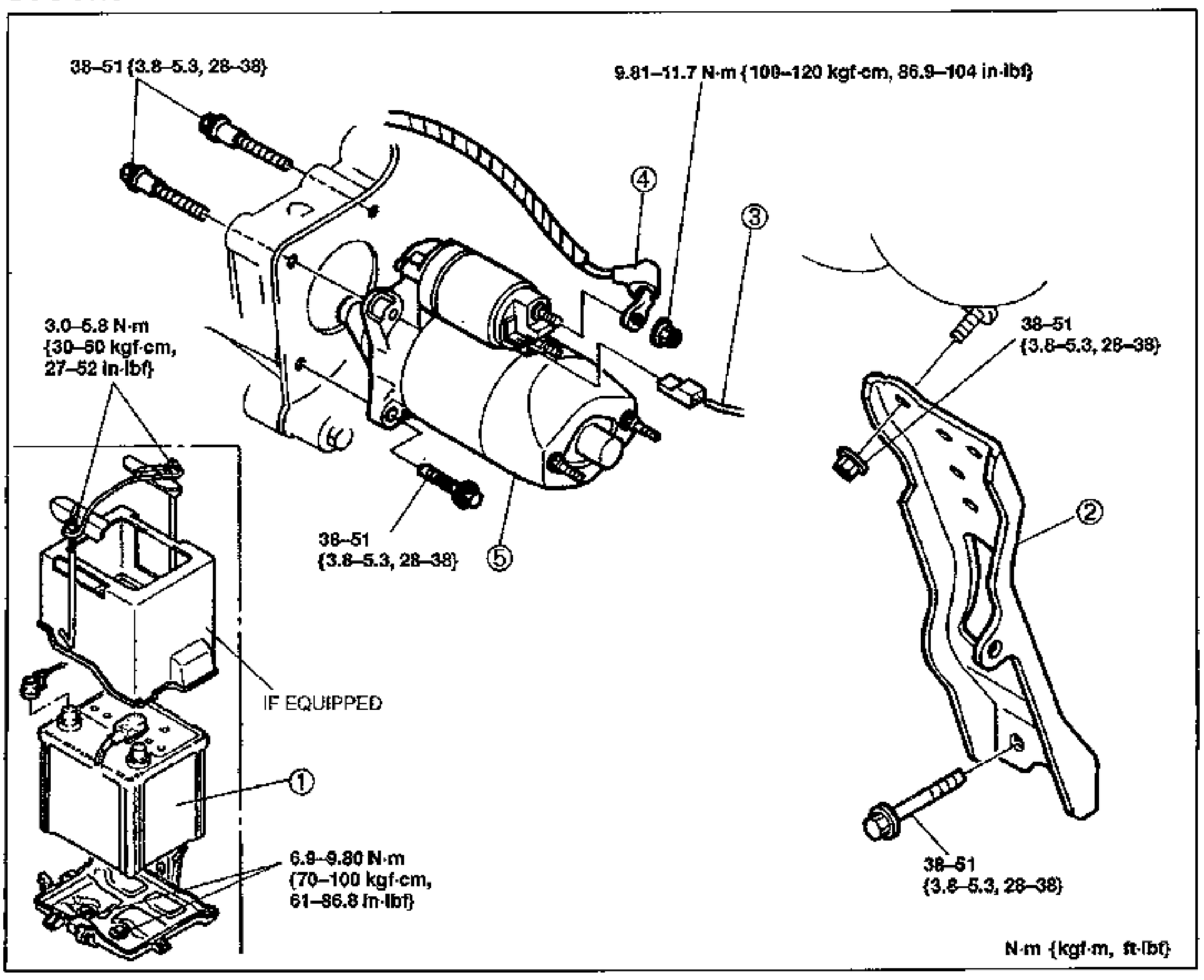
   Specification: Above 12.4V

2. Crank the engine, and verify that the starter turns smoothly.
3. If the starter does not turn, check the voltage of terminal S.
4. If the voltage is more than 8V, remove and inspect the starter. If the voltage is less than 8V, check the wiring harness, ignition switch, starter interlock switch (MTX) and transaxle range switch (ATX).

Removal / Installation

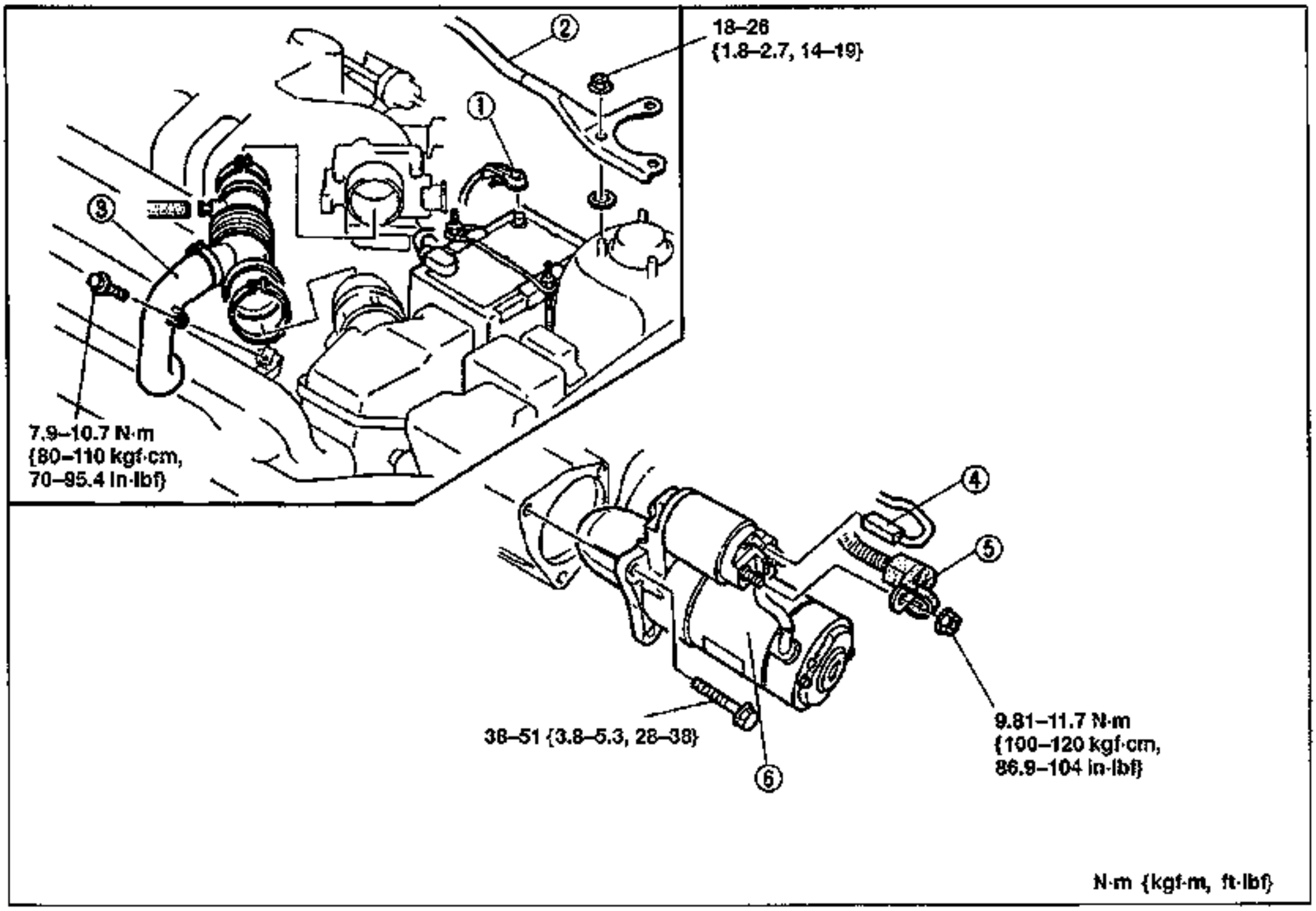
1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal.

B6 DOHC



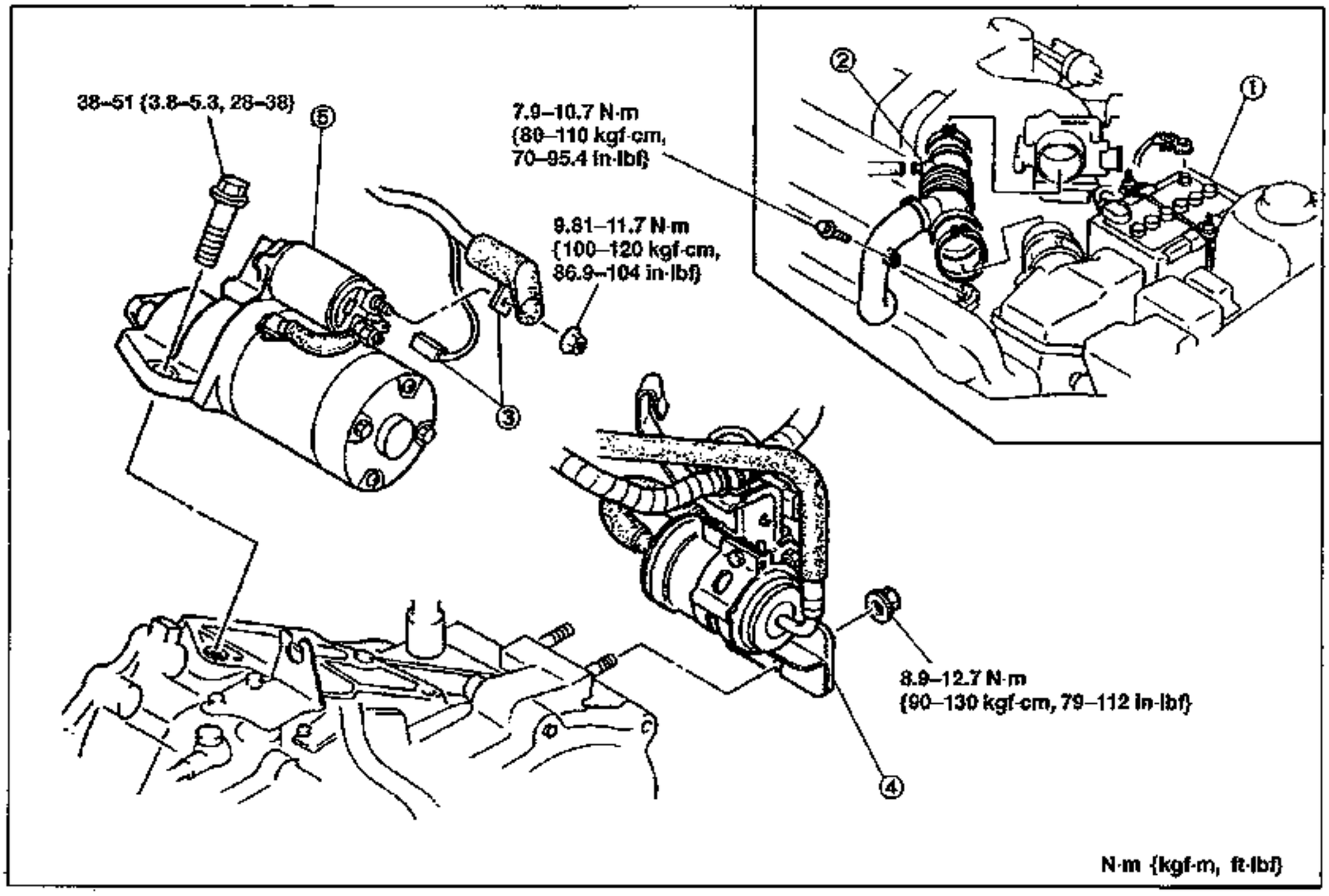
1. Battery
2. Intake manifold bracket
3. Terminal S wire
4. Terminal B wire
5. Starter
   Disassembly / Assembly ..... page G–39
   Inspection ..... page G–40

K8 DOHC (MTX)

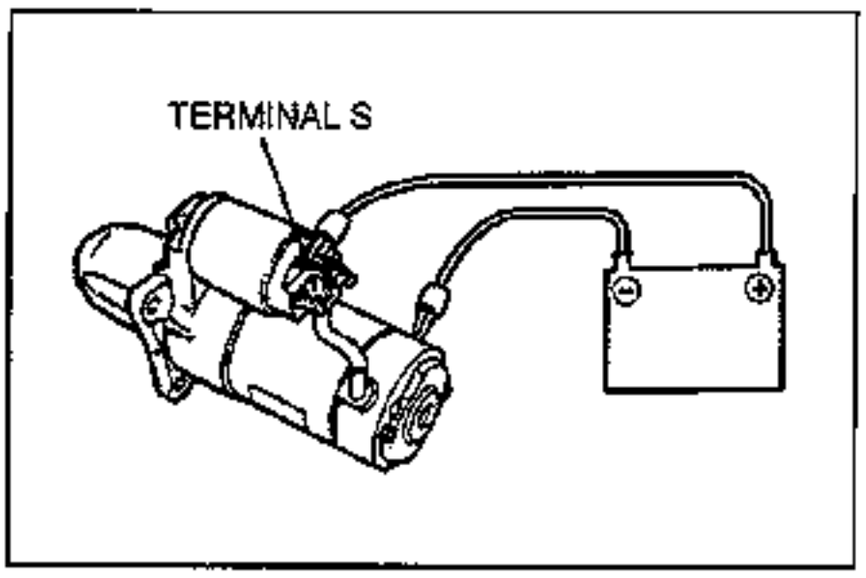


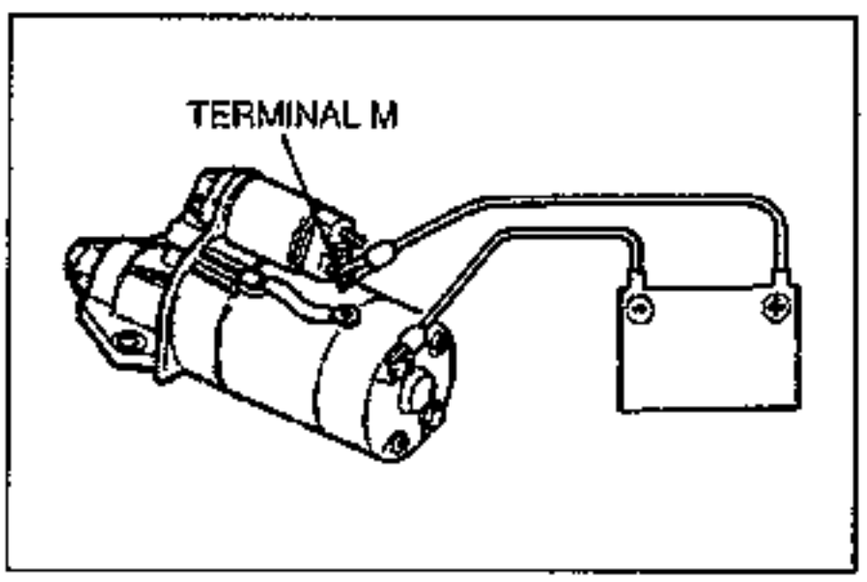
1. Negative battery cable
2. Strat bar
3. Intake air hose
4. Terminal S wire
5. Terminal B wire
6. Starter
   Disassembly / Assembly ..... page G–37
   Inspection ..... page G–40

(ATX)



1. Negative battery cable
2. Intake air hose
3. Terminal S and B wire
4. Fuel filter (High pressure side)
5. Starter
   Disassembly / Assembly ..... page G–38
   Inspection ..... page G–40



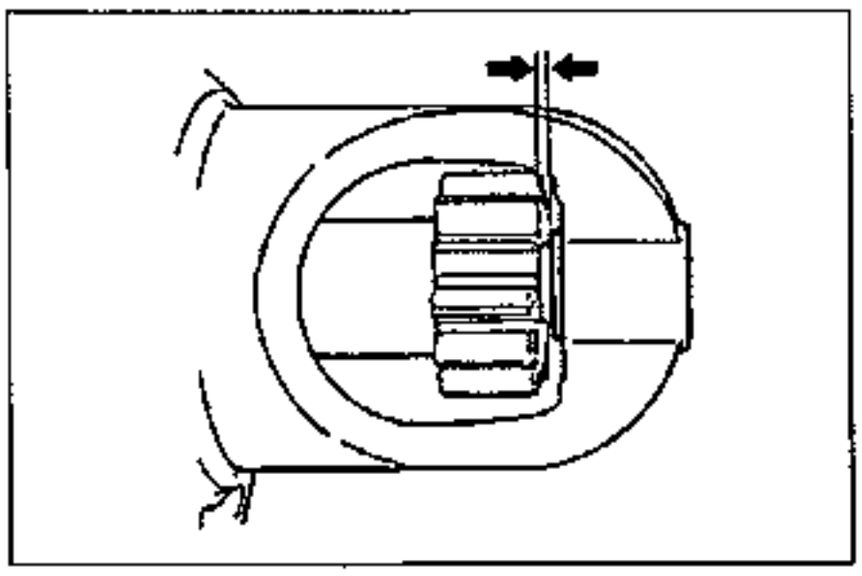


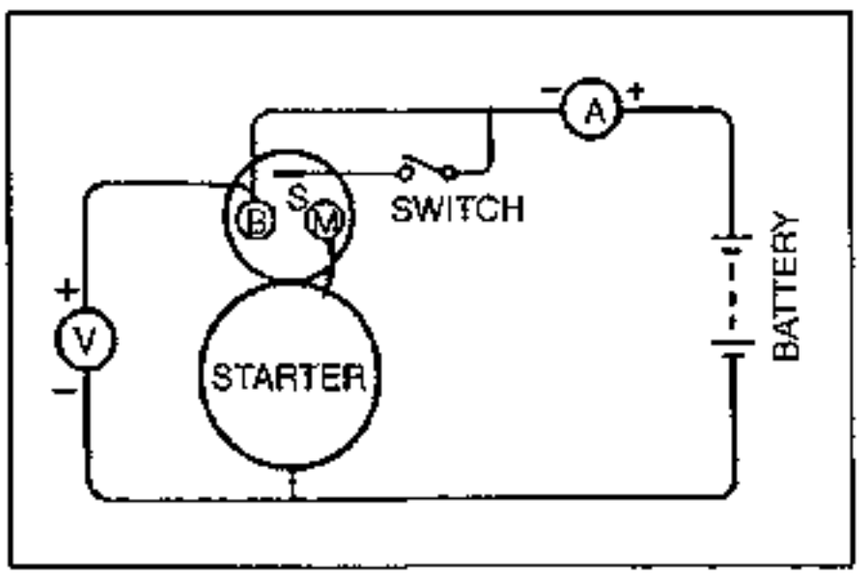
Performance Inspection
Magnetic switch
Disconnect the terminal S wire, and perform the following tests.

Pull-in test
Connect battery positive voltage as shown and verify that the pinion is ejected.

Caution
- **Applying power continuously for more than 10 seconds will damage the starter.**

Hold-in test
After completing the pull-in test, disconnect the wire from terminal M (with the pinion left ejected) and verify that the pinion does not return.





Adjustment of pinion gap

1. Disconnect the wiring from terminal M.
2. When the battery is connected between terminal S and the starter body, the pinion will be ejected and then stop. Measure the clearance (pinion gap) between the pinion and the stopper.

Caution

- **Applying power continuously for more than 10 seconds will damage the starter.**

Pinion gap: 0.5–2.0 mm {0.020–0.078 in}

3. If the pinion gap is not within the specification, make adjustment by increasing or decreasing the number of washers between the magnetic switch and the drive housing. (The gap becomes smaller as the number of washers is increased.)

No load test

1. Connect the circuit as shown.
2. Measure voltage, current, and speed as shown.

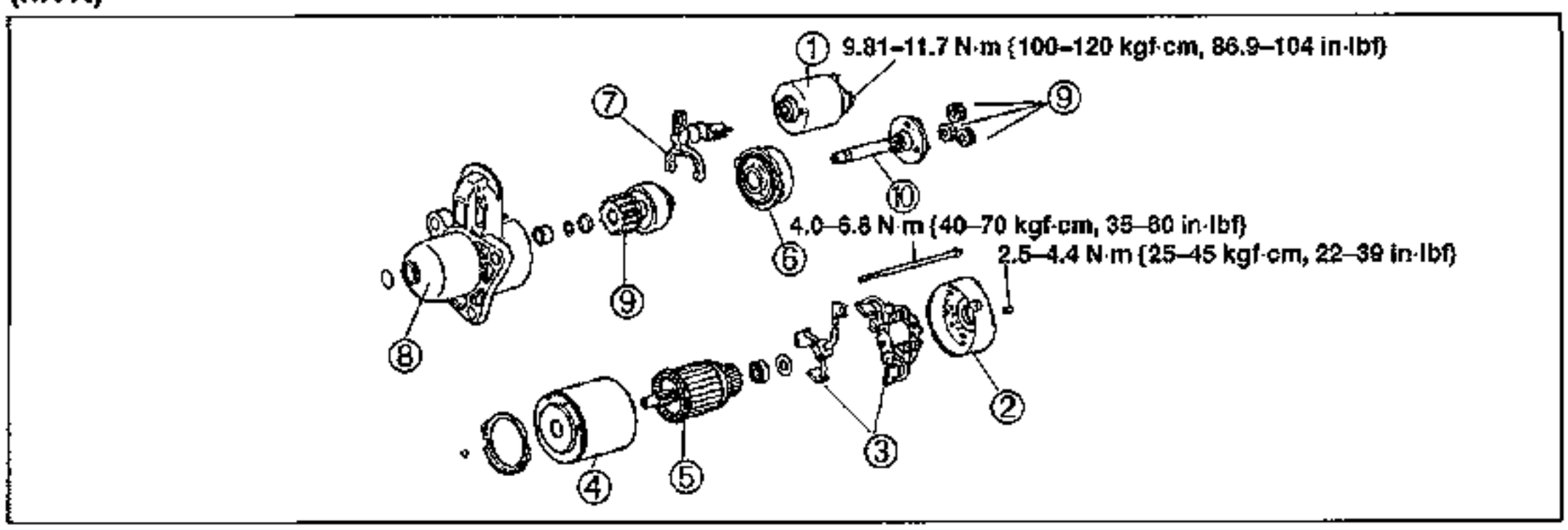
	B6 DOHC	K8 DOHC (MTX)	K8 DOHC (ATX)
Voltage(V)	11	11	11
Current (A)	below 50	below 90	below 70
Speed (rpm)	5000 or higher	3000 or higher 2900 or higher *1	2000 or higher 2200 or higher *1

*1: cold area

Disassembly / Assembly

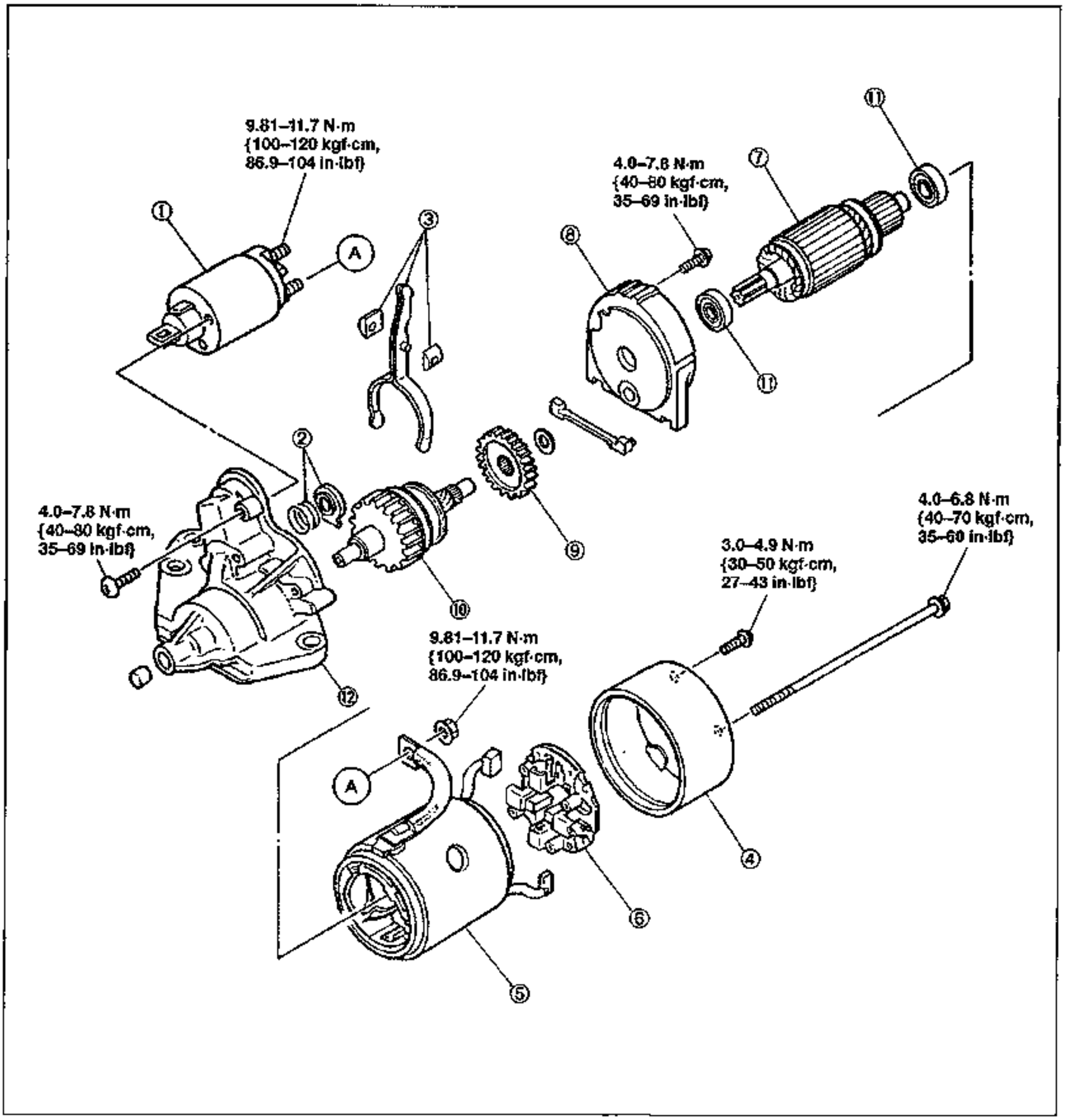
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.

K8 DOHC (MTX)



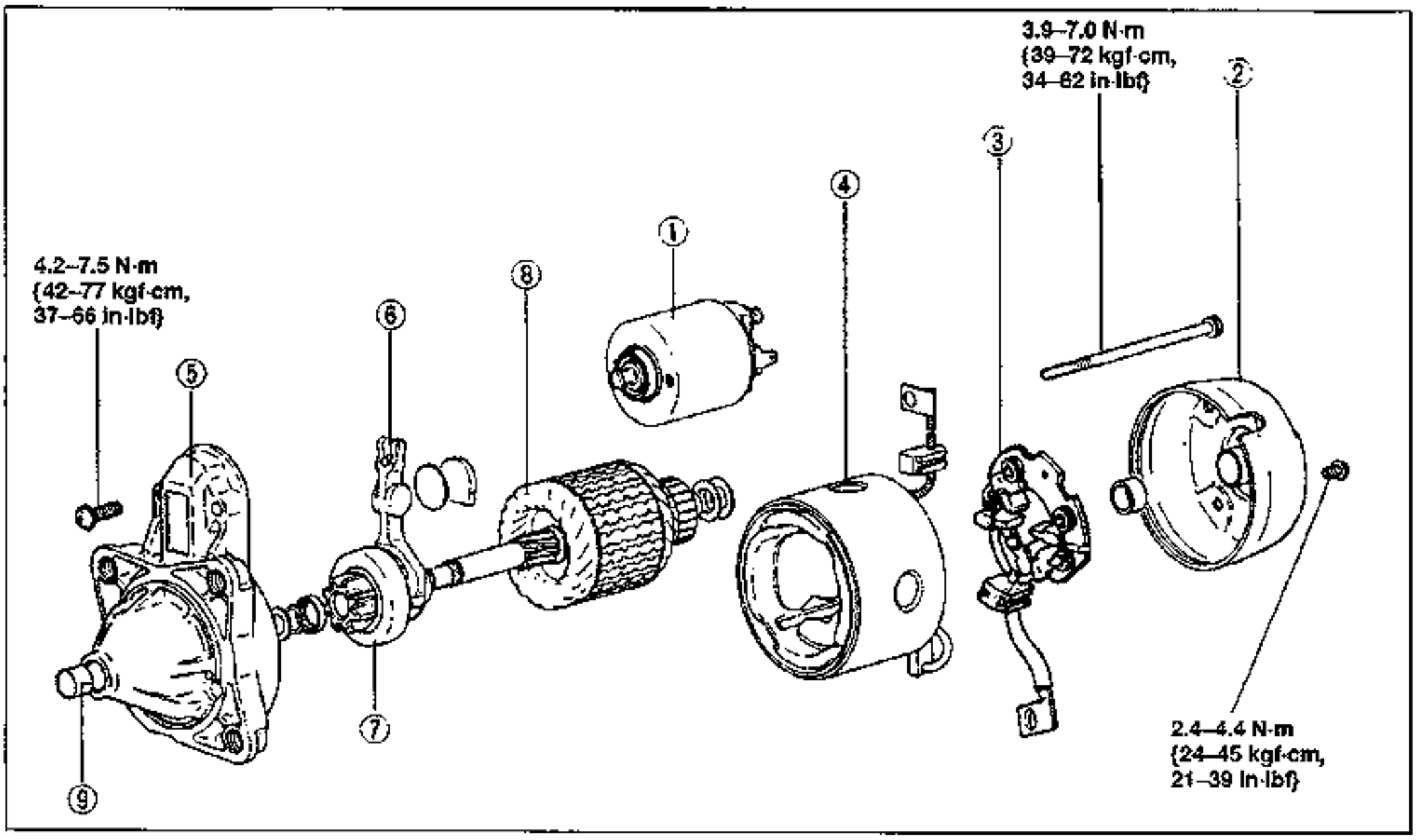
1. Magnetic switch
   Inspection ..... page G–40
2. Rear bracket
3. Brush holder assembly
   Inspection ..... page G–40
4. Yoke
   Inspection ..... page G–41
5. Armature
   Inspection ..... page G–41
6. Internal gear
7. Lever
8. Front bracket
9. Pinion gear and planetary gears
   Disassembly Note ..... page G–39
   Assembly Note ..... page G–39
   Inspection ..... page G–42
10. Shaft

(ATX)

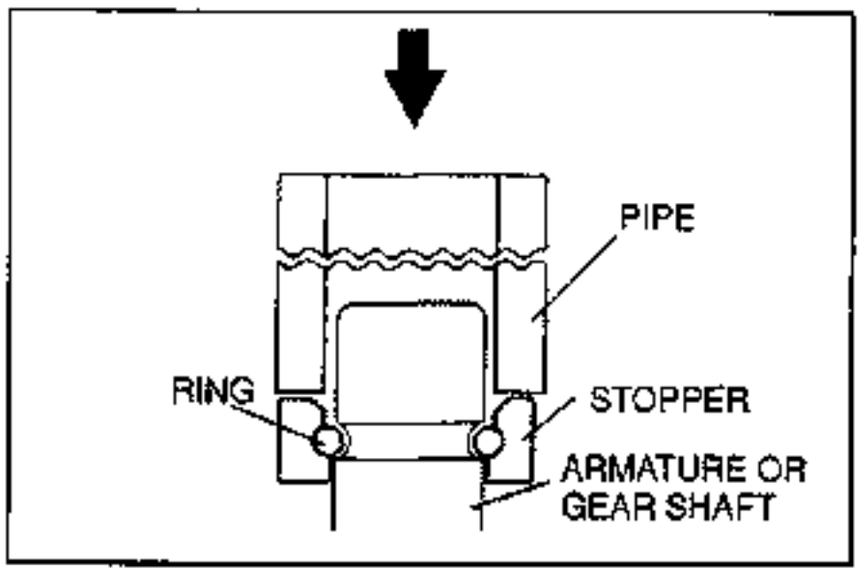


1. Magnetic switch
   Inspection ..... page G–40
2. Washer
3. Lever
4. Rear bracket
5. Yoke
   Inspection ..... page G–41
6. Brush holder assembly
   Inspection ..... page G–40
7. Armature
   Inspection ..... page G–41
8. Center bracket
9. Internal gear
10. Pinion shaft assembly (overrunning clutch)
    Disassembly Note ..... page G–39
    Assembly Note ..... page G–39
    Inspection ..... page G–42
11. Bearing
12. Front bracket

B6 DOHC

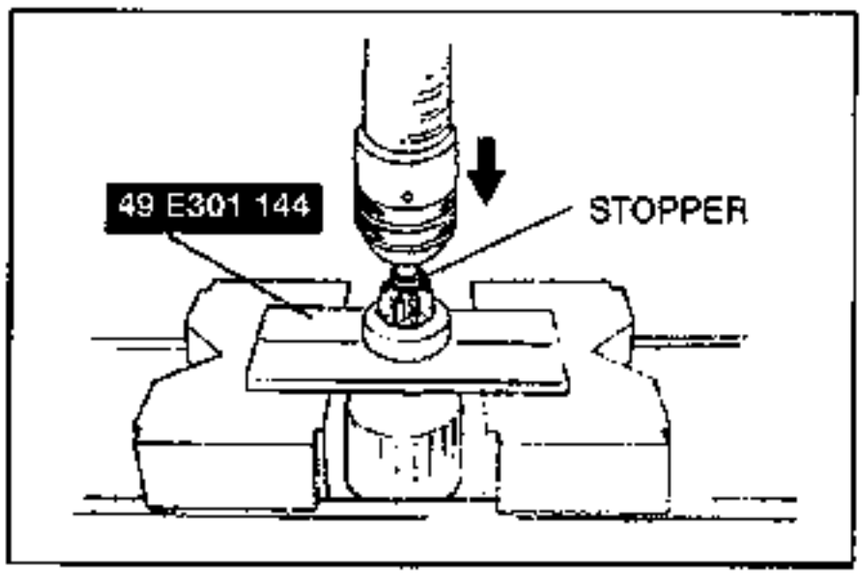


1. Magnetic switch
   Inspection ..... page G–40
2. Rear bracket
3. Brush holder assembly
   Inspection ..... page G–40
4. Yoke
   Inspection ..... page G–41
5. Front bracket
6. Lever
7. Drive pinion
   Disassembly Note ..... below
   Assembly Note ..... below
8. Armature
   Inspection ..... page G–41
9. Bearing (if equipped)



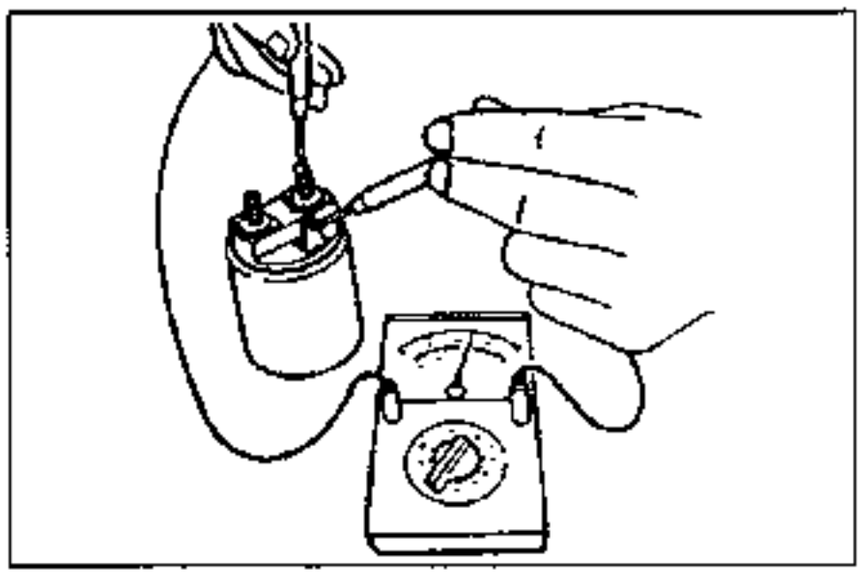
Disassembly Note
Drive pinion

Remove the stopper for the overrunning clutch with a pipe as shown in the figure.

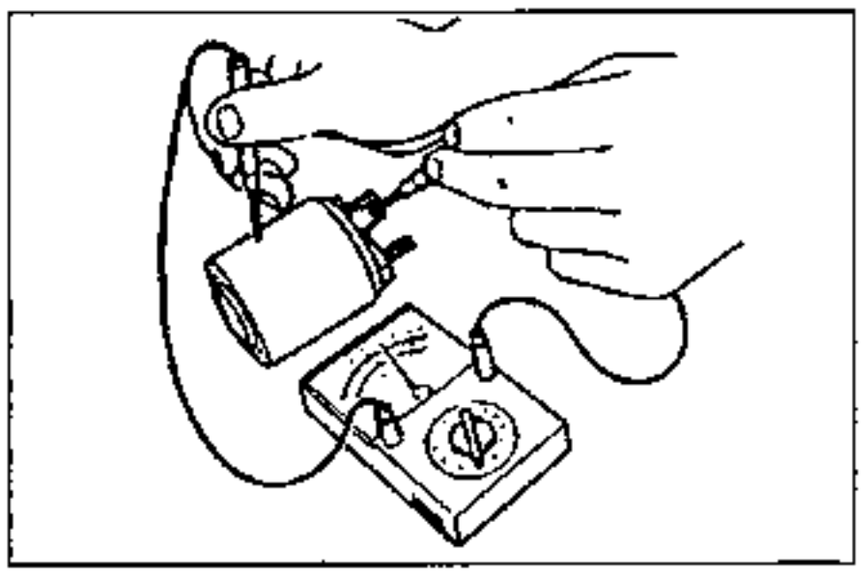


Assembly Note
Drive pinion

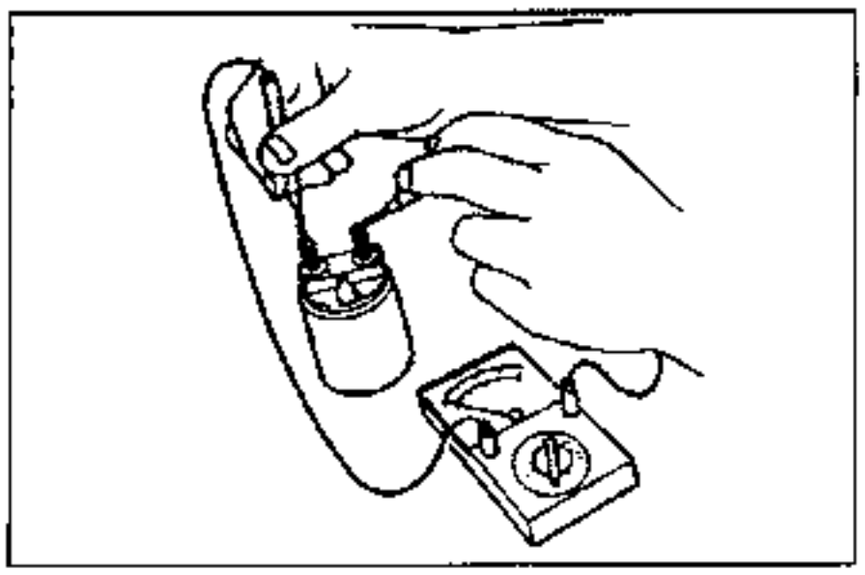
1. Set the drive pinion onto the armature (B6 DOHC) or gear shaft (K8 DOHC MTX), and install the ring.
2. Install the stopper with the **SST** and press as shown in the figure.



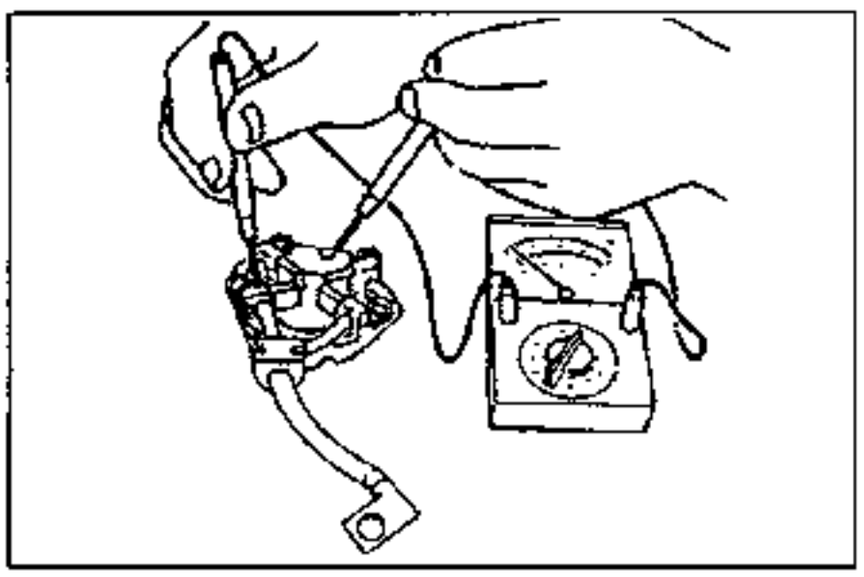
Inspection
Magnetic switch
1. Continuity (Terminal S–Terminal M)
   Check for continuity between terminals S and M.
   Replace the magnetic switch it there is no continuity.



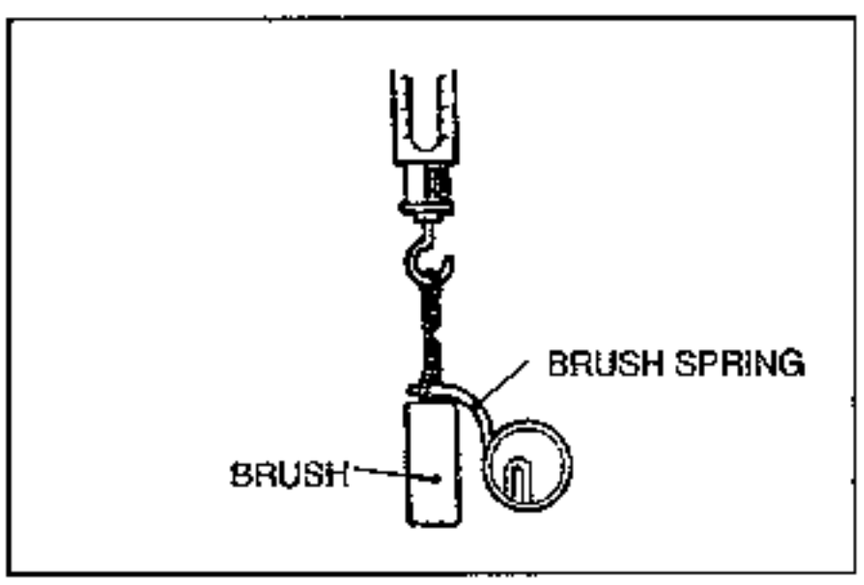
2. Continuity (Terminal S–Body)
   Check for continuity between terminal S and the body.
   Replace the magnetic switch if there is no continuity.



3. Grounding
   Check continuity between terminals M and B. Replace the magnetic switch if there is continuity.



Brush and brush holder
1. Check continuity between each insulated brush and the plate. Replace the brush holder if there is continuity.

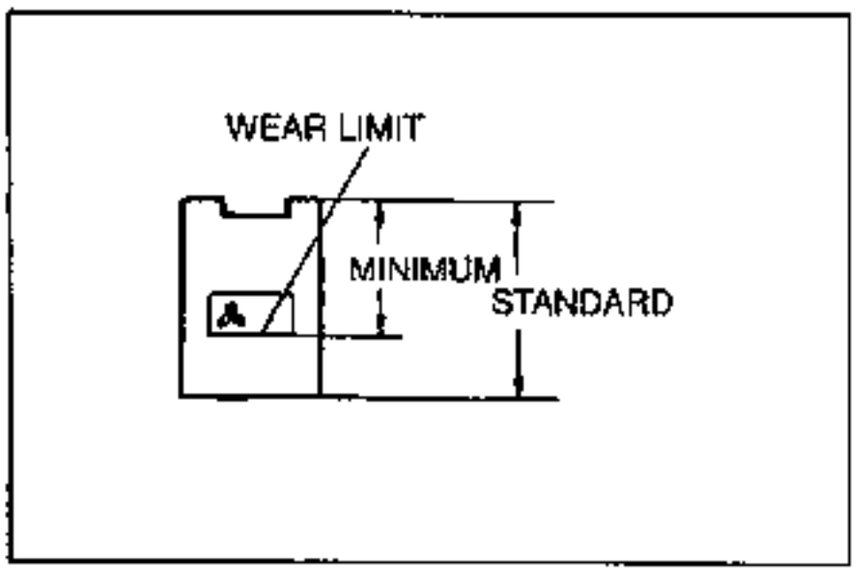


2. Measure the brush spring force with a spring balance.

Type	B6 DOHC	K8 DOHC	
		MTX	ATX
Standard N {kgf, lbf}	18.6 {1.89, 4.16}	20.6 {2.10, 4.62} 19.6 {2.00, 4.40}*1	19.2 {1.95, 4.29}
Minimum N {kgf, lbf}	11.8 {1.20, 2.64}	6.86 {0.70, 1.54} 9.32 {0.95, 2.09}*1	8.83 {0.90, 1.98}

*1: Cold area

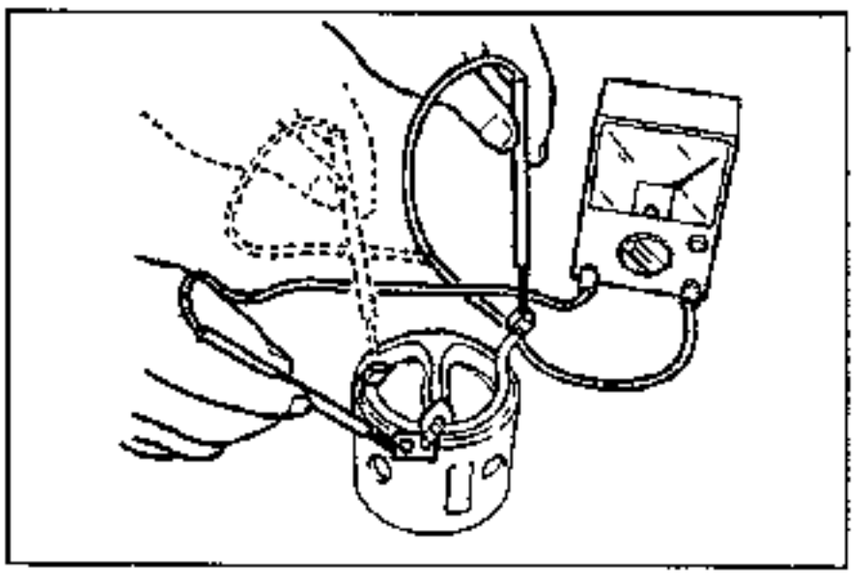
3. Replace the spring if not as specified.



Brush

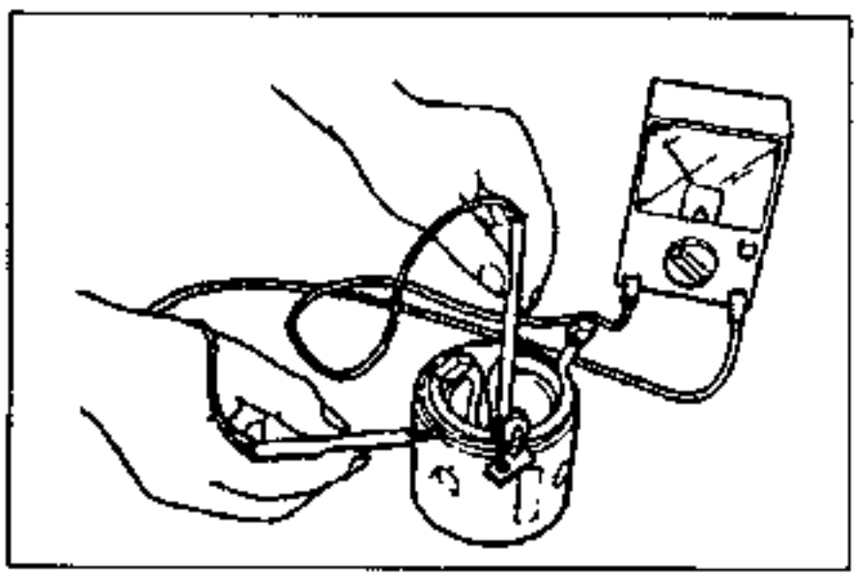
If a brush is worn almost to or beyond the wear limit, replace all the brushes.

Type	B6 DOHC	K8 DOHC	
		MTX	ATX
Standard mm {in}	16 {0.7}	17.5{0.69}	17.0{0.67}
Minimum mm {in}	10 {0.4}	12 {0.5}	11.5 {0.46}

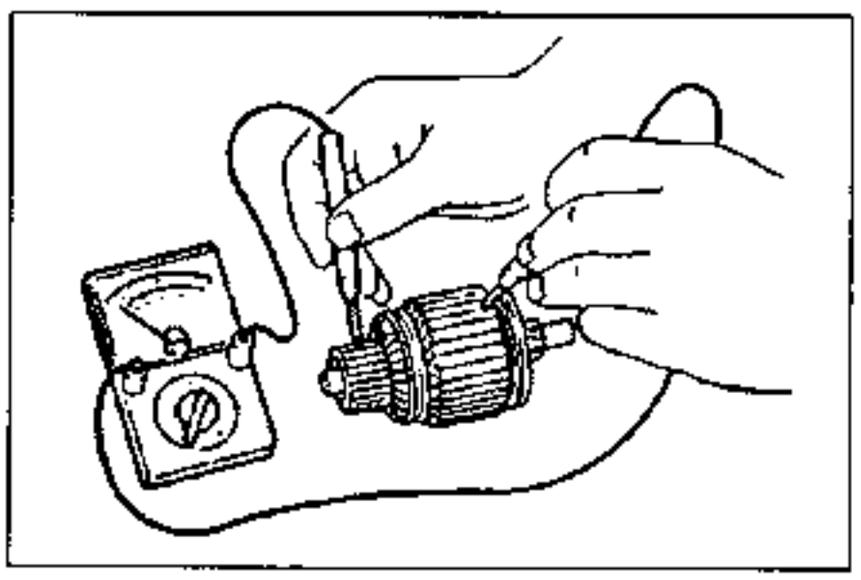


Yoke

1. Check for continuity between terminal M wire and brushes. Replace the yoke assembly if there is no continuity.

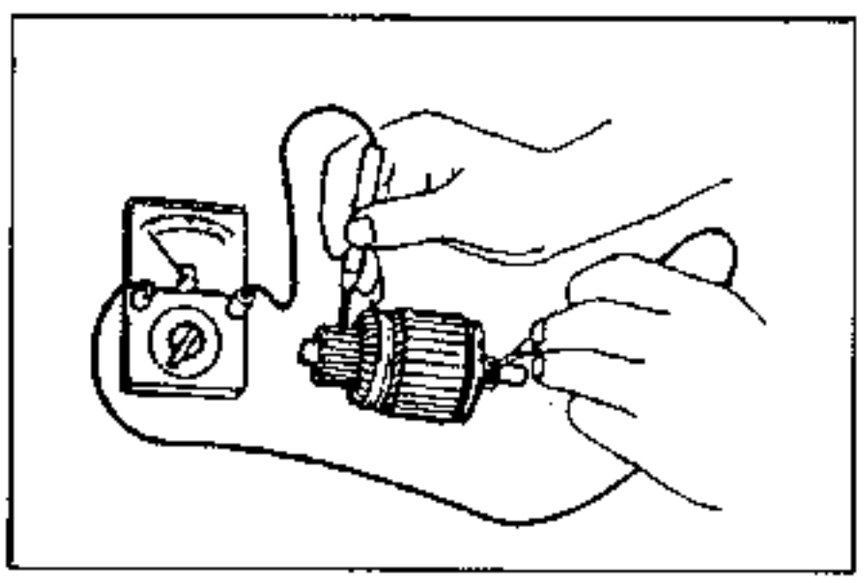


2. Check continuity between terminal M wire and yoke. Replace the yoke assembly if there is continuity.
3. Check if the field coil is loose. Replace the yoke assembly if it is.

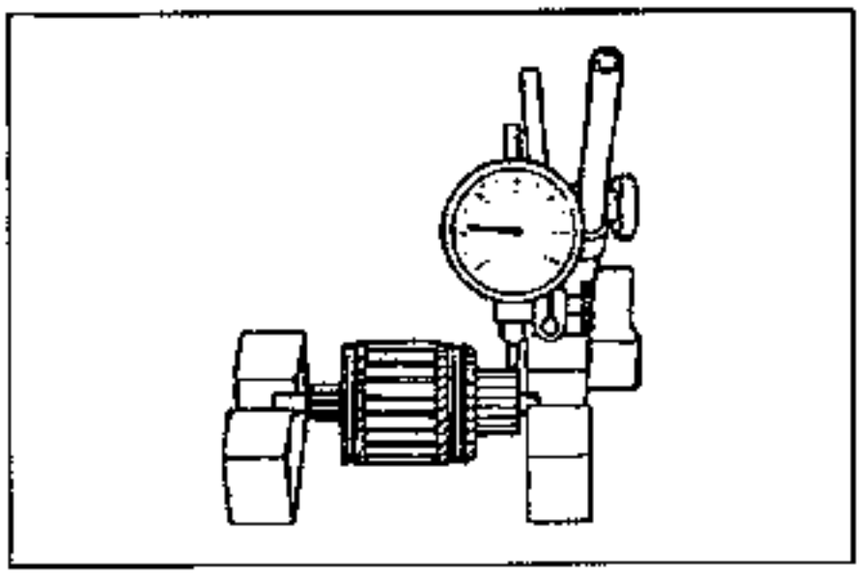


Armature

1. Check continuity between the commutator and the core. Replace the armature it there is continuity.

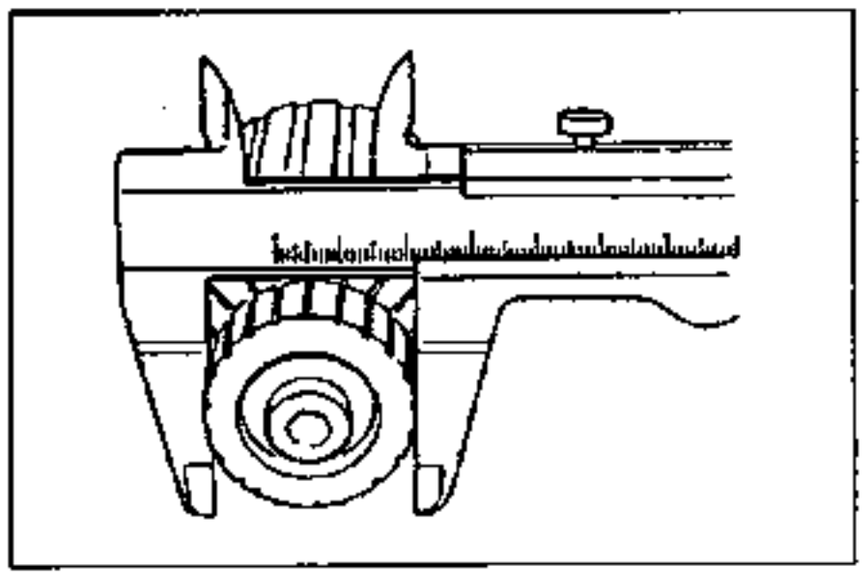


2. Check continuity between the commutator and the shaft. Replace the armature if there is continuity.



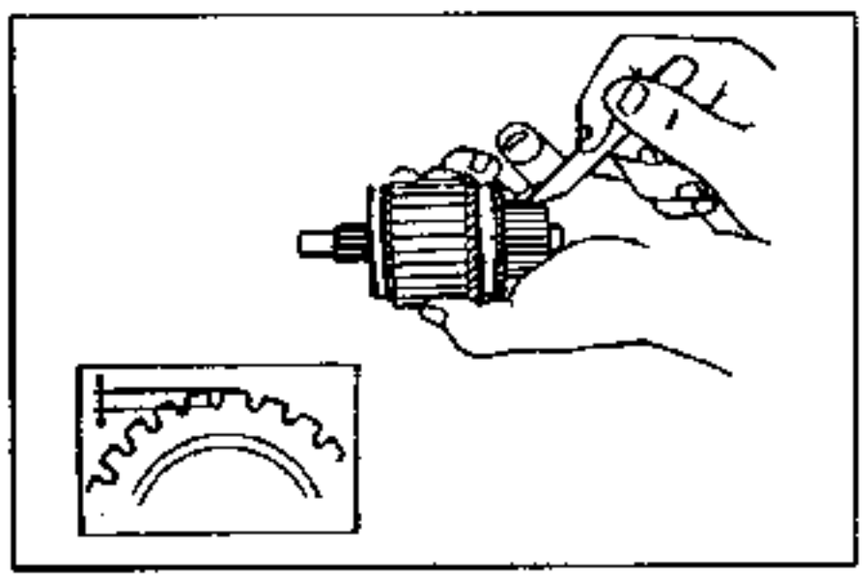
3. Place the armature on V-blocks, and measure the runout with a dial indicator.
   If the runout exceeds the maximum, repair it with a lathe or replace the armature.

   Runout: 0.05 mm {0.002 in}
   Maximum: 0.1 mm {0.004 in} (K8–DOHC)
   0.4 mm {0.015 in} (B6–DOHC)



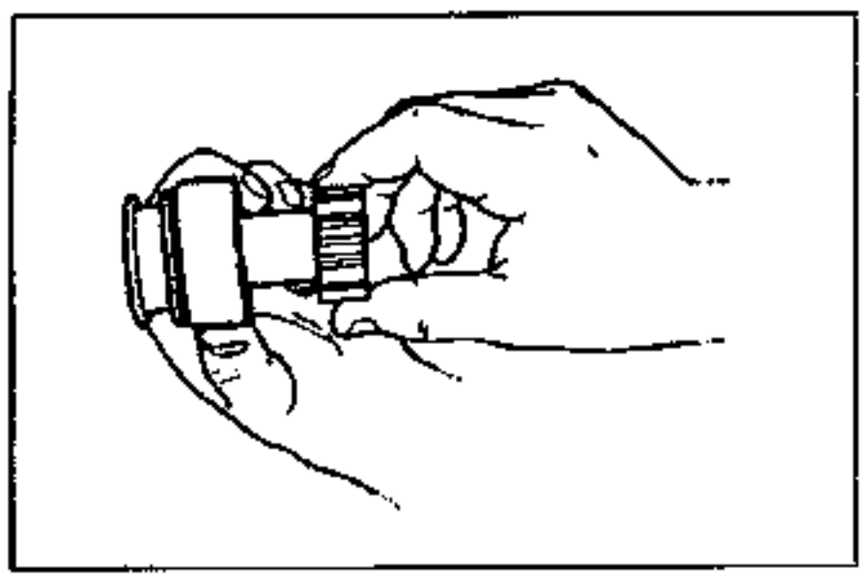
4. Replace the armature if the outer diameter of the commutator is almost at or less than the minimum.
5. If the commutator surface is dirty, wipe it with a cloth; if it is rough, repair it with a lathe or fine sandpaper.

Type	B6 DOHC	K8 DOHC (MTX)	K8 DOHC (ATX)
Minimum diameter mm {in}	27.0 {1.07}	28.8 {1.14}	31.4 {1.24}



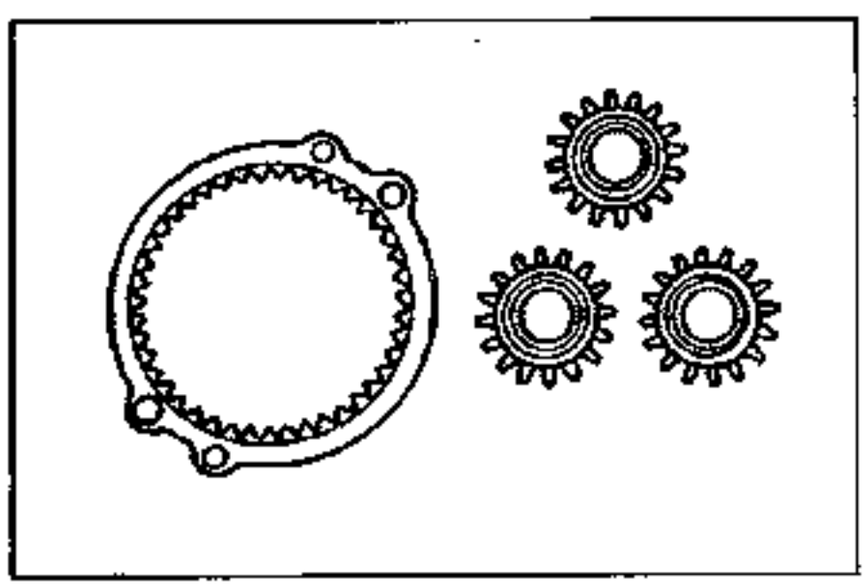
6. Measure the segment groove depth.
   If the depth of the mold between segments is almost at or less than the minimum, undercut the grooves to the standard depth.

   Depth: 0.4–0.8 mm {0.02–0.03 in} (B6–DOHC)
   0.4–0.6 mm {0.016–0.023 in} (K8–DOHC)
   Minimum: 0.2 mm {0.008 in}

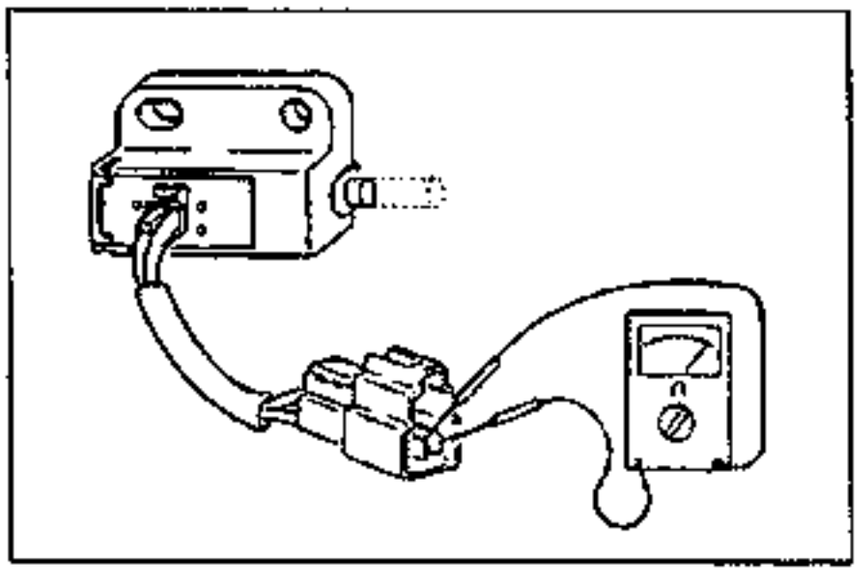


Overrunning Clutch
Turn the pinion shaft by hand and hold the overrunning clutch. Replace the overrunning clutch if the pinion turns in both directions or in neither direction.

Caution
- **Using cleaning fluids or a steam cleaner to clean the overrunning clutch can dissolve the grease in its sealed bearing.**



Internal Gear and Planetary Gears (K8 DOHC MTX)
1. Internal gear
   Check for wear or damage. Replace if necessary.
2. Planetary gears
   Check for wear or damage. Replace if necessary.



STARTER INTERLOCK SWITCH

Inspection

1. Disconnect the starter interlock switch connector.
2. Connect an ohmmeter to the switch.
3. Check the continuity.

Clutch pedal	Continuity
Depressed	Yes
Released	No

4. Replace the starter interlock switch if not as specified.

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SAFETY INFORMATION

LUBRICANTS

Avoid prolonged and repeated contact with petroleum-based oils. Used oil may irritate the skin, and can cause skin cancer and other skin disorders.
Wash thoroughly after working with oil. We recommend water soluble hand cleaners. Do not use kerosene, gasoline, or any other solvent, to remove oil from your skin.
If repeated or prolonged contact with oil is necessary, wear protective clothing. Soiled clothing, particularly those soiled with used oils and greases containing lead, should be cleaned at regular intervals.

JACKING POSITIONS

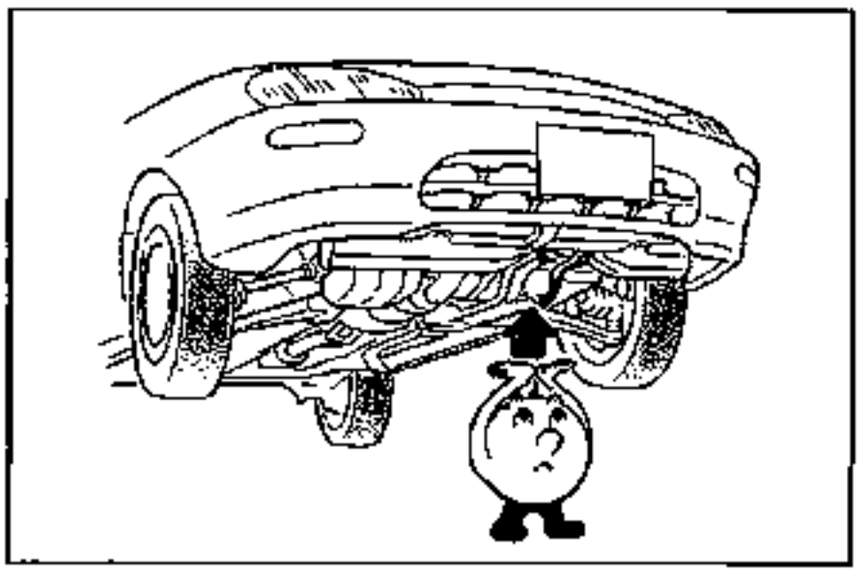
Warning

- **Improperly jacking a vehicle is dangerous. The vehicle can slip off the jack and cause serious injury. Use only the correct front and rear jacking positions and block the wheels.**

Use safety stands to support the vehicle after it has been lifted.

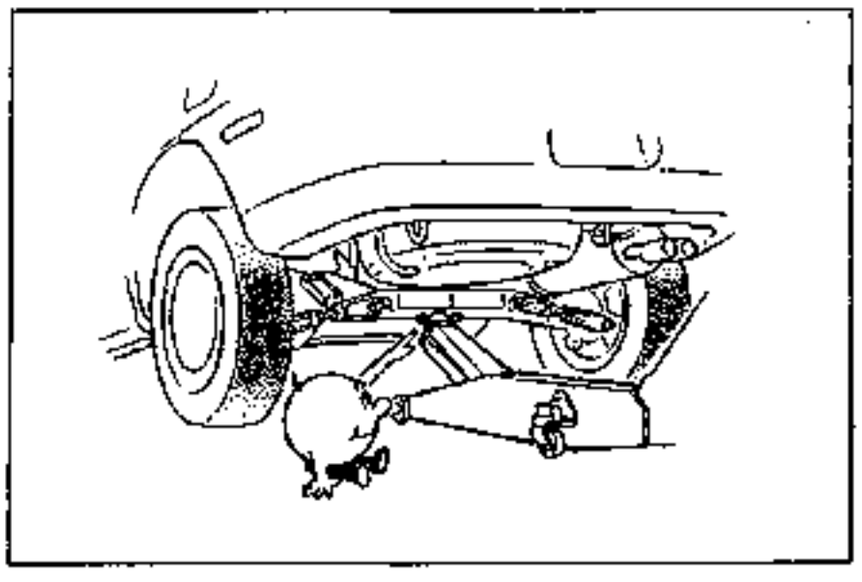
Front

At the center of the crossmember



Rear

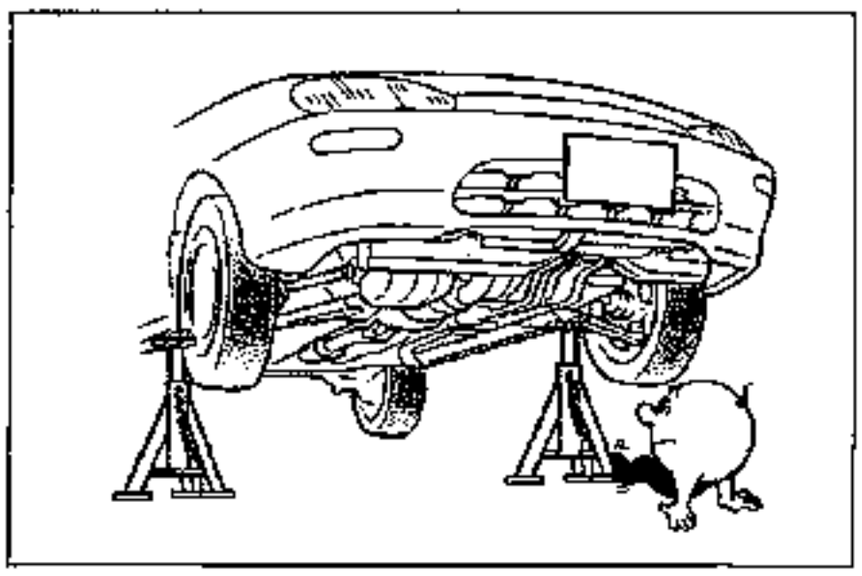
At the center of the crossmember



SAFETY STAND POSITIONS

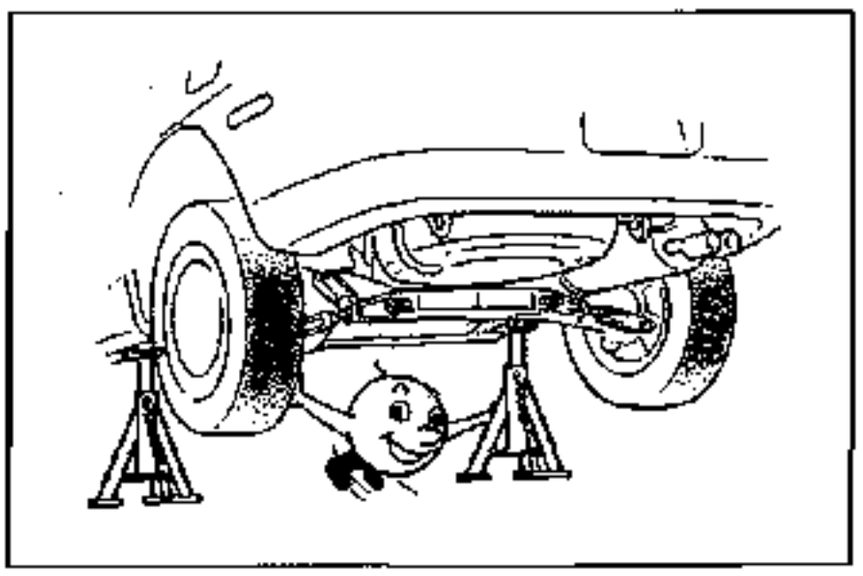
Front

Both sides of the vehicle



Rear

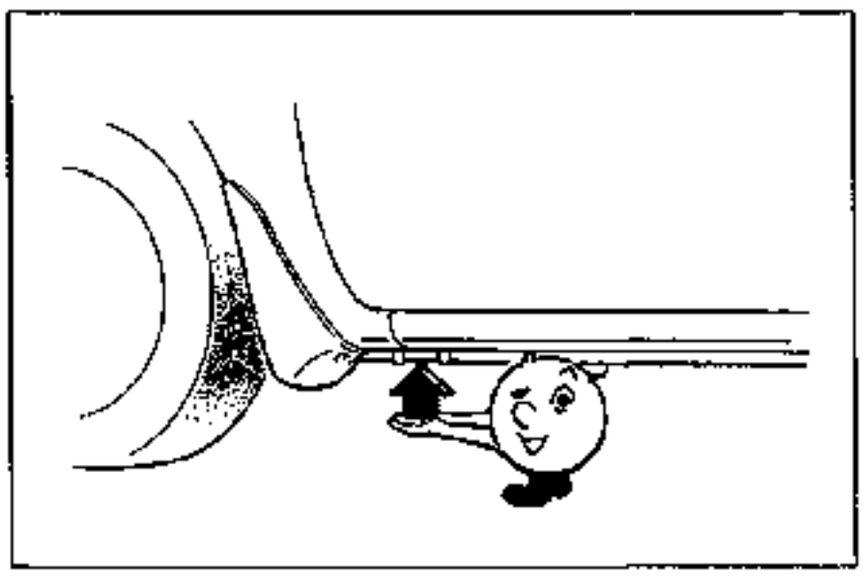
Both sides of the vehicle



VEHICLE LIFT POSITIONS

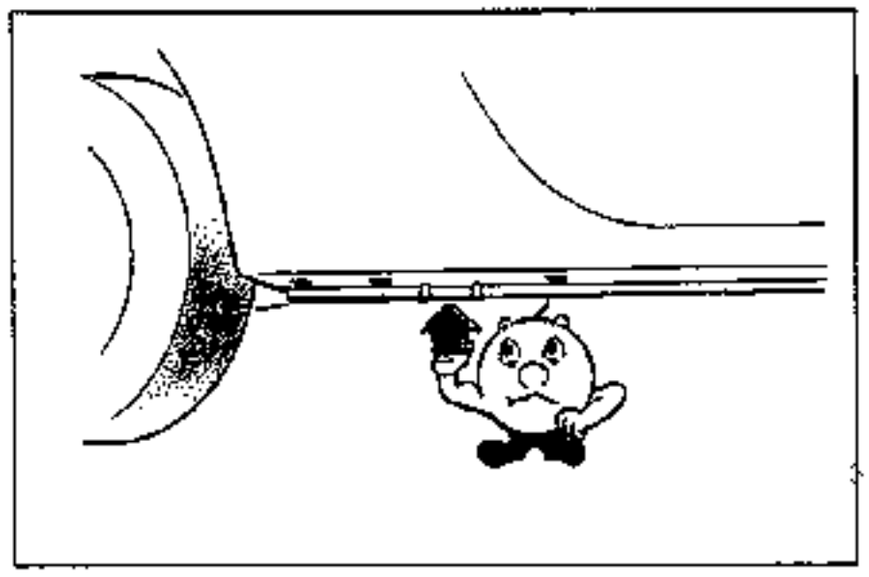
Front

Both sides of the side sill



Rear

Both sides of the side sill



DYNAMOMETER

When test-running a vehicle on a dynamometer:

- place a fan, preferably a vehicle-speed proportional type, in front of the vehicle.
- Connect an exhaust gas ventilation unit.
- Cool the exhaust pipes with a fan.
- Keep the area around the vehicle uncluttered.
- Watch the water temperature gauge.

COMPRESSED AIR

When using compressed air to clean or remove parts:

- Wear protective eye wear.
- Hold a rag over the opening to prevent parts from shooting out.
- Take precautions so that people around you are not struck by flying debris.

HOW TO USE THIS MANUAL

ADVISORY MESSAGES

You'll find several **Warnings**, **Cautions**, and **Notes** in this manual.

Warning

- **A Warning indicates a situation in which serious injury or death could result if the warning is ignored.**

Caution

- **A Caution indicates a situation in which damage to the vehicle could result if the caution is ignored.**

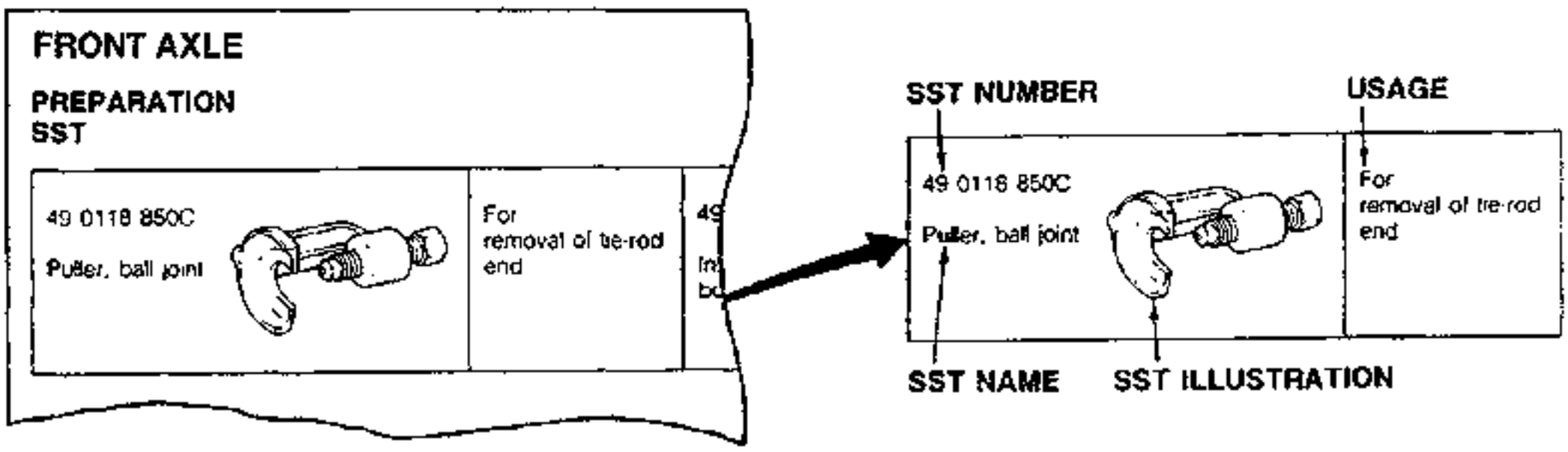
Note

- A **Note** provides added information that will help you to complete a particular procedure.

PREPARATION

This points out the needed **SSTs** for the service operation. It is best to gather all necessary **SSTs** before beginning work.

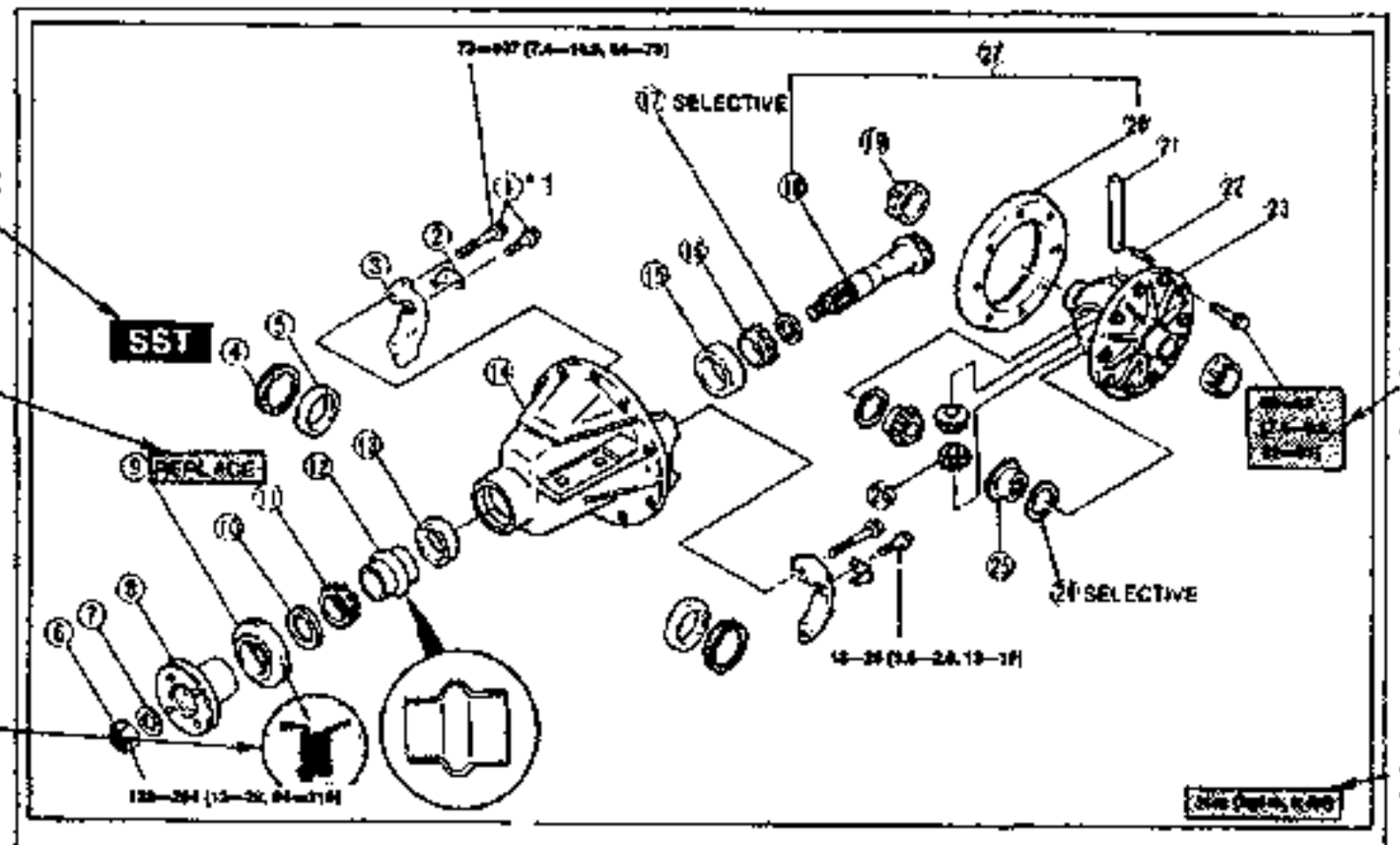
Example:



REPAIR PROCEDURE

1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and describes visual part inspection. If a damaged or worn part is found, repair or replace it as necessary.
2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration.
3. Pages related to service procedures are shown under the illustration. Refer to this information when servicing the related part.

Example:



* 1: The numbers (①, etc.) refer to part identification and servicing procedures.

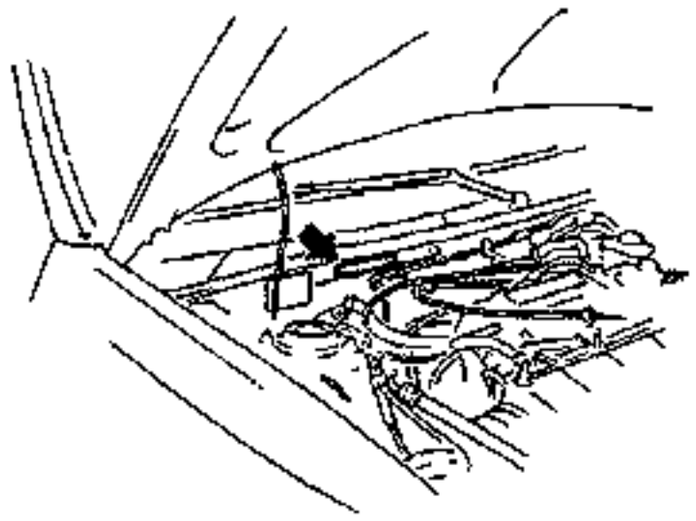
SYMBOLS

There are six symbols indicating oil, grease, and sealant. These symbols show the points of applying such materials during service.

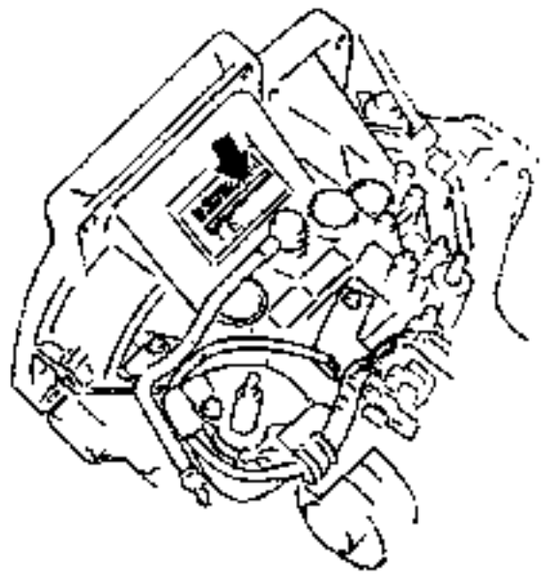
Symbol	Meaning	Kind
	Apply oil	New engine oil or gear oil as appropriate
	Apply brake fluid	FMVSS116: DOT-3
	Apply automatic transaxle fluid	Dexron ®II or M-III
	Apply grease	Appropriate grease
	Apply sealant	Appropriate sealant
	Apply petroleum jelly	Appropriate petroleum jelly

IDENTIFICATION NUMBER LOCATIONS

VEHICLE IDENTIFICATION NUMBER (VIN)

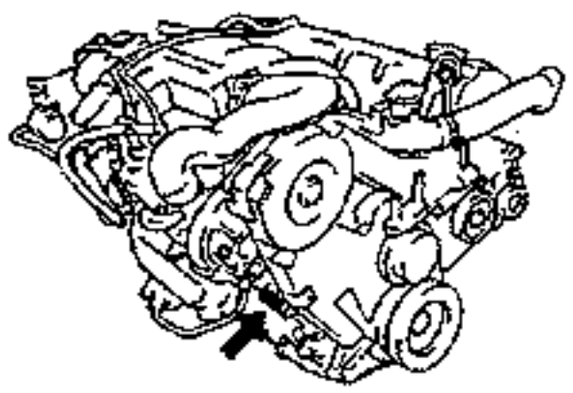


AUTOMATIC TRANSAXLE MODEL AND NUMBER

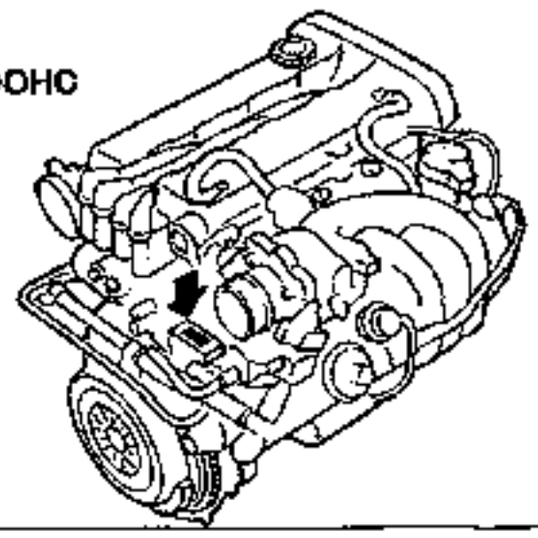


ENGINE MODEL AND NUMBER

K8 DOHC



B6 DOHC



UNITS

Electrical current	A (ampere)
Electric potential	V (volt)
Electric power	W (watt)
Length	mm (millimeter)
	in (inch)
Negative pressure	kPa (kilo Pascal)
	mmHg (millimeters of mercury)
	inHg (inches of mercury)
Positive pressure	kPa (kilo Pascal)
	kgf/cm^2 (kilogram force per square centimeter)
	psi (pounds per square inch)
Resistance	Ω (ohm)
Torque	N·m (Newton meter)
	kgf·m (kilogram force per meter)
	kgf·cm (kilogram force per centimeter)
	ft·lbf (foot pound)
	in·lbf (inch pound)
Volume	L (liter)
	US qt (U.S. quart)
	Imp qt (Imperial quart)
	ml (milliliter)
	cc (cubic centimeter)
	cu in (cubic inch)
	fl oz (fluid ounce)
Weight	g (gram)
	oz (ounce)

Conversion to SI Units (Système International d' Unités)

All numerical values in this manual are based on SI units. Numbers shown in conventional units are converted from these values.

Rounding off

Converted values are rounded off to the same number of places are the SI unit value. For example, if the SI unit value is 17.2 and the value after conversion is 37.84, the converted value will be rounded off to 37.8.

Upper and lower limits

When the data indicates upper and lower limits, the converted values are rounded down if the SI unit value is an upper limit and rounded up if the SI unit value is a lower limit. Therefore, converted values for the same SI unit value may differ after conversion. For example, consider 2.7kgf/cm^2 in the following specifications:

- 210—260 kPa {2.1—2.7 kgf/cm^2, 30—38 psi}
- 270—310 kPa {2.7—3.2 kgf/cm^2, 39—45 psi}

The actual converted values for 2.7 kgf/cm^2 are 264 kPa and 38.4 psi. In the top specification, 2.7 is used as an upper limit, so its converted values are rounded down to 260 and 38. In the bottom specification, 2.7 is used as a lower limit, so its converted values are rounded up to 270 and 39.

ABBREVIATIONS

AAS	Air adjusting screw
ABDC	After bottom dead center
ABS	Antilock brake system
ACC	Accessories
ATDC	After top dead center
ATX	Automatic transaxle
ATF	Automatic transaxle fluid
BBDC	Before bottom dead center
BTDC	Before top dead center
CM	Control Module
CPU	Central processing unit
D	Drive
DOHC	Double overhead camshaft
DRL	Daytime running lights
EC-AT	Electronically controlled automatic transaxle
E/L	Electrical load
EX	Exhaust
H	High
HLA	Hydraulic lash adjuster
HU	ABS hydraulic unit
IGN	Ignition
IN	Intake
INT	Intermittent
L	Low
LH	Left hand
LO	Low
M	Motor
M/S	Manual steering
MTX	Manual transaxle
N	Neutral
OFF	Switch off
ON	Switch on
P	Park
PCV	Positive crankcase ventilation
PRC	Pressure regulator control
P/S	Power steering
R	Reverse
RH	Right hand
RTS	Reduce torque signal
S	Slope
SR	Sensor rotor
SST	Special service tool
SW	Switch
TNS	Tail-, parking, and licence plate lights
TRS	Torque reduced signal
VICS	Variable inertia charging system
VRIS	Variable resonance induction system
WSS	Wheel speed sensor

SAE STANDARDS

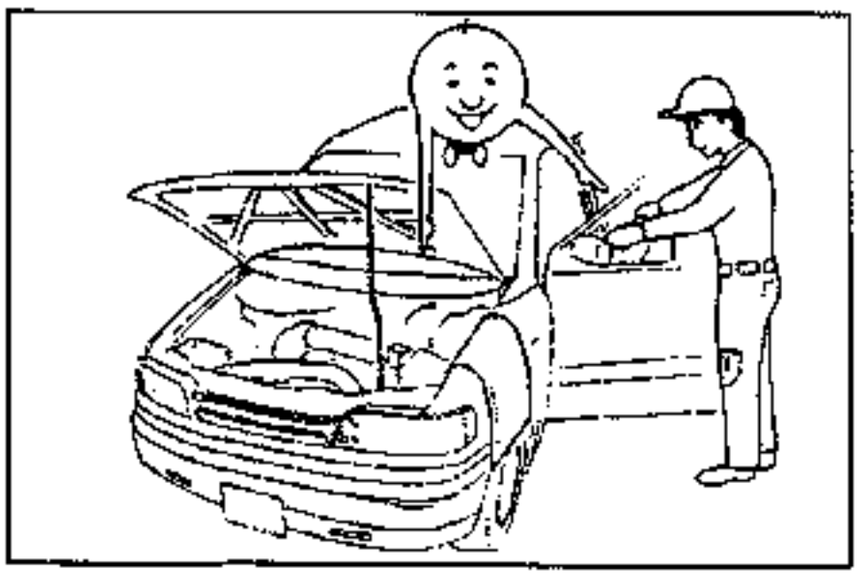
In accordance with new regulations, SAE (Society of Automotive Engineers) standard names and abbreviations are now used in this manual. The table below lists the names and abbreviations that have been used in Mazda manuals up to now and their SAE equivalents.

Previous Standard		SAE Standard		
Abbreviation	Name	Abbreviation	Name	Remark
—	Accelerator Pedal	AP	Accelerator Pedal	
—	Air Cleaner	ACL	Air Cleaner	
—	Air Conditioning	A/C	Air Conditioning	
—	Airflow Meter	VAF	Volume Air Flow Sensor	
—	Airflow Sensor	MAF	Mass Air Flow Sensor	
—	Alternator	GEN	Generator	
—	ATF Thermosensor	—	Transmission (Transaxle) Fluid Temperature Sensor	
—	Atmospheric Pressure	BARO	Barometric Pressure	
VB	Battery Voltage	B+	Battery Positive Voltage	
—	Catalytic Converter	OC	Oxidation Catalytic Converter	
		TWC	Three Way Catalytic Converter	
		WU-TWC	Warm Up Three Way Catalytic Converter	#1
—	Circuit Opening Relay	FPR	Fuel Pump Relay	#2
—	Clutch Position	CPP	Clutch Pedal Position	
—	Crank Angle Sensor	CMP	Camshaft Position Sensor	
—	Crank Angle Sensor 2	CKP	Crankshaft Position Sensor	
—	Diagnosis Connector	DLC	Data Link Connector	
—	Diagnosis/Self-Diagnosis	OBD	On-Board Diagnostic	
—	Direct Ignition	DLI	Distributorless Ignition	
—	EC-AT Control Unit	TCM	Transmission (Transaxle) Control Module	
EGI	Electronic Gasoline Injection System	CIS	Continuous Fuel injection System	
—	Electronic Spark Ignition	EI	Electronic Ignition	#3
ECU	Engine Control Unit	PCM	Powertrain Control Module	#4
		ECM	Engine Control Module	
—	Engine Modification	EM	Engine Modification	
—	Engine RPM Signal	—	Engine Speed Input Signal	
—	Engine Speed	RPM	Engine Speed	
—	Evaporative Emission	EVAP	Evaporative Emission	
—	Exhaust Gas Recirculation	EGR	Exhaust Gas Recirculation	
—	Fan Control	FC	Fan Control	
—	Feedback System	CLS	Closed Loop System	
—	Flexible Fuel	FF	Flexible Fuel	
—	Fuel Pump	FP	Fuel Pump	
—	Fully Closed	CTP	Closed Throttle Position	
—	Fully Open	WOT	Wide Open Throttle	
—	Ground/Earth	GND	Ground	

#1: Directly connected to exhaust manifold
#2: In some models, there is a fuel pump relay that controls pump speed. That relay is now called the fuel pump relay (speed).
#3: Controlled by the ECM (PCM)
#4: Device that controls engine and powertrain

Previous Standard		SAE Standard		
Abbreviation	Name	Abbreviation	Name	Remark
—	IC Regulator	VR	Voltage Regulator	
—	Idle Speed Control	IAC	Idle Air control	
—	Idle Switch	—	Closed Throttle Position Switch	
—	Igniter	ICM	Ignition Control Module	
—	Inhibitor Position	TR	Transmission (Transaxle) Range	
—	Intake Air Pressure	MAP	Manifold Absolute Pressure	
—	Intake Air Thermo	IAT	Intake Air Temperature	
—	Intercooler	CAC	Charge Air Cooler	
—	Knock Sensor	KS	Knock Sensor	
—	Line Pressure Solenoid Valve	—	Pressure Control Solenoid	
—	Lock-up Position	TCC	Torque Converter Clutch	
—	Malfunction Indicator Light	MIL	Malfunction Indicator Lamp	
—	Multiport Fuel Injection	MFI	Multiport Fuel Injection	
—	Open Loop	OL	Open Loop	
—	Overdrive	4GR	Fourth Gear	
—	Oxygen Sensor	HO2S	Heated Oxygen Sensor	With heater
		O2S	Oxygen Sensor	
—	Park/Neutral Range	PNP	Park/Neutral Position	
—	Power Steering Pressure	PSP	Power Steering Pressure	
—	Pulse Generator	—	Input/Turbine Speed Sensor	
—	Reed Valve	SAPV	Secondary Air Pulse Valve	
—	Secondary Air Injection System	PAIR	Pulsed Secondary Air Injection	Pulsed injection
		AIR	Secondary Air Injection	Inject with compressor
—	Sequential Fuel Injection	SFI	Sequential Multipoint Fuel Injection	
—	Service Code(s)	DTC	Diagnostic Trouble Code (s)	
—	Spark Ignition	DI	Distributor Ignition	
—	Stoplight Switch	—	Brake Switch	
—	Test Mode	DTM	Diagnostic Test Mode	#5
—	Throttle Body	TB	Throttle Body	
—	Throttle Sensor	TP	Throttle Position Sensor	
—	Turbocharger	TC	Turbocharger	
—	Vehicle Speed Sensor	VSS	Vehicle Speed Sensor	
—	Vehicle Speed Sensor 1	—	Output Speed Sensor	
—	Water Thermo	ECT	Engine Coolant Temperature	
—	1–2 Shift Solenoid Valve	—	Shift Solenoid A	
—	2–3 shift Solenoid Valve	—	Shift Solenoid B	
—	3–4 Shift Solenoid Valve	—	Shift Solenoid C	
—	3rd Gear	3GR	Third Gear	
—	—	—	Incorrect Gear Ratio	

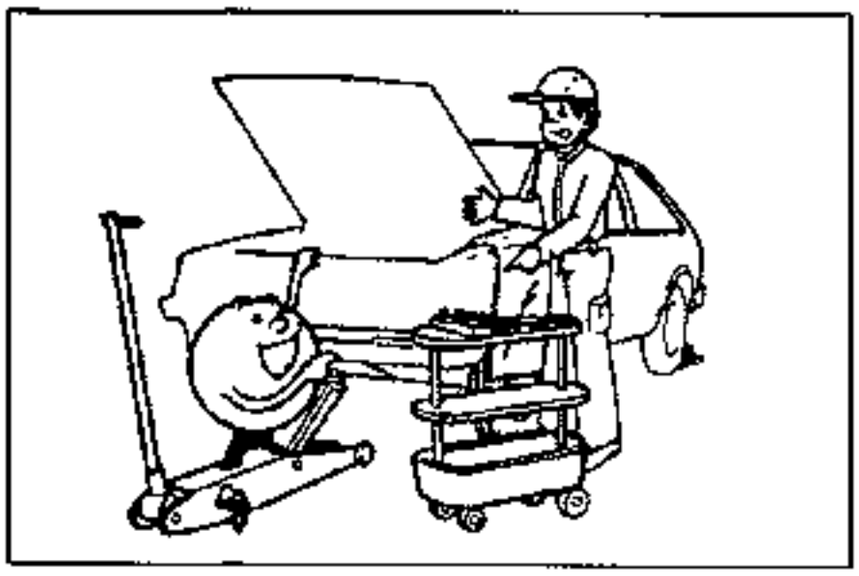
#5: Diagnostic trouble codes depend on the diagnostic test mode



FUNDAMENTAL PROCEDURES

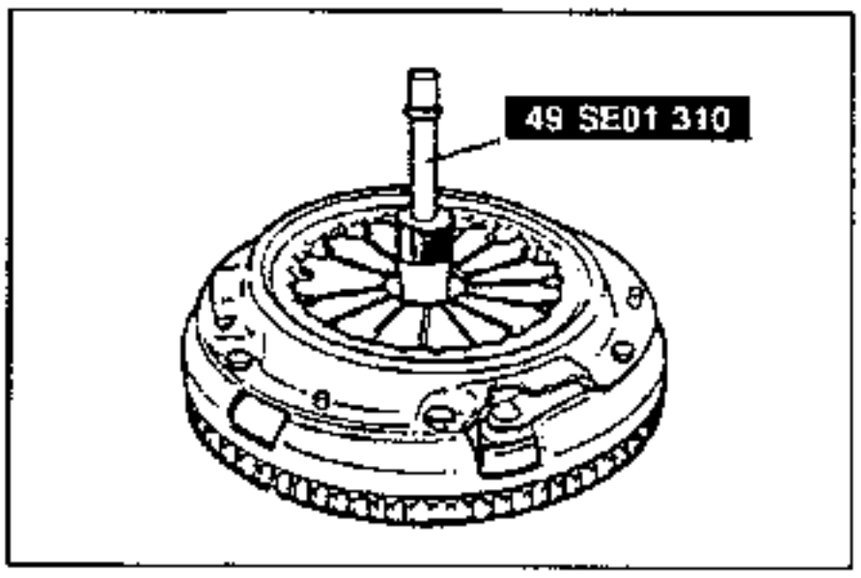
PROTECTION OF THE VEHICLE

Always be sure to cover fenders, seats, and floor areas before starting work.



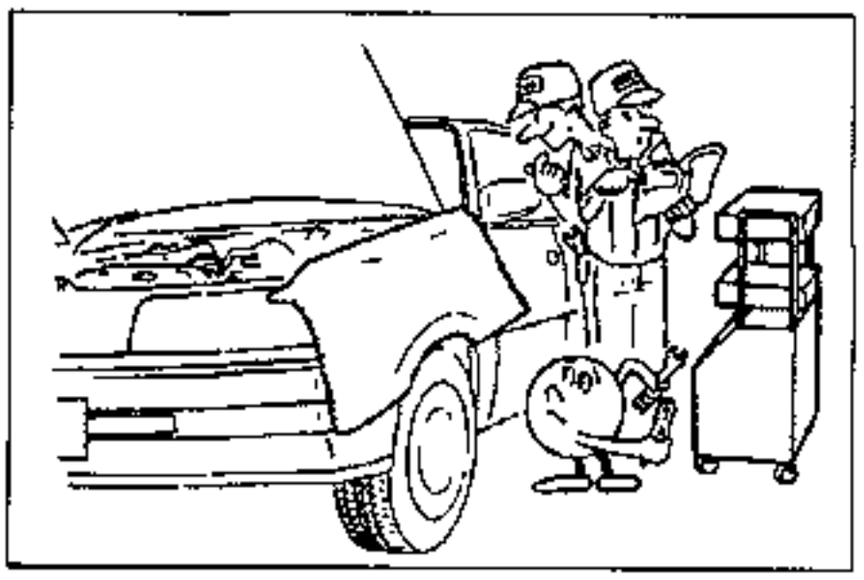
PREPARATION OF TOOLS AND MEASURING EQUIPMENT

Be sure that all necessary tools and measuring equipment are available before starting any work.



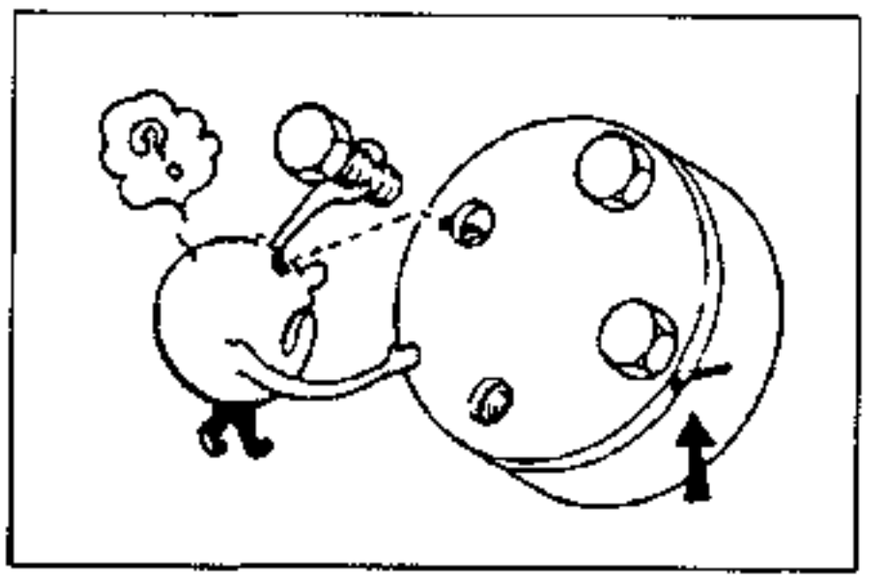
SPECIAL TOOLS

Use special tools when they are required.



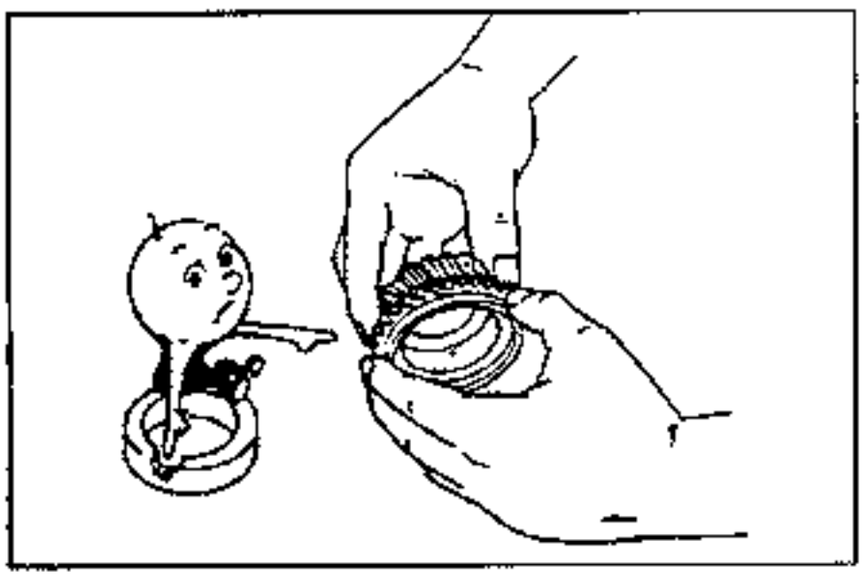
REMOVAL OF PARTS

While correcting a problem, try also to determine its cause. Begin work only after first learning which parts and subassemblies must be removed and disassembled for replacement or repair. After removing the part, plug all holes and ports to prevent foreign material from entering.

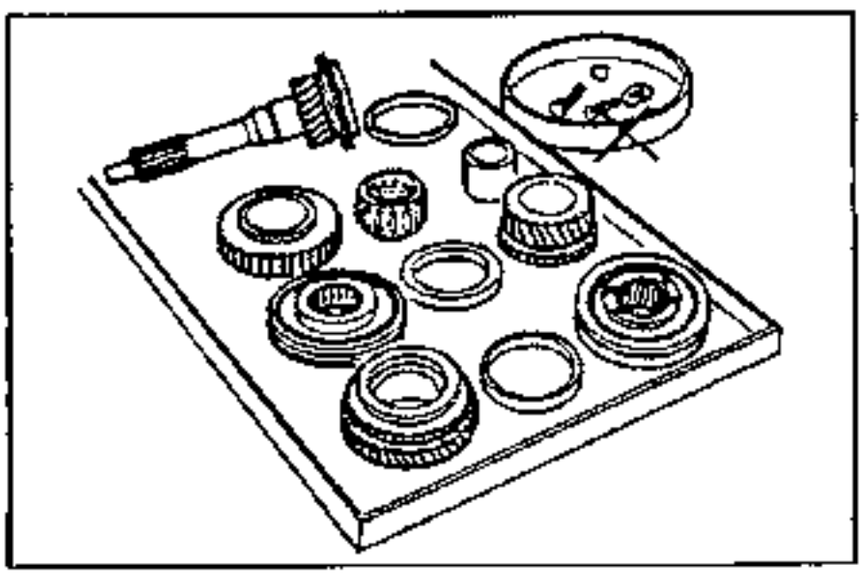


DISASSEMBLY

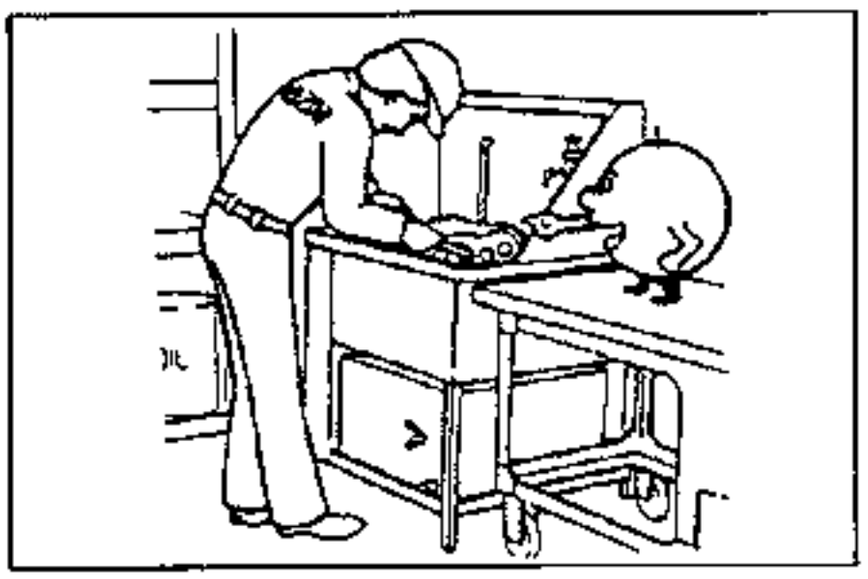
If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be disassembled in a way that will not affect their performance or external appearance and identified so that reassembly can be performed easily and efficiently.



1. Inspection of parts
When removed, each part should be carefully inspected for malfunctioning, deformation, damage, and other problems.

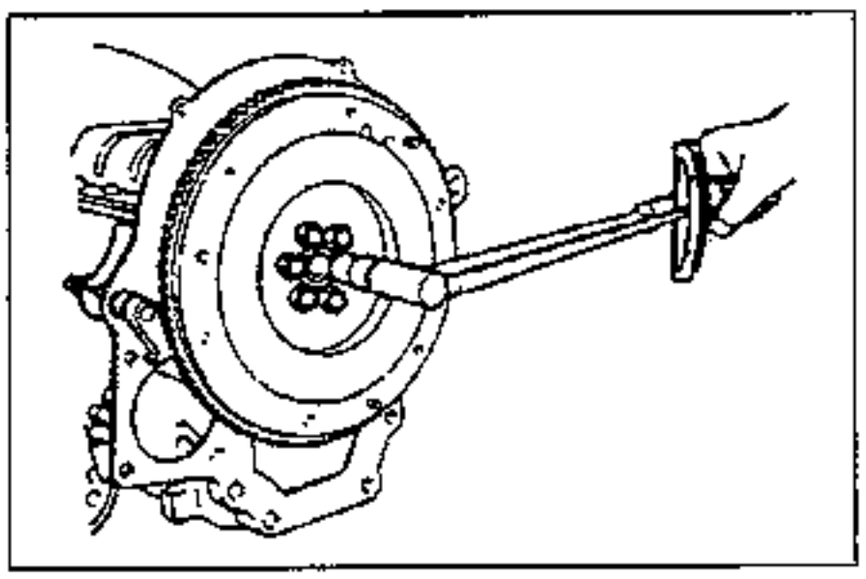


2. Arrangement of parts
All disassembled parts should be carefully arranged for reassembly.
Be sure to separate or otherwise identify the parts to be replaced from those that will be reused.



3. Cleaning parts for reuse
All parts to be reused should be carefully and thoroughly cleaned in the appropriate method.

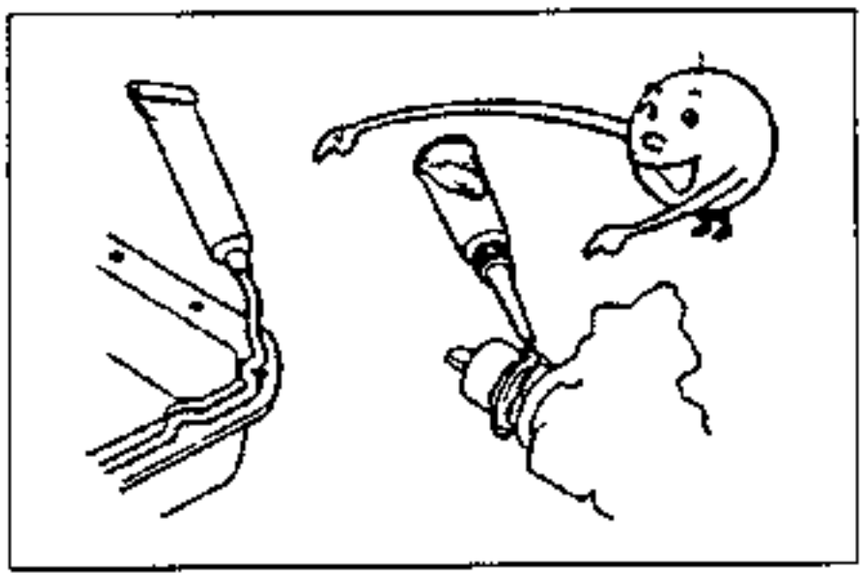
Warning
- **Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eye wear whenever using compressed air.**



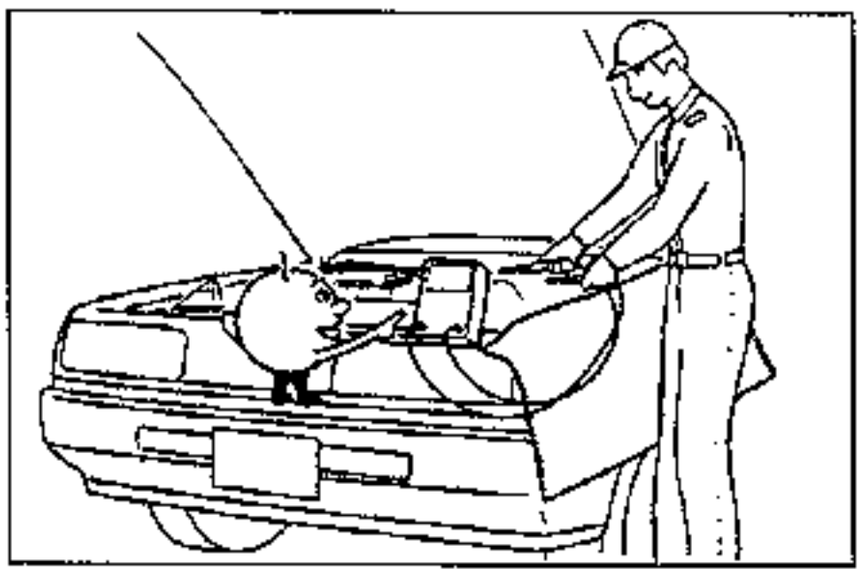
REASSEMBLY
Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts.

If removed, these parts should be replaced with new ones:

1. Oil seals	2. Gaskets
3. O-rings	4. Lock washers
5. Cotter pins	6. Nylon nuts

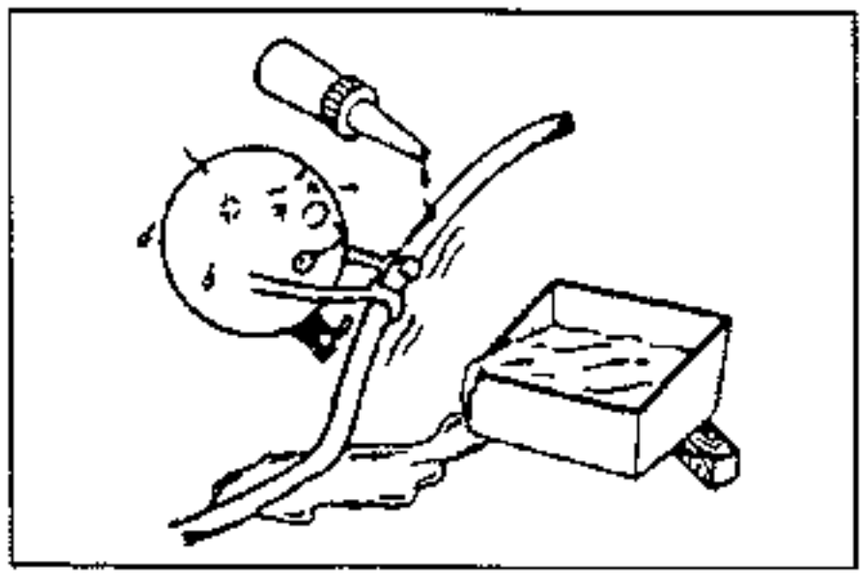


Depending on location:
1. Sealant should be applied to gaskets.
2. Oil should be applied to the moving components of parts.
3. Specified oil or grease should be applied at the prescribed locations (such as oil seals) before reassembly.



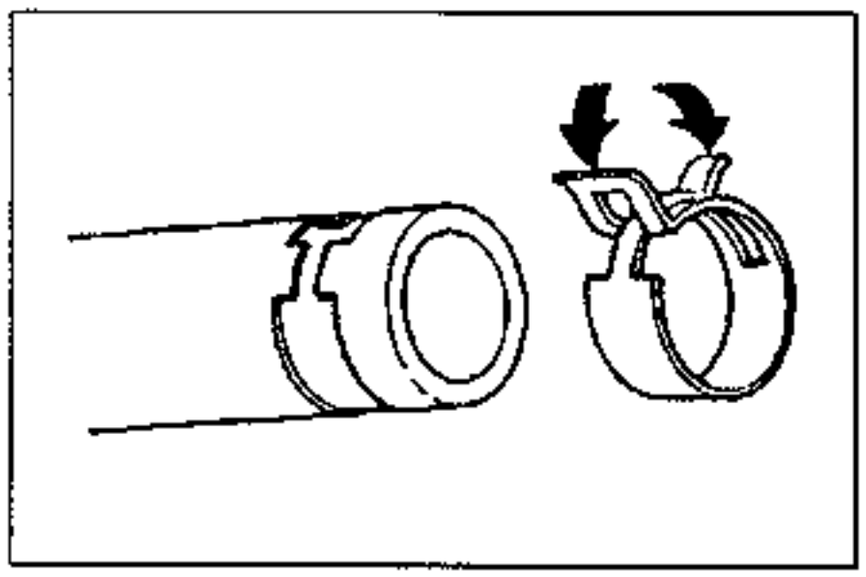
ADJUSTMENTS

Use suitable gauges and testers when making adjustments.



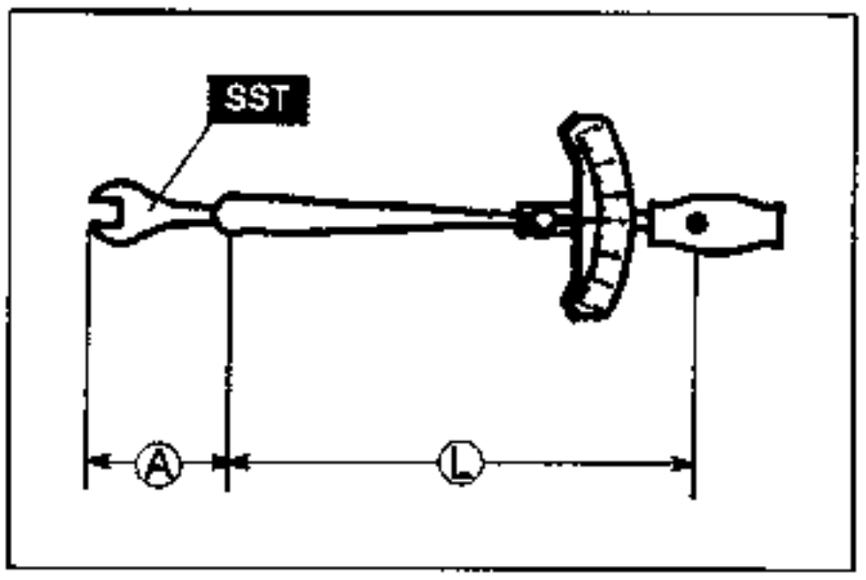
RUBBER PARTS AND TUBING

Prevent gasoline or oil from getting on rubber parts or tubing.



HOSE CLAMPS

When reinstalling, position the hose clamp in the original location on the hose, and squeeze the clamp llightly with large pliers to ensure a good fit.

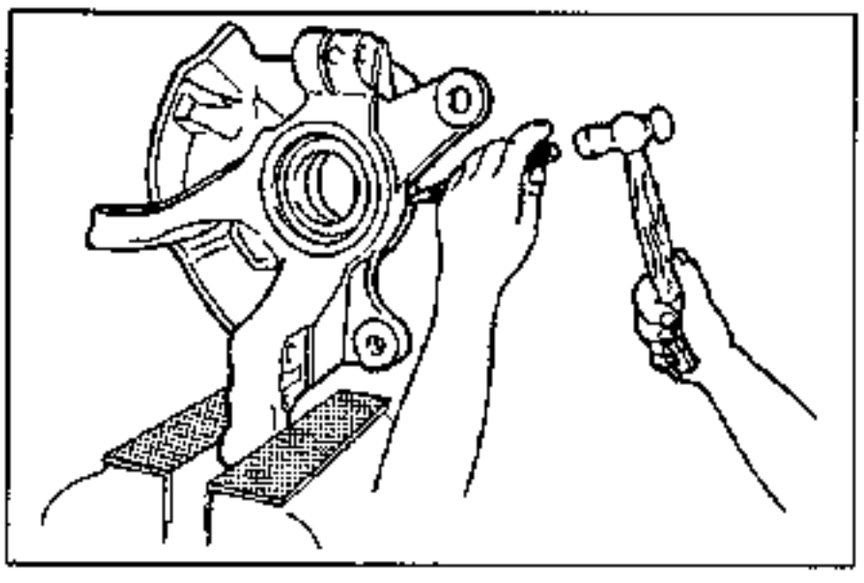


TORQUE FORMULAS

When using a torque wrench-**SST** combination, the written torque must be recalculated due to the extra length that the **SST** adds to the torque wrench. Recalculate the torque by using the following formulas. Choose the formula that applies to you.

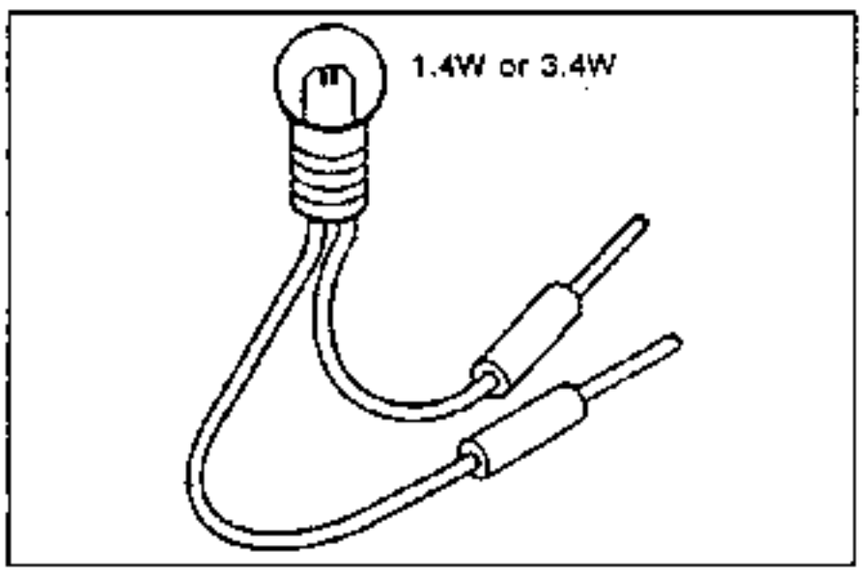
Torque Unit	Formula
N·m	N·m × [L/(L+A)]
kgf·m	kgf·m × [L/(L+A)]
kgf·cm	kgf·cm × [L/(L+A)]
ft·lbf	ft·lbf × [L/(L+A)]
in·lbf	in·lbf × [L/(L+A)]

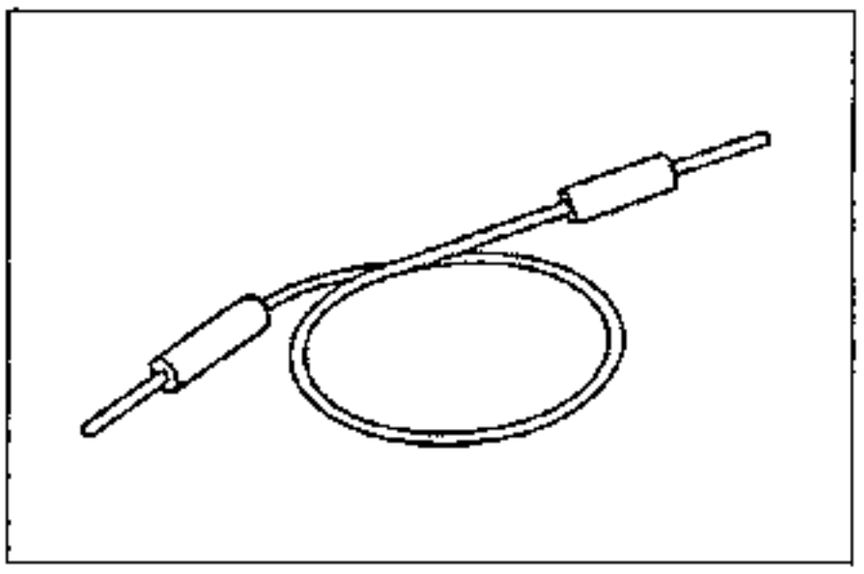
A = The length of the **SST** past the torque wrench drive.
L = The length of the torque wreanch.

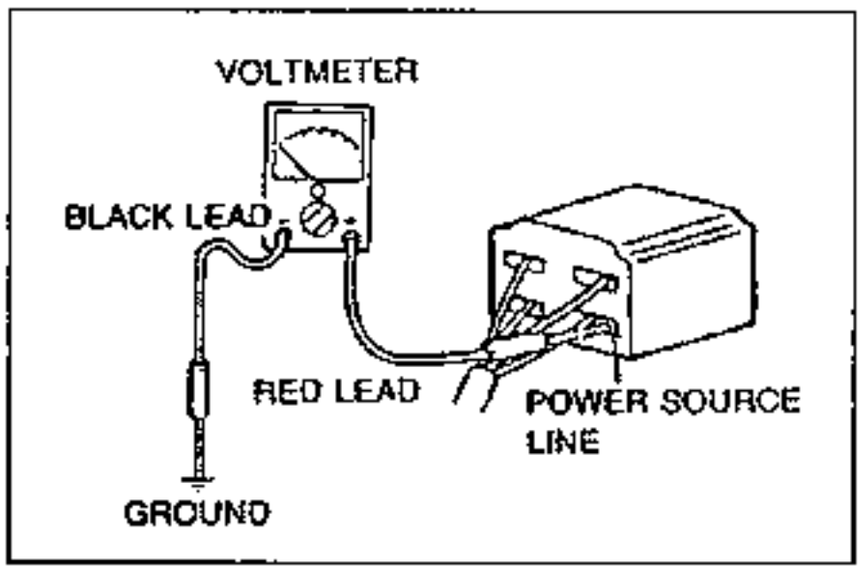


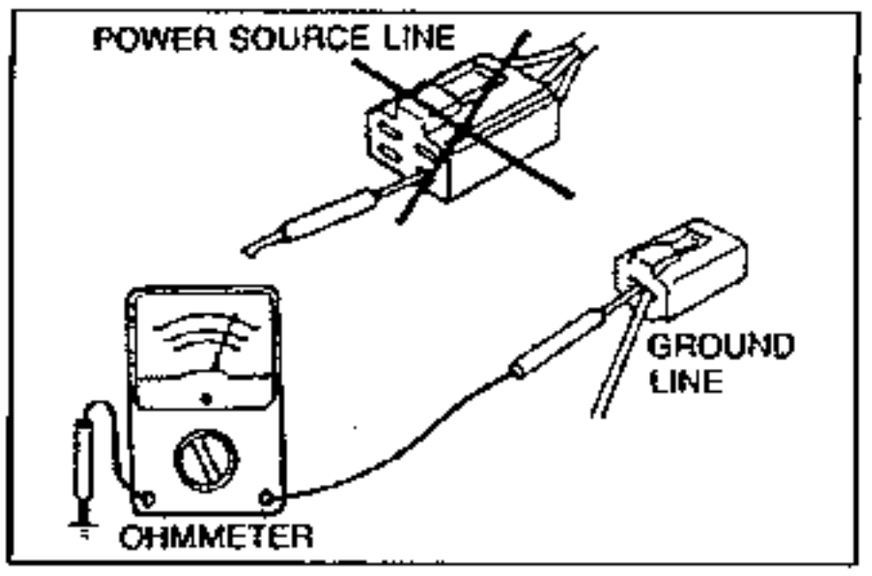
VISE

When using a vise, put protective plates in the jaws of the vise to prevent damage to parts.









ELECTRICAL TROUBLESHOOTING TOOLS

TEST LIGHT

The test light, as shown in the figure, uses a 12V bulb. The two lead wires should be connected to probes.
The test light is used for simple voltage checks and for checking for short circuits.

Caution

- **Using a bulb over 3.4W when checking the control module may damage the control module.**

JUMPER WIRE

A jumper wire is used to create a temporary circuit. Connect the jumper wire between the terminals of a circuit to bypass a switch.

Caution

- **Do not connect a jumper wire from the power source line to a body ground. This may cause burning or other damage to wiring harnesses or electronic components.**

VOLTMETER

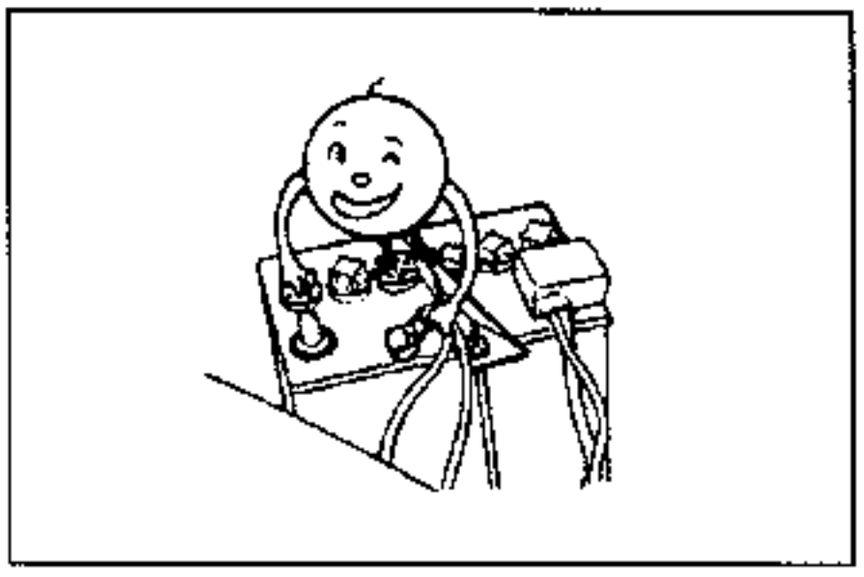
The DC voltmeter is used to measure circuit voltage. A voltmeter with a range of 15V or more is used by connecting the positive (+) probe (red lead wire) to the point where voltage is to be measured and the negative (–) probe (black lead wire) to a body ground.

OHMMETER

The ohmmeter is used to measure the resistance between two points in a circuit, and to check for continuity and short circuits.

Caution

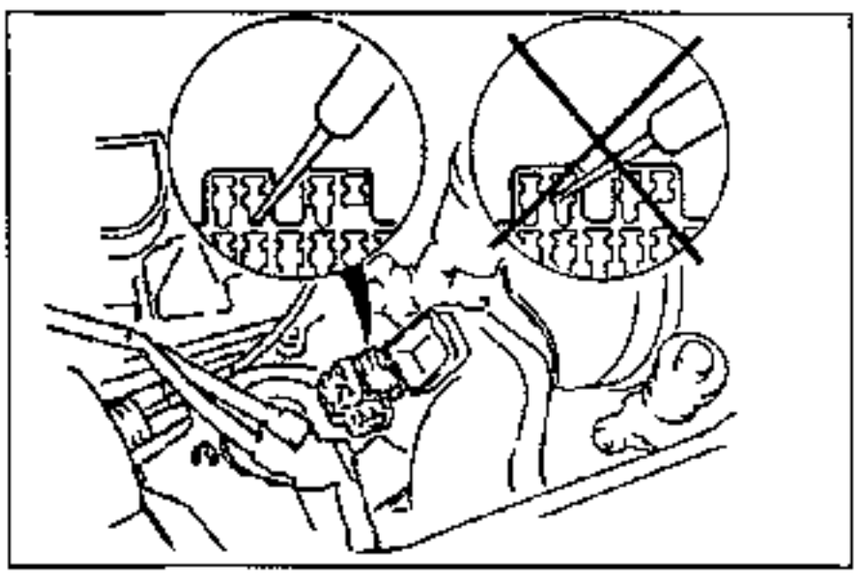
- **Do not connect the ohmmeter to any circuit to which voltage is applied. This will damage the ohmmeter.**



ELECTRICAL PARTS

BATTERY CABLE

Before disconnecting connectors or removing electrical parts, disconnect the negative battery cable.



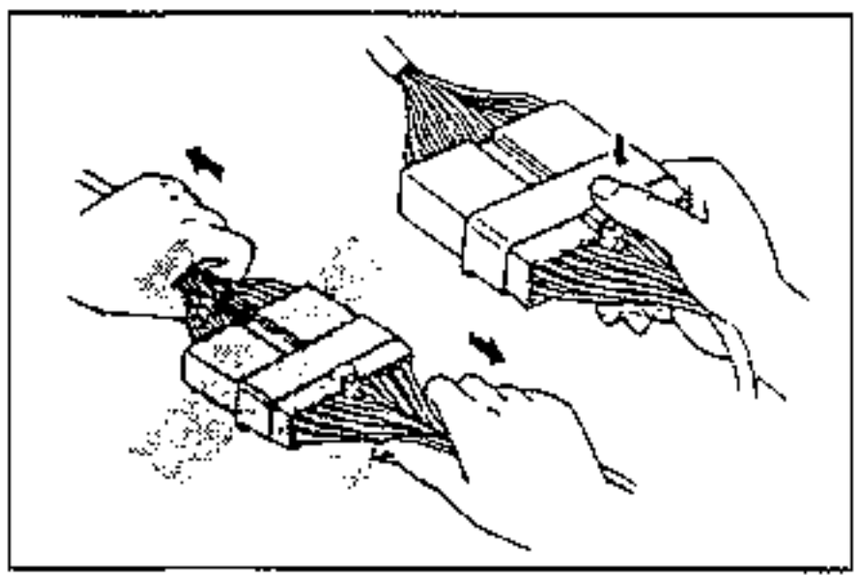
CONNECTORS

Data Link Connector

Insert the probe into the service hole when connecting a jumper wire to the data link connector.

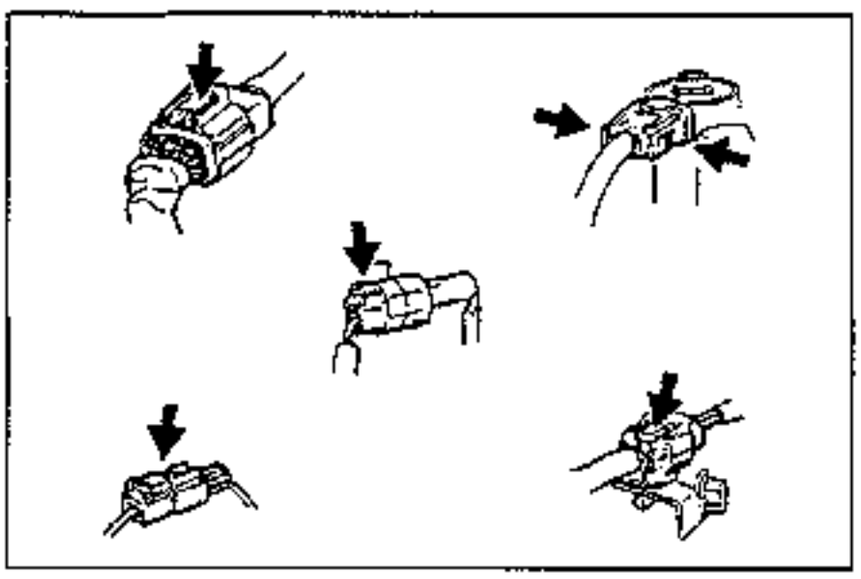
Caution

- **Inserting a jumper wire probe into the data link connector terminal may damage the terminal.**

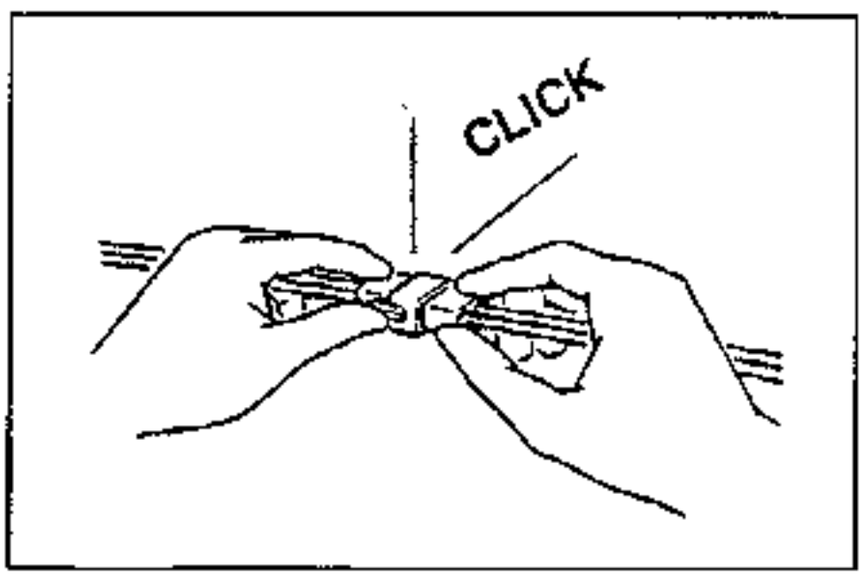


Disconnecting Connectors

When disconnecting two connectors, grasp the connectors, not the wires.

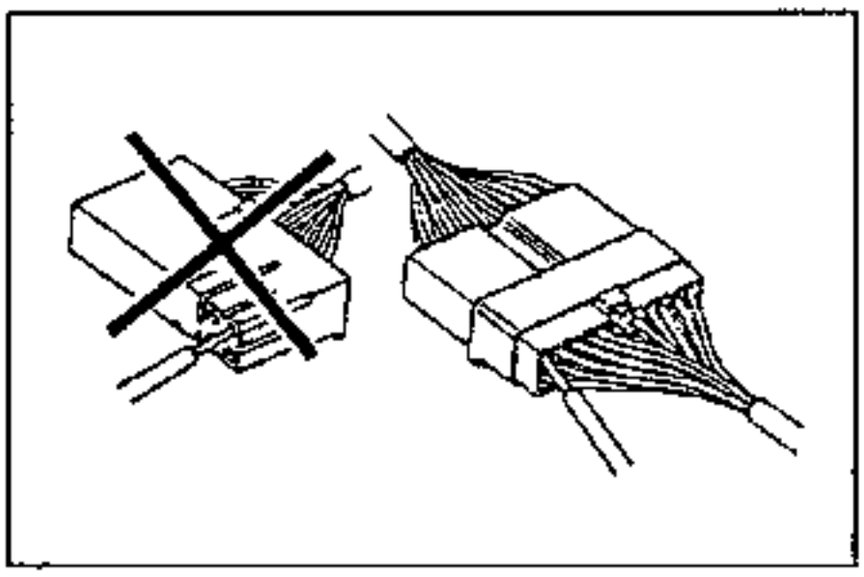


Connectors can be disconnected by pressing or pulling the lock lever as shown.



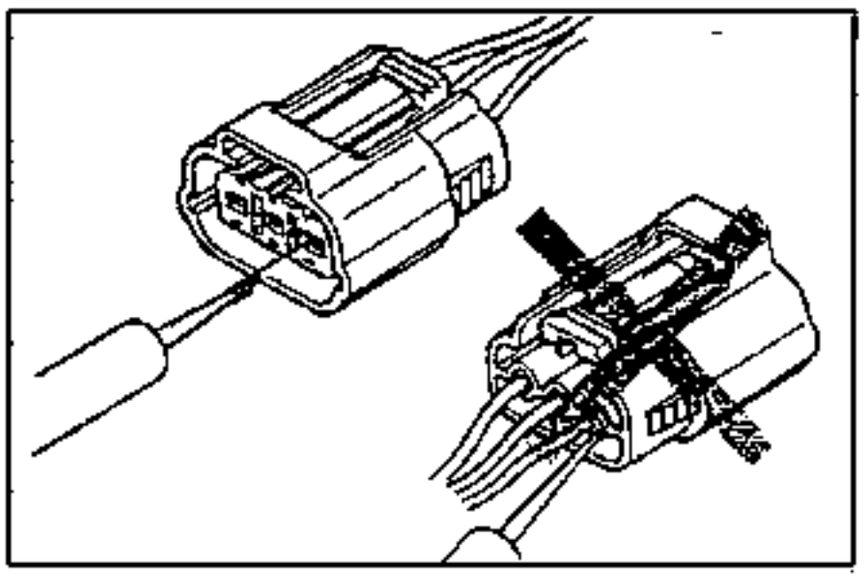
Locking Connector

When locking connectors, listen for a click that will indicate they are securely locked.



Inspection

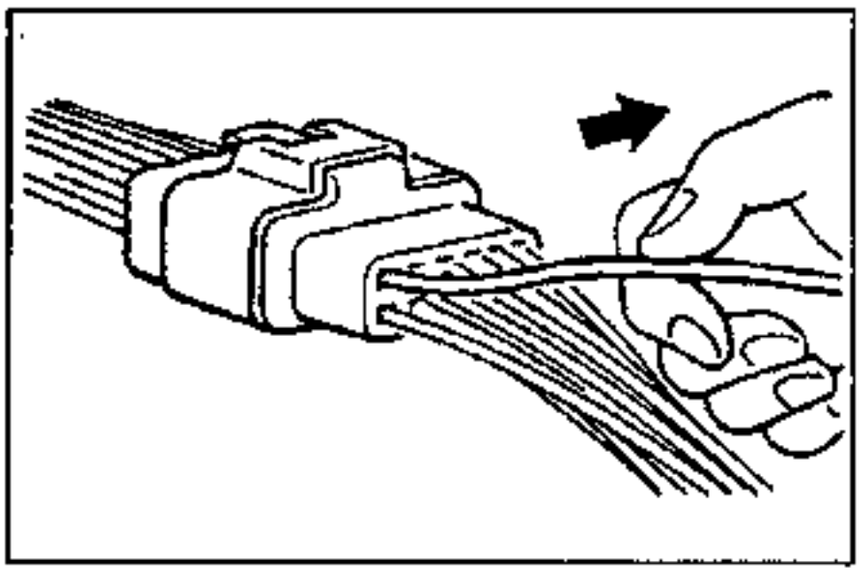
1. When a tester is used to check for continuity or to measure voltage, insert the tester probe from the wiring harness side.



2. Check the terminals of waterproof connectors from the connector side, as they cannot be accessed from the wiring harness side.

Caution

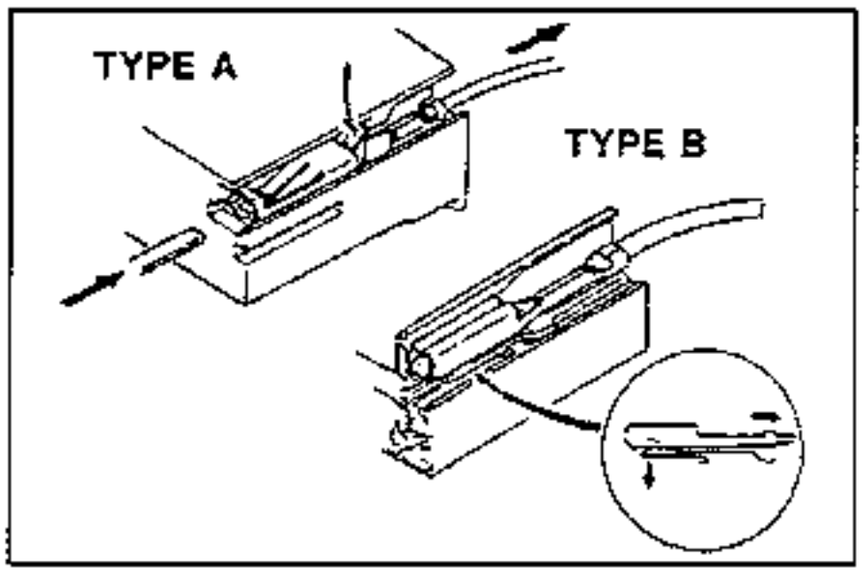
- **To prevent damage to the terminal, wrap a thin wire around the lead before inserting it into the terminal.**



TERMINALS

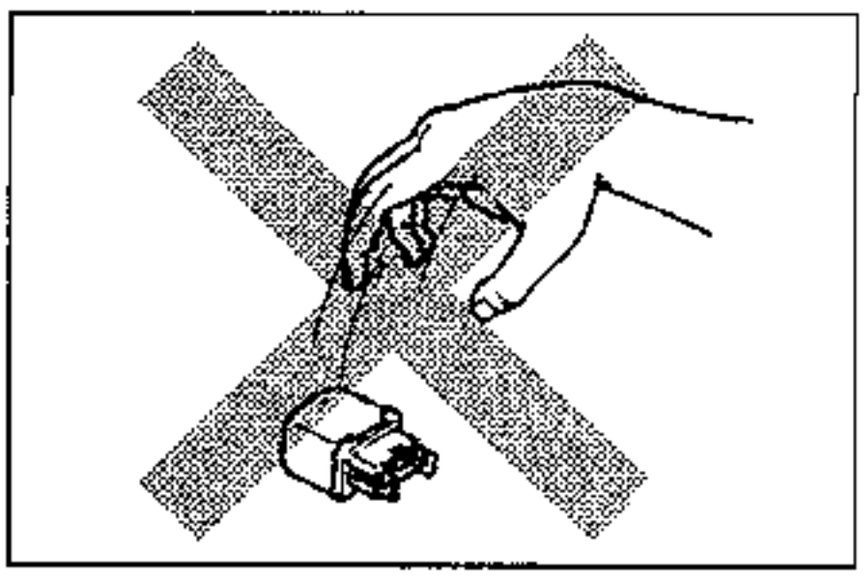
Inspection

Pull lightly on individual wires to check that they are secured in the terminal.



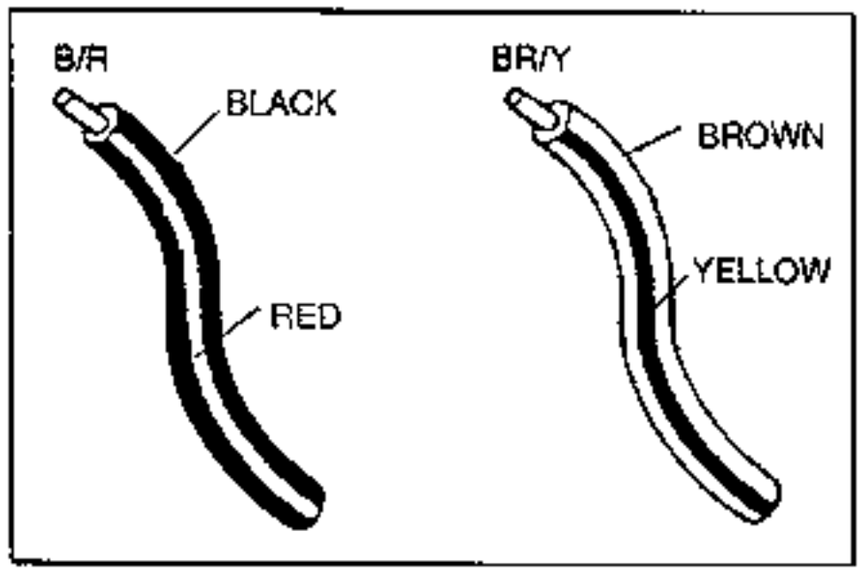
Replacement

Use the appropriate tools to remove a terminal as shown.
When installing a terminal, be sure to insert it until it locks securely.
Insert a thin piece of metal from the terminal side of the connector, and then, with the terminal locking tab pressed down, pull the terminal out from the connector.



SENSORS, SWITCHES, AND RELAYS

Handle sensors, switches, and relays carefully. Do not drop them or strike them against other objects.

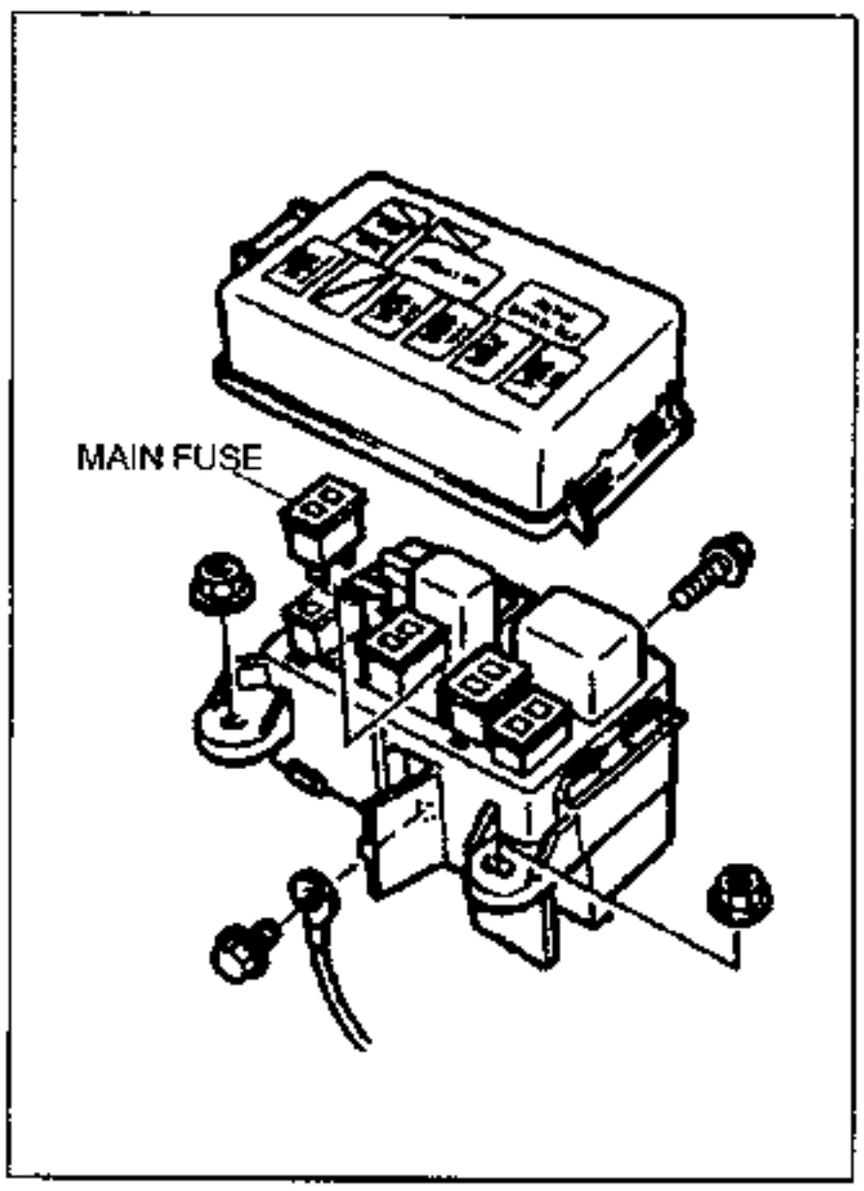


WIRING HARNESS

Wiring Color Codes

Two-color wires are indicated by a two-color code symbol. The first letter indicates the base color of the wire and the second the color of the stripe.

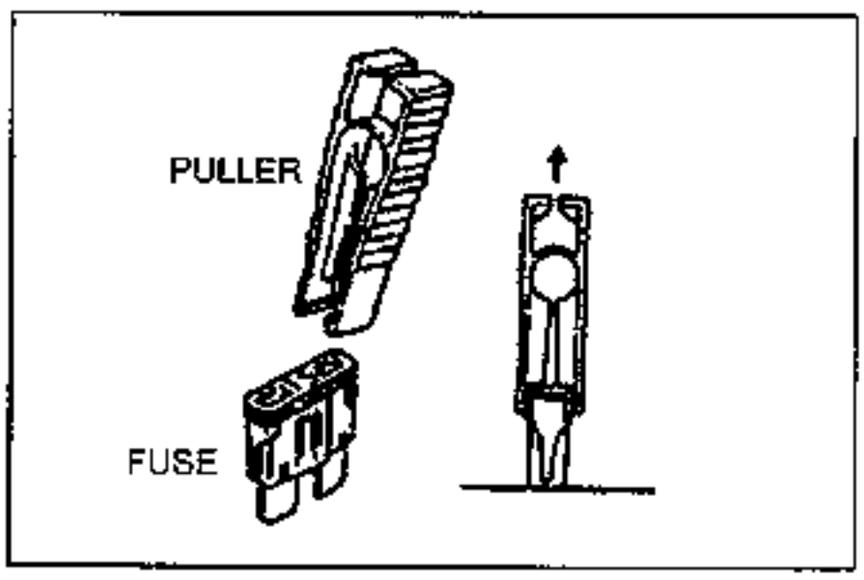
CODE	COLOR	CODE	COLOR
B	Black	O	Orange
BR	Brown	P	Pink
G	Green	R	Red
GY	Gray	V	Violet
L	Blue	W	White
LB	Light Blue	Y	Yellow
LG	Light Green	—	—



MAIN FUSE

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove the main fuse block mounting nuts.
3. Open the main fuse block lid and remove the main fuse mounting bolts.
4. Remove the main fuse.
5. Install in the reverse order of removal.



FUSE (PLATE TYPE)

Removal / Installation

1. Use the puller found on the back of the fuse block cover to remove the fuses. If one or more of the fuses are burnt, check for a short in the harness.

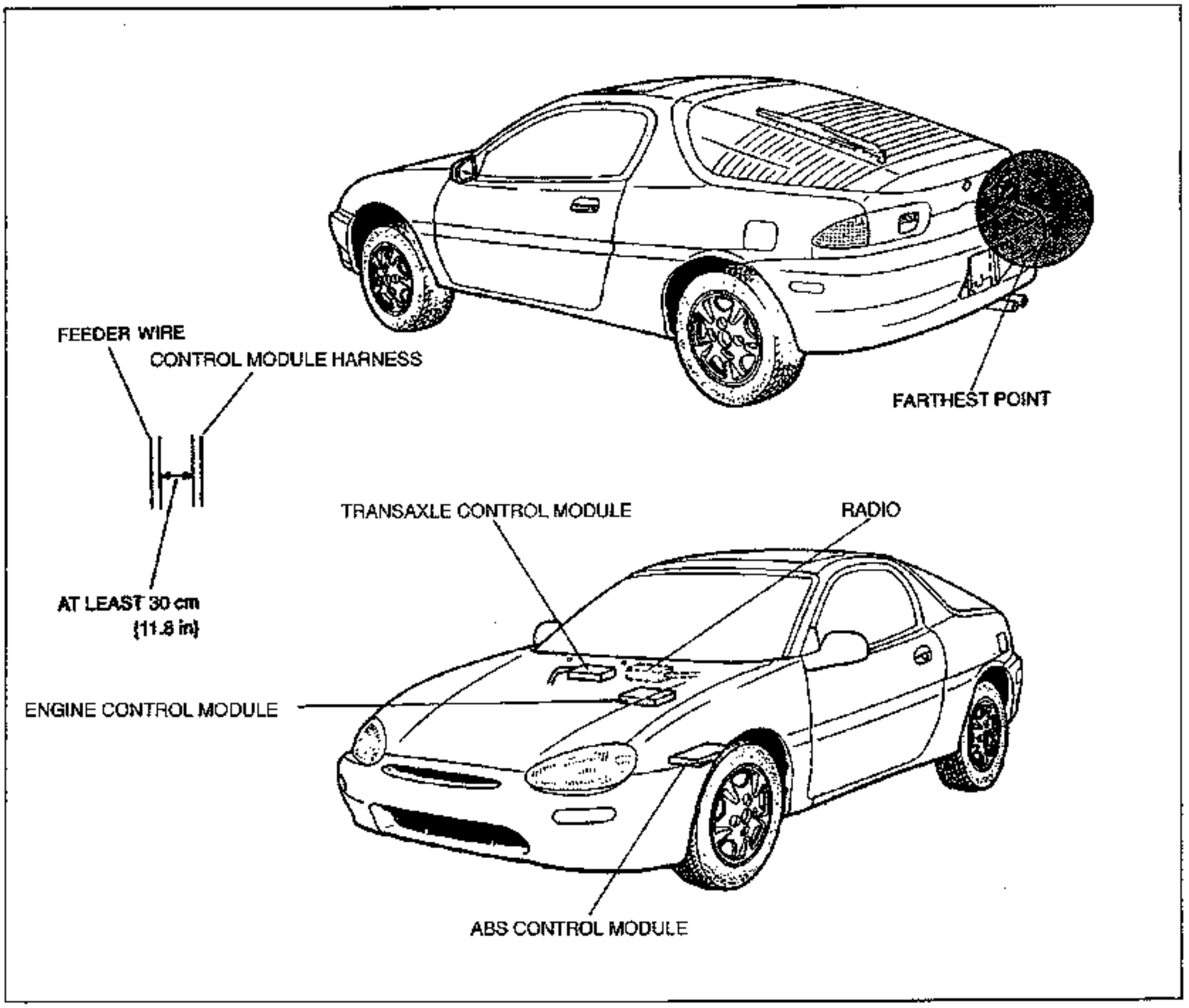
Caution

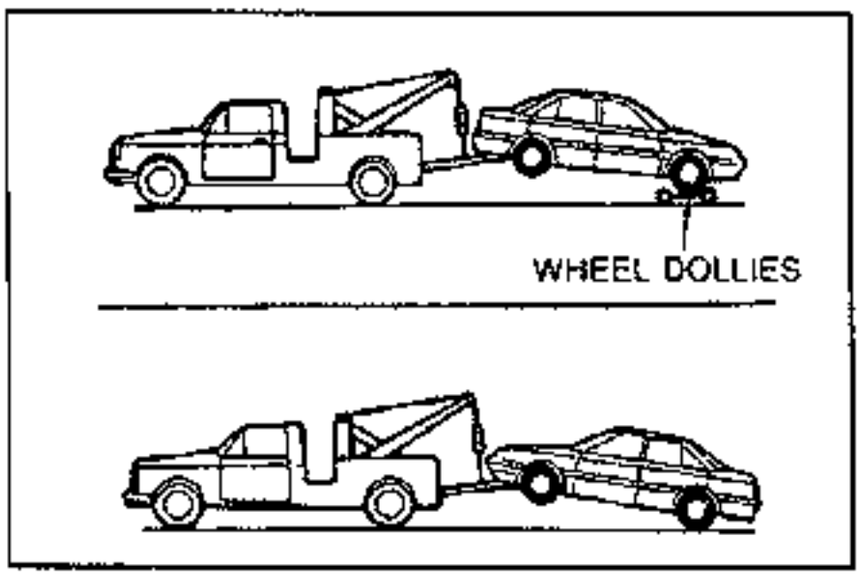
- **Determine and correct the cause of the burnt fuse before replacing it. If the fuse is replaced before doing this, it may burn again.**

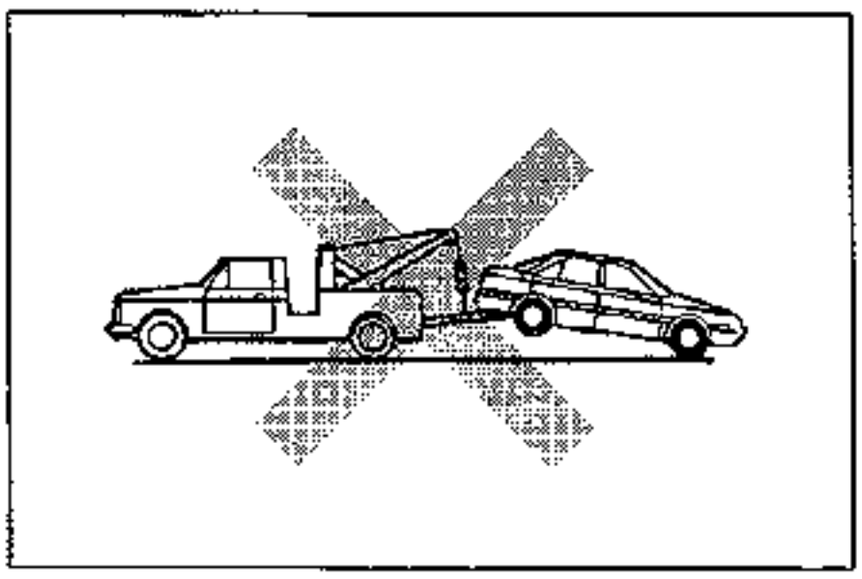
2. Install in the reverse order of removal.

INSTALLATION OF RADIO SYSTEM

If a radio system is installed improperly or if a high-powered type is used, the CIS and other systems may be affected.
When the vehicle is to be equipped with a radio, observe the following precautions:
1. Install the antenna at the farthest point from control modules.
2. Install the antenna feeder as far as possible from the control module harnesses **(at least 30 cm {11.8 in}).**
3. Ensure that the antenna and feeder are properly adjusted.
4. Do not install a high-powered radio system.







TOWING

Proper towing equipment is necessary to prevent damage to the vehicle. Laws and regulations applicable to vehicles in tow must always be observed.

As a general rule, towed vehicles should be pulled with thedriving wheels off the ground. If excessive damage or other conditions prevent towing the vehicle with the driving wheels off the ground, use wheel dollies.

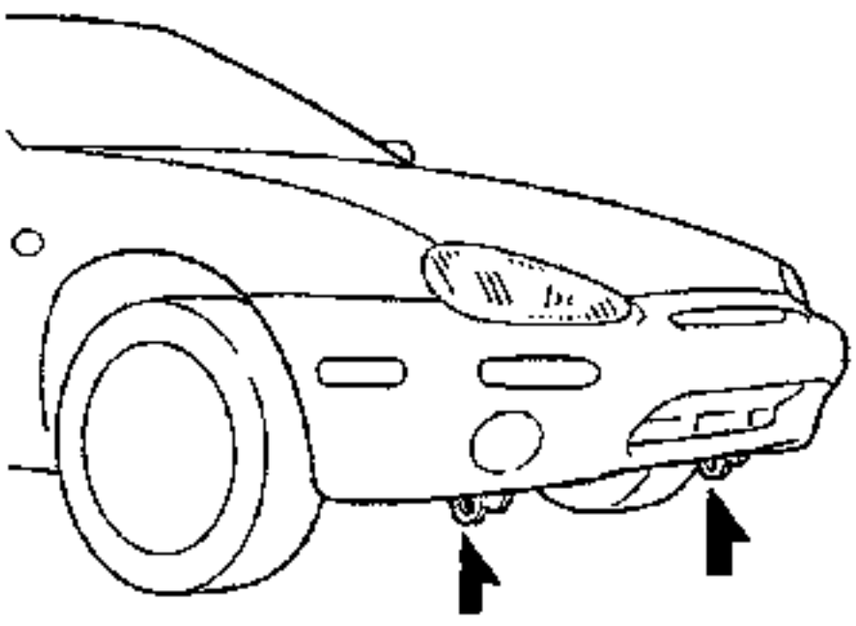
With either automatic or manual transaxle:
1. Set the ignition switch In the ACC position.
2. Place the selector lever or shift lever in N (Neutral).
3. Release the parking brake.

Caution
- **Do not tow the vehicle backward with driving wheels on the ground. This may cause internal damage to the transaxle.**

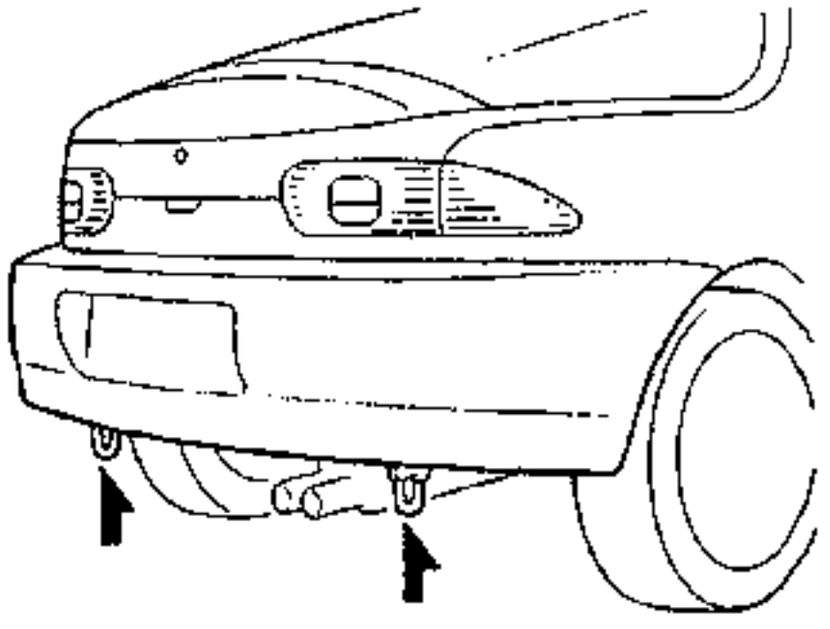
Caution
- **Don't use the hook loops under the front and rear for towing . They are designed ONLY for tying down the vehicle when it's being transported. Using them for towing will damage the bumper.**

TIE-DOWN HOOKS

FRONT



REAR



Before beginning any service procedure, refer to the 1995 MX–3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

CLUTCH

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SPECIFICATIONS ..... H– 4
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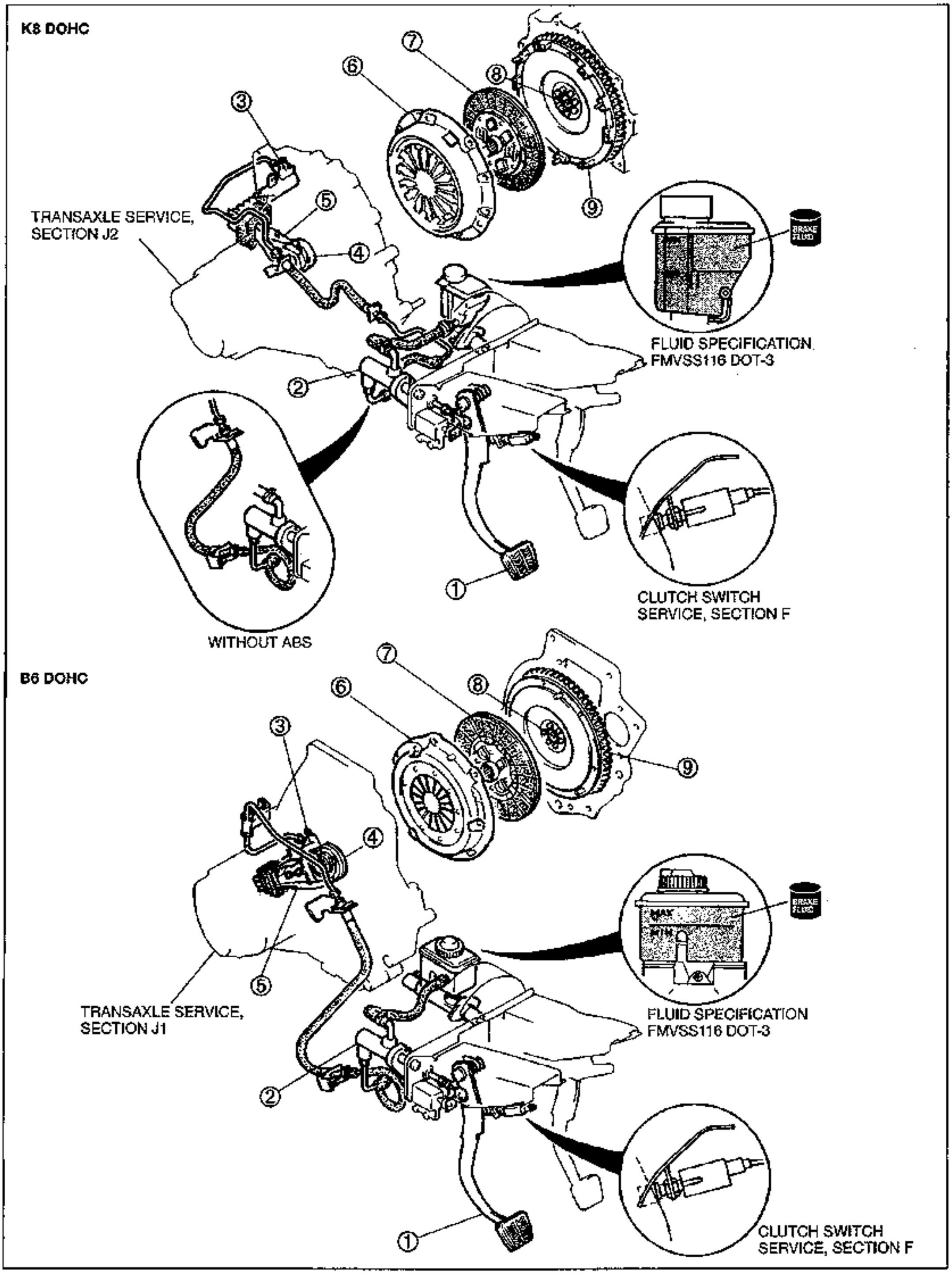
K8 DOHC
TRANSAXLE SERVICE, SECTION J2
FLUID SPECIFICATION FMVSS116 DOT-3
BRAKE FLUID
CLUTCH SWITCH SERVICE, SECTION F
WITHOUT ABS
B6 DOHC
TRANSAXLE SERVICE, SECTION J1
FLUID SPECIFICATION FMVSS116 DOT-3
BRAKE FLUID
CLUTCH SWITCH SERVICE, SECTION F

1. Clutch pedal
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2. Clutch master cylinder
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4. Clutch release collar
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6. Clutch cover
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7. Clutch disc
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8. Pilot bearing
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9. Flywheel
Removal / Installation ..... page H–16
Inspection ..... page H–20

OUTLINE

SPECIFICATIONS

Item \ Model				B6 DOHC	K8 DOHC
				F25M-R	G25M-R
Clutch control				Hydraulic	
Clutch cover	Type			Diaphragm Spring	
	Set load		N {kgf, lbf}	4,316 {440, 968}	
Clutch disc	Outer diameter		mm {in}	200 {7.87}	225 {8.86}
	Inner diameter		mm {in}	130 {5.12}	150 {5.91}
	Thick-ness	Pressure plate side	mm {in}	3.8 {0.150}	
		Flywheel side	mm {in}	3.5 {0.138}	
Clutch pedal	Type			Suspended	
	Pedal ratio			6.31	
	Full stroke		mm {in}	130 {5.12}	
	Height (with carpet)		mm {in}	199–204 {7.83–8.03}	
Master cylinder	Inner diameter		mm {in}	15.87 {0.625}	
Release cylinder	Inner diameter		mm {in}	19.05 {0.750}	
Clutch fluid				FMVSS116 DOT-3	

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Action	Page
Slipping	Clutch disc facing worn excessively	Replace	H–16
	Clutch disc facing surface hardened or oil on surface	Repair or replace	H–16, 19
	Pressure plate damaged	Replace	H–16
	Diaphragm spring damaged or weakened	Replace	H–16
	Insufficient clutch pedal play	Adjust	H– 6
	Clutch pedal sticking	Repair or replace	H– 7
	Flywheel damaged	Repair or replace	H–16, 20
Poor disengagement	Excessive runout or damaged clutch disc	Replace	H–16
	Clutch disc splines rusted or worn	Remove rust or replace	H–16
	Oil on facing	Repair or replace	H–16, 19
	Diaphragm spring weakened	Replace	H–16
	Excessive clutch pedal play	Adjust	H– 6
	Insufficient clutch fluid	Add fluid	H– 5
	Leakage of clutch fluid	Locate and repair or replace	—
Vibration of clutch when accelerating	Oil on facing	Repair or replace	H–16, 19
	Torsion dampers weakened	Replace	H–16
	Clutch disc facing hardened or damaged	Repair or replace	H–16, 19
	Clutch disc facing rivets loose	Replace	H–16
	Pressure plate damaged or has excessive runout	Replace	H–16
	Flywheel surface hardened or damaged	Repair or replace	H–16, 20
	Loose or worn engine mount	Tighten or replace	—
Clutch pedal sticking	Pedal shaft not properly lubricated	Lubricate or replace	H–7
Abnormal noise	Clutch release collar damaged	Replace	H–16
	Poor lubrication of release collar sleeve	Lubricate or replace	H–16
	Torsion dampers weakened	Replace	H–16
	Excessive crankshaft end play	Repair	Refer to section B1, B2
	Pilot bearing worn or damaged	Replace	H–16, 20
	Worn pivot points of release fork	Replace	H–16

CLUTCH FLUID

PREPARATION
SST

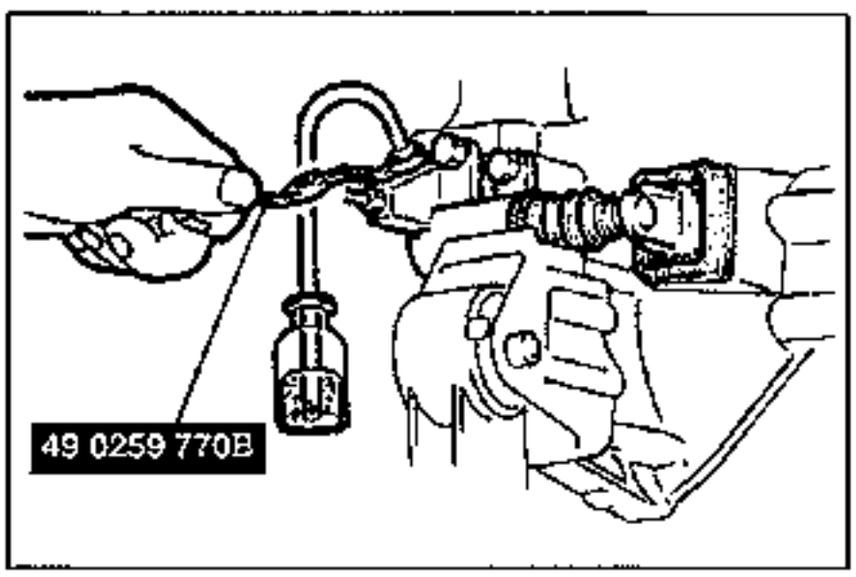
49 0259 770B Wrench, flare nut 	For air bleeding

REPLACEMENT

Note
- A common reservoir is used for the clutch and brake system fluids.

Caution
- **Clutch fluid will damage painted surfaces. If clutch fluid does get on a painted surface, wipe it off immediately.**

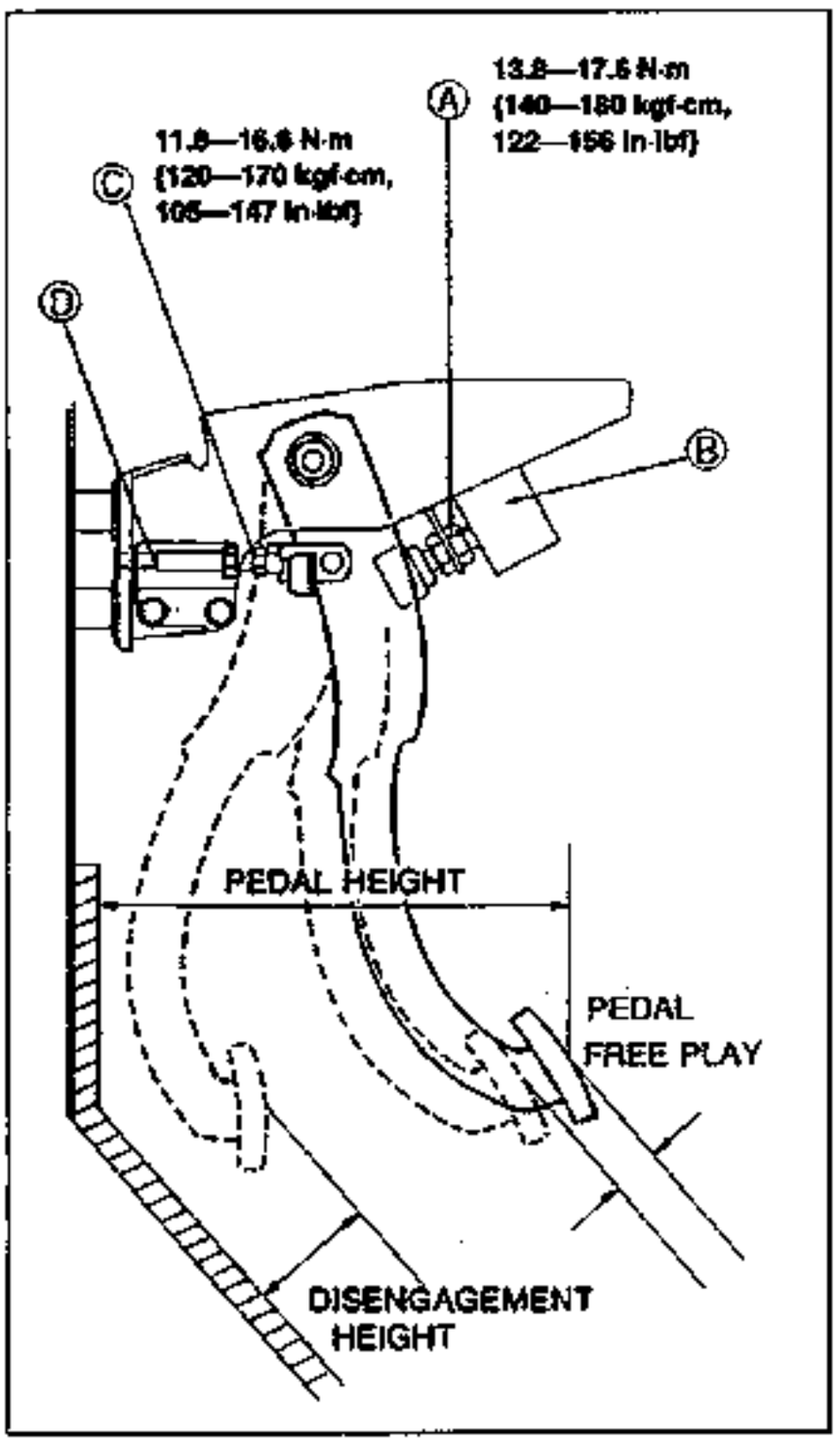
1. Remove the fluid from the reservoir by using a suction pump, and fill the reservoir with new fluid of the specified type.
2. Remove the bleeder cap from the clutch release cylinder and attach a vinyl hose to the bleeder plug.



3. Insert the other end of the vinyl hose into a clear container.
4. Working with another person, have the person depress the clutch pedal several times, then hold it down.
5. With the clutch pedal depressed, loosen the bleeder screw by using the **SST** to let the fluid escape. Close the bleeder screw.
6. Repeat steps 4 and 5 until only clean fluid is seen. Make sure the reservoir is always 3/4 full or more during this procedure.
7. Modify the bleeder screw tightening torque to allow for a torque wrench-**SST** combination. (Refer to section GI "Torque Formulas".)
8. Tighten the bleeder screw by using the **SST**.

   Tightening torque:
   5.9–8.8 N·m {60–90 kgf·cm, 53–78 in·lbf}

9. Fill the reservoir to MAX with new fluid of the specified type.
10. Slowly pump the clutch pedal several times. Verify that there is no fluid leakage.
11. Check operation of the clutch system.
12. Check operation of the brake system.



CLUTCH PEDAL

ADJUSTMENT

Height

Inspection

1. Measure the distance from the upper surface of the pedal pad to the carpet.

   Pedal height: 199–204 mm {7.83–8.03 in} (with carpet)

2. If necessary, adjust the pedel height

Adjustment

1. Disconnect the clutch switch connector.
2. Loosen locknut Ⓐ and turn clutch switch Ⓑ until the height is correct.
3. Tighten locknut Ⓐ.

   Tightening torque:
   13.8–17.6 N·m {140–180 kgf·cm, 122–156 in·lbf}

4. After adjustment, measure the pedal free play.

Free Play

Inspection

1. Depress the clutch pedal by hand until clutch resistance is felt.

   Pedal free play: 0.6–3.2 mm {0.02–0.12 in}

   Total pedal free play: 5–16 mm {0.19–0.63 in}

2. If necessary, adjust the pedal free play.

Adjustment

1. Loosen locknut Ⓒ and turn push rod Ⓓ until the pedal free play is correct.
2. Verify that the disengagement height (from the upper surface of the pedal pad to the carpet) is correct when the pedal is fully depressed.

   Minimum disengagement height: 39.5 mm {1.56 in} (with carpet)

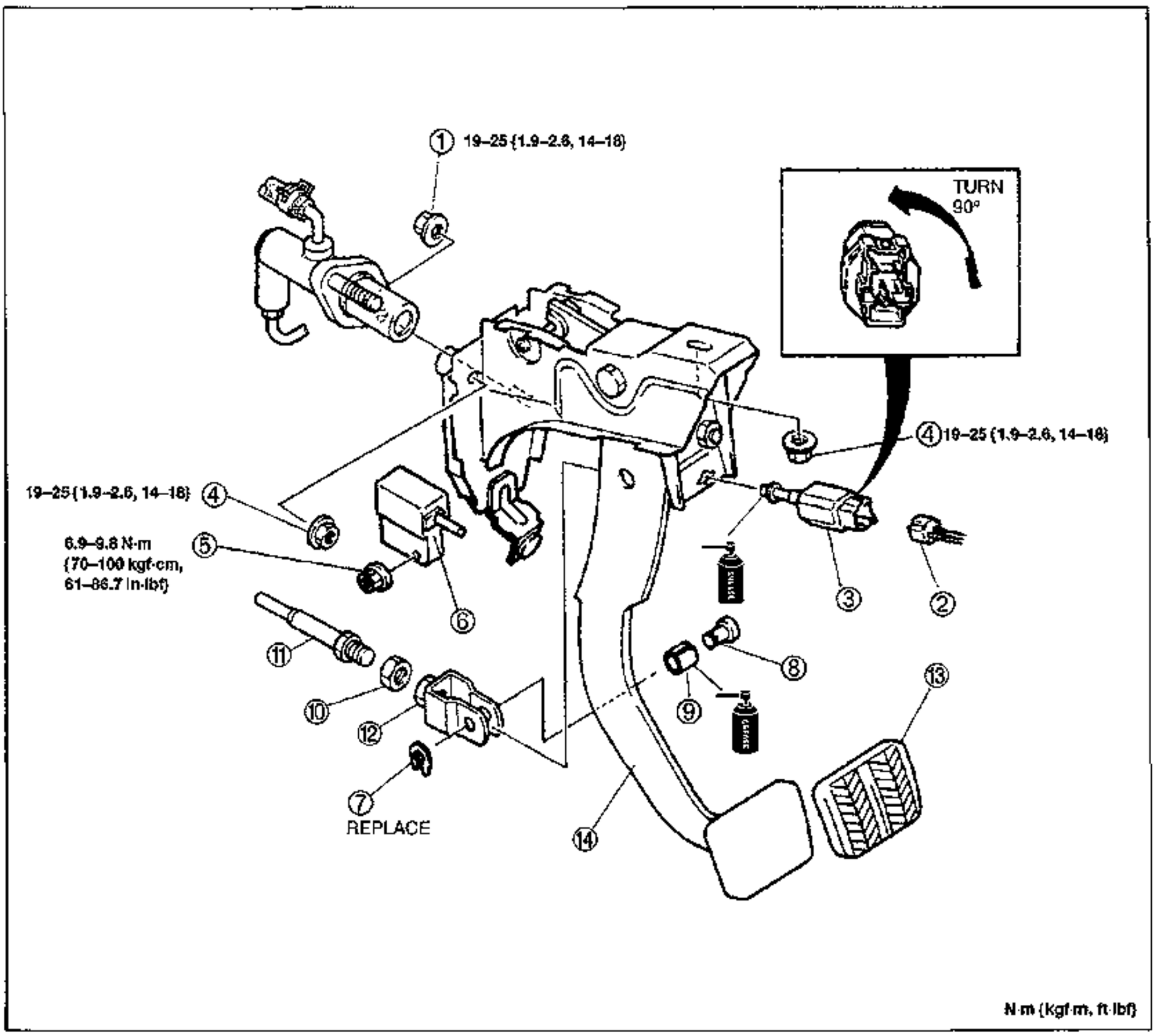
3. Tighten locknut Ⓒ.

   Tightening torque:
   11.8–16.6 N·m {120–170 kgf·cm, 105–147 in·lbf}

4. After adjustment, measure the pedal height.

REMOVAL / INSTALLATION

1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal.



1. Nut
2. Clutch switch connector
3. Clutch switch
4. Nut
5. Nut
6. Starter interlock switch
7. Clip
8. Pin
9. Bushing
10. Nut
11. Push rod
    Inspect for damage and bending
12. Clevis
13. Pedal pad
14. Clutch pedal
    Adjustment ..... page H–6

CLUTCH MASTER CYLINDER

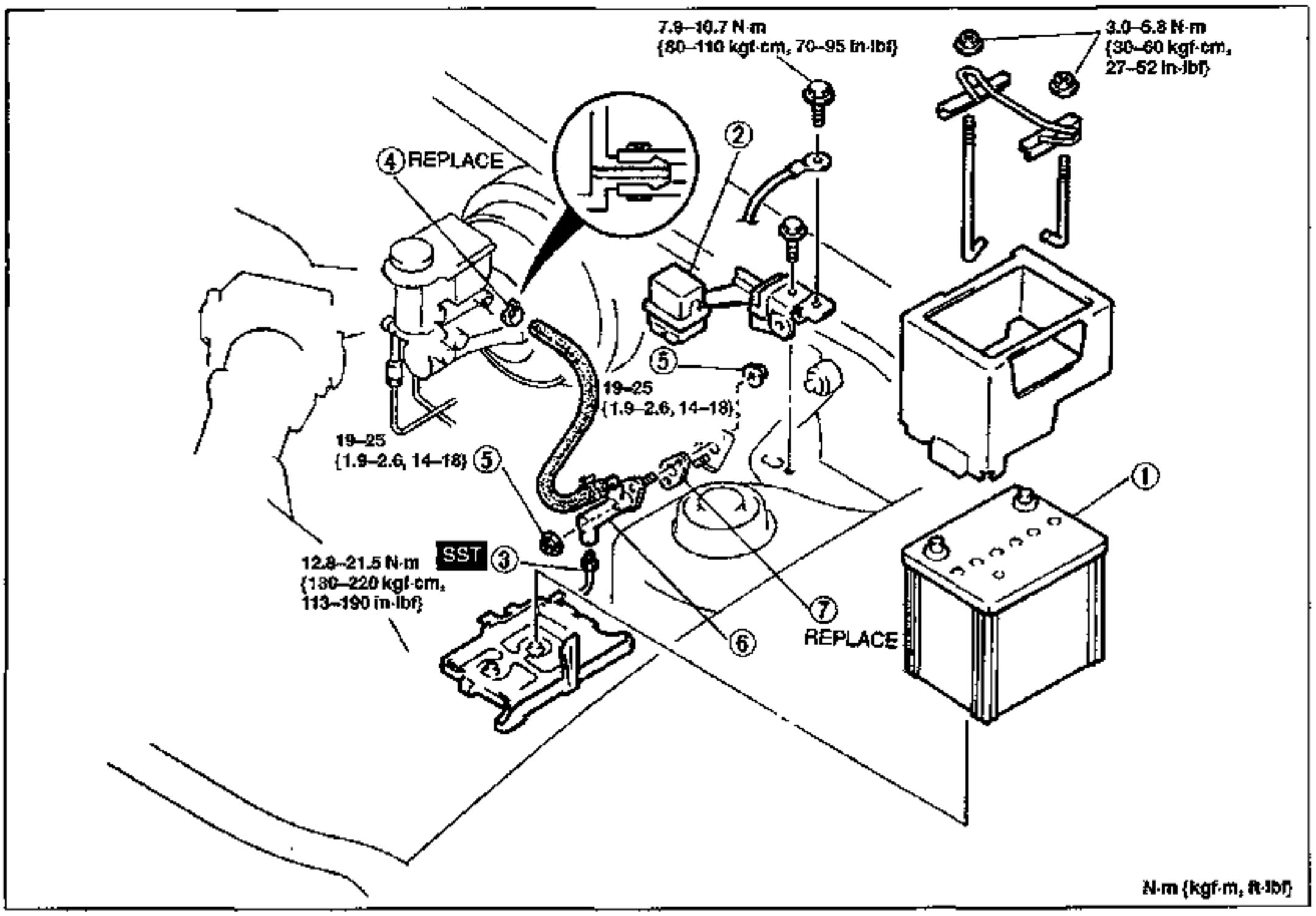
PREPARATION
SST

49 0259 770B Wrench, flare nut 	For disconnecting / connecting clutch pipe

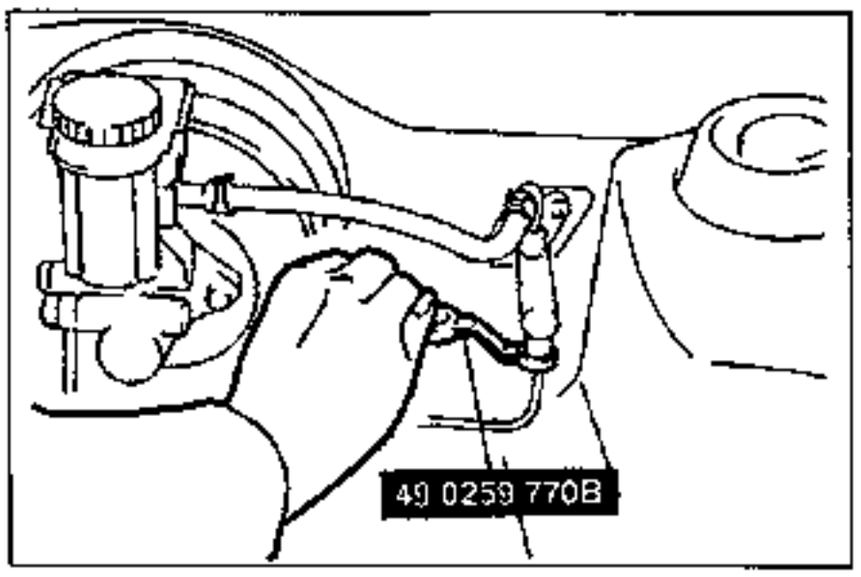
REMOVAL / INSTALLATION

Caution
- **Clutch fluid will damage painted surfaces. If clutch fluid does get on a painted surface, wipe it off immediately.**

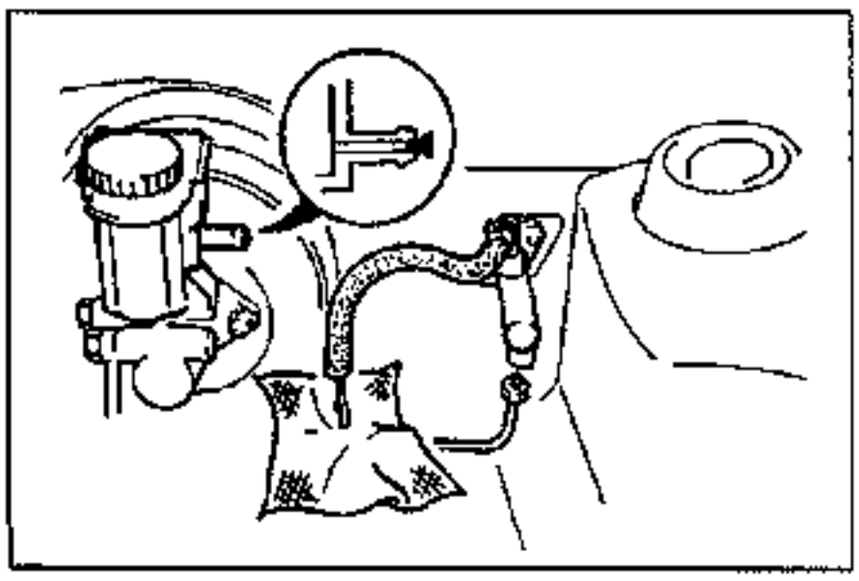
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.
3. After installation, bleed the clutch system. (Refer to page H–9.)
4. Inspect and adjust the clutch pedal height and free play. (Refer to page H–6.)



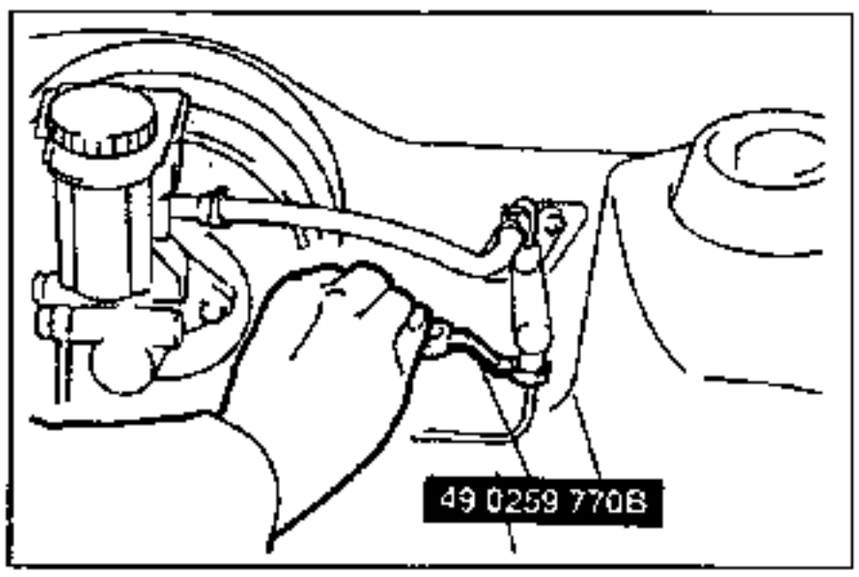
1. Battery
2. Data link connector
3. Clutch pipe
   - Removal Note ..... page H–9
   - Installation Note ..... page H–9
4. Clip
5. Nut
6. Clutch master cylinder
   - Check for fluid leakage from cylinder bore
   - Overhaul ..... page H–11
   - Air bleeding ..... page H– 9
7. Gasket



Removal Note
Clutch pipe
1. Disconnect the clutch pipe by using the **SST**.

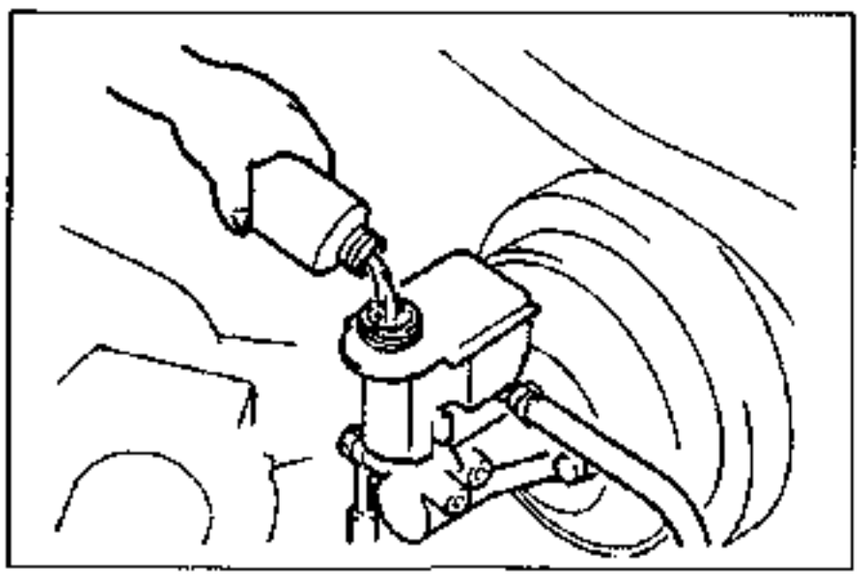


2. Disconnect the clutch hose from the reservoir.
3. Plug the outlet of the reservoir.



Installation Note
Clutch pipe
1. Modify the clutch pipe tightening torpue to allow for a torque wrench-**SST** combination. (Refer to section GI "Torque Formulas".)
2. Tighten the clutch pipe by using the **SST**.

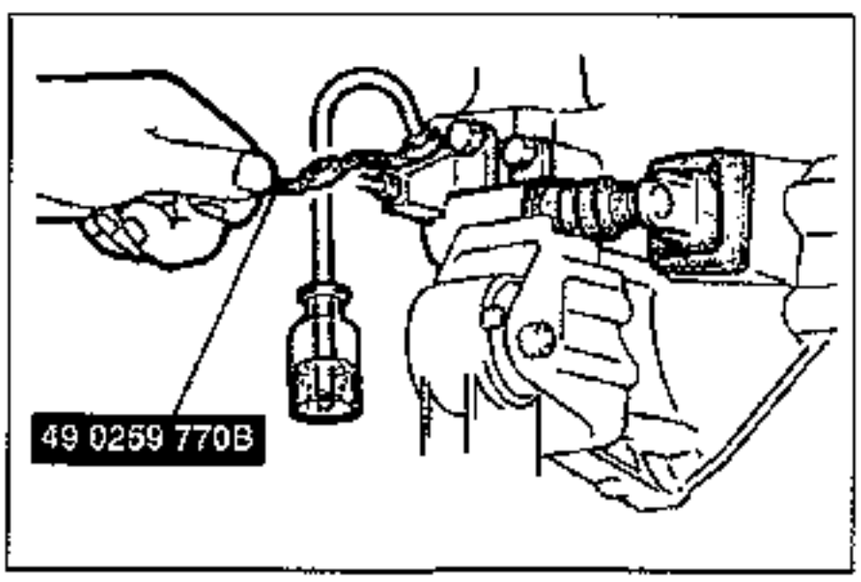
Tightening torque:
12.8–21.5 N·m {130–220 kgf·cm, 113–190 in·lbf}



AIR BLEEDING

The clutch hydraulic system must be bled to remove air introduced whenever a hydraulic line is disconnected.

Caution
- **Clutch fluid will damage painted surfaces. If clutch fluid does get on a painted surface, wipe it off immediately.**



1. Remove the bleeder cap from the clutch release cylinder and attach a vinyl hose to the bleeder plug.
2. Insert the other end of the vinyl hose into a clear container.
3. Working with another person, have the person depress the clutch pedal several times, then hold it down.
4. With the clutch pedal depressed, loosen the bleeder screw by using the **SST** to let fluid and air escape. Close the bleeder screw.
5. Repeat steps 3 and 4 until no air bubbles are seen. Make sure the reservoir is always 3/4 full or more during this procedure.

6. Modify the bleeder screw tightening torque to allow for a torque wrench-**SST** combination. (Refer to section GI "Torque Formulas".)
7. Tighten the bleeder screw by using the **SST**.

   Tightening torque:
   5.9–8.8 N·m {60–90 kgf·cm, 52–78 in·lbf}

8. Fill the reservoir to MAX with new fluid of the specified type.
9. Slowly pump the clutch pedal several times. Verify that there is no fluid leakage.
10. Check operation of the clutch system.
11. Check operation of the brake system.

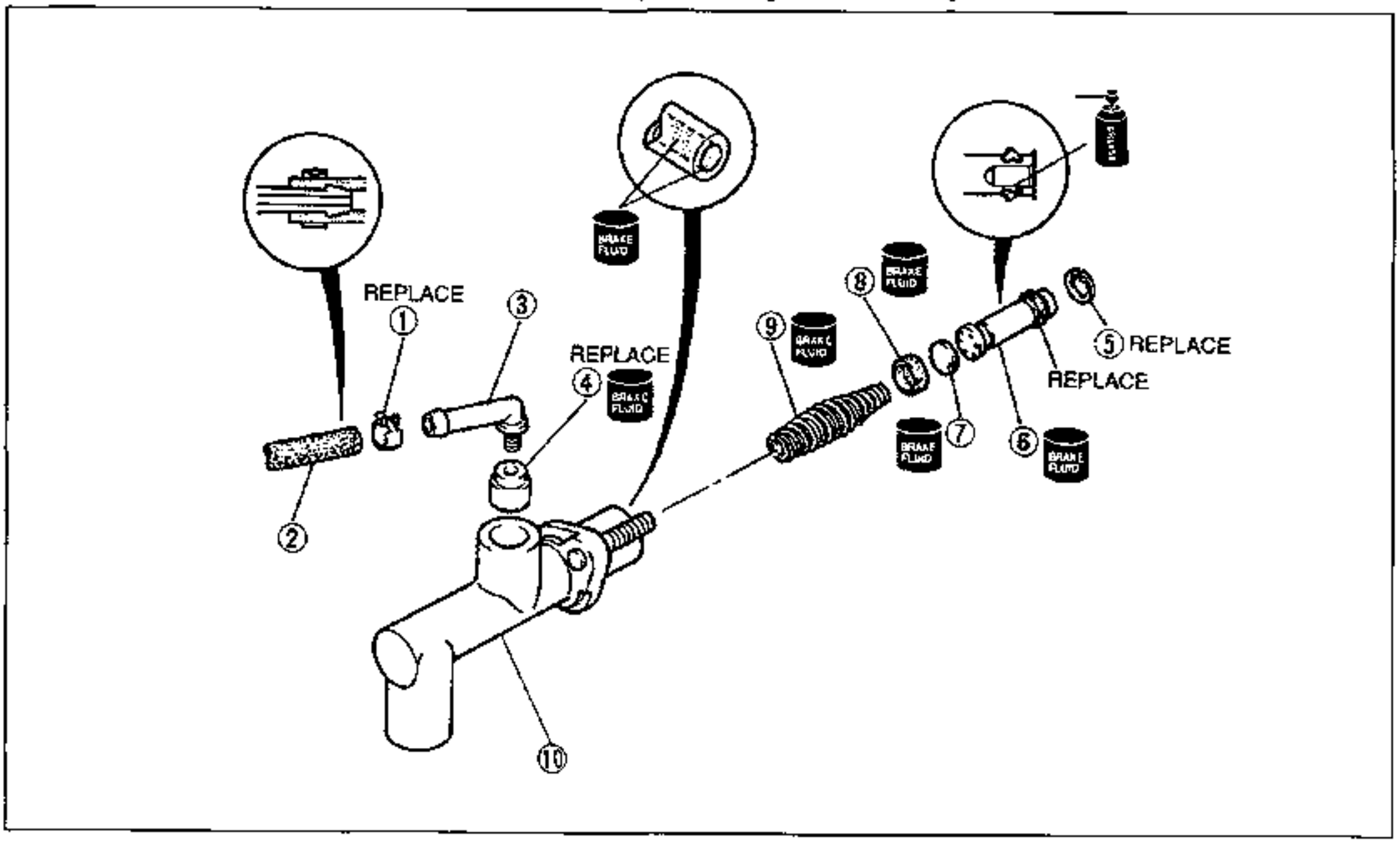
OVERHAUL

1. Disassemble in the order shown in the figure, referring to **Disassembly Note.**
2. Inspect all parts and repair or replace as necessary.

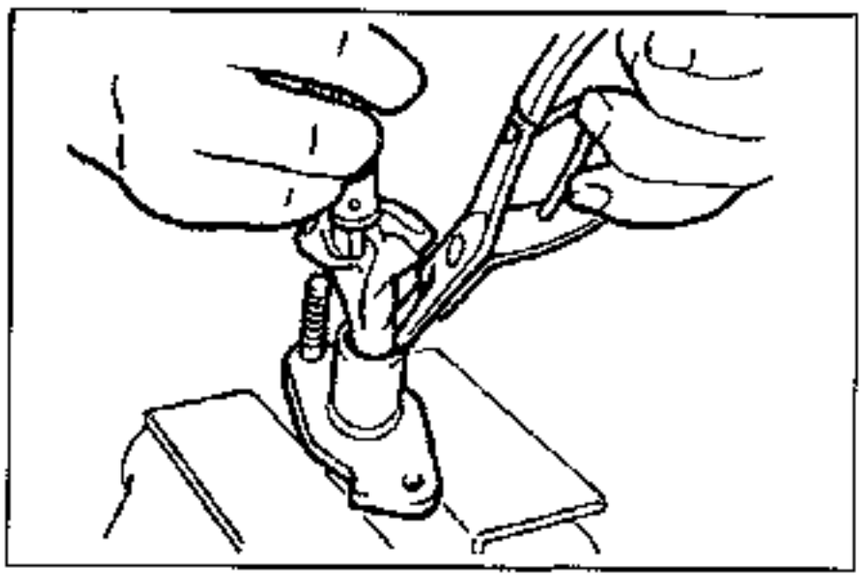
Warning

- **Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eye wear whenever using compressed air.**

3. Wipe all parts, and clean all parts, passages, and inner parts with compressed air.
4. Assemble in the reverse order of disassembly, referring to **Assembly Note.**



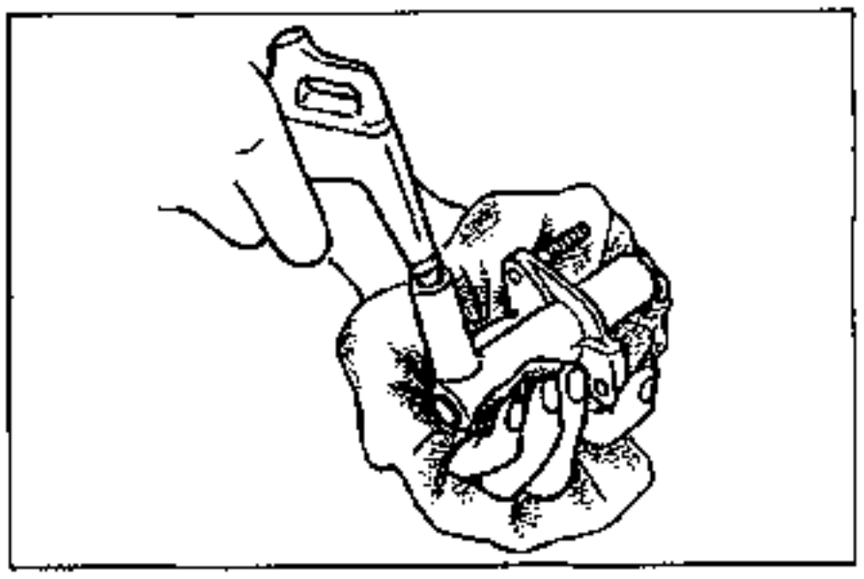
1. Clip
2. Hose
3. Joint
4. Bushing
5. Snap ring
   Disassembly Note ..... below
   Assembly Note ..... page H–12
6. Piston and secondary cup assembly
   Disassembly Note ..... page H–12
   Assembly Note ..... page H–12
   Inspect for wear, scoring and cracks
7. Spacer
8. Primary cup
   Inspect for wear and cracks
9. Return spring
10. Master cylinder body
    Inspect cylinder bore for scoring and corrosion



Disassembly Note

Snap ring

While holding the piston down with a cloth-wrapped pin punch, remove the snap ring.

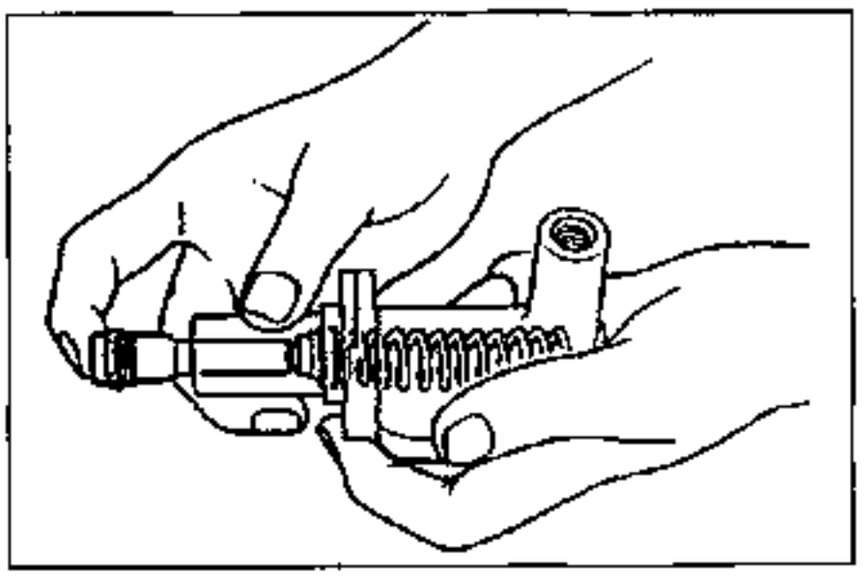


Piston and secondary cup assembly

Warning

- **Applying compressed air to the cylinder assembly can make the contents suddenly pop out, possibly causing injury. Hold a rag over the cylinder opening when using compressed air.**

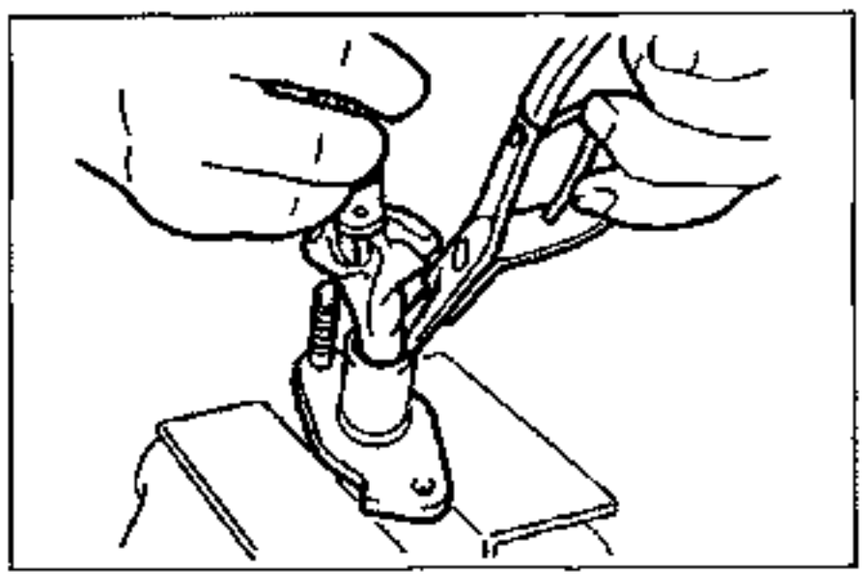
Remove the piston and secondary cup assembly, spacer, and primary cup by applying compressed air through the clutch pipe installation hole.



Assembly Note

Piston and secondary cup assembly

1. Apply new fluid of the specified type to the cylinder bore and all internal parts.
2. Verify that all parts are completely free of dirt, dust, and other small particles.
3. Install the spring, primary cup, spacer, and piston and secondary cup assembly into the master cylinder body.



Snap ring

While holding the piston down with a cloth-wrapped pin punch, install the snap ring.

CLUTCH RELEASE CYLINDER

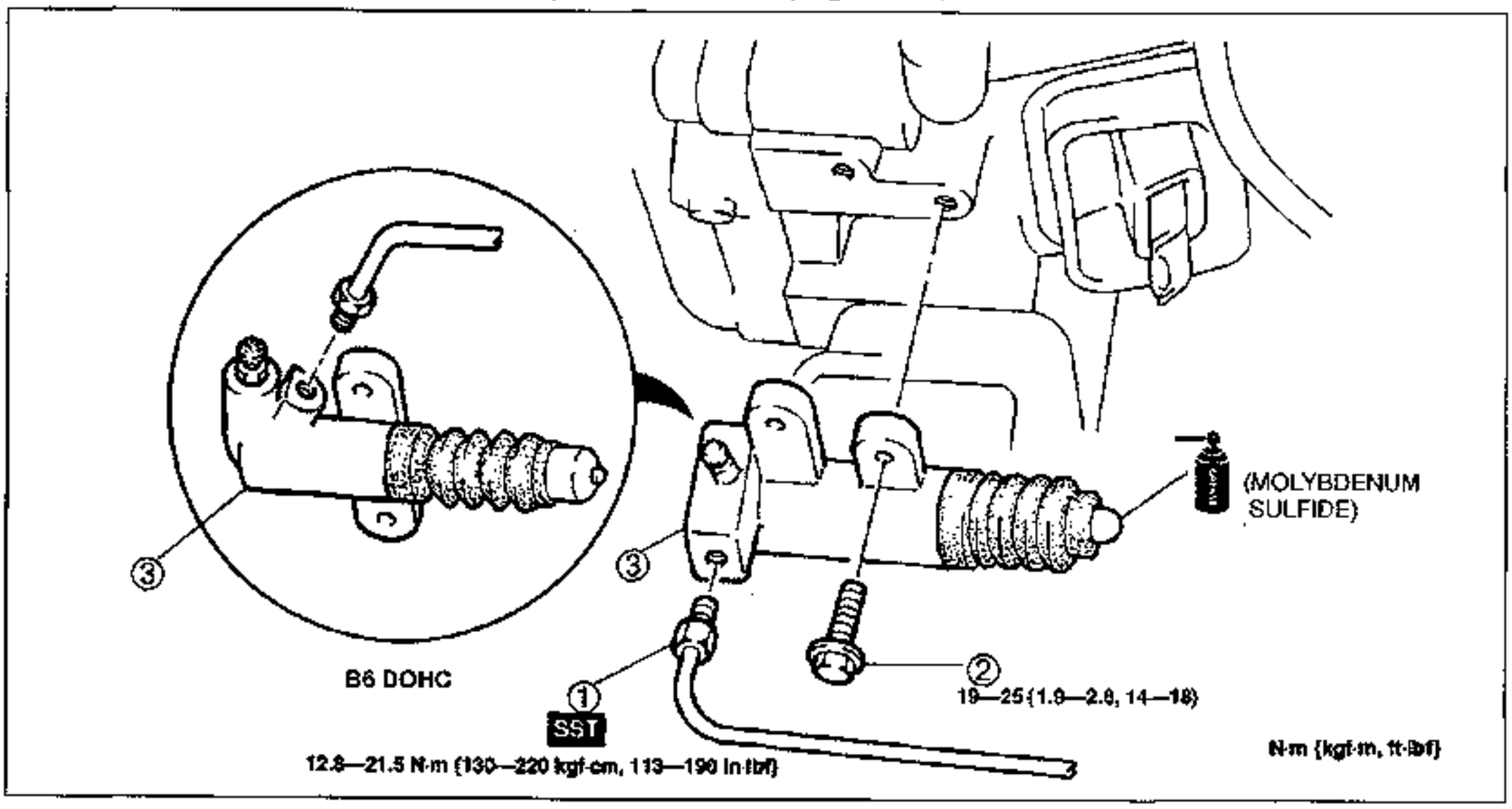
PREPARATION
SST

49 0259 770B Wrench, flare nut 	For disconnecting/ connecting clutch pipe

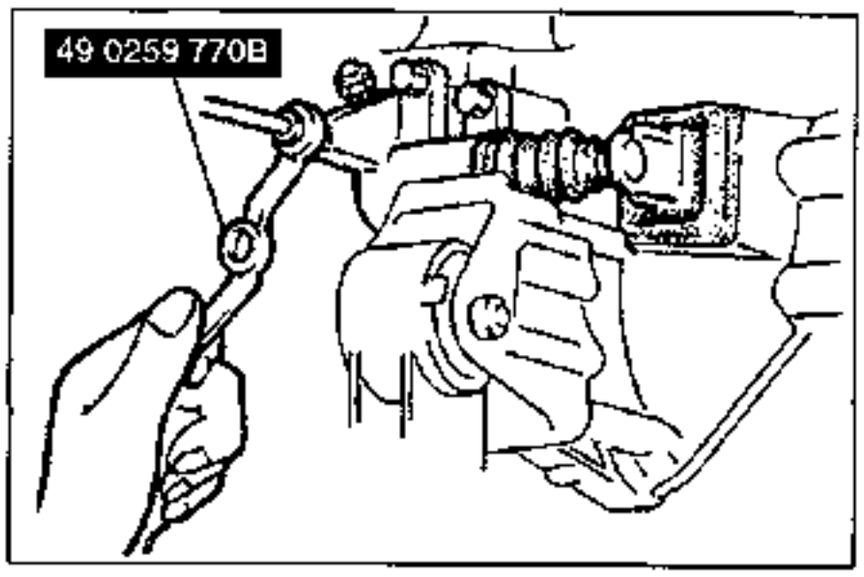
REMOVAL / INSTALLATION

Caution
- **Clutch fluid will damage painted surfaces. If clutch fluid does get on a painted surface, wipe it off immediately.**

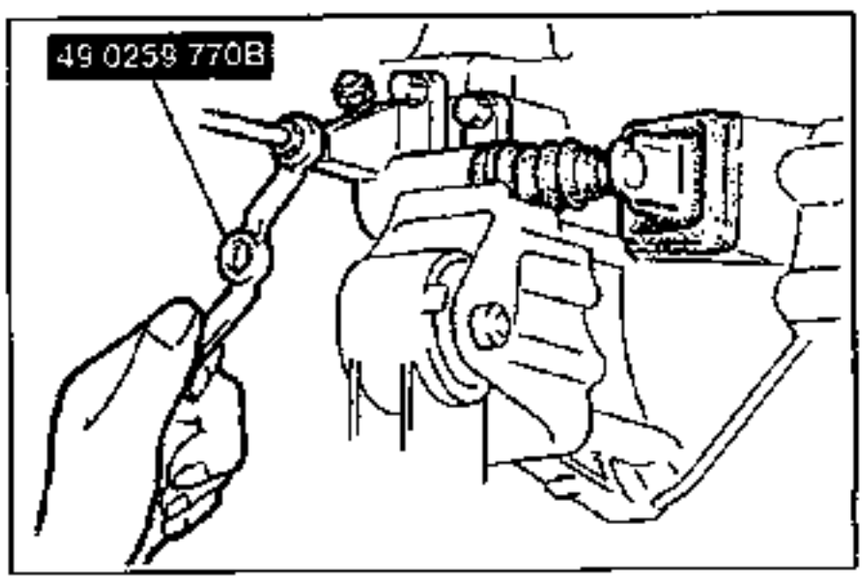
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.
3. After installation, bleed the clutch system. (Refer to page H–9.)



1. Clutch pipe
   Removal Note ..... below
   Installation Note ..... page H–14
2. Bolt
3. Clutch release cylinder
   Remove boot and check for fluid leakage
   Overhaul ..... page H–14



Removal Note
Clutch pipe
Disconnect the clutch pipe by using the **SST**, and plug the clutch pipe **immediately**.



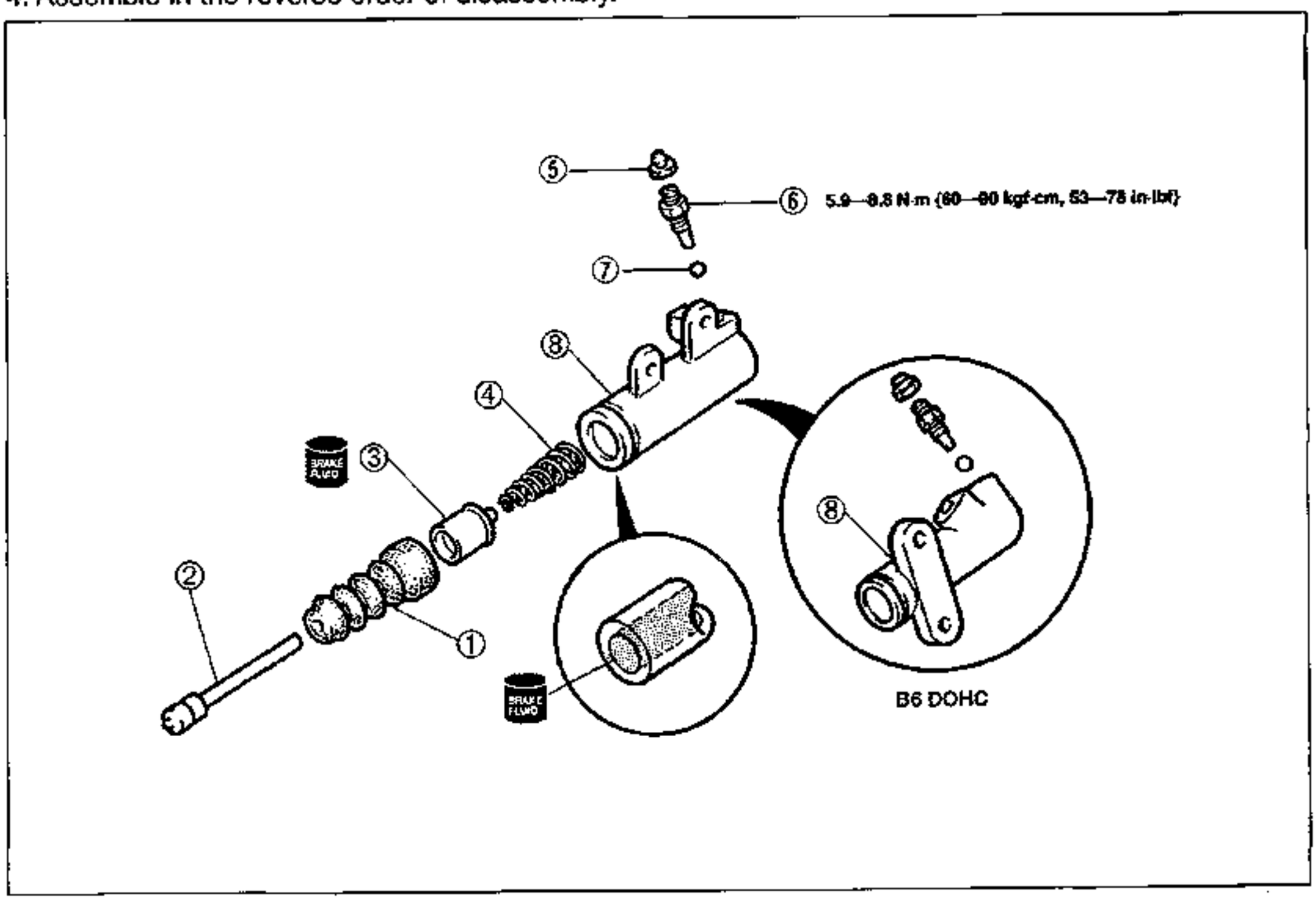
Installation Note
Clutch pipe
1. Modify the clutch pipe tightening torque to allow for a torque wrench-**SST** combination. (Refer to section GI "Torque Formulas".)
2. Tighten the clutch pipe by using the **SST**.

Tightening torque
12.8–21.5 N·m {130–220 kgf·cm, 113–190 in·lbf}

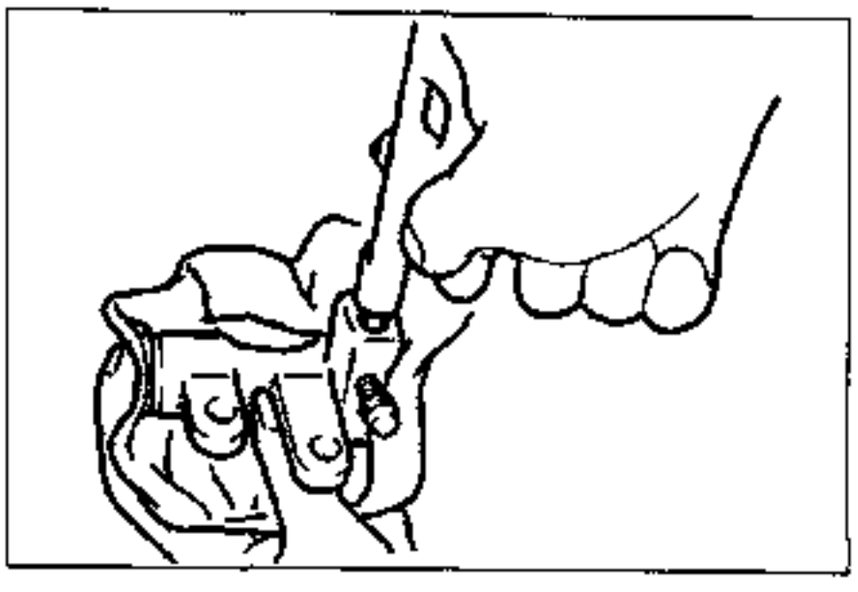
OVERHAUL
1. Disassemble in the order shown in the figure, referring to **Disassembly Note.**
2. Inspect all parts and repair or replace as necessary.

Warning
- **Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eye wear whenever using compressed air.**

3. Wipe all parts, and clean all ports, passages, and inner parts with compressed air.
4. Assemble in the reverse order of disassembly.



1. Boot
2. Push rod
3. Piston and cup assembly
   Disassembly Note ..... page H–15
   Inspect for wear, scoring and cracks
4. Return spring
5. Bleeder cap
6. Bleeder screw
7. Steel ball
8. Release cylinder body
   Inspect cylinder bore for scoring and corrosion
   Replace clutch release cylinder assembly if necessary.



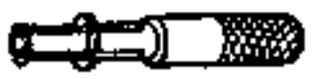
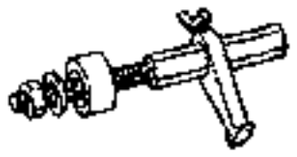
Disassembly Note
Piston and cup assembly

Warning
- **Applying compressed air to the cylinder assembly can make the contents suddenly pop out, possibly causing injury. Hold a rag over the cylinder opening when using compressed air.**

Remove the piston and cup assembly by applying compressed air through the clutch pipe installation hole.

CLUTCH UNIT

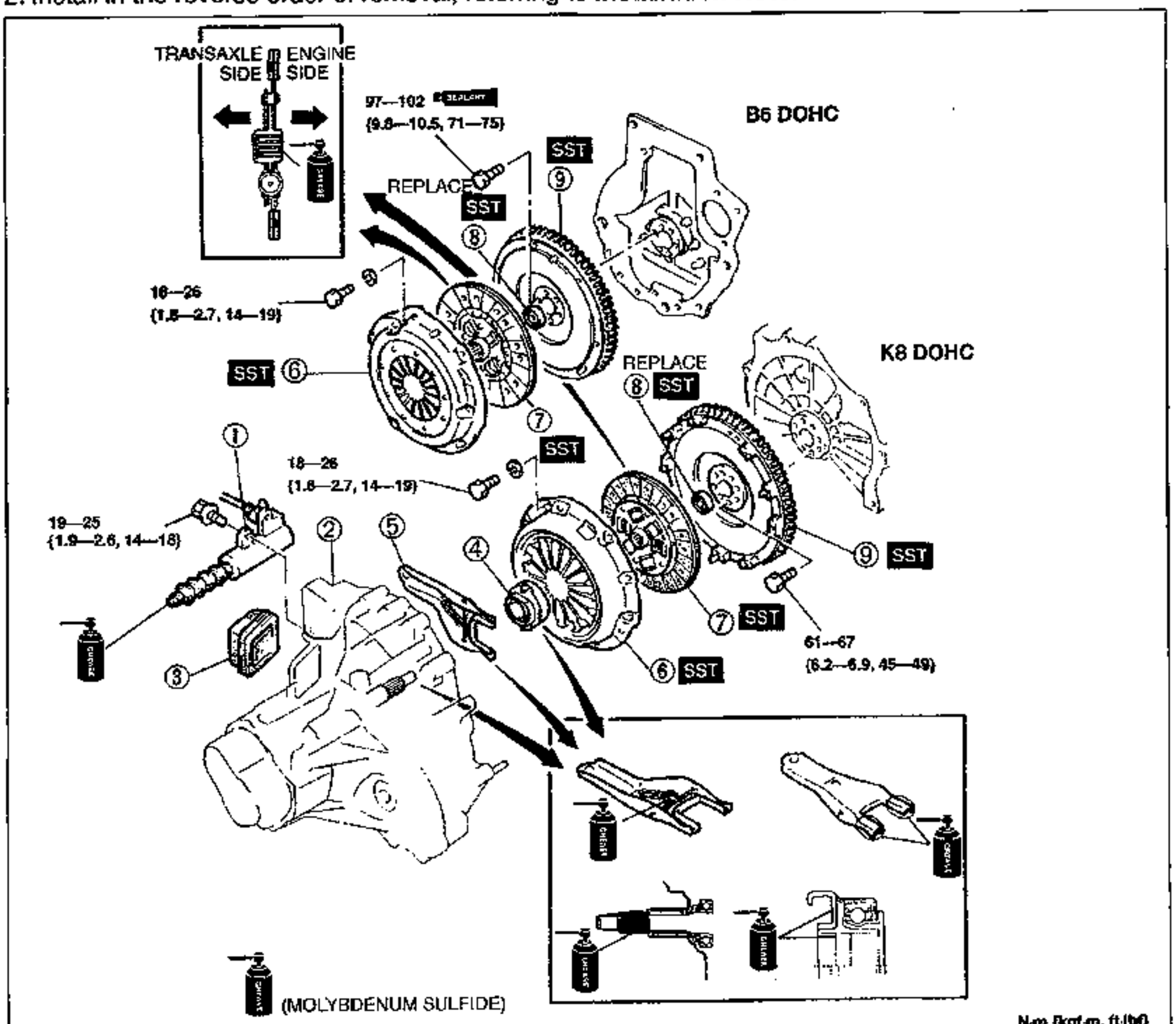
PREPARATION
SST

49 SE01 310A Centering tool, clutch disc 	For Support of clutch disc	49 1285 071 Puller, bearing 	For removal of pilot bearing
49 1285 073 Chuck (Part of 49 1285 071) 	For removal of pilot bearing	49 E011 1A0 Brake, ring gear 	For prevention of engine rotation
49 E011 103 Shaft (Part of 49 E011 1A0) 	For prevention of engine rotation	49 E011 105 Stopper (Part of 49 E011 1A0) 	For prevention of engine rotation
49 E011 104 Collar (Part of 49 E011 1A0) 	For prevention of engine rotation		

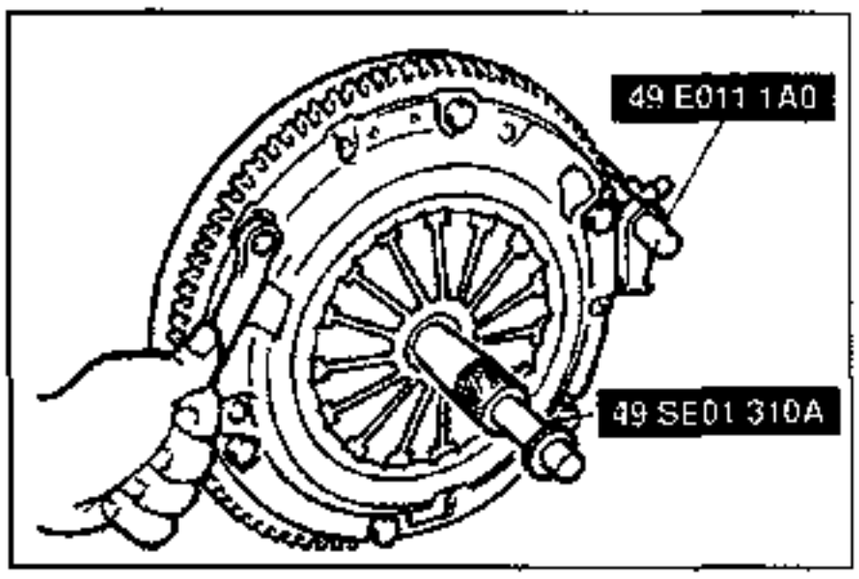
REMOVAL / INSTALLATION

Note
- The clutch release cylinder can be removed from the transaxle with the clutch pipe connected.

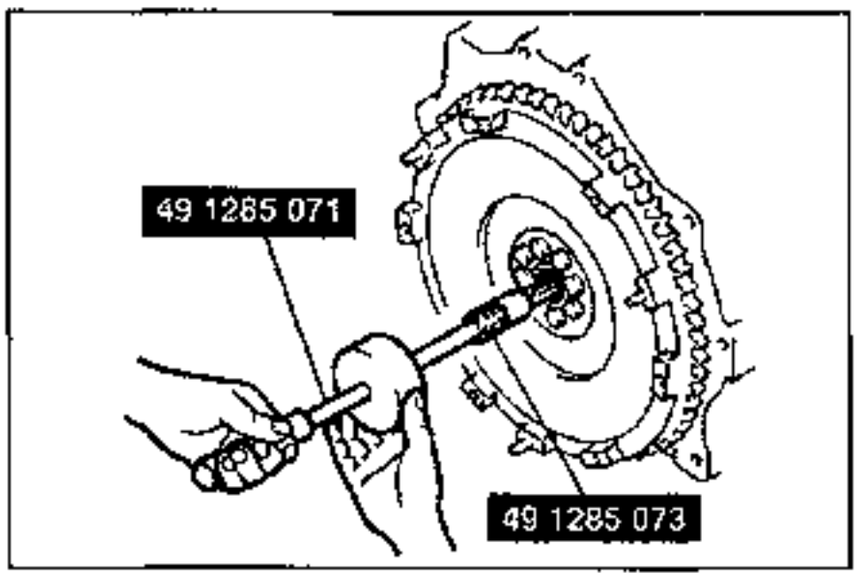
1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Install in the reverse order of removal, referring to **Installation Note.**



1. Clutch release cylinder
2. Transaxle
   Service ..... sections J1, J2
3. Boot
4. Clutch release collar
   Inspection ..... page H–20
5. Clutch release fork
6. Clutch cover
   Removal Note ..... page H–17
   Inspection ..... page H–18
   Installation Note ..... page H–18
7. Clutch disc
   Removal Note ..... page H–17
   Inspection ..... page H–19
   Installation Note ..... page H–18
8. Pilot bearing
   Inspection ..... page H–20
   Removal Note ..... page H–17
   Installation Note ..... page H–18
9. Flywheel
   Removal Note ..... page H–17
   Inspection ..... page H–20
   Installation Note ..... page H–17



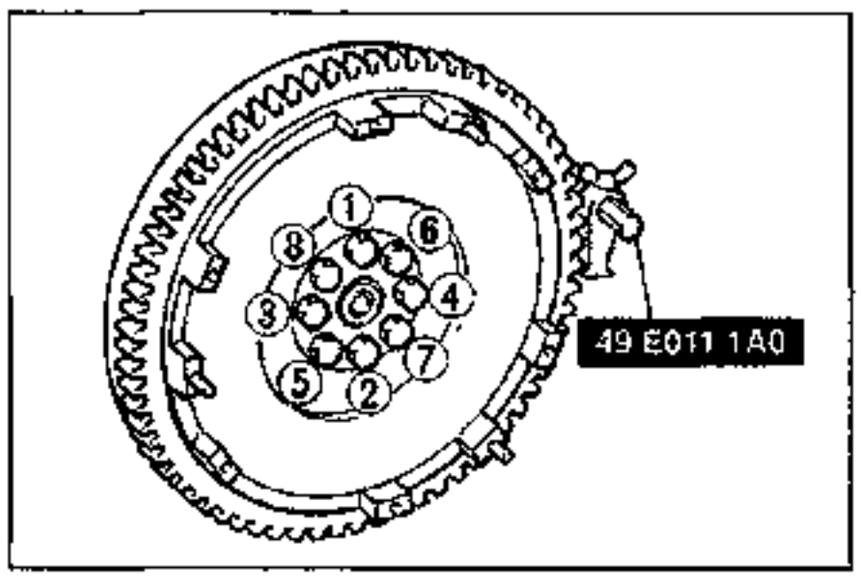
Removal Note
Clutch cover and clutch disc
1. Support the clutch disc by using the **SST**.
2. Install the **SST** or equivalent.
3. Loosen each bolt one turn at a time in a crisscross pattern until spring tension is released. Then remove the clutch cover and disc.



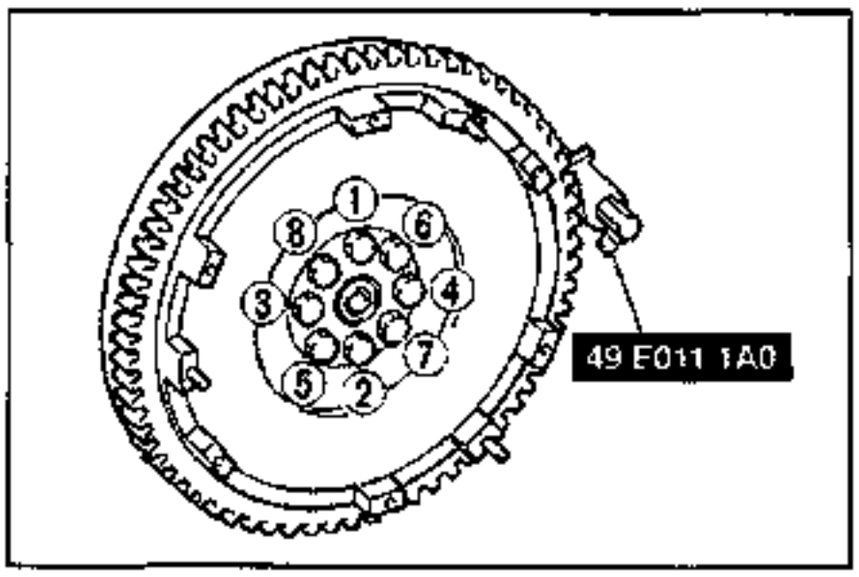
Pilot bearing

Note
- The pilot bearing does not have to be removed unless you are replacing it.

If removing the pilot bearing, use the **SST**.

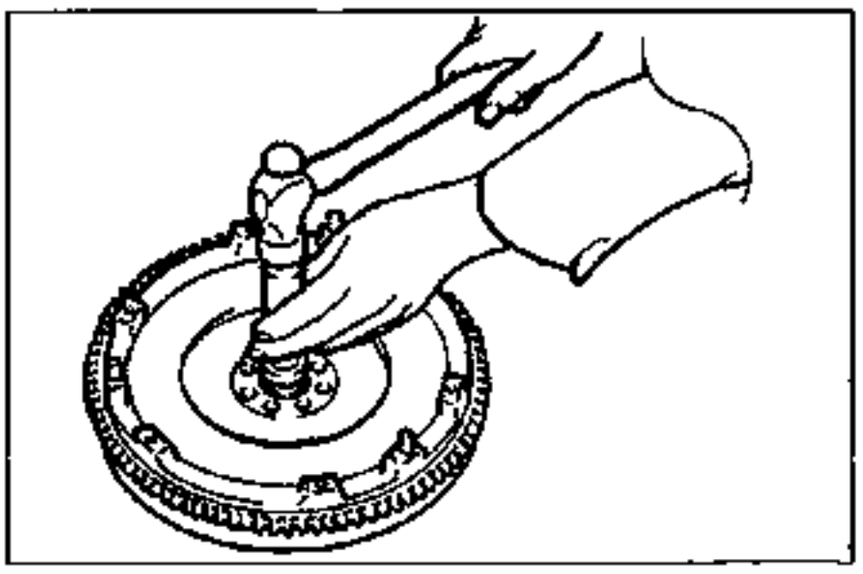


Flywheel
1. Hold the flywheel by using the **SST** or equivalent.
2. Remove the bolts evenly and gradually in the figure shown.
3. Remove the flywheel.
4. Inspect for oil leakage from the crankshaft rear oil seal. If there is any such leakage or if the oil seal is damaged, refer to sections B1 or B2 and replace the crankshaft oil seal.



Installation Note
Flywheel
1. Wipe the bolts clean and apply sealant to the bolt threads.
2. Install the flywheel and the **SST** or equivalent.
3. Tighten the bolts in the pattern shown.

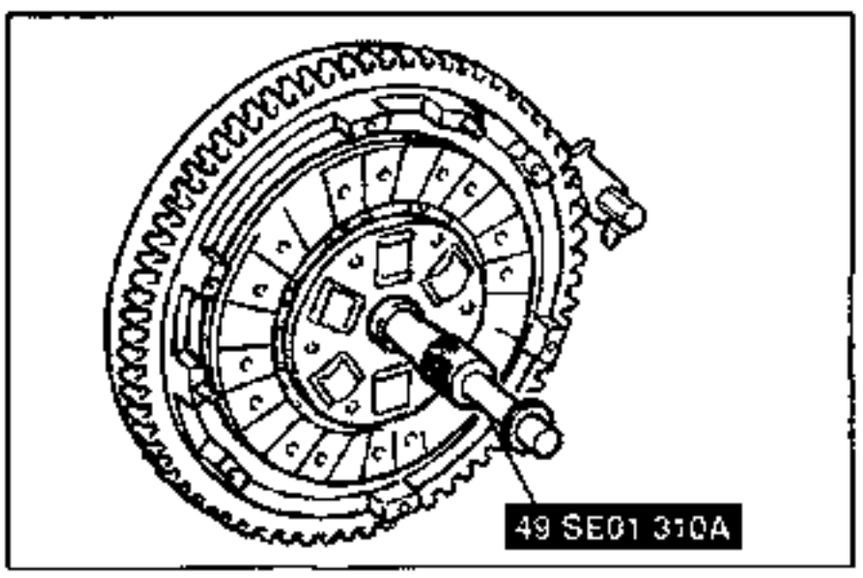
Tightening torque:
97–102 N·m {9.8–10.5 kgf·m, 71–75 ft·lbf} (B6 DOHC)
61–67 N·m {6.2–6.9 kgf·m, 45–49 ft·lbf} (K8 DOHC)



Pilot bearing

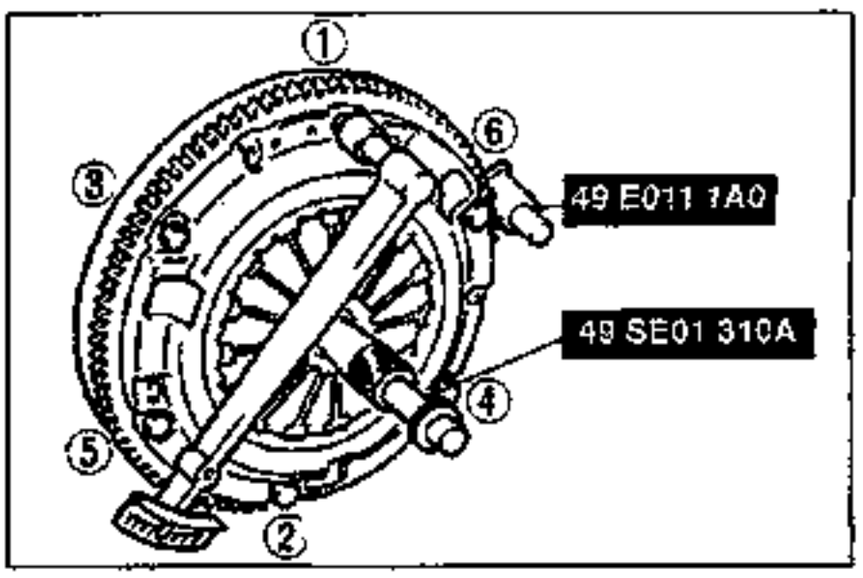
Install a new pilot bearing by using a suitable pipe.

Pipe outer diameter: 35 mm {1.378 in}
Depth of press: 0–0.4 mm {0–0.016 in}



Clutch disc

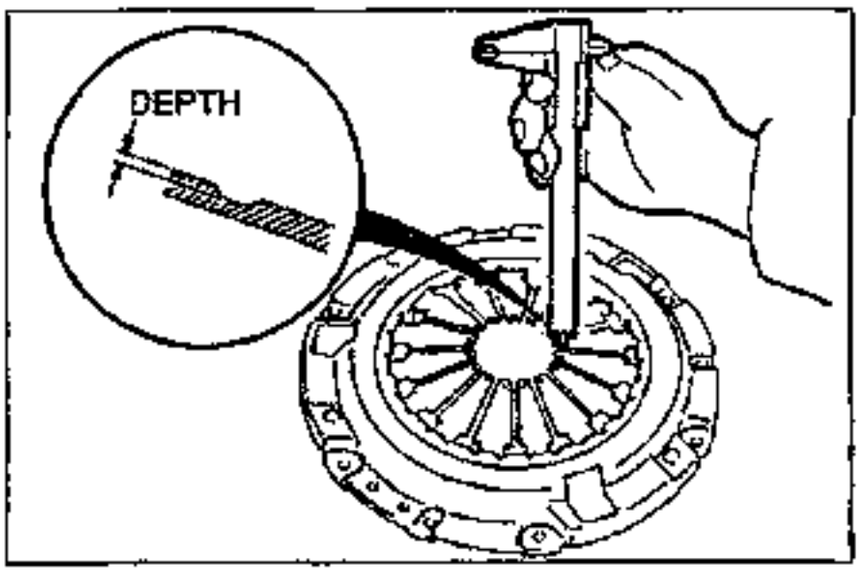
1. Clean the clutch disc splines and primary shaft gear splines.
2. Apply molybdenum sulfide to the splines.
3. Hold the clutch disc in position by using the **SST**.



Clutch cover

1. Align the dowel holes with the flywheel dowels.
2. Install the **SST** or equivalent.
3. Tighten the bolts evenly and gradually in the pattern shown.

Tightening torque:
18–26 N·m {1.8–2.7 kgf·m, 14–19 ft·lbf}

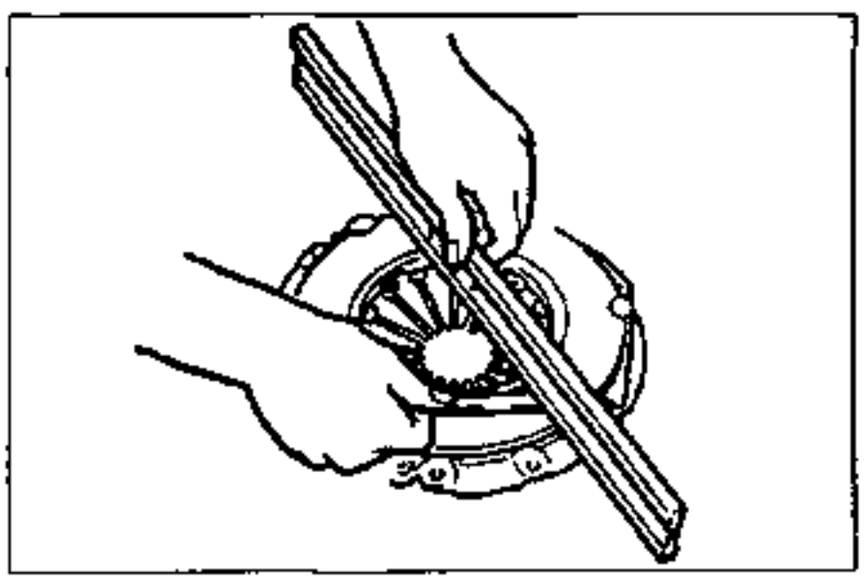


CLUTCH COVER

INSPECTION

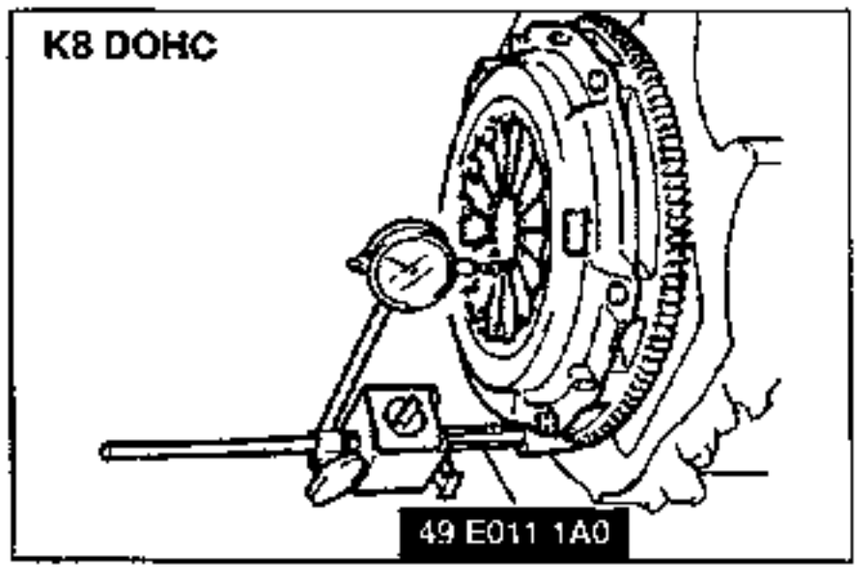
1. Measure wear of the diaphragm spring fingers.

Depth: 0.6 mm {0.024 in} max.



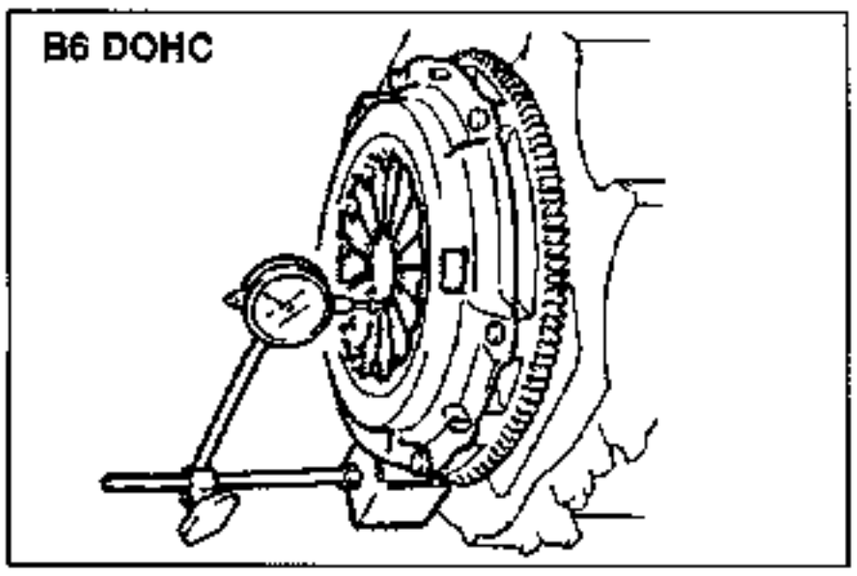
2. Inspect the flatness of the pressure plate contact surface with a straightedge and a feeler gauge.

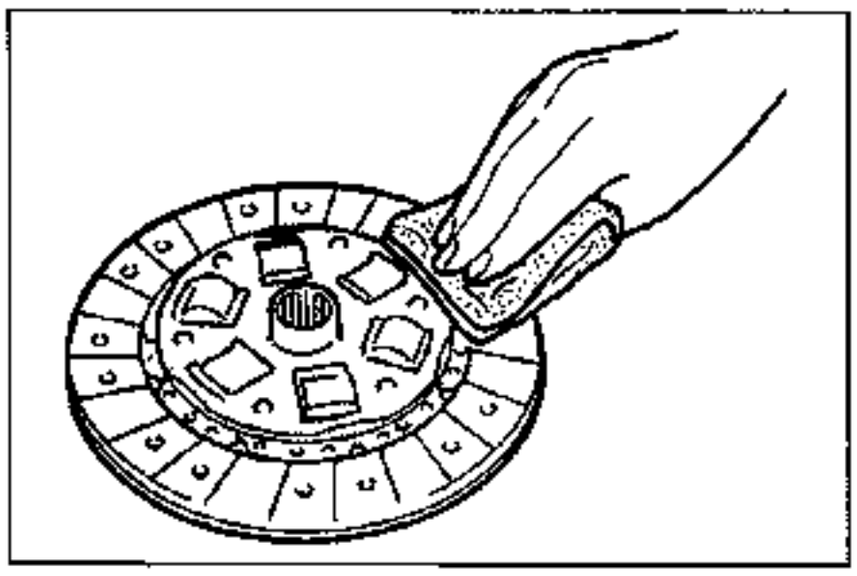
Maximum: 0.5 mm {0.020 in}



3. The K8 DOHC engine is made of aluminum, so the magnet will not hold the dial indicator to the block as it would for the B6 DOHC engine. Therefore, use the **SST** to hold the dial indicator when checking the runout of the diaphragm spring fingers for the K8 DOHC engine.
4. Rotate the flywheel and check for misaligned diaphragm spring fingers. Replace the clutch cover if not as specified.

Maximum: 0.6 mm {0.024 in}

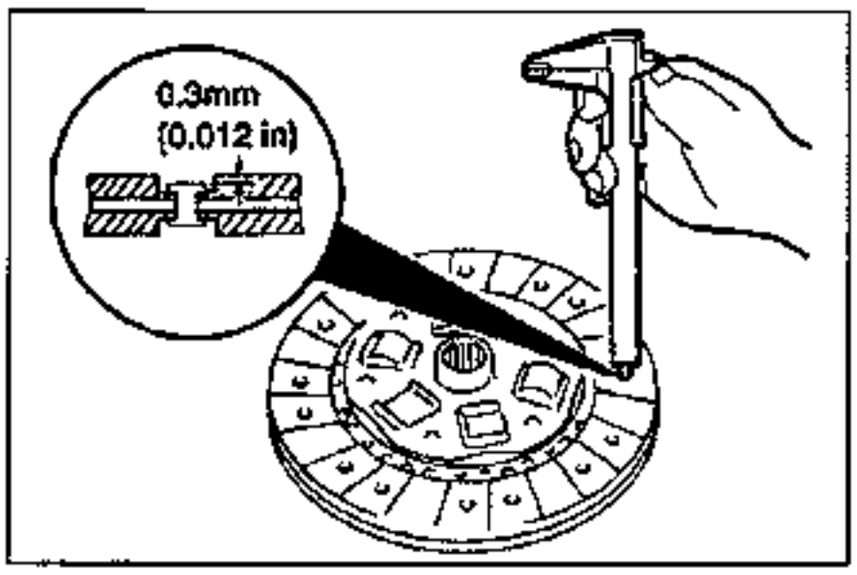




CLUTCH DISC

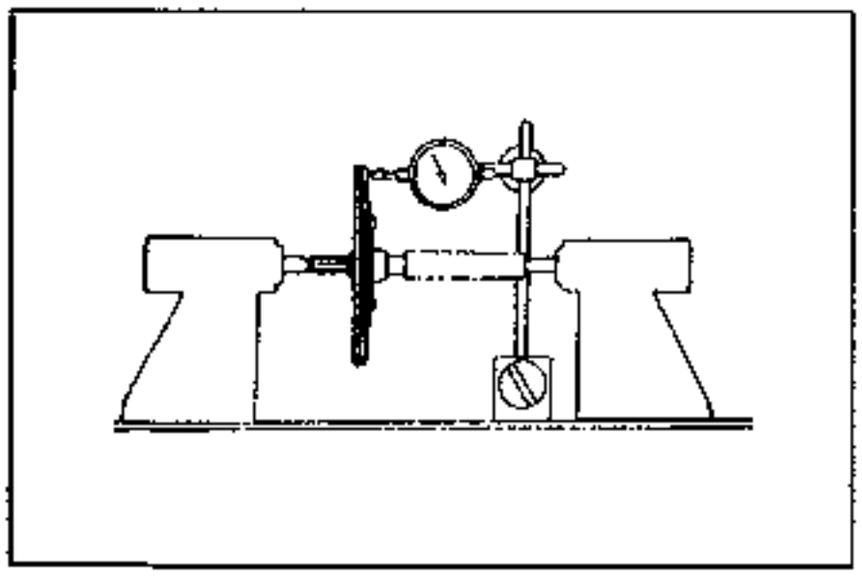
INSPECTION

1. Inspect the lining surface for burning and oil contamination. Remove minor scoring or burning with emery paper. Replace the clutch disc if it is badly burned or oil soaked.
2. Inspect for loose facing rivets and damper rubbers. Replace the clutch disc if either is loose.



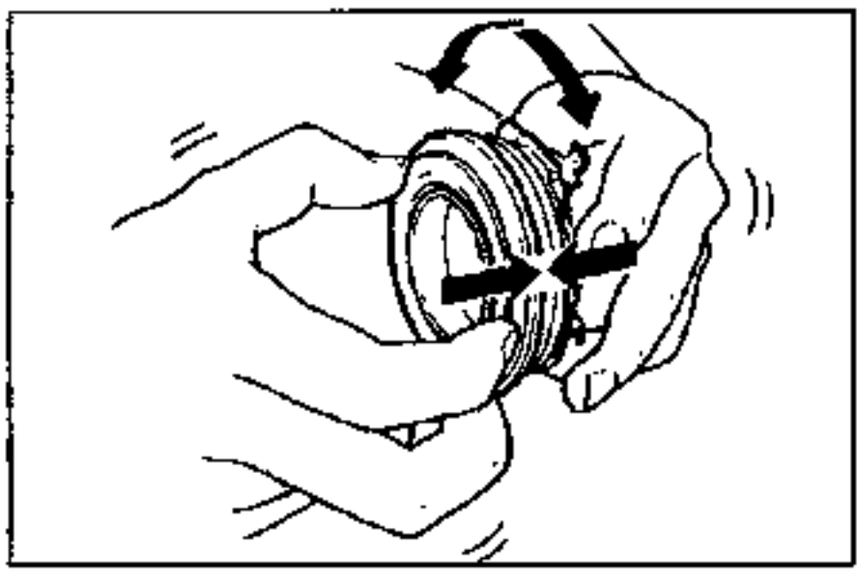
3. Measure the thickness of the lining at a rivet head on both sides with vernier calipers.
Replace the clutch disc if its thickness is less than minimum.

Thickness: 0.3 mm {0.012 in} min.



4. Measure the clutch disc runout with a dial indicator. Replace the clutch disc if runout is excessive.

Runout: 0.7 mm {0.027 in} max.

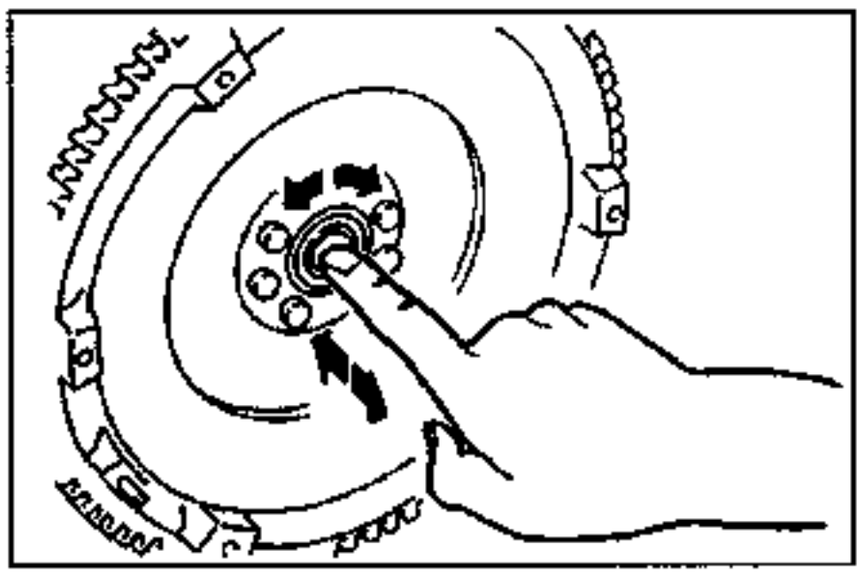


CLUTCH RELEASE COLLAR

INSPECTION

Caution
- **Cleaning the clutch release collar with cleaning fluids or a steam cleaner can wash the grease out of the sealed bearing.**

1. Turn the bearing while applying force in the axial direction.
2. If the collar sticks or has excessive resistance, replace it.

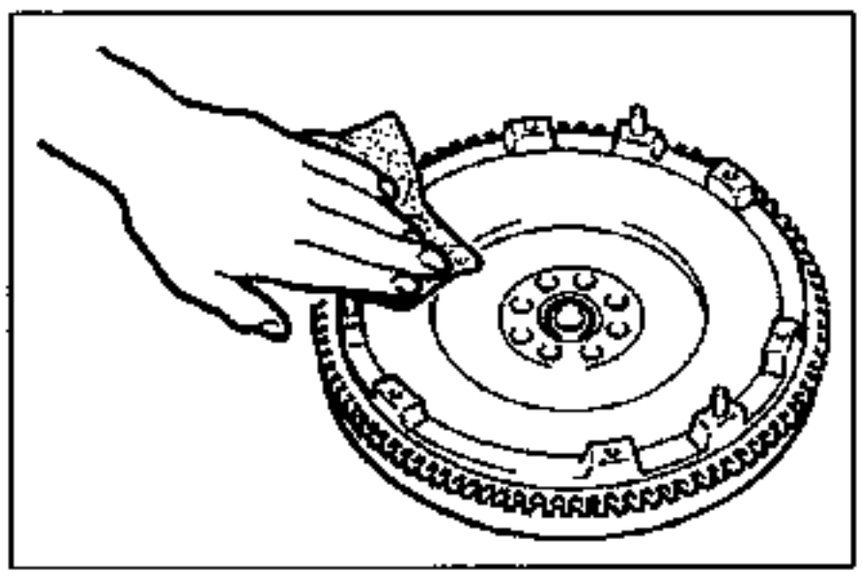


PILOT BEARING

INSPECTION

Note
- The pilot bearing can be inspected while it is the flywheel.

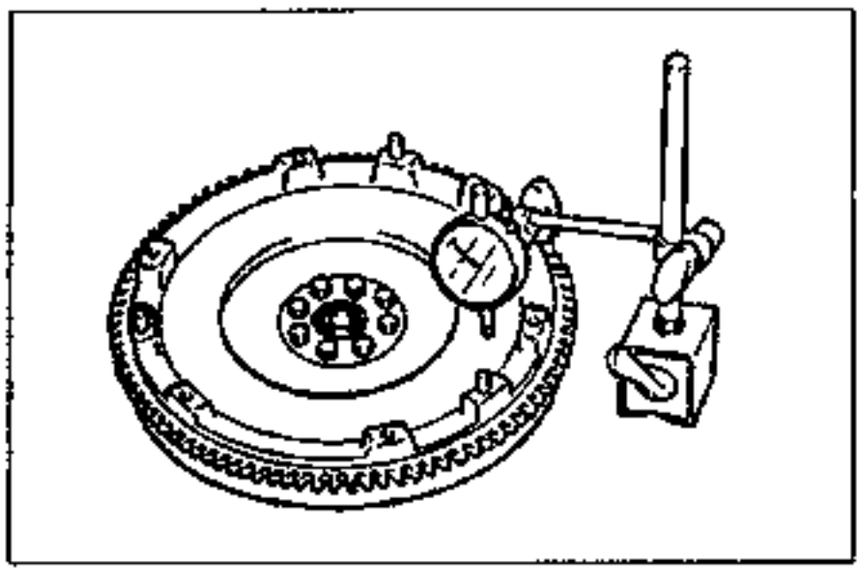
Turn the bearing while applying force in the axial direction. If the bearing sticks or has excessive resistance, replace it.



FLYWHEEL

INSPECTION

1. Inspect the contact surface of the clutch disc for scoring, cracks and burning. Remove minor scoring or burning with emery paper. Repair or replace as necessary.



2. Inspect the ring gear teeth for wear and damage. If necessary, replace the ring gear.
3. Measure the flywheel runout with a dial indicator. Replace the flywheel if runout is excessive.

Runout: 0.2 mm {0.008 in} max.

Before beginning any service procedure, refer to the 1995 MX–3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

MANUAL TRANSAXLE (G25M-R)

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INSPECTION J2– 7
REPLACEMENT J2– 7
OIL SEAL (DIFFERENTIAL) J2– 8
PREPARATION J2– 8
REPLACEMENT J2– 8
OIL SEAL (CHANGE ROD ASSEMBLY) J2– 9
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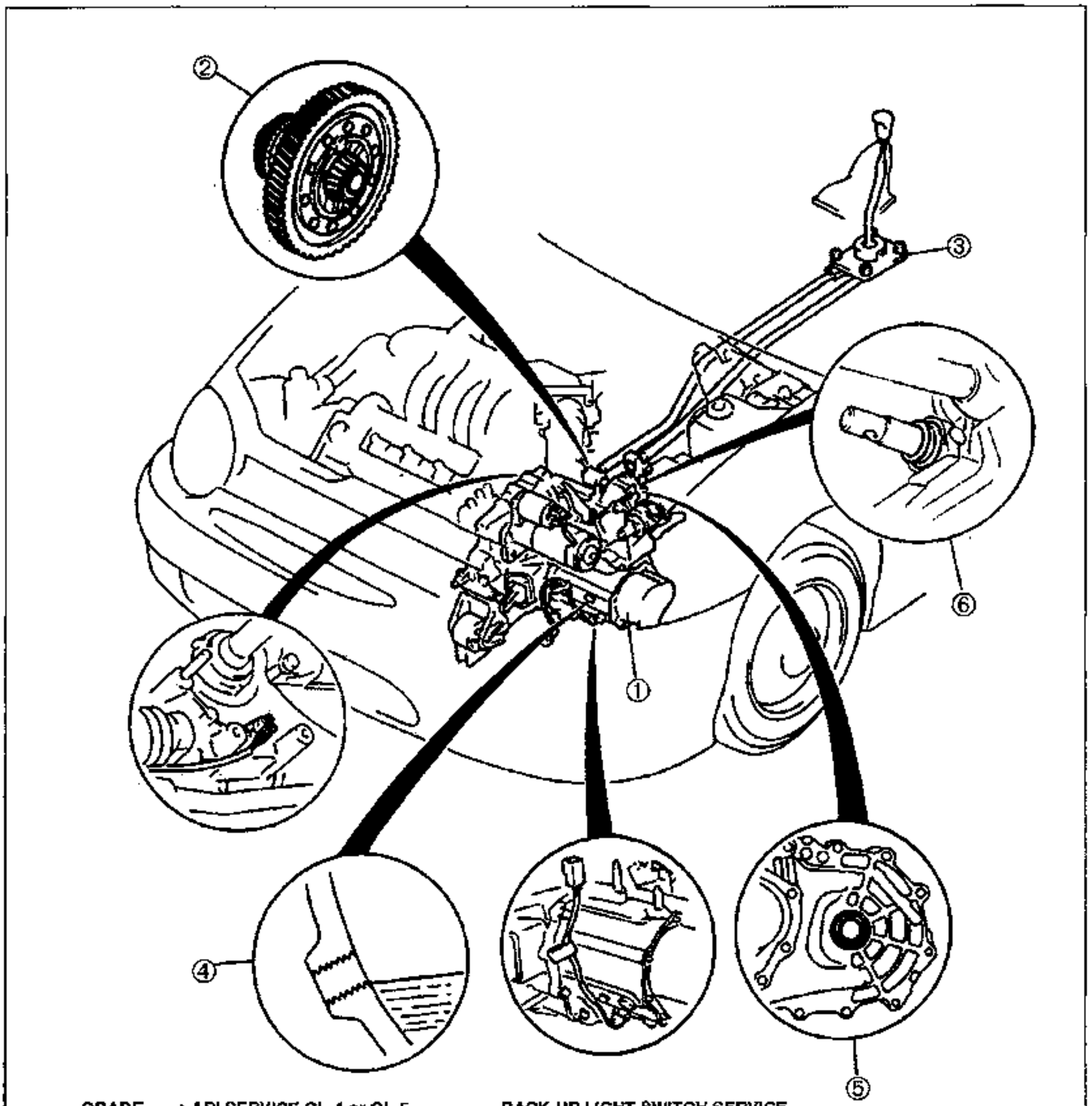

GRADE : API SERVICE GL-4 or GL-5
VISCOSITY : ALL-SEASON SAE75W-90
ABOVE 10°C (50°F) SAE 80W-90
CAPACITY : 2.70 L (2.85 US qt, 2.38 Imp qt)

BACK-UP LIGHT SWITCH SERVICE, 1995 MX-3 BODY ELECTRICAL TROUBLESHOOTING MANUAL

1. Transaxle
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Disassembly ..... page J2–15
Inspection ..... page J2–27
Assembly ..... page J2–30
Installation ..... page J2–46
2. Differential
Disassembly / Inspection
Assembly ..... page J2–51
3. Shift mechanism
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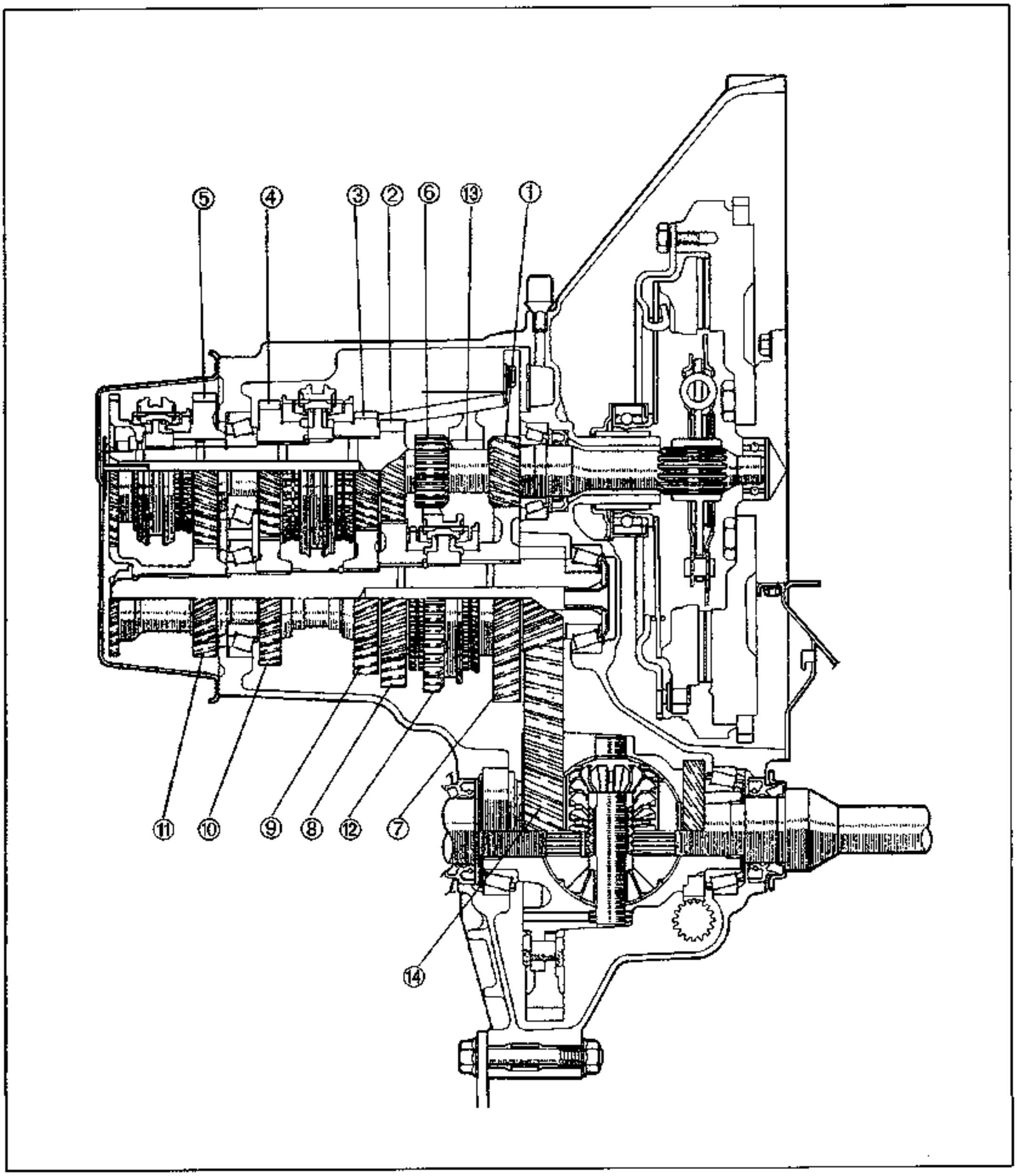
4. Transaxle oil
Inspection ..... page J2– 7
Replacement ..... page J2– 7
5. Oil seal (differential)
Replacement ..... page J2– 8
6. Oil seal (change rod assembly)
Replacement ..... page J2– 9

OUTLINE

SPECIFICATIONS

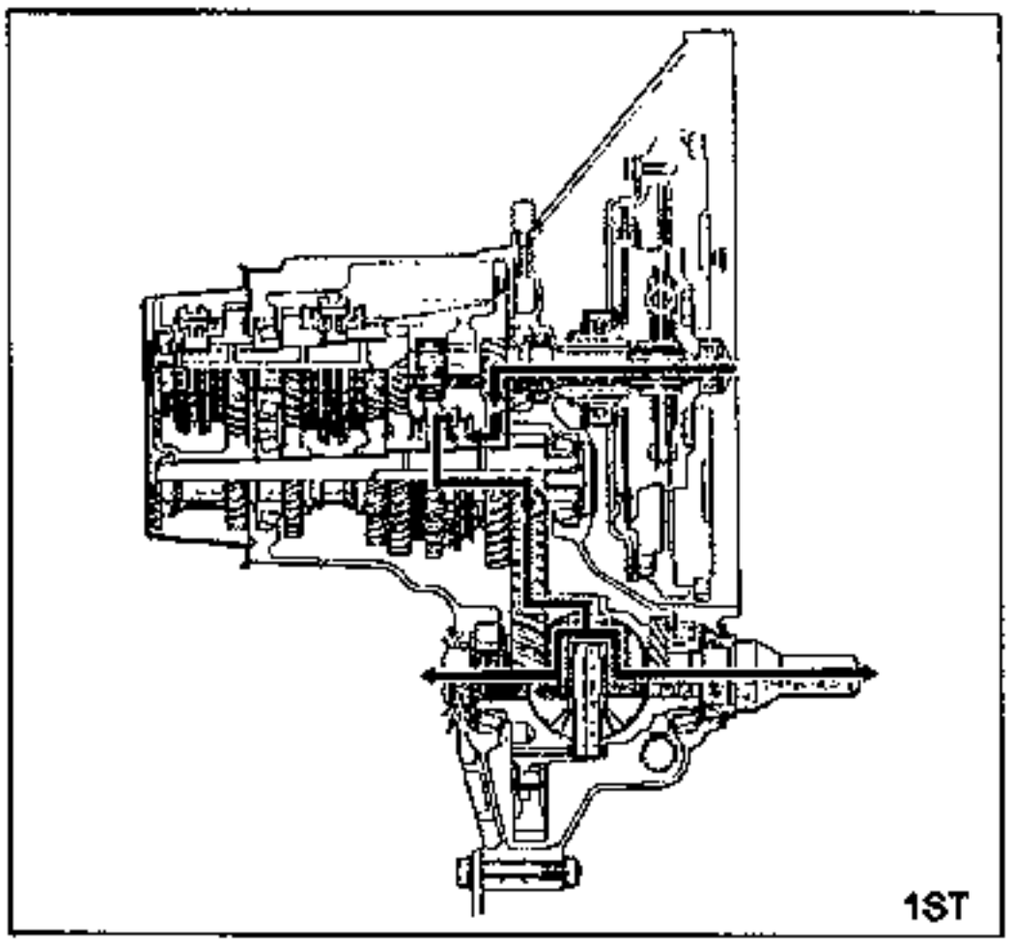
Item \ Engine/Transaxle			K8 DOHC
			G25M-R
Transaxle control			Floor shift
Synchromesh system			Forward: Synchromesh Reverse: Selective sliding and synchromesh
Gear ratio	1st		3.307
	2nd		1.833
	3rd		1.310
	4th		1.030
	5th		0.795
	Reverse		3.166
Final gear ratio			4.388
Oil	Grade		API service GL-4 or GL-5
	Viscocity	All-season	SAE 75W–90
		Above 10°C {50°F}	SAE 80W–90
	Capacity L {US qt, Imp qt}		2.70 {2.85,2.38}

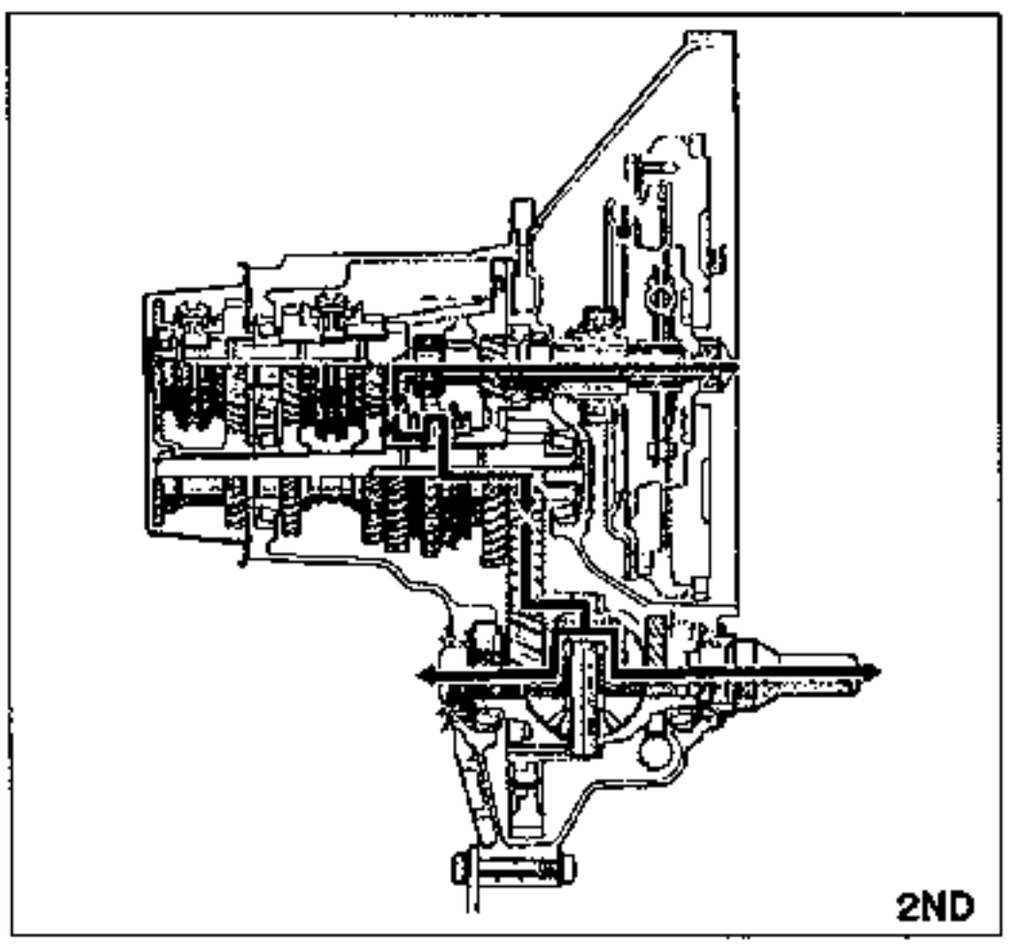
STRUCTURAL VIEW

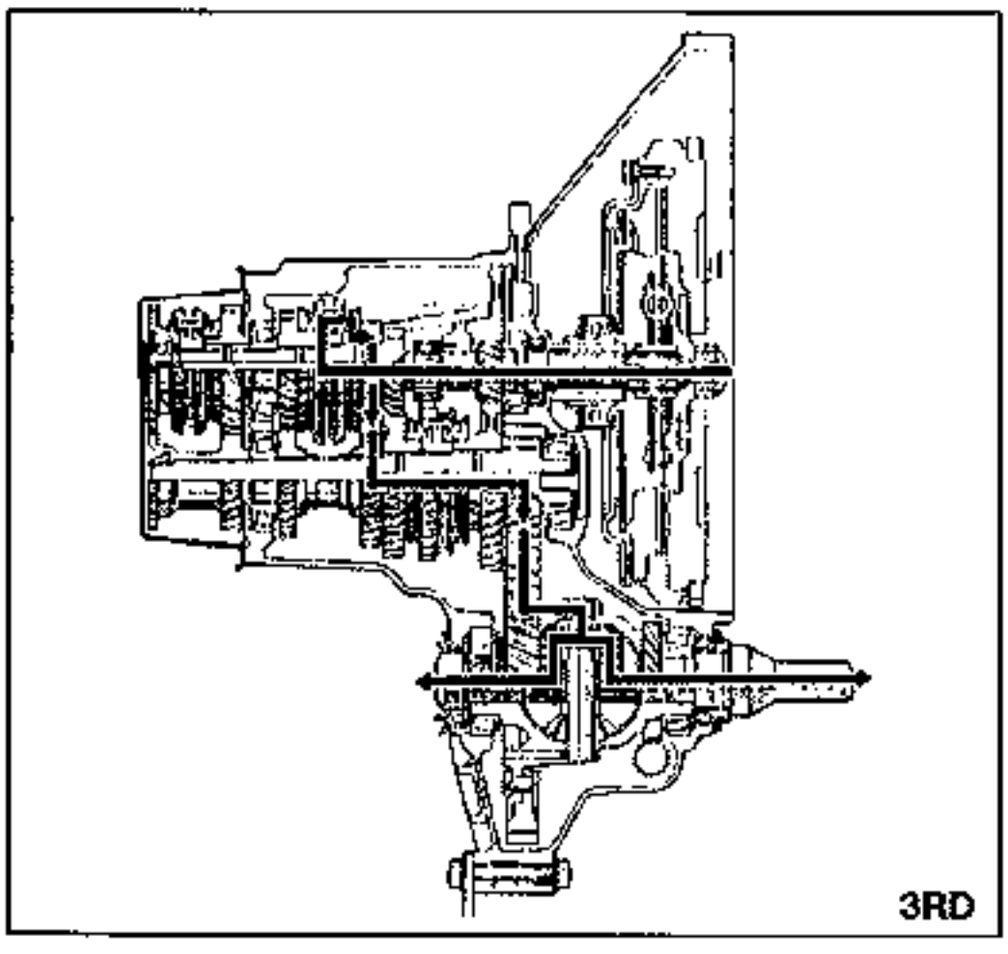


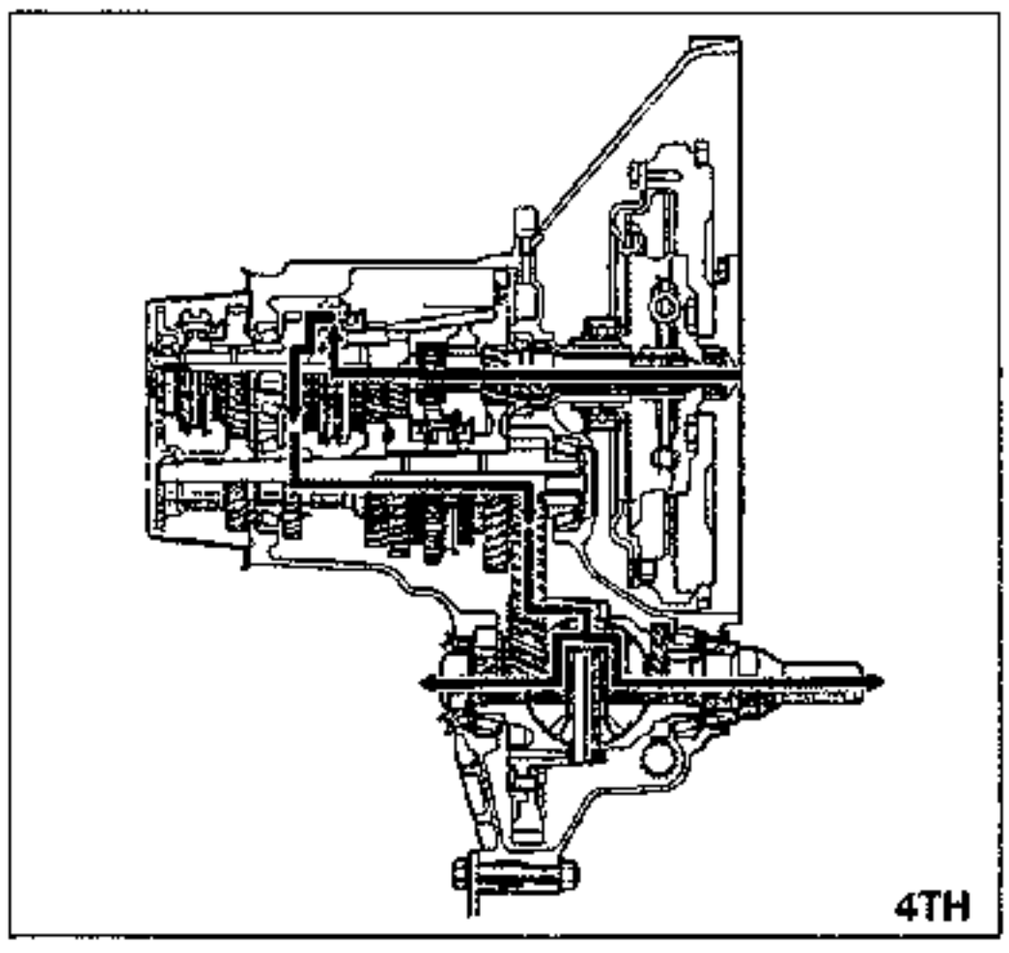
1. 1st gear
2. 2nd gear
3. 3rd gear
4. 4th gear
5. 5th gear
6. Reverse gear
7. 1st gear
8. 2nd gear
9. Secondary 3rd gear
10. Secondary 4th gear
11. Secondary 5th gear
12. Clutch hub sleeve (reverse gear)
13. Reverse idler gear
14. Differential

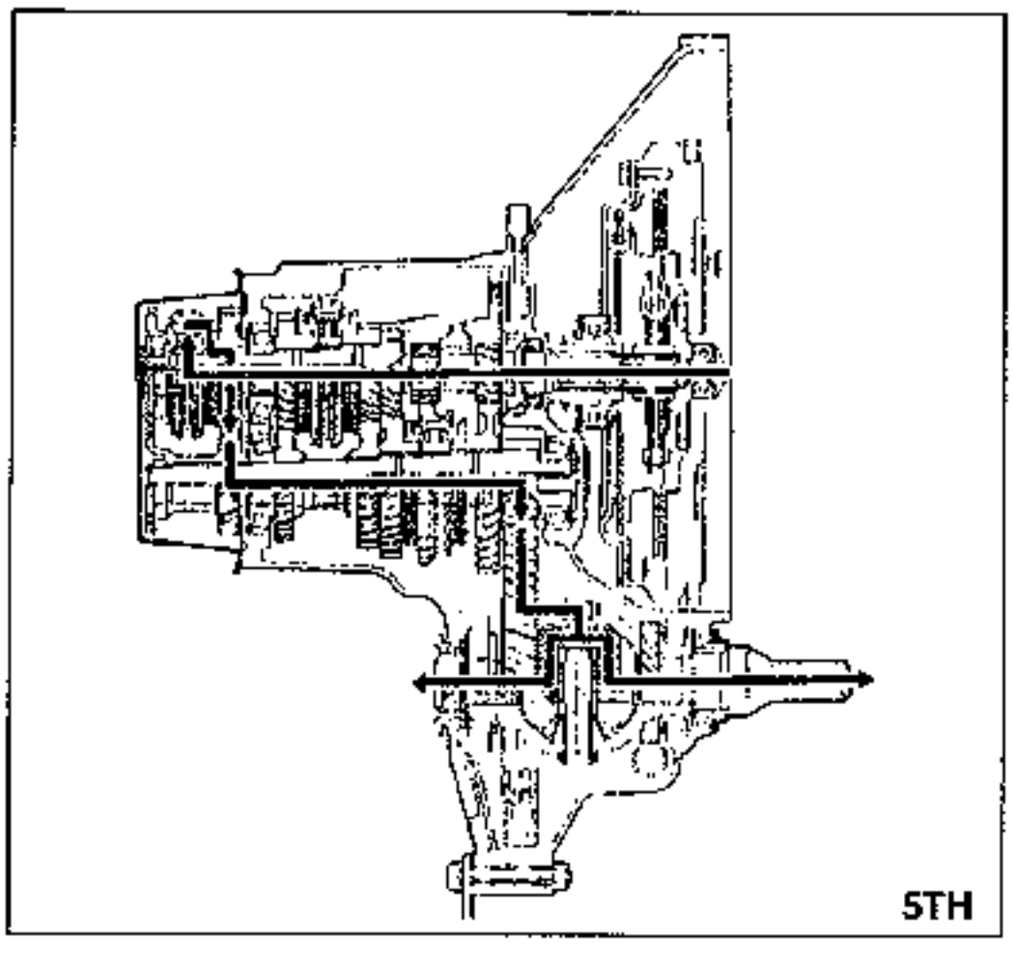
POWER FLOW

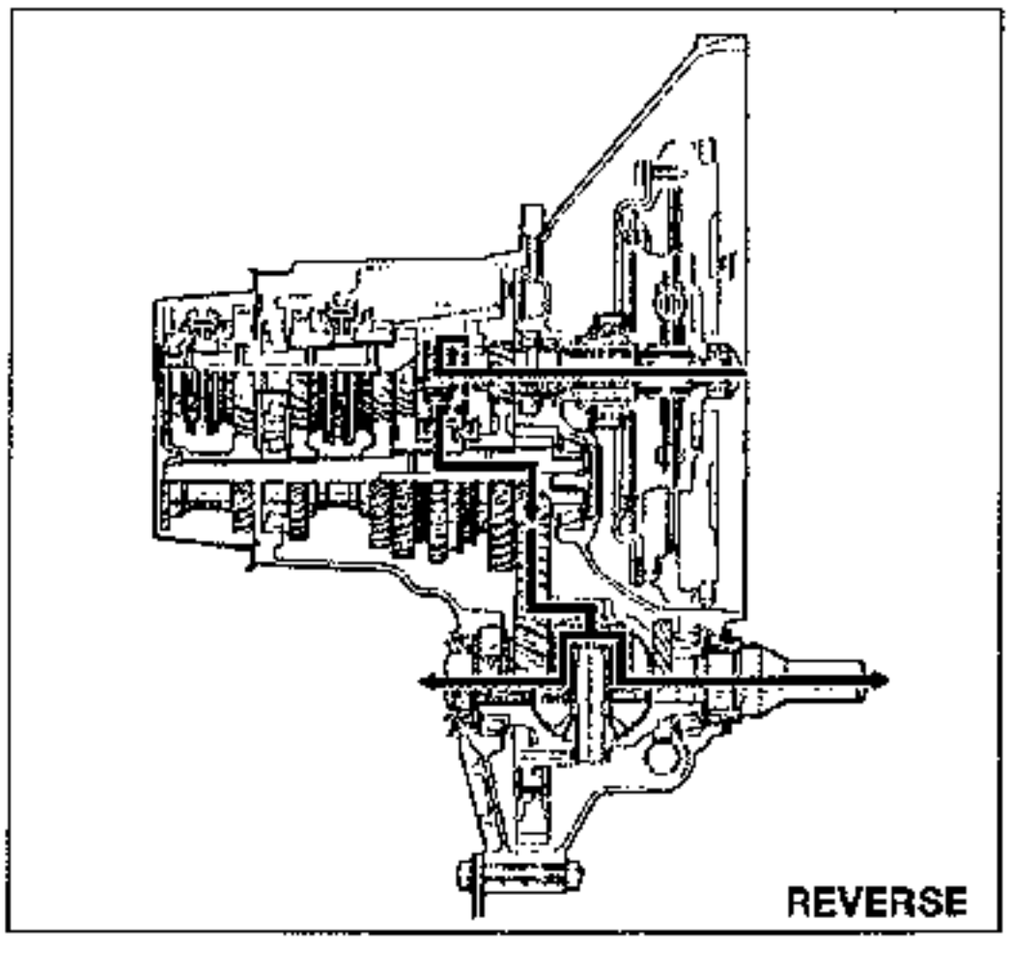






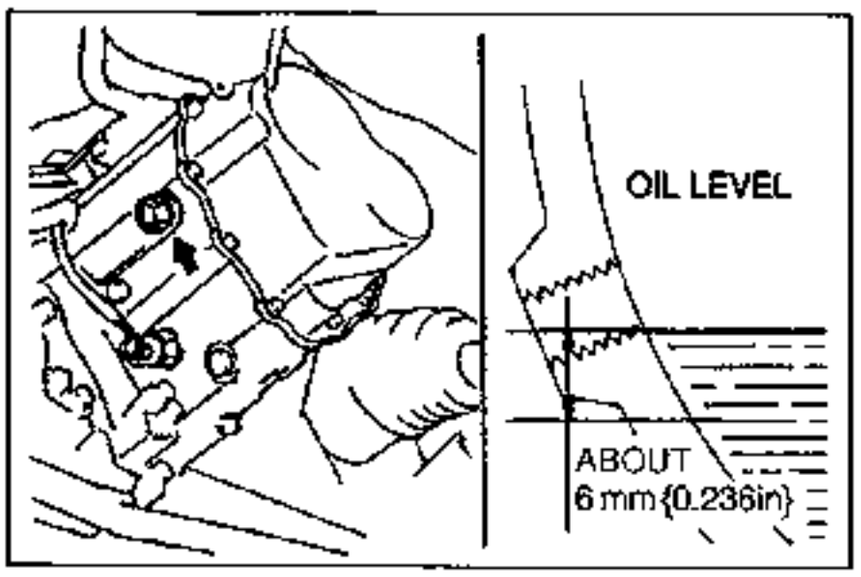






TROUBLESHOOTING GUIDE

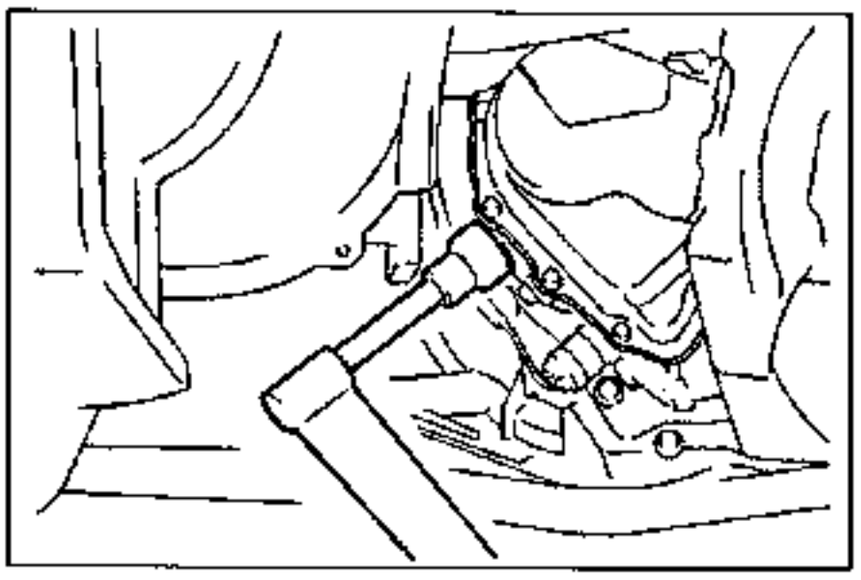
Problem	Possible cause	Action	Page
Shift lever does not shift smoothly or is hard to shift	Seized shift lever ball seat	Replace	J2–54
	Seized change control rod joint	Replace	J2–54
	Bent change control rod	Replace	J2–54
Too much play in shift lever	Worn change control rod bushing	Replace	J2–54
	Weak shift lever ball spring	Replace	J2–54
	Worn shift lever ball bushing	Replace	J2–54
Difficult to shift	Bent change control rod	Replace	J2–54
	No grease in transaxle control	Lubricate with grease	J2–54
	Insufficient oil	Add oil	J2–7
	Deterioration of oil quality	Replace with oil of specified quality	J2–7
	Wear or play of shift fork or shift rod	Replace	J2–16
	Worn synchronizer ring	Replace	J2–22, 24
	Worn synchronizer cone of gear	Replace	J2–22, 24
	Bad contact of synchronizer ring and cone of gear	Replace	J2–22, 24
	Excessive longitudinal play of gears	Replace	J2–22, 24
	Worn bearing	Replace	J2–22, 24
	Worn synchronizer key spring	Replace	J2–22, 24
	Excessive primary shaft gear bearing preload	Adjust	J2–36
	Improperly adjusted change guide plate	Adjust	J2–19
Does not stay in gear	Bent change control rod	Replace	J2–54
	Worn change control rod bushing	Replace	J2–54
	Weak shift lever ball spring	Replace	J2–54
	Improperly installed extension bar	Tighten	J2–54
	Worn shift fork	Replace	J2–16
	Worn clutch hub	Replace	J2–22, 24
	Worn clutch hub sleeve	Replace	J2–22, 24
	Worn gear sliding surface of shaft gears	Replace	J2–22, 24
	Worn gear sliding surface of gear	Replace	J2–22, 24
	Worn steel sliding groove of control end	Replace	J2–16
	Weak spring pressing against steel ball	Replace	J2–16
	Excessive thrust clearance	Replace	J2–16,22,24
	Worn bearing	Replace	J2–22, 24
	Improperly installed or loose engine mount	Tighten	J2–46
Abnormal noise	Insufficient oil	Add oil	J2–7
	Deterioration of oil quality	Replace with oil of specified quality	J2–7
	Worn bearing	Replace	J2–22, 24
	Worn sliding surfaces of gears or shafts	Replace	J2–22, 24
	Excessive gear backlash	Replace	J2–22, 24
	Damaged gear teeth	Replace	J2–22, 24
	Foreign material in gears	Replace	J2–22,24
	Damaged differential gear or excessive backlash	Replace	J2–51



TRANSAXLE OIL

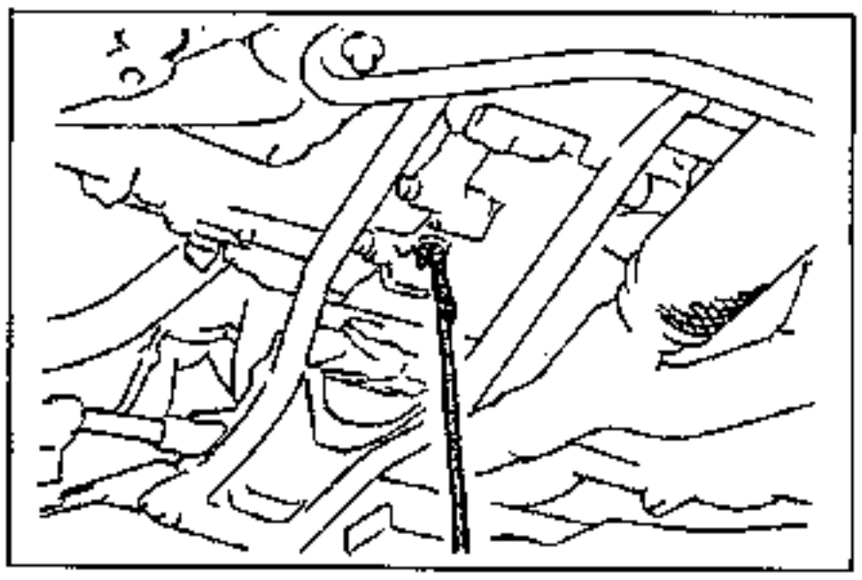
INSPECTION

1. Park the vehicle on level ground.
2. Remove the oil level plug and washer.
3. Verify that the oil level is near the bottom of the plug port.
4. If the oil level is low, add the specified amount and type of oil through oil level plug hole.



5. Install a new washer and the oil level plug.

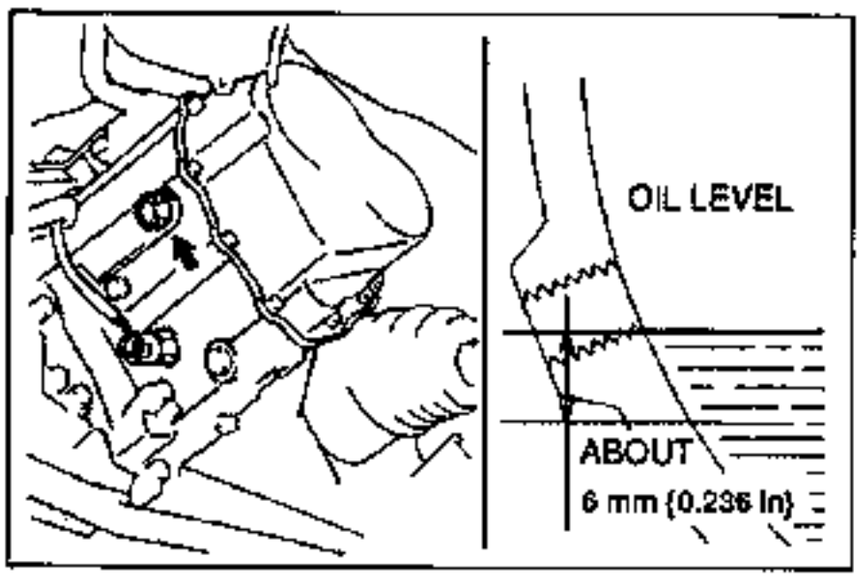
Tightening torque:
40–58 N·m {4.0–6.0 kgf·m, 29–43 ft·lbf}



REPLACEMENT

1. Remove the drain plug and the washer.
2. Drain the oil into a suitable container.
3. Install a new washer and the drain plug.

Tightening torque:
40–58 N·m {4.0–6.0 kgf·m, 29–43 ft·lbf}



4. Remove the oil level plug and the washer. Add the specified amount and type of oil through the oil level plug hole until the level reaches the bottom of the oil level plug hole.

Specified oil
Grade: API Service GL-4 or GL-5
Viscosity: All-season SAE 75W–90
Above 10°C {50°F} SAE 80W–90
Capacity: 2.70 L {2.85 US qt, 2.38 Imp qt}

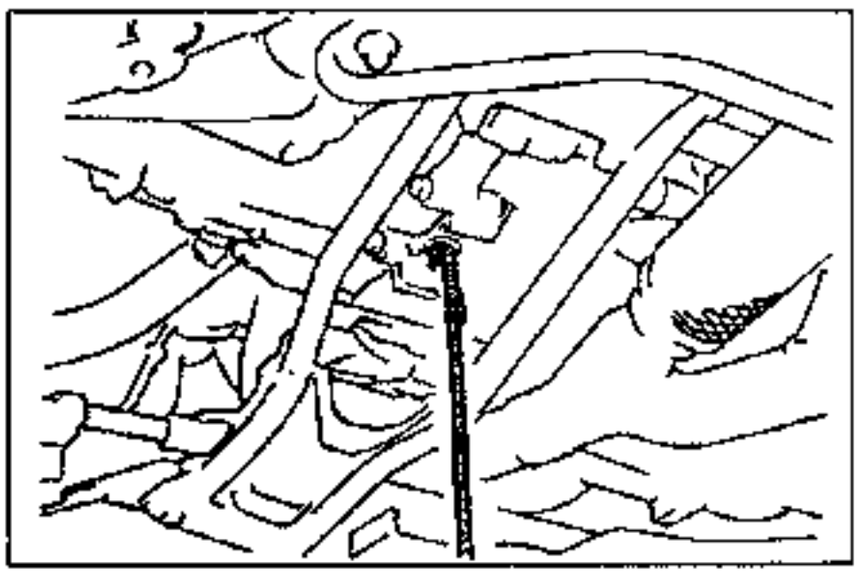
5. Install a new washer and the oil level plug.

Tightening torque:
40–58 N·m {4.0–6.0 kgf·m, 29–43 ft·lbf}

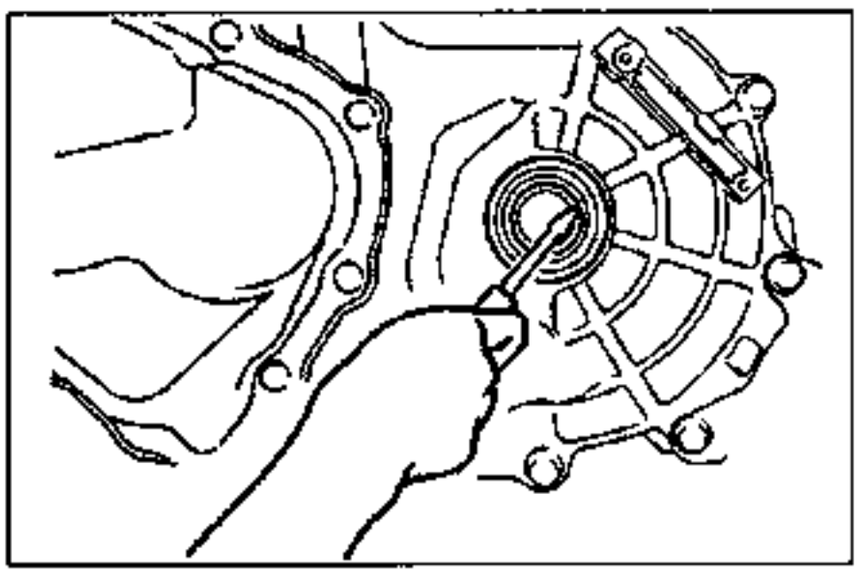
OIL SEAL (DIFFERENTIAL)

PREPARATION
SST

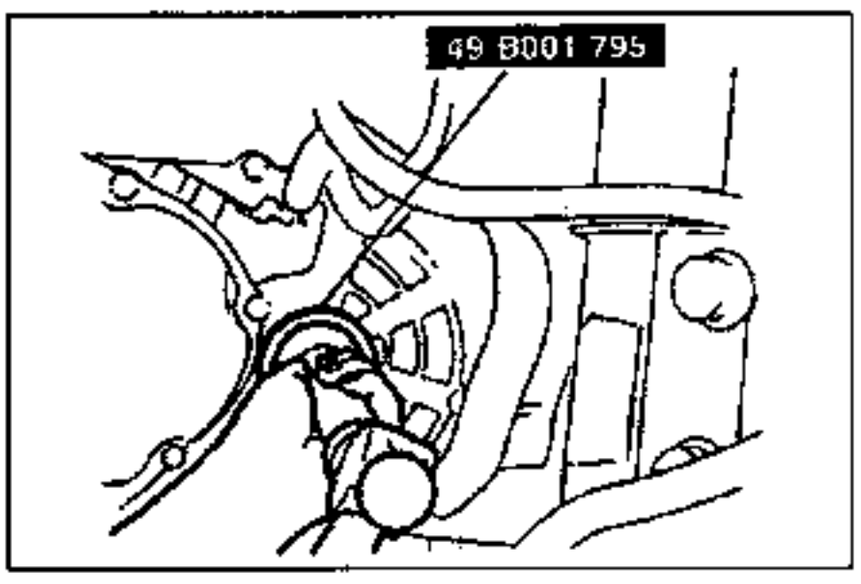
49 B001 795 Installer, oil seal		For installation of oil seal



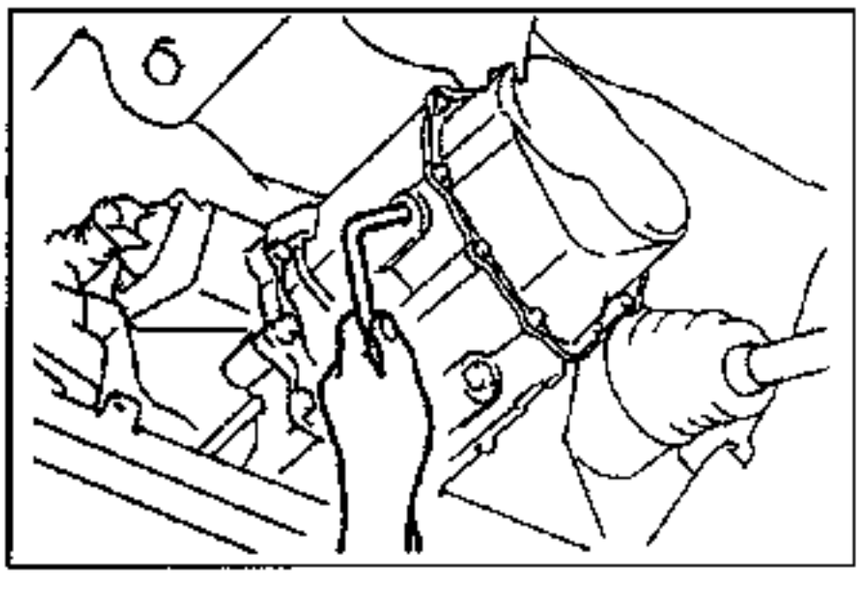
REPLACEMENT
1. Remove the drain plug and washer. (Refer to Replacement, page J2–7.)
2. Drain the oil into a suitable container.
3. Separate the drive shaft and joint shaft from the transaxle. (Refer to page J2–12.)



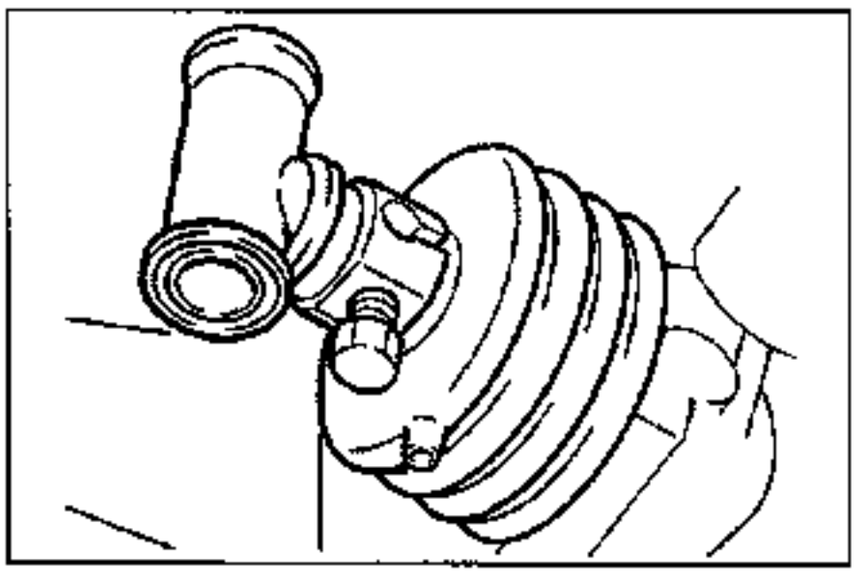
4. Remove the oil seal by using a screwdriver.



5. Using the **SST** and a hammer, tap the new oil seal in evenly until the **SST** contacts the transaxle case.
6. Coat the lip of the oil seal with transaxle oil.



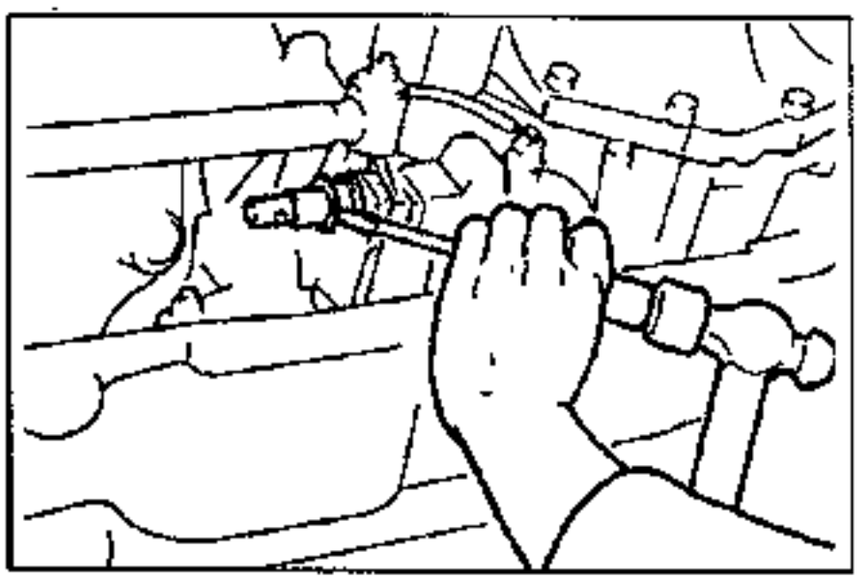
7. Insert the drive shaft and joint shaft to the transaxle. (Refer to page J2–46.)
8. Add the specified amount and type of oil. (Refer to page J2–7.)



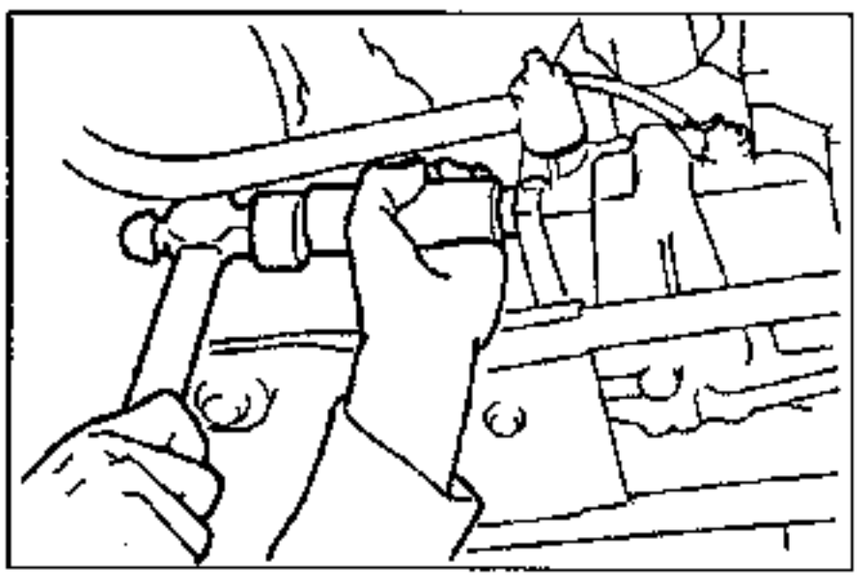
OIL SEAL (CHANGE ROD ASSEMBLY)

REPLACEMENT

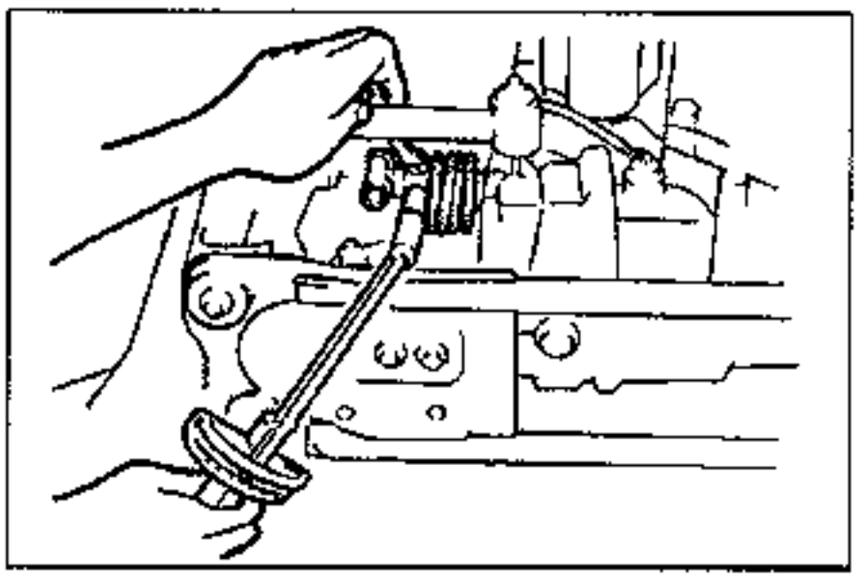
1. Remove the drain plug and washer.
   (Refer to Replacement page J2–7.)
2. Drain the oil into a suitable container.
3. Disconnect the change control rod from the transaxle.
4. Remove the joint and boot from the change rod assembly.



5. Remove the oil seal.



6. Install a new oil seal by using a **26 mm {1.024 in}** diameter pipe.
7. Coat the lip of the oil seal with transaxle oil.

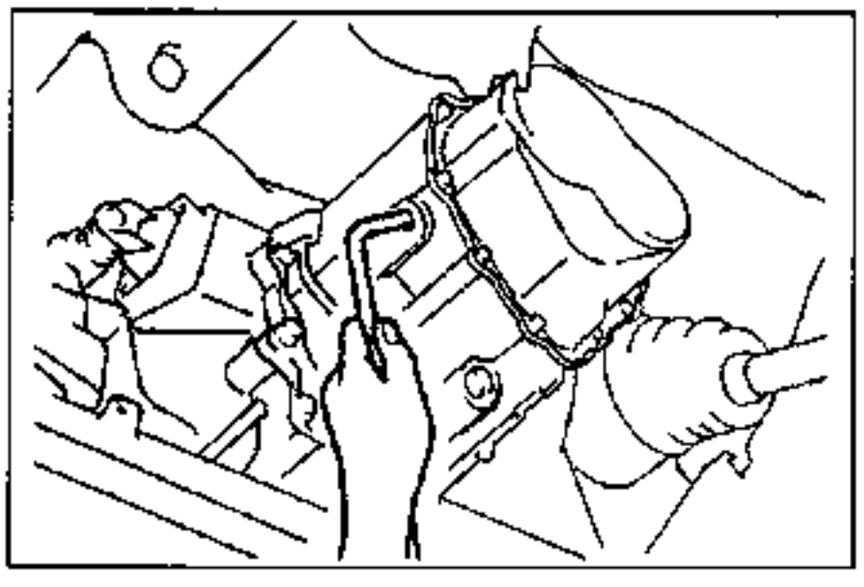


8. Install the boot and joint to the change rod assembly so that the drain hole is facing downward.

   Tightening torque:
   13.8–18.6 N·m {140–190 kgf·m, 122–164 in·lbf}

9. Connect the change control rod to the change rod assembly.

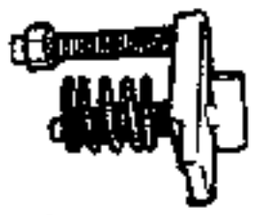
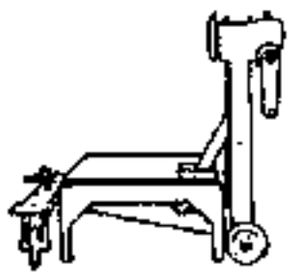
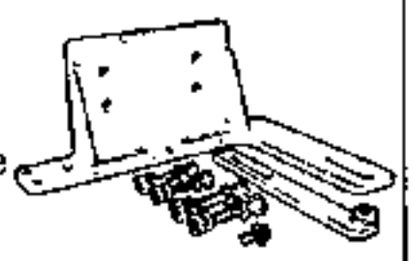
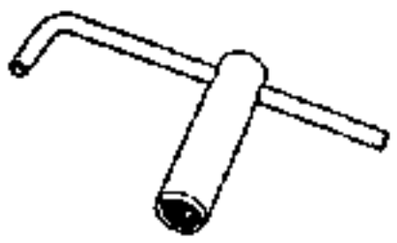
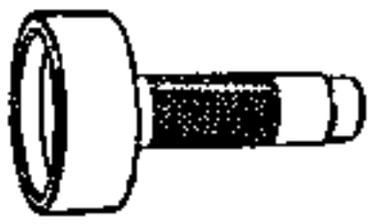
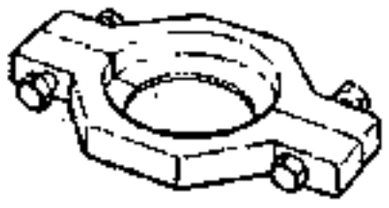
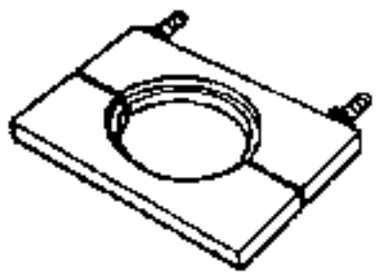
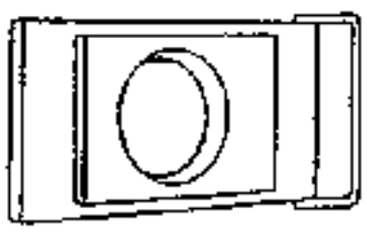
   Tightening torque:
   16–22 N·m {1.6–2.3 kgf·m, 12–16 ft·lbf}

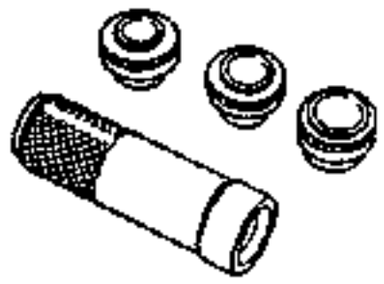
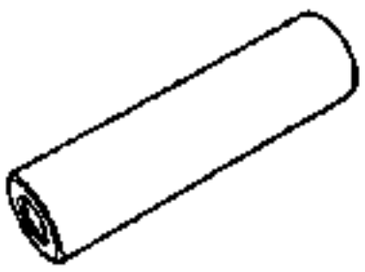
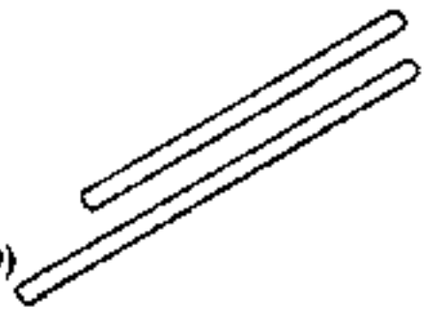
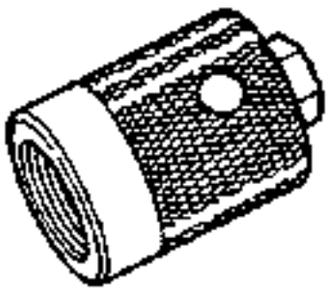
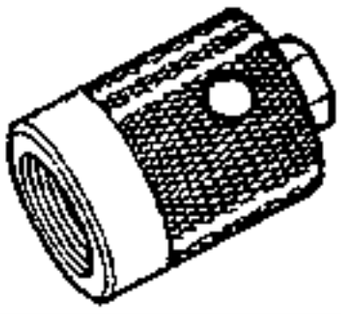
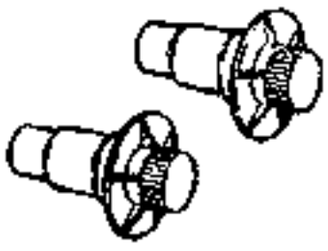


10. Add the specified amount and type of oil.
    (Refer to page J2–7.)

TRANSAXLE

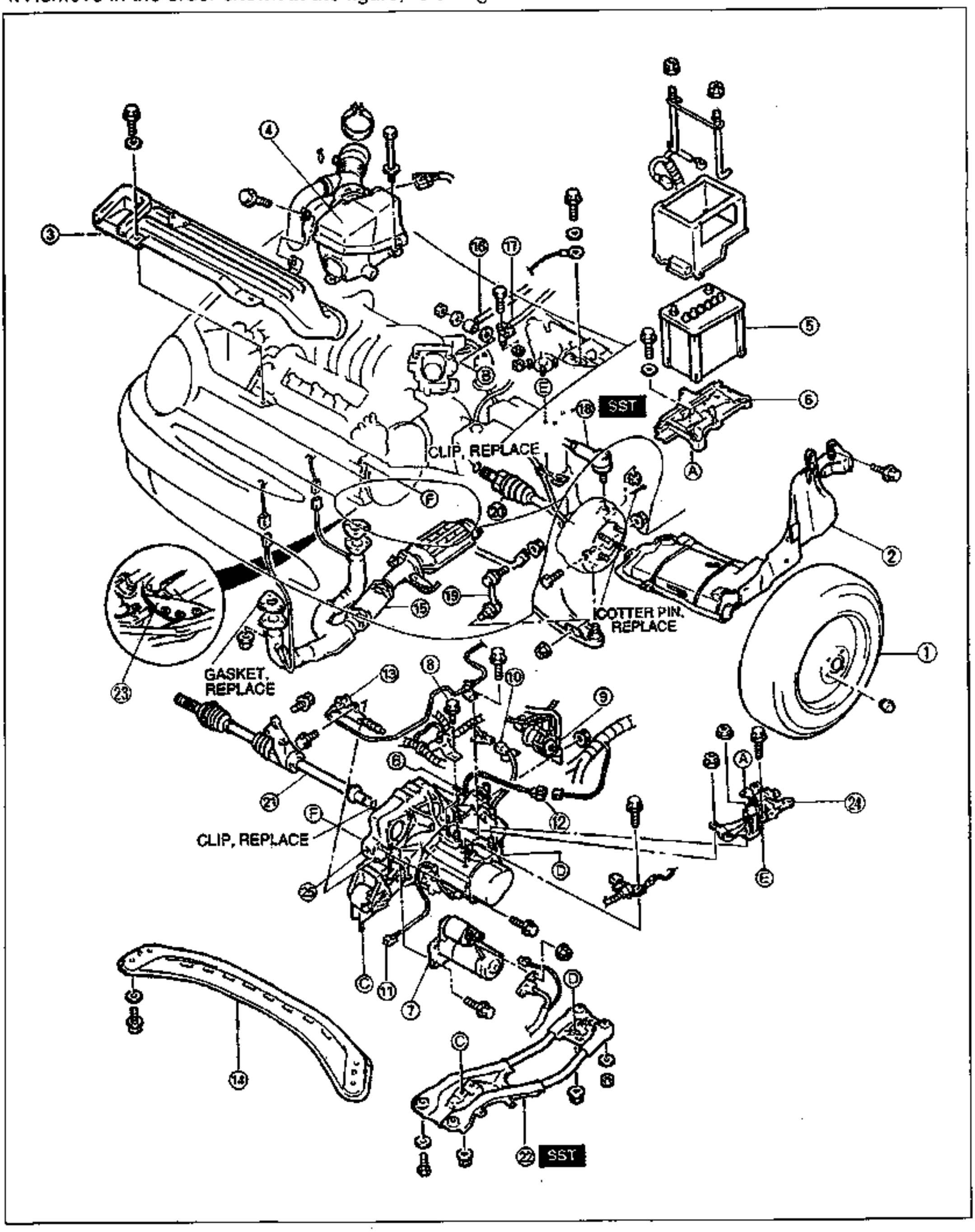
PREPARATION
SST

49 G017 5A0 Support, engine 	For support of engine	49 T028 3A0 Puller set, ball joint 	For removal of tie rod end
49 T028 303 Body (Part of 49 T028 3A0) 	For removal of tie rod end	49 T028 304 Attachment (Part of 49 T028 3A0) 	For removal of tie rod end
49 0107 680A Engine stand 	For disassembly/ assembly of transaxle	49 G019 0A0 Hanger, transaxle 	For disassembly/ assembly transaxle
49 G030 440 Holder, primary shaft 	For holding primary shaft	49 FT01 361 Remover, bearing 	For removal of bearing race
49 B001 795 Installer, oil seal 	For installation of oil seal	49 0636 145 Puller, fan pulley boss 	For removal of bearing
49 G030 370 Removing plate 	For removal of secondary 3rd gear and 2nd gear	49 G017 1A0 Remover set, bearing 	For removal of bearings
49 F401 366A Plate (Part of 49 G017 1A0) 	For removal of bearing	49 B092 373 Attachment G (Part of 49 G017 1A0) 	For removal of bearing
49 B092 374 Attachment H (Part of 49 G017 1A0) 	For removal of bearing	49 0839 425C Puller set, bearing 	For removal of bearing

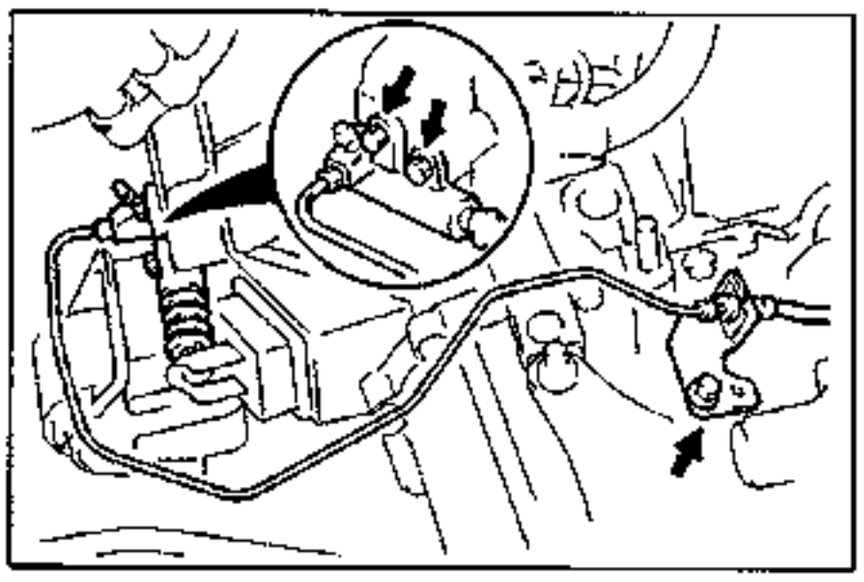
49 F401 330B Installer set, bearing 	For installation of bearing	49 F401 331 Body (Part of 49 F401 330B) 	For installation of bearing
49 F401 335A Attachment A (Part of 49 F401 330B) 	For installation of bearing	49 F401 336B Attachment B (Part of 49 F401 330B) 	For installation of bearing
49 G030 380D Shim selector set 	For adjustment of bearing preload	49 G030 381 Selector ø68 (Part of 49 G030 380D) 	For adjustment of bearing preload
49 G030 382A Selector ø58 (Part of 49 G030 380D) 	For adjustment of bearing preload	49 F401 382A Selector ø52 (Part of 49 G030 380D) 	For adjustment of bearing preload
49 F401 384 Collar (Part of 49 G030 380D) 	For adjustment of bearing preload	49 G019 021 Bolt set (Part of 49 G030 380D) 	For adjustment of bearing preload
49 FT01 515A Adapter, preload (Part of 49 G030 380D) 	For adjustment of bearing preload	49 F401 385 Bar (Part of 49 G030 380D) 	For adjustment of bearing preload
49 B017 102 Adapter, preload 	For adjustment of bearing preload	49 G017 202 Adapter, preload 	For adjustment of bearing preload
49 G030 455 Holder, diff. side gear 	For holding side gears		

REMOVAL

1. Disconnect the negative battery cable.
2. Oil level ground, raise the vehicle and support it evenly on safety stands.
3. Drain the transaxle oil into a suitable container.
4. Remove in the order shown in the figure, referring to **Removal Note**.

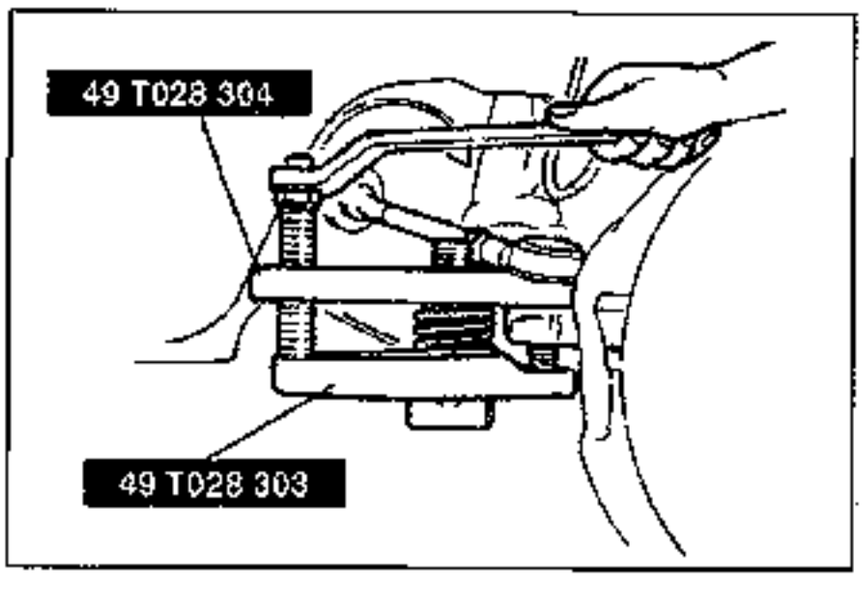


1. Wheel and tire
2. Splash shield
3. Fresh-air duct
4. Air cleaner assembly
5. Battery
6. Battery carrier
7. Starter
8. Harness bracket
9. Fuel filter
10. Neutral switch connector
11. Back-up light switch connector
12. Vehicle speedometer sensor (speedometer driven gear) connector
13. Clutch release cylinder
    Removal Note ..... *below*
14. Transverse member
15. Exhaust pipe
16. Extension bar
17. Change control rod
18. Tie rod end
    Removal Note ..... below
19. Stabilizer control link
20. Drive shaft
    Removal Note ..... page J2–14
21. Joint shaft
22. Engine mounting member
    Removal Note ..... page J2–14
23. Undercover
24. No.4 engine mount
25. Transaxle
    Removal Note ..... page J2–15



Removal Note
Clutch release cylinder

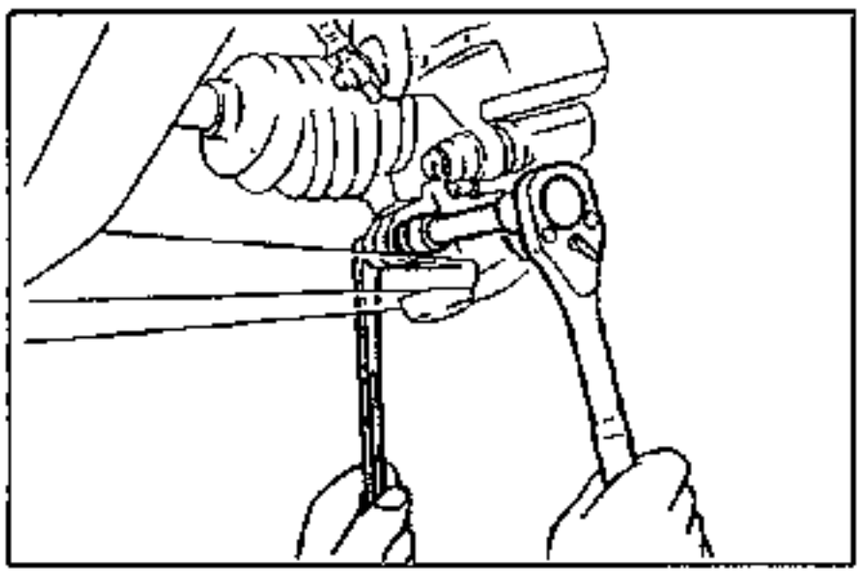
1. Remove the bolts shown.
2. Put the clutch release cylinder and the clutch pipe in a place where they will not interfere with transaxle removal.



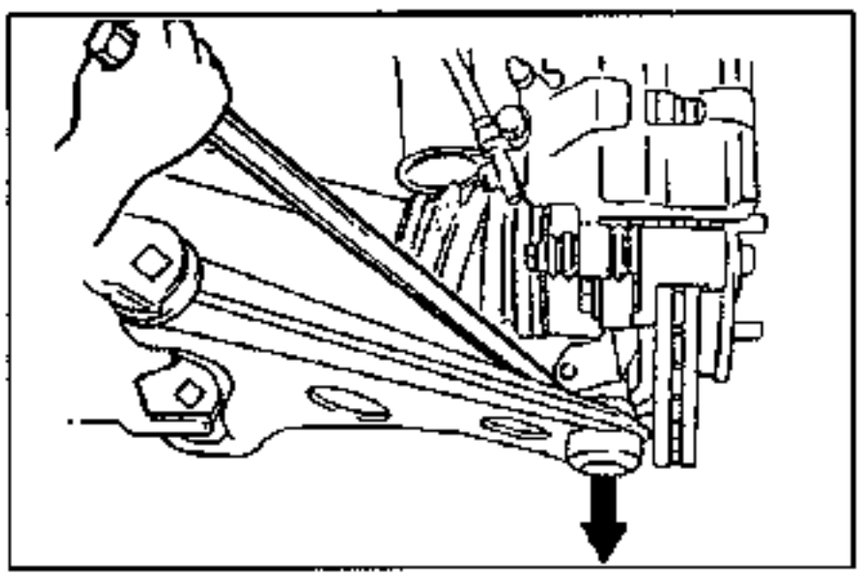
Tie rod end

Caution
- **The sharp edges of the SST can slice the tie rod end dust boot. Install the SST so that the sharp edges are between the dust boot and the knuckle.**

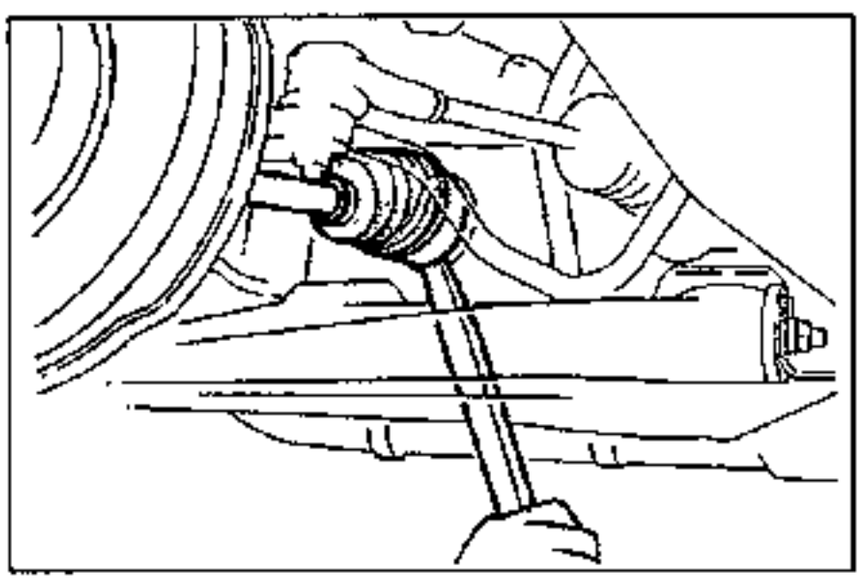
1. Remove the cotter pin and the nut.
2. Disconnect the tie rod end from the knuckle by using the **SST.**



Drive shaft
1. Remove the clinch bolt from the lower arm ball joint.

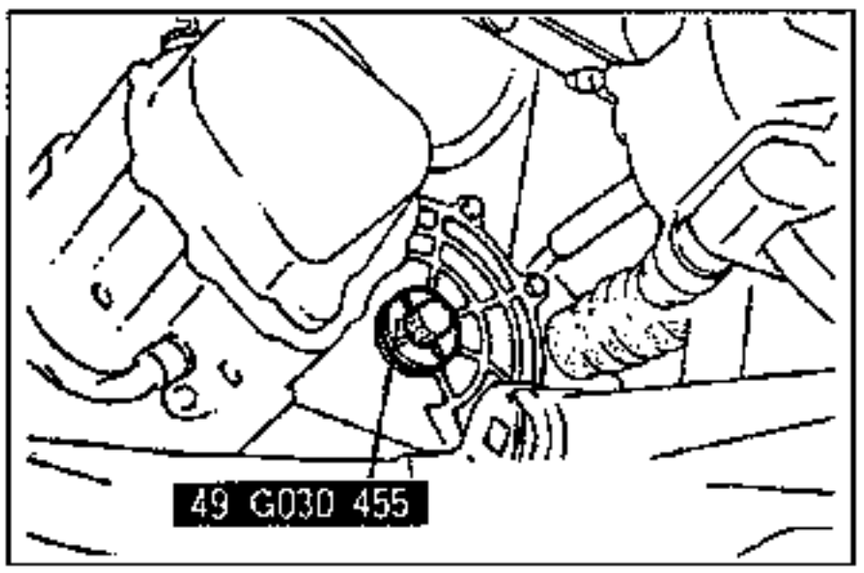


2. Wrap a rag around the ball joint dust seal.
3. Pry the lower arm out of the knuckle.

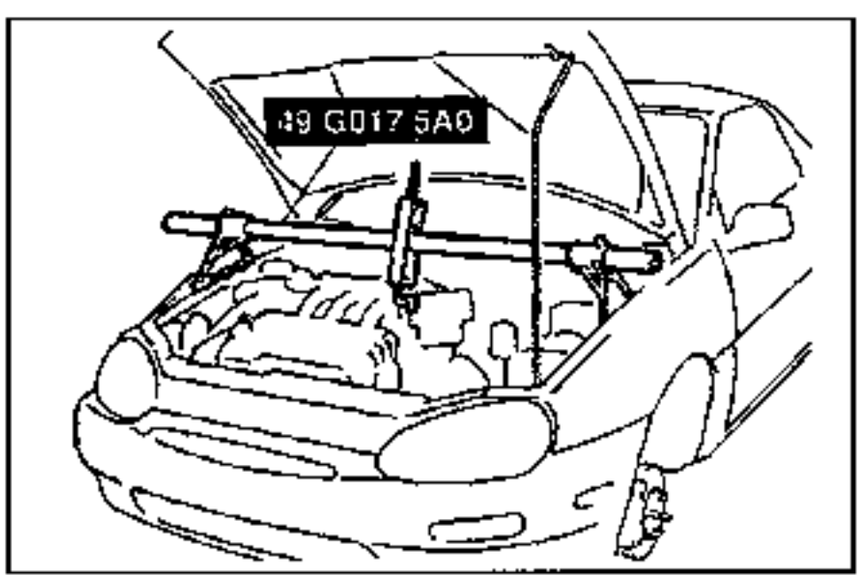


Caution
- **The sharp edges of the drive shaft snap ring can slice or puncture the oil seal. Be careful when removing the drive shaft from the transaxle.**

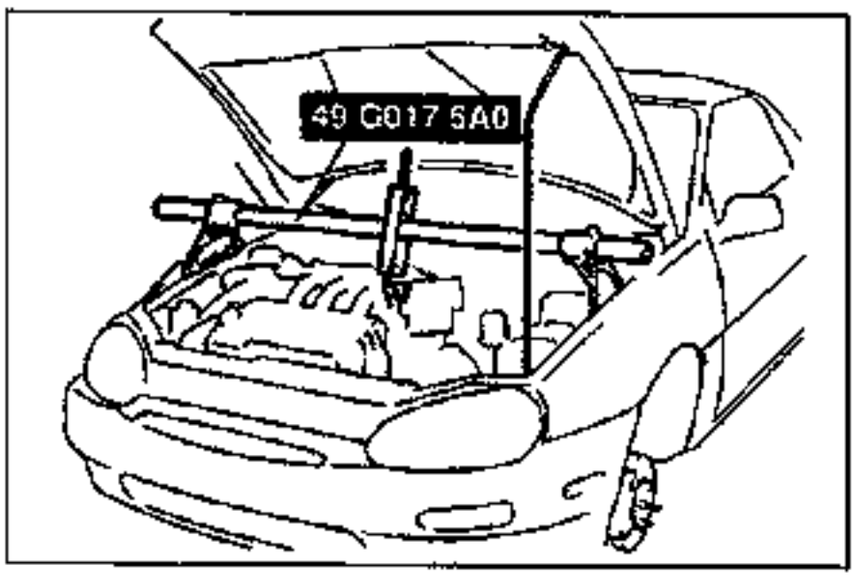
4. Separate the drive shaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle.
5. Suspend the drive shaft with a rope.



6. Install the **SSTs** into the transaxle to hold the side gears.

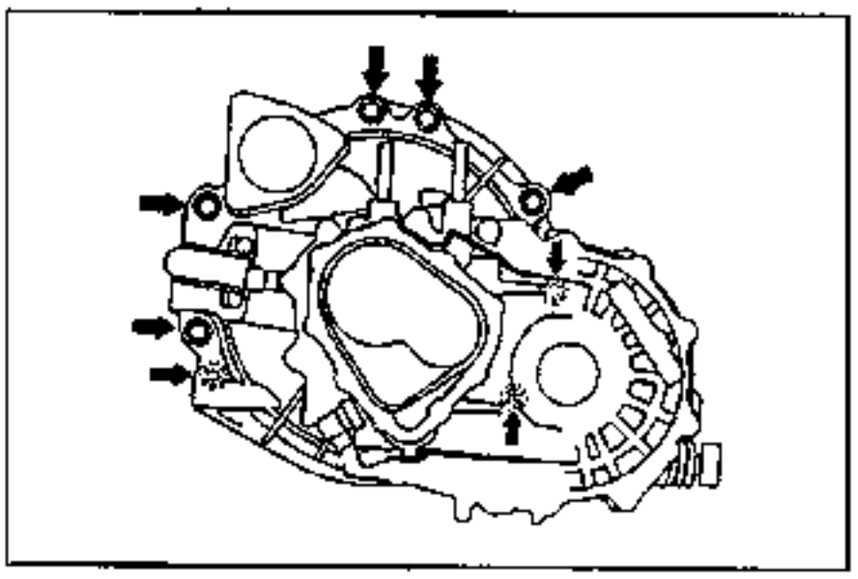


Engine mounting member
1. Support the engine by using the **SST** before removing the engine mounting member.
2. Remove the engine mounting member.



Transaxle

1. Loosen the **SST** (engine support) and lean the engine toward the transaxle.
2. Support the transaxle on a jack.



3. Remove the transaxle mounting bolts.
4. Remove the transaxle.

DISASSEMBLY

Precaution

1. Clean the transaxle exterior thoroughly with a steam cleaner or cleaning solvent before disassembly.

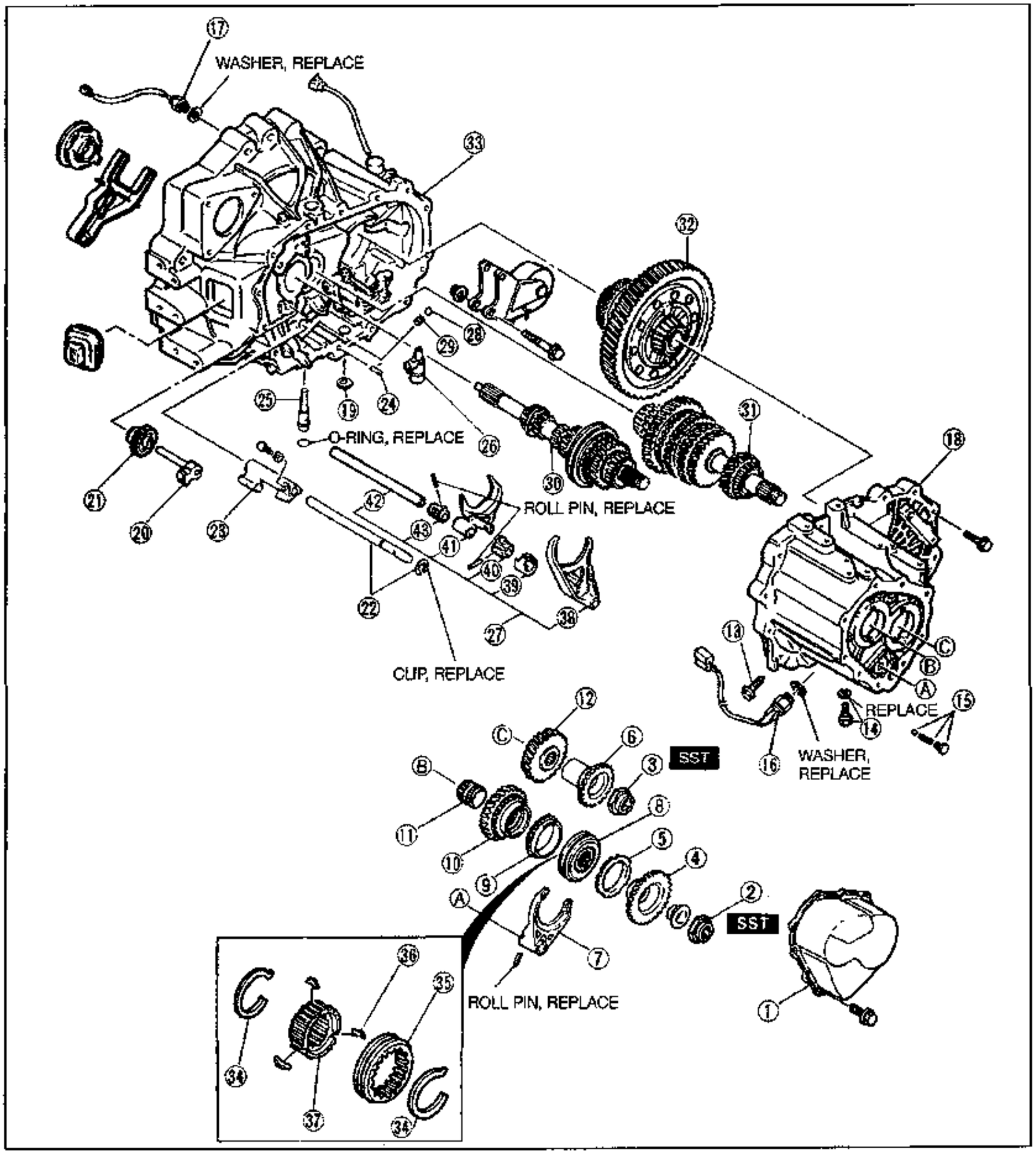
Warning

- **Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eye wear whenever using compressed air.**

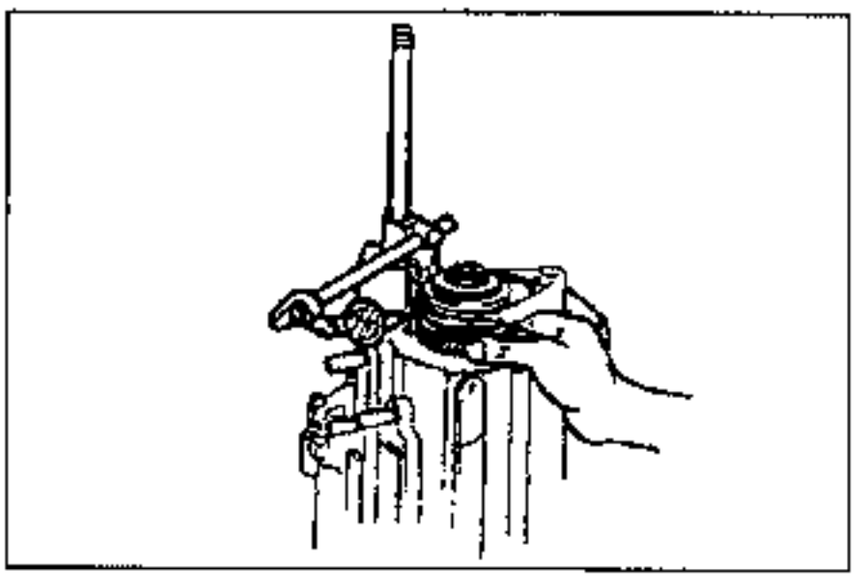
2. Clean the removed parts (except sealed bearings) and all sealing surfaces with cleaning solvent, and dry with compressed air.
3. Clean out all holes and passages with compressed air, and verify that there are no obstructions.

5th / Reverse Gear and Housing Parts

1. Measure the 5th gear thrust clearance, referring to **Preinspection**.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



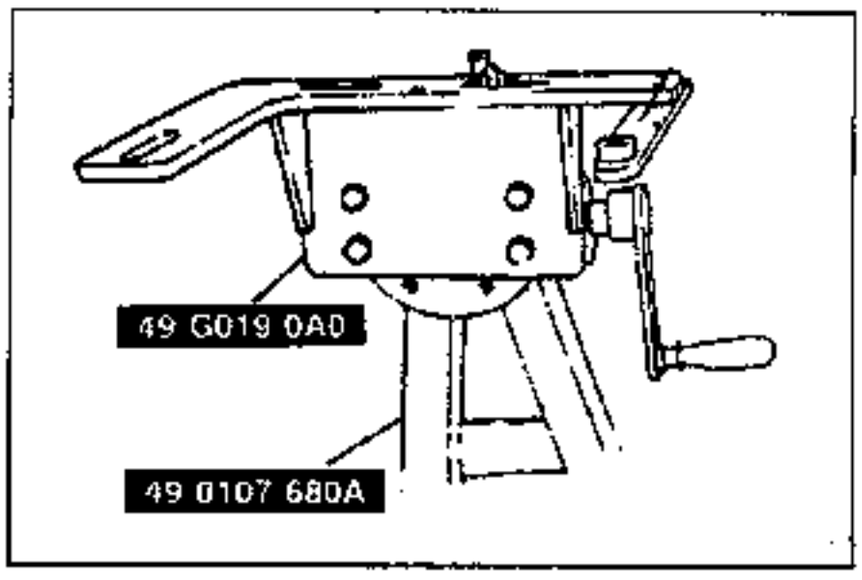
1. Rear cover
2. Locknut (primary shaft)
   Disassembly Note ..... below
3. Locknut (secondary shaft)
   Disassembly Note ..... below
4. Primary reverse synchronizer gear
   Inspection ..... page J2–27
5. Reverse synchronizer ring
   Inspection ..... page J2–27
6. Secondary reverse synchronizer gear
   Inspection ..... page J2–27
7. 5th/reverse shift fork
8. 5th/reverse clutch hub assembly
   Inspection ..... page J2–27
9. 5th synchronizer ring
   Inspection ..... page J2–27
10. 5th gear
    Preinspection ..... below
    Inspection ..... page J2–27
11. Gear sleeve
    Inspection ..... page J2–28
12. Secondary 5th gear
    Inspection ..... page J2–27
13. Lock bolt
14. Guide bolt and washer
15. Lock bolt, ball and spring
16. Back-up light switch
17. Neutral switch
18. Transaxle case assembly
19. Magnet
20. Reverse idler shaft
21. Reverse idler gear
    Inspection ..... page J2–27
22. 5th/reverse shift rod
23. 5th/reverse shift rod end
24. Pin
25. Crank lever shaft
26. Crank lever assembly
27. Shift fork and control rod assembly
    Disassembly Note ..... page J2–18
28. Steel ball
29. Spring
30. Primary shaft gear assembly
31. Secondary shaft gear assembly
32. Differential assembly
33. Clutch housing
34. Synchronizer key spring
35. Clutch hub sleeve
36. Synchronizer key
37. Clutch hub
38. 3rd/4th shift fork
39. Interlock sleeve
40. Control lever
41. 1st/2nd shift fork
42. Control rod
43. Control end



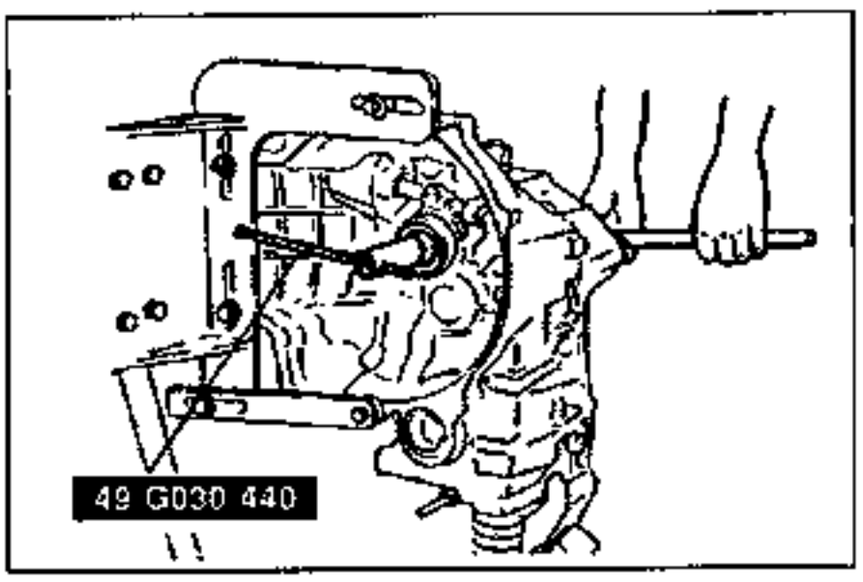
Preinspection
5th gear thrust clearance
1. Measure the 5th gear thrust clearance by using a dial indicator.

   Clearance: 0.10–0.22 mm {0.004–0.009 in}
   Maximum: 0.27 mm {0.011 in}

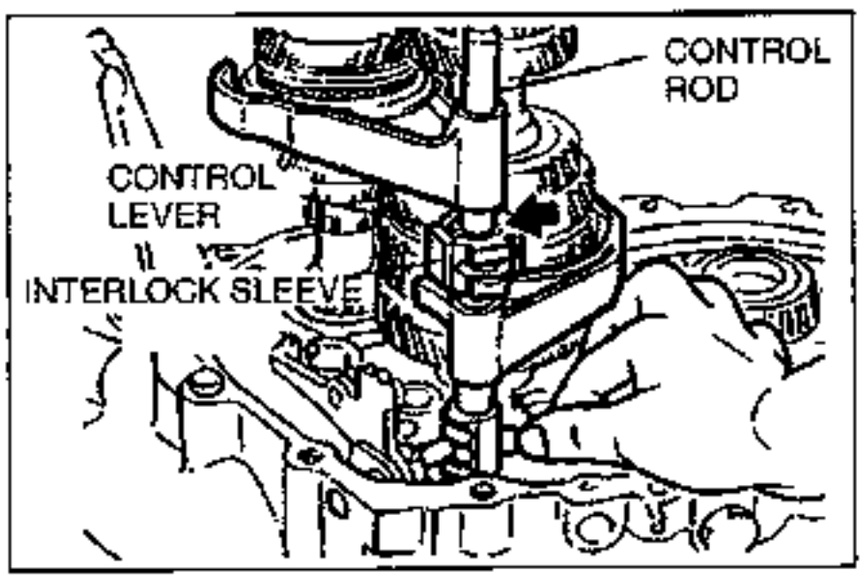
2. If the clearance exceeds the maximum, check the contact surfaces of 5th gear and the clutch hub. Replace worn or damaged parts.



Disassembly note
Locknut
1. Mount the transaxle on the **SSTs**.

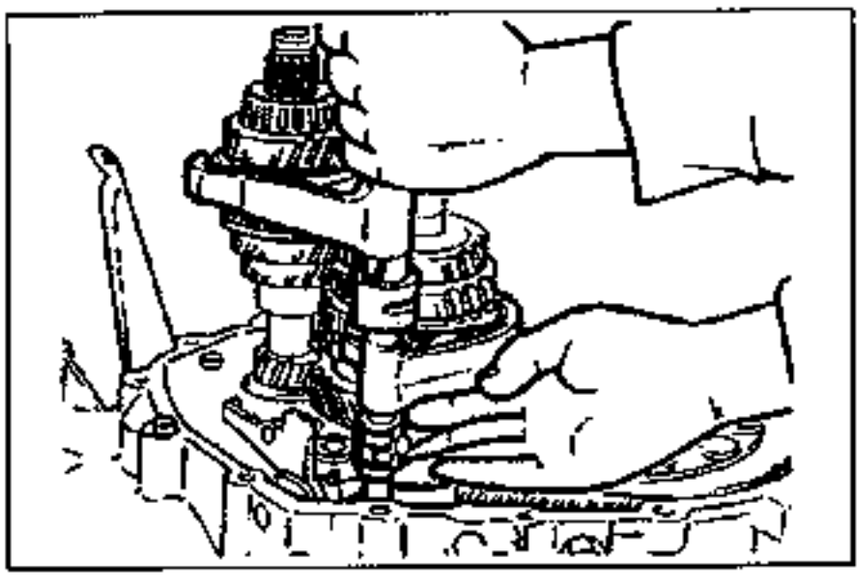


2. Lock the primary shaft by using the **SST**.
3. Shift to 1st gear to lock the rotation of the primary shaft.
4. Uncrimp the tabs of the locknuts.
5. Remove the locknuts from the primary and secondary shafts.



Shift fork and control rod assembly

1. Align the ends of the interlock sleeve and of the control lever (arrow). Turn the control rod counterclockwise.
2. While holding the 1st/2nd shift fork with one hand and the 3rd/4th shift fork with the other, raise them both at the same time and shift each of the clutch hub sleeves.

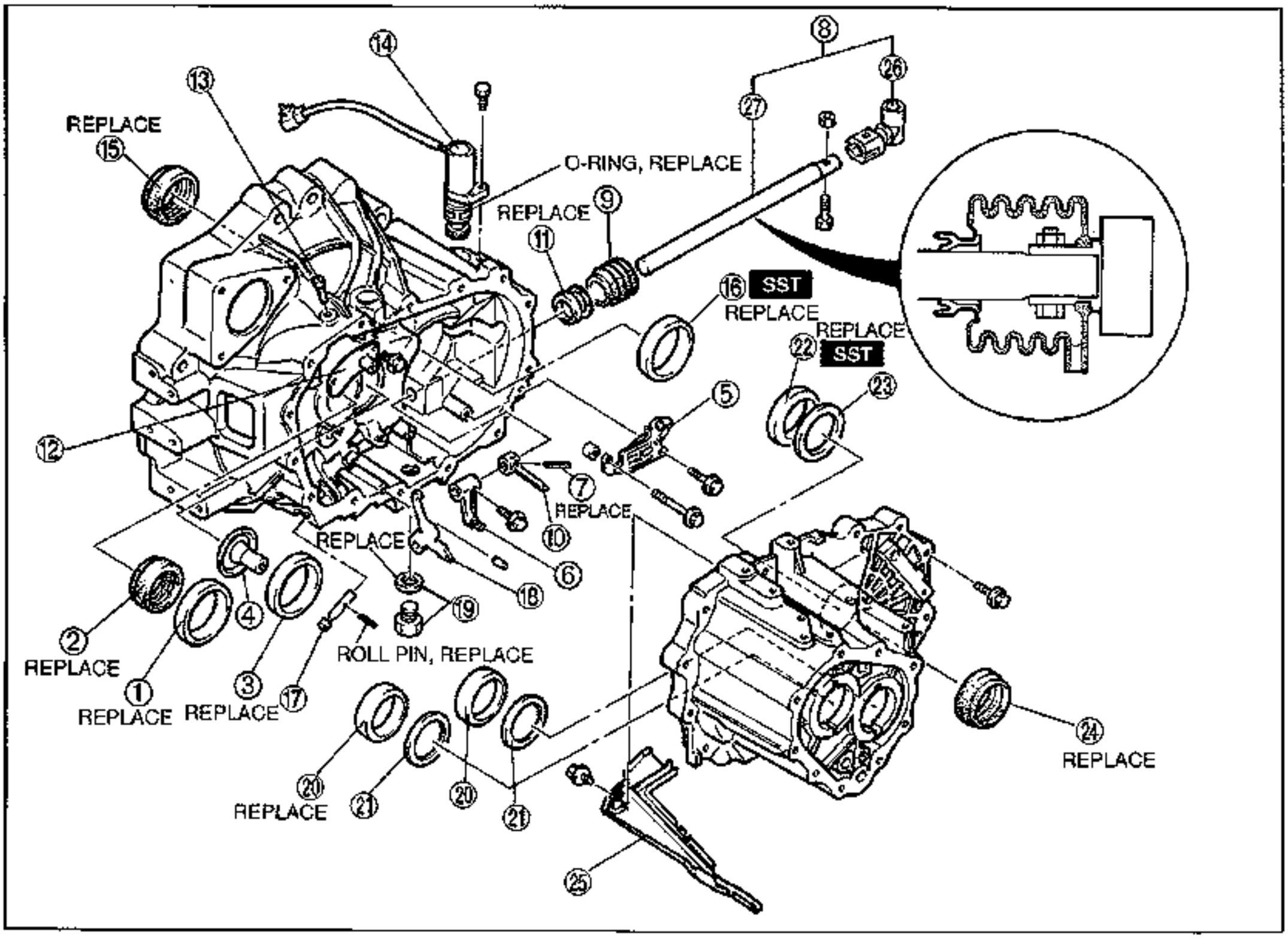


3. Lift the control end and remove the steel ball, and, at the same time, remove the control rod from the clutch housing.
4. Separate the control rod and shift fork assembly from each of the clutch hub sleeves.

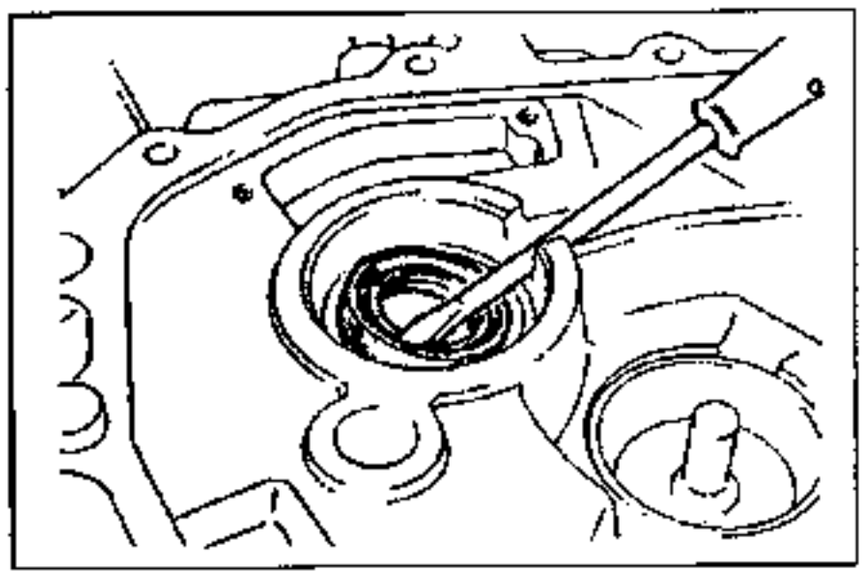
Clutch Housing and Transaxle Case Components

Note
- The oil seals do not need to be removed unless they are being replaced.

Disassemble in the order shown in the figure, referring to **Disassembly Note.**



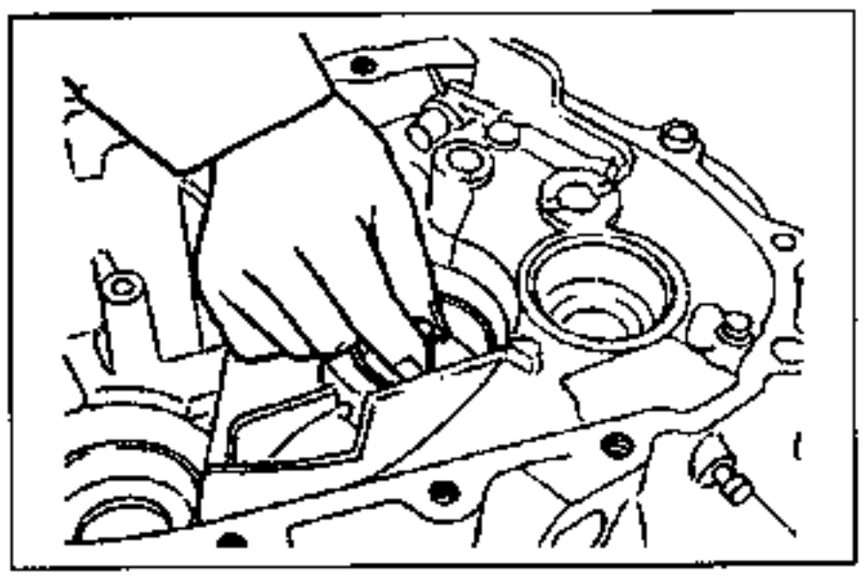
1. Bearing race (primary shaft)
2. Oil seal (primary shaft)
   Disassembly Note ..... page J2–20
3. Bearing race (secondary shaft)
   Disassembly Note ..... page J2–20
4. Funnel
5. Guide plate assembly
6. Change arm
7. Roll pin
   Disassembly Note ..... page J2–20
8. Change rod assembly
9. Boot
10. Selector
11. Oil seal (change rod assembly)
    Disassembly Note ..... page J2–20
12. Bleeder cover
13. Bleeder
14. Vehicle speedometer sensor
    Inspection ..... page J2–29
15. Oil seal (differential)
    Disassembly Note ..... page J2–20
16. Bearing race (differential)
    Disassembly Note ..... page J2–21
17. Reverse lever shaft
    Disassembly Note ..... page J2–21
18. Reverse lever
    Inspection ..... page J2–28
19. Drain plug and washer
20. Bearing race (transaxle case)
    Disassembly Note ..... page J2–21
21. Adjustment shim
22. Bearing race (differential)
    Disassembly Note ..... page J2–21
23. Adjustment shim(s)
24. Oil seal (differential)
    Disassembly Note ..... page J2–20
25. Oil passage
26. Joint
27. Change rod



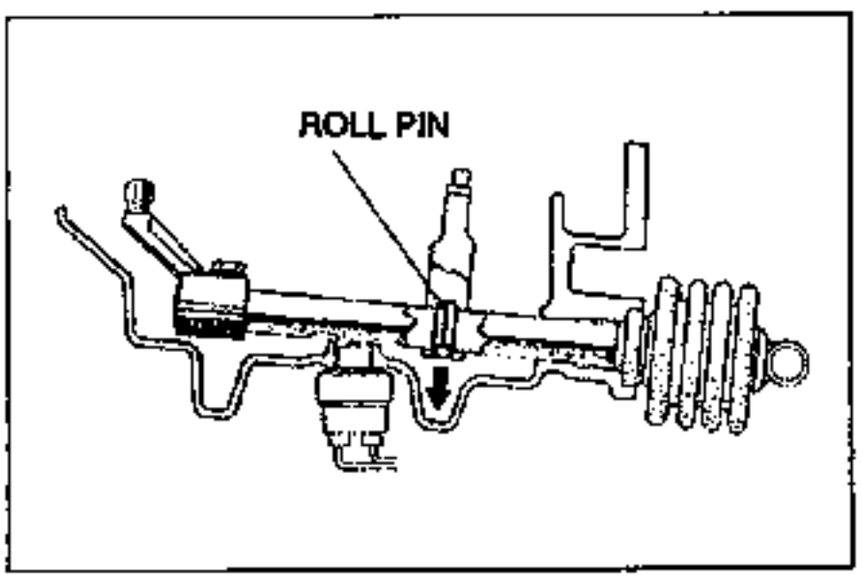
Disassembly note
Oil seal (primary shaft)

Caution
- **The clutch housing is made of aluminum, and is therefore easily dented and scratched by metal tools. When removing the oil seal, keep contact with the clutch housing to a minimum.**

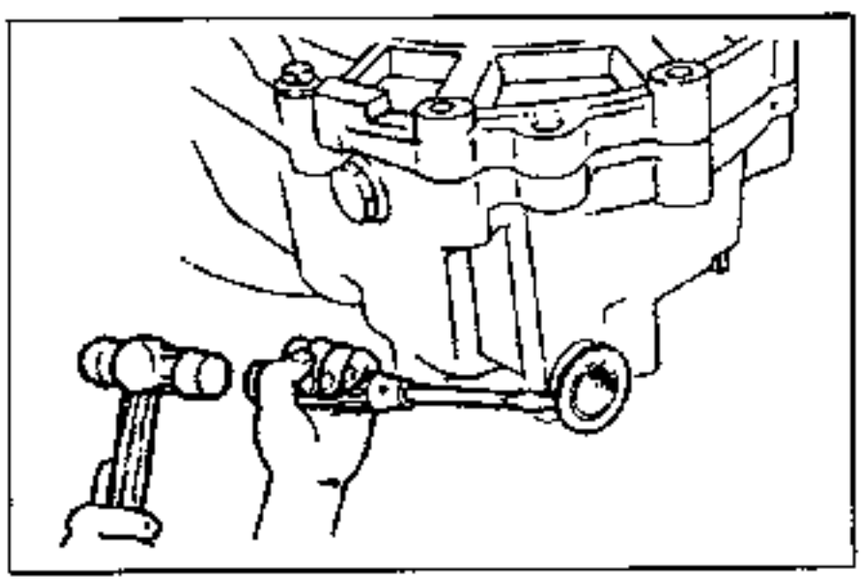
Remove the oil seal from the clutch housing as shown in the figure.



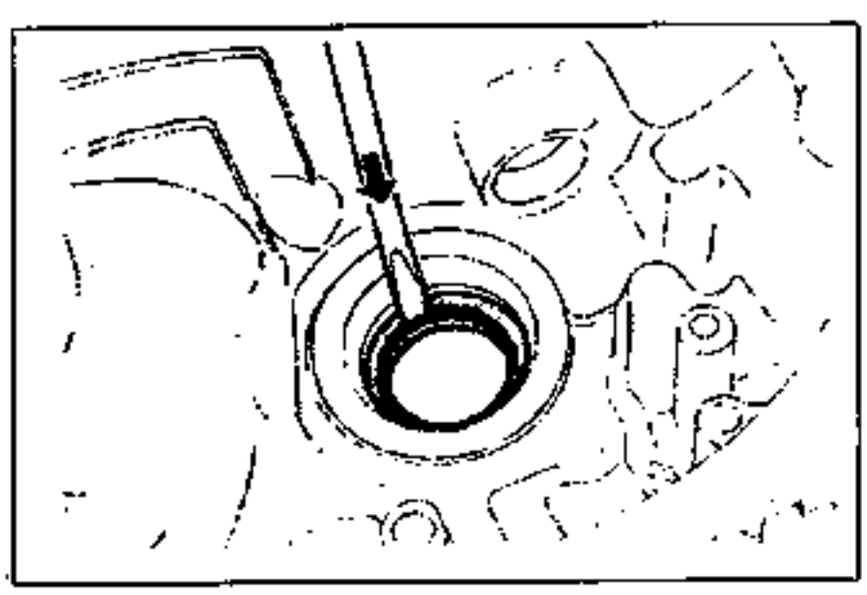
Bearing race (secondary shaft)
Remove the bearing race by lifting it and the funnel out together.



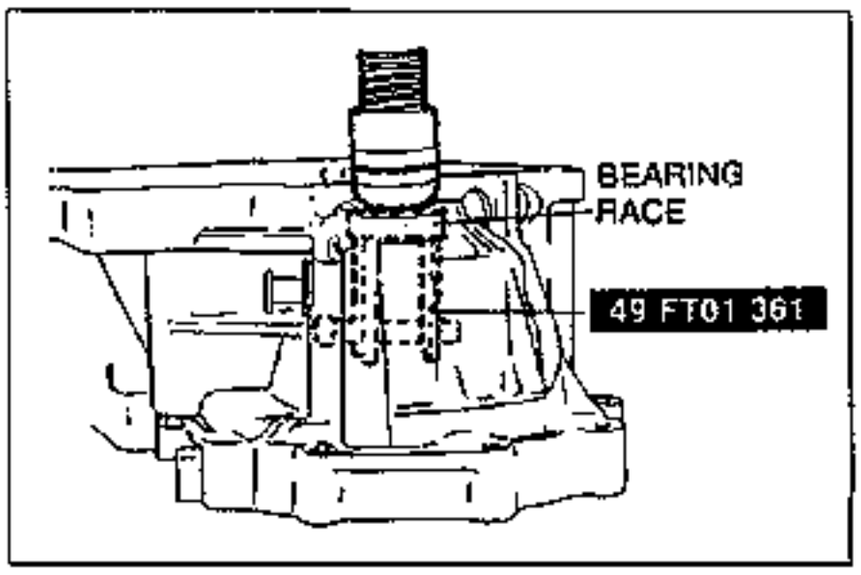
Roll pin
To remove the clutch housing pin, align the groove with the roll pin, then tap the pin out by using a pin punch.



Oil seal (change rod assembly)
Remove the oil seal.

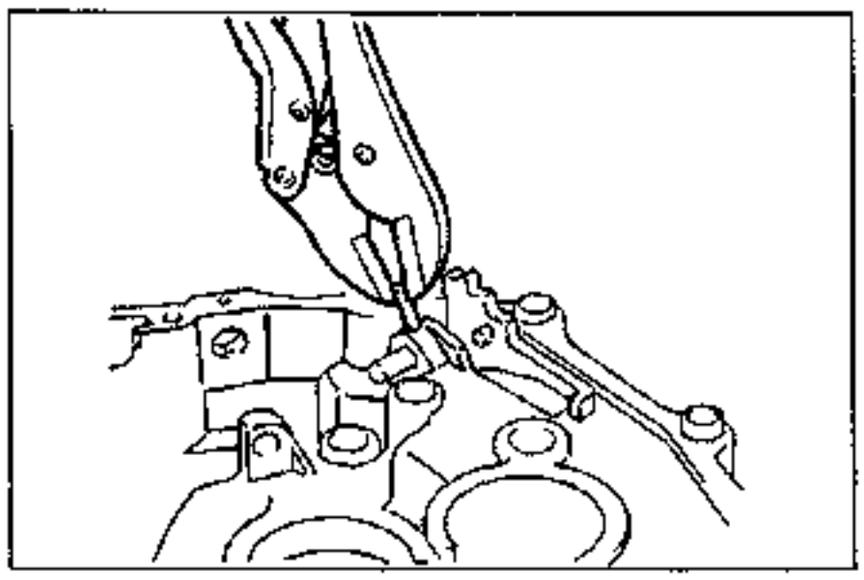


Oil seal (differential)
Remove the oil seal.



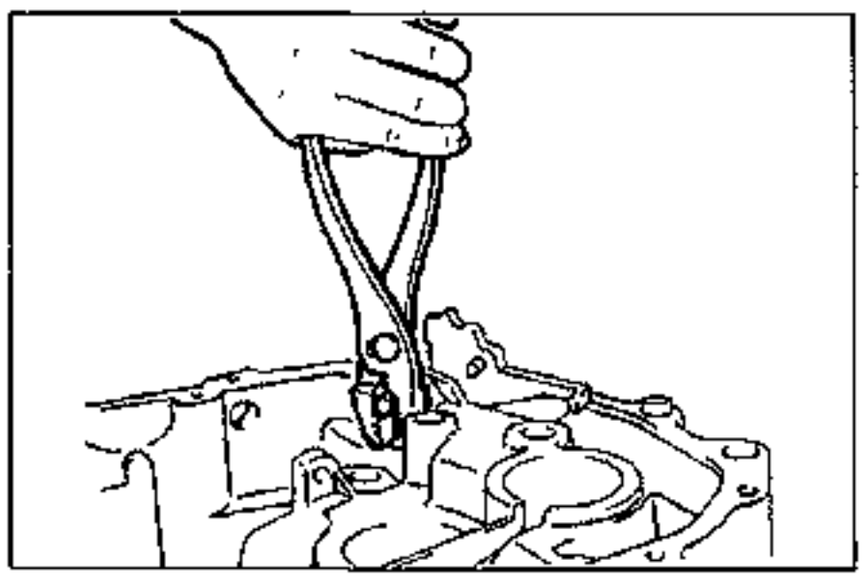
Bearing race (differential)

Remove the bearing race by using the **SST.**

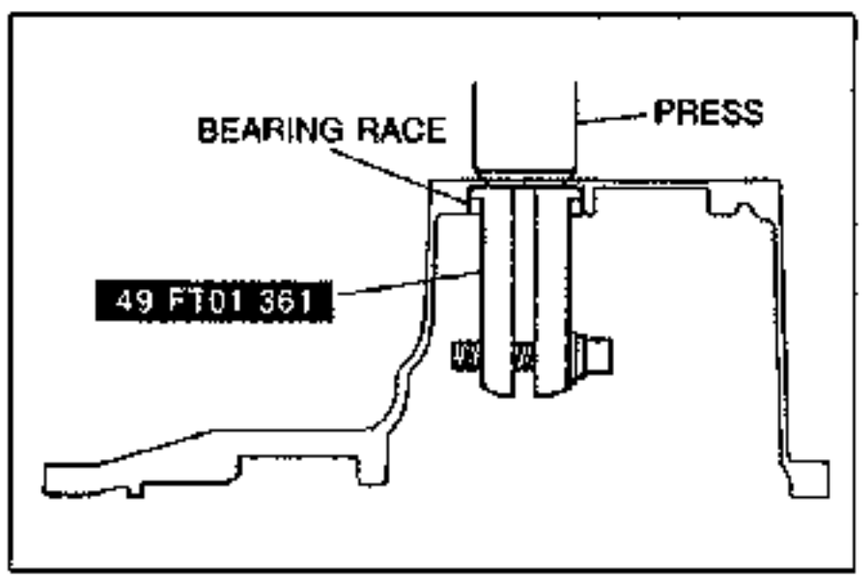


Reverse lever shaft

1. Remove the roll pin by using pliers.



2. Protect the reverse lever shaft with a rag, and use pliers to remove the shaft.

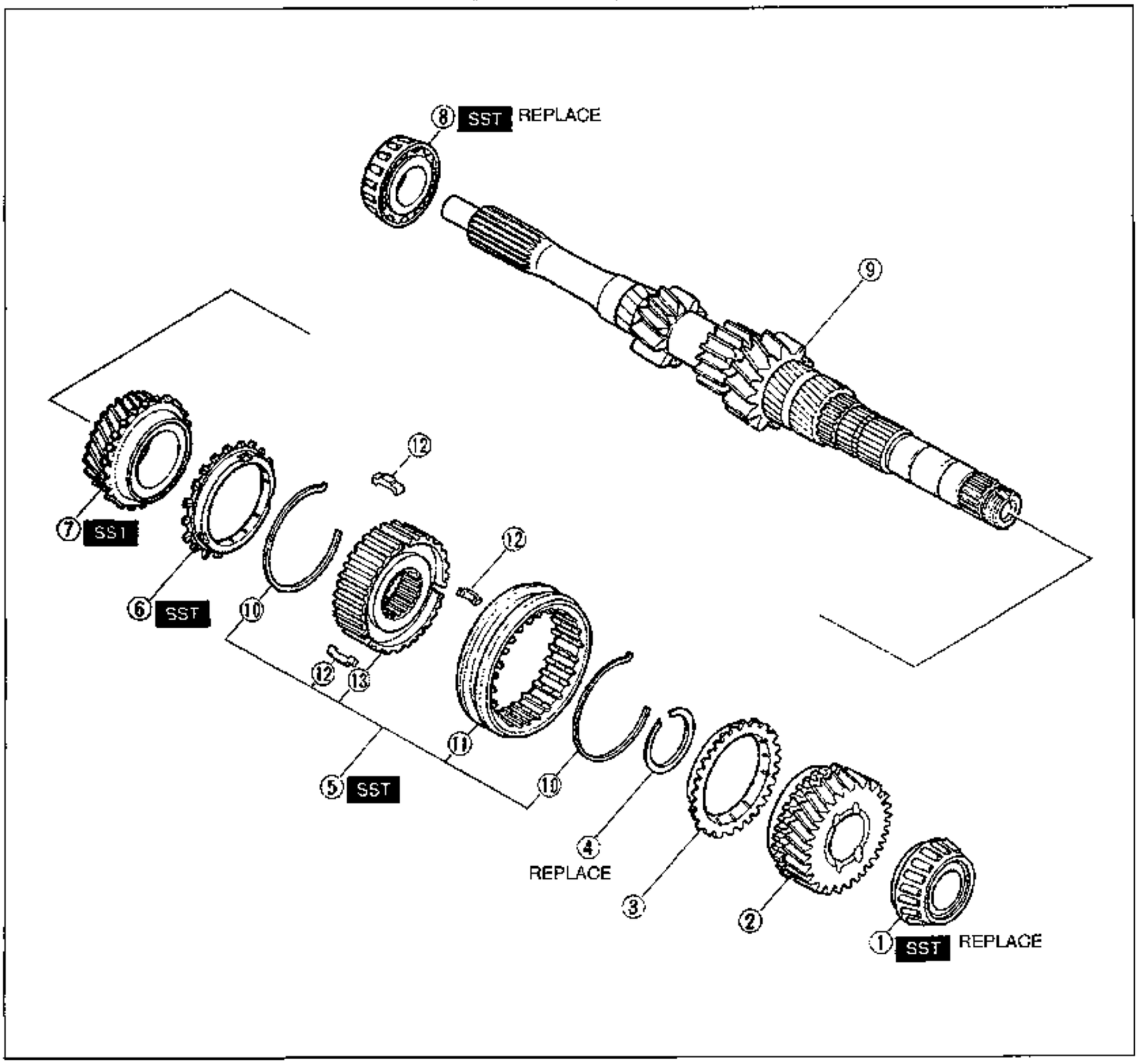


Bearing race (transaxle case)

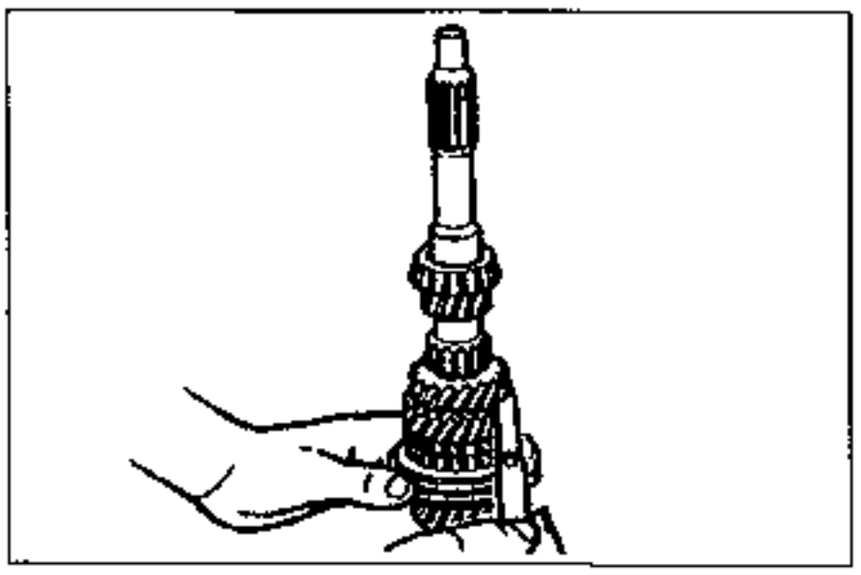
Remove the bearing race by using the **SST.**

Primary Shaft Assembly

1. Measure the thrust clearance of all gears before disassembly, referring to **Preinspection.**
2. Disassemble in the order shown in the figure, referring to **Disassembly Note.**



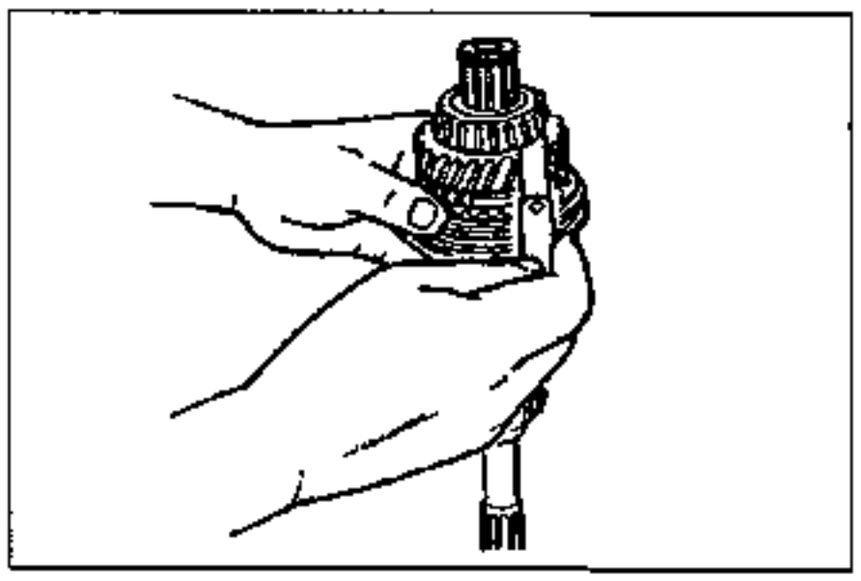
1. Bearing (4th gear end)
   - Disassembly Note ..... page J2–23
   - Inspection ..... page J2–28
2. 4th gear
   - Preinspection ..... page J2–23
   - Inspection ..... page J2–27
3. 4th synchronizer ring
   - Inspection ..... page J2–27
4. Retaining ring
5. 3rd/4th clutch hub assembly
   - Disassembly Note ..... page J2–23
   - Inspection ..... page J2–27
6. 3rd synchronizer ring
   - Disassembly Note ..... page J2–23
   - Inspection ..... page J2–27
7. 3rd gear
   - Preinspection ..... page J2–23
   - Disassembly Note ..... page J2–23
   - Inspection ..... page J2–27
8. Bearing (primary shaft end)
   - Disassembly Note ..... page J2–23
   - Inspection ..... page J2–28
9. Primary shaft gear
   - Inspection ..... page J2–28
10. Synchronizer key spring
11. 3rd/4th clutch hub sleeve
12. Synchronizer key
13. 3rd/4th clutch hub



Preinspection
3rd gear thrust clearance
1. Measure the clearance between 3rd gear and 2nd gear.

   Clearance: 0.05–0.20 mm {0.002–0.008 in}
   Maximum: 0.25 mm {0.010 in}

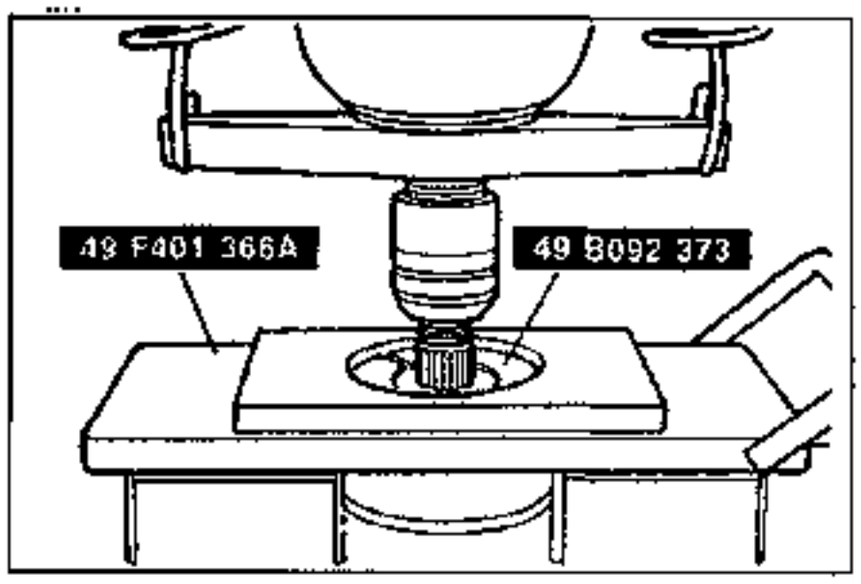
2. If the clearance exceeds the maximum, check the contact surfaces of the 3rd gear, 2nd gear and 3rd/4th clutch hub. Replace worn and damaged parts.



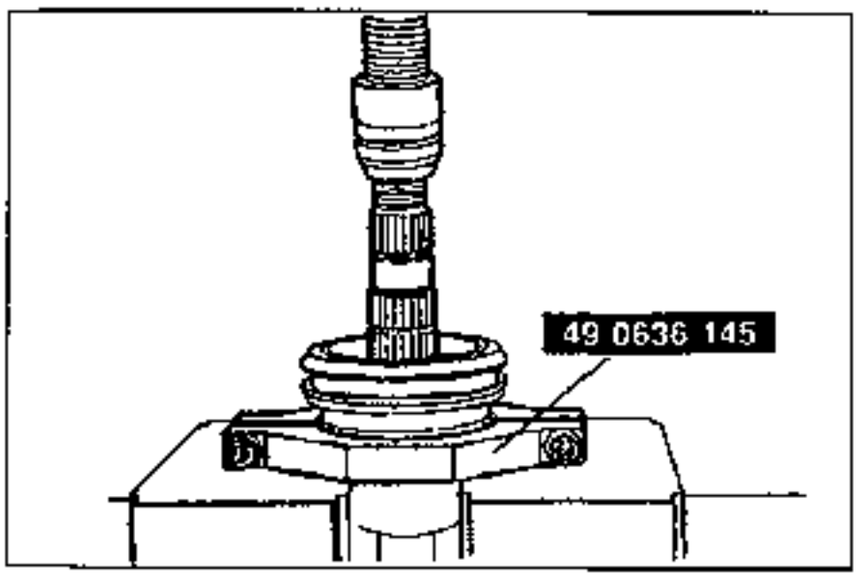
4th gear thrust clearance
1. Measure the clearance between 4th gear and the ball bearing.

   Clearance: 0.17–0.37 mm {0.007–0.015 in}
   Maximum: 0.42 mm {0.017 in}

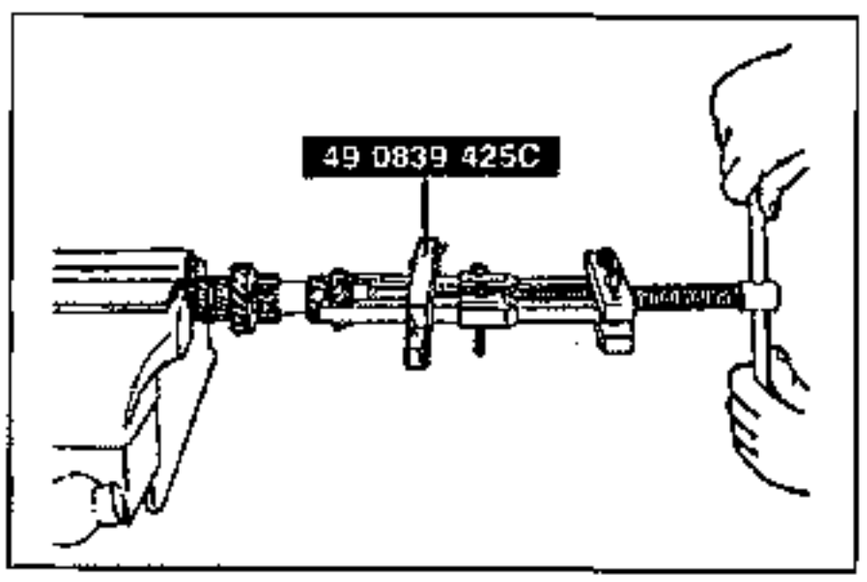
2. If the clearance exceeds the maximum, check the contact surfaces of the 4th gear, ball bearing, and 3rd/4th clutch hub. Replace worn and damaged parts.



Disassembly note
Bearing (4th gear end)
Remove the bearing by using the **SST.**



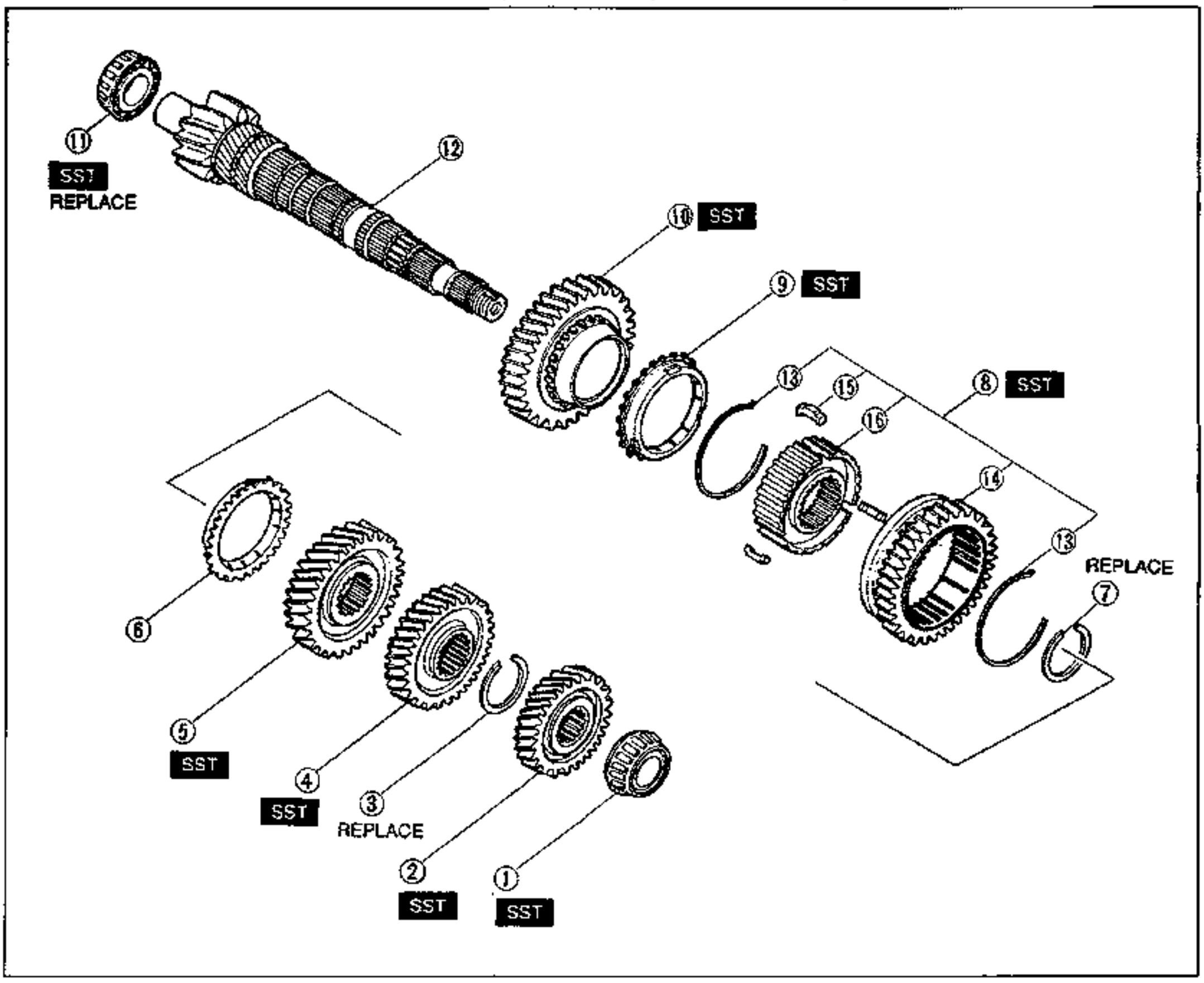
3rd/4th clutch hub assembly, 3rd synchronizer ring and 3rd gear
1. Remove the retaining ring.
2. Remove the 3rd/4th clutch hub assembly, 3rd synchronizer ring , and 3rd gear by using the **SST.**



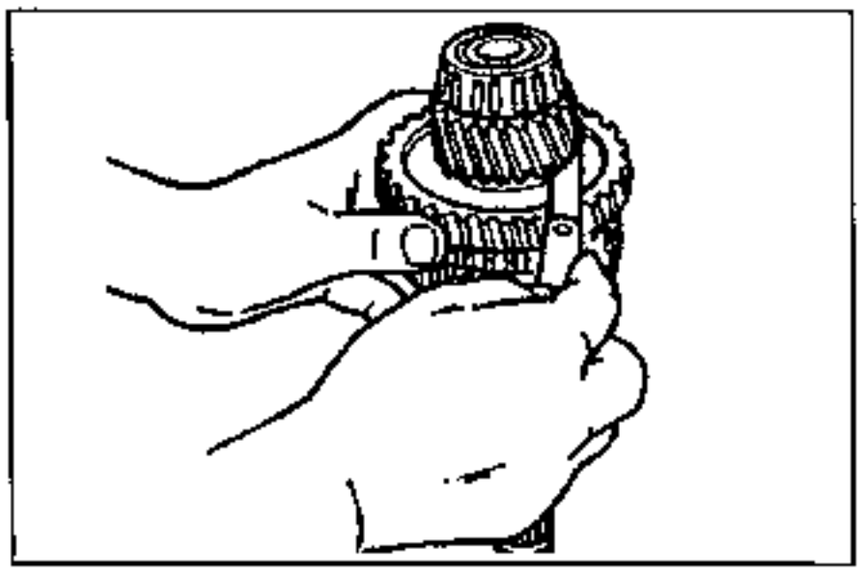
Bearing (primary shaft end)
Remove the bearing by using the **SST.**

Secondary Shaft Assembly

1. Measure the thrust clearance of 1st gear and 2nd gear before disassembly, referring to **Preinspection**.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note.**



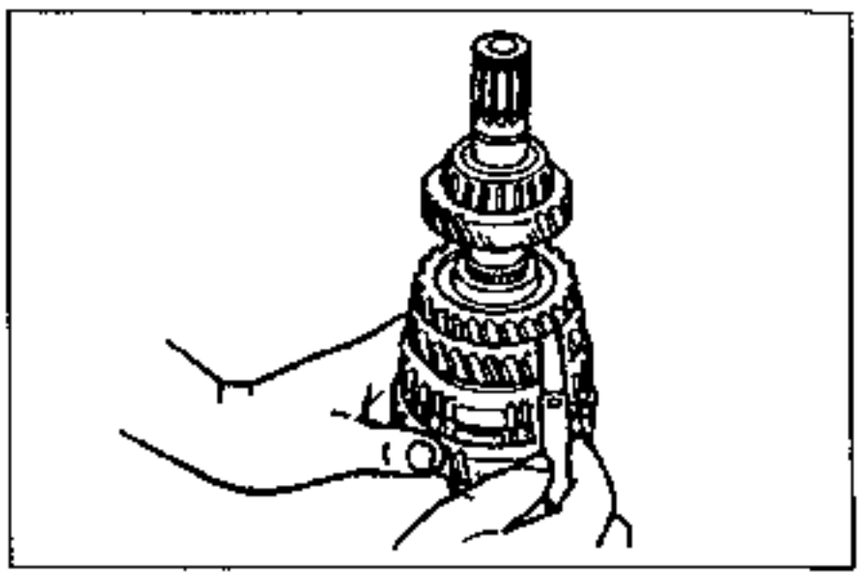
1. Bearing
   - Disassembly Note ..... page J2–25
   - Inspection ..... page J2–28
2. Secondary 4th gear
   - Disassembly Note ..... page J2–25
   - Inspection ..... page J2–27
3. Retaining ring
4. Secondary 3rd gear
   - Disassembly Note ..... page J2–25
   - Inspection ..... page J2–27
5. 2nd gear
   - Preinspection ..... page J2–25
   - Disassembly Note ..... page J2–25
   - Inspection ..... page J2–27
6. 2nd synchronizer ring
   - Inspection ..... page J2–27
7. Retaining ring
8. 1st/2nd clutch hub assembly
   - Disassembly Note ..... page J2–25
   - Inspection ..... page J2–27
9. 1st synchronizer ring
   - Disassembly Note ..... page J2–25
   - Inspection ..... page J2–27
10. 1st gear
    - Preinspection ..... page J2–25
    - Disassembly Note ..... page J2–25
    - Inspection ..... page J2–27
11. Bearing (secondary shaft end)
    - Disassembly Note ..... page J2–26
    - Inspection ..... page J2–28
12. Secondary shaft gear
    - Inspection ..... page J2–28
13. Synchronizer key spring
14. Clutch hub sleeve (reverse gear)
15. Synchronizer key
16 1st/2nd clutch hub



Preinspection
1st gear thrust clearance
1. Measure the clearance between 1st gear and the differential drive gear.

   Clearance: 0.05–0.28 mm {0.002–0.011 in}
   Maximum: 0.33 mm {0.013 in}

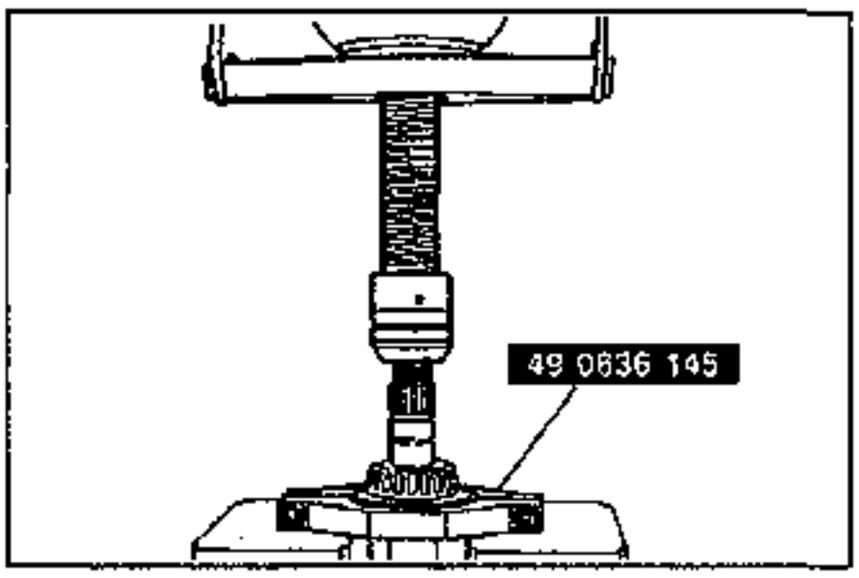
2. If the clearance exceeds the maximum, check the contact surfaces of the 1st gear, differential drive gear of the secondary shaft gear, and 1st/2nd clutch hub assembly . Replace worn and damaged parts.



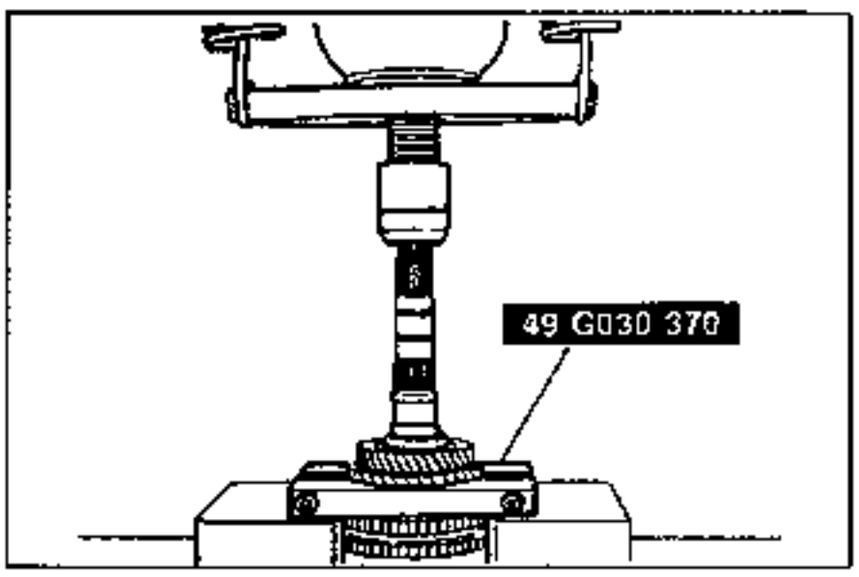
2nd gear thrust clearance
1. Measure the clearance between 2nd gear and secondary 3rd gear.

   Clearance: 0.18–0.46 mm {0.007–0.018 in}
   Maximum: 0.51 mm {0.020 in}

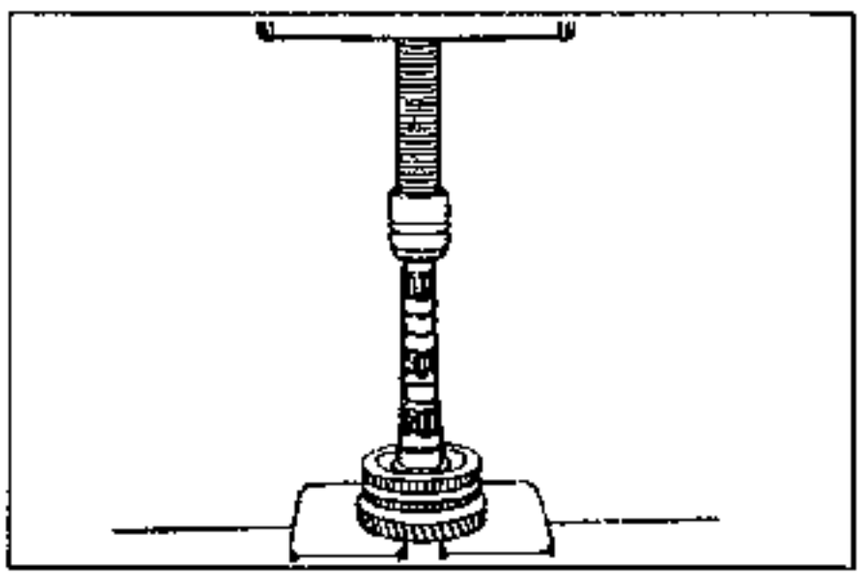
2. If the clearance exceeds the maximum, check the contact surfaces of the 2nd gear, secondary 3rd gear,and 1st/2nd clutch hub assembly . Replace worn and damaged parts.



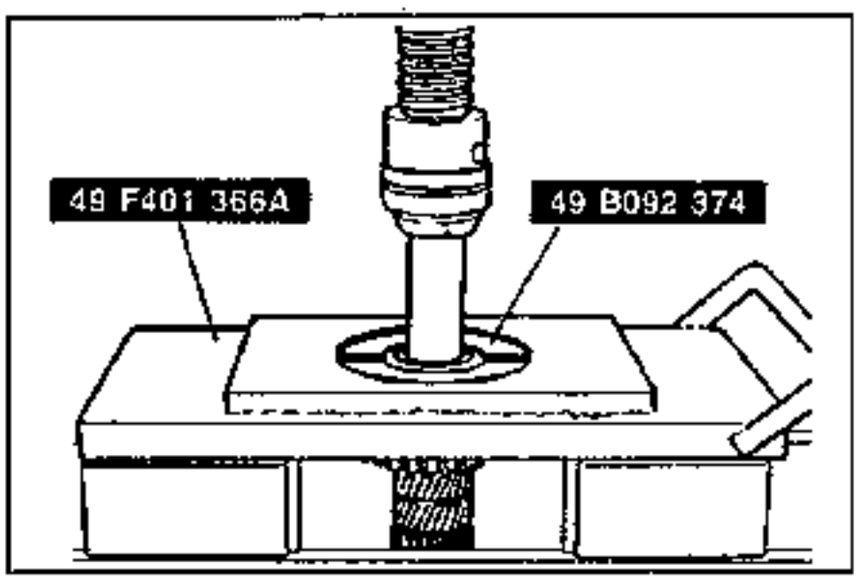
Disassembly note
Bearing and secondary 4th gear
Remove the bearing and secondary 4th gear by using the **SST**.



Secondary 3rd gear and 2nd gear
1. Remove the retaining ring.
2. Shift the gears to 1st gear.
3. Remove the secondary 3rd gear and 2nd gear by using the **SST**.

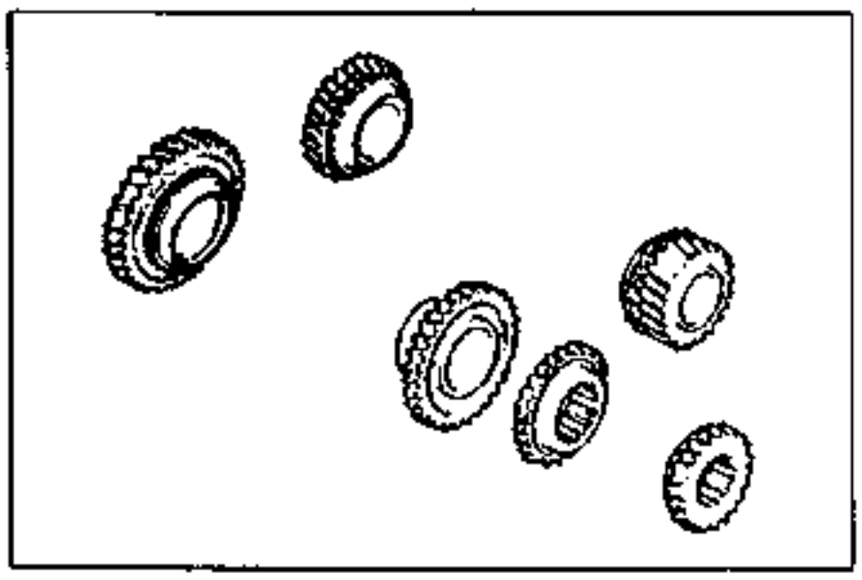


1st/2nd clutch hub assembly, 1st synchronizer ring, and 1st gear
1. Remove the retaining ring.
2. Remove the 1st/2nd clutch hub assembly, 1st synchronizer ring , and 1st gear by using a press.

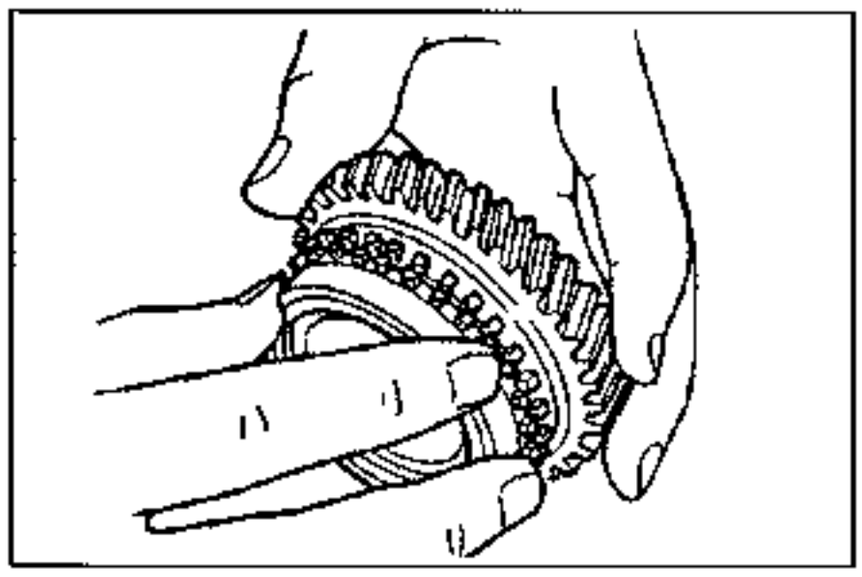


Bearing (secondary shaft end)
Remove the bearing by using the **SSTs.**

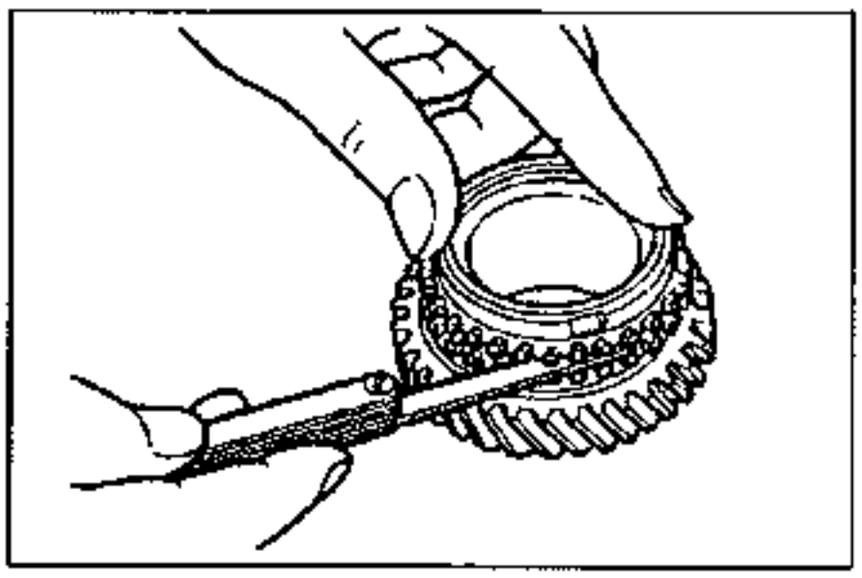
INSPECTION
Inspect all parts and repair or replace as necessary.



Gears
1. Inspect the synchronizer cones for wear.
2. Inspect the gear teeth for damage, wear, and cracks.
3. Inspect the synchronizer ring matching teeth for damage and wear.

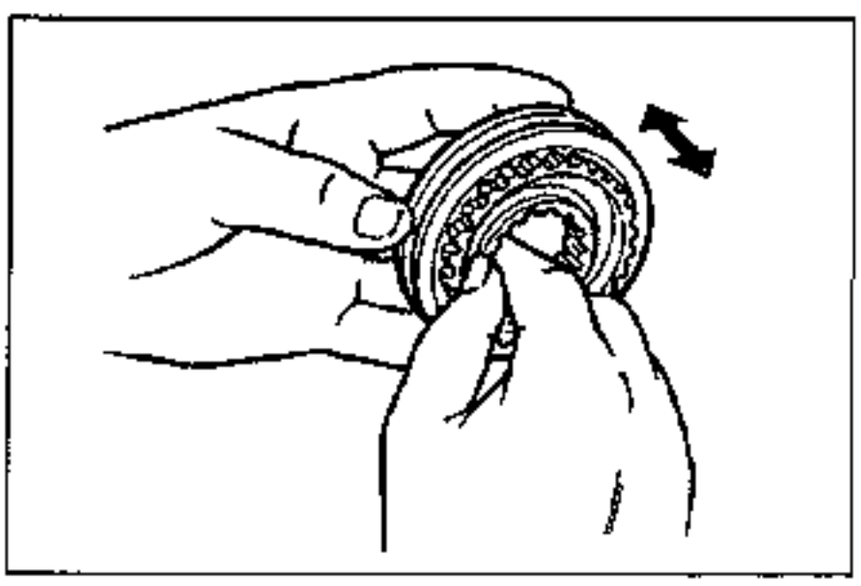


Synchronizer Ring
1. Inspect the synchronizer ring teeth for damage, wear, and cracks.
2. Inspect the tapered surface for wear and cracks.

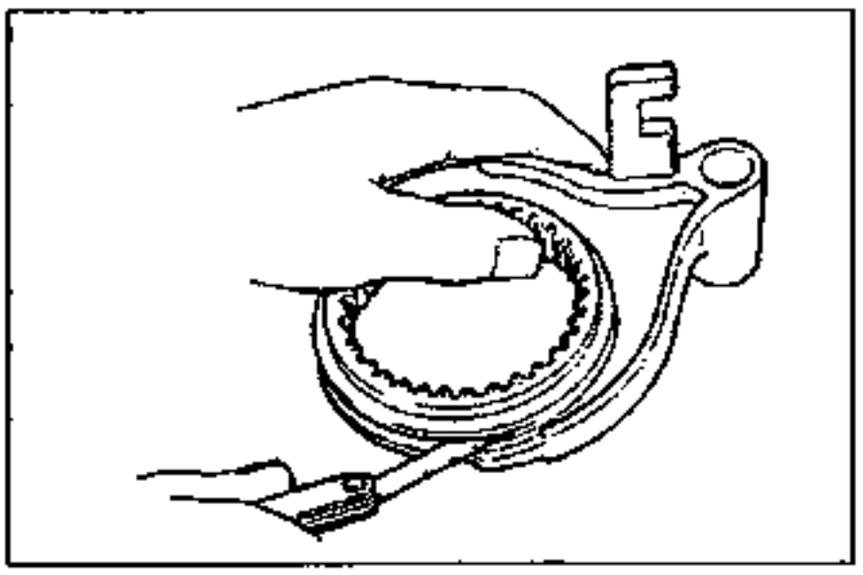


3. Set the synchronizer ring squarely in the gear.
4. Measure the clearance between the synchronizer ring and the flank surface of the gear.

Standard clearance: 1.50 mm {0.059 in}
Minimum: 0.80 mm {0.031 in}



Clutch Hub Assembly
1. Inspect the clutch hub sleeve and hub operation.
2. Inspect the gear teeth for damage, wear, and cracks.
3. Inspect the synchronizer keys for damage, wear, and cracks.

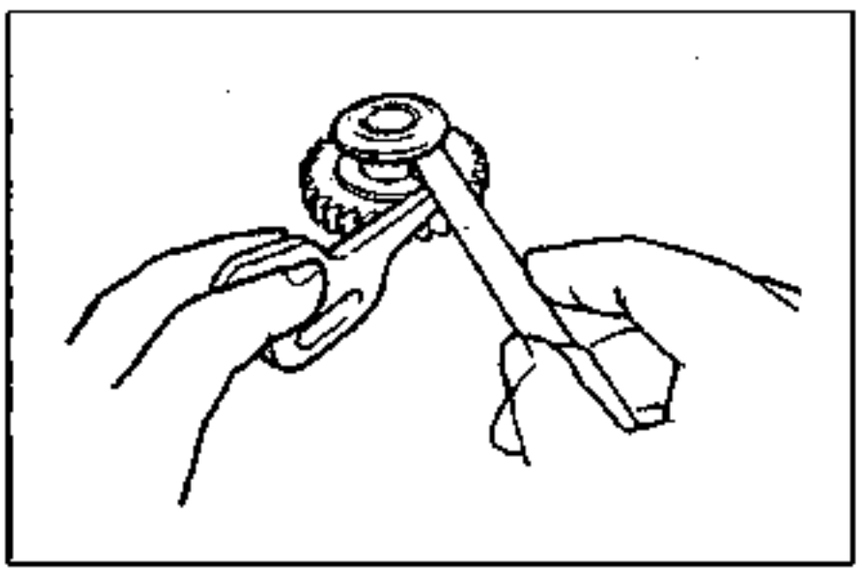


4. Measure the clearance between the hub sleeve and shift fork.

Clearance

mm {in}

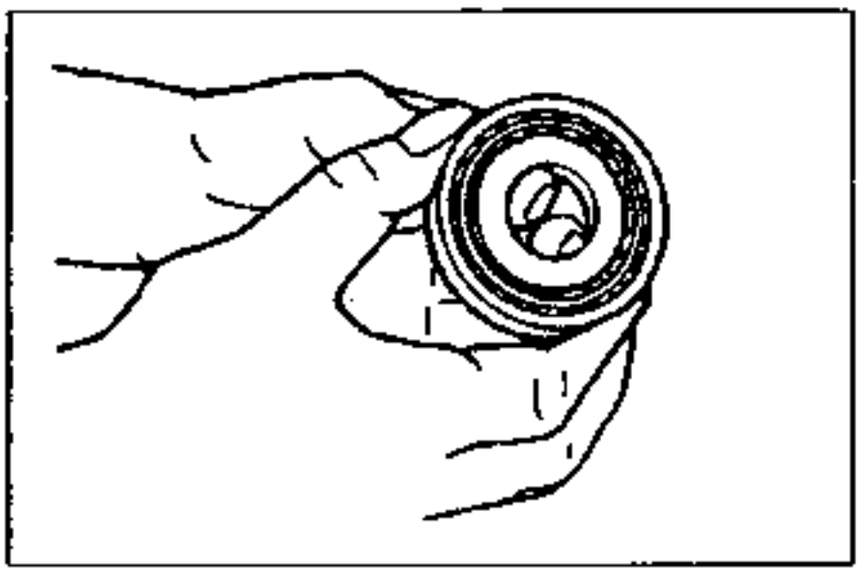
	Standard	Maximum
1st/2nd	0.10–0.45 {0.004–0.018}	0.95 {0.037}
3rd/4th	0.10–0.40 {0.004–0.016}	0.90 {0.035}
5th/Rev.	0.10–0.36 {0.004–0.014}	0.86 {0.034}



Reverse Idler Gear and Reverse Lever

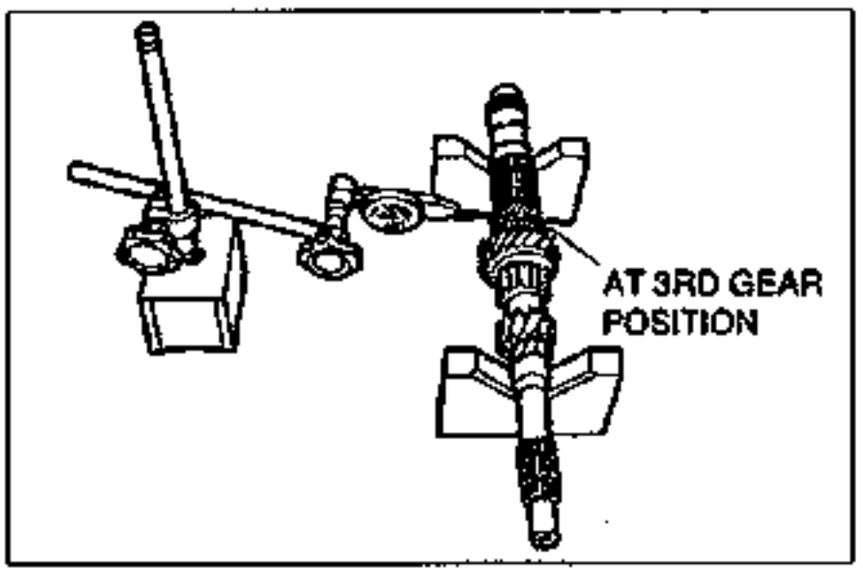
1. Inspect the gear teeth for damage, wear, and cracks.
2. Measure the clearance between the reverse idler gear bushing and the reverse lever.

Standard clearance:
0.10–0.32 mm {0.004–0.013 in}
Maximum: 0.82 mm {0.032 in}



Bearing

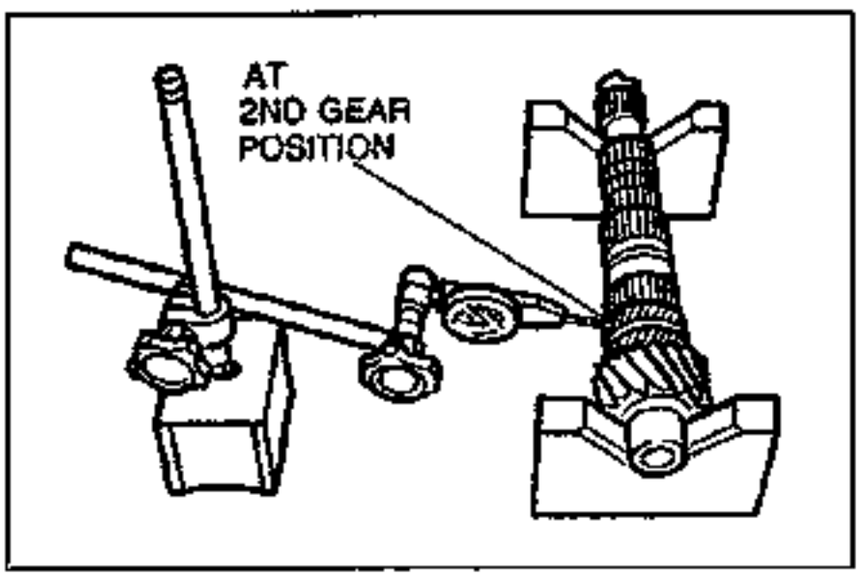
Inspect for damage and rough rotation.



Primary Shaft Gear and Secondary Shaft Gear

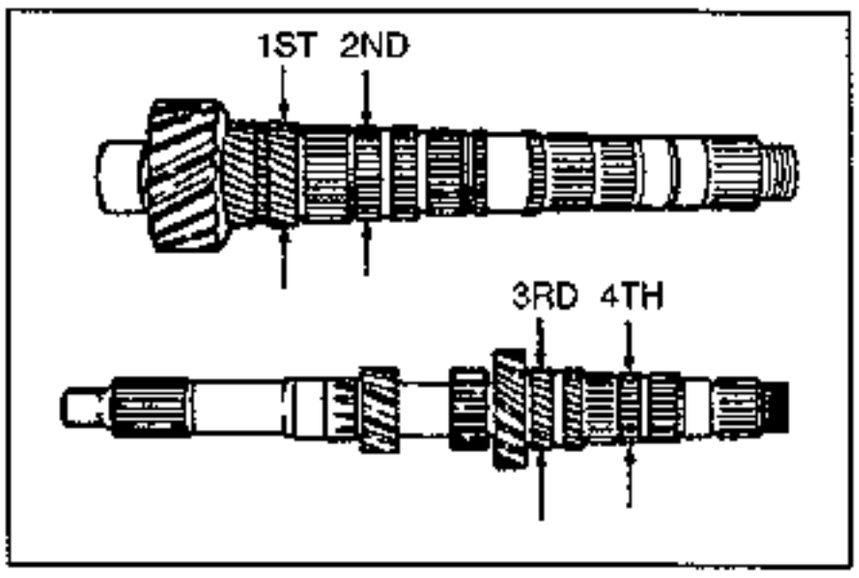
1. Inspect the gear contact surface for damage and wear.
2. Inspect the splines for damage and wear.
3. Inspect the gear teeth for damage, wear, and cracks.
4. Inspect the oil passage for clogging.
5. Measure the shaft gear runout.

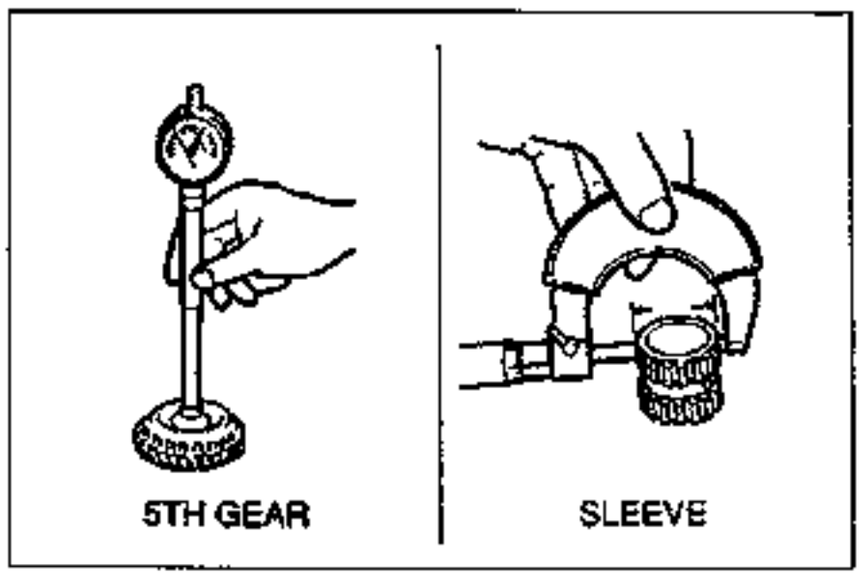
Primary shaft gear runout: 0.05 mm {0.002 in} max.

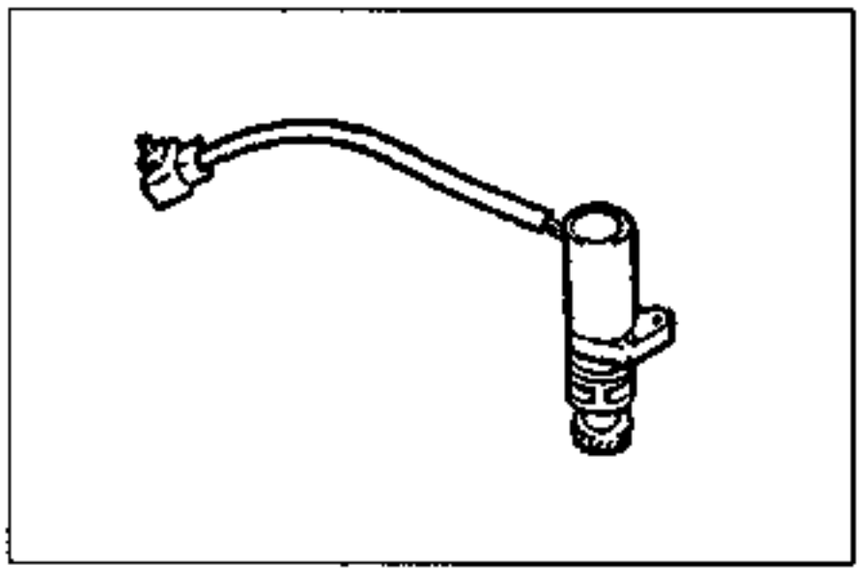


Secondary shaft gear runout:
0.015 mm {0.0006 in} max.

6. If the shaft gear is replaced, adjust the bearing preload. (Refer to page J2–36.)







6. Determine the clearance between the shaft gears and the gears.

Clearance

mm {in}

	Shaft (Outer dia.)	Gear (Inner dia.)	Sleeve (Outer dia.)	Clearance
1st	39.445–39.470 {1.553–1.554}	39.500–39.525 {1.555–1.556}	—	0.03–0.08 {0.001–0.003}
2nd	34.945–34.970 {1.376–1.377}	35.000–35.025 {1.378–1.379}	—	
3rd	35.945–35.970 {1.415–1.416}	36.000–36.025 {1.417–1.418}	—	
4th	30.945–30.970 {1.218–1.219}	31.000–31.025 {1.221–1.222}	—	
5th	—	34.000–34.025 {1.339–1.400}	33.945–33.970 {1.336–1.337}	

Vehicle speedometer sensor

1. Inspect the teeth for damage and wear.
2. Inspect the O-ring for damage and wear.

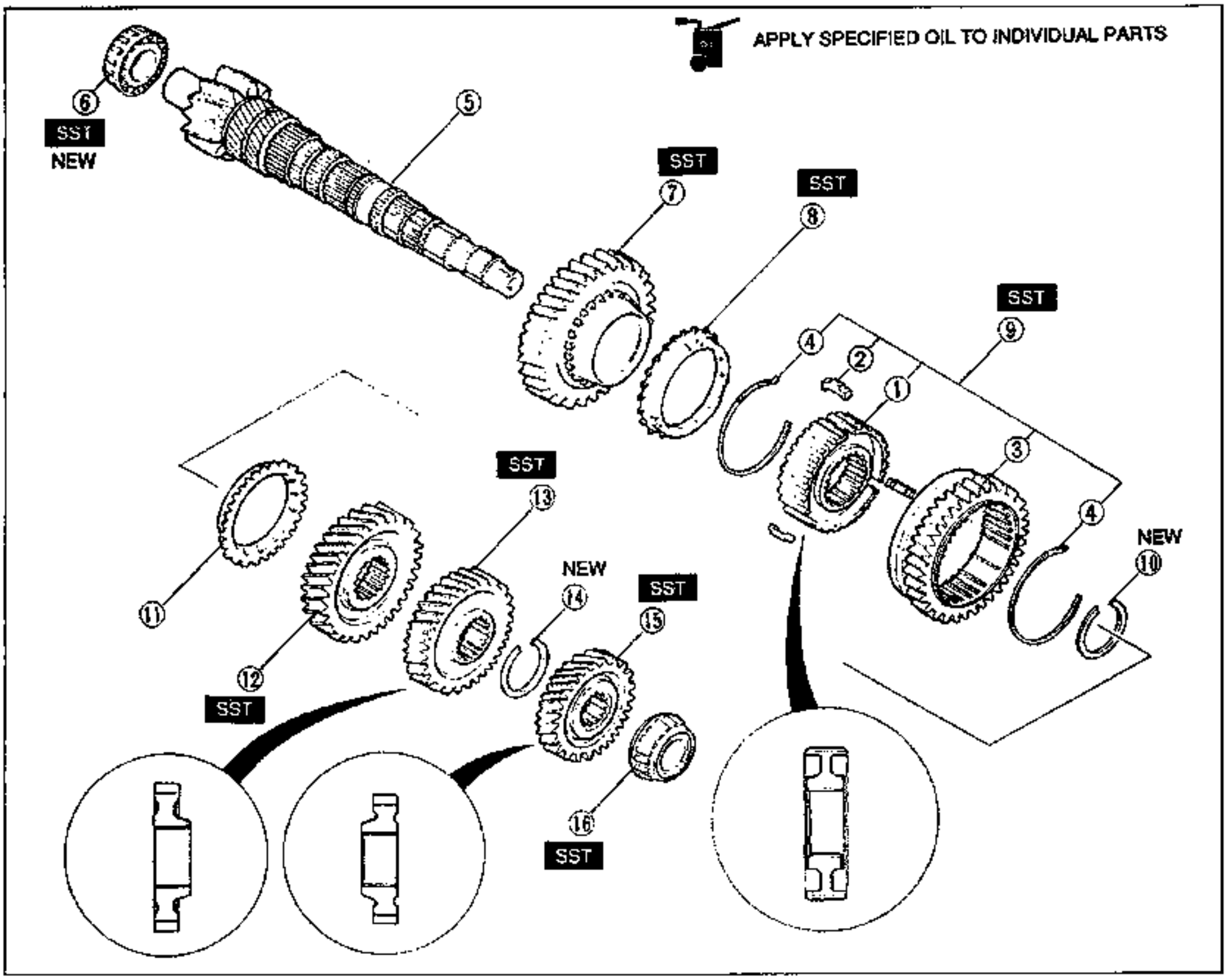
ASSEMBLY

Precaution

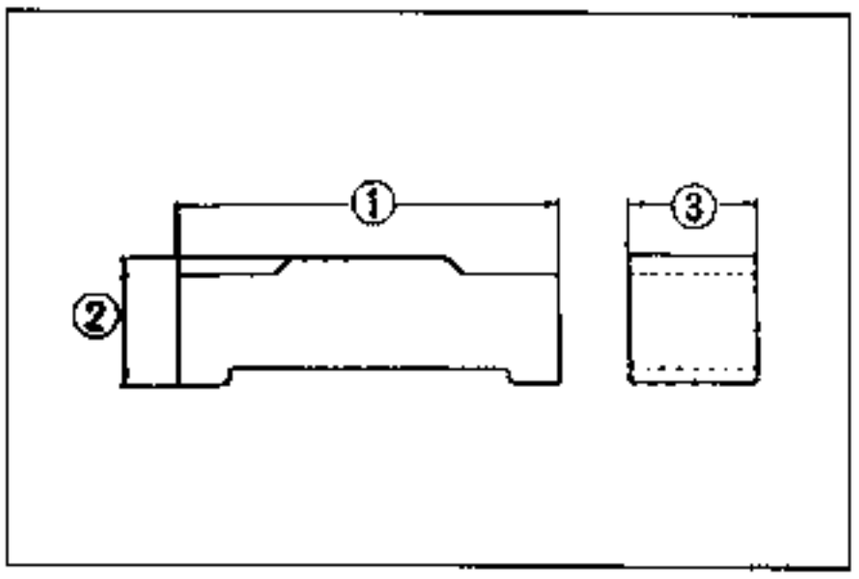
1. Replace all O-rings and gaskets with the new ones included in the overhaul kit.
2. Verify that all parts are completely clean before assembly.
3. Assemble parts within 10 minutes after applying sealant. Allow all sealant to cure for at least 30 minutes after assembly before filling the transaxle with transaxle oil.
4. Replace bearing races and bearings as sets.

Secondary Shaft Assembly

Assemble in the order shown in the figure, referring to **Assembly Note**.



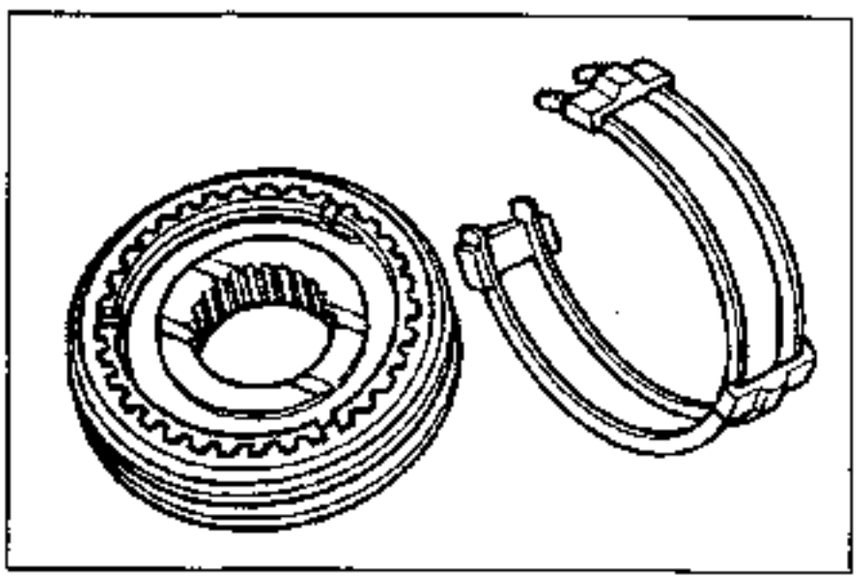
1. 1st/2nd clutch hub
   Assembly Note ..... page J2–31
2. Synchronizer key
3. Clutch hub sleeve (reverse gear)
4. Synchronizer key spring
5. Secondary shaft gear
6. Bearing (secondary shaft end)
   Assembly Note ..... page J2–31
7. 1st gear
   Assembly Note ..... page J2–31
8. 1st synchronizer ring
   Assembly Note ..... page J2–31
9. 1st/2nd clutch hub assembly
   Assembly Note ..... page J2–31
10. Retaining ring
11. 2nd synchronizer ring
   Assembly Note ..... page J2–32
12. 2nd gear
   Assembly Note ..... page J2–32
13. Secondary 3rd gear
   Assembly Note ..... page J2–32
14. Retaining ring
15. Secondary 4th gear
   Assembly Note ..... page J2–32
16. Bearing
   Assembly Note ..... page J2–32



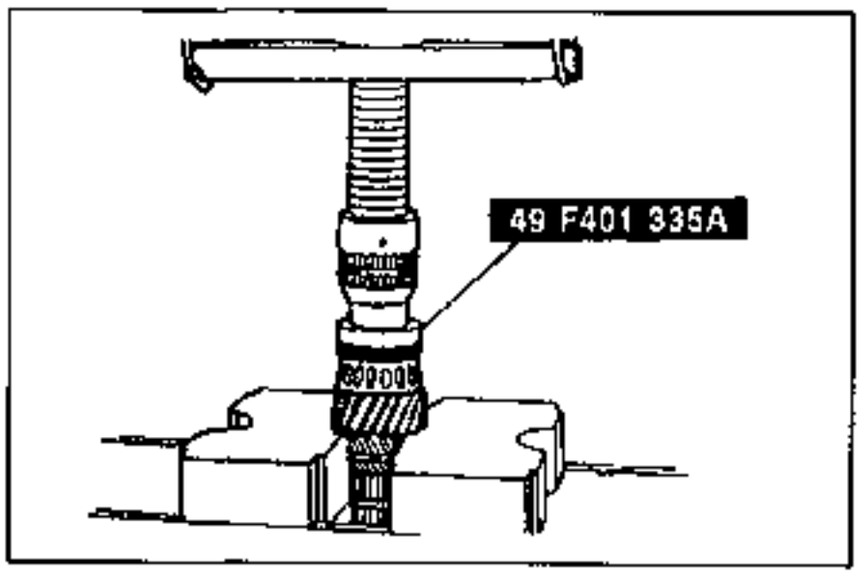
Assembly Note
Clutch hub
Synchronizer key dimensions

mm {in}

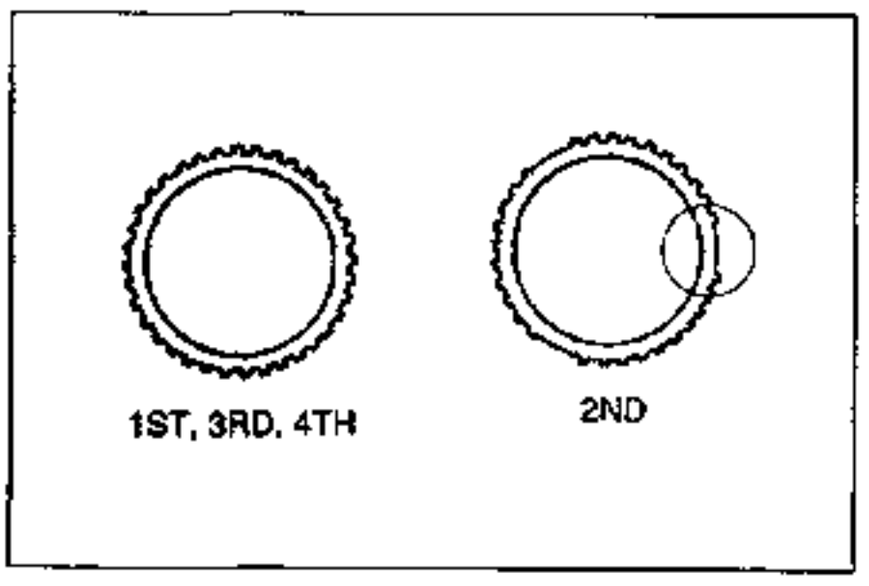
	①	②	③
1st/2nd	19.0 {0.748}	4.25 {0.167}	5.0 {0.197}
3rd/4th 5th/Rev.	17.0 {0.669}	4.25 {0.167}	5.0 {0.197}



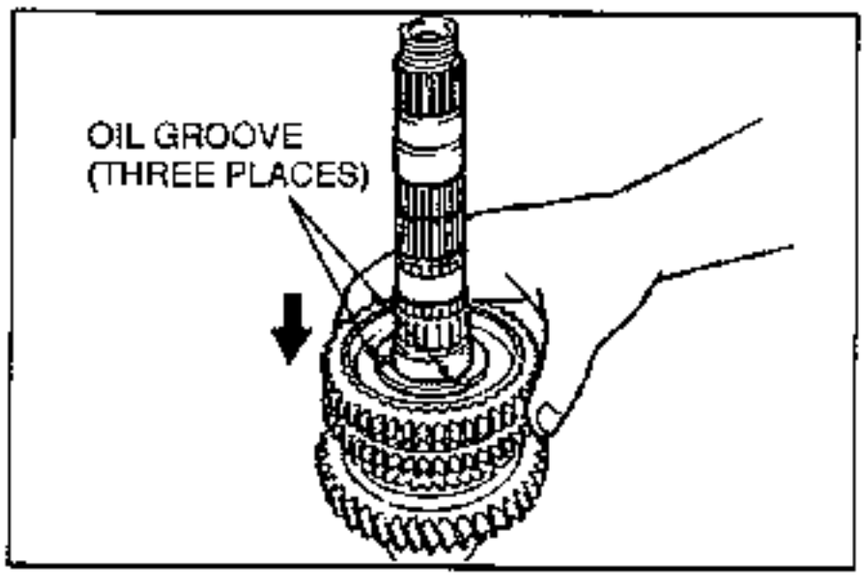
Install the synchronizer keys and springs in the clutch hub.



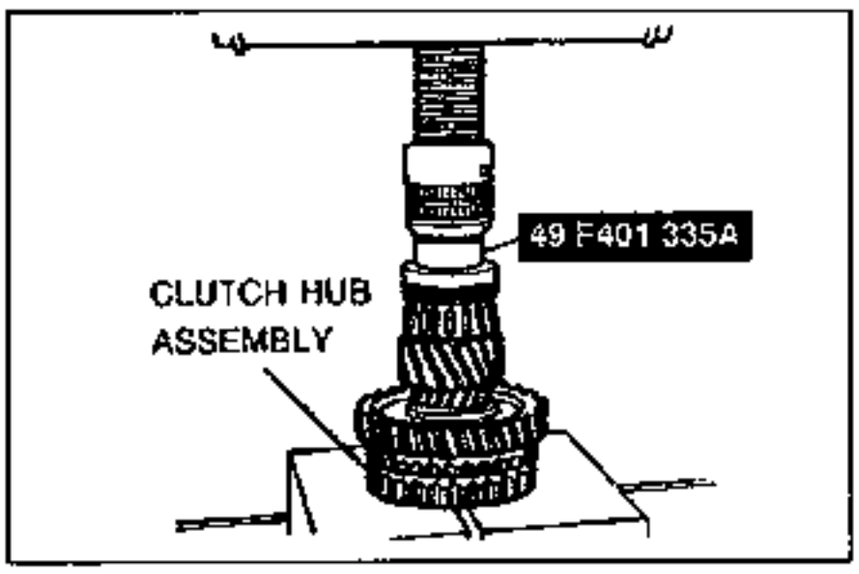
Bearing (secondary shaft end)
Install the new bearing by using the **SST**.



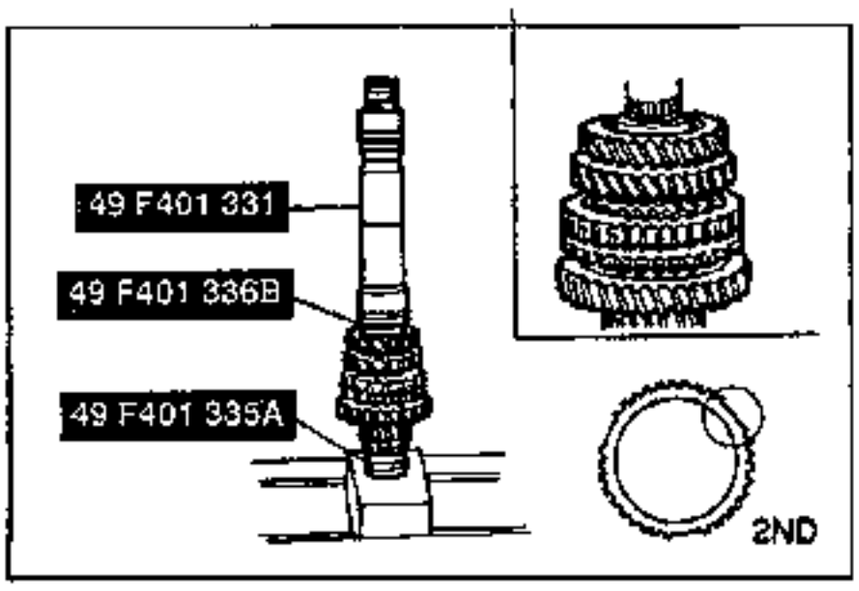
1st gear, 1st synchronizer ring and 1st/2nd clutch hub assembly
The 2nd synchronizer ring has teeth missing at three places around its outer edge to help distinguish it from the other synchronizer rings.



1. Assemble the 1st gear, 1st synchronizer ring, and 1st/2nd clutch hub assembly, as shown in the figure.
2. Align the synchronizer ring grooves and synchronizer keys.

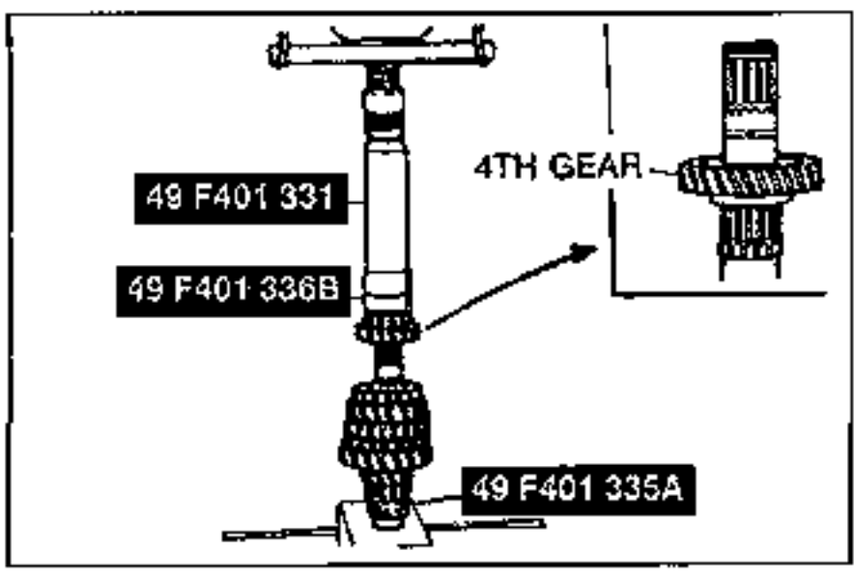


3. Press the 1st/2nd clutch hub assembly on by using the **SST**.



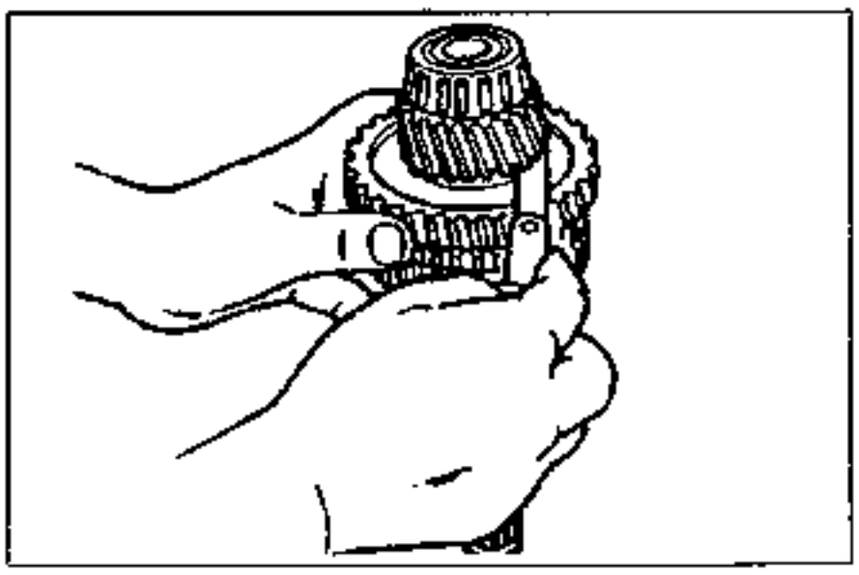
2nd synchronizer ring, 2nd gear and secondary 3rd gear

1. Install the 2nd synchronizer ring and 2nd gear.
2. Install the secondary 3rd gear by using the **SST**.



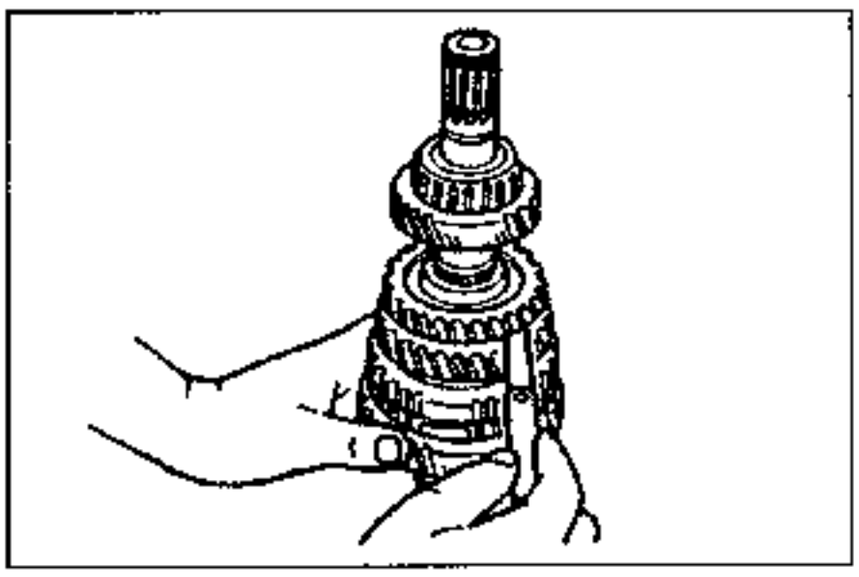
Secondary 4th gear and bearing

1. Install the secondary 4th gear and the bearing by using the **SST**.



2. Measure the clearance between the 1st gear and the differential drive gear.

Clearance: 0.05–0.28 mm {0.002–0.011 in}
Maximum: 0.33 mm {0.013 in}



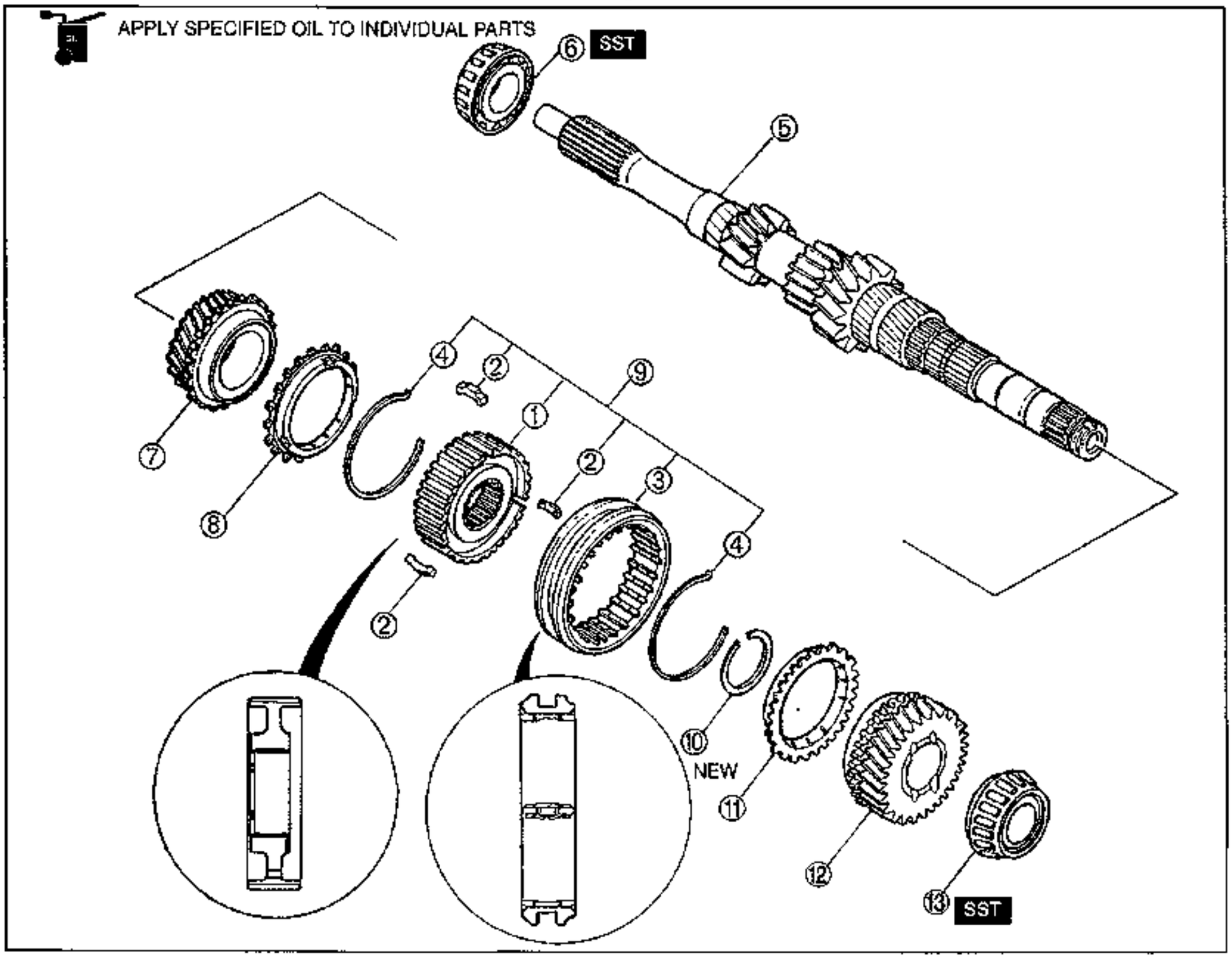
3. Measure the clearance between the 2nd gear and the secondary 3rd gear.

Clearance: 0.18–0.46 mm {0.007–0.018 in}
Maximum: 0.51 mm {0.020 in}

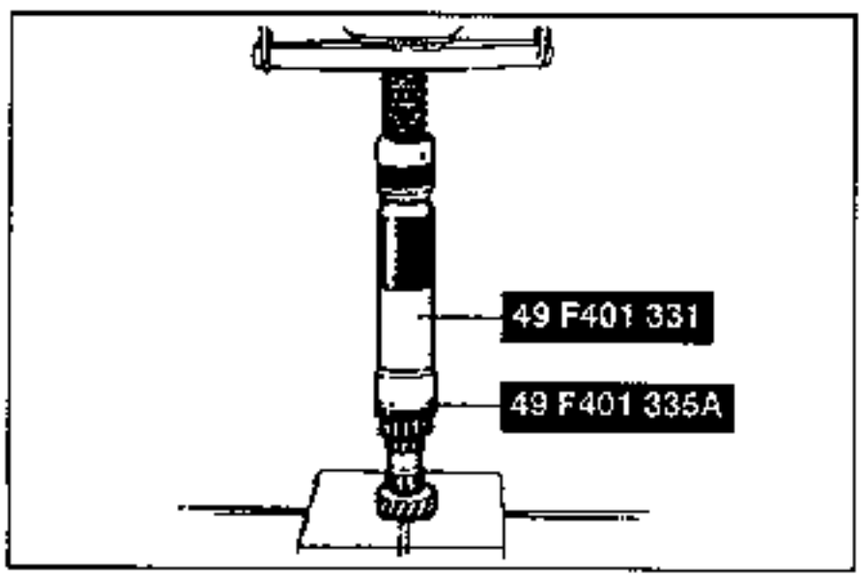
4. If not as specified, reassemble the secondary shaft assembly.

Primary Shaft Assembly

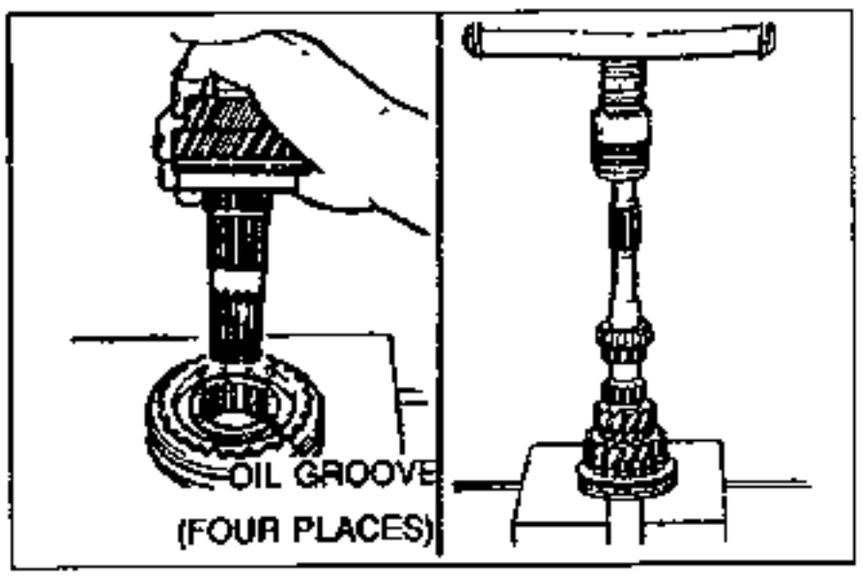
Assemble in the order shown in the figure, referring to **Assembly Note.**



1. 3rd/4th clutch hub
   Assembly Note ..... page J2–31
2. Synchronizer key
3. 3rd/4th clutch hub sleeve
4. Synchronizer key spring
5. Primary shaft gear
6. Bearing (primary shaft end)
   Assembly Note ..... below
7. 3rd gear
   Assembly Note ..... page J2–34
8. 3rd synchronizer ring
   Assembly Note ..... page J2–34
9. 3rd/4th clutch hub assembly
   Assembly Note ..... page J2–34
10. Retaining ring
11. 4th synchronizer ring
    Assembly Note ..... page J2–34
12. 4th gear
    Assembly Note ..... page J2–34
13. Bearing
    Assembly Note ..... page J2–34

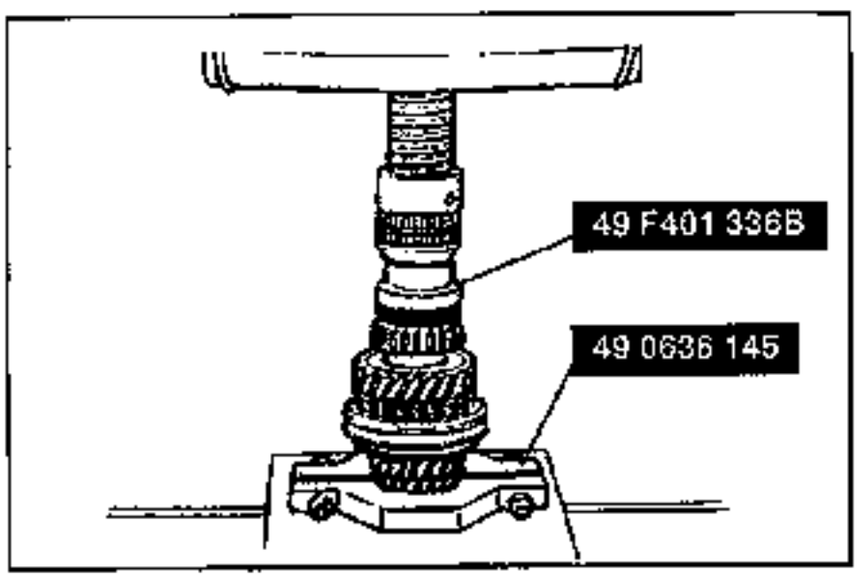


Assembly note
Bearing (primary shaft end)
Install the new bearing by using the **SST.**



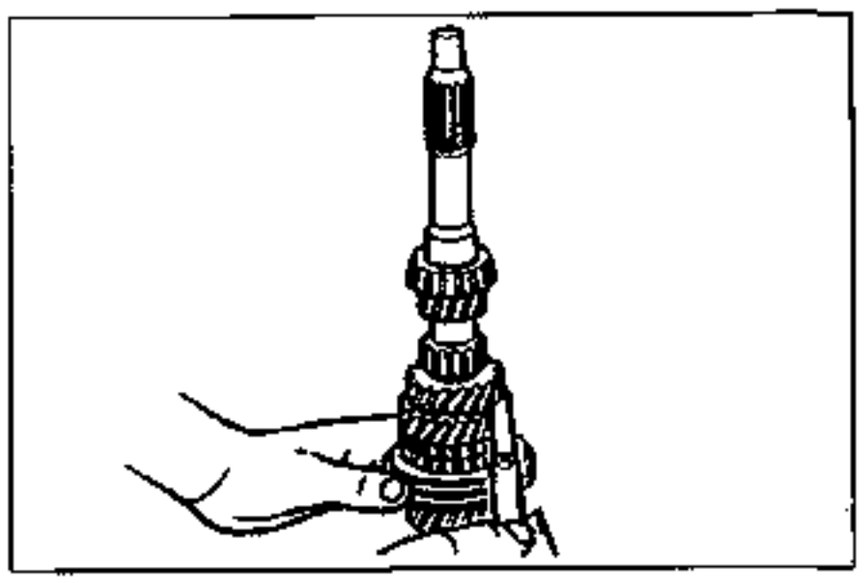
3rd gear, 3rd synchronizer ring and 3rd/4th clutch hub assembly

Install the 3rd gear, 3rd synchronizer ring , and 3rd/4th clutch hub assembly by using a press.



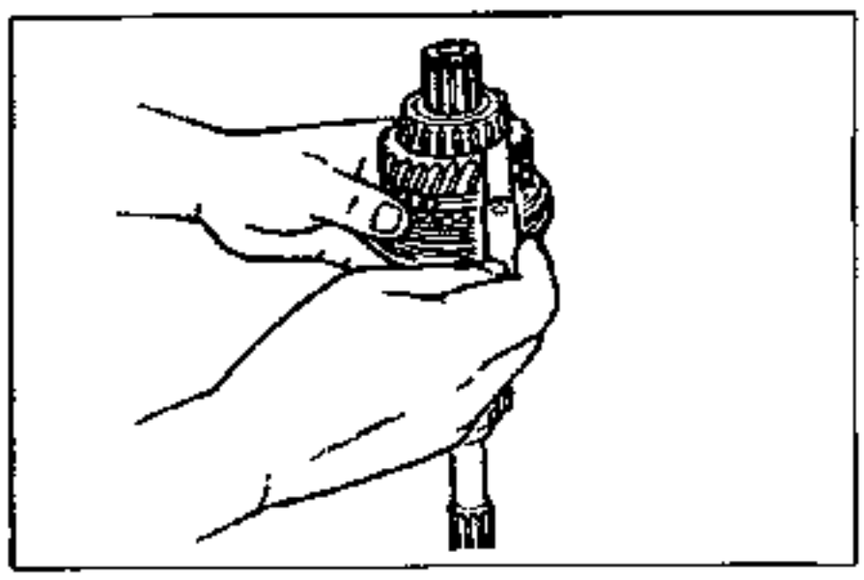
4th synchronizer ring, 4th gear and bearing

1. Install the 4th synchronizer ring , 4th gear, and a new bearing by using the **SSTs**.



2. Measure the clearance between the 3rd gear and 2nd gear.

Clearance: 0.05–0.20 mm {0.002–0.008 in}
Maximum: 0.25 mm {0.010 in}



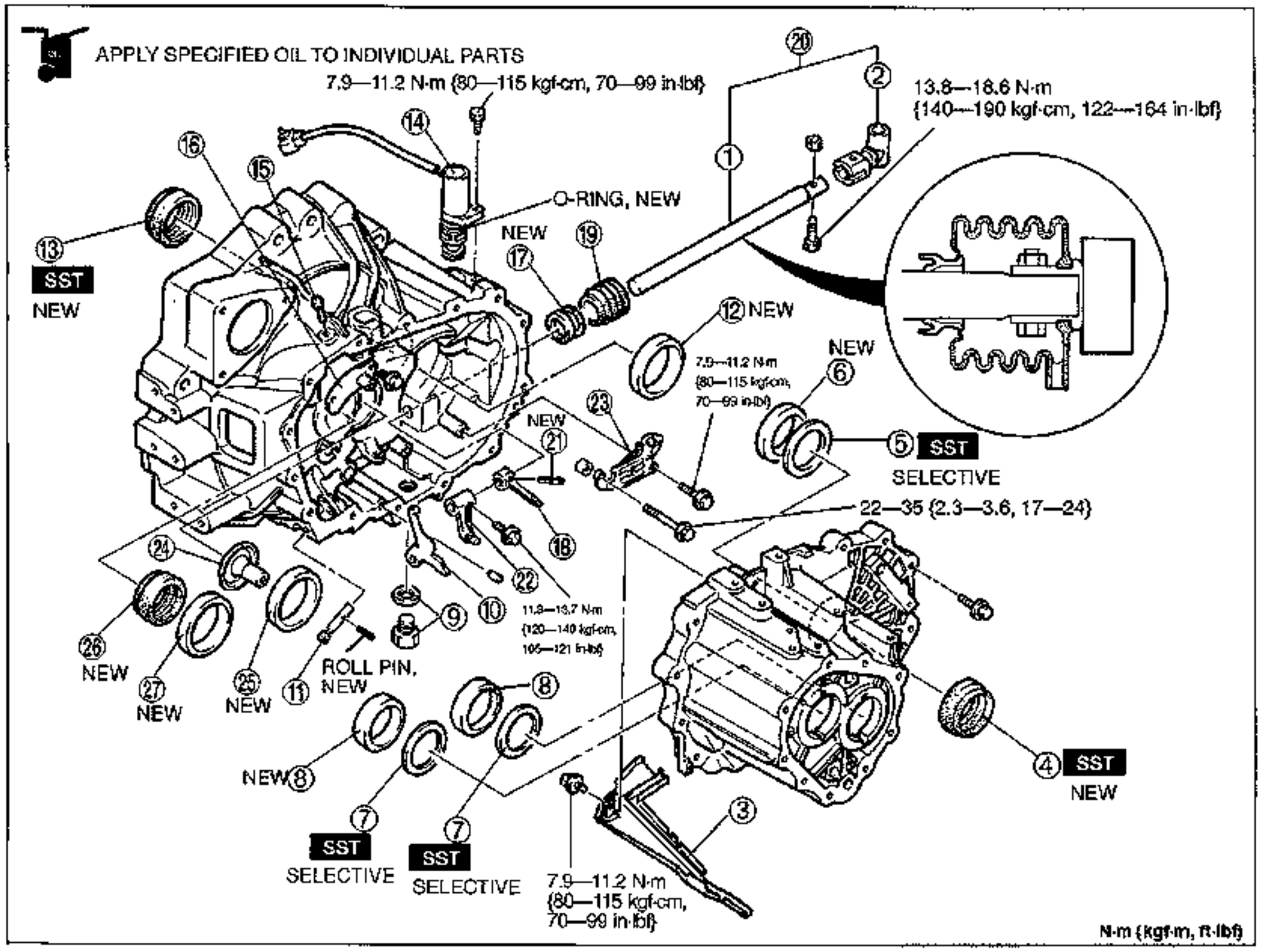
3. Measure the clearance between the 4th gear and bearing.

Clearance: 0.17–0.37 mm {0.007–0.015 in}
Maximum: 0.42 mm {0.017 in}

4. If not as specified, reassemble the primary shaft assembly.

Clutch Housing and Transaxle Case Components

1. Select the adjustment shim(s), referring to **Bearing Preload Adjustment**.
2. Assemble in the order shown in the figure, referring to **Assembly Note**.
3. Verify that the bearing preload is satisfied after assembly, referring to **Bearing Preload**.



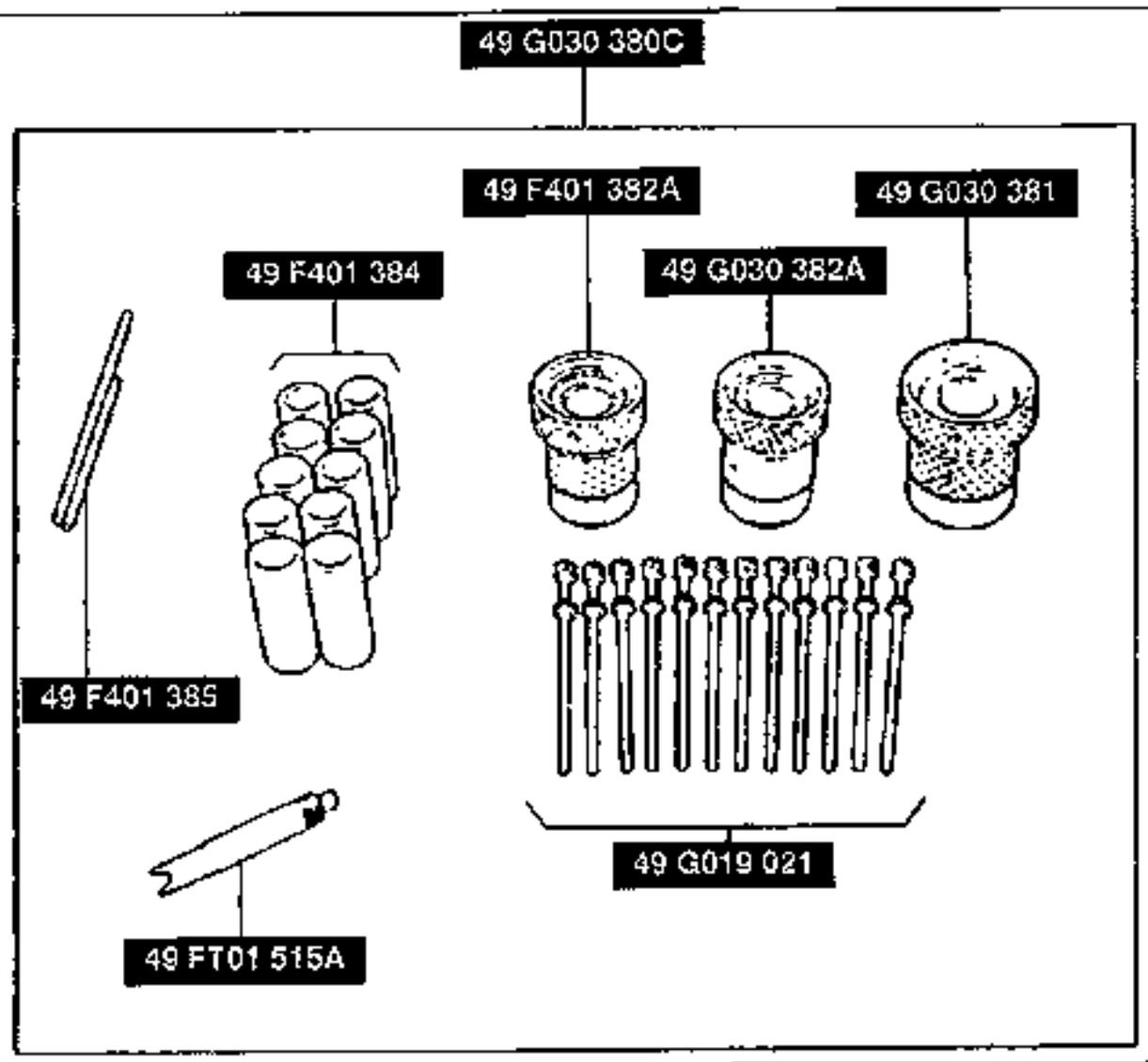
1. Change rod
2. Joint
3. Oil passage
4. Oil seal (differential)
   Assembly Note ..... page J2–39
5. Adjustment shim(s)
   Bearing preload adjustment .. page J2–36
   Bearing preload ..... page J2–40
6. Bearing race (differential)
   Assembly Note ..... page J2–39
7. Adjustment shim
   Bearing preload adjustment .. page J2–36
   Bearing preload ..... page J2–40
8. Bearing race (transaxle case)
   Assembly Note ..... page J2–40
9. Drain plug and washer
10. Reverse lever
11. Reverse lever shaft
12. Bearing race (differential)
    Assembly Note ..... page J2–39
13. Oil seal (differential)
    Assembly Note ..... page J2–39
14. Vehicle speedometer sensor (speedometer driven gear)
15. Bleeder
16. Bleeder cover assembly
17. Oil seal (change rod assembly)
    Assembly Note ..... page J2–40
18. Selector
19. Boot
    Assembly Note ..... page J2–40
20. Change rod assembly
21. Roll pin
22. Change arm
23. Guide plate assembly
24. Funnel
25. Bearing race (secondary shaft)
26. Oil seal (primary shaft)
    Assembly Note ..... page J2–40
27. Bearing race (primary shaft)

Bearing preload adjustment

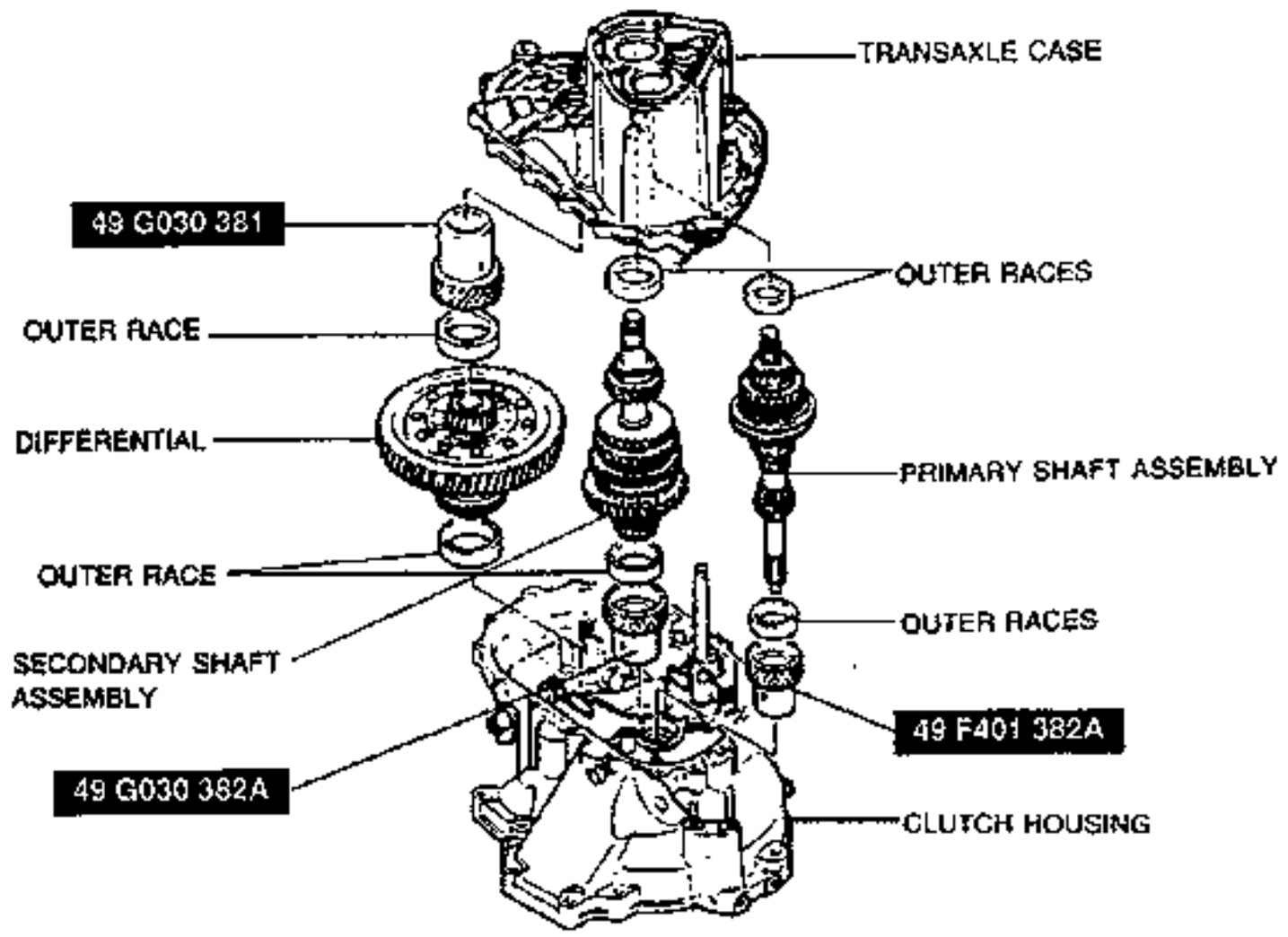
When replacing any of the parts listed in the table below, adjust the bearing preload by selecting and installing the proper adjustment shim(s).

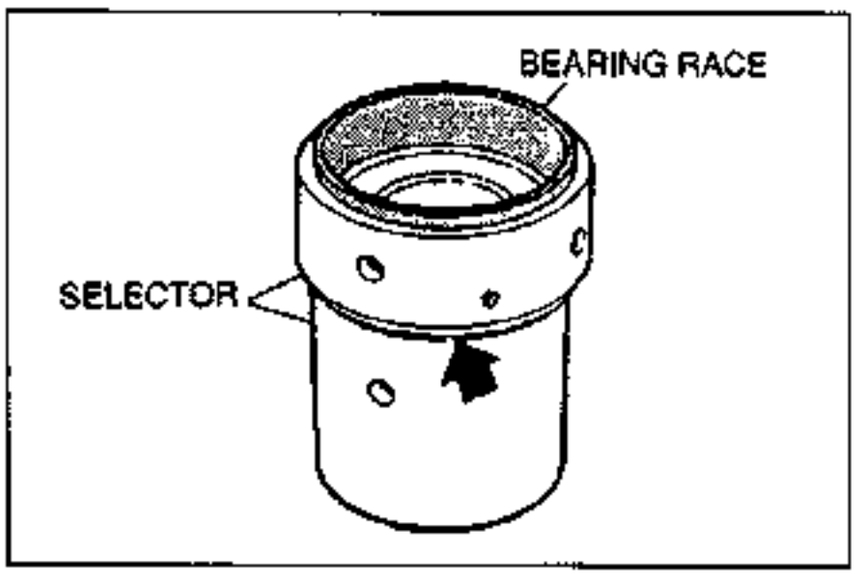
Primary shaft assembly	Secondary shaft assembly	Differential
• Transaxle case • Clutch housing • Primary shaft gear bearing • Primary shaft gear	• Transaxle case • Clutch housing • Secondary shaft gear bearing • Secondary shaft gear • Secondary 4th gear	• Transaxle case • Clutch housing • Differential side bearing • Ring gear and gear case assembly

SST

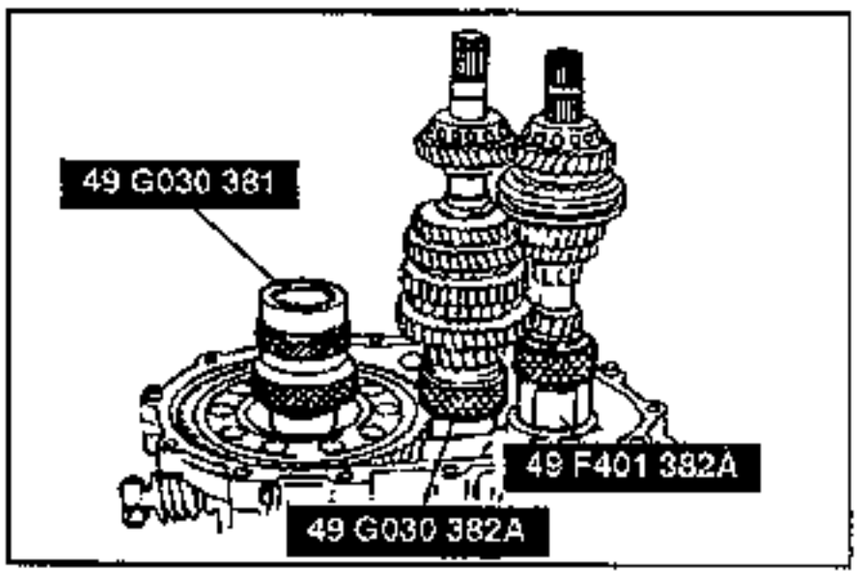


SST USAGE

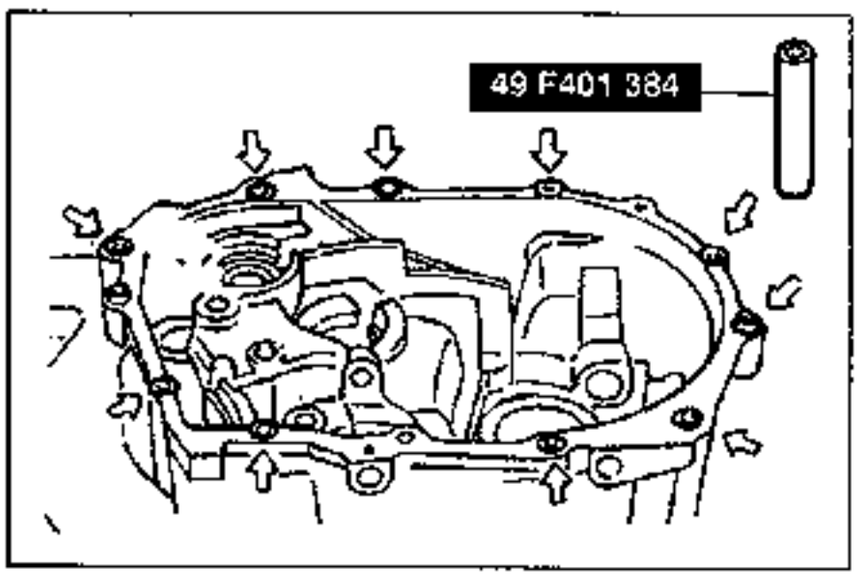




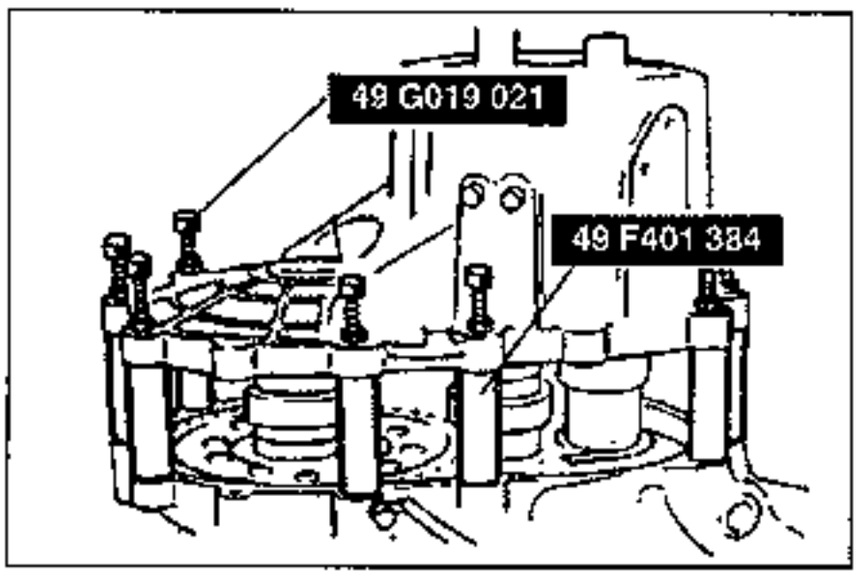
1. Install the primary and secondary shaft bearing races into the transaxle case (diaphragm springs and shims removed).
2. Mount the clutch housing onto the transaxle hanger, and set the differential bearing race into the clutch housing. Position a piece of pipe against the bearing race and tap it in until it contacts the clutch housing.
3. Set the bearing races into the **SSTs** (selector) as shown in the figure.
4. Turn the selector to eliminate the gap indicated by the arrow.



5. Set the differential assembly into the clutch housing, and set the bearing race and the **SST** (selector) on the differential. Set the assembled selectors for the primary and secondary shaft in the clutch housing.
   Mount the shaft gear assemblies as shown in the figure.

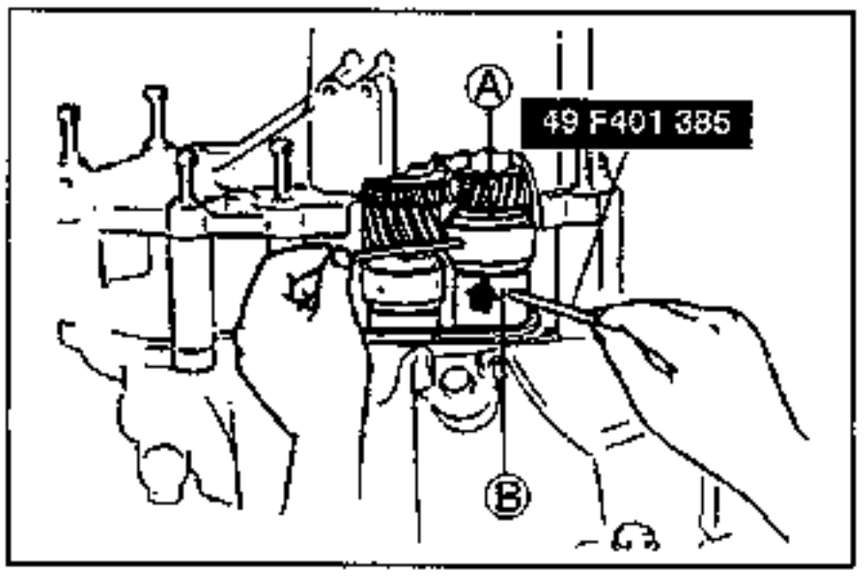


6. Set the **SST** (collars) in the positions shown in the figure.

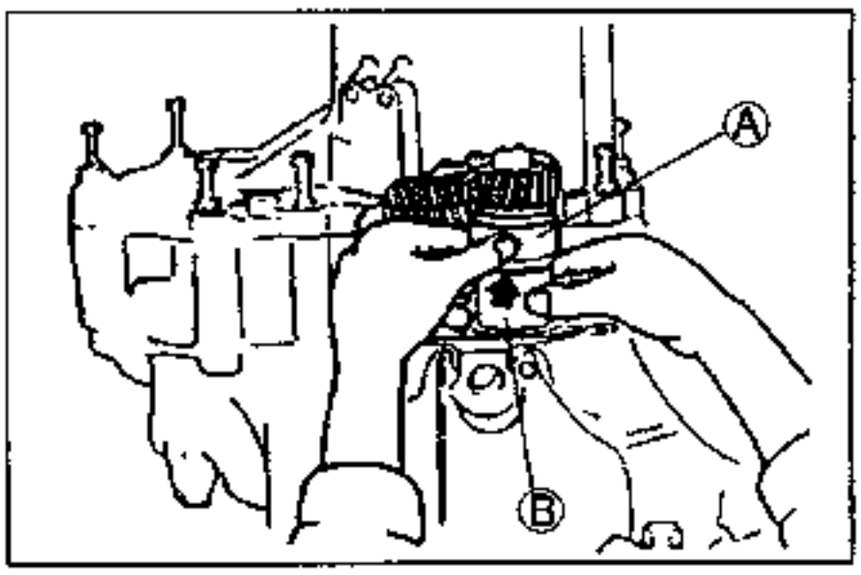


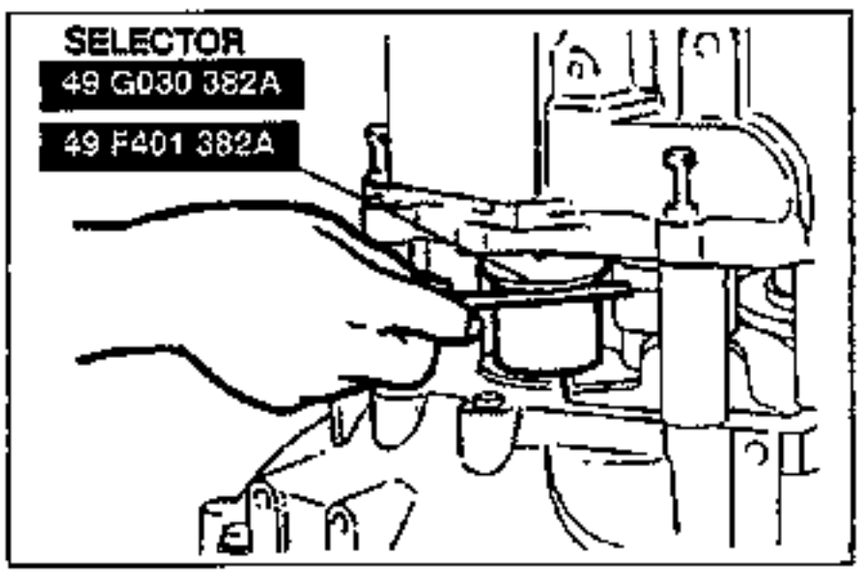
7. Install the transaxle case and tighten the **SST** (bolts) to the specified torque.

   Tightening torque:
   38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}

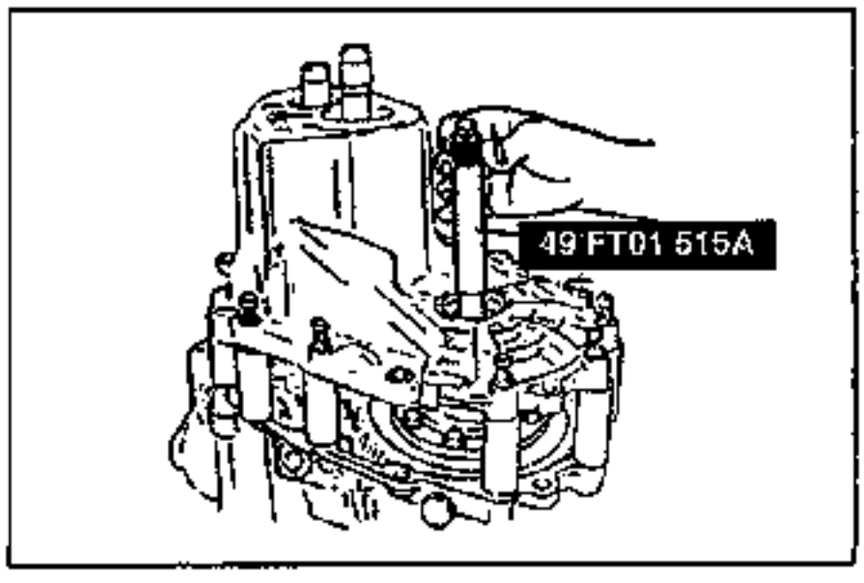


8. To seat the bearings, mount the **SST** (bars) on parts A and B of the selectors, and turn the selectors so the gaps are widened. Then turn the **SST** in the reverse direction until the gaps are eliminated.





Thickness (Shaft gears)	mm {in}
0.20 {0.008}	0.50 {0.020}
0.25 {0.010}	0.55 {0.022}
0.30 {0.012}	0.60 {0.024}
0.35 {0.014}	0.65 {0.026}
0.40 {0.016}	0.70 {0.028}
0.45 {0.018}	



9. Manually expand the selector until it no longer turns by hand.
10. Verify that both the primary and secondary shafts turn smoothly.

11. Measure the clearance between the two halves of the **SST** (selector) around the circumference by using a feeler gauge.
12. Take the maximum reading and determine the shim to be used. Use no more than two shims.

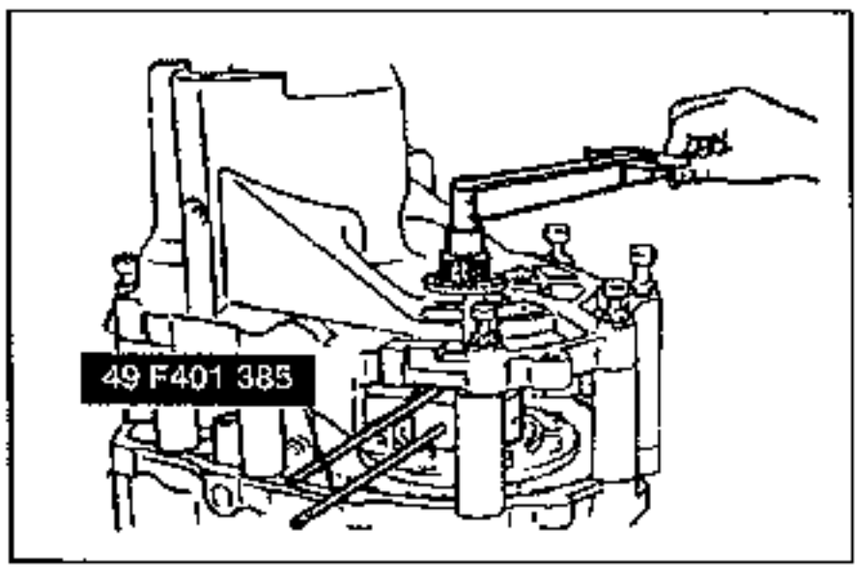
<Primary shaft adjustment shim>
- Subtract the diaphragm spring thickness (**0.65 mm, {0.026 in}**) from the gap determined in Step 11 for the primary shaft.
- Make a shim selection range by subtracting the standard clearance parameters from the result in the previous step.
- Select the thinner shim within the range to obtain the standard clearance.

Standard clearance:
0–0.05 mm {0–0.002 in}
Example: 0.57 mm {0.022 in}
Shim selection range:
(0.57 mm {0.022 in}–0.05 mm {0.002 in}) – (0.57 mm {0.022 in}–0 mm {0 in}) = 0.52 mm {0.020 in}–0.57 mm {0.022 in}
Shim: 0.55 mm {0.022 in}

<Secondary shaft adjustment shim>
- Subtract the diaphragm spring thickness (**0.65 mm {0.026 in}**) from the gap determined in Step 11 for the secondary shaft.
- Make a shim selection range by adding the standard clearance parameters to the result in the previous step.
- Select the thinner shim within the range to obtain the standard clearance.

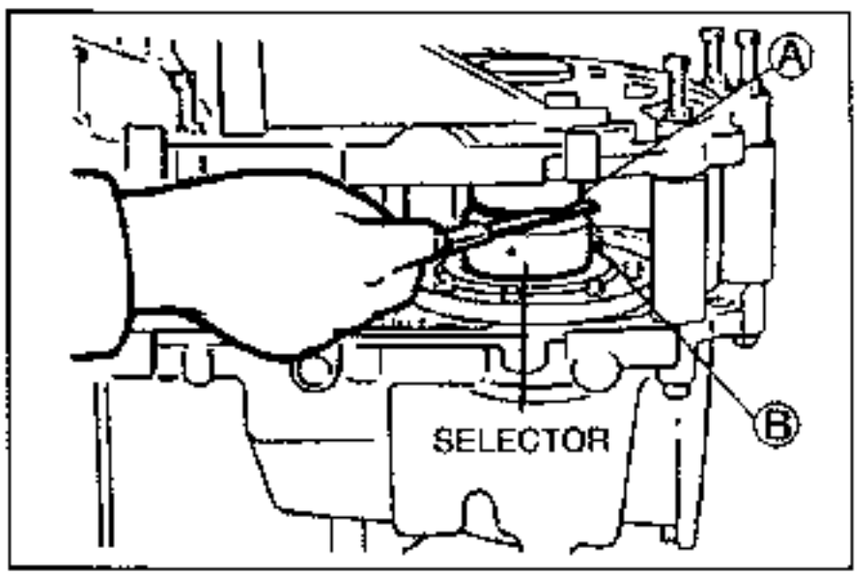
Tightening amount:
0.03–0.08 mm {0.001–0.003 in}
Example: 0.57 mm {0.022 in}
Shim selection range:
(0.57 mm {0.022 in} + 0.03mm {0.001 in})–(0.57 mm {0.022 In} + 0.08mm {0.003 in}) = 0.60 mm {0.024 in}–0.65 mm {0.026 in}
Shim: 0.60 mm {0.024 in}

13. Install the **SST** to the differential.



14. Turn the **SST** with a torque wrench. Adjust the **SST** (selector) with the **SST** (bars) until the specified preload is obtained.

Preload: 0.5 N·m {5.0 kgf-cm, 4.3 in-lbf}

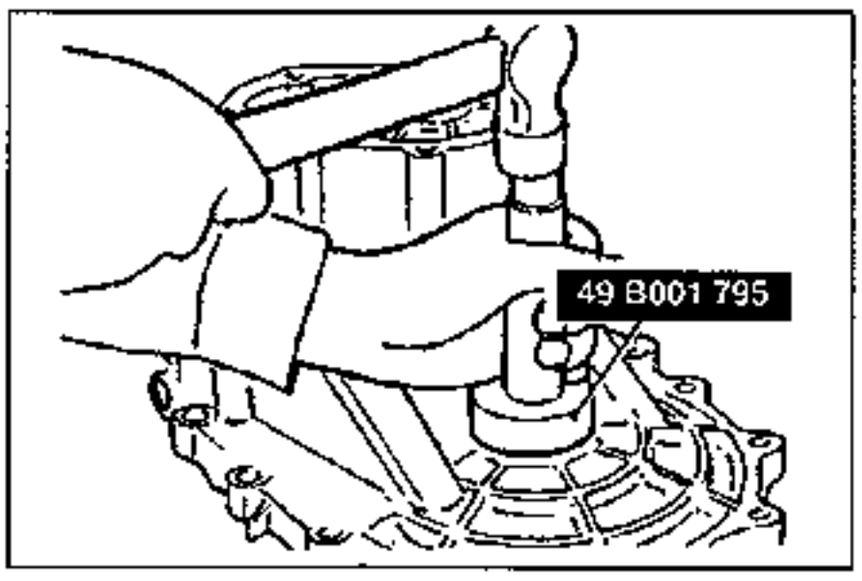


15. Measure the gap between A and B around the circumference of the **SST** (selector) by using a feeler gauge.
14. Add **0.15 mm {0.006 in}** to the measured clearance and select the combination of two shims closest in value to that measurement. Use no more than two shims.

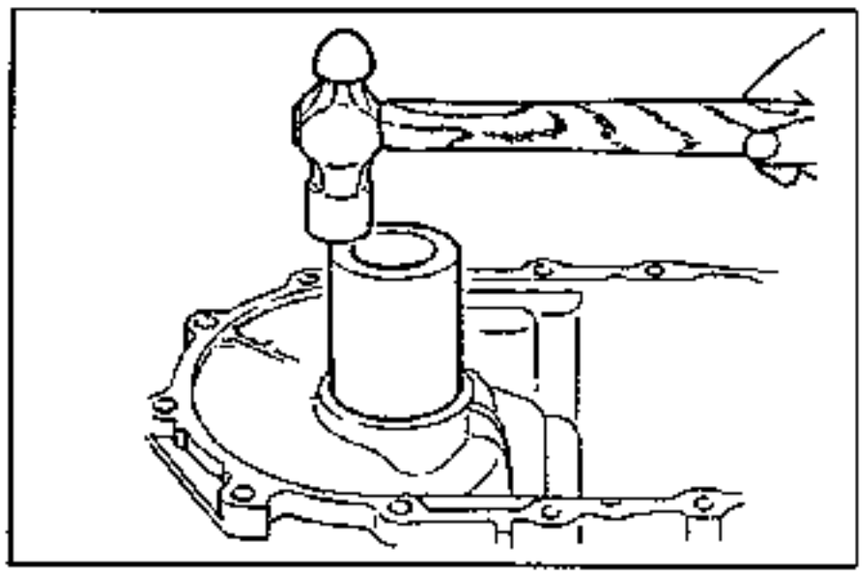
Thickness	mm {in}
0.10 {0.004}	0.70 {0.028}
0.20 {0.008}	0.75 {0.030}
0.25 {0.010}	0.80 {0.031}
0.30 {0.012}	0.85 {0.033}
0.35 {0.014}	0.90 {0.035}
0.40 {0.016}	0.95 {0.037}
0.45 {0.018}	1.00 {0.039}
0.50 {0.020}	1.05 {0.041}
0.55 {0.022}	1.10 {0.043}
0.60 {0.024}	1.15 {0.045}
0.65 {0.026}	1.20 {0.047}

Example: 0.32 mm {0.013 in}
0.32 mm {0.013 in} + 0.15 mm {0.006 in} = 0.47mm {0.019 in}.
Nearest shim (on thick side) to 0.47 mm {0.019 in} is 0.50 mm {0.020 in}.

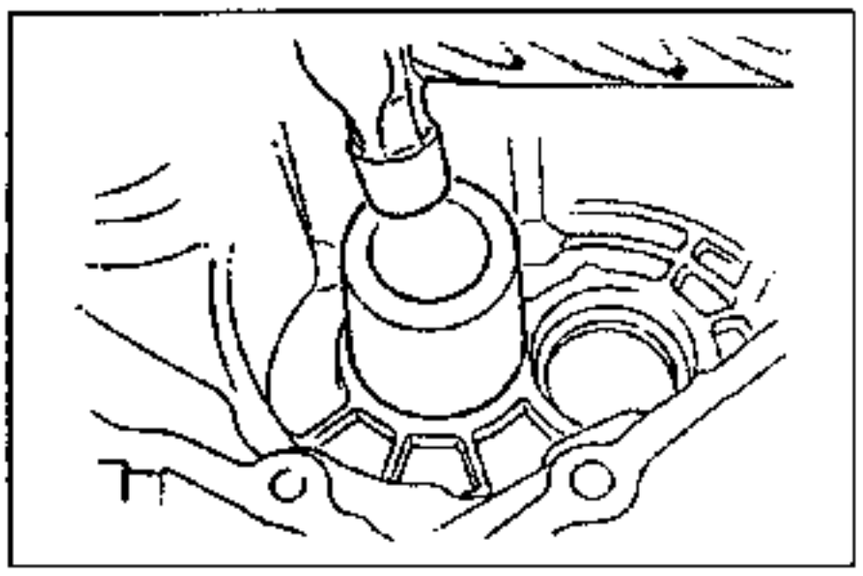
17. Remove the transaxle case and the **SSTs.**
18. Remove the selectors, the primary shaft assembly, and the differential.
19. Remove the bearing races.



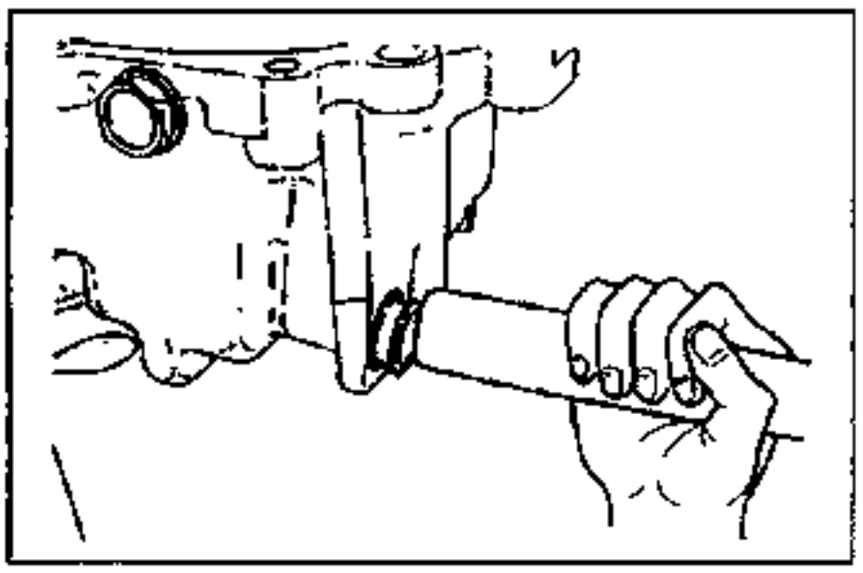
Assembly note
Oil seal (differential)
1. Using the **SST** and a hammer, tap the new oil seal in evenly until the **SST** contacts the transaxle case.
2. Coat the lip of the oil seal with transaxle oil.



Bearing race (differential)
1. Install the adjustment shim(s) to the differential case.
2. Apply transaxle oil to the bearing race, and install it to the differential case by using a suitable pipe.

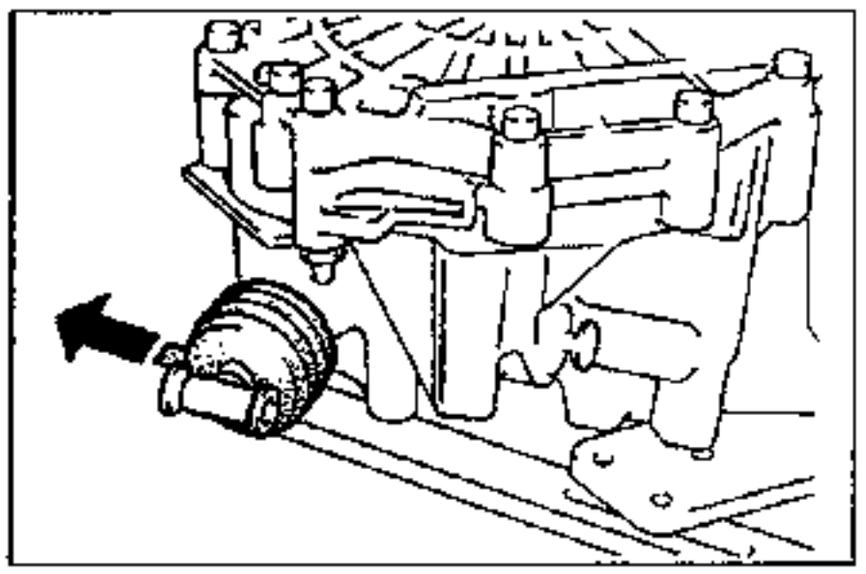


Bearing race (transaxle case)
1. Install the adjustment shim(s) to the primary and secondary shaft bearing seats in the transaxle case.
2. Apply transaxle oil to each bearing race, and install them to the transaxle case by using a suitable pipe.

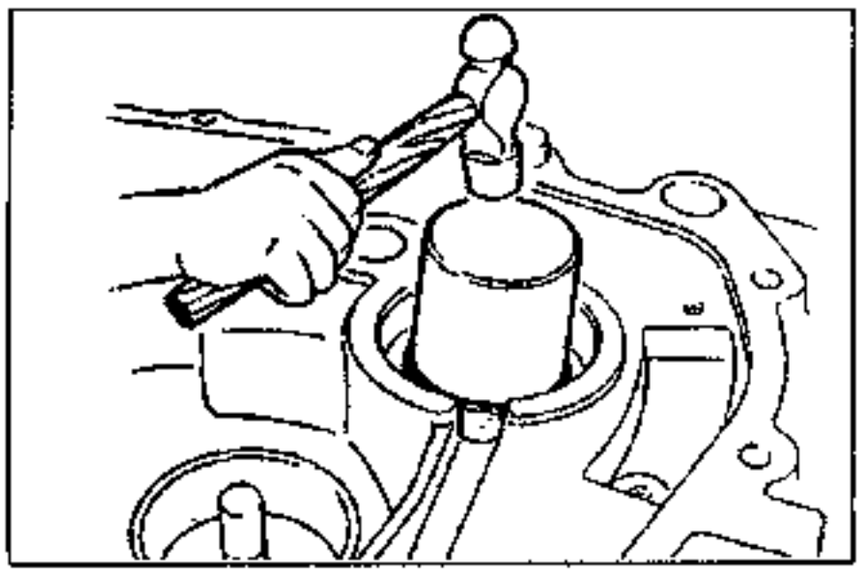


Oil seal (change rod assembly)
1. Install the new oil seal by using a suitable pipe.
2. Coat the lip of the oil seal with transaxle oil.

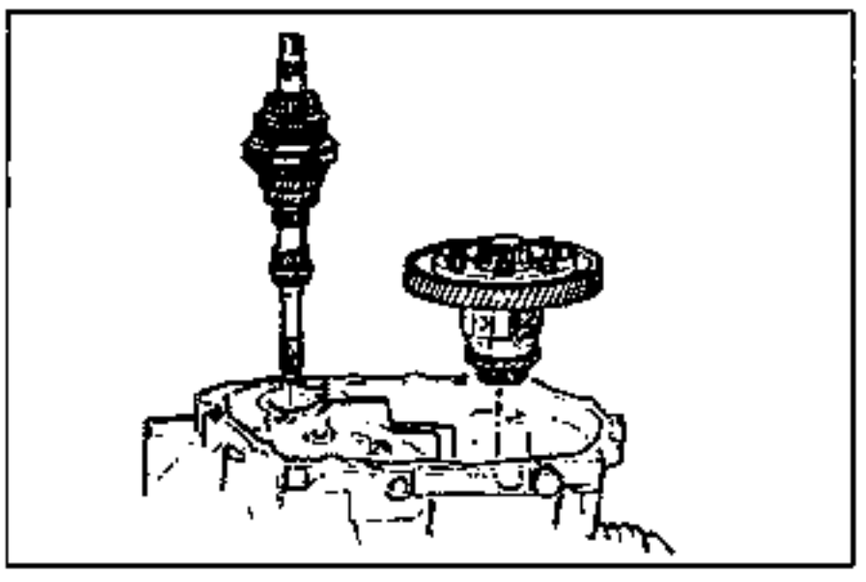
Outer diameter of pipe: 26.0 mm {1.02 in}



Boot
Install the boot so that the drain hole is facing downward when mounted on the vehicle.

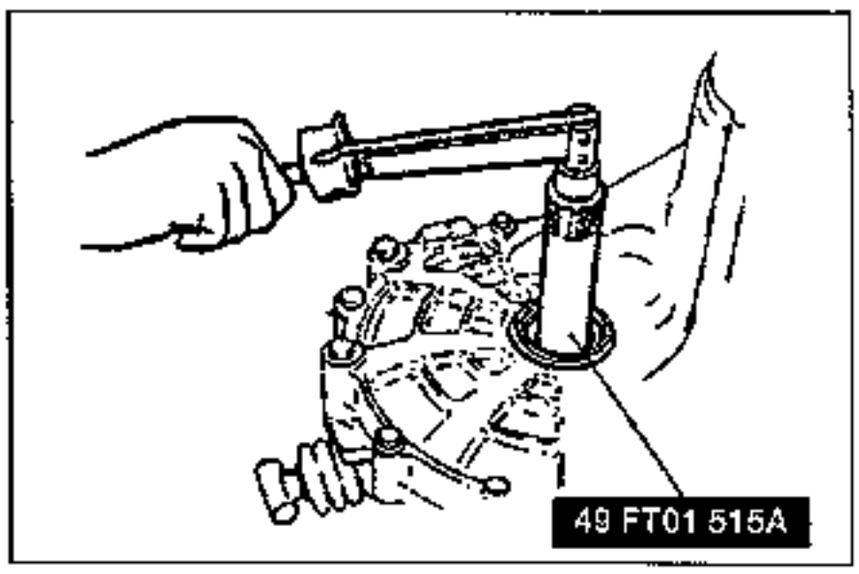


Oil seal (primary shaft)
Apply transaxle oil to the outer circumference of the oil seal, and Install it to the transaxle case by using a suitable pipe.



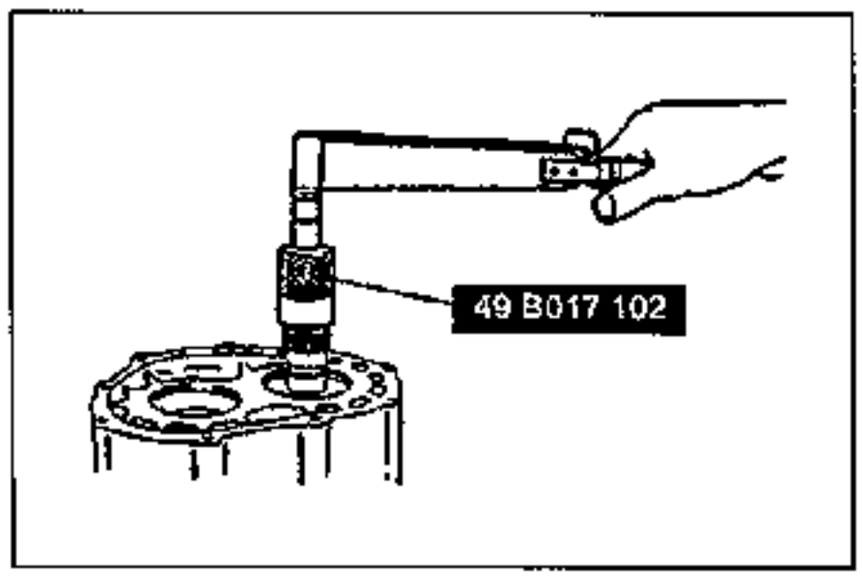
Bearing preload
Verify the shaft gears and the differential bearing preloads. Readjust the bearing preloads if they are not within specification.
1. Set the primary shaft gear assembly and the differential into the clutch housing.
2. Install the transaxle case, and tighten to the specified torque.

Tightening torque:
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}



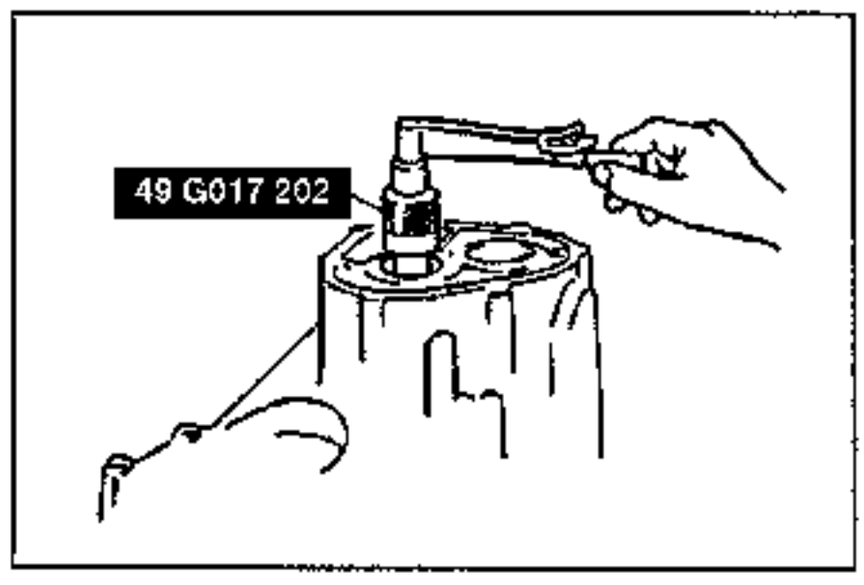
3. Install the **SST** to the differential.
4. Connect a torque wrench to the **SST** and measure the preload.

Preload:
1.4–1.9 N·m {14–20 kgf·cm, 13–17 in·lbf}



5. Remove the **SST**.
6. With the transaxle facing in the direction shown in the figure, install the **SST** to the primary shaft gear assembly.
7. Connect a torque wrench to the **SST** and measure the preload.

Preload:
0.1–0.2 N·m {1.0–2.5 kgf·cm, 0.9–2.1 in·lbf}



8. Remove the **SST**, transaxle case, primary shaft gear assembly and differential.
9. Install the secondary shaft gear assembly and transaxle case, and tighten to the specified torque.

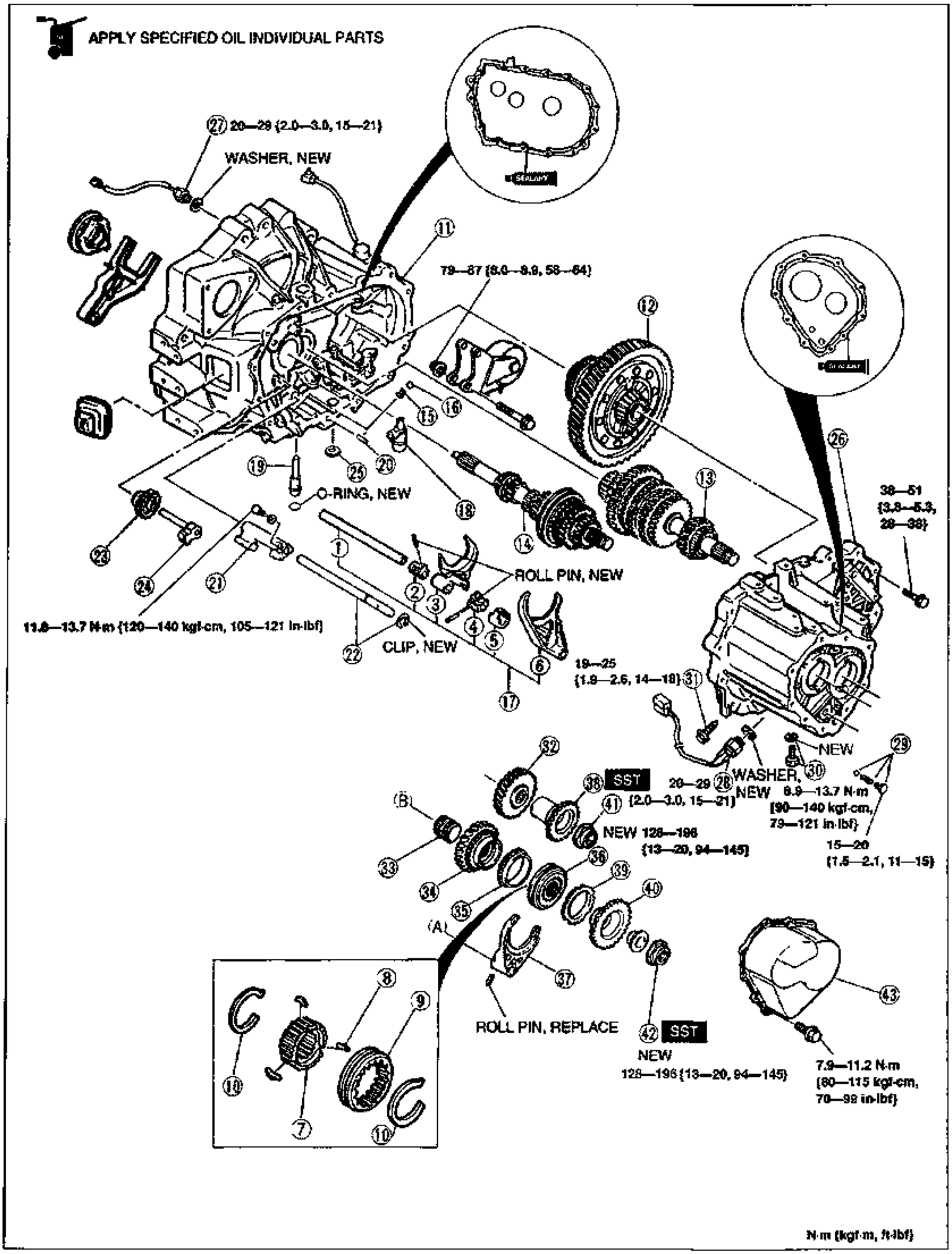
Tightening torque:
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}

10. Install the **SST** to the secondary shaft gear assembly.
11. Connect a torque wrench to the **SST** and measure the preload.

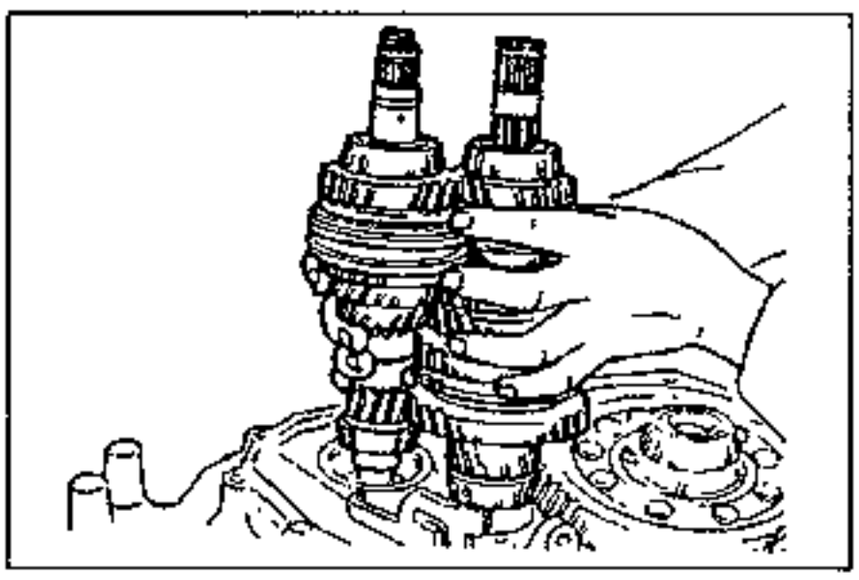
Preload:
0.2–0.4 N·m {2.0–4.0 kgf·cm, 1.8–3.4 in·lbf}

5th/Reverse Gear and Housing Parts

Assemble in the order shown in the figure, referring to **Assembly Note.**

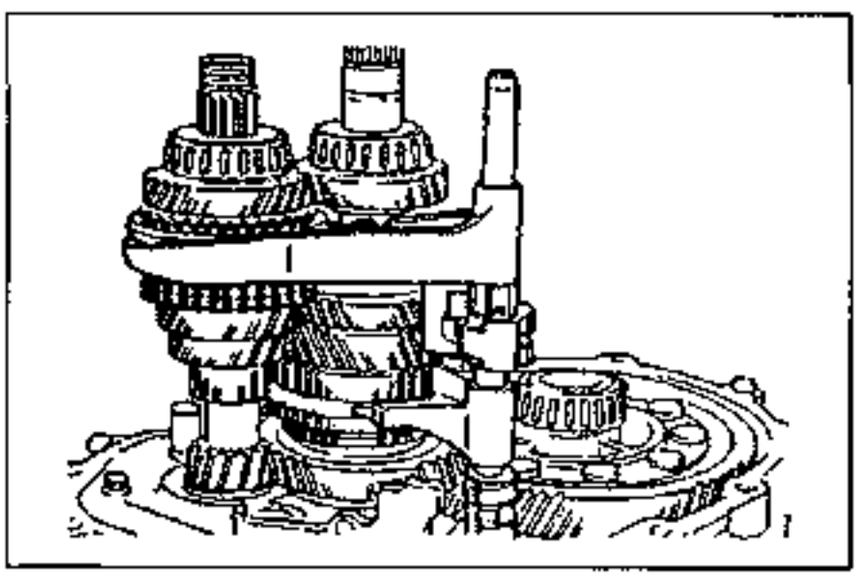


1. Control rod
2. Control end
3. 1st/2nd shift fork
4. Control lever
5. Interlock sleeve
6. 3rd/4th shift fork
7. Clutch hub
8. Synchronizer key
9. Clutch hub sleeve
10. Synchronizer key spring
11. Clutch housing
12. Differential assembly
13. Secondary shaft gear assembly
    Assembly Note ..... below
14. Primary shaft gear assembly
    Assembly Note ..... below
15. Spring
16. Steel ball
17. Shift fork and control rod assembly
    Assembly Note ..... below
18. Crank lever assembly
    Assembly Note ..... page J2–44
19. Crank lever shaft
    Assembly Note ..... page J2–44
20. Pin
21. 5th/reverse shift rod end
    Assembly Note ..... page J2–44
22. 5th/reverse shift rod
    Assembly Note ..... page J2–44
23. Reverse idler gear
    Assembly Note ..... page J2–44
24. Reverse idler shaft
    Assembly Note ..... page J2–44
25. Magnet
26. Transaxle case assembly
    Assembly Note ..... page J2–45
27. Neutral switch
28. Back-up light switch
29. Lock bolt, ball and spring
30. Guide bolt and washer
31. Lock bolt
32. Secondary 5th gear
    Assembly Note ..... page J2–45
33. Gear sleeve
34. 5th gear
35. 5th synchronizer ring
36. 5th/reverse clutch hub assembly
    Assembly Note ..... page J2–45
37. 5th/reverse shift fork
    Assembly Note ..... page J2–45
38. Secondary reverse synchronizer gear
39. Reverse synchronizer ring
40. Primary reverse synchronizer gear
41. Locknut (secondary shaft)
    Assembly Note ..... page J2–45
42. Locknut (primary shaft)
    Assembly Note ..... page J2–45
43. Rear cover



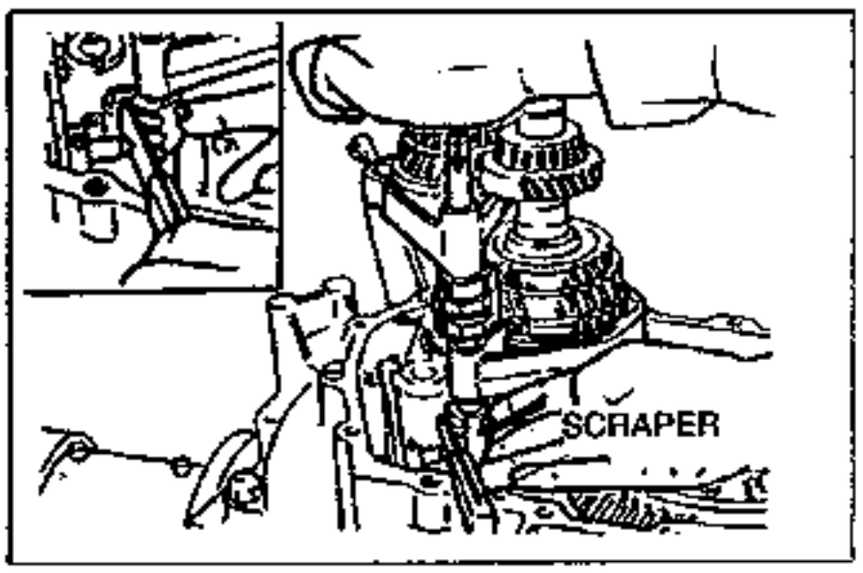
Assembly Note
Primary shaft gear assembly and secondary shaft gear assembly

Install the primary shaft gear assembly and the secondary shaft gear assembly together.

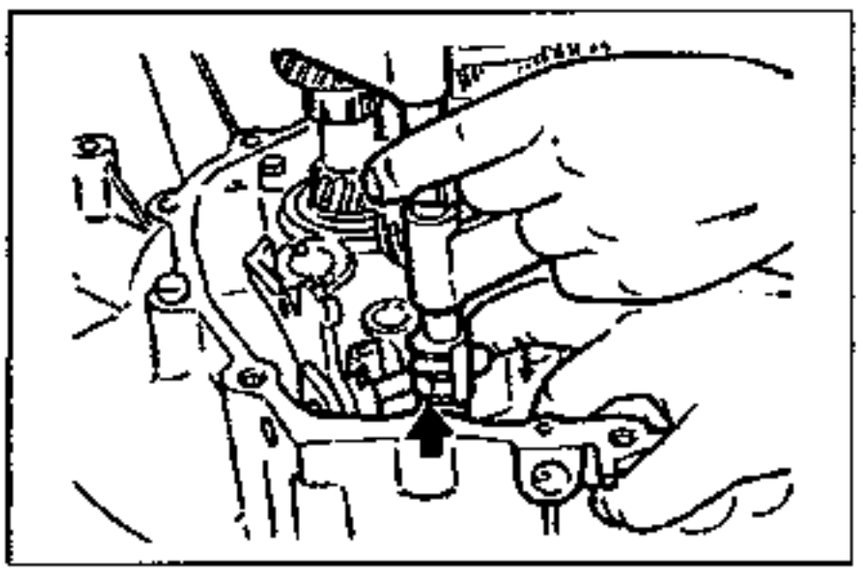


Shift fork and shift rod assembly

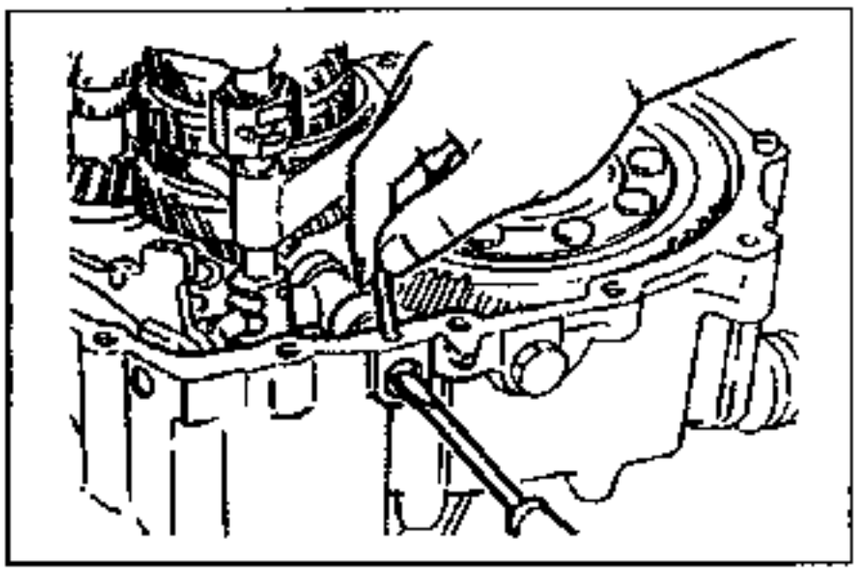
1. Shift to 2nd gear and position the shift fork and shift rod assembly as shown.



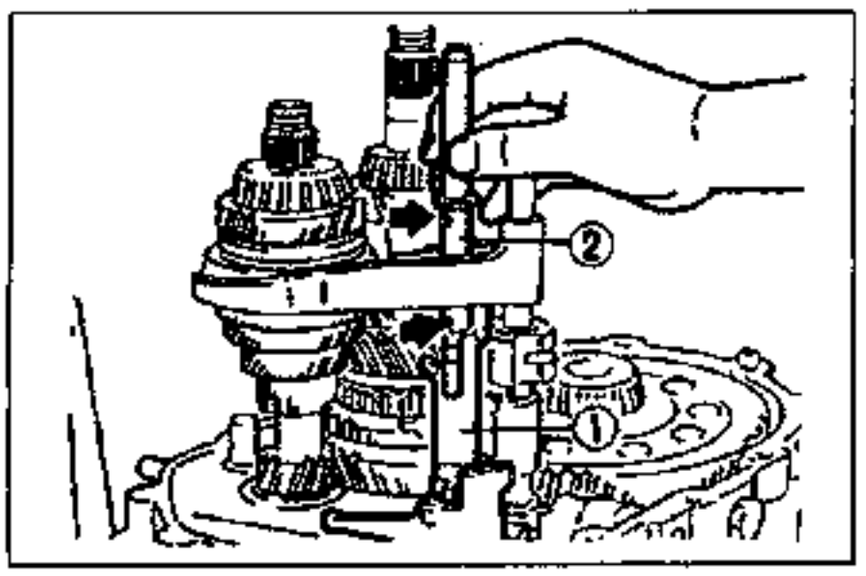
2. Insert the spring seat and spring into the reverse lever shaft, install the steel ball, and place a scraper against it.
3. With the edge of the control end against the scraper, push the control end in the direction of the arrow so that the ball goes into the shaft. This will line up the rod with the shift rod coupling hole in the clutch housing.



4. Set each clutch hub sleeve to the neutral position, and tap the shift rod from above so that the steel ball goes into the center groove (of the three grooves in the control end).
5. Pull the ball part of the control end forward so that the steel ball goes into the detent in the groove.

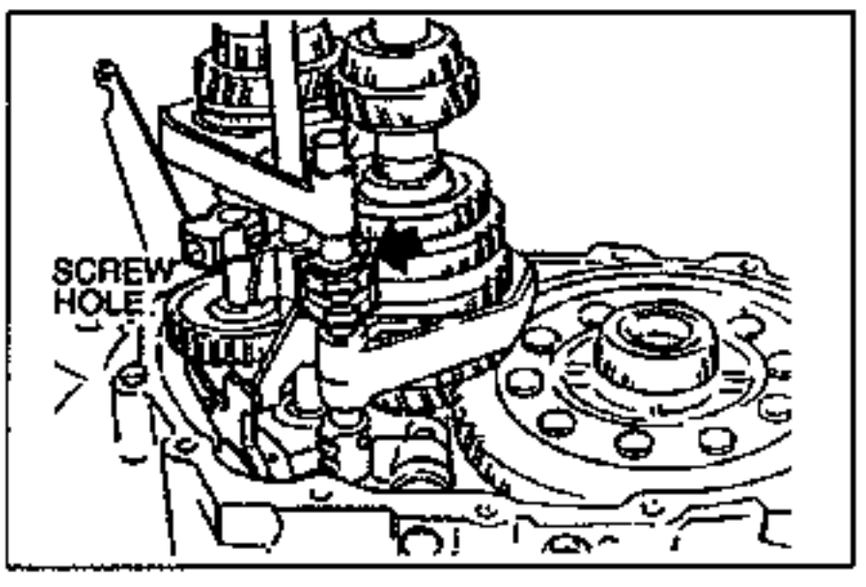


Crank lever assembly and crank lever shaft
1. Install a new O-ring to the crank lever shaft.
2. Fit the crank lever between the change arm and the control end, and connect the crank lever shaft to the crank lever.
3. Align the pin holes of the crank lever shaft and the clutch housing, and insert a new pin.

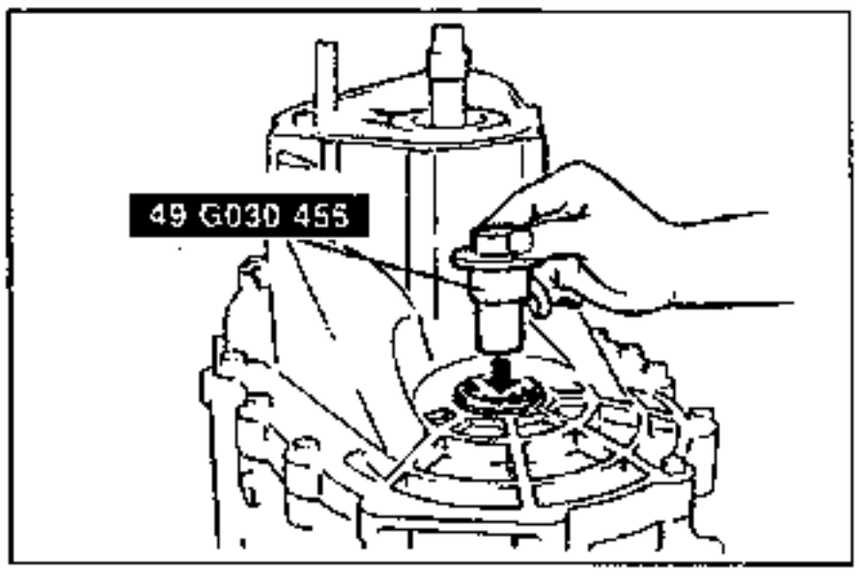


5th/reverse shift rod end and 5th/reverse shift rod
Install shift rod end (1)and the shift rod (2), and tighten the gate mounting bolt.

Tightening torque:
11.8–13.7 N·m {120–140 kgf·cm, 105–121 in·lbf}



Reverse idler gear and reverse idler shaft
1. Install the reverse idler gear and the reverse idler shaft.
2. Attach the magnet to the clutch housing.
3. Align the end of the interlock sleeve with the control lever (arrow), and face the reverse idler shaft screw hole in the direction shown in the figure.

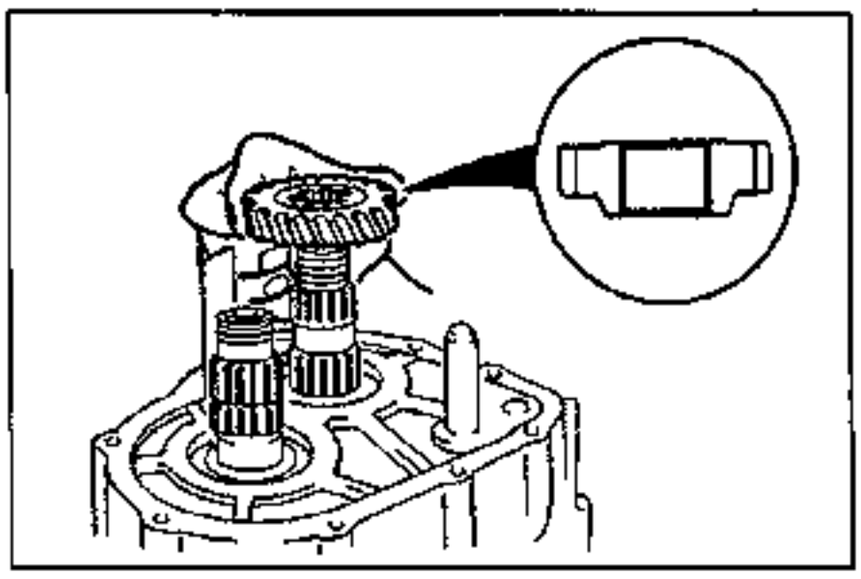


Transaxle case assembly

1. Apply a thin coat of sealant to the contact surfaces of the clutch housing and transaxle case, and tighten the transaxle case installation bolts to the specified torque.

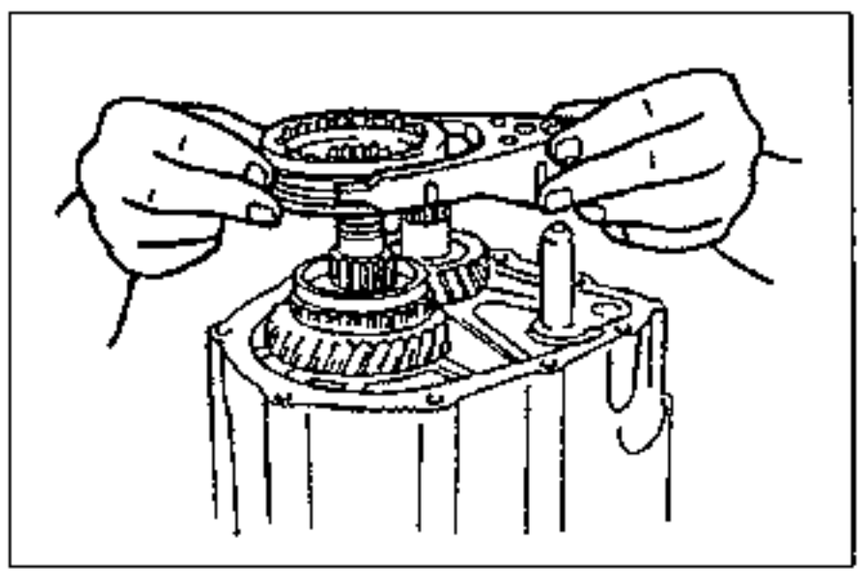
   Tightening torque:
   38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}

2. Insert the **SSTs** through the drive shaft and joint shaft hole.



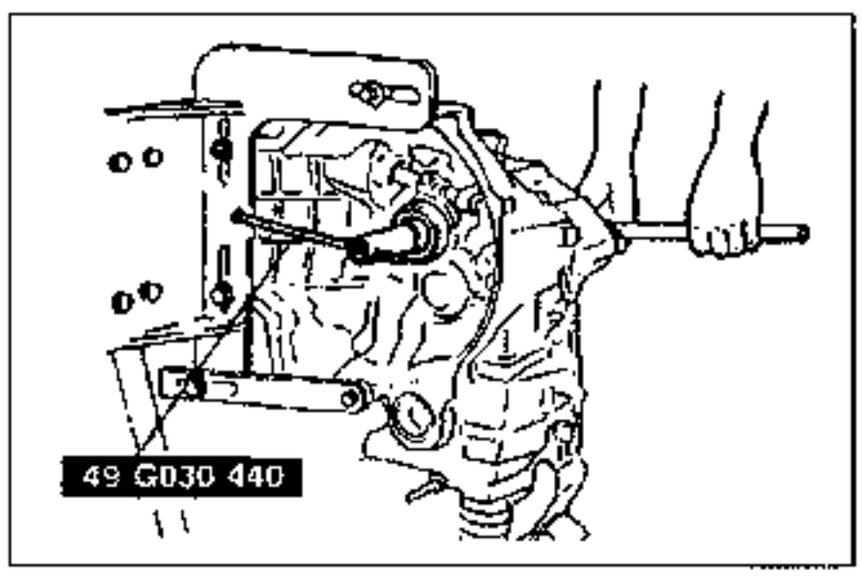
Secondary 5th gear

Install the secondary 5th gear as shown.



5th/reverse clutch hub assembly and 5th/reverse shift fork

Install the 5th/reverse clutch hub assembly and the 5th/reverse shift fork together.

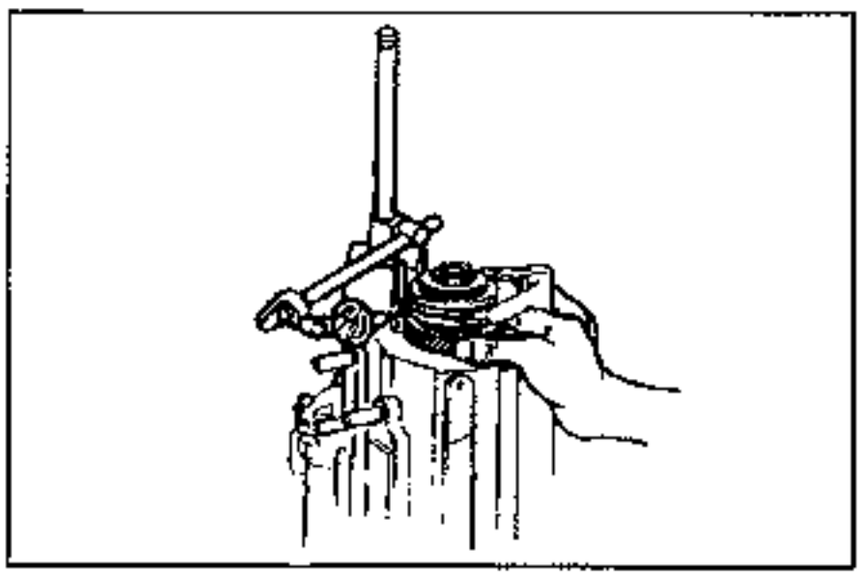


Locknut

1. Shift to 1st gear.
2. Lock the primary shaft by using the **SST.**
3. Tighten new locknuts onto the primary and secondary shafts.

   Tightening torque:
   128–196 N·m {13–20 kgf·m, 94–145 ft·lbf}

4. Stake the locknuts.



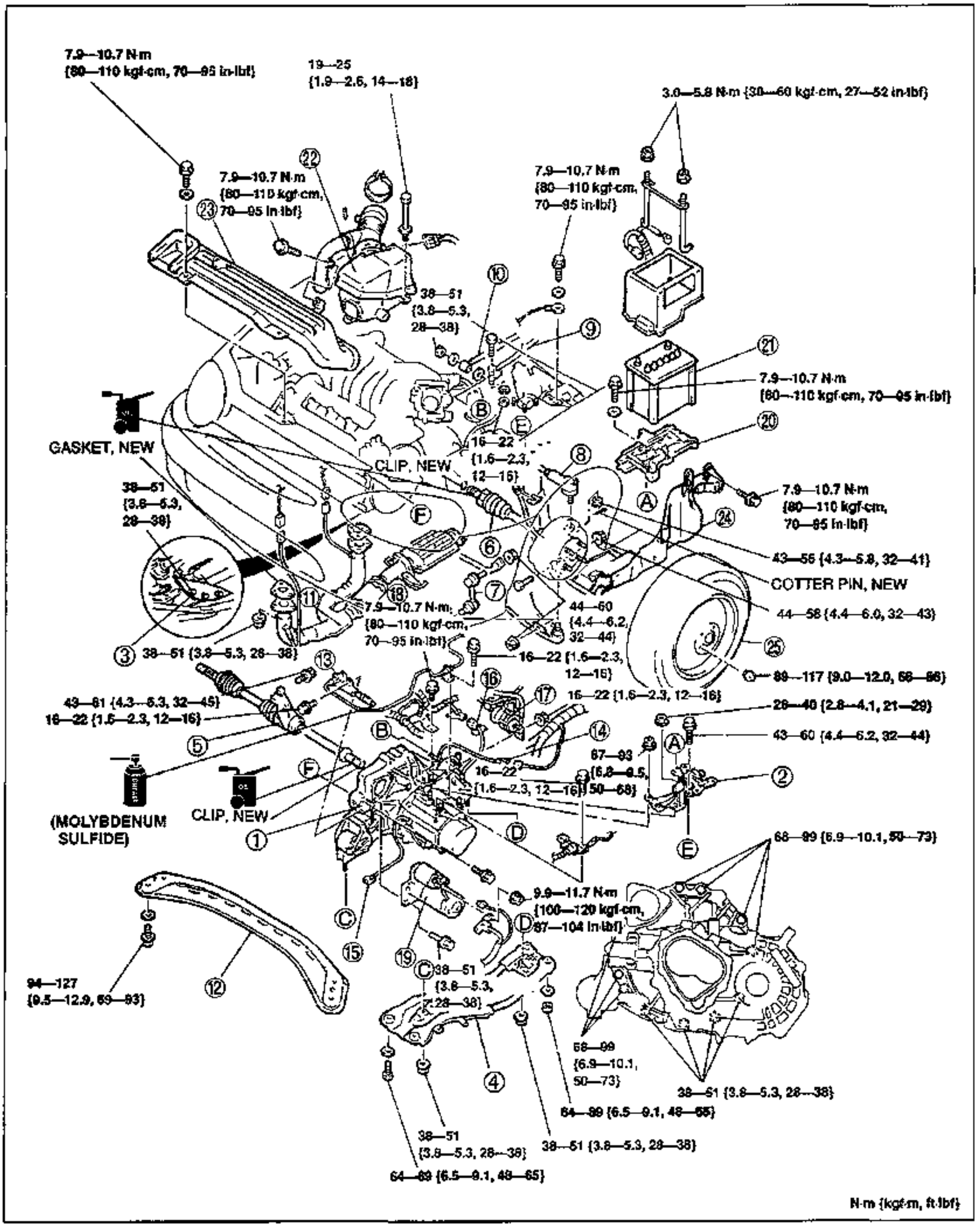
5. Measure the 5th gear thrust clearance by using a dial indicator.

   Clearance: 0.10–0.22 mm {0.004–0.009 in}
   Maximum: 0.27 mm {0.011 in}

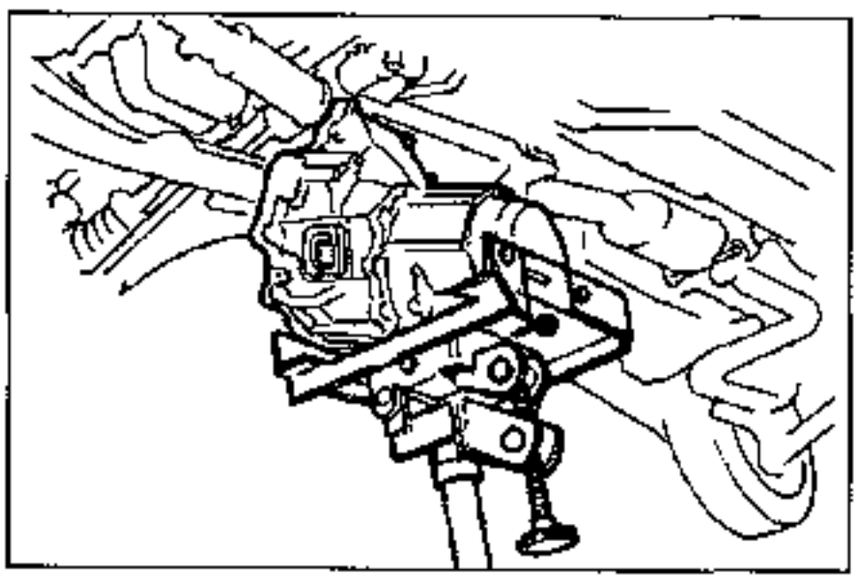
6. If not as specified, reassemble the transaxle.

INSTALLATION

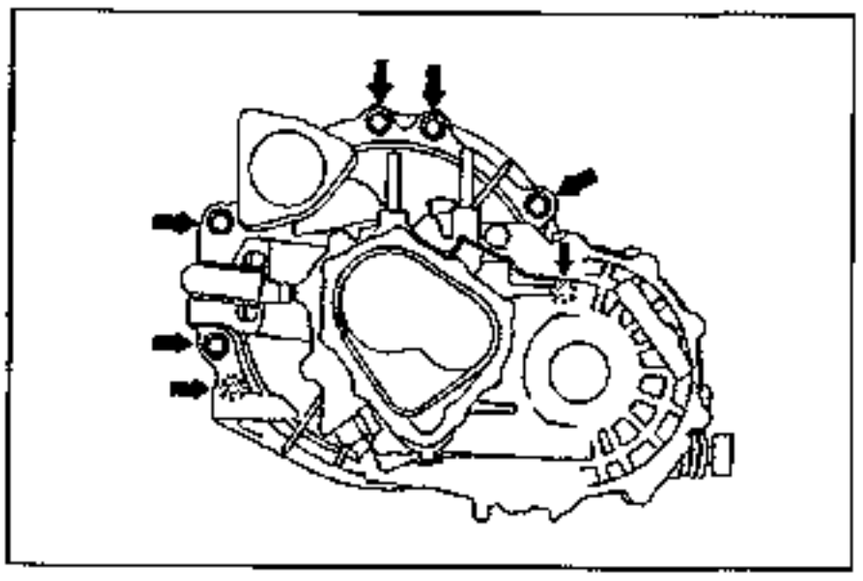
1. On level ground, raise the vehicle and support it evenly on safety stands.
2. Install in the order shown in the figure, referring to **Installation Note**.
3. Add the specified amount and type of transaxle oil. (Refer to page J2–7.)
4. Warm up the engine and transaxle, inspect for oil leakage, and check transaxle operation.



1. Transaxle
   Installation Note ..... below
2. No.4 engine mount
3. Undercover
4. Engine mounting member
   Installation Note ..... below
5. Drive shaft and joint shaft
   Installation Note ..... page J2–48
6. Drive shaft
   Installation Note ..... page J2–48
7. Stabilizer control link
   Installation Note ..... page J2–49
8. Tie rod end
   Installation Note ..... page J2–49
9. Change control rod
   Installation Note ..... page J2–49
10. Extension bar
    Installation Note ..... page J2–49
11. Exhaust pipe
12. Transverse member
13. Clutch release cylinder
14. Vehicle speedometer sensor (speedometer driven gear)
15. Back-up light switch connector
    Installation Note ..... page J2–49
16. Neutral switch connector
17. Fuel filter
18. Harness bracket
19. Starter
20. Battery carrier
21. Battery
22. Air cleaner assembly
23. Fresh-air duct
24. Splash shield
25. Wheel and tire



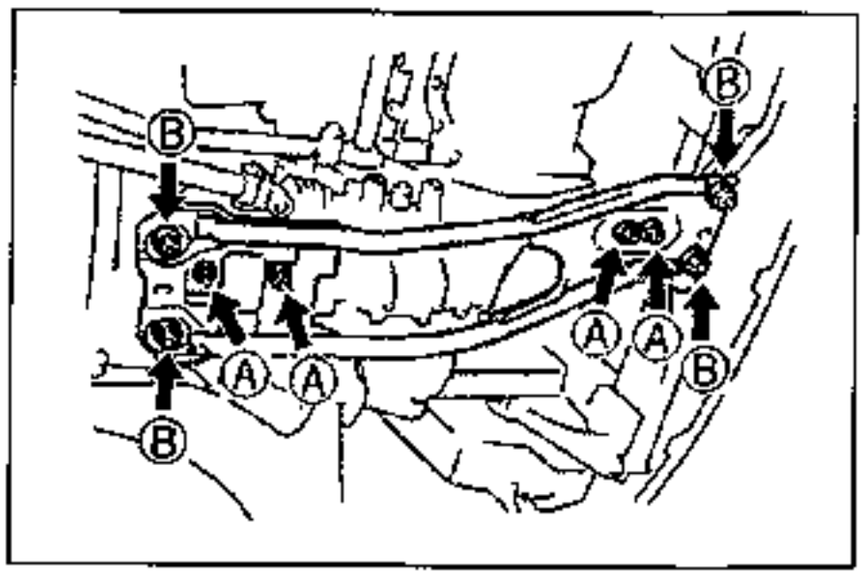
Installation Note
Transaxle
1. Set the transaxle on a jack and lift it into place.



2. Install the transaxle mounting bolts.

Tightening torque:
68–99 N·m {6.9–10.1 kgf·m, 50–73 ft·lbf}

3. Loosely tighten the No.4 engine mount bolts.

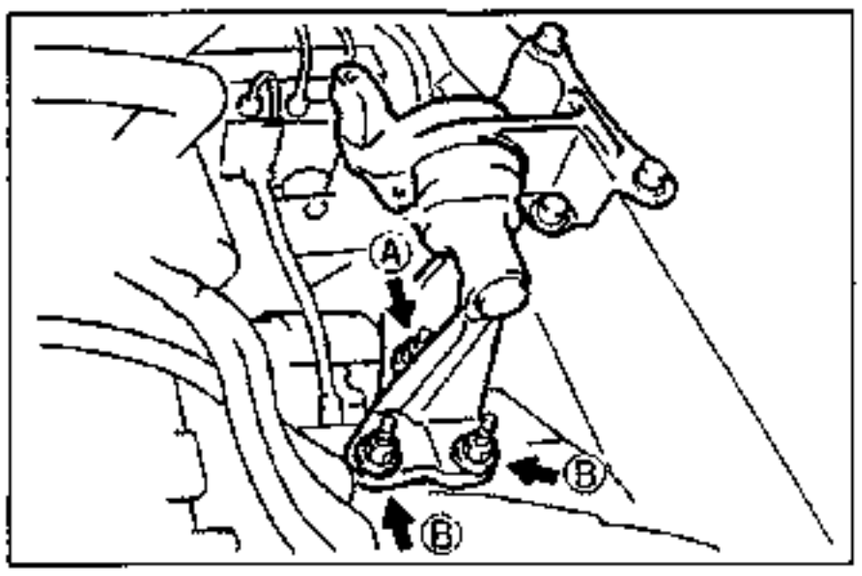


Engine mounting member

Note
- Put the No.1 and No.2 engine mount stud bolts in the installing holes when installing the engine mounting member.

1. Aligh the No.1 and No.2 engine mount stud bolts in the installing holes, and install the bolts and nuts as shown.

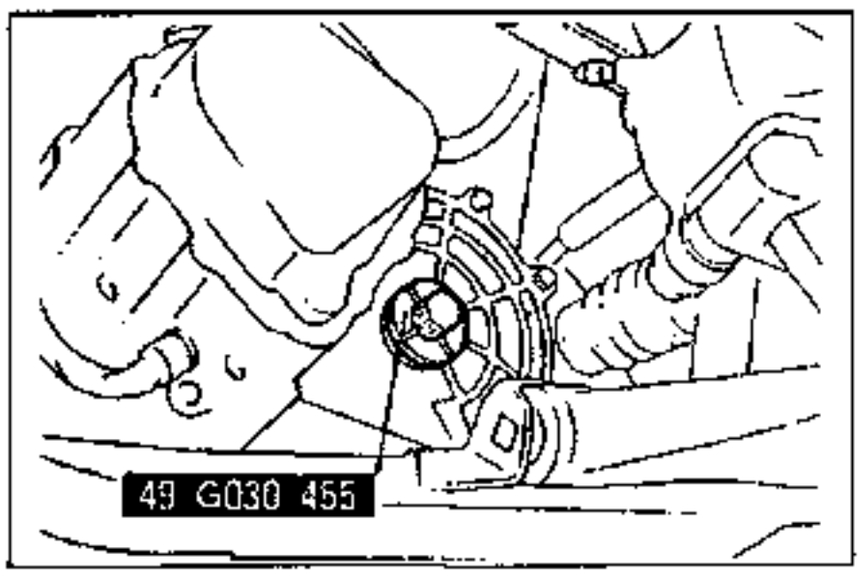
Tightening torque:
A: 38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}
B: 64–89 N·m {6.5–9.1 kgf·m, 48–65 ft·lbf}



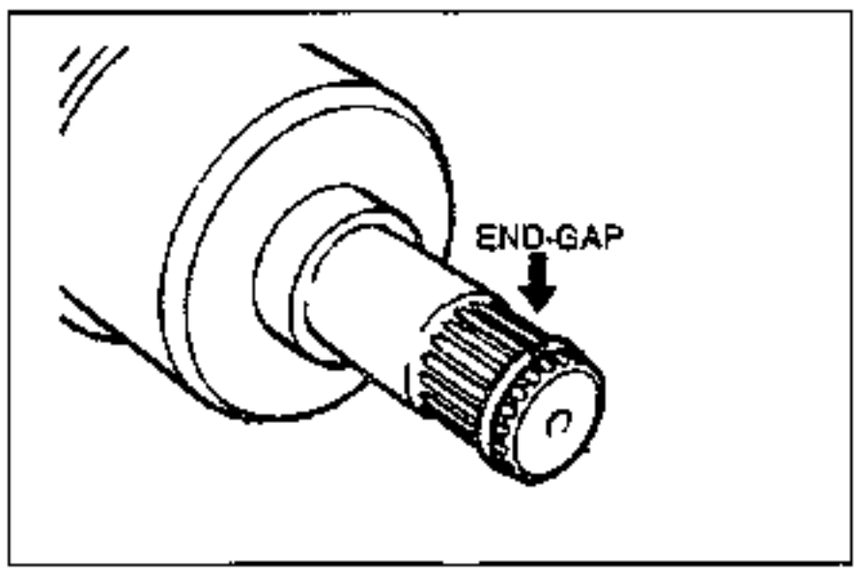
2. Tighten the No.4 engine mount nuts.

Tightening torque:
A: 67–93 N·m {6.8–9.5 kgf·m, 50–68 ft·lbf}
B: 28–40 N·m {2,8–4.1 kgf·m, 21–29 ft·lbf}

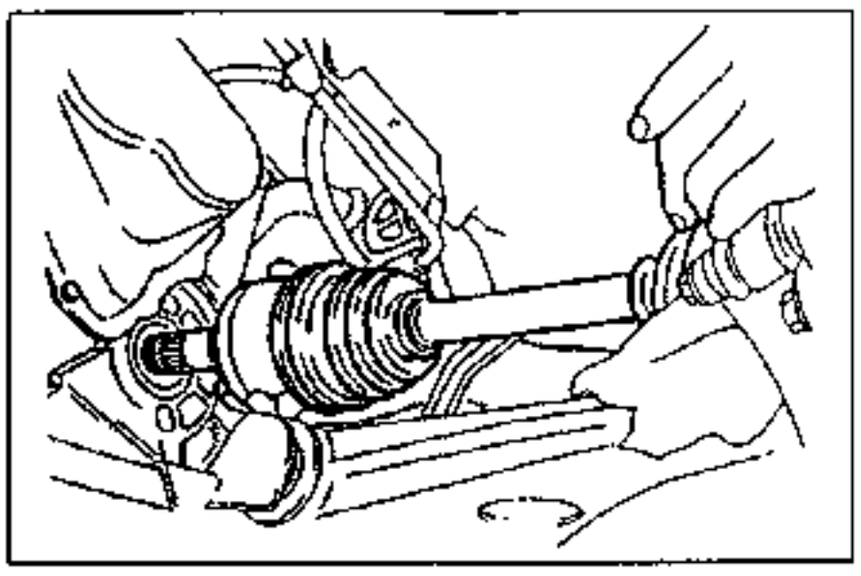
3. Remove the **SST** (engine support).



Drive shaft and joint shaft
1. Remove the **SSTs** from the transaxle case.

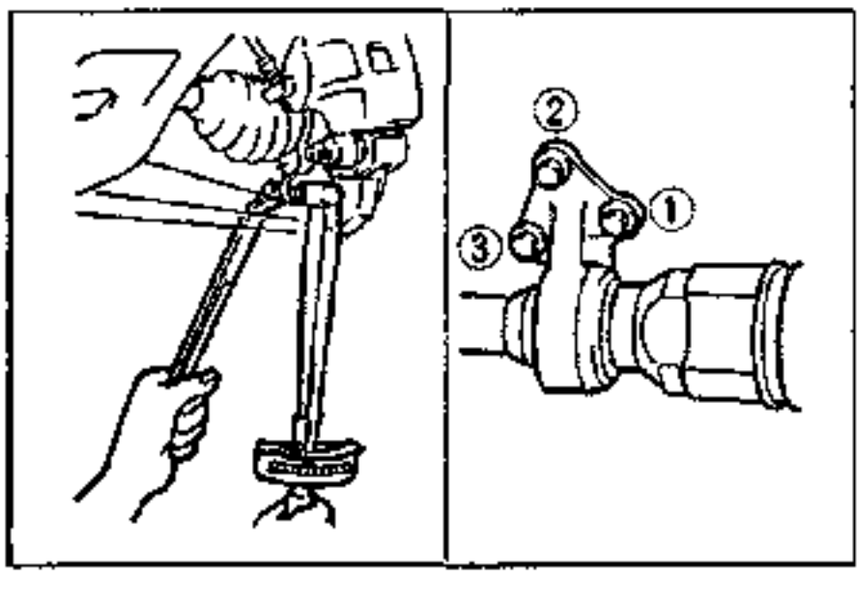


2. Install the clip with the gap at the top of the groove.



Caution
- **The sharp edges of the drive shaft snap ring can slice or puncture the oil seal. Be careful when installing the drive shaft to the transaxle.**

3. Apply transaxle oil to the oil seal lip, and install the drive shaft.
4. Verify that the drive shaft is correctly seated by pulling on the shaft. It must not slide out.

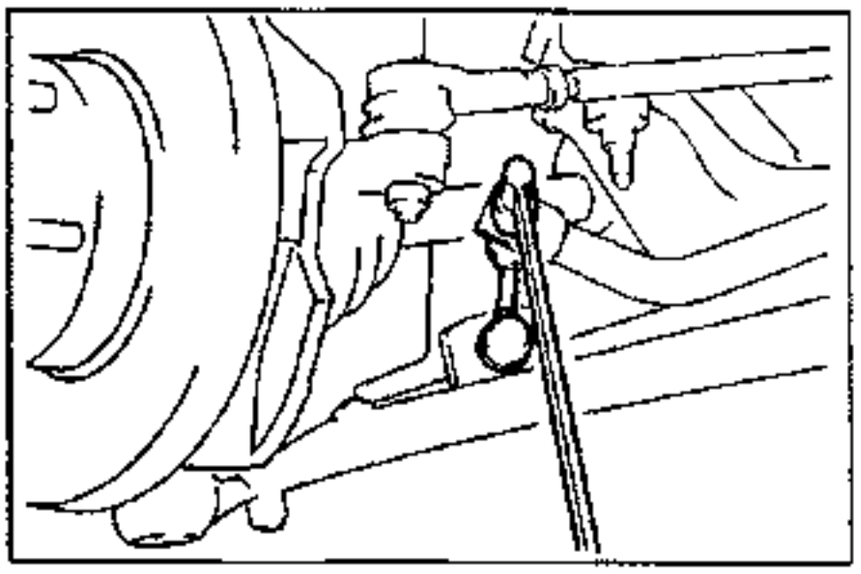


5. Insert the joint shaft to the transaxle.
6. Install the joint shaft to the cylinder block in the order shown.

Tightening torque:
43–61 N·m {4.3–6.3 kgf·m, 32–45 ft·lbf}

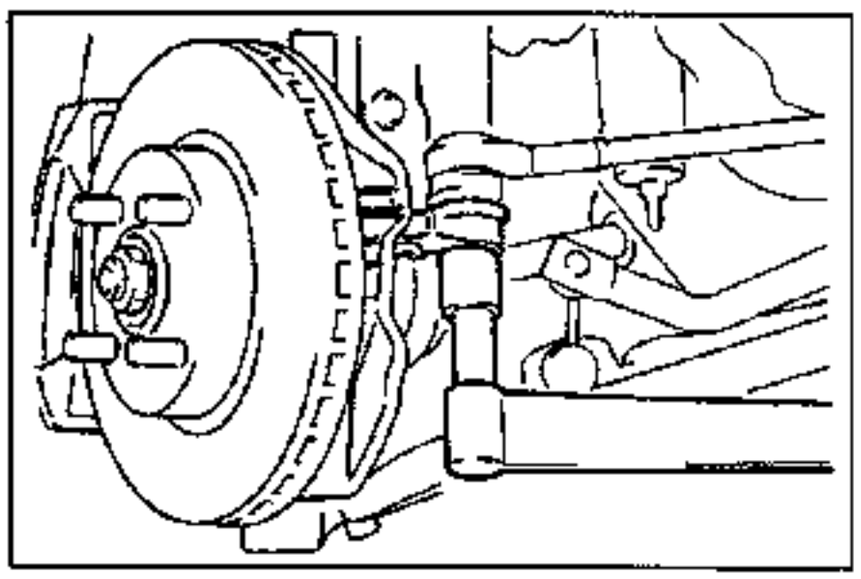
7. Connect the lower arm to the knuckle and tighten the clinch bolt.

Tightening torque:
44–58 N·m {4.4–6.0 kgf·m, 32–43 ft·lbf}



Stabilizer control link
Install the stabilizer control link.

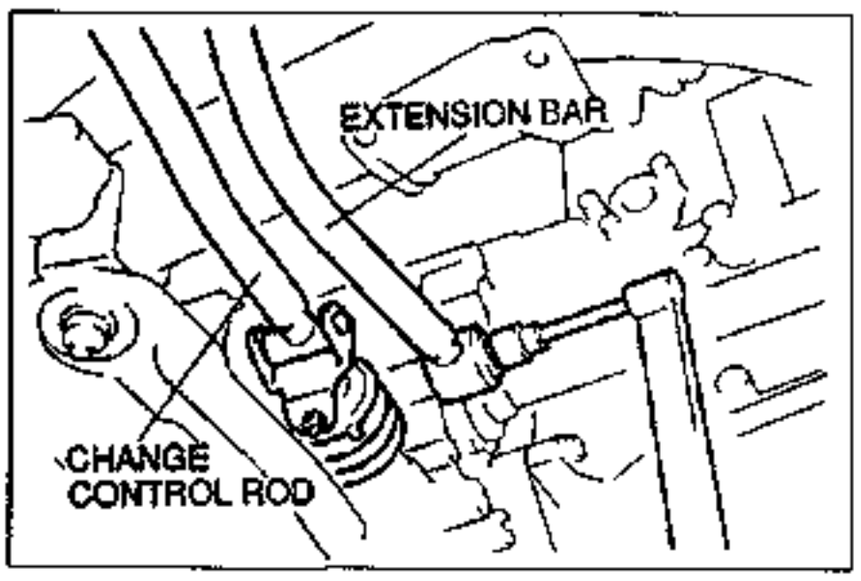
Tightening torque:
44–60 N·m {4.4–6.2 kgf·m, 32–44 ft·lbf}



Tie-rod end
1. Install the locknut.

Tightening torque:
43–56 N·m {4.3–5.8 kgf·m, 32–41 ft·lbf}

2. Secure the locknut by using a new cotter pin.

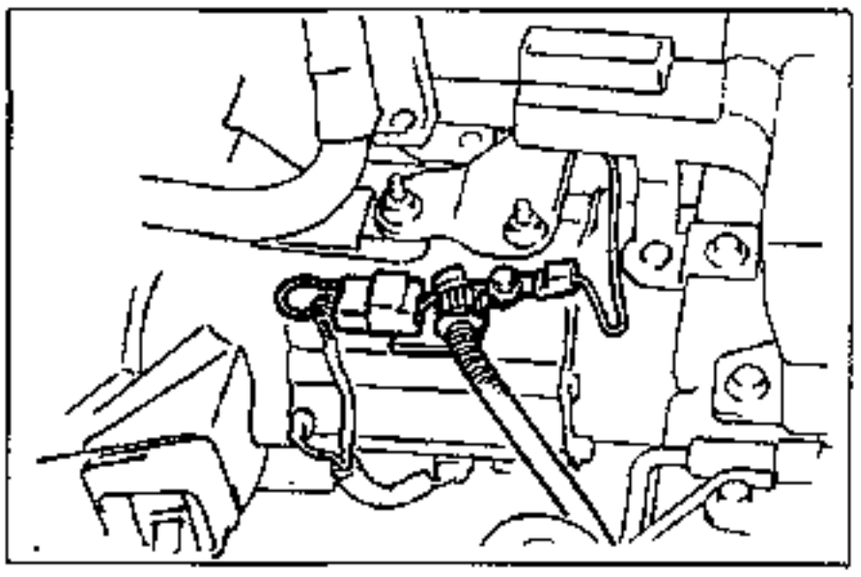


Change control rod and extension bar
1. Install the extension bar to the transaxle.

Tightening torque:
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}

2. Install the change control rod to the transaxle.

Tightening torque:
16–22 N·m {1.6–2.3 kgf·m, 12–16 ft·lbf}



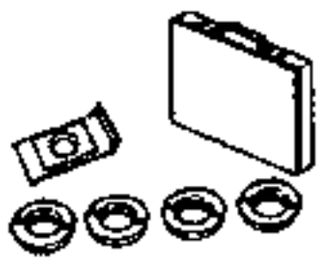
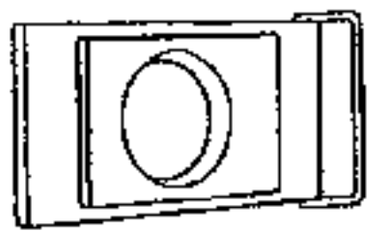
Back-up light switch connector
1. Install the back-up light switch connector and the bracket for the ground terminals.
2. Connect the back-up light switch connector.
3. Connect the ground terminals.

Tightening torque:
16–22 N·m {1.6–2.3 kgf·m, 12–16 ft·lbf}

After warming-up the engine, do the following.
- **Check the amount of oil.**
- **Conduct a road test.**
  1. No abnormal noise in each shift position.
  2. Smooth shift change is possible.
  3. Transaxle does not jump out of gear.
  4. Speedometer operates correctly.
  5. Back-up lights operate correctly.

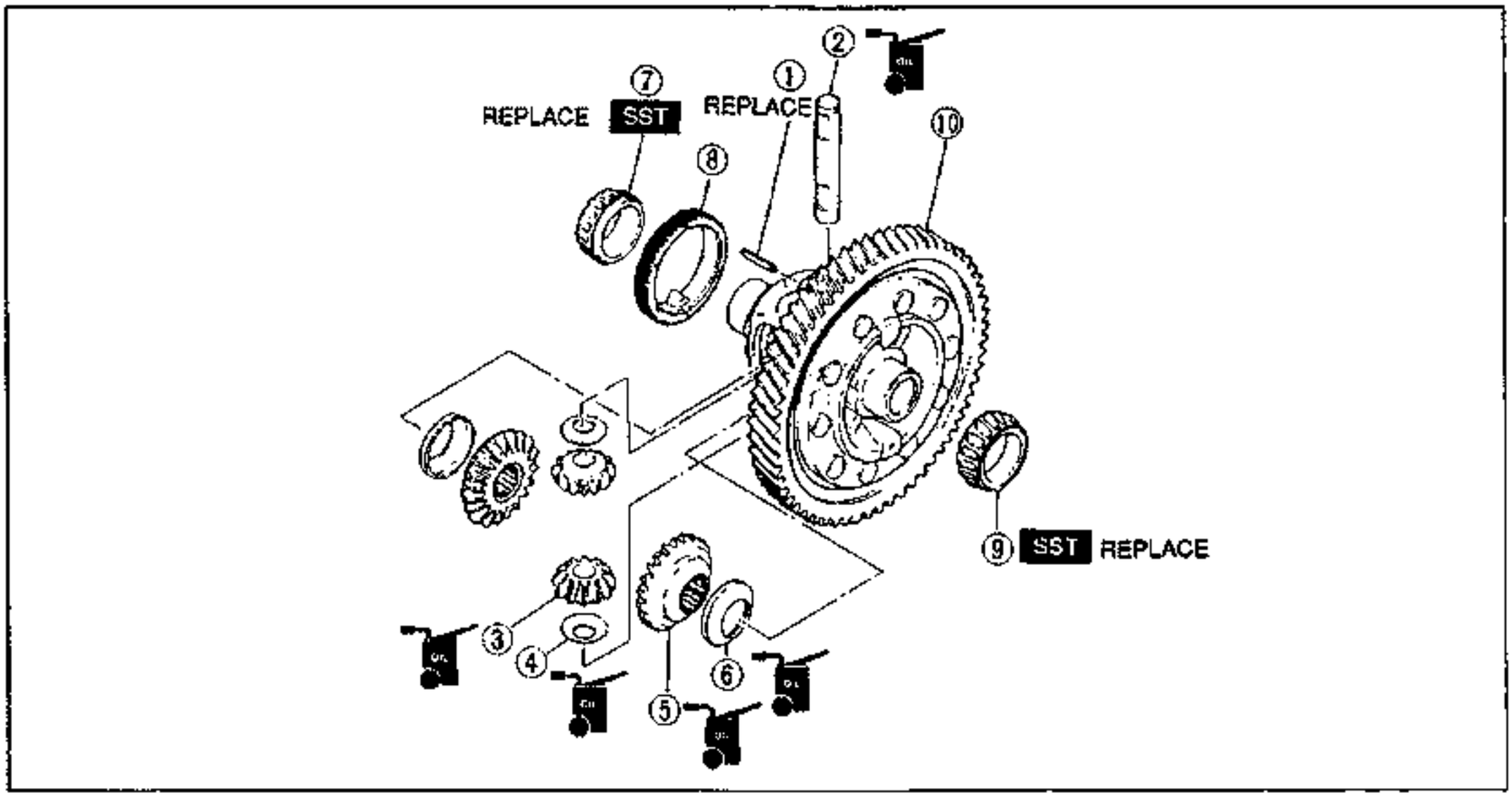
DIFFERENTIAL

PREPARATION
SST

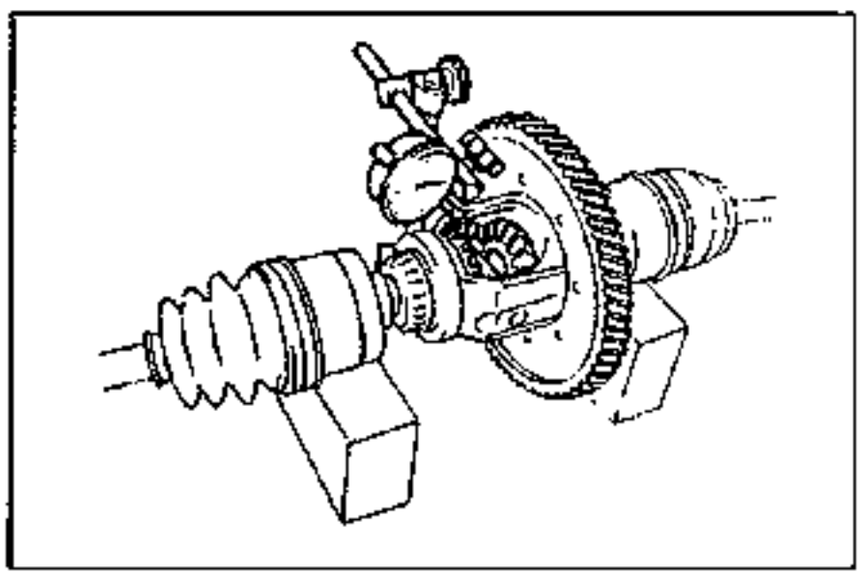
49 G017 1A0 Remove set, bearing		For removal of bearing	
49 B092 375 Attachment J (Part of 49 G017 1A0)		For removal of side bearing	
49 G030 338 Attachment E		For installation of side bearing	
		49 F401 366A Plate (Part of 49 G017 1A0)	 For removal of side bearing
		49 0839 425C Puller set, bearing	 For removal of side bearing

DISASSEMBLY / INSPECTION / ASSEMBLY

1. Before disassembly, inspect the backlash of the side gears and pinion gears, referring to **Preinspection**.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
3. Inspect all parts and repair or replace as necessary.
4. Assemble in the reverse order of disassembly, referring to **Assembly Note**.
5. Measure the backlash after assembly, referring to **Backlash of Side Gear and Pinion Gear**.



1. Roll pin
   Assembly Note ..... page J2–53
2. Pinion shaft
3. Pinion gear
   Inspect for wear and cracks
   Preinspection ..... below
   Inspection of backlash ..... page J2–53
4. Thrust washer
5. Side gear
   Inspect for wear and cracks
   Preinspection ..... below
   Inspection of backlash ..... page J2–53
6. Thrust washer
7. Bearing (side opposite ring gear)
   Disassembly Note ..... page J2–52
   Inspection ..... page J2–52
   Assembly Note ..... page J2–53
8. Speedometer drive gear
9. Bearing (ring gear side)
   Disassembly Note ..... page J2–52
   Inspection ..... page J2–52
   Assembly Note ..... page J2–52
10. Ring gear and gear case assembly
    Inspection ..... page J2–52



Preinspection

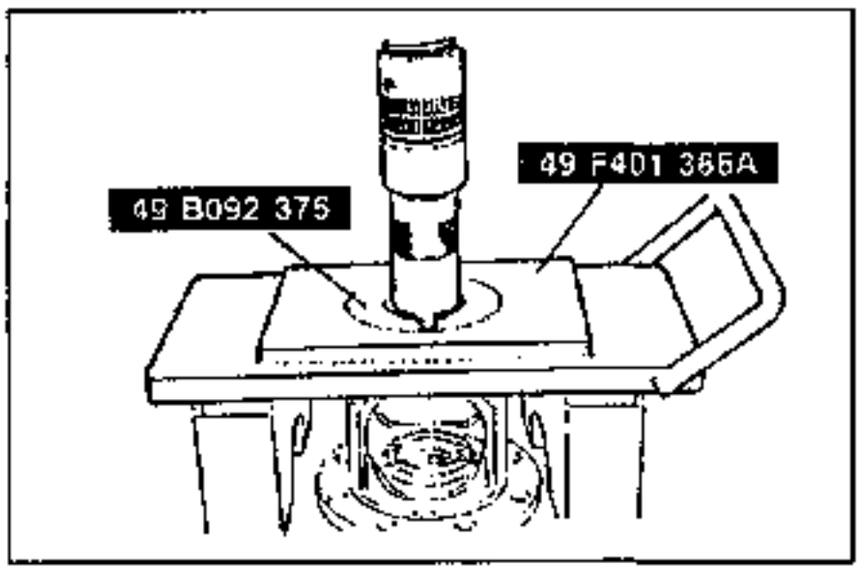
Backlash of side gear and pinion gear

Measure the backlash by the following procedure.

1. Install the left and right drive shafts in the differential assembly.
2. Support the drive shafts on V-blocks as shown in the figure.
3. Measure the backlash of both pinion gears.

   Backlash: 0–0.1 mm {0–0.004 in}

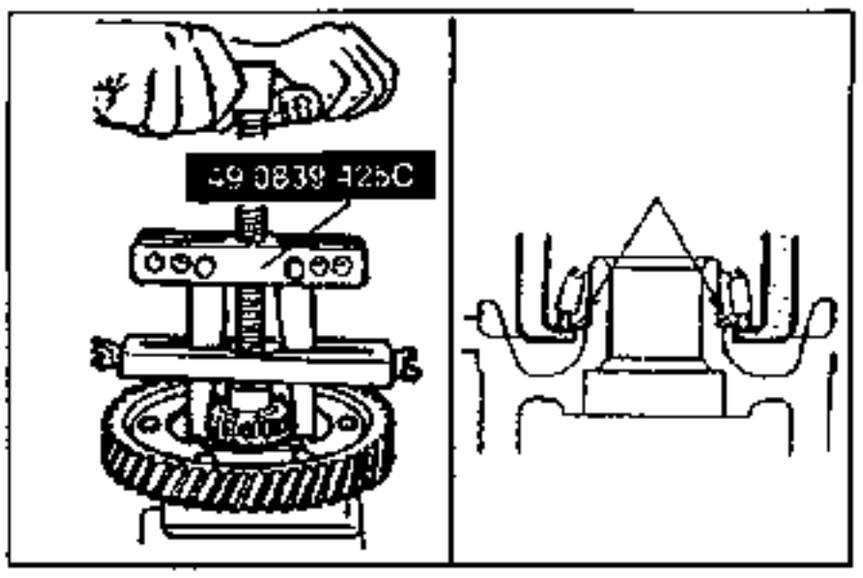
4. If not as specified, replace worn and damage parts.



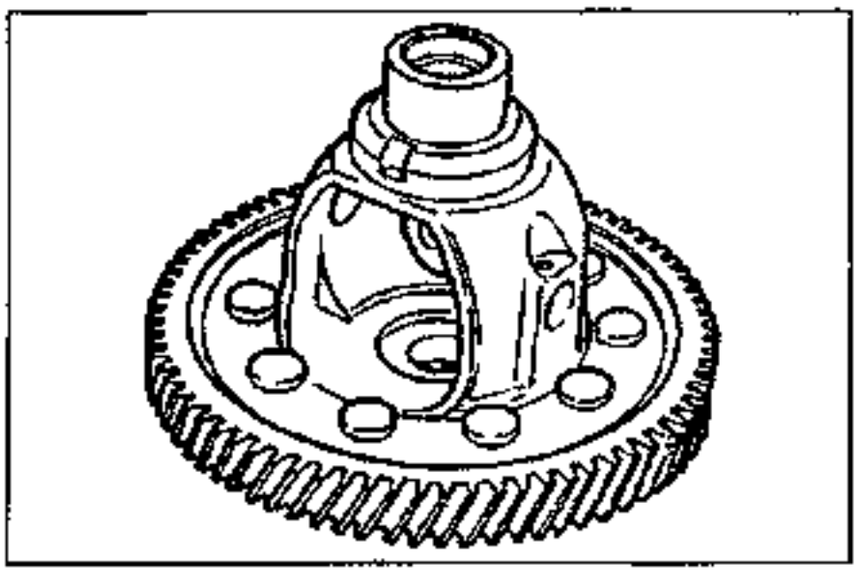
Disassembly Note
Bearing (side opposite ring gear)

Note
- The bearing does not need to be removed unless you are replacing it.

Remove the bearing by using the **SSTs.**

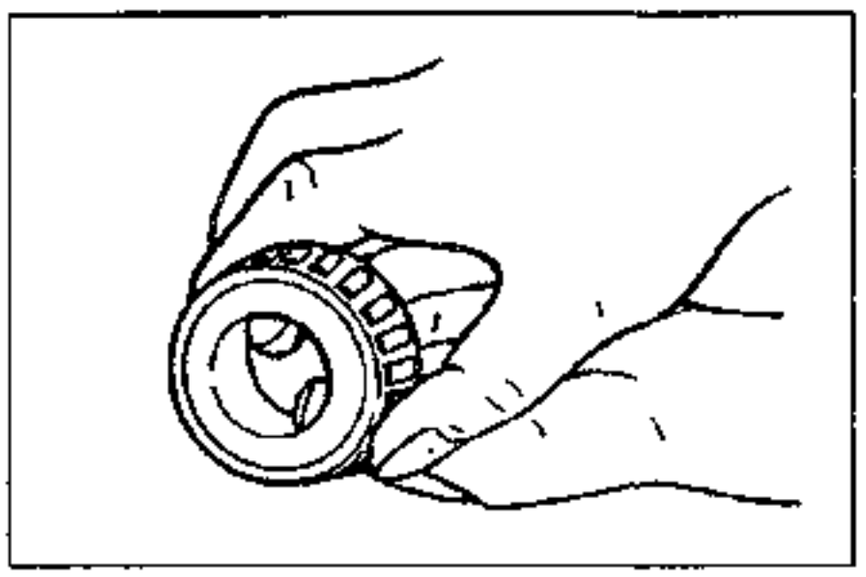


Bearing (ring gear side)
Remove the bearing by using the **SST.**

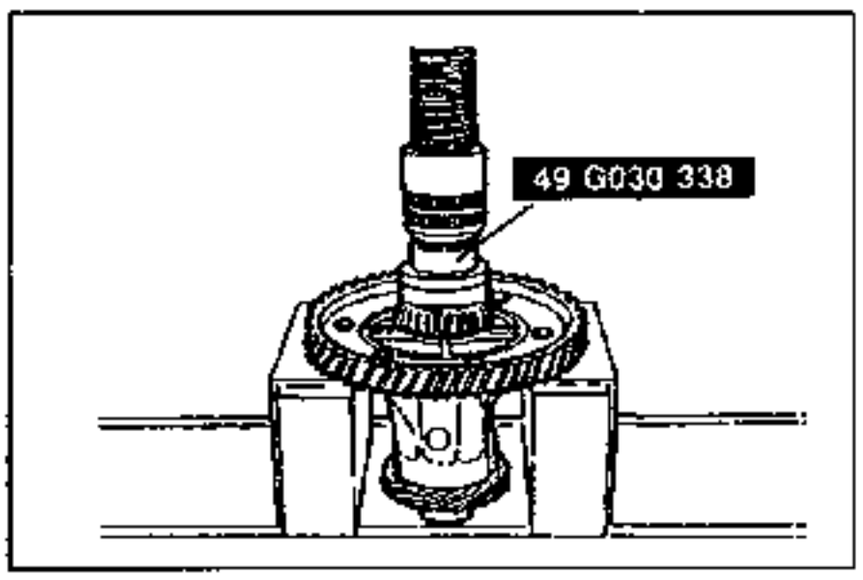


Inspection
Inspect all parts and repair or replace as necessary.

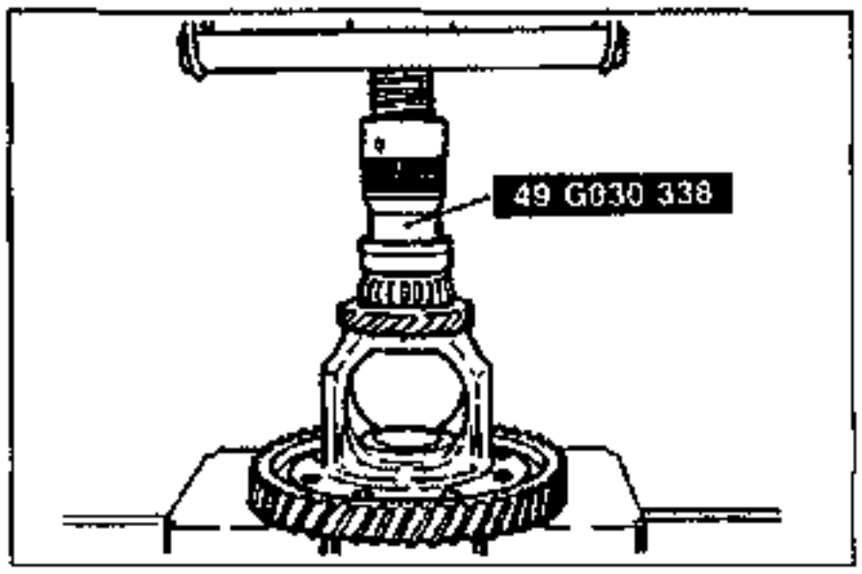
Ring gear and gear case assembly
Inspect the ring gear for wear and cracks. If the gear case is replaced, adjust the bearing preload.



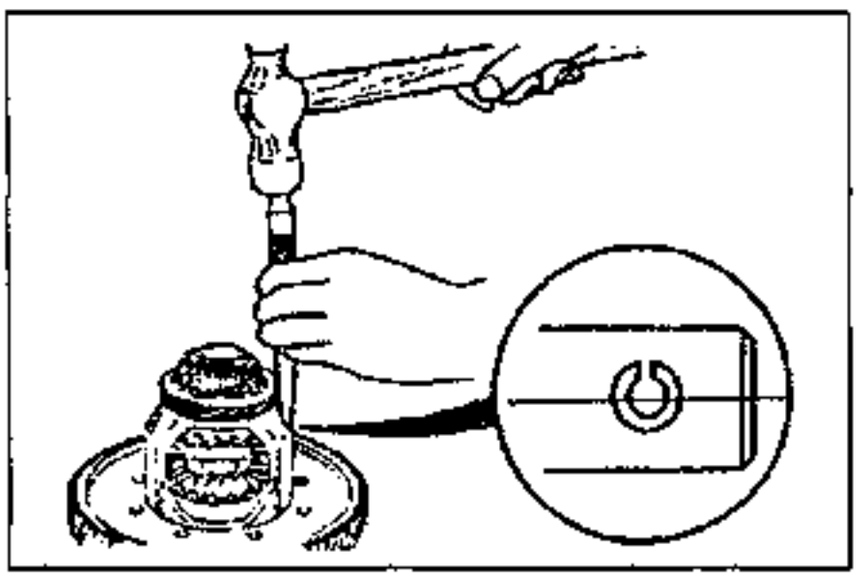
Bearing
Inspect for wear and rough rotation. If the bearing is removed, then replace it and the bearing race together, and adjust the bearing preload.



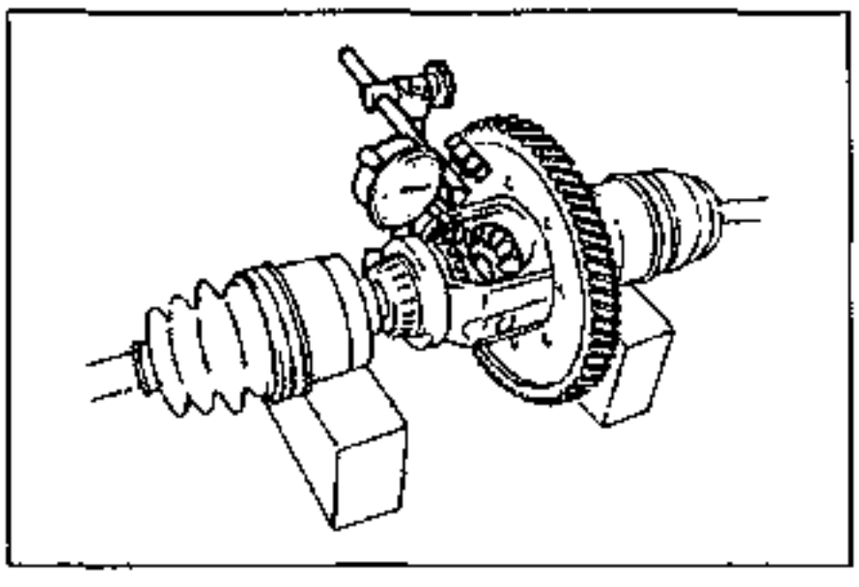
Assembly Note
Bearing (ring gear side)
Install the new bearing by using the **SST.**



Bearing (side opposite ring gear)
1. Install the speedometer drive gear.
2. Install the new bearing by using the **SST.**



Roll pin
Install the new roll pin as shown in the figure to hold the pinion shaft.



Backlash of Side Gear and Pinion Gear
Measure the backlash by the following procedure.
1. Install the left and right drive shafts in the differential assembly.
2. Support the drive shafts on V-blocks as shown in the figure.
3. Measure the backlash of both pinion gears.

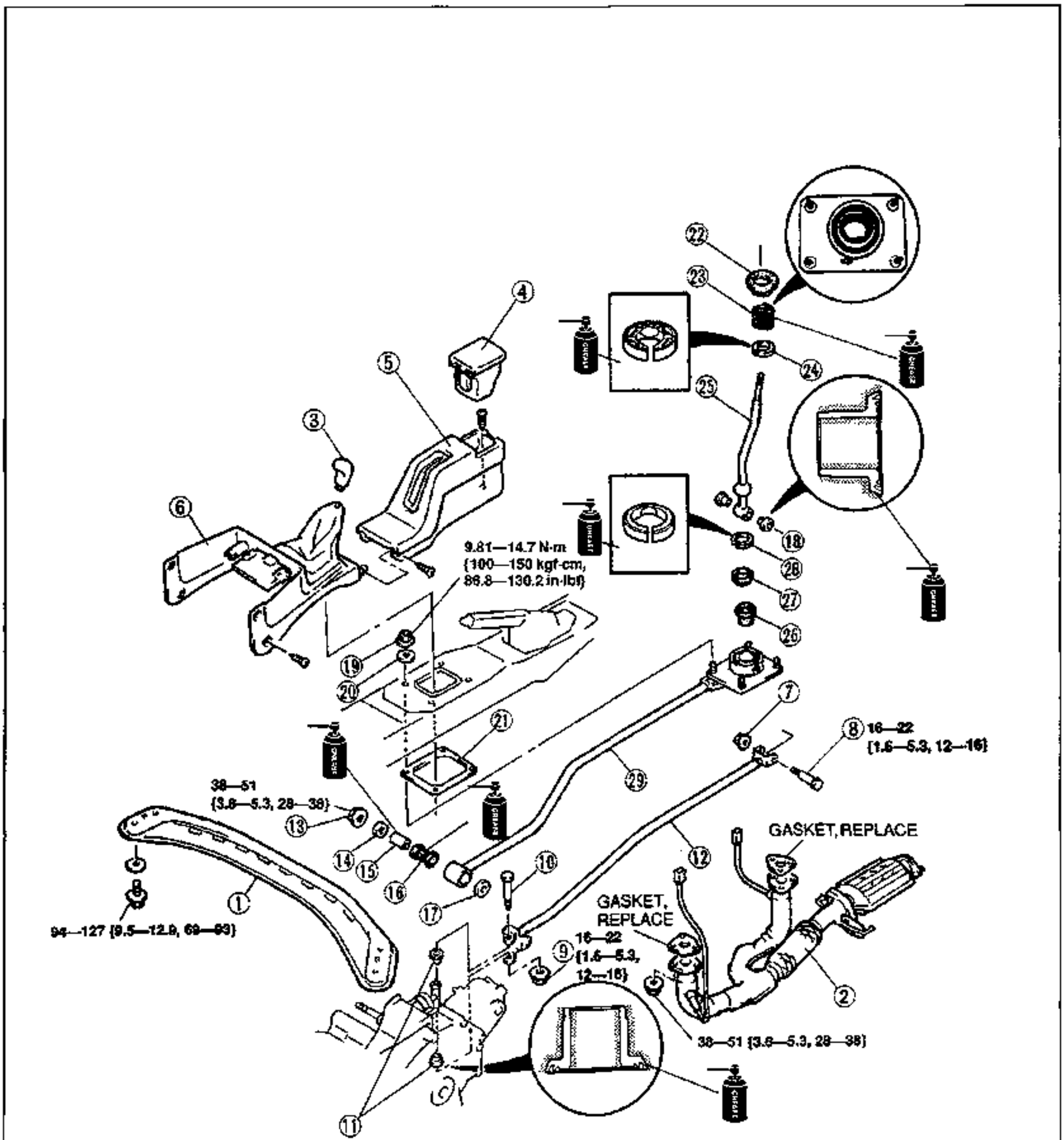
   Backlash: 0–0.1 mm (0–0.004 In)

4. If not as specified, replace worn and damage parts.

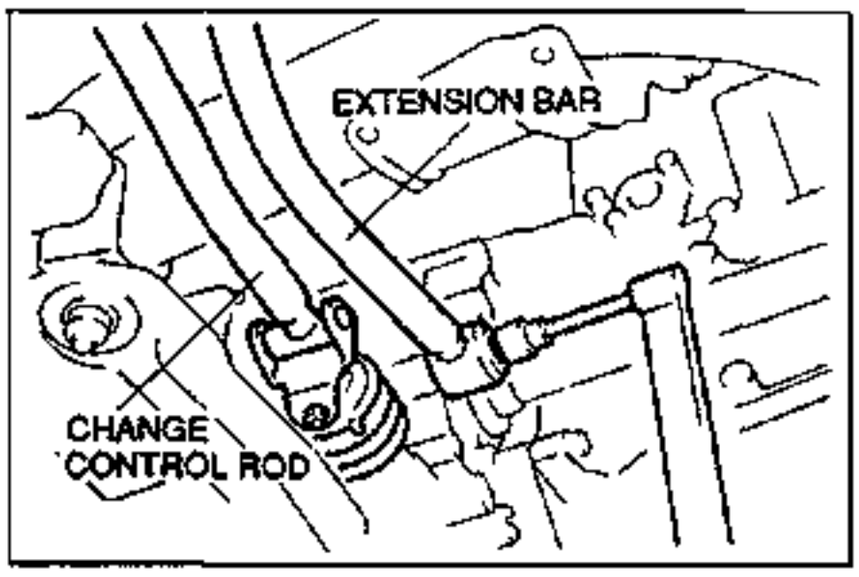
SHIFT MECHANISM

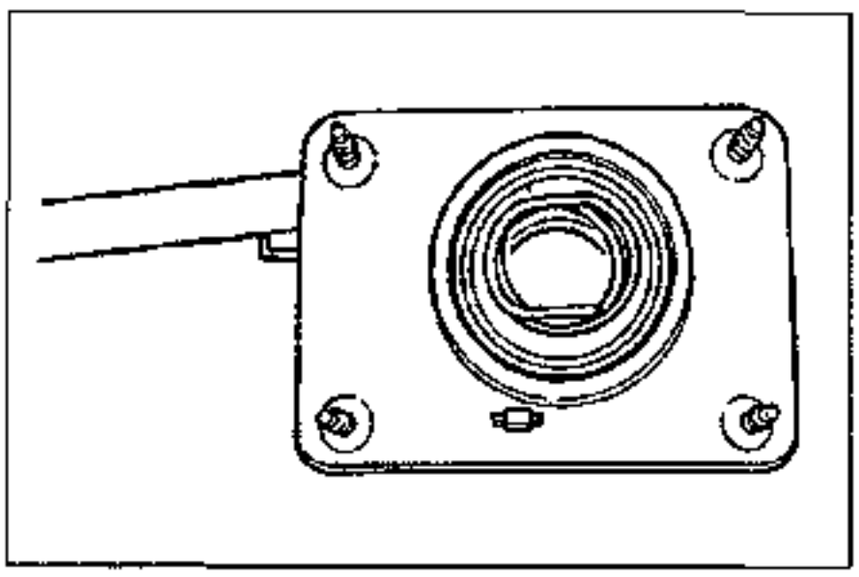
OVERHAUL

1. Disassemble in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note.**



1. Transverse member
2. Exhaust pipe
3. Shift lever knob
4. Rear ashtray
5. Rear console
6. Front console
7. Nut
8. Bolt
9. Nut
10. Bolt
11. Bushing
12. Change control rod
    Inspect for bending
13. Nut
14. Washer
15. Pipe
16. Bushing
17. Washer
18. Bushing
19. Nuts
20. Washers
21. Insulator
    Inspect for damage and cracks
22. Mounting boot
23. Spring
    Inspect for damage and weakness
    Assembly Note ..... below
24. Upper ball seat
25. Gear shift lever
26. Boot
    Inspect for wear and damage
27. Holder
28. Lower ball seat
29. Extension bar
    Assembly Note ..... below





Assembly Note
Extension bar

1. Install the extension bar to the floor, and then onto the transaxle.

   Tightening torque:
   38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}

2. Tighten the bracket installation nuts to the specified torque.

   Tightening torque:
   9.81–14.7 N·m {100–150 kgf·cm, 86.8–130.2 in·lbf}

Spring

Make sure that the hooked part of the spring is properly seated in the bracket groove, as shown in the figure.

Before beginning any service procedure, refer to the 1995 MX–3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

FRONT AND REAR AXLES

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PREPARATION ..... M– 4
WHEEL HUB, STEERING KNUCKLE ..... M– 5
REAR AXLE M–11
PREPARATION M–11
DRUM BRAKE TYPE M–11
DISC BRAKE TYPE M–14
DRIVE SHAFT M–17
PREPARATION M–17
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DRIVE SHAFT
(TRIPOD JOINT) M–24

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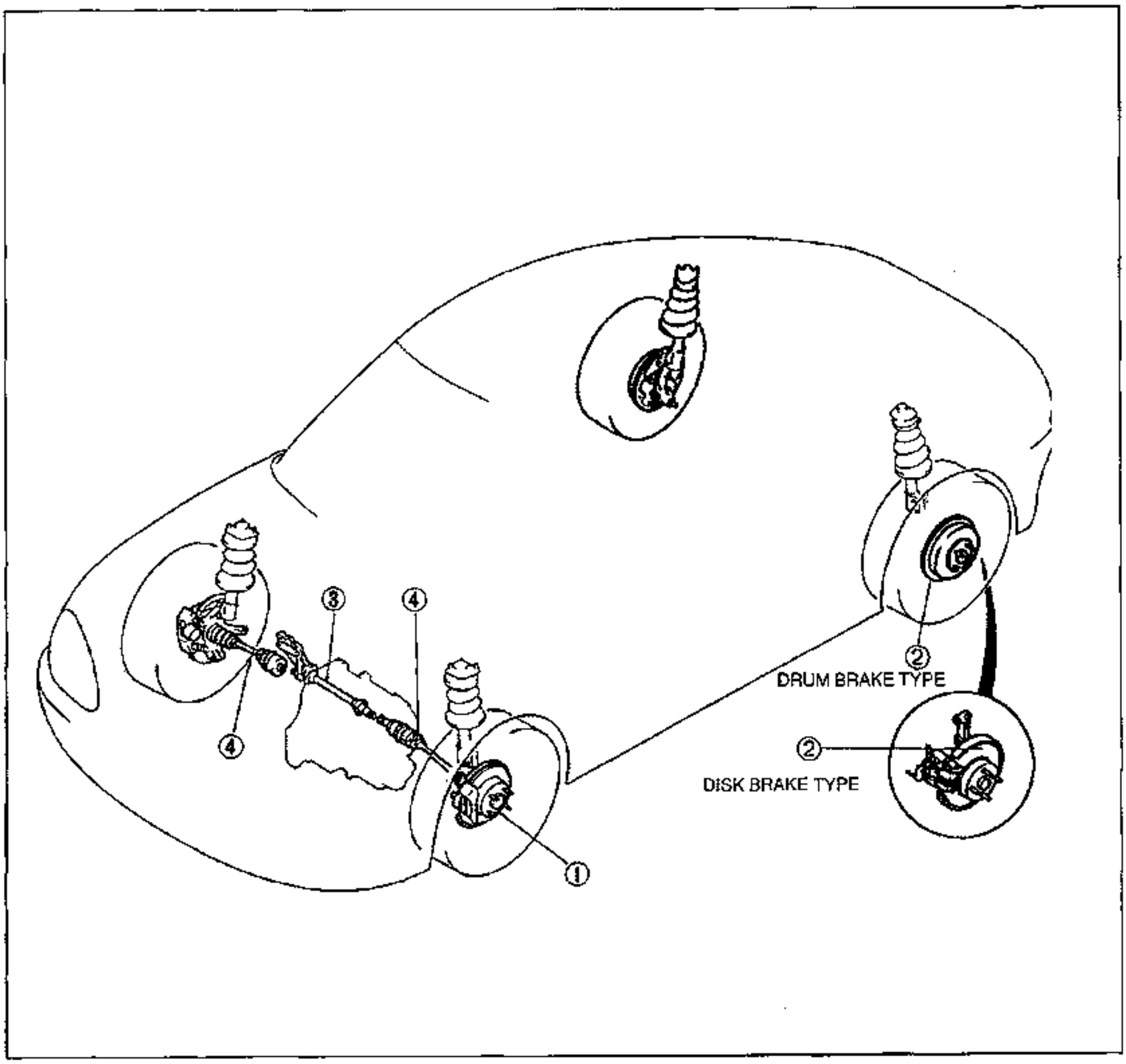

1. Front axle
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Removal / Installation ..... page M– 6
Disassembly / Inspection / Assembly ..... page M– 8
2. Rear axle
[Drum brake type]
Preinspection ..... page M–11
Removal / Inspection/ Installation ..... page M–12
Disassembly / Assembly ..... page M–13
[Disc brake type]
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3. Joint shaft
Preinspection ..... page M–19
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4. Drive shaft
Removal / Installation ..... page M–25
Disassembly / Inspection / Assembly ..... page M–29

OUTLINE

SPECIFICATIONS

Item \ Model			B6 DOHC		K8 DOHC	
			MTX	ATX	MTX	ATX
Front axle						
Maximum wheel bearing play mm {in}			0.05 {0.002}			
Rear axle						
Maximum wheel bearing play mm {in}	Drum brake type		0.05 {0.002}			
	Disc brake type		0.05 {0.002}			
Drive shaft						
Length of joint (between center of joint) mm {in}	Right side	NON ABS	380.5 {14.98}		388.9 {15.31}	384.5 {15.14}
		ABS			384.9 {15.15}	
	Left side	NON ABS	397.0 {15.63}		379.5 {14.94}	396.0 {15.59}
		ABS			375.5 {14.78}	
Shaft diameter mm {in}	Right side		23.0 {0.91}		25.0 {0.98}	
	Left side		21.5 {0.85}		25.0 {0.98}	

TROUBLESHOOTING GUIDE

Front Axle

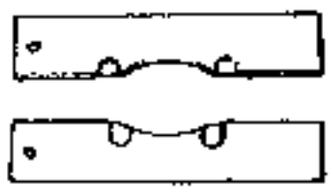
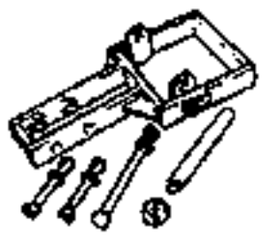
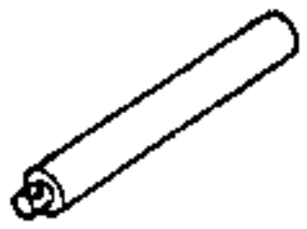
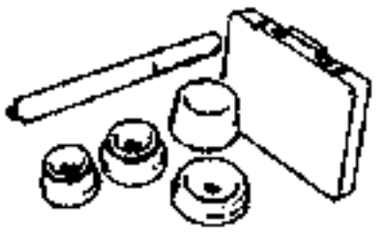
Problem	Possible Cause	Remedy	Page
Steering wheel vibration	Worn or damaged wheel bearing Excessive wheel bearing play	Replace Tighten or replace	M–8 M–5
Steering wheel pulls or one-sided braking	Worn or damaged wheel bearing Excessive wheel bearing play	Replace Tighten or replace	M–8 M–5
Excessive steering wheel play	Excessive wheel bearing play	Tighten or replace	M–5
Abnormal noise	Bent drive shaft or joint shaft Worn or damaged wheel bearing Worn drive shaft or joint shaft splines Insufficient grease in joint or on splines of drive shaft Insufficient grease in joint or splines of joint shaft Worn drive shaft tripod joint	Replace Replace Replace Replenish or replace Add or replace Replace	M–19, 25 M–8 M–19, 25 M–25, 29 M–19 M–29
Grease leakage from boot	Damaged or broken boot Faulty boot band Excessive grease	Replace Replace Repair	M–29 M–29 M–29

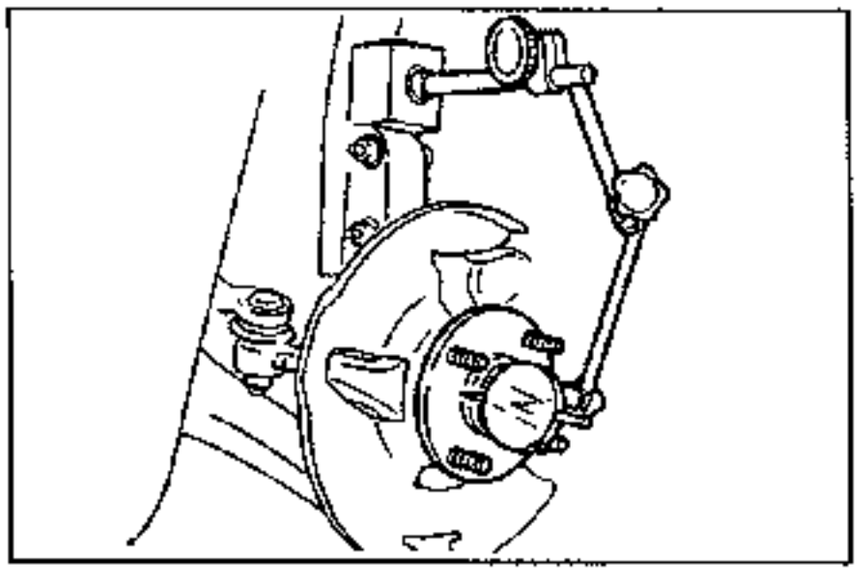
Rear Axle

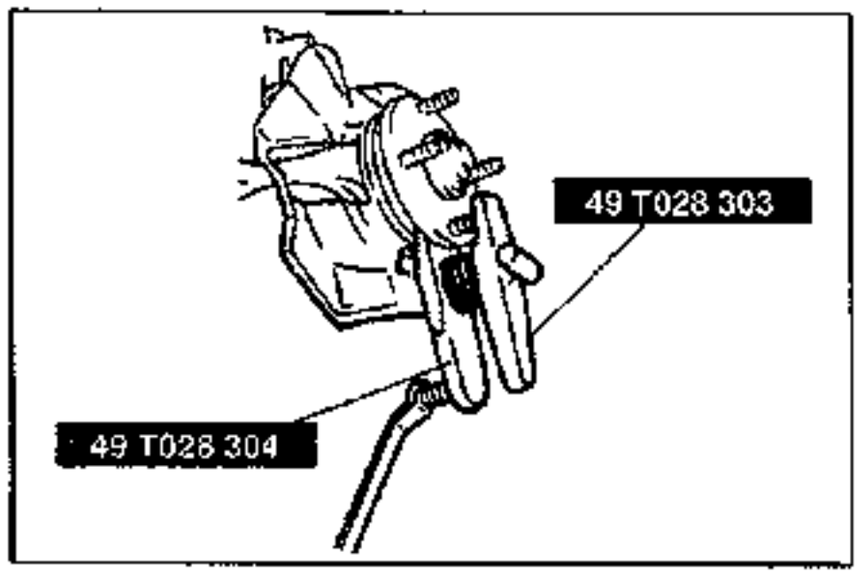
Problem	Possible Cause	Remedy	Page
Steering wheel vibration	Worn or damaged wheel bearing Excessive wheel bearing play	Replace Tighten or replace	M–12, 15 M–11, 14
Steering wheel pulls or one-sided braking	Worn or damaged wheel bearing Excessive wheel bearing play	Replace Tighten or replace	M–12, 15 M–11, 14
Excessive steering wheel play	Excessive wheel bearing play	Tighten or replace	M–11, 14
Abnormal noise	Worn or damaged wheel bearing	Replace	M–12, 15

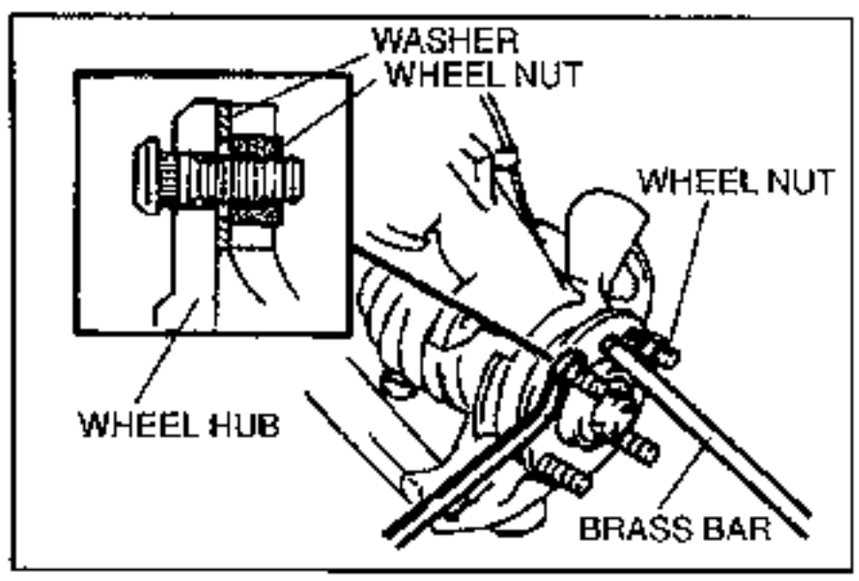
FRONT AXLE

PREPARATION
SST

49 T028 3A0 Puller set, ball joint 	For removal of tie-rod end	49 T028 303 Body (Part of 49 T028 3A0) 	For removal of tie-rod end
49 T028 304 Attachment (Part of 49 T028 3A0) 	For removal of tie-rod end	49 F026 103 Puller, wheel hub 	For disassembly of wheel bearing
49 B026 1A0 Puller, wheel hub 	For disassembly and assembly of wheel hub	49 G033 102 Handle (Part of 49 B026 1A0) 	For removal of front wheel hub
49 G030 727 Attachment A (Part of 49 B026 1A0) 	For removal of front wheel hub	49 E033 101 Installer, dust cover 	For installation of dust cover
49 F027 0A1 Installer set, bearing 	For installation of bearing	49 F027 003 Handle (Part of 49 F027 0A1) 	For removal and installation of wheel bearing
49 F027 005 Attachment 62 (Part of 49 F027 0A1) 	For removal of wheel bearing	49 F027 007 Attachment 72 (part of 49 F027 0A1) 	For installation of wheel bearing
49 F027 009 Attachment 68 & 77 (Part of 49 F027 0A1) 	For installation of dust cover	49 V001 795 Installer, oil seal 	For installation of oil seal
49 G030 797 Handle 	For installation of wheel bearing		







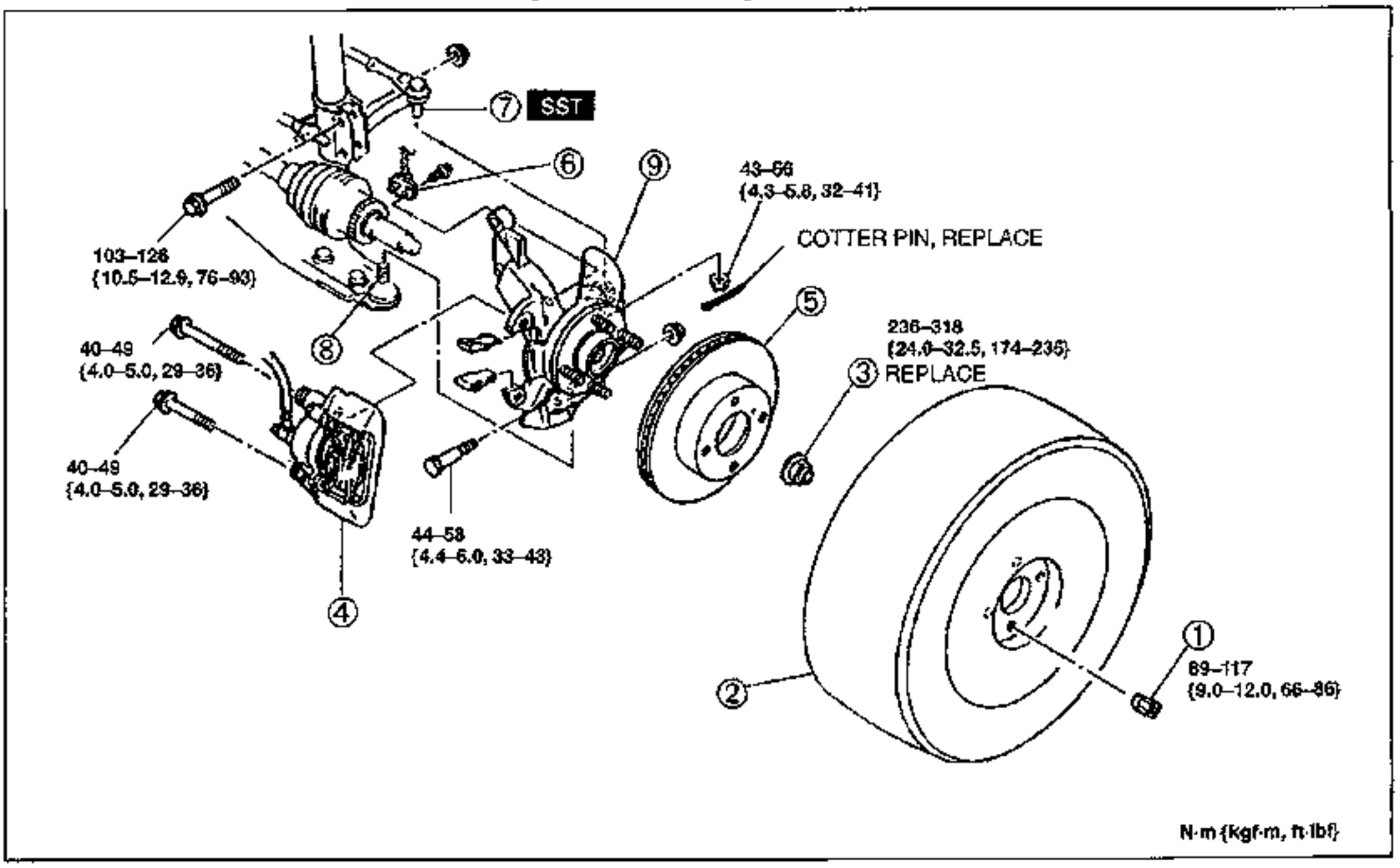
WHEEL HUB, STEERING KNUCKLE
Preinspection
Wheel bearing play
1. Remove the wheel and tire.
2. Remove the brake caliper assembly and disc plate.
3. Position a dial indicator against the wheel hub. Push and pull the wheel hub by hand in the axial direction and measure the wheel bearing play.
4. If the bearing play exceeds specification, check and adjust the locknut torque or replace the wheel bearing if necessary

Maximum wheel bearing play: 0.05mm {0.002 in}

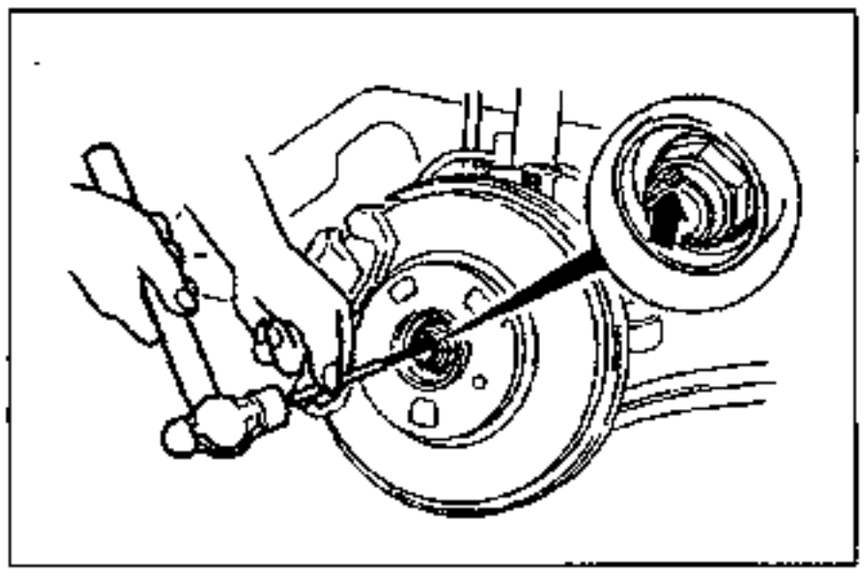
On vehicle service
Replacement
Wheel hub bolt replacement
1. Remove the wheel hub bolt by using the **SSTs.**
2. As shown in the figure, install the wheel hub bolt into the wheel hub and set a washer and wheel hub nut in the wheel hub bolt.
3. Tighten the wheel hub nut while holding the wheel hub by using the brass bar.

Removal / Installation

1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note.**
4. After installation, check the wheel alignment, referring to Section R.



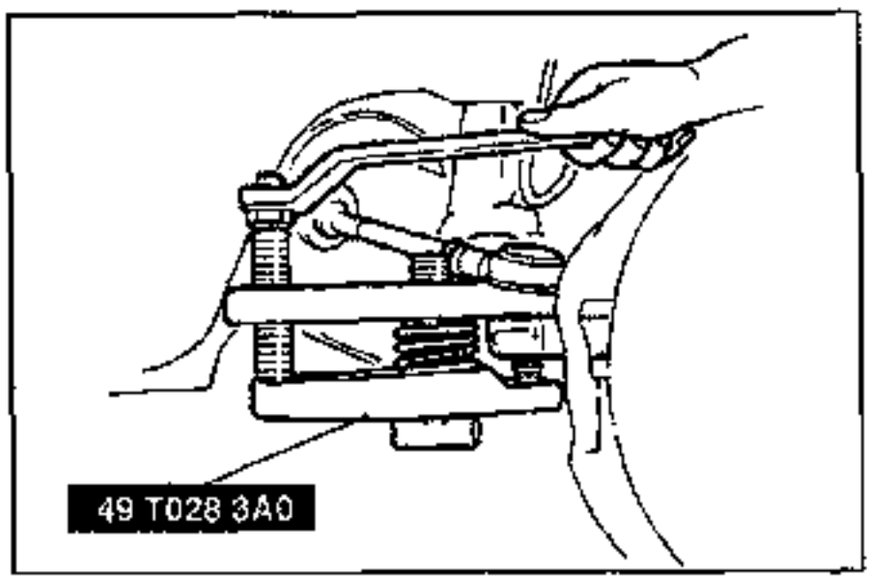
1. Wheel nut
2. Wheel and tire
3. Locknut
   - Removal Note ..... below
   - Installation Note ..... page M–7
4. Brake caliper assembly
   - Service ..... Section P
5. Disc plate
   - Service ..... Section P
6. ABS wheel-speed sensor
   - Service ..... Section P
7. Tie-rod end
   - Removal Note ..... page M–7
   - Installation Note ..... page M–7
8. Lower ball joint
9. Knuckle, wheel hub and dust cover
   - Inspect wheel hub for cracks and damage.
   - Inspect knuckle spindle for cracks and damage.
   - Inspect dust cover for damage and distortion.
   - Disassembly / Inspection / Assembly ..... page M–8



Removal Note

Locknut

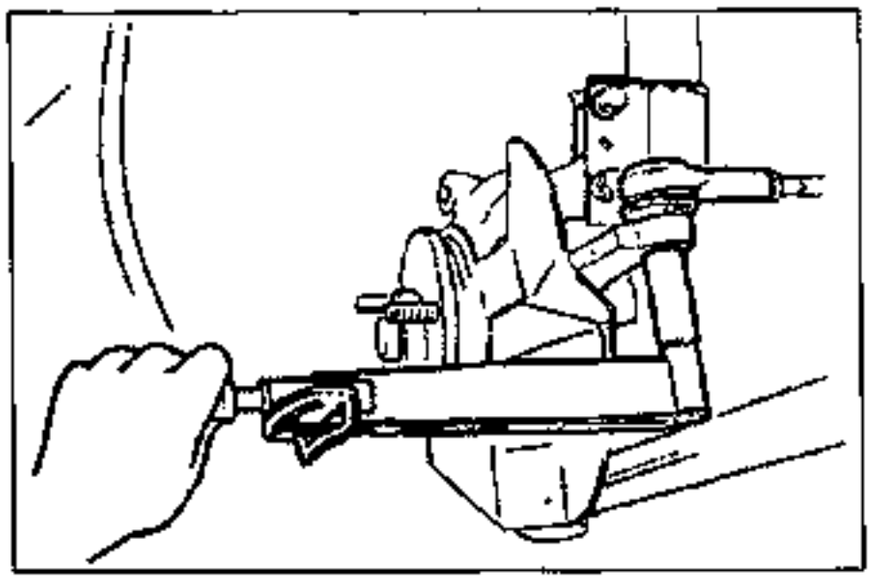
1. Knock the crimped portion of the locknut outward by using a small chisel and hammer.
2. Lock the hub by applying the brakes.
3. Remove the locknut.



Tie-rod end

Caution
- **The sharp edges of the SST can slice the tie-rod end dust boot. Install the SST so that the sharp edges are between the dust boot and tie-rod end.**

1. Remove the tie-rod end nut.
2. Disconnect the tie-rod end by using the **SST**.

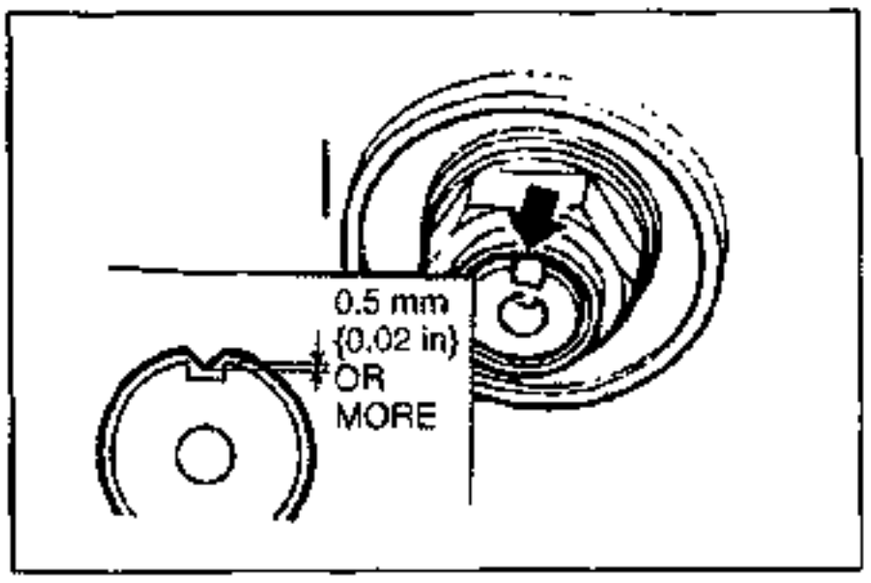


Installation Note
Tie-rod end

1. Position the tie-rod end and dust boot directly over the knuckle hole.
2. Install the nut to the tie-rod end and tighten.

Tightening torque:
43–56 N·m {4.3–5.8 kgf·m, 32–41 ft·lbf}

3. Install a new cotter pin.

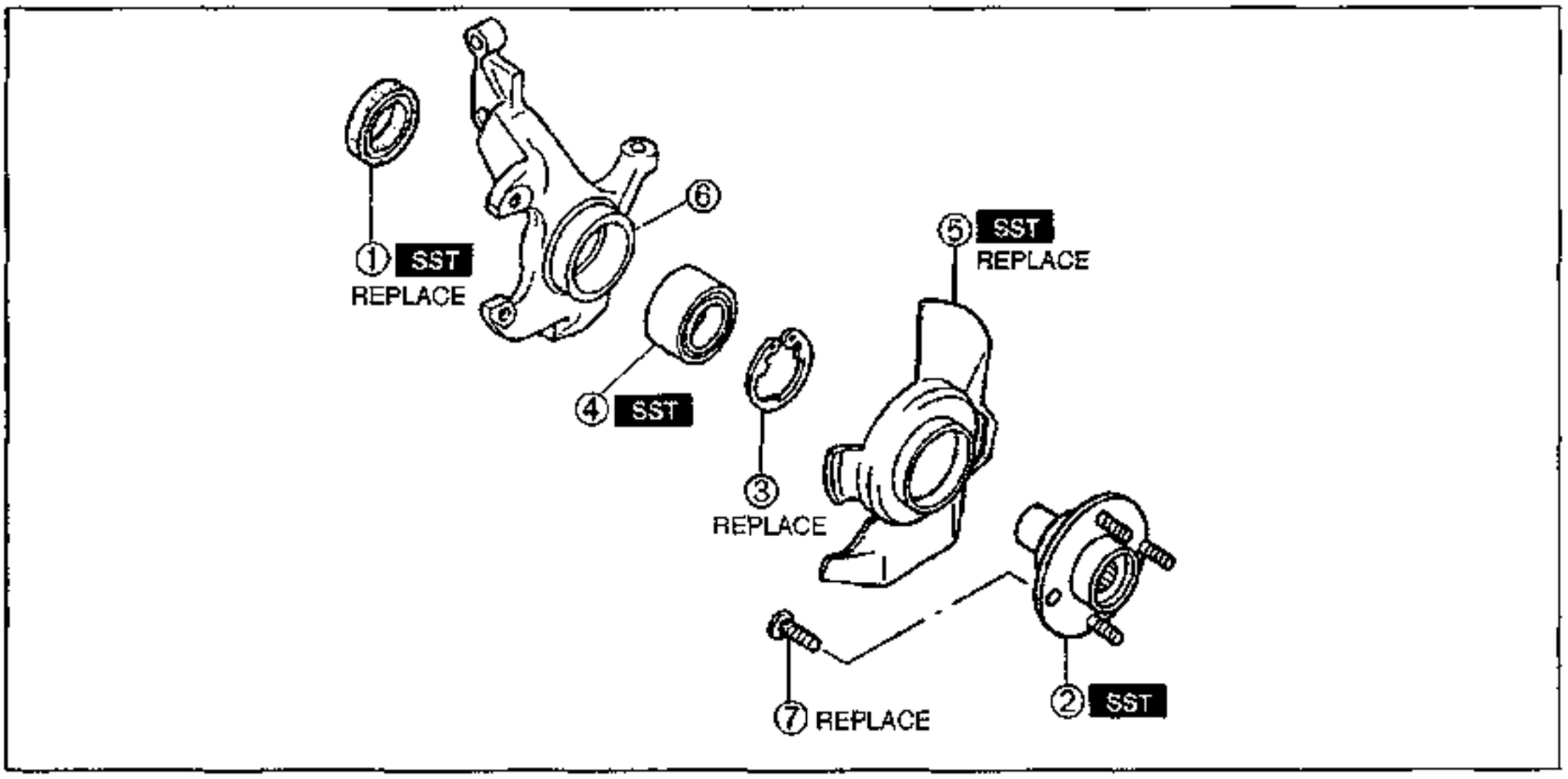


Locknut
Install a new locknut and stake it, as shown.

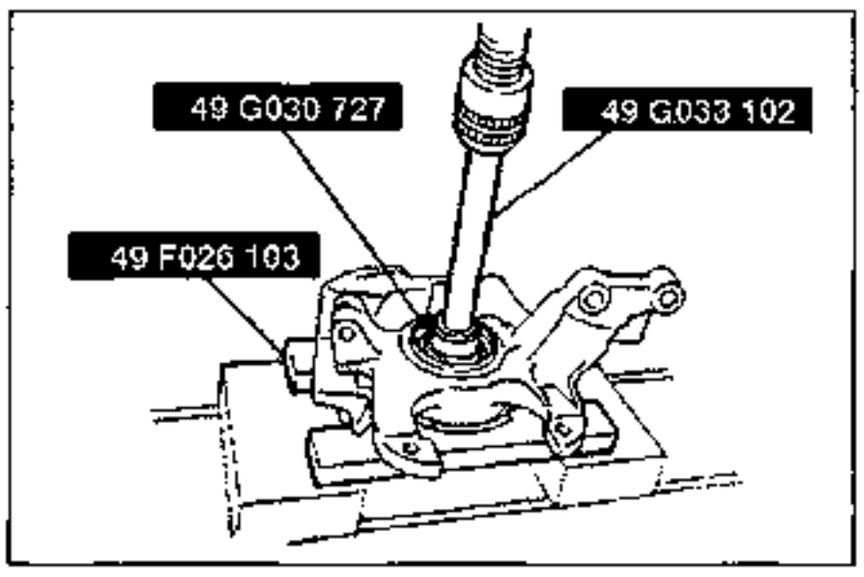
Tightening torque:
236–318 N·m {24.0–32.5 kgf·m, 174–235 ft·lbf}

Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note.**
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note.**



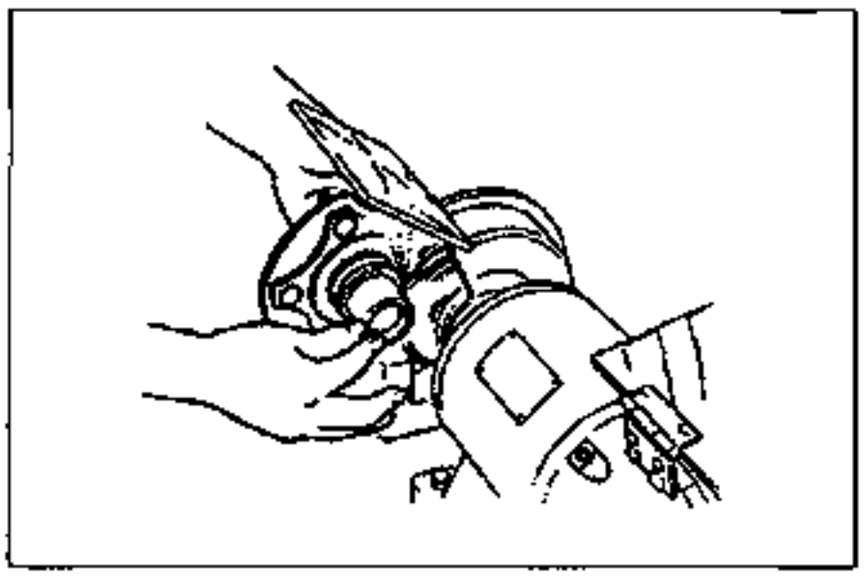
1. Oil seal
   Assembly Note ..... page M–10
2. Front wheel hub assembly
   Disassembly Note ..... below
   Assembly Note ..... page M–10
3. Retaining ring
4. Wheel bearing
   Disassembly Note ..... page M– 9
   Assembly Note ..... page M–10
5. Dust cover
   Disassembly Note ..... page M– 9
   Assembly Note ..... page M–10
6. Knuckle
7. Hub bolt
   Disassembly Note ..... page M– 9
   Assembly Note ..... page M– 9



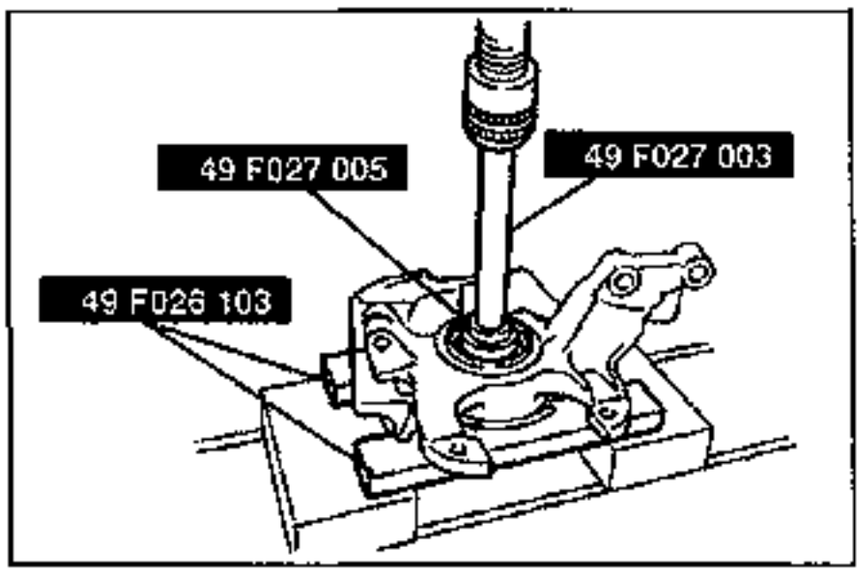
Disassembly Note

Front wheel hub assembly

1. Remove the front wheel hub assembly by using the **SSTs.**

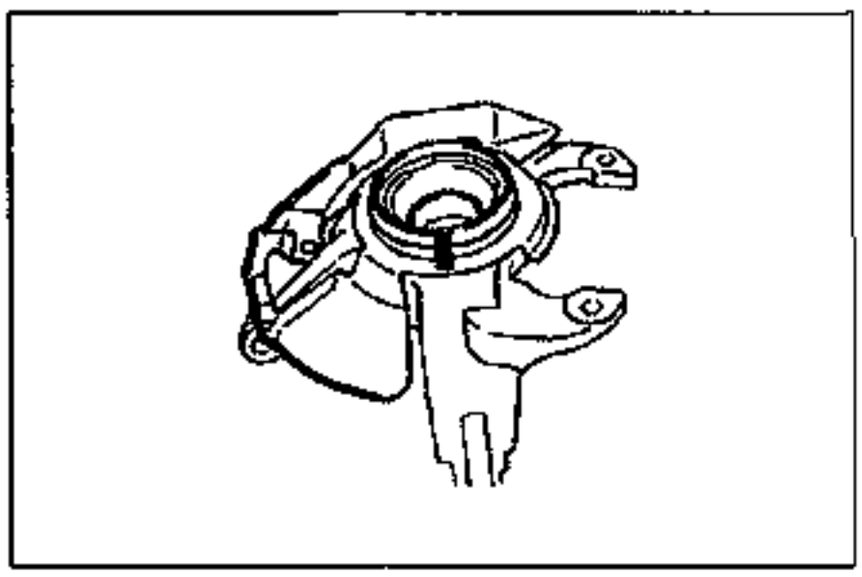


2. If the bearing inner race remains on the front wheel hub assembly, grind a section of the bearing inner race until approx. **0.5 mm {0.020 in}** remains. Then remove it with a chisel.



Wheel bearing

Using the **SSTs**, remove the wheel bearing.

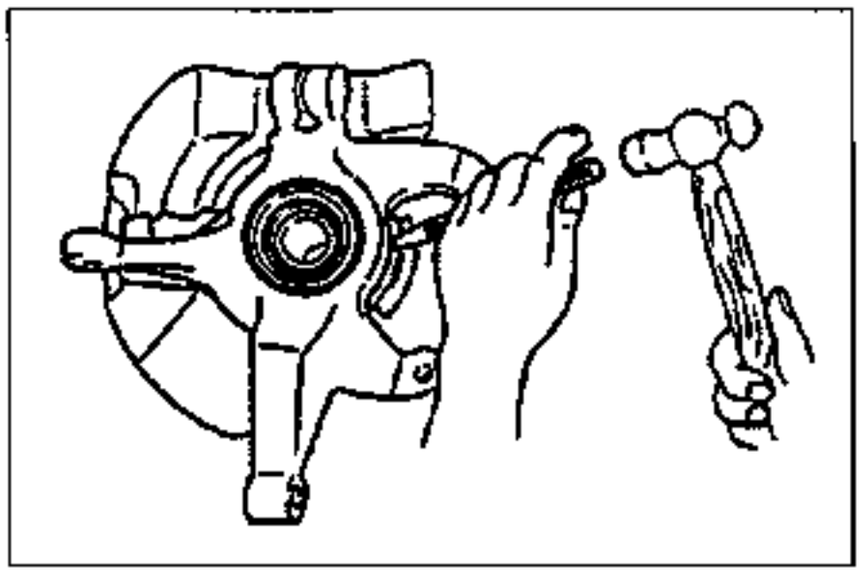


Dust cover

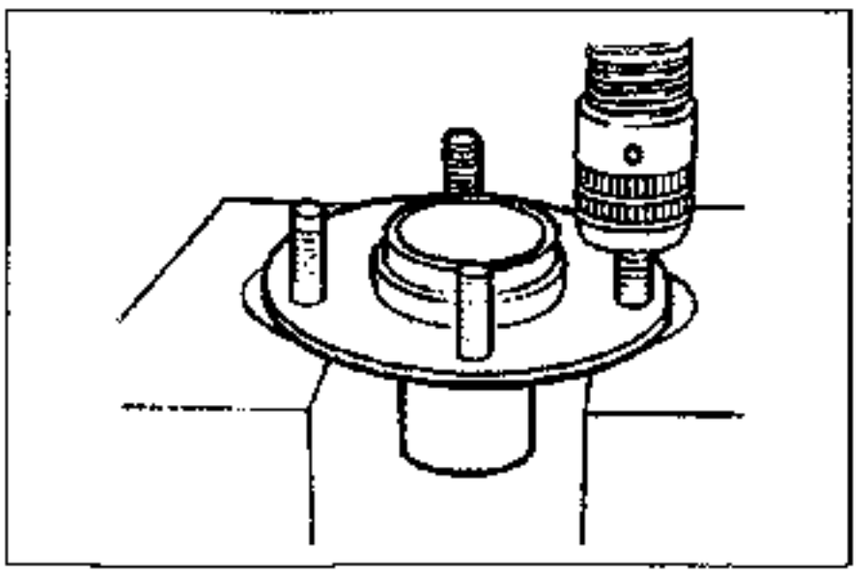
Note

- The dust cover does not need to be removed unless you are replacing it.

1. Mark the dust cover and knuckle for proper reassembly.



2. Remove the dust cover with a chisel.

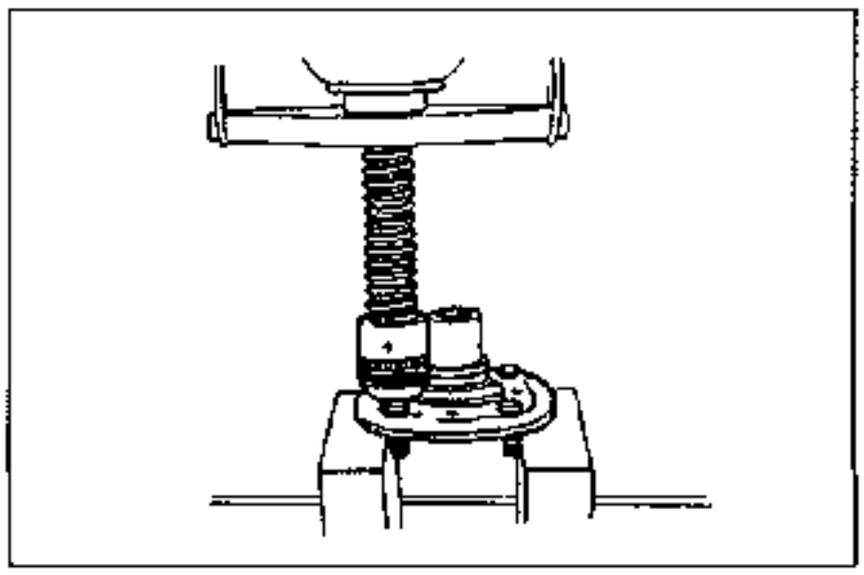


Hub bolt

Note

- The hub bolts do not need to be removed unless you are replacing them.

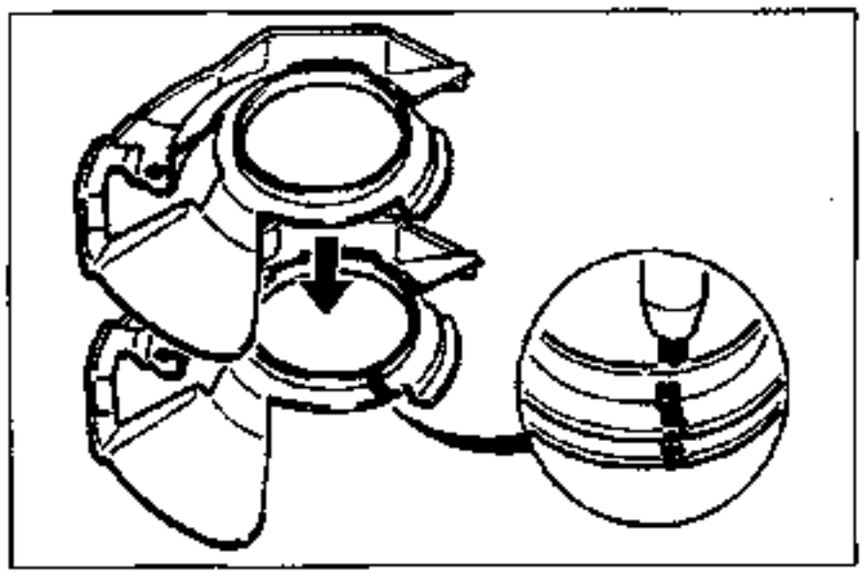
Remove the hub bolts with a press.



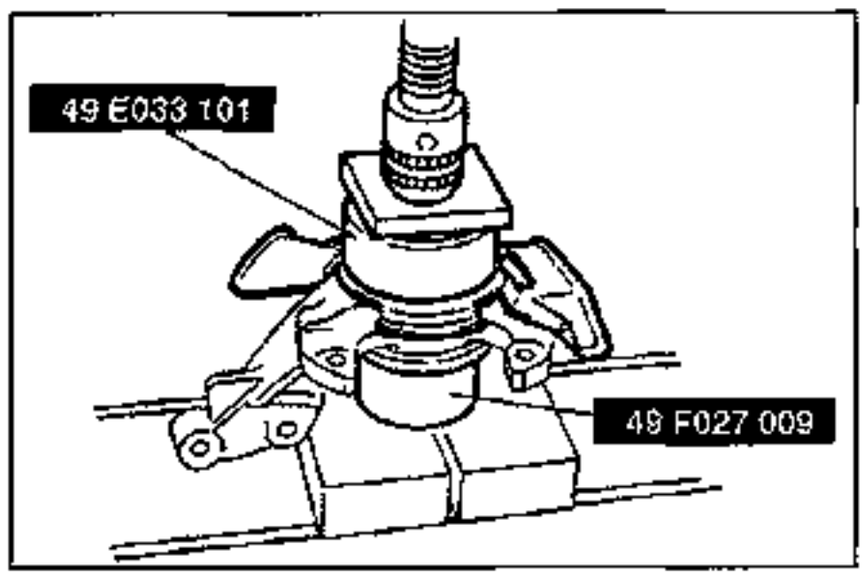
Assembly Note

Hub bolt

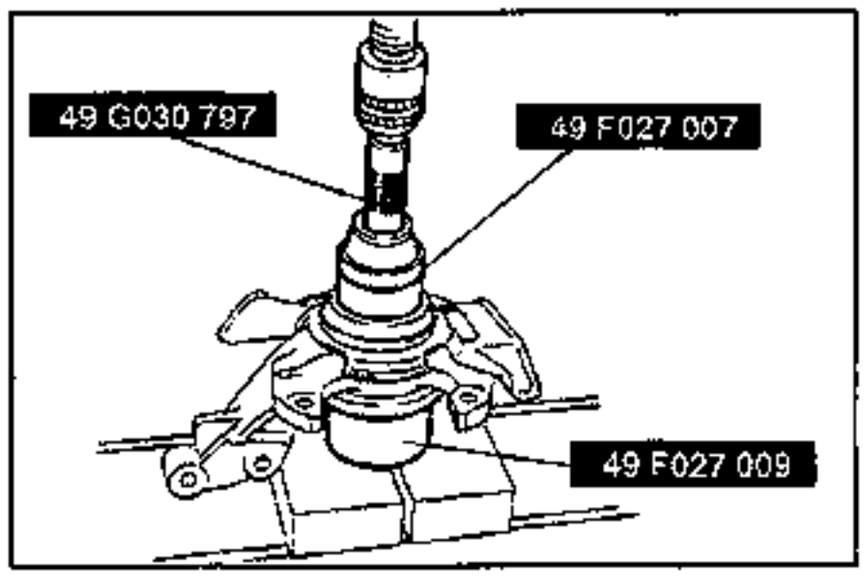
Press in new hub bolts.



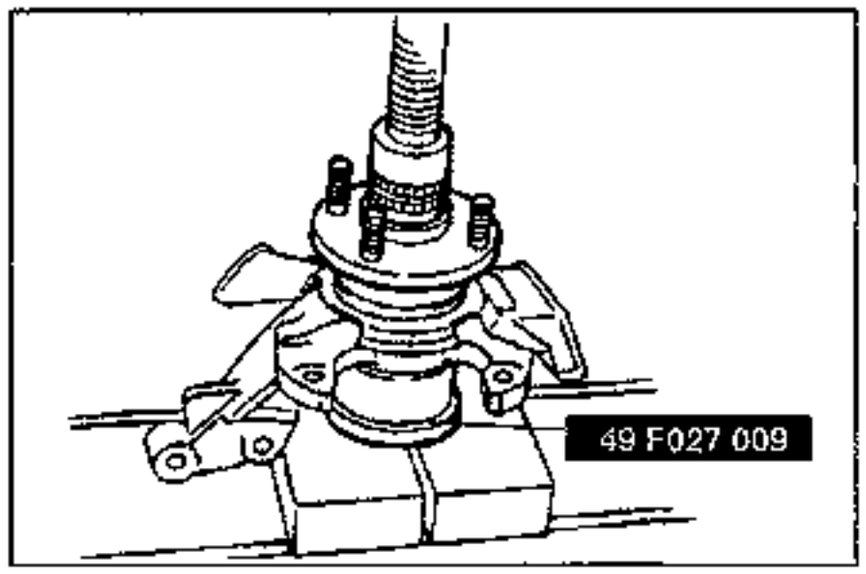
Dust cover
1. Mark the new dust cover as the one removed.



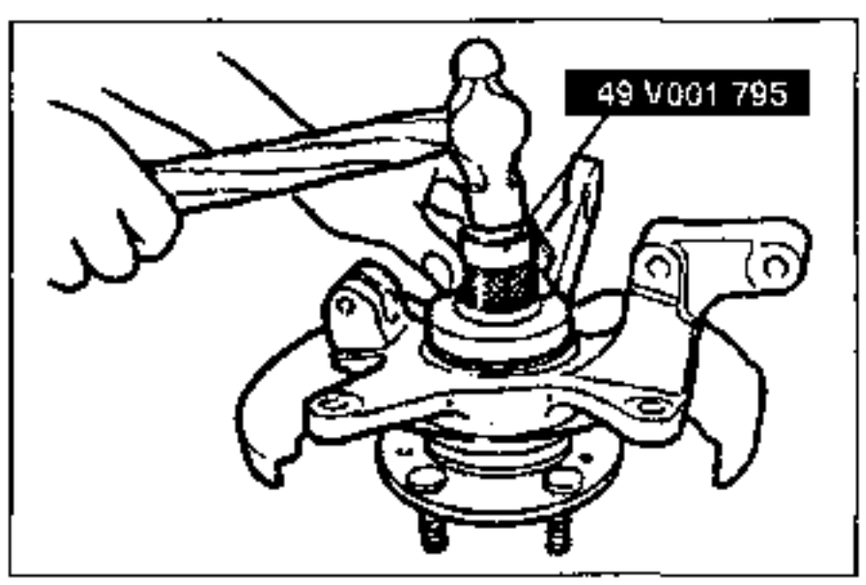
2. Align the marks of the new dust cover and the knuckle.
3. Using the **SSTs**, install the new dust cover.



Wheel bearing
Using the **SSTs**, install the new wheel bearing.



Front wheel hub assembly
Using the **SSTs**, install the front wheel hub assembly.

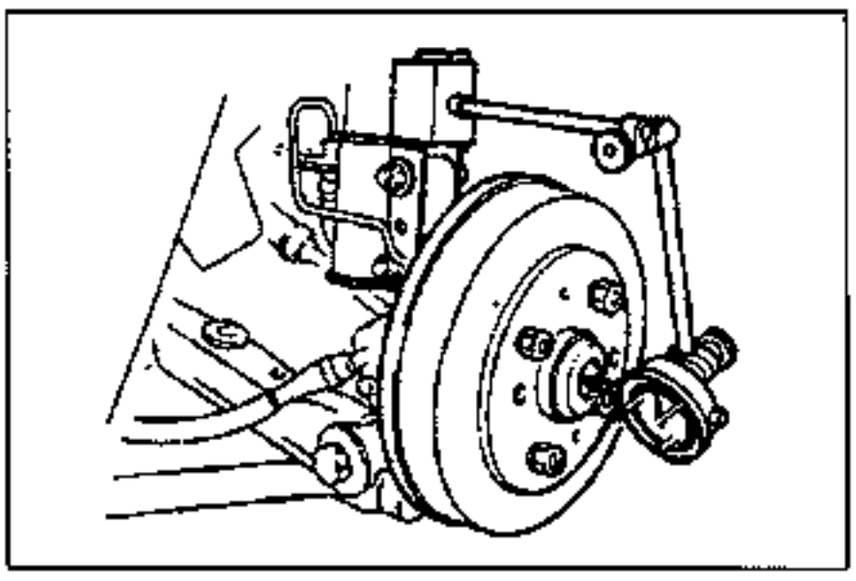


Oil seal
1. Using the **SST** and a hammer, tap a new oil seal in evenly until the **SST** contacts the steering knuckle.
2. Coat the lip of the oil seal with grease.

REAR AXLE

PREPARATION
SST

49 0259 770B Wrench, flare nut		For removal and installation of brake pipe	49 M005 796 Body		For installation of ABS sensor rotor



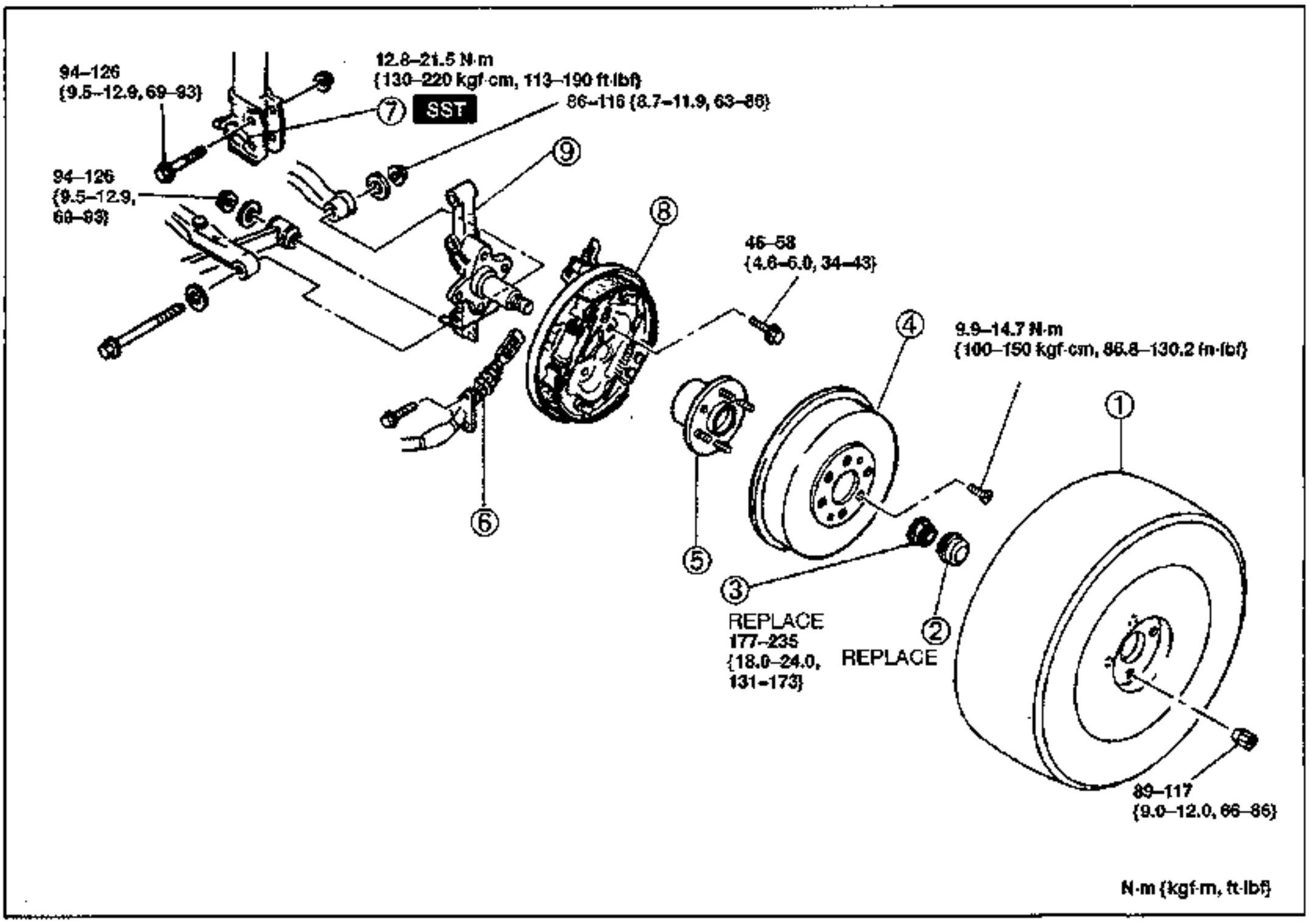
DRUM BRAKE TYPE
Preinspection
Wheel bearing play

1. Remove the wheel and tire.
2. Position a dial indicator against the brake drum. Push and pull the rear brake assembly by hand in the axial direction and measure the wheel bearing play.
3. If the bearing play exceeds specification, check and adjust the locknut torque or replace the hub bearing assembly if necessary.

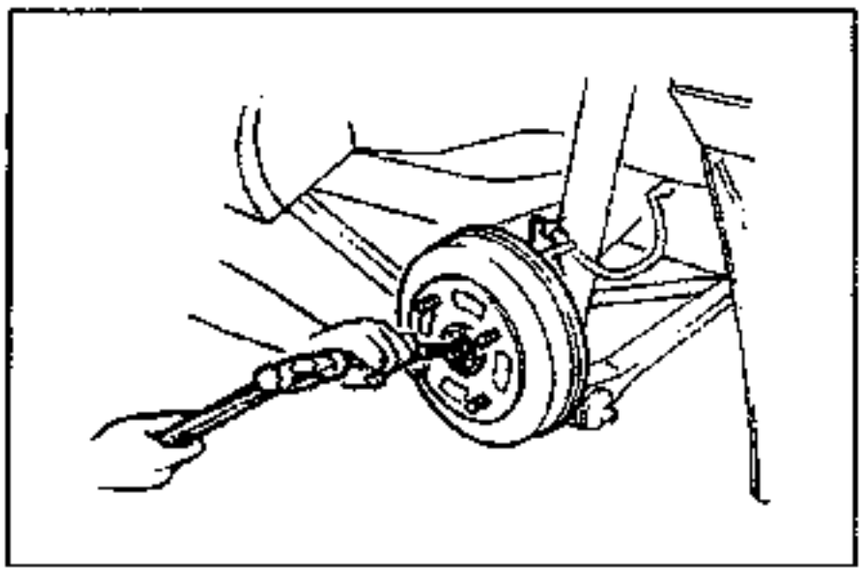
Maximum wheel bearing play: 0.05 mm {0.002 in}

Removal / Inspection / Installation

1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note.**
4. After installation, bleed the brake system, adjust the parking brake lever stroke (Refer to Section P.) and check the rear wheel alignment. (Refer to Section R.)



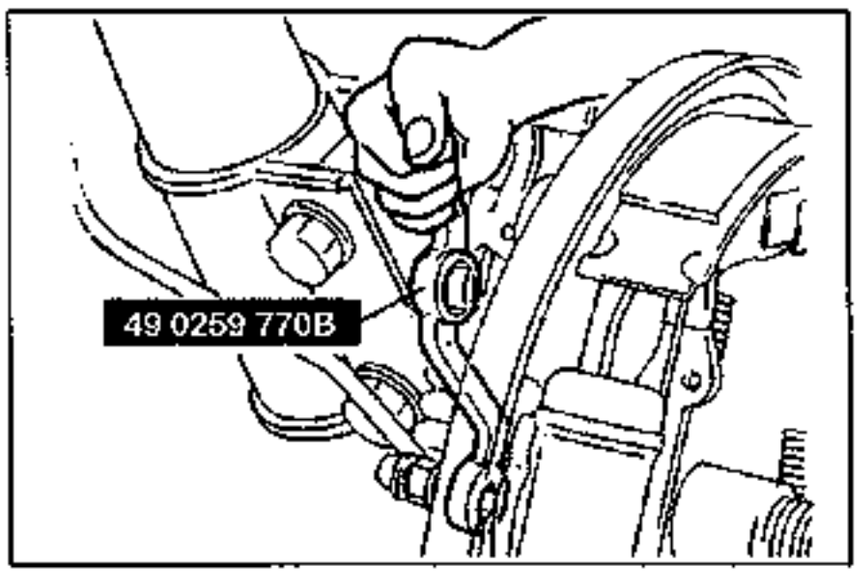
1. Wheel and tire
2. Hub cap
3. Locknut
   Removal Note ..... below
   Installation Note ..... page M–13
4. Brake drum
5. Hub bearing assembly
   Inspect for cracks and damage
   Disassembly / Assembly ..... page M–13
6. Parking brake cable
   Service ..... Section P
7. Brake pipe
   Removal Note ..... page M–13
   Installation Note ..... page M–13
8. Rear brake assembly
   Service ..... Section P
9. Rear hub spindle
   Inspect for cracks and damage



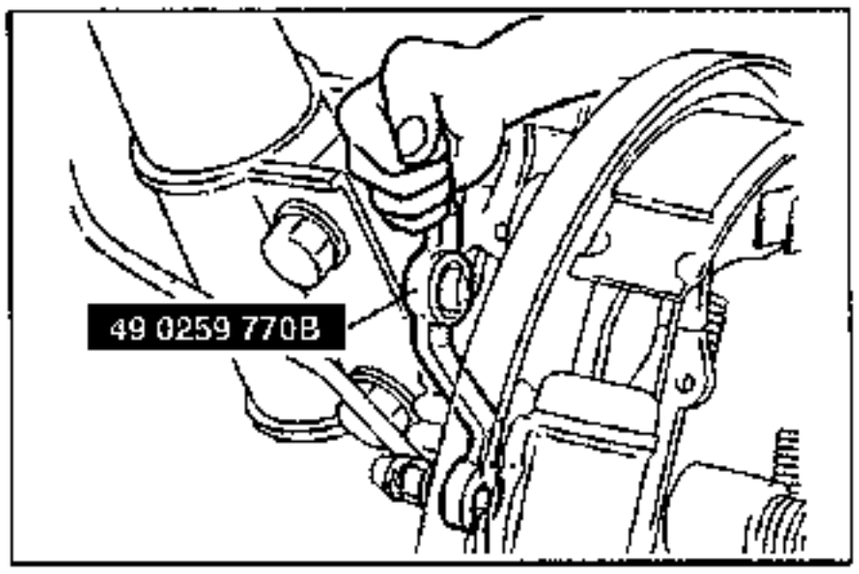
Removal Note

Locknut

1. Raise the staked portion of the locknut using a small cape chisel.
2. Lock the hub by applying the brakes.
3. Remove the locknut.

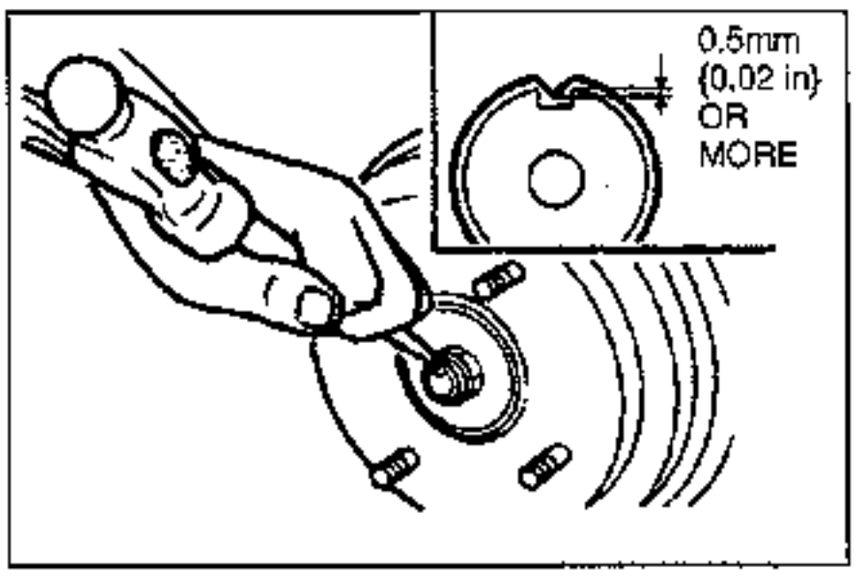


Brake pipe
1. Using the **SST**, disconnect the brake pipe.
2. Plug the brake pipe to avoid fluid leakage.



Installation Note
Brake pipe
Using the **SST**, tighten the brake pipe.

Tightening torque:
12.8–21.5 N·m {130–220 kgf·cm, 113–190 in·lbf}

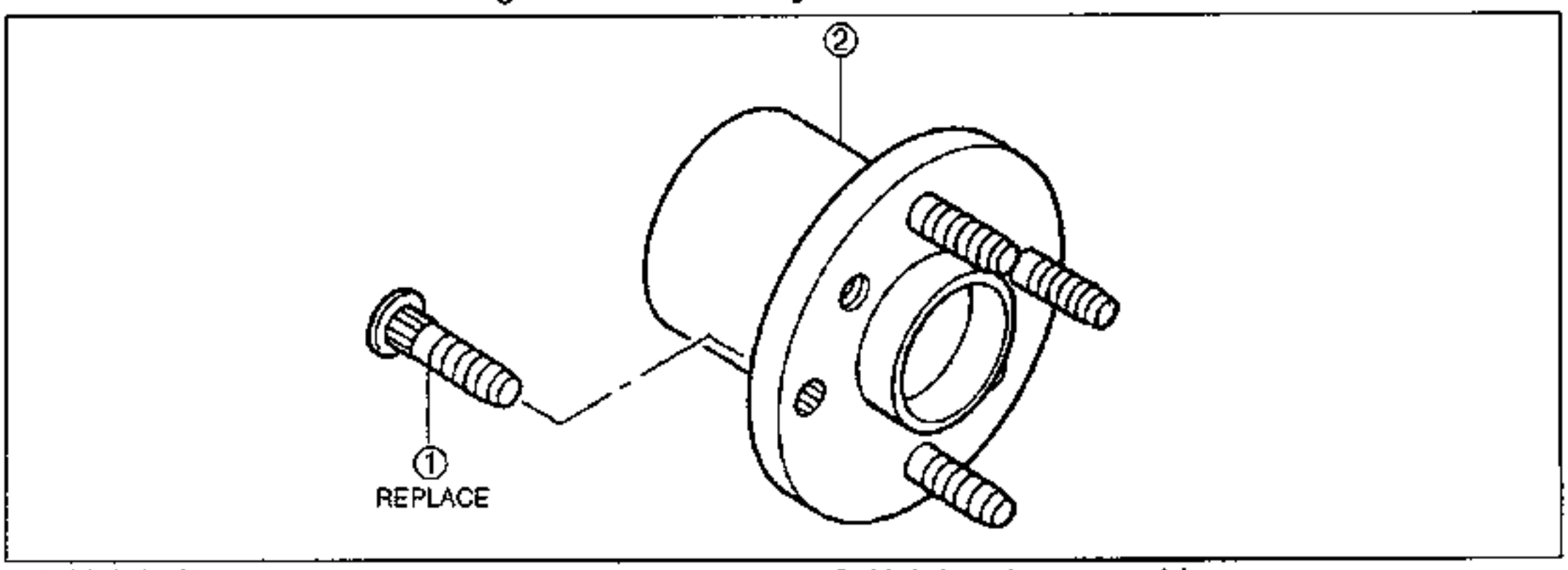


Locknut
Install a new locknut and stake it, as shown.

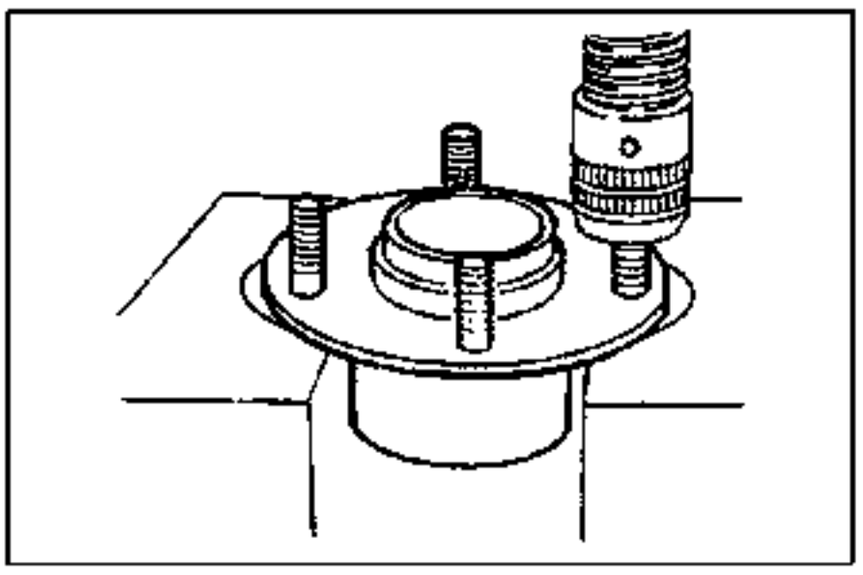
Tightening torque:
177–235 N·m {18.0–24.0 kgf·m, 131–173 ft·lbf}

Disassembly / Assembly
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Assemble in the reverse order of disassembly, referring to **Assembly Note**.

Caution
- **The wheel hub and bearing are one assembly and do not need to be disassembled.**



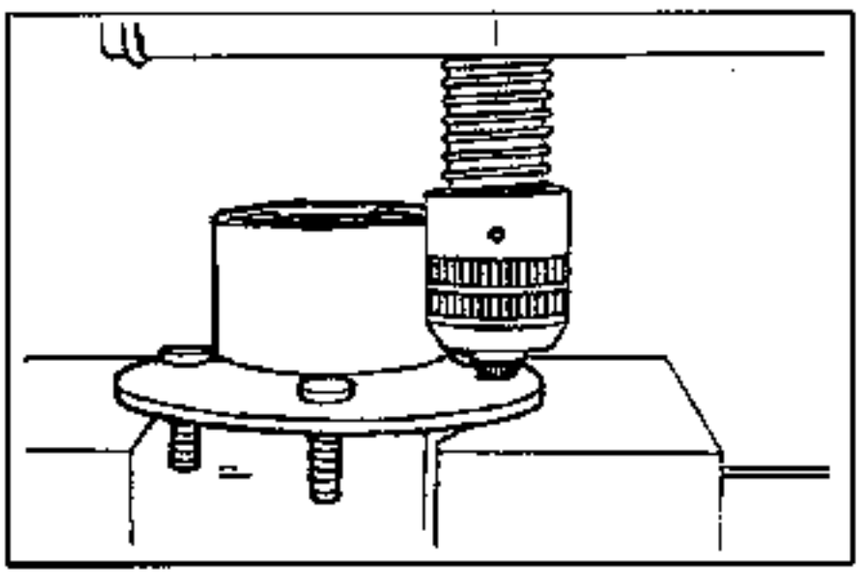
1. Hub bolt
   Disassembly Note ..... page M–14
   Assembly Note ..... page M–14
2. Hub bearing assembly



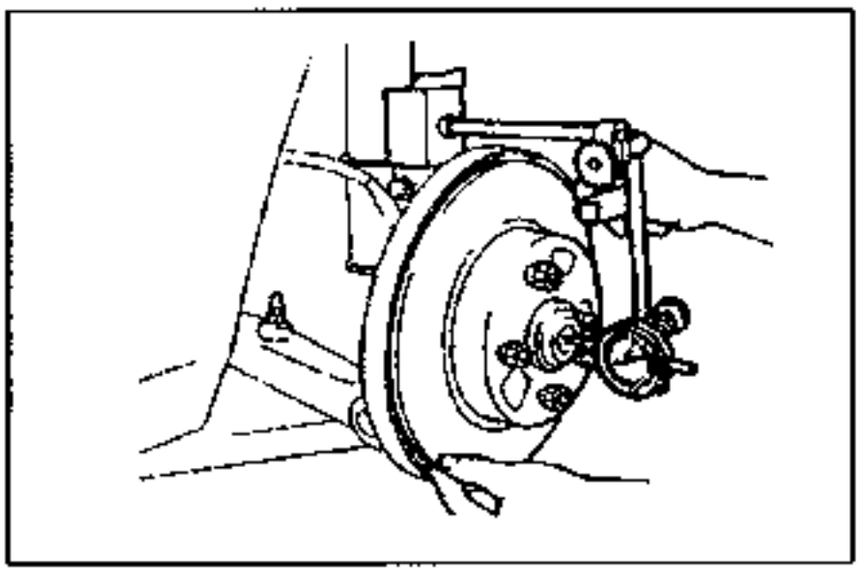
Disassembly Note
Hub bolt

Note
- The hub bolts do not need to be removed unless you are replacing them.

Remove the hub bolts with a press.

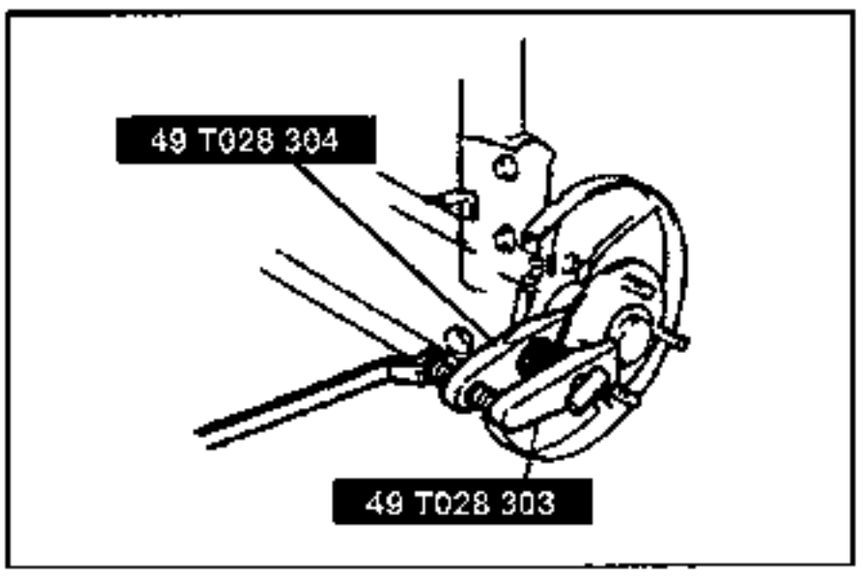


Assembly Note
Hub bolt
Press in new hub bolts.

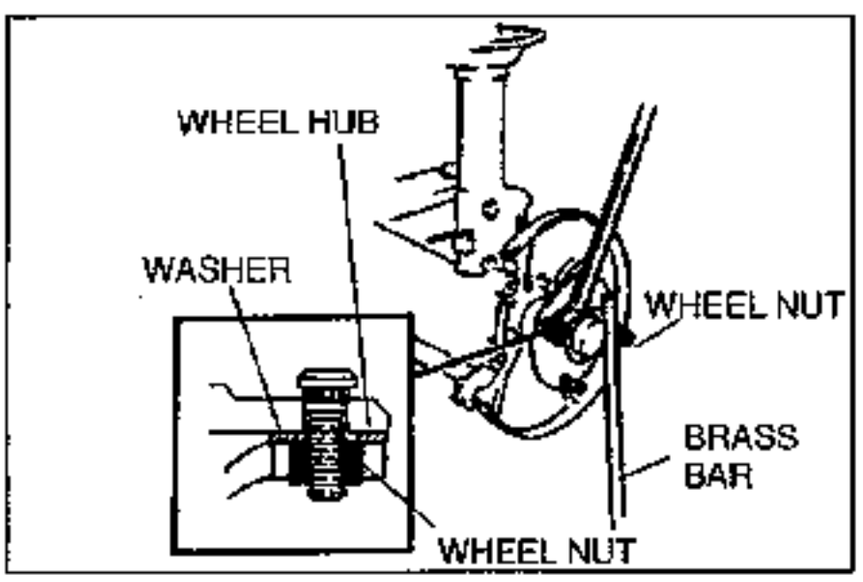


DISC BRAKE TYPE
Preinspection
Wheel bearing play
1. Remove the wheel and tire.
2. Remove the brake caliper assembly.
3. Position a dial indicator against the wheel hub. Push and pull the wheel hub by hand in the axial direction and measure the wheel bearing play.
4. If the bearing play exceeds specification, check and adjust the locknut torque or replace the hub bearing assembly if necessary.

Maximum wheel bearing play: 0.05 mm {0.002 in}



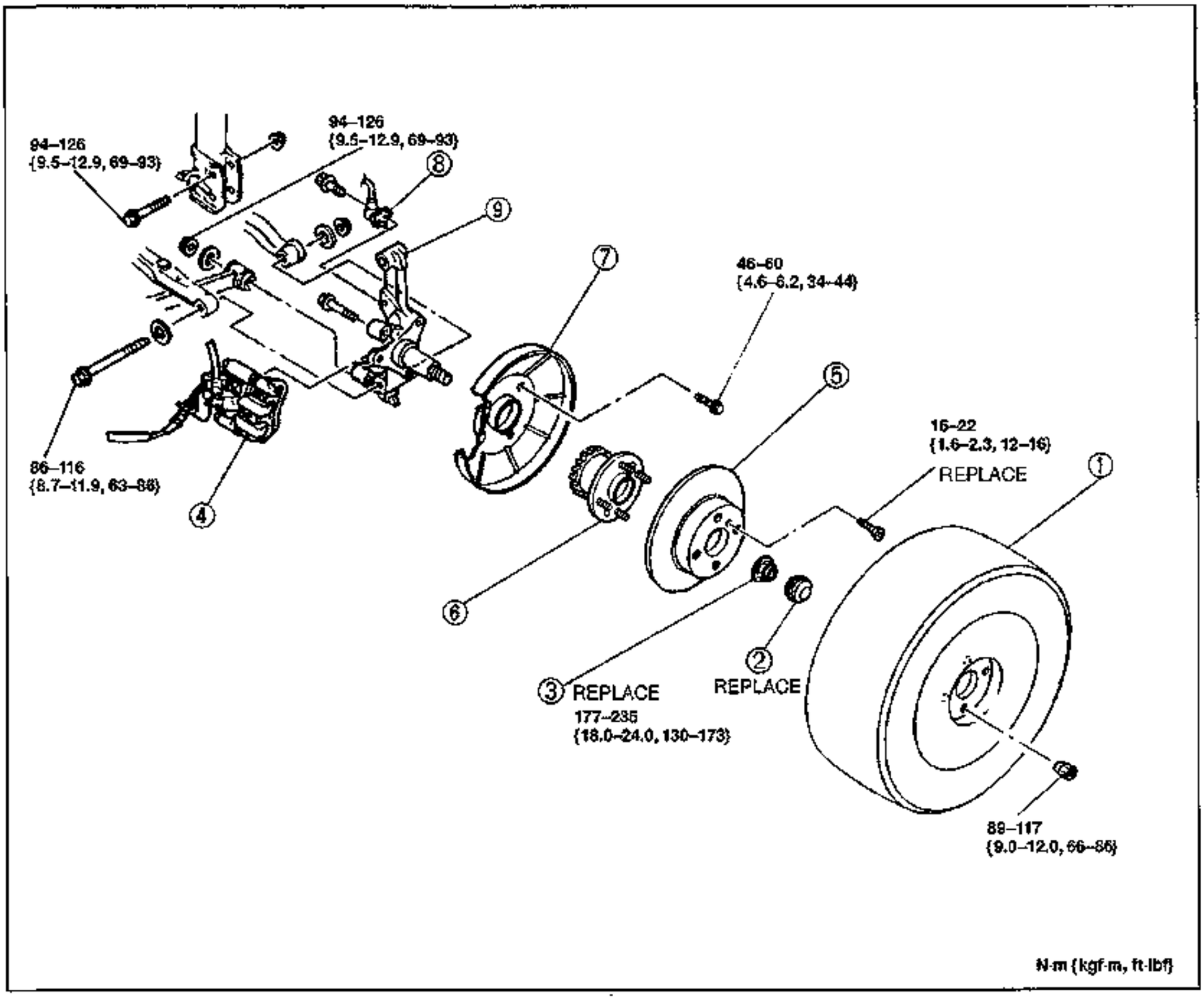
On vehicle service
Replacement
Wheel hub bolt replacement
1. Remove the wheel hub bolt by using the **SSTs.**



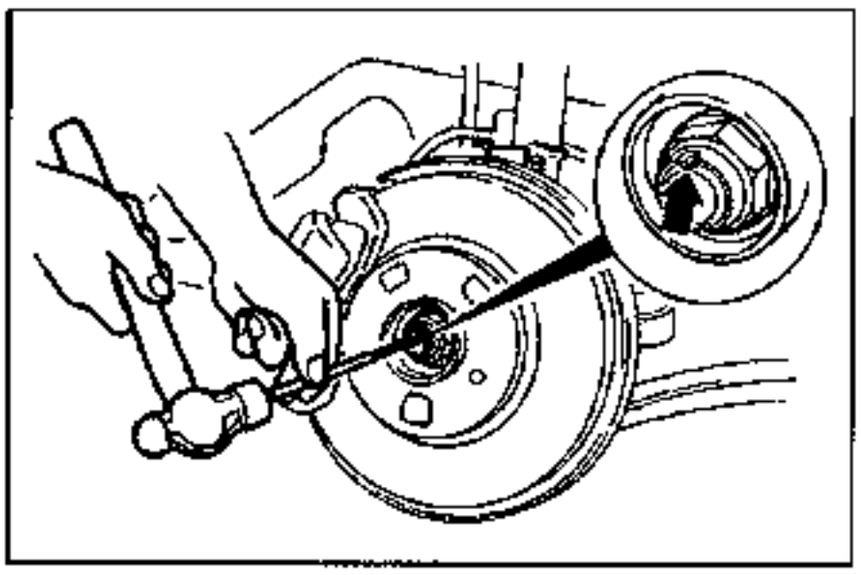
2. As shown in the figure, install the wheel hub bolt into the wheel hub and set a washer and wheel hub nut in the wheel hub bolt.
3. Tighten the wheel hub nut while holding the wheel hub by using the brass bar.

Removal / Inspection / Installation

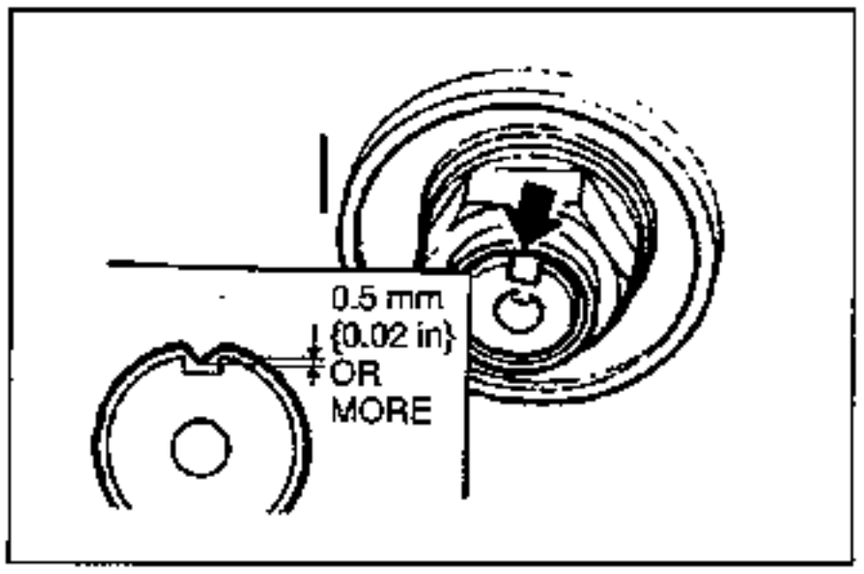
1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note.**
4. After installation, check the rear wheel alignment. (Refer to Section R.)



1. Wheel and tire
2. Hub cap
3. Locknut
   - Removal Note ..... page M–16
   - Installation Note ..... page M–16
4. Brake caliper assembly
   - Service ..... Section P
5. Disc plate
   - Inspection ..... Section P
6. Hub bearing assembly
   - Inspect for cracks and damage.
   - Disassembly / Assembly ..... page M–16
7. Dust cover
8. ABS wheel-speed sensor
9. Rear hub spindle
   - Inspect for cracks and damage



Removal Note
Locknut
1. Knock the crimped portion of the locknut outward by using a small chisel and a hammer.
2. Lock the hub by applying the brakes.
3. Remove the locknut.

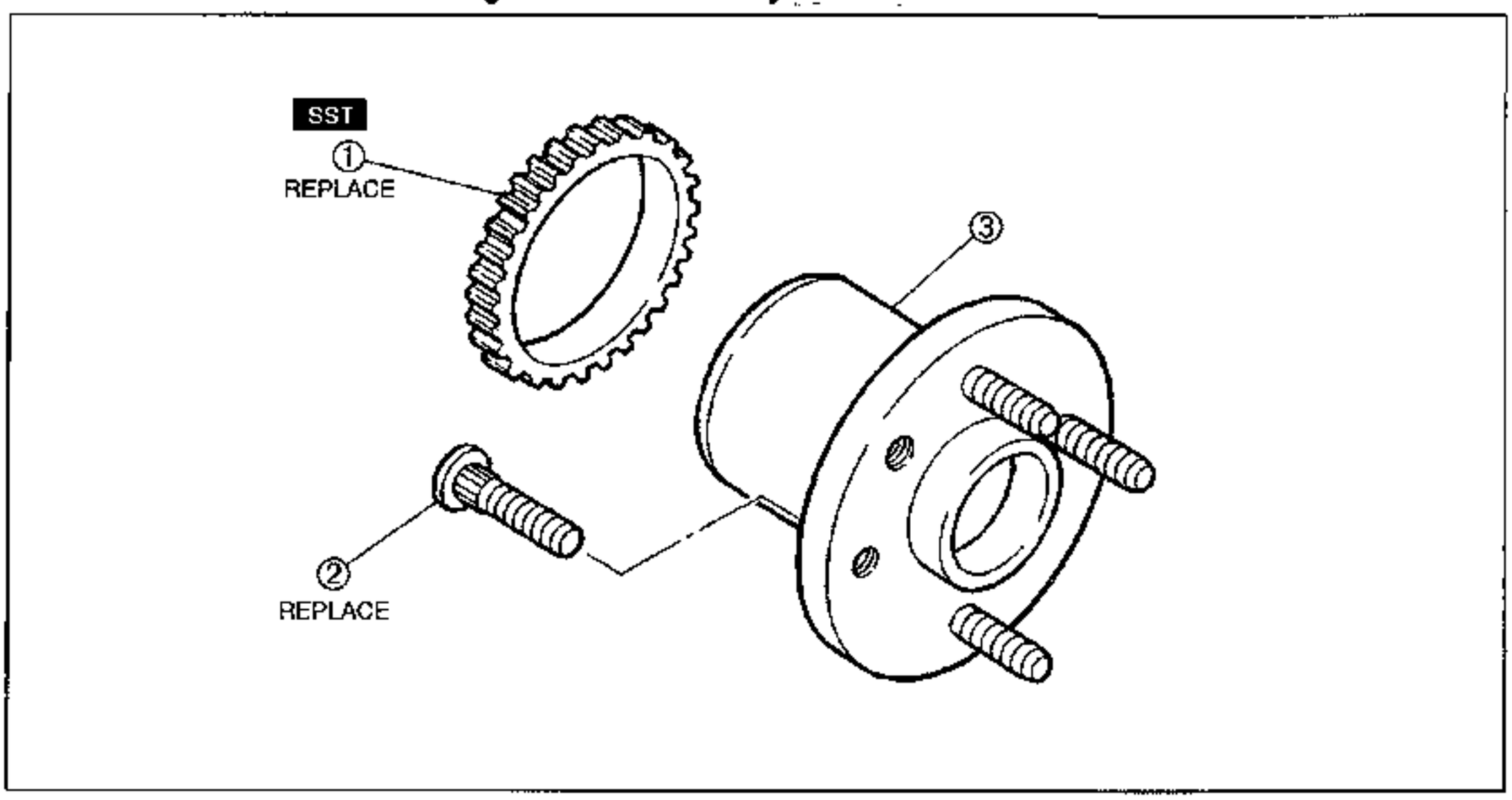


Installation Note
Locknut
Install a new locknut and stake it, as shown.

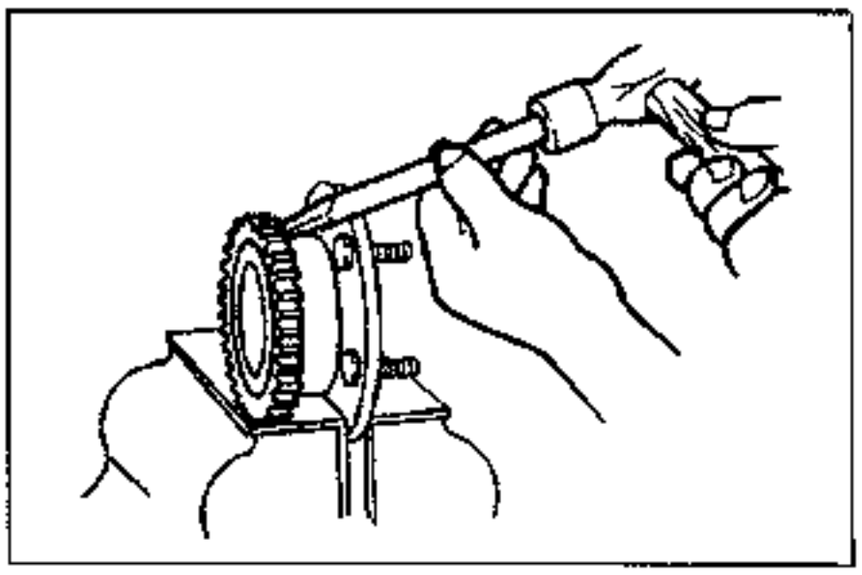
Tightening torque:
177–235 N·m {18.0–24.0 kgf·m, 130–173 ft·lbf}

Disassembly / Assembly
1. Disassemble in the order shown in the figure, referring to **Disassembly Note.**
2. Assemble in the reverse order of disassembly, referring to **Assembly Note.**

Caution
- **The wheel hub and bearing are one assembly and do not need to be disassembled.**



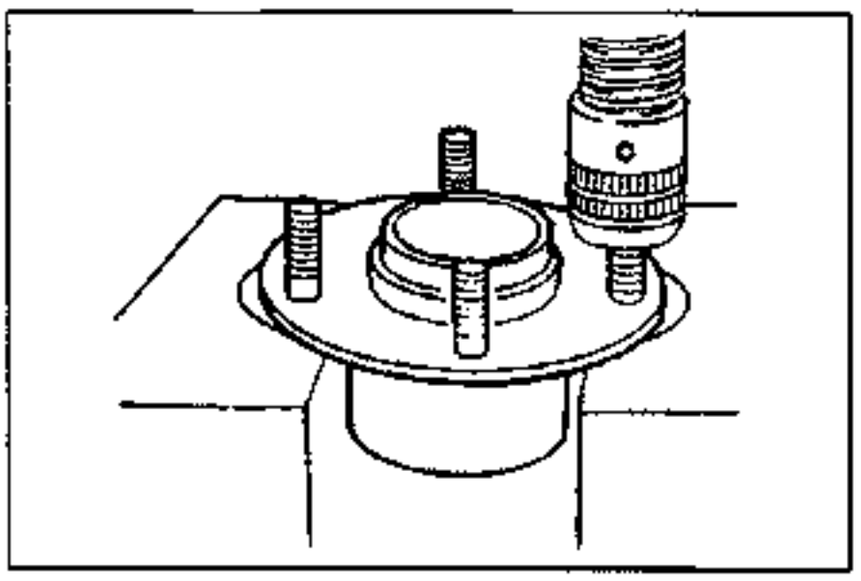
1. ABS sensor rotor
   Disassembly Note ..... page M–17
   Assembly Note ..... page M–17
2. Hub bolt
   Disassembly Note ..... page M–17
   Assembly Note ..... page M–17
3. Hub bearing assembly



Disassembly Note
ABS sensor rotor

Note
- The ABS sensor rotor does not have to be removed unless you are replacing it.

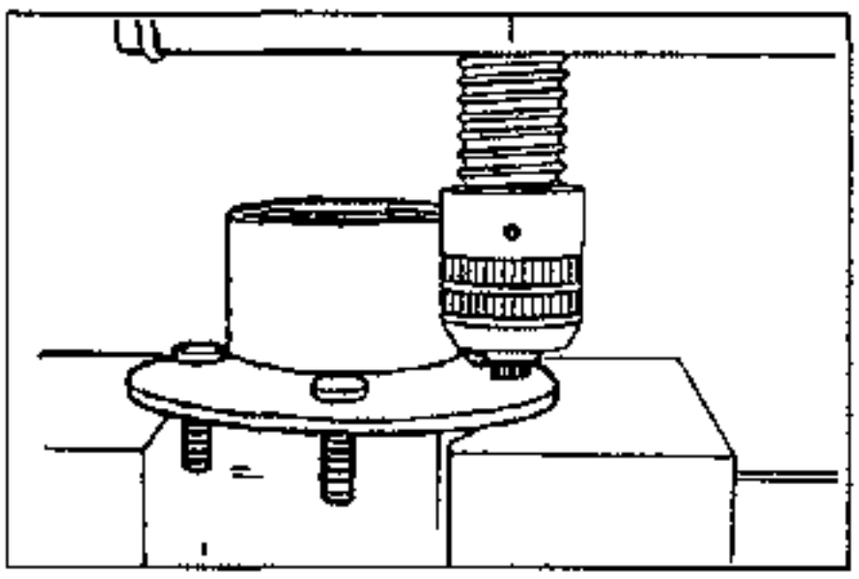
Remove the ABS sensor rotor with a chisel.



Hub bolt

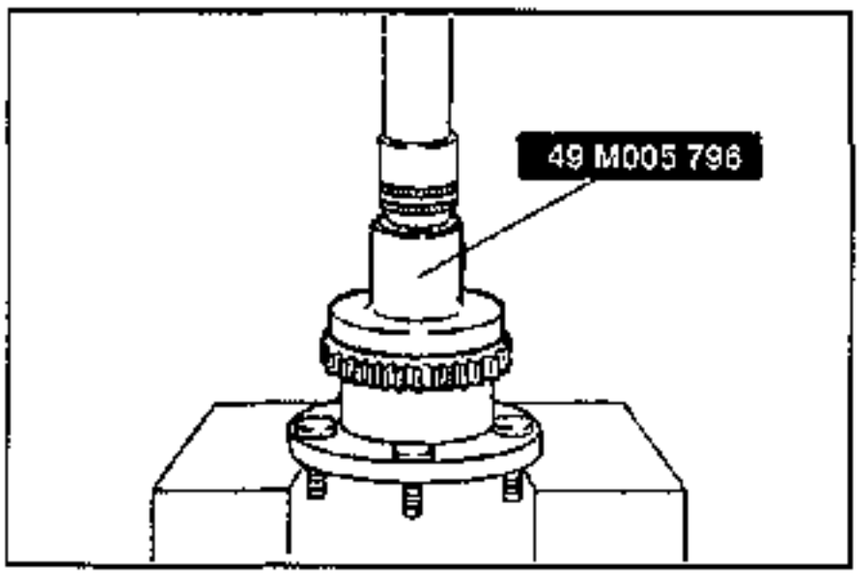
Note
- The wheel hub and bearing are one assembly and do not to be disassembled.

Remove the hub bolts with a press.



Assembly Note
Hub bolt

Press in new hub bolts.



ABS sensor rotor

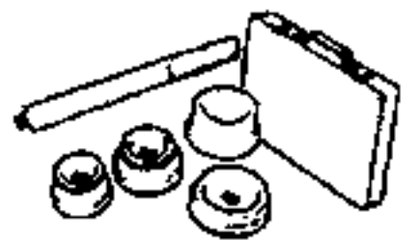
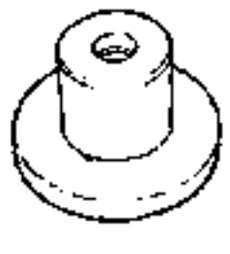
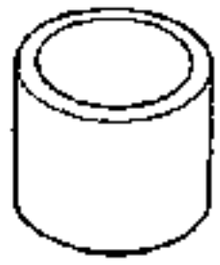
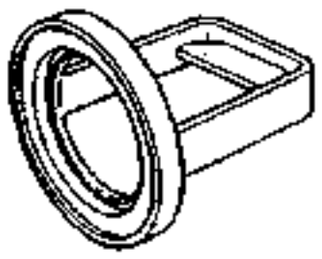
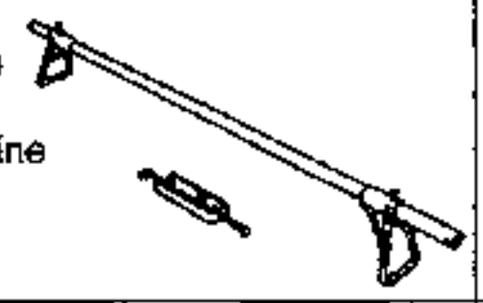
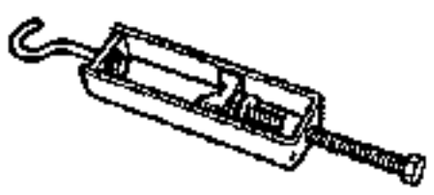
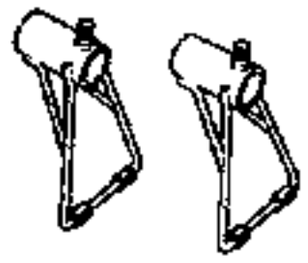
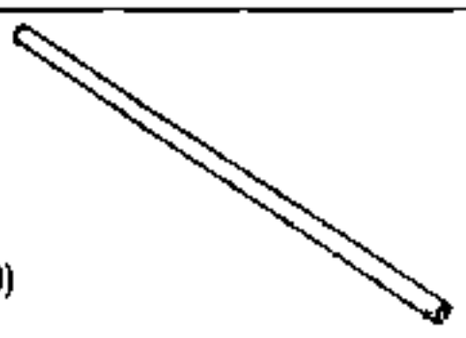
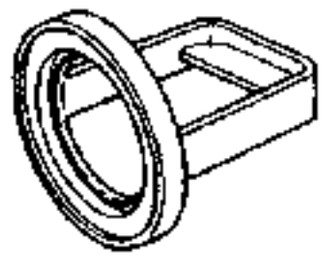
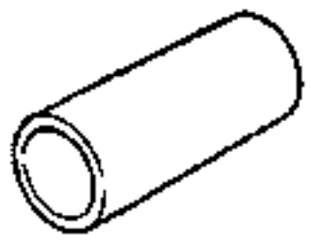
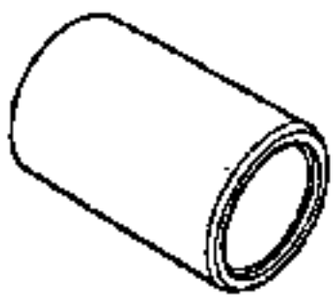
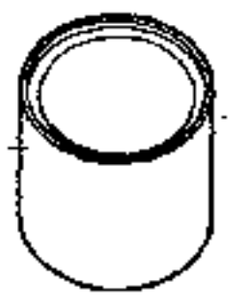
1. Install a new rear ABS sensor rotor on to the wheel hub.
2. Using a steel plate and the **SST**, press the ABS sensor rotor until it is flush with the wheel hub.

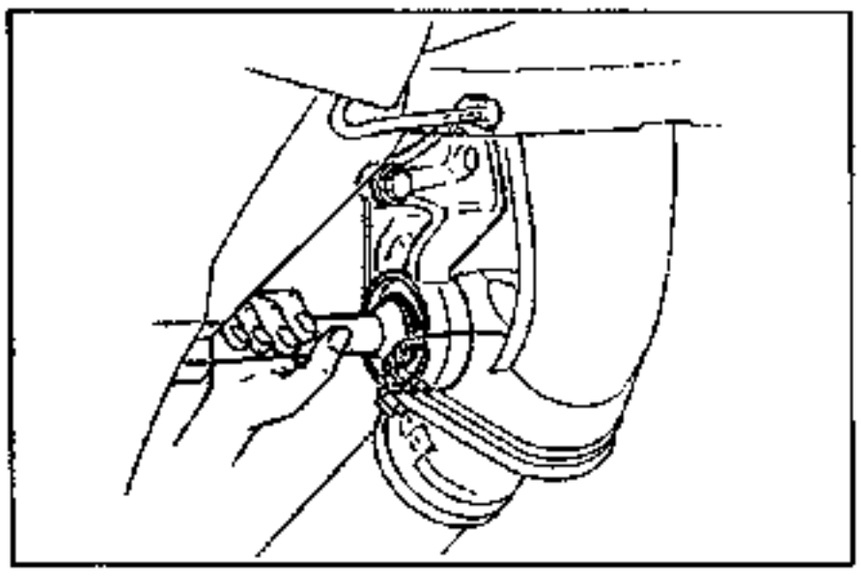
Note
- The ABS sensor rotor can be installed in either direction.

DRIVE SHAFT

PREPARATION
SST

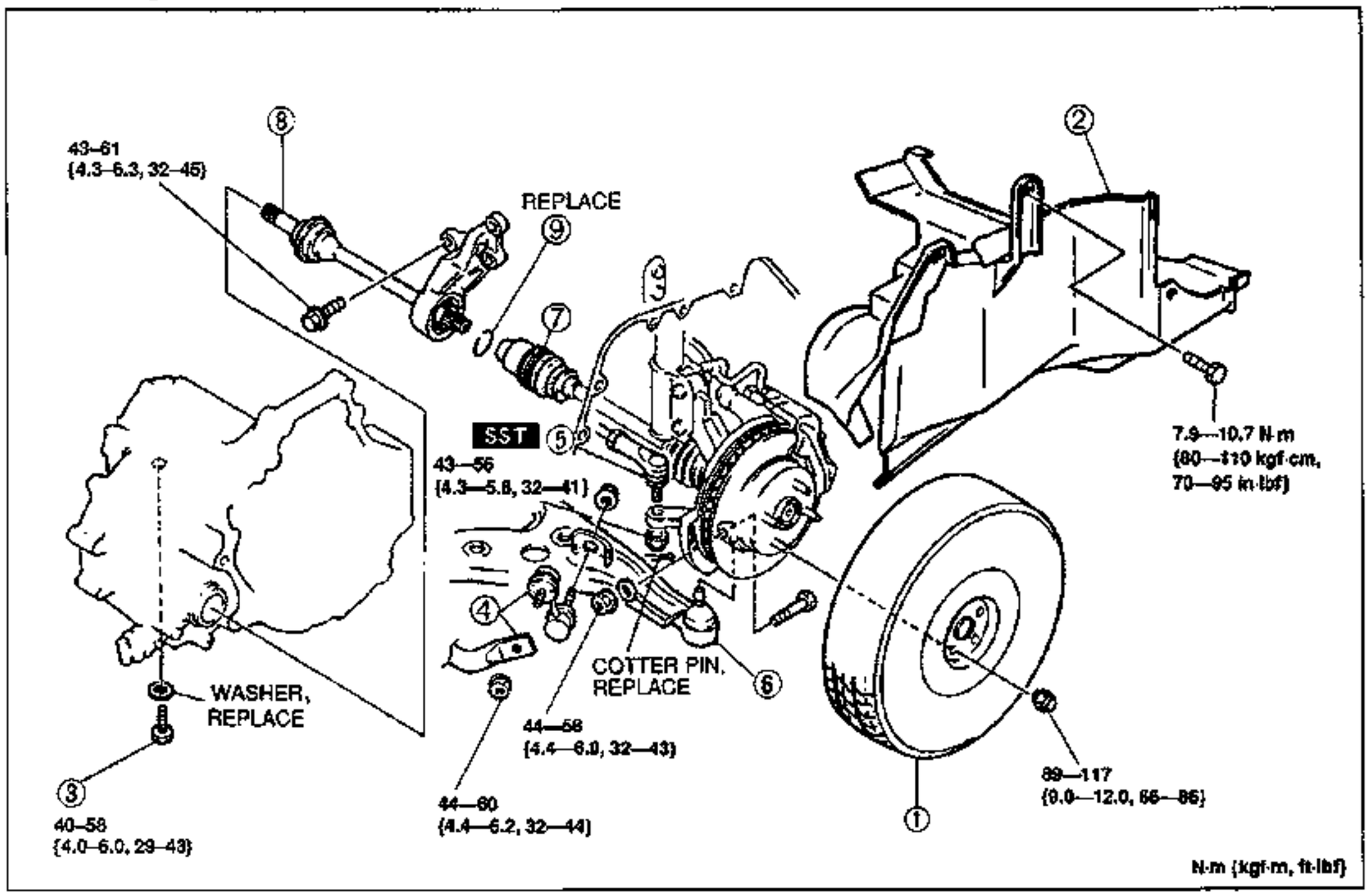
49 H034 2A0 Lower arm bushing puller & installer		For support of bracket	49 H034 201 Support block (Part of 49 H034 2A0)		For support of bracket

49 T028 3A0 Puller set, ball joint 	For removal of tie rod end	49 F027 0A1 Installer set, bearing 	For installation of bearing
49 F027 005 Attachment 62 (Part of 49 F027 0A1) 	For installation of bearing	49 G030 797 Handle (Part of 49 G030 795) 	For installation of right side dust seal and bearing
49 F026 102 Installer, bearing 	For removal of bearing and left side dust seal	49 W027 003 Installer, oil seal 	For installation of left side dust seal
49 G025 001 Installer, ABS sensor rotor 	For installation of ABS sensor rotor (K8 DOHC)	49 G017 5A0 Support, engine 	For support of engine
49 G017 503 Hook (Part of 49 G017 5A0) 	For support of engine	49 G017 502 Support (Part of 49 G017 5A0) 	For support of engine
49 G017 501 Bar (Part of 49 G017 5A0) 	For support of engine	49 B025 003 Installer, ABS sensor rotor 	For installation of ABS sensor rotor (B6 DOHC)
49 H027 002 Remover, bearing 	For removal of dust cover	49 B025 005 Installer, dust cover 	For installation of dust cover (K8 DOHC)
49 S120 785 Installer, dust boot 	For installation of dust boot (K8 DOHC)	49 B025 004 Installer, dust seal 	For installation of dust seal (B6 DOHC)

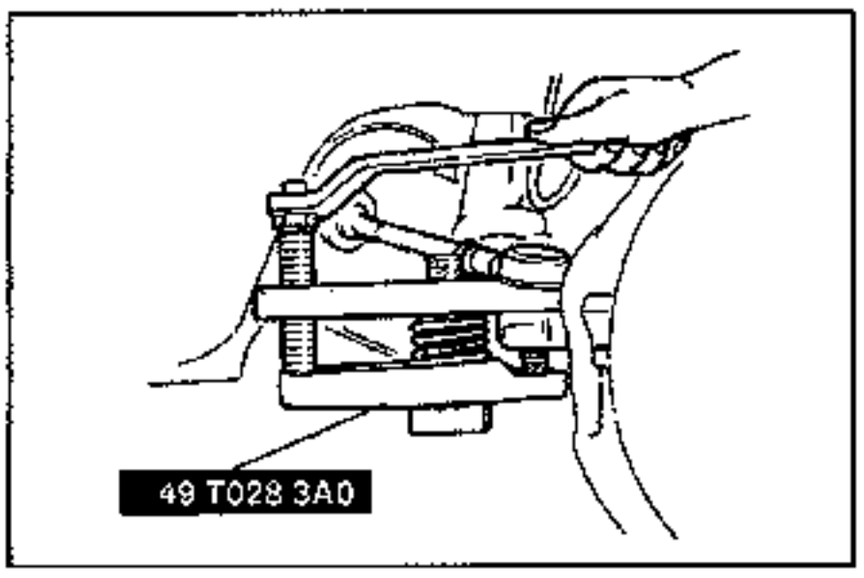


JOINT SHAFT
Preinspection
Joint shaft
1. Verify that the joint shaft is not twisted or cracked. Replace it if necessary.
2. Turn the joint shaft by hand and verify that the bearing rotates smoothly and freely. Replace it if necessary.

Removal / Installation
1. Drain the transaxle oil before removal.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.
4. After installation, fill the transaxle with the specified amount of the specified transaxle oil and inspect for oil leakage.



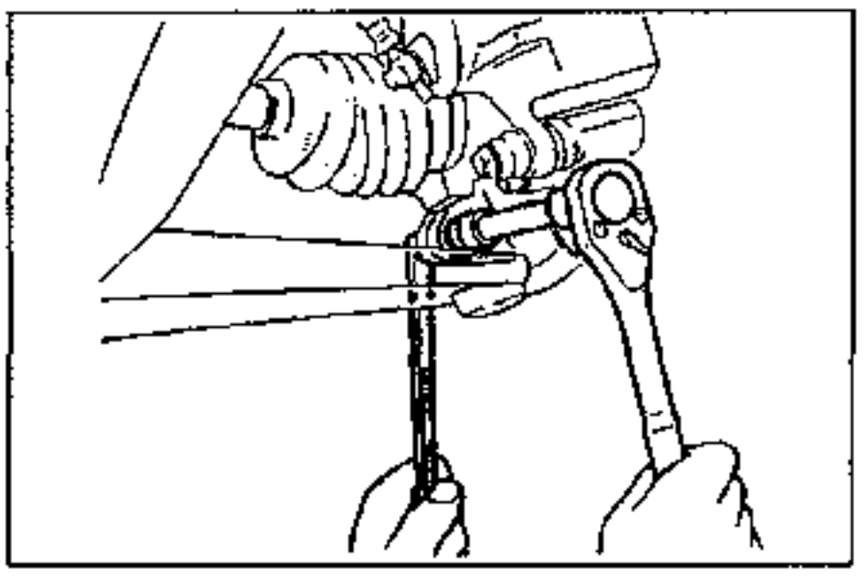
1. Wheel and tire
2. Splash shield
3. Drain plug
4. Stabilizer control link
5. Tie-rod end
   Removal Note ..... page M–20
   Installation Note ..... page M–21
6. Lower ball joint
7. Right drive shaft and axle
   Removal Note ..... page M–20
   Installation Note ..... page M–21
8. Joint shaft
   Removal Note ..... page M–20
   Installation Note ..... page M–21
   Disassembly / Inspection / Assembly ..... page M–22
9. Clip
   Installation Note ..... page M–21



Removal Note
Tie-rod end

Caution
- **The sharp edges of the SST can slice the tie-rod end boot. Install the SST so that the sharp edges are between the dust boot and tie-rod end.**

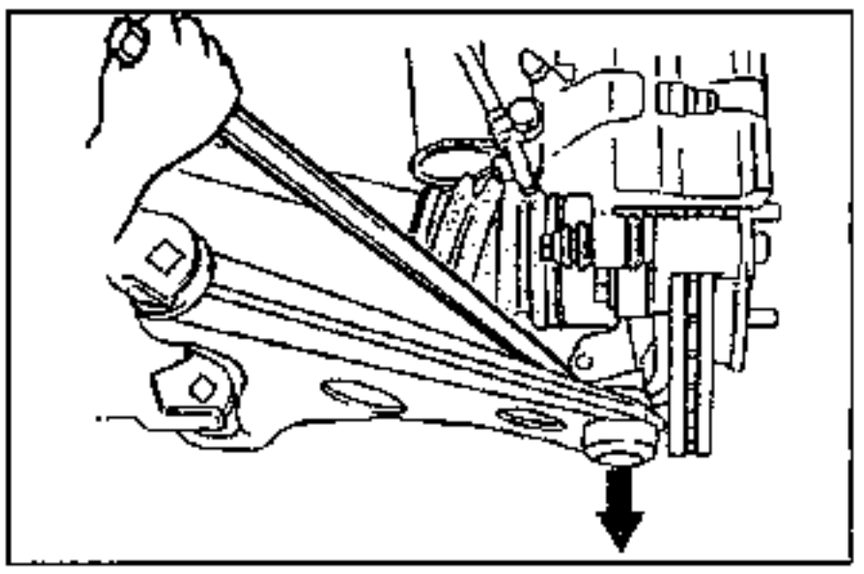
1. Remove the tie-rod end nut.
2. Disconnect the tie-rod end by using the **SST**.



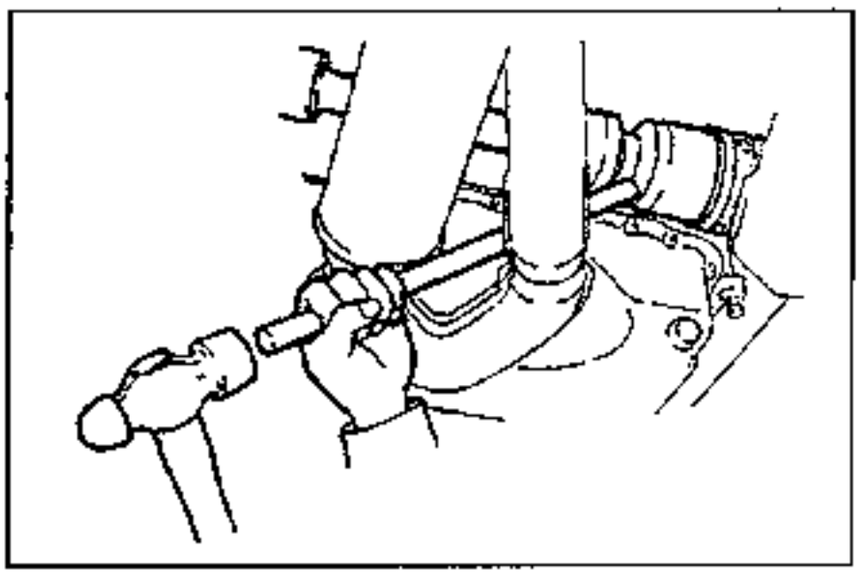
Right drive shaft and axle

Caution
- **Be careful not to damage the ball joint dust boot.**

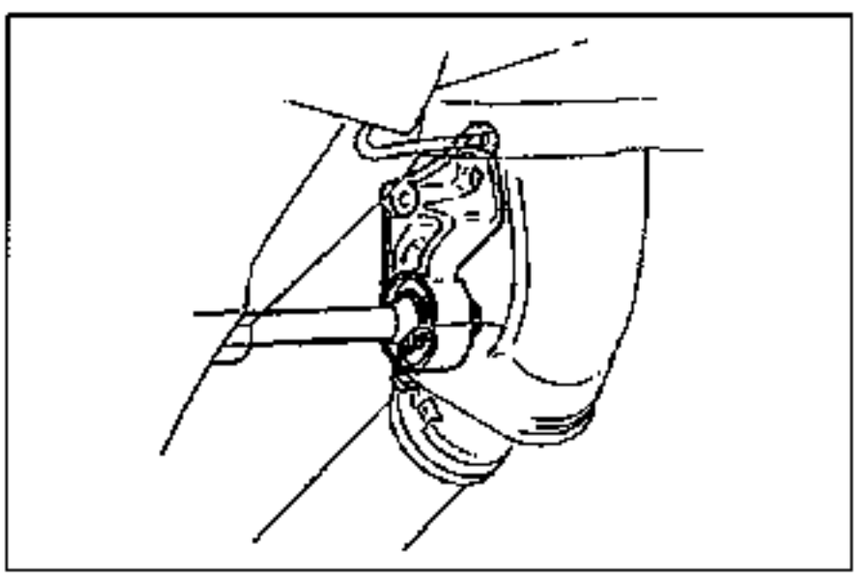
1. Remove the clinch bolt and nut.



2. Pry down on the lower arm to disconnect the ball joint.

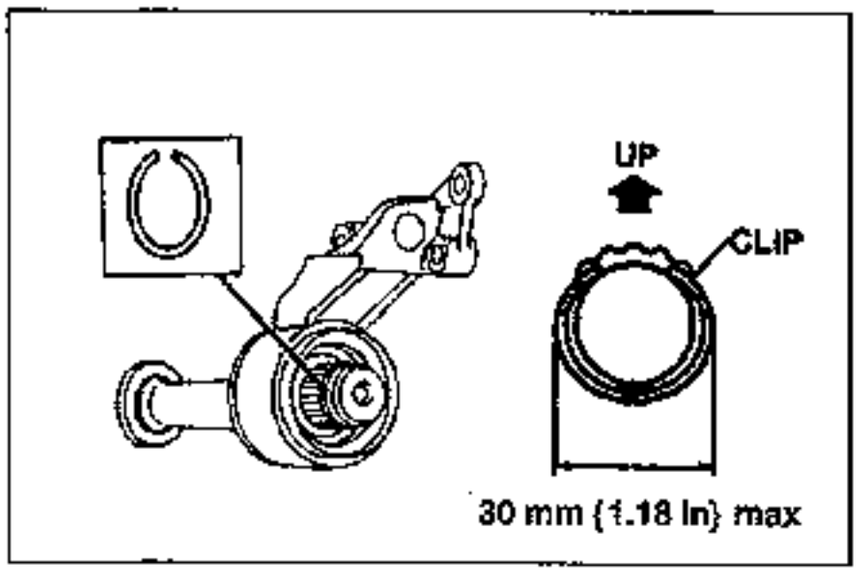


3. As shown in the figure, insert a pry bar between the drive shaft and the joint shaft and tap on the bar to uncouple them.

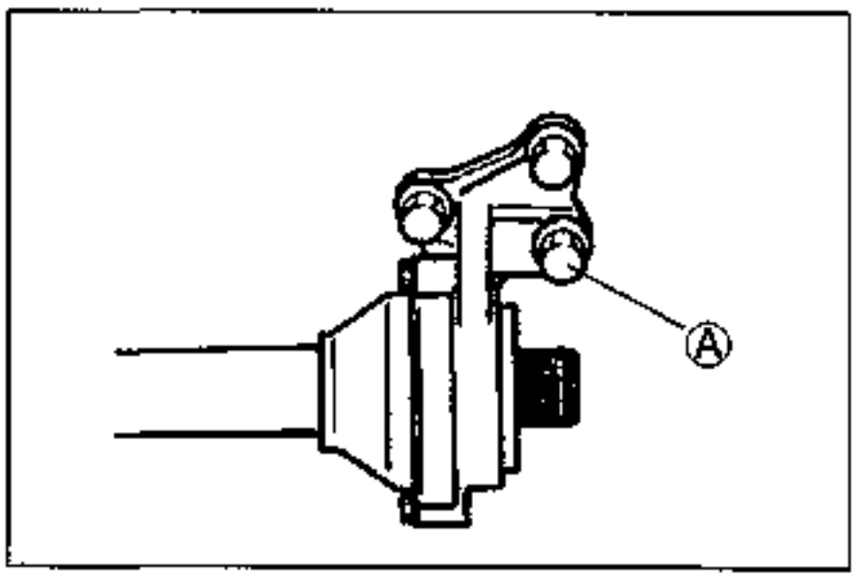


Joint shaft

Pull the joint shaft straight out.



Installation Note
Clip
1. Install a new clip so that the opening is facing upward.
2. Measure the outer diameter of the clip after installing, and replace the clip if it exceeds the specification.

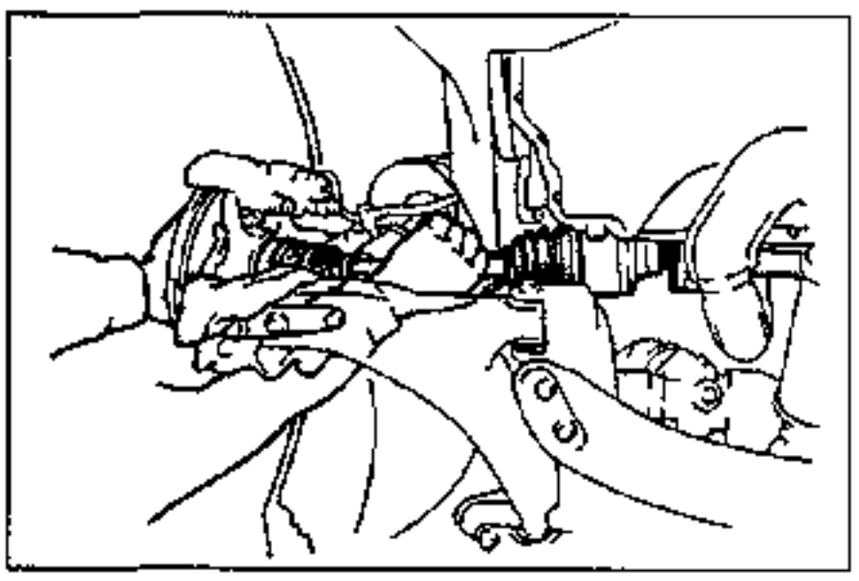


Joint shaft
1. Install a new clip so that the opening is facing upward.

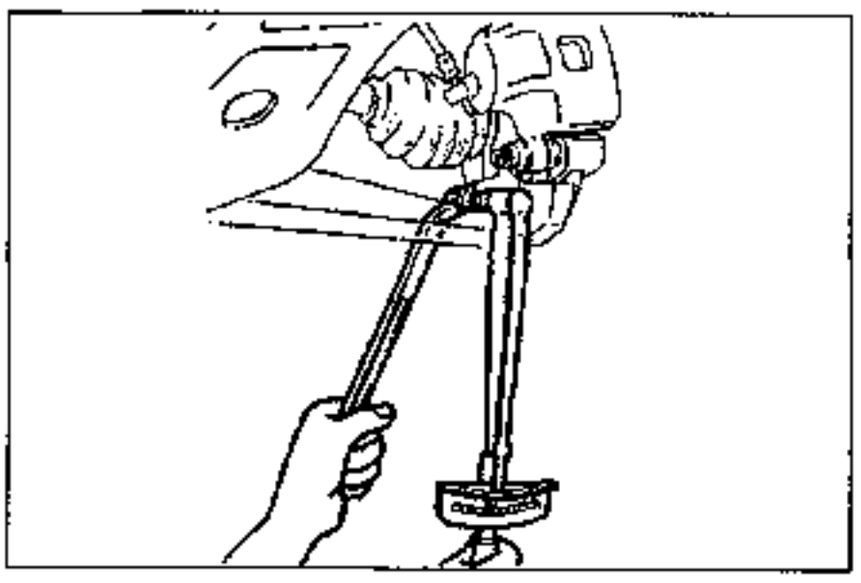
Caution
- **Do not damage the transaxle oil seal.**

2. Install the joint shaft.
3. Install the joint shaft, bolt Ⓐ must be tightened last as shown. (B6 DOHC)

Tightening torque:
43–61 N·m {4.3–6.3 kgf·m, 32–45 ft·lbf}

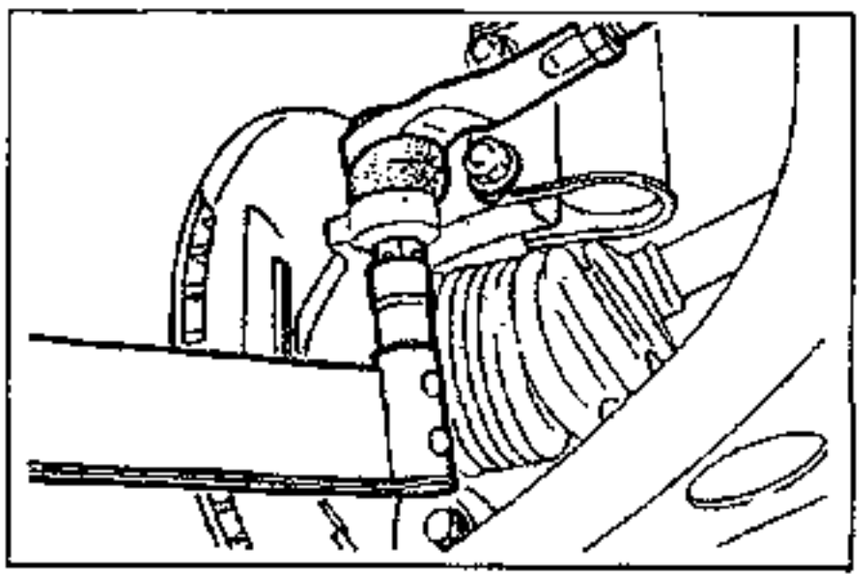


Right drive shaft and axle
1. Push the drive shaft into the joint shaft.
2. After installation, pull the front hub outward to verify that the drive shaft is securely held by the clip.



3. Install the lower arm ball joint to the knuckle and tighten the through bolt.

Tightening torque:
44–58 N·m {4.4–6.0 kgf·m, 32–43 ft·lbf}



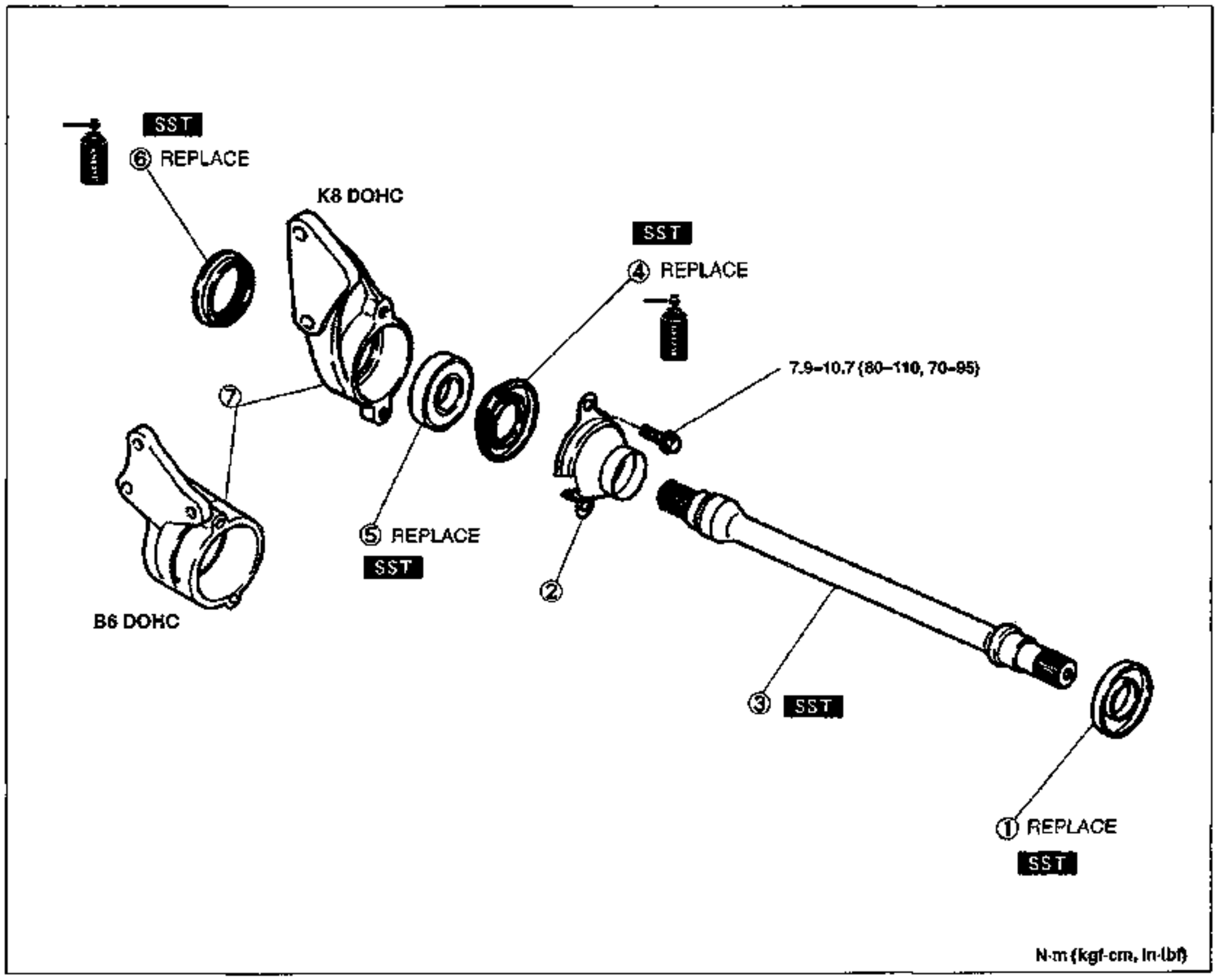
Tie-rod end
1. Position the tie-rod end and dust boot directly over the knuckle hole.
2. Install the nut to the tie-rod end and tighten.

Tightening torque:
43–56 N·m {4.3–5.8 kgf·m, 32–41 ft·lbf}

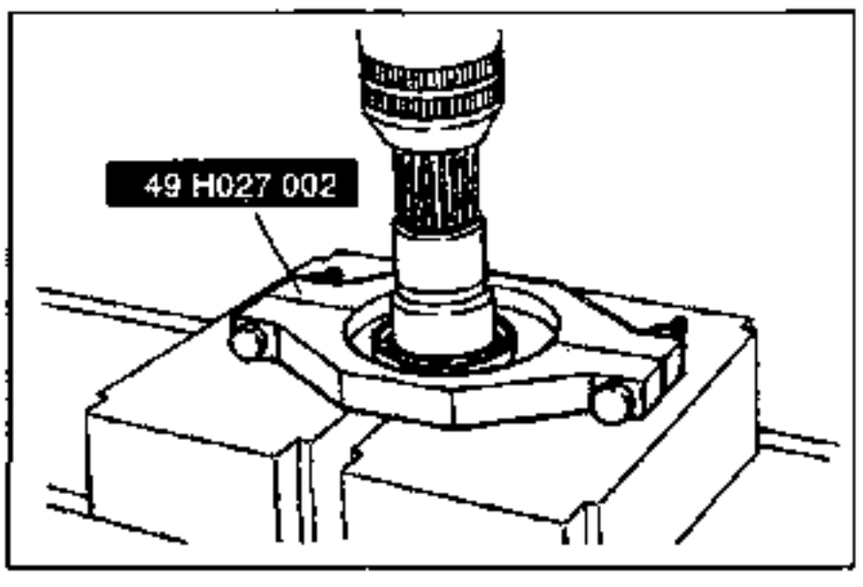
3. Install a new cotter pin.

Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note.**
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note.**



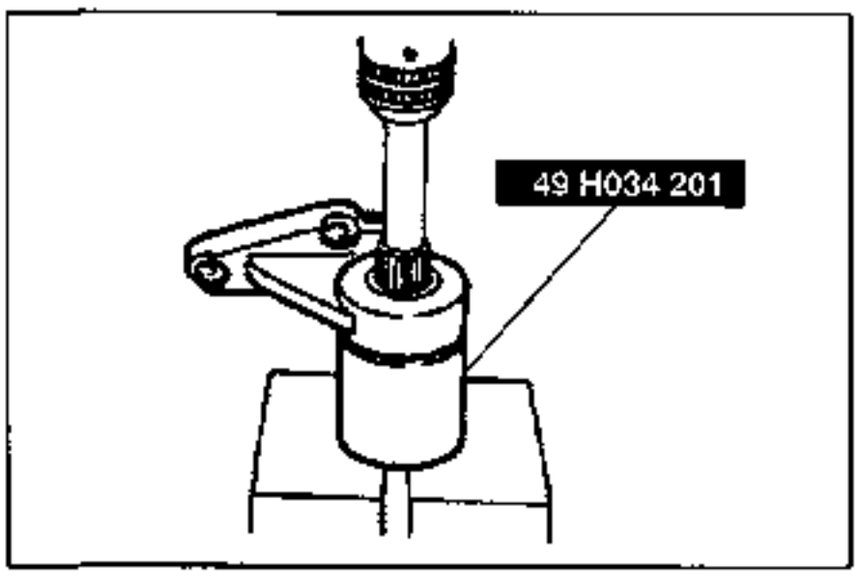
1. Dust cover (differential side, K8 DOHC)
   Disassembly Note ..... below
   Assembly Note ..... page M–24
2. Dust cover (bracket side, K8 DOHC)
3. Joint shaft
   Inspect splines for damage and wear
   Disassembly Note ..... page M–23
   Assembly Note ..... page M–24
4. Dust seal (differential side)
   Disassembly Note ..... page M–23
   Assembly Note ..... page M–24
5. Bearing
   Disassembly Note ..... page M–23
   Assembly Note ..... page M–23
6. Dust seal (drive shaft side)
   Assembly Note ..... page M–23
7. Bracket



Disassembly Note

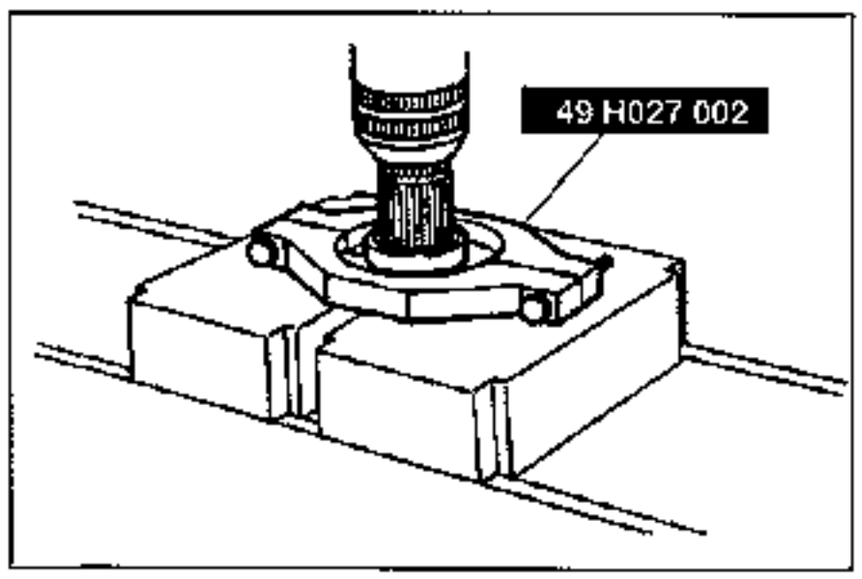
Dust cover (differential side, K8 DOHC)

While holding the joint shaft, press out the dust cover by using the **SST**.

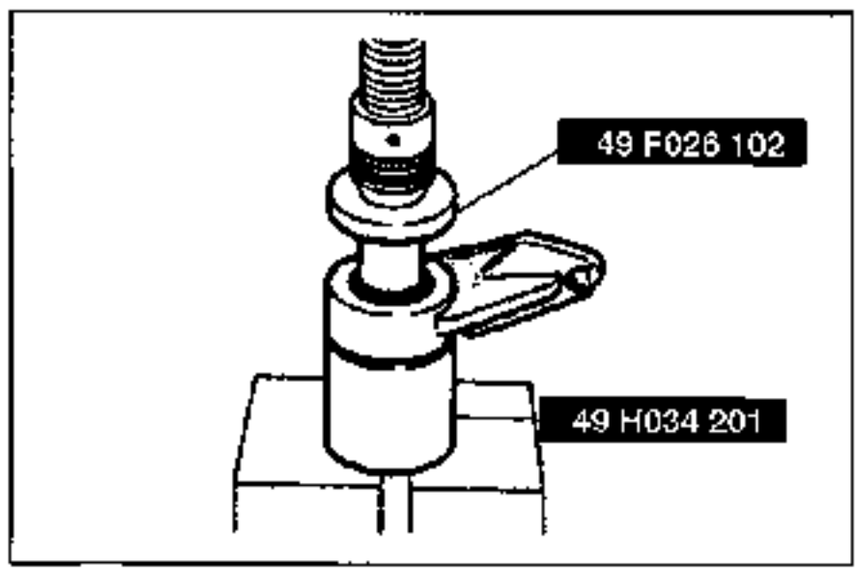


Joint shaft

1. While holding the joint shaft, press it out by using the **SST**.

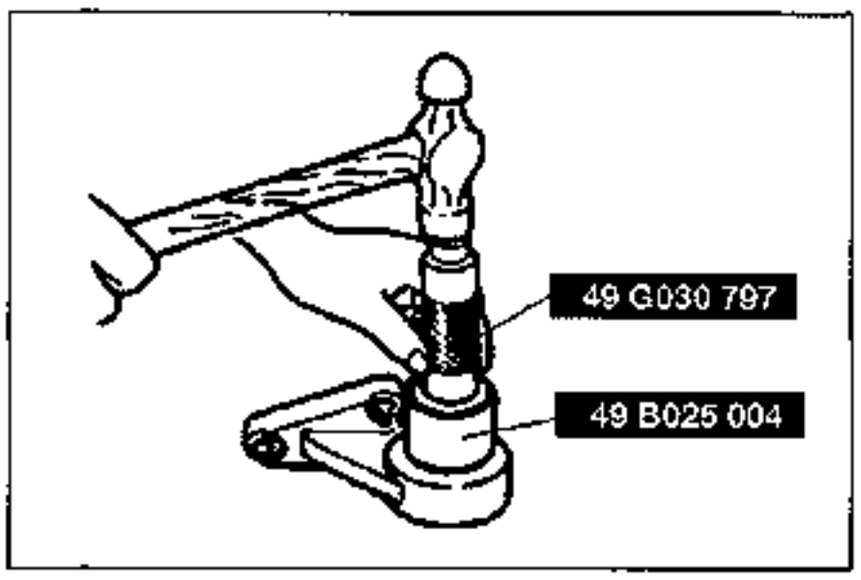


2. while holding the shaft, press out the bearing inner race by using the **SST**.



Dust seal (differential side)/Bearing

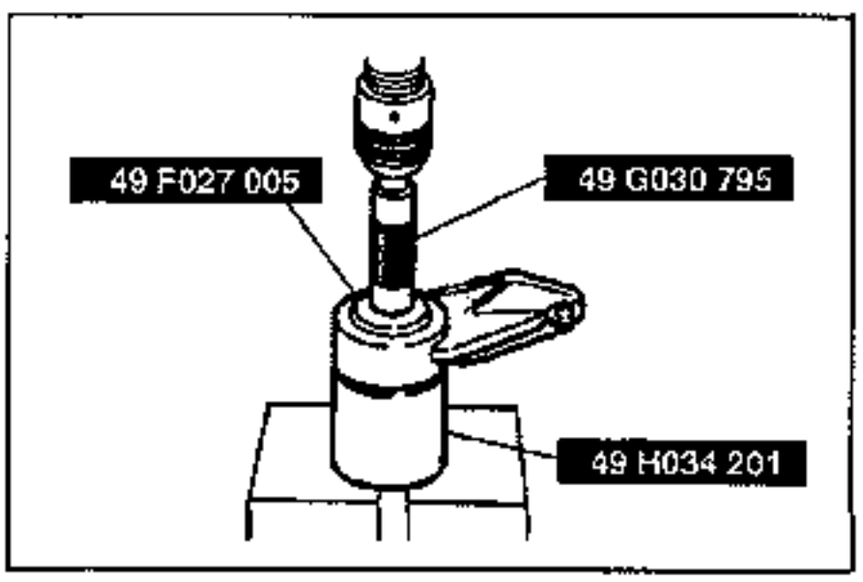
Press out the differential side dust seal and bearing by using the **SSTs**.



Assembly note

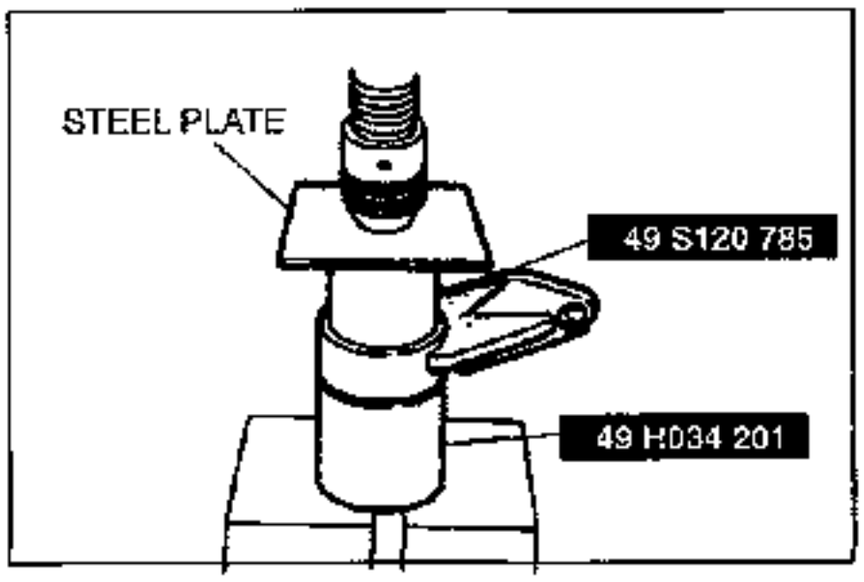
Dust seal (drive shaft side)

Tap in the new drive shaft side dust seal by using the **SSTs**.



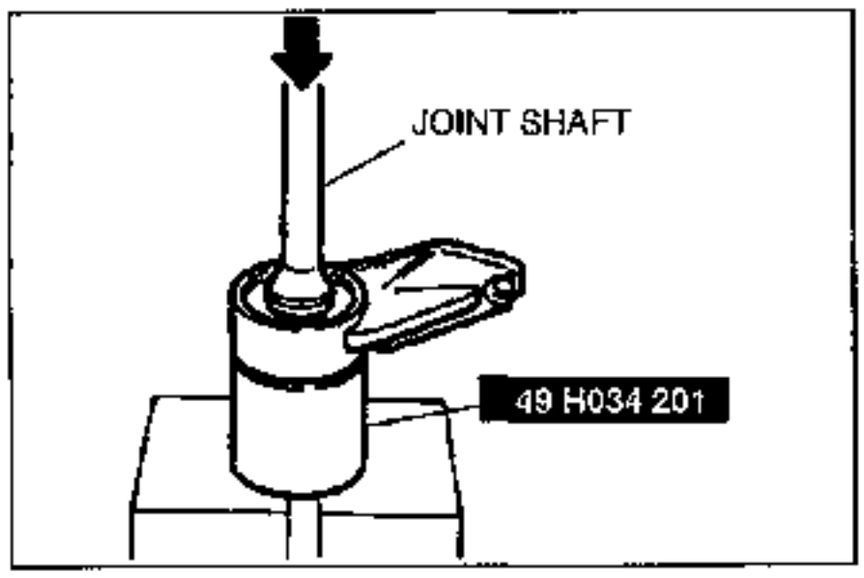
Bearing

Press in the new bearing by using the **SSTs**.



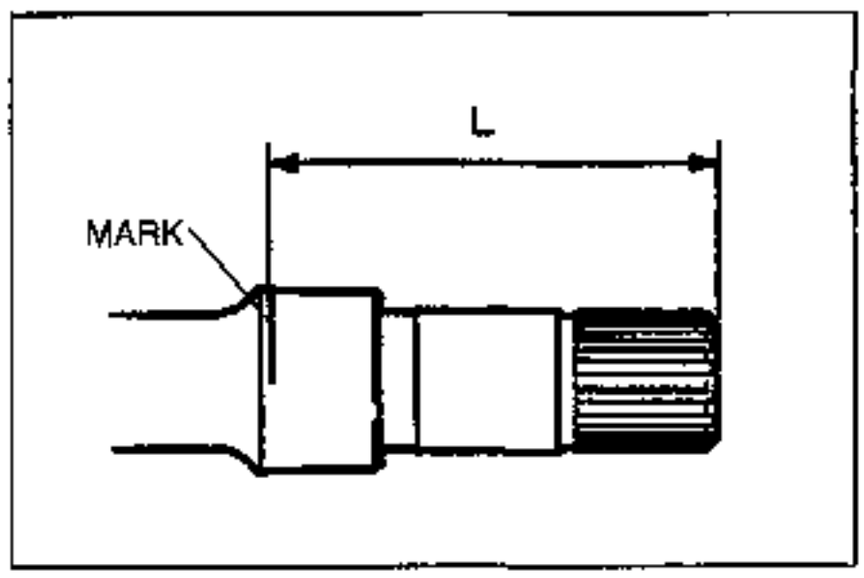
Dust seal (differential side)

Press in the new differential side dust seal by using a steel plate and the **SSTs**.



Joint shaft

Press in the new bearing by using the **SST**.

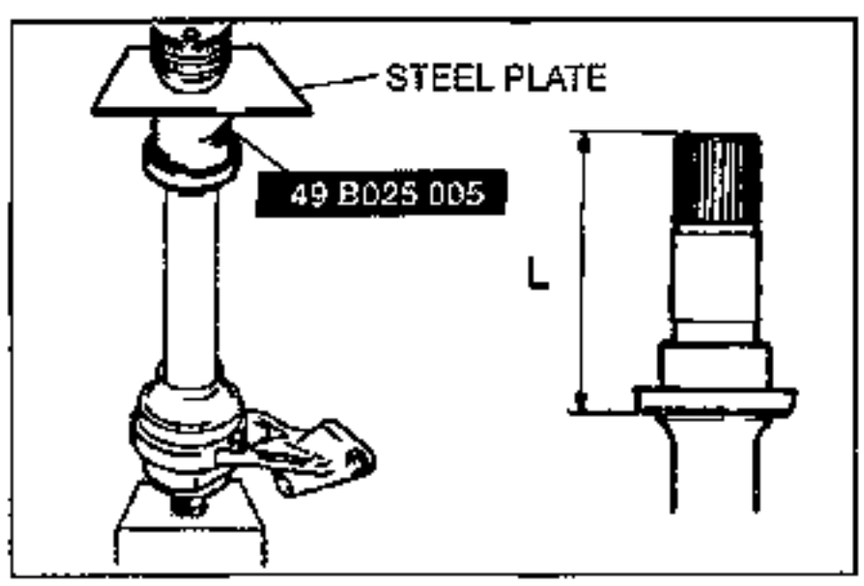


Dust cover (differential side, K8 DOHC)

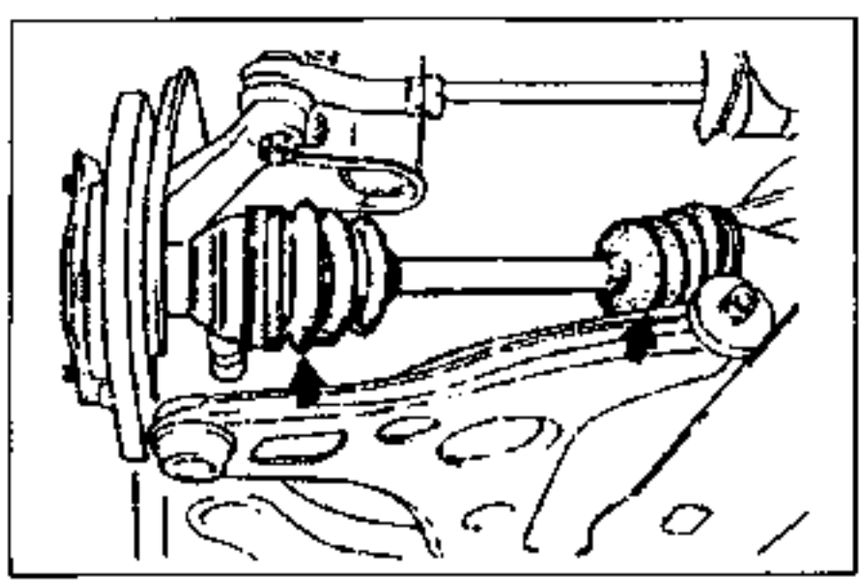
1. Mark the shaft as shown in the figure.

Length

MTX : 89.0 ± 0.5 mm {3.50 ± 0.02 in}
ATX : 110.5 ± 0.5 mm {4.35 ± 0.02 in}



2. Press in the dust cover to the marked position by using a steel plate and the **SST**.
3. Verify that length L is within specification.

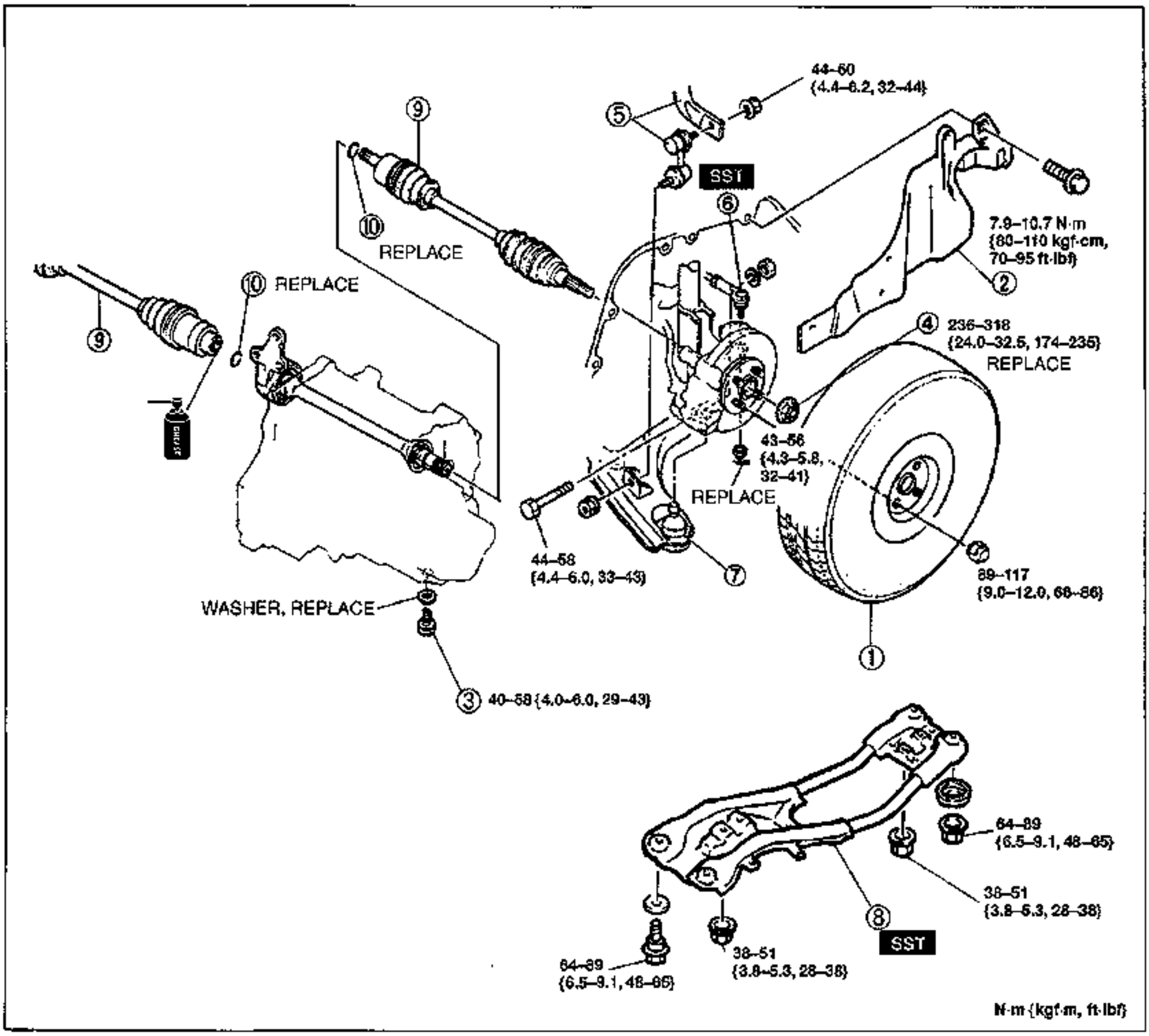


DRIVE SHAFT
(TRIPOD JOINT)
Preinspection
Drive shaft

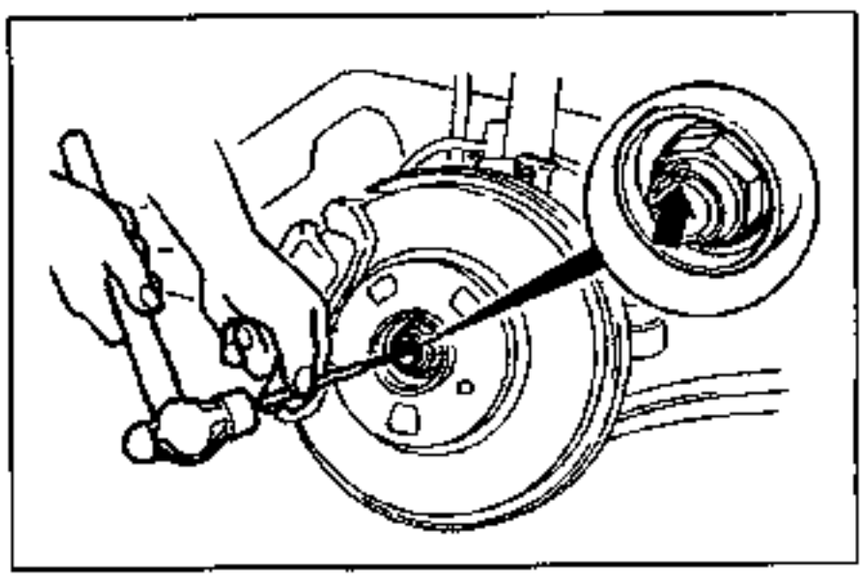
1. Check the drive shaft dust boot for cracks, damage, leaking grease, and loose boot bands.
2. Check the drive shaft for bending, cracks, and wear of joints or splines.
3. Repair or replace the drive shaft if necessary.

Removal / Installation

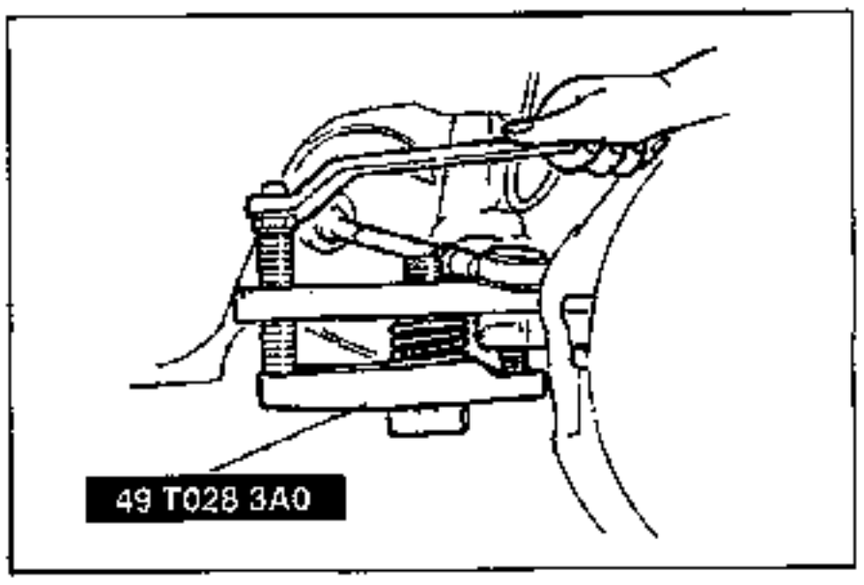
1. Drain the transaxle oil before removal.
2. Remove in the order shown in the figure, referring to **Removal Note.**
3. Install in the reverse order of removal, referring to **Installation Note.**
4. After installation, fill the transaxle with the specified amount of the specified transaxle oil and inspect for oil leakage.
5. Check the front wheel alignment, referring to Section R.



1. Wheel and tire
2. Splash shield
3. Drain plug
4. Locknut
   - Removal Note ..... page M–26
   - Installation Note ..... page M–28
5. Stabilizer control link
6. Tie-rod end
   - Removal Note ..... page M–26
   - Installation Note ..... page M–28
7. Lower ball joint
8. Engine mount member
   (Only for ATX at left side drive shaft)
   - Removal Note ..... page M–26
9. Drive shaft
   - Removal Note ..... page M–26
   - Installation Note ..... page M–27
   - Disassembly / Inspection / Assembly ..... page M–29
10. Clip
    - Installation Note ..... page M–27



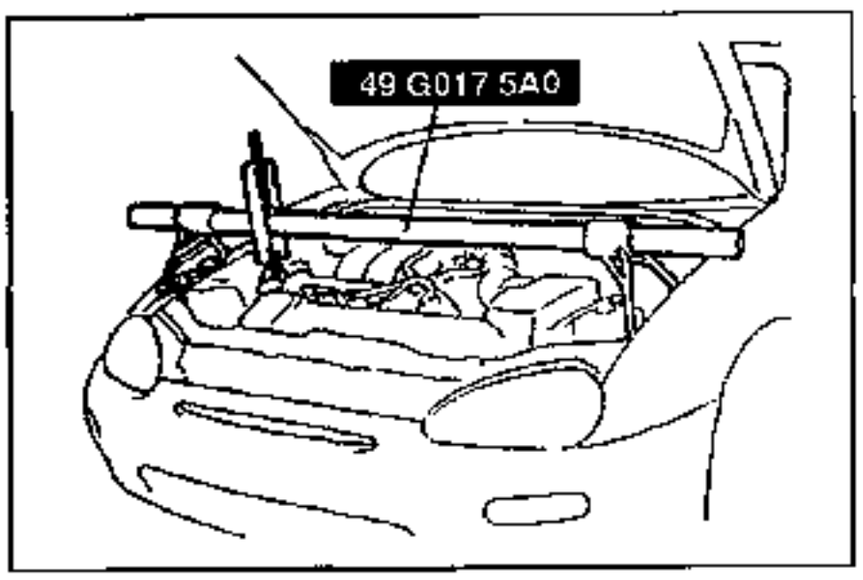
Removal Note
Locknut
1. Knock the crimped portion of the locknut outward by using a chisel and a hammer.
2. Lock the hub by applying the brakes.
3. Remove the locknut.



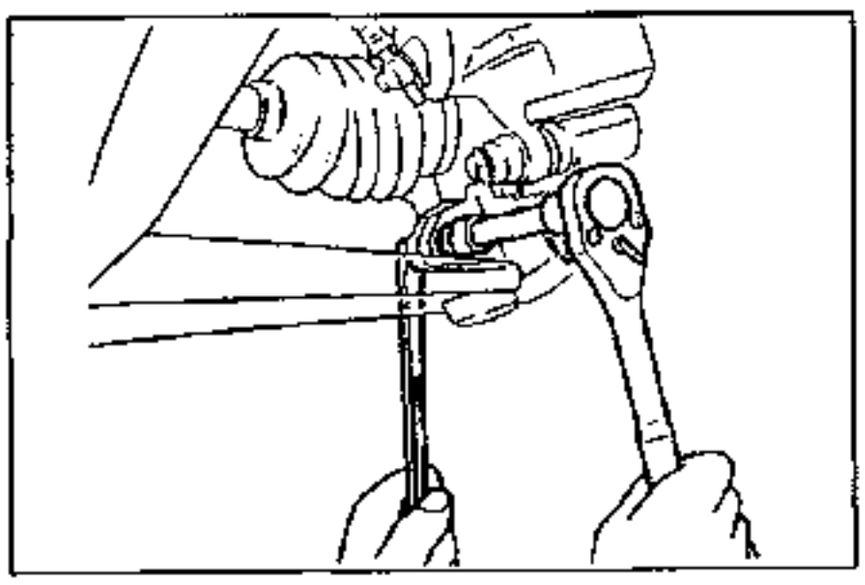
Tie-rod end

Caution
- **The sharp edges of the SST can slice the tie-rod end dust boot. Install the SST so that the sharp edges are between the dust boot and tie-rod end.**

1. Remove the tie-rod end nut.
2. Disconnect the tie-rod end by using the **SST**.



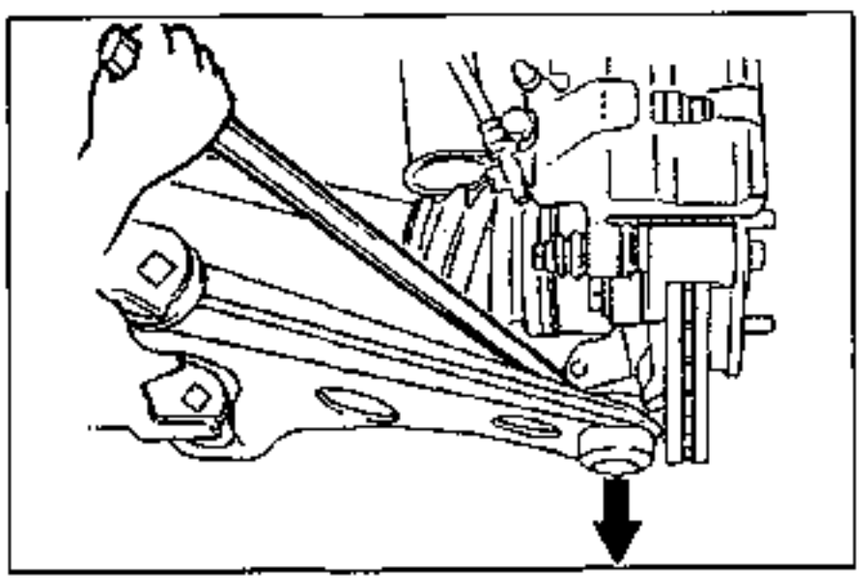
Engine mount member
Suspend the engine by using the **SST** and remove the engine mount member.



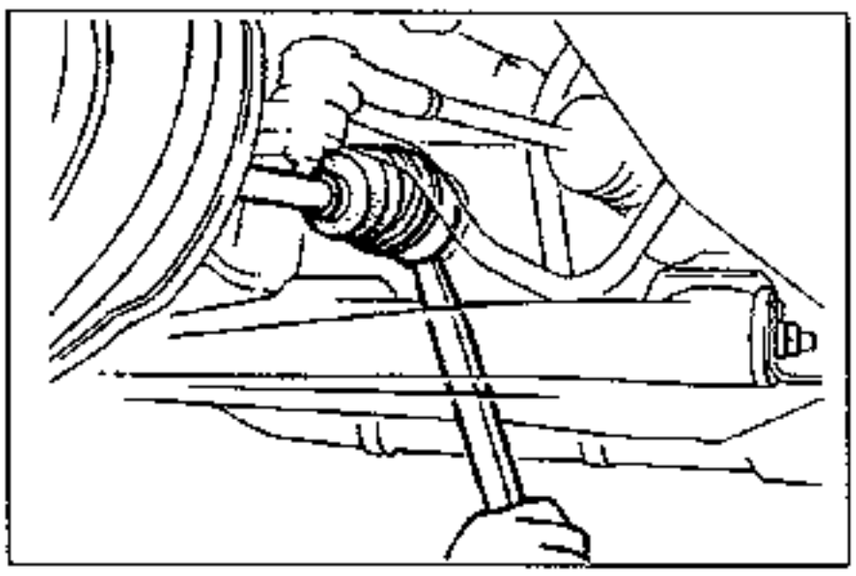
Drive shaft

Caution
- **Be careful not to damage the ball joint dust boot.**

1. Remove the clinch bolt and nut.

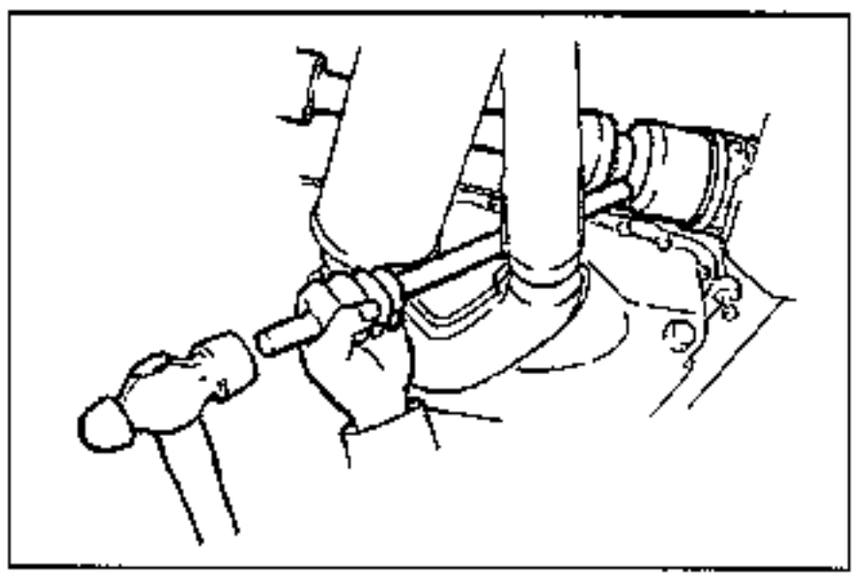


2. Pry down on the lower arm to disconnect the ball joint.

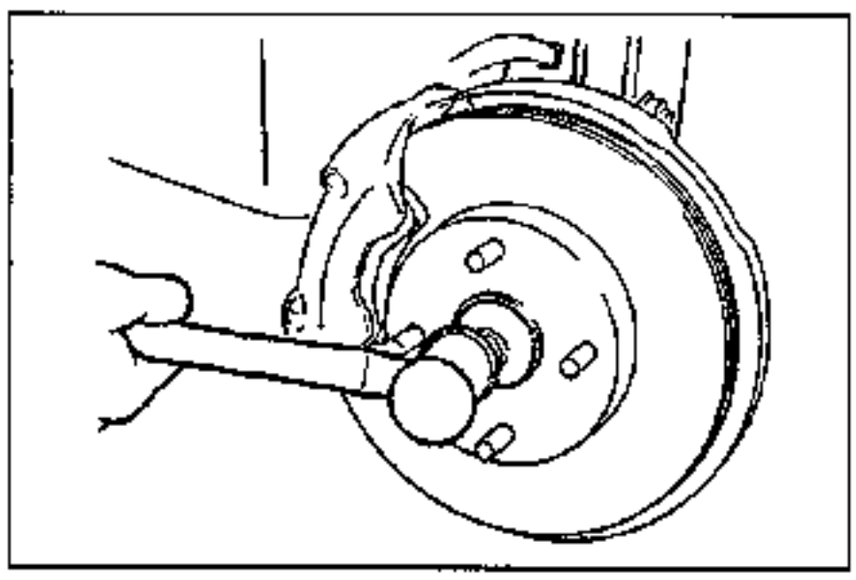


Caution
- **The sharp edges of the drive shaft can slice or puncture the oil seal. Be careful when removing the drive shaft from the transaxle.**

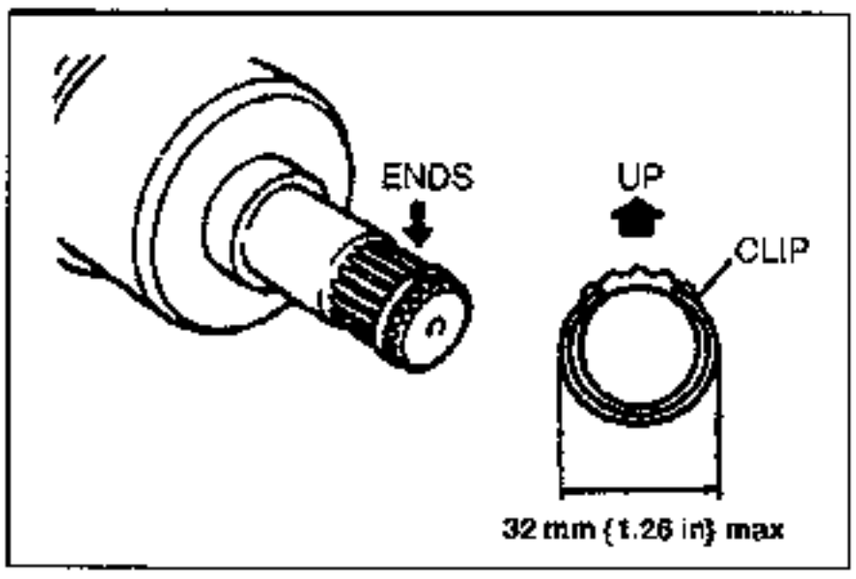
3. Separate the left–side drive shaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle, as shown in the figure.



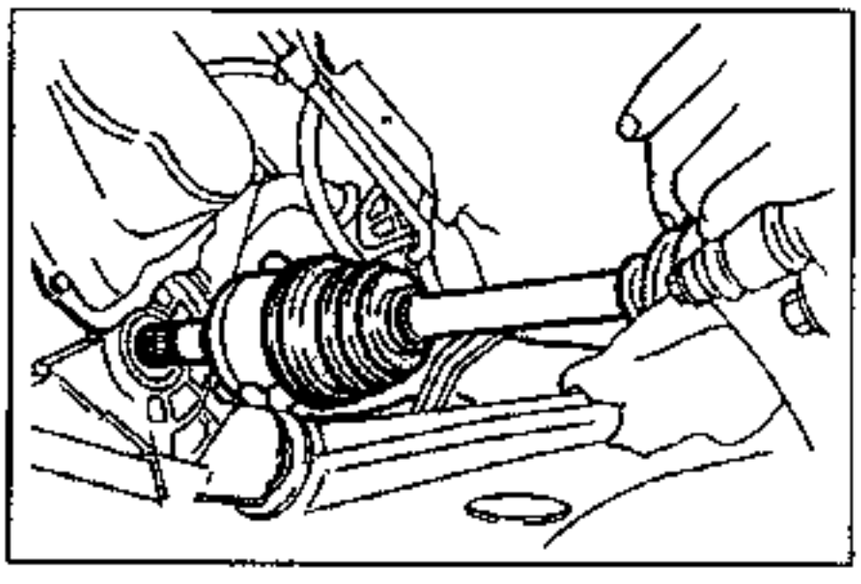
4. Separate the right–side drive shaft from the joint shaft by hammering on a bar inserted between them.



Note
- If the drive shaft will not come out of the front wheel hub easily, install an already discarded nut onto the drive shaft so that the nut is flush with the end of the drive shaft. Tap the nut with a copper hammer to loosen the drive shaft from the front wheel hub.



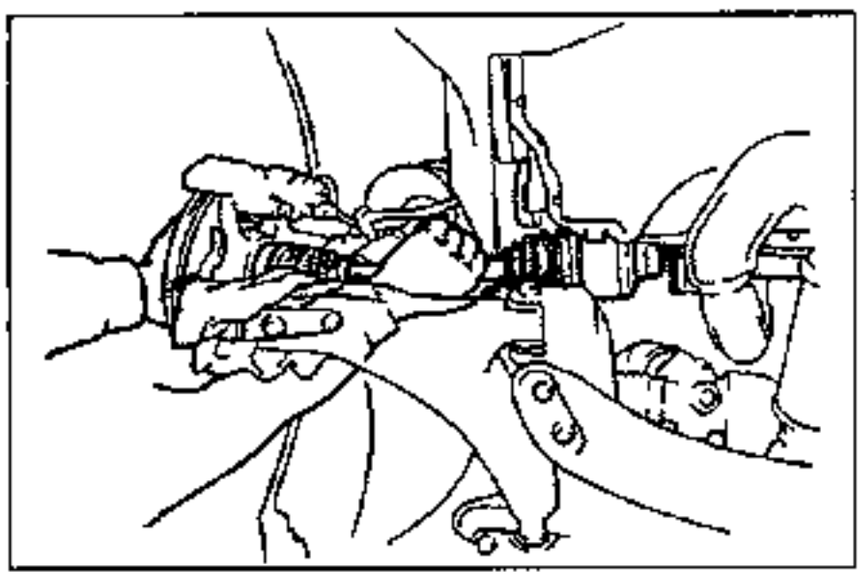
Installation Note
Clip
1. Install a new clip onto the drive shaft.
2. Measure the outer diameter of the clip after installing, and replace the clip if it exceeds the specification.



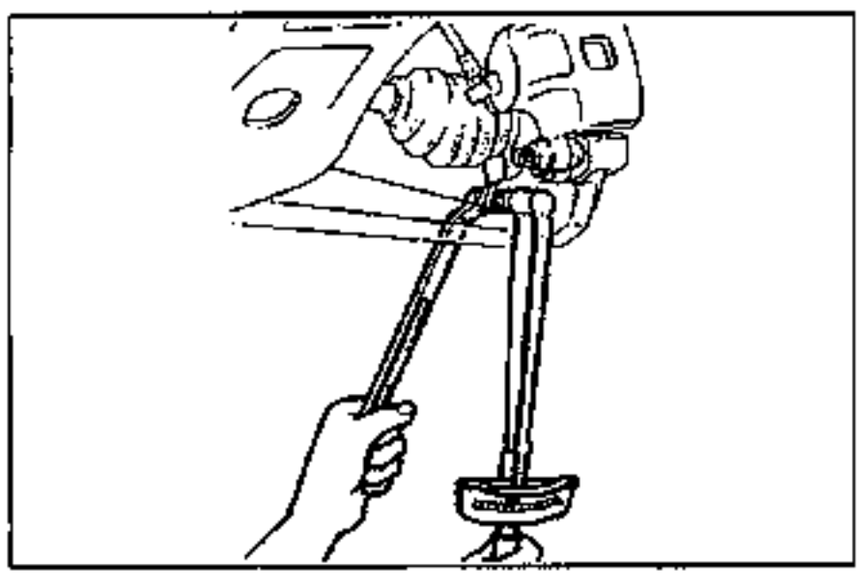
Drive shaft

Caution
- **The sharp edges of the drive shaft can slice or puncture the oil seal. Be careful when installing the drive shaft to the transaxle.**
- **The oil seals are damaged easily if this procedure is not done correctly.**

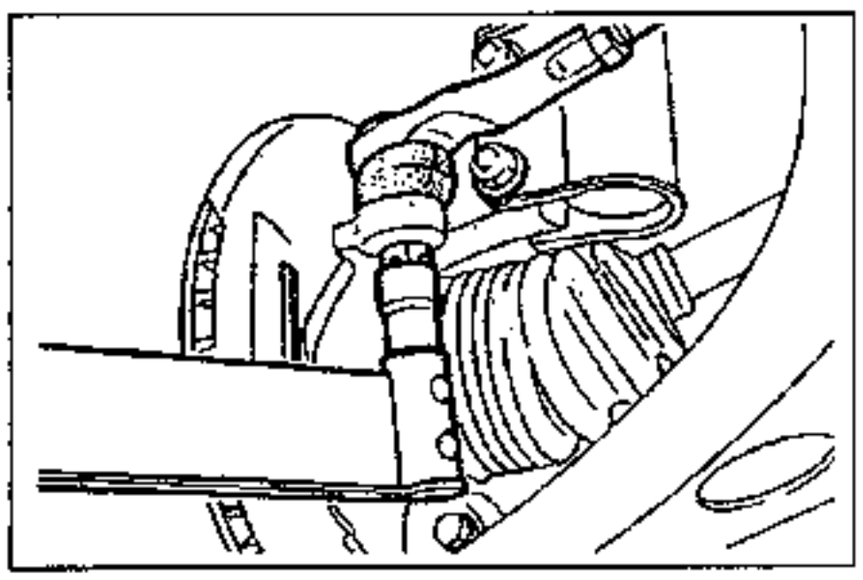
1. Apply grease to the ends of the drive shafts.
2. Push the dirve shaft into the transaxle (left side) or joint shaft (right side).



3. After installation, pull the front hub outward to confirm that the drive shaft is securely held by the clip.



4. Install the lower arm ball joint to the knuckle and tighten the through bolt.

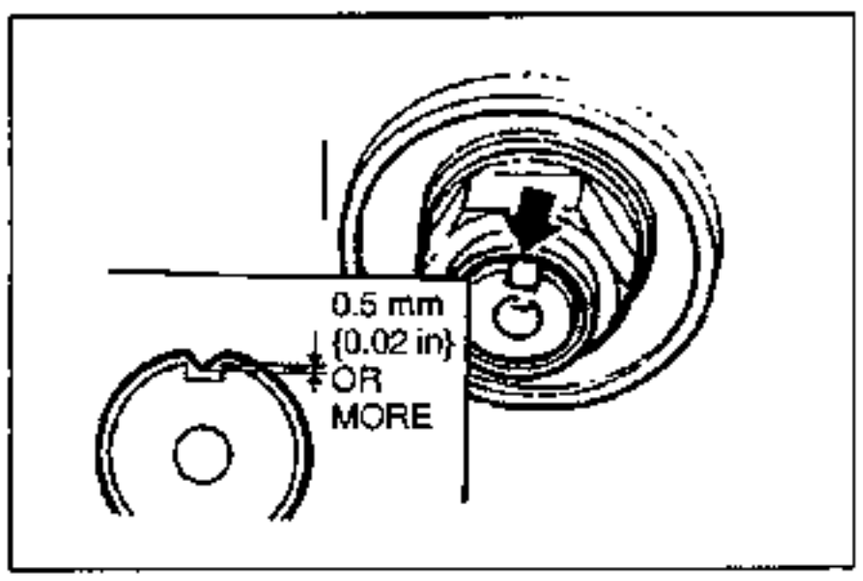


Tie-rod end

1. Position the tie-rod end and dust boot directly over the knuckle hole.
2. Install the nut to the tie-rod end and tighten.

Tightening torque:
43–56 N·m {4.3–5.8 kgf·m, 32–41 ft·lbf}

3. Install a new cotter pin.



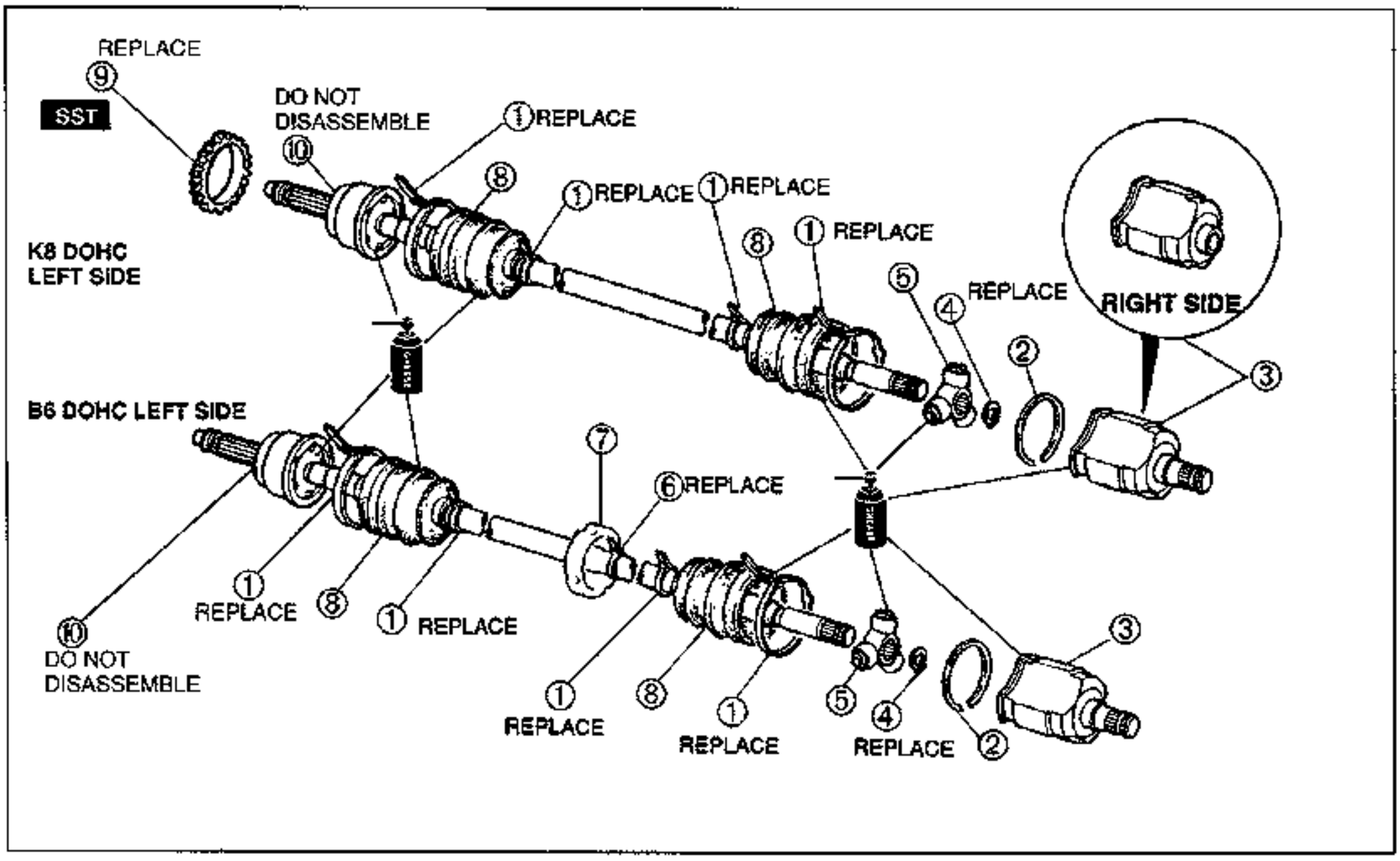
Locknut

Install a new locknut and stake it, as shown.

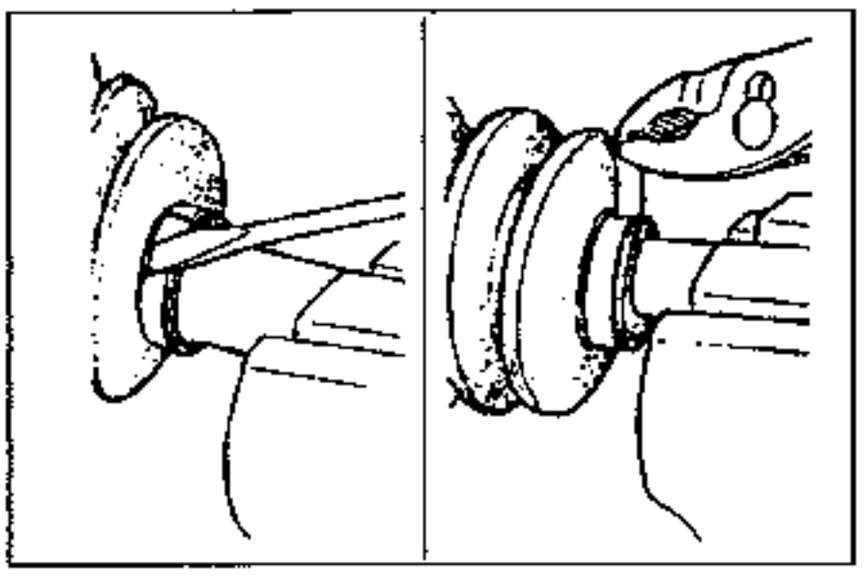
Tightening torque:
236–318 N·m {24.0–32.5 kgf·m, 174–235 ft·lbf}

Disassembly / Inspection / Assembly

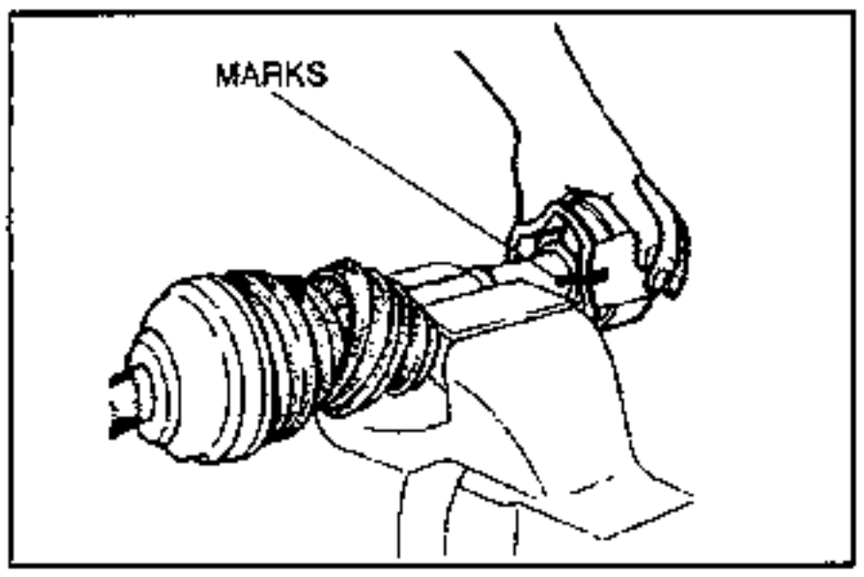
1. Disassemble in the order shown in the figure, referring to **Disassembly Note.**
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note.**



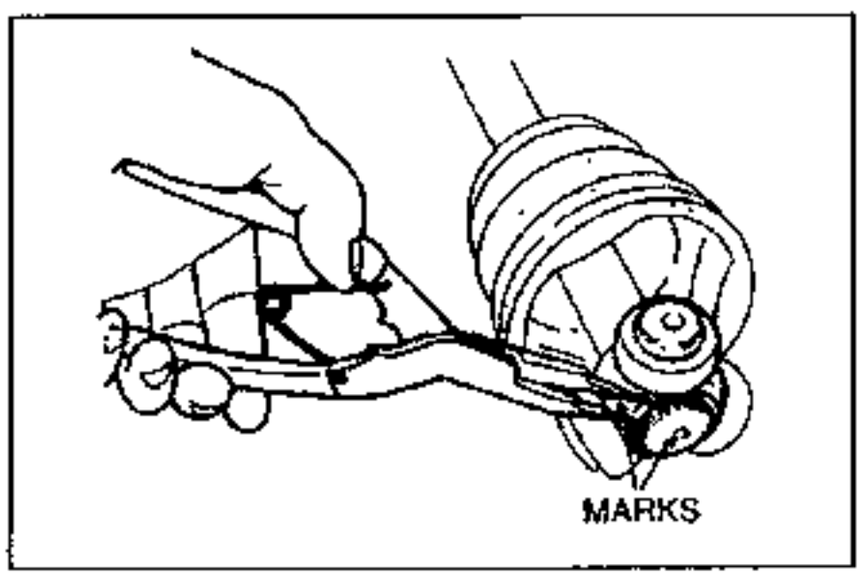
1. Boot band
   - Disassembly Note ..... page M–30
   - Assembly Note ..... page M–32
2. Stopper ring
3. Outer ring
   - Disassembly Note ..... page M–30
   - Inspect inside bore for wear, corrosion, and scoring.
   - Assembly Note ..... page M–32
4. Snap ring
   - Disassembly Note ..... page M–30
   - Assembly Note ..... page M–31
5. Tripod joint
   - Disassembly Note ..... page M–30
   - Inspect for damage and wear.
   - Assembly Note ..... page M–31
6. Band
   - Disassembly Note ..... page M–30
   - Assembly Note ..... page M–32
7. Dynamic damper
   - Disassembly Note ..... page M–30
   - Assembly Note ..... page M–31
8. Boot
   - Disassembly Note ..... page M–30
   - Inspect for damage.
   - Assembly Note ..... page M–31
9. ABS sensor rotor
   - Disassembly Note ..... page M–31
   - Assembly Note ..... page M–31
10. Shaft and ball joint assembly
    - Inspect splines for damage and wear.
    - Inspect wheel-side joint for excessive play and rough rotation.



Disassembly Note
Boot band
1. Pry up the locking clips of the boot bands with a screwdriver.
2. Remove the bands with pliers.



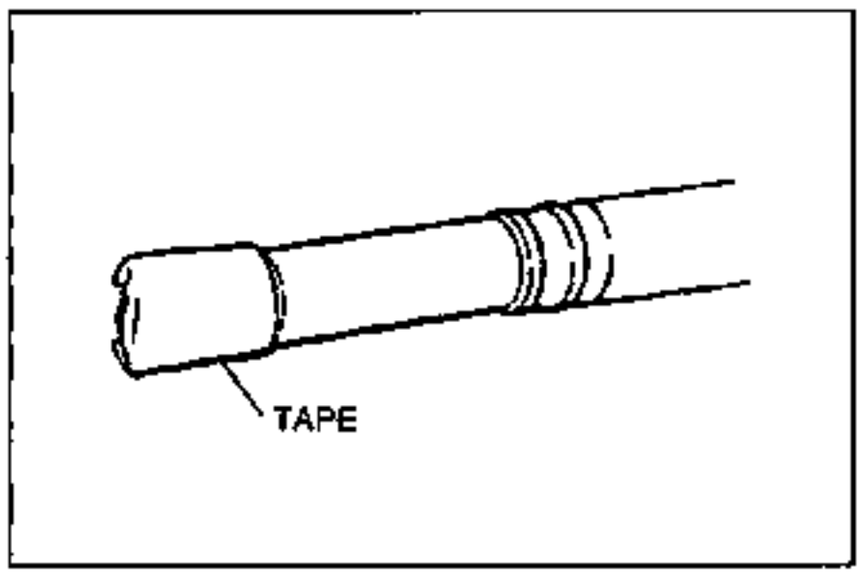
Outer ring
Mark the outer ring and the shaft for proper reassembly.



Snap ring / Tripod joint
1. Mark the shaft and tripod joint for proper reassembly.
2. Remove the snap ring with snap-ring pliers.

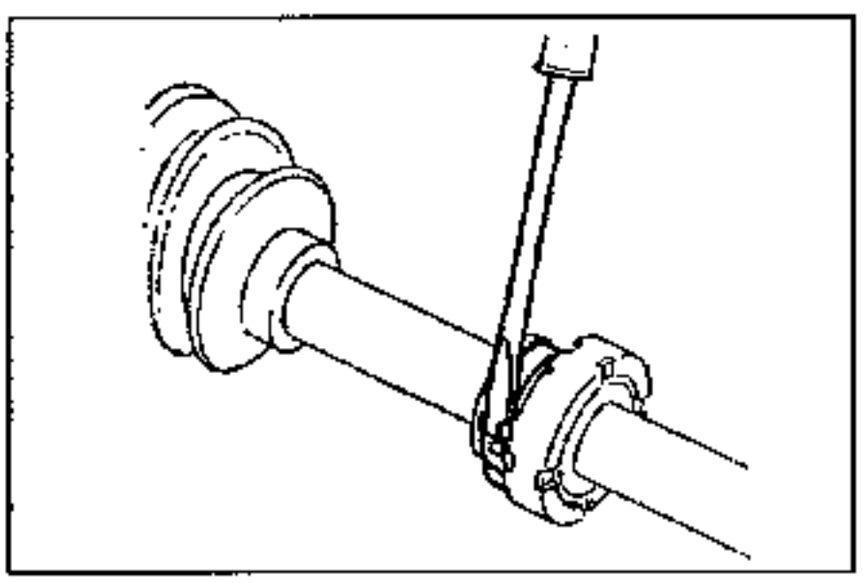
Caution
- **Do not damage the bearing.**

3. Remove the tripod joint from the shaft with a bar and a hammer.



Note
- The wheel–side boot does not need to be removed unless you are replacing it.

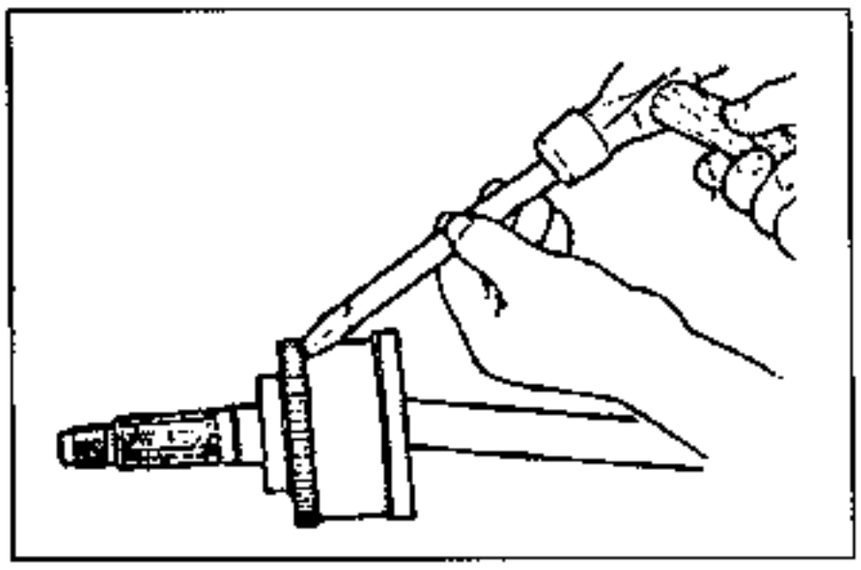
Wrap the splines of the shaft with tape to prevent damaging the boot.



Band / Dynamic damper

Note
- The dynamic damper does not need to be removed unless you are replacing it.

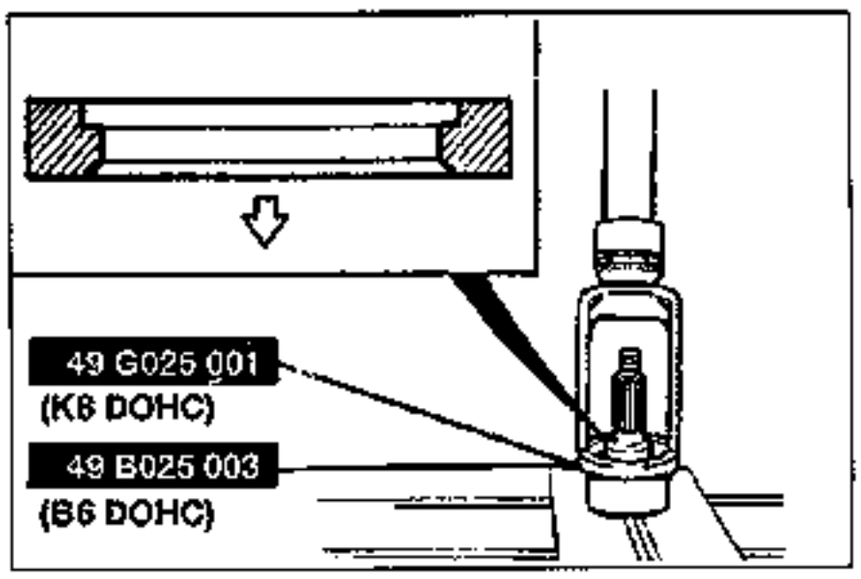
1. Pry up the locking clip of the band with a screwdriver.
2. Remove the band with pliers.
3. Remove the dynamic damper.



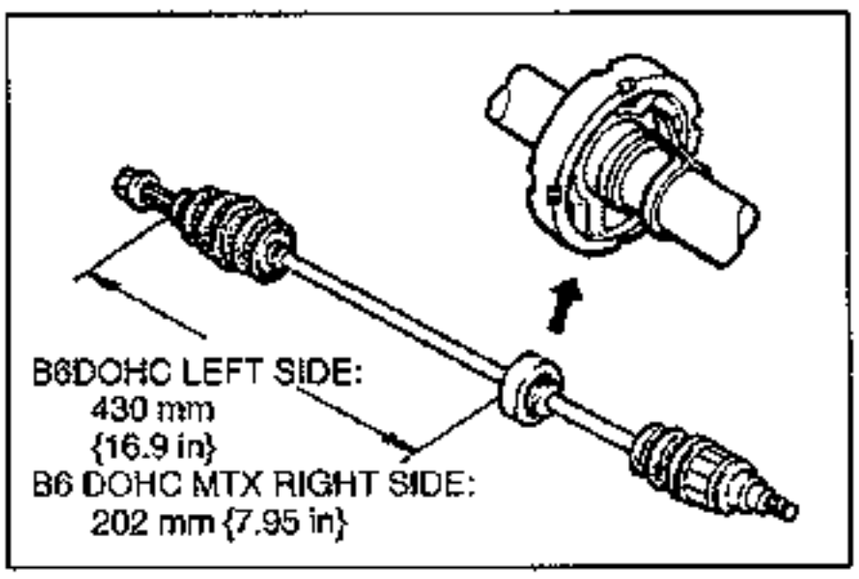
ABS sensor rotor

Note
- The ABS sensor rotor does not need to be removed unless you are replacing it.

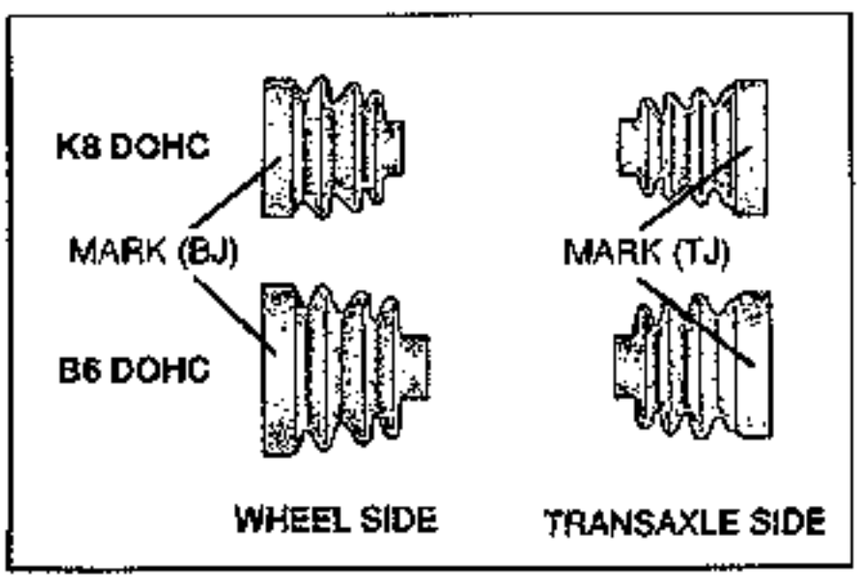
Tap the sensor rotor off the drive shaft with a chisel.



Assembly Note
ABS sensor rotor
Set a new ABS sensor rotor on the drive shaft in the direction as shown, and press it onto the shaft assembly by using the **SST**.



Dynamic damper / Band
1. Push the joint fully toward the drive shaft.
2. Make sure the dynamic damper position is as shown in the figure.
3. Install the band and dynamic damper.
4. Fold the band back by pulling on the end of it with pliers, so that the end of the bard is pointing opposite the forward revolving direction of the shaft.
5. Lock the end of the band by bending the locking clip.

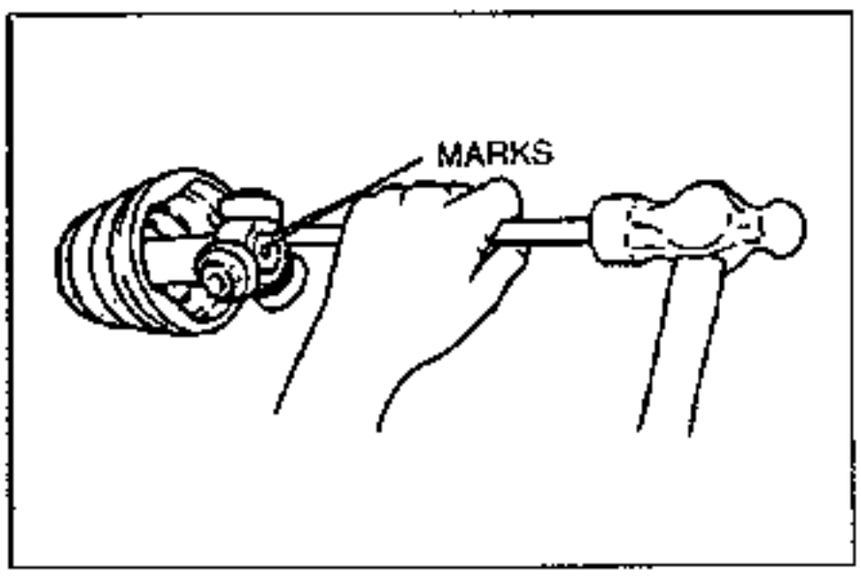


Boot

Note
- The initials TJ and BJ are stamped on the wheel-side and differential-side boots respectively.

1. Wrap the splines of the transaxle side shaft, and install the boot, noting the shape and size of each one in the figure.
2. Fill the wheel side boot with the grease, supplied in the boot and joint kit.

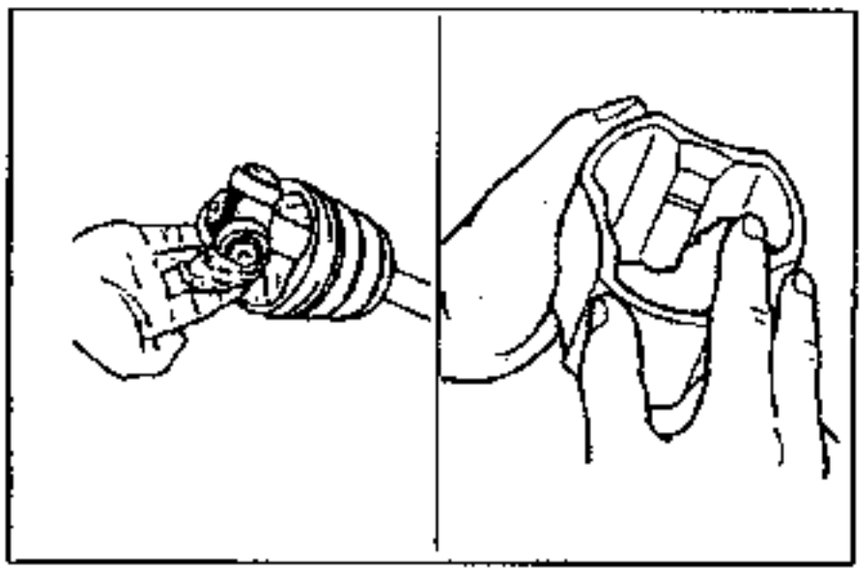
Grease amount
B6 DOHC: 60–80 g {2.12–2.82 oz}
K8 DOHC: 80–100 g {2.83–3.53 oz}



Tripod Joint / Snap ring

Caution
- **Do not damage the bearing.**

1. Align the marks and install the tripod joint With a bar and a hammer.
2. Install the new snap ring With snap-ring pliers.



Outer ring

1. Fill the outer ring and boot (transaxle side) with the specified grease supplied in the boot and joint kit.

Grease amount

B6 DOHC

Right side: 110–130 g {3.89–4.58 oz}
Left side: 115–135 g {4.06–4.76 oz}

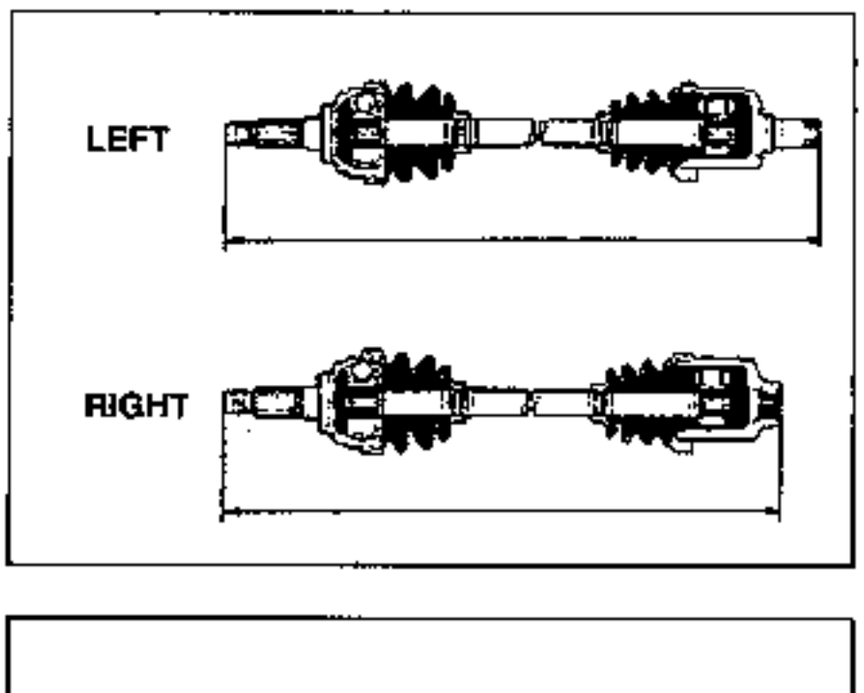
K8 DOHC

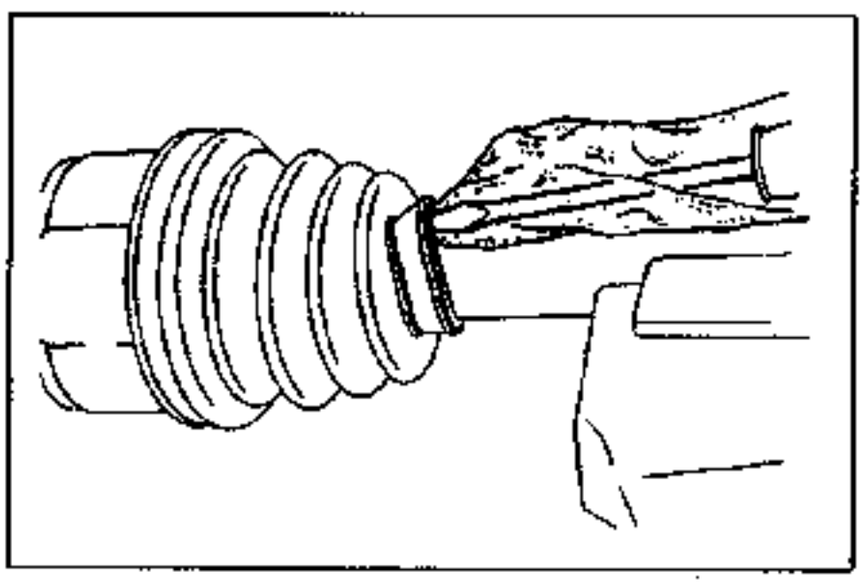
MTX : 135–155g {4.97–5.47 oz}
ATX : 130–150g {4.59–5.29 oz}

2. Align the free ring marks and the tripod joint marks.

Caution

- **Be careful not to drop the free rings when installing the tripod joint outer ring.**





Boot band

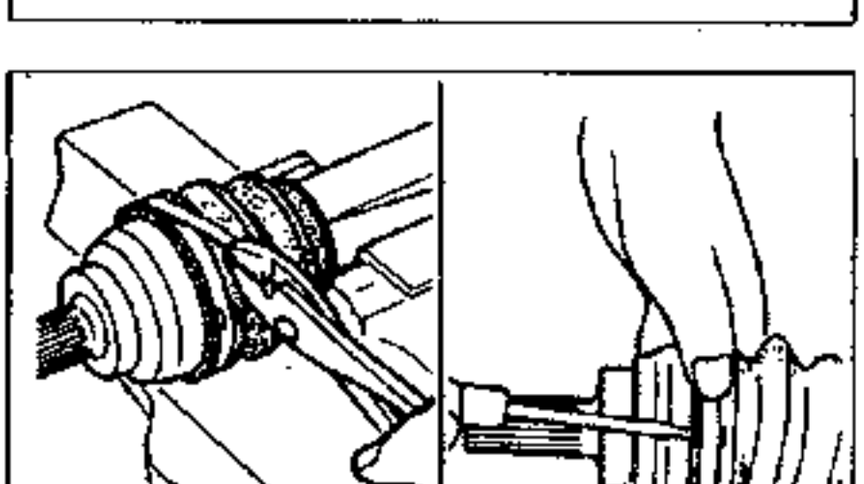
1. Verify that the boots are not dented or twisted.
2. Set the drive shaft to the standard length.

Standard length

mm {in}

		B6 DOHC		K8 DOHC	
		MTX	ATX	MTX	ATX
Right side		595.5–605.5 {23.45–23.83}		595.9–605.9 {23.47–23.85}	597.5–607.5 {23.53–23.91}
Left side	NON ABS	653.0–663.0 {25.71–26.10}		635.5–645.5 {25.02–25.41}	648.0–658.0 {25.52–25.90}
	ABS			639.5–649.5 {25.18–25.57}	

3. Release any trapped air from inside the boot by using a rag-covered screwdriver.
4. Verify that the drive shaft length is within the standard.
5. If the drive shaft length is not within the standard, return to step 1.



6. Fold the new bands back by pulling on the ends with pliers, so that the end of the bands are pointing opposite the forward revolving direction of the shaft.
7. Lock the ends of the bands by bending the locking clips.

Before beginning any service procedure, refer to the 1995 MX–3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

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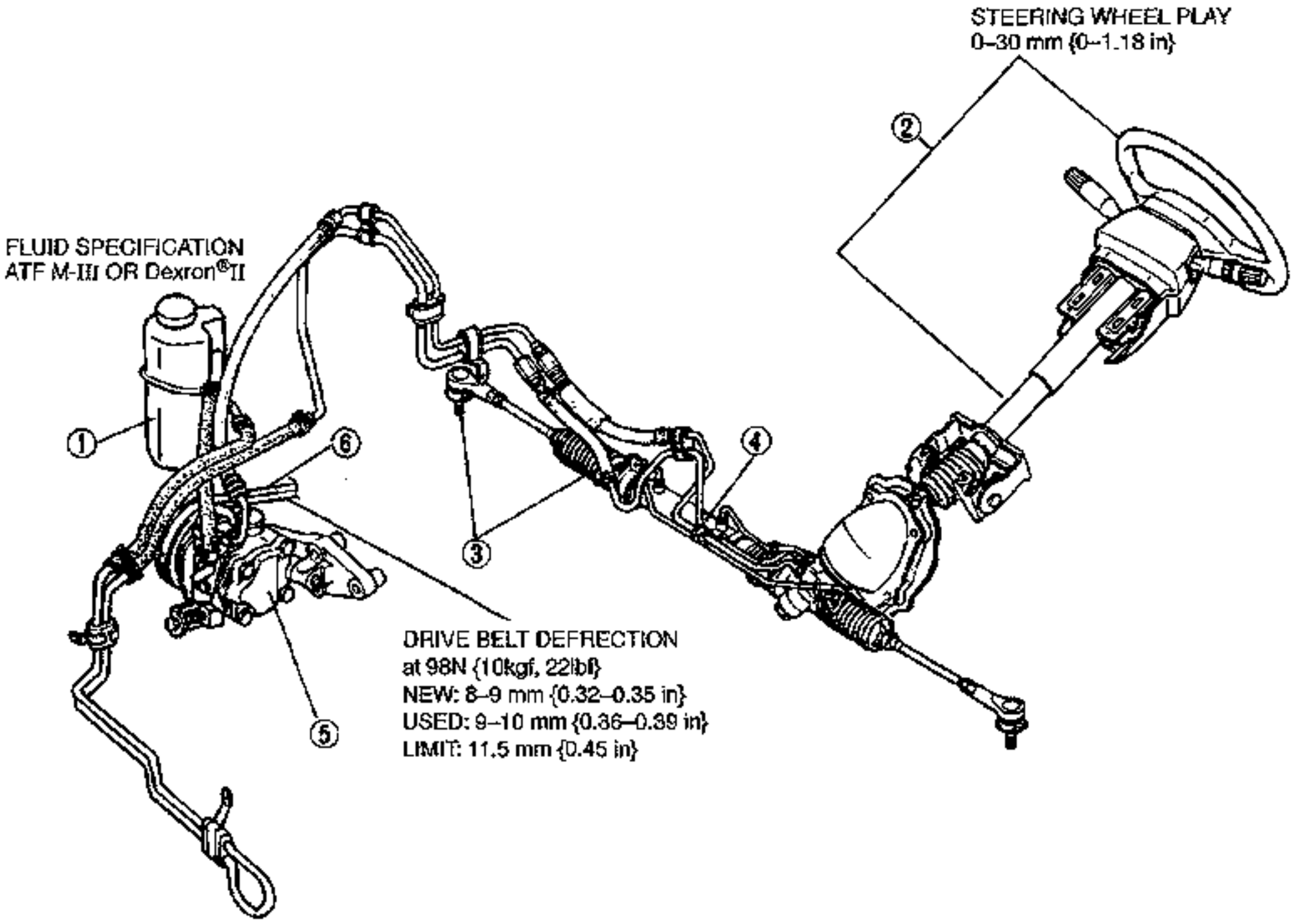
ENGINE SPEED SENSING POWER STEERING (ESPS)

B6 DOHC



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4. Steering gear and linkage
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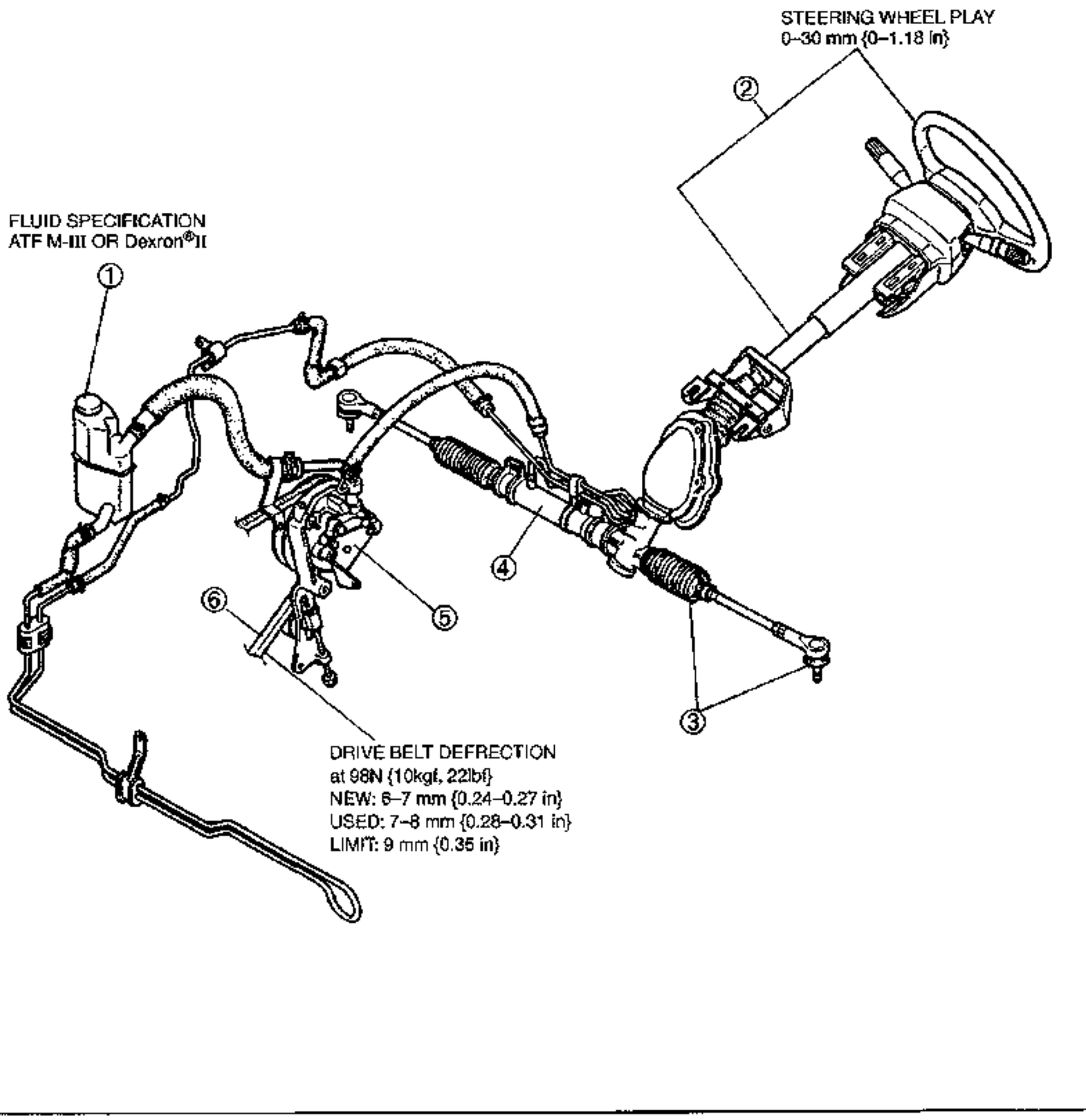
K8 DOHC



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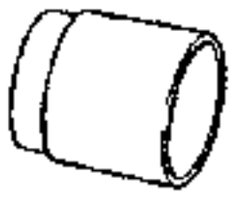
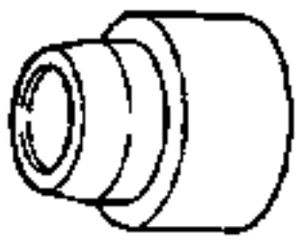
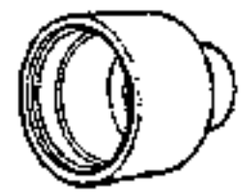
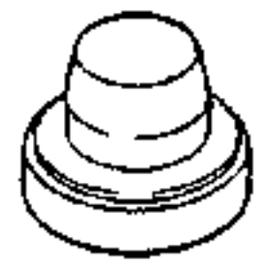
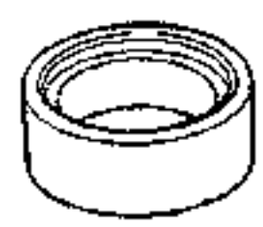
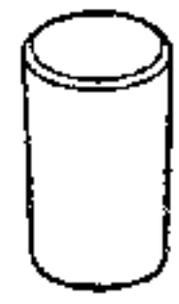
OUTLINE

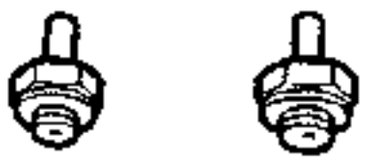
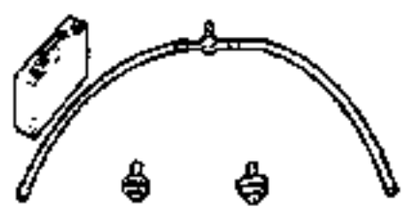
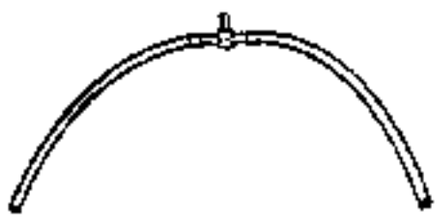
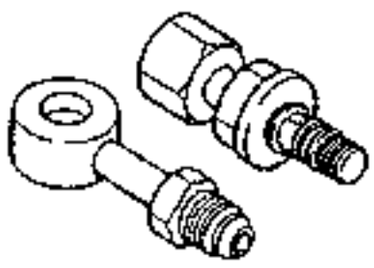
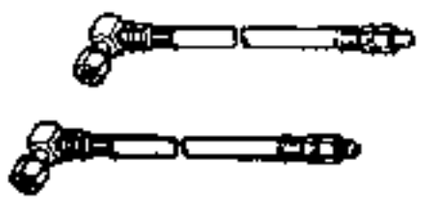
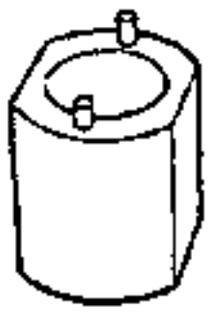
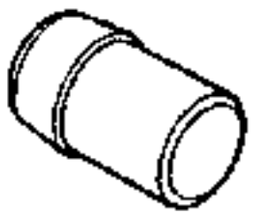
SPECIFICATIONS

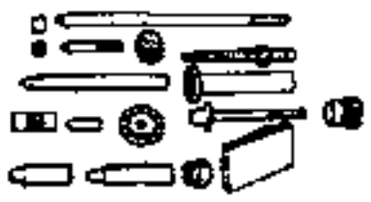
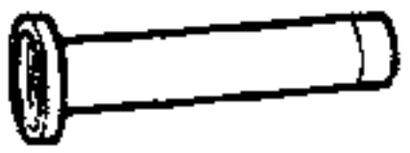
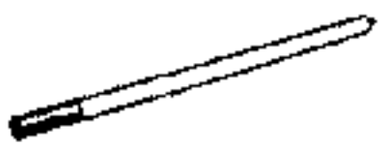
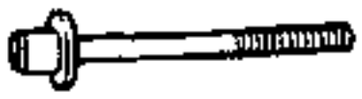
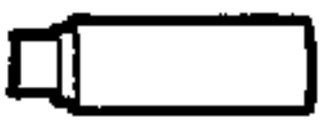
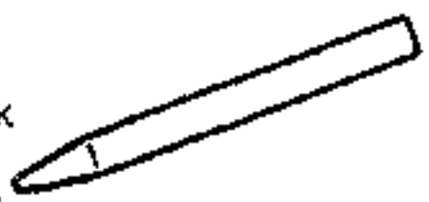
Item \ Type/Engine		Engine speed sensing power steering	
		B6 DOHC	K8 DOHC
Steering wheel	Outer diameter mm {in}	370 {14.57}, 380 {14.96} (With air bag)	
	Lock-to-lock	3.1	2.7
Steering shaft and joint	Type	Collapsible	
	Joint type	2-cross joint	
	Tilt stroke mm {in}	30 {1.18}	
Steering gear	Type	Rack-and-pinion	
	Gear ratio	15.0	
	Rack stroke mm {in}	140 {5.51}	
Oil	Capacity liters {US qt, Imp, qt}	0.8 {0.85, 0.70}	1.2 {1.27, 1.06}
	Type	ATF M-III or Dexron®II	

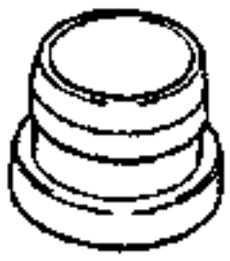
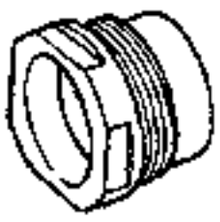
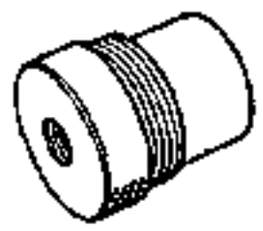
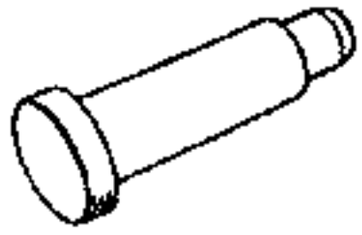
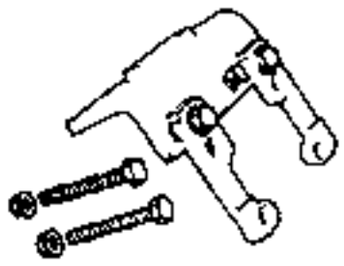
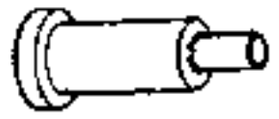
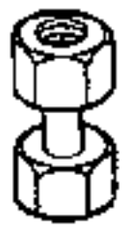
ENGINE SPEED SENSING POWER STEERING

PREPARATION
SST

49 B032 312 Protector, slipper seal		For installation of seal ring	
49 B032 311 Protector, slipper seal		For installation of pinion shaft	
49 B032 309 Installer body, pinion seal		For installation of oil seal	
49 B032 310 Protector, pinion seal		For installation of oil seal	
49 B032 306 Wrench, plug		For removal and installation of plug	
49 1243 785 Installer, dust boot		For installation of dust boot	
49 B032 315 Installer, oil seal		For installation of oil seal	
49 B032 316 Support block, plug		For removal of oil seal & bearing	
49 B032 317 Remover, bearing & oil seal		For removal of oil seal & bearing	

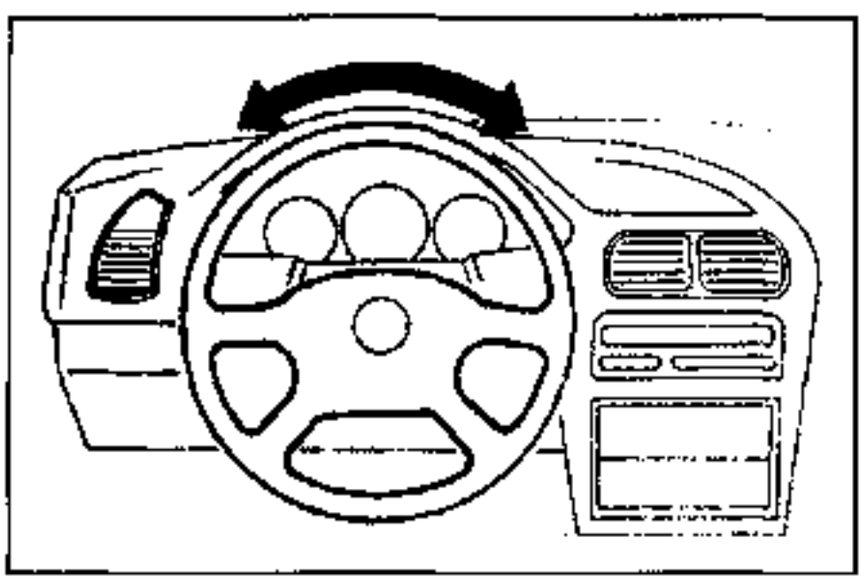
49 B032 320 Wrench		For removal and installation of adjustment cover locknut	49 0180 510B Attachment, preload 	For measurement of pinion torque
49 B032 314 Slipper seal former		For form of seal ring	49 G030 797 Handle 	For installation of pinion seal
49 B032 321 Adapter 		For hermetic inspection	49 G032 3A1 Joint hose 	For hermetic inspection
49 G032 317 Hose (Part of 49 B032 3A1) 		For hermetic inspection	49 1232 670A Gauge set, power steering 	For measurement of fluid pressure
49 1232 673 Valve body (Part of 49 1232 670A) 		For measurement of fluid pressure	49 H032 301 Wrench 	For removal of tie-rod
49 1232 672 Gauge (Part of 49 1232 670A) 		For measurement of fluid pressure	49 B032 304 Adapter 	For measurement of fluid pressure
49 H002 671 Adapter 		For measurement of fluid pressure	49 B032 313 Protector, outer box 	For installation of outer box
49 B032 307 Wrench, outer box 		For removal and installation of outer box	49 B032 318 Guide, rod seal 	For installation of inner guide & oil seal

49 B032 308 Remover body, rod seal 	For removal of oil seal	49 B032 319 Protector body, rod seal 	For installation of inner guide & oil seal
49 G032 3A0 Repair set, power steering 	For repairing power steering	49 G032 307 Remover body, oil seal (Part of 49 G032 3A0) 	For removal of oil seal
49 F032 303 Handle (Part of 49 G032 3A0) 	For removal of spacer and oil seal	49 G032 308 Installer, oil seal (Part of 49 G032 3A0) 	For installation of oil seal
49 G032 301 Attachment (Part of 49 G032 3A0) 	For removal of spacer and oil seal	49 G032 309 Protector, pinion shaft (Part of 49 G032 3A0) 	For installation of oil seal
49 G032 302 Attachment (Part of 49 G032 3A0) 	For removal of oil seal and bearing	49 G032 310 Installer, oil seal & spacer (Part of 49 G032 3A0) 	For installation of spacer and oil seal
49 G032 303 Handle (Part of 49 G032 3A0) 	For removal of oil seal and bearing	49 G032 311 Installer, guide, oil seal & spacer (Part of 49 G032 3A0) 	For installation of spacer and oil seal
49 G032 304 Installer, oil seal (Part of 49 G032 3A0) 	For installation of oil seal	49 G032 312 Installer, bearing (Part of 49 G032 3A0) 	For installation of bearing
49 G032 305 Protector, rack (Part of 49 G032 3A0) 	For removal and installation of rack	49 G032 306 Remover shaft, oil seal (Part of 49 G032 3A0) 	For removal of oil seal

49 G032 335 Installer, oil seal		For installation of oil seal	49 H032 321A Hexagon wrench (Part of 49 G032 3A0) 	For removal and installation of a djusting cover
49 D032 316 Protractor (Part of 49 G032 3A0)		For installation of adjusting cover	49 G032 319 Adapter (Part of 49 G032 3A0) 	For hermetic inspection
49 E032 301 Installer, oil seal		For installation of oil seal	49 E032 302 Installer guide, spacer & oil seal 	For installation of spacer & oil seal
49 E032 303 Installer, bearing		For Installation of bearing	49 E032 304 Installer, pinion seal 	For installation of pinion seal
49 F032 301 Hanger, power steering pump		For disassembly of oil pump	49 B032 305 Holder, power steering pump 	For installation of oil pump
49 T028 3A0 Puller set, ball joint		For removal of tie-rod end ball joint	49 9200 020 V-ribbed belt tension gauge 	For measurement of drive belt tension
49 G032 3A4 Adapter, power steering gauge		For inspection of power steering fluid pressure	49 G032 351 Adapter (Part of 49 G032 3A4) 	For inspection of power steering pressure
49 G032 352 Adapter (Part of 49 G032 3A4)		For inspection of power steering fluid pressure	49 G032 353 Bolt (Part of 49 G032 3A4) 	For inspection of power steering fluid pressure

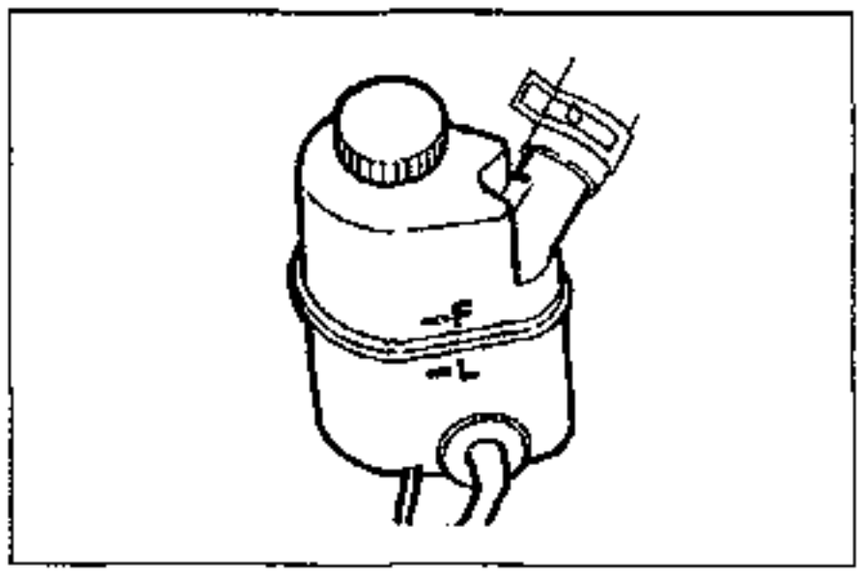
TROUBLESHOOTING GUIDE

Problem	Possible cause	Action	Page
Steering feels heavy	Poor lubrication, foreign material in mechanism, stuck or abnormal wear of steering ball joint	Lubricate or replace	N–19, 20
	Improper steering pinion preload	Adjust	N–28, 41
	Damaged steering gear	Replace gear assembly	N–19, 20
	Malfunction of steering shaft joint	Replace	N–13
	Malfunction of steering gear	Replace gear assembly	N–19, 20
	Leakage of fluid	Repair or replace	N–9
	Low fluid level or air in system	Add fluid or bleed air	N–9
	Malfunction of P/S oil pump	Replace	N–43, 44
	Damaged or loose P/S oil pump drive belt	Adjust or replace	N–51, 52
	Clogged lines	Repair or replace	—
	Damaged wheel or tire	—	Section Q
	Malfunction of suspension	—	Section R
Steering wheel pulls to one side	Damaged steering linkage	Replace	N–19, 20
	Damaged wheel or tire	—	Section Q
	Malfunction of braking system	—	Section P
	Malfunction of suspension	—	Section R
General instability	Worn or damaged steering ball joint	Replace	N–17
	Improper steering pinion preload	Adjust	N–28, 41
	Damaged steering linkage	Replace	N–19, 20
	Damaged wheel or tire	—	Section Q
	Malfunction of suspension	—	Section R
Steering feels unstable	Loose P/S oil pump drive belt	Adjust or replace	N–51, 52
	Malfunction of steering gear	Replace gear assembly	N–19, 20
	Malfunction of steering ball joint	Replace	N–17
	Malfunction of steering linkage	Replace	N–19, 20
Excessive steering wheel play	Worn steering gear	Replace gear assembly	N–19, 20
	Worn or damaged steering ball joint	Replace	N–17
	Loose steering gear mounting bolts	Tighten	N–19, 20
Steering wheel doesn't return properly	Stuck or damaged steering ball joint	Replace	N–17
	Improper steering pinion preload	Replace gear assembly	N–19, 20
	Damaged wheel or tire	—	Section Q
	Malfunction of suspension	—	Section R
Shimmy (Steering wheel vibrates circumfrencial)	Damaged steering linkage	Replace	N–19, 20
	Loose steering gear mounting bolts	Tighten	N–19, 20
	Stuck or damaged steering ball joint	Replace	N–17
	Damaged or worn front wheel bearing	Replace	Section M
	Damaged wheel or tire	—	Section Q
	Malfunction of suspension	—	Section R
Abnormal noise from steering system	Loose steering gear mounting bolts	Tighten	N–19, 20
	Malfunction of steering gear	Replace gear assembly	N–19, 20
	Obstruction near steering column	Repair	N–13
	Loose steering linkage	Tighten	N–19, 20
	Worn or damaged steering ball joint	Replace	N–17
	Loose or damaged P/S oil pump drive belt	Adjust or replace	N–51, 52
	Loose P/S oil pump bracket	Tighten	Section B1, B2
	Loose P/S oil pump mounting bolts	Tighten	N–43, 44
	Air in system	Bleed air	N– 8
	Malfunction of P/S oil pump	Replace	N–43, 44



AIR BLEEDING

1. Jack up the front of the vehicle.
2. Check the fluid level. (Refer to page N–9.)
3. Turn the steering wheel fully to the left and right several times with the engine not running.
4. Recheck the fluid level. If the level has lowered, add fluid.
5. Repeat steps 2 and 3 until the fluid level stabilizes.
6. Lower the vehicle.
7. Start the engine and let it idle.
8. Turn the steering wheel fully to the left and right several times.



9. Check that the fluid is not foamy and that the fluid level has not dropped.
10. Add fluid if necessary and repeat steps 6 and 7.

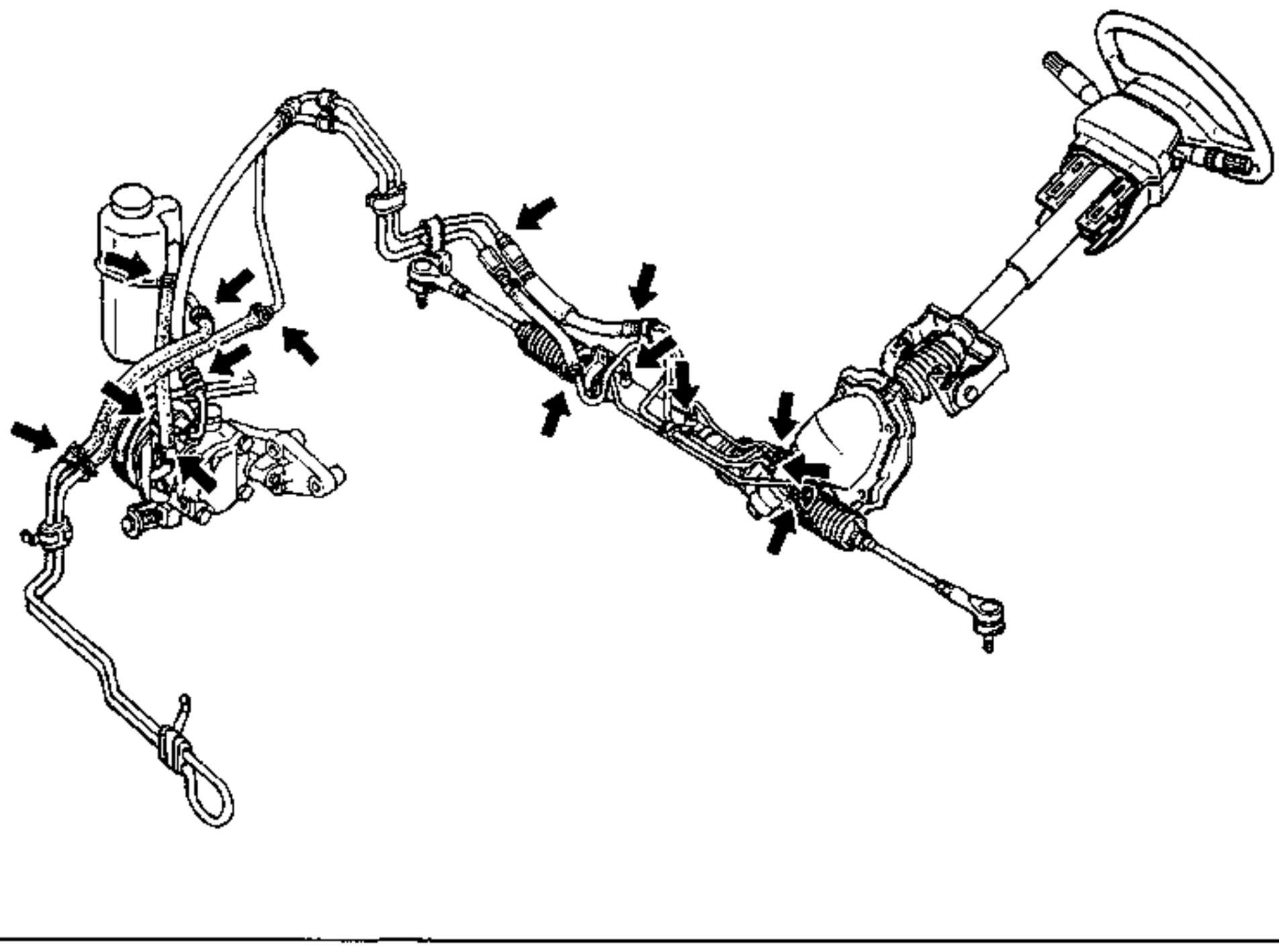
POWER STEERING FLUID
On-vehicle Inspection
Inspection of fluid level
1. Verify that the fluid level is between the F and L marks.
2. Add or remove the specified power steering fluid fluid if not within specification.

Inspection of fluid leakage

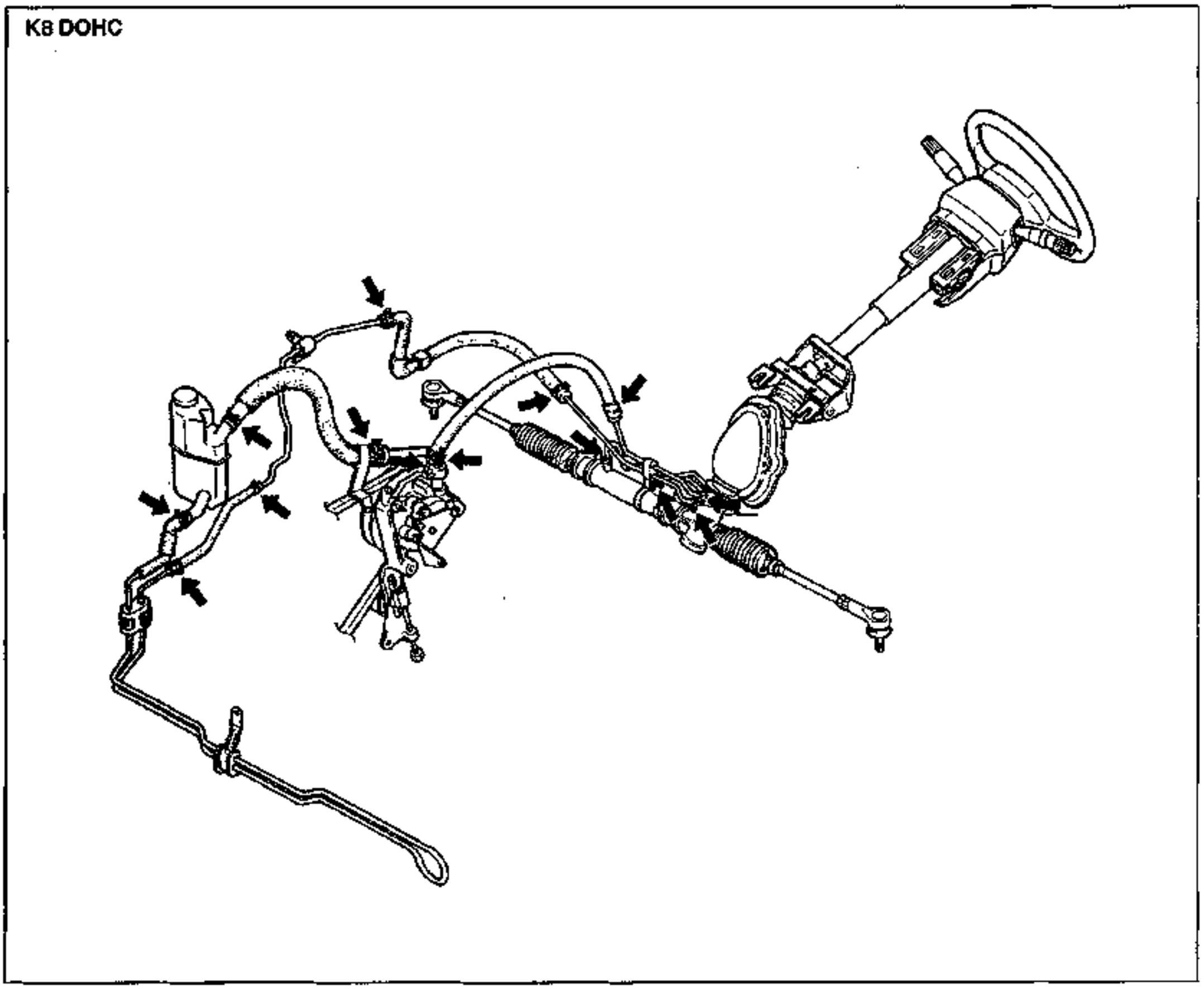
Caution
- **Never hold the steering wheel to the extreme left or right for more than five seconds with the engine running. This could damage power steering pump.**

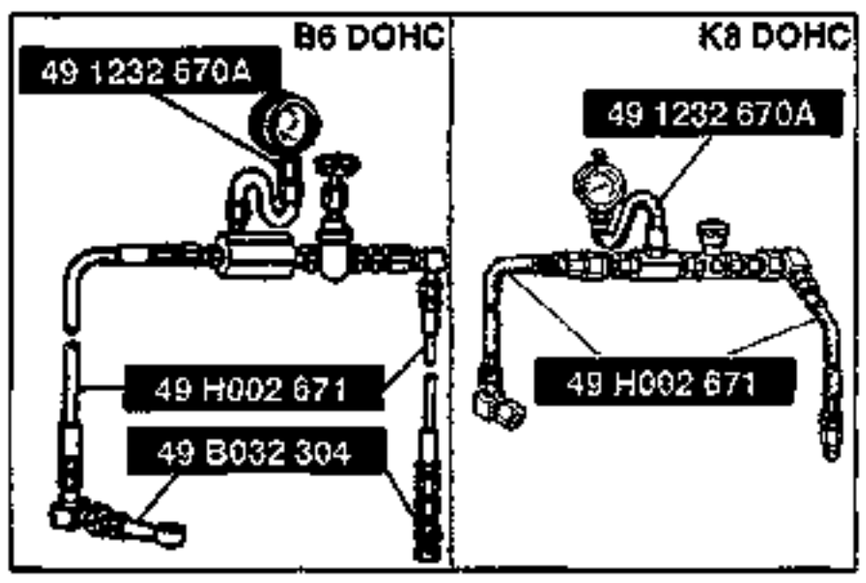
Start the engine and let it idle. Turn the steering wheel fully left and right to apply fluid pressure. Inspect the points shown in the figure for fluid leakage.

B6 DOHC



N

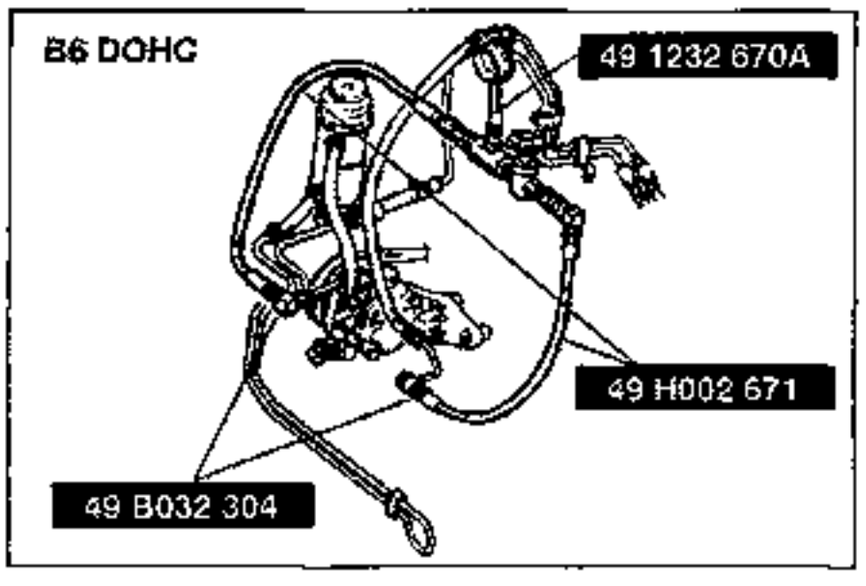




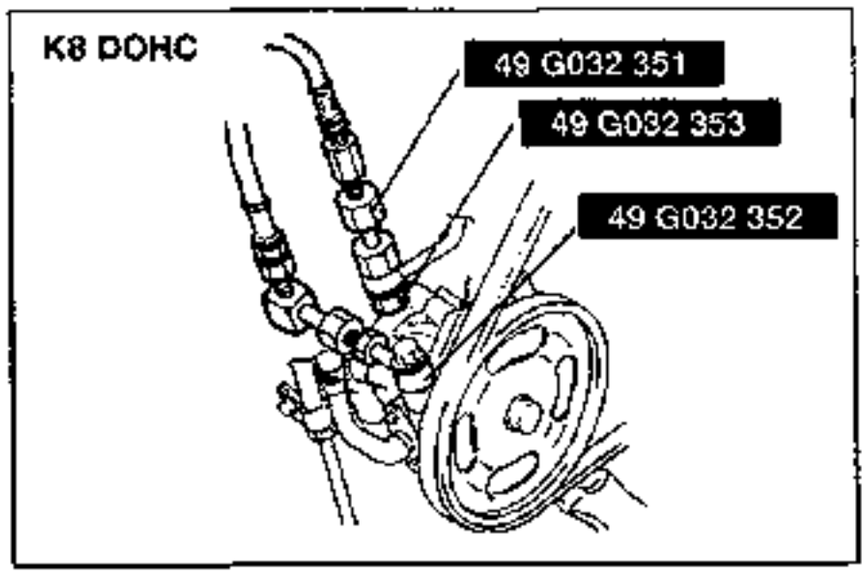
Inspection of fluid pressure

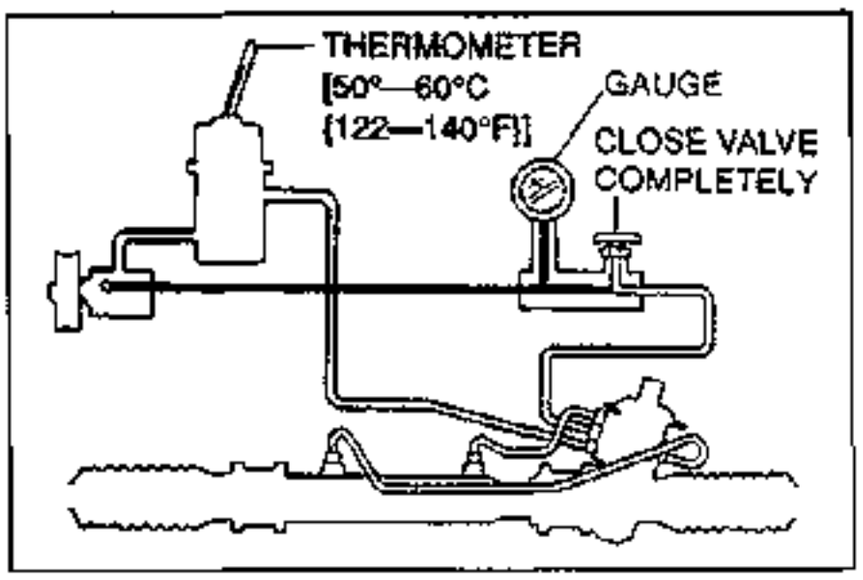
1. Assemble the **SSTs** as shown in the figure. Remove the transverse member. (K8 engine) (Refer to section R.)

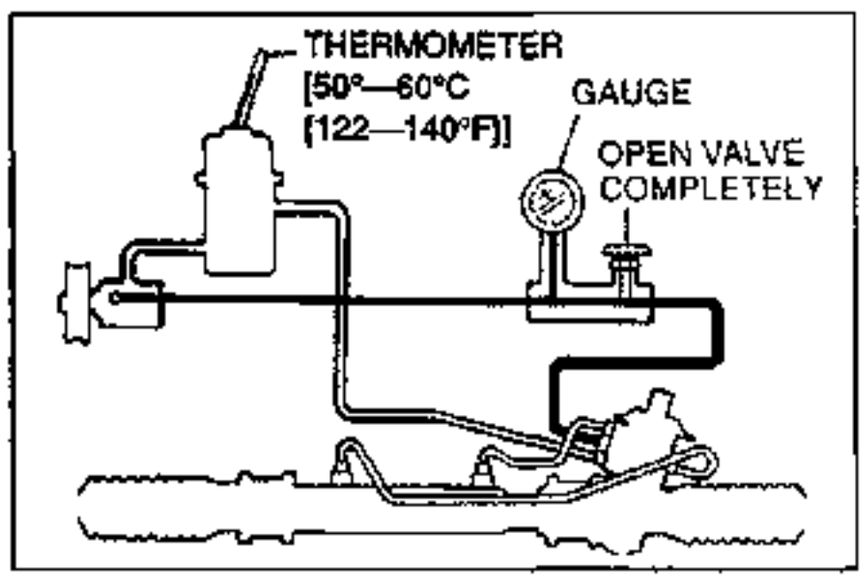
Tightening torque:
40–49 N·m {4.0–5.0 kgf·m, 29–36 ft·lbf}



2. Mark both hose connections to ensure that the hose is reinstalled in its original position.
3. Disconnect the pressure hose on the oil pump side, and attach the **SSTs.**
4. Bleed the air from the system. (Refer to page N–8.)
5. Open the gauge valve fully. Start the engine and turn the steering wheel fully left and right to raise the fluid temperature to **50–60 °C {122–140°F}**.







6. Close the gauge valve completely. Increase the engine speed to **1,000–1,500 rpm** and measure the fluid pressure generated by the oil pump. If the pressure is below specification, replace the oil pump assembly.

   Oil pump fluid pressure:
   7,846–8,335 kPa {80.0–80.5 kgf/cm², 1,138–1.208 psi}

   Caution
   - **Do not left the valve stay closed for more than 5 seconds. The increase in fluid temperature will damage the power steering oil pump.**

7. Open the gauge valve fully again and increase the engine speed to **1,000–1,500 rpm**.

   Caution
   - **Never hold the steering wheel to the extreme left or right for more than five seconds. This could damage power steering oil pump.**

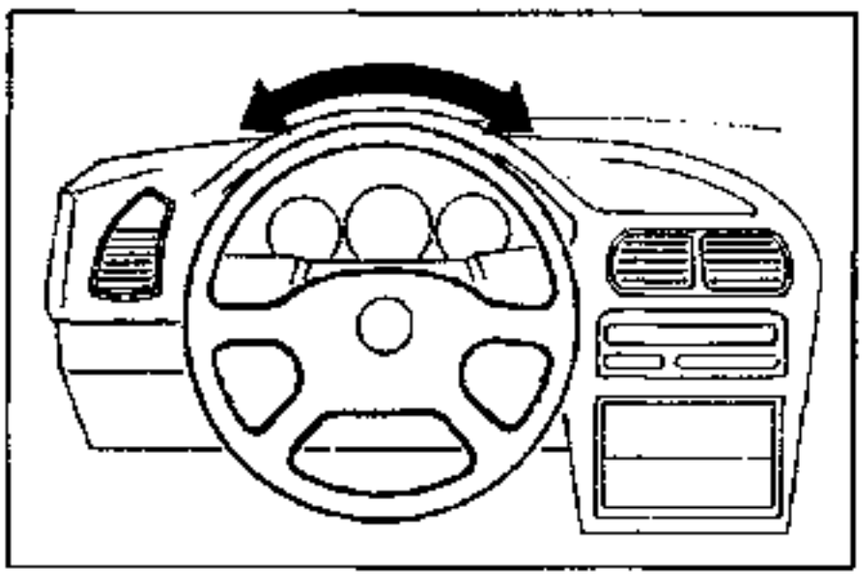
8. Turn the steering wheel fully to the left and right and measure the fluid pressure generated by the gear housing. If the pressure is below specification, repair or replace the steering gear assembly.

   Gear housing fluid pressure:
   7,846–8,335 kPa {80.0–80.5 kgf/cm², 1,138–1.208 psi}

9. Remove the gauge set. Install the high pressure hose and tighten the joint nut to the specified torque.

   Tightening torque:
   B6 DOHC: 16–23 N·m {1.6–2.4 kgf·m, 12–17 ft·lbf}
   K8 DOHC: 24–35 N·m {2.4–3.6 kgf·m, 18–26 ft·lbf}

10. Bleed the air from the system. (Refer to page N–8.)



STEERING WHEEL AND COLUMN

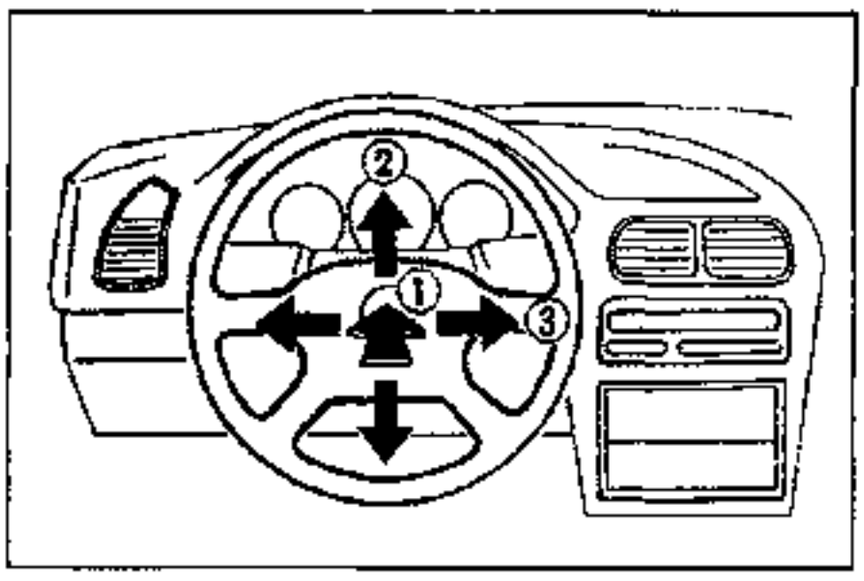
On-vehicle inspection

Steering wheel play

With the wheel in the straight-ahead position, gently turn the steering wheel to the left and right to determine if play is within specification.

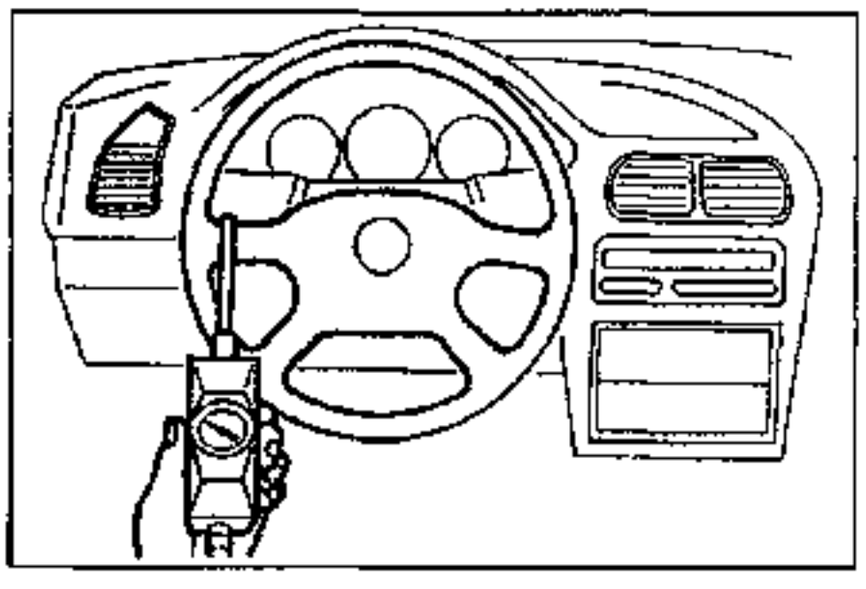
Play: 0–30 mm {0–1.18 in}

If play exceeds specification, either the steering joints are worn or the backlash of the steering gear is excessive.



Looseness of steering wheel and column

Move the steering wheel in directions ①, ②, and ③ to check for column bearing wear, steering shaft joint play, steering wheel looseness, and column looseness.



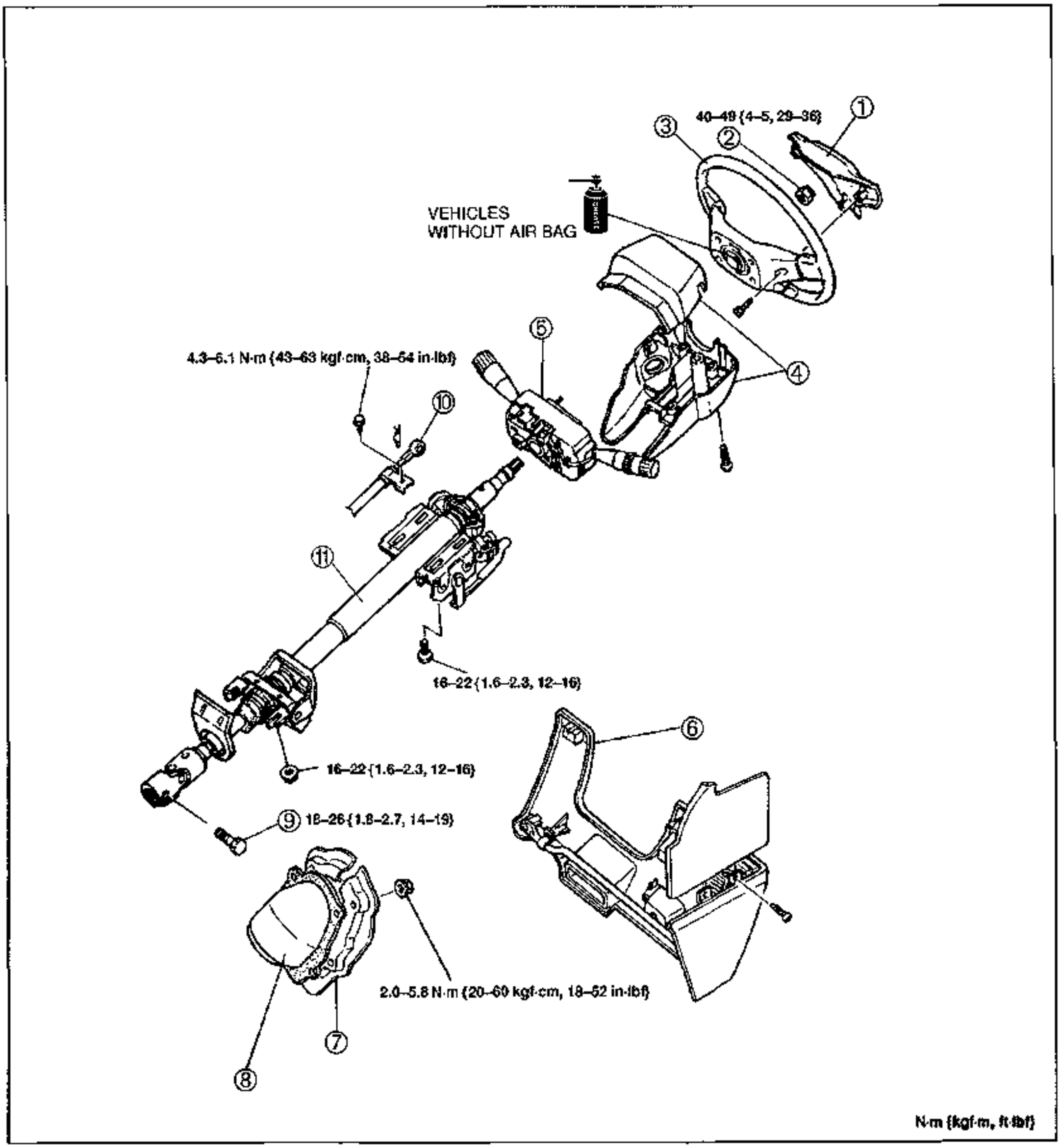
Steering wheel effort

1. With the vehicle on a hard level surface, move the steering wheel to put the wheels in the straight-ahead position.
2. Turn the steering wheel to the left and right five times or more.
3. Attach a pull scale to the outer of the steering wheel, and then starting with the wheels in the straight-ahead position, check the steering effort required to turn the steering wheel to the left and to the right.
4. If the measured effort exceeds specification, check the following: rotation-starting torque of the pinion, rotation torque of each ball joint, and seizure of each joint.

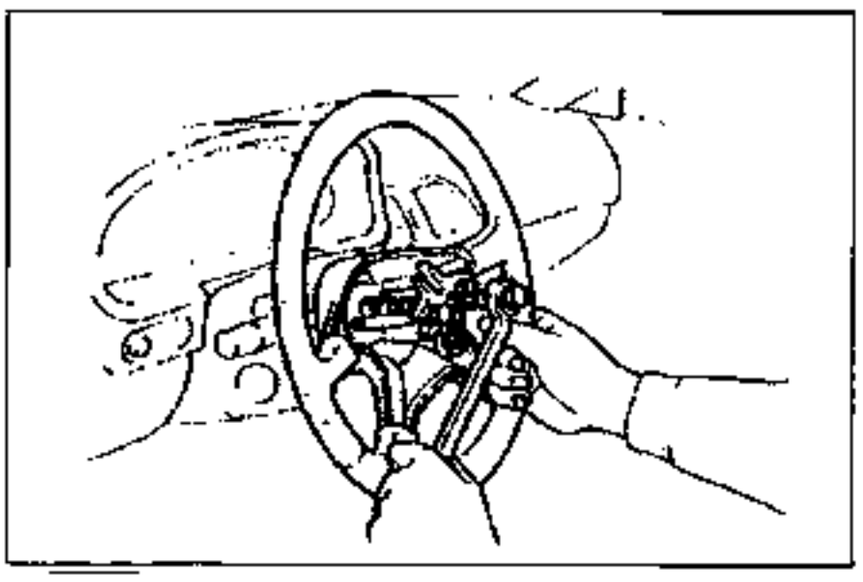
Steering wheel effort: 108 N {11 kgf, 24.2 lbf}

Removal/Installation

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



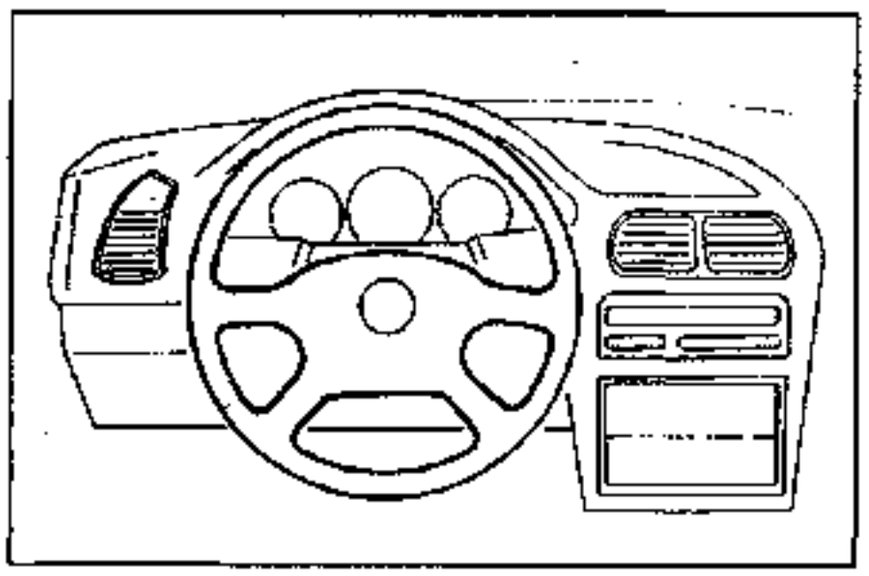
1. Horn cap or air bag module
   Service ..... Body electrical troubleshooting manual, section S
2. Locknut
3. Steering wheel
   Removal Note ..... page N–14
   Installation Note ..... page N–14
4. Column cover
5. Combination switch
   Operation ..... section T
6. Lower panel
7. Set plate
8. Dust cover
9. Fixing bolt (Intermediate shaft / Pinion shaft)
   Installation Note ..... page N–21
10. Interlock cable (ATX only)
11. Steering shaft assembly
    Disassembly / Inspection / Assembly ..... page N–14



Removal Note
Steering wheel

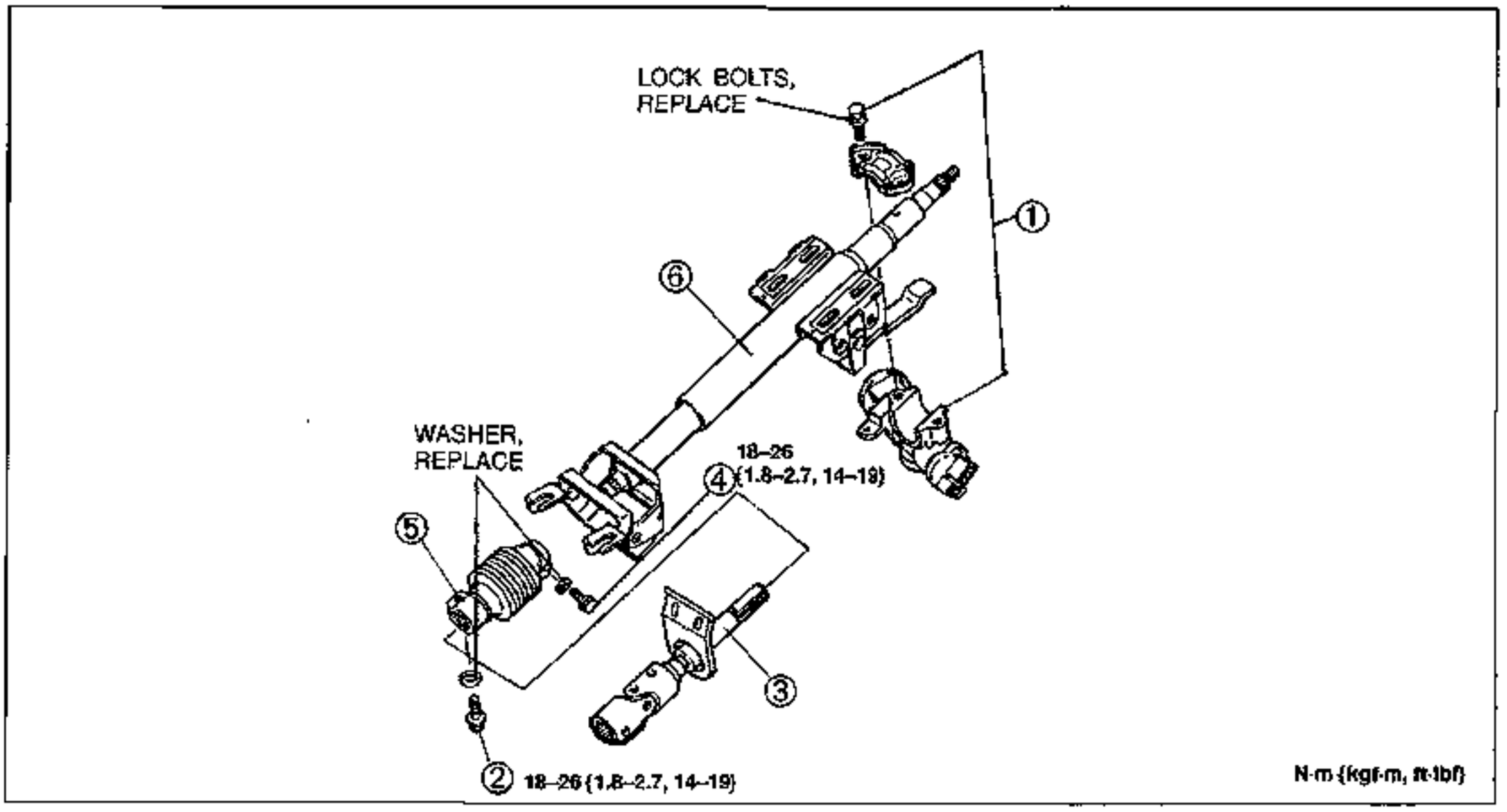
Caution
- **Do not try to remove the steering wheel by hitting the shaft with a hammer. The column will collapse.**

Remove the steering wheel with a suitable puller.

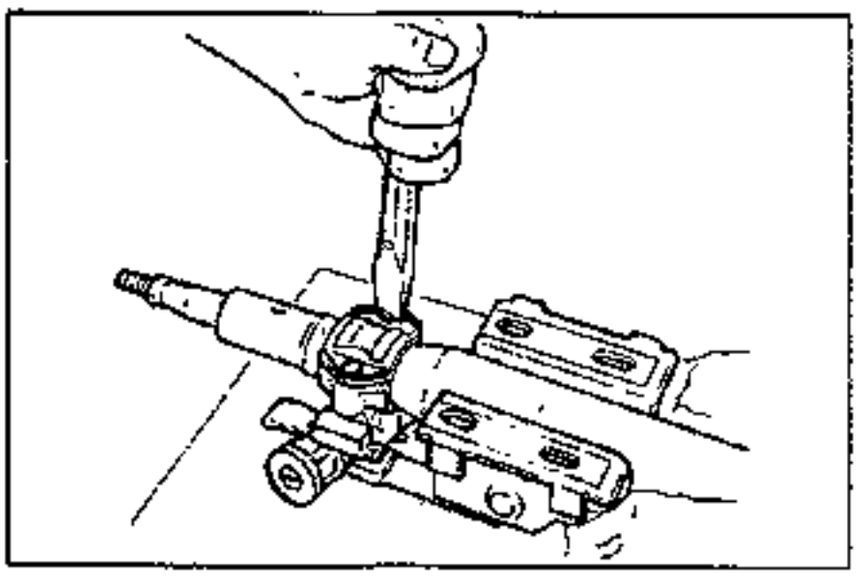


Installation Note
Steering wheel
With the wheels in the straight-ahead position, install the steering wheel.

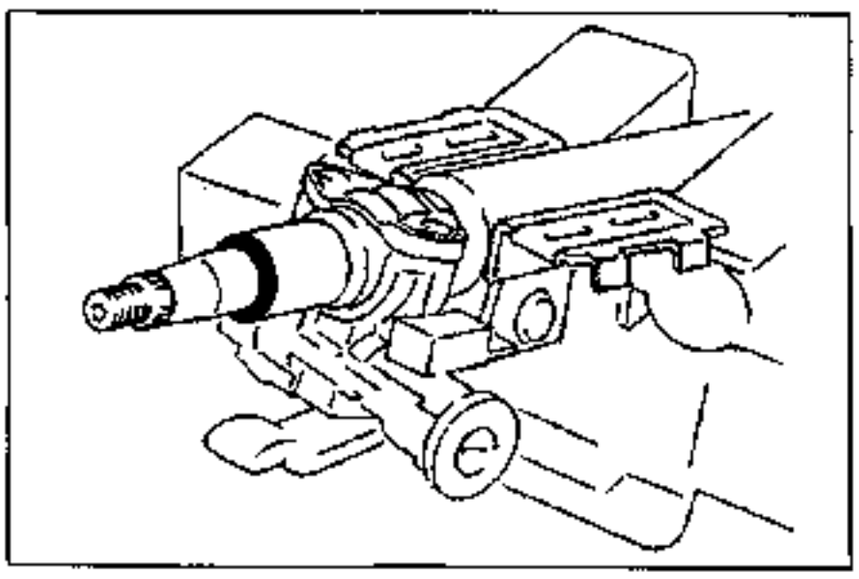
Disassembly / Inspection / Assembly
1. Disassemble in the order shown in the figure, referring to **Disassembly Note.**
2. Assemble in the reverse order of disassembly, referring to **Assembly Note.**



1. Steering lock assembly
   Disassembly Note ..... page N–15
   Inspection ..... page N–16
   Assembly Note ..... page N–16
2. Fixing bolt
   (Universal joint / Intermediate shaft)
3. Intermediate shaft
   Inspection ..... page N–15
4. Fixing bolt
   (Steering shaft / Universal joint)
5. Universal joint
   Inspection ..... page N–15
6. Energy absorbing shaft assembly
   Inspection ..... page N–15

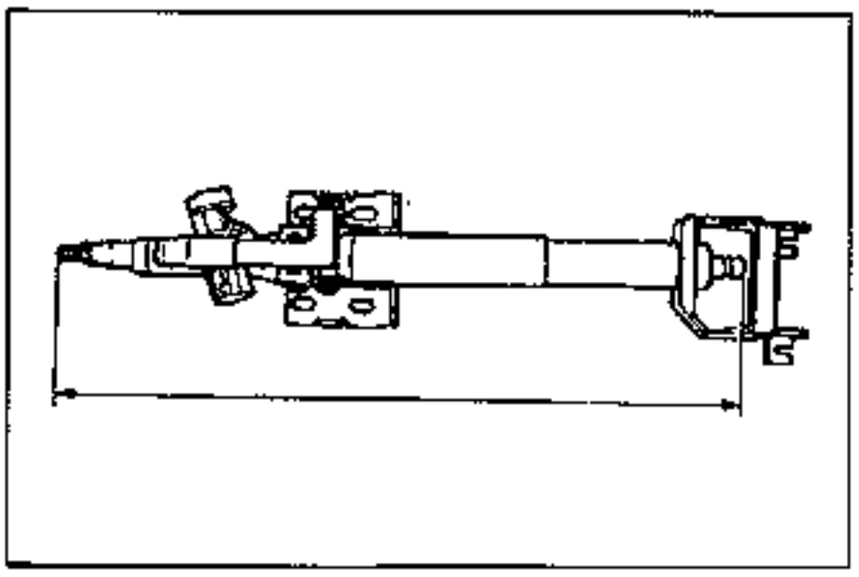


Disassembly Note
Steering lock assembly
Use a chisel to make a groove in the head of the steering lock mounting bolts. Remove the bolts with a screwdriver; then remove the steering lock assembly.



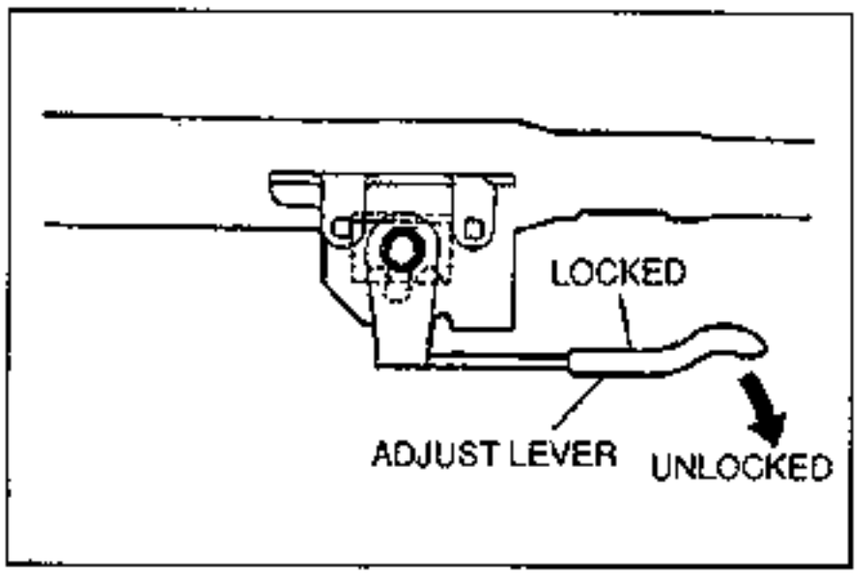
Inspection
Check for the following and replace the assembly if necessary.

Steering shaft assembly
1. Column bushing wear.

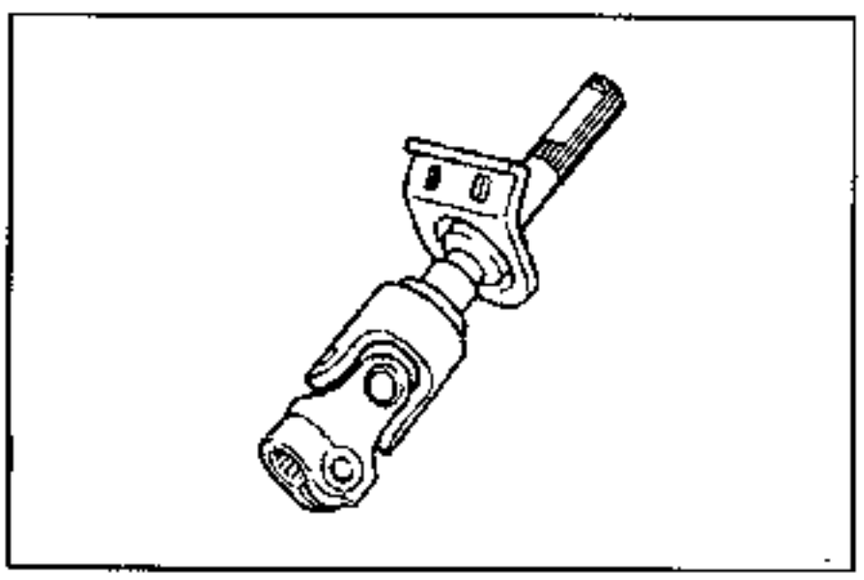


2. Steering shaft length.

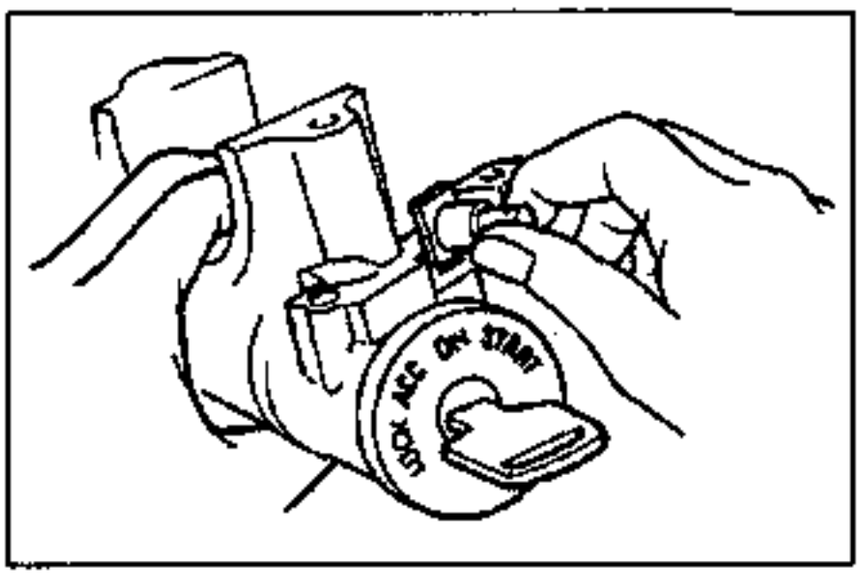
Specified length
With air bag: 570.6–572.6 mm {22.47–22.54 in}
Without air bag (Canada):
558.3–560.3 mm {21.99–22.05 in}



Inspection of tilt operation
Check the following and repair or replace if necessary.
1. Adjust lever operates smoothly to locked position from unclocked position.
2. Steering shaft is held securely in the locked position.

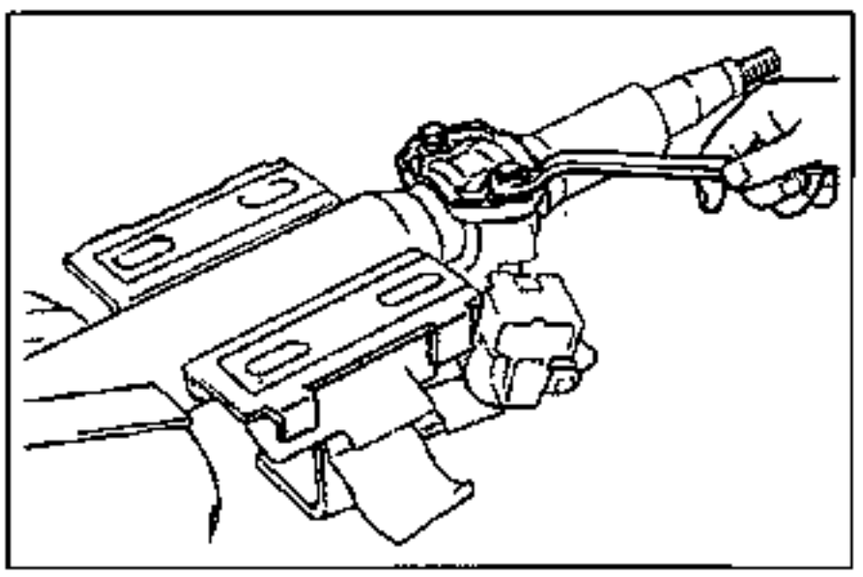


Intermediate shaft and universal joint
Universal joint and intermediate shaft looseness, abnormal noise, or sticking.



Steering lock assembly
(ATX)

Verify that the cable connector does not move when the key is in the LOCK position and that it moves freely with the key in other positions.



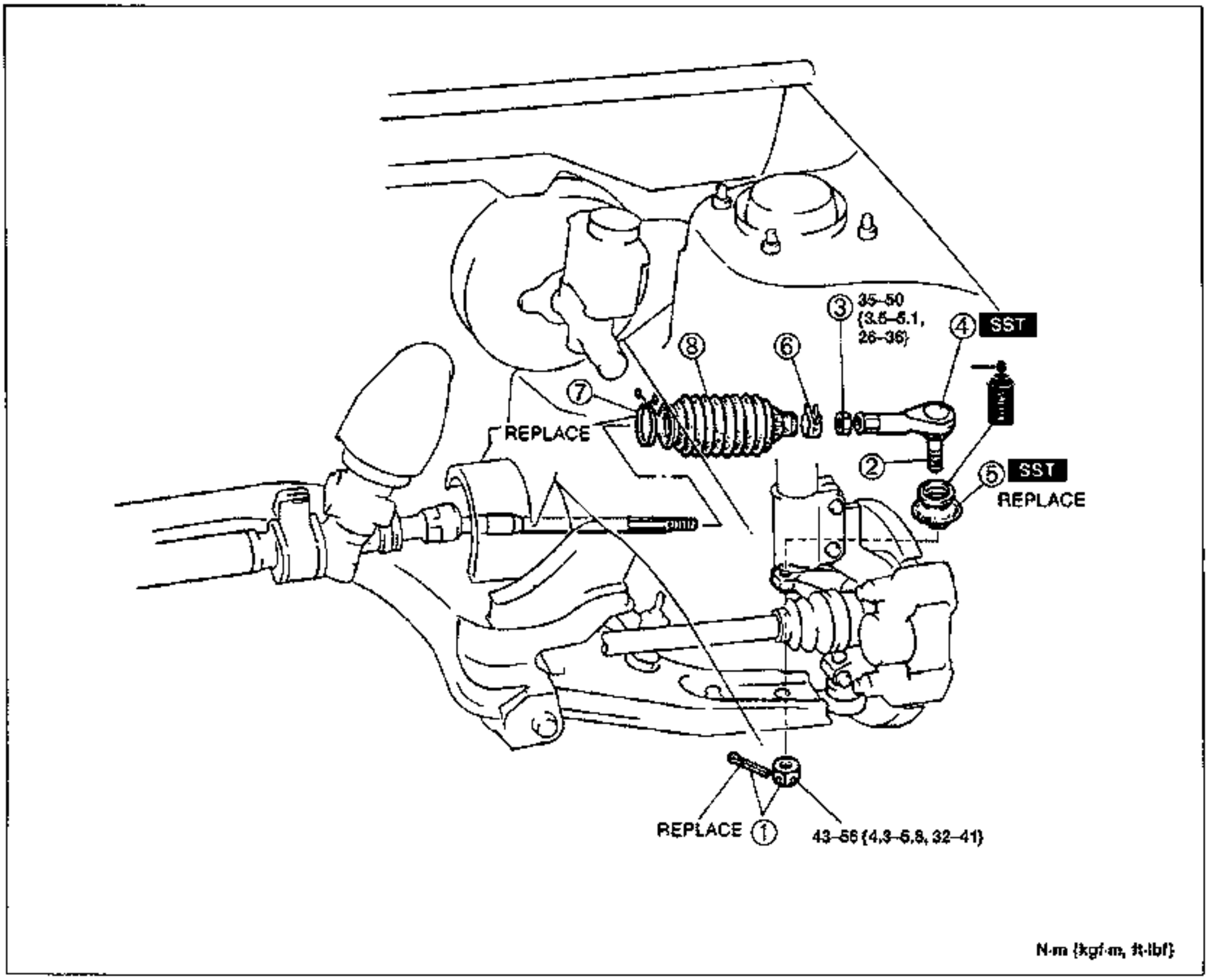
Assembly Note
Steering lock assembly

Install the steering lock assembly on the jacket. Install new steering lock mounting bolts, and tighten them until the heads break off.

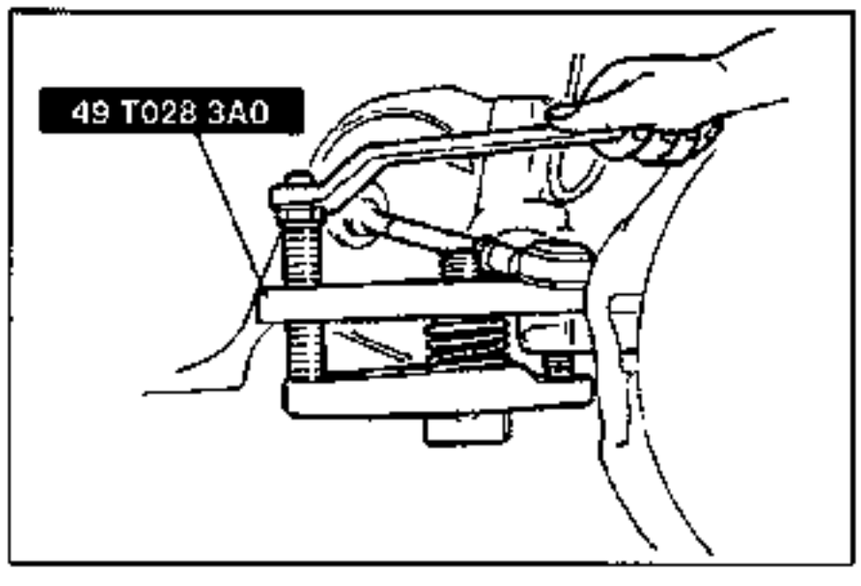
BOOT

Removal / Installation

1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Install in the reverse order of removal, referring to **Installation Note.**
3. Check the front wheel alignment. (Refer to Section R.)



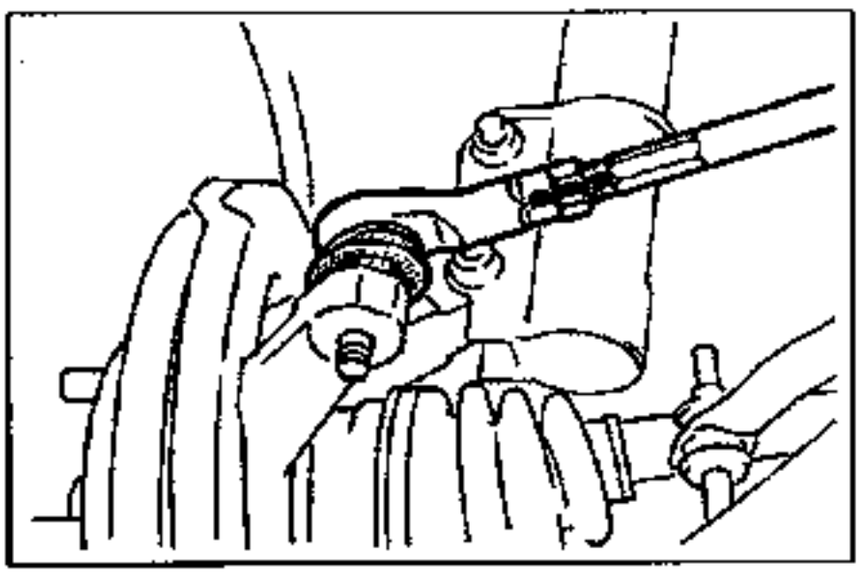
1. Cotter pin, nut
2. Tie-rod end ball joint
   Removal Note ..... below
3. Locknut
   Removal Note ..... page N–18
4. Tie-rod end
5. Tie-rod end boot
   Removal Note ..... page N–18
   Installation Note ..... page N–18
6. Boot band
7. Boot wire
8. Rack boot



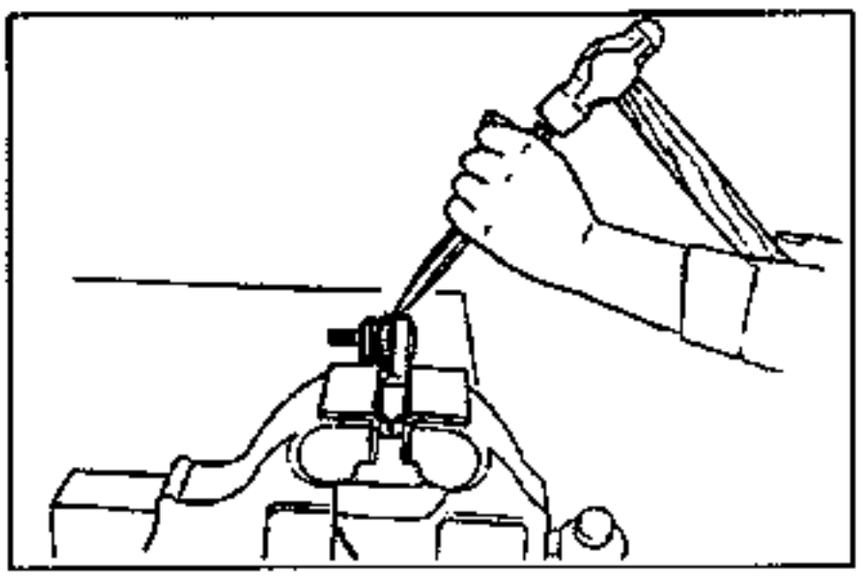
Removal Note

Tie-rod end ball joint

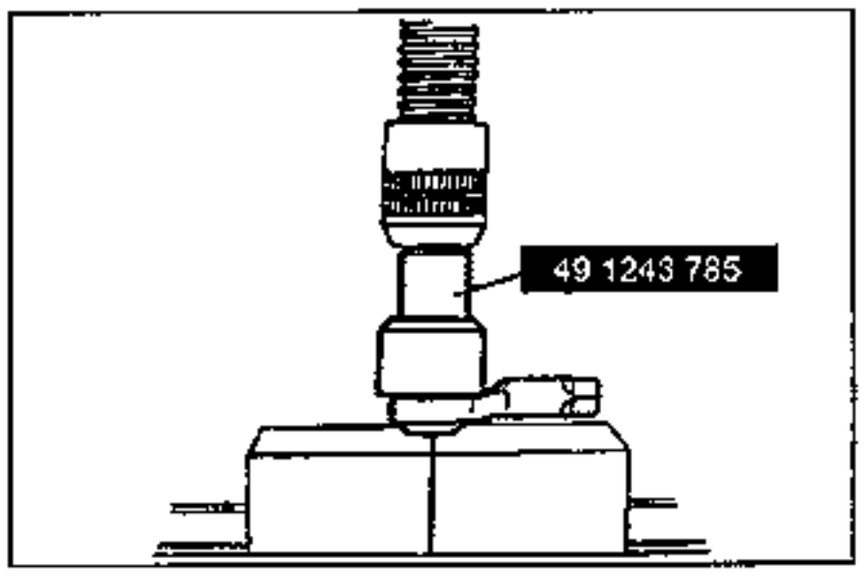
Disconnect the tie-rod end ball joint by using the **SST.**



Locknut
Mark the tie-rod end, the locknut, and the tie rod.



Tie-rod end boot
1. Secure the tie-rod end ball joint in a vise.
2. Place a chisel against the boot and hold it at the angle shown.
3. Remove the boot by tapping it with a hammer.

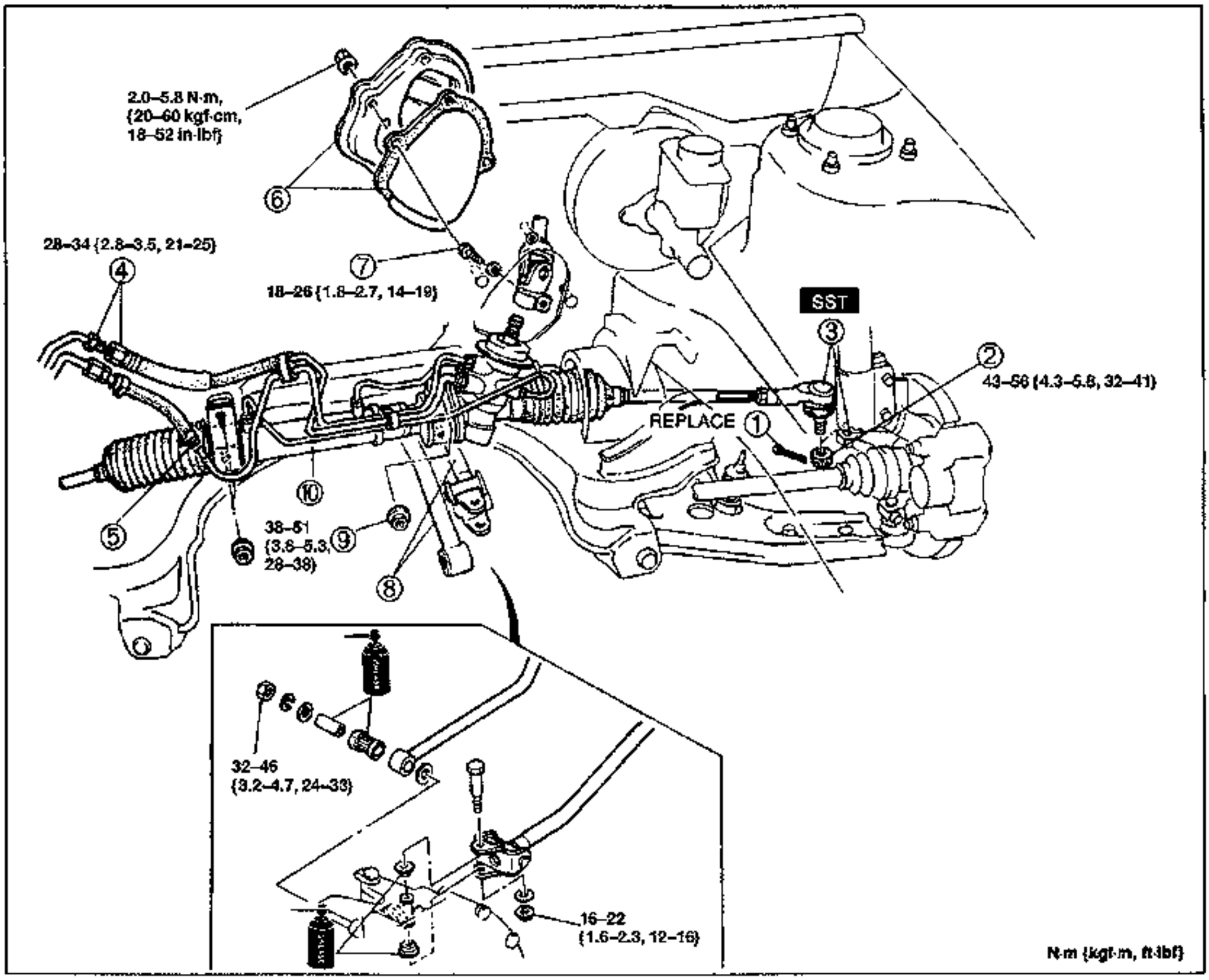


Installation Note
Tie-rod end boot
1. Wipe the grease off the tie-rod end ball joint.
2. Put a small amount of lithium-based grease into a new dust boot.
3. Install the dust boot onto the tie-rod end ball joint by using the **SST** and a press.
4. Wipe away any excess grease.

STEERING GEAR AND LINKAGE (B6 DOHC)

Removal / Installation

1. Loosen the wheel lug nuts.
2. Jack up the front of the vehicle and support it with safety stands.
3. Remove the wheels.
4. Remove in the order shown in the figure, referring to **Removal Note**.
5. Install in the reverse order of removal, referring to **Installation Note**.
6. After installation, bleed air from the steering system and adjust the toe-in if necessary. (Refer to section R.)

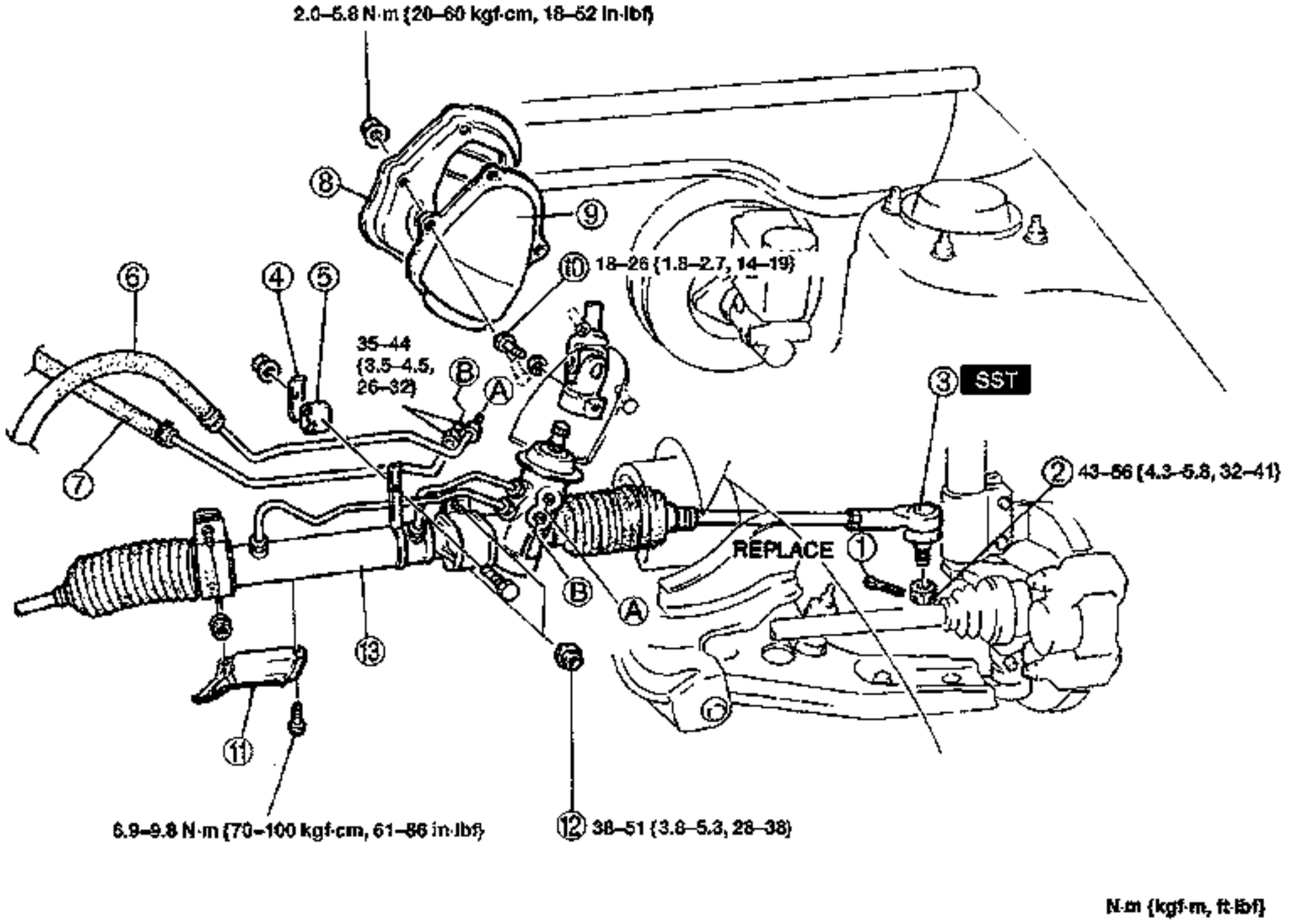


1. Cotter pin
2. Locknut
3. Tie-rod end ball joint
   Removal Note ..... page N–17
4. Pressure pipe
5. Return hose
6. Set plate and dust cover
7. Fixing bolt (intermediate shaft / pinion shaft)
   Installation Note ..... page N–21
8. Extension bar / Control rod (MTX)
9. Nut (Steering gear mounting bolt)
   Installation Note ..... page N–21
10. Steering gear and linkage
    Removal Note ..... page N–21

STEERING GEAR AND LINKAGE (K8 DOHC)

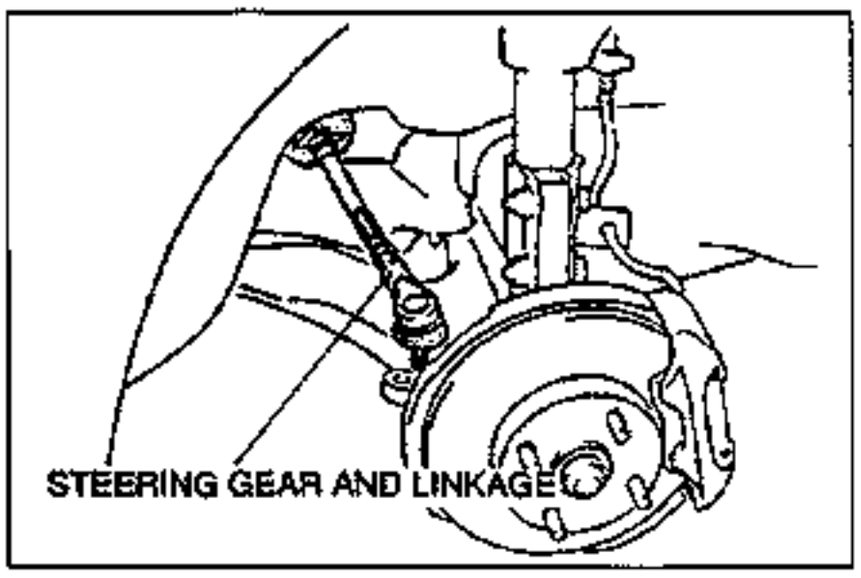
Removal / Installation

1. Loosen the wheel lug nuts.
2. Jack up the front of the vehicle and support it with safety stands.
3. Remove the wheels.
4. Remove in the order shown in the figure, referring to **Removal Note**.
5. Install in the reverse order of removal, referring to **Installation Note**.
6. After installation, bleed air from the steering system and adjust the toe-in if necessary. (Refer to section R.)

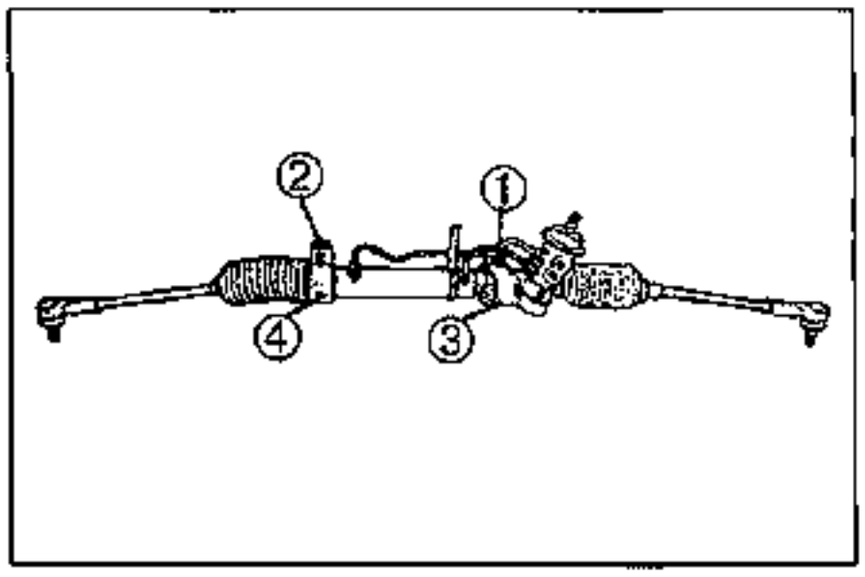


N·m {kgf·m, ft·lbf}

1. Cotter pin
2. Locknut
3. Tie-rod end ball joint
   Removal Note ..... page N–17
4. Support bracket
5. Tube rubber
6. Pressure pipe
7. Return pipe
8. Set plate
9. Dust cover
10. Fixing bolt
    (intermediate shaft / pinion shaft)
    Installation Note ..... page N–21
11. Insulator
12. Nut (Steering gear mounting bolt)
    Installation Note ..... page N–21
13. Steering gear and linkage
    Removal Note ..... page N–21

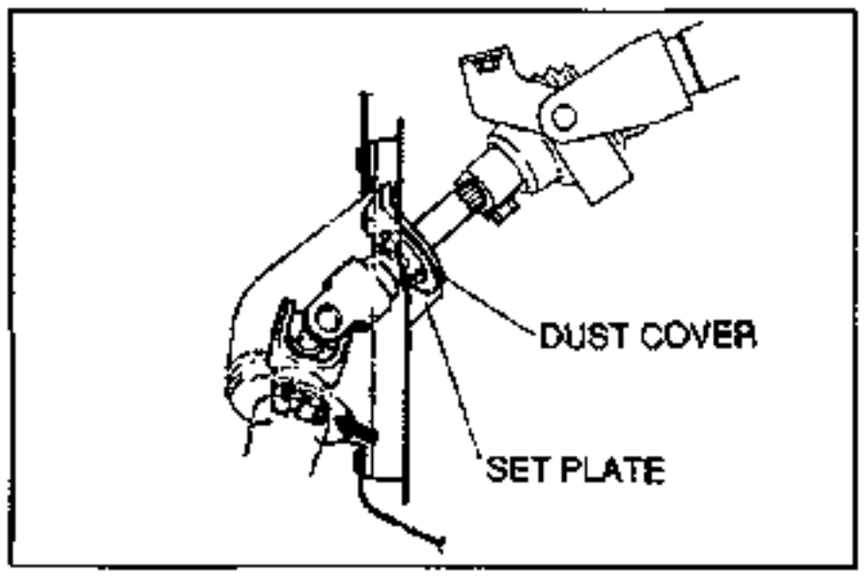


Removal Note
Steering gear and linkage
Remove the steering gear from the right side of the vehicle.



Installation Note
Nut
Tighten the steering gear mounting nuts in the order shown in the figure.

Tightening torque:
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}

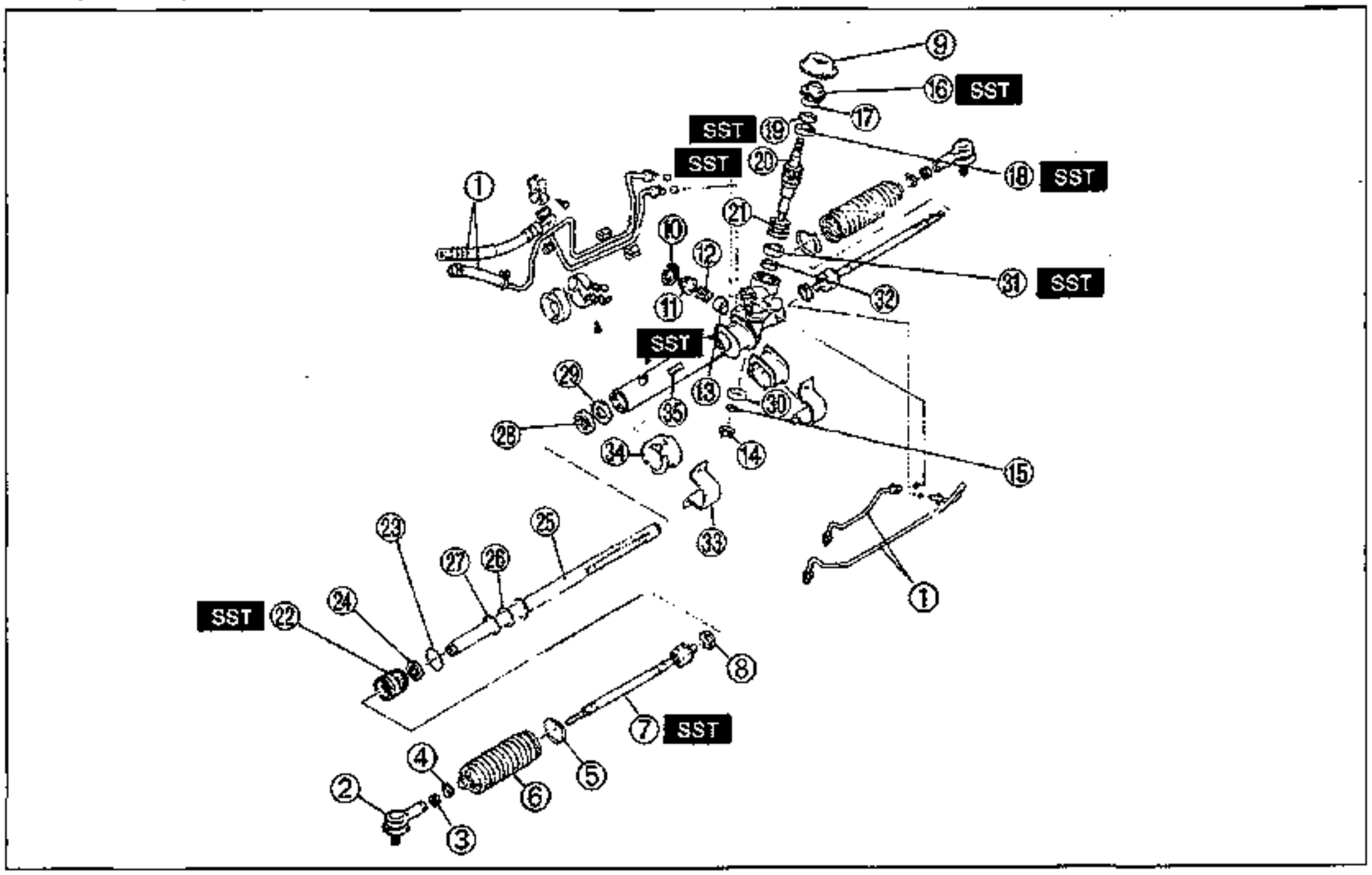


Fixing bolt (Intermediate shaft / Pinion shaft)
1. Remove the intermediate shaft and pinion shaft bolts, and move the intermediate shaft upward.
2. Connect the intermediate shaft and the pinion shaft. Tighten the bolts, to the specified torques.
3. Attach the dust cover onto the set plate.

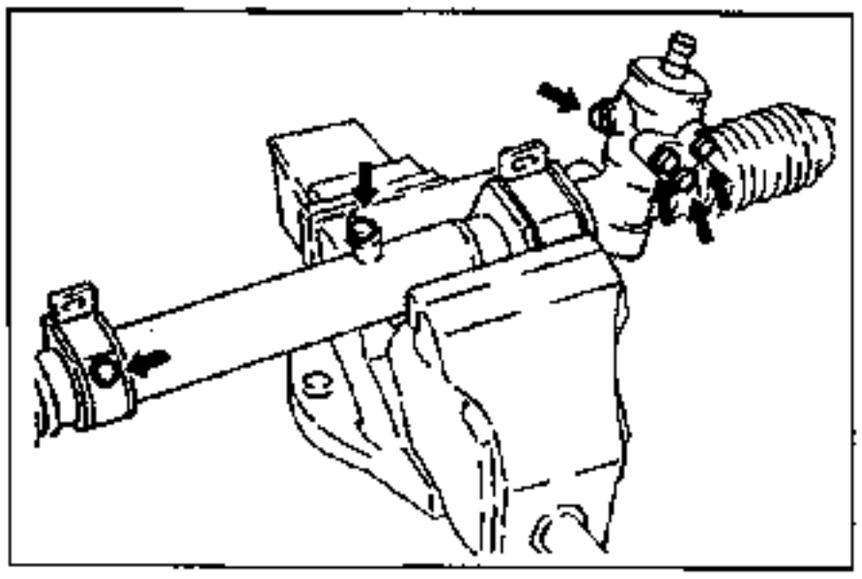
Tightening torque:
18–26 N·m {1.8–2.7 kgf·m, 14–19 ft·lbf}

Disassembly / Inspection (B6 DOHC)

1. Disassemble in the order shown in the figure, referring to **Disassembly Note.**
2. Inspect all parts and repair or replace as necessary.



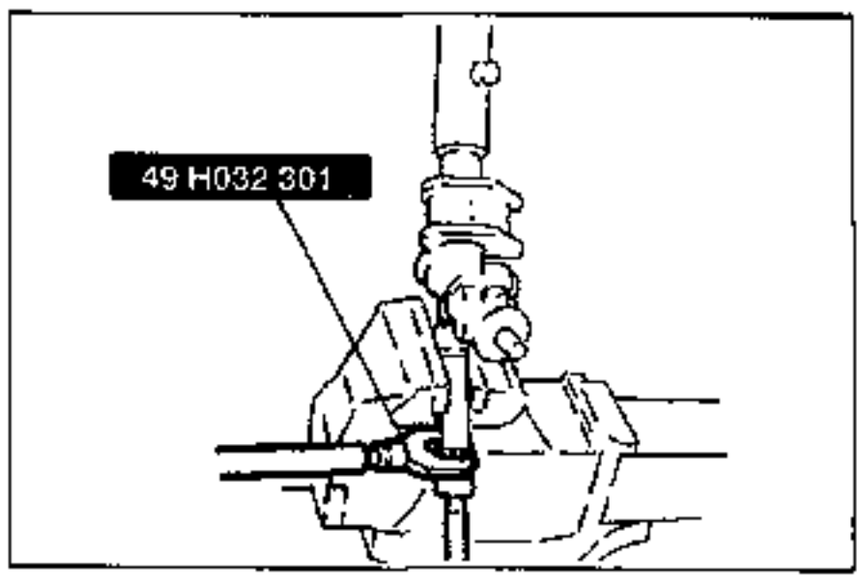
1. Oil pipe
   Disassembly Note ..... page N–23
2. Tie rod end
3. Locknut
4. Boot band
5. Boot wire
6. Boot
7. Tie rod
   Disassembly Note ..... page N–23
   Inspect for damage
   Inspect operation of ball joint
8. Locknut
   Disassembly Note ..... page N–23
9. Dust cover
10. Washer
11. Adjustment cover
12. Spring
13. Support yoke
14. Housing cover
    Disassembly Note ..... page N–23
15. Locknut
16. Plug
    Disassembly Note ..... page N–23
    Inspection ..... page N–25
17. O-ring
18. Bearing
    Disassembly Note ..... page N–24
19. Oil seal
    Disassembly Note ..... page N–24
20. Pinion shaft assembly
    Inspect for damage and wear
21. Seal ring
22. Outer box
    Disassembly Note ..... page N–24
23. O-ring
24. U-gasket
25. Steering rack
    Inspection ..... page N–25
26. Seal ring
27. O-ring
28. Oil seal
    Disassembly Note ..... page N–24
29. Inner guide
    Disassembly Note ..... page N–24
30. Bearing
31. Oil seal
32. Bearing
33. Mounting bracket
34. Mounting rubber
35. Gear housing
    Inspect for damage and crack



Disassembly Note

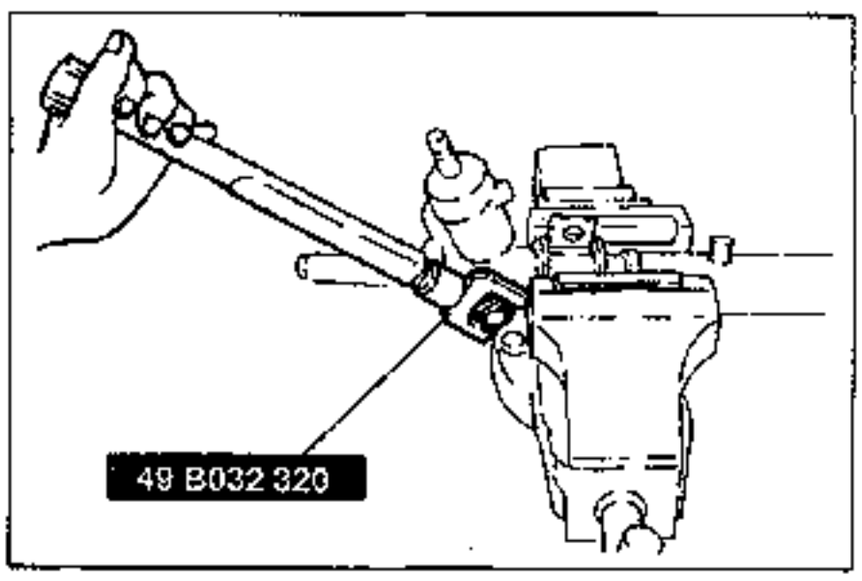
Oil pipe

After disconnecting the pipes, use a plug or adhesive type tape to seal each port to prevent the entry of foreign materials.



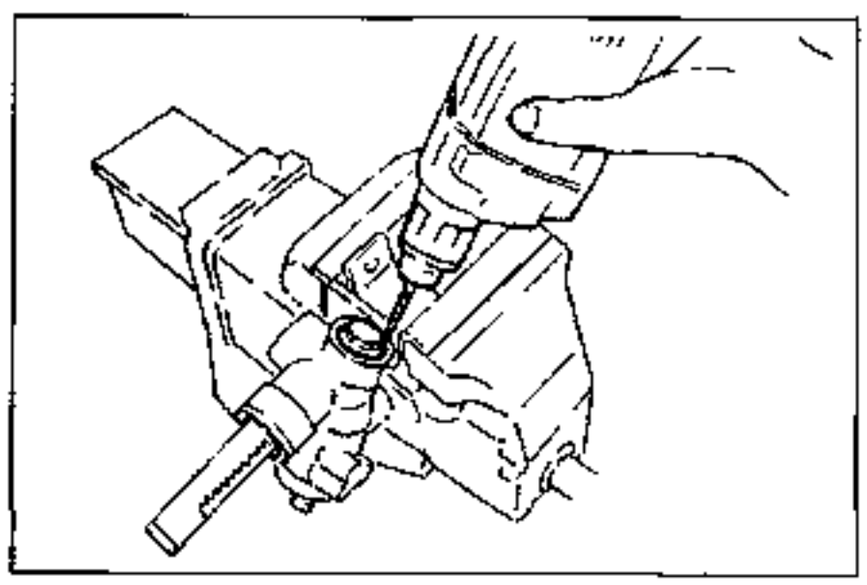
Tie rod

Use the **SST** to remove the tie rod.



locknut

Use the **SST** to remove the locknut.

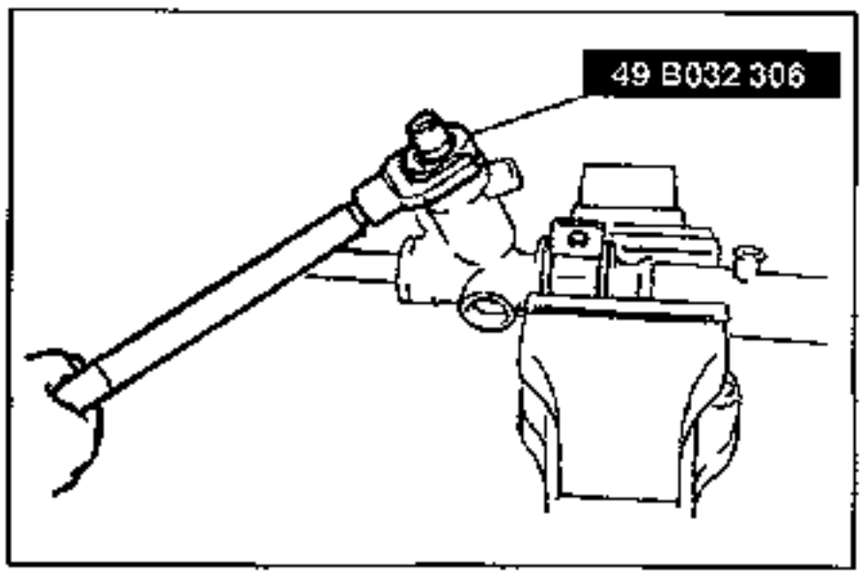


Housing cover

Caution

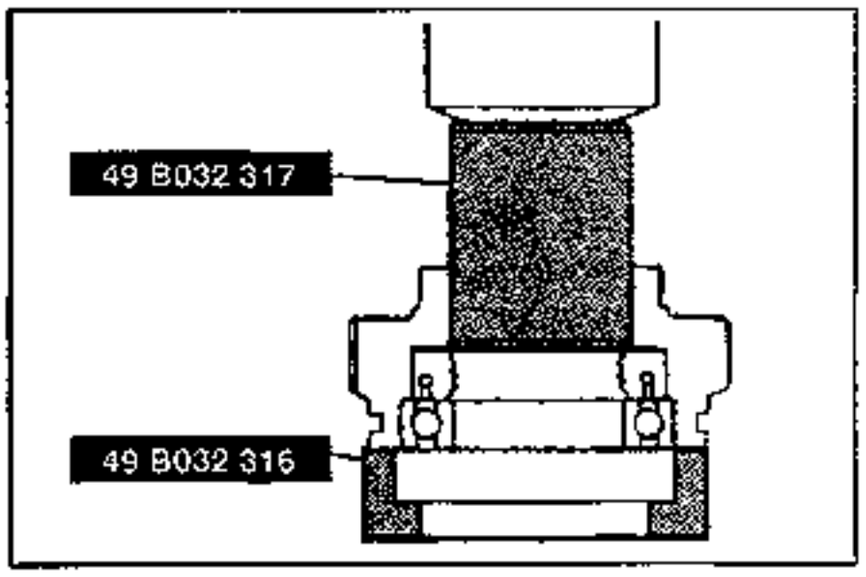
- **If the drill diameter and/or the depth of the recess are excessive, the threads will be too loose when the plug reused.**

Use a drill **(Φ1 .5mm {0.06 in})** to make a recessed area **(approx. 1.5mm {0.06 in})** at the punch-crimped part of the threaded part.

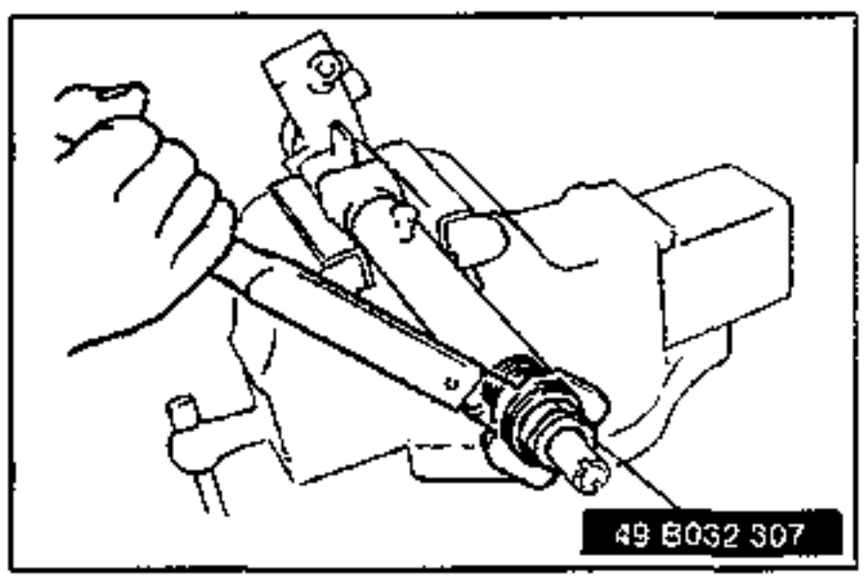


Plug

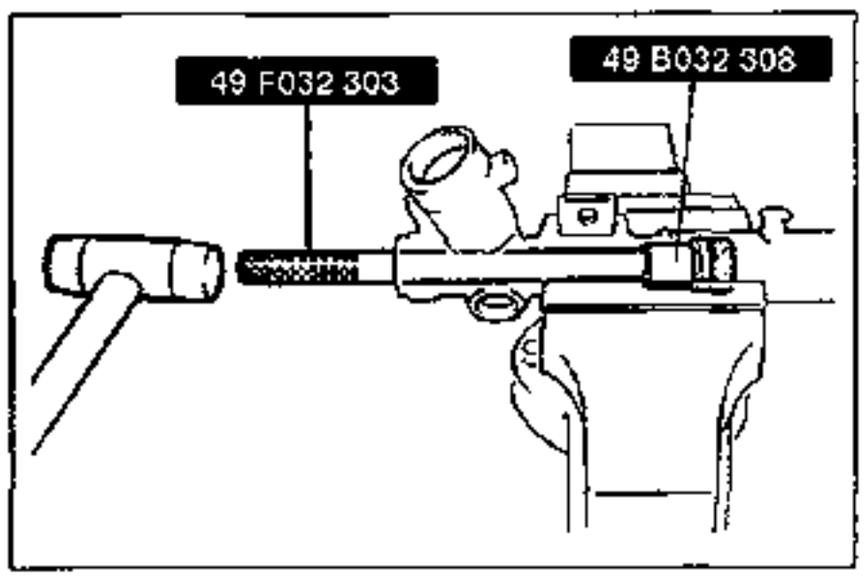
Use the **SST** to remove the plug.



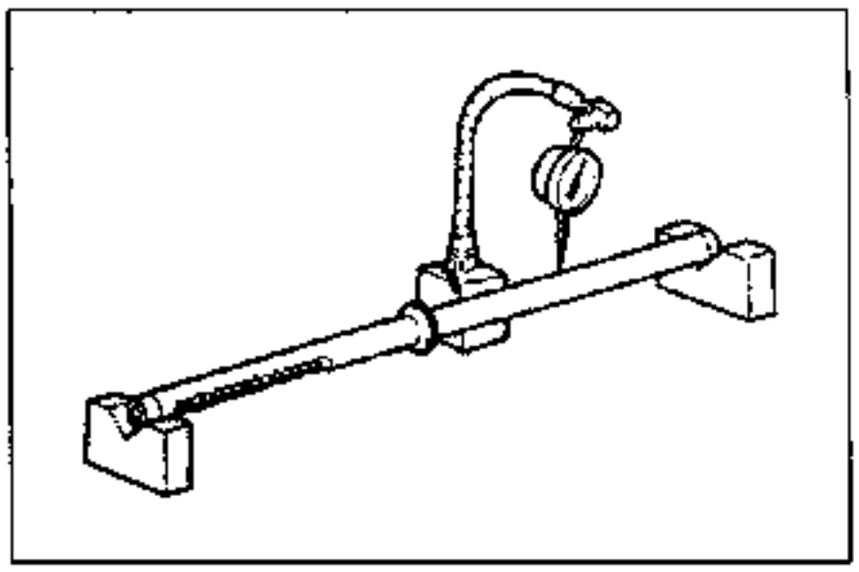
Oil seal and bearing
Use the **SSTs** to remove the bearing and the oil seal from the plug.



Outer box
Use the **SST** to remove the outer box.

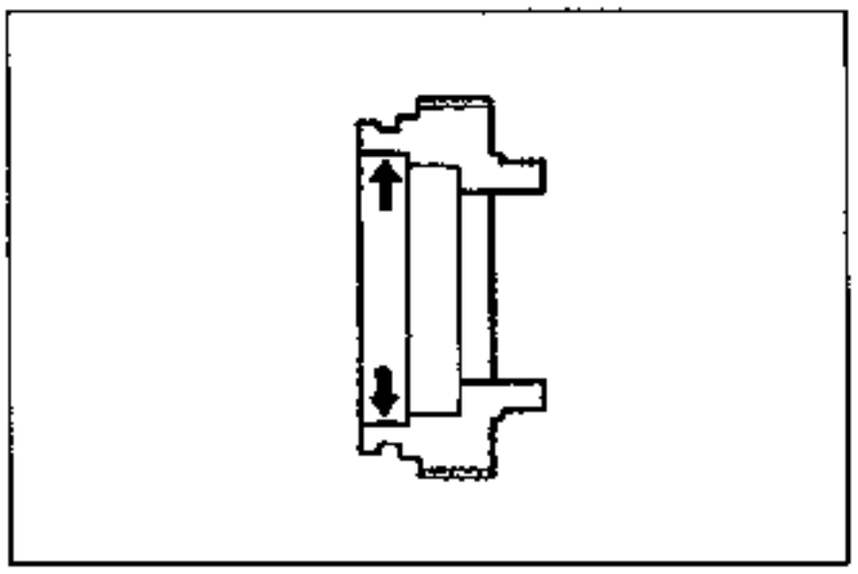


Oil seal, inner guide
Use the **SSTs** to remove the oil seal and inner guide toward the cylinder side.

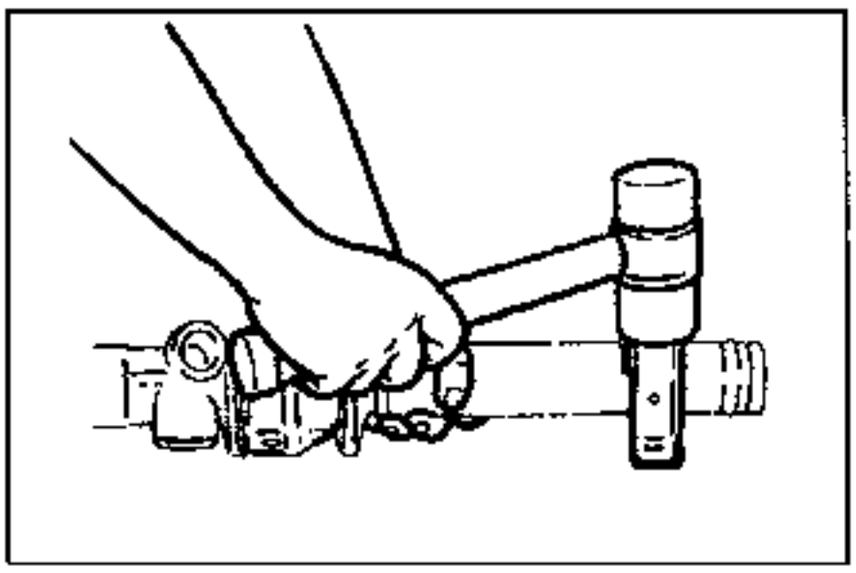


Inspection
Steering rack
1. Check the rack for cracking or other damage or for abnormal wear of the teeth; replace it if necessary.
2. Check the seal ring installation part of the rack for abnormal wear or damage; replace it if necessary.
3. Use V blocks to support both ends of the large-diameter part of the rack; check for excessive bending; replace it if necessary.

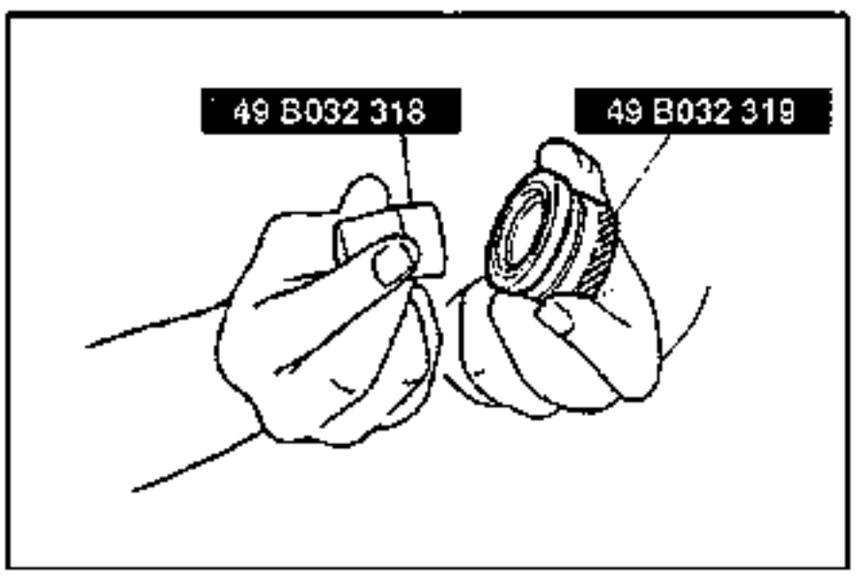
Bending limit: 0.15 mm {0.006 In} (near rack center)



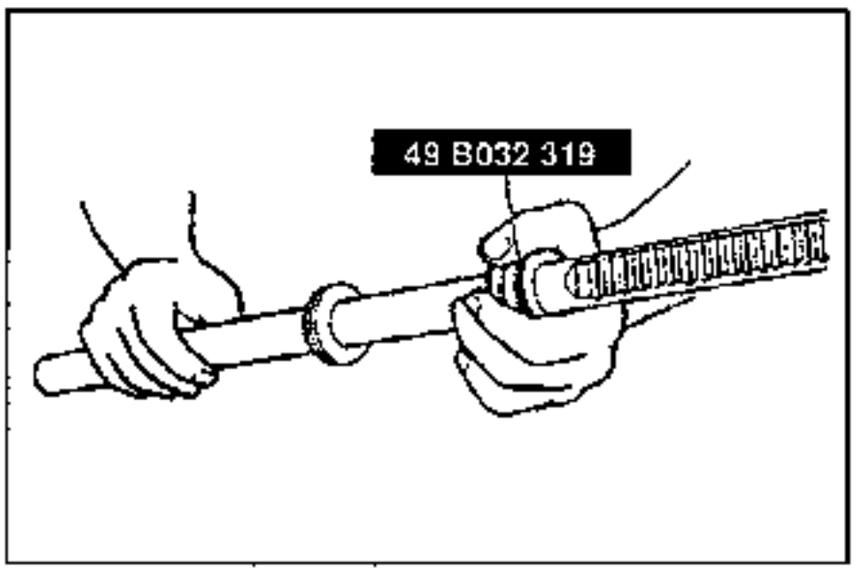
Plug
Check for scratches or other damage at the oil seal installation inner diameter; replace it if necessary.



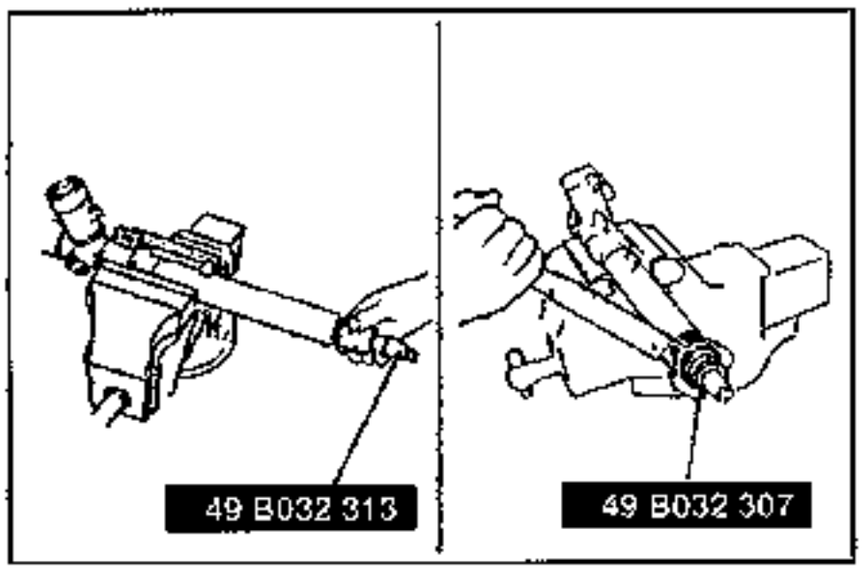
Assembly
1. Mounting bracket and mounting rubber
(1) Install the mounting rubber.
(2) Tap the mounting bracket on with a plastic hammer.



2. Steering rack assembly
(1) Install a new O-ring and new seal ring to the rack's piston.
(2) After installing the seal ring, seat it properly at the piston circumference.
(3) Install a new oil seal and inner guide to the **SSTs**.



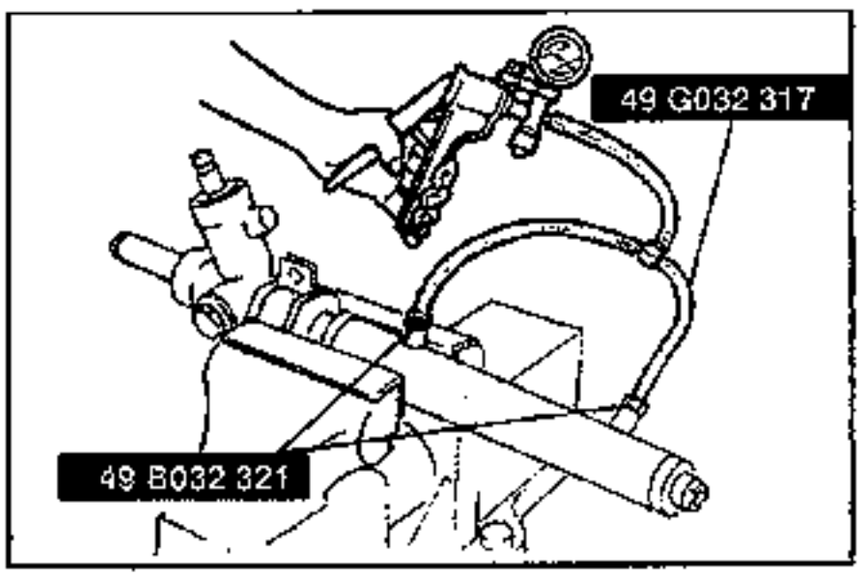
(4) Using the **SST**, place the oil seal and inner guide at the edge of the steering rack's pinion, and remove the **SST**.
(5) After mounting the steering rack to the gear housing, use a press to install the oil seal and inner guide to the correct position. Do not press over **2,940 N {300 kgf, 660 lbf}**.
(6) Apply grease to the seal ring, oil seal and inner guide.



3. Outer box assembly

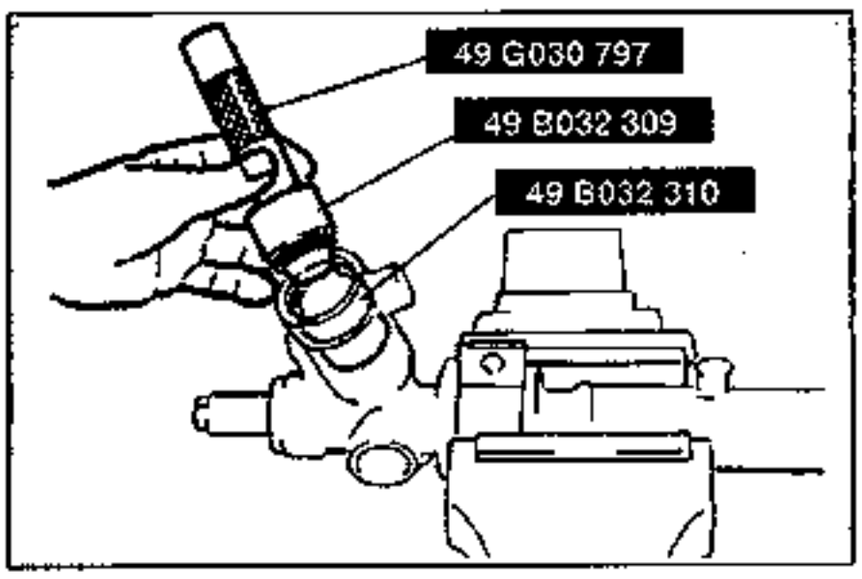
(1) Apply grease to a U-gasket and new O-ring.
(2) Install the U-gasket and O-ring into the outer box.

Tightening torque:
40–49 N·m {4.0–5.0 kgf·m, 29–36 ft·lbf}



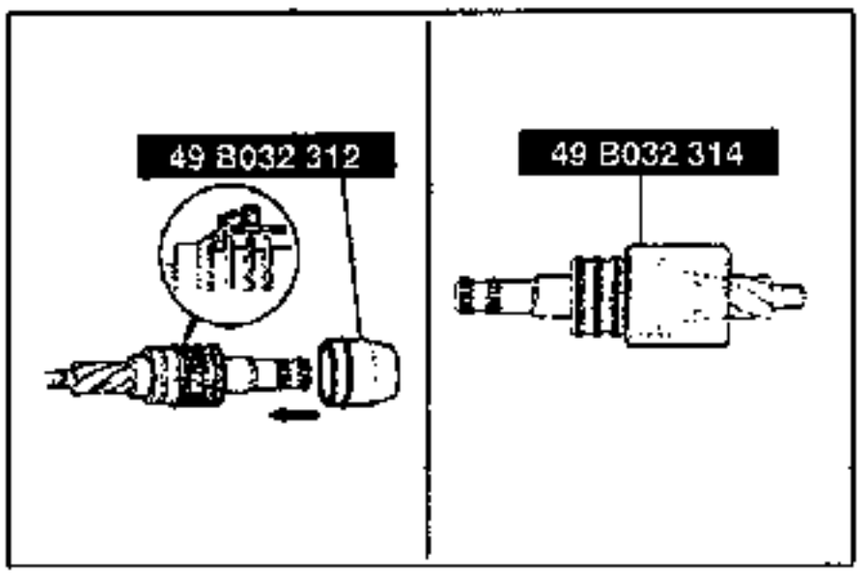
4. Cylinder air-tightness check

(1) Install the **SSTs** to the cylinder part of the gear housing.
(2) Using a vacuum pump, apply a vacuum of **400 mmHg** and check to be sure that the vacuum is maintained for **30 seconds**.
(3) If there is any leakage, replace the oil seal.



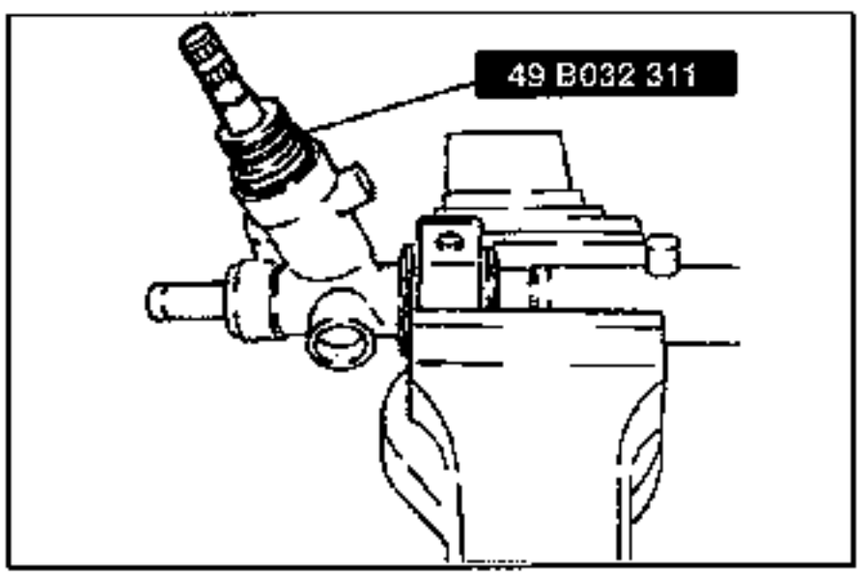
5. Oil seal and bearing (Upper, Lower)

(1) Use the **SSTs** to install a new oil seal and bearing (Upper) to the gear housing.
(2) Apply grease to the oil seal.
(3) Install the bearing (Lower).

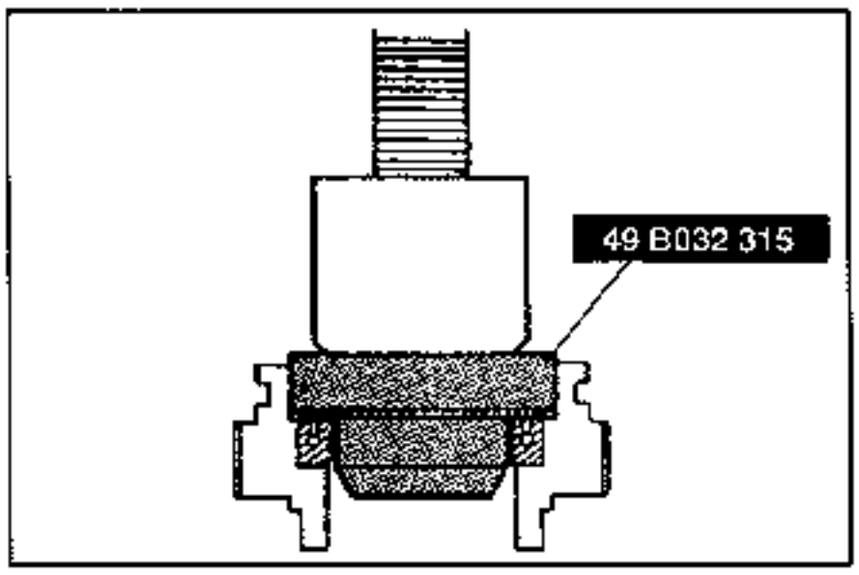


6. Pinion shaft assembly and seal ring

(1) Use the **SST** to install a new seal ring to the valve part of the pinion shaft.
(2) After installing it, use the **SSTs** to seat it properly.

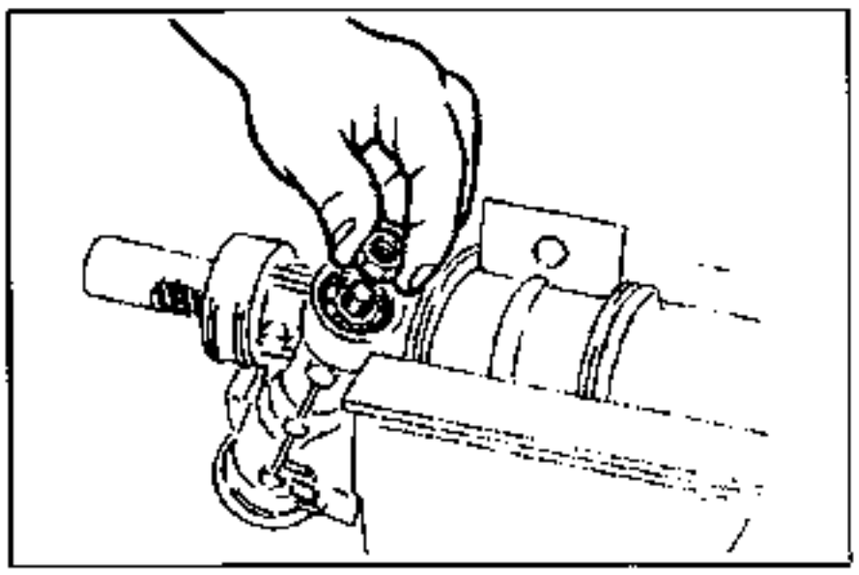


(3) Use the **SST** to install the pinion shaft assembly to the gear housing.



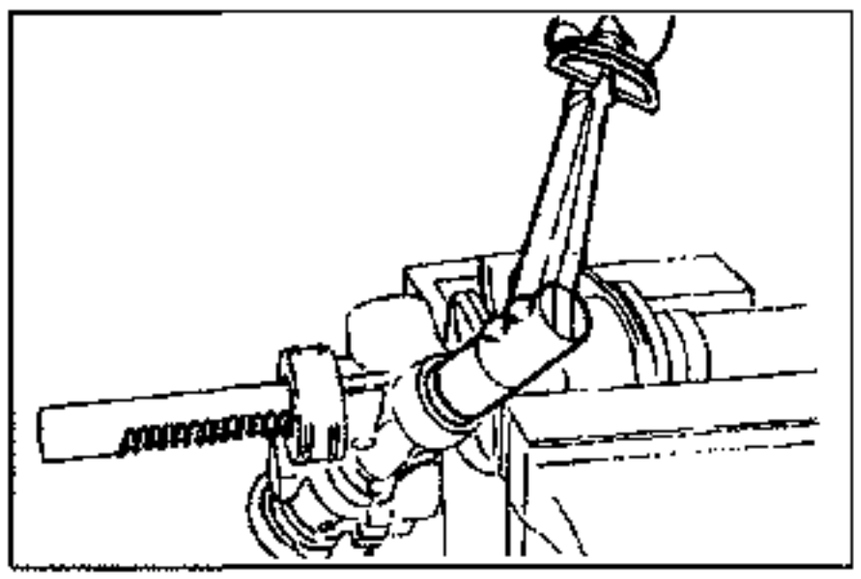
7. Plug assembly
(1) Use the **SST** to press in a new oil seal.
(2) Press in by placing the flat plate against the bearing.
(3) Install the new O-ring.

Caution
- **Apply grease to the O-ring, oil seal and bearing.**



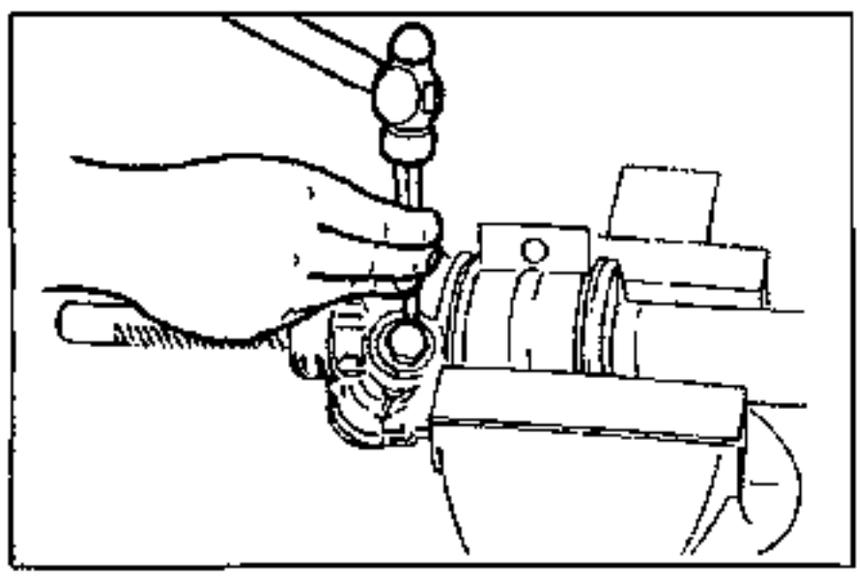
8. Locknut
(1) Temporarily install the tie rod on the tube side of the rack.
(2) Invert the housing and install the locknut on the pinion shaft. Turn it until the tie rod contacts the tube.
(3) Tighten the locknut.

Tightening torque:
40–49 N·m {4.0–5.0 kgf·m, 29–36 ft·lbf}

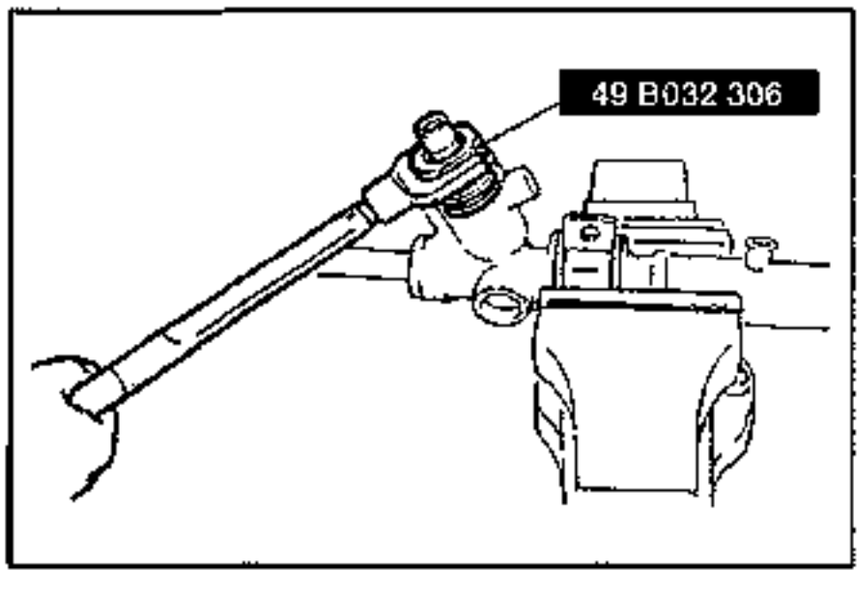


9. Housing cover
(1) Apply thread sealant to the housing cover threads.
(2) Install the housing cover.

Tightening torque:
40–49 N·m {4.0–5.0 kgf·m, 29–36 ft·lbf}



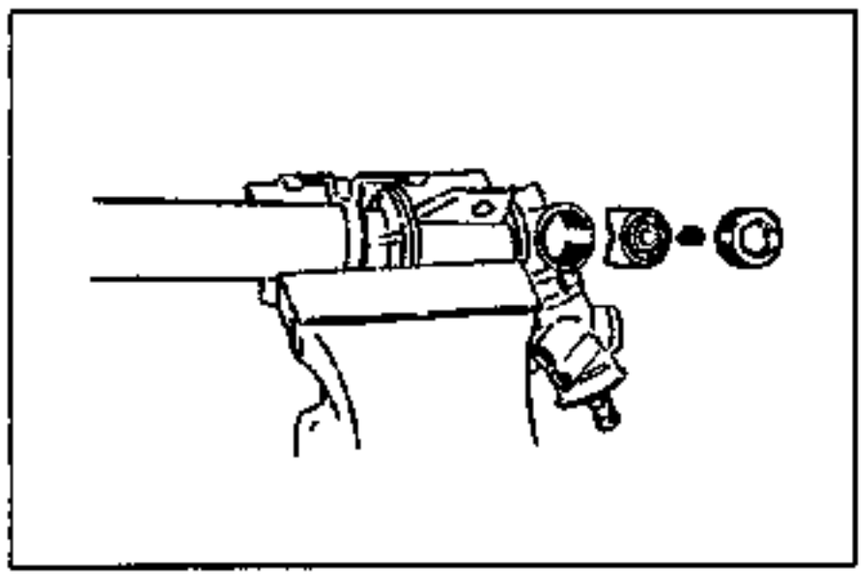
(3) Stake between the rack housing and housing cover at two points with a center punch.



(4) Use the **SST** to tighten the plug assembly to the gear housing.

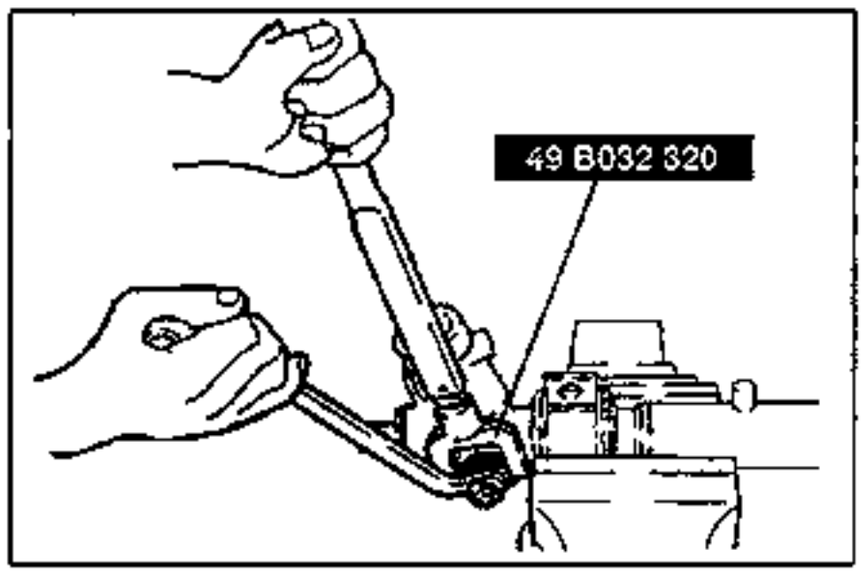
Tightening torque:
30–39 N·m {3.0–4.0 kgf·m, 22–28 ft·lbf}

(5) Stake between the housing and plug assembly at one point with a center punch.



10. Support yoke

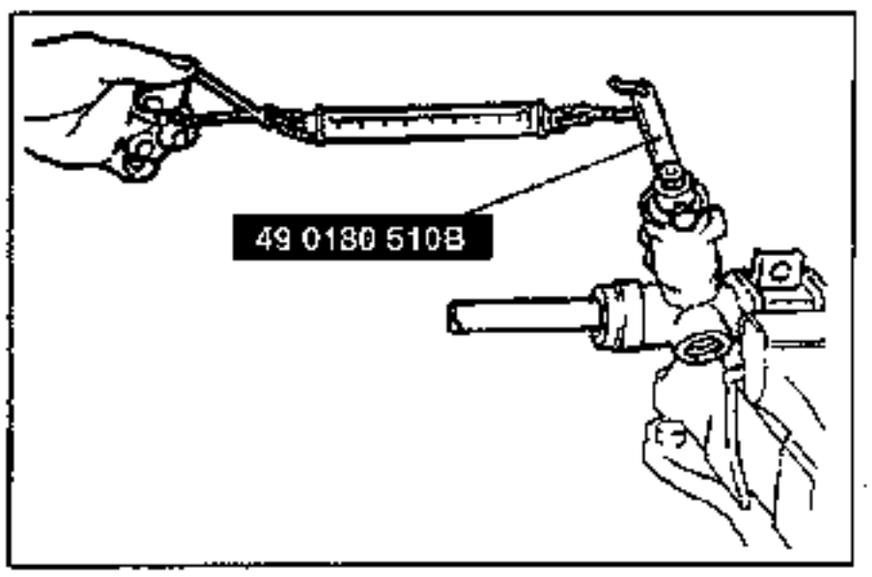
(1) Secure the gear housing in a vise so that the support yoke position faces upward.
(2) Apply grease to the rack sliding surface of the support yoke, then install it in the housing.
(3) Install the support yoke.
(4) Install the spring.



11. Adjusting cover and locknut

(1) Apply sealant to the adjusting cover and temporarily tighten it to a torque of **11 N·m {110 kgf·cm, 95 in·lbf}**.
(2) Move the rack back and forth **approx. 3 times** and loosen the adjusting cover.
(3) Retighten the adjusting cover to the specified torque and then loosen it **0–40°**.

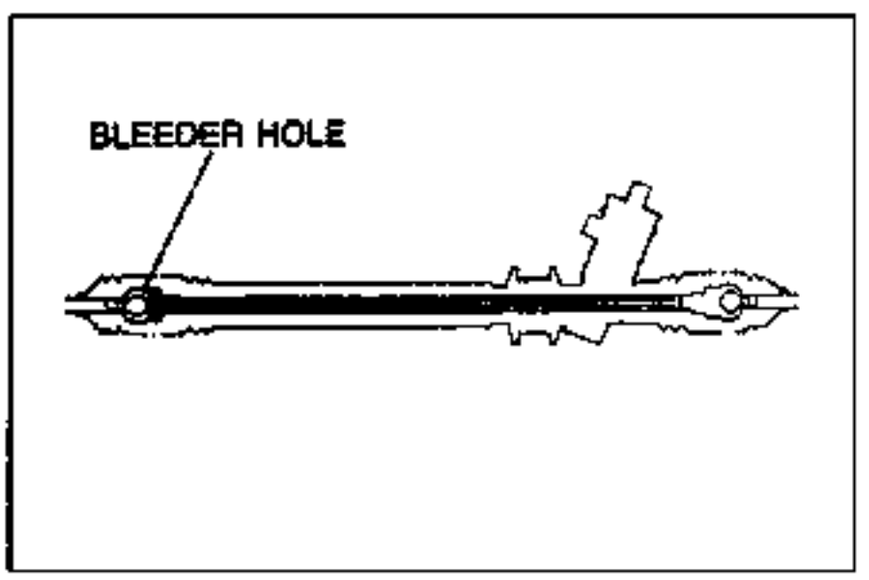
Tightening torque:
4.5–5.3 N·m {45–55 kgf·cm, 40–47 in·lbf}



(4) Tighten the locknut with the **SST**.
(5) Measure the pinion starting torque with the **SST** and a pull scale.

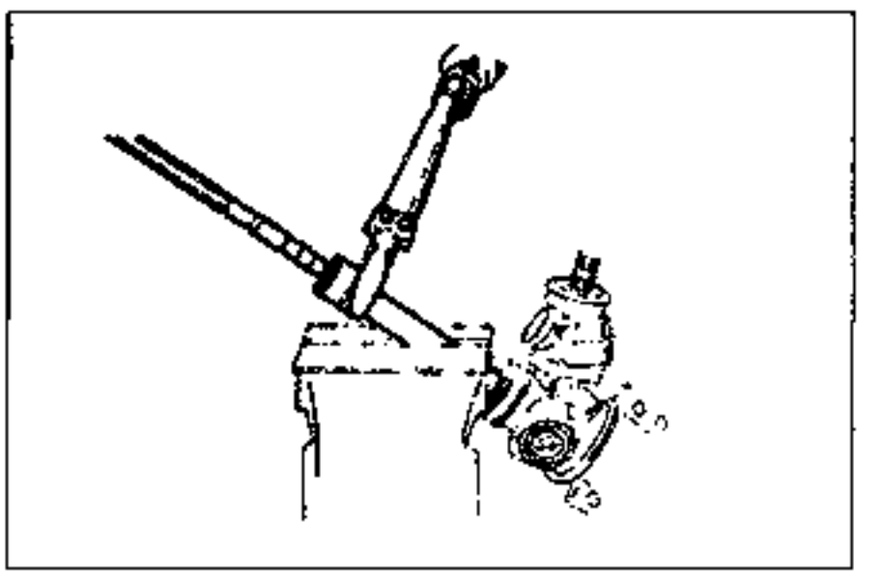
Starting torque
At ±90° form the straight-ahead position
1.0–1.3 N·m {10–14 kgf·cm, 8.7–12.1 in·lbf}
(Pull scale reading: 1.0–1.4 kgf {2.2–3.0 lbf})
At other position:
1.6 N·m {17 kgf·cm, 14.7 in·lbf} max.
(Pull scale reading: 1.7 kgf {3.7 lbf} max.)

(6) If not as specified, repeat Steps 3 to 5.



12. Tie rod

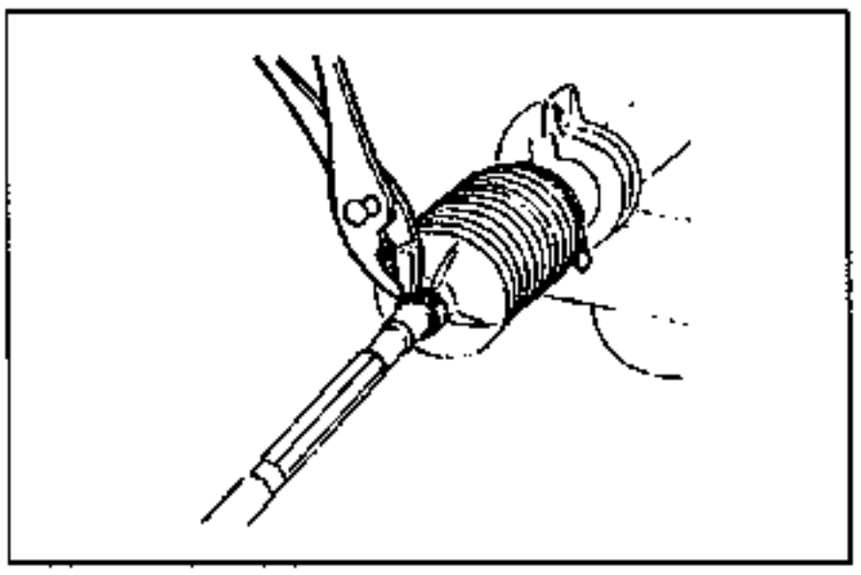
(1) Install the tie rod (with air bled out) at the rack housing side.



(2) Secure the rack in a vise.
(3) Install the new washer and tie rod onto the steering rack.

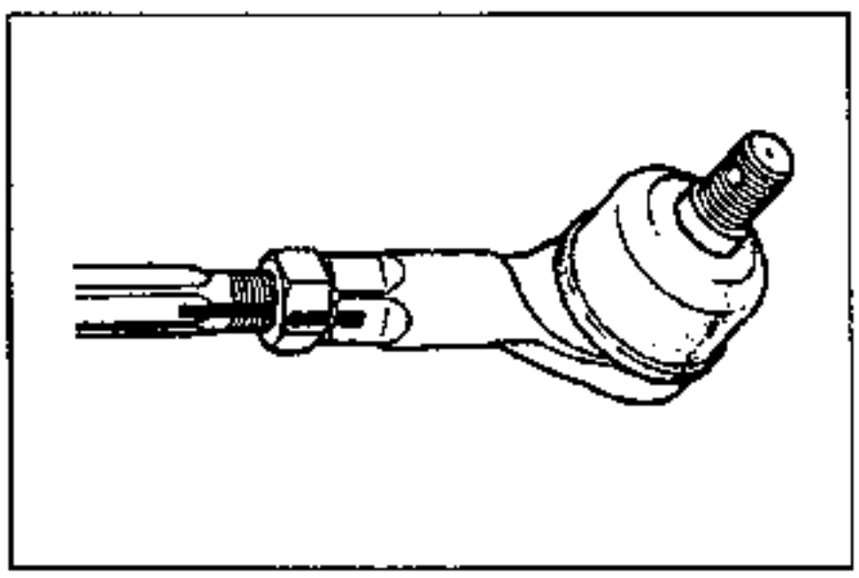
Tightening torque:
59–78 N·m {6.0–8.0 kgf·m, 44–57 ft·lbf}

(4) Align the washer with the rack groove, and crimp the washer.



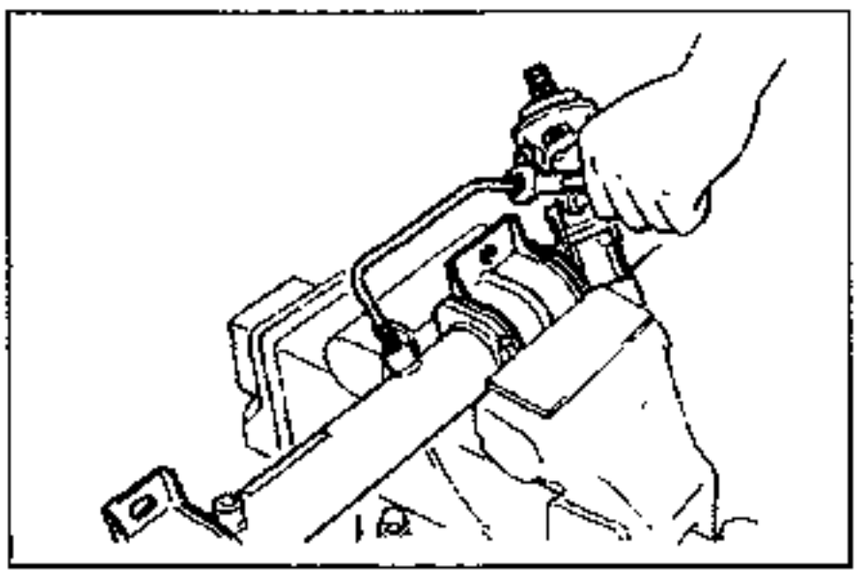
13. Boot, Boot wire, Boot band

(1) Apply grease to the inner surface of the small end of the boot.
(2) Install the boot. Wrap a new boot wire around the large end of the boot twice and then twist it 4 to 4.5 times. Bend the twisted part toward the mounting bracket.
(3) Install the boot band on the small end of the boot.



14. Tie-rod end

Align with the marks made before disassembly, and tighten the nut.



15. Oil pipe and dust cover

(1) Secure the mounting bracket in a vise so that the oil pipe connections face upward.
(2) Install the oil pipes.

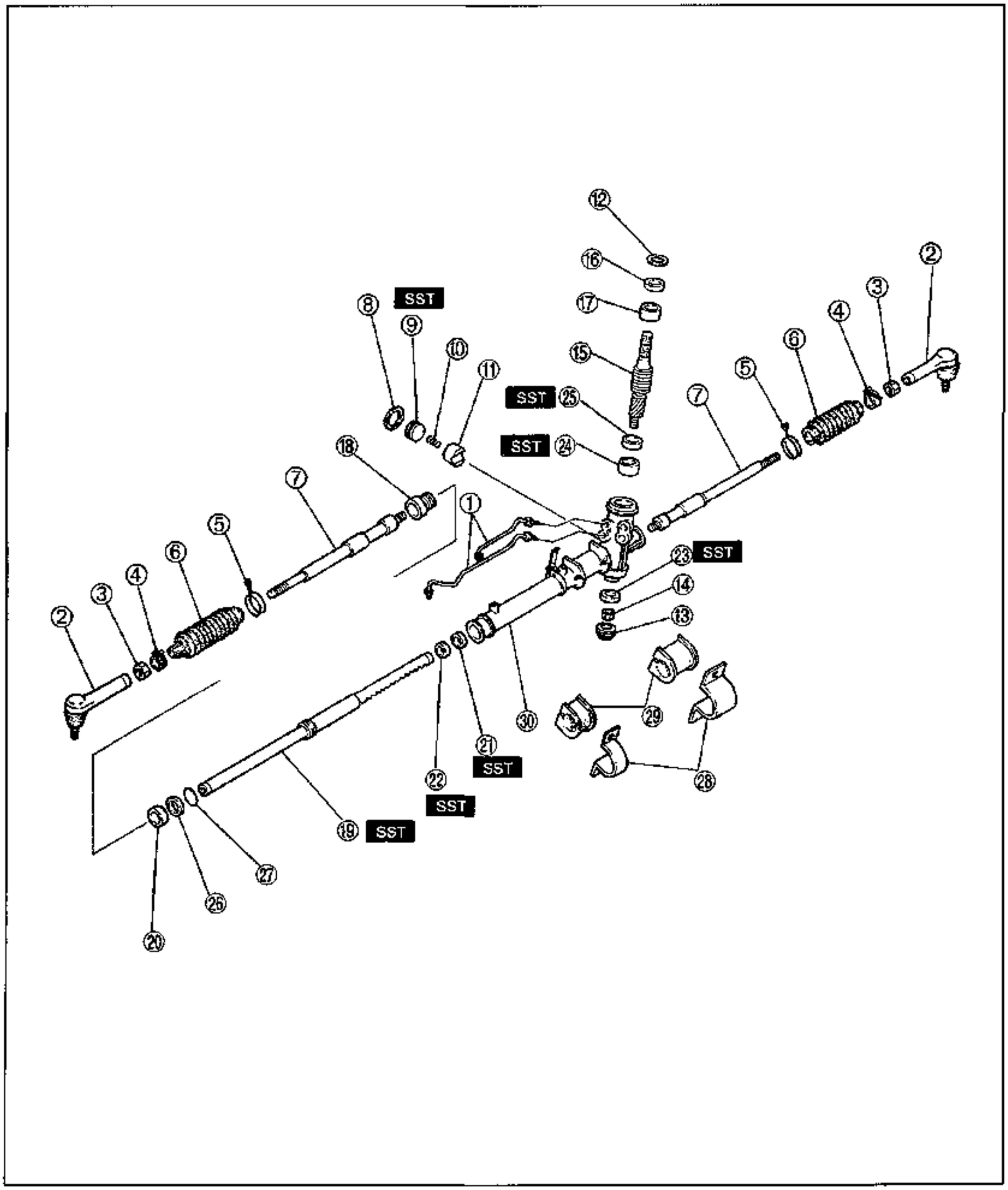
Tightening torque
Cylinder pipe:
20–29 N·m {2.0–3.0 kgf·m, 15–21 ft·lbf}

Pressure and return pipe:
30–39 N·m {3.0–4.0 kgf·m, 22–28 ft·lbf}

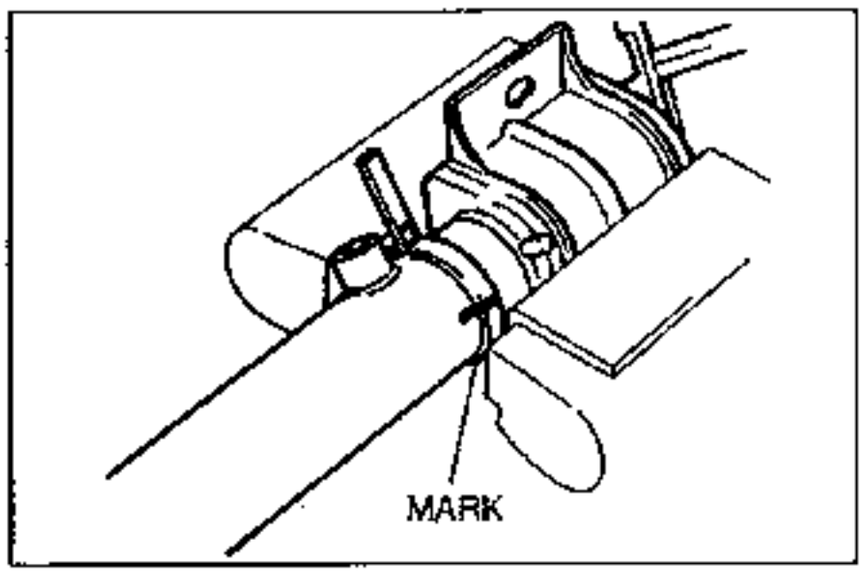
(3) Install the dust cover.

Disassembly / Inspection (K8 DOHC)

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace if necessary.



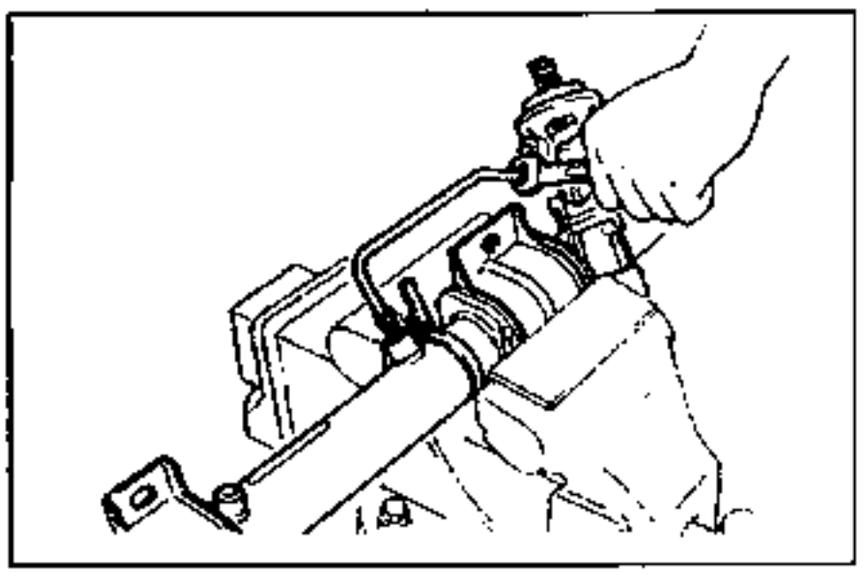
1. Oil pipe
   Disassembly Note ..... page N–32
   Inspect for clogging and damage
2. Tie-rod end
   Disassembly Note ..... page N–32
   Inspect ball joint for
   damage and malfunction
3. Locknut (Tie rod end)
4. Boot clamp
5. Boot wire
6. Boot
   Inspect for cracks and other damage
7. Tie rod
   Disassembly Note ..... page N–32
   Inspect for bending
   Inspect ball joint for
   damage and malfunction
8. Locknut (Adjusting cover)
9. Adjusting cover
   Assembly Note ..... page N–32
10. Yoke spring
    Inspect for weakness and damage
11. Support yoke
    Disassembly Note ..... page N–33
    Inspect for damage and wear
12. Snap ring
    Disassembly Note ..... page N–33
13. Housing cover
    Disassembly Note ..... page N–33
14. Locknut
15. Pinion shaft assembly
    Disassembly Note ..... page N–33
    Inspect for damage and wear
16. Oil seal
17. Upper bearing
    Inspect for wear, damage and malfunction
18. Rack bushing
    Disassembly Note ..... page N–33
    Inspect for damage and wear
19. Steering rack
    Disassembly Note ..... page N–34
    Inspection ..... page N–35
20. Oil seal
    Disassembly Note ..... page N–34
21. Spacer
    Disassembly Note ..... page N–34
22. Oil seal
    Disassembly Note ..... page N–34
23. Lower bearing
    Disassembly Note ..... page N–34
    Inspect for cracks, damage and wear
24. Needle bearing
    Disassembly Note ..... page N–35
    Inspect for cracks, damage and wear
25. Oil seal
    Disassembly Note ..... page N–35
26. Seal ring
    Disassembly Note ..... page N–35
27. O-ring
    Disassembly Note ..... page N–35
28. Mounting bracket
29. Mounting rubber
30. Gear housing
    Inspect for cracks and damage



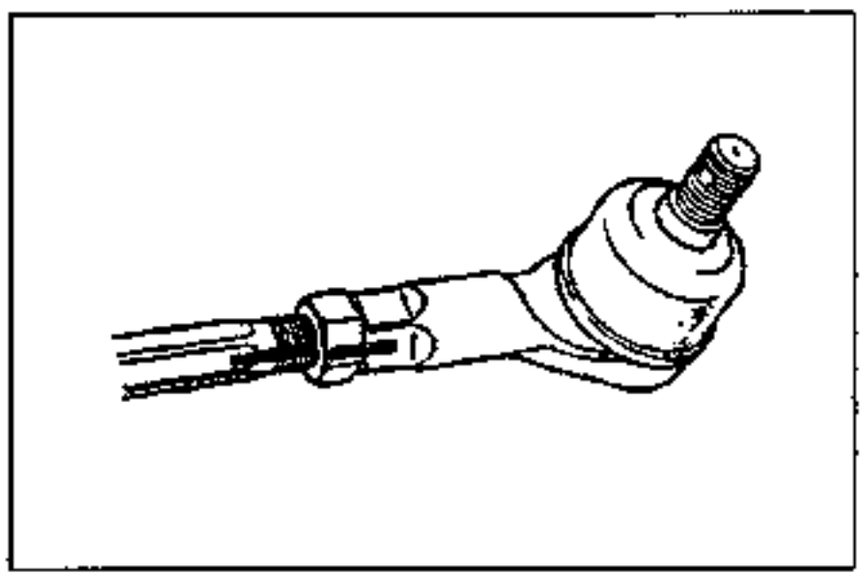
Disassembly Note
Oil pipe

Note
- The pipe clip does not need to be removd unless you are replacing it.

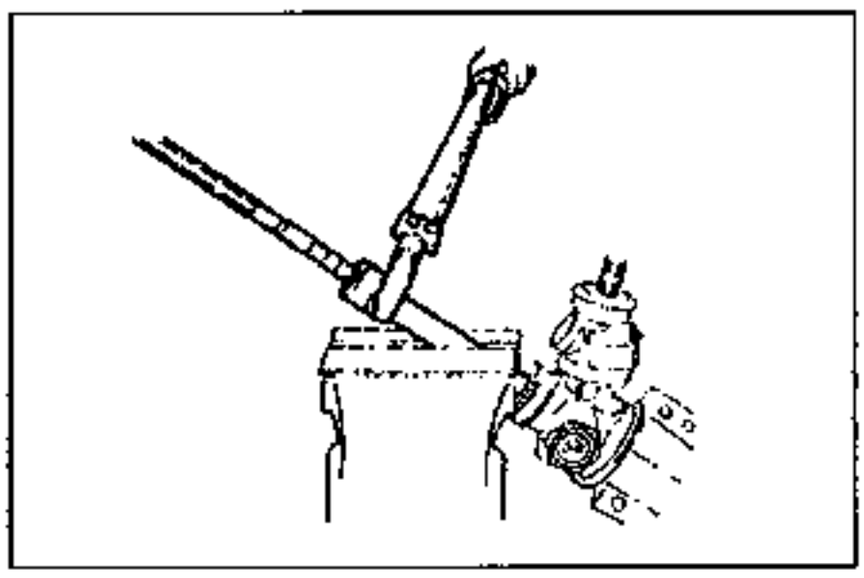
1. Secure the gear and linkage in a vise.
2. Mark the pipe clip and the gear housing for proper assembly.



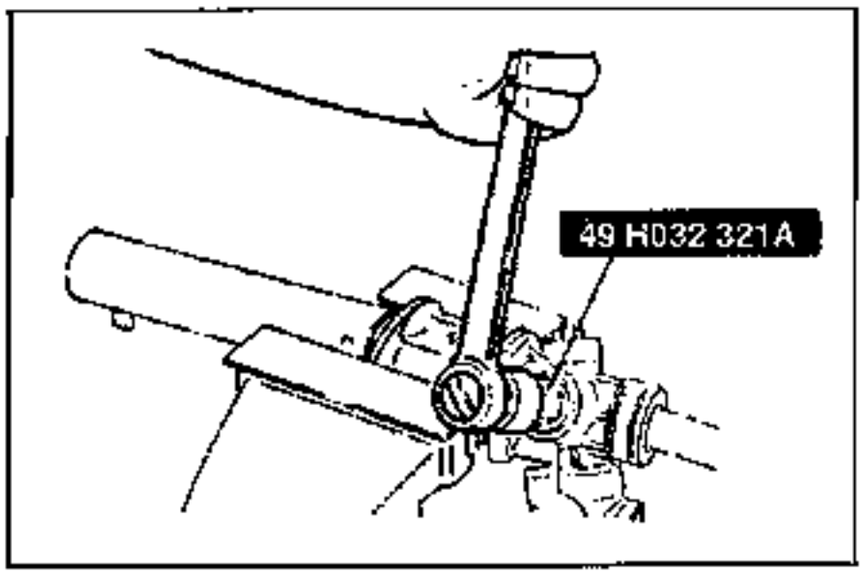
3. Remove the oil pipe.



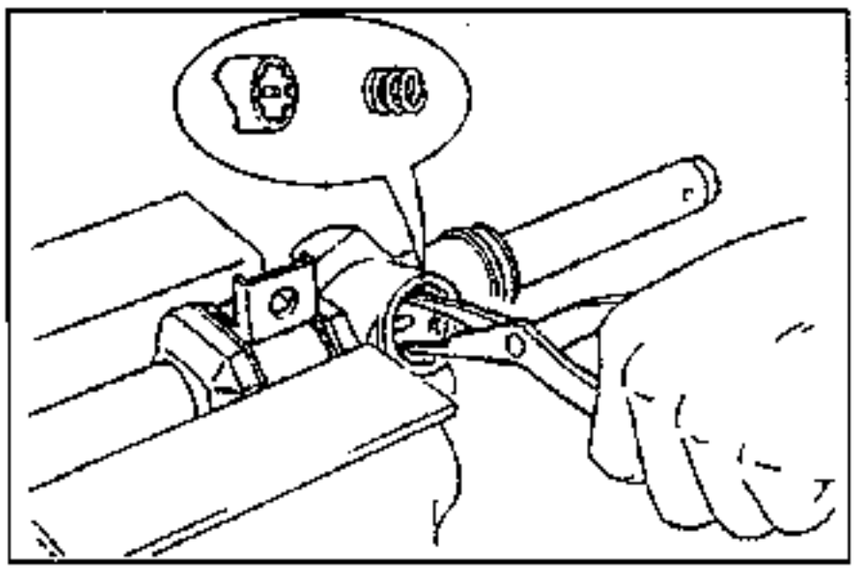
Tie-rod end
1. Before removing the tie-rod end, make a mark for proper installation.
2. Remove the tie-rod end.



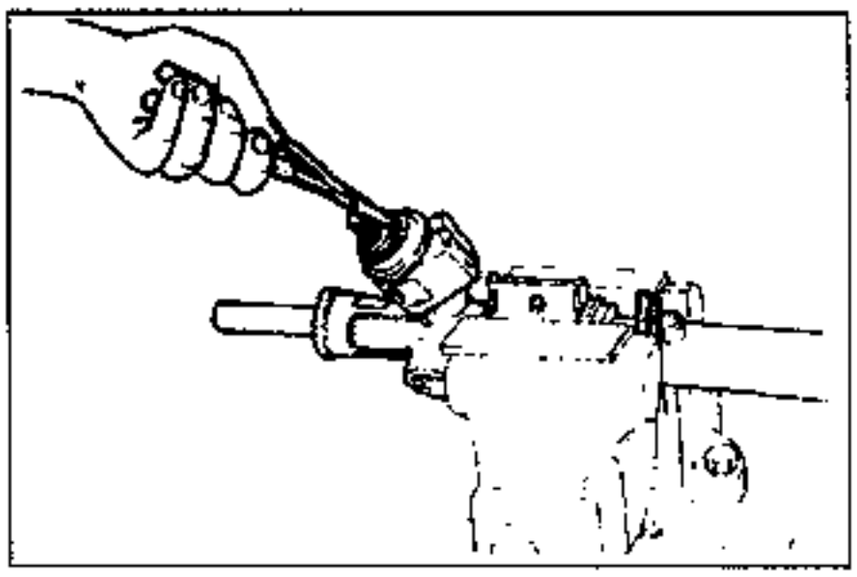
Tie rod
1. Secure the rack in a vise.
2. Remove the tie rod.



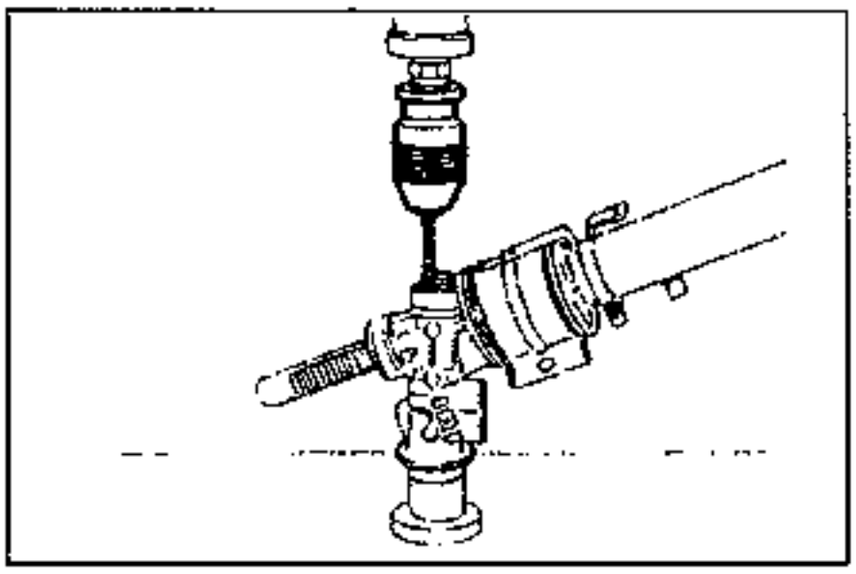
Adjusting cover
1. Remove the locknut from the adjusting cover.
2. Remove the adjusting cover with the **SST**.
3. Remove the yoke spring.



Support yoke
Remove the support yoke with a snap ring plier.



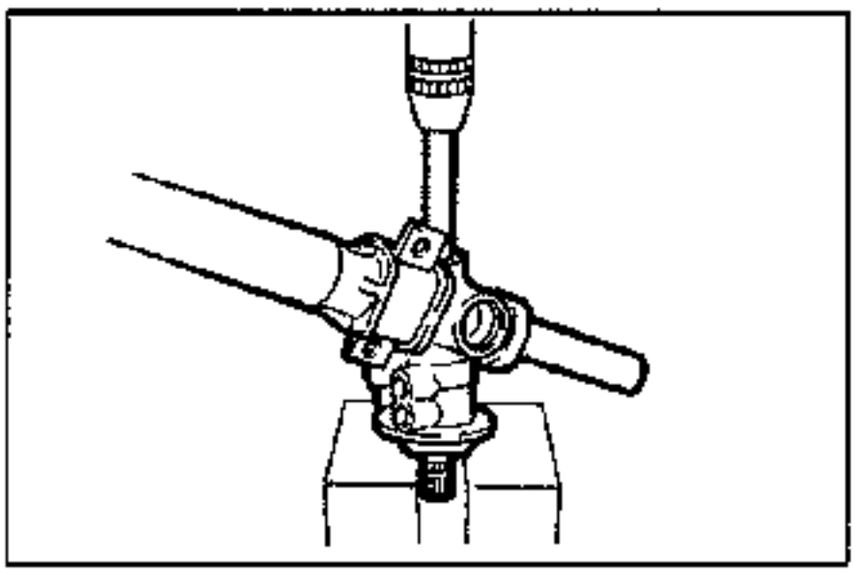
Snap ring
Remove the snap ring with a snap ring plier.



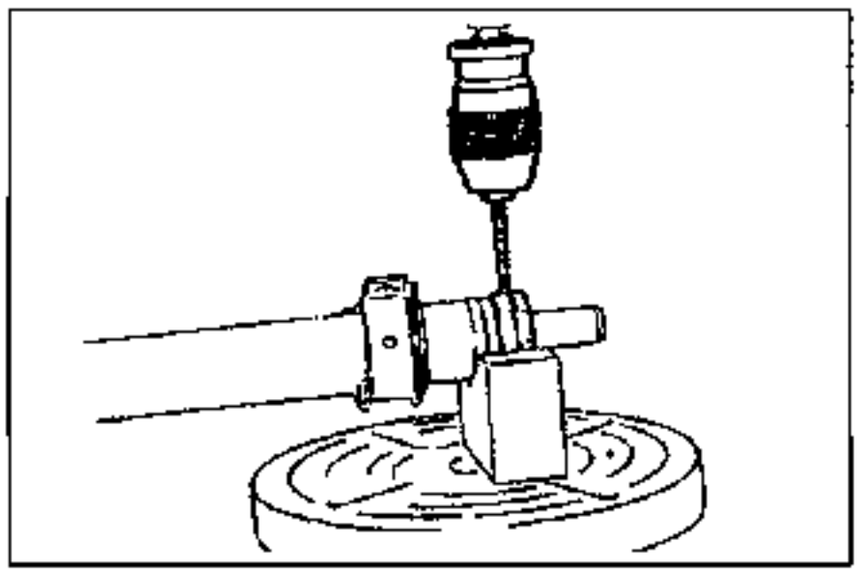
Housing cover

Caution
- **If the drill diameter and/or the depth of the recess are excessive, the threads will be too loose when the plug is reused.**

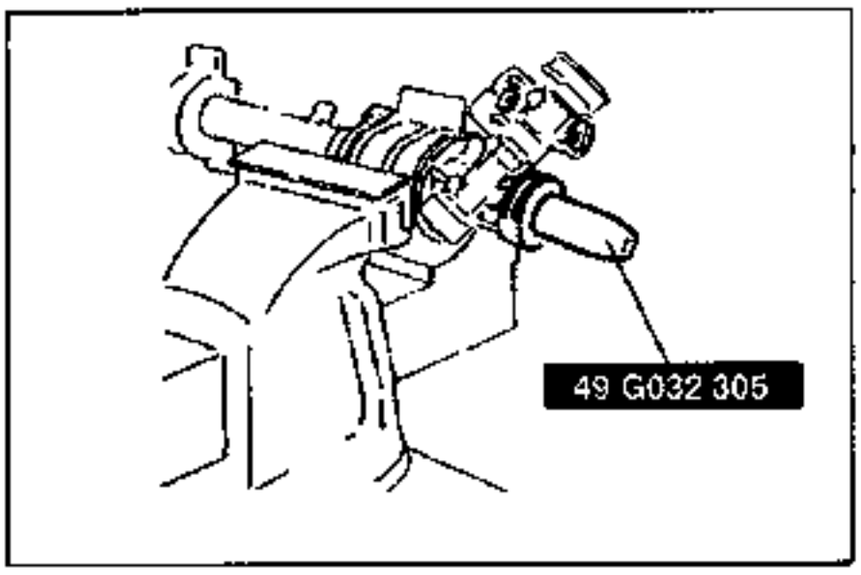
1. Use a drill **(Φ1 .5mm {0.06 in})** to make a recessed area **(approx. 1.5mm {0.06 in})** at the punch-crimped part of the threaded part.
2. Remove the housing cover.



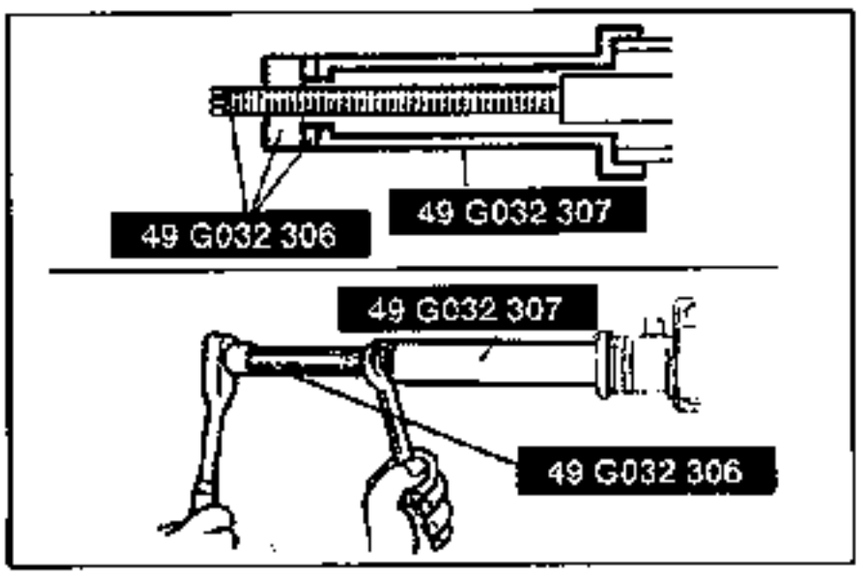
Pinion shaft assembly
1. Remove the locknut.
2. Set the gear housing assembly on a press and remove the pinion shaft assembly as shown in the figure.



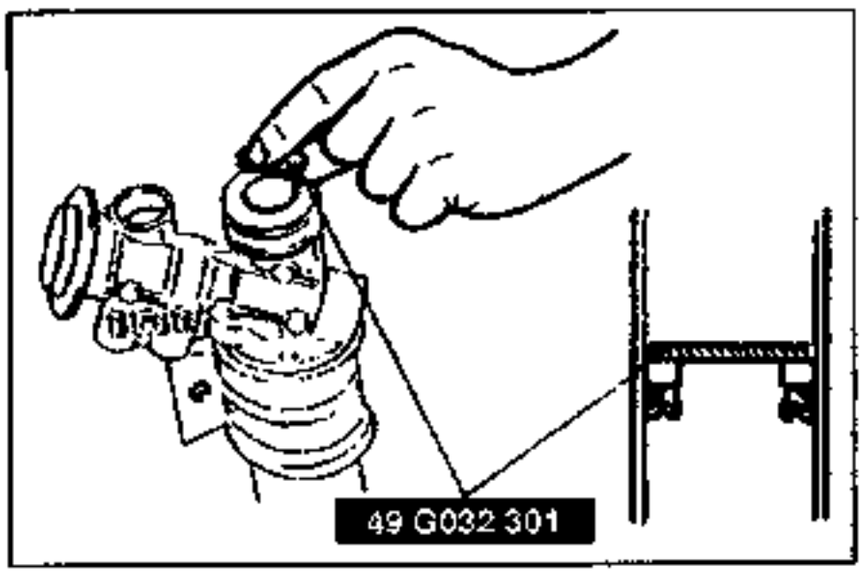
Rack bushing
1. Cut away the staked areas with a drill.
2. Remove the rack bushing.



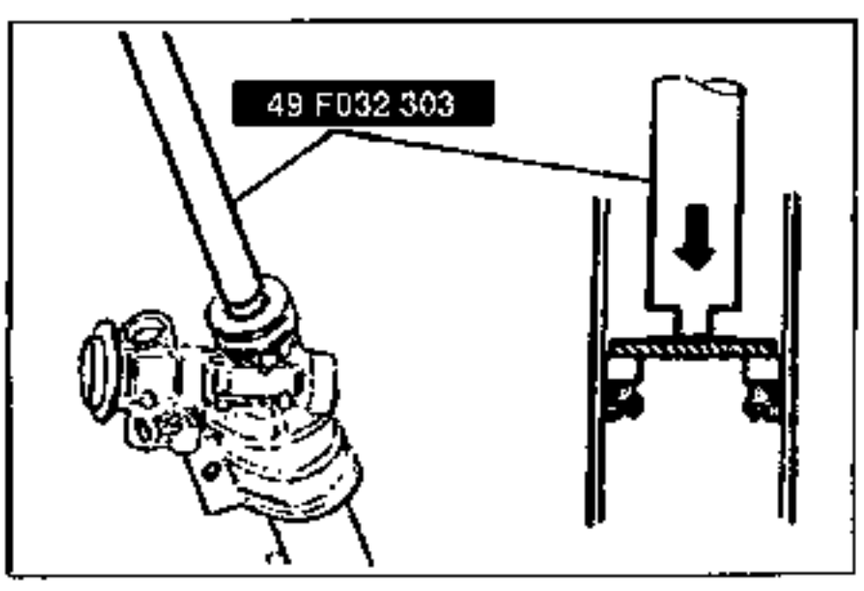
Steering rack and oil seal at tube side
1. Slide the **SST** over the rack from the gear housing side.



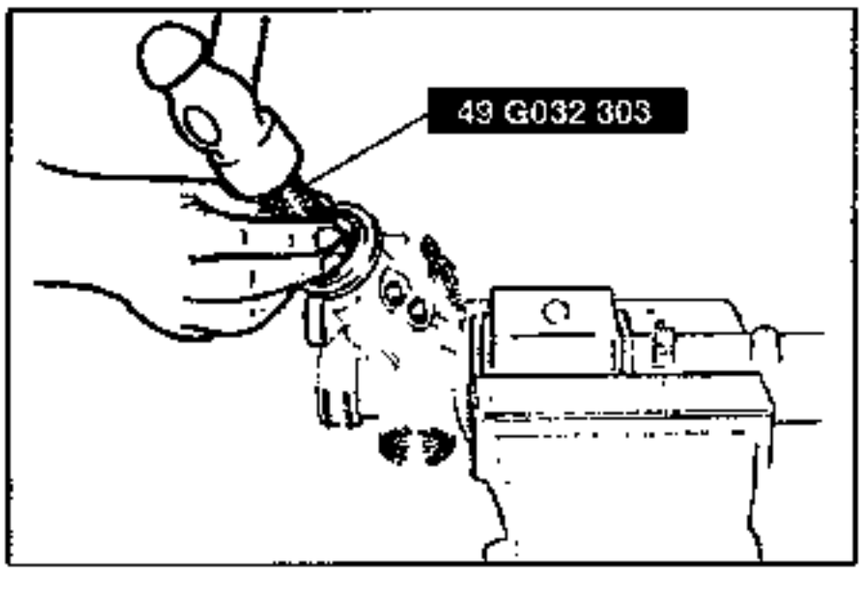
2. Install the **SSTs** to the threaded part of the rack at the tube side.
3. Remove the oil seal at the tube side by pulling out the rack.



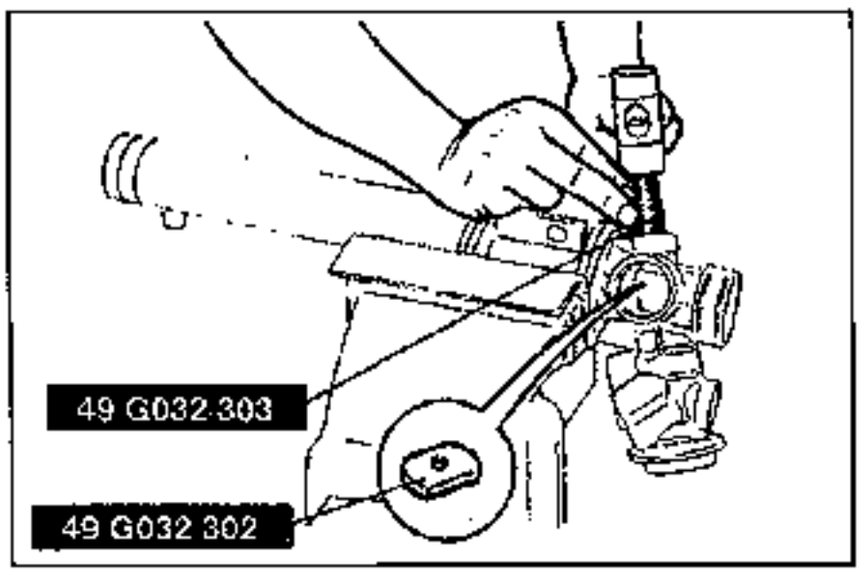
Spacer, oil seal
1. Insert the **SST** from the pinion housing side so that it contacts the spacer.



2. Set the **SST** against the **SST** inserted in step 1.
3. Secure the gear housing in a vise.
4. Remove the spacer and oil seal out of the housing.

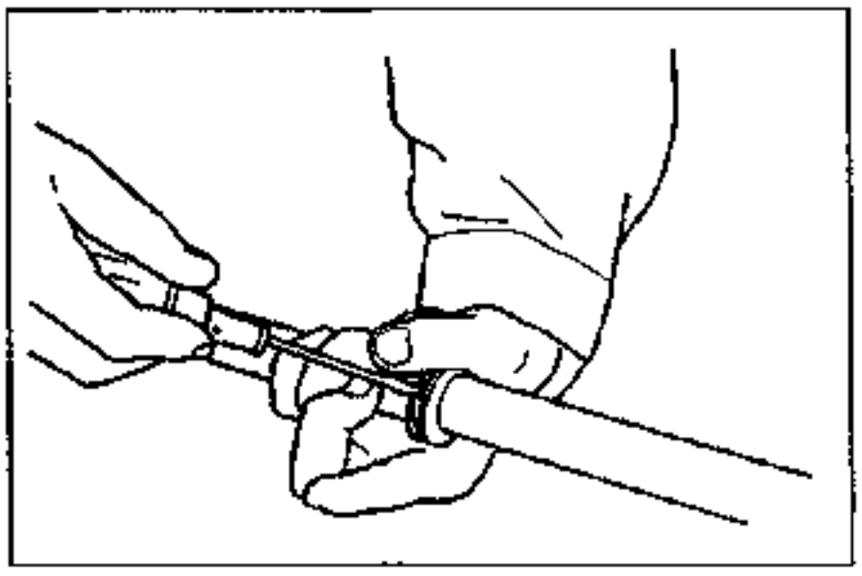


Lower bearing
Remove the lower bearing out of the housing with the **SST**.



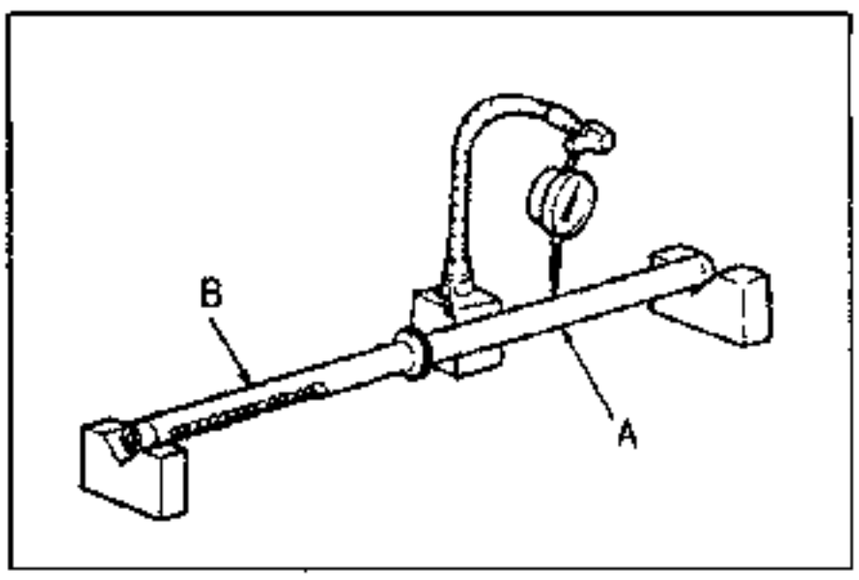
Needle bearing oil seal

1. Insert the **SST** so that it contacts the needle bearing.
2. Remove the oil seal and needle bearing out with the **SST** bar.



Seal ring, O-ring

Remove the seal ring and O-ring out of the steering rack with a flat-tipped screw driver.



Inspection

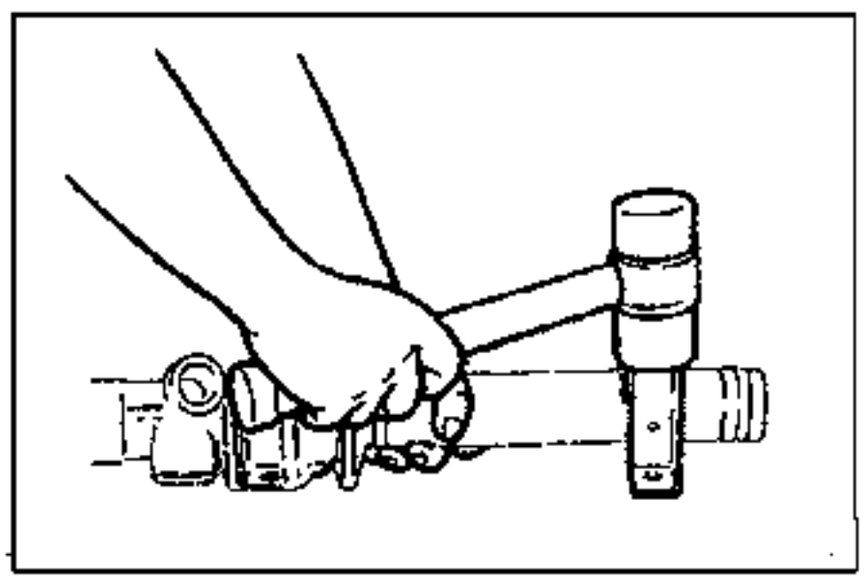
Steering rack

1. Inspect for cracking, damage, and tooth wear, replace if necessary.
2. Measure runout of the rack.

Runout

Near point A: 0.15 mm {0.006 in}
Near point B: 0.20 mm {0.008 in}

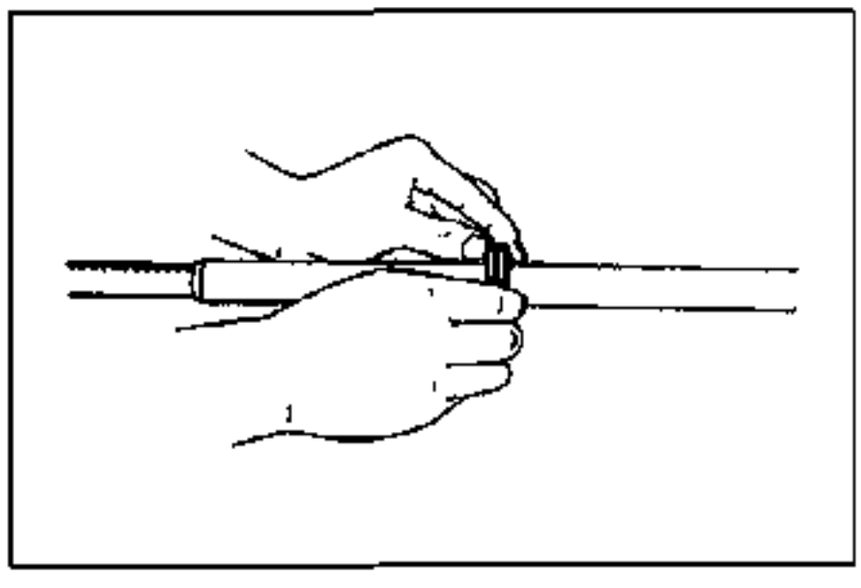
3. If not within specification, replace the rack.



Assembly

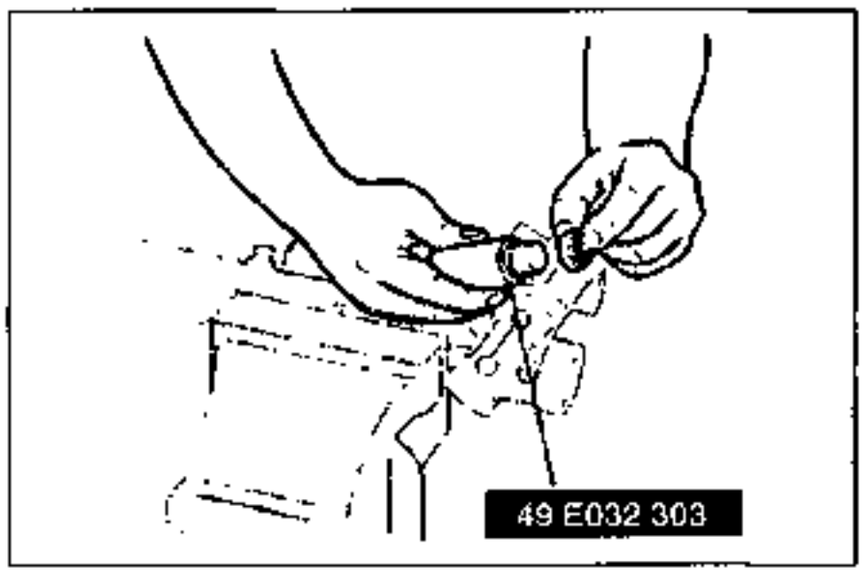
1. Mounting bracket and rubber

(1) Install the mounting rubber.
(2) Tap the mounting bracket on with a plastic hammer.



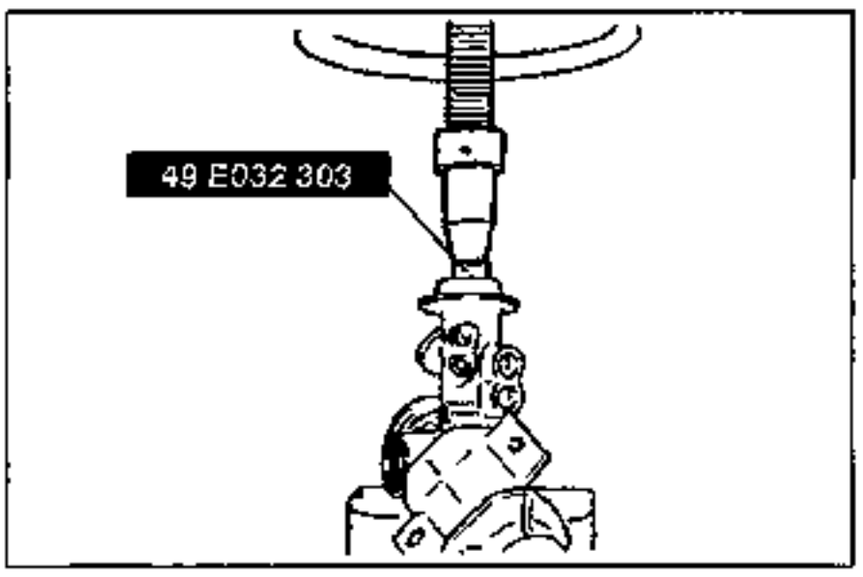
2. O-ring and seal ring

(1) Apply ATF to a new O-ring and seal ring.
(2) Install the O-ring in the ring groove of the rack.
(3) Install the seal ring in the groove of the rack.
(4) Compress the seal ring by hand to fit it into the groove.

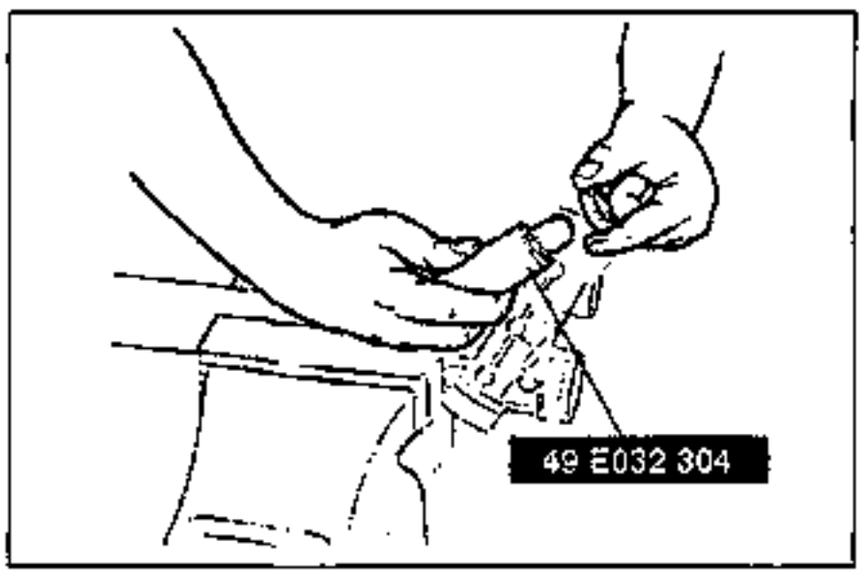


3. Needle bearing

(1) Apply grease to the end of the **SST**.
(2) Apply ATF to the needle bearing.
(3) Set the needle bearing on the **SST** so that the embossed side of the bearing faces the **SST**.

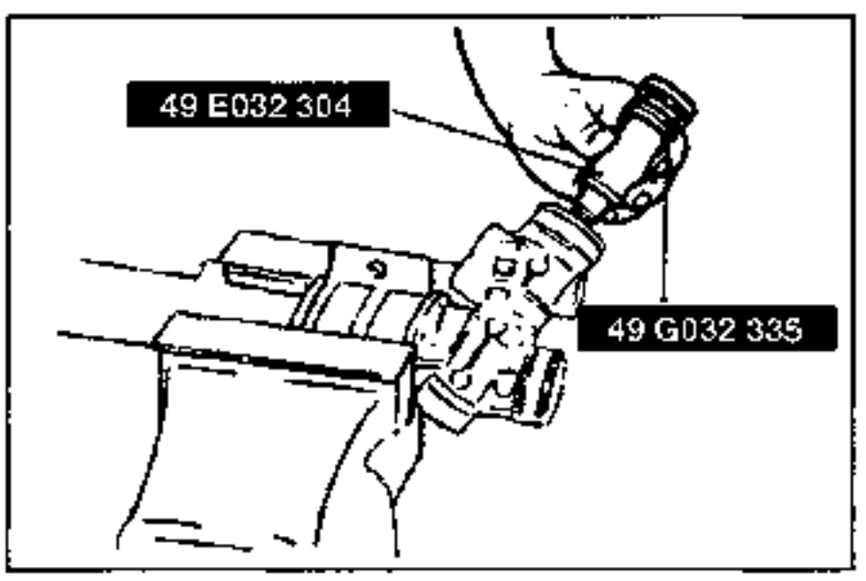


(4) Insert the needle bearing and the **SST** into the housing.
(5) Set the housing on a press and press in the bearing.

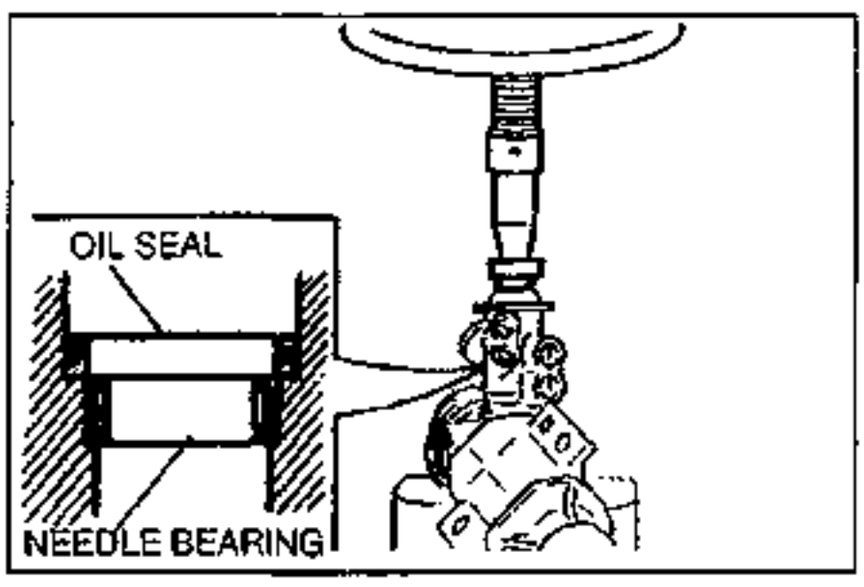


4. Oil seal

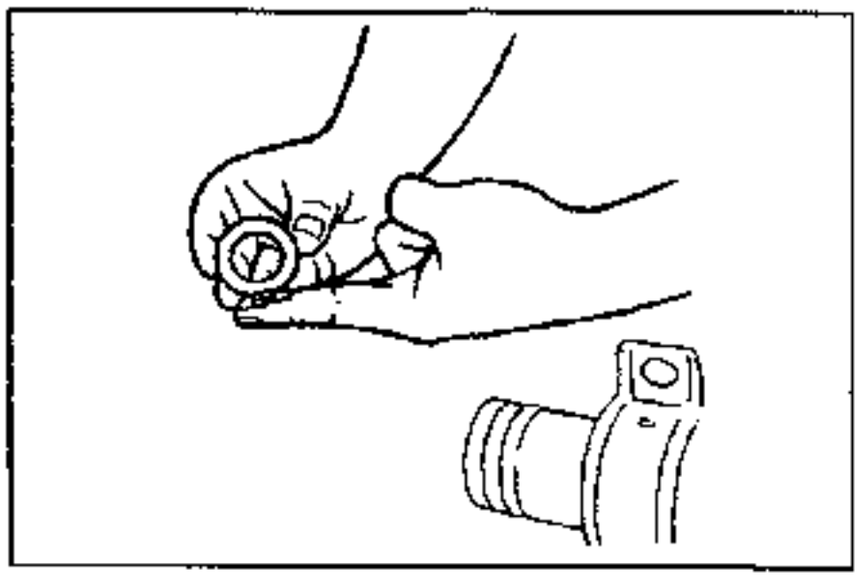
(1) Apply grease to the end of the **SST**.
(2) Apply ATF to a new oil seal.
(3) Set the oil seal on the **SST**.



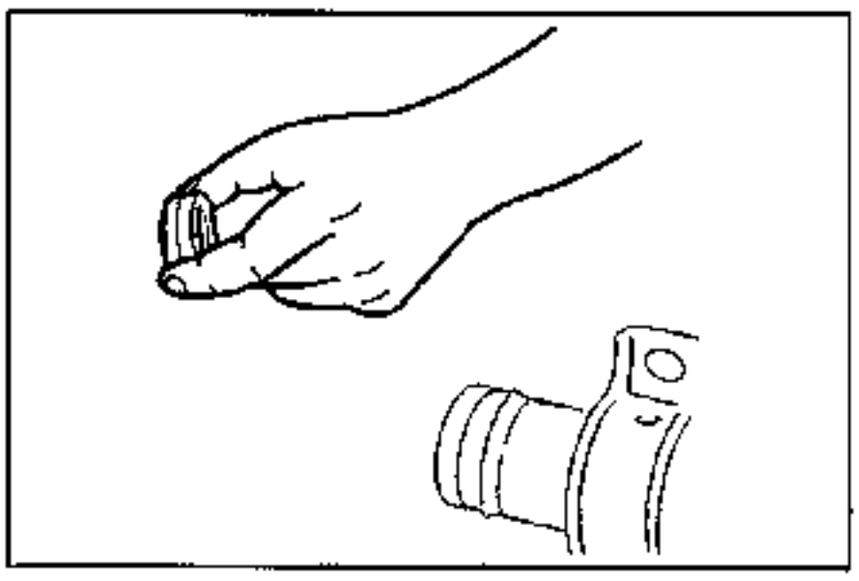
(4) Insert the oil seal and the **SSTs** into the housing.



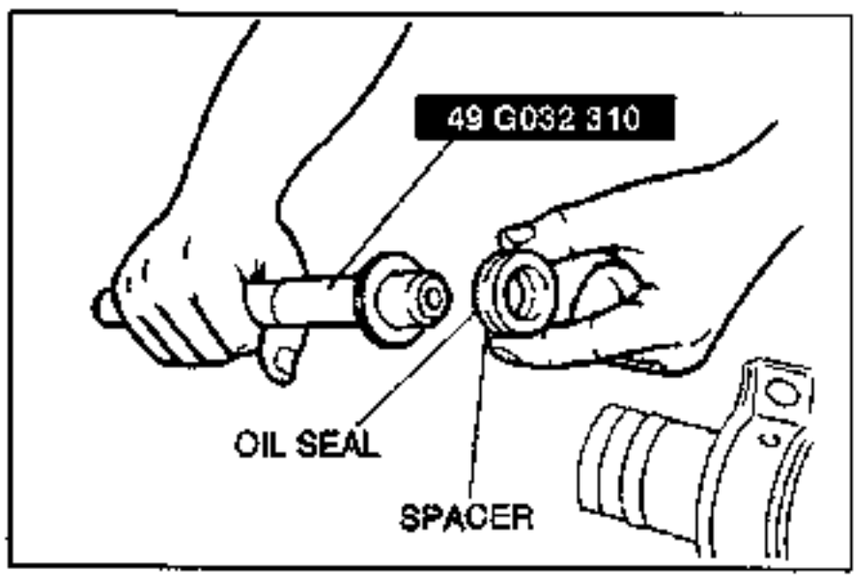
(5) Set the housing on a press and press in the oil seal
(6) Remove the **SSTs**.



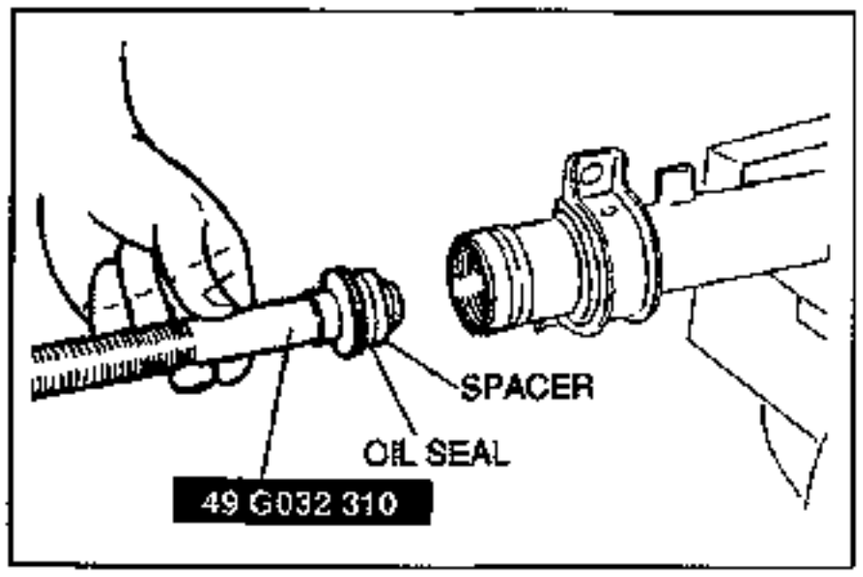
5. Spacer and pinion housing side oil seal
(1) Apply grease to flat surface of the spacer.



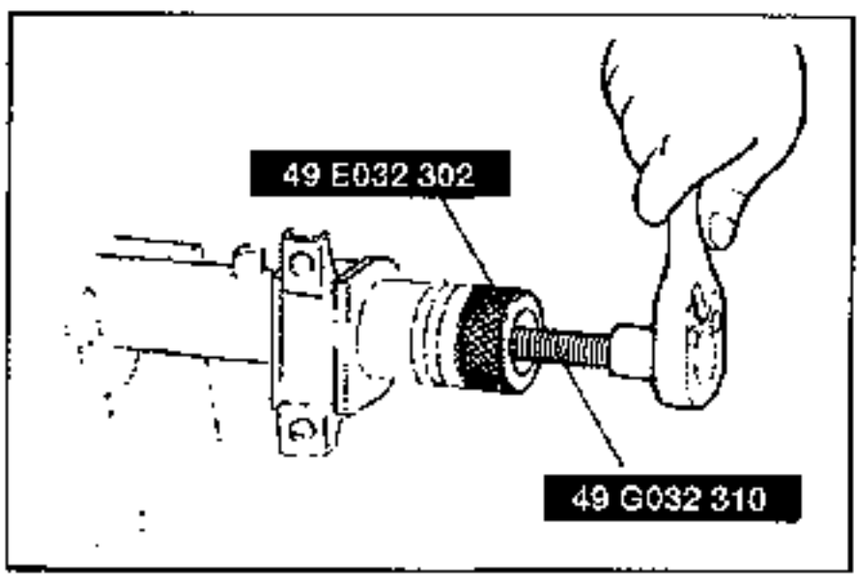
(2) Connect a new oil seal to the grease coated surface of the spacer.
(3) Apply ATF to the inside and outside of the spacer and new oil seal.



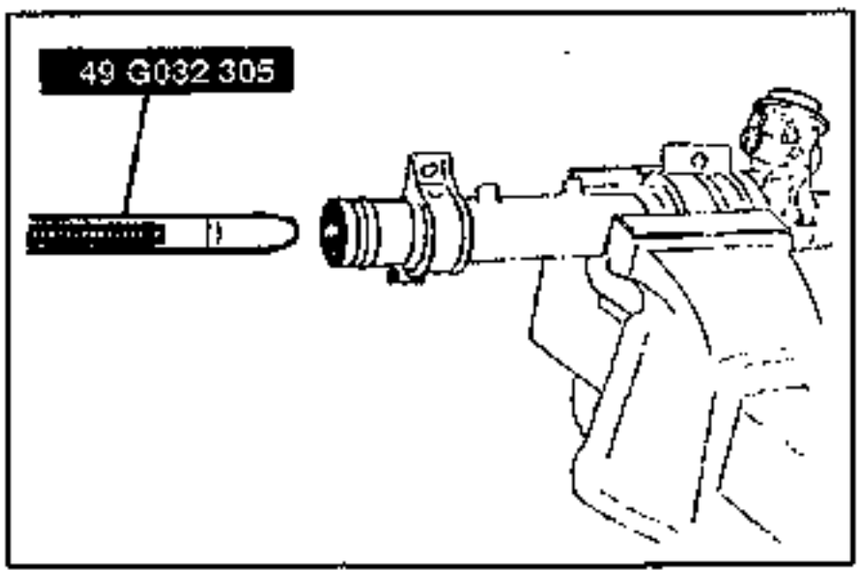
(4) Set the spacer and oil seal on the **SST**.



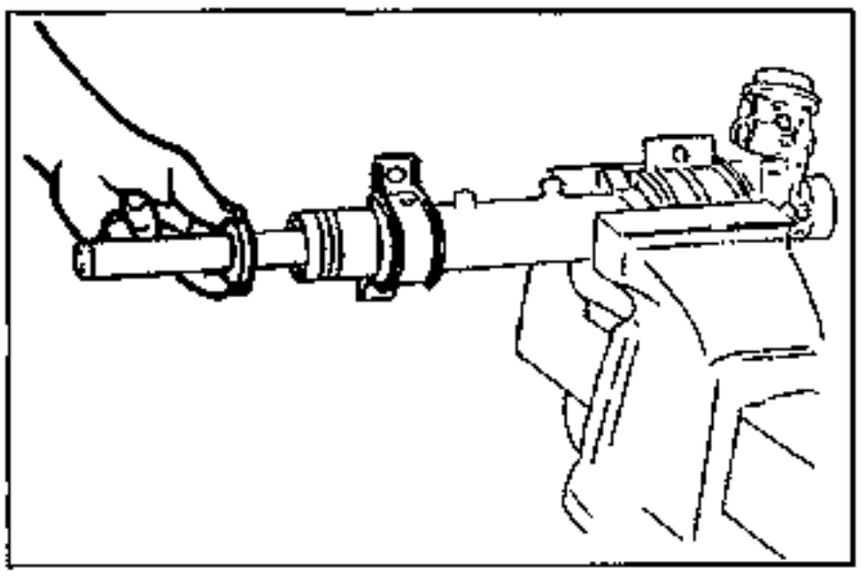
(5) Insert the **SST** from the tube side.



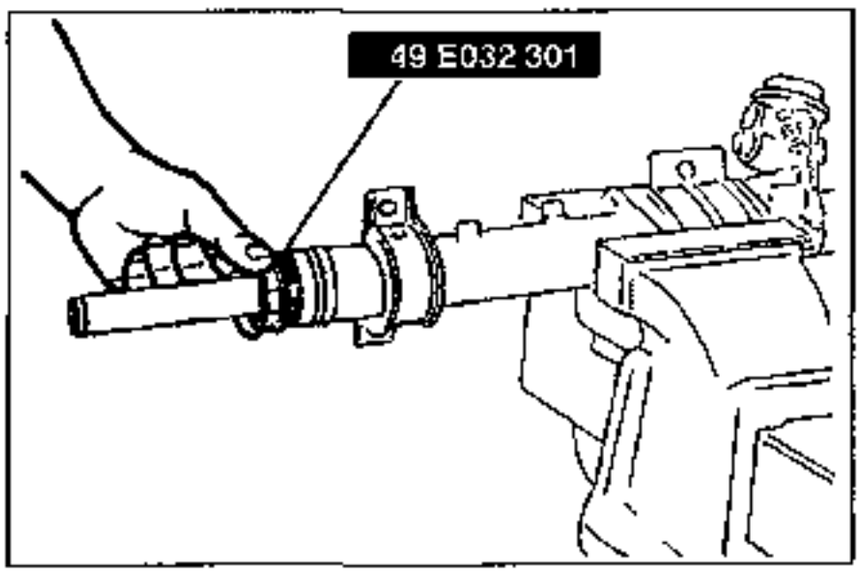
(6) Install and tighten the **SST** nut against the tube.
(7) Turn the **SST** shaft in as far as it will go to push in the seal and spacer.
(8) Remove the **SSTs**.



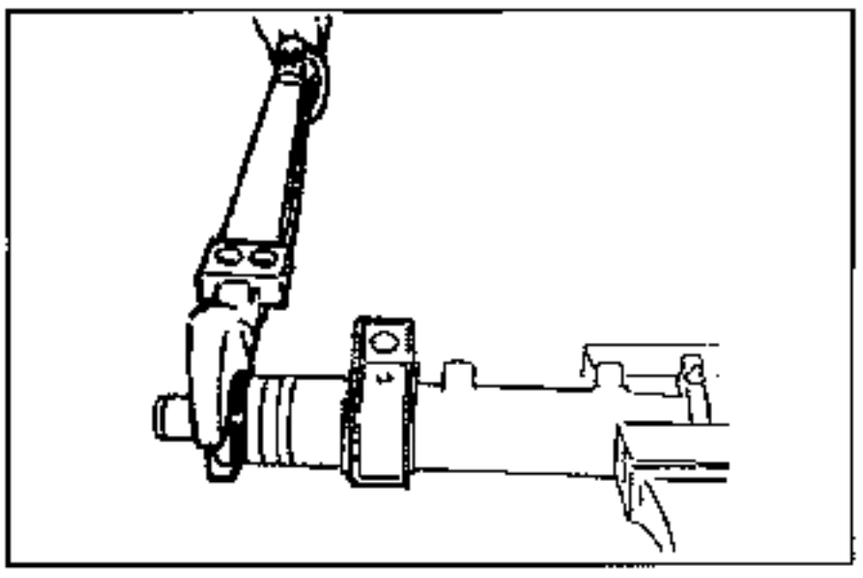
6. Steering rack
(1) Apply grease (lithium base, NLGI No.2) to the friction surface and teeth of the steering rack.
(2) Slide the **SST** over the steering rack and slide it in from the tube side.
(3) Remove the **SST.**



7. Oil seal (Rack)
(1) Apply ATF to a new oil seal and slide it on the steering rack.



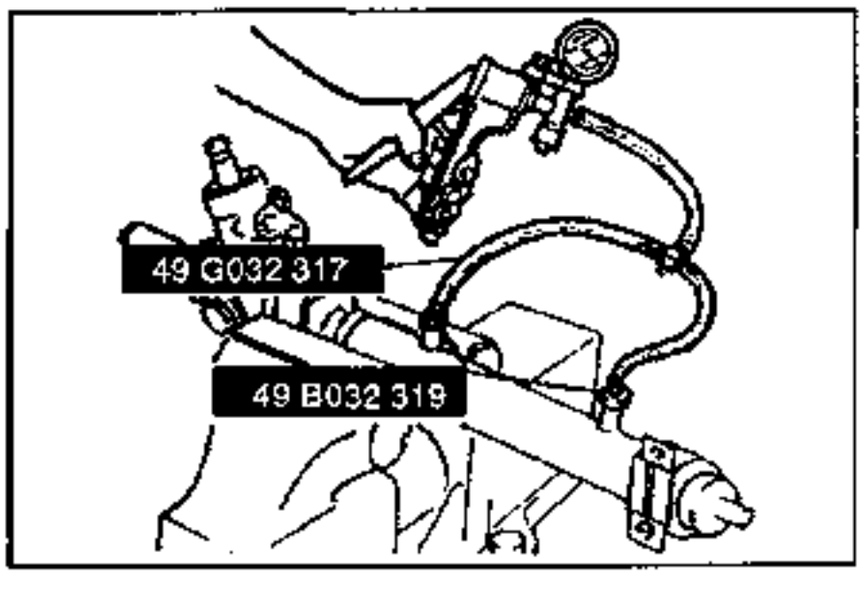
(2) Set the **SST** on the rack.
(3) Turn the **SST** as far as it will go to push the oil seal into the tube.
(4) Remove the **SST.**



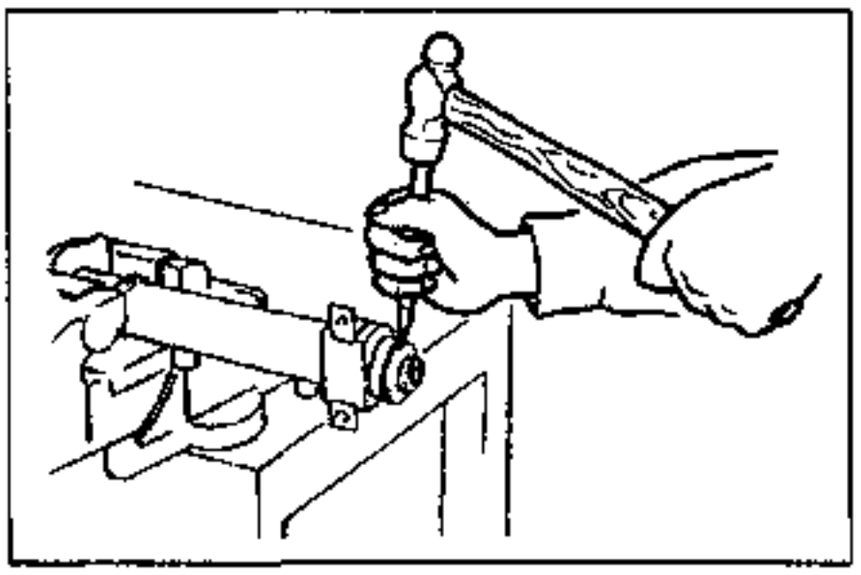
8. Rack bushing
Install the rack bushing assembly in the rack housing.

Tightening torque:
89–98 N·m {9.0–10.0 kgf·m, 66–72 ft·lbf}

Note
- The oil seal is pushed to the correct position in the rack housing by tightening the rack bushing.

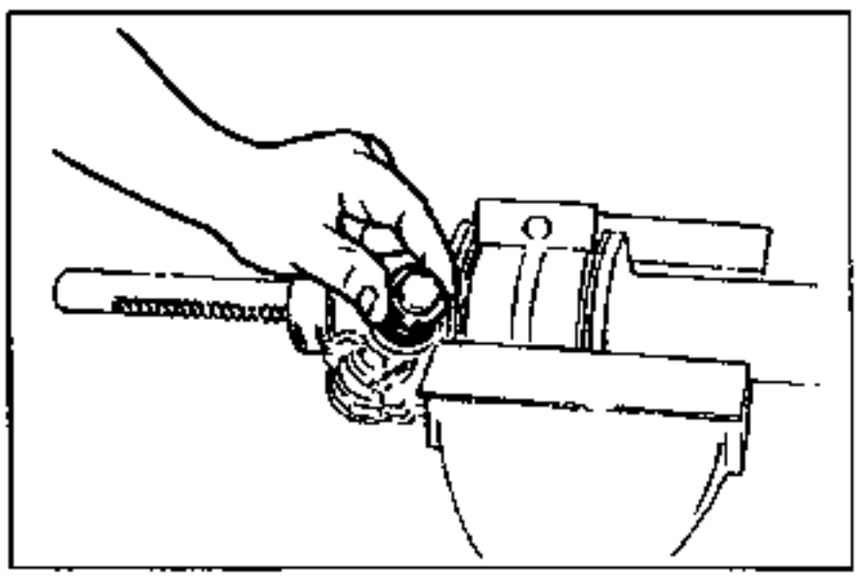


9. Hermetic inspection
(1) Connect the **SSTs** to the cylinder housing.
(2) Connect a vacuum pump to the **SST.**
(3) Apply **53.3 kPa {400 mmHg, 15.7 inHg}** vacuum.
(4) Verify that vacuum is held for at least **30 sec.** If not, check the seal and assembly.

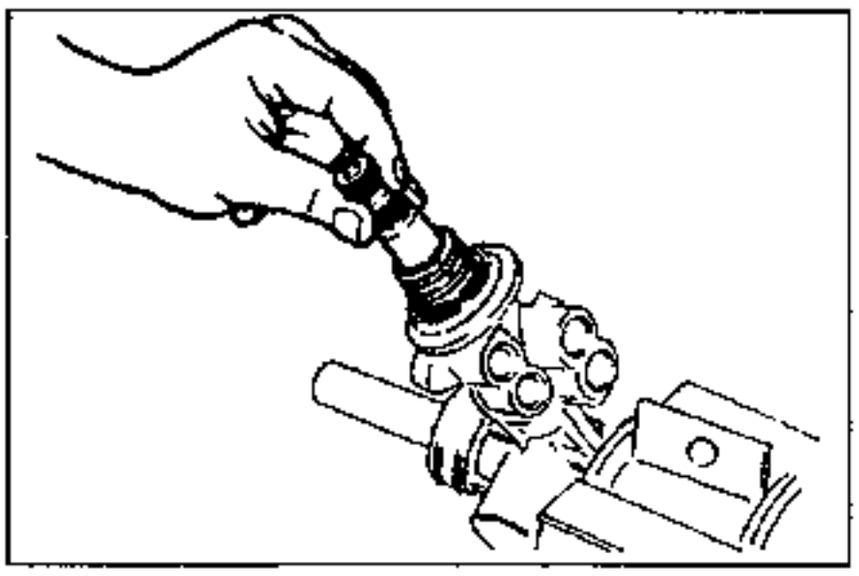


(5) Stake the rack housing at two points **approx 1 .5mm {0.06 in}** from the end.

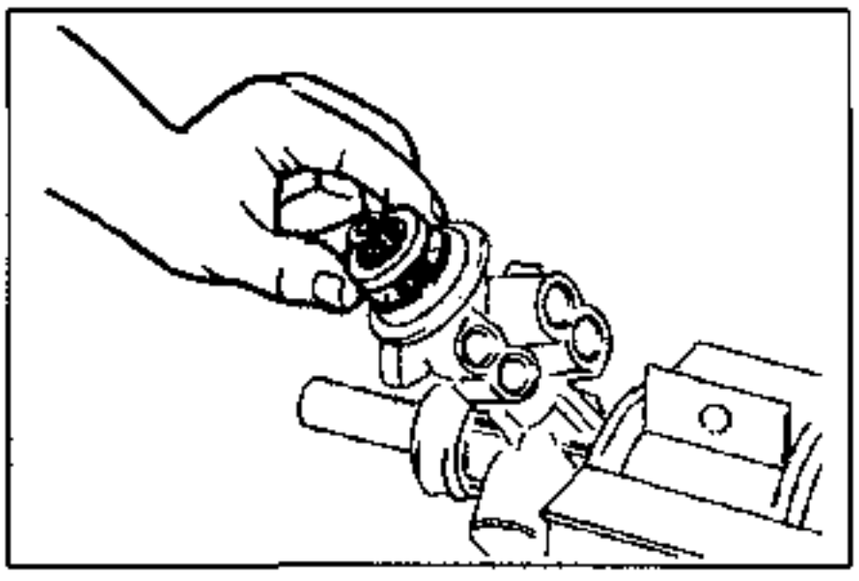
Caution
- **Stake a point 90° from the part which was cut away with a drill during disassembly.**



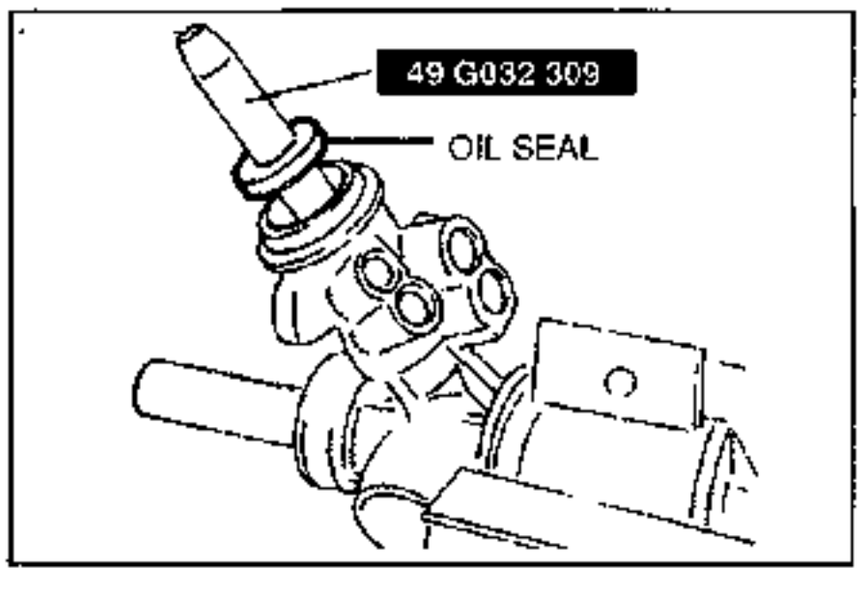
10. Lower bearing
(1) Secure the gear housing in a vise so that the lower bearing bore faces upward.
(2) Apply ATF to the lower bearing, then install it in the housing.
(3) Press the bearing into the gear housing with the housing cover. Tighten the cover until resistance suddenly increases.



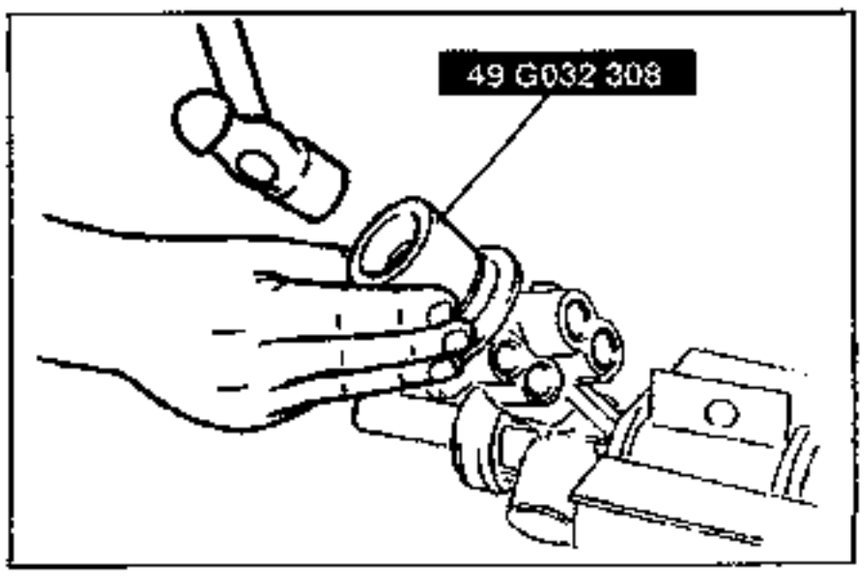
11. Pinion shaft assembly
(1) Apply grease (lithium base, NLGI No.2) to the teeth of the pinion shaft.
(2) Apply ATF to a new seal ring and the friction surface of the control valve.
(3) Install the pinion shaft in the housing.



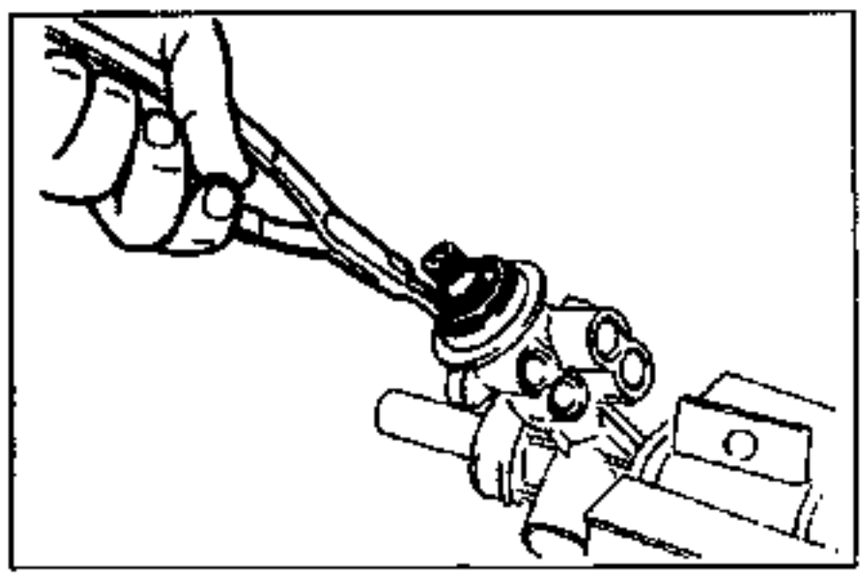
12. Upper bearing
Apply ATF to the upper bearing, then install it.



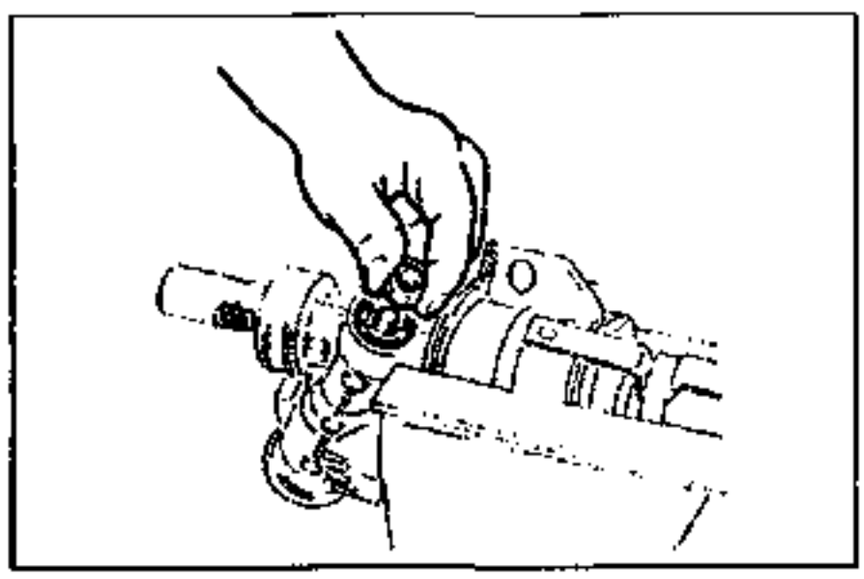
13. Oil seal
(1) Apply ATF to a new oil seal, and fill inside the lip with grease (lithium base, NLGI No.2).
(2) Slide the **SST** over the serrations of the pinion shaft assembly.
(3) Slide the oil seal over the **SST** and position it in the housing.



(4) Tap the oil seal in with the **SST** until the snap ring installation groove in the housing is just visible.

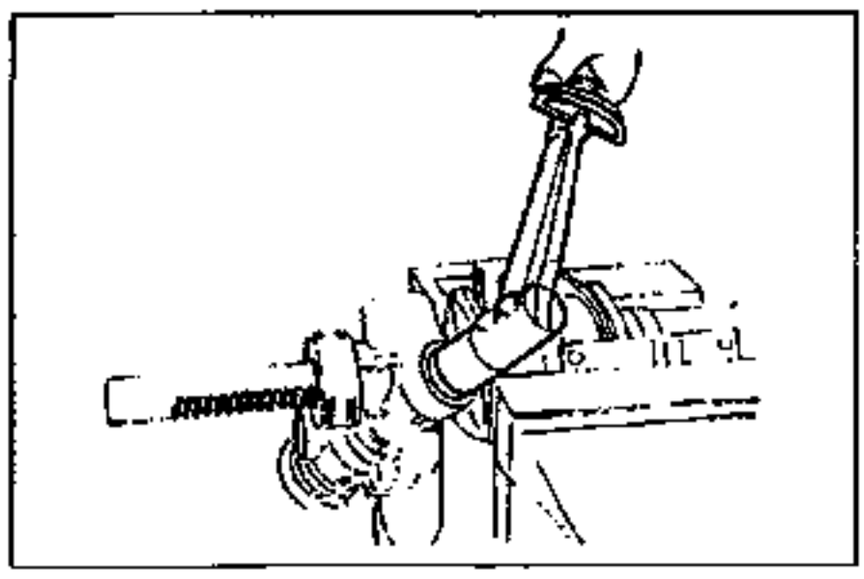


14. Snap ring
1. Install the new snap ring.
2. Verify that the snap ring is correctly seated in the ring groove of the housing.



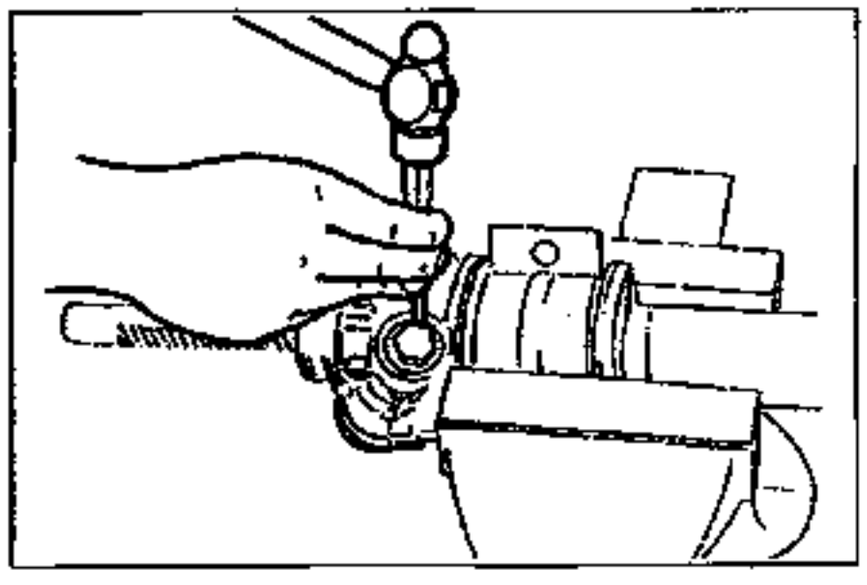
15. Locknut
(1) Temporarily install the tie rod on the tube side of the rack.
(2) Invert the housing and install the locknut on the pinion shaft. Turn it until the tie rod contacts the tube.
(3) Tighten the locknut.

Tightening torque:
40–49 N·m {4.0–5.0 kgf·m, 29–36 ft·lbf}

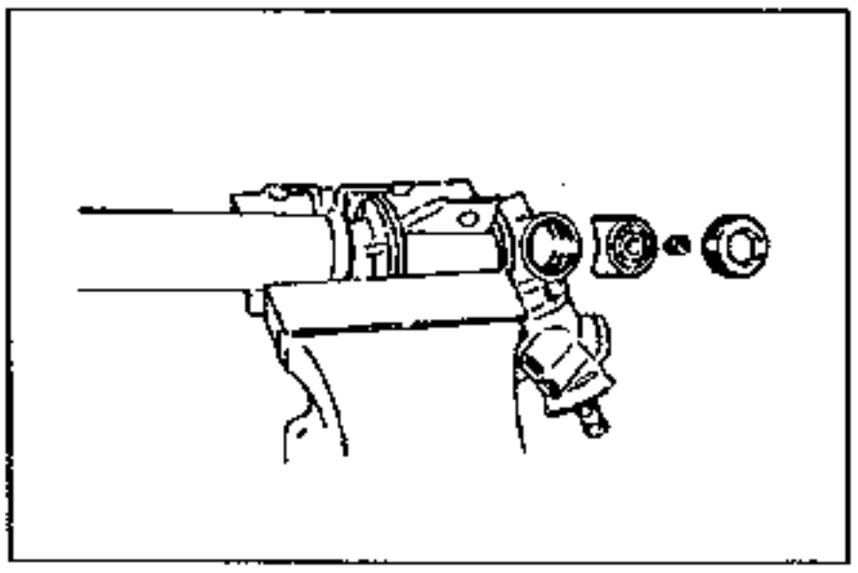


16. Housing cover
(1) Apply thread sealant to the hosing cover threads.
(2) Install the housing cover.

Tightening torque:
54–68 N·m {5.5–7.0 kgf·m, 40–50 ft·lbf}

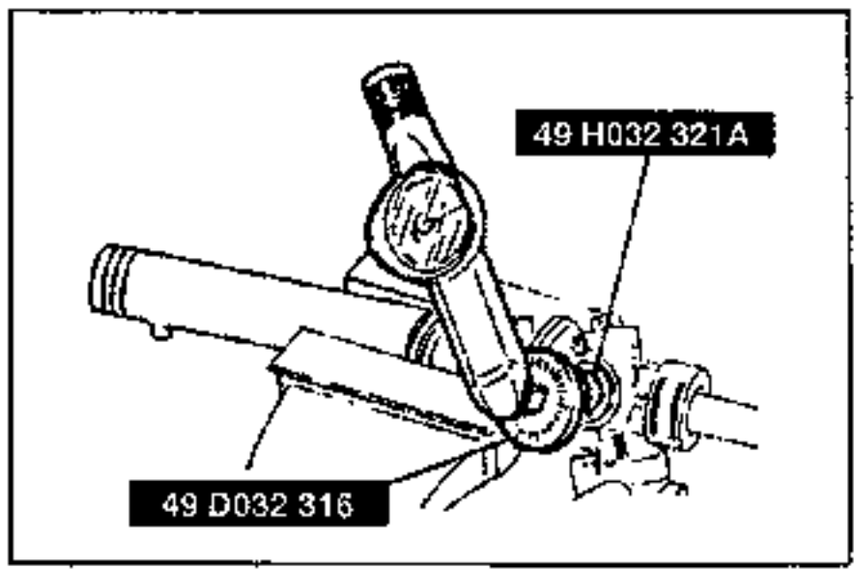


(3) Stake between the rack housing and housing cover at two points with a center punch.



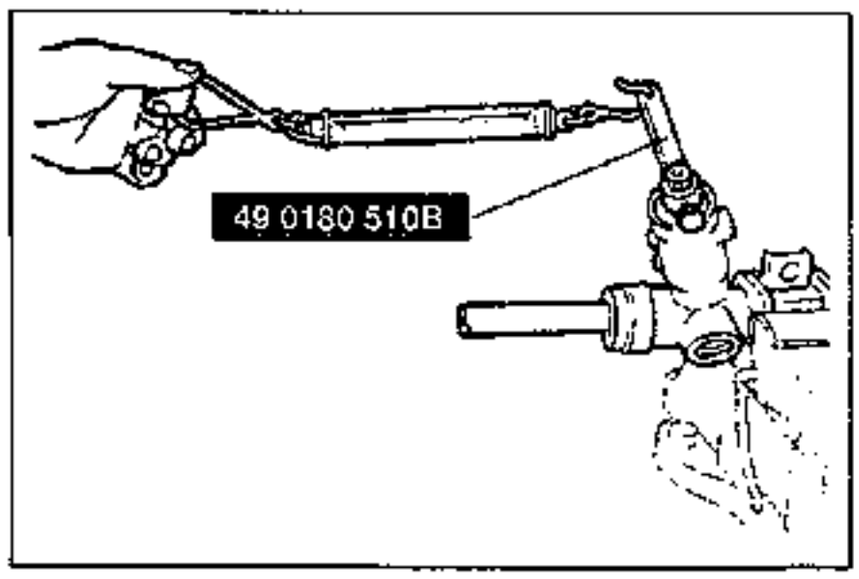
17. Support yoke

(1) Secure the gear housing in a vise so that the support yoke position faces upward.
(2) Apply grease (lithium base NLGI No.2) to the rack sliding surface of the pressure pad, then install it in the housing.
(3) Install the support yoke.
(4) Install the yoke spring.



18. Adjusting cover

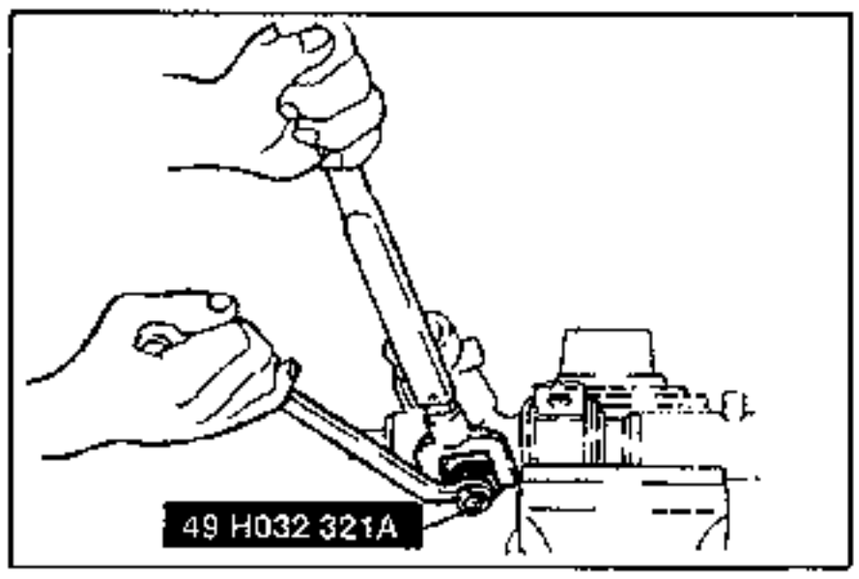
(1) Set the rack in the center position.
(2) Apply sealant to the adjusting cover.
(3) Set the **SSTs** and a torque wrench against the adjusting cover.
(4) Tighten the adjusting cover to **9.8 N·m {100 kgf·cm, 87 in·lbf}**, then loosen it.
(5) Tighten again to **4.5–5.3 N·m {45–55 kgf·cm, 40–47 in·lbf}**, and then return it 45°.



(6) Measure pinion torque with the **SST** and a pull scale.

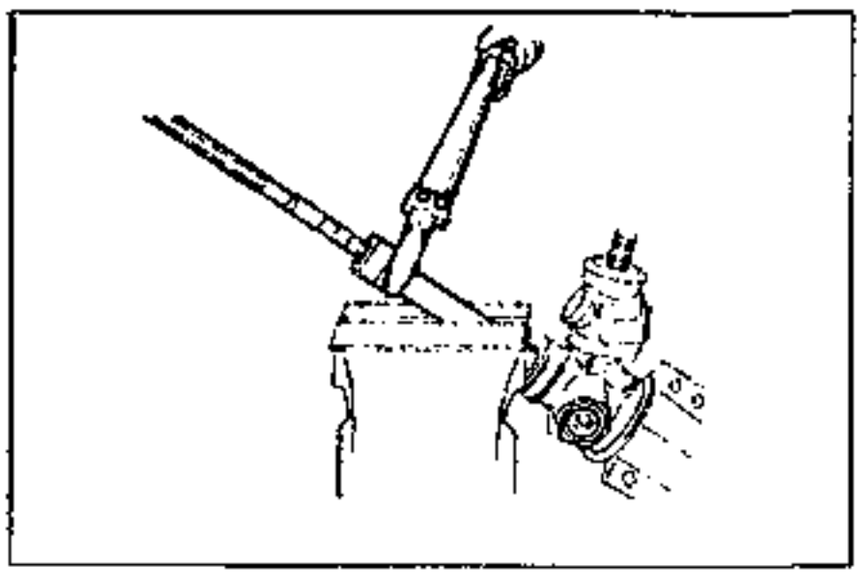
Standard
Center of rack ±90°:
1.0–1.3 N·m {10–14 kgf·cm, 8.7–12.1 in·lbf}
(Pull scale reading: 1.0–1.2 kgf {2.2–2.6 lbf})
At other position:
1.6 N·m {17 kgf·cm, 14.7 in·lbf} max.
(Pull scale reading: 1.7 kgf {3.7 lbf} max.)

(7) If not within specification, repeat steps (5) through (6).



(8) Apply thread sealant to the threads of the locknut.
(9) Use the **SST** to tighten the locknut.

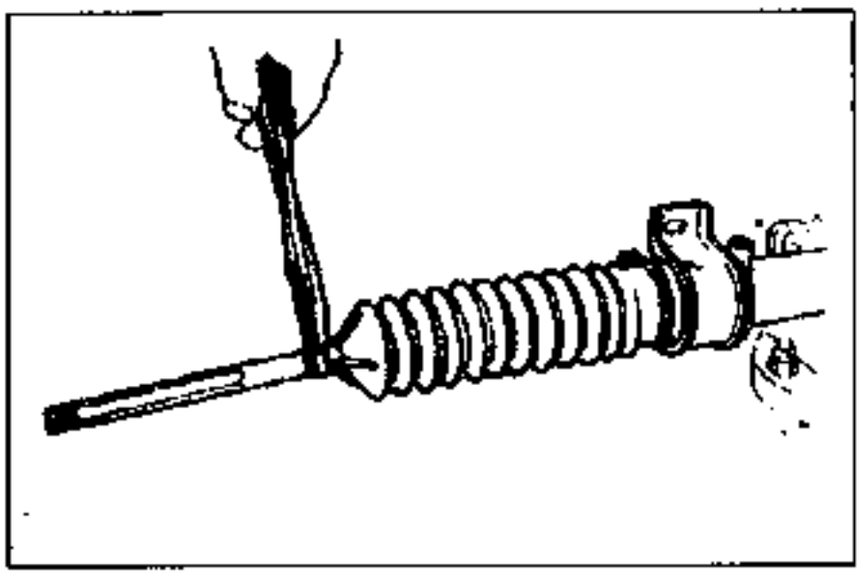
Tightening torque:
50–58 N·m {5.0–6.0 kgf·m, 37–43 ft·lbf}



19. Tie rod

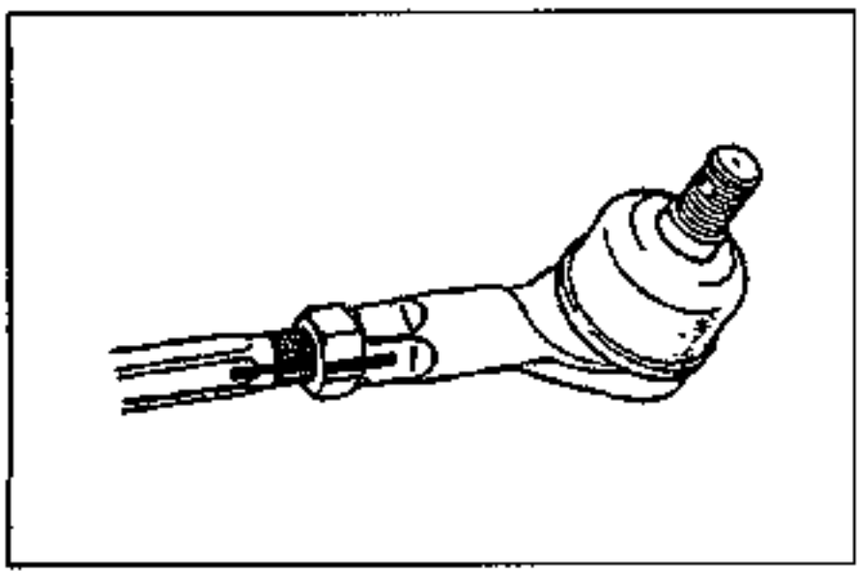
(1) Secure the rack in a vise.
(2) Install the tie rod onto the rack.

Tightening torque:
123–142 N·m {12.5–14.5 kgf·m, 91–104 ft·lbf}



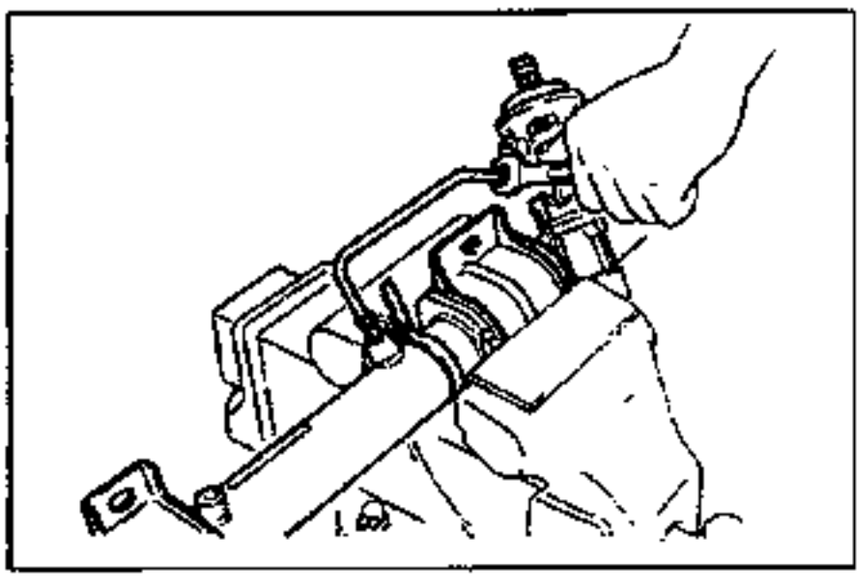
20. Boot, boot wire, boot clamp

(1) Apply grease to the inner surface of the small end of the boot.
(2) Install the boot. Wrap a new boot wire around the large end of the boot twice and then twist it 4 to 4.5 times. Bend the twisted part toward the mounting bracket.
(3) Install the boot clamp on the small end of the boot.



21. Tie-rod end

Align with the marks made before disassembly, and tighten the nut.



22. Oil pipe

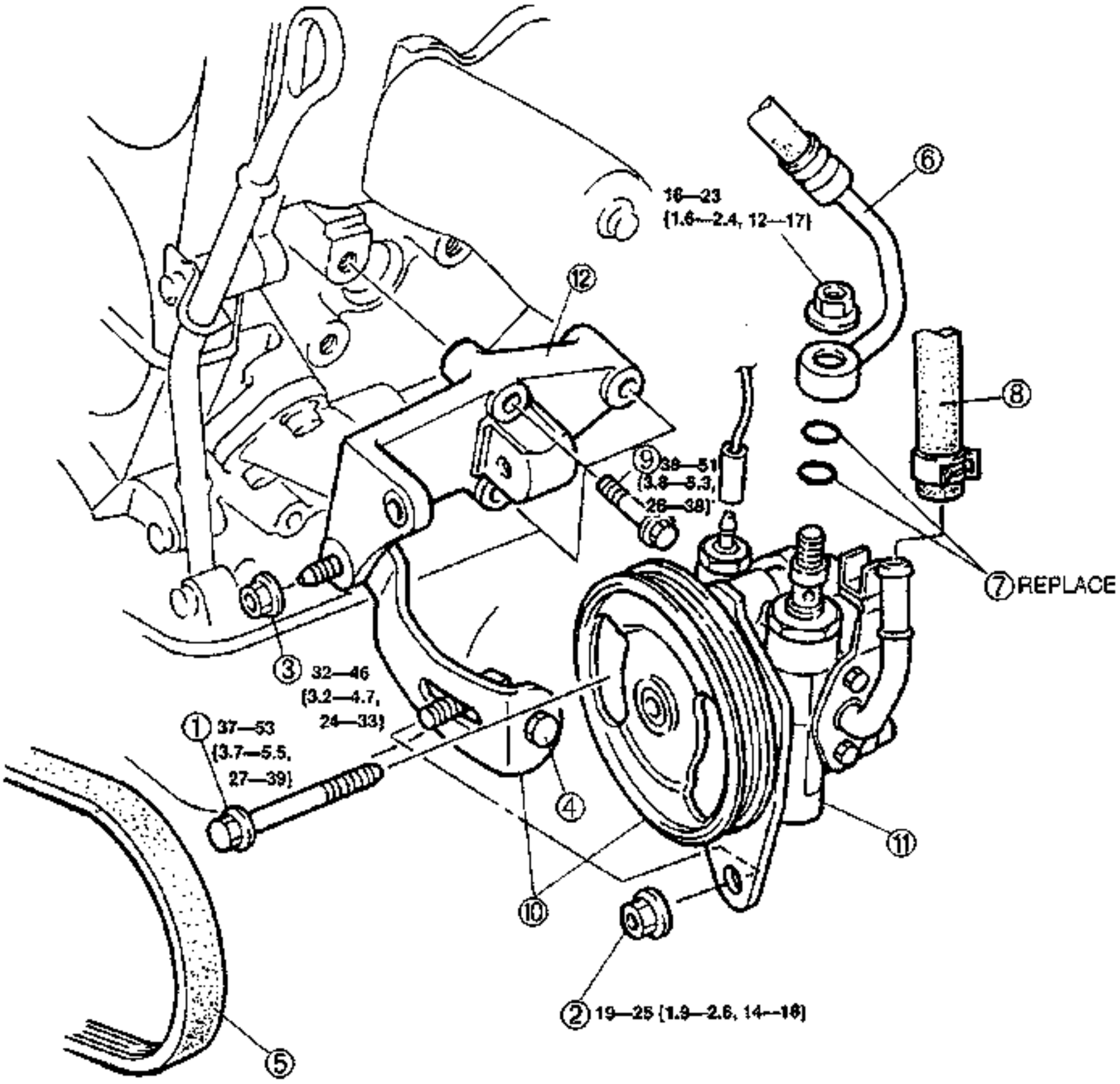
(1) Secure the mounting bracket in a vise so that the oil pipe connections face upward.
(2) Install the oil pipes.

Tightening torque:
25–34 N·m {2.5–3.5 kgf·m, 19–25 ft·lbf}

POWER STEERING OIL PUMP (B6 DOHC)

Removal / Installation

1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal.
4. After installation, bleed air from system (Refer to page N–8.)

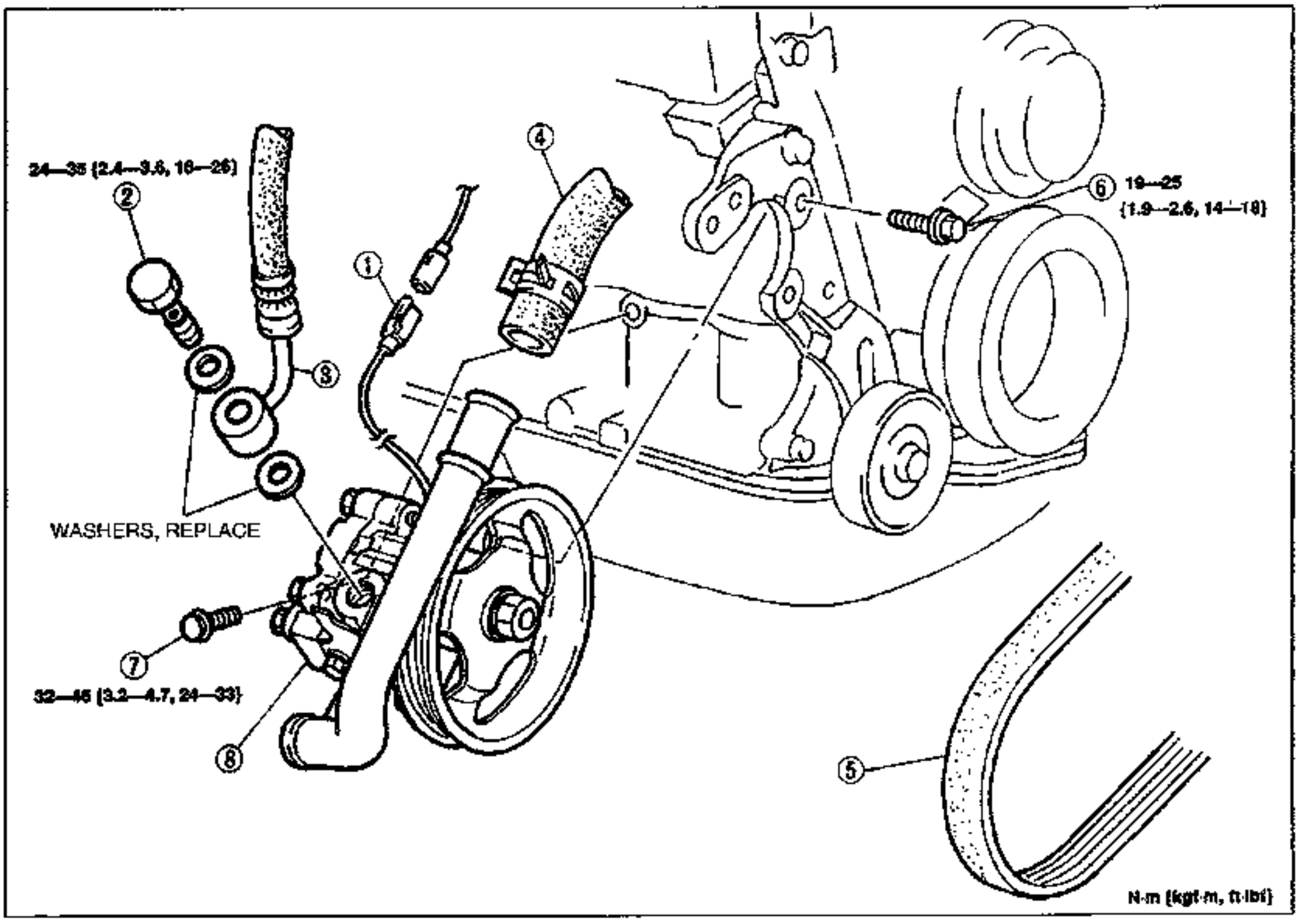


1. Bolt
2. Nut
3. Nut
4. Adjusting bolt
5. P/S drive belt
   - Replacement ..... page N–51
   - Adjustment ..... page N–51
   - Inspection ..... page N–51
6. Pressure hose
7. O-Rings
8. Return hose
9. Bolts
10. P/S oil pump assembly and bracket
11. P/S oil pump assembly
    - Disassembly / Inspection / Assembly ..... page N–45
12. Bracket
    - Inspect cracks and damage

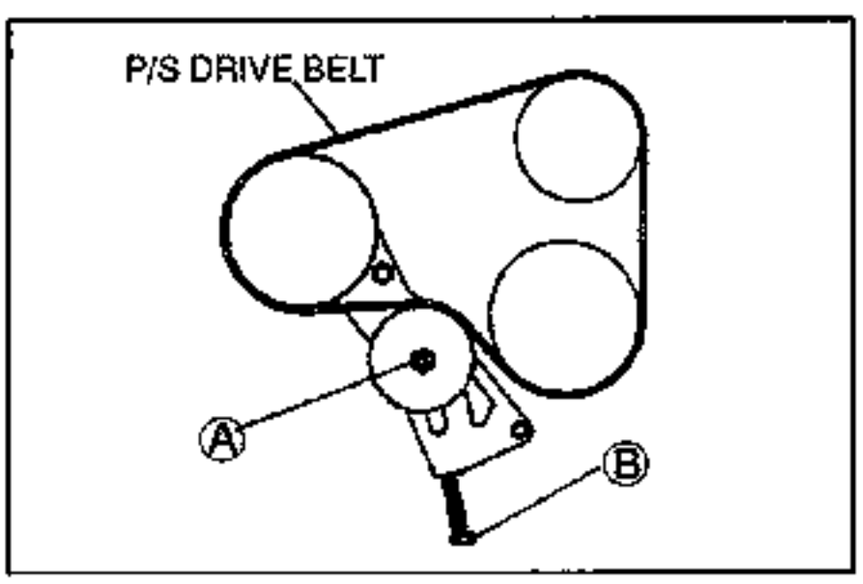
POWER STEERING OIL PUMP (K8 DOHC)

Removal / Installation

1. Remove the A/C drive belt. (Refer to section U.)
2. Remove in the order shown in the figure, referring to **Removal Note.**
3. Install in the reverse order of removal.
4. After installation, bleed air from system.
5. Install the A/C drive belt. (Refer to section U.)



1. Power steering pressure switch connector
2. Bolt
3. Pressure hose
4. Return hose
5. P/S drive belt
   Removal Note ..... below
   Inspection / Adjustment / Replacement ..... page P–52
6. Bolt
7. Bolt
8. P/S oil pump assembly
   Disassembly / Inspection / Assembly ..... page N–48



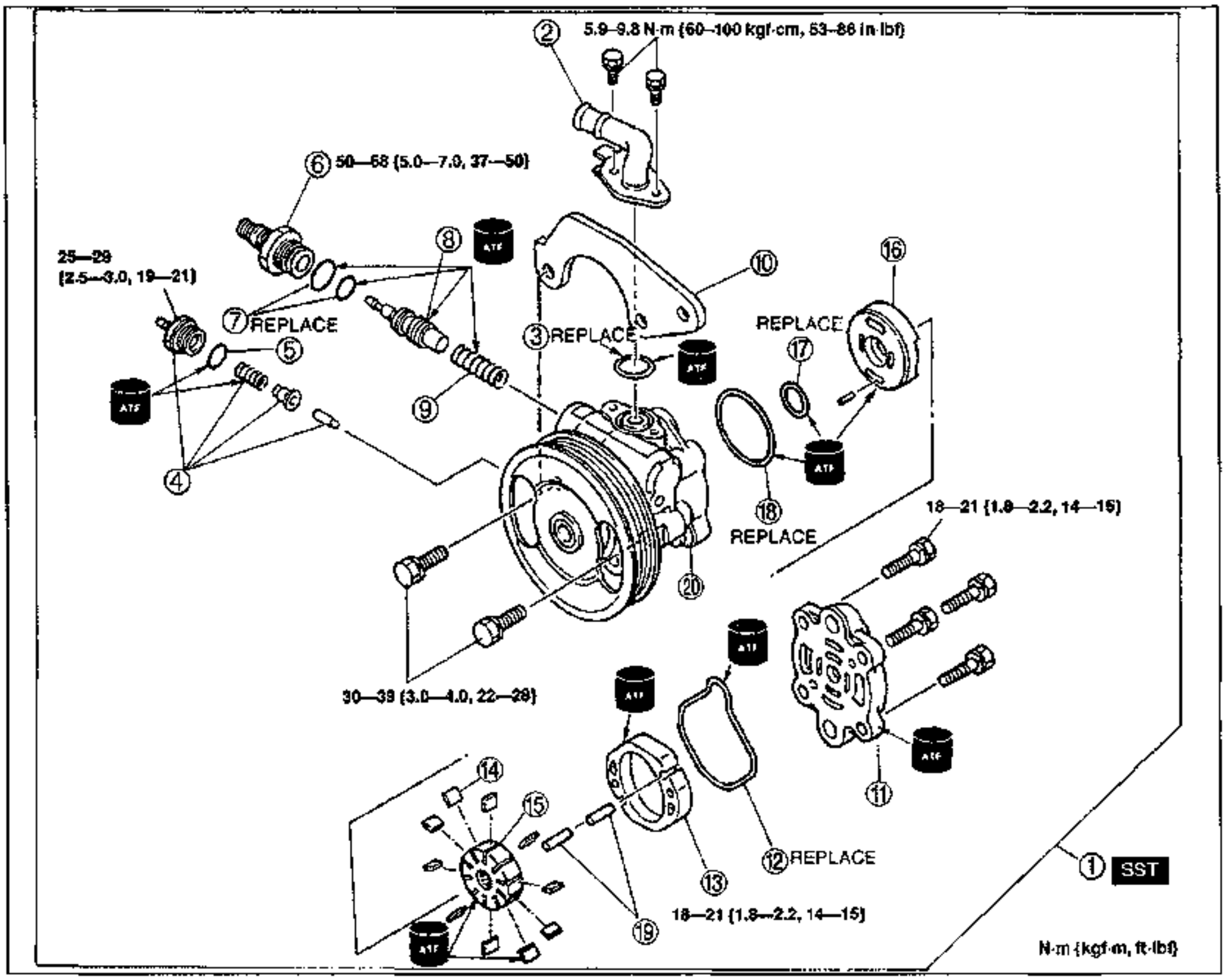
Removal Note

P/S Drive belt

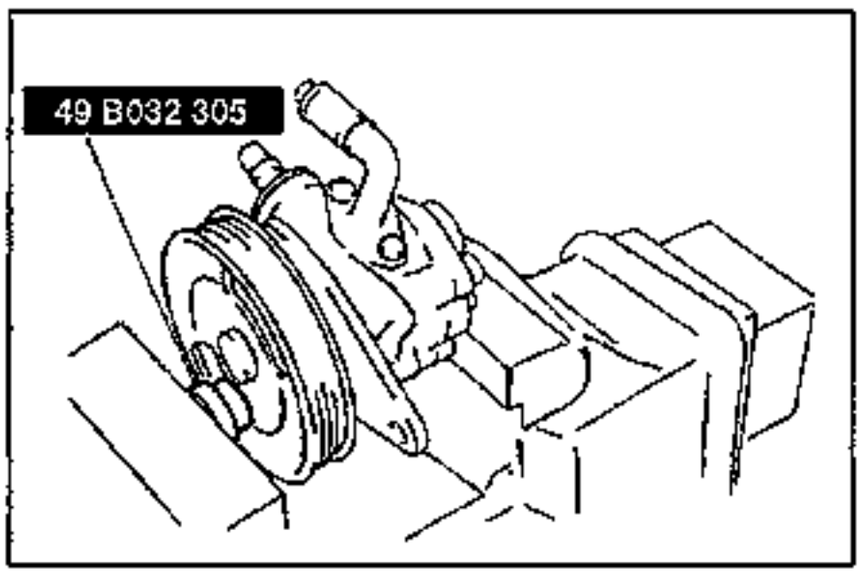
Loosen nut Ⓐ and turn adjusting bolt Ⓑ to release the belt tension.

Disassembly / Inspection / Assembly (B6 DOHC)

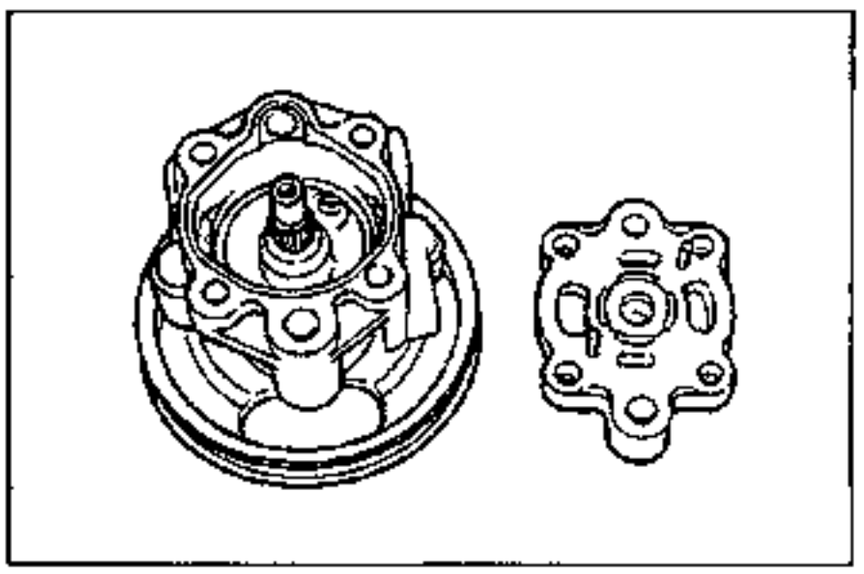
1. The following procedures show replacement of the O-rings. If a problem is found in other parts, replace the oil pump assembly.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note.**
3. Inspect **all** parts and replace as necessary.
4. .Assemble in the reverse order of disassembly, referring to **Assembly Note.**



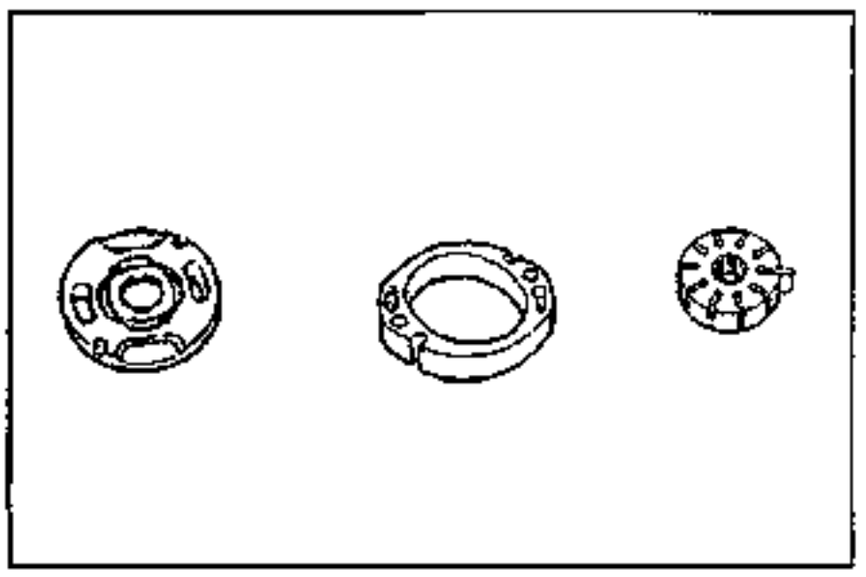
1. Oil pump
   Disassembly Note ..... page N–46
2. Suction pipe
3. O-ring
4. Pressure-switch assembly
5. O-ring
6. Connector
7. O-rings
8. Control valve
   Inspection ..... page N–46
9. Spring
   Inspection ..... page N–46
10. Bracket
11. Pump body (rear)
    Inspection ..... page N–46
    Assembly Note ..... page N–47
12. O-ring
13. Cam ring
    Inspection ..... page N–46
    Assembly Note ..... page N–47
14. Vane
    Inspection ..... page N–46
    Assembly Note ..... page N–47
15. Rotor
    Inspection ..... page N–46
    Assembly Note ..... page N–46
16. Side plate
    Inspection ..... page N–46
17. O-ring
18. O-ring
19. Pin
20. Pump body (front)
    Inspection ..... page N–46



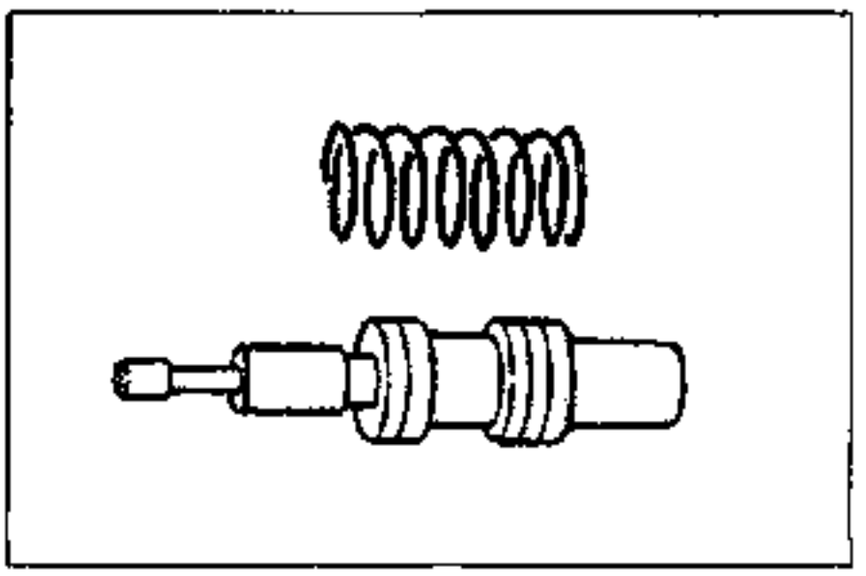
Disassembly Note
Oil pump
Use the **SST** when securing the oil pump in a vise, so that force is not applied to the pulley or shaft.



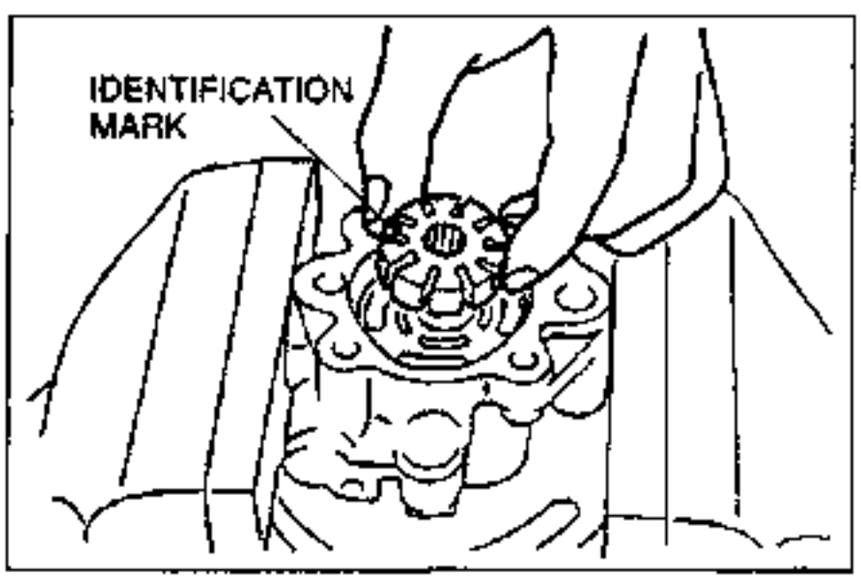
Inspection
pump body
Check the front and rear pump bodies for cracking or other damage and for abnormal wear of the moving surface of the rotor. Replace the pump assembly if a problem is found.



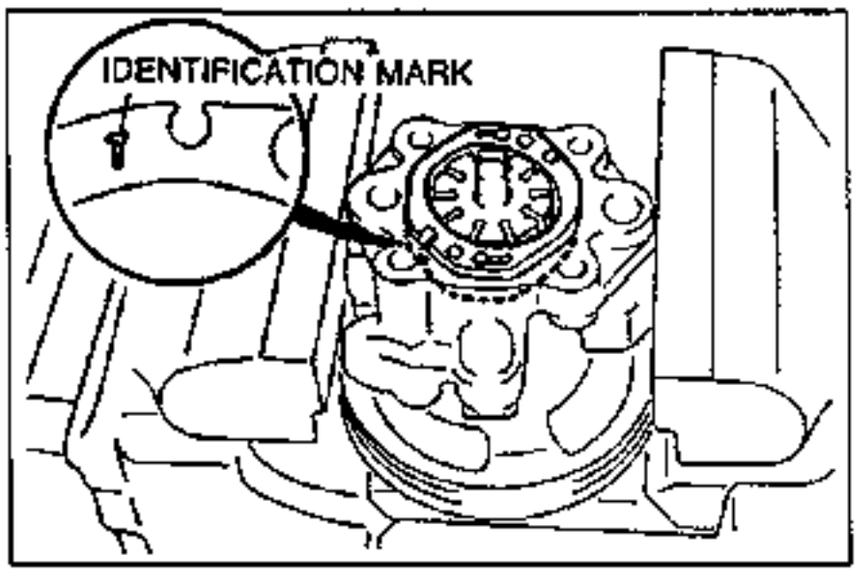
Cam ring, rotor, vanes, side plate
1. Check the moving surface of the cam ring's vanes for abnormal wear.
2. Check the moving surface of the side plate and the pump bodies for abnormal wear.
3. Check the moving surface of the vane cam ring for abnormal wear.
4. Check the clearance of the rotor and vanes.



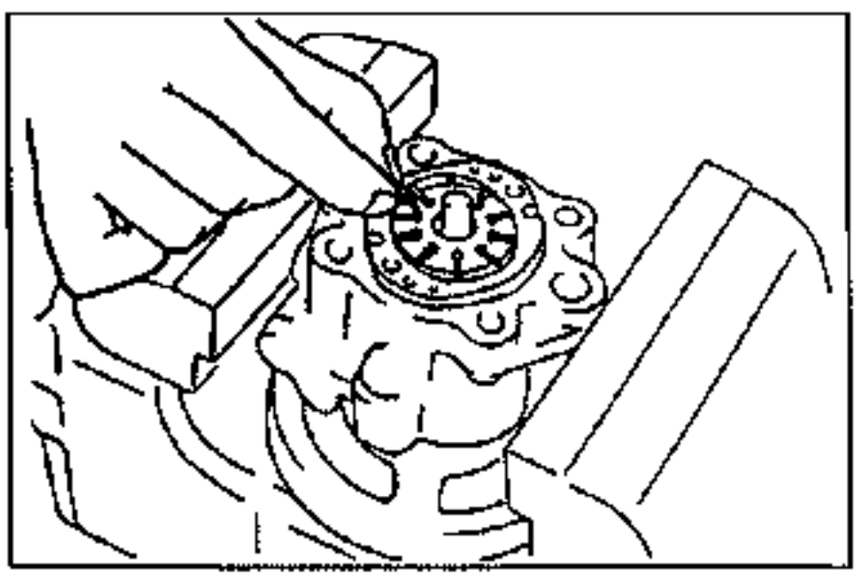
Control valve and spring
1. Check the control valve for cracking and other damage, for blockage, and for abnormal wear of the moving part.
2. Check the spring for damage.



Assembly Note
Rotor
Install the rotor to the shaft with the rotor's identification mark facing upward.



Cam ring
Install the cam ring so that its identification mark is facing downward.

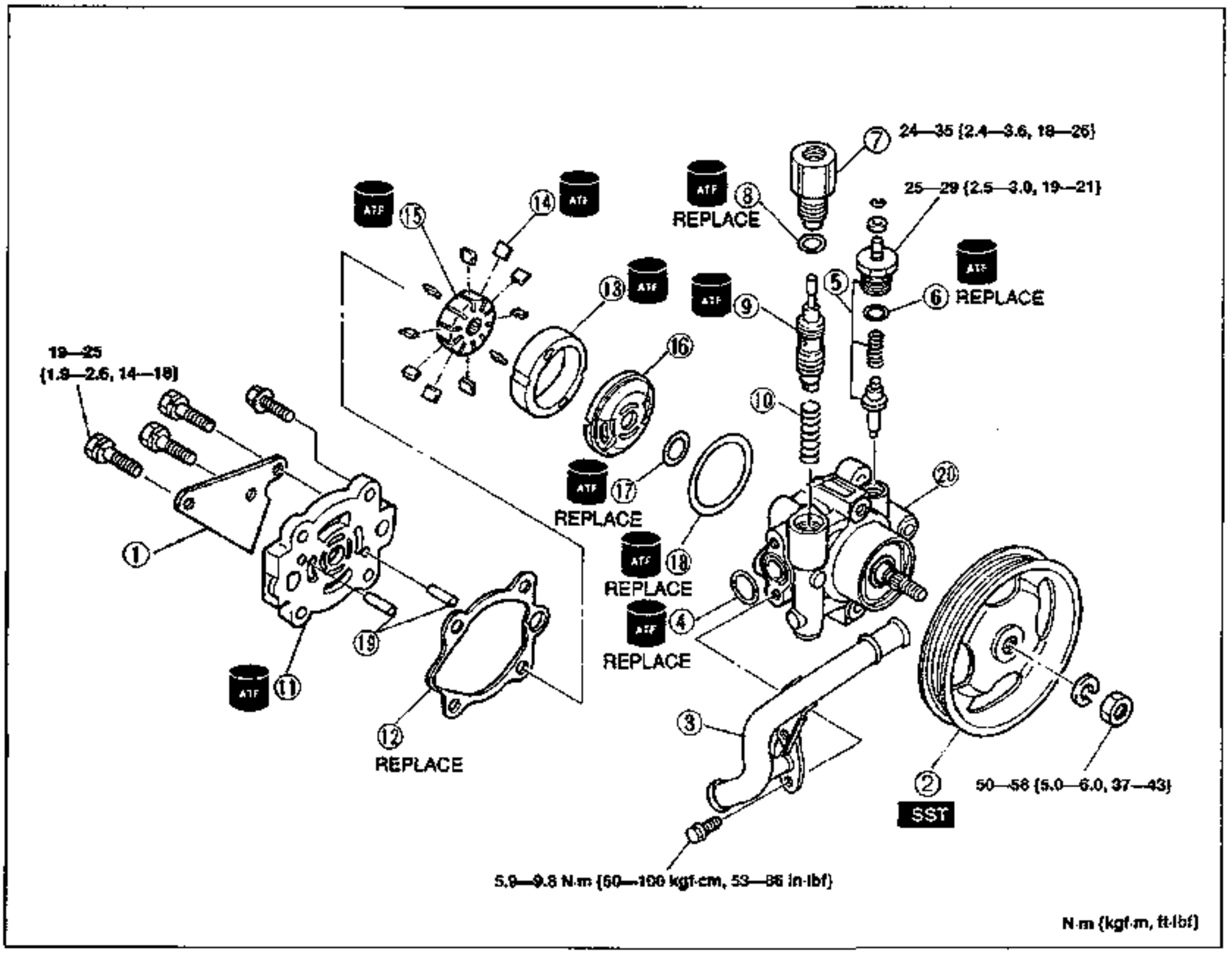


Vane
Install the vanes (10 pieces) to the rotor, with the radiused part of the vanes facing outward.

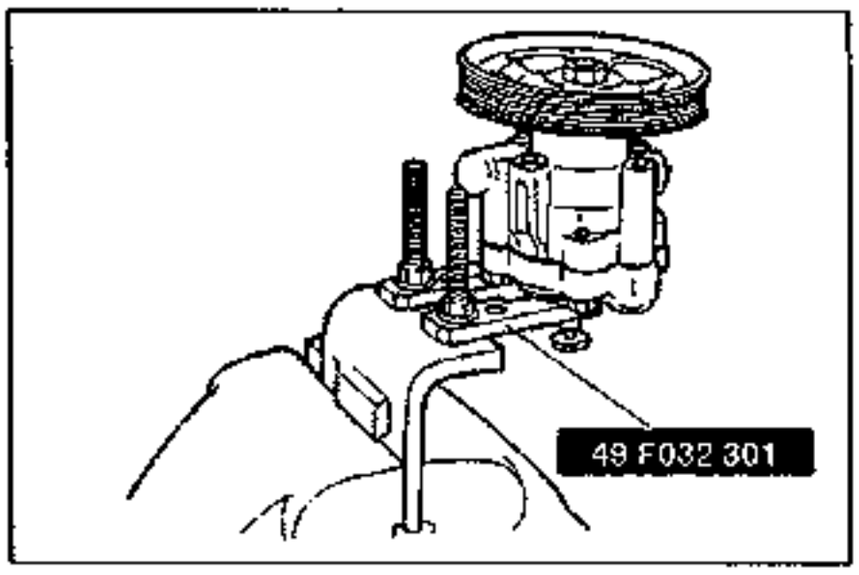
Pump body (rear)
Turn the pulley by hands, inspect for smooth turn.

Disassembly / Inspection / Assembly (K8 DOHC)

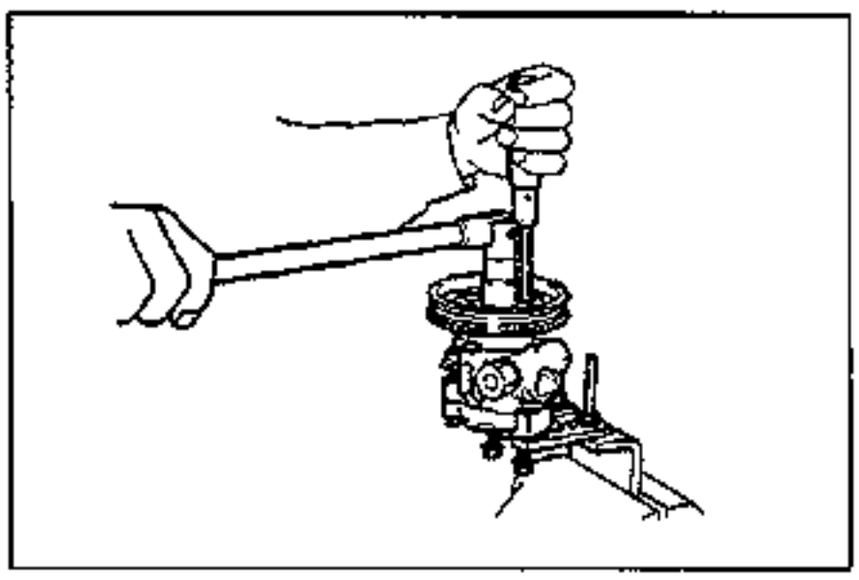
1. The following procedures show replacement of the O-rings. If a problem is found in other parts, replace the oil pump assembly.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
3. Inspect all parts and replace as necessary.
4. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



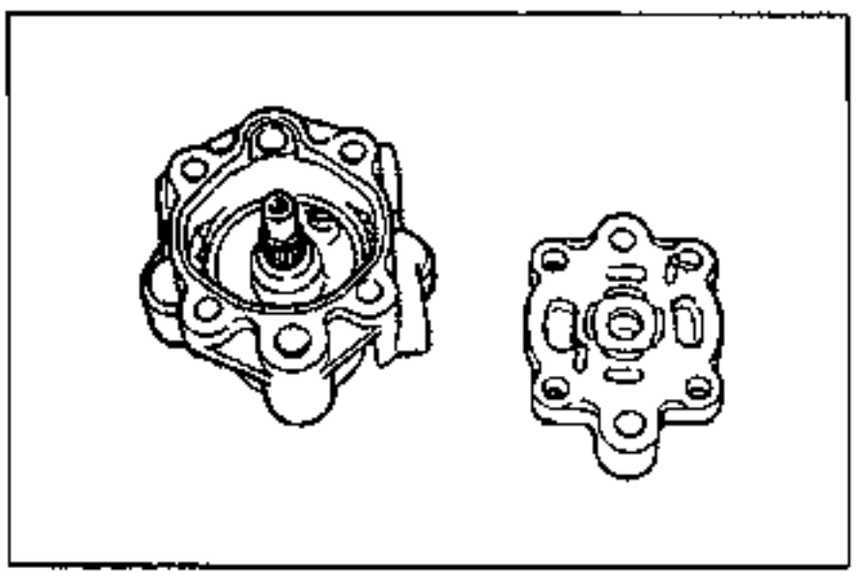
1. Bracket
2. Pulley
   - Disassembly Note ..... page N–49
   - Assembly Note ..... page N–50
3. Suction pipe
4. O-ring
5. Pressure-switch assembly
6. O-ring
7. Connector
8. O-ring
9. Control valve
   - Inspection ..... page N–49
10. Spring
    - Inspection ..... page N–49
11. Pump body (rear)
    - Inspection ..... page N–49
    - Assembly Note ..... page N–50
12. Seal washer
13. Cam ring
    - Inspection ..... page N–49
    - Assembly Note ..... page N–50
14. Vane
    - Inspection ..... page N–49
    - Assembly Note ..... page N–50
15. Rotor
    - Inspection ..... page N–49
    - Assembly Note ..... page N–50
16. Side plate
    - Inspection ..... page N–49
17. O-ring
18. O-ring
19. Pin
20. Pump body (front)
    - Inspection ..... page N–49



Disassembly Note
Pulley
1. Secure the oil pump assembly in a vise with the **SST** and bolts.

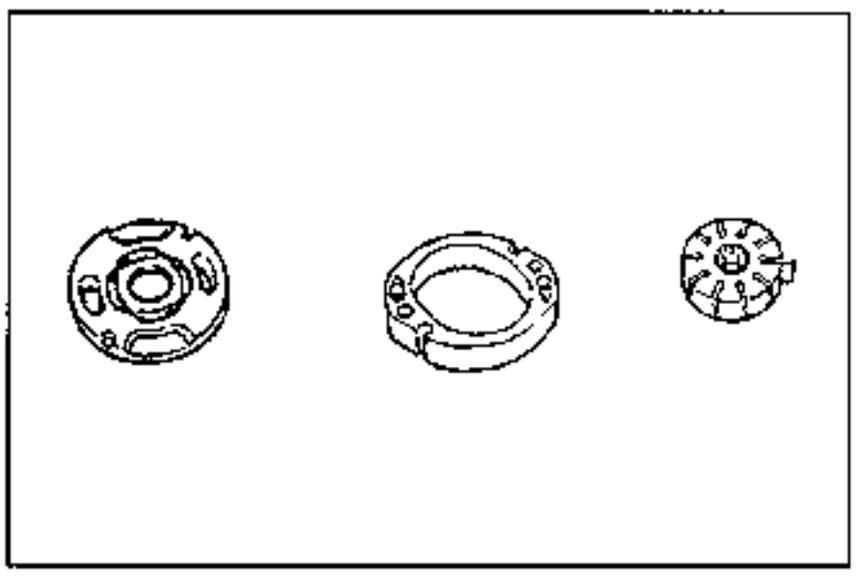


2. Remove the locknut while holding the pulley by using a screw driver.

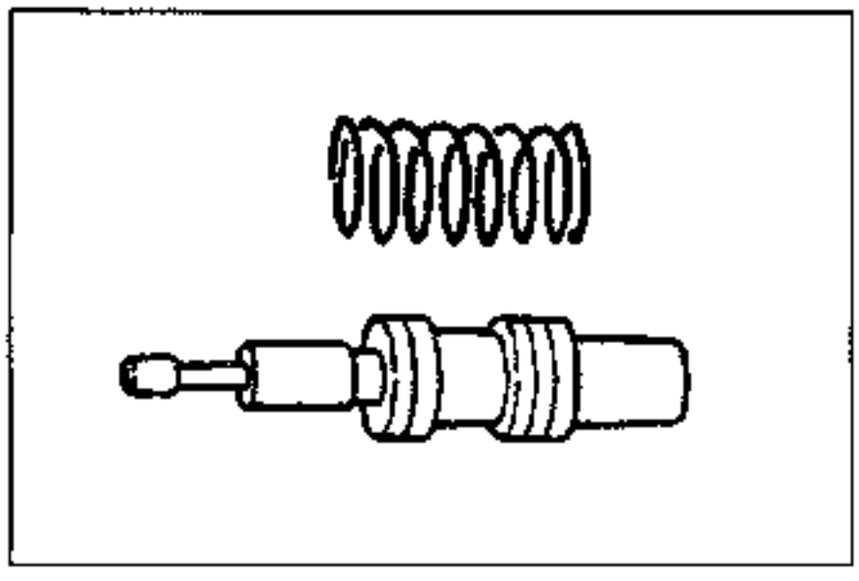


Inspection
Pump body

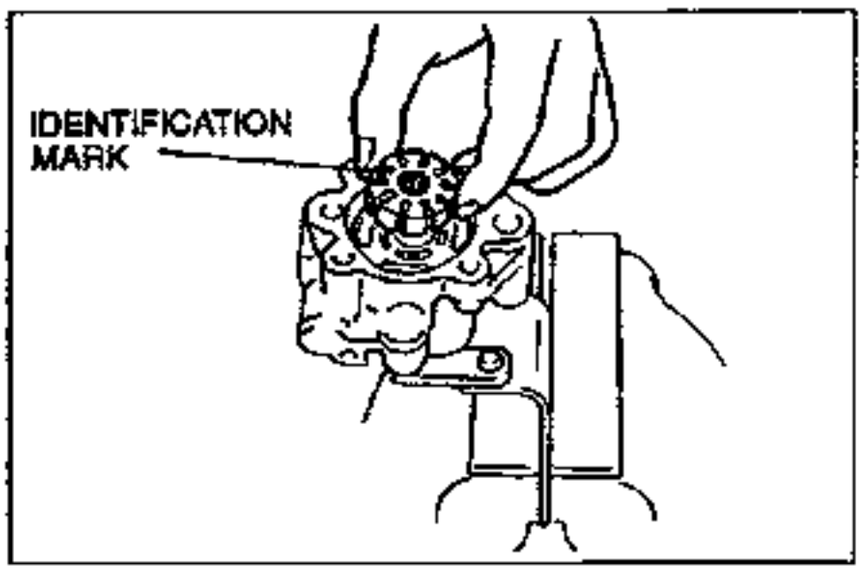
Check the front and rear pump bodies for cracking and other damage and for abnormal wear of the friction surface of the rotor. Replace the pump assembly if a problem is found.



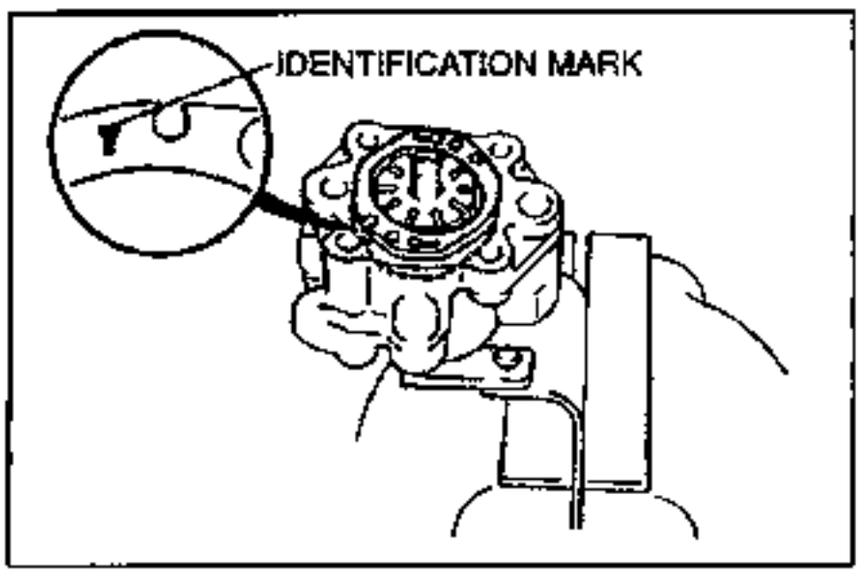
Cam ring, rotor, vanes, side plate
1. Check the friction surface of the cam ring vanes for abnormal wear.
2. Check the friction surface of the side plate and the pump bodies for abnormal wear.
3. Check the friction surface of the cam ring for abnormal wear.
4. Check the clearance of the rotor and vanes.



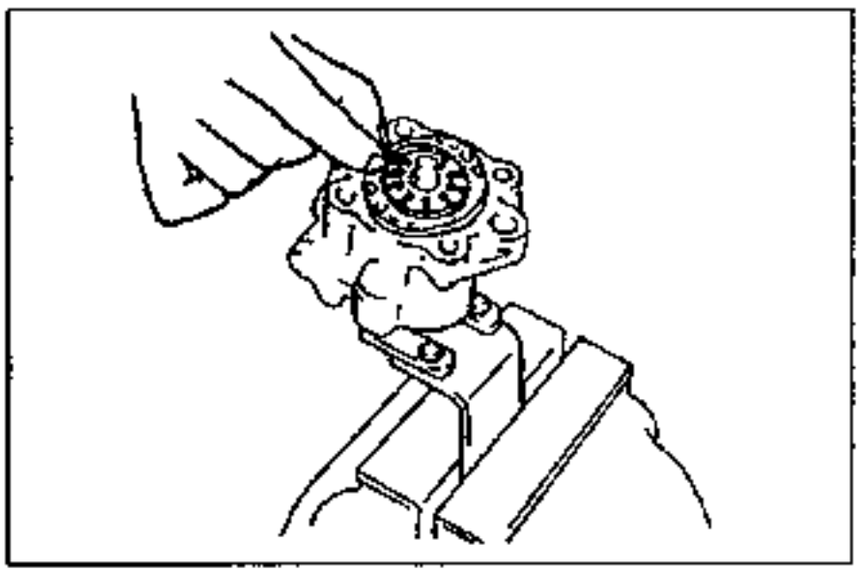
Control Valve and spring
1. Check the control valve for cracking, damage, blockage, and abnormal wear.
2. Check the spring for damage.



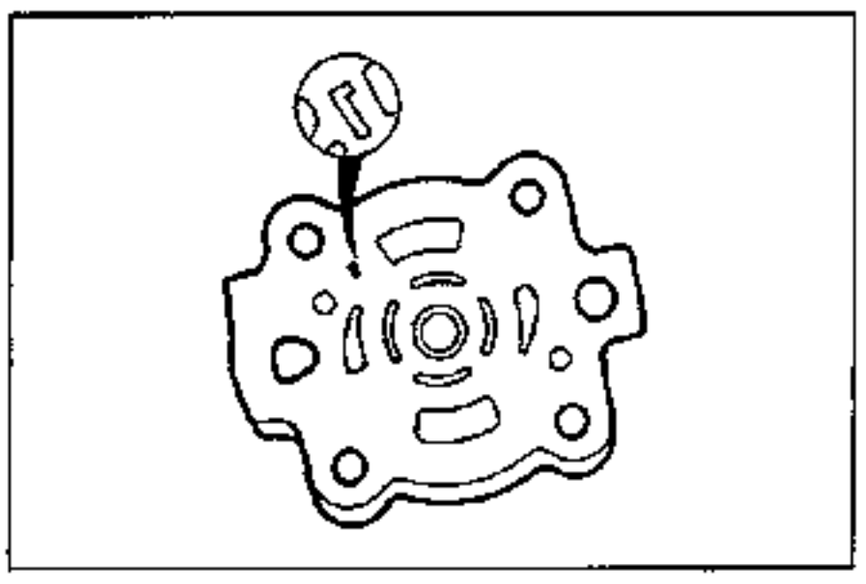
Assembly Note
Rotor
Install the rotor to the shaft with the rotor identification mark upward.



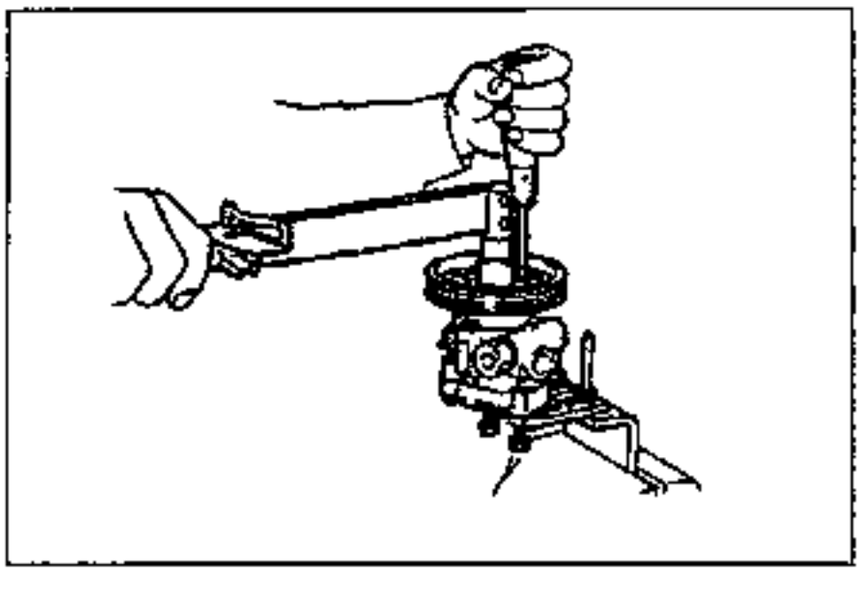
Cam ring
Install the cam ring with its identification mark downward.



Vane
Install the vanes (10 pieces) to the rotor, with the radiused part of the vanes outward.

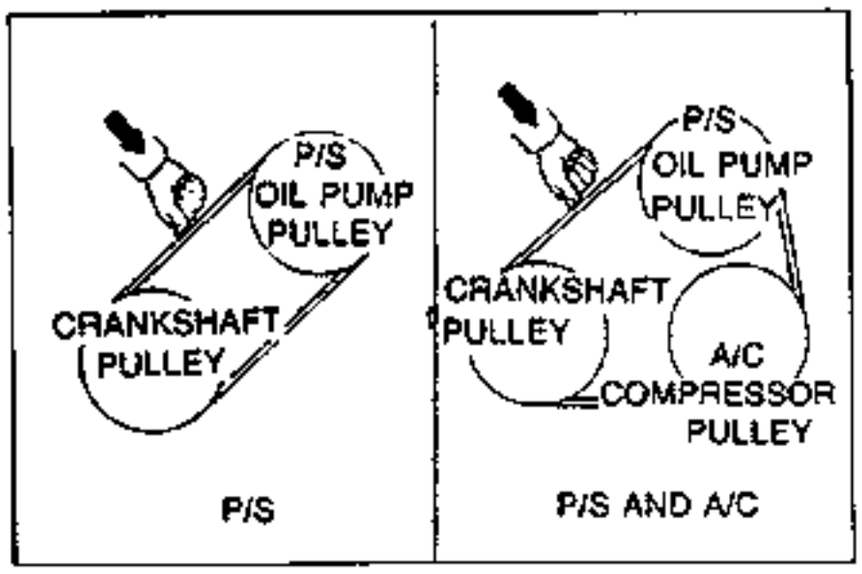


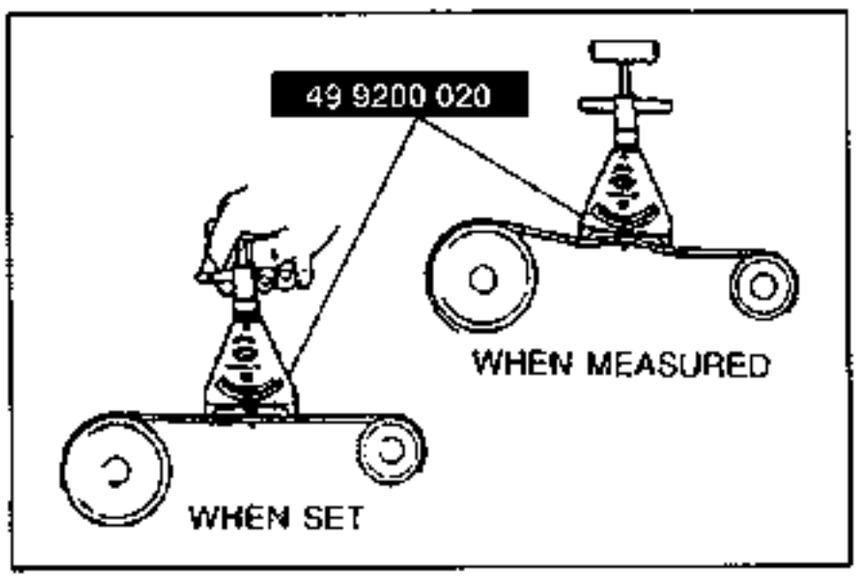
Pump body (rear)
1. Install the rear pump body.
2. Turn the pump shaft by hand, and verify that it turns smoothly.



Pulley
Install the pulley locknut while holding the pulley by using a screwdriver.

TIGHTENING TORQUE:
50–58 N·m {5.0–6.0 kgf·m, 37–43 ft·lbf}





DRIVE BELT (B6 DOHC)

Inspection

1. Check the drive belt for wear, cracks and fraying. Replace as necessary.
2. Verify that the drive belts are correctly mounted on the pulleys.
3. Check the drive belt deflection when the engine is cold, or at least 30 minutes after the engine has stopped. Apply moderate pressure **(98 N {10 kgf, 22 lbf})** midway between the specified pulleys.

Deflection

mm{in}

New*	Used	Limit
8.0–9.0 {0.32–0.35}	9.0–10.0 {0.36–0.39}	11.5 {0.45}

* A belt that has been on a running engine for less than five minutes.

4. If the deflection is not within specification, adjust it.

Drive belt tension check

1. Belt tension can be checked in place of belt deflection. Check the drive belt tension when the engine is cold, or at least 30 minutes after the engine has stopped. Using the **SST**, check the belt tension between any two pulleys.

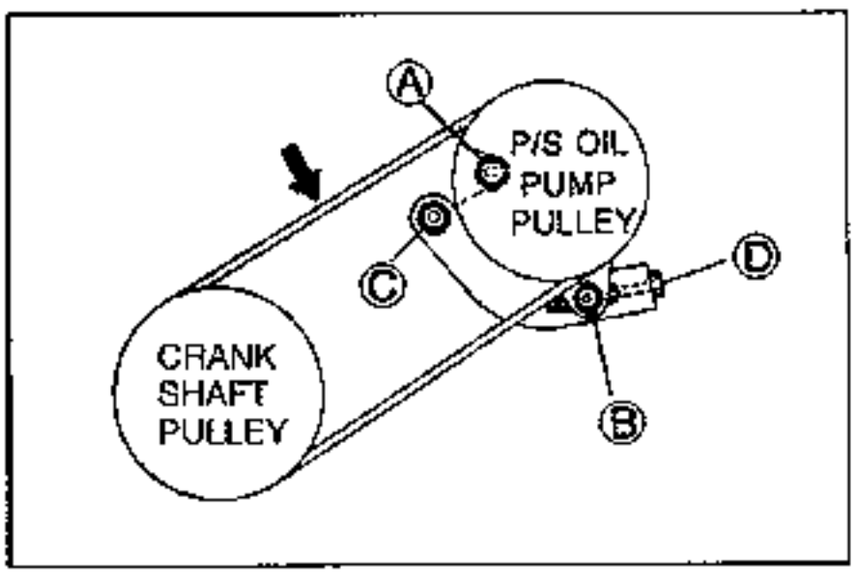
Tension

N{kgf·lbf}

New*	Used	Limit
491–588 {50–60,110–132}	422–490 {43–50, 95–110}	245 {25,55}

* A belt that has been on a running engine for less than five minutes.

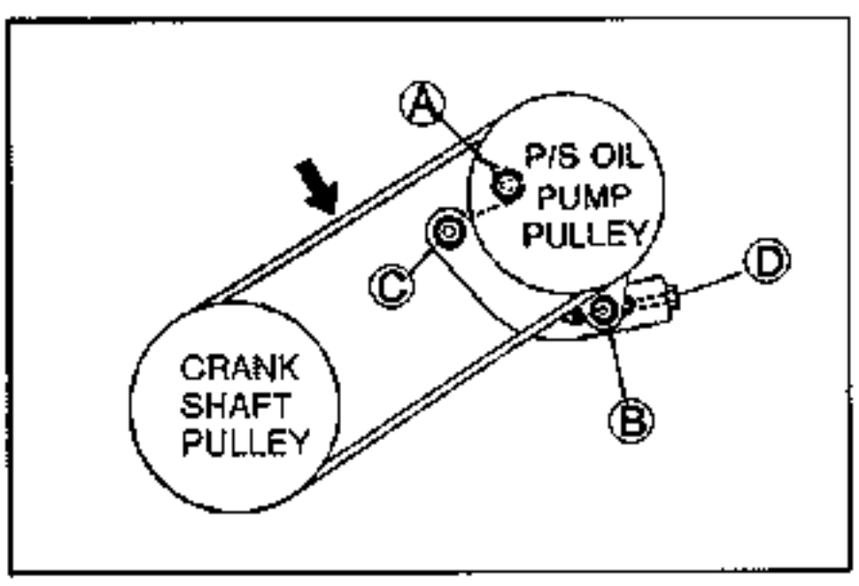
2. If the tension is not within specification, adjust it.



Adjustment

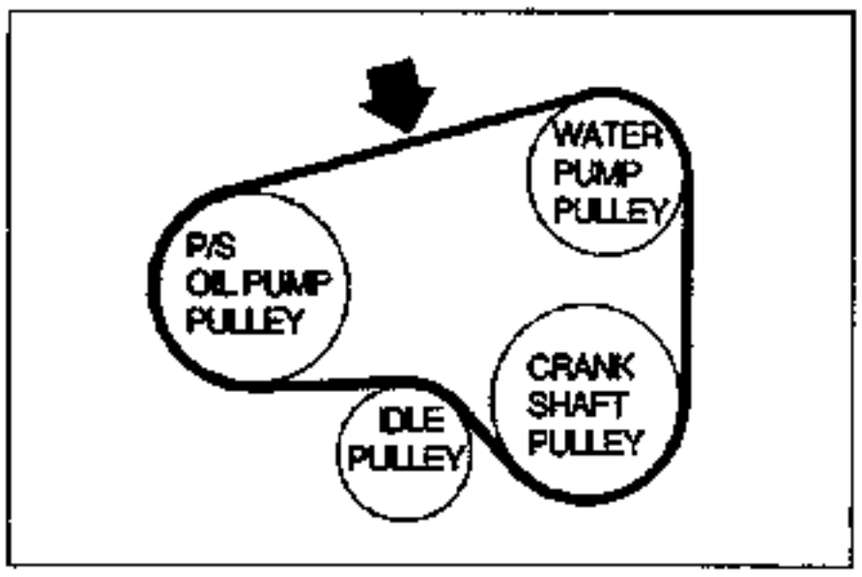
1. Loosen bolt Ⓐ, locknut Ⓑ, and nut Ⓒ. Turn adjusting bolt Ⓓ to adjust the belt to the specified deflection and tension.
2. Tighten nut Ⓒ, bolt Ⓐ, and locknut Ⓑ to the specified torques.

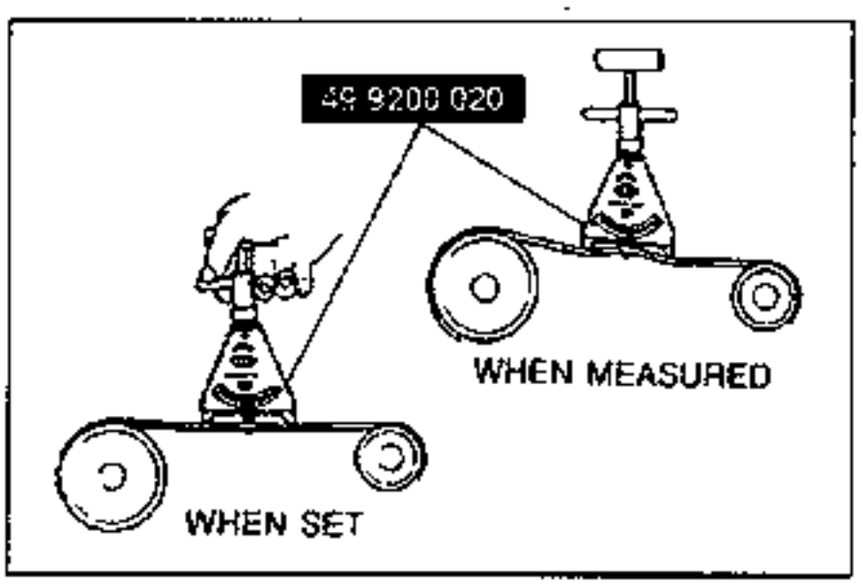
Tightening torque
Bolt A : 37–53 N·m {3.7–5.5 kgf·m, 27–39 ft·lbf}
Nut B : 19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}
Locknut C : 32–46 N·m {3.2–4.7 kgf·m, 24–33 ft·lbf}



Replacement

1. Loosen bolt Ⓐ, nut Ⓒ, and locknut Ⓑ.
2. Turn adjusting bolt Ⓓ to release the belt tension.
3. Remove the belt.
4. Install a new drive belt and adjust the tension and deflection. (Refer to above for adjustment.)





DRIVE BELT (K8 DOHC)

Inspection

1. Check the drive belt for wear, cracks, and fraying. Replace as necessary.
2. Verify that the drive belts are correctly mounted on the pulleys.
3. Check the drive belt deflection when the engine is cold, or at least 30 minutes after the engine has stopped. Apply moderate pressure **(98 N {10 kgf, 22 lbf})** midway between the specified pulleys.

Deflection

mm{in}

New*	Used	Limit
6.0–7.0 {0.24–0.27}	7.0–8.0 {0.28–0.31}	9.0 {0.35}

* A belt that has been on a running engine for less than five minutes.

4. If the deflection is not within specification, adjust it.

Drive belt tension check

1. Belt tension can be checked in place of belt deflection. Check the drive belt tension when the engine is cold, or at least 30 minutes after the engine has stopped. Using the **SST**, check the belt tension between any two pulleys.

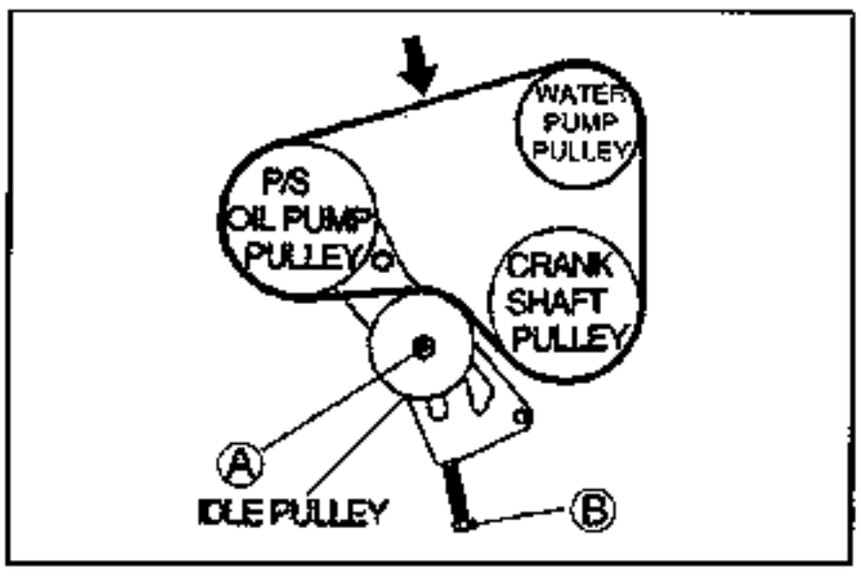
Tension

N{kgf·lbf}

New*	Used	Limit
540–686 {55–70,130–154}	392–539 {40–55, 88–121}	343 {35,77}

* A belt that has been on a running engine for less than five minutes.

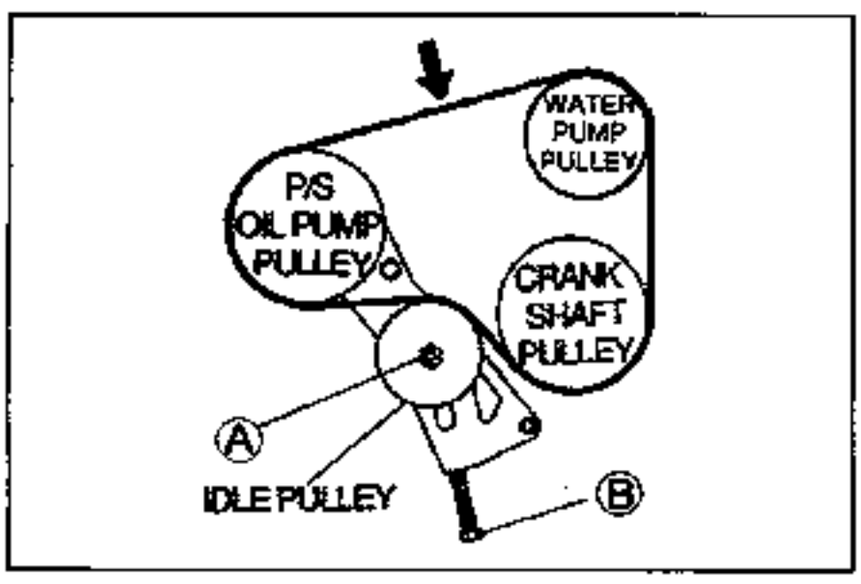
2. If the tension is not within specification, adjust it.



Adjustment

1. Loosen locknut Ⓐ. Turn adjusting bolt Ⓑ to adjust the belt to the specified deflection and tension.
2. Tighten locknut Ⓐ to the specified torques.

Tightening torque
Nut A : 32–46 N·m {3.2–4.7 kgf·m, 24–33 ft·lbf}



Replacement

1. Remove the alterator and A/C drive belt. (Refer to body electrical troubleshooting manual, section G.)
2. Loosen locknut Ⓐ.
3. Turn adjusting bolt Ⓑ to release the belt tension.
4. Remove the belt.
5. Install a new P/S drive belt and adjust the tension and deflection. (Refer to above for adjustment.)
6. Install A/C drive belt and adjust the tension and deflection. (Refer to body electrical troubleshooting manual, section G.)

Before beginning any service procedure, refer to the 1995 MX–3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

BRAKING SYSTEM

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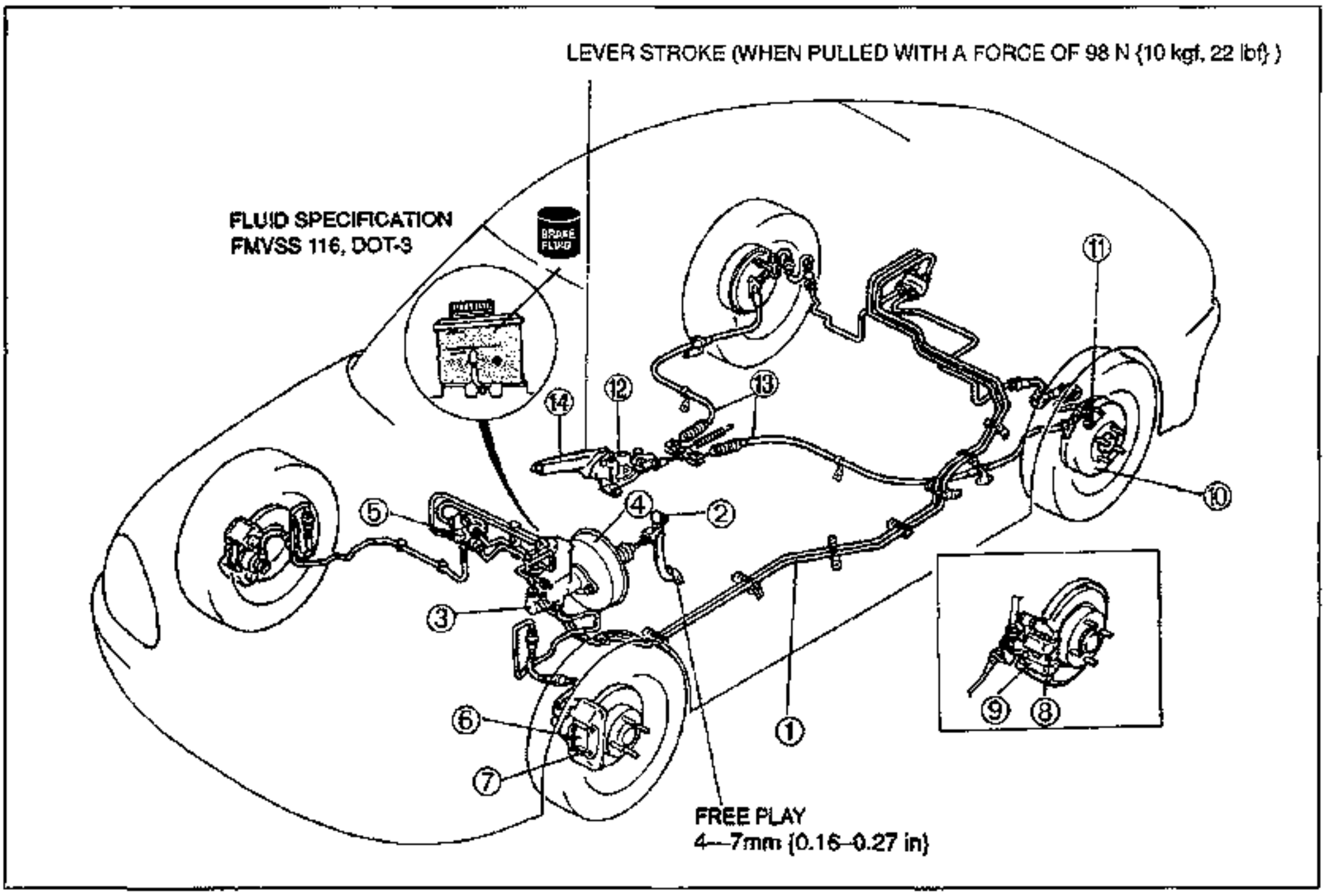

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14. Parking brake lever
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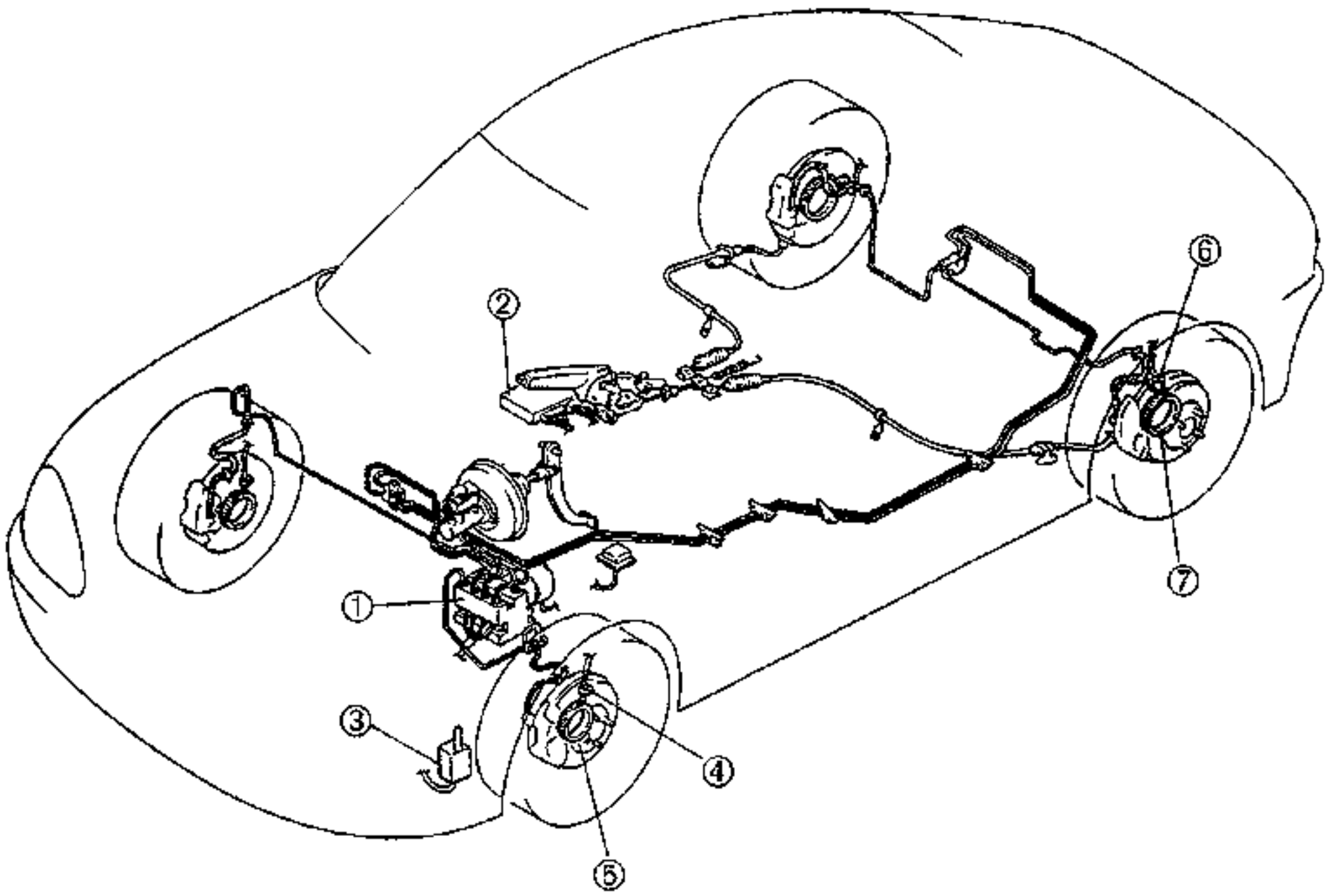
ANTI-LOCK BRAKE SYSTEM (ABS)



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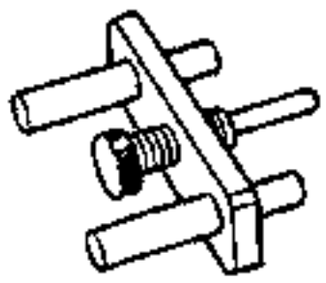
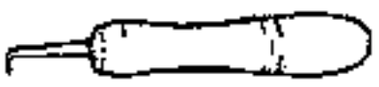
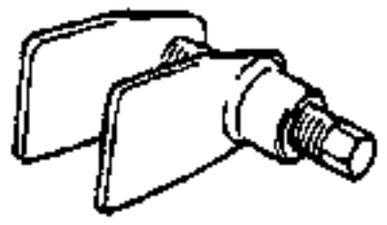
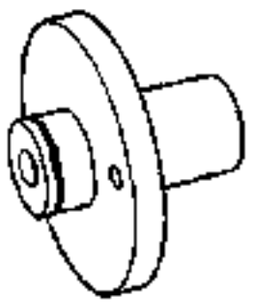
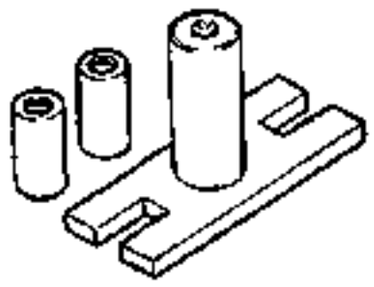
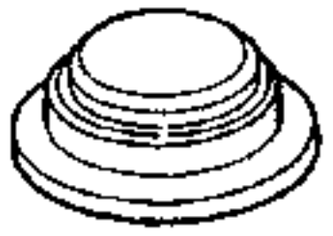
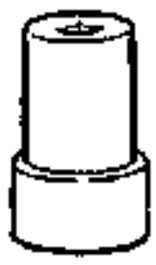
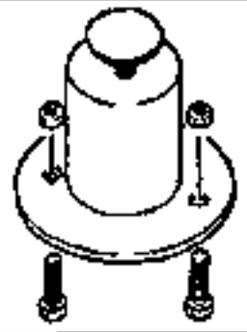
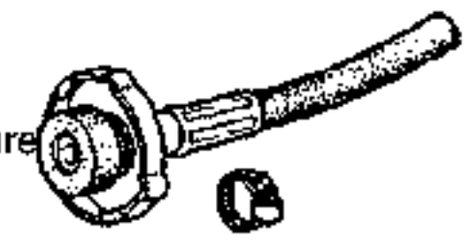
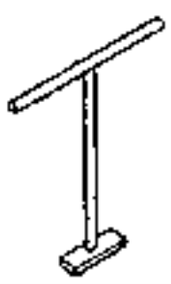
OUTLINE

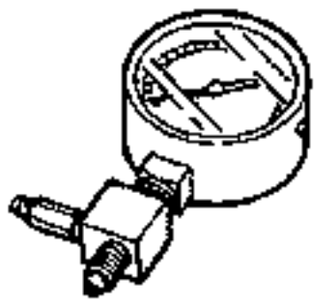
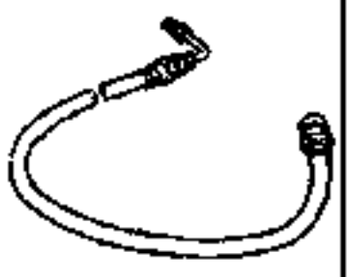
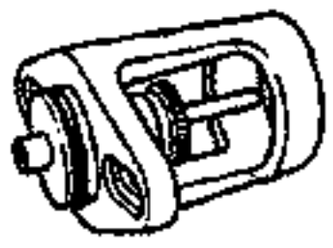
SPECIFICATIONS

Item \ Engine		B6 DOHC	K8 DOHC
Brake pedal	Type	Suspended	
	Pedal lever ratio	4.1	
	Max. stroke mm {in}	140 {5.51}	
Master cylinder	Type	Tandem (with level sensor)	
		Conventional	Plunger
	Cylinder inner diameter mm {in}	22.22 {0.875}	23.81 {0.937}
Front disc brake	Type	Ventilated disc	
	Cylinder bore mm {in}	53.97 {2.125}	
	Pad dimensions (area × thickness) mm² {in²} × mm {in}	4300 {6.66} × 10 {0.39}	
	Disc plate dimensions (outer diameter × thickness) mm {in}	257 × 22 {10.12 × 0.87}	
Rear disc brake	Type	Solid disc	
	Cylinder bore mm {in}	30.2 {1.19}	
	Pad dimensions (area × thickness) mm² {in²} × mm {in}	2600 × 7.5 {4.03 × 0.3}	
	Disc plate dimensions (outer diameter × thickness) mm {in}	251 × 9.0 {9.88 × 0.35}	
Rear drum brake	Type	Leading-trailing	—
	Wheel cylinder inner diameter mm {in}	17.46 {0.687}	—
	Lining dimensions (width × length × thickness) mm {in}	35.0 × 191.9 × 4.0 {1.38 × 7.56 × 0.16}	—
	Drum inner diameter mm {in}	200 {7.87}	—
	Shoe clearance adjustment	Automatic adjuster	—
Power brake unit	Type	Vacuum multiplier	
		Single diaphragm	Tandem diaphragm
	Diameter mm {in}	214 {8.4}	188 + 215 {7.4 + 8.5}
Braking force control device	Type	Dual proportioning valve	
Brake fluid		FMVSS116, DOT–3	
Parking brake	Type	Mechanical two-rear-wheel control	
	Operation system	Center lever	

CONVENTIONAL BRAKE SYSTEM

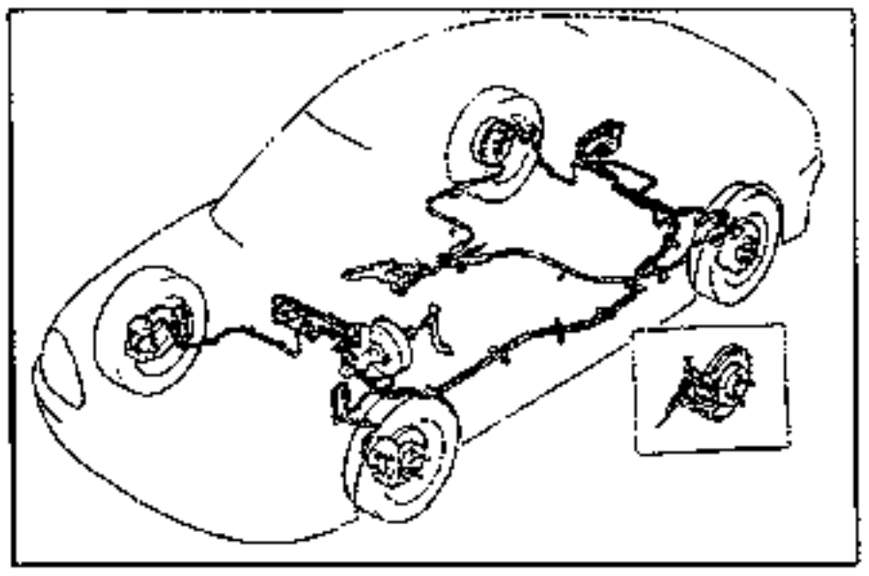
PREPARATION
SST

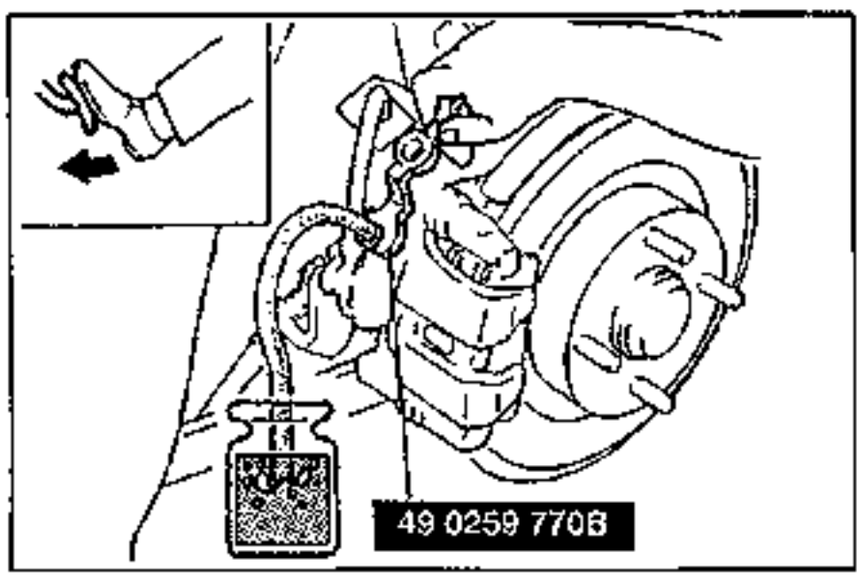
49 0259 770B Wrench, flare nut 	For removal of brake pipe	49 F043 001 Adjust gauge 	For adjustment of piston-to-push rod clearance
49 0208 701A Air-out tool, boot 	For removal of piston seal	49 0221 600C Expand tool, disc brake 	For installation of brake pads (Front disc brake)
49 E043 001A Adjust gauge 	For adjustment of push rod clearance	49 E043 003A Lock tool, turning 	For adjustment of push rod clearance
49 B043 004 Socket wrench 	For adjustment of push rod clearance	49 E043 002A Installer, retainer 	For installation of retainer
49 Z043 001 Wrench, cap nut 	For removal and installation of cap	49 Z043 0A0 Piston adjuster set 	For adjustment of master cylinder
49 Z043 002 Adapter 	For adjustment of master cylinder	49 R015 002 Hose, pressure 	For adjustment of master cylinder
49 FA18 602 Wrench, disc brake piston 	For removal of piston	49 1285 071 Puller, bearing 	For removal of needle bearing
49 B043 002 Installer, bearing 	For installation of needle bearing	49 U043 0A0 Gauge set, oil pressure 	For inspection of brake fluid pressure

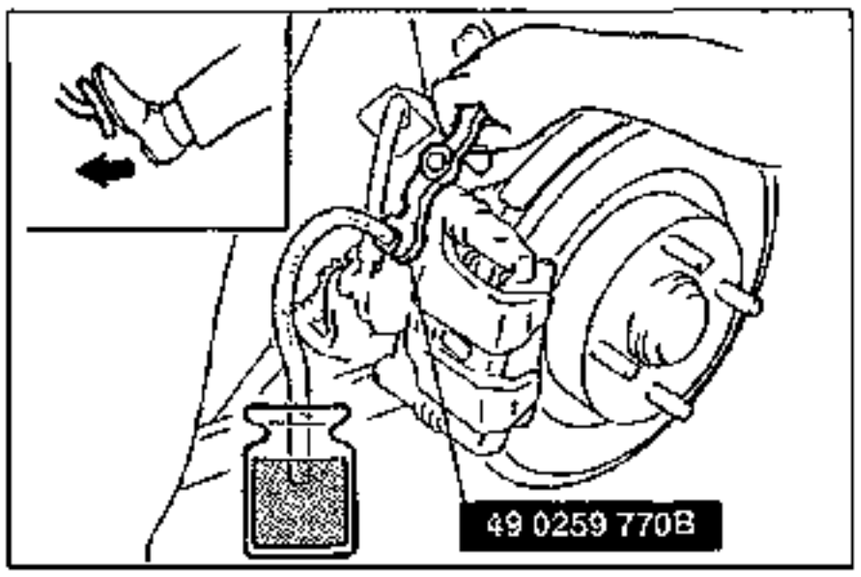
49 U043 004 Gauge, oil pressure (Part of 49 U043 0A0) 	For inspection of brake fluid pressure	49 U043 005 Joint (Part of 49 U043 0A0) 	For inspection of brake fluid pressure
49 U043 006 Hose (Part of 49 U043 0A0) 	For inspection of brake fluid pressure	49 B043 001 Adjust gauge 	For adjustment of push rod clearance

TROUBLESHOOTING GUIDE

Problem	Possible cause	Remedy	Page
Poor braking	Leakage of brake fluid	Repair	P–8
	Air in system	Bleed air	P–7
	Worn pad or lining	Replace	P–32,37,42
	Brake fluid, grease, oil, or water on pad or lining	Clean or replace	P–32,37,42
	Hardening of pad or lining surface or poor contact	Grind or replace	P–32,37,42
	Malfunction of disc brake piston	Replace	P–33,40
	Malfunction of master cylinder or wheel cylinder	Repair or replace	P–14,19 35,40,42, 44
	Malfunction of power brake unit	Repair or replace	P–28,29
	Malfunction of check valve (vacuum hose)	Replace	P–28
	Damaged vacuum hose	Replace	—
	Deterioration of flexible hose	Replace	—
	Malfunction of dual proportioning valve	Replace	P–30
Brakes pull to one side	Worn pad or lining	Replace	P–32,37,42
	Brake fluid, grease, oil, or water on pad or lining	Clean or replace	P–32,37,42
	Hardening of pad or lining surface or poor contact	Grind or replace	P–32,37,42
	Abnormal wear or distortion of disc, drum, pad, or lining	Repair or replace	P–32,37,42
	Malfunction of automatic adjuster	Repair or replace	—
	Looseness of backing plate / dust cover mounting bolts	Tighten	Section M
	Malfunction of wheel cylinder	Repair or replace	P–35,40,42
	Improperly adjuster wheel alignment	Adjust	Section R
	Unequal tire air pressures	Adjust	Section Q
Brakes do not release	No brake pedal play	Adjust	P–13
	Improperly adjusted push rod clearance	Adjust	P–15,20
	Clogged master cylinder return port	Clean	—
	Weak brake pad or shoe return spring	Replace	P–32,37,42
	Wheel cylinder not returning properly	Clean or replace	P–42,44
	Malfunction of piston seal of disc brake	Replace	P–35,40
	Excessive runout of disc plate	Replace	P–34,39
Pedal goes too far (too much pedal stroke)	Improperly adjusted pedal play	Adjust	P–13
	Worn pad or lining	Replace	P–32,37,42
	Air in system	Bleed air	P–10
Abnormal noise or vibration during braking	Worn pad or lining	Replace	P–32,37,42
	Deteriorated pad or lining	Grind or replace	P–32,37,42
	Brakes do not release	Repair	—
	Foreign material or scratches on disc plate or drum contact surface	Clean	P–33,38,42
	Looseness of backing plate / dust cover or caliper mounting bolts	Tighten	Section M P–33,38
	Damaged disc or drum contact surface	Replace	P–33,38,42
	Poor contact of pad or lining	Repair or replace	P–32,37,42
	Insufficient grease on sliding parts	Grease	—
Steering wheel pulls to one side	Dragging brake	Repair	—
	Malfunction of steering system	—	Section N
	Damaged or unbalanced wheels	—	Section Q
	Incorrect tire pressure	—	Section Q
	Malfunction of suspension	—	Section R







AIR BLEEDING

Note

- The brakes should be bled whenever a brake line is disconnected. If a hydraulic line is disconnected at the master cylinder, start at the slave cylinder farthest from the brake master cylinder, and move to the next closest slave cylinder until all four cylindres have been bled. If the disconnection point is anywhere except the master cylinder, start at the point closest to the disconnection, and move to the next farthest slave cylinder until all four cylinders have been bled.

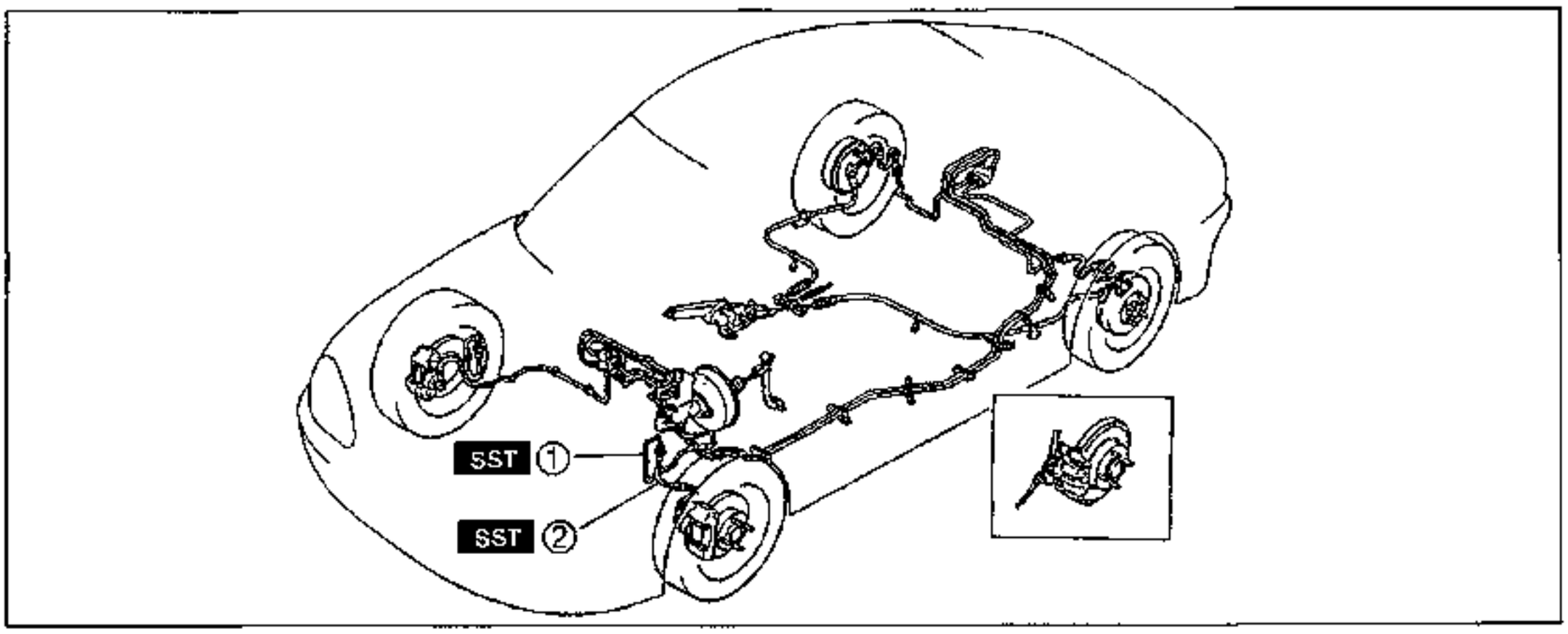
1. On level ground, jack up the vehicle and supoprt it evenly on safety stands.
2. Remove the bleeder cap and attach a vinyl tube to the bleeder screw.
3. Place the other end of the vinyl tube in a clear container.
4. One person should depress the brake pedal a few times, and then hold it in the depressed position.
5. A second person should loosen the bleeder screw, drain out the fluid, and retighten the screw by using the **SST.**
6. Repeat step 4 and 5 until no air bubbles are seen. The reservoir should be kept about 3/4 full during bleeding to prevent air from reentering the lines.

   Tightening torque:
   5.9–8.8 N·m {60–90 kgf·cm, 53–78 in·lbf}

7. Check for correct brake operation.
8. Verify that there is no fluid leakage. Wipe off any spilled fluid immediately.
9. After bleeding the brakes, add brake fluid to MAX.

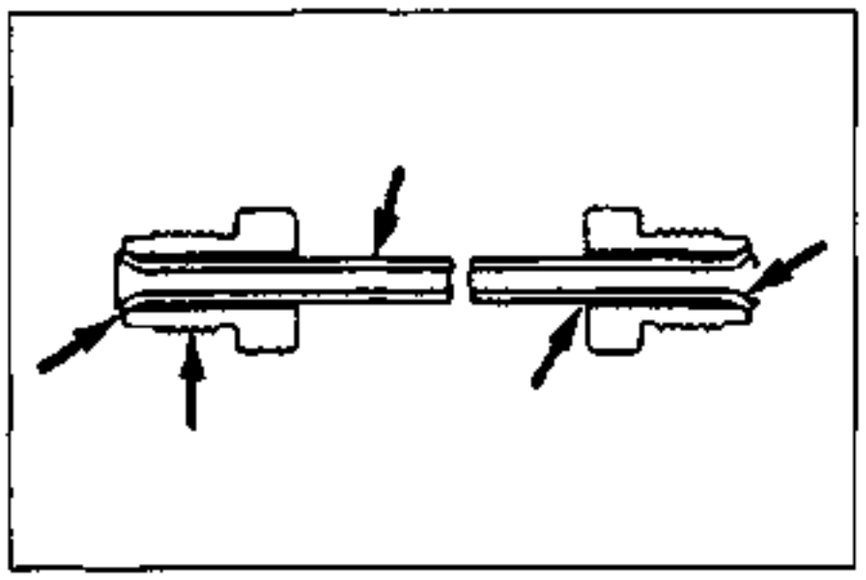
P

BRAKE HYDRAULIC LINE



1. Brake pipe
   Inspection / Removal / Installation ..... page P–8

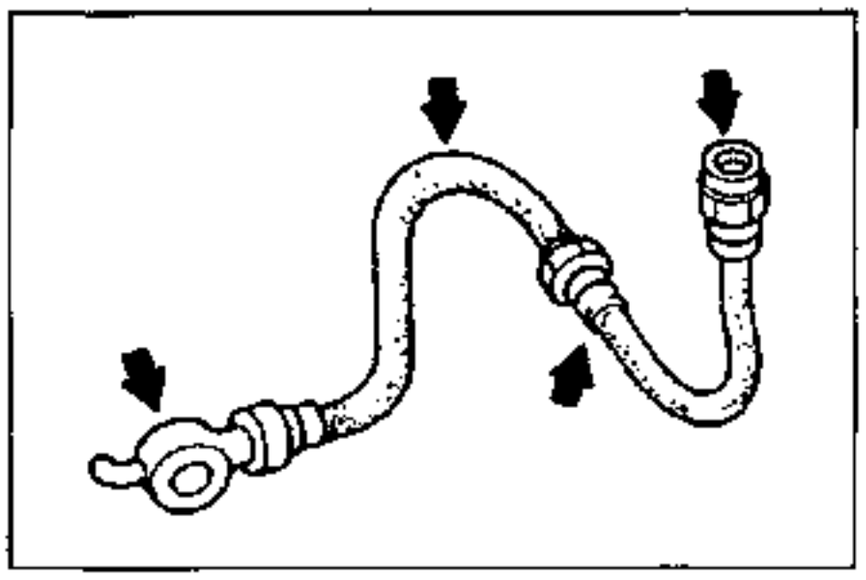
2. Flexible hose
   Inspection / Removal / Installation ..... page P–8



Inspection (on-vehicle)

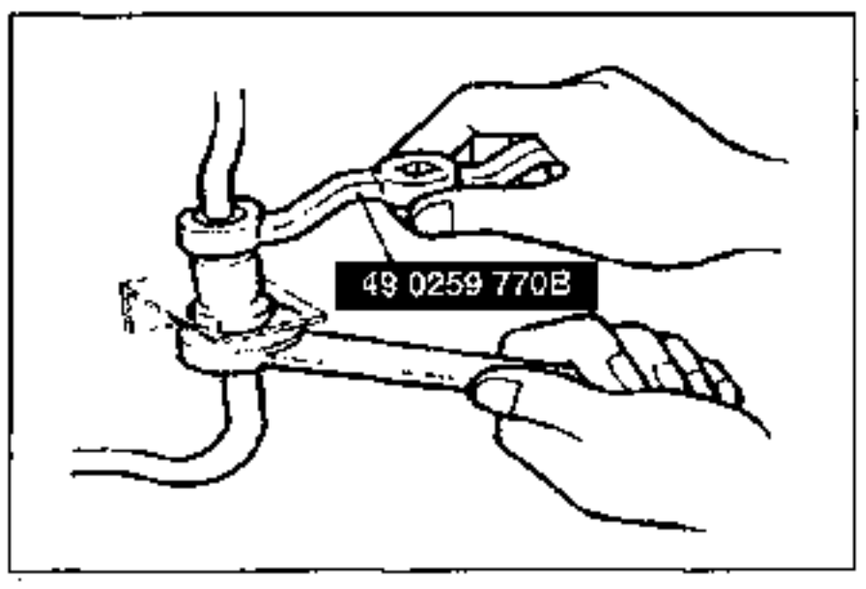
Brake pipe

Check for cracks, damage, and corrosion of the brake pipe. Replace the pipe or flare nut(s) if necessary.



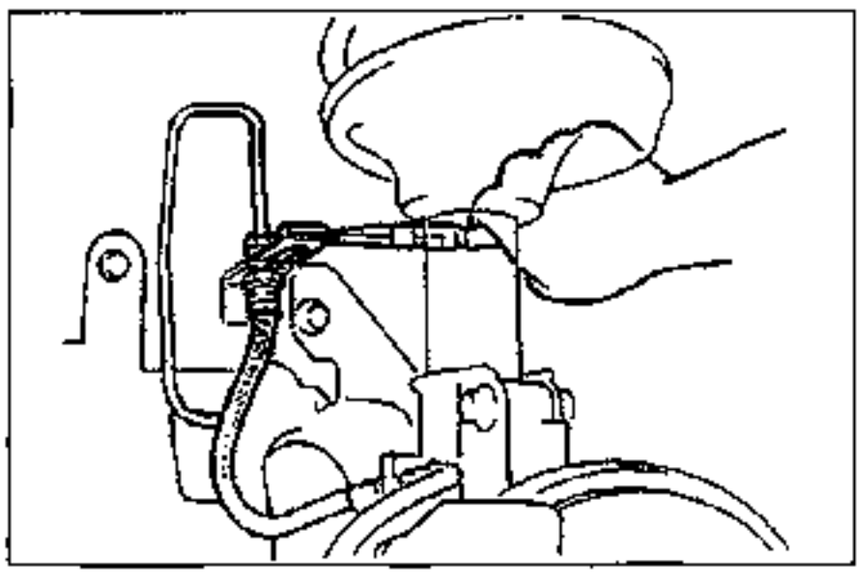
Flexible hose

Check for scars, cracks, and swelling of flexible hose. Replace the hose if necessary.



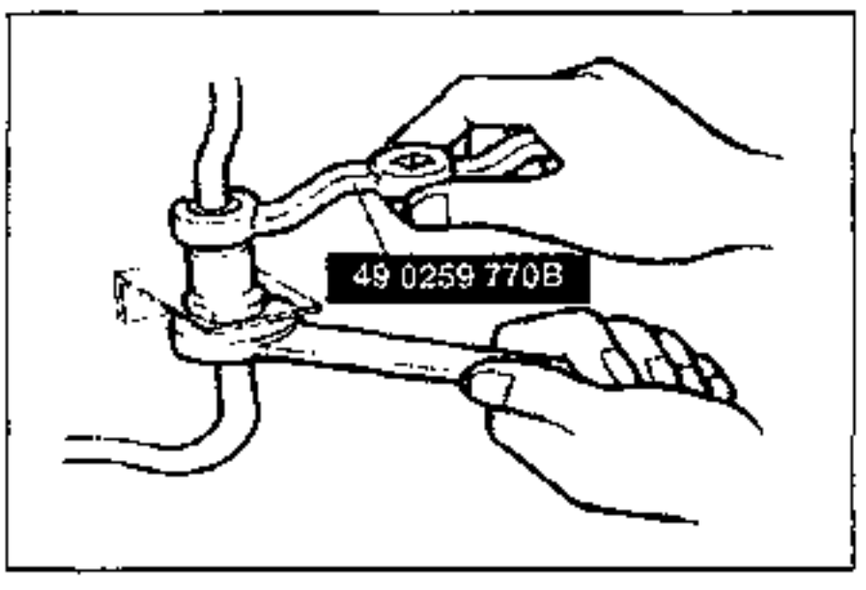
Removal

1. Remove the brake pipe by using the **SST**.
2. Disconnect the clip and remove the flexible hose from the bracket.



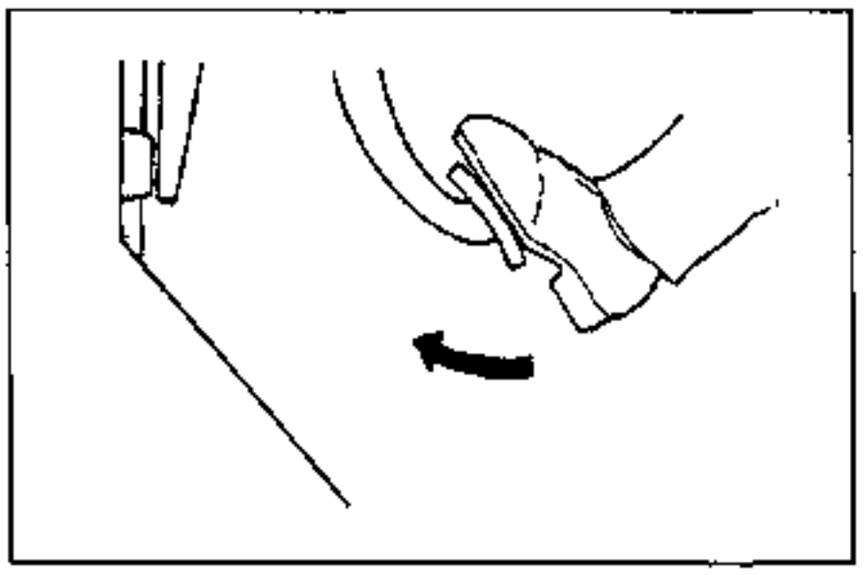
Installation

1. Fix the flexible hose in the bracket and connect the clip to it.



2. Connect the flexible hose to the brake pipe. Verify that the hose is not twisted.
3. Tighten the flare nut by using the **SST**. Verify that the hose can not come in contact with any other parts of vehicle.

Tightening torque:
12.8–21.5 N·m {130–220 kgf·cm, 113–190 in·lbf}

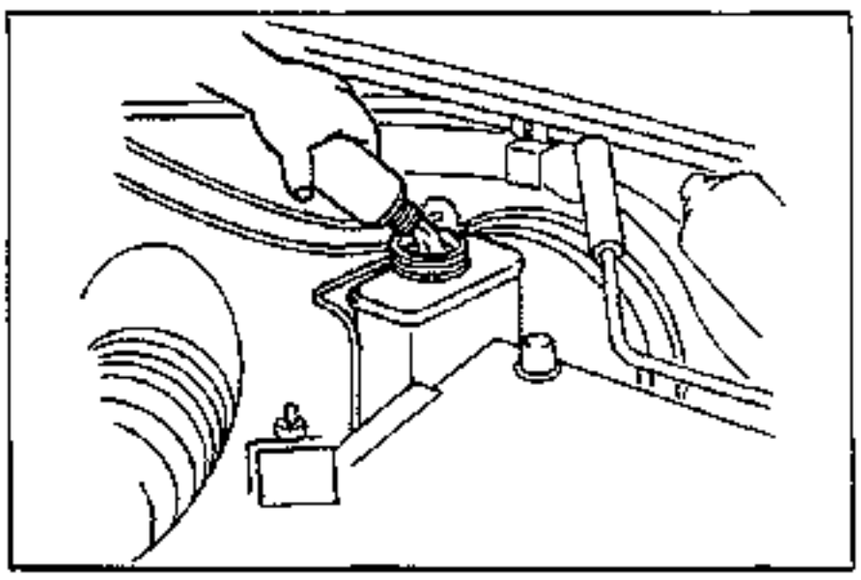


BRAKE FLUID

Inspection

Leakage inspection

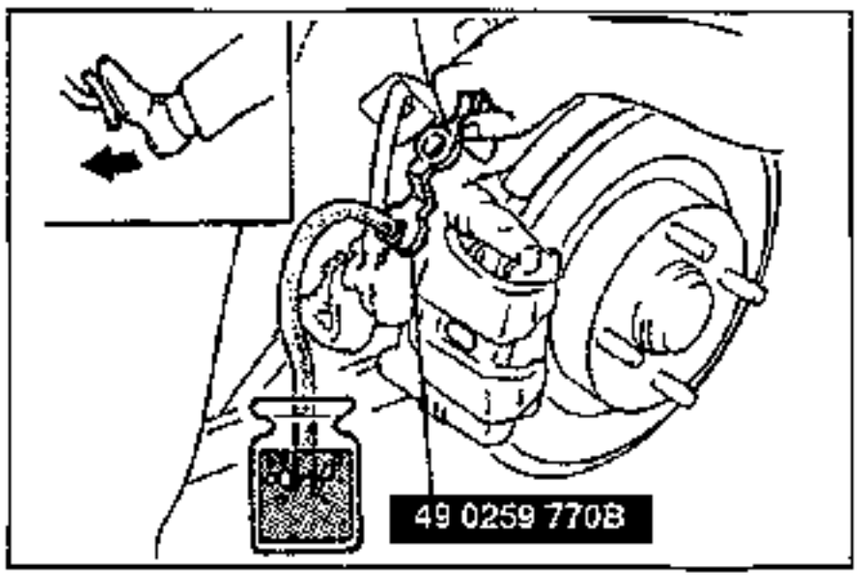
Depress the brake pedal several times, and inspect for leakage of the brake line system.



Brake Fluid Level

Leakage check

Verify that the fluid level in the reservoir is between the MAX and MIN lines on the reservoir.
Add fluid if it is below MAX.



Replacement

1. Follow the procedure outlined in Air Bleeding. (Refer to page P–7.)
2. Continue bleeding and replacing the brake fluid until only clean fluid is expelled.
3. Fill the reservoir to the MAX level.

BRAKE PEDAL

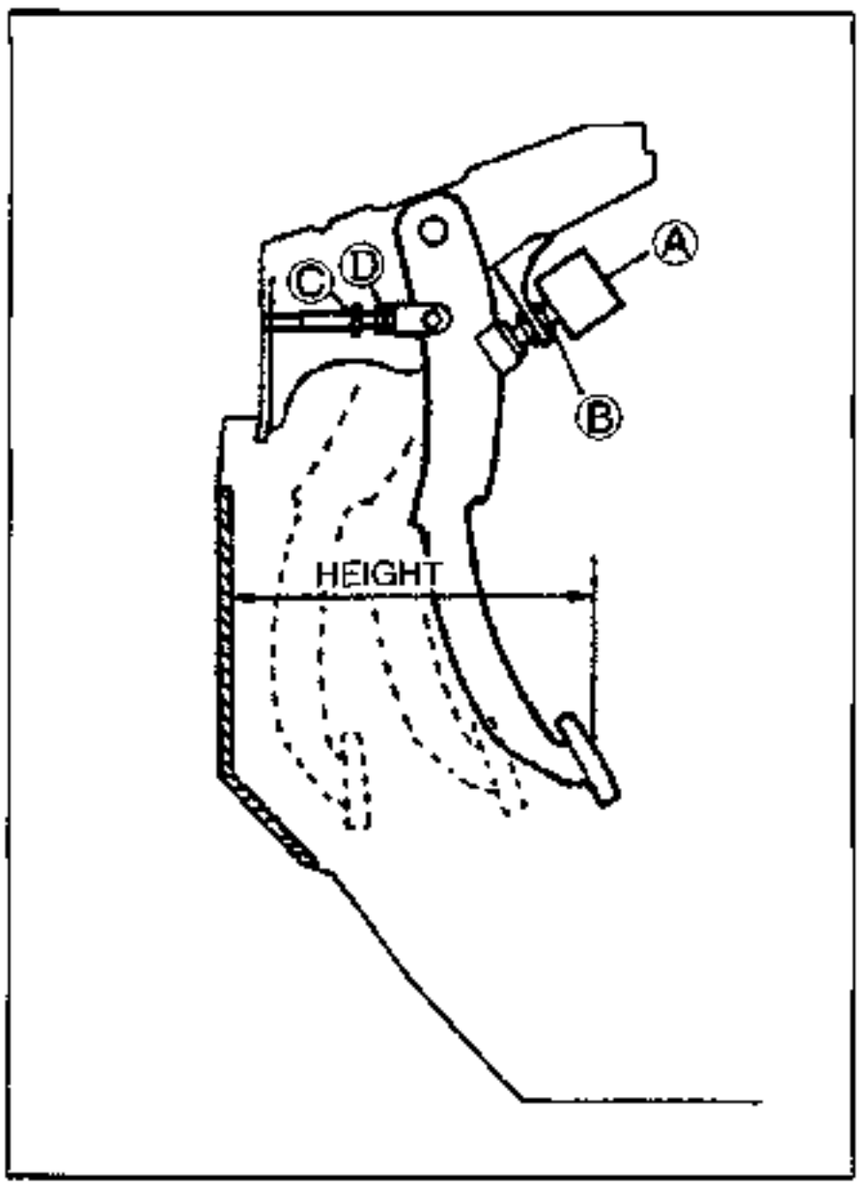
Inspection (on-vehicle)

Brake pedal height

Inspection

Verify that the distance from the center on the pedal pad to the floor mat is as specified.

Specification: 193–196 mm {7.598–7.717 in}

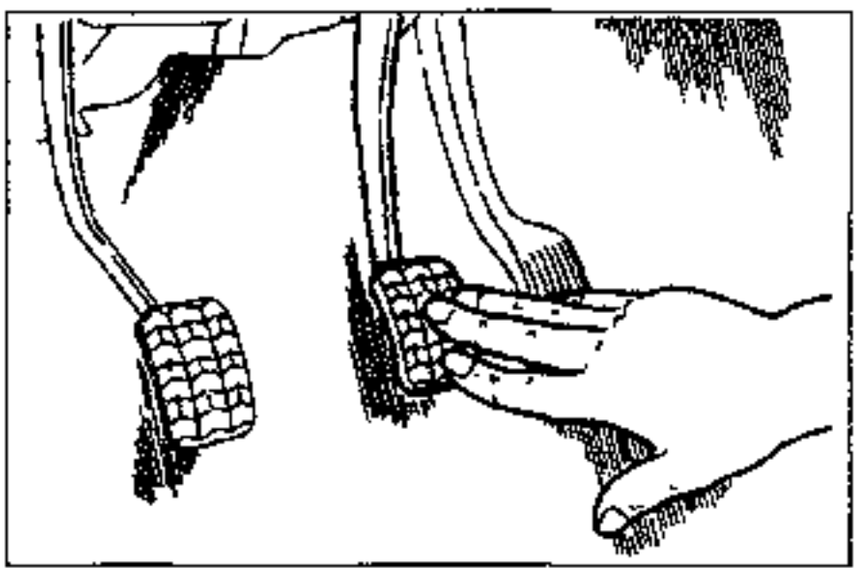


Adjustment

1. Disconnect the brake switch connector.
2. Loosen locknut Ⓑ and turn switch Ⓐ until it does not contact the pedal.
3. Loosen locknut Ⓓ and turn rod Ⓒ to adjust the height of the brake pedal.
4. Tighten the brake switch until it contacts the pedal; then turn it an additional 1/2 turn. Tighten locknut Ⓑ and Ⓓ.

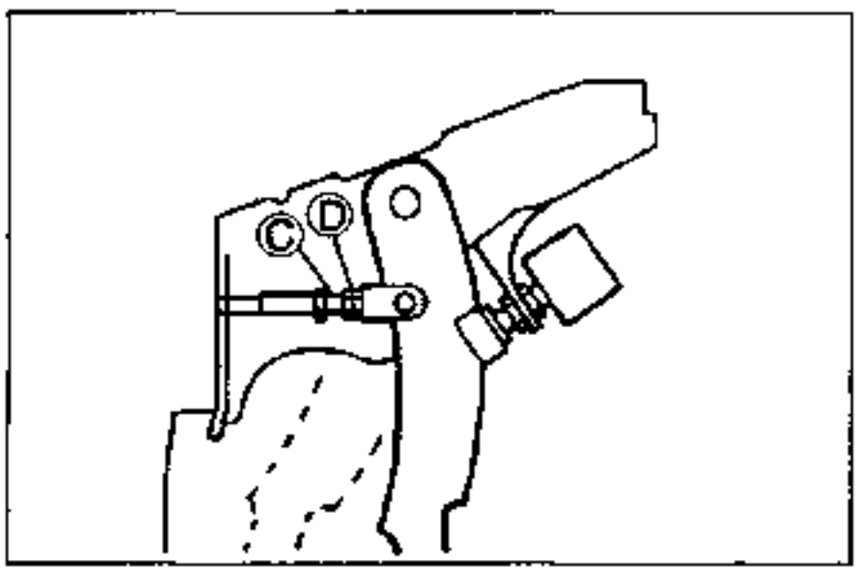
Tightening torque:
13.8–17.6 N·m {140–180 kgf·m, 122–156 in·lbf}

5. Connect the brake switch connector.
6. Verify operation of the brake lights.

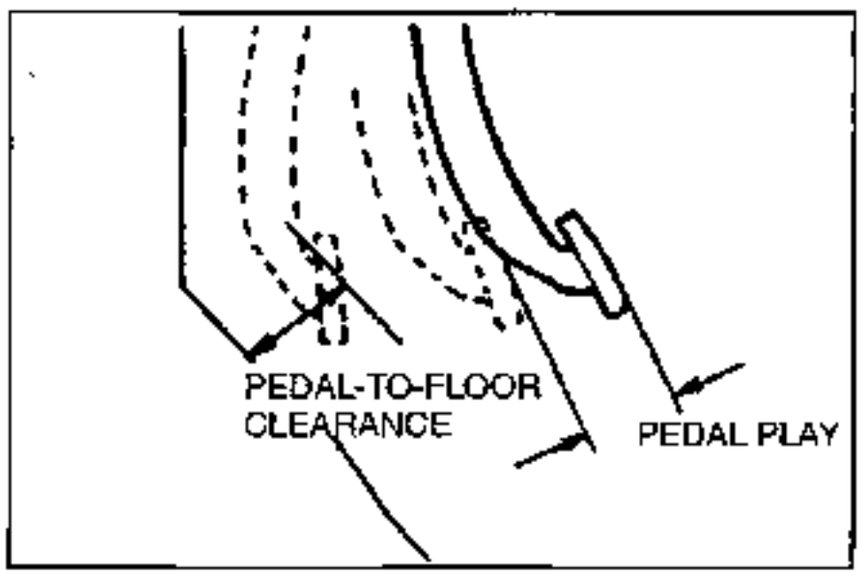


Pedal Play
Inspection
1. Depress the pedal a few times to eliminate the vacuum in the system.
2. Gently depress the pedal by hand and check the free play (until resistance is felt).

Pedal play: 4–7 mm {0.16–0.27 in}



Adjustment
1. Loosen lock nut Ⓓ and turn rod Ⓒ to adjust the free play.
2. Verify the pedal height and the brake light operation.
   Tightening torque:
   24–34 N·m {2.4–3.5 kgf·m, 18–25 ft·lbf}



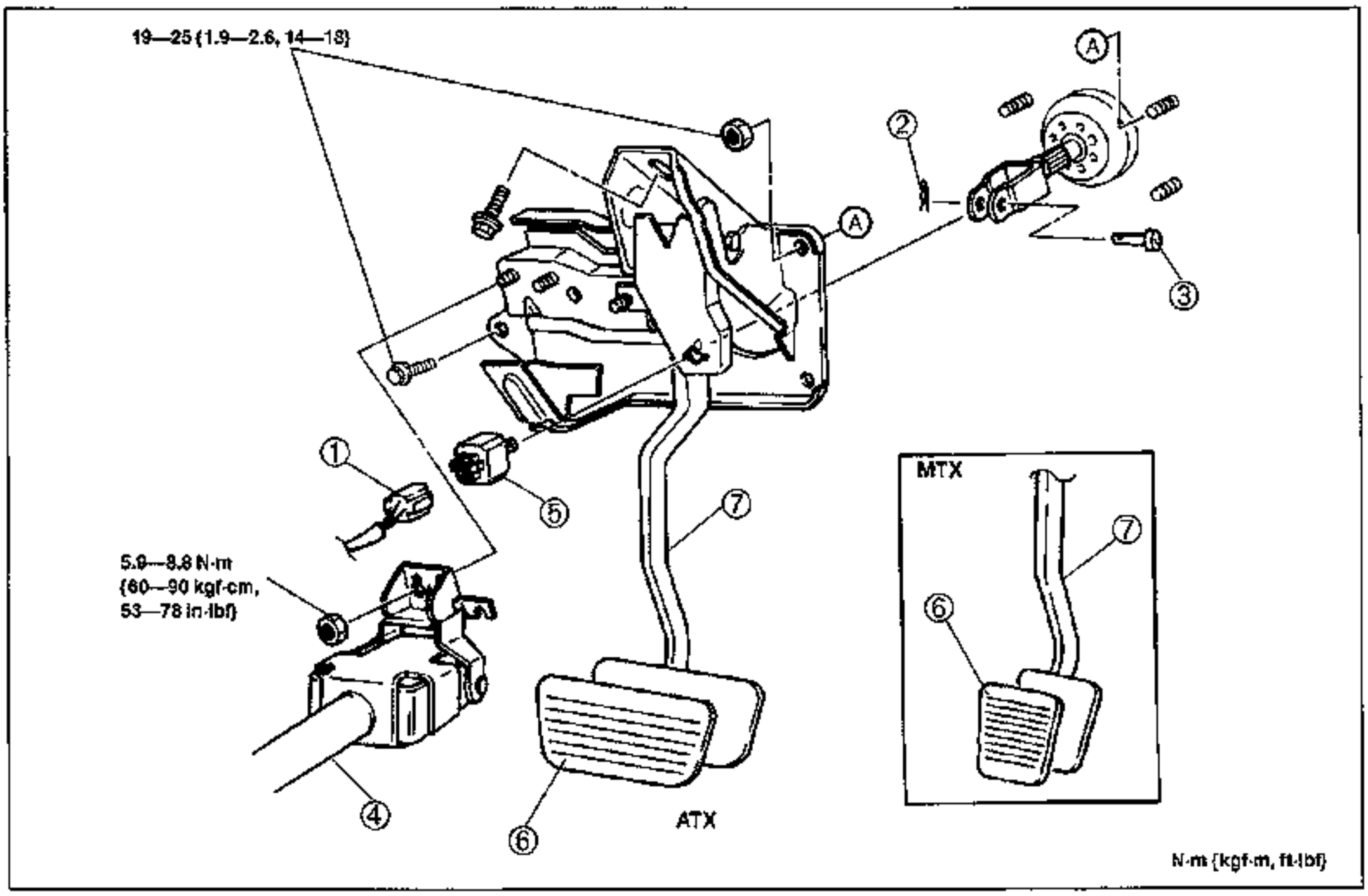
Pedal-To-Floor Clearance
Inspection
Verify that the distance from the floor panel to the center of the pedal pad is as specified when the pedal is depressed with a force of **588 N {60 kgf, 132 lbf}**.

Pedal-to-floor clearance: 70 mm {2.76 in} min.

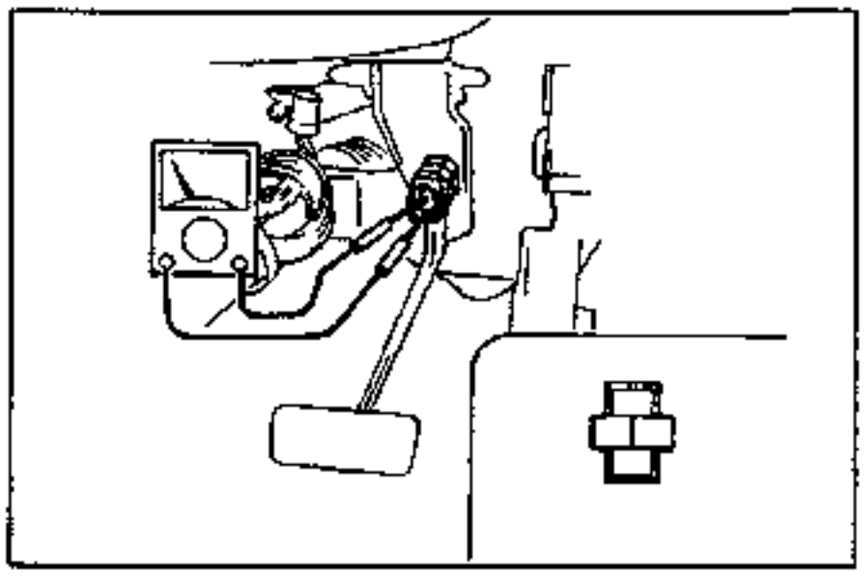
If the distance is less than specified, check for the following problems:
1. Air in brake system
2. Malfunction of automatic adjuster (Rear drum brakes)
3. Worn shoes or pads

Removal / Inspection / Installation

1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal.
4. After installation, check and adjust the pedal height and free play if necessary.



1. Brake switch connector
2. Snap pin
3. Clevis pin
4. Steering shaft
   Service ..... section N
5. Brake switch
   Inspection ..... below
6. Pad
   Inspect for wear
7. Brake pedal
   Inspect for bending and damage



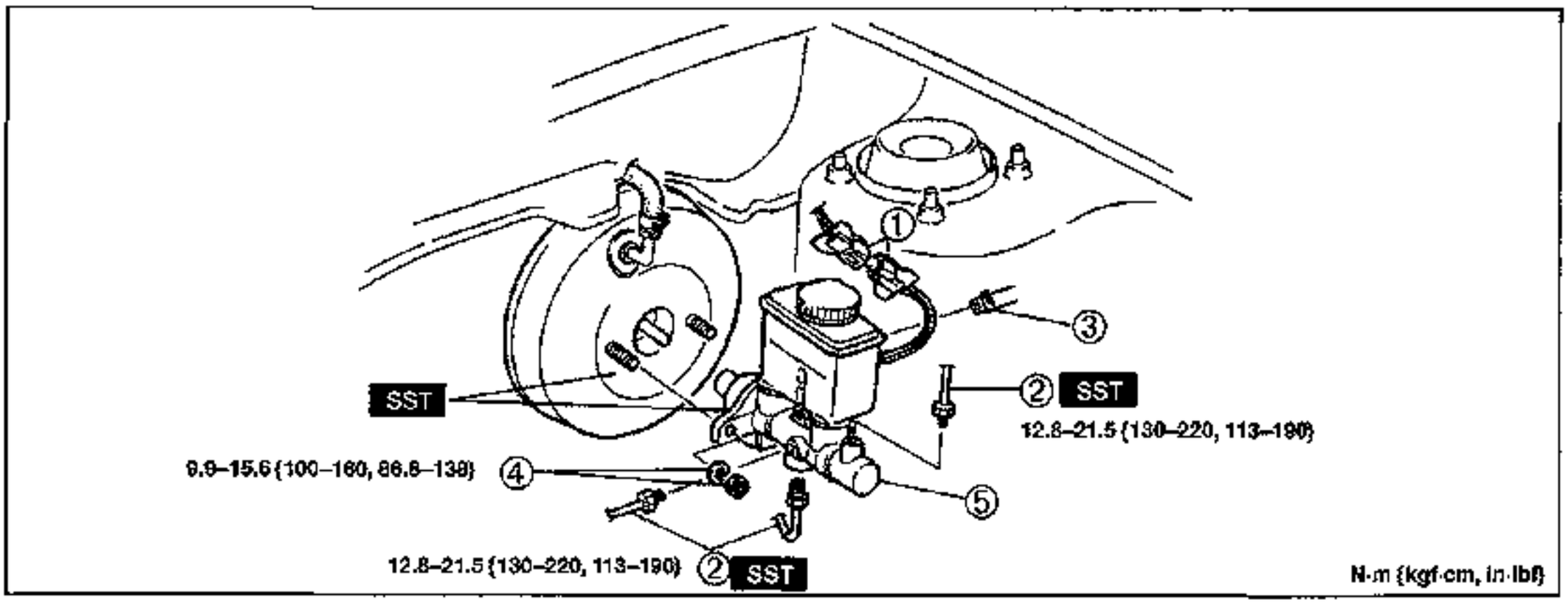
Inspection

Brake switch

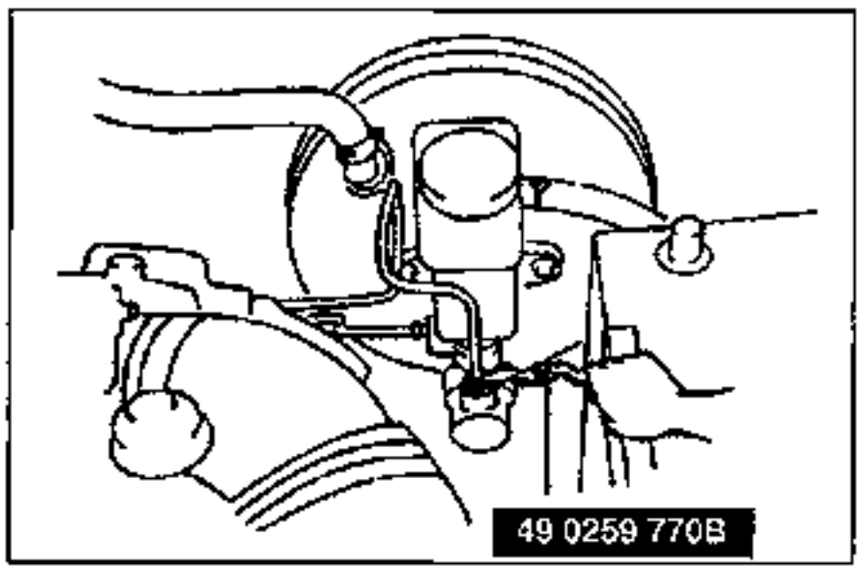
1. Disconnect the brake switch connector.
2. Connect an ohmmeter between the terminals of the brake switch.
3. Confirm continuity between the terminals when the brake pedal is depressed.

MASTER CYLINDER (B6 DOHC)
Removal / Installation / Inspection
(NON ABS)

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.
3. After installation, add brake fluid, bleed air, and check for fluid leakage.



1. Fluid level sensor
   Inspection ..... page P–13
2. Brake pipe
   Removal Note ..... below
   Installation Note ..... page P–13
3. Hose (MTX)
4. Nut and washer
5. Master cylinder
   Installation Note ..... below
   Disassembly / Inspection / Assembly ..... page P–17

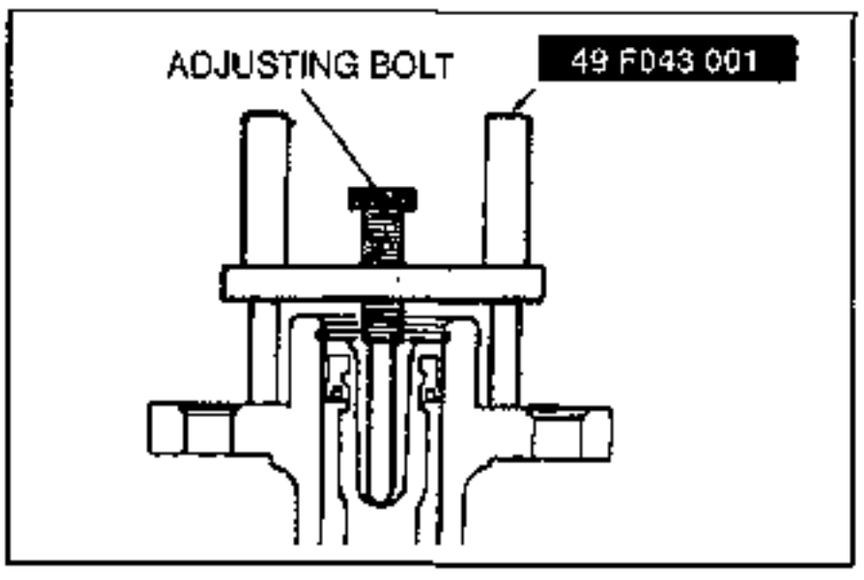


Removal Note
Brake pipe

Disconnect the brake pipe from the master cylinder by using the **SST**.

Caution

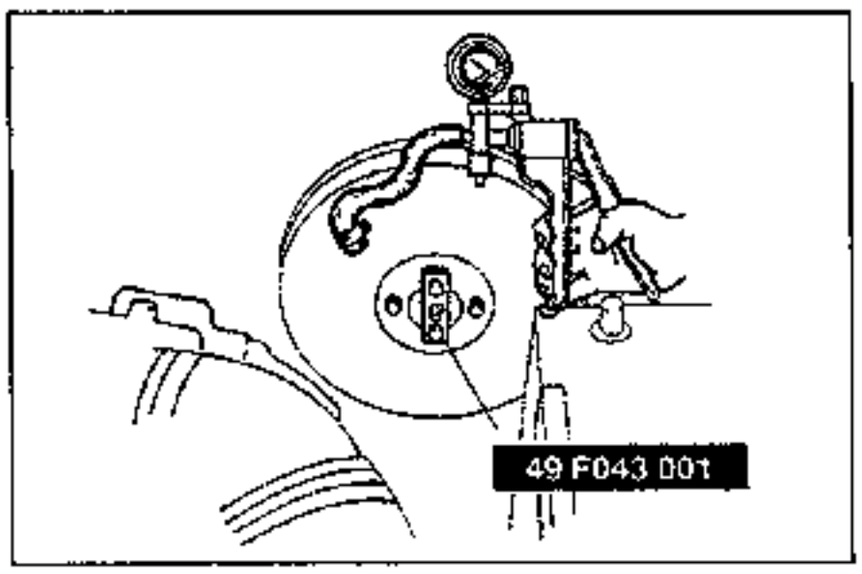
- **Brake fluid will damage painted surfaces. If brake fluid does get on a painted surface, wipe it off immediately.**



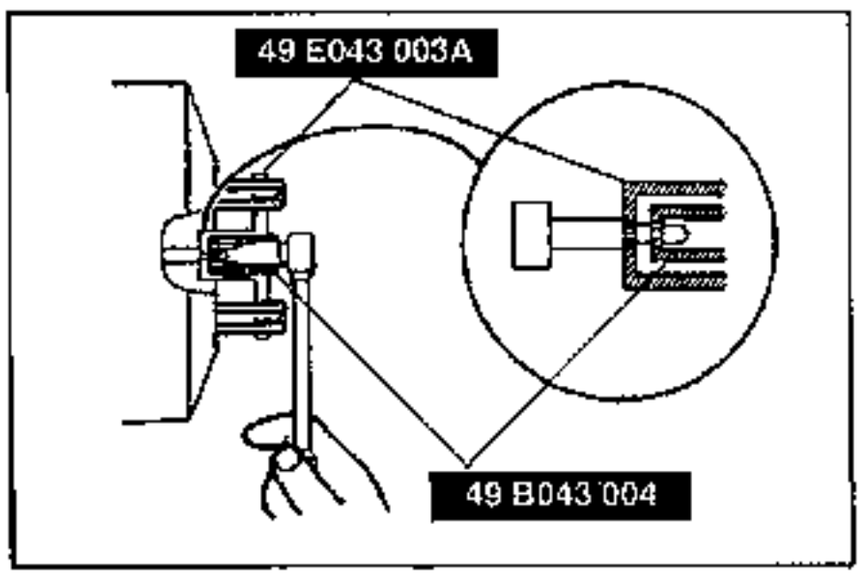
Installation Note
Master cylinder
Piston to push rod clearance

Before installing the master cylinder, check the clearance between the piston of the master cylinder and the push rod of the power brake unit as follows.

1. Place the **SST** atop the master cylinder. Turn the adjusting bolt until it bottoms in the push rod hole in the piston.

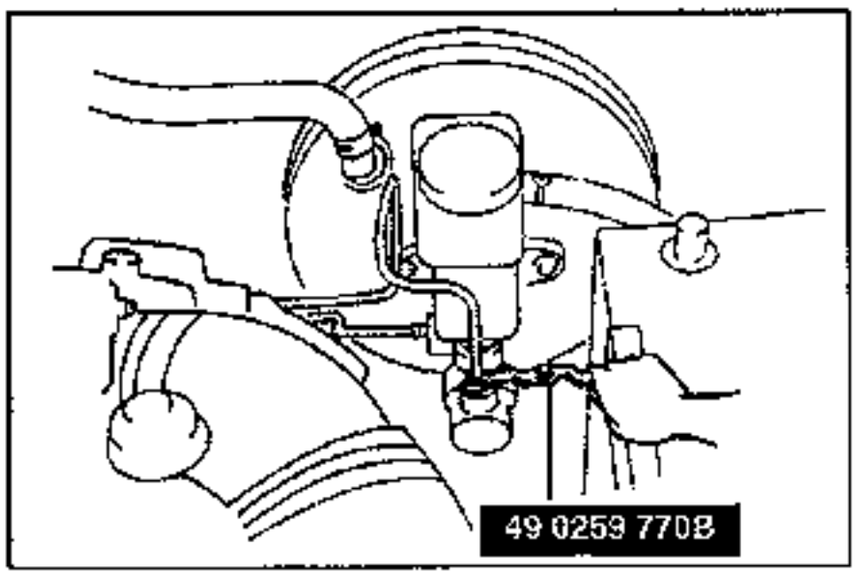


2. Apply **66.7 kPa {500 mmHg, 19.7 inHg}** vacuum to the power brake unit with a vacuum pump.
3. Invert the adjustment gauge used in Step 1 and place it on the power brake unit.
4. Measure the clearance between the end of the gauge and the push rod of the power brake unit. If it is not **0 mm {0 in}**, loosen the push rod locknut and turn the push rod to make the adjustment.



Note
- This adjustment produces the following distance.

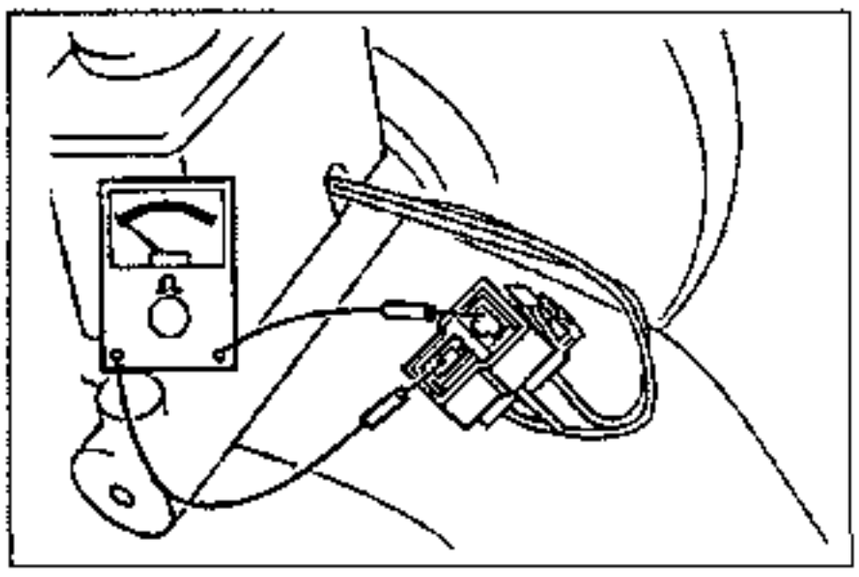
	Push rod-to-piston clearance
When vacuum applied to unit is approx. 66.7 kPa {500 mmHg, 19.7 inHg}	0.1–0.4 mm {0.004–0.015 in}



Brake pipe

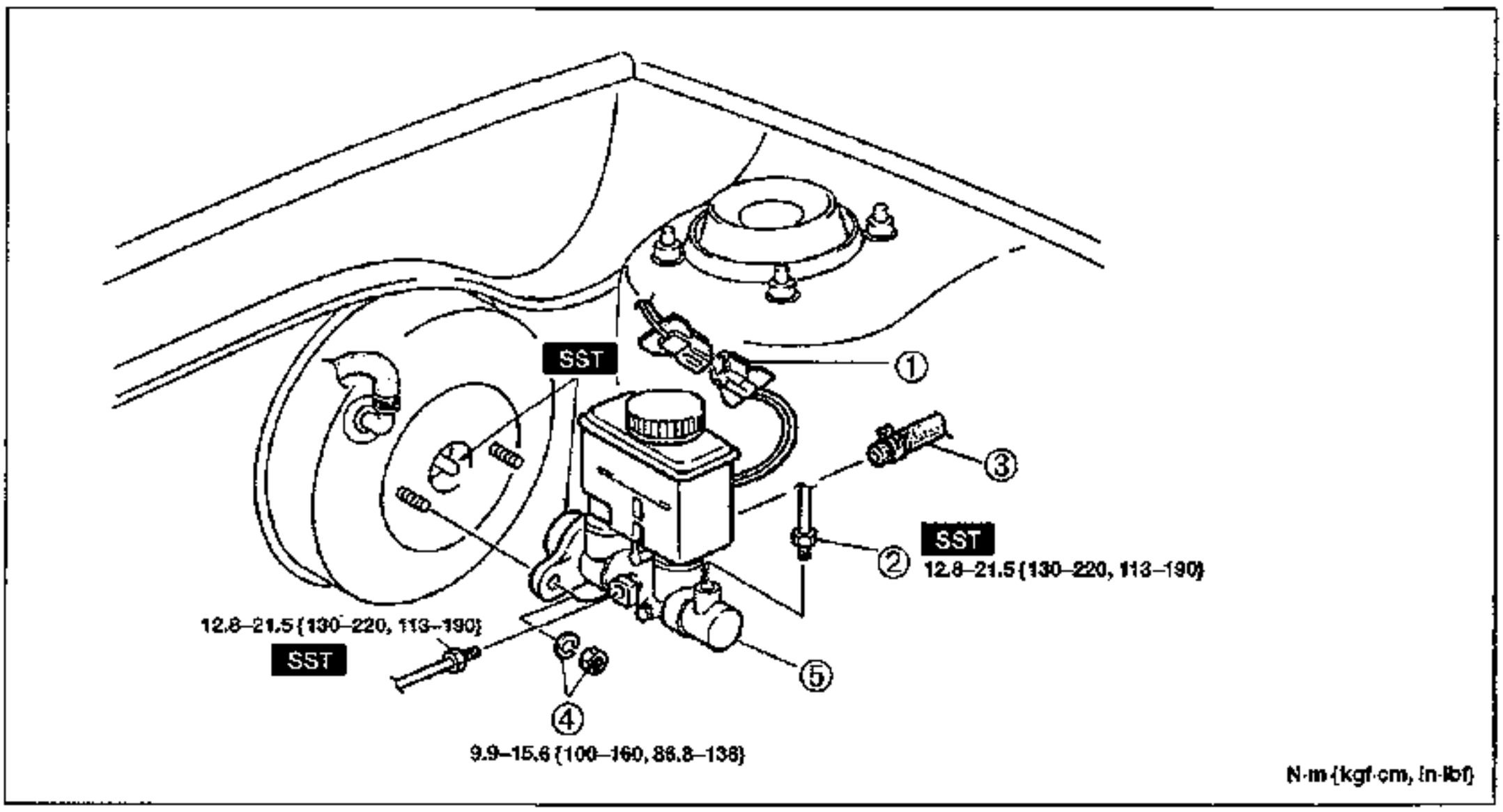
Tighten the brake pipe flare nut with the **SST**.

Tightening torque:
12.8–21.5 N·m {130–220 kgf·cm, 113–190 in·lbf}

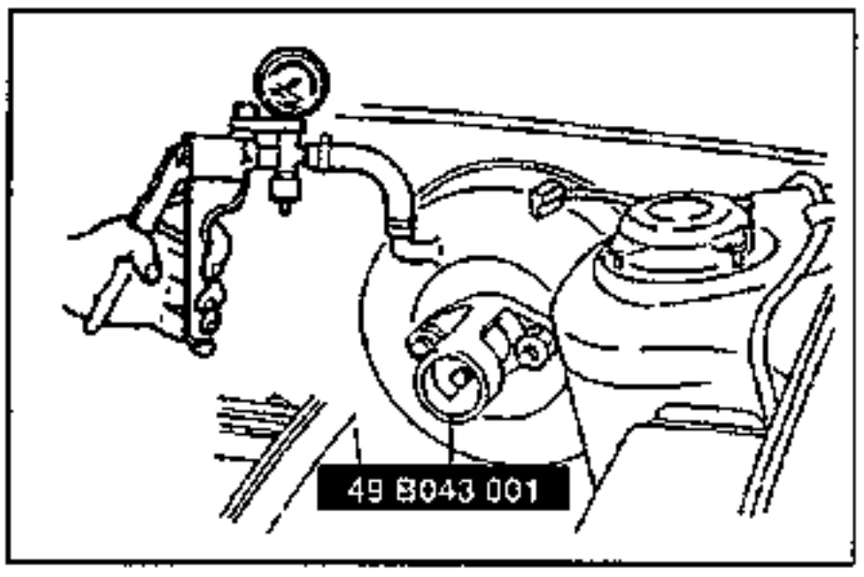


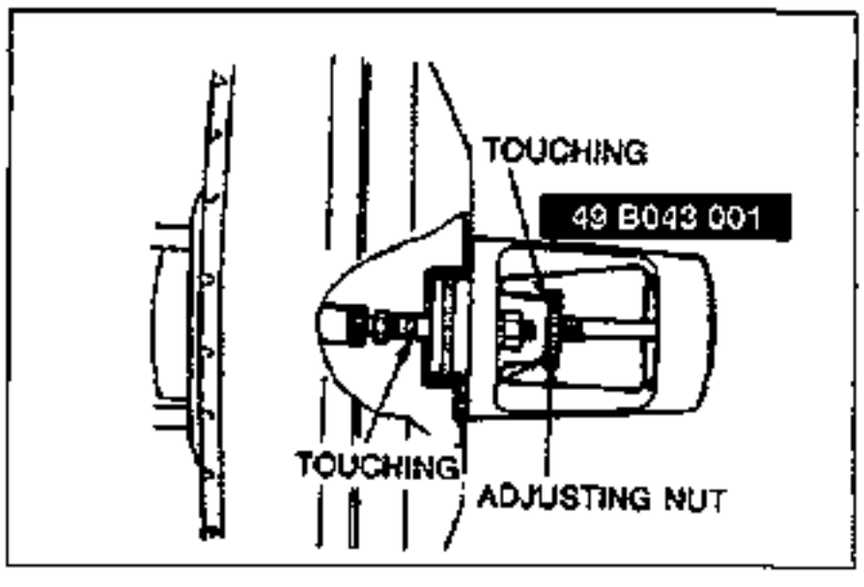
Inspection
Fluid level sensor
1. Disconnect the sensor connector.
2. Connect an ohmmeter to the connector.
3. Starting with the fluid level above the MIN mark on the reservoir, verify that there is no continuity.
4. Remove the brake fluid and verify continuity when the level is below the MIN mark.
5. Replace the sensor if necessary.

Removal / Installation / Inspection
(ABS)
1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Install in the reverse order of removal, referring to **Installation Note.**
3. After installation, add brake fluid, bleed air, and check for fluid leakage.



1. Fluid level sensor
   Inspection ..... page P–16
2. Brake pipe
   Removal Note ..... page P–12
   Installation Note ..... page P–13
3. Hose (MTX)
4. Nuts and washers
5. Master cylinder
   Installation Note ..... page P–14
   Disassembly / Inspection / Assembly ..... page P–17

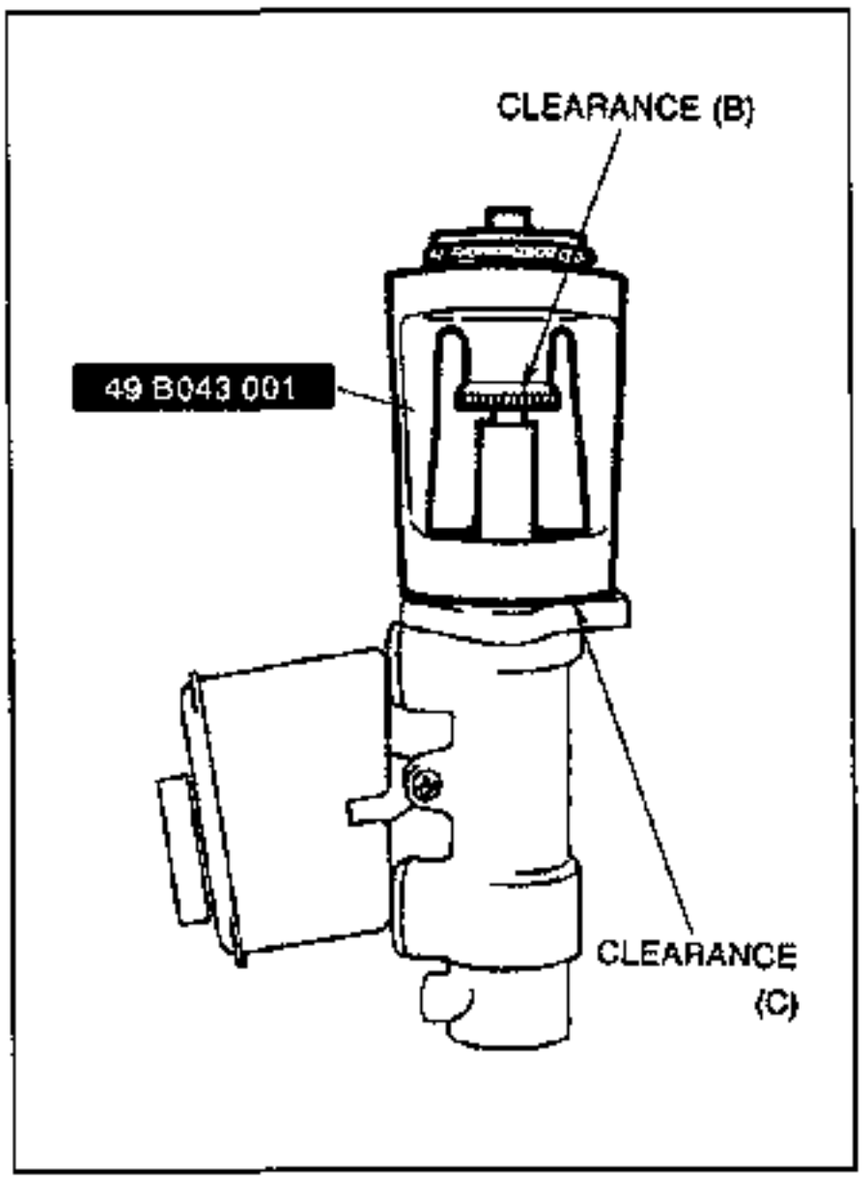




Installation Note
Master cylinder
Push rod clearance
Inspect the push rod clearance as follows.
1. Turn the nut of the **SST** clockwise to fully retract the **SST** gauge rod. Attach the **SST** to the power brake unit.

   Tightening torque:
   9.9–15.6 N·m {100–160 kgf·cm, 86.8—138 in·lbf}

2. Apply **66.7 kPa {500 mmHg, 19.7 inHg}** vacuum using a vacuum pump.
3. Turn the adjusting nut of the **SST** counterclockwise until the gauge rod just contacts the push rod end of the power brake unit.
   Push lightly on the end of the gauge rod to be sure it is seated. Verify that there is no gap between the adjusting nut and **SST** body.

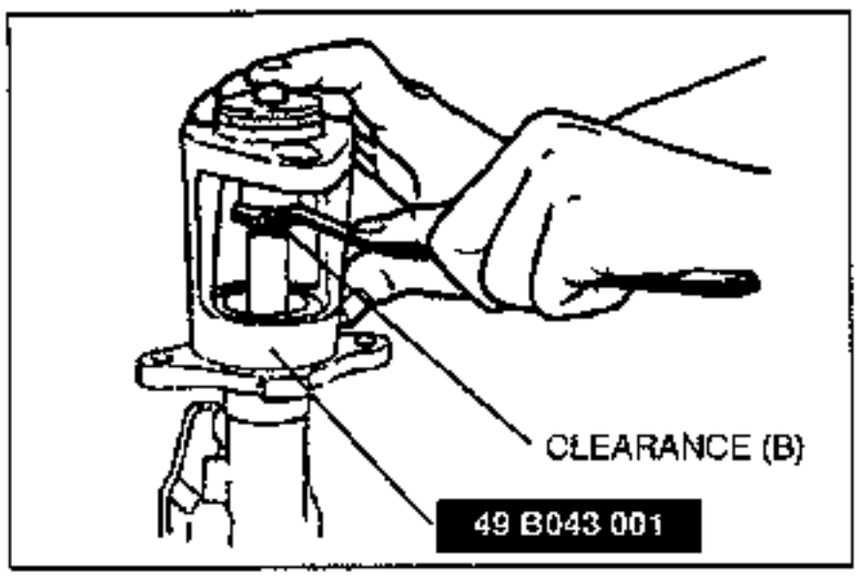


4. Remove the **SST** from the power brake unit without disturbing the adjusting nut. Set the **SST** onto the master cylinder as shown in the figure.

Caution
- **When pushing only use enough pressure to bottom the rod in the piston. If too much pressure is applied a false reading will occur.**

5. Push lightly on the end of the **SST** gauge rod to be sure it is bottomed in the master cylinder piston, and note any clearance between the **SST** body and the adjusting nut (clearance B) or between the body and the master cylinder (clearance C). Adjust the push rod as necessary as outlined in "Adjustment" below.

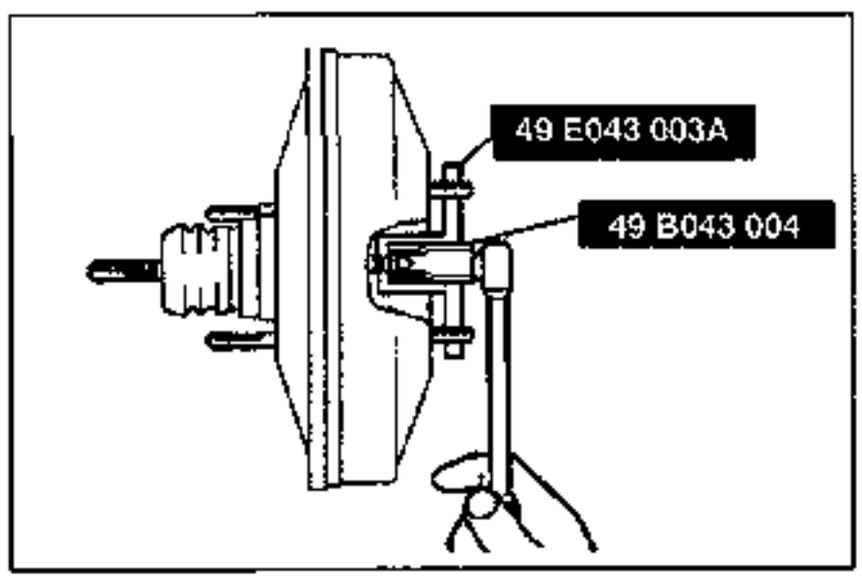
Measurement	Push rod
Clerance at (B)	Too short
Clerance at (C)	Too long
No clearance at (B) or (C)	OK

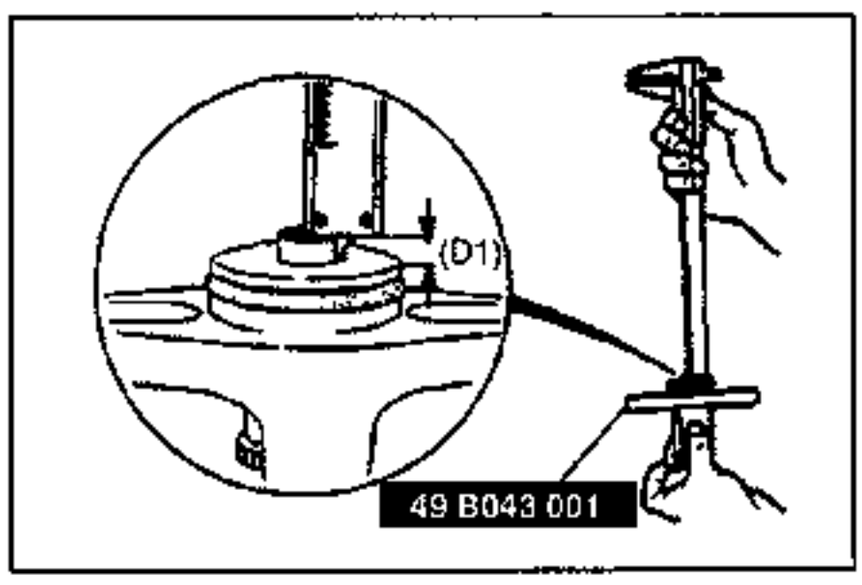


Adjustment

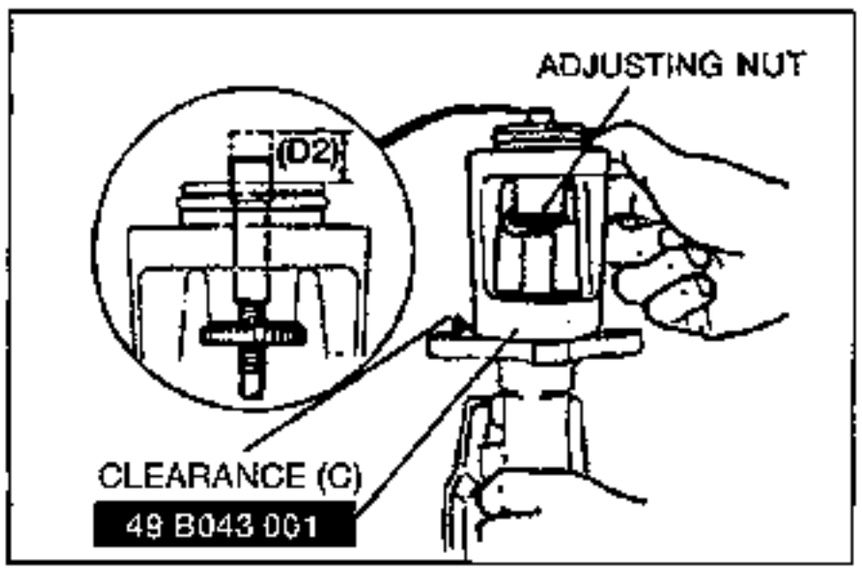
Note
- The threads of the push rod are specially designed so that the bolt becomes harder to turn past a certain point to prevent loosening of the bolt. Turn the bolt only within this range when adjusting.

Clearance at B
1. Push lightly on the end of the **SST** gauge rod, and measure the clearance between the adjusting nut and the **SST** body.
2. Using the **SSTs**, turn the nut to lengthen the power brake unit push rod an amount equal to the clearance measured at B.

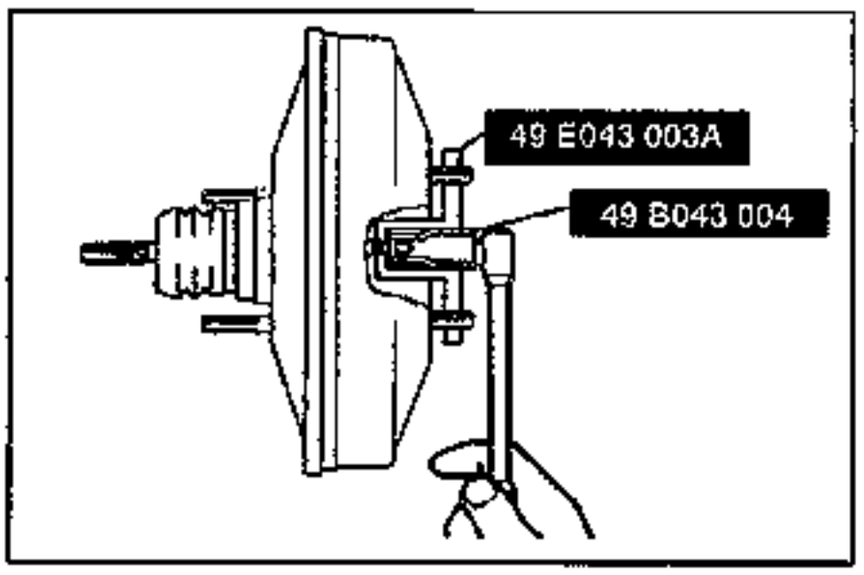




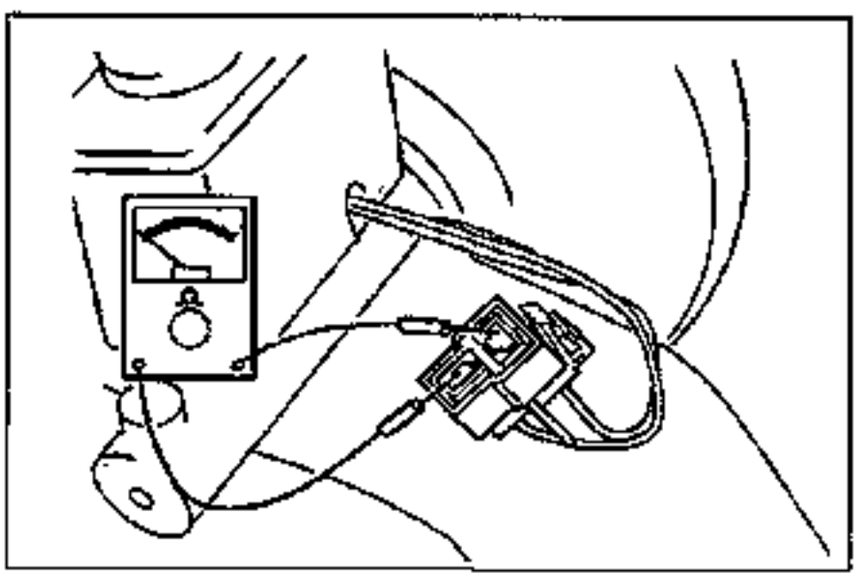
Clearance at C
1. Measure and record height D1 of the gauge rod.



2. Turn the adjusting nut until the **SST** body sets squarely on the master cylinder. (Turn only enough for the body to touch.)
3. Measure and record height D2 of the gauge rod.



4. Subtract D1 from D2 and using the **SSTs**, turn the nut to shorten the power brake unit push rod an amount equal to the sum.



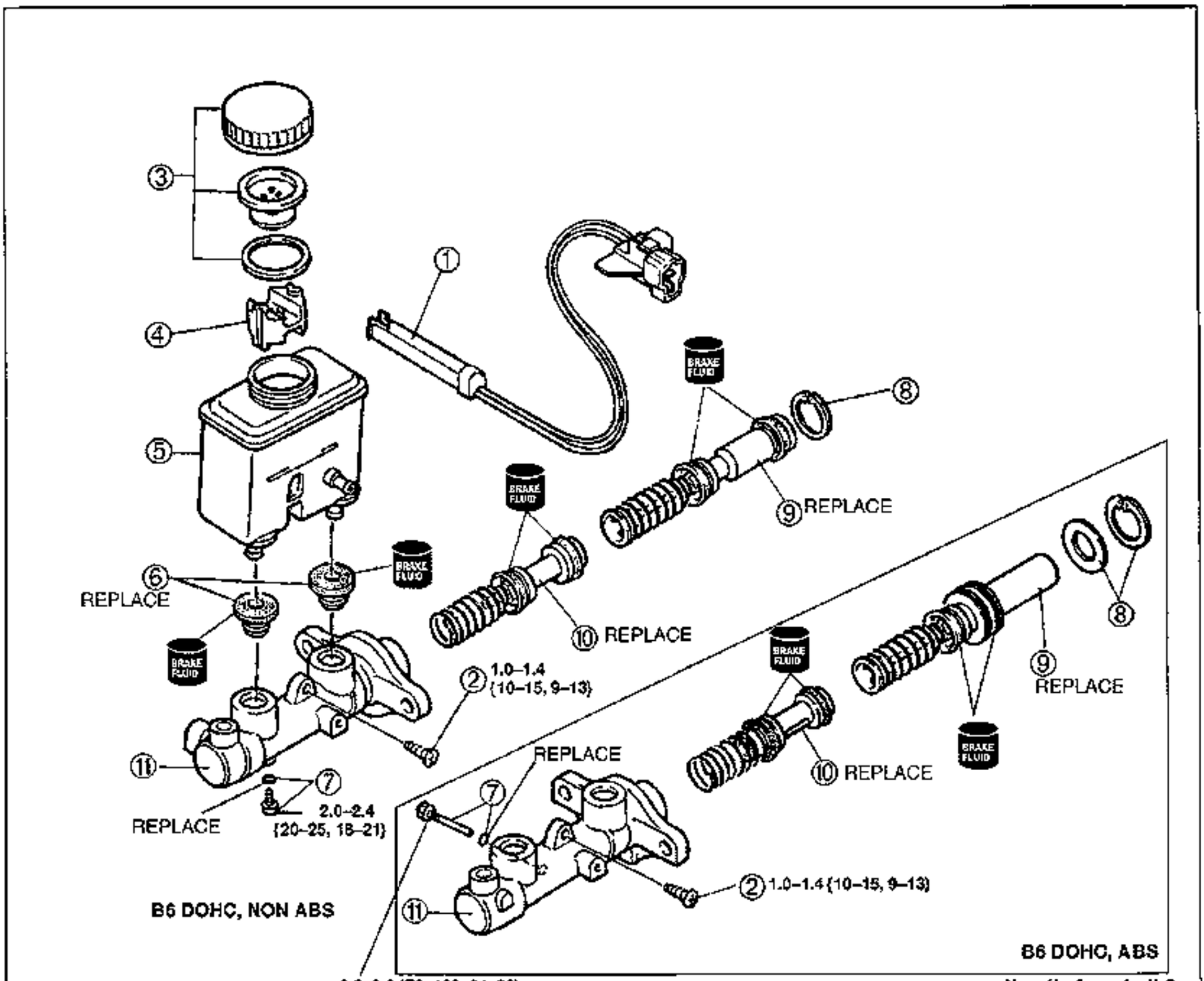
Inspection
Fluid level sensor
1. Disconnect the sensor connector.
2. Connect an ohmmeter to the connector.
3. Starting with the fluid level above the MIN mark on the reservoir, verify that there is no continuity.
4. Remove the brake fluid and verify continuity when the level is below the MIN mark.
5. Replace the sensor if necessary.

Disassembly / Assembly / Inspection

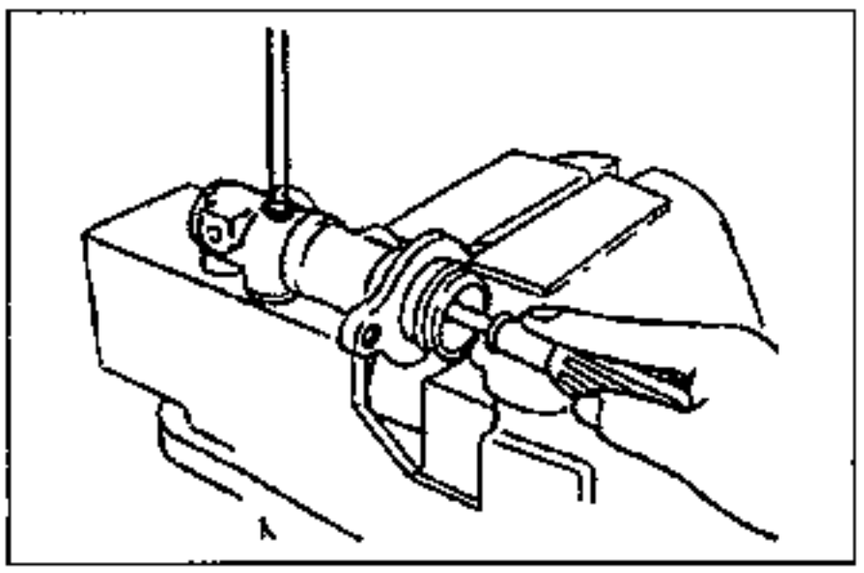
1. After removing the brake fluid, disassemble in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of removal, referring to **Assembly Note.**

Caution

- **The brake master cylinder is made of aluminum, and can be easily damaged by tightening in a vise. When securing the master cylinder in a vise, tighten only the flange of the master cylinder.**

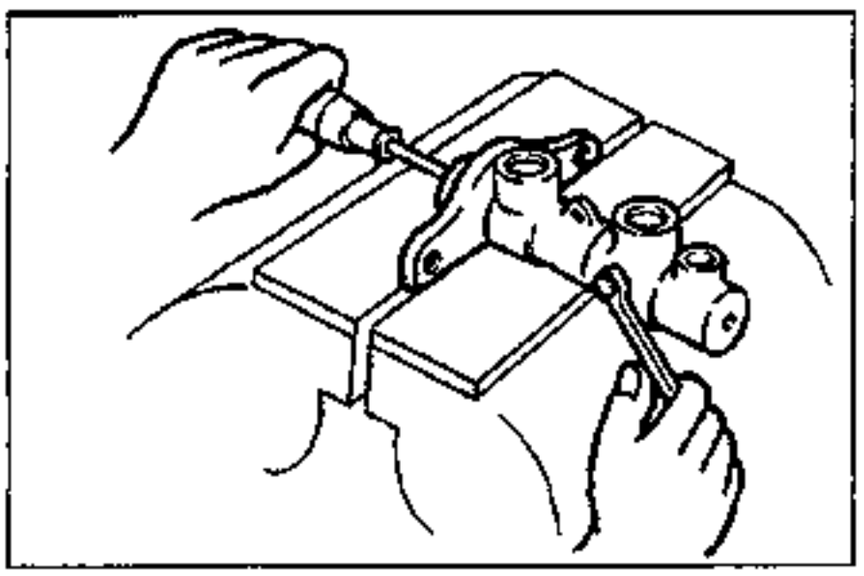


1. Fluid level sensor
   Inspection ..... page P–13
2. Screw
3. Cap set
4. Float
5. Reservoir
   Inspect for damage and deformation
6. Bushings
7. Stop screw and O-ring
   (B6 DOHC, NON ABS)
   Assembly Note ..... page P–18
7. Stop pin and O–ring (B6 DOHC, ABS)
   Assembly Note ..... page P–18
8. Snap ring (B6 DOHC, NON ABS)
8. Snap ring and space (B6 DOHC, ABS)
9. Primary piston assembly
   Inspect for abnormal wear, rust, and damage
10. Secondary piston assembly
    Assembly Note ..... page P–18
    Inspect for abnormal wear, rust, and damage
11. Master cylinder body
    Inspect for abnormal wear, rust, and damage



Assembly Note
Secondary piston assembly, stop screw and O-ring (B6 DOHC, NON ABS)

1. Push the secondary piston assembly in fully.
2. Install and tighten a new O-ring and stop screw.
3. Push and release the piston to verify that it is held by the stop screw.



Secondary piston assembly, stop pin and O–ring (B6 DOHC, ABS)

1. Install the secondary piston assembly with the piston hole facing the stop pin.
2. Install and tighten the new O–ring and stop pin.
3. Push and release the piston to verify that it is held by the stop pin.

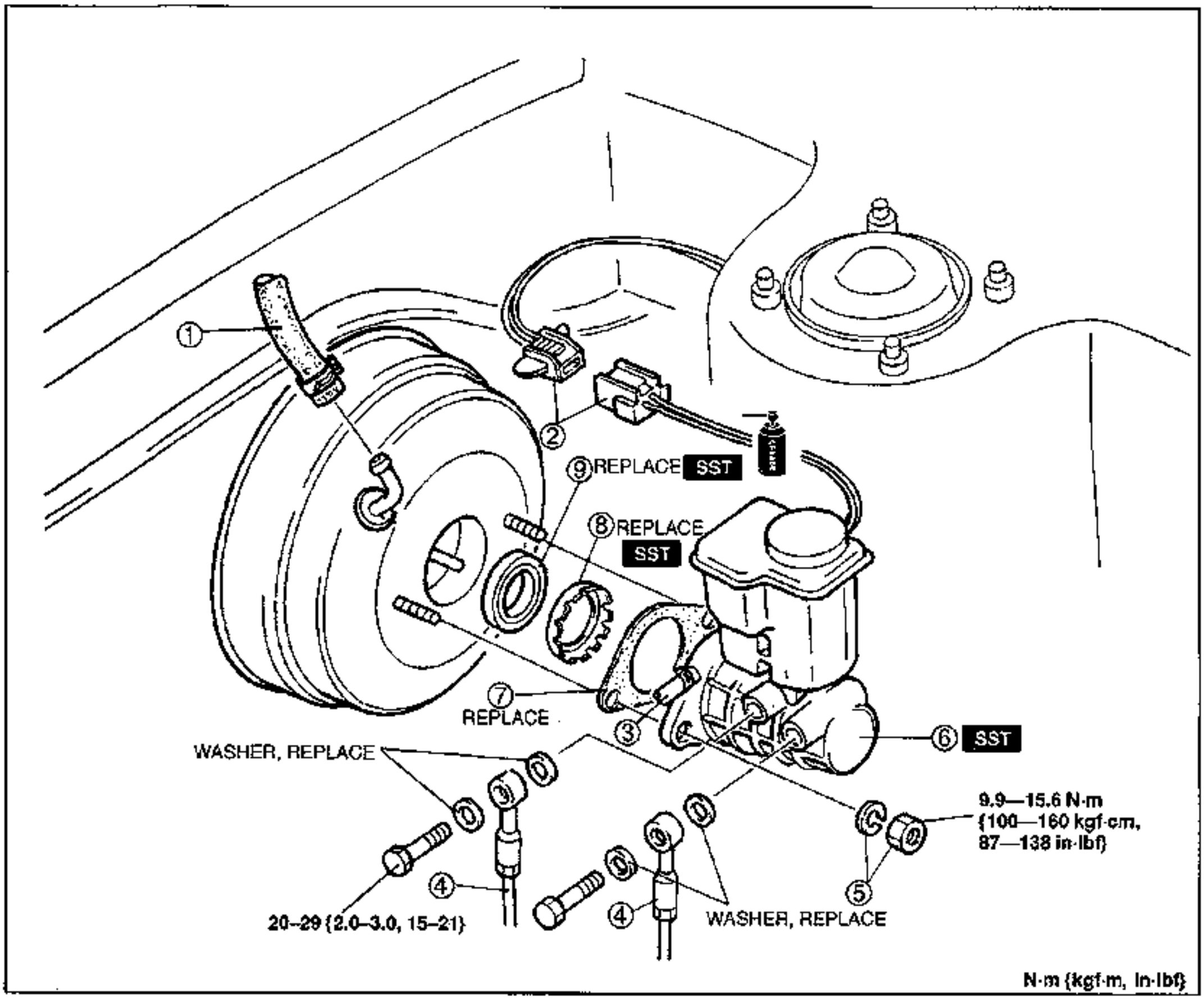
MASTER CYLINDER (K8 DOHC)

Removal / Installation / Inspection

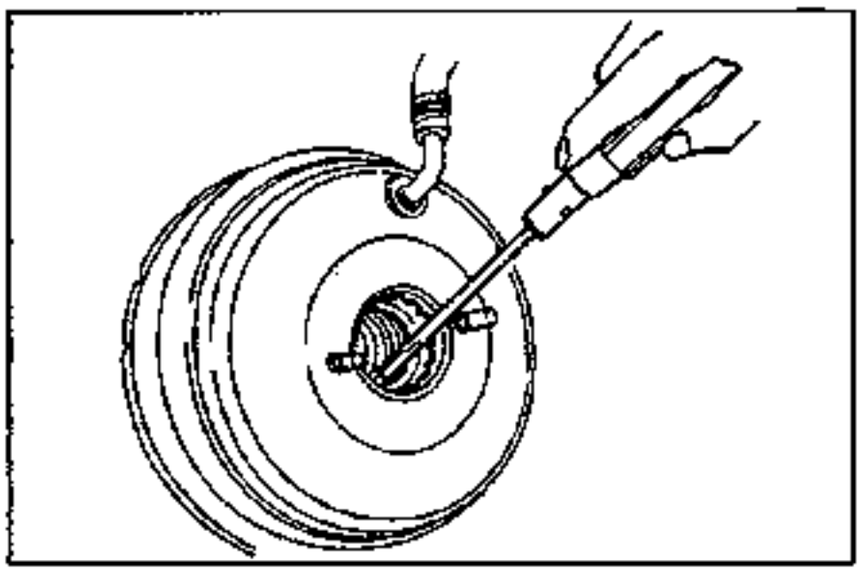
1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Install in the reverse order of removal, referring to **Installation Note.**
3. After installation, add brake fluid, bleed air, and check for fluid leakage.

Caution

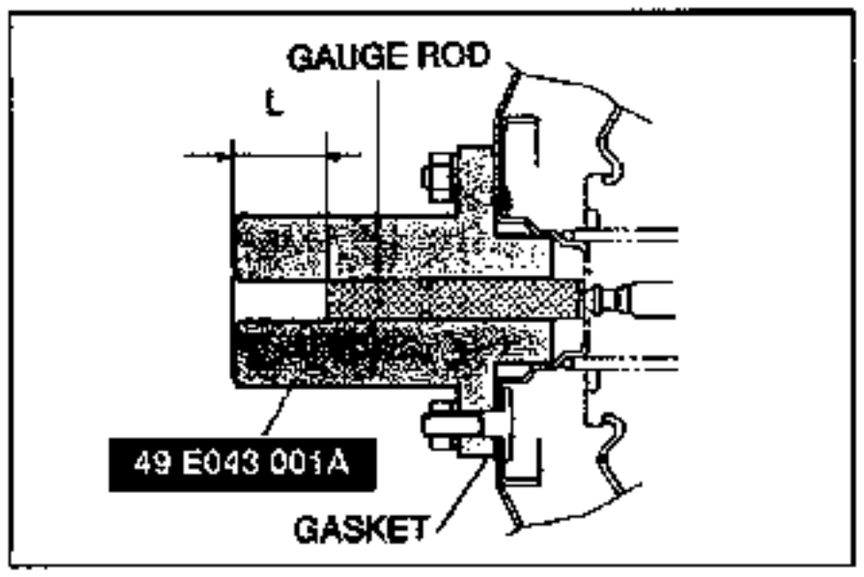
- **Before removing the master cylinder, be sure to disconnect the vacuum hose (with check valve) from the power brake unit. Removing the master cylinder with vacuum remaining in the power brake unit will cause the master cylinder piston to pop out and drain the brake fluid.**



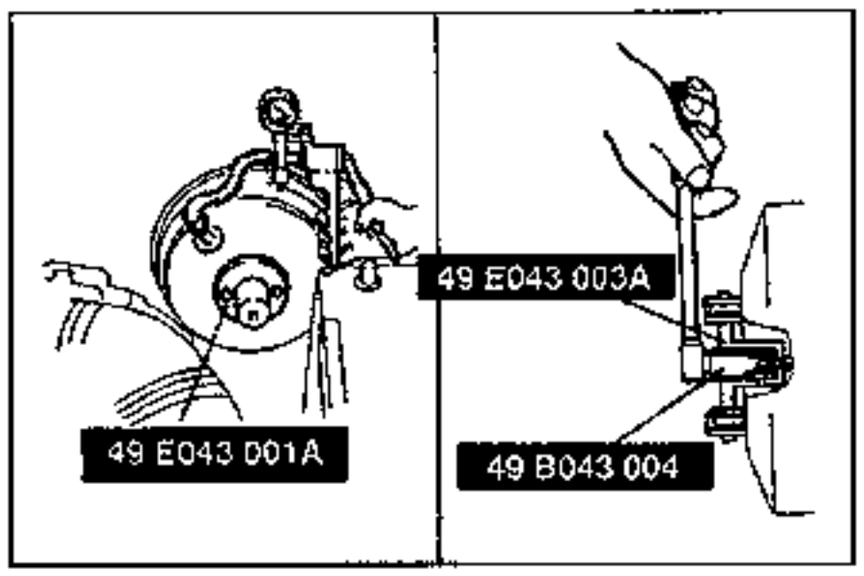
1. Vacuum hose
2. Fluid level sensor
   Inspection ..... page P–21
3. Hose (MTX)
4. Brake pipe
5. Nuts and washers
6. Master cylinder
   Installation Note ..... page P–20
   Disassembly / Inspection / Assembly ..... page P–22
7. Gasket
8. Retainer
   Removal Note ..... page P–20
   Installation Note ..... page P–20
9. Seal and plate assembly
   Removal Note ..... page P–20
   Installation Note ..... page P–20



Removal Note
Retainer, seal and plate assembly
1. Remove the retainer as shown in the figure.
2. Remove the seal and plate assembly.



Installation Note
Master cylinder, retainer, seal and plate assembly
1. Remove the seal and plate assembly, and install the power brake unit gasket.
2. Adjust the push rod clearance as follows.



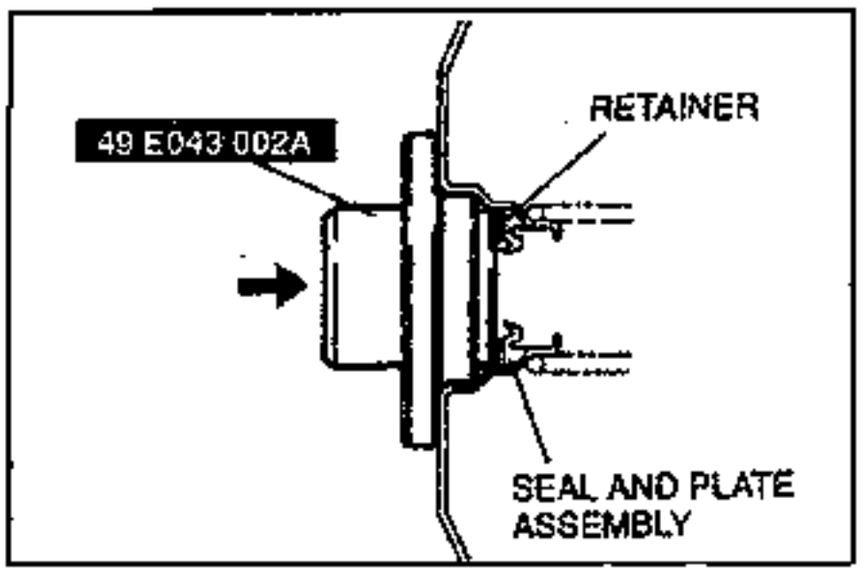
(1) Attach the **SST** to the power brake unit as shown in the figure, and tighten the locknuts to the specified torque.

Tightening torque:
9.9–15.6 N·m {100–160 kgf·cm, 86.8–138 in·lbf}

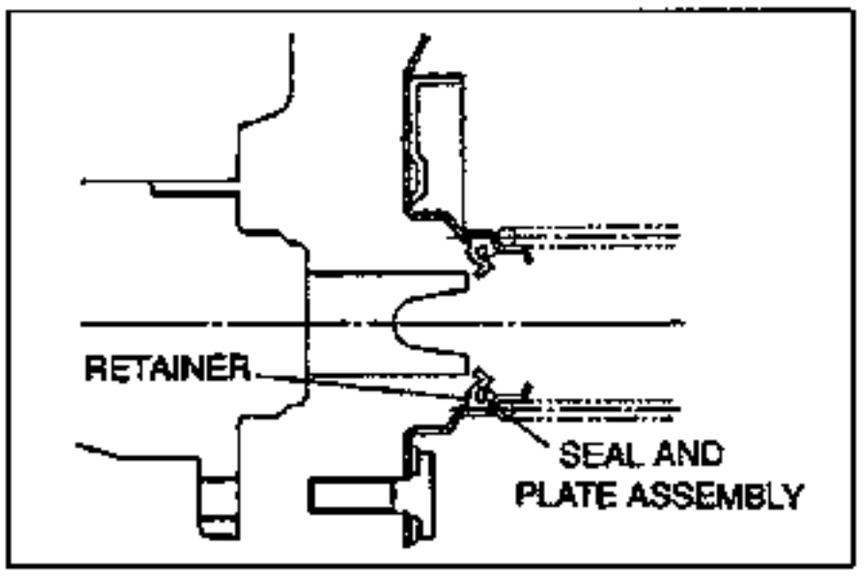
(2) Apply **66.7kpa {500 mmHg, 19.7 inHg}** vacuum by using a vacuum pump.
(3) Measure the depth L of the gauge rod.

Depth: 35.3–35.5 mm {1.390–1.397 in}

(4) If it not specified, use the **SSTs** to adjust the push rod to the proper length.
(5) Verify depth L of the gauge rod.

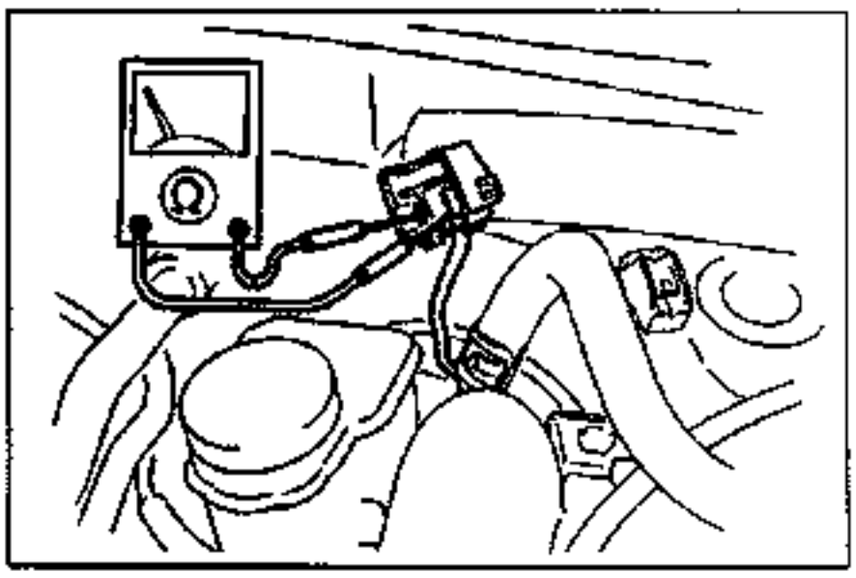


3. (1) Install the new retainer and the seal and plate assembly by using the **SST**.
(2) Apply specified grease supplied in the repair kit to the seal plate assembly.



4. When installing the master cylinder into the power brake unit, be sure to align it correctly, fitting the master cylinder squarely into the power brake unit seal. Do not roll the lip of the power brake unit seal.

5. After tightening the brake pipe:
   (1) Add brake fluid and bleed the air. (Refer to page P–7.)
   (2) Check the brake lines for fluid leakage. (Refer to page P–9.)



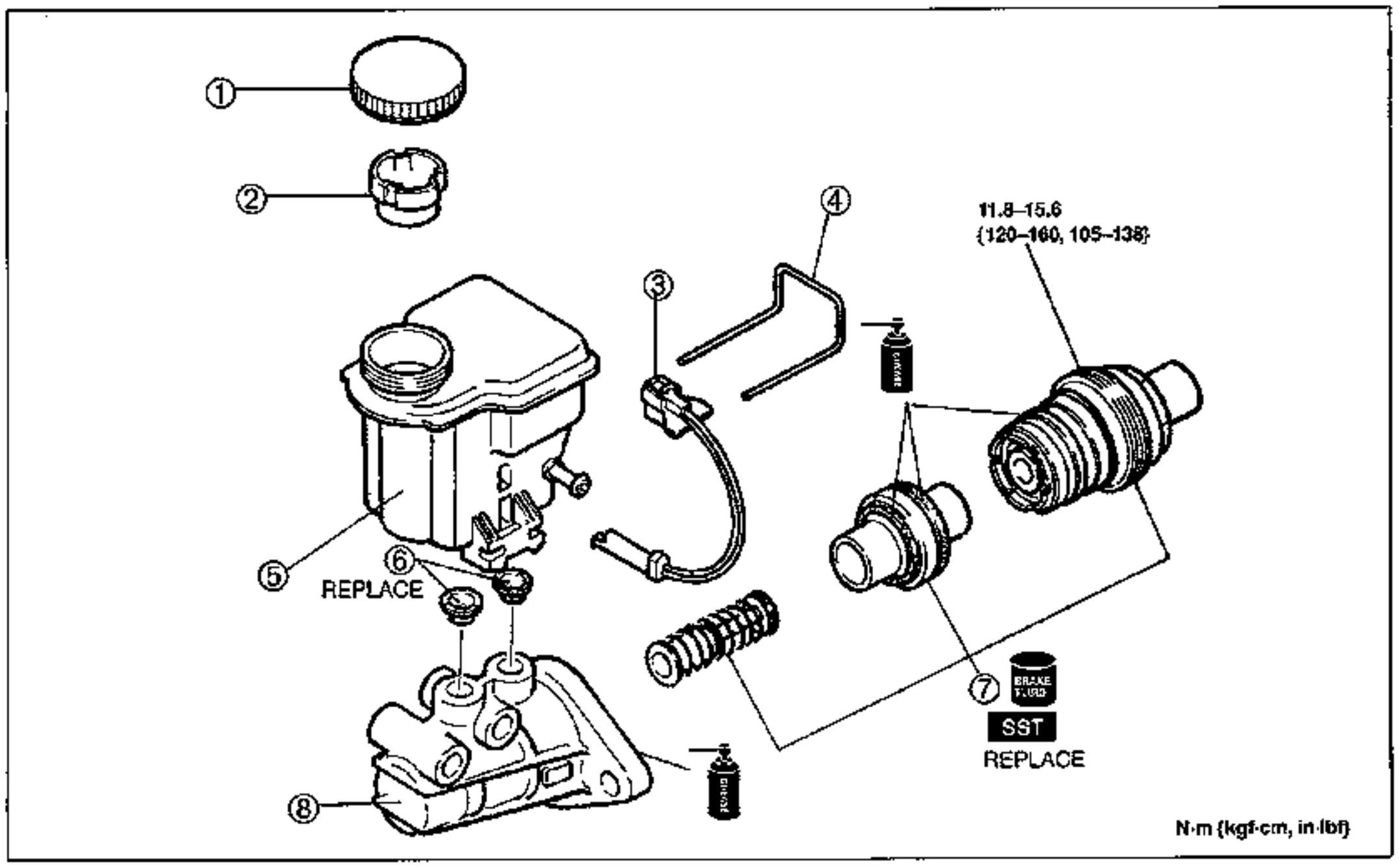
Inspection
Fluid level sensor
1. Disconnect the sensor connector.
2. Connect an ohmmeter to the connector.
3. Starting with the fluid level above MIN mark on the reservoir, verify that there is no continuity.
4. Remove the brake fluid and verify continuity when the level is below the MIN mark.
5. Replace the sensor if necessary.

Disassembly / Assembly / Inspection

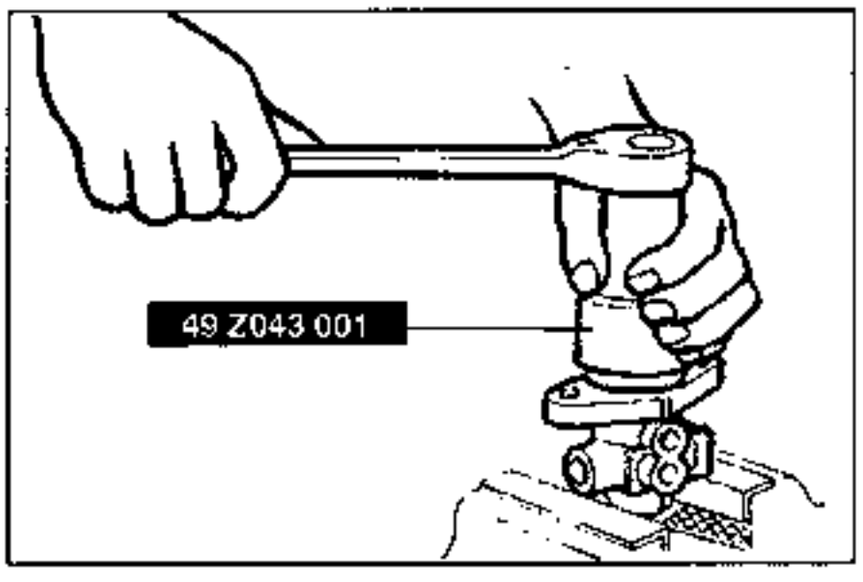
1. After removing the brake fluid, disassemble in the order shown in the figure, referring to **Disassembly Note.**
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of removal, referring to **Assembly Note.**

Caution

- **The brake master cylinder is made of aluminum, and can be easily damaged by tightening in a vise. When securing the master cylinder in a vise, tighten only the front ports of the cylinder body.**



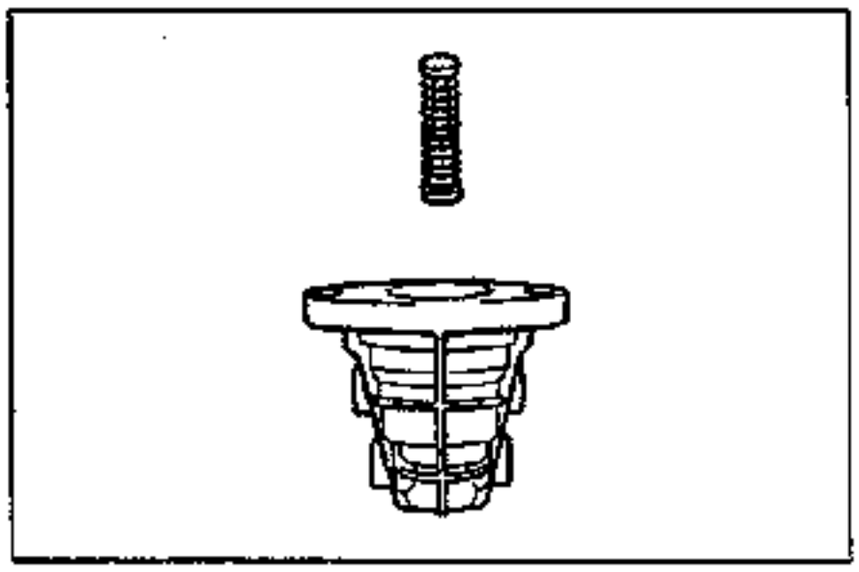
1. Cap
2. Tank filter
3. Fluid level sensor
4. Tank retainer
   Assembly Note ..... page P–24
5. Reservoir tank
   Inspect for damage and deformation ..... page P–24
6. Grommet
   Assembly Note ..... page P–24
7. Piston assembly
   Disassembly Note ..... below
   Assembly Note ..... page P–23
8. Master cylinder body
   Inspect for abnormal wear, rust and damage



Disassembly Note

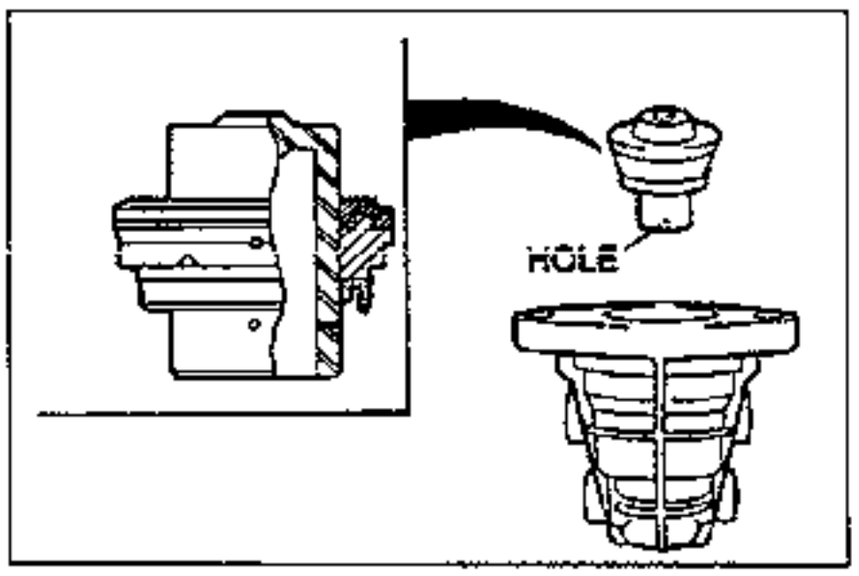
Piston Assembly

Loosen the cap by using the **SST**, remove the primary piston assembly out of the cylinder.

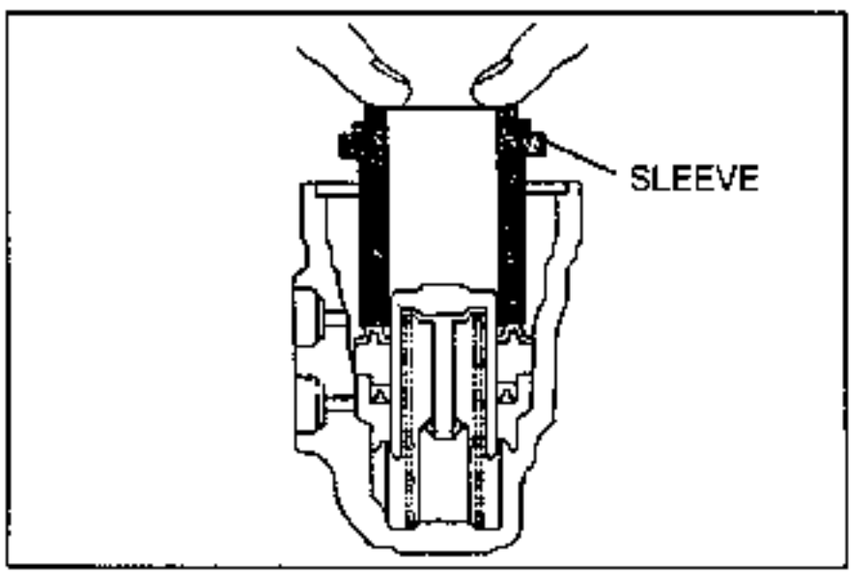


Assembly Note
Piston assembly

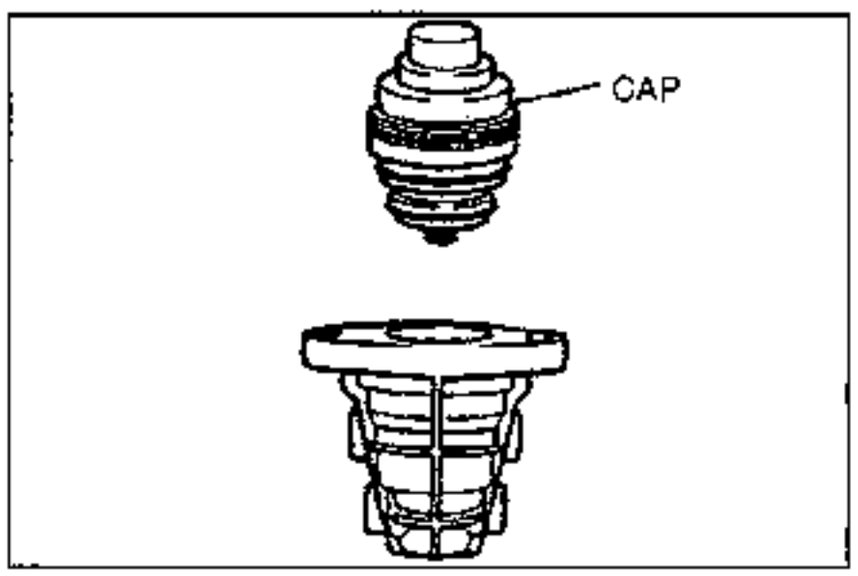
1. Before assembly, clean the cylinder body inner surface and a new piston assembly by using brake fluid.
2. Install the secondary spring assembly into the cylinder body with the larger diameter facing the cylinder body.



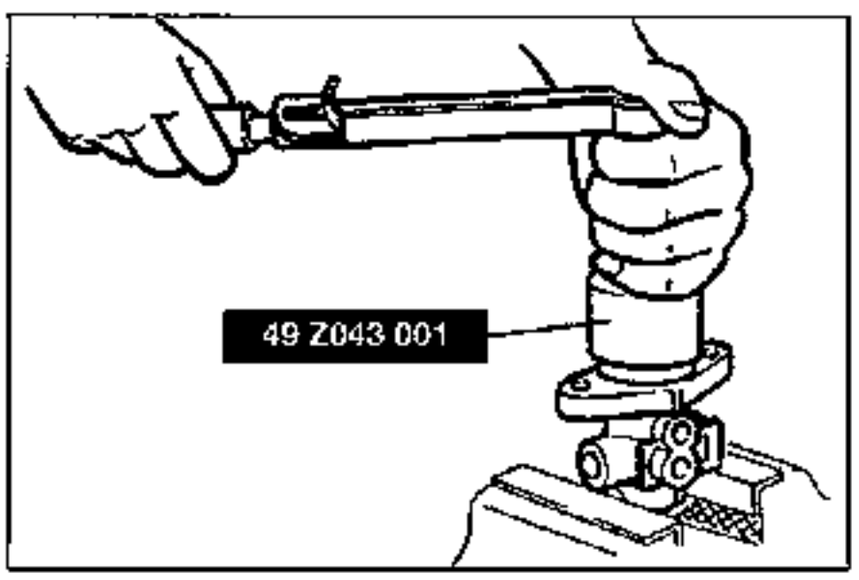
3. Apply specified grease supplied in the repair kit to the cup of the secondary piston assembly.
4. Install the secondary piston assembly into the cylinder body with the hole on the piston assembly facing the cylinder body.



5. Using the old sleeve of the primary piston assembly, push the secondary piston assembly to the cylinder body.

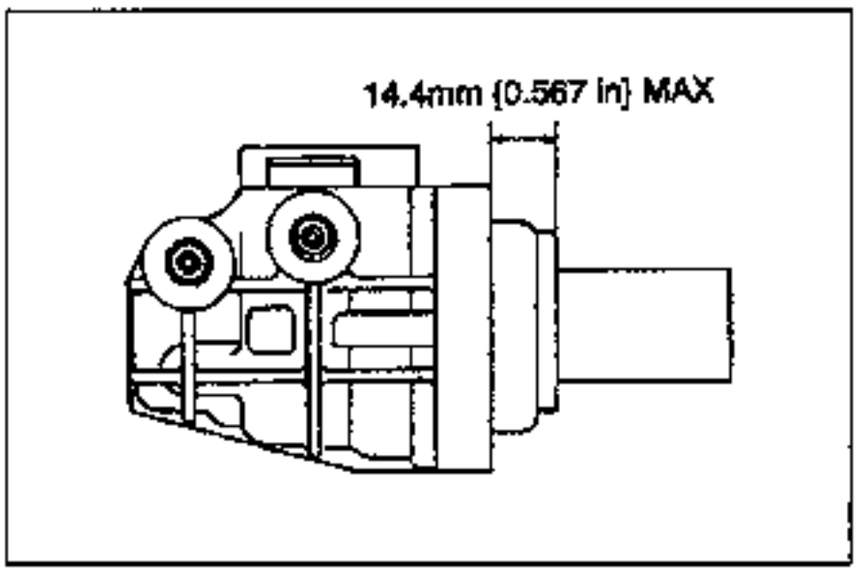


6. Apply specified grease supplied in the repair kit to the cup of the primary piston assembly.
7. Install the primary piston assembly into the cylinder body.



8. Tighten the cap by using the **SST**.

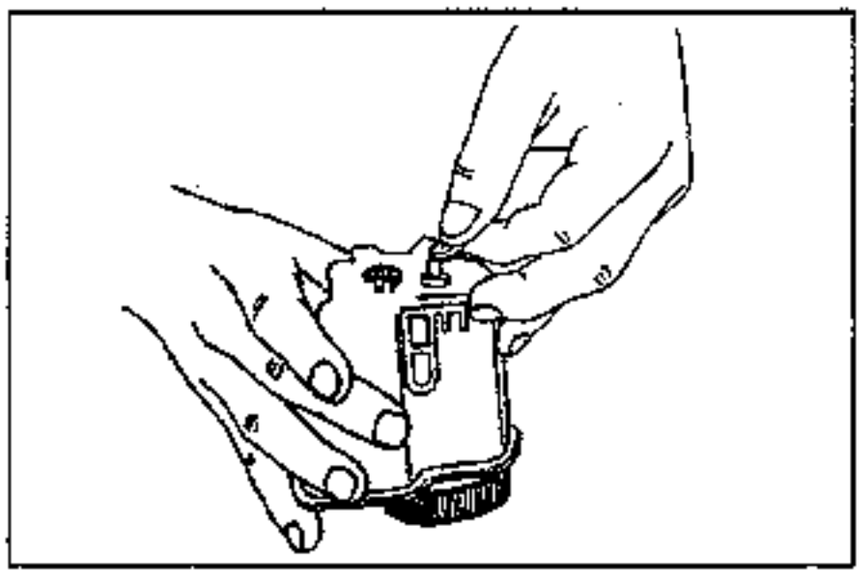
Tightening torque:
11.8–15.6 N·m {120–160 kgf·m, 105–138 in·lbf}



9. Measure clearance between the cylinder body flange and the cap.

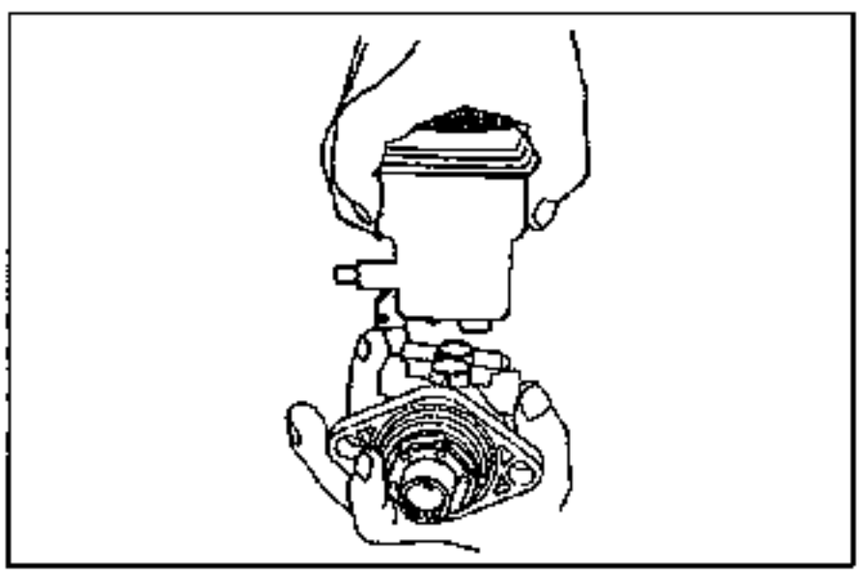
   Clearance: 14.4 mm {0.567 in} max.

10. If the clearance is greater than specified, disassemble and reassemble the master cylinder.

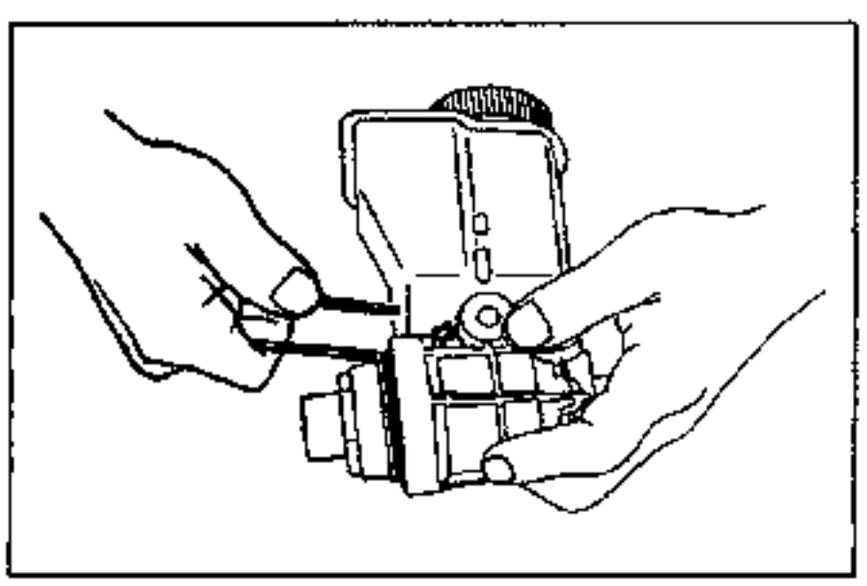


Grommet, reserve tank, tank retainer

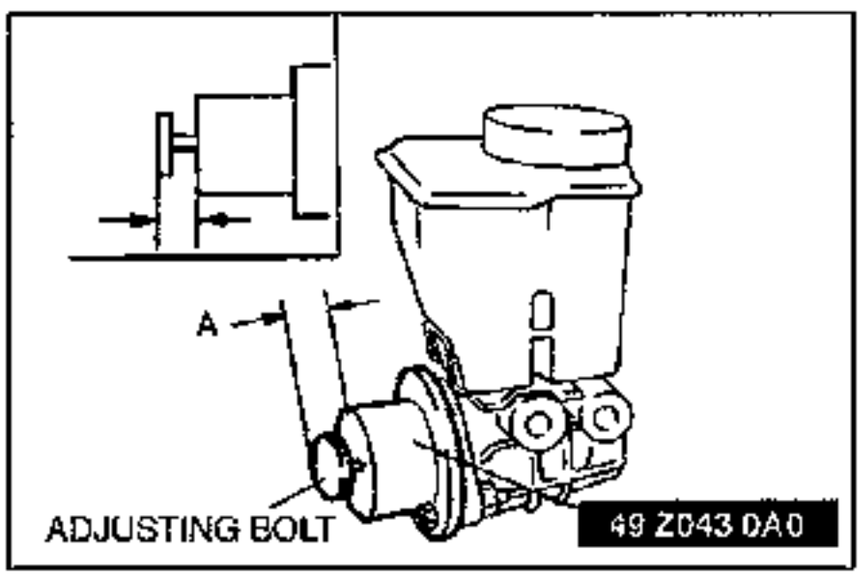
1. Install the new grommet to the reserve tank.



2. Install the reserve tank to the cylinder.



3. Install the tank retainer while pushing the reserve tank to the cylinder body.



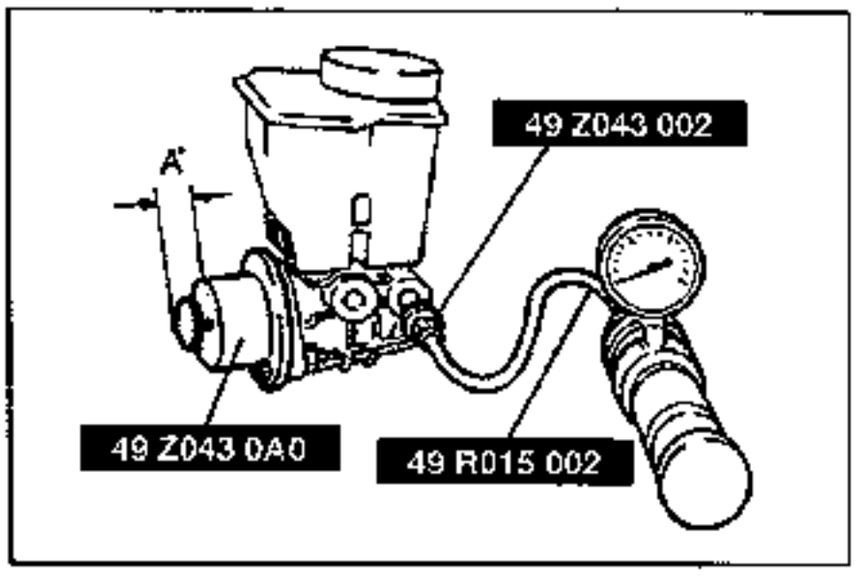
Inspection

Master cylinder assembly

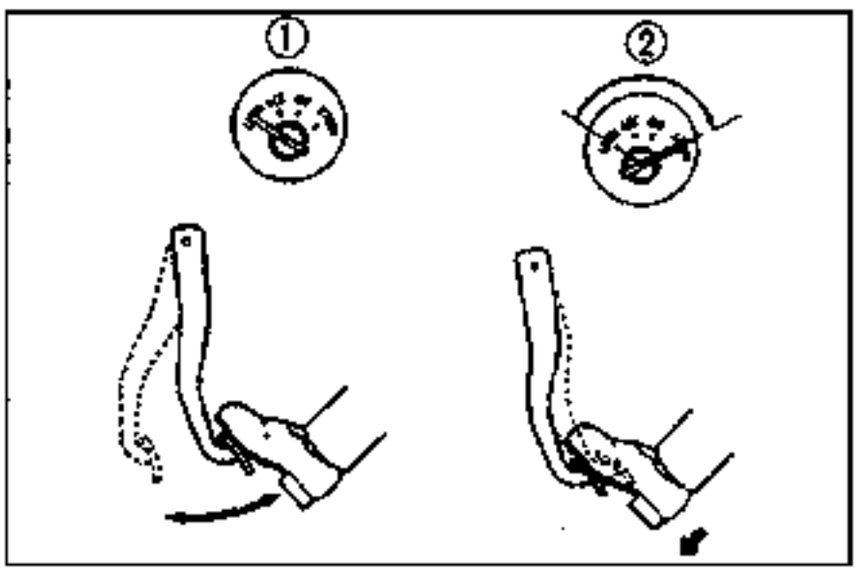
1. Set the **SST** as shown in the figure, tighten the nut to the specified torque.

   Tightening torque:
   9.9–15.6 N·m {100–160 kgf·cm, 87–138 in·lbf}

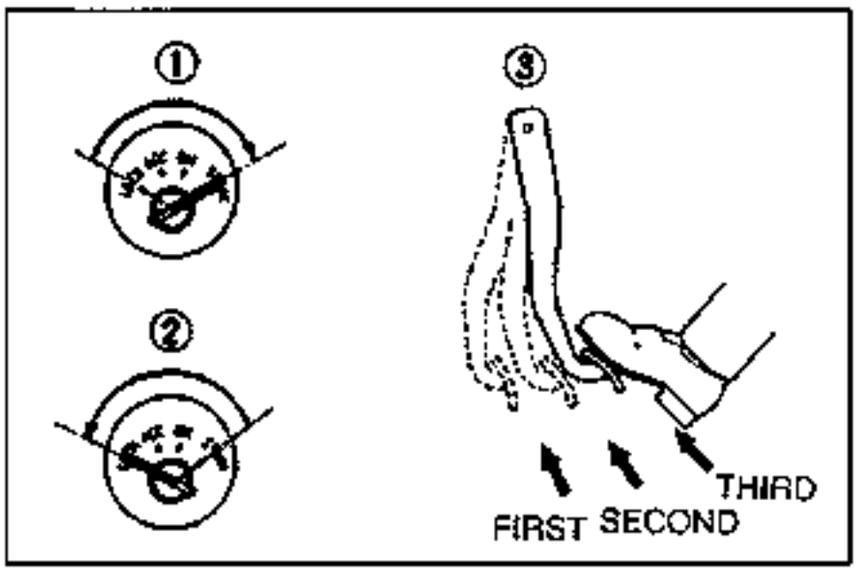
2. Turn the adjusting bolt until gap A is **21 mm {0.83 in}**.



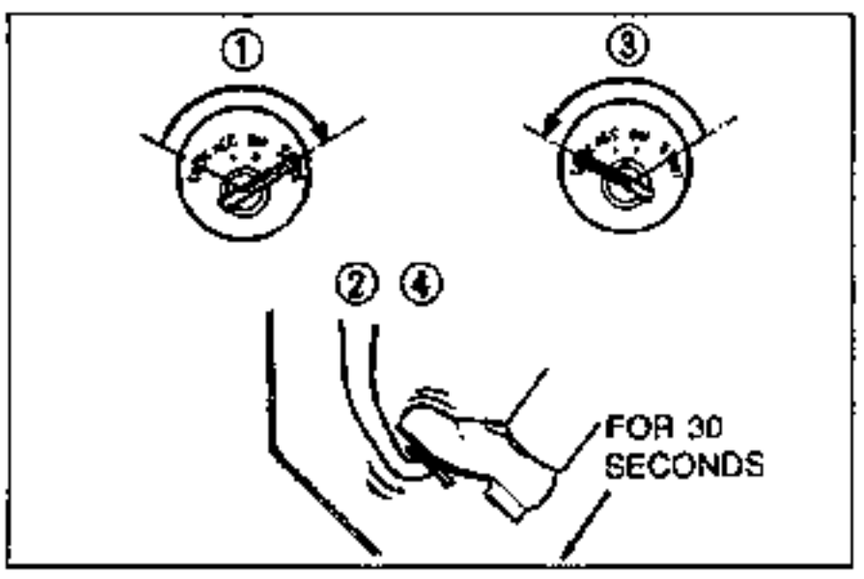
3. Install a radiator cap tester and the **SSTs** to the front port on the master cylinder. Apply air into the master cylinder and verify that the air pressure is not built.
4. Tighten the adjustment bolt on the **SST** until the gap A' becomes **11 mm {0.433 in}**. Raise the air pressure **49.05 kPa {0.5 kgf/cm^2, 7.11 psi}** and verify that the pressure is held for more than 5 seconds.
5. Check for the rear port on the master cylinder by using same procedure.



POWER BRAKE UNIT
Quick inspection (on-vehicle)
Power brake unit function Check
(Simple method)
Step 1
1. With the engine stopped, depress the pedal a few times.
2. With the pedal depressed, start the engine.
3. If immediately after the engine starts the pedal moves down slightly, the unit is operating.

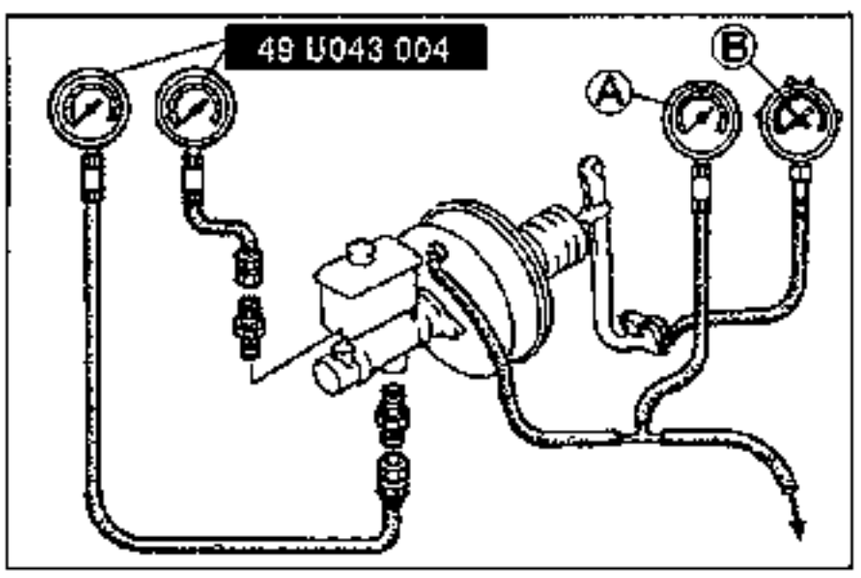


Step 2
1. Start the engine.
2. Stop the engine after it has run for **1 or 2 minutes.**
3. Depress the pedal with the usual force.
4. If the first pedal stroke is long and becomes shorter with subsequent strokes, the unit is operating.
5. If a problem is found, inspect for damage of the check valve or vacuum hose and examine the installation. Repair if necessary, and inspect it once again.

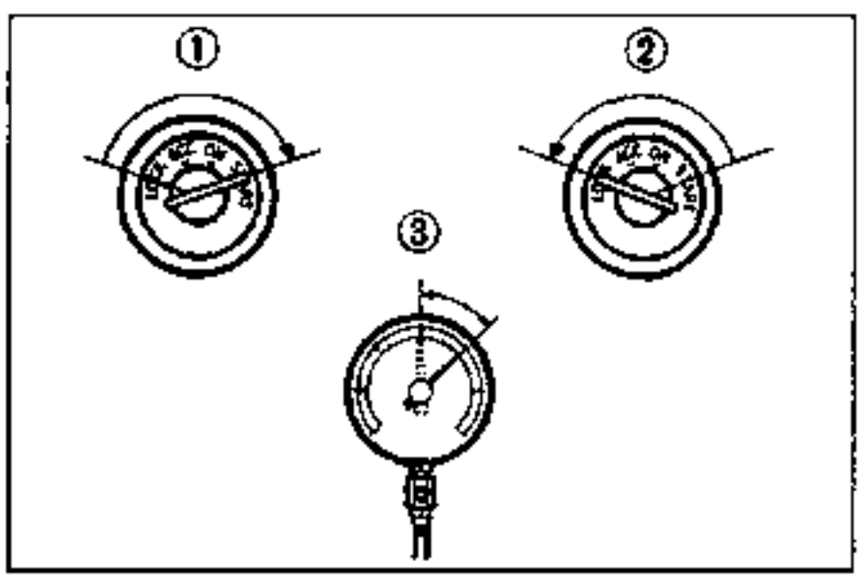


Step 3
1. Start the engine.
2. Depress the pedal with the usual force.
3. Stop the engine with the pedal held depressed.
4. Hold the pedal down for **about 30 seconds.**
5. If the pedal height does not change, the unit is operating.
6. If there is a problem, check for damage to the check valve or vacuum hose, and check the connection. Repair if necessary and check once again.

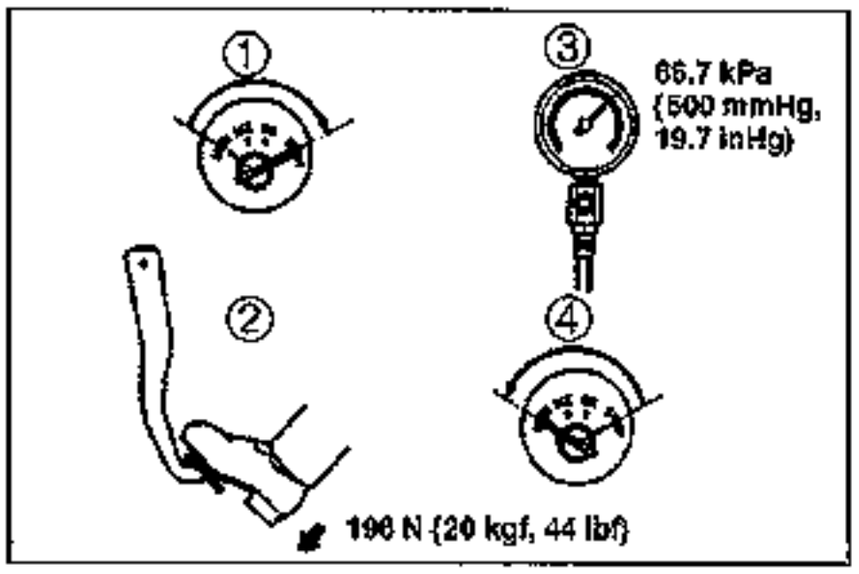
If the nature of the problem is still not clear after the 3 steps above, follow the more detailed check described in "Method-using tester," below.



(Inspection using gauges)
Connect the **SST** gauges, vacuum gauge Ⓐ, and pedal depression force gauge Ⓑ as shown. Bleed the air from the **SST** gauges before performing the following tests.

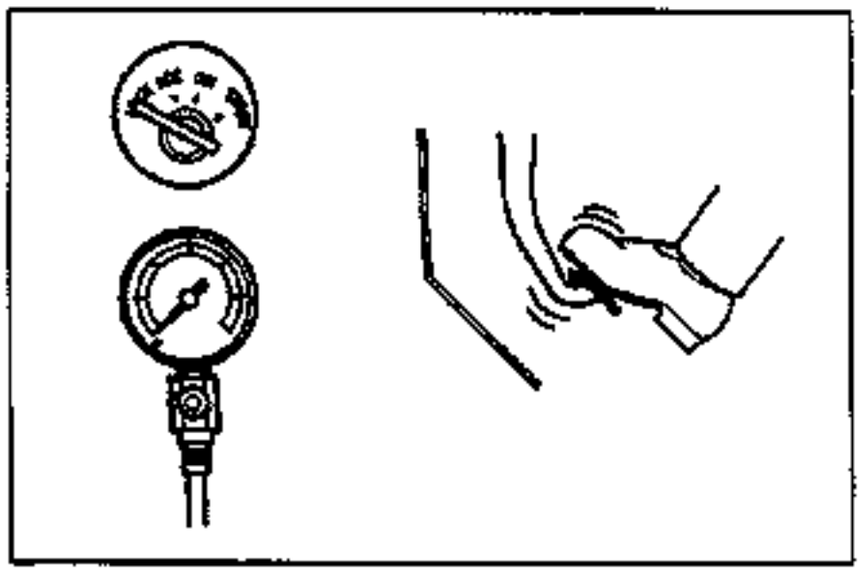


a) Checking for vacuum loss
Unloaded condition
1. Start the engine.
2. Stop the engine when the vacuum gauge reading reaches **66.7 kPa {500 mmHg, 19.7 inHg}**.
3. Observe the vacuum gauge **for 15 seconds.** If the gauge shows **63.3–66.7 kPa {475–500 mmHg, 18.7–19.7 inHg}**, the unit is operating.



Loaded condition

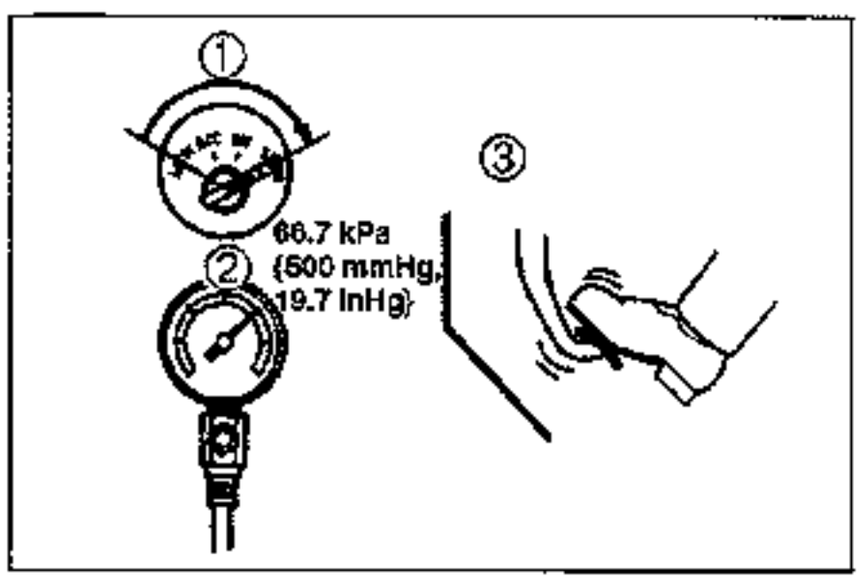
1. Start the engine.
2. Depress the brake pedal with a force of **196 N {20 kgf, 44 lbf}**.
3. With the brake pedal depressed, stop the engine when the vacuum gauge reading reaches **66.7 kPa {500 mm Hg, 19.7 inHg}**.
4. Observe the vacuum gauge for **15 seconds**. If the gauge shows **63.3–66.7 kPa {475–500 mmHg, 18.7–19.7 inHg}**, the unit is operating.



b) Checking for hydraulic pressure

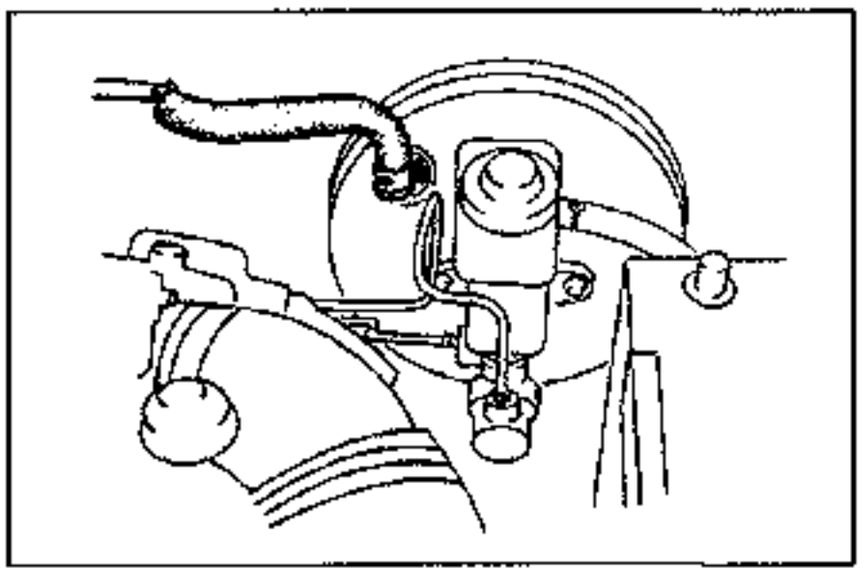
1. Depress the brake pedal with the engine stopped (Vacuum **0 kPa {0 mmHg, 0 inHg}**). If the fluid pressure is within specification, the unit is operating.

Pedal force	Fluid pressure
196 N {20 kgf, 44 lbf}	B6 DOHC . . 588 kPa {6 kgf/cm^2, 86 psi} min
	K8 DOHC . . 393 kPa {4 kgf/cm^2, 57 psi} min

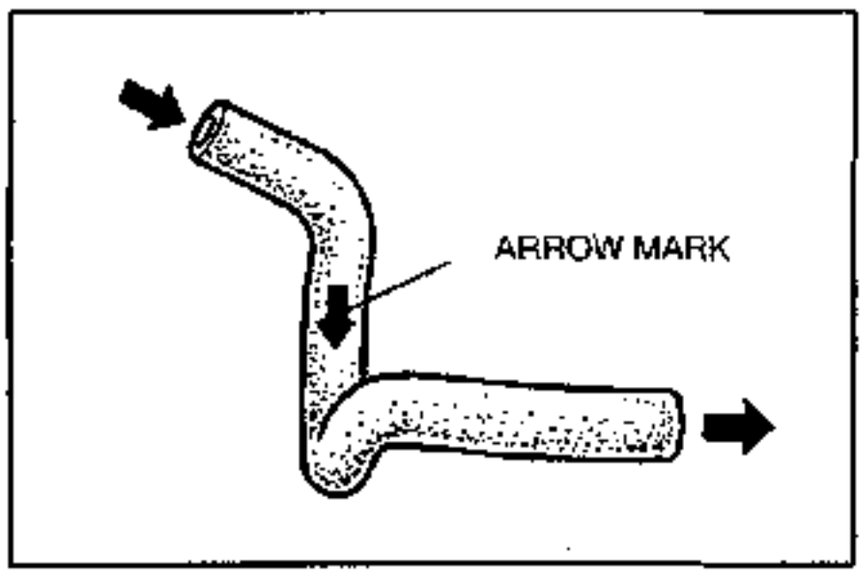


2. Start the engine. Depress the brake pedal when the vacuum reaches **66.7 kPa {500 mmHg, 19.7 inHg}**. If the fluid pressure is within specification, the unit is operating.

Pedal force	Fluid pressure
196 N {20 kgf, 44 lbf}	B6 DOHC (MTX)...6081 kPa {62 kgf/cm^2, 882 psi} min
	B6 DOHC (ATX)....6767 kPa {69 kgf/cm^2, 982 psi} min
	K8 DOHC . . . . . 7061 kPa {72 kgf/cm^2, 1024 psi} min

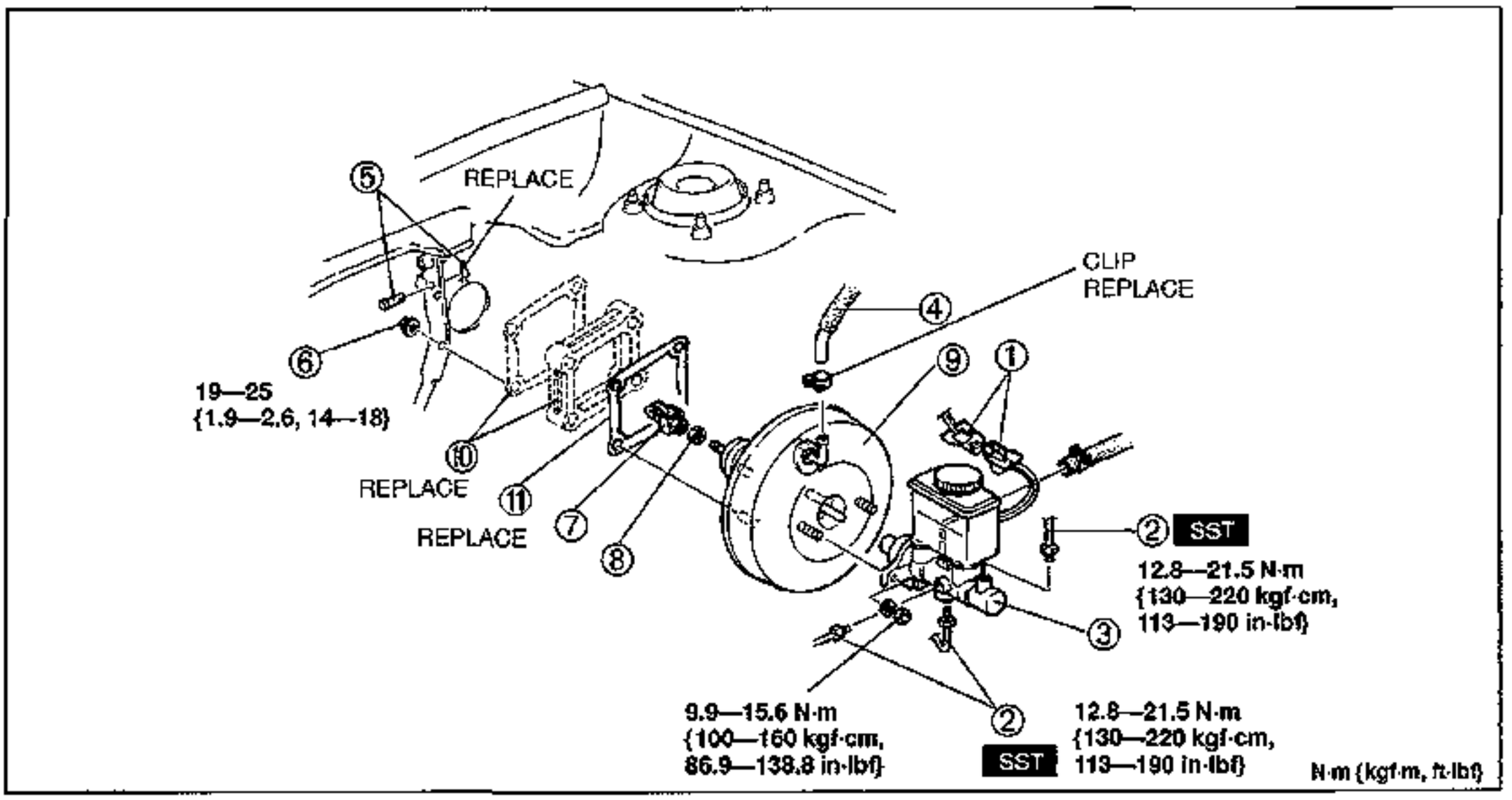


Check Valve
Inspection
1. Remove the clamps and the vacuum hose.



2. Apply both suction and pressure to the engine–side of the hose, and verify that air flows only toward that side. If air flows in both directions or not at all, replace the vacuum hose.

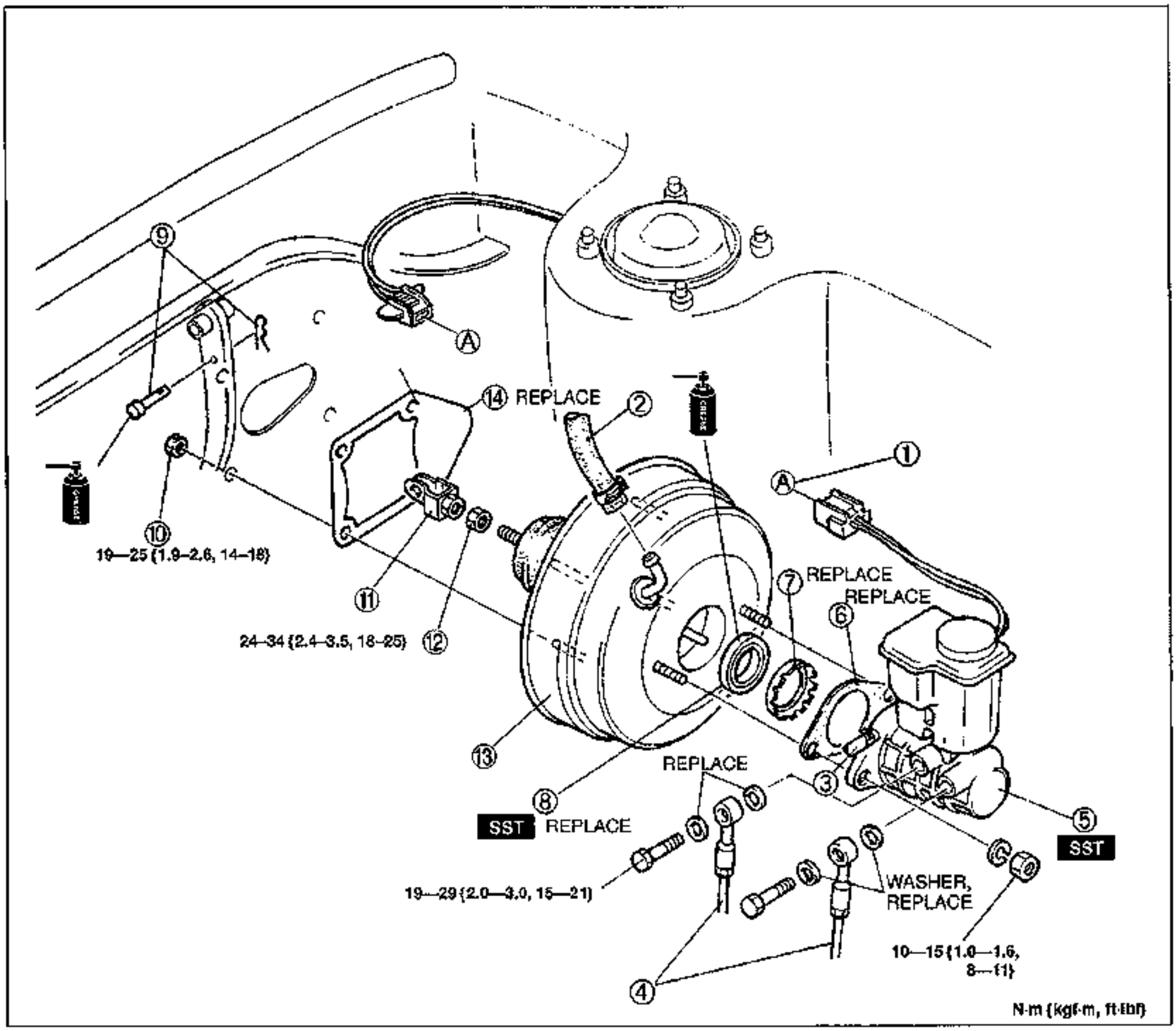
Removal / Installation (B6 DOHC)
1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Install In the reverse order of removal, referring to **Installation Note.**



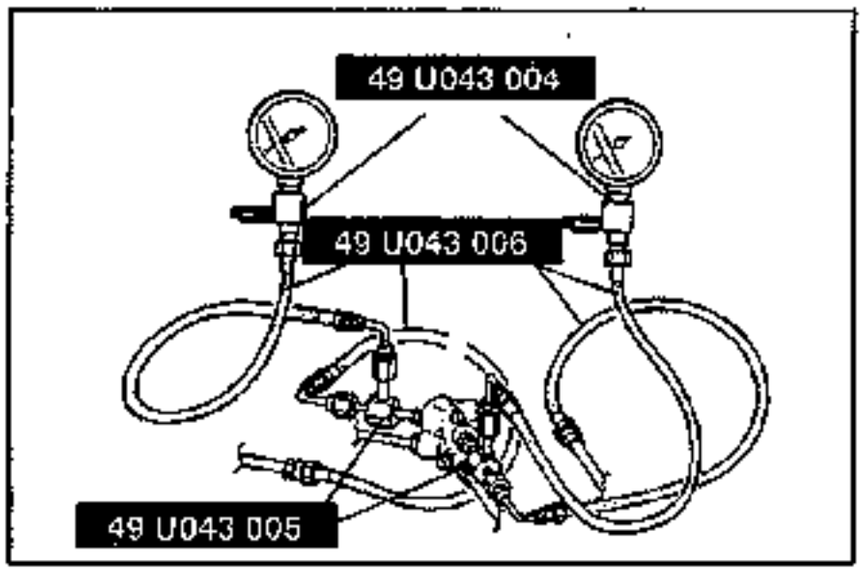
1. Connector
2. Brake pipe
   Removal Note ..... page P–11
   Installation Note ..... page P–11
3. Master cylinder assembly
   Installation Note ..... page P–12
4. Vacuum hose
5. Spring clip and clevis pin
6. Nut
7. Fork
8. Nut
9. Power brake unit
10. Gasket, spacer (ATX model)
11. Gasket

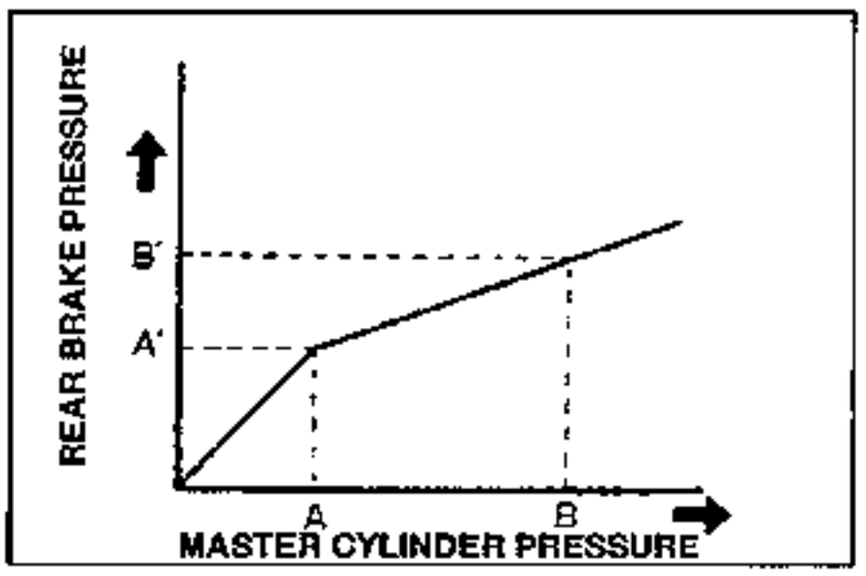
Removal / Installation (K8 DOHC)

1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Install in the reverse order of removal, referring to **Installation Note.**
3. Take the following steps after installation:
   - Add fluid and bleed the air. (Refer to page P–7.)
   - Check all parts for fluid leakage. (Refer to page P–9.)
   - Adjust and check the brake pedal. (Refer to page P–9.)
   - Make an on-vehicle check of the unit. (Refer to page P–26.)



1. Connector
2. Vacuum hose
3. Hose (MTX)
4. Brake pipe
5. Master cylinder assembly
   Installation Note ..... page P–20
6. Gasket
7. Retainer
   Removal Note ..... page P–20
   Installation Note ..... page P–20
8. Seal and plate assembly
   Removal Note ..... page P–20
   Installation Note ..... page P–20
9. Spring clip and clevis pin
10. Nut
11. Fork
12. Nut
13. Power brake unit
14. Gasket





DUAL PROPORTIONING VALVE

Inspection

1. Connect the **SSTs** to the brake pipes with adapters as shown in the figure.

   Adapter and flare nut tightening torque:
   12.8–21.5 N·m {130–220 kgf·cm, 113–190 in·lbf}

   Note
   - Connect the brake pipes with **SST** (49 0259 770B)

2. Bleed the air from the brake system. (Refer to page P–7.)
3. Depress the brake pedal until the master cylinder pressure equals A; then record rear brake pressure A'.
4. Depress the brake pedal again, apply additional pressure until the pressure equals B; then record pressure B'.

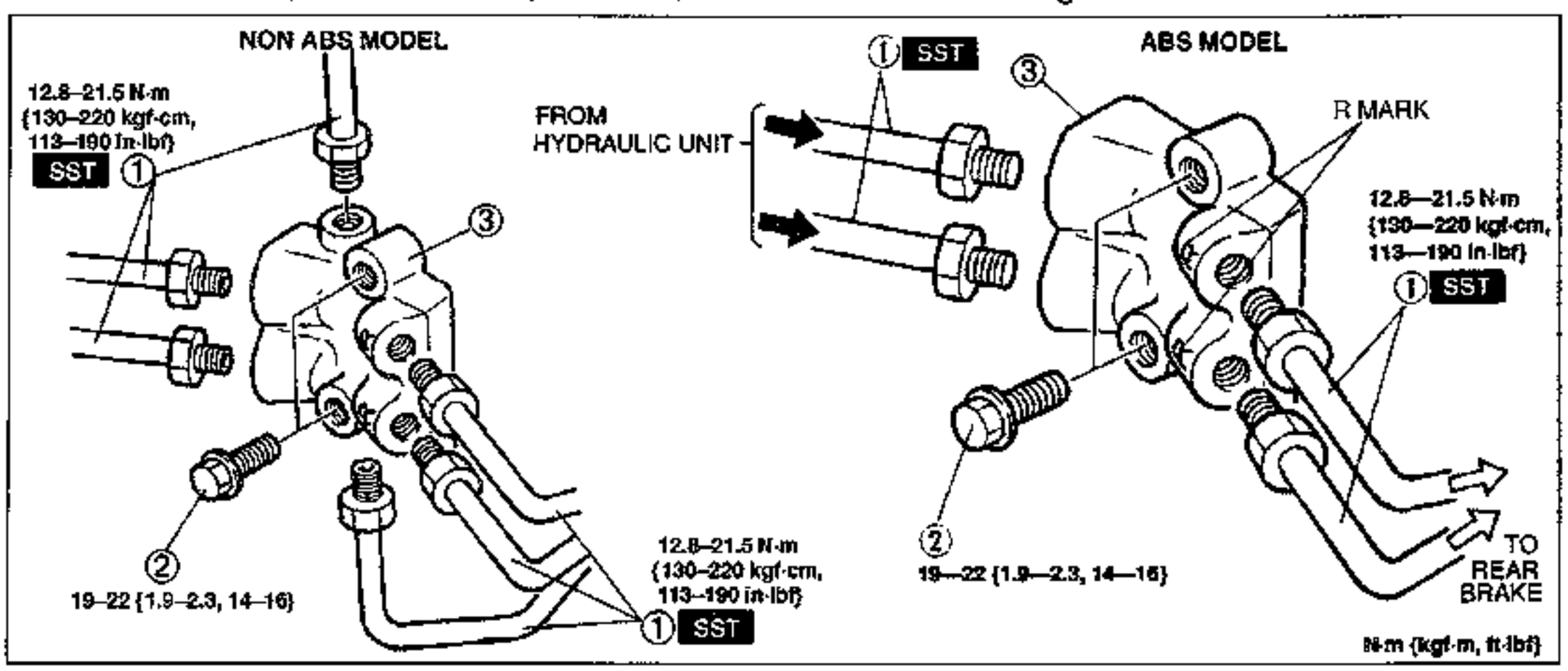
Fluid pressure

kPa {kgf/cm², psi}

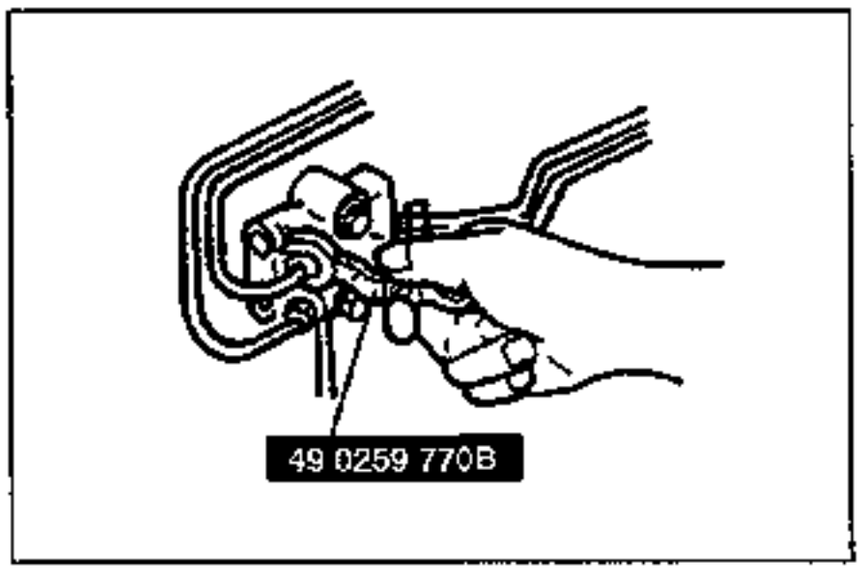
	A	A'	B	B'
ABS	2,453 {25,356}	2,453 {25,356} ±196 {2,28}	5,886 {60,853}	3,826 {39,555} ±333 {3,43}
K8 DOHC (non ABS)	2,453 {25,356}	2,453 {25,356} ±196 {2,28}	5,886 {60,853}	3,138 {32,455} ±294 {3,43}
B6 DOHC (nonABS)	2,943 {30,427}	2,943 {30,427} ±196 {2,28}	5,886 {60,858}	3826 {39,555} ±284 {3,43}

Replacement

1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Install in the reverse order of removal, referring to **Installation Note.**
3. After installation, add brake fluid, bleed air, and check for fluid leakage.

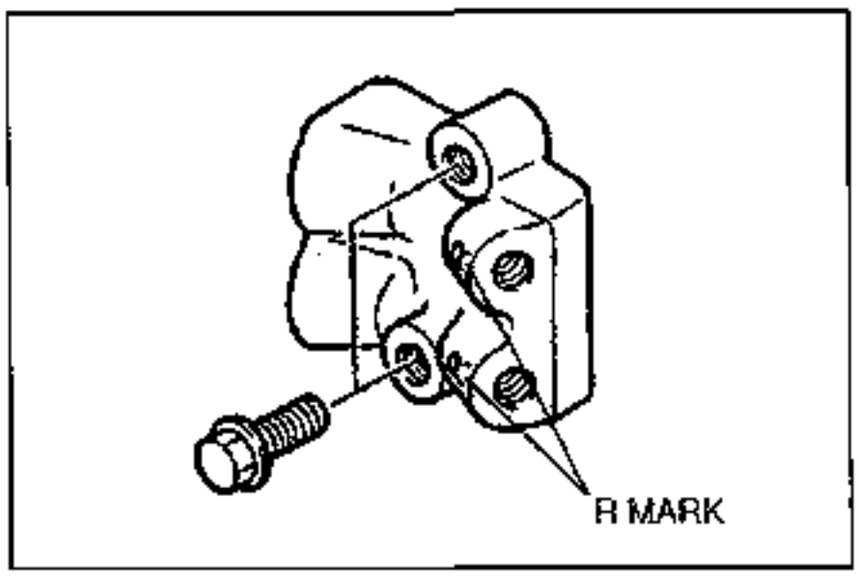


1. Brake pipe
   Removal / Installation Note .... page P–31
2. Bolt
3. Dual proportioning valve
   Installation Note ..... page P–31

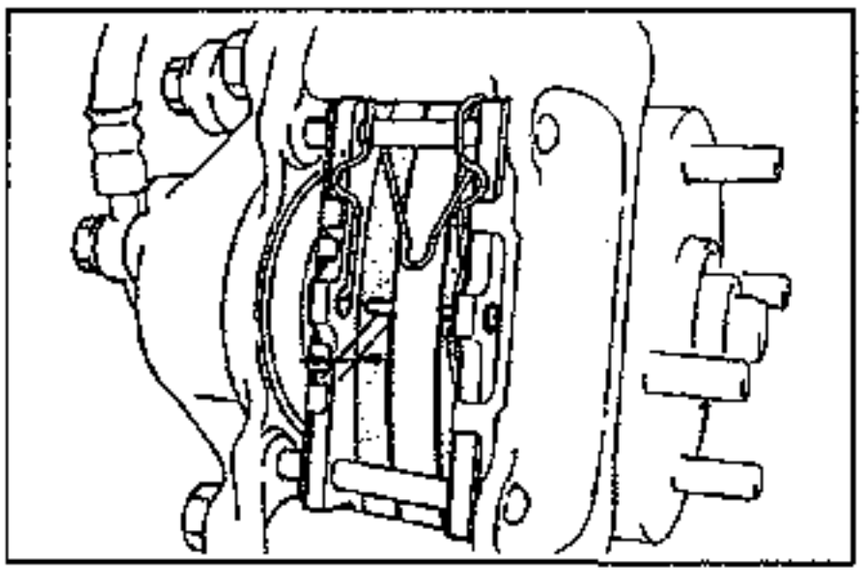


Removal / Installation Note
Brake pipe
Loosen and tighten the brake pipe by using the **SST**.

Tightening torque:
12.8–21.5 N·m {130–220 kgf·cm, 113–190 in·lbf}



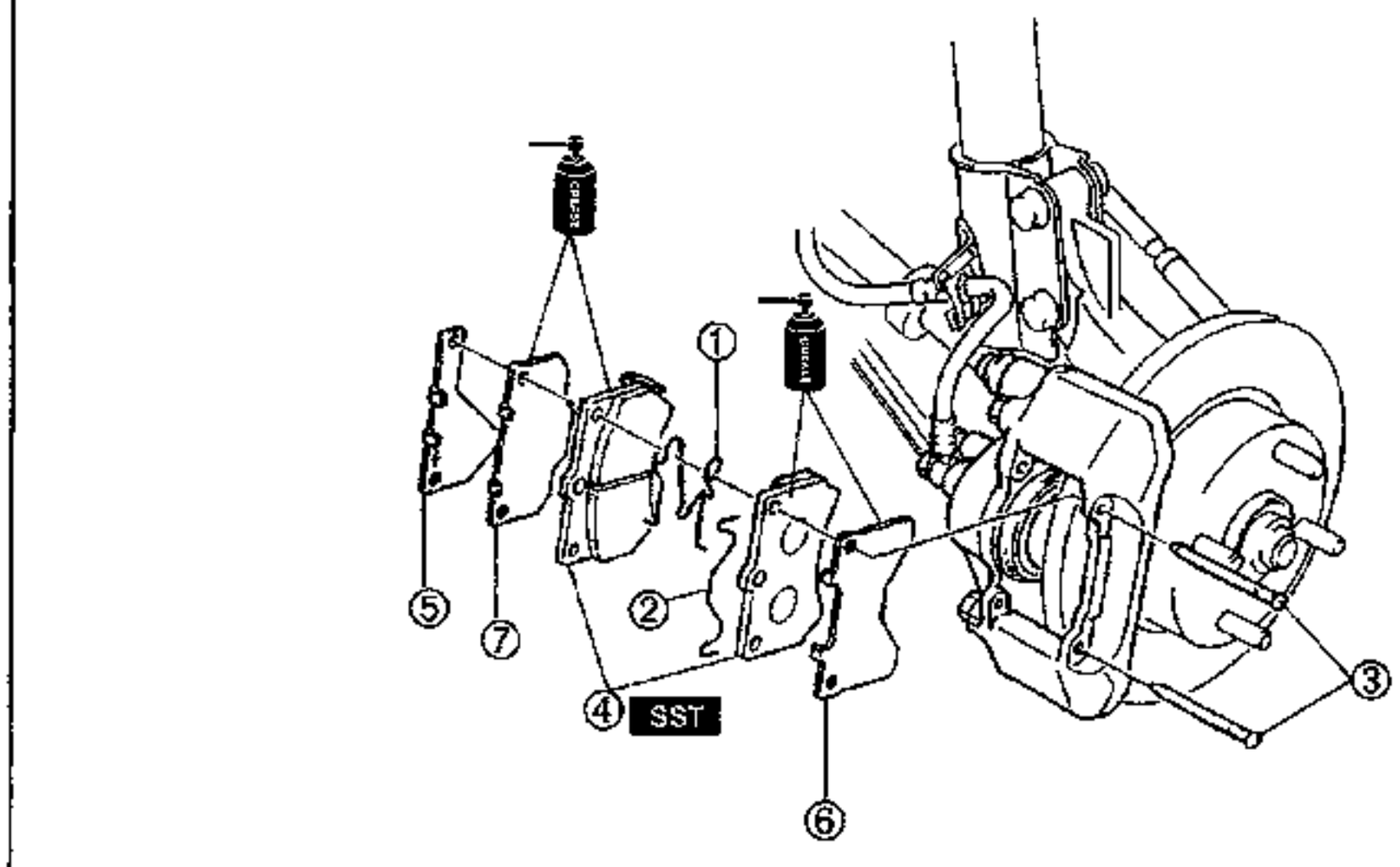
Installation Note
Dual proportioning valve
Install the dual proportioning valve with R marks facing the right side.



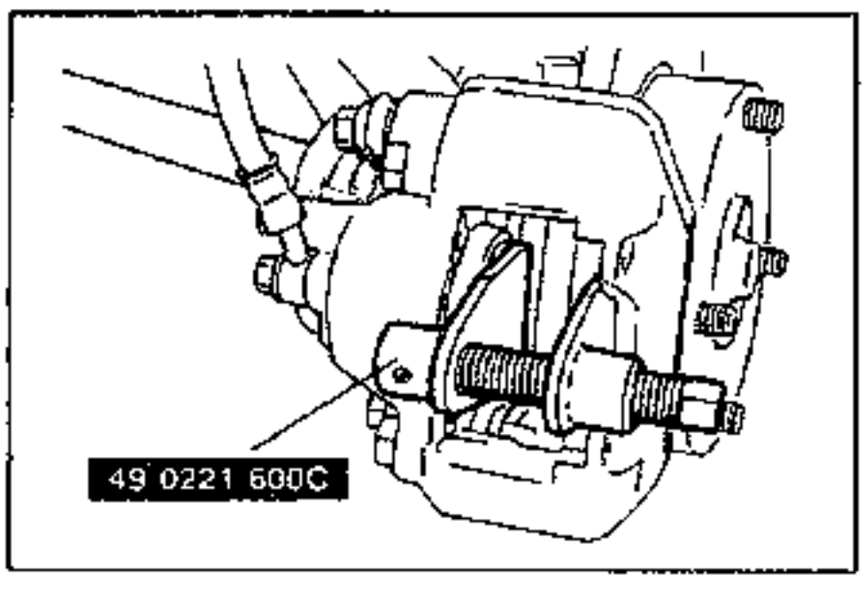
FRONT BRAKE (DISC)
Quick inspection (on-vehicle)
Disc pad
1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheel and tires.
3. Verify the remaining thickness of the pads.

Thickness: 2.0 mm {0.08 in} min.

Replacement
Disc pad
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal, referring to **Installation Note**.

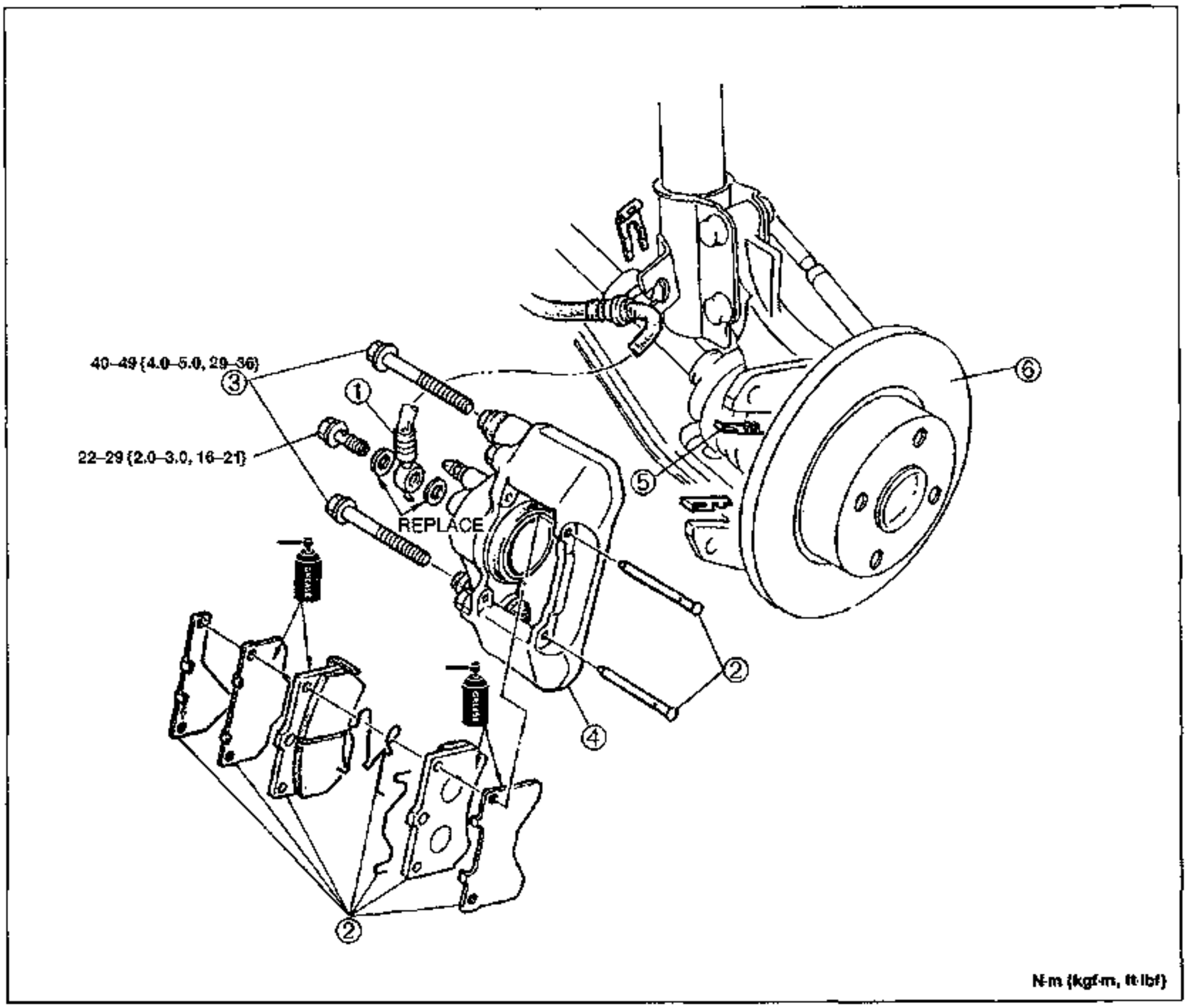


1. M-spring
2. W-pin
3. Pad pin
4. Disc pad
   Installation Note ..... below
   Inspection ..... page P–32
5. Anti-squeak shim
6. Outer shim
7. Inner shim

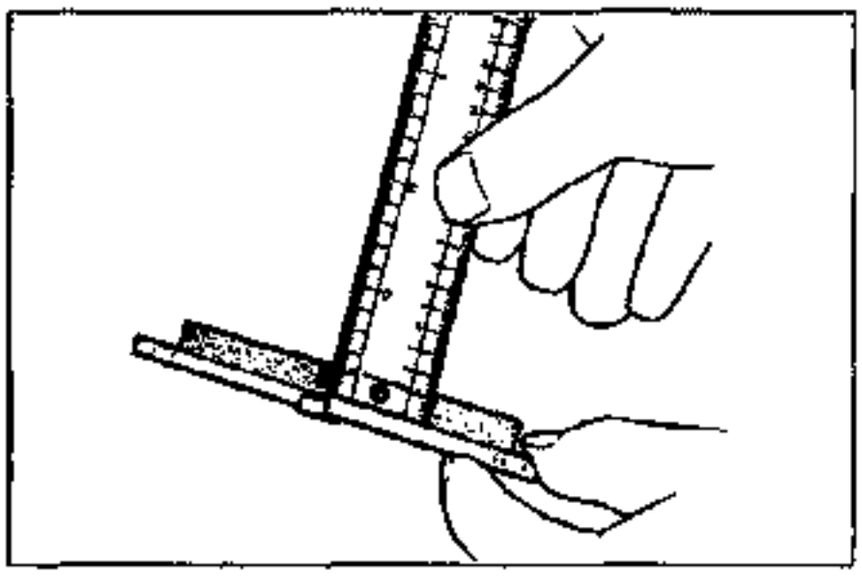


Installation Note
Disc pad
When installing the disc pads, push the piston fully inward by using the **SST** and the old pad.

Removal / Installation
Caliper
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.
3. Take the following steps after installation:
   - Add fluid and bleed the air. (Refer to page P–7.)
   - Check for fluid leakage. (Refer to page P–9.)
   - Depress the brake pedal a few times and check that the rear brakes do not drag while rotating the wheel.



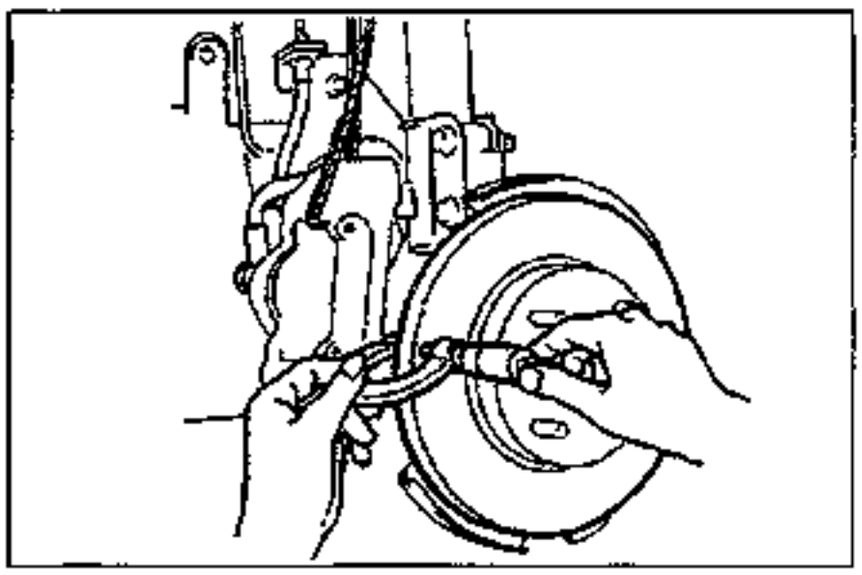
1. Flexible hose
2. Disc pad assembly
   Inspection ..... page P–34
3. Bolt
4. Caliper
   Disassembly / Inspection / Assembly ..... page P–35
5. Guide plate
6. Disc plate
   Inspection ..... page P–34



Inspection
Check for the following and repair or replace parts as necessary.

Disc pad
1. Check for oil or grease on the facing, abnormal wear or cracks, and deterioration or damage from heat.
2. Measure the thickness of the lining.

Standard: 10.0 mm {0.39 in}
Minimum: 2.0 mm {0.08 in}

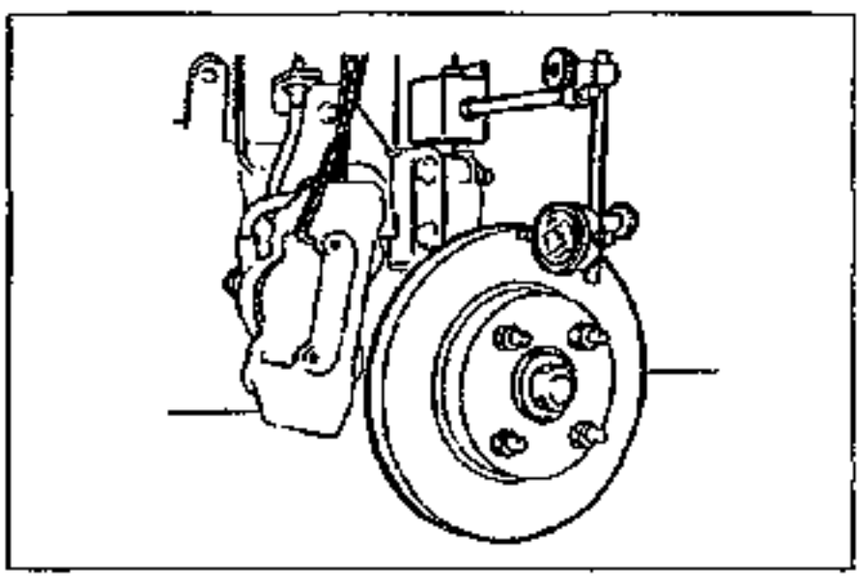


3. Check visually for damage or wear of the guide plate.

Disc plate
Thickness
1. measure the thickness of the disc plate.

Caution
- **Runout will increase if the machining is performed off-vehicle.**

Standard : 22.0 mm {0.8661 in}
Minimum : 20.0 mm {0.7874 in}
Minimum thickness after machining by using a brake lathe on-vehicle
: 20.8 mm {0.8189 in}



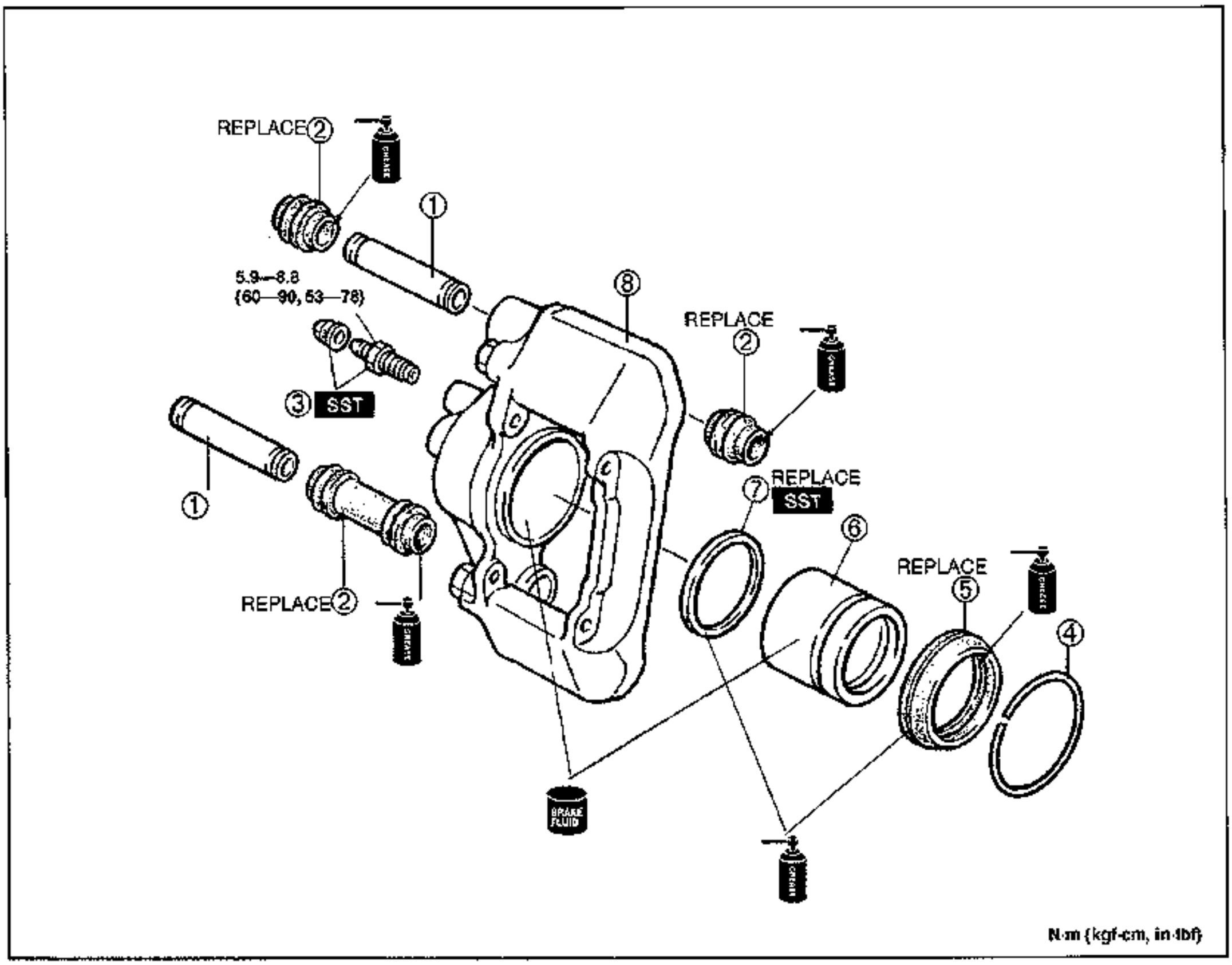
Runout
1. Verify that there is no wheel bearing looseness. (Refer to section M)
2. Measure the runout at the outer edge of the contact surface of the disc pad.

Runout: 0.05 mm {0.002 in} max.

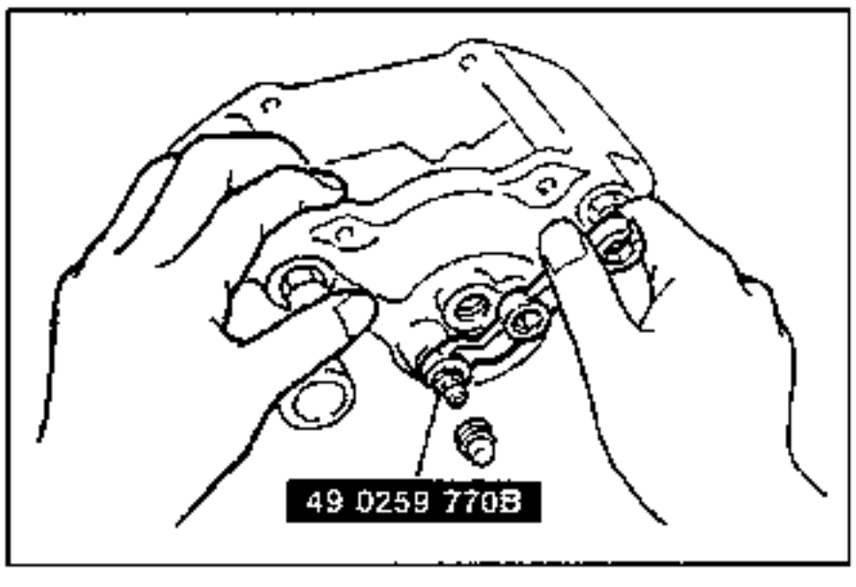
CALIPER

Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note.**
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly.



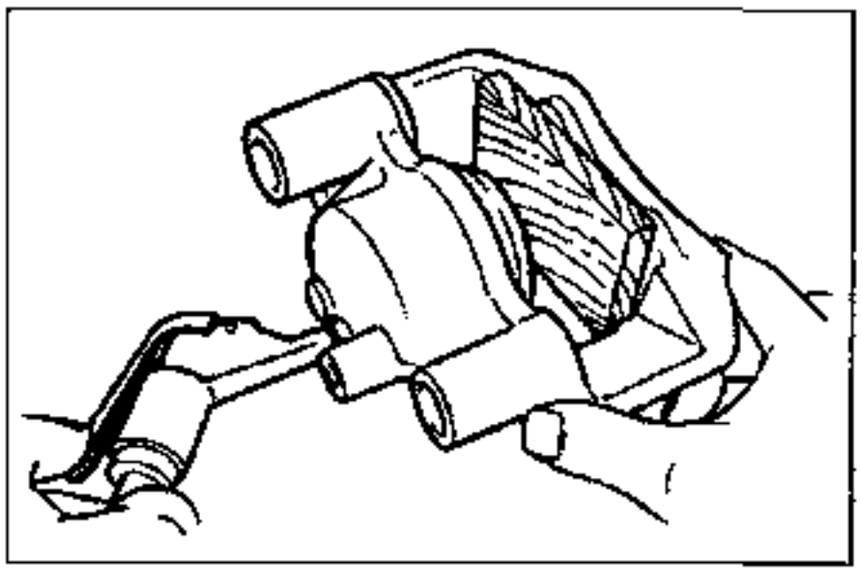
1. Sleeve pin
2. Boot
3. Rubber cap and bleeder screw ..... below
4. Retaining ring
5. Dust seal
6. Piston
   Disassembly Note ..... page P–36
   Inspect or damage, wear and rust
7. Piston seal
   Disassembly Note ..... page P–36
8. Caliper body
   Inspect for damage, wear and rust



Disassembly Note

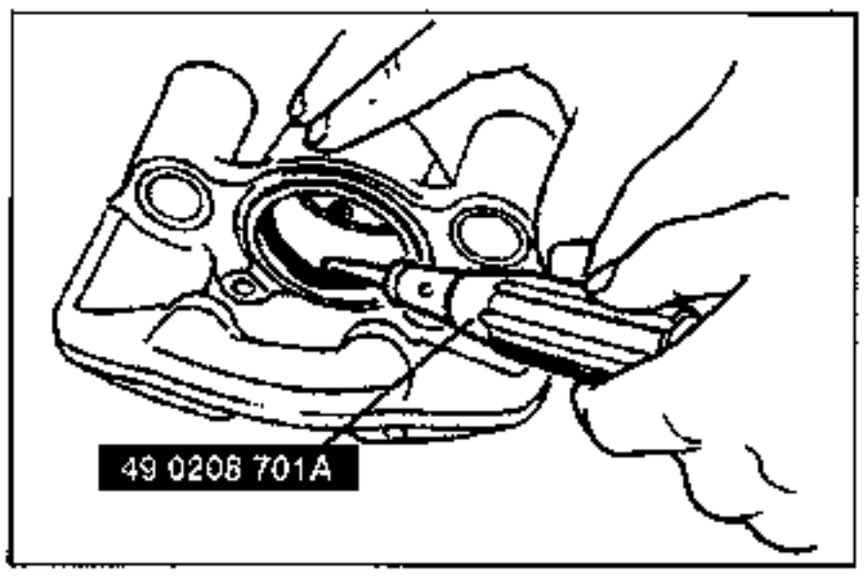
Rubber cap and bleeder screw

Remove the rubber cap and remove the bleeder screw from the brake caliper by using the **SST.**



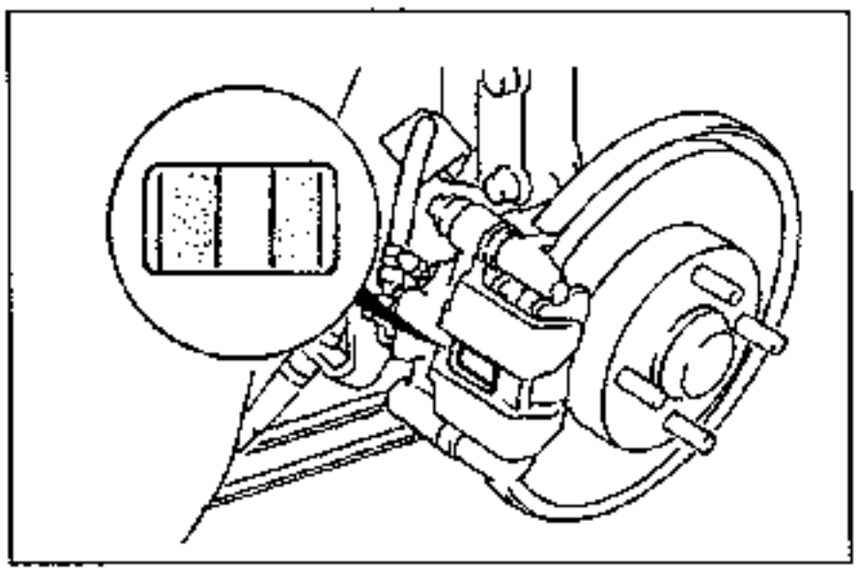
Piston

1. Place a piece of wood in the caliper.
2. Gently blow compressed air through the hole to force the piston out of the caliper.



Piston seal

Remove the piston seal from the brake caliper by using the **SST**.

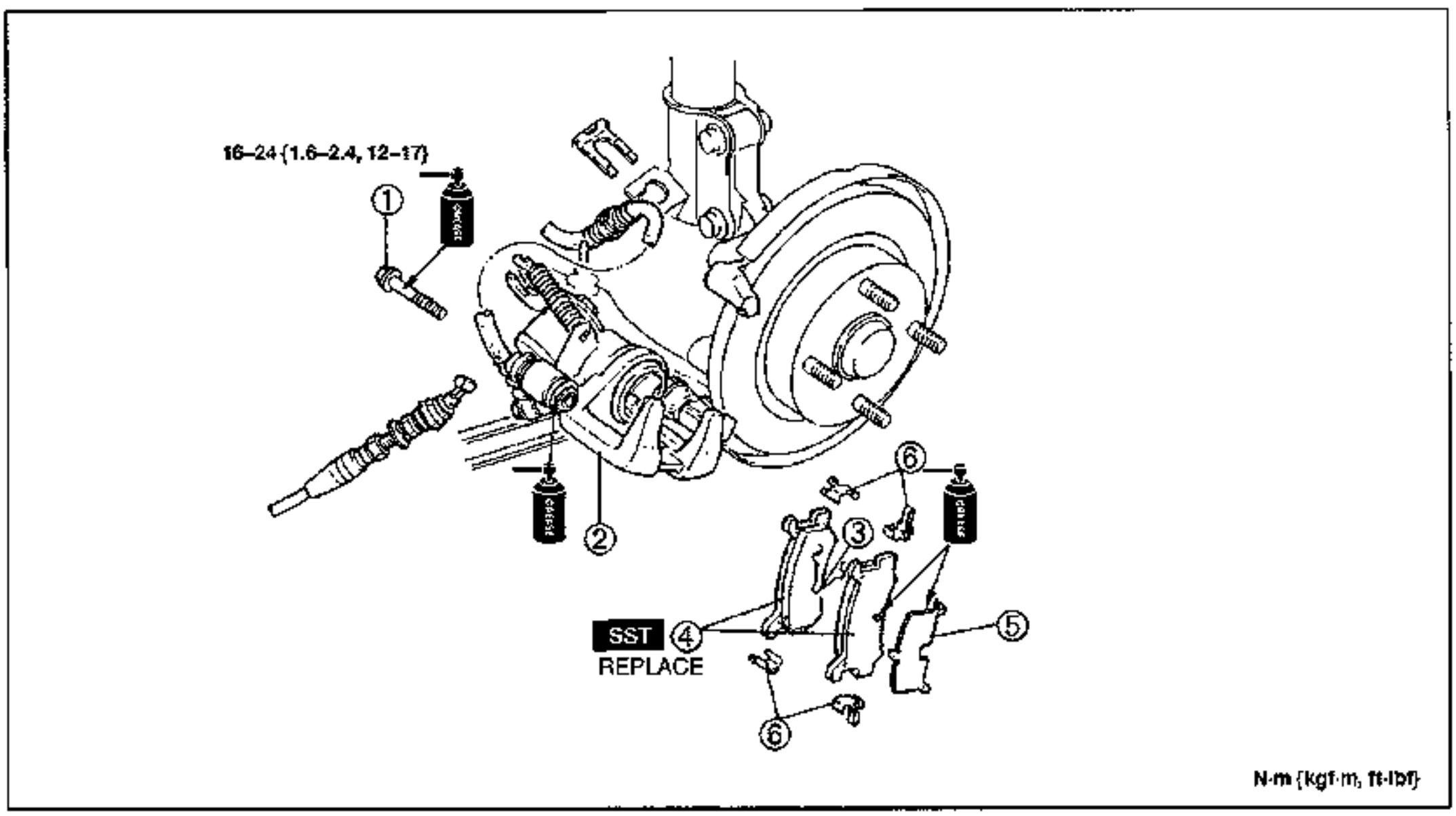


REAR BRAKE (DISC)
Quick inspection (on-vehicle)
Disc pad
1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Sight through the caliper inspection hole and verify the remaining thickness of the pads.

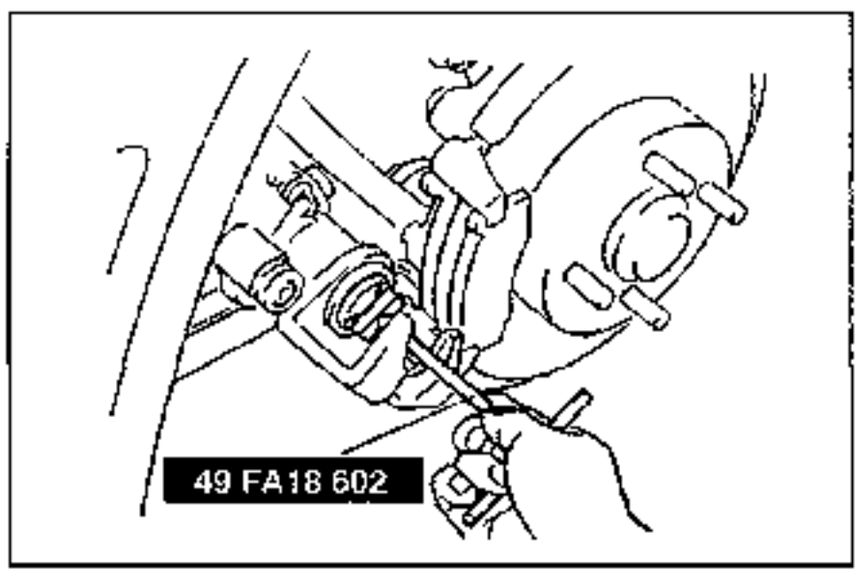
   Thickness: 1.0 mm {0.04 in} min.

4. Replace the pads on the axle as a set if they are at or less than the minimum thickness.

Replacement
Disc pad
1. Remove in the order shown in the figure, referring to **Removal Note.**
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note.**



1. Bolt
2. Caliper assembly
   Removal / Installation ..... page P–38
3. V–spring
4. Disc pad
   Removal Note ..... below
   Inspection ..... page P–39
5. Shim
6. Guide plate

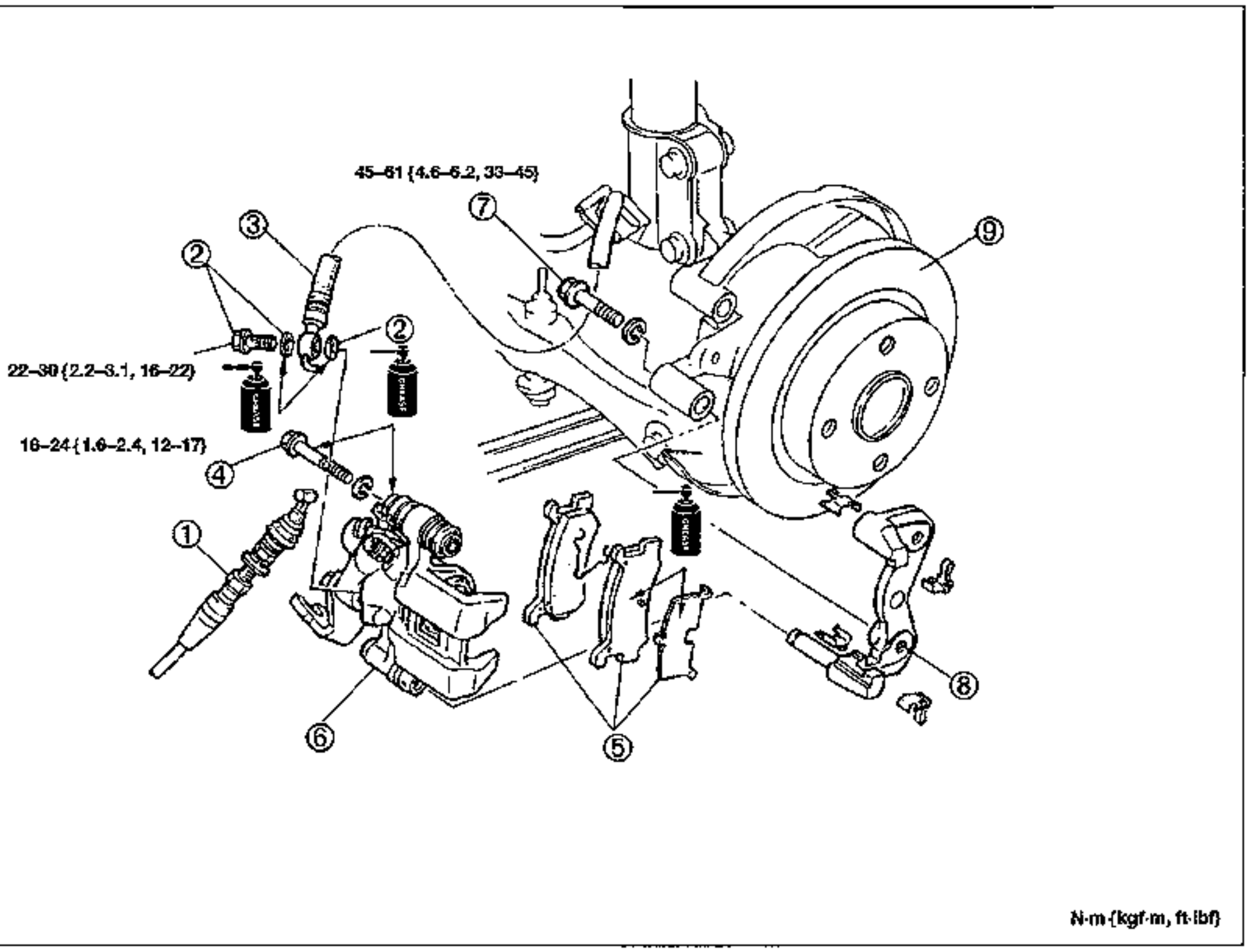


Removal Note
Disc pad
Install the piston with the **SST** by turning it clockwise until it stops.

Removal / Installation

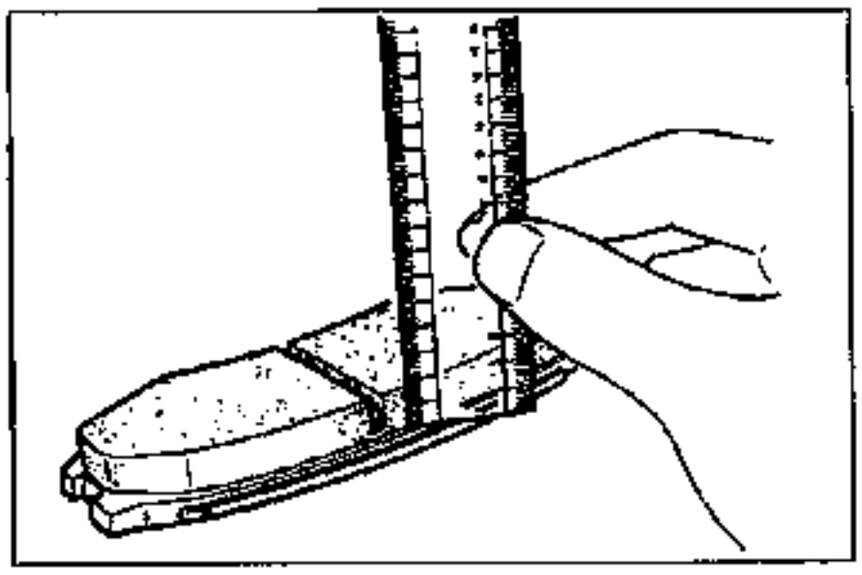
Caliper

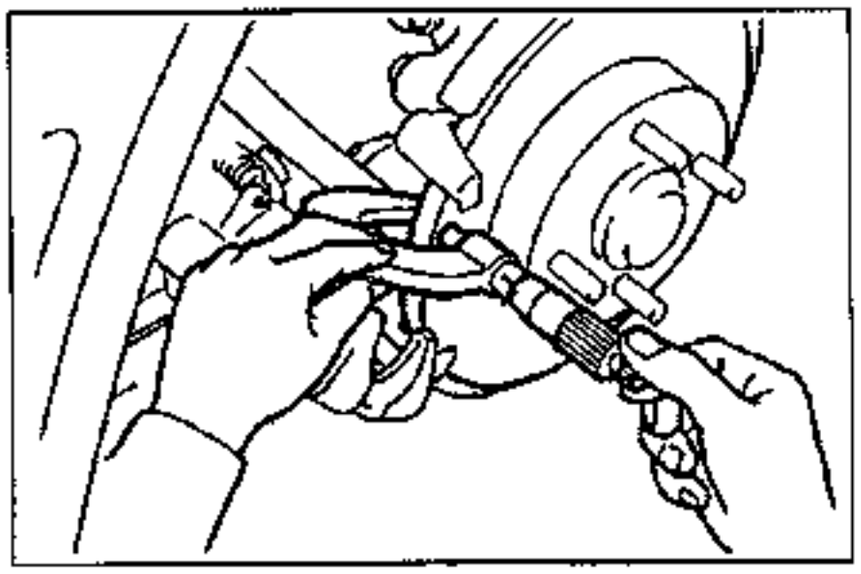
1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheel and tires.
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.
5. Perform the following after installation:
   - Add brake fluid and bleed the air. (Refer to page P–7.)
   - Check for fluid leakage. (Refer to page P–9.)
   - Depress the brake pedal and operate the parking brake a few times and check that the rear brakes do not drag excessively while rotating the wheels by hand.



N·m {kgf·m, ft·lbf}

1. Parking cable
   Removal / Inspection / Installation ..... page P–47
2. Connector and gasket
3. Flexible hose
4. Bolt
5. Disc pad assembly
6. Caliper assembly
   Disassembly / Inspection / Assembly ..... page P–42
7. Bolt
8. Mounting support
9. Disc plate
   Inspection ..... page P–41





Inspection

Check for the following and repair or replace parts as necessary.

Disc pad assembly

1. Oil or grease on facing
2. Abnormal wear or cracks
3. Deterioration or damage by heat
4. Remaining lining thickness

Standard: 7.5 mm {0.30 in}
Minimum: 1.0 mm {0.04 in}

Disc plate

Disc plate thickness

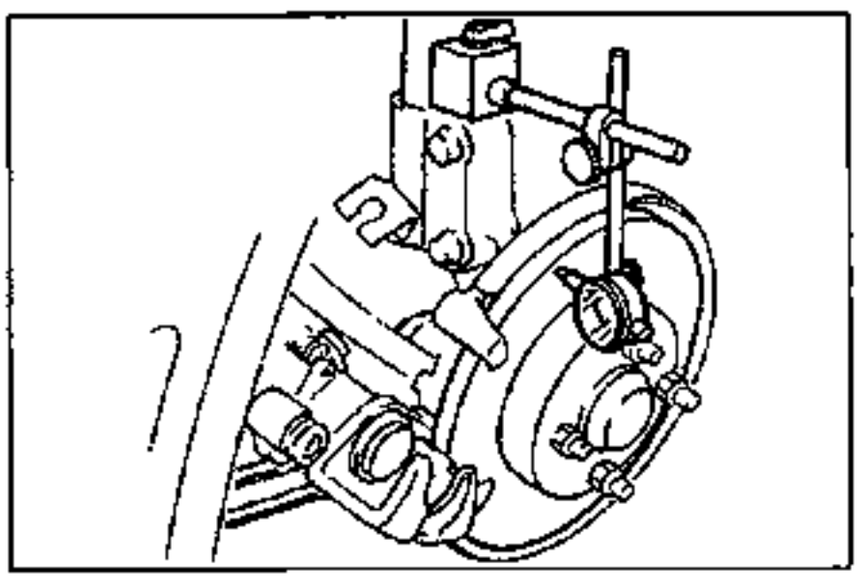
Measure the thickness of the disc plate.

Caution

- **Runout will increase if the machining is performed off-vehicle.**

Standard : 9.0 mm {0.3543 in}
Minimum : 8.0 mm {0.315 in}

Minimum thickness after machining by using a brake lathe on-vehicle
: 8.4 mm {0.331 in}



Disc plate runout

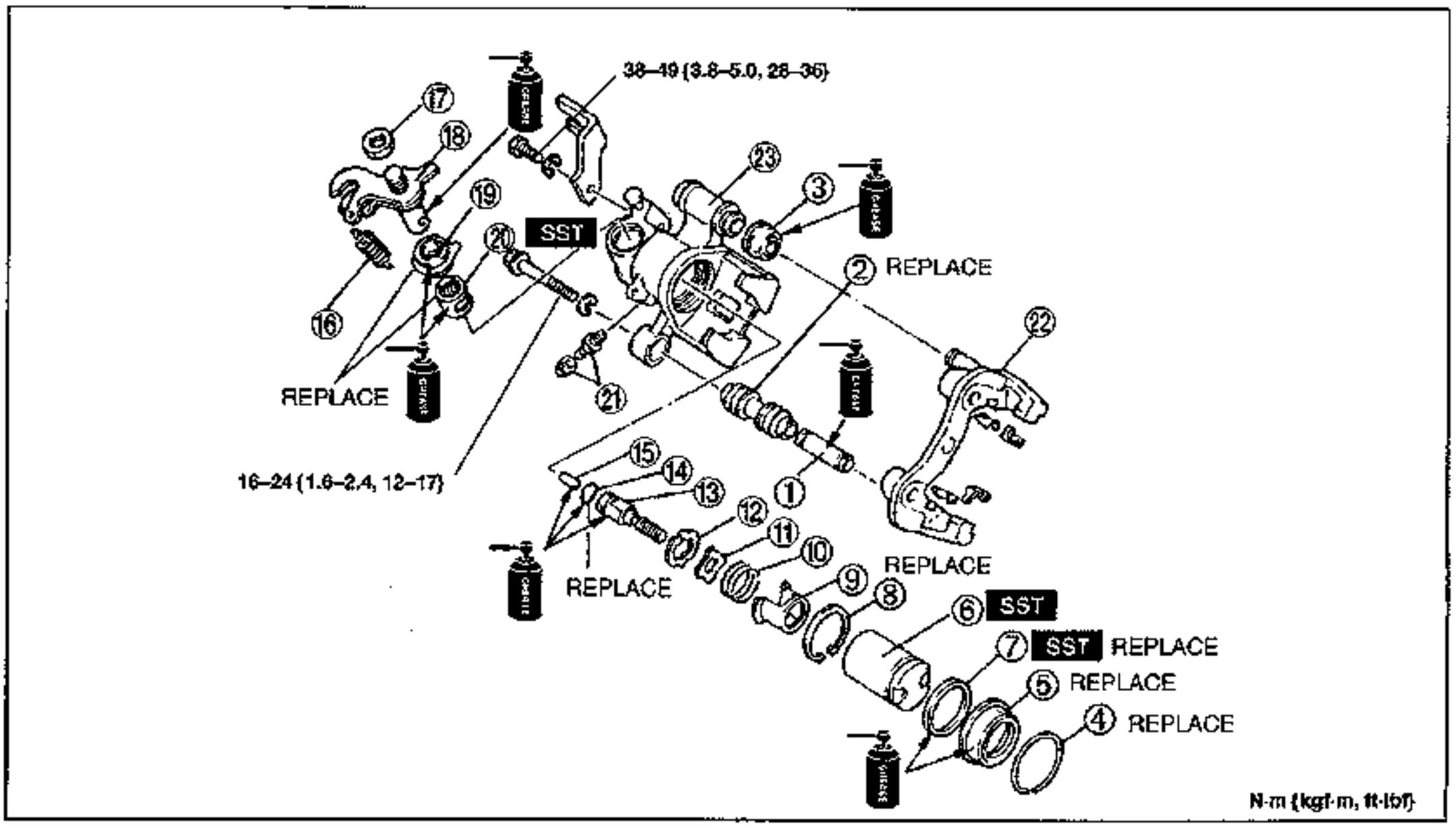
1. Verify that there is no wheel bearing looseness. (Refer to section M.)
2. Measure the runout at the outer edge of the contact surface of the disc pad.

Runout: 0.05 mm {0.002 In} max.

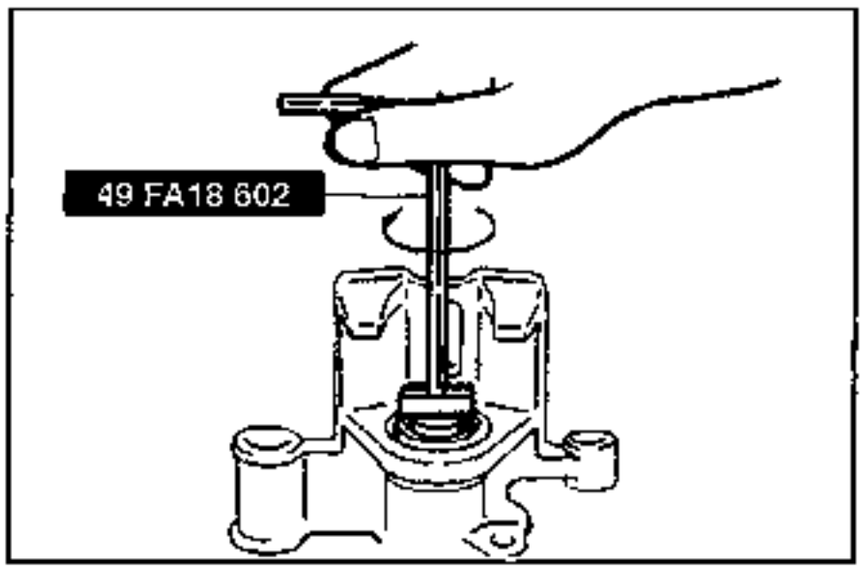
CALIPER

Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



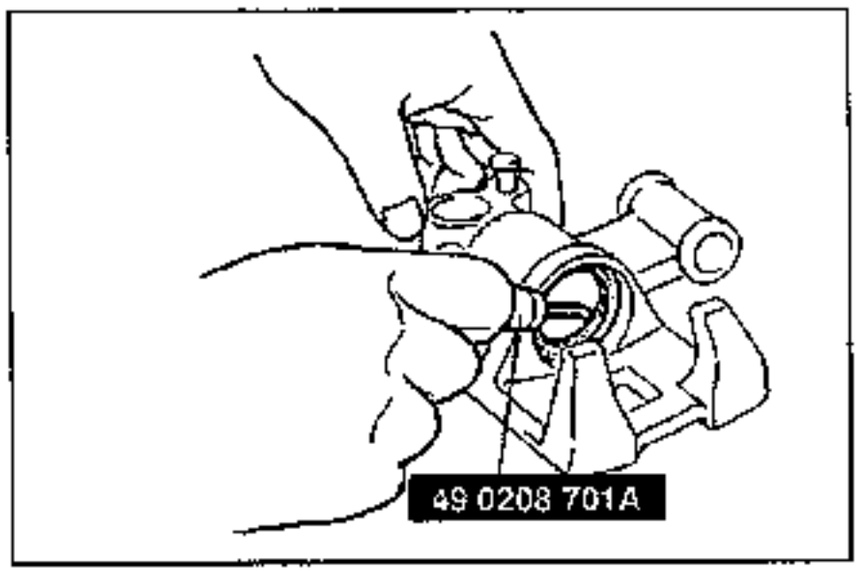
1. Guide pin
   Inspect for damage and wear
2. Pin boot
3. Bushing
4. Retaining ring
5. Dust seal
6. Piston
   Disassembly Note ..... below
   Inspect for damage, wear and corrosion
   Assembly Note ..... page P–41
7. Piston seal
   Disassembly Note ..... page P–41
8. Snap ring
9. Spring case
10. Spring
11. Washer
12. Stopper
13. Adjuster spindle
    Inspect for damage and wear
14. O–ring
15. Connecting link
    Inspect for damage and wear
16. Spring
17. Nut
18. Operating lever
19. Boot
20. Needle bearing
    Disassembly Note ..... page P–41
    Assembly Note ..... page P–41
21. Rubber cap and bleeder screw
22. Mounting support
23. Caliper body
    Inspect for damage, wear and corrosion.



Disassembly Note

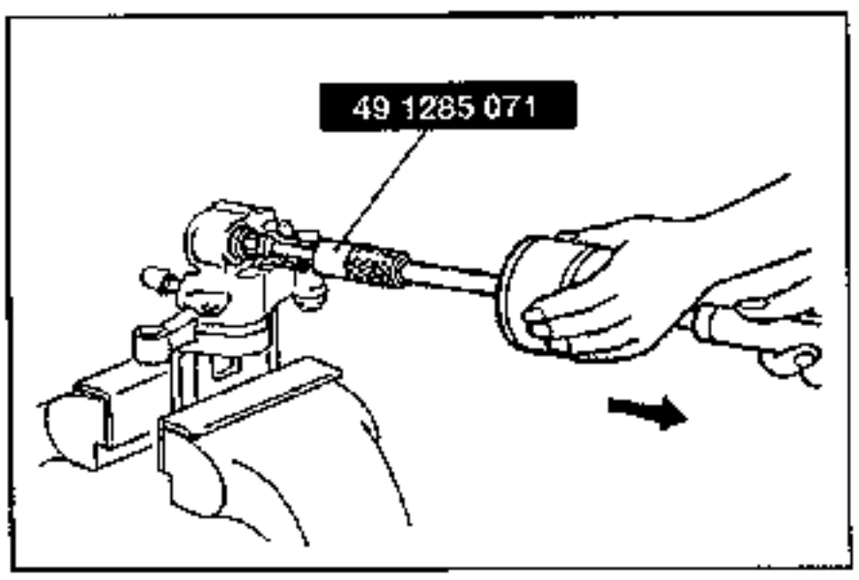
Piston

Remove the piston by turning the **SST** counterclockwise.



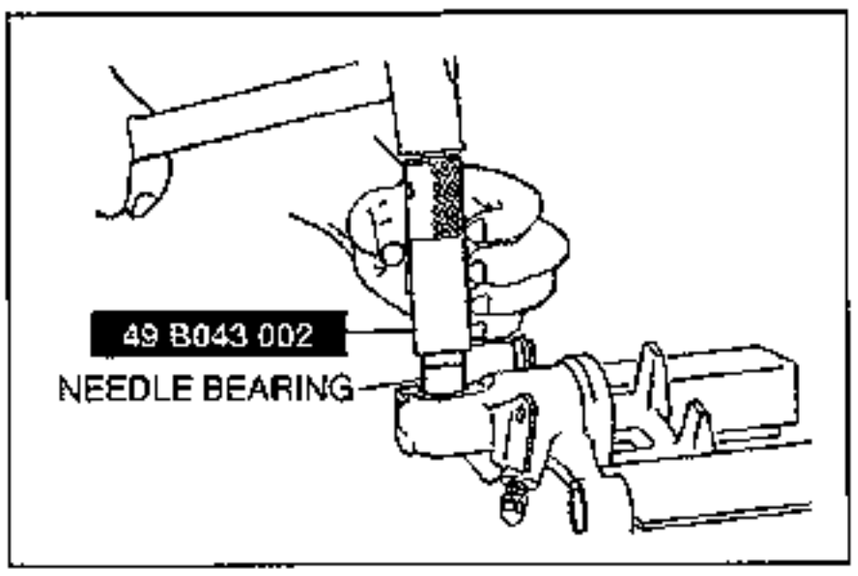
Piston seal

Remove the piston seal with the **SST.**



Needle bearing

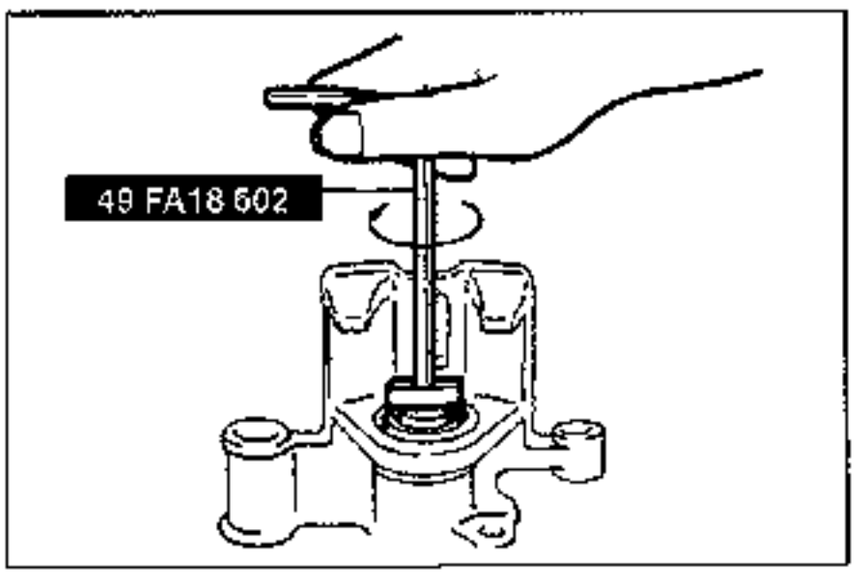
1. Secure the caliper in a vise.
2. Remove the needle bearing from the caliper with the **SST.**



Assembly Note

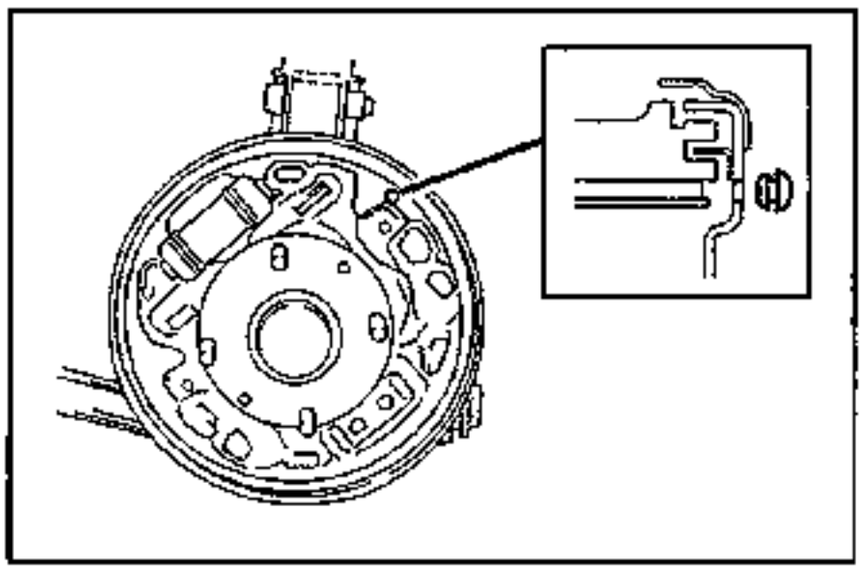
Needle bearing

Press the needle bearing into the caliper with the **SST** until the **SST** bottoms against the caliper.



Piston

1. Clean the piston.
2. Install a new dust seal in the piston groove.
3. Turn the piston into the caliper by rotating the **SST** clockwise until it stops.



REAR BRAKE (DRUM)

Quick Inspection (On-vehicle)

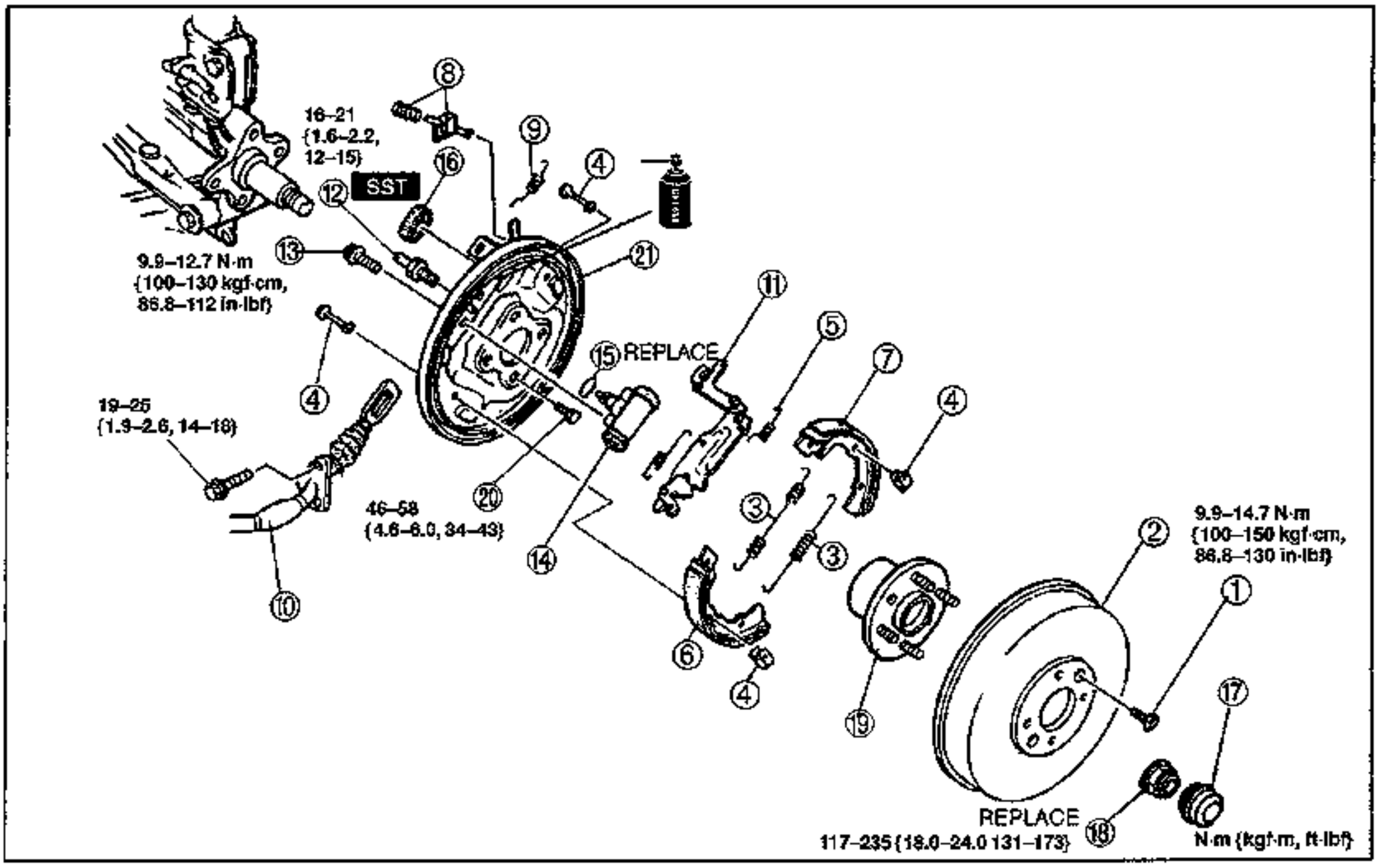
1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the plug as shown in the figure, then inspect the thickness of the brake lining through the inspection hole.

   Thickness:
   Standard : 4.0 mm {0.16 in}
   Minimum : 1.0 mm {0.04 in}

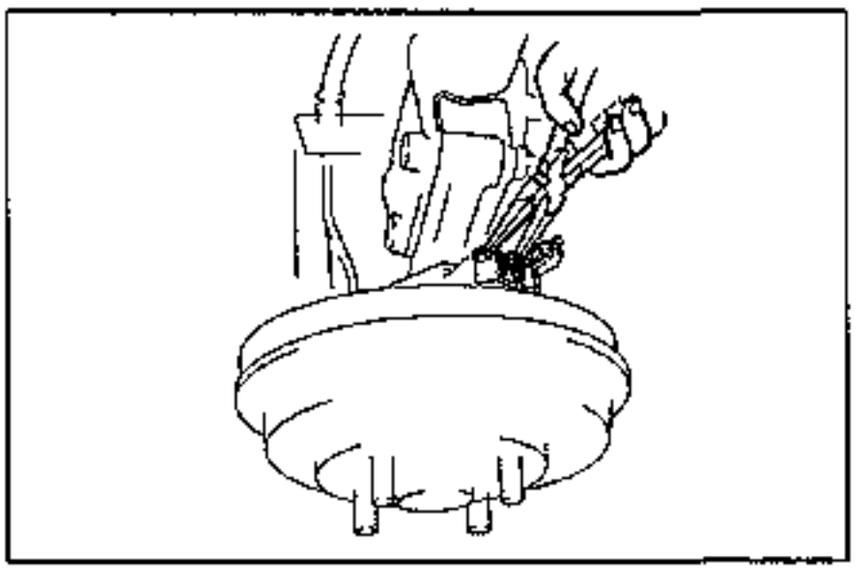
3. Replace if below the limit.

Removal / Inspection / Installation

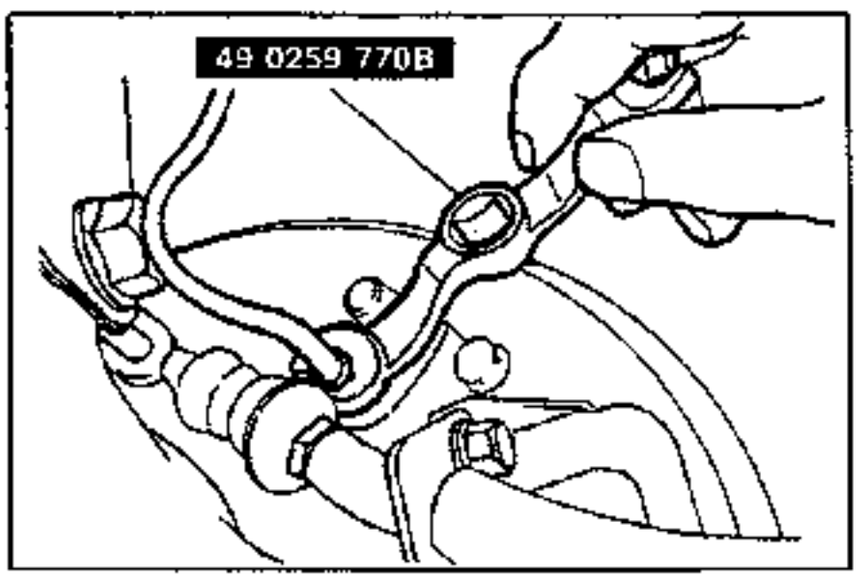
1. Remove the lining in the order shown in the figure, referring to **Removal Note**.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note**.



1. Screw
2. Brake drum
   Removal Note ..... page P–43
   Inspection ..... page P–43
   Installation Note ..... page P–43
3. Return spring
4. Hold pin and spring
5. Anti-rattle spring
6. Brake shoe (leading side)
   Inspection ..... Above
7. Brake shoe (trailing side)
   Inspection ..... Above
8. Stopper spring and clip
9. Return spring
10. Parking brake cable
11. Operating lever assembly
12. Brake pipe
    Removal Note ..... page P–43
13. Bolt
14. Wheel cylinder assembly
    Disassembly / Inspection / Assembly ..... page P–44
15. Wheel cylinder gasket
16. Dust boot
17. Hub cap
18. Locknut
19. Wheel hub assembly
20. Bolt
21. Backing plate

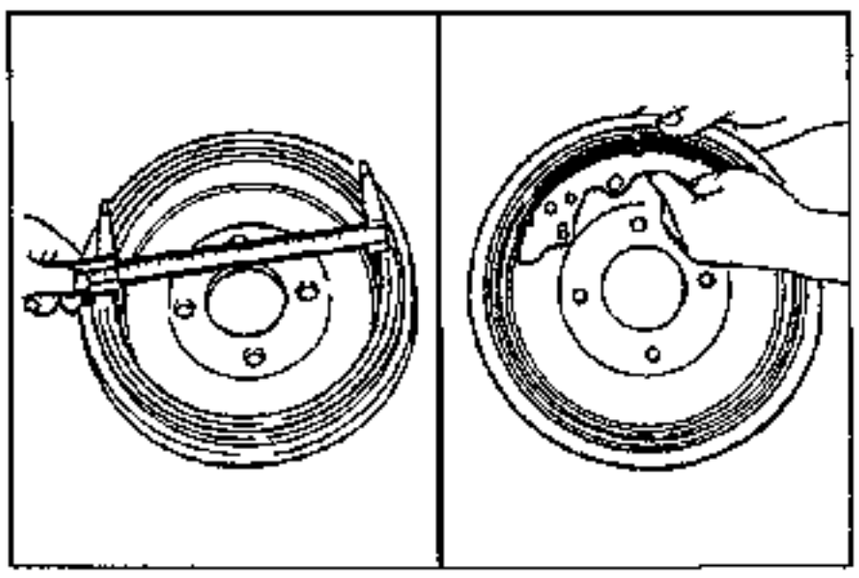


Removal Note
Brake drum
If the brake drum is hard to remove, secure the stopper until the operating lever returns to release the sticking of the brake drum.



Brake pipe
Disconnect or connect the brake pipe from/to the wheel cylinder by using the **SST**.

Tightening torque:
16–21 N·m {1.6–2.2 kgf·m, 12–15 ft·lbf}

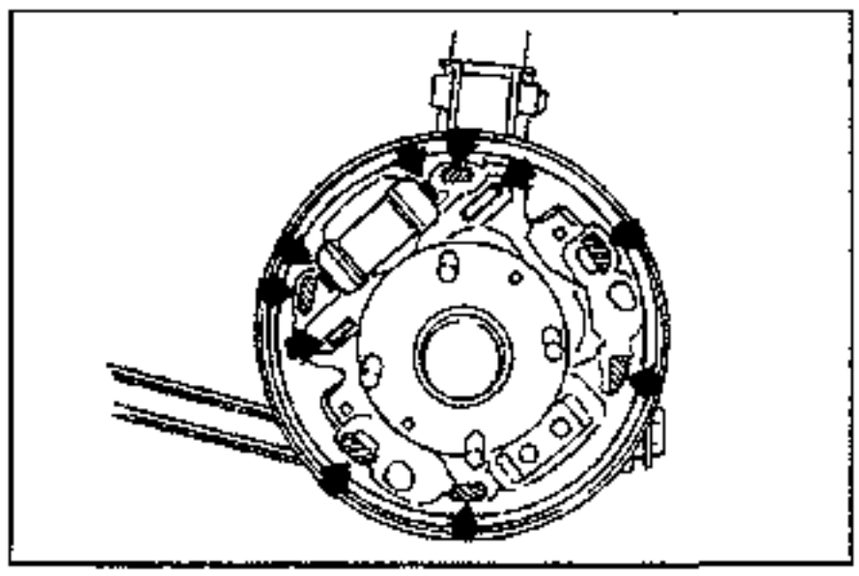


Inspection
Check for the following and repair or replace as necessary.

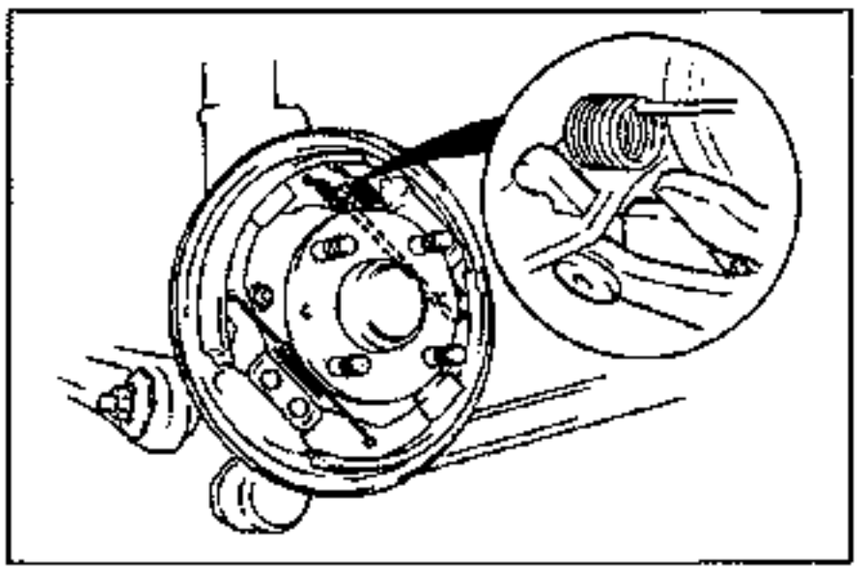
Brake drum
1. Drum inner diameter

Standard diameter : 200.0 mm {7.874 in}
Diameter limit : 201.0 mm {7.913 in}

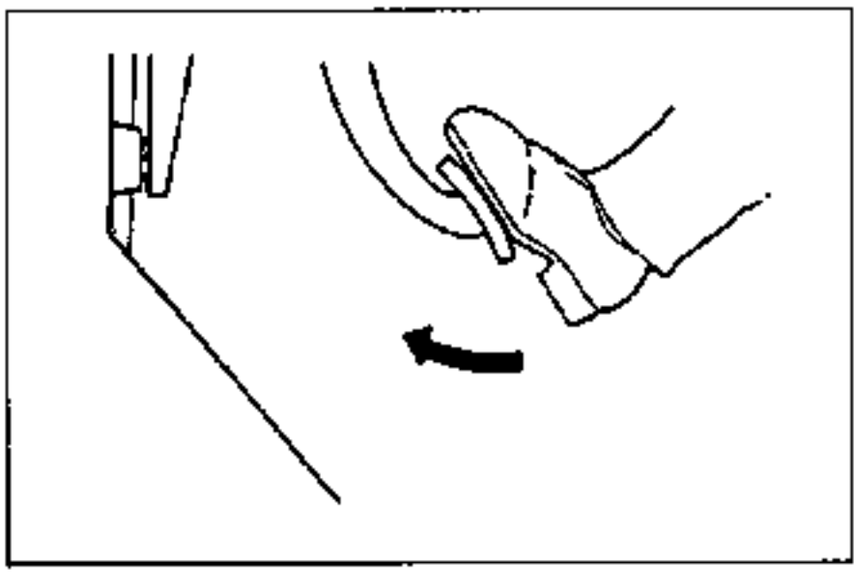
2. Scratches, uneven or abnormal wear inside drum.



Installation Note
Grease points
(1) Piston of wheel cylinder
(2) Anchor sliding parts
(3) Projection of backing plate
(4) Adjusting screw
(5) Adjusting sleeve contact surfaces



Brake drum
1. Before installing the brake drum, depress the brake pedal to verify operation of the automatic adjuster.
2. Install the brake drum.

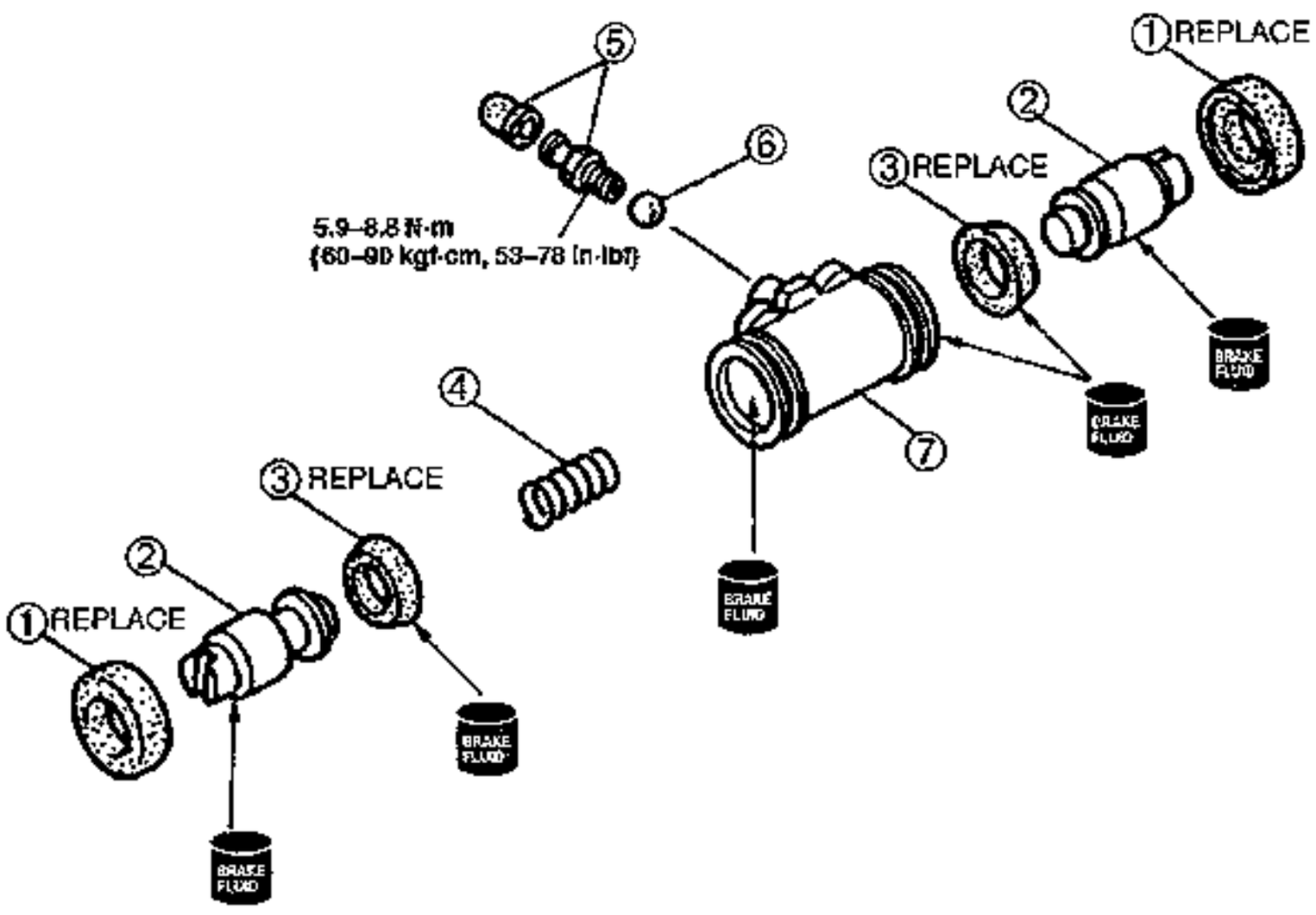


3. Take the following steps after installation:
   - Add fluid and bleed the air. (Refer to page P–7.)
   - Check for fluid leakage. (Refer to page P–9.)
   - Depress the brake pedal a few times; then verify that the rear brakes do not drag while rotating the wheel.
   - Check the parking brake lever stroke. (Refer to page P–45.)

WHEEL CYLINDER

Disassembly / Inspection / Assembly

1. Disassemble the wheel cylinder in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary. If a problem is found in wheel cylinder body or piston replace the wheel cylinder as an assembly.
3. Assemble in the reverse order of disassembly.



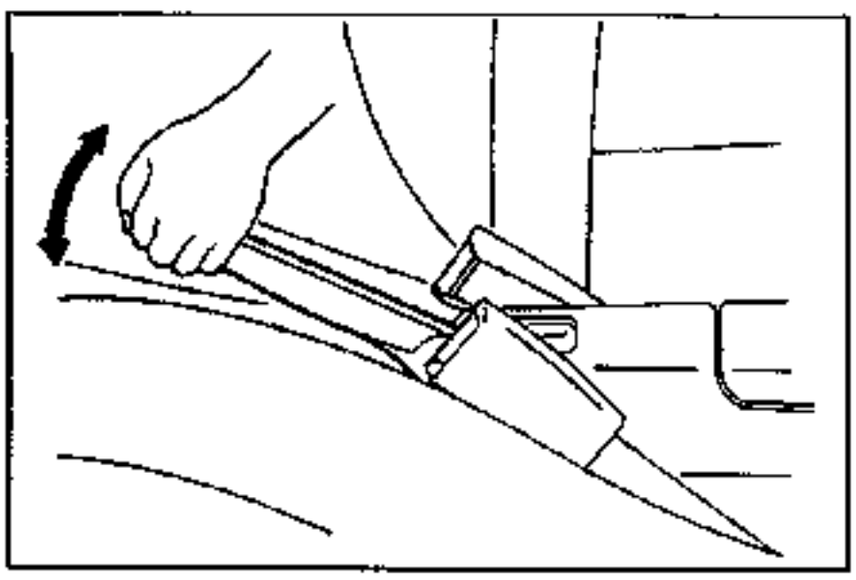
1. Dust boot
2. Piston
   Inspect for corrosion and damage
3. Piston cup
4. Spring
5. Rubber cup and bleeder screw
   Inspect for corrosion and damage
6. Steel ball
7. Wheel cylinder body

PARKING BRAKE SYSTEM

TROUBLESHOOTING GUIDE

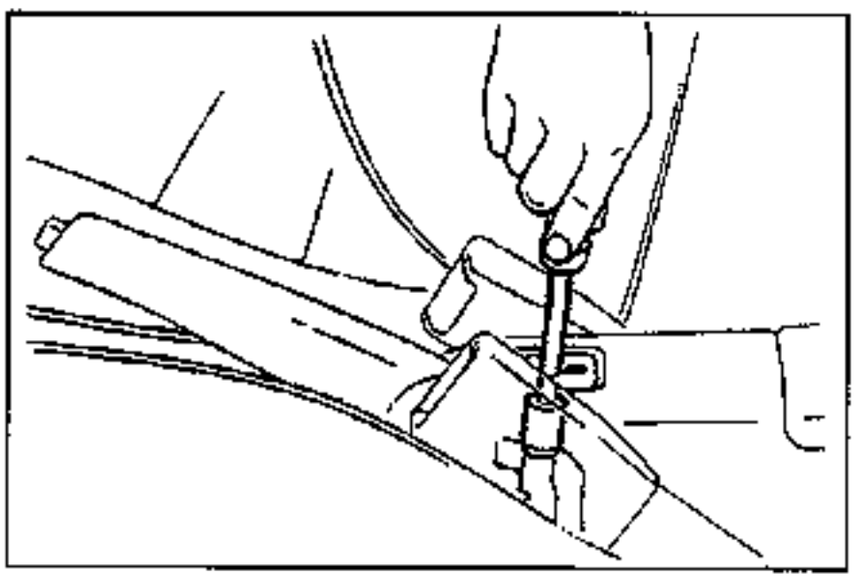
Problem	Possible cause	Remedy	Page
Brakes do not release	Improper return of parking brake cable or improper adjustment	Repair or adjust	P–46
Parking brake does not hold well	Excessive lever stroke	Adjust	P–45
	Brake cable stuck or damaged	Repair or replace	P–46
	Brake fluid or oil on pad or lining	Clean or replace	—
	Hardening of pad / lining surface or poor contact	Grind or replace	P–42

PARKING BRAKE SHOE
Removal / Inspection / Installation
Drum brake
Removal and Installation (Refer to page P–42)
Inspection (Refer to page P–43)



PARKING BRAKE (LEVER TYPE)
Inspection
Check the stroke is within specification when parking brake lever is pulled with a force of **98 N {10 kgf, 22 lbf}**.

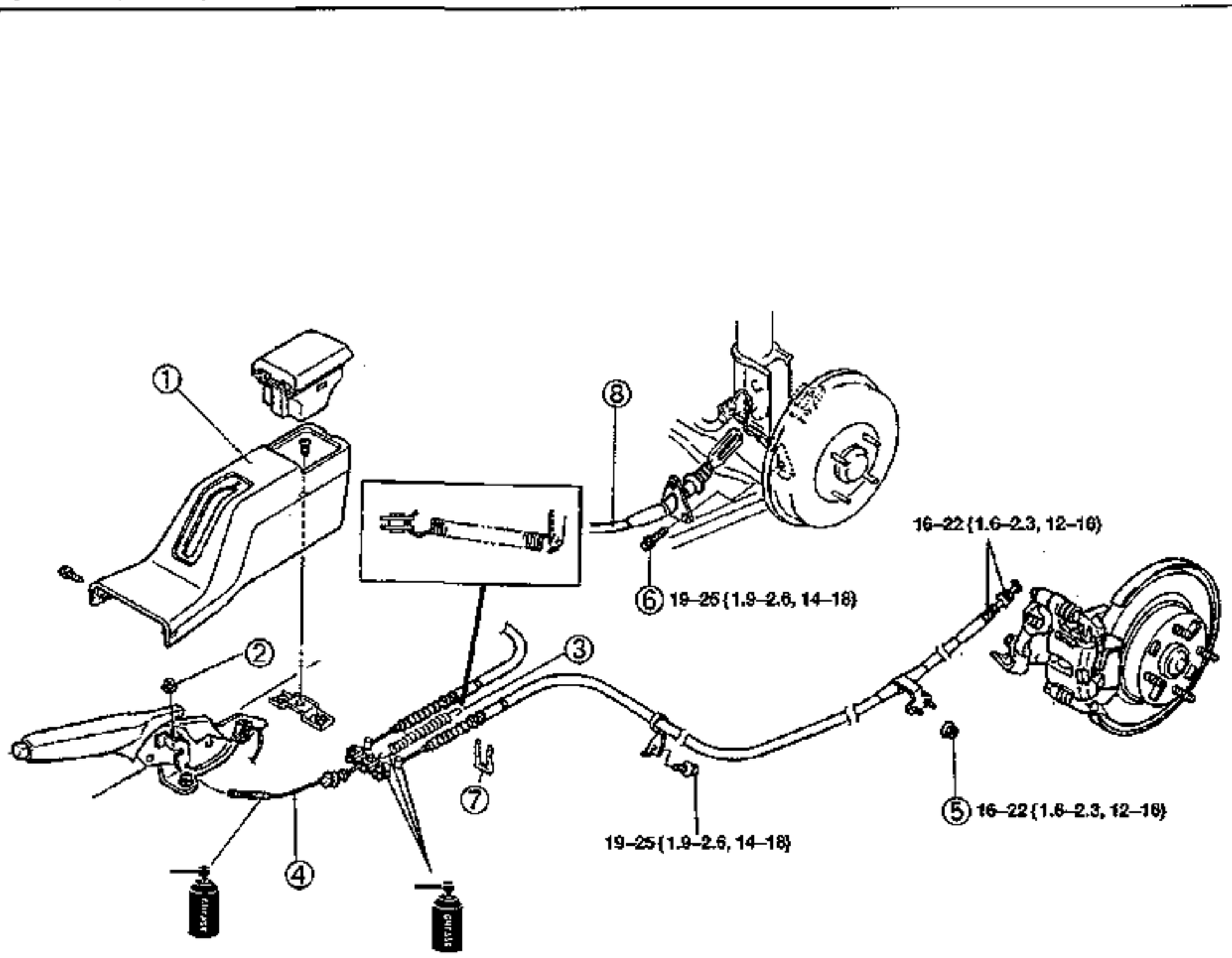
Stroke: 5–7 notches



Adjustment
1. Before adjustment, start the engine and depress the brake pedal several times while the vehicle is moving in reverse.
2. Stop the engine.
3. Remove the screw and the parking brake lever cover.
4. Remove the adjusting nut clip and turn the adjusting nut at the front of the parking cable.
5. After adjustment, check the following points:
   (1) Turn the ignition switch ON, pull the parking brake lever one notch, and check that the parking brake warning light illuminates.
   (2) Verify that the rear brakes do not drag.

PARKING BRAKE CABLE
Removal / Inspection / Installation

1. Remove the cable in the order shown in the figure.
2. Visually check each part, and replace it if necessary.
3. Install in the reverse order of removal.
4. Depress the brake pedal a few times and check the rear brakes do not drag while rotating the wheels.
5. Adjust the parking brake lever stroke.

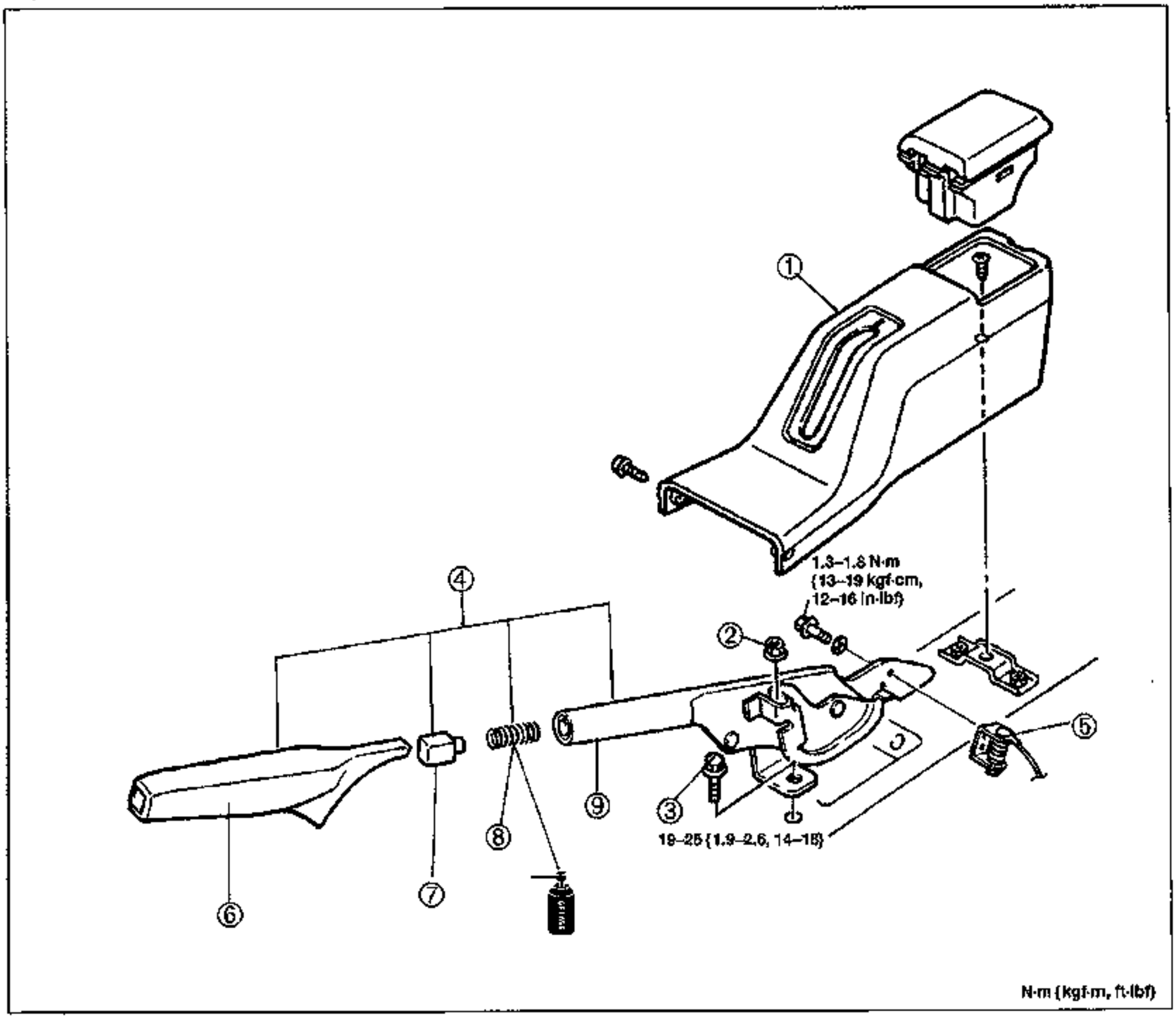


1. Rear console
   Removal / Installation ..... Section S
2. Adjusting nut
3. Return spring
4. Front parking cable
   Inspect for damage and wear
5. Nut (Disc brake type)
6. Bolts (Drum brake type)
7. Clip
8. Rear parking cable

PARKING BRAKE LEVER

Removal / Inspection / Installation

1. Block the wheels firmly.
2. Release the parking brake.
3. Remove in the order shown in the figure.
4. Inspect all components and parts. Replace parts if necessary.
5. Install in the reverse order of removal. Install the parking brake switch so that it contacts the parking brake lever when the lever is fully released.
6. After installation: Adjust the parking lever stroke. (Refer to page P-45.)
7. Turn the ignition switch ON, and check that the parking brake warning light illuminates with the lever pulled one notch.



1. Rear console
   Removal / Installation ..... Section S
2. Adjusting nut
3. Bolt
4. Parking brake lever assembly
   Inspect for damage and wear
5. Parking brake switch
6. Parking lever cap
7. Release button
8. Parking lever spring
9. Parking brake lever

ANTI-LOCK BRAKE SYSTEM (ABS)

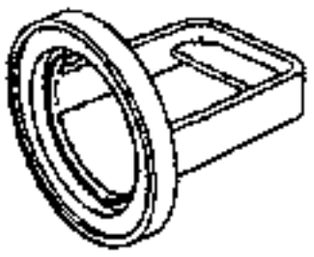
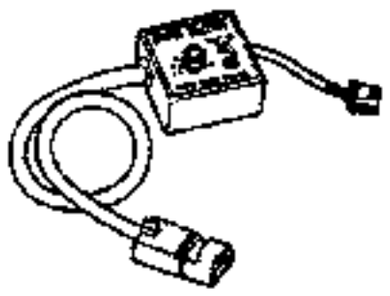
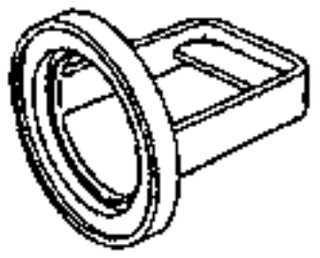
DESCRIPTION

There is the following distinctive characteristics in the ABS vehicles compared with the non-ABS vehicles. Note that it does not indicate malfunction.

- When the brakes are applied rapidly or on a slippery road surface, the ABS will activate; the brake pedal will pulsate slightly and the vehicle and the steering wheel will vibrate slightly.

PREPARATION

SST

49 G025 001 ABS sensor rotor installer 	For installation of ABS sensor rotor	49 0259 770B Wrench, flare nut 	For removal and installation of brake pipe
49 H018 9A1 On-Board Diagnosis Checker 	For diagnosis	49 B019 9A0 System Selector 	For diagnosis
49 M005 796 Body 	For installation of ABS sensor rotor	49 B025 003 Sensor rotor installer 	For installation of ABS sensor rotor

TROUBLESHOOTING GUIDE

Precaution

Conditions that are not malfunctions

1. It may happen that vibration is felt in the steering wheel, body, and/or brake pedal when the ABS is functioning; such vibration is simply an indication that the system is functioning.
2. The ABS warning light may illuminate under any of the following conditions:
   - When the vehicle is traveling on snow or ice with the parking brake activated or a brake dragging at one wheel.
   - When different size tires are used.
   - When tires of different gripping performance are used.
   - When (while the vehicle is jacked up or stuck) the front wheels only are spun for **20 seconds** or more.
   - When there is insufficient battery positive voltage.

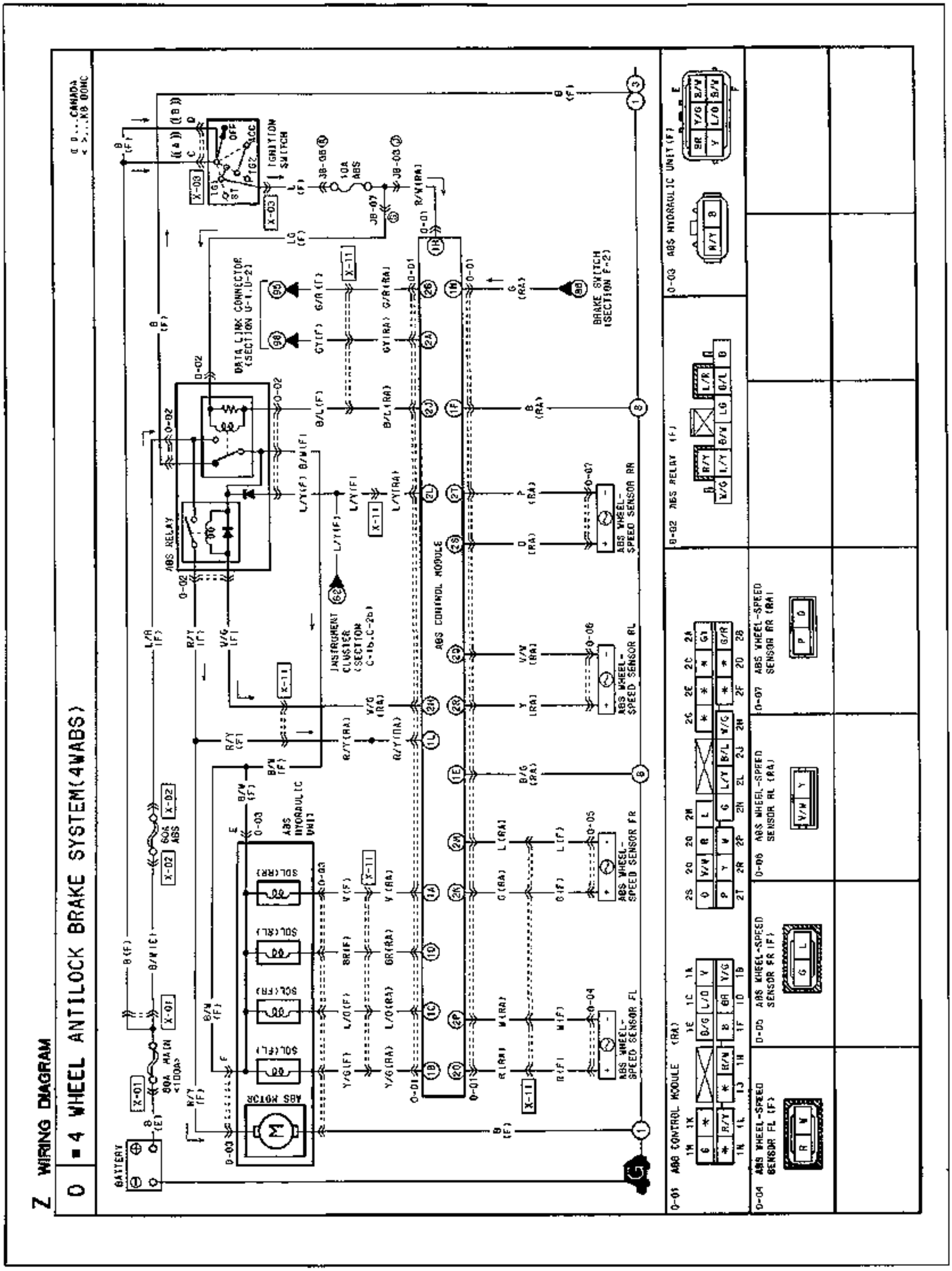
Note:

- Under the above conditions, the warning light will not illuminate a second time when the ignition is switched OFF then back ON, and there will be no problem entry made to the ABS control module memory.

Troubleshooting notes

The ABS is composed of electrical components, mechanical components (ABS hydraulic unit), and the components of the standard brake system.
Fundamentally, malfunction of the ABS electrical or mechanical components is judged by the on-board diagnosis function within the ABS control module. and malfunctions are indicated by the warning light in the instrument panel. The location of a malfunction is indicated by the technician switching the system to the diagnosis-indication mode.
The on-board diagnosis and indication functions must be used when diagnosing malfunctions of the ABS.

WIRING DIAGRAM



RELATIONSHIP CHART

Output / Input	ABS hydraulic unit		ABS warning light	Data link connector
	Solenoid valve	ABS motor		
ABS wheel-speed sensor	○	○	○	○
Brake switch	○	○		
Fail-safe relay	○		○	○
Motor relay		○	○	○

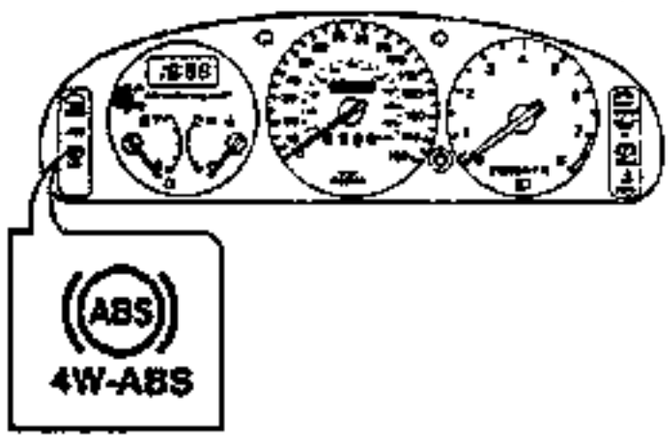
DIAGNOSTIC CHART

	Cause / Symptom	Input				Output				
				ABS relay		Hydraulic unit				
		ABS wheel-speed sensor	Brake switch	Fail-safe relay	Motor relay	Solenoid valve	ABS motor	ABS warning light	Data link connector	ABS control module
1	ABS warning light not illuminated when ignition switch turned ON.							○		
2	ABS warning light remains ON.	○	○	○	○	○	○	○		○
3	ABS warning light flashes.								○	

DIAGNOSTIC INDEX

No.	Troubleshooting Items	Remarks	Page
1	ABS warning light not illuminated when ignition switch turned ON.	—	P–51
2	Warning light remains ON.	Warning light remains ON and ABS does not operate	P–52
3	ABS warning light flashes.	—	P–53

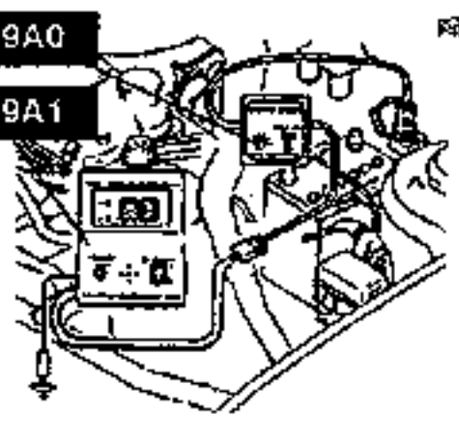
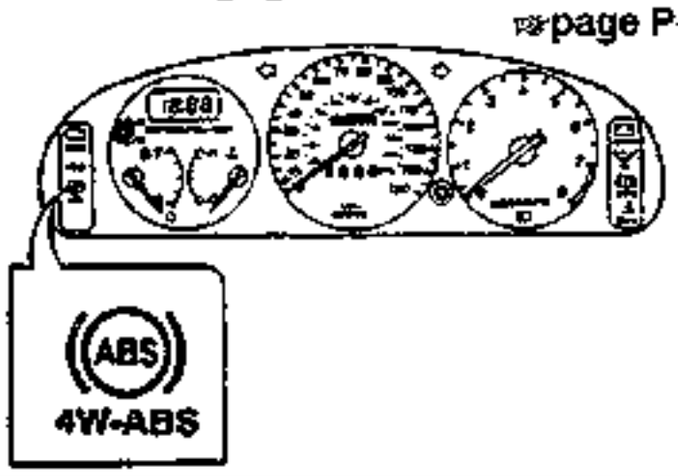
SYMPTOM TROUBLESHOOTING

1	WARNING LIGHT NOT ILLUMINATED WHEN IGNITION SWITCH TURNED ON.		
DETAILED DESCRIPTION	—		
Possible cause: • If other warning indicators do not illuminate, METER 15A fuse may be fused. • Failed indicator light or open in related wiring harness.			
STEP	**INSPECTION**		**ACTION**
1	Is METER 15A fuse OK? ☞page P–63 	Yes	Go to next step
		No	Replace METER 15A fuse
2	Are harness of ABS warning light normal? ☞page P–60 	Yes	Inspect ABS warning light ☞page P–60
		No	• Inspect harness between ABS CM and ABS relay. • Inspect harness between instrument panel and ABS CM. • Inspect harness between instrument panel and ABS relay. • Inspect ABS warning light bulb.

CM: CONTROL MODULE

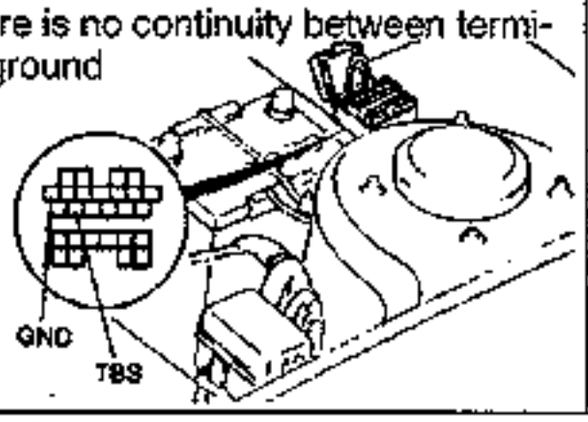
2	WARNING LIGHT REMAINS ON.		
DETAILED DESCRIPTION	**Warning light remains ON and ABS does not operate**		

Possible cause:
- If ABS warning light only illuminates, activate diagnostic mode and check for diagnostic trouble code.
- Malfunction of battery
- Malfunction of ABS warning light harness (fail-safe relay)
- Malfunction of ABS CM

STEP	INSPECTION		ACTION
1	With the **SSTs** (self diagnosis checker), verify that diagnostic trouble code is indicated. (Connect the **SSTs** to the data link connector) ☞page P–54 49 B019 9A0 49 H018 9A1 	Yes	Read diagnostic trouble code ⇨Inspect as indicated ☞page P–56
		No	Go to next step
2	Is battery voltage OK? ☞page P–60	Yes	Go to next step
		No	Charge or replace battery
3	Are ABS warning light harness normal? ☞page P–60 	Yes	Go to next step
		No	• Inspect harness between ABS CM and ABS relay. • Inspect harness between instrument panel and ABS CM. • Inspect harness between instrument panel and ABS relay.
4	Connect terminal 2J of ABS CM connector (18 pins) to a ground and check the following points (IG ON) • Operation sound of relay is heard. • ABS warning light is not illuminated. • 1D terminal of ABS CM connector indicates 12V.	Yes	Go to next step
		No	• Inspect ABS relay (fail-safe relay) • Inspect harness between ABS relay (fail-safe relay) and ABS CM, battery • Inspect harness between ABS relay (fail-safe relay) and HU

CM: CONTROL MODULE

STEP	INSPECTION		ACTION
5	Is voltage at terminals 1 E, 1F and 1 H of ABS CM connector (12 pins) and terminals 2B and 2L of ABS CM connector (18 pins) as specified? ☞page P–64	Yes	Replace ABS CM
		No	• Inspect harness between ABS CM and ground • Inspect harness between ignition switch and ABS CM • Inspect harness between data link connector and ABS CM • Inspect harness between ABS warning light and ABS CM

3	ABS WARNING LIGHT FLASHES.		
DETAILED DESCRIPTION	—		
Possible cause: • Data link connector terminal TBS grounded			
STEP	**INSPECTION**		**ACTION**
1	Verify that there is no continuity between terminal TBS and ground 	Yes	Inspect ABS CM
		No	Repair short between terminals TBS and ground

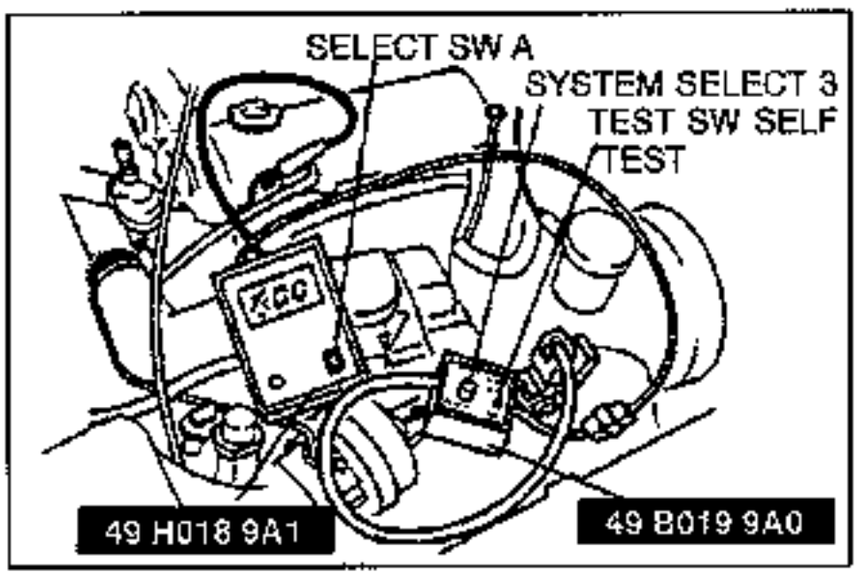
CM: CONTROL MODULE

ON-BOARD DIAGNOSIS FUNCTION

Inspection By Diagnostic Mode

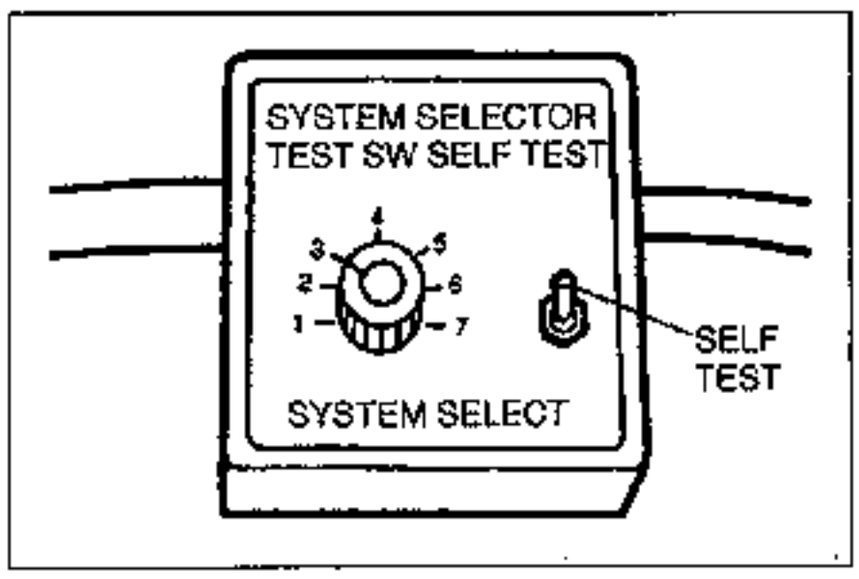
Outline

The ABS control module contains on-board diagnosis and memory functions to watch for and indicate present and past failures. Read and note the diagnostic indications using the **SSTs** then take action according to the diagnostic trouble code table. (Refer to page P–56.)

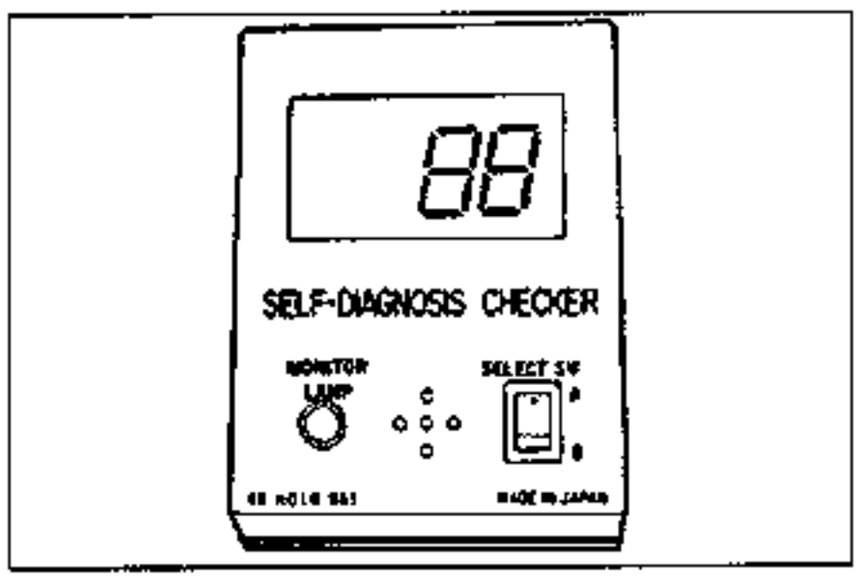


Inspection procedure

1. Connect the **SSTs** to the data link connector and a ground.
2. Set the select switch to position A.



3. Set the system selector to position 3 and SELF TEST as shown.

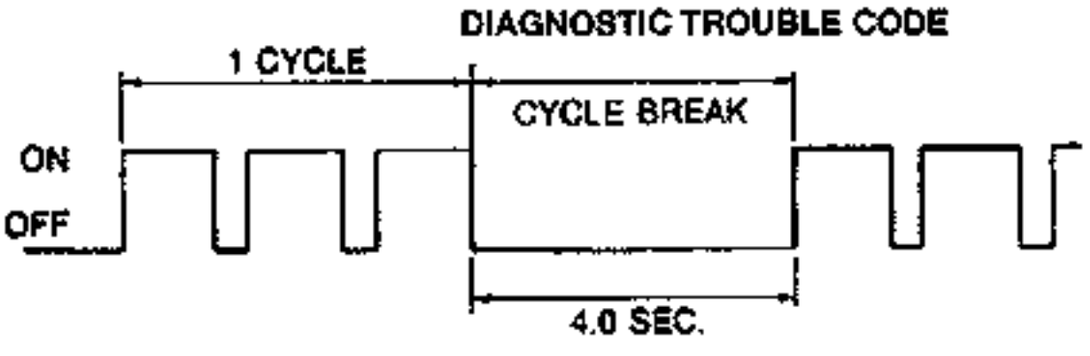


4. Turn the ignition switch ON.
5. Verify that **88** flashes on the digital display and the buzzer sounds for **3 sec.** after turning the ignition switch ON.
6. If **88** does not flash, check power supply circuit, and ground wiring.
7. If **88** flashes and the buzzer continues for more than **20 sec.**, check for a short circuit between terminal TBS and ground. Replace ABS control module if necessary and perform steps 3 and 4 again.
8. Note any code numbers and check for the causes by referring to the check sequences shown on pages P–57 to P–59. Repair as necessary.
9. After repairs, cancel the code numbers by performing "Memory Cansel." (Refer to page P–56.)

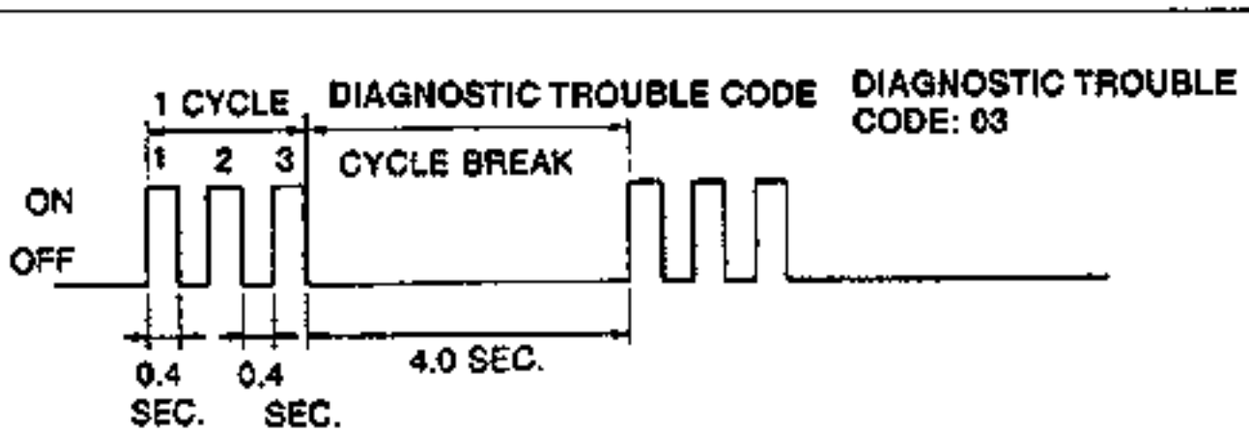
Principle of Code Cycle

Diagnostic trouble codes are determined as shown below.

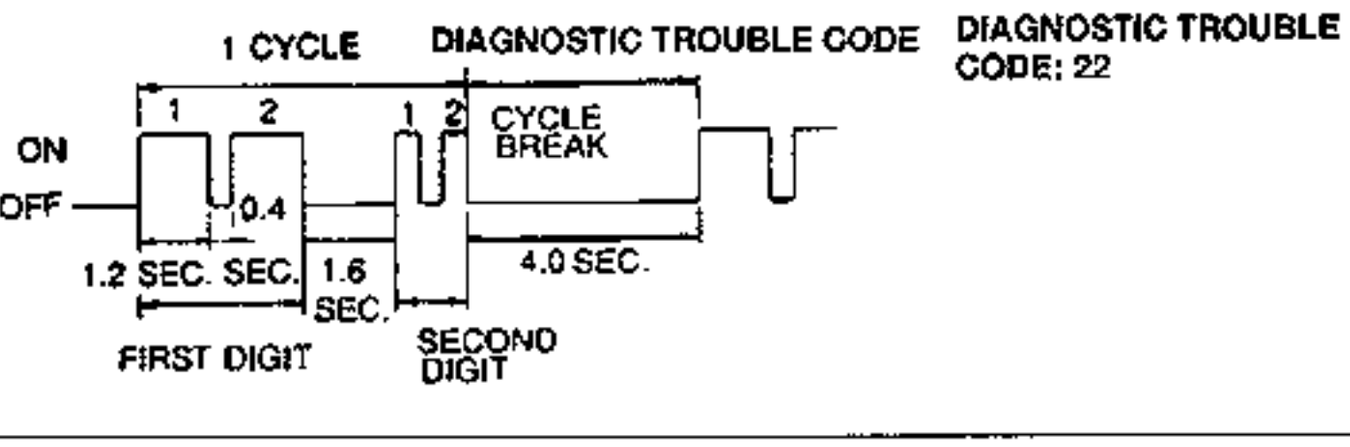
1. Code cycle break
The time between diagnostic trouble code cycles is 4.0 seconds (the time the buzzer is off).



2. Second digit of diagnostic trouble code (ones position)
The digit in the ones position of the diagnostic trouble code represents the number of times the buzzer sounds 0.4 second during one cycle.



3. First digit of diagnostic trouble code (tens position)
The digit in the tens position of the diagnostic trouble code represents the number of times the buzzer is on 1.2 seconds during one cycle.
It should also be noted that the light goes off for 1.6 seconds between the long and short pulses of the buzzer.



Memory Cancel

Diagnostic trouble codes memorized in the ABS control module are canceled by performing the following steps.

1. Connect the TBS terminal to GND at the data link connector.
2. Turn the ignition switch ON.
3. Output all memorized codes.
4. After verifying that the first code is repeated, depress the brake pedal 10 times at intervals of less than **one second (1 sec.)**.

Note

Diagnostic trouble codes will not be canceled if:
Intervals of depressing the brake pedal exceed **one second (1 sec.)**.
Brake switch has failed.

- While performing the memory cancel operation, the ABS warning light will illuminate.
- After memory cancel, the ABS control module will perform on-board diagnosis.

Diagnostic Trouble Code Table

Code No.	Possible cause	Pattern of output signal (On-Board Diagnosis Checker)	Diagnosis chart No.
11	Right front ABS wheel-speed sensor Right front ABS sensor rotor		ABS-1
12	Left front ABS wheel-speed sensor Left front ABS sensor rotor		
13	Right rear ABS wheel-speed sensor Right rear ABS sensor rotor		
14	Left rear ABS wheel-speed sensor Left rear ABS sensor rotor		
15*	ABS wheel-speed sensor		ABS-2
22	Right front solenoid valve		ABS-3
24	Left front solenoid valve		
26	Right rear solenoid valve		
28	Left rear solenoid valve		

*If the ignition switch is turned OFF and then ON again, and the vehicle is then accelerated to higher than **10km/h {6.2MPH}**, diagnostic trouble code 15 will be replaced by a code from 11 through 14.

51	Fail–safe relay		ABS-4
53	Motor Motor relay		ABS-5
61	ABS control module		ABS-6

Diagnosis Chart

ABS-1	Diagnostic trouble code: 11–14
	Possible failure: ABS wheel-speed sensor, harness, sensor rotor, hydraulic pressure 11: Right front 12: Left front 13: Right rear 14: Left rear

Step	Check item	Remark	Refer to
1	Check ABS control module connector	Check for poor connection	—
2	Check wiring harness between control module and ABS wheel-speed sensor	Check for open or short to ground	—
3	Check ABS wheel-speed sensor	—	P–68
4	Check ABS sensor rotor	—	P–68
5	Check brake switch	—	P–61
6	Check hydraulic system	If a problem is found, replace hydraulic unit or repair hydraulic system piping as necessary	P–69
7	If all above are OK after diagnostic trouble code(s) is erased, recheck for diagnostic code after driving from vehicle stop to over 10 km/h {6.2 mph}	If code of 11–14 is obtained, replace ABS control module	P–71
8	If all above are OK, there was temporary poor contact in wiring and now ABS system is functioning		

ABS-2	Diagnostic trouble code: 15
	Possible failure: Wheel-speed sensor, harness

Step	Check item	Remark	Refer to
1	If all the malfunction are OK after diagnostic trouble code is erased, recheck for diagnostic trouble code after driving from vehicle stop to over 10 km/h {6.2 mph}	If code of 11–14 is obtained, go to ABS-1	Above
		If code 15 is obtained, replace ABS control module	P–71
		If nothing is displayed, there was a temporary poor contact in wiring and now ABS is OK	—

ABS-3	Diagnostic trouble code: 22, 24, 26, 28		
	Possible failure: Solenoid valve, harness		
Step	**Check item**	**Remark**	**Refer to**
1	Check ABS control module connector	Check for poor connection	—
2	Check wiring harness between hydraulic unit and ABS control module	Check for open or short to ground	—
3	Check ABS hydraulic unit solenoid valve	Check for open circuit	P–63
4	Check ABS warning light operation	If warning illuminates constantly after turning ignition switch ON, replace ABS control module	—
		If warning light does not illuminate after turning ignition switch ON, there was a temporary poor contact in wiring and now ABS system is functioning	

ABS-4	Diagnostic trouble code: 51		
	Possible failure: Fail-safe relay		
Step	**Check item**	**Remark**	**Refer to**
1	Check pump fuse	Check pump fuse condition	P–63
		Check short to ground	—
2	Check relay box	Check for open circuit	P–72
3	Check wiring harness between relay box and hydraulic unit or control module	Check for open or short to ground	—
4	Check ABS warning light operation	If warning light illuminates constantly after turning ignition switch ON, replace ABS control module	—
		If warning light does not illuminate after turning ignition switch ON, there was a temporary poor contact in wiring an now ABS system is functioning	

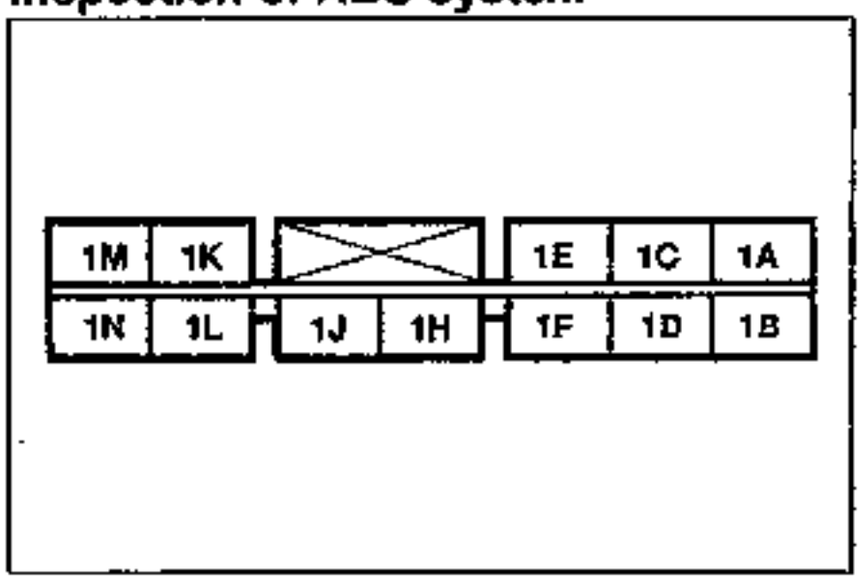
ABS-5	Diagnostic trouble code: 53
	Possible failure: Motor, motor relay

Step	Check item	Remark	Refer to
1	Check ABS motor relay	If pump motor continues operating after turning ignition switch OFF, motor relay may be faulty	P–73
2	Check ABS pump fuse	Check ABS pump fuse condition	P–63
		Check short to ground	—
3	Check wiring harness between ABS relay and hydraulic unit and ABS control module	Check for open or short to ground	—
4	Check voltage at ABS control module terminal	Turn ignition switch ON and check motor relay terminal voltage	P–65
5	Check ABS motor	Check for open circuit	P–62
6	Check wiring harness between ABS motor and ground	Check for open circuit	—
7	Check wiring harness between ABS motor and ABS control module	Check for open or short to ground	—
8	Check ABS warning light operation	If warning illuminates constantly after turning ignition switch ON, replace control module	—
		If warning light does not illuminate after turning ignition switch ON, there was a temporary poor contact in wiring and now ABS system is functioning	

ABS-6	Diagnostic trouble code: 61
	Possible failure: ABS control module

Step	Check item	Remark	Refer to
1	—	Replace ABS control module	P–71

Inspection of ABS system



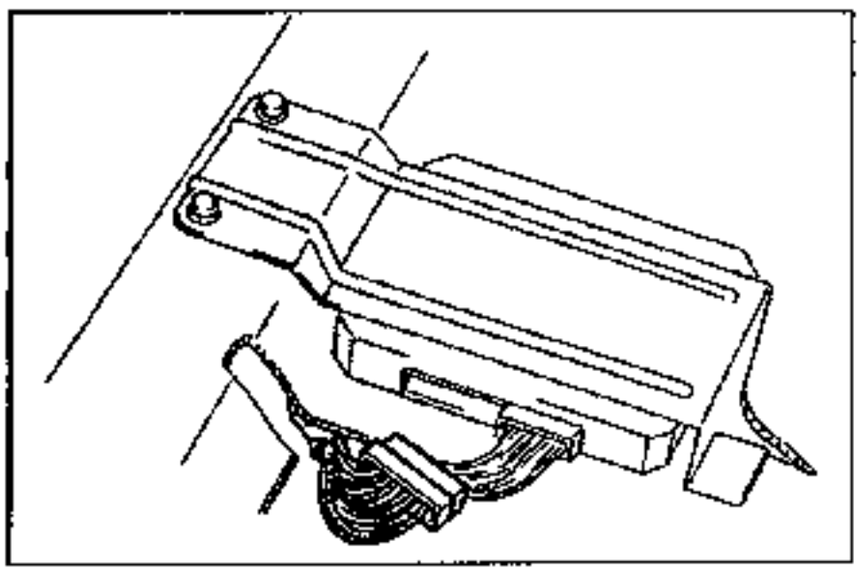
Check battery

Note
- If the battery positive voltage is low, the ABS warning light may illuminate.

1. Start the engine.
2. Check the voltage at the battery and at the ABS control module terminal 1H.

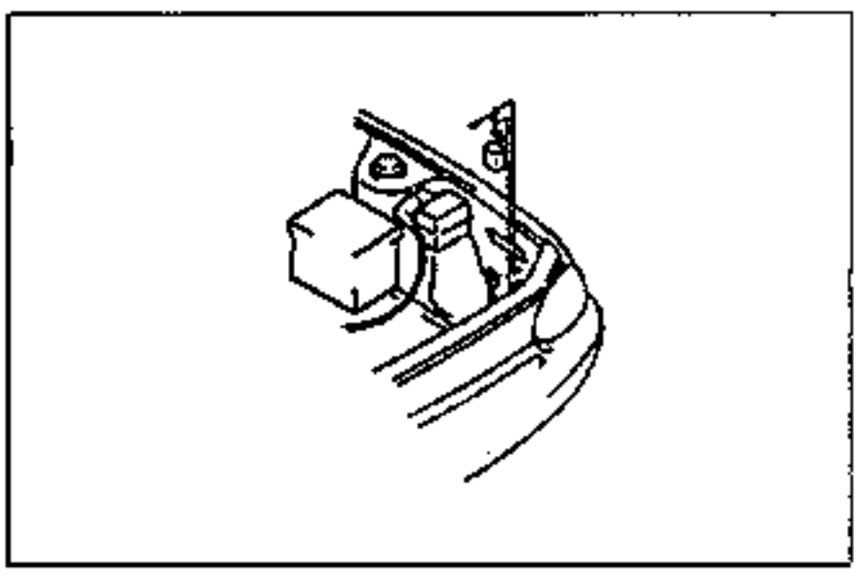
Voltage: 10V min.

3. If the battery positive voltage is below specification, charge or replace the battery as necessary.
4. If the battery positive voltage is within specification and terminal 1H voltage is below specification, check the wiring harness between the battery and the ABS control module terminal 1H.

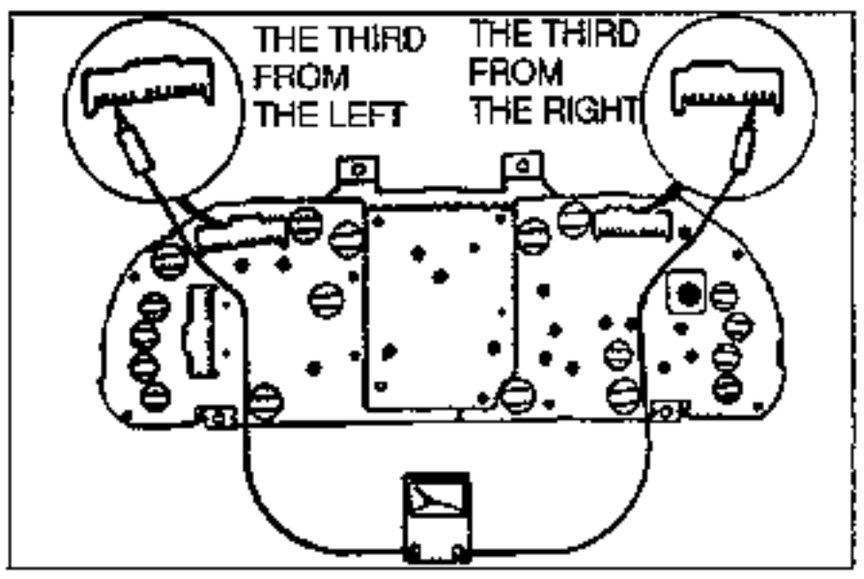


Check ABS warning light harness

1. Turn the ignition switch OFF, and disconnect the ABS control module connector (18 pins).
2. Turn the ignition switch ON. If the warning light is ON, go to next step. If the warning light is OFF, check ABS relay and the harness. (Warning light-ABS relay (h), ABS relay (b)-Ground)



3. Disconnect the ABS relay connector.
4. If the warning light harness remains illuminated, check the warning light harness for short to ground.

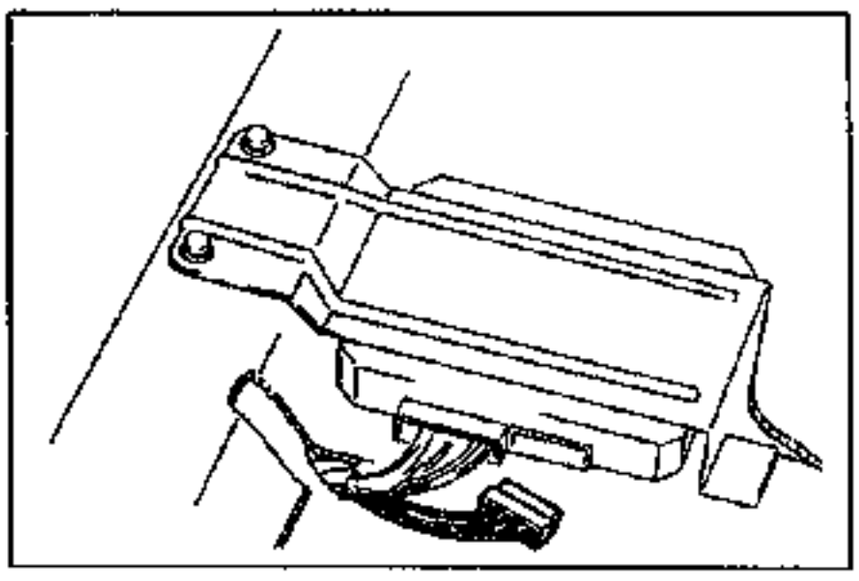


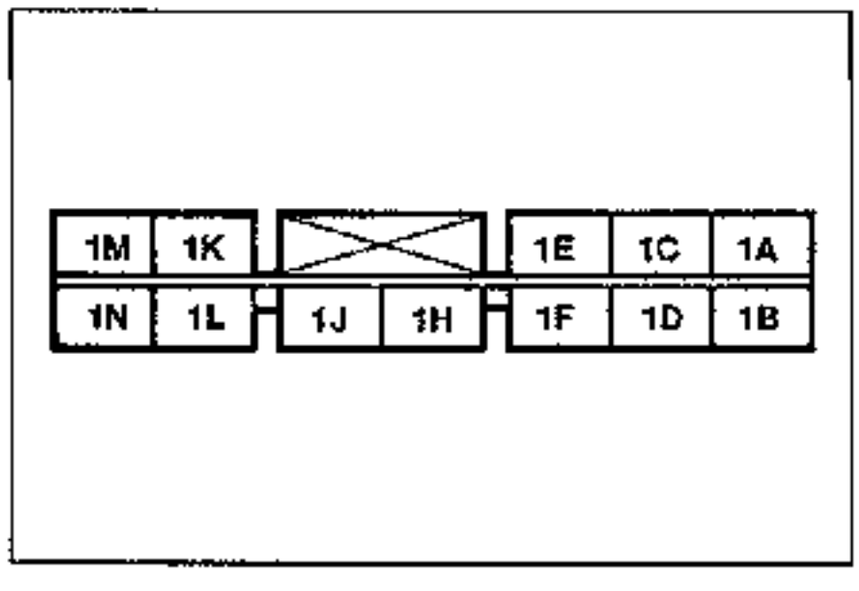
Check ABS warning light bulb

1. Remove the meter assembly.
2. Remove the warning light bulb from the rear of the cluster.
3. Check the condition of the bulb.
4. Replace the bulb if necessary.

Check brake switch

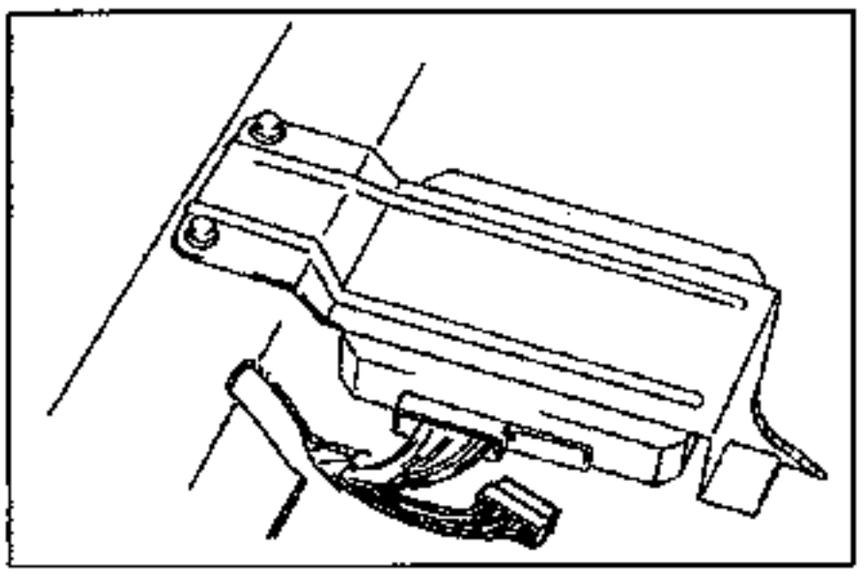
1. Depress the brake pedal.
2. Verify that the brake lights illuminate.
3. If not illuminated, check the following:
   - Brake light bulb
   - Brake light fuse
   - Brake switch
   - Brake switch harness
   - Brake light harness
4. Repair or replace parts as necessary.





Check brake switch harness at ABS control module

1. Turn the ignition switch OFF.
2. Disconnect the ABS control module connector (12 pins).
3. Turn the ignition switch ON.
4. Check for voltage between terminal 1M at the vehicle side harness and ground. (Refer to page–64.)
5. If not as specified, check wiring harness between the brake switch and the ABS control module.

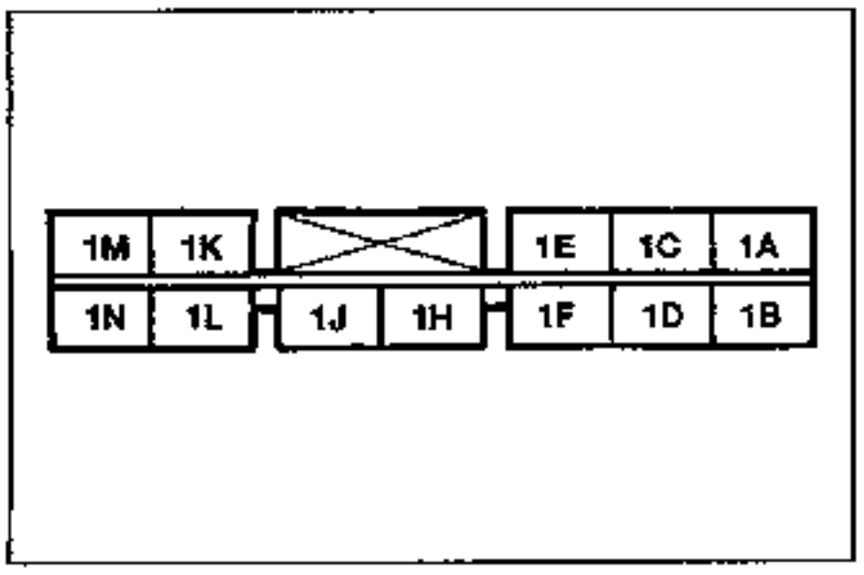


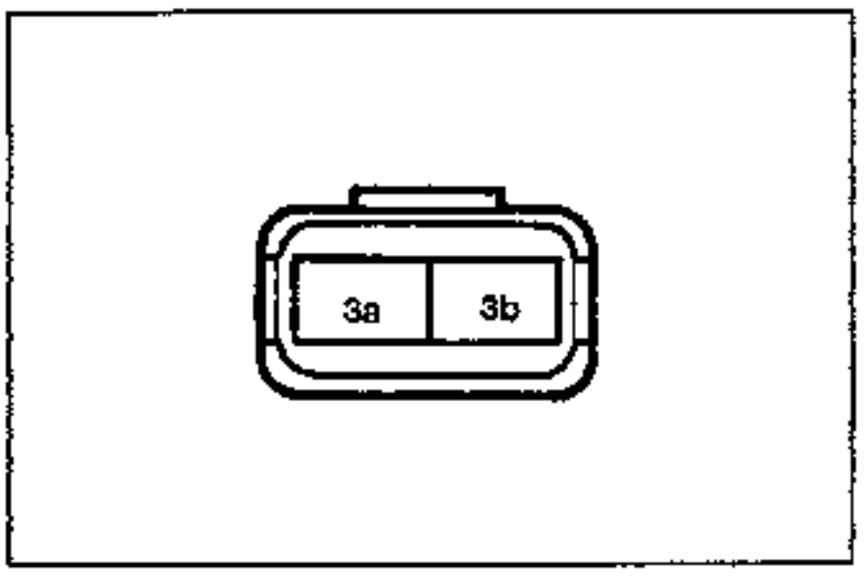
Check motor harness at ABS control module

1. Turn the ignition switch OFF, and disconnect the ABS control module connector (12 pin).
2. Measure the resistance between 1 L terminal of the ABS control module connector and a ground.

   Resistance: 1Ω max.

3. If not as specified, check the wiring harness between the ABS motor and the ABS control module and check the motor.



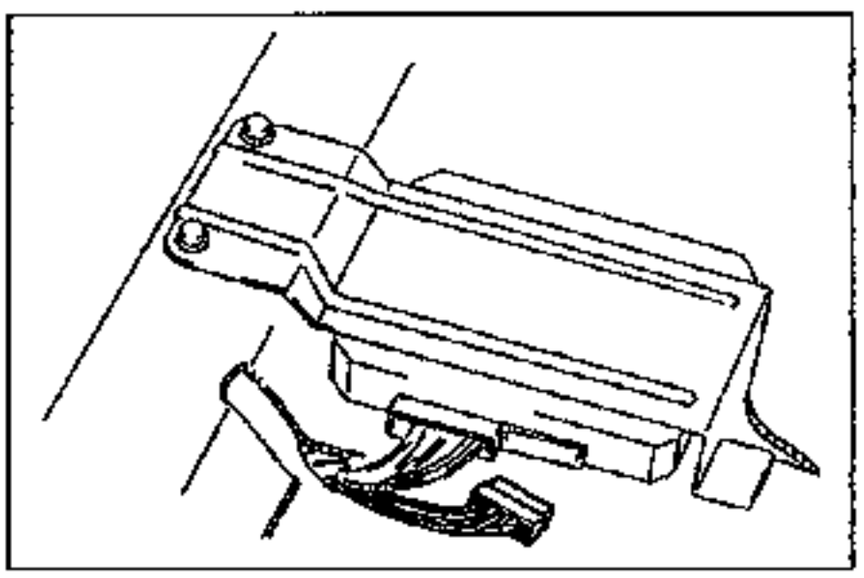


Check motor at ABS hydraulic unit

1. Turn the ignition switch OFF.
2. Disconnect the ABS hydraulic unit connector (2 pin).
3. Measure the resistance between the connector terminals.

   Resistance: 1Ω max.

4. Verify that the motor operates when applying 12V to connector (2 pin).
5. If not as specified, replace the ABS hydraulic unit.



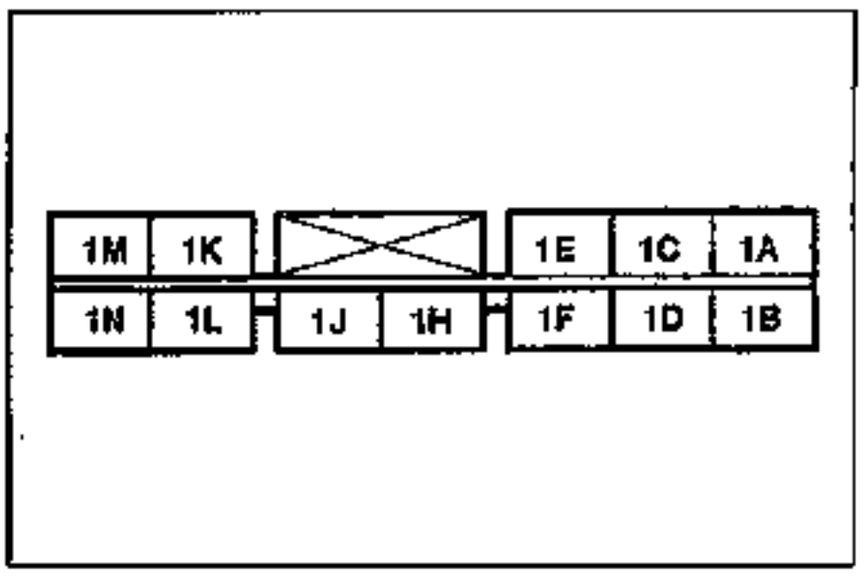
Check solenoid valve harness of ABS control module

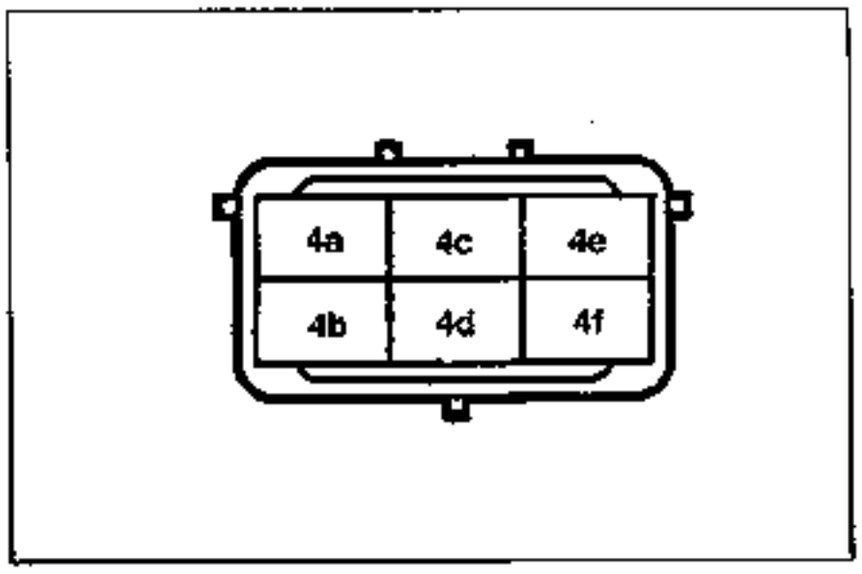
1. Turn the ignition switch OFF.
2. Measure the resistance between a ground and the following terminals at the ABS control module connector (12 pin).

   Terminal: 1A, Right rear
   1B, Left front
   1C, Right front
   1D, Left rear

   Resistance: Approx. 3Ω

3. If not as specified, check the wiring harness between the hydraulic unit connector (8 pin) and the ABS control module.





Check solenoid valve at ABS hydraulic unit

1. Disconnect the ABS hydraulic unit connector (6 pin).
2. Measure the resistance between following terminals.
   4f-4a, 4b
   4e-4c, 4d

   Resistance: approx. 3Ω

3. If not as specified, check the ABS hydraulic unit wiring harness or replace the ABS hydraulic unit if necessary.

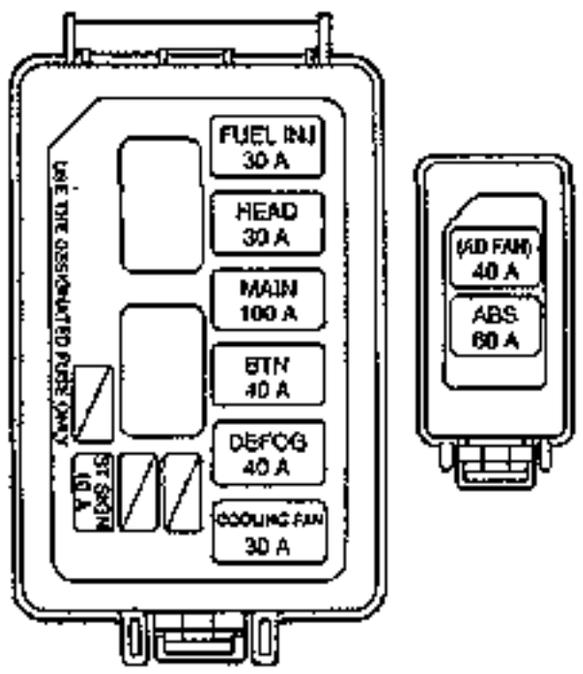
Check fuse

Check the fuses according to the following table. If a fuse is burned, replace it.

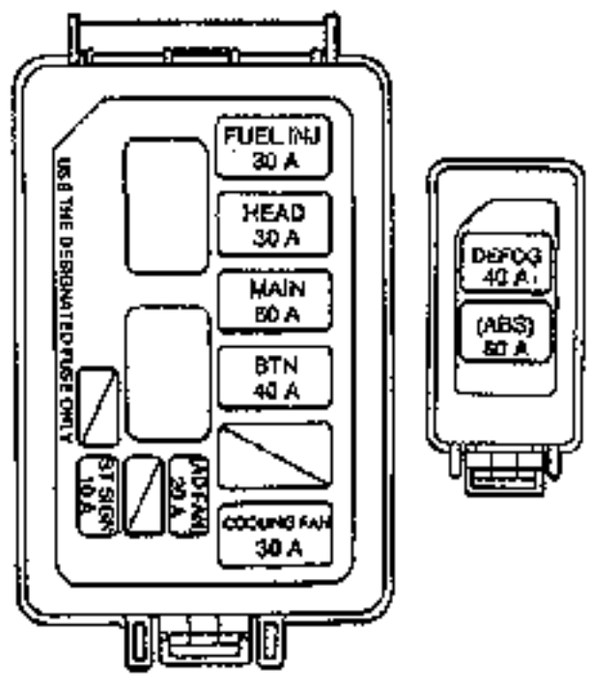
Fuse name	Rating (Amp)	Location	Failure condition	Refer to
ABS PUMP	60	Main fuse box	• ABS warning light illuminates (Diagnostic troulbe code 51 or 53) • ABS motor and solenoid valves do not operate	P–58, 59
MAIN	100		• Engine does not start	—
ABS	10	Fuse panel (at driver's side)	• ABS warning light illuminates after engine started • ABS control module not activated	—
STOP	20		• Brake light does not illuminate	—
METER	15		• ABS warning light does not illuminate	—

MAIN FUSE BLOCK

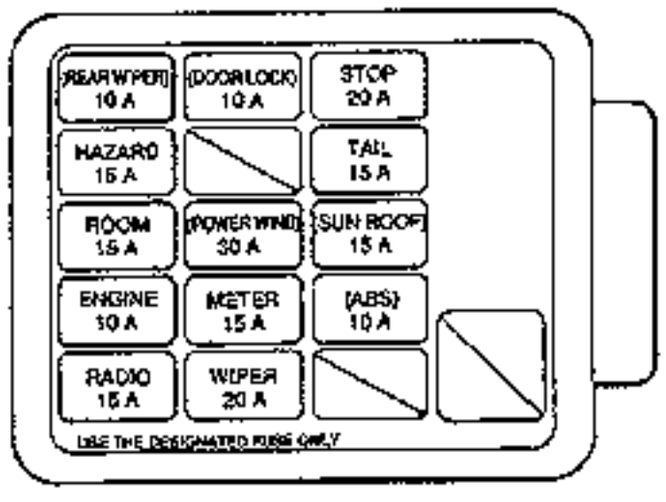
K8



B6



FUSE BLOCK



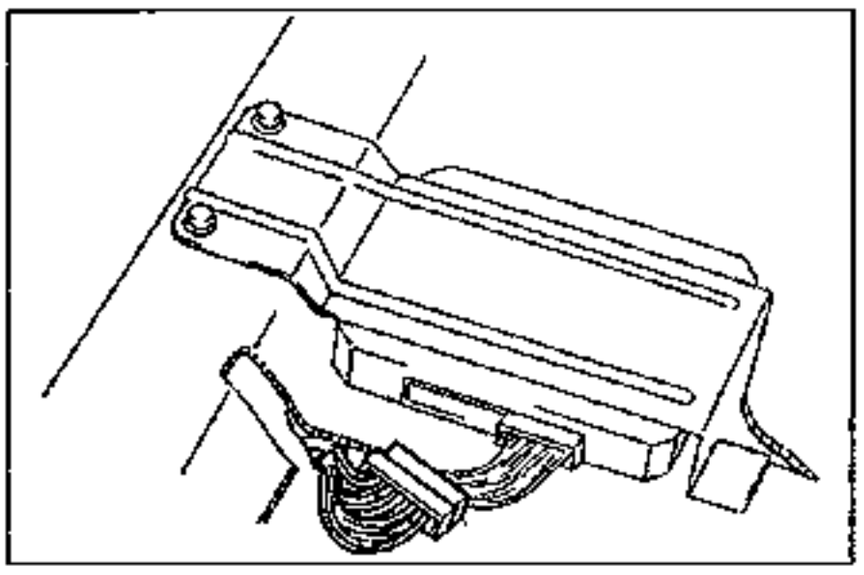
Check ABS control module

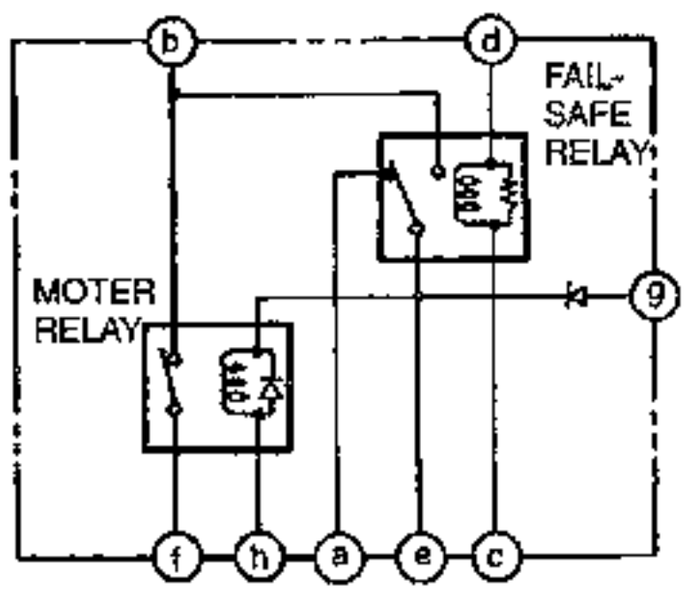
ABS CONTROL MODULE CONNECTOR

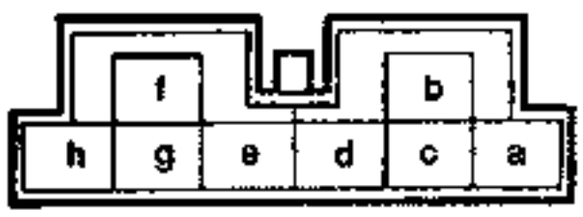
B+: Battery Positive Voltage

Connector	Terminal	Connected to	Condition	Voltage (v)	Remark
12 pins	1A	Right rear wheel solenoid	Solenoid ON*	0–2	* Solenoid is ON only when ABS system is functioning. Voltage when solenoid is ON can be measured following "Hydraulic System Test". (Refer to P–69.)
			Ignition switch ON	B+	
	1B	Left front wheel solenoid	Solenoid ON*	0–2	
			Ignition switch ON	B+	
	1C	Right front wheel solenoid	Solenoid ON*	0–2	
			Ignition switch ON	B+	
	1D	Left rear wheel solenoid	Solenoid ON*	0–2	
			Ignition switch ON	B+	
	1E	Ground	Constant	0	
	1F	Ground	Constant	0	
	1H	Battery	Ignition switch ON	B+	
			Ignition switch OFF	0	
	1J	Not used	—	—	
	1K	Not used	—	—	
	1L	ABS motor	ABS motor running	B+	
			ABS motor stopped	0–1	
	1M	Brake switch	Brake pedal depressed	B+	
			Brake pedal released	0–2	
	1N	Not used	—	—	

Connector	Terminal	Connected to		Condition	Voltage (v)	Remark
18 pins	2A	FBS check terminal		Ignition switch ON	0	
	2B	TBS check terminal		Normal mode	B+	
				Diagnostic mode	0	
	2C	Not used		—	—	
	2D	Not used		—	—	
	2E	Not used		—	—	
	2F	Not used		—	—	
				Engine idling	B+	
	2H	Motor relay		Motor relay ON	0–2	
				Motor relay OFF	B+	
	2J	Fail-safe relay		Normal	0–2	• Turn wheel at specified speed to prevent incorrect diagnosis • Check following terminals of ABS wheel-speed sensor in AC range: 2N-2M (right front) 2O-2P (left front) 2R-2Q (left rear) 2S-2T (right rear)
				If malfunction present	B+	
	2L	Warning light		Illuminated	0–3	
				Not illuminated	B+	
	2M	ABS wheel-speed sensor	Right front	Vehicle stopped	0	
	2N			Wheel turned 1 revolution per second	0.25–1.2	
	2O		Left front	Vehicle stopped	0	
	2P			Wheel turned 1 revolution per second	0.25–1.2	
	2Q		Left rear	Vehicle stopped	0	• In DC range, ABS wheel-speed sensor voltage will be approx. 1.0V (with ignition switch ON)
	2R			Wheel turned 1 revolution per second	0.25–1.2	
	2S		Right rear	Vehicle stopped	0	
	2T			Wheel turned 1 revolution per second	0.25–1.2	







Check ABS relay harness (fail-safe relay)

1. Turn the ignition switch OFF and disconnect the ABS control module connector (18 pin).
2. Turn the ignition switch ON.
3. Connect terminal 2J of the ABS control module connector (18 pin) to a ground.
4. Check the following points.

Condition	Action
Fail-safe relay in ABS relay does not click when 2J terminal grounded	• Check fail-safe relay • Check harness between fail-safe relay and ABS control module
Warning light illuminates after grounding 2J terminal	• Check fail-safe relay
1D (BR) terminal of ABS control module connector does not indicate 12V	• Check fail-safe relay • Check harness between fail-safe relay and ABS hydraulic unit

Check ABS relay (fail-safe relay)

1. Measure resistance between terminals (c) and (d) of ABS relay connector.

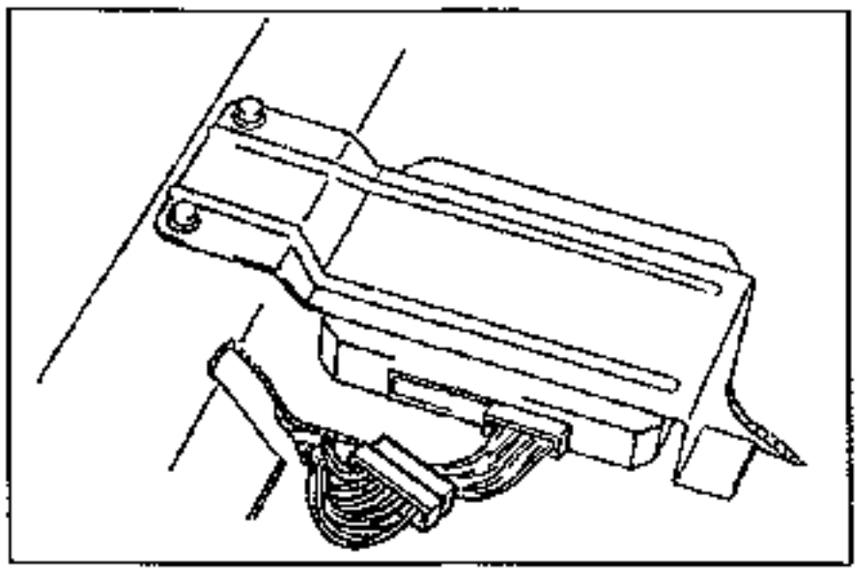
   Resistance: 60–100Ω

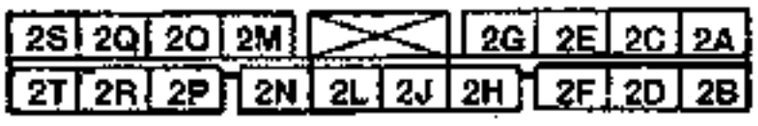
2. Check continuity between terminals (a) and (e) and between (b) and (e).

Terminal	Continuity
a–e	Yes
b–e	No

3. Apply 12V to terminals between d and c.
   Check for continuity between terminals (b) and (e) and between (a) and (e).

Terminal	Continuity
b–e	Yes
a–e	No





Check ABS relay harness (motor relay)

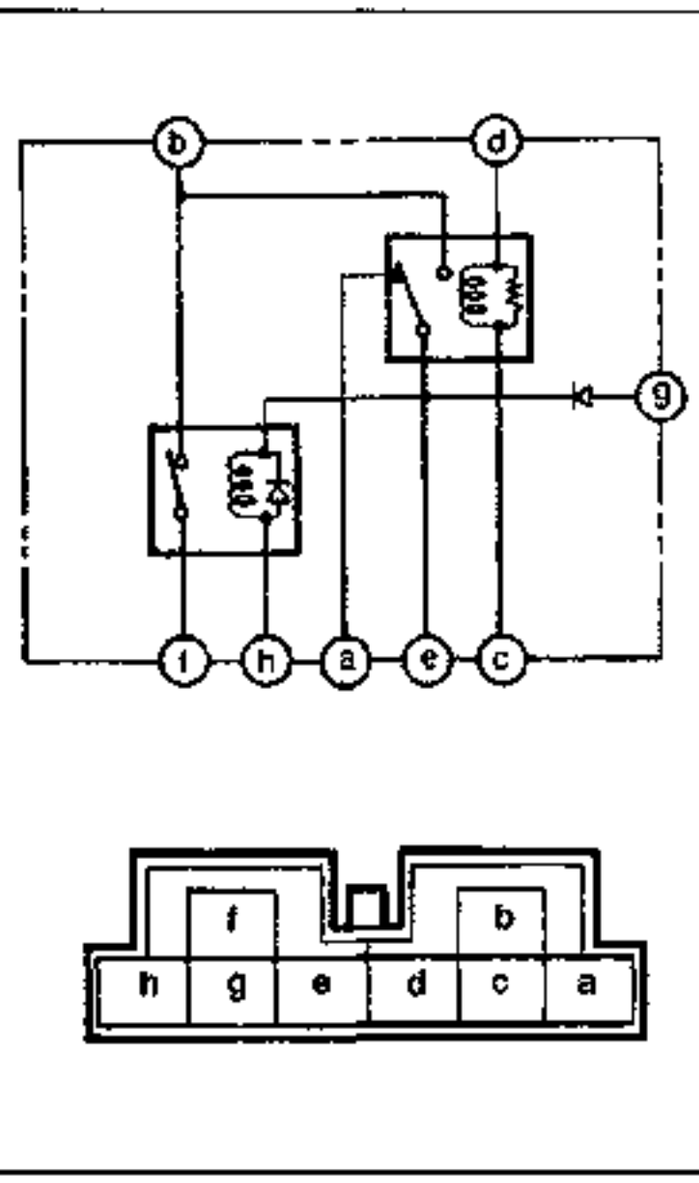
1. Inspect the fail–safe relay.
2. Turn the ignition switch OFF and disconnect the ABS control module connector (18 pin).
3. Turn the ignition switch ON.
4. Connect terminal 2J to a ground.
5. Connect terminal 2H to a ground.
6. Check the following points:

Condition	Action
Motor relay in ABS relay does not click when terminals grounded	• Check harness between motor relay and ABS control module • Check motor relay
ABS motor does not operate	• Check motor relay • Check harness between motor relay and ABS motor • Check fuse

Caution

- **Allowing the motor to operate for more than two seconds will damage the ABS motor.**

7. If not as specified, replace the ABS relay.



Check ABS relay (motor relay)

1. Measure the resistance between terminals (e) and (h) or between (a) and (h) of ABS relay box connector.

   Resistance: 50–90Ω

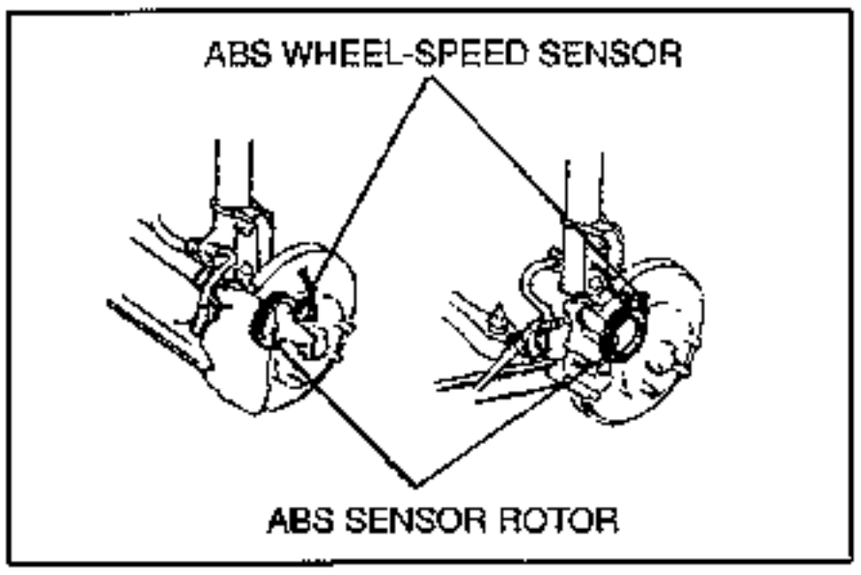
2. Check continuity between terminals (b) and (f).

Terminal	Continuity
b–f	No

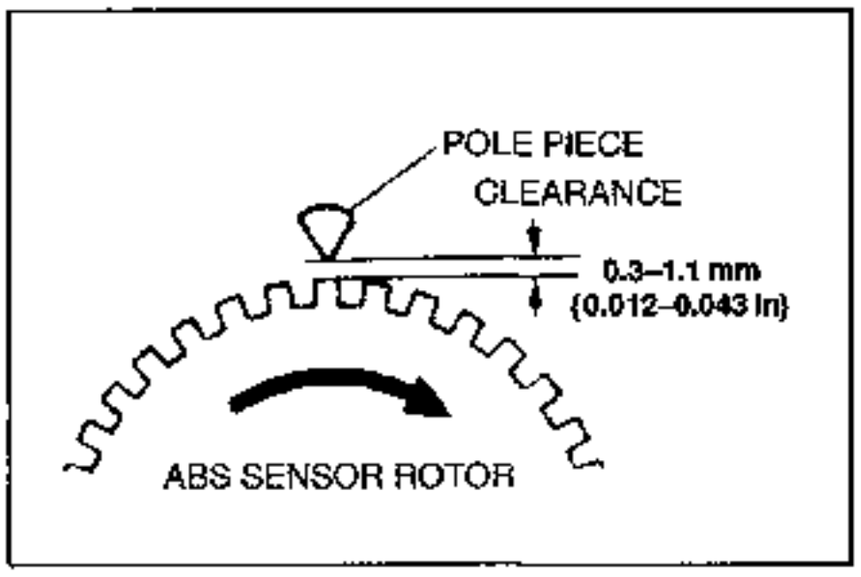
3. Apply 12V to terminals (g) (+) and (h) (–).
   Check for continuity between terminals (b) and (f).

Terminal	Continuity
b–f	Yes

4. If not as specified, replace the ABS relay.



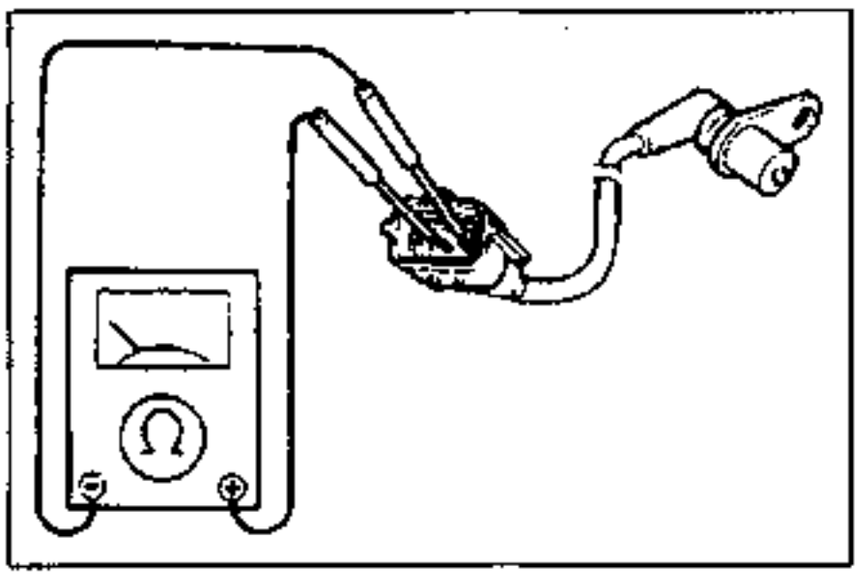
Check ABS wheel-speed sensor
1. On level ground, jack up the vehicle and support it evenly on safety stands.
2. Remove the wheel and tire assembly.
3. Check for looseness and damage.



4. Check the clearance between the ABS wheel-speed sensor and the ABS sensor rotor.

   Clearance: 0.3–1.1 mm {0.012–0.043 in}

5. If not as specified, replace the ABS wheel-speed sensor or ABS sensor rotor as needed.



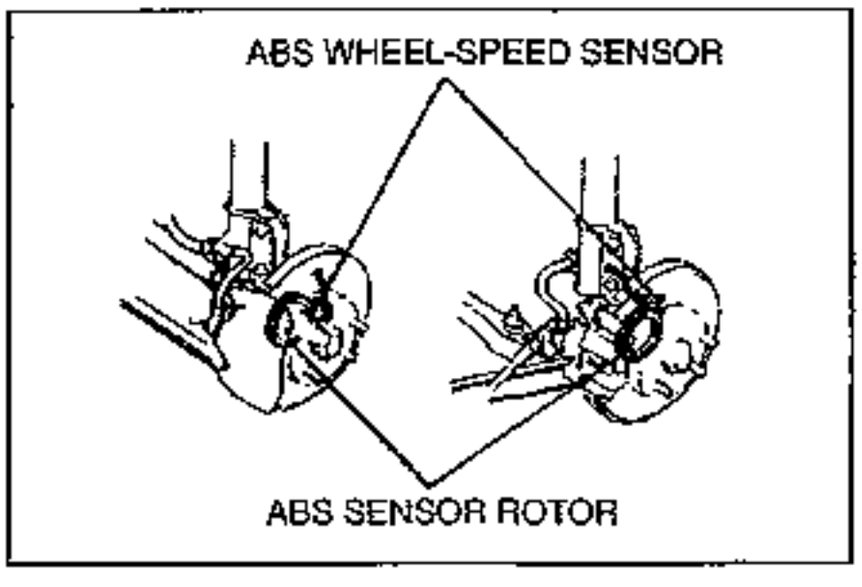
Check resistance of ABS wheel-speed sensor
1. Disconnect the ABS wheel-speed sensor connector.
2. Check resistance at the ABS wheel-speed sensor.

   Resistance: 1.6–2.0 kΩ

Check Voltage of ABS wheel-speed sensor
1. On level ground, jack up the vehicle and support it evenly-on safety stands.
2. Disconnect the ABS wheel-speed sensor connector.
3. While rotating a wheel one revolution per second by hand, check for voltage at the ABS wheel-speed sensor terminal. Check each wheel.

   Voltage: 0.25–1.2V (AC)

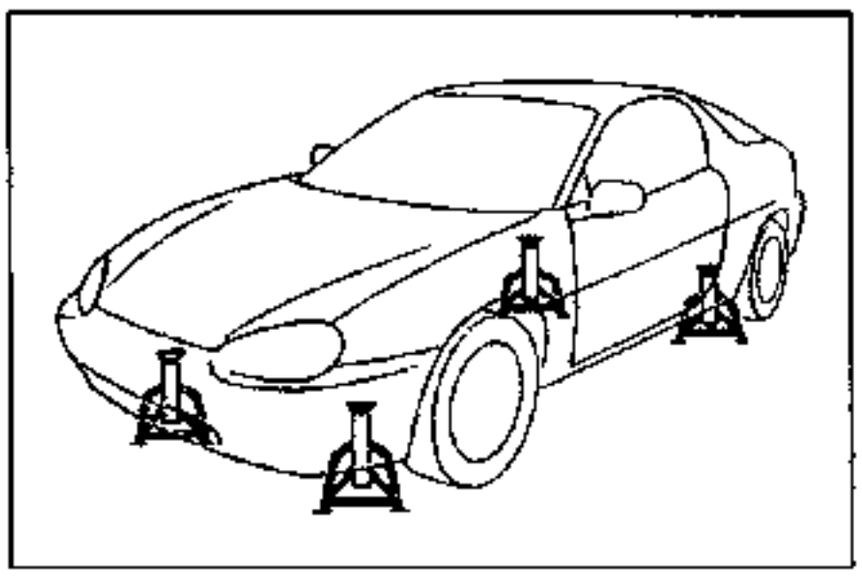
4. If not as specified, replace the ABS wheel-speed sensor or ABS sensor rotor as needed.
5. Cancel the ABS control module memory.

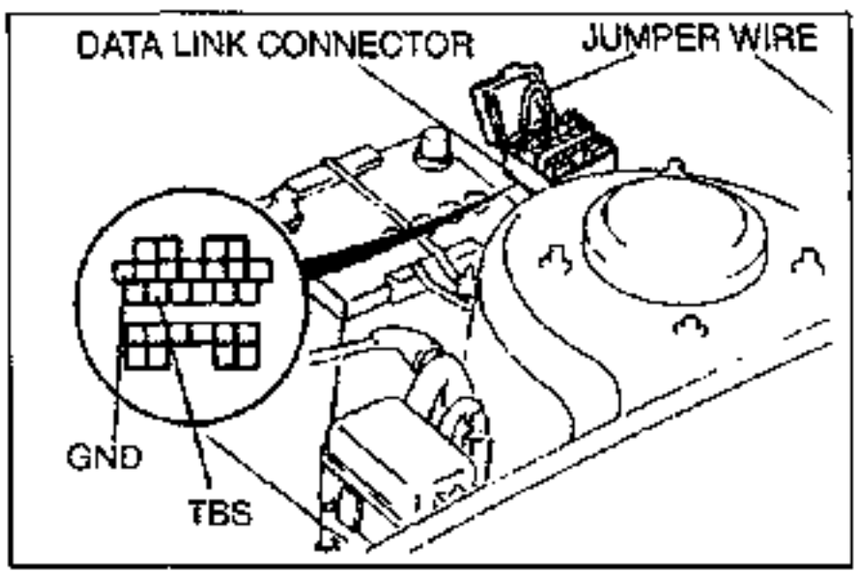


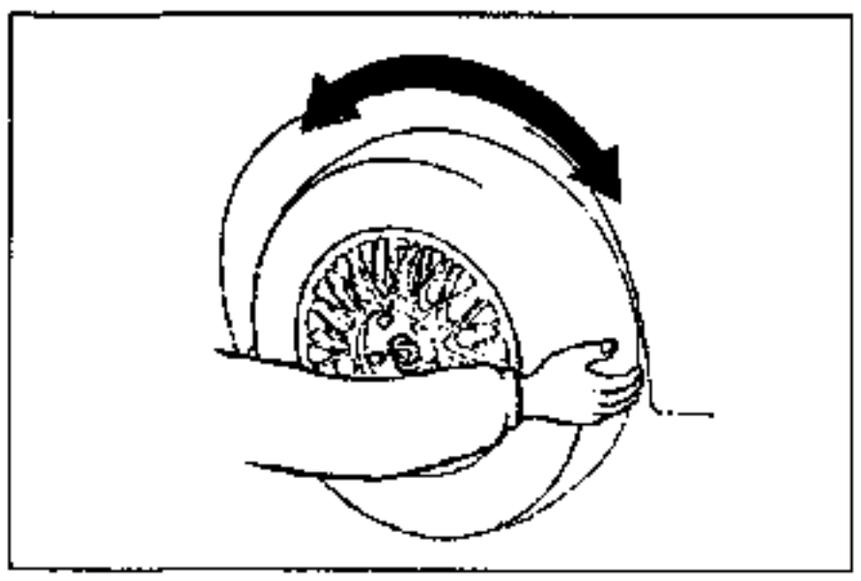
Check ABS sensor rotor
1. On level ground, jack up the vehicle and support it evenly on safety stands.
2. Remove the wheel and tire assembly.
3. Inspect for missing and damaging teeth.
4. Replace the ABS sensor rotor as necessary.

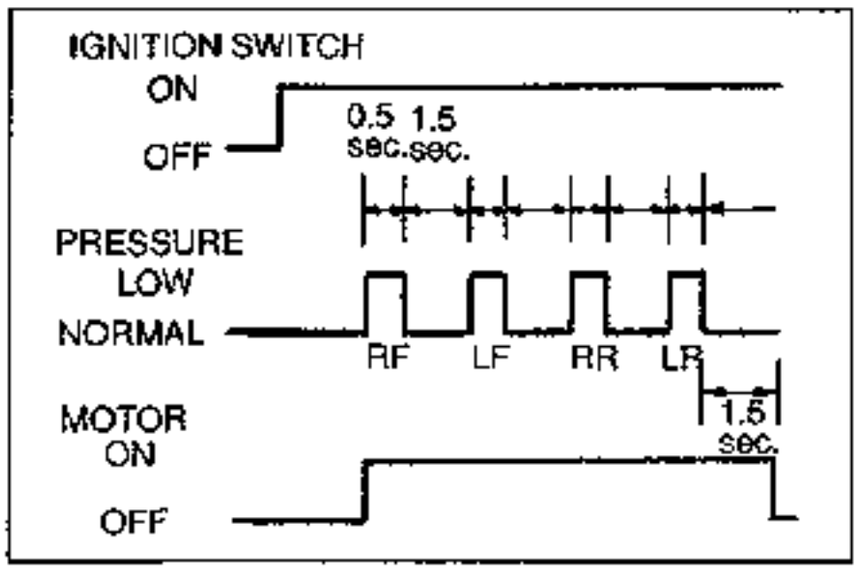
ABS HYDRAULIC UNIT

The ABS control module contains a self-diagnostic function to check the hydraulic system operation. During the diagnostic mode, the ABS control module activates the ABS hydraulic unit to reduce the hydraulic pressure of the right front, left front, right rear, left rear in sequence for **0.5 second** each at intervals of **1.5 seconds**.









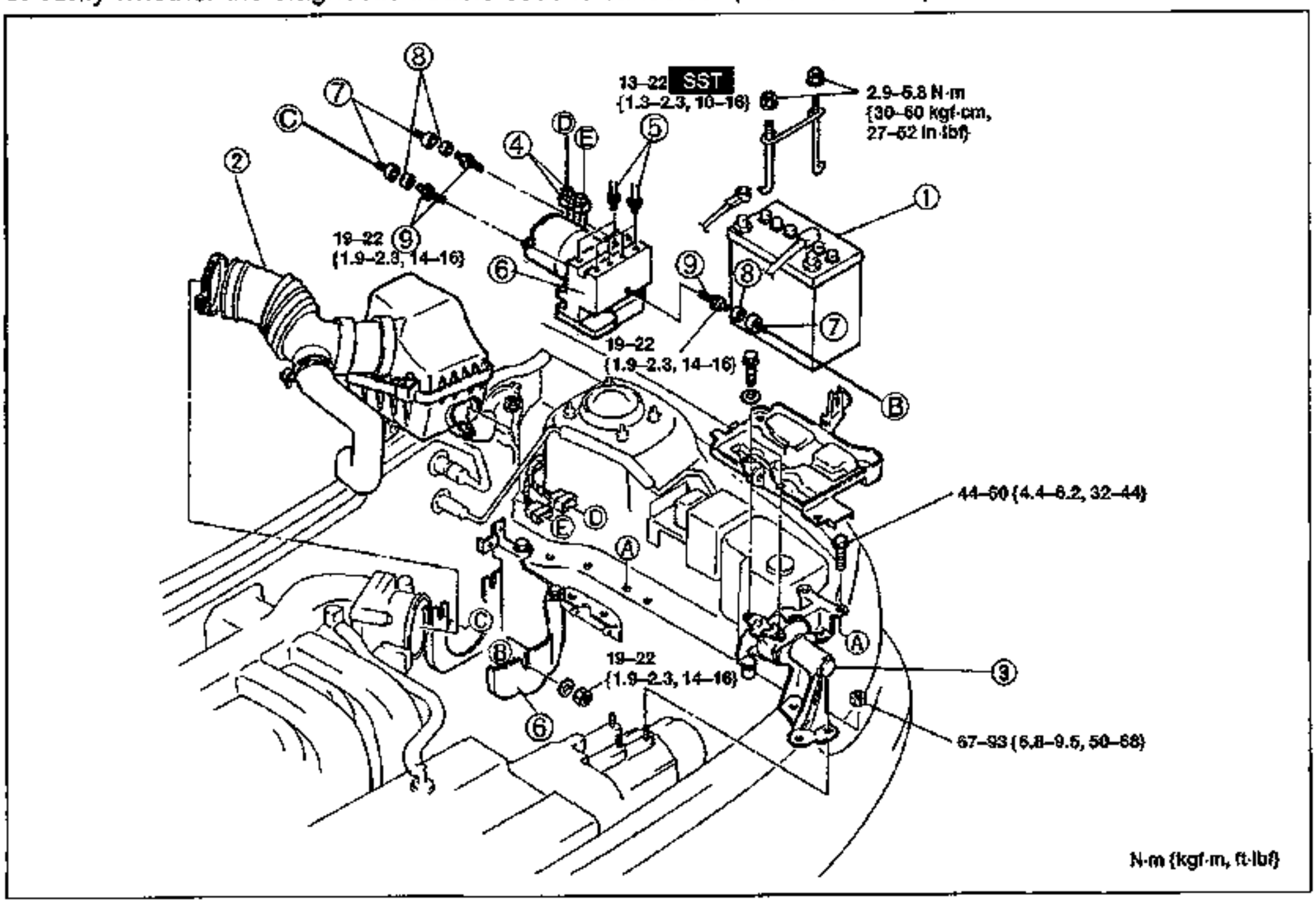
Inspection

1. Verify that the battery is fully charged. Verify that the ABS warning light goes out after the engine is started.
2. If the light stays ON after the engine has started, the ABS control module detects a failure and will not activate the hydraulic unit.
3. Turn off the engine.
4. On level ground, jack up the vehicle and support it evenly on safety stands. Shift the transaxle to neutral or N range.
5. Release the parking brake.
6. Rotate the wheels by hand, and inspect for brake drag.
7. Using a jumper wire, connect the TBS and GND terminals of the data link connector.
8. Depress the brake pedal, and have an assistant verify that the right front wheel will not turn.
9. With the brake still depressed, turn the ignition switch ON and verify that the brake is released momentarily **(approx. 0.5 sec.)** and the wheel turns when pressure-reduction operates.
10. Check operation of the remaining wheels in order: left front, right rear, left rear.
11. If Steps 8,9 and 10 show correct operation, the following systems are OK:
    - Brake piping to ABS hydraulic unit
    - Braking system, including ABS hydraulic unit
    - Electrical system in ABS hydraulic unit (solenoid, motor, etc.)
    - ABS control module, its output system (solenoid, relay, etc.) and harness

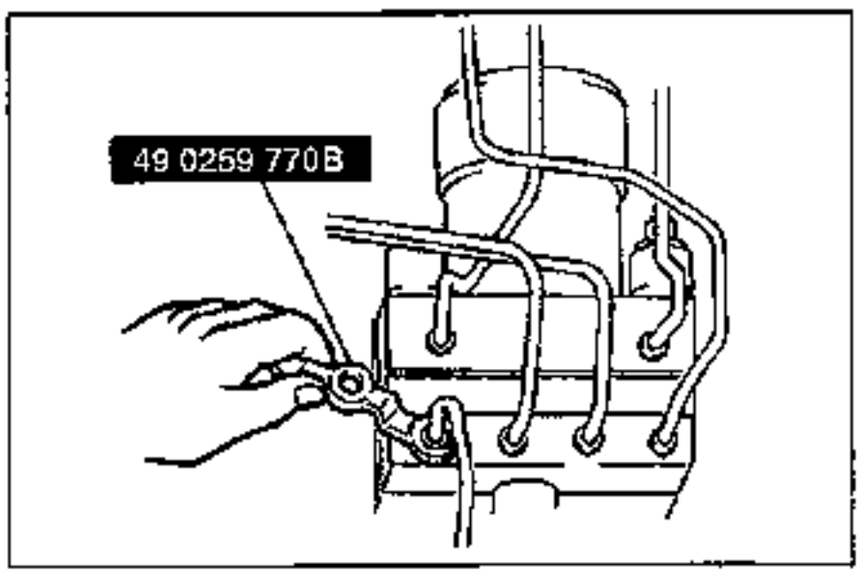
    The following are not checked with the above steps.
    - Input system and harness of ABS control module
    - Fluid leakage
    - Intermittent failure
12. Replace the ABS hydraulic unit if necessary.

Removal / Installation

1. Remove the nuts mounting the fuel filter and igniter to the bracket, and move them toward the engine.
2. Remove the hydraulic unit in order shown in the figure, referring to **Removal Note.**
3. Install in the reverse order of removal, referring to **Installation Note.**
4. Add brake fluid, bleed the air, and check for fluid leakage.
5. Verify whether the diagnostic trouble code is canceled. (Refer to P–56.)



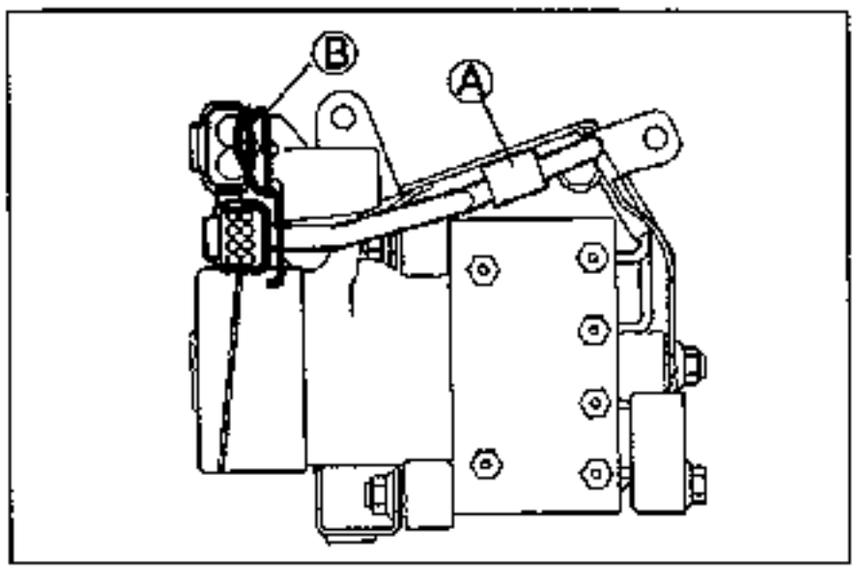
1. Battery
2. Air cleaner
3. Mount bushing
4. Connectors
5. Brake pipe
   Removal / installation
   Note ..... below
6. ABS hydraulic unit assembly
7. Casing
8. Mount
9. Hex stud



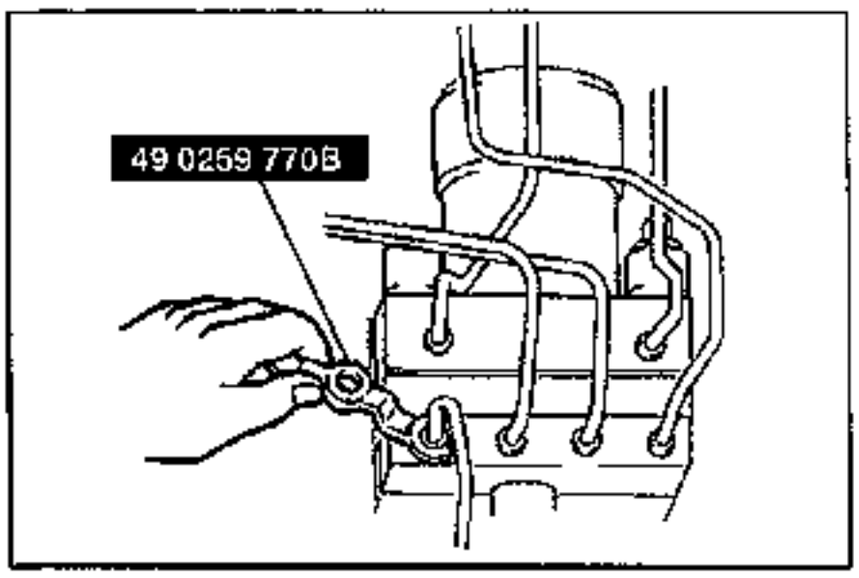
Removal Note
Brake pipes

Caution
- **Brake fluid will damage painted surfaces. If it does get on a painted surface, wipe it off immediately.**

Loosen the brake pipes by using the **SST**.



Installation Note
ABS hydrauric unit
1. Clamp the harness to point A of the bracket.
2. Install the band around point B of the bracket and the harness, and tighten the band until it contacts the bracket.
3. Cut off the rest of the band end so that the rest of band notches are less than seven.

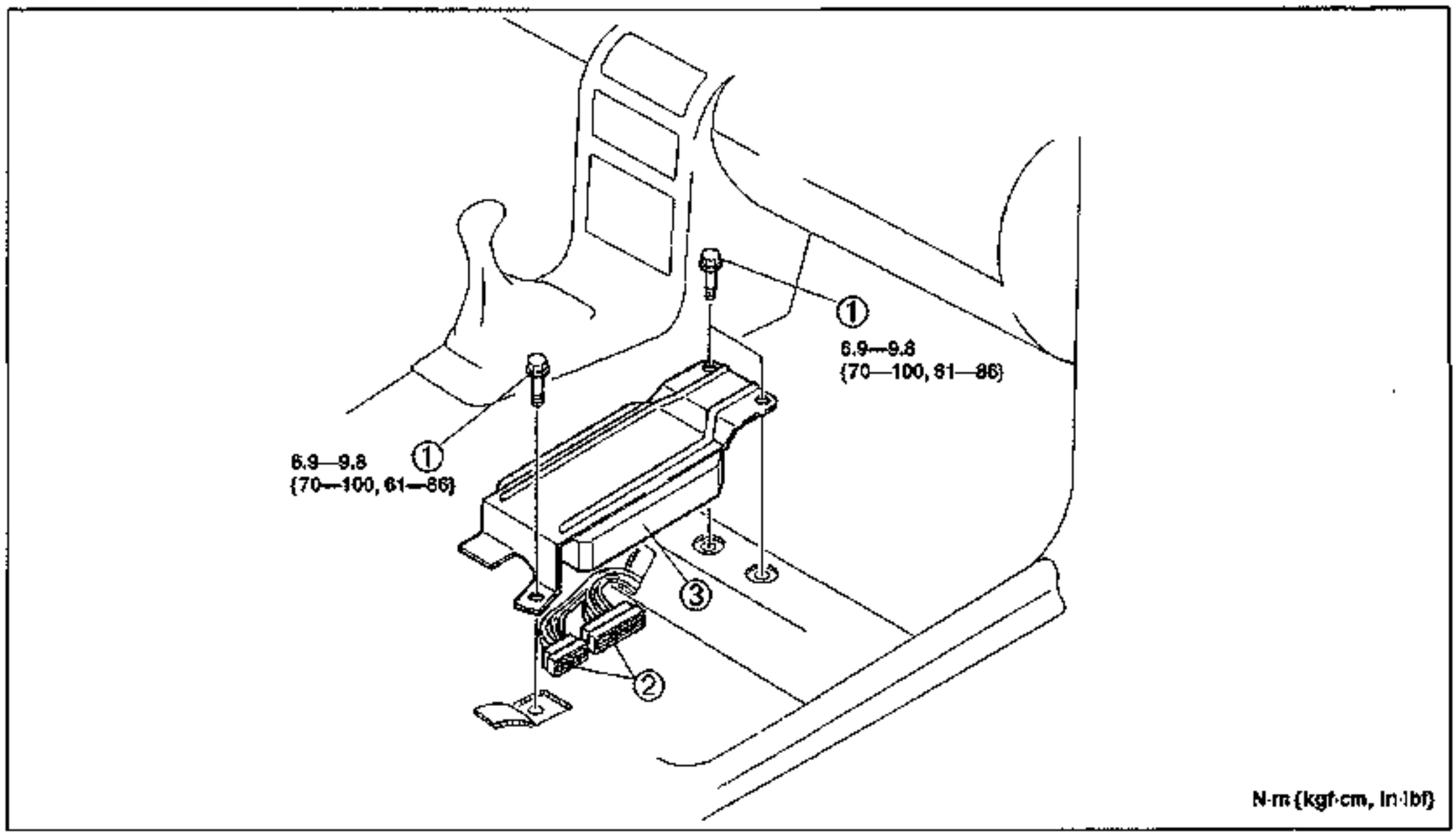


Brake pipes
Tighten the brake pipe by using the **SST**.

Tightening torque:
13–22 N·m {1.3–2.3 kgf·m, 10–16 ft·lbf}

ABS CONTROL MODULE

Removal / Installation
1. Disconnect the negative battery cable.
2. Remove the passenger seat.
3. Roll back the carpet.
4. Remove in order shown in the figure.
5. Install in the reverse order of removal.
6. Connect the negative battery cable, verify whether the diagnostic trouble code is canceled. (Refer to page P–56.)

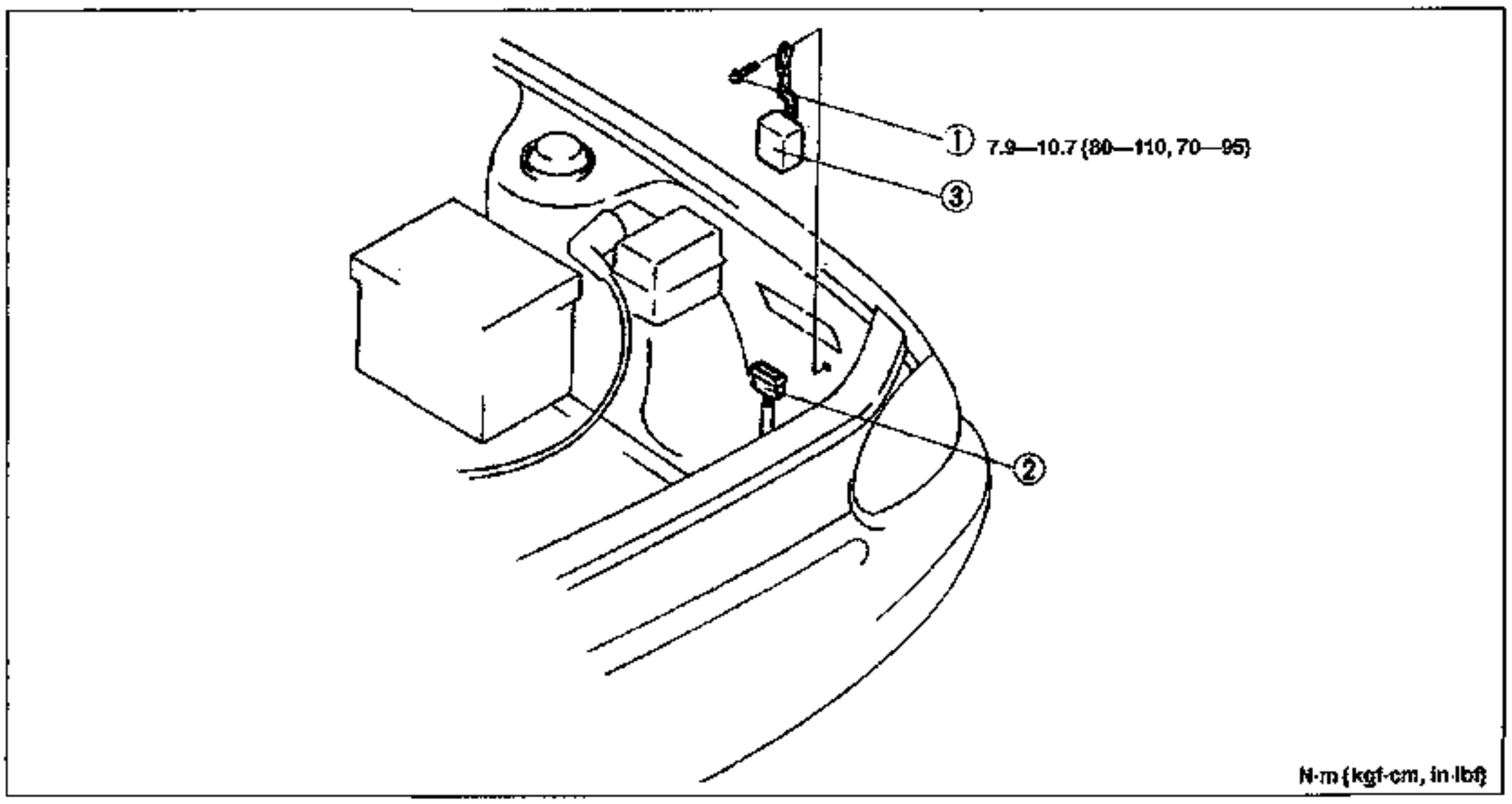


1. Bolt
2. Connector
3. ABS control module

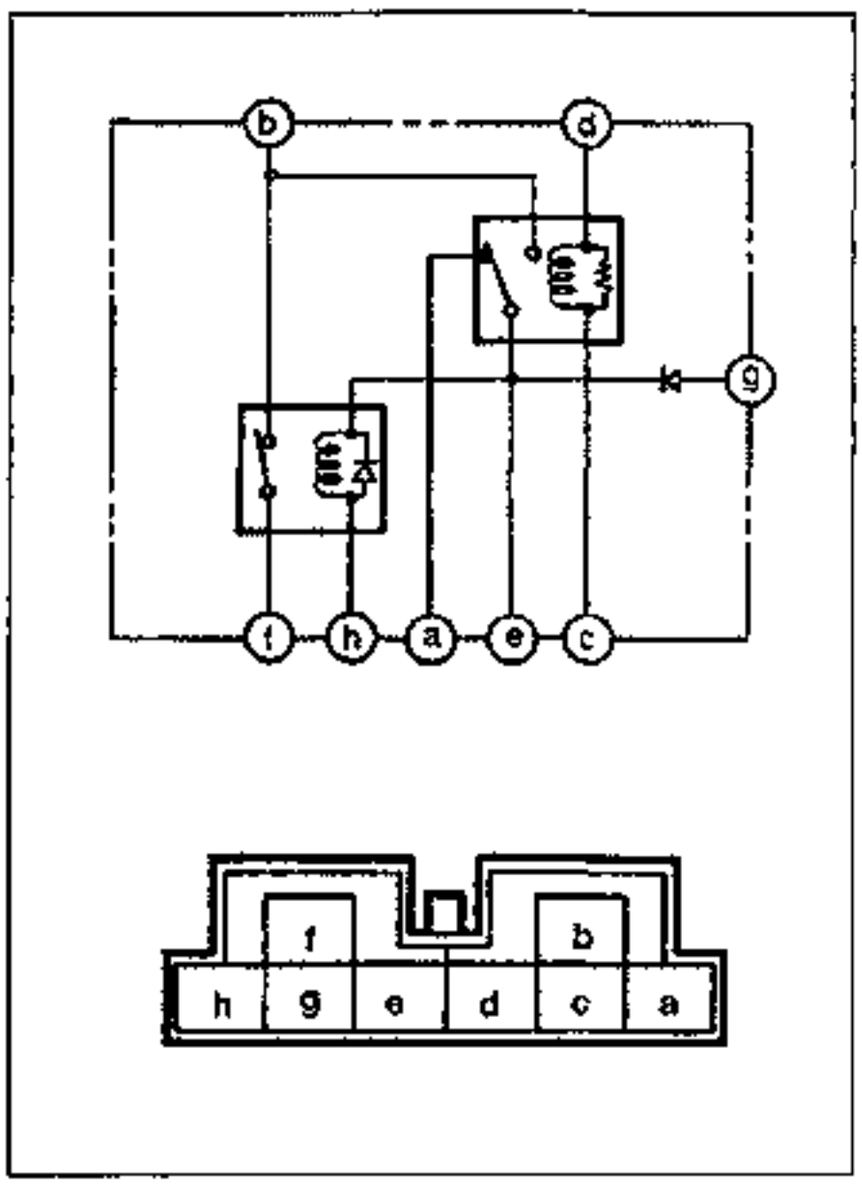
ABS RELAY

Removal / Inspection / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.
4. Connect the negative battery cable, verify whether the diagnostic trouble code is canceled. (Refer to page P–56.)



1. Bolt
2. Connector
3. ABS relay
   Inspection ..... below



Inspection

ABS relay (Fail-safe relay)

1. Measure resistance between terminals (c) and (d) of the ABS relay connector.

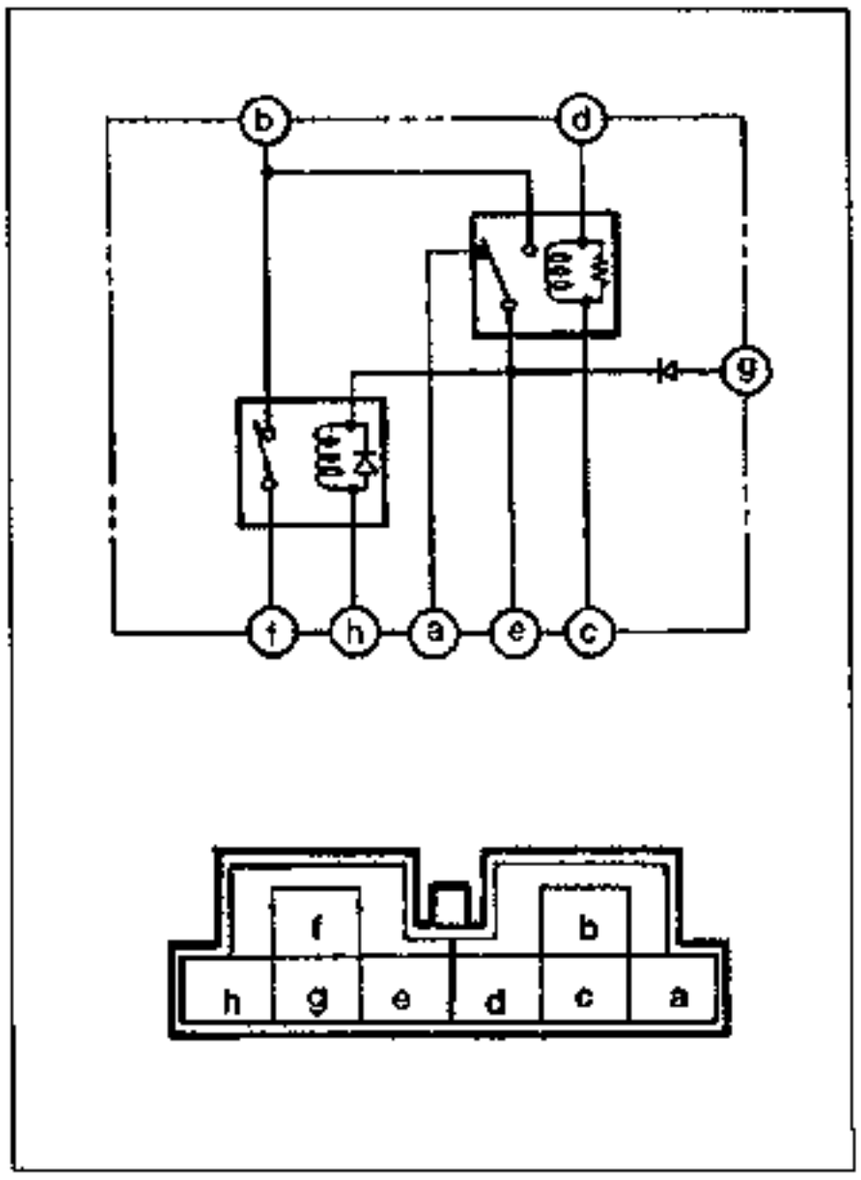
   Resistance: 60–100Ω

2. Check continuity between terminals (a) and (e) and between (b) and (e).

Terminal	Continuity
a–e	Yes
b–e	No

3. Apply 12V to terminals (d) and (c). Check for continuity between terminals (b) and (e) and between (a) and (e).

Terminal	Continuity
b–e	Yes
a–e	No



4. If not as specified, replace the ABS relay.

ABS relay (Motor relay)

1. Measure the resistance between terminals (e) and (h) or between (a) and (h) of the ABS relay connector.

   Resistance: 50–90Ω

2. Check continuity between terminals (b) and (f).

Terminal	Continuity
b–f	No

3. Apply 12V to terminals (g) (+) and (h) (–). Check for continuity between terminals (b) and (f).

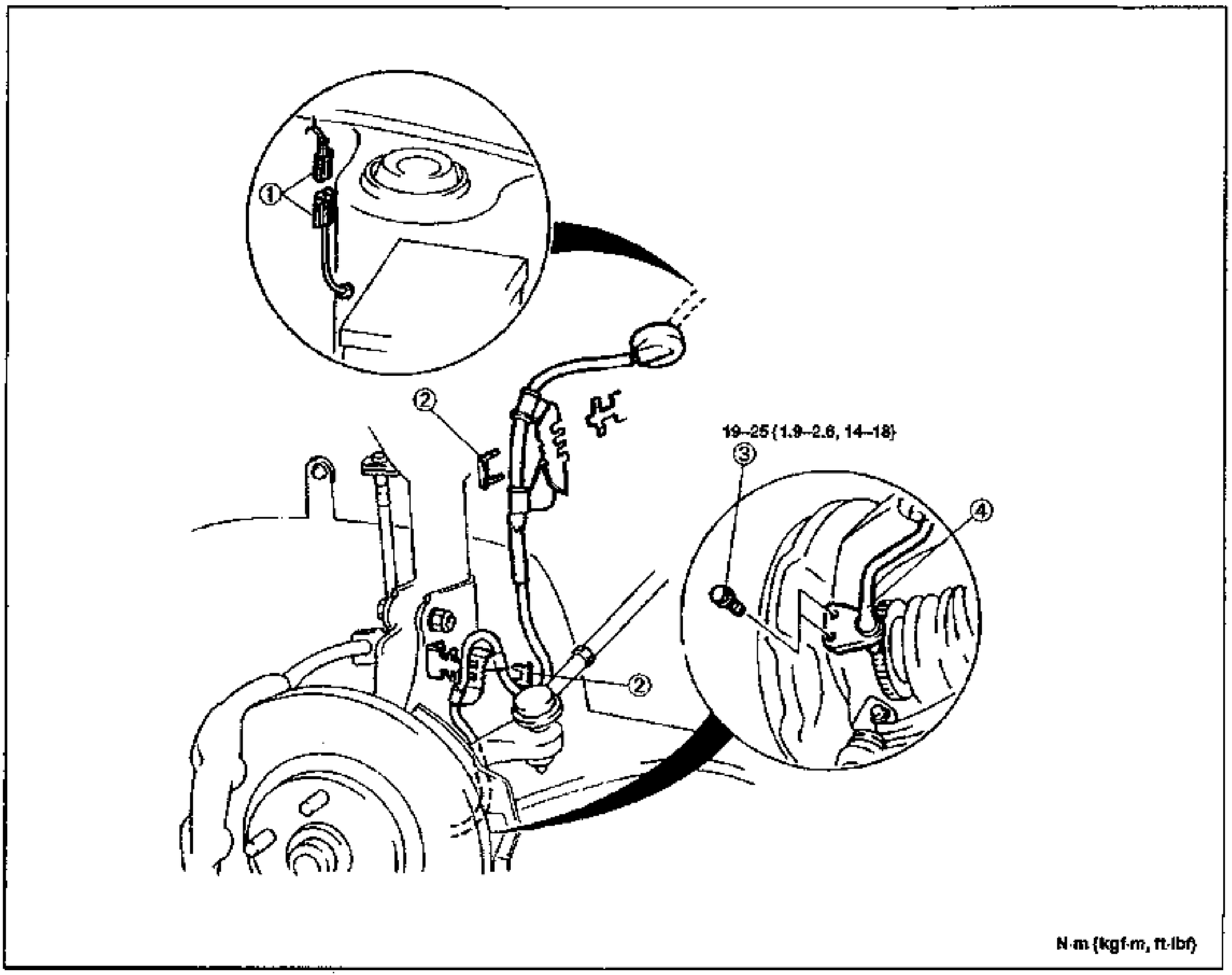
Terminal	Continuity
b–f	Yes

4. If not as specified, replace the ABS relay.

ABS WHEEL-SPEED SENSOR (FRONT)

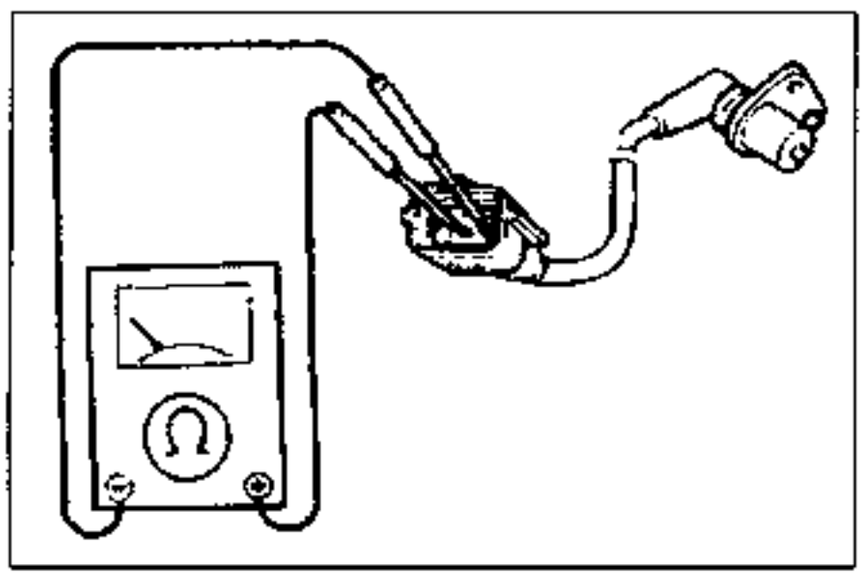
Removal / Inspection / Installation

1. Jack up the vehicle and support it on safety stands.
2. Remove the wheel and tire assembly.
3. Remove in the order shown in the figure.
4. Install in the reverse order of the removal.
5. Install the wheel and tire assembly.
6. Verify whether the diagnostic trouble code is canceled. (Refer to page P–56.)



N·m {kgf·m, ft·lbf}

1. Connector
2. Clip
3. Bolts
4. ABS wheel-speed sensor
   Inspection ..... below



Inspection

1. Check resistance at the ABS wheel-speed sensor terminals.

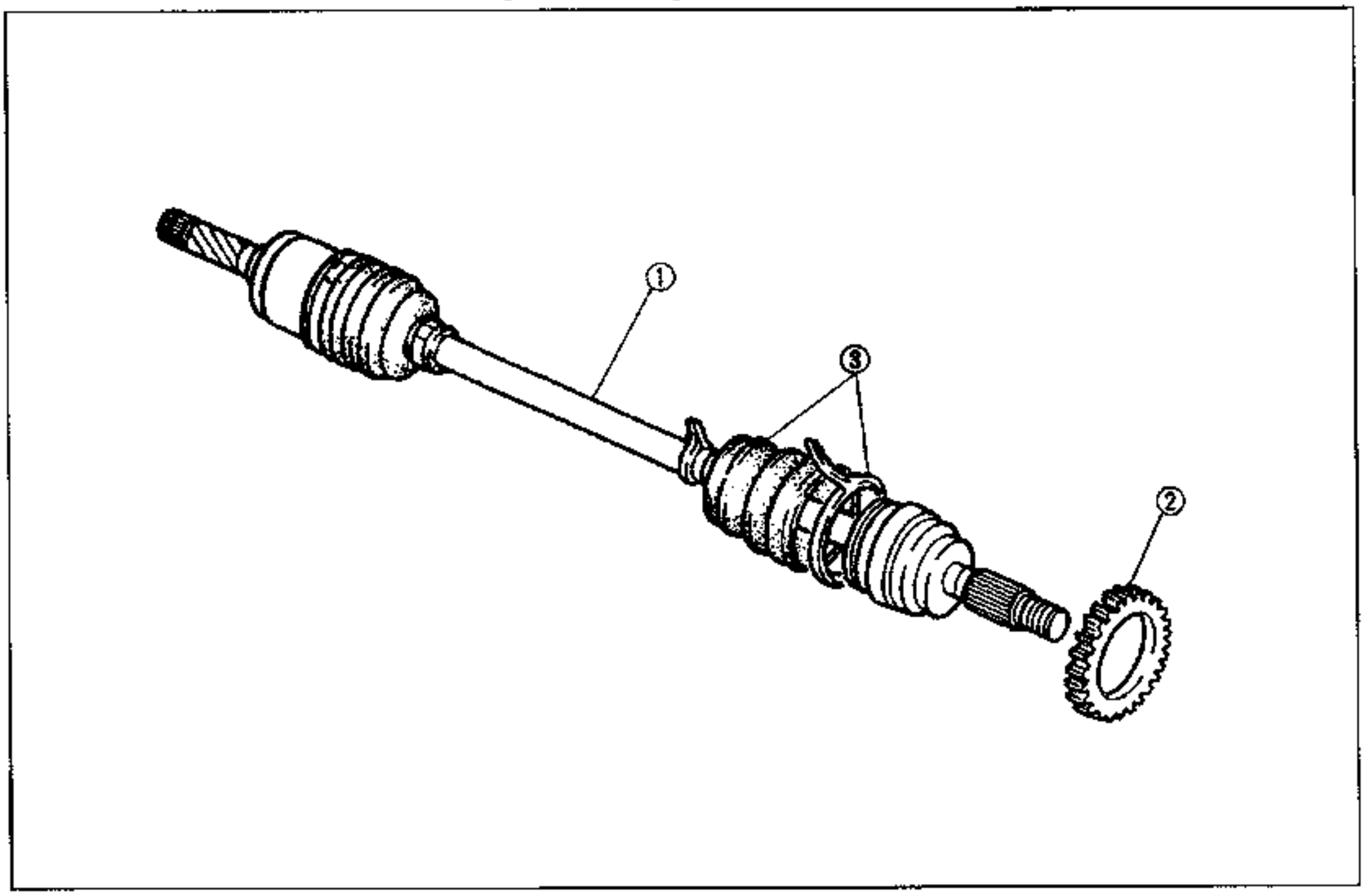
   Resistance: 1.6–2.0 kΩ

2. If not as specified, replace the ABS wheel-speed sensor.

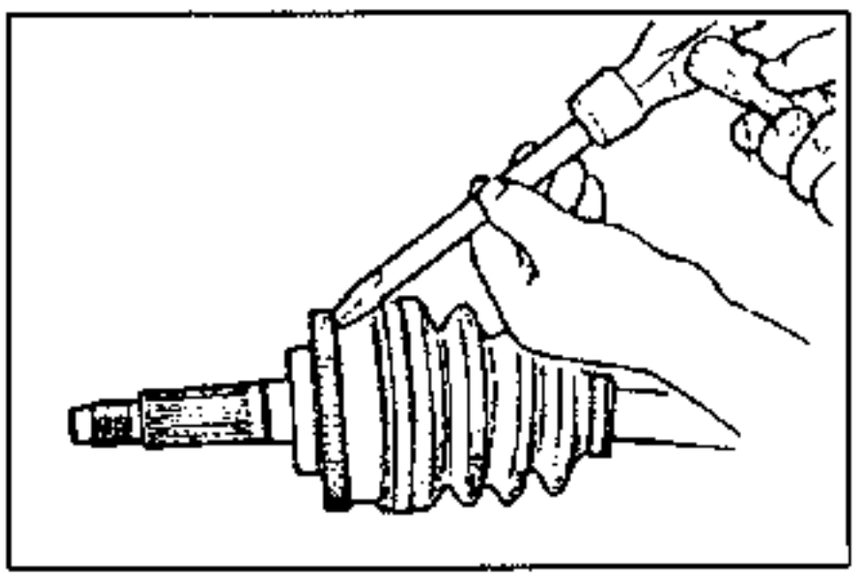
ABS SENSOR ROTOR (FRONT)

Removal / Inspection

1. Inspect the ABS sensor rotor for missing and damaged teeth.
2. Remove the drive shaft assembly from the vehicle.
3. Remove in the order shown in the figure, referring to **Removal Note**.



1. Driveshaft
   Removal ..... section M
2. ABS sensor rotor
   Removal Note ..... below
3. Boot band and boot

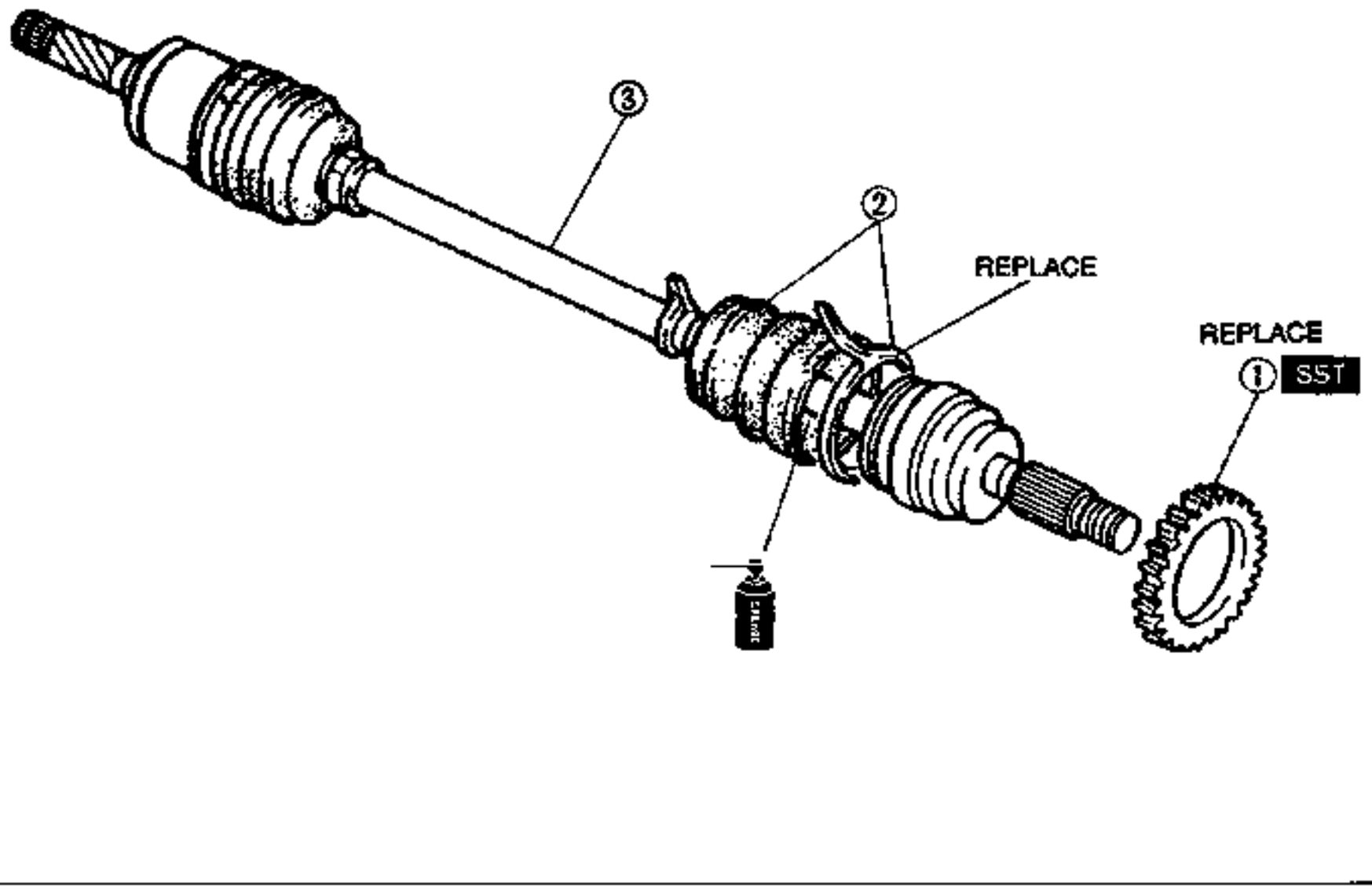


Removal Note

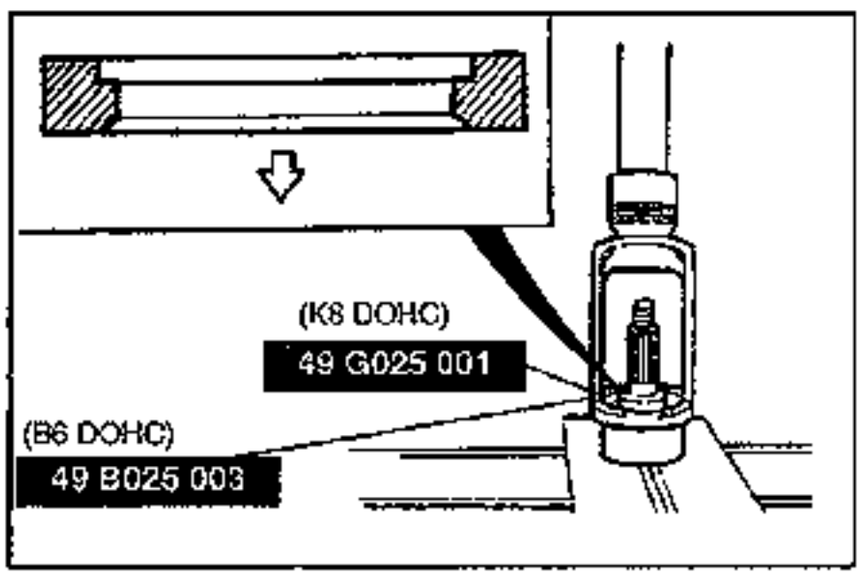
ABS sensor rotor

Tap the ABS sensor rotor off the drive shaft with a chisel as shown.

Installation
1. Install in the order shown in the figure, referring to **Installation Note**.
2. Install the drive shaft assembly to the vehicle.



1. ABS sensor rotor
   Installation Note ..... below
2. Boot and boot band
   Installation ..... section M
3. Drive shaft
   Installation ..... section M

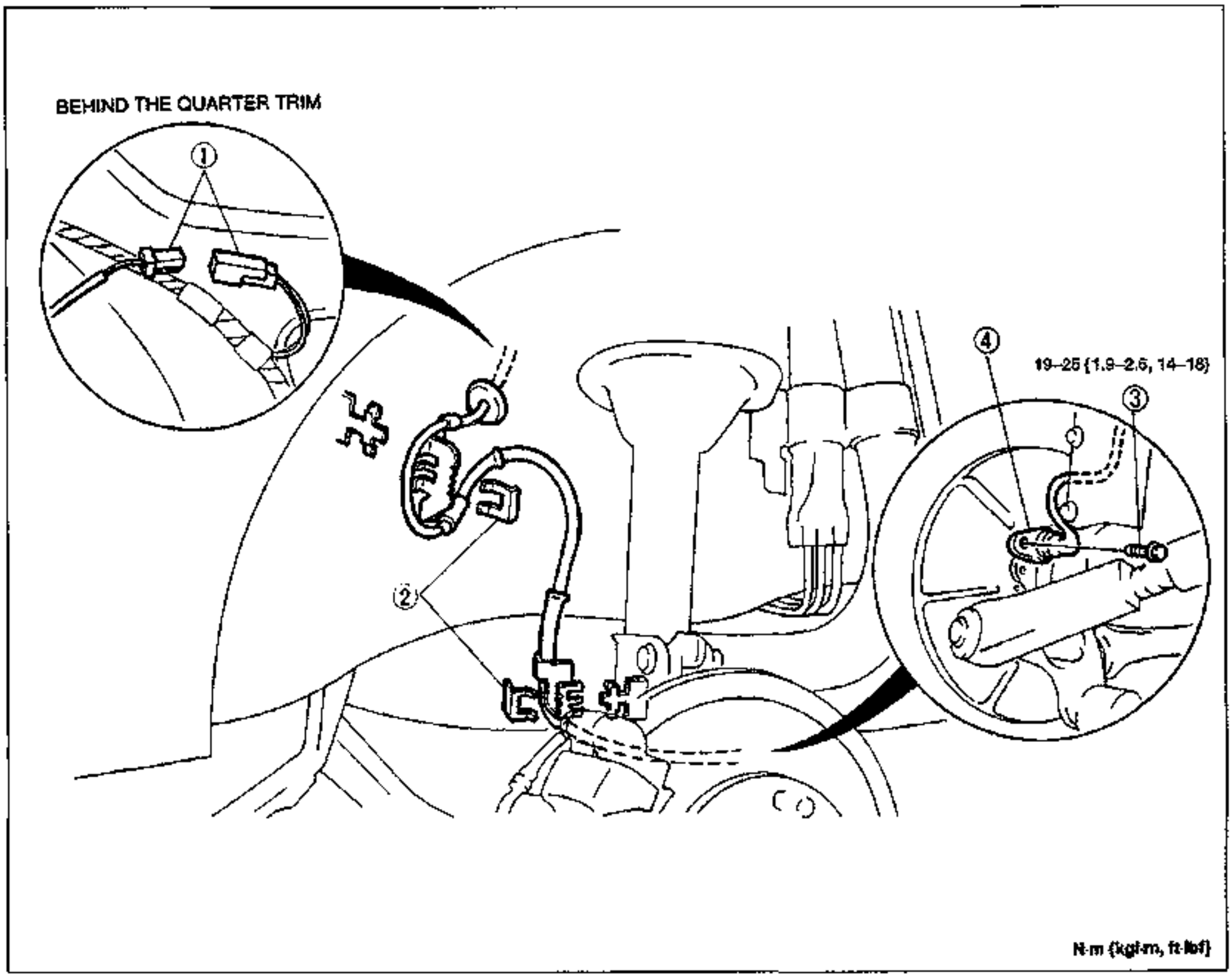


Installation Note
ABS sensor rotor
Set a new ABS sensor rotor on the drive shaft in the direction shown and press it on by using the **SST**.

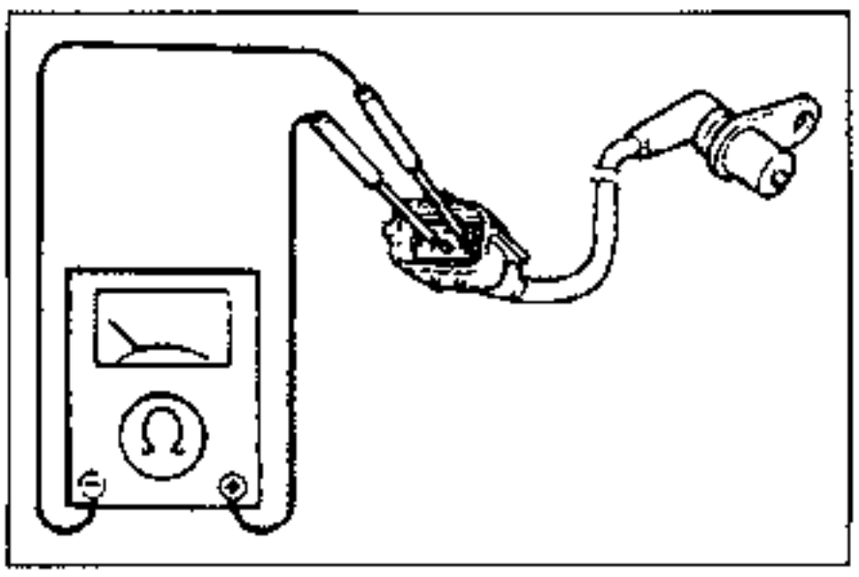
ABS WHEEL-SPEED SENSOR (REAR)

Removal / Inspection / Installation

1. Jack up the vehicle and support it on safety stands.
2. Remove the wheel and tire assembly.
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.
5. Install the wheel and tire assembly.
6. Verify whether the diagnostic trouble code is canceled. (Refer to P–56.)



1. Connector
2. Clip
3. Bolt
4. ABS wheel-speed sensor
   Inspection ..... below



Inspection

1. Check resistance at the ABS wheel-speed sensor terminals.

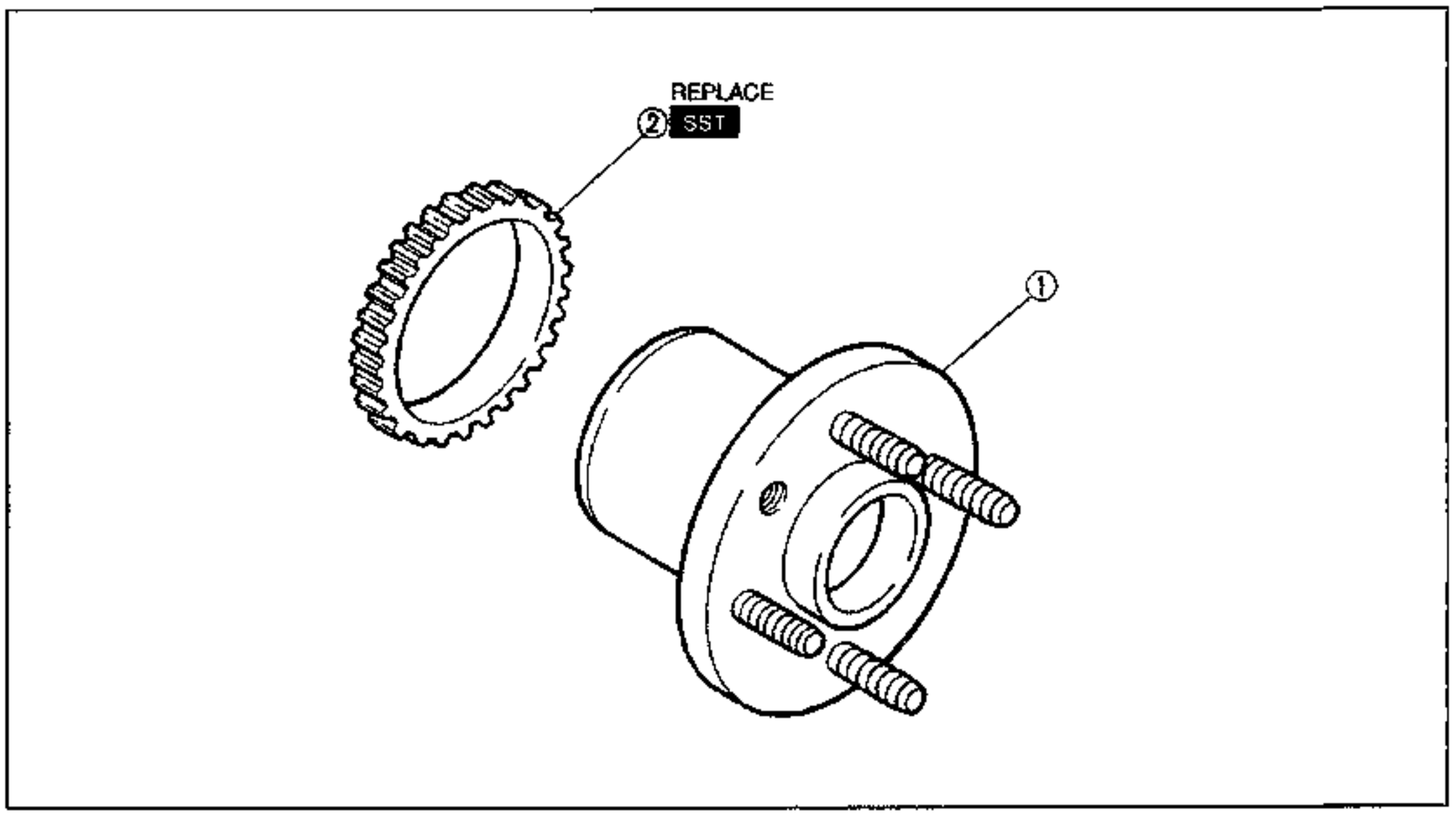
   Resistance: 1.6–2.0 kΩ

2. If not as specified, replace the ABS wheel-speed sensor.

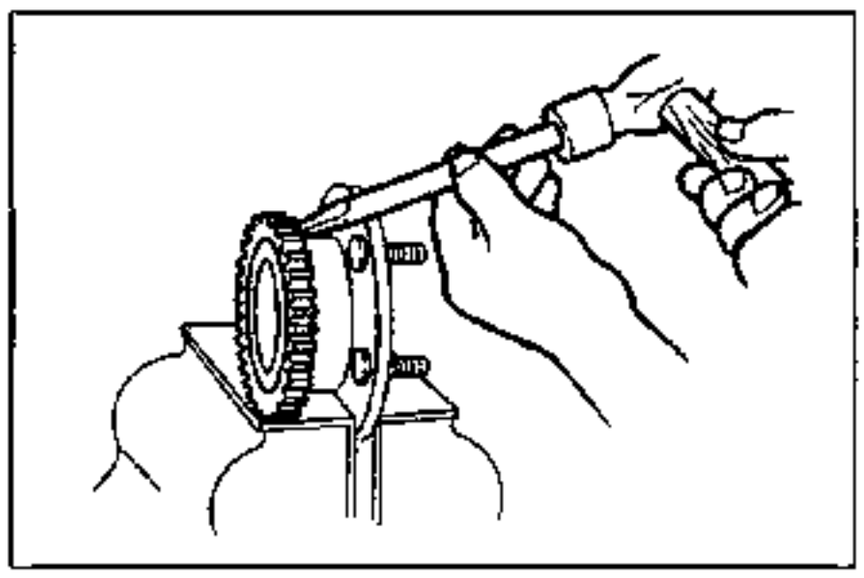
ABS SENSOR ROTOR (REAR)

Removal/Installation

1. Remove the rear wheel hub assembly from the vehicle.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the order shown in the figure, referring to **Installation Note**.
4. Install the rear wheel hub assembly to the vehicle.



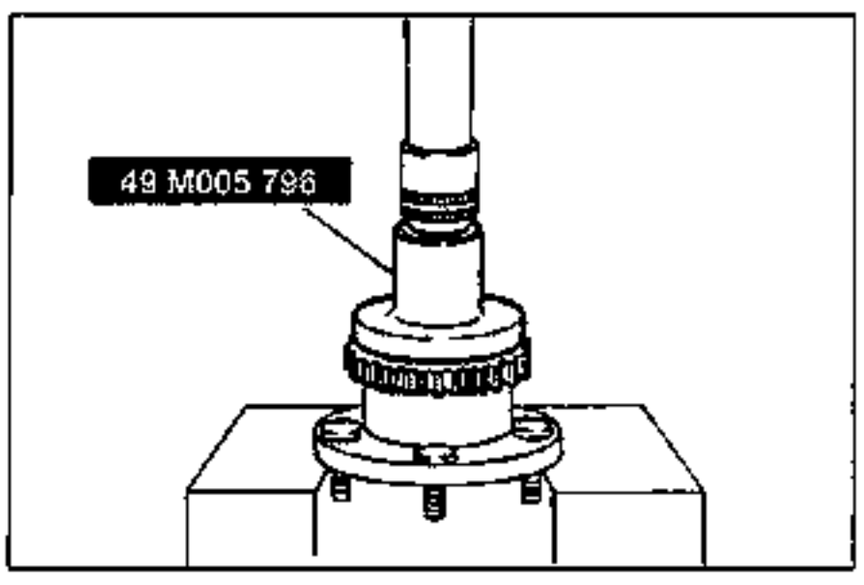
1. Wheel hub
2. ABS sensor rotor
   Removal Note ..... below
   Installation Note ..... below



Removal Note

ABS sensor rotor

Tap the ABS sensor rotor off the wheel hub with a chisel.



Installation Note

ABS sensor rotor

1. Install a new rear ABS sensor rotor on to the wheel hub.
2. Press the rotor until it is flush with the wheel hub by using the **SST**.

Note

- The ABS sensor rotor can be installed in either direction.

WHEELS AND TIRES

OUTLINE ..... Q- 2
SPECIFICATIONS ..... Q- 2
TROUBLESHOOTING GUIDE ..... Q- 3
WHEELS AND TIRES ..... Q- 4
SPECIAL NOTES ABOUT WHEELS AND TIRES ..... Q- 4
NOTES REGARDING TIRE REPLACEMENT ..... Q- 4
INSPECTION / ADJUSTMENT ..... Q- 4
REMOVAL / INSTALLATION ..... Q- 6
TIRE ROTATION ..... Q- 6
WHEEL BALANCE ADJUSTMENT ..... Q- 6

OUTLINE

SPECIFICATIONS
Standard Tire

Item			Specifications		
			B6 DOHC	K8 DOHC	
Wheel	Size		14x51/2JJ	15x6JJ	
	Offset	mm {in}	45 {1.77}	45 {1.77}	
	Pitch circle diameter	mm {in}	100 {3.94}	100 {3.94}	
	Material		Steel or aluminum alloy	Aluminum alloy	
Tire	Size		P185/65R14 85S	P205/55R15 87V	P205/55R15 87V M+S
	Air pressure kPa {kgf/cm^2, psi}	Front	216 {2.2,32}	196 {2.0, 28}	216 {2.2, 32}
		Rear	216 {2.2,32}	196 {2.0, 28}	216 {2.2, 32}

Temporary spare tire

Item			Specifications	
			B6 DOHC	K8 DOHC
Wheel	Size		15 × 4T	
	Offset	mm {in}	45 {1.77}	
	Pitch circle diameter	mm {in}	100 {3.94}	
	Material		Steel	
Tire	Size		T115/70D14	T115/70D15
	Air pressure	kPa {kgf/cm^2, psi}	415 {4.2,60}	

TROUBLESHOOTING GUIDE

Problem	Possibl cause	Action	Page
Excessive or irregular tire wear	Refer to pages Q–5 for details.		
Premature tire wear	Incorrect tire pressure	Adjust	Q–5
Tire squeal	Incorrect tire pressure Tire deterioration	Adjust Replace	Q–5 —
Road noise or body vibration	Insufficient tire pressure Unbalanced wheel Deformed wheel or tire Irregular tire wear	Adjust Adjust Repair or replace —	Q–5 Q–6 — Q–5
"Shake" occurs (steering wheel vibrates up / down)	Excessive tire and wheel runout Loose lug nuts Unbalanced wheel Cracked or worn engine mount rubber Cracked or worn transaxle mount rubber	Replace Tighten Adjust Replace Replace	— Q–5 Q–6 section B section J, K
"Shimmy" occurs (steering wheel vibrates circumferentially)	Excessive tire and wheel runout Loose lug nuts Unbalanced wheel Irregular tire wear Insufficient tire pressure Damaged or worn front wheel bearing Malfunction of steering system Malfunction of suspension	Replace Tighten Adjust — Adjust Replace — —	— Q–5 Q–6 Q–5 Q–5 section M section N section R
Steering wheel pulls to one side	Incorrect tire pressure Excessive or irregular tire wear Malfunction of steering system Malfunction of braking system Malfunction of suspension	Adjust — — — —	Q–5 Q–5 section N section P section R
General driving instability	Unequal tire pressures Deformed wheel or tire Loose lug nuts Malfunction of steering system Malfunction of suspension	Adjust Repair or replace Tighten — —	Q–5 — Q–5 section N section R
Uneven (one-sided) braking	Unequal tire pressures Malfunction of braking system	Adjust —	Q–5 section P
Heavy handling	Insufficient tire pressure Malfunction of steering system Malfunction of suspension	Adjust — —	Q–5 section N section R
Steering wheel doesn't return properly	Insufficient tire pressure Malfunction of steering system Malfunction of suspension	Adjust — —	Q–5 section N section R

WHEELS AND TIRES

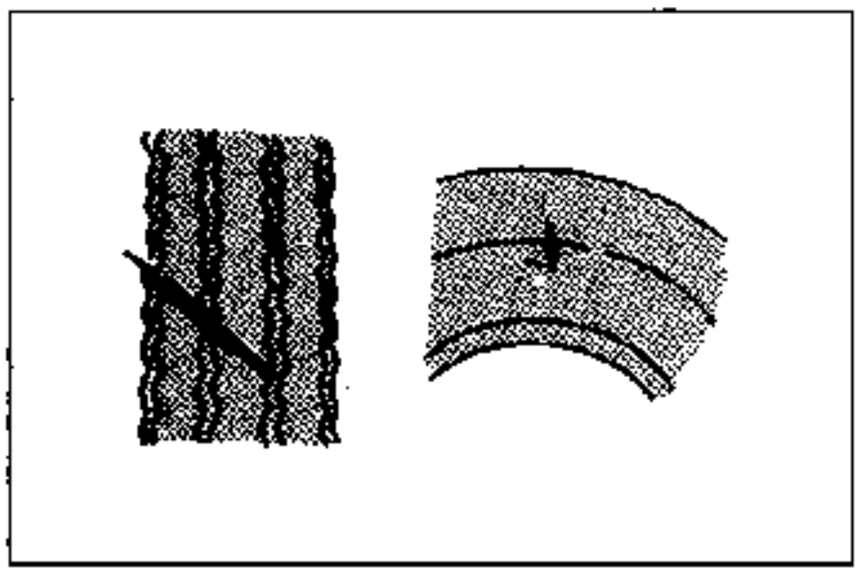
SPECIAL NOTES ABOUT WHEELS AND TIRES

1. Do not use wheels or tires other than those types specified.
2. Aluminum wheels are easily scratched. When washing them, use a soft cloth, never a wire brush. If the vehicle is steam cleaned, do not allow boiling water to contact the wheels.
3. If alkaline compounds (such as salt-water or road salts) get on aluminum wheels, wash them as soon as possible to prevent damage. Use only a neutral detergent.

NOTES REGARDING TIRE REPLACEMENT

Note the following points when tires are to be removed from or mounted onto the wheels.

1. Be careful not to damage the tire bead, the rim bead, or the edge of the rim.
2. Use a wire brush, sandpaper, or cloth to clean and remove all rust and dirt from the rim edge and the rim bead.
3. When cleaning aluminum wheels, use a soft cloth, never a wire brush or sandpaper.
4. Remove pebbles, glass, nails, and other foreign items embedded in the tire tread.
5. Be sure the air valve is installed correctly.
6. Apply a soapy solution to the tire bead and the edge of the rim before mounting.
7. After mounting a tire onto a wheel, inflate the tire to **250–300 kPa {2.55–3.06 kgf/cm^2, 36–42 psi}**. Verify that the bead is seated correctly on the rim and that there are no air leaks. Then reduce the pressure to the specified level.
8. If a tire iron is used to change a tire on an aluminum wheel, be sure to use a piece of rubber between the iron lever and the wheel to avoid damage to the wheel. Work should be done on a rubber mat, not on a hard or rough surface.

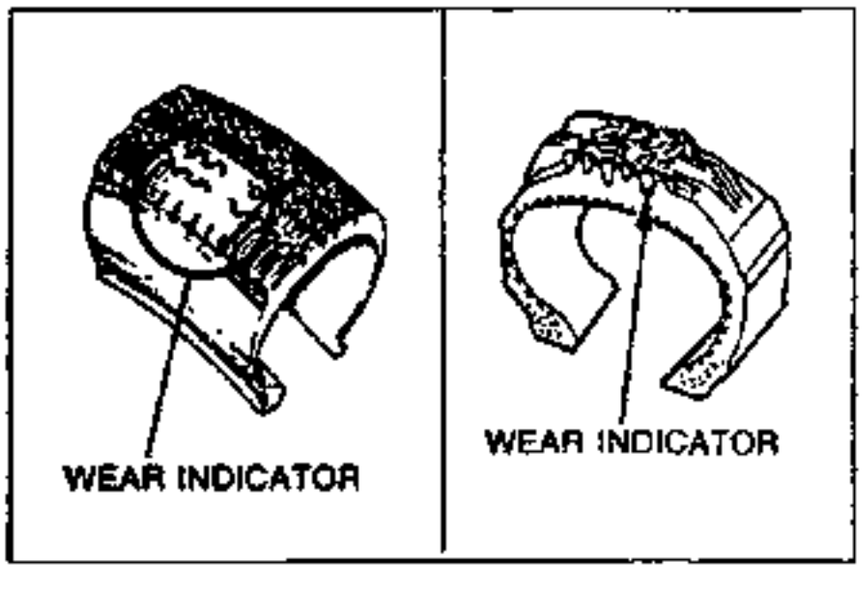


INSPECTION / ADJUSTMENT

Visual Inspection

Inspection (Tire and Wheel)

A wheel or a tire should be replaced if any cracks, damage, deformation and other problem is found.

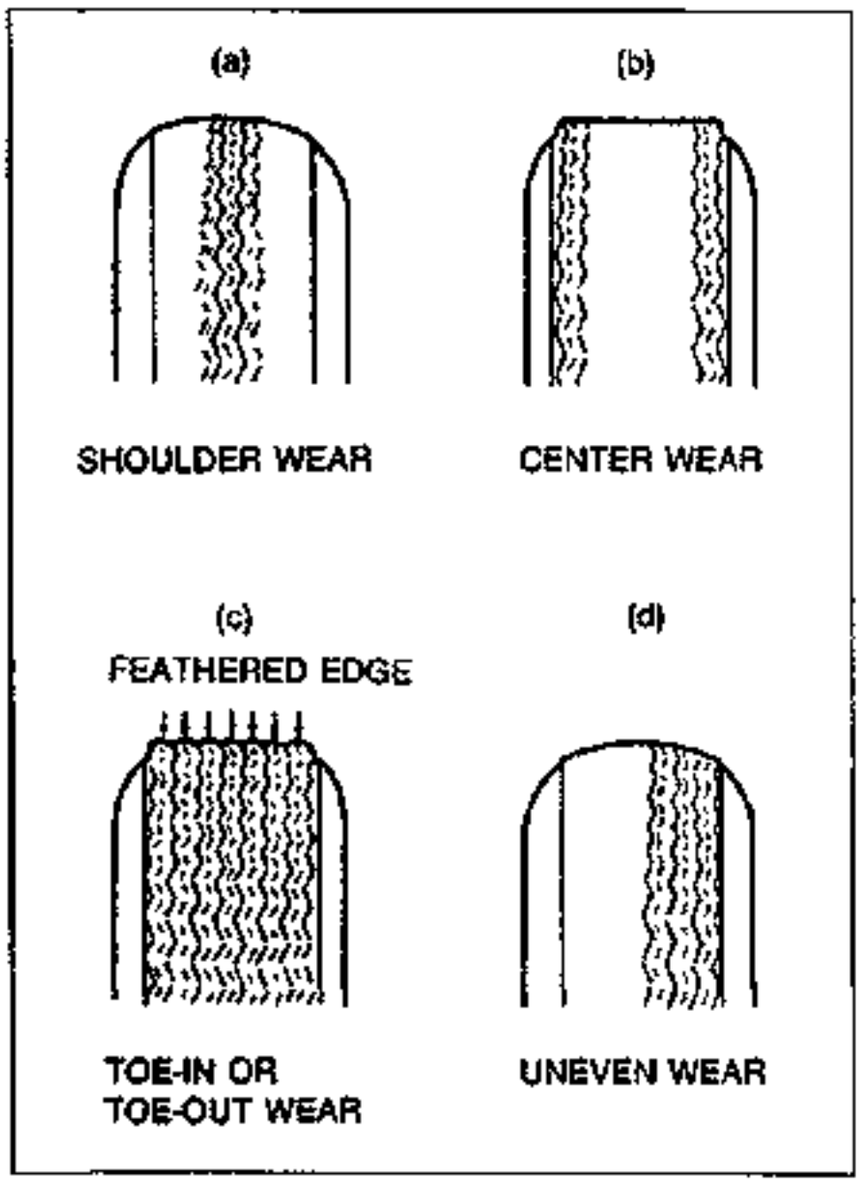


Tire Wear

1. Check the remaining tread.

Remaining tread
Standard tires: 1.6 mm {0.063 in} min.
Snow tires : 50% of tread

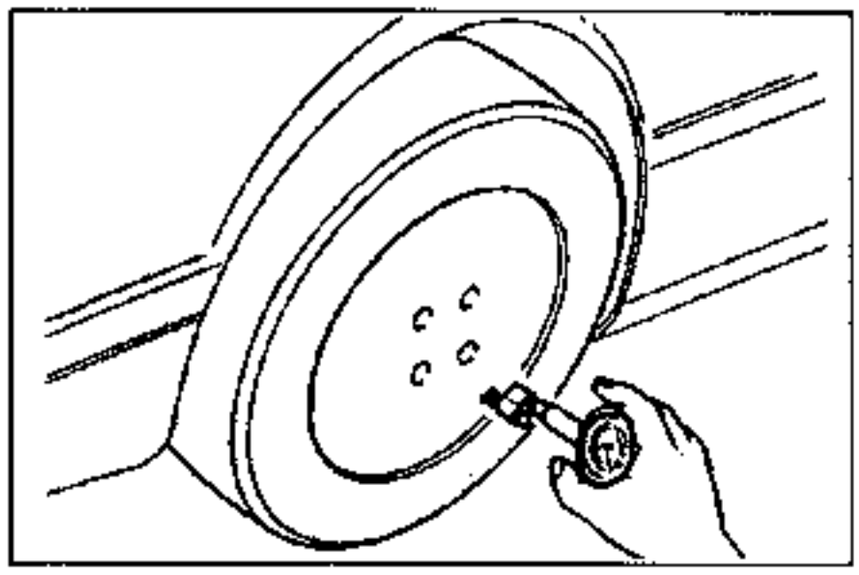
2. A tire should be replaced if the wear indicators are exposed.



Abnormal tire wear

Abnormal tire wear patterns, such as those shown in the illustration can occur. Refer to the chart for the possible causes and actions.

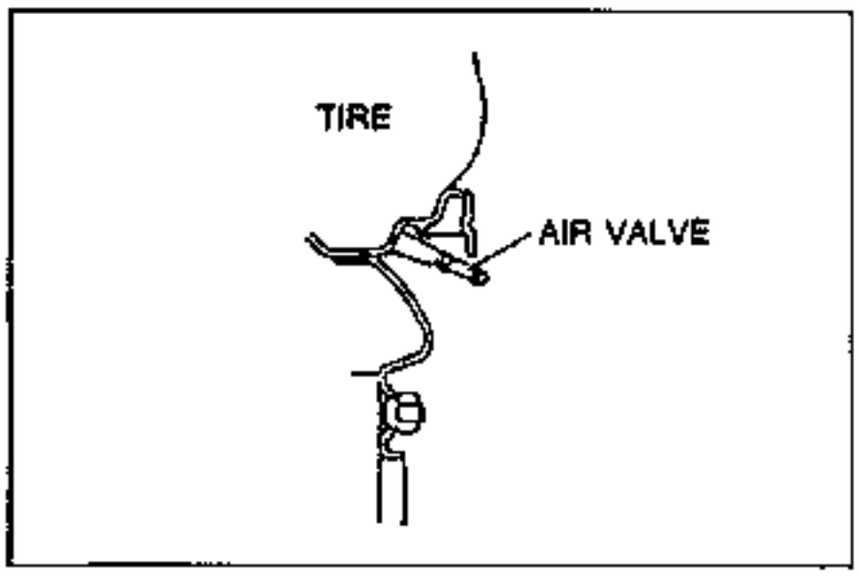
	Possible cause	Action
(a)	• Excessive tire pressure (both sides worn) • Incorrect camber (one side worn) • Hard cornering • Lack of rotation	• Measure and adjust pressure • Repair or replace suspension parts • Reduce speed • Rotate tires
(b)	• Insufficient tire pressure • Lack of rotation	• Measure and adjust pressure • Rotate tires
(c)	• Incorrect toe-in	• Adjust toe-in
(d)	• Incorrect camber or caster • Malfunctioning suspension • Unbalanced wheel • Out-of-round brake drum or disc • Other mechanical problem • Lack of rotation	• Repair or replace axle and suspension parts • Repair or replace • Balance or replace • Correct or replace • Correct or replace • Rotate tires



Air Pressure

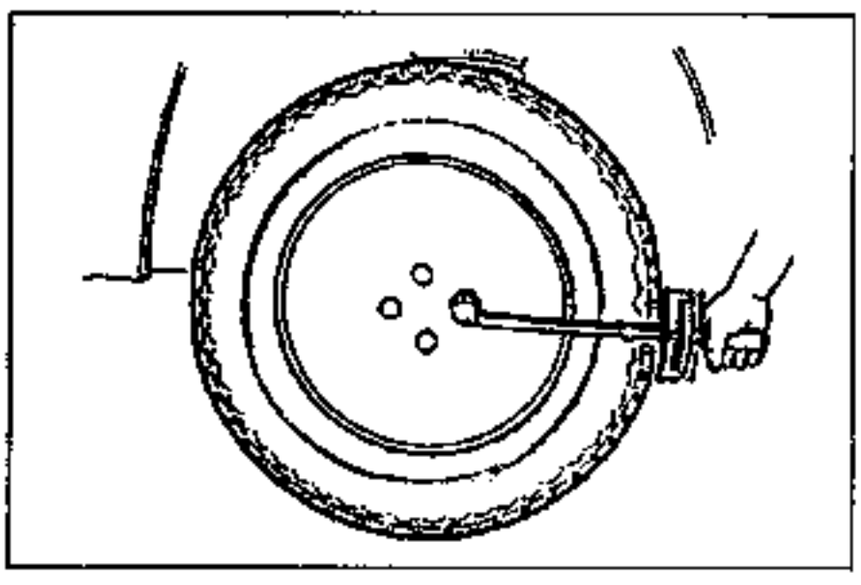
Check the air pressure of all tires when they are cold, including the spare tire, with an air pressure gauge. If necessary, adjust the air pressure.

Air pressure: Refer to Page Q–2



Air Leakage

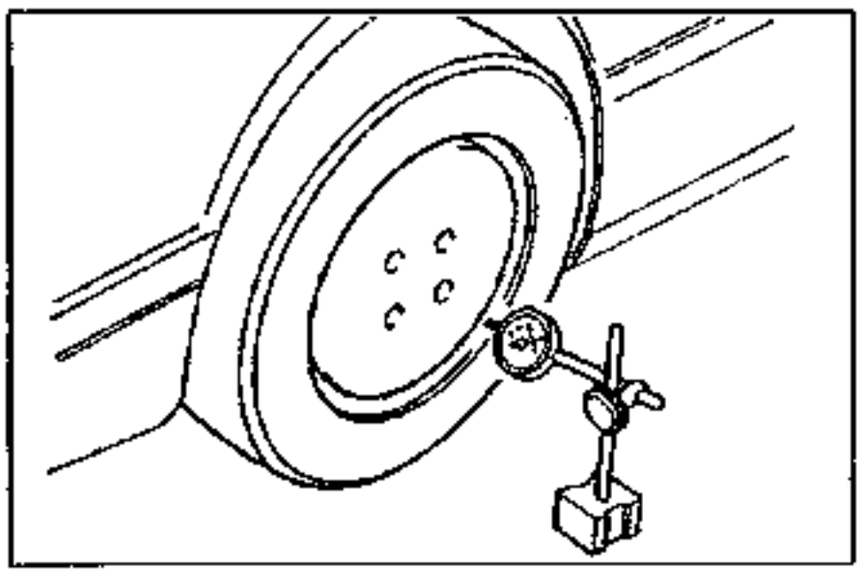
Verify that there is no air leakage from the air valve.



Loose Lug Nut

Verify that the lug nuts are tightened to the specified torque.

Tightening torque:
89–117 N·m {9.0–12.0 kgf·m, 66–86 ft·lbf}



Wheel and Tire Runout

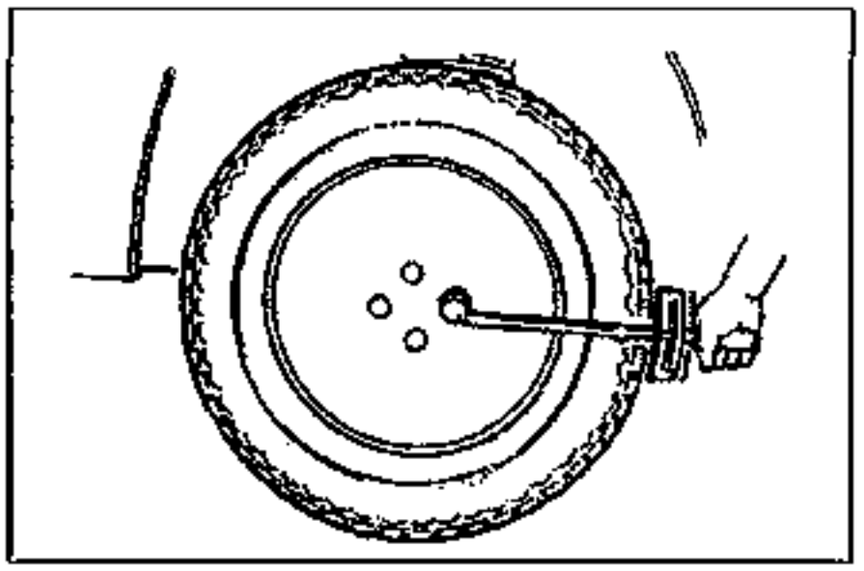
1. Jack up the vehicle and support it on safety stands.
2. Set the probe of a dial indicator against the wheel, and measure the runout through one full revolution.

Runout limit

mm{in}

Radial direction	1.5 {0.06}	
Lateral direction	2.5 {0.10}	Steel
	2.0 {0.08}	Aluminum

3. Replace the wheel if necessary.



REMOVAL / INSTALLATION

Installation

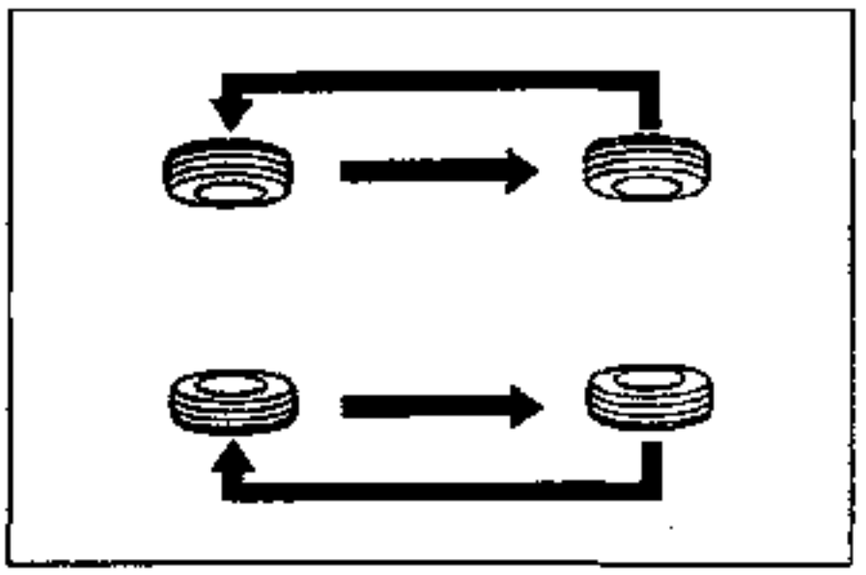
Caution

- **Applying oil to the lug nuts, bolts, or wheels will cause the lug nuts to become loosened.**

1. The wheel-to-hub contact surfaces must be clean.
2. Tighten the lug nuts to the specified torque in a crisscross fashion.

Tightening torque:
89–117 N·m {9.0–12.0 kgf·m, 66–86ft·lbf}

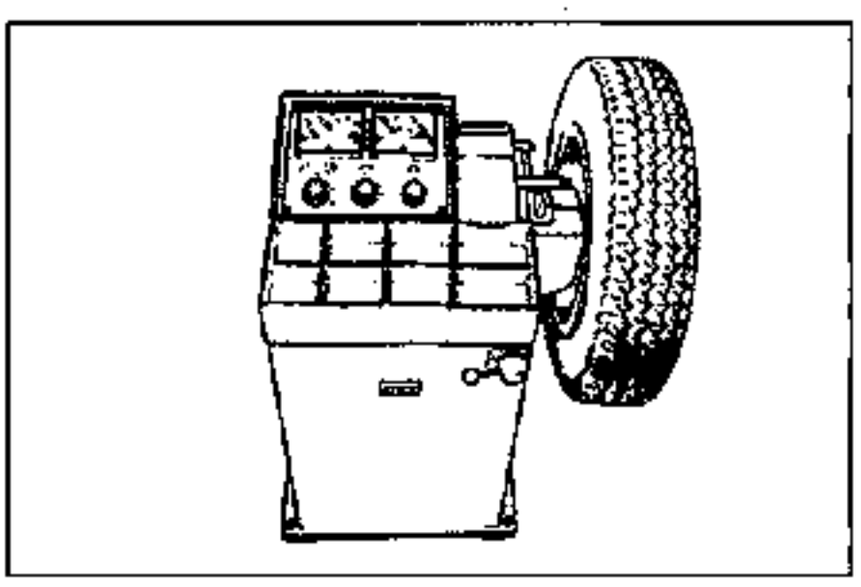
3. When reinstalling a wheel, retighten the lug nuts to the specified torque after about **1,000km {620 miles}** driving.



TIRE ROTATION

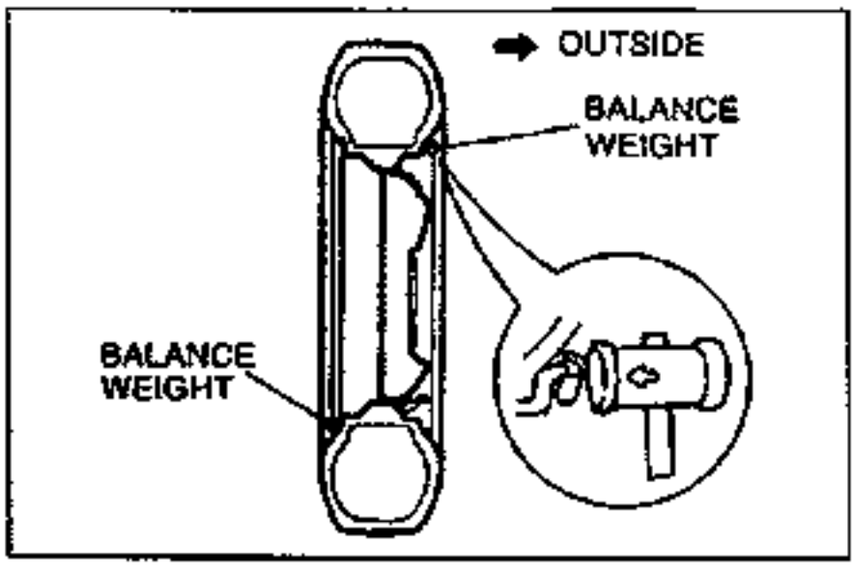
To prolong tire life and assure uniform tire wear, rotate the tires as specified below except the "TEMPORARY USE ONLY" spair tire after rotating the tires, adjust each tire to the specified air pressure. (Refer to page Q–2.)

USA: Evely 6,000 km{3,750 miles}
Canada: Evely 24,000km{15,000miles} or 15 monthes (Which ever comes first)



WHEEL BALANCE ADJUSTMENT

If a wheel becomes unbalanced or if a tire is replaced or repaired, the wheel must be rebalanced to within specification.



When balancing a wheel:

(1) Use no more than two balance weights on the inner or outer side of the wheel.
(2) One balance weight should weigh no more than **60g {2.1 oz}**. If the total weight of all the balance weights on one side exceeds **100g {3.53 oz}**, then rebalance after repositioning the tire on the rim.
(3) Select suitable balance weights for steel or aluminum alloy wheels.

Caution

- **Using an on–vehicle balancer may cause damage to the transaxle. Always use an off–vehicle balancer whenever balancing a wheel (s).**

Before beginning any service procedure, refer to the 1995 MX–3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

SUSPENSION

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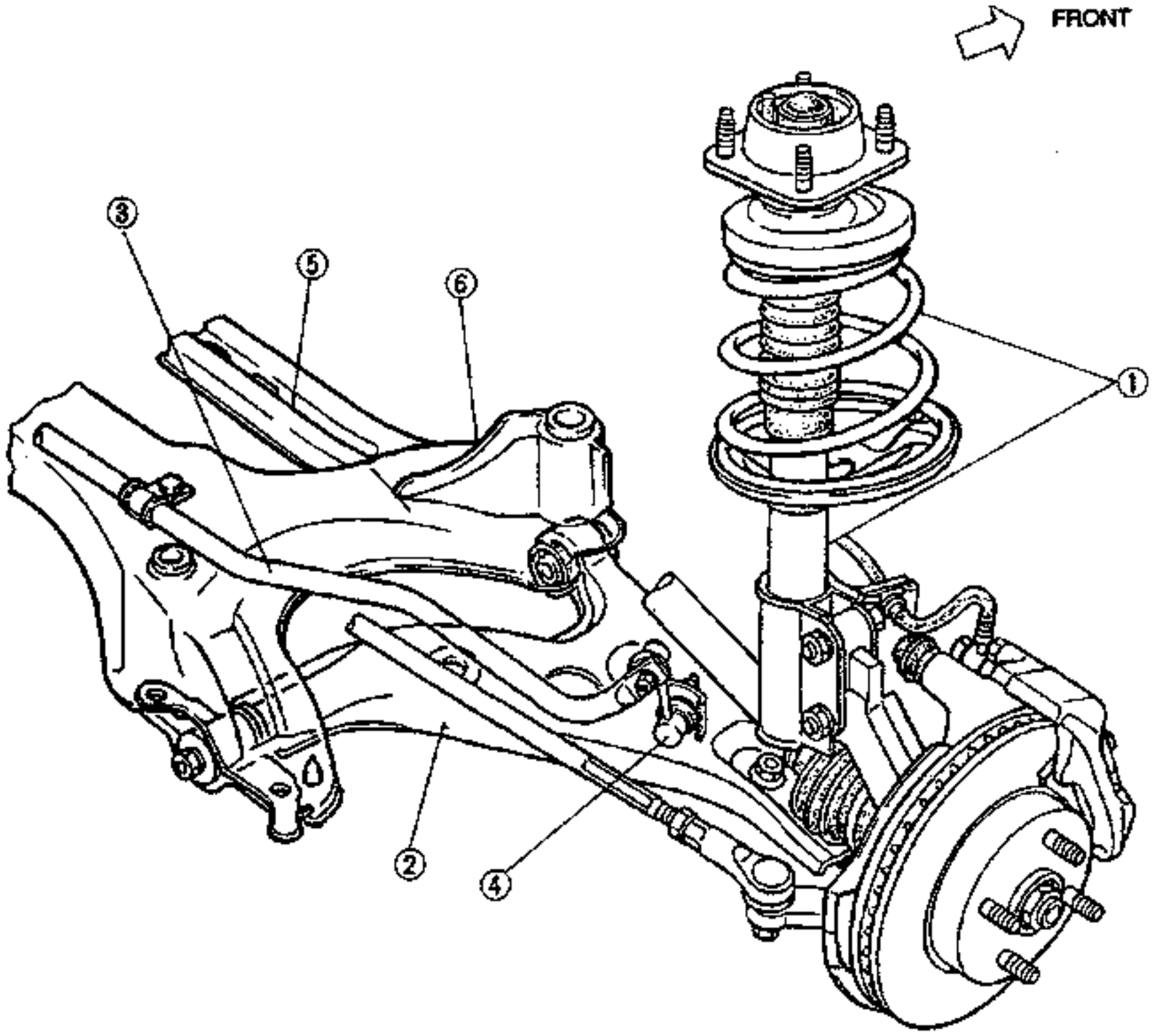
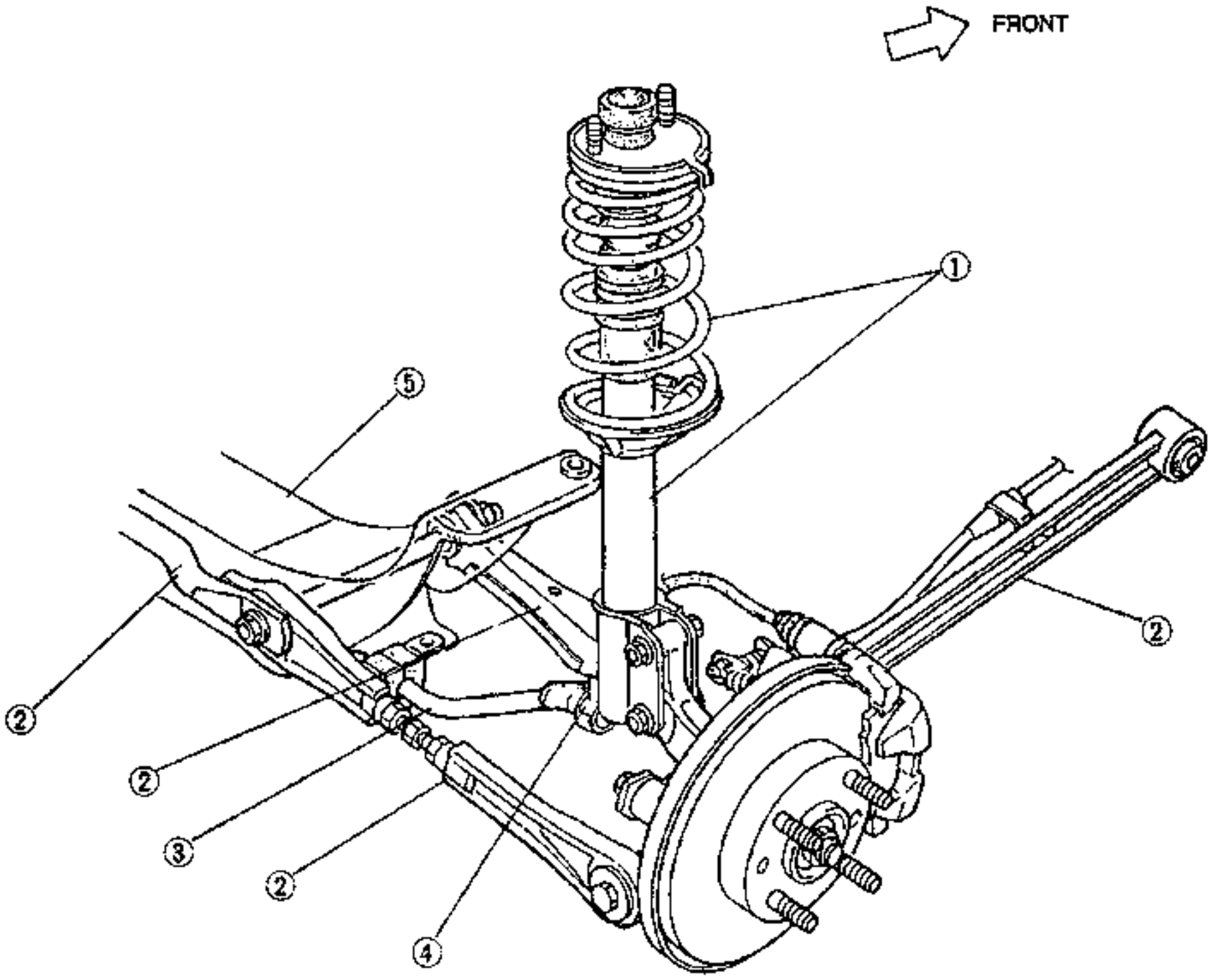
FRONT SUSPENSION



FRONT WHEEL ALIGNMENT
MAXIMUM STEERING ANGLE: 39°31' ± 2° (Inner) 32°54' ± 2° (Outer)
TOTAL TOE-IN: 3 ± 4 mm {0.12 ± 0.15 in}
0.3° ± 0.4°
CAMBER: –0°58' ± 1°
CASTER: 2°46' ± 1°

1. Front shock absorber and spring
Removal / Installation ..... page R–11
Disassembly / Inspection ..... page R–12
Assembly ..... page R–14
2. Front lower arm
Removal / Inspection / Installation ..... page R–18
3. Front stabilizer
Removal / Inspection / Installation ..... page R–20
4. Stabilizer control link
Removal / Inspection / Installation ..... page R–24
5. Transverse member
Removal/Inspection / Installation ..... page R–25
6. Front crossmember
Removal / Inspection / Installation ..... page R–26

REAR SUSPENSION



REAR WHEEL ALIGNMENT
TOTAL TOE–IN: 2 ± 4 mm {0.08 ± 0.15 in}
0.2° ± 0.4°
CAMBER: –0° 57' ± 1°
THRUST ANGLE: 0° ± 0.8°

1. Rear shock absorber and spring
   Removal / Installation ..... page R–29
   Disassembly / Inspection / Assembly ..... page R–30
2. Performance rod, lateral link and trailing link
   Removal / Inspection / Installation ..... page R–34
3. Rear stabilizer
   Removal / Inspection / Installation ..... page R–35
4. Stabilizer control link
   Removal / Inspection / Installation ..... page R–36
5. Rear crossmember
   Removal / Inspection / Installation ..... page R–37

OUTLINE

SPECIFICATIONS
Front Suspension

Item			Specifications
Type			Strut
Shock absorber	Type		Cylindrical double-acting (Oil-filled)
Stabilizer	Type		Torsion bar
	Diameter mm {in}		22.0 {0.87}
Wheel alignment (Unladen)*1	Maximum steering angle	Inner	39°31' ± 2°
		Outer	32°54' ± 2°
	Total toe-in	mm {in}	3 ± 4 {0.12 ± 0.15}
		degree	0.3° ± 0.4° *2
	Camber angle *3		–0°58' ± 1°
	Caster angle *3		2°46' ± 1°
	SAI *4		14°16'

*1 • Fuel tank full: radiator coolant and engine oil at specified level, and spare tire, jack and tools in designated position
• Adjust to the median when carrying out wheel alignment

*2 Indicates measurements made by using the 4–wheel alignment tester

*3 Difference between left and right must not exceed 1.5°

*4 SAI: Steering Axis Inclination

Rear Suspension

Item			Specifications
Type			Strut
Shock absorber	Type		Cylindrical double-acting (Oil-filled)
Stabilizer	Type		Torsion bar
	Diameter mm {in}		20.0 {0.79}
Wheel alignment (Unladen)*1	Total toe-in	mm {in}	2 ± 4 {0.08 ± 0.15}
		degree	0.2° ± 0.4° *2
	Camber angle *3		–0° 57' ± 1°
	Thrust angle *2		0° ± 0.8°

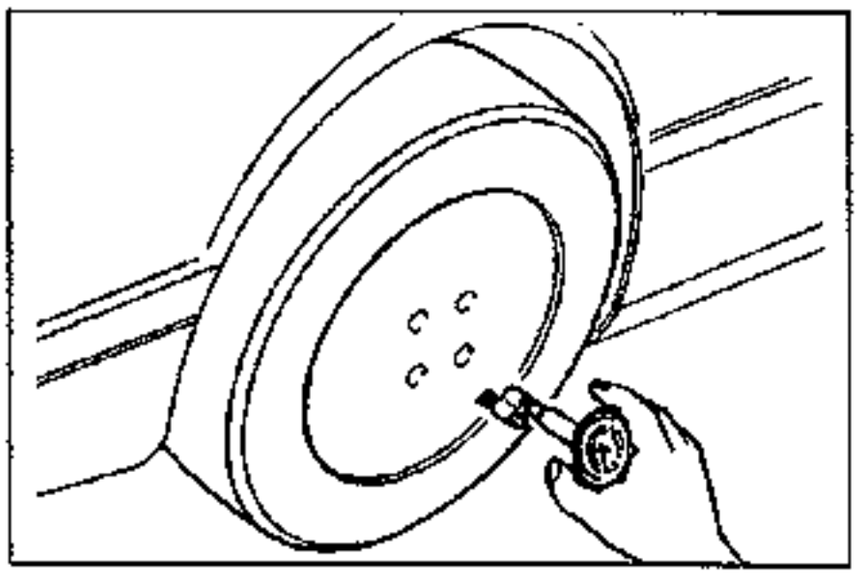
*1 • Fuel tank full; radiator coolant and engine oil at specified level, and spare tire, jack and tools in designated position
• Adjust to the median when carrying out wheel alignment

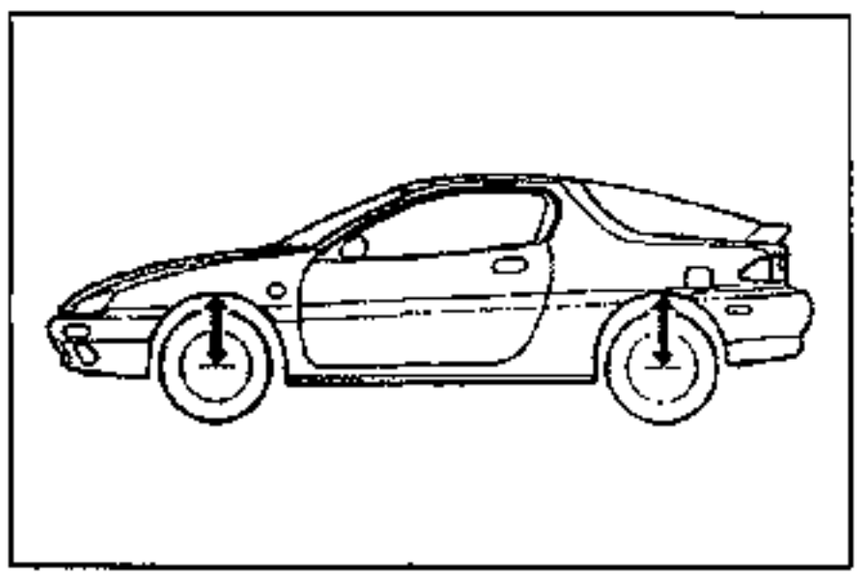
*2 Indicates measurements made by using the 4–wheel alignment tester

*3 Difference between left and right must not exceed 1.5°

TROUBLESHOOTING GUIDE

Problem	Possible cause	Remedy	Page
Body "rolls"	Weak stabilizer	Replace	R–20, 35
	Damaged or worn stabilizer bushing, control link	Replace	R–20, 35
	Worn or deteriorated lower arm bushing	Replace	—
	Malfunction of shock absorber	Replace	R–11, 27
Poor riding comfort	Weak coil spring	Replace	R–12, 30
	Malfunction of shock absorber	Replace	R–11, 29
Body leans	Weak coil spring	Replace	R–12, 30
	Damaged or worn stabilizer bushing, control link	Replace	R–24, 35
	Worn or deteriorated lower arm bushing	Replace	—
Abnormal noise from suspension system	Poor lubrication or wear of thrust bearing	Replace	R–12
	Poor lubrication or wear of lower arm ball joint	Lubricate or replace	R–16
	Looseness of peripheral connections	Tighten	—
	Malfunction of shock absorber	Replace	R–11, 29
	Damaged or worn stabilizer, control link and stabilizer bracket	Replace	R–24, 35
	Worn or deteriorated lower arm bushing	Replace	—
General driving instability	Weak coil spring	Replace	R–12, 30
	Malfunction of shock absorber	Replace	R–11, 29
	Worn or deteriorated lower arm bushing	Replace	—
	Damaged or worn stabilizer bushing, control link	Replace	R–24, 35
	Improperly adjusted wheel alignment	Adjust	R–7
	Damaged lower arm ball joint	Replace	R–18
	Malfunction of steering system	—	Section N
	Damaged or unbalanced wheel(s)	—	Section Q
Heavy steering	Poor lubrication or wear of lower arm ball joint	Lubricate or replace	R–18
	Improperly adjusted wheel alignment	Adjust	R–7
	Malfunction of steering system	—	Section N
	Damaged or unbalanced wheel(s)	—	Section Q
Steering wheel pulls to one side	Weak coil spring	Replace	R–12, 30
	Damaged or worn stabilizer bushing, control link	Replace	R–24, 35
	Worn or deteriorated lower arm bushing	Replace	—
	Damaged lower arm ball joint	Replace	R–18
	Improperly adjusted wheel alignment	Adjust	R–7
	Malfunction of steering system	—	Section N
	Malfunction of braking system	—	Section P
	Damaged or unbalanced wheel(s)	—	Section Q
"Shimmy" occurs (Steering wheel vibrates left/right)	Damaged lower arm ball joint	Replace	R–18
	Malfunction of shock absorber	Replace	R–12, 29
	Loose shock absorber mounting	Tighten	R–12, 29
	Worn or deteriorated lower arm bushing	Replace	—
	Damaged or worn stabilizer bushing, control link	Replace	R–24, 35
	Damaged and oil leakage lower arm bushing (rear)	Replace	R–18
	Improperly adjusted wheel alignment	Adjust	R–7
	Damaged or worn wheel bearing	Replace	Section M
	Malfunction of steering system	—	Section N
	Damaged or unbalanced wheel(s)	—	Section Q
Steering wheel doesn't return properly	Stuck or damaged lower arm ball joint	Replace	R–18
	Improperly adjusted wheel alignment	Adjust	R–7
	Malfunction of steering system	—	Section N
	Damaged or unbalanced wheel(s)	—	Section Q





WHEEL ALIGNMENT

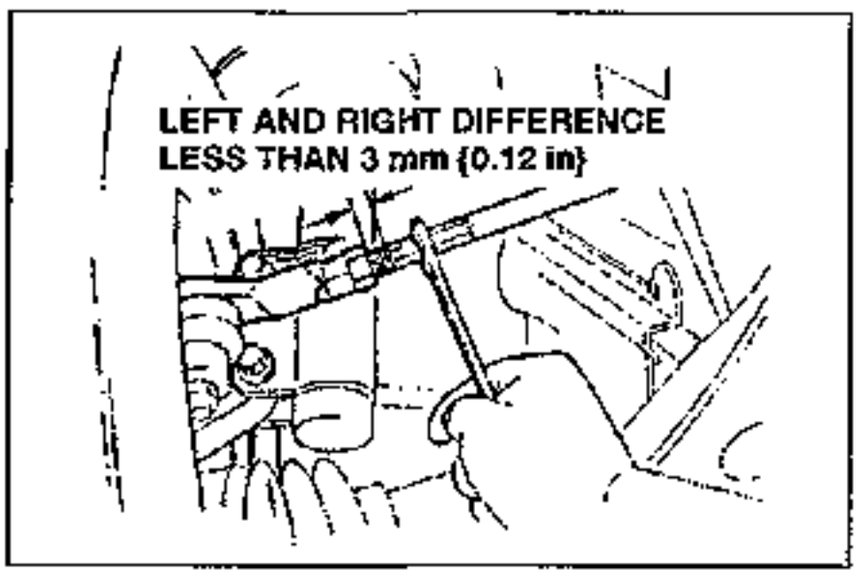
PRE–INSPECTION

1. Check the tire inflations and set to the recommended pressure, if necessary.
2. Inspect the front wheel bearing play; replace the bearing if necessary.
3. Inspect the wheel and tire runout.
4. Inspect the ball joints and steering linkage for any excessive looseness.
5. The vehicle must be on level ground and have no luggage or passenger load.
6. The difference in height between the left and right sides from the center of the wheel to the fender brim must not exceed **10 mm {0.39 in}**.
7. Shake the vehicle to check operation of the shock absorbers.

FRONT WHEEL ALIGNMENT
Specifications (Unladen) *1

Item		Specifications
Maximum steering angle	Inner	39°31' ± 2°
	Outer	32°54' ± 2°
Total toe–in	mm {in}	3 ± 4 {0.12 ± 0.15}
	Degree	0.3° ± 0.4° *2
Camber angle *3		–0°58' ± 1°
Caster angle *3		2° 46' ± 1°
SAI *4		14° 16'

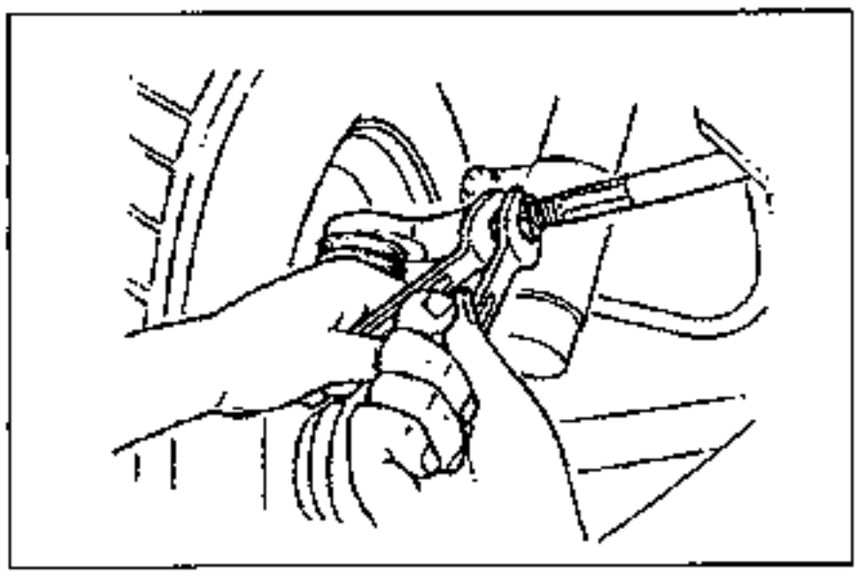
*1 • Fuel tank full: radiator coolant and engine oil at specified level, and spare tire, jack and tools in designated position
• Adjust to the median when carrying out wheel alignment
*2 Indicates measurements made by using the 4–wheel alignment tester
*3 Difference between left and right must not exceed 1.5°
*4 SAI : Steering Axis Inclination



Adjustment
Maximum steering angle

1. Loosen the left and right tie rod locknuts, then turn the tie rods equally.

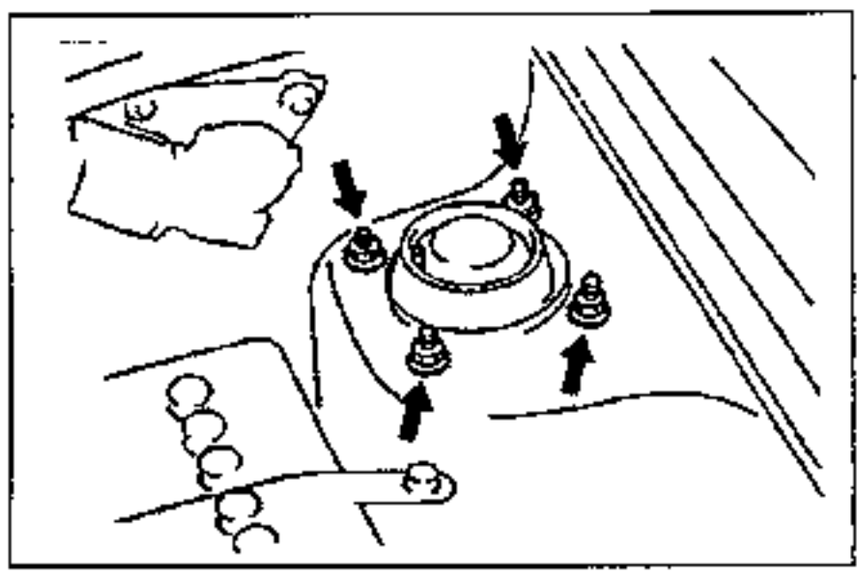
Maximum left/right difference: 3 mm {0.12 in}



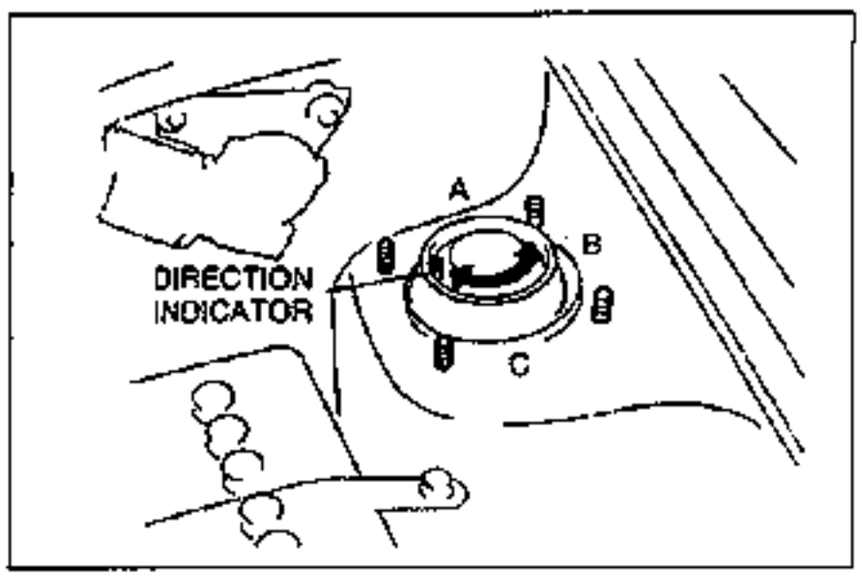
2. Tighten the tie rod locknuts.

Tightening torque:
35–50 N·m {3.5–5.1 kgf·m, 26–36 ft·lbf}

3. Adjust the toe-in after adjusting the steering angle.
4. Inspect and adjust the toe-in after adjusting the turning angle.

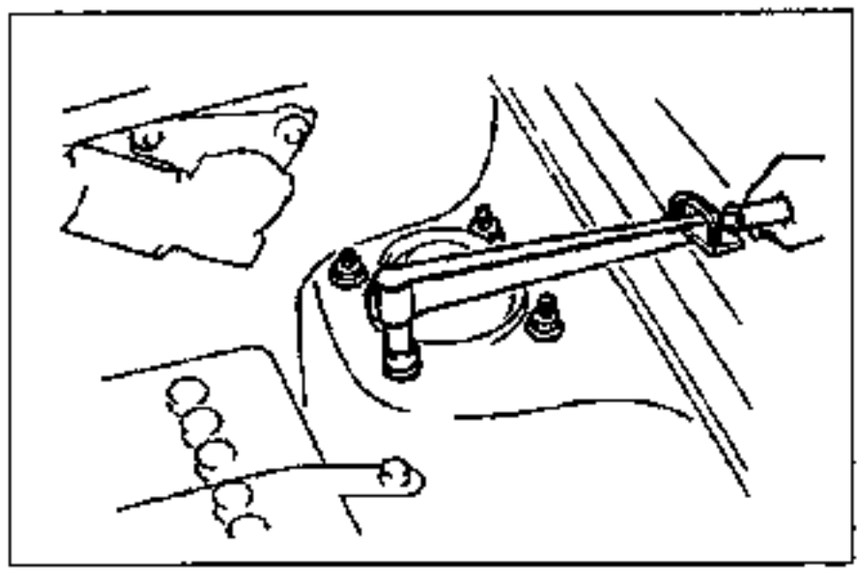


Camber and caster
1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the mounting block nuts.



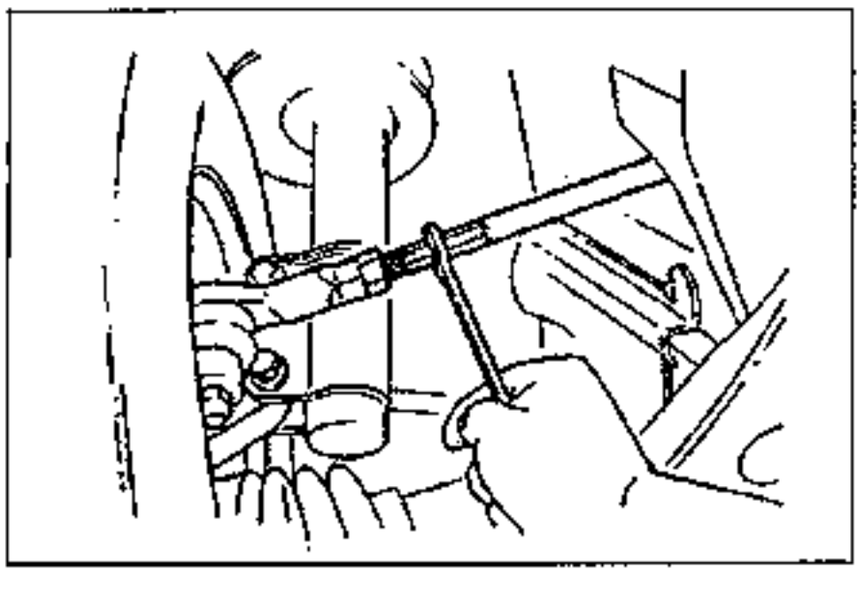
3. Push the mounting block downward, and turn it to the desired position.

Direction indicator position	Difference from standard position	
	Camber angle	Caster angle
A	+14'	+14'
B	+29'	0°
C	+14'	–14'



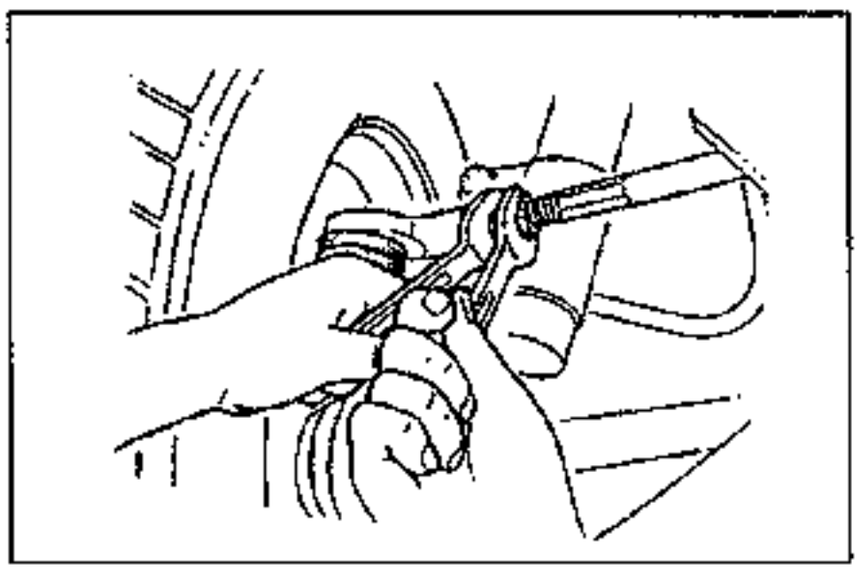
4. Install and tighten the mounting nuts to the specified torque.

Tightening torque:
47–62 N·m {4.7–6.4 kgf·m, 34–46 ft·lbf}



Total toe–in
1. Remove the steering gear boot clamps.
2. Loosen the left and right tie rod locknuts, and turn the tierods equally. Both tie rods are right threaded, so turning the right tie rod toward the front of the vehicle and the left toward the rear increases toe–in.

Note
- Turning both tie rods one complete turn changes toe–in by about **6mm (0.24 in)**.



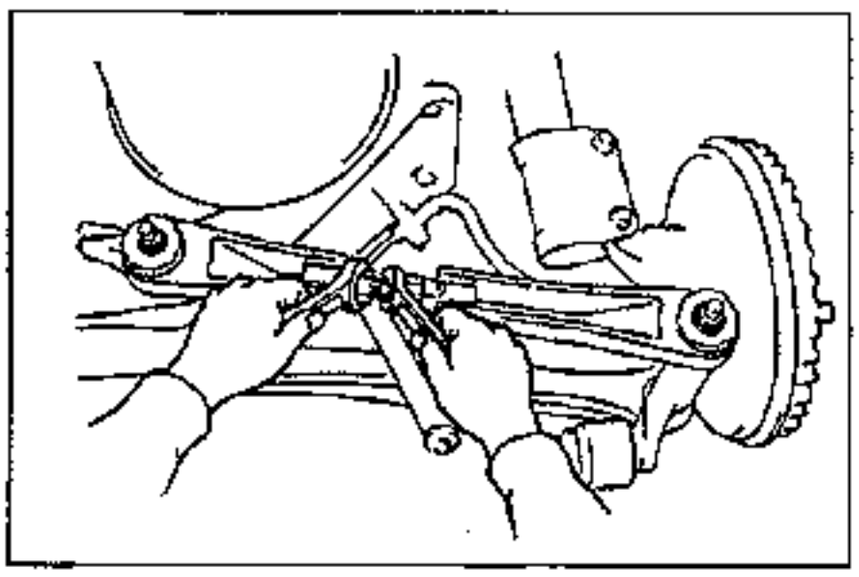
3. Tighten the tie rod locknuts.

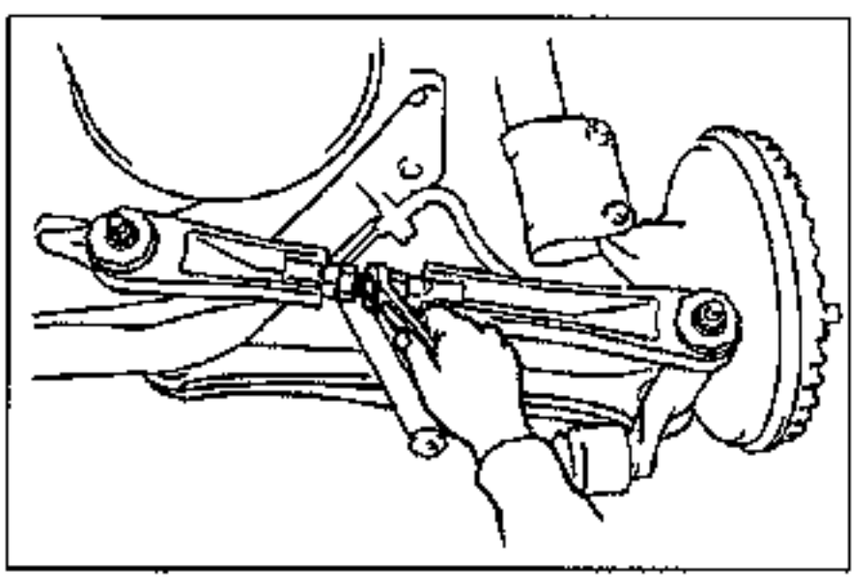
Tightening torque:
35–50 N·m {3.5–5.1 kgf·m, 26–36 ft·lbf}

REAR WHEEL ALIGNMENT
Specifications (*1 Unladen)

Item		Specifications
Total toe–in	mm {in}	2 ± 4 {0.08 ± 0.15}
	Degree	0.2° ± 0.4° *2
Camber angle *3		–0°57′ ± 1°
Thrust angle		0° ± 0.8° *2

*1 • Fuel tank full; radiator coolant and engine oil at specified level, and spare tire, jack and tools in designated position
• Adjust to the median when carrying out wheel alignment
*2 Indicates measurements made by using the 4–wheel alignment tester
*3 Difference between left and right must not exceed 1.5°





Adjustment
Total toe–in

Note
- The rear toe–in setting be adjusted to maintain a thrust angle within specified limits.
- If the thrust angle is not within specification, check the body dimensions.

Thrust angle: 0° ± 0.8°

1. Loosen the lateral link locknuts.
2. Turn the lateral link adjustment link to adjust.

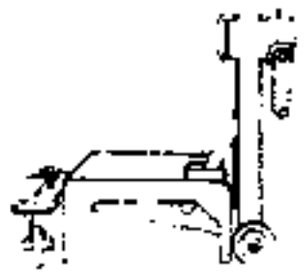
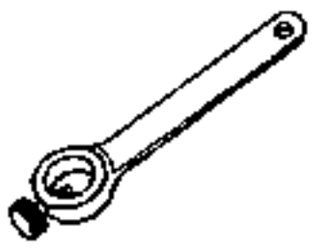
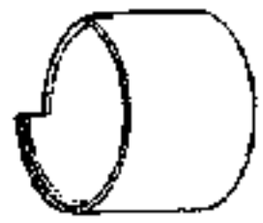
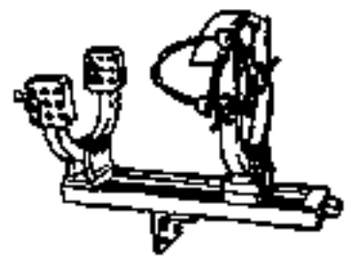
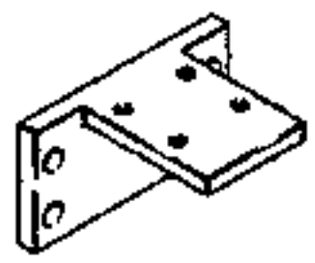
Note
- One turn of the link changes **11.3 mm {0.44 in}.**

3. Tighten the lateral link locknuts to the specified torque.

Tightening torque:
55—63 N·m {5.6—6.5 kgf·m, 41—47 ft·lbf}

FRONT SUSPENSION (STRUT)

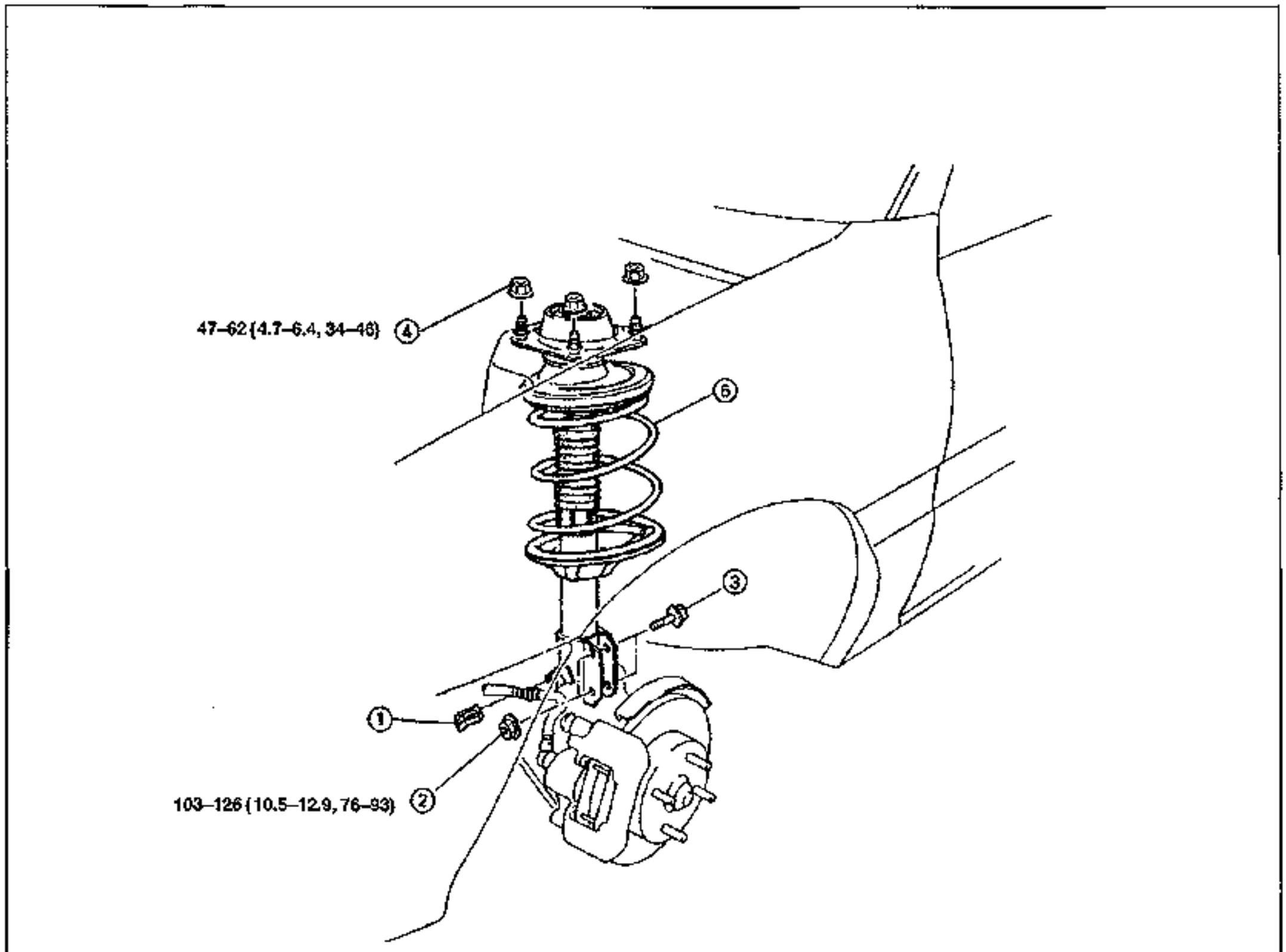
PREPARATION
SST

49 G034 1A0 Compressor, coil spring 	For disassembly and assembly of coil spring	49 0107 680A Engine stand 	For disassembly and assembly of coil spring
49 G034 101 Body (Part of 49 G034 1A0) 	For disassembly and assembly of coil spring	49 G034 102 Screw (part of 49 G034 1A0) 	For disassembly and assembly of coil spring
49 1243 785 Installer, boot 	For removal and installation of ball joint dust boot	49 G034 103 Arm (Part of 49 G034 1A0) 	For disassembly and assembly of coil spring
49 0180 510B Attachment, preload measuring 	For measurement of ball joint preload	49 B034 201 Support block 	For removal and installation of lower arm bushing
49 T034 1A0 Compressor, coil spring 	For disassembly and assembly of coil spring	49 T034 101 Compressor, spring (Part of 49 T034 1A0) 	For disassembly and assembly of coil spring
49 T034 102 Stand (Part of 49 T034 1A0) 	For disassembly and assembly of coil spring	49 T034 103 Hook (Part of 49 T034 1A0) 	For disassembly and assembly of coil spring
49 T034 104 Support (Part of 49 T034 1A0) 	For disassembly and assembly of coil spring	49 T034 105 Attachment 	For disassembly and assembly of coil spring

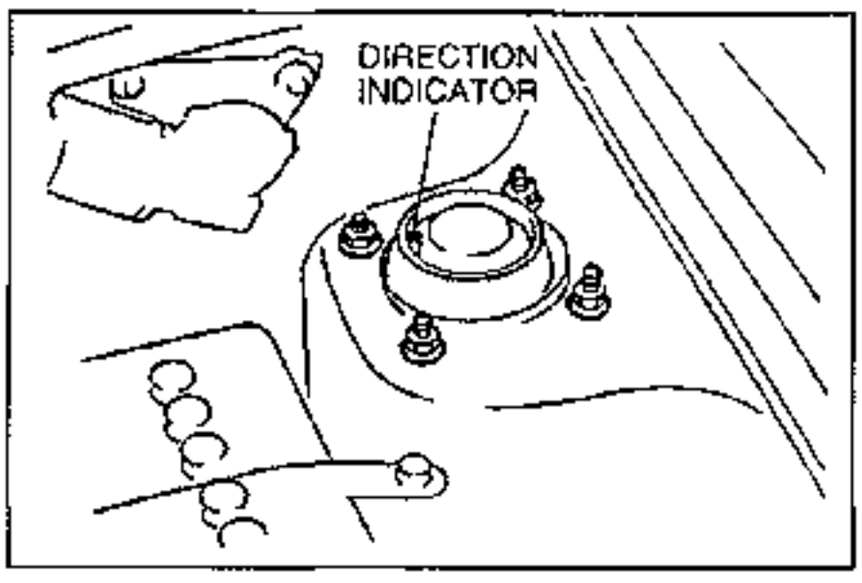
FRONT SHOCK ABSORBER AND SPRING

Removal / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal, referring to **Installation Note**.
5. Install the wheels. **(Tightening torque: 89–117 N·m {9.0–12.0 kgf·m, 66–86 ft·lbf})**
6. After installation, measure the front wheel alignment, and adjust it if necessary. (Refer to page R–7.)



1. Clip
2. Nuts
3. Bolts
4. Nuts
5. Front shock absorber and spring
   Installation Note ..... below
   Disassembly / Inspection / Assembly ..... page R–12



Installation Note

Front shock absorber and spring

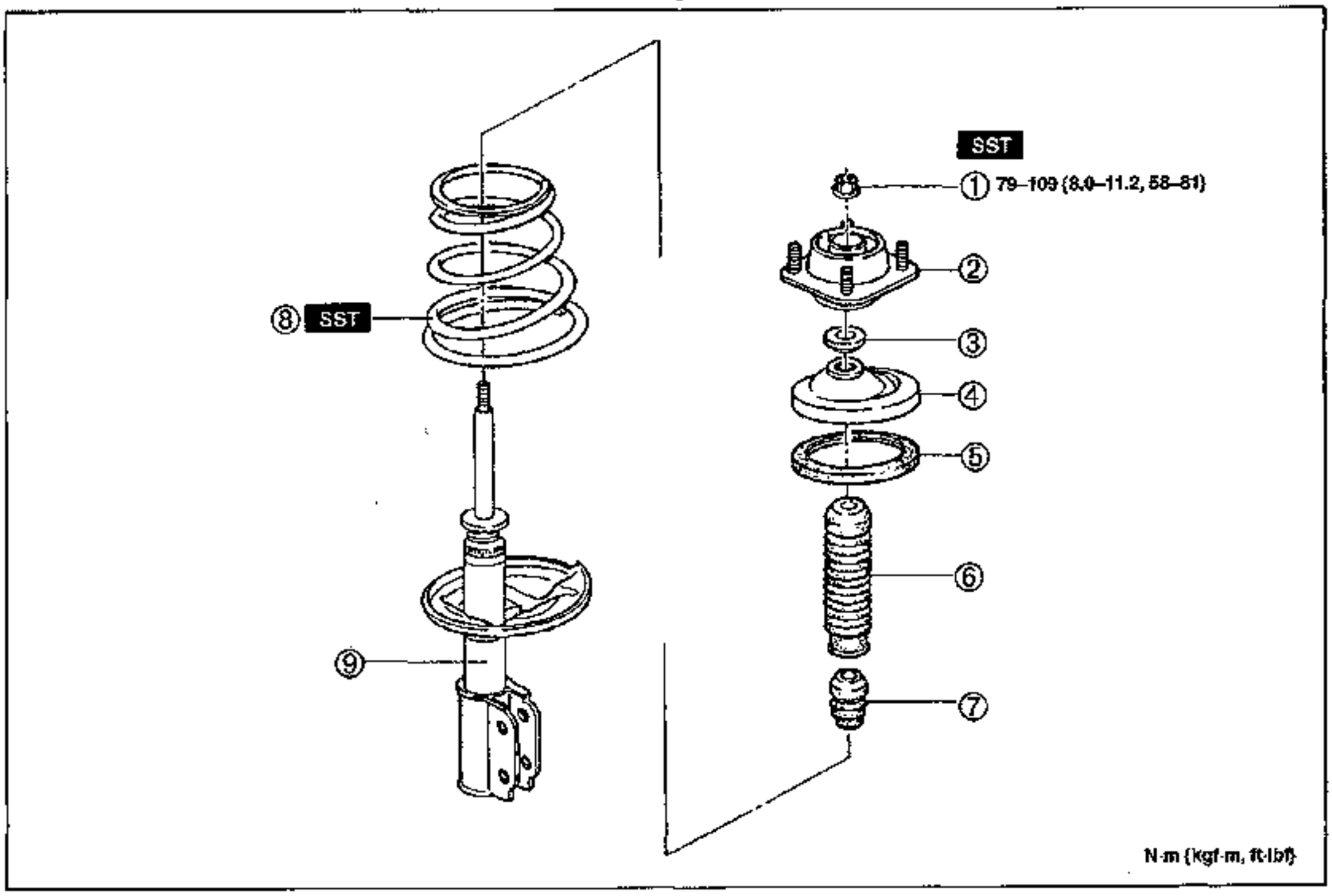
Face the direction indicator of the mounting block inboard, and install the shock absorber and spring.

Note

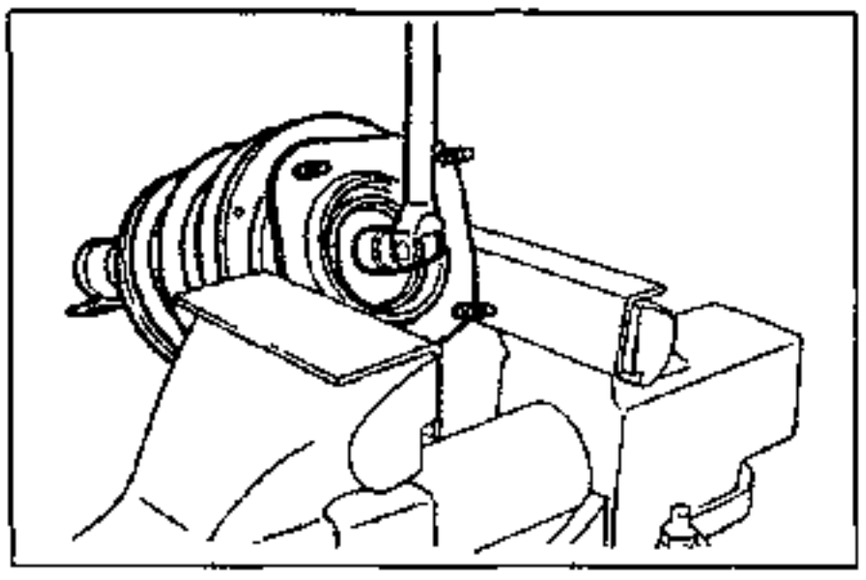
- When facing the indicator outboard, camber is adjusted to **+ 29'**.

Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note.**
2. Visually inspect each part and replace as necessary.
3. Assemble in the reverse order of removal, referring to **Assembly Note.**

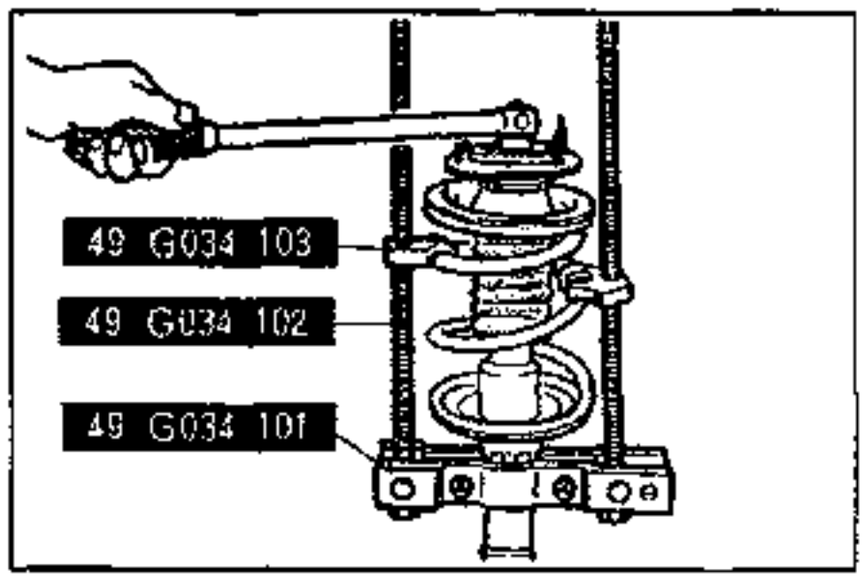


1. Nut
   Disassembly Note ..... page R–13
   Assembly Note ..... page R–17
2. Mounting block
   Inspect for damage, deterioration and weakness
   Assembly Note ..... page R–14
3. Thrust bearing
   Inspect for damage, wear and poor lubrication
4. Upper spring seat
   Inspect for damage and cracks
5. Rubber spring seat
   Inspect for damage and deterioration
6. Dust cover
   Inspect for damage and deterioration
7. Bound stopper
   Inspect for damage and cracks
8. Coil spring
   Inspect for damage deterioration, and weakness
   Assembly Note ..... page R–14
9. Shock absorber
   Inspection ..... page R–14
   Disposal of shock absorber .... page R–14

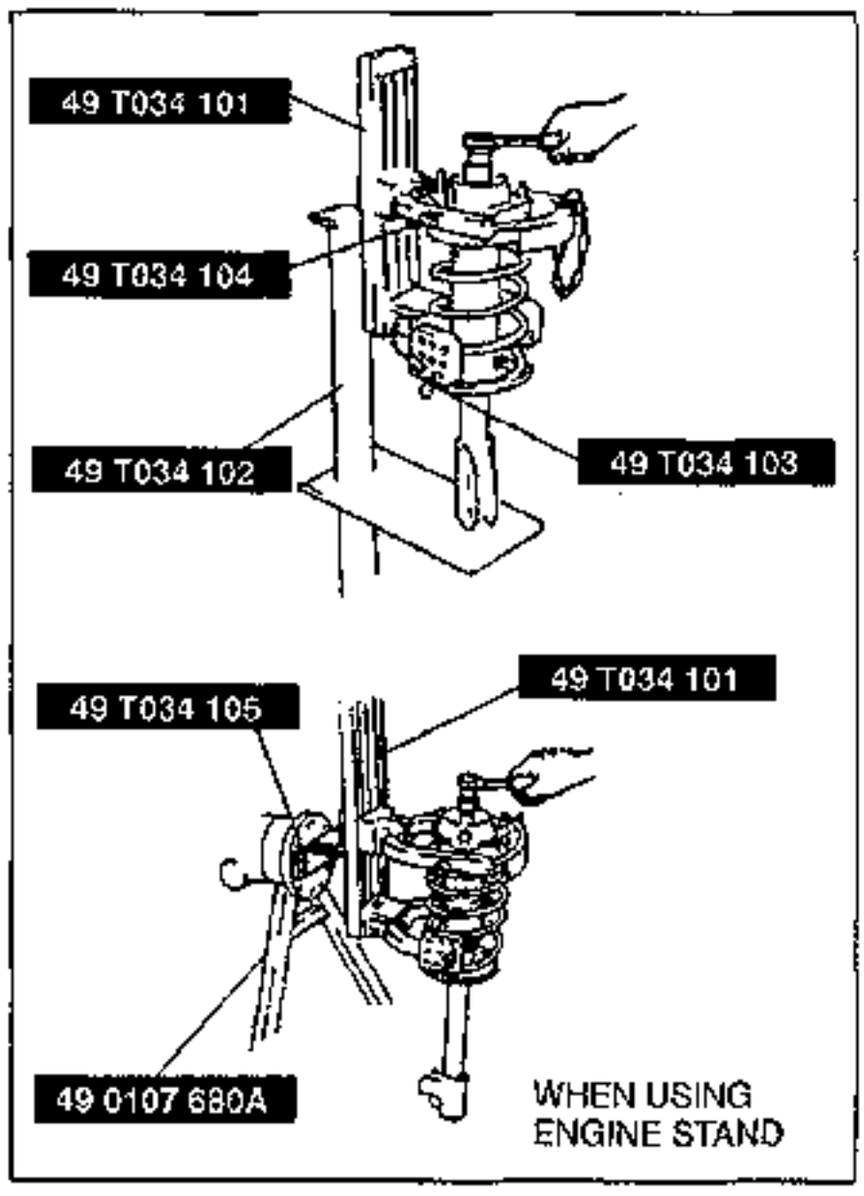


Disassembly Note
Nut

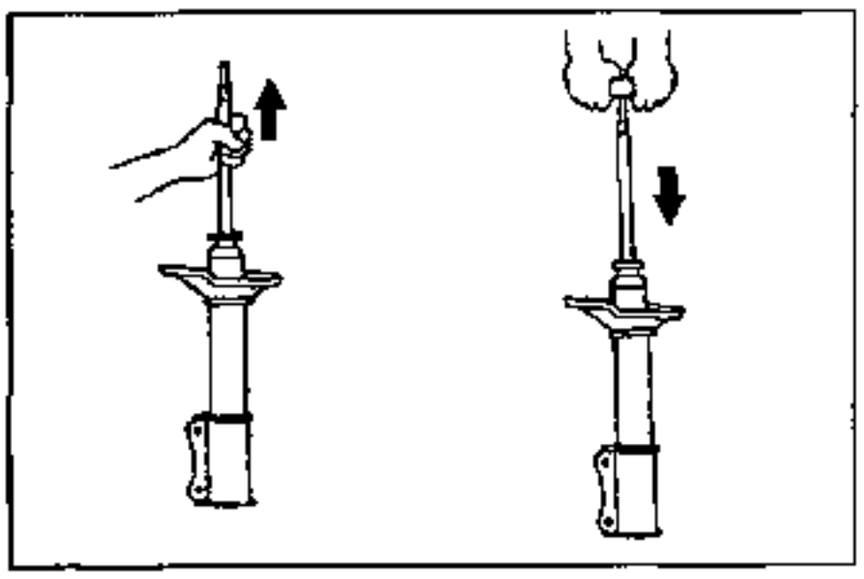
Warning
- **Removing the nut is dangerous. The shock absorber and spring could fly off under tremendous pressure and cause serious injury or death. Secure the shock absorber in the SSTs before removing the nut.**



When using SST(49 G034 1A0)
1. Secure the mounting block in a vise.
2. Loosen the nut a few turns, but do not remove the nut.
3. Compress the coil spring by using the **SSTs.**
4. Remove the nut.
5. Remove the coil spring.

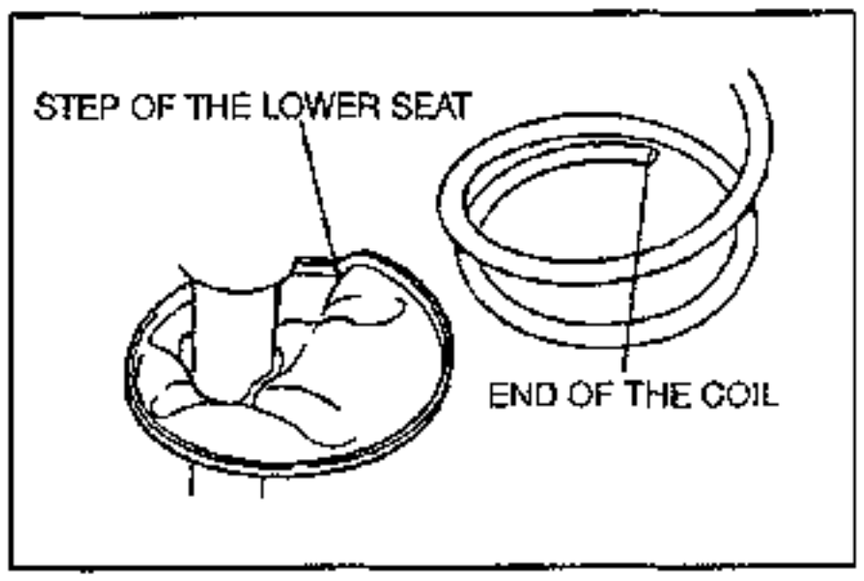


When using SST(49 T034 1A0)
1. Secure the mounting block in a vise.
2. Loosen the nut a few turns, but do not remove the nut.
3. Assemble the **SSTs.**
4. Secure the shock absorber in the **SSTs.**
5. Compress the coil spring by using the **SSTs** and remove the nut.

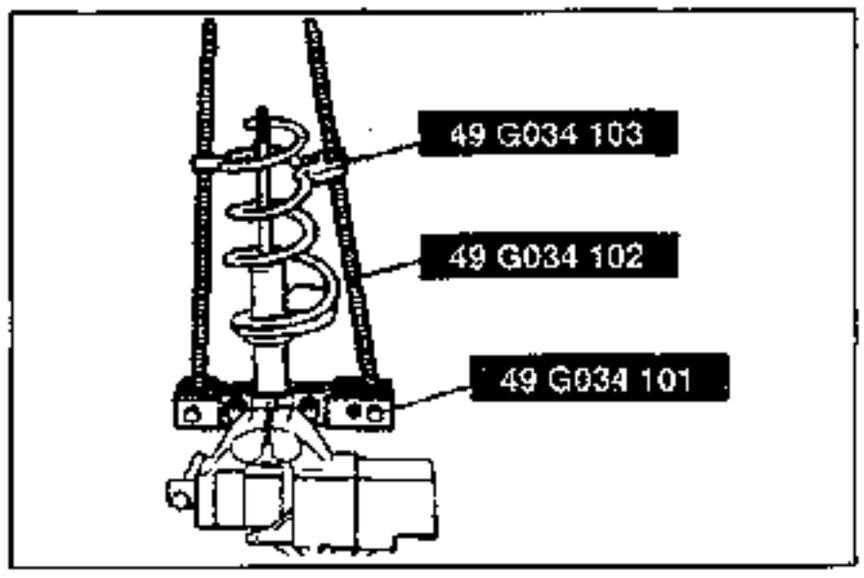


Inspection
Shock absorber
Check the following and replace if necessary.

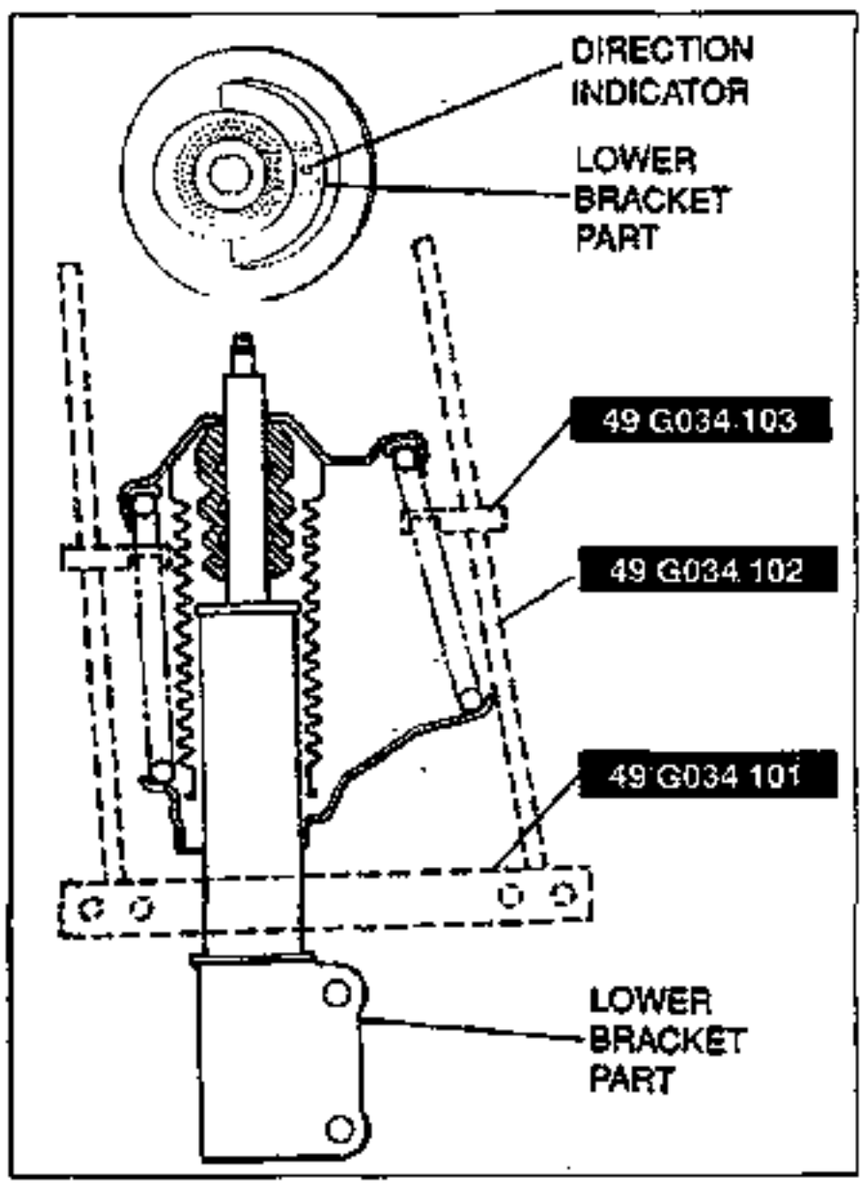
1. Inspect for damage and oil leakage.
2. Secure a handle to the piston rod, and compress and expand the shock piston at least three times. Verify that the operational force does not change and that there is no unusual noise.



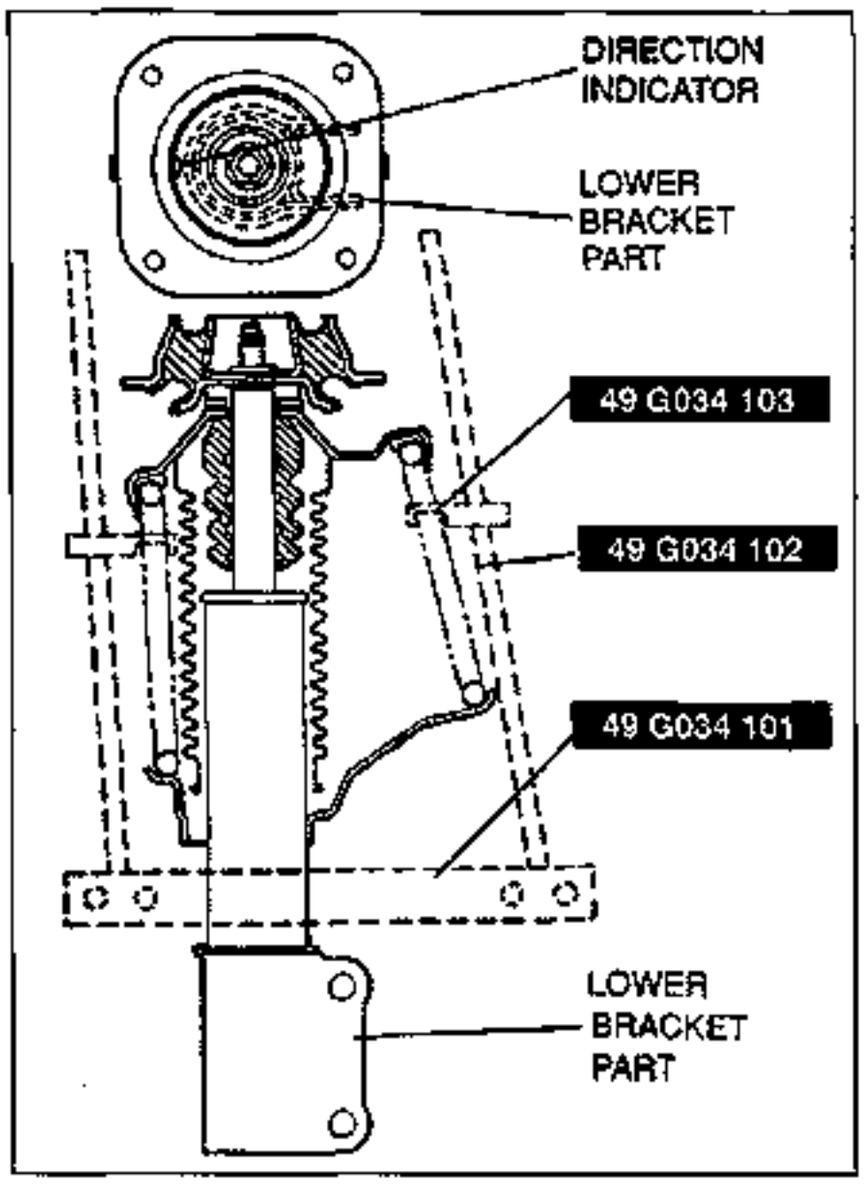
Assembly Note
Coil spring / Mounting block
When using SST (49 G034 1A0)
1. Secure the shock absorber in a vise.
2. Install the coil spring, fitting the end of the coil into the step of the lower seat.



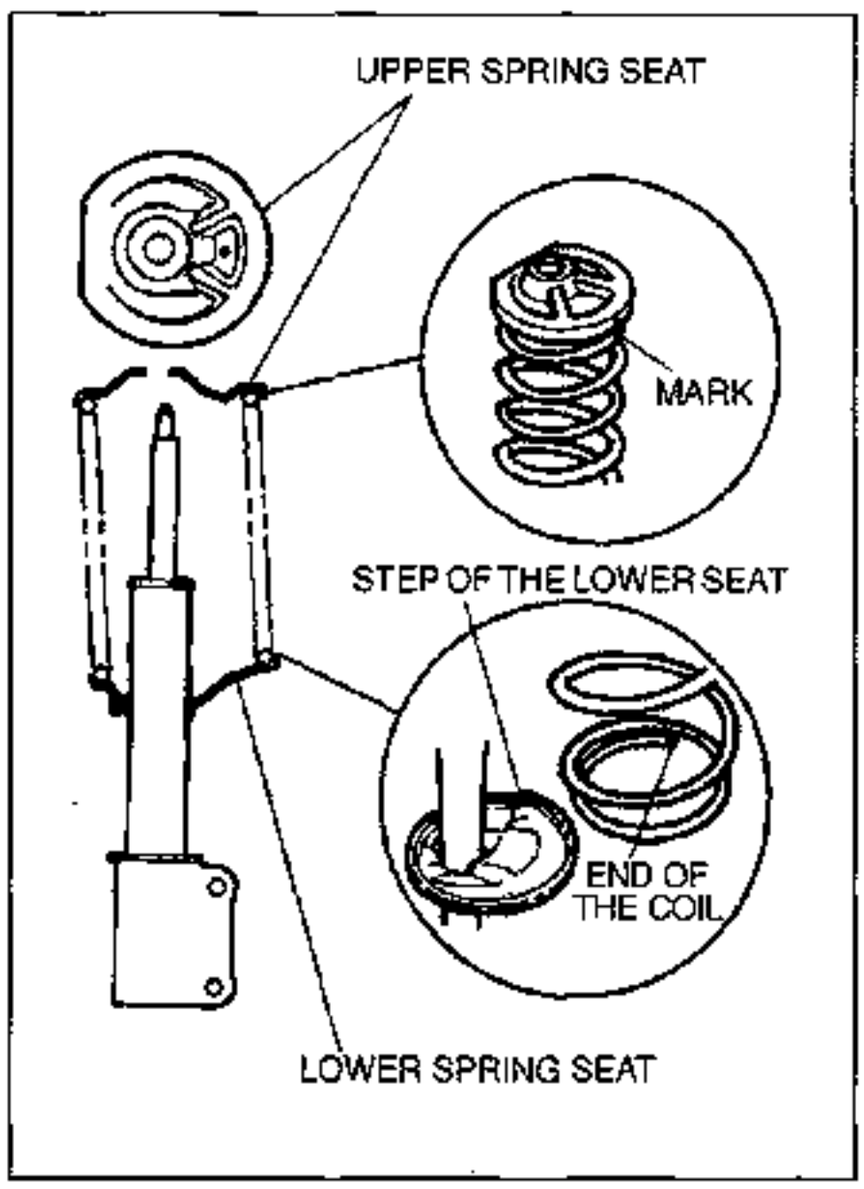
3. Compress the coil spring by using the **SSTs**.
4. Install the bound stopper.



5. Apply the rubber lubricant to the bound stopper and the upper spring seat contact surfaces.
6. Install the dust cover.
7. Install the rubber spring seat.
   Install the upper spring seat, facing the direction indicator as shown in the figure.

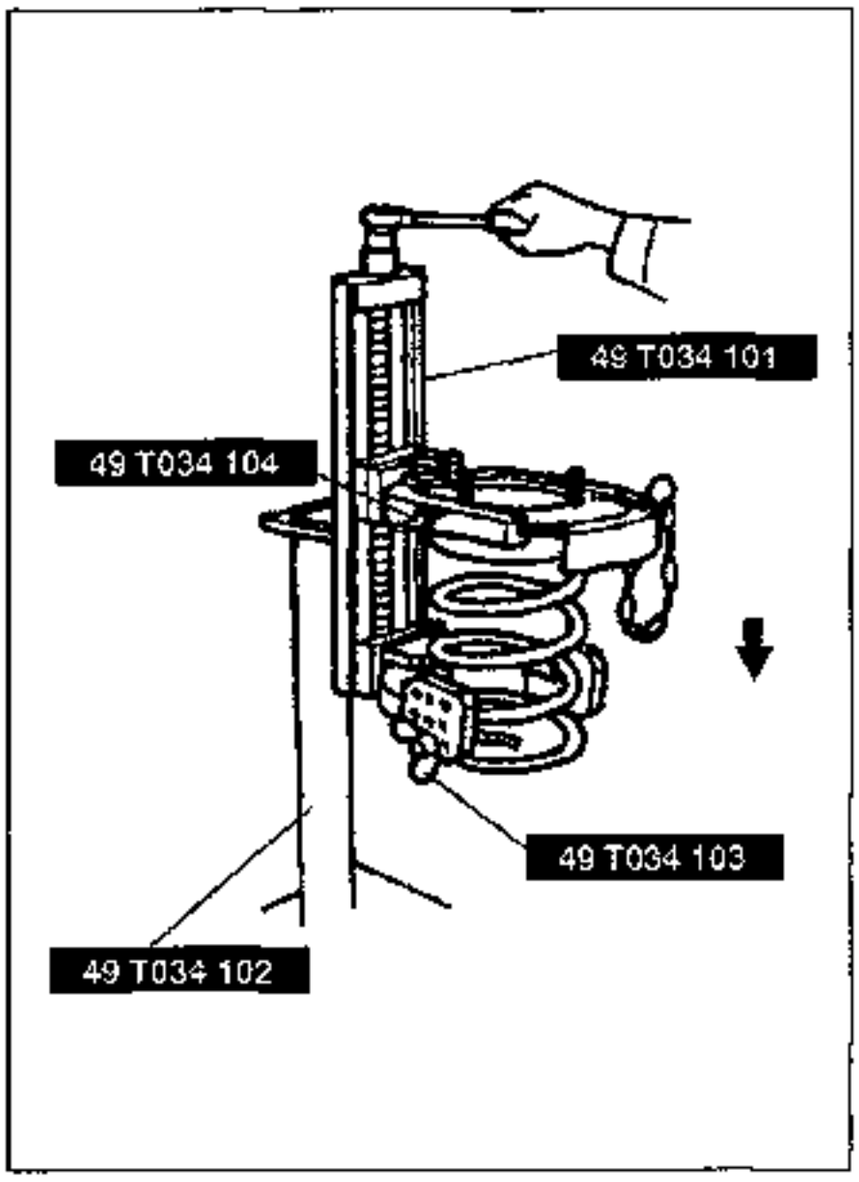


8. Install the thrust bearing.
9. Install the mounting block, facing the direction indicator as shown in the figure.
10. Loosely tighten the nut.
11. Verify that the coil spring is correctly seated in the upper and lower seats.
12. Carefully loosen, and remove the **SSTs.**

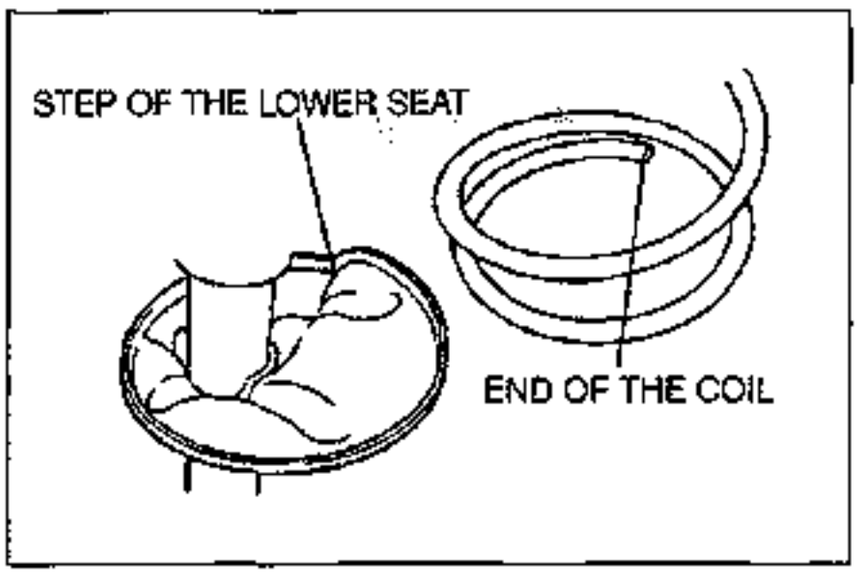


When using SST (49 T034 1A0)

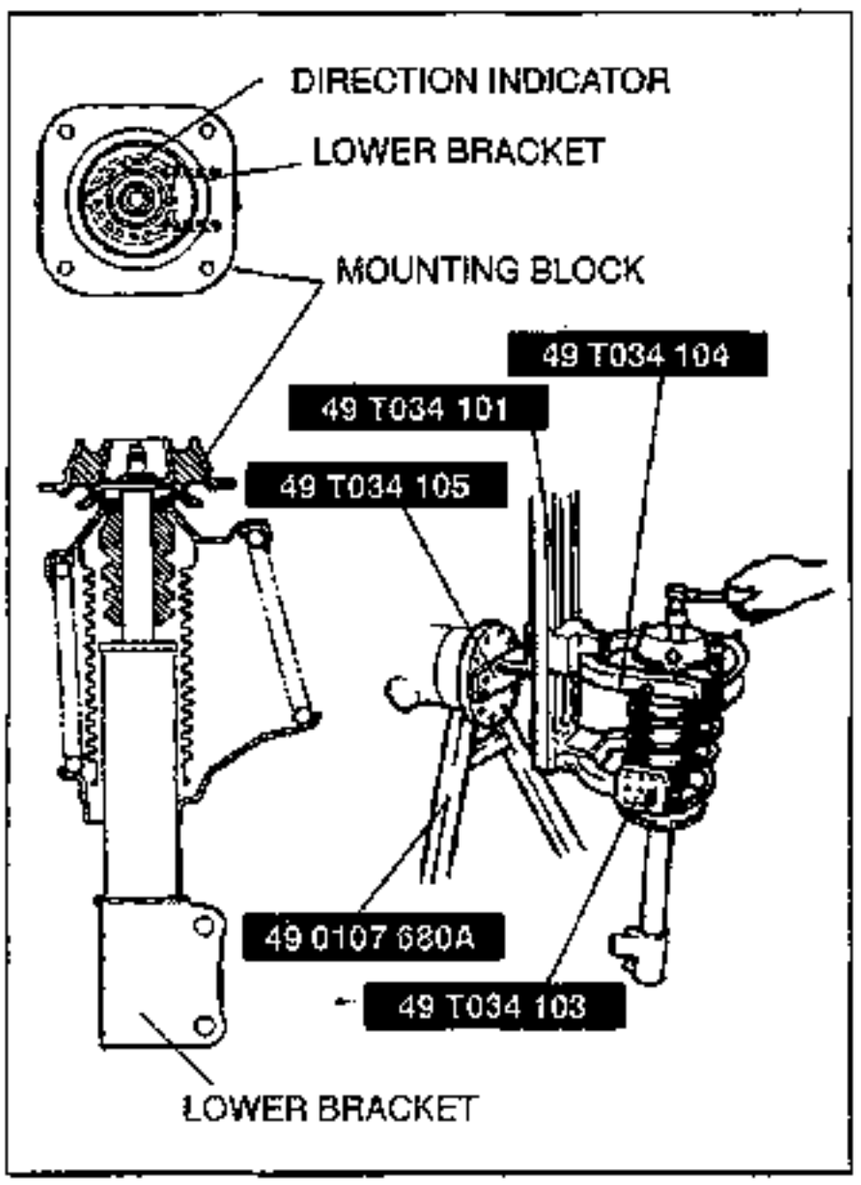
1. Temporarily assemble the upper spring seat and coil spring to the shock absorber, as shown.
2. Mark the upper spring seat and coil spring for proper reassembly.



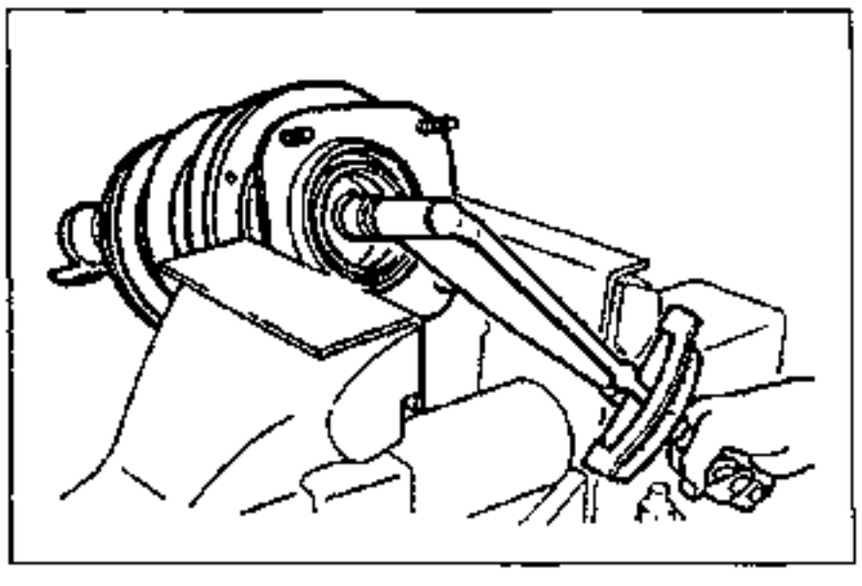
3. Install the rubber spring seat to the upper spring seat.
4. Align the marks of the upper spring seat and coil spring. Protect the upper spring seat and the soil spring with a piece of cloth; then assemble the **SSTs.**
5. Use the **SSTs** to compress the spring.
6. Install the bound stopper.
7. Install the dust cover.



8. Install the shock absorber, fitting the end of the coil into the step of the lower seat.



9. Install the mounting block facing the direction indicator as shown.
10. Tighten the nut several turns.
11. Remove the **SSTs.**
12. Verify that the lower coil of the spring is seated on the step of the lower seat.



Nut

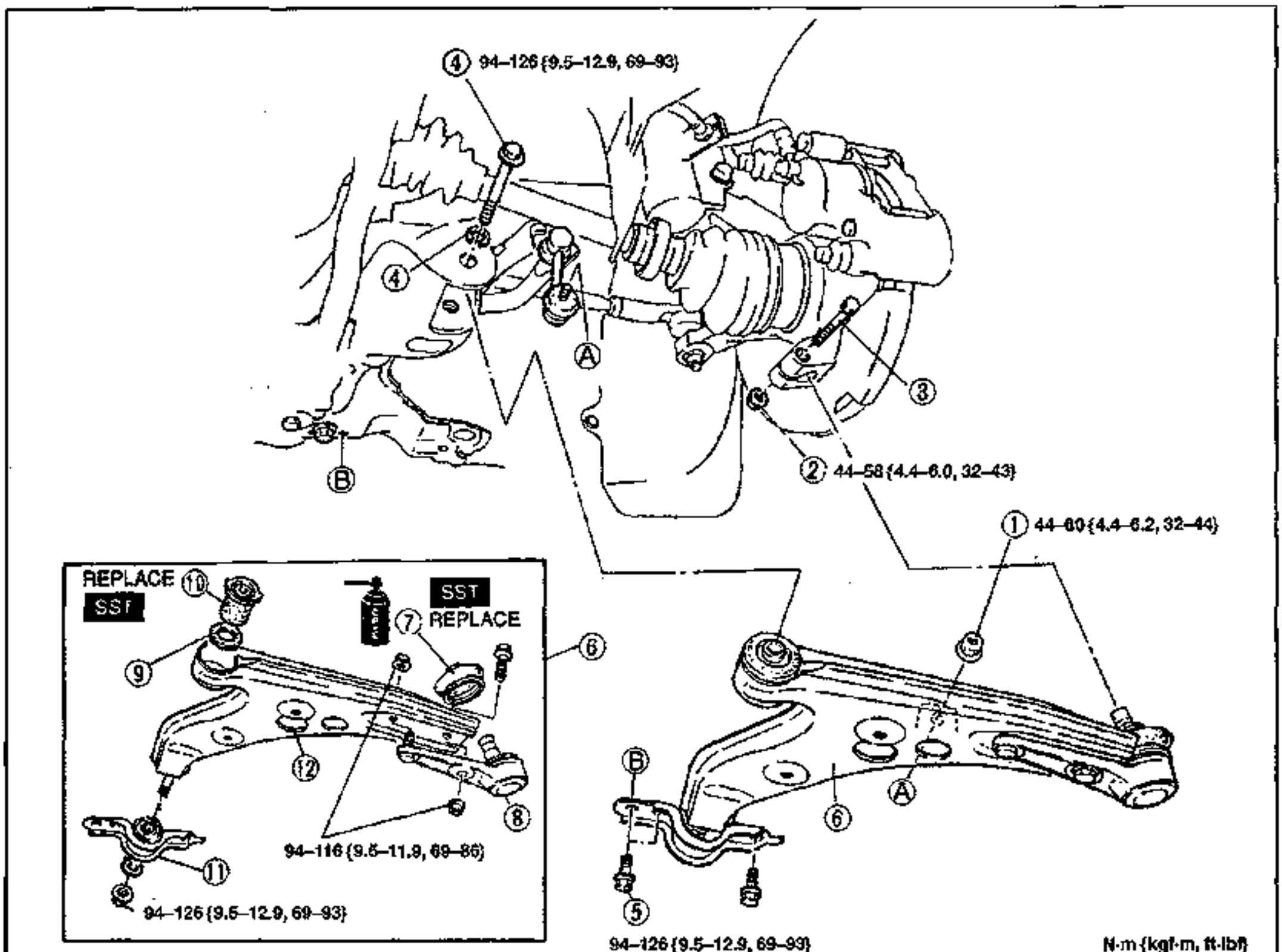
1. Secure the mounting block in a vise.
2. Tighten the nut.

Tightening torque:
78–109 N·m {8.0–11.2 kgf·m, 58–81 ft·lbf}

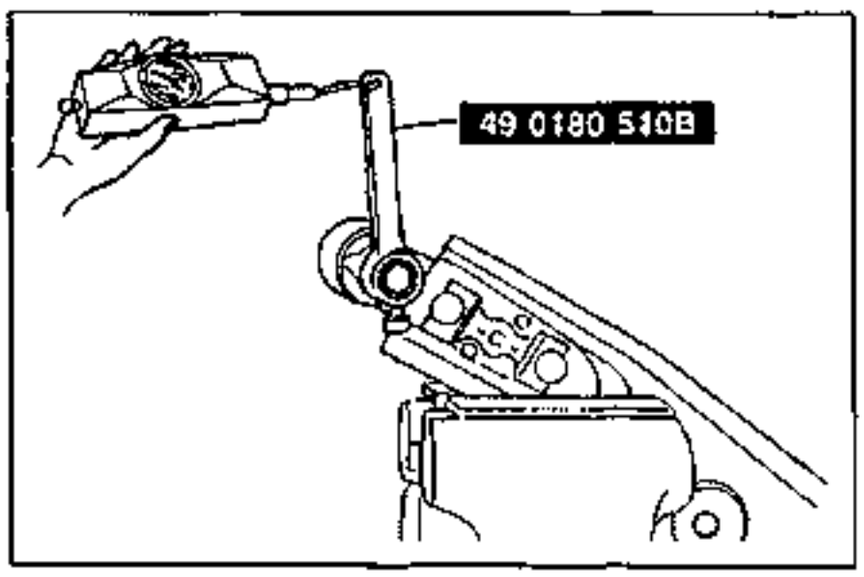
FRONT LOWER ARM

Removal / Inspection / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure, referring to **Removal Note.**
4. Visually inspect each part and replace as necessary.
5. Install in the reverse order of removal, referring to **Installation Note.**
6. Loosely tighten the lower arm bolt and nuts. Tighten all other nuts and bolts to the specified torque.
7. Install the wheels. **(Tightening torque: 89–117 N·m {9.0–12.0 kgf·m, 66–86 ft·lbf})**
8. Lower the vihicle.
9. With the vehicle unloaded, tighten the lower arm bolt and nuts to the specified torque.
10. After installation, measure the front wheel alignment, and adjust it, if necessary. (Refer to page R–7.)



1. Stabilizer control link nut
2. Nut
3. Bolt
4. Bolt and washer
5. Bolt
6. Front lower arm assembly
7. Ball joint dust boot
   Inspect for damage and deterioration
   Removal Note ..... page R–19
   Installation Note ..... page R–19
8. Lower arm ball joint
   Inspect for damage
   Inspection ..... page R–19
9. Stopper
   Inspect for damage and deterioration
10. Lower arm bushing (front)
    Inspect for damage and deterioration
    Removal Note ..... page R–19
    Installation Note ..... page R–19
11. Lower arm bushing (rear)
    Inspect for damage, oil leakage and deterioration
12. Front lower arm
    Inspect for damage and deterioration

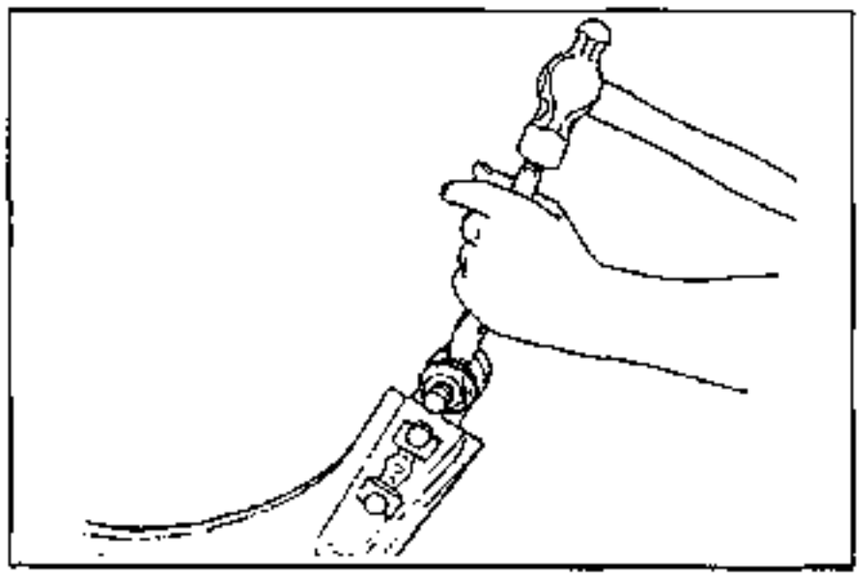


Inspection
Lower arm ball joint
Check the following and replace the ball joint if necessary.

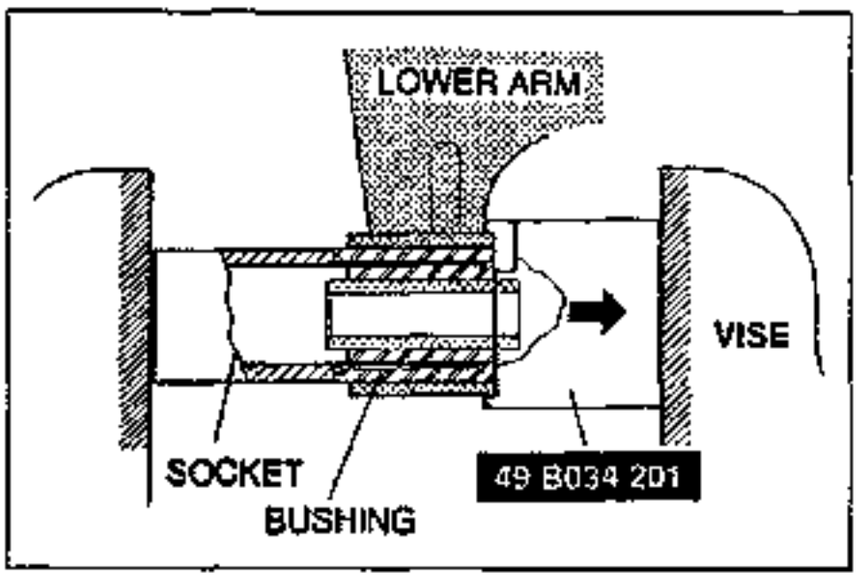
1. Inspect for damage.
2. Attach the **SST** to the ball stud, and measure the torque with a pull scale.

Rotation torque:
2.0–3.4 N·m {20–35 kgf·cm, 18–30 in·lbf}
(While ball stud rotating)

Pull scale reading:
20–34 N {2.0–3.5 kgf, 4.4–7.7 lbf}

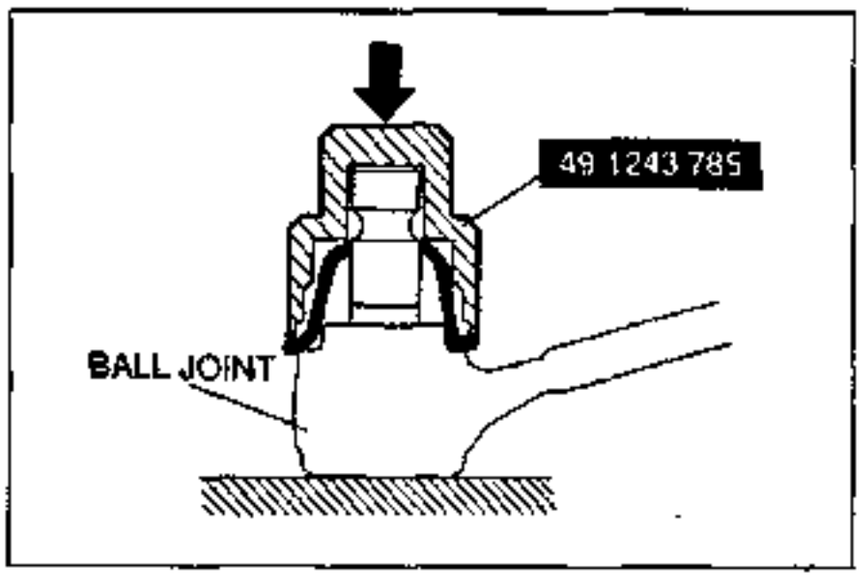


Removal Note
Ball joint dust boot
1. Secure the ball joint in vise.
2. Carefully remove the dust boot from the ball joint with a chisel.

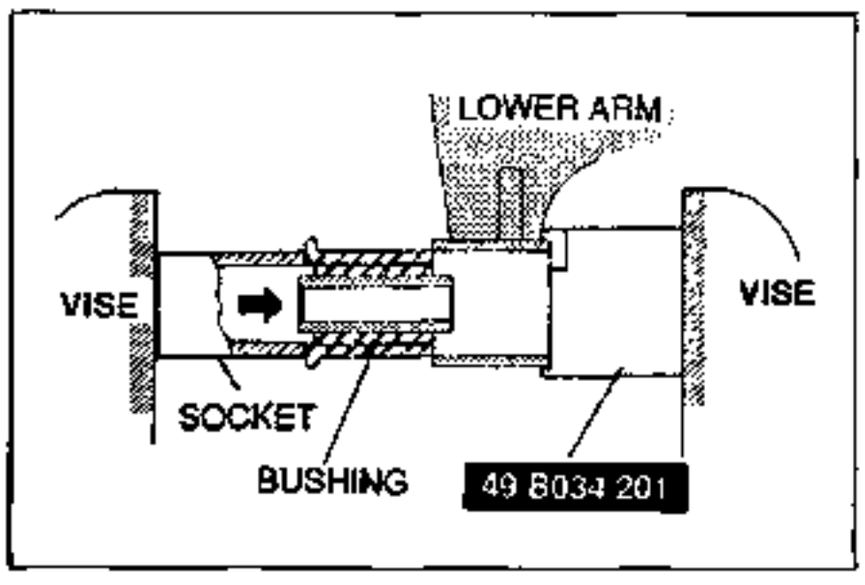


Lower arm bushing (front)
1. Cut away the protecting rubber of the bushing.
2. Remove the bushing by using the **SST** and a suitable socket as shown.

Note
- If the bushing is not easily removed, burn and cut the outer circumference to release the tension.



Installation Note
Ball joint dust boot
1. Wipe the grease off the ball stud.
2. Apply general-purpose grease to the new dust boot.
3. Install the dust boot to the ball joint, and press it on by using the **SST**.
4. Wipe off the leaked grease.

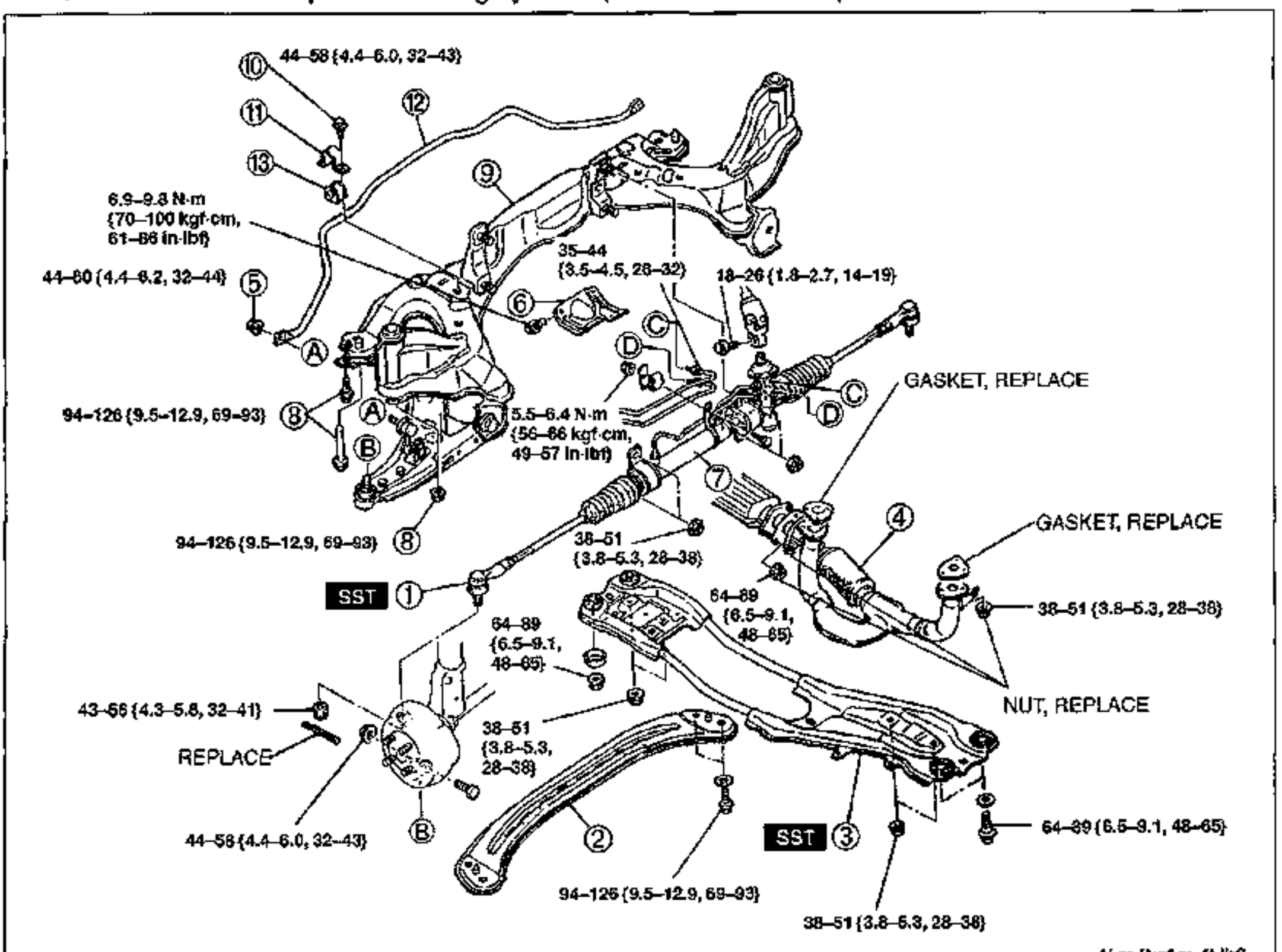


Lower arm bushing (front)
1. Apply soapy water to the new bushing.
2. Press it into the lower arm by using the **SST** and a suitable socket as shown.

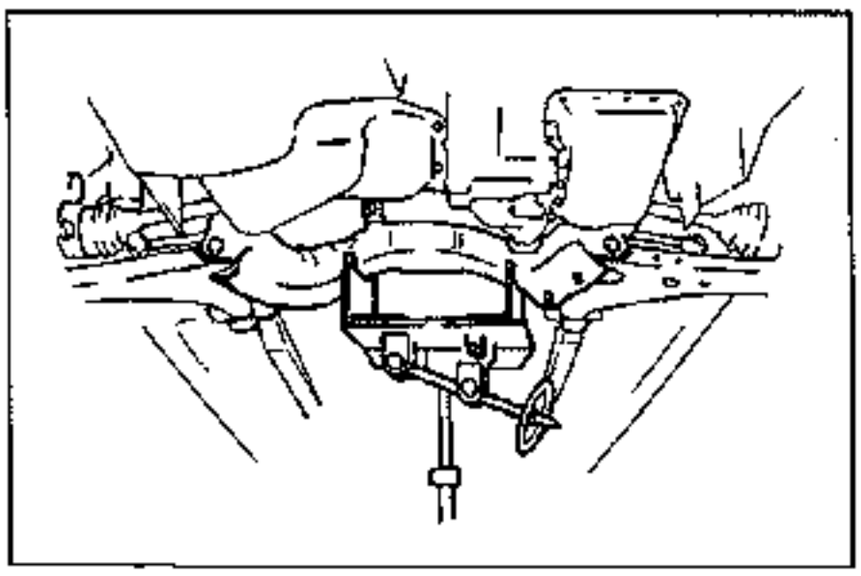
FRONT STABILIZER (K8 DOHC)

Removal / Inspection / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove the undercover.
4. Remove in the order shown in the figure, referring to **Removal Note**.
5. Visually inspect each part and replace as necessary.
6. Install in reverse order of removal, referring to **Installation Note.**
7. Loosely tighten the stabilizer bracket bolts. Tighten all other nuts and bolts to the specified torque.
8. Install the wheels. **(Tightening torque: 89–117 N·m {9.0–12.0 kgf·m, 66–86 ft·lbf})**
9. Lower the vehicle.
10. With the vehicle unloaded, tighten the stabilizer bracket bolts to the specified torque.
11. After installation, measure the front wheel alignment, and adjust it, if necessary. (Refer to page R–7.)
12. Bleed the air from the power steering system. (Refer to section N.)

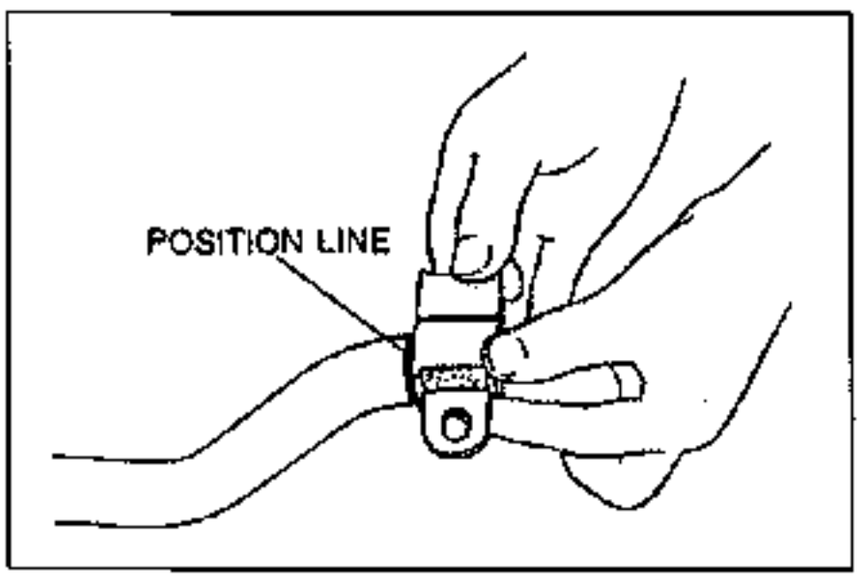


1. Tie-rod end/Steering knuckle
   Service ..... section N
2. Transverse member
3. Engine mounting member
   Service ..... section B2
4. Front exhaust pipe
5. Stabilizer nuts
6. Insulator
7. Steering gear and linkage
   Service ..... section N
8. Bolts and nuts
9. Lower arm and front crossmember assembly
10. Bolts
11. Stabilizer brackets
12. Stabilizer bar
    Inspect for damage
    Removal Note ..... page R–21
13. Stabilizer bushings
    Inspect for damage
    Installation Note ..... page R–21



Removal Note
Stabilizer bar

1. Support the crossmember with a jack, and remove the bolts and nuts.
2. Remove the stabilizer bracket.
3. Lower the crossmember slowly, and remove the stabilizer bar from the crossmember.



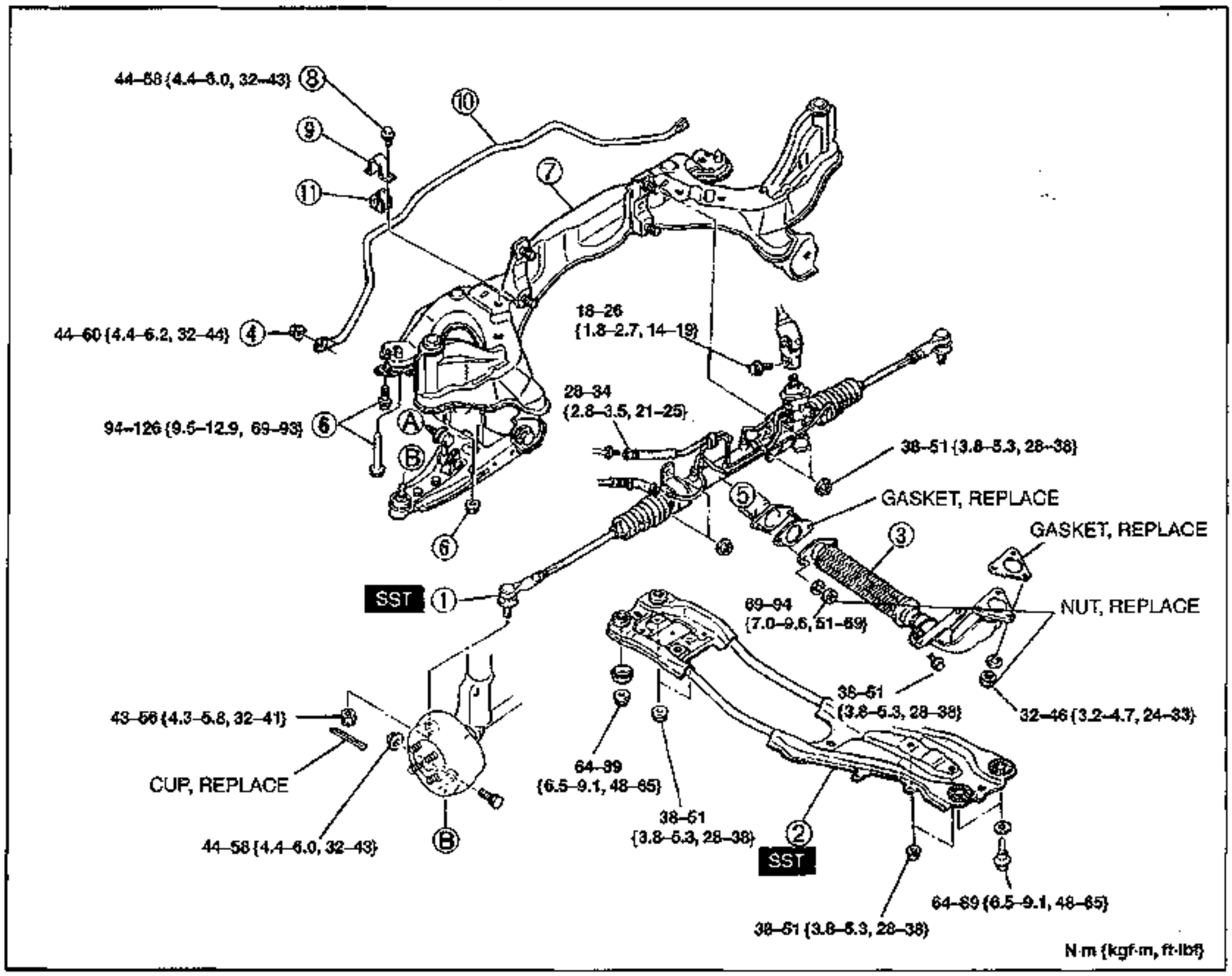
Installation Note
Stabilizer bushing

Align the bushing with the installation position painted on the stabilizer bar.

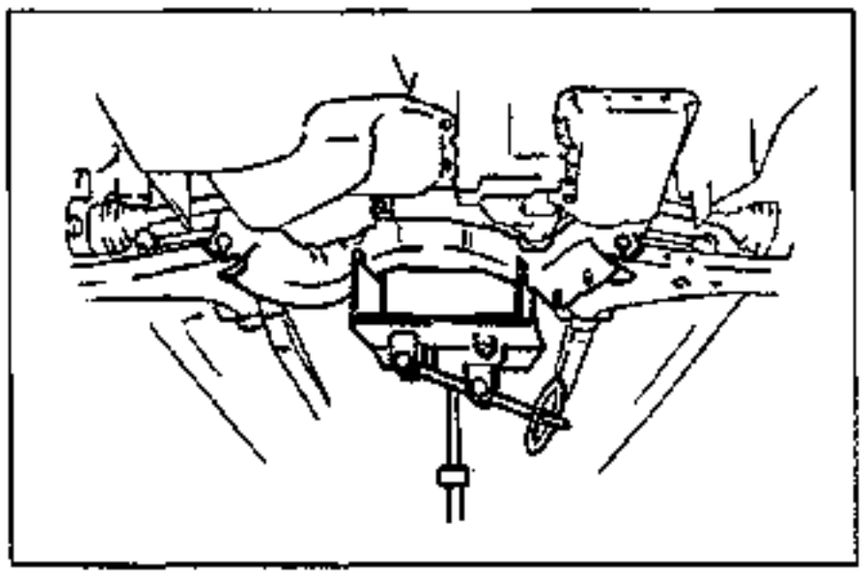
FRONT STABILIZER (B6 DOHC)

Removal / Inspection / Installation

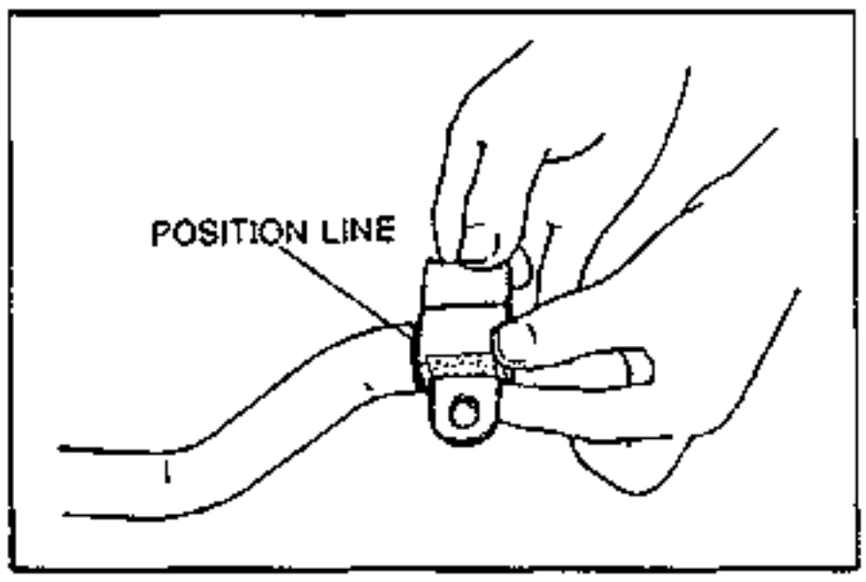
1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove the undercover.
4. Remove in the order shown in the figure, referring to **Removal Note**.
5. Visually inspect each part and replace as necessary.
6. Install in the reverse order of removal, referring to **Installation Note**.
7. Loosely tighten the stabilizer bracket bolts. Tighten all other nuts and bolts to the specified torque.
8. Install the wheels. **(Tightening torque: 89–117 N·m {9.0–12.0 kgf·m, 66–86 ft·lbf})**
9. Lower the vehicle.
10. With the vehicle unloaded, tighten the stabilizer bracket bolts to the specified torque.
11. After installation, measure the front wheel alignment, and adjust it, if necessary. (Refer to page R–7.)
12. Bleed the air from the power steering system. (Refer to section N.)



1. Tie-rod end/Steering knuckle
   Service ..... section N
2. Engine mounting member
   Service ..... section B1
3. Front exhaust pipe
4. Stabilizer nuts
5. Steering gear and linkage
   Service ..... section N
6. Bolts and nuts
7. Lower arm and front crossmember assembly
8. Bolts
9. Stabilizer brackets
10. Stabilizer bar
    Inspect for damage
    Removal Note ..... page R–23
11. Stabilizer bushings
    Inspect for damage
    Installation Note ..... page R–23



Removal Note
Stabilizer bar
1. Support the crossmember with a jack, and remove the bolts and nuts.
2. Remove the stabilizer bracket.
3. Lower the crossmember slowly, and remove the stabilizer bar from the crossmember.

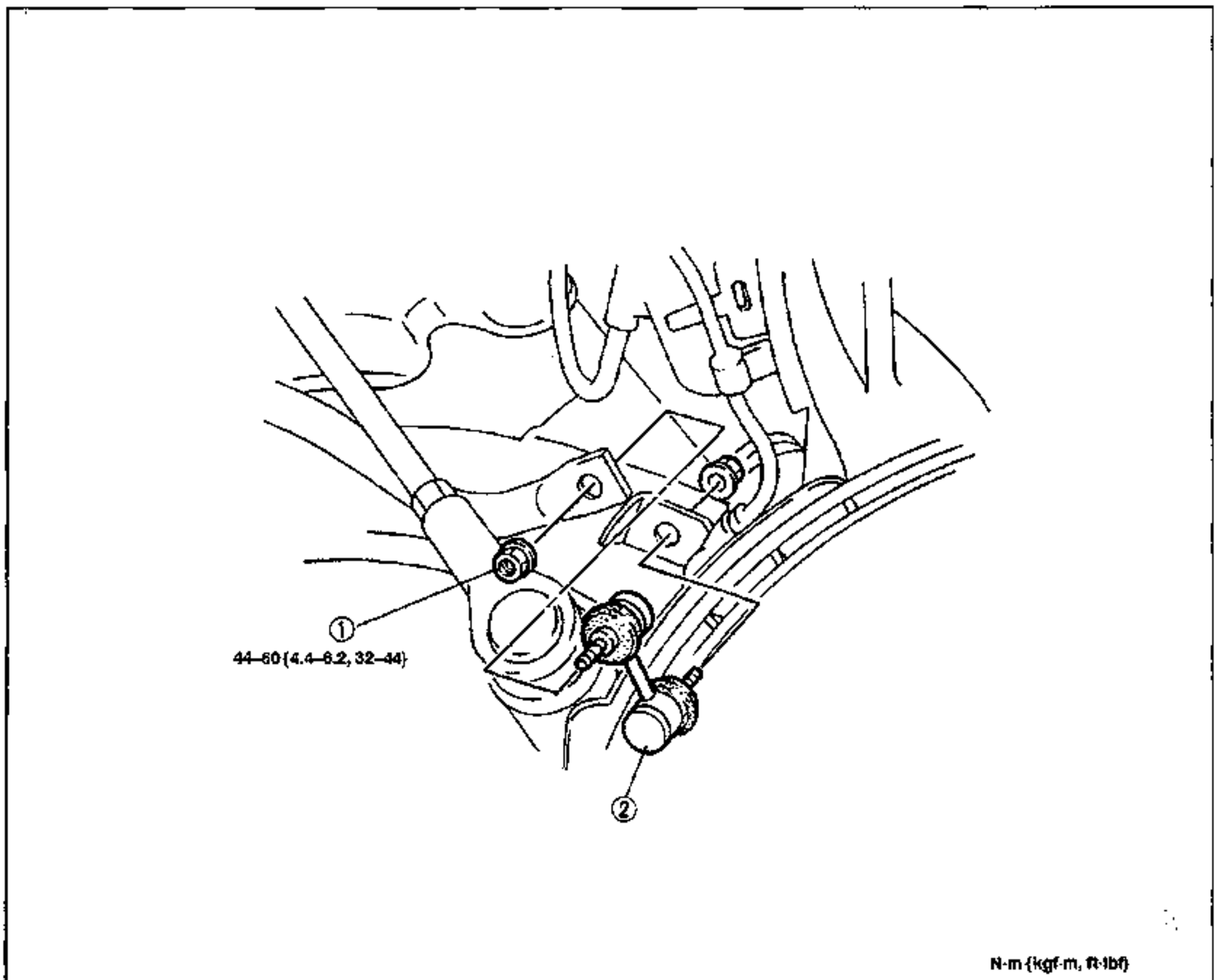


Installation Note
Stabilizer bushing
Align the bushing with the installation position painted on the stabilizer bar.

STABILIZER CONTROL LINK

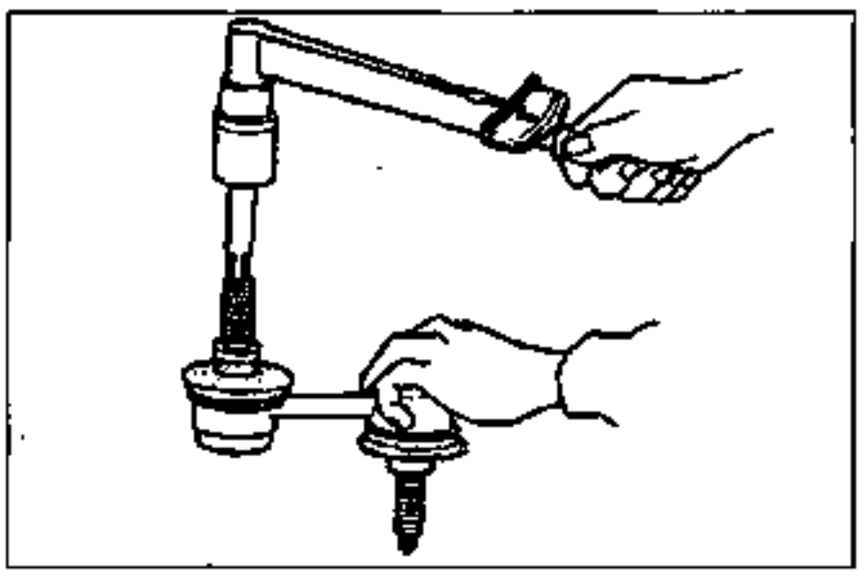
Removal / Inspection / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure.
4. Visually inspect each part and replace as necessary.
5. Install in the reverse order of removal.
6. Install the wheels. **(Tightening torque: 89–117 N·m {9.0–12.0 kgf·m, 66–86 ft·lbf})**



1. Nuts
2. Stabilizer control link

Inspection ..... Below



Inspection

Check the following and replace if necessary

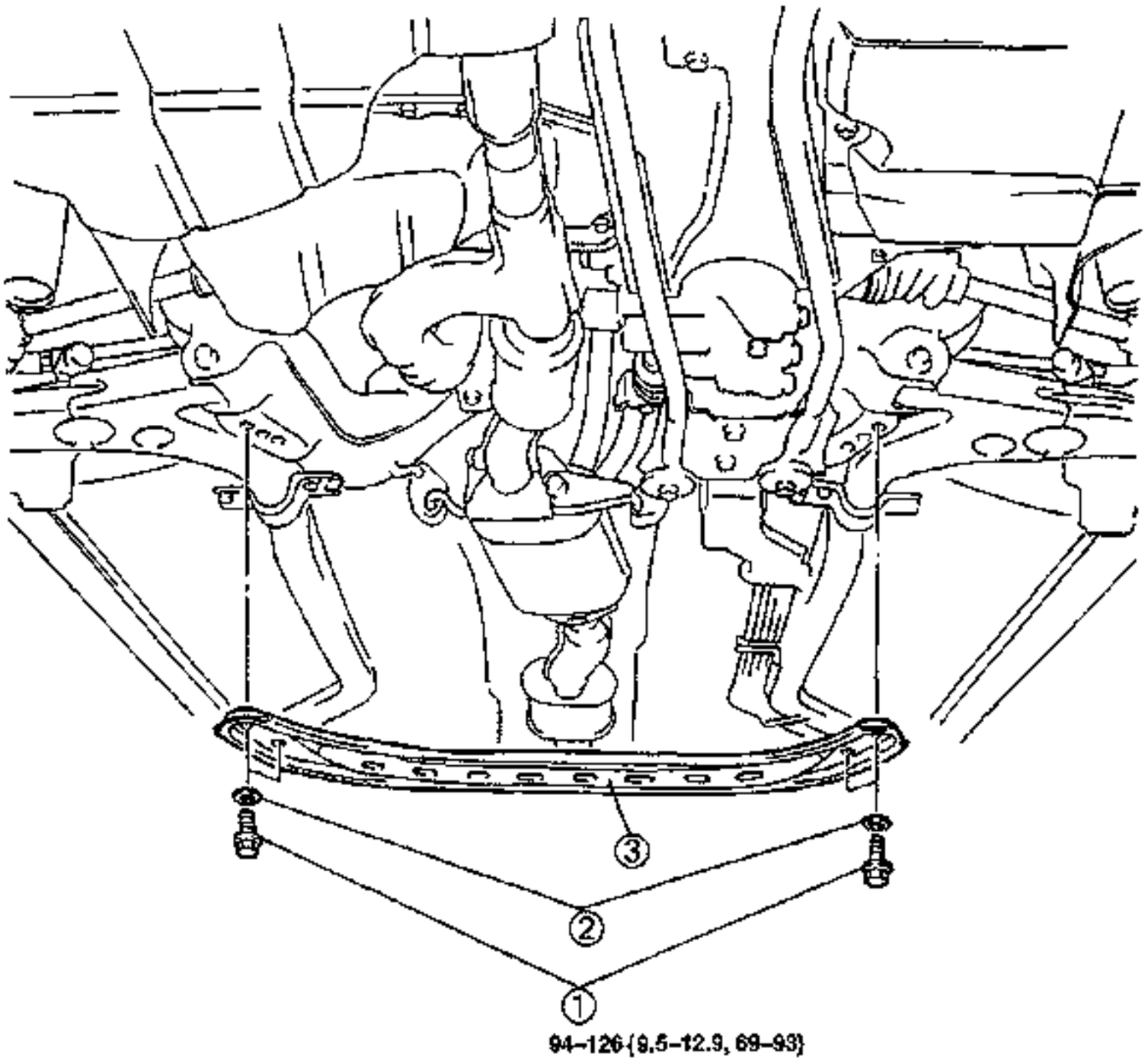
Stabilizer control link

1. Inspect for bending and damage.
2. Shake the ball joint stud 10 times.
3. Rotate the ball joint stud 10 times.
4. Measure the preload with a suitable hexagon wrench and torque wrench.

Preload:

0.2–1.4 N·m {2.0–15.0 kgf·cm, 1.8–13.0 in·lbf}

TRANSVERSE MEMBER (K8 DOHC)
Removal / Inspection / Installation
1. Jack up the front of the vehicle and support it with safety stands.
2. Remove in the order shown in the figure.
3. Visually inspect each part and replace as necessary.
4. Install in the reverse order of removal.



N·m {kgf·m, ft·lbf}

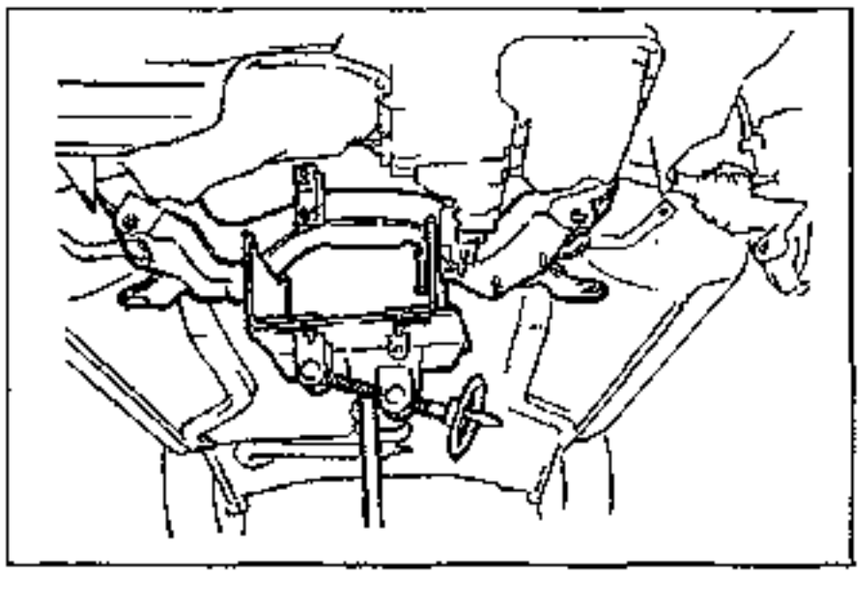
1. Bolts
2. Washers
3. Transverse member
   Inspect for bending and damage

FRONT CROSSMEMBER

Removal / Inspection / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove the undercover.
4. Remove in the order shown in the figure, referring to **Removal Note.**
5. Visually inspect each part and replace as necessary.
6. Install in the reverse order of removal.
7. Loosely tighten the lower arm bolts and the stabilizer bracket bolts. Tighten all other nuts and bolts to the specified torques.
8. Install the wheels. **(Tightening torque: 89–117 N·m {9.0–12.0 kgf·m, 66–86 ft·lbf})**
9. Lower the vehicle.
10. With the vehicle unloaded, tighten the lower arm bolts and the stabilizer bracket bolts to the specified torque.
11. Adjust the front wheel alignment. (Refer to page R–7.)
12. Bleed the air from the power steering system. (Refer to section N.)

1. Tie-rod end / Steering knuckle
   Service ..... section N
2. Transverse member (K8 DOHC)
3. Engine mounting member
   Service ..... section B1, B2
4. Front exhaust pipe
5. Stabilizer nuts
6. Insulator (K8 DOHC)
7. Steering gear and linkage
   Service ..... section N
8. Bolts and nuts
9. Front lower arm assembly
   Removal / Inspection /
   Installation ..... page R–18
10. Bolts
11. Nuts
12. Front crossmember
    Removal Note ..... below
    Inspect for damage
13. Stabilizer bolts
14. Stabilizer brackets
15. Stabilizer bar
    Removal Note ..... page R–21, 23
16. Stabilizer bushings
    Installation Note ..... page R–21, 23

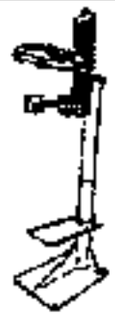
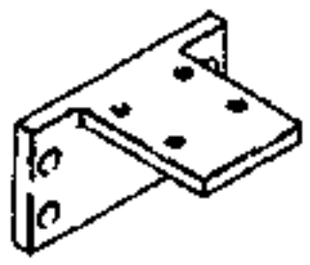
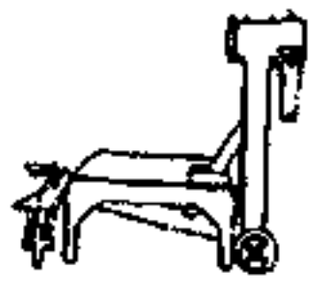


Removal Note
Front Crossmember

1. Support the crossmember with a jack, and remove the bolts and nuts.
2. Remove the front crossmember.

REAR SUSPENSION (STRUT)

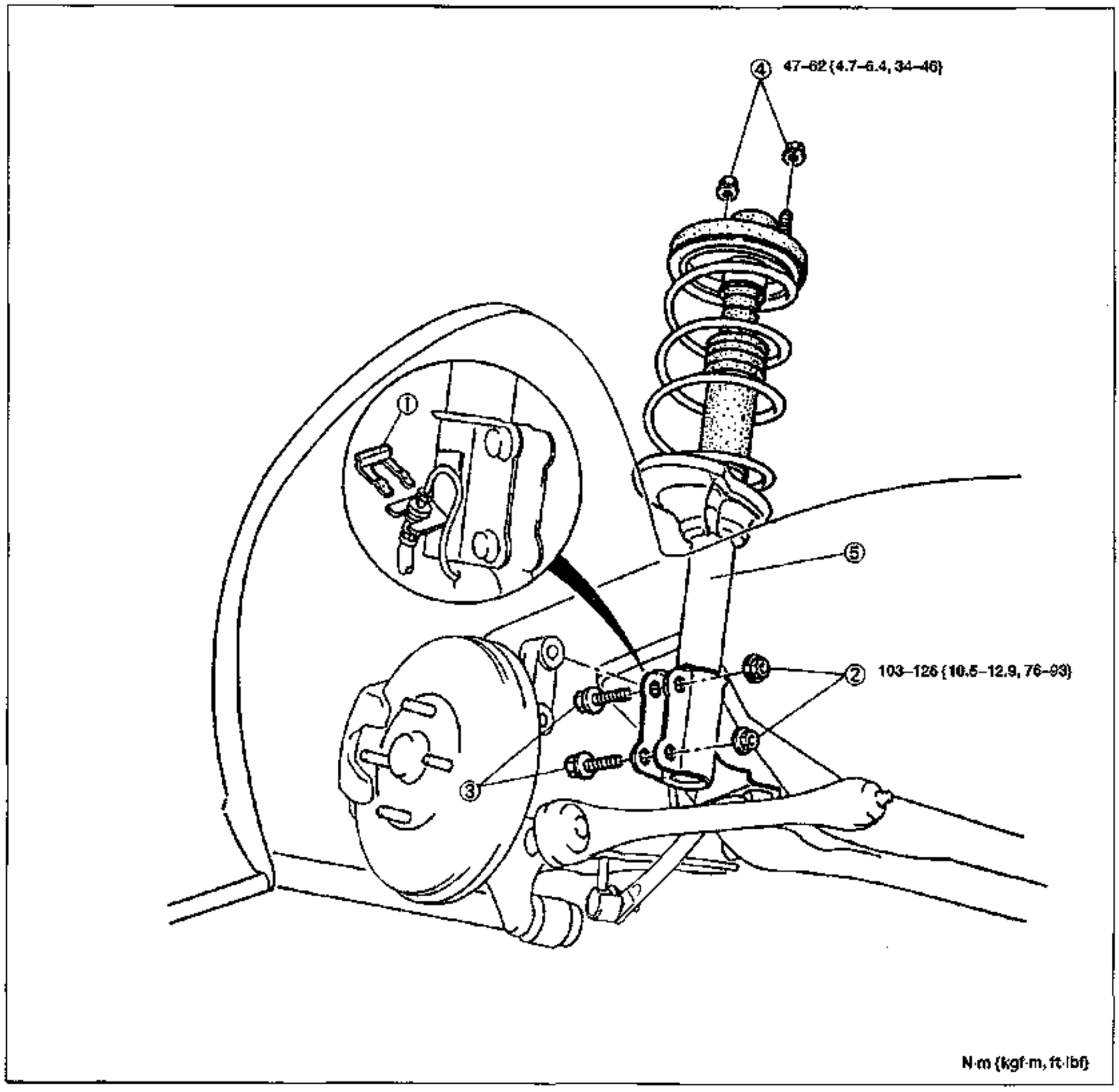
PREPARATION
SST

49 G034 1A0 Compressor, coil spring 	For disassembly and assembly of coil spring	49 G034 102 Screw (Part of 49 G034 1A0) 	For disassembly and assembly of coil spring
49 G034 101 Body (Part of 49 G034 1A0) 	For disassembly and assembly of coil spring	49 G034 103 Arm (Part of 49 G034 1A0) 	For disassembly and assembly of coil spring
49 0259 770B Wrench, flare nut 	For removal and installation of brake pipe	49 T034 1A0 Compressor, coil spring 	For disassembly and assembly of coil spring
49 T034 101 Compressor, spring (Part of 49 T034 1A0) 	For disassembly and assembly of brake pipe	49 T034 103 Hook (Part of 49 T034 1A0) 	For disassembly and assembly of coil spring
49 T034 102 Stand (Part of 49 T034 1A0) 	For disassembly and assembly of coil spring	49 T034 105 Attachment 	For disassembly and assembly of coil spring
49 T034 104 Support (Part of 49 T034 1A0) 	For disassembly and assembly of coil spring	49 0107 680A Engine stand 	For disassembly and assembly of coil spring

REAR SHOCK ABSORBER AND SPRING

Removal / Installation

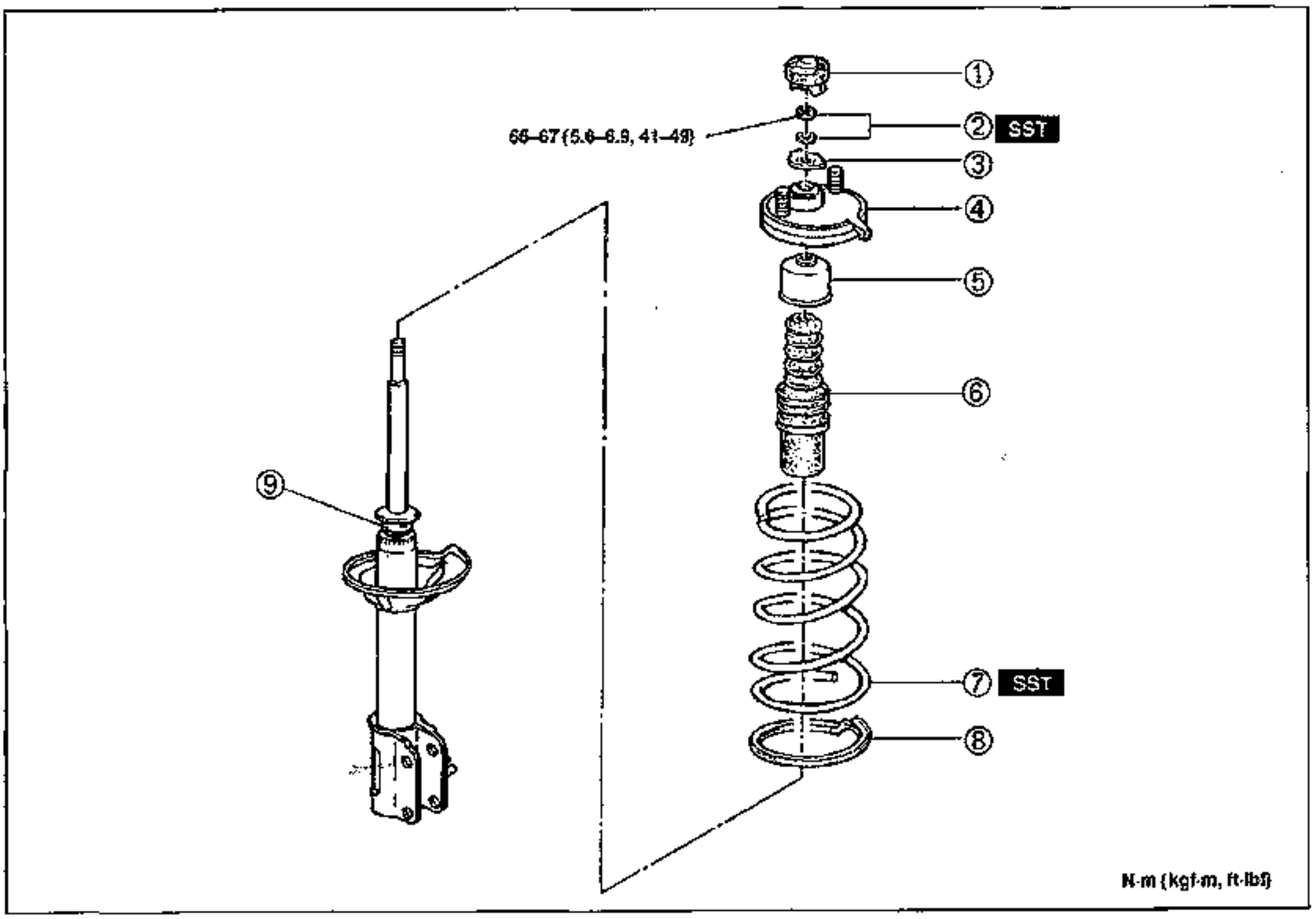
1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove the rear speaker cover and rear seat belt. (Refer to section S.)
4. Remove in the order as shown in the figure.
5. Install in the reverse order of removal.
6. Install the rear speaker cover and rear seat belt. (Refer to section S.)
7. Install the wheels.
   (Tightening torque: 89–117 N·m {9.0–12.0 kgf·m, 66–86 ft·lbf})
8. After installation, measure the rear wheel alignment, if necessary. (Refer to page R–9.)



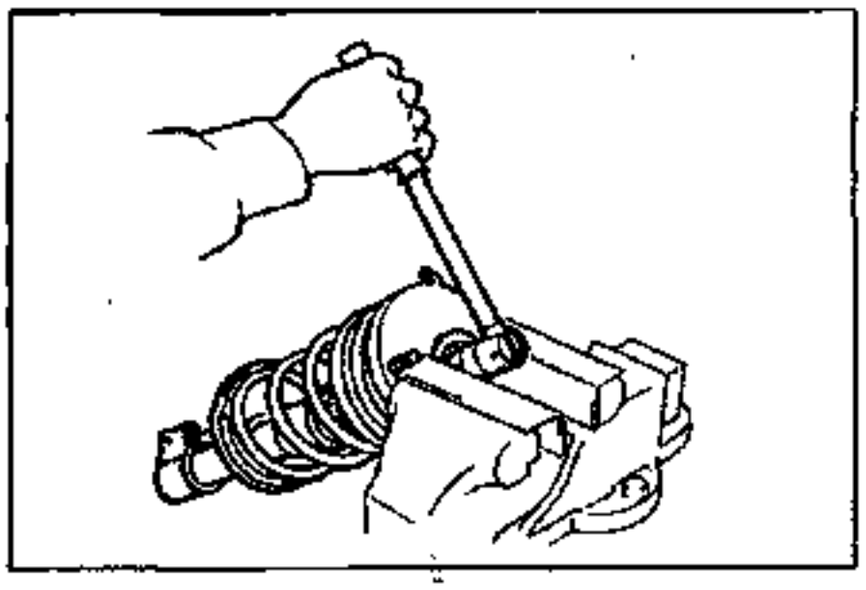
1. Clip
2. Nut
3. Bolt
4. Nut
5. Shock absorber and spring
   Disassembly / Inspection / Assembly ..... page R–30

Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Visually inspect each part and replace as necessary.
3. Assemble in the reverse order of removal, referring to **Assembly Note.**



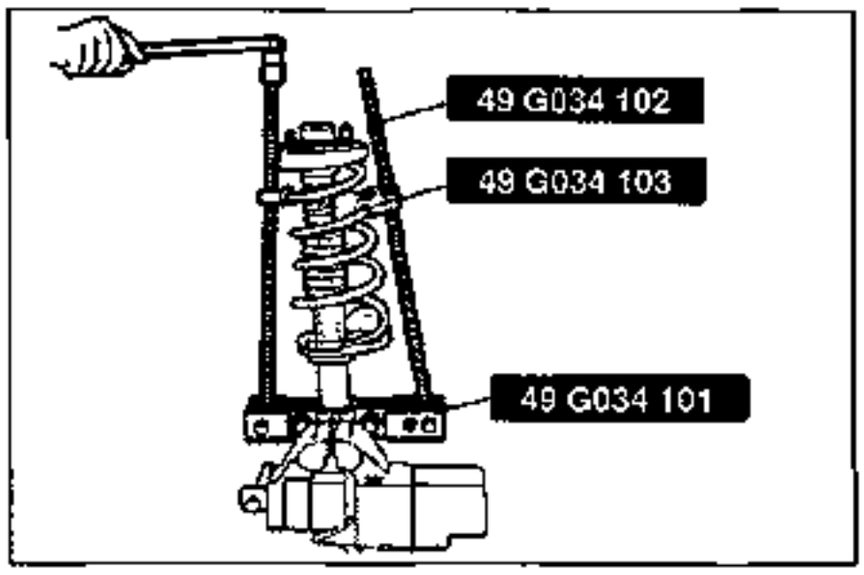
1. Cap
2. Nut and washer
   Disassembly Note ..... below
3. Retainer
4. Mounting block
   Inspect for damage weakness
5. Stopper seat
6. Bound stopper
   Inspect for damage and cracks
7. Coil spring
   Assembly Note ..... page R–31
   Inspect for damage and weakness
8. Lower spring seat
   Inspect for damage and cracks
9. Shock absorber
   Inspection ..... page R–14
   Disposal of shock absorber .... page R–14



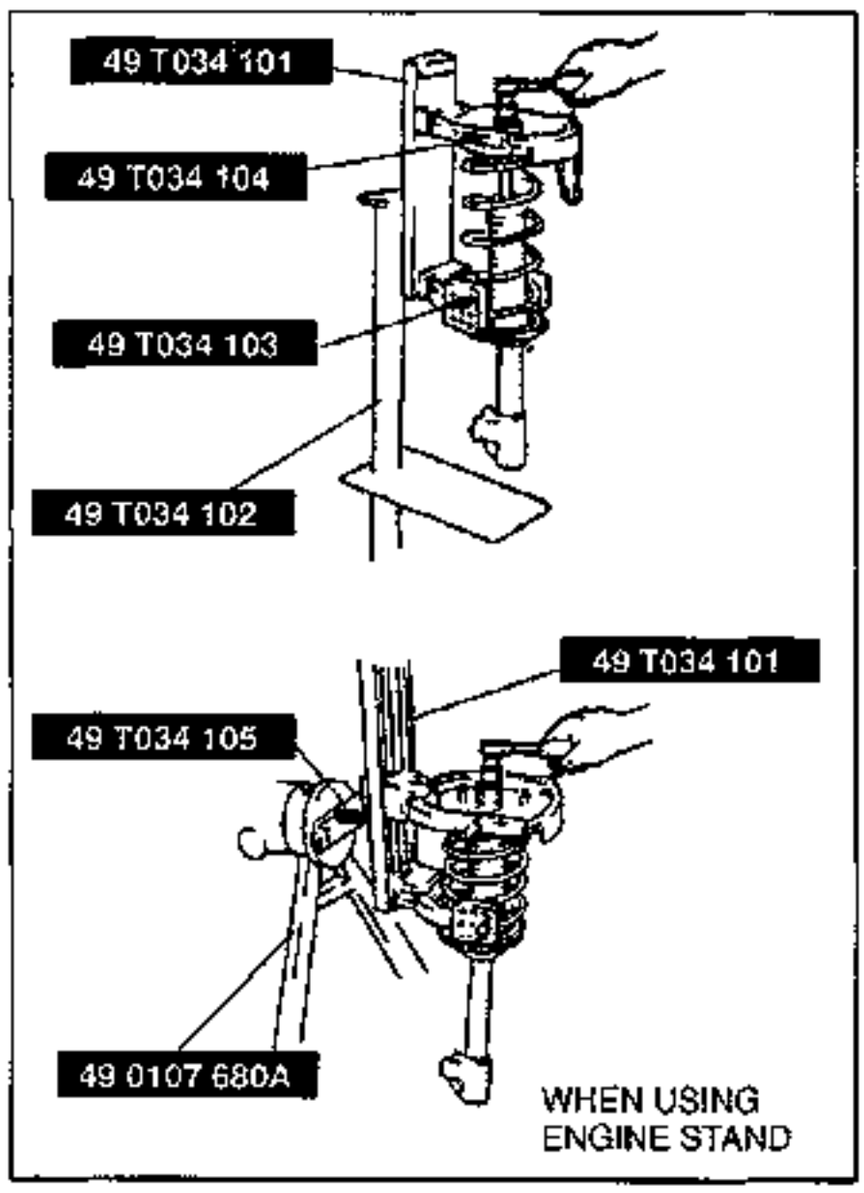
Disassembly Note
Nut and washer

Warning
- **Removing the nut is dangerous. The shock absorber and spring could fly off under tremendous pressure and cause serious injury or death. Secure the shock absorber in the SSTs before removing the nut.**

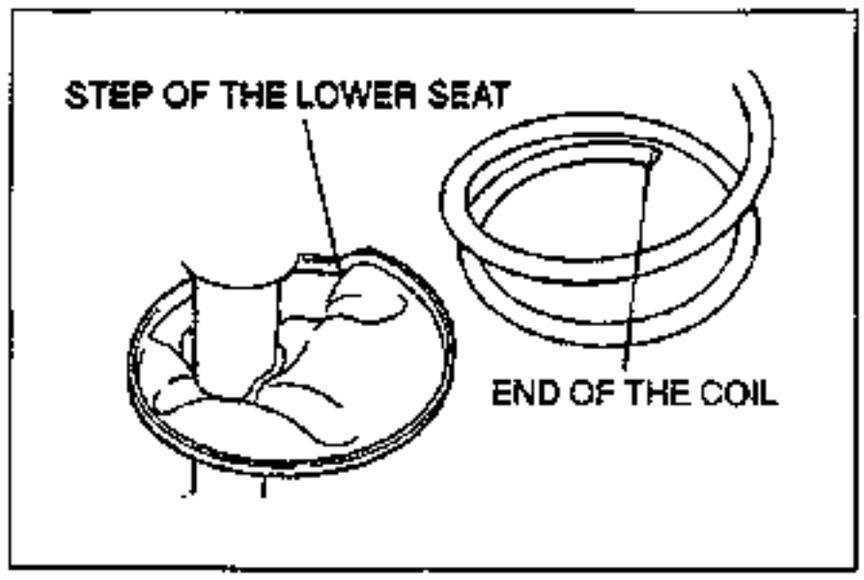
1. Secure the mounting block in a vise.
2. Loosen the nut several turns, but do not remove it.



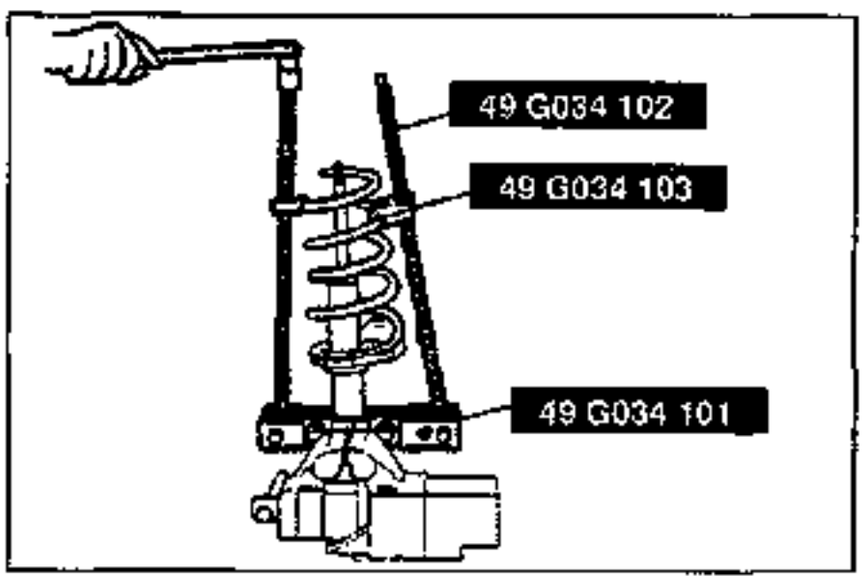
When using SST (49 G034 1A0)
3. Assemble the **SSTs.**
4. Compress the coil spring by using the **SSTs.**
5. Remove the nut.
6. Remove the coil spring.



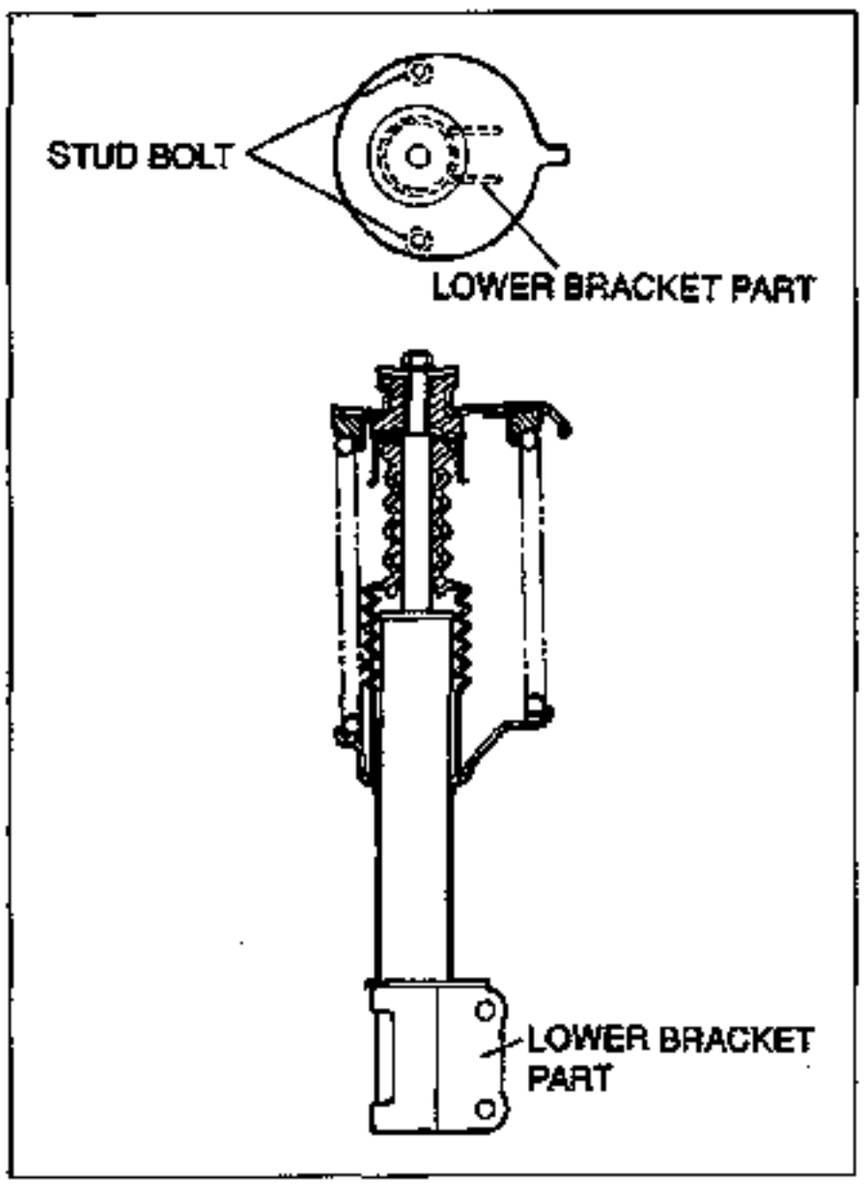
When using SST (49 T034 1A0)
3. Assemble the **SSTs.**
4. Secure the shock absorber in the **SSTs.**
5. Compress the coil spring by using the **SSTs** and remove the nut.



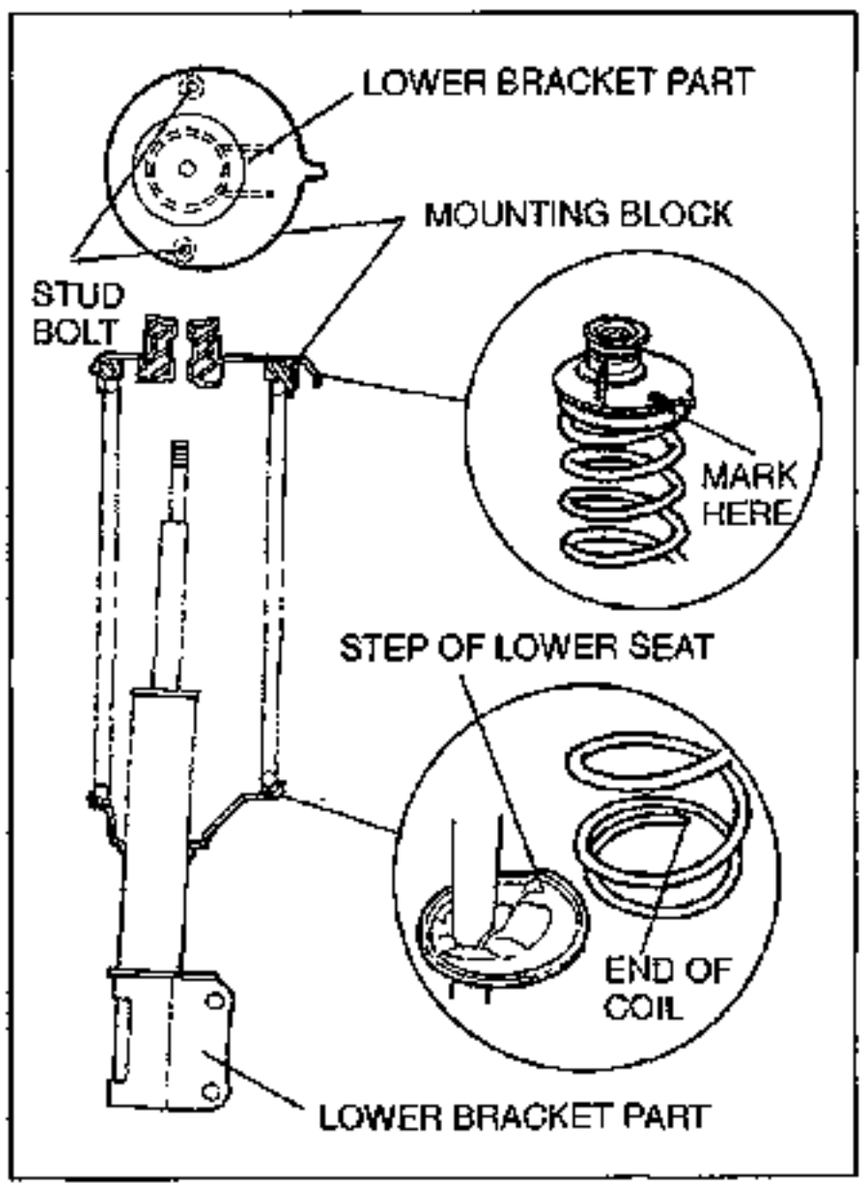
Assembly Note
Coil spring
When using SST (49 G034 1A0)
1. Secure the shock absorber in a vise.
2. Install the lower spring seat.
3. Install the coil spring, fitting the end of the coil into the step of the lower seat.



4. Compress the coil spring by using the **SSTs.**
5. Install the bound stopper and the stopper seat.

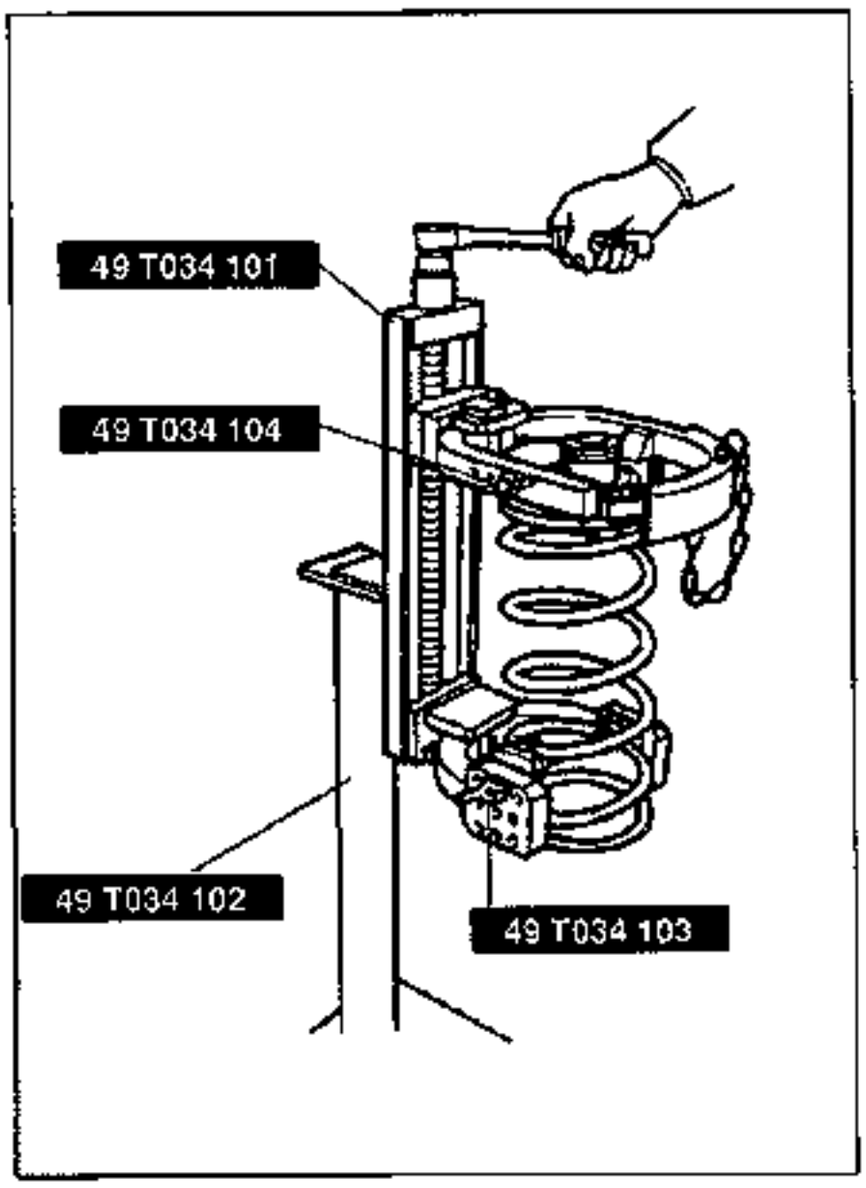


6. Install the mounting block, aligning the studs of the mounting block and the lower bracket of the shock absorber as shown in the figure.
7. Install the retainer and washer.
8. Loosely tighten the nut.
9. Carefully loosen and remove the **SSTs.**
10. Verify that the coil spring is correctly seated in the mounting block and lower spring seat.

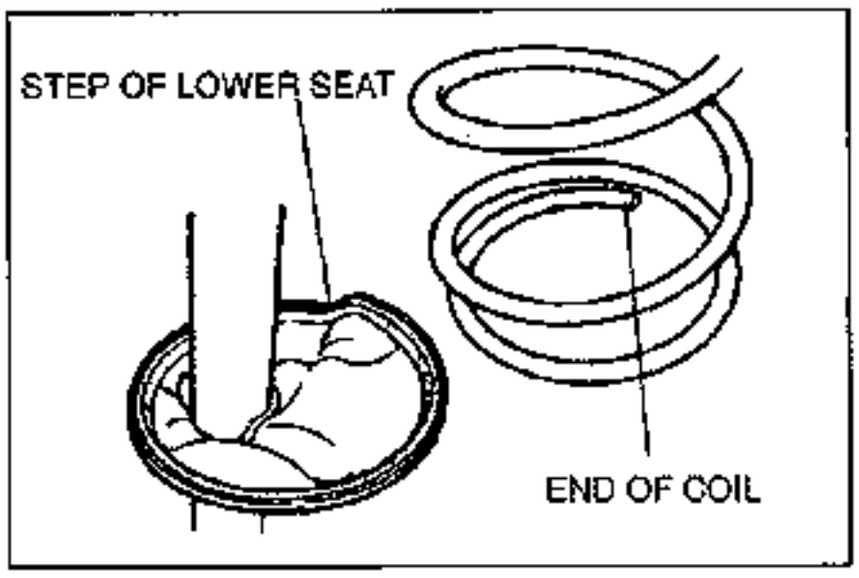


When using SST (49 T034 1A0)

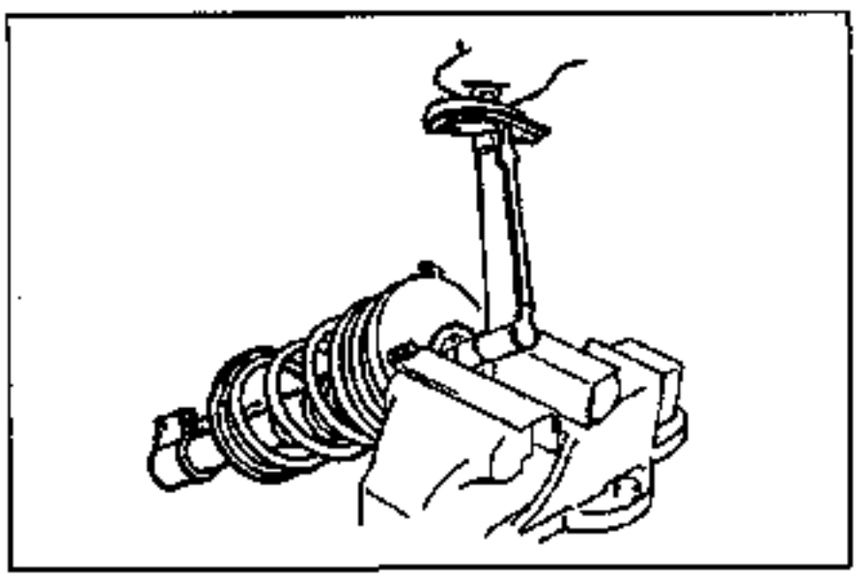
1. Temporarily assemble the mounting block and coil spring to the shock absorber, as shown.
2. Mark the mounting block and coil spring for proper reassembly.



3. Align the marks of the mounting block and coil spring. Protect the mounting block and the coil spring with a piece of cloth; then assemble the **SSTs.**
4. Use the **SSTs** to compress the spring.



5. Install the lower spring seat.
6. Install the bound stopper.
7. Install the dust cover.
8. Install the shock absorber, fitting the end of the coil into the step of the lower seat.
9. Install the retainer and washer.
10. Loosely tighten the nut.
11. Carefully loosen and remove the **SSTs.**
12. Verify that the coil spring is correctly seated in the mounting block and lower spring seat.



13. Secure the mounting block in a vise.
14. Install the retainer and washer.
15. Tighten the nut to the specified torque.

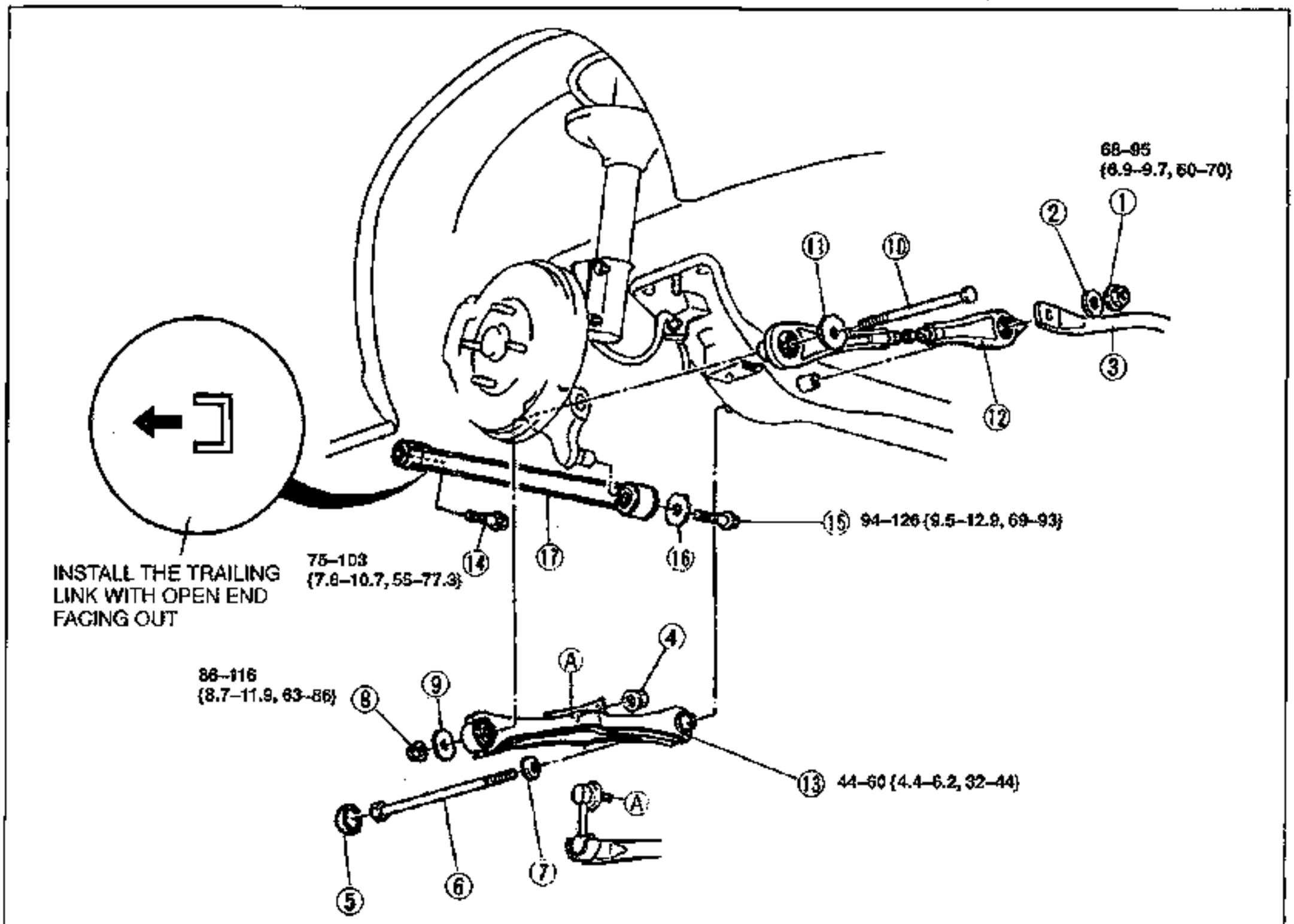
Tightening torque:
55–67 N·m {5.6–6.9 kgf·m, 41–49 ft·lbf}

16. Install the cap over the nut.

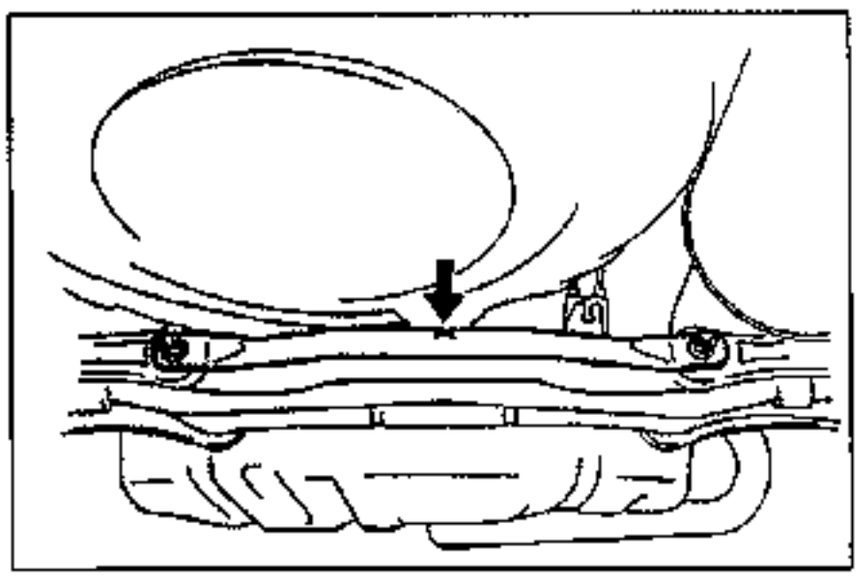
PERFORMANCE ROD, LATERAL LINK AND TRAILING LINK

Removal / Inspection / Installation

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure.
4. Visually inspect each part and replace as necessary.
5. Install in the reverse order of removal, referring to **Installation Note**.
6. Loosely tighten the lateral link and trailing link bolts. Tighten all other nuts and bolts to the specified torque.
7. Install the wheels. **(Tightening torque: 89–117 N·m {9.0–12.0 kgf·m, 66–86 ft·lbf})**
8. Lower the vehicle.
9. With the vehicle unloaded, tighten the lateral link and trailing link bolts to the specified torque.
10. After installation, measure the rear wheel alignment, and adjust it if necessary. (Refer to page R–9.)

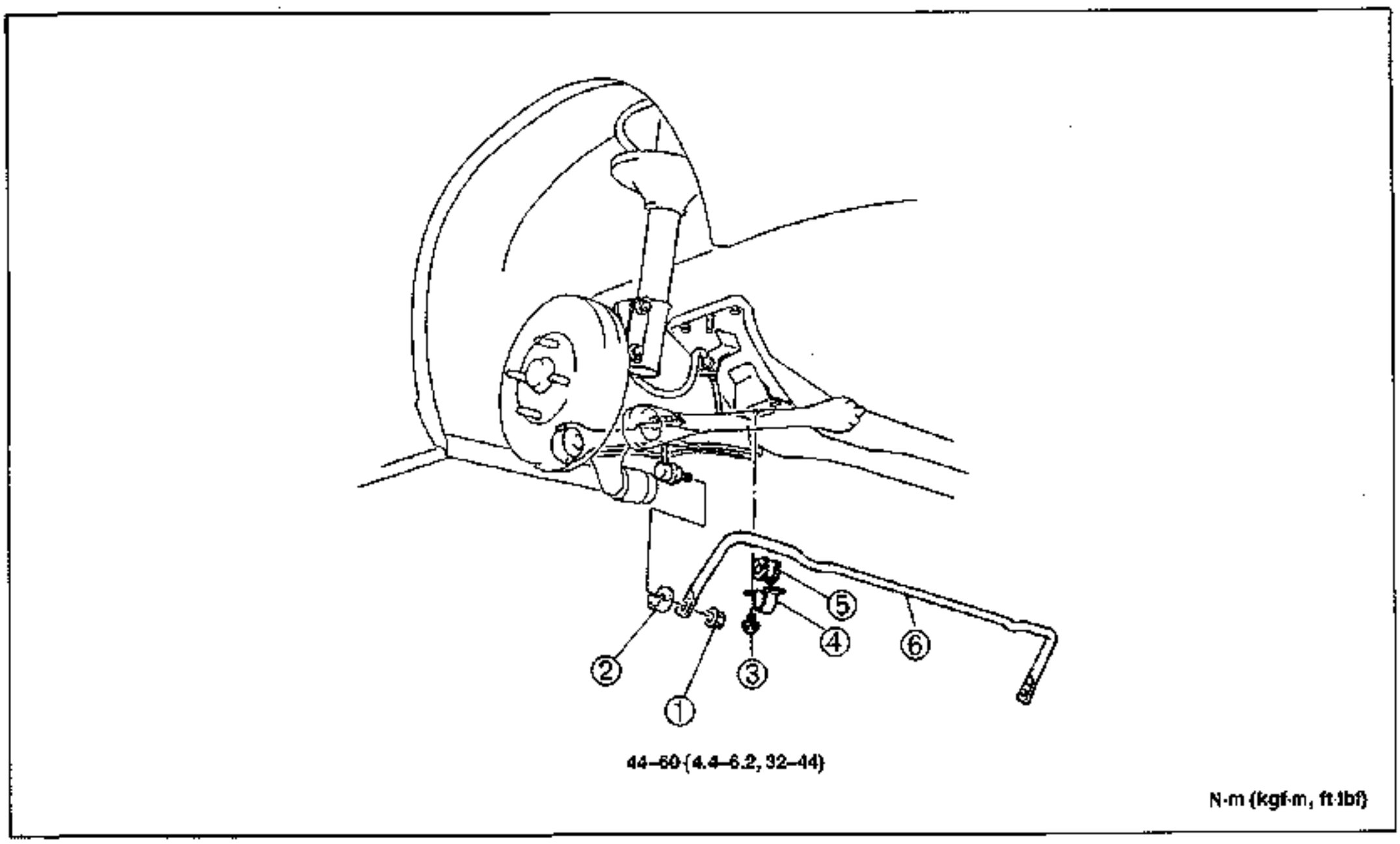


1. Nut
2. Washer
3. Performance rod (K8 DOHC)
   Inspect for bending and damage
   Installation Note ..... page R–36
4. Stabilizer nut
5. Cap
6. Bolt
7. Washer
8. Nut
9. Washer
10. Bolt
11. Retainer
12. Lateral link (rear)
    Inspect for deformation
    Inspect for weakness of bushing
13. Lateral link (front)
    Inspect for deformation
    Inspect weakness of bushing
14. Bolt
15. Bolt
16. Washer
17. Trailing link
    Inspect for deformation
    Inspect weakness of bushing

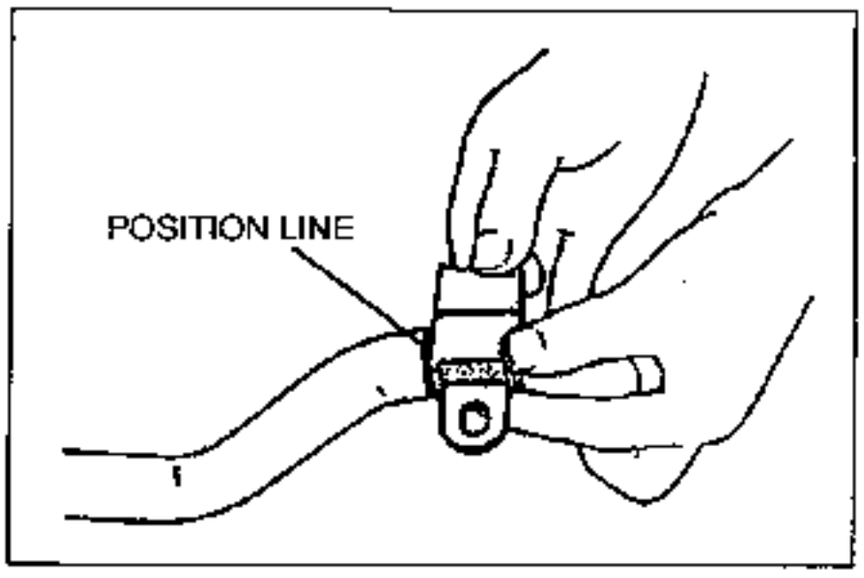


Installation Note
Performance rod
Install the performance rod with the "^" toward the rear crossmember.

REAR STABILIZER
Removal/Inspection / Installation
1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure.
4. Visually inspect each part and replace as necessary.
5. Install in the reverse order of removal.
6. Loosely tighten the stabilizer bracket bolts. Tighten other nuts to the specified torque.
7. Install the wheels. **(Tightening torque: 89–117 N·m {9.0–12.0 kgf·m, 66–86 ft·lbf})**
8. Lower the vehicle.
9. With the vehicle unloaded, tighten the stabilizer bracket bolts to the specified torque.



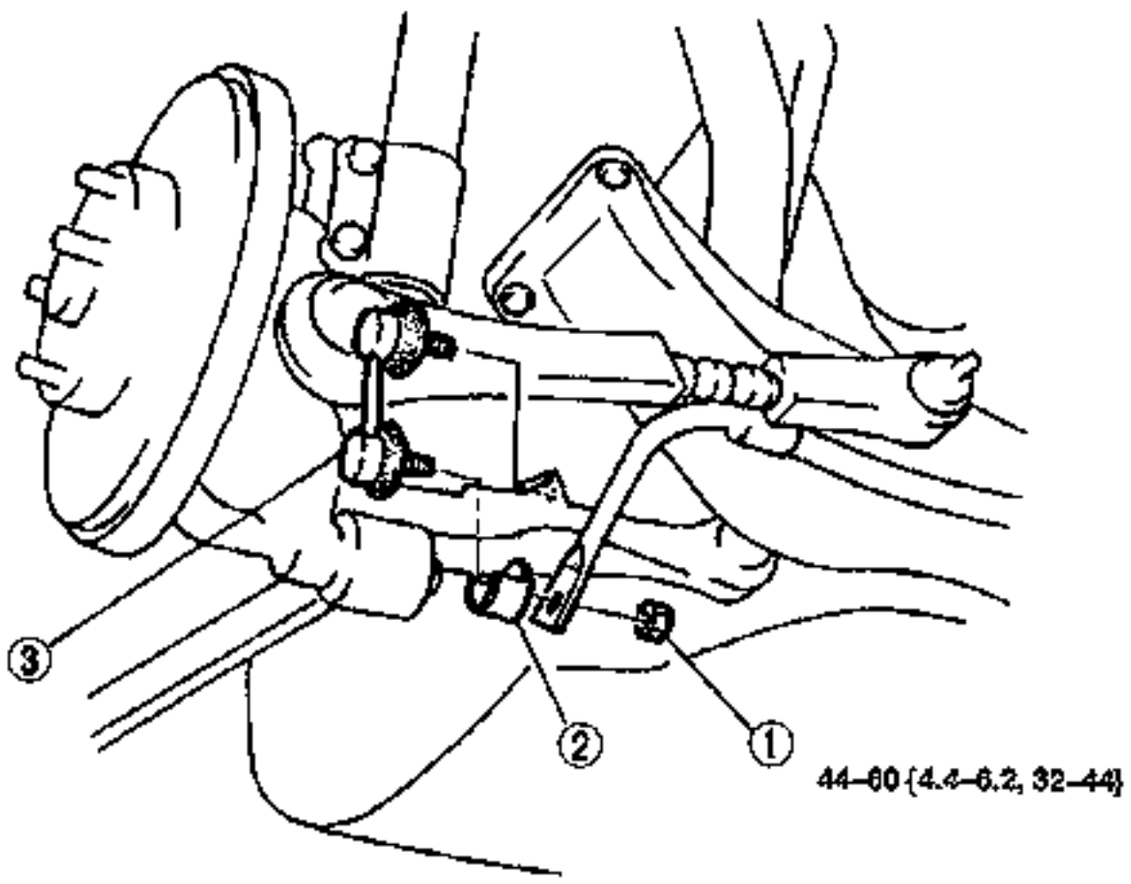
1. Nuts
2. Protectors
3. Bolts
4. Stabilizer brackets
5. Stabilizer bushings
   Inspect for damage and weakness
   Installation Note . . . . . page R–36
6. Stabilizer bar
   Inspect for damage and deformation



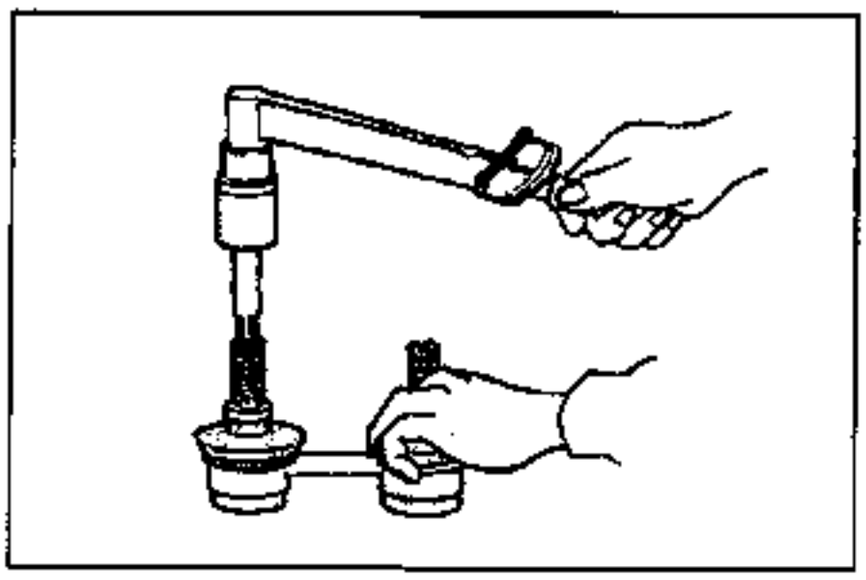
Installation Note
Stabilizer bushing
Align the bushing with the installation position line painted on the stabilizer bar.

STABILIZER CONTROL LINK

Removal / Inspection / Installation
1. Jack up the rear of the vehicle and support it with the safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure.
4. Visually inspect each part and replace as necessary.
5. Install in the reverse order of removal.
6. Install the wheels. **(Tightening torque: 89–117 N·m {9.0–12.0 kgf·m, 66–86 ft·lbf})**



1. Nuts
2. Protector
3. Stabilizer control link
   Inspection ..... Below



Inspection
Stabilizer control link
Check the following and replace if necessary
1. Inspect for bending and damage.
2. Shake the ball joint stud 10 times.
3. Rotate the ball joint stud 10 times.
4. Measure the preload with a suitable hexagon wrench and a torque wrench.

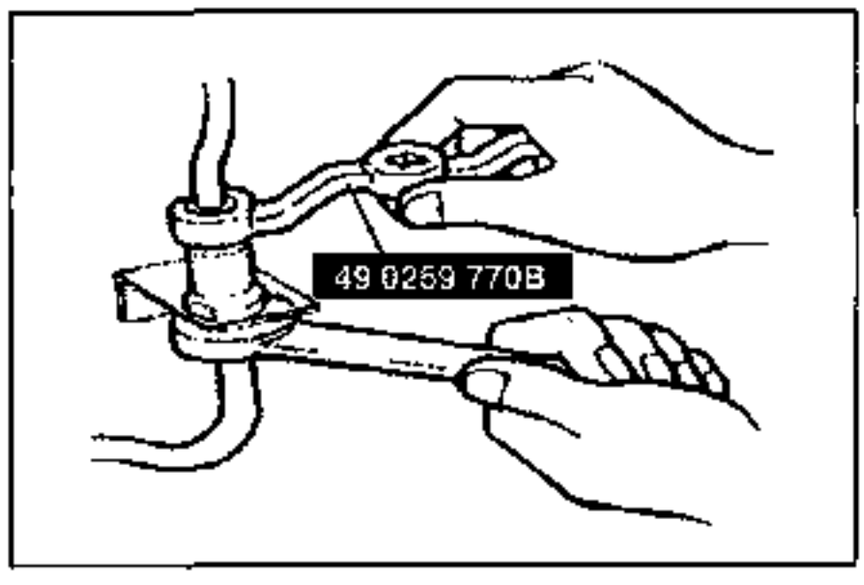
Preload:
0.2–1.4 N·m {2.0–15.0 kgf·cm, 1.7–13.0 in·lbf}

REAR CROSSMEMBER

Removal / Inspection / Installation

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure, referring to **Removal Note.**
4. Visually inspect each part and replace as necessary.
5. Install in the reverse order of the removal, referring to **Installation Note.**
6. Loosely tighten the stabilizer bracket, lateral link and performance rod bolts and nuts. Tighten all other bolts and nuts to the specified torque.
7. Bleed the air from the Brake System. (Refer to section P.)
8. Install the wheels. **(Tightening torque: 89–117 N·m {9.0–12.0 kgf·m, 66–86 ft·lbf})**
9. Lower the vehicle.
10. With the vehicle unloaded, tighten the stabilizer bracket, lateral link and performance rod bolts to the specified torque.
11. After installation, measure the rear wheel alignment, and adjust it, if necessary. (Refer to page R–9.)

1. Brake pipe
   Removal / Installation Note .... page R–38
2. Rear stabilizer
   Removal / Inspection / Installation ..... page R–36
3. Performance rod (K8 DOHC)
   Removal / Inspection / Installation ..... page R–34
4. Lateral link (front and rear)
   Removal/Inspection / Installation ..... page R–34
5. Bolts
6. Rear crossmember
   Inspect for damage



Removal/Installation Note
Brake pipe
Disconnect/connect the brake pipes by using the **SST**.

Tightening torque:
12.8–21.5 N·m {130–220 kgf·cm, 113–190 in·lbf}

Before beginning any service procedure, refer to the 1995 MX–3 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings.

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NOTE: Refer to the 1995 MX-3 Body Electrical Troubleshooting Manual (1474-10-94H) for servicing of the body electrical components.

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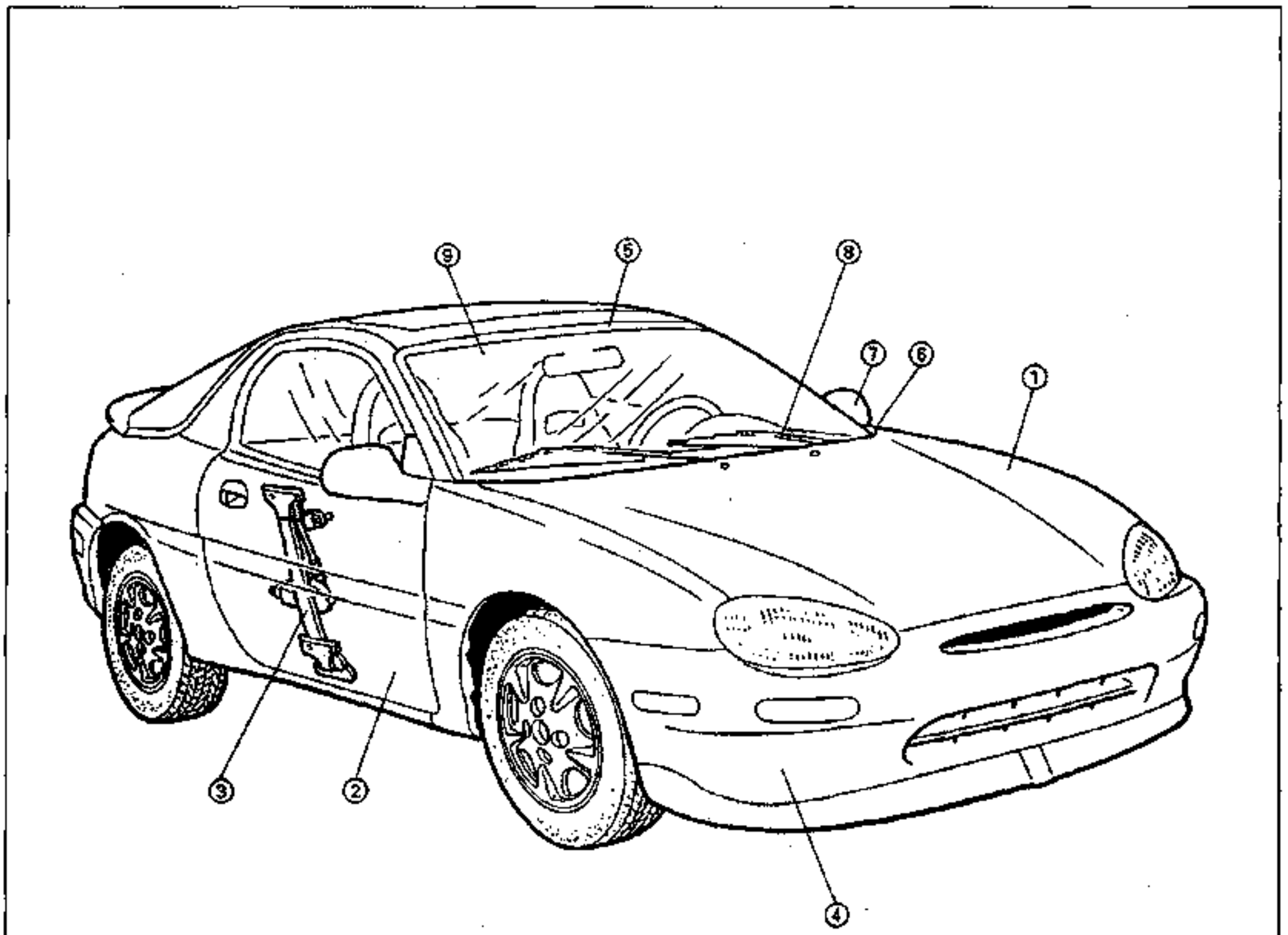

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2. Door
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3. Window regulator and glass
Removal / Installation ..... page S–10
4. Front bumper
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5. Molding
Removal / Installation ..... page S–22
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7. Power outside mirror
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8. Windshield wiper and washer
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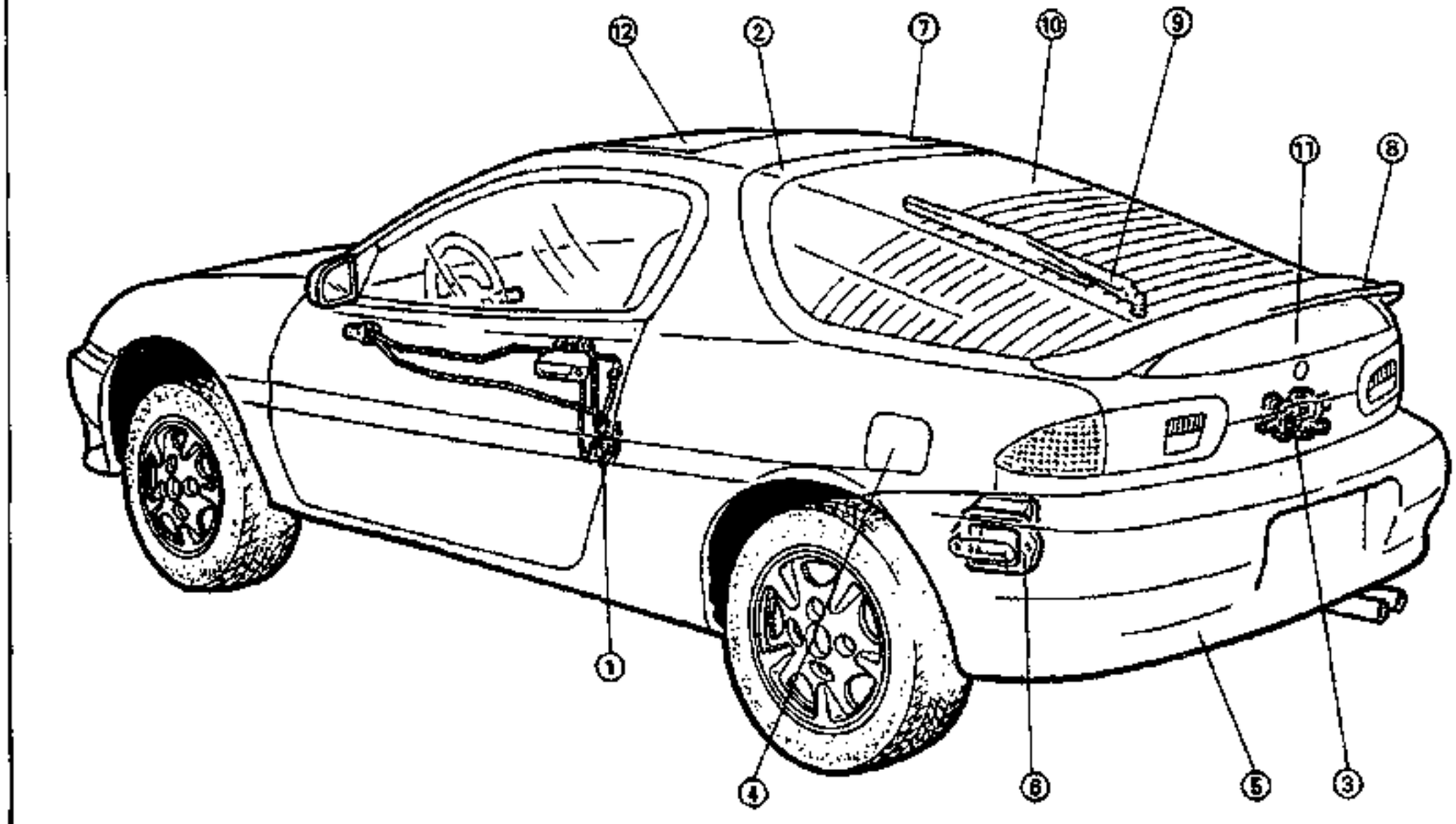

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10. Liftgate glass
Removal / Installation ..... page S–45
11. Vertical window glass
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12. Sliding sunroof
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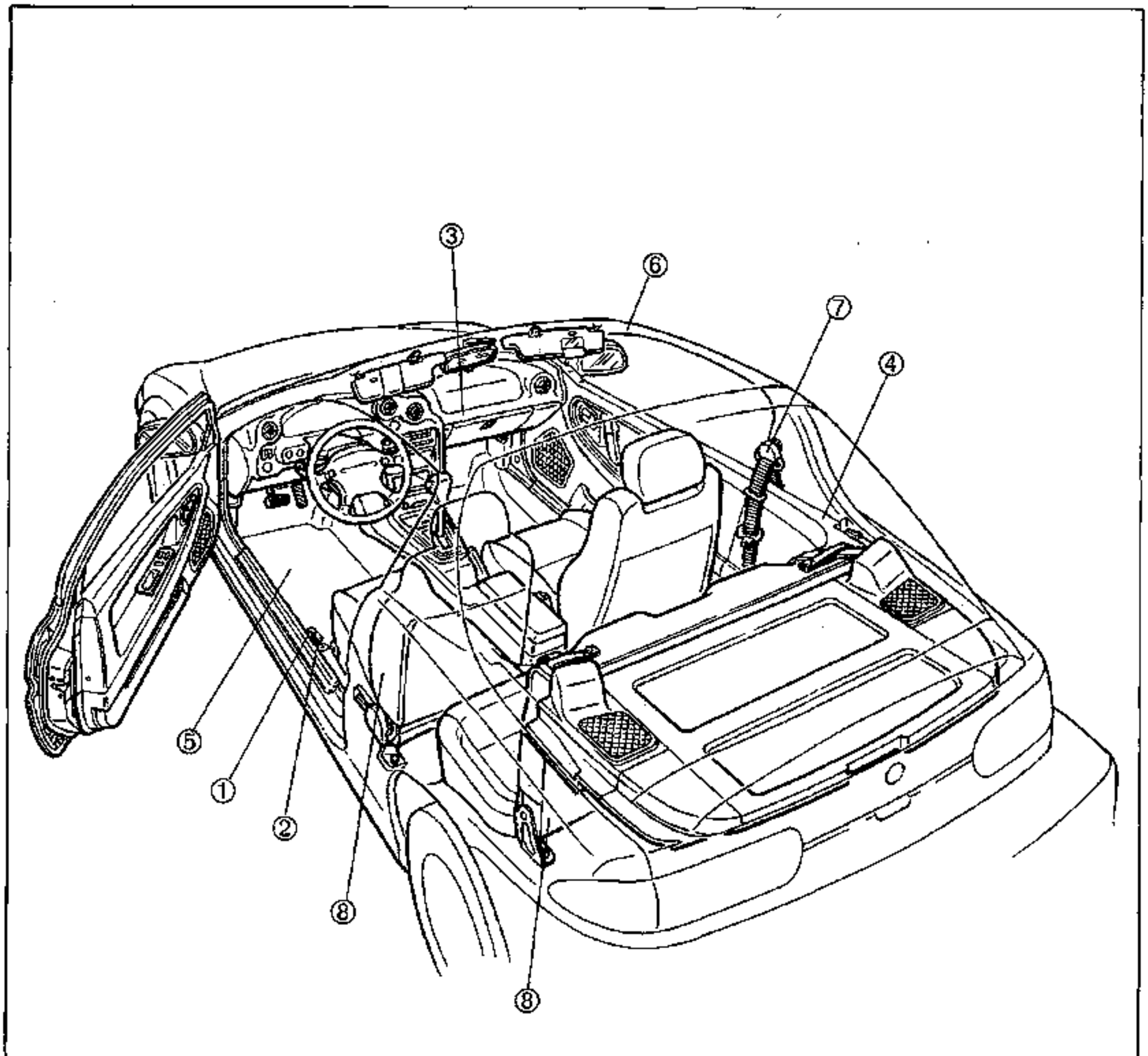

1. Liftgate lock and opener
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2. Fuel-filler lid and opener
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3. Dashboard and console
Removal / Installation ..... page S–61
4. Trim
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5. Floor covering
Removal / Installation ..... page S–69
6. Headliner
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7. Seat belt
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8. Seat
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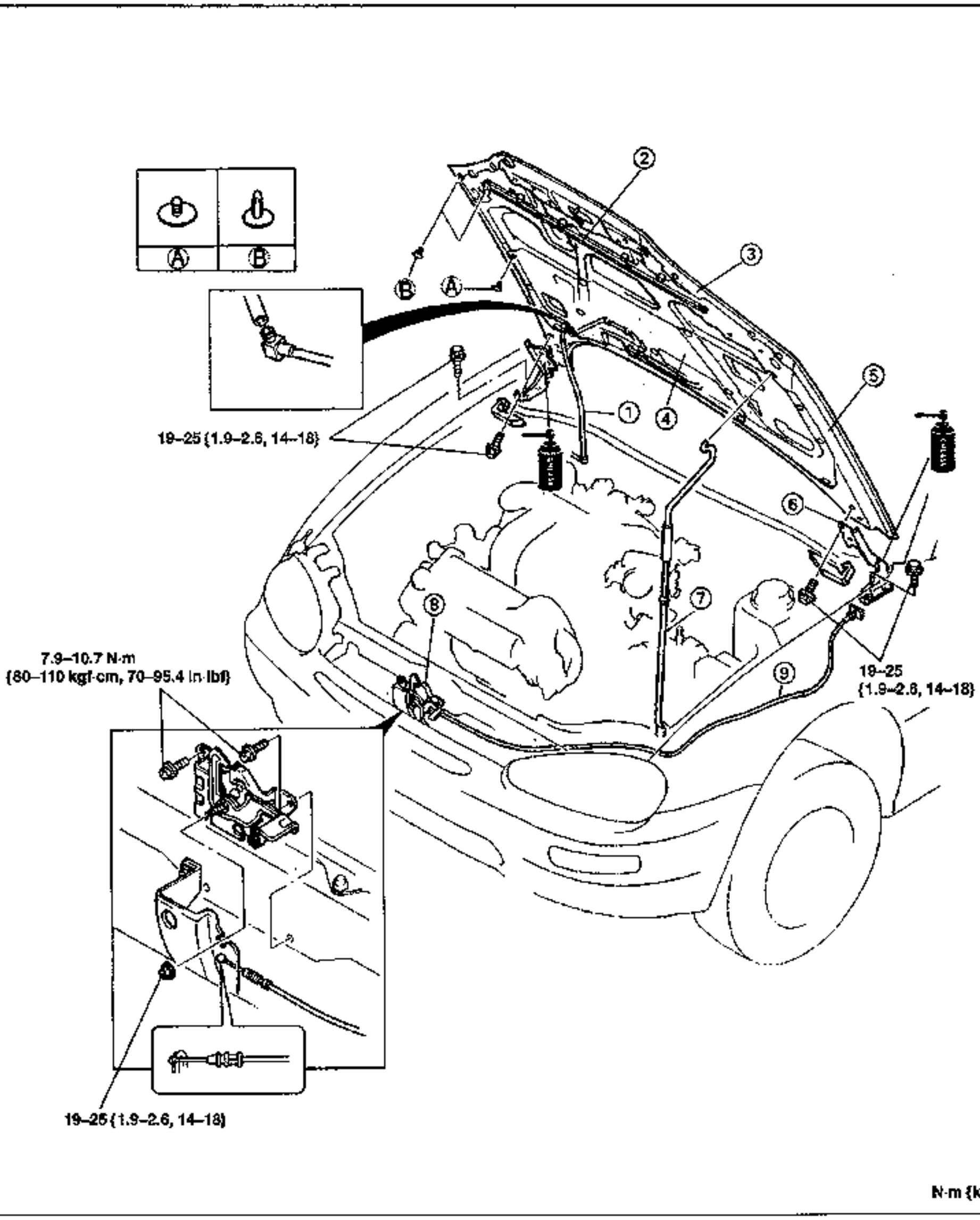
HOOD

COMPONENTS

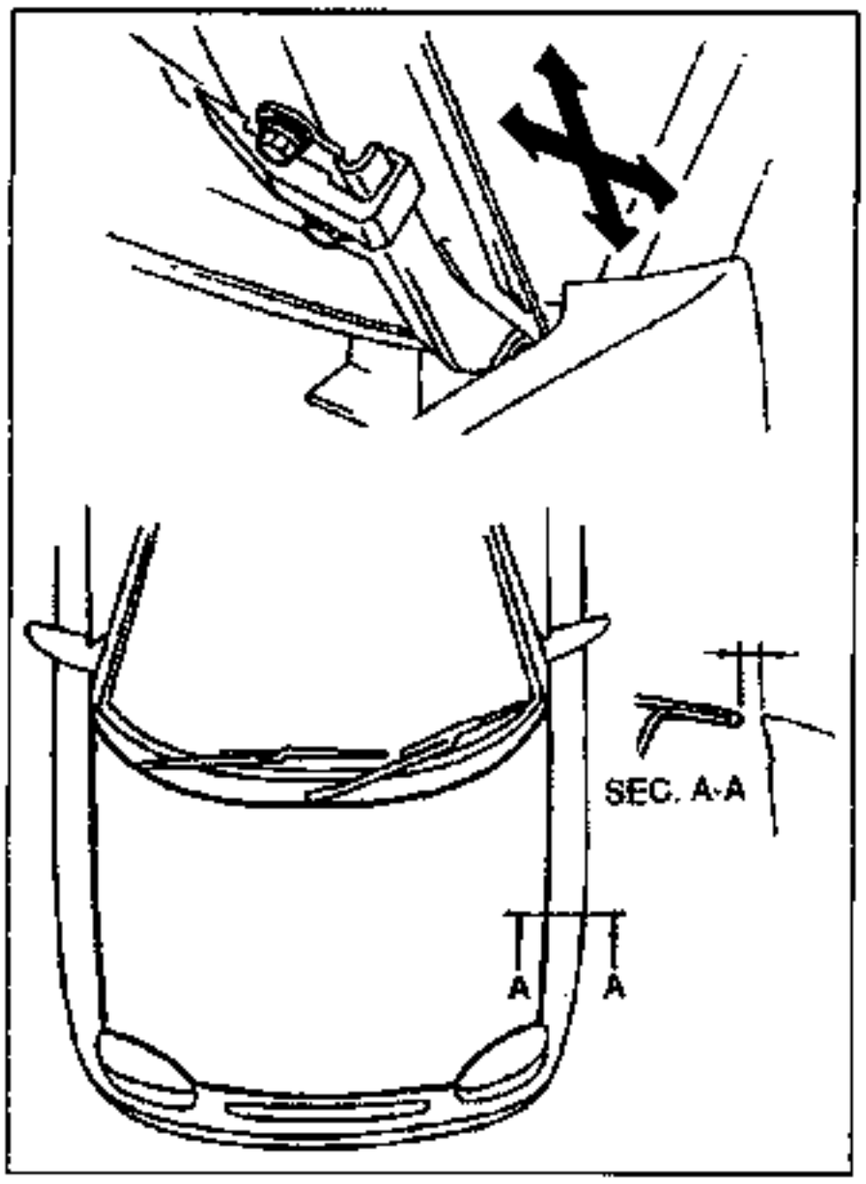
Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



1. Windshield washer pipe
2. Surround seal weatherstrip
3. Hood deflector
4. Hood insulator
5. Hood
   Adjustment ..... page S–6
6. Hood hinge
7. Hood stay
8. Hood lock
   Adjustment ..... page S–6
9. Hood release cable

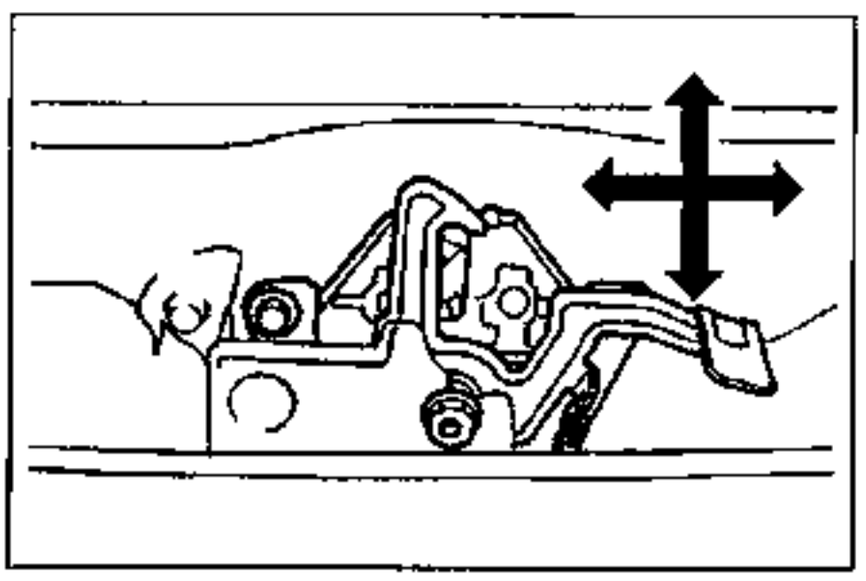
N·m {kgf·m, ft·lbf}



Adjustment
Hood
Adjust the hood laterally and vertically by loosening the hood to hinge mounting bolts and repositioning the hood.

Clearance: 2.3–4.7 mm {0.09–0.18 in}

Tightening torque:
19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}



Hood lock
1. Verify that the hood is properly aligned. (Refer above.)
2. Loosen the hood lock mounting bolts and nut, and align the hood lock with the striker on the hood.

Tightening torque
Bolt: 7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}
Nut : 19–25 N·m {1.9–2.6 kgf·m, 14–18 ft·lbf}

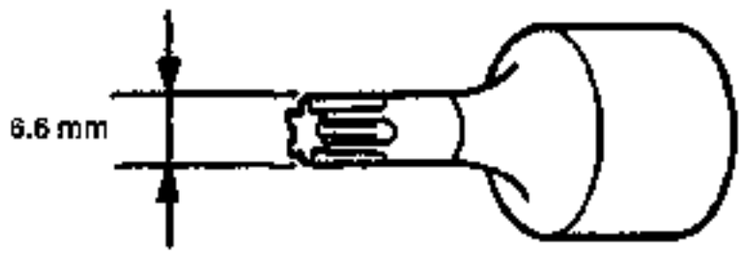
DOOR

PREPARATION

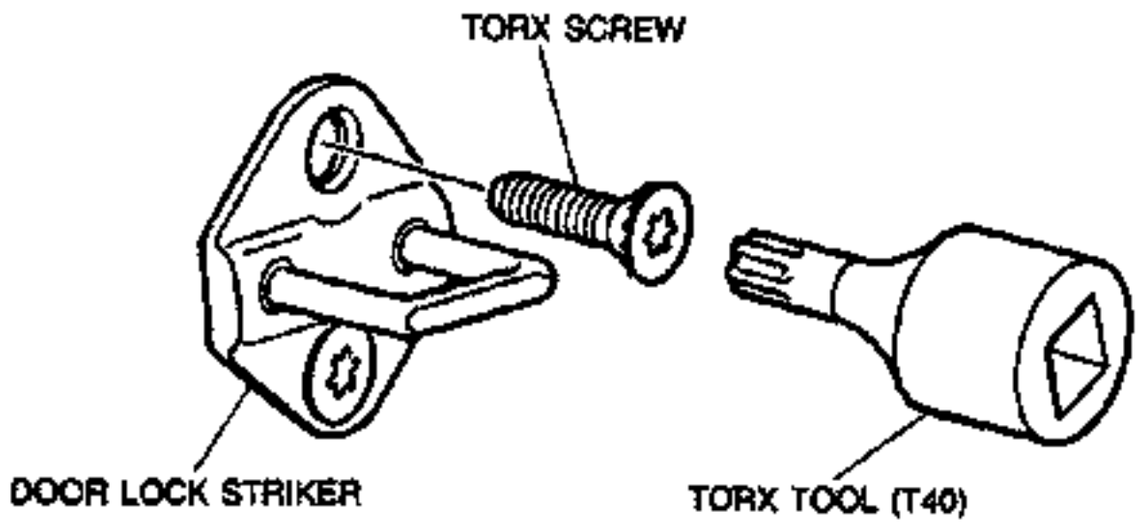
TORX tool (T40)	For removal / installation of door lock striker

TORX TOOL (T40)

1. ILLUSTRATION



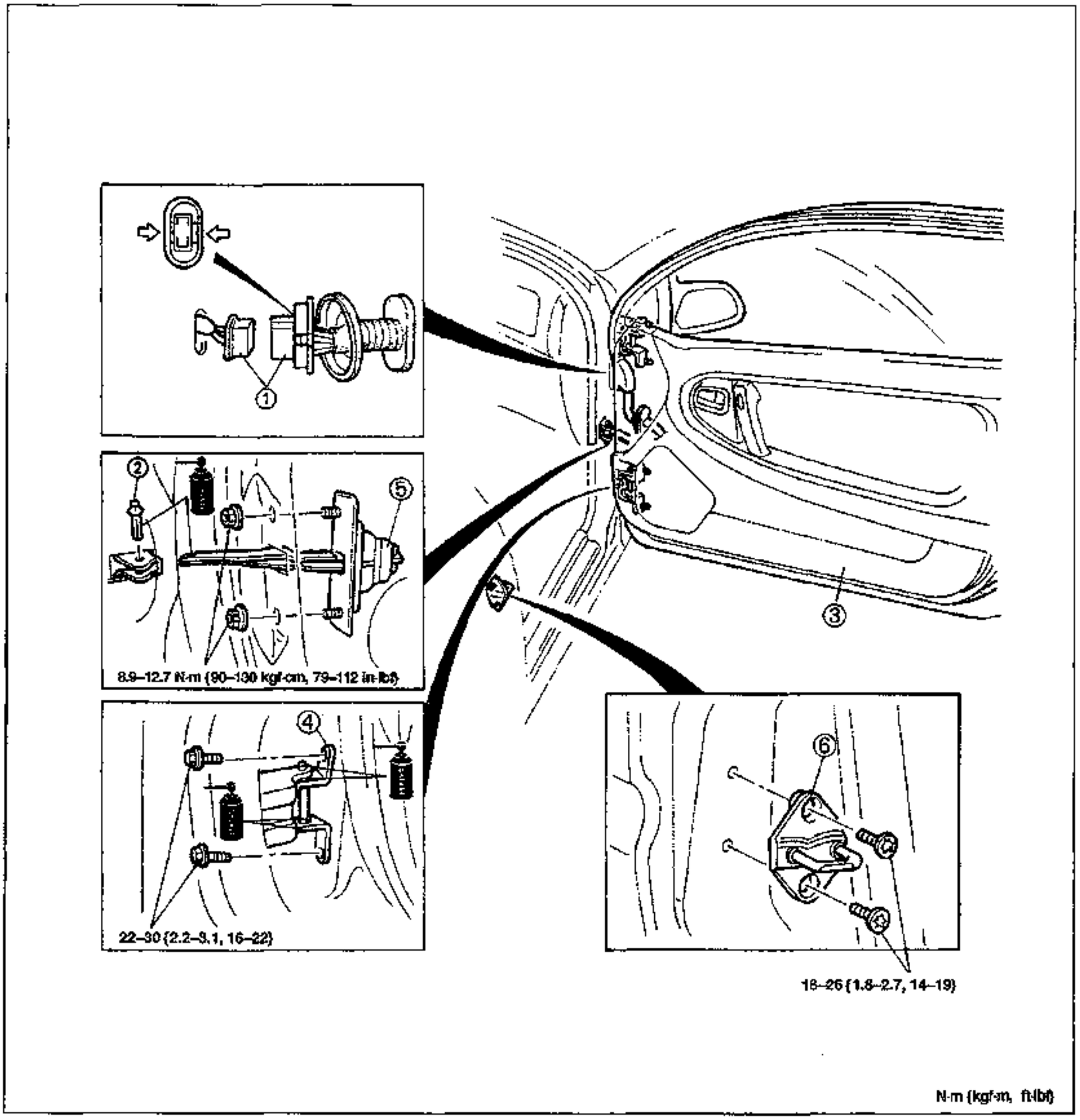
2. USAGE



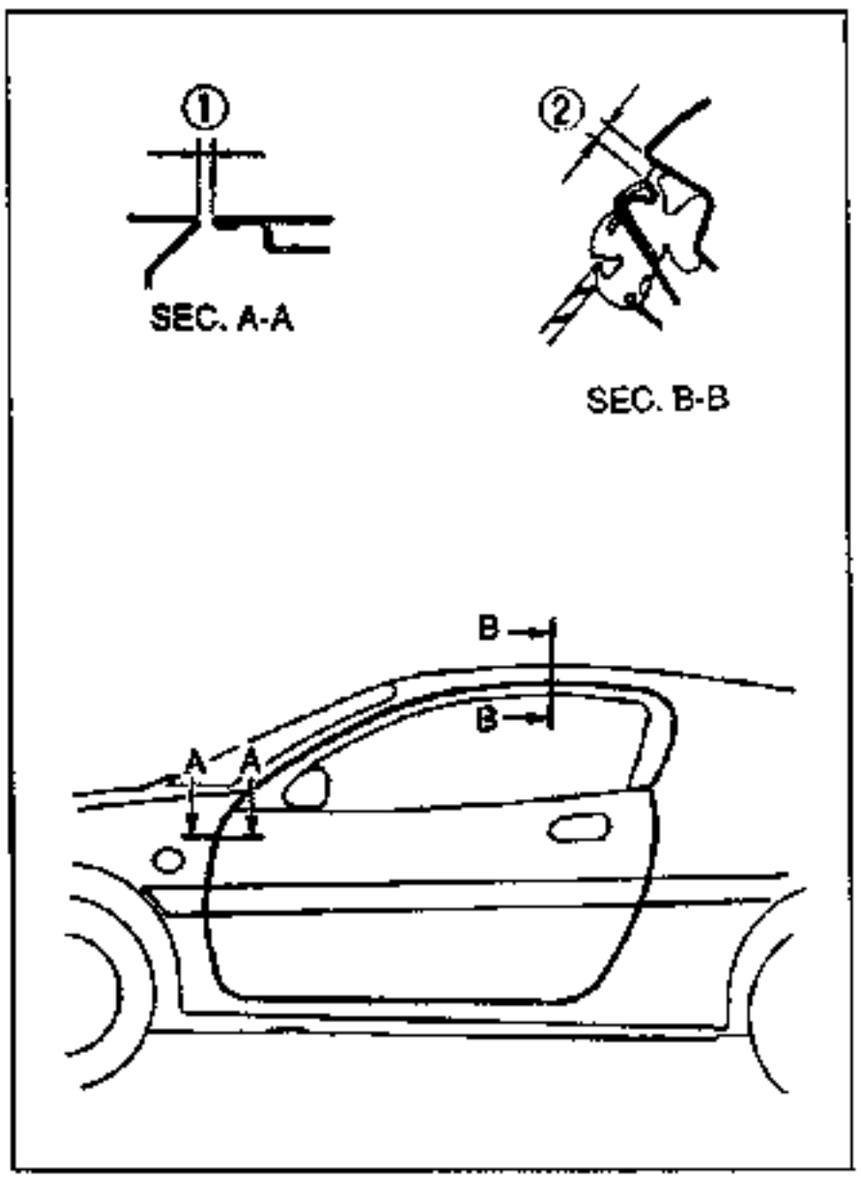
COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure. To remove the checker, remove the door trim and door screen. (Refer to page S–10.)
3. Install in the reverse order of removal.



1. Harness connector
2. Checker pin
3. Door
   Adjustment ..... page S–9
4. Door hinge
5. Checker
6. Door lock striker
   Adjustment ..... page S–9



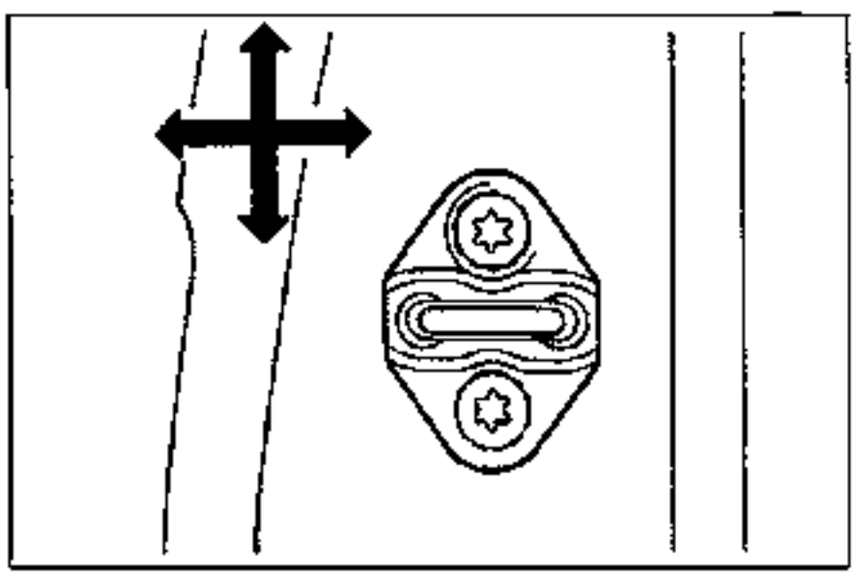
Adjustment

Door

Adjust the door laterally and vertically by loosening the door-hinge-to-body mounting bolts and repositioning the door.

Clearance: ① 3–5 mm {0.12–0.20 in}
② 4–8 mm {0.16–0.31 in}

Tightening torque:
22–30 N·m {2.2–3.1 kgf·m, 16–22 ft·lbf}



Door lock striker

1. Verify that the door can be closed easily and that there is no looseness. If there is a problem, loosen the striker mounting screws and move the striker horizontally or vertically.
2. Verify the rear offset of the door to the body. If there is a problem, move the door lock striker vertically.

Tightening torque:
18–26 N·m {1.8–2.7 kgf·m, 14–19 ft·lbf}

WINDOW REGULATOR AND GLASS

COMPONENTS

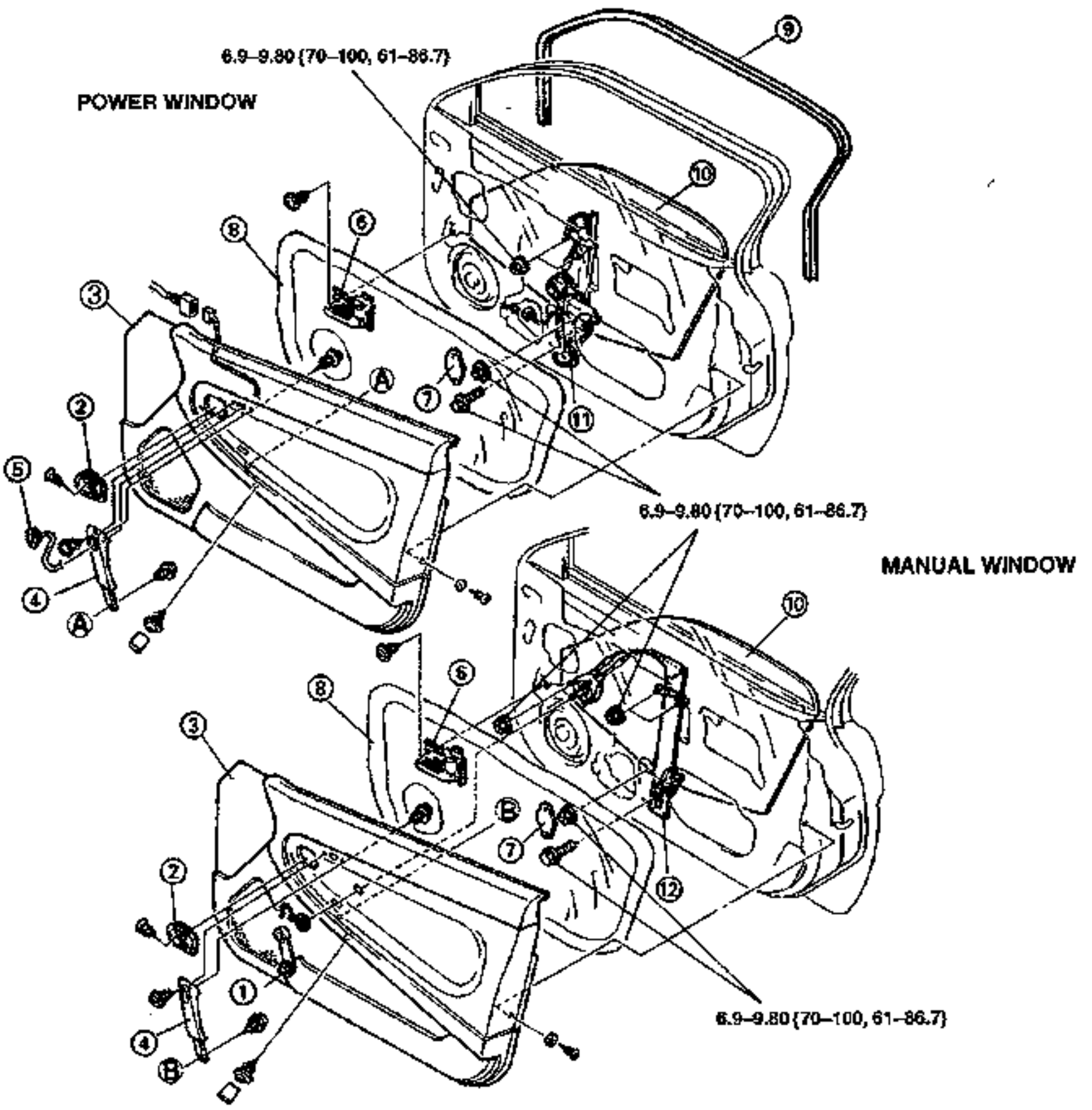
Removal / Installation

1. Lower the door glass **280 mm {11.0 in}** from the fully closed position.
2. Disconnect the negative battery cable, if equipped with power windows.

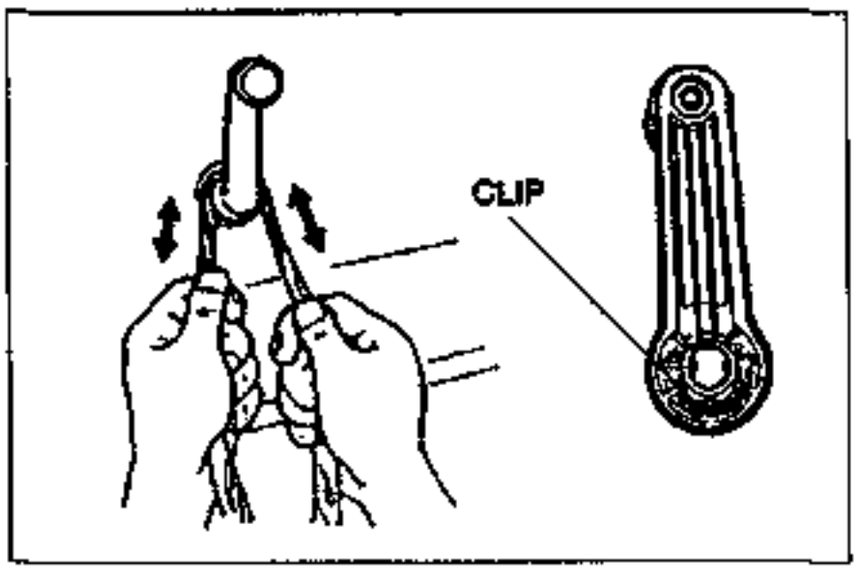
Note

- Remove the door screen carefully so that it may be reused.

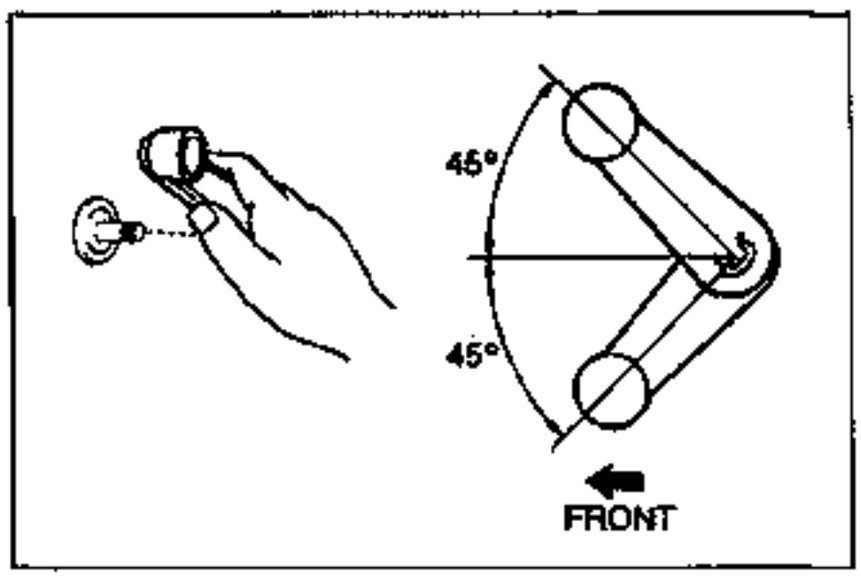
3. Remove in the order shown in the figure, referring to **Removal note**.
4. Install in the reverse order of removal, referring to **Installation note**.



1. Regulator handle
   - Removal note ..... page S–11
   - Installation note ..... page S–11
2. Inner handle cover
3. Door trim
   - Removal / Installation ..... page S–65
4. Pull handle
5. Power window subswitch
6. Inner handle
7. Sealing pad
8. Door screen
9. Glass run channel
10. Door glass
11. Power window regulator
12. Manual window regulator



Removal note
Regulator handle
Remove the regulator handle clip by using a rag as shown.



Installation note
Regulator handle
Install the clip in the handle and push the regulator handle on as shown.

DOOR LOCK AND OPENER

COMPONENTS

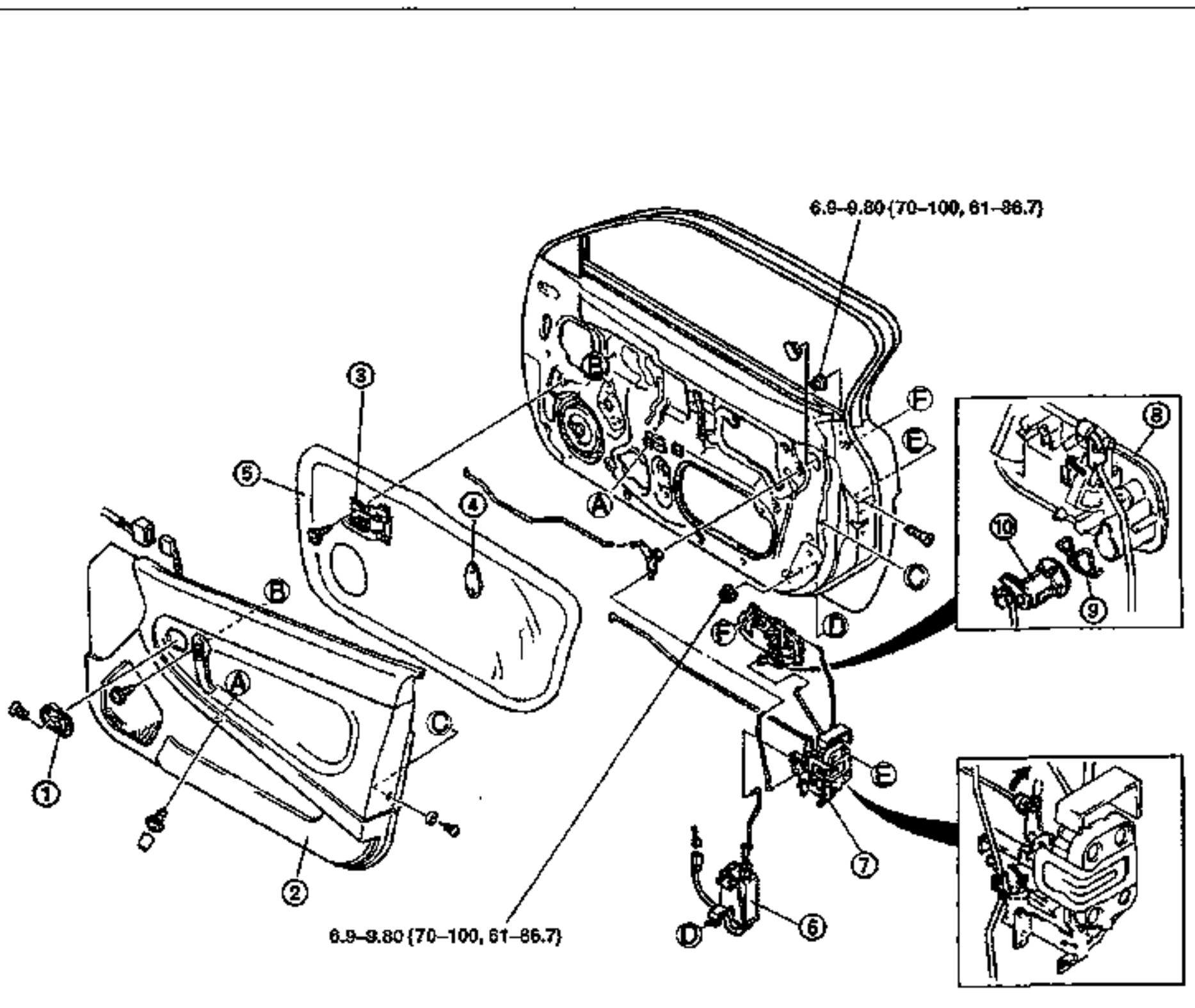
Removal / Installation

1. Raise the front door glass fully.
2. Disconnect the negative battery cable.

Note

- Remove the door screen carefully so that it may be reused.

3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.



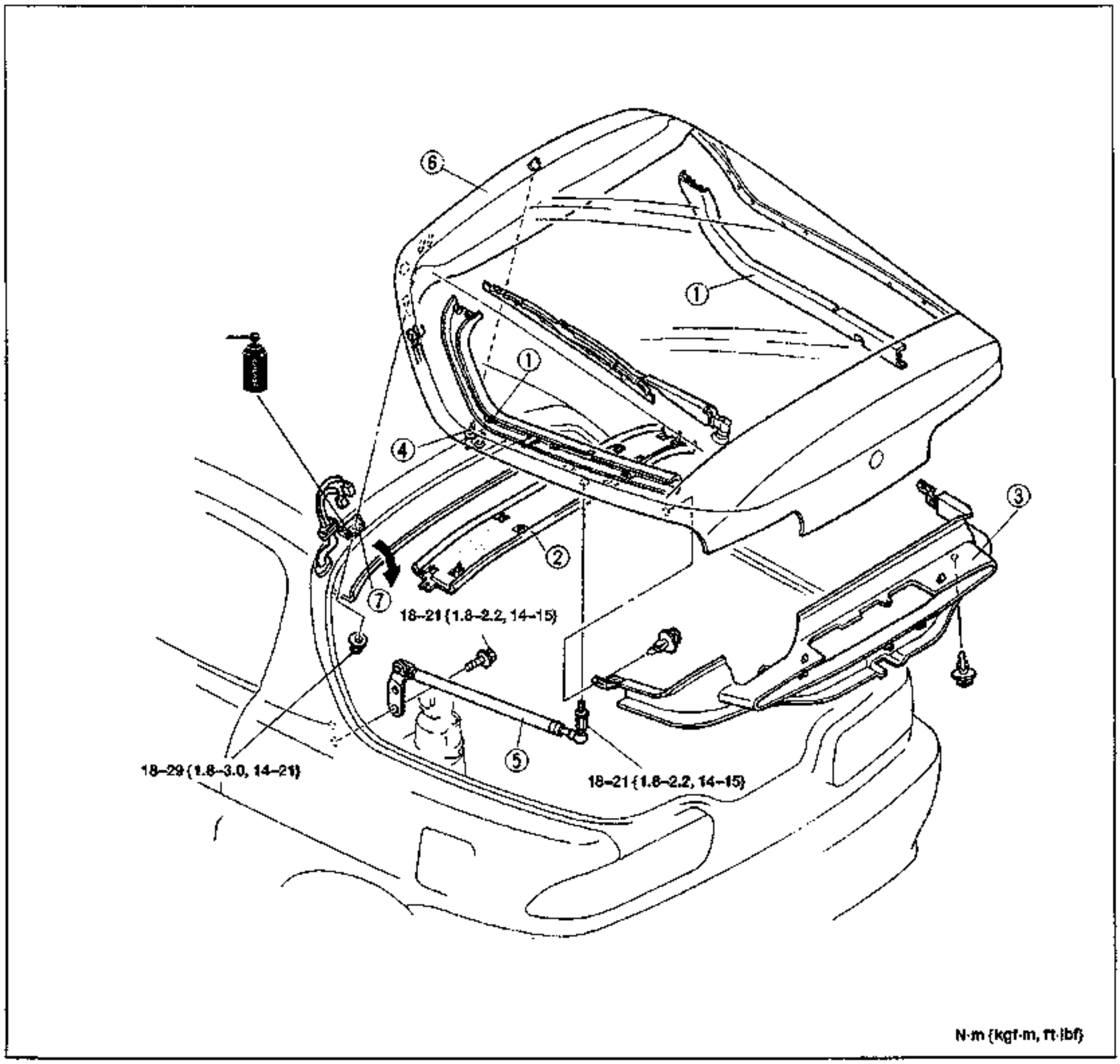
1. Inner handle cover
2. Door trim
   Removal / Installation ..... page S–65
3. Inner handle
4. Sealing pad
5. Door screen
6. Door lock actuator
7. Door lock
8. Outer handle
9. Lock cylinder retainer
10. Lock cylinder

LIFTGATE

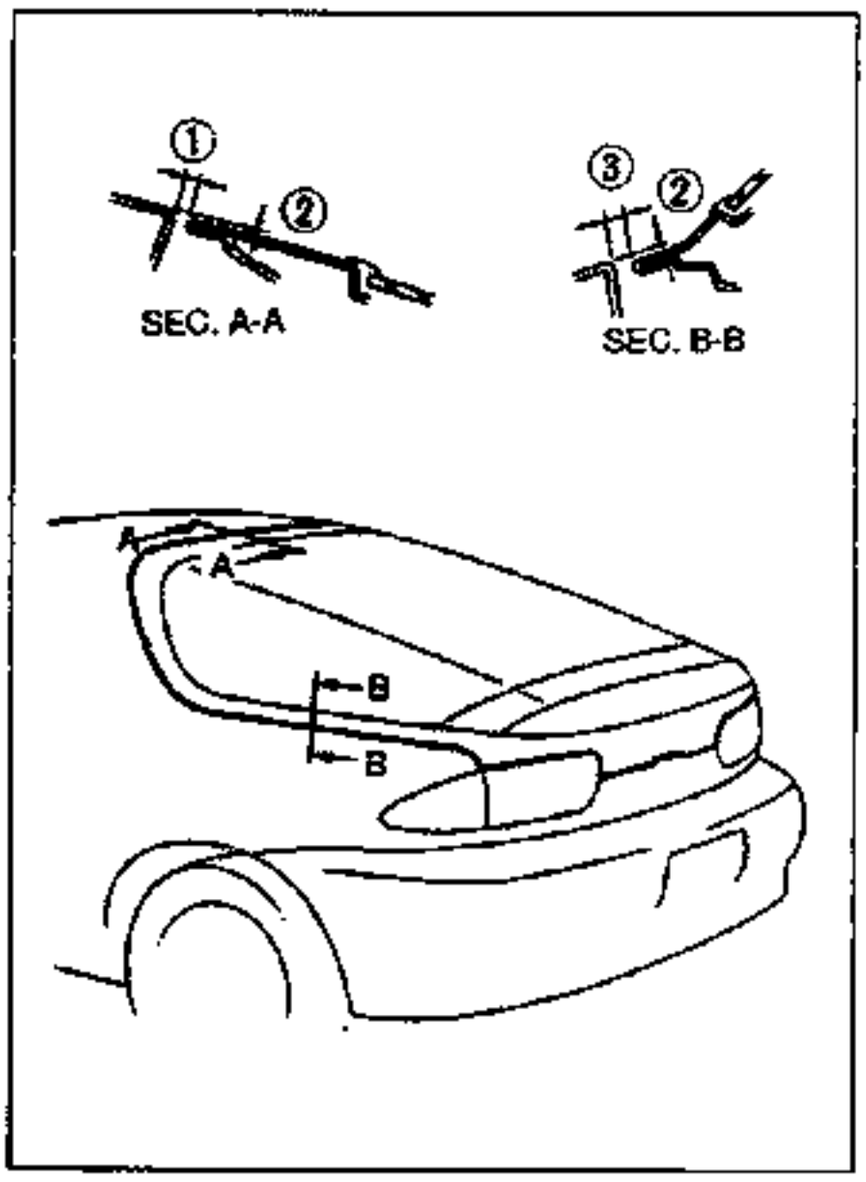
COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure. To remove the liftgate hinges, remove the headliner. (Refer to page S–70.)
3. Install in the reverse order of removal.



1. Liftgate side trim
   Removal / Installation ..... page S–65
2. Liftgate upper trim
   Removal / Installation ..... page S–65
3. Liftgate lower trim
   Removal / Installation ..... page S–65
4. Rear washer pipe
5. Stay damper
6. Liftgate
   Adjustment ..... page S–14
7. Liftgate hinge

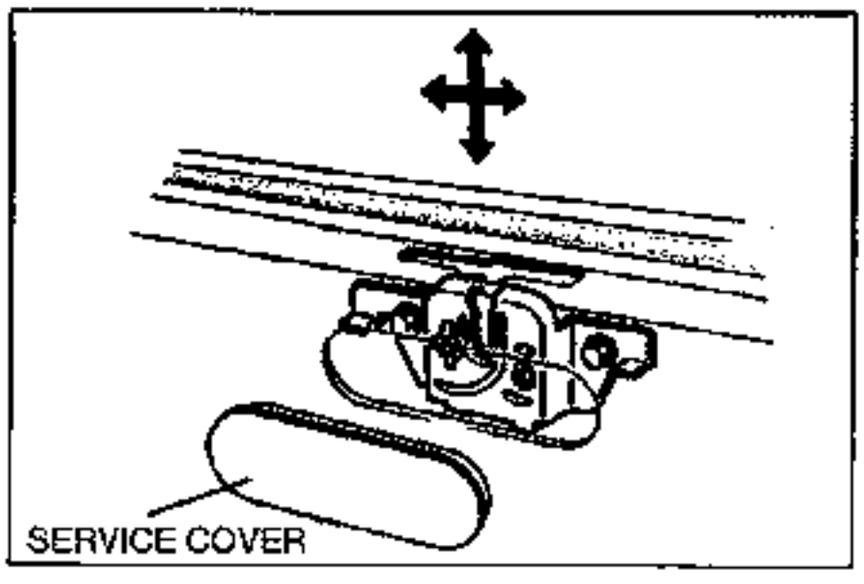


Adjustment
Liftgate

Adjust the liftgate laterally and vertically by loosening the liftgate-to-hinge mounting nuts shown in the figure.

Clearance: **① 4.5–7.5 mm {0.18–0.29 in}**
② –0.2–1.8 mm {–0.01–0.07 in}
③ 2.5–5.5 mm {0.10–0.22 in}

Tightening torque:
18–29 N·m {1.8–3.0 kgf·m, 14–21 ft·lbf}



Liftgate lock

1. Verify that the liftgate is properly aligned. (Refer above.)
2. Remove the service cover from the trunk end trim.
3. Loosen the liftgate lock mounting bolts, and align the lock with striker on the liftgate.

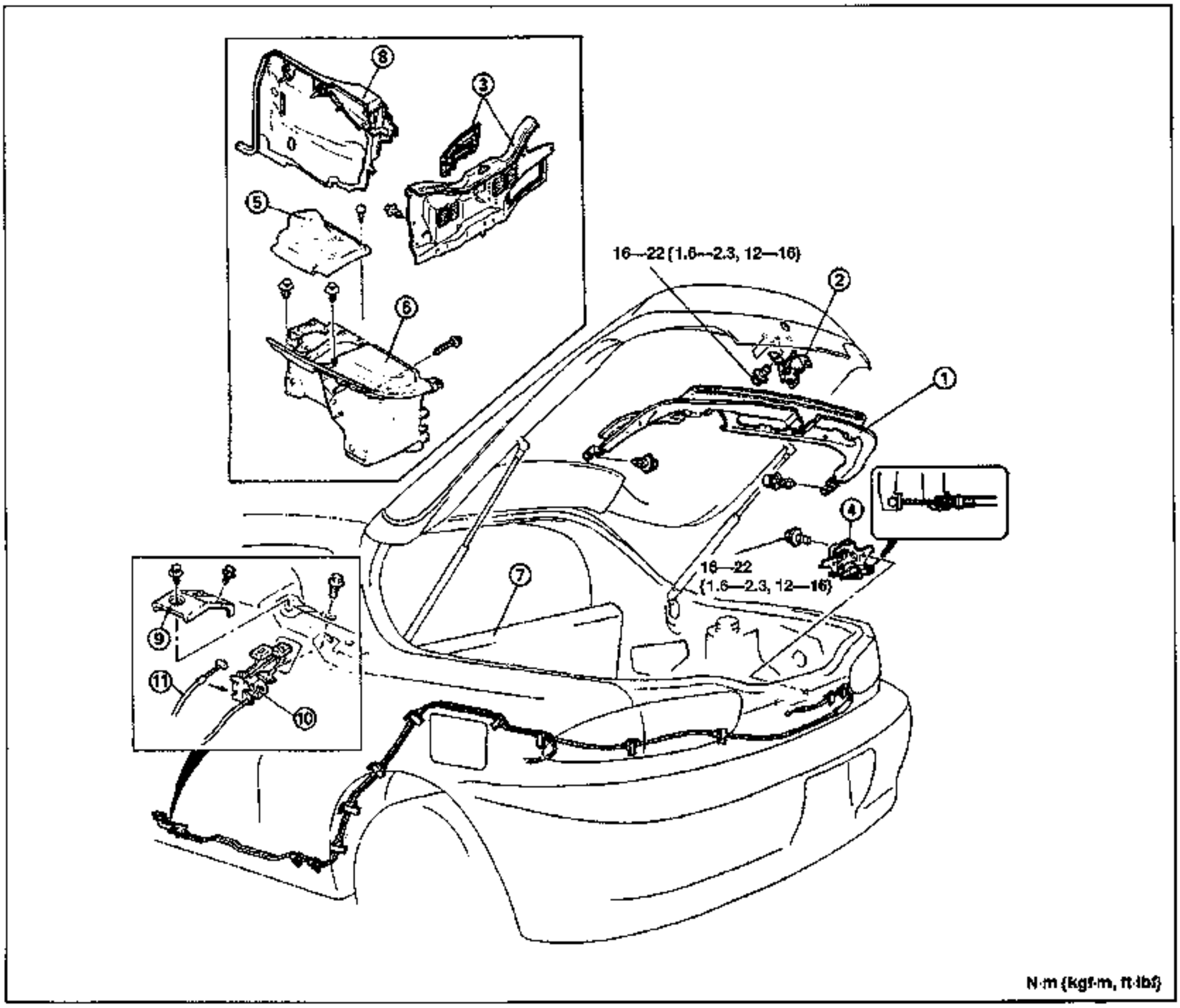
Tightening torque:
16–22 N·m {1.6–2.3 kgf·m, 12–16 ft·lbf}

LIFTGATE LOCK AND OPENER

COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



Liftgate lock

1. Liftgate lower trim
   Removal / Installation ..... page S–65
2. Liftgate striker
3. Trunk end trim
   Removal / Installation ..... page S–65
4. Liftgate lock
   Adjustment ..... page S–14

Liftgate opener, liftgate opener cable

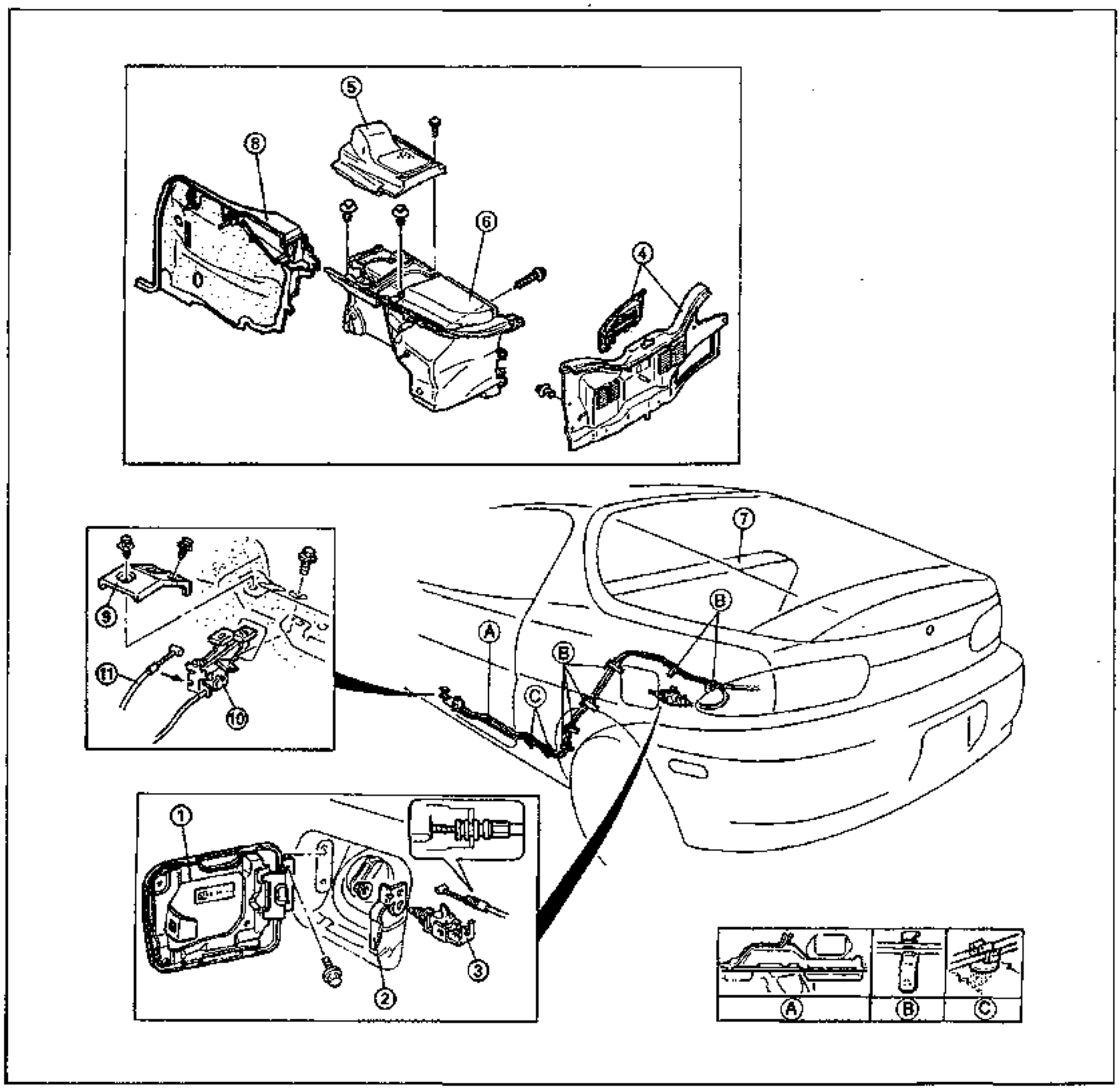
5. Rear speaker cover
   Removal /Installation ..... page S–65
6. Trunk side trim
   Removal / Installation ..... page S–65
7. Rear seat
   Removal / Installation ..... page S–76
8. Quarter trim
   Removal / Installation ..... page S–65
9. Opener bezel
10. Opener lever
11. Liftgate opener cable

FUEL-FILLER LID AND OPENER

COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



Fuel-filler lid

1. Fuel-filler lid
2. Lift spring
3. Fuel-filler lid opener

Fuel-filler lid opener lever and cable

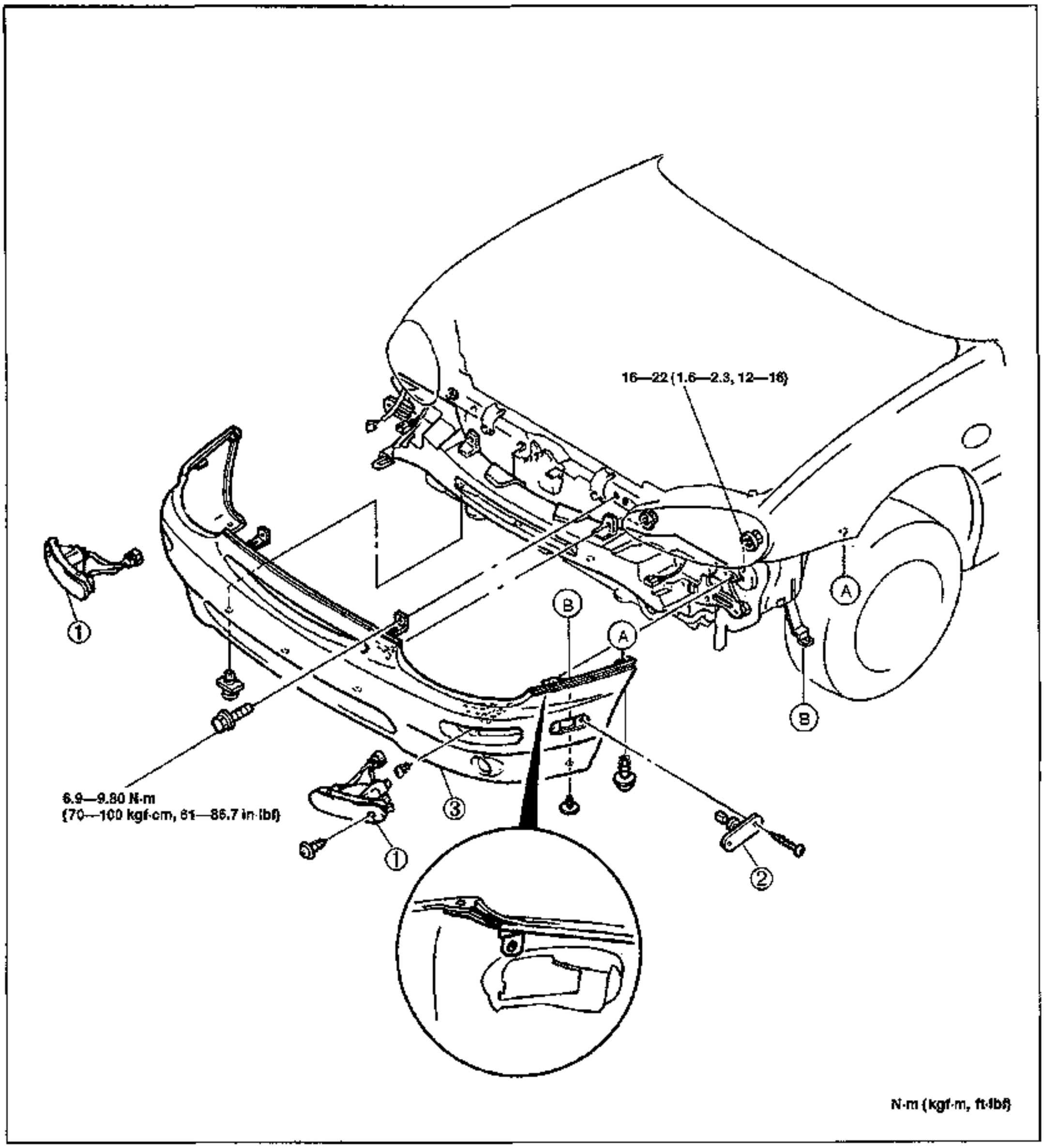
4. Trunk end trim
   Removal / Installation ..... page S–65
5. Rear speaker cover
   Removal / Installation ..... page S–65
6. Trunk side trim
   Removal / Installation ..... page S–65
7. Rear seat
   Removal / Installation ..... page S–76
8. Quarter trim
   Removal / Installation ..... page S–65
9. Opener bezel
10. Opener lever
11. Fuel–filler lid opener cable

FRONT BUMPER

COMPONENTS

Removal / Installation

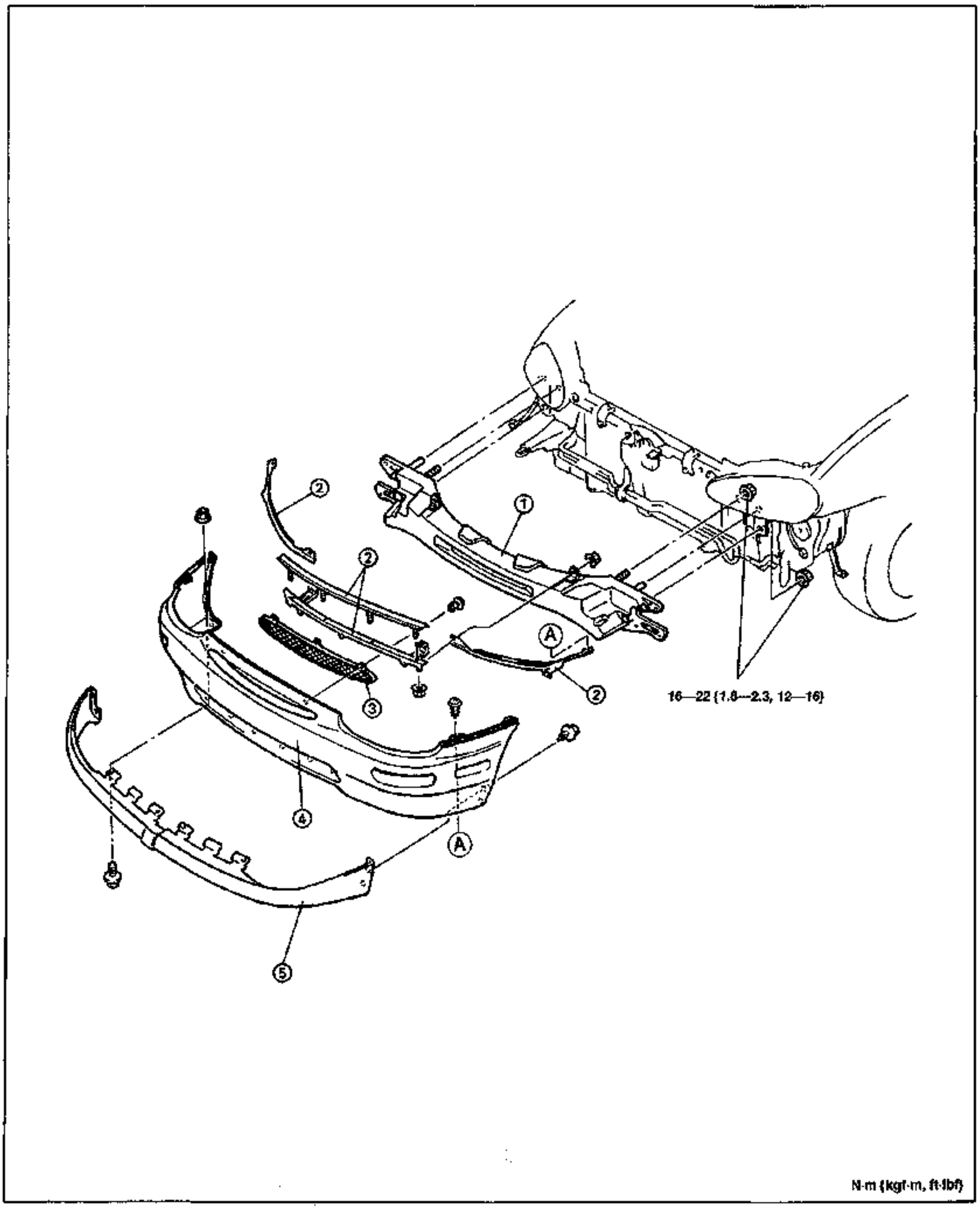
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure. (Refer to the 1995 MX–3 Body Electrical Troubleshooting Manual, section E, when removing the front combination lights and front side marker lights.)
3. Install in the reverse order of removal.



1. Front combination light
2. Front side marker light
3. Front bumper
   Disassembly / Assembly ..... page S–18

Disassembly / Assembly

1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.



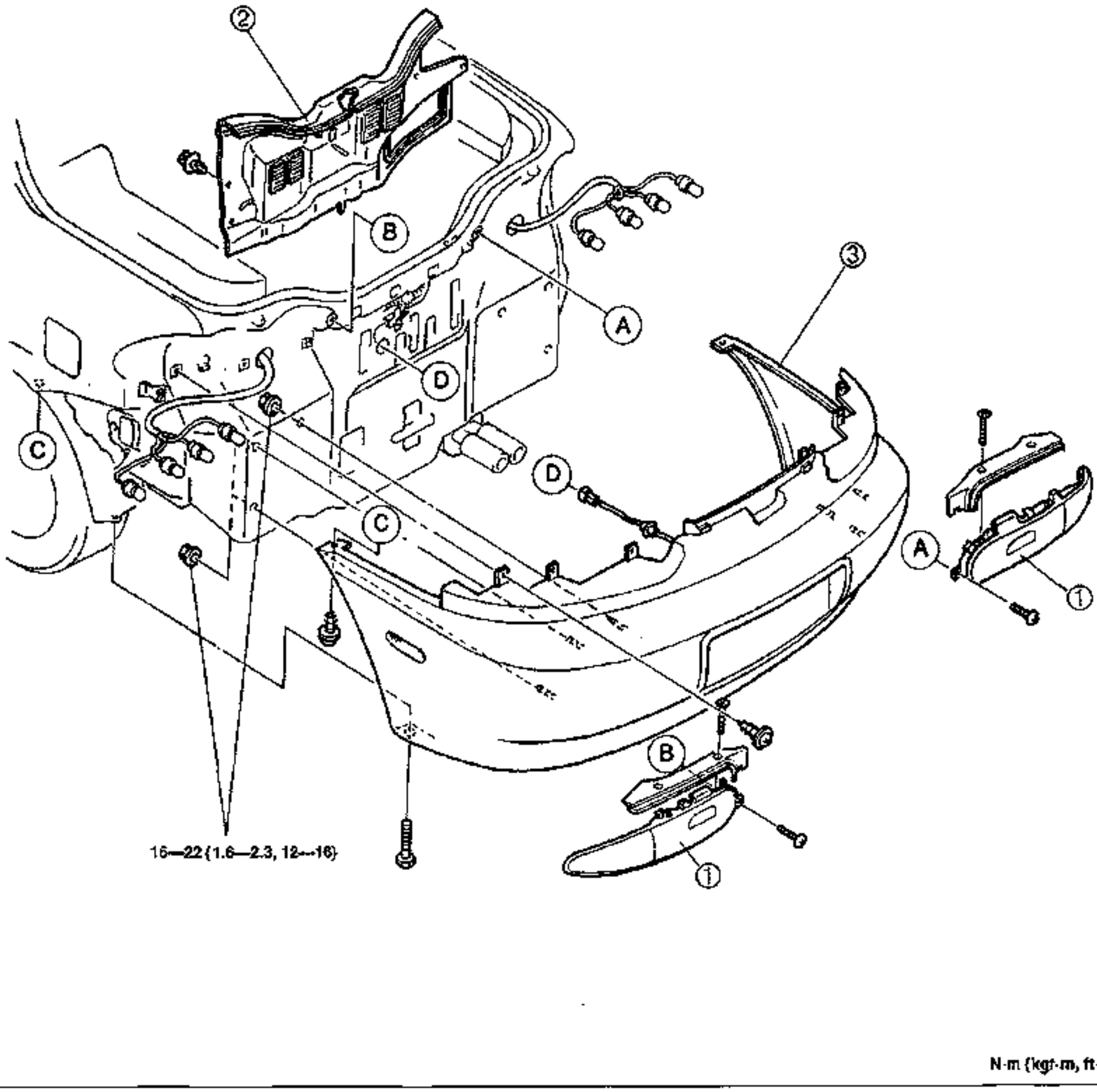
1. Front bumper reinforcement
2. Set plate
3. Center mesh
4. Front bumper fascia
5. Front air dam

REAR BUMPER

COMPONENTS

Removal / Installation

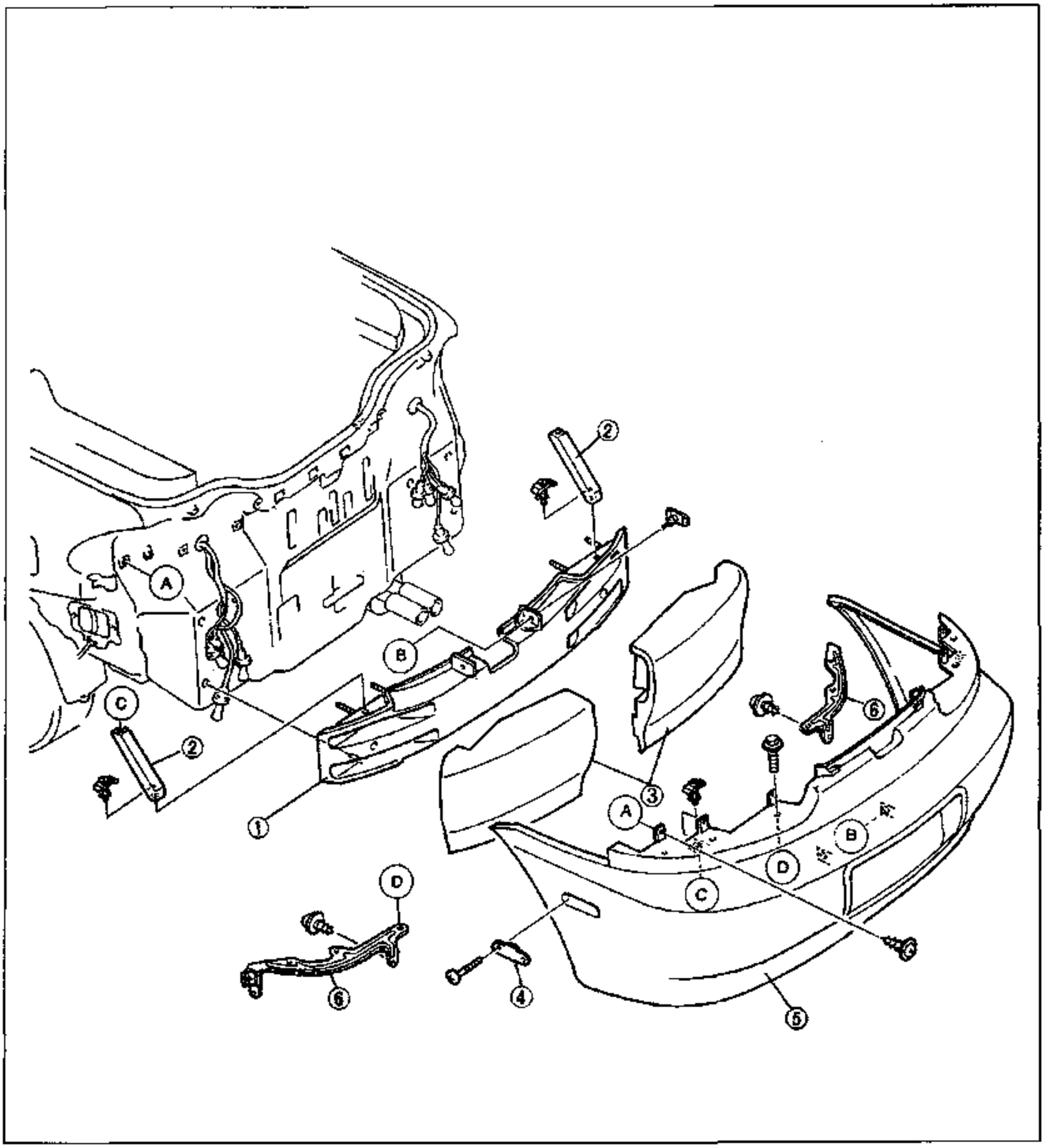
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure. (Refer to the 1995 MX-3 Body Electrical Troubleshooting Manual, section E, when removing the rear combination lights.)
3. Install in the reverse order of removal.



1. Rear combination light
2. Trunk end trim
   Removal / Installation ..... page S–65
3. Rear bumper
   Disassembly / Assembly ..... page S–20

Disassembly / Assembly

1. Disassemble in the order shown in the figure. (Refer to the 1995 MX–3 Body Electrical Troubleshooting Manual, section E, when removing the rear side marker lights.)
2. Assemble in the reverse order of disassembly.



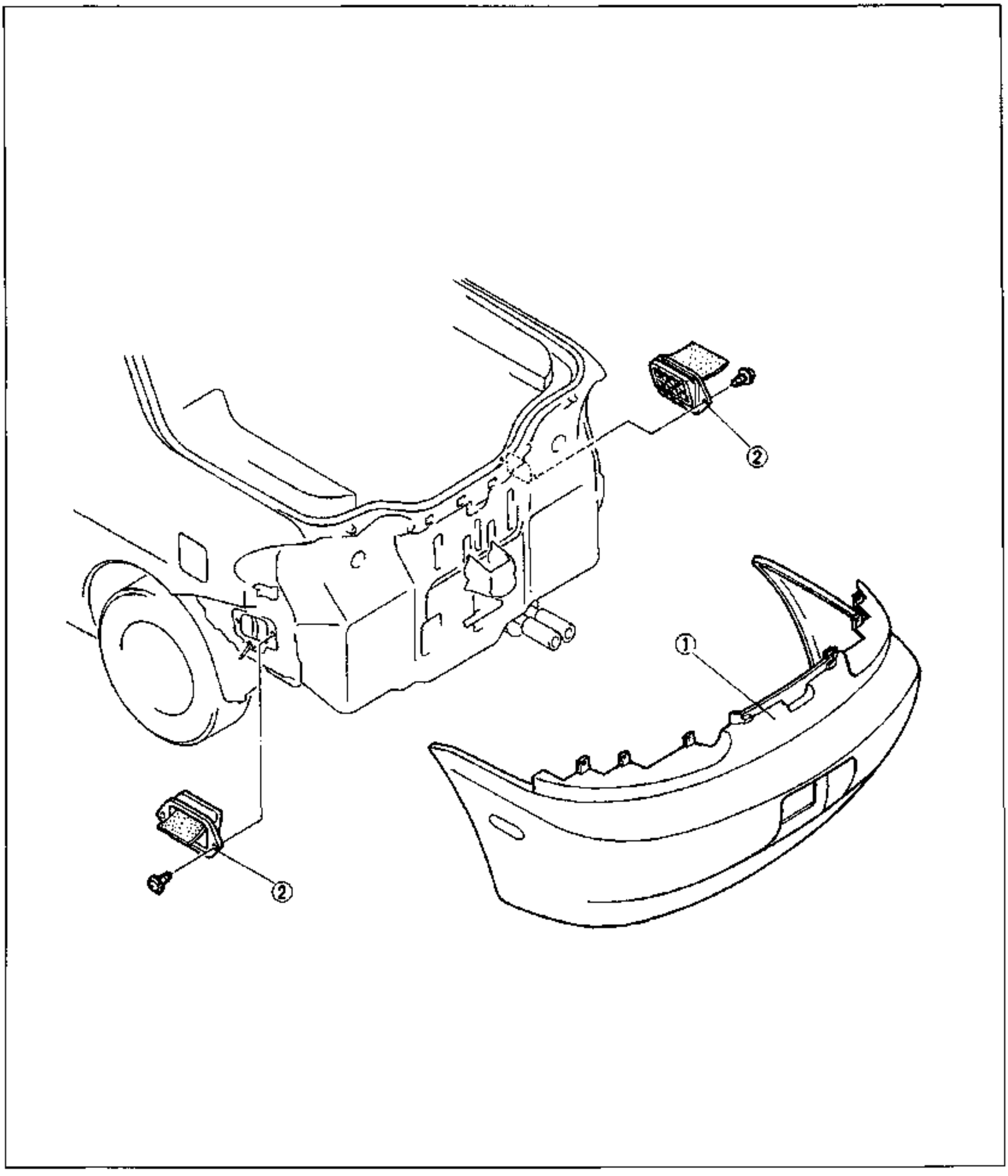
1. Rear bumper reinforcement
2. Rear bumper bracket
3. Energy-absorbing foam
4. Rear side marker light
5. Rear bumper fascia
6. Rear bumper retainer

EXTRACTOR CHAMBER

COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. install in the reverse order of removal.



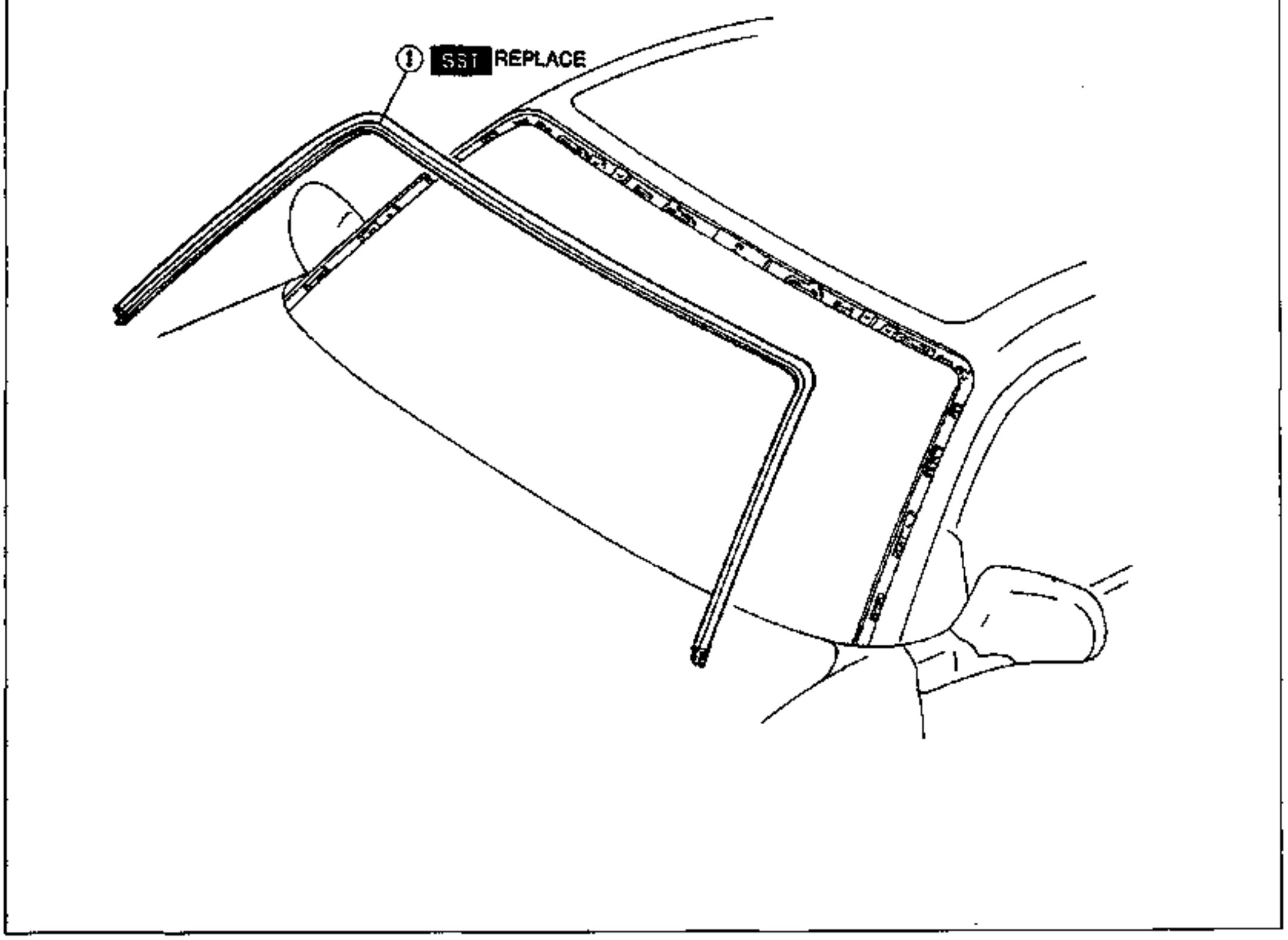
1. Rear bumper
   Removal / Installation ..... page S–19
2. Extractor chamber

MOLDING

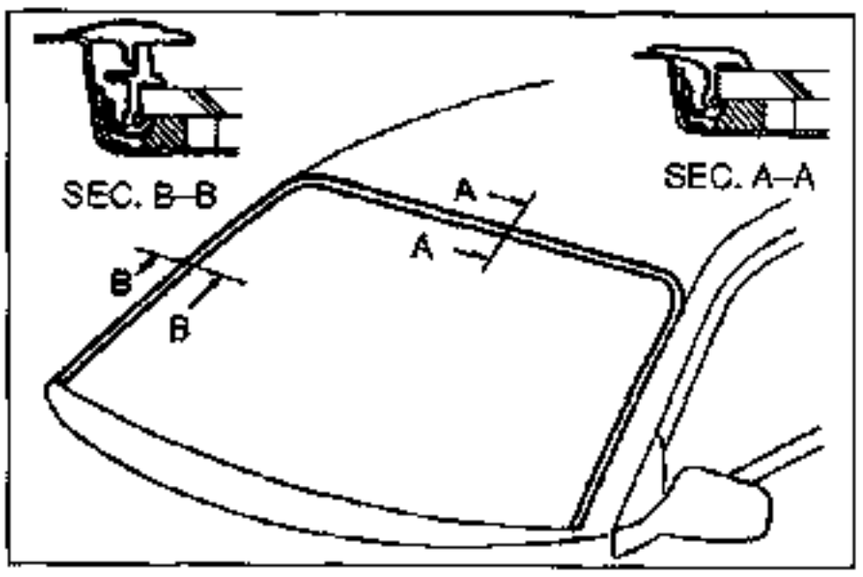
PREPARATION
SST

49 0305 870A Tool set, window		For removal / installation of molding	49 G050 1A0 Remover, sealant		For removal of sealant

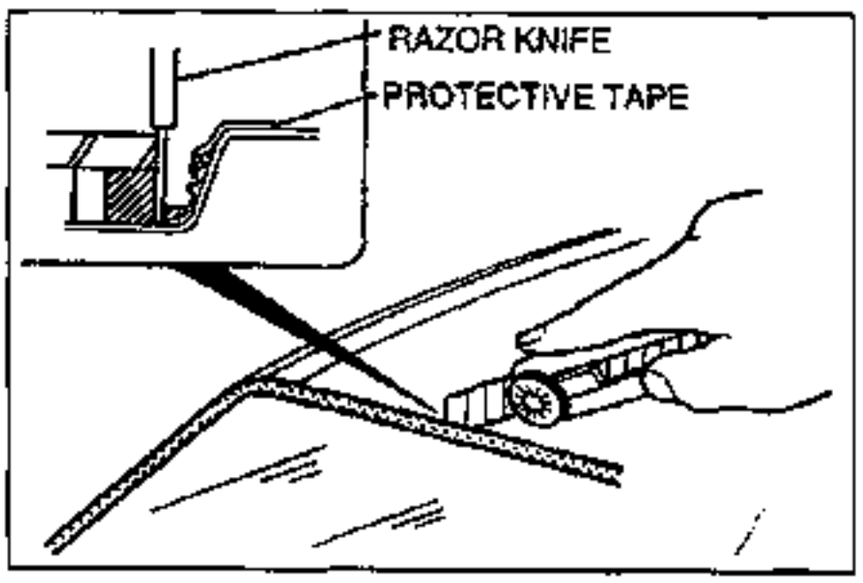
WINDSHIELD MOLDING
Removal / Installation
1. Remove in the order shown in the figure, referring to **Removal note.**
2. Install in the reverse order of removal, referring to **Installation note.**



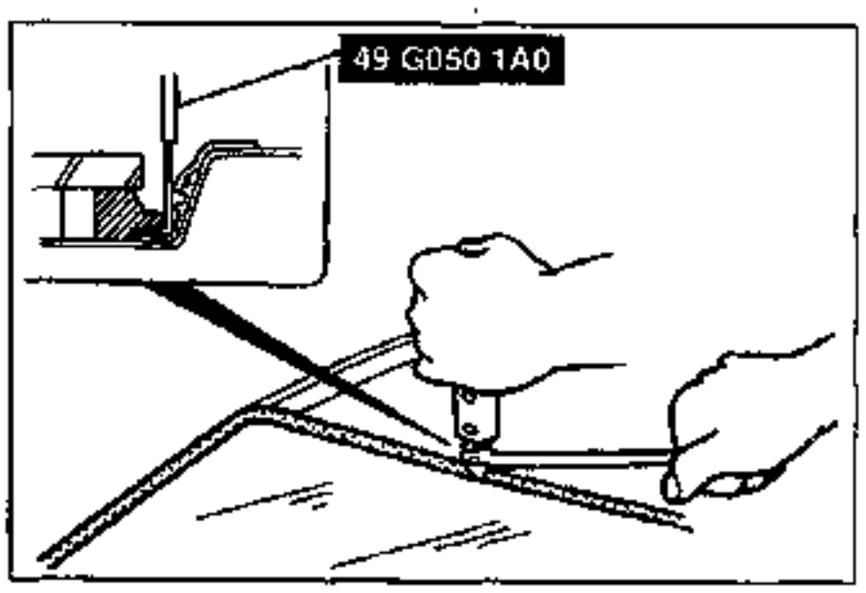
1. Windshield molding
   Removal note ..... page S–23
   Installation note ..... page S–23



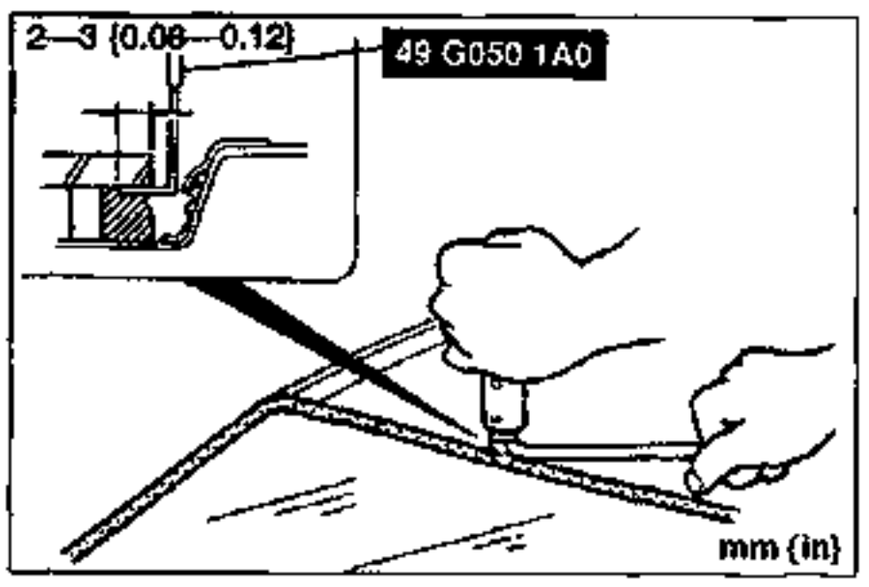
Removal note
Windshield molding
The upper molding is attached to the windshield by sealant as shown.



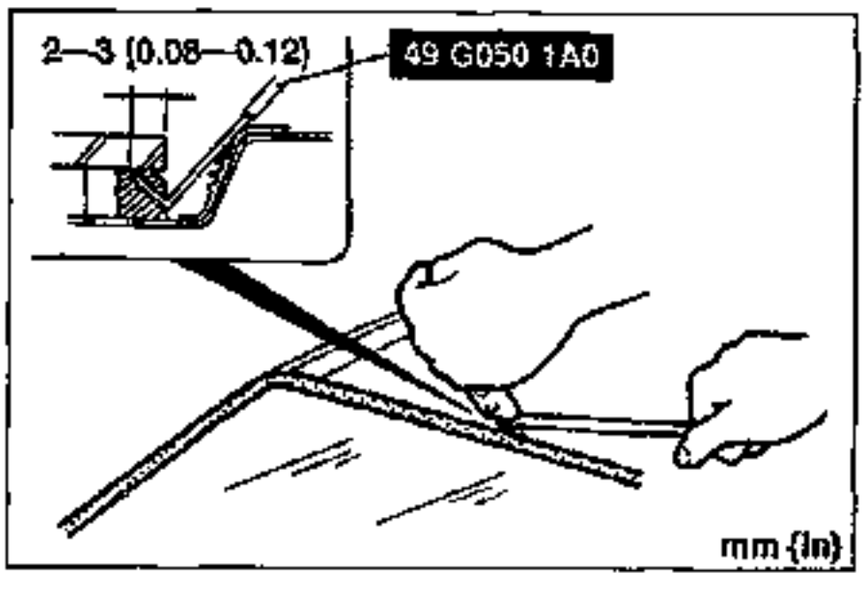
Installation note
Windshield molding
1. Apply protective tape along the edge of the body to protect it from damage.
2. Cut the sealant by using a razor knife as shown.



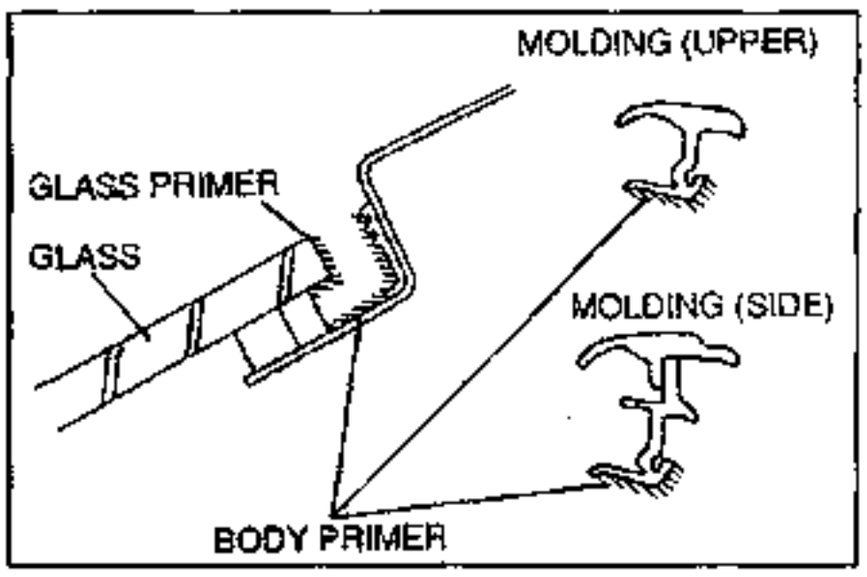
3. Insert the blade of the **SST** into the sealant, and pull on the bar to cut the sealant near the body as shown.



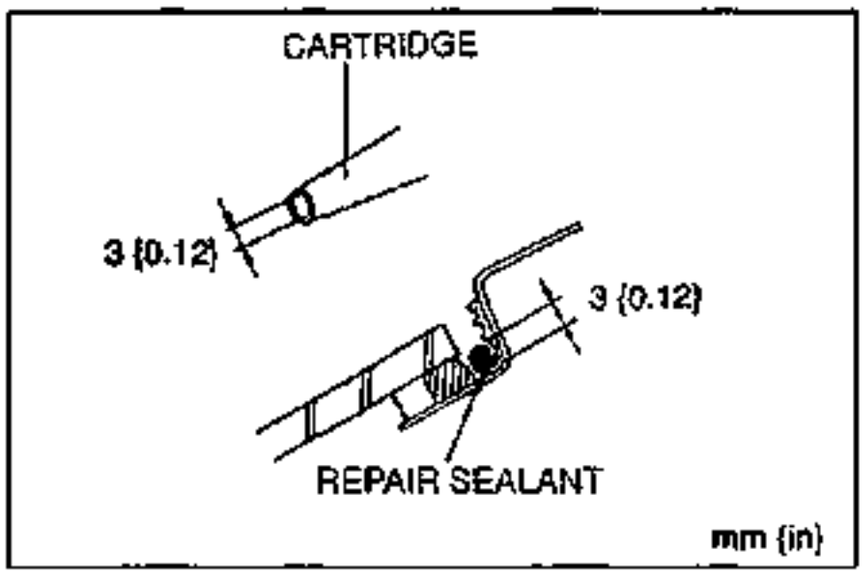
4. Insert the blade of the **SST** into the sealant, and pull on the bar to cut the sealant near the glass as shown.



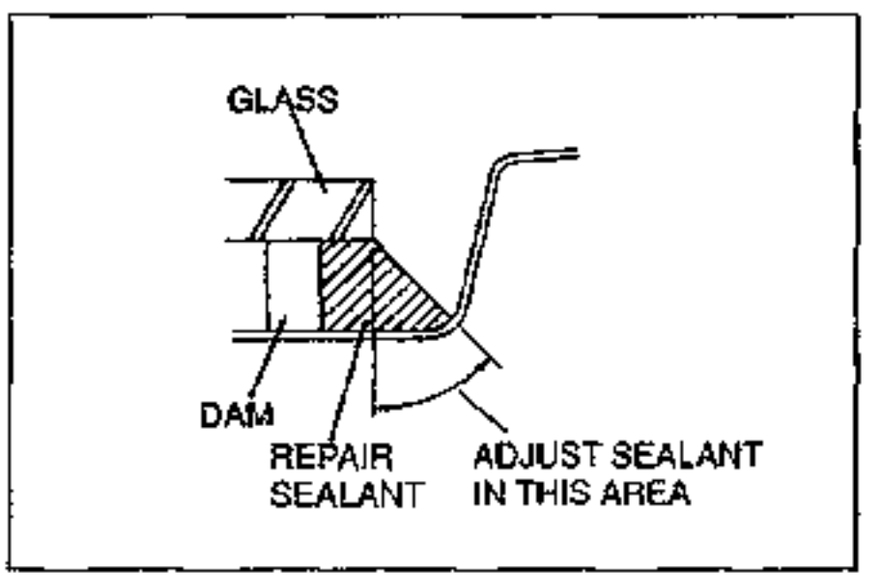
5. Remove as much sealant as possible from between the body and the glass.
6. Carefully clean around the edge of the glass and the adhesion surface at the body.



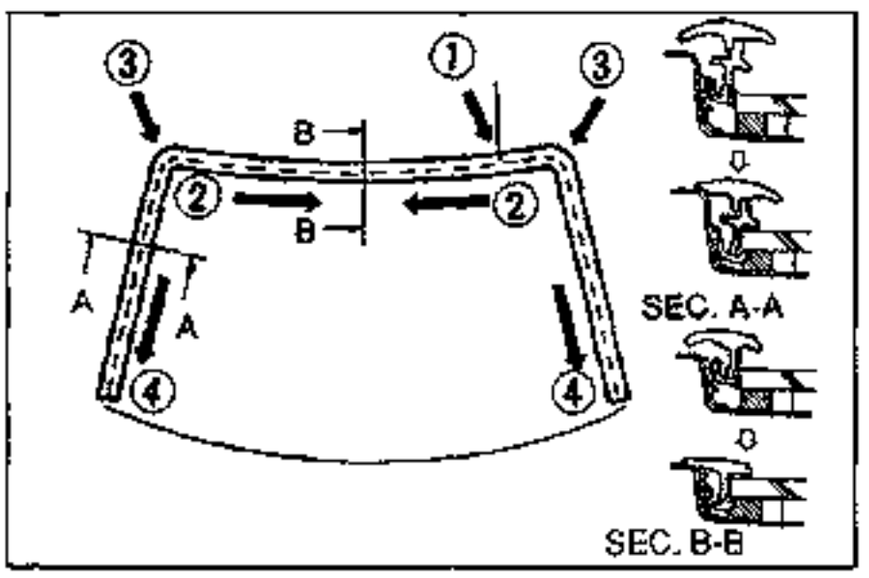
7. If the protector is damaged, replace it with a new one.
8. Apply primer onto the bonding area of the glass, body, and new windshield molding by using a brush. Use only glass primer on the glass and body primer on the body and molding. Keep the area free of dirt and grease, and do not touch the surface. Allow the primer to dry for approximately **30 minutes.**



10. Apply a **3 mm {0.12 in}** bead of repair sealant between the glass and the body.



11. Reshape the repair sealant as shown if necessary.



12. Install the windshield molding before the sealant hardens.
    ① Align the marks on the molding to the roof inner line.
    ② Install the top of the molding.
    ③ Install the corners of the molding.
    ④ Install the sides of the molding, starting from the top and then toward the bottom.

Hardening time of repair sealant

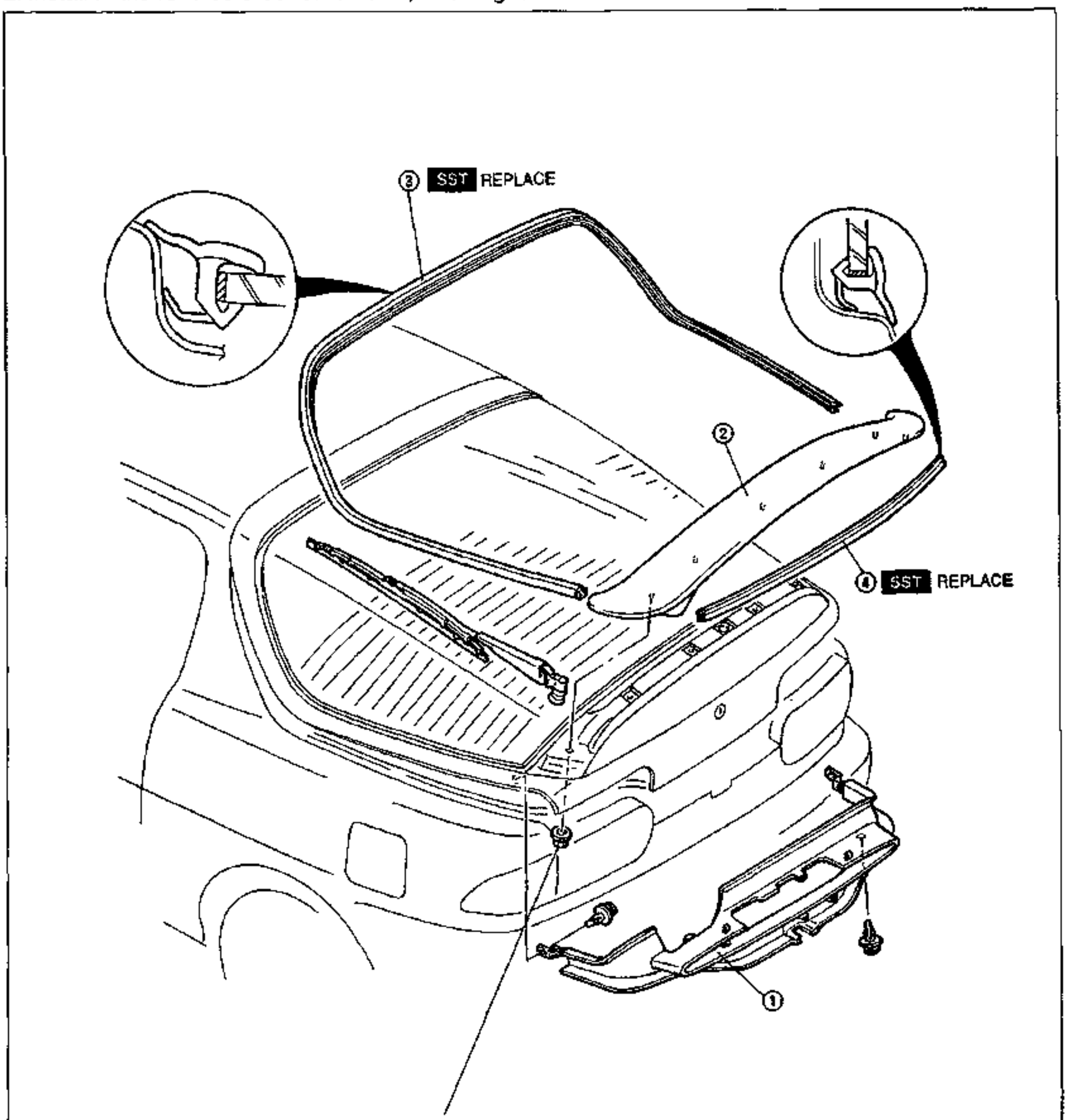
Temperature	Surface hardening time	Time required until car can be put into service
5°C {41°F}	Approx. 1.5 hr	12 hr
20°C {68°F}	Approx. 1 hr	4 hr
35°C {95°F}	Approx. 10 min	2 hr

13. Check for water leaks. If a leak is found, wipe the water off well and repeat the installation.

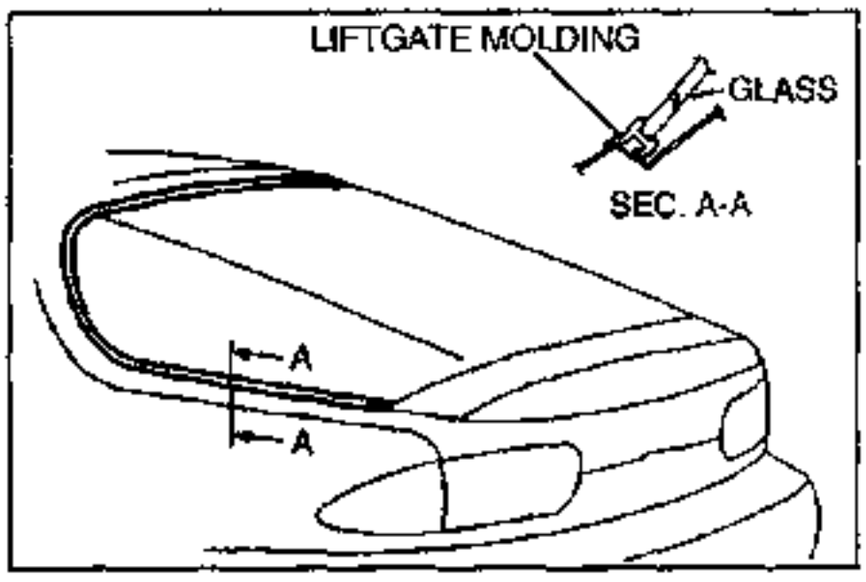
LIFTGATE MOLDING / VERTICAL WINDOW MOLDING

Removal / Installation

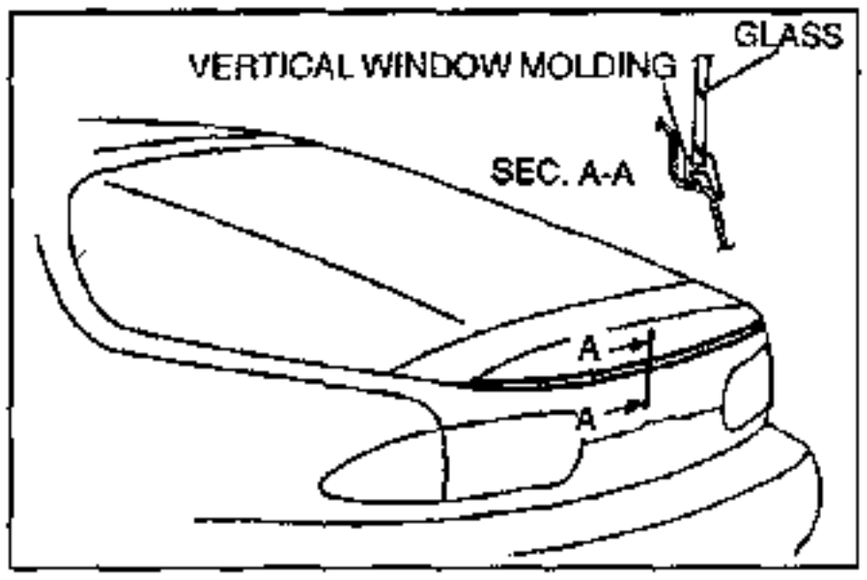
1. Remove in the order shown in the figure, referring to **Removal note.**
2. Install in the reverse order of removal, referring to **Installation note.**



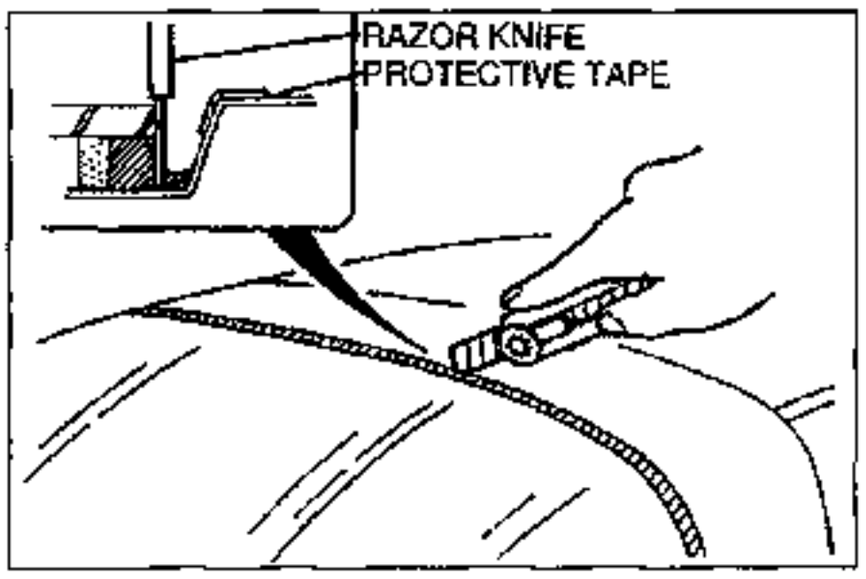
1. Liftgate lower trim
   Removal / Installation ..... page S–65
2. Rear spoiler
   Removal / Installation ..... page S–32
3. Liftgate molding
   Removal note ..... page S–26
   Installation note ..... page S–26
4. Vertical window molding
   Removal note ..... page S–26
   Installation note ..... page S–28



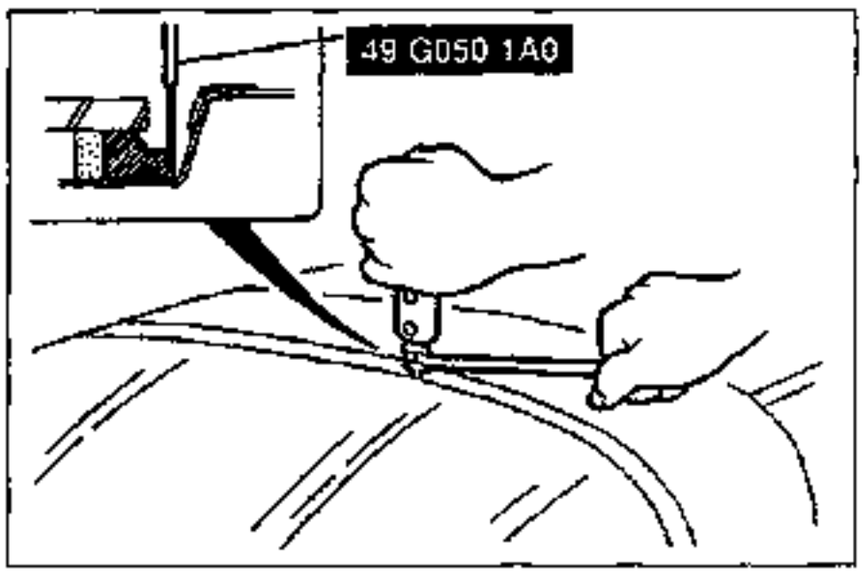
Removal note
Liftgate molding
The molding is attached to the liftgate glass by sealant as shown.



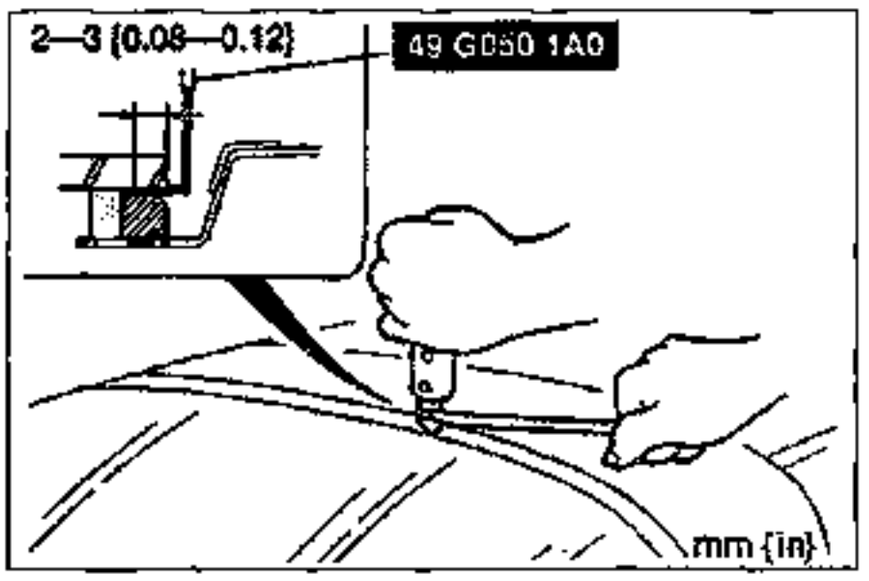
Vertical window molding
The molding is attached to the vertical window by sealant as shown.



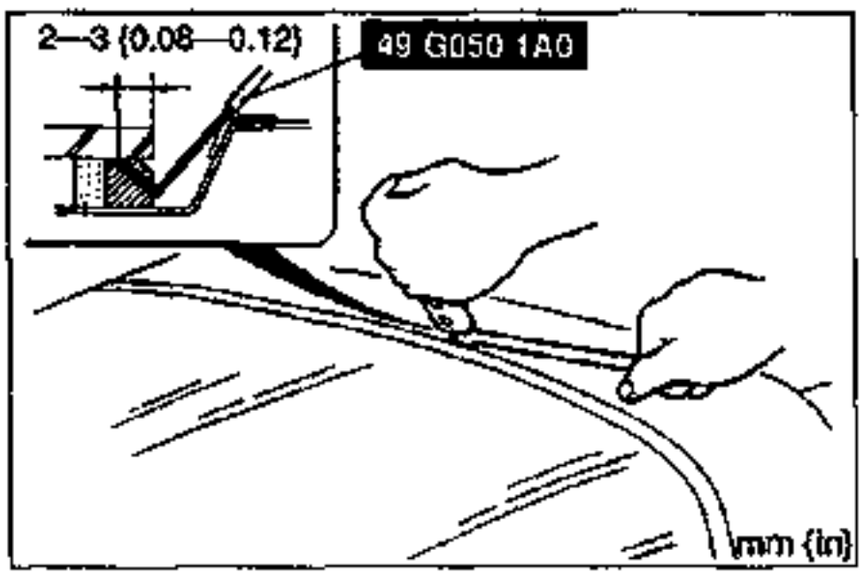
Installation note
Liftgate molding
1. Apply protective tape along the upper edge of the liftgate to protect it from damage.
2. Cut the upper sealant by using a razor knife as shown.



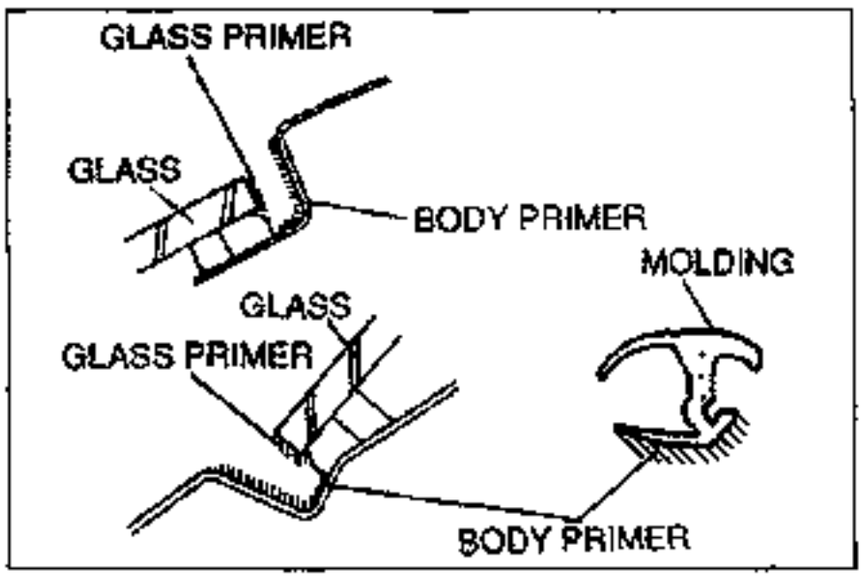
3. Insert the blade of the **SST** into the sealant, and pull on the bar to cut the sealant near the liftgate as shown.



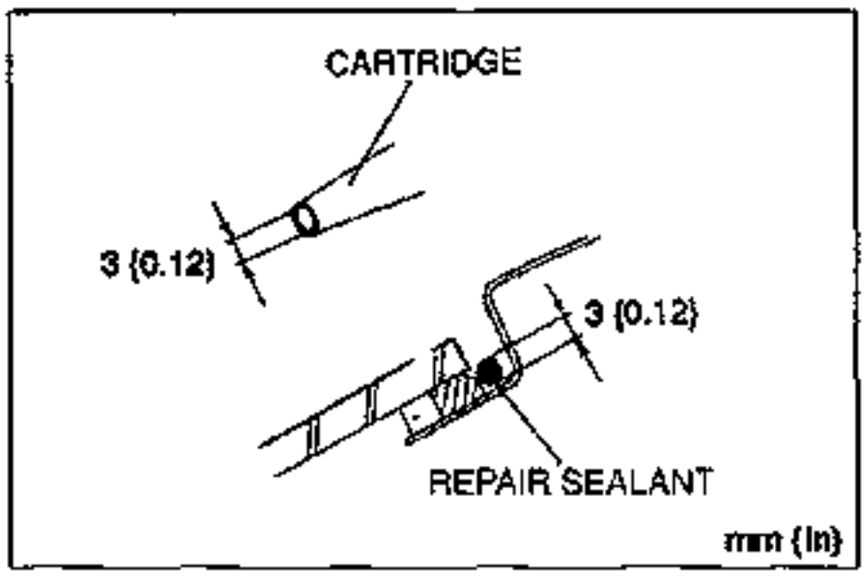
4. Insert the blade of the **SST** into the sealant, and pull on the bar to cut the sealant near the glass as shown.



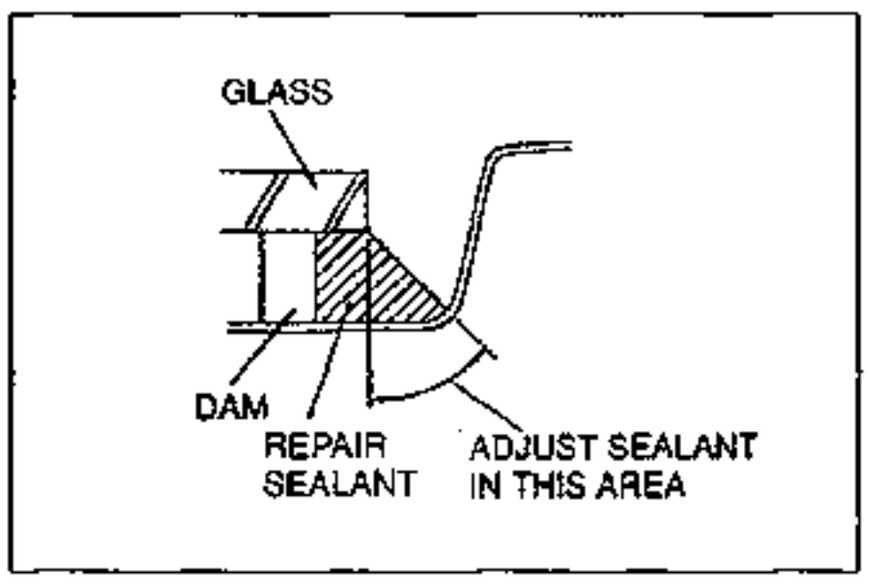
5. Insert the blade of the **SST** into the sealant, and pull on the bar to cut the sealant near the glass as shown.



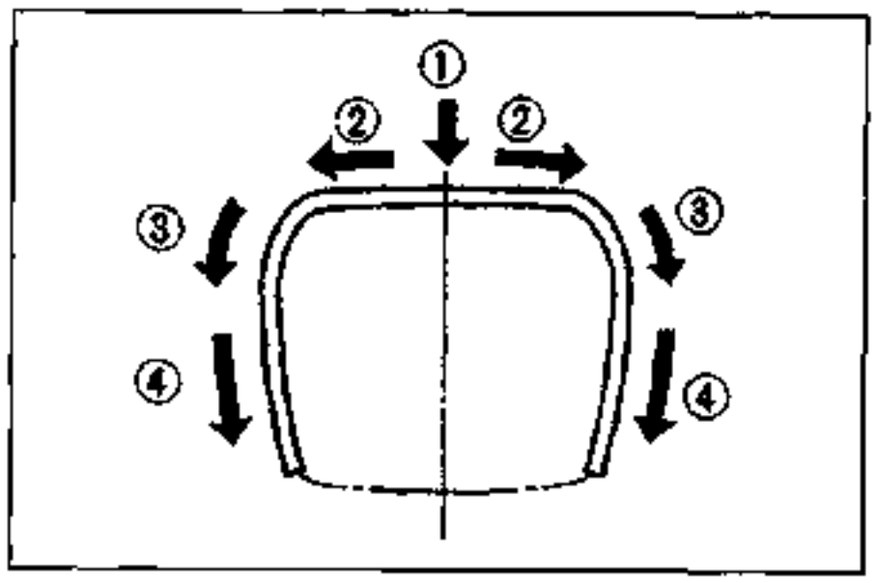
6. Apply primer onto the bonding area of the glass, liftgate, and new liftgate molding by using a brush. Use only glass primer on the glass and body primer on the liftgate and molding. Keep the area free of dirt and grease, and do not touch the surface. Allow the primer to dry for approximately **30 minutes**.



7. Apply a **3 mm {0.12 in}** bead of repair sealant between the glass and the liftgate.



8. Reshape the repair sealant as shown if necessary.

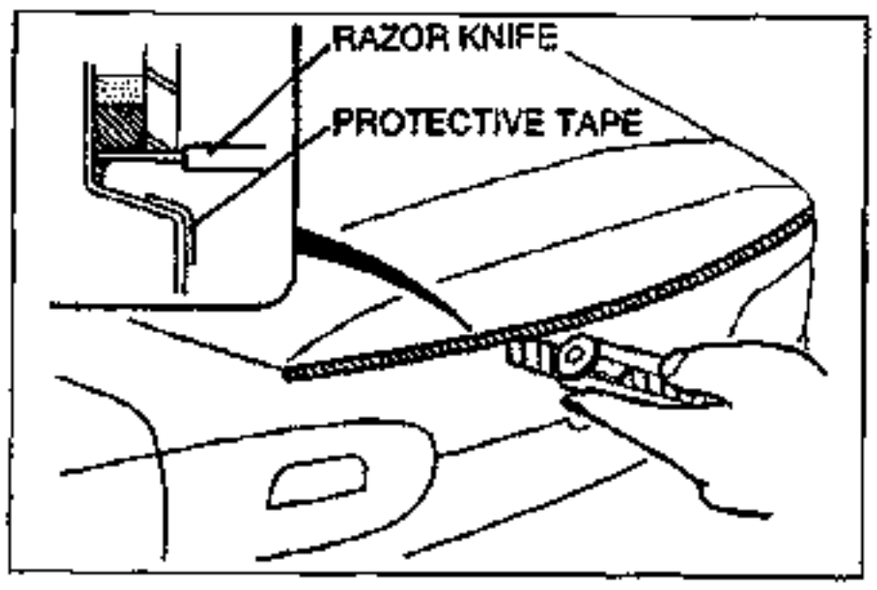


9. Install the liftgate molding before the sealant hardens.
   ① Align the mark on the glass to that on the molding.
   ② Install the top of the molding.
   ③ Install the corners of the molding.
   ④ Install the sides of the molding, starting from the top and then toward the bottom.

Hardening time of repair sealant

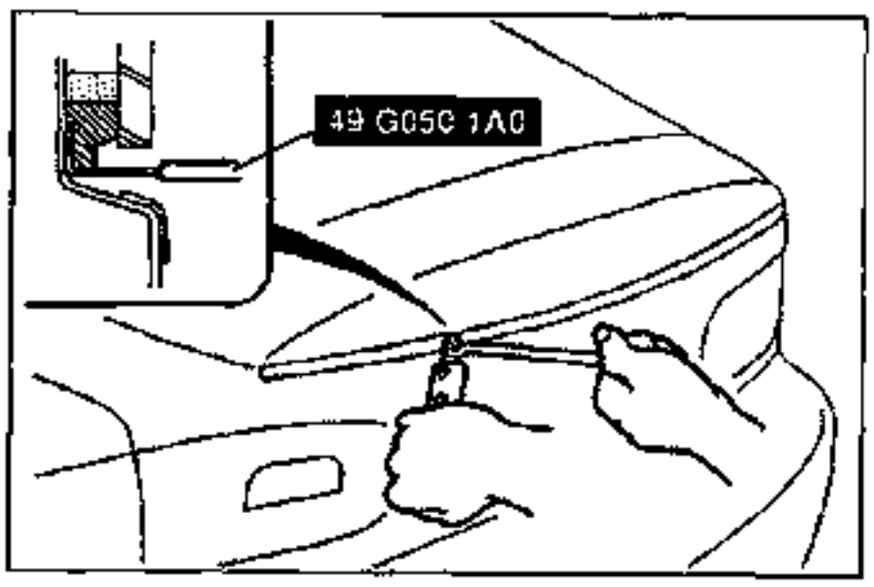
Temperature	Surface hardening time	Time required until car can be put into service
5°C {41°F}	Approx. 1.5 hr	12 hr
20°C {68°F}	Approx. 1 hr	4 hr
35°C {95°F}	Approx. 10 min	2 hr

10. Check for water leaks. If a leak is found, wipe the water off well and repeat the installation.

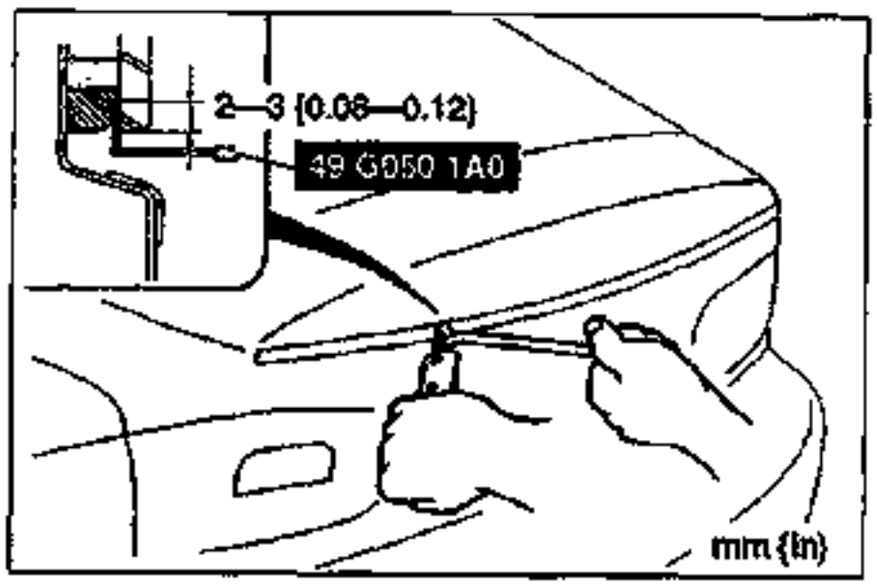


Vertical window molding

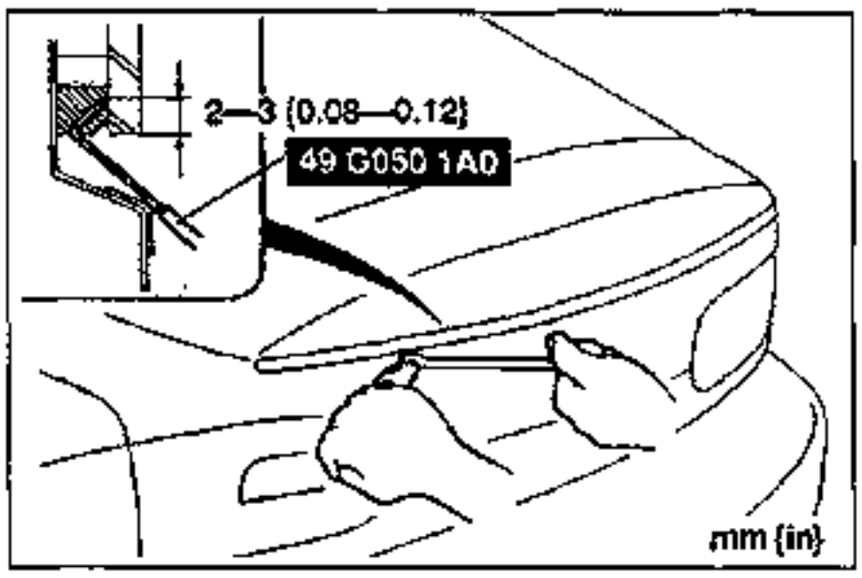
1. Cut the sealant by using a razor knife as shown.



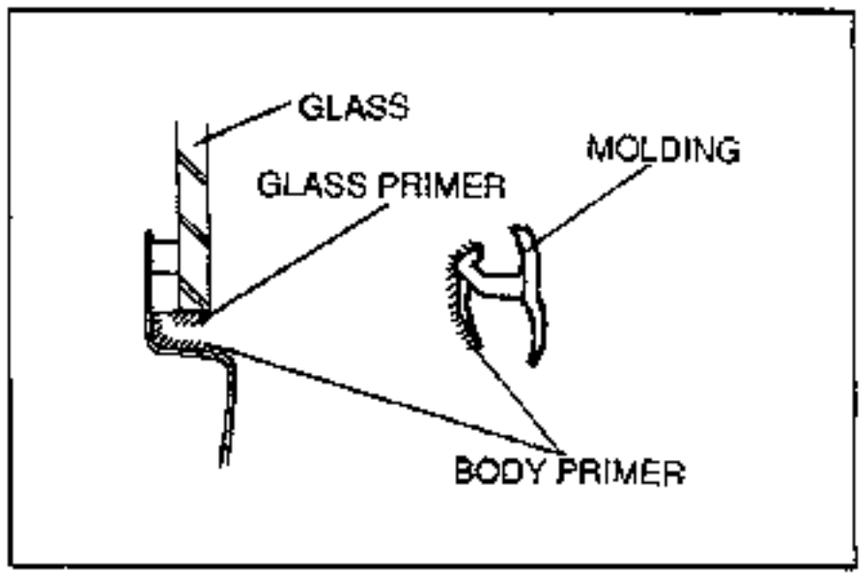
2. Insert the blade of the **SST** into the sealant, and pull on the bar to cut the sealant near the body as shown.



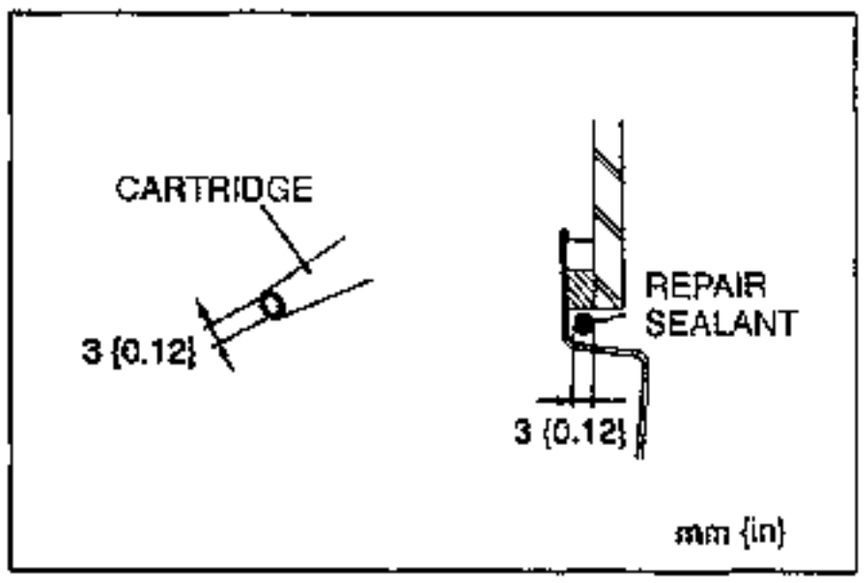
3. Insert the blade of the **SST** into the sealant, and pull on the bar to cut the sealant near the glass as shown.



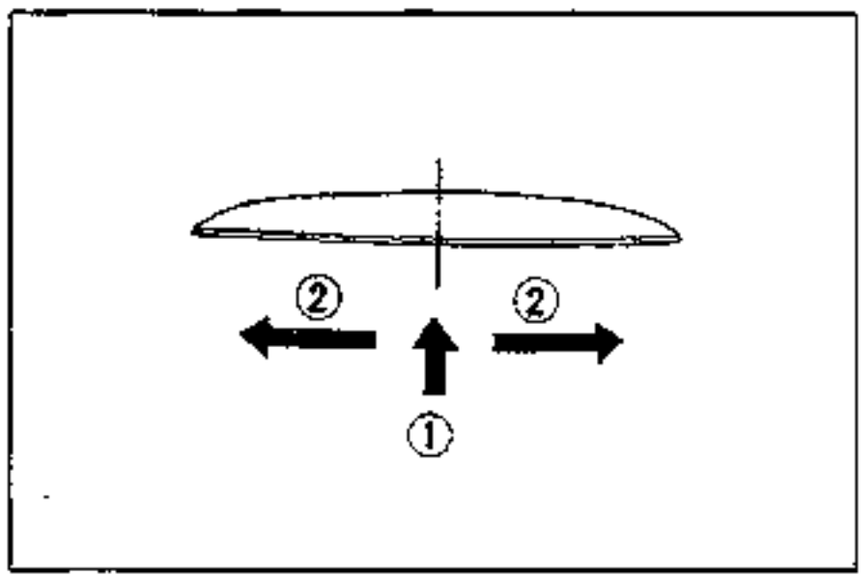
4. Insert the blade of the **SST** into the sealant, and pull on the bar to cut the sealant near the glass as shown.



5. Apply primer to the bonding area of the glass, liftgate, and new vertical window molding by using a brush. Use only glass primer on the glass and body primer on the liftgate and molding. Keep the area free of dirt and grease, and do not touch the surface. Allow the primer to dry for approximately **30 minutes**.



6. Apply a **3 mm {0.12 in}** bead of repair sealant between the glass and the liftgate.



7. Remove the protective liner paper of the double-sided adhesive tape of the vertical window molding.
8. Install the vertical window molding before the sealant hardens.
   ① Align the mark of the molding to that on the glass.
   ② Starting from the center, press the molding into place toward both ends.

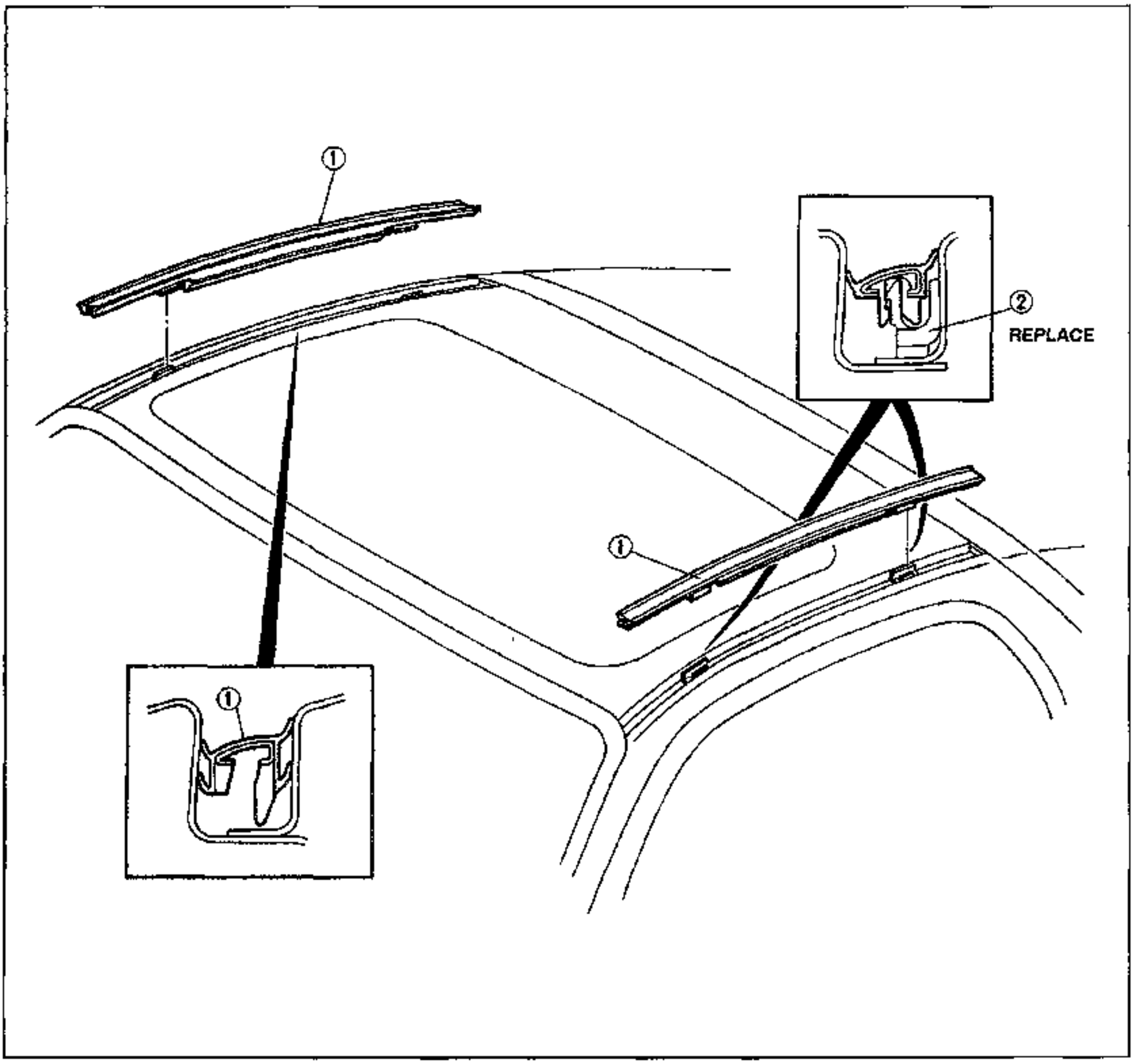
Hardening time of repair sealant

Temperature	Surface hardening time	Time required until car can be put into service
5°C {41°F}	Approx. 1.5 hr	12 hr
20°C {68°F}	Approx. 1 hr	4 hr
35°C {95°F}	Approx. 10 min	2 hr

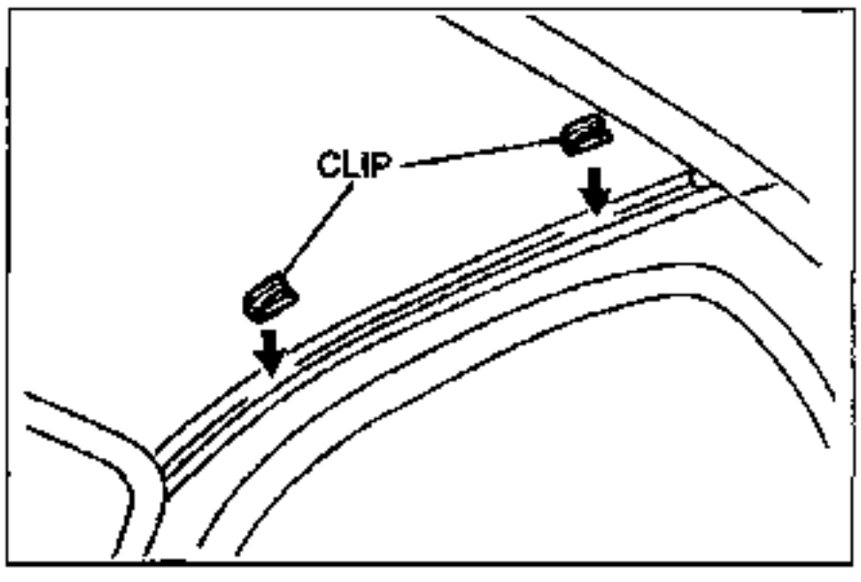
ROOF MOLDING

Removal / Installation

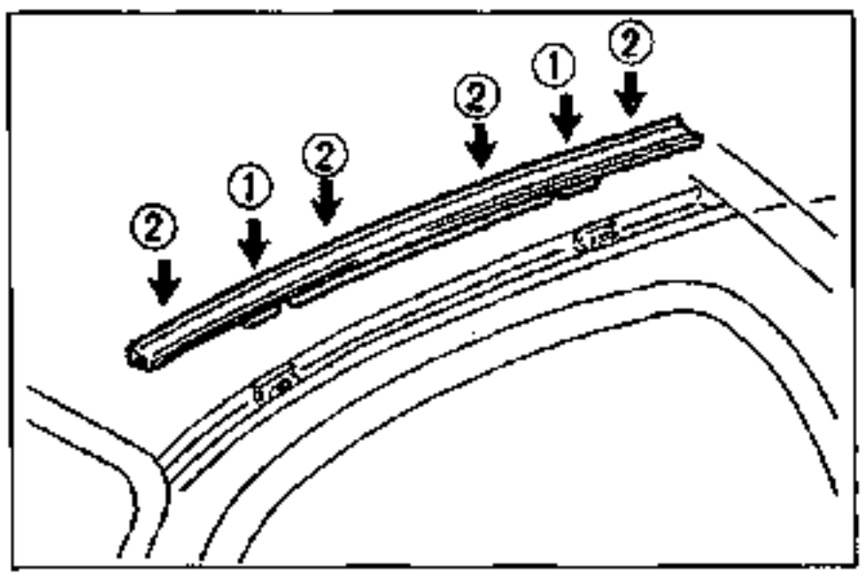
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal, referring to **Installation note.**



1. Roof molding
   Installation note ..... below
2. Clip

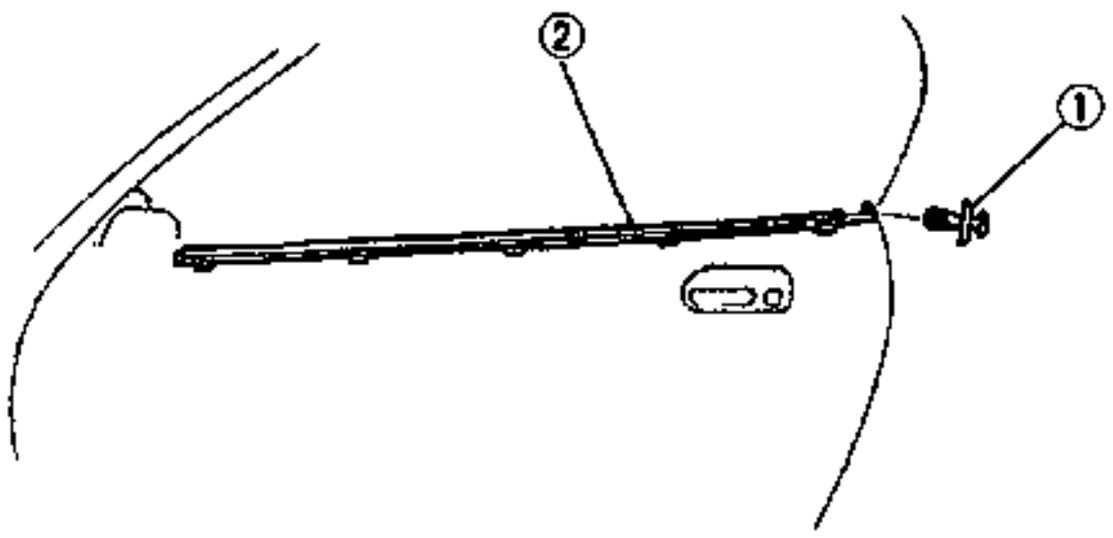


Installation note
Roof molding
1. Remove the clips from the roof panel.
2. Clean and degrease the clip installation points.
3. Install new clips to the roof panel.

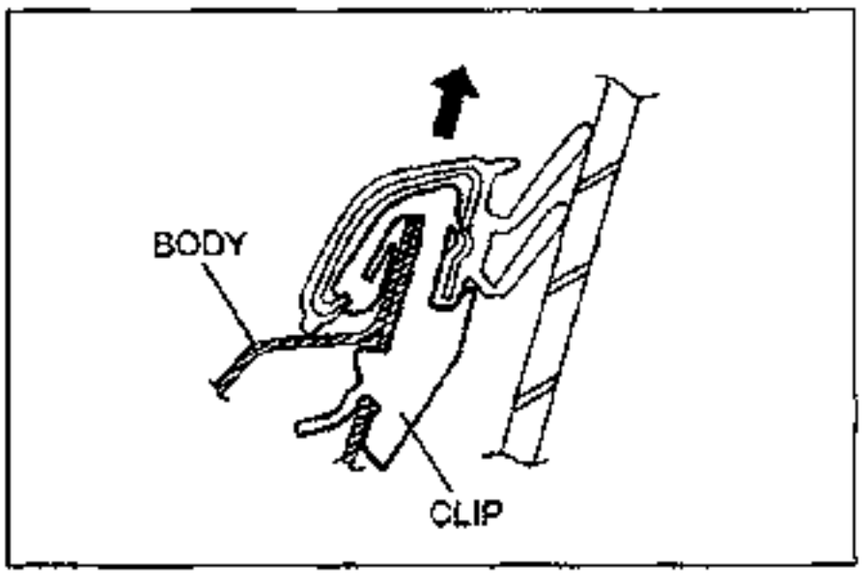


4. Remove the protective liner paper of the double-sided adhesive tape at the rear end of the molding. Align the rear end of the molding to the clip and press the clip area ①.
5. Press the molding down firmly, especially the rear end of the molding ②.

BELTLINE MOLDING
Removal / Installation
1. Lower the door glass fully.
2. Remove the power outside mirror. (Refer to page S–34.)
3. Remove in the order shown in the figure, referring to **Removal note**.
4. Install in the reverse order of removal.



1. Fastener
2. Beltline molding
   Removal note ..... below



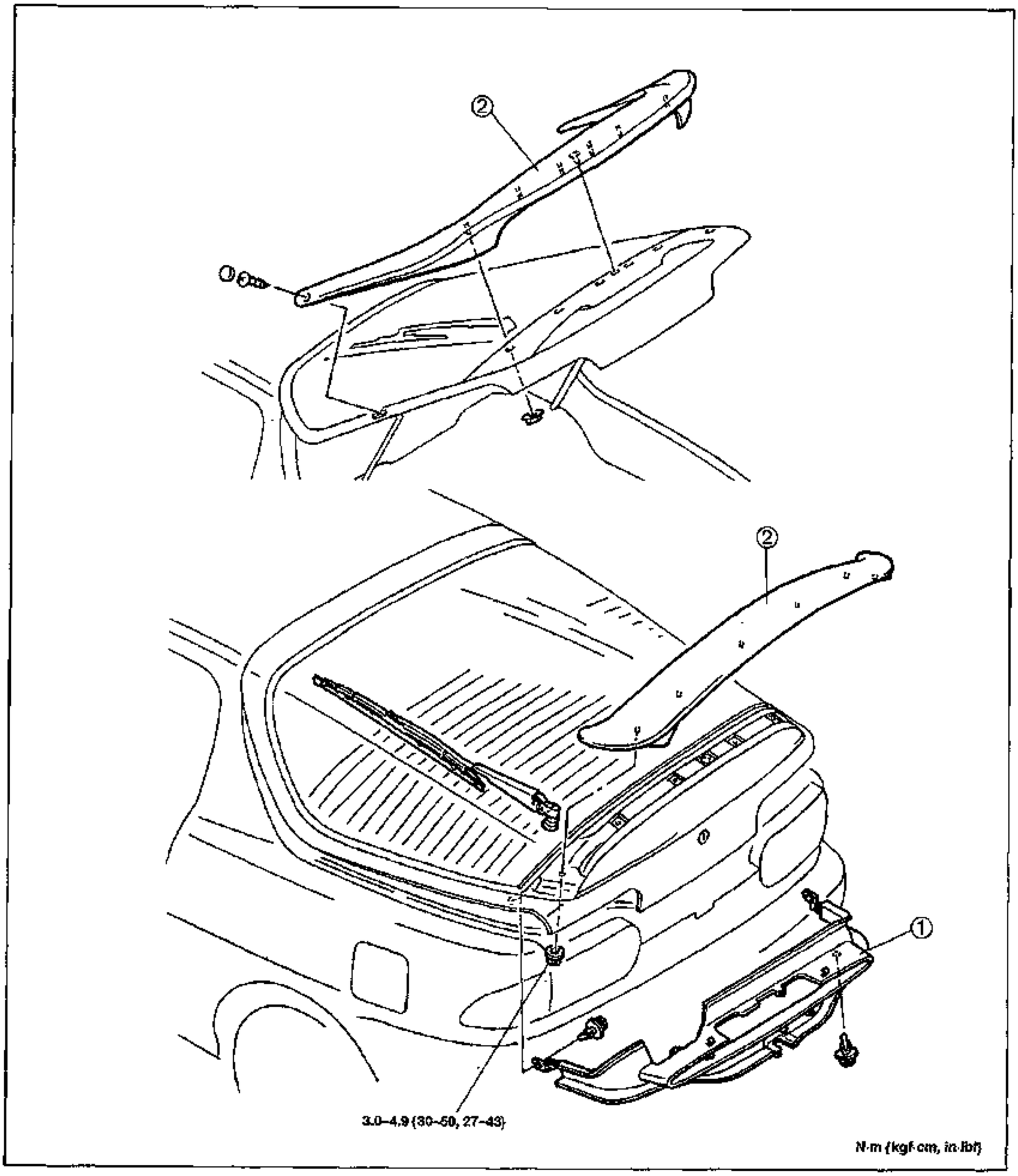
Removal note
Beltline molding
Pull the beltline molding upward to remove the clips from the body.

REAR SPOILER

COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



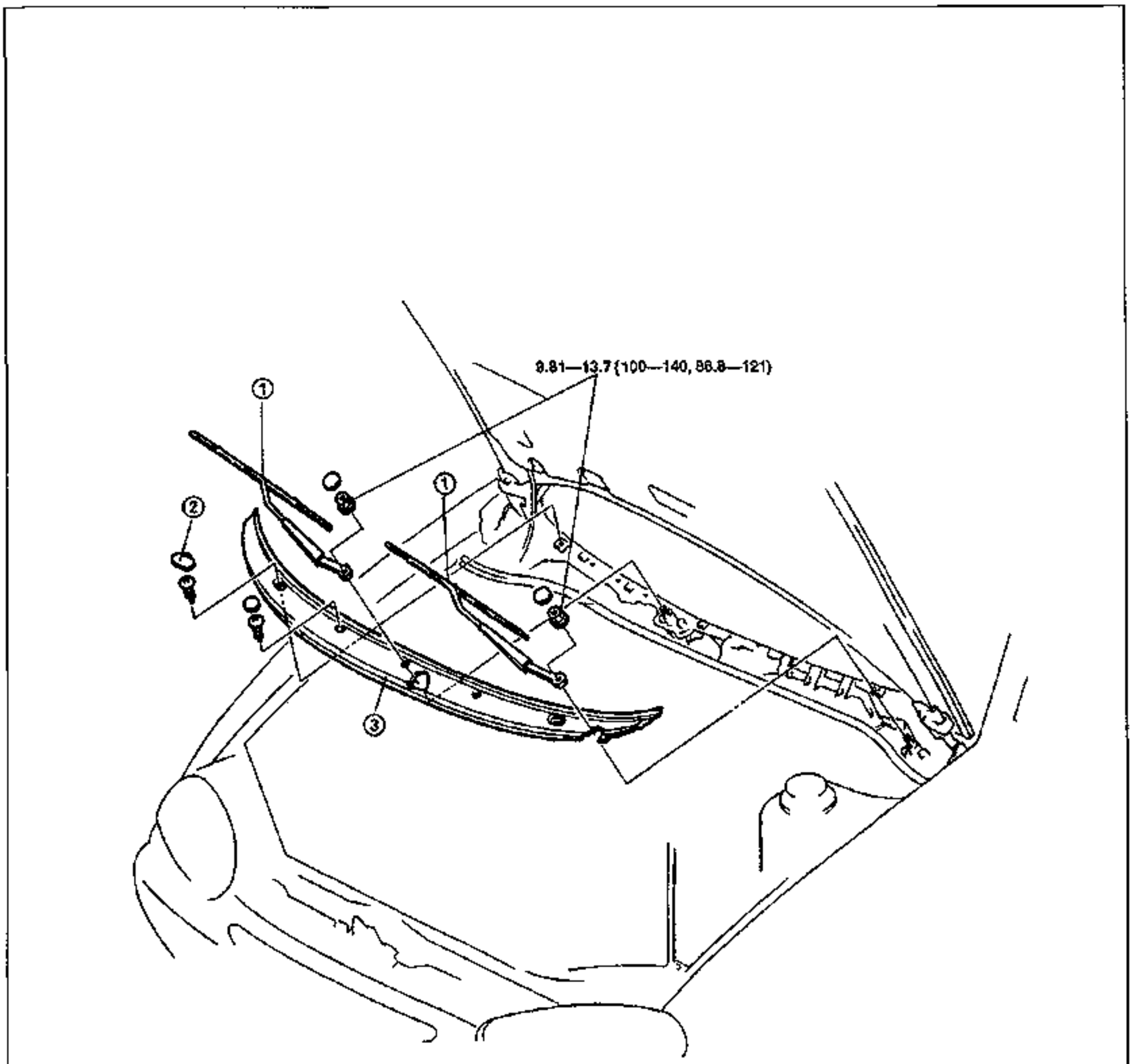
1. Liftgate lower trim
   Removal / Installation ..... page S–65
2. Rear spoiler

COWL GRILLE

COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



1. Windshield wiper arm and blade
   Removal / Installation ..... page S–36
2. Cowl cap
3. Cowl grille

POWER OUTSIDE MIRROR

COMPONENTS

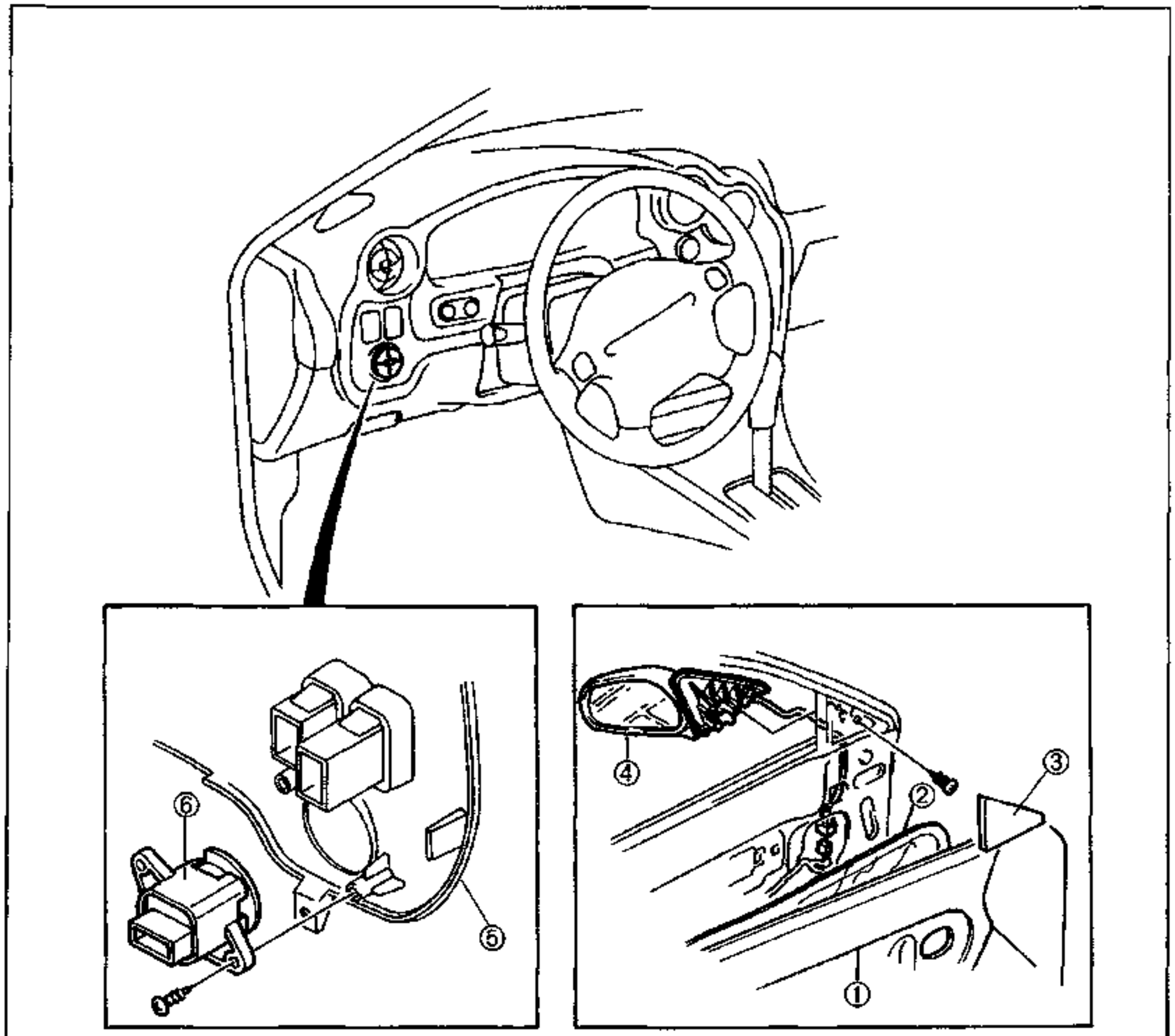
Removal / Installation

1. Disconnect the negative battery cable.

Note

- Remove the door screen carefully so that it may be reused.

2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.

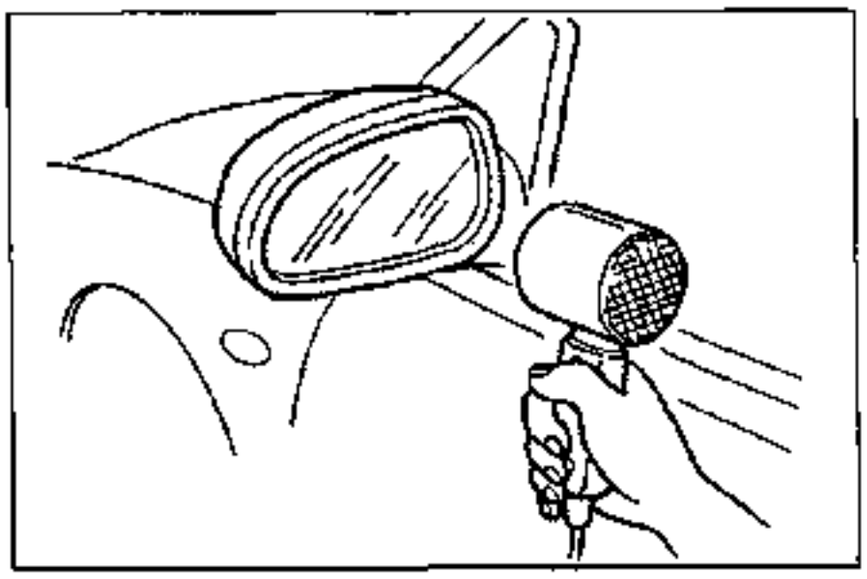


Power outside mirror

1. Door trim
   Removal / Installation ..... page S–65
2. Door screen
3. Inner garnish
4. Power outside mirror
   Replacement of mirror glass ... page S–35

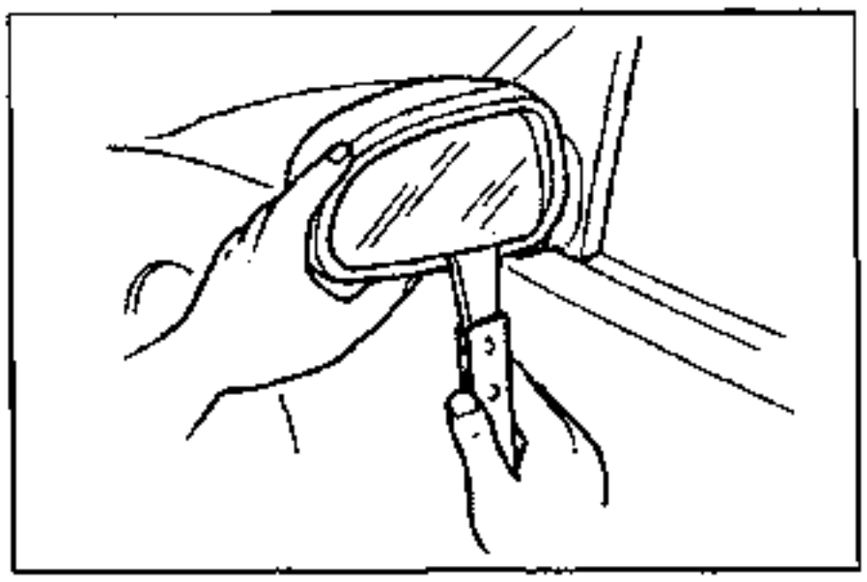
Power outside mirror switch

5. Meter hood
   Removal / Installation ..... page S–61
6. Power outside mirror switch

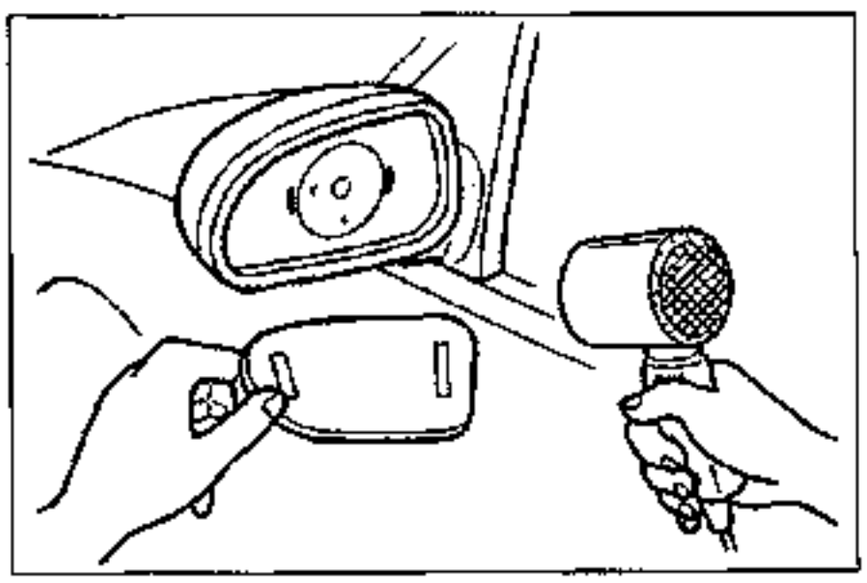


Replacement of Mirror Glass

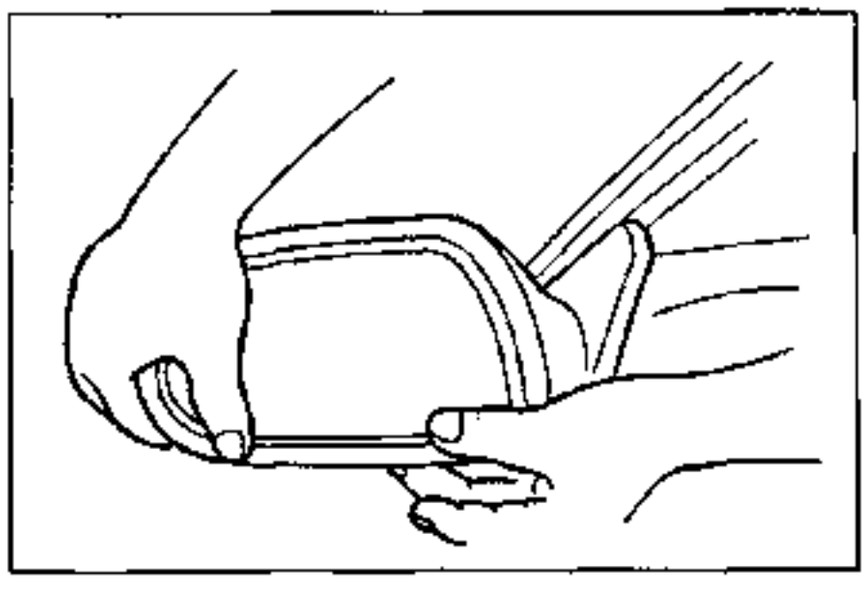
1. Warm the frame and the mirror glass by using a hot-air blower.



2. Insert a scraper between the mirror glass and the frame, and pry the glass loose.
3. Remove the remaining adhesive.



4. Warm the adhesive surface of the frame and the mirror by using a hot-air blower.



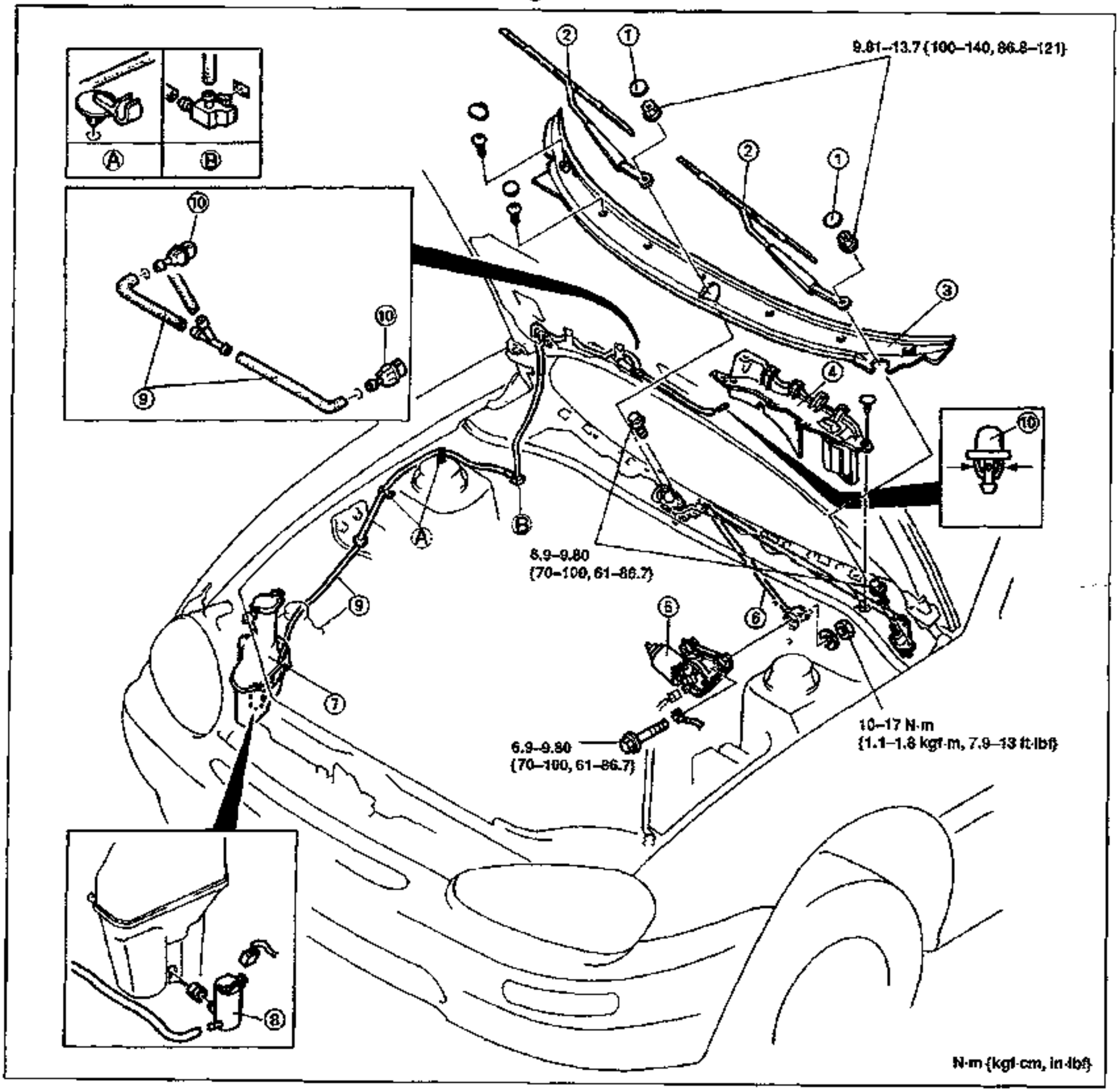
5. Install the glass in the frame and gently press it in to secure it.

WINDSHIELD WIPER AND WASHER

COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal, referring to **Installation note.**

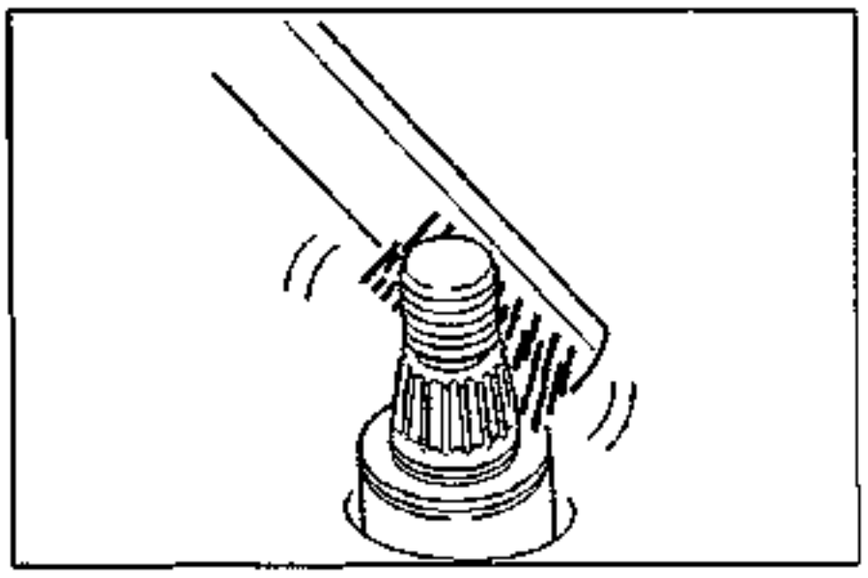


Windshield wiper

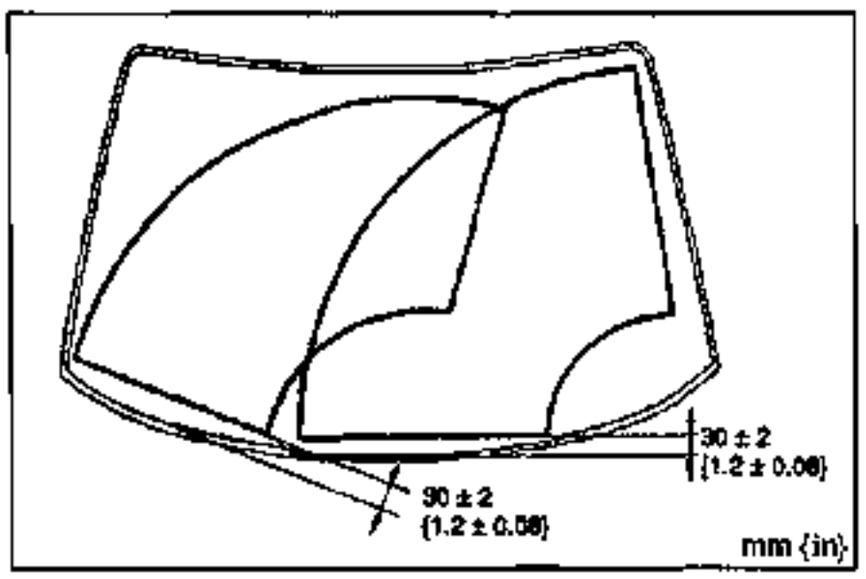
1. Windshield wiper arm cover
2. Windshield wiper arm and blade
   Installation note ..... page S–37
   Adjustment ..... page S–37
3. Cowl grille
4. Baffle
5. Windshield wiper motor
   Disassembly / Assembly ..... page S–38
6. Windshield wiper link

Windshield washer

7. Windshield washer tank
8. Windshield washer motor
9. Windshield washer pipe
10. Windshield washer nozzle
    Adjustment ..... page S–37

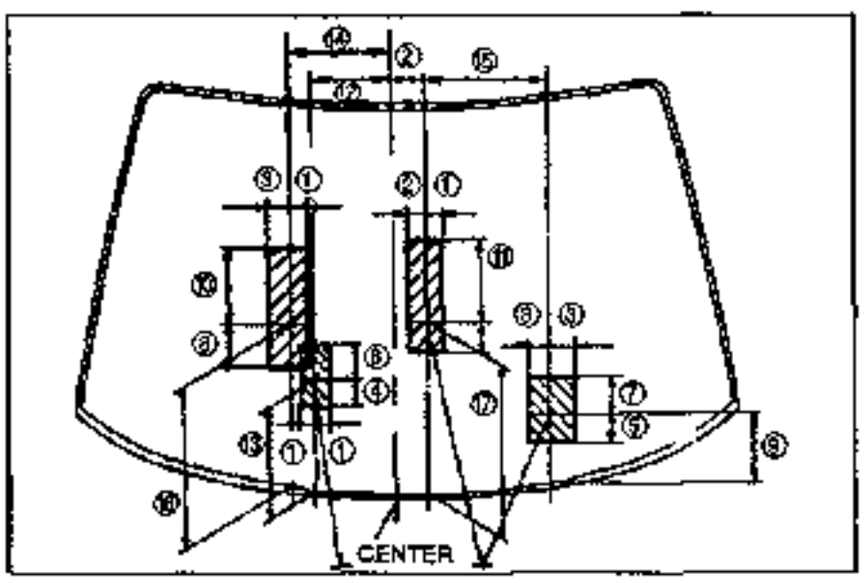


Installation note
Windshield wiper arm and blade
Clean the wiper arm connector shafts with a wire brush before installing the wiper arms.



Adjustment
Windshield wiper arm and blade
1. Turn the ignition switch to ON and turn the wiper switch on to operate the wipers.
2. Turn the wiper switch off to set the wipers in the park position.
3. Set the wiper arm height as shown in the figure.

Tightening torque:
9.81–13.7 N·m {100–140 kgf·cm, 86.8–121 in·lbf}



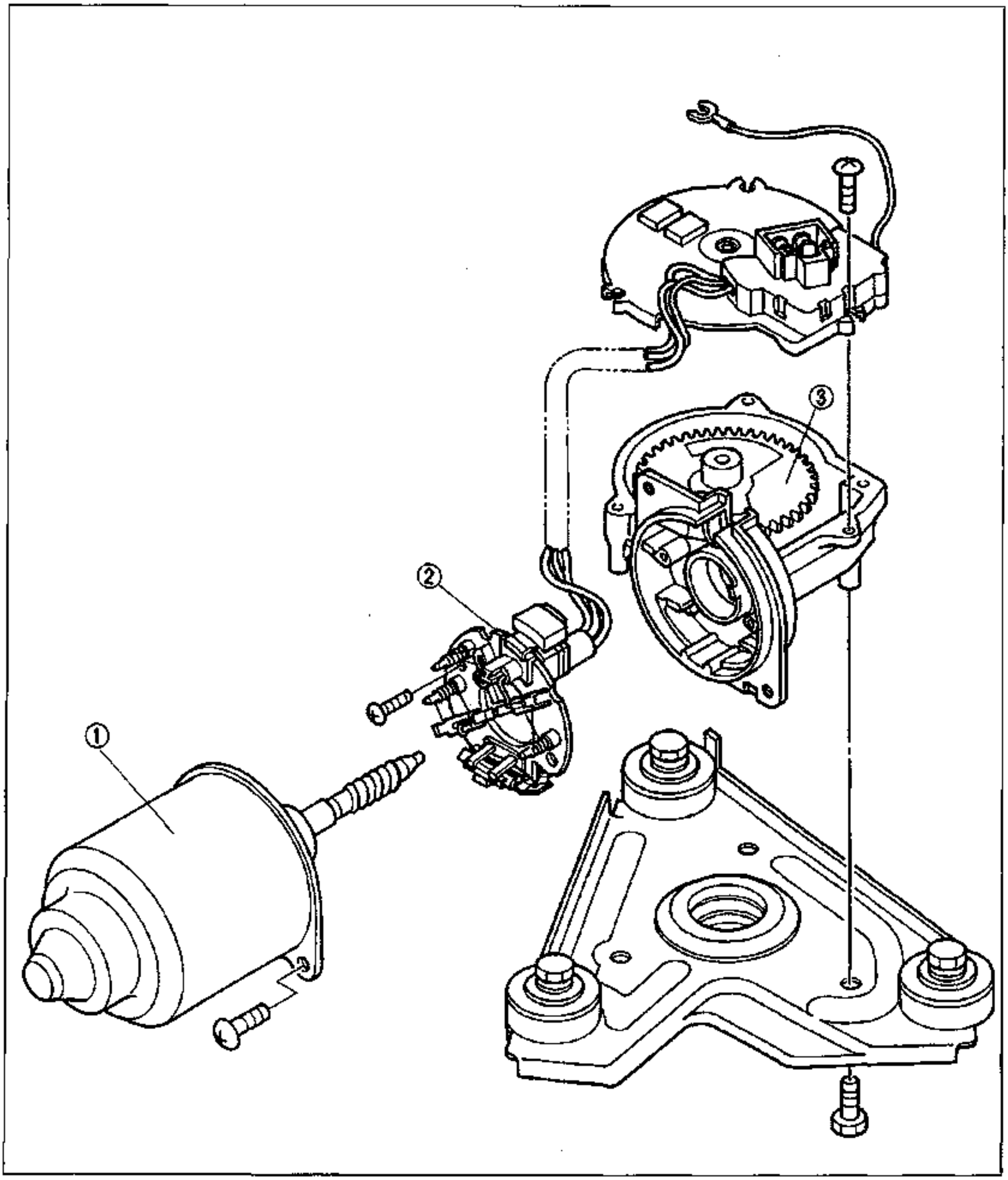
Windshield washer nozzle
Insert a needle or similar object into the nozzle hole and move the nozzle to adjust the spray direction.

Clearance mm {in}	
① 30 {1.2}	⑩ 160 {6.30}
② 40 {1.6}	⑪ 170 {6.69}
③ 50 {2.0}	⑫ 200 {7.87}
④ 55 {2.2}	⑬ 231 {9.09}
⑤ 60 {2.4}	⑭ 249 {9.80}
⑥ 75 {3.0}	⑮ 260 {10.2}
⑦ 80 {3.1}	⑯ 336 {13.2}
⑧ 90 {3.5}	⑰ 360 {14.2}
⑨ 145 {5.71}	

WINDSHIELD WIPER MOTOR

Disassembly / Assembly

1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.



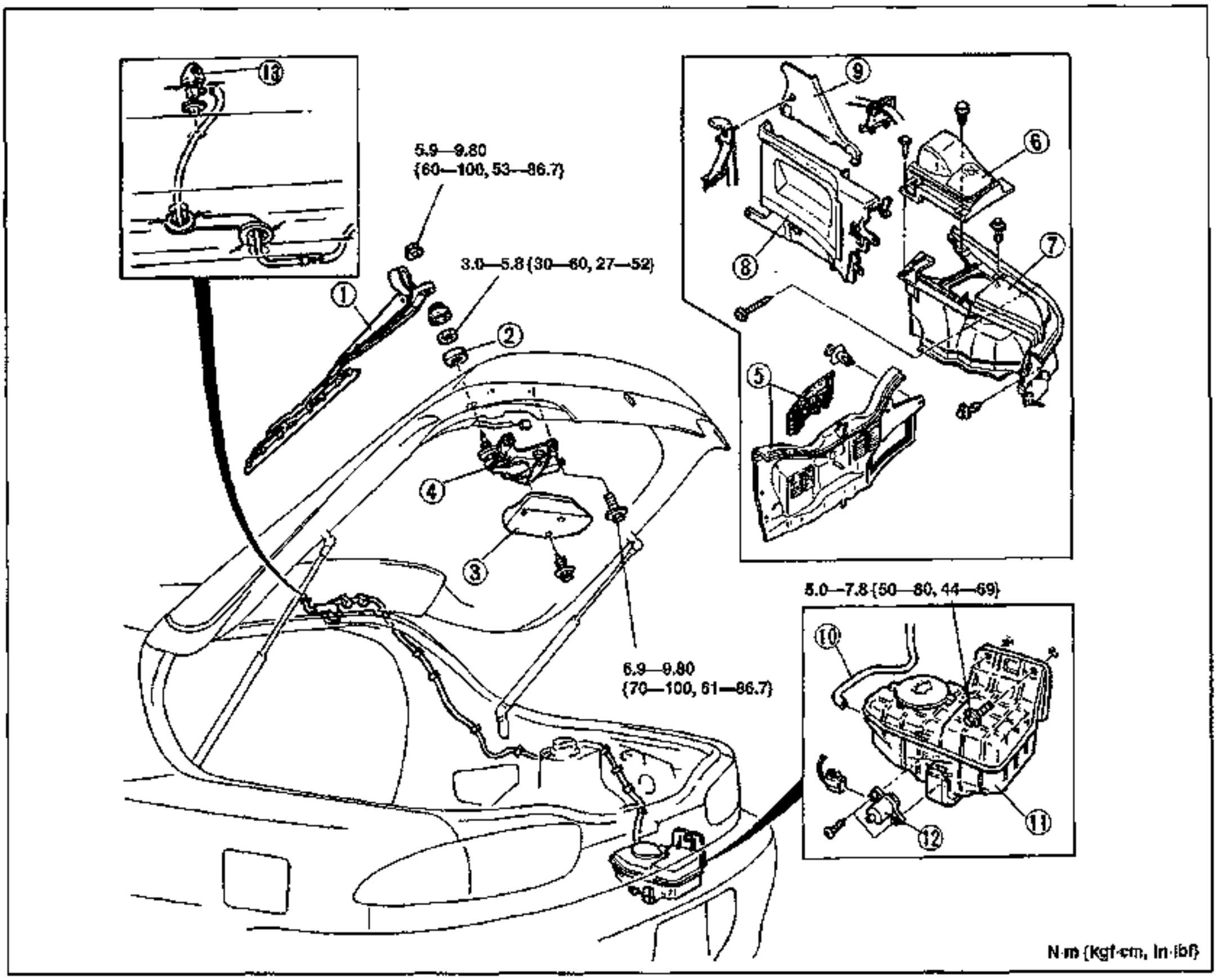
1. Wiper motor
2. Brush plate holder
3. Motor gear assembly

REAR WIPER AND WASHER

COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure. To remove the rear washer pipe, remove the liftgate upper trim (page–65) and the rear portion of the headliner (page S–70).
3. Install in the reverse order of removal, referring to **Installation note.**

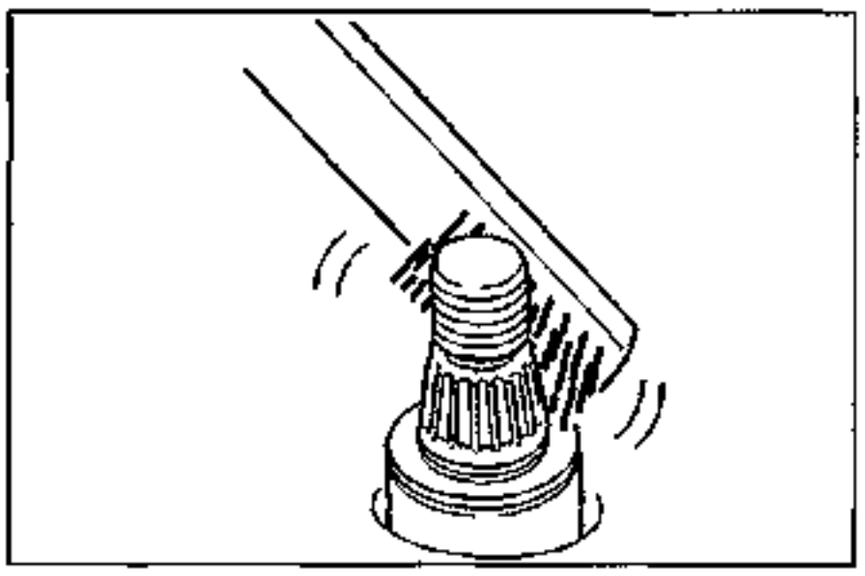


Rear wiper

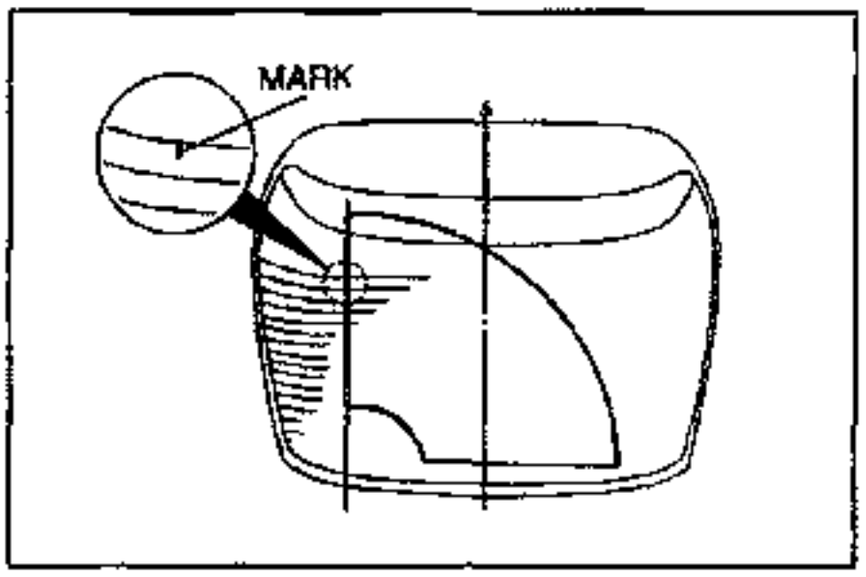
1. Rear wiper arm and blade
   - Installation note ..... page S–40
   - Adjustment ..... page S–40
2. Outer bushing
3. Rear wiper cover
4. Rear wiper motor

Rear washer

5. Trunk end trim
   - Removal / Installation ..... page S–65
6. Rear speaker cover
   - Removal / Installation ..... page S–65
7. Trunk side trim
   - Removal / Installation ..... page S–65
8. Quarter trim
   - Removal / Installation ..... page S–65
9. B-pillar trim
   - Removal / Installation ..... page S–65
10. Rear washer pipe
11. Rear washer tank
12. Rear washer motor
13. Rear washer nozzle
    - Adjustment ..... page S–40

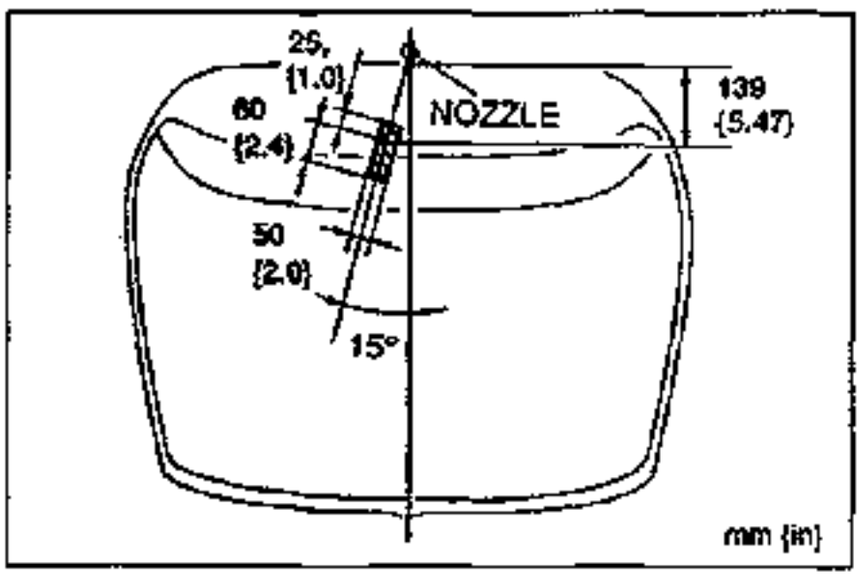


Installation note
Rear wiper arm and blade
Clean the wiper arm connector shaft with a wire brush before installing the wiper arm.



Adjustment
Rear wiper arm and blade
1. Set the motor shaft to the park position by turning the rear wiper switch on and off.
2. Set the wiper arm height as shown in the figure.

Tightening torque:
5.9–9.80 N·m {60–100 kgf·cm, 53–86.7 in·lbf}



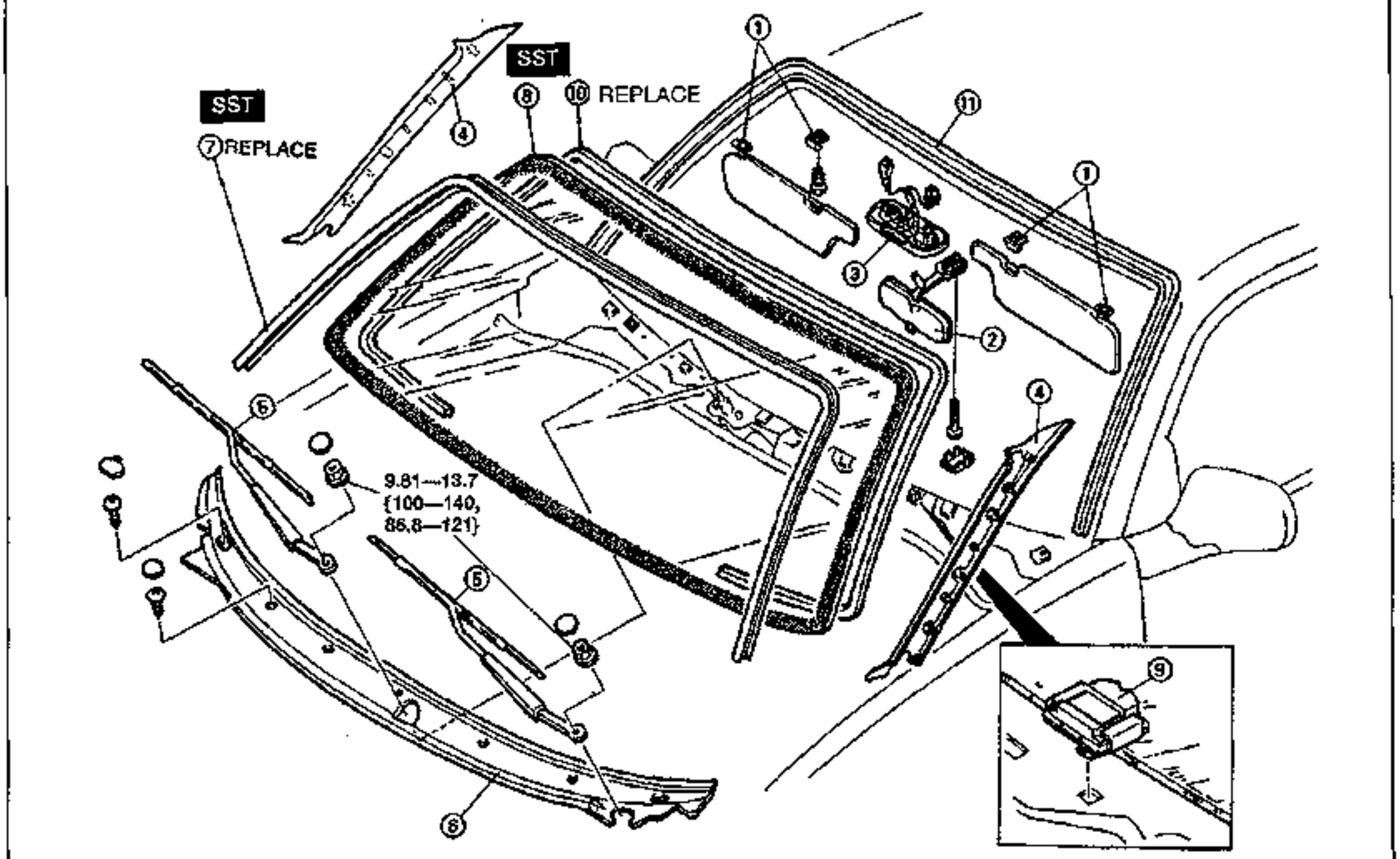
Rear washer nozzle
Insert a needle or similar object into the nozzle hole and move the nozzle to adjust the spray direction.

WINDSHIELD

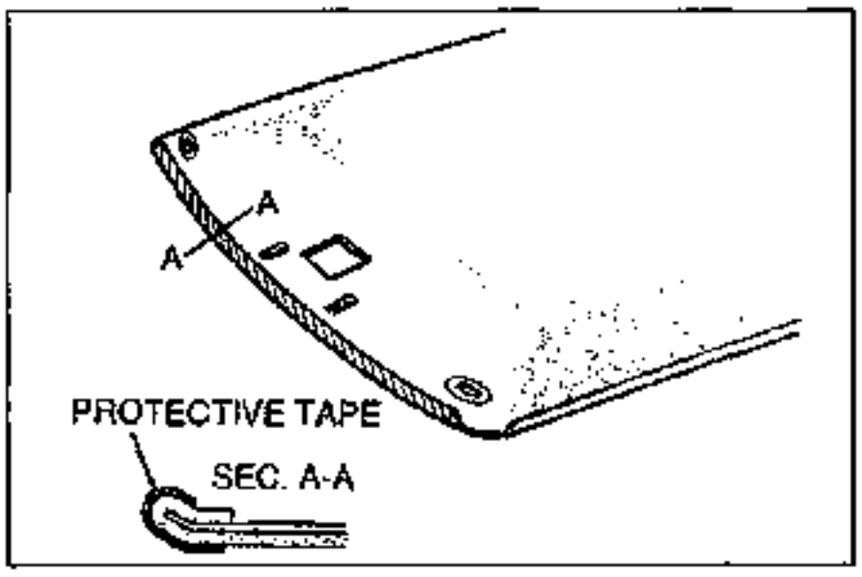
PREPARATION
SST

49 0305 870A Tool set, window		For removal / installation of glass

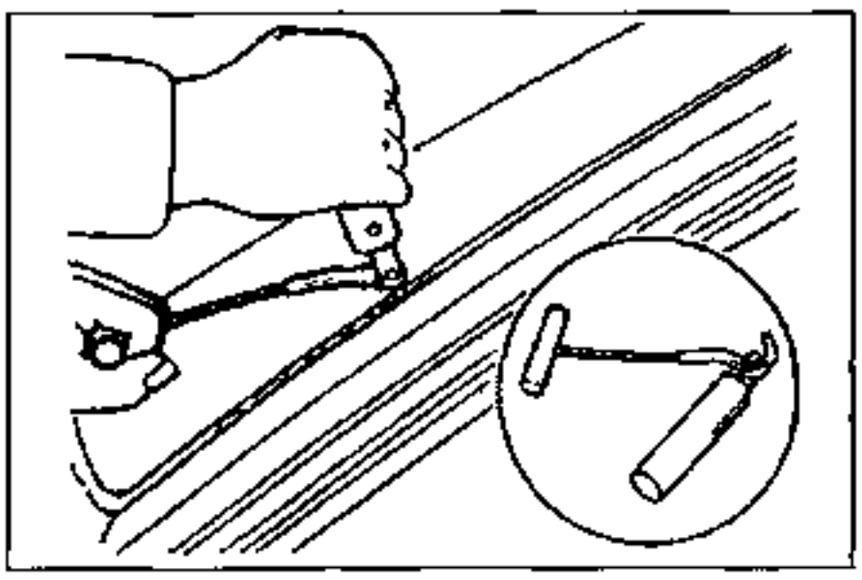
COMPONENTS
Removal / Installation
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal note.**
3. Install in the reverse order of removal, referring to **Installation note.**



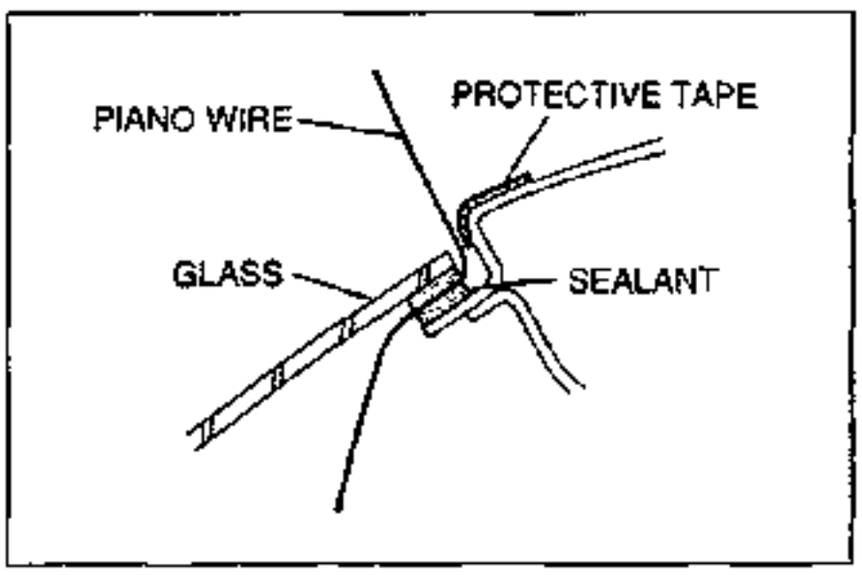
1. Sunvisor and adapter
2. Rearview mirror
3. Overhead console
4. A-pillar trim
   Removal / Installation ..... page S–65
5. Windshield wiper arm and blade
   Removal / Installation ..... page S–36
6. Cowl grille
   Removal / Installation ..... page S–33
7. Windshield molding
   Removal / Installation ..... page S–22
8. Windshield
   Removal note ..... page S–42
   Installation note ..... page S–42
9. Spacer
10. Dam
11. Protector



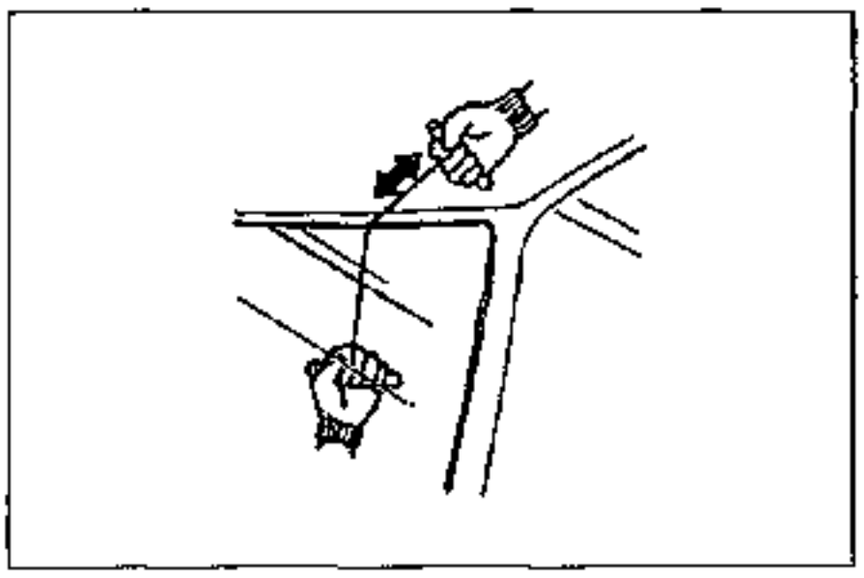
Removal note
Windshield
1. Apply protective tape along the front edge of the headliner to protect it from damage.
2. Apply protective tape along the edge of the body to protect it from damage.



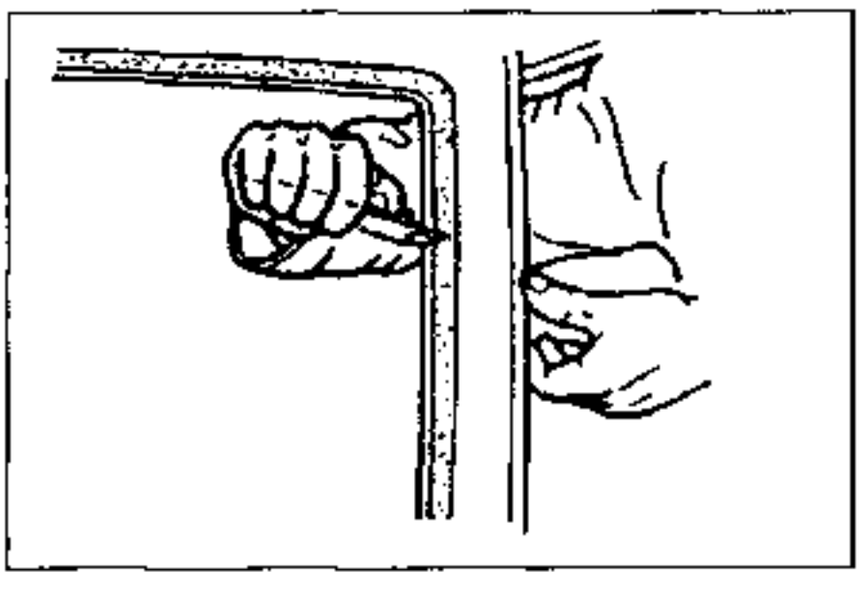
If the glass will not be reused
3. Use a tool like that shown in the figure and insert the blade into the sealant.
4. Pull through the sealant around the edge of the glass.
5. If the protector is damaged, remove it.
6. Remove the glass.



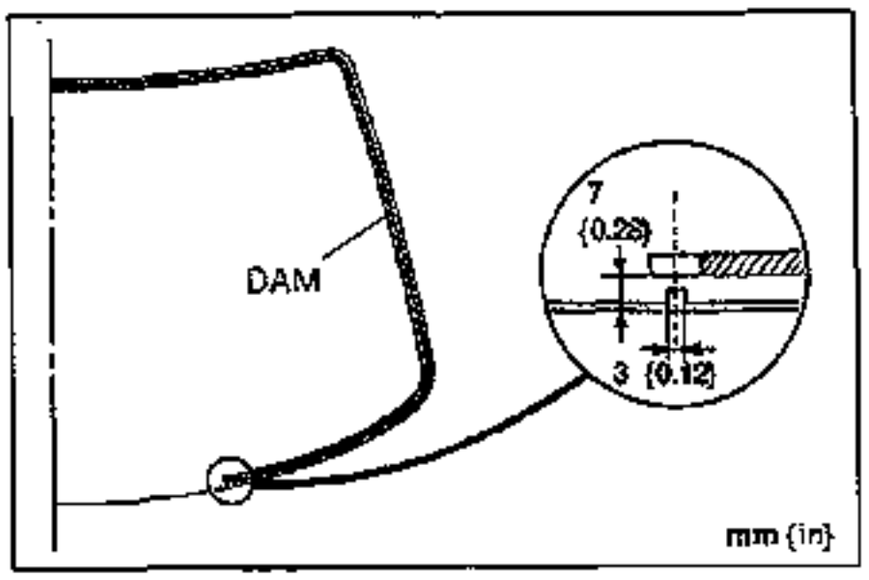
If the glass will be reused
3. Make a hole through the sealant from the inside of the vehicle by using an awl.
4. Pass piano wire through the hole.



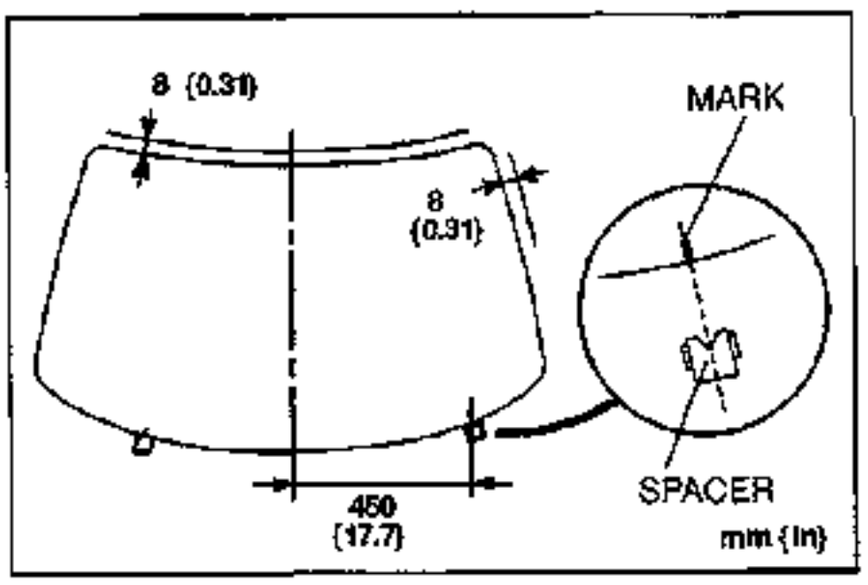
5. Wind each end of the wire around a bar.
6. Working with another person, saw through the sealant around the edge of the glass. Use a long sawing action to spread the work over the whole length of wire to prevent it from breaking.
7. Remove the glass.



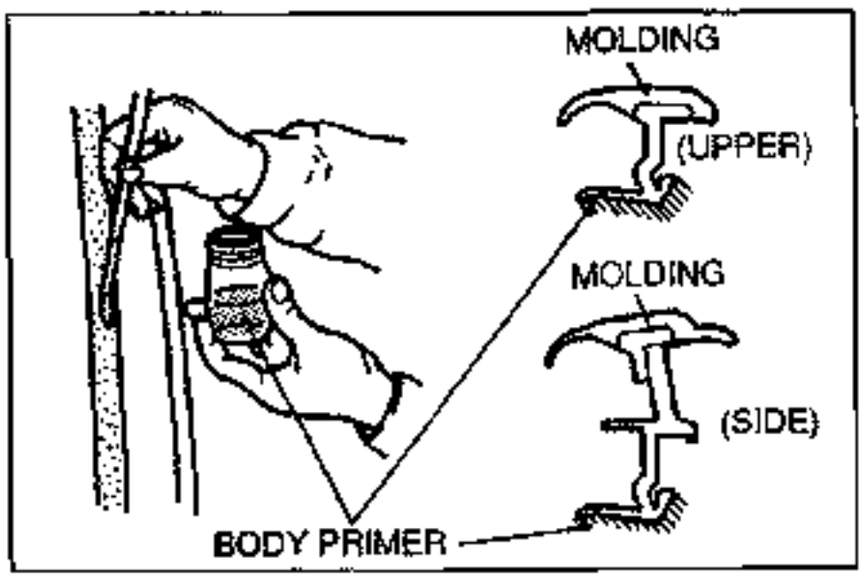
Installation note
Windshield
1. Cut away the old sealant by using a razor knife so that **1 to 2 mm {0.04 to 0.08 in}** of sealant remains around the circumference of the frame. If all the sealant has come off in any one place, apply some primer after degreasing, and allow it **30 minutes** to dry. Then apply new sealant to create a **2 mm {0.08 in}** layer.
2. Carefully clean an area **50 mm {2.0 in}** wide around the circumference of the glass and the bonding area on the body.



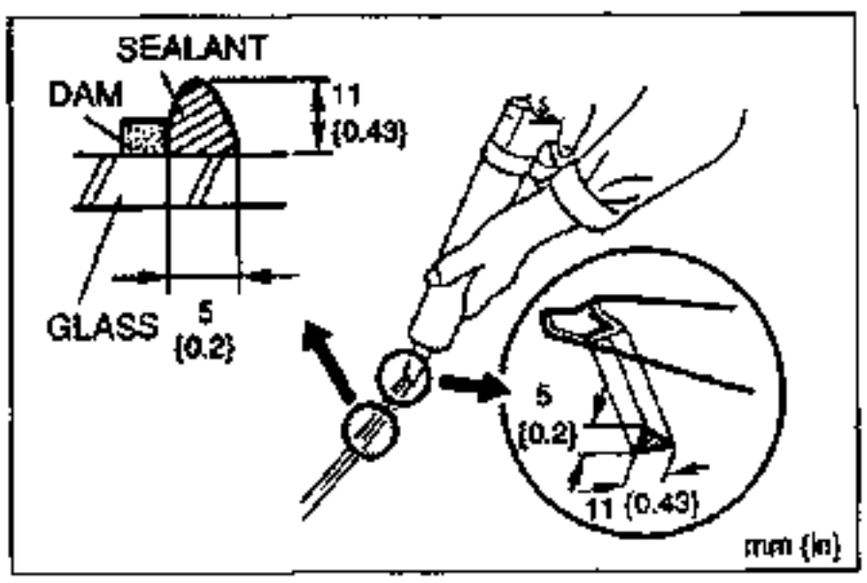
3. Securely bond a new dam **7 mm {0.28 in}** from the edge of the glass as shown. Allow it to dry completely.



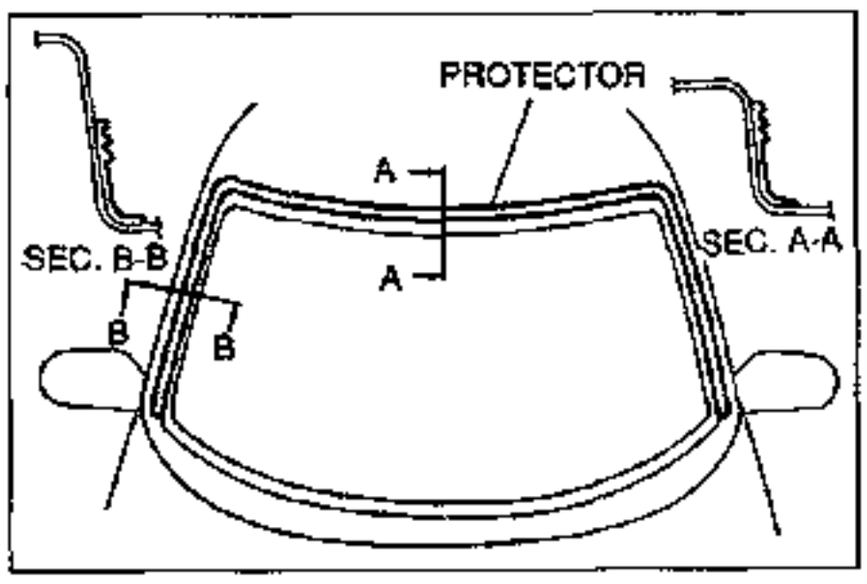
4. Install the spacers onto the body. If a spacer is damaged, replace it.
5. Temporarily install the glass onto the body and adjust the glass-to-body clearance.
6. Make a mark on the glass directly above the V-notch of the spacers.
7. Remove the glass.



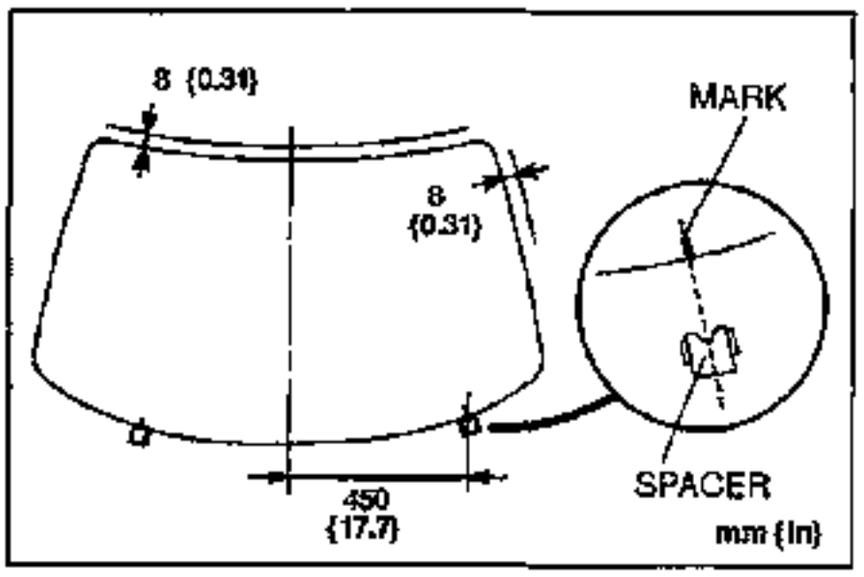
8. Apply primer onto the bonding area of the glass, body, and molding by using a brush. Use only glass primer on the glass and body primer on the body and molding. Keep the area free of dirt and grease, and do not touch the surface. Allow it to dry for approximately **30 minutes.**



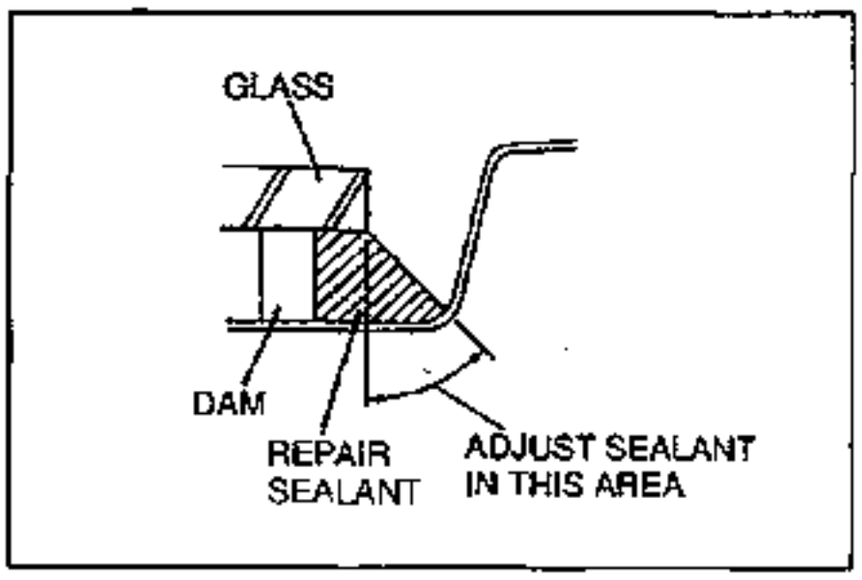
9. After the primer has dried, apply an **11 mm {0.43 in}** high bead of repair sealant around the circumference of the glass as shown. Keep the bead of sealant smooth and even, reshaping it with a spatula where necessary. If the windshield is being reused, apply new repair sealant over the original.



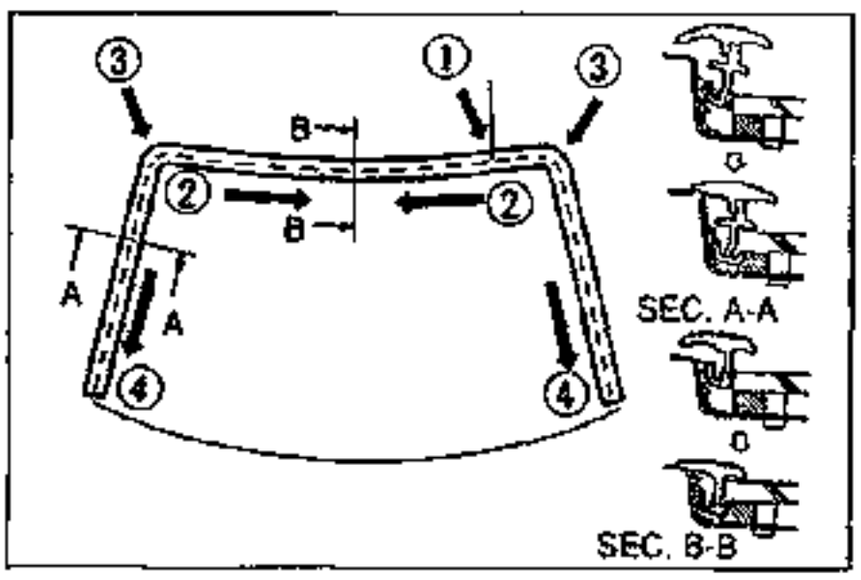
10. If the protector was removed, bond a new one onto the body as shown.



11. Align the glass marks with the notches in the spacers and install the glass onto the body.
12. Press firmly on the glass to compress the sealant. Verify that the body-to-glass clearance is as shown.



13. Use a scraper to smooth away any sealant that oozes out. Add more sealant to any points of poor contact. Adjust the upper and side sealant as shown, if necessary.



14. Install the windshield molding before the sealant hardens.
    ① Align the marks on the molding to the roof inner line.
    ② Install the top of the molding.
    ③ Install the corners of the molding.
    ④ Install the sides of the molding, starting from the top and then toward the bottom.

15. To prevent the glass from being pushed out by air pressure if a door is closed, open all of the windows until the repair sealant has hardened.

Hardening time of repair sealant

Temperature	Surface hardening time	Time required until car can be put into service
5°C {41°F}	Approx. 1.5 hr	12 hr
20°C {68°F}	Approx. 1 hr	4 hr
35°C {95°F}	Approx. 10 min	2 hr

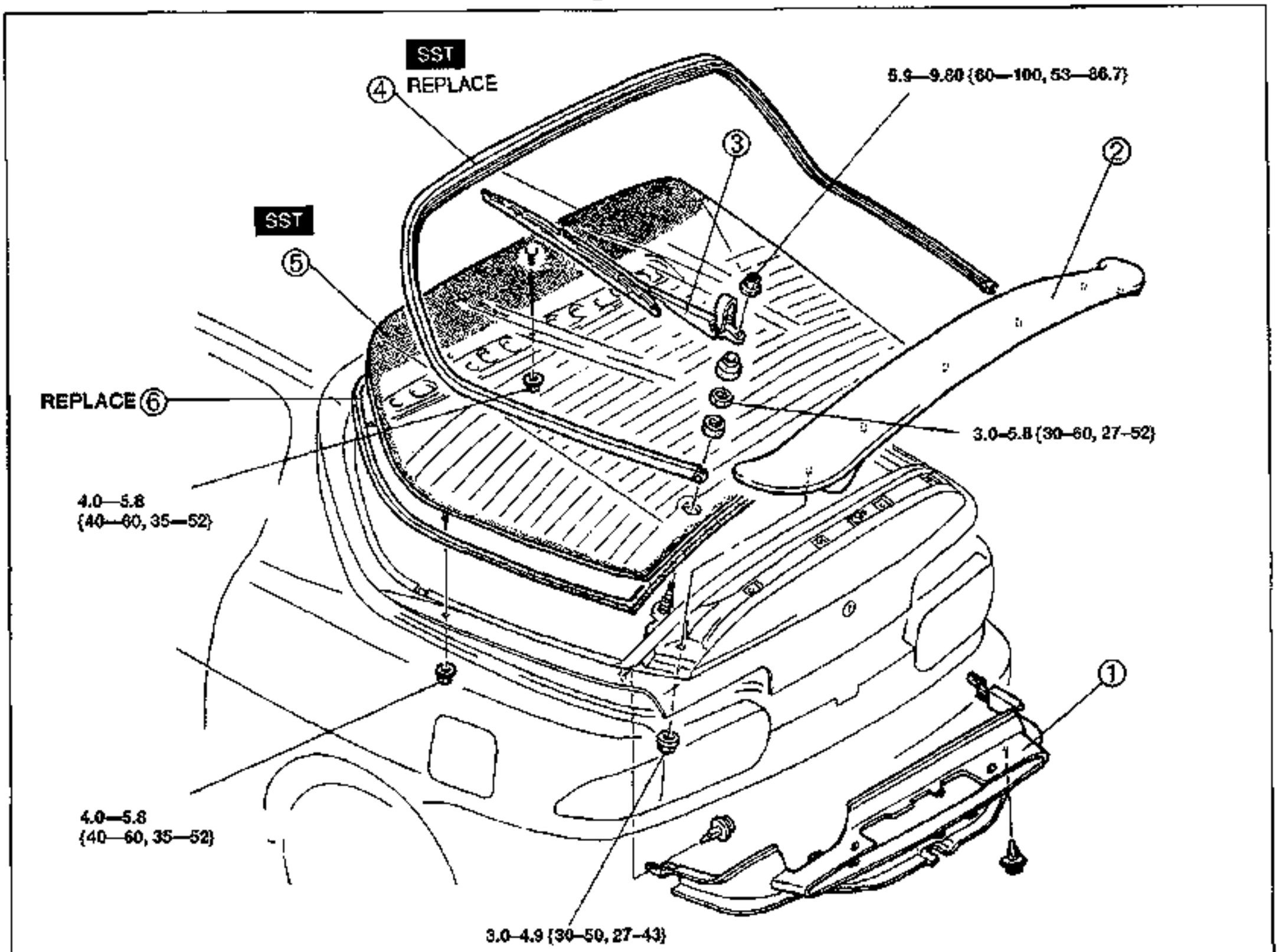
16. Check for water leaks. If a leak is found, wipe the water off well and reinstall the windshield.

LIFTGATE GLASS

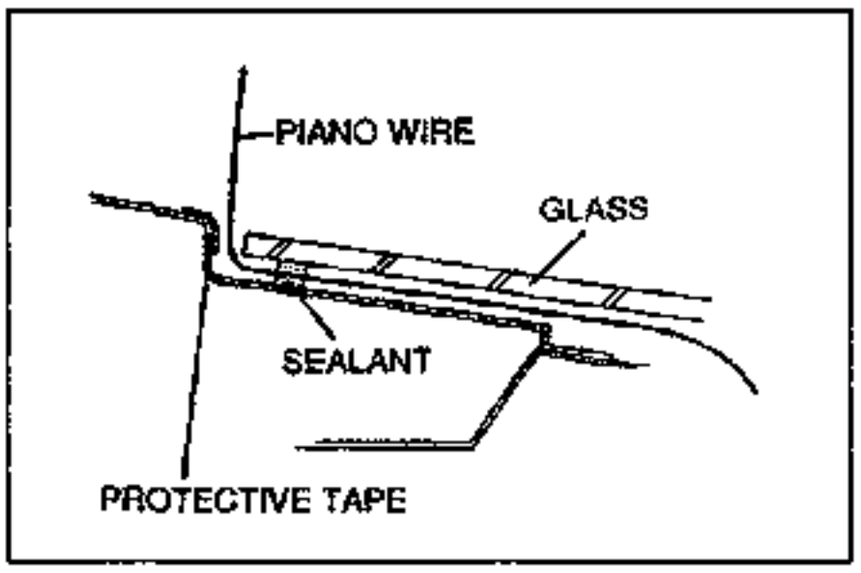
PREPARATION
SST

49 0305 870A Tool set, window		For removal / installation of glass

COMPONENTS
Removal / Installation
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal note.**
3. Install in the reverse order of removal, referring to **Installation note.**

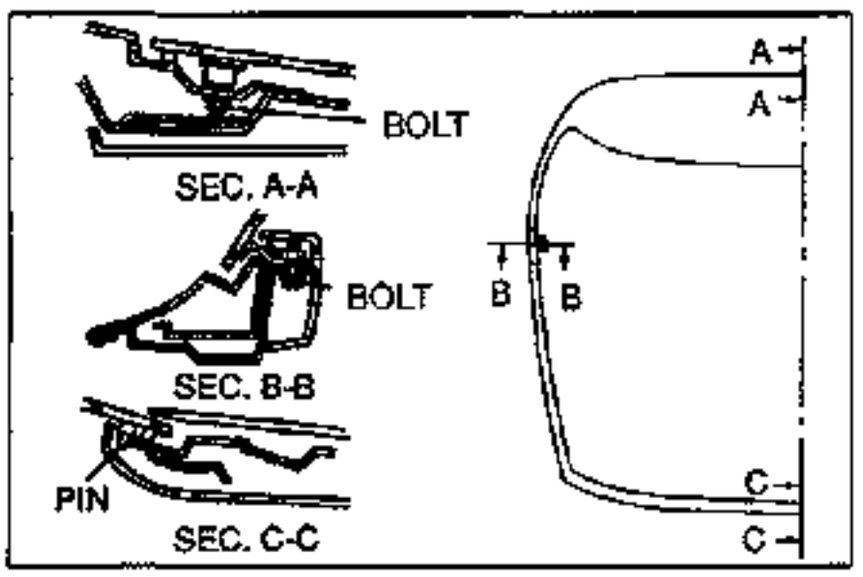


1. Liftgate lower trim
   Removal / Installation ..... page S–65
2. Rear spoiler
   Removal / Installation ..... page S–32
3. Rear wiper arm and blade
   Removal / Installation ..... page S–39
4. Liftgate molding
   Removal / Installation ..... page S–25
5. Liftgate glass
   Removal note ..... page S–46
   Installation note ..... page S–46
6. Dam



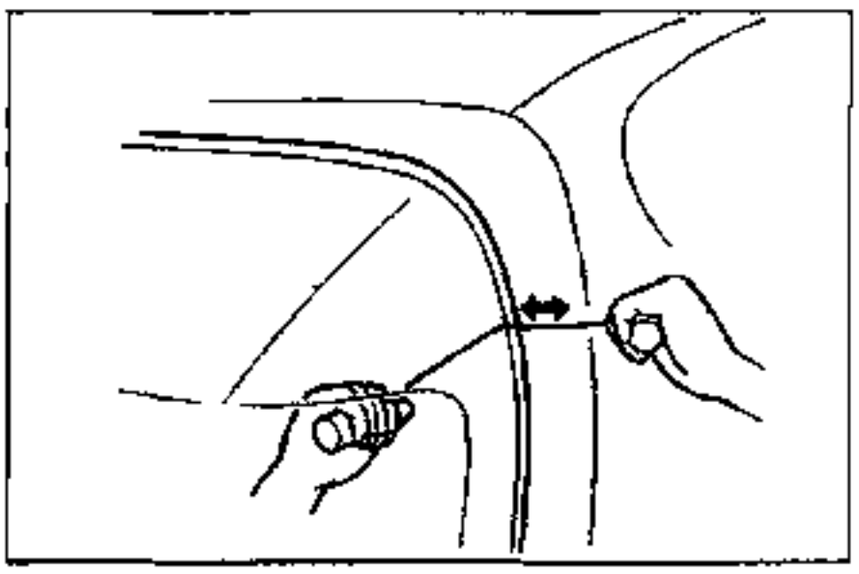
Removal note
Liftgate glass

1. Apply protective tape along the edge of the liftgate to protect it from damage.
2. Using an awl, make a hole through the sealant from the inside of the vehicle.
3. Pass piano wire through the hole.

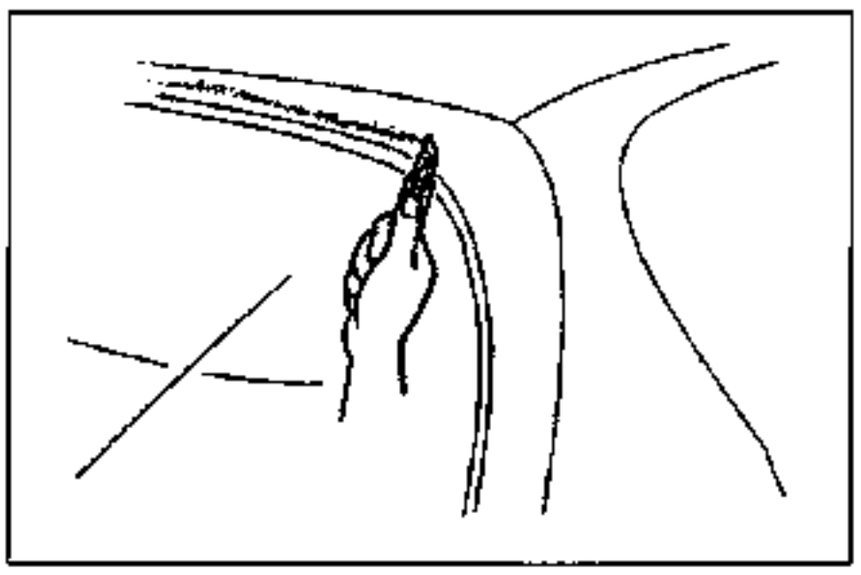


Note

- Three locating bolts and a locating pin are installed on the liftgate glass. Use a razor knife from inside the vehicle to cut the sealant around the bolts and pin.

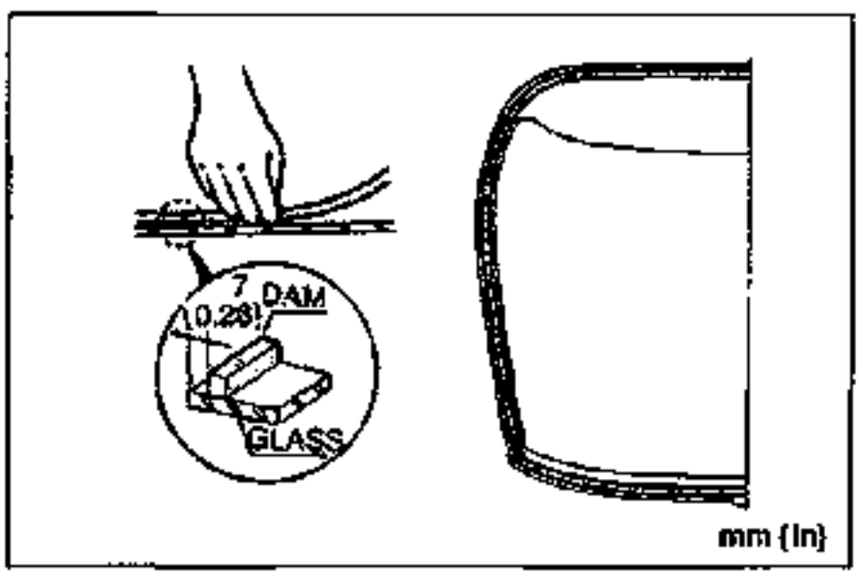


4. Wind each end of the wire around a bar.
5. Working with another person, saw through the sealant around the edge of the glass. Use a long sawing action to spread the work over the whole length of wire to prevent it from breaking.
6. Remove the glass.

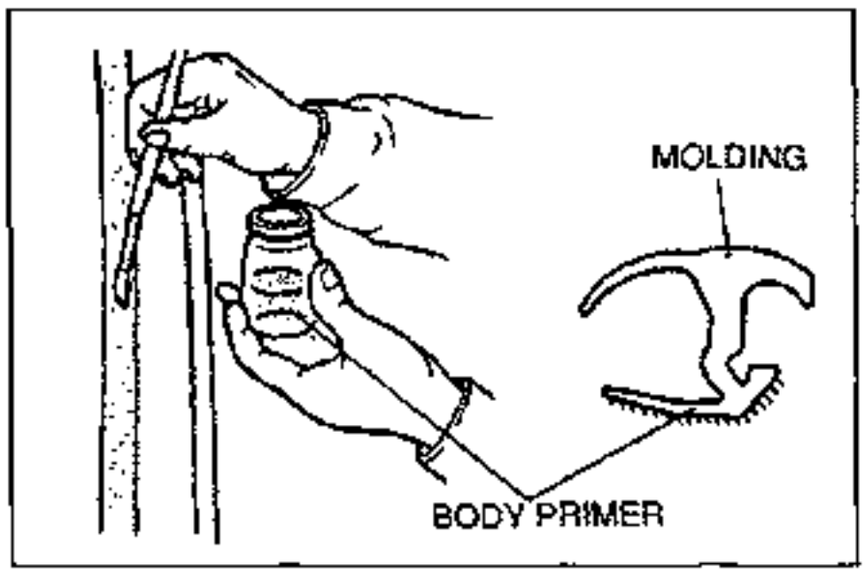


Installation note
Liftgate glass

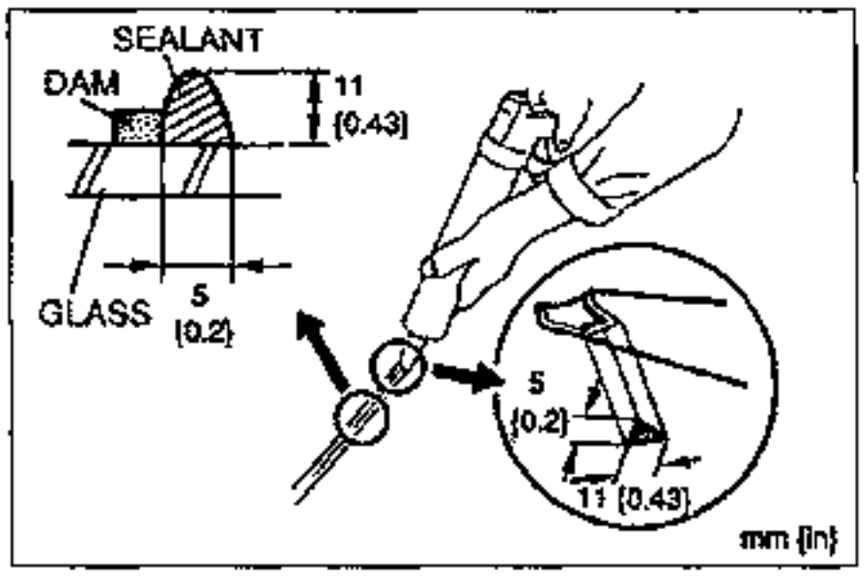
1. Cut away the old sealant with a razor knife so that **1 to 2 mm {0.04 to 0.08 in}** of sealant remains around the circumference of the frame. If all the sealant has come off in any one place, apply primer after degreasing, and allow it **30 minutes** to dry. Then apply new sealant to create a **2 mm {0.08 in}** layer.
2. Carefully clean an area **50 mm {2.0 in}** wide around the circumference of the glass and the bonding area on the liftgate.



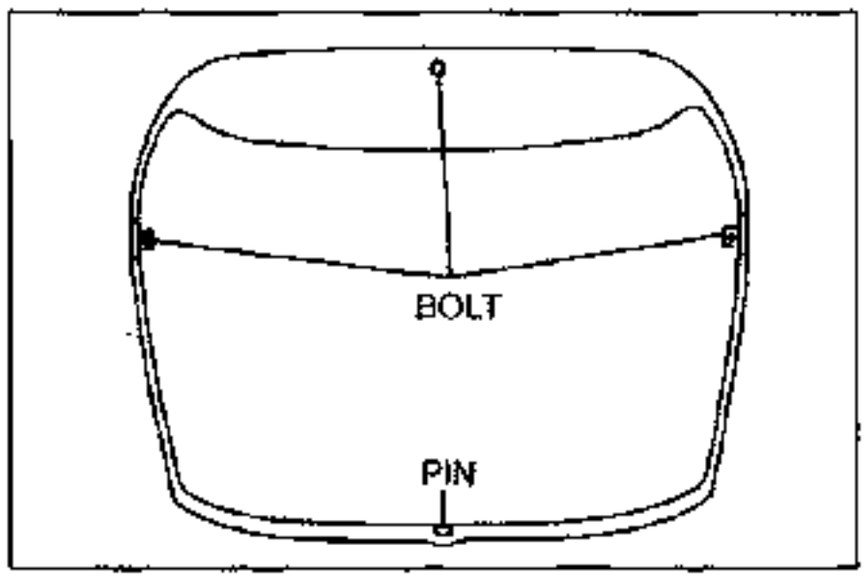
3. Securely bond a new dam along the circumference of the glass **7 mm {0.28 in}** from the edge. Allow it to dry completely.



4. Apply primer with a brush to the bonding area of the glass, body, and molding. Keep the area free of dirt and grease, and do not touch the surface. Allow the primer to dry for approximately **30 minutes.**

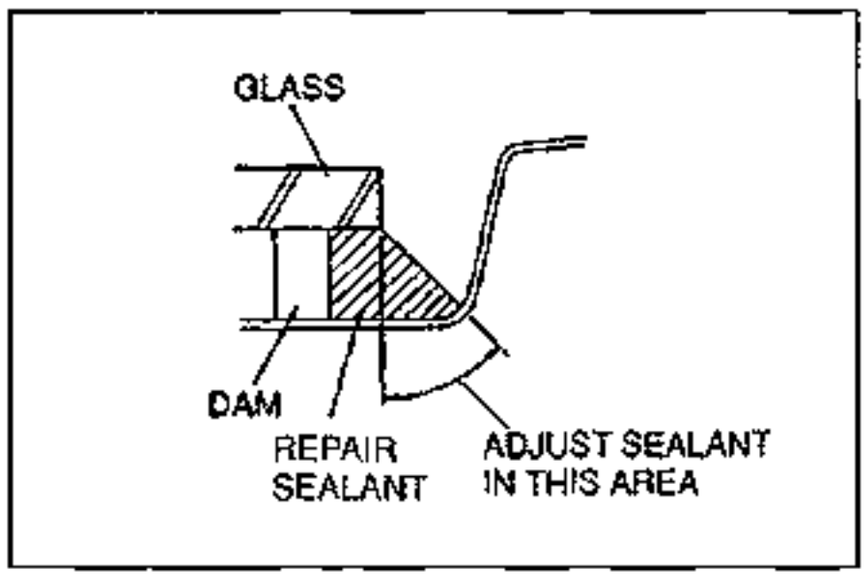


5. After the primer has dried, apply an **11 mm {0.43 in}** high bead of repair sealant around the circumference of the glass as shown. Keep the bead of sealant smooth and even, reshaping it with a spatula where necessary.

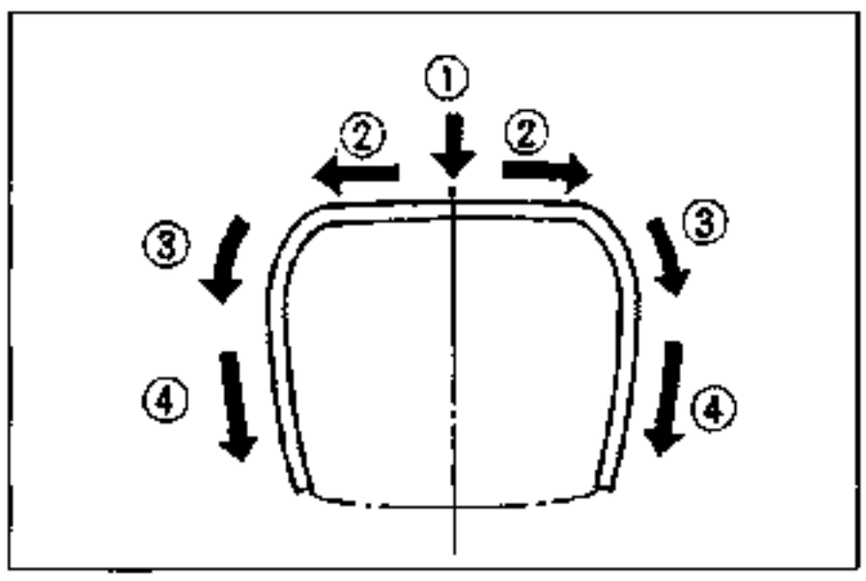


6. Align the glass via the locating pin and bolts and install the glass onto the body. Verify that the clearance between the top of the glass and the liftgate is **8 mm {0.31 in}.**
7. Press firmly on the glass to compress the sealant and install the nuts onto the bolts.

Tightening torque:
4.0–5.8 N·m {40–60 kgf·cm, 35–52 in·lbf}



8. Use a scraper to smooth away any sealant that oozes out. Add more sealant to any points of poor contact. Adjust the upper and side sealant as shown, if necessary.



9. Install the liftgate molding before the sealant hardens.
   ① Align the mark on the glass to that on the molding.
   ② Install the top of the molding.
   ③ Install the corners of the molding.
   ④ Install the sides of the molding, starting from the top and then toward the bottom.

10. To prevent the glass from being pushed out by air pressure if a door is closed, open all of the windows until the repair sealant has hardened.

Hardening time of repair sealant

Temperature	Surface hardening time	Time required until car can be put into service
5°C {41°F}	Approx. 1.5 hr	12 hr
20°C {68°F}	Approx. 1 hr	4 hr
35°C {95°F}	Approx. 10 min	2 hr

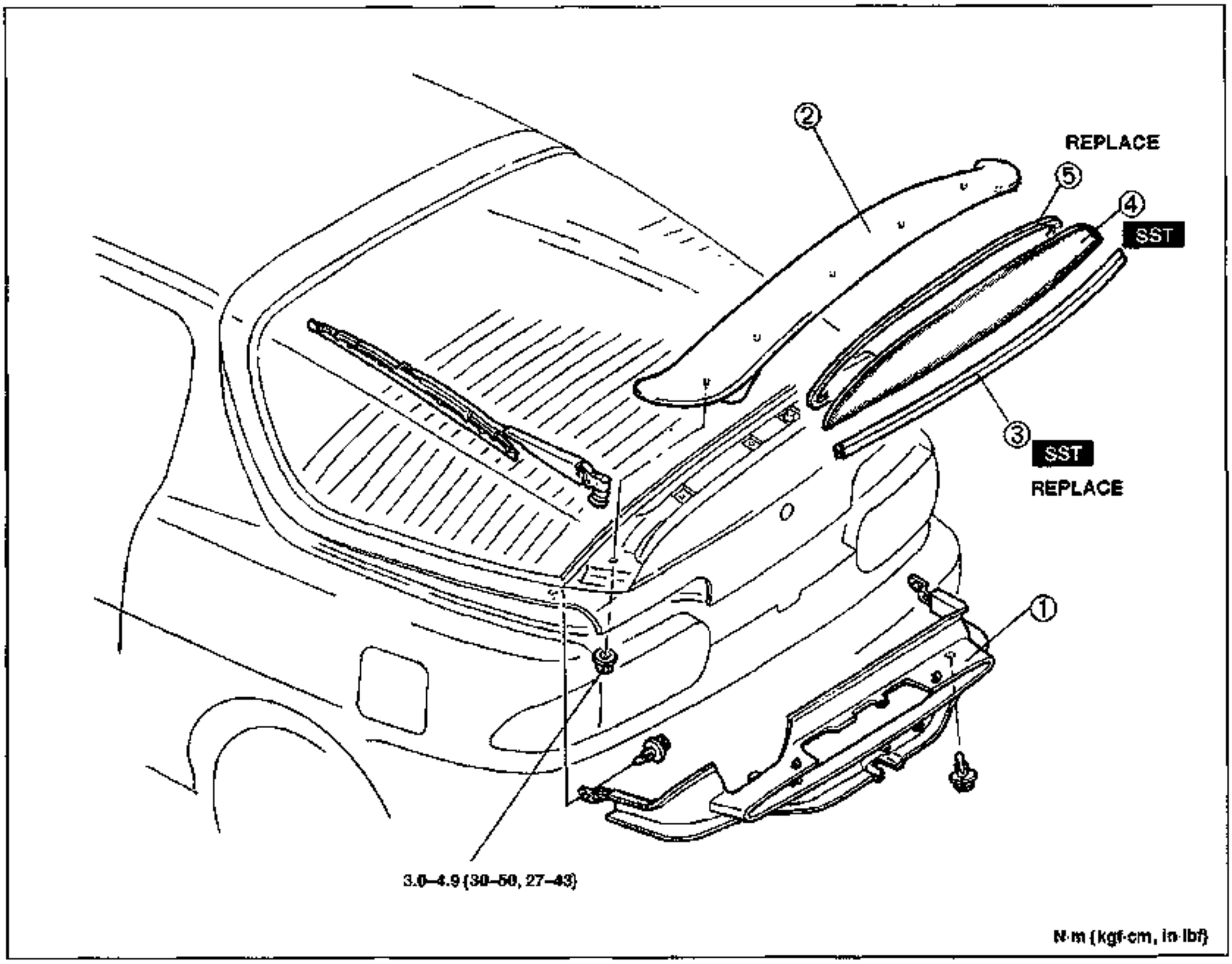
11. Check for water leaks. If a leak is found, wipe the water off well and reinstall the liftgate glass.

VERTICAL WINDOW GLASS

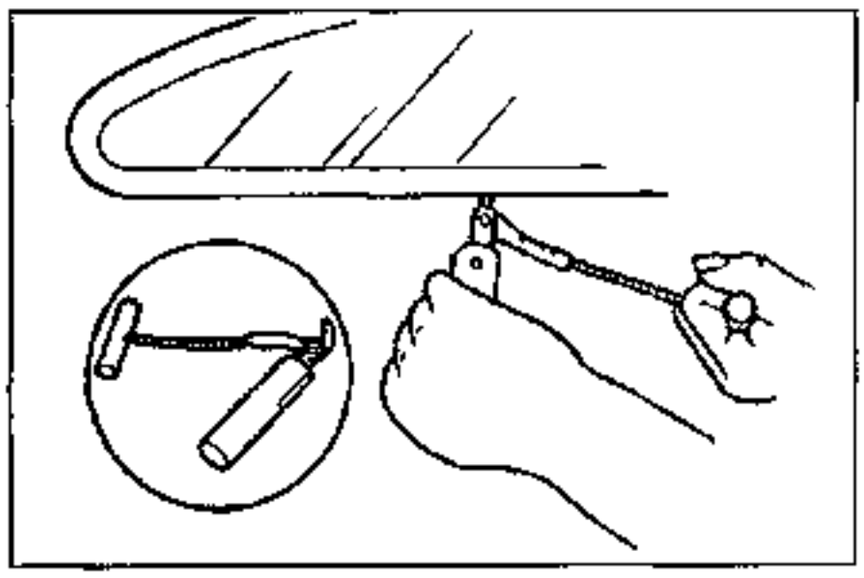
PREPARATION
SST

49 03058 70A Tool set, window		For removal / installation of glass

COMPONENTS
Removal / Installation
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal note**.
3. Install in the reverse order of removal, referring to **Installation note**.

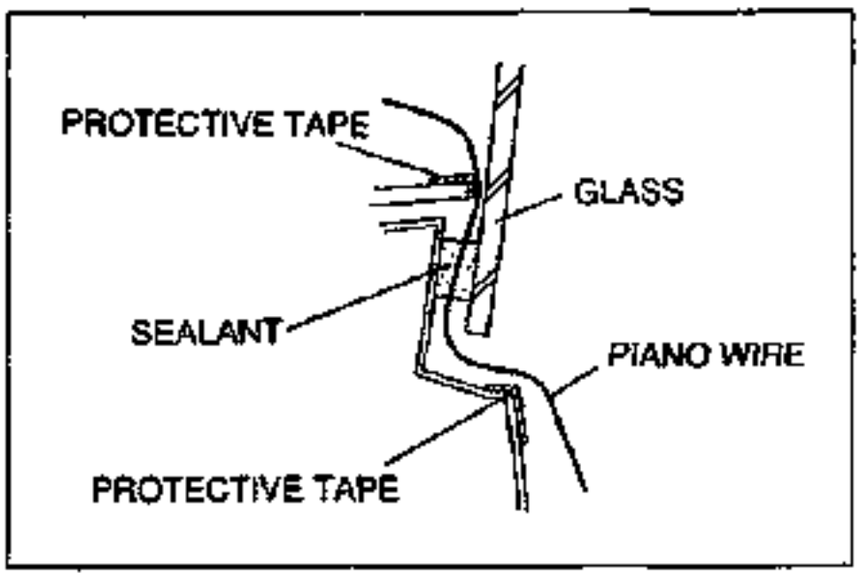


1. Liftgate lower trim
   Removal / Installation ..... page S–65
2. Rear spoiler
   Removal / Installation ..... page S–32
3. Vertical window molding
   Removal / Installation ..... page S–25
4. Vertical window glass
   Removal note ..... page S–50
   Installation note ..... page S–50
5. Dam

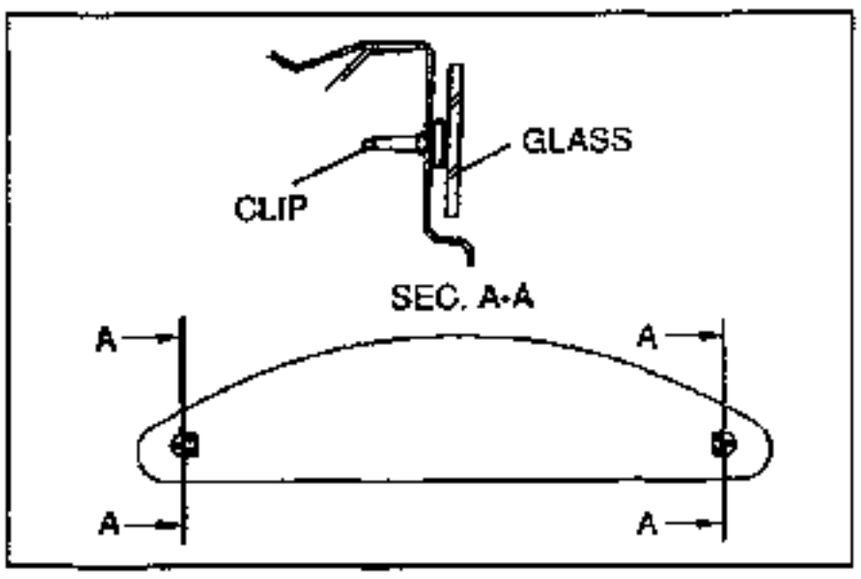


Removal note
Vertical window glass
1. Apply protective tape along the edge of the liftgate to protect it from damage.

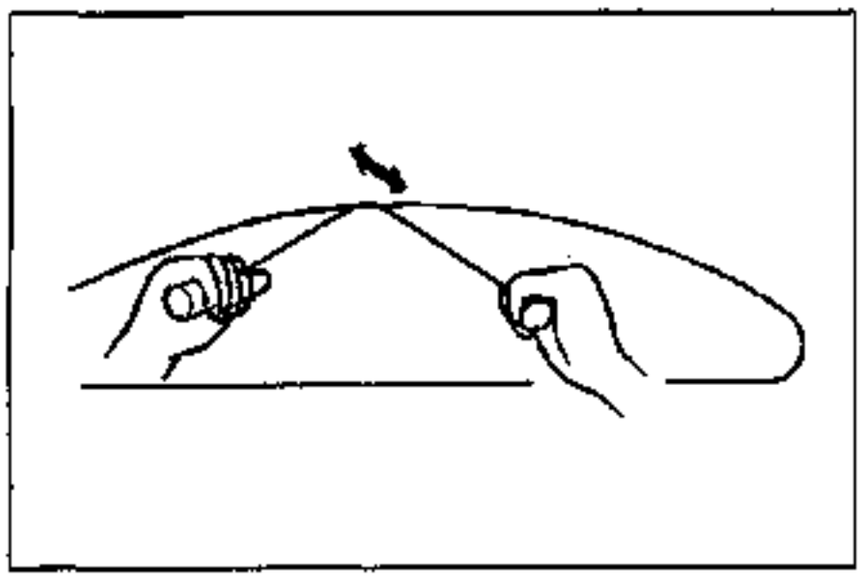
If the glass will not be reused
2. Use a tool like that shown in the figure and insert the blade into the sealant.
3. Pull through the sealant around the edge of the glass.
4. Remove the glass.



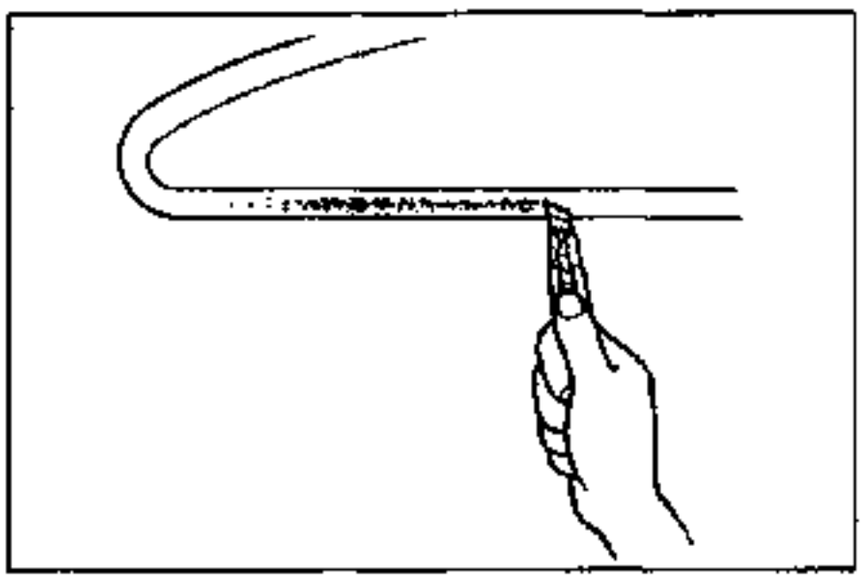
If the glass will be reused
1. Using an awl, make a hole through the sealant from the inside of the vehicle.
2. Pass piano wire through the hole.



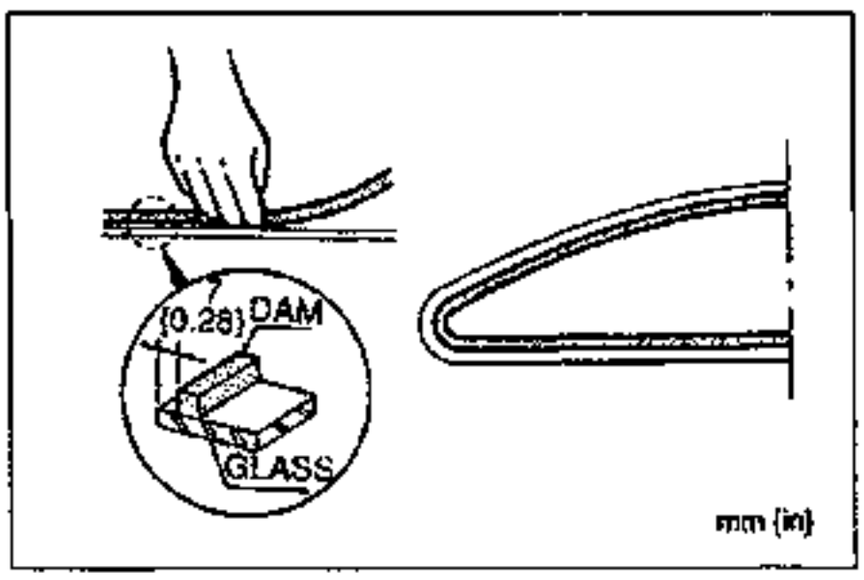
Note
- Two locating clips are installed on the vertical window glass. Use a razor knife to cut the sealant around the clips.



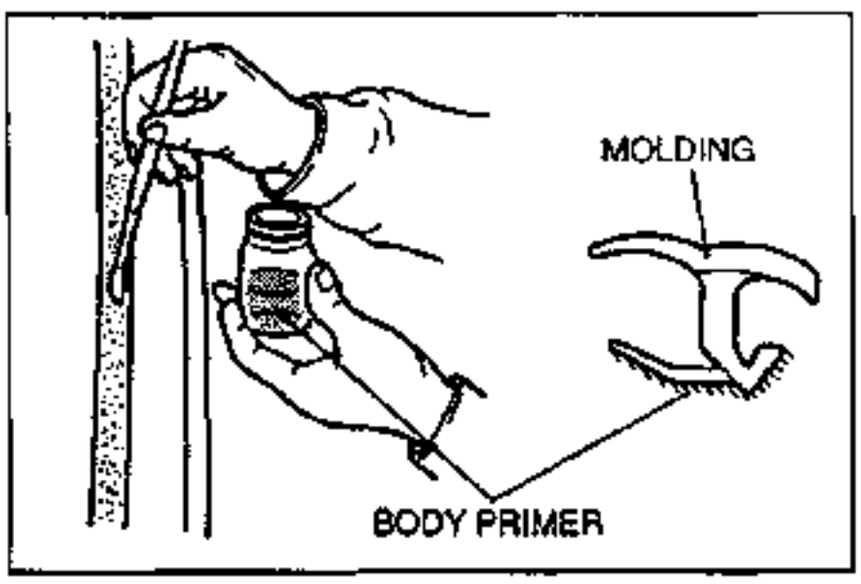
4. Wind each end of the wire around a bar.
5. Working with another person, saw through the sealant around the edge of the glass. Use a long sawing action to spread the work over the whole length of wire to prevent it from breaking.
6. Remove the glass.



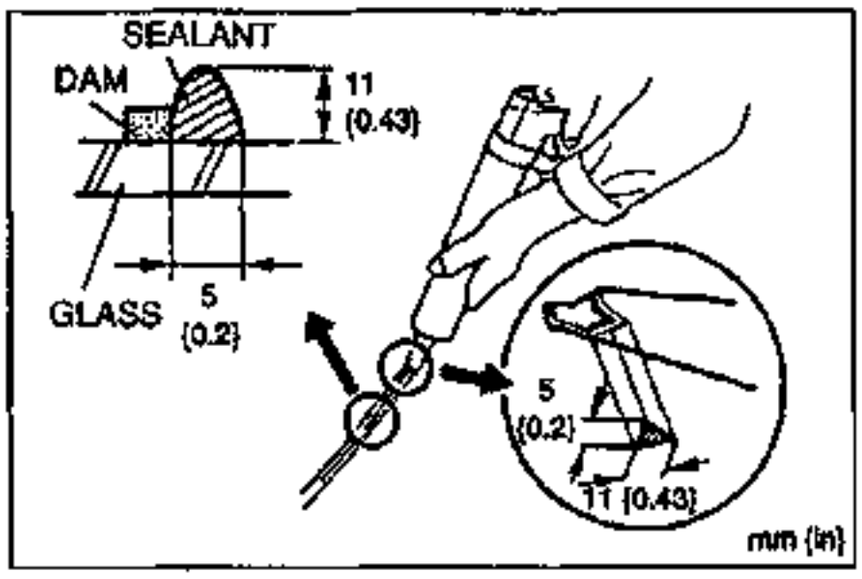
Installation note
Vertical window glass
1. Cut away the old sealant by using a razor knife so that **1 to 2 mm {0.04 to 0.08 in}** of sealant remains around the circumference of the frame. If all the sealant has come off in any one place, apply some primer after degreasing, and allow it **30 minutes** to dry. Then apply new sealant to create a **2 mm {0.08 in}** layer.
2. Carefully clean an area **50 mm {2.0 in}** wide around the circumference of the glass and the bonding area on the liftgate.



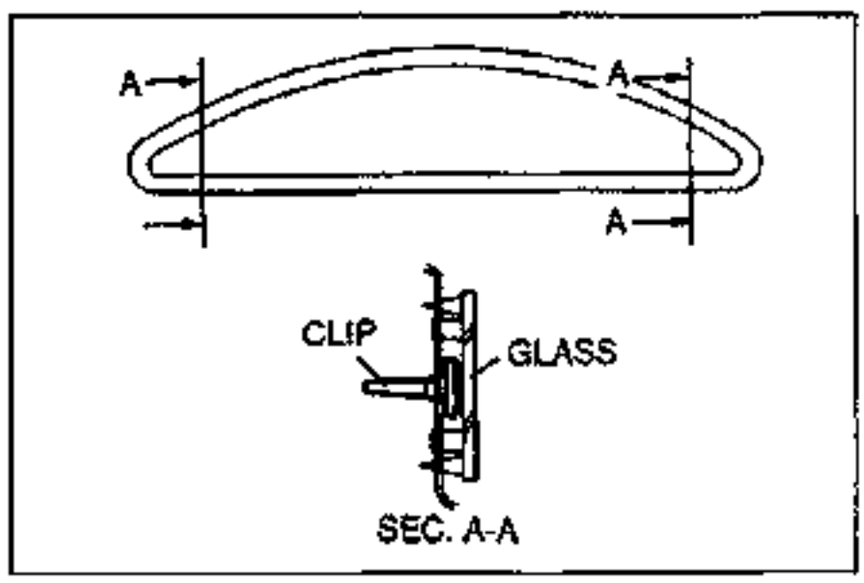
3. Securely bond a new dam **7 mm {0.28 in}** from the edge of the glass as shown. Allow it to dry completely.



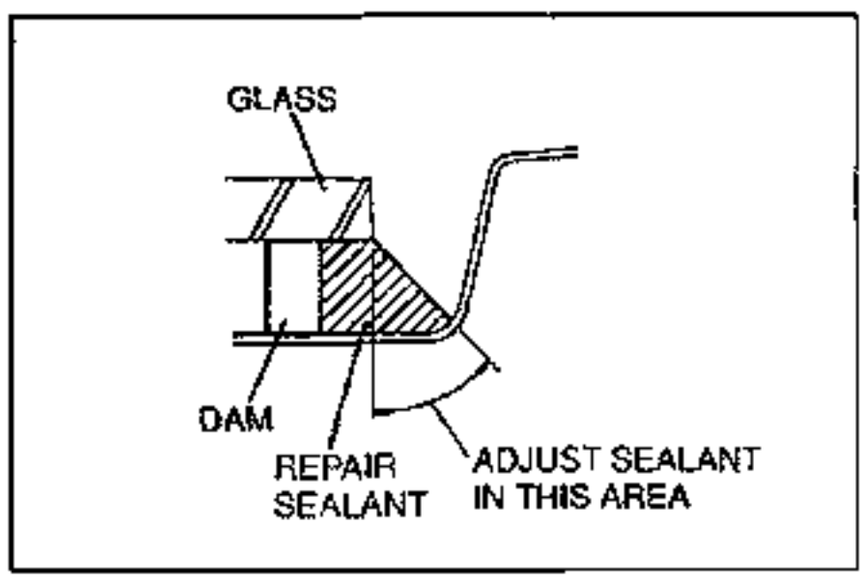
4. Apply primer to the bonding area of the glass, body, and molding by using a brush. Use only glass primer on the glass and body primer on the body and molding. Keep the area free of dirt and grease, and do not touch the surface. Allow the primer to dry for approximately **30 minutes.**



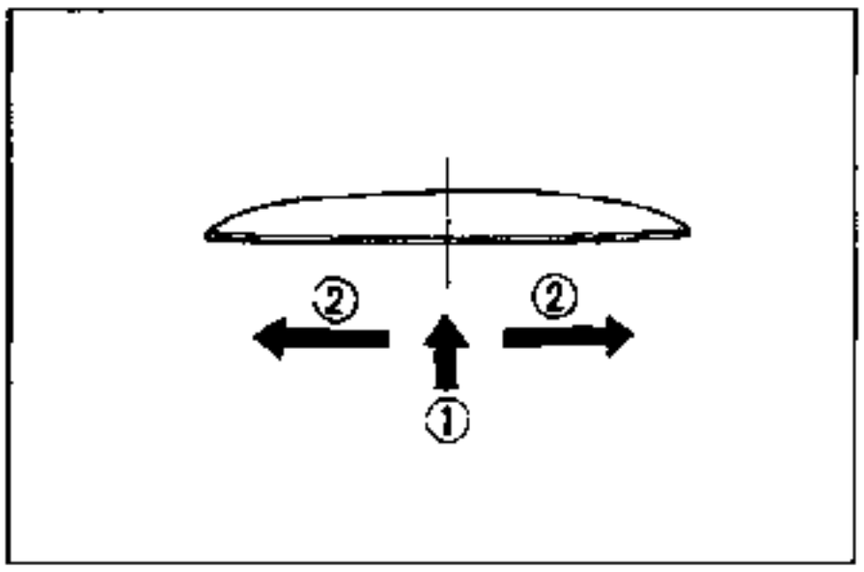
5. After the primer has dried, apply an **11 mm {0.43 in}** high bead of repair sealant around the circumference of the glass as shown. Keep the bead of sealant smooth and even, reshaping it with a spatula where necessary.



6. Align the glass via the locating clips and install the glass onto the body.
7. Press firmly on the glass to compress the sealant.



8. Use a scraper to smooth away any sealant that oozes out. Add more sealant to any points of poor contact. Adjust the lower and side sealant as shown, if necessary.



9. Install the vertical window molding before the sealant hardens.
   ① Align the mark of the molding to that on the glass.
   ② Starting from the center, press the molding into place toward both ends.

10. To prevent the glass from being pushed out by air pressure if a door is closed, open all of the windows until the repair sealant has hardened.

Hardening time of repair sealant

Temperature	Surface hardening time	Time required until car can be put into service
5°C {41°F}	Approx. 1.5 hr	12 hr
20°C {68°F}	Approx. 1 hr	4 hr
35°C {95°F}	Approx. 10 min	2 hr

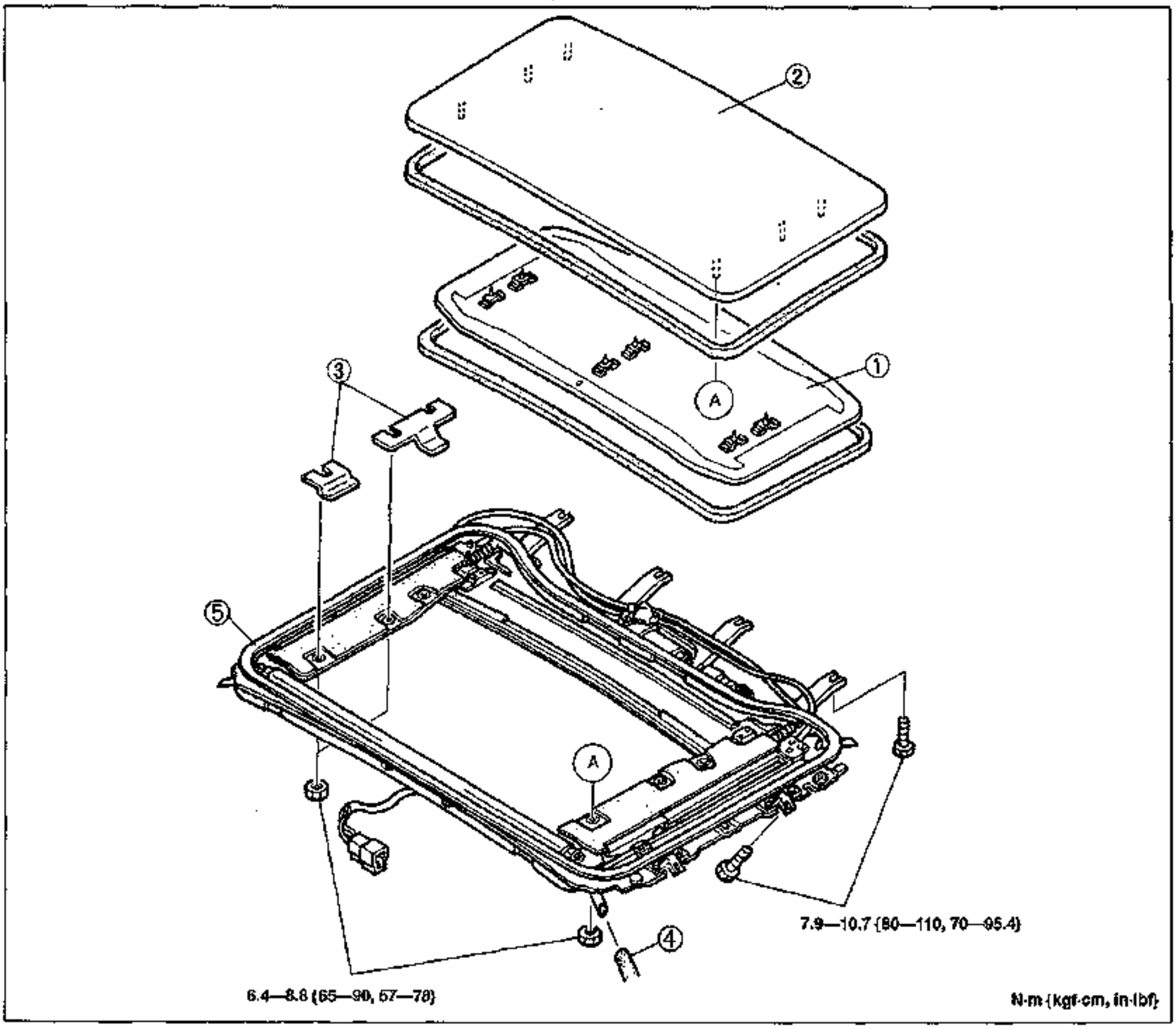
11. Check for water leaks. If a leak is found, wipe the water off well and reinstall the vertical window glass.

SLIDING SUNROOF

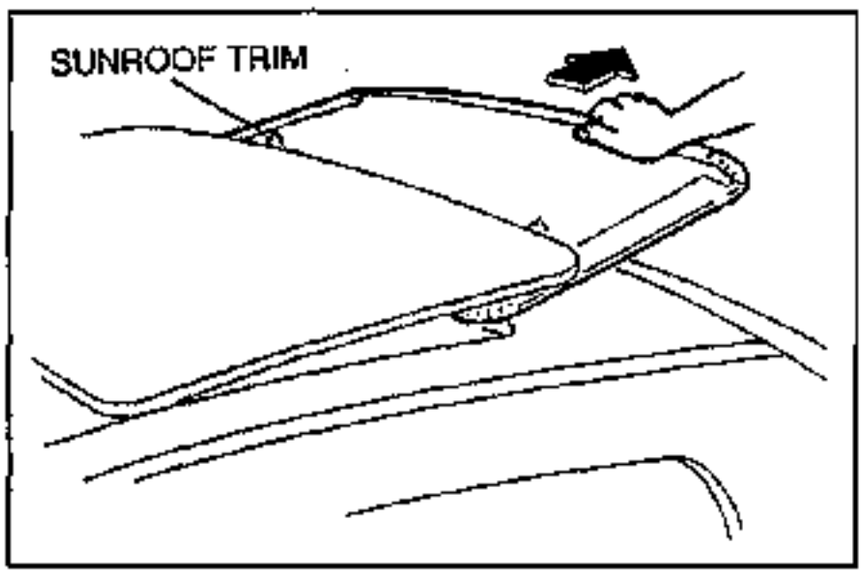
COMPONENTS

Removal / Installation

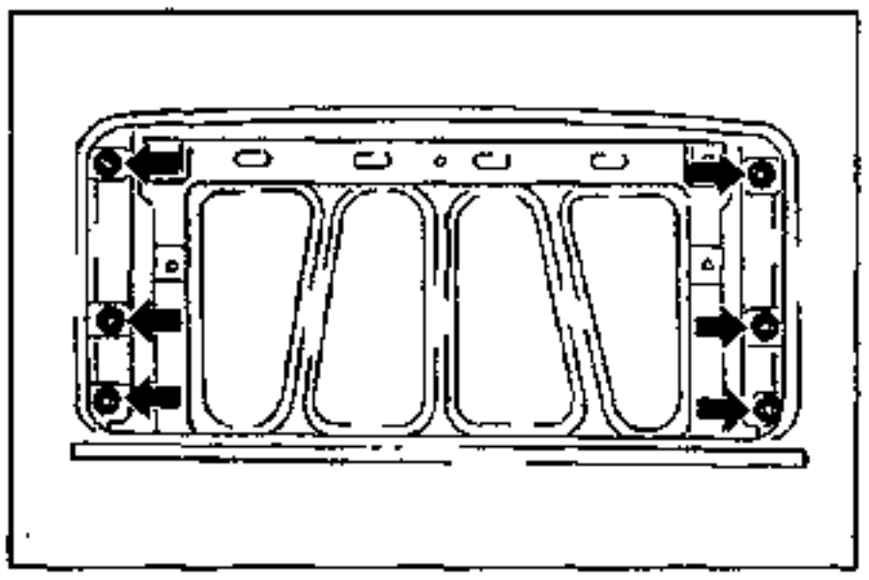
1. Open the slide panel **100 mm {3.9 in}** from the fully closed position.
2. Disconnect the negative battery cable.
3. Remove in the order shown in the figure, referring to **Removal note**. To remove the sunroof drive unit, remove the headliner. (Refer to page S–70.)
4. Install in the reverse order of removal, referring to **Installation note**.



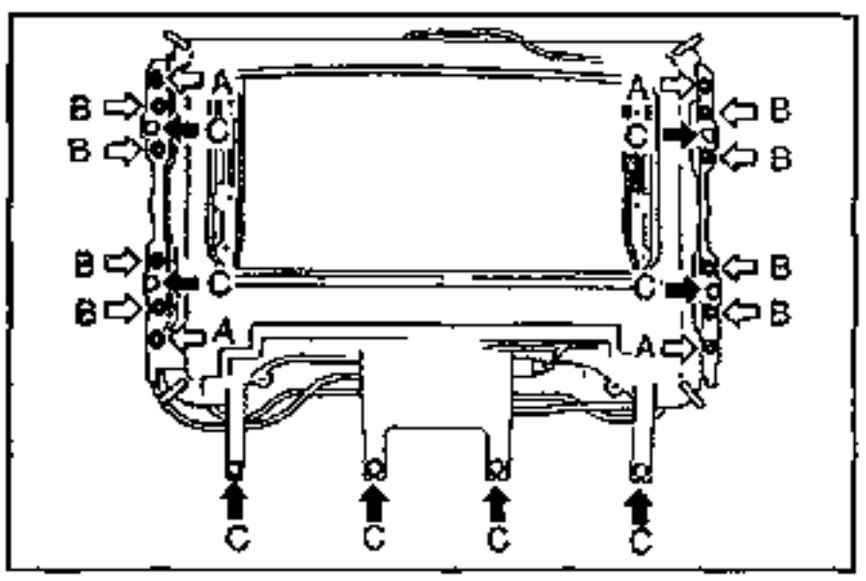
1. Sunroof trim
   - Removal note ..... page S–54
   - Installation note ..... page S–56
2. Slide panel
   - Removal note ..... page S–54
   - Installation note ..... page S–55
3. Sunroof shim
4. Drain hose
   - Installation note ..... page S–55
5. Sunroof drive unit
   - Removal note ..... page S–54
   - Installation note ..... page S–54
   - Disassembly / Assembly ..... page S–57



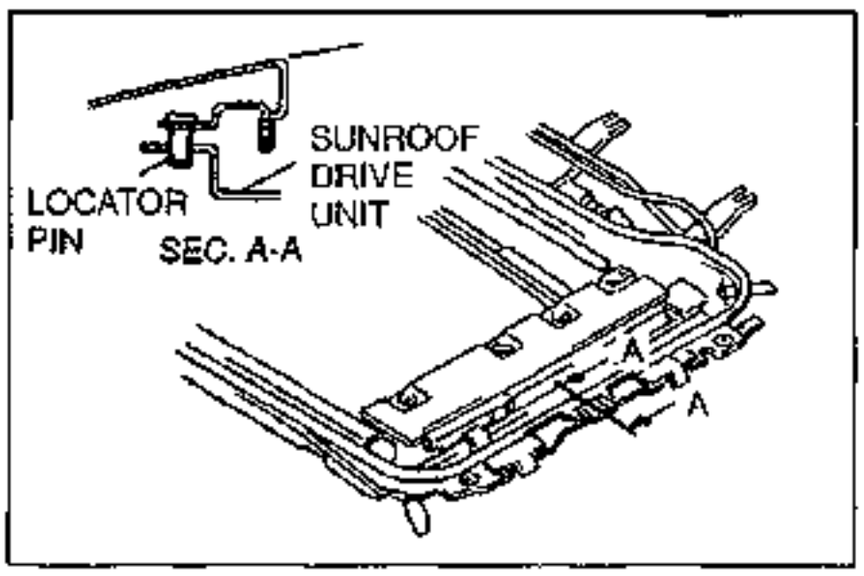
Removal note
Sunroof trim
1. Tilt up the slide panel.
2. Remove the fasteners on the front side of the sunroof trim.
3. Pull down the trim and remove it from the sunroof panel.
4. Pull out the sunroof trim from between the slide panel and the roof.



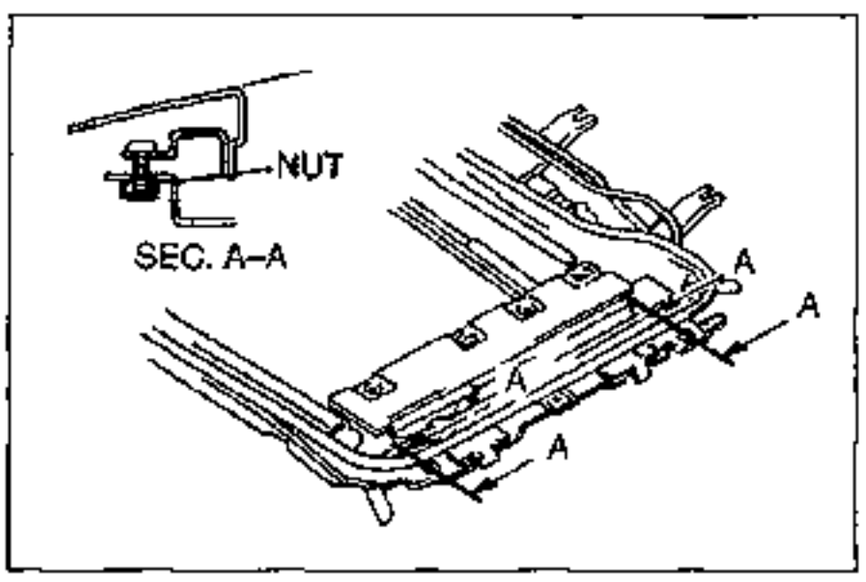
Slide panel
1. Fully close the slide panel by using an allen wrench.
2. Remove the slide panel fixing nuts. Push up the slide panel from inside and remove it from the lower panel.



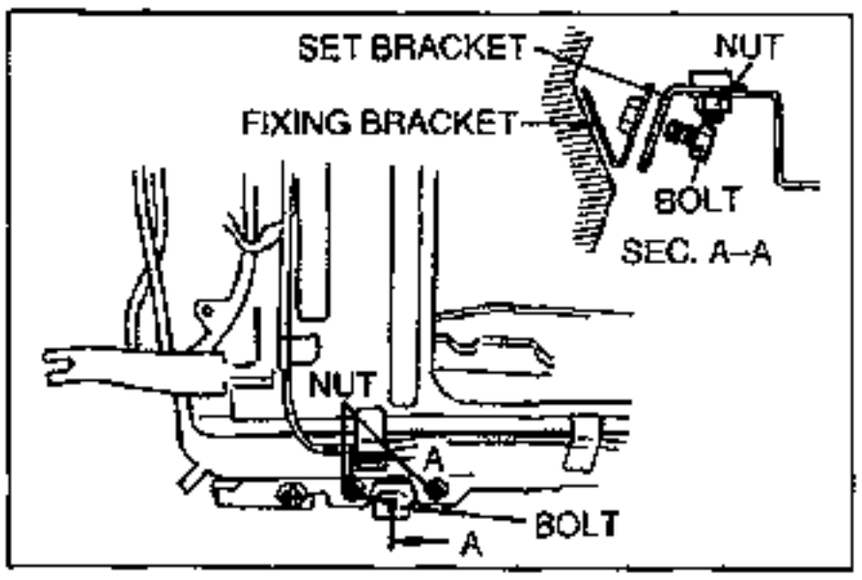
Sunroof drive unit
1. Remove the bolts C.
2. Loosen the nuts B.
3. Loosen the height adjusting nuts A and remove the sunroof drive unit from the body.



Installation note
Sunroof drive unit
1. Align the locator pins and set the sunroof drive unit to the roof panel.

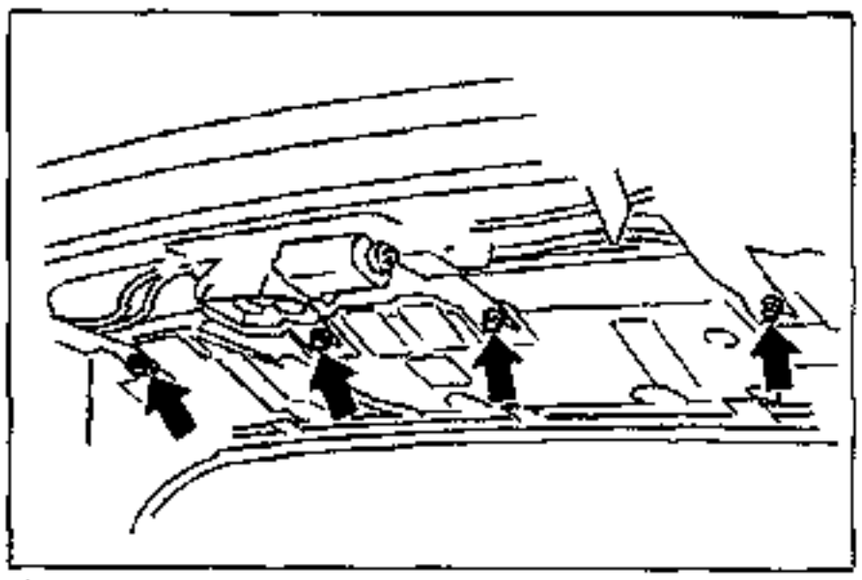


2. Loosely install the sunroof drive unit to the roof panel with the height adjusting nuts.



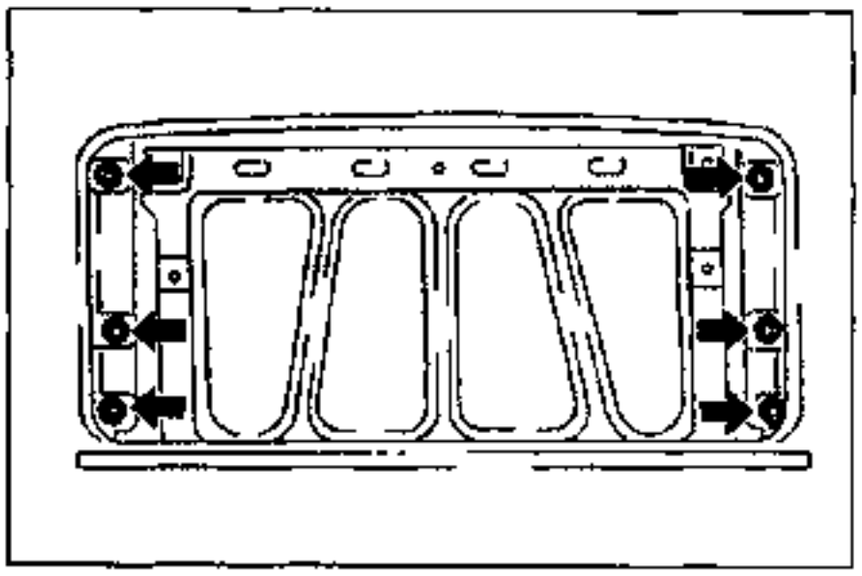
3. Loosen the set bracket attaching nuts. Position the set bracket so that it touches the roof panel fixing bracket. Tighten the fixing bracket bolts, and then tighten the nuts.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



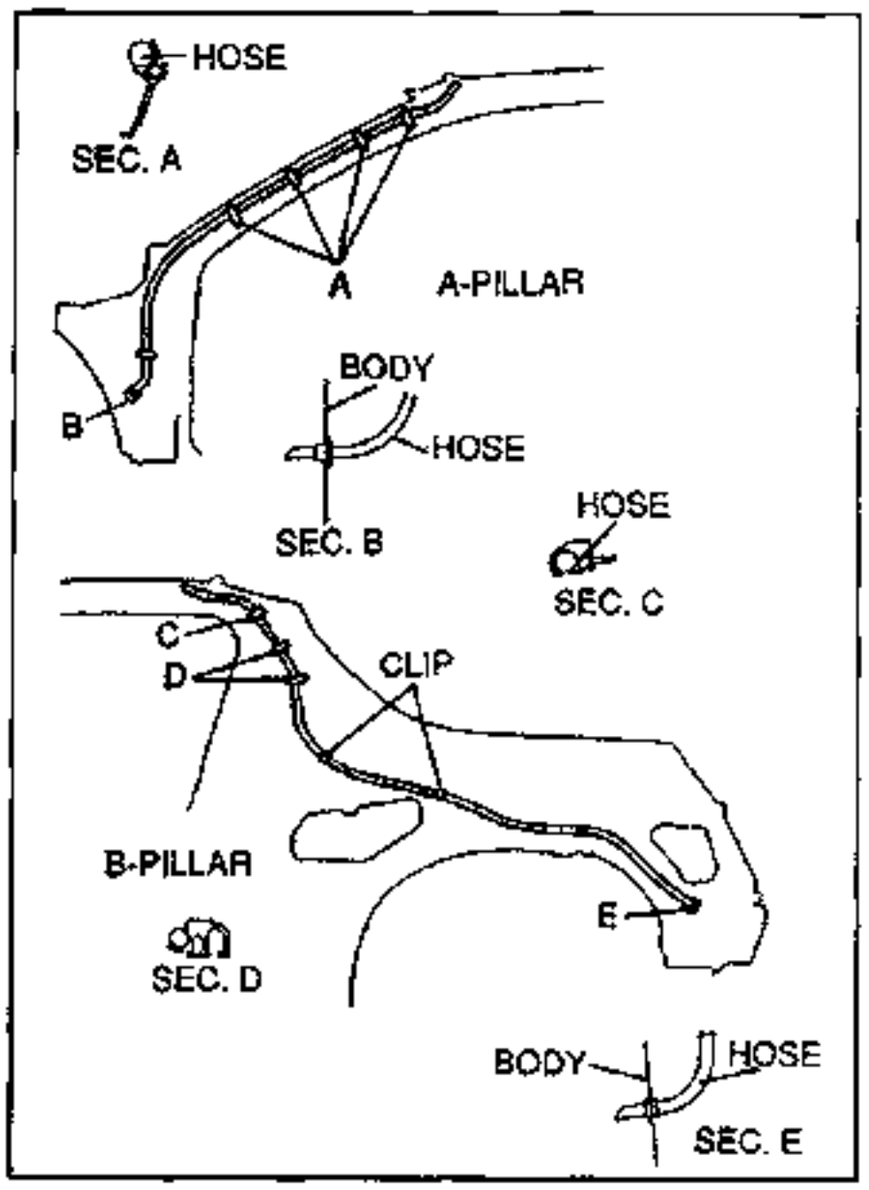
4. Affix the rear of the sunroof frame to the roof panel.

Tightening torque:
7.9–10.7 N·m {80–110 kgf·cm, 70–95.4 in·lbf}



Slide panel
Install the slide panel to the lower panel. If the height difference between the slide panel and the roof panel is greater than **2.0 mm {0.08 in}**, loosen the slide panel attaching nuts and insert shims between the panels.

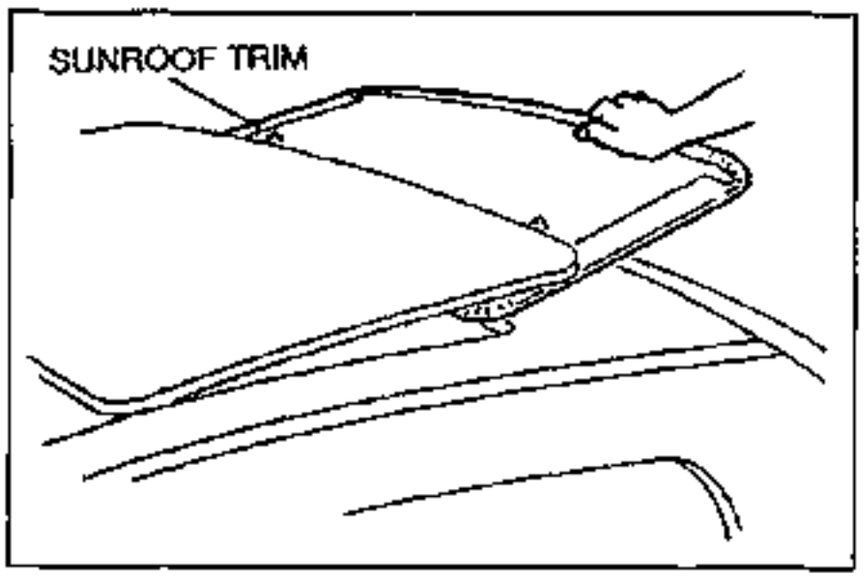
Tightening torque:
6.4–8.8 N·m {65–90 kgf·cm, 57–78 in·lbf}



Drain hose

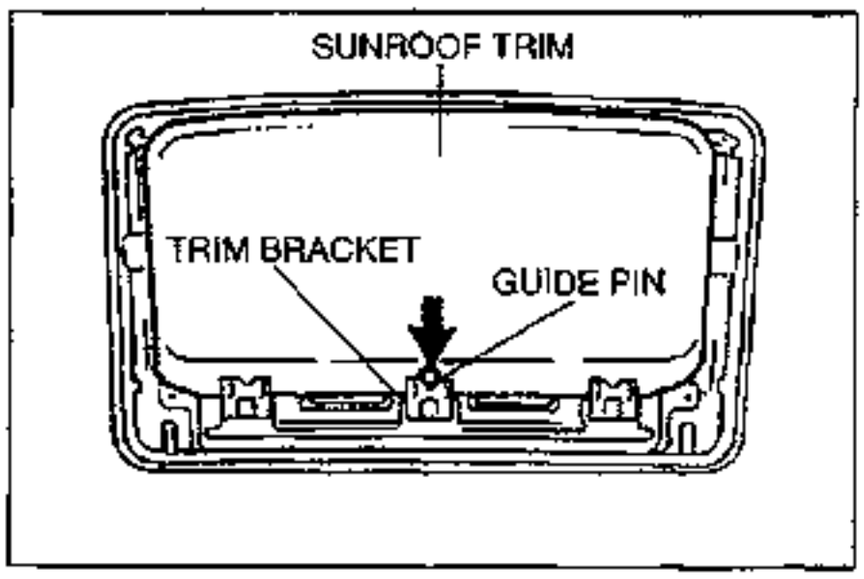
Note
- Apply soapy water to the drain hose and insert it fully into the sunroof frame.

1. On the A-pillar side, insert one end of the hose into the sunroof frame, set the hose along the A-pillar, and insert the other end into the cowl side panel hole.
2. On the B-pillar side, insert one end of the hose into the sunroof frame, and insert the other end into the rear fender panel hole via the hole in the upper part of the B-pillar.



Sunroof trim

1. Tilt up the slide panel. Insert the sunroof trim between the slide panel and the roof panel from the rear of the vehicle.

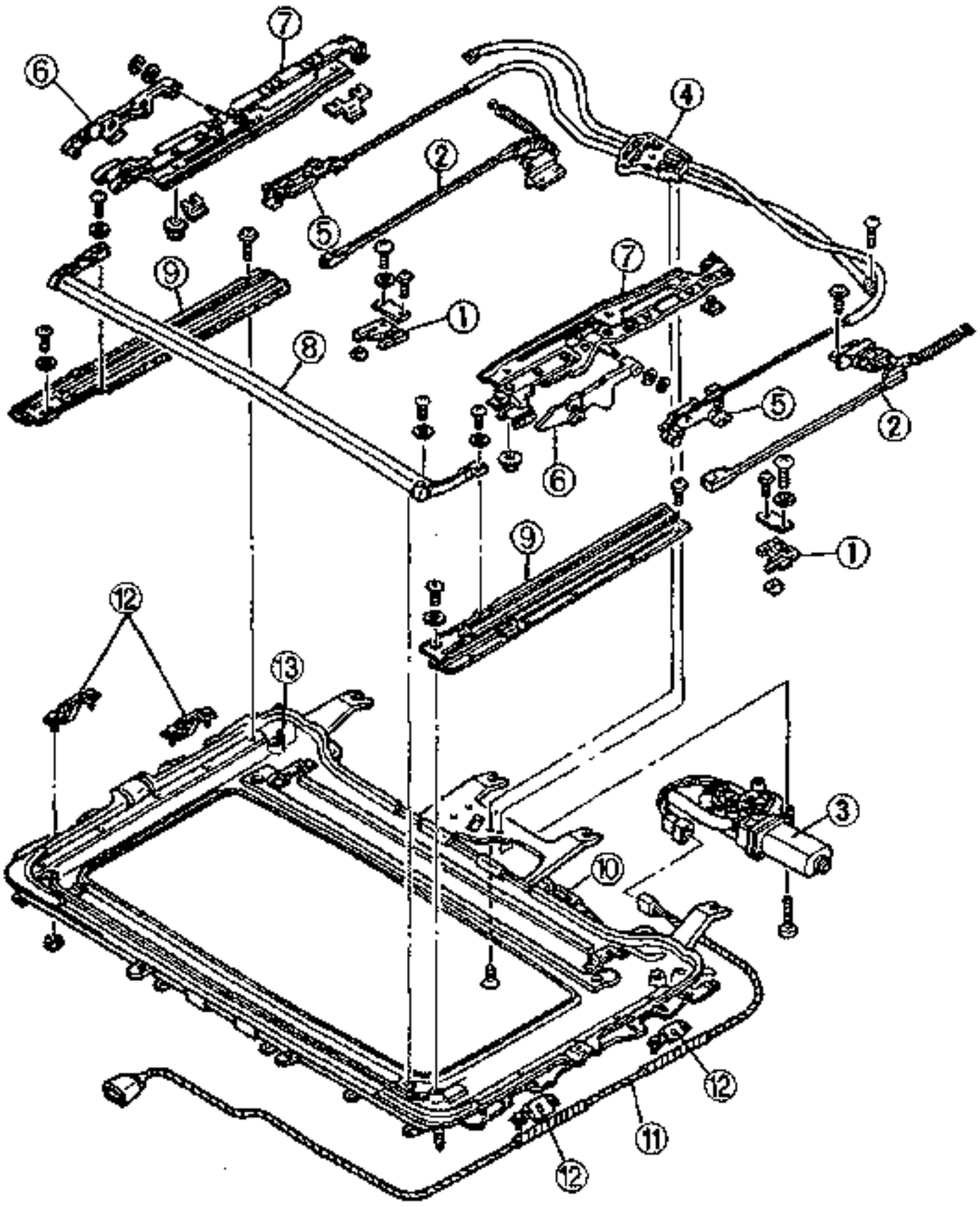


2. To locate the trim, match the sunroof trim guide pin and notch in the slide panel trim bracket.
3. Install the sunroof trim fasteners to the slide panel.

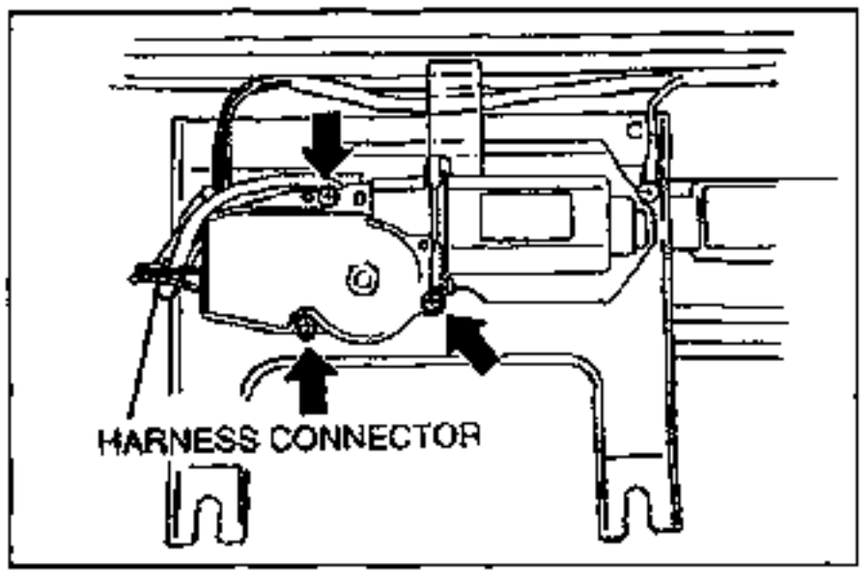
SUNROOF DRIVE UNIT

Disassembly / Assembly

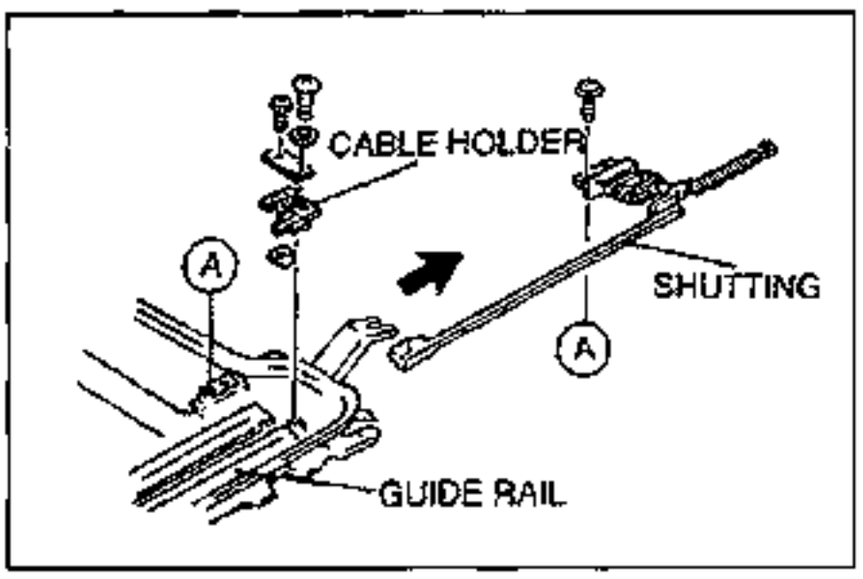
1. Disassemble in the order shown in the figure, referring to **Disassembly note.**
2. Assemble in the reverse order of disassembly, referring to **Assembly note.**



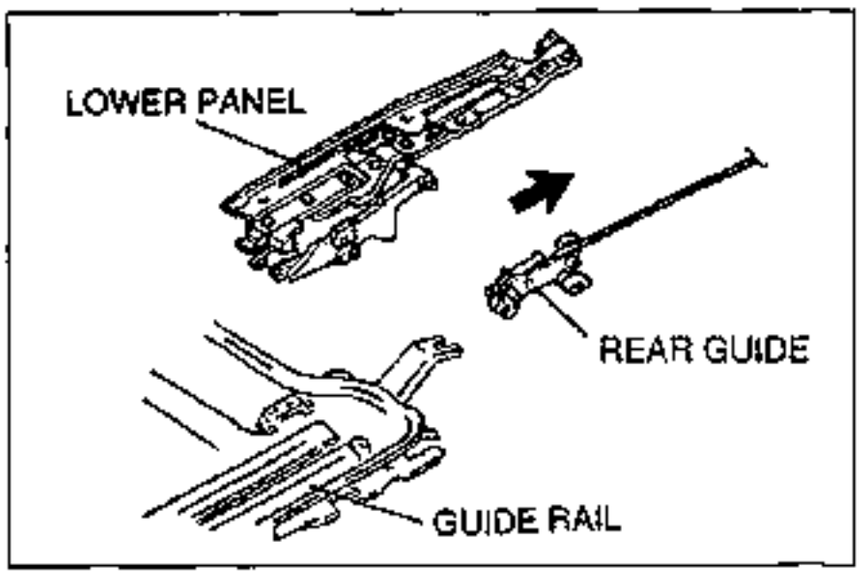
1. Cable holder
2. Shutting
3. Sunroof motor assembly
   - Disassembly note ..... page S–58
   - Assembly note ..... page S–59
4. Drive unit
5. Rear guide
   - Disassembly note ..... page S–58
   - Assembly note ..... page S–59
6. Front guide
   - Disassembly note ..... page S–58
   - Assembly note ..... page S–59
7. Lower panel
8. Wind deflector
9. Guide rail
   - Disassembly note ..... page S–58
   - Assembly note ..... page S–59
10. Sunroof relay
11. Harness assembly
12. Set bracket
13. Sunroof frame



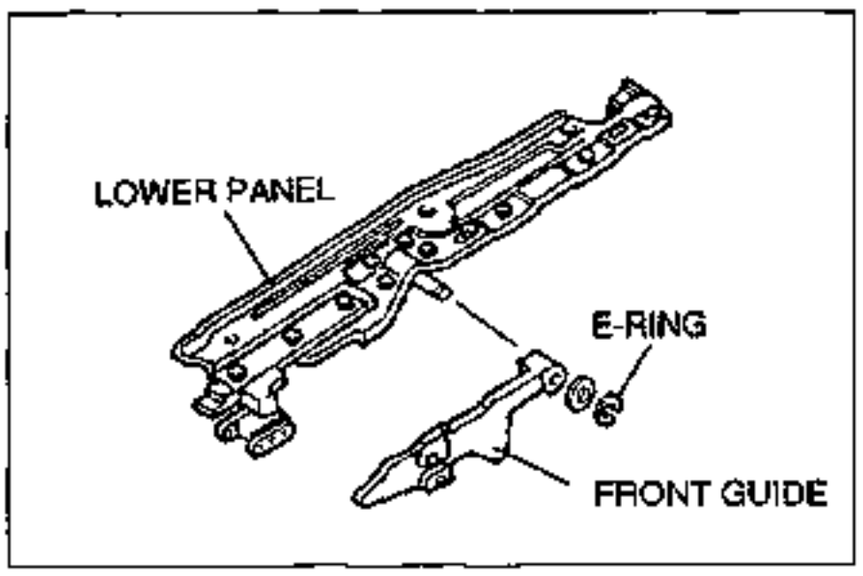
Disassembly note
Sunroof motor assembly
1. Remove the screws and remove the motor assembly from the sunroof frame.
2. Disconnect the sunroof motor assembly harness connector.



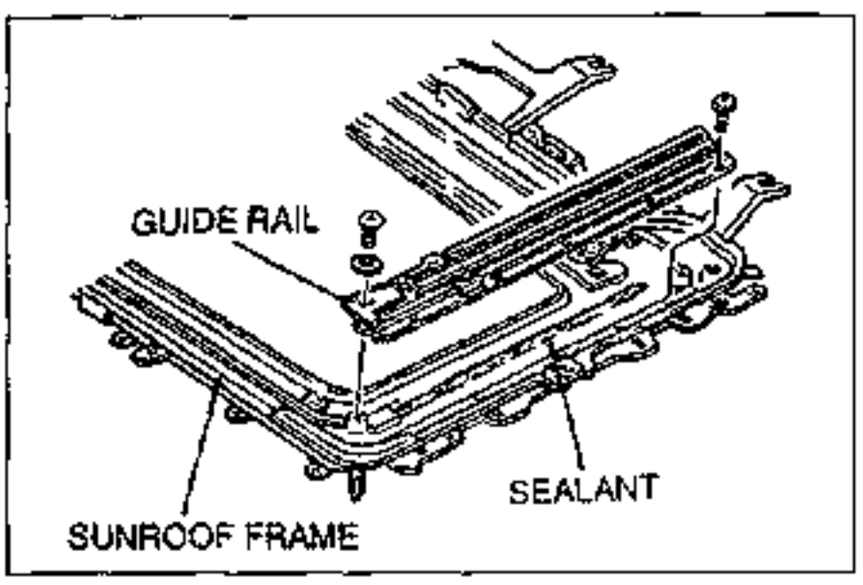
Rear guide
1. Remove the cable holder from the sunroof frame.
2. Remove the shutting attaching screw and spring. Remove the shutting from the guide rail.



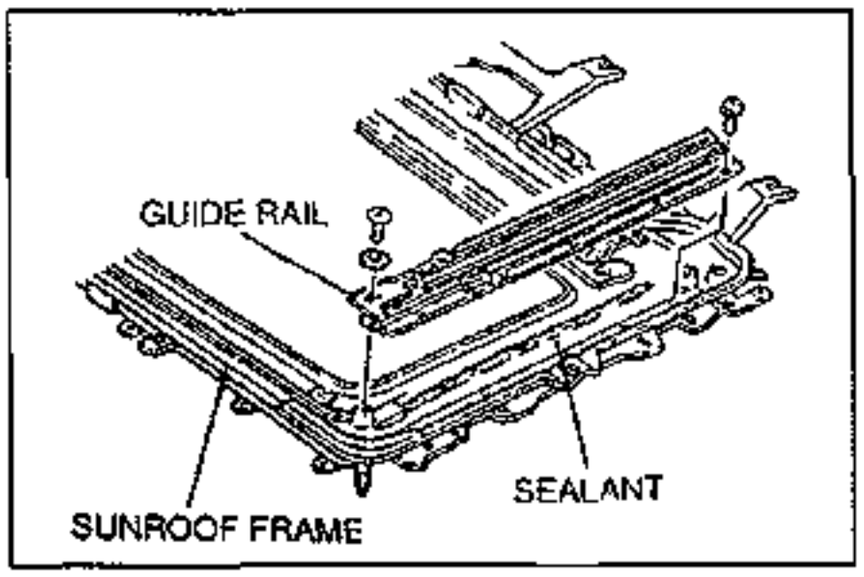
3. Pull the rear guide rearward and remove it from the guide rail,
4. Pull the lower panel rearward and remove it from the guide rail.



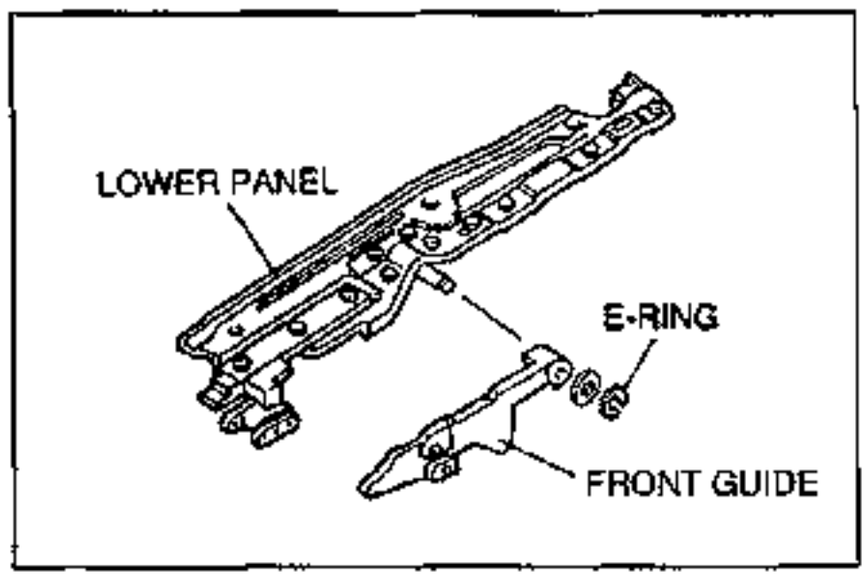
Front guide
Remove the E-ring and remove the front guide from the lower panel.



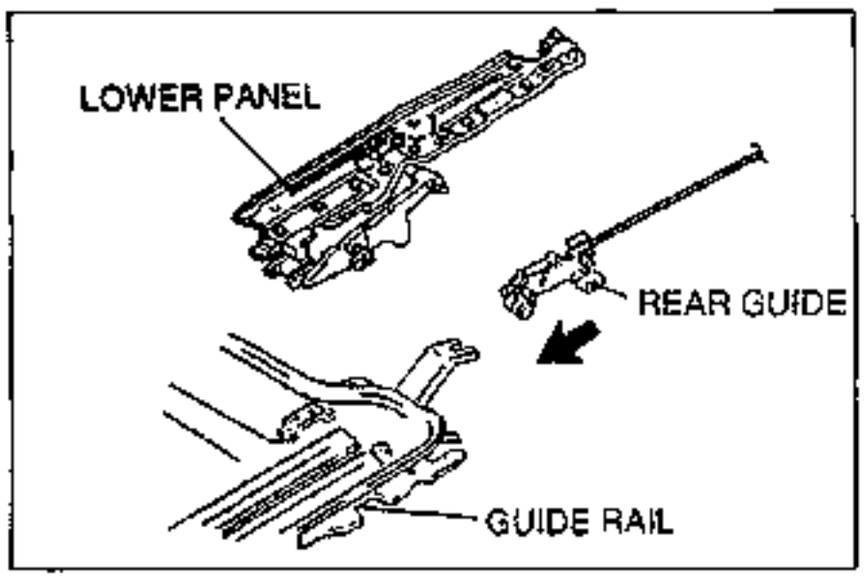
Guide rail
1. Remove the guide rail attaching screws.
2. Pry the guide rail from the sealant on the sunroof frame by using a protected screwdriver.



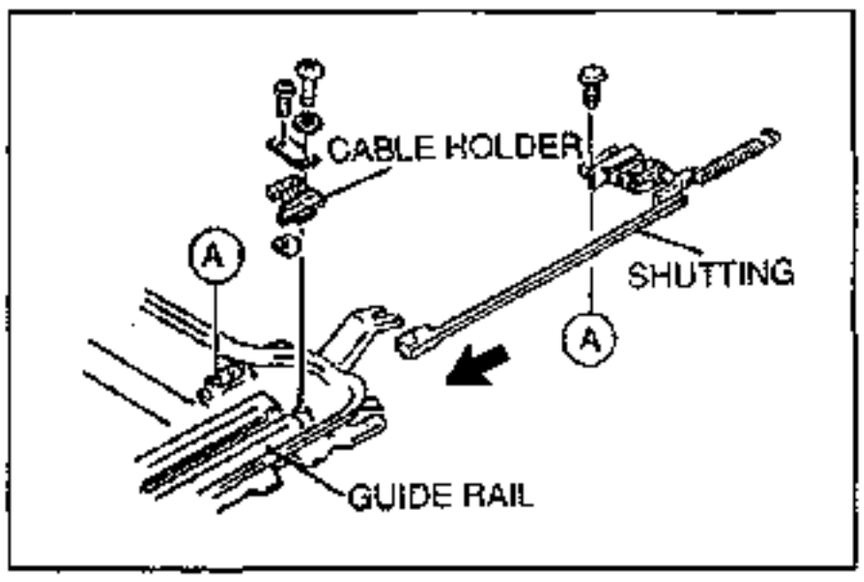
Assembly note
Guide rail
1. Clean and degrease the sunroof contact area between the sunroof frame and the guide rail.
2. Apply approximately **2 mm {0.08 in}** of sealant to the sunroof frame.
3. Install the guide rail to the sunroof frame with the screws.
4. Clean any excessive sealant by using white gasoline.



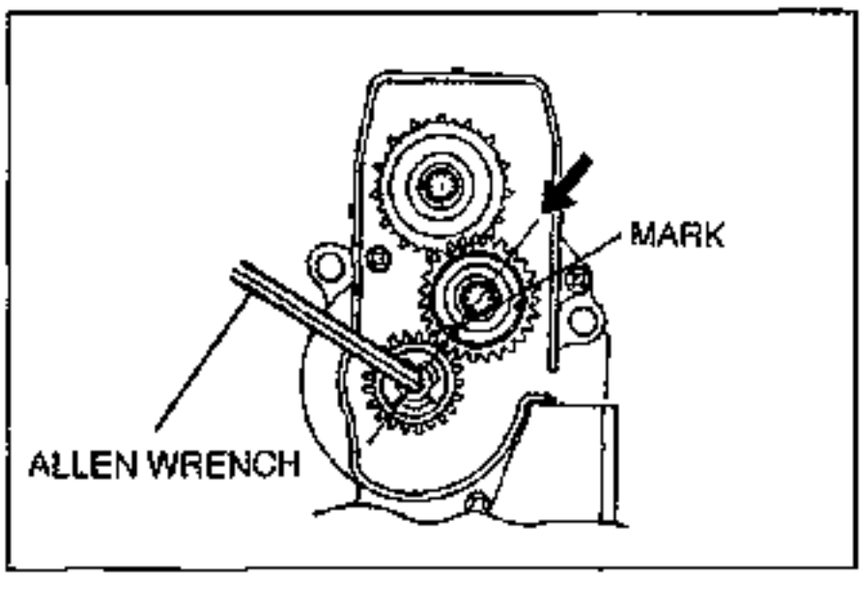
Front guide
Install the front guide to the lower panel with the E-ring.



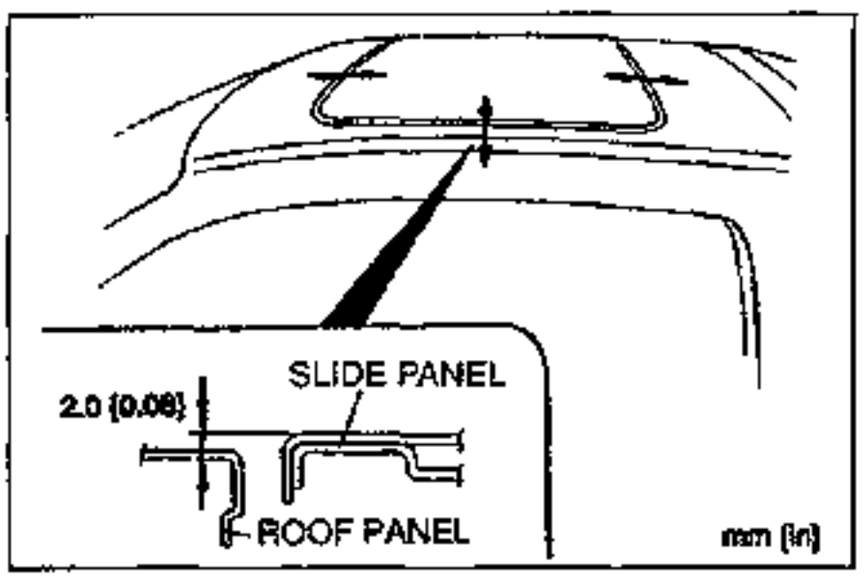
Rear guide
1. Install the lower panel to the guide rail.
2. Install the rear guide to the guide rail.



3. Install the shutting to the guide rail.
4. Install the cable holder to the sunroof frame.



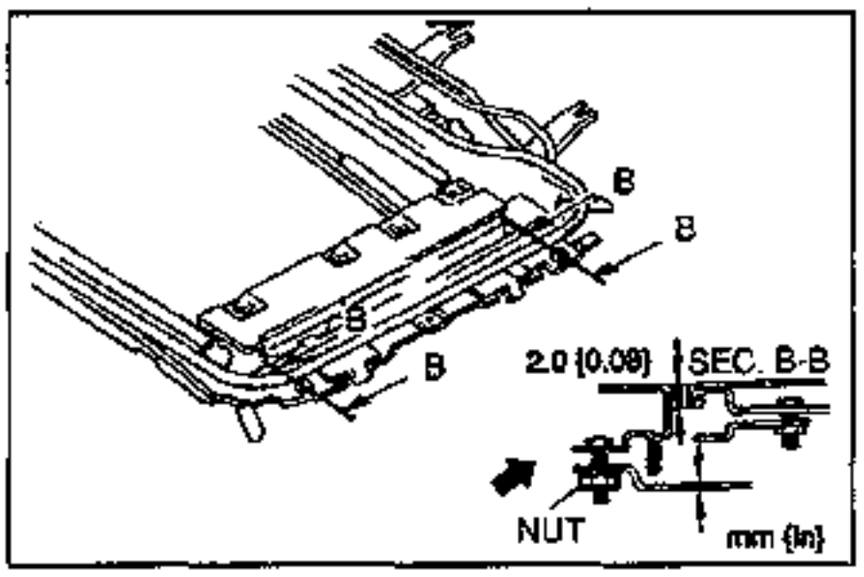
Sunroof motor assembly
Remove the motor cover. Position the mark on the timing gear as shown in the figure by using an allen wrench.



Adjustment
Slide panel
Height

Adjust the height difference between the slide panel and the roof panel by using the following procedure.

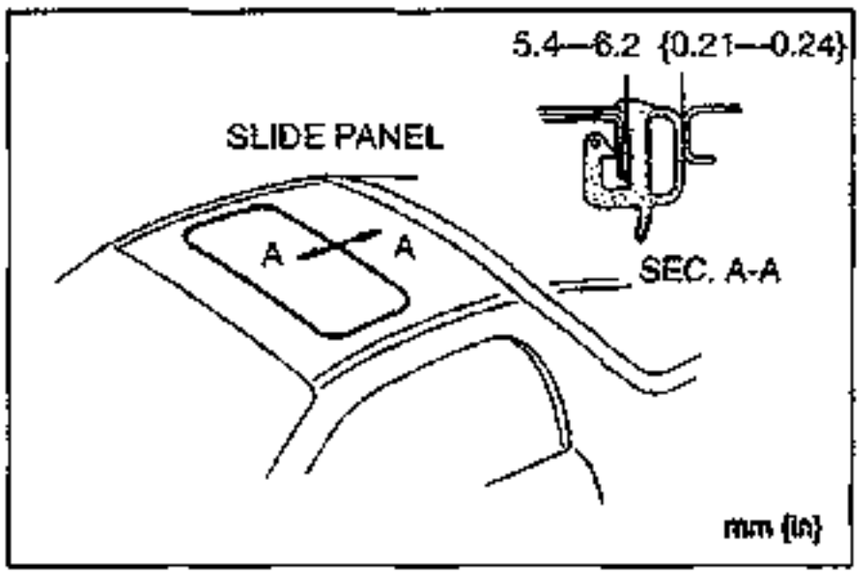
Allowable height difference: 2.0 mm {0.08 in} max.



1. Remove the headliner. (Refer to page S–70.)
2. Loosen the set bracket attaching nuts.

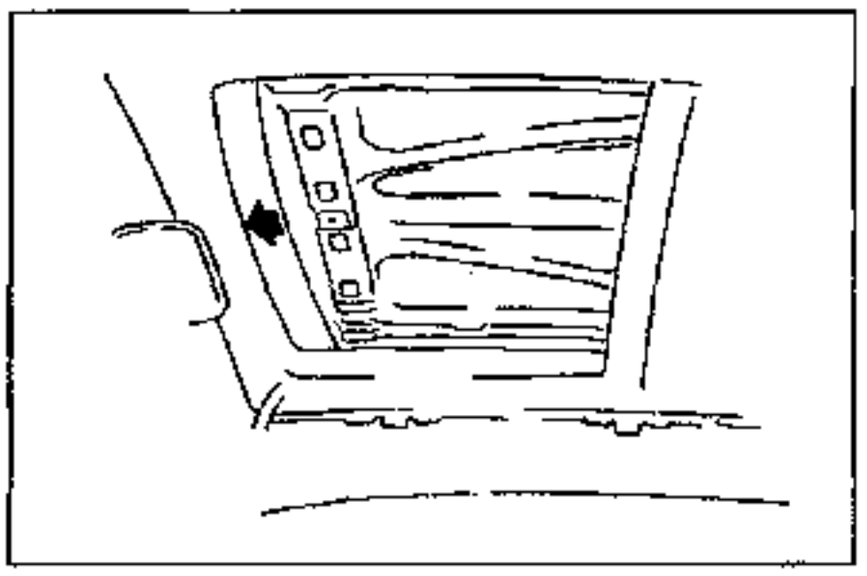
Note
- Clockwise rotation raises the frame.

3. Turn the height adjusting nuts and adjust the sunroof frame height.
4. After adjustment, securely install the sunroof frame to the roof panel.



Gap

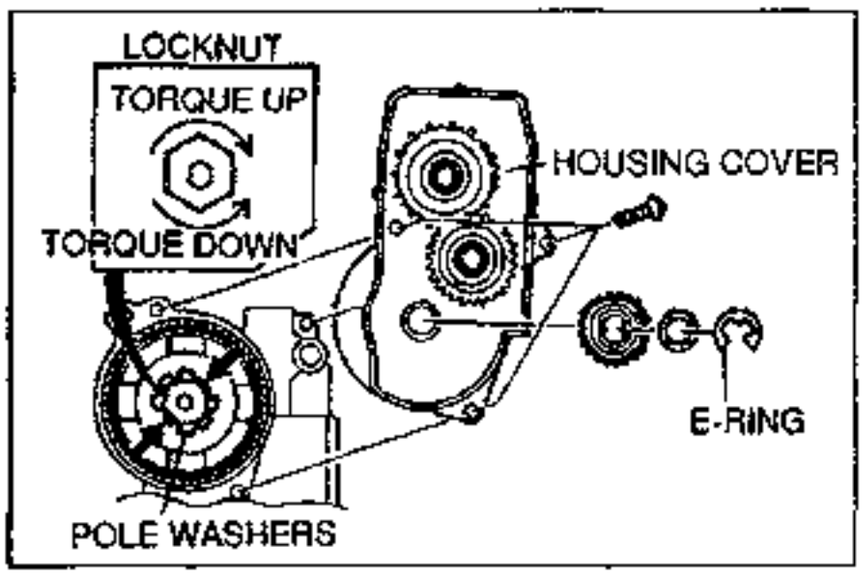
1. Verify that the slide panel does not interfere with the roof panel when operated.
2. If it interferes, loosen the slide panel attaching nuts and move the panel as necessary.
3. If the above adjustment is not enough, loosen the attaching screws and bolts of the sunroof frame and set bracket and carry out adjustment.
   (Refer to page S–54, Installation note for the sunroof drive unit.)



Moving load

1. Measure the operation time of the slide panel from fully opened to fully closed or vice versa.

Specified time: 4–7 sec.



2. If not as specified, adjust it by turning the locknut on the sunroof motor assembly.
   (1) Remove the housing cover attaching screw and the E-ring. Remove the housing cover from the motor.
   (2) Unfold the pole washers indicated by arrows.
   (3) Hold the motor shaft by using an allen wrench and turn the locknut to adjust the torque.
   (4) Fold the pole washers.

DASHBOARD AND CONSOLE

COMPONENT

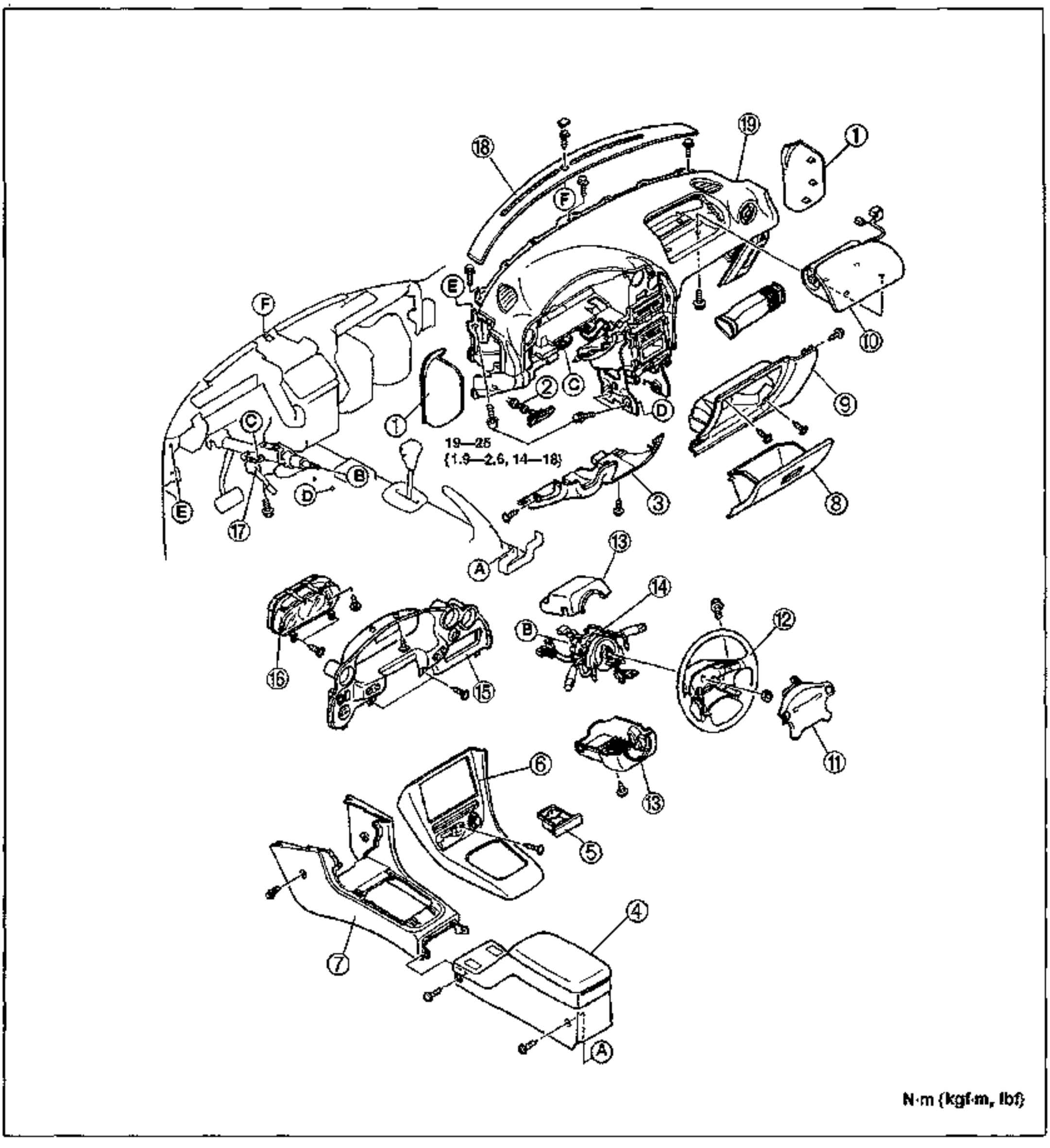
Removal / Installation

1. Disconnect the negative battery cable.

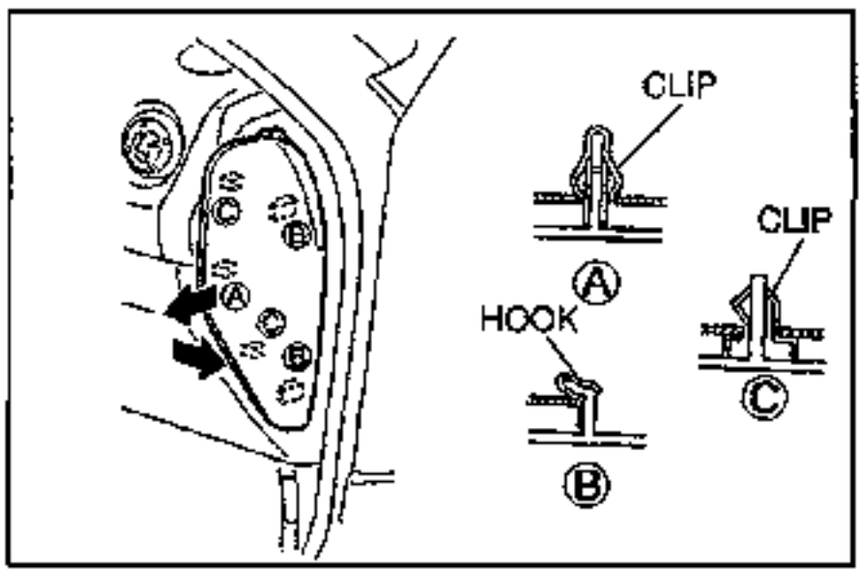
Warning

- **Handling the air bag module improperly can accidently deploy the air bag, which may seriously injure you. Read SERVICE WARNINGS in the Body Electrical Troubleshooting Manual, section S, before handing the air bag module.**

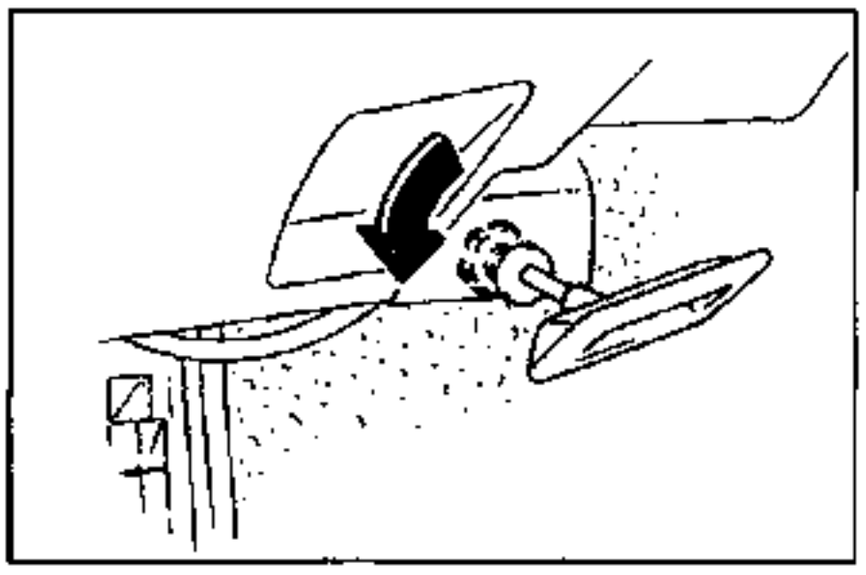
2. Remove in the order shown in the figure, referring to **Removal note.**
3. Install in the reverse order of removal.



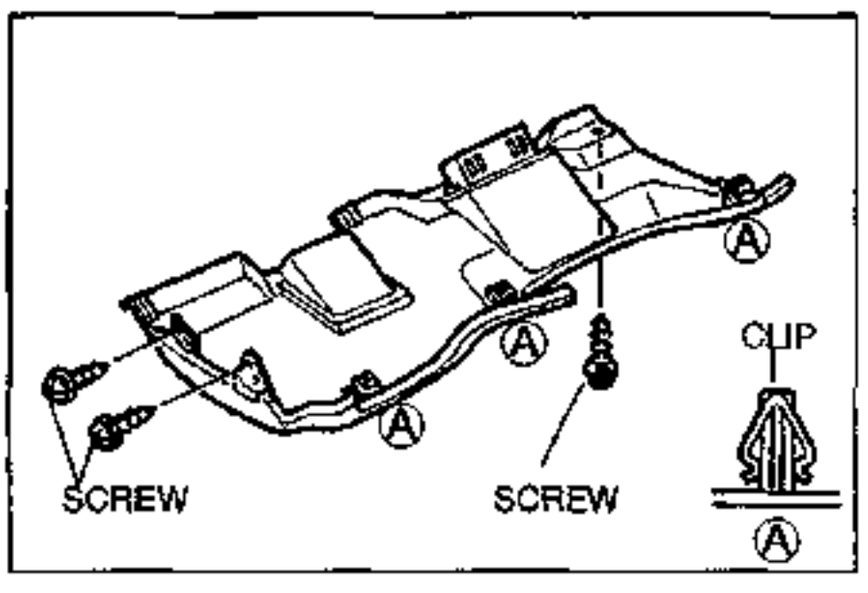
1. Side panel
   Removal note ..... below
2. Hood release lever
   Removal note ..... below
3. Lower panel
   Removal note ..... below
4. Rear console
   Removal note ..... page S–63
5. Ashtray
6. Front console panel
   Removal note ..... page S–63
7. Front console
   Removal / note ..... page S–63
8. Glove compartment
   Removal note ..... page S–63
9. Glove compartment cover
10. Passenger–side air bag module
    Removal / Installation .....
    1995 Body Electrical Troubleshooting Manual, section S
11. Driver–side air bag module
    Removal / Installation .....
    1995 Body Electrical Troubleshooting Manual, section S
12. Steering wheel
    Removal / Installation ..... section N
13. Column cover
14. Combination switch
    Removal / Installation .....
    1995 Body Electrical Troubleshooting Manual, section Z4
15. Meter hood
    Removal note ..... page S–64
16. Instrument cluster
    Removal / Installation .....
    1995 Body Electrical Troubleshooting Manual, section C1
17. Steering shaft
18. Upper garnish
    Removal note ..... page S–64
19. Dashboard



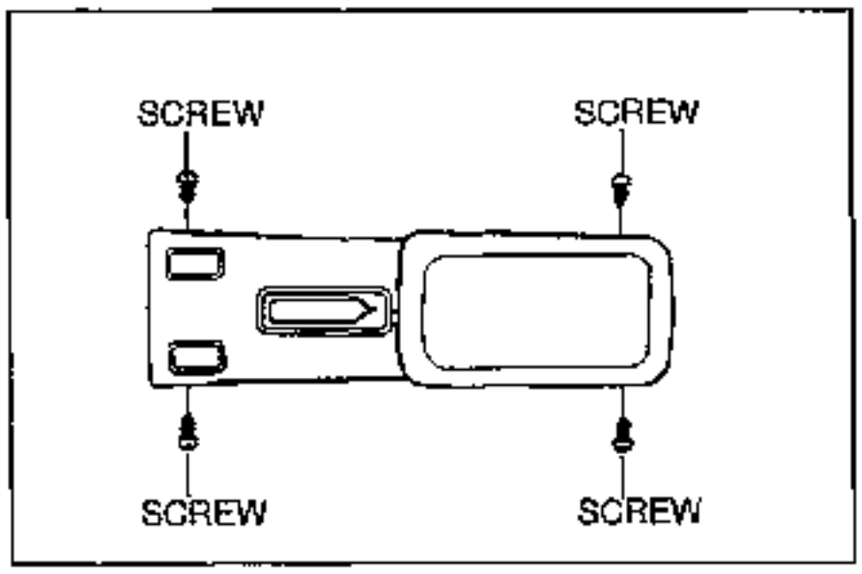
Removal note
Side panel
1. Pull the front edge of the side panel forward to remove the clips from the body.
2. Pull the side panel forward to remove the hook from the body.



Hood release lever
Loosen the hood release lever mounting nut.

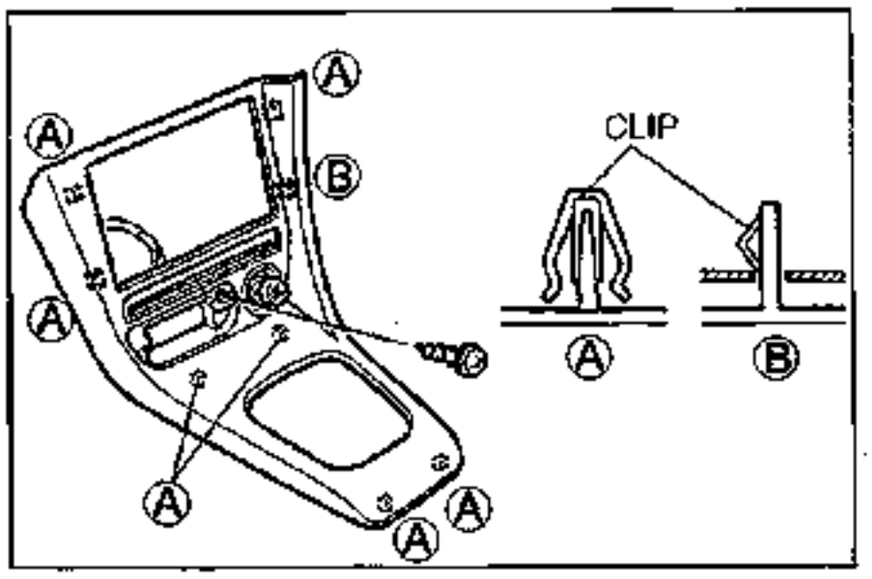


Lower panel
1. Remove the lower panel installation screws.
2. Pull the lower panel forward to disengage the clips.



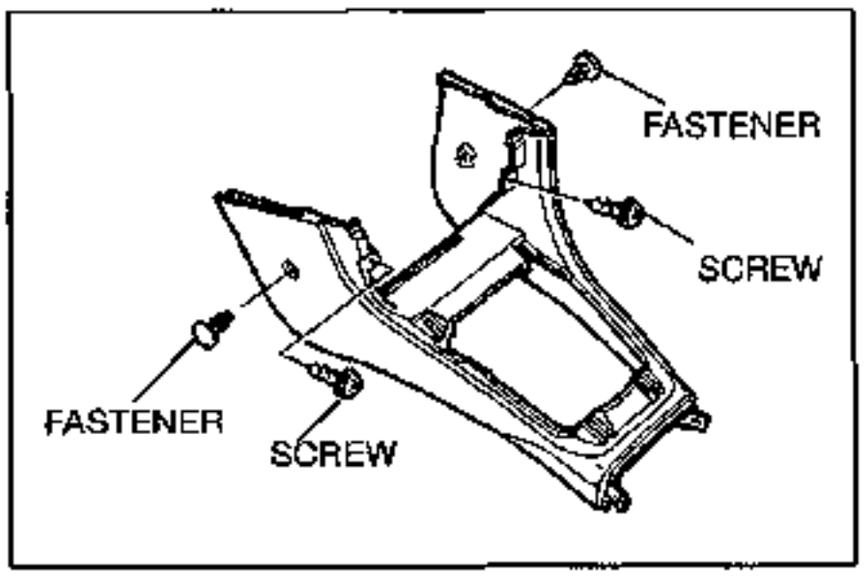
Rear console

Remove the rear console installation screws.



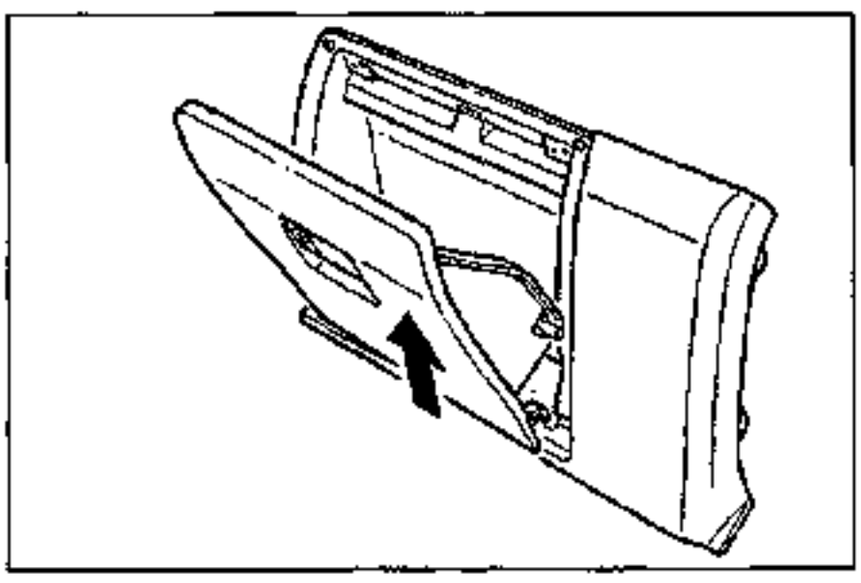
Front console panel

1. Remove the front console panel installation screws.
2. Pull the front console panel forward to disengage the clips.
3. Disconnect the harness connectors.



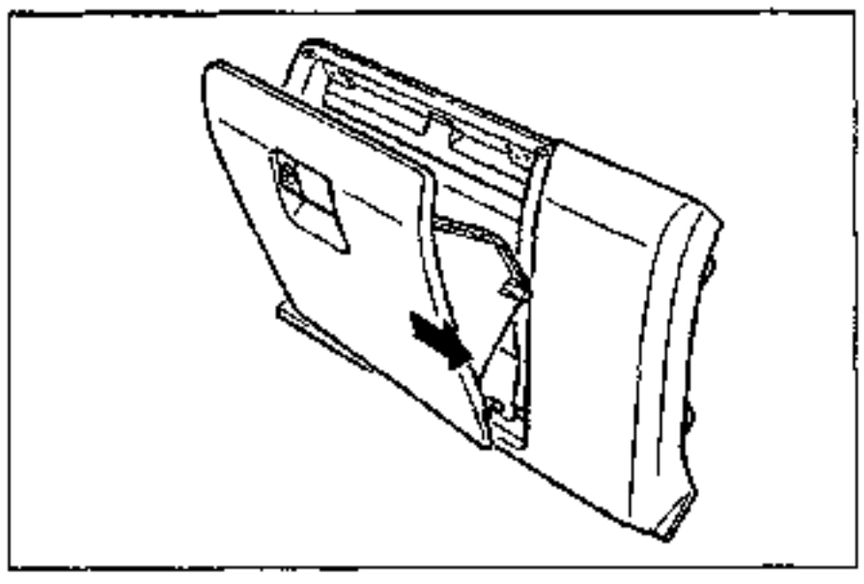
Front console

Remove the front console installation screws and fasteners.

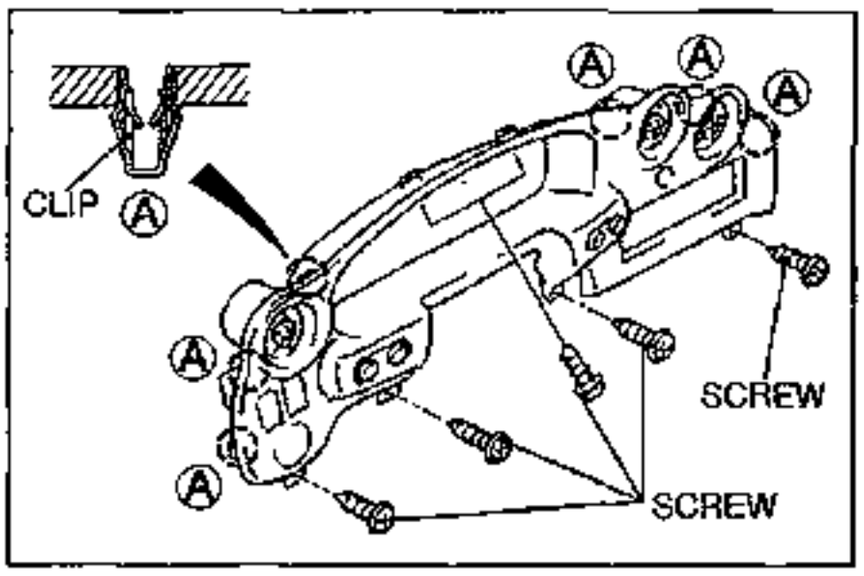


Glove compartment

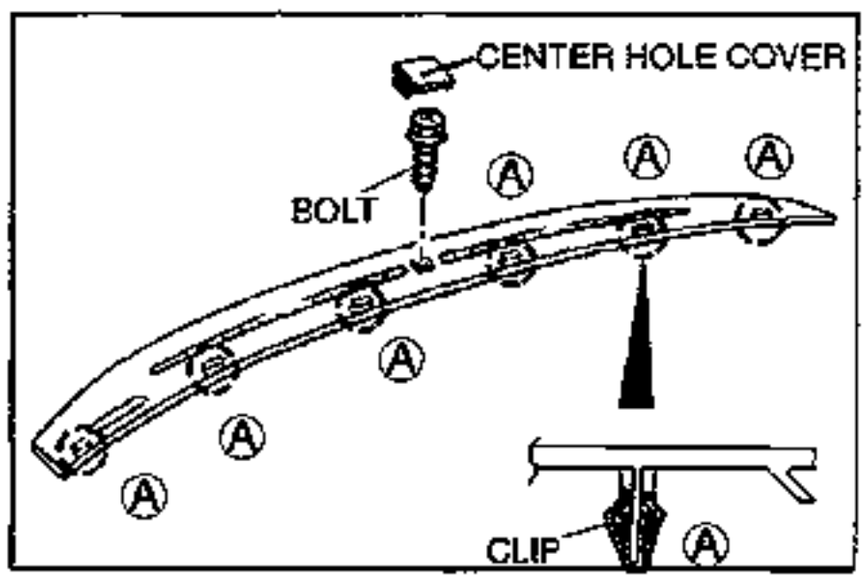
1. Open the glove compartment and pull up on the right side.



2. Slide the glove compartment to the right to remove it.



Meter hood
1. Remove the meter hood installation screws.
2. Pull the meter hood foward the disengage the clips.



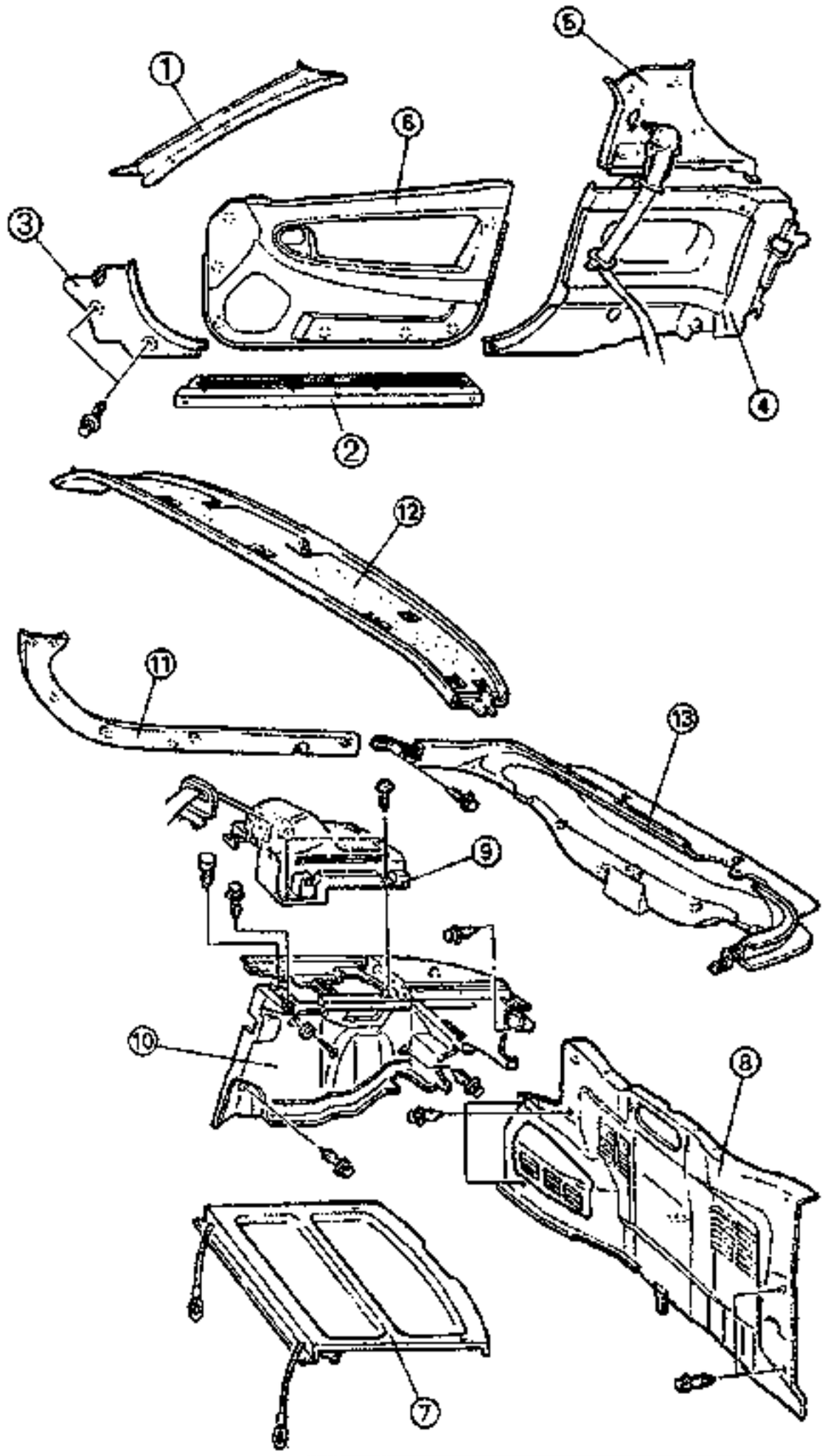
Upper garnish
1. Remove the center hole cover.
2. Remove the upper garnish installation bolt.
3. Pull the upper garnish up to disengage the clips.

TRIM

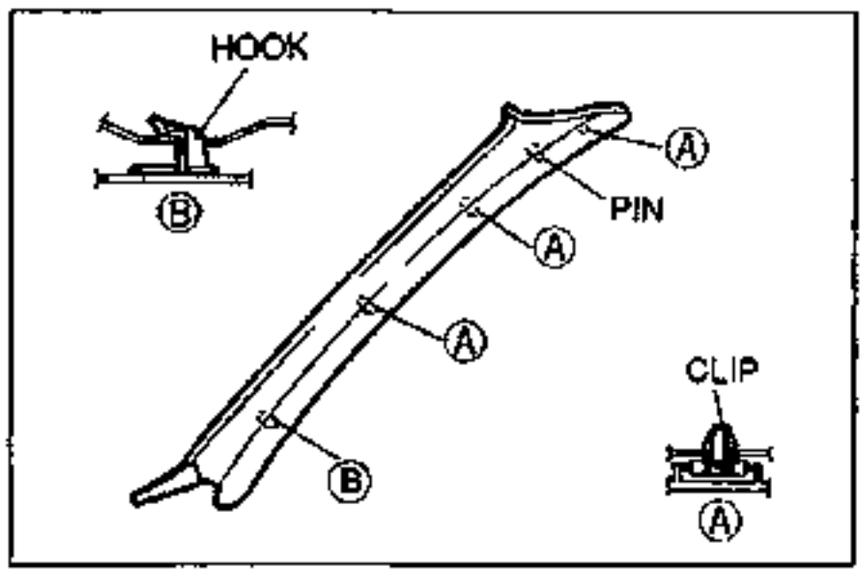
COMPONENTS

Removal / Installation

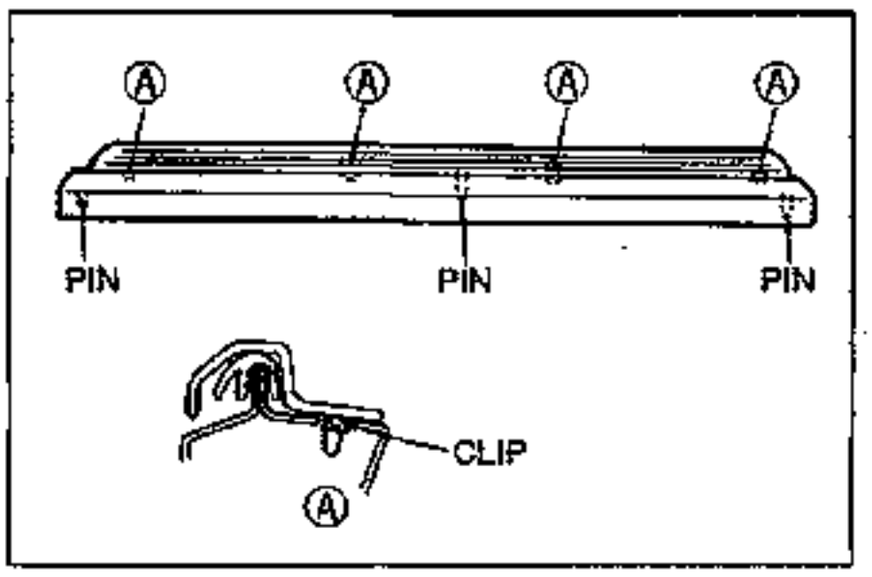
1. Remove in the order shown in the figure, referring to **Removal note.**
2. Install in the reverse order of removal.



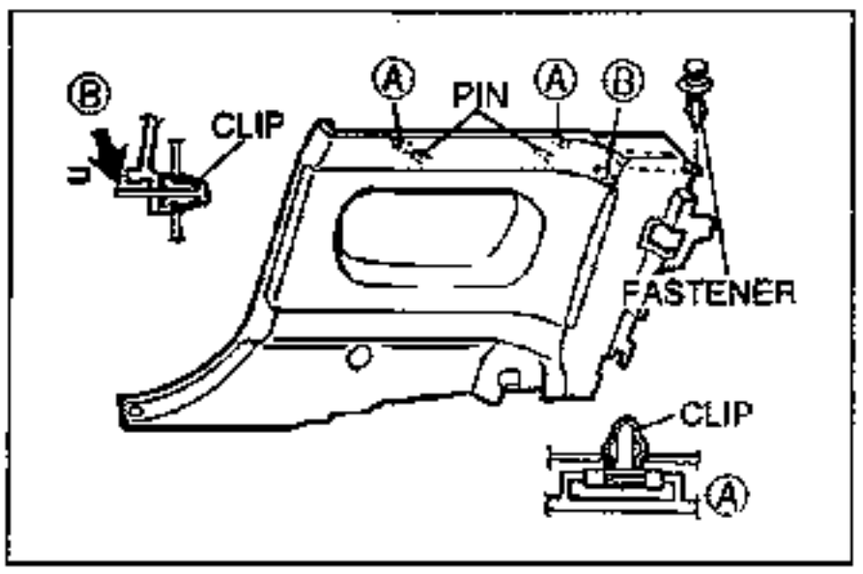
1. A-pillar trim
   Removal note ..... page S–66
2. Scuff plate
   Removal note ..... page S–66
3. Front side trim
4. Quarter trim
   Removal note ..... page S–66
5. B-pillar trim
   Removal note ..... page S–66
6. Door trim
   Removal note (driver side) .... page S–66
   Removal note (passenger side) page S–67
7. Rear package trim
8. Trunk end trim
   Removal note ..... page S–67
9. Rear speaker cover
10. Trunk side trim
11. Liftgate side trim
    Removal note ..... page S–67
12. Liftgate upper trim
    Removal note ..... page S–68
13. Liftgate lower trim
    Removal note ..... page S–68



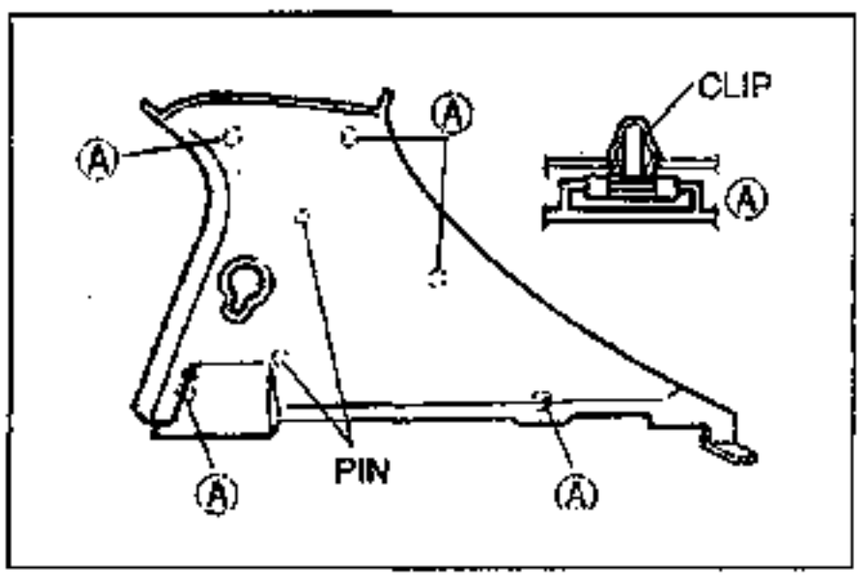
Removal note
A-pillar trim
1. Remove the seaming welt.
2. Pull the A-pillar trim to remove the clips from the body.
3. Pull the A-pillar trim upward to remove the hook from the body.



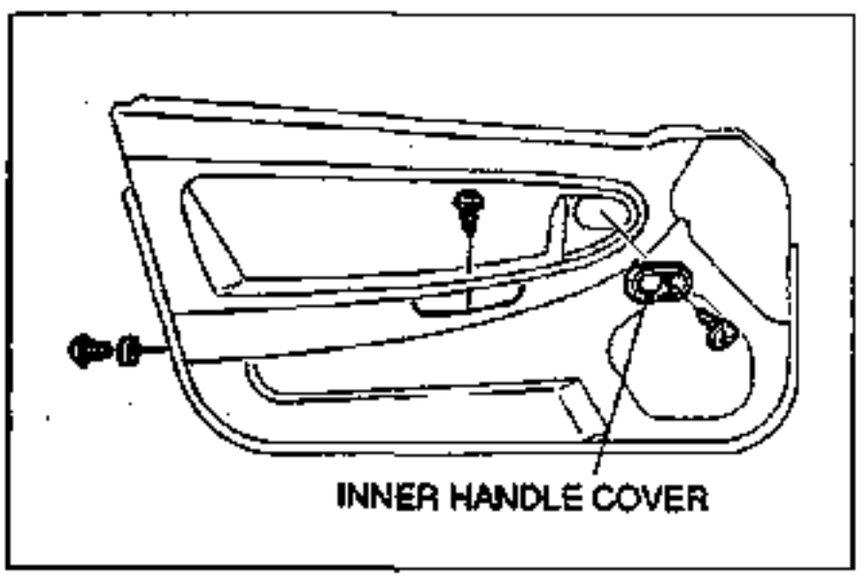
Scuff plate
Pull the scuff plate to remove the clips from the body.



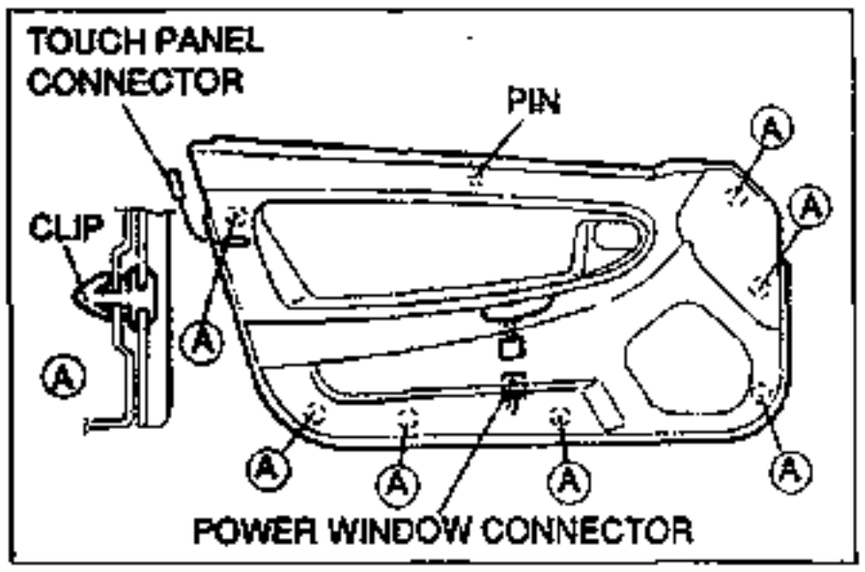
Quarter trim
1. Remove the rear seat back. (Refer to page S–76.)
2. Remove the scuff plate. (Refer above.)
3. Remove the quarter trim installation fastener.
4. Pull the quarter trim to remove the clips from the body.



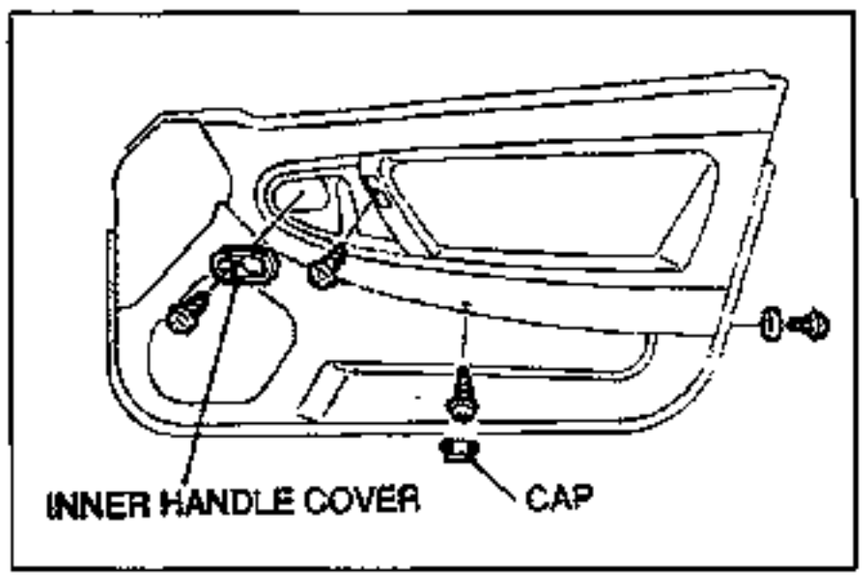
B-pillar trim
1. Remove the seaming well.
2. Remove the front seat belt upper anchor. (Refer to page S–73.)
3. Pull the B-pillar trim to remove the clips from the body.



Door trim
Driver side
1. Remove the regulator handle. (Refer to page S–11.)
2. Remove the inner handle cover.
3. Remove the door trim installation screws.

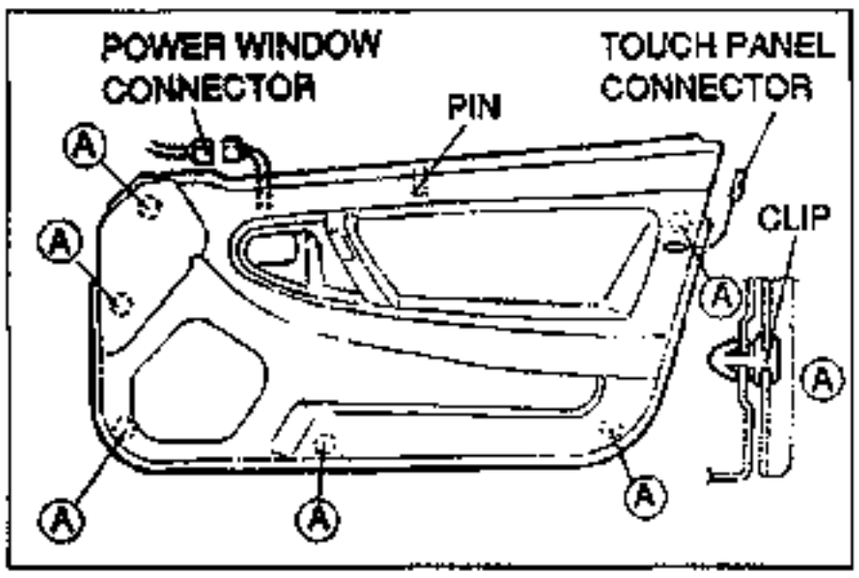


4. Pull the door trim to remove the clips from the body.
5. Lift the door trim to remove it.
6. Disconnect the harness connectors, if equipped.

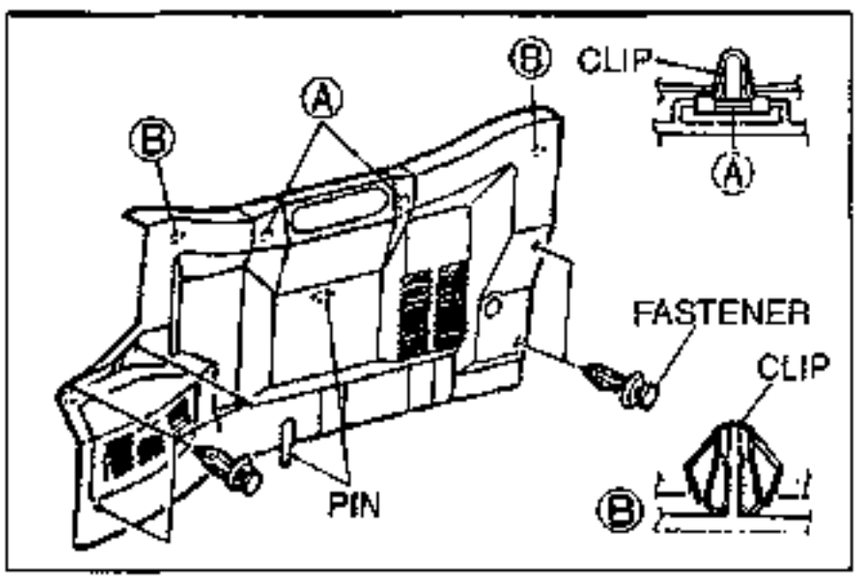


Passenger side

1. Remove the regulator handle. (Refer to page S–11.)
2. Remove the inner handle.
3. Remove the cap and door trim mounting screws.

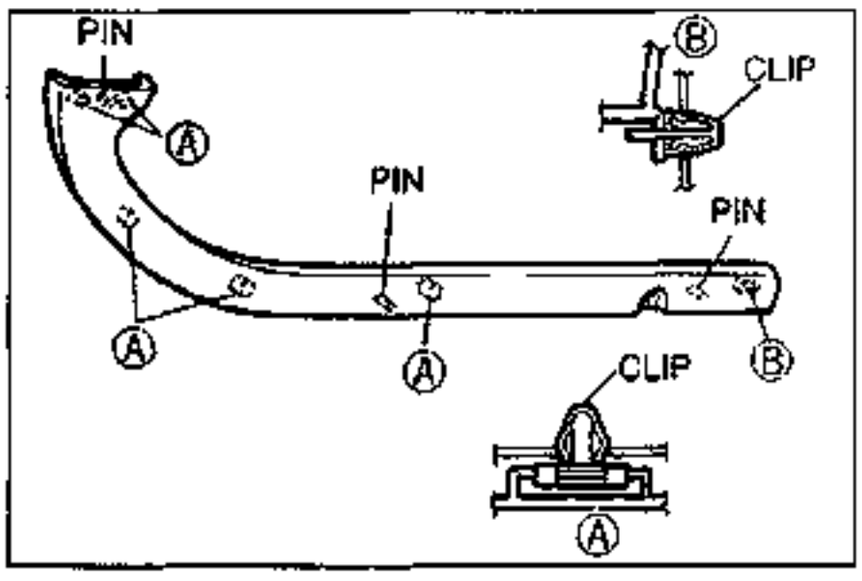


4. Pull the door trim to remove the clips from the body.
5. Lift up the door trim to remove it.
6. Disconnect the harness connectors, if equipped.



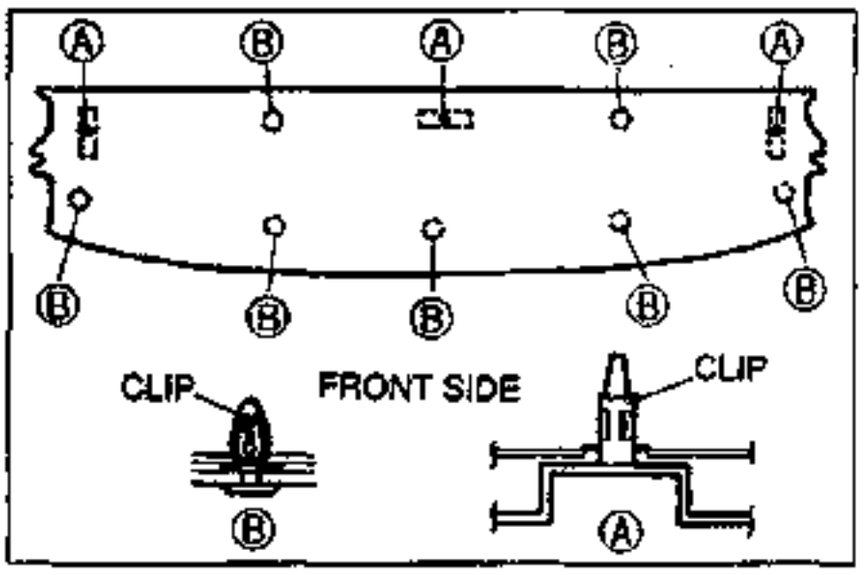
Trunk end trim

1. Remove the installation fastener.
2. Pull the trunk end trim to remove the clips from the body.
3. Lift the trunk end trim to remove it.



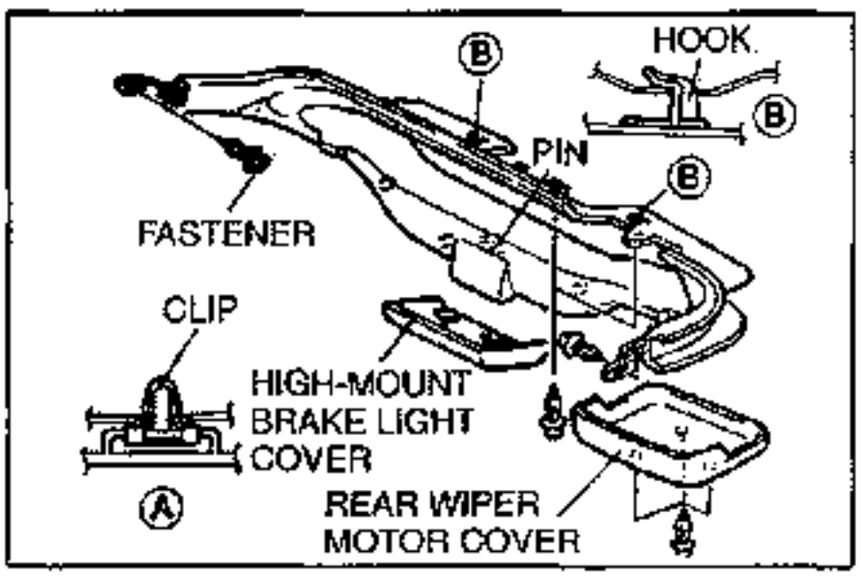
Liftgate side trim

Pull the liftgate side trim to remove the clips from the body.



Liftgate upper trim

1. Remove the liftgate side trim. (Refer to page S–67.)
2. Pull the liftgate upper trim to remove the clips from the body.



Liftgate lower trim

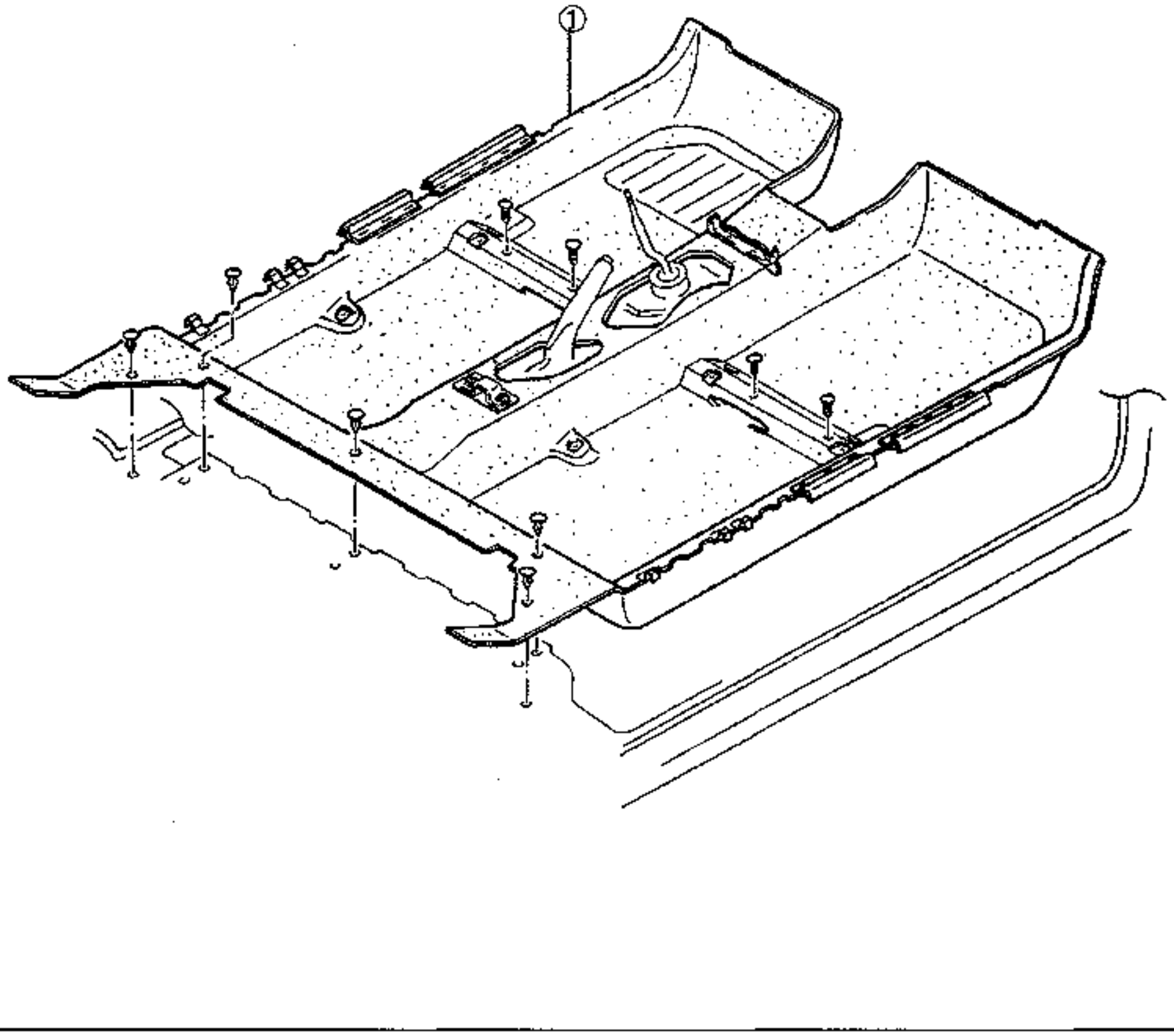
1. Remove the liftgate side trim. (Refer to page S–67.)
2. Remove the rear wiper motor or high-mount brake light cover from the body.
3. Remove the fastener.
4. Pull the liftgate lower trim to remove the clips from the body.
5. Pull the liftgate lower trim upward to remove the hook from the body.

FLOOR COVERING

COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove the following:
   a. Front seats and rear seat cushion (Refer to page S–75, 76.)
   b. Front side trim (Refer to page S–65.)
   c. Quarter trim (Refer to page S–65.)
   d. Front and rear consoles (Refer to page S–61.)
3. Remove as shown in the figure.
4. Install in the reverse order of removal.



1. Cabin carpet

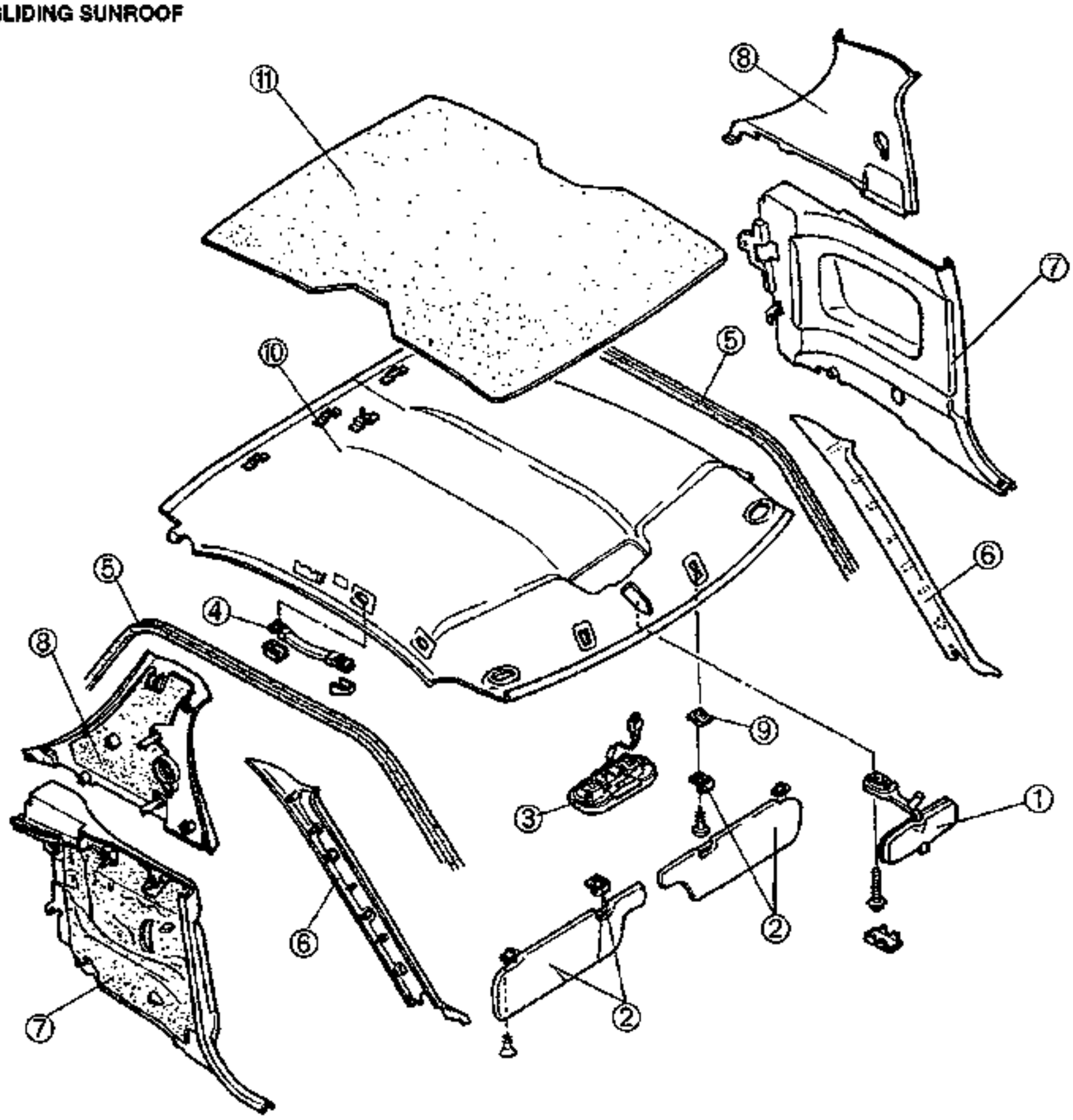
HEADLINER

COMPONENTS

Removal / Installation

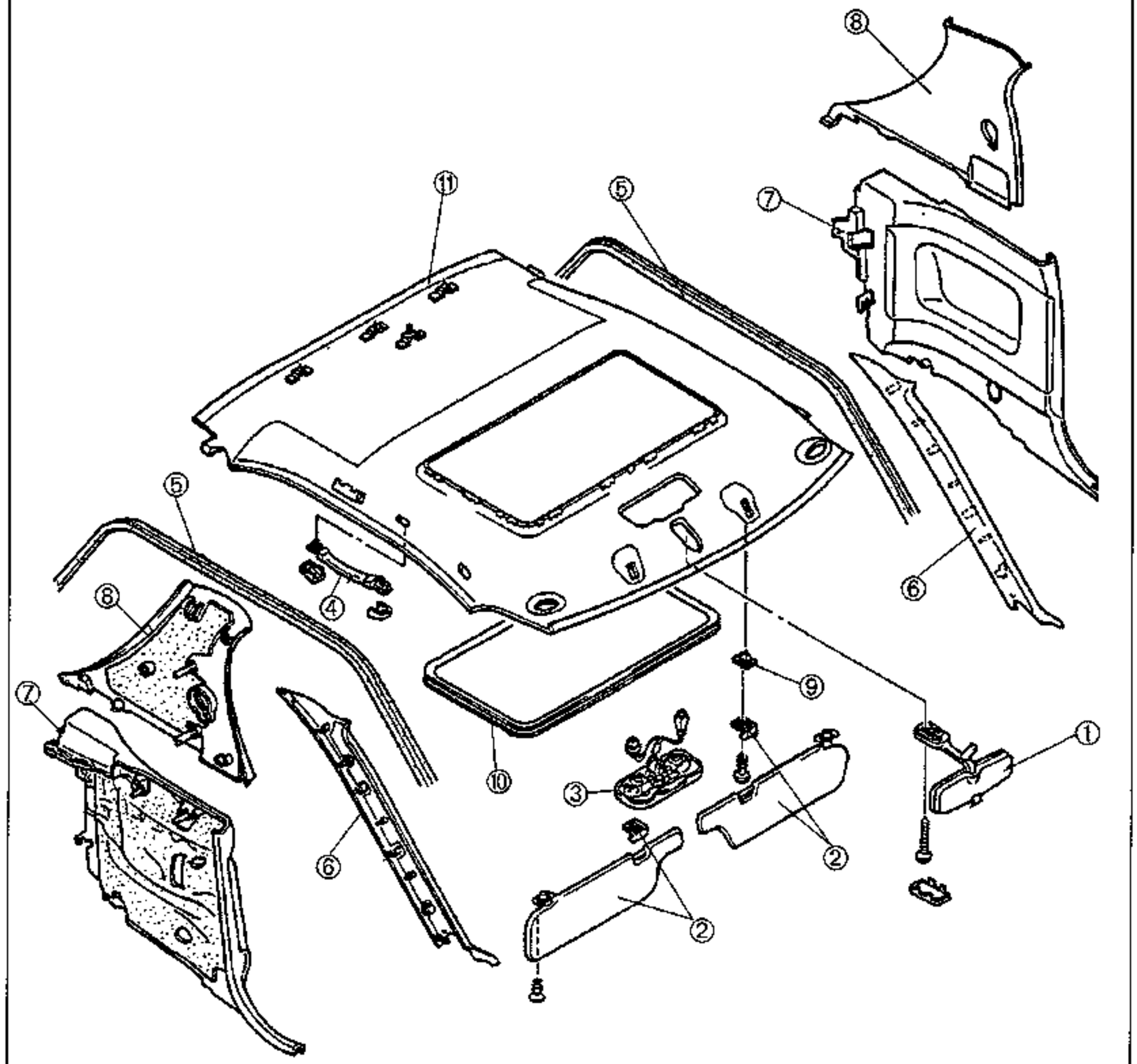
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal note.**
3. Install in the reverse order of removal, referring to **Installation note.**

WITHOUT SLIDING SUNROOF

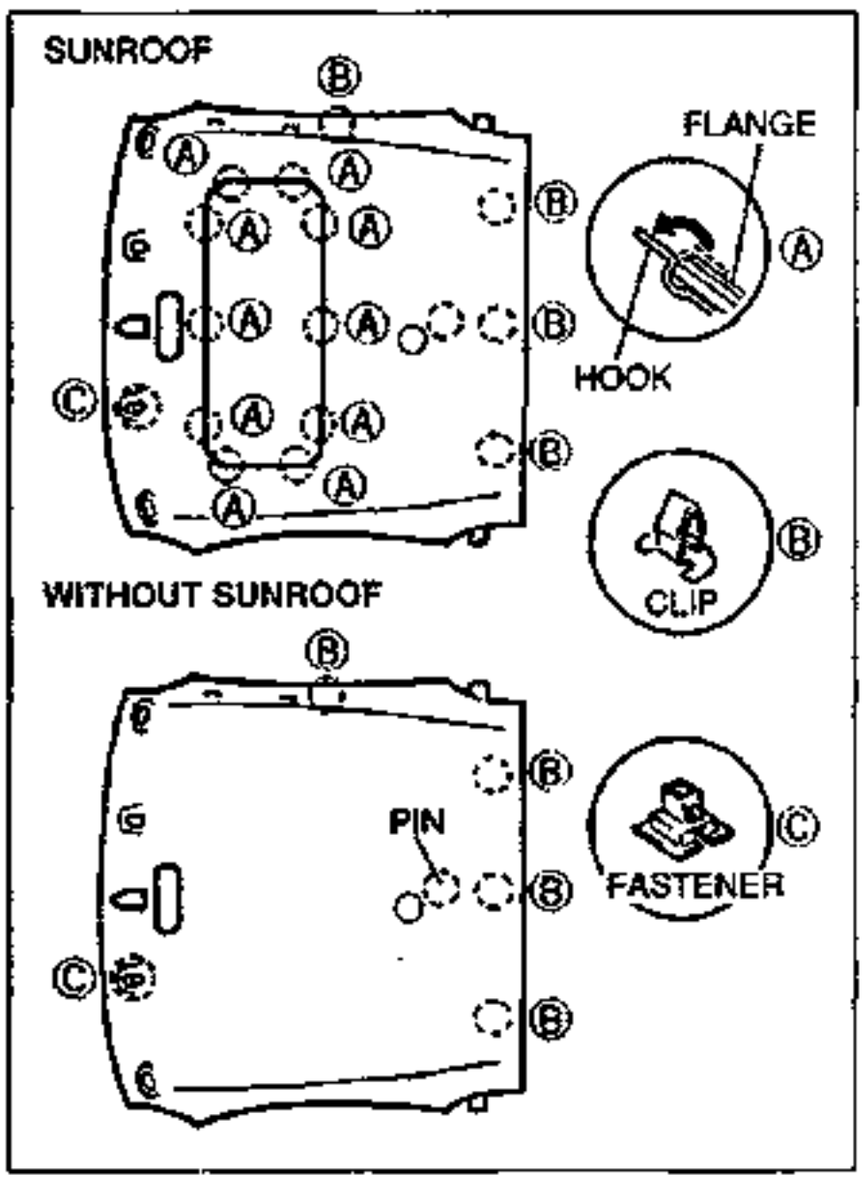


1. Rearview mirror
2. Sunvisor and adapter
3. Overhead console
4. Assist handle
5. Seaming welt
6. A-pillar trim
   Removal / Installation ..... page S–65
7. Quarter trim
   Removal / Installation ..... page S–65
8. B-pillar trim
   Removal / Installation ..... page S–65
9. Fastener
10. Headliner
    Removal note ..... page S–72
11. Insulator

WITH SLIDING SUNROOF

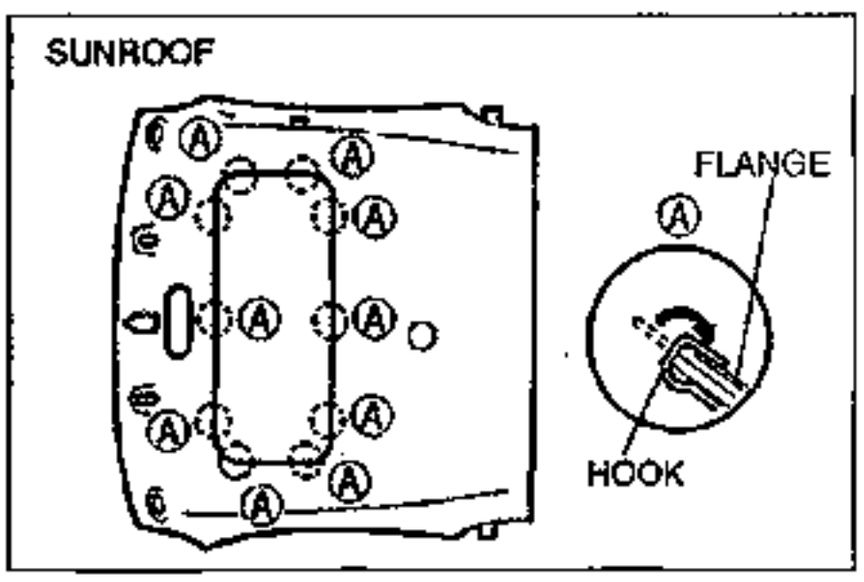


1. Rearview mirror
2. Sunvisor and adapter
3. Overhead console
4. Assist handle
5. Seaming welt (door)
6. A-pillar trim
   Removal / Installation ..... page S–65
7. Quarter trim
   Removal / Installation ..... page S–65
8. B-pillar trim
   Removal / Installation ..... page S–65
9. Fastener
10. Seaming welt (sliding sunroof)
11. Headliner
    Removal note ..... page S–72
    Installation note ..... page S–72



Removal note
Headliner
Without sliding sunroof
1. Remove the fasteners on the front side of the headliner. Remove the clips on the rear and sides of the headliner.
2. Remove the headliner.

With sliding sunroof
1. Remove the fasteners on the front side of the headliner. Remove the clips on the rear and sides of the headliner.
2. Remove the seaming welt and unfold the hooks at the sunroof frame flange.
3. Remove the headliner.



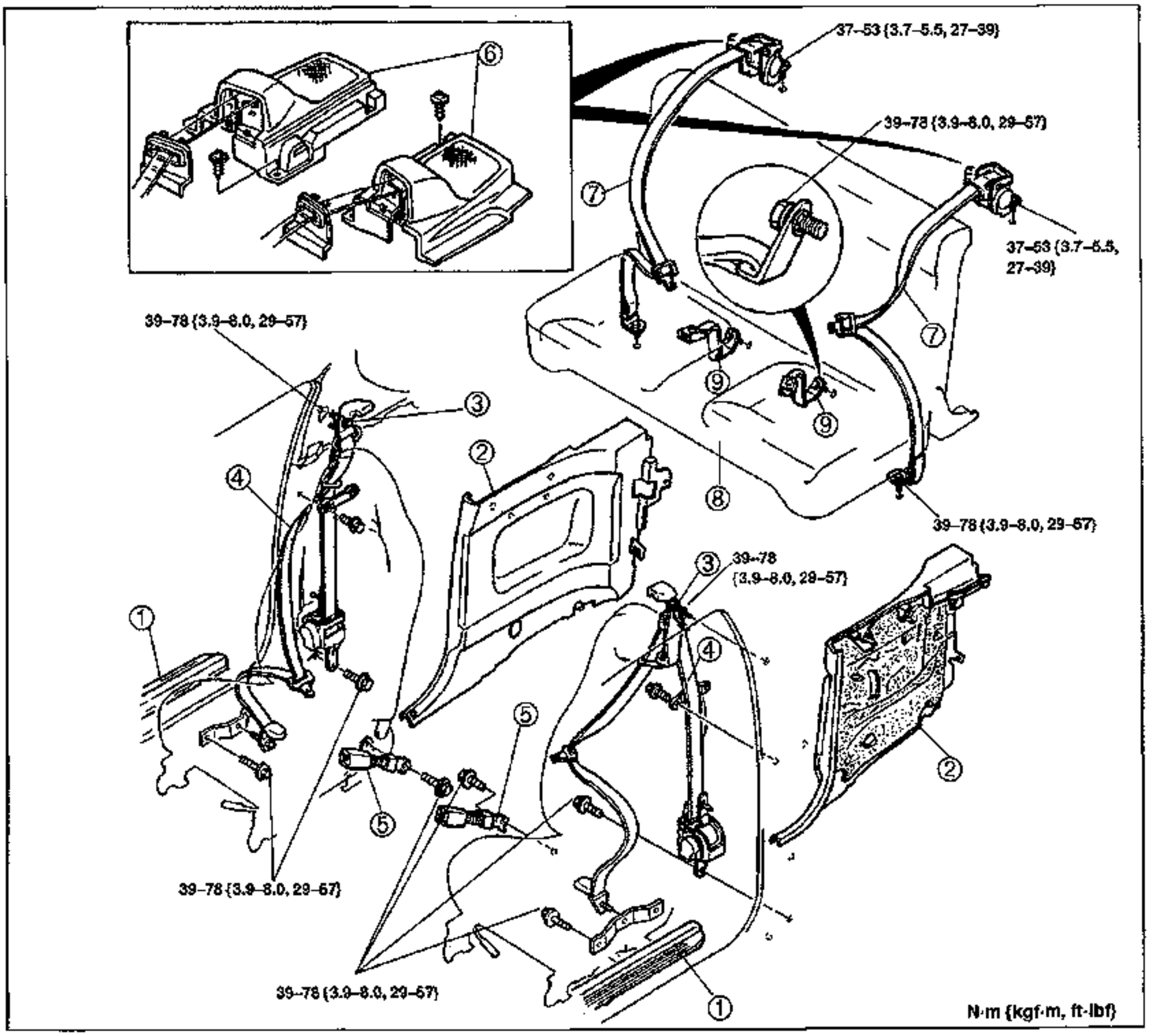
Installation note
Headliner
With sliding sunroof model
1. Fold the headliner hooks on the sunroof frame flange.
2. Install the seaming welt, and then install the headliner.

SEAT BELT

COMPONENTS
Removal / Installation

Caution
- **The ELR (emergency locking retractor) has a spring that will unwind if the retractor's cover is removed. The spring cannot be rewound by hard. If this occurs, the ELR will not work properly. Therefore, do not disassemble the refractor.**

1. Removal in the order shown in the figure.
2. Install in the reverse order of removal.



Front seat belt
1. Scuff plate
   Removal / Installation ..... page S–65
2. Quarter trim
   Removal / installation ..... page S–65
3. Upper anchor
4. Front seat belt
   Installation ..... page S–74
5. Front buckle

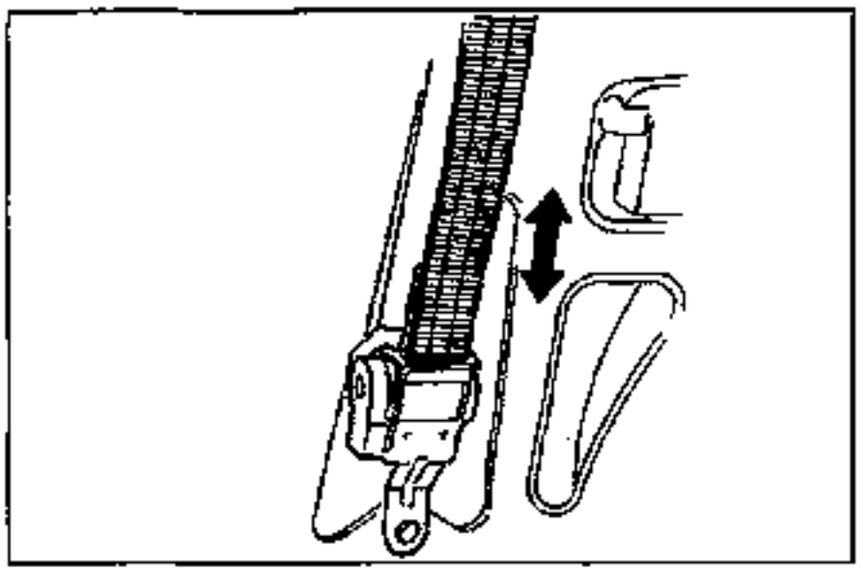
Rear seat belt
6. Rear speaker cover
7. Rear seat belt
   Inspection ..... page S–74
8. Rear seat cushion
   Removal / Installation ..... page S–76
9. Rear buckle

SEAT BELT

Inspection

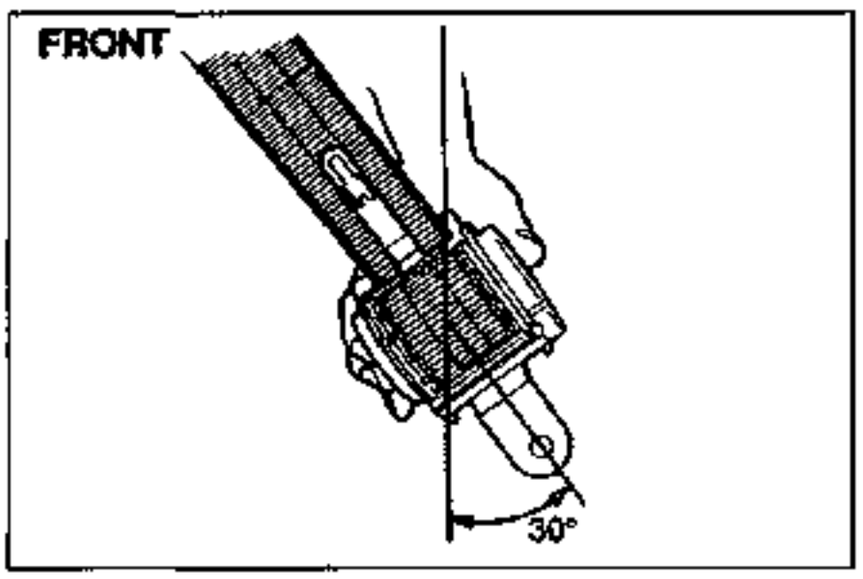
Webbing

1. Inspect the webbing for scars, tears, and wear.
2. Inspect the fittings for deformation.
2. If a problem is found, replace the seat belt assembly.

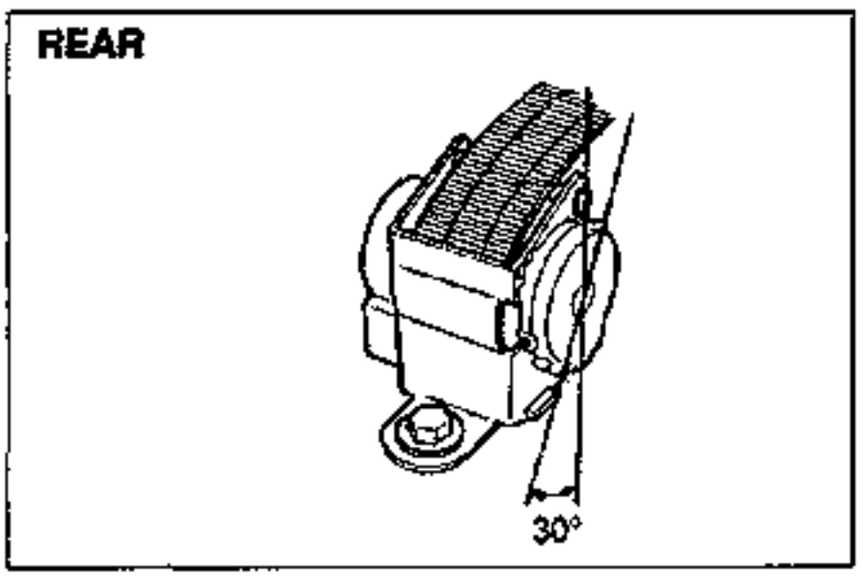


Emergency locking retractor

1. Verify that the belt can be pulled out smoothly, and that it moves smoothly when worn.
2. Verify that the retractor locks when the belt is quickly pulled.



3. Remove the retractor.
4. Hold the retractor as it would be installed.
5. Slowly incline the retractor while pulling out the belt.
6. Verify that the retractor locks at approximately **30 degrees** inclination.
7. If not as specified, replace the seat belt assembly.



SEAT

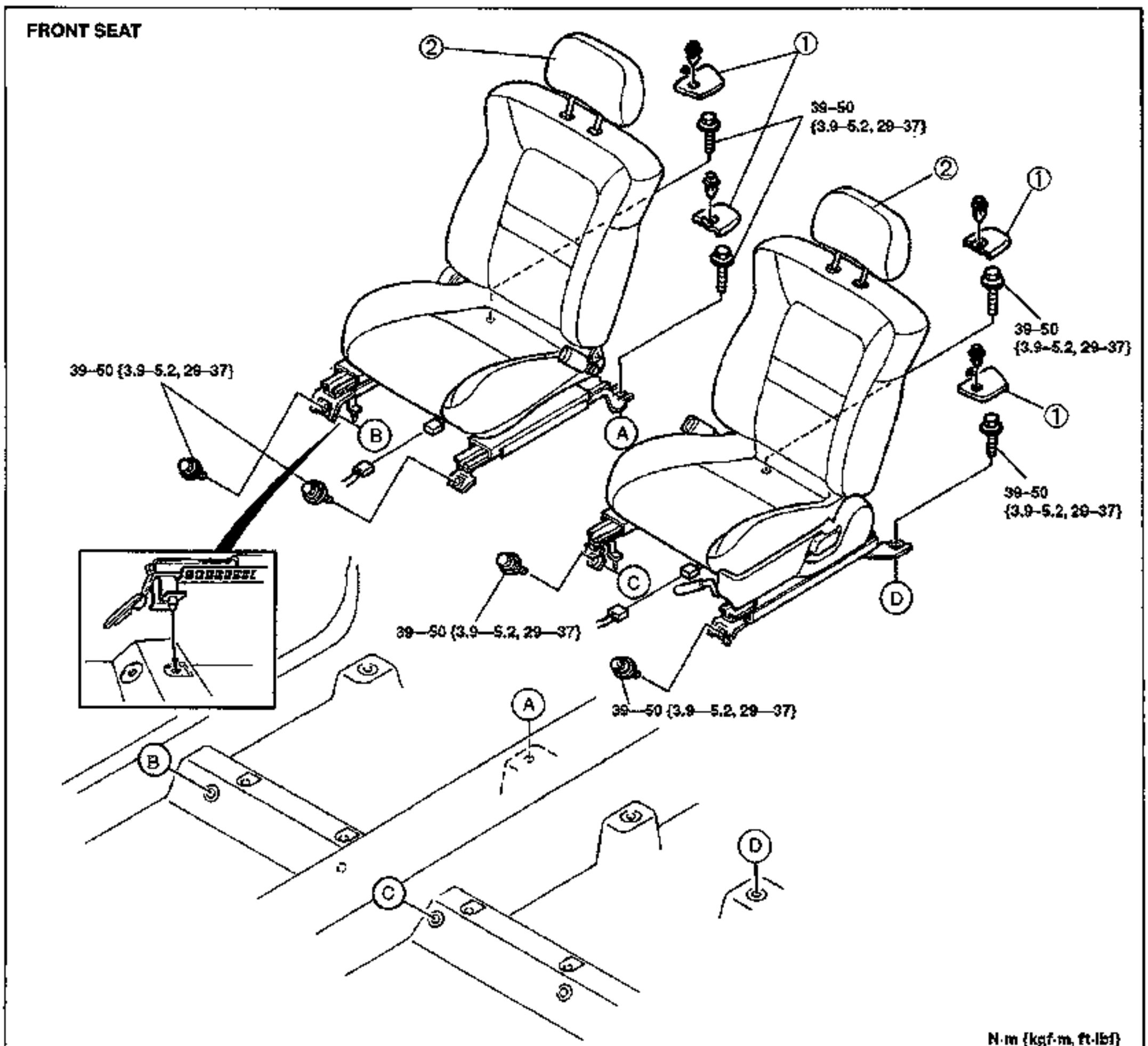
PREPARATION

TORX T30	For removal / installation of rear seat back catch look

COMPONENTS

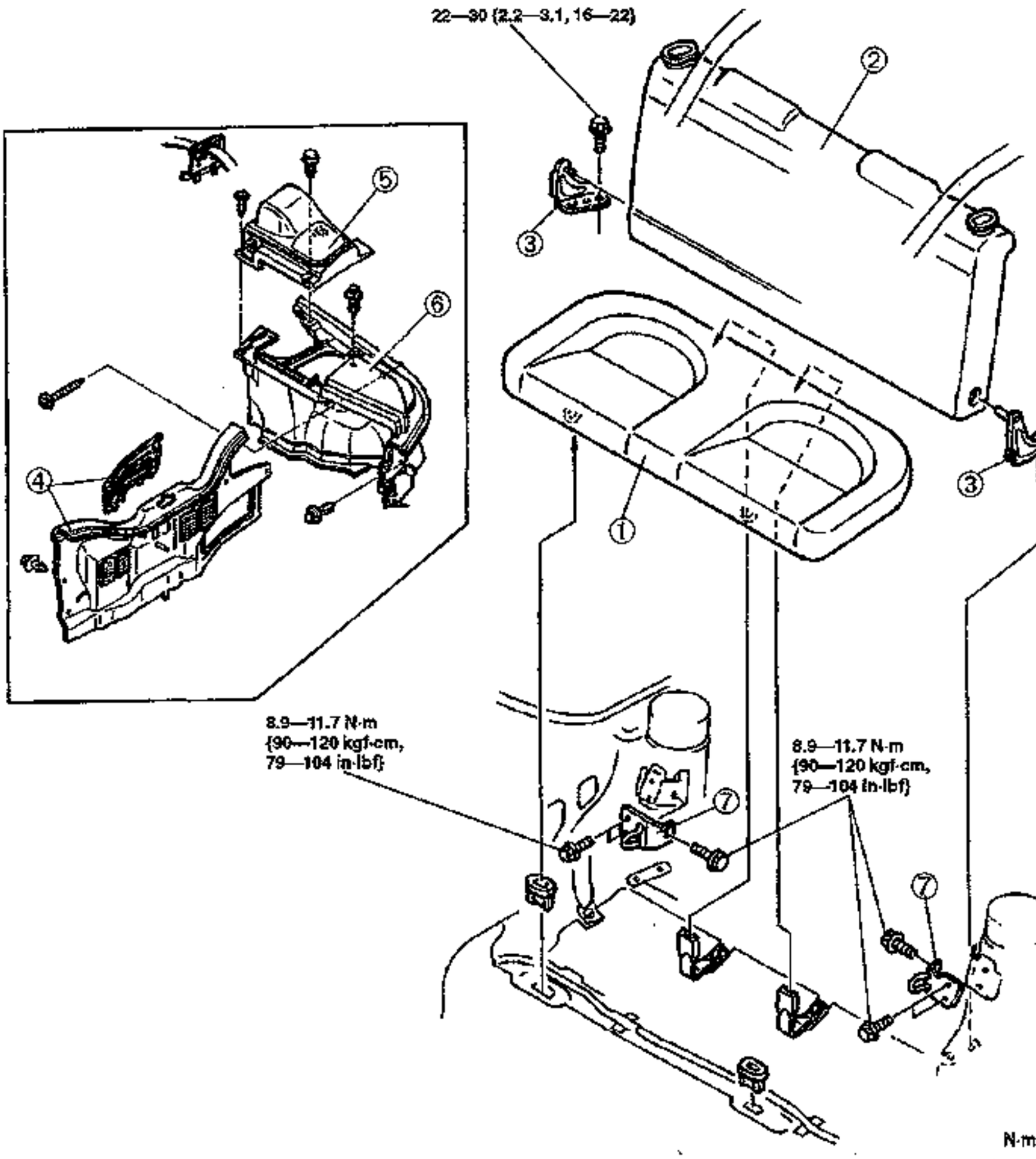
Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.



1. Cover
2. Front seat
   Disassembly / Assembly ..... page S–77

REAR SEAT

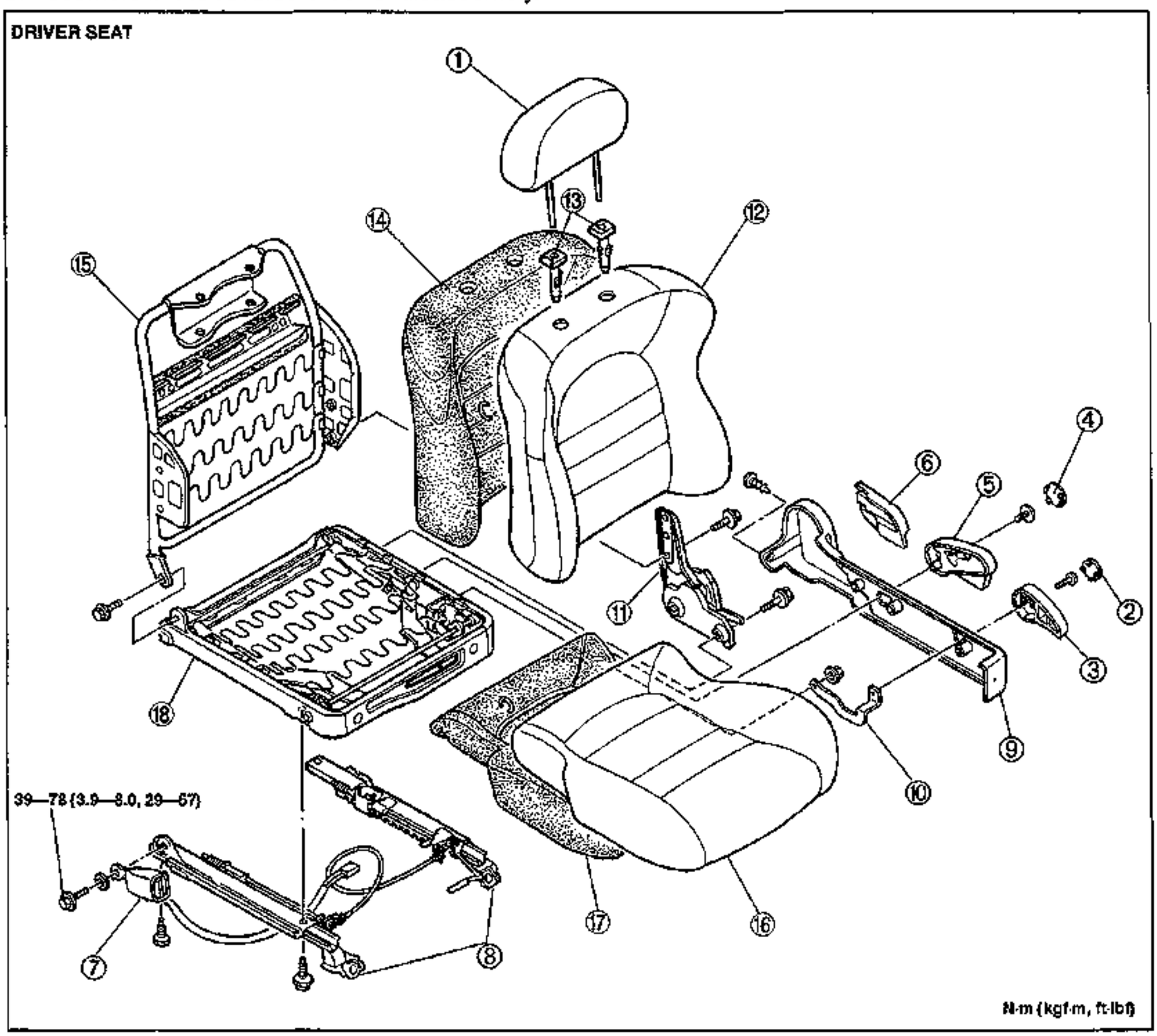


Rear seat
1. Rear seat cushion
2. Rear seat back
   Disassembly / Assembly ..... page S–79
3. Rear seat back hinge

Rear seat back striker
4. Trunk end trim
   Removal / Installation ..... page S–65
5. Rear speaker cover
6. Trunk side trim
   Removal / Installation ..... page S–65
7. Rear seat back striker

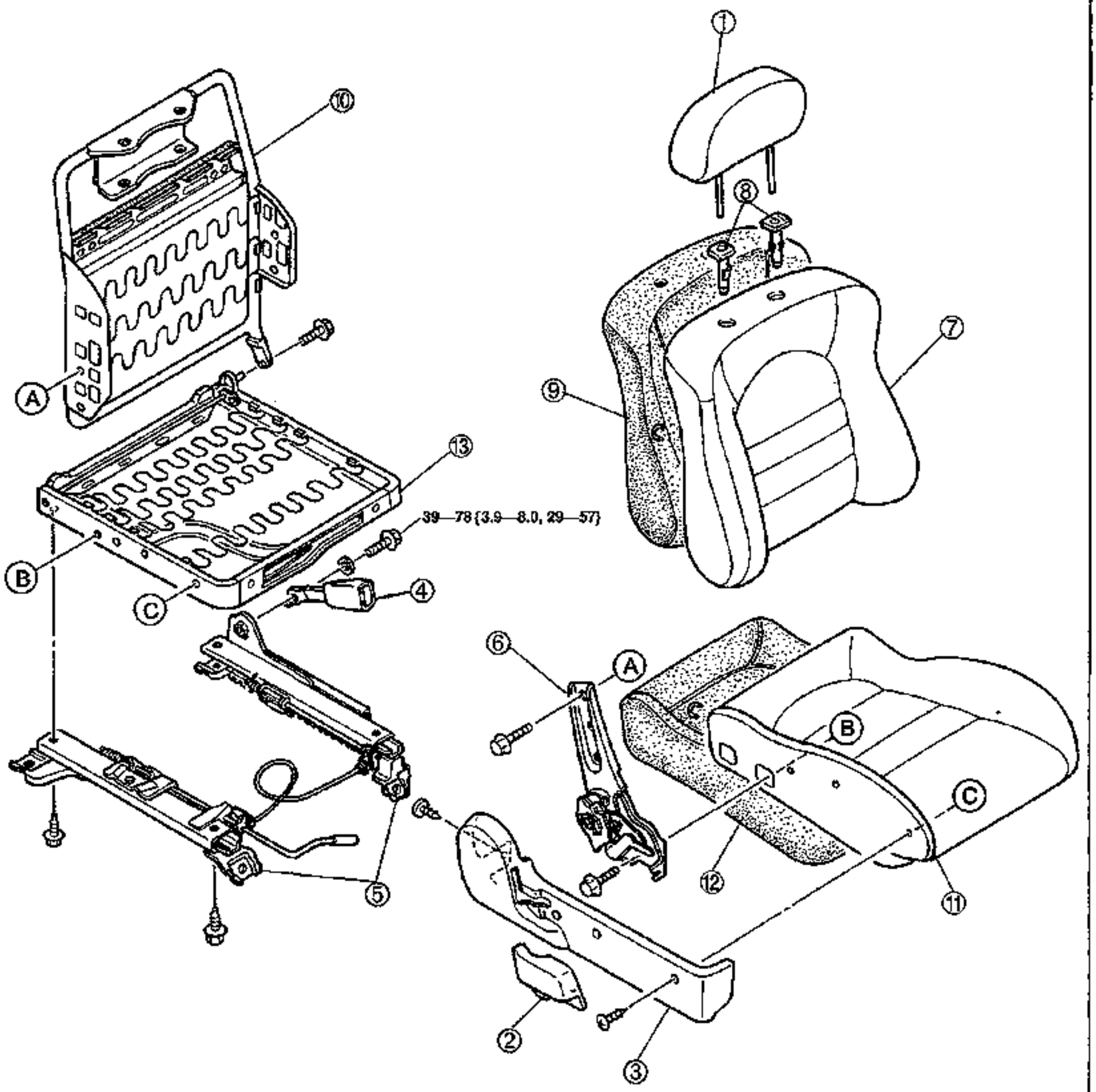
Disassembly / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly note.**
2. Assemble in the reverse order of disassembly.



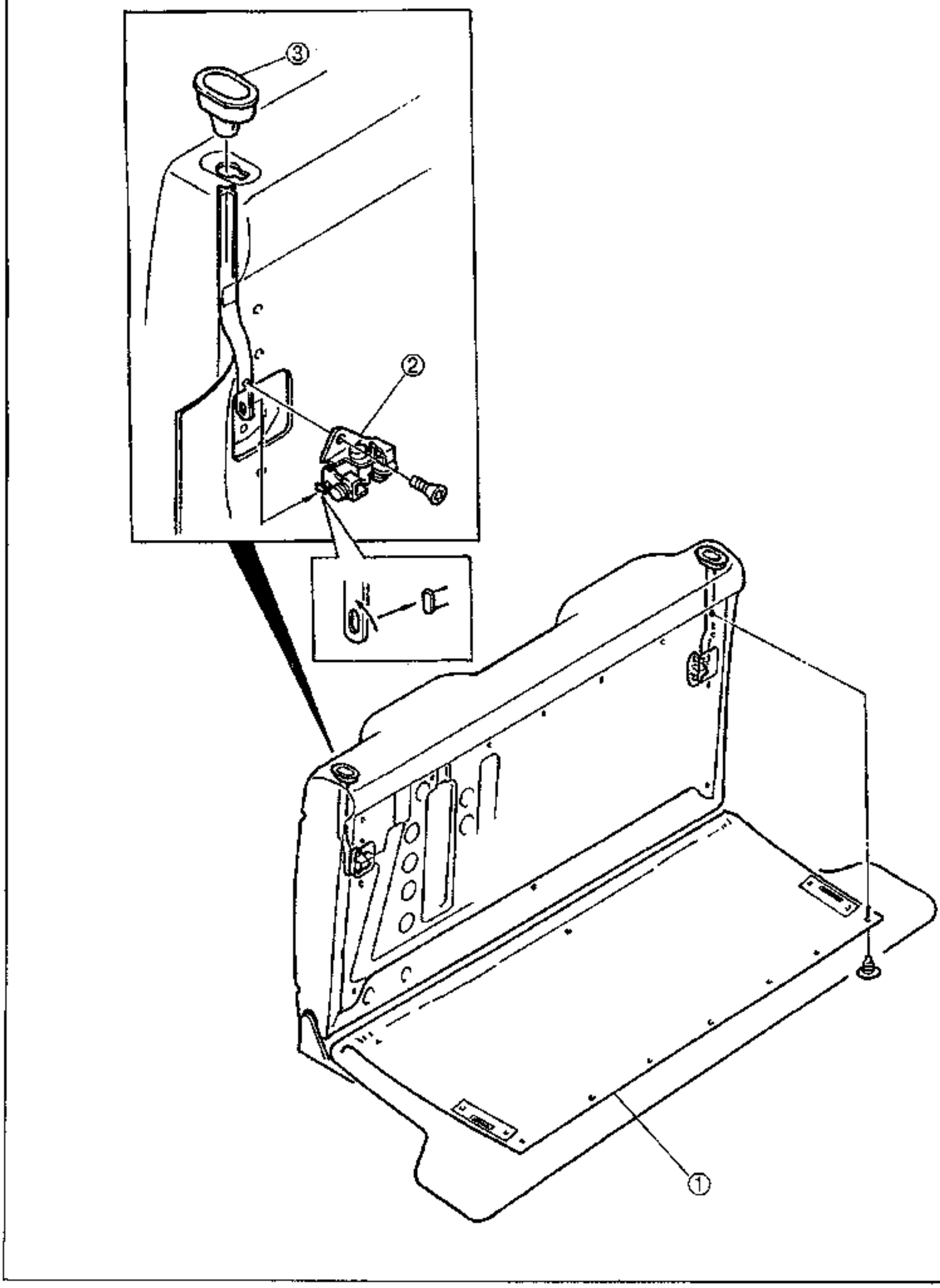
1. Headrest
2. Tilt knob cap
3. Tilt knob
4. Lift knob cap
5. Lift knob
6. Recliner knob
7. Front buckle
8. Slide adjuster
9. Seat side cover
10. Tilt lever
11. Recliner knuckle
12. Seat back trim
    Disassembly note ..... page S–80
13. Pole guide
14. Seat back pad
15. Seat back frame
16. Seat cushion trim
    Disassembly note ..... page S–80
17. Seat cushion pad
18. Seat cushion frame

PASSENGER SEAT

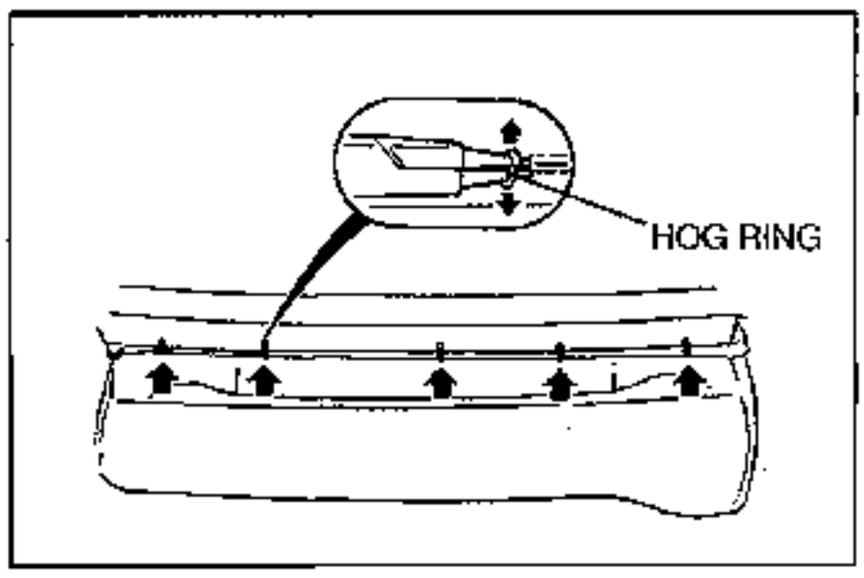


1. Headrest
2. Recliner knob
3. Seat side cover
4. Front buckle
5. Slide adjuster
6. Recliner knuckle
7. Seat back trim
8. Pole guide
9. Seat back pad
10. Seat back frame
11. Seat cushion trim
    Disassembly note ..... page S–80
12. Seat cushion pad
13. Seat cushion frame

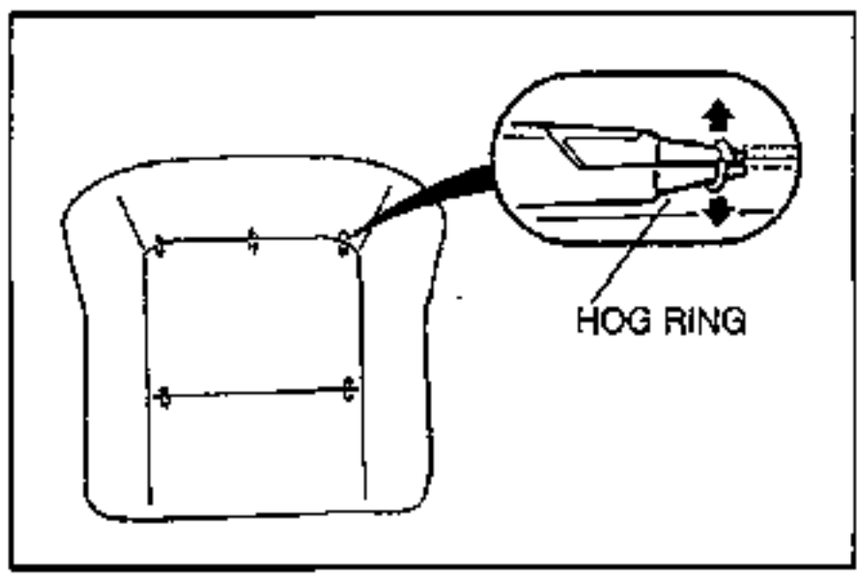
REAR SEAT



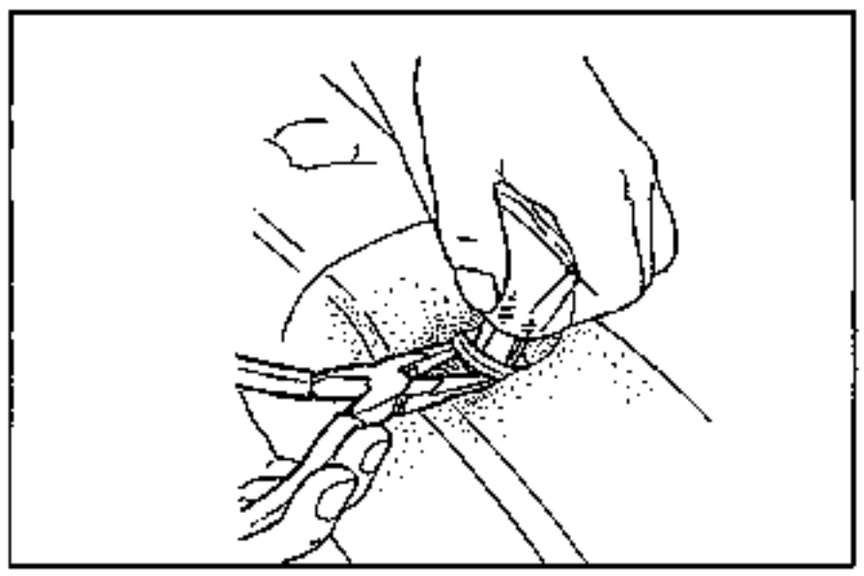
1. Trunk carpet
2. Rear seat back catch lock
3. Rear seat back catch knob



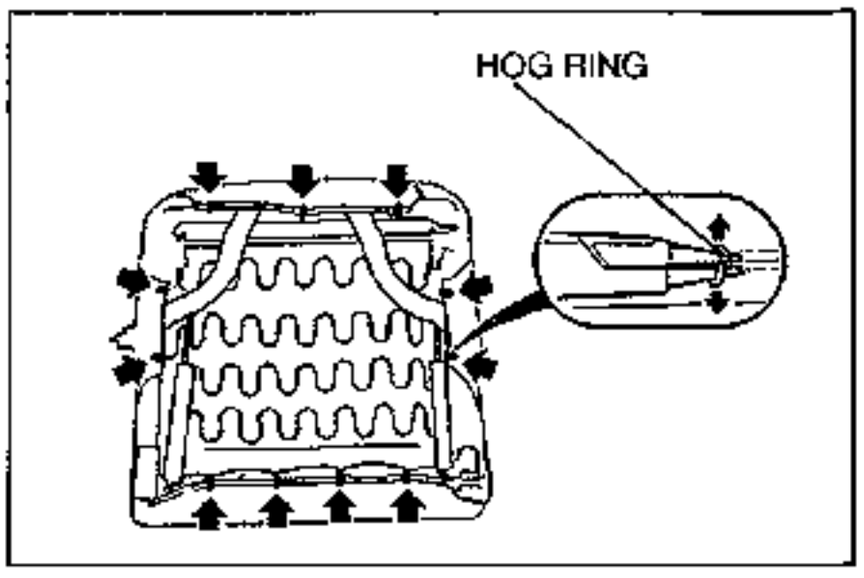
Disassembly note
Seat back trim
1. Remove the hog rings from the lower part of the seat back trim.



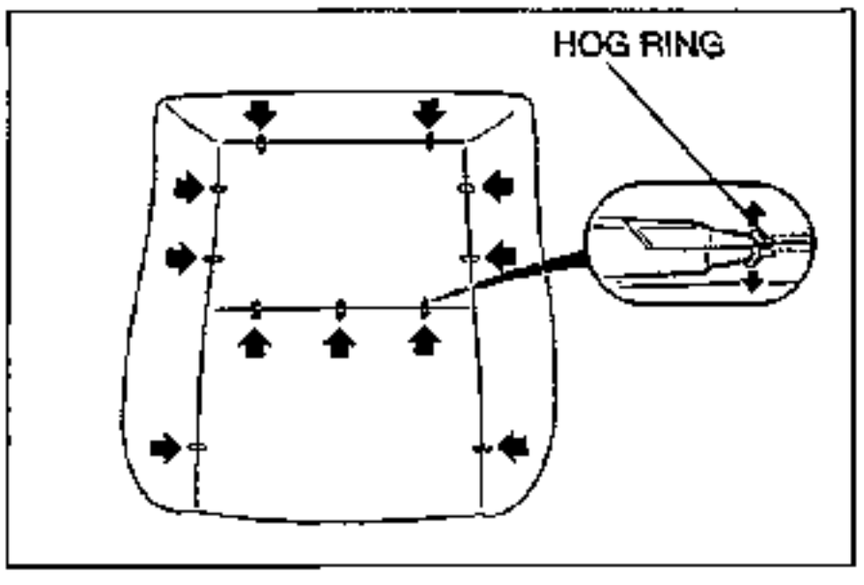
2. Pull the seat back trim away from the padding and remove the remaining hog rings.



3. Remove the pole guide by using pliers as shown in the figure.



Seat cushion trim
1. Remove the hog rings from the bottom of the seat cushion trim.



2. Pull the seat cushion trim away from the padding and remove the remaining hog rings.

SPECIAL TOOLS

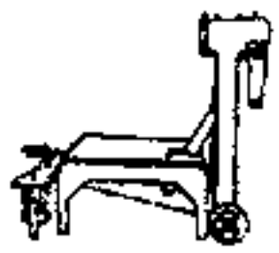
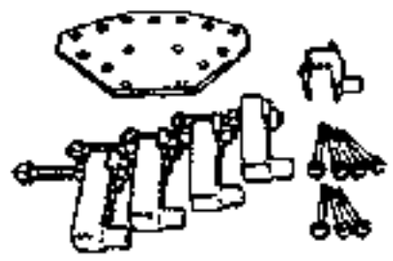
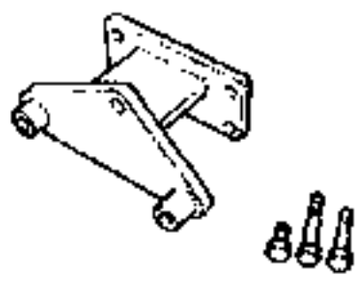
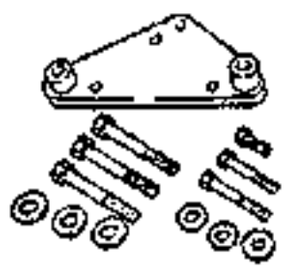
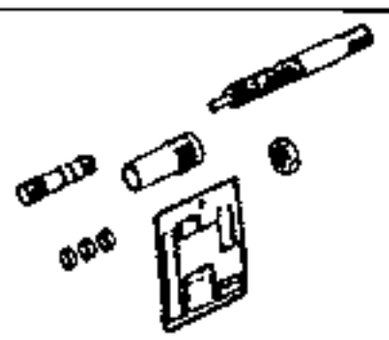
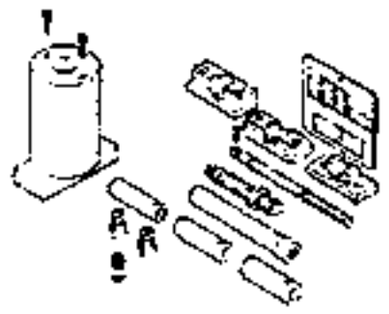
GENERAL INFORMATION ..... ST– 2
ENGINE (K8 DOHC, B6 DOHC) ..... ST– 3
CLUTCH AND MANUAL TRANSAXLE
(F25M–R, G25M–R) ..... ST– 4
AUTOMATIC TRANSAXLE (FA4A–EL) .... ST– 6
FRONT AND REAR AXLES ..... ST– 7
STEERING SYSTEM ..... ST– 8
BRAKING SYSTEM ST–10
FRONT AND REAR SUSPENSIONS ST–12
AIR CONDITIONER SYSTEM ST–12
CHECKER AND OTHER EQUIPMENT ST–12

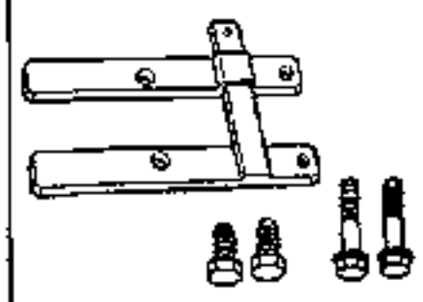
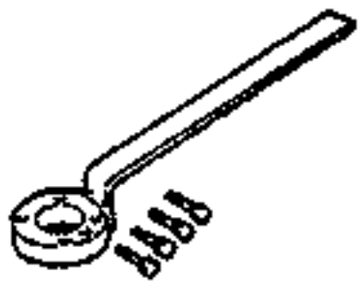
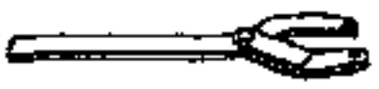
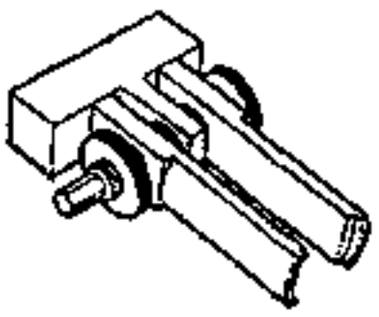
ST

GENERAL INFORMATION

The letters A and B in the priority column indicate the degree of importance of each tool.
A . . . Necessary for performing operation. All service shops should have these tools.
B . . . Selective
Not as necessary as tools ranked A, but these tools will help to perform repairs more easily and efficiently.
When ordering tool sets, check the List in the Parts Catalogue to make sure that some tools in the set are duplicated in other sets you may already have. If they are, instead of ordering the set, order only the tools that are needed.

ENGINE (K8 DOHC, B6 DOHC)

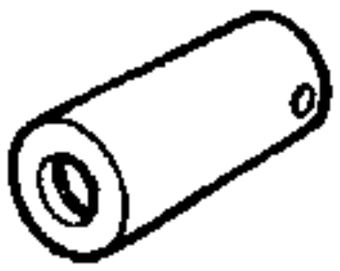
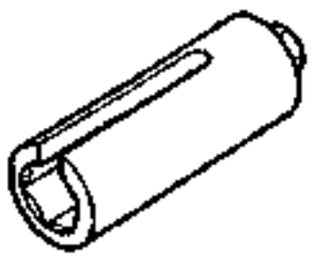
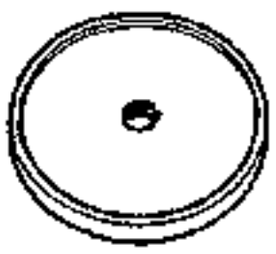
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0107 680A Engine stand Ⓐ	A	
49 L010 1A0 Hanger set, engine stand Ⓒ	A	
49 E010 1A0 Hanger set engine (K8 DOHC) Ⓑ	A	
49 E010 1A1 Hanger set engine (with 49 L010 1A0 K8 DOHC) Ⓑ	A	
49 0636 100B Arm, valve spring litter	A	
49 L012 0A0 Installer set, valve seal & valve guide	A	
49 B012 005 Remover & installer, valve guide	A	
49 L011 0A0B Setting tool set, piston pin (K8 DOHC)	A	

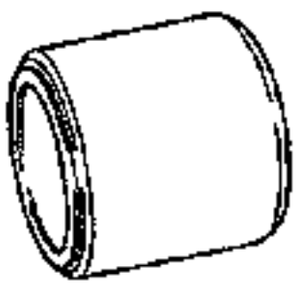
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 E011 1A1 Holder (K8 DOHC)	A	
49 D011 102 Lock tool, crankshaft (B6 DOHC)	A	
49 S120 710 Holder, coupling flange	A	
49 E011 1A0 Brake set, ring gear	A	
49 1285 071 Puller, needle bearing	A	
49 S120 170 Remover, valve seal	A	
49 B012 0A2 Pivot	A	
49 E011 002 Screw (K8 DOHC)	A	

Note SST Ⓐ, Ⓑ, Ⓒ and Ⓓ are used in the following combinations.
- **Use Ⓐ + Ⓑ.**
- **Use Ⓐ + Ⓒ + Ⓓ.**

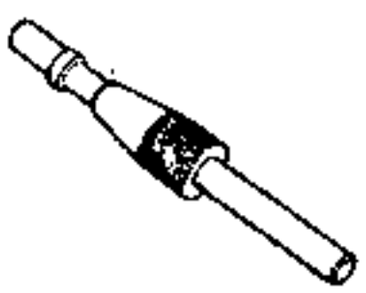
Either combination can be used.

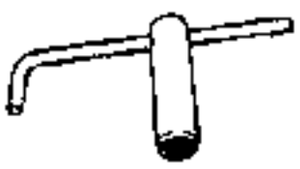
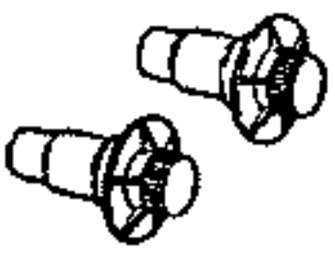
ENGINE (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 E011 001 Guide, piston pin (K8 DOHC)	A	
49 H018 001 Knock sensor wrench (K8 DOHC)	A	
49 0221 061A Installer. Piston Pin (B6 DOHC)	A	
49 W033 105 Installer, oil seal (B6 DOHC) **New SST**	A	
49 H010 401 Installer, oil seal (K8 DOHC) **New SST**	A	

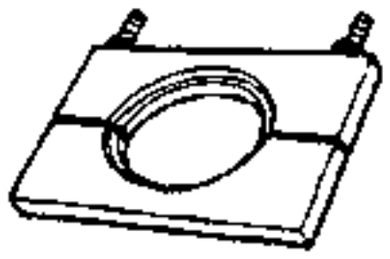
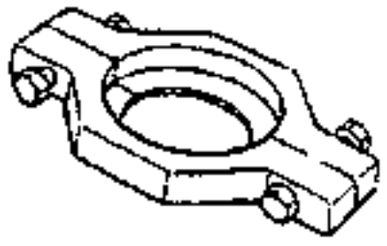
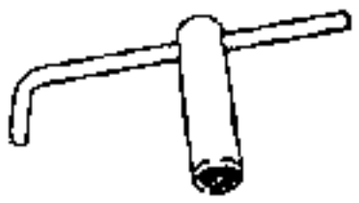
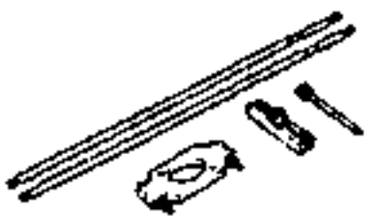
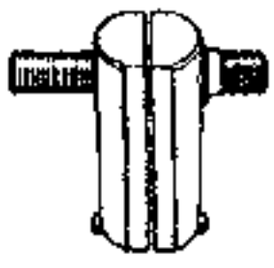
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G014 001 Wrench, oil filter	A	
49 9200 145 Adapter, radiator cap tester	A	
49 E301 144 Removing plate	A	
49 B014 001 Installer, oil seal (K8 DOHC) **New SST**	A	

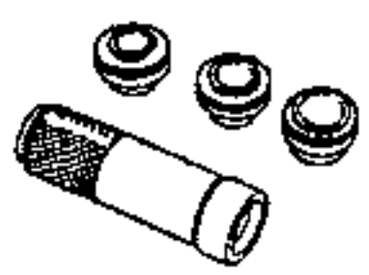
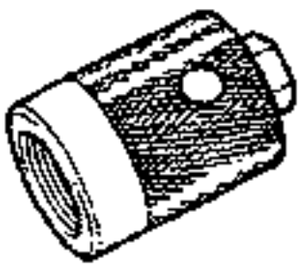
CLUTCH AND MANUAL TRANSAXLE (F25M–R, G25M–R)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G017 5A0 Engine support	A	
49 SE01 310A Clutch disc centering tool	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G030 440 Holder, primary shaft (G25M–R)	A	
49 G030 455 Holder, differential side gear (G25M–R)	A	

CLUTCH AND MANUAL TRANSAXLE (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G030 370 Removing plate	A	
49 0636 145 Puller, fan pulley boss	A	
49 G017 1A0 Remover set, bearing	A	
49 G030 380D Shim selector set	A	
49 F401 440 Holder, primary shaft (F25M–R)	A	
49 0187 520 Bearing puller, rear axle shaft (F25M–R)	A	
49 G019 0A0 Hanger, transaxle	A	
49 FT01 361 Remover, bearing **New SST**	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 F401 330B Installer set, bearing	A	
49 B001 795 Installer, oil seal	A	
49 B017 102 Preload adapter (G25M–R)	A	
49 G017 202 Preload adapter (G25M–R)	A	
49 0839 425C Puller set, bearing	A	
49 G030 338 Attachment E (G25M–R) **New SST**	A	
49 F401 381B Selector ø60 (F25M–R) **New SST**	A	

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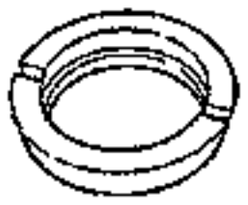
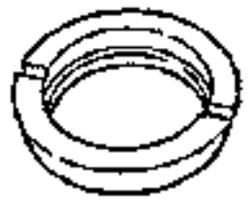
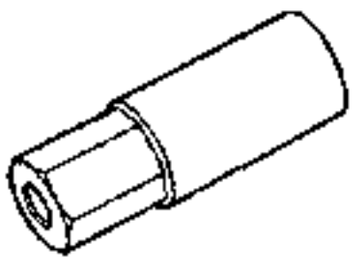
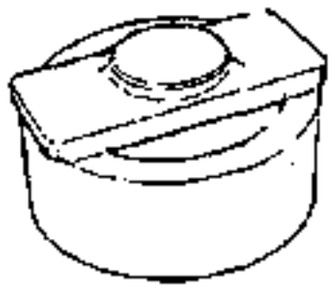
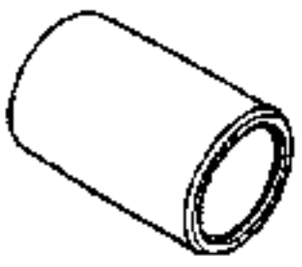
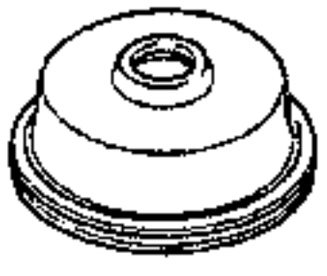
CLUTCH AND MANUAL TRANSAXLE (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G019 019 Bolt set (F25M–R) **New SST**	A	
49 B092 369 Attachment C (F25M–R) **New SST**	A	

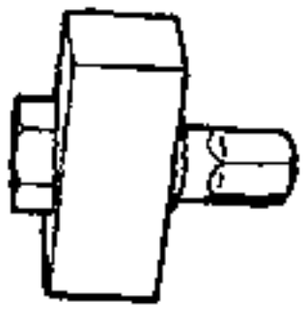
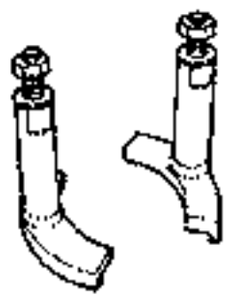
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B027 002A Preload Adapter (F25M–R) **New SST**	A	
49 B092 371 Attachment E (F25M–R) (FA4A–EL) **New SST**	A	

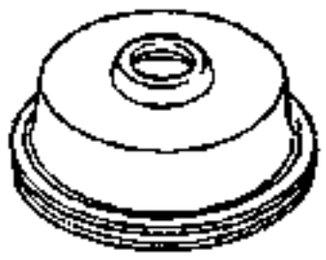
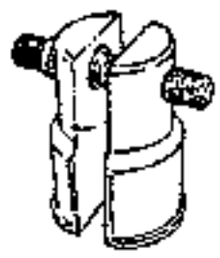
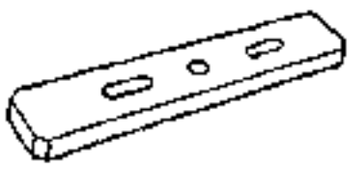
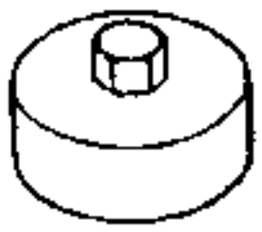
AUTOMATIC TRANSAXLE(FA4L–EL)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G030 795 Installer, oil seal	A	
49 G019 029 Nut	A	
49 B019 002 Body	A	
49 H019 002 Adapter	A	
49 B019 008 Leak checker	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0378 400B Gauge set, oil pressure	A	
49 B019 901 Oil pressure gauge	A	
49 G019 017 Installer, oil seal	A	
49 S120 765 Installer, dust boot	A	
49 B019 004 Adapter (B6 DOHC)	B	

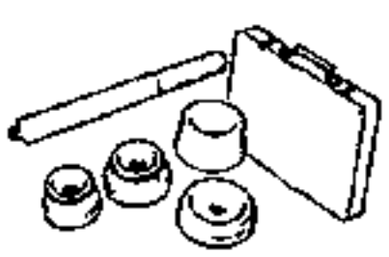
AUTOMATIC TRANSAXLE (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 FT01 439 Holder, idler gear shaft	A	
49 G019 0A2 Holder, turbine shaft	A	
49 G019 025 Body B	A	
49 G019 027 Attachment A	A	
49 FT01 384 Collar	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B019 005 Adapter (K8 DOHC)	B	
49 G019 013 Remover, bearing	A	
49 G019 026 Plate	A	
49 B019 007 Preload adaptor	A	
49 D019 001 Bolt	A	

FRONT AND REAR AXLES

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G033 102 Handle	A	
49 H034 201 Support block	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 V001 795 Installer, oil seal	A	
49 F027 0A1 Installer set, bearing	A	

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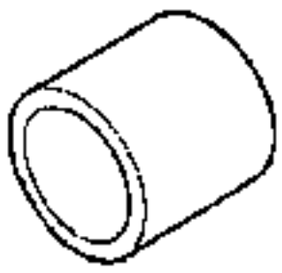
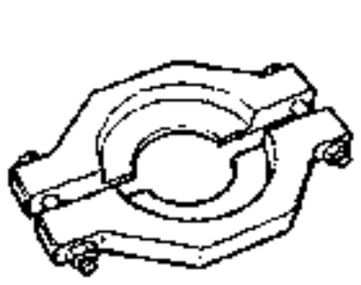
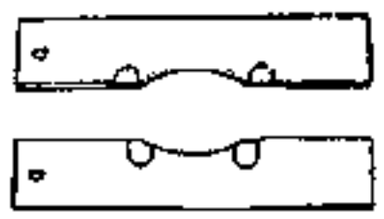
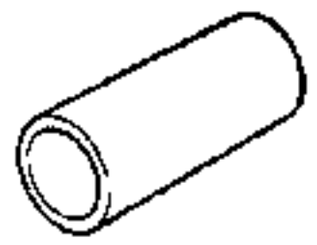
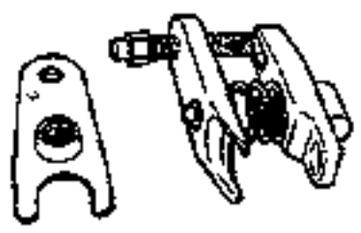
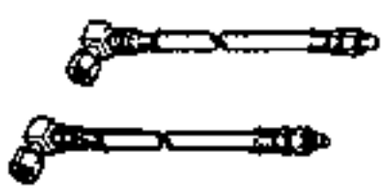
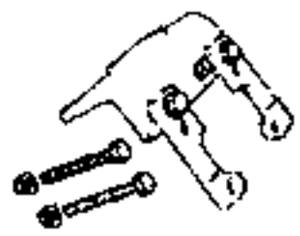
FRONT AND REAR AXLES (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 F026 102 Installer bearing	A	
49 W027 003 Installer bearing	A	
49 H027 002 Remover bearing	A	
49 B025 004 Installer dust seal (B6 DOHC)	A	

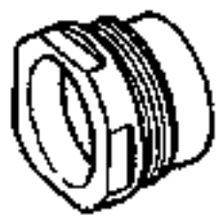
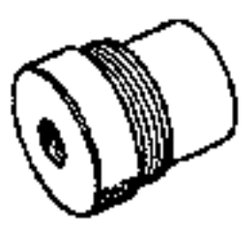
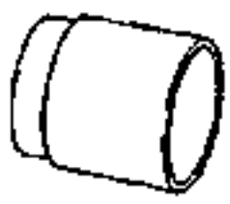
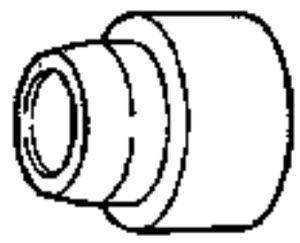
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 F026 103 Puller, wheel hub	A	
49 E033 101 Installer, dust cover	A	
49 G030 727 Attachment	A	
49 B025 005 Installer dust cover (K8 DOHC)	A	

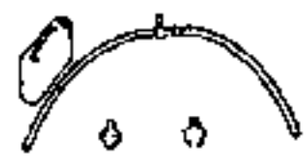
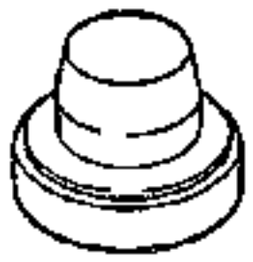
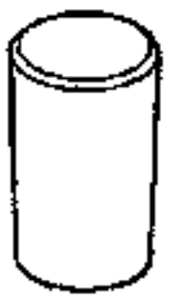
STEERING SYSTEM

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 T028 3A0 Puller set, ball joint **New SST**	A	
49 H002 671 Adapter	A	
49 1232 670A Gauge set, power steering	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B032 321 Adapter (B6 DOHC)	A	
49 F032 301 Hanger, power steering pump (K8 DOHC)	B	
49 E032 303 Installer, bearing (K8 DOHC)	A	

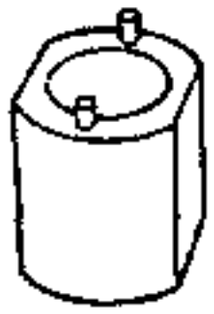
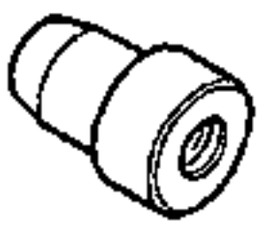
STEERING SYSTEM (CONT'D)

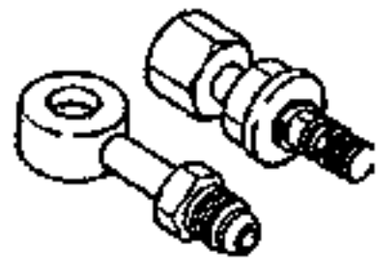
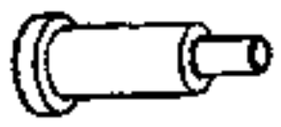
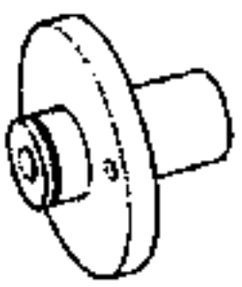
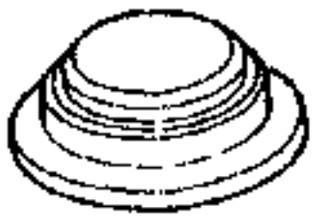
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G032 3A4 Adapter, power steering gauge (K8 DOHC) **New SST**	A	
49 E032 301 Installer, oil seal (K8 DOHC)	A	
49 E032 302 Installer guide, oil seal and spacer (K8 DOHC)	A	
49 B032 311 Protector, slipper seal (B6 DOHC)	A	
49 B032 309 Installer body, pinion seal (B6 DOHC)	A	
49 B032 310 Protector, pinion seal (B6 DOHC)	A	
49 B032 306 Wrench, plug (B6 DOHC)	A	
49 B032 320 Wrench (B6 DOHC)	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 E032 304 Installer, pinion seal (K8 DOHC)	A	
49 G032 3A1 Joint hose set	A	
49 G032 3A0 Repair set, power steering	A	
49 B032 315 Installer, oil seal (B6 DOHC)	A	
49 B032 316 Support block, plug (B6 DOHC)	A	
49 B032 317 Remover, bearing & oil seal (B6 DOHC)	A	
49 B032 312 Protector, slipper seal (B6 DOHC)	A	
49 G030 797 Handle (B6 DOHC)	A	

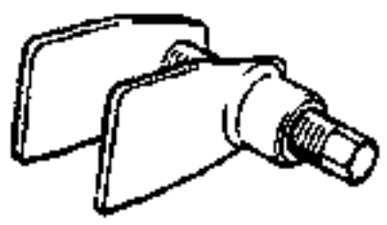
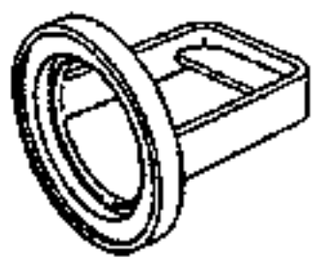
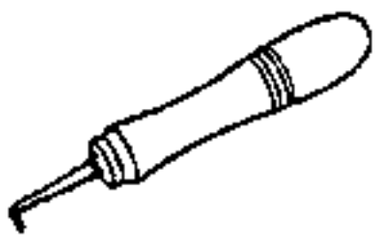
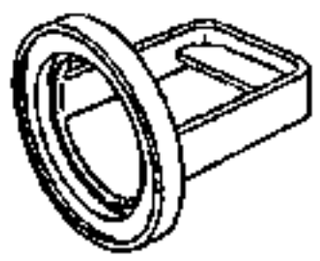
ST

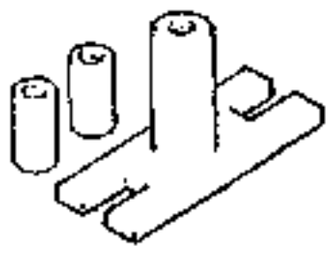
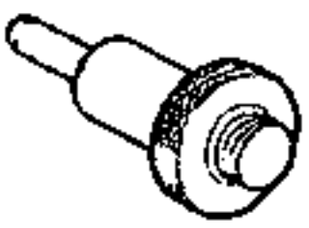
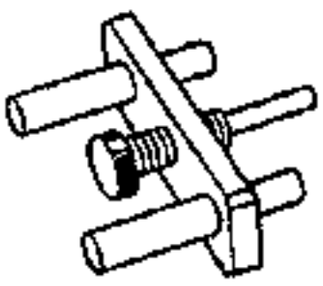
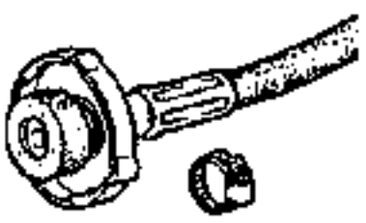
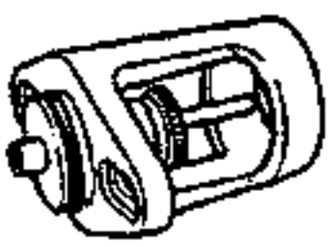
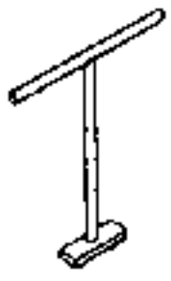
STEERING SYSTEM (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B032 314 Slipper seal former (B6 DOHC)	A	
49 B032 307 Wrench, outer box (B6 DOHC)	A	
49 B032 313 Protector, outer box (B6 DOHC)	A	
49 B032 308 Remover body, rod seal (B6 DOHC)	A	
49 G032 335 Installer, oil seal (B6 DOHC)	A	
49 0259 770B Wrench. flare nut	A	
49 Z043 0A0 Adjuster set piston (K8 DOHC)	A	

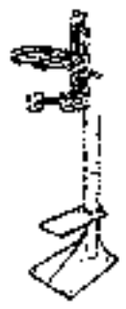
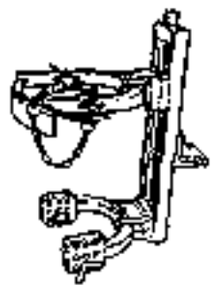
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 H032 301 Wrench (K8 DOHC)	A	
49 B032 304 Adapter (B6 DOHC)	A	
49 B032 318 Guide, rod seal (B6 DOHC)	A	
49 B032 319 Protector body, rod seal (B6 DOHC)	A	
49 B032 305 Holder, power steering pump (B6 DOHC)	A	
49 E043 001A Gauge, push rod (K8 DOHC)	A	
49 E043 002A Installer, retainer (K8 DOHC)	A	

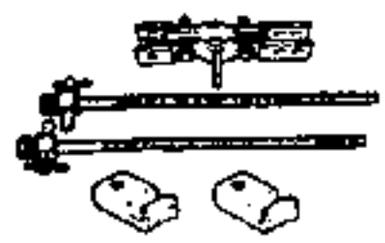
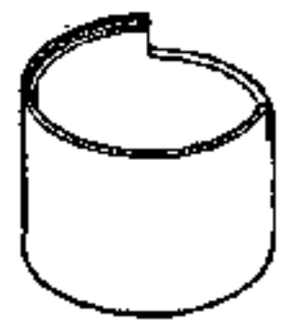
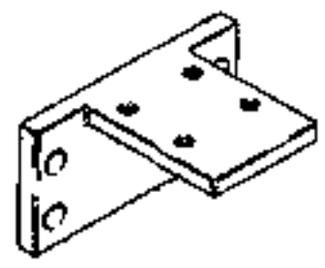
BRAKING SYSTEM

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0221 600C Expand tool, disc brake	A	
49 Z043 001 Wrench, cap nut (K8 DOHC)	A	
49 M005 796 Installer bearing (K8 DOHC) (ABS)	A	
49 G025 001 Sensor rotor installer (K8 DOHC)	A	
49 0208 701A Air out tool, boot	B	
49 B025 003 Sensor rotor Installer (B6 DOHC)	A	
49 U043 0A0 Gauge set oil pressure	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 E043 003 Lock tool, turning	A	
49 B043 004 Socket wrench (K8 DOHC)	A	
49 Z043 002 Adapter (K8 DOHC)	A	
49 F043 001 Adjust gauge (B6 DOHC)	A	
49 R015 002 Hose, pressure (K8 DOHC)	A	
49 B043 001 Adjust gauge (B6 DOHC)	A	
49 FA18 602 Wrench disc brake piston	A	

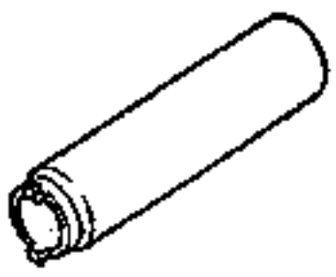
FRONT AND REAR SUSPENSIONS

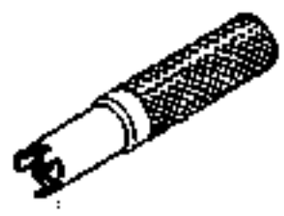
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 1243 785 Installer, dust boot	A	
49 0180 510B Attachment preload	B	
49 T034 1A0 Compressor set, coil spring Ⓑ **New SST**	A	
49 T034 101 Compressor, coil spring Ⓓ **New SST**	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G034 1A0 Compressor, coil spring Ⓐ	A	
49 B034 201 Support block	B	
49 T034 105 Attachment Ⓒ **New SST**	B	

Note SST Ⓐ, Ⓑ, Ⓒ and Ⓓ are used in the following combinations.
- **Use Ⓐ only.**
- **Use Ⓑ only.**
- **Use Ⓒ + Ⓓ + 49 0107 680A Engine stand**
  Either combination can be used.

AIR CONDITIONER SYSTEM

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B061 005 Replacer, seal plate	A	

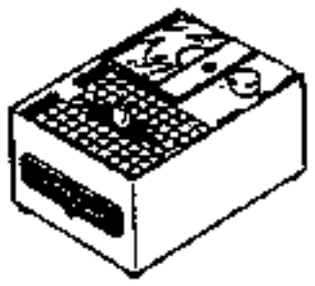
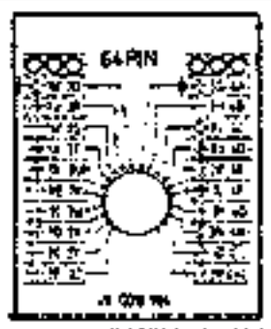
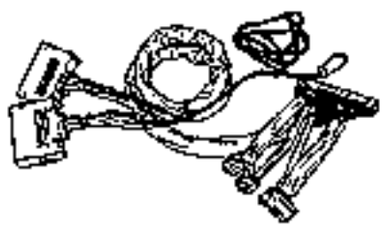
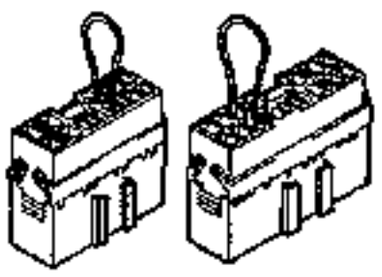
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B061 006 Replacer, shaft seal	A	

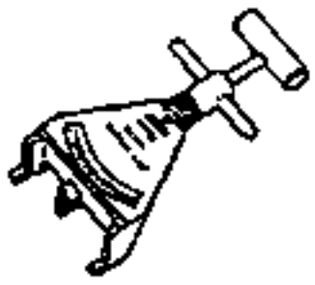
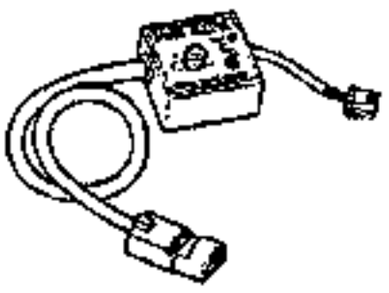
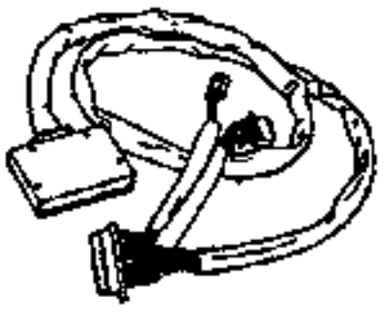
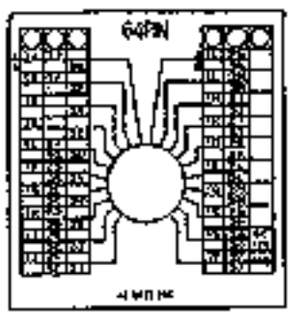
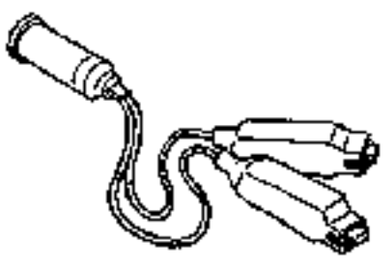
CHECKER AND OTHER EQUIPMENT

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0839 285 Checker, fuel & thermometer	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0187 280 Gauge, oil pressure	B	

CHECKER AND OTHER EQUIPMENT (CONT'D)

49 H018 9A1 Checker, self-disgnosis	A	
49 9200 162A Monitor, engine signal	A	
49 G018 904 Sheet (EC–AT)	A	
49 UN01 050 Radio Removing tool	A	
49 0305 870A Tool set, window	A	
49 L018 901 Injector checker (B6 DOHC)	A	
49 T018 902 Adapter harness (ECM) **New SST**	A	
49 H066 004 Short circuit connector	A	

49 H066 002 Deployment tool	A	
49 9200 020A V-ribbed belt tension gauge	B	
49 E018 9A0 Injector checker (K8 DOHC)	B	
49 B019 9A0 System selector	A	
49 G050 1A0 Remover, sealant	A	
49 D019 902 Adapter harness (EC–AT)	A	
49 G018 906 Sheet (ECM) **New SST**	A	
49 D088 008 Harness adapter power (ECM) **New SST**	A	

TECHNICAL DATA

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E2. COOLING SYSTEM (K8) TD–11
F1. FUEL AND EMISSION CONTROL SYSTEMS (B6) TD–13
F2. FUEL AND EMISSION CONTROL SYSTEMS (K8) TD–14
G. ENGINE ELECTRICAL SYSTEM TD–15
H. CLUTCH TD–16
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STANDARD BOLT AND NUT TIGHTENING TORQUES TD–27

B1. ENGINE (B6)

Item \ Engine			B6 DOHC
Type			Gasoline, 4-cycle
Cylinder arrangement and number			In-line, 4-cylinders
Combustion chamber			Pentroof
Valve system			DOHC, belt-driven 16 valves
Bore × Stroke mm {in}			78.0 × 83.6 {3.07 × 3.29}
Total piston displacement ml {cc, cu in}			1,598 {1,598, 97.5}
Compression ratio			9.4
Compression pressure kPa {kgf/cm², psi}-rpm	Standard		1,324 {13.5,192}-300
	Minimum		932 {9.5,135}-300
	Maximum difference between each cylinder		196 {2.0, 28}
Valve timing	IN	Open BTDC	5°
		Close ABDC	51°
	EX	Open BBDC	15°
		Close ATDC	55°
Valve clearance mm {in}	IN		0:Maintenance-free
	EX		0:Maintenance-free
Cylinder head			
Height mm {in}			133.8–134.0 {5.268–5.275}
Distortion mm {in}			0.15 {0.006} max.
Grinding mm {in}			0.10 {0.004} max.
Cylinder head-to-HLA clearance mm {in}		Standard	0.025–0.066 {0.0010–0.0026}
		Maximum	0.18 {0.0071}
Valve and valve guide			
Valve head diameter mm {in}		IN	30.9–31.1 {1.217–1.224}
		EX	26.1–26.3 {1.028–1.035}
Valve head margin thickness mm {in}		IN	0.9–1.3 {0.035–0.051}
		EX	1.0–1.4 {0.039–0.055}
Valve face angle		IN	45°
		EX	45°
Valve length mm {in}	IN	Standard	105.29 {4.1452}
		Minimum	104.89 {4.1295}
	EX	Standard	105.39 {4.1492}
		Minimum	104.99 {4.1335}
Valve stem diameter mm {in}		IN	5.970–5.985 {0.2350–0.2356}
		EX	5.965–5.980 {0.2348–0.2354}
Guide inner diameter mm {in}			6.01–6.03 {0.2366–0.2374}
Valve stem-to-guide clearance mm {in}		IN	0.025–0.060 {0.0010–0.0024}
		EX	0.030–0.065 {0.0012–0.0026}
		Maximum	0.20 {0.008}
Guide projection (Height "A") mm {in}		IN	16.8–17.4 {0.661–0.685}
		EX	16.8–17.4 {0.661–0.685}

Item \ Engine			B6 DOHC
Valve seat			
Seat angle		IN	45°
		EX	45°
Seat contact width		mm{in}	0.8–1.4 {0.031–0.055}
Seat sinking	mm {in}	Standard	43.5 {1.713}
		Maximum	45.0 {1.772}
Valve spring			
Free length	mm {in}	IN	48.01 {1.6902}
		EX	48.34 {1.9031}
Minimum length	mm {in}	IN	40.0 {1.575} with a set load of 217.0–245.6 N {22.13–25.05 kgf, 48.69–55.11 lbf}
		EX	40.0 {1.575} with a set load of 209.6–242.2 N {21.37–24.70 kgf, 23.57–54.34 lbf}
Out-of-square	mm {in}	IN	1.68 {0.0661} max.
		EX	1.69 {0.0665} max.
Setting load/height	N {kgf, lbf}/mm {in}	IN	217–246 {22.1–25.1, 48.6–55.2}/40.0 {1.575}
		EX	174–196 {17.7–20.0, 38.9–44.0}/40.0 {1.575}
Camshaft			
Cam height	mm {in}	IN Standard	40.888 {1.6098}
		IN Minimum	40.688 {1.6019}
		EX Standard	40.886 {1.6097}
		EX Minimum	40.686 {1.6018}
Journal diameter	mm {in}	Standard (No.1–No.5)	33.961–34.000 {1.3370–1.3386}
		Out-of-round	0.05 {0.002} max.
Camshaft bearing oil clearance	mm {in}	Standard (No.1–No.5)	0.035–0.081 {0.0014–0.0031}
		Maximum	0.15 {0.006}
Camshaft runout		mm{in}	0.03 {0.0012} max.
Camshaft end play	mm {in}	Standard	0.07–0.19 {0.0028–0.0074}
		Maximum	0.20 {0.008}
Cylinder block			
Height		mm {in}	221.5 {8.720}
Distortion		mm {in}	0.05 {0.002} max.
Cylinder bore diameter	mm{in}	Standard size	78.006–78.013 {3.0711–3.0713}
		0.25{0.010} oversize	78.256–78.263 {3.0809–3.0812}
		0.50{0.020} oversize	78.506–78.513 {3.0908–3.0910}
Cylinder bore taper and out-of-round		mm {in}	0.019 {0.0007} max.
Piston			
Piston diameter Measured at 90° to pin bore axis and 16.5mm {0.650 in} below oil ring groove	mm {in}	Standard size	77.954–77.974 {3.0690–3.0698}
		0.25 {0.010} oversize	78.211–78.217 {3.0792–3.0794}
		0.50 {0.020} oversize	78.461–78.467 {3.0890–3.0892}
Piston-to-cylinder clearance	mm {in}	Standard	0.039–0.052 {0.0015–0.0020}
		Maximum	0.15 {0.006}

Item \ Engine			B6 DOHC
Piston ring			
Thickness mm {in}		Top	1.47–1.49 {0.0579–0.0587}
		Second	1.47–1.49 {0.0579–0.0587}
End gap (Measured in cylinder) mm {in}		Top	0.15–0.30 {0.006–0.012}
		Second	0.30–0.45 {0.012–0.018}
		Oil (rail)	0.20–0.70 {0.008–0.028}
		Maximum	1.0 {0.039}
Ring groove width in piston mm {in}		Top	1.52–1.54 {0.0598–0.0606}
		Second	1.52–1.54 {0.0598–0.0606}
		Oil	4.02–4.04 {0.1583–0.1591}
Piston ring-to-ring groove clearance mm{in}		Top	0.03–0.07 {0.0012–0.0028}
		Second	0.03–0.07 {0.0012–0.0028}
		Maximum	0.15 {0.006}
Piston pin			
Diameter mm {in}			19.987–19.993 {0.7869–0.7871}
Piston-to-pin clearance mm {in}			–0.005–0.013 {–0.0002–0.0005}
Connecting rod bush-to-piston pin clearance mm {in}			0.010–0.027 {0.0004–0.0010}
Connecting rod and connecting rod bearing			
Length (Center to center) mm {in}			132.85–132.95 {5.230–5.234}
Bending mm {in}			0.075 {0.0030} max./50 {1.97}
Small end bore (Bush inner diameter) mm {in}			20.003–20.014 {0.7875–0.7880}
Big end bore mm {in}			48.000–48.016 {1.8898–1.8904}
Big end width mm {in}			21.838–21.890 {0.8598–0.8618}
Connecting rod side clearance mm {in}		Standard	0.110–0.262 {0.0043–0.0103}
		Maximum	0.30 {0.012}
Crankshaft			
Crankshaft runout mm {in}			0.04 {0.0016} max.
Main journal diameter mm {in}	Standard size	Standard	49.938–49.956 {1.9661–1.9668}
		Minimum	49.904 {1.9647}
	0.25 {0.010} undersize	Standard	49.704–49.708 {1.9568–1.9570}
		Minimum	49.652 {1.9548}
	0.50 {0.020} undersize	Standard	49.454–49.458 {1.9470–1.9472}
		Minimum	49.402 {1.9450}
	0.75 {0.030} undersize	Standard	49.204–49.208 {1.9372–1.9373}
		Minimum	49.152 {1.9351}
Main journal taper and out-of round mm {in}			0.05 {0.002} max.
Crankpin diameter mm {in}	Standard size	Standard	44.940–44.956 {1.7693–1.7699}
		Minimum	44.908 {1.7680}
	0.25 {0.010} undersize	Standard	44.690–44.706 {1.7594–1.7601}
		Minimum	44.658 {1.7582}
	0.50 {0.020} undersize	Standard	44.440–44.456 {1.7496–1.7502}
		Minimum	44.408 {1.7483}
	0.75 {0.030} undersize	Standard	44.190–44.206 {1.7398–1.7404}
		Minimum	44.158 {1.7385}
Crankpin taper and out-of-round mm {in}			0.05 {0.002} max.

Item \ Engine			B6 DOHC
Main bearing			
Main journal bearing oil clearance mm{in}		Standard	0.018–0.036 {0.0007–0.0014}
		Maximum	0.10 {0.004}
Available undersize bearing mm {in}			0.25 {0.010}, 0.50 {0.020}, 0.75 {0.030}
Crankpin bearing			
Crankpin bearing oil clearance mm {in}		Standard	0.028–0.068 {0.0011–0.0027}
		Maximum	0.10 {0.004}
Available undersize bearing mm {in}			0.25 {0.010}, 0.50 {0.020}, 0.75 {0.030}
Thrust bearing			
Crankshaft end play mm {in}		Standard	0.080–0.282 {0.0031–0.0111}
		Maximum	0.30 {0.012}
Bearing width mm {in}	Standard size		2.500–2.550 {0.0984–0.1004}
	0.25 {0.010} oversize		2.625–2.675 {0.1033–0.1053}
	0.50 {0.020} oversize		2.750–2.800 {0.1083–0.1102}
	0.75 {0.030} oversize		2.875–2.925 {0.1132–0.1152}
Timing belt			
Belt deflection	mm {in}/98 N {10 kgf, 22 lbf}		9.0–11.5 {0.35–0.45}

B2. ENGINE (K8)

Item \ Engine			K8 DOHC
Type			Gasoline, 4–cycle
Cylinder arrangement and number			60° vconfiguration 6 cylinders
Combustion chamber			Pentroof
Valve system			DOHC, belt-driven 24 valves
Bore × Stroke mm {in}			75 × 69.6 {2.95 × 2.74}
Total piston displacement ml {cc, cu in}			1,844 {1,844, 112.4}
Compression ratio			9.2
Compression pressure kPa {kgf/cm², psi}-rpm	Standard		1,334 {13.6, 198–300}
	Minimum		981 {10.0, 142–300}
	Maximum difference between each cylinder		196 {2.0, 28}
Valve timing	IN	Open BTDC	6°
		Close ABDC	37°
	EX	Open BBDC	49°
		Close ATDC	6°
Valve clearance mm {in}		IN	0: Maintenance-free
		EX	0: Maintenance-free
Cylinder head			
Height mm {in}			133.5–133.6 {5.252–5.259}
Distortion mm {in}			0.10 {0.004} max.
Grinding mm {in}			0.15 {0.006} max.
Cylinder head-to-HLA clearance mm {in}		Standard	0.025–0.066 {0.00099–0.00259}
		Maximum	0.18 {0.0071}
Valve and valve guide			
Valve head diameter mm {in}		IN	28.35–28.65 {1.117–1.127}
		EX	22.95–23.25 {0.904–0.915}
Valve head margin thickness mm {in}		IN	0.9 {0.035} min.
		EX	1.0 {0.039} min.
Valve face angle		IN	45°
		EX	45°
Valve length mm {in}	IN	Standard	94.11 {3.7051}
		Minimum	93.61 {3.6854}
	EX	Standard	95.19 {3.7476}
		Minimum	94.69 {3.7279}
Valve stem diameter mm {in}		IN	5.970–5.985 {0.2351–0.2356}
		EX	5.965–5.980 {0.2349–0.2354}
Guide inner diameter mm {in}			6.01–6.03 {0.2367–0.2374}
Valve stem-to-guide clearance mm {in}		IN	0.025–0.060 {0.0010–0.0023}
		EX	0.030–0.065 {0.0012–0.0025}
		Maximum	0.20 {0.008}
Guide projection (Height "A") mm {in}		IN	14.7–15.3 {0.579–0.602}
		EX	12.2–12.8 {0.481–0.503}

Item \ Engine			K8 DOHC		
Valve seat					
Seat angle		IN	45°		
		EX	45°		
Seat contact width mm {in}		IN	0.8–1.4 {0.032–0.055}		
		EX	0.8–1.4 {0.032–0.055}		
Seat sinking mm {in}	IN	Standard	41.5 {1.634}		
		Maximum	43.1 {1.697}		
	EX	Standard	41.5 {1.634}		
		Maximum	43.1 {1.697}		
Valve spring					
Free length	Standard mm {in}		46.92 {1.847}		
	Minimum mm {in}/ N {kgf, lbf}		38.7 {1.524}/233–263 {23.75–26.88, 171.8–194.4}		
Out-of-square	mm{in}		1.63 {0.064}		
Camshaft					
Cam height mm {in}	IN	Standard	42.665 {1.6797}		
		Wear limit	42.465 {1.6718}		
	EX	Standard	43.516 {1.7132}		
		Wear limit	43.318 {1.705}		
Journal diameter mm {in}	Journal number		No.1	No.2, 3, 4	No.5
	RH cylinder head	IN	29.975–29.995 {1.1802–1.1809}	25.910–25.930 {1.0201–1.0208}	25.940–25.960 {1.0213–1.0220}
		EX	25.940–25.960 {1.0213–1.0220}		
	LH cylinder head	IN	25.940–25.960 {1.0213–1.0220}		
		EX	29.975–29.995 {1.1802–1.1809}		
	Out-of-round		0.02 {0.0008}		
Camshaft bearing oil clearance mm {in}	RH cylinder head	IN	0.040–0.081 {0.0016–0.0031}	0.070–0.111 {0.0028–0.0043}	0.040–0.081 {0.0016–0.0031}
		EX			
	LH cylinder head	IN			
		EX			
	Maximum		0.120 {0.0047}	0.150 {0.0059}	0.120 {0.0047}
Camshaft runout	mm{in}		0.02 {0.0008} max.		
Camshaft end play mm {in}		Standard	0.05–0.10 {0.0020–0.0039}		
		Maximum	0.14 {0.006}		
Cylinder block					
Distortion	mm {in}		0.15 {0.006} max.		
Cylinder bore diamete mm {in}	Standard size		75.000–75.022 {2.9528–2.9536}		
	0.25 {0.010} oversize		75.250–75.272 {2.9626–2.9634}		
	0.50 {0.020} oversize		75.500–75.522 {2.9725–2.9733}		
Cylinder bore taper and out-of-round	mm {in}		0.022 {0.0009} max.		
Piston					
Piston diameter Measured at 90° to pin bore axis and 16.5mm {0.650 in} below oil ring groove mm {in}	Standard size		74.953–74.985 {2.9509–2.9521}		
	0.25 {0.010} oversize		75.203–75.235 {2.9608–2.9620}		
	0.50 {0.020} oversize		75.453–75.485 {2.9706–2.9718}		
Piston to cylinder clearance mm {in}		Standard	0.028–0.056 {0.0011–0.0022}		
		Maximum	0.15 {0.006}		

Item \ Engine			K8 DOHC
Piston ring			
Thickness mm {in}		Top	1.47–1.50 {0.0579–0.0590}
		Second	1.47–1.49 {0.0579–0.0586}
End gap (Measured in the cylinder) mm {in}		Top	0.15–0.28 {0.006–0.011}
		Second	0.25–0.38 {0.010–0.014}
		Oil (rail)	0.20–0.70 {0.008–0.027}
		Maximum	1.0 {0.039}
Ring groove width in piston mm {in}		Top	1.520–1.535 {0.0599–0.0604}
		Second	1.520–1.535 {0.0599–0.0604}
		Oil	3.02–3.04 {0.1189–0.1196}
Piston ring-to-ring groove clearance mm {in}		Top	0.020–0.065 {0.008–0.0025}
		Second	0.030–0.065 {0.0012–0.0025}
		Maximum	0.15 {0.006}
Piston pin			
Diameter mm {in}			18.974–18.980 {0.7470–0.7472}
Piston-to-piston pin clearance mm {in}			0.008–0.026 {0.0004–0.0010}
Connecting rod and connecting rod bearing			
Length (Center to center) mm {in}			140.60–140.70 {5.538–5.539}
Bending mm {in}			0.15 {0.059} / 100 {3.937}
Small end bore (Bush inner diameter) mm {in}			18.943–18.961 {0.7458–0.7464}
Big end bore mm {in}			51.000–51.015 {2.0079–2.0084}
Big end width mm {in}			21.338–21.390 {0.8401–0.8421}
Connecting rod side clearance mm {in}		Standard	0.178–0.330 {0.0070–0.0129}
		Maximum	0.40 {0.016}
Crankshaft			
Crankshaft runout mm {in}			0.04 {0.0016} max.
Main journal diameter mm{in}	Standard size	Standard	61.938–61.955 {2.4385–2.4391}
		Minimum	61.931 {2.4382}
	0.25 {0.010} undersize	Standard	61.688–61.705 {2.4287–2.4293}
Main journal taper and out-of-round			0.05 {0.020} max.
Crankpin diameter mm{in}	Standard size	Standard	47.940–47.955 {1.8874–1.8879}
		Minimum	47.935 {1.8872}
	0.25 {0.010} undersize	Standard	47.690–47.705 {1.8776–1.8781}
Crankpin taper and out-of-round mm {in}			0.05 {0.020} max.
Main bearing			
Main journal bearing oil clearance mm{in}		Standard	0.037–0.057 {0.0015–0.0022}
		Maximum	0.064 {0.0025}
Available undersized bearing mm {in}			0.25 {0.010}
Crankpin bearing			
Crankpin bearing oil clearance mm {in}		Standard	0.023–0.043 {0.0009–0.0016}
		Maximum	0.08 {0.0031}
Available undersized bearing mm {in}			0.25 {0.010}

D1. LUBRICATION SYSTEM (B6)

Item \ Engine		B6 DOHC
Lubricating method		Force-fed
Oil pump		
Type		Trochoid gear
Relief pressure kPa {kgf/cm^2, psi}		343–442 {3.5–4.5, 50–60}
Regulated pressure kPa {kgf/cm^2, psi}-rpm		300–390 {3.0–4.0, 43–56}-3,000
Inner rotor tooth tip to outer rotor clearance mm {in}	Standard	0.02–0.16 {0.0008–0.0063}
	Maximum	0.20 {0.0079}
Outer rotor to body clearance mm {in}	Standard	0.09–0.18 {0.0035–0.0071}
	Maximum	0.22 {0.0087}
Side clearance mm {in}	Standard	0.03–0.11 {0.0012–0.0043}
	Maximum	0.14 {0.0055}
Oil filter		
Type		Full-flow, paper element
Relief pressure differential kPa {kgf/cm^2, psi}		79–117 {0.8–1.2,12–17}
Engine oil		
Capacity L {US qt, Imp qt}	Total (dry engine)	3.4 {3.6, 3.0}
	Engine oil replacement (without oil filter)	3.0 {3.2, 2.6}
	Engine oil replacement (With oil filter)	3.3 {3.48, 2.90}
Grade		API service SG, SH energy conserving II (ECII) ILSAC
Viscosity number	Above –25°C {–13°F}	SAE 10W–30
	Below 0°C {32°F}	SAE 5W–30

D2. LUBRICATION SYSTEM (K8)

Item \ Engine		K8 DOHC
Lubricating method		Force-fed
Oil pump		
Type		Trochoid gear
Relief pressure kPa {kgf/cm^2, psi}		491–589 {5.0–8.0, 71–85}
Regulated pressure kPa {kgf/cm^2, psi}–rpm		196 {2.0, 28}–1 ,000
		330–490 {3.4–5.0, 49–71 }-3,000
Inner rotor tooth tip to outer rotor clearance mm {in}	Standard	0.02–0.18 {0.0008–0.0070}
	Maximum	0.20 {0.0078}
Outer rotor to body clearance mm {in}	Standard	0.113–0.186 {0.0045–0.0073}
	Maximum	0.22 {0.0087}
Side clearance mm {in}	Standard	0.03–0.09 {0.0012–0.0035}
	Maximum	0.13 {0.0051}
Oil filter		
Type		Full-flow, paper element
Relief pressure differential kPa {kgf/cm^2, psi}		79–117 {0.8–1.2, 12–17}
Engine oil		
Capacity L {US qt, Imp qt}	Total (dry engine)	4.9 {5.2, 4.3}
	Engine oil replacement	3.7 {3.9, 3.3}
	Engine oil replacement (with oil filter)	4.0 {4.2, 3.5}
Grade		API service SG, SH Energy conserving II (ECII) ILSAC
Viscosity number	Above –25°C {–13°F}	SAE 10W–30
	Below 0°C {32°F}	SAE 5W–30

E1. COOLING SYSTEM (B6)

Item \ Engine		B6 DOHC
Cooling method		Water-cooled, forced circulation
Water pump		
Type		Centrifugal, V-belt driven
Impeller diameter mm {in}		75 {2.95}
Number of impeller blades		6
Speed ratio		1 : 1.05
Water seal type		Unified mechanical seal
Thermostat		
Type		Wax, two-stage
Opening temperature °C {°F}		Min: 88 {190} Sub: 85 {185}
Full-open temperature °C {°F}		100 {212}
Full-open lift mm {in}		Min: 8 {0.31} Sub: 1.5 {0.06}
Radiator		
Type		Corrugated fin
Cap valve opening pressure kPa {kgf/cm^2, psi}		74–103 {0.75–1.05, 11–15}
Cooling circuit checking pressure kPa {kgf/cm^2, psi}		103 {1.05, 15}

Item \ Engine					B6 DOHC
Coolant fan					
Type					Electric
Number of blades					4
Outer diameter				mm {in}	300 {11.8}
Capacity				W-V	80–12
Current				A	5.6–7.6
Water thermoswitch					
OFF ON				°C {°F}	97 {207}
Coolant					
Capacity				L {US qt, Imp qt}	6.0 {6.3, 5.3}
Antifreeze solution	Coolant protection	Volume percentage %		Specific gravity at 20°C {68°F}	
		Water	Coolant		
	Above –16°C {3°F}	65	35	1.054	
	Above –26°C {–15°F}	55	45	1.066	
	Above –40°C {–40°F}	45	55	1.078	

E2. COOLING SYSTEM (K8)

Item \ Engine		K8 DOHC
Cooling method		Water-cooled, forced circulation
Water pump		
Type		Centrifugal, V-ribbed belt-driven
Impeller diameter	mm {in}	60 {2.36}
Number of impeller blades		6
Speed ratio		1 : 1.05
Water seal type		Unified mechanical seal
Thermostat		
Type		Wax, bottom-bypass
Opening temperature	°C {°F}	80–84 {176–183}
Full-open temperature	°C {°F}	95 {203}
Full-open lift	mm {in}	8.5 {0.33} min.
Radiator		
Type		Corrugated fin
Cap valve opening pressure	kPa {kgf/cm^2, psi}	74–102 {0.75–1.05, 10.7–14.9}
Cooling circuit checking pressure	kPa {kgf/cm^2, psi}	103 {1.05, 15}

Item \ Engine/Transaxle			K8 DOHC		
			MTX	ATX	
Coolant fan					
Type			Electric		
Fan	Number of blades		5		
	Outer diameter	mm {in}	340 {13.39}		
	Fan speed		—	Low	High
Motor	Capacity	W-V	160–12		
	Current	A	11.0	12.0	16.8
Coolant					
Capacity		L {US qt, Imp qt}	7.5 {7.9, 6.6}		
Antifreeze solution	Coolant protection		Volume percentage %		Specific gravity at 20°C {68°F}
			Water	Coolant	
	Above –16°C {3°F}		65	35	1.054
	Above –26°C {–15°F}		55	45	1.066
	Above –40°C {–40°F}		45	55	1.078

F1. FUEL AND EMISSION CONTROL SYSTEMS (B6)

Item \ Engine			B6 DOHC
Idle speed*		rpm	650–750 (700 ± 50)[MTX] 700–800 (750 ± 50)[ATX]
Ignition timing*		BTDC	9–11°(10 ± 1°)
Throttle body			
Type			Horizontal draft
Throat diameter		mm{in}	55 {2.2}
Fuel pump			
Type			Impeller (in-tank)
Output pressure		kPa {kgf/cm^2, psi}	441–589 {4.5–6.0, 64–85}
Fuel filter			
Type	Low-pressure side		Nylon element (in fuel pump)
	High-pressure side		Paper element
Pressure regulator			
Type			Diaphragm (Two stage type)
Regulating pressure		kPa {kgf/cm^2, psi}	284 {2.90, 41}
Fuel Injector			
Type			High-ohmic, top-feeding
Type of drive			Voltage
Resistance		Ω	Approx. 13.8 (at 20°C {68°F})
Idle air control valve			
Solenoid resistance		Ω	10.7–12.3 (at 20°C {68°F})
Purge solenoid valve			
Solenoid resistance		Ω	23–27 (at 20°C {68°F})
Camshaft position sensor			
Type			Hall effect
Mass airflow sensor			
Type			Hot wire type
Engine coolant temperature sensor			
Resistance		kΩ	20°C {68°F} 2.21–2.69
			80°C {176°F} 0.287–0.349
Fuel Tank			
Capacity		L {US gal, Imp gal}	50 {13.2, 11.0}
Air cleaner element			
Element type			Oil permeated
Accelerator cable			
Free play		mm{in}	1–3 {0.039–0.118}
Fuel			
Specification			Unleaded --(R+M)/2 method 87 or higher

* With System Selector (49 B019 9A0) test switch at "SELF TEST" or TEN terminal of data link connector grounded.

F2. FUEL AND EMISSION CONTROL SYSTEMS (K8)

Item \ Engine				K8 DOHC
Idle speed*			rpm	640–700 {670 ± 30}
Ignition timing*			BDTC	9–11° {10 ± 1°}
Throttle body				
Type				Horizontal draft
Throat diameter			mm{in}	55 {2.2}
Fuel pump				
Type				Impeller (in-tank)
Maximum output pressure			kPa {kgf/cm^2, psi}	637 {6.5,92}
Fuel filter				
Type	Low-pressure side			Nylon element (in fuel pump)
	High-pressure side			Paper element
Pressure regulator				
Type				Diaphragm
Regulating pressure			kPa {kgf/cm^2, psi}	284 {2.9,42}
Fuel injector				
Type				High-ohmic, side-feed
Type of drive				Voltage
Resistance			Ω	Approx. 13.8 (at 20°C {68°F})
Idle air control valve				
Solenoid resistance			Ω	10.7–12.3 (at 20°C {68°F})
Purge solenoid valve				
Solenoid resistance			Ω	23–27 (at 20°C {68°F})
Camshaft position sensor (SGC, SGT signal)				
Type				Hall element
Volume airflow sensor				
Type				Measuring coré type
Resistance	Ω	$E_2 \Leftrightarrow V_S$	Closed throttle position (at 20°C {68°F})	200–1,000
			Wide open throttle (at 20°C {68°F})	20–800
		$E_2 \Leftrightarrow V_C$		200–400
		$E_2 \Leftrightarrow$ THA (Intake air temperature sensor)	20°C {68°F}	2,000–3,000
			60°C {140°F}	400–700
Engine coolant temperature sensor				
Resistance	kΩ		20°C {68°F}	2.2–2.7
			80°C {176°F}	0.28–0.35

*With System Selector (49 B019 9A0) test switch at "SELF TEST" or TEN terminal of data link connector grounded.

Item \ Engine	K8 DOHC
Fuel tank	
Capacity L {US gal, Imp gal}	50 {13.2, 11.0}
Air cleaner element	
Element type	Oil permeated
Accelerator cable	
Free play mm {in}	1–3 {0.039–0.118}
Fuel	
Specification	Unleaded regular (antiknock index of 87 or higher)

G. ENGINE ELECTRICAL SYSTEM

Item \ Engine			B6 DOHC	K8 DOHC
Battery	Voltage V		12	
	Type and capacity (5-hour rate A·h)		50D20L (40) 55D23L (48)	50D20L (40) 65D23L (43)
Dark current *1		mA	Max. 20	
Alternator	Type		A.C.	
	Output V-A		12–70	12–90
	Regulator type		Transistorized (built-in Voltage regulator)	
	Regulated voltage V		14.1–14.7	
	Brush length mm {in}	Standard	20.0 {0.79}	21.5 {0.85}
		Minimum	5.0 {0.20}	8.0 {0.32}
	Drive belt deflection mm {in}/9.8N {10kgf, 22lbf}	New	5.5–7.0 {0.22–0.27}	5.5–6.5 {0.22–0.25} (with A/C) 6.0–7.0 {0.24–0.27} (without A/C)
		Used	6.0–7.5 {0.24–0.29}	6.5–7.5 {0.26–0.29} (with A/C) 7.0–8.0 {0.28–0.31} (without A/C)
		Limit	8.0 {0.32}	8.0 {0.32} (with A/C) 9.0 {0.35} (without A/C)
Starter	Type		Direct	MTX...Coaxial reduction ATX...Eccentric reduction
	Output V-kW		12–0.8	MTX...12–1.4, ATX...12–1.4 MTX...12–1.7*3, ATX...12–1.6*3
	Brush length mm {in}	Standard	16 {0.7}	MTX...17.5 {0.69}, ATX...17.0 {0.67}
		Minimum	10 {0.4}	MTX...12.0 {0.48}, ATX...11.5 {0.46}
Distributor	Spark advance type		ESA	
Ignition timing (TEN terminal of data link connector grounded) BTDC			9–11°	
Ignition coil	Resistance (at 20°C {68°F})	Primary coil winding	0.49–0.73Ω	
		Secondary coil winding	20–31kΩ	
Spark plug	Type	NGK	BKR5E-11 *2 BKR6E-11	
		NIPPON–DENSO	K16PR-U11*2 K20PR-U11	
	Plug gap mm {in}		1.0–1.1 {0.040–0.043}	
Firing order			1–3–4–2	1–2–3–4–5–6

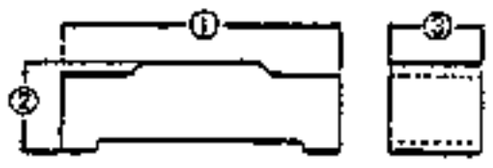
*1 Dark current is the constant flow of current present when the ignition switch is OFF (i.e., audio unit, clock, etc.).
*2 Standard plug.
*3 Cold area.

H. CLUTCH

Item \ Engine/Transaxle			B6 DOHC	K8 DOHC
			F25M-R	G25M-R
Clutch control			Hydraulic	
Clutch pedal				
Type			Suspended	
Pedal ratio		mm {in}	6.31	
Full stroke		mm {in}	130 {5.12}	
Height (from carpet)		mm {in}	199–204 {7.83–8.03}	
Free play		mm {in}	5–16 {0.19–0.63}	
Distance to carpet when clutch fully disengaged mm {in}	Minimum		39.5 {1.56}	
Flywheel				
Runout limit		mm {in}	0.2 {0.008}	
Clutch disc				
Type			Single dry plate	
Runout limit		mm {in}	0.7 {0.027}	
Wear limit		mm {in}	0.3 {0.012} from rivet head	
Outer diameter		mm {in}	200 {7.87}	225 {8.86}
Inner diameter		mm {in}	130 {5.12}	150 {5.91}
Facing thickness mm {in}	Flywheel side		3.5 {0.138}	
	Pressure plate side		3.8 {0.150}	
Clutch cover				
Type			Diaphragm spring	
Set load		N {kgf, lbf}	4,310 {440, 968}	

J1 and J2. MANUAL TRANSAXLE

Item \ Engine			B6 DOHC	K8 DOHC
Specification				
Transaxle type			F25M-R	G25M-R
Transaxle control			Floor shift	
Transaxle shift control			Rod	
Synchromesh system			Forward: Synchromesh Reverse: Selective sliding and synchromesh	Forward: Synchromesh Reverse: Selective sliding and synchromesh
Gear ratio	1st		3.416	3.307
	2nd		1.842	1.833
	3rd		1.290	1.310
	4th		0.918	1.030
	5th		0.731	0.795
	Reverse		3.214	3.166
Final gear ratio			4.105	4.388
Speedometer gear ratio (Driven gear/drive gear)			0.88{22/25}	0.84{21/25}
Oil	Grade		API service GL-4 or GL-5	API service GL-4 or GL-5
	Viscocity		All-season : SAE 75W-90 Above 10°C {50°F}: SAE 80W-90	All-season :SAE 75W-90 Above 10°C {50°F}: SAE 80W-90
	Capacity	L {US qt, Imp qt}	2.68 {2.83, 2.36}	2.70 {2.85, 2.38}
Runout				
Primary shaft gear runout		mm {in}	0.05 {0.002}	0.05 {0.002}
Secondary shaft gear runout		mm {in}	0.015 {0.0006}	0.015 {0.0006}
Clearance				
1st (Gear inner dia. -shaft outer dia)		mm {in}	0.03–0.07 {0.001–0.0028}	0.03–0.08 {0.001–0.003}
2nd (Gear inner dia. -shaft outer dia)		mm {in}	0.03–0.07 {0.001–0.0028}	0.03–0.08 {0.001–0.003}
3rd (Gear inner dia. -shaft outer dia)		mm {in}	0.03–0.07 {0.001–0.0028}	0.03–0.08 {0.001–0.003}
4th (Gear inner dia. -shaft outer dia)		mm {in}	0.03–0.07 {0.001–0.0028}	0.03–0.08 {0.001–0.003}
5th (Gear inner dia. -sleeve outer dia)		mm {in}	0.03–0.08 {0.001–0.0028}	0.03–0.08 {0.001–0.003}
1-2 shift fork and reverse gear mm{in}	Standard		0.05–0.35 {0.002–0.013}	0.10–0.45 {0.004–0.018}
	Wear limit		0.65 {0.033}	0.95 {0.037}
3-4 shift fork and clutch hub sleeve mm{in}	Standard		0.20–0.50 {0.008–0.020}	0.10–0.40 {0.004–0.016}
	Wear limit		1.00 {0.039}	0.90 {0.035}
5th shift fork and clutch hub sleeve mm{in}	Standard		0.40–0.75 {0.016–0.030}	0.10–0.36 {0.004–0.014}
	Wear limit		1.25 {0.049}	0.86 {0.034}
Synchronizer ring and gear mm{in}	Standard		1.12–1.88 {0.044–0.074}	1.50 {0.059}
	Wear limit		0.80 {0.031}	0.80 {0.031}
Reverse idler gear and reverse lever mm{in}	Standard		0.10–0.32 {0.004–0.013}	0.10–0.32 {0.004–0.013}
	Wear limit		0.82 {0.032}	0.82 {0.032}

Item \ Engine		B6 DOHC	K8 DOHC
Thrust clearance			
1st gear mm {in}	Standard	0.05–0.28 {0.002–0.011}	0.05–0.28 {0.002–0.011}
	Limit	0.33 {0.013}	0.33 {0.013}
2nd gear mm {in}	Standard	0.18–0.51 {0.007–0.020}	0.18–0.46 {0.007–0.018}
	Limit	0.56 {0.022}	0.51 {0.020}
3rd gear mm {in}	Standard	0.06–0.21 {0.002–0.008}	0.05–0.20 {0.002–0.008}
	Limit	0.26 {0.010}	0.25 {0.010}
4th gear mm {in}	Standard	0.14–0.39 {0.005–0.015}	0.17–0.37 {0.007–0.015}
	Limit	0.44 {0.017}	0.42 {0.017}
5th gear mm {in}	Standard	0.08–0.15 {0.003–0.006}	0.10–0.22 {0.004–0.009}
	Limit	0.20 {0.008}	0.27 {0.011}
Primary shaft gear mm {in}	Standard	0.005–0.100 {0.0002–0.0039}	0–0.05 {0–0.002}
	Adjustment shims	0.1 {0.004}, 0.2 {0.008}, 0.3 {0.012}, 0.4 {0.016}, 0.5 {0.020}, 0.6 {0.024}	0.20 {0.008}, 0.25 {0.010}, 0.30 {0.012}, 0.35 {0.014}, 0.40 {0.016}, 0.45 {0.018}, 0.50 {0.020}, 0.55 {0.022}, 0.60 {0.024}, 0.65 {0.026}, 0.70 {0.028}
Secondary shaft gear mm {in}	Standard	0.03–0.08 {0.001–0.003}	0.03–0.08 {0.001–0.003}
	Adjustment shims	0.15 {0.006}, 0.20 {0.008}, 0.25 {0.010}, 0.30 {0.012}, 0.35 {0.014}, 0.40 {0.016}, 0.45 {0.018}, 0.50 {0.020}, 0.55 {0.022}, 0.60 {0.024}, 0.65 {0.026}, 0.70 {0.028}	0.20 {0.008}, 0.25 {0.010}, 0.30 {0.012}, 0.35 {0.014}, 0.40 {0.016}, 0.45 {0.018}, 0.50 {0.020}, 0.55 {0.022}, 0.60 {0.024}, 0.65 {0.026}, 0.70 {0.028}
Bearing preload			
Differential side bearing preload	Bearing preload N·m {kgf·cm, in·lbf}	0.03–0.74 {0.3–7.6, 0.26–6.60}	1.4–2.0 {14–20, 13–17}
	Adjustment shims mm {in}	0.20 {0.008}, 0.25 {0.010}, 0.30 {0.012}, 0.35 {0.014}, 0.40 {0.016}, 0.45 {0.018}, 0.50 {0.020}, 0.55 {0.022}	0.10 {0.004}, 0.20 {0.008}, 0.25 {0.010}, 0.30 {0.012}, 0.35 {0.014}, 0.40 {0.016}, 0.45 {0.018}, 0.50 {0.020}, 0.55 {0.022}, 0.60 {0.024}, 0.65 {0.026}, 0.70 {0.028}, 0.75 {0.030}, 0.80 {0.031}, 0.85 {0.033}, 0.90 {0.035}, 0.95 {0.037}, 1.00 {0.039}, 1.05 {0.041}, 1.10 {0.043}, 1.15 {0.045}, 1.20 {0.047}
Differential			
Backlash of side gear and pinion gear	Standard mm {in}	0–0.1 {0–0.004}	0–0.1 {0–0.004}
	Adjustment washers mm{in}	2.0 {0.079}, 2.1 {0.083}, 2.2 {0.087}	—
Note			
Synchronizer ring outer diameter mm {in}	1st and 2nd	61.7 {2.429}	75.6 {2.98}
	3rd and 4th	61.7 {2.429}	75.6 {2.98}
	5th and reverse	49.7 {1.957}	63.6 {2.50}
Synchronizer key dimension mm {in} 	1st and 2nd	① 19.0 {0.748}, ② 4.25 {0.167}, ③ 5.0 {0.197}	① 19.0 {0.748}, ② 4.25 {0.167}, ③ 5.0 {0.197}
	3rd and 4th	① 17.0 {0.669}, ② 4.25 {0.167}, ③ 5.0{0.197}	① 17.0 {0.669}, ② 4.25 {0.167}, ③ 5.0{0.197}
	5th and reverse	① 17.0 {0.669}, ② 4.25 {0.167}, ③ 5.0 {0.197}	① 17.0 {0.669}, ② 4.25 {0.167}, ③ 5.0 {0.197}

K. AUTOMATIC TRANSAXLE

Item \ Engine/Transaxle				B6 DOHC	K8 DOHC
				FA4A-EL (F4A-EL)	
Torque converter stall torque ratio				2.000:1	
Gear ratio			1GR	2.800	
			2GR	1.540	
			3GR	1.000	
			4GR	0.700	
			Reverse	2.333	
Final gear ratio				3.833	4.058
Automatic transaxle fluid (ATF)		Type		Dexron® II or M-III	
		Capacity L {US qt, Imp qt}		5.8 {6.1,5.1}	
Engine stall speed rpm		All ranges and R position		2,100–2,400	2,450–2,750
Time lag sec.		N D range		0.5–0.6	
		N R position		0.6–0.7	
Line pressure kPa {kgf/cm², psi}	At idle	All ranges		430–550 {4.3–5.7, 62–81}	
		R position		730–870 {7.4–8.9, 110–120}	
	At stall	All ranges		920–1040 {9.3–10.7, 140–152}	
		R position		1500–1700 {15.2–17.4, 217–247}	
Throttle pressure kPa {kgf/cm², psi}	At idle	D range		68–116 {0.69–1.19, 9.9–16.9}	
	At stall	D range		420–510 {4.2–5.3, 60–75}	
Oil pump	Outer and inner rotor clearance mm {in}		Standard	0.02–0.04 {0.00079–0.00157}	
			Maximum	0.05 {0.00197}	
	Spool outer diameter mm {in}		Standard	14.00 {0.551}	
			Minimum	13.98 {0.550}	
	Between oil pump boss and inner rotor clearance mm {in}		Standard	0.04–0.115 {0.00157–0.00453}	
			Maximum	0.125 {0.00492}	
3-4 clutch	Number of drive/driven plates			3/3	
	Drive plate thickness mm {in}		Standard	1.6 {0.063}	
			Minimum	1.4 {0.055}	
	3-4 clutch clearance mm {in}			1.3–1.6 {0.051–0.063}	
	Snap ring size mm {in}			1.4 {0.055}, 1.6 {0.063}, 1.8 {0.071}, 2.0 {0.07 9 }, 2.2 {0.087}, 2.4 {0.094}	
Forward clutch	Number of drive/driven plates			3/3	
	Drive plate thickness mm{in}		Standard	1.6 {0.063}	
			Minimum	1.4 {0.055}	
	Forward clutch clearance mm {in}			1.0–1.2 {0.039–0.047}	
	Snap ring size mm {in}			1.8 {0.071}, 1.95 {0.077}, 2.1 {0.083}, 2.25 {0.089}, 2.4 {0.094}, 2.55 {0.100}, 2.7 {0.106}, 2.85 {0.112}	
Coasting clutch	Number of drive/driven plates			2/2	
	Drive plate thickness mm{in}		Standard	1.6{0.063}	
			Minimum	1.4{0.055}	
	Coasting clutch clearance mm {in}			1.0–1.2 {0.039–0.047}	
	Snap ring size mm {in}			1.60 {0.063}, 1.75 {0.069}, 1.90 {0.075}, 2.05 {0.081}, 2.20 {0.087}, 2.35 {0.093}, 2.50 {0.098}, 2.65 {0.104}	
Reverse clutch	Number of drive/driven plates			2/2	
	Drive plate thickness mm{in}		Standard	1.6 {0.063}	
			Minimum	1.4 {0.055}	
	Reverse clutch clearance mm {in}			1.0–1.3 {0.039–0.051}	
	Snap ring size mm {in}			2.0 {0.079}, 2.2 {0.087}, 2.4 {0.094}, 2.6 {0.102}, 2.8 {0.110}, 3.0 {0.118}	

Item \ Engine/Transaxle			B6 DOHC	K8 DOHC
			FA4A-EL (F4A-EL)	
Low and reverse brake	Number of drive/driven plates		4/4	
	Drive plate thickness mm {in}	Standard	1.6 {0.063}	
		Minimum	1.4 {0.055}	
	Low and reverse brake clearance mm {in}		2.1–2.4 {0.083–0.094}	
	Snap ring size mm {in}		2.0 {0.079}, 2.2 {0.087}, 2.4 {0.094}, 2.6 {0.102}, 2.8 {0.110}, 3.0 {0.118}	
Carrier hub	Clearance between pinion washer and planet carrier mm {in}	Maximum	0.2–0.7 {0.008–0.028}	
Sun gear drum	Bushing inner diameter mm {in}	Maximum	30.425 {1.198}	
Small sun gear	Bushing inner diameter mm {in}	Maximum	21.021 {0.828}	
Gear assembly				
Total end play		mm {in}	0.25–0.50 {0.010–0.020}	
End play adjustment race		mm {in}	1.2 {0.047}, 1.4 {0.055}, 1.6 {0.063}, 1.8 {0.071}, 2.0 {0.079}, 2.2 {0.087}	
Idler gear bearing preload		N·m {kgf·cm, in·lbf}	0.03–0.8 {0.3–9.0, 0.27–7.8}	
Preload adjustment shims		mm {in}	3.80 {0.150}, 3.85 {0.152}, 3.90 {0.154}, 3.95 {0.156}, 4.00 {0.157}, 4.05 {0.159}, 4.10 {0.161}, 4.15 {0.163}, 4.20 {0.165}, 4.25 {0.167}, 4.30 {0.169}, 4.35{0.171}, 4.40 {0.173}, 4.45 {0.175}, 4.50 {0.177}, 4.55 {0.179}, 4.60 {0.181}, 4.65 {0.183}, 4.70 {0.185}, 4.75 {0.187}	
Output gear bearing preload		N·m {kgf·cm, in·lbf}	0.03–0.8 {0.3–9.0, 0.27–7.8}	0.9–1.7 {9–18, 8–15}
Preload adjustment shims		mm {in}	0.50 {0.020}, 0.525 {0.021}, 0.55 {0.022}, 0.575{0.623}, 0.60 {0.024}, 0.625 {0.025}, 0.65 {0.026}, 0.675 {0.027}, 0.70 {0.028}, 0.725 {0.029}, 0.75 {0.030}, 0.775 {0.031}, 0.80 {0.031}, 0.825 {0.032}, 0.85 {0.033}, 0.875 {0.034}, 0.90 {0.035}, 0.925 {0.036}, 0.95 {0.037}, 0.975 {0.038}, 1.00 {0.039}, 1.025 {0.040}, 1.05 {0.041}, 1.075 {0.042}, 1.10 {0.043}, 1.125 {0.044}, 1.15 {0.045}, 1.175 {0.046}, 1.20 {0.047}, 1.225 {0.048}, 1.25 {0.049}, 1.275 {0.050}, 1.30 {0.051}, 1.325 {0.052}, 1.35 {0.053}, 1.375 {0.054}, 1.40 {0.055}, 1.425 {0.056}, 1.45 {0.057}	
Differential				
Bearing preload		N·m {kgf·cm, in·lbf}	3.0–3.9{30–40, 27–34}	
Preload adjustment shims		mm {in}	0.50 {0.020}, 0.525 {0.021}, 0.55 {0.022}, 0.575 {0.623}, 0.60 {0.024}, 0.625 {0.025}, 0.65 {0.026}, 0.675 {0.027}, 0.70 {0.028}, 0.725 {0.029}, 0.75 {0.030}, 0.775 {0.031}, 0.80 {0.031}, 0.825 {0.032}, 0.85 {0.033}, 0.875 {0.034}, 0.90 {0.035}, 0.925 {0.036}, 0.95 {0.037}, 0.975 {0.038}, 1.00 {0.039}, 1.025 {0.040}, 1.05 {0.041}, 1.075 {0.042}, 1.10 {0.043}, 1.125 {0.044}, 1.15 {0.045}, 1.175 {0.046}, 1.20 {0.047}, 1.225 {0.048}, 1.25 {0.049}, 1.275 {0.050}, 1.30 {0.051}, 1.325 {0.052}, 1.35 {0.053}, 1.375 {0.054}, 1.40 {0.055}, 1.425 {0.056}, 1.45 {0.057}	
Backlash of side gear and pinion mm {in}		Standard	0.025–0.1 {0.001–0.004}	
		Maximum	0.5 {0.020}	
Torque converter				
Bushing inner diameter mm {in}		Standard	53.030 {2.083}	
		Maximum	53.076 {2.089}	

Spring Specification

Spring name		Outer diameter mm{In}		Free length mm {in}	No. of coils	Wire diameter mm {in}
Upper control valve body	Throttle modulator spring	8.1 {0.319}		43.4 {1.709}	10.5	0.8 {0.031}
	Throttle spring	5.4 {0.213}		46.2 {1.819}	29.0	0.88 {0.035}
	Throttle assist spring	5.15 {0.203}		26.88 {1.058}	16.2	0.6 {0.024}
Main control valve body	Pressure regulator spring	11.5 {0.453}		34.2 {1.346}	9.5	1.0 {0.039}
	1-2 shift spring	8.7 {0.343}		41.3 {1.626}	13.5	1.0 {0.039}
	Low reducing spring	7.9 {0.311}		34.5 {1.358}	11.0	0.8 {0.031}
	2-3 timing spring	8.6 {0.339}		28.3 {1.114}	8.6	1.2 {0.047}
	3-2 timing spring	8.0 {0.315}		29.98 {1.180}	10.0	0.8 {0.031}
	3-4 shift spring	8.7 {0.343}		41.3 {1.626}	13.5	1.0 {0.039}
Premain control valve body	Bypass spring	4.9 {0.193}		30.5 {1.201}	23.0	0.55 {0.022}
	2-3 shift spring	8.7 {0.343}		41.3 {1.626}	13.5	1.0 {0.039}
	Converter relief spring	8.6 {0.339}		68.4 {2.693}	27.5	1.2 {0.047}
	TCC control spring	5.0 {0.197}		30.1 {1.185}	21.5	0.55 {0.022}
Control valve body	Throttle relief spring	6.6 {0.260}		21.6 {0.850}	11.5	0.8 {0.032}
Oil pump	Spring	11.8 {0.465}	11.8 {0.465}	53.0 {2.087}	12.0	1.2 {0.047}
Accumulator	2-3 accumulator small spring	B6DOHC	10.0 {0.394}	67.8 {2.669}	20.0	1.3 {0.051}
		K8DOHC	11.6 {0.457}	59.7 {2.350}	16.9	1.8 {0.071}
	2-3 accumulator large spring	B6DOHC	15.0 {0.591}	69.5 {2.736}	15.8	2.0 {0.079}
		K8DOHC		71.8 {2.827}	9.8	1.2 {0.047}
	1-2 accumulator small spring	B6DOHC	11.2 {0.441}	84.7 {3.335}	25.5	1.5 {0.059}
		K8DOHC	11.0 {0.433}	81.7 {3.217}	25.9	1.4 {0.055}
	1-2 accumulator large spring	B6DOHC	16.0 {0.630}	84.7 {3.335}	19.5	1.9 {0.075}
		K8DOHC		82.1 {3.232}	18.0	2.0 {0.079}
	N-D accumulator small spring	10.8 {0.425}		101.2 {3.984}	28.2	1.2 {0.047}
	N-D accumulator large spring	15.0 {0.591}		94.2 {3.709}	16.5	1.6 {0.063}
	N-R accumulator small spring	9.8 {0.386}		93.2 {3.669}	31.5	1.3 {0.051}
	N-R accumulator large spring	14.0 {0.551}		106.5 {4.193}	23.0	1.7 {0.067}
3–4 clutch	Return spring	74.4 {2.929}		40.5 {1.594}	1.0	5.0 {0.197}
Coasting clutch	Return spring	7.3 {0.287}		20.45 {0.805}	10.0	1.0 {0.039}
Low and reverse brake	Return spring	5.55 {0.219}		14.3 {0.563}	12.0	0.75 {0.030}
Servo	Return spring	27.7 {1.091}		43.25 {1.703}	4.5	3.2 {0.126}
Orifice	Check spring	7.5 {0.295} 8.3 {0.327}		32.8 {1.291}	10.1	0.6 {0.024}

Vehicle Speed at Shift point Table

Mode	Range	Throttle condition (throttle position sensor voltage)	Shift	Vehicle speed km/h {mph}	
				B6 DOHC	K8 DOHC
Normal	D	Wide open throttle (3.1–4.4 V)	D_1 D_2	58–64 {36–40}	59–65 {37–40}
			D_2 D_3	102–110 {63–68}	101–109 {62.7–67.5}
			D_3 D_4	166–176 {103–109}	167–177 {104–109}
		Half throttle (1.7–2.7 V)	D_1 D_2	34–43 {22–26}	39–48 {25–29}
			D_2 D_3	60–77 {37–48}	70–88 {44–54}
			D_3 D_4	104–130 {64–81}	127–153 {78.8–94.8}
			TCC operation	99–124 {61–77}	127–153 {78.8–94.8}
		Closed throttle position (0.1–1.1 V)	D_4 D_3	29–35 {18–22}	27–33 {17–20}
			D_3 D_1	9–15 {5.6–9.3}	12–18 {7.5–11}
		Kickdown	D_4 D_3	142–152 {88.1–94.2}	155–165 {96.1–102}
			D_3 D_2	82–90 {51–55}	94–102 {59–63.2}
			D_2 D_1	42–48 {27–29}	52–58 {33–35}
	S	Wide open throttle (3.1–4.4 V)	S_1 S_2	58–64 {36–40}	59–65 {37–40}
			S_2 S_3	102–110 {63–68}	101–109 {62.7–67.5}
		Half throttle (1.7–2.7 V)	S_1 S_2	34–43 {22–26}	39–48 {25–29}
			S_2 S_3	60–77 {37–48}	70–88 {44–54}
		Closed throttle position (0.1–1.1 V)	S_4 S_3	166–172 {103–107}	167–173 {104–107}
			S_3 S_1	9–15 {5.6–9.3}	12–18 {7.5–11}
		Kickdown	S_3 S_2	82–90 {51–55}	94–102 {59–63.2}
			S_2 S_1	42–48 {27–29}	52–58 {33–35}
	L	Wide open throttle (3.1–4.4 V)	L_1 L_2	58–64 {36–40}	59–65 {37–40}
		Half throttle (1.7–2.7 V)	L_1 L_2	34–43 {22–26}	39–48 {25–29}
		Closed throttle position (0.1–1.1 V)	L_2 L_1	9–15 {6–9.3}	12–18 {7.5–11}
		Kickdown	L_2 L_1	42–48 {27–29}	52–58 {33–35}
Hold	D	—	D_1 D_2	27–33 {17–20}	27–33 {17–20}
			D_2 D_3	40–50 {25–31}	40–50 {25–31}
			D_4 D_3	166–172 {103–107}	167–173 {104–107}
			D_3 D_1	9–15 {6–9.3}	12–18 {7.5–11}
	S	—	S_4 S_3	166–172 {103–107}	167–173 {104–107}
			S_3 S_2	101–107 {62–66}	100–106 {62–65.7}
	L	—	L_2 L_1	43–49 {27–30}	52–58 {33–35}

M. FRONT AND REAR AXLES

Item \ Engine/Transaxle			B6 DOHC		K8 DOHC	
			MTX	ATX	MTX	ATX
Front axle						
Maximum wheel bearing play mm {in}			0.05 {0.002}			
Rear axle						
Maximum wheel bearing play mm {in}	Drum brake type		0.05 {0.002}			
	Disc brake type		0.05 {0.002}			
Drive shaft						
Length of joint (between center of joint) mm {in}	Right side	NON ABS	380.5 {14.98}		388.9 {15.31}	384.5 {15.14}
		ABS			384.9 {15.15}	
	Left side	NON ABS	397.0 {15.63}		379.5 {14.94}	396.0 {15.59}
		ABS			375.5 {14.78}	
Shaft diameter mm {in}	Right side		23.0 {0.91}		25.0 {0.98}	
	Left side		21.5 {0.85}		25.0 {0.98}	

N. STEERING SYSTEM

Item \ Engine		B6 DOHC	K8 DOHC
Steering wheel			
Outer diameter mm{in}		370 {14.6}, 380 {14.96} (With air bag)	
Free play mm {in}		0–30 {0–1.18}	
Wheel effort N {kgf, lbf}		29 {3.0,6.6} or less	
Lock-to-lock turns		3.1	2.7
Steering Shaft			
Shaft type		Collapsible	
Joint type		2-cross joint	
Power steering system			
Power assist type		Engine speed sensing	
Gear type		Rack-and-pinion	
Gear ratio		15.0	
Rack stroke mm {in}		140 {5.51}	
Power steering fluid		ATF M-III or Dexron®-II	
Fluid capacity L {US qt, Imp qt}		0.8 {0.85,0.70}	1.2 {1.27,1.06}
Fluid pressure kPa {kgf/cm^2, psi}		7,846–8,335 {80.0–85.0, 1,138–1,208}	
Drive belt deflection mm {in}/9.8N {10 kgf, 22 lbf}	New	8.0–9.0 {0.32–0.35}	6.0–7.0 {0.24–0.27}
	Used	9.0–10.0 {0.36–0.39}	7.0–8.0 {0.28–0.31}
	Limit	11.5 {0.45}	9.0 {0.35}

P. BRAKING SYSTEM

Item \ Engine			B6 DOHC	K8 DOHC
Brake pedal	Height (with carpet) mm {in}		193–196 {7.60–7.71}	
	Free play mm {in}		4–7 {0.16–0.27}	
	Reserve travel mm {in} (without carpet, clearance when pedal is depressed at 589 N {60 kgf, 132 lbf})		70 {2.76}	
Master cylinder	Type		Tandem	
	Bore mm {in}		22.22 {0.875}	23.81 {0.937}
	Fluid type		SAEJ1703 or FMVSS116, DOT-3	
Front brake (Disc)	Type		Disc (Ventilated)	
	Thickness of pad mm {in}	Standard	10.0 {0.39}	
		Limit	2.0 {0.08}	
	Thickness of disc plate mm{in}	Standard	22.0 {0.87}	
		Limit	20.0 {0.79}	
	Disc plate runout mm {in}		0.05 {0.002} max.	
	Cylinder bore mm {in}		53.97 {2.125}	
Rear brake (Drum)	Type		Drum (Leading-trailing)	—
	Clearance between shoe and drum		Self-adjusting	—
	Thickness of lining mm{in}	Standard	4.0 {0.16}	—
		Minimum	1.0 {0.04}	—
	Width of lining mm {in}		35.0 {1.38}	—
	Length of lining mm {in}		191.9 {7.56}	—
	Inner diameter of drum mm{in}	Standard	200.0 {7.87}	—
		Maximum	201.0 {7.91}	—
	Wheel cylinder bore mm {in}		17.46 {0.687}	—
Rear brake (Disc)	Type		—	Disc (Solid)
	Thickness of pad mm {in}	Standard	—	7.5 {0.3}
		Limit	—	1.0 {0.04}
	Thickness of disc plate mm{in}	Standard	—	9.0 {0.35}
		Limit	—	8.0 {0.31}
	Disc plate runout mm {in}		0.05 {0.002} max.	
	Cylinder bore mm {in}		—	30.2 {1.19}
Parking brake	Lever notches (Pulled at 98N {10 kgf, 22 lbf})		5–7	
Power brake unit	Type		Single diaphragm	Tandem diaphragm
	Diameter mm{in}		214.0 {8.4}	188.4+215.2 {7.4+8.5}
	Push rod-to-piston clearance mm {in}		With vacuum applied to unit (approx. 66.7 kPa {500 mmHg, 19.7 inHg}) 0.1–0.4 {0.004–0.0016}	With vacuum applied to unit (approx. 66.7 kPa {500 mmHg,19.7 inHg}) 0 {0}
	Fluid pressure per treading force kPa {kgf/cm^2, psi}/196N {20 kgf, 44lbf}		589 {6,85} min. at 0 kPa {0 mmHg, 0 inHg} MTX: 6,082 {62,882} min at 66.7kPa {500 mmHg, 19.7 inHg} ATX: 6.769 {69,981} min at 66.7kPa {500 mmHg, 19.7 inHg}	392 {4, 57} min. at 0 kPa {0 mmHg, 0 inHg} 7,063 {72,1024} min. at 66.7kPa {500 mmHg, 19.7 inHg}
Rear wheel hydraulic control system	Type		Dual Proportioning valve	
	Bend portion (Rear brake pressure) kPa {kgf/cm^2, psi}		2,943 {30,427}	ABS: 1,962 {20,284} non ABS: 2,453 {25, 356}

Q. WHEEL AND TIRES

Item			Specifications		
			B6 DOHC	K8 DOHC	
Wheel	Size		14x51/2JJ	15x6JJ	
	Offset	mm {in}	45 {1.77}	45 {1.77}	
	Pitch circle diameter	mm {in}	100 {3.94}	100 {3.94}	
	Material		Steel or aluminum alloy	Aluminum alloy	
Tire	Size		P185/65R14 85S	P205/55R15 87V	P205/55R15 87V M+S
	Air pressure kPa {kgf/cm^2, psi}	Front	216 {2.2,32}	196 {2.0, 28}	216{2.2, 32}
		Rear	216 {2.2,32}	196 {2.0, 28}	216 {2.2, 32}

Temporary spare tire

Item			Specifications	
			B6 DOHC	K8 DOHC
Wheel	Size		15 × 4T	
	Offset	mm {in}	45 {1.77}	
	Pitch circle diameter	mm {in}	100 {3.94}	
	Material		Steel	
Tire	Size		T115/70D14	T115/70D15
	Air pressure	kPa {kgf/cm^2, psi}	415 {4.2,60}	

R. SUSPENSION
Front Suspension

Item \ Model			B6 DOHC			K8 DOHC
			MTX		ATX	
			NON ABS	ABS		
Type			Strut			
Shock absorber	Type		Cylindrical double-acting (Oil-filled)			
Stabilizer	Type		Torsion bar			
	Diameter	mm {in}	22.0 {0.87}			
Wheel alignment (Unladen)*1	Maximum steering angle	Inner	39° ± 2°			
		Outer	33° ± 2°			
	Total toe-in	mm {in}	3±4 {0.12 ± 0.15}			
		degree*2	0.3° ± 0.4°			
	Camber angle *3		–0°58' ± 10			
	Caster angle *3		2°46' ± 10			
	SAI *4		14°16'			

*1 • Fuel tank full: radiator coolant and engine oil at specified level, and spare tire, jack and tools in designated position
• Adjust to the median when carrying out wheel alignment
*2 Indicates measurements made by using the 4–wheel alignment tester
*3 Difference between left and right must not exceed 1.5°
*4 SAI: Steering Axis Inclination

Rear Suspension

Item			Specifications
Type			Strut
Shock absorber	Type		Cylindrical double-acting (Oil-filled)
Stabilizer	Type		Torsion bar
	Diameter mm {in}		20.0 {0.79}
Wheel alignment (Unladen)*1	Total toe-in	mm {in}	2 ± 4 {0.08 ± 0.15}
		degree*2	0.2° ± 0.4°
	Camber angle *3		–0° 57' ± 1'
	Thrust angle	degree*2	0° ± 0.8°

*1 • Fuel tank full: radiator coolant and engine oil at specified level, and spare tire, jack and tools in designated position
•Adjust to the median when carrying out wheel alignment

*2 Indicates measurements made by using the 4–wheel alignment tester

*3 Difference between left and right must not exceed 1.5°

T. BODY ELECTRICAL SYSTEM

Item		Specification (W)
Exterior lights	Headlight	65/45 (9004)
	Front combination light	27/8 (1157)
	Front side marker light	3.8 (194)
	Brake light/Taillight	27/8 (1157)
	Rear side marker light	3.8 (194)
	Rear turn and hazard warning light	27 (1156)
	High-mount brake light	18.4 (921)
	Back-up light	27 (1156)
	License plate light	5 (168)
Interior lights	Interior light	5 (168)
	Cargo compartment light	5 (168)
	Ignition key illumination	1.4
Indicator and warning lights	High beam indicator light	3.4
	Turn indicator light	3.4
	Brake system warning light	1.4
	HOLD indicator light	3.4
	Alternator warning light	3.4
	Oil pressure warning light	1.4
	ABS warning light	3
	Seat belt warning light	3
	Instrument cluster illumination	3.4,1.4
	Malfunction indicator lamp	3
	Fuel-level warning light	3.4
	Air bag system warning light	1.4

U. HEATER AND AIR CONDITIONER SYSTEMS

Item			Specifications
Refrigerant amount		g {oz}	750 {26.5}
Refrigerant pressure		MPa {kgf/cm^2, psi}	High: 1.23–1.61 {12.5–16.5,178–234} Low: 0.14–0.16 {1.4–1.7, 20–24}
A/C compressor	Discharge capacity	ml {cc, fl oz} / rev	130 {130, 4.39}
	Compressor oil amount	ml {cc, fl oz}	175–185 {175–185, 5.92–6.25}

STANDARD BOLT AND NUT TIGHTENING TORQUE

Diameter mm {in}	Pitch mm {in}	4T			6T			8T		
		N·m	kgf·m	ft·lbf	N·m	kgf·m	ft·lbf	N·m	kgf·m	ft·lbf
6 {0.236}	1 {0.039}	4.3–6.1	0.43–0.63	3.2–4.5	6.9–9.8	0.7–1.0	5.0–7.2	7.9–11.7	0.8–1.2	5.8–8.6
8 {0.315}	1.25 {0.049}	10–14	1.0–1.5	7.3–10.8	16–22	1.6–2.3	12–16	18–26	1.8–2.7	13–19
10 {0.394}	1.25 {0.049}	20–28	2.0–2.9	15–20	32–46	3.2–4.7	24–33	37–53	3.7–5.5	27–39
12 {0.472}	1.5 {0.059}	35–50	3.5–5.1	26–36	55–80	5.6–8.2	41–59	63–93	6.4–9.5	47–68
14 {0.551}	1.5 {0.059}	—	—	—	76–102	7.7–10.5	56–75	98–137	10–14	73–101
16 {0.630}	1.5 {0.059}	—	—	—	118–156	12–16	87–115	157–215	16–22	116–159
18 {0.709}	1.5 {0.059}	—	—	—	167–225	17–23	123–166	226–304	23–31	167–224
20 {0.787}	1.5 {0.059}	—	—	—	236–313	24–32	174–231	305–421	31–43	225–311
22 {0.866}	1.5 {0.059}	—	—	—	314–421	32–43	232–311	422–568	43–58	311–419
24 {0.945}	1.5 {0.059}	—	—	—	403–549	41–56	297–405	540–725	55–74	398–535

Before beginning any service procedure, refer to section S of this manual for air bag system service warnings.

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Before beginning any service procedure, refer to section S of this manual for air bag system service warnings.

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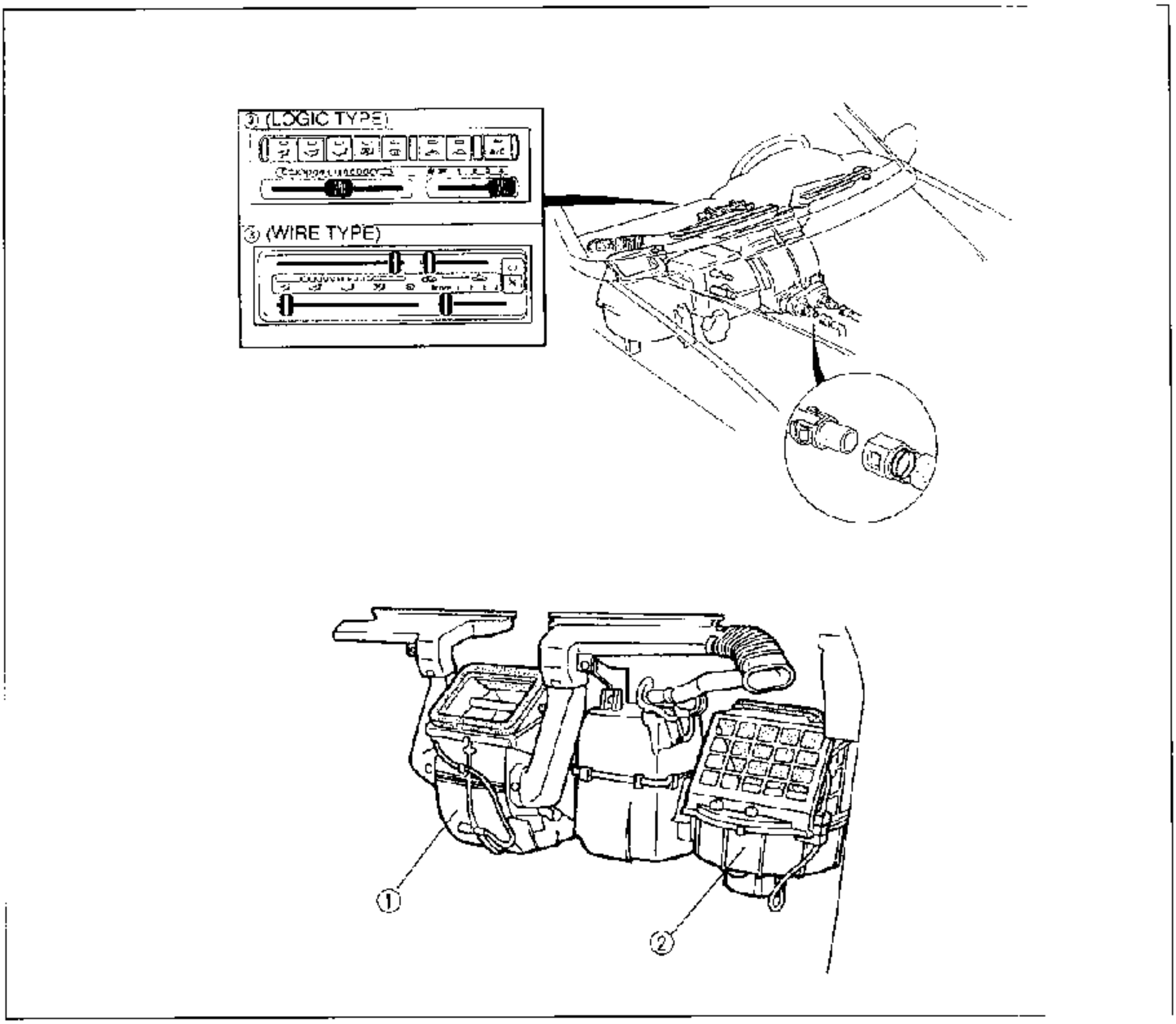

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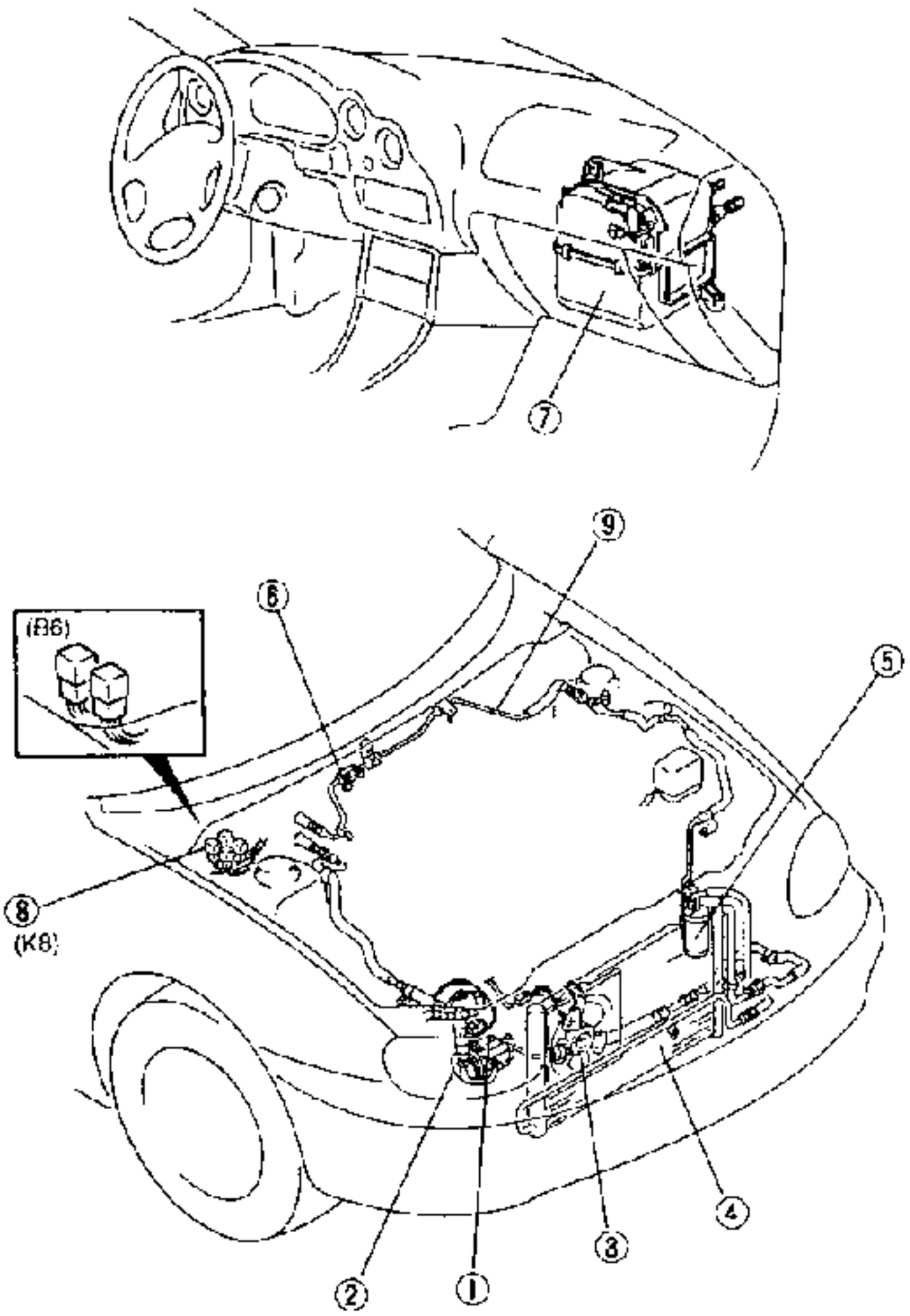

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CAUTIONARY POINTS FOR MAINTENANCE

REFRIGERANT–134a (R–134a)

Outline

- R–12 and other fluorocarbons now used in air conditioners can destroy the ozone layer in the stratosphere. The result is an increase in hazardous ultraviolet rays which over time can adversely affect both human health and the biosphere. Because of this concern, Mazda has chosen to use Refrigerant–134a (R–134a), a hydrofluorocarbon-based refrigerant that does not deplete the ozone layer, in this vehicle.
- R–12 and R–134a are not interchangeable; system parts and system service tools also differ. The table below compares the two systems.

Refrigerant systems

Part	R–12 system	R–134a system	Remarks
Refrigerant	Chlorofluorocarbon–12 (CFC–12) (CCl_2F_2)	Hydrofluorocarbon–134a (HFC–134a) (CH_2FCF_3)	If the refrigerants are mixed or one refrigerant is used in a system that requires the other, the compressor oil will separate from the refrigerant and not circulate within the system. This can damage the A/C compressor and cause abnormal A/C compressor vane noise. In addition, mixing R–134a with R–12 or using R–134a instead of R–12 in an R–12 system can lower the durability of the NBR O-ring and dissolve the fluorine rubber O-rings. If the fluorine rubber O-rings are dissolved, refrigerant may leak.
Compressor oil	Mineral oil	Polyalkylene glycol oil (PAG oil) [ATMOS GU10]	Special compressor oils for R–134a air conditioning systems are developed by each air conditioning vendor. Therefore, use only the specified oil for each model vehicle. If a PAG oil other than the specified type is used, the A/C compressor and refrigerant system can be damaged. If the compressor oils are mixed or one compressor oil is used in a system that requires the other, the compressor oil will separate from the refrigerant and not circulate within the system. This can damage the A/C compressor and cause abnormal A/C compressor vane noise. Mixing PAG oil with mineral oil or using PAG oil instead of mineral oil in an R–12 system can lower the durability of the NBR and fluorine rubber O-rings.
O-ring	Nitrile butadiene rubber (NBR) Fluorine rubber	Highly saturated nitrile butadiene rubber (HNBR)	If an NBR O-ring is used in an R–134a system, the PAG oil and R–134a will lower the durability of the O-ring. If a fluorine rubber O-ring is used in an R–134a system, the R–134a will dissolve the O-ring and cause the refrigerant to leak.

(Cont'd)

Part	R–12 system	R–134a system	Remarks
Joint nuts	Inch threads	Metric threads	Thread standards for joint nuts connecting cooler pipes and hoses have been changed to avoid connecting R–12 system parts with R–134a system parts.
Joint blocks	Refer to remarks		The bolt sizes and part measurements for joint blocks connecting cooler pipes and cooler hoses have been changed to avoid connecting R–12 system parts with R–134a system parts.
Charging valve	Screw-on type Hi: 3/8–24 UNF Lo: 7/16–20 UNF	Quick-connect type Hi: 16 mm {0.6 in} dia. Lo: 13 mm {0.5 in} dia.	The shape of the charging valve differs for each system to avoid confusion. The quick-connect charging valve prevents refrigerant from leaking when the charging hose is connected to the valve

Service tools

Part	R–12 system	R–134a system	Remarks
Tool joints	Inch threads	Metric threads	Thread standards for tool joints have been changed to avoid connecting R–12 system tools with R–134a system tools.
Charging valve joints	Screw-on type Hi: 3/8—24 UNF Lo: 7/16—20 UNF	Quick-connect type Hi: 16 mm {0.6 in} dia. Lo: 13 mm {0.5 in} dia.	The shape of the charging valve joints differs for each system to avoid confusion. The quick-connect charging valve joint prevents refrigerant from leaking when the charging hose is connected to the valve.
Manifold gauge	High-pressure-side maximum reading: 2.9 MPa {30 kgf/cm², 430 psi}	High-pressure-side maximum reading: 3.5 MPa {35 kgf/cm², 500 psi}	R-134a requires a higher pressure to condense than R-12.
Leak tester	Gas type Electric type	Electric type	A gas leak tester reacts with chlorine in R–12 to indicate the location of a leak. This kind of tester does not work with an R–134a system, however, because R–134a has no chlorine. Two kinds of electric testers are available: those that work exclusively with one system or the other and those that work with both.

SERVICE WARNINGS

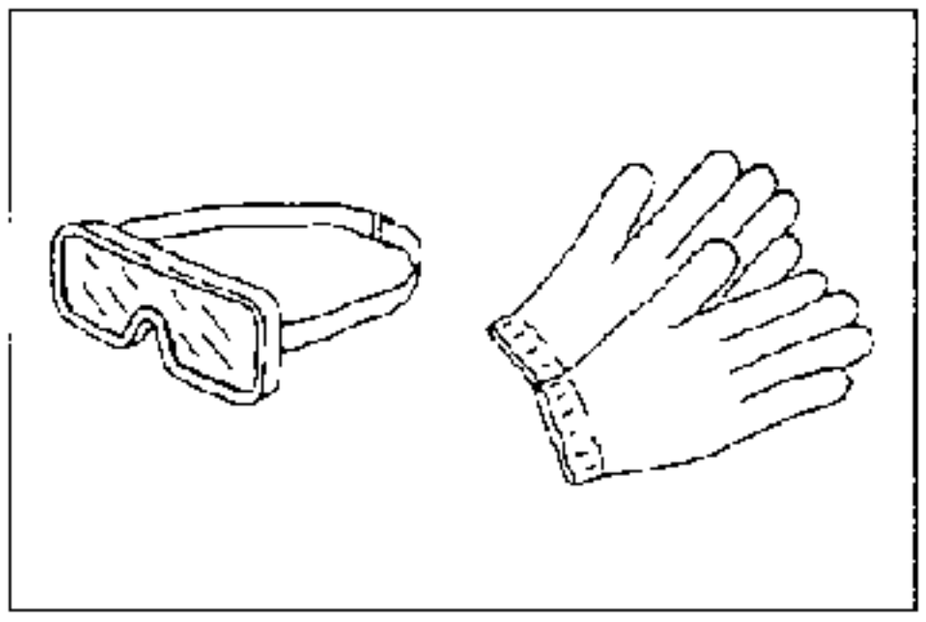
Using/Handling Unapproved Refrigerant

* **Using a flammable refrigerant, such as OZ–12, in this vehicle is dangerous. In an accident, the refrigerant may catch fire, resulting in serious injury or death. When servicing this vehicle, use only R–134a.**

* **Checking for system leaks on a vehicle that has been serviced with flammable refrigerant, such as OZ–12, is dangerous. Conventional leak detectors use an electronically generated arc which can ignite the refrigerant, causing serous injury or death. If a flammable refrigerant may have been used to service the system, or if you suspect a flammable refrigerant has been used, contact the local fire marshall or EPA office for information on handling the refrigerant.**

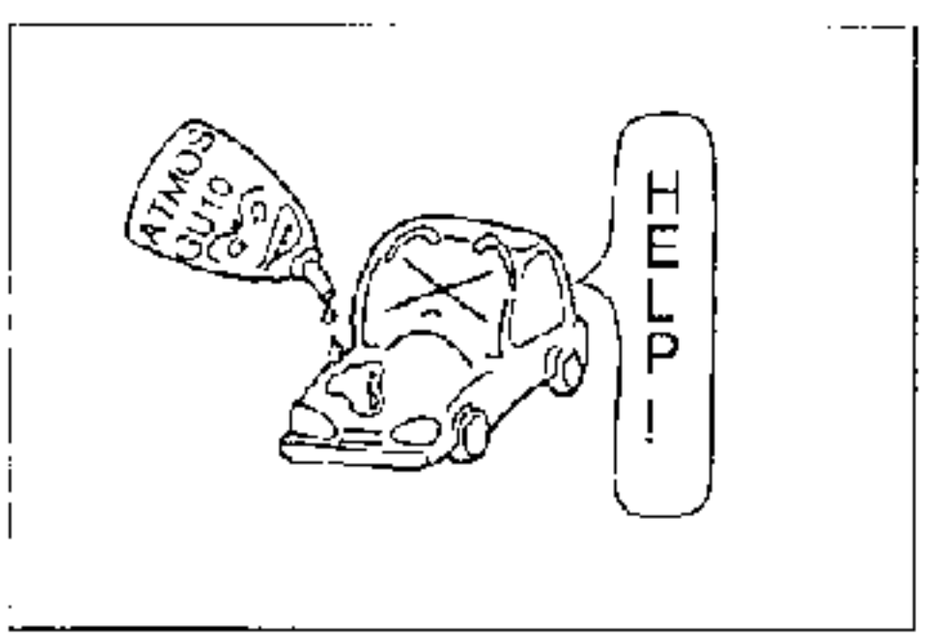
Storing Refrigerant

- **The refrigerant container is highly pressurized. If it is subjected to high heat, it could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Store the refrigerant at temperatures below 40 °C (104 °F).**



Handling Refrigerant

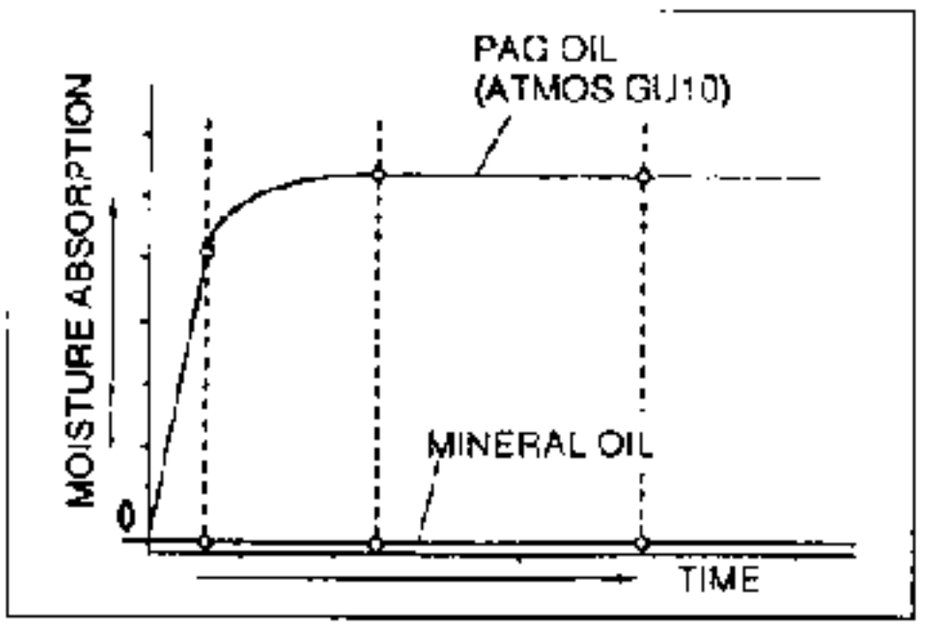
- **Handling liquid refrigerant is dangerous. A drop of it on the skin can result in localized frostbite. When handling the refrigerant, wear gloves and safety goggles. If refrigerant splashes into the eyes, immediately wash them with clean water and consult a doctor.**



SERVICE CAUTIONS

Compressor Oil (ATMOS GU10)

- **Do not spill compressor oil on the vehicle. A drop of compressor oil on the vehicle surface can eat away at the paint. If oil gets on the vehicle, wipe it off immediately.**

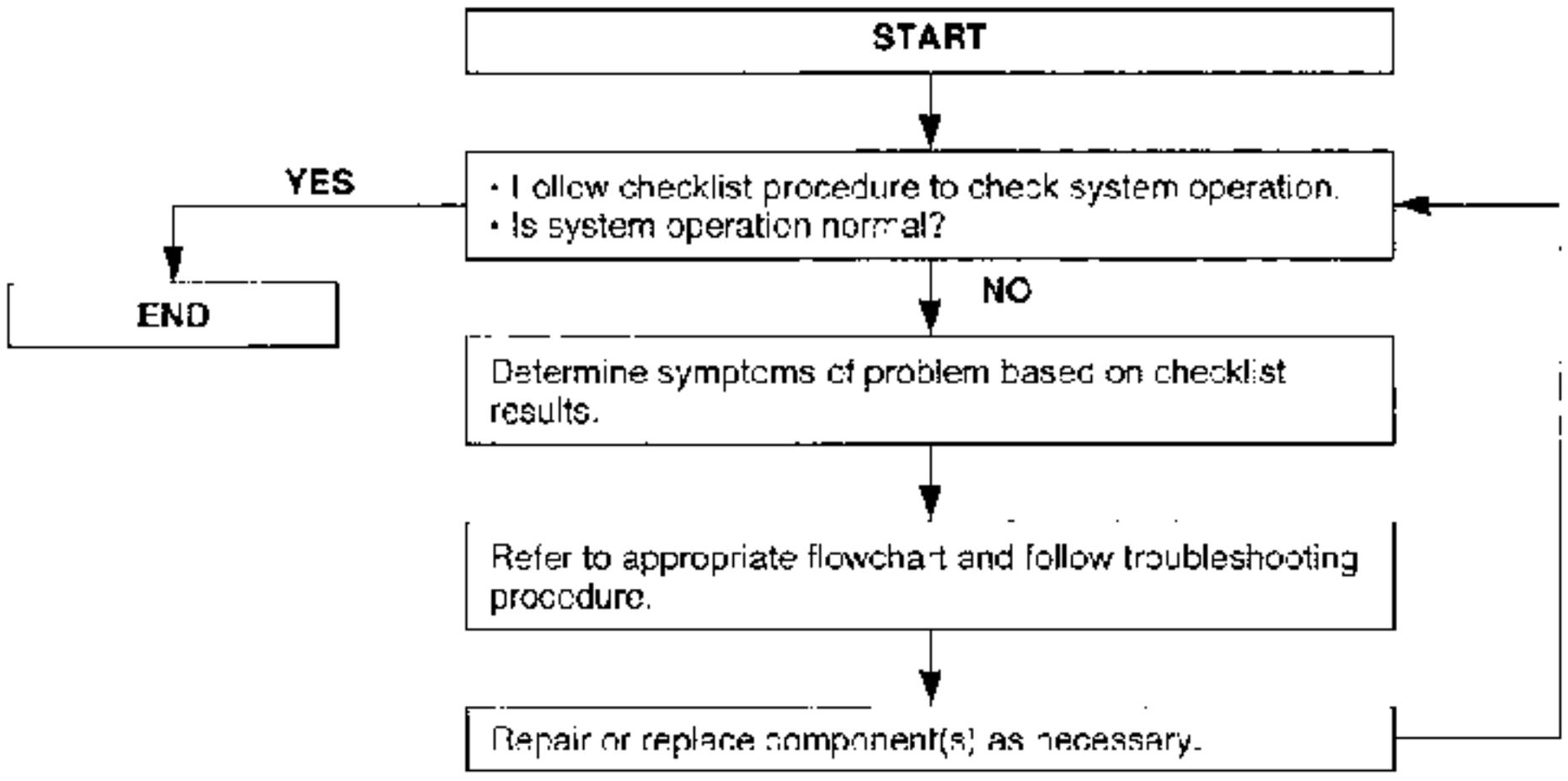


- **PAG oil (ATMOS GU10) has a higher moisture absorption efficiency than the previously used mineral oil. If moisture mixes with the compressor oil, the refrigerant system could be damaged. Therefore, install caps immediately after using the compressor oil or removing refrigerant system parts to prevent moisture absorption.**

TROUBLESHOOTING

FLOW OF TROUBLESHOOTING

Follow the steps below to troubleshoot the heater and air conditioner.



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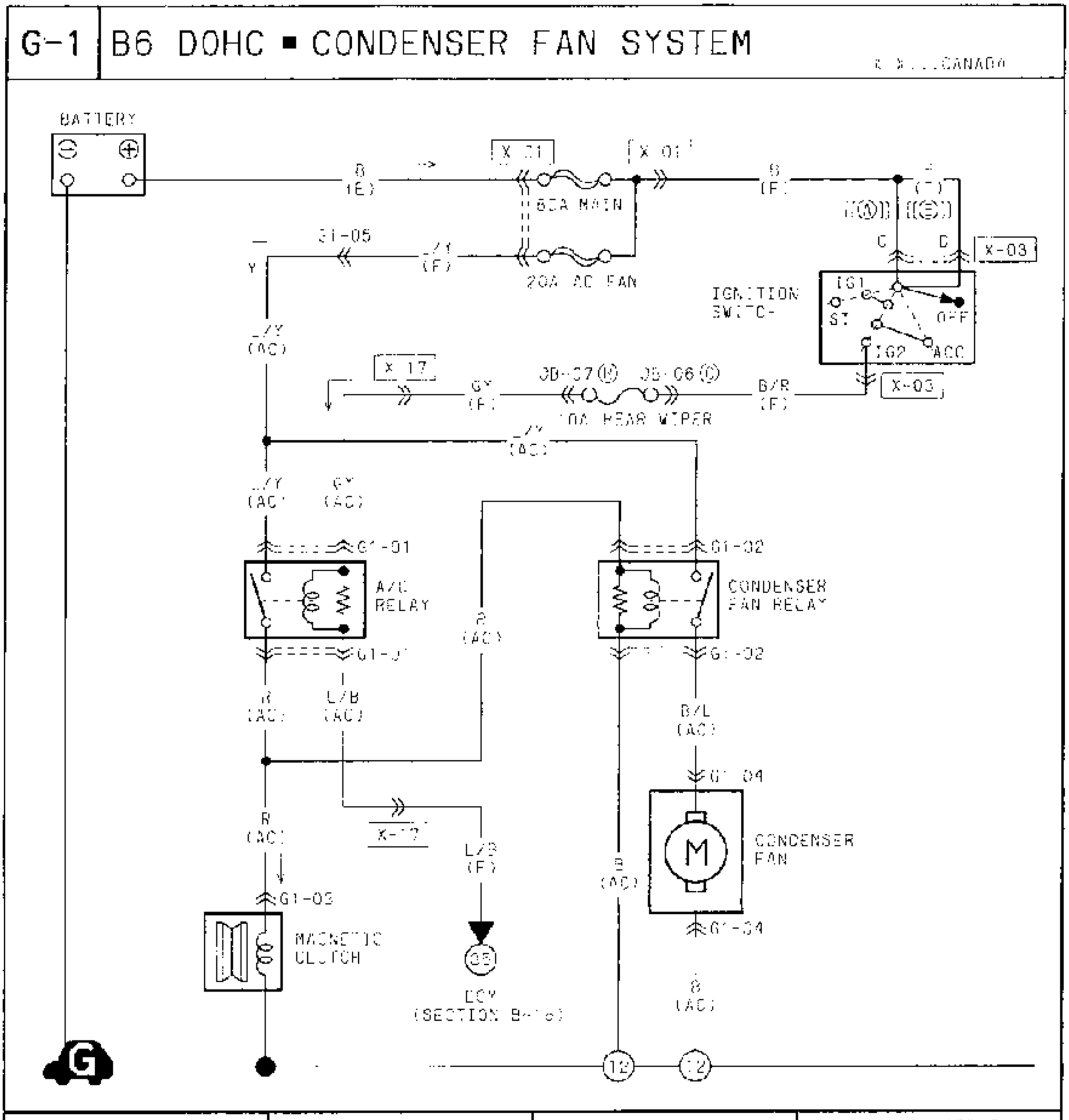
CHECKLIST

- When inspecting the heater or air conditioner, warm up the engine before each operational check. The engine coolant temperature must be 40 °C {104 °F} or higher.
- The air conditioner is composed of an electrical system as well as a refrigerant system. Because some refrigerant system components require the evacuation of refrigerant gas before replacement, inspect the electrical system first.

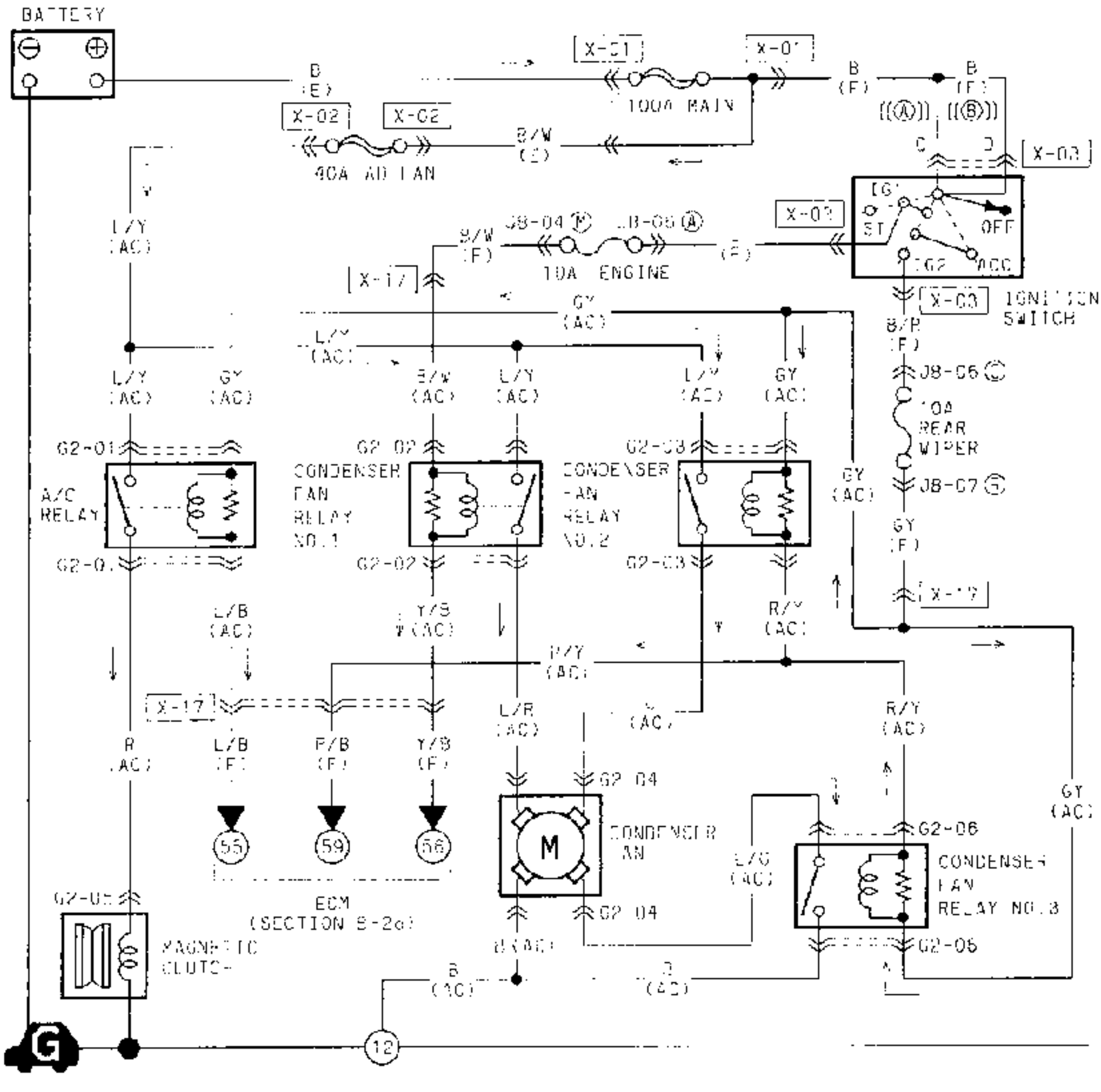
Operational check	Symptom	Flowchart No.
Check motor operation when fan switch is turned to 1st, 2nd, 3rd, and 4th respectively.	Blower motor does not operate at any fan switch position	1
	Blower motor does not operate with fan switch at specific position	2
Turn on fan switch and A/C switch on; check operation of magnetic clutch and condenser fan.	Magnetic clutch and condenser fan do not operate	3
	Magnetic clutch does not operate, but condenser fan operates normally	4
	Condenser fan does not operate, but magnetic clutch operates normally	5 (K8)
		6 (B6)
	Airflow is not cool; magnetic clutch and condenser fan operate	13
	Engine overheats at high load; A/C operates normally	7 (K8)
Move mode switch or lever to each mode and verify that air outlets change accordingly.	Airflow mode does not change	8 (logic type)
		9 (wire type)
Move REC/FRESH switch or lever and verify that recirculation and fresh change accordingly	Intake air mode does not change	10 (logic type)
		11 (wire type)
Move temperature control lever from MAX COLD to MAX HOT and verify that airflow temperature changes.	Airflow temperature does not change	12
Check refrigerant amount. (Refer to page G–53.)	Airflow is not cool; magnetic clutch and condenser fan operate	13

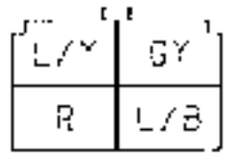
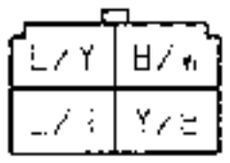
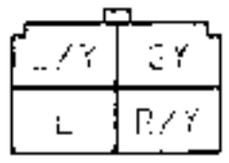
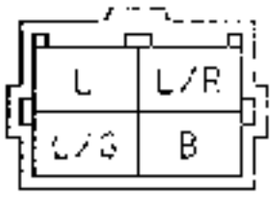
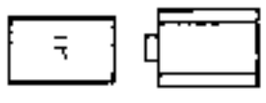
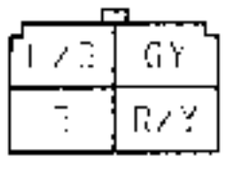
WIRING DIAGRAM

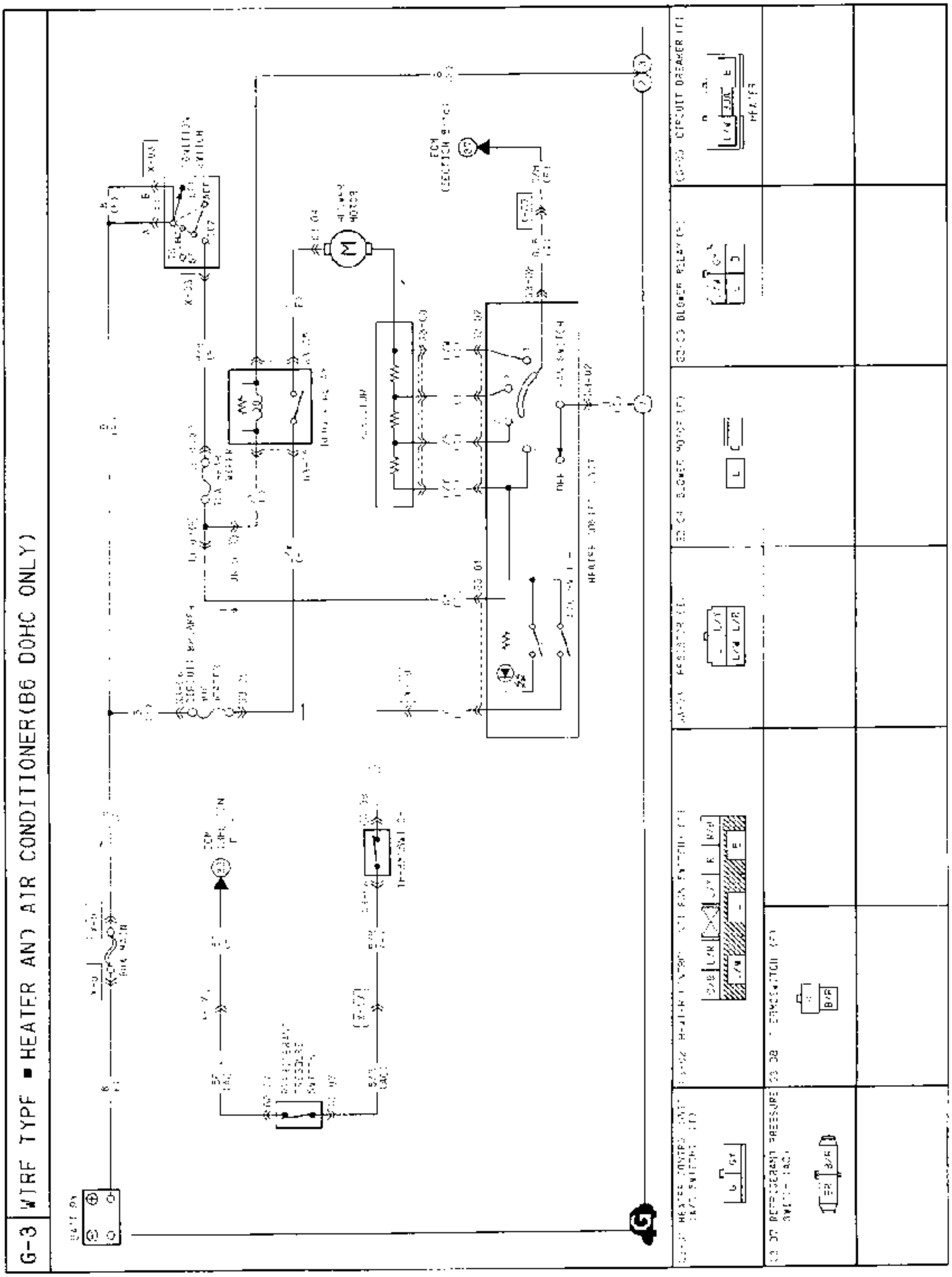


G-2 K8 DOHC ■ CONDENSER FAN SYSTEM

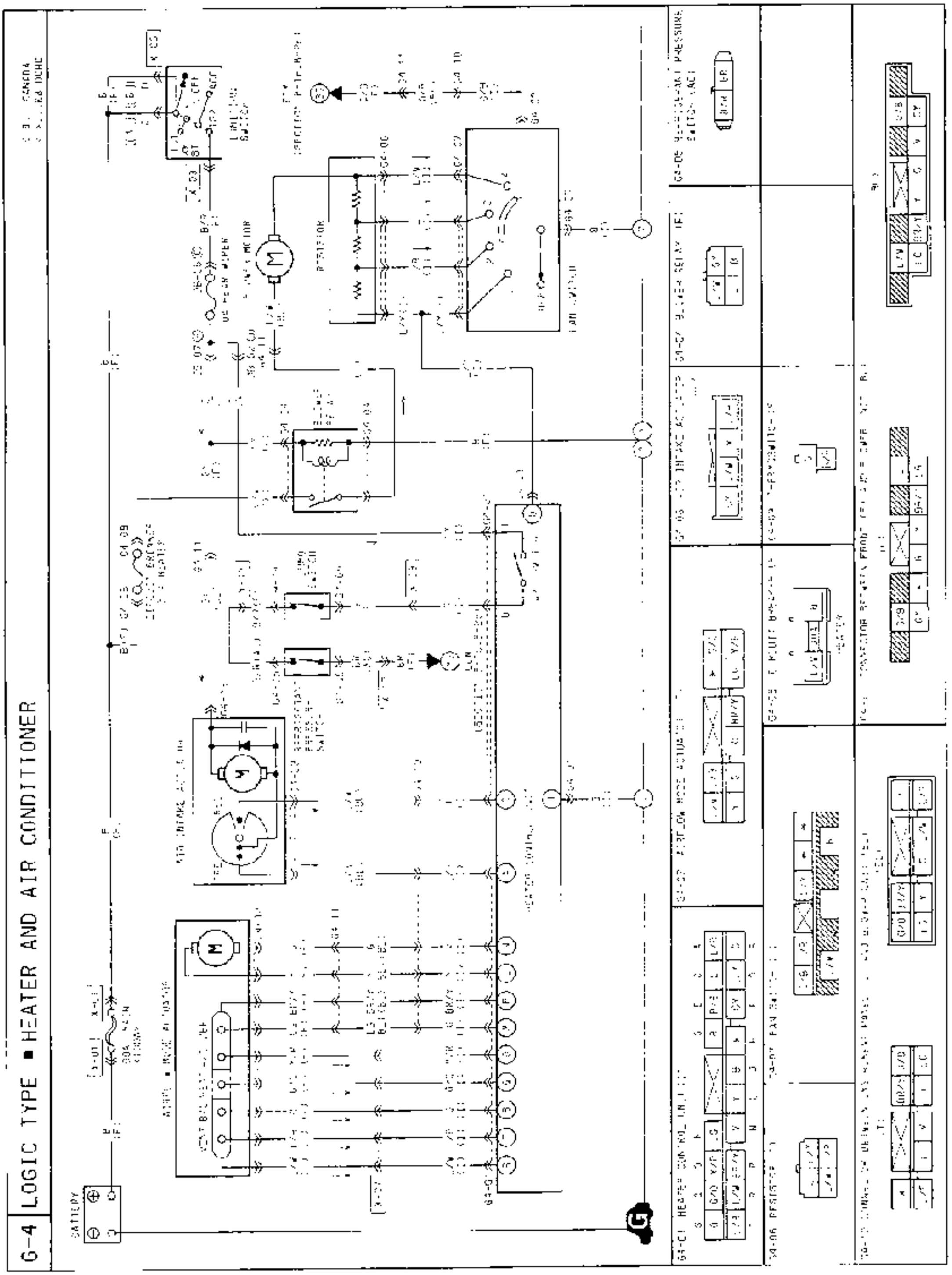
( ) ...CANADA



G2-01 A/C RELAY (AC) 	G2-02 CONDENSER FAN RELAY NO.1 (AC) 	G2-03 CONDENSER FAN RELAY NO.2 (AC) 	G2-04 CONDENSER FAN (AC) 
G2-05 MAGNETIC CLUTCH (AC) 	G2-06 CONDENSER FAN RELAY NO.3 (AC) 		

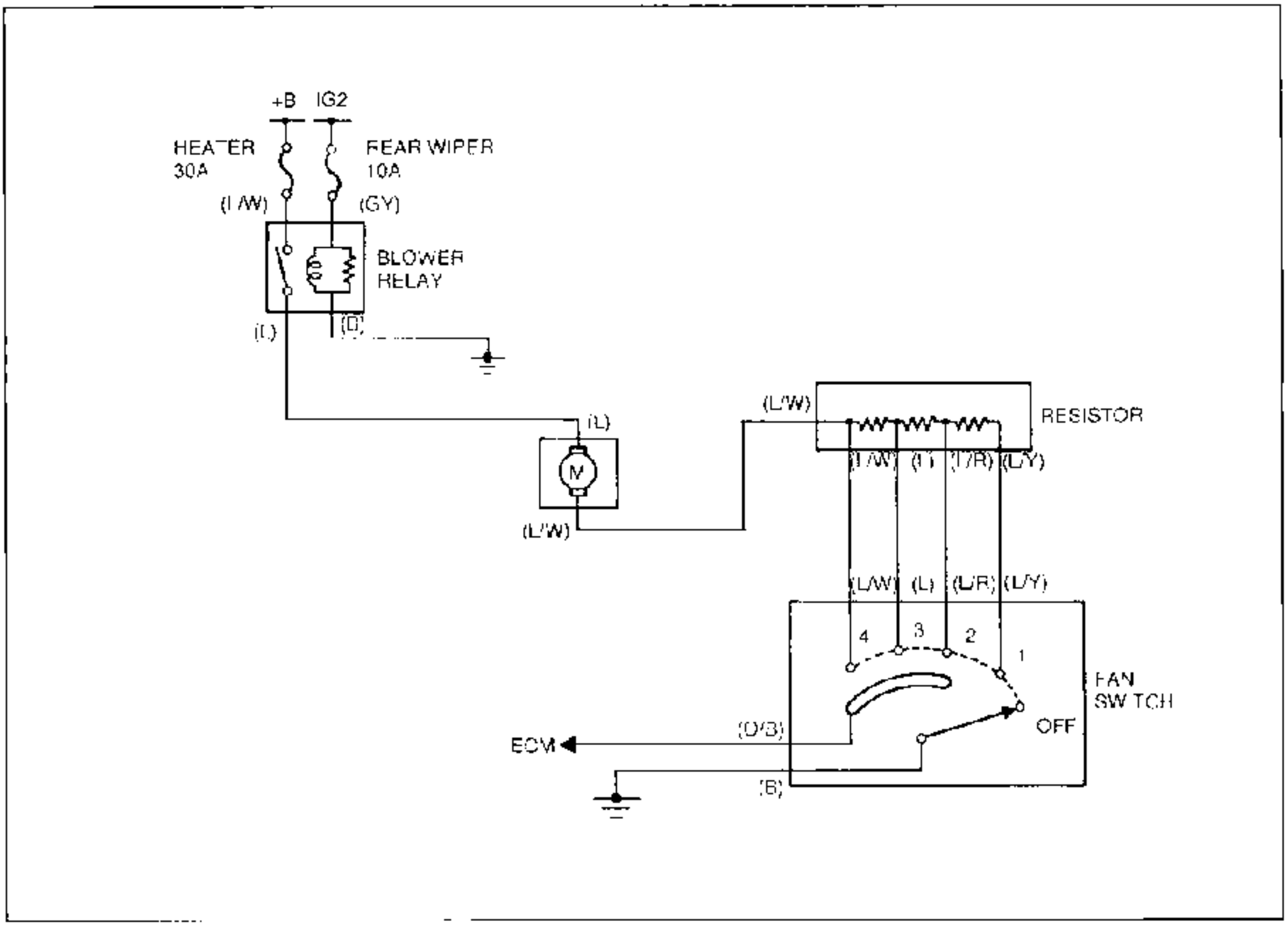

G-3 WITH TYPE ■ HEATER AND AIR CONDITIONER(B6 DOHC ONLY)
CIRCUIT BREAKER (15A)
BLOWER RELAY (1)
BLOWER MOTOR (F)
HEATER CONTROL UNIT
AIR CONDITIONER PRESSURE SWITCH (LOW)
ECM
HEATER CONTROL PANEL
G

G-4 LOGIC TYPE ■ HEATER AND AIR CONDITIONER



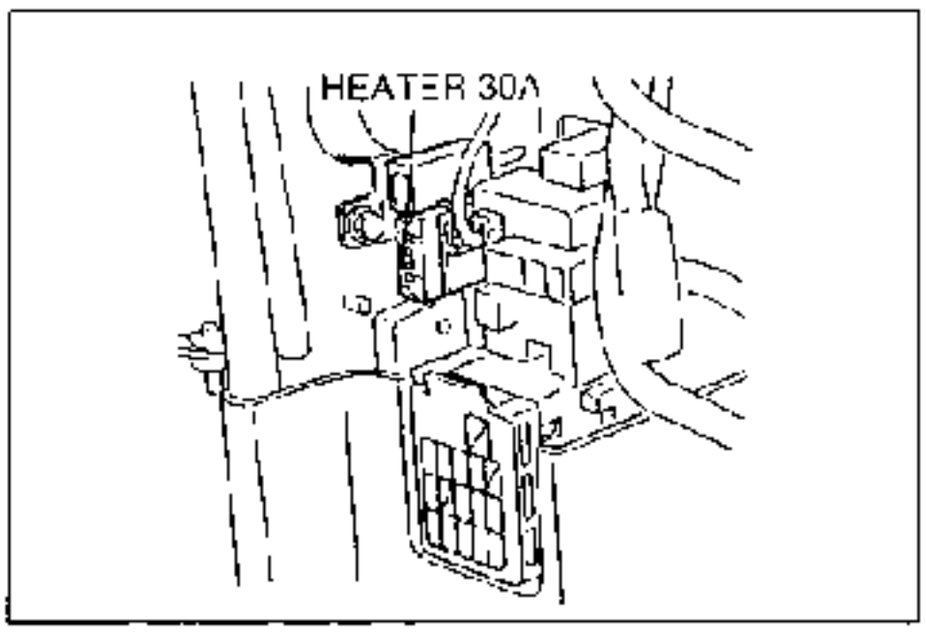
FLOWCHARTS

Flowchart No.	Symptom .....Blower motor does not operate at any fan switch position Related components ...Fuse, blower relay, blower motor, resistor, fan switch, wiring harness
1	



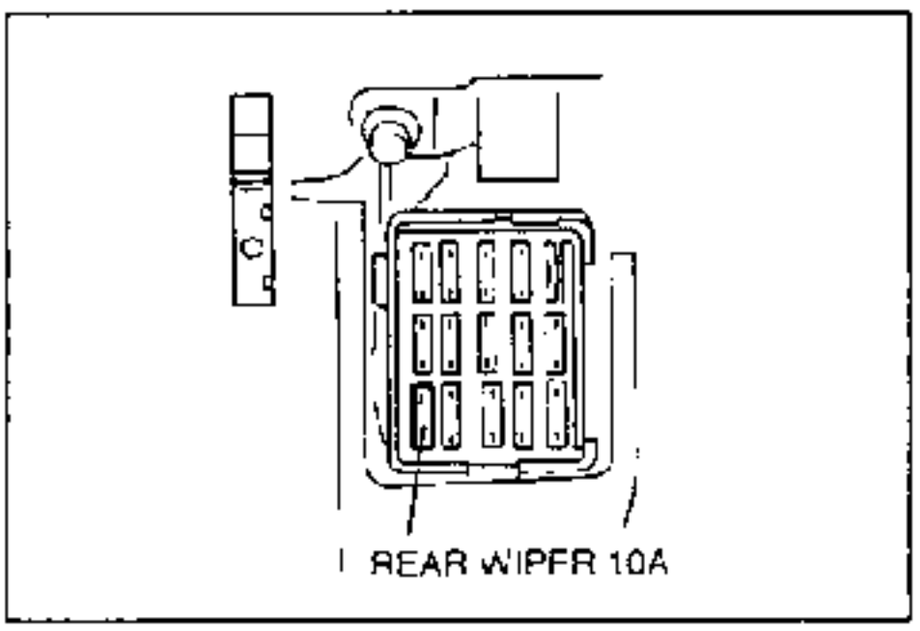
System Operation

- Blower motor speed is controlled by the fan switch and resistor in the blower unit.
  When the fan switch is in the OFF position, the motor ground circuit is open and the blower motor does not operate. When the switch is in the first position, current flow from the blower motor is restricted by the resistor, and the blower motor turns at low speed.
- Changing the fan switch to the second, third, or fourth positions causes the circuit resistance to decrease and the blower speed to increase.



Step 1

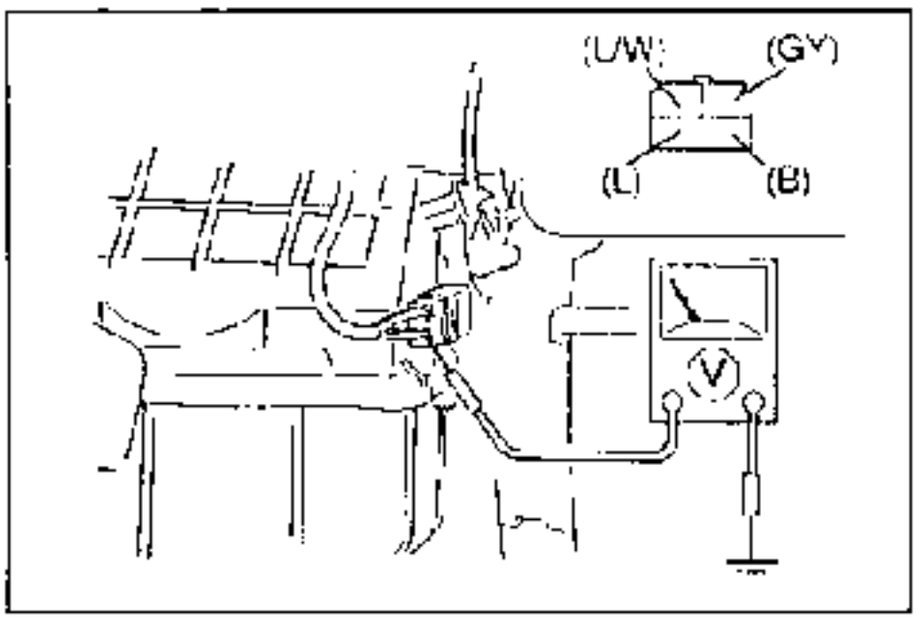
1. Check the HEATER 30A fuse (circuit breaker) in the joint box.
2. If the reset button is not out, go to Step 2.
3. If the reset button is out, check for a short circuit in the harness. Repair as necessary, and then depress the reset button to reset the circuit breaker.



Step 2

Check the REAR WIPER 10A fuse in the fuse block.

Fuse	Action
OK	Go to Step 3
Burnt	Replace fuse after checking and repairing wiring harness

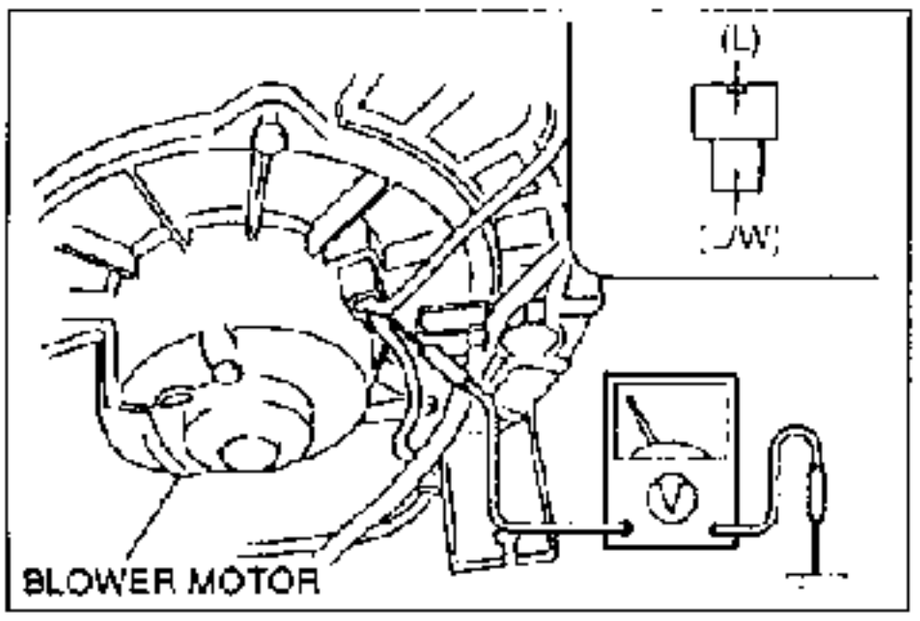


Step 3

1. Turn the ignition switch to ON.
2. Set the fan switch to the fourth position.
3. Measure the voltage at the following terminal wires of the blower relay connector.

B+: Battery positive voltage

Wire	Voltage	Action
(GY)	B+	Measure voltage at (L/W) wire
	Other	Repair wiring harness (REAR WIPER 10A fuse—Blower relay)
(L/W)	B+	Measure voltage at (B) wire
	Other	Repair wiring harness (Circuit breaker—Blower relay)
(B)	B+	Repair wiring harness (Blower relay—GND)
	Other	Measure voltage at (L) wire
(L)	B+	Go to Step 4
	Other	Replace blower relay (Refer to page G–42)

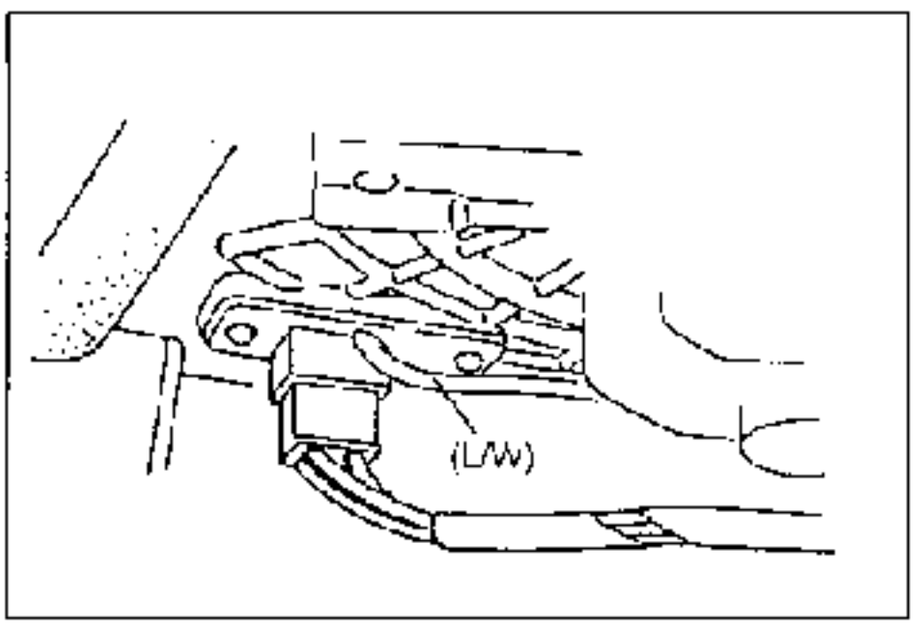


Step 4

1. Verify that the ignition switch is at ON and that the fan switch is in the fourth position.
2. Measure the voltage at the following terminal wires of the blower motor connector.

B+: Battery positive voltage

Wire	Voltage	Action
(L)	B+	Measure voltage at (L/W) wire
	Other	Repair wiring harness (Blower relay—Blower motor)
(L/W)	0V	Replace blower motor (Refer to page G–41)
	Other	Go to Step 5

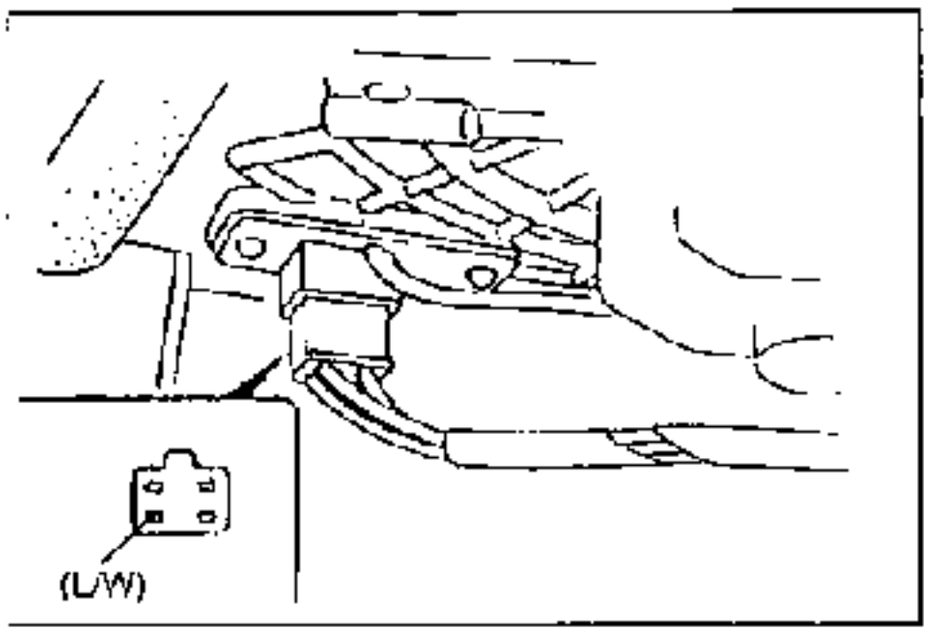


Step 5

Measure the voltage at the (L/W) terminal wire of the resistor connector.

B+: Battery positive voltage

Voltage	Action
0V	Repair wiring harness (Blower motor—Resistor)
Other	Go to Step 6

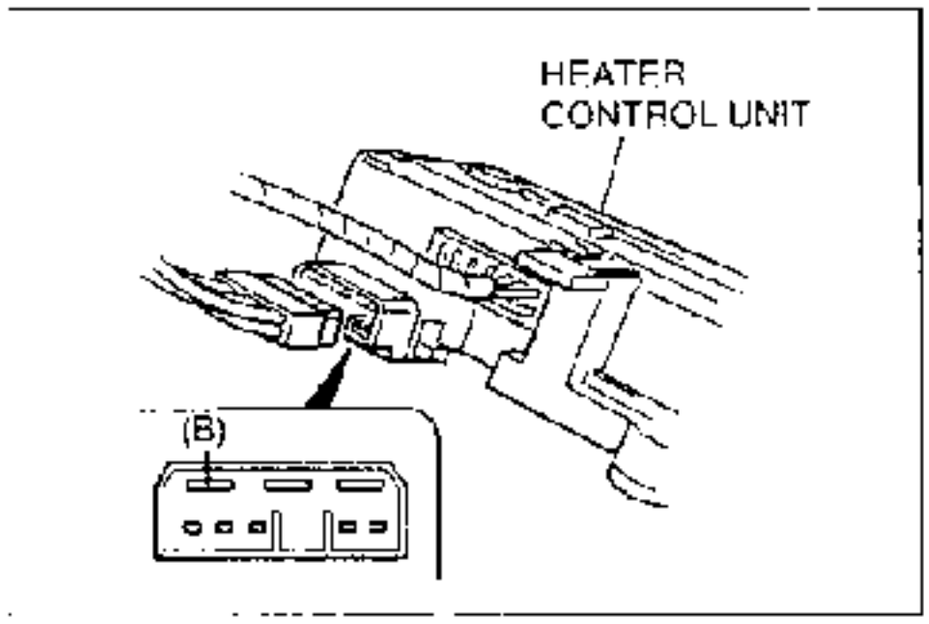


Step 6

1. Turn the fan switch off.
2. Measure the voltage at the (L/W) terminal wire of the resistor connector.

B+: Battery positive voltage

Voltage	Action
B+	Go to Step 7
Other	Replace resistor (Refer to page G–41)

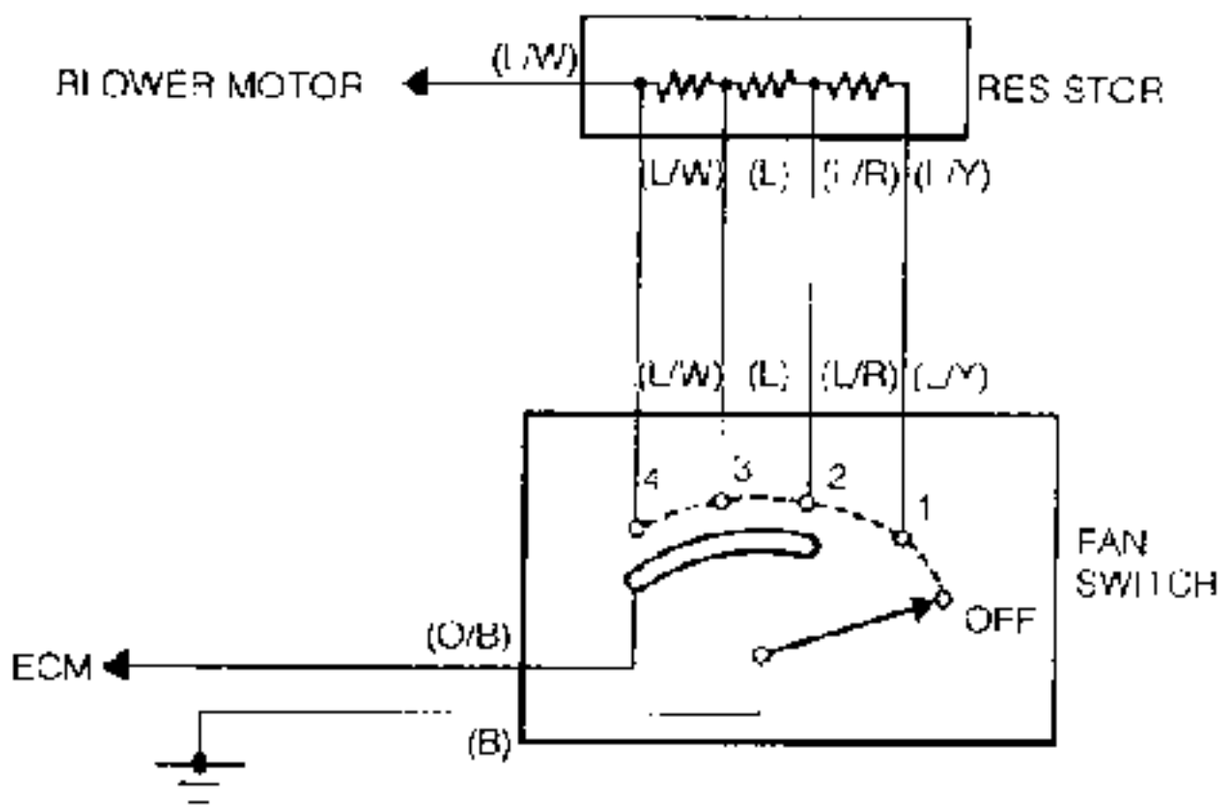


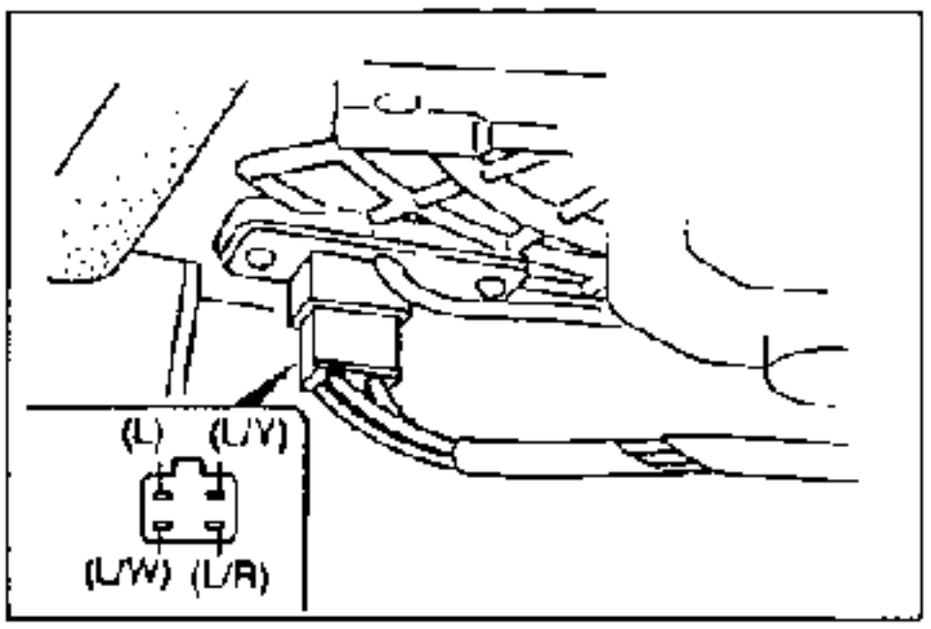
Step 7

1. Turn the ignition switch to OFF.
2. Remove the heater control unit and disconnect the fan switch connector. (Refer to page G–43.)
3. Check for continuity between the (B) terminal wire of the fan switch connector and ground.

Continuity	Action
Yes	Replace fan switch (Refer to page G–44 or G–45)
No	Repair wiring harness (Fan switch—GND)

Flowchart No.	Symptom .....Blower motor does not operate with fan switch at specific position Related components ...Resistor, fan switch, wiring harness
2	

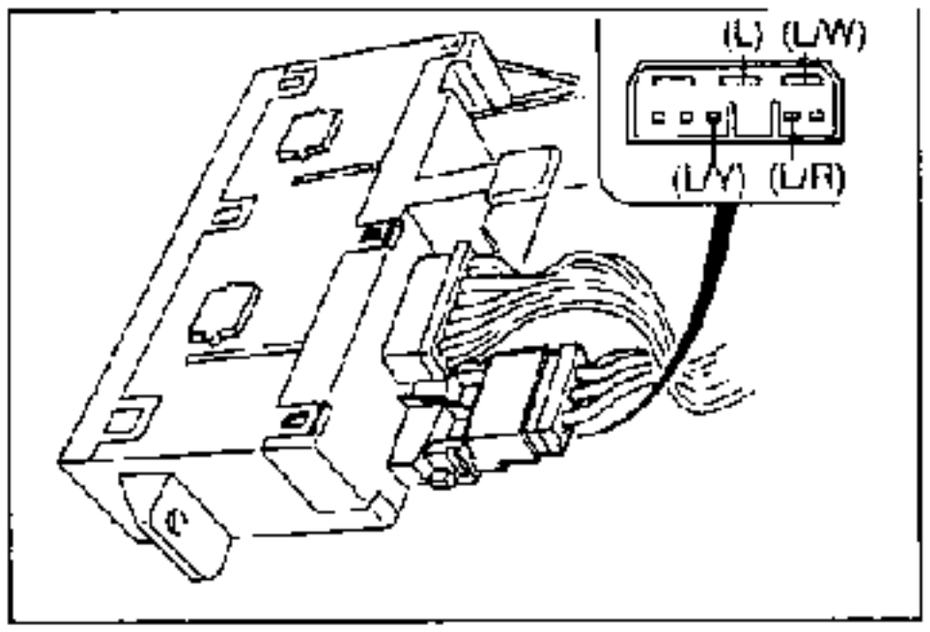




Step 1
1. Turn the ignition switch to ON.
2. Verify that the fan switch is off.
3. Measure the voltage at the following terminal wires of the resistor connector.

B+: Battery positive voltage

Wire	Voltage	Action
(L/W)	B+	Measure voltage at (L) wire
	Other	Replace resistor (Refer to page G–41)
(L)	B+	Measure voltage at (L/R) wire
	Other	Replace resistor (Refer to page G–41)
(L/R)	B+	Measure voltage at (L/Y) wire
	Other	Replace resistor (Refer to page G–41)
(L/Y)	B+	Go to Step 2
	Other	Replace resistor (Refer to page G–41)



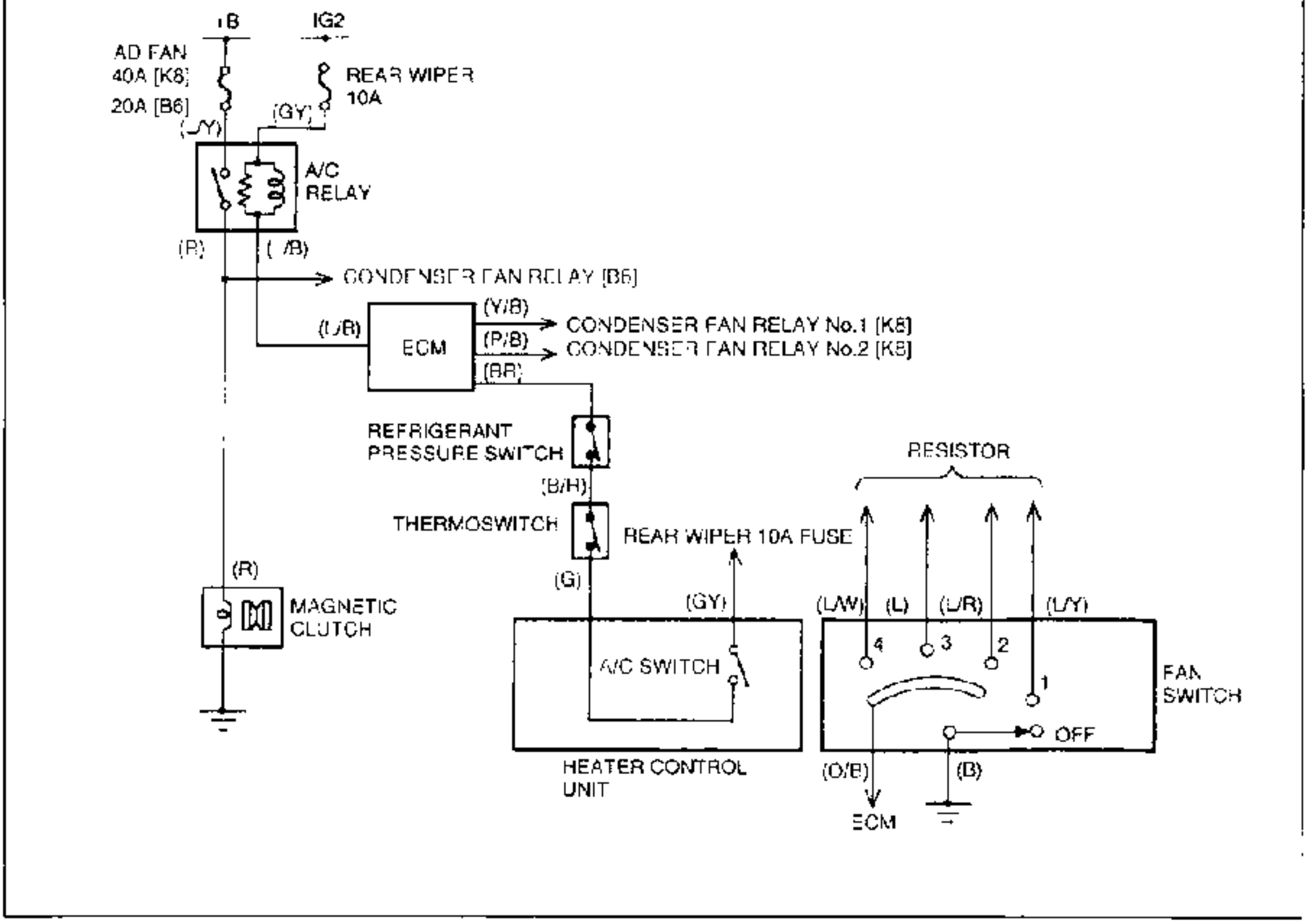
Step 2

1. Verify that the ignition switch is ON.
2. Verify that the fan switch is off.
3. Measure the voltage at the following terminal wires of the fan switch connector.

B+: Battery positive voltage

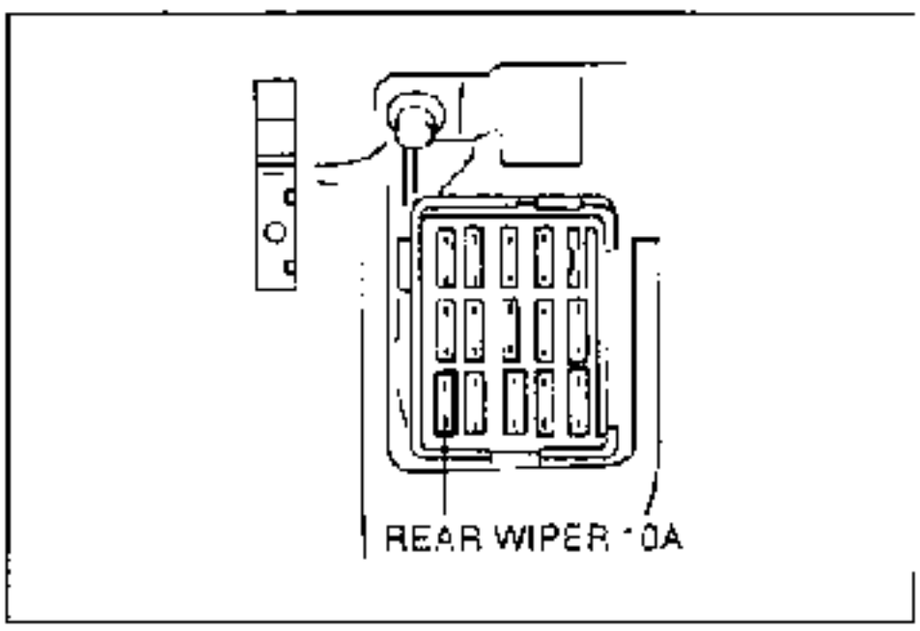
Wire	Voltage	Action
(L/W)	B+	Measure voltage at (L) wire
	Other	Repair wiring harness (Resistor—Fan switch)
(L)	B+	Measure voltage at (L/R) wire
	Other	Repair wiring harness (Resistor—Fan switch)
(L/R)	B+	Measure voltage at (L/Y) wire
	Other	Repair wiring harness (Resistor—Fan switch)
(L/Y)	B+	Replace fan switch (Refer to page G–44 or G–45)
	Other	Repair wiring harness (Resistor—Fan switch)

Flowchart No.	Symptom .....Magnetic clutch and condenser fan do not operate Related components ...Fuse, A/C relay, ECM, heater control unit, thermoswitch, refrigerant pressure switch
3	



System Operation

- Signals from the fan switch and A/C switch are sent to the ECM.
- The thermoswitch detects the evaporator temperature and opens or closes the circuit to keep the evaporator temperature at a certain level to protect against freezing.
- To help liquefy the refrigerant, the condenser fan rotates and sends airflow to the condenser when the A/C compressor is on.



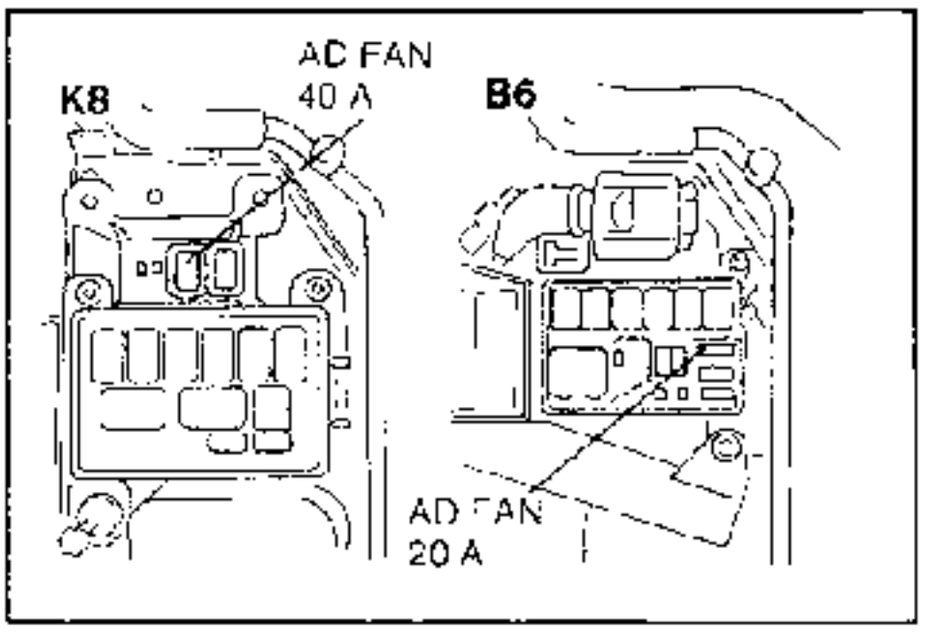
Step 1

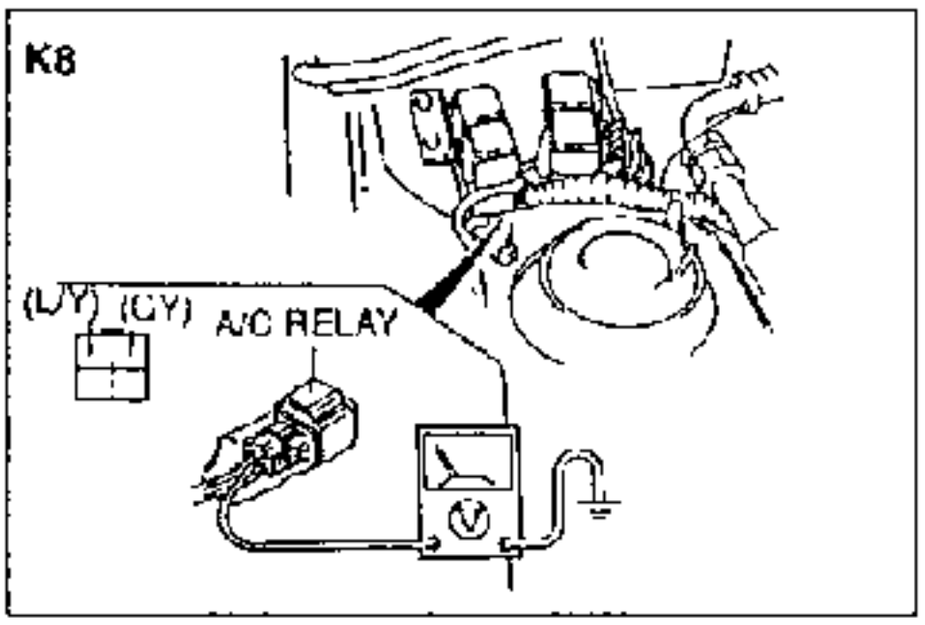
1. Check the following fuses.

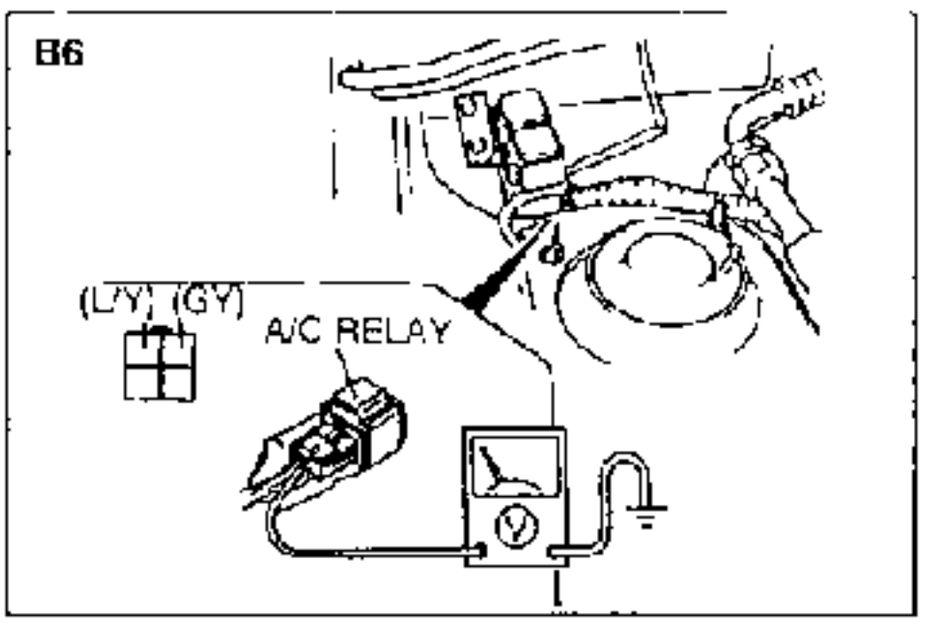
Fuse	Amperage (A)	Location
REAR WIPER	10	Fuse block
AD FAN	40 [20]	Main fuse block No.2 [Main fuse block No.1]

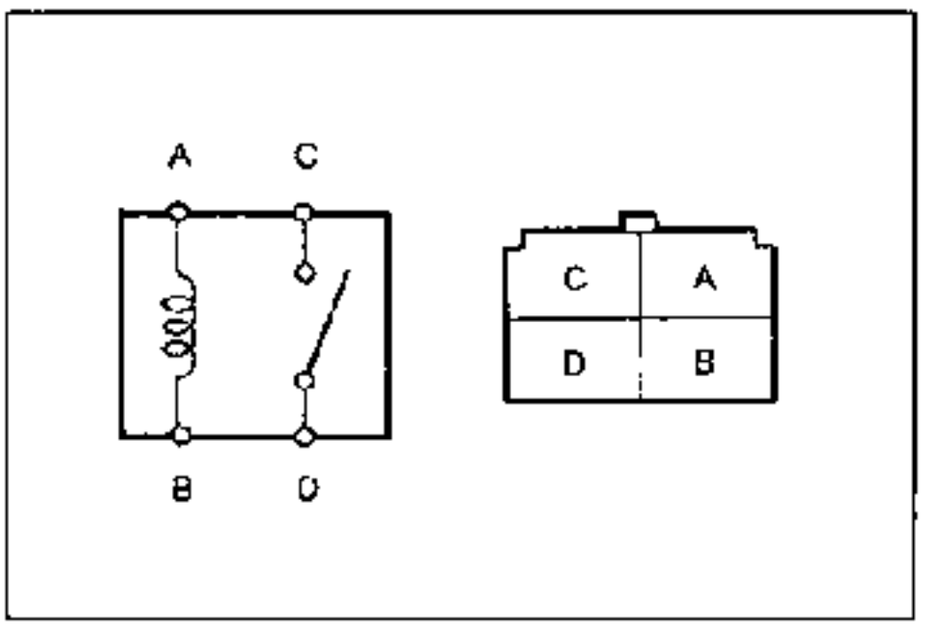
[ ]: B6

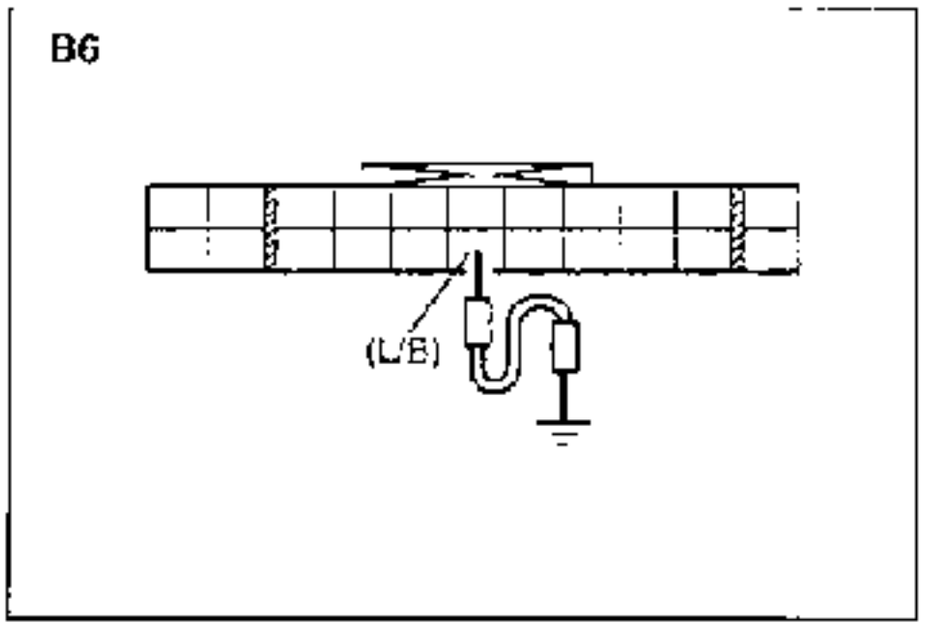
2. If the fuses are OK, go to Step 2.
3. If a fuse is burnt, check for a short circuit in the wiring harness before replacing the fuse.











Step 2

1. Turn the ignition switch to ON.
2. Measure the voltage at the following terminal wires of the A/C relay connector.

B+: Battery positive voltage

Wire	Voltage	Action
(L/Y)	B+	Measure voltage at (GY) wire
	Other	Repair wiring harness (AD FAN 40A [K8], AD FAN 20A [B6] fuse—A/C relay)
(GY)	B+	Go to Step 3
	Other	Repair wiring harness (RR AIR WIPER 10A fuse—A/C relay)

Step 3

1. Turn the ignition switch to OFF.
2. Remove the A/C relay.
3. Connect battery positive voltage and check for continuity between the terminals of the A/C relay.

B+: Battery positive voltage

Connection		Teminal			
B+	GND	A	B	C	D
—	—	○	○		
A	B			○——	——○

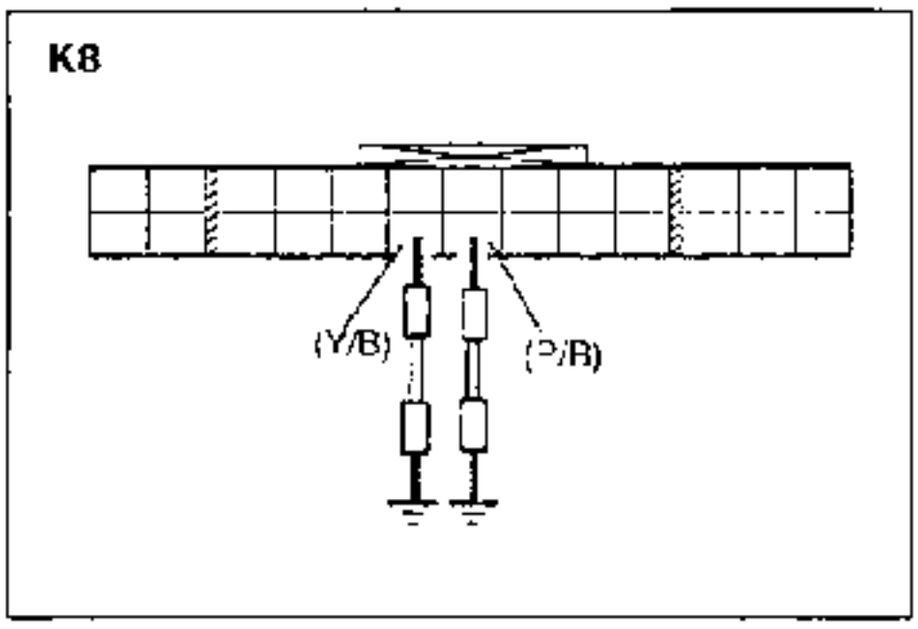
○—○ : Continuity

4. If correct, reinstall the A/C relay and go to Step 4.
5. If not as specified, replace the A/C relay.

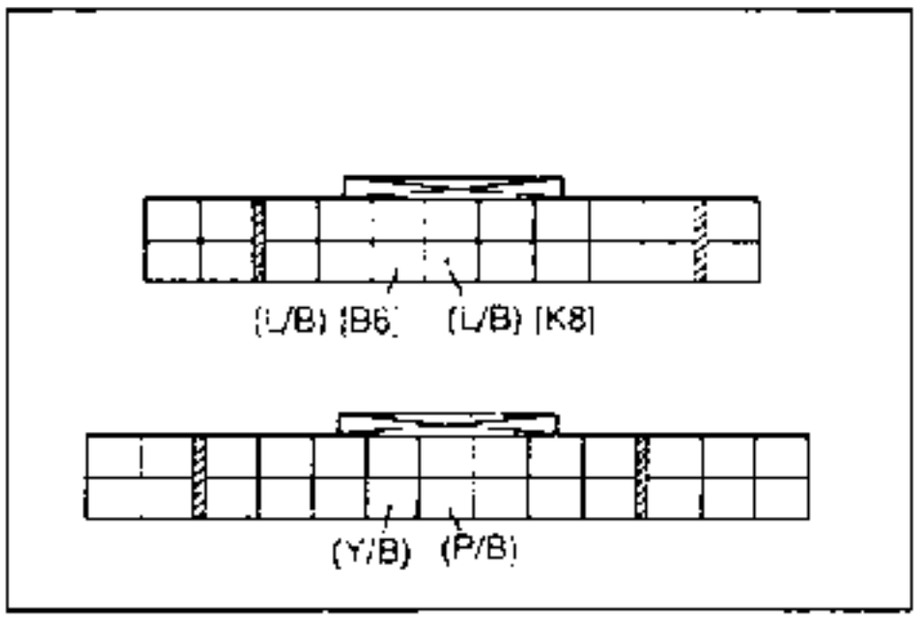
Step 4

1. Disconnect the ECM connector.
2. Connect a jumper wire between the terminal wires of the ECM connector and ground.
3. Start the engine and verify that the magnetic clutch and condenser fan operate.

Wire	Magnetic clutch, condenser fan	Action
(L/B)	Operate	Remove jumper wire, reconnect ECM connector, and go to Step 6
	Do not operate	Remove jumper wire and go to Step 5



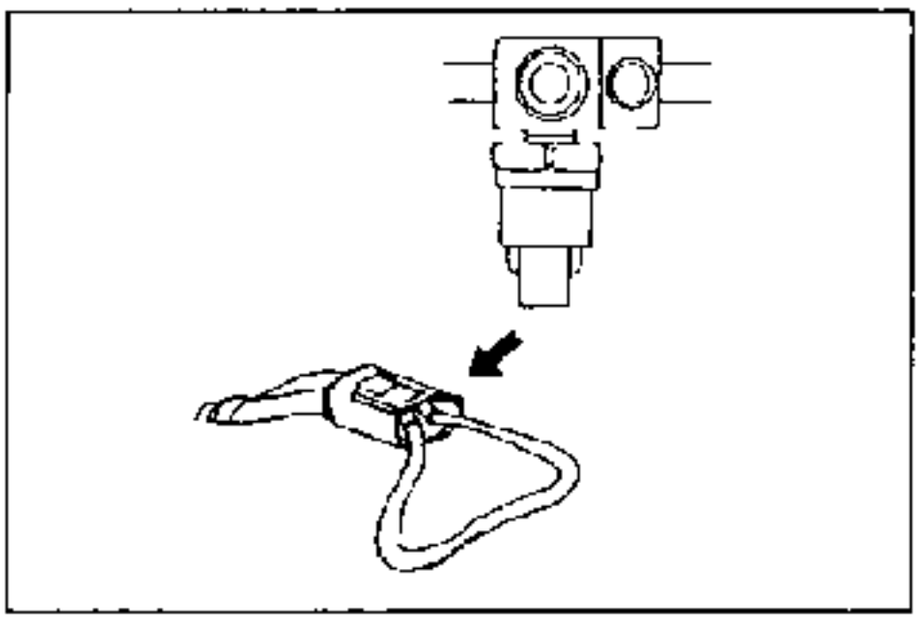
Wire	Condenser fan	Action
(Y/B)	Operates (low speed)	Remove jumper wire, reconnect ECM connector, and go to Step 6
	Does not operate	Remove jumper wire and go to Step 5
(P/B)	Operates (high speed)	Remove jumper wire, reconnect ECM connector, and go to Step 6
	Does not operate	Remove jumper wire and go to Step 5



Step 5
1. Verify that the engine is running.
2. Measure the voltage at the following terminal wires of the ECM connector.

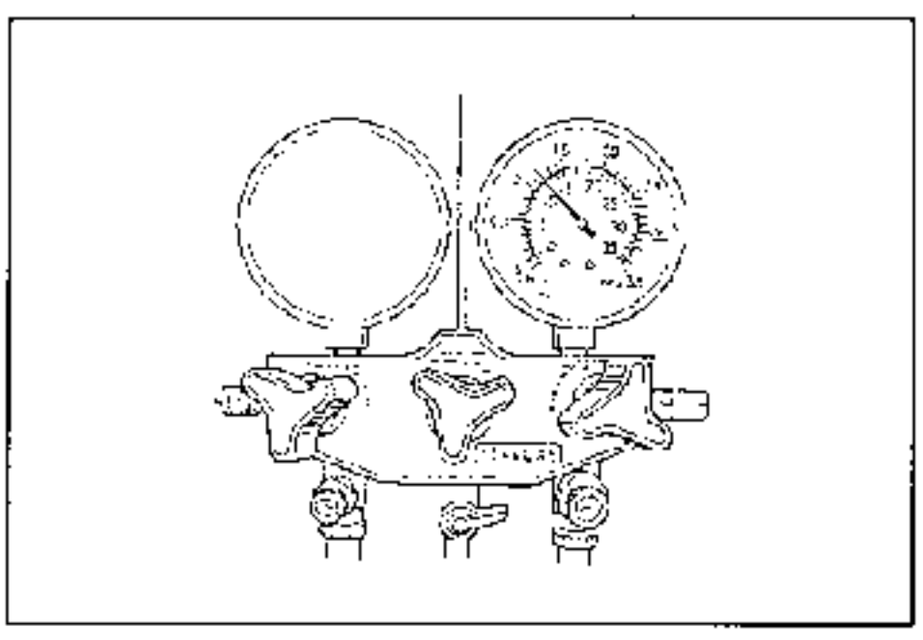
B+: Battery positive voltage

Wire	Voltage	Action
(L/B)	B+	Reconnect ECM connector, and go to Step 6 [B6] or measure voltage at (Y/B) wire [K8]
	Other	Repair wiring harness (A/C relay—ECM)
(Y/B)	B+	Measure voltage at (P/B) wire
	Other	Repair wiring harness (Condenser fan relay No.1—ECM)
(P/B)	B+	Go to Step 6
	Other	Repair wiring harness (Condenser fan relay No.2—ECM)



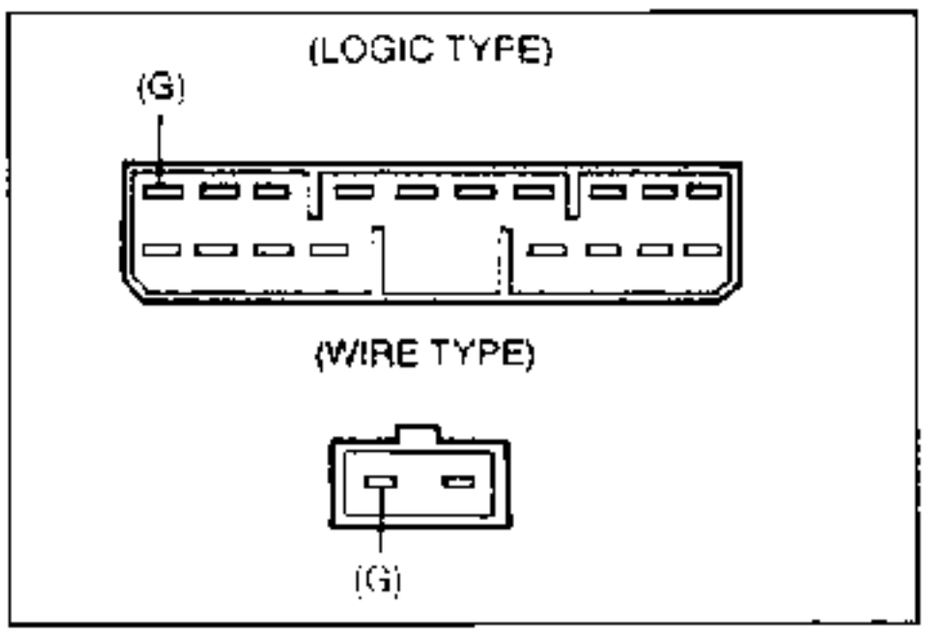
Step 6
1. Turn the ignition switch to OFF and disconnect the refrigerant pressure switch connector.
2. Connect a jumper wire between terminals A and B of the refrigerant pressure switch connector.
3. Start the engine.
4. Turn the fan switch and A/C switch on and check the operation of the magnetic clutch and condenser fan.

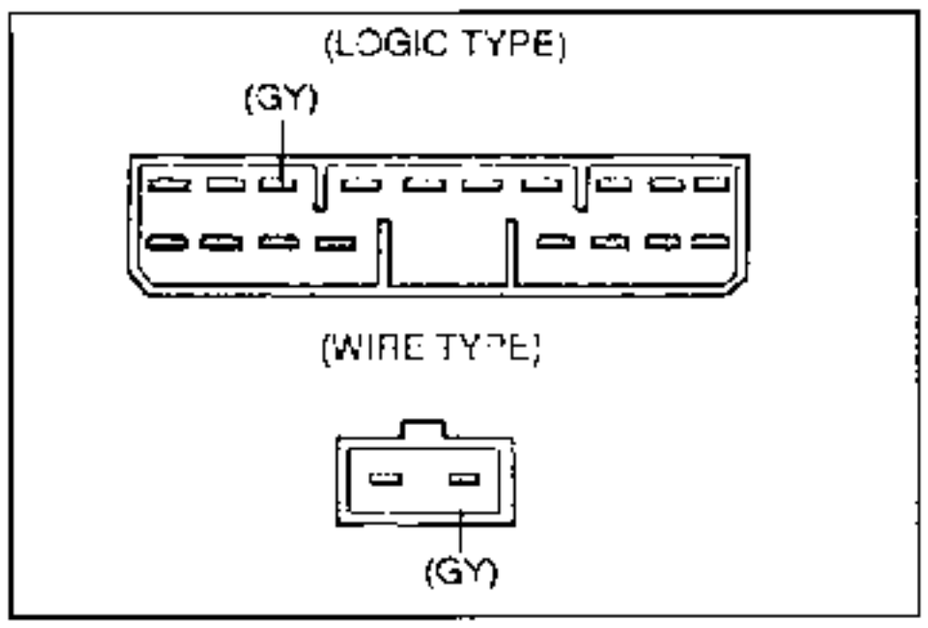
Magnetic clutch, condenser fan	Action
Operate	Go to Step 7
Do not operate	Remove jumper wire, reconnect refrigerant pressure switch connector, and go to Step 8

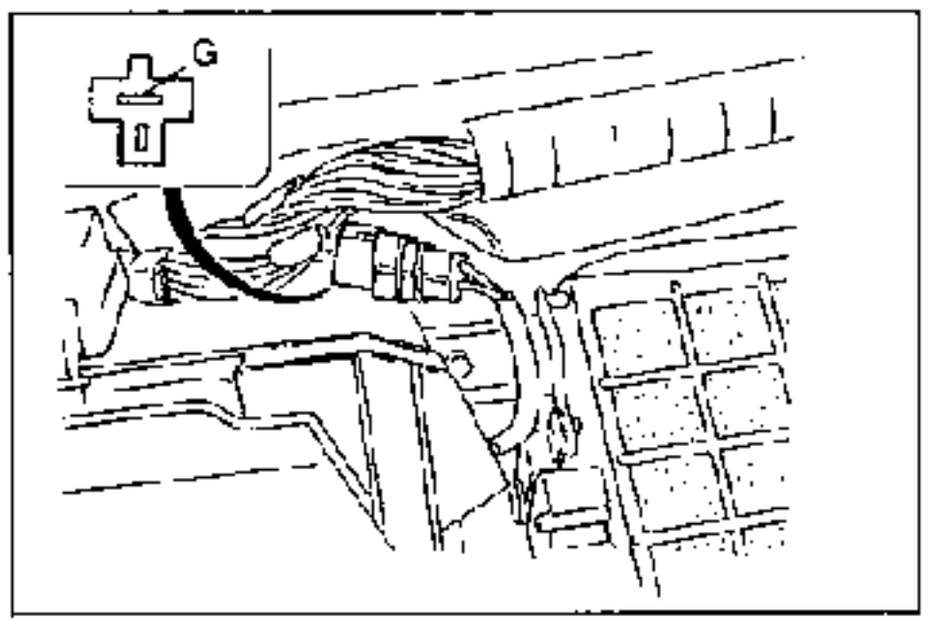


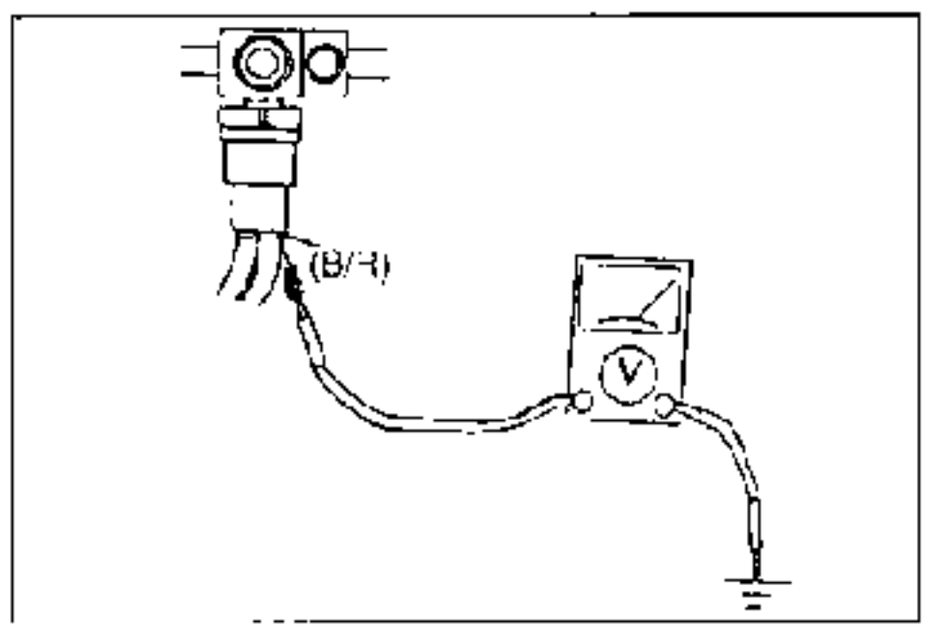
Step 7
1. Connect a manifold gauge set to the charging valves. (Refer to page G–50.)
2. Measure the high-pressure side pressure.

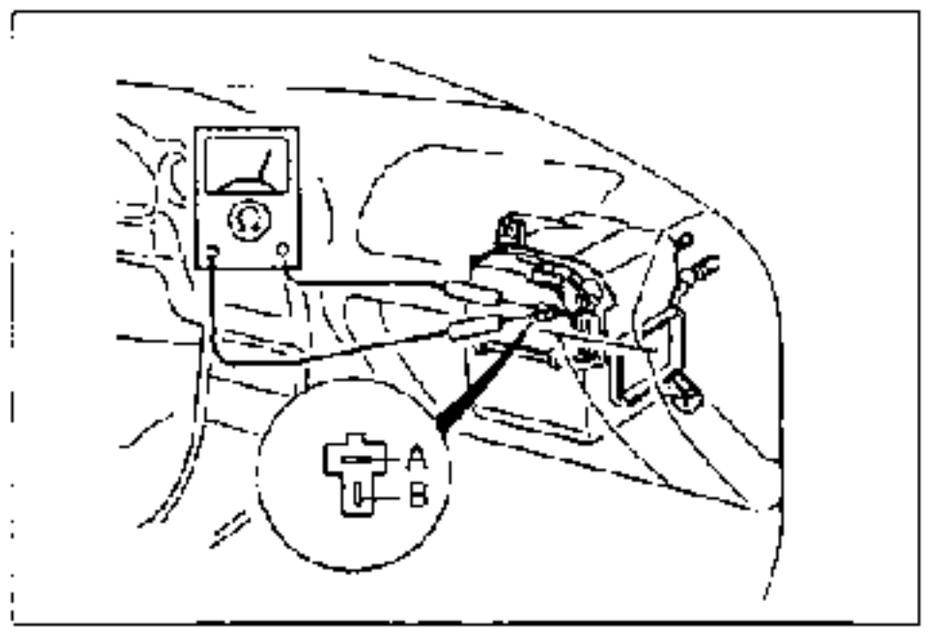
Refrigerant pressure	Action
0.21 – 2.9 MPa {2.1—30 kgf/cm², 30—430 psi}	Replace refrigerant pressure switch (Refer to page G–65)
Other	Check for leaks (Refer to page G–51)











Step 8

1. Verify that the ignition switch and fan switch are on.
2. Measure the voltage at the (G) terminal wire of the heater control unit connector.

B+: Battery positive voltage

Engine	A/C switch	Voltage (V)	Action
K8	ON	1.5—3.5	Measure voltage with A/C switch off
		Other	Go to Step 10
	OFF	4.5—5.5	Go to Step 9
		Other	Go to Step 10
B6	ON	Below 2.5	Measure voltage with A/C switch off
		Other	Go to Step 10
	OFF	B+	Go to Step 9
		Other	Go to Step 10

Step 9

Measure the voltage at the (GY) terminal wire of the heater control unit connector.

B+: Battery positive voltage

Voltage	Action
B+	Replace heater control unit (Refer to page G-43)
Other	Repair wiring harness (REAR WIPER 10A—Heater control unit)

Step 10

1. Remove the glove compartment and glove compartment cover.
   (Refer to the 1995 MX-3 Workshop Manual, section S.)
2. Measure the voltage at the (G) terminal wire of the thermoswitch connector.

B+: Battery positive voltage

Voltage	Action
B+	Go to Step 11
Other	Repair wiring harness (Thermoswitch—Heater control unit)

Step 11

Measure the voltage at the (B/R) terminal wire of the refrigerant pressure switch connector.

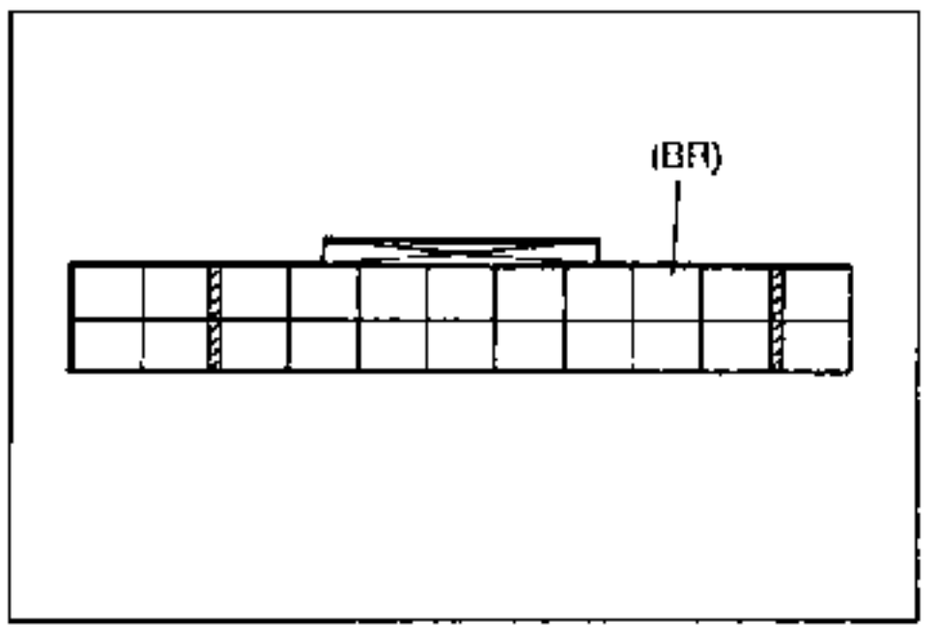
B+: Battery positive voltage

Voltage	Action
B+	Go to Step 13
Other	Go to Step 12

Step 12

1. Disconnect the thermoswitch connector.
2. Check for continuity between terminals A and B of the thermoswitch.

Continuity	Action
Yes	Repair wiring harness (Refrigerant pressure switch—Thermoswitch)
No	Replace thermoswitch (Refer to page G-68)



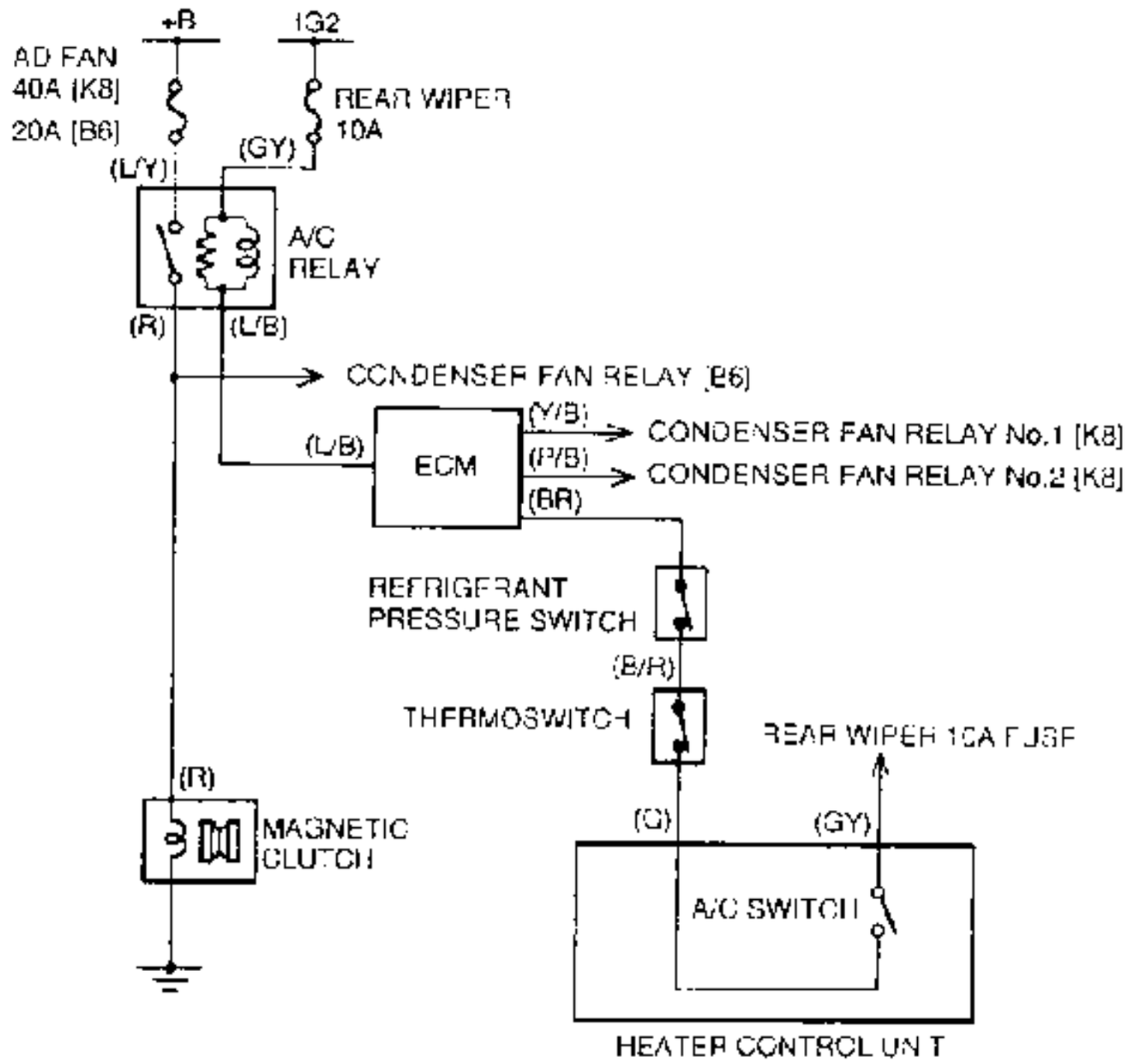
Step 13

Measure the voltage at the (BR) terminal wire of the ECM connector.

B+: Battery positive voltage

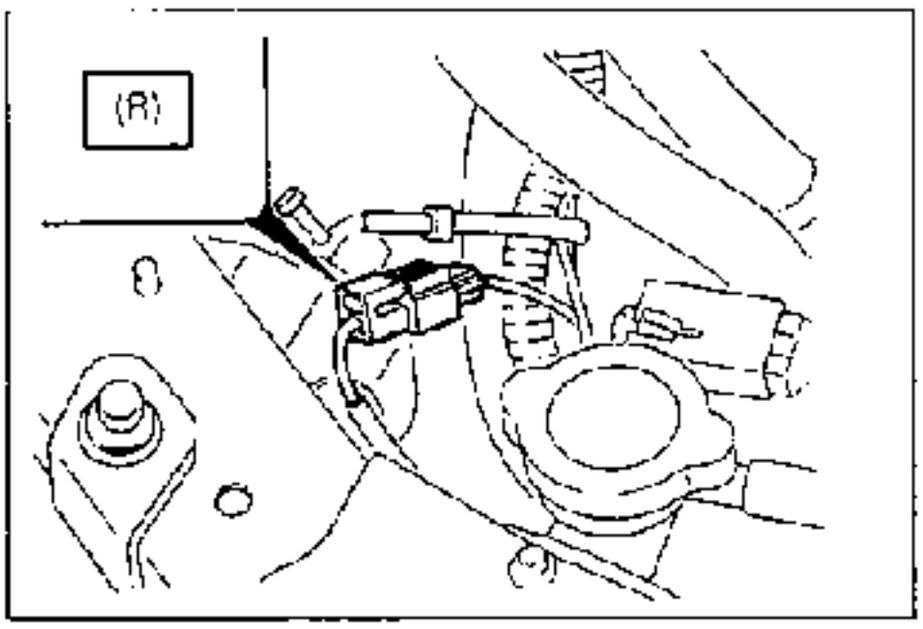
Voltage	Action
B+	Check ECM (Refer to 1995 MX-3 Workshop Manual, sections F1 and F2)
Other	Repair wiring harness (ECM—Refrigerant pressure switch)

Flowchart No.	
4	Symptom .....Magnetic clutch does not operate, but condenser fan operates normally Related components ....Magnetic clutch, wiring harness



System Operation

- When the fan switch and A/C switch are turned on, the ECM receives a signal that the A/C switch and fan switch are on and creates a ground circuit. The A/C relay is magnetized and the contact is closed. Battery positive voltage is applied to the magnetic clutch and the clutch locks.
- The ECM also controls the condenser fan depending on engine load.



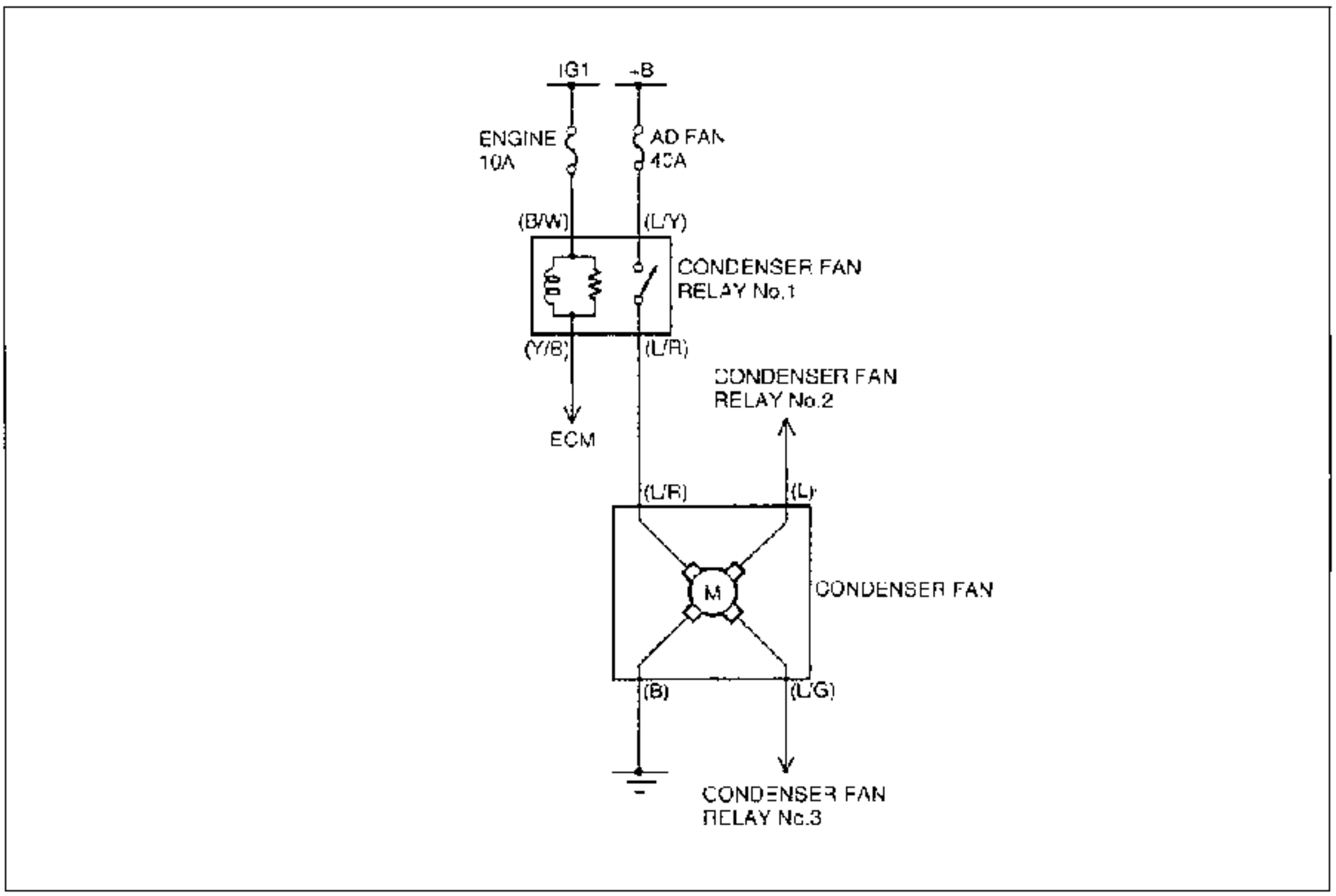
Remedy

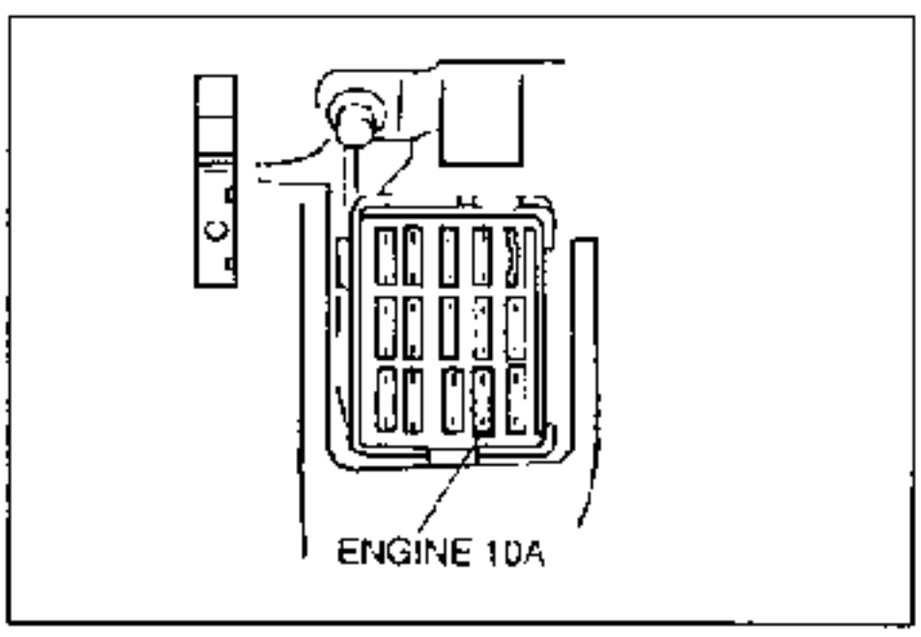
1. Turn the fan switch and A/C switch on.
2. Measure the voltage at the (R) terminal wire of the magnetic clutch connector.

B+: Battery positive voltage

Voltage	Action
B+	Check magnetic clutch (Refer to page G–52)
Other	Repair wiring harness (A/C relay—Magnetic clutch)

Flowchart No.	
5	Symptom .....Condenser fan does not operate, but magnetic clutch operates normally [K8] Related components....Fuse, condenser fan relay No.1, condenser fan, ECM, wiring harness

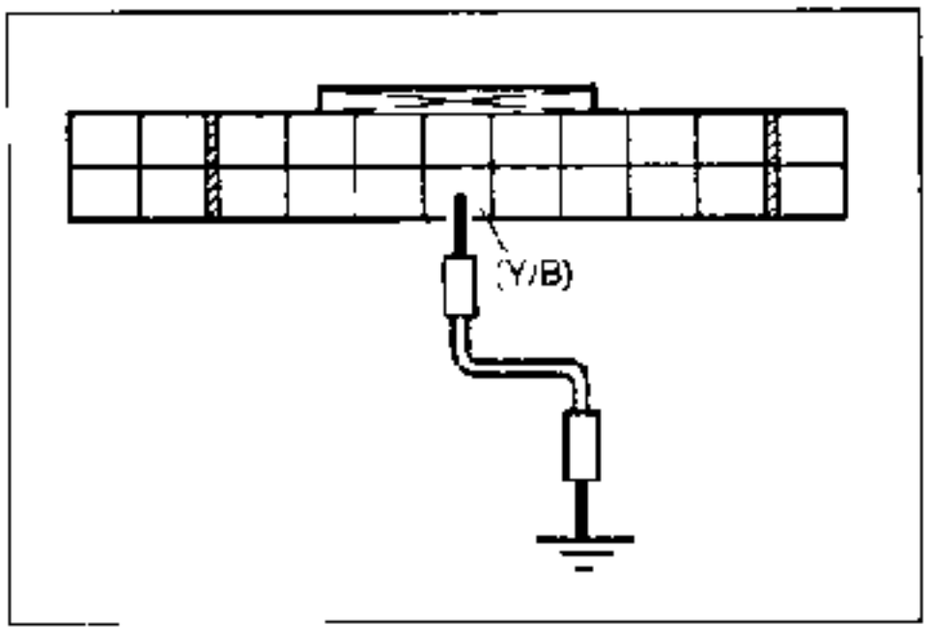




Step 1

Check the ENGINE 10A fuse in the fuse block.

Fuse	Action
OK	Go to Step 2
Burnt	Replace fuse after checking and repairing wiring harness



Step 2

1. Disconnect the ECM connector.
2. Connect a jumper wire between the (Y/B) terminal wire of the ECM connector and ground.
3. Turn the ignition switch to ON.
4. Verify that the condenser fan operates.

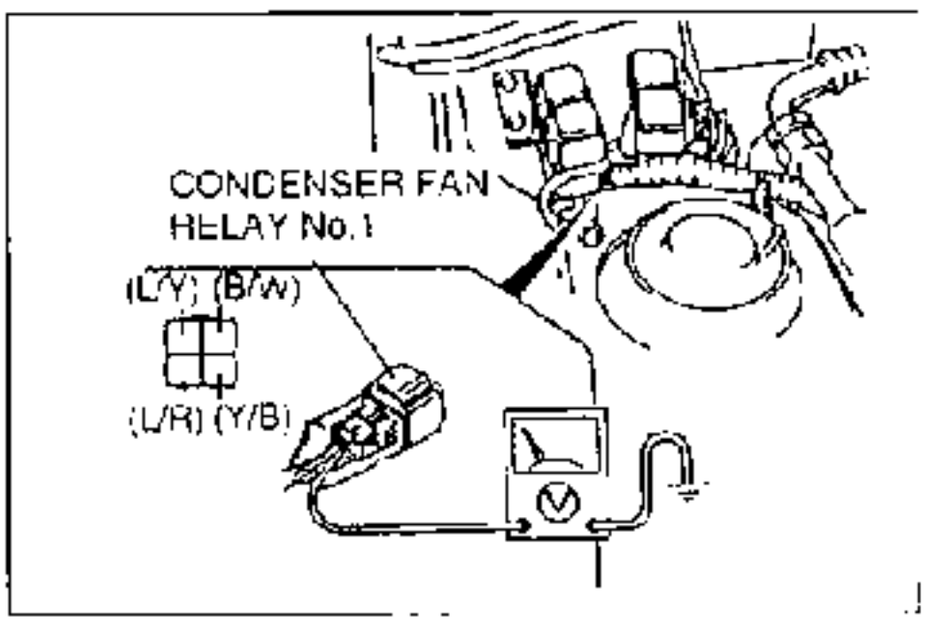
Condenser fan	Action
Operates	Check ECM (Refer to 1995 MX-3 Workshop Manual, section F2)
Does not operate	Remove jumper wire and go to Step 3.

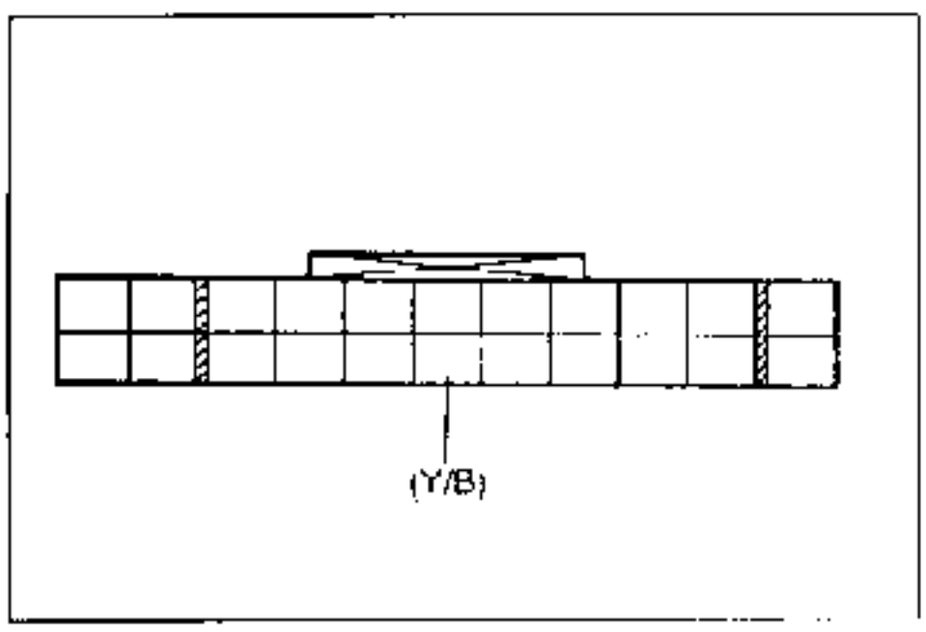
Step 3

1. Verify that the ECM connector is disconnected.
2. Verify that the ignition switch is at ON.
3. Measure the voltage at the following terminal wires of the condenser fan relay No.1 connector.

B+: Battery positive voltage

Wire	Voltage	Action
(B/W)	B+	Measure voltage at (Y/B) wire
	Other	Repair wiring harness (ENGINE 10A fuse—Condenser fan relay No.1)
(Y/B)	B+	Measure voltage at (L/Y) wire
	Other	Replace condenser fan relay No.1
(L/Y)	B+	Measure voltage at (L/R) wire
	Other	Repair wiring harness (AD FAN 40A fuse—Condenser fan relay No.1)
(L/R)	B+	Go to Step 4
	Other	Replace condenser fan relay No.1



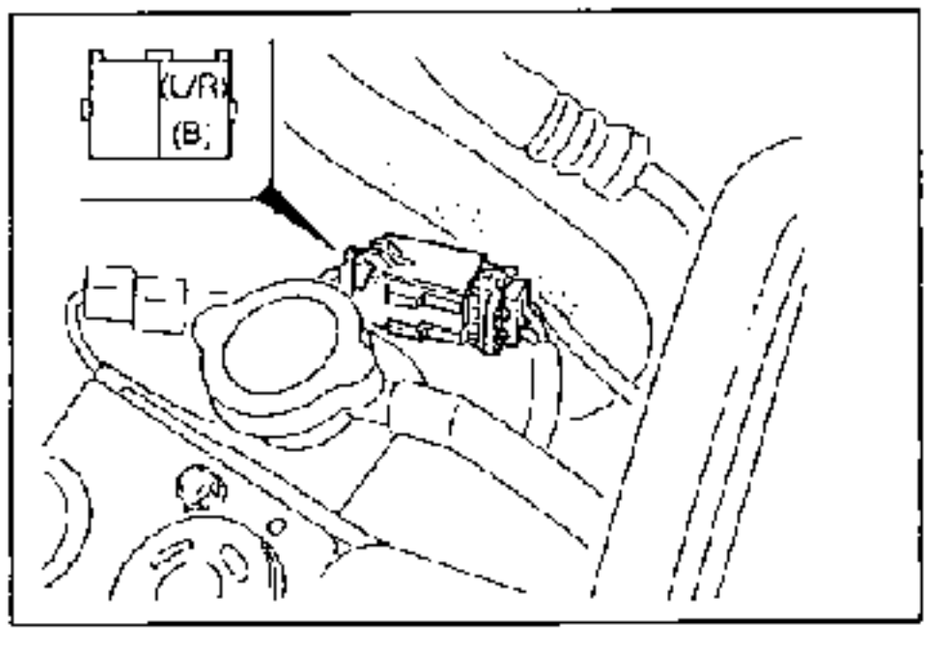


Step 4

1. Verify that the ignition switch is at ON.
2. Measure the voltage at the (Y/B) terminal wire of the ECM connector.

B+: Battery positive voltage

Voltage	Action
B+	Go to Step 5
Other	Repair wiring harness (Condenser fan relay No.1—ECM)



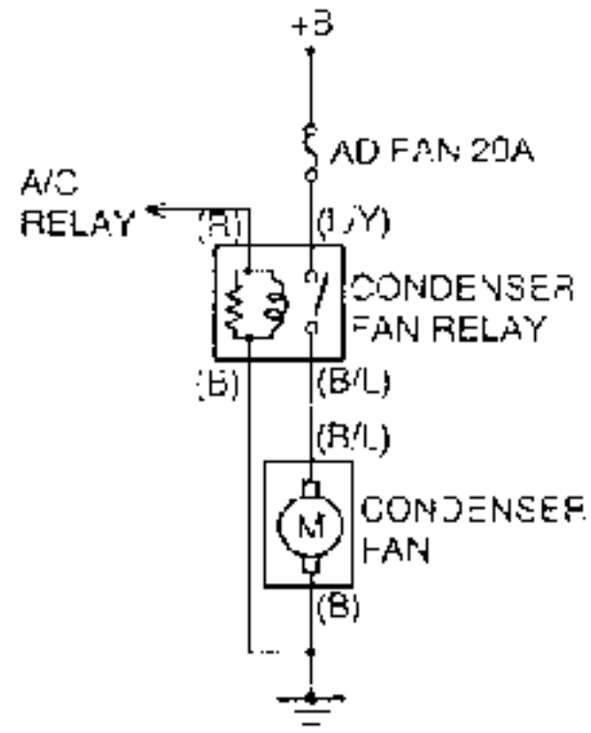
Step 5

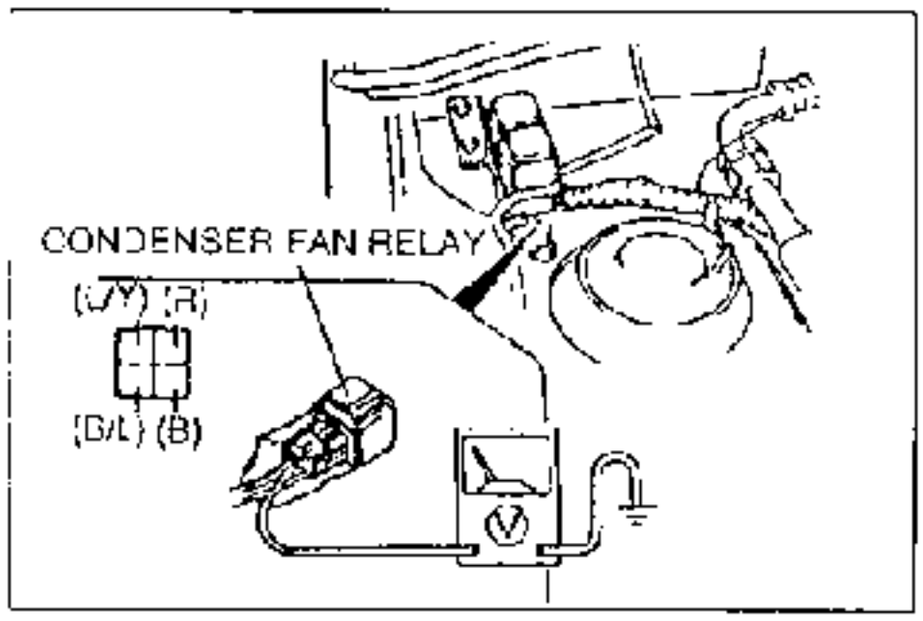
Measure the voltage at the following terminal wires of the condenser fan connector.

B+: Battery positive voltage

Wire	Voltage	Action
(L/R)	B+	Measure voltage at (B) wire
	Other	Repair wiring harness (Condenser fan relay No.1—Condenser fan)
(B)	0V	Check condenser fan (Refer to page G-63)
	Other	Repair wiring harness (Condenser fan—GND)

Flowchart No.	Symptom .....Condenser fan does not operate, but magnetic clutch operates normally [B6]
6	Related components ...Condenser fan relay, condenser fan, wiring harness



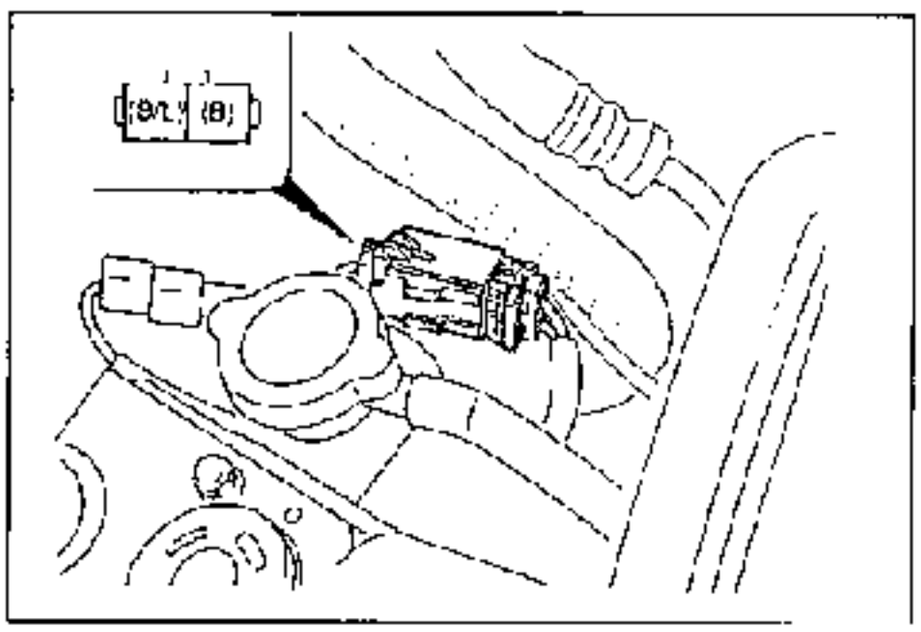


Step 1

1. Start the engine.
2. Turn the fan switch and A/C switch on.
3. Measure the voltage at the following terminal wires of the condenser fan relay connector.

B+: Battery positive voltage

Wire	Voltage	Action
(R)	B+	Measure voltage at (B) wire
	Other	Repair wiring harness (A/C relay—Condenser fan relay)
(B)	0V	Measure voltage at (L/Y) wire
	Other	Repair wiring harness (Condenser fan relay—GND)
(L/Y)	B+	Measure voltage at (B/L) wire
	Other	Repair wiring harness (AD FAN 20A fuse—Condenser fan relay)
(B/L)	B+	Go to Step 2
	Other	Replace condenser fan relay



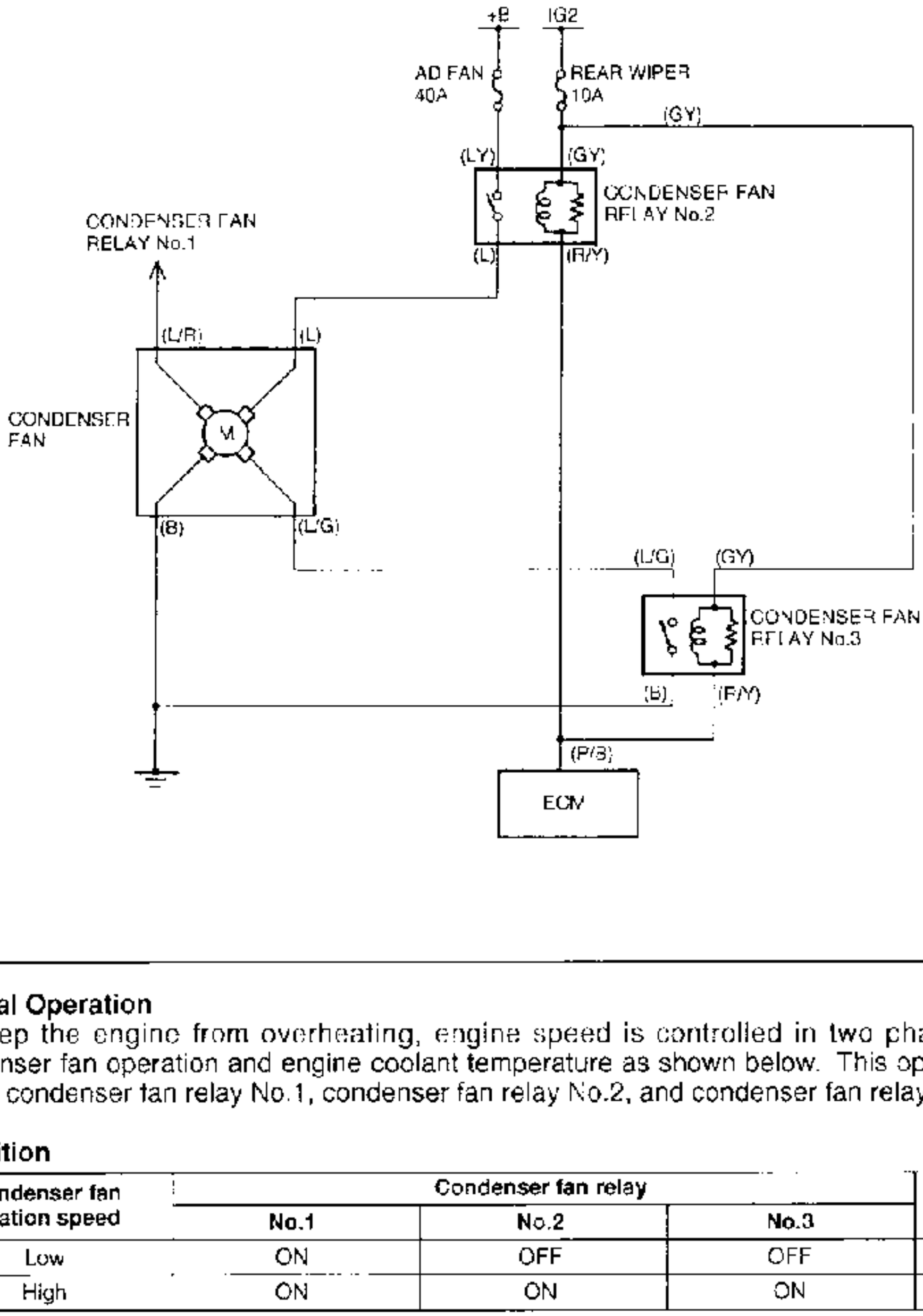
Step 2

Measure the voltage at the following terminal wires of the condenser fan connector.

B+: Battery positive voltage

Wire	Voltage	Action
(B/L)	B+	Measure voltage at (B) wire
	Other	Repair wiring harness (Condenser fan relay—Condenser fan)
(B)	0V	Check condenser fan (Refer to page G–63)
	Other	Repair wiring harness (Condenser fan—GND)

Flowchart No.	Symptom .....Engine overheats at high load; A/C operates normally [K8] Related components ...ECM, condenser fan, condenser fan relay No.2, condenser fan relay No.3, wiring harness
7	

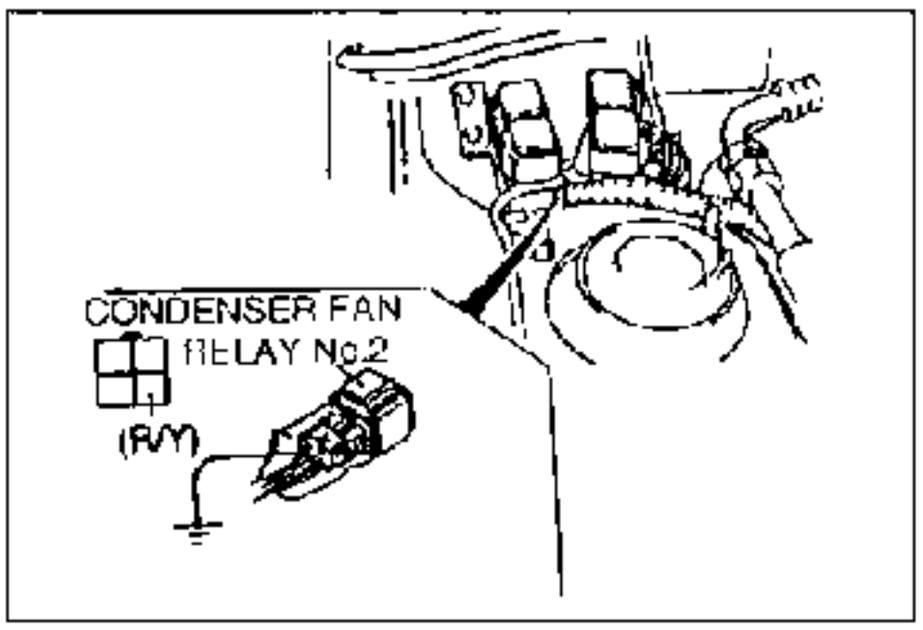


Normal Operation

To keep the engine from overheating, engine speed is controlled in two phases by combining condenser fan operation and engine coolant temperature as shown below. This operation is controlled by the condenser fan relay No.1, condenser fan relay No.2, and condenser fan relay No.3.

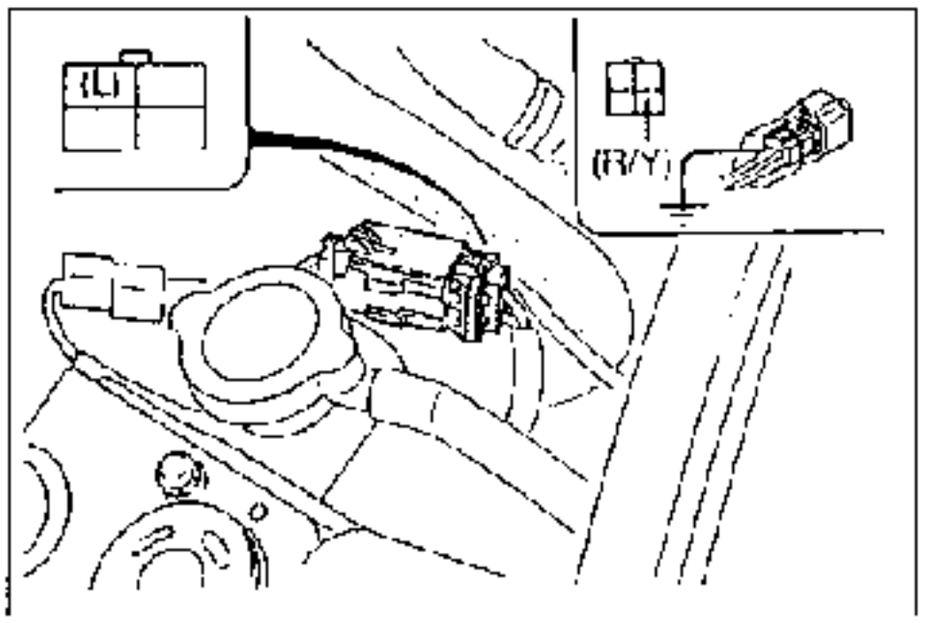
Condition

Condenser fan rotation speed	Condenser fan relay			Engine coolant temperature
	No.1	No.2	No.3	
Low	ON	OFF	OFF	above 100°C {212°F}
High	ON	ON	ON	above 108°C {226°F}



Step 1
1. Connect a jumper wire between the (R/Y) terminal wire of the condenser fan relay No.2 connector and ground.
2. Turn the ignition switch to ON.
3. Verify that the condenser fan operates at high speed.

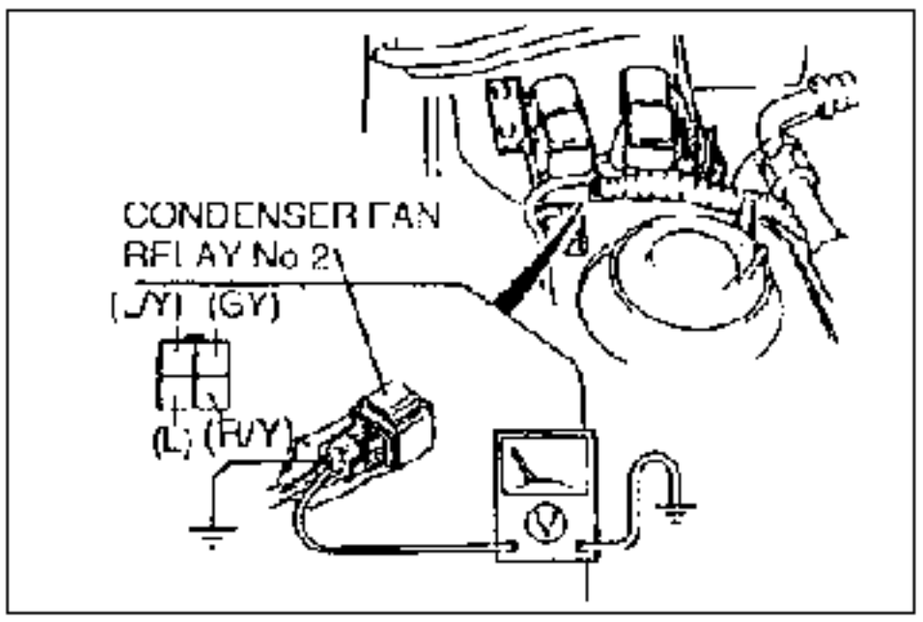
Condenser fan speed	Action
High	Check ECM (Refer to 1995 MX-3 Workshop Manual, section F2)
Low	Go to Step 1
Does not operate	Go to Step 2



Step 2
1. Verify that the jumper wire is connected and the ignition switch is at ON.
2. Measure the voltage at the (L) terminal wire of the condenser fan connector.

B+: Battery positive voltage

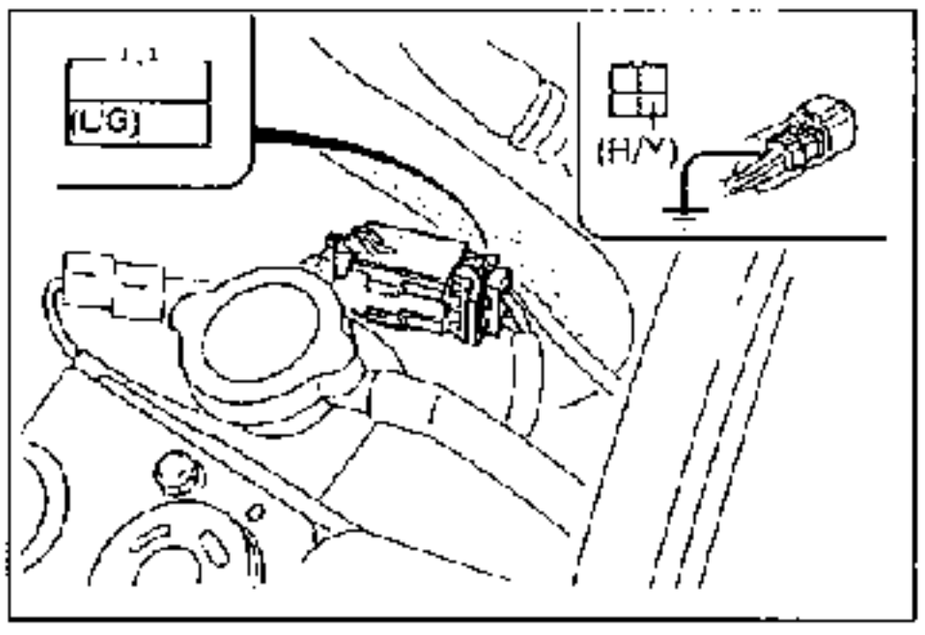
Voltage	Action
B+	Check condenser fan (Refer to page G-63)
Other	Go to Step 3



Step 3
1. Verify that the jumper wire is connected and the ignition switch is at ON.
2. Measure the voltage at the following terminal wires of the condenser fan relay No.2 connector.

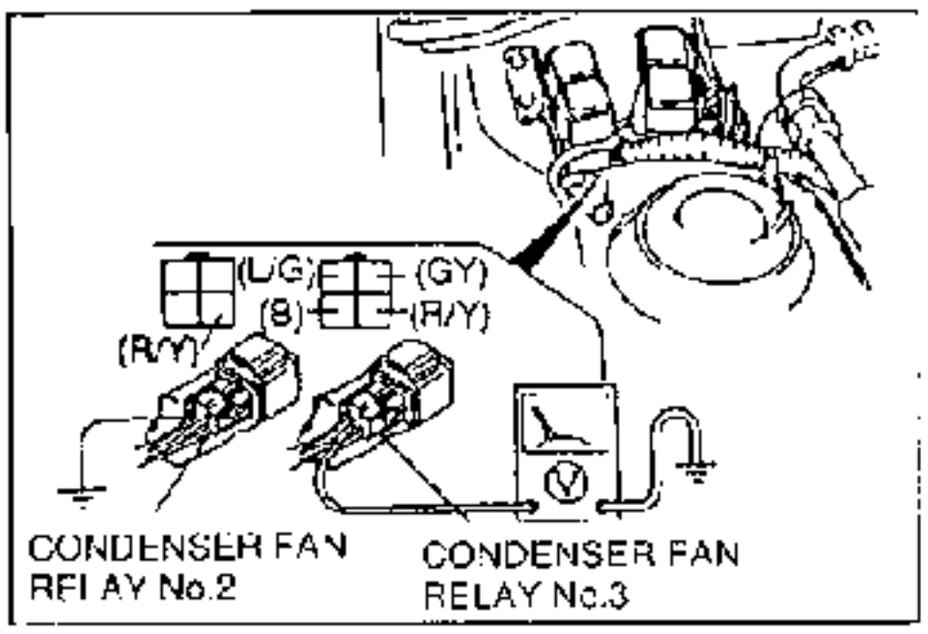
B+: Battery positive voltage

Wire	Voltage	Action
(GY)	B+	Measure voltage at (L/Y) wire
	Other	Repair wiring harness (REAR WIPER 10A fuse—Condenser fan relay No.2)
(L/Y)	B+	Measure voltage at (L) wire
	Other	Repair wiring harness (A/C FAN 40A fuse—Condenser fan relay No.2)
(L)	B+	Repair wiring harness (Condenser fan relay No.2—Condenser fan)
	Other	Replace condenser fan relay No.2



Step 4
1. Verify that the jumper wire is connected and the ignition switch is at ON.
2. Measure the voltage at the (L/G) terminal wire of the condenser fan connector.

Voltage	Action
0V	Check condenser fan (Refer to page G-63)
Other	Go to Step 5



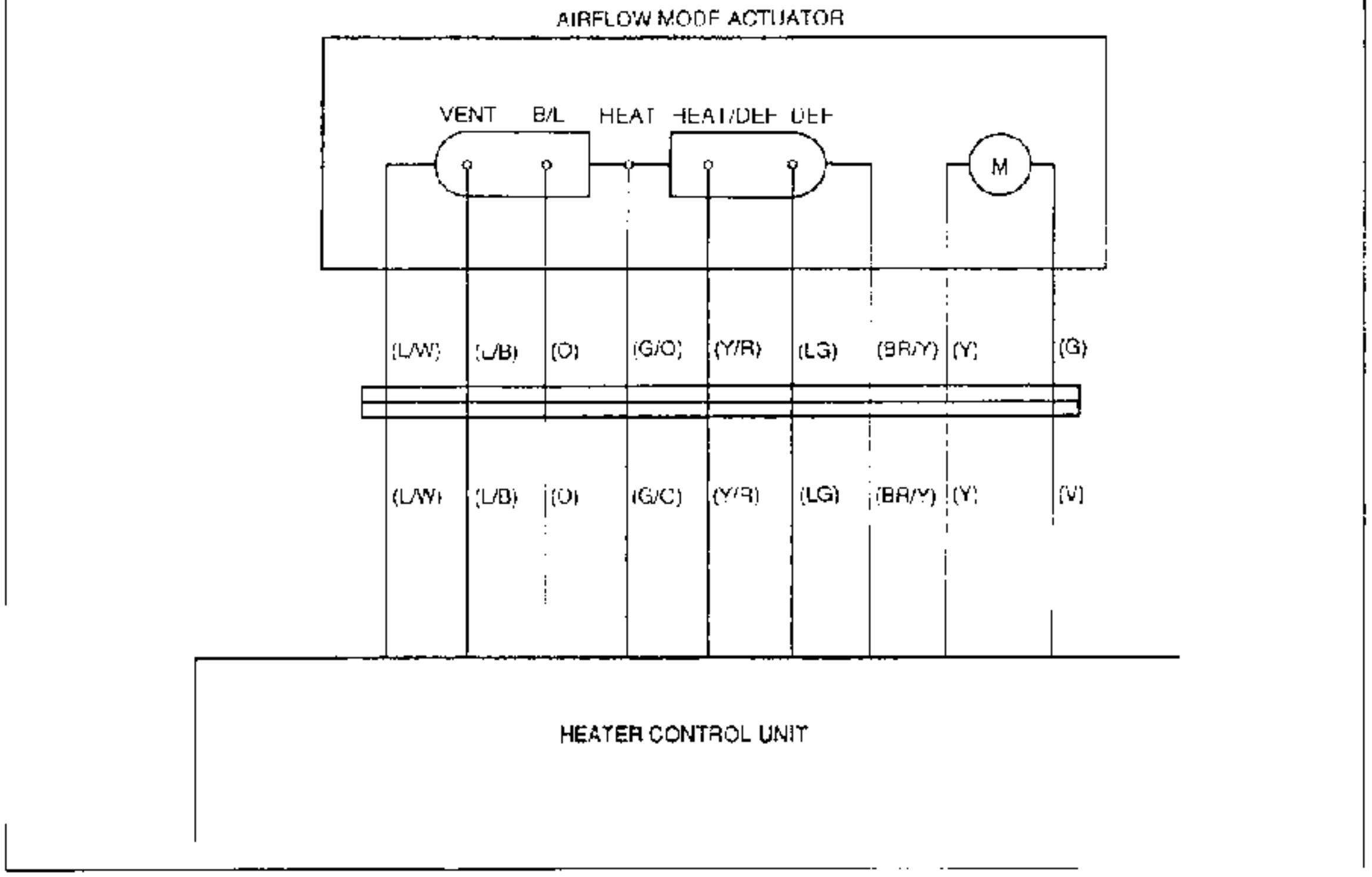
Step 5

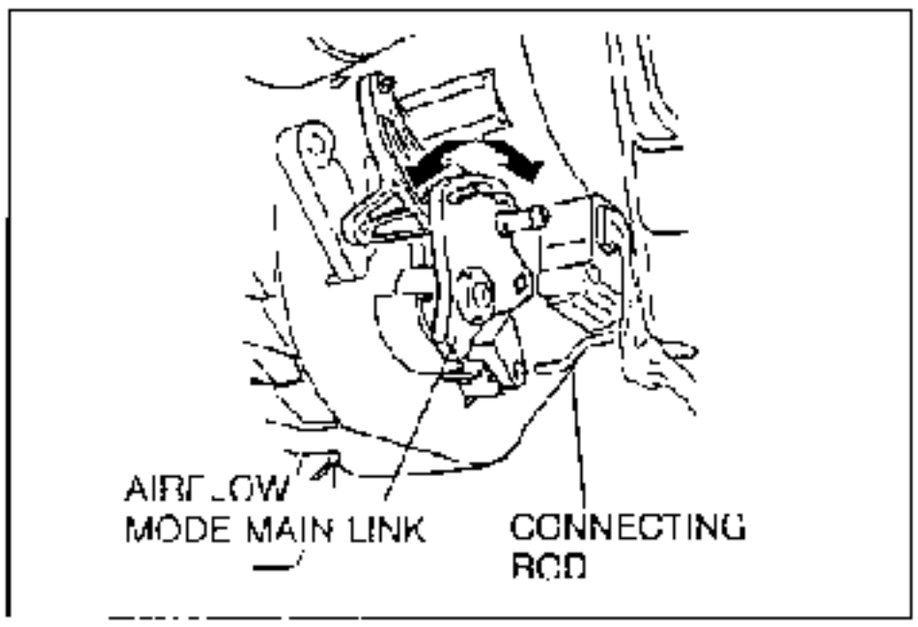
1. Verify that the jumper wire is connected and the ignition switch is at ON.
2. Measure the voltage at the following terminal wires of the condenser fan relay No.3 connector.

B+: Battery positive voltage

Wire	Voltage	Action
(GY)	B+	Measure voltage at (R/Y) wire
	Other	Repair wiring harness (REAR WIPER 10A fuse—Condenser fan relay No.3)
(R/Y)	0V	Measure voltage at (L/G) wire
	Other	Repair wiring harness (Condenser fan high relay—Condenser fan relay No.3)
(L/G)	0V	Repair wiring harness (Condenser fan—Condenser fan relay No.3)
	Other	Measure voltage at (B) wire
(B)	0V	Replace condenser fan relay No.3
	Other	Repair wiring harness (Condenser fan relay No.3—GND)

Flowchart No.	Symptom .....Airflow mode does not change (logic type) Related components ...Mode door assembly, airflow mode actuator, heater control unit, wiring harness
8	

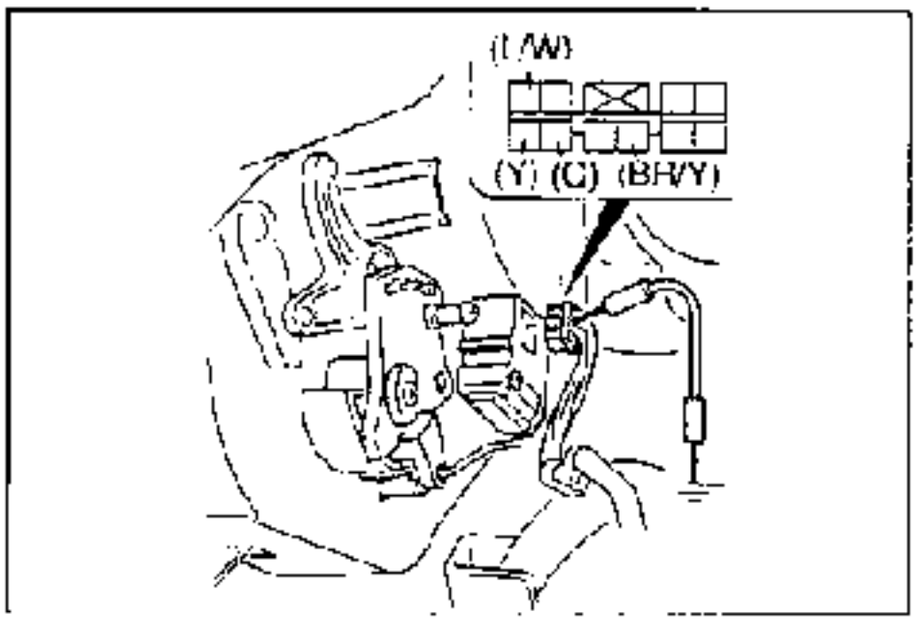




Step 1

1. Disconnect the connecting rod from the mode main link.
2. Turn the ignition switch to ON and set the fan switch to the fourth position.
3. Check the outlet airflow while handling the airflow mode main link.

Outlet airflow	Action
Normal	Go to Step 2
Abnorma	Check heater unit (Refer to page G–38)

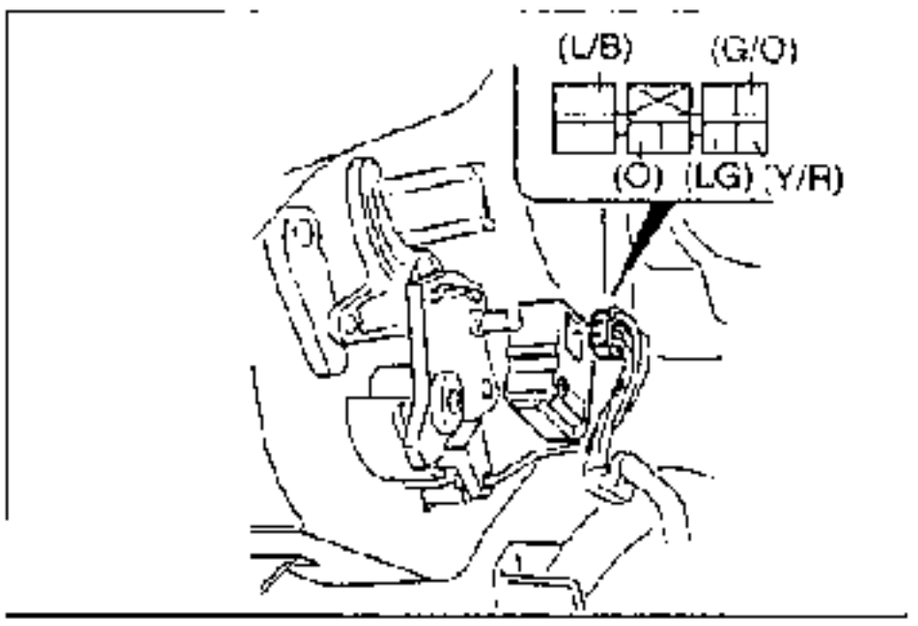


Step 2

1. Turn the ignition switch to OFF.
2. Disconnect the airflow mode actuator connector.
3. Connect a jumper wire between the (L/W) and (BR/Y) terminal wires of the airflow mode actuator connector and ground.
4. Turn the ignition switch to ON.
5. Measure the voltage at the following terminal wires of the airflow mode actuator connector.

B+: Battery positive voltage

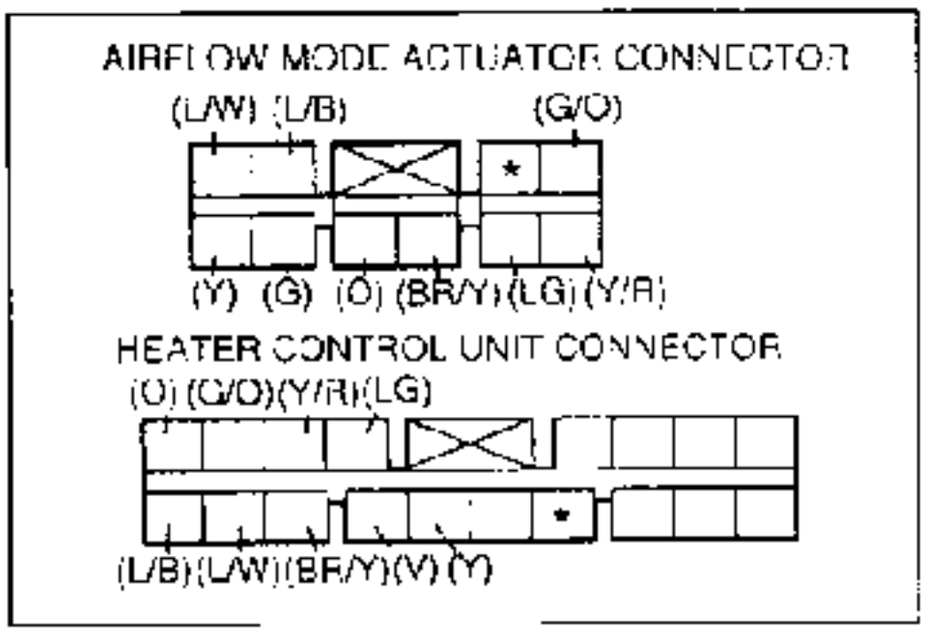
Wire	GND	Voltage	Action
(G)	(L/W)	B+	Measure voltage at (Y) wire
		Other	Go to Step 4
(Y)	(BR/Y)	B+	Go to Step 3
		Other	Go to Step 4



Step 3

1. Turn the ignition switch to OFF.
2. Check for continuity between the following terminal wires of the airflow mode actuator connector and ground while turning the mode switches on.

Wire	Mode switch	Continuity	Action
(L/B)	VENT	Yes	Check for continuity at (O) wire
		No	Go to Step 4
(O)	B/L	Yes	Check for continuity at (G/O) wire
		No	Go to Step 4
(G/O)	HEAT	Yes	Check for continuity at (Y/R) wire
		No	Go to Step 4
(Y/R)	H/D	Yes	Check for continuity at (LG) wire
		No	Go to Step 4
(LG)	DEF	Yes	Replace airflow mode actuator (Refer to page G–38)
		No	Go to Step 4

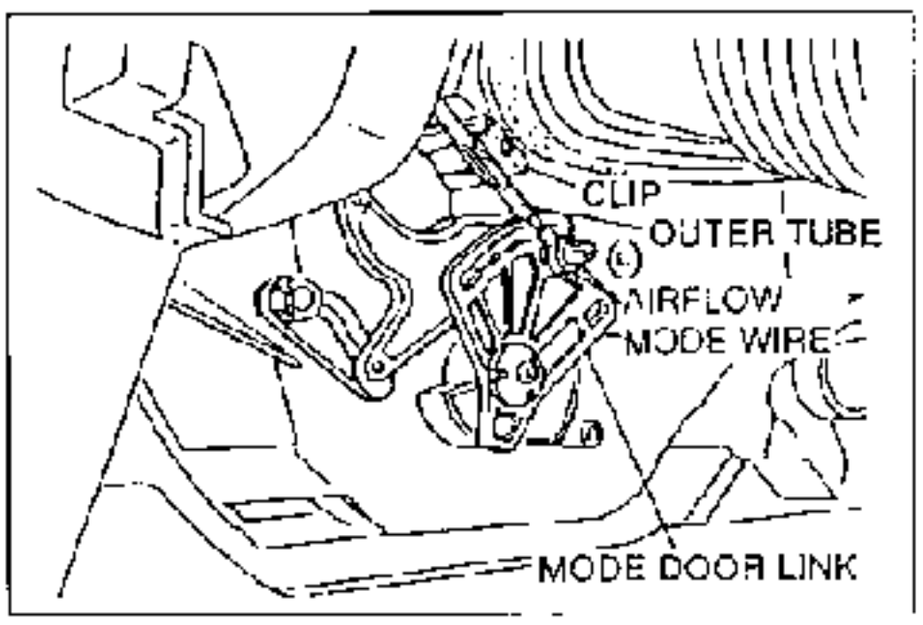


Step 4

1. Verify that the ignition switch is at OFF.
2. Disconnect the heater control unit connector.
3. Check for continuity between the terminal wires of the airflow mode actuator and heater control unit connectors.

Wire	Continuity	Action
(L/W) (L/B) (O) (G/O) (Y/R) (LG) (BR/Y) (Y) (G)-(V)	Yes (all)	Check heater control unit (Refer to page G–46)
	No (portion)	Repair faulty wiring harness

Flowchart No.	
9	Symptom .....Airflow mode does not charge (wire type) Related components ...Airflow mode wire, moce door assembly, mode lever



Step 1

Verify that the airflow mode wire is secured to the mode door link and that the outer tube is secured by the clip.

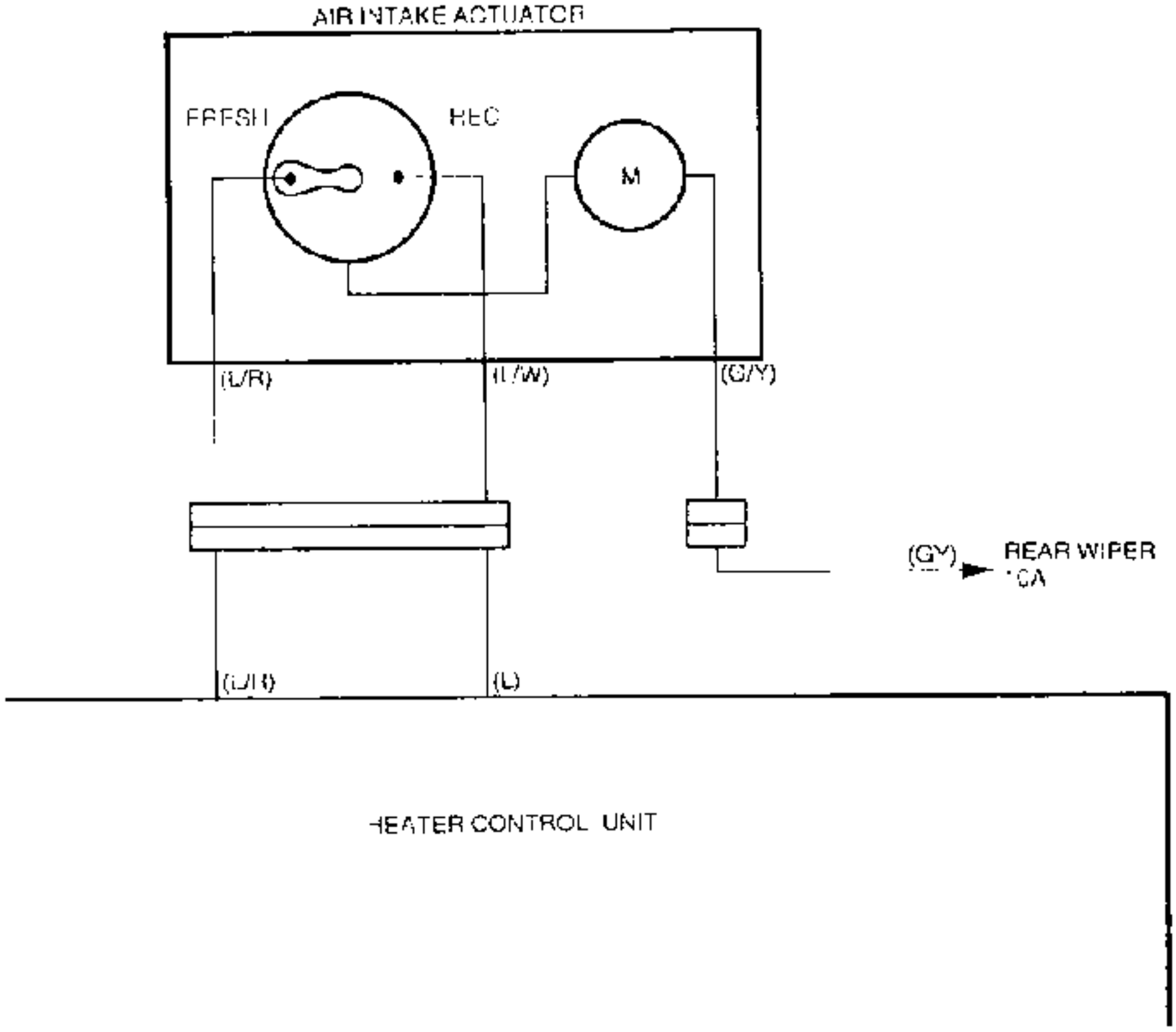
Mode wire/outer tube	Action
Secured	Go to Step 2
Not secured	Connect airflow mode wire and/or outer tube (Refer to page G–47)

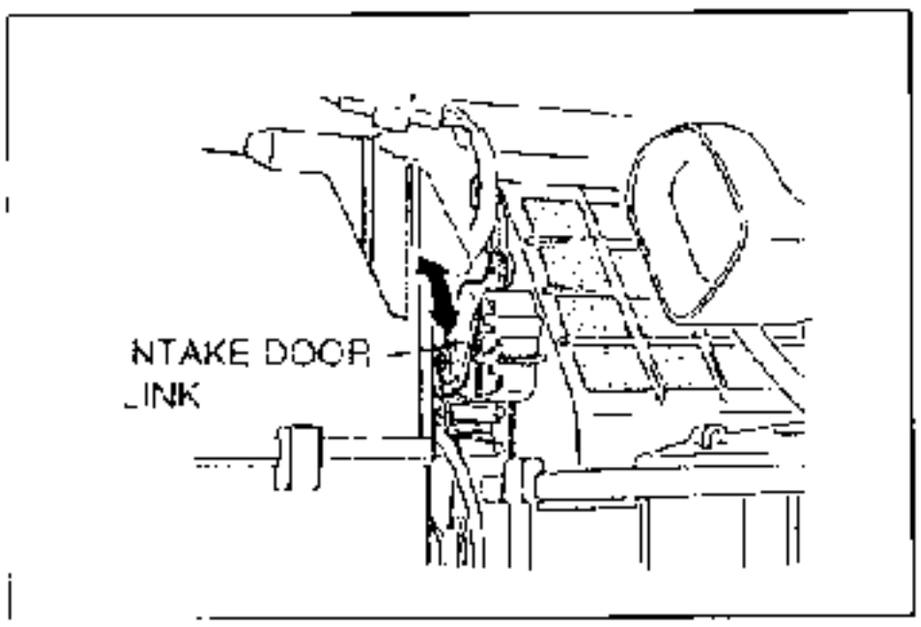
Step 2

1. Turn the ignition switch to ON and set the fan switch to the fourth position.
2. Move the mode lever from VENT to DEF and verify that the mode door link operates and the air outlets change.

Condition	Action
Mode door link does not operate	Check connection between mode door and airflow mode wire (Refer to page G–47)
Lever sticks, air outlets change	Check wire routing from mode door to mode door link Check lubrication of lever (Refer to page G–47)
Air outlets do not change; mode door link operates	Check mode door for damaged (Refer to page G–38)
Air outlets and lever indication do not match	Adjust outer tube and mounting (Refer to page G–47)

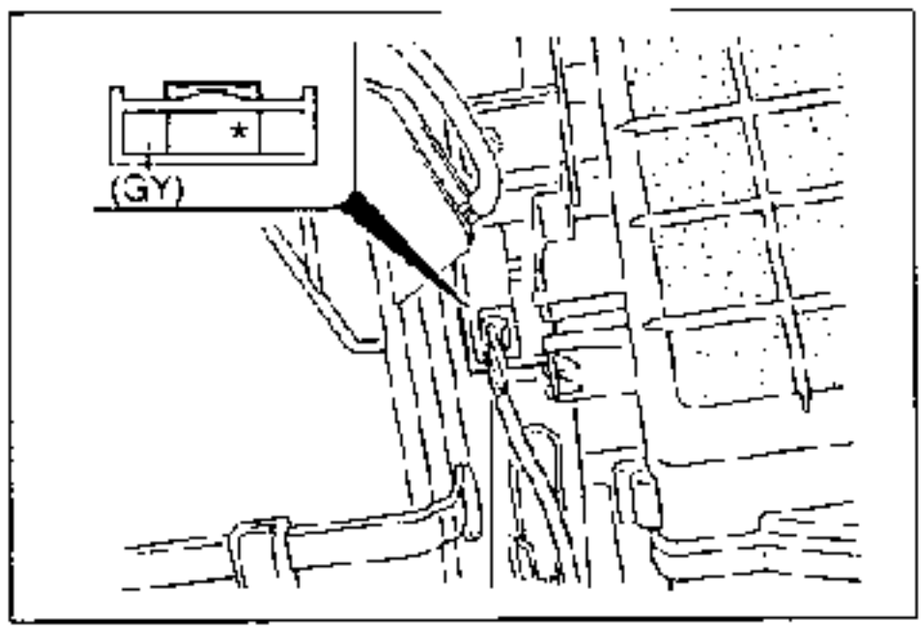
Flowchart No.	Symptom .....Intake air mode does not change (logic type) Related components ...Intake door assembly, air intake actuator, heater control unit, wiring harness
10	





Step 1
1. Disconnect the connecting rod from the intake door link.
2. Turn the ignition switch to ON and set the fan switch to the fourth position.
3. Check the inlet airflow while handling the intake door link.

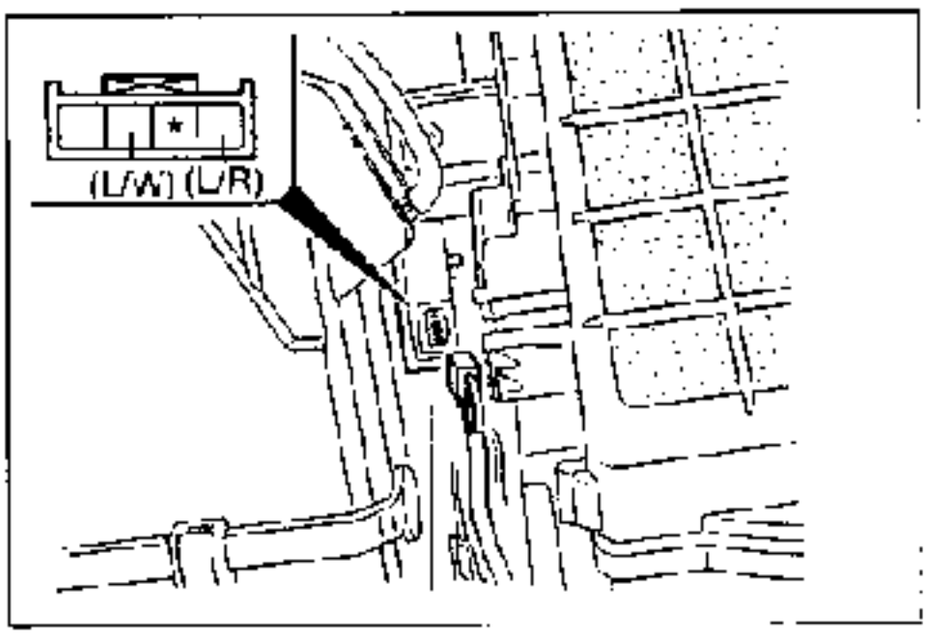
Outlet airflow	Action
Normal	Go to Step 2
Abnormal	Check blower unit (Refer to page G–41)



Step 2
Measure the voltage at the (GY) terminal wire of the air intake actuator connector.

B+: Battery positive voltage

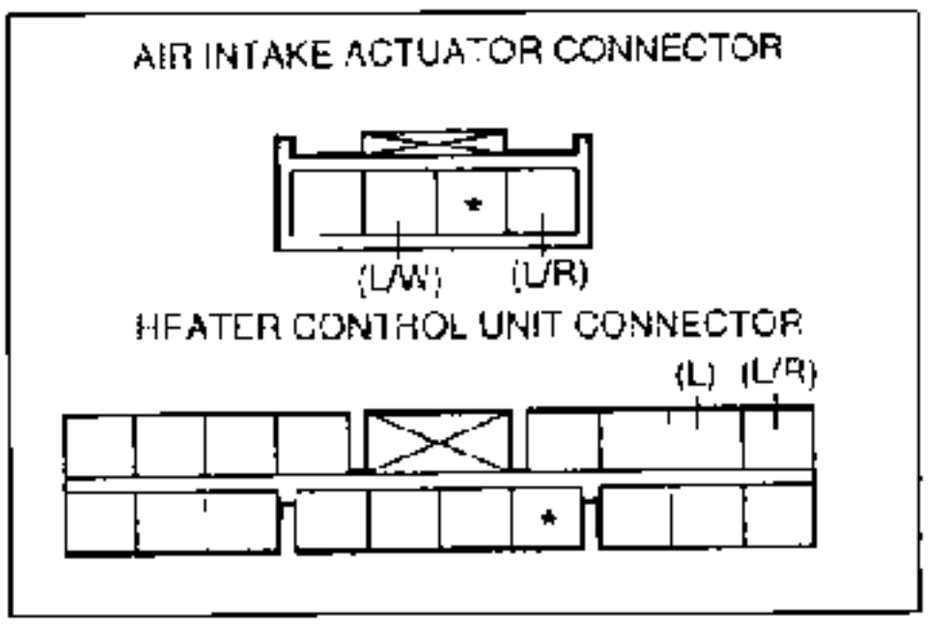
Voltage	Action
B+	Go to Step 3
Other	Repair wiring harness (REAR WIPER 10A fuse—Air intake actuator)



Step 3

1. Turn the ignition switch to OFF.
2. Disconnect the air intake actuator connector.
3. Check for continuity between the following terminal wires of the air intake actuator connector and ground while operating the REC/FRESH switch.

Wire	Switch	Continuity	Action
(L/W)	REC	Yes	Check (L/R) wire
		No	Go to Step 4
(L/R)	FRESH	Yes	Check air intake actuator (Refer to page G–42)
		No	Go to Step 4

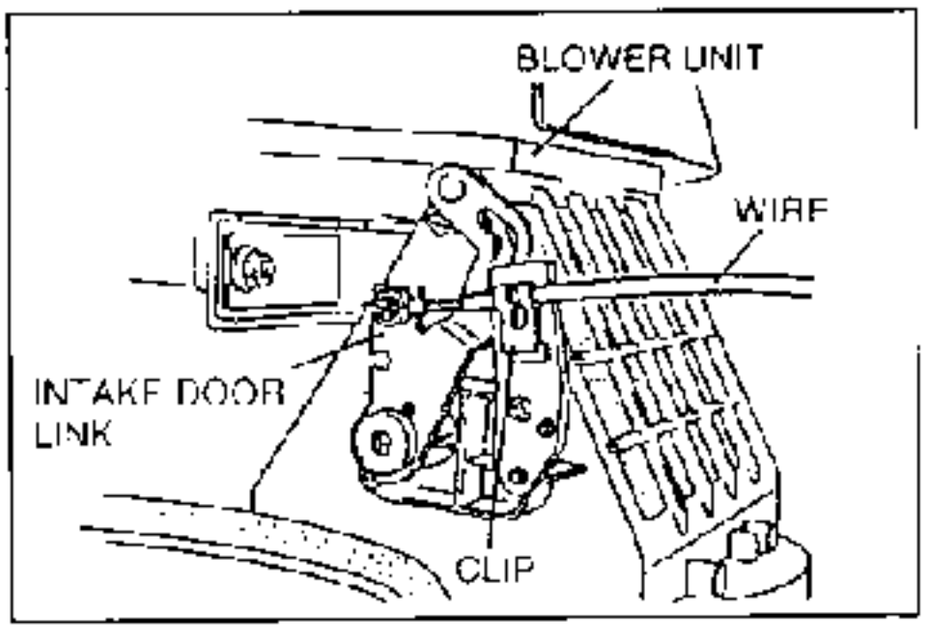


Step 4

1. Verify that the ignition switch is at OFF.
2. Disconnect the heater control unit connectors.
3. Check for continuity between the following terminal wires of the air intake actuator and heater control unit connectors.

Wire	Continuity	Action
(L/R)	Yes	Check for continuity at (L/W)–(L) wire
	No	Repair wiring harness (Heater control unit—Air intake actuator)
(L/W)	Yes	Check heater control unit (Refer to page G–43)
(L)	No	Repair wiring harness (Heater control unit—Air intake actuator)

Flowchart No.	Symptom .....Intake air mode does not change (wire type) Related components ...Air intake wire, intake door assembly, REC/FRESH lever
11	



Step 1

Verify that the air intake wire is secured to the intake door link and that the outer tube is secured by the clip.

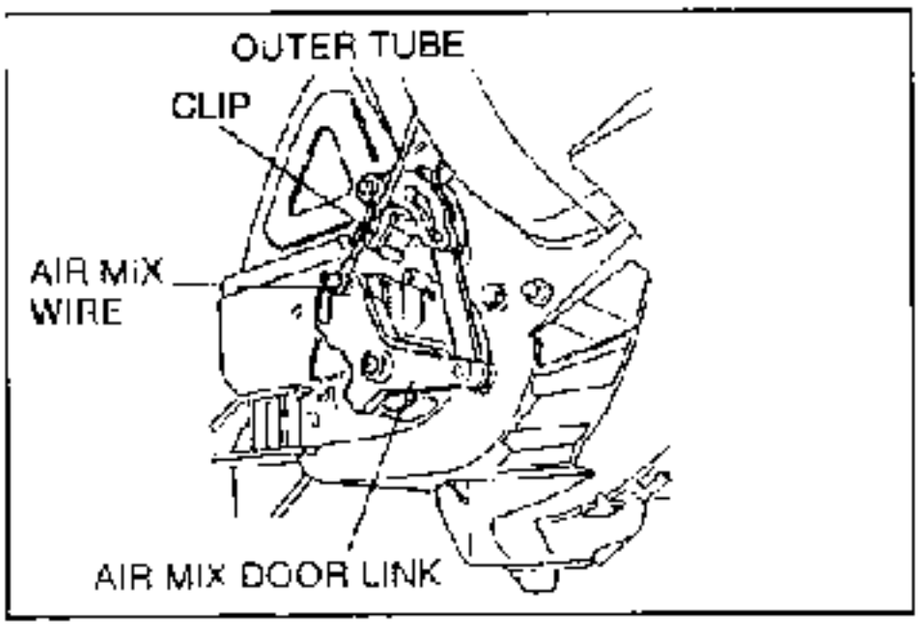
Air intake wire/Outer tube	Action
Securec	Go to Step 2
Not secured	Connect air intake wire and/or outer tube (Refer to page G–47)

Step 2

Move the REC/FRESH lever from REC to FRESH and check the operation of the intake door.

Condition	Action
Intake door link does not operate	Check connection between REC/FRESH lever and air intake wire (Refer to page G–47)
Lever sticks; intake door link operates	Check wire routing from REC/FRESH lever to intake door link Check lubrication on parts of lever (Refer to page G–47)
Intake door operates smoothly	Check intake door for damage (Refer to page G–41)

Flowchart No.	Symptom .....Airflow temperature does not change Related components ...Air mix wire, mix door assembly, temperature control lever
12	



Step 1

Verify that the air mix wire is secured to the air mix door link and that the outer tube is secured by the clip.

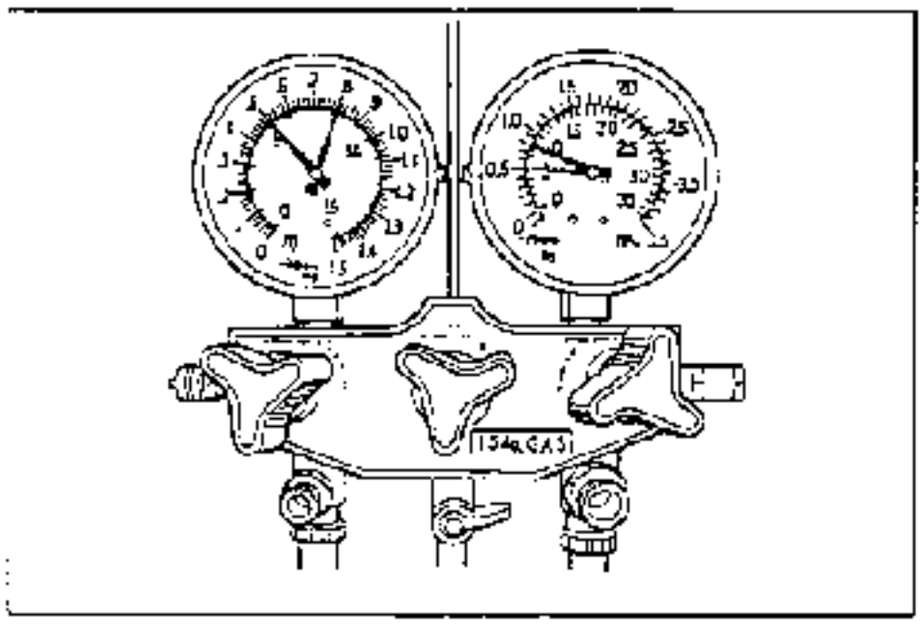
Air mix wire/outer tube	Action
Secured	Go to Step 2
Not secured	Connect air mix wire and/or outer tube (Refer to page G–48)

Step 2

Move the temperature control lever from MAX HOT to MAX COLD and check the operation of the air mix door.

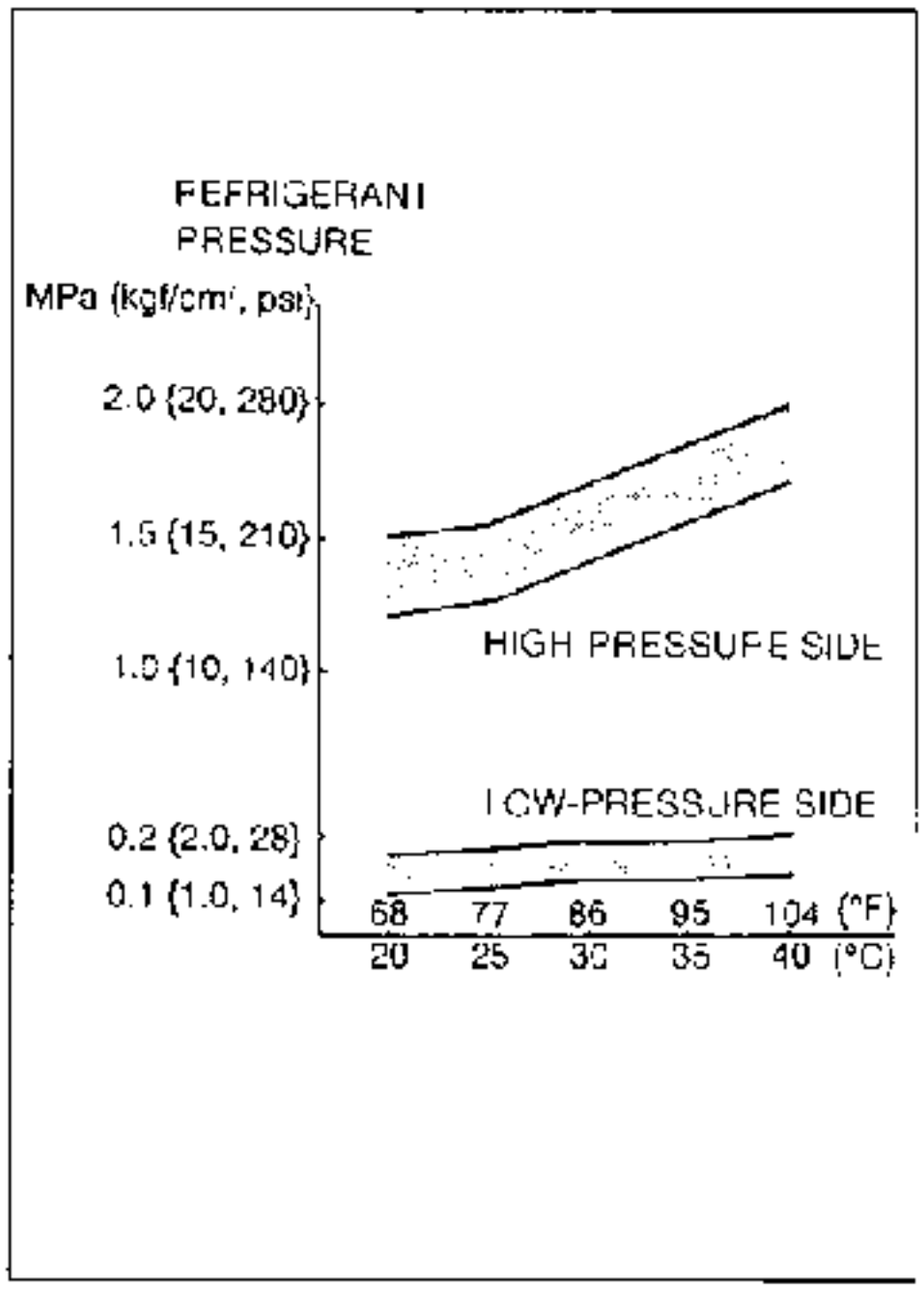
Condition	Action
Air mix door does not operate	Check connection between temperature control lever and air mix wire (Refer to page G–44)
Lever sticks; air mix door link operate	Check wire routing from temperature control lever to air mix door link Check lubrication of temperature control lever
Air mix door operates smoothly	Check air mix door for damage (Refer to page G–38)

Flowchart No.	Symptom .....Airflow is not cool; magnetic clutch and condenser fan operate
13	Related components ...Refrigerant system



Step 1

1. Install the manifold gauge set. (Refer to page G–50.)
2. Check the refrigerant pressure reading with the engine stopped.
3. Verify that the high- and low-pressure-side readings of the manifold gauge are at 493—788 kPa {5.02—8.04 kgf/cm², 72—114 psi}. If the pressure readings are lower than specified, recharge the refrigerant amount. (Refer to page G–50.) If the pressure readings are within specification but there is insufficient cooling, go to the next step. If the pressure readings are within specification and there are no leaks, the refrigerant amount is OK.
4. Start the engine and run it at a constant 2,000 rpm.
5. Turn the A/C switch on, set the fan switch at MAX-HI, and set the air intake mode at recirculate.
6. If the A/C compressor is short-cycling, note the low-pressure-side reading at which the magnetic clutch kicks out.
7. If the pressure is 170 kPa {1.7 kgf/cm², 24 psi} or lower, evacuate and recharge the refrigerant system with the proper amount of refrigerant. (Refer to page G–50.) If the pressure is 210 kPa {2.1 kgf/cm², 30 psi} or higher, inspect the thermoswitch. (Refer to page G–69.)



Step 2

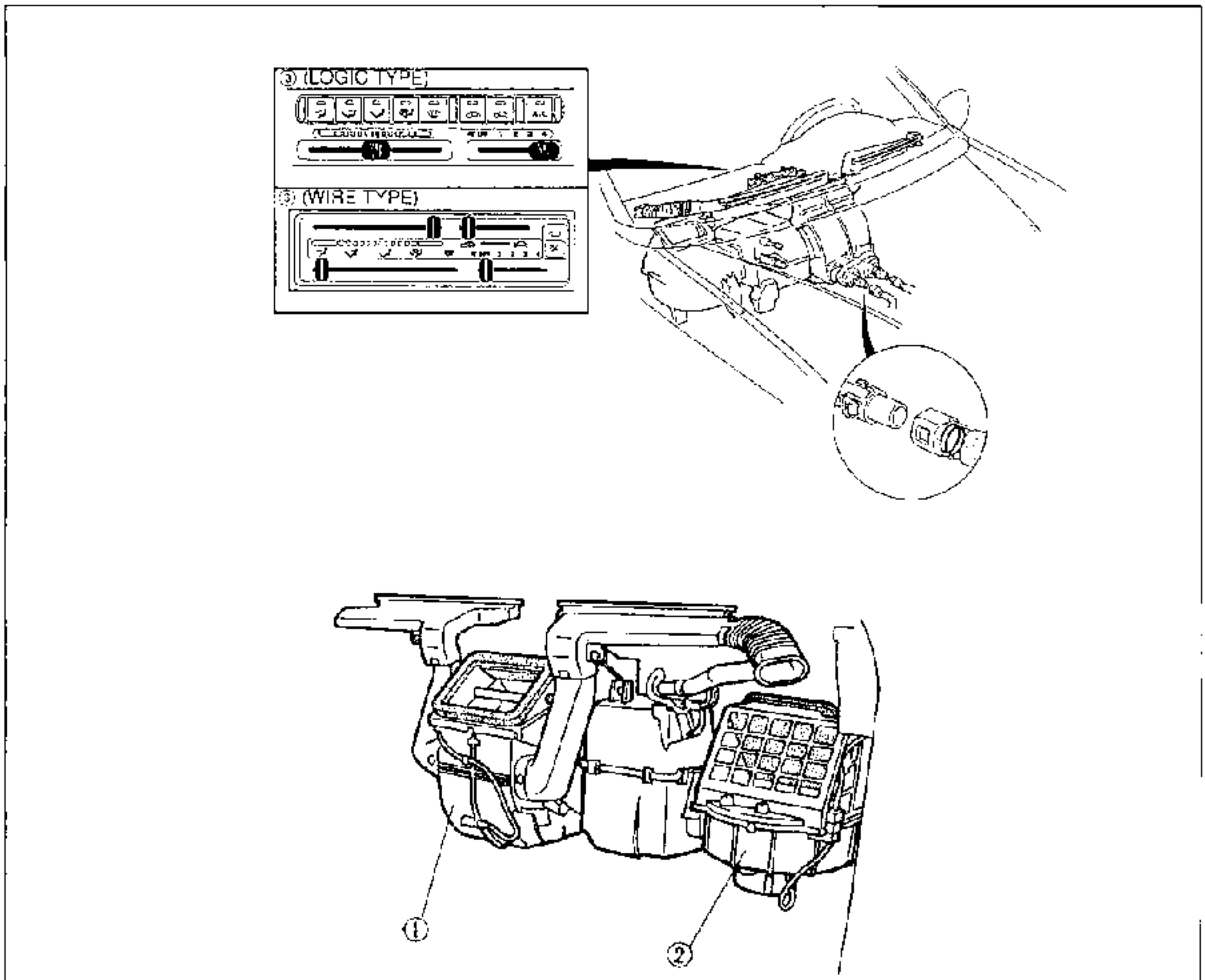
1. Install the manifold gauge set. (Refer to page G–50.)
2. Shut all doors and windows.
3. Warm up the engine and run it at a constant 1,500 rpm.
4. Set the fan switch to the fourth position.
5. Turn the A/C switch on.
6. Set the REC/FRESH switch (logic type) or REC/FRESH lever (wire type) at recirculate.
7. Set the mode switch (logic type) or mode lever (wire type) at VENT.
8. Set the temperature control lever at MAX COLD.
9. Measure the ambient temperature and the high- and low-pressure-side readings of the manifold gauge.
10. If the high- and low-pressure-side readings are in the shaded zones shown in the figure, the refrigerant system is normal.
11. If not as specified, refer to "Refrigerant pressure flowchart" and repair the air conditioning system. (Refer to page G–35.)

Refrigerant pressure flowchart

Pressure condition	Step	Procedure		Cause and action
High- and low-pressure-side readings are higher than normal	—	Check condenser fins. (Refer to page G–64) Are they clogged or damaged?	Yes	• Insufficient condenser refrigeration Clean or repair condenser fins (Refer to page G–64)
			No	• Too much refrigerant Discharge refrigerant and recharge to proper amount (Refer to page G–50)
High- and low-pressure-side readings are lower than normal	1	Check all connections. Are there any oil stains?	Yes	• Insufficient refrigerant because of leakage Repair leaks and recharge refrigerant to proper amount (Refer to page G–50)
			No	Go to Step 2
	2	Check for leakage (Refer to page G–51) Are there any leaks?	Yes	• Insufficient refrigerant because of leakage Repair leaks and recharge refrigerant to proper amount (Refer to page G–50)
			No	• Insufficient charging Recharge refrigerant to proper amount (Refer to page G–50)
High-pressure-side reading is a little lower than normal; low-pressure-side reading is a little higher than normal	—	Check heat-sensing tube. Is it in its proper position and securely connected to evaporator outlet pipe?	Yes	• Expansion valve opening too wide because of expansion valve malfunction Replace expansion valve (Refer to page G–68)
			No	• Expansion valve opening too wide because heat-sensing tube is improperly installed Reinstall heat-sensing tube properly (Refer to page G–68)
High-pressure-side reading rises to normal pressure range and then drops below range; low-pressure-side reading is negative	1	1. Turn A/C compressor off for about 10 minutes. 2. Turn A/C compressor on and immediately check pressure reading. Is pressure reading normal?	Yes	• Expansion valve clogged because of freezing by moisture Discharge refrigerant and replace receiver/drier (Refer to page G–65)
			No	Go to Step 2
	2	Check heat sensing tube. Is it properly installated?	Yes	• Expansion valve clogged with foreign material • Expansion valve opening too wide because of expansion valve malfunction or heat-sensing tube leakage Replace expansion valve (Refer to page G–68)
			No	• Expansion valve opening too narrow because heat-sensing tube is improperly installated Reinstall heat sensing tube properly (Refer to page G–68)
No difference between high- and low-pressure-side readings	—	—	—	• Improper compression of A/C compressor Repair or replace A/C compressor (Refer to page G–54)

HEATER

STRUCTURAL VIEW

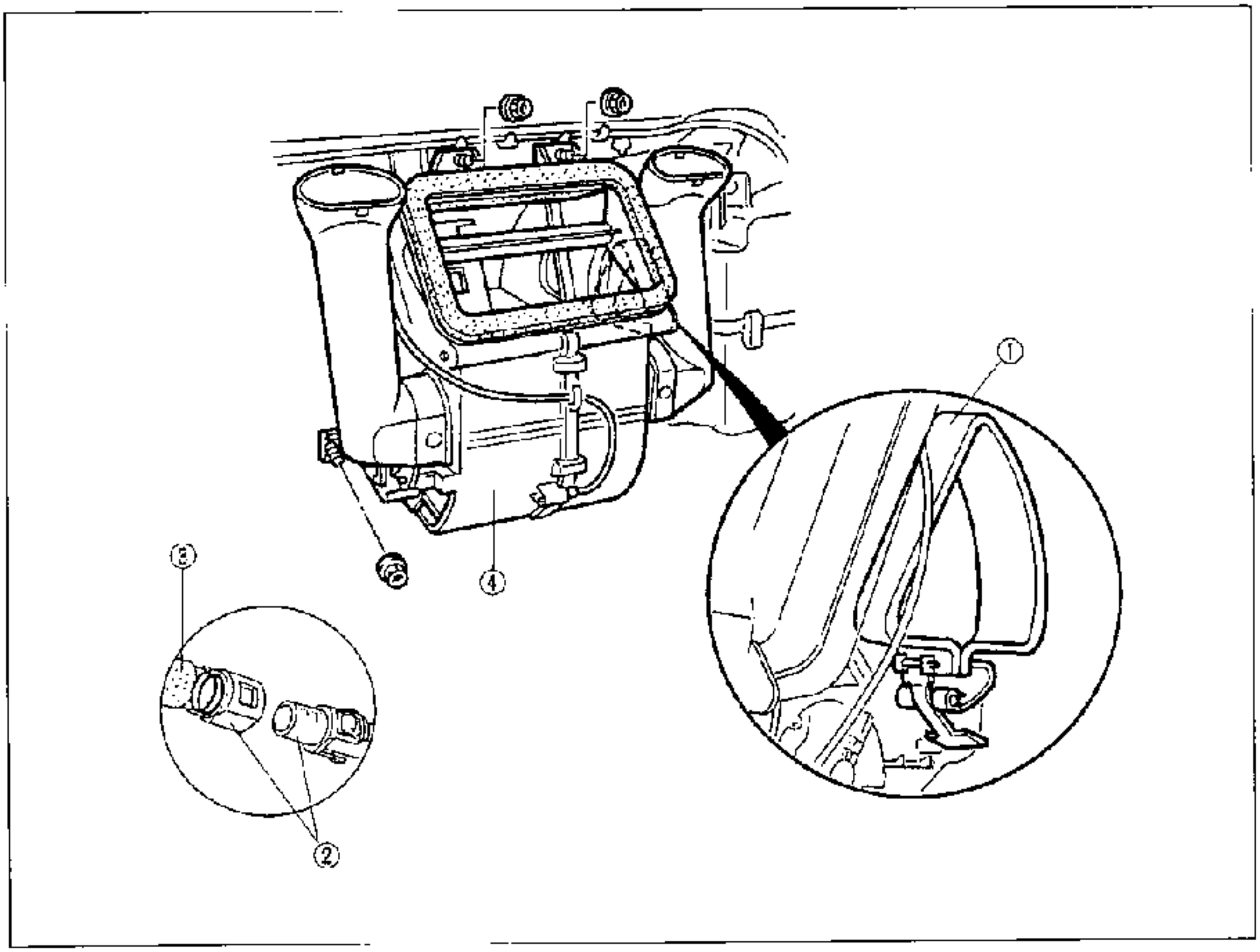


1. Heater unit
   - Removal / Installation ..... page G–37
   - Disassembly / Inspection / Assembly ..... page G–38
   - Airflow mode actuator
     - Inspection ..... page G–39
2. Blower unit
   - Removal / Installation ..... page G–40
   - Disassembly / Assembly ..... page G–41
   - Blower motor (in blower unit)
     - Inspection ..... page G–42
   - Resistor (in blower unit)
     - Inspection ..... page G–42
   - Air intake actuator
     - Inspection ..... page G–42
   - Blower relay
     - Removal / Installation ..... page G–42
     - Inspection ..... page G–42
3. Heater control unit
   - Removal / Installation ..... page G–43
   - Disassembly / Assembly ..... page G–44
   - Inspection ..... page G–46
   - Air intake wire
     - Adjustment ..... page G–47
   - Airflow mode wire
     - Adjustment ..... page G–47
   - Air mix wire
     - Adjustment ..... page G–48

HEATER UNIT

Removal / Installation

1. Drain the engine coolant. (Refer to the 1995 MX-3 Workshop Manual, section E.)
2. Remove the dashboard. (Refer to the 1995 MX-3 Workshop Manual, section S.)
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.



1. Seal plate
   Removal note ..... below
2. Hose connector
3. Heater hose
   Removal note ..... below
   Installation note ..... below
4. Heater unit
   Disassembly / Inspection / Assembly..... page G–38

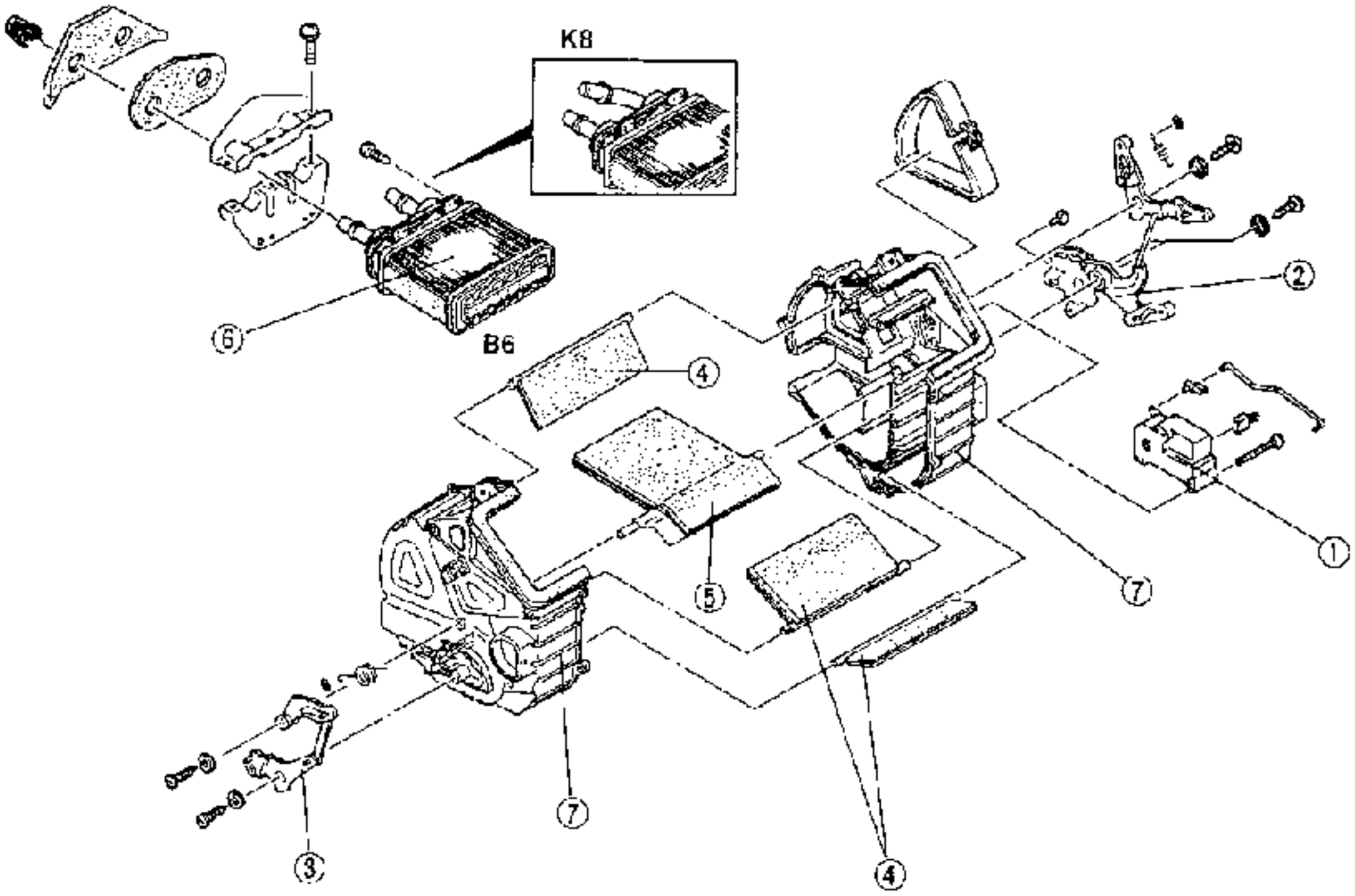
Removal note
Seal plate
Release the clamp and remove the seal plate together with the heater unit.

Heater hose
When disconnecting the heater hose from the heater core, unlock the hose connector from the heater core side.

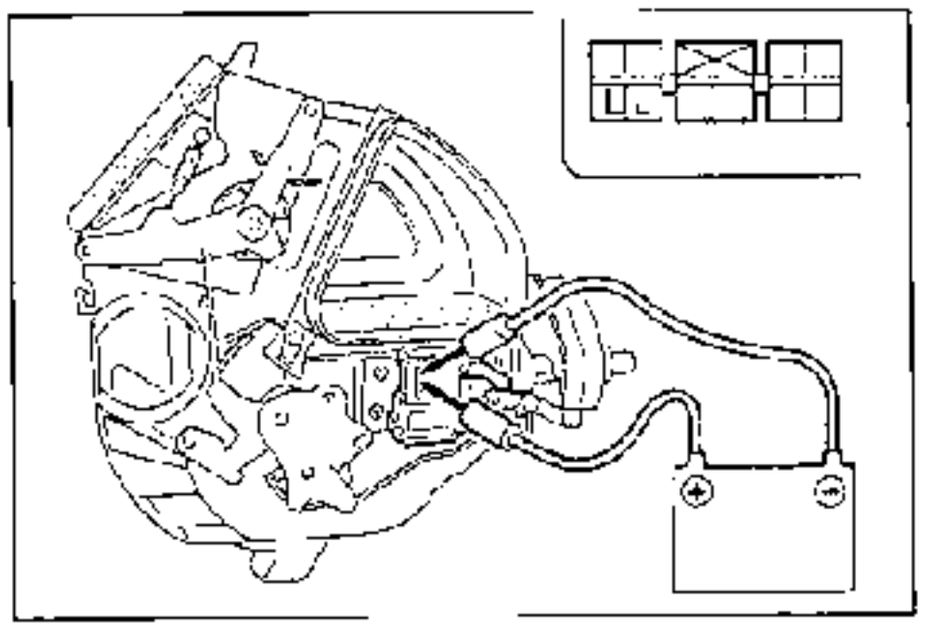
Installation note
Heater hose
After installing the heater hose to the heater core, verify that the hose connector is securely locked.

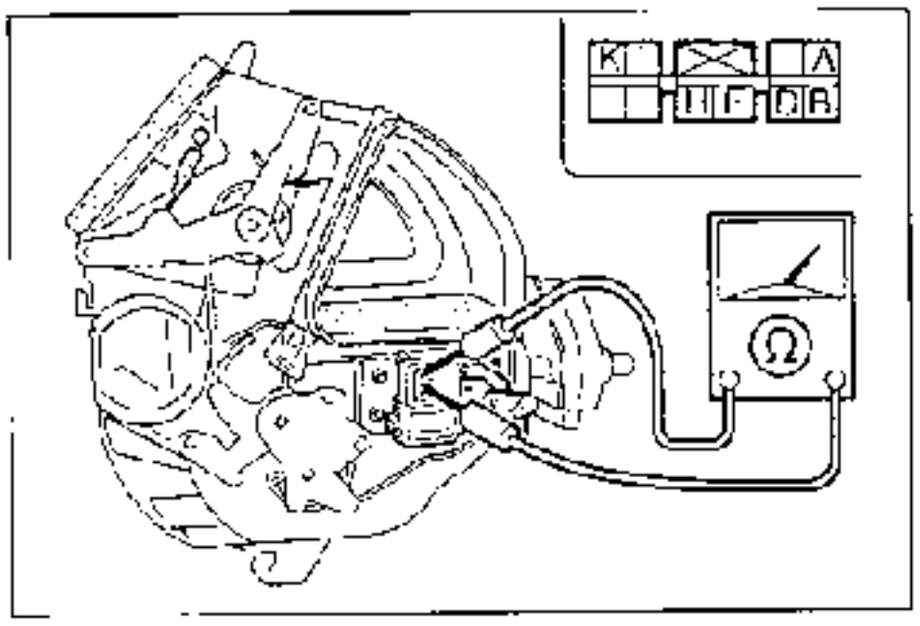
Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure.
2. Check for the following and repair or replace the heater core as necessary.
   ①Cracks, damage, and water leakage
   ②Bent fins
   ③Distorted and bent inlet
3. Assemble in the reverse order of disassembly.



1. Airflow mode actuator
   Inspection ..... page G–39
2. Mode door link
3. Air mix link
4. Mode door assembly
5. Mix door assembly
6. Heater core
7. Heater unit case





AIRFLOW MODE ACTUATOR

Inspection

1. Remove the cooling unit. (Refer to page G–67.)
2. Disconnect the airflow mode actuator connector.
3. Connect battery positive voltage to terminals L and J and check the operation of the airflow mode actuator.

B+: Battery positive voltage

Connection		Actuator operation
B+	GND	
L	J	VENT → B/L → HEAT → H/D → DEF
J	L	DEF → H/D → HEAT → B/L → VENT

4. If not as specified, replace the airflow mode actuator. (Refer to page G–38.)
5. Check for continuity between the terminals of the airflow mode actuator.

Airflow mode	Terminal						
	K	I	H	A	B	D	F
VENT			○	○	○	○—○	
B/L	○—○			○	○—○	○—○	
HEAT	○	○—○			○	○—○	
H/D	○	○	○	○		○—○	
DEF	○—○	○—○	○—○	○—○	○		

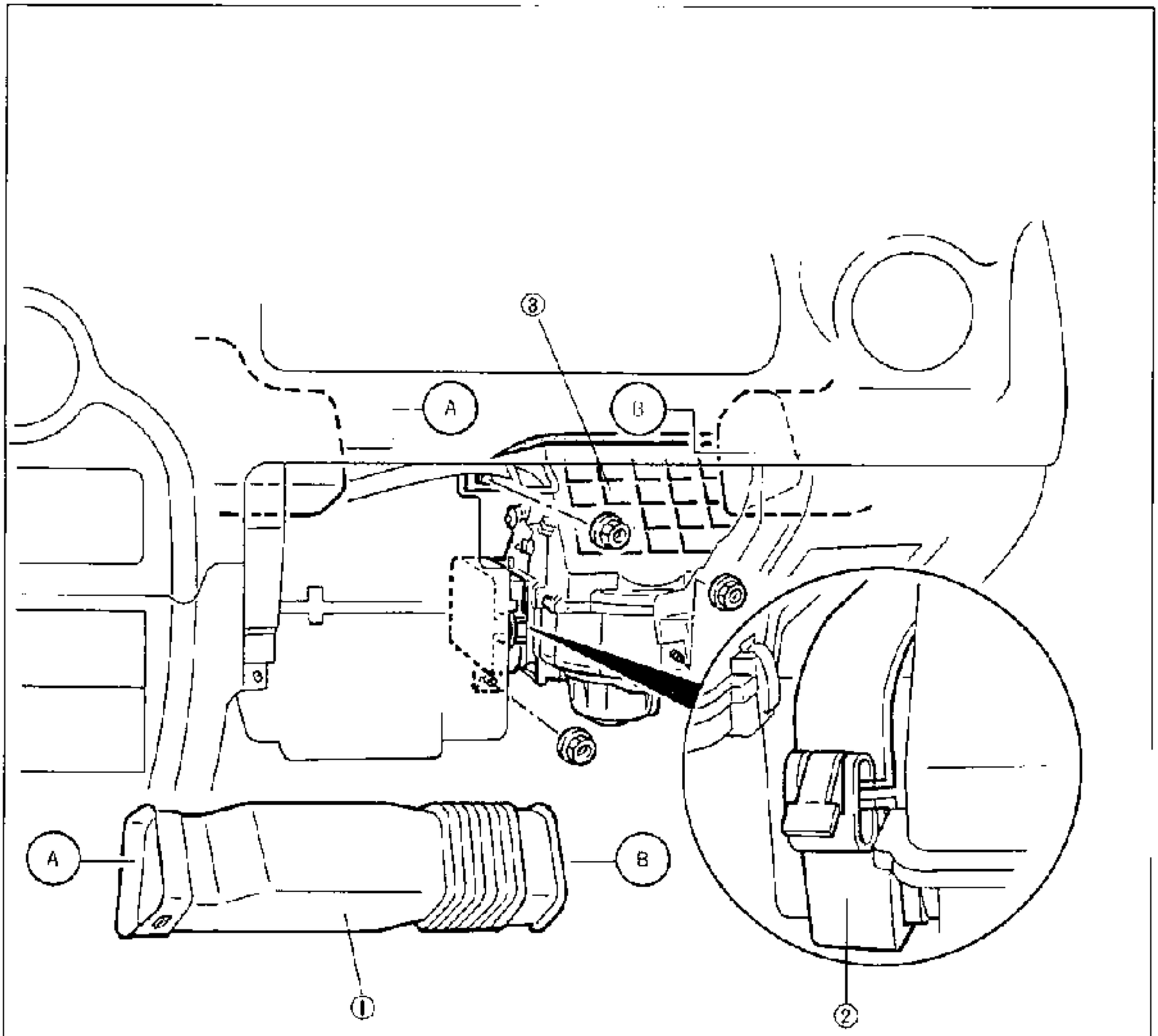
○—○ : Continuity

6. If not as specified, replace the airflow mode actuator. (Refer to page G–38.)

BLOWER UNIT

Removal / Installation

1. Remove the glove compartment. (Refer to the 1995 MX-3 Workshop Manual, section S.)
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.



1. Duct
2. Seal plate
   Removal note ..... below
3. Blower unit
   Disassembly / Assembly ..... page G–41

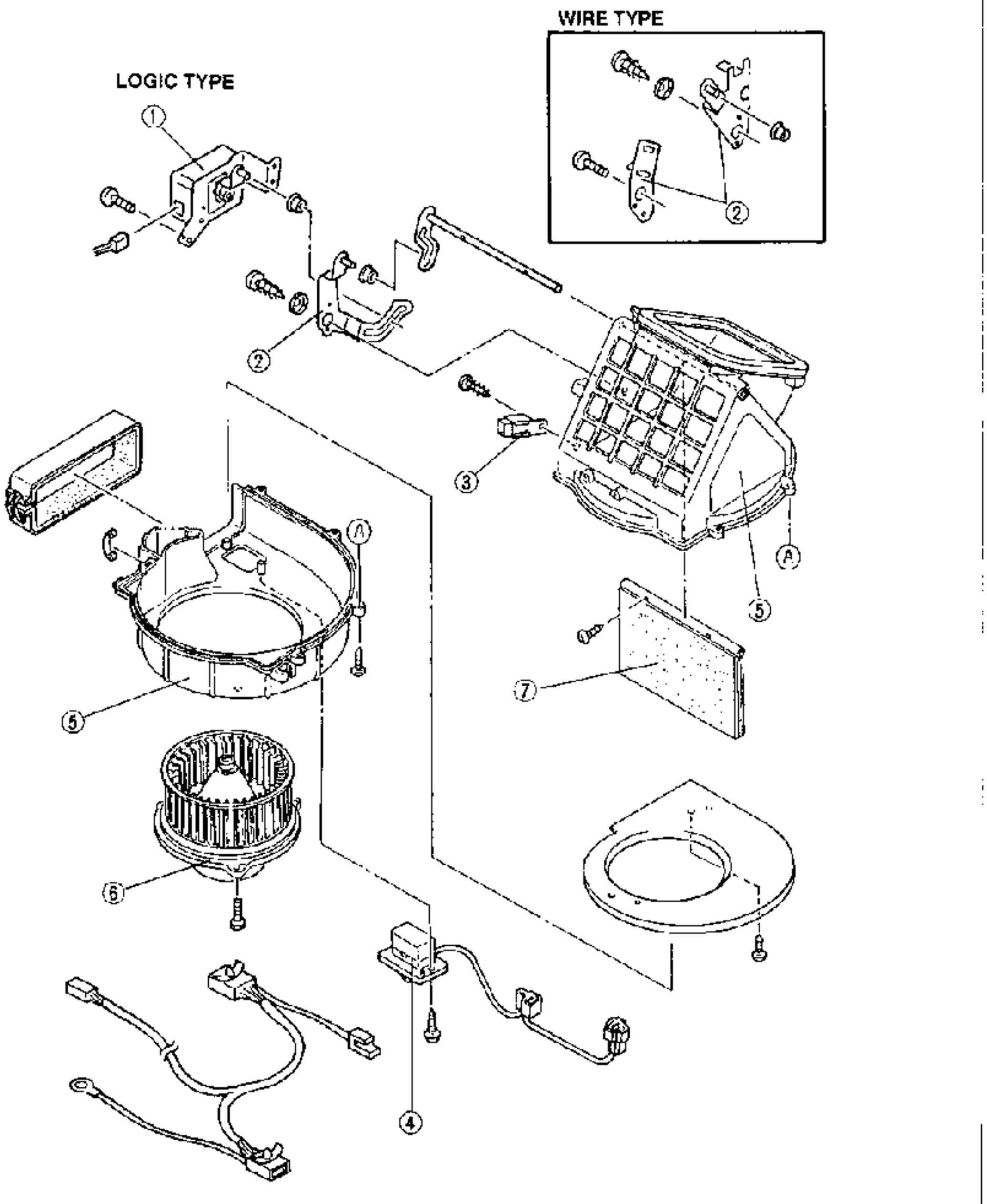
Removal note

Seal plate

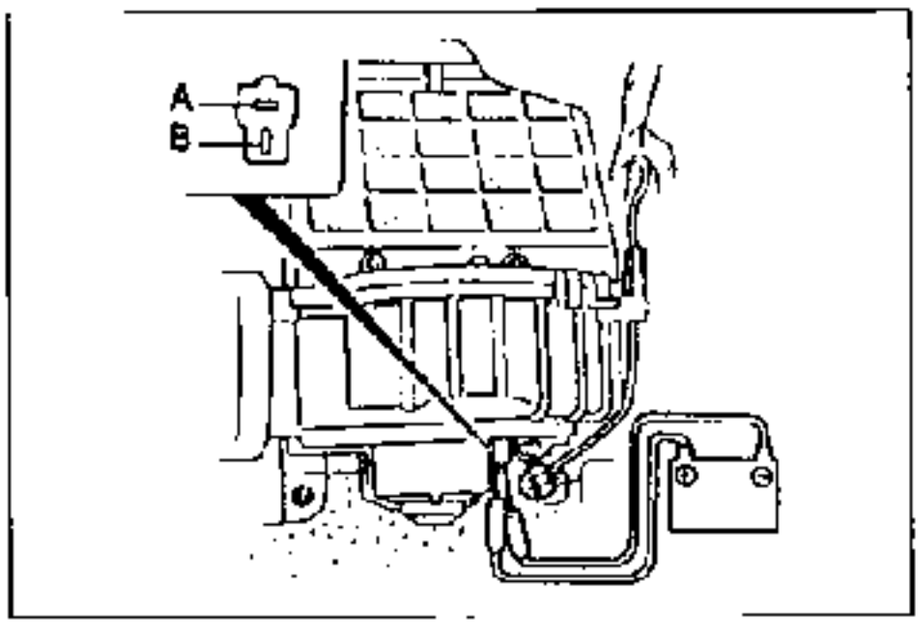
Release the clamp and remove the seal plate together with the blower unit.

Disassembly / Assembly

1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.



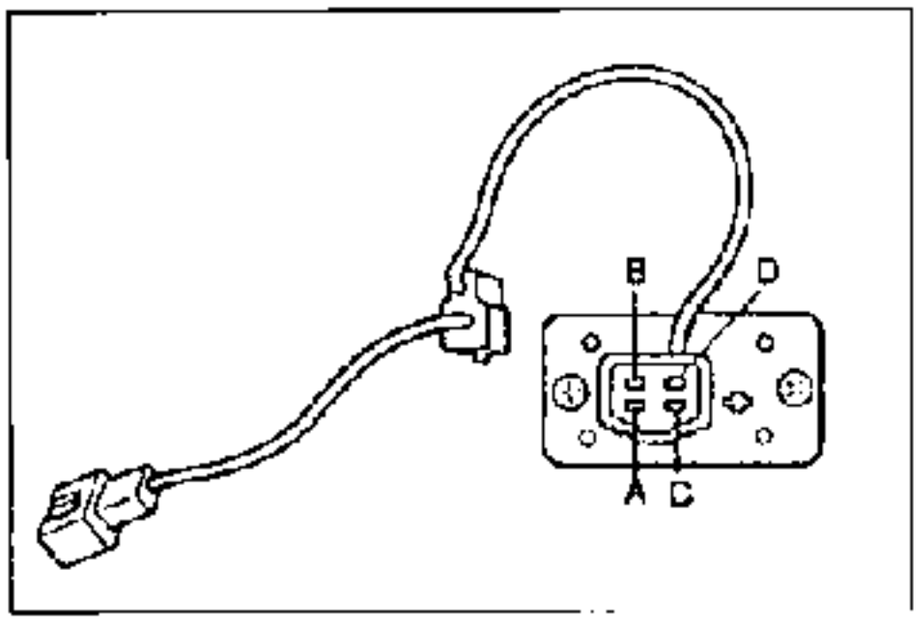
1. Air intake actuator (logic type)
   Inspection ..... page G–42
2. Intake door link
3. Blower relay
   Inspection ..... page G–42
4. Resistor
   Inspection ..... page G–42
5. Blower unit case
6. Blower motor
   Inspection ..... page G–42
7. Intake door assembly



BLOWER MOTOR

Inspection

1. Disconnect the blower motor connector.
2. Connect battery positive voltage to terminal A and ground to terminal B of the blower motor. Verify that the motor operates.
3. If not as specified, replace the blower motor. (Refer to page G–41.)



RESISTOR

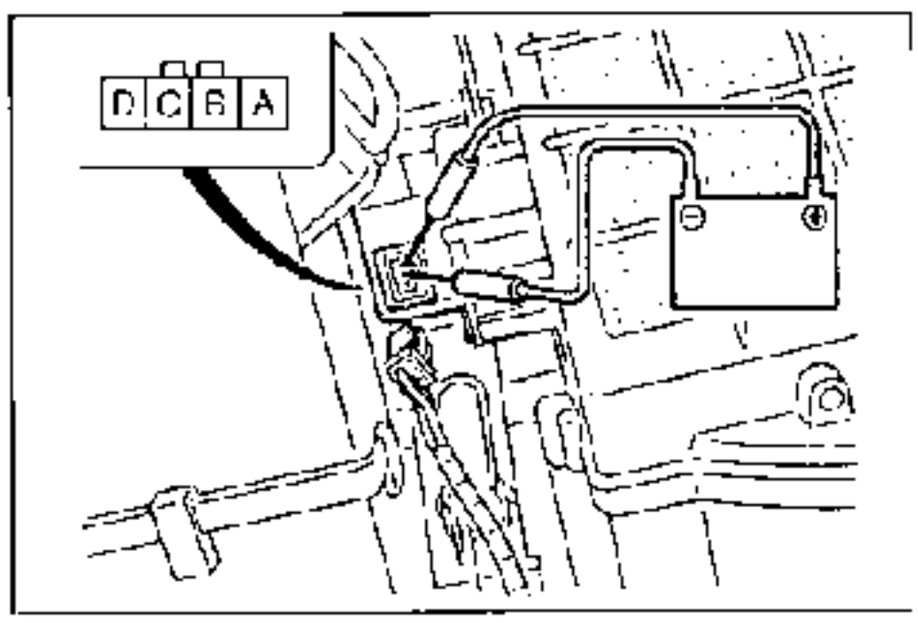
Inspection

1. Disconnect the resistor connector.
2. Check for continuity between the resistor terminals.

Terminal			
A (D)	B (C)	C (A)	D (B)
○——	——○		
○- -	- - - -	- - ○	
○-	- - - -	- - -	- - ○

○—○ : Continuity ( ): Wire type

3. If not as specified, replace the resistor. (Refer to page G–41.)



AIR INTAKE ACTUATOR

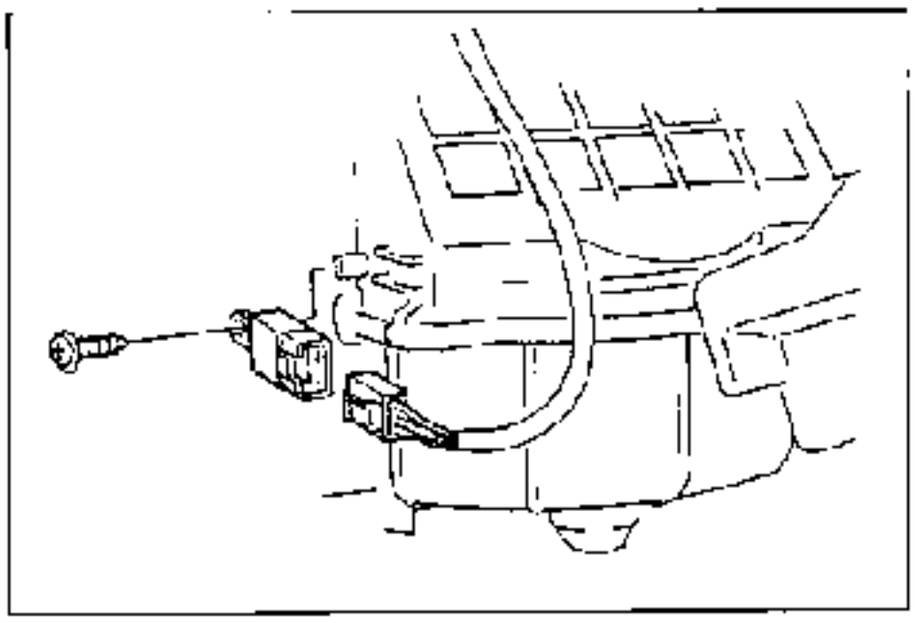
Inspection

1. Disconnect the air intake actuator connector.
2. Connect battery positive voltage to the following terminals and check the operation of the air intake actuator.

B+: Battery positive voltage

Connection		Actuator operation
B+	GND	
D	C	REC → FRESH
D	A	FRESH → REC

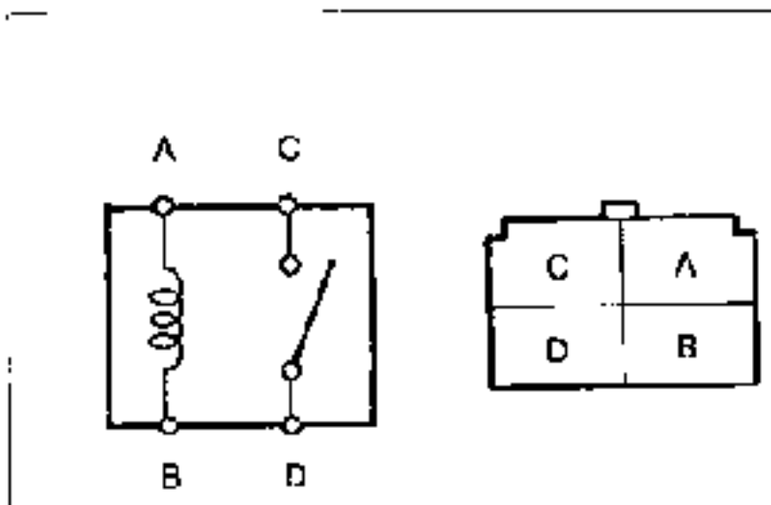
3. If not as specified, replace the air intake actuator. (Refer to page G–41.)



BLOWER RELAY

Removal / Installation

1. Remove the blower unit. (Refer to page G–40.)
2. Disconnect the blower relay connector.
3. Remove the blower relay from the blower unit.
4. Install in the reverse order of removal.



Inspection

1. Remove the blower relay.
2. Check for continuity between the relay terminals.

B+: Battery positive voltage

Connection		Terminal			
B+	GND	A	B	C	D
—	—	○	——○		
A	B			○ -	○

○—○ : Continuity

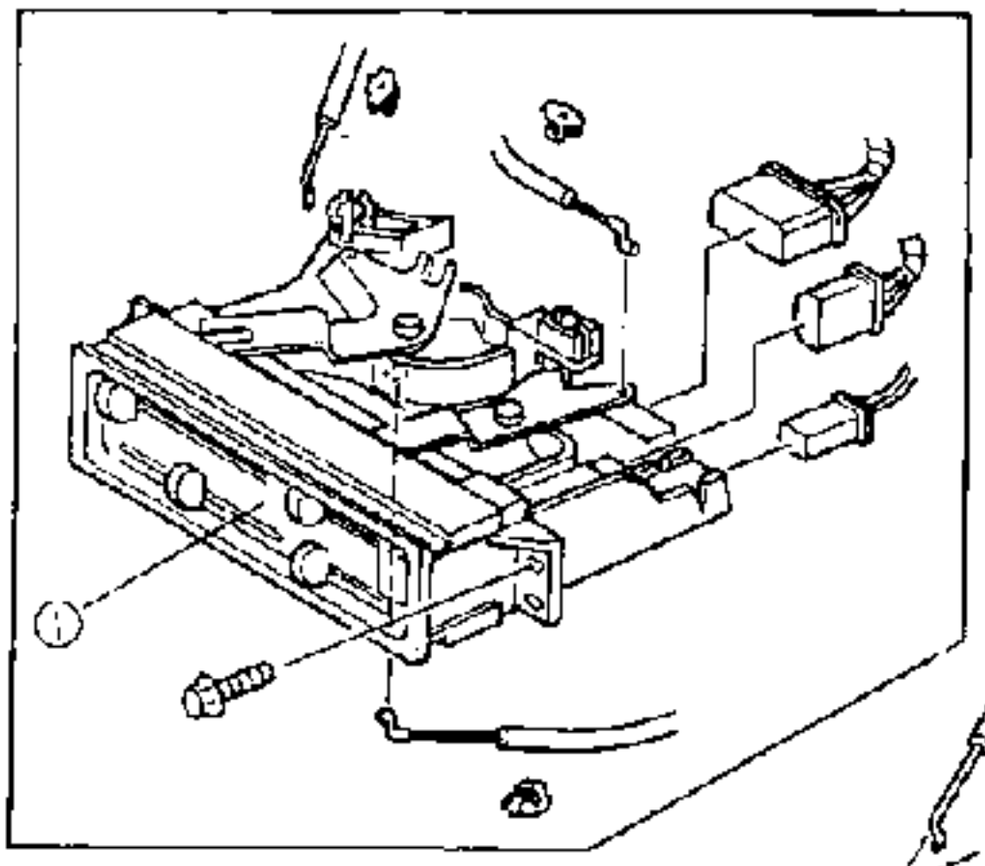
3. If not as specified, replace the blower relay.

HEATER CONTROL UNIT

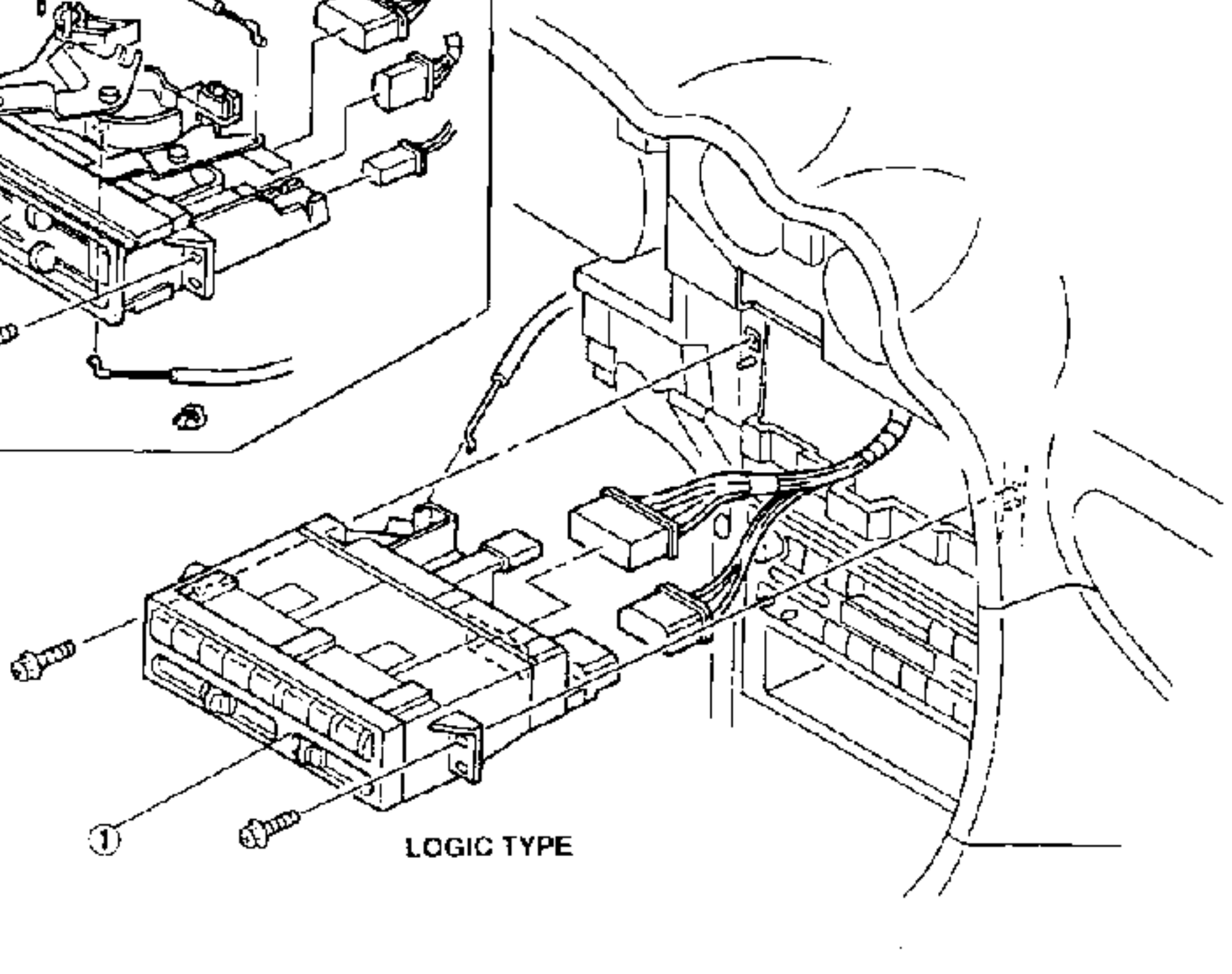
Removal / Installation

1. Remove the side panel, lower panel, rear console, console panel, front console, and meter hood. (Refer to the 1995 MX-3 Workshop Manual, section S.)
2. Remove the air mix wire from the mix door link.
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.

WIRE TYPE



LOGIC TYPE

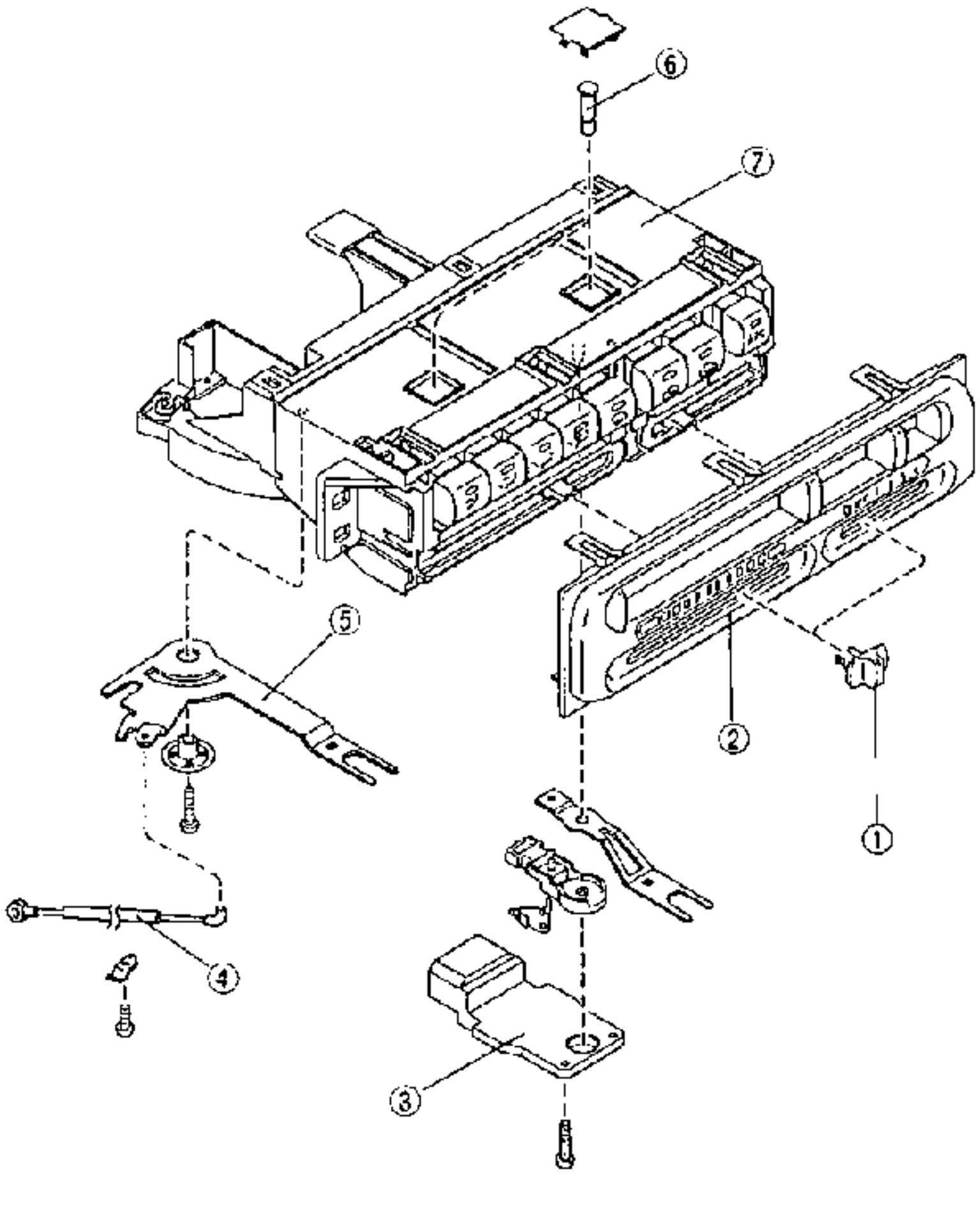


1. Heater control unit
   Disassembly / Assembly ..... page G–44
   Inspection ..... page G–46

Disassembly / Assembly

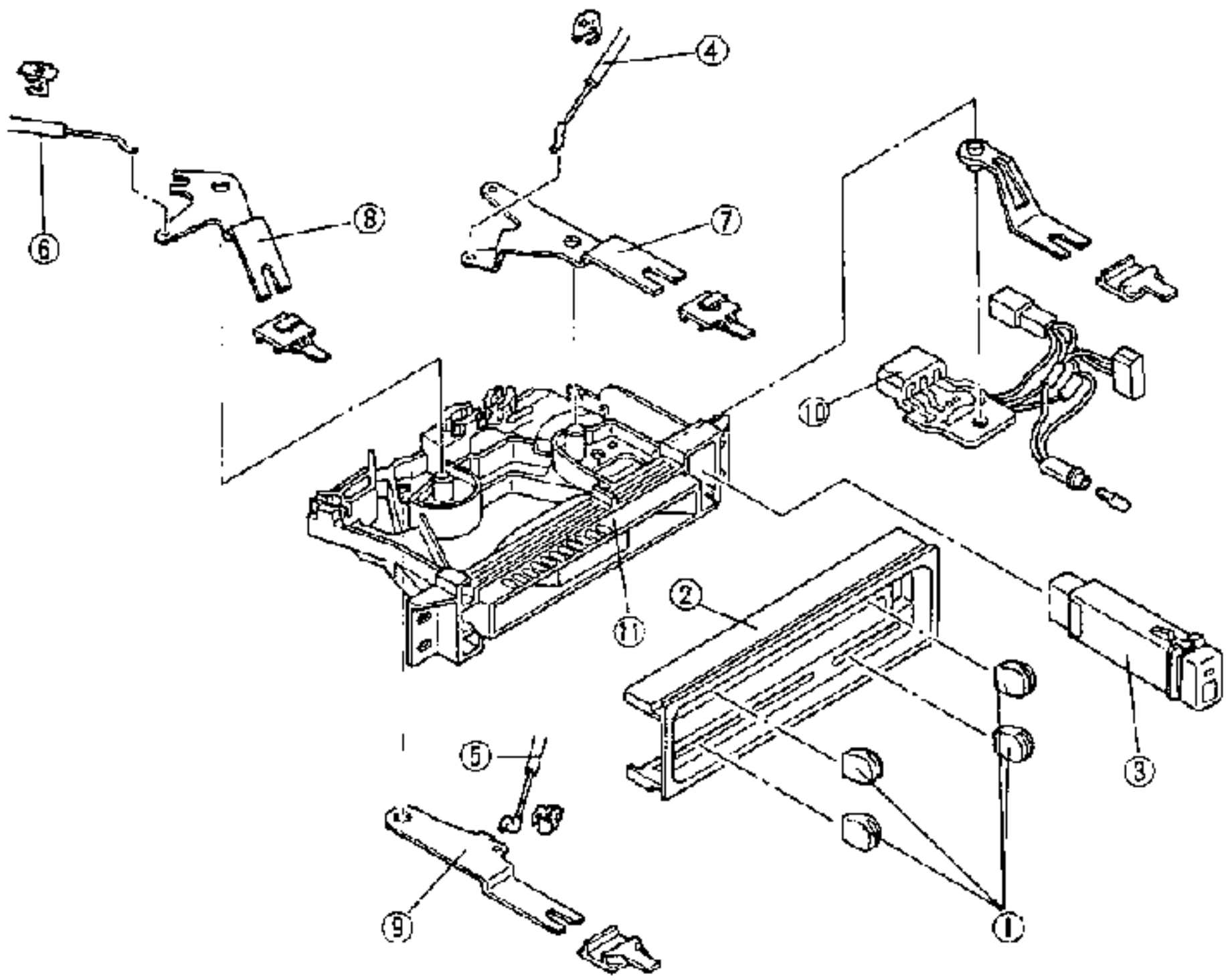
1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.

LOGIC TYPE

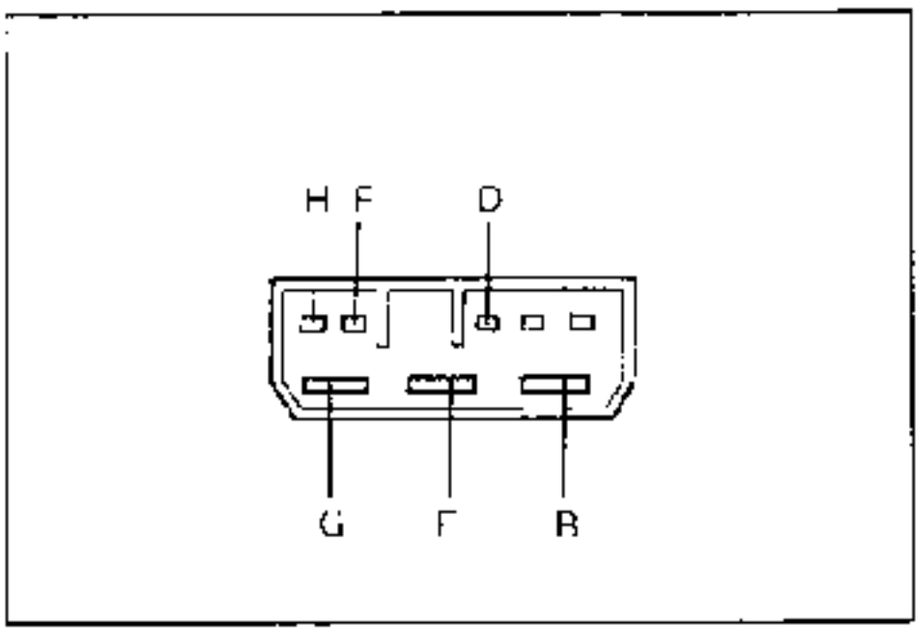


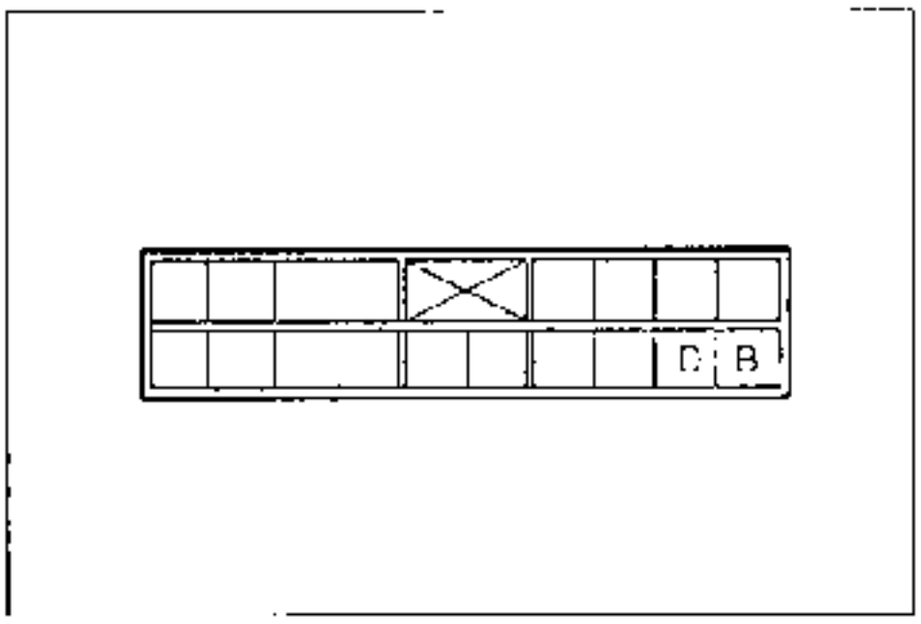
1. Knob
2. Switch panel
3. Fan switch
   Inspection ..... page G–46
4. Air mix wire
   Adjustment ..... page G–48
5. Temperature control lever
6. Bulb
7. Heater control unit
   Inspection ..... page G–46

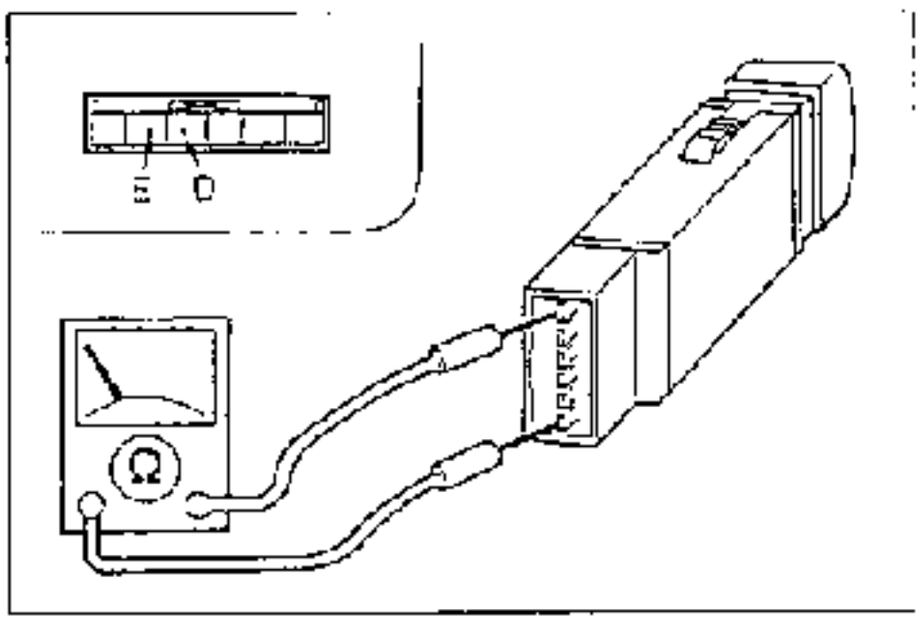
WIRE TYPE

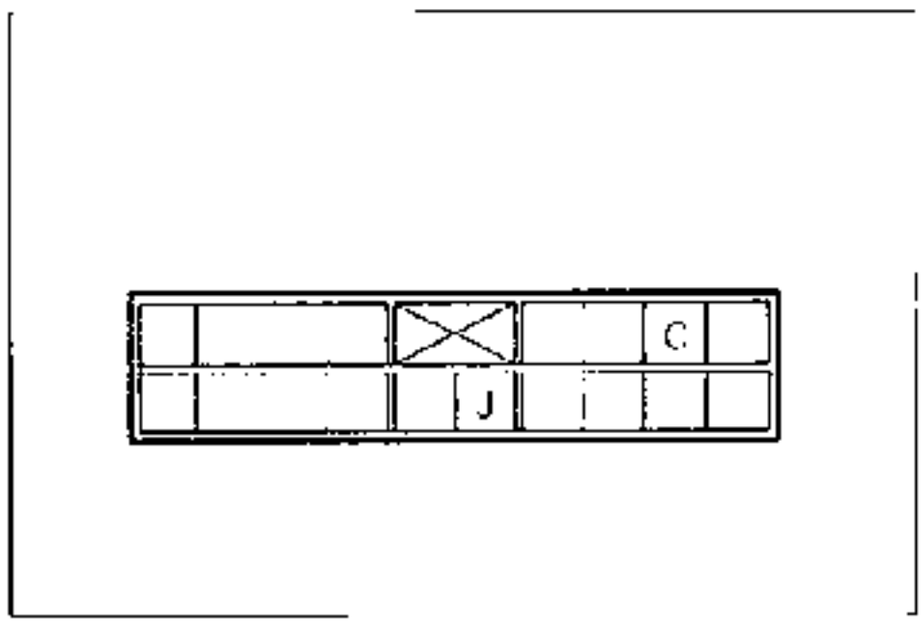


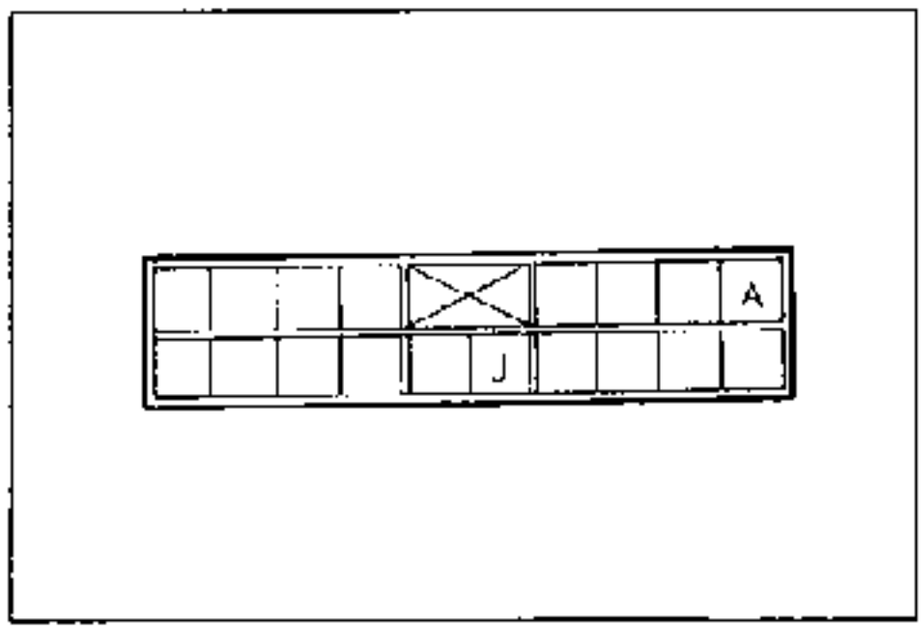
1. Knob
2. Switch panel
3. A/C switch
   Inspection ..... page G–46
4. Air intake wire
   Adjustment ..... page G–47
5. Airflow mode wire
   Adjustment ..... page G–47
6. Air mix wire
   Adjustment ..... page G–48
7. REC/FRESH lever
8. Mode lever
9. Temperature control lever
10. Fan switch
    inspection ..... page G–46
11. Heater control unit











Inspection

Fan switch

1. Check for continuity between the terminals of the fan switch.

Switch position	B	D	F	E	G	H
OFF						
1	○	○				
2	○		○			○
3	○			○		○
4	○				○	○

○—○ : Continuity

2. If not as specified, replace the fan switch. (Refer to page G–44 or G–45.)

A/C switch (Logic type)

1. Check for continuity between the terminals of the heater control unit.

A/C switch	B	D
OFF		
ON	○	○

○—○ : Continuity

2. If not as specified, replace the heater control unit. (Refer to page G–43.)

(Wire type)

1. Remove the A/C switch from the switch panel. (Refer to page G–45.)
2. Check for continuity between the terminals of the A/C switch.

A/C switch	D	E
OFF		
ON	○	○

○—○ : Continuity

3. If not as specified, replace the A/C switch. (Refer to page G–45.)

REC switch

1. Remove the heater control unit. (Refer to page G–43.)
2. Operate the REC switch and check for continuity between terminals C and J of the heater control unit.

REC switch	Continuity
OFF	No
ON	Yes

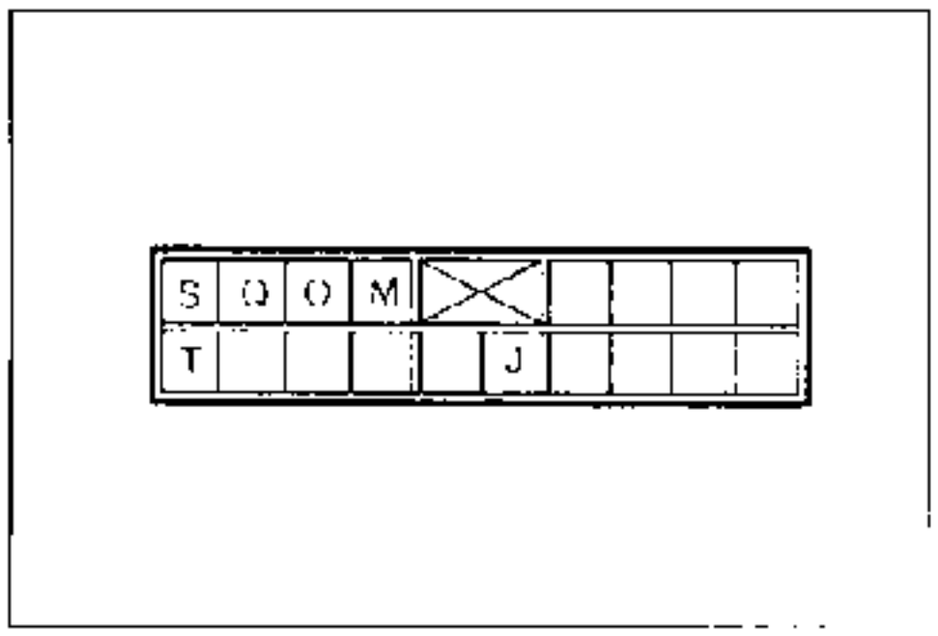
3. If not as specified, replace the heater control unit. (Refer to page G–43.)

FRESH switch

1. Remove the heater control unit. (Refer to page G–43.)
2. Operate the FRESH switch and check for continuity between terminals A and J of the heater control unit.

FRESH switch	Continuity
OFF	No
ON	Yes

3. If not as specified, replace the heater control unit. (Refer to page G–43.)



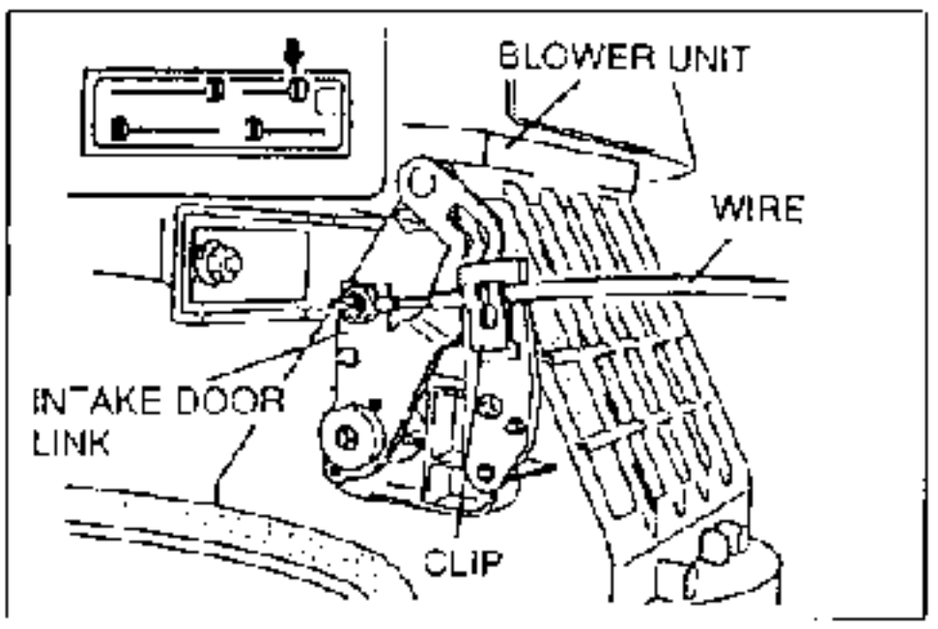
MODE switch

1. Remove the heater control unit.
   (Refer to page G–43.)
2. Press the MODE switch and check for continuity between the terminals of the heater control unit.

MODE switches	Terminal					
	J	T	S	Q	O	M
VENT	○	○				
B/L	○	○	○			
HEAT	○	○	○	○		
H/D	○	○	○	○	○	
DEF	○	○	○	○	○	○

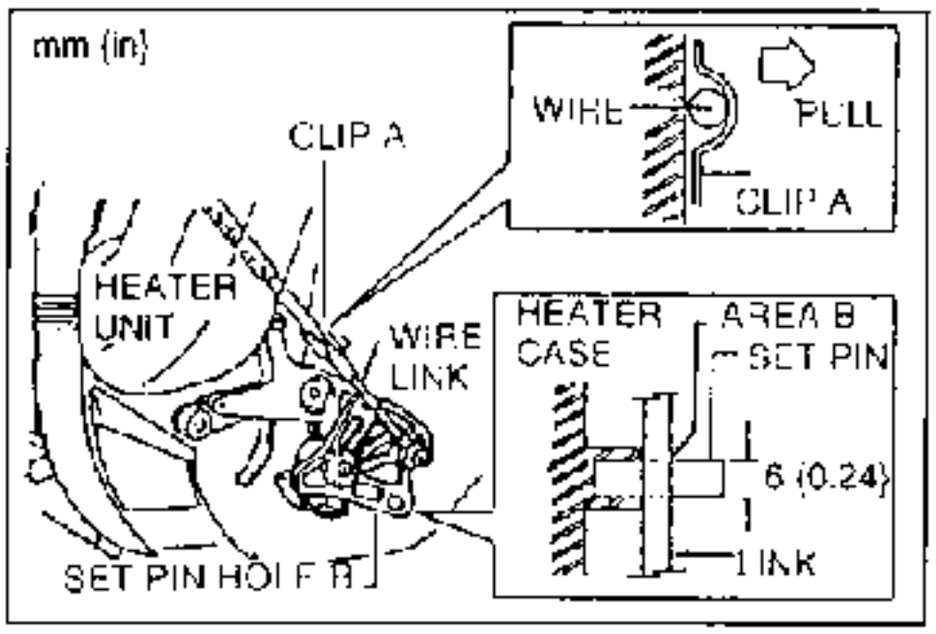
○–○ : Continuity

3. If not as specified, replace the heater control unit.
   (Refer to page G–43.)



AIR INTAKE WIRE
Adjustment

1. Set the REC/FRESH lever to FRESH.
2. Connect the air intake wire to the intake door link.
3. Set the door at the FRESH position and clamp the wire into place.
4. Verify that the REC/FRESH lever moves its full stroke.

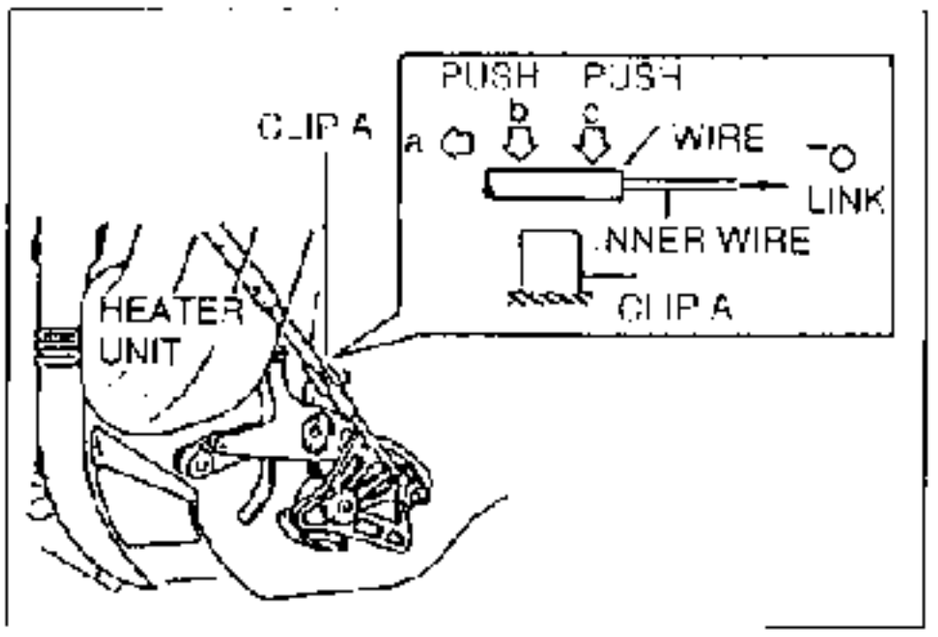


AIRFLOW MODE WIRE
Adjustment

1. Set the mode lever at DEFROST.
2. Remove the airflow mode wire from clip A.
3. Align set pin hole B of the link with the corresponding hole of the heater unit. Insert a 6mm {0.24 in} pin to fix the link in the correct position.
4. Verify that the mode lever is in the defrost position.

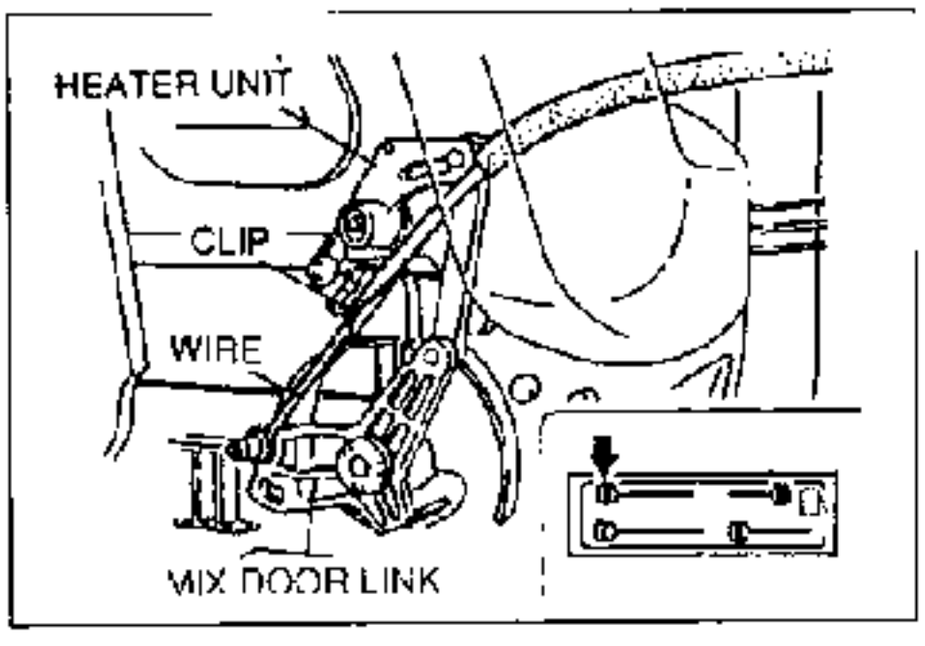
Caution

- **Do not push the inner wire of the airflow mode wire when setting. If pushed, the wire may be deformed, preventing the correct setting.**



5. Set the airflow mode wire against clip A as shown. Pull the airflow mode wire slightly in direction a. Press areas b and c simultaneously when setting the wire into the clip.

6. Remove the set pin.
7. Verify that the mode lever functions correctly. If not, pull the airflow mode wire 2 mm {0.08 in} in direction a.
8. Verify that the mode lever functions correctly.



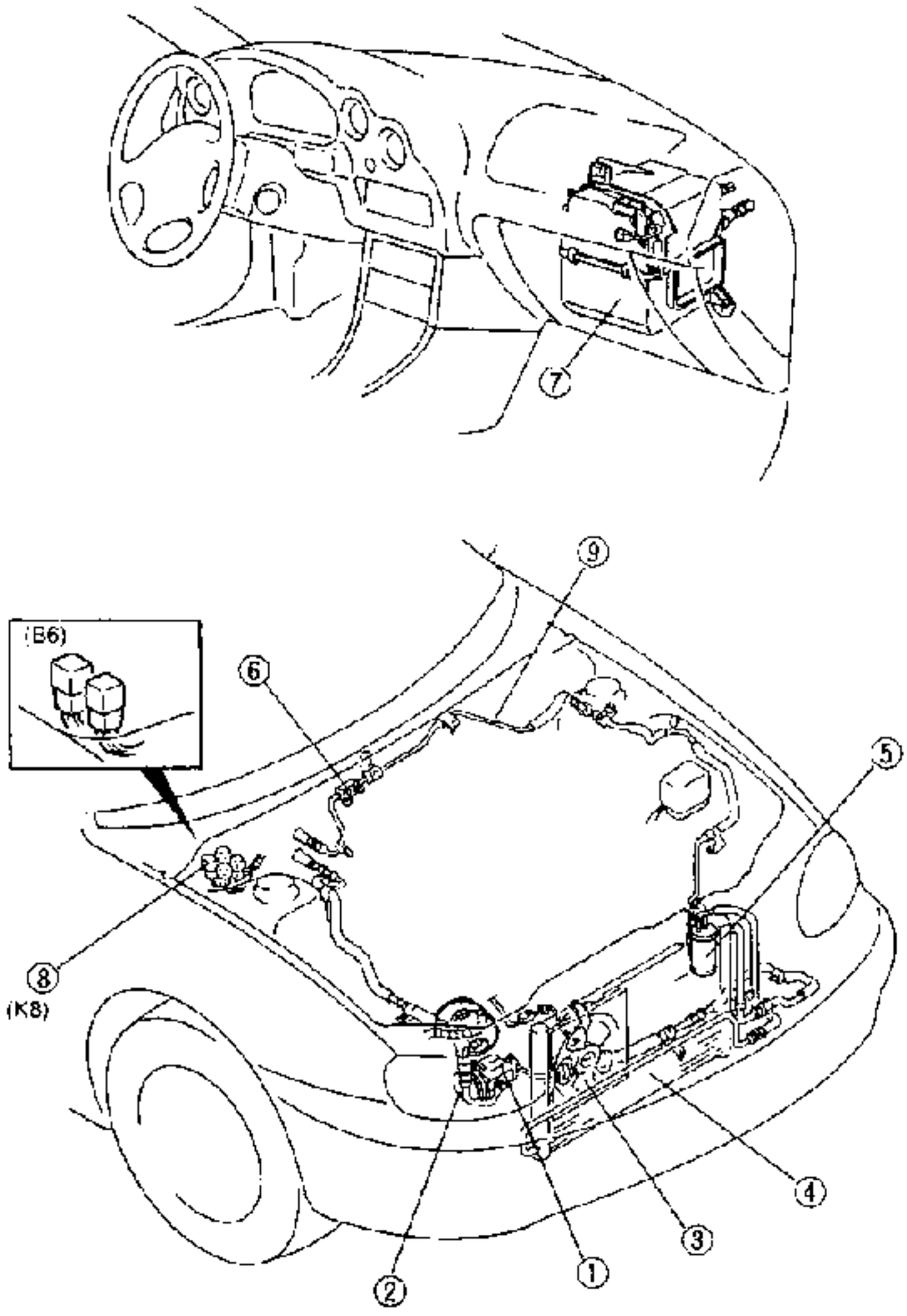
AIR MIX WIRE

Adjustment

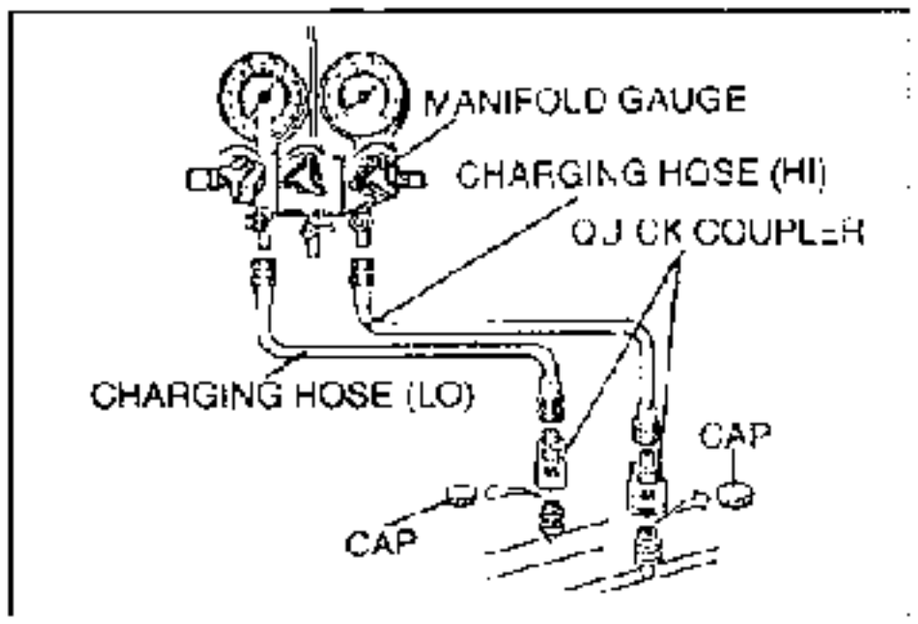
1. Set the temperature control lever to MAX COLD.
2. Connect the air mix wire to the mix door link.
3. Set the door to MAX COLD and clamp the wire into place.
4. Verify that the temperature control lever moves its full stroke.

AIR CONDITIONER

STRUCTURAL VIEW



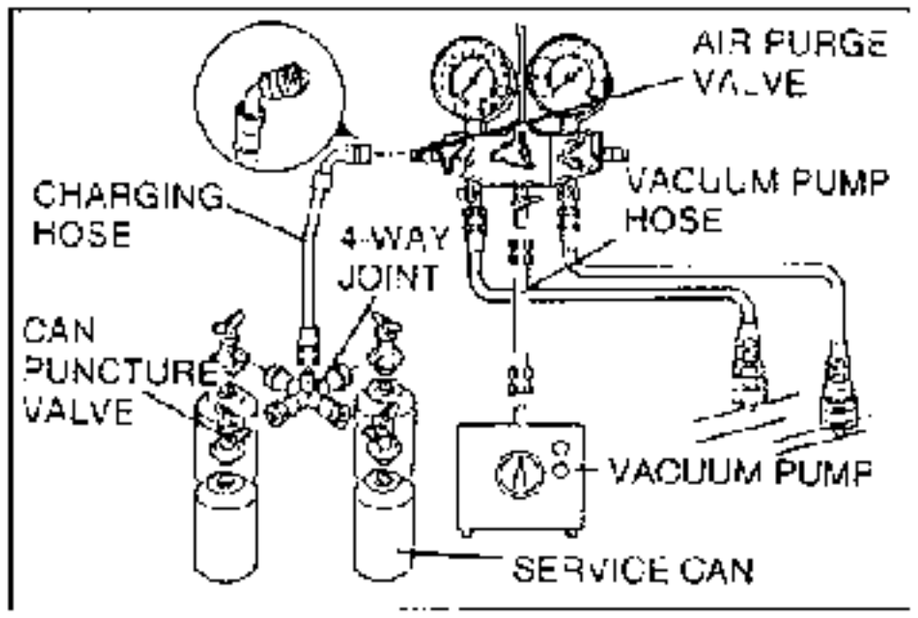
1. A/C compressor
   - Removal / Installation ..... page G–54
   - Disassembly / Assembly ..... page G–56
2. Magnetic clutch
   - Disassembly / Assembly ..... page G–62
   - Inspection ..... page G–62
3. Condenser fan
   - Removal / Installation ..... page G–63
   - Inspection ..... page G–63
4. Condenser
   - Removal / Installation ..... page G–64
   - Inspection ..... page G–64
5. Receiver drier
   - Removal / Installation ..... page G–65
6. Refrigerant pressure switch
   - Removal / Installation ..... page G–65
   - Inspection ..... page G–65
7. Cooling unit
   - Removal / Installation ..... page G–67
   - Disassembly / Assembly ..... page G–68
   - Replacement ..... page G–68
8. Relays
   - Removal / Installation ..... page G–70
   - Inspection ..... page G–70
9. Refrigerant lines
   - On-vehicle Inspection ..... page G–71
   - Removal / Installation ..... page G–71



REFRIGERANT SYSTEM SERVICE PROCEDURES

Manifold Gauge Set Installation

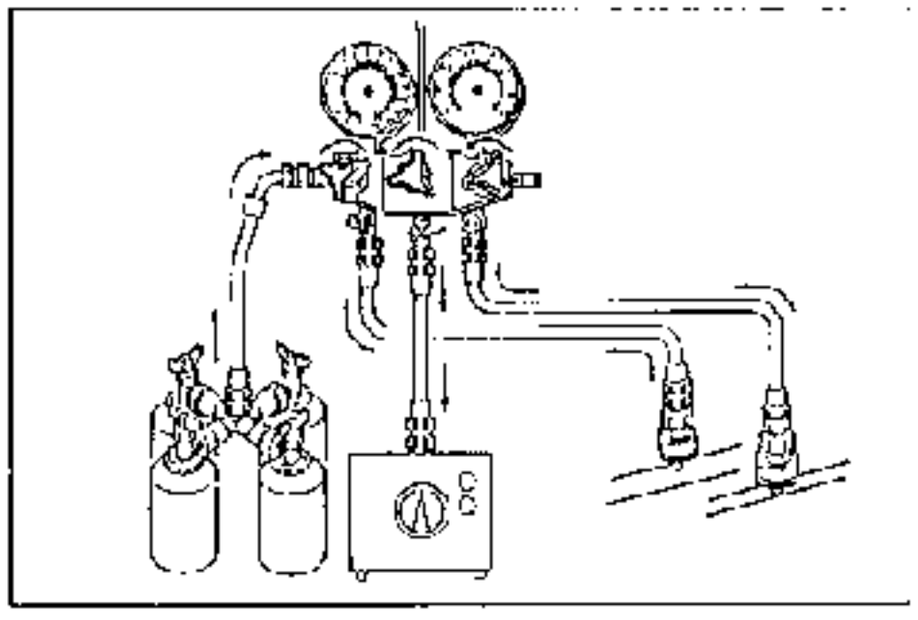
1. Fully close the valves of the manifold gauge.
2. Connect charging hoses to the high- and low-pressure side joints of the manifold gauge.
3. Connect quick couplers to the ends of the charging hoses.
4. Remove the caps from the charging valves of the high- and low-pressure side cooler pipes.
5. Connect the quick couplers to the charging valves of the cooler pipes.



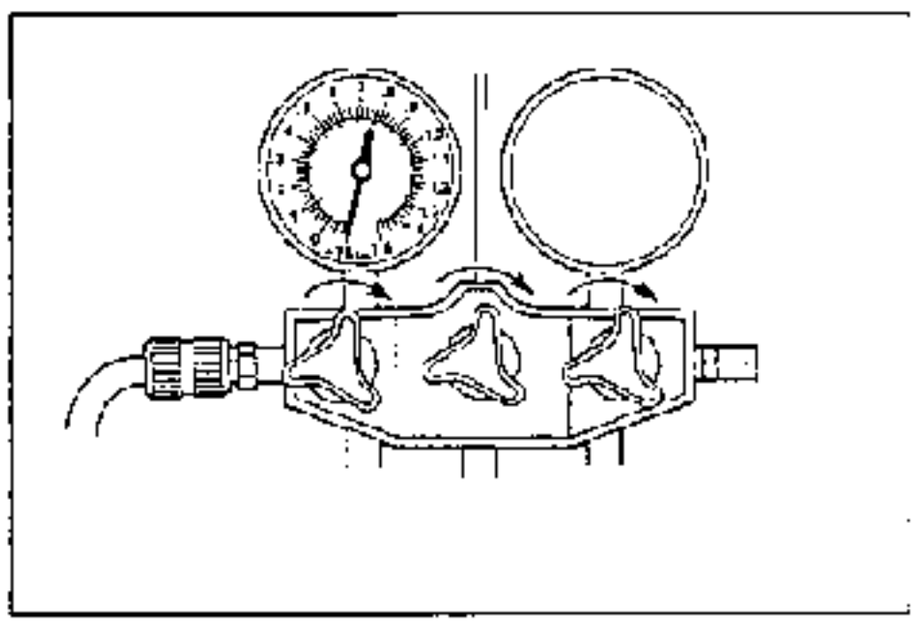
Charging

1. Install the manifold gauge set.
2. Connect the tap pin side of the charging hose to the air purge valve of the manifold gauge.
3. Connect the vacuum pump hose to the center joint of the manifold gauge.
4. Connect the vacuum pump hose to the vacuum pump.
5. Connect can puncture valves to a 4-way joint.
6. Fully open the can puncture valves and connect service cans to the valves.

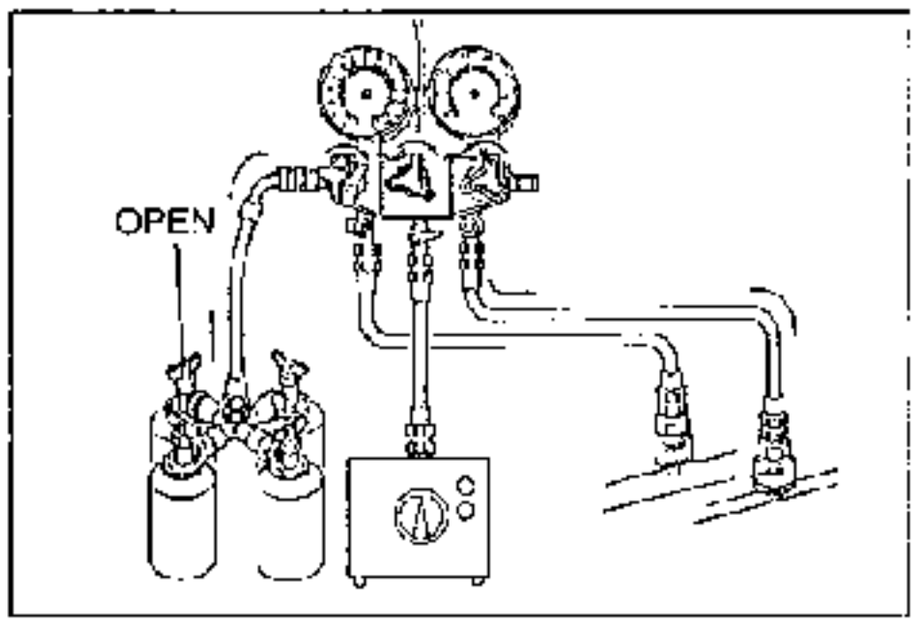
Regular amount of refrigerant: 750g {26.5 oz}



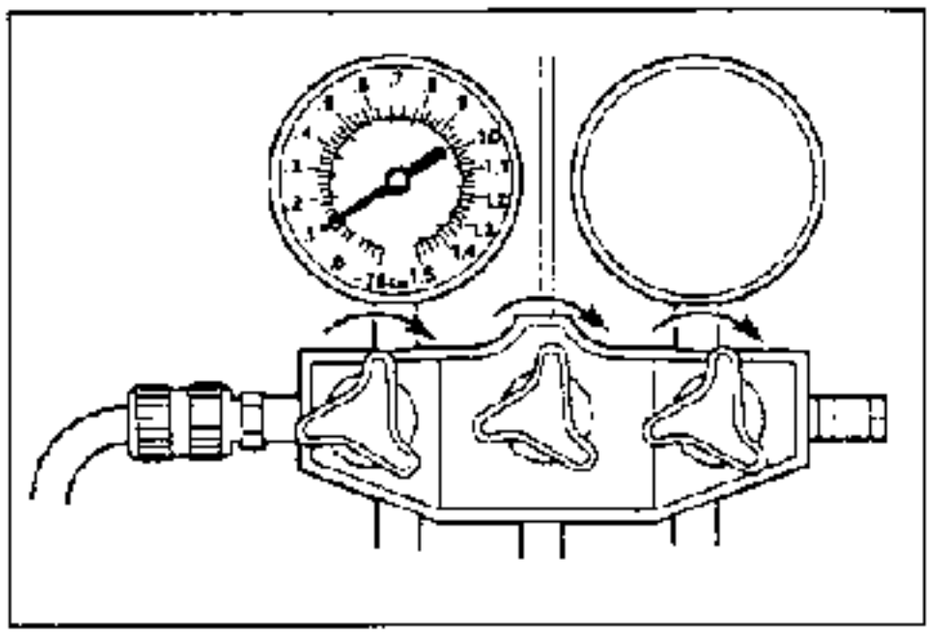
7. Fully close any can puncture valve that is not connected to a service can.
8. Connect the 4-way joint to the charging hose that is connected to the gauge set air purge valve.
9. Open all the valves of the manifold gauge.
10. Start the vacuum pump and let it operate for **15 minutes**.



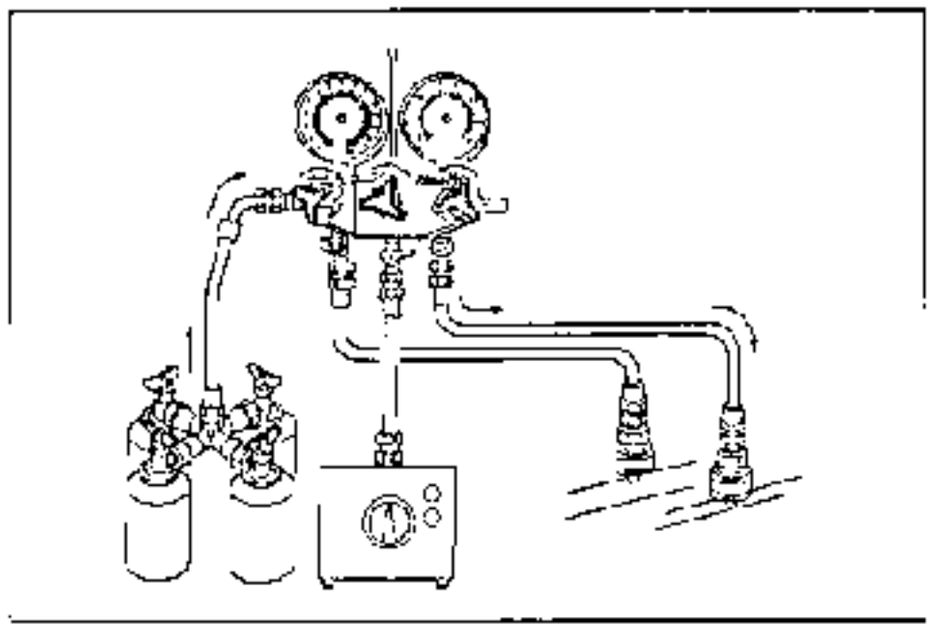
11. After 15 minutes, verify that the high- and low-pressure-side readings of the manifold gauge are at **–101 kPa {–760 mmHg, –29.9 inHg}**. Close each valve of the manifold gauge.
12. Stop the vacuum pump and wait for about **5 minutes**.
13. After 5 minutes, check the low-pressure-side reading of the manifold gauge. If the reading has changed, check for leaks and then repeat from step 9. If reading has not changed, go to step 14.



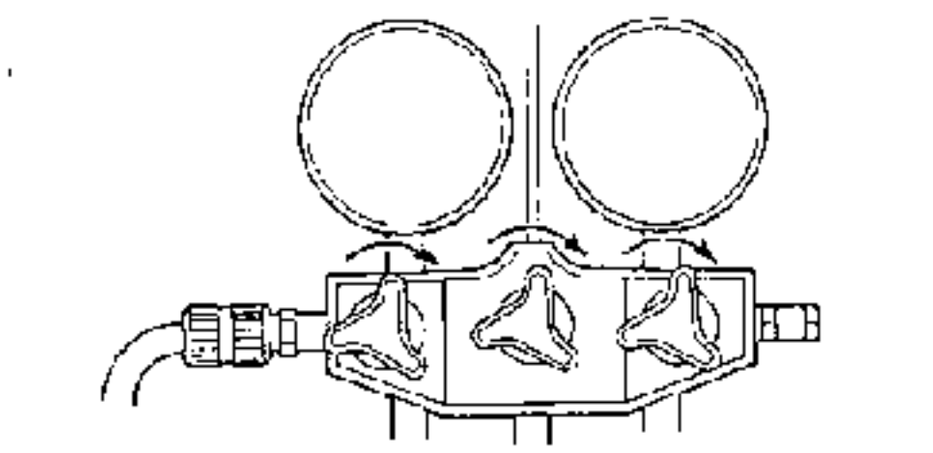
14. Open the service cans by using the can puncture valves.
15. Open the high-pressure side valve to the manifold gauge and charge with refrigerant until the low-pressure -side reading is at **100 kPa {1 kgf/cm², 10 psi}**.



16. Close the high-pressure side valve of the manifold gauge.
17. Check for leaks by using a gas leak tester. If there are no leaks, go to step 18. If a leak is found at a loose joint, tighten the joint and check for leaks again. If there is still a leak at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from step 9. If there are no leaks after tightening the joint, go to step 18.



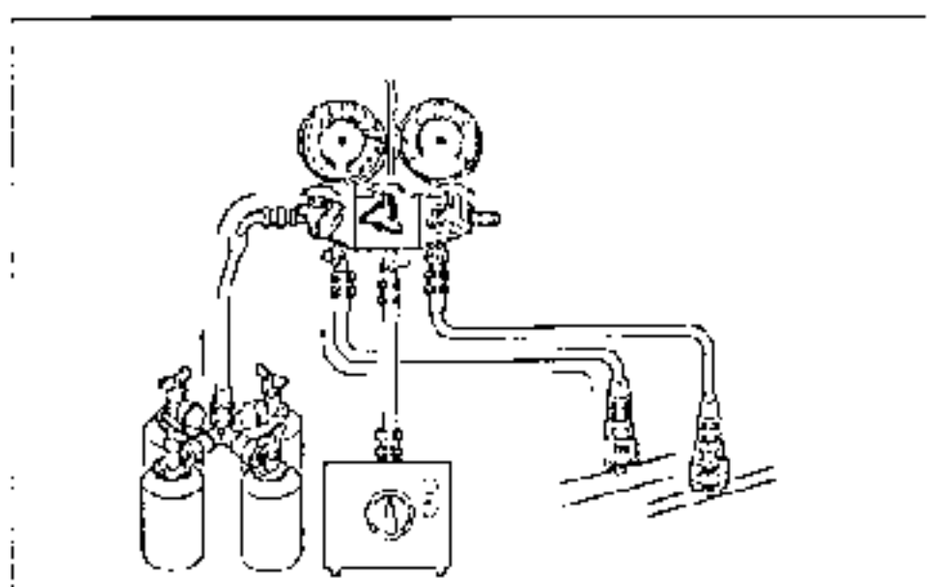
18. Open the high-pressure side valve of the manifold gauge and charge with half the regular amount of refrigerant.



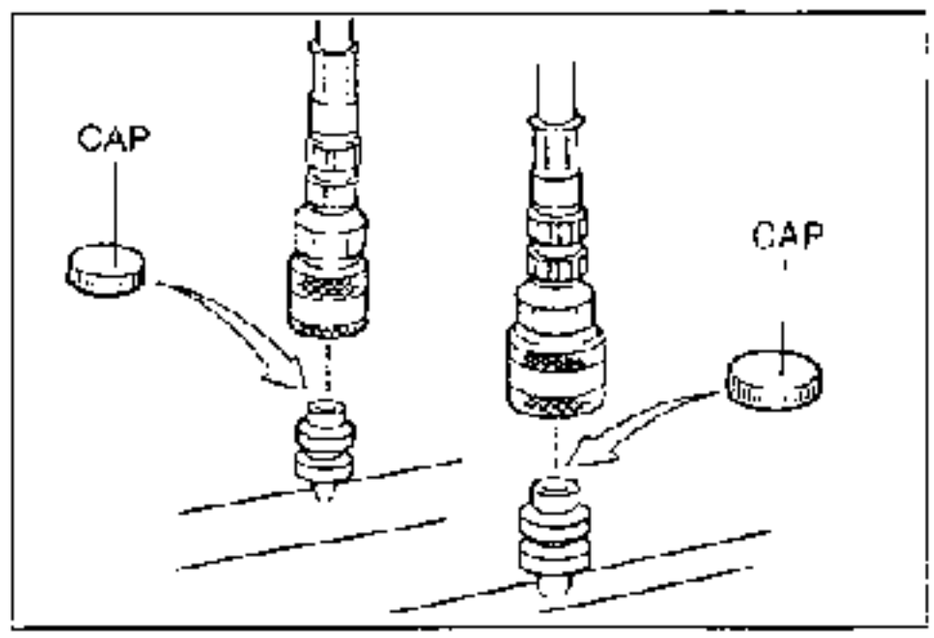
19. Close the high-pressure side valve of the manifold gauge.

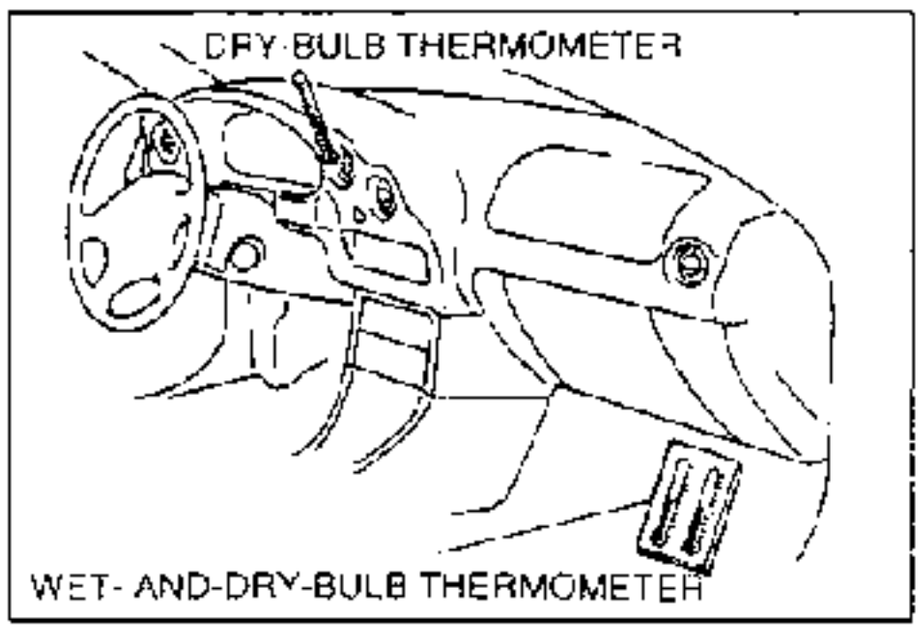
Warning

- **Running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans will increase and the cans could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.**



20. Start the engine and actuate the A/C compressor.
21. Open the low pressure side valve of the gauge set and charge with the remaining refrigerant.
22. Close the low-pressure side valve of the manifold gauge.
23. Stop the engine and A/C compressor.
24. Check for leaks by using a gas leak tester. If there are no leaks, go to step 25. If a leak is found at a loose joint, tighten the joint and check for leaks again. If there is still a leak at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from step 9. If there are no leaks after tightening the joint, go to step 25.
25. Disconnect the high- and low-pressure side quick couplers from the charging valves.
26. Install the caps to the charging valves.





Performance Test

After servicing the refrigerant system, test its performance.

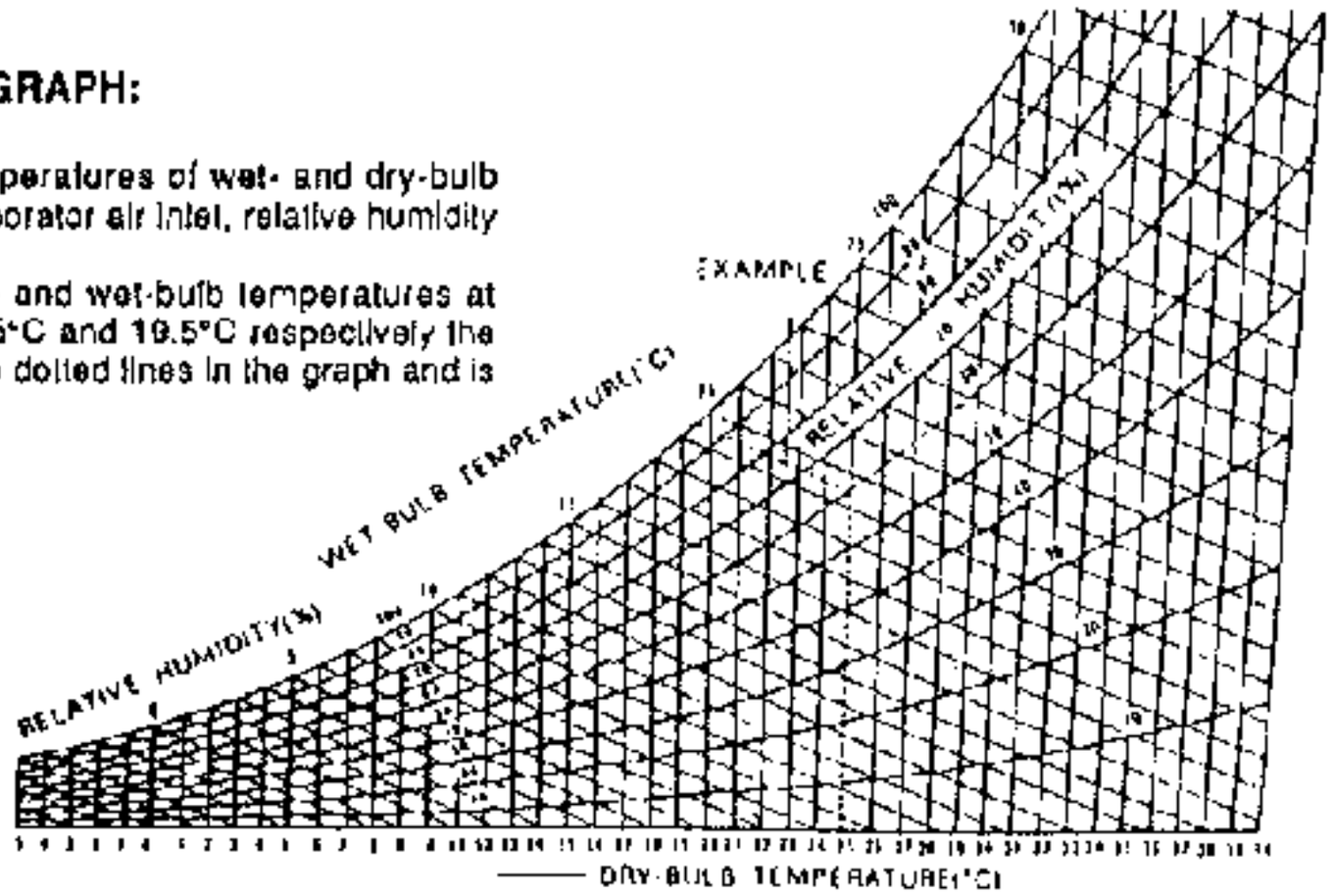
1. Install the manifold gauge set. (Refer to page G–50.)
2. Place a dry-bulb thermometer in the center ventilator outlet.
3. Place a wet-and-dry-bulb thermometer at the blower inlet.
4. Open all doors and windows.
5. Warm up the engine and run it at constant 1,500 rpm.
6. Set the fan switch at the fourth position.
7. Turn the A/C switch on.
8. Set the REC/FRESH lever (wire type) or REC/FRESH switch (logic type) at recirculate.
9. Set the mode lever (wire type) or mode switch (logic type) to VENT.
10. Set the temperature control lever to MAX COLD.
11. Wait until the air conditioner output temperature stabilizes.

    Stabilized condition
    Blower inlet temperature: 25—35 °C {77—95 °F}
    High-pressure-side reading:
    1380—1660 kPa {14.0—17.0 kgf/cm², 200—241 psi}

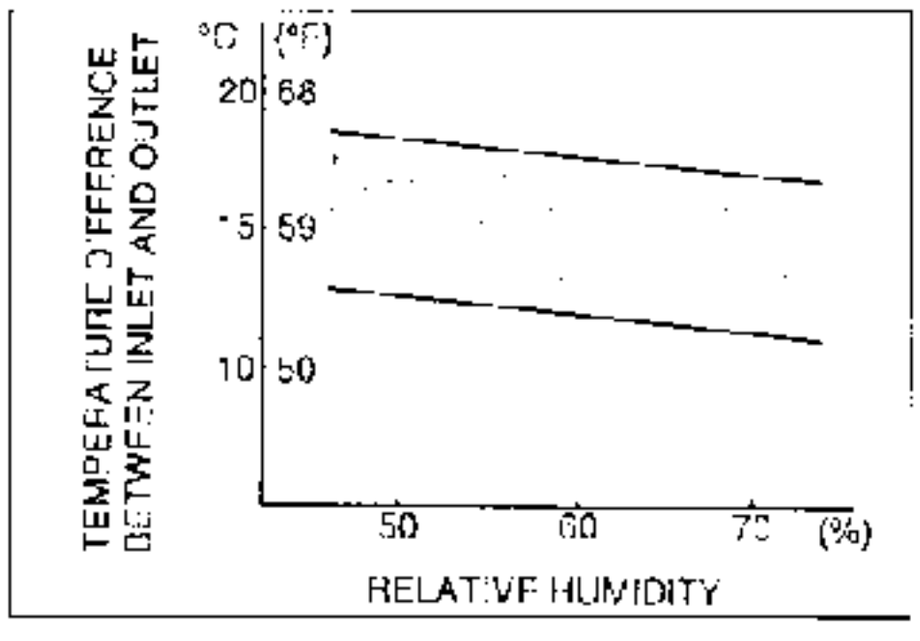
12. After the air conditioner stabilizes, read the wet-and-dry-bulb thermometer, and then calculate the relative humidity by using the graph below.

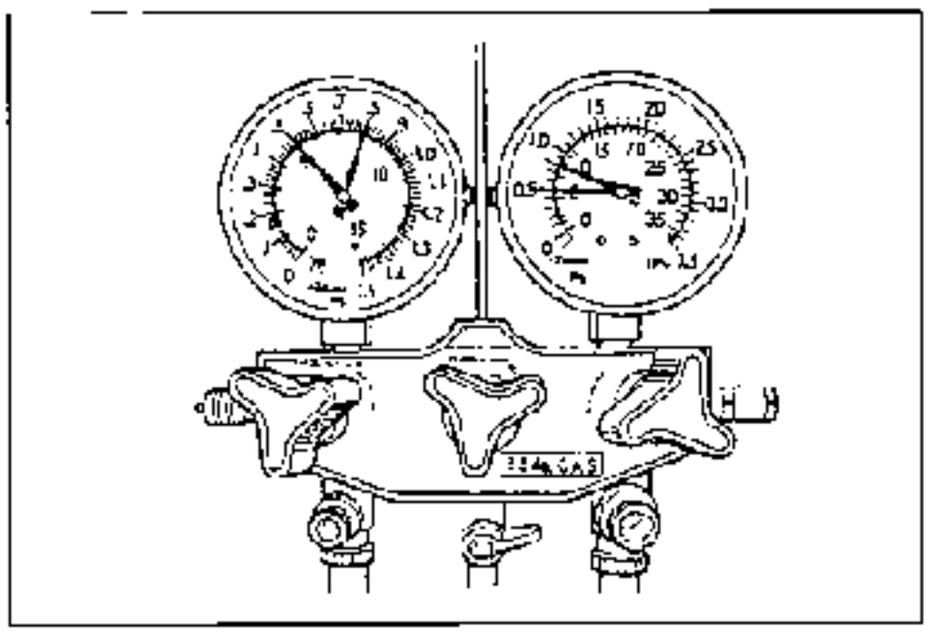
HOW TO READ THE GRAPH:

After measuring the temperatures of wet- and dry-bulb thermometers at the evaporator air inlet, relative humidity (%) can be obtained.
Example Supposing dry- and wet-bulb temperatures at evaporator air inlet are 25°C and 19.5°C respectively the point of intersection of the dotted lines in the graph and is 60%.



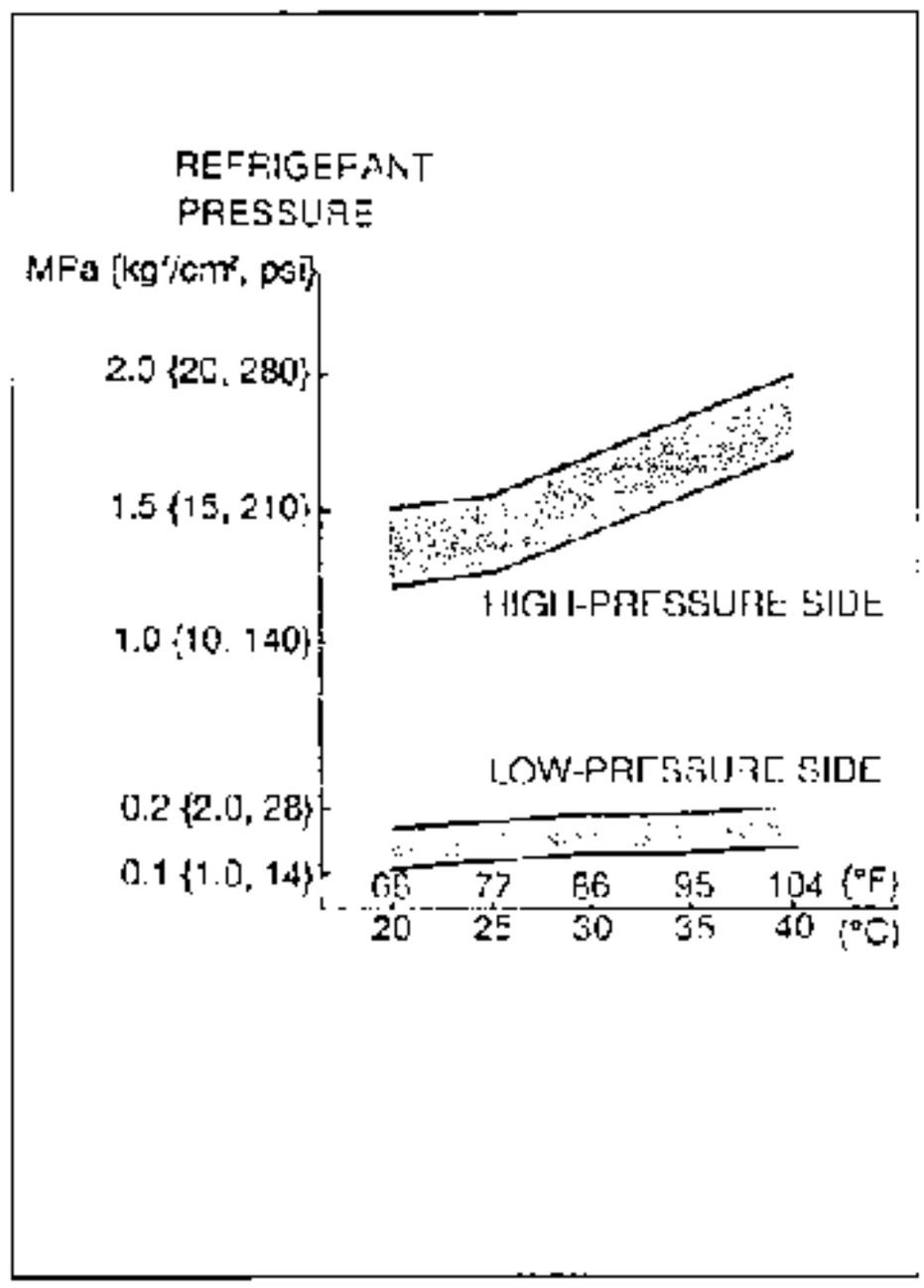
13. Read the dry thermometer at the air outlet, and calculate the difference between the inlet dry-bulb and outlet dry-bulb temperatures.
14. Verify that the intersection of the relative humidity and temperature difference is in the shaded zone.





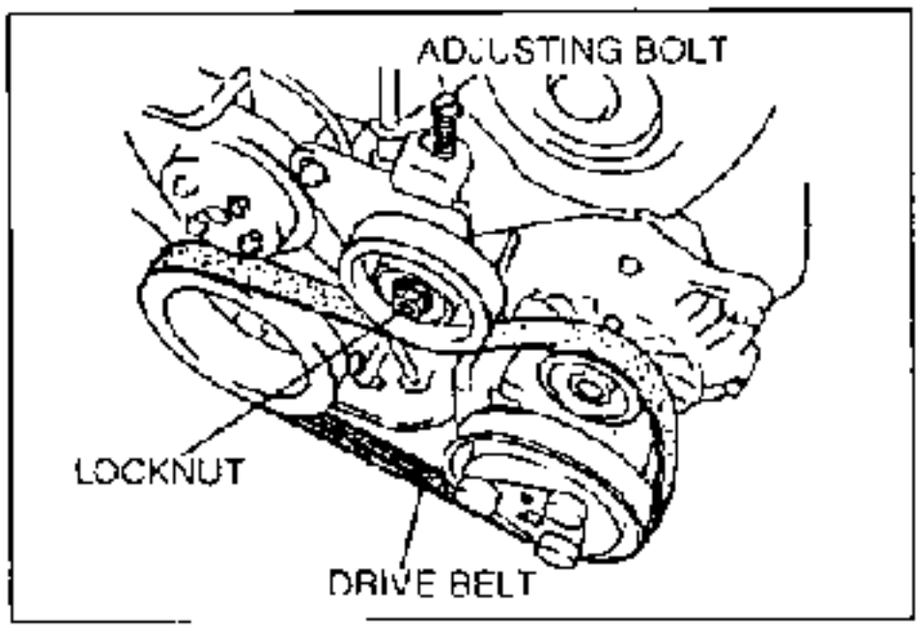
Checking Refrigerant Charge

1. Install the manifold gauge set. (Refer to page G–50.)
2. Check the refrigerant pressure reading with the engine stopped.
3. Verify that the high- and low-pressure-side readings of the manifold gauge are at 493—788 kPa {5.02—8.04 kgf/cm², 72—114 psi}. If the pressure readings are lower than specified, recharge the refrigerant amount. (Refer to page G–50.) If the pressure readings are within specification but there is insufficient cooling, go to the next step. If the pressure readings are within specification and there are no leaks, the refrigerant amount is OK.
4. Start the engine and run it at a constant 2,000 rpm.
5. Turn the A/C switch on, set the fan switch at MAX-HI, and set the air intake mode at recirculate.
6. If the A/C compressor is short-cycling, note the low-pressure-side reading at which the magnetic clutch kicks out.
7. If the pressure is 170 kPa {1.7 kgf/cm², 24 psi} or lower, evacuate and recharge the refrigerant system with the proper amount of refrigerant. (Refer to page G–50.) If the pressure is 210 kPa {2.1 kgf/cm², 30 psi} or higher, inspect the thermoswitch. (Refer to page G–69.)



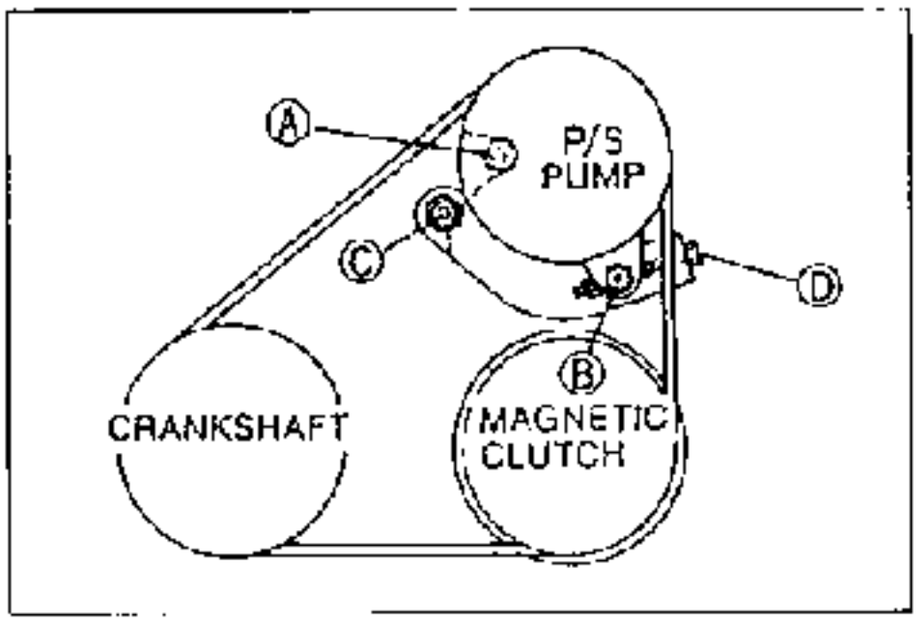
Checking Refrigerant Pressure

1. Install the manifold gauge set. (Refer to page G–50.)
2. Shut all doors and windows.
3. Warm up the engine and run it at constant 1,500 rpm.
4. Set the fan switch at the fourth position.
5. Turn the A/C switch on.
6. Set the REC/FRESH lever (wire type) or REC/FRESH switch (logical type) at recirculate.
7. Set the mode lever (wire type) or mode switch (logic type) at VENT.
8. Set the temperature control lever at MAX COLD.
9. Measure the ambient temperature and the high- and low-pressure side readings of manifold gauge.
10. If the high- and low-pressure-side readings are in the shaded zones shown in the figure, the refrigerant system is normal.

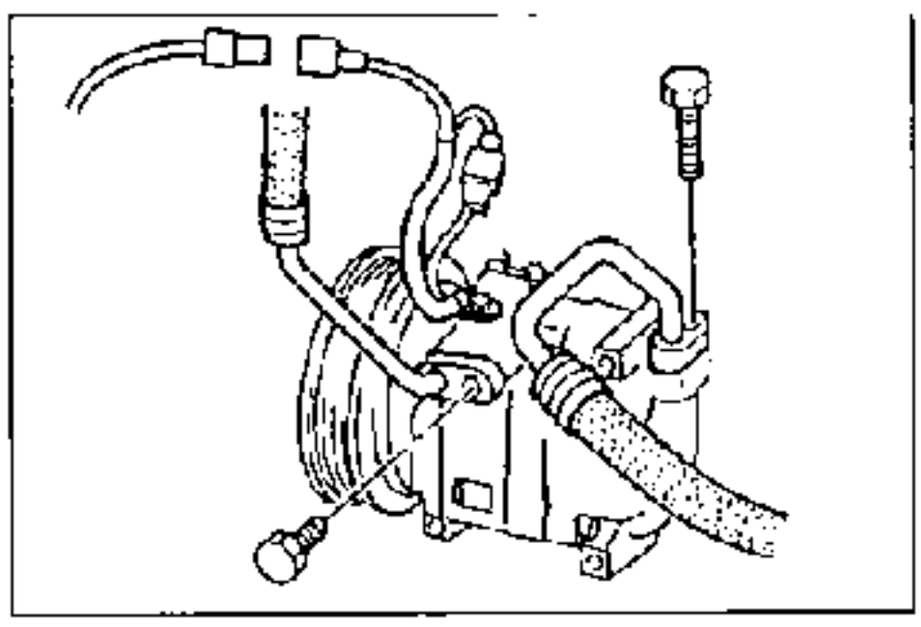


A/C COMPRESSOR
Removal / Installation
1. Discharge the refrigerant from the system.
2. Remove the drive belt as follows.

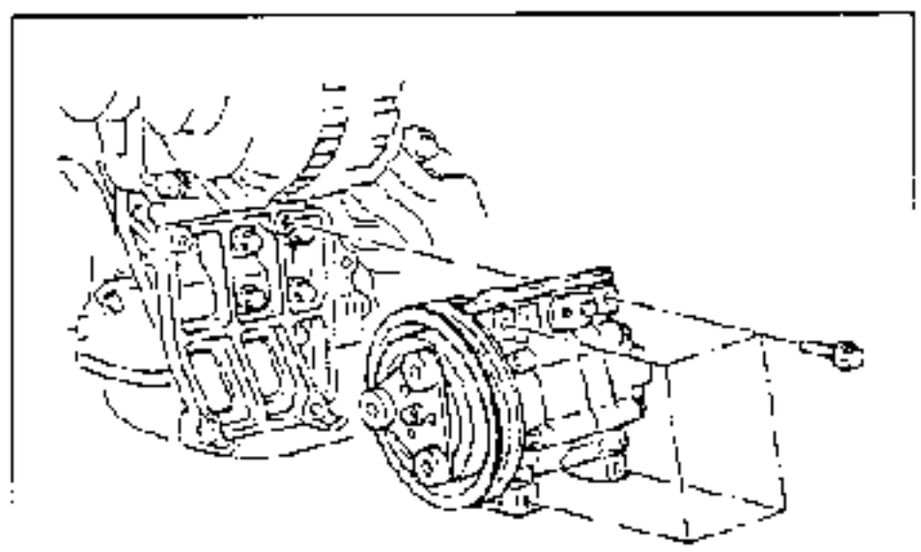
K8
1) Loosen the idle pulley locknut.
2) Loosen the adjusting bolt and remove the drive belt.



B6
1) Loosen bolt A.
2) Loosen nut C.
3) Loosen nut B.
4) Loosen adjusting bolt D and remove the drive belt.



3. Remove the lower cover.
4. Disconnect the hoses from the A/C compressor.

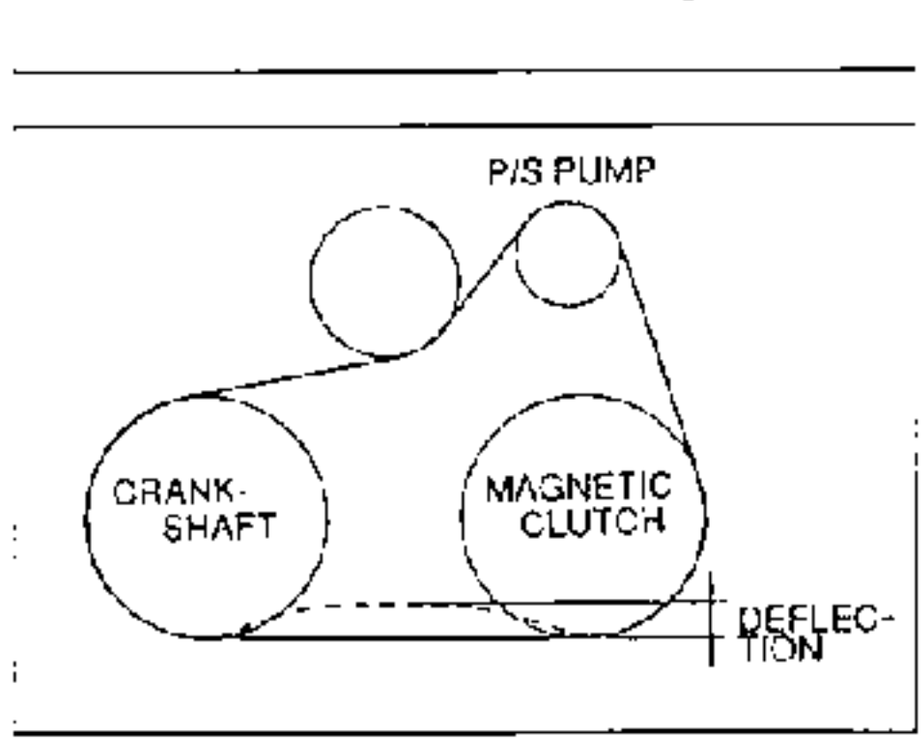


5. Remove the bolts and remove the A/C compressor.
6. Install in the reverse order of removal. When replacing the A/C compressor with a new one, remove the following amount of compressor oil from the new A/C compressor.

Removed oil amount cm³ {cc, fl oz}

$$= \underset{\{175,\ 5.92\}}{175} - \left[\begin{array}{l}\text{oil from old} \\ \text{A/C compressor}\end{array} + \underset{(15^{+5}_{0},\ 0.5^{+0.2}_{0})}{15^{+5}_{0}}\right]$$

7. Adjust the drive belt deflection as follows:

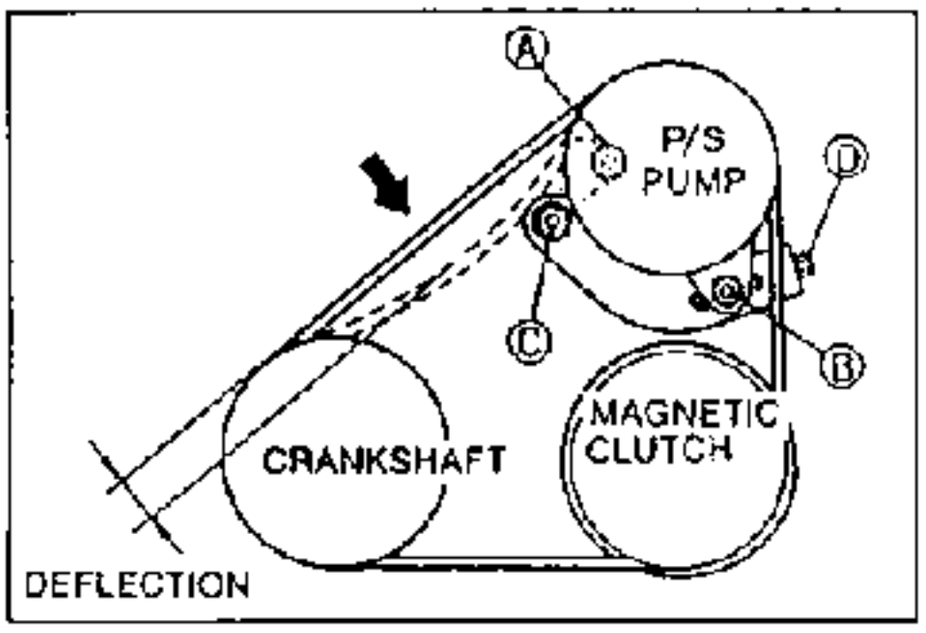


K8
1) Loosen the locknut.
2) Turn the adjusting bolt to adjust the drive belt deflection to specification.

Drive belt	Deflection when applying moderate pressure 98 N {10kgf, 22lbf}
New	8.0—9.0 mm {0.32—0.35 in}
Used	9.0—10.0 mm {0.36—0.39 in}

3) Tighten the locknut.

Tightening torque:
32—46 N·m {3.2—4.7 kgf·m, 24—33 ft·lbf}



B6

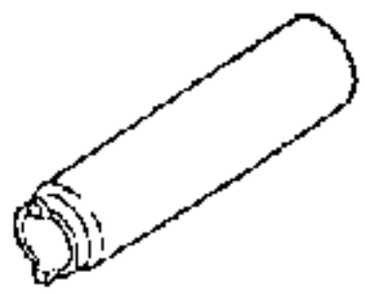
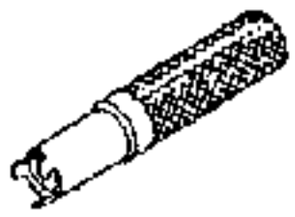
1) Loosen bolt A, nut B, and nut C.
2) Turn the adjusting bolt D and adjust the drive belt deflection to specification.

Drive belt	Deflection when applying moderate pressure 98 N {10kgf, 22lbf}
New	8.0—9.0 mm {0.32—0.35 in}
Used	9.0—10.0 mm {0.36—0.39 in}

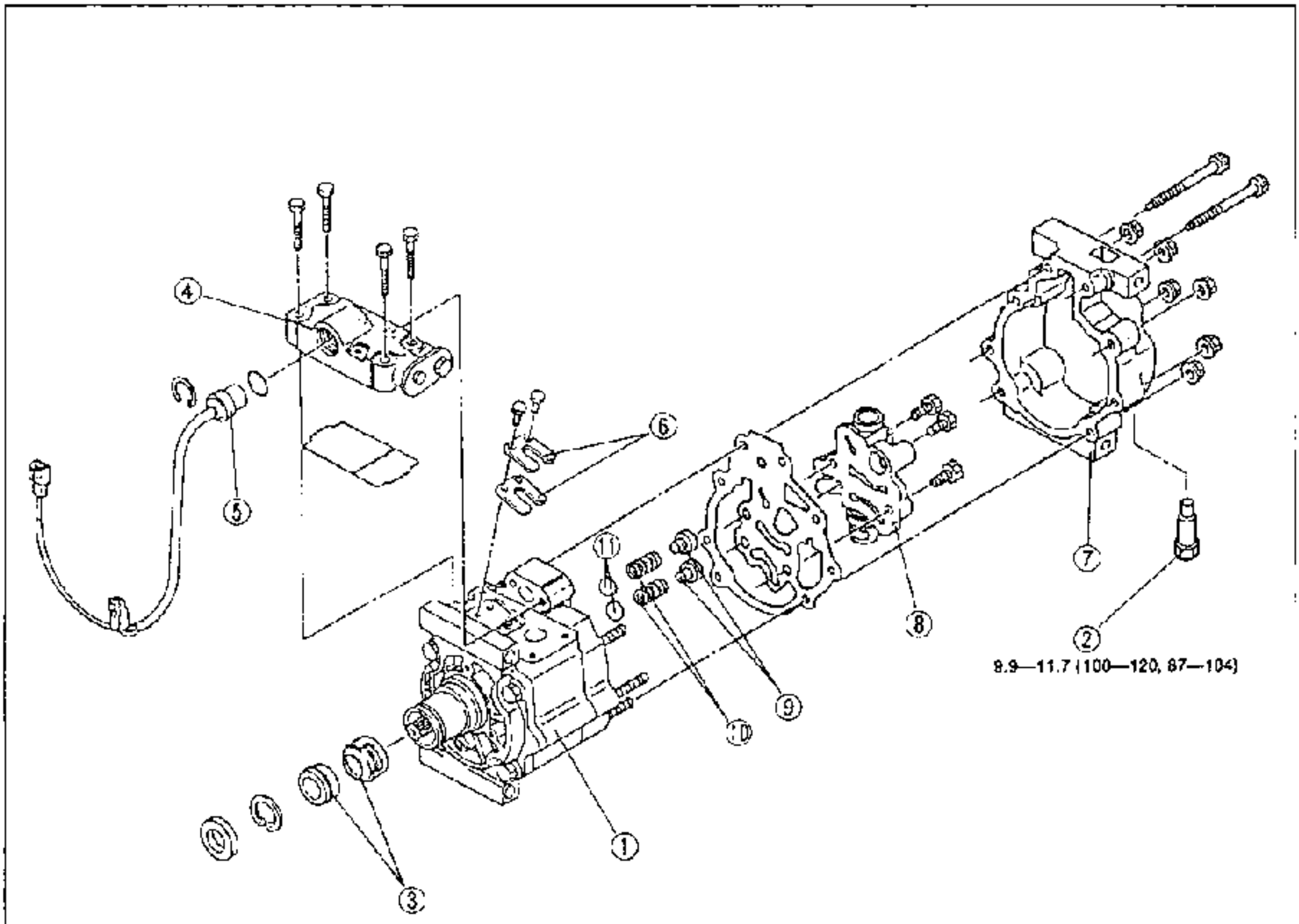
3) Tighten bolt A, nut B, and nut C.

Tightening torque
Bolt A: 37—53 N·m {3.7—5.5 kgf·m, 27—39 ft·lbf}
Nut B: 38—51 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf}
Nut C: 32—46 N·m {3.2—4.7 kgf·m, 24—33 ft·lbf}

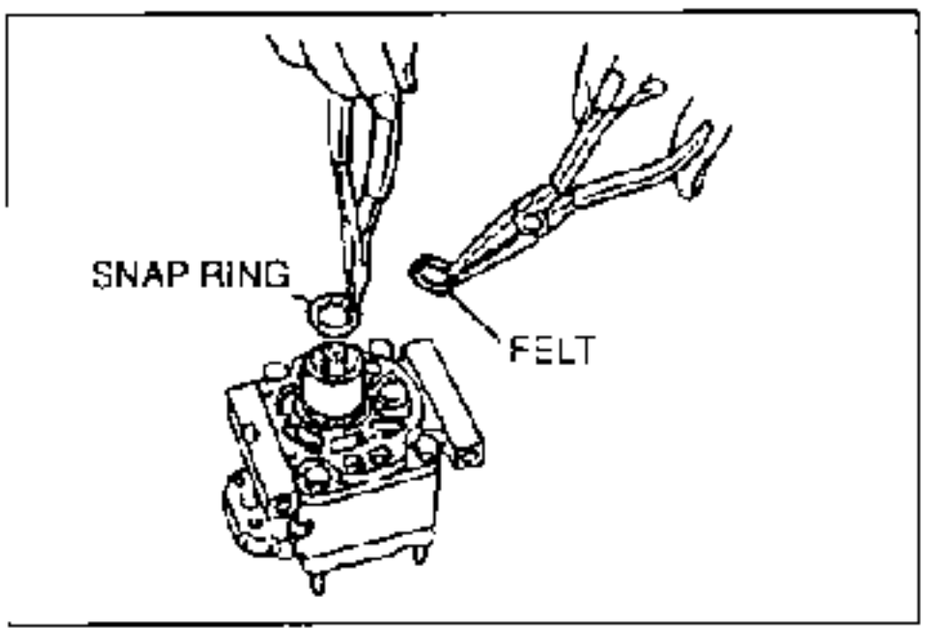
Disassembly / Assembly
Preparation
SST

49 B061 005 Replacer seal plate		For replacement of shaft seal plate	49 B061 005 Remover and installer, seal 	For replacement of shaft seal

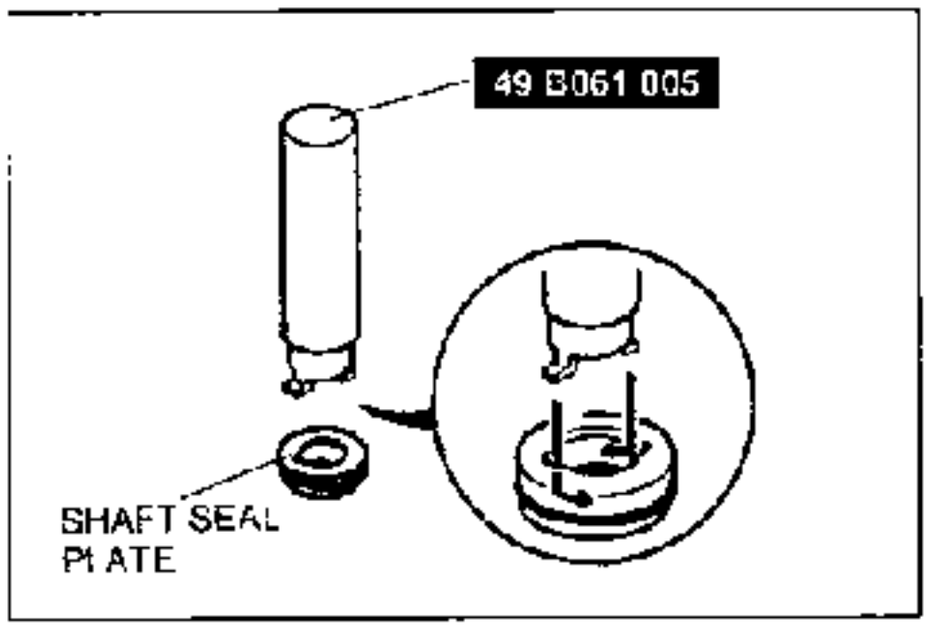
1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.



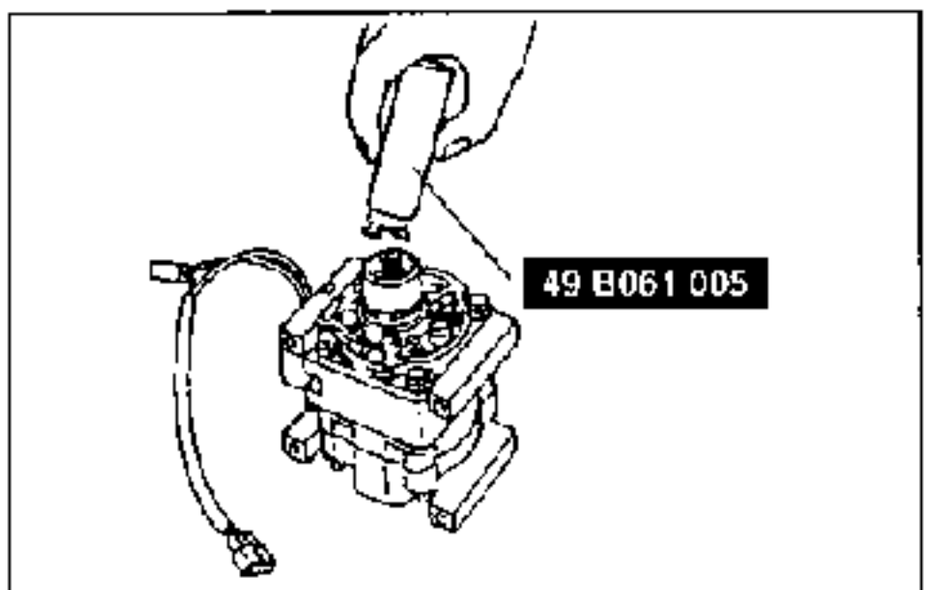
1. Compressor body
2. Pressure relief valve
3. Shaft seal and seal plate
   - Disassembly note ..... page G–57
   - Assembly note ..... page G–60
4. Head cover
   - Assembly note ..... page G–59
5. Thermal protector
   - Disassembly note ..... page G–58
   - Assembly note ..... page G–58
6. Discharge valve and valve stopper
   - Assembly note ..... page G–58
7. Rear case
8. Oil control valve
9. Spring stopper
10. Compression spring
11. Anti-valve



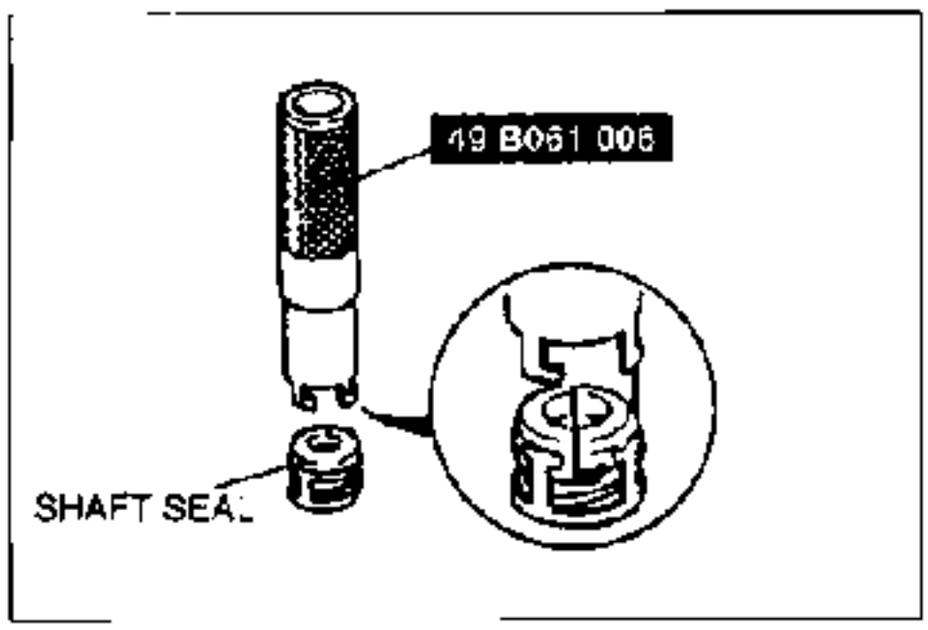
Disassembly note
Shaft seal and seal plate
1. Remove the armature plate.
2. Remove the felt seal and snap ring.
3. Remove the shim(s).
4. Align the cutout of the **SST** with the groove of the shaft seal plate and insert the **SST** into the A/C compressor.
5. Rotate the **SST** counterclockwise to make sure that the cutout is engaged with the seal plate.



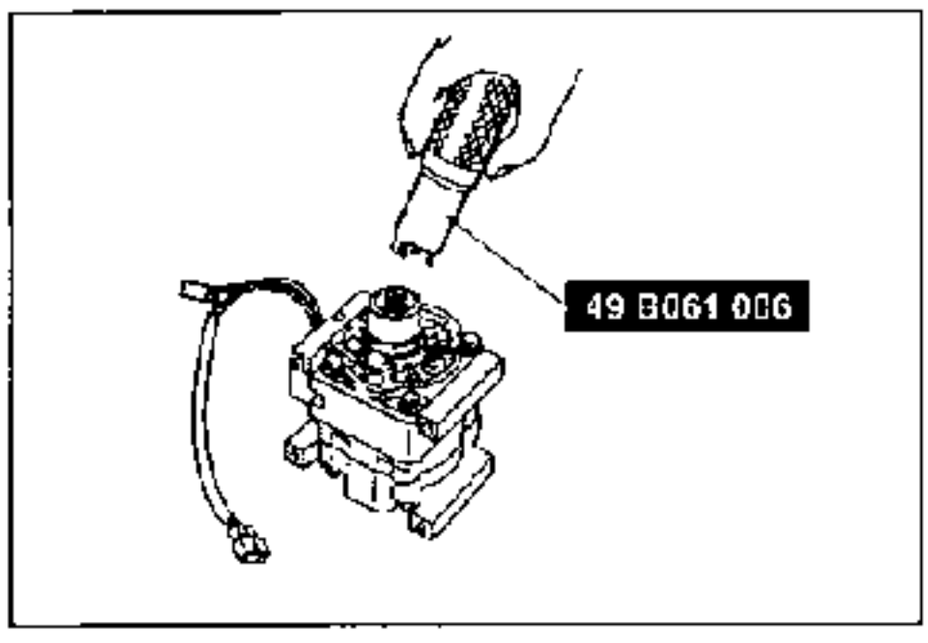
6. Pull out the shaft seal plate.

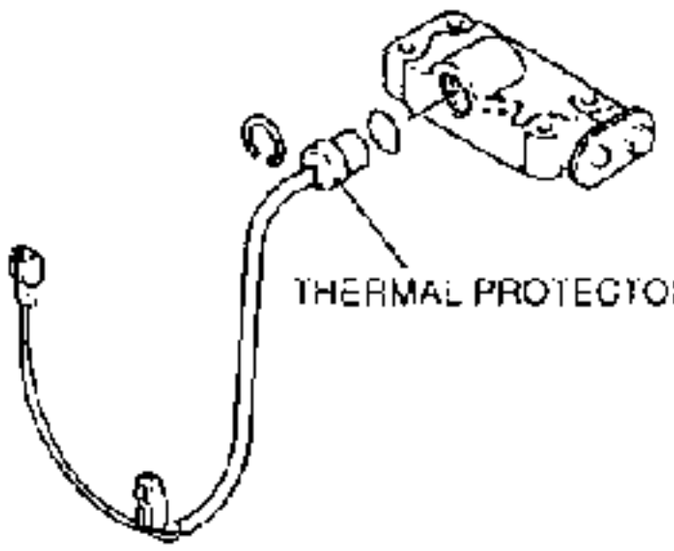


7. Align the cutout of the **SST** with the metal pawl of the shaft seal and insert the **SST** into the A/C compressor.
8. Rotate the **SST** counterclockwise to make sure that the cutout is engaged with the metal pawl.



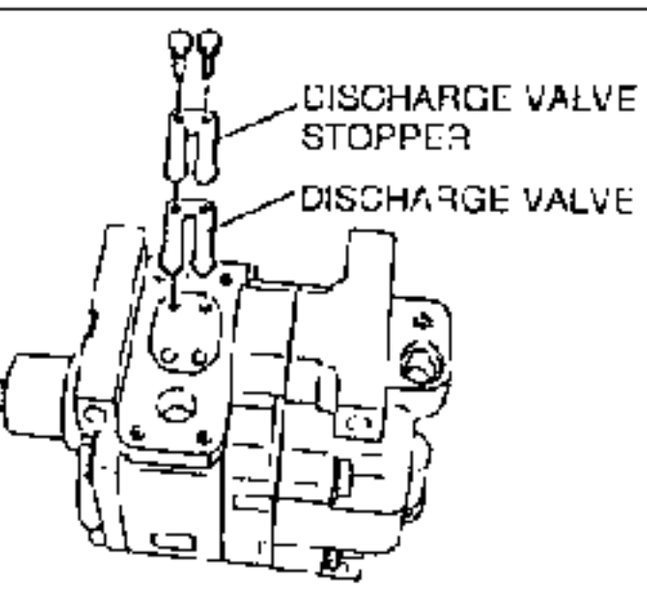
9. Pull out the shaft seal.





Thermal protector

Remove the snap ring and push the protector out from its back side to remove it. Do not pull on the wiring harness.



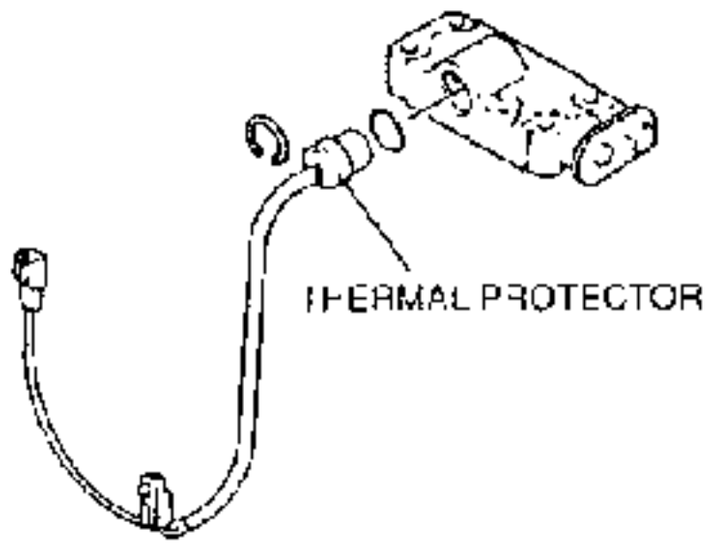
Assembly note

Discharge valve and valve stopper

1. Replace the O-ring and gasket.
2. Make sure the compressor body and surfaces of the discharge valve and valve stopper are free from foreign material before installing them.

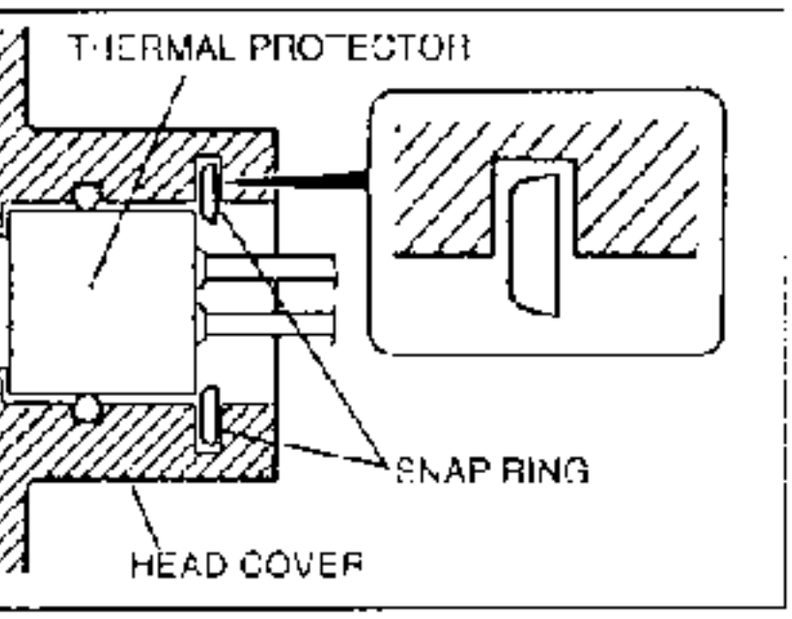
   Tightening torque: 2.9 N·m {30 kgf·cm, 26 in·lbf}

3. Plug the suction and discharge ports with the caps.

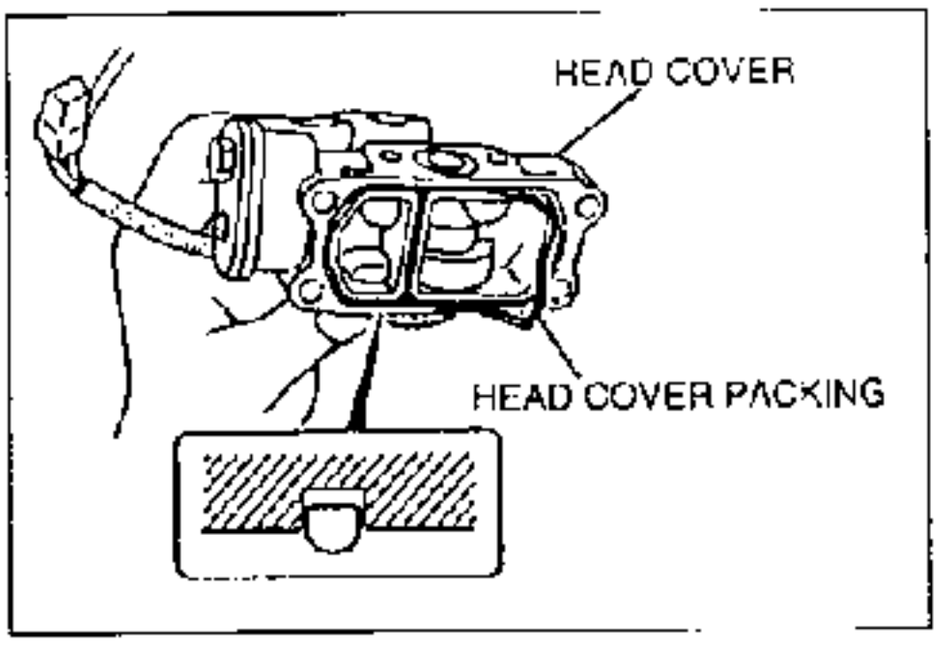


Thermal protector

1. Make sure the O-ring is free from foreign material. Apply compressor oil to the O-ring and fit it into the groove securely.
2. Check for continuity between the protector terminals.
3. Install the snap ring so that its chamfered edge faces the thermal protector. Make sure the snap ring is seated securely in its groove.

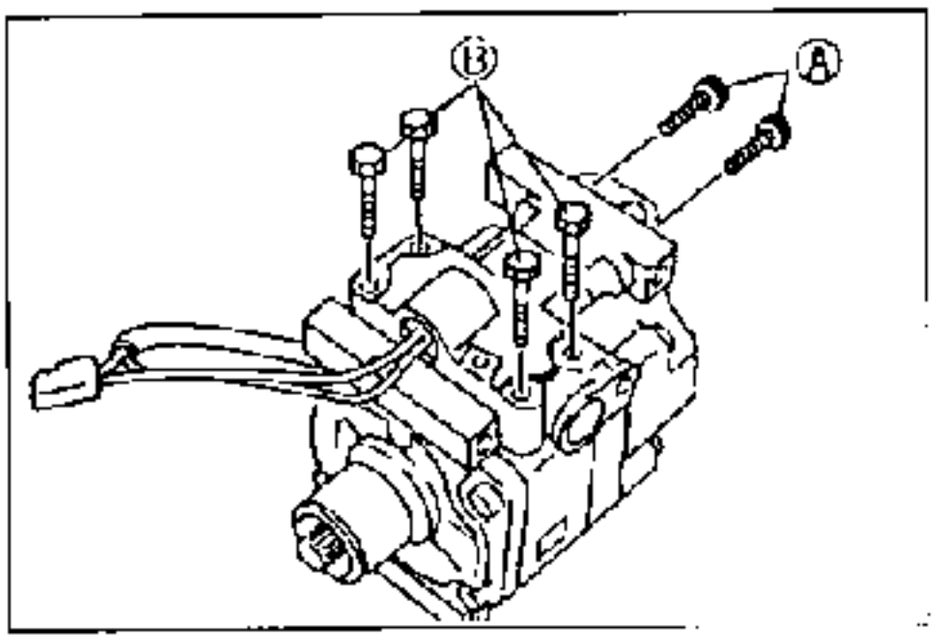


1. Install the thermal protector so that its two lead wire outlet sections are horizontal, as shown on the left.



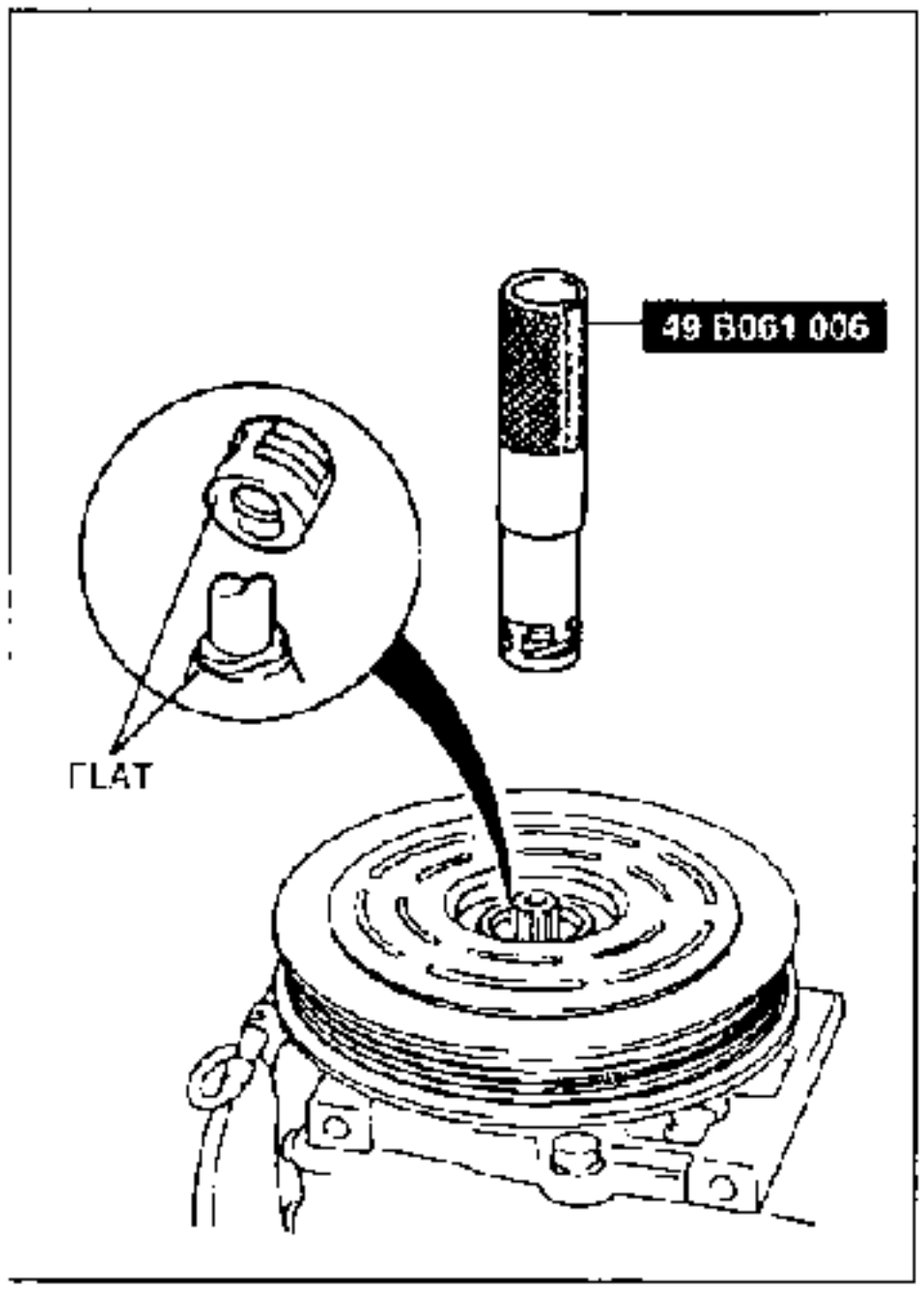
Head cover

1. Replace the head cover packing with new ones. Apply compressor oil to the new head cover packing and assemble them. Make sure the top side of the gasket faces upward.



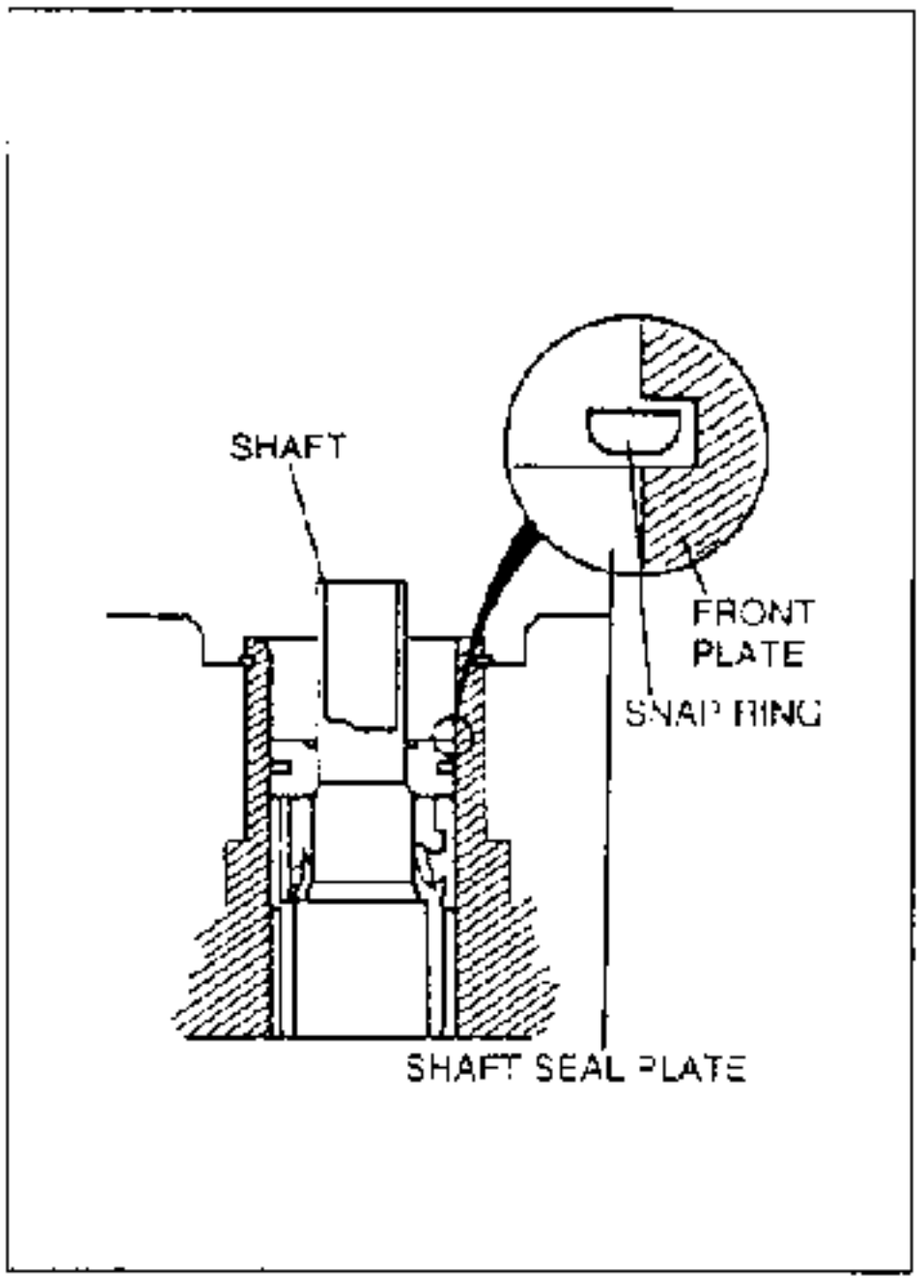
2. Carefully install the head cover on the A/C compressor. Tighten socket head bolts A, and then tighten bolts B in a diagonal manner.

Tightening torque:
A: 9.81 N·m {100 kgf·cm, 86.8 in·lbf}
B: 9.81 N·m {100 kgf·cm, 86.8 in·lbf}

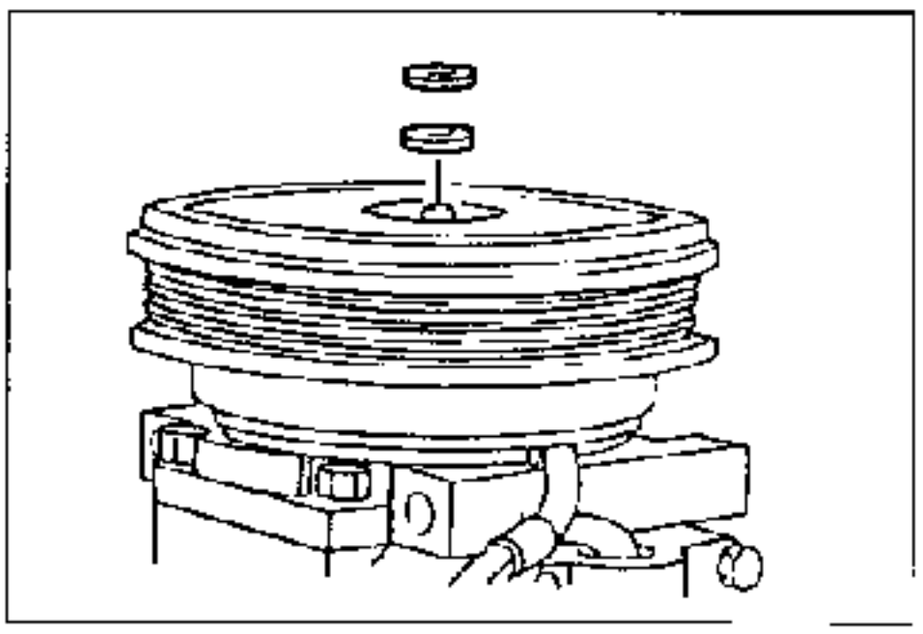


Shaft seal and seal plate

1. Clean the shaft seal contacting face of the A/C compressor with cleaning solvent. Do not use a cloth. Keep dirt and solvent out of the A/C compressor. If refrigerant oil spills from the A/C compressor, refill with the same amount of oil.
2. Clean the new shaft seal thoroughly with cleaning solvent.
3. Lubricate the shaft seal with clean compressor oil (ATMOS GU10) and install it on the **SST**. Do not touch the sealing surfaces of the shaft seal after lubrication.
4. Liberally lubricate the compressor shaft with compressor oil.
5. Align the seal case flats with the shaft flats and install the shaft seal onto the compressor shaft.



6. Clean the shaft seal plate with cleaning solvent.
7. Lubricate the seal plate with clean refrigerant oil (ATMOS GU10). Do not touch the sealing surface of the seal plate after lubrication.
8. Slide the seal plate into the A/C compressor by hand as far as possible.
9. Press the seal plate with the grip side of the **SST**.
10. Install the snap ring with its chamfered edge inside.
11. Press the snap ring with the grip side of the **SST**, and then install the felt seal. Make sure the snap ring is seated correctly in its groove.
12. Install the shim(s).
13. Install the pressure plate.
14. Measure the clearance between the pulley and the pressure plate all the way around. If the clearance is not as specified, add or remove the shim(s) as required.



Clearance: 0.4—0.5 mm {0.016—0.020 in}

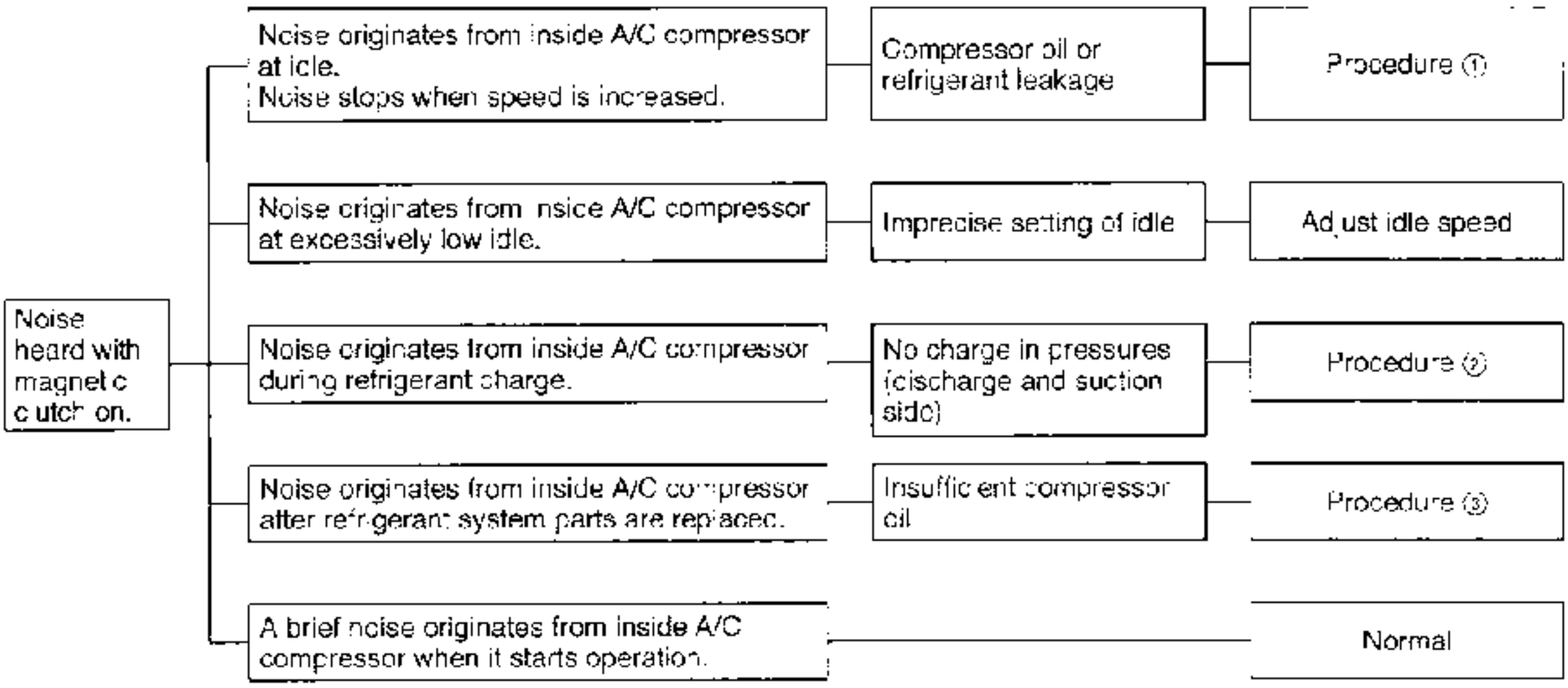
Shim

Shim part number	Thickness mm {in}
B456 61 L15	0.2 {0.008}
B456 61 L15	0.5 {0.020}

Inspection

Because the A/C compressor is a rotary vane type, an irregular noise may be heard when the refrigerant is charged from the low-pressure side or after replacing components without adjusting the amount of compressor oil. Noise is produced when the vanes are not properly pressed against the inner wall of the rotor housing.

A/C compressor noise troubleshooting



Procedure ①

Check the entire refrigerant system for compressor oil and refrigerant leaks. If leakage is found, repair or replace as necessary.

Procedure ②

Run the engine at a constant 3000 4000 rpm; then alternately switch the A/C compressor on and off (turn the A/C switch on and off). If the noise remains, turn the ignition switch to OFF for 1—2 minutes. Start the engine again. hold its speed at 3000—4000 rpm, and alternately switch the A/C compressor on and off (turn the A/C switch on and off).

Procedure ③

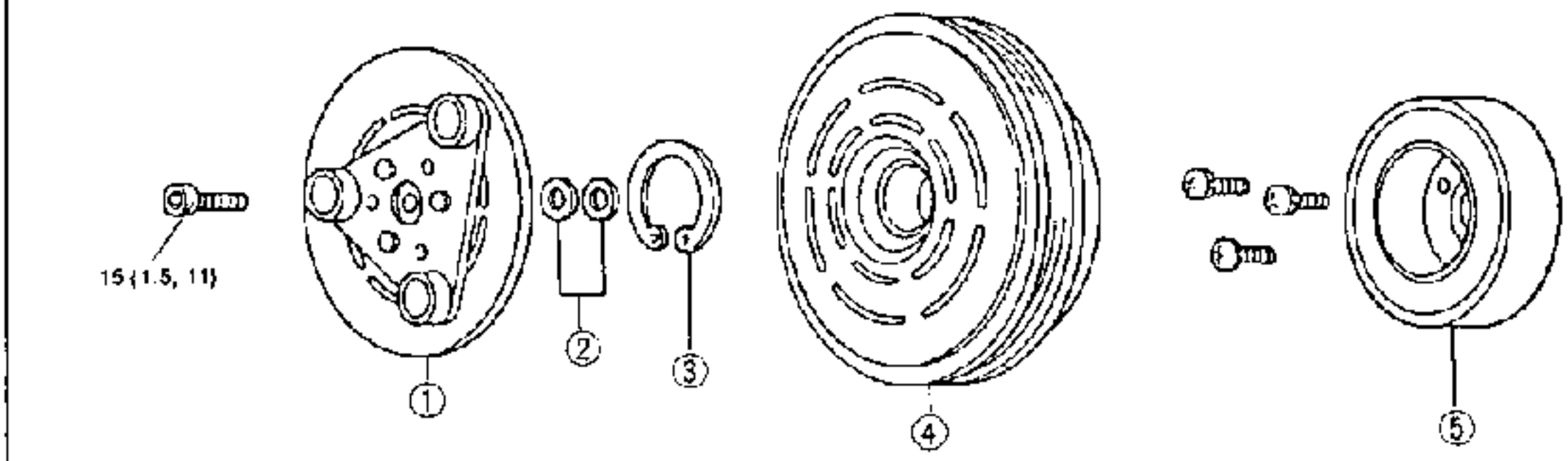
After replacing parts, add compressor oil as shown in the following table.

Replaced part	Oil supplement
Condenser	30 ml {30 cc, 1.0 fl oz}
Cooling unit	60 ml {60 cc, 2.0 fl oz}
Piping hose/p pe	5 ml {5 cc, 0.2 f oz}
Receiver/dr ver	10 ml {10 cc, 0.3 fl oz}

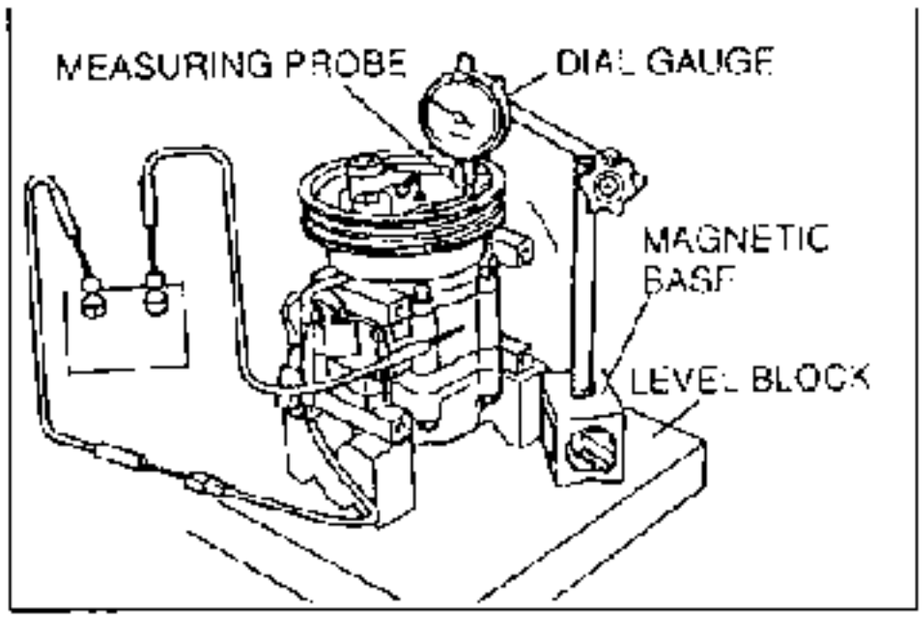
MAGNETIC CLUTCH

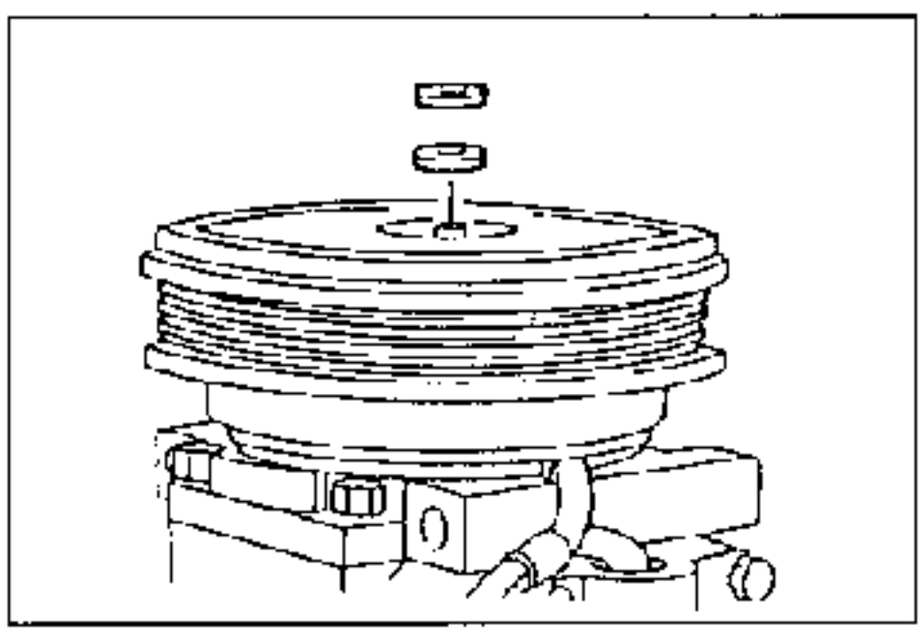
Disassembly / Assembly

1. Disassemble in the order as shown in the figure.
2. Assemble in the reverse order of disassembly.



1. Pressure plate
   Assembly note ..... below
2. Shim
3. Snap ring
4. Rotor pulley
5. Stator
   Inspection ..... below





Assembly note

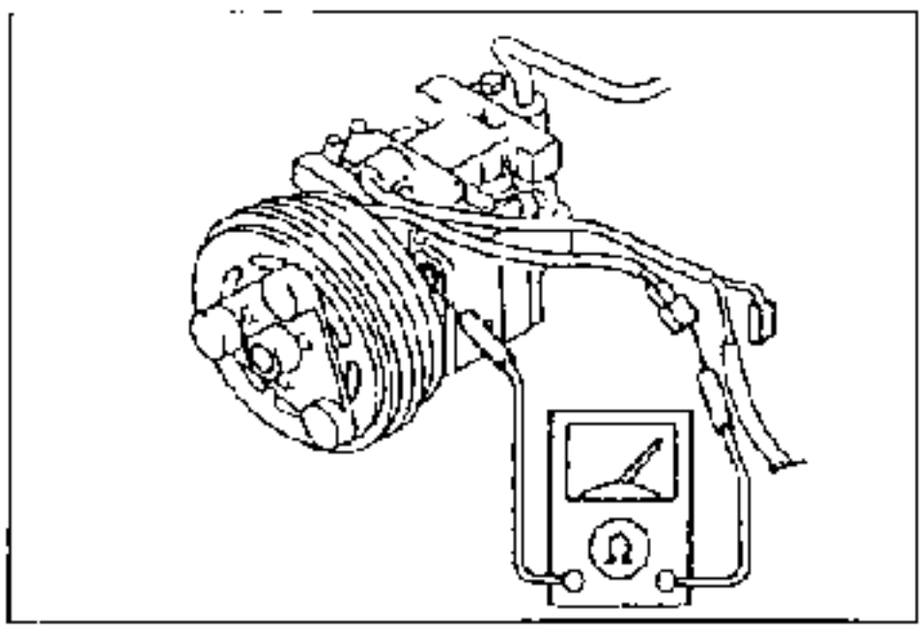
Pressure plate

1. Measure the clearance between the pressure plate and the rotor pulley.
   (1) Set the A/C compressor on a level block.
   (2) Fix a dial gauge on a magnetic base and set the measuring probe on the pressure plate surface.
   (3) Alternately apply and remove battery positive voltage as shown in the figure. The clearance is the difference in the dial gauge readings.
   (4) Compare the measured clearance with the specified clearance below.

Clearance: 0.4—0.5 mm {0.016—0.020 in}

2. If not as specified, install shims to adjust the clearance.

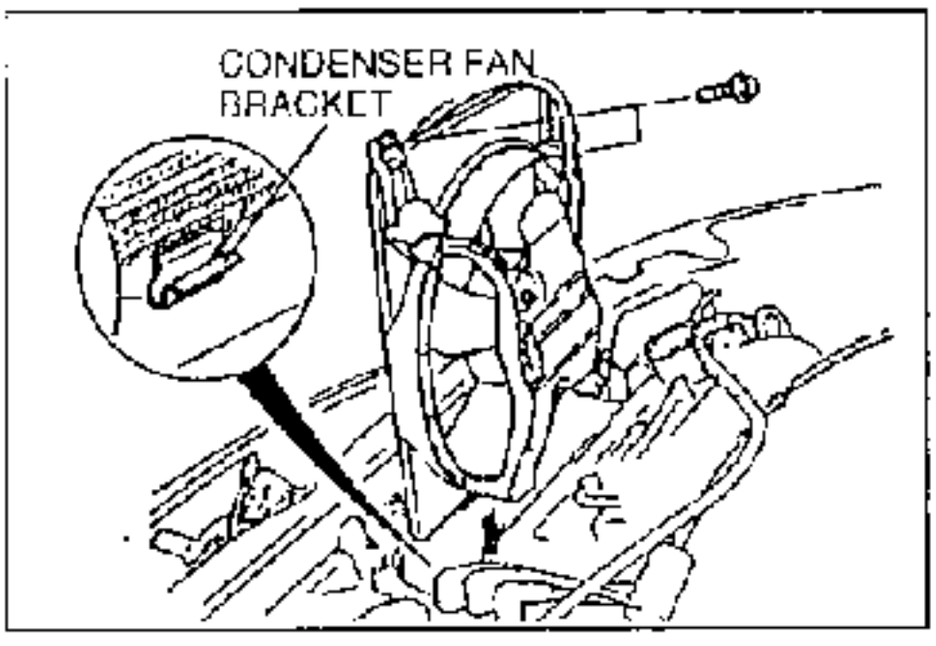
Shim part number	Thickness mm {in}
8455 61 L15	0.2 {0.008}
8456 61 L15	0.5 {0.020}



Inspection

Stator

1. Set the ohmmeter to the × 1,000Ω range.
2. Verify that there is continuity between the stator terminal and the A/C compressor body.
3. If there is no continuity, replace the stator.



CONDENSER FAN

Removal / Installation

1. Remove the fresh-air duct.
2. Remove the upper seal board.
3. Disconnect the condenser fan connector.
4. Remove the condenser fan as shown in the figure.
5. Install in the reverse order of removal.

Inspection

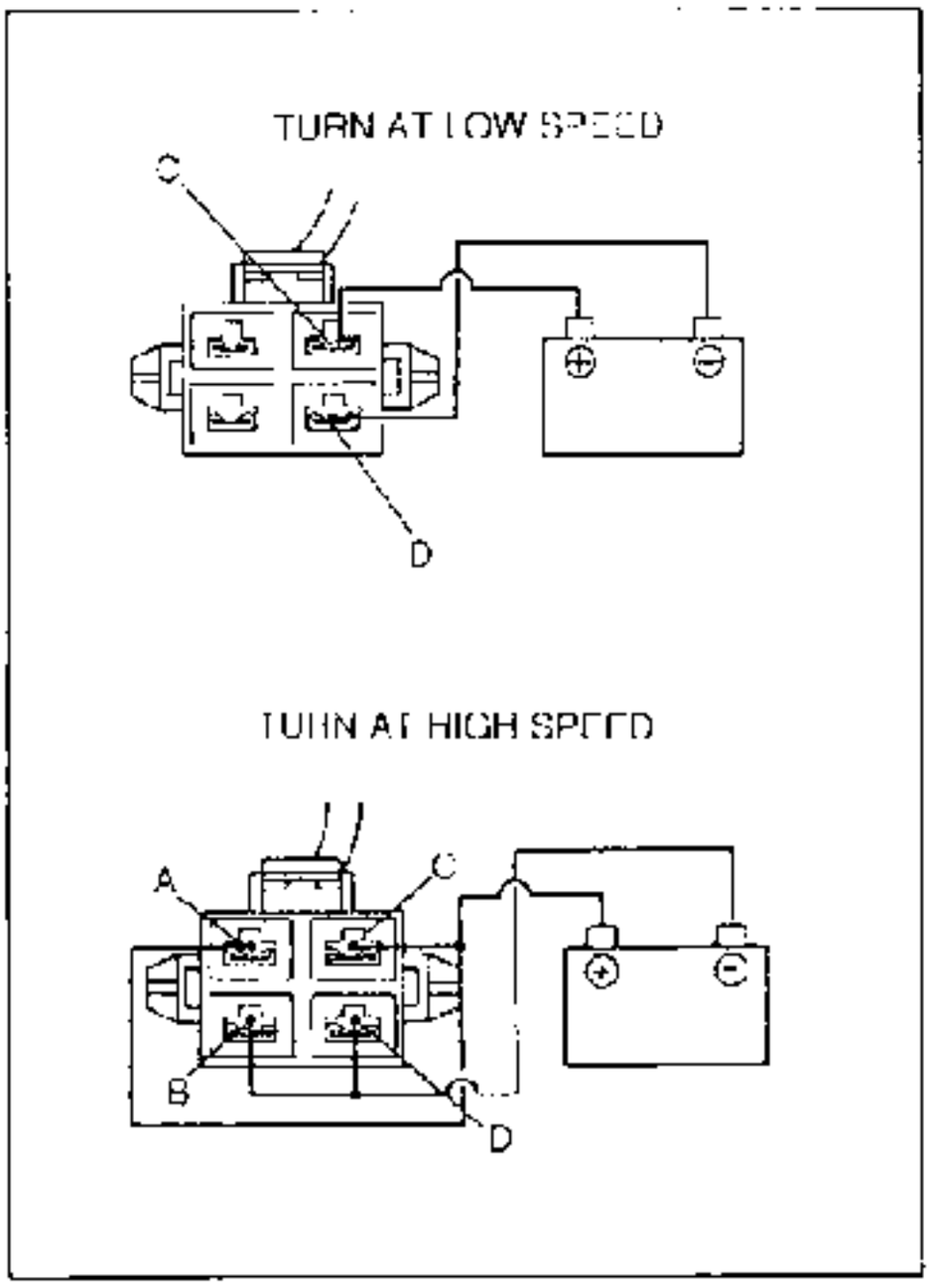
K8

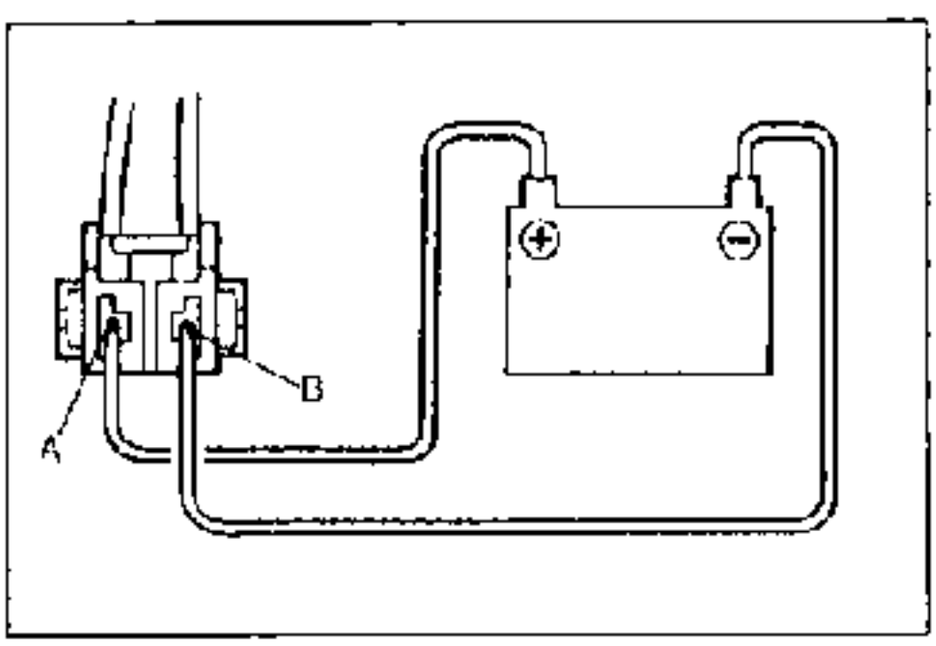
1. Disconnect the condenser fan connector.
2. Connect battery positive voltage and check the operation of the condenser fan.

B+: Battery positive voltage

Connection		Condenser fan operation
B+	GND	
C	D	Low speed
A, C	B, D	High speed

3. If not as specified, replace the condenser fan.





B6

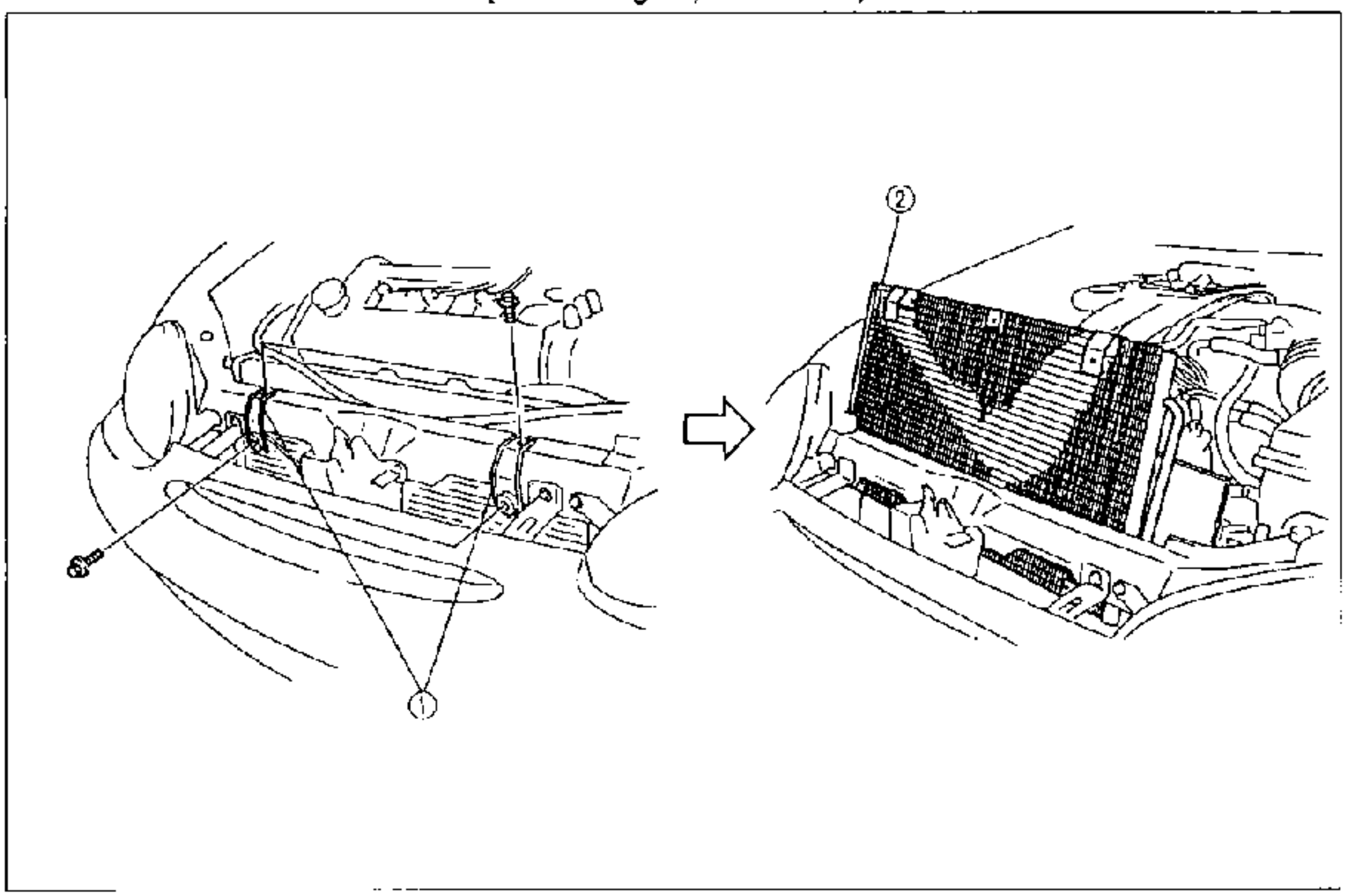
1. Disconnect the condenser fan connector.
2. Connect battery positive voltage to terminal A and connect terminal B to ground. Verify that the condenser fan operates.
3. If the condenser fan does not operate, replace it.

CONDENSER

Removal / Installation

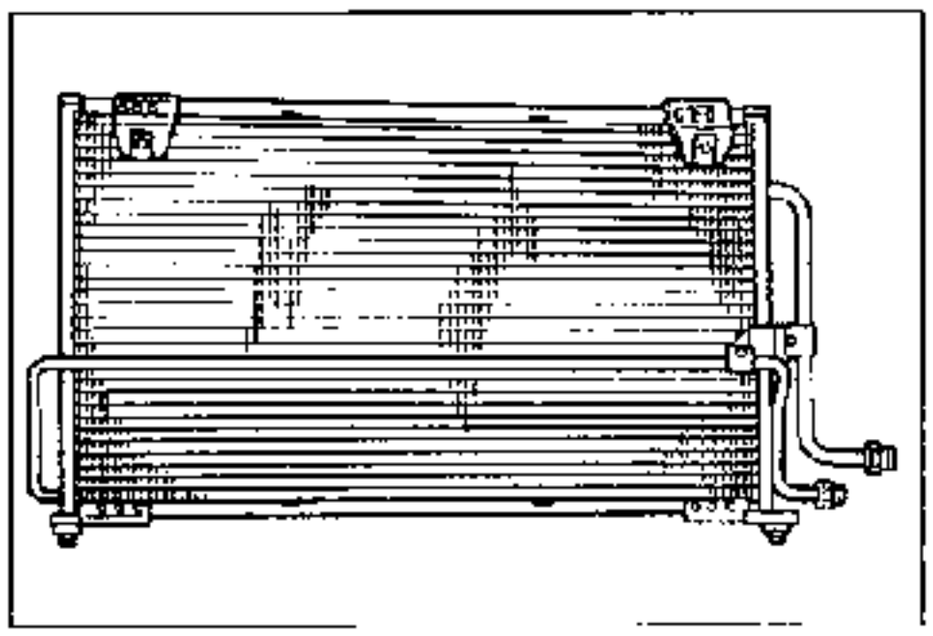
1. Discharge the refrigerant from the system.
2. Remove the fresh-air duct.
3. Remove the upper seal board.
4. Disconnect the cooler pipes from the condenser.
5. Insert a protector, such as cardboard, between the condenser and the radiator.
6. Remove in the order shown in the figure.
7. Install in the reverse order of removal. Apply clean compressor oil to the O-rings before connecting the fittings; do not apply compressor oil to the fitting nuts. When installing a new condenser, add **30 ml {30 cc, 1.0 fl oz}** of compressor oil through the high-pressure-side of the A/C compressor.

Tightening torque
Condenser inlet: 15—24 N·m {1.5—2.5 kgf·m, 11—18 ft·lbf}
Condenser outlet: 10—19 N·m {1.0—2.0 kgf·m, 8—14 ft·lbf}



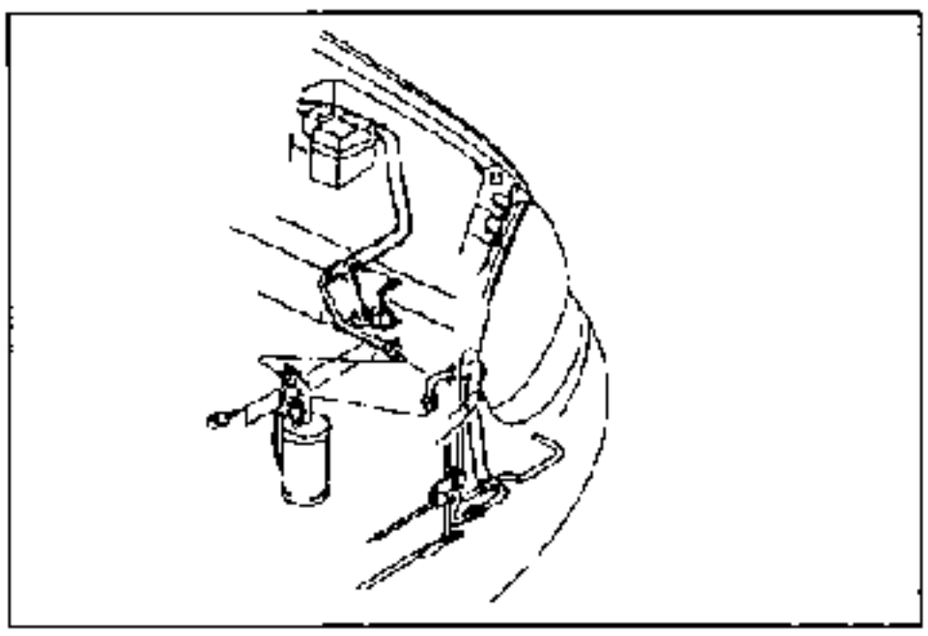
1. Condenser bracket
2. Condenser

Inspection ..... below



Inspection

Check for the following and repair or replace the condenser as necessary.
1. Cracks, damage, or refrigerant leakage
2. Bent fins
3. Distorted or damaged condenser inlet or outlet

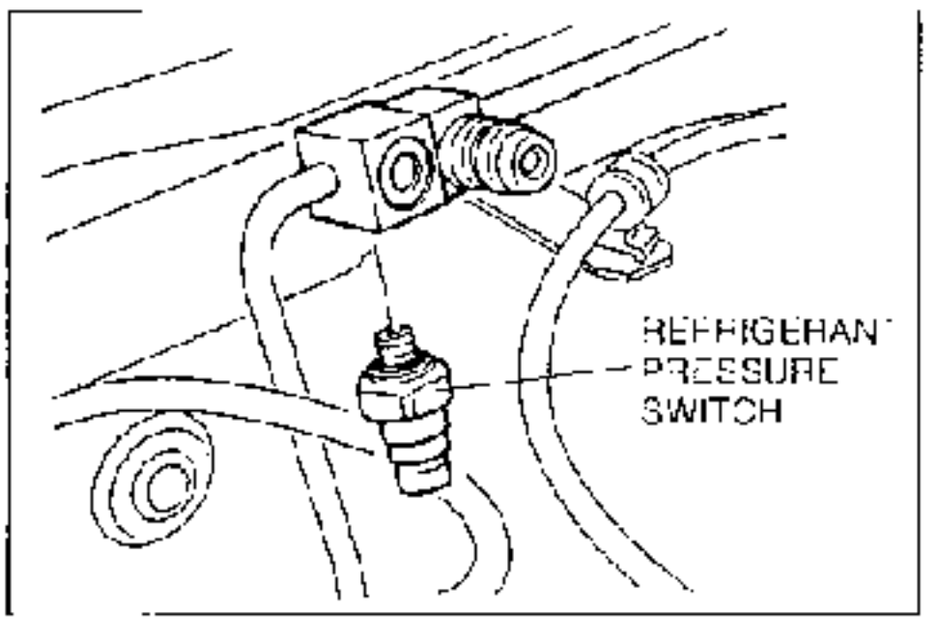


RECEIVER/DRIER

Removal / Installation

1. Discharge the refrigerant from the system.
2. Remove the airflow meter.
3. Remove the ccolant reservoir.
4. Disconnect the cooler pipes from the receiver/drier.
5. Remove the receiver/drier from the bracket.
6. Install in the reverse order of removal. Apply clean compressor oil to the O-rings before connecting the fittings. When installing a new receiver/drier, add **10 ml {10 cc, 0.3 fl oz}** compressor oil through the high-pressure side of the A/C compressor.

Tightening torque:
Receiver/drier inlet:
10—19 N·m {1.0—2.0 kgf·m, 8—14 ft·lbf}
Receiver/drier outlet:
15—24 N·m {1.5—2.5 kgf·m, 11—18 ft·lbf}

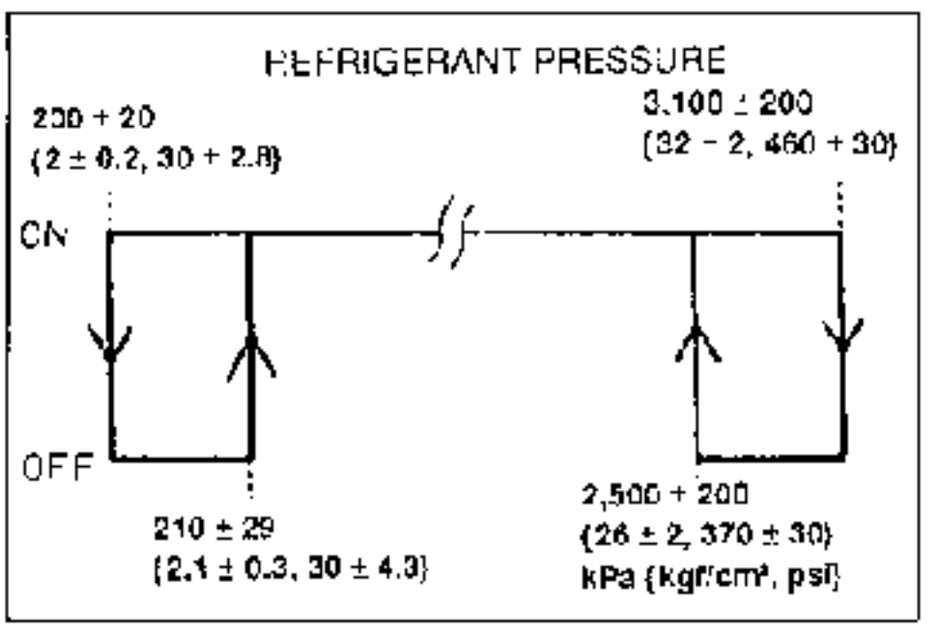


REFRIGERANT PRESSURE SWITCH

Removal / Installation

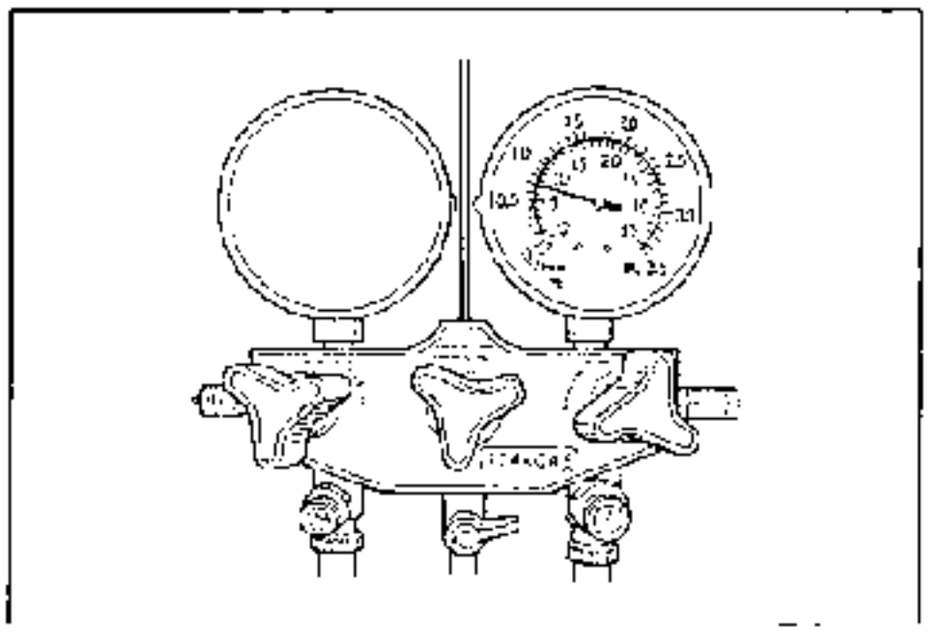
1. Discharge the refrigerant from the system.
2. Disconnect the refrigerant pressure switch connector and remove the refrigerant pressure switch.
3. Before installing the refrigerant pressure switch, wrap sealing tape on the threads of the switch and replace the O-ring. Then install in the reverse order of removal.

Tightening torque: 9.81 N·m {100 kgf·cm, 86.8 in·lbf}



Inspection

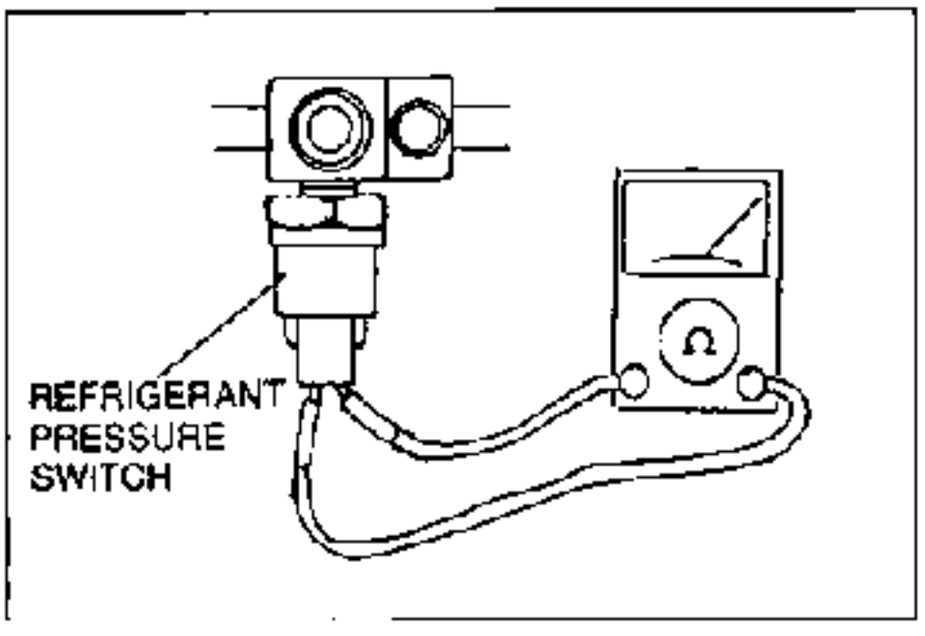
If problems occur in the refrigerant system that cause abnormally high pressure or abnormally low pressure, the refrigerant pressure switch will cut power to the magnetic clutch to protect the mechanical components. If the pressure recovers to within normal operating range, the power will be restored. These operating values are shown in the figure.



1. Turn the ignition switch to OFF.
2. Connect the manifold gauge set and measure the high-pressure-side reading. (Refer to page G–50.)

   High-pressure-side reading:
   Above 450 kPa {4.6 kgf·cm², 65 psi}

3. If not as specified, refer to page G–53 and check the refrigerant system.



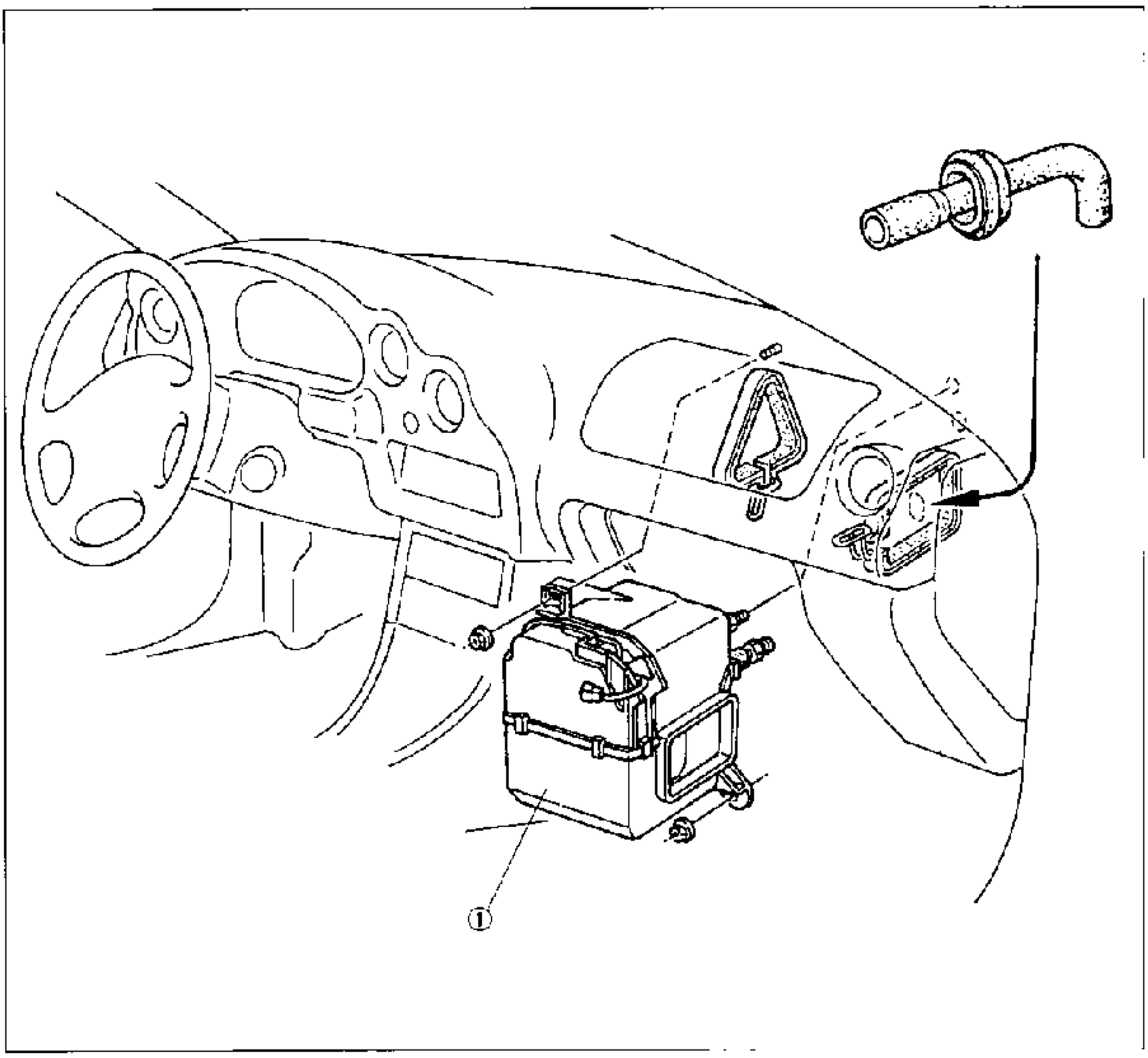
4. If correct, disconnect the refrigerant pressure switch connector.
5. Check for continuity between the switch terminals.
6. If there is no continuity, replace the refrigerant pressure switch. (Refer to page G–55.)

COOLING UNIT

Removal / Installation

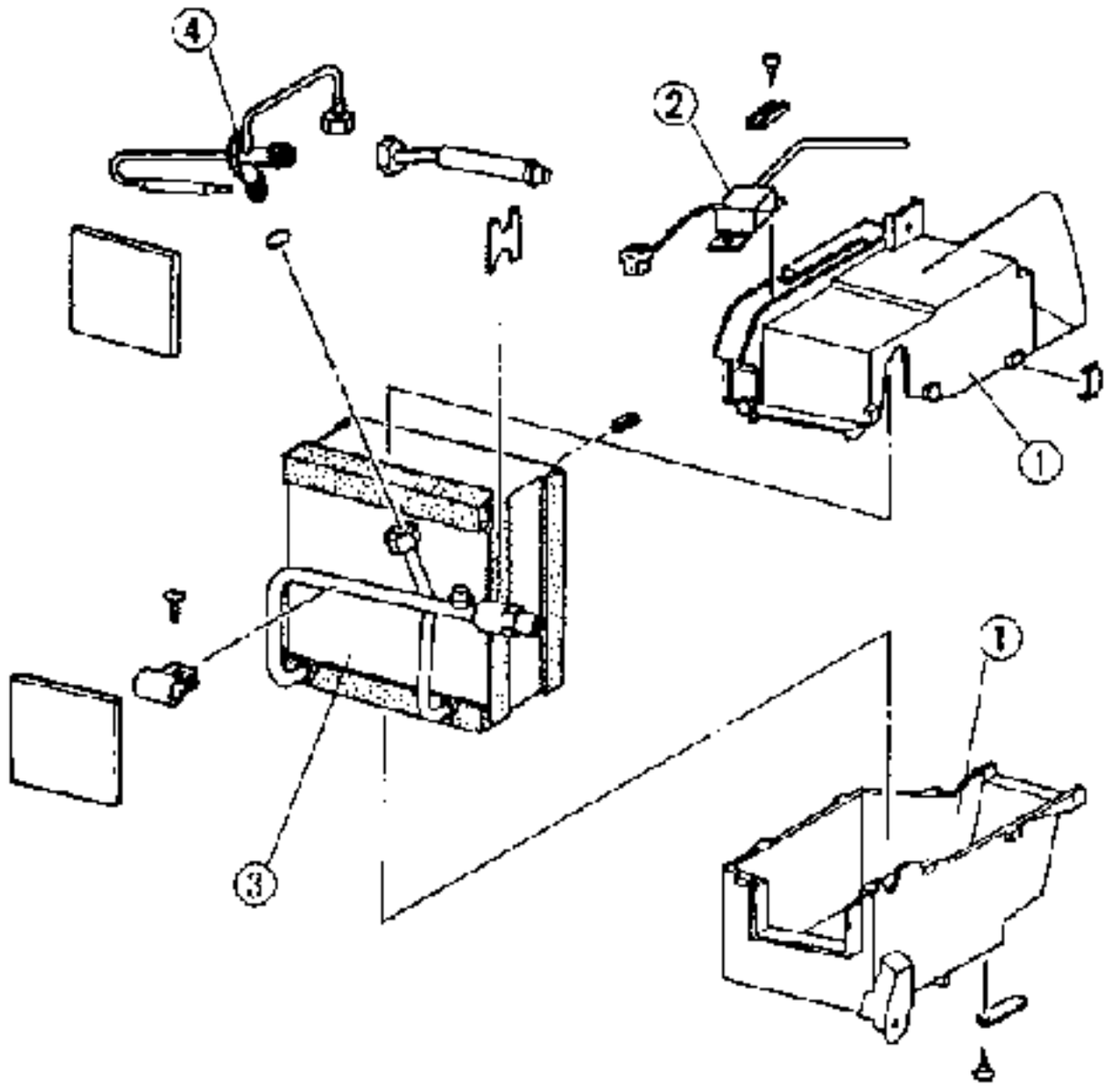
1. Discharge the refrigerant from the system.
2. Remove the glove compartment and glove compartment cover.
   (Refer to the 1995 MX-3 Workshop Manual, section S.)
3. Disconnect the thermoswitch connector.
4. Unlock the seal plate and slide the seal plate toward the heater unit and blower unit.
5. Disconnect the cooler pipes from the cooling unit.
6. Remove as shown in the figure.
7. Install in the reverse order of removal. Apply clean compressor oil to the O-rings before connecting the fittings; do not apply compressor oil to the fitting nuts. When installing a new cooling unit, add **60 ml {60 cc, 2.0 fl oz}** of compressor oil through the high-pressure side of the A/C compressor.

Tightening torque
Outlet pipe: 20—29 N·m {2.0—3.0 kgf·m, 15—21 ft·lbf}
Inlet pipe: 10—19 N·m {1.0—2.0 kgf·m, 8—14 ft·lbf}

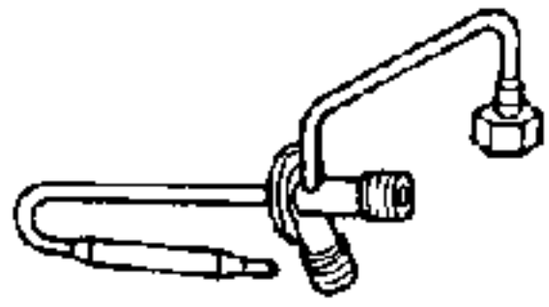


1. Cooling unit
   Disassembly / Assembly ..... page G–68

Disassembly / Assembly
1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.

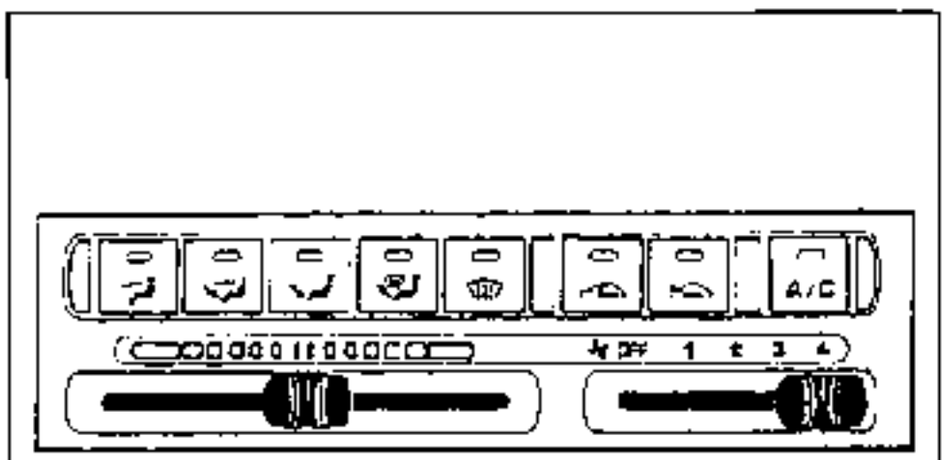


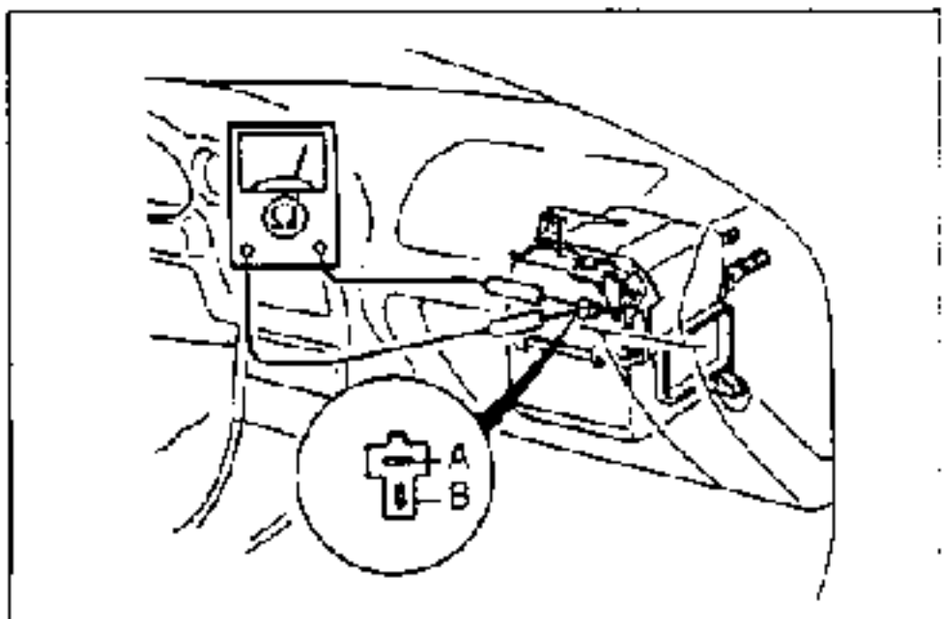
1. Cooling unit case
2. Thermoswitch
   On-vehicle inspection..... page G–69
   Inspection..... page G–69
3. Evaporator
   Inspection..... page G–69
4. Expansion valve
   Replacement ..... below

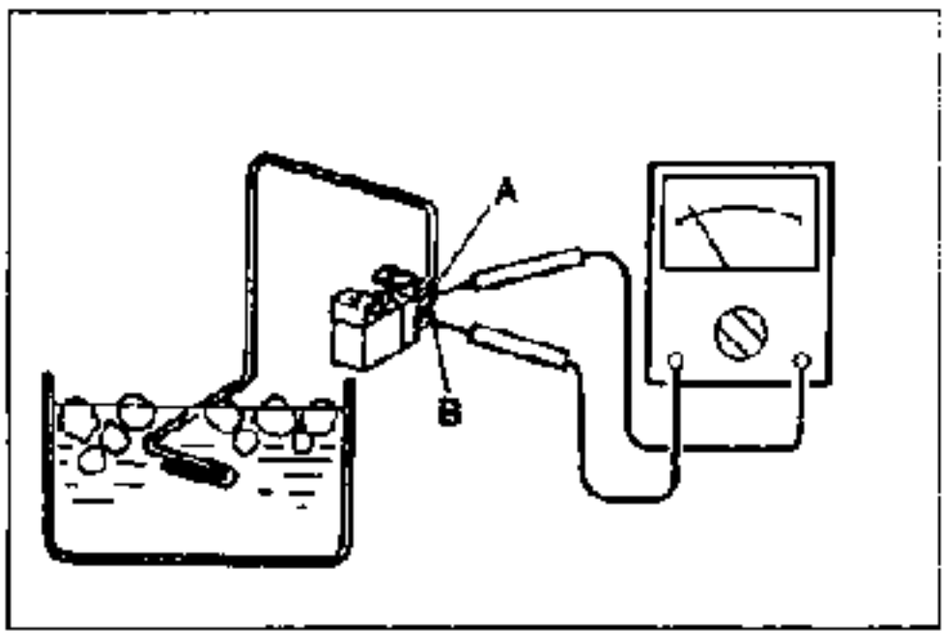


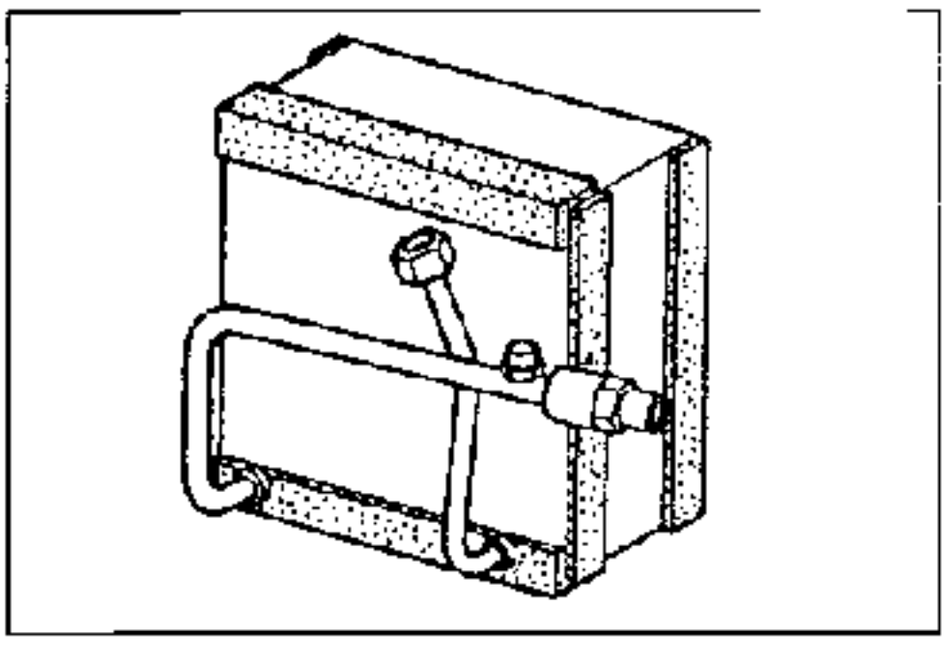
Replacement
Expansion valve
1. Inspect the refrigerant system before replacing the expansion valve. (Refer to page G–53.)
2. Remove the cooling unit. (Refer to page G–67.)
3. Disassemble the cooling unit. (Remove the evaporator and expansion valve as an assembly.)
4. Disconnect the inlet and outlet pipes.
5. Remove the heat-sensing tube from the outlet pipe and remove the expansion valve.
6. Install in the reverse order of removal. Apply clean compressor oil to the O-rings before connecting the fittings.

Tightening torque
Inlet pipe:
11.8—14.7 N·m
{120—150 kgf·cm, 105—130 in·lbf}
Outlet pipe:
30—34 N·m {3.0—3.5 kgf·m, 22—25 ft·lbf}









On-vehicle Inspection

Thermoswitch

1. Remove the glove compartment and glove compartment cover.
2. Run the engine at idle.
3. Turn the A/C switch off and set the fan switch off to the fourth position to operate the blower fan for a few minutes.
4. After a few minutes. turn the fan switch off and stop the engine.

Note

- The thermoswitch contacts will be open if the evaporator temperature is below 0.4 ± 0.7 °C {32.5 ± 1.0 °F}

5. Disconnect the thermoswitch connector and check for continuity between the switch terminals.
6. If there is no continuity, replace the thermoswitch. (Refer to page G–68.)

Inspection

Thermoswitch

1. Immerse the sensing bulb in a container of ice water.
2. Check for continuity between the switch terminals.

Temperature	Continuity
Above 5°C	Yes
Below 0°C	No

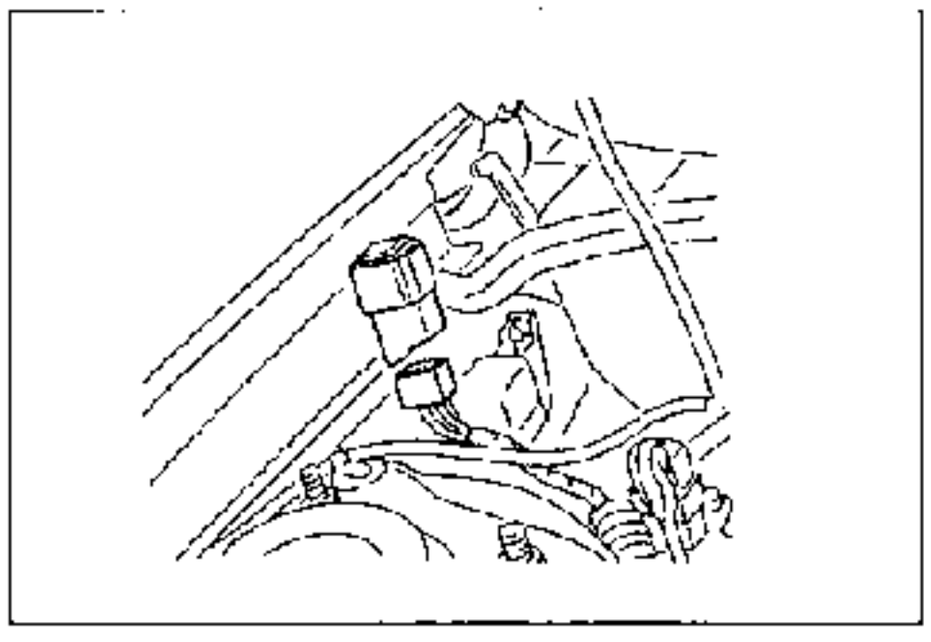
3. If not as specified, replace the thermoswitch. (Refer to page G–68.)

Evaporator

Caution

- **If water is used to clean the evaporator, the water may freeze inside the pipes and block the flow of refrigerant. Do not use water to clean the evaporator.**

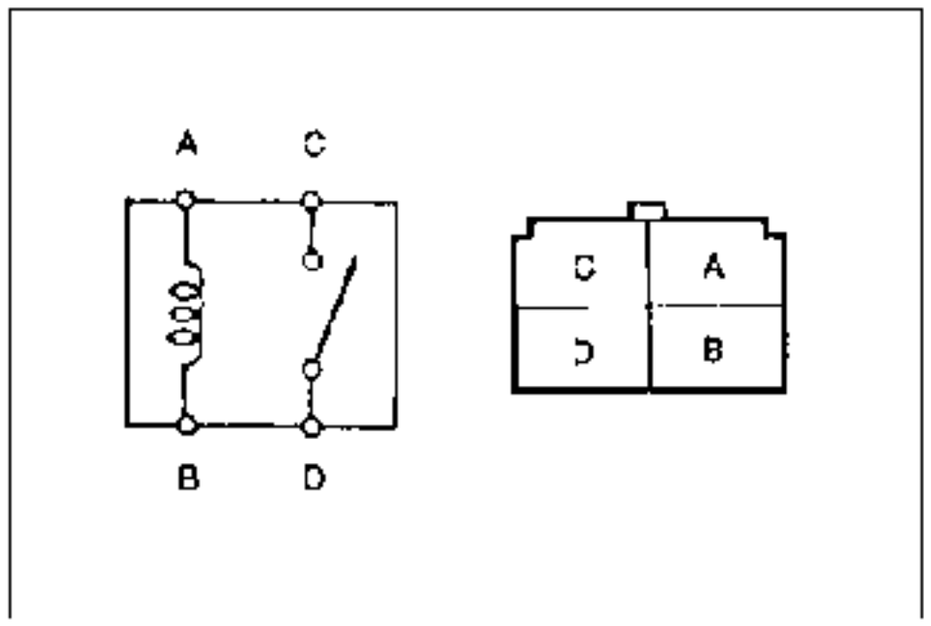
1. Check the evaporator fins for blockage. If the fins are clogged, clean them with compressed air.
2. Check the fittings for cracks and other damage. Replace the evaporator if necessary. (Refer to page G–68.)



RELAYS

Removal / Installation

1. Remove the relays from the relay bracket.
2. Disconnect the relay connector and remove the relays.
3. Install in the reverse order of removal. Lower the relay boots after connecting the relay connector.



Inspection

1. Remove the relays.
2. Check for continuity between the relay terminals.

B+: Battery positive voltage

Connection		Terminal			
B+	GND	A	B	C	D
—	—	○	○		
A	B			○	○

○—○ : Continuity

3. If not as specified, replace the relay.

Note

- The same type of relays are used for the A/C relay, condenser fan relay No.1, condenser fan relay No.2, and condenser fan relay No.3.

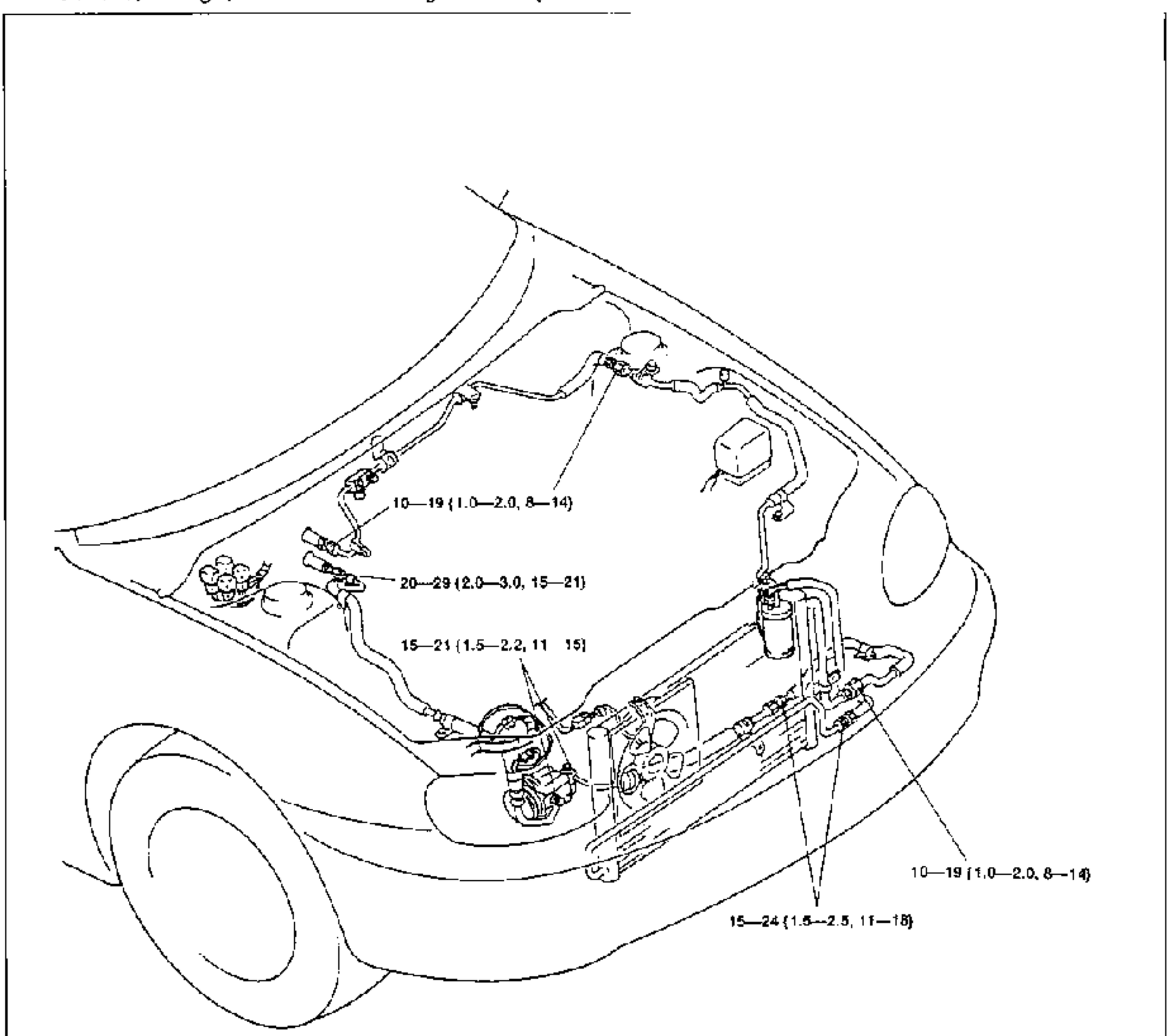
REFRIGERANT LINES

On-vehicle Inspection

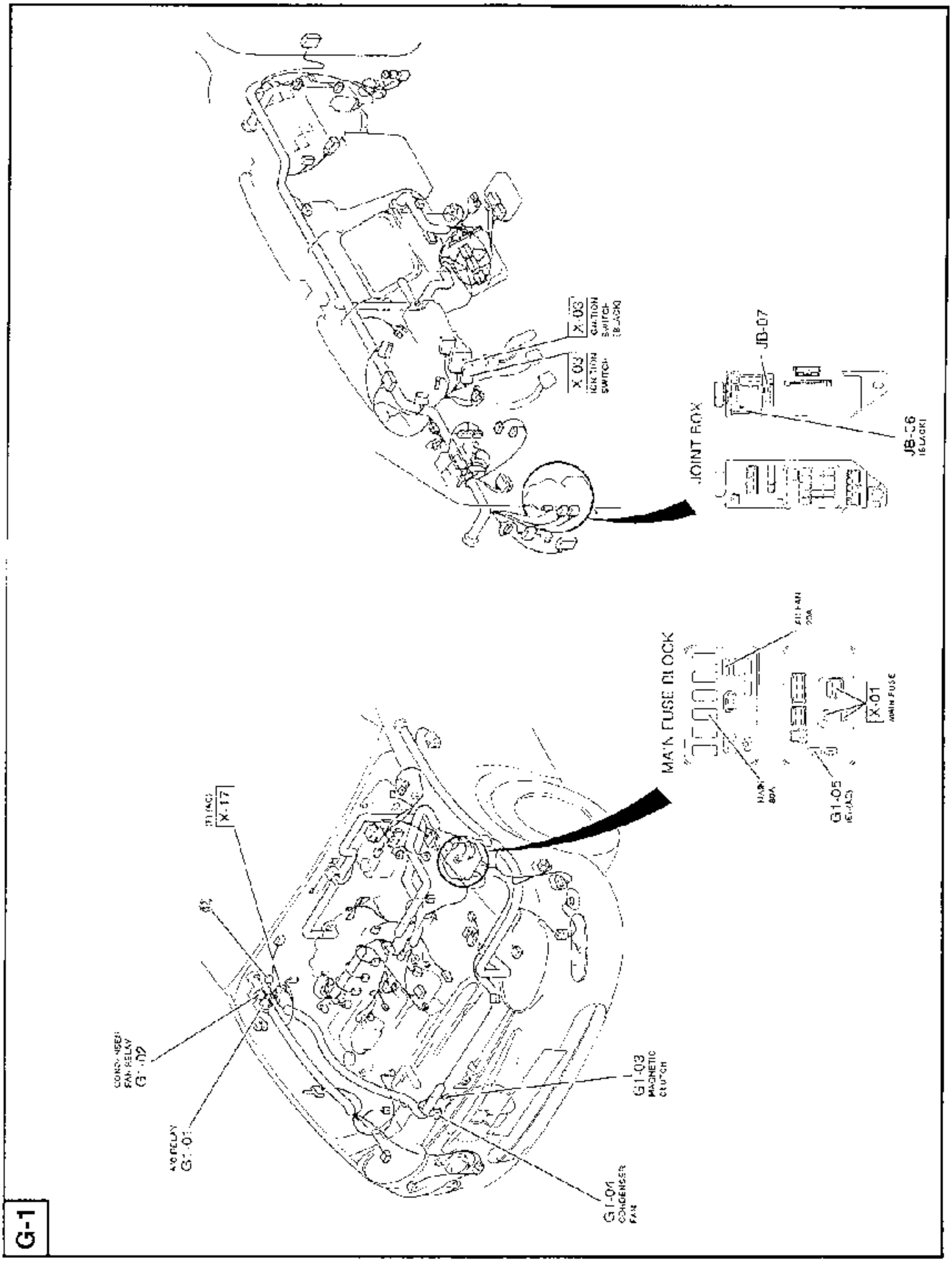
Check for leakage at all connections by using a gas leak tester. (Refer to page G–51.)
Repair or replace as necessary.

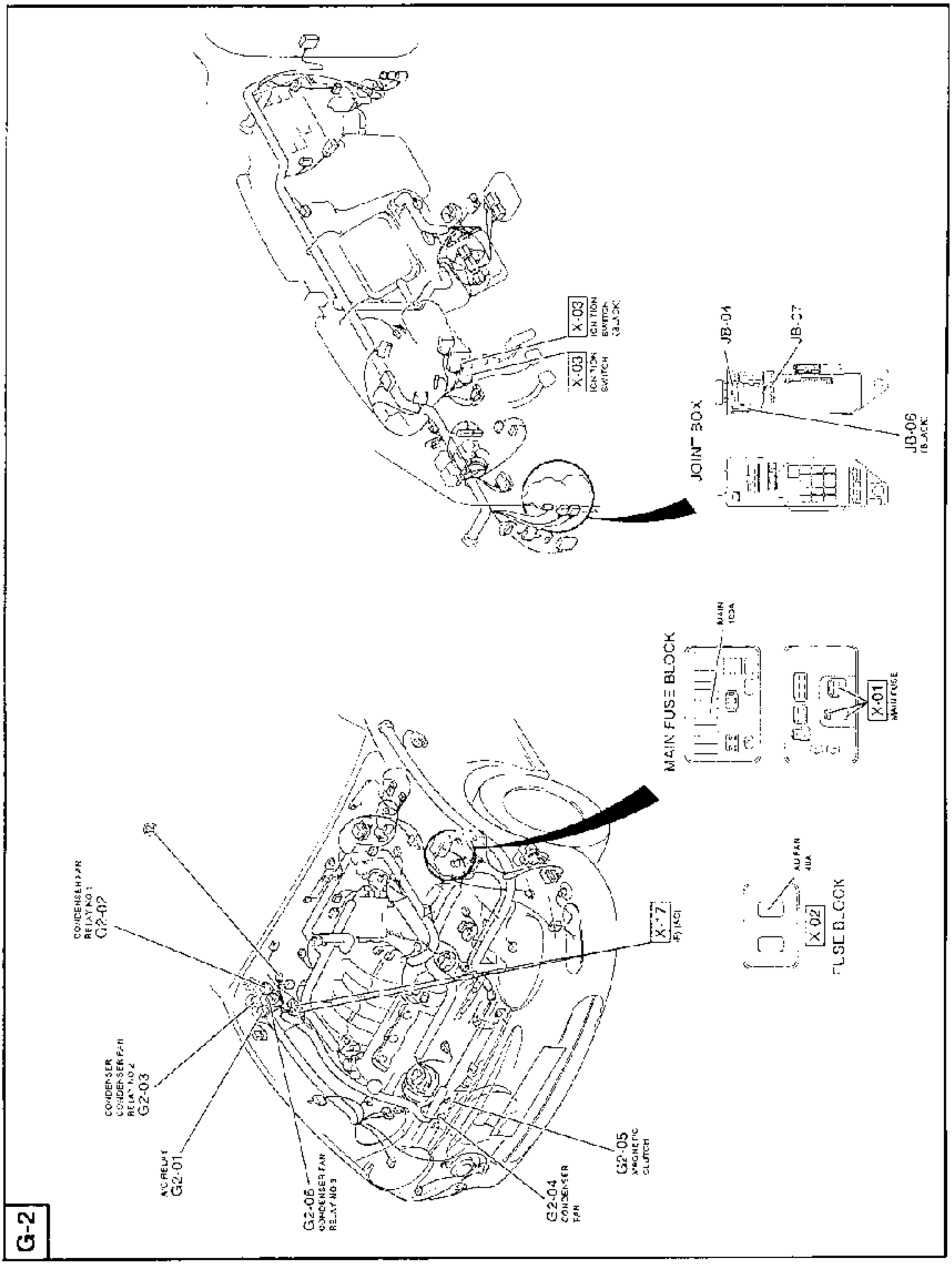
Removal / Installation

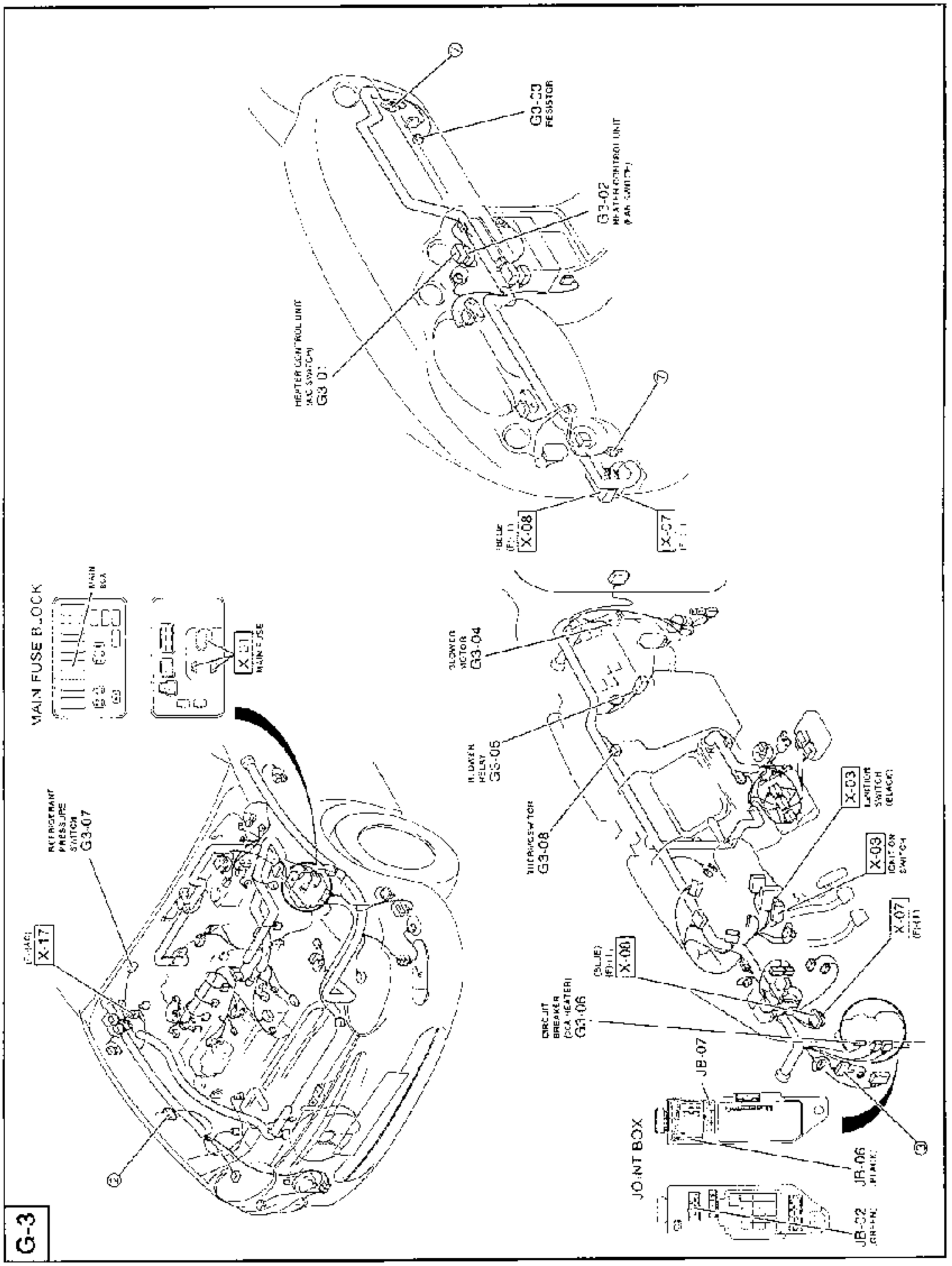
1. Discharge the refrigerant from the system.
2. Remove as shown in the figure. Immediately plug all open fittings to keep moisture out of the system.
3. Install in the reverse order of removal. Apply clean compressor oil to the O-rings before connecting the fittings; do not apply compressor oil to the fitting nuts. When installing a new pipe or hose, add **5 ml {5 cc, 0.2 fl oz}** of compressor oil through the high pressure side of the A/C compressor.
4. Evacuate, charge, and test the refrigeration system.



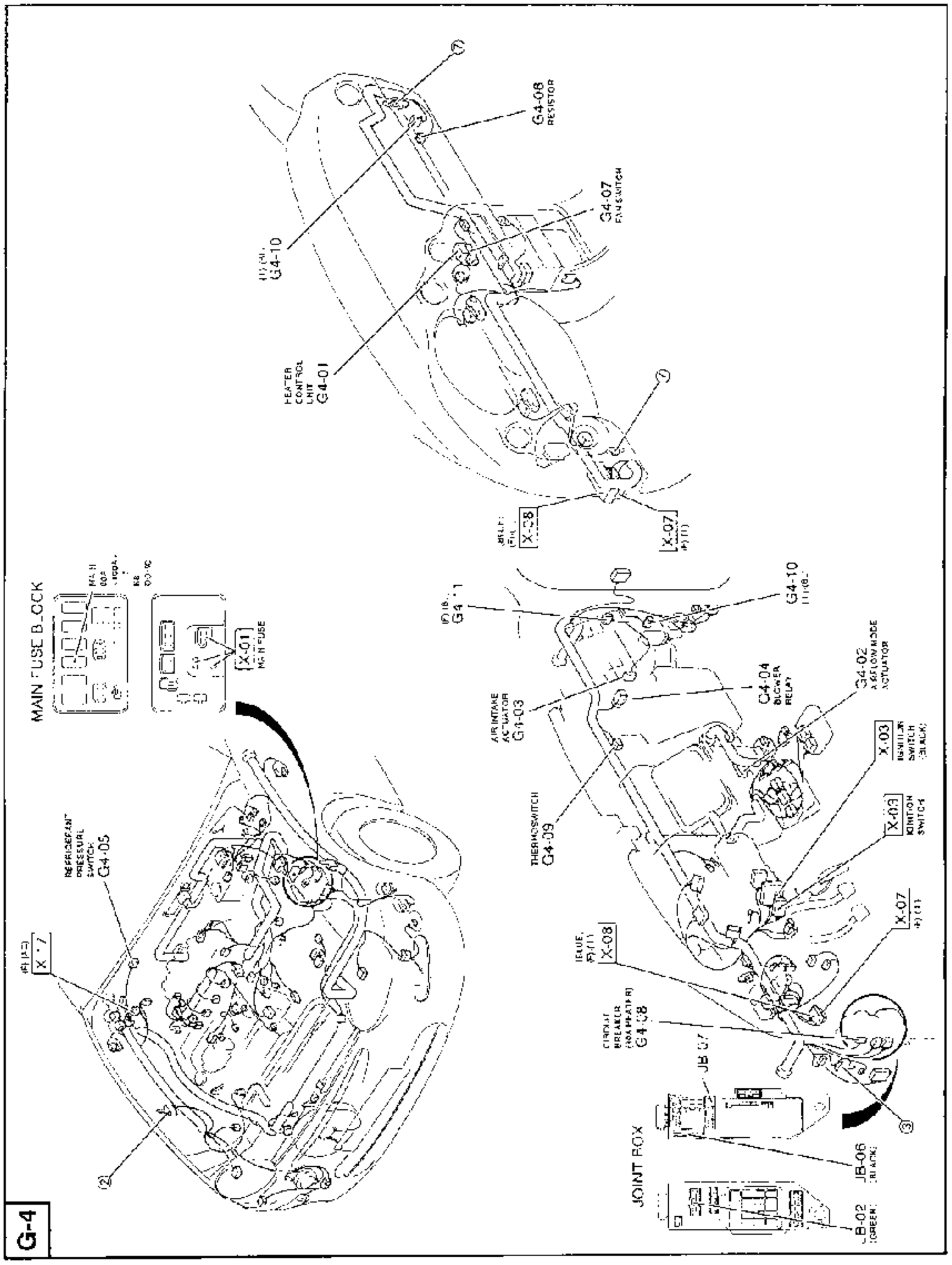
CONNECTOR LOCATIONS




G-2
X-03
IGNITION SWITCH
X-03
IGNITION SWITCH (BACK)
JOINT BOX
JB-04
JB-07
JB-06
(BACK)
MAIN FUSE BLOCK
MAIN 100A
X-01
MAIN FUSE
X-02
FUSE BLOCK
AU FAN 40A
X-17
(BACK)
CONDENSER FAN RELAY NO.1
G2-02
CONDENSER FAN RELAY NO.2
G2-03
A/C RELAY
G2-01
G2-06
CONDENSER FAN RELAY NO.3
G2-04
CONDENSER FAN
G2-05
MAGNETIC CLUTCH


G3-03
RESISTOR
G3-02
HEATER CONTROL UNIT
(A/C SWITCH)
G3-01
X-08
X-07
MAIN FUSE BLOCK
MAIN
60A
X-01
MAIN FUSE
REFRIGERANT
PRESSURE
SWITCH
G3-07
X-17
BLOWER
MOTOR
G3-04
BLOWER
RELAY
G3-05
THERMOSWITCH
G3-08
X-03
IGNITION
SWITCH
(BLACK)
X-03
IGNITION
SWITCH
X-07
CIRCUIT
BREAKER
(A/C-HEATER)
G3-06
X-06
JB-07
JOINT BOX
JB-06
JB-02

G-3


G4-08
RESISTOR
G4-10
G4-07
HEATER CONTROL UNIT
G4-01
X-08
X-07
MAIN FUSE BLOCK
X-01
MAIN FUSE
REFRIGERANT PRESSURAL SWITCH
G4-05
X-17
AIR INTAKE ACTUATOR
G4-03
G4-04
BLOWER RELAY
G4-02
A/F FLOW MODE ACTUATOR
THERMOSWITCH
G4-09
X-03
IGNITION SWITCH (BLACK)
X-09
IGNITION SWITCH
X-08
CIRCUIT BREAKER (FOR HEATER)
G4-08
X-07
JOINT BOX
JB-06
JB-02
(GREEN)
G-4

Before beginning any service procedure, refer to section S of this manual for air bag system service warnings.

AUDIO

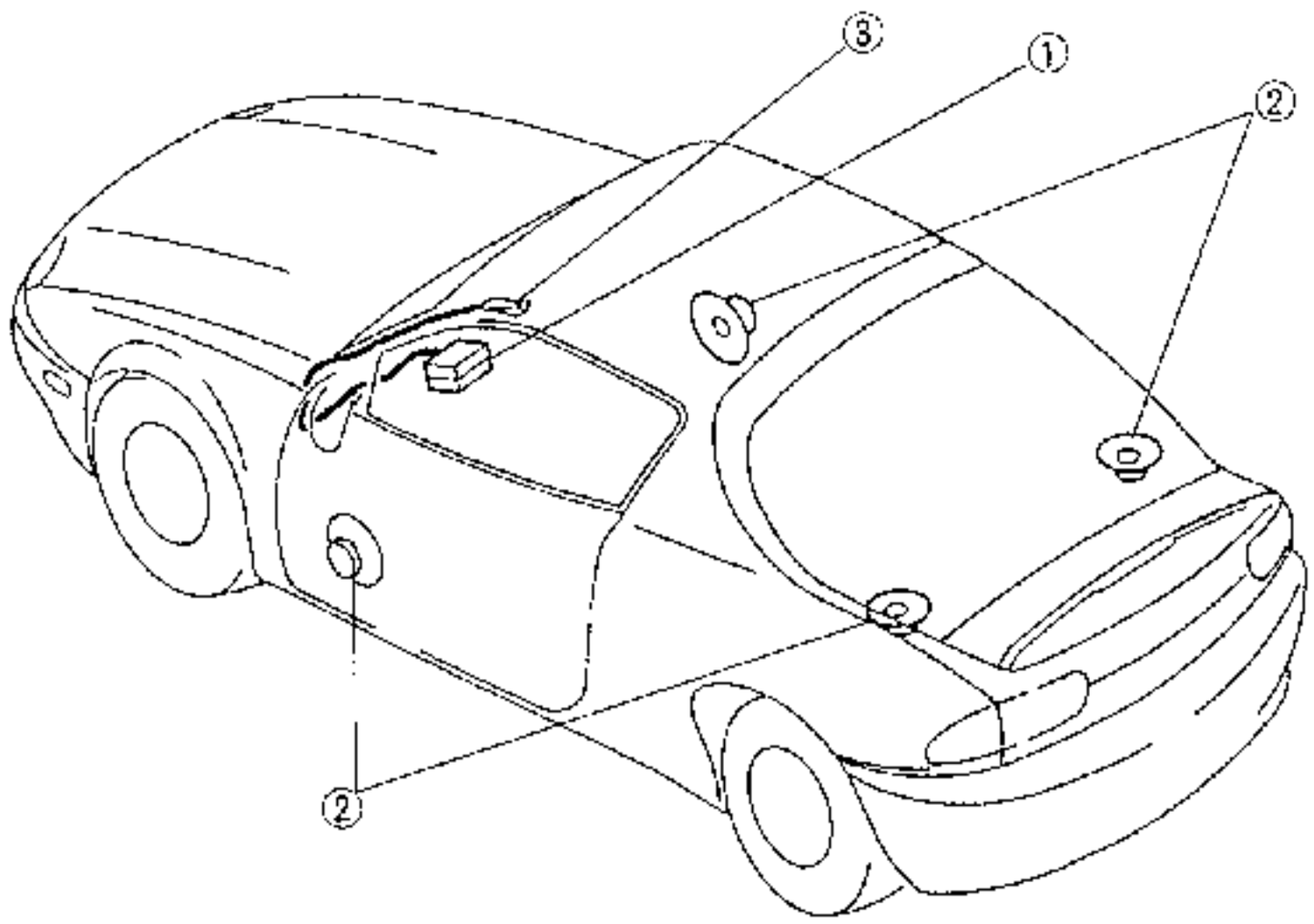
PREPARATION ..... J– 2
STRUCTURAL VIEW ..... J– 2
SYSTEM DESCRIPTION ..... J– 3
CONNECTOR SPECIFICATIONS ..... J– 4
TROUBLESHOOTING ..... J– 5
AUDIO UNIT J–20
SPEAKER J–20
ROOF ANTENNA J–21

AUDIO

PREPARATION
SST

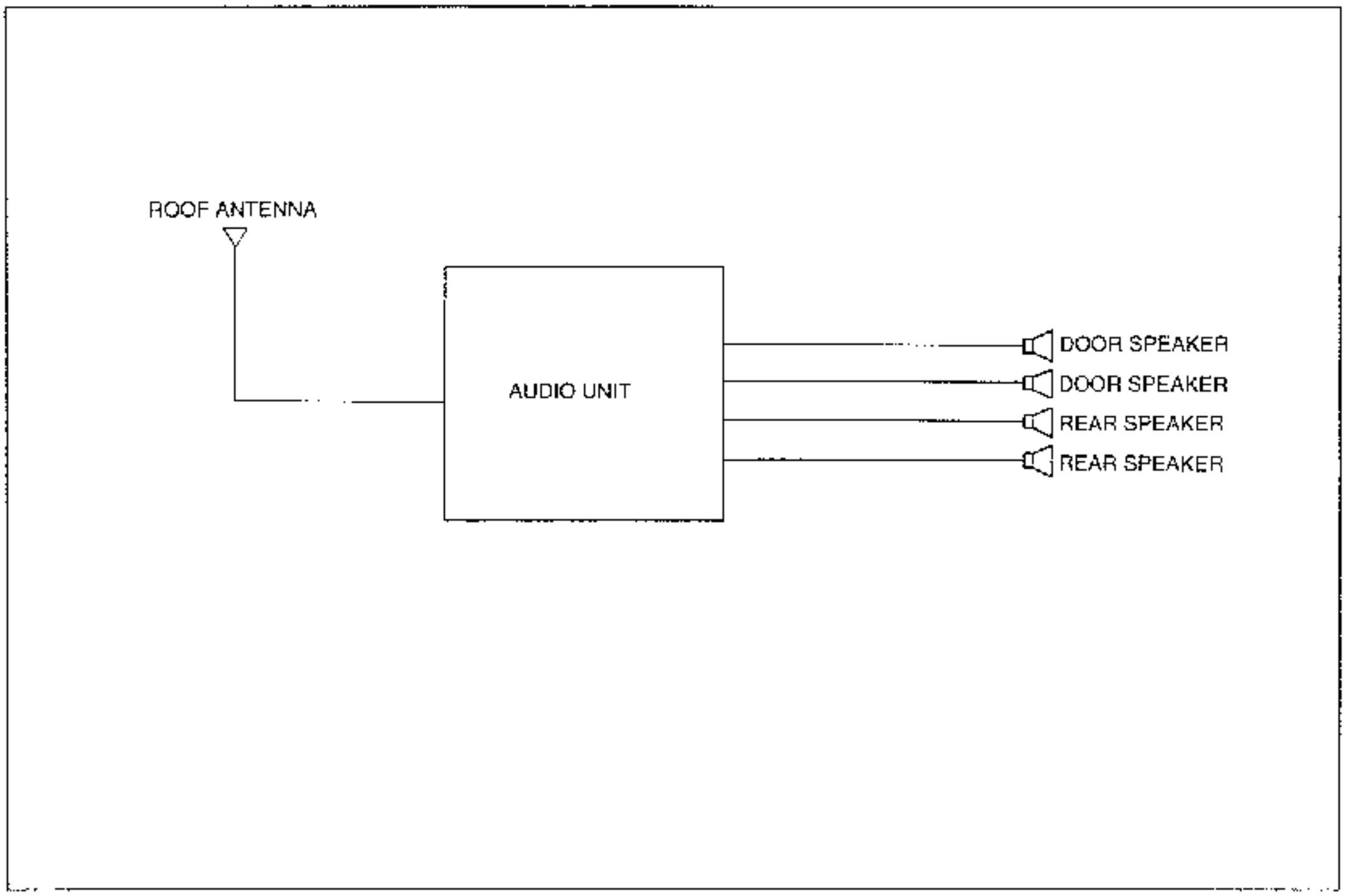
49 UN01 050 Tool, radio removal		For removal of audio unit

STRUCTURAL VIEW



1. Audio unit
Removal ..... page J–20
Installation ..... page J–20
2. Speaker
Removal / Installation ..... page J–20
Inspection ..... page J–21
3. Roof antenna
Removal ..... page J–21
Installation ..... page J–21
Inspection ..... page J–22

SYSTEM DESCRIPTION
System Diagram

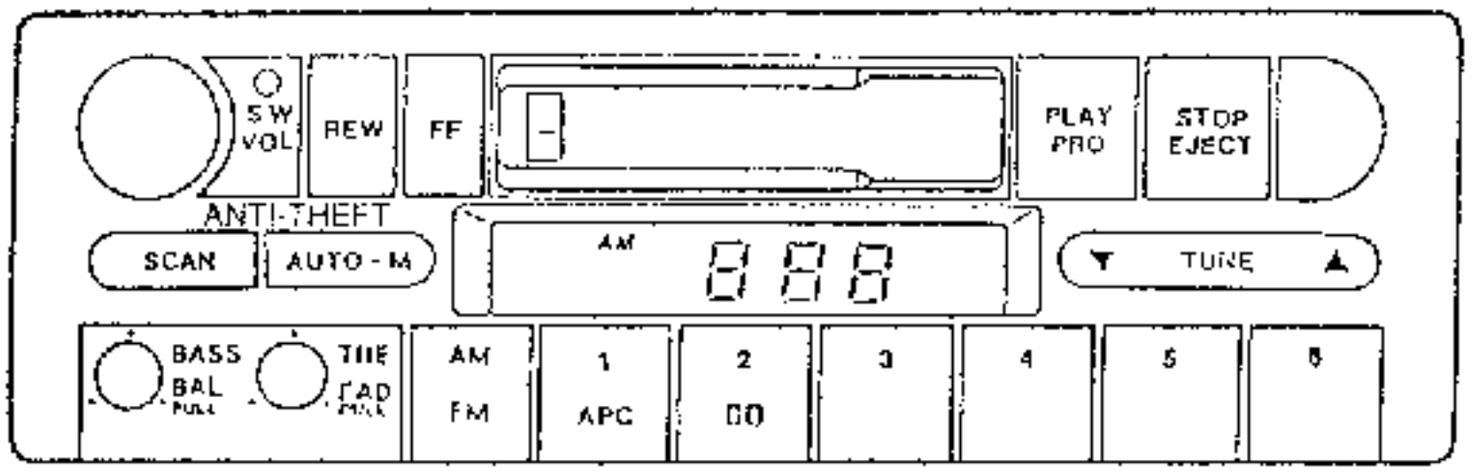


CONNECTOR SPECIFICATIONS

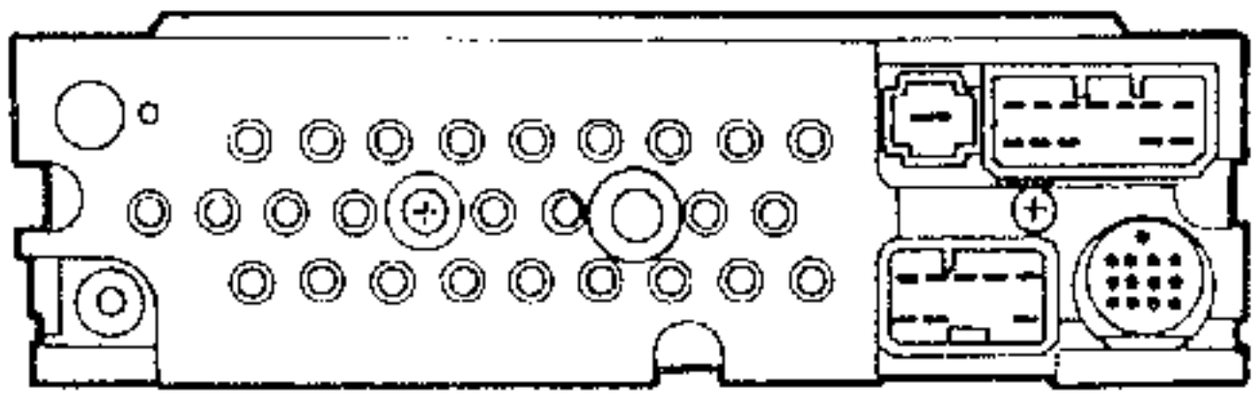
Audio Unit

AM·FM tuner / cassette tape deck

FRONT VIEW

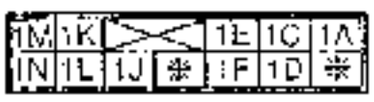


REAR VIEW



B+: Battery positive voltage

12-pin connector

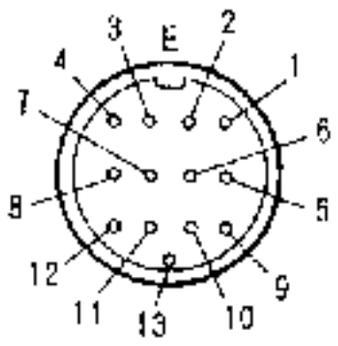


1A	ACC
1B	
1C	Backup power (B+)
1D	Antenna SW (13.2V)
1E	TNS
1F	Illumination ⊖
1H	
1J	Amp control (13.2V)
1K	Door speaker (LH) ⊕
1L	Door speaker (LH) ⊖
1M	Door speaker (RH) ⊕
1N	Door speaker (RH) ⊖

8-pin connector

2A	Rear speaker (LH) ⊕
2B	Rear speaker (LH) ⊖
2C	ACC
2D	Amp control (13.2V)
2F	Rear speaker (RH) ⊕
2H	Rear speaker (RH) ⊖
2I	System mute
2J	

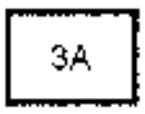
DIN connector (13-pin)



1	Output LH ⊕
2	Input LH ⊕
3	Output RH ⊕
4	Input RH ⊕
5	Signal ground
6	TNS
7	ACC
8	Backup power (B+)
9	System on
10	Illumination ⊕
11	System off
12	System control (play)
13	Mute (input)
E	Shield ground

1-pin connector

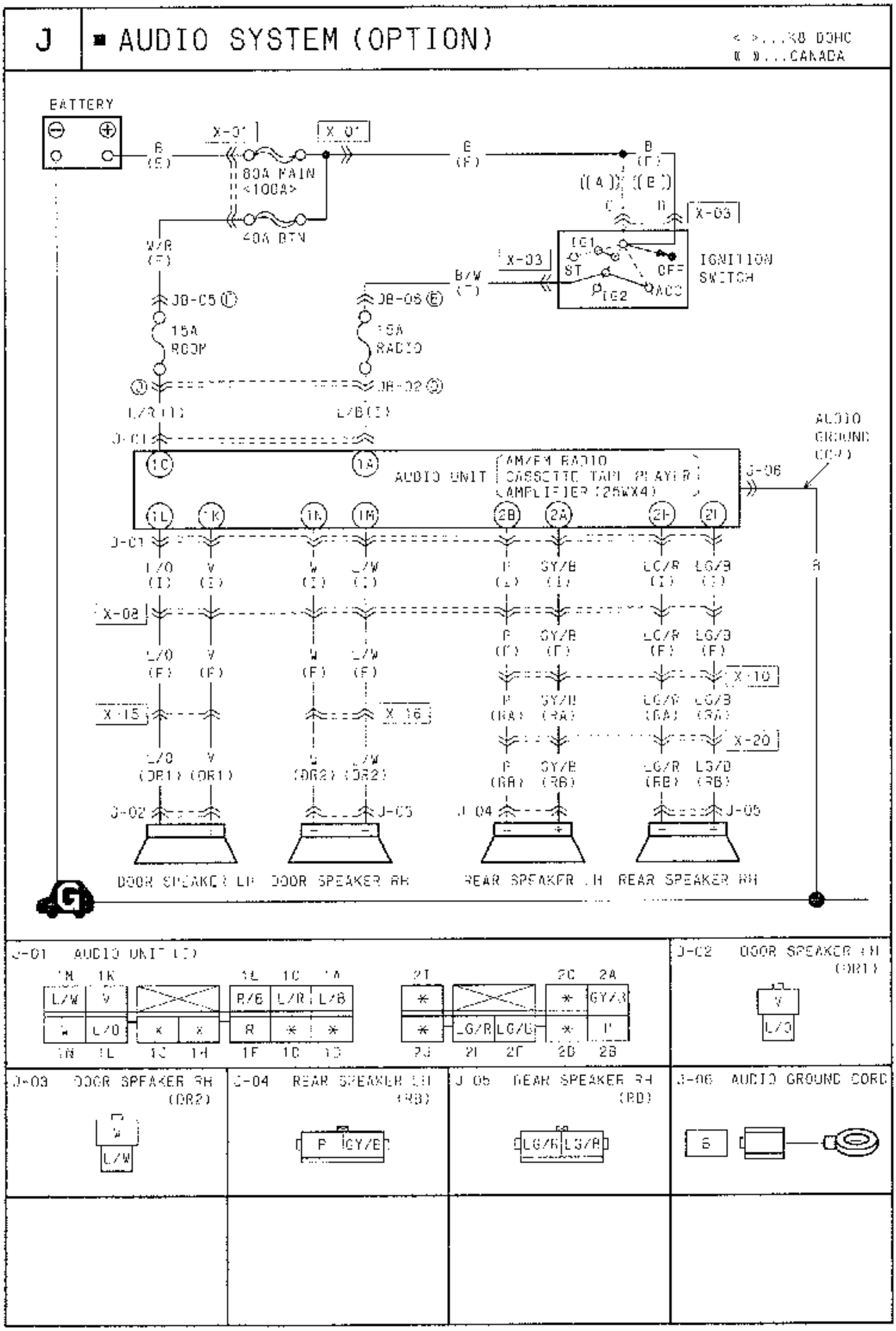
3A	Ground



Specifications

Rated voltage	12V
Frequency band	AM 530—1,710 kHz FM 87.75—107.9 MHz
Output impedance	25W × 4

TROUBLESHOOTING
Circuit Diagram



J-01 AUDIO UNIT (C)

J-02 DOOR SPEAKER LH (OR1)

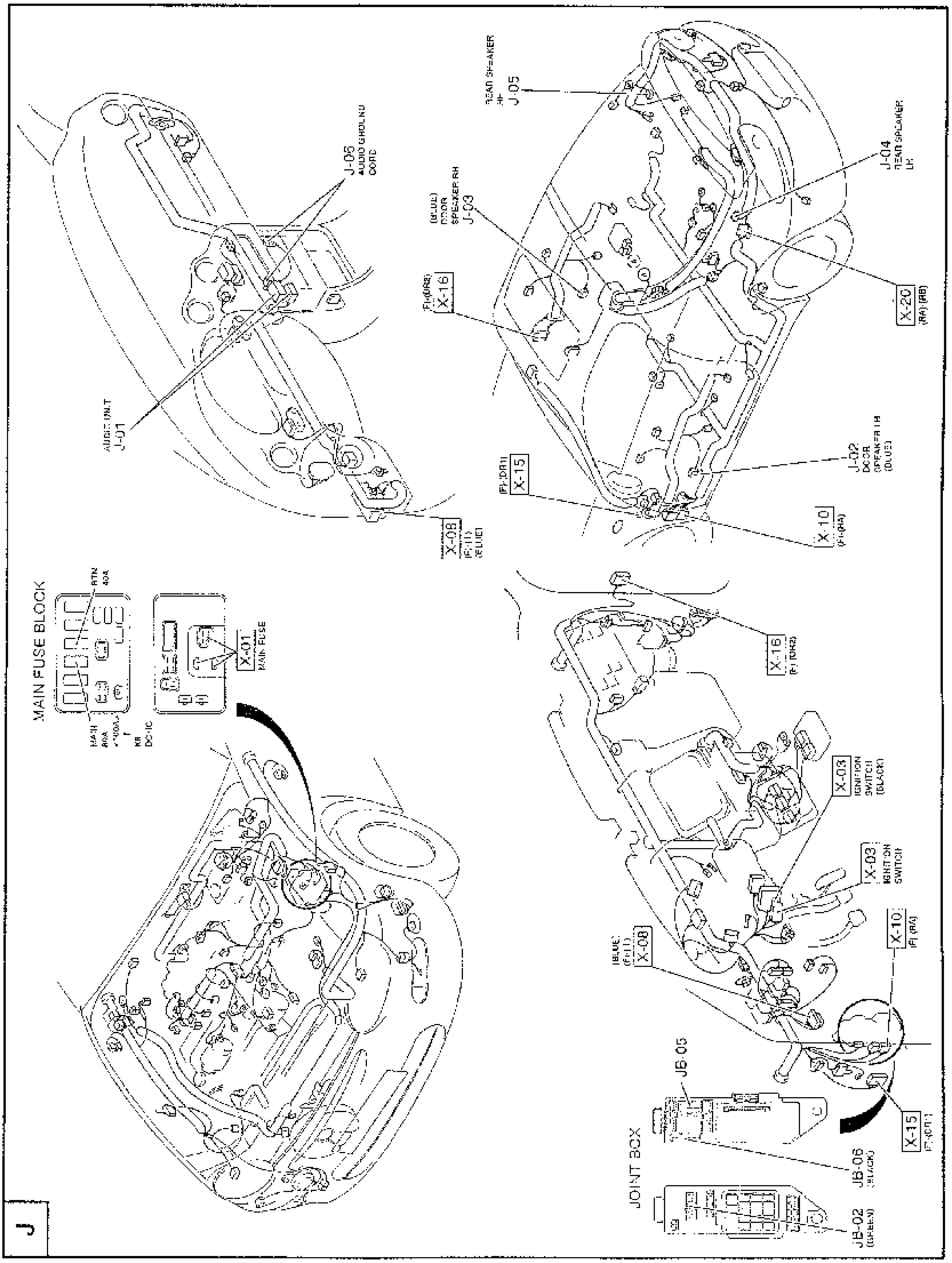
J-03 DOOR SPEAKER RH (OR2)

J-04 REAR SPEAKER LH (RB)

J-05 REAR SPEAKER RH (RD)

J-06 AUDIO GROUND CORD

Connector Locations



Preinspection

An audio system malfunction can be caused by external factors such as noise or improper operation. Before troubleshooting, refer to the list below and correct any external factors.

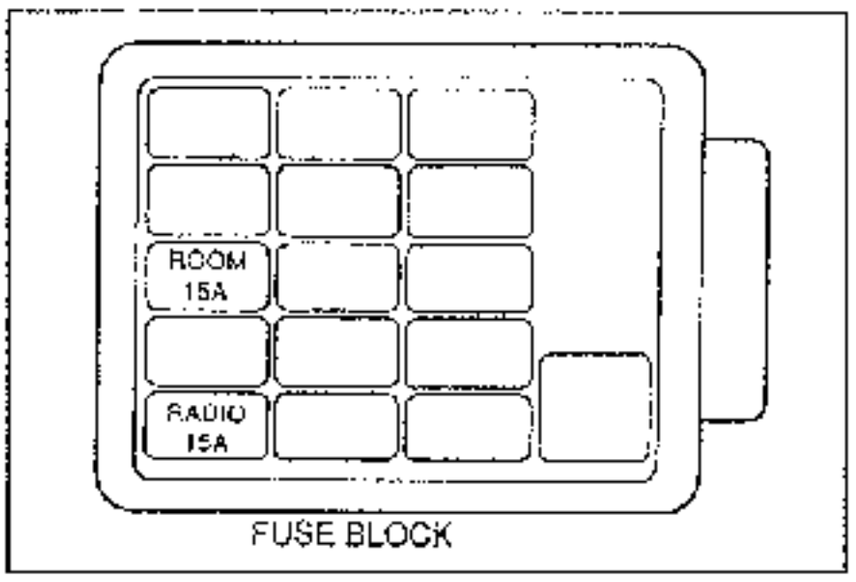
Problem	Possible cause		
	Radio	Cassette deck	Other
No speakers operate	Volume control knob turned down	Player in pause mode	
Some speakers do not operate	Sound control knobs not set properly		Speaker(s) damaged
Sound distorted (noise occurs)	• Incorrect tuning • Antenna not extended • Radio obstacle (fading or multi-path receiving)	• Faulty tape • Long-playing tape (90 min. or 120 min.)	• Volume too high • Door glass resonating • Speaker(s) damaged
Poor sound quality or stereophonic function does not operate	• Incorrect tuning • Sound control knobs not set properly	• Faulty tape • Long-playing tape (90 min. or 120 min.) • Dolby mode playback for non-Dolby recorded tape	Speaker(s) damaged

Checklist

Symptom	Flowchart No.
No speakers operate	1
Some speakers do not operate	2
Poor sound quality only when radio is played	3
Poor sound quality only when cassette tape is played	4
Poor sound quality when radio or cassette tape is played	5
Noise occurs	6
Cassette tape does not unload or reverse function works unintentionally	7
Cassette tape does not load or playback is not possible	8

Flowchart No.1	Symptom	No speakers operate

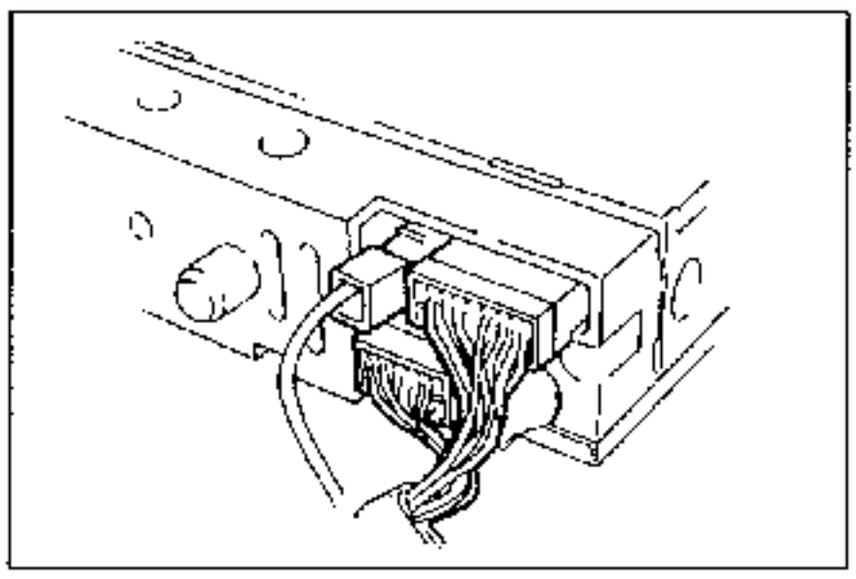
Possible cause
- Burnt RADIO 15 A fuse
- Burnt ROOM 15 A fuse
- Damaged audio unit
- Open or short circuit in wiring harness
- Poor connection of connector



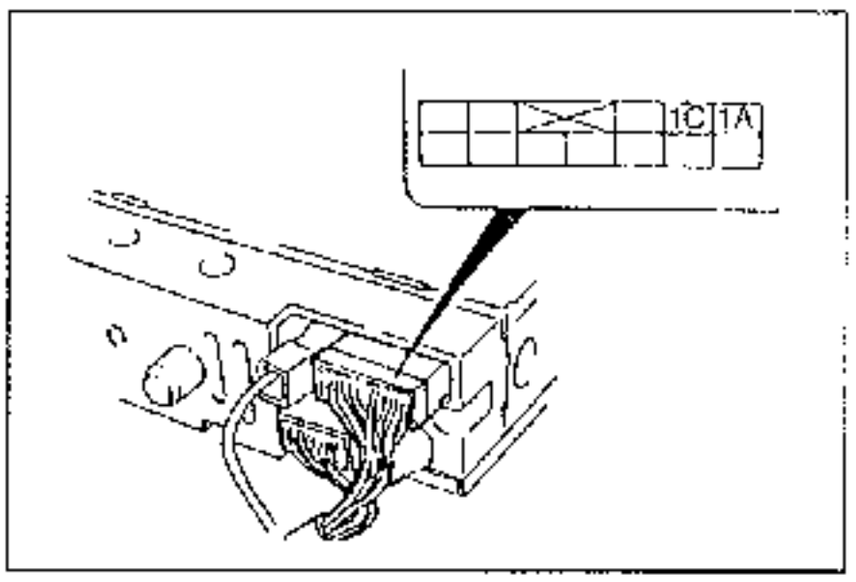
FUSE BLOCK

Step 1
Check the RADIO 15 A fuse and ROOM 15 A fuse in the fuse block.

Fuse	Action
OK	Go to Step 2
Burnt	Replace fuse after checking and repairing wiring harness



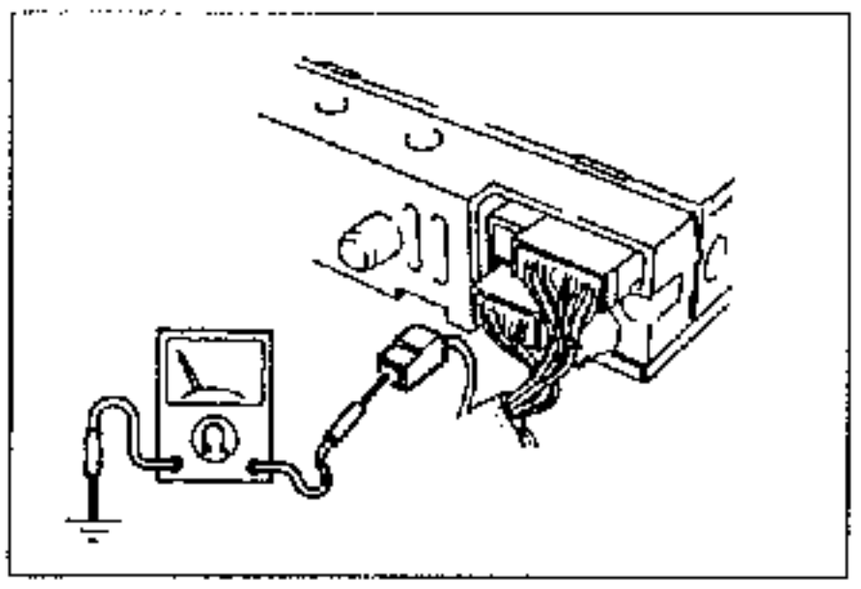
Step 2
1. Remove the audio unit. (Refer to page J–20.)
2. Verify that the audio unit connector is properly connected. Reconnect it if necessary.
3. If the connections are OK, go to Step 3.



Step 3
1. Turn the ignition switch to ACC.
2. Measure the voltage at the terminals of the audio unit connector.

B+: Battery positive voltage

Terminal	Voltage	Action
1A	B+	Measure voltage at terminal 1C
	Other	Repair wiring harness (RADIO 15 A fuse—Audio unit)
1C	B+	Turn ignition switch to LOCK and go to Step 4
	Other	Repair wiring harness (ROOM 15 A fuse—Audio unit)

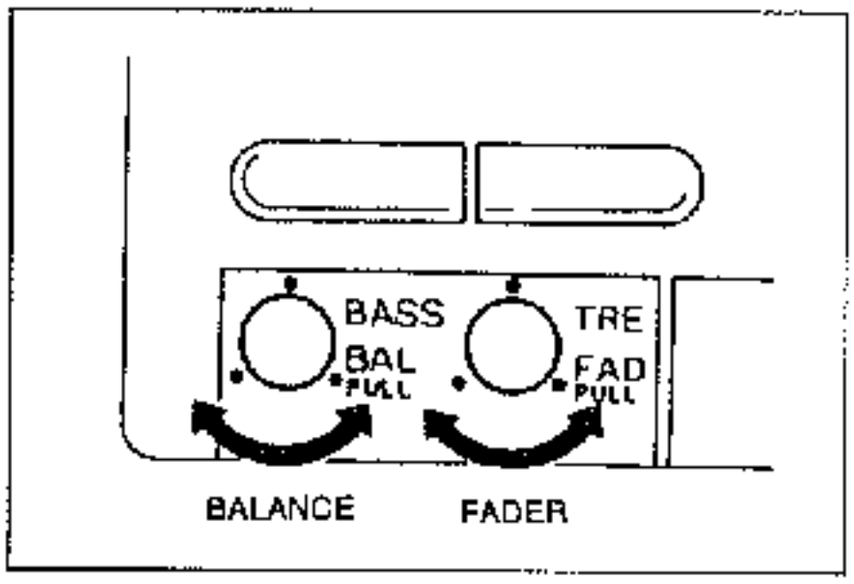


Step 4
1. Disconnect the audio unit connector.
2. Check for continiuty between terminal 3A (B) of the audio unit connector and ground.

Continuity	Action
Yes	Replace audio unit
No	Repair wiring harness (Audio unit—GND)

Flowchart No.2	Symptom	Some speakers do not operate

Possible cause
- Damaged speaker
- Damaged audio unit
- Open or short circuit in wiring harness
- Poor connection of connector



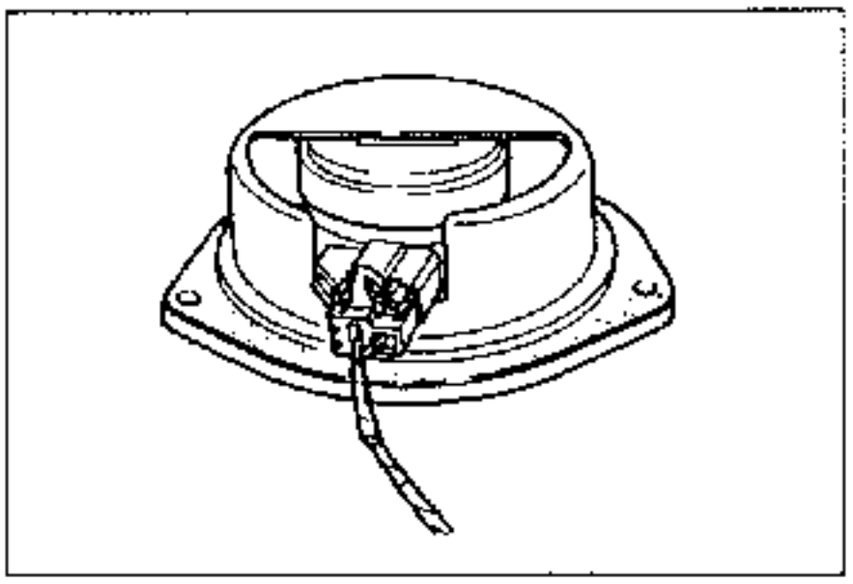
Step 1
1. Turn the ignition switch to ACC.
2. Turn the audio system power on.
3. Insert a recorded tape and set the volume to a comfortable level.
4. Set the bass/balance control knob and the treble/fader control as specified in Table 1.
5. Check the performance of each speaker. Refer to table 2 and follow the appropriate action.

Table 1

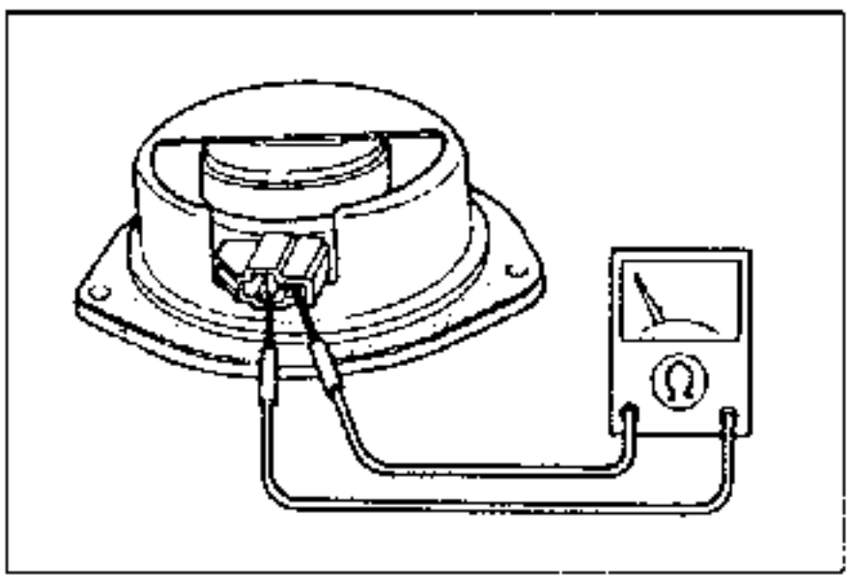
Speaker	Fader	Balance	Speaker operates	Judgement
Right door	Front	Right	Yes	Right door speaker circuit OK
			No	Right door speaker circuit malfunction
Left door		Left	Yes	Left door speaker circuit OK
			No	Left door speaker circuit malfunction
Right rear	Left	Right	Yes	Right rear speaker circuit OK
			No	Right rear speaker circuit malfunction
Left rear		Left	Yes	Left rear speaker circuit OK
			No	Left rear speaker circuit malfunction

Table 2

Symptom				Action
Right door	Left door	Right rear	Left rear	
×				Go to Step 2
	×			Go to Step 2
		×		Go to Step 6
			×	Go to Step 6

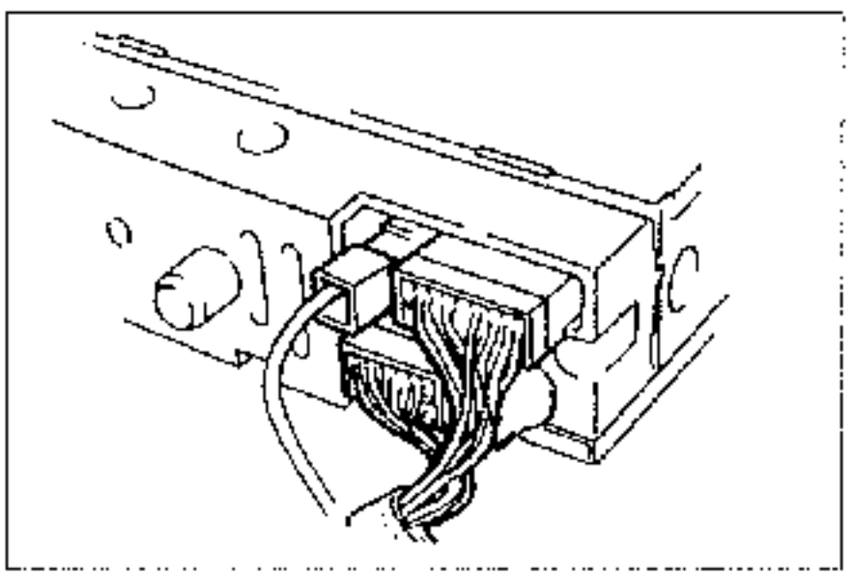


Step 2
1. Remove the door speaker. (Refer to page J–20.)
2. Verify that the door speaker connector is properly connected. Reconnect it if necessary.
3. If the connection is OK, go to Step 3.

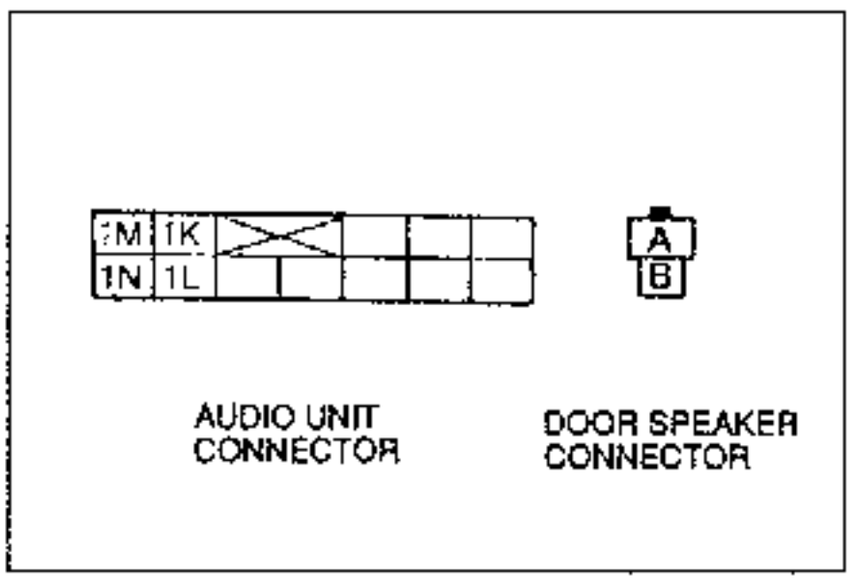


Step 3
1. Disconnect the door speaker connector.
2. Measure the resistance between the terminals of the door speaker.

Resistance	Action
3.6 Ω	Go to Step 4
Other	Replace door speaker (Refer to page J–20.)



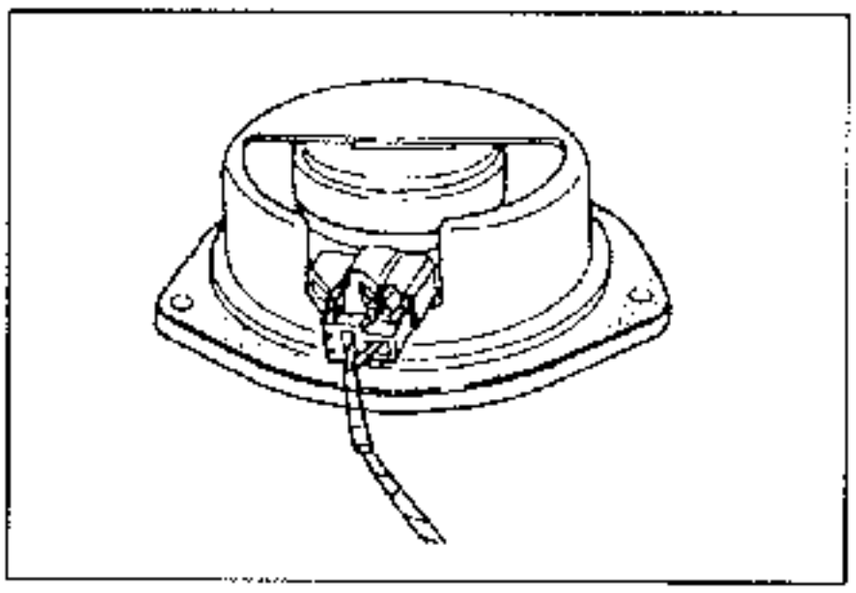
Step 4
1. Remove the audio unit. (Refer to page J–20.)
2. Verify that the audio unit connector is properly connected. Reconnect it if necessary.
3. If the connections are OK, go to Step 5.



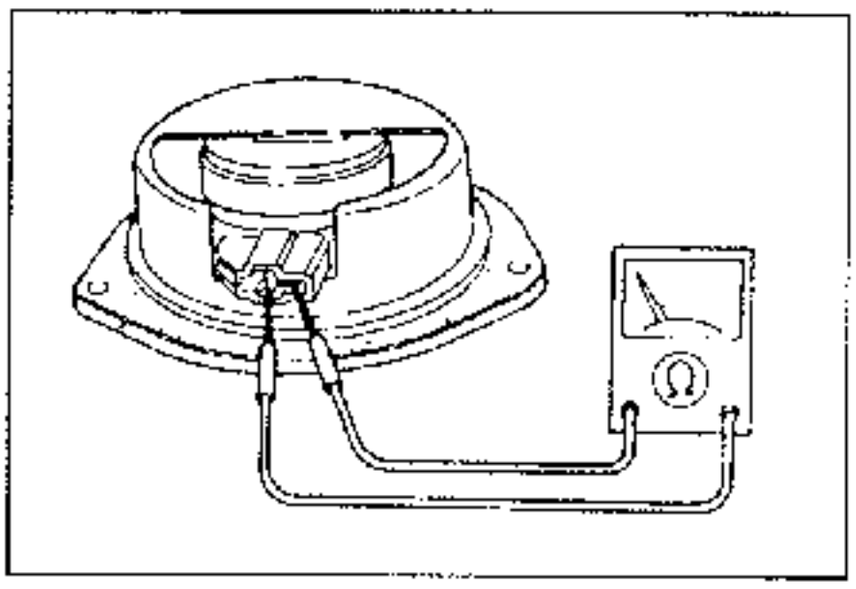
Step 5
1. Disconnect the audio unit connector and the door speaker connector.
2. Check for continuity between terminals of the audio unit connector and the door speaker connector.

Speaker	Audio unit		Door speaker	Continuity
Right door	Terminal 1M	↔	Terminal B	Yes
	Terminal 1N	↔	Terminal A	Yes
Left door	Terminal 1K	↔	Terminal B	Yes
	Terminal 1L	↔	Terminal A	Yes

3. If correct, go to Step 6.
4. If not as specified, repair the wiring harness (Audio unit—Door speaker).

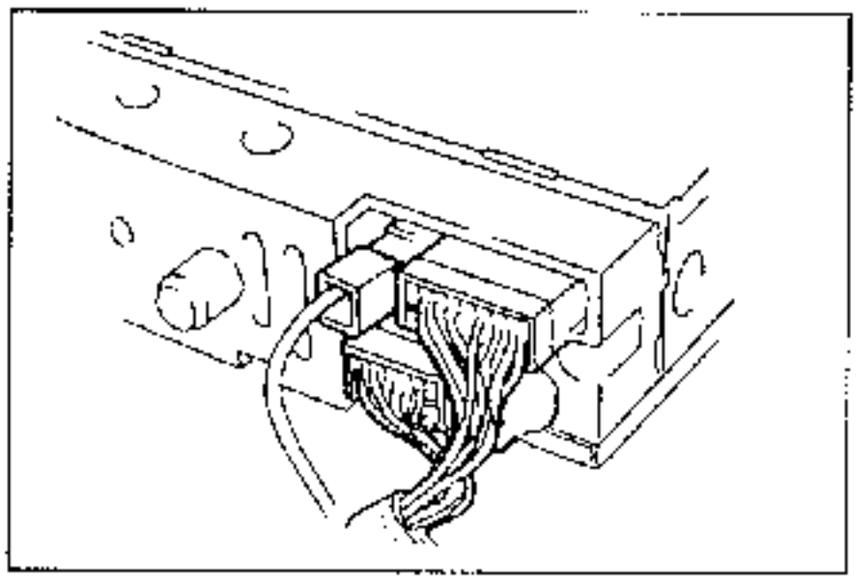


Step 6
1. Remove the rear speaker. (Refer to page J–20.)
2. Verify that the rear speaker connector is properly connected. Reconnect it if necessary.
3. If the connection is OK, go to Step 7.



Step 7
1. Disconnect the rear speaker connector.
2. Measure the resistance between the terminals of the rear speaker.

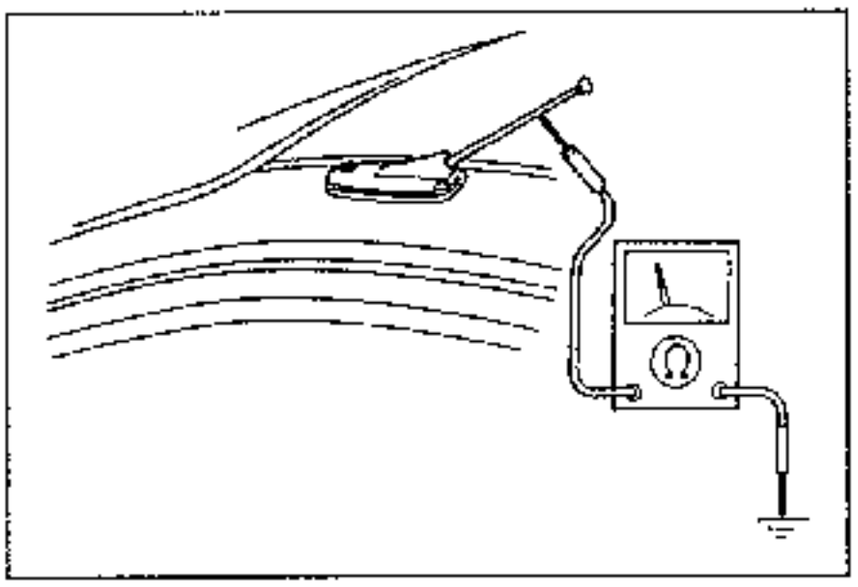
Resistance	Action
4 Ω	Go to Step 8
Other	Replace door speaker (Refer to page J–20)



Step 8
1. Remove the audio unit. (Refer to page J–20.)
2. Verify that the audio unit connector is properly connected. Reconnect it if necessary.
3. If the connections are OK, repair the wiring harness (Audio unit—Rear speaker).

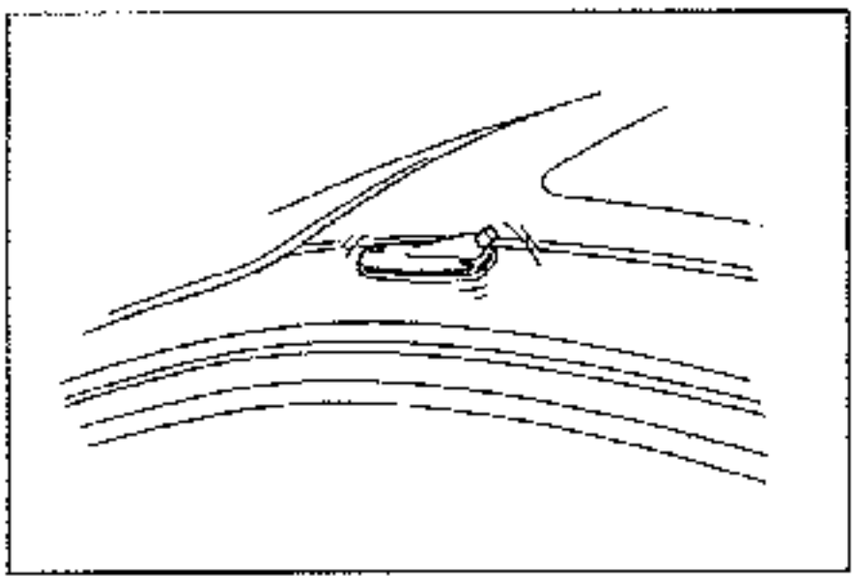
Flowchart No.3	Symptom	Poor sound quality only when radio is played

Possible cause
- Damaged antenna
- Damaged audio unit
- Damaged antenna feeder
- Open or short circuit in wiring harness
- Poor connection of connector



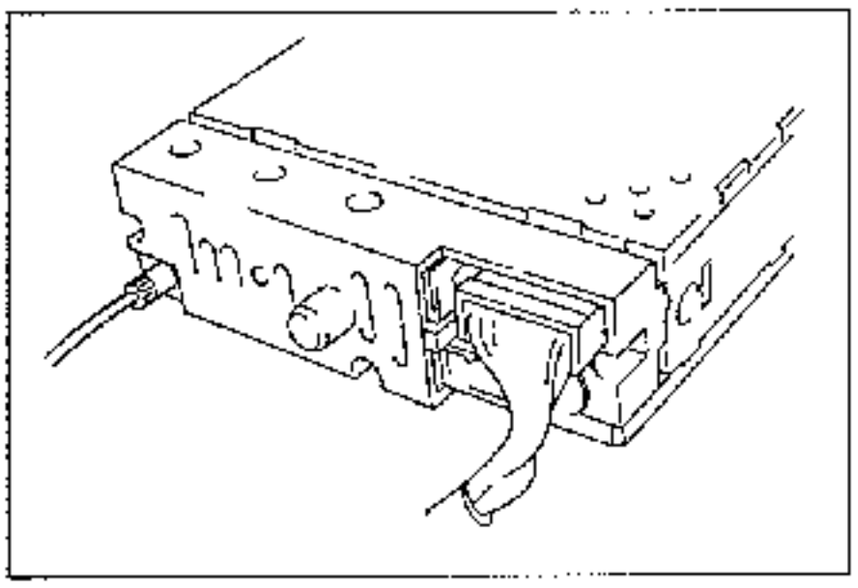
Step 1
Check for continuity between the antenna mast and ground.

Continuity	Action
Yes	Replace roof antenna
No	Go to Step 2



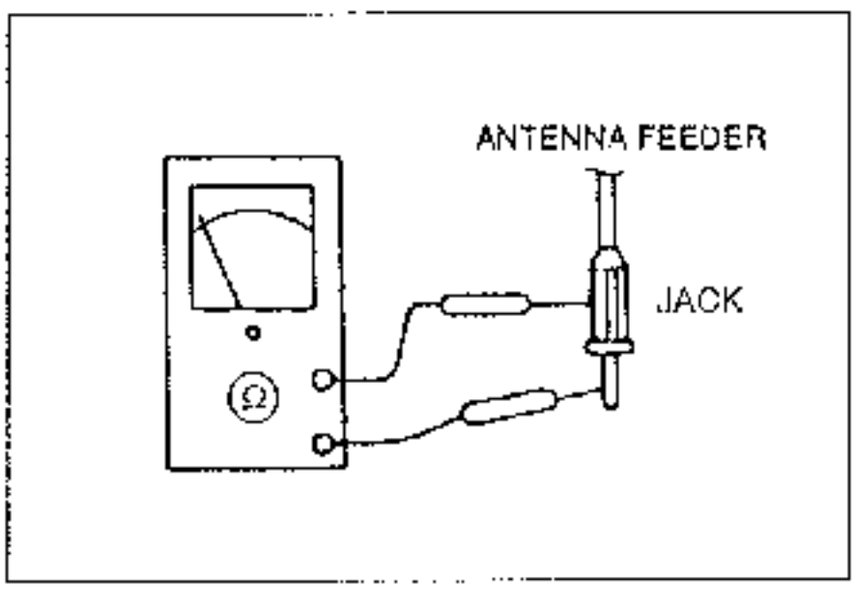
Step 2
Verify that the antenna base is securely installed.

Antenna base	Action
OK	Go to Step 3
Loose	Correct or reinstall



Step 3
1. Remove the audio unit. (Refer to page J–20.)
2. Verify that the antenna jack is properly connected.

Connection	Action
OK	Go to Step 4
Loose	Reconnect connector

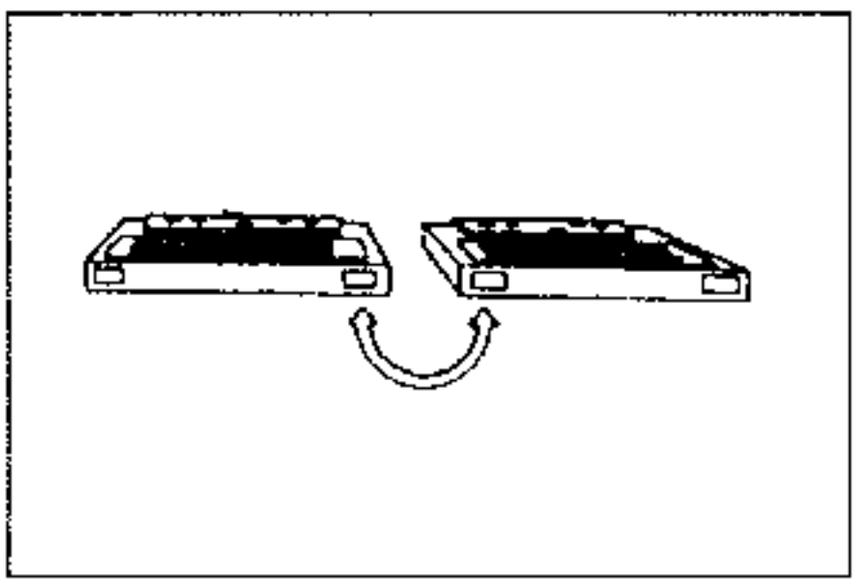


Step 4
1. Disconnect the antenna jack.
2. Check for continuity between the outer surface and at the center of the antenna jack.

Continuity	Action
Yes	Replace roof antenna
No	Replace audio unit

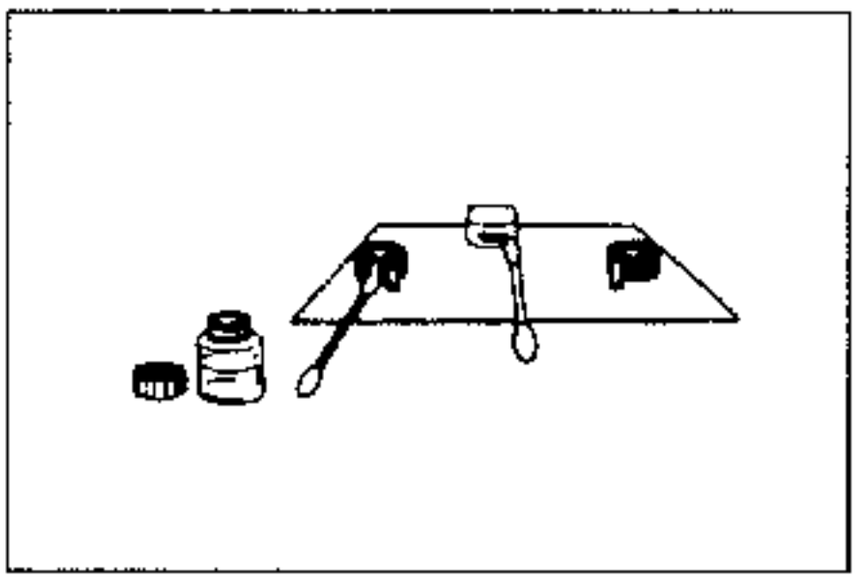
Flowchart No.4	Symptom	Poor sound quality only when cassette tape is played

Possible cause
- Damaged cassette tape
- Damaged audio unit
- Dirty heads and pinchroller



Step 1
Play a known good cassette tape and check the sound quality.

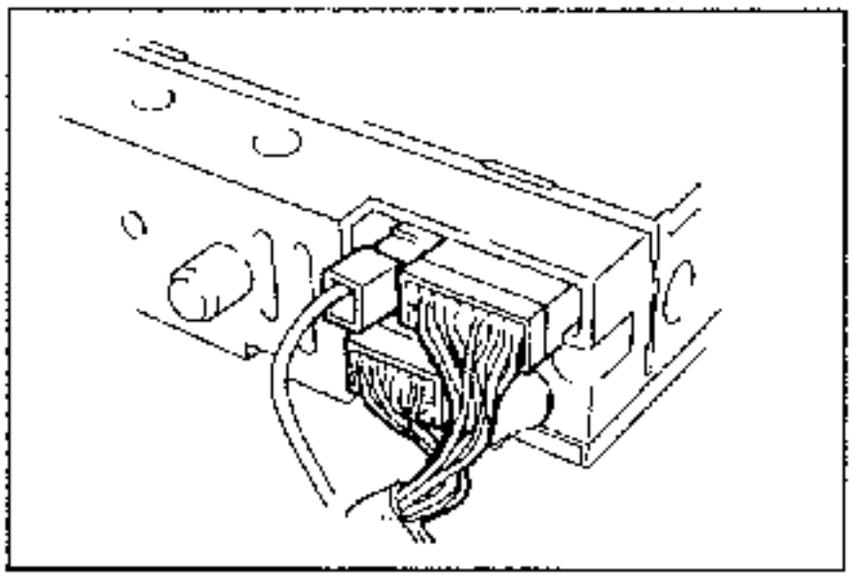
Sound quality	Action
Normal	Replace original cassette tape (audio unit OK)
Poor	Go to Step 2



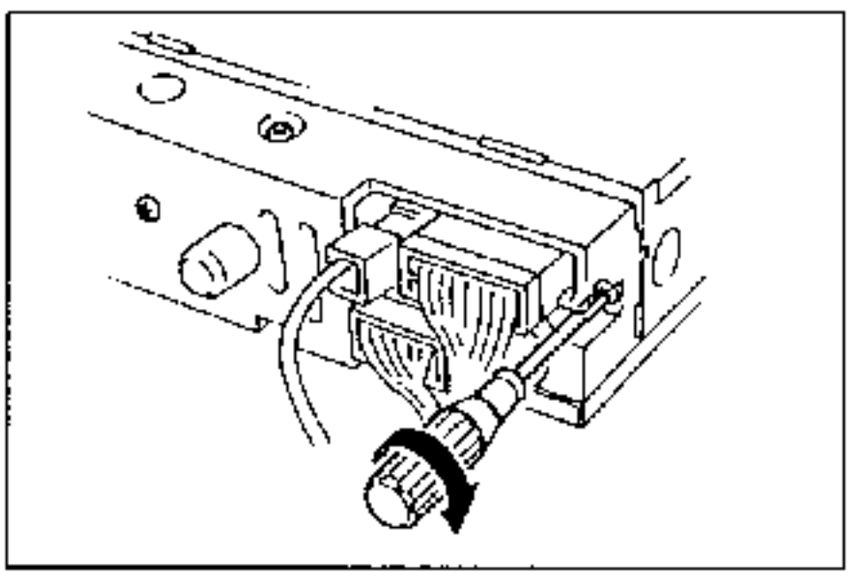
Step 2
1. Clean the heads and pinchroller by using a cassette tape player cleaning kit (commercially available).
2. Play the tape and check the sound quality.
3. If the sound quality is still poor, replace the audio unit.

Flowchart No.5	Symptom	Poor sound quality when radio or cassette tape is played

Possible cause
- Damaged speaker
- Open or short circuit in wiring harness
- Poor connection of connector

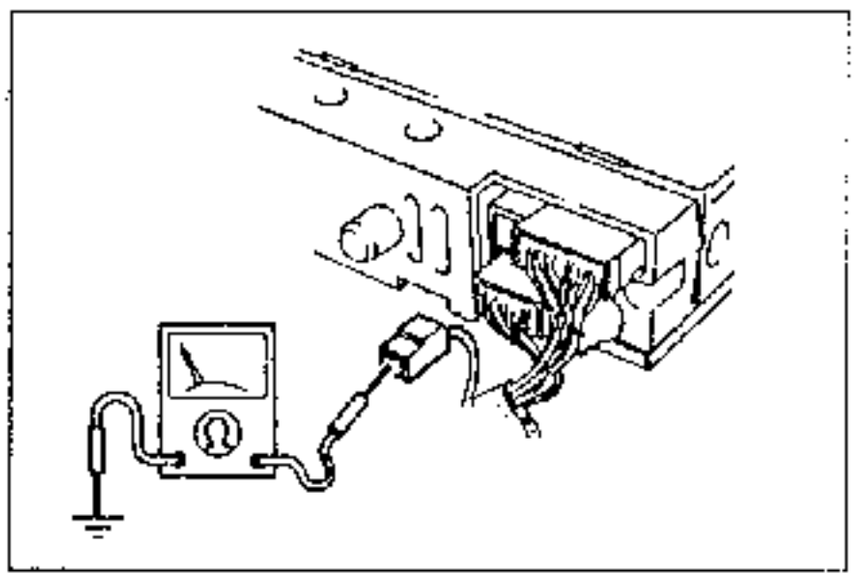


Step 1
1. Remove the audio unit. (Refer to page J–20.)
2. Verify that the audio unit conector is properly connected. Reconnect it if necessary.
3. If the connections are OK, go to Step 2.



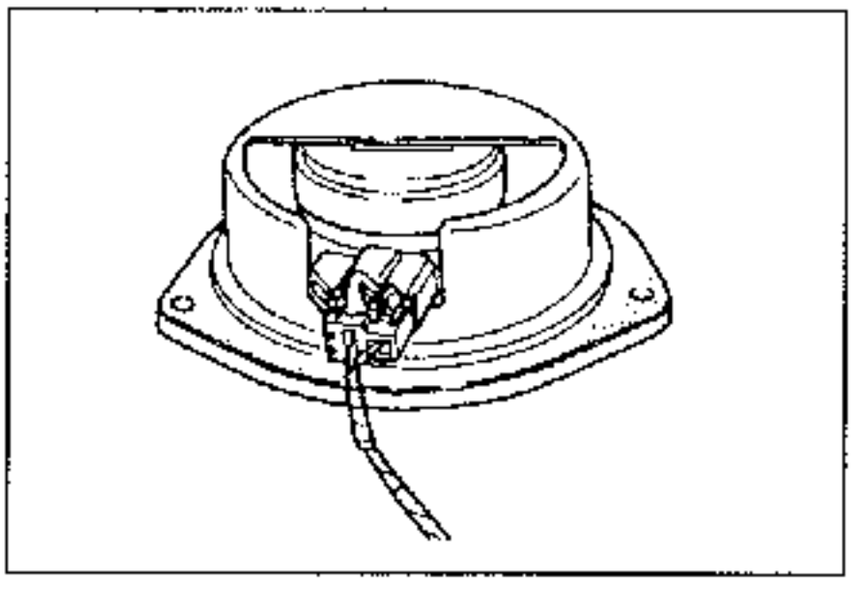
Step 2
Verify that the audio unit mounting screws are securely installed.

Screws	Action
OK	Go to Step 3
Loose	Tighten screws

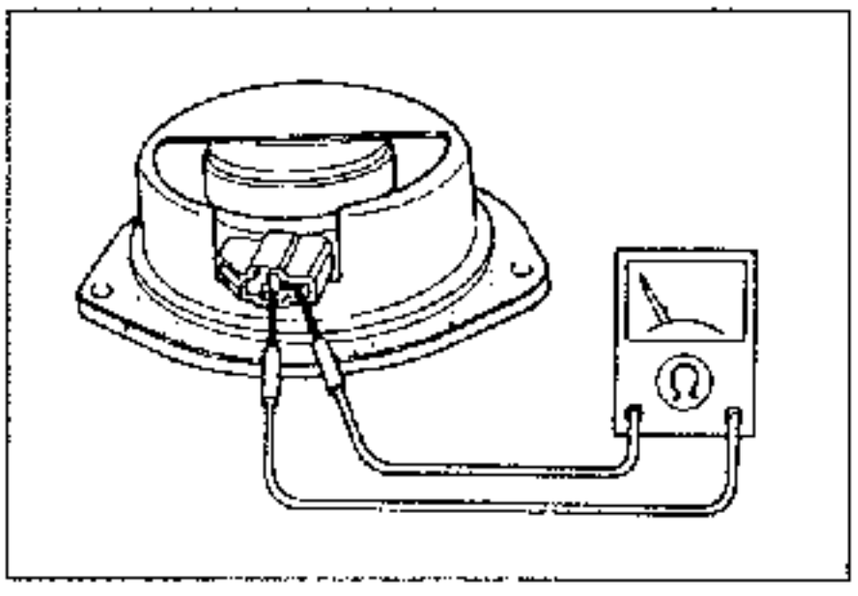


Step 3
1. Disconnect the audio unit connector.
2. Check for continuity between terminal 3A (B) of the audio unit connector and ground.

Continuity	Action
Yes	Go to Step 4
No	Repair wiring harness (Audio unit—GND)



Step 4
1. Remove the all speaker. (Refer to page J–20.)
2. Verify that the door speaker connector and rear speaker connector is properly connected. Reconnect it if necessary.
3. If the connection is OK, go to Step 5.



Step 5

1. Disconnect the speaker connector.
2. Measure the resistance between the terminals of the speaker.

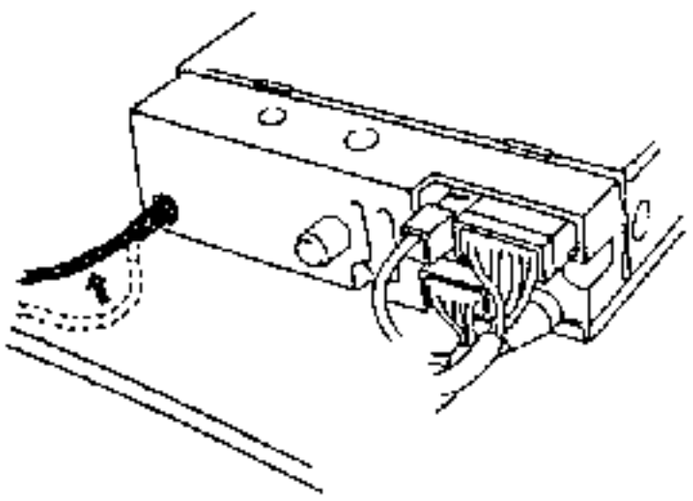
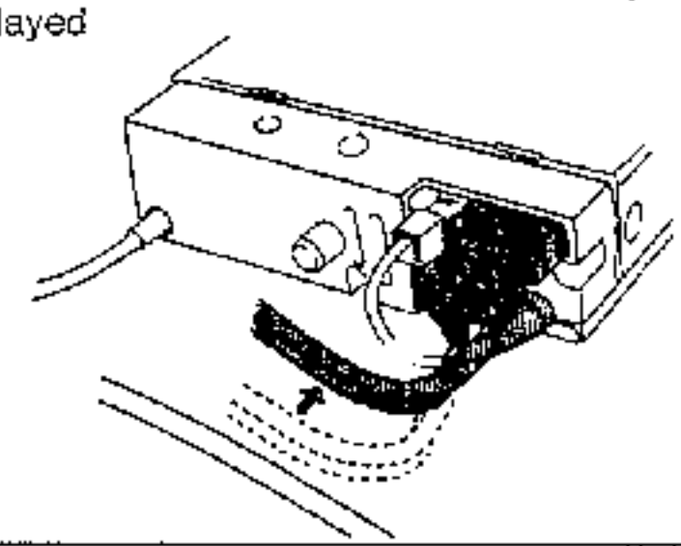
Speaker	Resistance
Door	3.6 Ω
Rear	4 Ω

3. If correct, repair the wiring harness (Audio unit—Speaker).
4. If not as specified, replace the speaker.

Flowchart No.6	Symptom	Noise occurs

Possible cause
- Defective or improperly installed audio unit
- Ambient noise
- Outside noise (vehicle-induced noise)

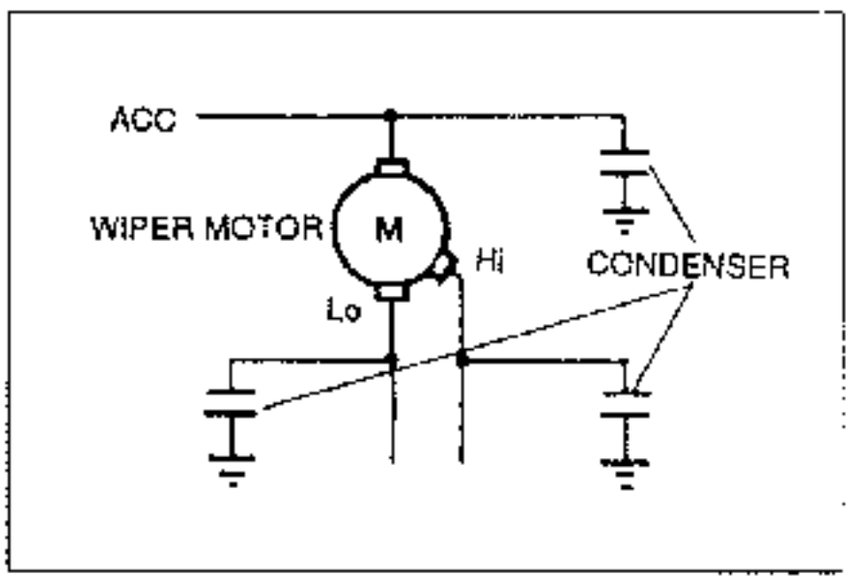
1. Defective or improperly installed audio unit

Problem	Action
Noise occurs only when radio is played 	1. Troubleshoot according to flowchart No.3. (Refer to page J–12.) 2. Secure audio unit antenna feeder away from other wiring harnesses.
Noise occurs only when cassette tape is played	Troubleshoot according to flowchart No.4. (Refer to page J–13.)
Noise occurs when radio or casselte tape is played 	1. Troubleshoot according to flowchart No.5. (Refer to page J–14.) 2. Secure harness between audio unit and speakers away from other wiring harnesses.

2. Ambient noise
   (1) Fading (AM)
   As the distance between the source and the receiver increases, AM radio waves from other sources, reflecting off the ionosphere, interfere with the original source radio waves. Reception strength is lowered and sound quality is reduced. This effect is called fading.
   (2) Fast fading (FM)
   Fast fading is noise or sound distortion caused by mountains or buildings obstructing the FM radio waves.
   (3) Multipath noise (FM)
   Multipath noise occurs when the radio antenna picks up a direct wave and a reflected wave at the same time.
   Since ambient noise is a temporary occurrence, it will be solved when vehicle location changes.

3. Outside noise (vehicle-induced noise)

Name of noise		Condition
Noise when engine is started	Fuel pump noise	Noise occurs immediately after ignition switch is turned to ON
	Ignition noise	Consecutive noise Tone changes when acceleration pedal is depressed
	Alternator noise	Whizzing noise occurs when acceleration pedal is depressed
Noise when electrical parts are operated	Wiper motor noise	Howling noise occurs synchronized with wiper operation
	Washer motor noise	Noise occurs when window washer is operated
	Power window noise	Noise occurs when power window is operated
	Fan motor noise	Noise occurs when fan is operated
	Stoplight noise	Noise occurs at beginning or end of brake operation
	Turn signal noise	Clicking noise occurs synchronized with signal flash
	Horn switch noise	Whizzing noise occurs when acceleration pedal is depressed
	Air conditioner noise	Howling noise occurs when air conditioner is operated



Although it is difficult to eliminate these noises, they can be reduced by installing a noise suppressor or noise-preventive capacitor near the electrical system which emits the noise current. For example, to reduce wiper motor noise, install noise-preventive capacitors near the wiper motor. If there is no change after installing the capacitors, make sure the circuit is properly ground.

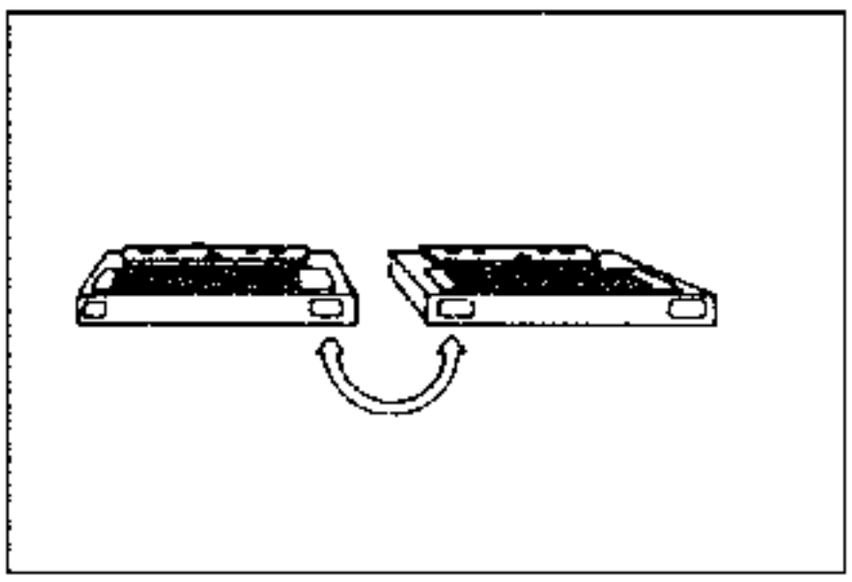
Flowchart No.7	Symptom	Cassette tape does not unload or reverse function works unintentionally

Note
- A loosely wound or stretched cassette tape can become tangled in the cassette deck and make unloading impossible.

Problem	Possible cause	Action
Cassette tape playback not possible (eject function works normally)	1. Cassette tape is cut	Use good cassette tape
	2. Cassette tape is loosely wound	Eliminate sag in cassette tape by using pencil
	3. Cassette tape is stretched	Use good cassette tape
Cassette tape cannot be ejected	1. Cassette tape playback/fast-forward/ rewind notpossible (Cassette label is peeled off and is keeping cassette caught in system) (Damaged cassette deck)	Contact sales shop
	2. Only cassette deck does not operate (Cassette tape is tangled in system) (Damaged cassette deck)	
Reverse function works unintentionally	Cassette tape roughly wound	Fast forward or rewind cassette tape to wind it uniformly and firmly

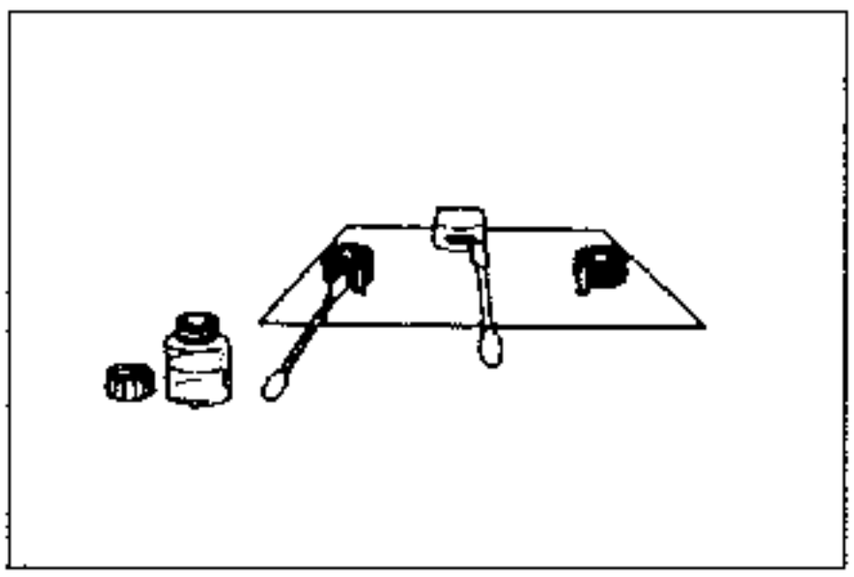
Flowchart No.8	Symptom	Cassette tape does not load or playback is not possible

Possible cause
- Damaged cassette tape
- Damaged audio unit
- Open or short circuit in wiring harness
- Poor connection of connector

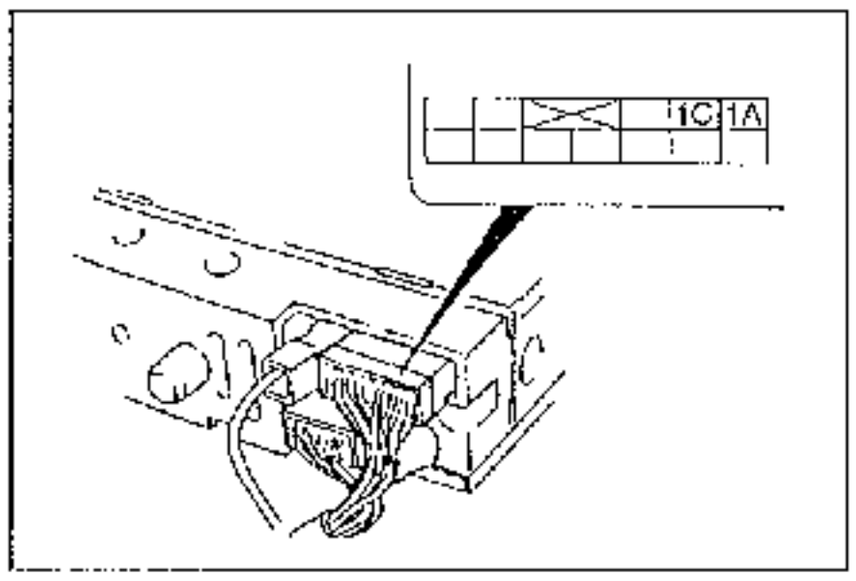


Step 1
Replace the cassette tape with a known good one and verify that the tape loads and operates normally.

Original tape	Good tape	Action
Does not load	Does not load	Go to Step 3
	Loads	Replace original cassete tape (system OK)
Does not play	Does not play	Go to Step 2
	Plays	Replace original cassette tape (system OK)



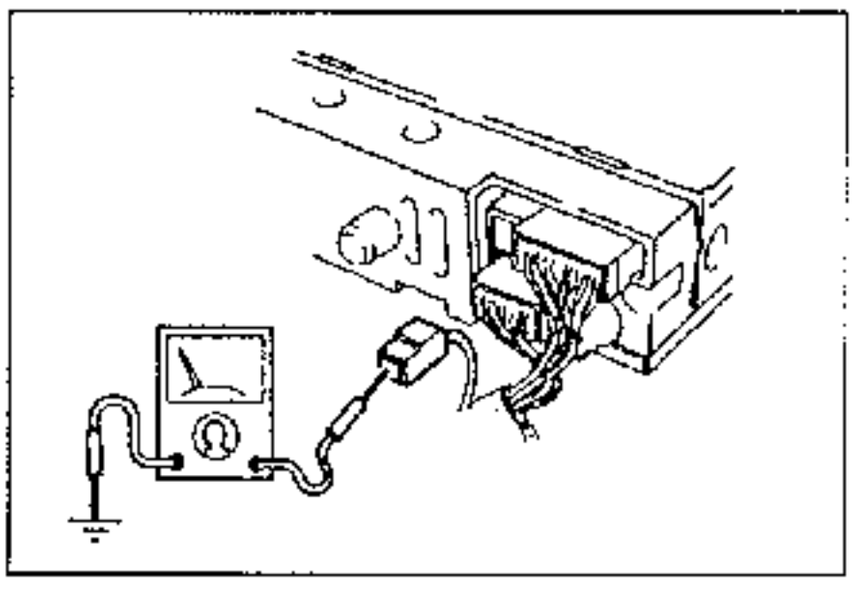
Step 2
1. Clean the heads and pinchroller by using a cassette tape player cleaning kit (commercially available).
2. Play the cassette tape and check the sound quality.
3. If the cassette tape still does not play, go to Step 3.



Step 3
1. Turn the ignition switch to ACC.
2. Measure the voltage at the terminals of the audio unit connector.

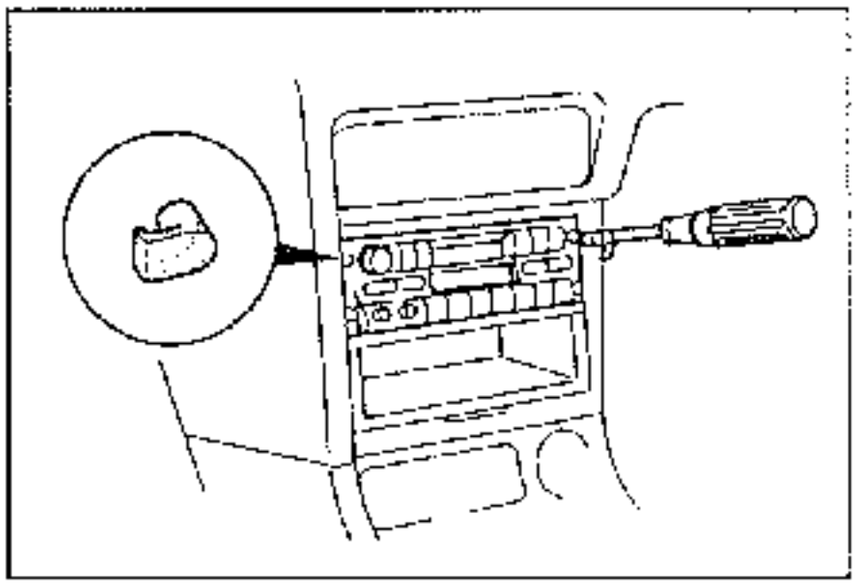
B+: Battery positive voltage

Terminal	Voltage	Action
1A	B+	Measure voltage at terminal 1C
	Other	Repair wiring harness (RADIO 15 A fuse—Audio unit)
1C	B+	Turn ignition switch to LOCK and go to Step 4
	Other	Repair wiring harness (ROOM 15 A fuse—Audio unit)



Step 4
1. Disconnect the audio unit connector.
2. Check for continuity between terminal 3A (B) of the audio unit connector and ground.

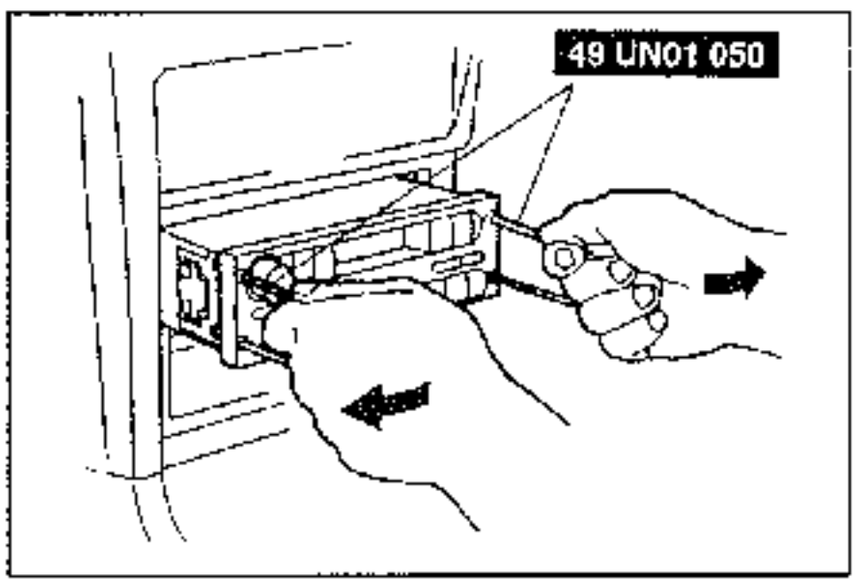
Continuity	Action
Yes	Replace audio unit
No	Repair wiring harness (Audio unit—GND)



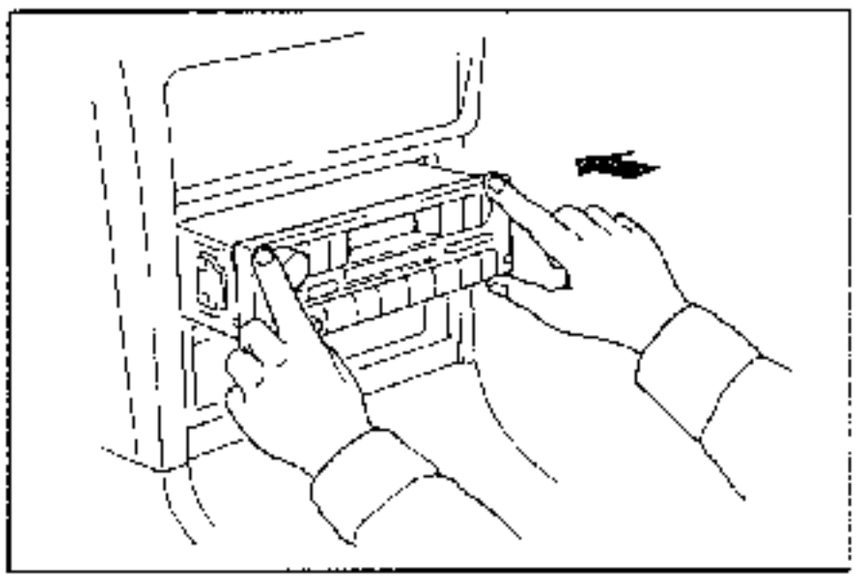
AUDIO UNIT

Removal

1. Pry out the audio unit service hole covers by using a protected screwdriver. Keep the hole covers for reinstallation.

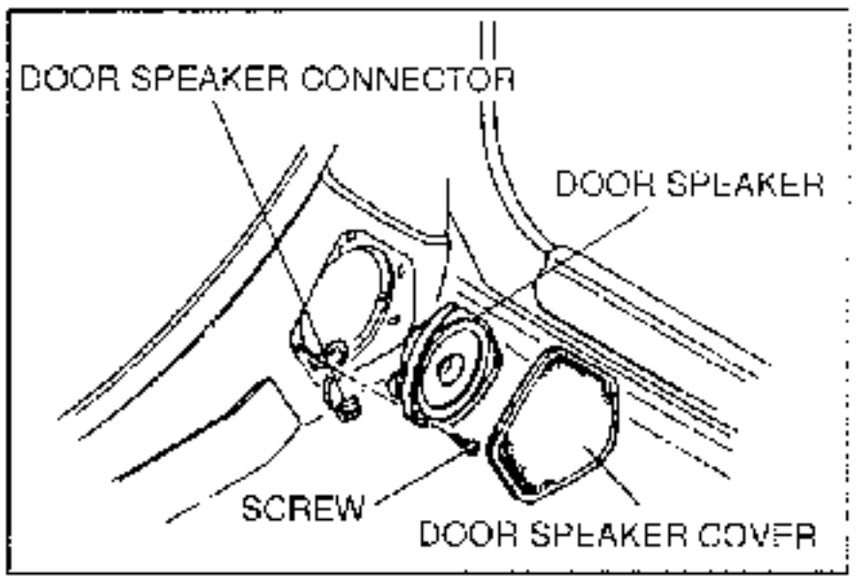


2. With the beveled parts of the **SST** facing inward, insert them into the audio unit.
3. Pull the **SST** outward and rearward to side out the audio unit.
4. Disconnect the connector and antenna jack.



Installation

1. Install the audio unit service hole covers.
2. Connect the audio unit connectors and antenna jack.
3. Insert the audio unit until each clip clicks. Verify that the wiring harness and antenna feeder are not caught between the audio unit and the dashboard.

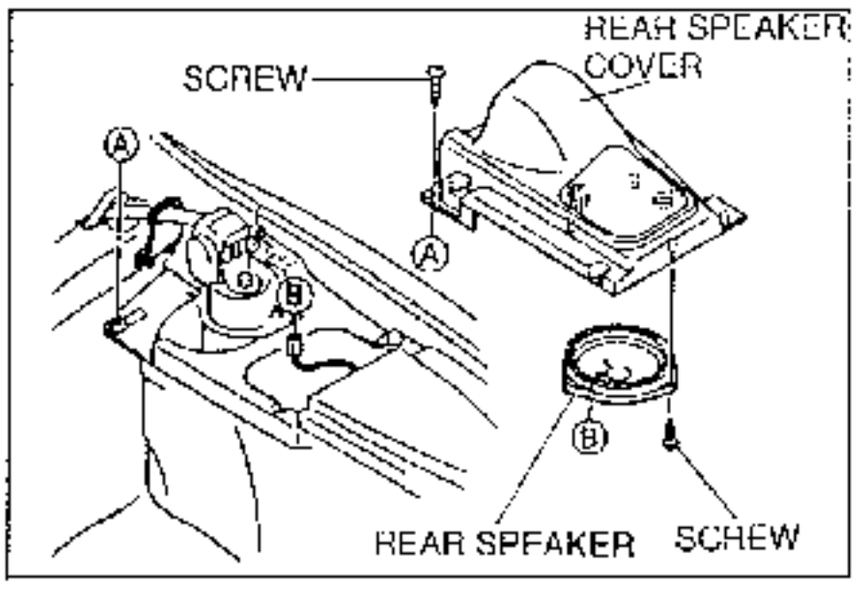


SPEAKER

Removal / Installation

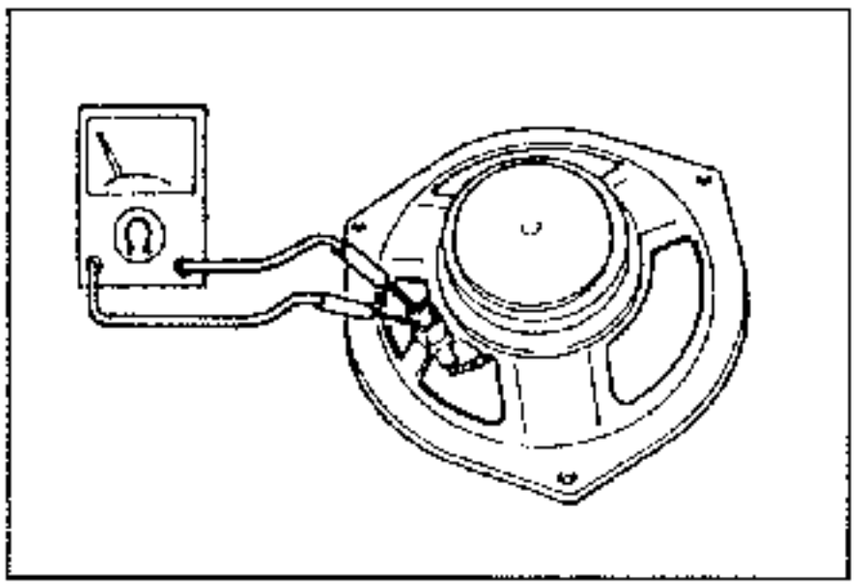
Door speaker

1. Remove the door speaker cover by using a protected screwdriver.
2. Remove the 3 screws and the door speaker.
3. Install in the reverse order of removal.



Rear speaker

1. Remove the rear speaker cover.
2. Remove the 3 screws and the rear speaker.
3. Install in the reverse order of removal.



Inspection

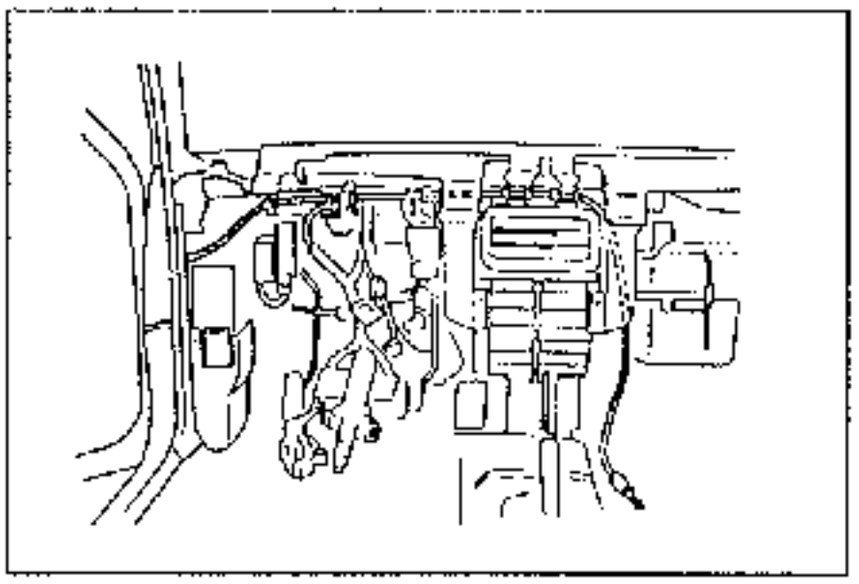
1. Measure the resistance between the speaker terminals.

   Door speaker: 3.6 Ω
   Rear speaker: 4 Ω

2. Touch the leads of an ohmmeter to the speaker terminals and verify that the speaker clicks.

   Range: × 1 Ω

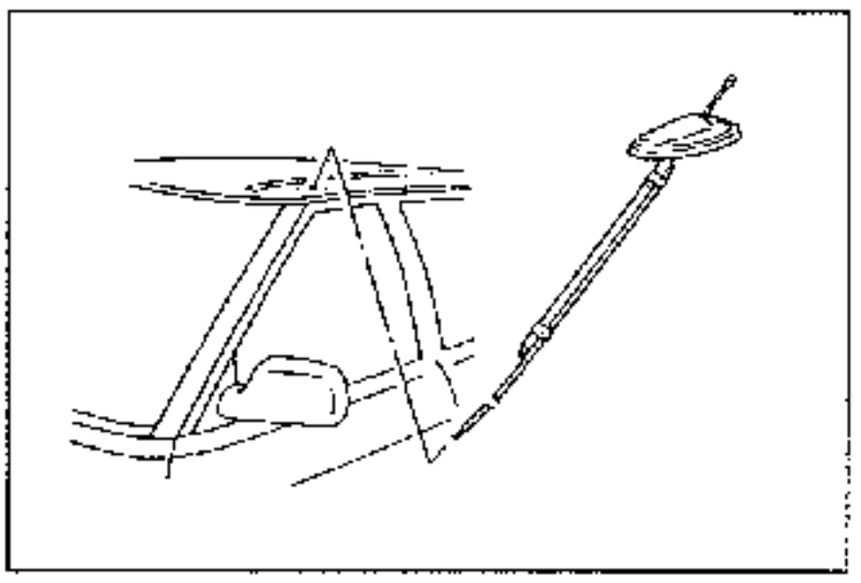
3. If not as specified, replace the speaker.



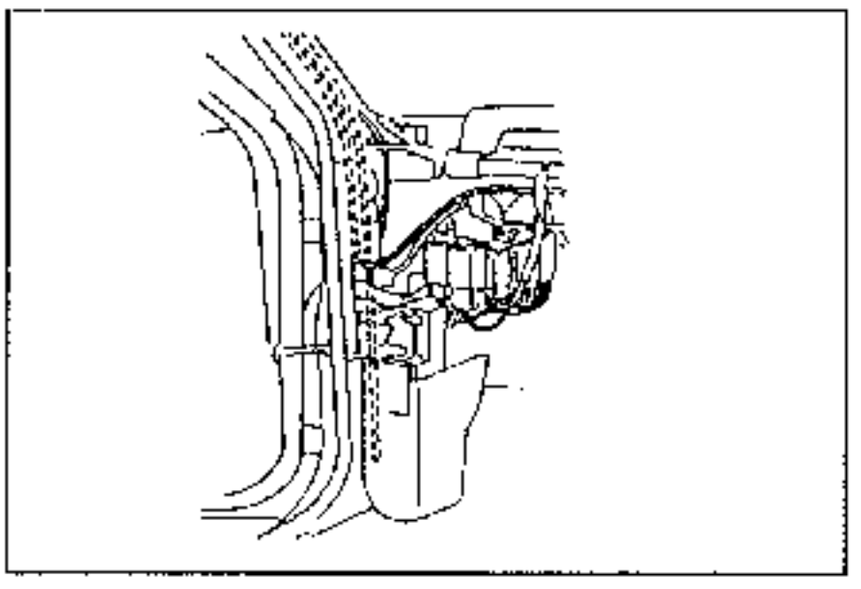
ROOF ANTENNA

Removal

1. Remove the dashboard.
   (Refer to the 1995 MX-3 Workshop Manual, section S.)
2. Remove the front side trim.

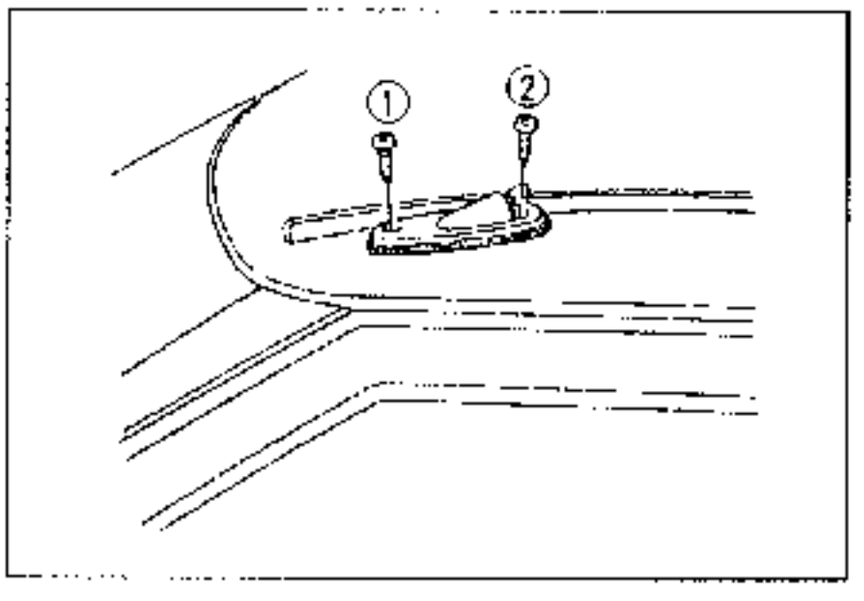


3. Remove the antenna feeder from the clip.
4. Remove the screws and the antenna assembly.

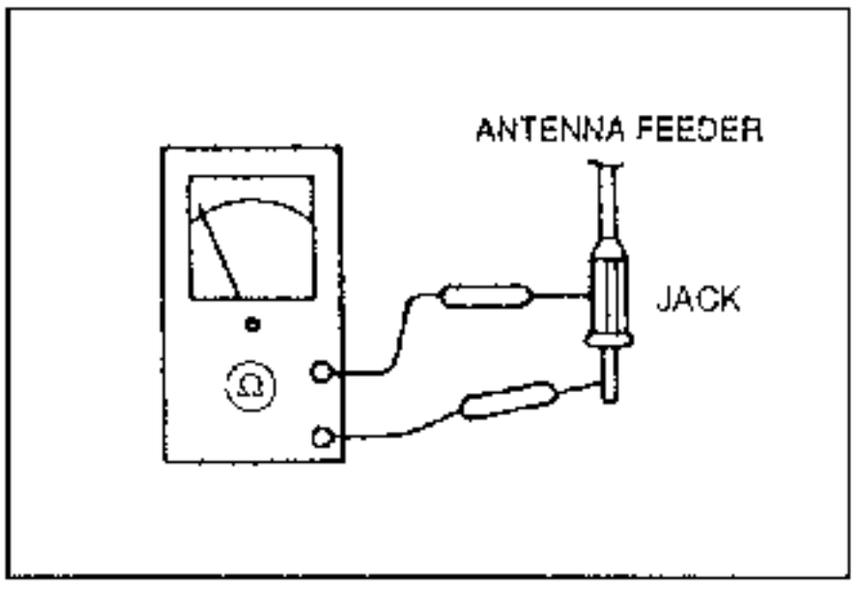


Installation

1. Extend the antenna. Insert the antenna feeder and the drain pipe through the hole in the roof toward the front pillar.
2. Fix the antenna feeder.



3. Install the antenna base in the order shown in the figure.



Inspection

1. Disconnect the antenna jack.
2. Measure the resistance at the antenna jack terminals.

   Resistance: Infinite

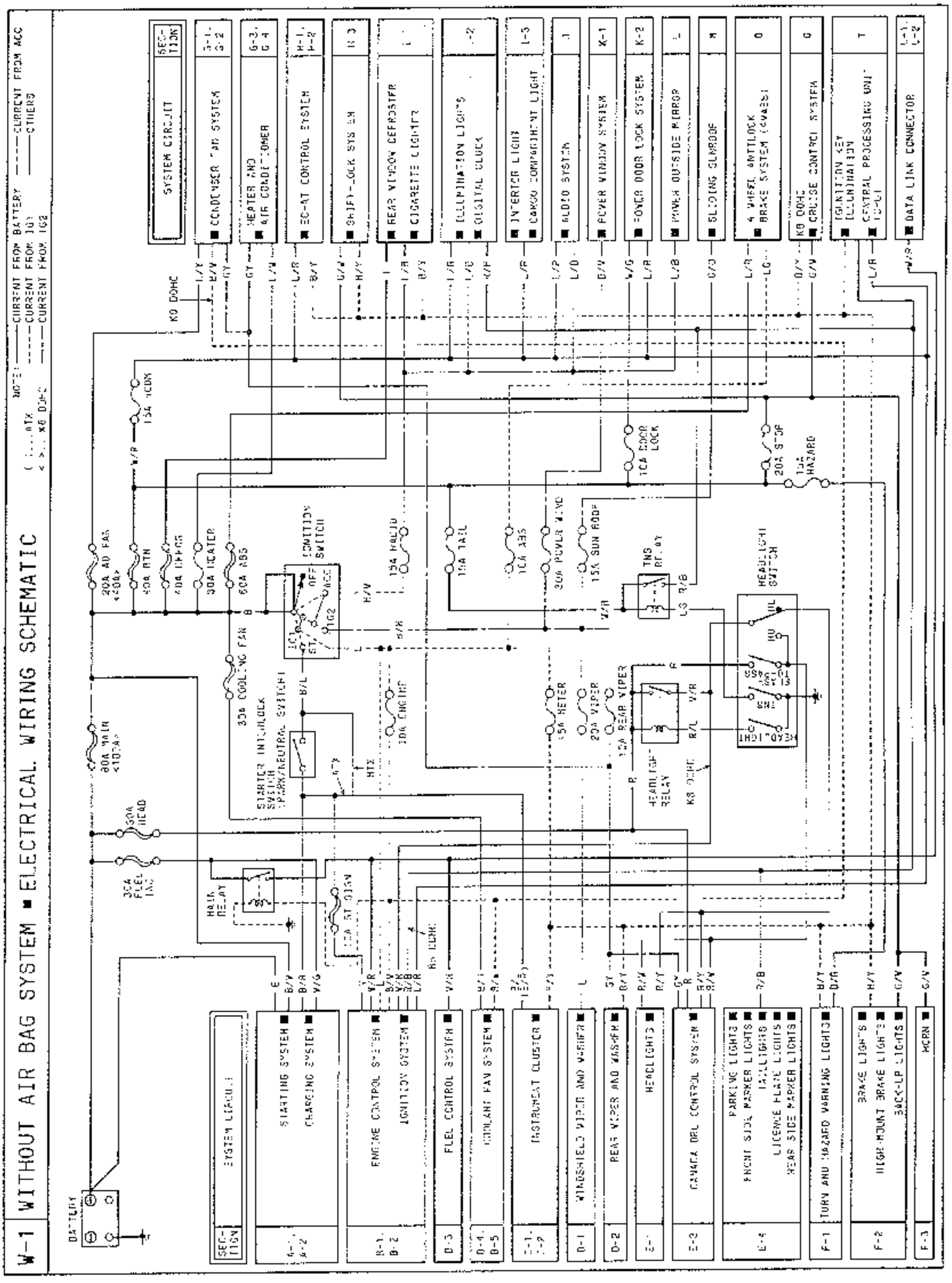
3. If not as specified, replace the antenna feeder.

ELECTRICAL
WIRING SCHEMATIC

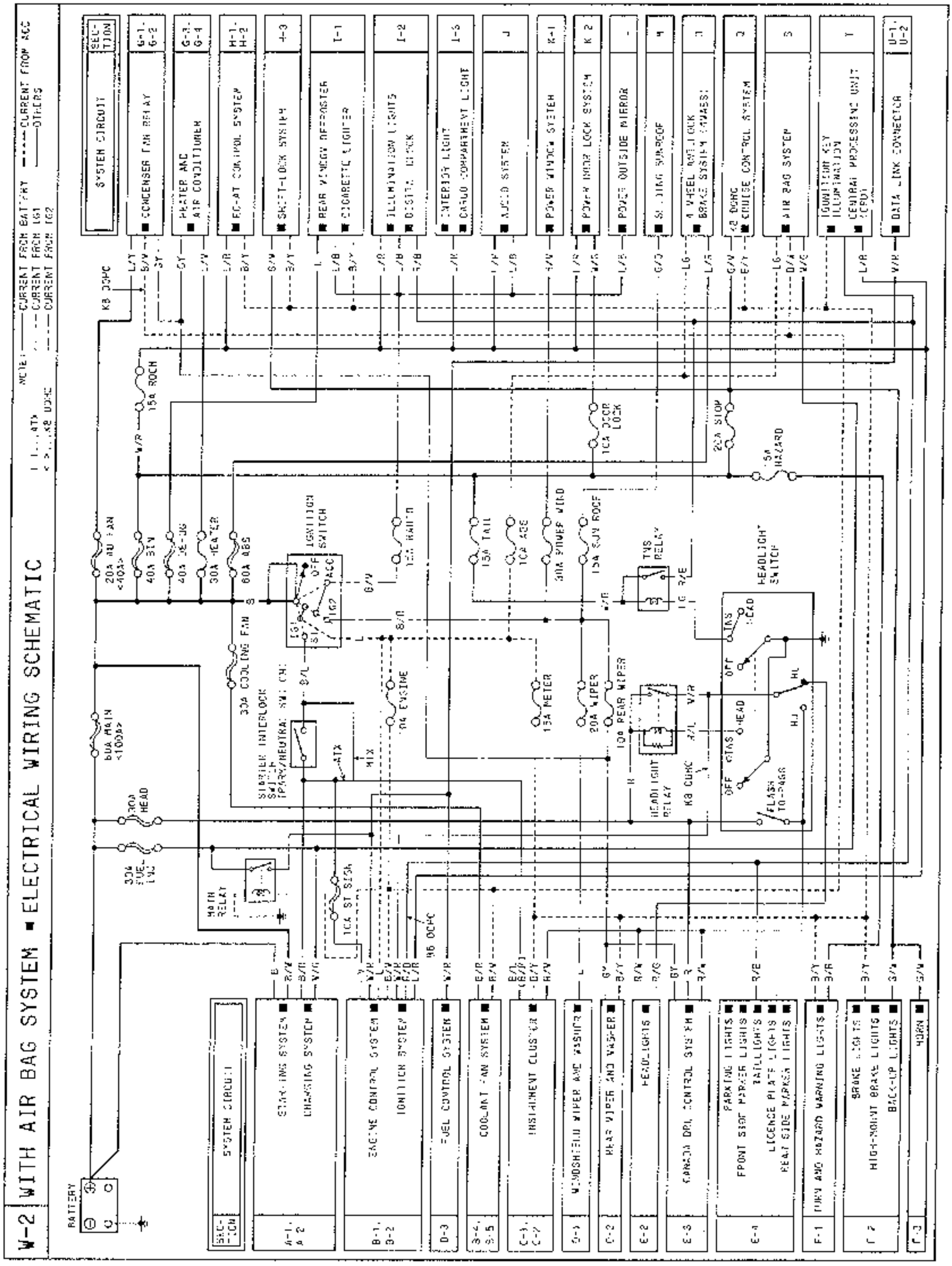
B6 ENGINE ..... W– 2
K8 ENGINE ..... W– 3

ELECTRICAL WIRING SCHEMATIC

B6 ENGINE

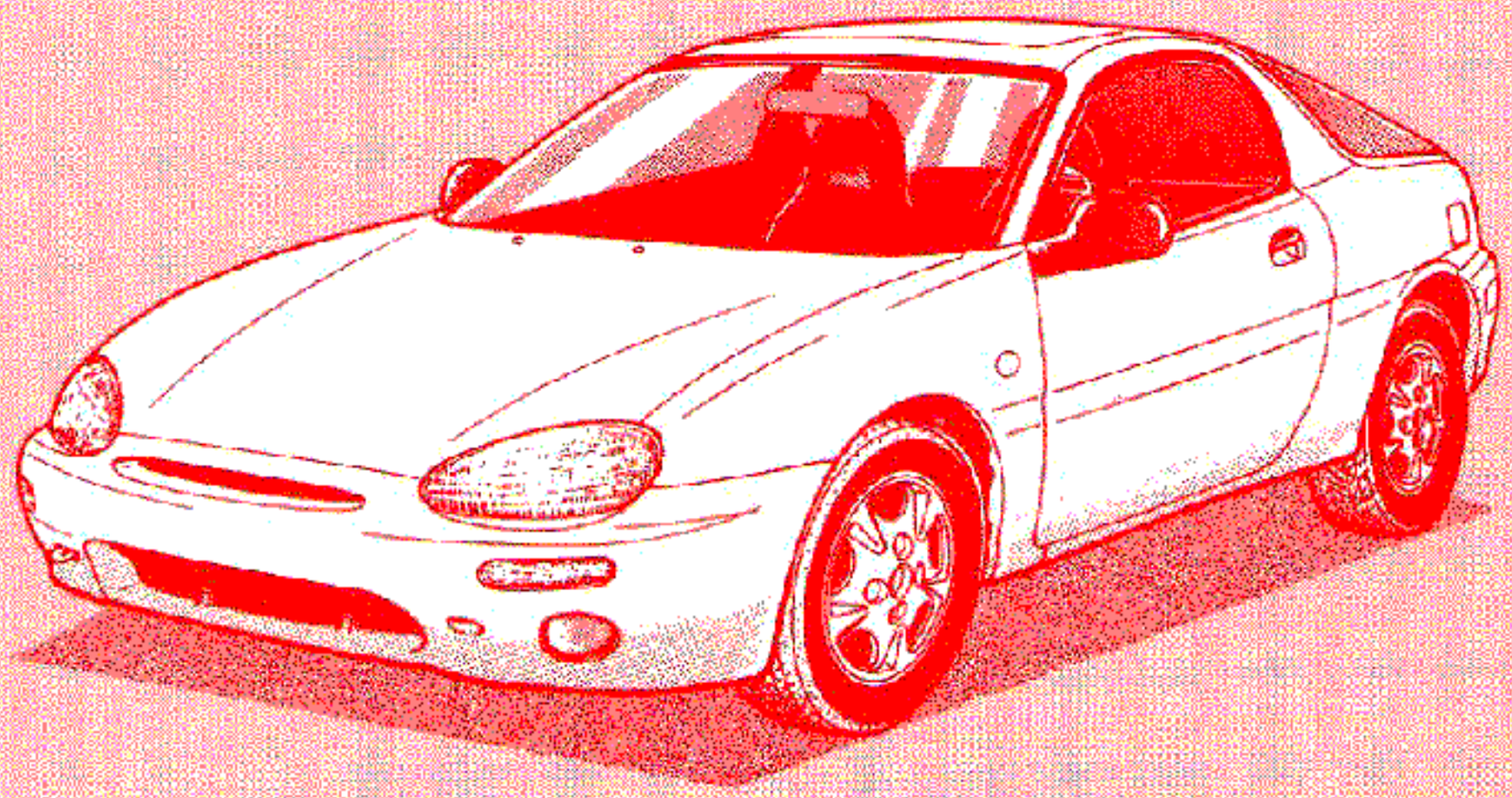


K8 ENGINE


W-2 WITH AIR BAG SYSTEM ■ ELECTRICAL WIRING SCHEMATIC
K8 DOHC
15A ROCH
20A RR FAN
40A STV
30A HEATER
60A ABS
IGNITION SWITCH
15A TAIL
10A ACC
30A POWER WIND
15A SUN ROOF
TNS RELAY
HEADLIGHT SWITCH
10A DOOR LOCK
20A SLOW
5A HAZARD
80A MAIN
30A COOLING FAN
SHIFT/NEUTRAL SW
30A HEAD
15A METER
20A WIPER
10A REAR WIPER
HEADLIGHT RELAY
30A SUB-TWS
HORN RELAY
10A ST SIGN
BATTERY
SYSTEM CIRCUIT
STARTING SYSTEM
CHARGING SYSTEM
ENGINE CONTROL SYSTEM
IGNITION SYSTEM
FUEL CONTROL SYSTEM
COOLANT FAN SYSTEM
INSTRUMENT CLUSTER
WINDSHIELD WIPER AND WASHER
REAR WIPER AND WASHER
HEADLIGHTS
CARGO DOOR CONTROL SYSTEM
PARKING LIGHTS
FRONT SIDE MARKER LIGHTS
TAILLIGHTS
LICENSE PLATE LIGHTS
REAR SIDE MARKER LIGHTS
TURN AND HAZARD WARNING LIGHTS
BRAKE LIGHTS
HIGH-MOUNT BRAKE LIGHTS
BACK-UP LIGHTS
HORN
CURRENT FROM BATTERY
CURRENT FROM IG1
CURRENT FROM IG2
CURRENT FROM ACC
OTHERS

Mazda MX-3

1995 Wiring Diagram



mazda

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1995
Mazda MX-3
Wiring Diagram

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GROUND POINTS — Y

ELECTRICAL WIRING SCHEMATIC — W

SYSTEM CIRCUIT DIAGRAM/ CONNECTOR LOCATIONS — A~U

COMMON CONNECTORS — X

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PARTS LOCATION — PL

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FOREWORD

This wiring diagram incorporates the wiring schematics of the basic vehicle and available optional equipment. Actual vehicle wiring may vary slightly depending on optional equipment or local specifications, or both. All information in this booklet is based on information available at the time of printing. Mazda Motor Corporation reserves the right to make changes without previous notice.

Mazda Motor Corporation
HIROSHIMA, JAPAN

APPLICATION:
This manual applies to vehicles beginning with the Vehicle Identification Numbers (VIN) on the following page.

PRINTED IN USA, JULY '94
5330-10-94G

VEHICLE IDENTIFICATION NUMBERS (VIN) (CHASSIS NUMBER)

JM1 EC433*S0 400001~
JM1 EC434*S0 400001~

WIRING COLOR CODE

Color	Code	Color	Code
Blue	L	Orange	O
Black	B	Pink	P
Brown	BR	Red	R
Dark Blue	DL	Purple	PU
Dark Green	DG	Sky Blue	SB
Green	G	Tan	T
Gray	GY	White	W
Light Blue	LB	Yellow	Y
Light Green	LG	Violet	V
Natural	N		

GENERAL INFORMATION

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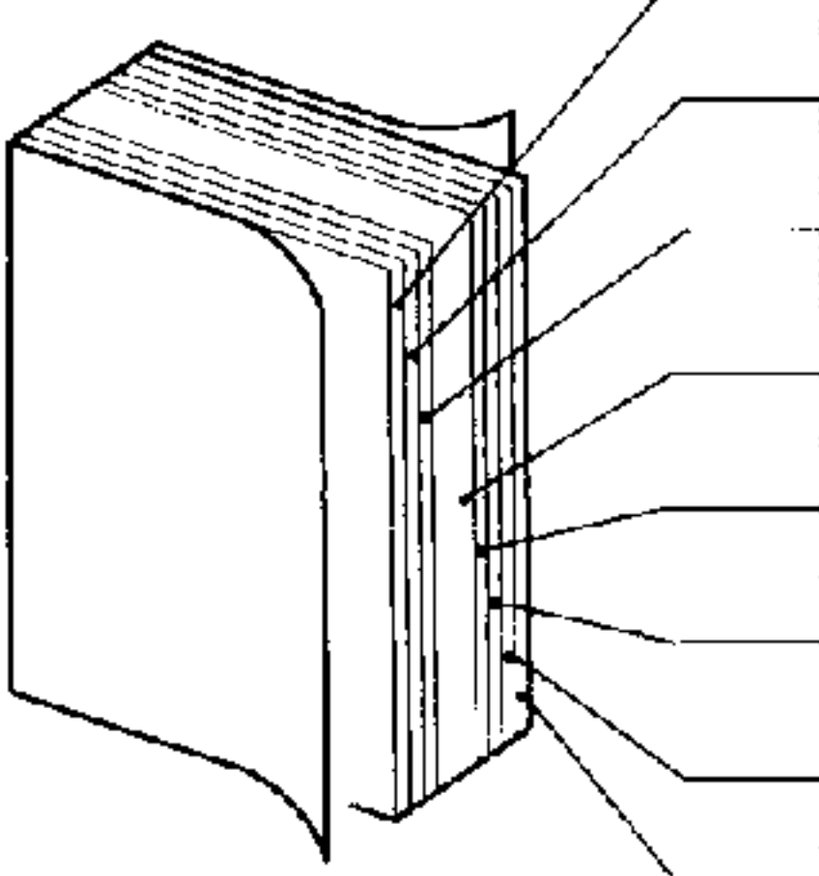
Contents of wiring diagrams

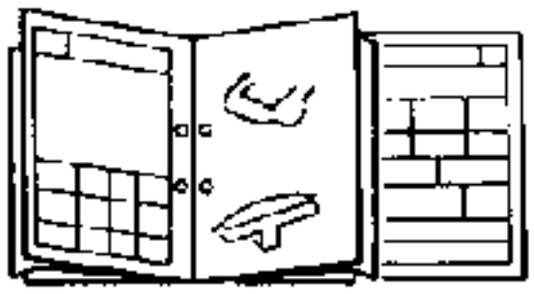
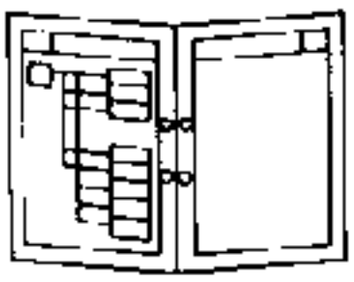
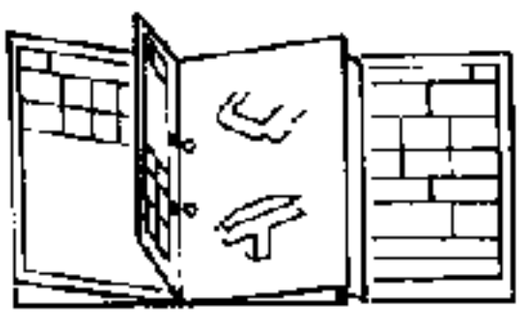
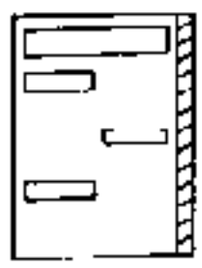
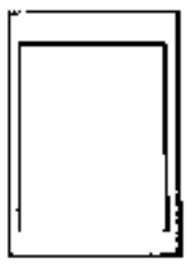
- This document comprises the 8 groups shown below. The main components are summarized in the components location diagram at the end of the document.



GI	General information	A how-to on using and reading wiring diagrams, using test equipment, checking harnesses and connectors, and finding trouble spots
Y	Ground points	Ground routes from and to the battery
W	Electrical wiring schematics	Shows main fuses and other fuses for each system
A~U	Circuit diagrams for individual systems	Shows circuit and connector diagrams and component and connector location diagrams
X	Common connectors	Shows connectors common throughout system
JB	Joint box complete wiring system	Shows internal circuits and connectors
PL	Parts location	Shows location of major electrical parts
PI	Index	Gives page number of circuit diagram for each component

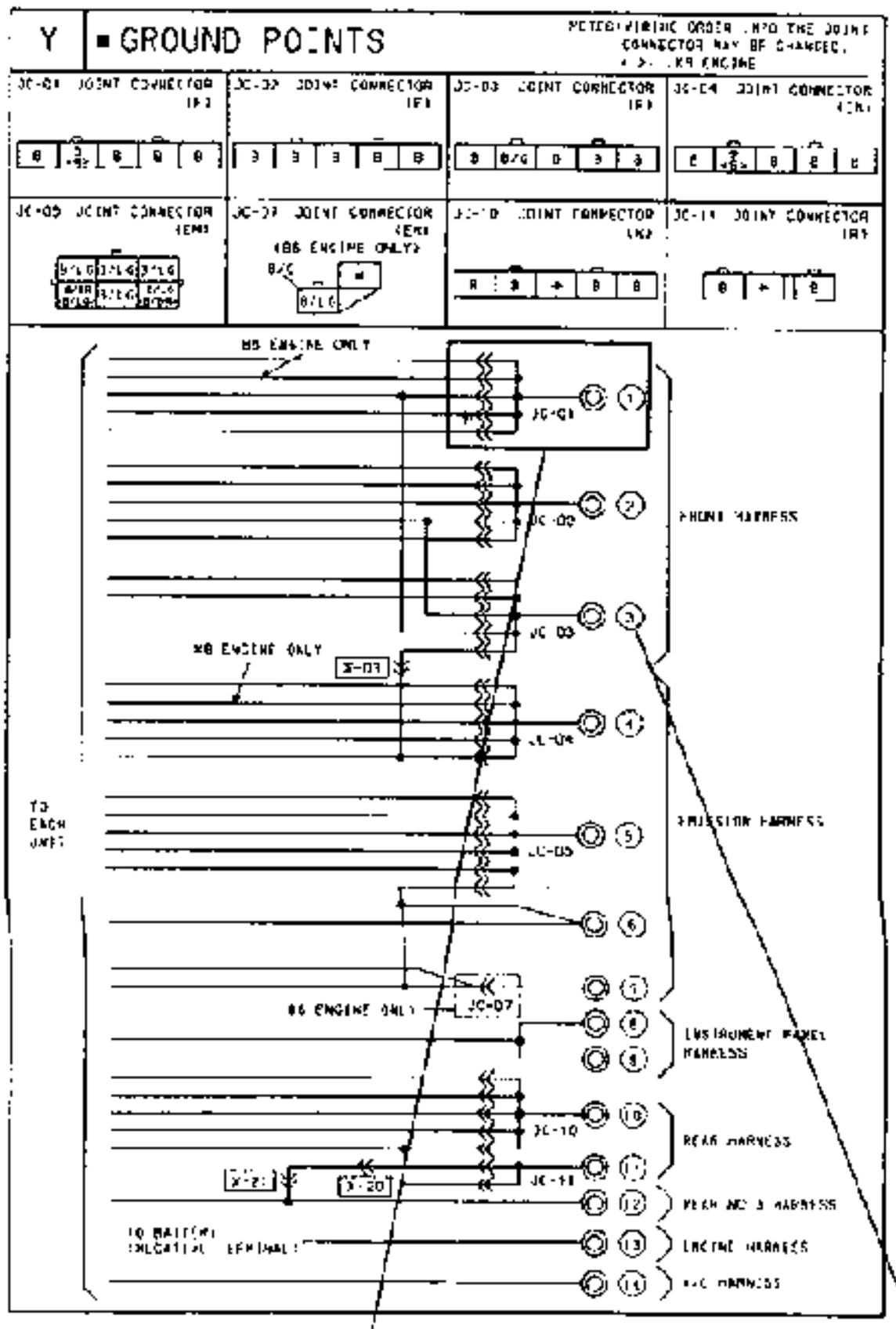
Using wiring diagrams

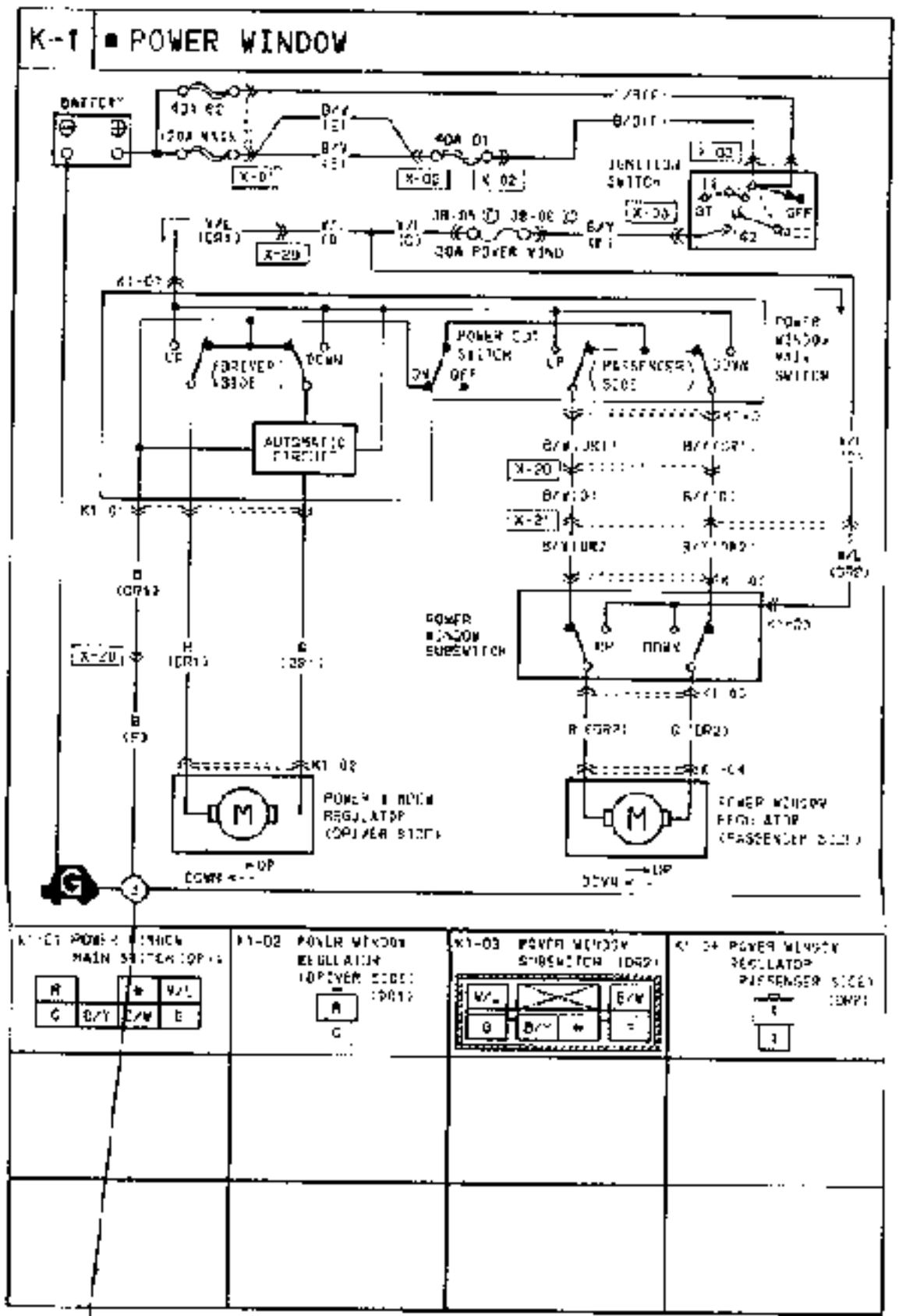
- The use of the wiring diagram depends on its application.

Application	Use	Application	Use
For checking circuits of individual systems	 Open to page with circuit diagram and harness routing to be used and fold out common connector diagram or joint box diagram.	For checking fuse connections	 Open to electrical wiring schematic.
For checking ground circuit of individual systems	 Open to page with ground point diagram and fold out common connector diagram or joint box diagram.	For finding page numbers of systems and components	Parts Index  or System Index  Open to parts index or system index.

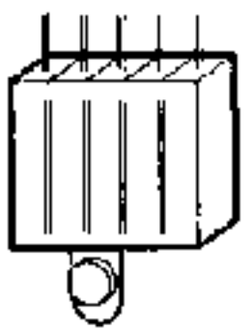
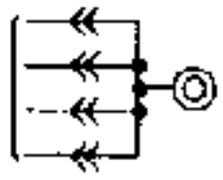
Ground points

- This shows ground points of the harness.





Ground indication

On vehicle	Indication
	To circuit 

On circuit diagrams and ground points

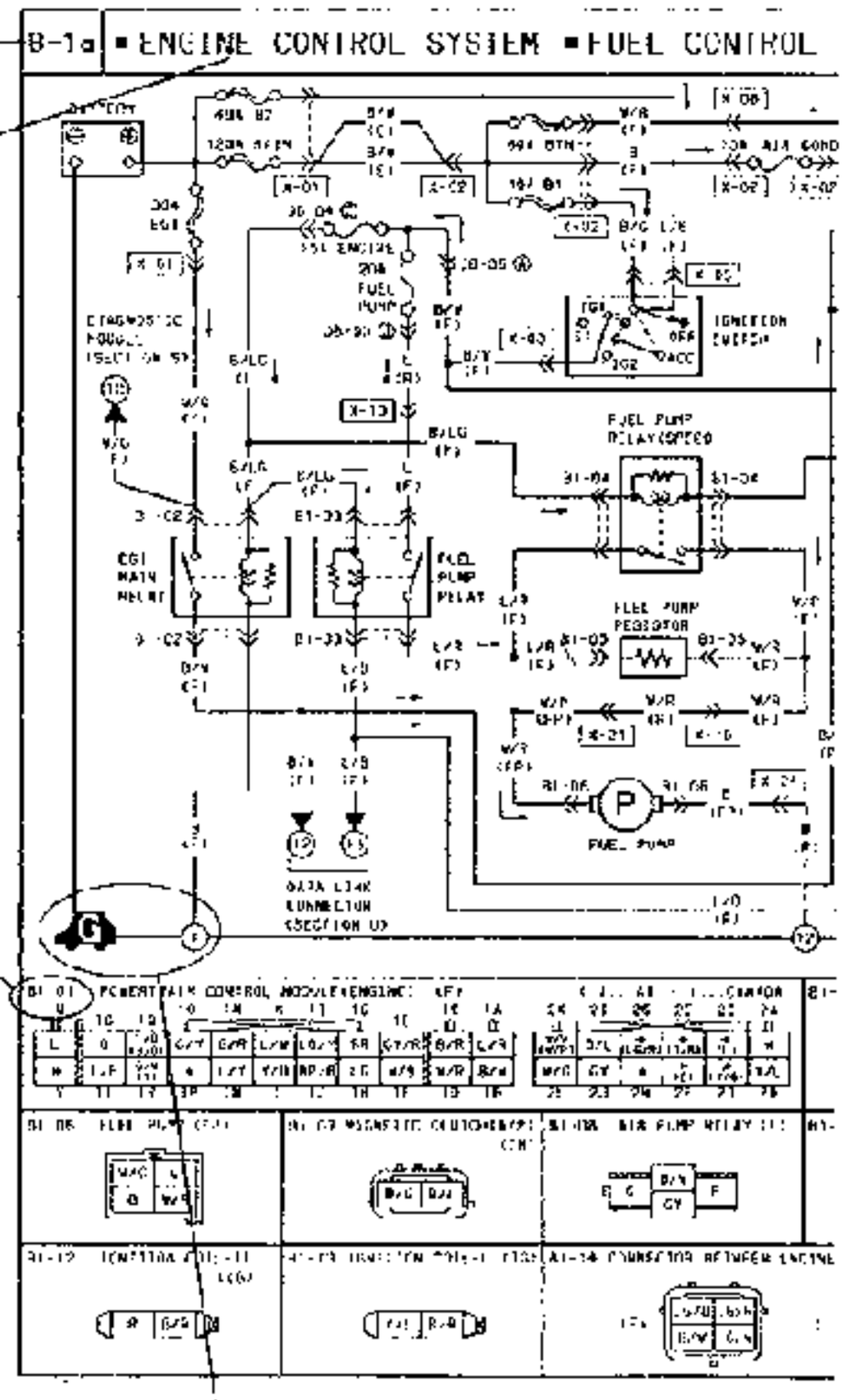
The ground connection numbers in system circuit diagrams correspond to those in the ground point diagram.

System circuit diagram/connector diagram

- These show the circuits for each system, from the power supply to the ground. The power supply side is on the upper part of the page, the ground side on the lower part. The diagrams describe circuits with the ignition switch off.
Below is an explanation of the various points in the diagram.

System code

System name



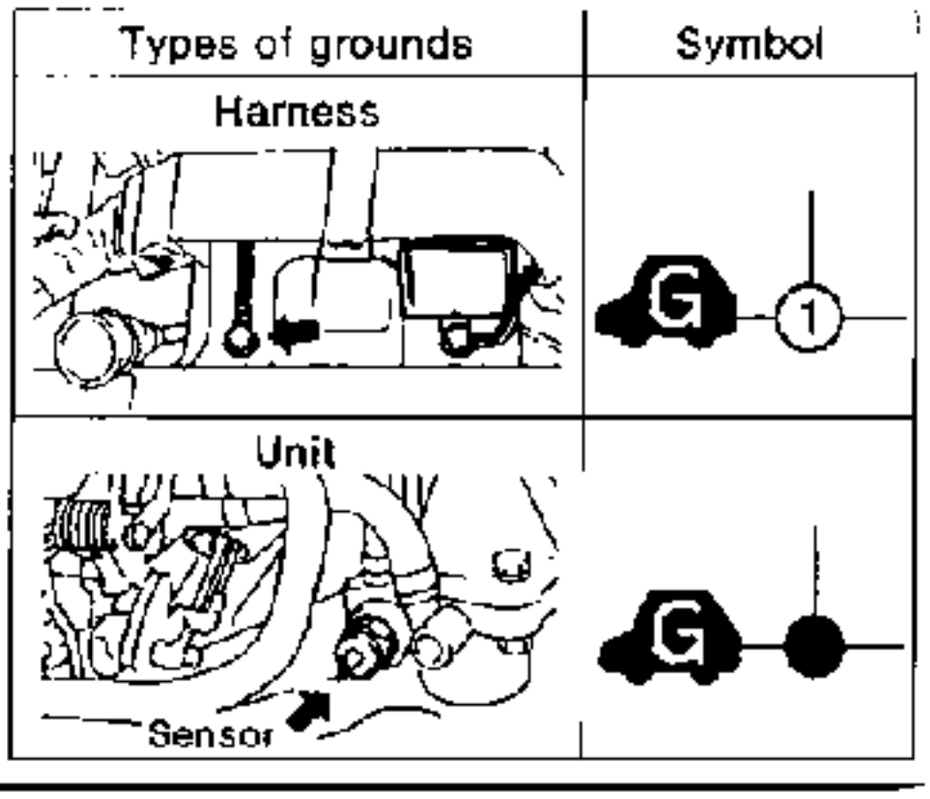
Connector code

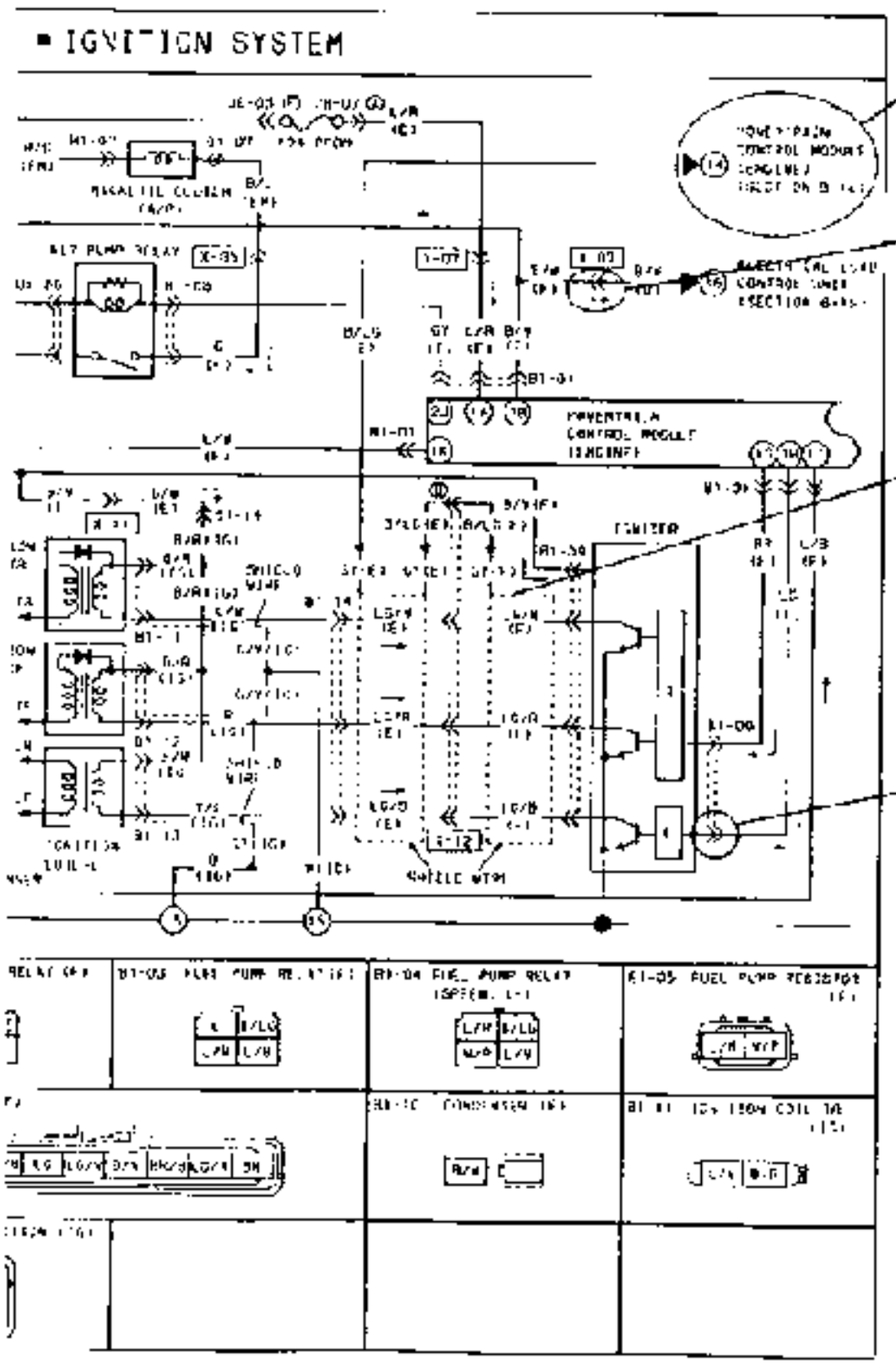
The prefix letter indicates the system in which the connector is used.

- JB: Joint box connections
- X : Common connectors
- A : Charging system/starting system connectors
- B : Engine control system connectors
- C : Gauge control system connectors
- D : Wiper system connectors
- E : Lighting system connectors
- F : Signal system connectors
- G : Air-conditioning system connectors
- H : Transmission control system connectors
- I : Interior lamp system connectors
- J : Audio/radio connectors
- K : Power window/power door lock system connectors
- L : Remote control mirror system connectors
- M : Sliding sunroof system connectors
- N : Power steering/4-wheel steering system connectors
- O : Anti-lock brake system connectors
- P : Power seat/seat heater system connectors
- Q : Auto cruise control system connectors
- R : Auto adjusting suspension system connectors
- S : Passive shoulder belt control/air bag system connectors
- T : Others
- Y : Ground connector

Ground numbers

A harness ground is represented differently than a unit ground.





The number indicates that the circuit continues to the related system diagram.

Current symbol

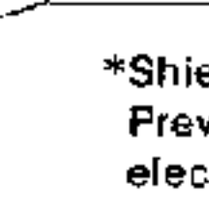
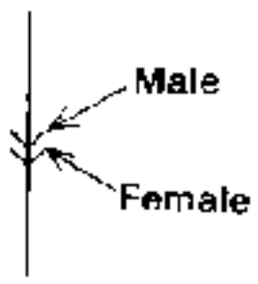
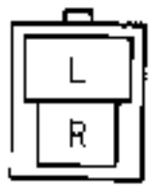
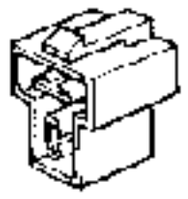
Current flows in the direction of the arrow.

Indicates shielded wire.*

*Shielded wire:
Prevents signal disturbances from electrical interference.
Wire is covered by a metal meashing for grounding.

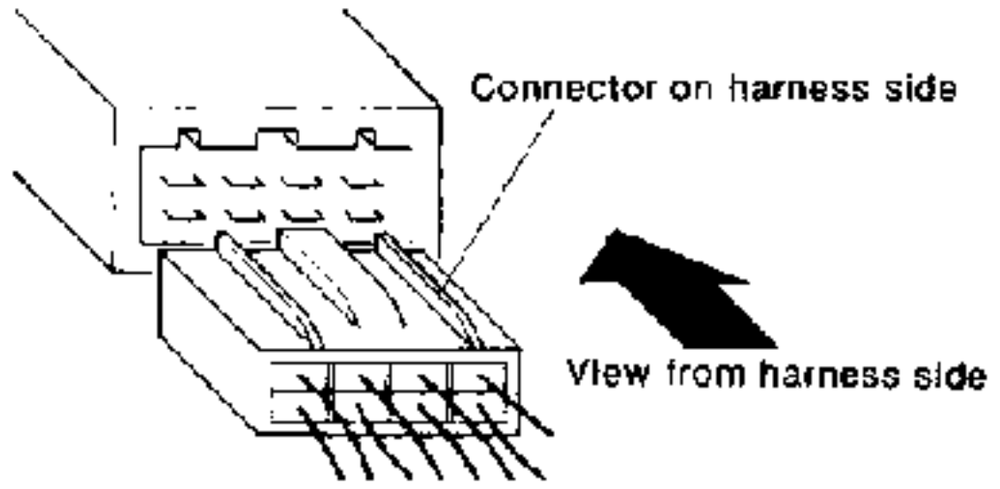
Connector symbols

- Male and female connectors are represented as follows in the circuit and connector diagrams.

		Circuit diagram symbol	Connector diagram symbol
Male			
Female			

- Like connectors are linked by dashed lines between the connector symbols.
- Connector diagrams show connectors on the harness side. The terminal indicates the view from the harness side.

(Example)



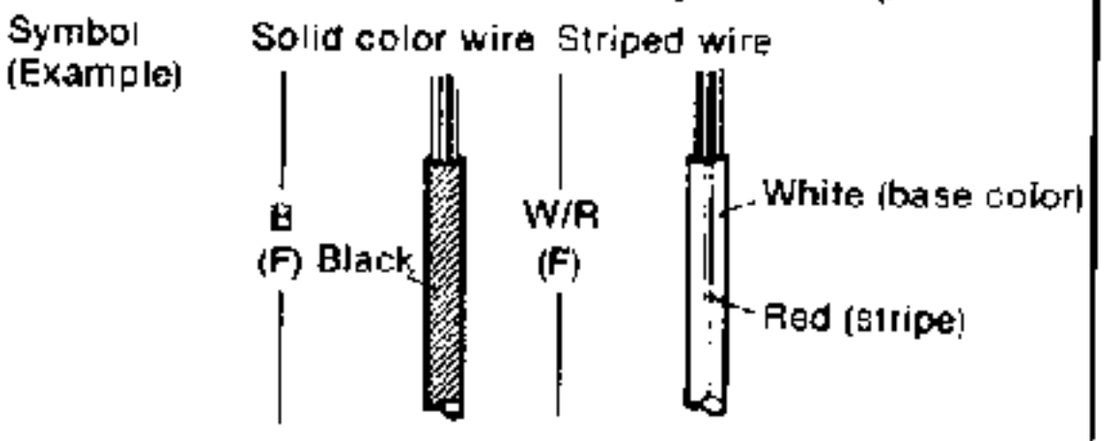
- Colors for connectors except milk-white are given in locations.
- Unused terminals are indicated by * .

Wire color code (harness symbol)

- Two-color wires are indicated by a two-letter symbol. The first indicates the base color of the wire, the second the color of the stripe.

For example:

W/R is a white wire with a red strip
BR/Y is a brown wire with a yellow strip



- The harness symbol is in ( ) following the harness symbols (refer to GI-7.).

Routing diagram

- The routing diagram shows where electrical components are on the system circuit diagram by call out line and connector symbols.
- Specified values are listed beside the routing diagram or on the following page.

Connector symbol

Shows the system that uses the connector.

(Example)

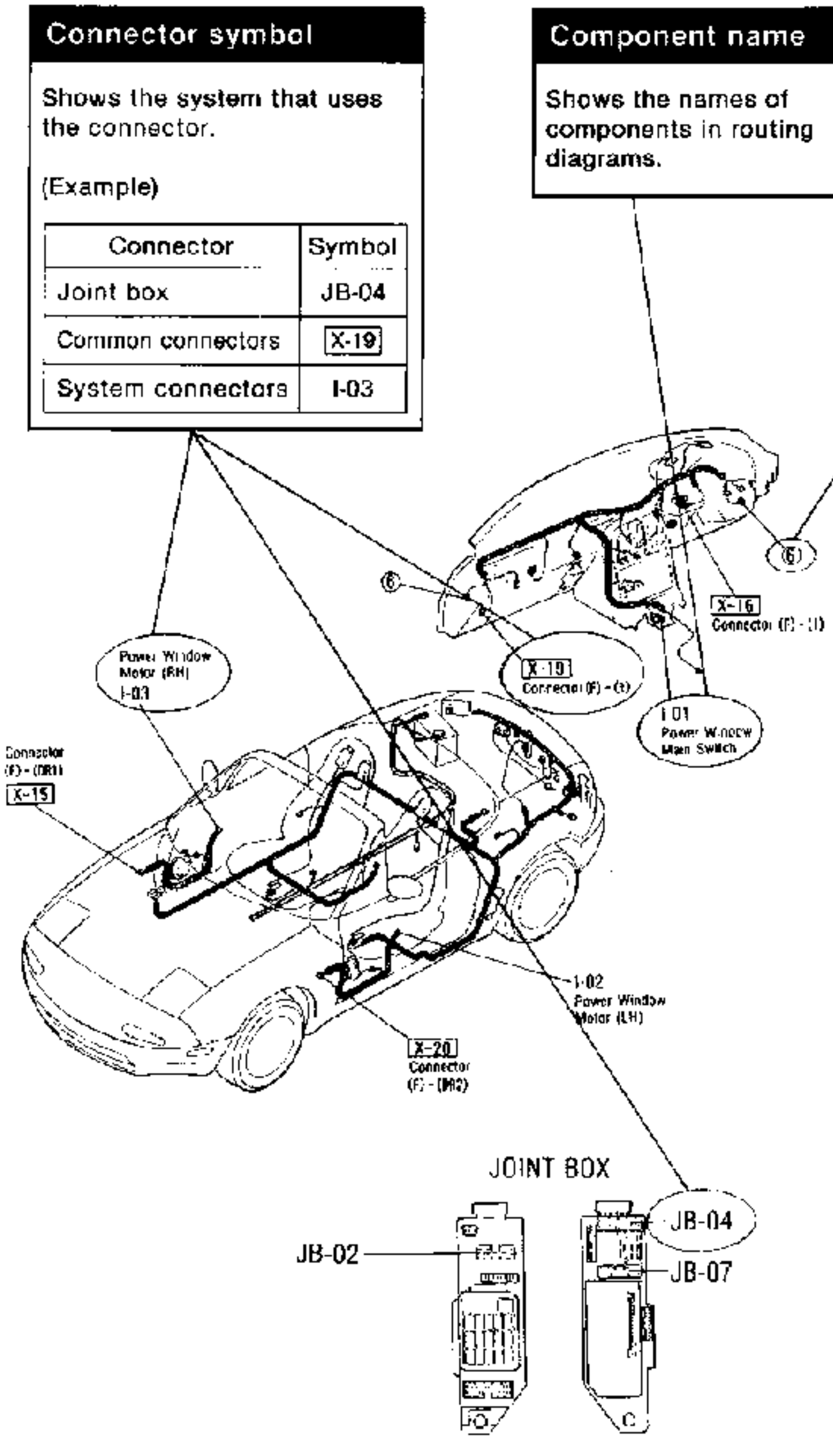
Connector	Symbol
Joint box	JB-04
Common connectors	X-19
System connectors	I-03

Component name

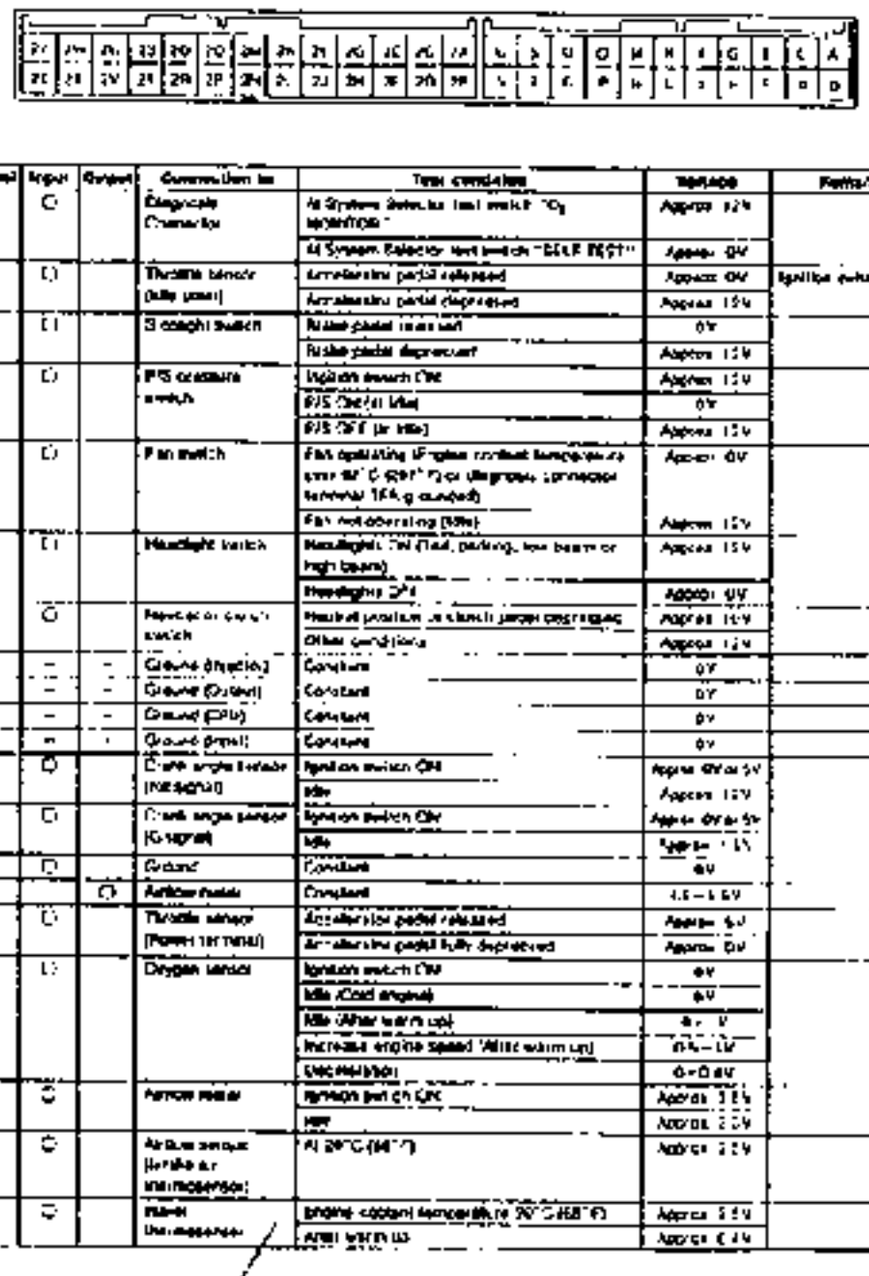
Shows the names of components in routing diagrams.

Ground symbol

Shows the ground in system diagrams.



Engine control unit terminal (unit side)



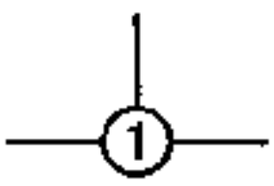
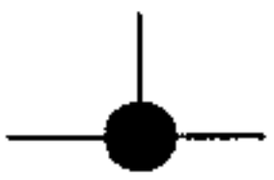
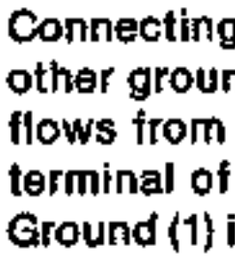
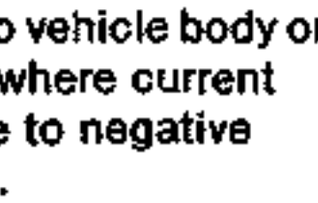
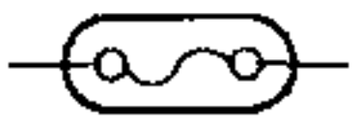
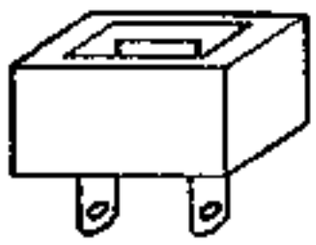
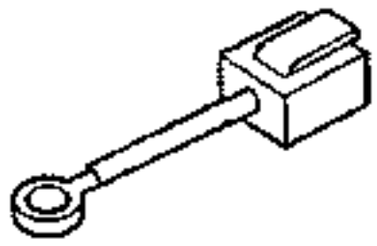
Terminal No.	Input/Output	Connection to	Test condition	Standard	Remarks
1K	O	Diagnostic Connector	At System Selector test switch "O2 operation"	Approx. 12V	
			At System Selector test switch "SELF TEST"	Approx. 0V	
1R	O	Throttle sensor (fully open)	Accelerator pedal released	Approx. 0V	Ignition switch ON
			Accelerator pedal depressed	Approx. 12V	
1Q	O	Starter switch	Brake pedal released	0V	
			Brake pedal depressed	Approx. 12V	
1P	O	PS pressure switch	Ignition switch ON	Approx. 12V	
			P/S ON (at idle)	0V	
			P/S OFF (at idle)	Approx. 12V	
1K	O	Fan switch	Fan operating (Engine coolant temperature over 94°C (201°F) for diagnosis connector terminal 15A is grounded)	Approx. 0V	
			Fan not operating (ON)	Approx. 12V	
1U	O	Headlight switch	Headlight "ON" (Tail, parking, low beam or high beam)	Approx. 12V	
			Headlight "OFF"	Approx. 0V	
1V	O	Neutral position switch	Neutral position (A/T), clutch pedal depressed (M/T)	Approx. 12V	
			Other conditions	Approx. 12V	
2F	–	– Ground (Injector)	Constant	0V	
2G	–	– Ground (Output)	Constant	0V	
2K	–	– Ground (CPU)	Constant	0V	
2M	–	– Ground (Input)	Constant	0V	
2P	O	Crank angle sensor (Reference)	Ignition switch ON	Approx. 6V or 0V	
			Idle	Approx. 12V	
2Q	O	Crank angle sensor (G-signal)	Ignition switch ON	Approx. 6V or 0V	
			Idle	Approx. 1.0V	
2J	O	Ground	Constant	0V	
2K		O Ambient sensor	Constant	1.5 – 1.6V	
2L	O	Throttle sensor (Power transistor)	Accelerator pedal released	Approx. 5V	
			Accelerator pedal fully depressed	Approx. 0V	
2M	O	Oxygen sensor	Ignition switch ON	0V	
			Idle (Cold engine)	0V	
			Idle (After warm up)	0.7 – 1V	
			Increase engine speed (After warm up)	0.4 – 1V	
			Deceleration	0 – 0.4V	
2O	O	Ambient sensor	Ignition switch ON	Approx. 3.5V	
			Idle	Approx. 2.0V	
2P	O	Air flow sensor (Intake air temperature sensor)	At 20°C (68°F)	Approx. 2.5V	
2Q	O	Water temperature sensor	Engine coolant temperature 70°C (158°F)	Approx. 1.5V	
			After warm up	Approx. 0.4V	

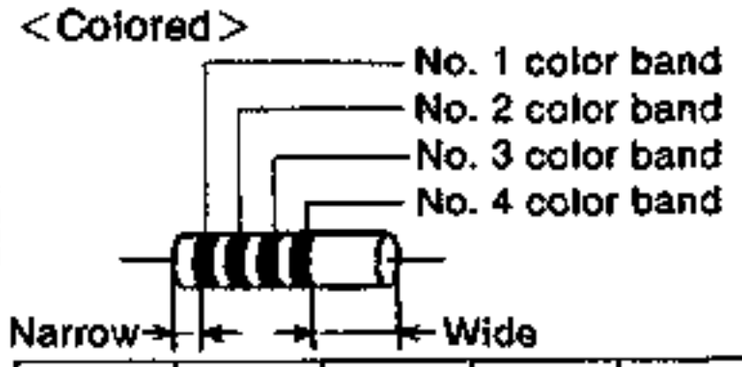
Specified values

Shows values for determining whether an electrical component is good.

Reading Wiring Diagrams

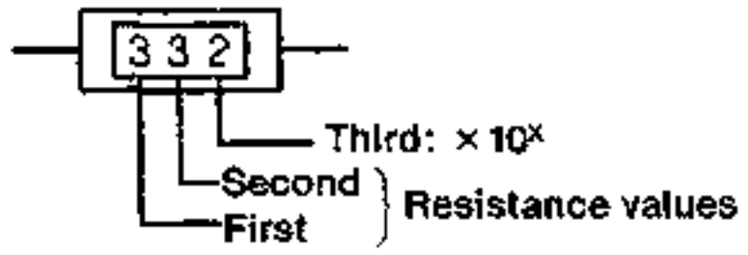
Symbols

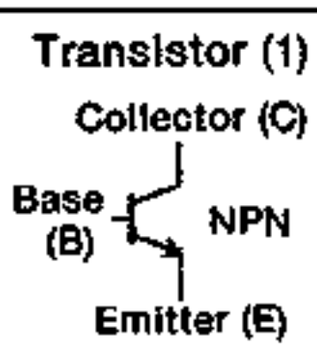
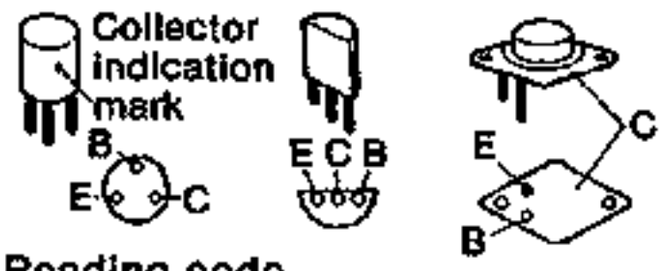
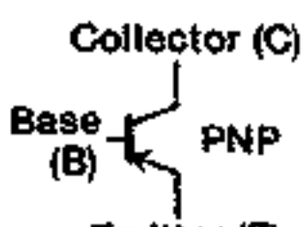
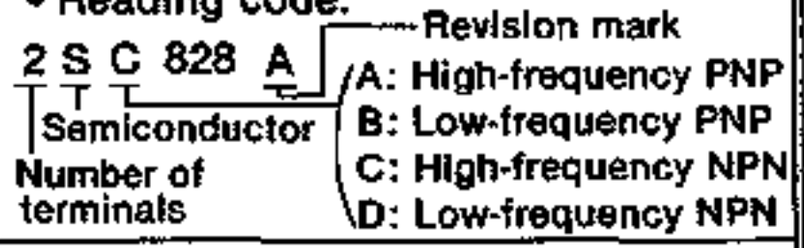
Symbol	Meaning
Battery 	• Generates electricity through chemical reaction. • Supplies direct current to circuits.
Ground (1) 	• Connecting point to vehicle body or other ground wire where current flows from positive to negative terminal of battery. • Ground (1) indicates a ground point to body through wire harness. • Ground (2) indicates point where component is grounded directly to body. Remarks • Current will not flow through a circuit if ground is faulty.
Ground (2) 	
Fuse (1)  (box)	• Melts when current flow exceeds that specified for circuit, interrupts current flow. Precautions • Do not replace with fuses exceeding specified capacity. <Blade type>  <Tube type> 
Fuse (2)  (Cartridge)	
Main fuse/ Fusible link 	<Cartridge type>  <Fusible link> 

Symbol	Meaning
Resistance 	• A resistor with a constant value. • Mainly used to protect electrical components in circuits by maintaining rated voltage. • Reading resistance values. <Colored> 

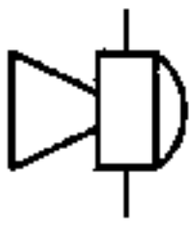
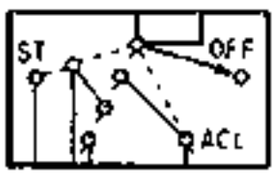
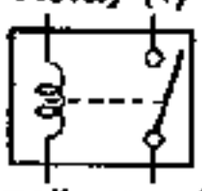
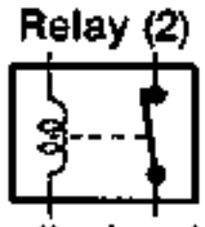
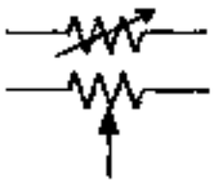
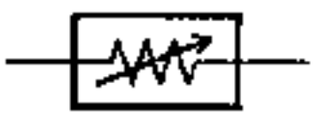
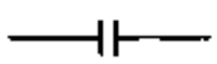
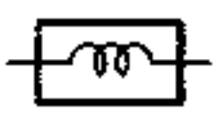
Color	No. 1	No. 2	No. 3	No. 4
	Resistance values		Multiplier	Tolerance
Black	0	0	$\times 10^0$	
Brown	1	1	$\times 10^1$	
Red	2	2	$\times 10^2$	
Orange	3	3	$\times 10^3$	
Yellow	4	4	$\times 10^4$	
Green	5	5	$\times 10^5$	
Blue	6	6	$\times 10^6$	
Purple	7	7	$\times 10^7$	
Grey	8	8	$\times 10^8$	
White	9	9	$\times 10^9$	
Gold			$\times 10^{-1}$	±5%
Silver			$\times 10^{-2}$	±10%
—				±20%

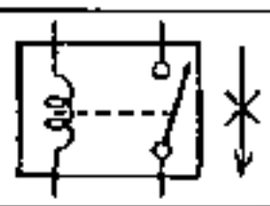
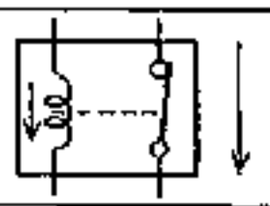
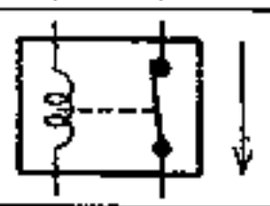
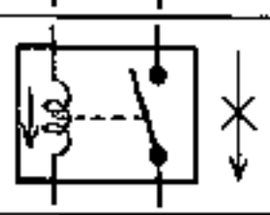
<Numerical>

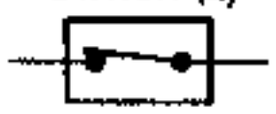
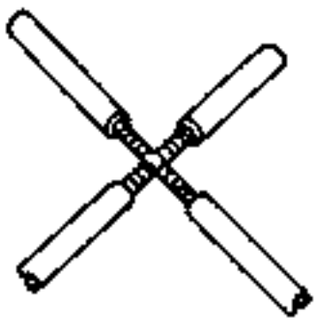
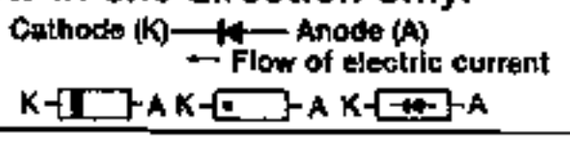
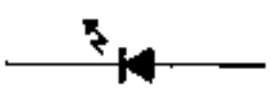
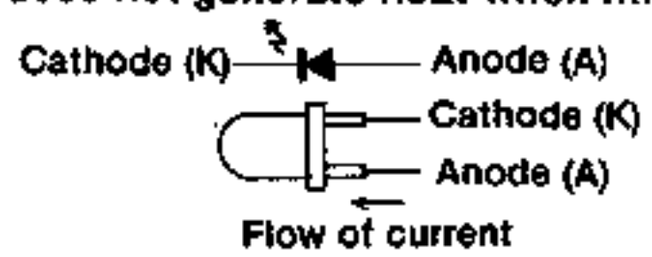


Transistor (1) 	• Electrical switching component. • Turns on when voltage is applied to the base (B). 
Transistor (2) 	• Reading code. 
Lamp 	• Emits light and generates heat when current flows through filament.

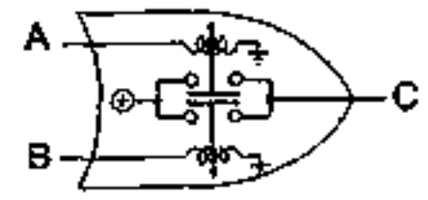
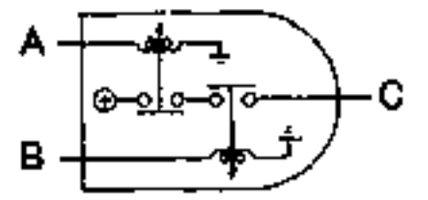
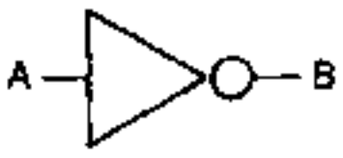
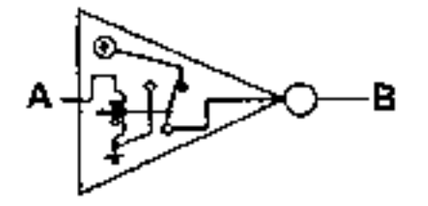
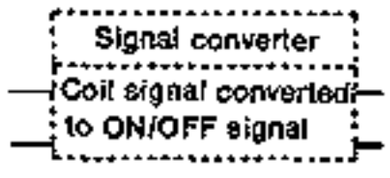
Motor	• Converts electrical energy into mechanical energy.
Pump 	• Pulls in and discharges gases and liquids.
Cigarette lighter 	• Electrical coil that generates heat.

Symbol	Meaning
Horn 	• Generates sound when current flows.
Speaker 	
Heater 	• Generates heat when current flows.
Speed sensor 	• Movement of magnet in speedometer turns contact within sensor on and off.
Ignition switch 	• Turning ignition key switches circuit to operate various component. (NOTE) Ignition switch is called engine switch on diesel vehicles.
Relay (1)  Normally open (NO)	• Current flowing through coil produces electromagnetic force causing contact to open or close.
Relay (2)  Normally closed (NC)	
Sensor (variable) 	• Resistance changes with other components operation.
Sensor (thermistor) 	• Resistance changes with temperature.
Capacitor 	• Component that temporarily stores electrical charge.
Solenoid 	• Current flowing through coil generates electromagnetic force to operate plungers.

Normally open relay (NO)	No current to coil:  No flow	Current to coil:  Flow
Normally closed relay (NC)	 Flow	 No flow

Symbol	Meaning
Switch (1)  Normally open (NO)	• Allows or breaks current flow by opening and closing circuits.
Switch (2)  Normally closed (NC)	
Harness  (Not connected)  (Connected)	• Unconnected intersecting harness.  • Connected intersecting harness. 
Diode 	• Known as a semiconductor rectifier, the diode allows current flow in one direction only. 
Light-emitting diode (LED) 	• A diode that lights when current flows. • Unlike ordinary bulbs, the diode does not generate heat when lit. 
Reference diode (Zener diode) 	• Allows current to flow in one direction up to a certain voltage; allows current to flow in the other direction once that voltage is exceeded.

Logic symbols

Types of logic symbols	Operation	Expressing output	Simple relay circuits
OR 	Input to A or B will produce output at C.	Low electrical potential (L) at A and B→no output (L) at C High electrical potential (H) at A or B→output (H) at C	
AND 	Input to A and B will produce output at C.	High electrical potential (H) at A and B→output (H) at C Low electrical potential (L) at A or B→no output (L) at C	
INV 	No Input to A will produce an output at B. An input to A will not produce an output at B.	Low electrical potential (L) at A→no ground (H) B High electrical potential (H) at A→grounds (L) B	
PROCESS 	Simplified representation of complex functions within circuit describes main function. 1. Signal detector for engine control unit, cooling unit, and tachometer. 2. Signal converter for turn and hazard flasher unit and igniter unit.		(Examples) Igniters 

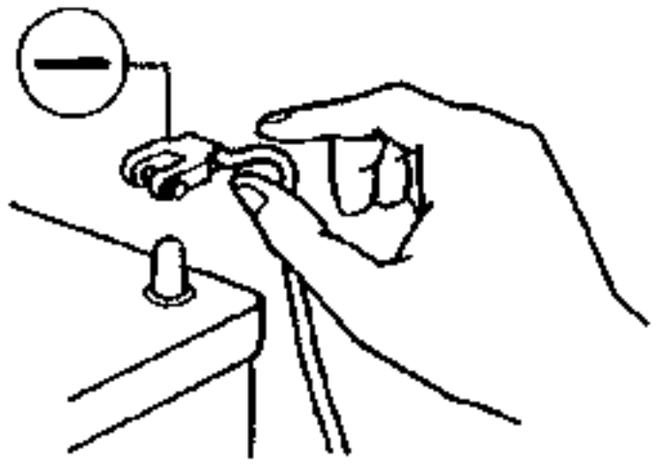
Abbreviations used in this booklet

3GR	Third Gear	ECM	Engine Control Module	MTX	Manual Transaxle
4GR	Fourth Gear	ECPS	Electronically Controlled Power Steering	NC	Normally Closed
A	Ampere	ECT	Engine Coolant Temperature	NO	Normally Open
A/C	Air Conditioning	EGR	Exhaust Gas Recirculation	O2S	Oxygen Sensor
A/F	Air Fuel	EI	Electronic Ignition	OBD	On-Board Diagnostic
A/R	Auto Reverse	ELEC	Electric	OFF	Switch Off
AAS	Autoadjusting Suspension	ELR	Emergency Locking Retractor	ON	Switch On
ABS	Antilock Brake System	ETR	Electronic Tuner	P	Power
ACC	Accessory	F	Front	P/S	Power Steering
ACV	Air Control Valve	F/I	Fuel Injector	PAIR	Pulsed Secondary Air Injection
ADD	Additional	FC	Fan Control	PCM	Powertrain Control Module
AIR	Secondary Air Injection	FICB	Fast-Idle Cam Breaker	PNP	Park/Neutral Position
AIS	Air Injection System	FM	Frequency Modulation	PRCV	Pressure Regulator Control Solenoid Valve
ALL	Automatic Load Leveling	FP	Fuel Pump	PRG	Purge Solenoid Valve
AM	Amplitude Modulation	FPR	Fuel Pump Relay	PSP	Power Steering Pressure
AMP	Amplifier	GEN	Generator	PTC	Positive Temperature Coefficient Heater
ANT	Antenna	GND	Ground	QSS	Quick-Start System
AP	Accelerator Pedal	H/D	Heater/Defroster	R	Rear
AS	Autostop	HEAT	Heater	REC	Recirculation
ASV	Air Supply Valve	HEI	High-Energy Ignition	RF	Right Front
AT	Automatic transmission	HI	High	RH	Right Hand
ATX	Automatic Transaxle	HO2S	Heated Oxygen Sensor	RPM	Engine Speed
B+	Battery Positive Voltage	IAC	Idle Air Control	RR	Rear Right
BAC	Bypass Air Control Valve	IAT	Intake Air Temperature	SAPV	Secondary Air Pulse Valve
BARO	Barometric Pressure	ICM	Ignition Control Module	SFI	Sequential Multipoint Fuel Injection
CAC	Charge Air Cooler	IG	Ignition	SOL	Solenoid
CARB	Carburetor	ILLUMI	Illumination	ST	Start
CCT	Circuit	INT	Intermittent	SW	Switch
CIGAR	Cigarette	JB	Joint Box	TC	Turbocharger
CIS	Continuous Fuel Injection System	KS	Knock Sensor	TCM	Transmission (Transaxle) Control Module
CKP	Crankshaft Position Sensor	LCD	Liquid Crystal Display	TCV	Twin Scroll Turbocharger Solenoid Valve
CLS	Closed Loop System	LF	Left Front	TEMP	Temperature
CMP	Camshaft Position Sensor	LH	Left Hand	TICS	Triple Induction Control System
COMBI	Combination	LO	Low	TP	Throttel Position Sensor
CON	Conditioner	LR	Left Rear	TR	Transmission Range
CONT	Control	M	Motor	TR	Transmission (Transaxle) Range
CPU	Central Processing Unit	MAF	Mass Air Flow Sensor	TWS	Total Wiring System
CSD	Cold Start Device	MAP	Manifold Absolute Pressure	V	Volt
CTP	Closed Throttle Position	MFI	Multiport Fuel Injection	VAF	Volume Air Flow Sensor
DEF	Defroster	MID	Middle	VENT	Ventilation
DI	Distributor Ignition	MIL	Malfunction Indicator Lamp	VOL	Volume
DLC	Data Link Connector	MIN	Minute	VR	Voltage Regulator
DLI	Distributorless Ignition	MIX	Mixture	VRIS	Variable Resonance Induction System
DOHC	Double-Overhead Camshaft	MPX	Multiplex	VSS	Vehicle Speed Sensor
DTC	Diagnostic Trouble Code(s)	MT	Manual Transmission	W	Watt(s)
DTM	Diagnostic Test Mode	MTR	Mechanical Tuning Radio	WOT	Wide Open Throttle

Precautions to take when servicing an electrical system

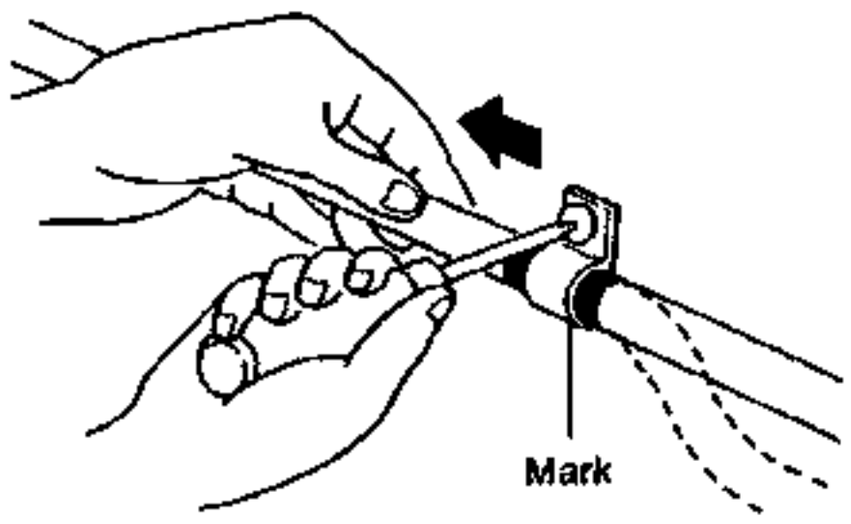
- Note the following items when servicing the electrical system.
- Do not alter the wiring or electrical equipment in any way; this may damage the vehicle or cause a fire from short-circuiting a circuit or overloading it.

- The negative (−) battery cable must be removed first and installed last.



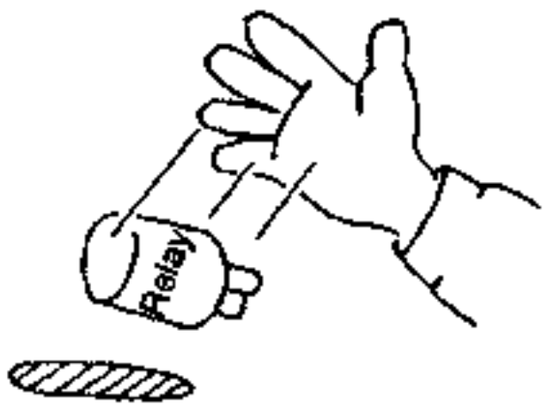
Caution
- Be sure that the ignition and other switches are off before disconnecting or connecting the battery cables.
  Failure to do so may damage the semiconductor components.

- Secure harnesses with provided clamps to take up slack.



Caution
- Clamp all harnesses near vibrating components (for example, the engine) to remove slack and to prevent contact resulting from vibration.

- Do not handle electrical components roughly or drop them.

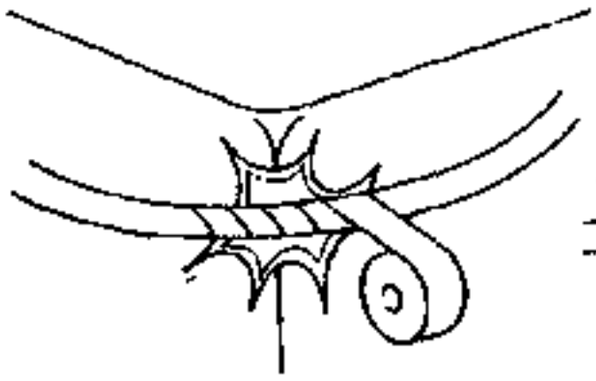


- Do not replace with fuses exceeding specified capacity.

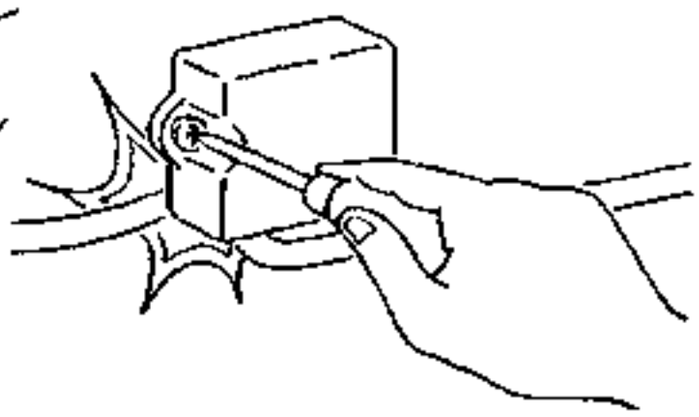
10A 15A

Caution
- Replacing a fuse with one of a larger capacity than designated may damage components or cause a fire.

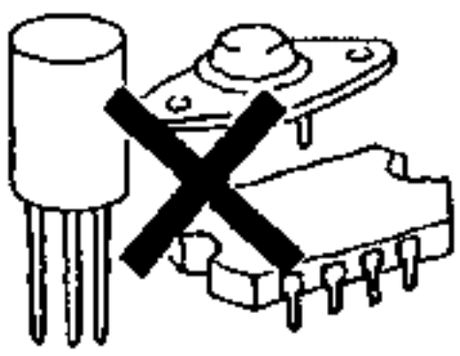
- Tape areas of the harness that may rub or bump against sharp edges to protect it from damage.



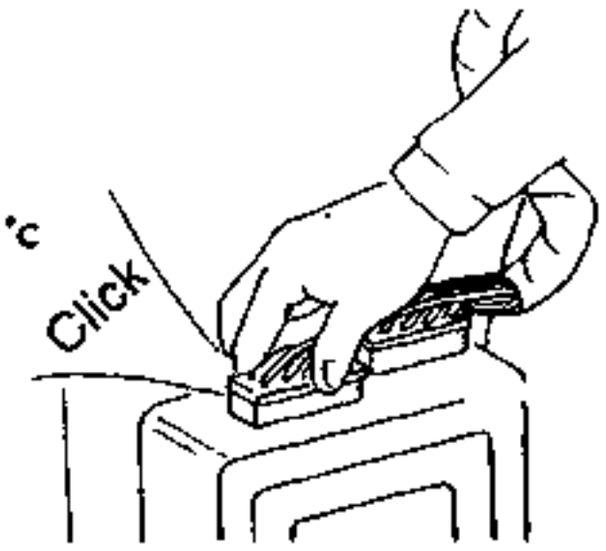
- When mounting components, be sure the harness is not caught or damaged.



- Disconnect heat-sensitive parts (for example, relays and ECU) when performing maintenance (such as welding) where temperatures may exceed 80°C (176°F).

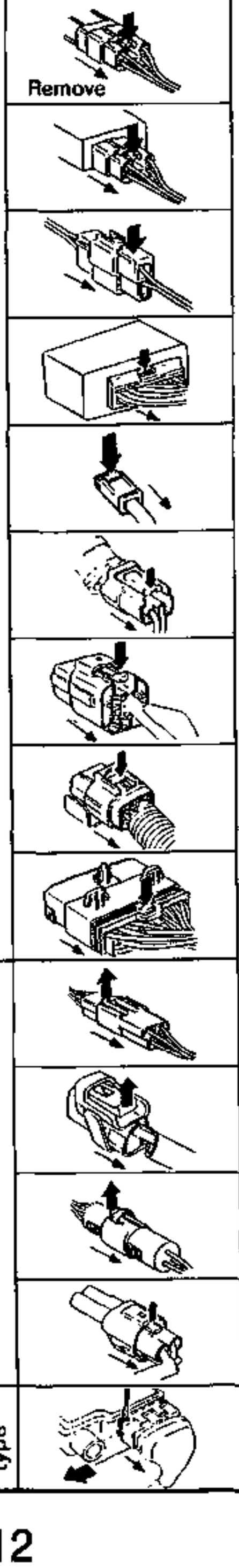
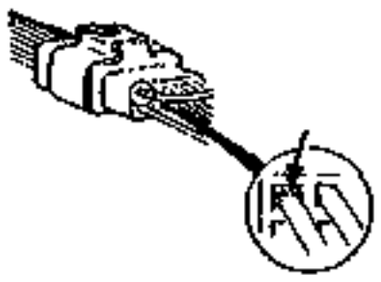
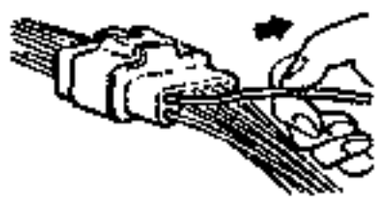
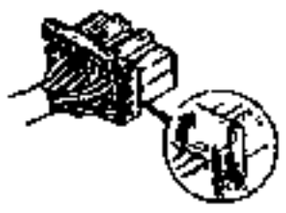
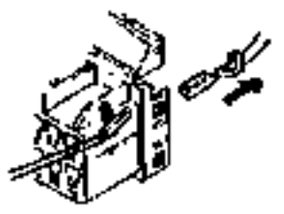
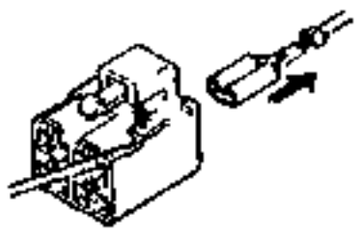
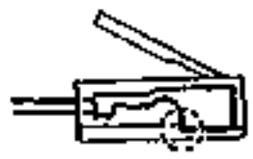


- Make sure that the connectors are securely connected when installed.

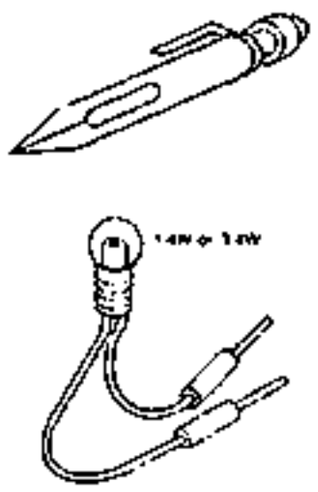
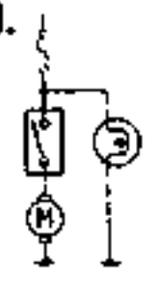
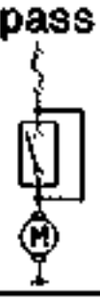
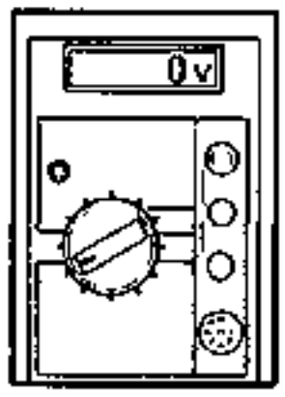
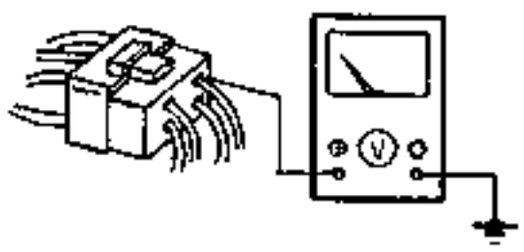
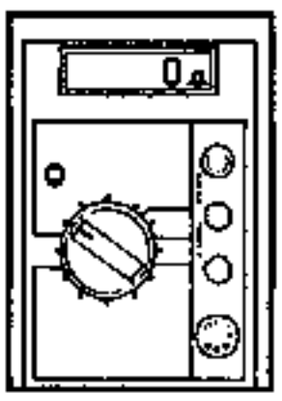
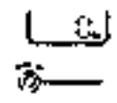
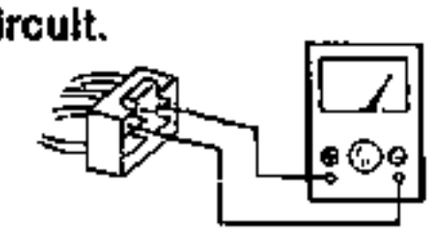
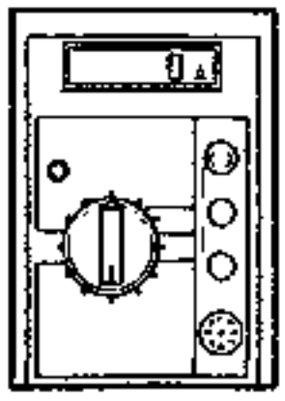
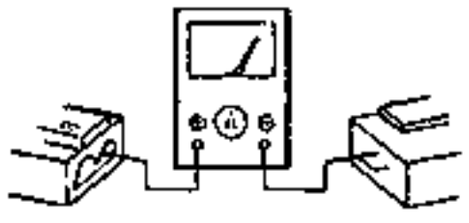


Handling connectors

Caution
- Be sure to grasp the connectors, not the wires, when disconnecting them.

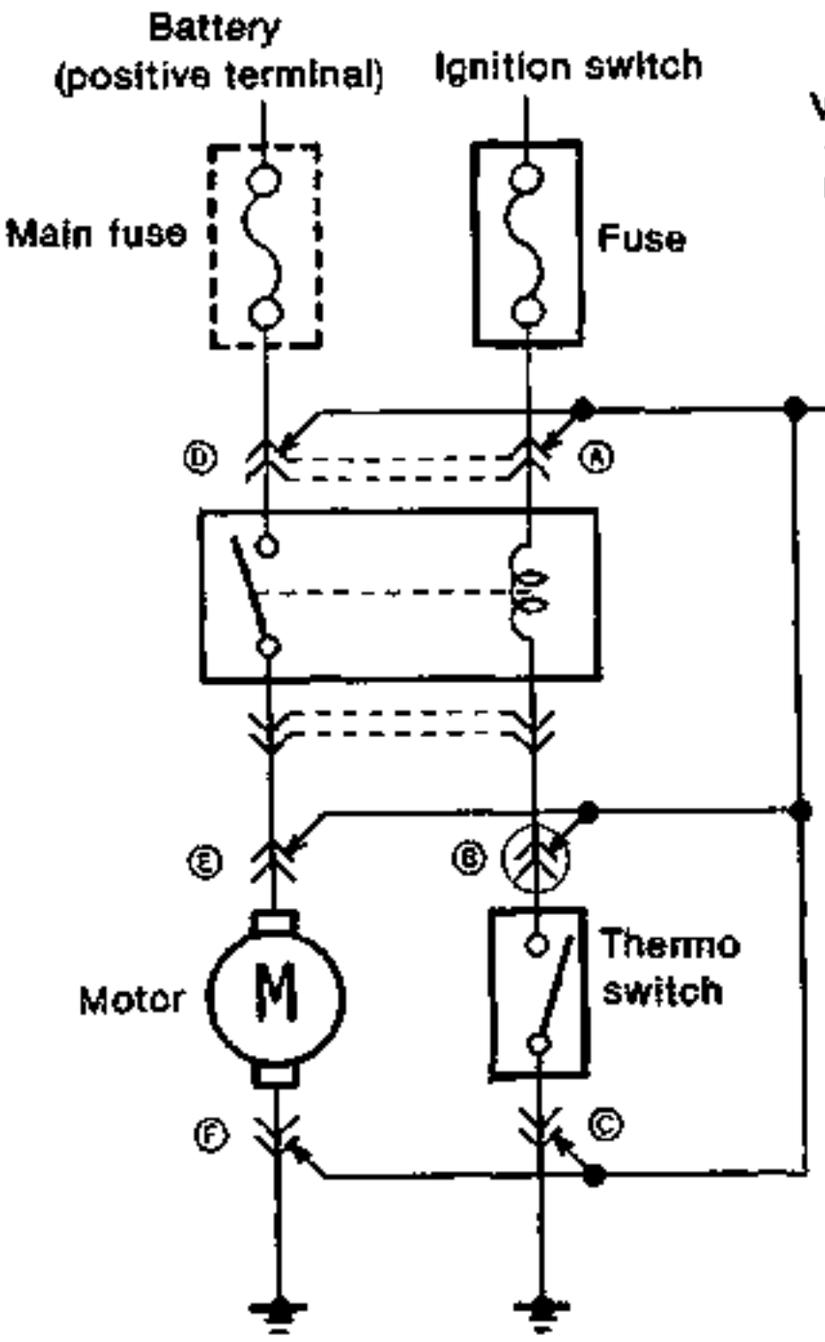
Connector removal	Checking connector contacts	Checking for loose terminals	Replacing terminal
Push type  Remove	Caution Improperly engaged connectors will cause poor terminal contact.  When using a matching male terminal, make sure there is no looseness in the female terminal.	Caution A loose terminal will cause poor terminal contact.  Make sure the terminals are not pushed out of the connector when engaged.  Pull lightly on individual wires to check that they are secured in the terminal.	<CPU connector>  1. Raise the rear cover. 2. Lift the tab with a thin piece of metal and remove the terminal.  <General connector>  Lift the tab with a thin piece of metal and remove the terminal. <Round connectors>  1. Raise the cover. 2. Lift the terminal to remove it. 3. Make sure the terminal is securely mounted in the connector when installing.  <Common ground connectors>  1. Raise the cover. 2. Remove A. 3. Lift the tab with a thin piece of metal and remove the terminal. 
Pull-up type 			
Spring type 			

Using electrical measuring equipment

Equipment	Use	Operation	Handling precautions
Test lamp 	Test to find open or shorted circuits.	• Connect the test lamp between the circuit being measured and a ground. • The lamp will light if the circuit is energized to the point tested. 	• Test lamps use 12V 1.4W or 3.4W bulbs or light-emitting diodes (LEDs). Using a large-capacity bulb may damage the CPU.
Jumper wire 	Used to create a temporary circuit.	• Connect the jumper wire between the terminals of a circuit to bypass a switch. 	• Do not connect the jumper wire from the power source line to a ground; this may cause burning or other damage to harnesses or electronic components.
Voltmeter 	Used for measuring the voltage of a circuit to locate possible opens or shorts.	• Connect the positive (+) probe to the point where voltage is to be measured and the negative (−) probe to a ground. 	• Connect the voltmeter in parallel with the circuit. • Set the range to the desired voltage. • Use the service hole when measuring the voltage at the diagnosis connector.  • Tie a thin wire to the positive (+) probe to access narrow terminals.
Ohmmeter 	Used to find opens and shorts in the circuit, to confirm continuity and to measure resistance.	• Zero the ohmmeter.  • Verify that voltage is not applied to the circuit. • Connect the probes between two points in a circuit. 	• Zero the meter after switching to the measuring range. • Before using the ohmmeter, make sure the ignition switch is off or the negative (−) battery cable is disconnected to prevent burning or otherwise damaging the ohmmeter.
Ammeter 	Used to check alternator output, current supplied to the starter, and dark current within a circuit. Note Dark current is the constant flow of current while the ignition switch is OFF.	• Connect the ammeter in series with the circuit by touching the positive (+) probe to the power-side terminal and the negative (−) probe to the ground-side terminal. 	• Set the range to the desired amperage. • Connect the ammeter in series with the circuit. The ammeter may be burned or otherwise damaged if it is connected in parallel.

Measuring voltage

Checks



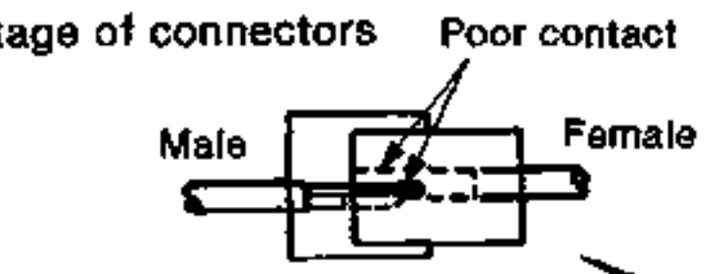
1. Connect a voltmeter or test lamp to the measuring points.

Measuring points	Circuit operation (normal)					
	Ignition switch: OFF		Ignition switch: ON			
			Thermo switch: OFF		Thermo switch: ON	
Ⓐ	0V	×	12V	○	12V	○
Ⓑ	0V	×	12V	○	0V	×
Ⓒ	0V	×	0V	×	0V	×
Ⓓ	12V	○	12V	○	12V	○
Ⓔ	0V	×	0V	×	12V	○
Ⓕ	0V	×	0V	×	0V	×

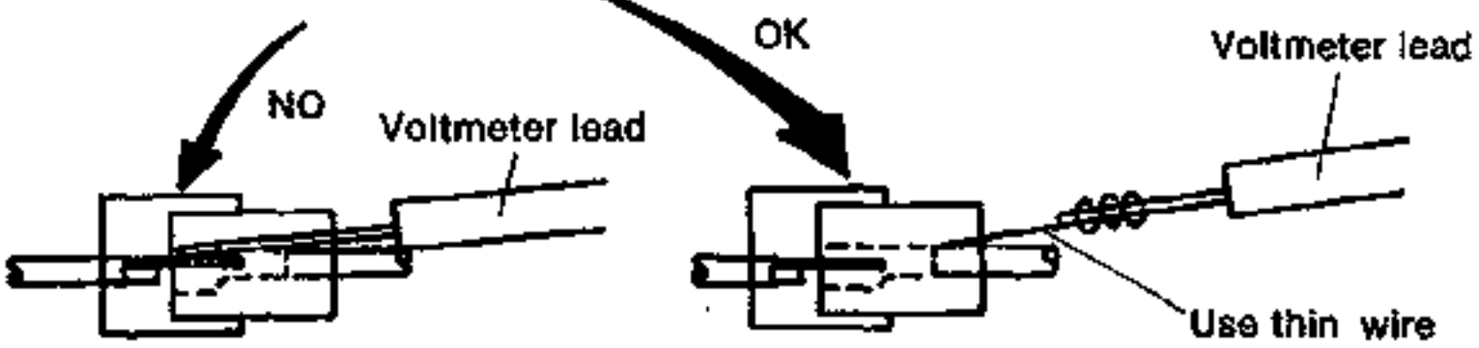
○ : Test lamp ON
× : Test lamp OFF

Precautions during checks

Measuring voltage of connectors

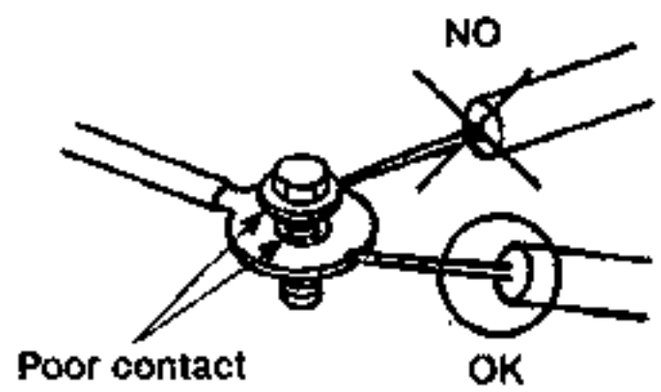


A voltmeter probe may momentarily connect a terminal when inserted into the connector and give an erroneous reading when checking for improperly engaged connectors, poor terminal contacts, or loose terminals.



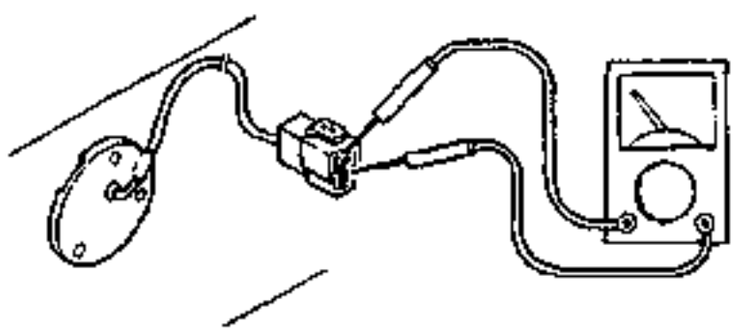
Measuring voltage of ground unit

Touch the voltmeter probe to the ground wire when checking the ground circuit.



Measuring continuity/resistance

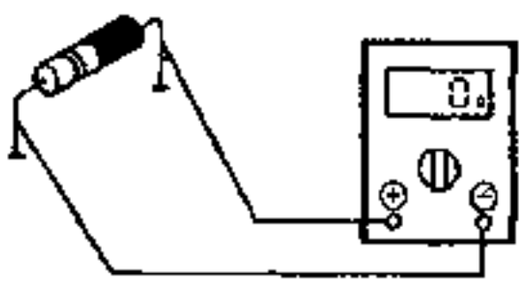
Checking switches



Touch the ohmmeter probes to the switch terminals to check continuity.

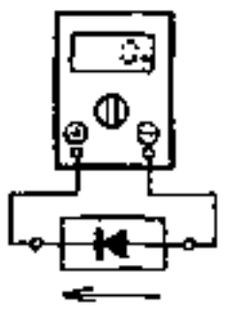
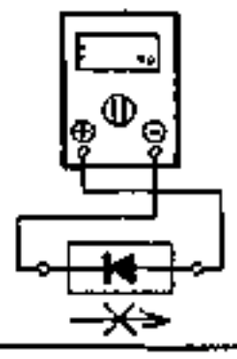
Caution
Verify the operating state of the switch before checking continuity because readings vary accordingly.

Checking diodes

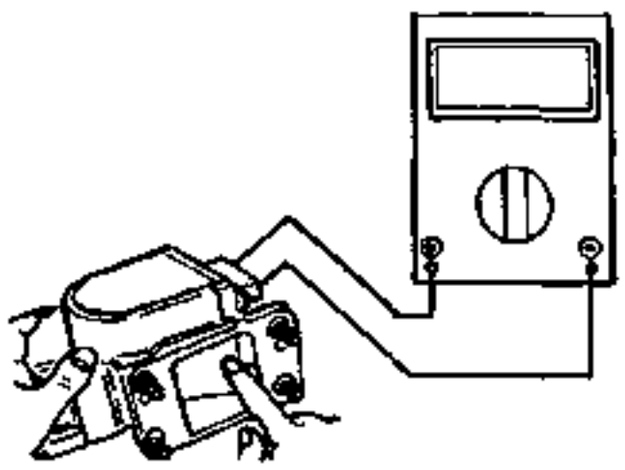


Note
The negative (−) probe of the ohmmeter is connected to the positive terminal of the internal ohmmeter battery, the positive (+) probe to the negative terminal of the battery.

Continuity is checked according to the direction of the positive (+) and negative (−) probes of the ohmmeter in the circuit containing the diode.

Connection	Continuity
	Yes
	No

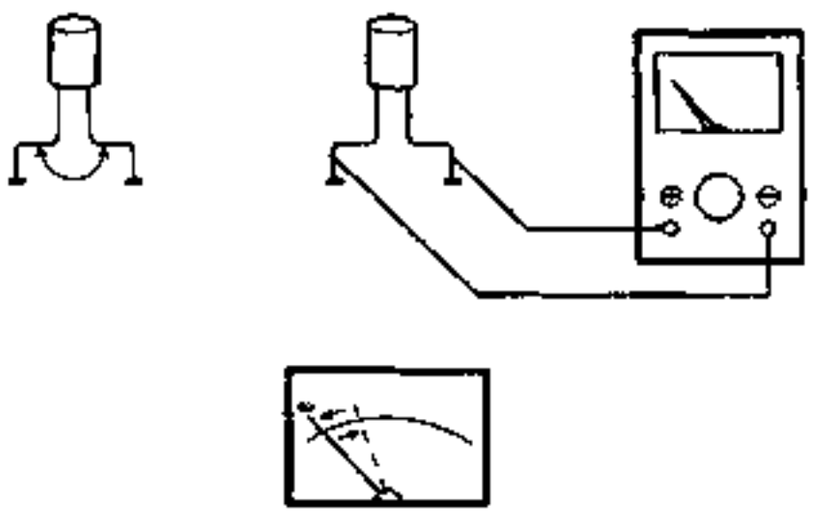
Checking sensors and solenoid valves



Connect the ohmmeter probes to the sensor or solenoid valve terminals to check resistance.

Caution
Verify the operating state of the sensor before checking resistance because readings vary accordingly.

Checking condensers

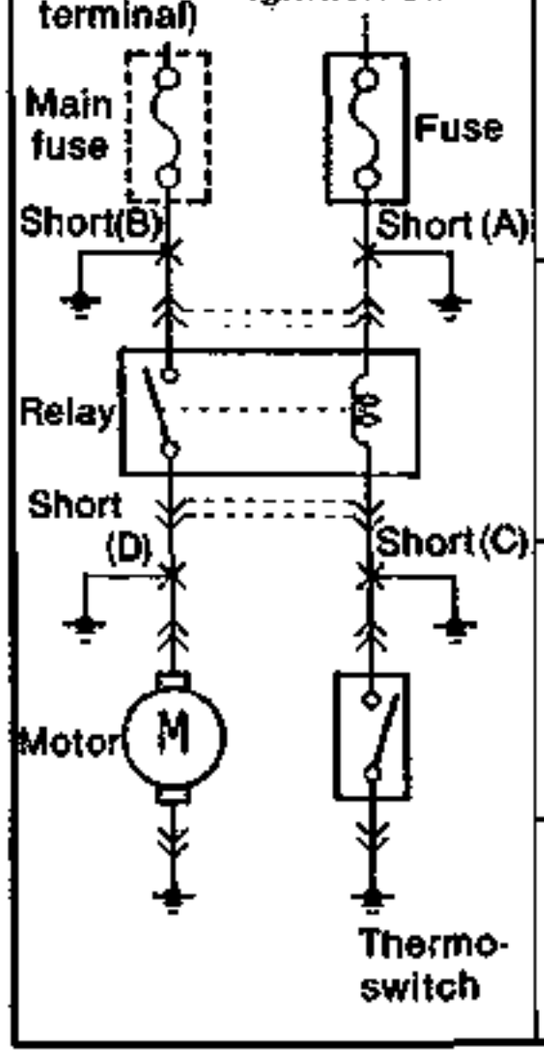


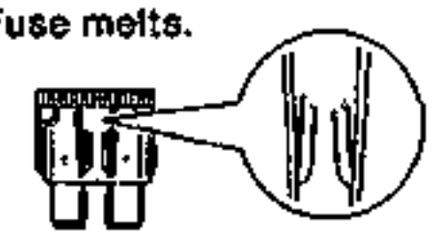
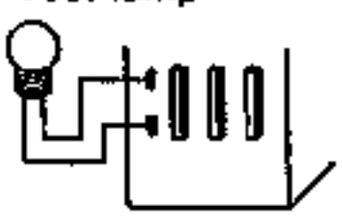
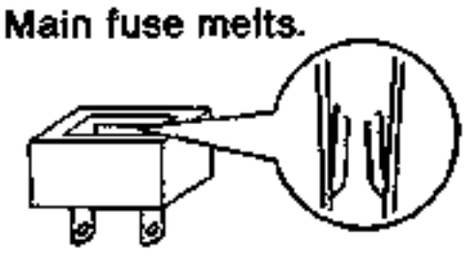
1. Short between the terminals with a jumper wire to discharge the capacitor.
2. Set the ohmmeter range to ×10kΩ and connect it to the capacitor terminals.
3. The capacitor is good if the needle of the ohmmeter swings once and returns to its original position.

Finding short circuits

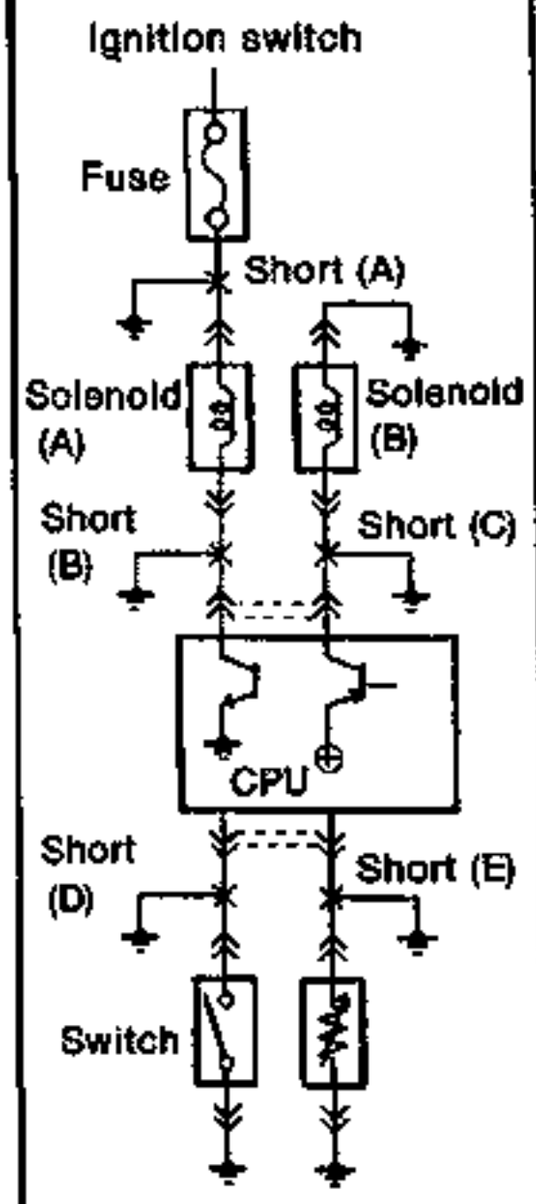
Shorts occur between the power (positive) and ground (negative) sides of a circuit. Therefore, finding a short circuit requires determining how the circuit is routed.

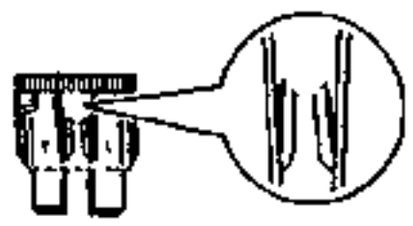
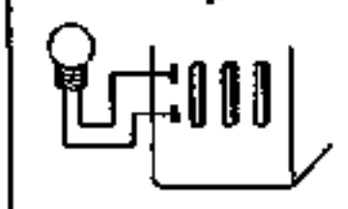
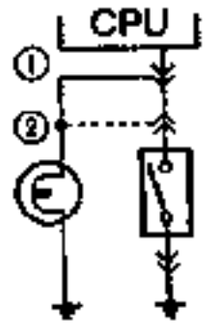
Circuits not connected to control unit



Examples		Finding short circuit
Short location	**Symptom**	
Short (A)	• Fuse melts. 	 Test lamp  1. Remove the fuse and main fuse of the circuit. 2. Disconnect all connectors of electrical components in the circuit. 3. Attach a voltmeter or test lamp to the fuse box and reconnect each connector, beginning nearest the power source. 4. Check the voltmeter reading or test lamp as the connectors are connected.
Short (B)	• Main fuse melts. 	
Short (C)	• The motor operates regardless of whether the thermoswitch is ON or OFF when the ignition switch is ON. • The fuse is not melted.	A short has occurred where the voltmeter reading changes or the test lamp comes on.
Short (D)	• The main fuse melts when the ignition switch and thermoswitch are ON and the relay is operating.	

Circuits connected to control unit



Examples		Finding short circuit
Short location	**Symptom**	
Short (A)	• Fuse melts. 	 Test lamp  1. Remove the fuse and main fuse of the circuit. 2. Disconnect all connectors of electrical components in the circuit. 3. Attach a voltmeter or test lamp to the fuse box and reconnect each connector, beginning nearest to the power source. 4. Check the voltmeter reading or test lamp as the connectors are connected.
Short (B)	• Solenoid A operates when the ignition switch is ON.	
Short (C)	• The CPU transistor burns out when the ignition switch is turned ON.	A short has occurred where the voltmeter reading changes or the test lamp comes on.
Short (D)	• The CPU thinks the switch is ON because the same conditions exist as when the switch is ON.	Sensor/switch  1. Attach the test lamp or voltmeter to the CPU connector. 2. Connect to the switch/ sensor connector. 3. Check the voltmeter reading or test lamp.
Short (E)	• The CPU senses the sensor to be 0Ω because the same conditions exist as when the resistance value is 0Ω. • The CPU equipped with the self-diagnosis function outputs the code.	A short has occurred where the voltmeter reads 0V or the test lamp goes out.

Y

Y-1 B6 DOHC ■ GROUND POINTS

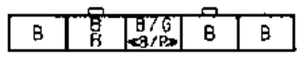
NOTE: WIRING ORDER INTO THE JOINT CONNECTOR MAY BE CHANGED

« »...WITH AIR BAG SYSTEM
< >...WITH ABS
( )...ATX
( )...CANADA

JC-01 JOINT CONNECTOR (F)

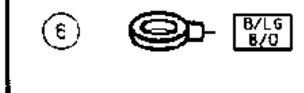
JC-02 JOINT CONNECTOR (F)

JC-03 JOINT CONNECTOR (F)



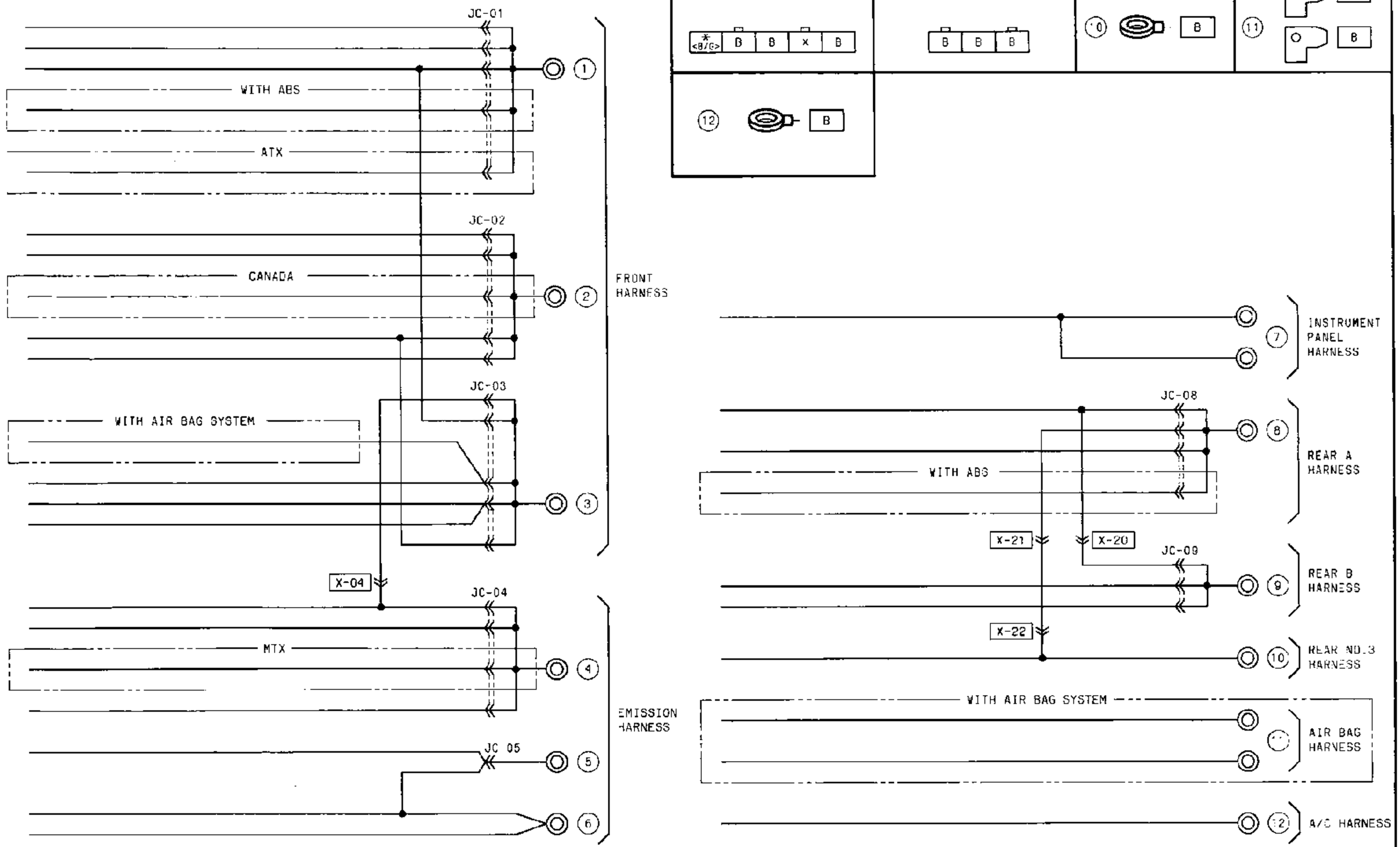
JC-04 JOINT CONNECTOR (EM)

JC-05 JOINT CONNECTOR (EM)



JC-08 JOINT CONNECTOR (RA)

JC-09 JOINT CONNECTOR (RB)

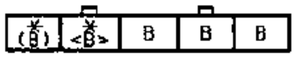


Y-2 K8-DOHC ■ GROUND POINTS

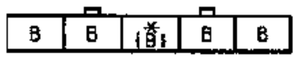
NOTE: WIRING ORDER INTO THE JOINT CONNECTOR MAY BE CHANGED

< >...WITH AIR BAG SYSTEM
< >...WITH ABS
( )...ATX
[ ]...CANADA

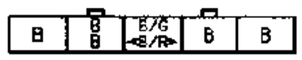
JC-01 JOINT CONNECTOR (F)



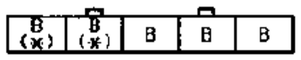
JC-02 JOINT CONNECTOR (F)

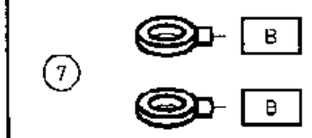


JC-03 JOINT CONNECTOR (F)

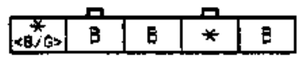


JC-04 JOINT CONNECTOR (EM)

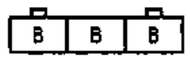


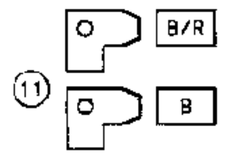


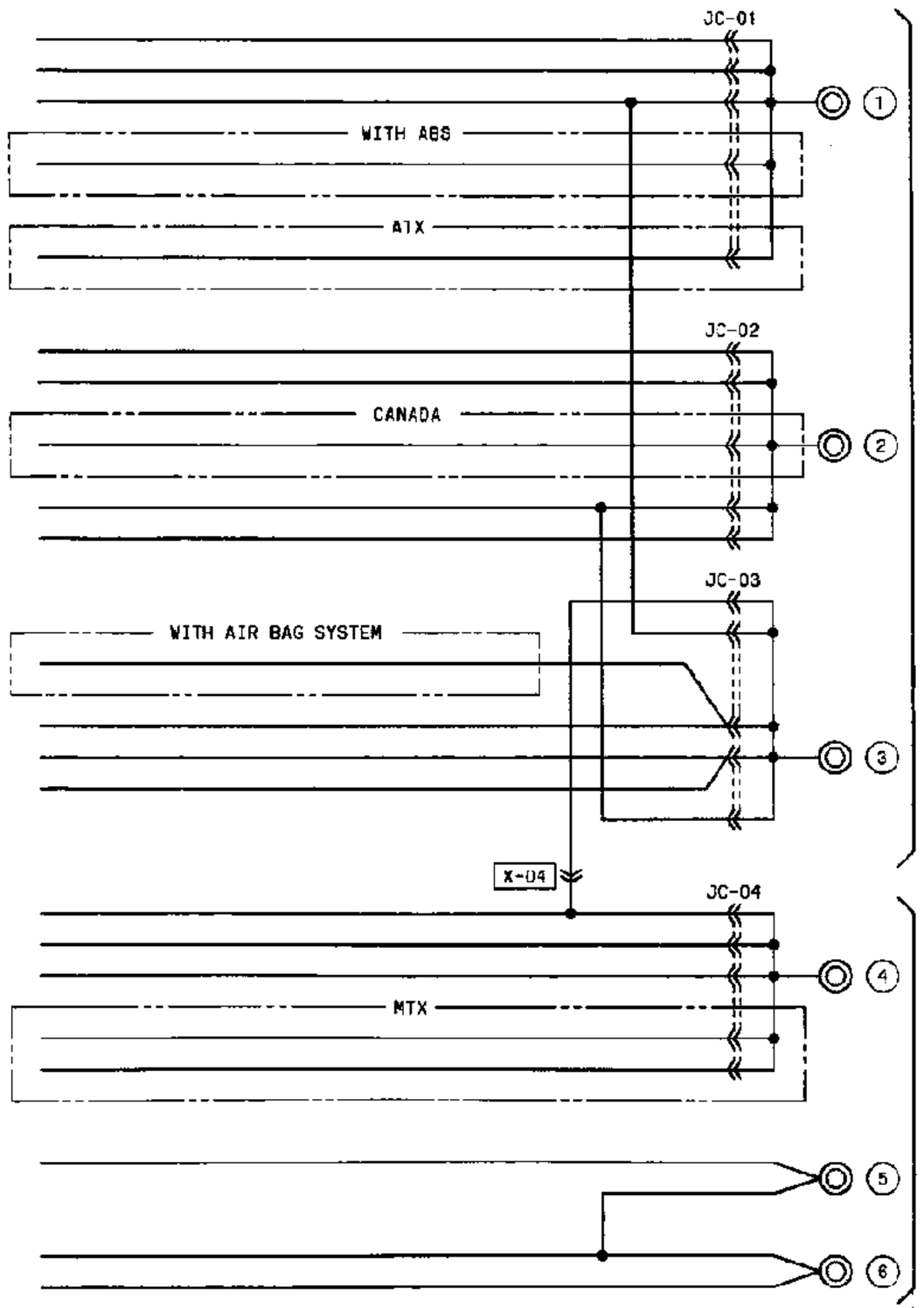
JC-08 JOINT CONNECTOR (RA)

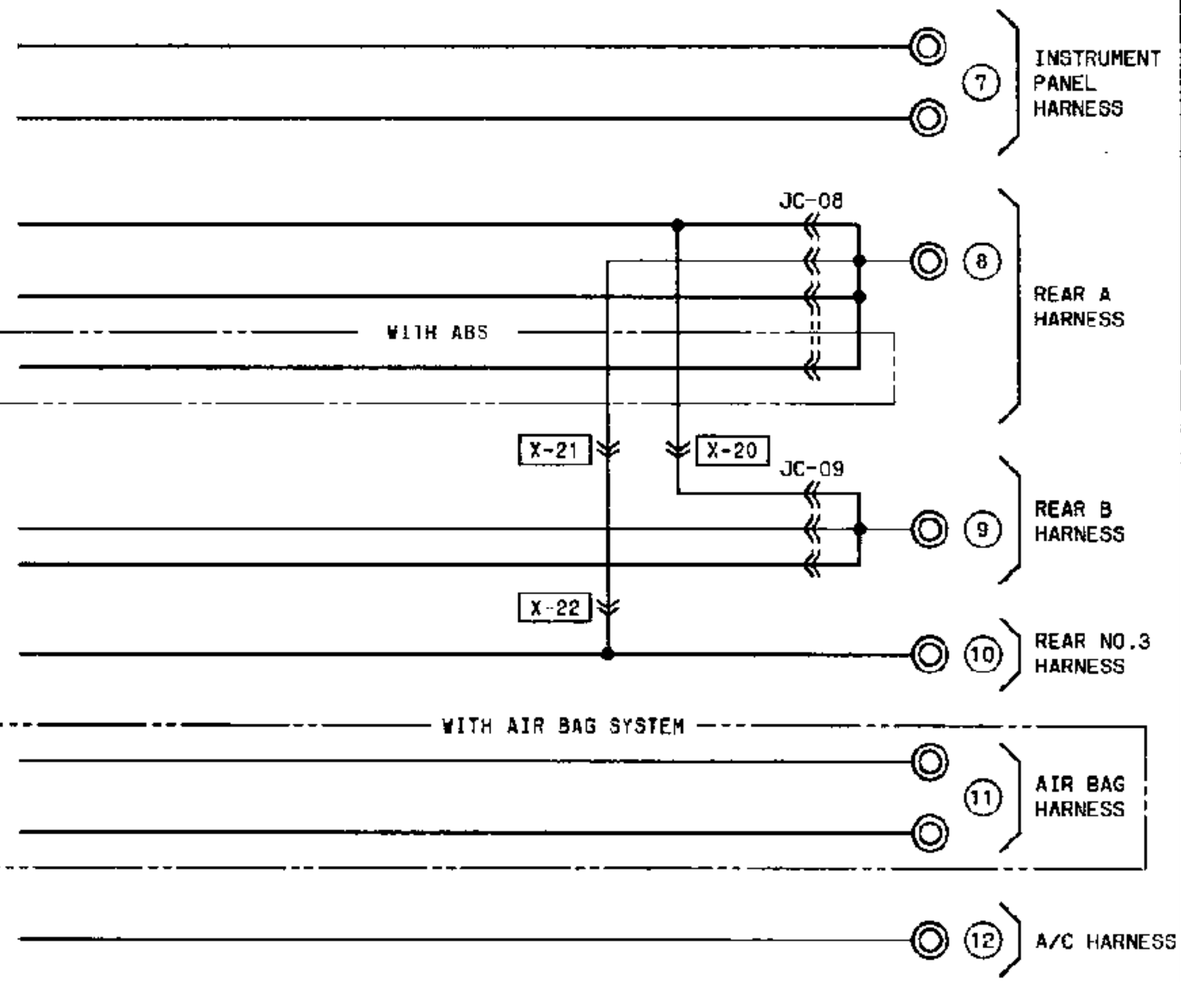


JC-09 JOINT CONNECTOR (RB)





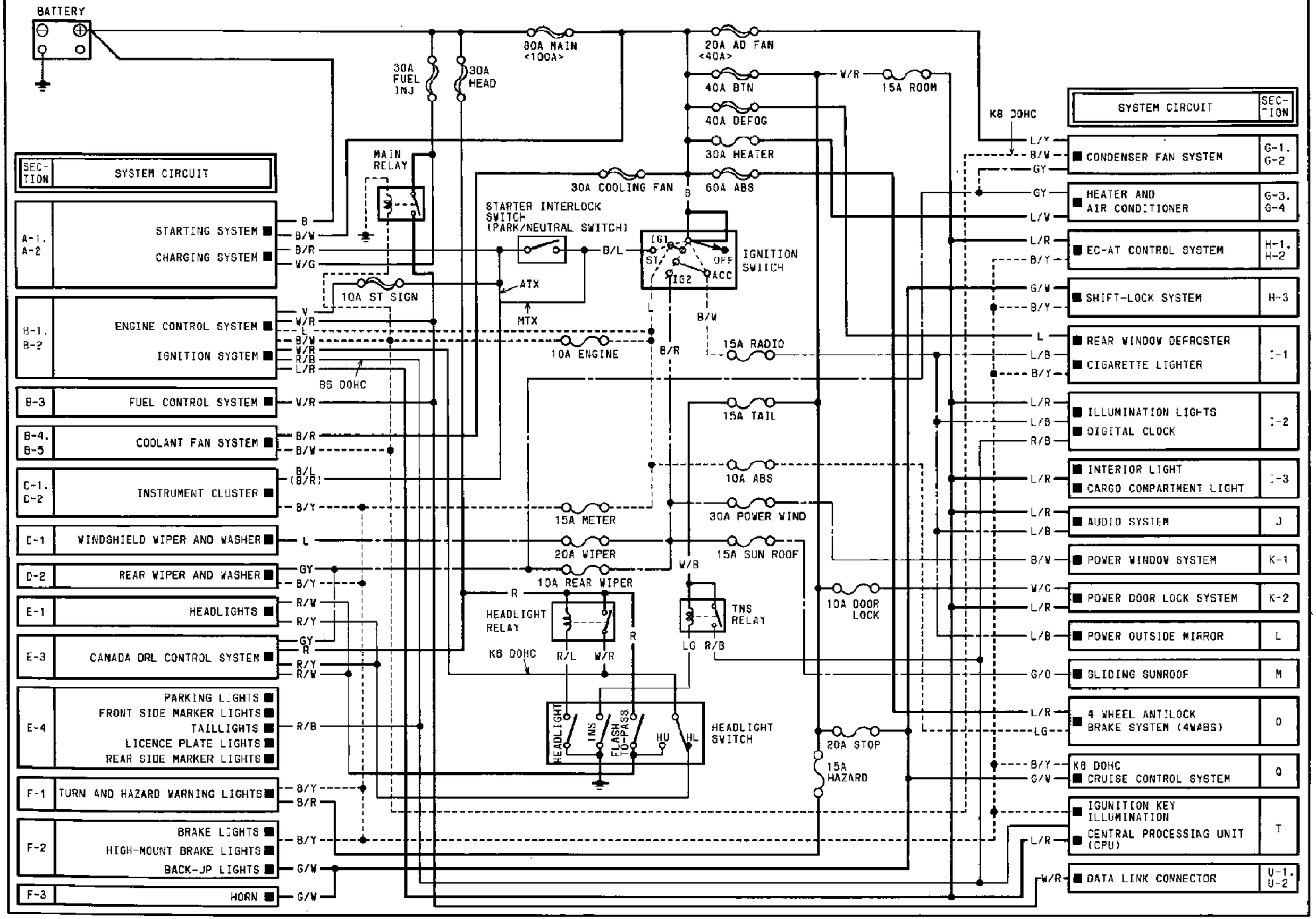




W

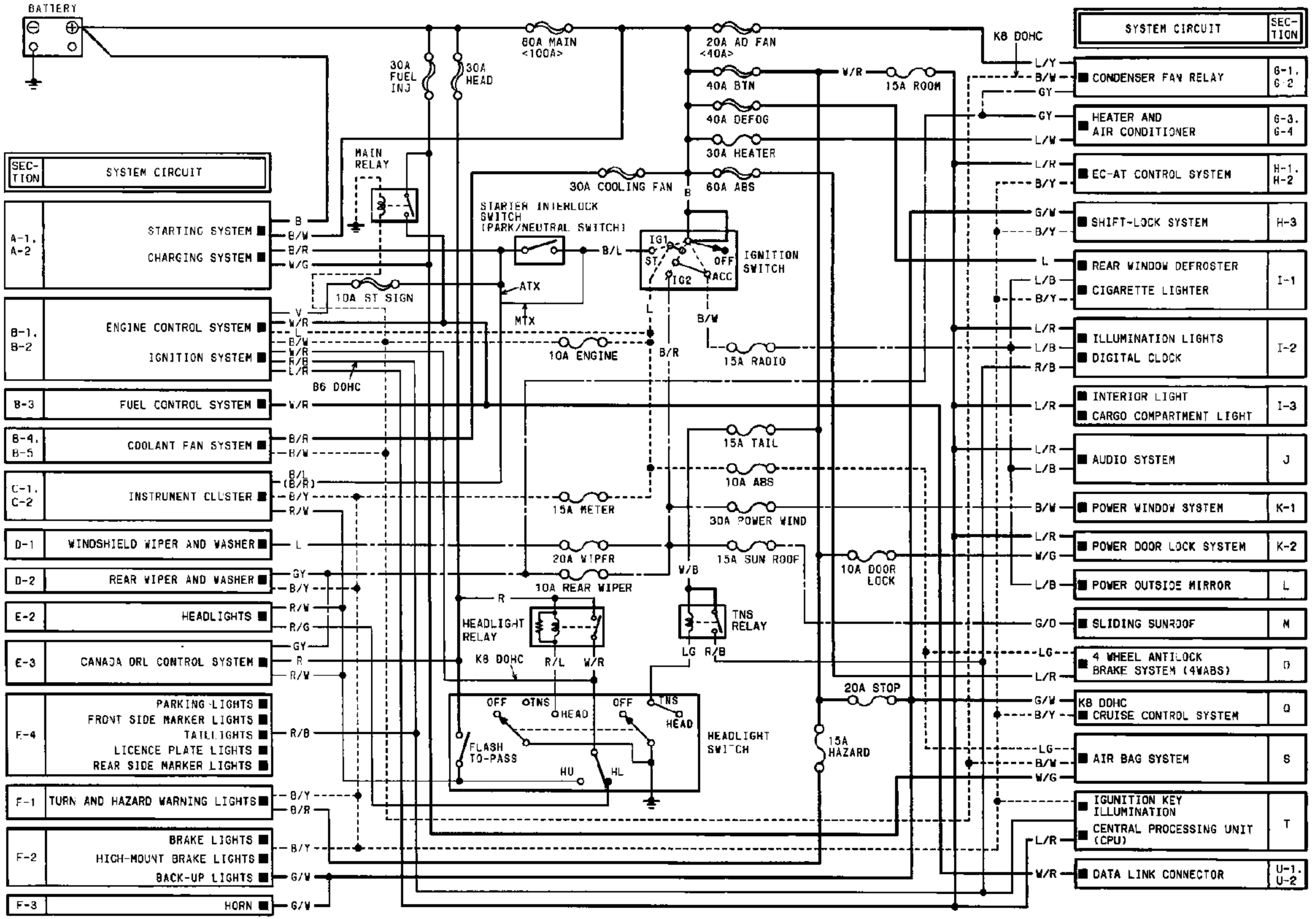
W-1 WITHOUT AIR BAG SYSTEM ■ ELECTRICAL WIRING SCHEMATIC

NOTE: ( )...ATX, < >...K8 DOHC
——CURRENT FROM BATTERY
- - - -CURRENT FROM IG1
— — —CURRENT FROM IG2
——— —CURRENT FROM ACC
———OTHERS



W-2 WITH AIR BAG SYSTEM ■ ELECTRICAL WIRING SCHEMATIC

NOTE: ( )...ATX, < >...K8 DOHC
——CURRENT FROM BATTERY
- - - -CURRENT FROM IG1
— - —CURRENT FROM IG2
— - - —CURRENT FROM ACC
———OTHERS



SYSTEM CIRCUIT DIAGRAM/ CONNECTOR LOCATIONS

ENGINE-RELATED SYSTEMS
- STARTING SYSTEM
  - MTX Z-28
  - ATX Z-30
- CHARGING SYSTEM
  - MTX Z-28
  - ATX Z-30
- ENGINE CONTROL SYSTEM
  - B6 DOHC Z-32
  - K8 DOHC Z-40
- IGNITION SYSTEM
  - B6 DOHC Z-32
  - K8 DOHC Z-40
- FUEL CONTROL SYSTEM Z-48
- COOLANT FAN SYSTEM
  - B6 DOHC, K8 DOHC MTX Z-50
  - K8 DOHC ATX Z-52

CHASSIS-RELATED SYSTEMS
- EC-AT CONTROL SYSTEM
  - B6 DOHC Z-88
  - K8 DOHC Z-90
- SHIFT-LOCK SYSTEM Z-94
- 4 WHEEL ANTILOCK BRAKE SYSTEM (4WABS) Z-112

INSTRUMENT CLUSTER-RELATED SYSTEMS
- INSTRUMENT CLUSTER
  - B6 DOHC Z-54
  - K8 DOHC Z-58

BODY-RELATED SYSTEMS
- WINDSHIELD WIPER AND WASHER Z-62
- REAR WIPER AND WASHER Z-64
- HORN Z-78
- REAR WINDOW DEFROSTER Z-96
- POWER WINDOW SYSTEM Z-104
- POWER DOOR LOCK SYSTEM Z-106
- POWER OUTSIDE MIRROR Z-108
- SLIDING SUNROOF Z-110
- CRUISE CONTROL SYSTEM
  - K8 DOHC Z-116
- AIR BAG SYSTEM Z-122
- CENTRAL PROCESSING UNIT (CPU) Z-124

INTERIOR LIGHTING SYSTEMS
- ILLUMINATION LIGHTS Z-98
- INTERIOR LIGHT Z-100
- CARGO COMPARTMENT LIGHT Z-100
- IGNITION KEY ILLUMINATION Z-124

EXTERIOR LIGHTING SYSTEMS
- HEADLIGHTS
  - WITHOUT AIR BAG SYSTEM Z-66
  - WITH AIR BAG SYSTEM Z-68
- DRL CONTROL SYSTEM Z-70
- PARKING LIGHTS Z-72
- FRONT SIDE MARKER LIGHTS Z-72
- TAILLIGHTS Z-72
- LICENCE PLATE LIGHTS Z-72
- REAR SIDE MARKER LIGHTS Z-72
- TURN AND HAZARD WARNING LIGHTS Z-74
- BRAKE LIGHTS Z-76
- HIGH-MOUNT BRAKE LIGHT Z-76
- BACK-UP LIGHTS Z-76

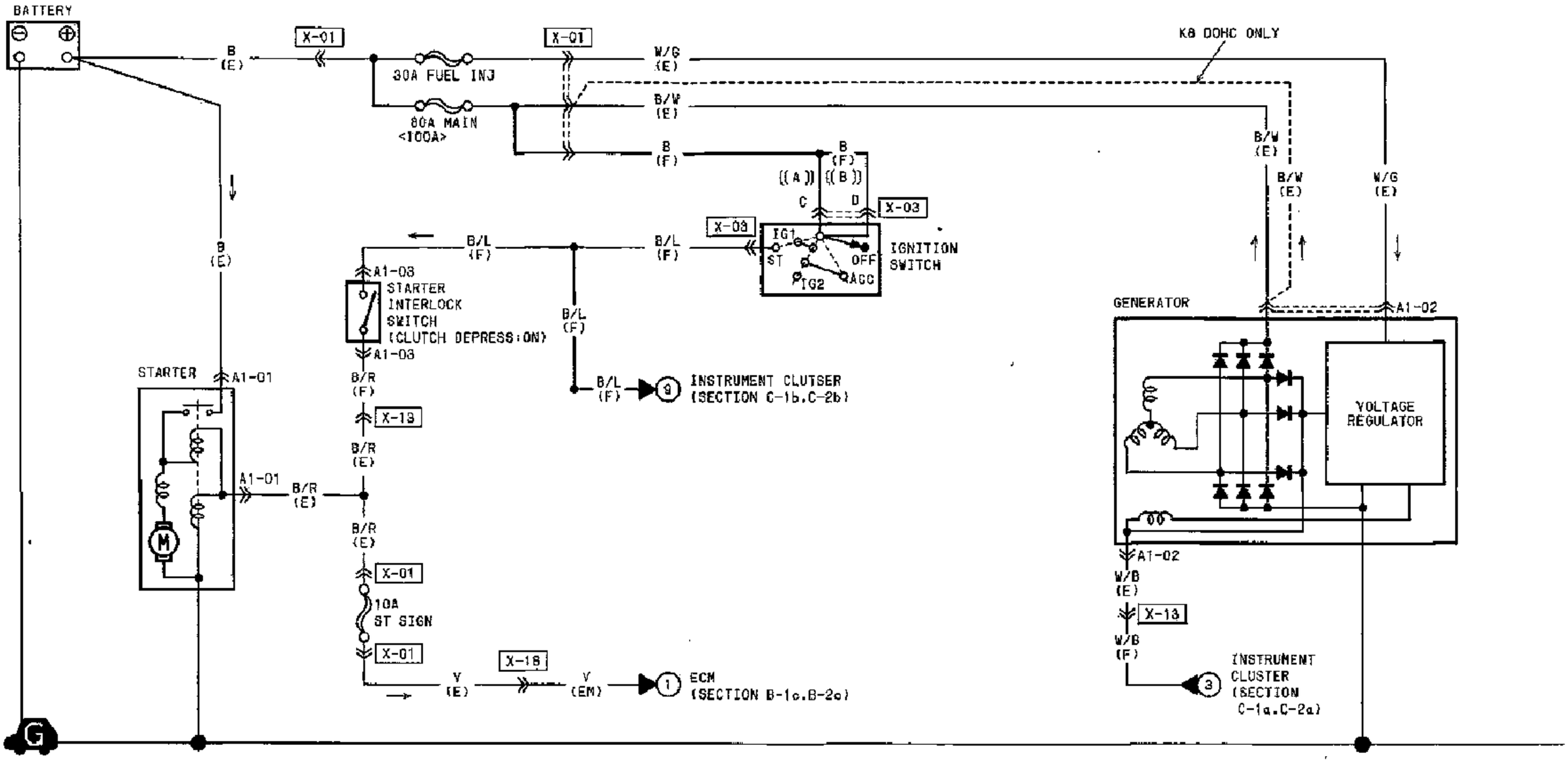
AIR CONDITIONING-RELATED SYSTEMS
- CONDENSER FAN SYSTEM
  - B6 DOHC Z-80
  - K8 DOHC Z-82
- HEATER AND AIR CONDITIONER
  - WIRE TYPE Z-84
  - LOGIC TYPE Z-86

ACESSORIES
- CIGARETTE LIGHTER Z-96
- DIGITAL CLOCK Z-98
- AUDIO SYSTEM Z-102

OTHERS
- DATA LINK CONNECTOR
  - B6 DOHC Z-128
  - K8 DOHC Z-130

A-1 MTX ■ STARTING SYSTEM ■ CHARGING SYSTEM

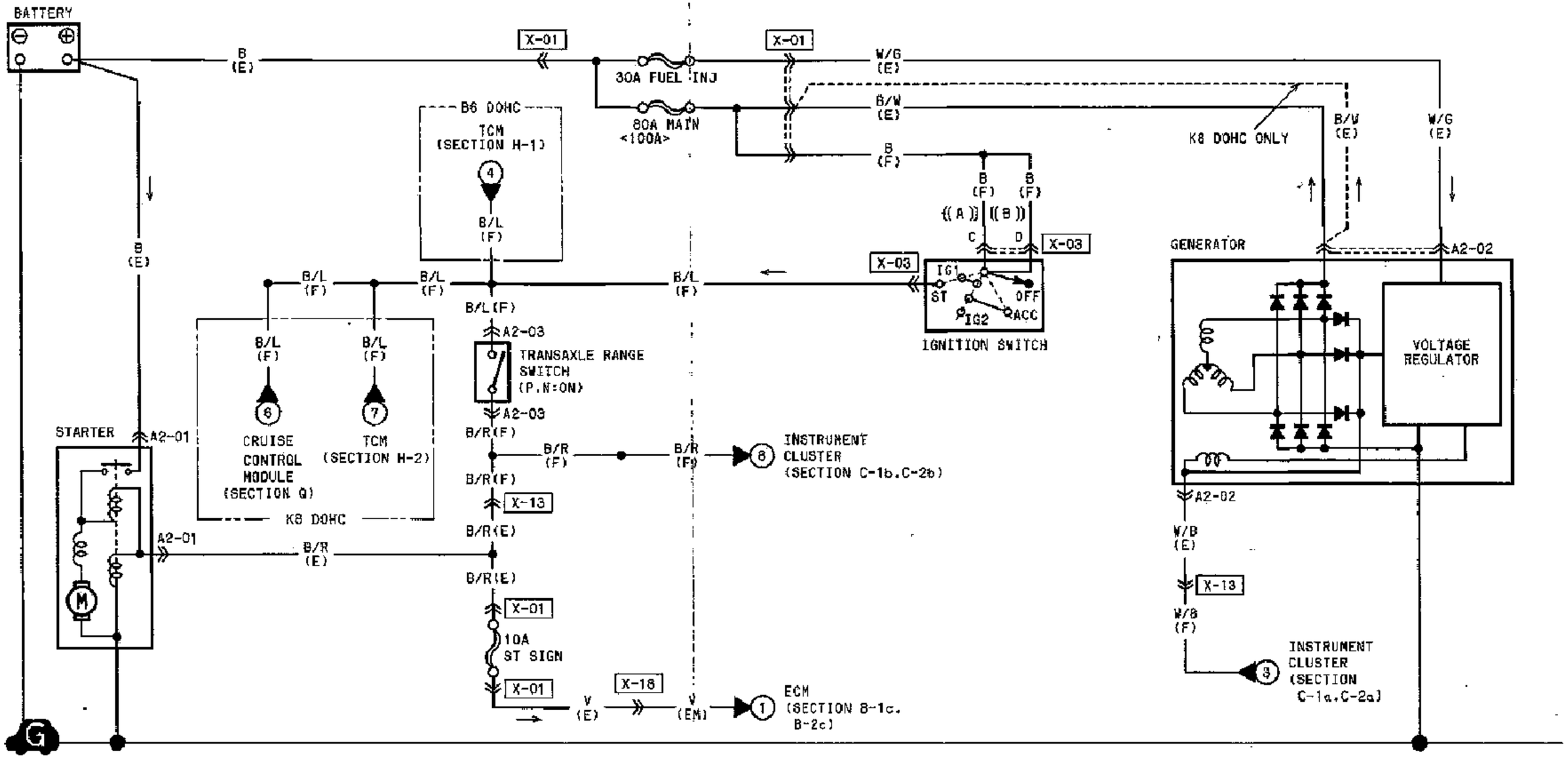
( ) ...CANADA
< >...K8 DOHC



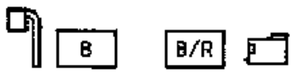
A1-01 STARTER (E)	A1-02 GENERATOR (E)		A1-03 STARTER INTERLOCK SWITCH (F)			
B B/R	W/G W/B	B/W <B/W>	B/R B/L			

A-2 ATX ■ STARTING SYSTEM ■ CHARGING SYSTEM

( )...CANADA
< >...K8 DOHC



A2-01 STARTER (E)

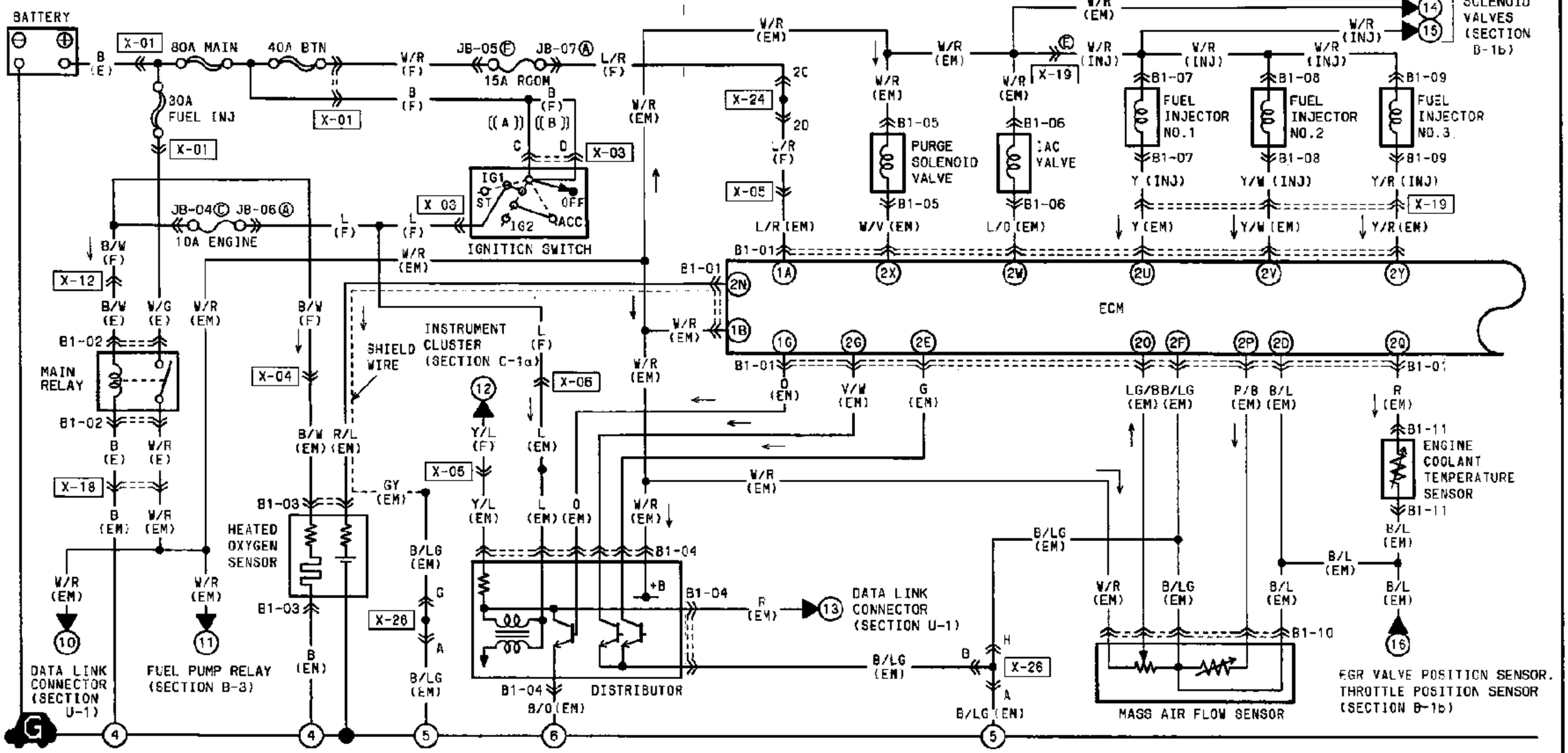


A2-02 GENERATOR (E)

A2-03 TRANSAXLE RANGE SWITCH (F)

B-1a B6 DOHC ■ ENGINE CONTROL SYSTEM ■ IGNITION SYSTEM

( )...CANADA
( )...CALIFORNIA



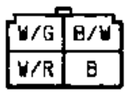
B1-01 ECM (EM)

< >...CANADA MTX ( )...ATX

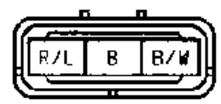
1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
R/B	O/B	BR	(G/B)	V/R	LG/Y	(R/G)	O	GY/R	V	L/R
BR/Y (P)	GY	W/V	BR/B	R/W	Y/B	L/B	W	GY/B	W/Y	W/R
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A
Y/R	L/O	Y	<↓>	R	LG/B	L/W	LG/R	Y	V/W	G	B/LG	B/O
L	W/V	Y/W	LG	G/O	P/B	R/L	G	W/O	O/L (LG/B)	B/LG	B/L	B/P
2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B

B1-02 MAIN RELAY (E)



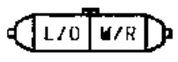
B1-03 HEATED OXYGEN SENSOR (EM)



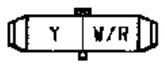
B1-04 DISTRIBUTOR (EM)

B1-05 PURGE SOLENOID VALVE (EM)

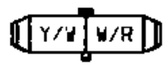
B1-06 IAC VALVE (EM)



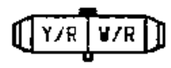
B1-07 FUEL INJECTOR NO.1 (INJ)



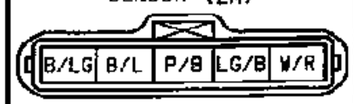
B1-08 FUEL INJECTOR NO.2 (INJ)



B1-09 FUEL INJECTOR NO.3 (INJ)

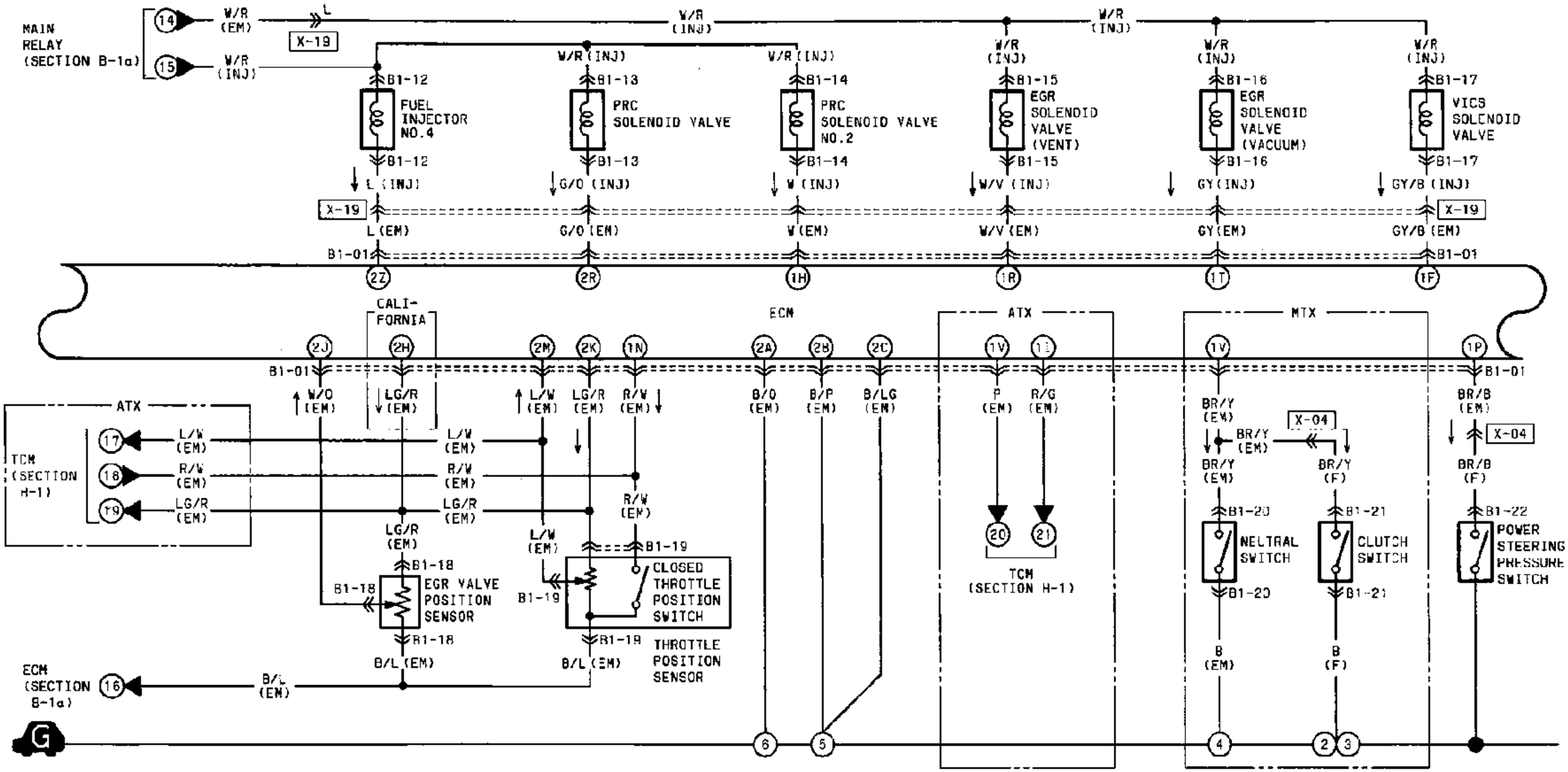


B1-10 MASS AIR FLOW SENSOR (EM)



B1-11 ENGINE COOLANT TEMPERATURE SENSOR (EM)

B-1b B6 DOHC ■ ENGINE CONTROL SYSTEM

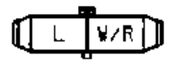


B1-01 ECM (EM) ( )...ATX { }...CALIFORNIA < >...CANADA MTX

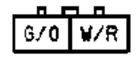
1J	1G	1Q	1O	1M	1K	1I	1G	1E	1C	1A
R/B	O/B	BR	(G/B)	V/R	LG/Y	(R/G)	O	GY/R	V	L/R
BR/Y (P)	GY	W/V	BR/B	R/W	Y/B	L/B	W	GY/B	W/Y	W/R
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A
Y/R	L/O	Y	<*>	R	LG/B	L/W	LG/R	Y	V/W	G	B/LG	B/O
L	W/V	Y/W	LG	G/O	P/B	R/L	G	W/O	O/L (LG/R)	B/LG	B/L	B/P
2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B

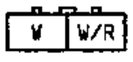
B1-12 FUEL INJECTOR NO.4 (INJ)



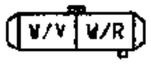
B1-13 PRC SOLENOID VALVE (INJ)



B1-14 PRC SOLENOID VALVE NO.2 (INJ)

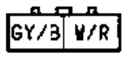


B1-15 EGR SOLENOID VALVE (VENT) (INJ)



B1-16 EGR SOLENOID VALVE (VACUUM) (INJ)

B1-17 VICS SOLENOID VALVE (INJ)



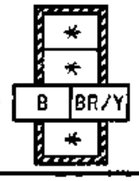
B1-18 EGR VALVE POSITION SENSOR (EM)

B1-19 THROTTLE POSITION SENSOR (EM)

B1-20 NEUTRAL SWITCH (EM) (MTX ONLY)

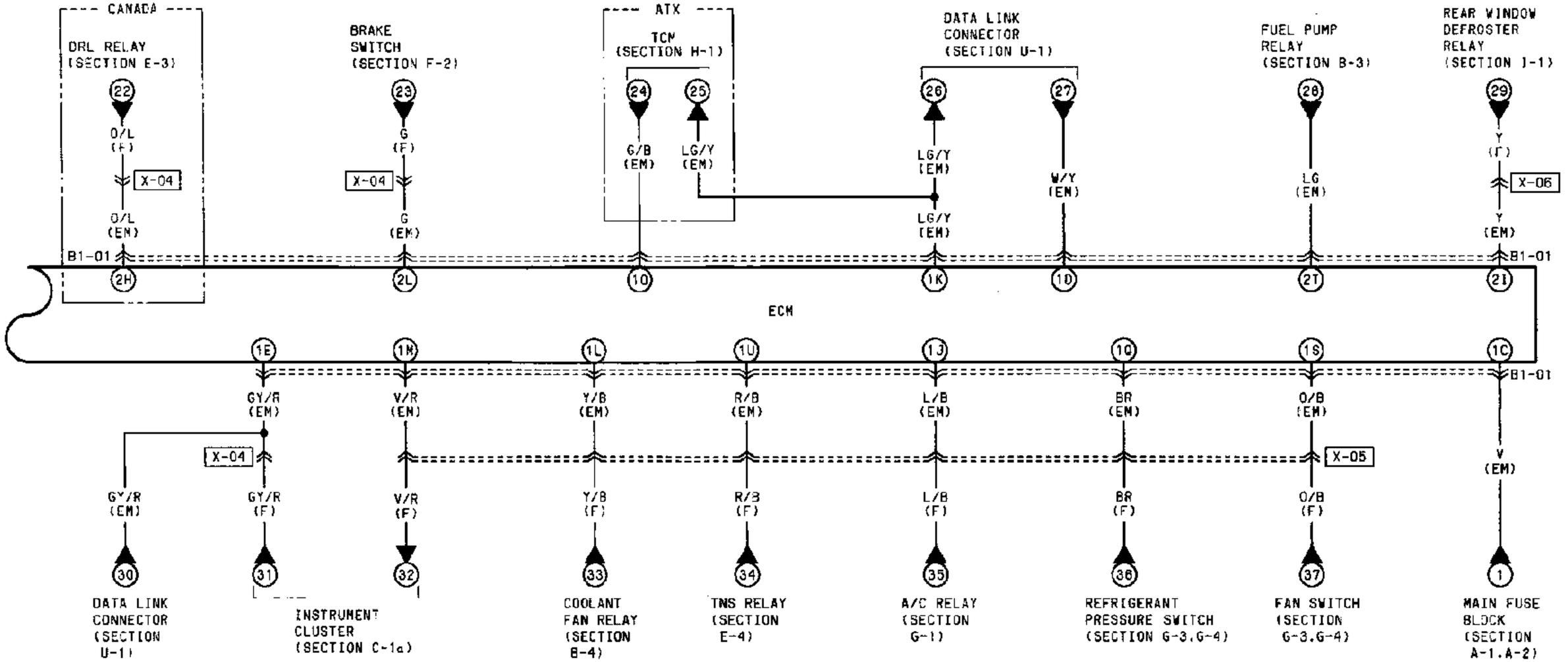
B1-21 CLUTCH SWITCH (F)

(MTX ONLY)



B1-22 POWER STEERING PRESSURE SWITCH (F)

B-1c B6 DOHC ■ ENGINE CONTROL SYSTEM



G

B1-01 ECM (EM) ( )...ATX [ ]...CALIFORNIA < >...CANADA MTX

1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
R/B	O/B	BR	(G*/B)	V/R	LG/Y	(R*/G)	O	GY/R	V	L/R
BR/Y (P)	GY	W/V	BR/B	R/W	Y/B	L/B	W	GY/B	W/Y	W/R
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A
Y/R	L/G	Y	<V*>	R	LG/B	L/W	LG/R	Y	V/W	G	B/LG	B/O
L	W/V	Y/W	LG	G/O	P/B	R/L	G	W/O	G/L (LG/R)	B/LG	B/L	B/P
2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B

B-1

Terminal voltage (reference data)

B+: Battery positive voltage

Terminal	Input	Output	Connection to	Test condition		Correct voltage	Remark
1A	O		Battery	Constant		B+	For backup
1B	O		Main relay (FUEL INJ relay)	Ignition switch	OFF	0V	—
					ON	B+	
1C	O		Ignition switch (START)	Ignition switch ON		0V	—
				While cranking		Approx. 10V	
1D		O	Data link connector (MEN terminal)	Test switch at "SELF-TEST" Lamp illuminated for 3 sec. after ignition switch OFF → ON		4.5–5.5V	With Self-Diagnosis Checker and System Selector
				Lamp not illuminated after 3 sec.		B+	
				Test switch at "O_2 MONITOR" at idle Monitor lamp illuminated		4.5V–5.5V	
				Test switch at "O_2 MONITOR" at idle Monitor lamp not illuminated		B+	
1E		O	Malfunction indicator lamp (MIL)	Lamp illuminated for 3 sec. after ignition switch OFF → ON		Below 2.5V	With System Selector test switch at "SELF-TEST"
				Lamp not illuminated after 3 sec.		B+	
				Lamp illuminated		Below 2.5V	
				Lamp not illuminated		B+	
			Data link connector (FEN terminal)	Buzzer sounded for 3 sec. after ignition switch OFF → ON		Below 2.5V	• With Self-Diagnosis Checker and System Selector • With System Selector test switch at "SELF-TEST"
				Buzzer not sounded after 3 sec.		B+	
				Buzzer sounded		Below 2.5V	
				Buzzer not sounded after 3 sec.		B+	
1F		O	VICS solenoid valve	Engine speed below 4,750 rpm		0V	VICS: Variable Inertia Charging System
				Engine speed above 4,750 rpm		B+	
1G		O	Ignition control module	Ignition switch ON		0V	—
				Idle		Approx. 0.2V	
1H		O	PRC solenoid valve No.2	Hot condition: Engine coolant temp. above 95°C (203°F) and intake air temp. above 60°C (140°F) for 149 sec. after engine starting.		Below 1.0V	—
				Other conditions (idle)		B+	
1I		O	TCM (ATX)	Engine coolant temperature below 72°C (162°F) at idle		Below 2.5V	Ignition switch ON
				Engine coolant temperature above 72°C (162°F) at idle		B+	
1J		O	A/C relay	A/C switch ON at idle		Below 2.5V	Blower switch ON
				A/C switch OFF at idle		B+	
1K	O		Data link connector (TEN terminal)	System Selector test switch at O_2 MONITOR		B+	• With Self-Diagnosis Checker and System Selector • Ignition switch ON
				System Selector test switch at SELF-TEST		0V	

B+: Battery positive voltage

Terminal	Input	Output	Connection to	Test condition		Correct voltage	Remark
1L		O	Coolant fan relay	Ignition switch ON		B+	—
				Idle	Engine coolant temp. above 97°C (206.6°F)	Below 1.0V	A/C sensor OFF
					Other conditions	B+	—
				·Ignition switch ON ·Ground data link connector TEN terminal ·Closed throttle position switch OFF		Below 1.0V	—
1M	O		Vehicle speed sensor	While driving		2–5V	—
				Vehicle stopped		1 or 7V	
1N	O		Throttle position sensor (Closed throttle position switch)	Accelerator pedal released		0V	Ignition switch ON
				Accelerator pedal depressed		B+	
1O	O		TCM*1	At shifting		Below 1.0V	—
				Other		B+	
1P	O		Power steering pressure switch	Ignition switch ON		B+	—
				P/S ON at idle		0V	
				P/S OFF at idle		B+	
1Q	O		Air conditioning switch	A/C switch ON		Below 2.5V	Ignition switch ON and blower switchON
				A/C switch OFF		B+	
1R		O	EGR solenoid valve (vent)	Idle		B+	*Engine Signal Monitor : Green and red lamps flash after warm
				Driving		B+*	
1S	O		Fan switch	Fan switch OFF or 1st position		B+	Ignition switch ON
				Fan switch 2nd or higher position		0V	
1T		O	EGR solenoid valve (vacuum)	Idle		B+	*Engine Signal Monitor : Green and red lamps flash after warm up
				Driving		B+*	
1U	O		TNS RELAY	Headlights ON		B+	—
				Headlights OFF		Below 1.0V	

*1 Reduce torque signal

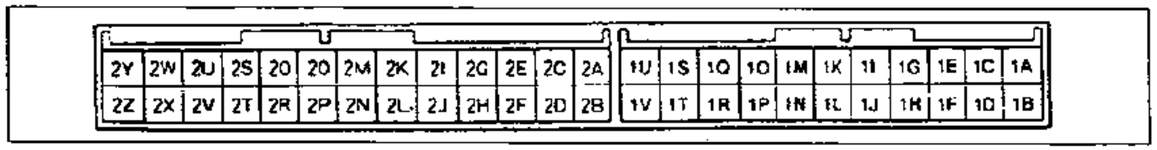
B-1

B+: Battery positive voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
1V	O		Clutch switch Neutral switch (MTX)	Clutch pedal depressed	0V	Ignition switch ON
				Neutral position	0V	
				Others	B+	
			Transaxle range switch (ATX)	N or P range	0V	Ignition switch ON
				Others	B+	
2A	—	—	Ground (Fuel injector)	Constant	0V	—
2B	—	—	Ground (Output)	Constant	0V	—
2C	—	—	Ground (CPU)	Constant	0V	—
2D	—	—	Ground (Input)	Constant	0V	—
2E	O		Distributor (SGT signal)	Ignition switch ON	Approx. 0V or 4.5–5.5V	—
				Idle	Approx. 2V	
2F	O		Mass air flow sensor (VGN signal)	Ignition switch ON	Below 1.0V	—
				Idle		
2G	O		Distributor (SGC signal)	Ignition switch ON	Approx. 0V or 4.5–5.5V	—
				Idle	Approx. 1.5V	
2H	O		DRL relay (CANADA)	Parking brake pulled with ignition switch ON	B+	—
				Parking brake released with ignition switch ON	Below 2.5V	
			V_{REF} (California)	Ignition switch ON	Approx. 5V	
			Open (Federal)	–	–	
2I	O		Rear window defroster relay	Rear window defroster switch OFF	B+	Ignition switch ON
				Rear window defroster switch ON	Below 1.0V	
2J	O		EGR valve position sensor	Ignition switch ON	Approx. 1.0V	—
				While running	Approx. 0–5V	
2K		O	V_{REF}	Ignition switch ON	Approx. 5V	—
2L	O		Brake switch	Brake pedal released	Below 1.0V	—
				Brake pedal depressed	B+	
2M	O		Throttle position sensor	Accelerator pedal released	0.1–1.1V	Ignition switch ON
				Accelerator pedal fully depressed	2.8–4.5V	

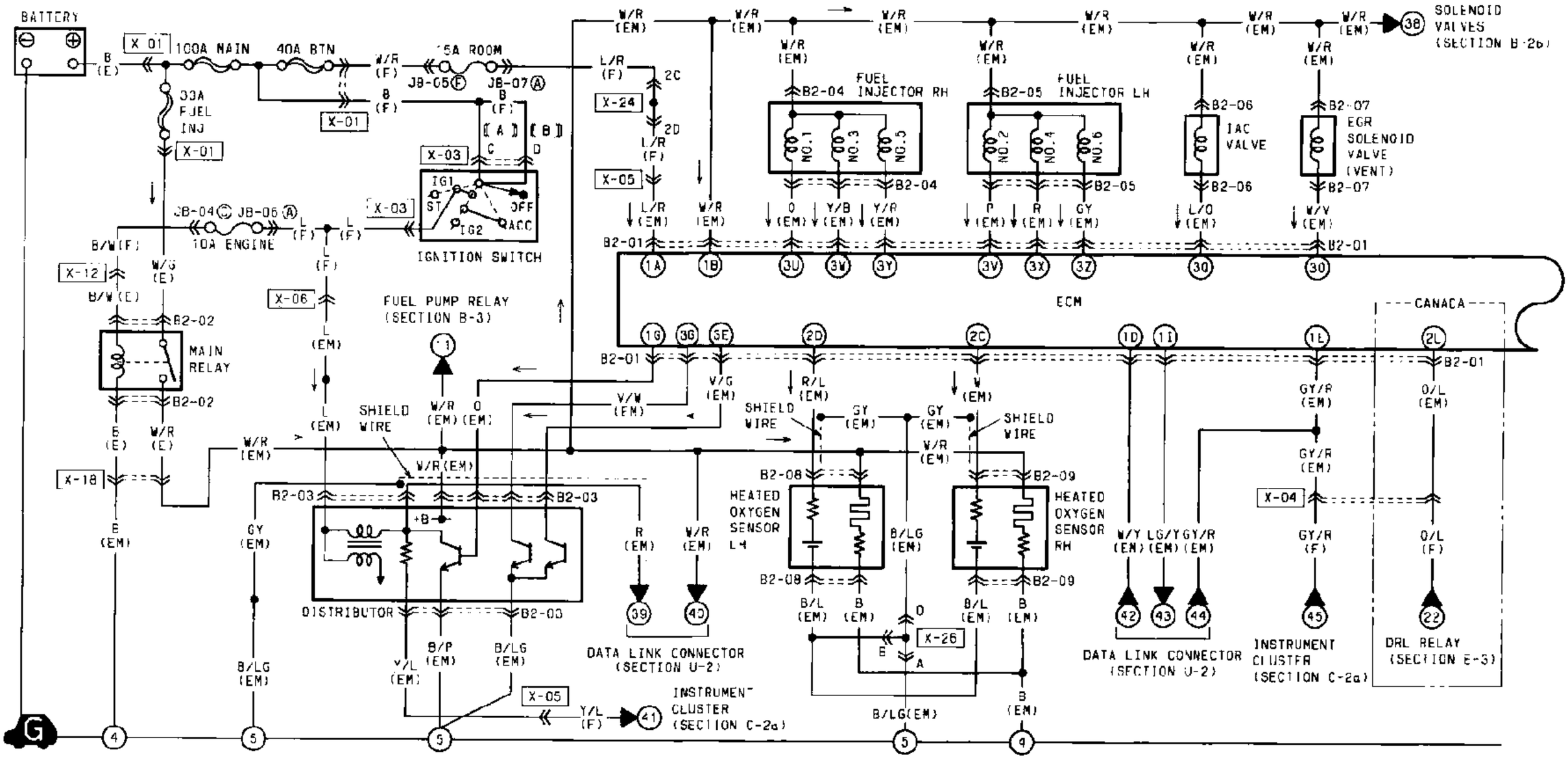
B+: Battery positive voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
2N	O		Heated oxygen sensor	Ignition switch ON	0V	–
				Idle (Cold engine)	0V	
				Idle (After warm-up)	0–1.0V	
				Increasing engine speed (After warm-up)	0.5–1.0V	
				Deceleration	0–0.4V	
2O	O		Mass air flow sensor (VGP signal)	Ignition switch ON	Below 1.0V	—
				Idle	1.0–2.0V	
2P	O		Intake air temperature sensor	Ambient air temperature 20°C (68°F)	Approx. 2.5V	·Built in mass air-flow sensor ·Ignition switch ON
2Q	O		Engine coolant temperature sensor	Engine coolant temperature 20°C (68°F)	Approx. 2.5V	Ignition switch ON
				After warm-up	Below 0.5V	
2R	O		PRC solenoid valve	Hot condition: Engine coolant temperature between 85°C (185°F) and 95°C (203°F) and intake air temperature between 48°C (119°F) and 60°C (140°F) for 149 sec. after engine starting	Below 1.0V	—
				Other condition at idle	B+	
2S	—	—	—	—	—	—
2T		O	Fuel pump relay	Ignition switch ON	B+	—
				During cranking or at idle	0	
2U		O	Fuel injector (No.1)	Ignition switch ON	B+	*Engine Signal Monitor: Green and red lamps flash
				*Idle	B+	
				Engine speed above 2,000 rpm on deceleration (After warm-up)	B+	
2V		O	Fuel injector (No.2)	Ignition switch ON	B+	*Engine Signal Monitor: Green and red lamps flash
				*Idle	B+	
				Engine speed above 2,000 rpm on deceleration (After warm-up)	B+	
2W		O	IAC valve	Ignition switch ON	Approx. 2.0V	—
				Idle	Approx. 10V	
2X		O	Purge solenoid valve	Ignition switch ON	B+	—
				Idle	B+	
2Y		O	Fuel injector (No.3)	Ignition switch ON	B+	*Engine Signal Monitor: Green and red lamps flash
				*Idle	B+	
				Engine speed above 2,000 rpm on deceleration (After warm-up)	B+	
2Z		O	Fuel injector (No.4)	Ignition switch ON	B+	*Engine Signal Monitor: Green and red lamps flash
				*Idle	B+	
				Engine speed above 2,000 rpm on deceleration (After warm-up)	B+	



B-2a K8 DOHC ■ ENGINE CONTROL SYSTEM ■ IGNITION SYSTEM

( ) ...CANADA



B2-01 ECM (EM) ( )...ATX [ ]...CANADA ATX < >...CANADA

1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
B (*)	* (W/L)	G	BR	V/R	* (R/G)	LG/Y	O	GY/R	V	L/R
* (LG/B)	R/W	BR/Y (P)	O/B	BR/B	L/B	B/L	W/R	*	W/Y	W/R
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

2O	2M	2K	2I	2G	2E	2C	2A
G/O	Y/L	R/B	LG/R	*	P/L	W	*
* (L)	*	* <O/L>	W/O	B (**)	L/W	R/L	R
2P	2N	2L	2J	2H	2F	2D	2B

3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
Y/R	Y/B	O	*	L/O	W/V	V	*	O/G	V/W	V/G	B/LG	B/O
GY	R	P	LG	*	GY/Y	P/B	Y/B	BR/W	L/G	L/Y	B/L	B/P
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

B2-02 MAIN RELAY (E)

W/G	B/W
W/R	B

B2-03 DISTRIBUTOR (EM)

O	B/P	V/W	V/G	W/R	B/LG

Y/L	R	L

B2-04 FUEL INJECTOR RH (EM)

Y/R	W/R
Y/B	O

B2-05 FUEL INJECTOR LH (EM)

W/R	P	R	GY

B2-06 IAC VALVE (EM)

L/O	W/R

B2-07 EGR SOLENOID VALVE (VENT) (EM)

W/V	W/R

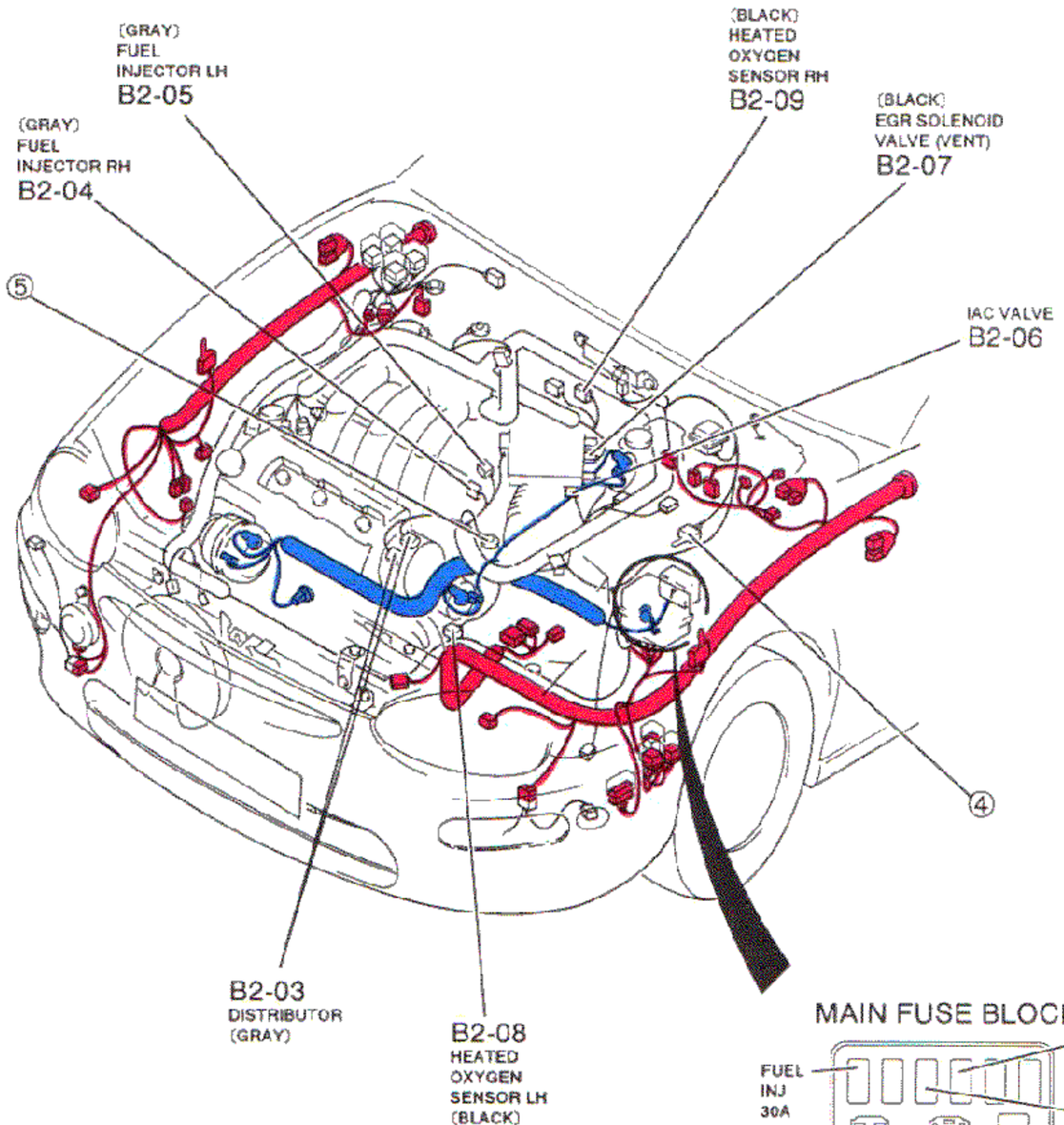
B2-08 HEATED OXYGEN SENSOR LH (EM)

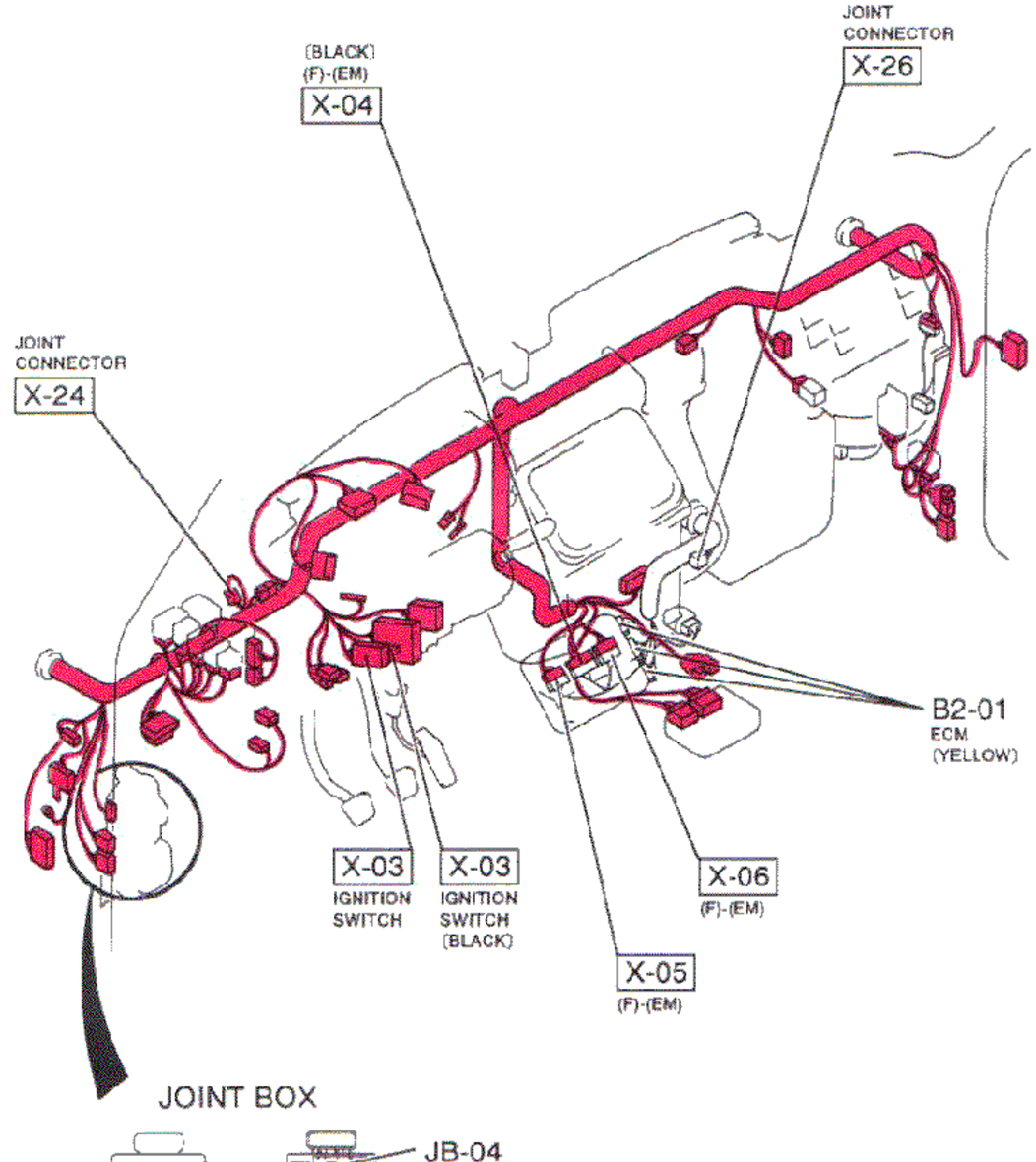
R/L	W/R
B/L	B

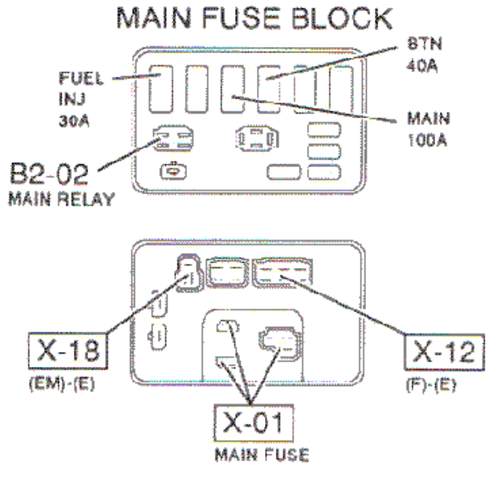
B2-09 HEATED OXYGEN SENSOR RH (EM)

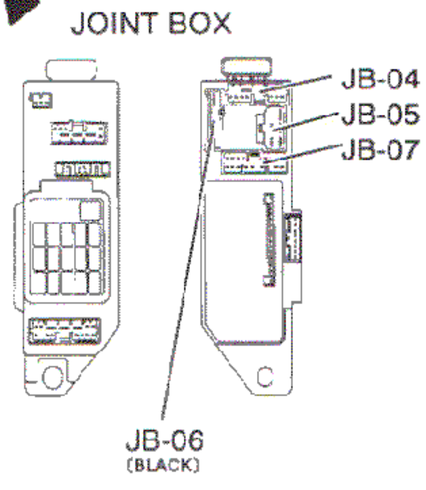
W	W/R
B/L	B

B-2a

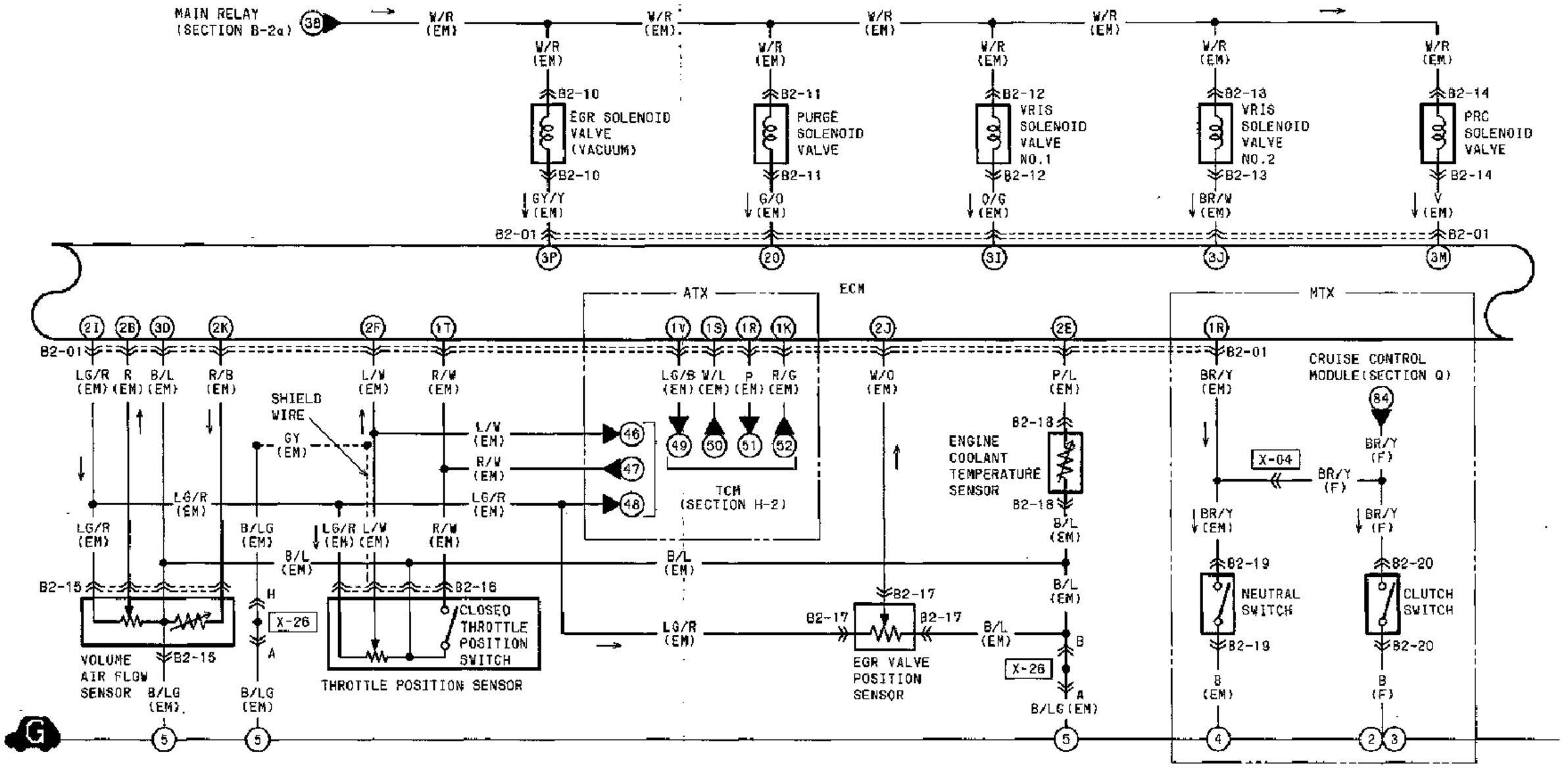

(GRAY)
FUEL
INJECTOR LH
B2-05
(GRAY)
FUEL
INJECTOR RH
B2-04
(BLACK)
HEATED
OXYGEN
SENSOR RH
B2-09
(BLACK)
EGR SOLENOID
VALVE (VENT)
B2-07
IAC VALVE
B2-06
⑤
④
B2-03
DISTRIBUTOR
(GRAY)
B2-08
HEATED
OXYGEN
SENSOR LH
(BLACK)


(BLACK)
(F)-(EM)
X-04
JOINT
CONNECTOR
X-26
JOINT
CONNECTOR
X-24
B2-01
ECM
(YELLOW)
X-03
IGNITION
SWITCH
X-03
IGNITION
SWITCH
(BLACK)
X-06
(F)-(EM)
X-05
(F)-(EM)


MAIN FUSE BLOCK
FUEL
INJ
30A
B2-02
MAIN RELAY
8TN
40A
MAIN
100A
X-18
(EM)-(E)
X-12
(F)-(E)
X-01
MAIN FUSE


JOINT BOX
JB-04
JB-05
JB-07
JB-06
(BLACK)

B-2b K8 DOHC ■ ENGINE CONTROL SYSTEM



B2-01 ECM (EM) ( )...ATX 《 》...CANADA ATX < >...CANADA

1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
B (*) / * (LG/B)	* (W/L)	G	BR	V/R	* (R/G)	LG/Y	O	GY/R	V	L/R
R/W	BR/Y (F)	O/B	BR/B	L/B	B/L	W/R	*	W/Y	W/R	
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

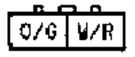
2O	2M	2K	2I	2G	2E	2C	2A
G/O	Y/L	R/B	LG/R	*	P/L	W	*
* (L)	*	* 《O/L》	W/O	B 《*》	L/W	R/L	R
2P	2N	2L	2J	2H	2F	2D	2B

3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
Y/R	Y/B	O	*	L/O	W/V	V	*	O/G	V/W	V/G	B/LG	B/O
GY	R	P	LG	*	GY/Y	P/B	Y/B	BR/W	L/G	L/Y	B/L	B/P
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

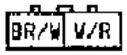
B2-10 EGR SOLENOID VALVE (VACUUM) (EM)

B2-11 PURGE SOLENOID VALVE (EM)

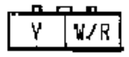
B2-12 VRIS SOLENOID VALVE NO.1 (EM)



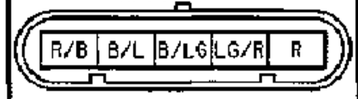
B2-13 VRIS SOLENOID VALVE NO.2 (EM)



B2-14 PRC SOLENOID VALVE (EM)



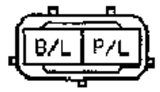
B2-15 VOLUME AIR FLOW SENSOR (EM)



B2-16 THROTTLE POSITION SENSOR (EM)

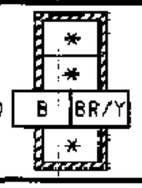
B2-17 EGR VALVE POSITION SENSOR (EM)

B2-18 ENGINE COOLANT TEMPERATURE SENSOR (EM)

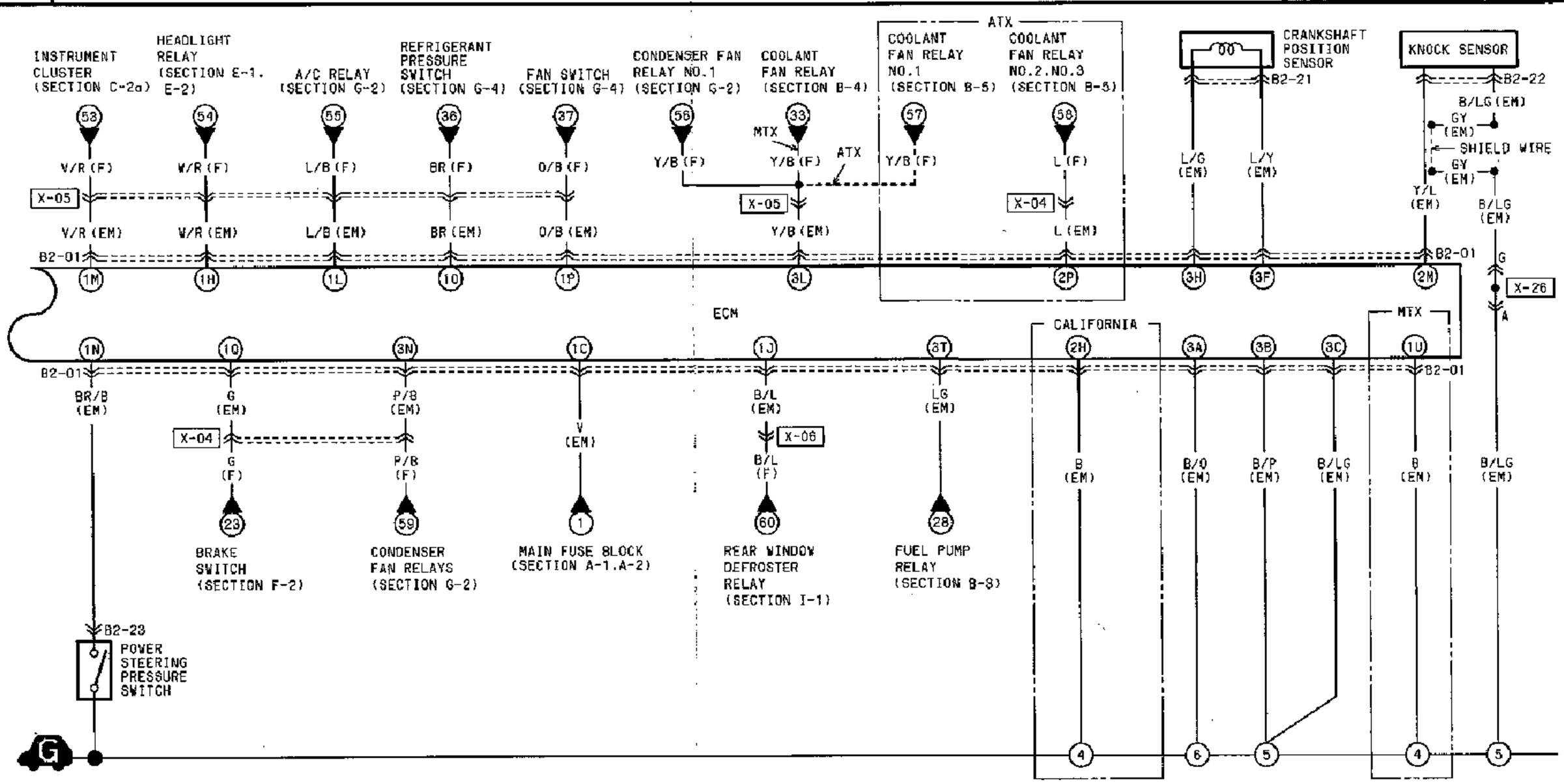


B2-19 NEUTRAL SWITCH (EM) (MTX ONLY)

B2-20 CLUTCH SWITCH (F) (MTX ONLY)



B-2c K8 DOHC ■ ENGINE CONTROL SYSTEM



B2-01 ECM (EM) ( )...ATX 《 》...CANADA ATX < >...CANADA

1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
B (*)	* (W/L)	G	BR	V/R	* (R/G)	LG/Y	O	GY/R	V	L/R
* (LG/B)	R/W	BR/Y (P)	O/B	BR/B	L/B	B/L	W/R	*	W/Y	W/R
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

2O	2M	2K	2I	2G	2E	2C	2A
G/O	Y/L	R/B	LG/R	*	P/L	W	*
* (L)	*	* <O/L>	W/O	B (*)	L/W	R/L	R
2P	2N	2L	2J	2H	2F	2D	2B

3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
Y/R	Y/B	O	*	L/O	W/V	V	*	O/G	V/W	V/G	B/LG	B/O
GY	R	P	LG	*	GY/Y	P/B	Y/B	BR/W	L/G	L/Y	B/L	B/P
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

B2-21 CRANKSHAFT POSITION SENSOR (EM)

B2-22 KNOCK SENSOR (EM)

B2-23 POWER STEERING PRESSURE SWITCH (EM)

B-2

Terminal Voltage

B+: Battery positive voltage

Terminal	Input	Output	Connection to	Test condition		Correct voltage	Remarks
1A	O		Battery	Constant		B+	For backup
1B	O		Main relay (FUEL INJ relay)	Ignition switch	OFF	0V	—
					ON	B+	
1C	O		Ignition switch (START)	While cranking		10V	—
				Ignition switch ON		Below 1.0V	
1D		O	Data link connector (MEN terminal)	Test switch at "SELF-TEST" Lamp illuminated for 3 sec. after ignition switch OFF→ON		4.5–5.5V	With Self-Diagnosis Checker and System Selector
				Lamp not illuminated after 3 sec.		B+	
				Test switch at "O2 MONITOR" at idle Monitor lamp illuminated		4.5–5.5V	
				Test switch at "O2 MONITOR" at idle Monitor lamp not illuminated		B+	
1E		O	Malfunction indicator light (MIL)	Light illuminated for 3 sec. after ignition switch OFF→ON		Below 2.5V	With System selector test Switch at "SELF-TEST"
				Light not illuminated after 3 sec.		B+	
				Light illuminated		Below 2.5V	
				Light not illuminated		B+	
			Data link connector (FEN terminal)	Buzzer sounded for 3 sec. after ignition switch OFF→ON		Below 2.5V	• With Self-Diagnosis Checker and System Selector • With System Selector test switch at "SELF-TEST"
				Buzzer not sounded after 3 sec.		B+	
				Buzzer sounded		Below 2.5V	
				Buzzer not sounded		B+	
1F	—	—	—	—		—	—
1G		O	Ignition control module	Ignition switch ON		Approx. 0V	—
				Idle		Approx. 0.6	
1H	O		Headlight switch	Head light ON		B+	—
				Head light OFF		0V	
1I	O		Data link connector (TEN terminal)	System Selector test switch at "O_2 MONITOR"		B+	• With Self-Diagnosis Checker and System Selector • Ignition switch ON
				System Selector test switch at "SELF-TEST"		Below 1.0V	
1J	O		Rear window defroster relay	Rear window defroster switch OFF		B+	Ignition switch ON
				Rear window defroster switch ON		Below 1.5V	
1K		O	TCM	Engine coolant temperature below 60°C (140°F)		Below 1.0V	Ignition switch ON
				Engine coolant temperature above 60°C (140°F)		B+	
1L		O	A/C relay	A/C switch ON		Below 2.5V	Ignition switch ON
				A/C switch OFF		B+	

B+: Battery positive voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remarks
1M	O		Vehicle speed sensor	Ignition switch ON	0V or approx. 5.0V	—
				Driving	Approx. 2.5V	
1N	O		P/S pressure switch	Ignition switch ON	B+	—
				P/S ON at idle	Below 1.0V	
				P/S OFF at idle	B+	
1O	O		A/C switch	A/C switch ON	1.5–3.5V	Ignition switch ON and blower motor ON
				A/C switch OFF	4.5–5.5V	
1P	O		Fan switch	Fan speed control 2nd–4th position	Below 1.0V	Ignition switch ON and blower Motor ON
				Fan speed control 1st position or fan switch OFF	B+	
1Q	O		Brake switch	Brake pedal released	Below 1.0v	—
				Brake pedal depressed	B+	
1R	O		Neutral/Clutch switch (MTX)	Neutral position or clutch pedal depressed	Below 1.0V	Ignition switch ON
				Others	B+	
			TCM (ATX)	N or P range	Below 1.0V	—
				Others	B+	
1S	O		TCM (ATX)	At shifting	Approx. 2.5V	—
				Others	B+	
1T	O		Throttle position sensor (Closed throttle position switch)	Accelerator pedal released	Below 1.0V	Ignition switch ON
				Accelerator pedal depressed	B+	
1U	O		Ground (MTX)	Constant	0V	—
1V	O		TCM	At shifting	0V	—
				Others	B+	
2A	—	—	—	—	—	—
2B	O		Volume air flow sensor	Ignition switch ON	Approx. 4V	—
				Idle	Approx. 2.6V	
2C	O		Heated oxygen sensor (RH)	Ignition switch ON	0V	—
				Idle (After warm-up)	0–1.0V	
2D	O		Heated oxygen sensor (LH)	Increasing engine speed (After warm-up)	0.5–1.0V	
				Deceleration	0–0.4V	
2E	O		Engine coolant temperature sensor	Engine coolant temperature 20°C (68°F)	Approx. 3.1V	Ignition switch ON
				After warm-up	Approx. 0.9V	
2F	O		Throttle position sensor	Closed throttle position	0.1—1.1V	Ignition switch ON
				Wide open throttle	2.8—4.5V	

B-2

B+: Battery positive voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remarks
2H	O		—	Constant	Approx. 5V	—
			Ground (California)	Constant	0V	—
2I	O		Throttle position sensor Volume airflow sensor EGR valve position sensor TCM	Constant	5V	
2J	O		EGR valve position sensor	Ignition switch ON	Approx. 0.8V	—
				Engine running	Approx. 0.8–4.5V	
2K	O		Intake air temperature sensor (Volume air flow sensor)	Ambient air temperature 20°C (68°F)	Approx. 2.5V	Ignition switch ON
2L	O		DRL relay (Canada)	Parking brake pulled with ignition switch ON (DRL OFF)	B+	DRL: Daytime Running Lights
				Idle (DRL ON)	Below 2.5V	
2M*	O		Knock sensor	Ignition switch ON	Approx. 0.7V	—
				Idle	Approx. 0.7V	
2N	—	—	—	—	—	—
2O		O	Purge solenoid valve	Ignition switch ON or idle	B+	
2P		O	Coolant fan relay (ATX)	Engine coolant temp. 108°C (226°F)	Below 2V	—
				Others	B+	
3A	—	—	Ground (Output)	Constant	0V	—
3B	—	—	Ground (Fuel injector)	Constant	0V	—
3C	—	—	Ground (CPU)	Constant	0V	—
3D	—	—	Ground (Input)	Constant	0V	—
3E	O		Camshaft position sensor (in distributor) (SGT signal)	Ignition switch ON	Approx. 0V or 5V	—
				Idle	Approx. 2.6 V	
3F	O		Crankshaft position sensor (Crankshaft pulley) (Ground)	Constant	0V	—
3G	O		Camshaft position sensor (in distributor) (SGC signal)	Ignition switch ON	Approx. 0V or 5V	—
				Idle	Approx. 2.5V	
3H	O		Crankshaft position sensor (Crankshaft pulley) (NE signal)	Ignition switch ON	0V	
				Idle	Approx. 0V	
3I		O	VRIS solenoid valve No.1	Engine speed 3,900–6,300 rpm	Approx. 1.2V	—
				Others	B+	
3J		O	VRIS solenoid valve No.2	Engine speed 4,700–6,300 rpm	Approx. 1.2V	—
				Others	B+	
3K	—	—	—	—	—	—
3L		O	Coolant fan relay	Engine coolant temp. 100°C (212°F)	Below 1.0V	—
				Others	B+	
3M		O	PRC solenoid valve	Hot condition: Engine coolant temp. above 70°C and intake air temp. above 75°C for 120 sec. after engine starting	Approx. 1.2V	—
				Others	B+	
3N		O	Condenser fan relay	Ignition switch ON	B+	—
				Idle — Engine coolant temp. 108°C (226°F)	Below 2.0V	
				Idle — Others	B+	

*: Diagnostic Trouble Code No. 05 may be memorized by ECM when the Engine Signal Monitor is set to position 2M.

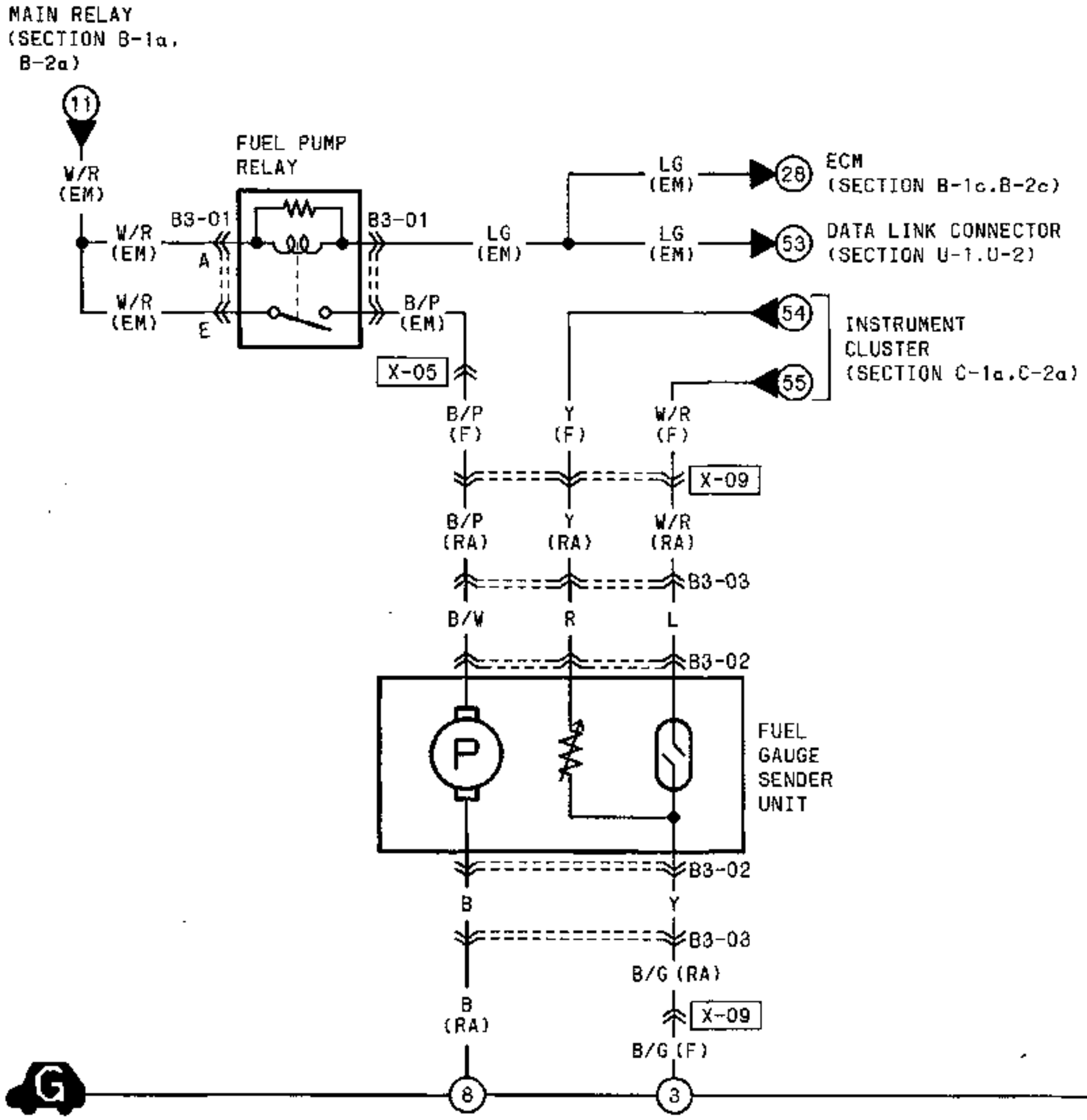
B+: Battery positive voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remarks
3O		O	EGR solenoid Valve (vent)	Idle	B+	* Engine Signal Monitor: Green and red light flash
				Initial acceleration *	B+	
3P		O	EGR solenoid valve (vacuum)	Idle	B+	
				Initial acceleration*	B+	
3Q		O	Idle air control valve	Ignition switch ON	Approx. 7V	—
				Idle	Approx. 9V	
3R	—	—	—	—	—	—
3S	—	—	—	—	—	—
3T		O	Fuel pump relay	Ignition switch ON	B+	—
				Idle	Below 1.0V	
3U		O	Fuel injector No.1	Ignition switch ON or Idle*	B+	* Engine Signal Monitor: Green and red lights flash
3V		O	Fuel injector No.2			
3W		O	Fuel injector No.3			
3X		O	Fuel injector No.4			
3Y		O	Fuel injector No.5			
3Z		O	Fuel injector No.6			

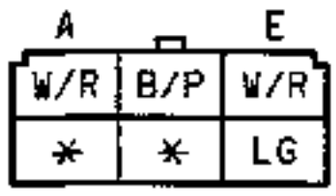
Control Unit Connector (Control Unit Side)

3V	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A	2O	2M	2K	2I	2G	2E	2C	2A	1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B	2P	2N	2L	2J	2H	2F	2D	2B	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

B-3 ■ FUEL CONTROL SYSTEM



B3-01 FUEL PUMP RELAY (EM)

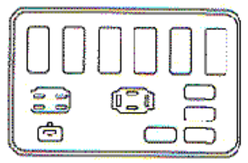


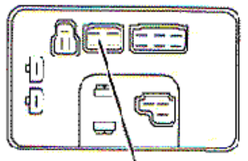
B3-02 FUEL GAUGE SENDER UNIT

B3-03 CONNECTOR BETWEEN REAR A (RA) AND FUEL GAUGE SENDER UNIT

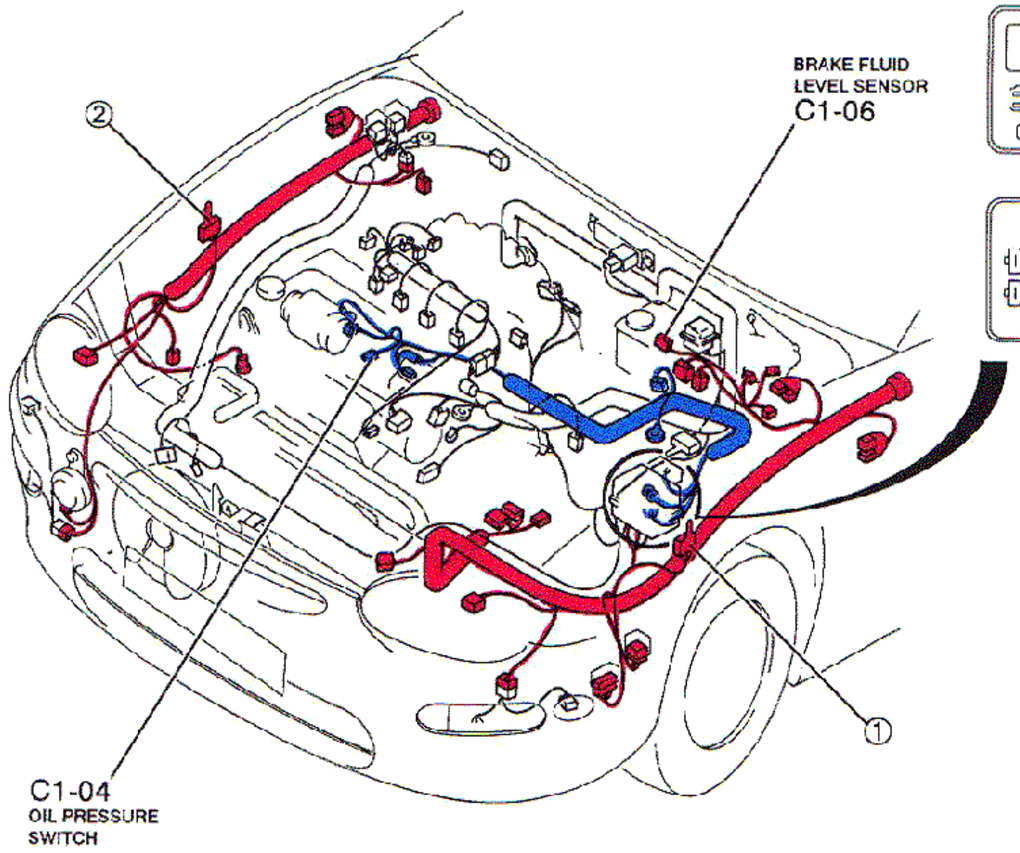
C-1b

MAIN FUSE BLOCK

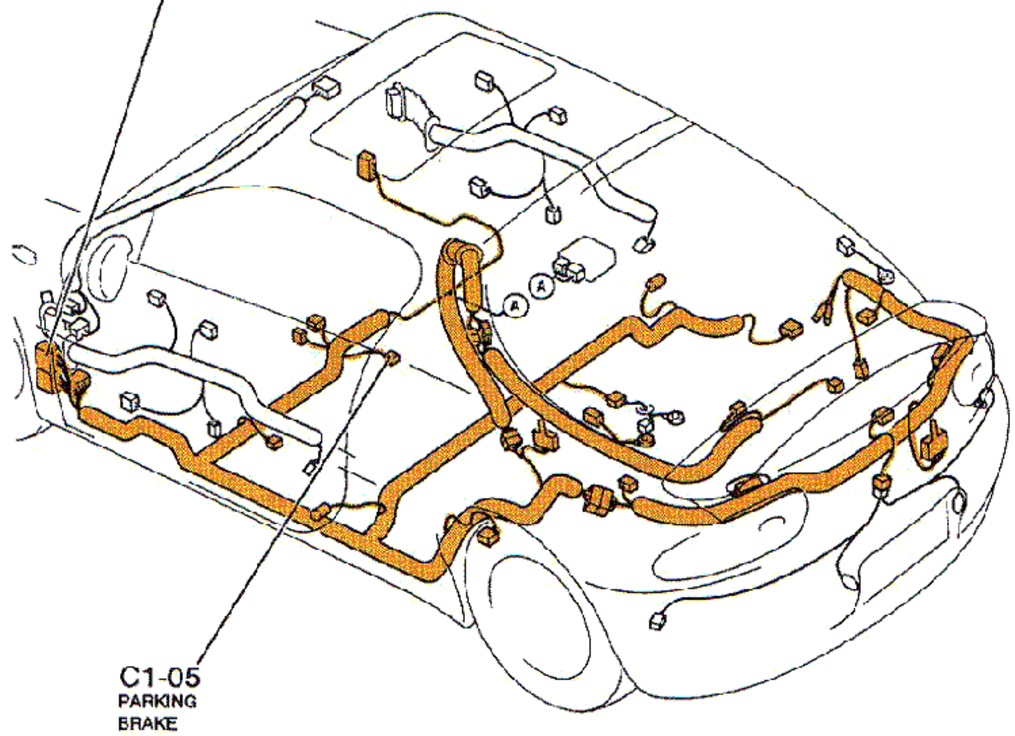


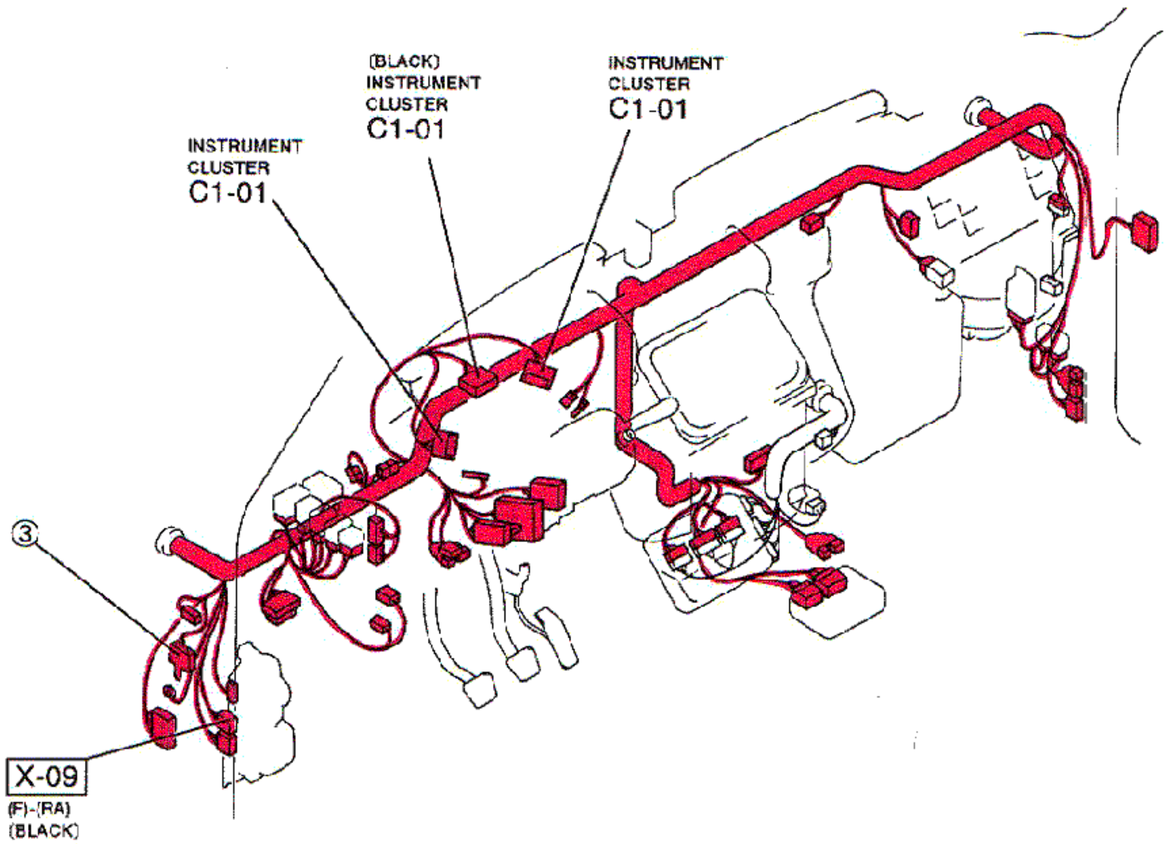


X-13
(F)-(E)



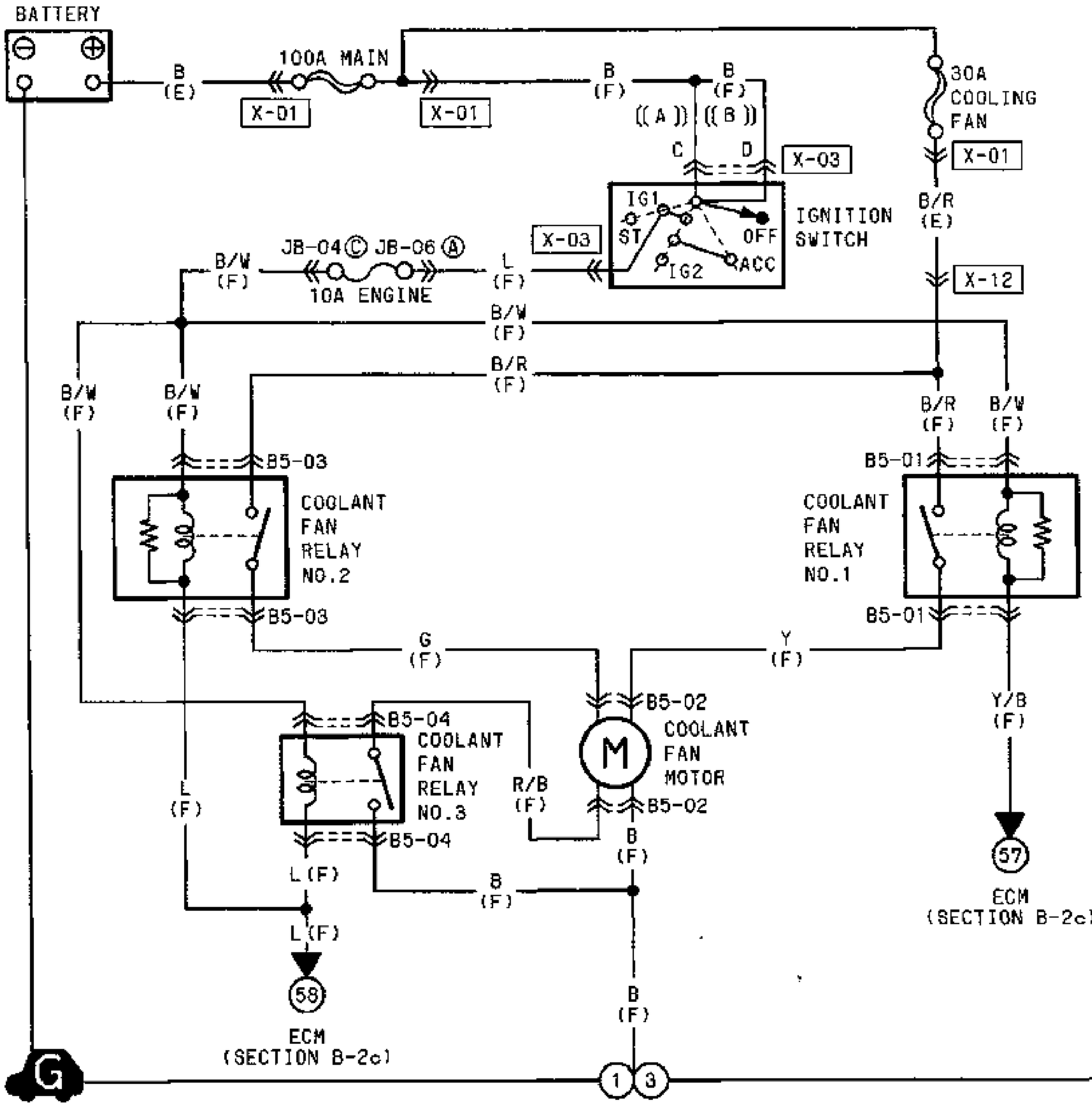
(BLACK)
(F)-(RA)
X-09





B-5 K8 DOHC ATX ■ COOLANT FAN SYSTEM

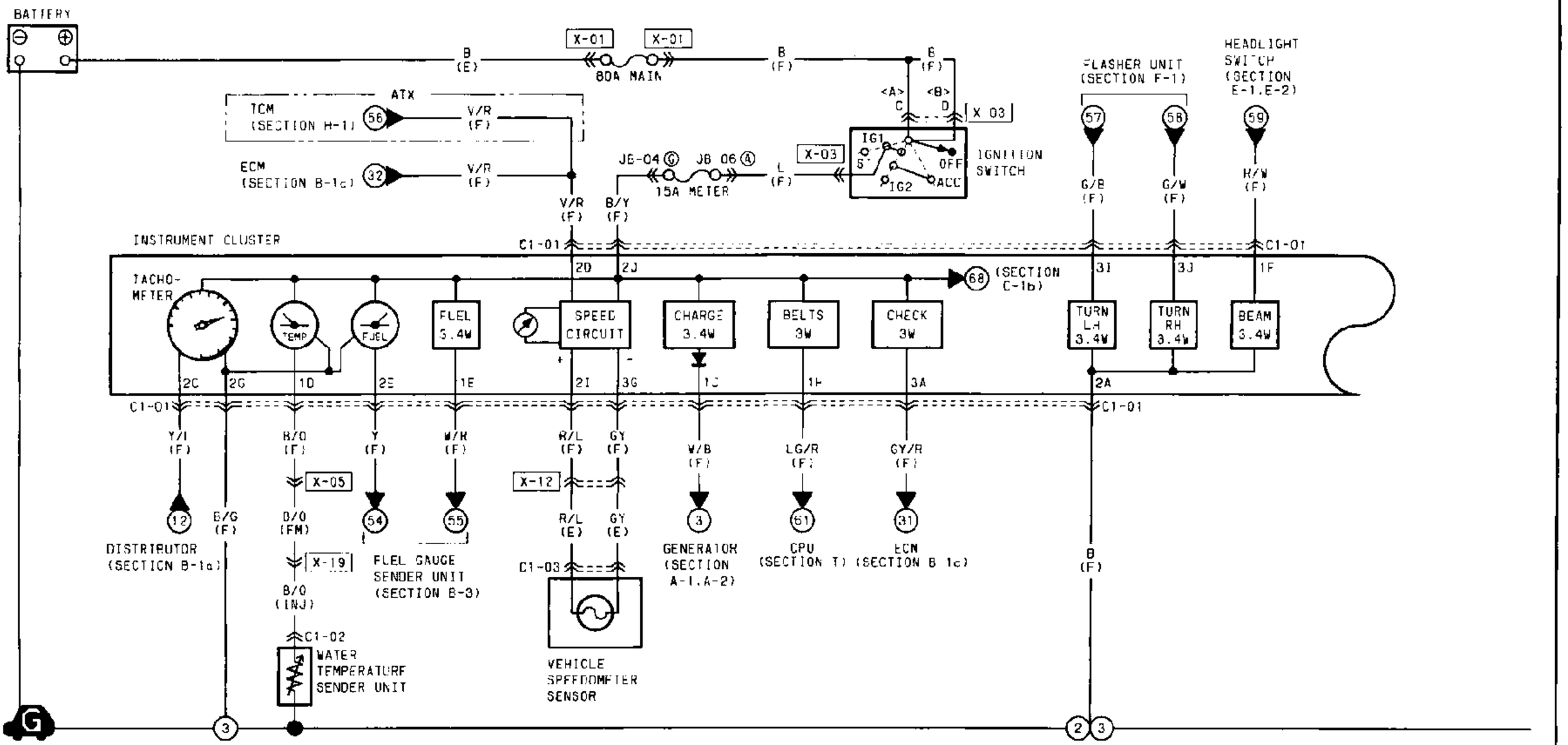
《 》...CANADA



B5-01 COOLANT FAN RELAY NO.1 (F)	B5-02 COOLANT FAN MOTOR (F)	B5-03 COOLANT FAN RELAY NO.2 (F)	B5-04 COOLANT FAN RELAY NO.3 (F)
B/R | B/W Y | Y/B	G | Y R/B | B	B/R | B/W G | L	R/B | B/W B | L

C-1a B6 DOHC ■ INSTRUMENT CLUSTER

< >...CANADA
( )...ATX < >...WITH ABS
[ ]...WITH AIR BAG SYSTEM



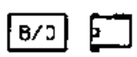
C1-01 INSTRUMENT CLUSTER (F)

*	*	W/B	Y/R	LG/R	G/Y	R/W	W/R	B/O	*	*	*
1L	1K	1J	1I	1H	1G	1F	1E	1D	1C	1B	1A

R	R/B	B/Y	R/L	B/L (B/R)	B/G	L/R	Y	V/R	Y/L	*	B
2L	2K	2J	2I	2H	2G	2F	2E	2D	2C	2B	2A

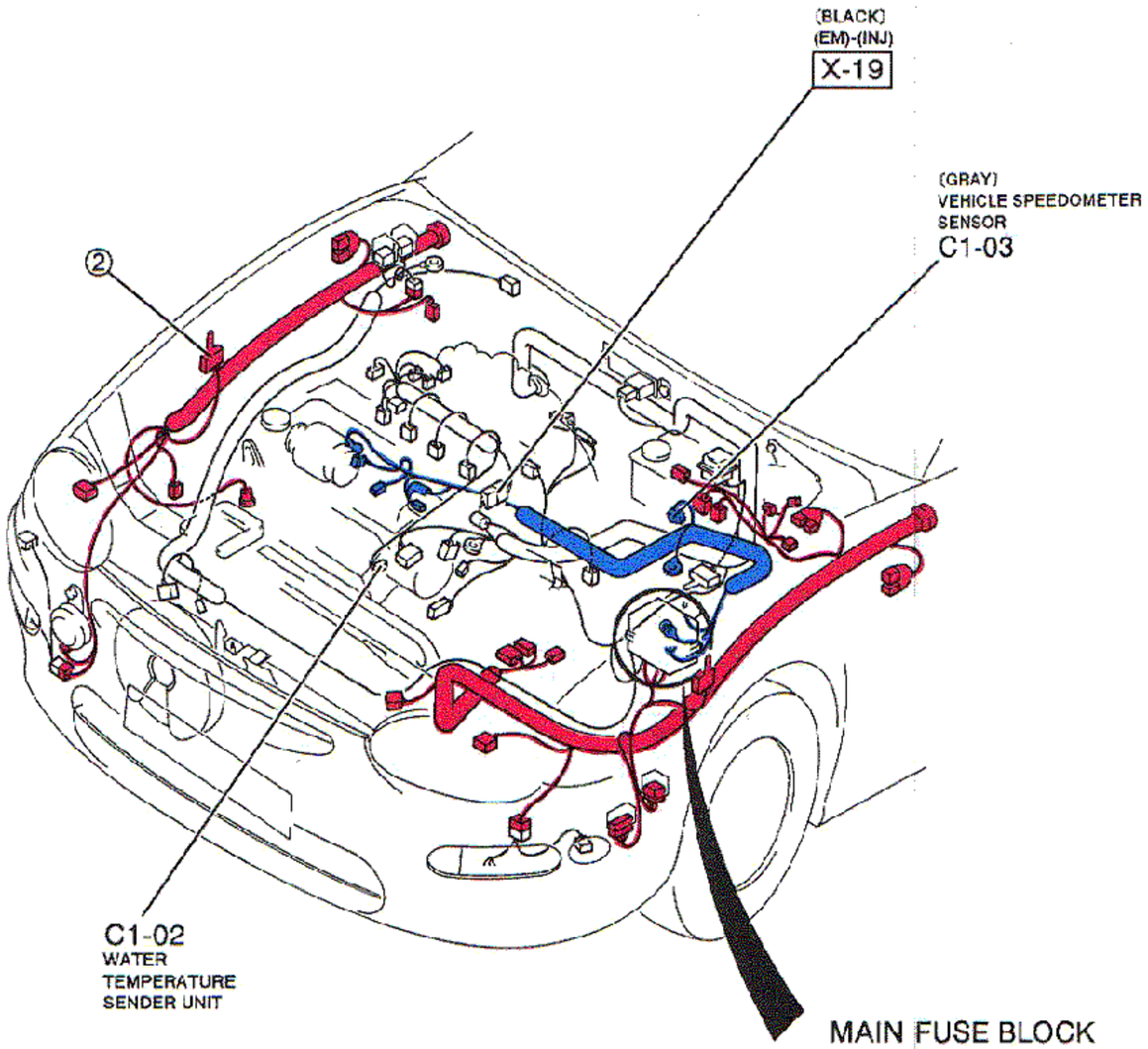
G/W	G/B	*	GY	L/B	* (Y/W)	* (R/Y)	* (L/Y)	* (BR/Y)	GY/R
3J	3I	3H	3G	3F	3E	3D	3C	3B	3A

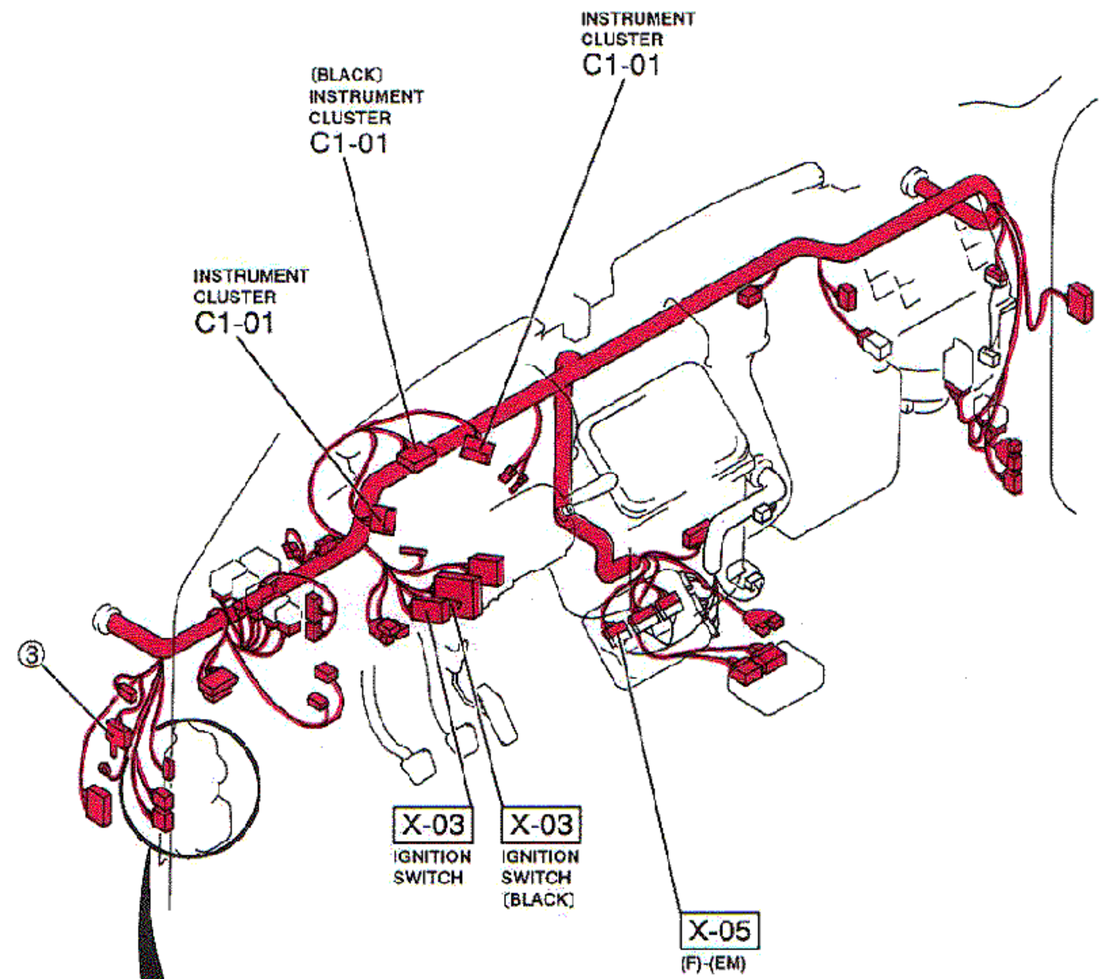
C1-02 WATER TEMPERATURE SENDER UNIT (INJ)

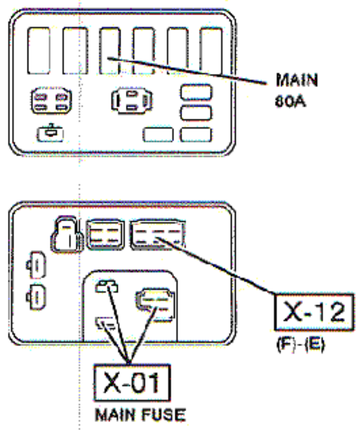


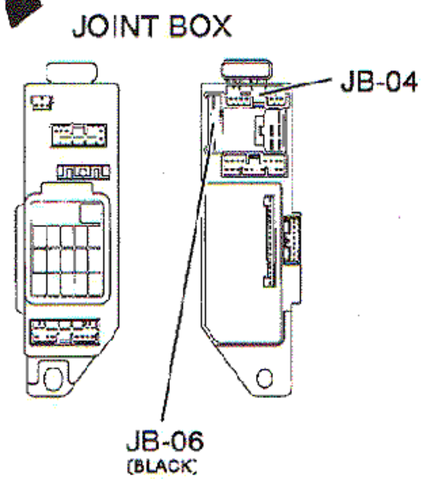
C1-03 VEHICLE SPEEDOMETER SENSOR (F)

C-1a


(BLACK)
(EM)-(INJ)
X-19
(GRAY)
VEHICLE SPEEDOMETER
SENSOR
C1-03
②
C1-02
WATER
TEMPERATURE
SENDER UNIT

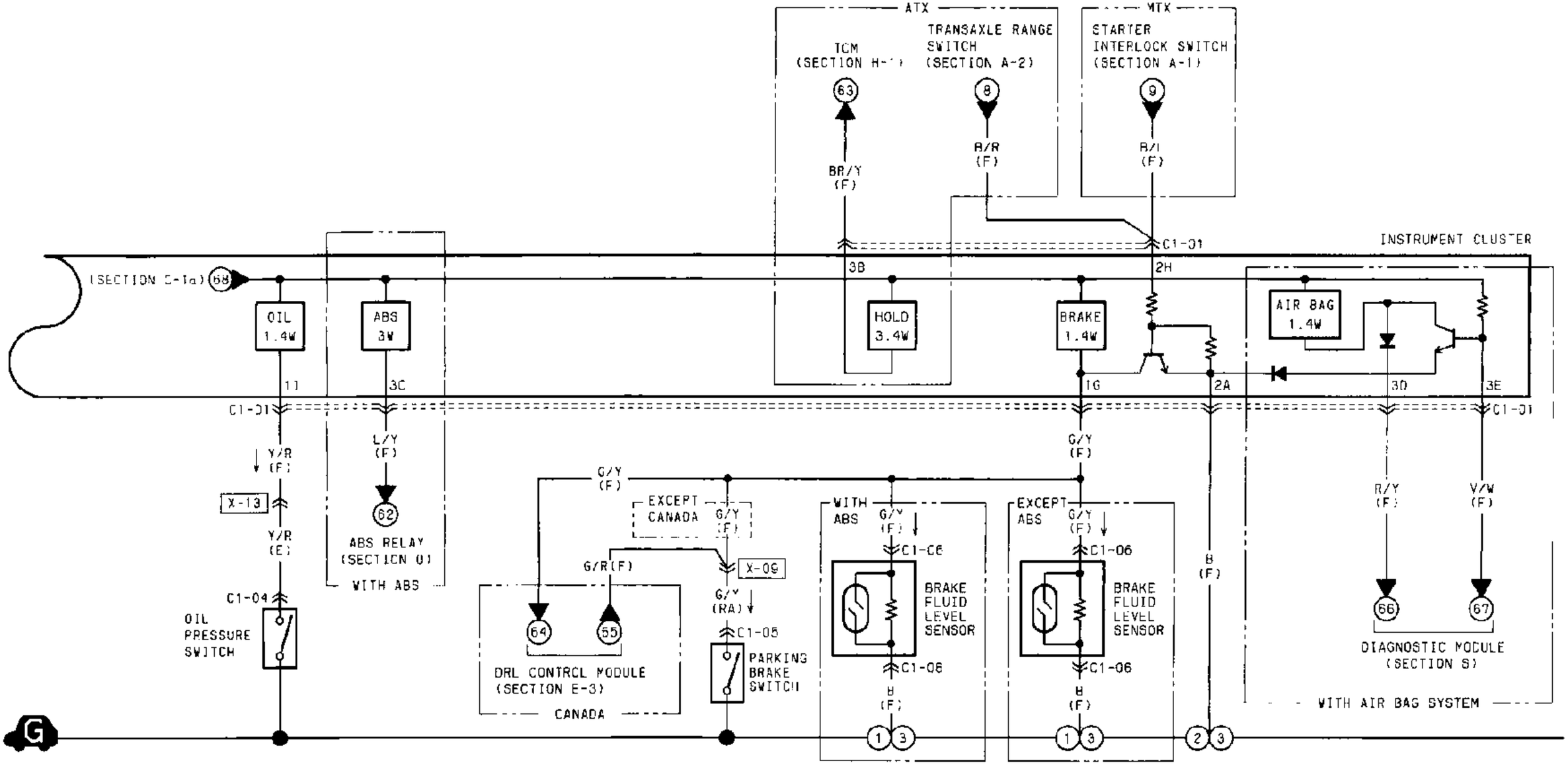

INSTRUMENT
CLUSTER
C1-01
(BLACK)
INSTRUMENT
CLUSTER
C1-01
INSTRUMENT
CLUSTER
C1-01
③
X-03
IGNITION
SWITCH
X-03
IGNITION
SWITCH
(BLACK)
X-05
(F)-(EM)


MAIN FUSE BLOCK
MAIN
80A
X-12
(F)-(E)
X-01
MAIN FUSE


JOINT BOX
JB-04
JB-06
(BLACK)

C-1b B6 DOHC ■ INSTRUMENT CLUSTER

< >...CANADA
( )...ATX < >...WITH ABS
[ ]...WITH AIR BAG SYSTEM



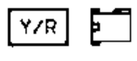
C1-01 INSTRUMENT CLUSTER (F)

*	*	W/B	Y/R	LG/R	G/Y	R/W	W/R	B/O	*	*	*
1L	1K	1J	1I	1H	1G	1F	1E	1D	1C	1B	1A

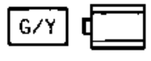
R	R/B	B/Y	R/_	B/L (B/R)	B/G	_/R	Y	V/R	Y/L	*	B
2L	2K	2J	2I	2H	2G	2F	2E	2D	2C	2B	2A

G/W	G/B	*	GY	L/B	* (V/W)	* (R/Y)	* (L/Y)	* (BR/Y)	GY/R
3J	3I	3H	3G	3F	3E	3D	3C	3B	3A

C1-04 OIL PRESSURE SWITCH (E)

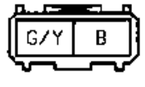


C1-05 PARKING BRAKE SWITCH (RA)



C1-06 BRAKE FLUID LEVEL SENSOR (F)

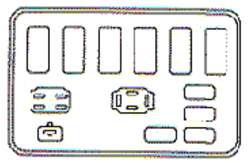
EXCEPT ABS

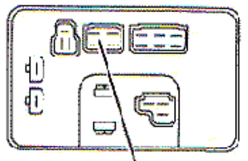


WITH ABS

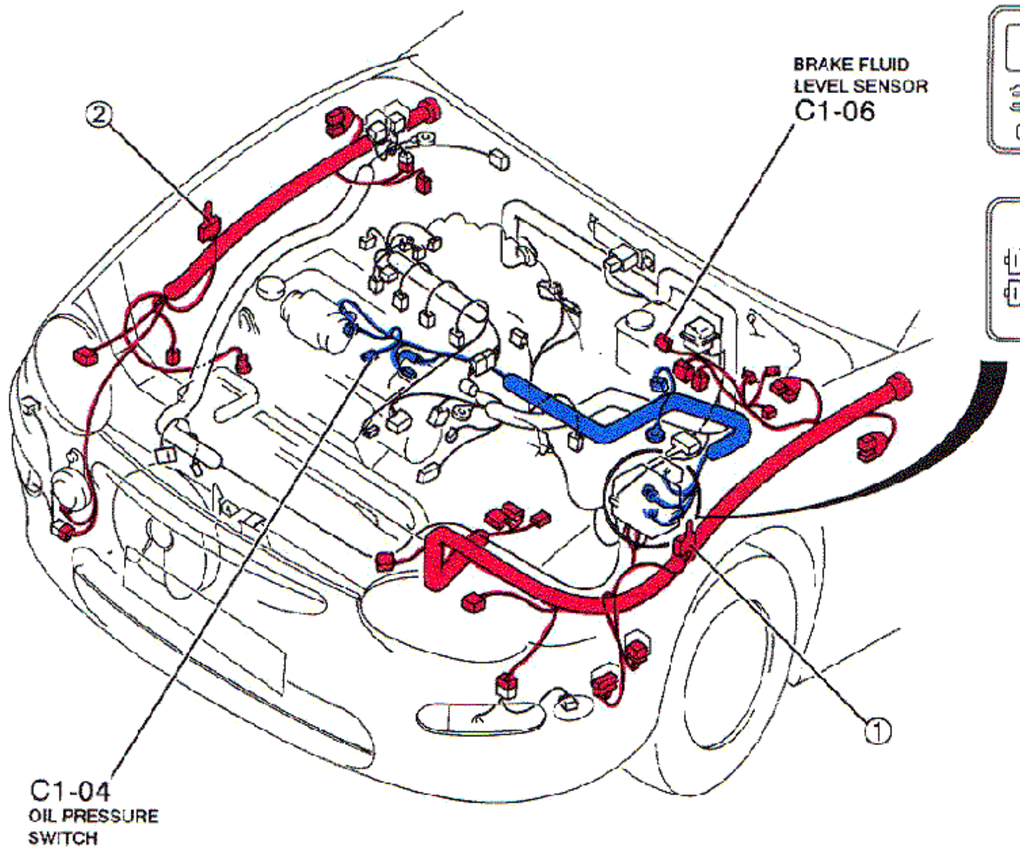
C-1b

MAIN FUSE BLOCK

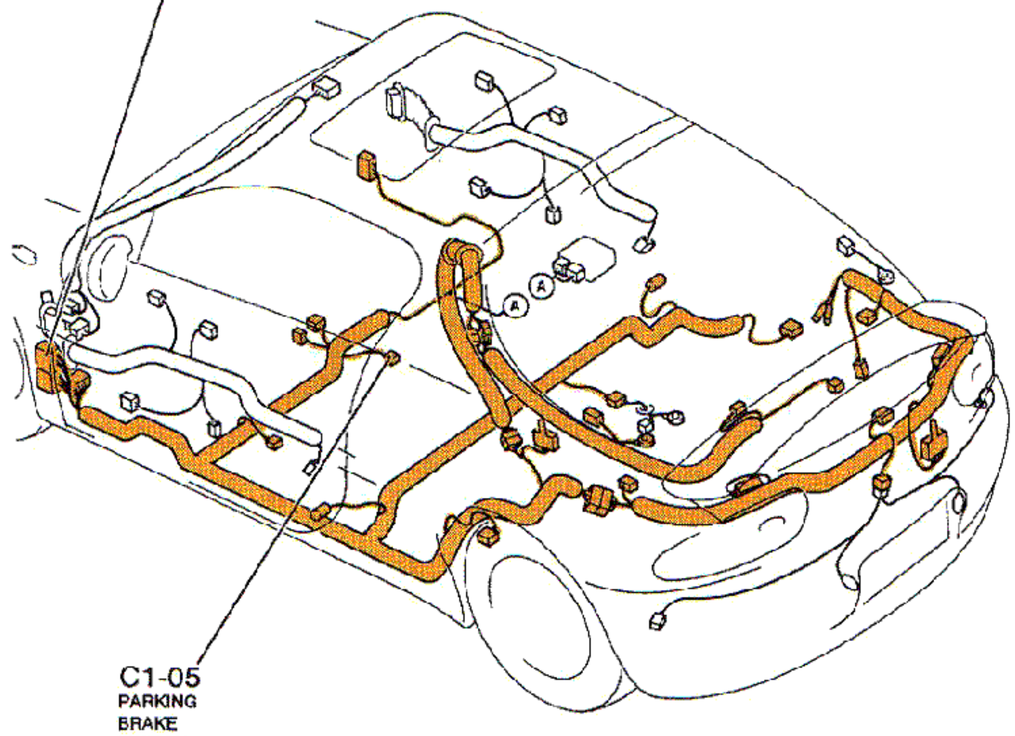


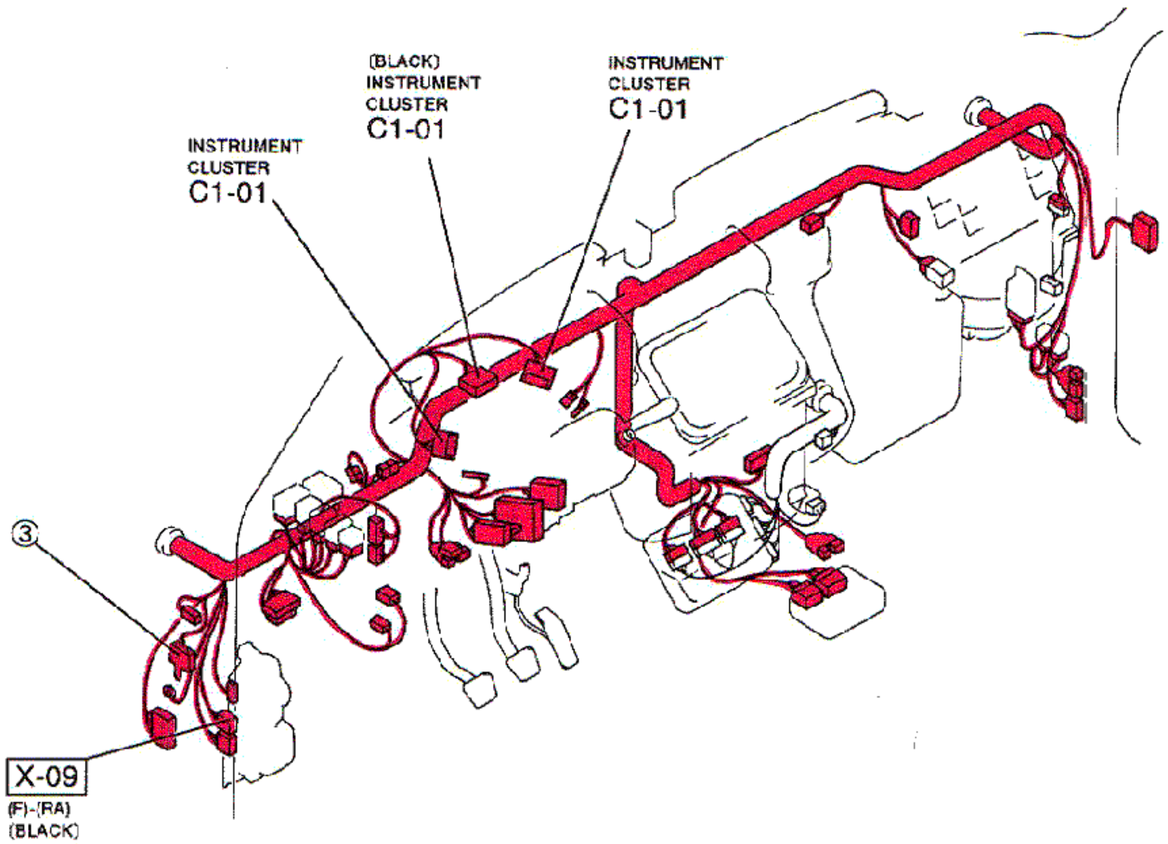


X-13
(F)-(E)



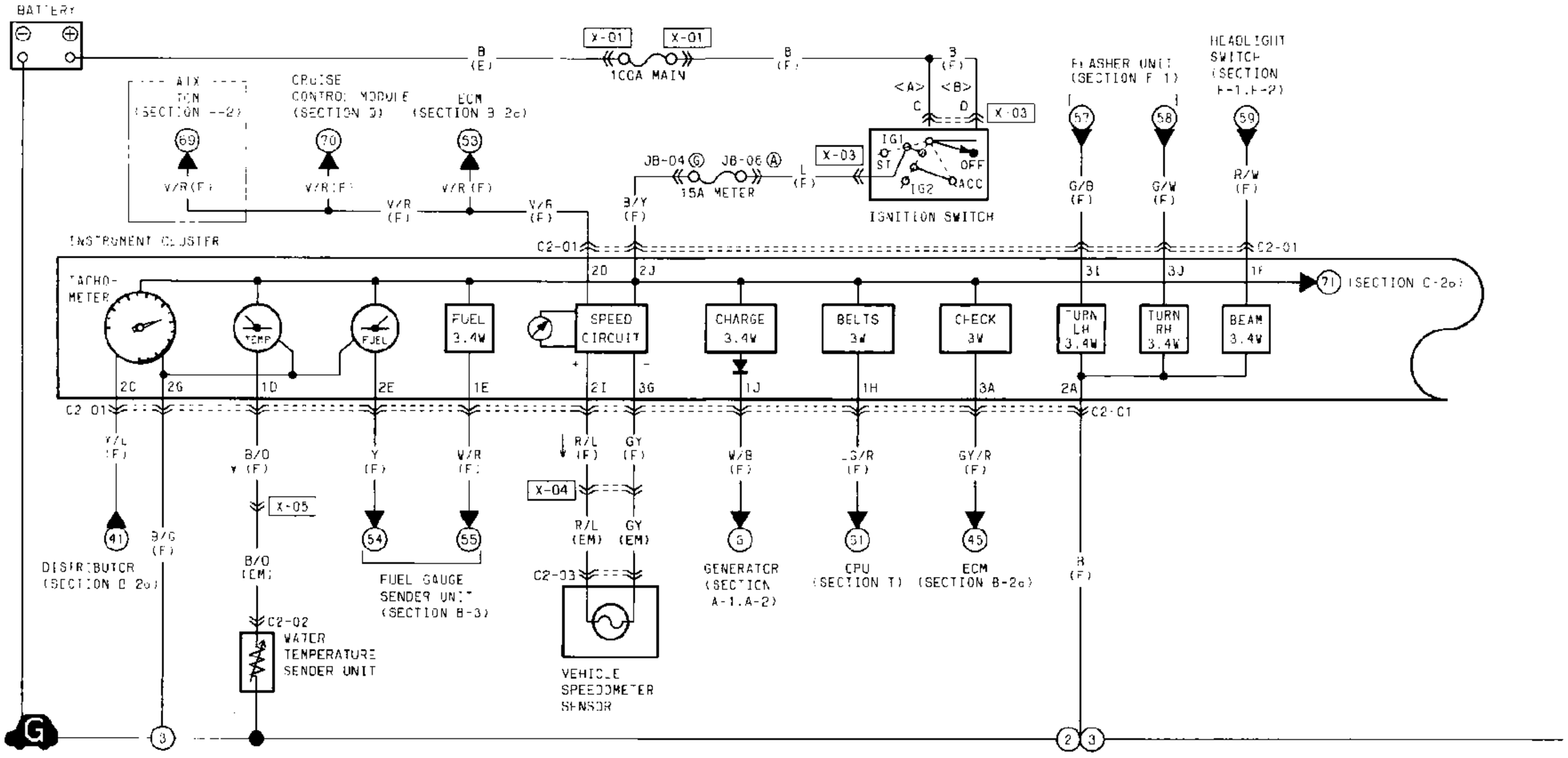
(BLACK)
(F)-(RA)
X-09



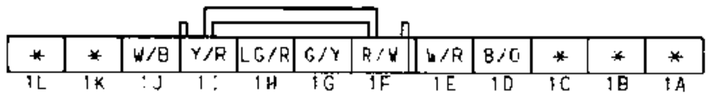


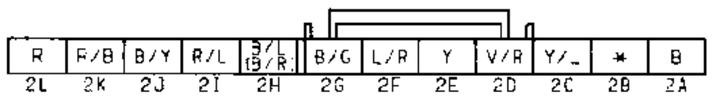
C-2a K8 DOHC ■ INSTRUMENT CLUSTER

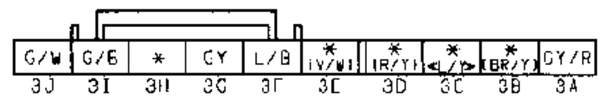
< >...CANADA < >...WITH ABS
[ ]...AIX
* *...WITH AIR BAG SYSTEM



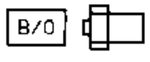
C2-01 INSTRUMENT CLUSTER (F)





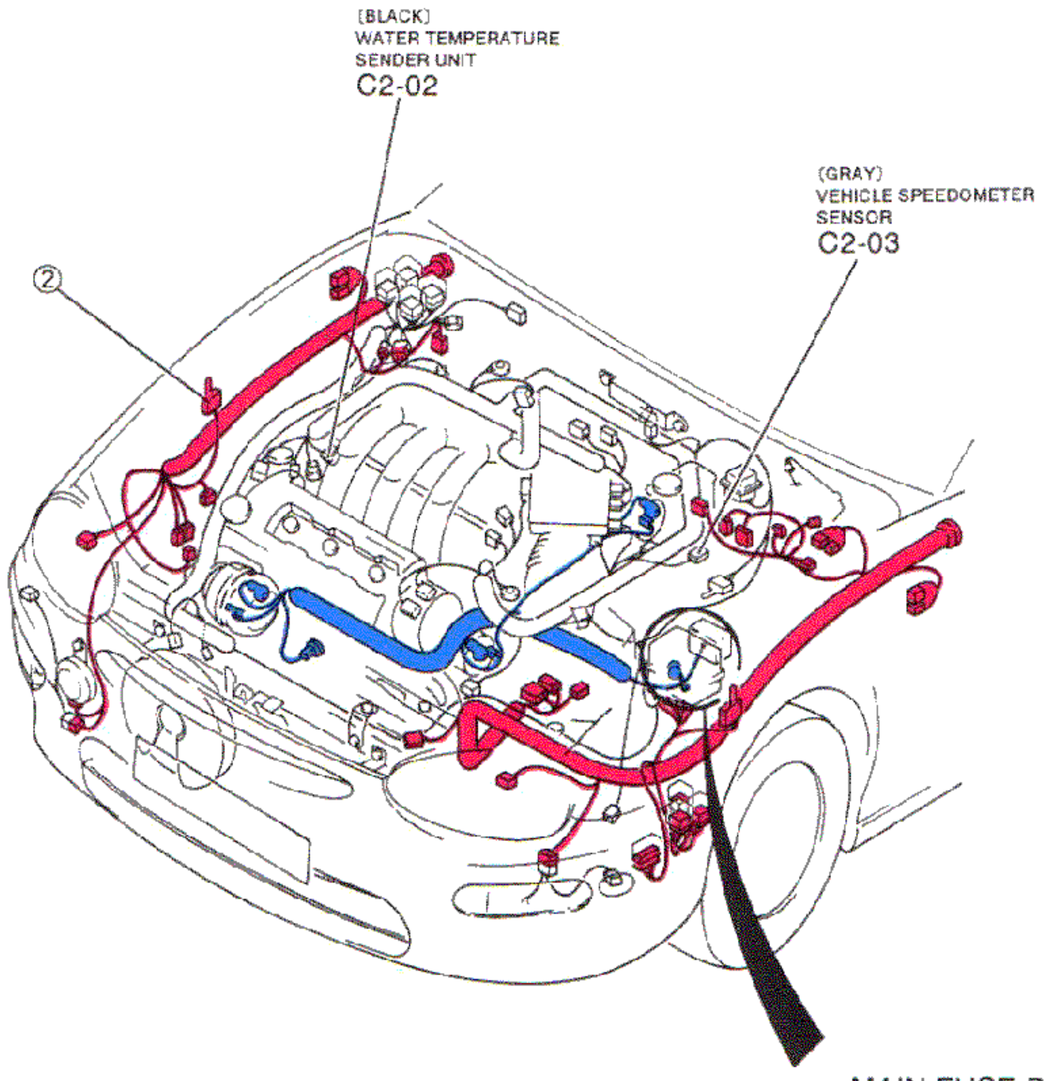


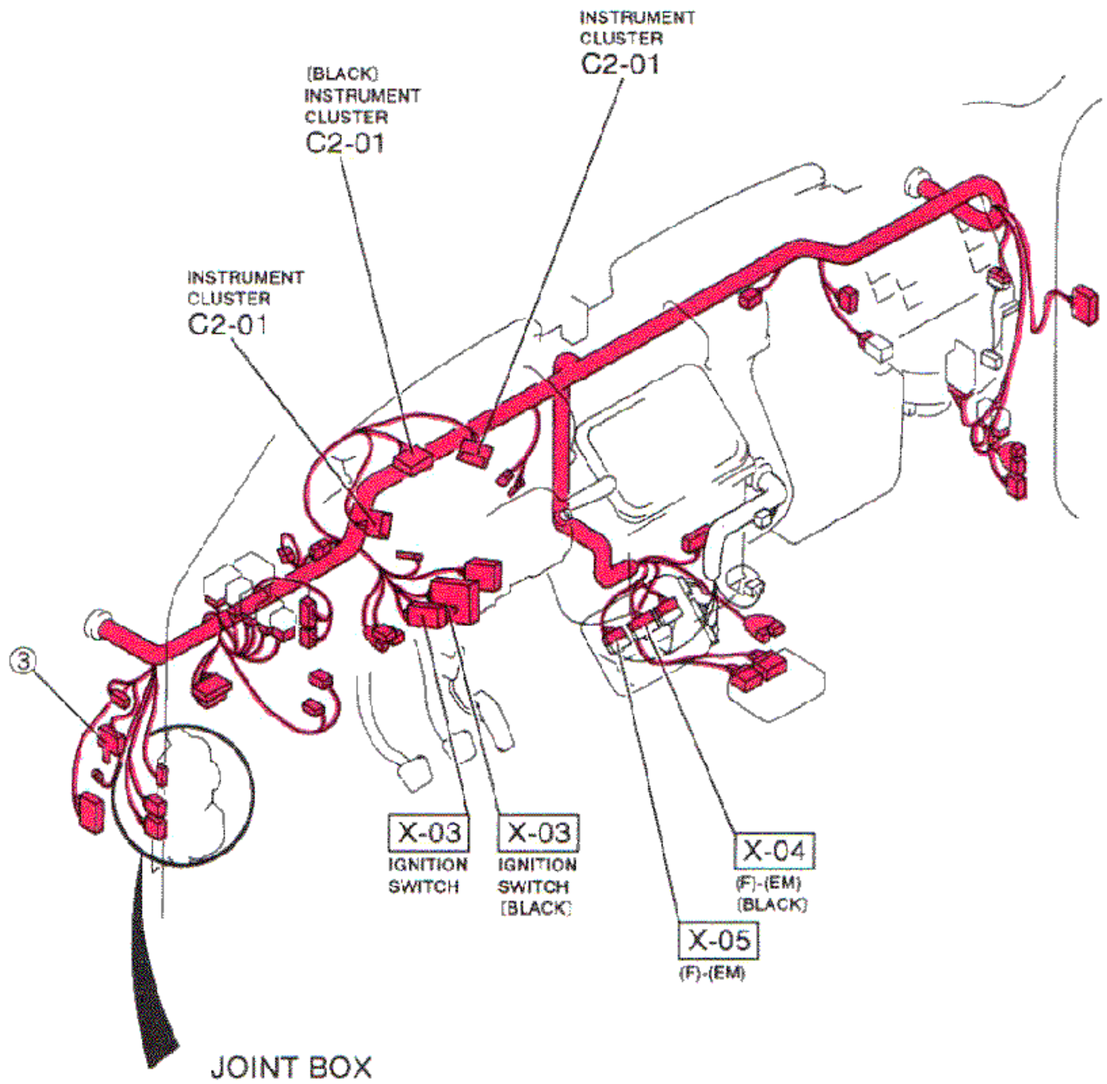
C2-02 WATER TEMPERATURE SENDER UNIT (EM)



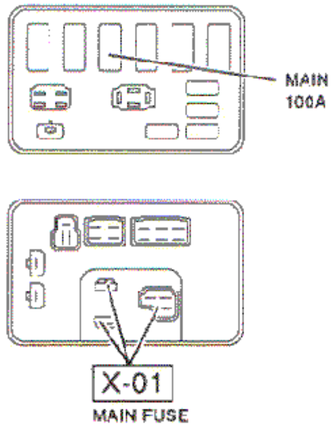
C2-03 VEHICLE SPEEDOMETER SENSOR (EM)

C-2a

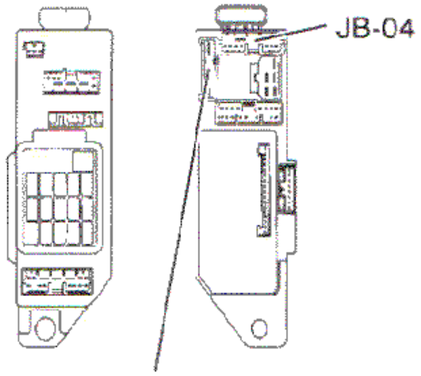




MAIN FUSE BLOCK

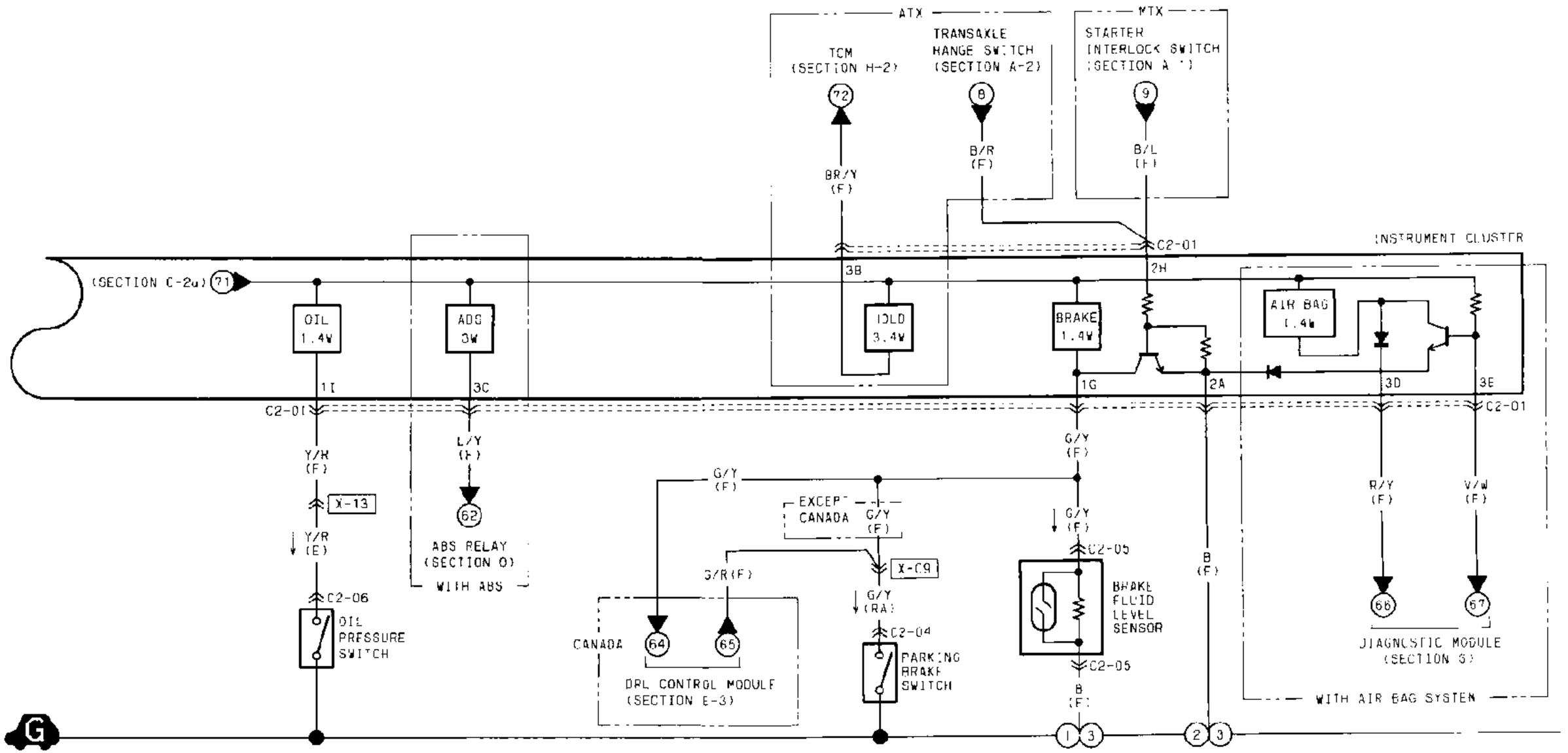


JOINT BOX

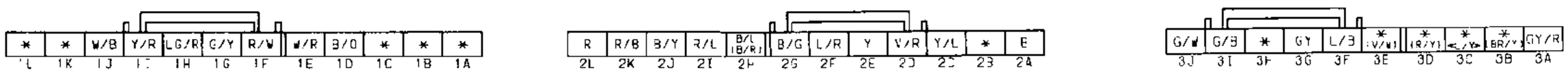


C-2b K8 DOHC ■ INSTRUMENT CLUSTER

< >...CANADA < >...WITH ABS
[ ]...ATX
[ ]...WITH AIR BAG SYSTEM

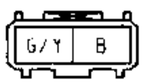


C2-01 INSTRUMENT CLUSTER (F)



C2-04 PARKING BRAKE SWITCH (RA)

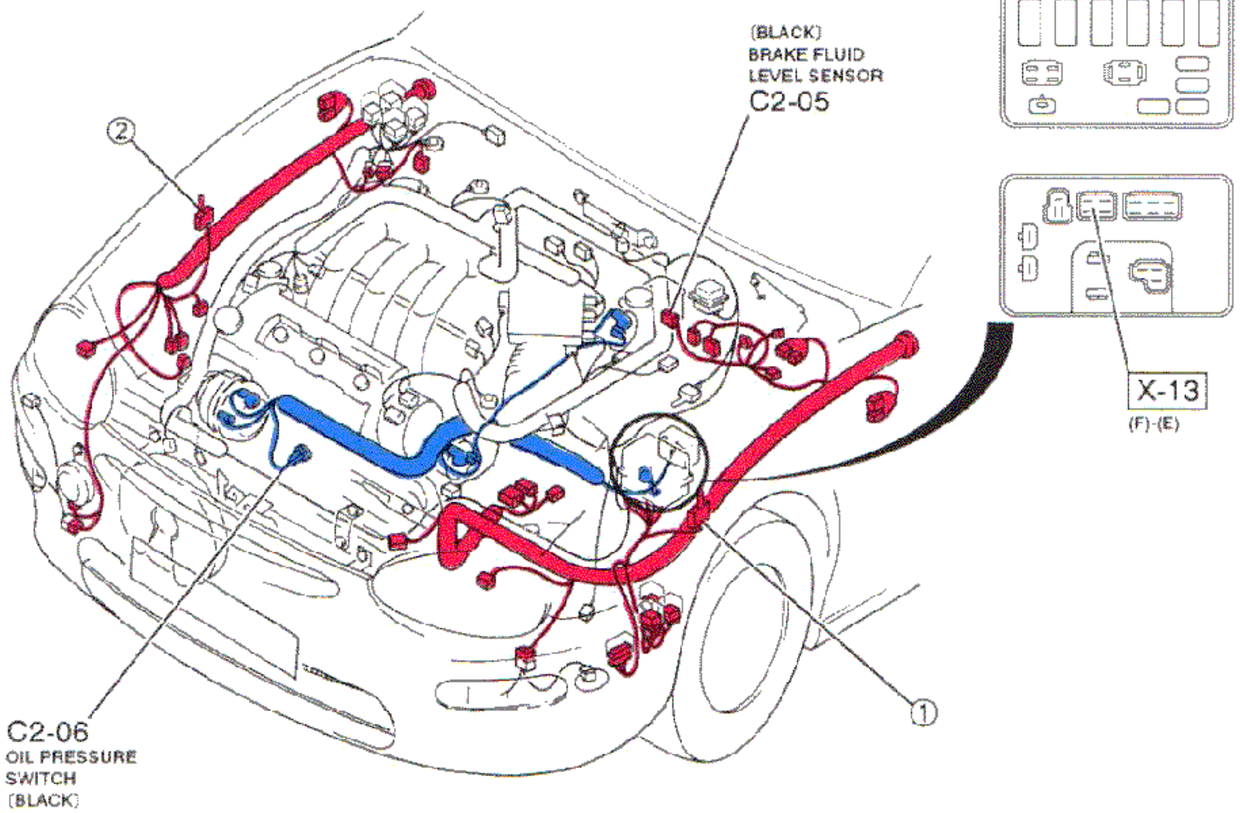
C2-05 BRAKE FLUID LEVEL SENSOR (F)

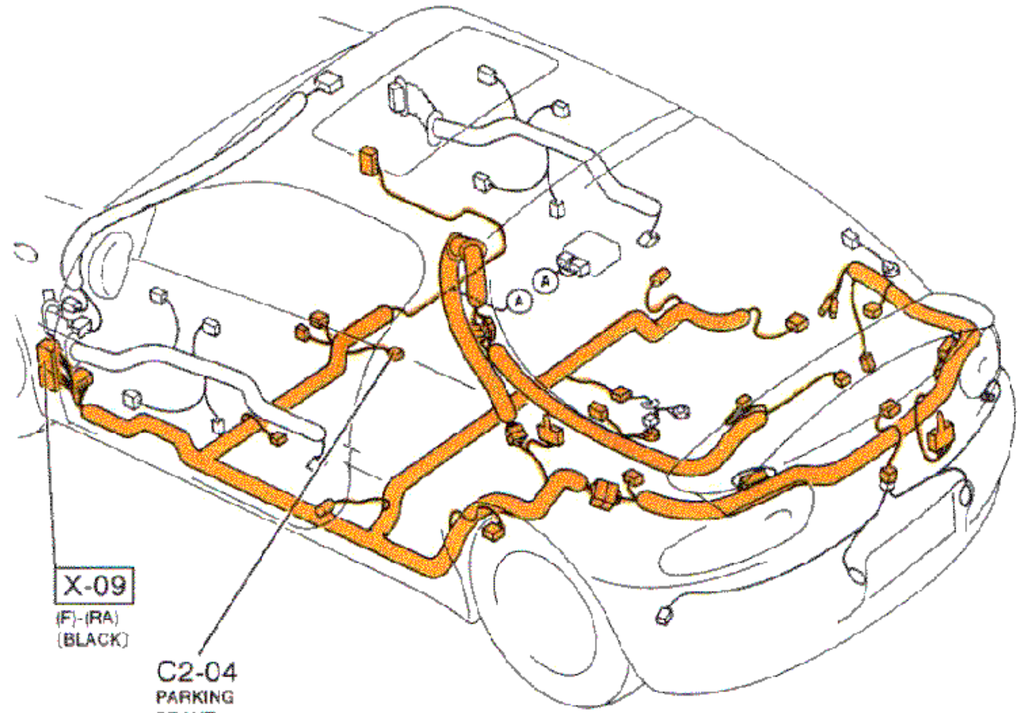


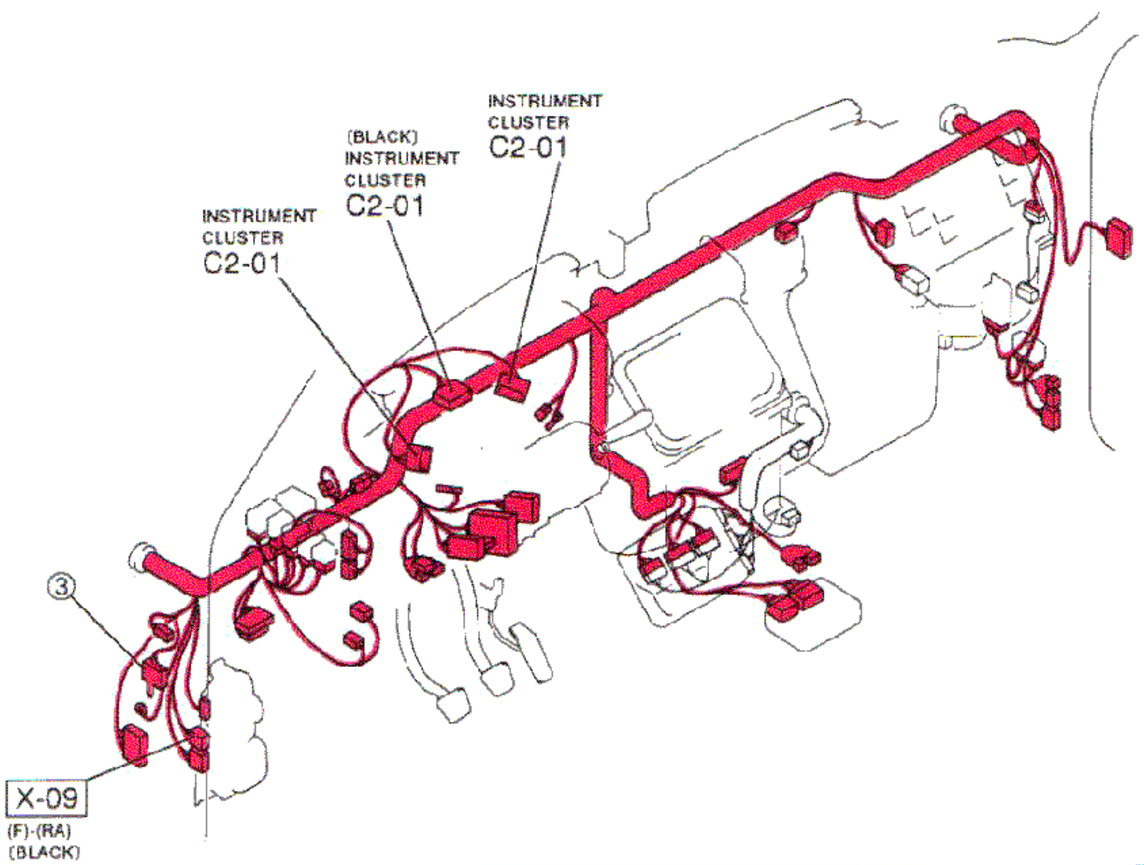
C2-06 OIL PRESSURE SWITCH (E)

C-2b

MAIN FUSE BLOCK

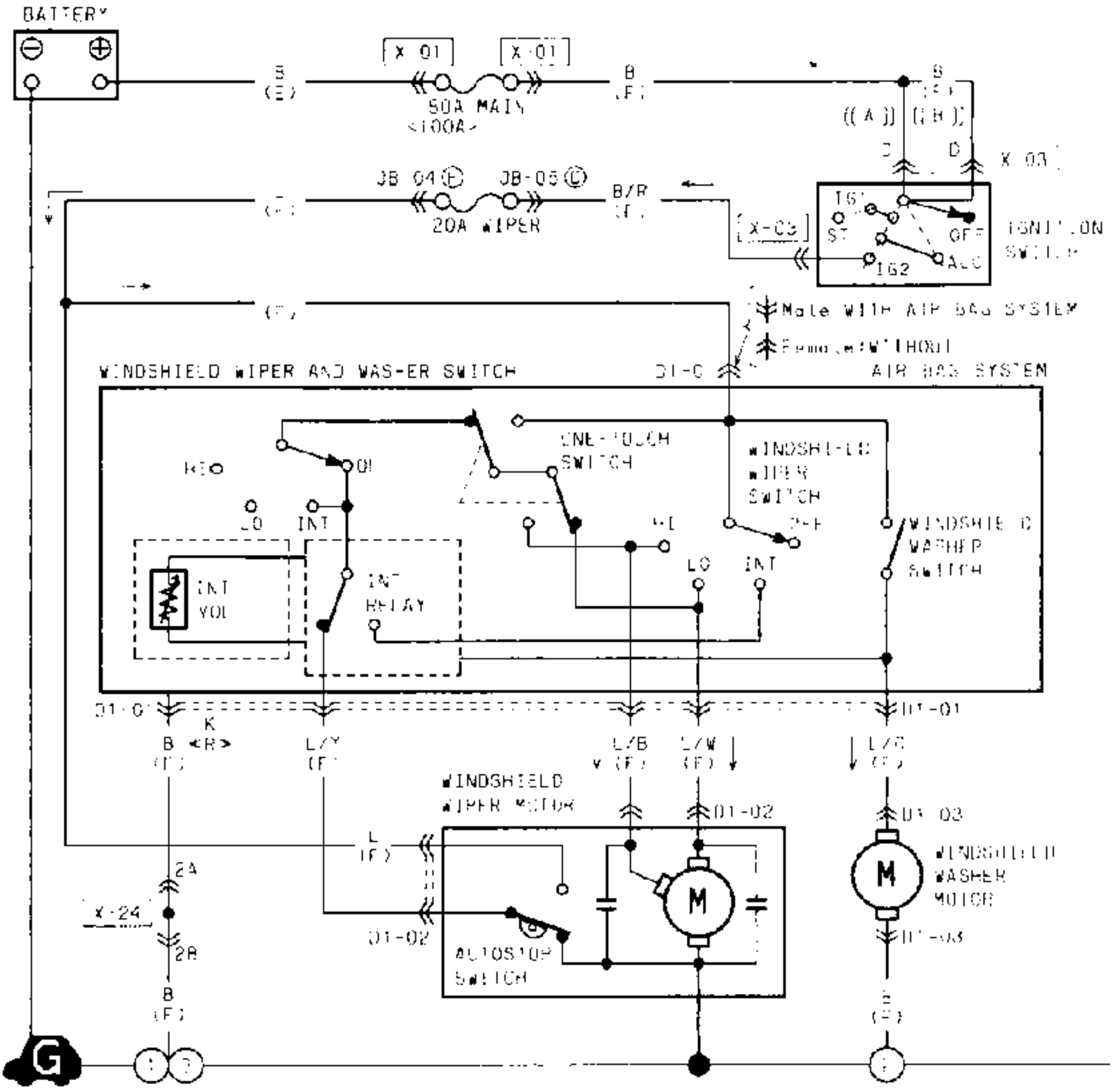






D-1 ■ WINDSHIELD WIPER AND WASHER

< >...WITH AIR BAG SYSTEM
( )...CANADA
< >...KE DOHC



D1-01 ■WINDSHIELD WIPER AND WASHER SWITCH (F)

WITHOUT AIR BAG SYSTEM

C						
L/Y	L/R	V		B	O	Y/R
B	L	L/B	L/W	L/G		

K

WITH AIR BAG SYSTEM

M											P
L/R	LG	B/Y	P	Y/L		O	L/W	L/B	L/O	B	L/Y
V	R/L	R/G (LH/YB)	R/W	B	W/P	I			Y/R (*1)	R (*1)	O (*1)

S

*1 ...WITH REAR WIPER AND WASHER

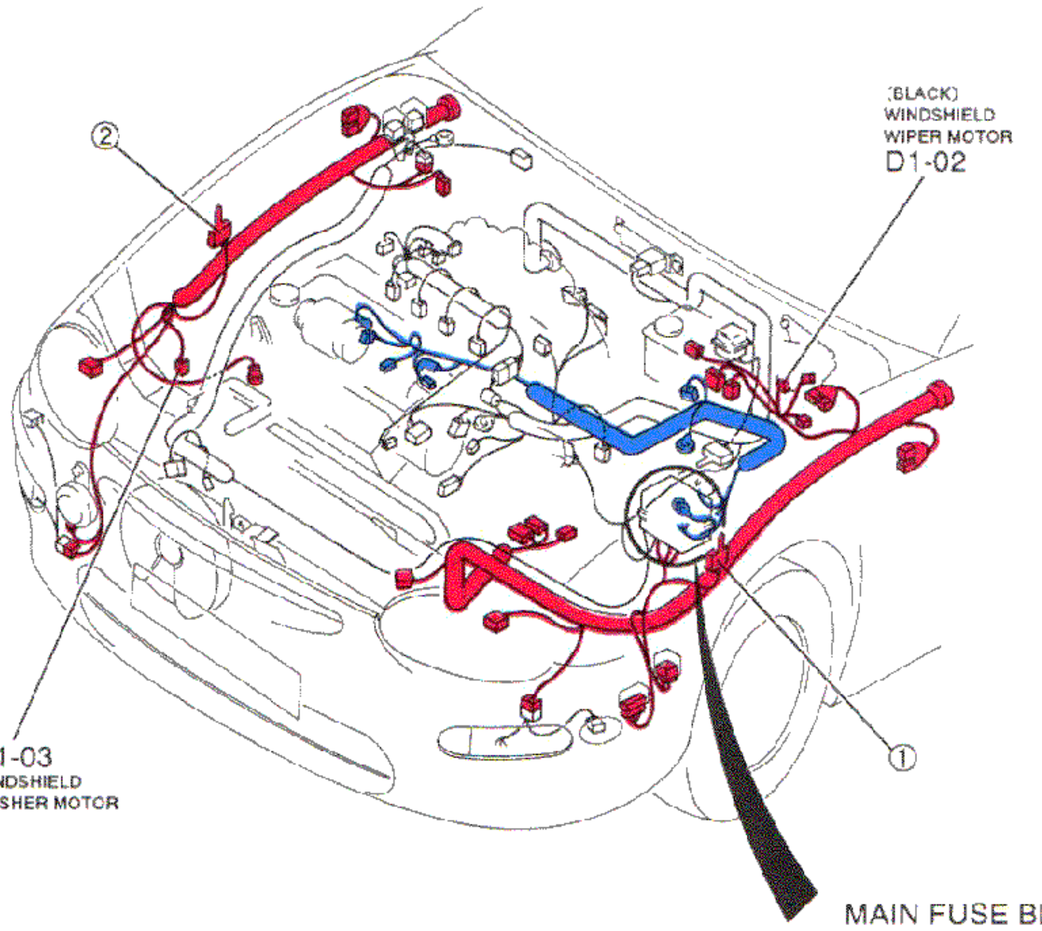
D1-02 ■WINDSHIELD WIPER MOTOR (F)

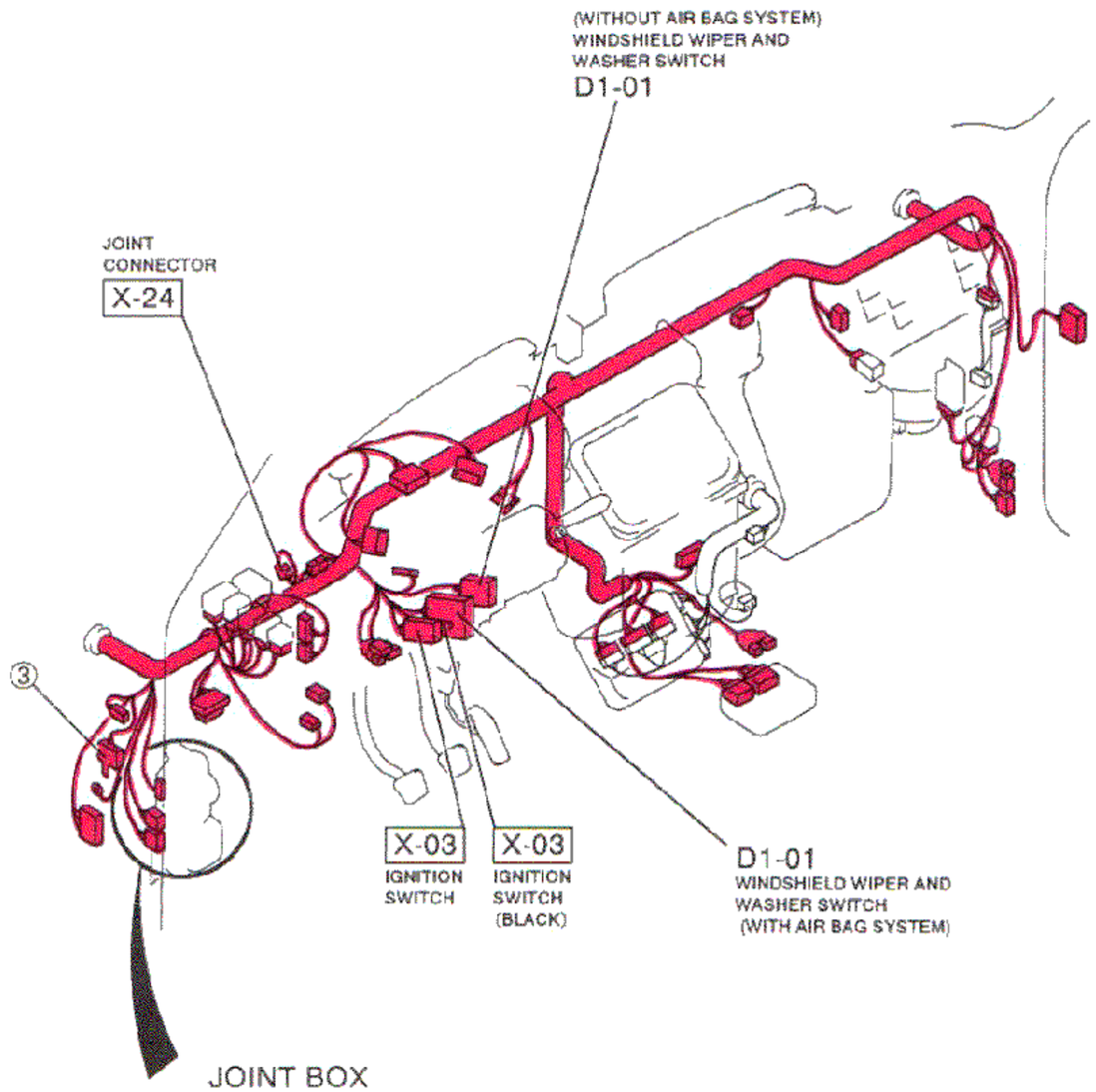
L/W	L/B
	L/Y

D1-03 WINDSHIELD WASHER MOTOR (F)

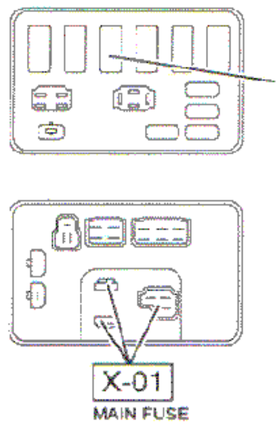
B
L/O

D-1

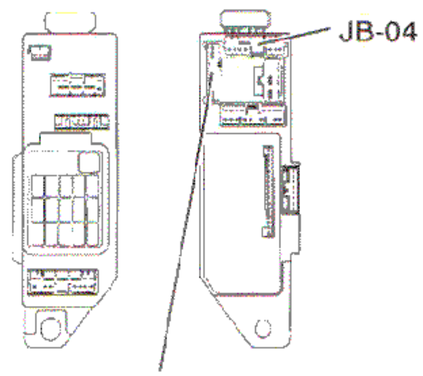




MAIN FUSE BLOCK

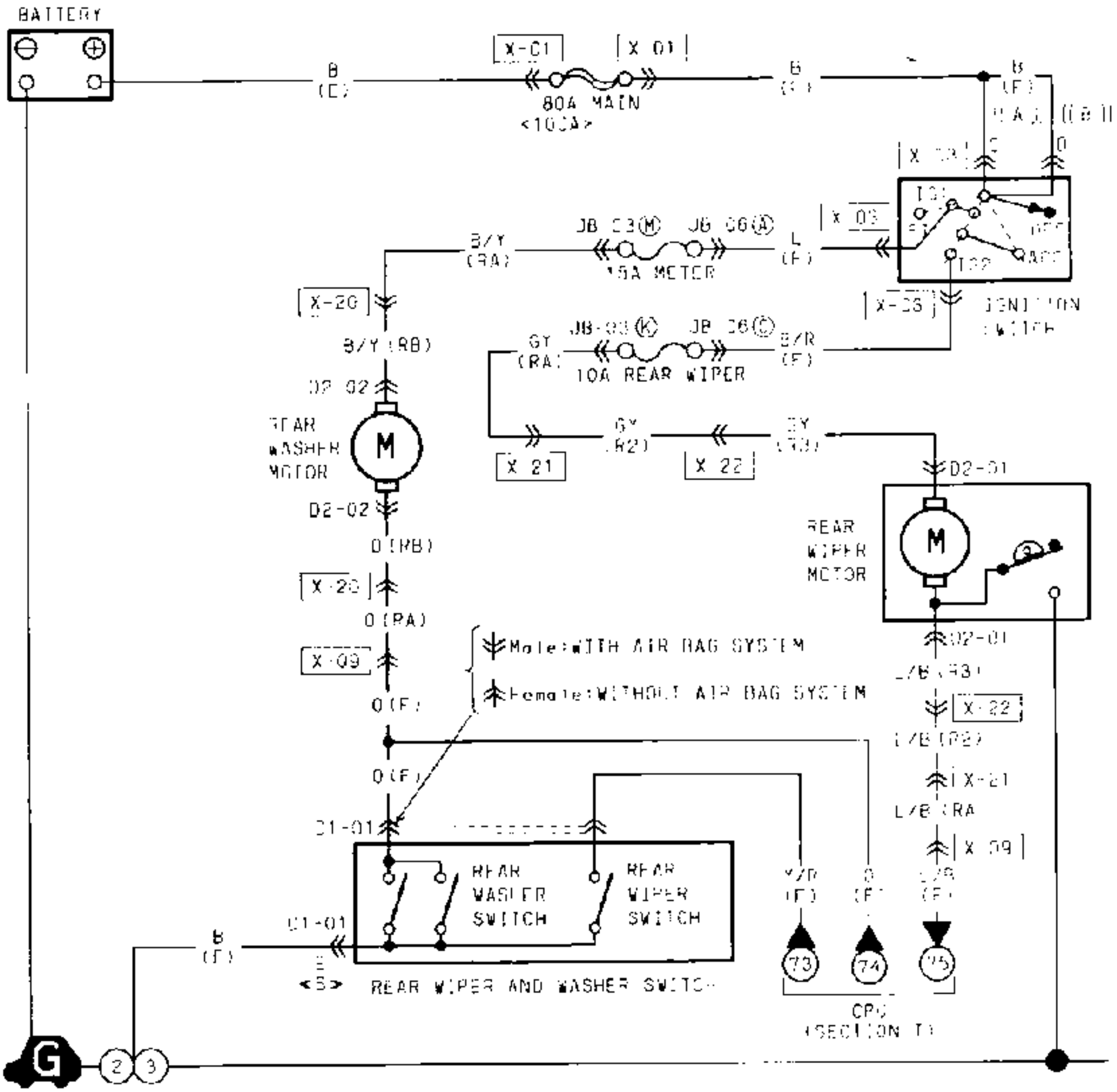


JOINT BOX

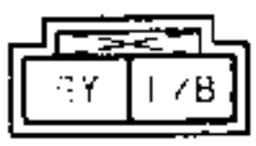


D-2 ■ REAR WIPER AND WASHER

※ ...WITH AIR BAG SYSTEM
※ ...CANADA
... LHD



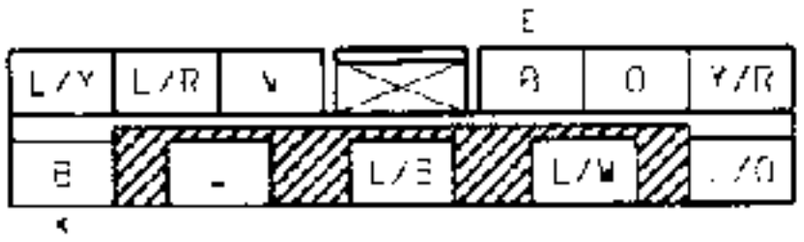
D2-01 REAR WIPER MOTOR (R3)



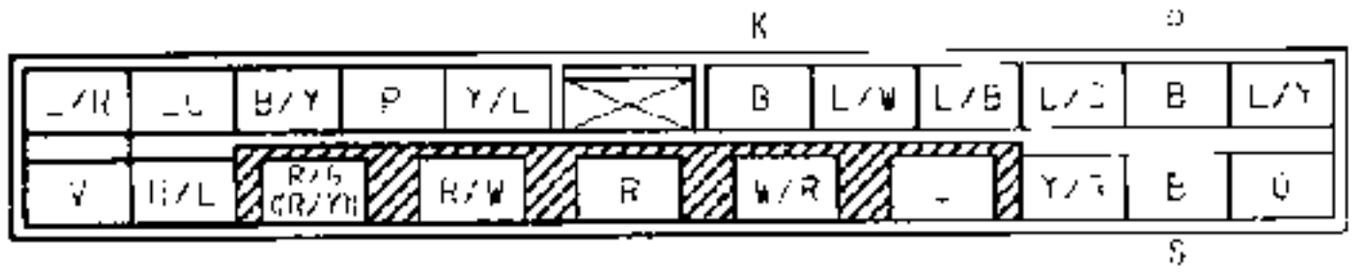
D2 02 REAR WASHER MOTOR (RB)

D1-01 REAR WIPER AND WASHER SWITCH (F)

WITHOUT AIR BAG SYSTEM

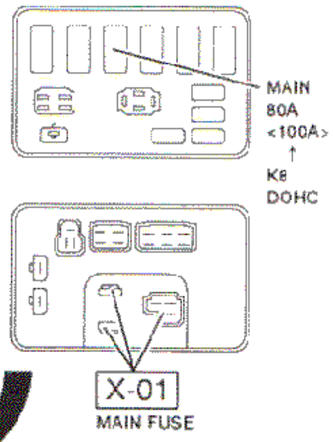


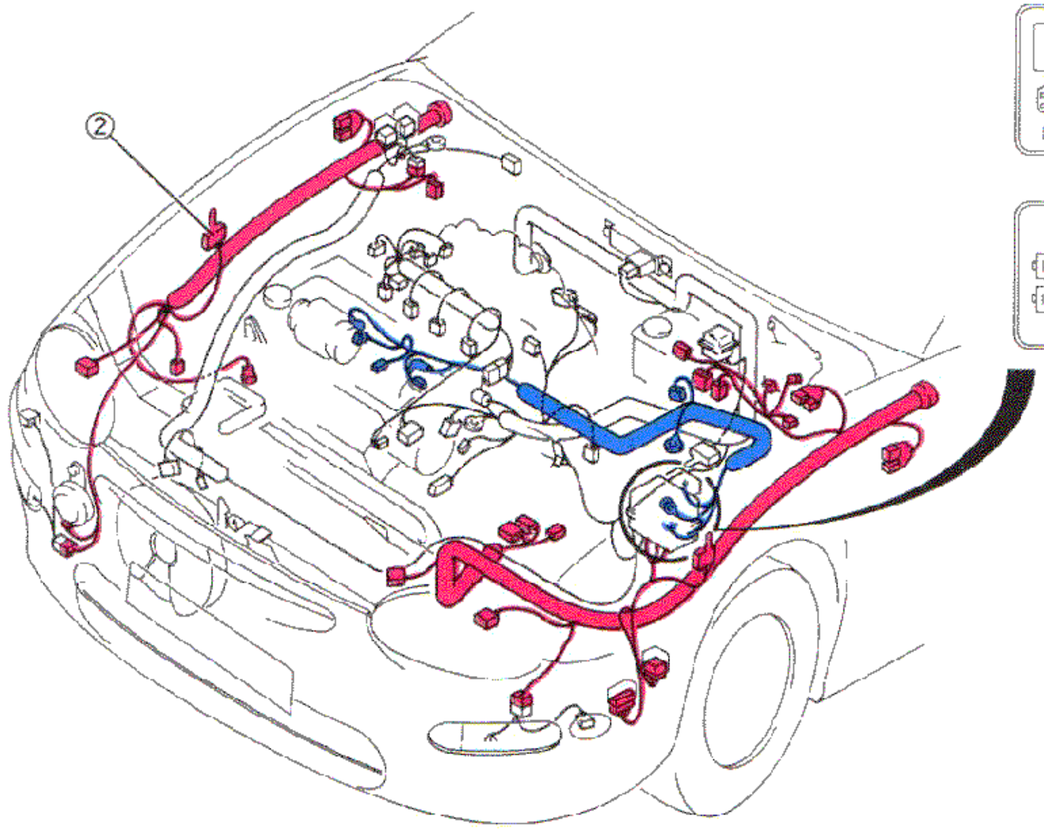
WITH AIR BAG SYSTEM

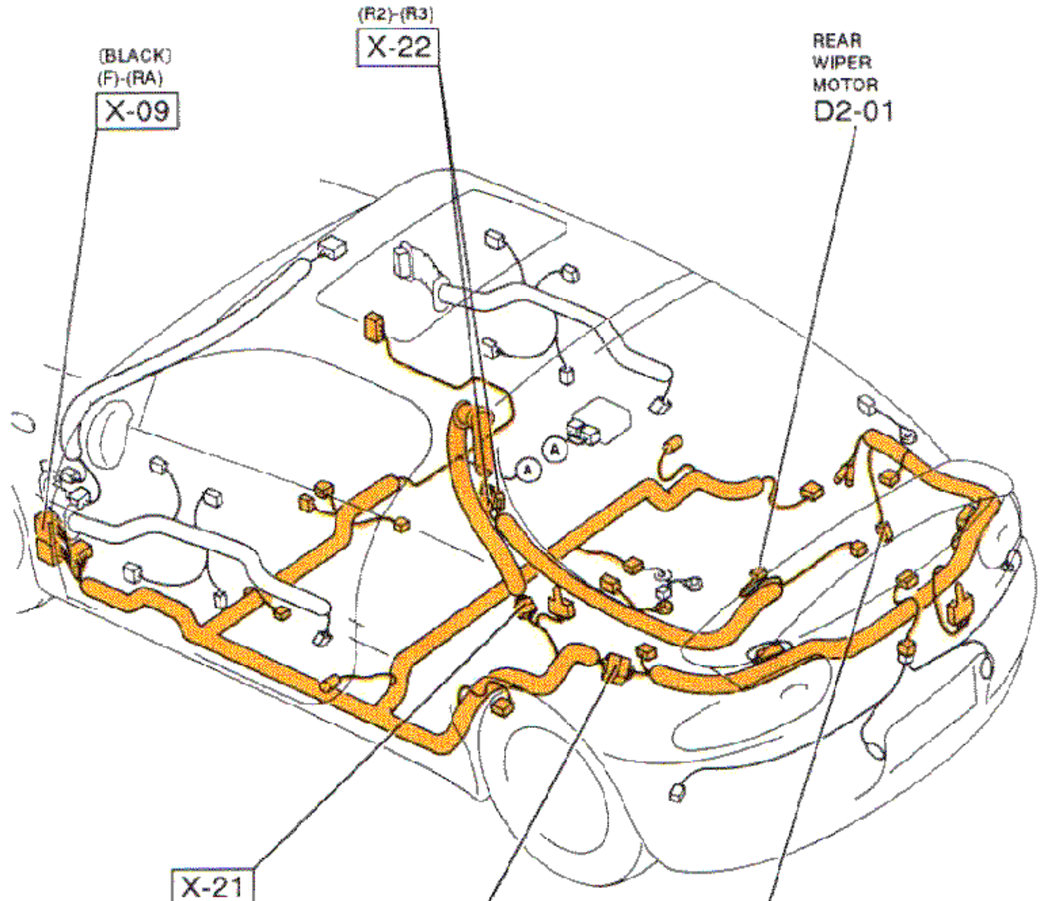


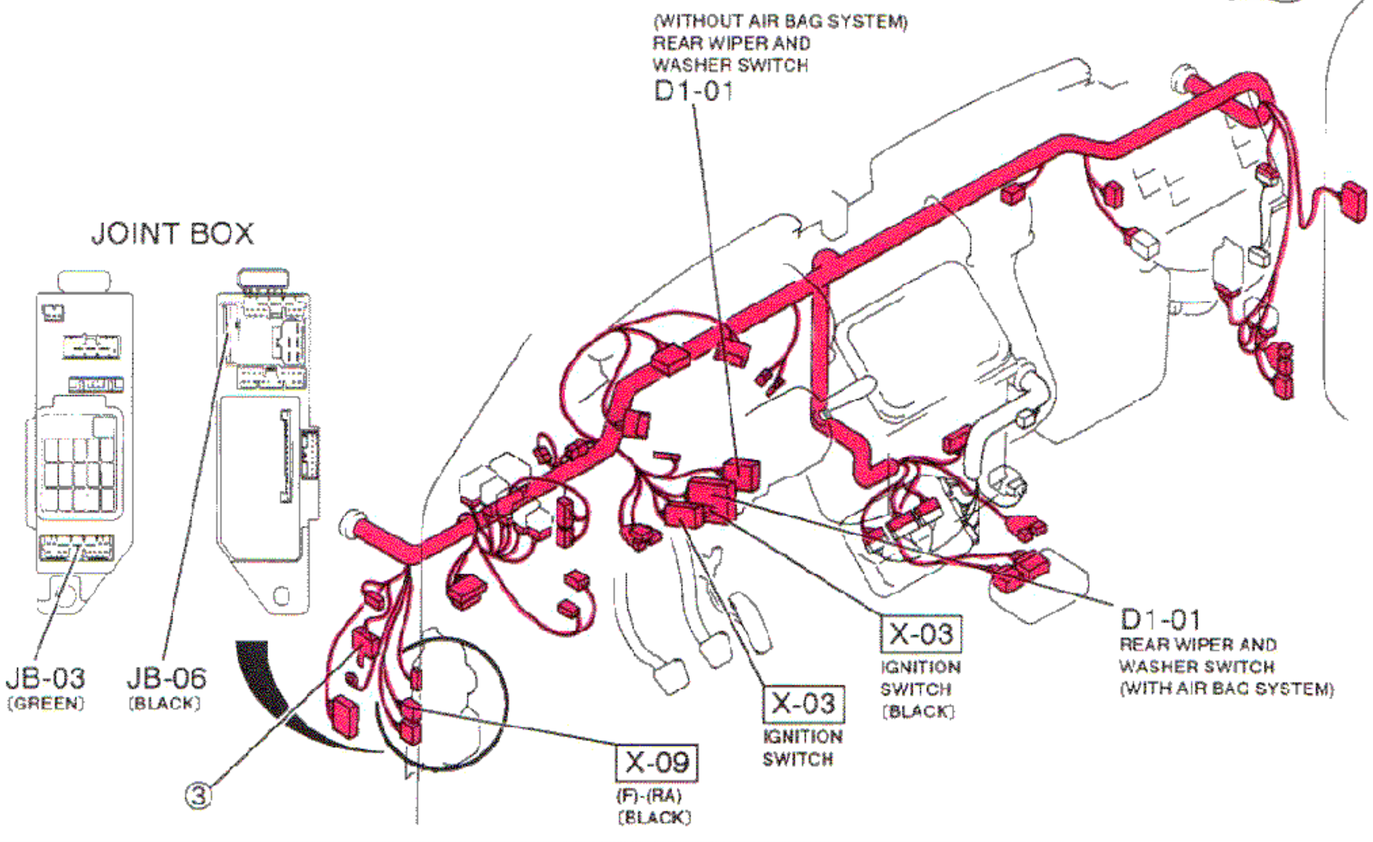
D-2

MAIN FUSE BLOCK

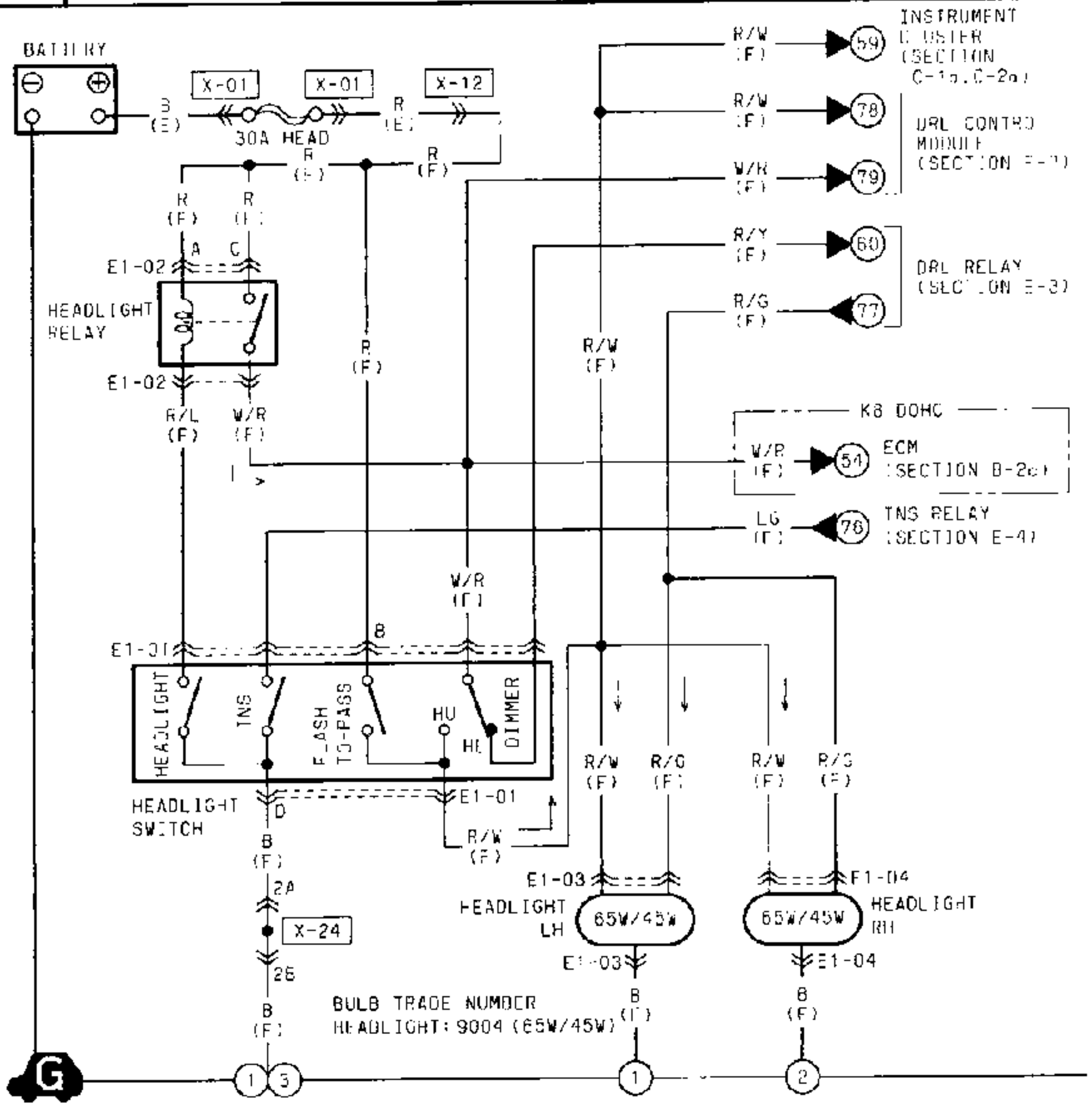






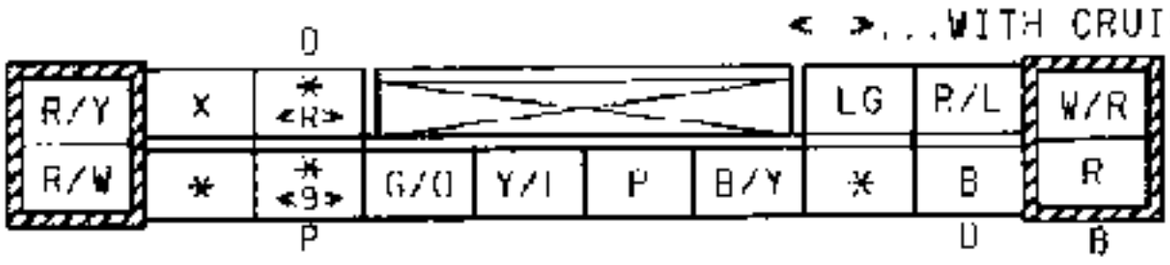


E-1 WITHOUT AIR BAG SYSTEM ■ HEADLIGHTS

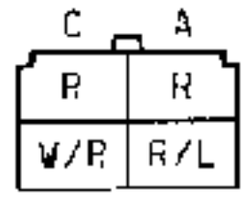


E1-01 HEADLIGHT SWITCH (F)

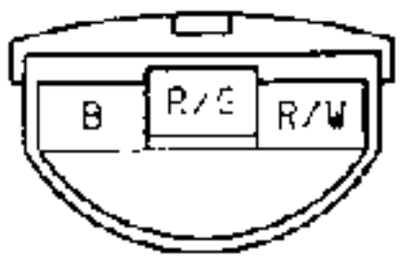
< >...WITH CRUISE CONTROL



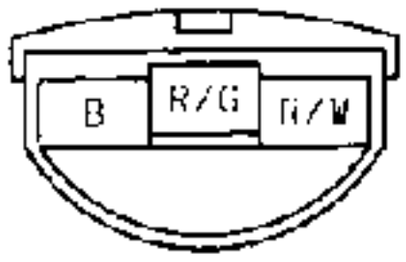
E1-02 HEADLIGHT RELAY (F)



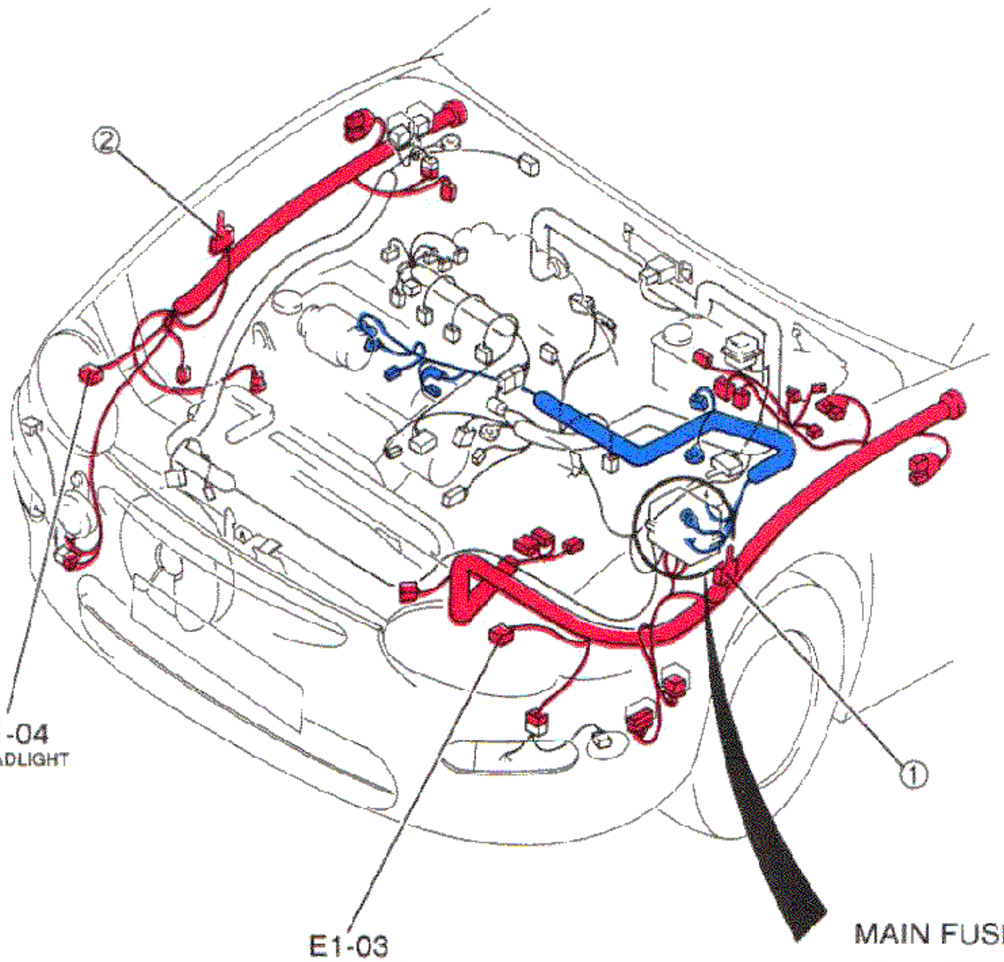
E1-03 HEADLIGHT LH (F)

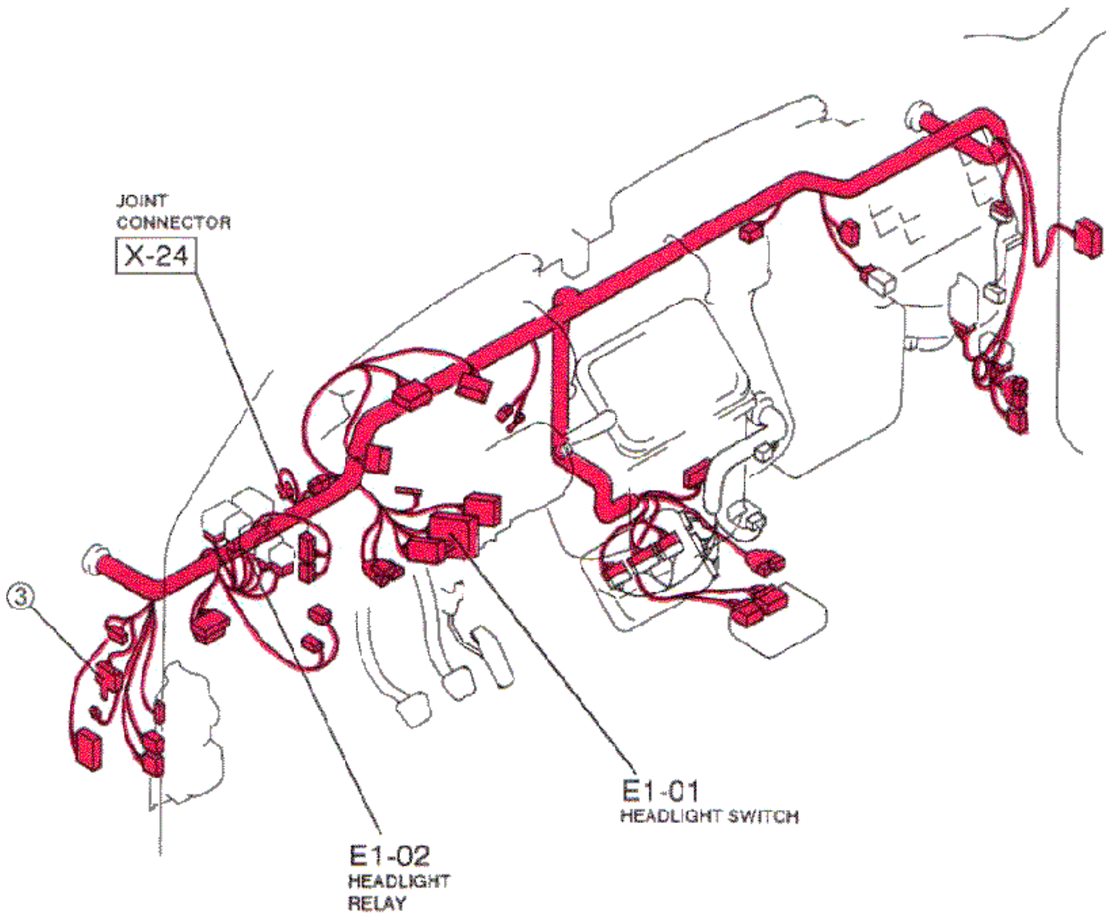


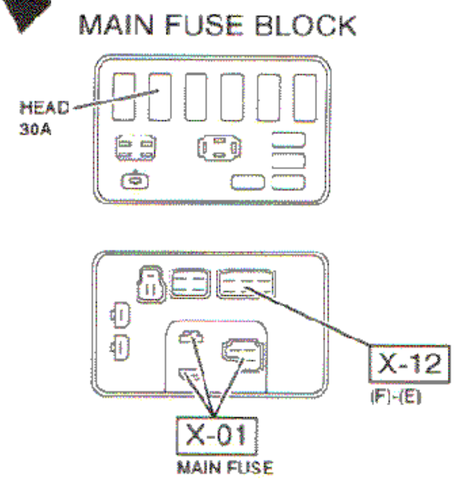
E1-04 HEADLIGHT RH (F)



E-1

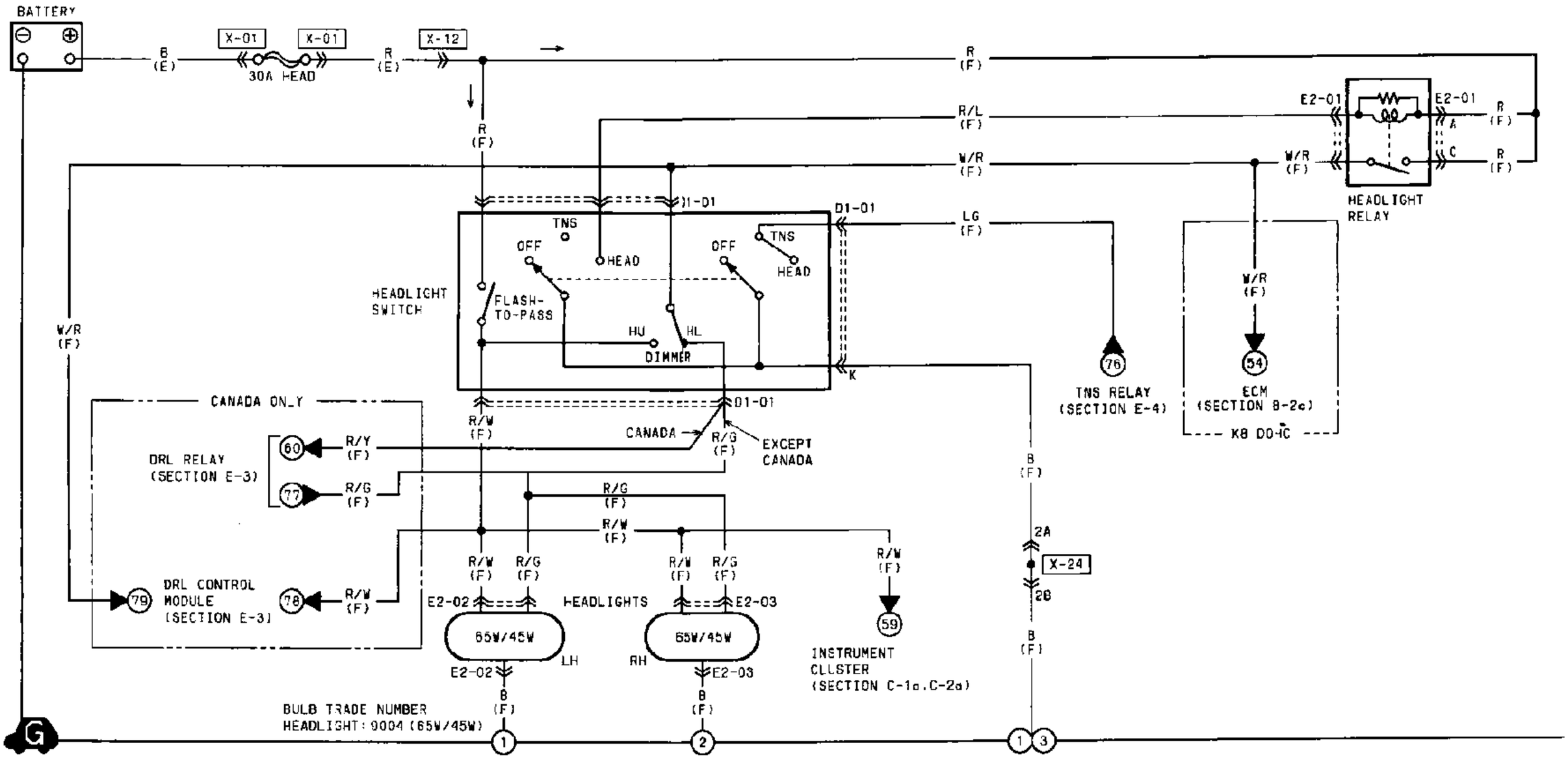

②
①
E1-04
HEADLIGHT
RH
E1-03
HEADLIGHT
LH


JOINT
CONNECTOR
X-24
③
E1-01
HEADLIGHT SWITCH
E1-02
HEADLIGHT
RELAY

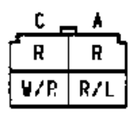

MAIN FUSE BLOCK
HEAD
30A
X-12
(F)-(E)
X-01
MAIN FUSE

E-2 WITH AIR BAG SYSTEM ■ HEADLIGHTS

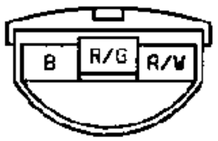
< >...CANADA



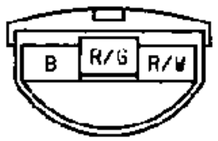
E2-01 HEADLIGHT RELAY (F)



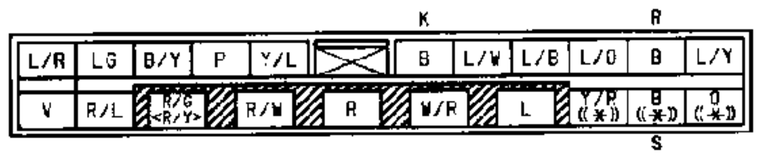
E2-02 HEADLIGHT LH (F)



E2-03 HEADLIGHT RH (F)

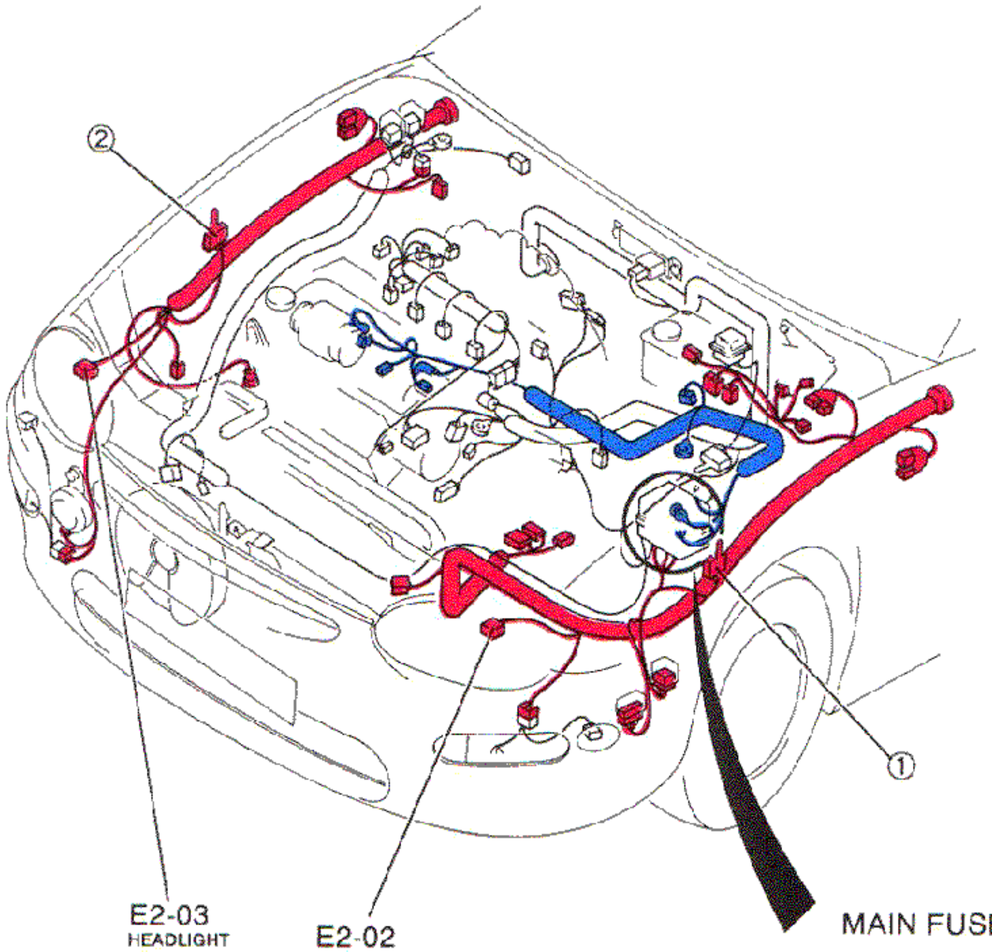


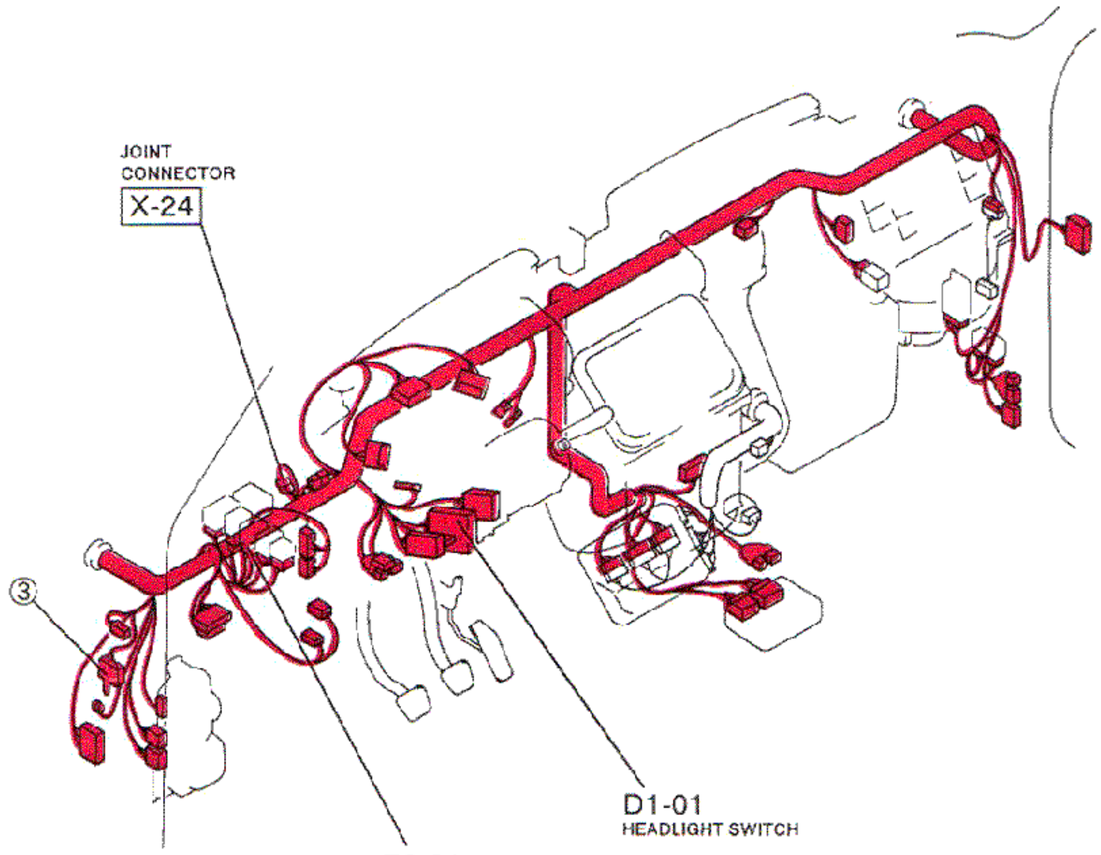
D1-01 HEADLIGHT SWITCH (F)

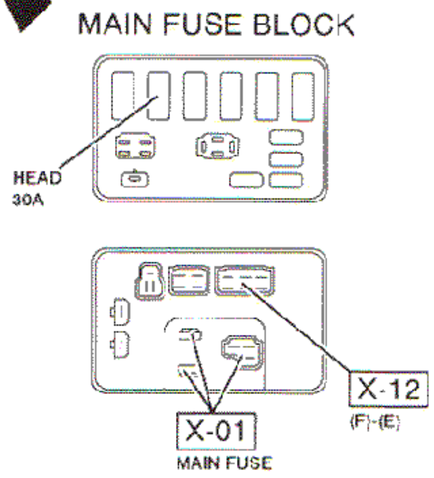


(*)...WITHOUT REAR WIPER AND WASHER

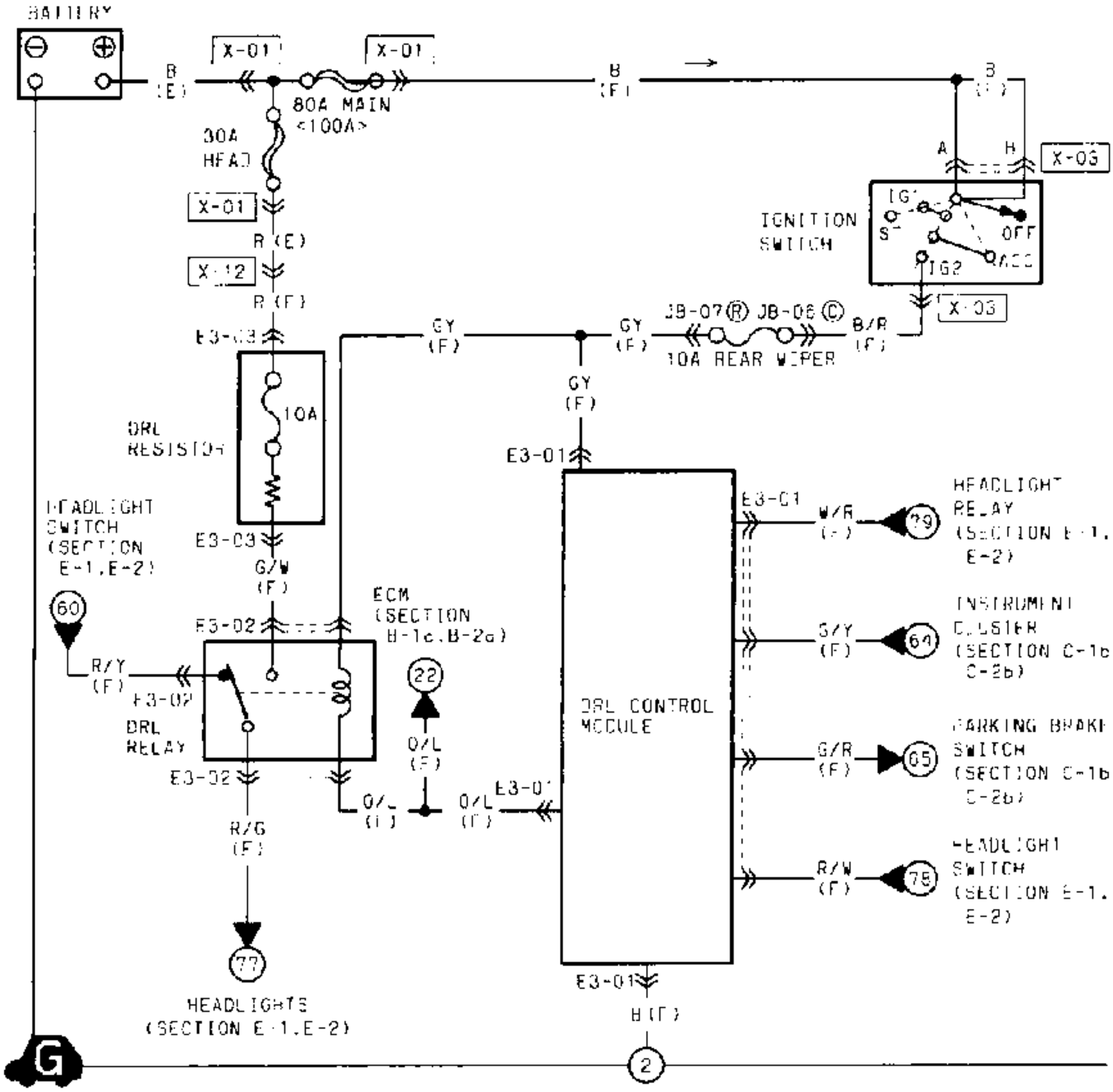
E-2


②
①
E2-03
HEADLIGHT
RH
E2-02
HEADLIGHT
LH

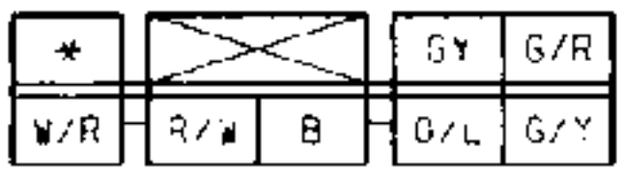

JOINT
CONNECTOR
X-24
③
D1-01
HEADLIGHT SWITCH
E2-01
HEADLIGHT
RELAY


MAIN FUSE BLOCK
HEAD
30A
X-12
(F)-(E)
X-01
MAIN FUSE

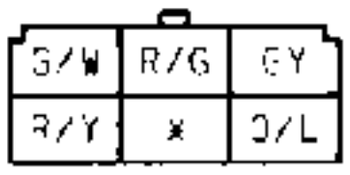
E-3 CANADA ■ DRL CONTROL SYSTEM



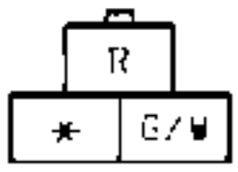
E3-01 DRL CONTROL MODULE (F)



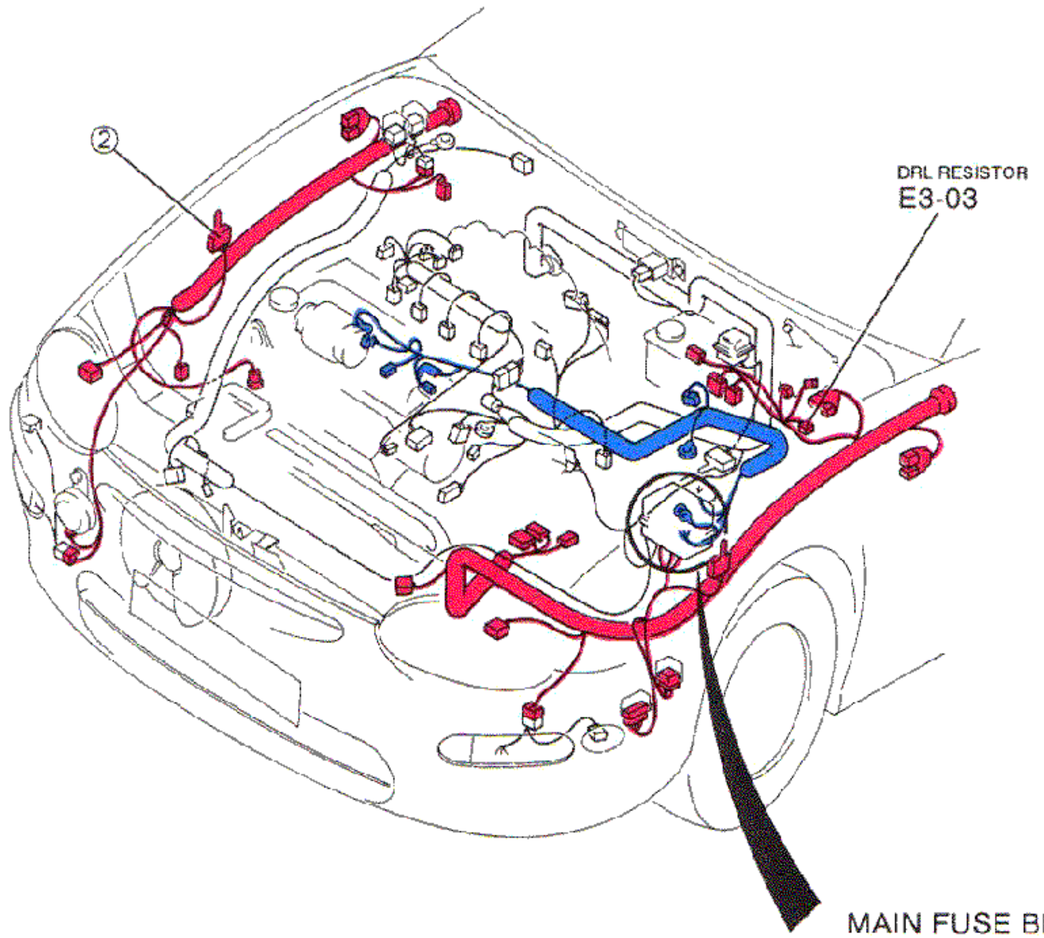
E3-02 DRL RELAY (F)

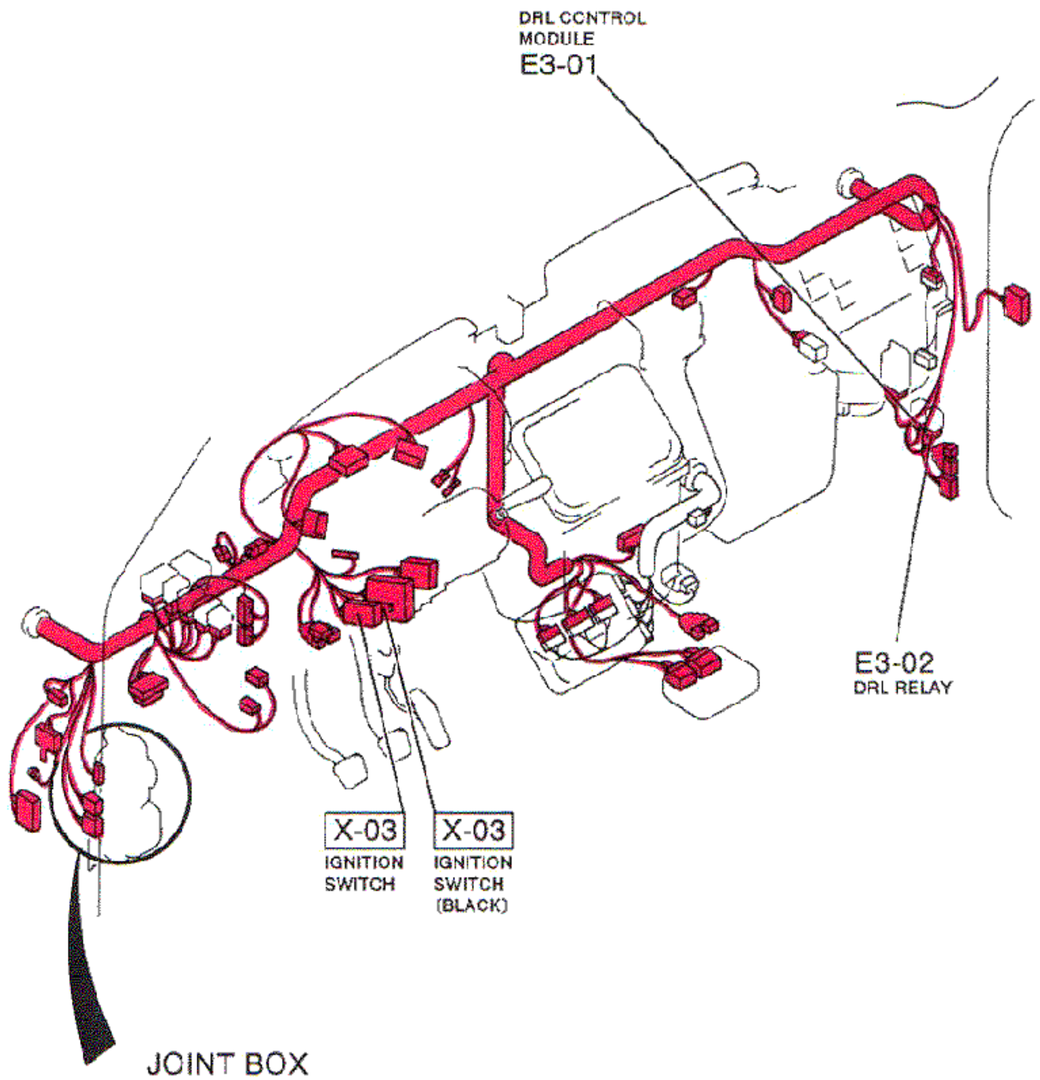


E3-03 DRL RESISTOR (F)

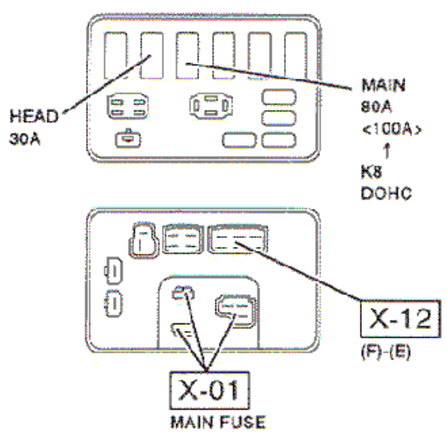


E-3

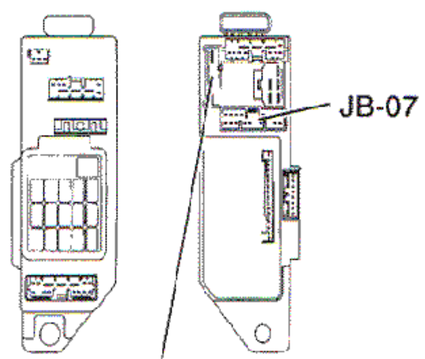




MAIN FUSE BLOCK

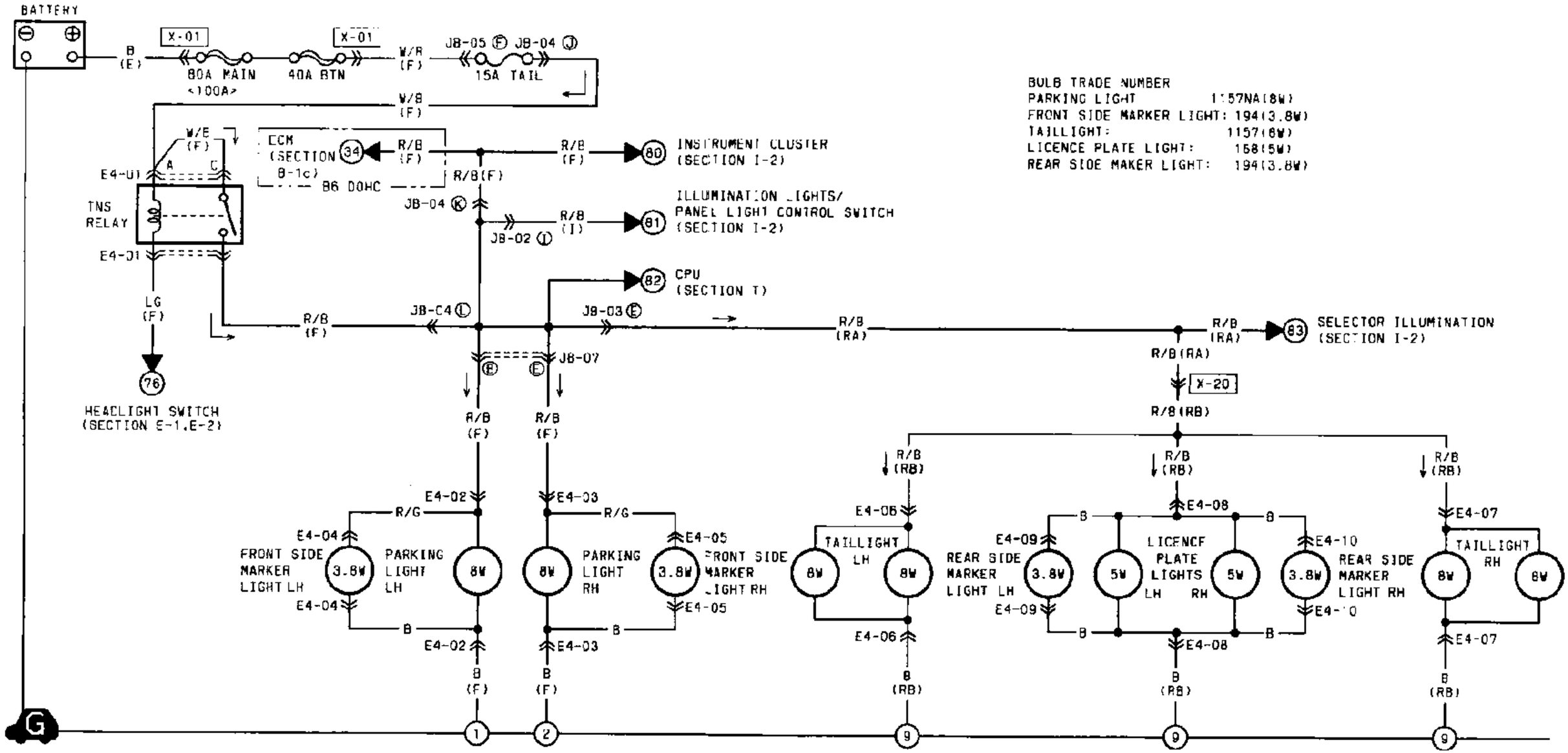


JOINT BOX



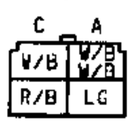
E-4 ■ PARKING LIGHTS ■ FRONT SIDE MARKER LIGHTS ■ TAILLIGHTS ■ LICENCE PLATE LIGHTS ■ REAR SIDE MARKER LIGHTS

< >...K8 DOHC

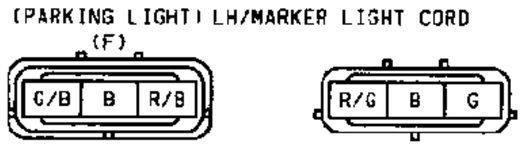


BULB TRADE NUMBER
PARKING LIGHT 1:57NA(8W)
FRONT SIDE MARKER LIGHT: 194(3.8W)
TAILLIGHT: 1157(8W)
LICENCE PLATE LIGHT: 168(5W)
REAR SIDE MAKER LIGHT: 194(3.8W)

E4-01 TNS RELAY (F)

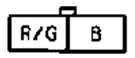


E4-02 FRONT COMBINATION LIGHT (PARKING LIGHT) LH/MARKER LIGHT CORD

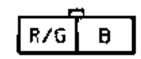


E4-03 FRONT COMBINATION LIGHT (PARKING LIGHT) RH/MARKER LIGHT CORD

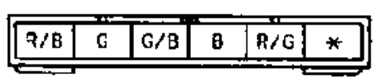
E4-04 FRONT SIDE MARKER LIGHT LH



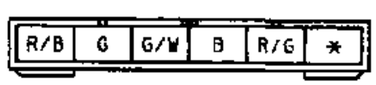
E4-05 FRONT SIDE MARKER LIGHT RH



E4-06 REAR COMBINATION LIGHT (TAILLIGHT) LH (RB)

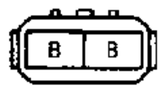


E4-07 REAR COMBINATION LIGHT (TAILLIGHT) RH (RB)

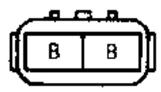


E4-08 LICENCE PLATE LIGHTS / MARKER LIGHT CORDS

E4-09 REAR SIDE MARKER LIGHT LH

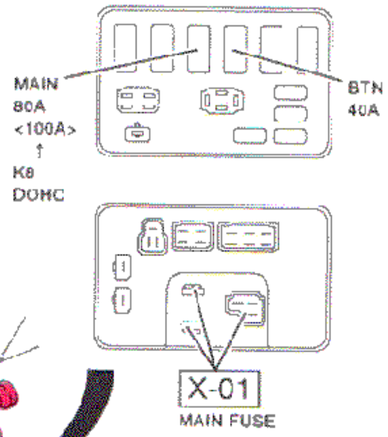


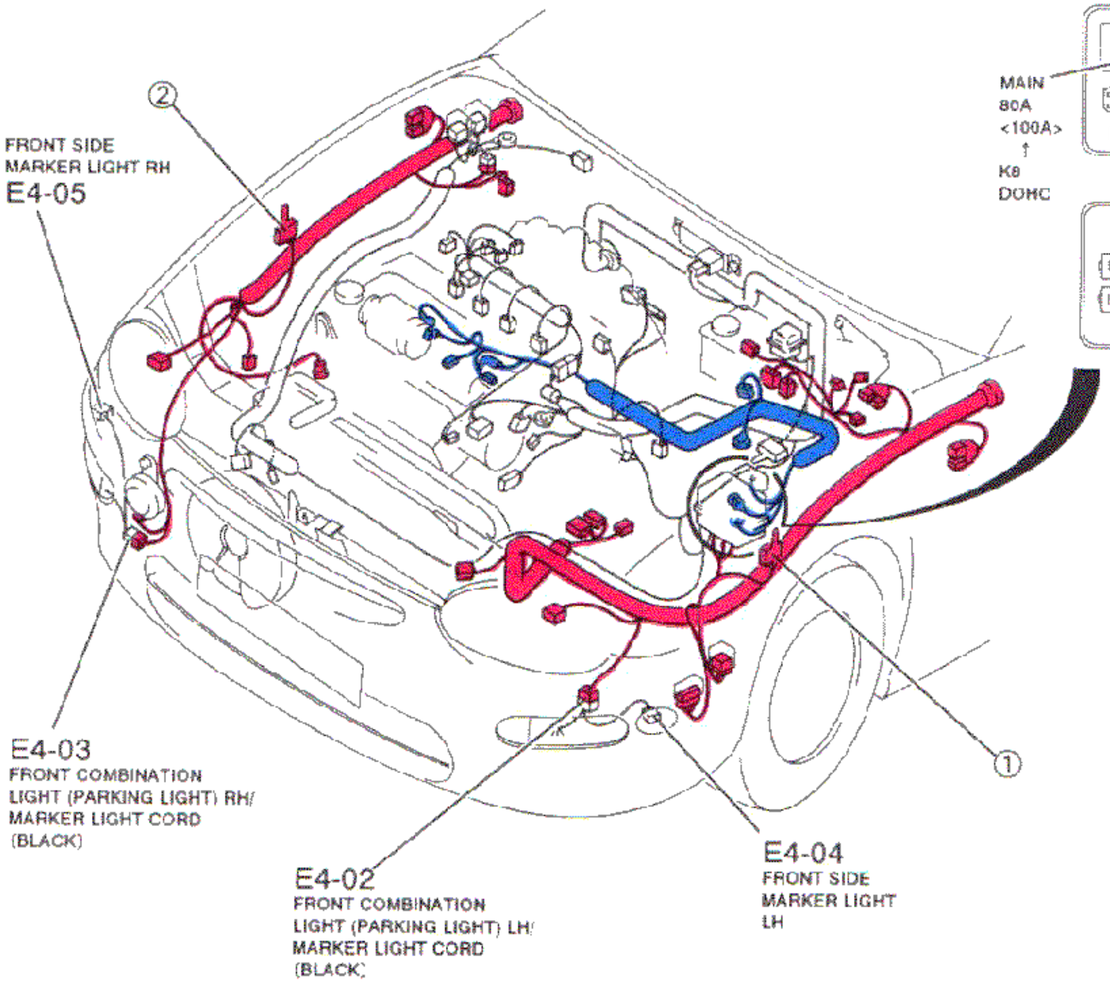
E4-10 REAR SIDE MARKER LIGHT RH

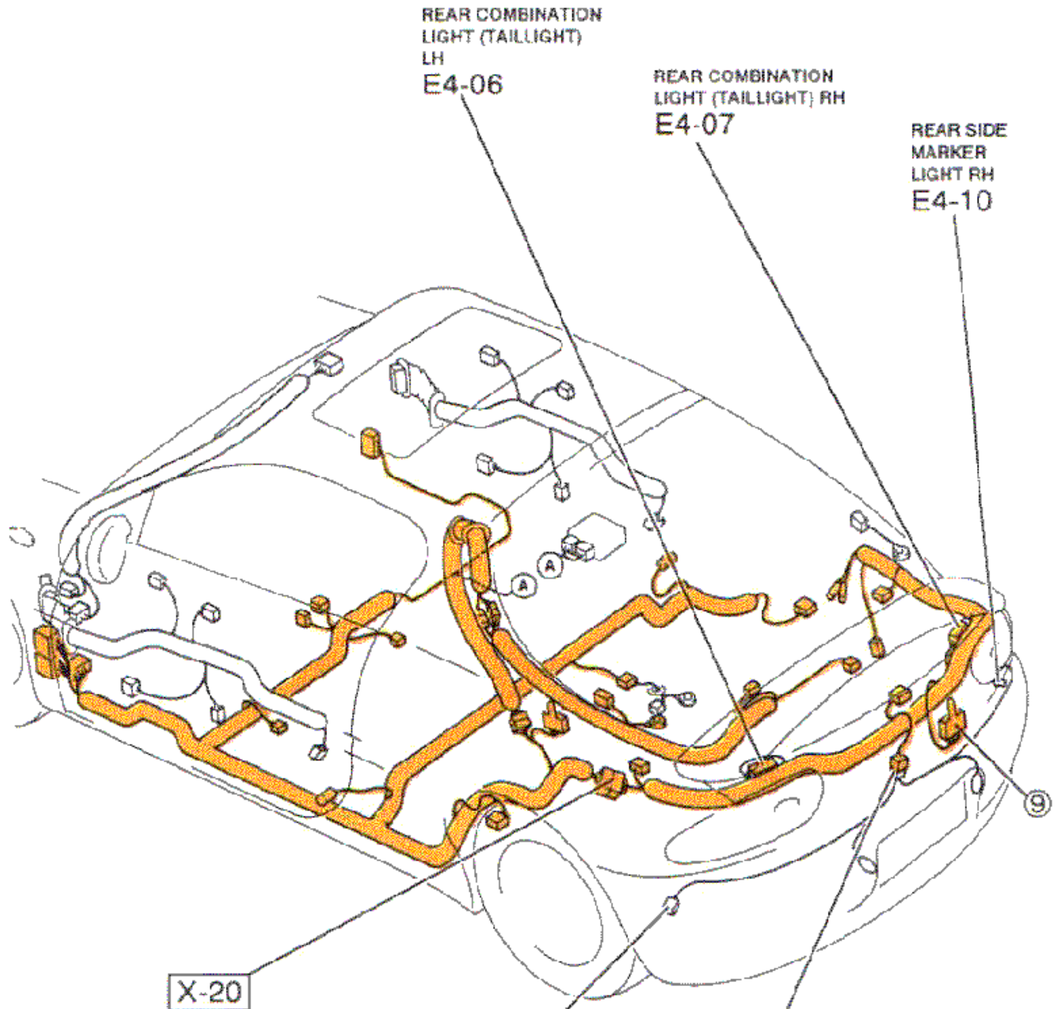


E-4

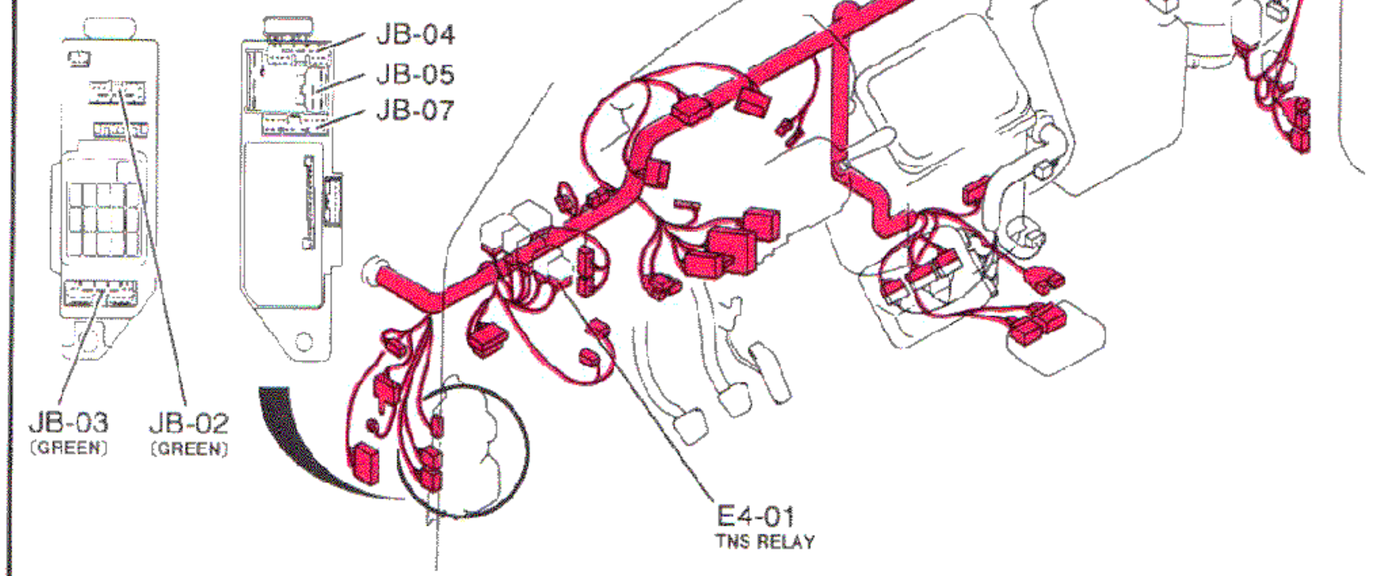
MAIN FUSE BLOCK





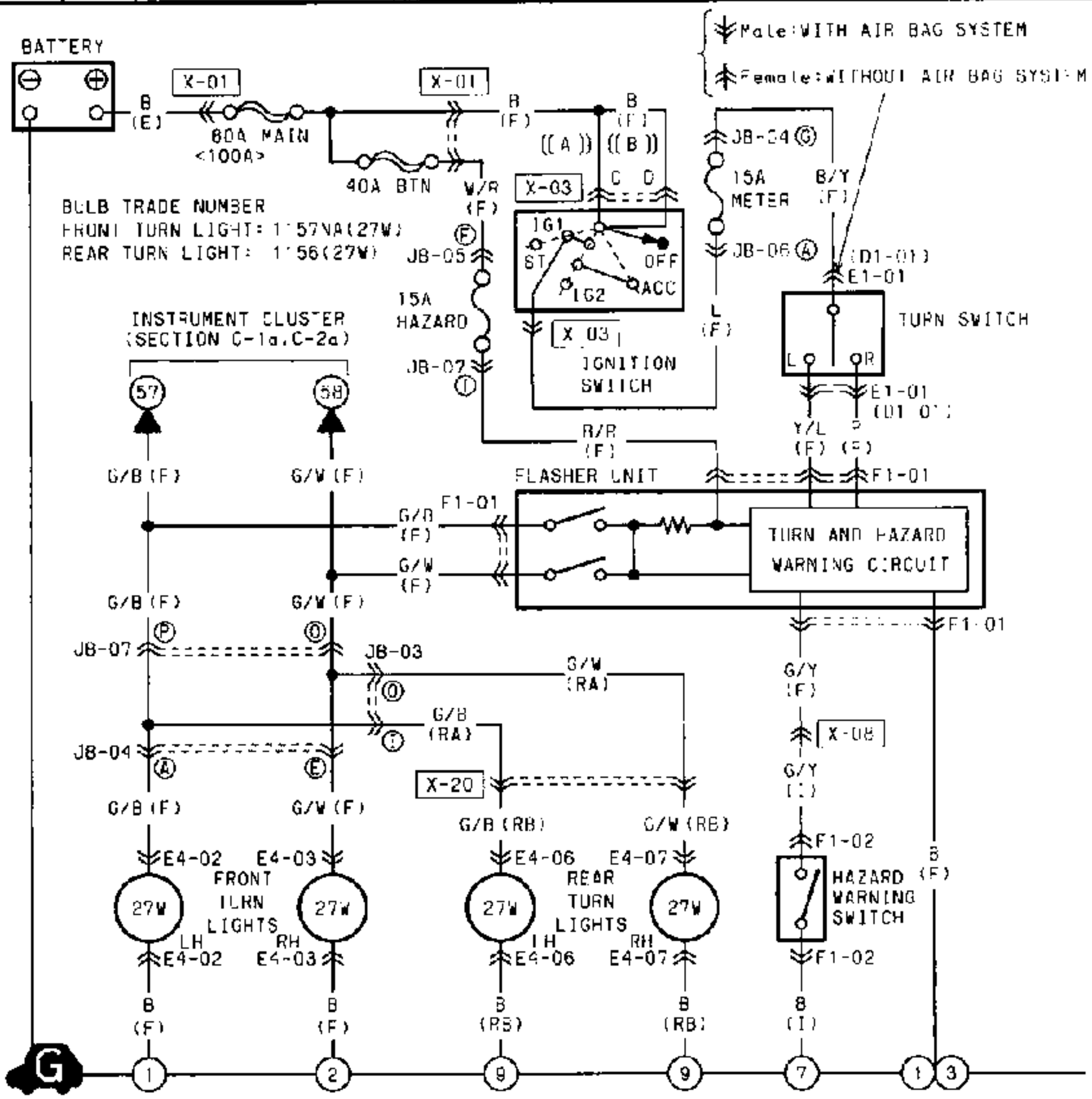


JOINT BOX



F-1 ■ TURN AND HAZARD WARNING LIGHTS

< >...K8 DOHC
(( ))...CANADA
( )...WITH AIR BAG SYSTEM



F1-01 FLASHER UNIT (F)

G/W	P	G/Y	B
B/R	Y/L	G/B	*

F1-02 HAZARD WARNING SWITCH (I)

R	B	G/Y	R/B

E1-01 TURN SWITCH (F)

WITHOUT AIR BAG SYSTEM

R/Y	*	* <R>						LG	R/L	W/R
R/W	*	* <B>	G/O	Y/L	P	B/Y	*	B	R

< >...WITH CRUISE CONTROL

E4-02 FRONT COMBINATION LIGHT (FRONT TURN LIGHT) LH (F)

G/B	B	R/B

E4-03 FRONT COMBINATION LIGHT (FRONT TURN LIGHT) RH (F)

G/W	B	R/B

E4-06 REAR COMBINATION LIGHT (REAR TURN LIGHT) LH (RB)

R/B	G	G/B	B	R/G	*

E4-07 REAR COMBINATION LIGHT (REAR TURN LIGHT) RH (RB)

R/B	G	G/W	B	R/G	*

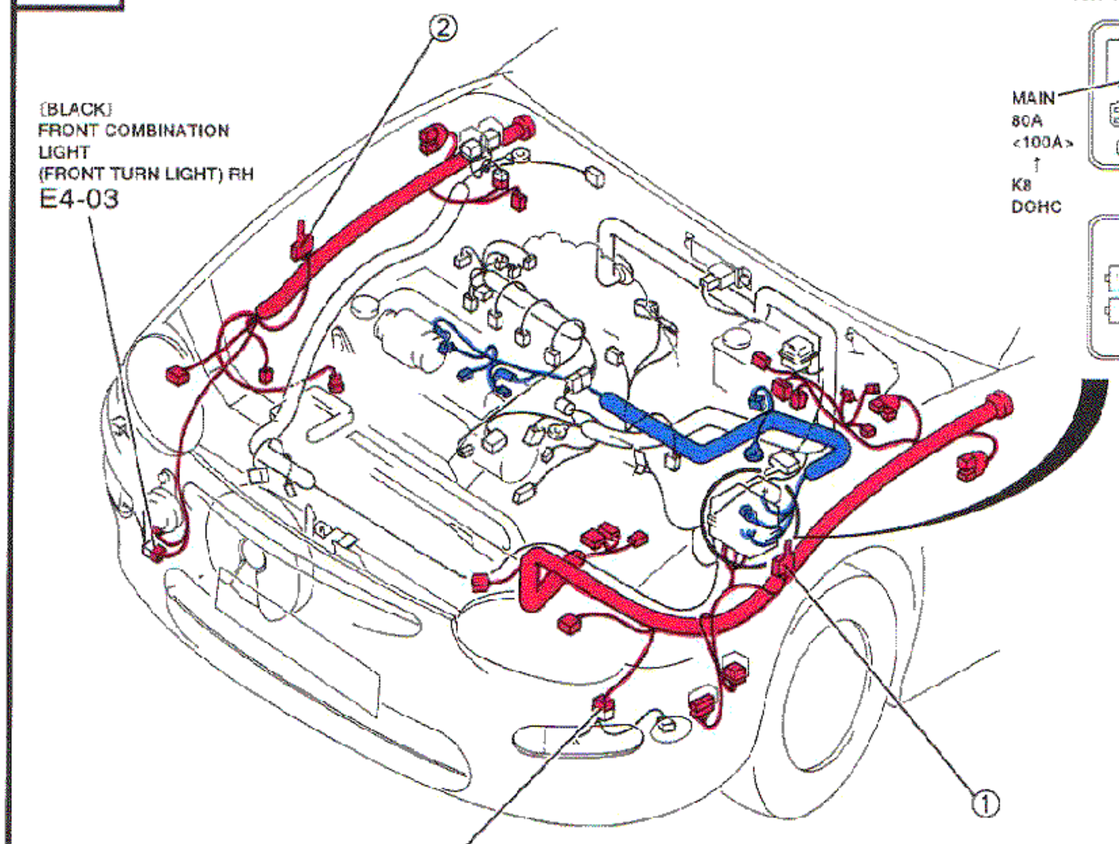
D1-01 TURN SWITCH (F)

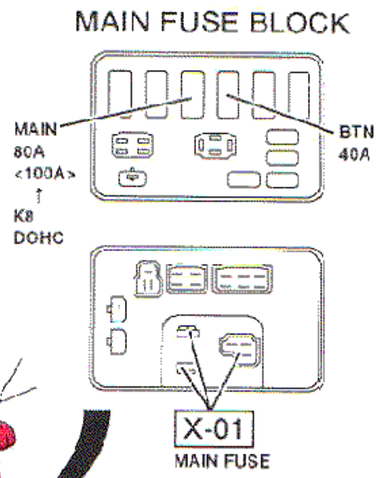
WITH AIR BAG SYSTEM

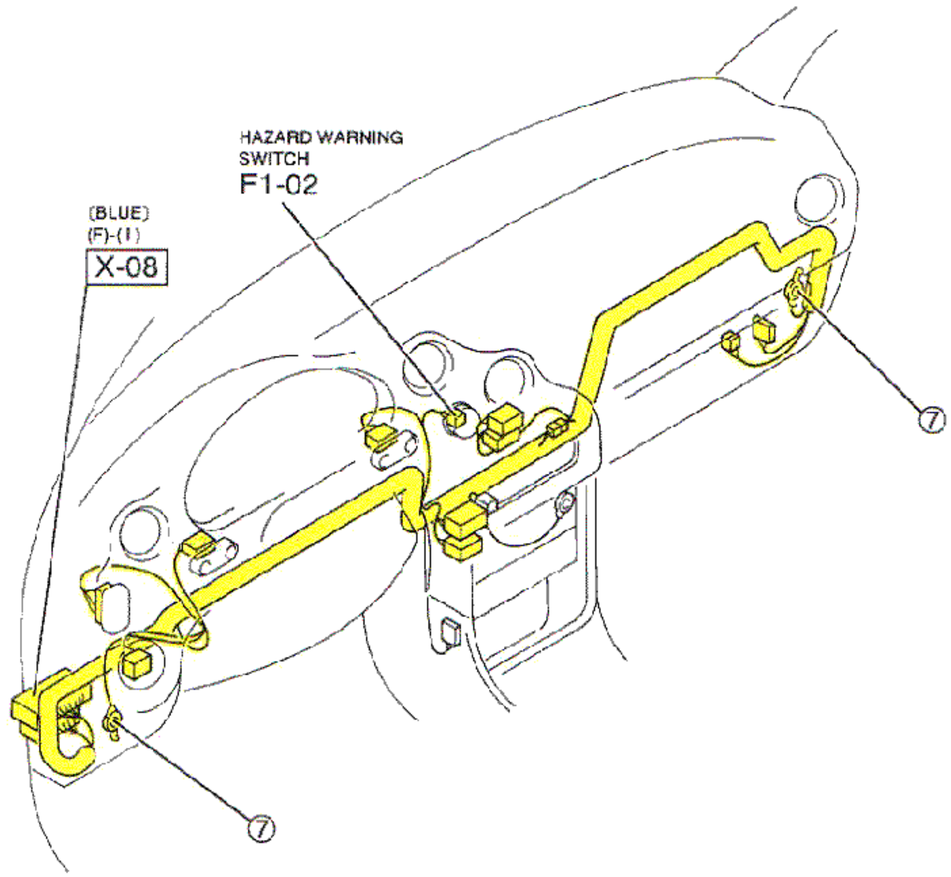
L/R	LG	B/Y	P	Y/L		B	L/W	L/B	L/O	B	L/Y
V	R/L	R/G ((R/Y))	R/W	R	W/R	L	Y/R ((*))	B ((*))	((*))

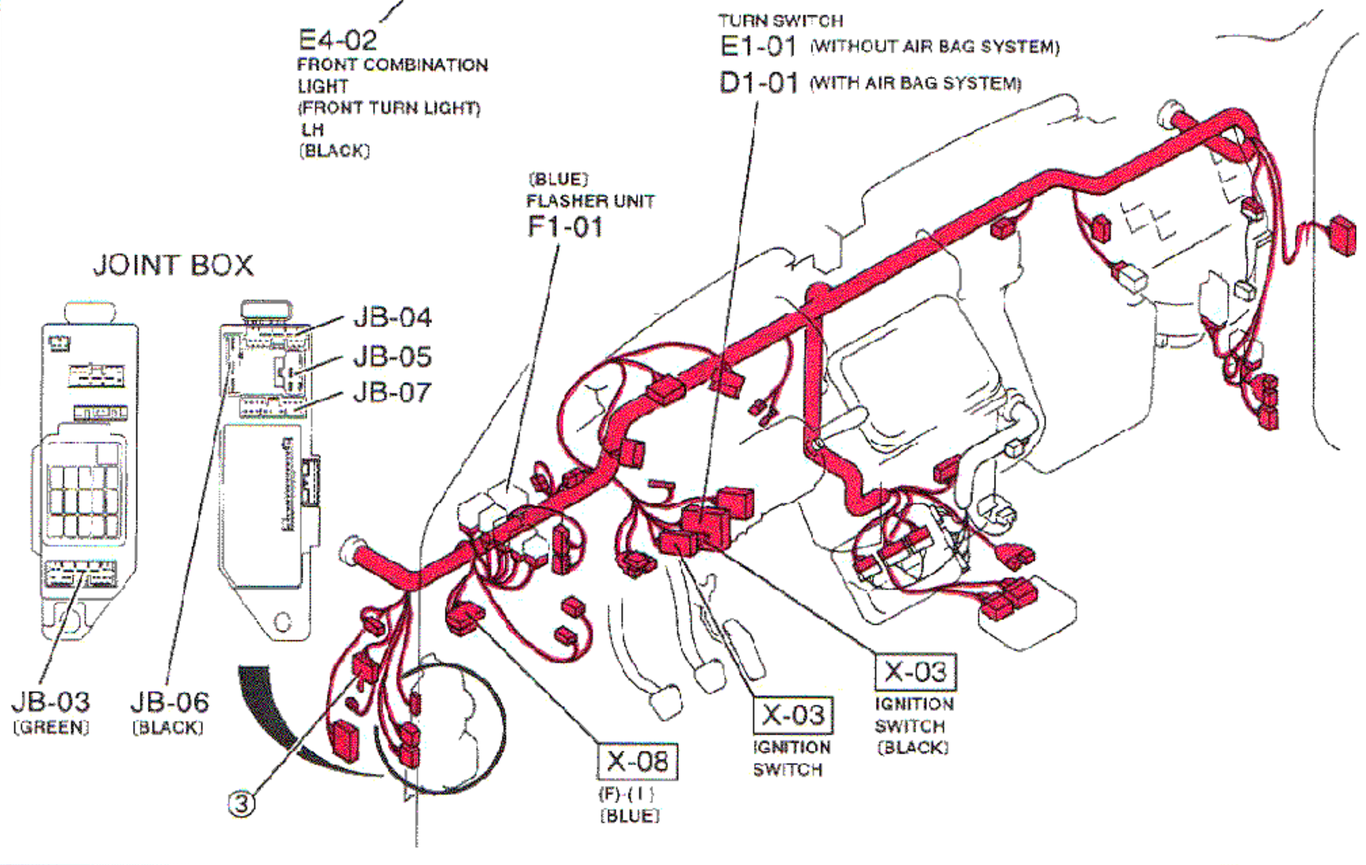
(( ))...WITHOUT REAR WIPER AND WASHER

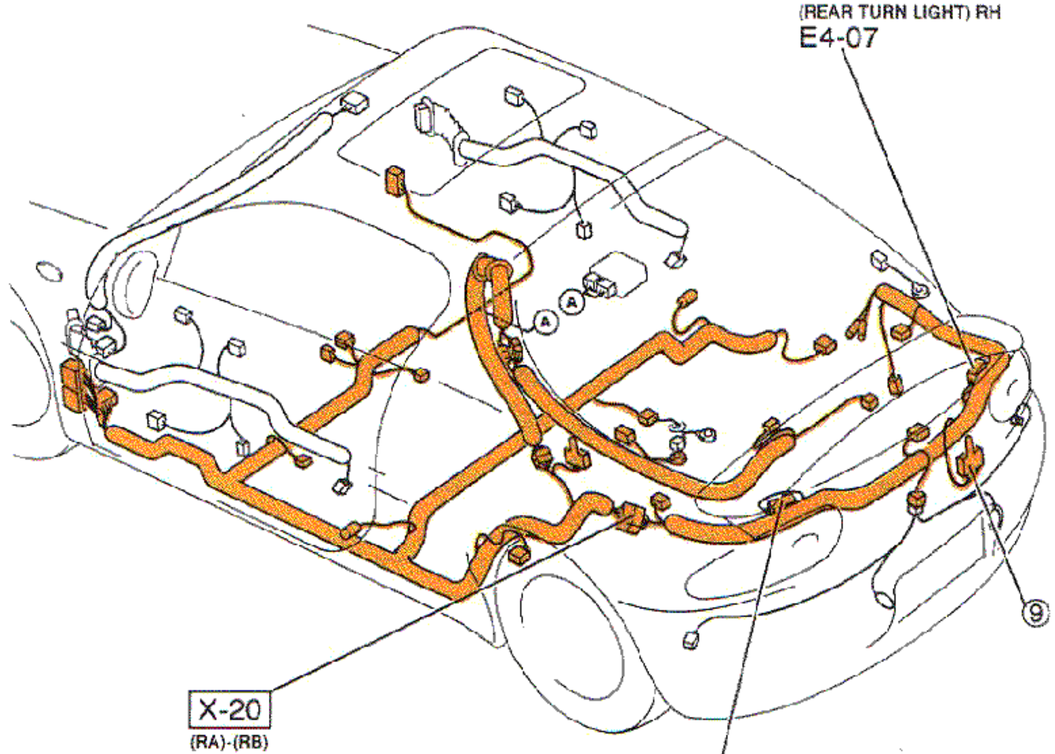
F-1


(BLACK)
FRONT COMBINATION LIGHT (FRONT TURN LIGHT) RH
E4-03
②
①
E4-02
FRONT COMBINATION LIGHT (FRONT TURN LIGHT) LH
(BLACK)
③


MAIN FUSE BLOCK
MAIN
80A
<100A>
↑
K8
DOHC
BTN
40A
X-01
MAIN FUSE

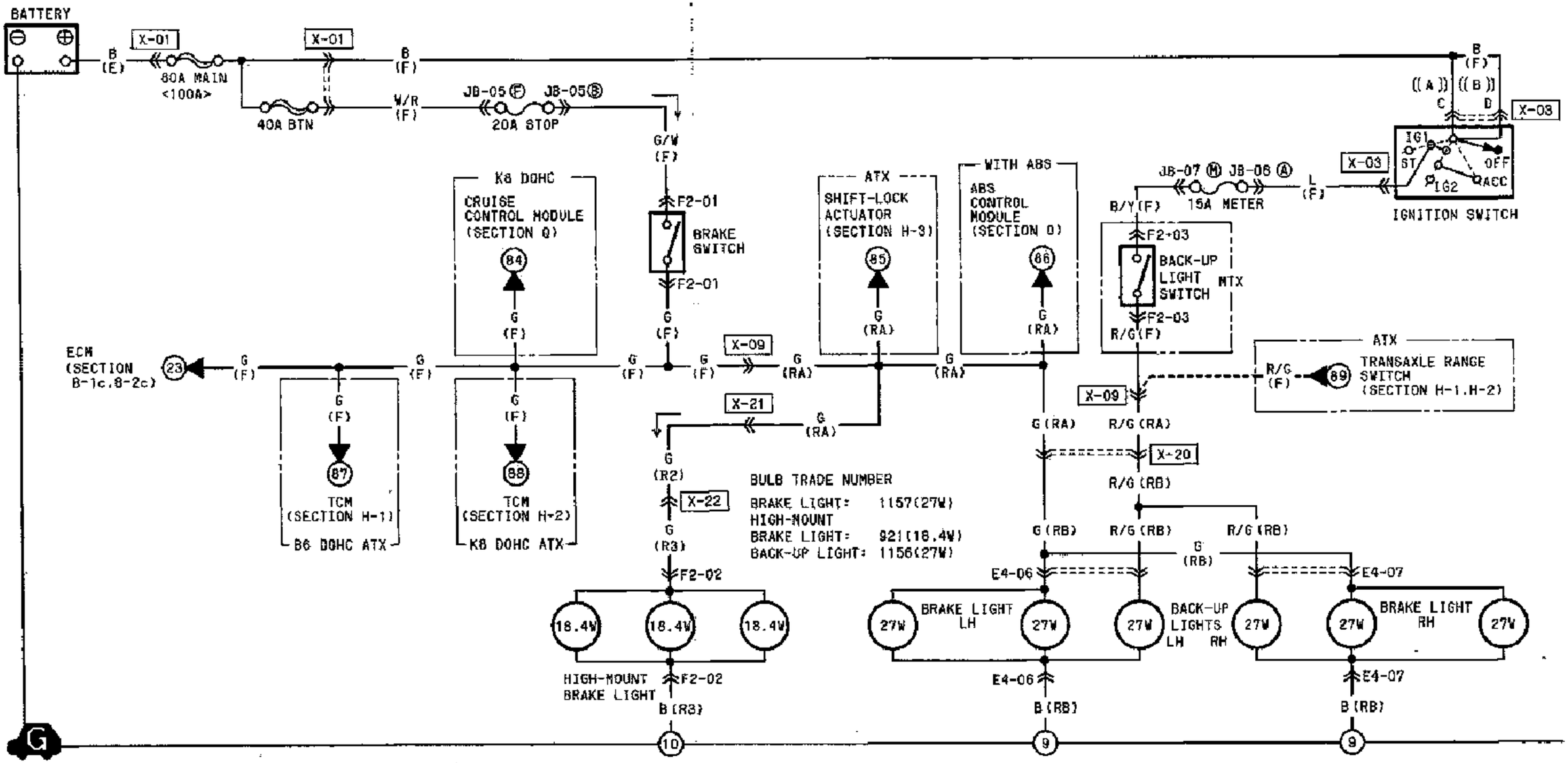

HAZARD WARNING SWITCH
F1-02
(BLUE)
(F)-(I)
X-08
⑦
⑦


TURN SWITCH
E1-01 (WITHOUT AIR BAG SYSTEM)
D1-01 (WITH AIR BAG SYSTEM)
(BLUE)
FLASHER UNIT
F1-01
JOINT BOX
JB-04
JB-05
JB-07
JB-03
(GREEN)
JB-06
(BLACK)
X-08
(F)-(I)
(BLUE)
X-03
IGNITION SWITCH
X-03
IGNITION SWITCH
(BLACK)


REAR COMBINATION LIGHT (REAR TURN LIGHT) RH
E4-07
X-20
(RA)-(RB)
⑨
E4-06
REAR COMBINATION LIGHT (REAR TURN LIGHT) LH

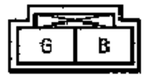
F-2 ■ BRAKE LIGHTS ■ HIGH-MOUNT BRAKE LIGHTS ■ BACK-UP LIGHTS

( ) ... CANADA
< > ... K8 DOHC



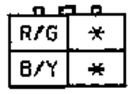
F2-01 BRAKE SWITCH (F)

F2-02 HIGH-MOUNT BRAKE LIGHT (R3)

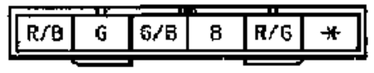


F2-03 BACK-UP LIGHT SWITCH (F)

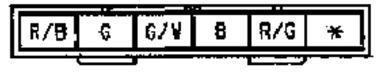
M/T ONLY



E4-06 REAR COMBINATION LIGHT (BRAKE LIGHT/BACK-UP LIGHT)LH (RB)

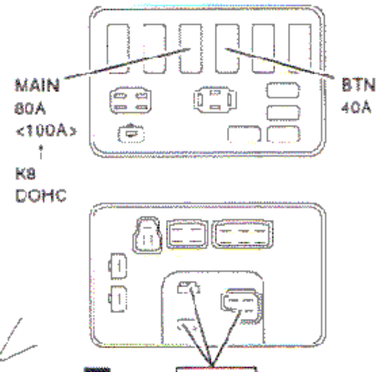


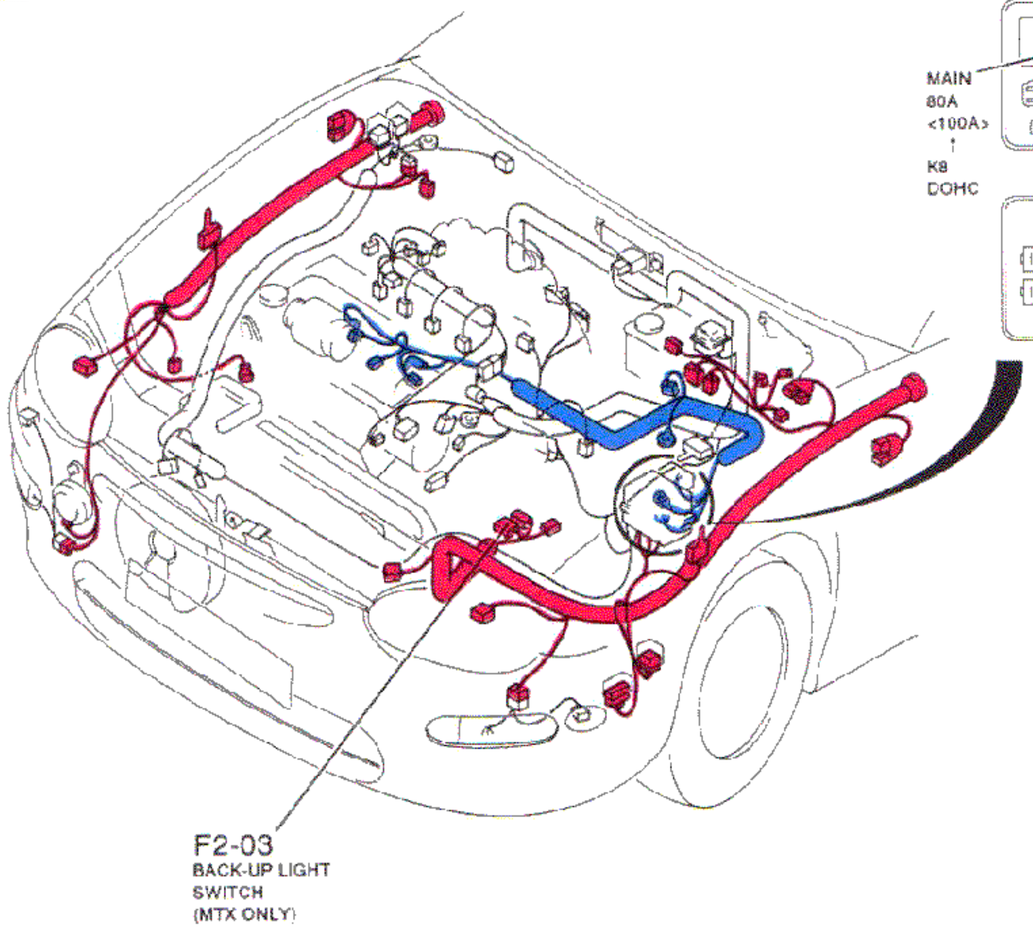
E4-07 REAR COMBINATION LIGHT (BRAKE LIGHT/BACK-UP LIGHT)RH (RB)



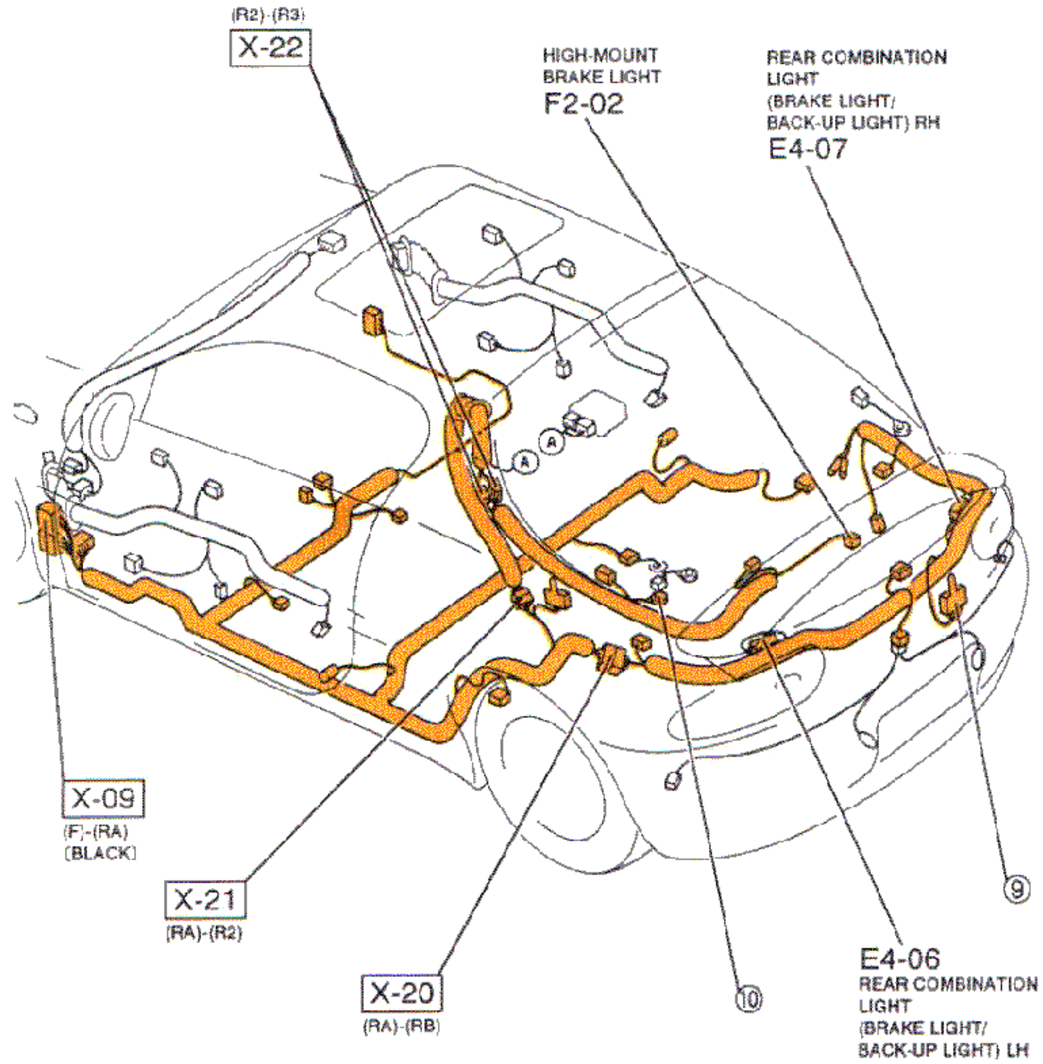
F-2

MAIN FUSE BLOCK

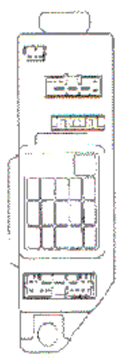




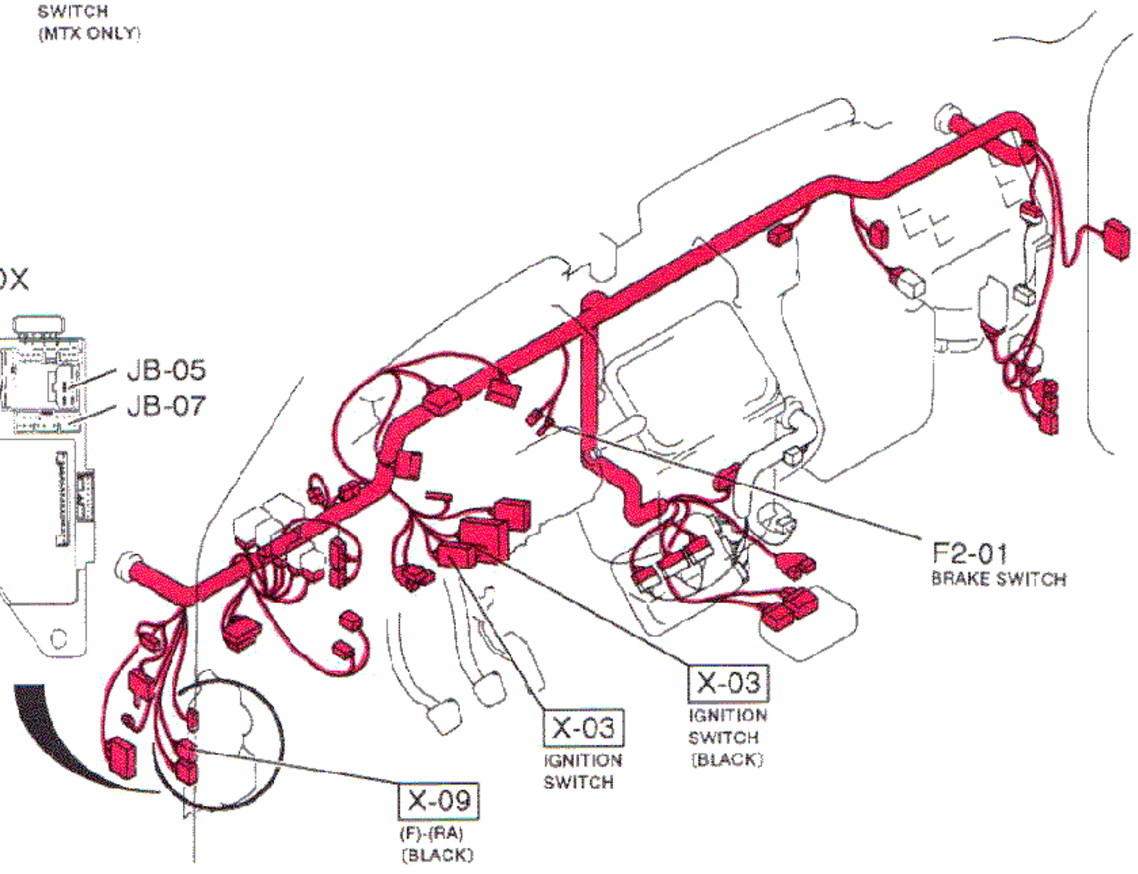
F2-03
BACK-UP LIGHT
SWITCH
(MTX ONLY)



JOINT BOX



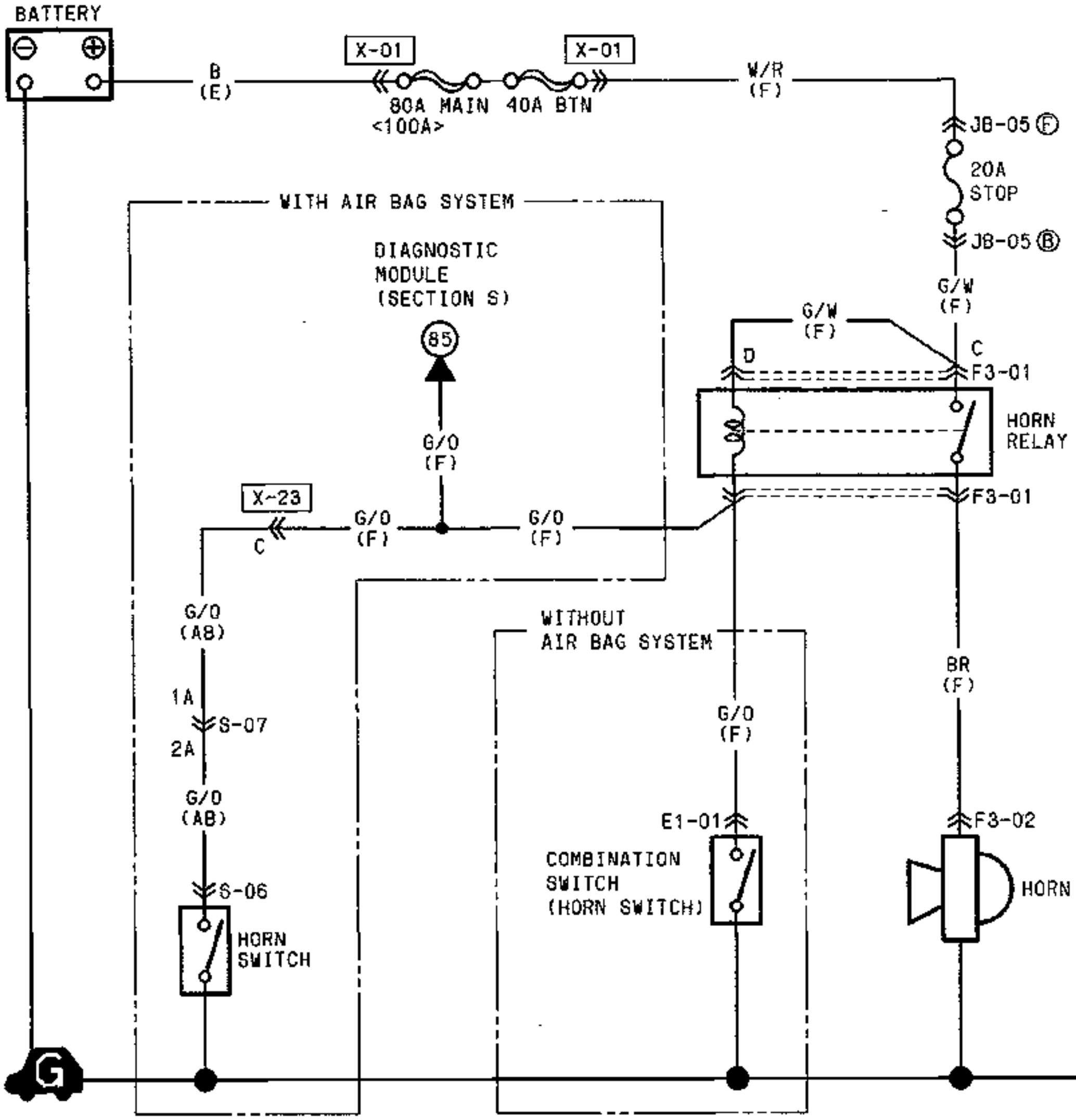
JB-05
JB-07
JB-06
(BLACK)



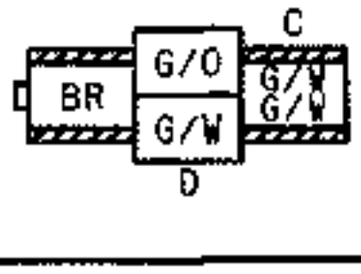
F2-01
BRAKE SWITCH
X-03
IGNITION
SWITCH
(BLACK)
X-03
IGNITION
SWITCH
X-09
(F)-(RA)
(BLACK)

F-3 ■ HORN

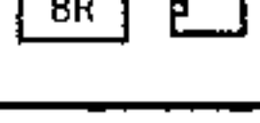
< >...K8 DOHC



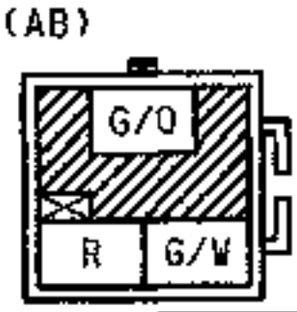
F3-01 HORN RELAY (F)



F3-02 HORN (F)

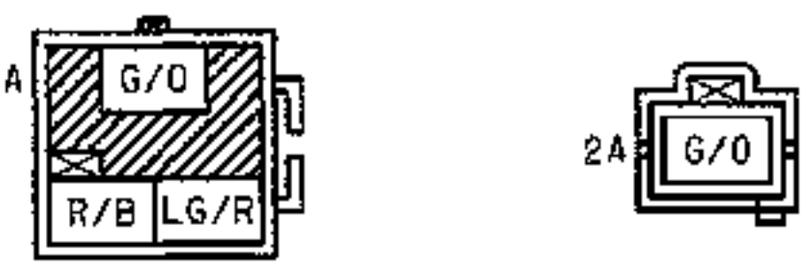


S-06 HORN SWITCH (AB)



WITH AIR BAG SYSTEM

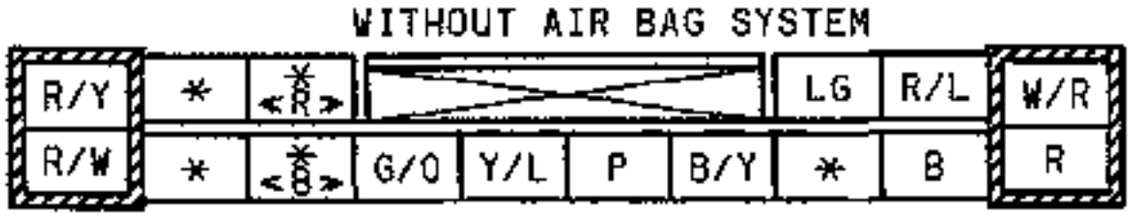
S-07 PASSENGER-SIDE AIR BAG MODULE (AB)



E1-01 COMBINATION SWITCH(HORN SWITCH) (F)

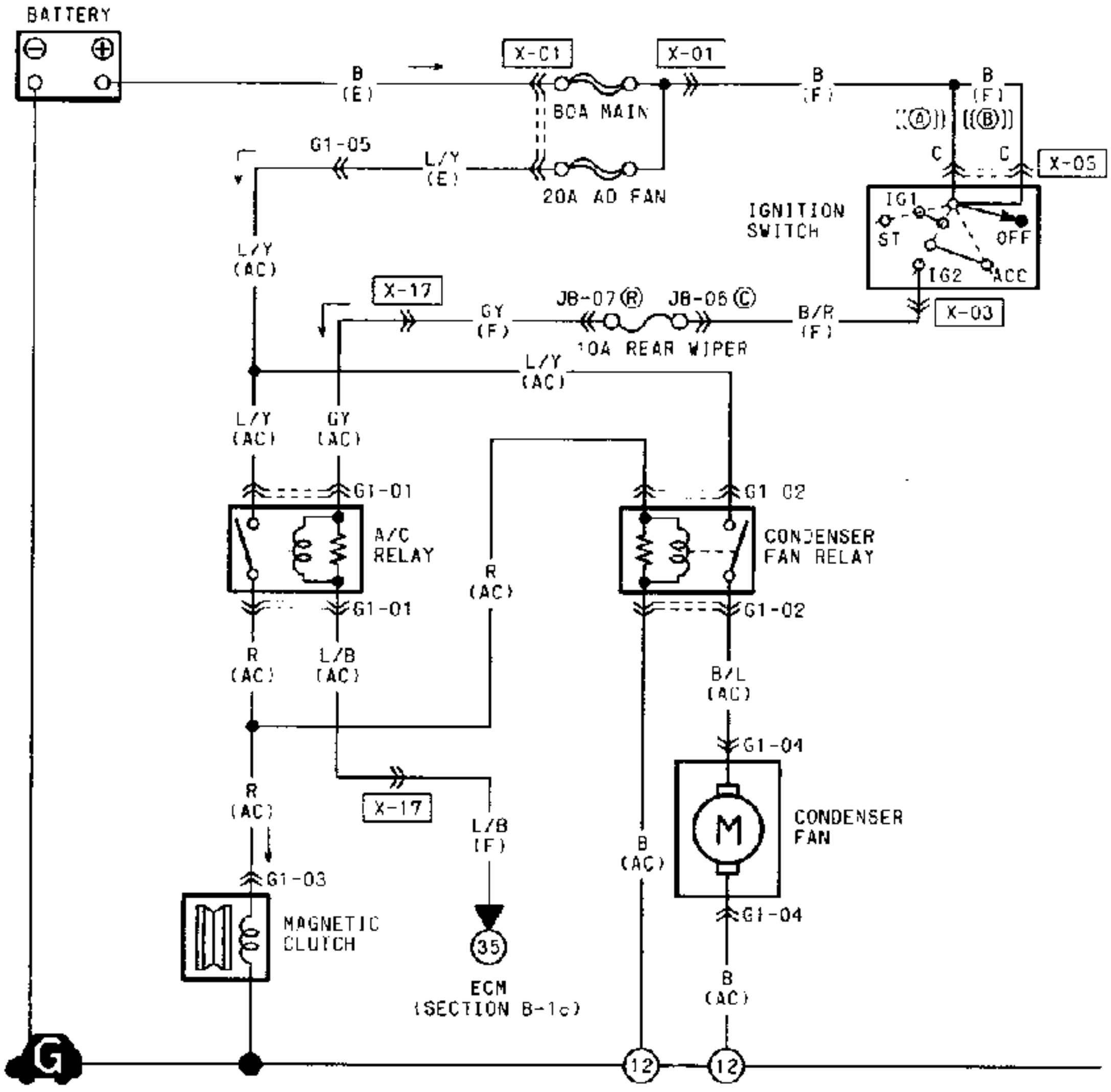
< >...WITH CRUISE CONTROL

WITHOUT AIR BAG SYSTEM



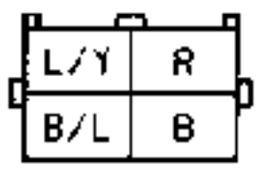
G-1 B6 DOHC ■ CONDENSER FAN SYSTEM

■ ... CANADA



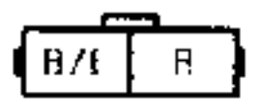
G1-01 A/C RELAY (AC)

G1-02 CONDENSER FAN RELAY (AC)



G1-03 MAGNETIC CLUTCH (AC)

G1-04 CONDENSER FAN (AC)

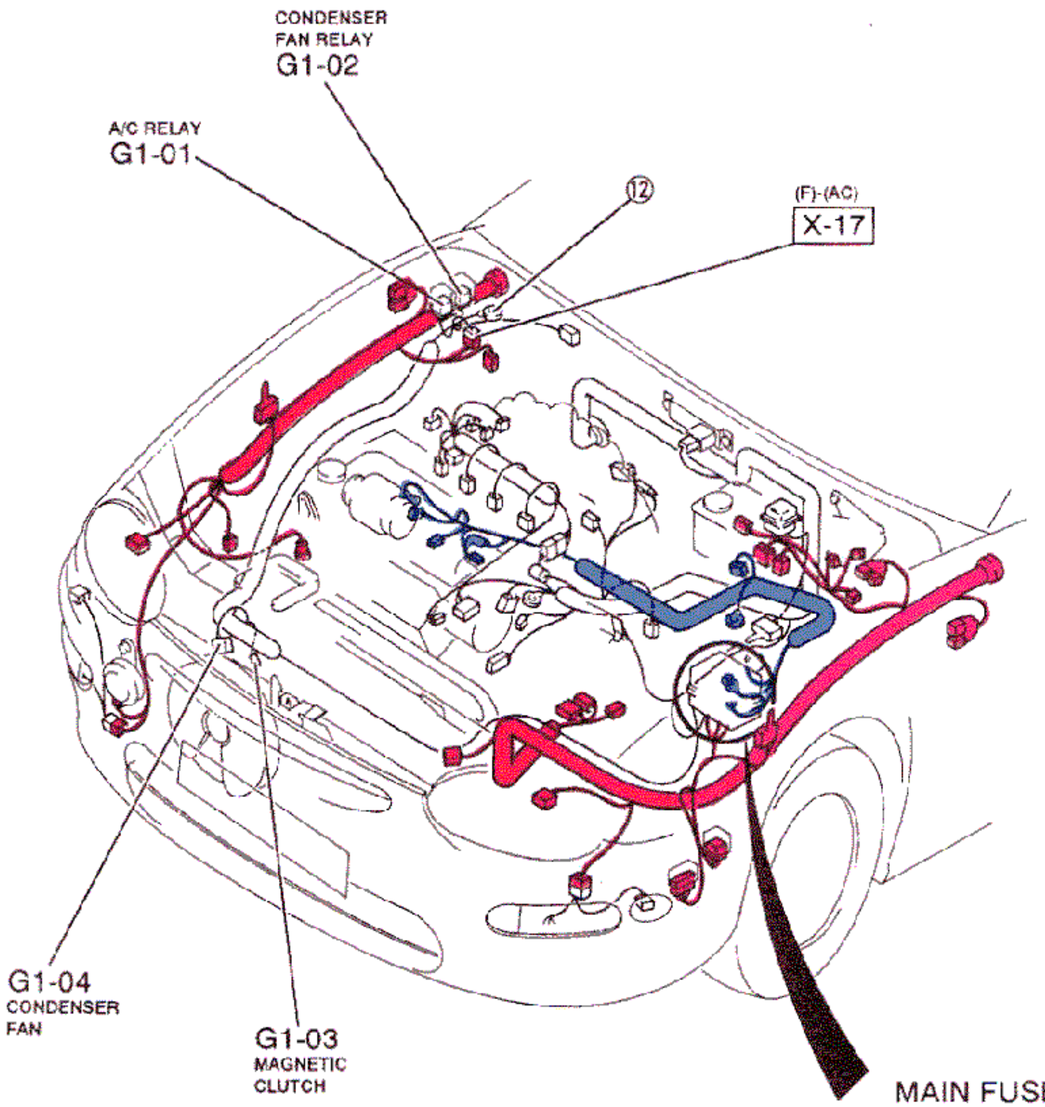


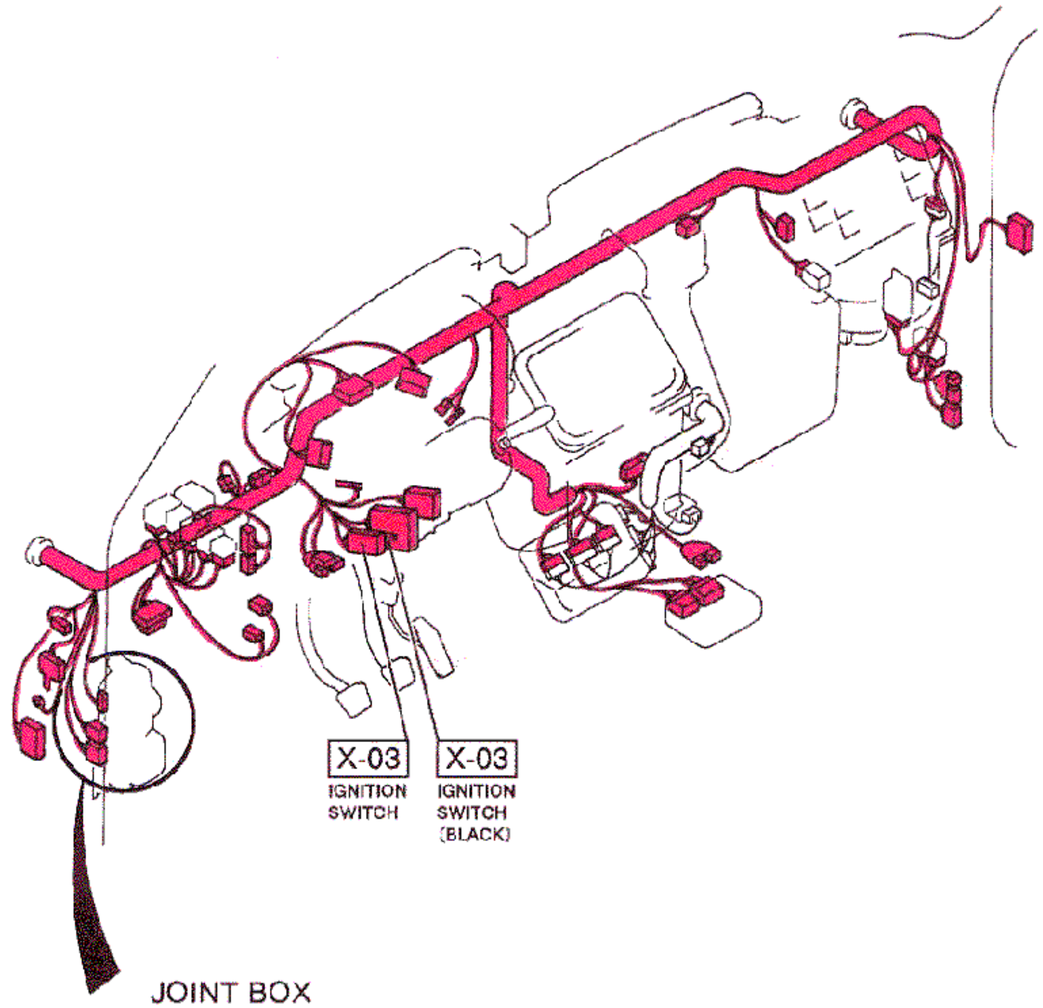
G1-05 CONNECTOR BETWEEN ENGINE(E) AND A/C(AC)

(E)

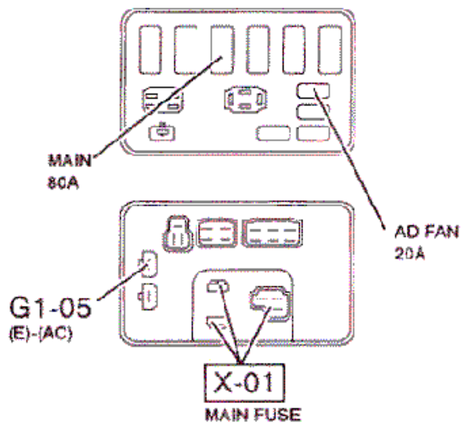
(AC)

G-1

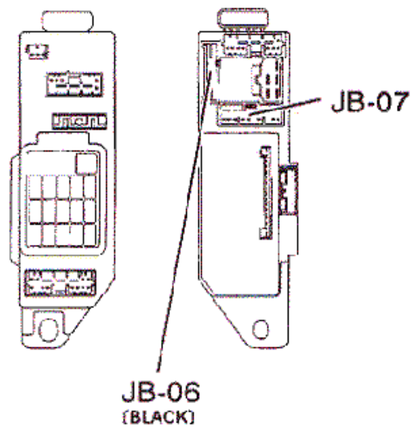




MAIN FUSE BLOCK

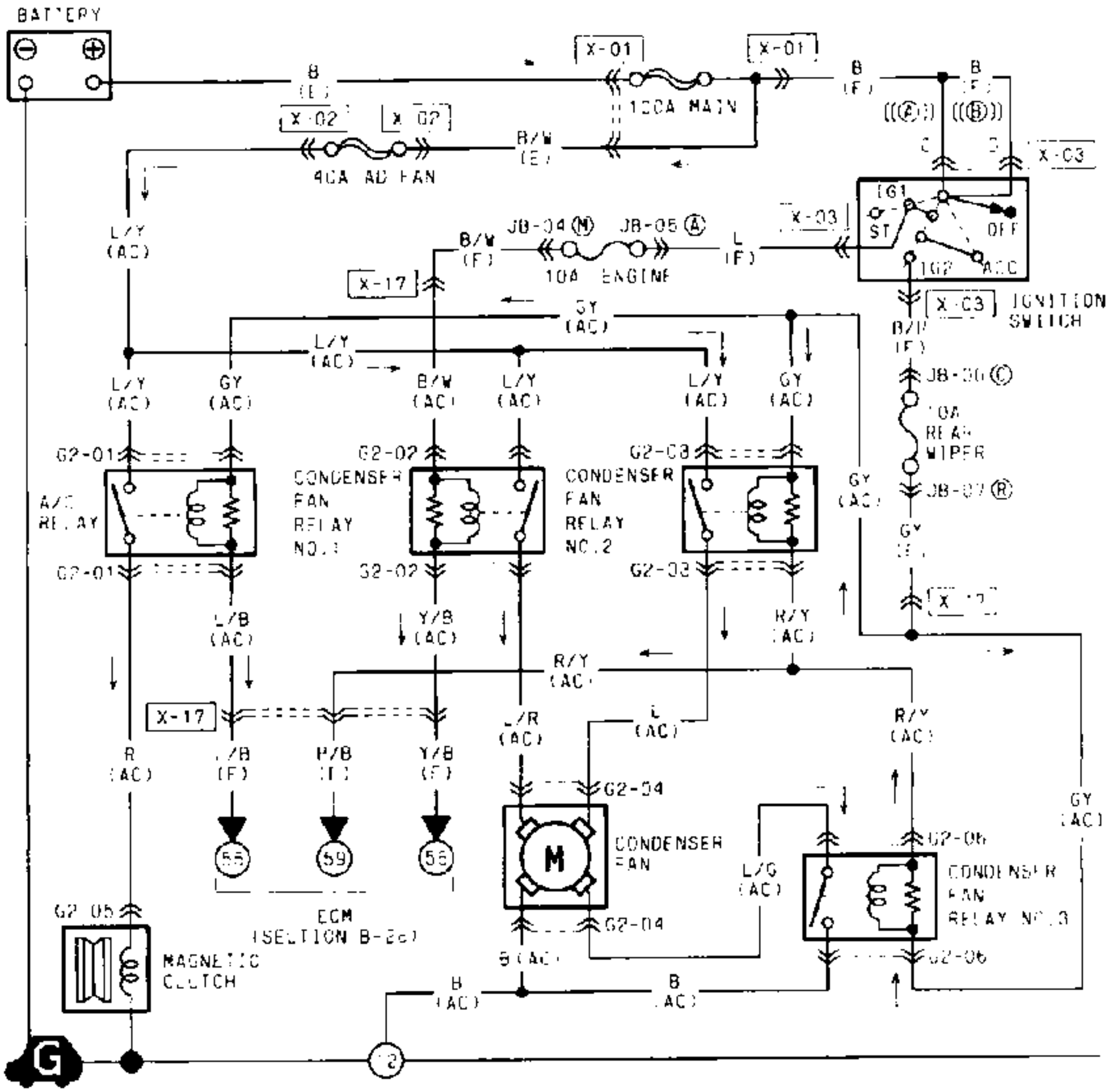


JOINT BOX



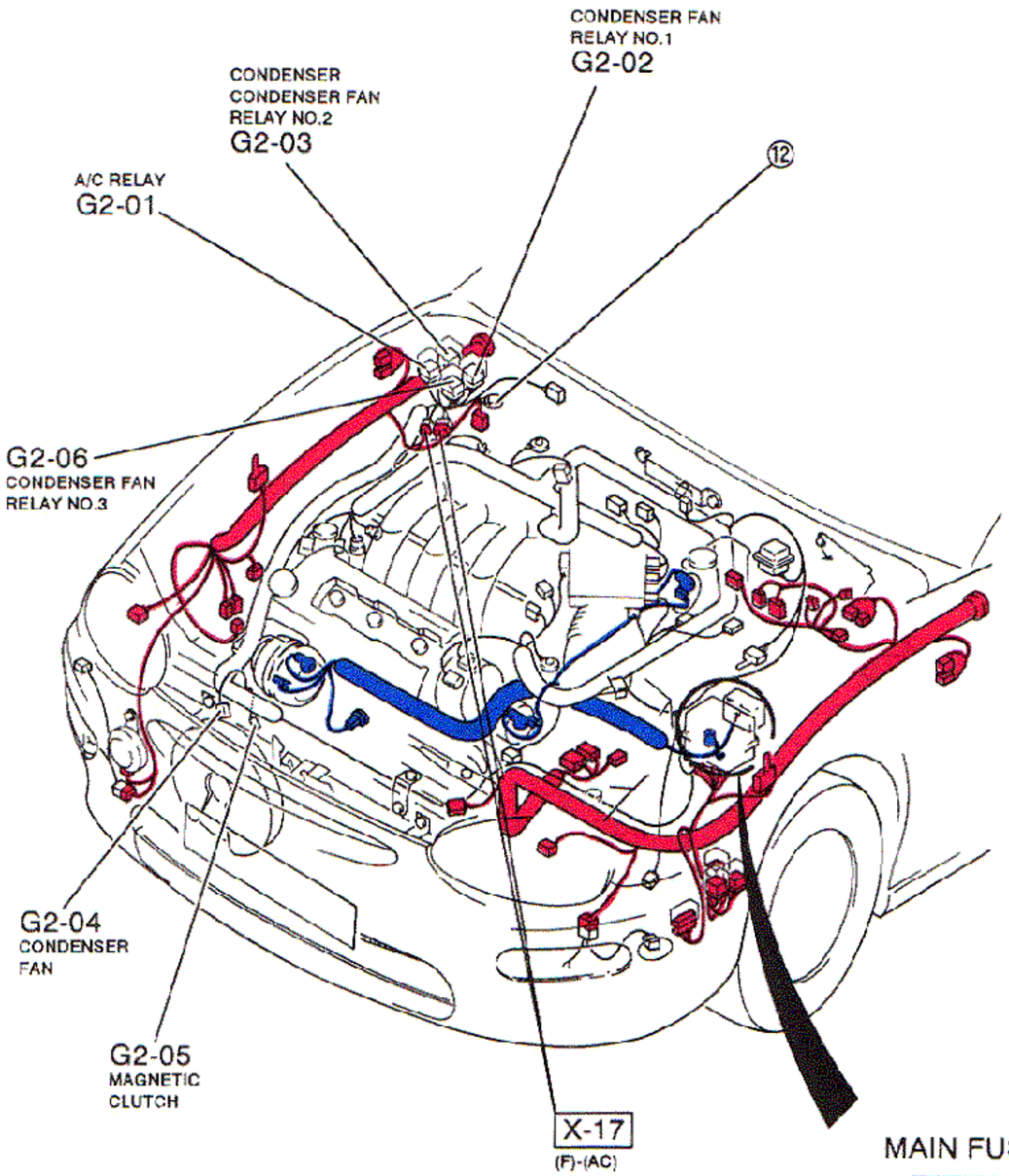
G-2 K8 DOHC ■ CONDENSER FAN SYSTEM

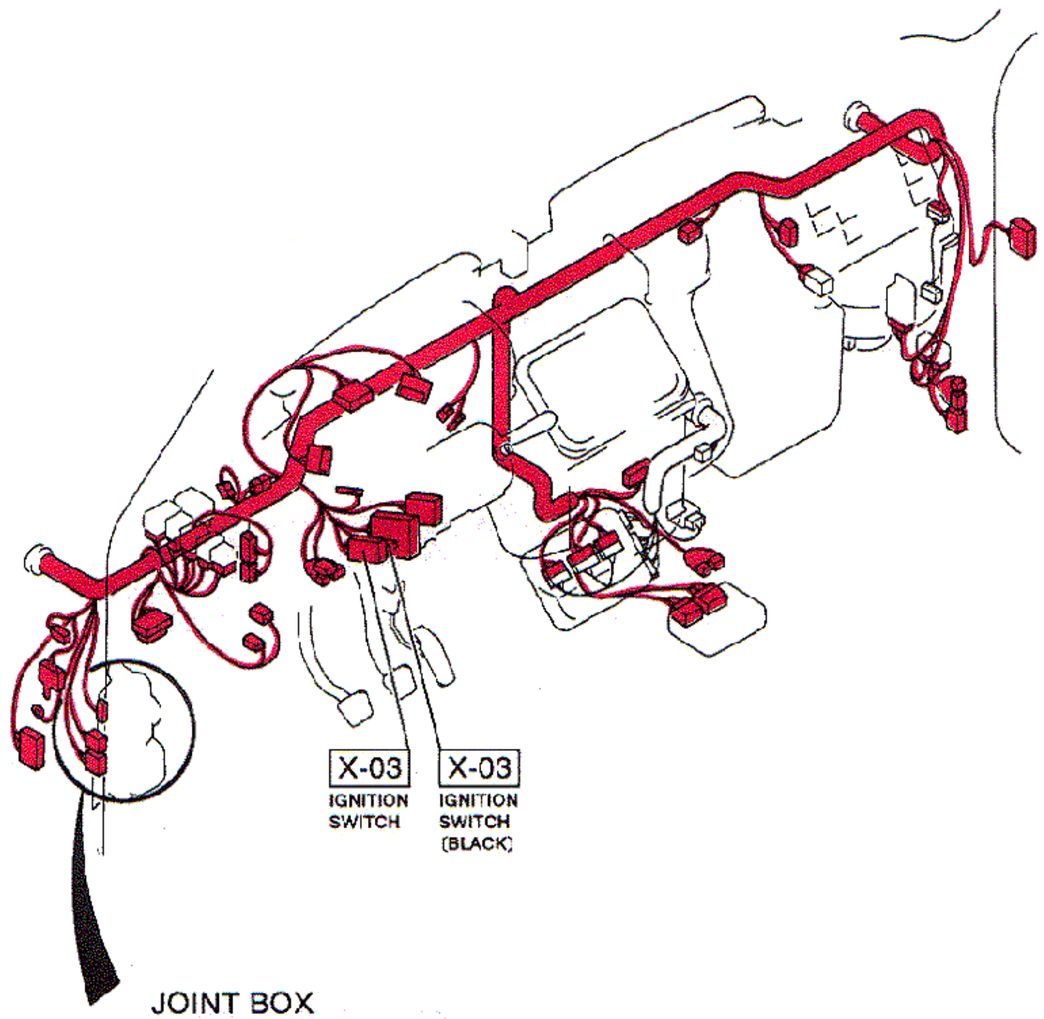
J D . . . CANADA

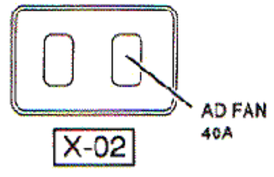


G2-01 A/C RELAY (AC) L/Y GY R L/B	G2-02 CONDENSER FAN RELAY NO.1 (AC) L/Y B/W L/R Y/B	G2-03 CONDENSER FAN RELAY NO.2 (AC) L/Y GY L R/Y	G2-04 CONDENSER FAN (AC) L L/R L/G B
G2-05 MAGNETIC CLUTCH (AC) R	G2-06 CONDENSER FAN RELAY NO.3 (AC) L/G GY B R/Y		

G-2

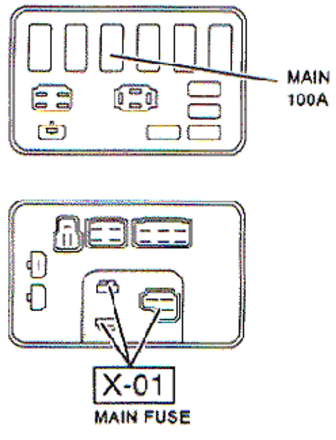




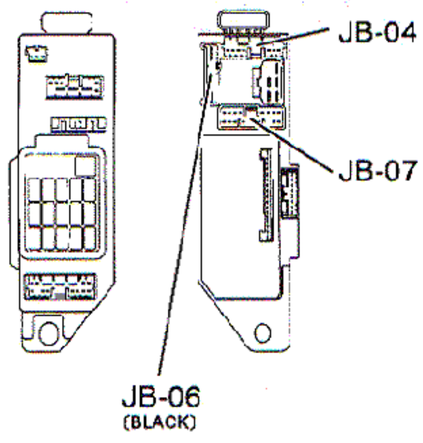


FUSE BLOCK

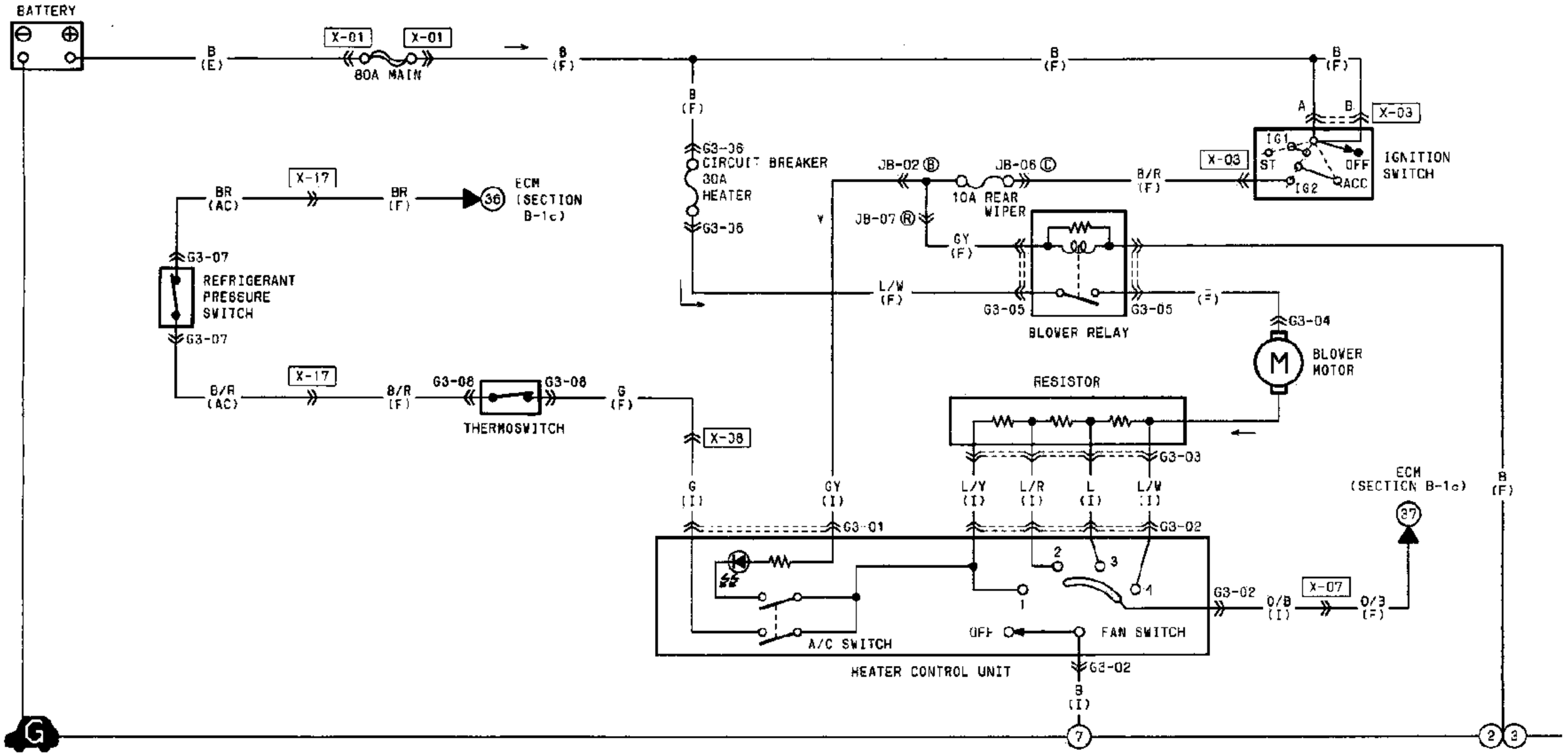
MAIN FUSE BLOCK



JOINT BOX

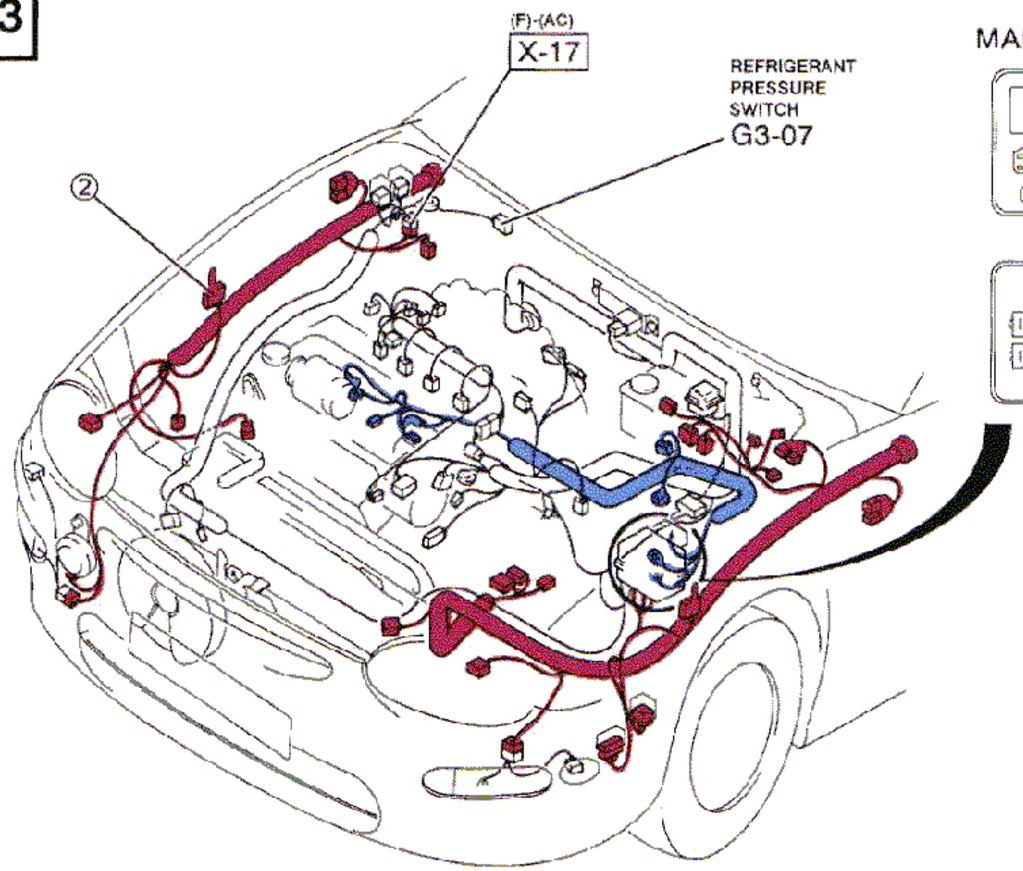


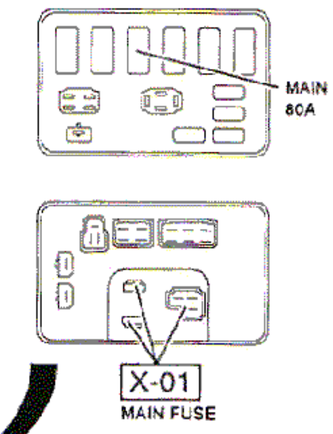
G-3 WIRE TYPE ■ HEATER AND AIR CONDITIONER(B6 DOHC ONLY)

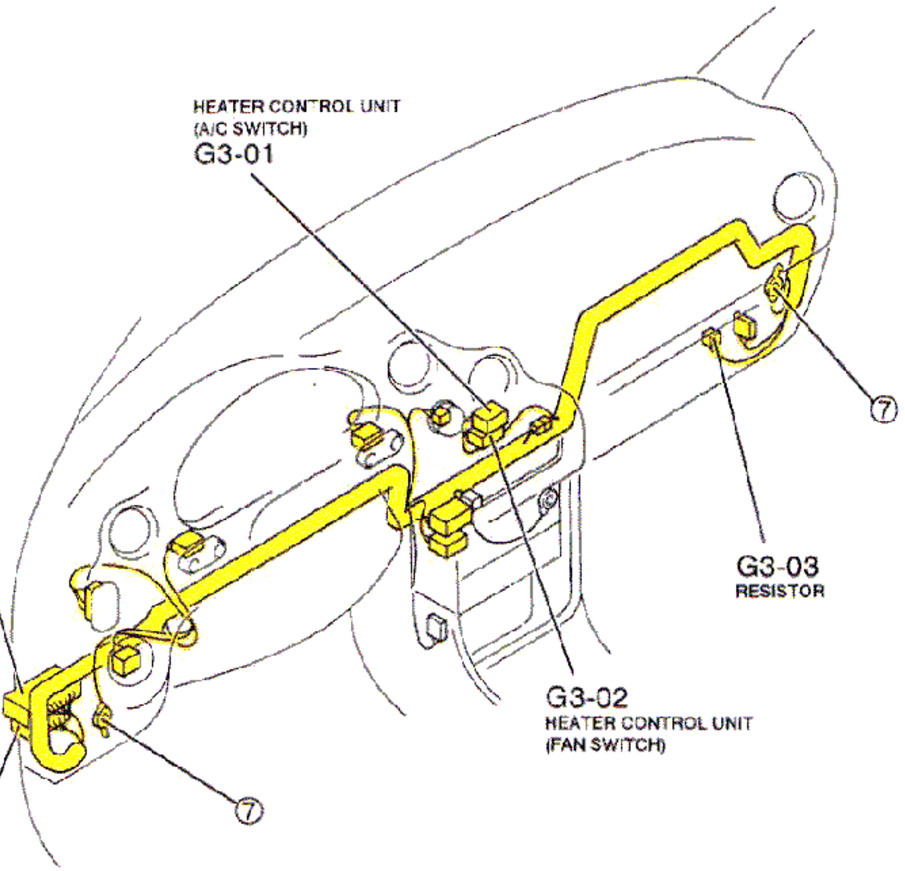


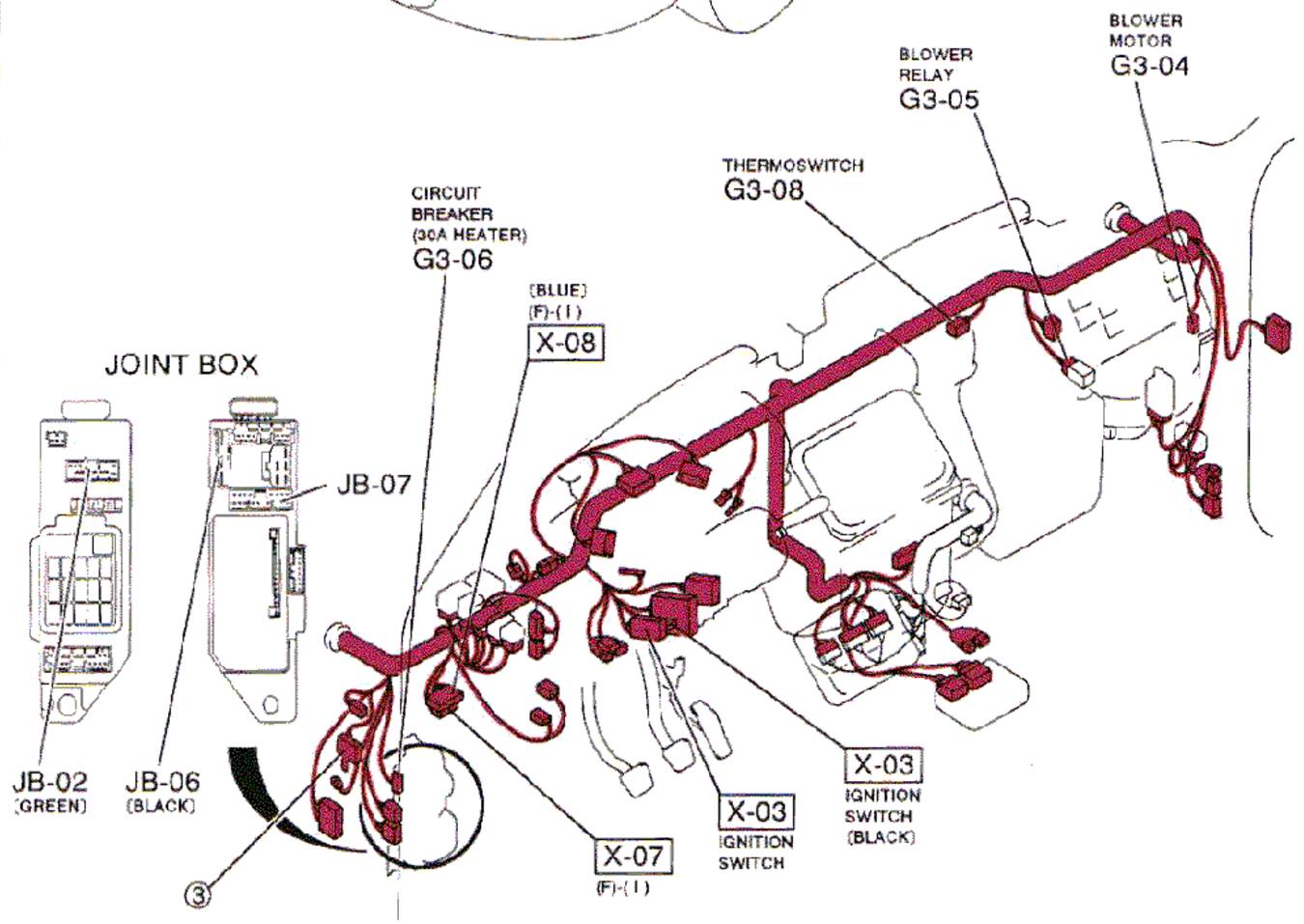
G3-01 HEATER CONTROL UNIT (A/C SWITCH) (I) G | GY	G3-02 HEATER CONTROL UNIT(FAN SWITCH) (I) O/B | L/R | L/Y | R | R/B L/W | L | B		G3-03 RESISTOR (I) L | L/Y L/W | L/R	G3-04 BLOWER MOTOR (F) L	G3-05 BLOWER RELAY (F) L/W | GY L | B	G3-06 CIRCUIT BREAKER (F) L/W | 30A | B HEATER
G3-07 REFRIGERANT PRESSURE SWITCH (AC) BR | B/R	G3-08 THERMOSWITCH (F) G B/R					

G-3


(F)-(AC)
X-17
REFRIGERANT PRESSURE SWITCH
G3-07
②

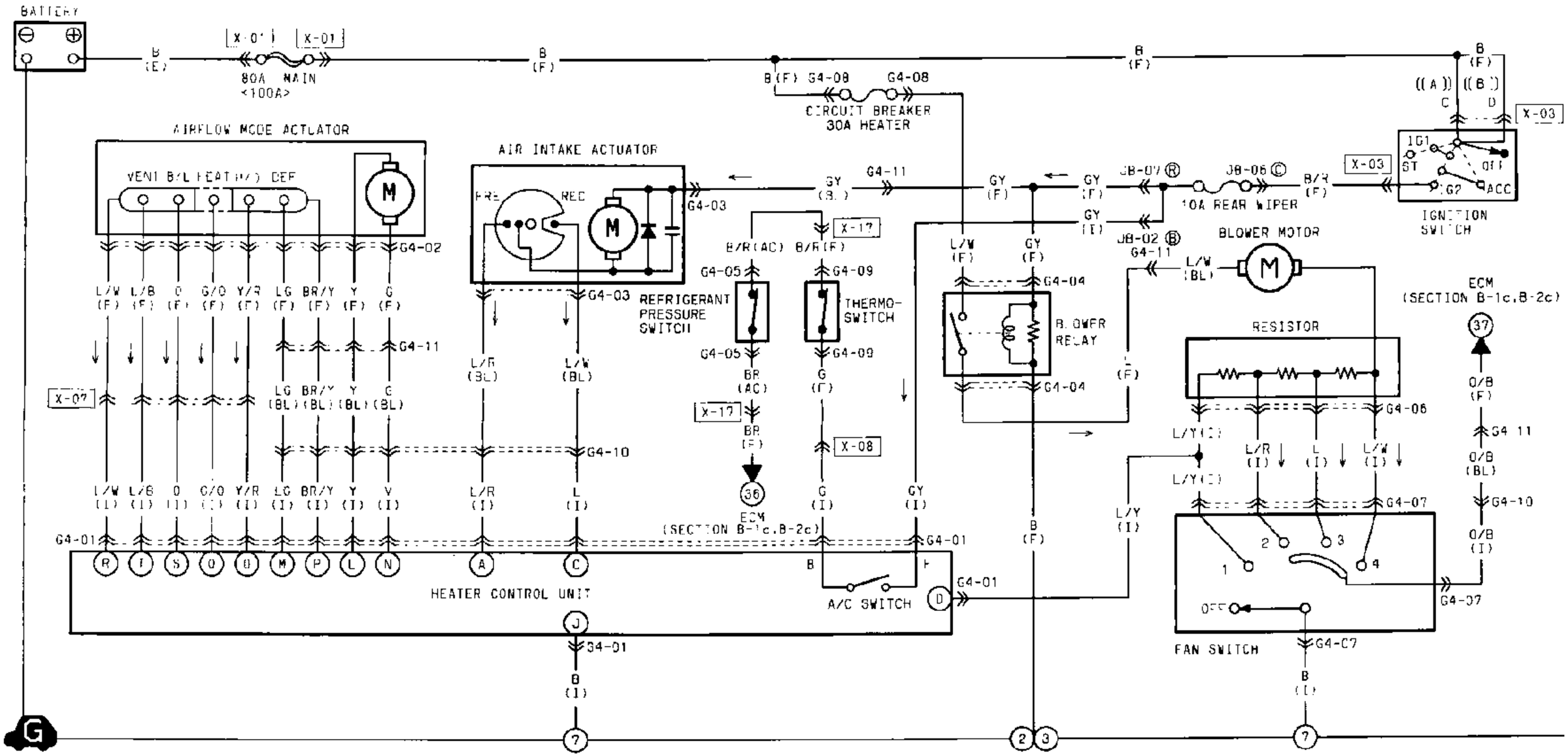

MAIN FUSE BLOCK
MAIN 60A
X-01
MAIN FUSE


HEATER CONTROL UNIT (A/C SWITCH)
G3-01
⑦
G3-03
RESISTOR
G3-02
HEATER CONTROL UNIT (FAN SWITCH)
(BLUE)
(F)-(I)
X-08
X-07
(F)-(I)
⑦


BLOWER RELAY
G3-05
BLOWER MOTOR
G3-04
THERMOSWITCH
G3-08
CIRCUIT BREAKER (30A HEATER)
G3-06
(BLUE)
(F)-(I)
X-08
JOINT BOX
JB-07
JB-02
(GREEN)
JB-06
(BLACK)
③
X-07
(F)-(I)
X-03
IGNITION SWITCH
X-03
IGNITION SWITCH
(BLACK)

G-4 LOGIC TYPE ■ HEATER AND AIR CONDITIONER

( ) ... CANADA
< > ... K8 DOHC



G4-01 HEATER CONTROL UNIT (I)

S	Q	O	M			G	E	C	A
O	G/O	Y/R	LG			R	R/B	I	L/R
L/B	L/W	BR/Y	V	Y	B	*	GY	L/Y	G
T	R	P	N	L	J	H	F	D	B

G4-02 AIRFLOW MODE ACTUATOR (F)

L/W	L/B					*	G/O
Y	G			O	BR/Y	LG	Y/R

G4-03 AIR INTAKE ACTUATOR (BL)

GY	L/W	*	L/R

G4-04 BLOWER RELAY (F)

L/W	GY
L	B

G4-05 REFRIGERANT PRESSURE SWITCH (AC)

B/R	BR

G4-06 RESISTOR (I)

L	L/Y
L/W	L/R

G4-07 FAN SWITCH (I)

O/B	L/R		L/Y	*	*
L/W		L		B	

G4-08 CIRCUIT BREAKER (F)

L/W	30A	B

HEATER

G4-09 THERMOSWITCH (F)

G
B/R

G4-10 CONNECTOR BETWEEN INSTRUMENT PANEL (I) AND BLOWER UNIT (BL)

(I)

*			BR/Y	O/B
L/R	L	V	Y	LG

(BL)

O/B	BR/Y			V
LG	Y	G	L/W	L/R

G4-11 CONNECTOR BETWEEN FRONT (F) AND BLOWER UNIT (BL)

(F)

O/B				L	
GY	*	G	Y	BR/Y	LG

(BL)

L/W				O/B	
LG	BR/Y	Y	G	V	GY

G-4

(F)-(AC)
X-17

REFRIGERANT PRESSURE SWITCH
G4-05

②

MAIN FUSE BLOCK

MAIN
80A
<100A>
↑
K8
DOHC

X-01
MAIN FUSE

(I)-(BL)
G4-10

HEATER CONTROL UNIT
G4-01

⑦

G4-06
RESISTOR

G4-07
FAN SWITCH

(F)-(BL)
G4-11

AIR INTAKE ACTUATOR
G4-03

THERMOSWITCH
G4-09

[BLUE]
(F)-(I)
X-08

CIRCUIT BREAKER
(30A HEATER)
G4-08

JOINT BOX

JB-07

G4-04
BLOWER RELAY

G4-10
(I)-(BL)

G4-02
AIRFLOW MODE ACTUATOR

JB-02
(GREEN)

JB-06
(BLACK)

③

X-07
(F)-(I)

X-03
IGNITION SWITCH

X-03
IGNITION SWITCH
(BLACK)

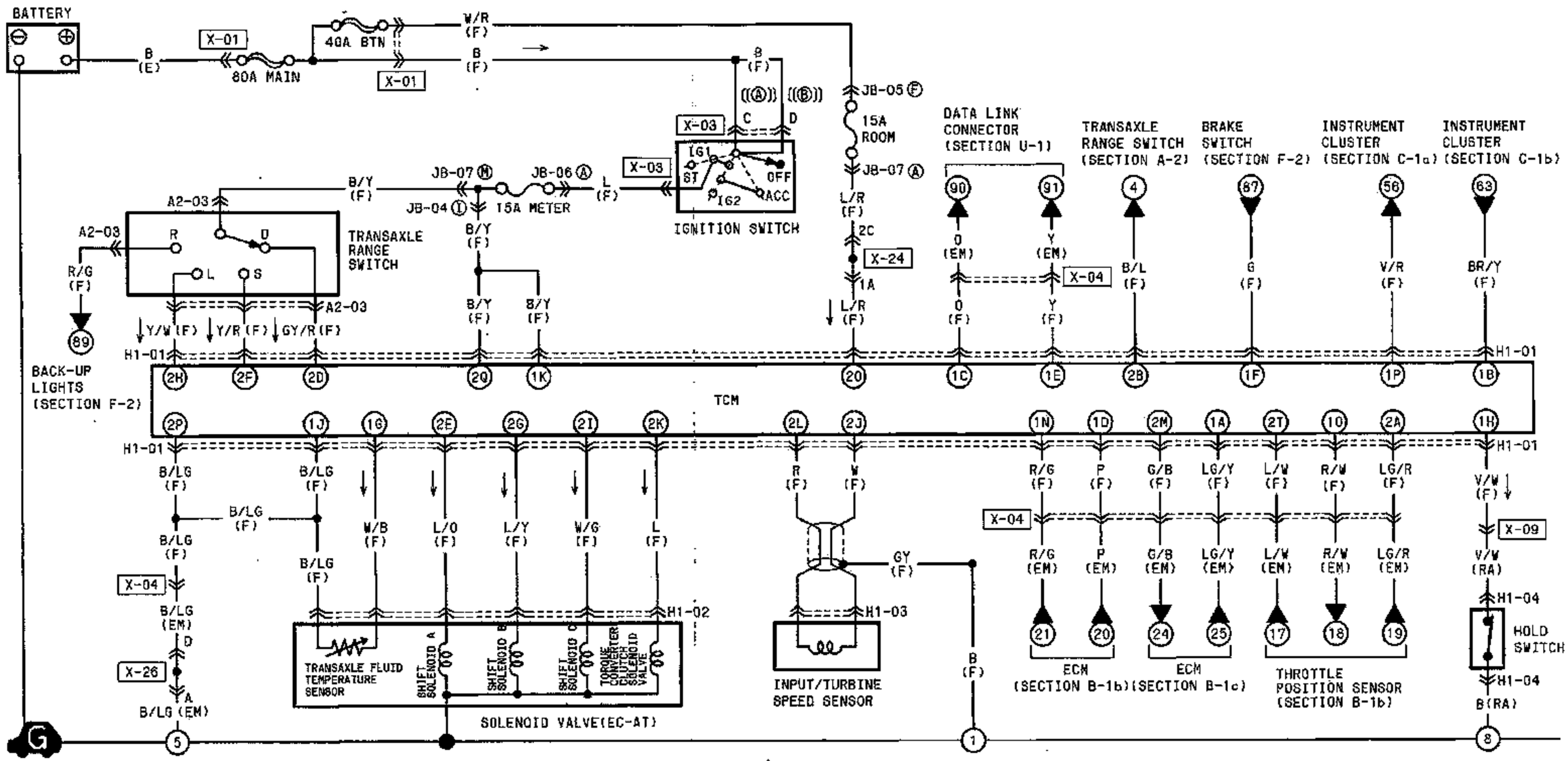
[BLUE]
(F)-(I)
X-08

X-07
(F)-(I)

⑦

H-1 B6 DOHC ■ EC-AT CONTROL SYSTEM

《 》...CANADA



H1-01 TCM (F)

1O	1M	1K	1I	1G	1E	1C	1A
R/W	*	B/Y	*	W/B	Y	O	LG/Y
V/R	R/G	*	B/LG	V/W	G	P	BR/Y
1P	1N	1L	1J	1H	1F	1D	1B

2S	2Q	2O	2N	2K	2I	2G	2E	2C	2A
*	B/Y	L/R	G/B	L	W/G	L/Y	L/O	*	LG/R
L/W	*	B/LG	*	R	W	Y/W	Y/R	GY/R	B/L
2T	2R	2P	2N	2L	2J	2H	2F	2O	2B

H1-02 SOLENOID VALVE (EC-AT)(F)

L	W/B	L/O
B/LG	W/G	L/Y

H1-03 INPUT/TURBINE SPEED SENSOR (F)

R	W

H1-04 HOLD SWITCH (RA)

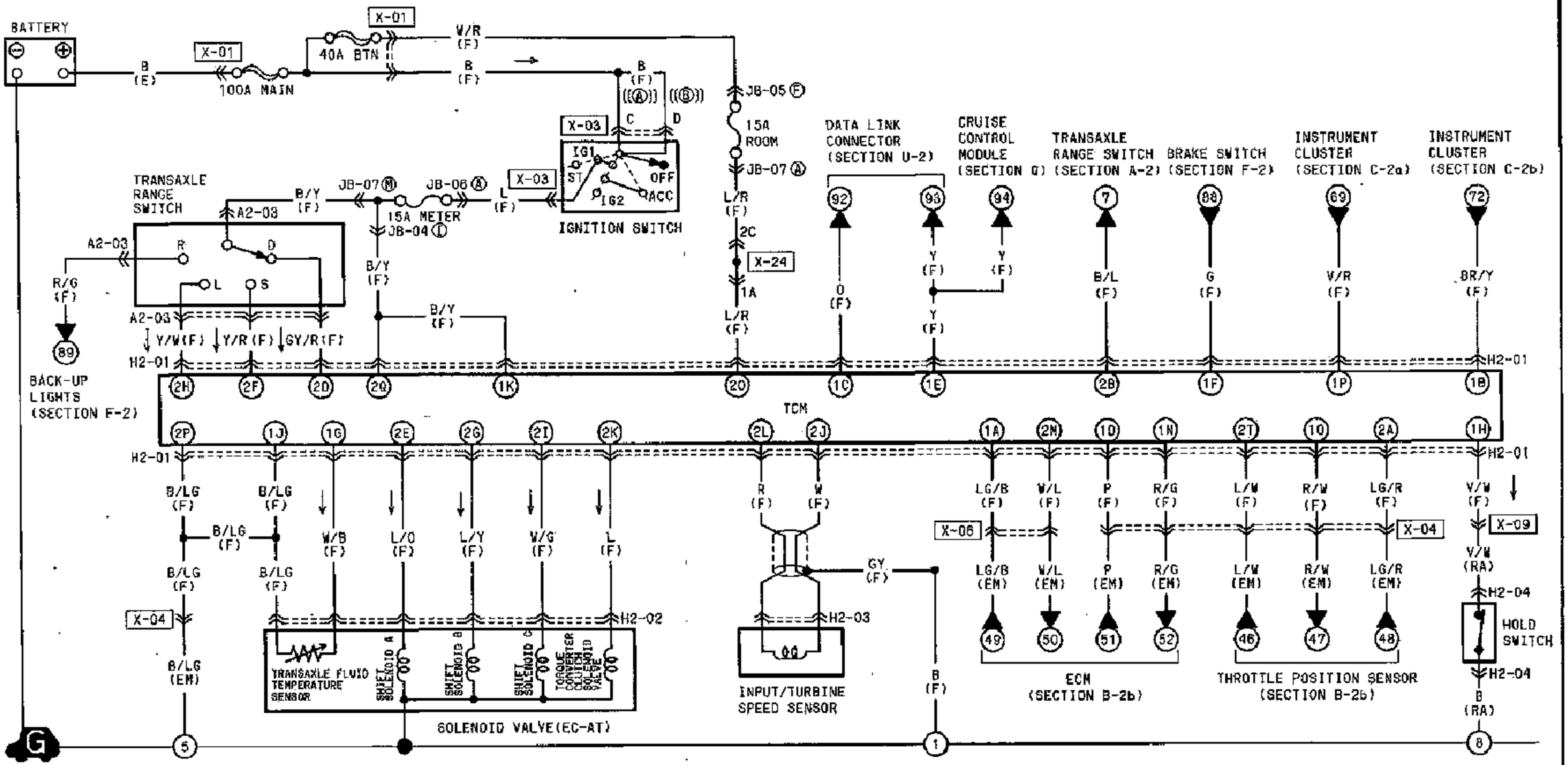
V/W	R/B	*
B	R	*

A2-03 TRANSAXLE RANGE SWITCH (F)

B/Y	GY/R	Y/W	R/G	*
B/L	Y/R	*	B/R	

H-2 K8 DOHC ■ EC-AT CONTROL SYSTEM

( ) ... CANADA



H2-01 TCM (F)

1O	1M	1K	1I	1G	1E	1C	1A
R/W	*	B/Y	*	W/B	Y	O	LG/B
V/R	R/G	*	B/LG	V/W	G	P	BR/Y
1P	1N	1L	1J	1H	1F	1D	1B

2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A
*	B/Y	L/R	W/L	L	W/G	L/Y	L/O	*	LG/R
L/W	*	B/LG	*	R	W	Y/W	Y/R	GY/R	B/L
2T	2R	2P	2N	2L	2J	2H	2F	2D	2B

H2-02 SOLENOID VALVE (EC-AT) (F)

L	W/B	L/O
B/LG	W/G	L/Y

H2-03 INPUT/TURBINE SPEED SENSOR (F)

R	W

H2-04 HOLD SWITCH (RA)

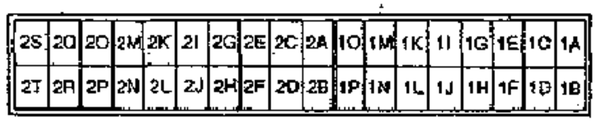
V/W	R/B	*
B	R	*

A2-03 TRANSAXLE RANGE SWITCH (F)

B/Y	GY/R	Y/W	R/G	*
B/L	Y/R	*	B/R	

H-1, 2

Terminal Voltage Chart



B+: Battery positive voltage

Terminal	Connected to	Voltmeter		Voltage	Condition
		+ terminal	−terminal		
1A (Output)	Engine control module (Reduce torque signal 2)	1A	Ground	Below 5 V	D, S, or L ranges and downshifting (except 4→3 shift) with throttle valve opening 1/8 or more
				B+	Others
1B (Output)	HOLD indicator light	1B	Ground	0 V	HOLD mode
				B+	NORMAL mode
1C (Output)	TAT terminal (Data link connector)	1C	Ground	0 V	HOLD mode
				B+	NORMAL mode
				0V or Approx. B+ (fluctuating)	If malfunction present
				Code signal	TAT terminal grounded
1D (Output)	Engine control module (Park / neutral position signal)	1D	Ground	Below 1.6 V	P or N position
				B+	R position, All ranges
1E (Input)	TAT terminal (Data link connector)	1E	Ground	B+	Normal
				0 V	TAT terminal grounded
1F (Input)	Brake switch	1F	Ground	B+	Brake pedal depressed
				0 V	Brake pedal released
1G (Input)	Transaxle fluid temperature sensor	1G	Ground	Approx. 4.95 V–1.12 V (ATF temp.–30°C (–20°F)–150°C (302°F))	While warming-up ATF Note Approx. 4.6 V: ATF temp. 20°C (68°F) Approx. 1.5 V: ATF temp. 130°C (266°F)
1H (Input)	HOLD switch	1H	Ground	0 V	Switch depressed point
				B+	Switch released point
1I	—	—	—	—	—
1J (Ground)	Battery ground	1J	Ground	0 V	Constant
1K (Battery power)	Battery	1K	Ground	B+	Ignition switch ON
				0 V	Ignition switch OFF
1L	—	—	—	—	—
1M	—	—	—	—	—
1N (Input)	Engine control module (Torque reduced signal/ water thermo signal)	1N	Ground	B+	Above 60°C(140°F)
				0 V	Operate torque reduction
				0 V	Below 60°C(140°F)
1O (Input)	Closed throttle position switch	1O	Ground	0 V	Closed throttle position switch ON (Closed throttle position)
				B+	Closed throttle position switch OFF (Throttle valve open)
1P (Input)	Vehicle speed sensor	1P	Ground	3 V–4 V	While driving
				0 V or 6 V–8 V	Vehicle stopped
2A (Input)	Throttle position sensor(V_{REF})	2A	Ground	4.5 V–5.5 V	Ignition switch ON
				0 V	Ignition switch OFF
2B (Input)	Transaxle range switch (P or N position)	2B	Ground	0 V	P or N position
				B+	R position, All ranges
2C	—	—	—	—	—
2D (Input)	Transaxle range switch (D range)	2D	Ground	B+	D range
				0 V	Other ranges, All positions
2E (Output)	Shift solenoid A	2E	Ground	B+	Solenoid valve ON
				0 V	Solenoid valve OFF
2F (Input)	Transaxle range switch (S range)	2F	Ground	B+	S range
				0 V	Other ranges, All positions
2G (Output)	Shift solenoid B	2G	Ground	B+	Solenoid valve ON
				0 V	Solenoid valve OFF
2H (Input)	Transaxle range switch (L range)	2H	Ground	B+	L range
				0 V	Other ranges, All positions
2I (Output)	Shift solenoid C	2I	Ground	B+	Solenoid valve ON
				0 V	Solenoid valve OFF
2J (Input)	Input / turbine speed sensor*	2J	Ground	0 V	Engine stopped
				Approx. 0.5 V	Engine running (N position)
2K (Output)	Torque converter clutch solenoid valve	2K	Ground	B+	Solenoid valve ON
				0 V	Solenoid valve OFF
2L (Ground)	Input / turbine speed sensor	2L	Ground	0 V	Constant
2M (Output)	Engine control module (Reduce torque signal 1)	2M	Ground	B+	D, S, or L ranges and 1→2 or 2→3 upshifting with throttle valve opening 6/8 or more
				Below 2.5 V	Others
2N	—	—	—	—	—
2O (Memory power)	Battery	2O	Ground	B+	Constant
2P (Ground)	Battery ground	2P	Ground	0 V	Constant
2Q (Battery power)	Battery	2Q	Ground	B+	Ignition switch ON
				0 V	Ignition switch OFF
2R	—	—	—	—	—
2S	—	—	—	—	—
2T (Input)	Throttle position sensor (TVO)	2T	Ground	0.1 V–1.1 V	Closed throttle position
				3.1 V–4.4 V	Wide open throttle

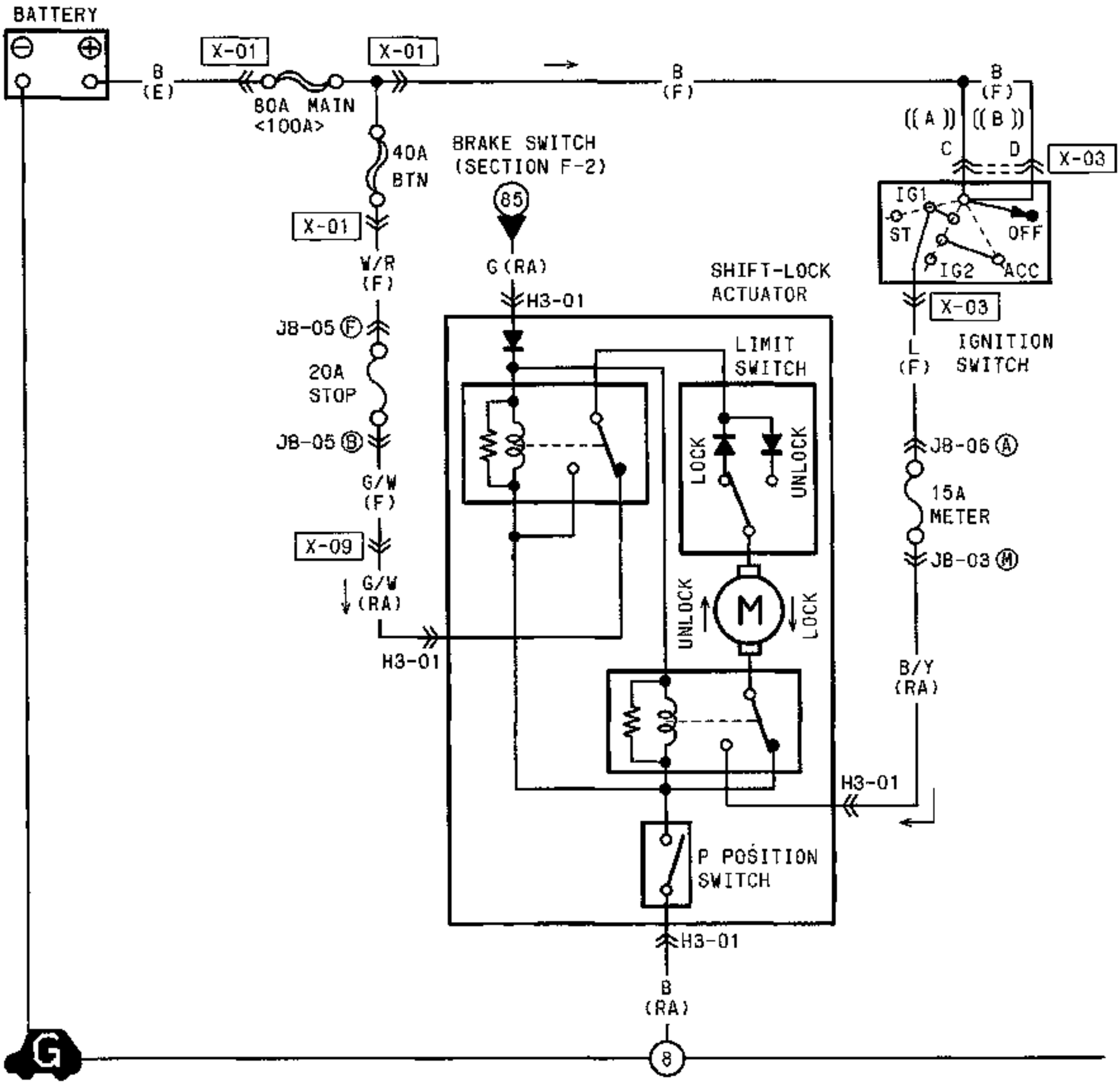
* Checked in AC range

Replacement

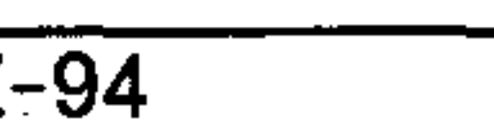
1. Disconnect the negative battery cable.
2. Disconnect the transaxle control module connector.
3. Remove the nuts and remove the transaxle control module.
4. Install the new transaxle control module.
   Tightening torque:
   19–25 N·m {1.9–2.6 kgf-m, 14–18 ft-lbf}
5. Connect the transaxle control module connector.
6. Connect the negative battery cable.

H-3 ■ SHIFT-LOCK SYSTEM

《 》...CANADA
< >...K8 DOHC

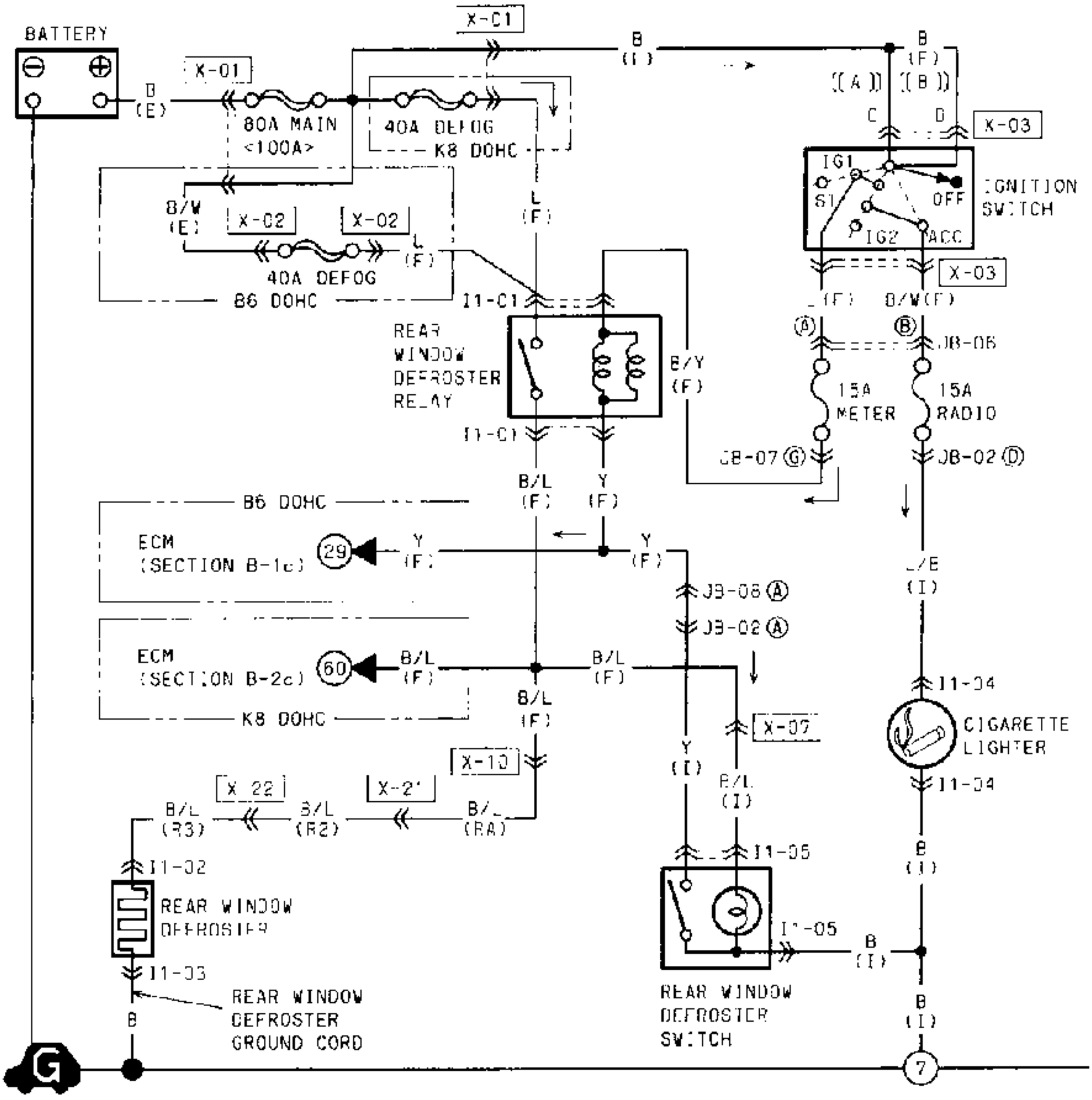


H3-01 SHIFT-LOCK ACTUATOR (RA)



I-1 ■ REAR WINDOW DEFROSTER ■ CIGARETTE LIGHTER

( ) ... CANADA
< > ... K8 DOHC



I1-01 REAR WINDOW DEFROSTER RELAY (F)

B/L	B/Y
L	Y

I1-02 REAR WINDOW DEFROSTER (R3)

B/L

I1-03 REAR WINDOW DEFROSTER GROUND CORD

B

I1-04 CIGARETTE LIGHTER (I)

B	R	R/B	L/B

I1-05 REAR WINDOW DEFROSTER SWITCH (I)

B/L	R				*	B	
Y	*		R/B	*	*	*	

I-1

MAIN FUSE BLOCK

MAIN
80A
<100A>
↑
K8
DOHC

DEFOG
40A
(K8 DOHC)

X-01
MAIN FUSE

X-02

DEFOG
40A
(B6 DOHC)

FUSE BLOCK

REAR WINDOW
DEFROSTER
SWITCH
I1-05

I1-04
CIGARETTE
LIGHTER

⑦

X-07
(F)-(I)

(R2)-(R3)
X-22

(BLACK)
REAR WINDOW
DEFROSTER
GROUND CORD
I1-03

REAR WINDOW
DEFROSTER
RELAY
I1-01

JOINT BOX

JB-07

JB-08

JB-02
(GREEN)

JB-06
(BLACK)

X-10
(F)-(RA)

X-07
(F)-(I)

X-03
IGNITION
SWITCH

X-03
IGNITION
SWITCH
(BLACK)

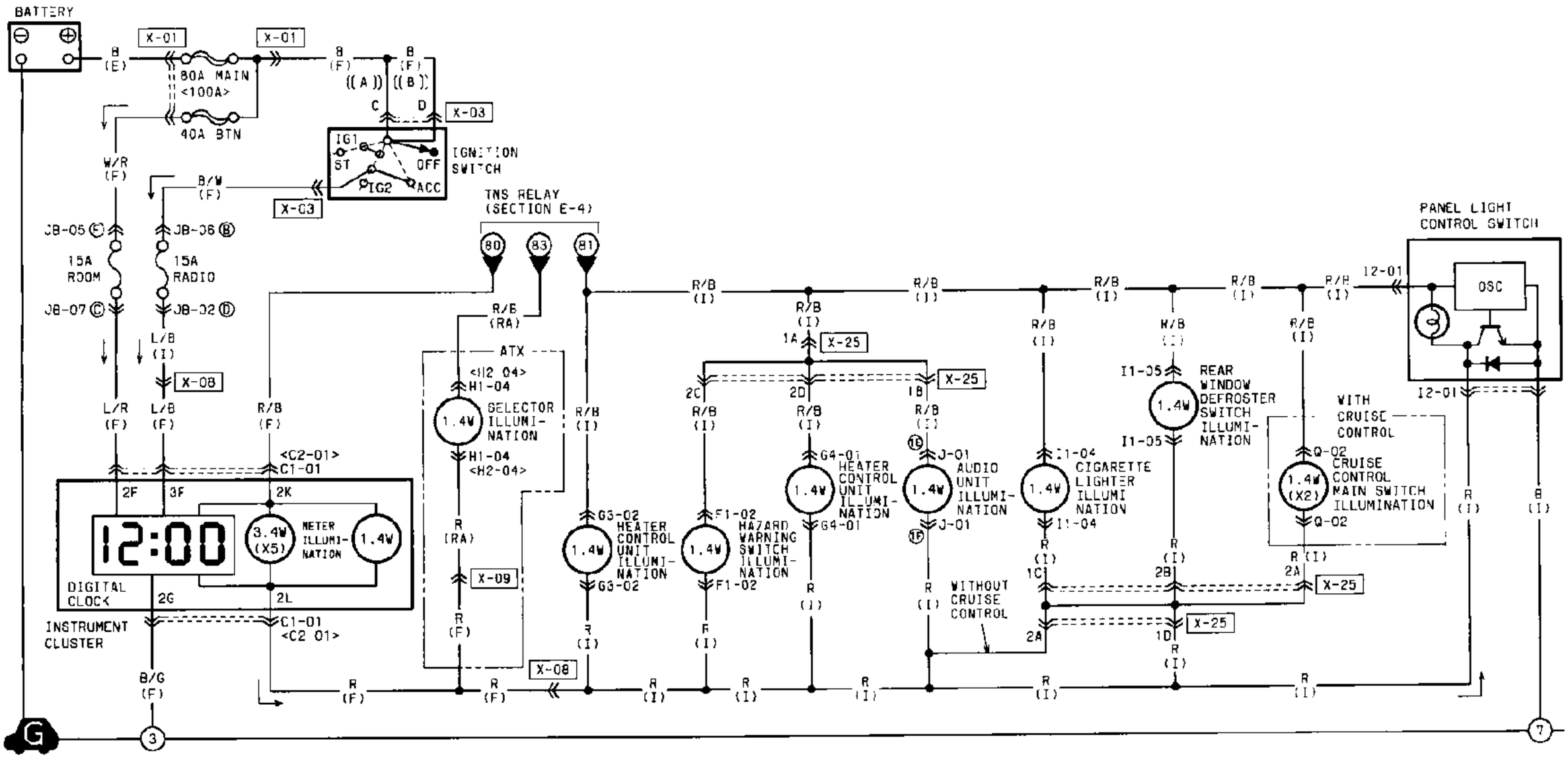
X-10
(F)-(RA)

X-21
(RA)-(R2)

I1-02
REAR WINDOW
DEFROSTER
(BLACK)

I-2 ■ ILLUMINATION LIGHTS ■ DIGITAL CLOCK

( ) ...CANADA < > ...KB DCHC [ ] ...ATX
< > ...WITH ABS [ ] ...WITH AIR BAG SYSTEM



I2-01 PANEL LIGHT CONTROL SWITCH (I)

B	R	R/B	*

C1-01 INSTRUMENT CLUSTER (ILLUMINATION/DIGITAL CLOCK) (F) <C2-01>

R	R/B	B/Y	R/L	B/L (B/R)	B/G	L/R	Y	V/R	Y/L	*	B
2L	2K	2J	2I	2H	2G	2F	2E	2D	2C	2B	2A

G/W	G/B	*	GY	L/B	(V/W)	(R/Y)	(L/Y)	(BR/Y)	GY/R
3J	3I	3H	3G	3F	3E	3D	3C	3B	3A

F1-02 HAZARD WARNING SWITCH ILLUMINATION (I)

R	B	G/Y	R/B

G3-02 HEATER CONTROL UNIT ILLUMINATION (I)

WIRE TYPE

O/B	L/R		L/Y	R	R/B
L/W		L		B	

G4-01 HEATER CONTROL UNIT ILLUMINATION(I)

LOGIC TYPE

O	G/O	Y/R	LG		R	R/B	L	L/R
L/B	L/W	BR/Y	V	Y	B	*	GY	L/Y	G

H1-04 SELECTOR ILLUMINATION(ATX ONLY) <H2-04> (RA)

V/W	R/B	*
B	R	*

I1-04 CIGARETTE LIGHTER ILLUMINATION (I)

B	R	R/B	L/B

I1-05 REAR WINDOW DEFROSTER SWITCH ILLUMINATION (I)

B/L	R			*	B
Y	*	R/B	*	*	*

J-01 AUDIO UNIT ILLUMINATION (I)

1M	1K			1E	1C	1A
L/W	Y			R/B	L/R	L/B
W	L/O	*	*	R	*	*
1N	1L	1J	1H	1F	1D	1B

Q-02 CRUISE CONTROL MAIN SWITCH ILLUMINATION(I)

R	R/B			*	*
B/Y	*	Y	O	*	B

I-2

MAIN FUSE BLOCK

MAIN
80A
<100A>
↑
K8
DOHC

BTN
40A

X-01
MAIN FUSE

CRUISE
CONTROL MAIN
SWITCH
ILLUMINATION
Q-02

REAR WINDOW
DEFROSTER
SWITCH
ILLUMINATION
I1-05

(LOGIC TYPE)
HEATER CONTROL
UNIT ILLUMINATION
G4-01

PANEL LIGHT
CONTROL
SWITCH
I2-01

⑦

X-25
JOINT
CONNECTOR

G3-02
HEATER CONTROL UNIT
ILLUMINATION
(WIRE TYPE)

⑦

F1-02
HAZARD
WARNING
SWITCH
ILLUMINATION

I1-04
CIGARETTE
LIGHTER
ILLUMINATION

J-01
AUDIO UNIT
ILLUMINATION

X-08
(F)-(I)
(BLUE)

(BLACK)
INSTRUMENT
CLUSTER
C1-01
<C2-01> ← K8 DOHC

INSTRUMENT
CLUSTER
C1-01
<C2-01> ← K8 DOHC

JOINT BOX

JB-05
JB-07

③

JB-02
(GREEN)

JB-06
(BLACK)

X-09
(F)-(RA)
(BLACK)

X-08
(F)-(I)
(BLUE)

X-03
IGNITION
SWITCH

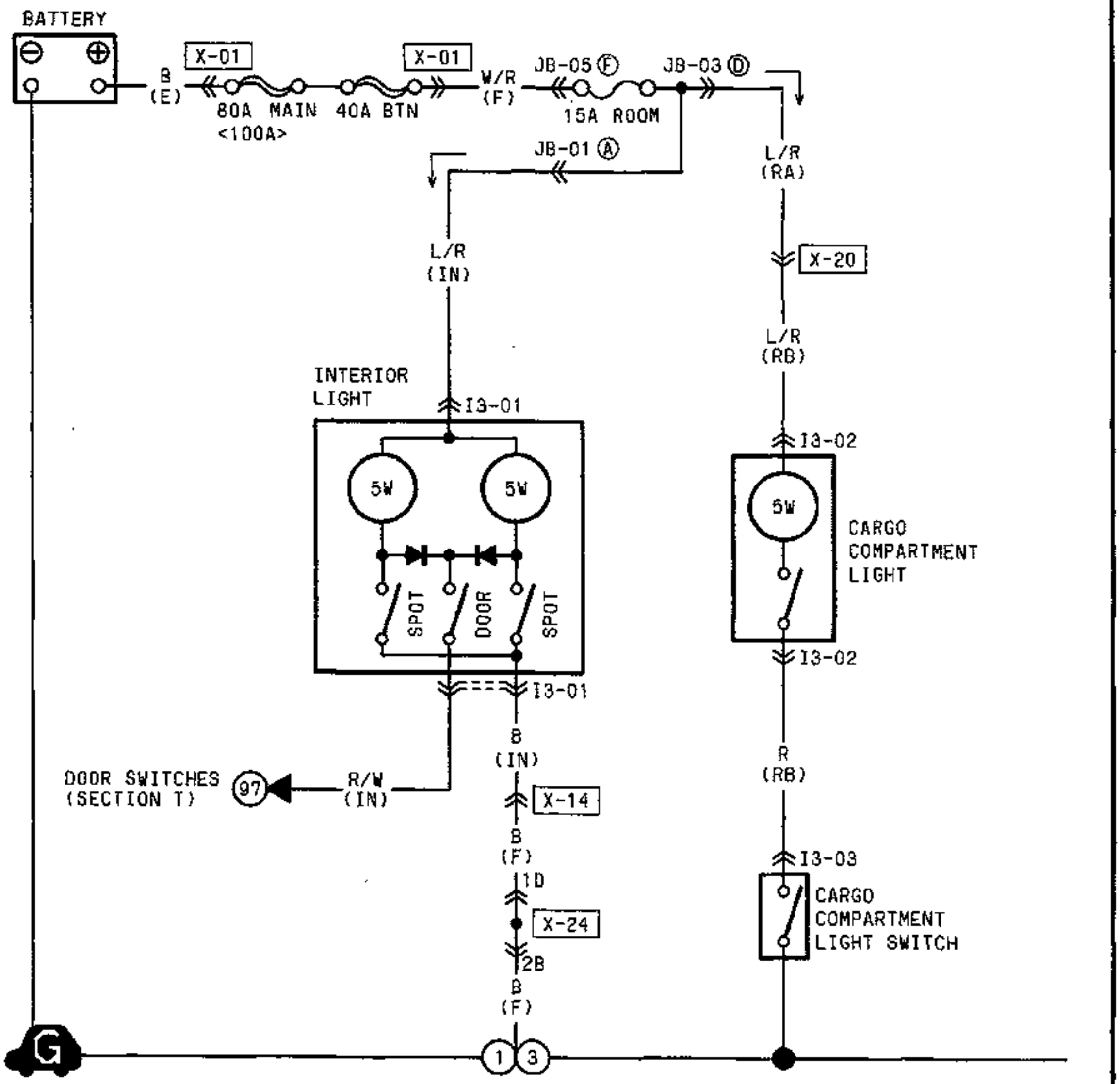
X-03
IGNITION
SWITCH
(BLACK)

X-09
(F)-(RA)
(BLACK)

H1-04
<H2-04> ← K8 DOHC
SELECTOR
ILLUMINATION
(ATX ONLY)

I-3 ■ INTERIOR LIGHT ■ CARGO COMPARTMENT LIGHT

< >...K8 DOHC



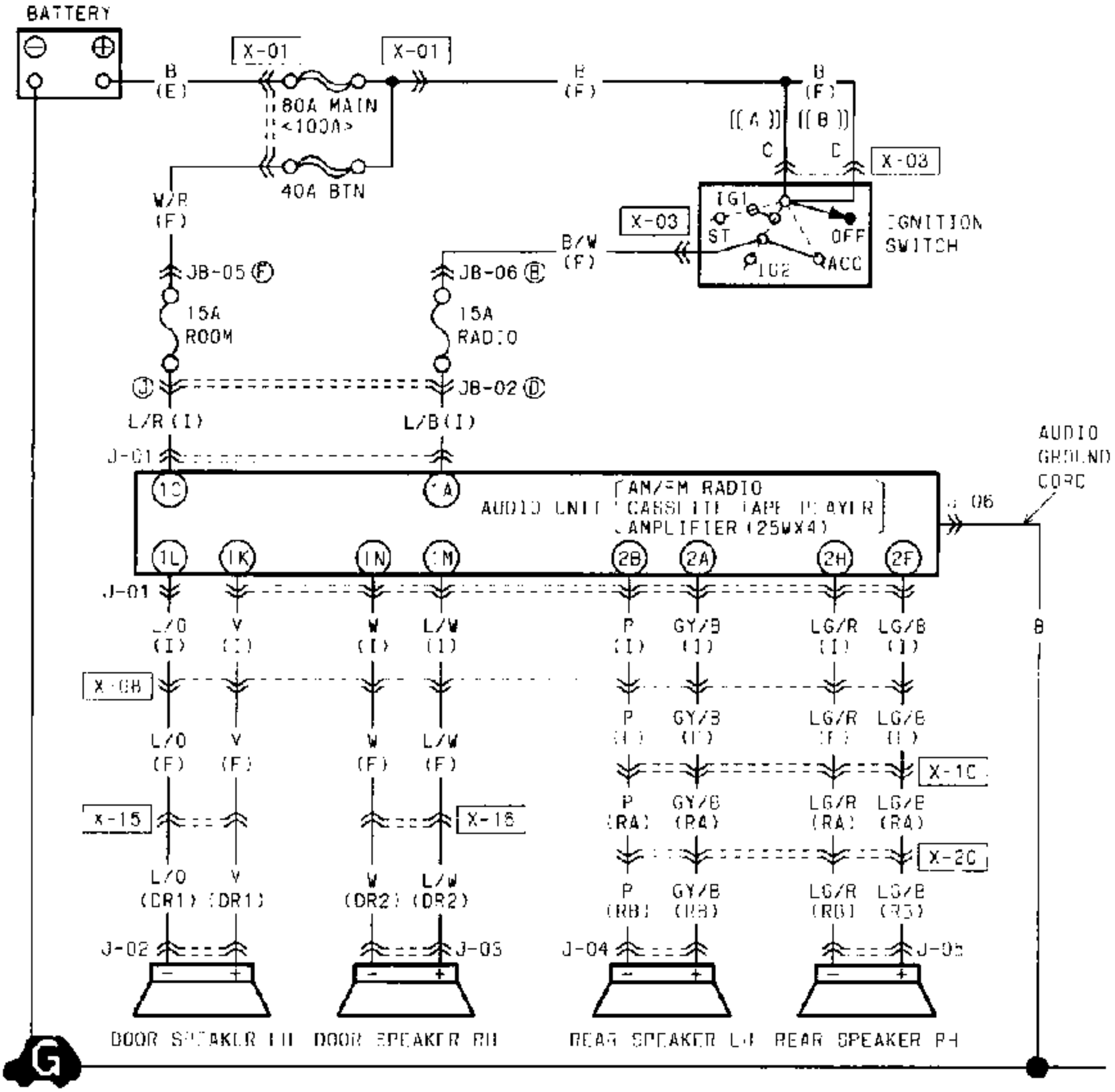
I3-01 INTERIOR LIGHT (IN)

I3-02 CARGO COMPARTMENT LIGHT (RB)

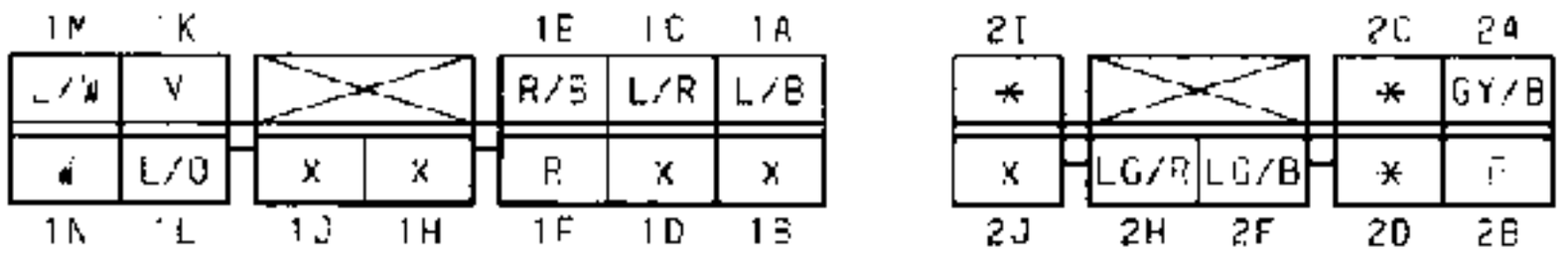
I3-03 CARGO COMPARTMENT LIGHT SWITCH (RB)

J ■ AUDIO SYSTEM (OPTION)

< >...4E DOHC
( )...CANADA



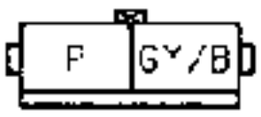
J-01 AUDIO UNIT (I)



J-02 DOOR SPEAKER LH (DR1)

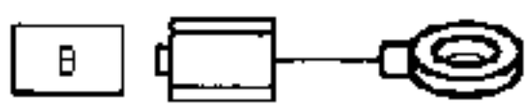
J-03 DOOR SPEAKER RH (DR2)

J-04 REAR SPEAKER LH (RB)

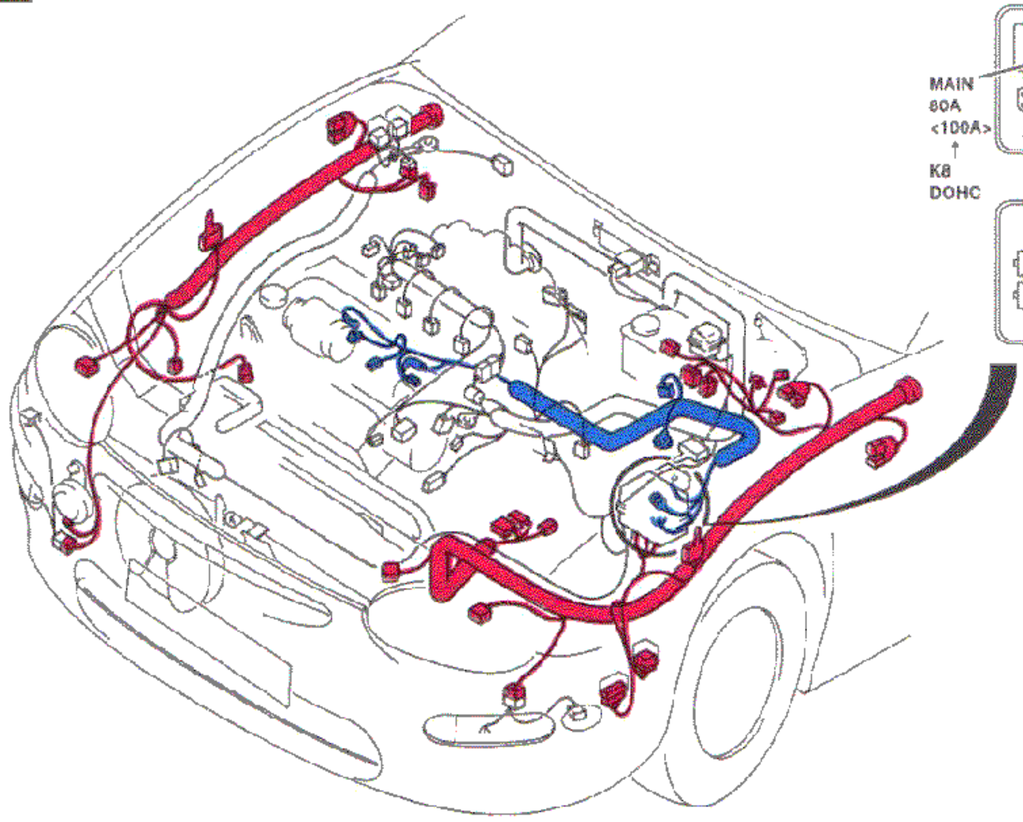


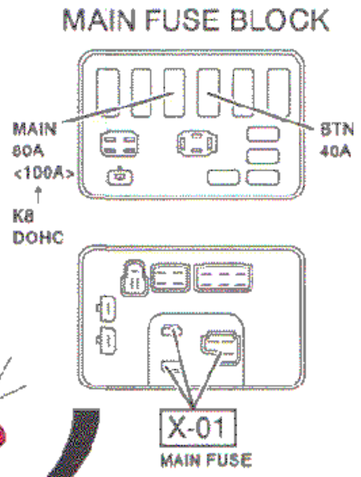
J-05 REAR SPEAKER RH (RB)

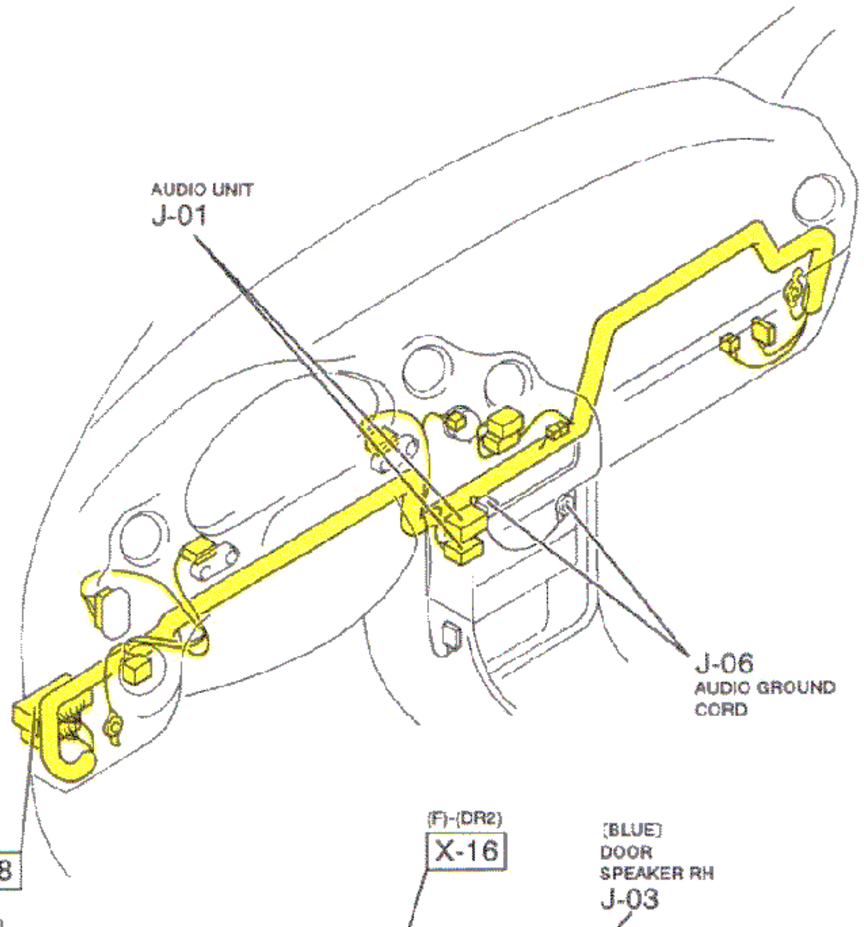
J-06 AUDIO GROUND CORD

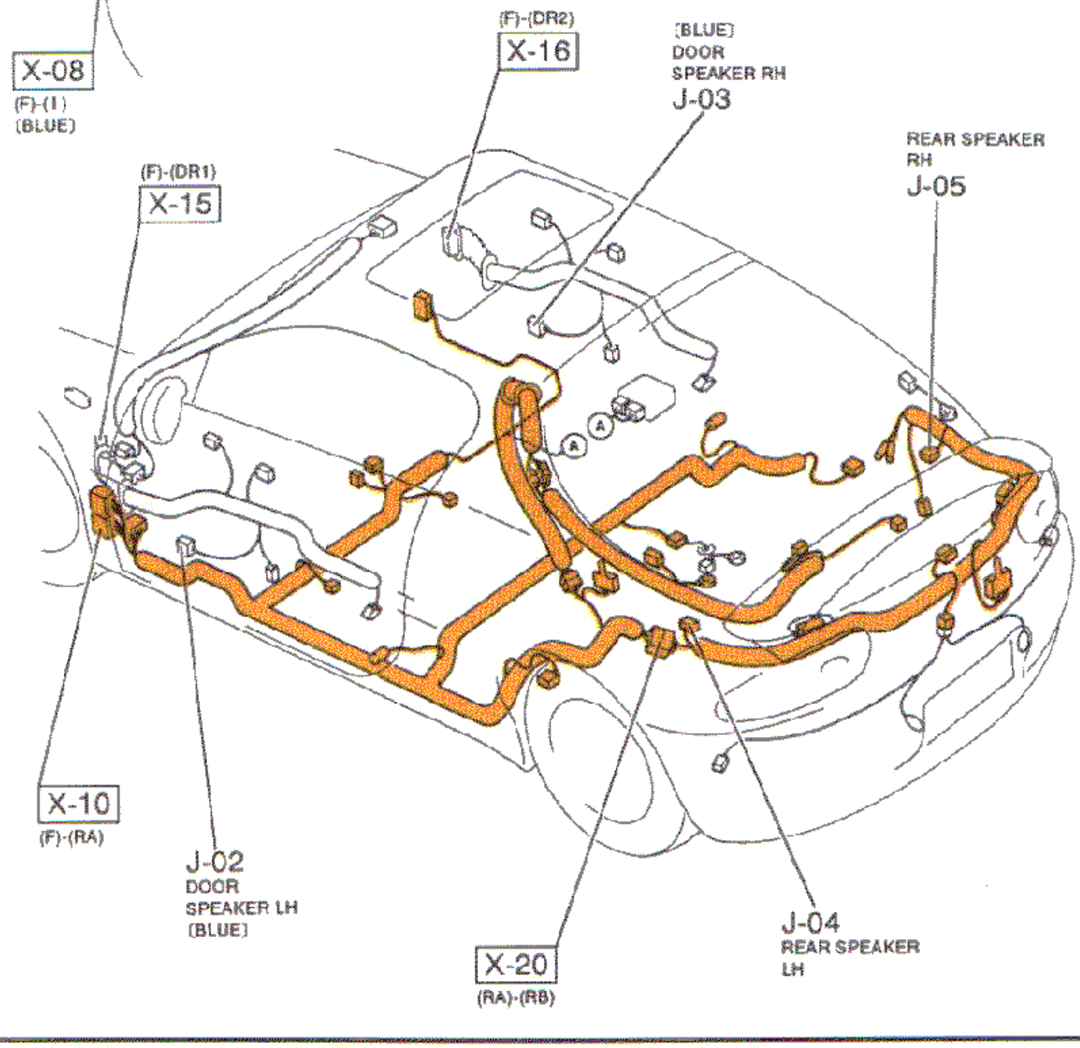


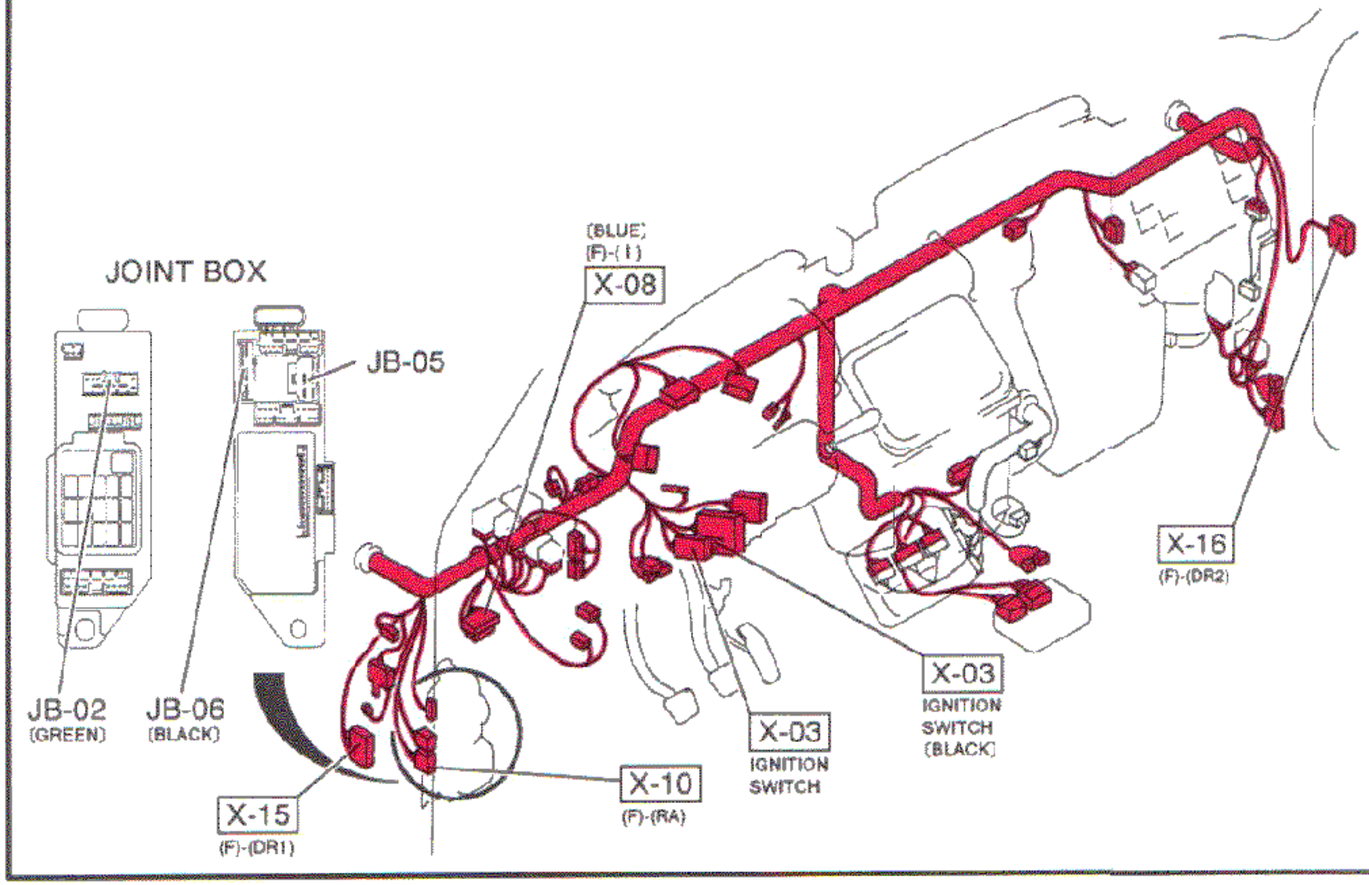
J




MAIN FUSE BLOCK
MAIN
80A
<100A>
K8
DOHC
BTN
40A
X-01
MAIN FUSE

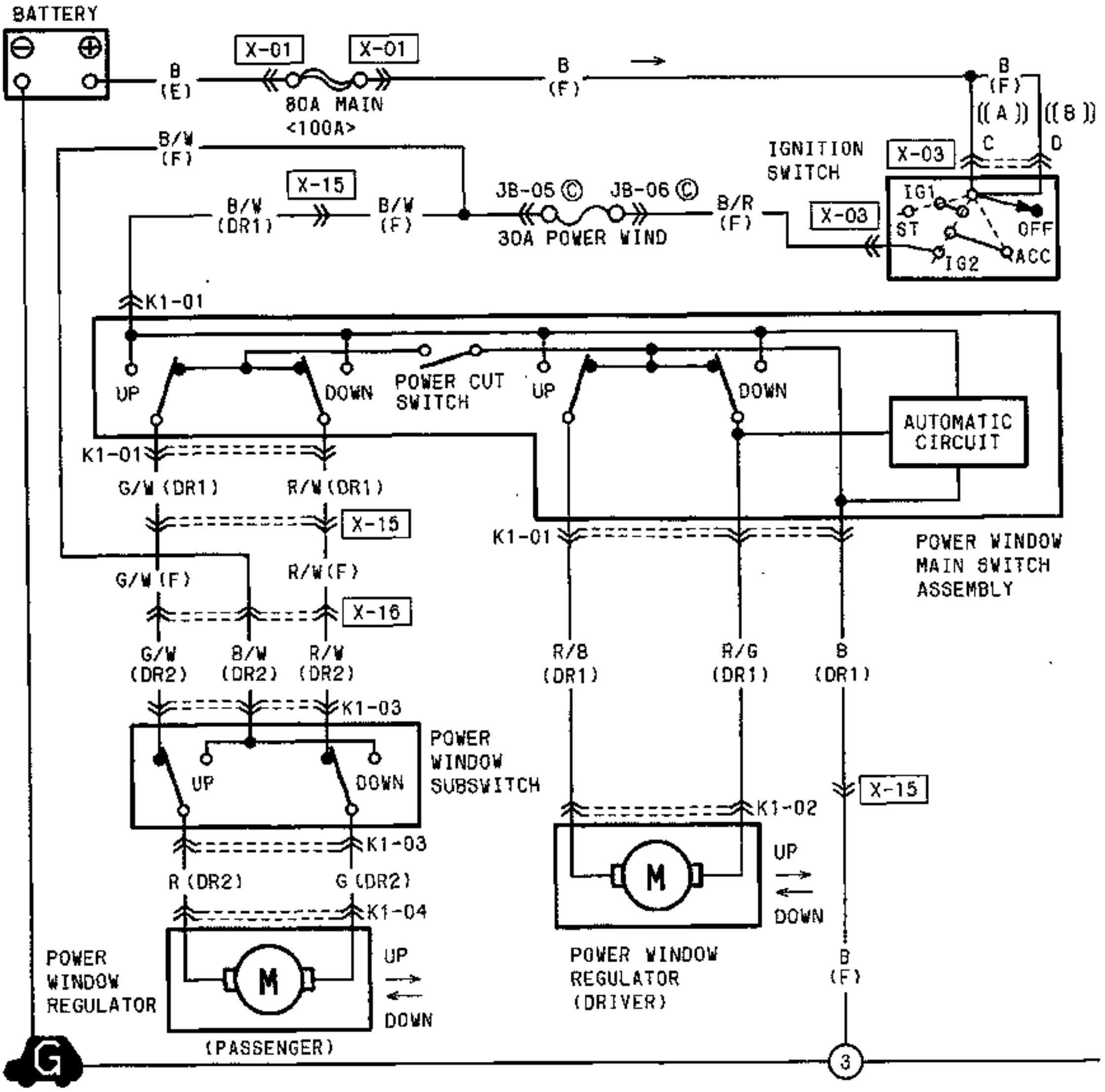

AUDIO UNIT
J-01
J-06
AUDIO GROUND
CORD


X-08
(F)-(I)
(BLUE)
(F)-(DR2)
X-16
(BLUE)
DOOR
SPEAKER RH
J-03
REAR SPEAKER
RH
J-05
(F)-(DR1)
X-15
X-10
(F)-(RA)
J-02
DOOR
SPEAKER LH
(BLUE)
X-20
(RA)-(RB)
J-04
REAR SPEAKER
LH


JOINT BOX
JB-05
JB-02
(GREEN)
JB-06
(BLACK)
(BLUE)
(F)-(I)
X-08
X-15
(F)-(DR1)
X-10
(F)-(RA)
X-03
IGNITION
SWITCH
X-03
IGNITION
SWITCH
(BLACK)
X-16
(F)-(DR2)

K-1 ■ POWER WINDOW SYSTEM

《 》...CANADA
< >...K8 DOHC

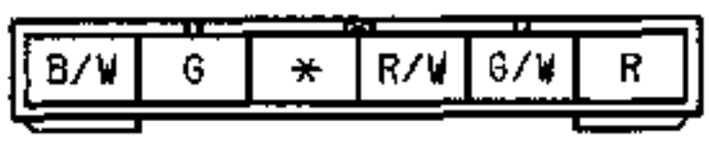


K1-01 POWER WINDOW MAIN SWITCH ASSEMBLY (DR1)

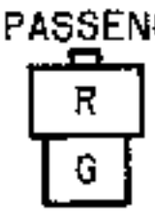
R/W		B	R/G
G/W	B/W	B/L	R/B

K1-02 POWER WINDOW REGULATOR (DRIVER) (DR1)

K1-03 POWER WINDOW SUBSWITCH (DR2)

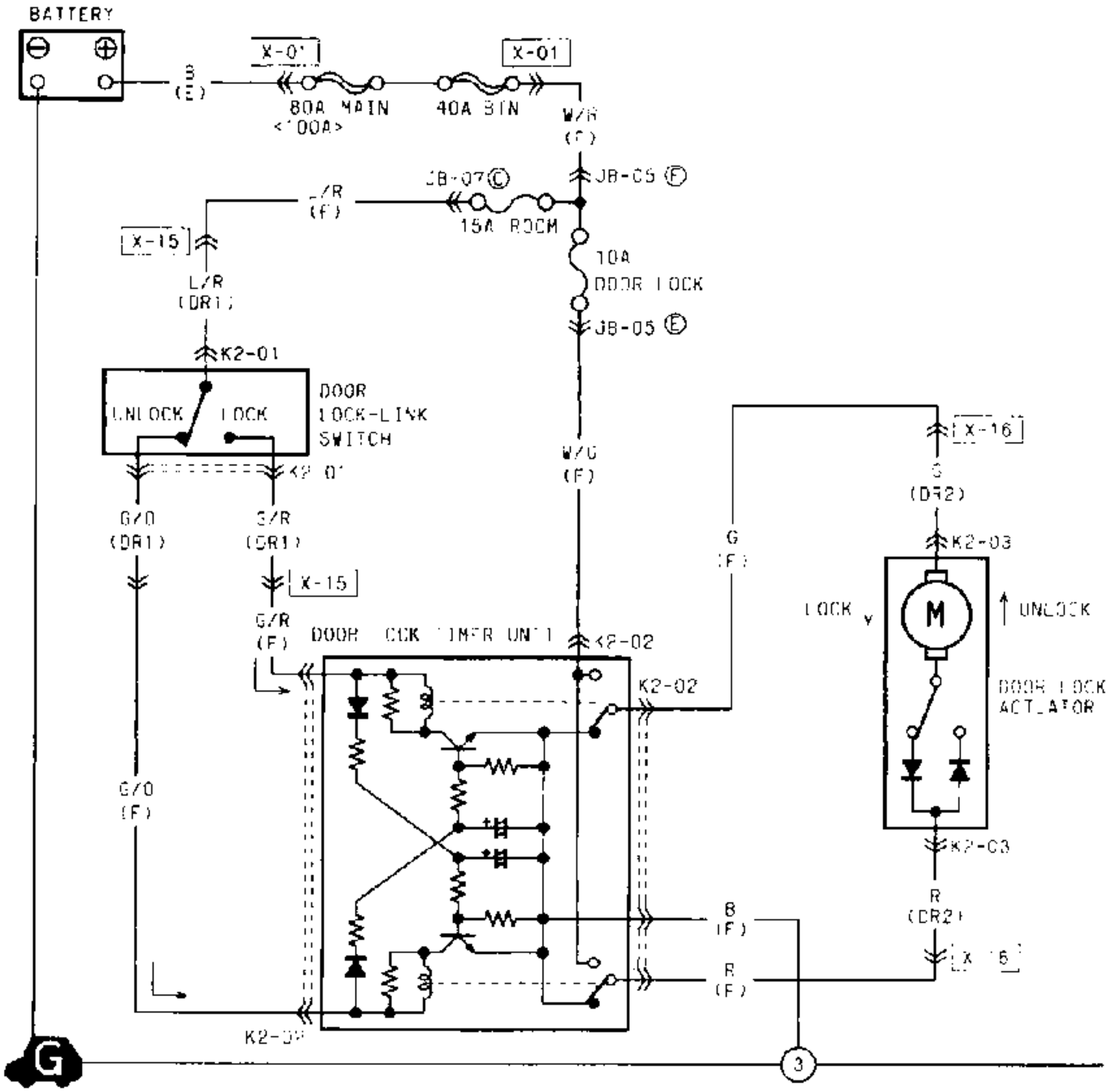


K1-04 POWER WINDOW REGULATOR (PASSENGER) (DR2)

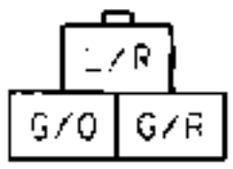


K-2 ■ POWER DOOR LOCK SYSTEM

< > ..KB DOHC



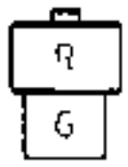
K2-01 DOOR LOCK-LINK SWITCH (DR1)



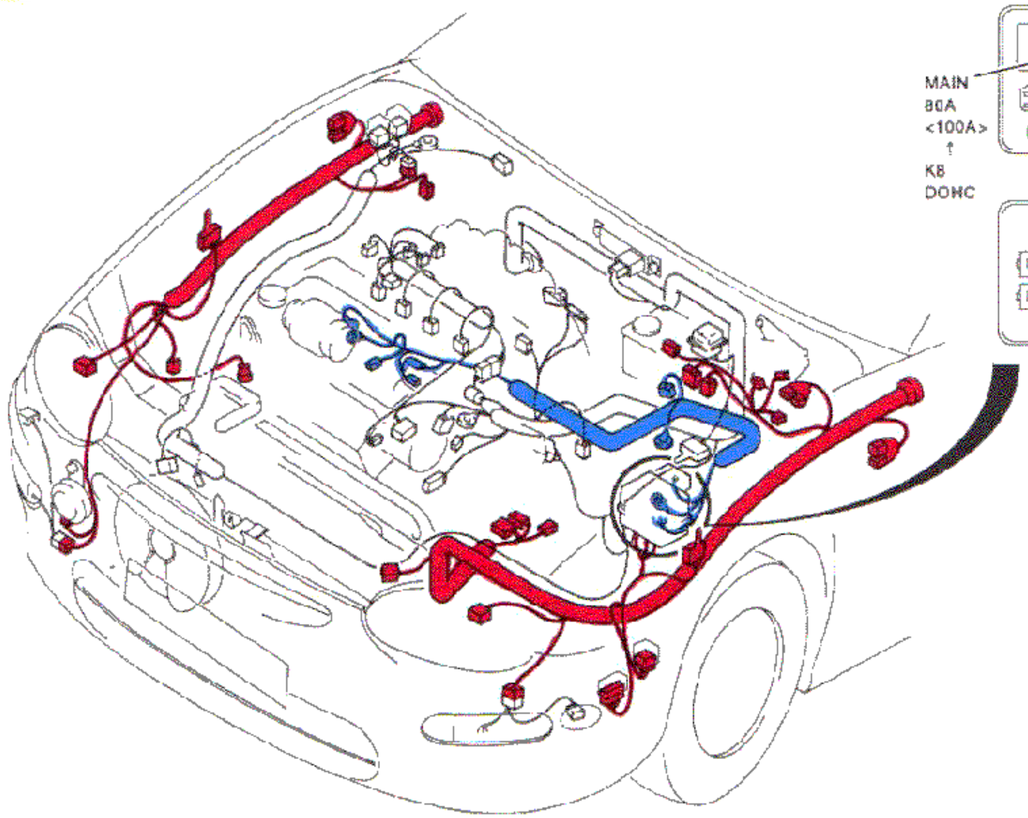
K2-02 DOOR LOCK TIMER UNIT (F)

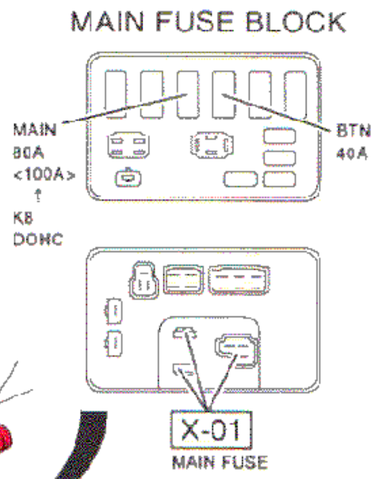
*	G	G/O	B
*	R	G/R	W/G

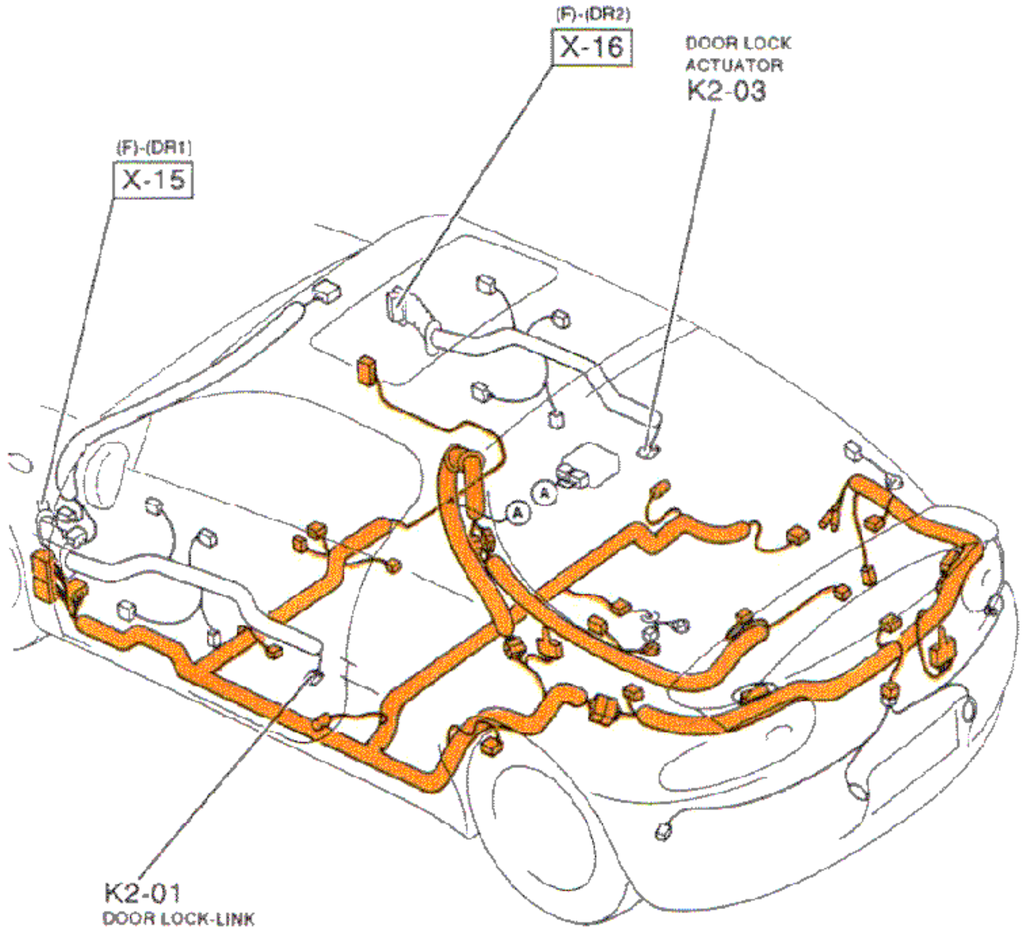
K2-03 DOOR LOCK ACTUATOR (DR2)

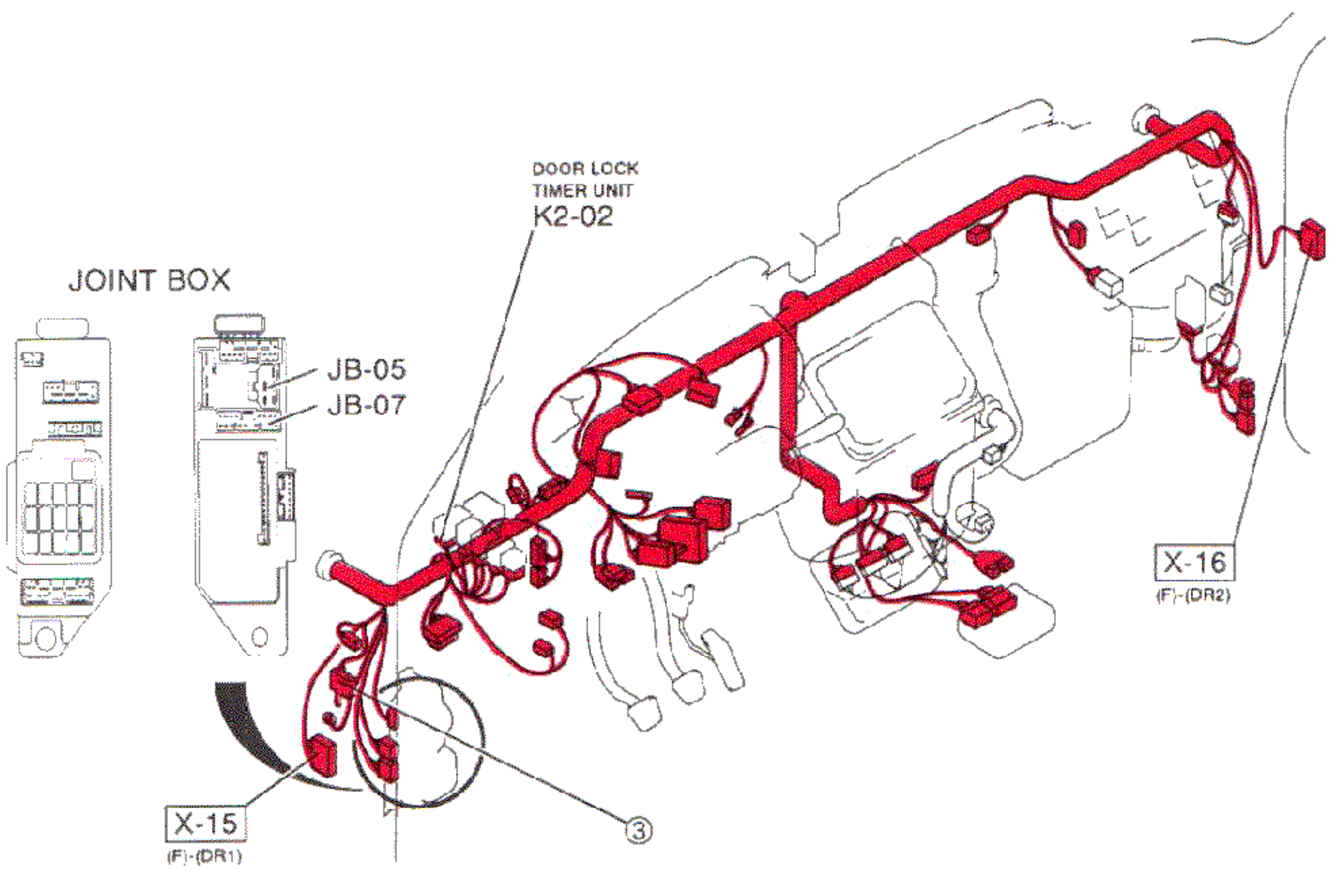


K-2



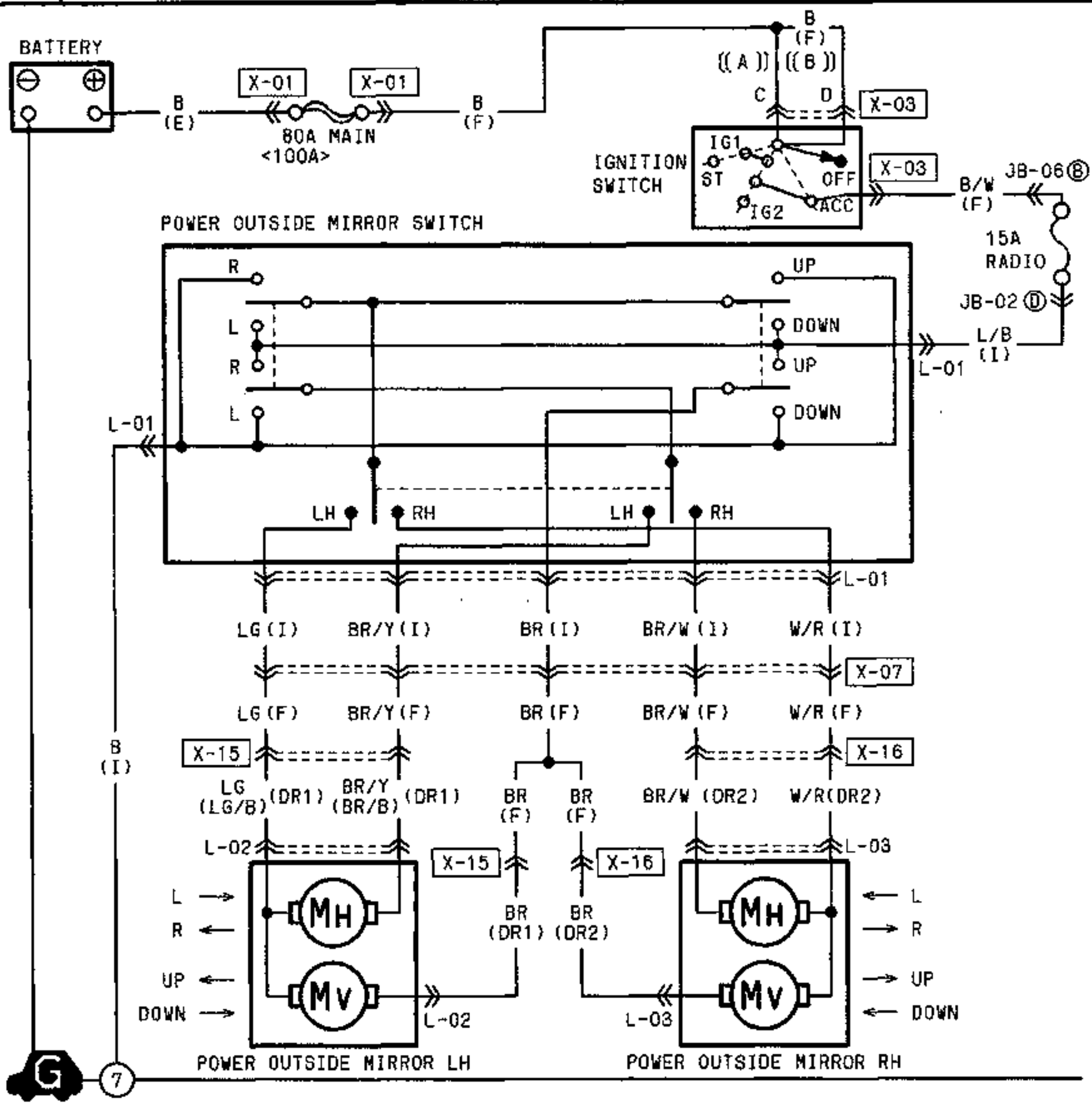

MAIN FUSE BLOCK
MAIN
80A
<100A>
↑
K8
DOHC
BTN
40A
X-01
MAIN FUSE


(F)-(DR2)
X-16
DOOR LOCK
ACTUATOR
K2-03
(F)-(DR1)
X-15
K2-01
DOOR LOCK-LINK
SWITCH
(GRAY)


DOOR LOCK
TIMER UNIT
K2-02
JOINT BOX
JB-05
JB-07
X-15
(F)-(DR1)
X-16
(F)-(DR2)
③

L ■ POWER OUTSIDE MIRROR

( )...WITH POWER WINDOW
(( ))...CANADA
< >...K6 DOHC



L-01 POWER OUTSIDE MIRROR SWITCH (I)

*	L/B			LG	W/R
BR	B	BR/Y	BR/W	*	*

L-02 POWER OUTSIDE MIRROR LH (DR1)

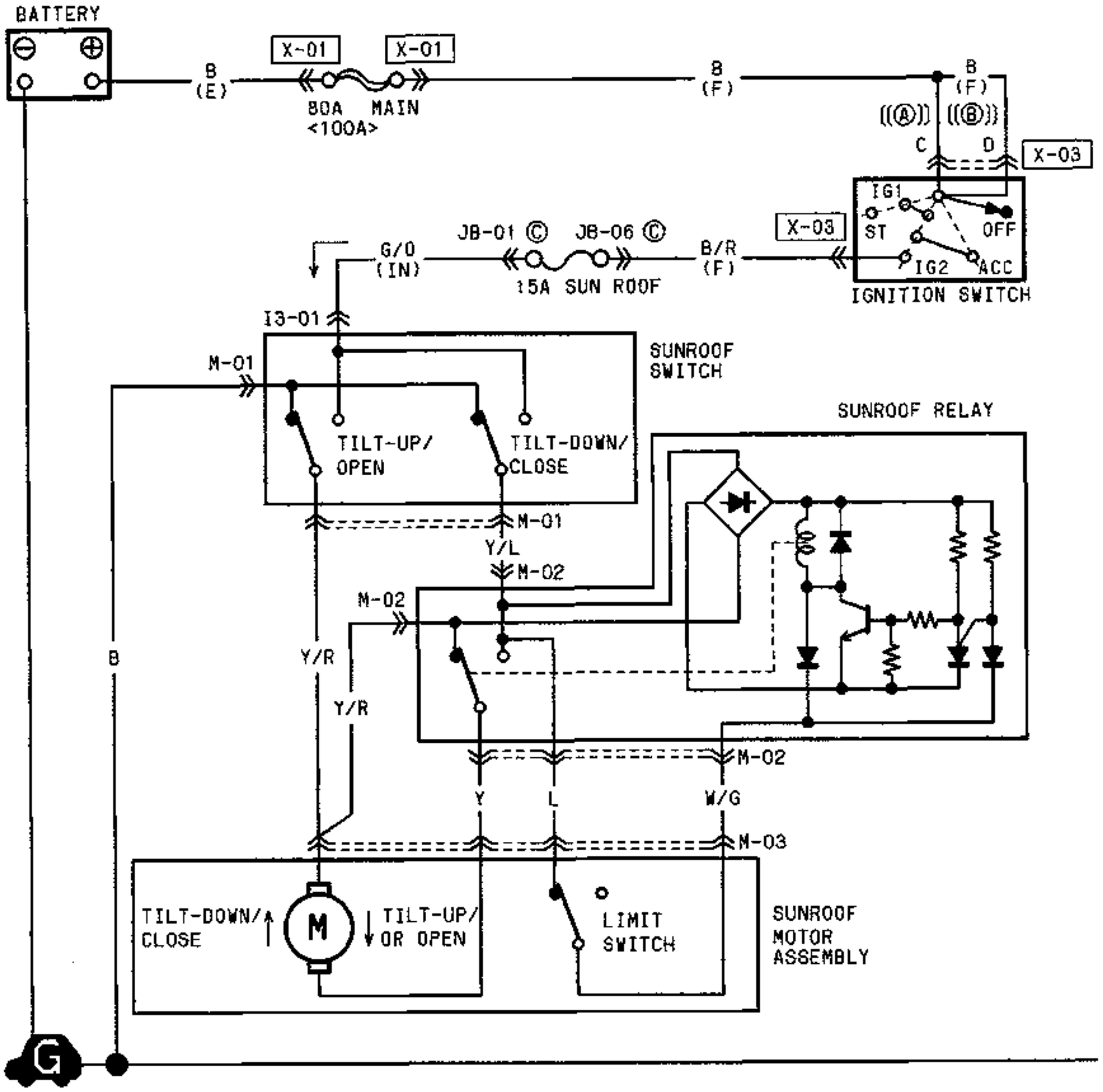
LG (LG/B)	BR
BR/Y (BR/B)	*

L-03 POWER OUTSIDE MIRROR RH (DR2)

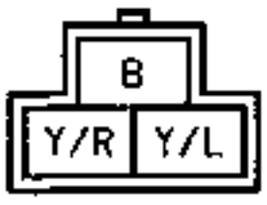
W/R	BR
BR/W	*

M ■ SLIDING SUNROOF

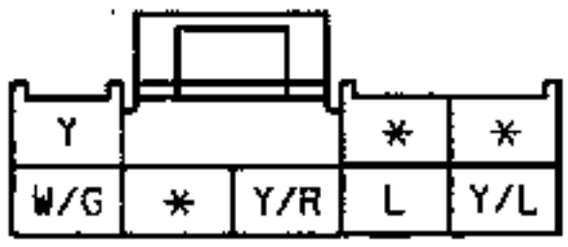
《 》...CANADA
< >...K8 DOHC



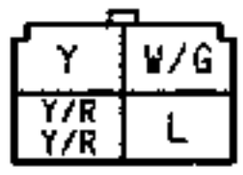
M-01 SUNROOF SWITCH



M-02 SUNROOF RELAY



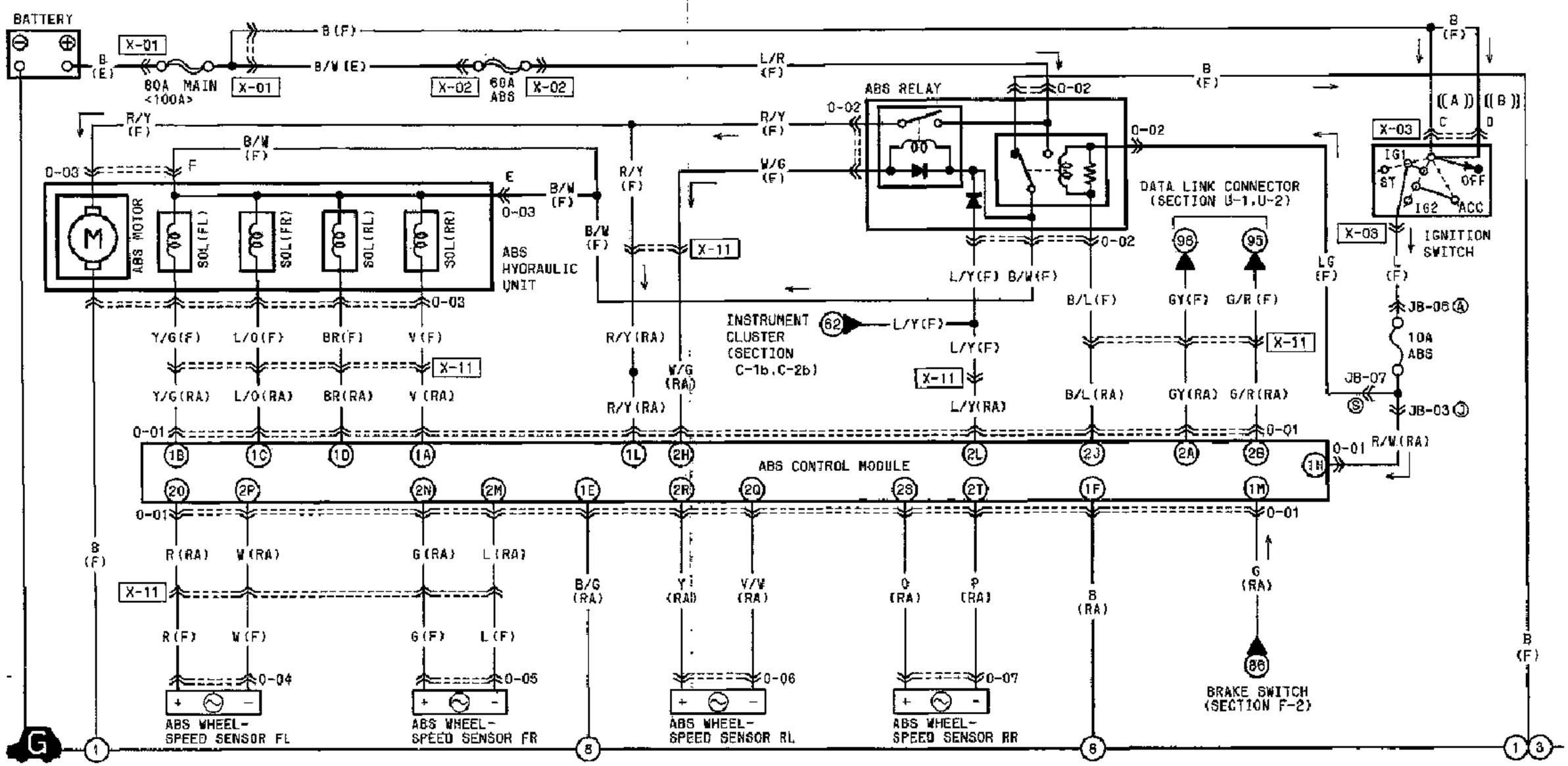
M-03 SUNROOF MOTOR ASSEMBLY



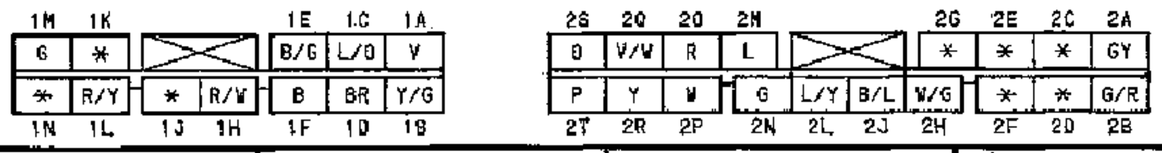
I3-01 SUNROOF SWITCH (IN)

0 ■ 4 WHEEL ANTILOCK BRAKE SYSTEM(4WABS)

※ D...CANADA
< >...K8 DOHC

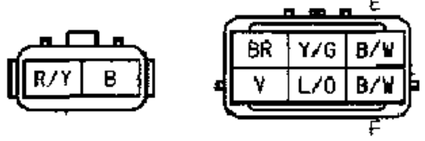


0-01 ABS CONTROL MODULE (RA)



0-02 ABS RELAY (F)

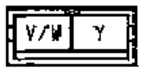
0-03 ABS HYDRAULIC UNIT (F)



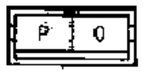
0-04 ABS WHEEL-SPEED SENSOR FL (F)

0-05 ABS WHEEL-SPEED SENSOR FR (F)

0-06 ABS WHEEL-SPEED SENSOR RL (RA)



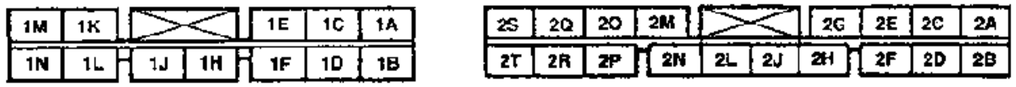
0-07 ABS WHEEL-SPEED SENSOR RR (RA)



O

Check ABS control module

ABS CONTROL MODULE CONNECTOR



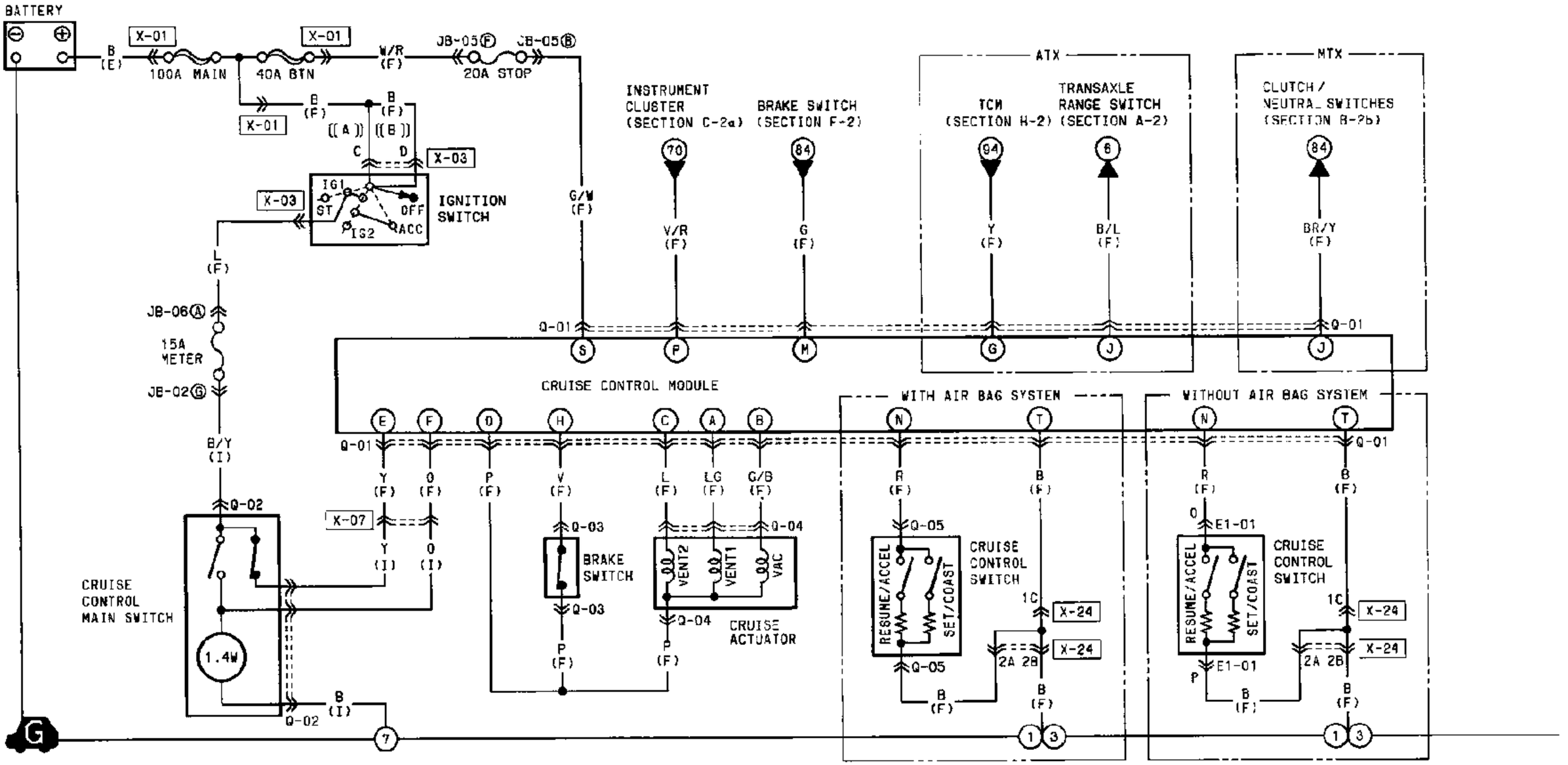
B+: Battery Positive Voltage

Connector	Terminal	Connected to	Condition	Voltage (v)	Remark
12 pins	1A	Right rear wheel solenoid	Solenoid ON*	0–2	* Solenoid is ON only when ABS system is functioning. Voltage when solenoid is ON can be measured following "Hydraulic System Test". (Refer to P–69.)
			Ignition switch ON	B+	
	1B	Left front wheel solenoid	Solenoid ON*	0–2	
			Ignition switch ON	B+	
	1C	Right front wheel solenoid	Solenoid ON*	0–2	
			Ignition switch ON	B+	
	1D	Left rear wheel solenoid	Solenoid ON*	0–2	
			Ignition switch ON	B+	
	1E	Ground	Constant	0	
	1F	Ground	Constant	0	
	1H	Battery	Ignition switch ON	B+	
			Ignition switch OFF	0	
	1J	Not used	—	—	
	1K	Not used	—	—	
	1L	Motor	Motor running	B+	
			Motor stopped	0 1	
	1M	Brake switch	Brake pedal depressed	B+	
			Brake pedal released	0–2	
	1N	Not used	—	—	

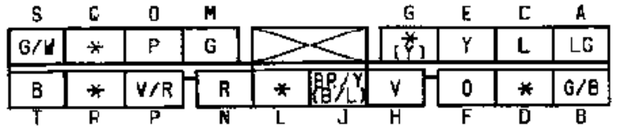
Connector	Terminal	Connected to		Condition	Voltage (v)	Remark
18 pins	2A	FBS check terminal		Ignition switch ON	0	
	2B	TBS check terminal		Normal mode	B+	
				Diagnostic mode	0	
	2C	Not used		—	—	
	2D	Not used		—	—	
	2E	Not used		—	—	
	2F	Not used		—	—	
				Engine idling	B+	
	2H	Motor relay		Motor relay ON	0–2	
				Motor relay OFF	B+	
	2J	Fail-safe relay		Normal	0–2	• Turn wheel at specified speed to prevent incorrect diagnosis • Check following terminals of ABS wheel-speed sensor in AC range: 2N-2M (right front) 2O-2P (left front) 2R-2Q (left rear) 2S-2T (right rear)
				If malfunction present	B+	
	2L	Warning light		Illuminated	0–3	
				Not illuminated	B+	
	2M	ABS wheel-speed sensor	Right front	Vehicle stopped	0	
	2N			Wheel turned 1 revolution per second	0.25–1.2	
	2O		Left front	Vehicle stopped	0	
	2P			Wheel turned 1 revolution per second	0.25–1.2	
	2Q		Left rear	Vehicle stopped	0	• In DC range, ABS wheel-speed sensor voltage will be approx. 1.0V (with ignition switch ON)
	2R			Wheel turned 1 revolution per second	0.25–1.2	
	2S		Right rear	Vehicle stopped	0	
	2T			Wheel turned 1 revolution per second	0.25–1.2	

Q K8 DOHC ■ CRUISE CONTROL SYSTEM

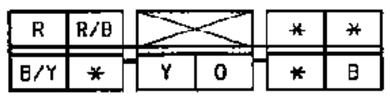
E I ...CANADA



Q-01 CRUISE CONTROL MODULE (F) ( )...ATX

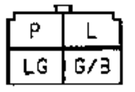


Q-02 CRUISE CONTROL MAIN SWITCH (I)

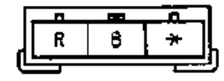


Q-03 BRAKE SWITCH (F)

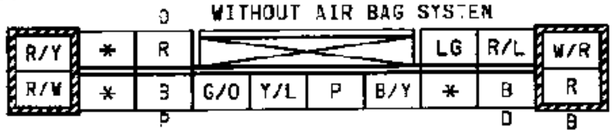
Q-04 CRUISE ACTUATOR (F)



Q-05 CRUISE CONTROL SWITCH (F)
WITH AIR BAG SYSTEM



E1-01 COMBINATION SWITCH (CRUISE CONTROL SWITCH) (F)
WITHOUT AIR BAG SYSTEN

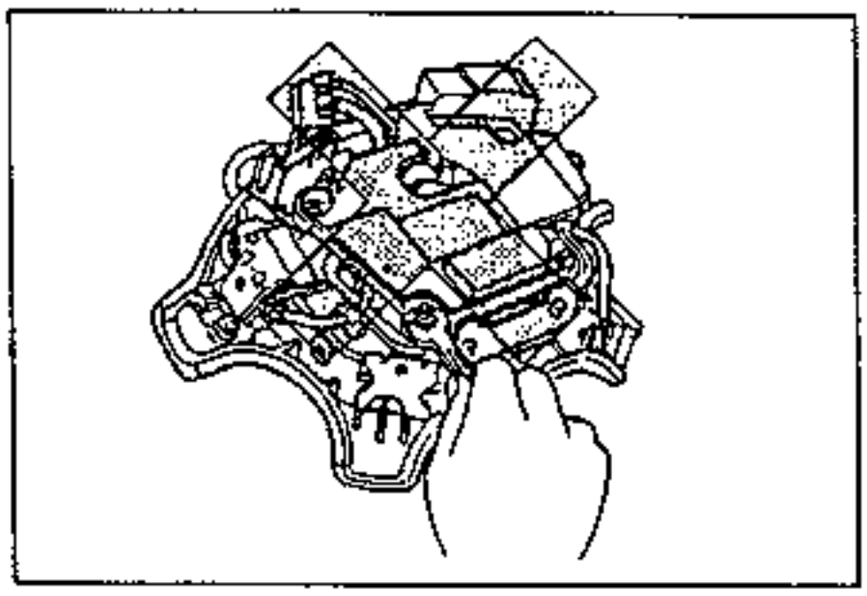


Q

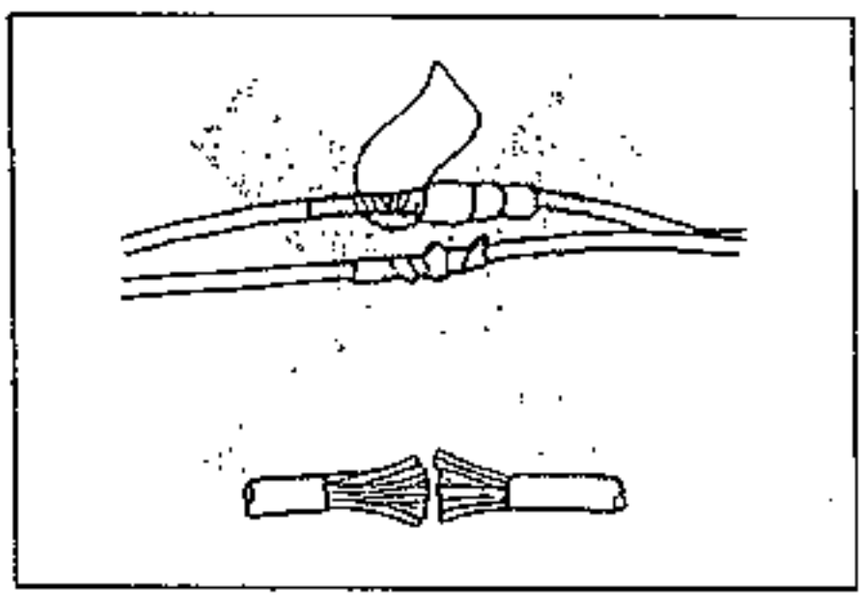
B+: Battery positive voltage

Terminal (Input / Output)		Connection	Test condition		Voltage/ Continuity
A (Output)		Cruise actuator (vent 1)	Ignition switch at ON		0V
			Ignition switch at ON and cruise control main switch on		Approx. 9V
B (Output)		Cruise actuator (vac)	Ignition switch at ON		0V
			Ignition switch at ON and cruise control main switch on		Approx. 9V
C (Output)		Cruise actuator (vent 2)	Ignition switch at ON		0V
			Ignition switch at ON and cruise control main switch on		Approx. 9V
E (Input)		Cruise control main switch (N.C.)	Ignition switch at ON	Cruise control main switch at off	B+
				Cruise control main switch at on	0V
F (Input)		Cruise control main switch (N.O.)	Ignition switch at ON	Cruise control main switch at off	0V
				Cruise control main switch at on	B+
G (Input)		TCM	Ignition switch at ON		B+
H (Input)		Brake switch (N.C.)	Ignition switch and cruise control main switch at ON		Approx. 9V
			Brake pedal depressed		B+
J (Input)	ATX	Transaxle range switch	Ignition switch at ON	N or P range	0V
				Other	B+
	MTX	Clutch switch	Ignition switch at ON	Depress clutch pedal or in neutral position	0V
				Other	B+
M (Input)		Brake switch (N.O.)	Depress brake pedal		B+
			Other		0V
N (Input)		Cruise control switch	Ignition switch at ON and cruise control main switch on		5V
			Ignition switch at ON and cruise control main switch on	SET/COAST switch pushed	2V
				RESUME/ACCEL switch pushed	3V
O (Input)		Brake switch (N.C.)	Ignition switch at ON		0V
			Ignition switch at ON and cruise control main swtich on		9V
P (Input)		Vehicle speedometer sensor	While rear tires rotating		0–5V
S (Input)		Battery (STOP 20 A fuse)	Constant		B+
T (Input)		GND	Constant: check for continuity		0V/Yes

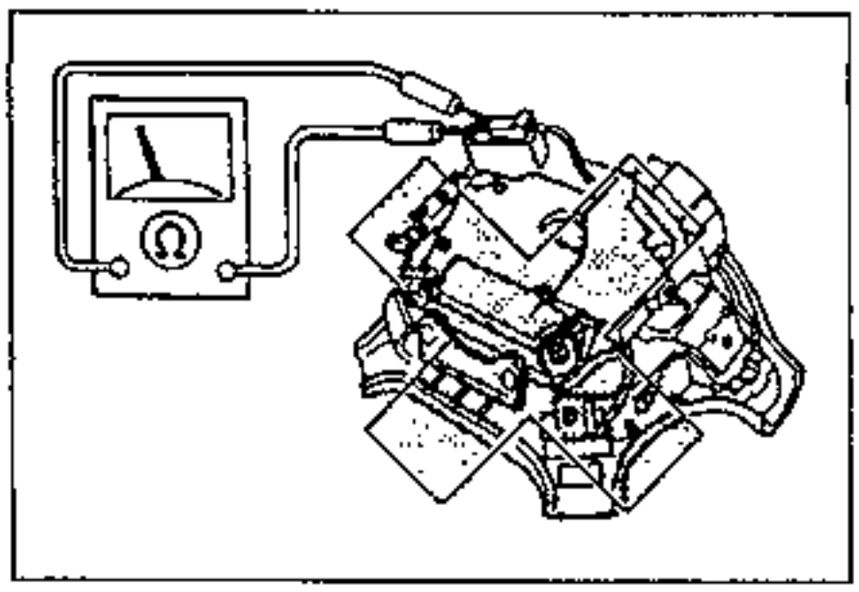
S



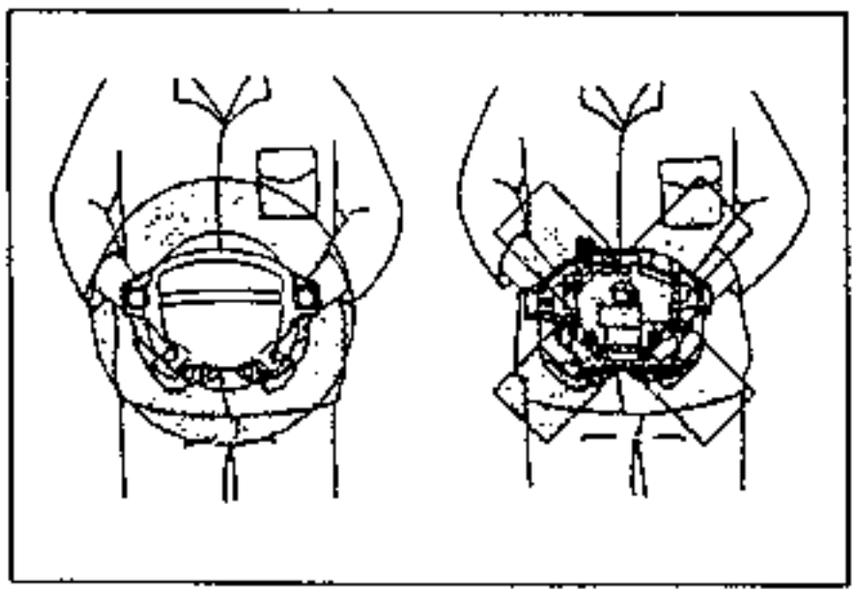
SERVICE WARNINGS
Component Disassembly
- Disassembling and reassembling the components of the air bag system can render the system inoperative, which may result in serious injury or death in the event of an accident. Do not disassemble any air bag system components.



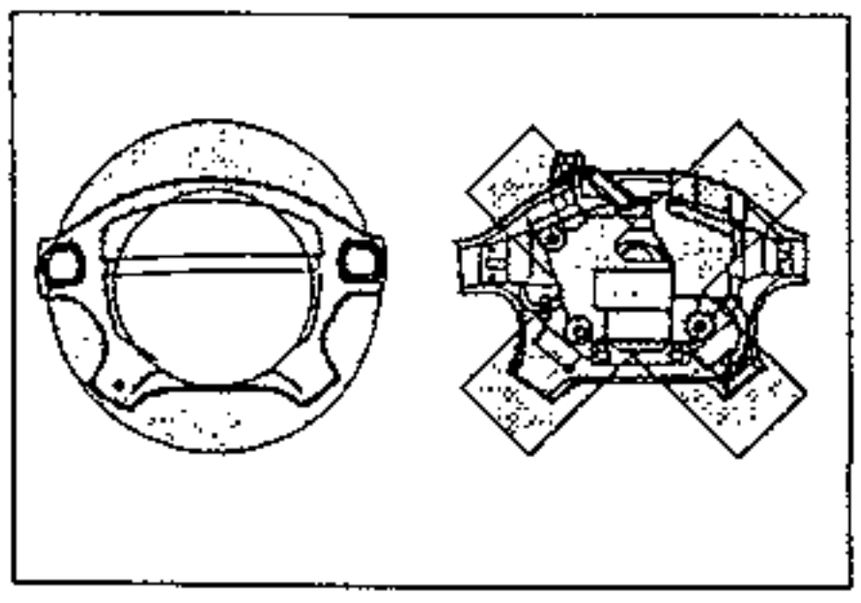
Wiring Harness Repair
- Incorrectly repairing an air bag system wiring harness can accidently deploy the air bag, which can cause serious injury. If a problem is found in the system wiring, replace the wiring harness. Do not try to repair it.



Air Bag Module Inspection
- Inspecting the air bag module with an ohmmeter can deploy the air bag, which can cause serious injury. Do not use an ohmmeter to inspect the air bag module.



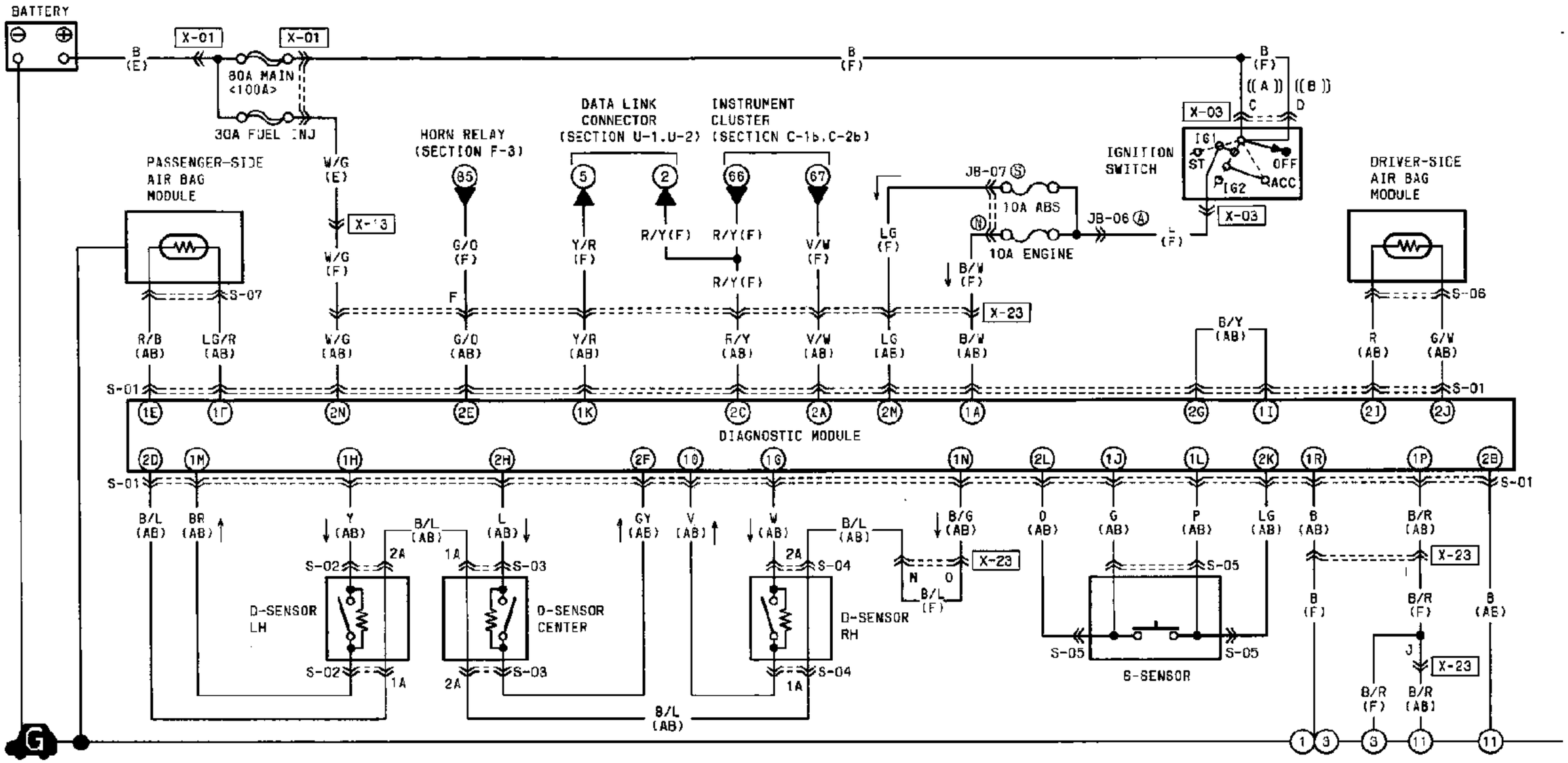
Air Bag Module Handling
- A live (undeployed) air bag may accidently deploy when it is handled and cause serious injury. When carrying a live air bag module, point the trim cover away from your body to lessen the chance of injury in case it deploys.



- A live air bag placed face down on a surface is dangerous. If the air bag deploys, the motion of the module can cause serious injury. Always face the trim cover up to reduce the motion of the module in case it accidently deploys.

S ■ AIR BAG SYSTEM

( )...CANADA
< >...K8 DOHC

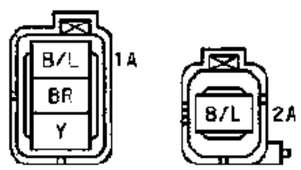


S-01 DIAGNOSTIC MODULE (AB)

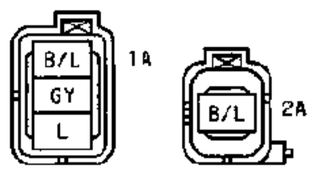
1Q	1O	1M	1K	1I	1G	1E	1C	1A
*	V	BR	Y/R	B/Y	W	R/B	*	B/W
B	B/R	B/G	P	G	Y	LG/R	*	*
1R	1P	1N	1L	1J	1H	1F	1D	1B

2M	2K	2I	2G	2E	2C	2A
LG	LG	R	B/Y	G/O	R/Y	V/W
W/G	O	G/W	L	GY	B/L	B
2N	2L	2J	2H	2F	2D	2B

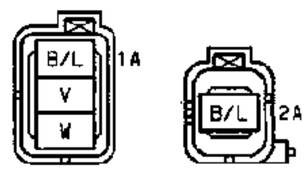
S-02 D-SENSOR LH (AB)



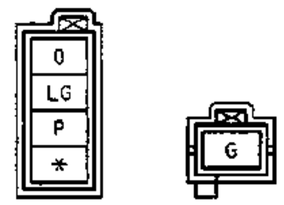
S-03 D-SENSOR CENTER (AB)



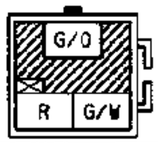
S-04 D-SENSOR RH (AB)



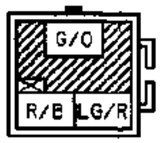
S-05 S-SENSOR (AB)



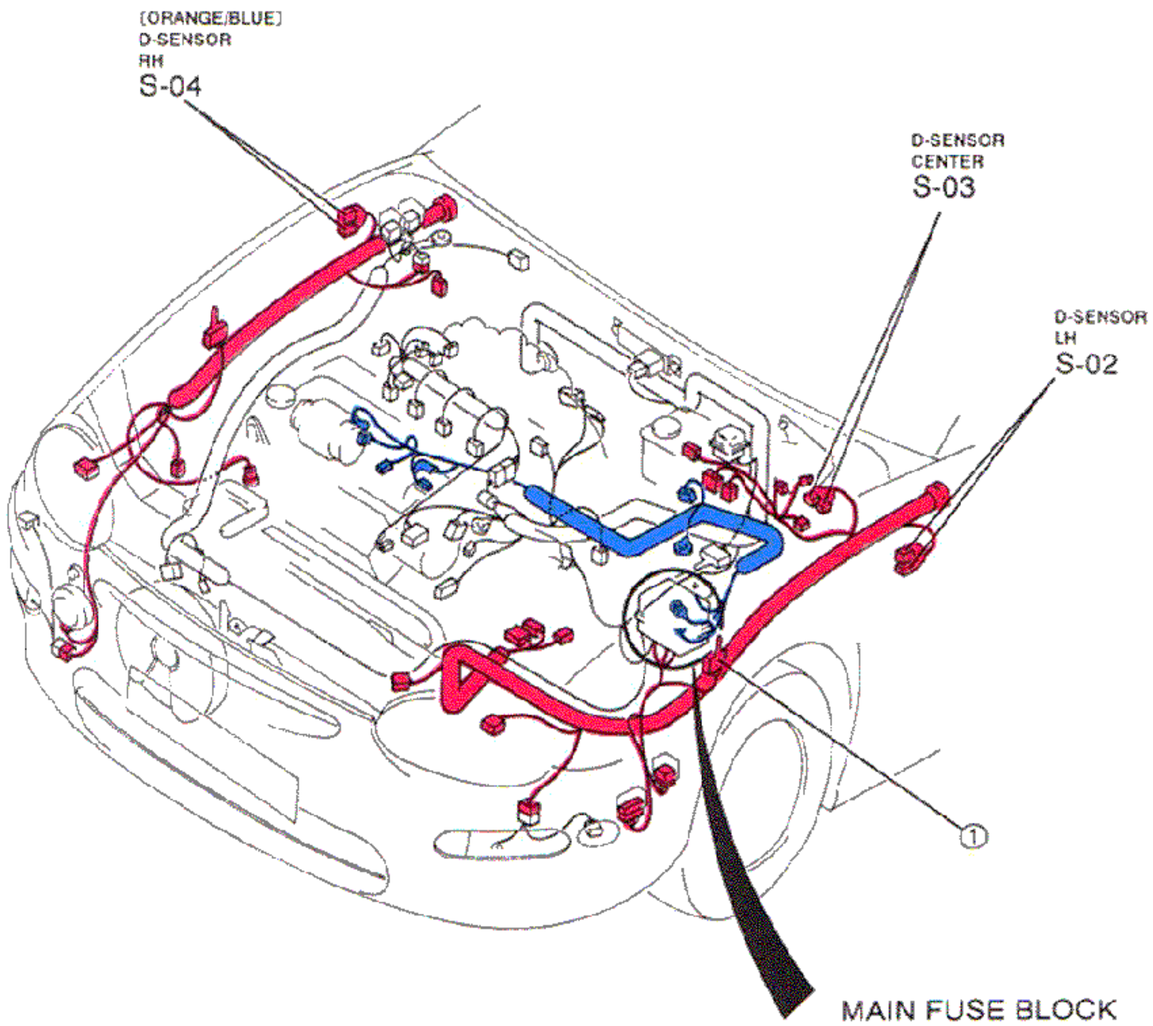
S-06 DRIVER-SIDE AIR BAG MODULE (AB)

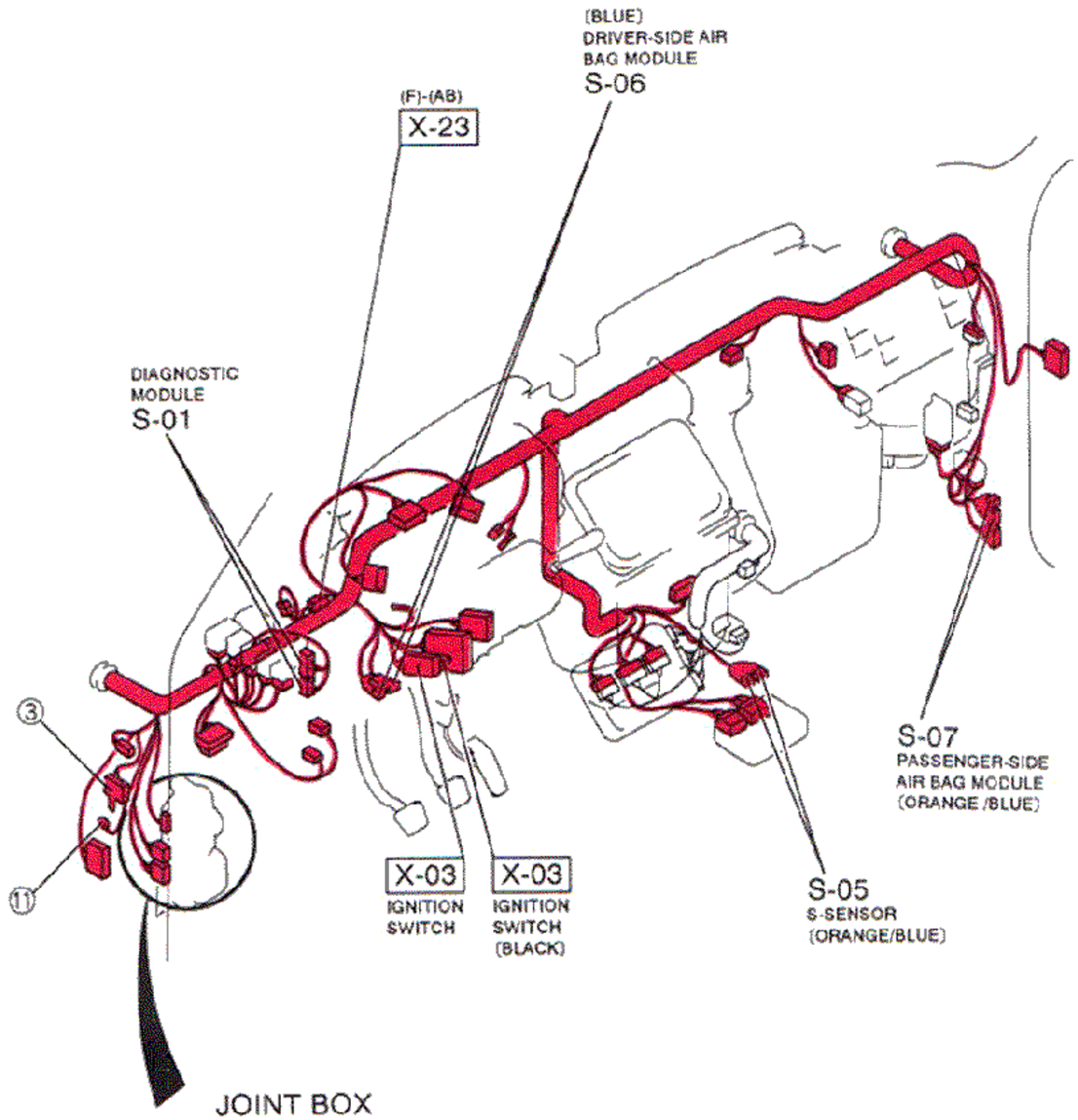


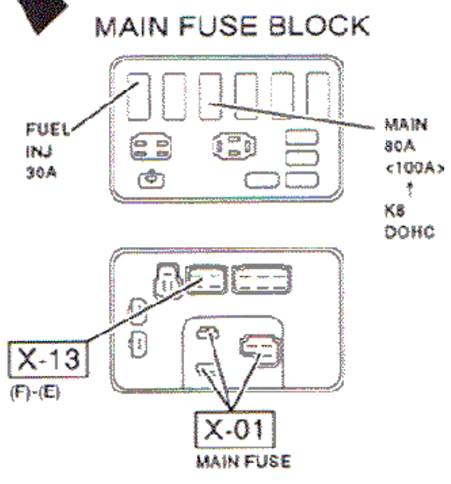
S-07 PASSENGER-SIDE AIR BAG MODULE (AB)

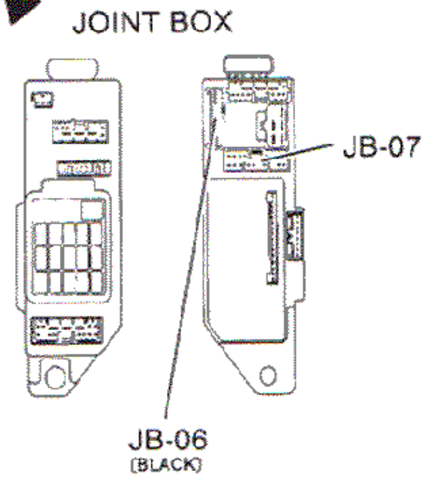


S


(ORANGE/BLUE)
D-SENSOR
RH
S-04
D-SENSOR
CENTER
S-03
D-SENSOR
LH
S-02
①

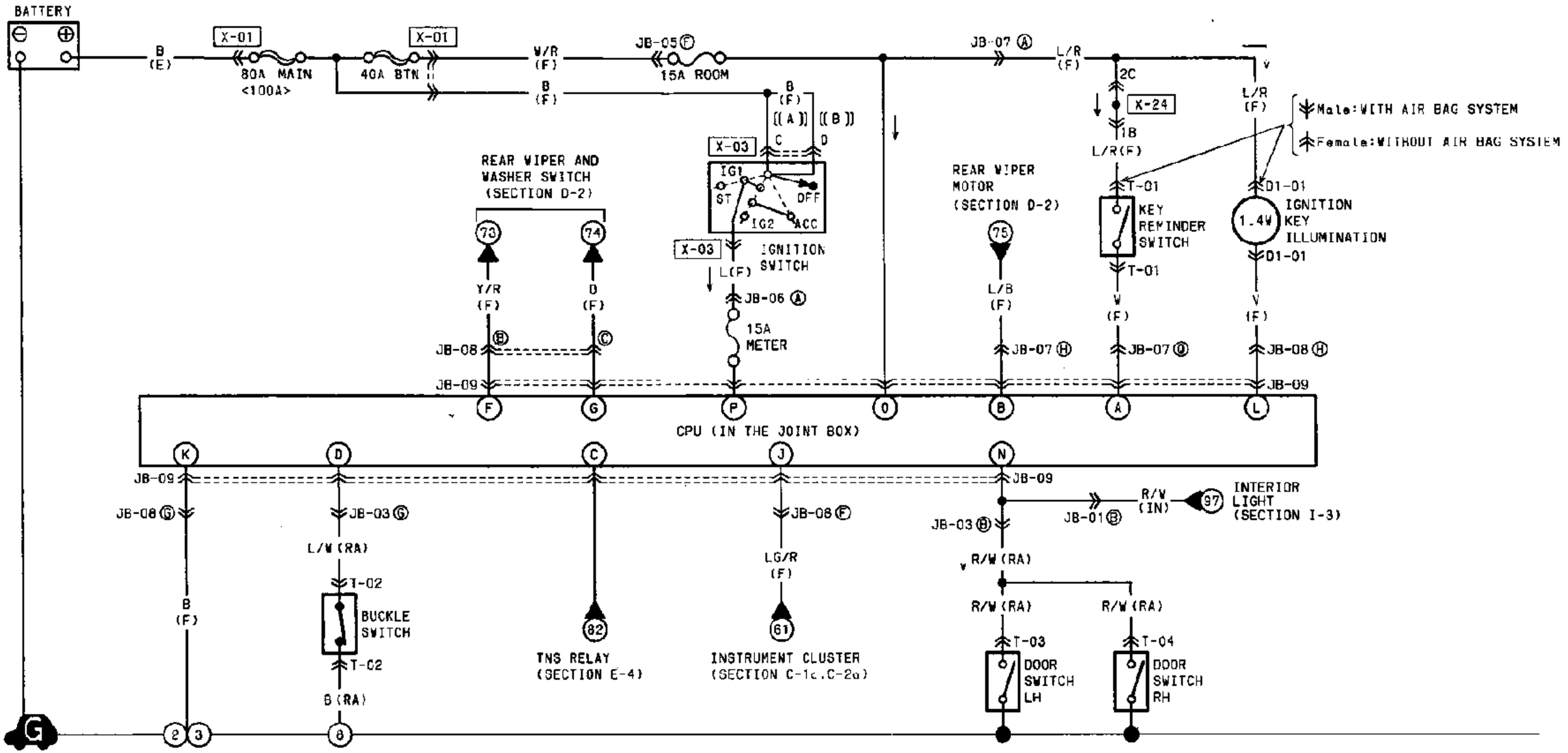

(BLUE)
DRIVER-SIDE AIR
BAG MODULE
S-06
(F)-(AB)
X-23
DIAGNOSTIC
MODULE
S-01
③
⑪
X-03
IGNITION
SWITCH
X-03
IGNITION
SWITCH
(BLACK)
S-07
PASSENGER-SIDE
AIR BAG MODULE
(ORANGE /BLUE)
S-05
S-SENSOR
(ORANGE/BLUE)


MAIN FUSE BLOCK
FUEL
INJ
30A
MAIN
80A
<100A>
↑
K6
DOHC
X-13
(F)-(E)
X-01
MAIN FUSE


JOINT BOX
JB-07
JB-06
(BLACK)

T ■ IGNITION KEY ILLUMINATION ■ CENTRAL PROCESSING UNIT(CPU)

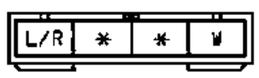
B ...CANADA
< >...K8 DOHC



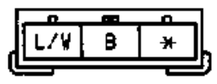
T-01 KEY REMINDER SWITCH (F)

WITHOUT AIR BAG SYSTEM

WITH AIR BAG SYSTEM



T-02 BUCKLE SWITCH (RA)



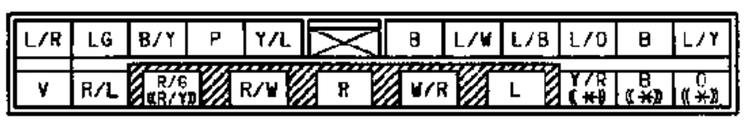
T-03 DOOR SWITCH LH (RA)

T-04 DOOR SWITCH RH (RA)

D1-01 COMBINATION SWITCH(IGNITION KEY ILLUMINATION)(F)

WITHOUT AIR BAG SYSTEM

WITH AIR BAG SYSTEM



( )...WITHOUT REAR WIPER AND WASHER

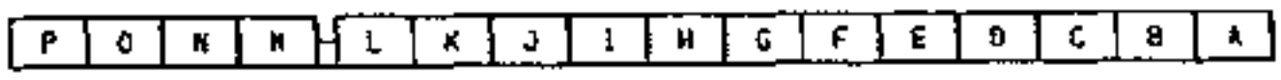
T

Inspection
1. Remove the CPU from the joint box and measure the voltage from the joint box side.
2. If not as specified, inspect the parts listed under "Inspection area" and the related wiring harnesses.
3. If the parts and wiring harnesses are OK but system still does not work properly, replace the CPU.

Terminal voltage list

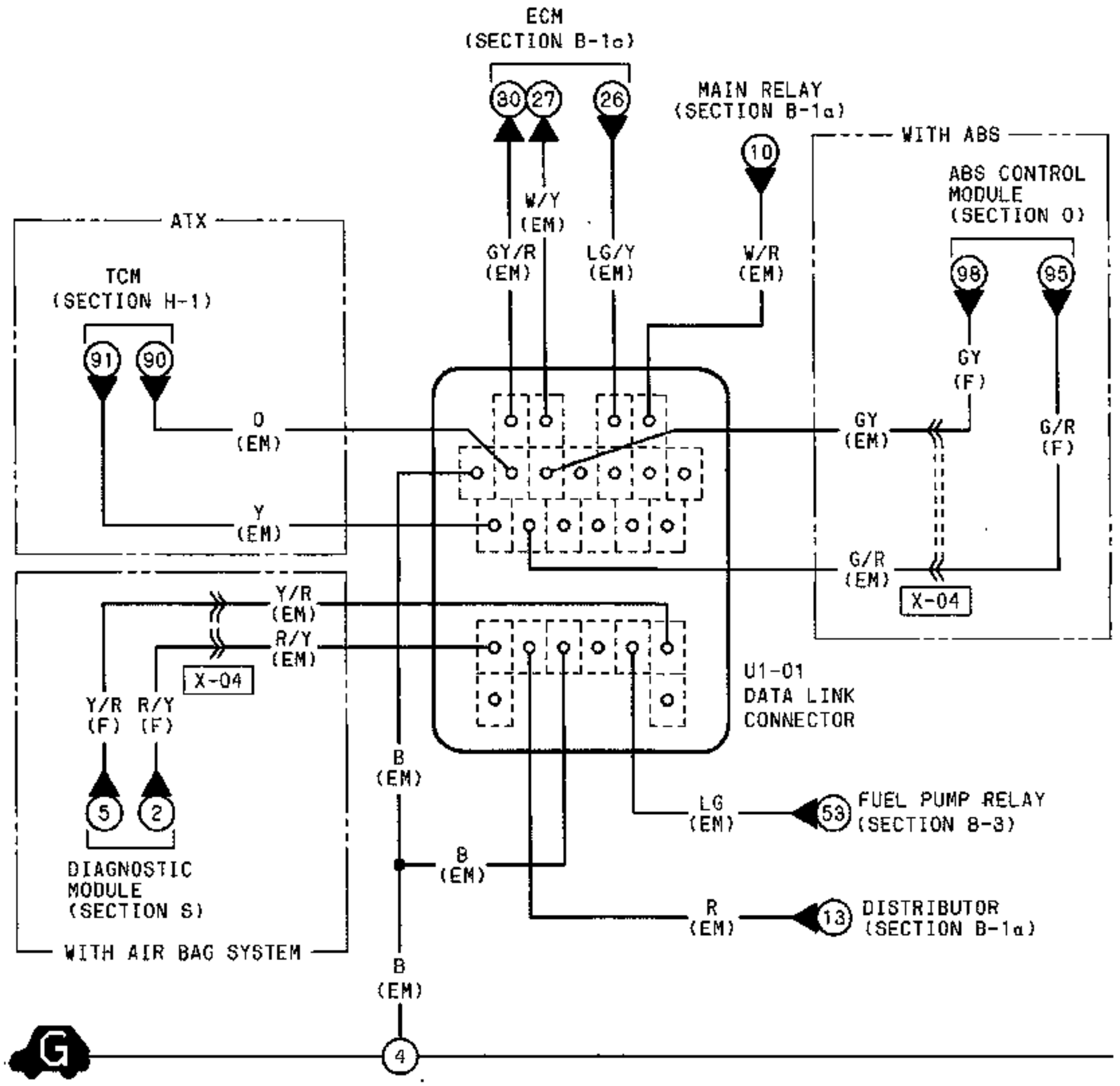
B+: Battery positive voltage

16-PIN CONNECTOR



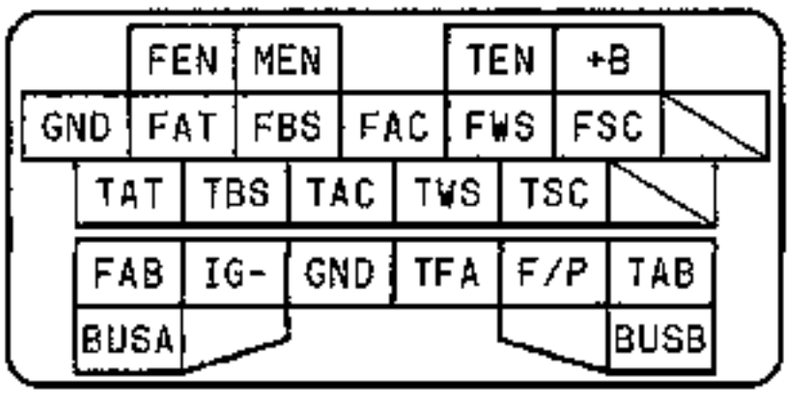
Terminal	Signal	Connection	Test condition		Voltage (V)/ Continuity	Inspection area
A	Key insert	Key reminder switch	Ignition key inserted		B+	• ROOM 15 A fuse • Key reminder switch
			Ignition key removed		0	
B	Rear wiper	Rear wiper motor	Ignition switch at ON		B+	• REAR WIPER 15 A fuse • Rear wiper motor
C	TNS	TNS relay	Headlight switch on		B+	• TAIL 15 A fuse • TNS relay • Combination switch
			Headlight switch off		0	
D	Seat belt warning	Buckle switch	Continuity inspection	Seat belt unfastened	Yes	Buckle switch
				Seat belt fastened	No	
E	—	—	—		—	—
F	Rear wiper	Rear wiper switch	Continuity inspection	Rear wiper switch on	Yes	Combination switch
				Rear wiper switch off	No	
G	Rear washer	Rear washer switch	Ignition switch at ON	Rear washer switch on	0	• METER 15 A fuse • Rear washer motor • Combination switch
				Rear washer switch off	B+	
H	—	—	—		—	—
I	—	—	—		—	—
J	Seat belt warning	Seat belt warning light	Ignition switch at ON		B+	• METER 15 A fuse • Seat belt warning light
K	CPU ground	GND	Continuity inspection		Yes	—
L	Key illumination	Ignition key illumination	Constant		B+	• ROOM 15 A fuse • Ignition key illumination
M	—	—	—		—	—
N	Interior light	Interior light switch	Interior light switch at DOOR	Any door open	0	• ROOM 15 A fuse • Interior light • Door switch
				All doors closed	B+	
O	+B	Battery	Constant		B+	ROOM 15 A fuse
P	IG 1	Ignition switch	Ignition switch at ON		B+	METER 15 A fuse

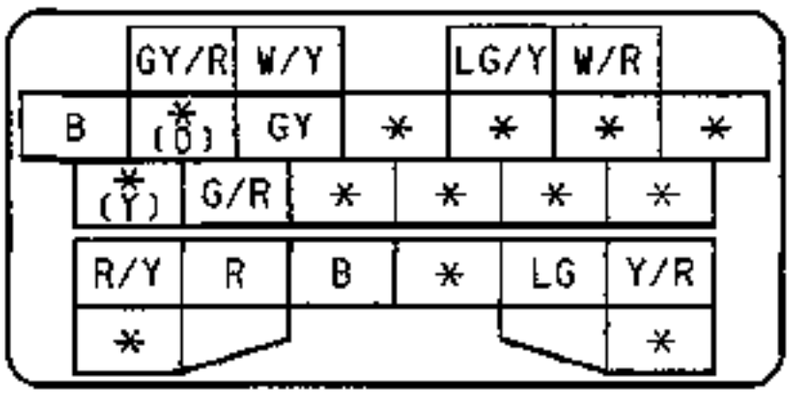
U-1 B6 DOHC ■ DATA LINK CONNECTOR



U1-01 DATA LINK CONNECTOR (EM)

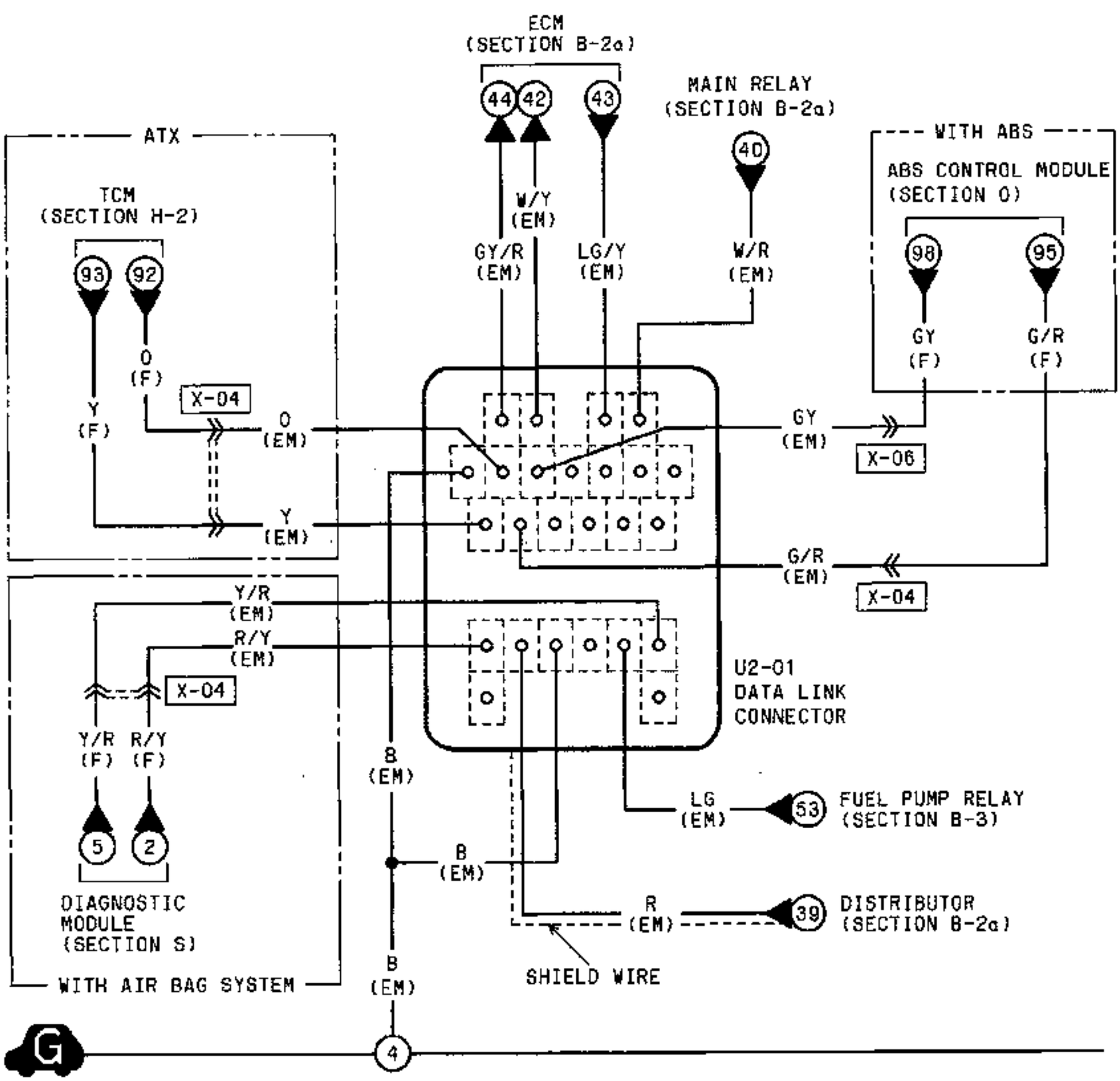
( )...ATX





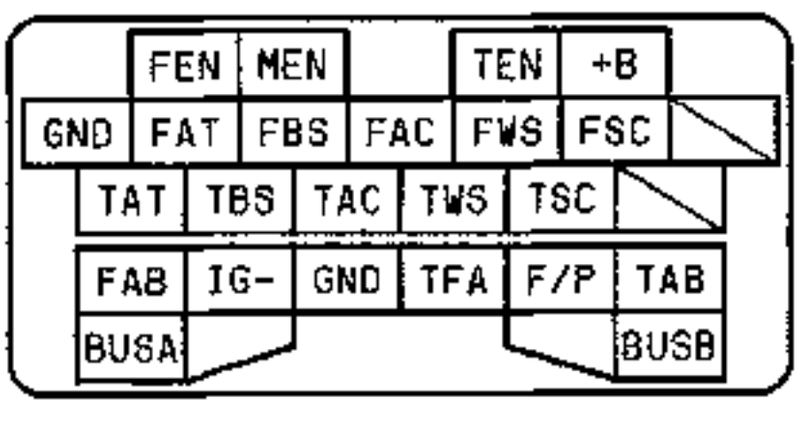
NOTES: THIS IS THE CONNECTOR AS SEEN FROM THE TERMINAL SIDE.

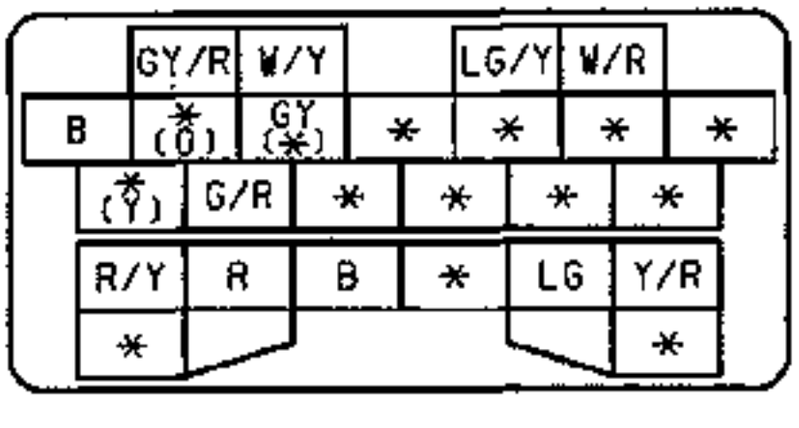
U-2 K8 DOHC ■ DATA LINK CONNECTOR



U2-01 DATA LINK CONNECTOR (EM)

( )...ATX



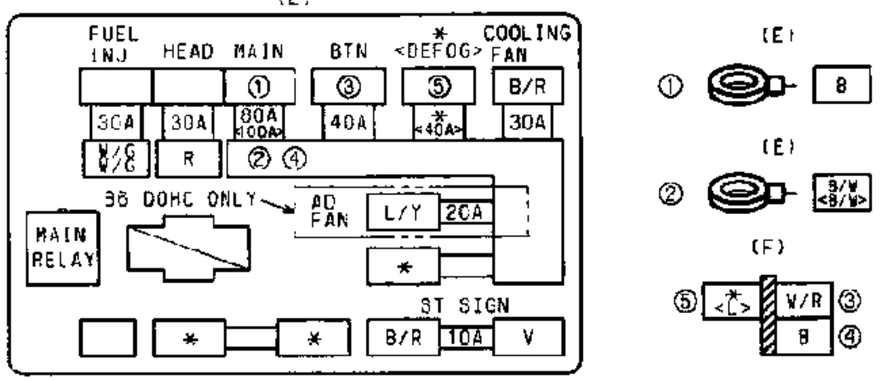


NOTES: THIS IS THE CONNECTOR AS SEEN FROM THE TERMINAL SIDE.

X-1 ■ COMMON CONNECTOR LIST

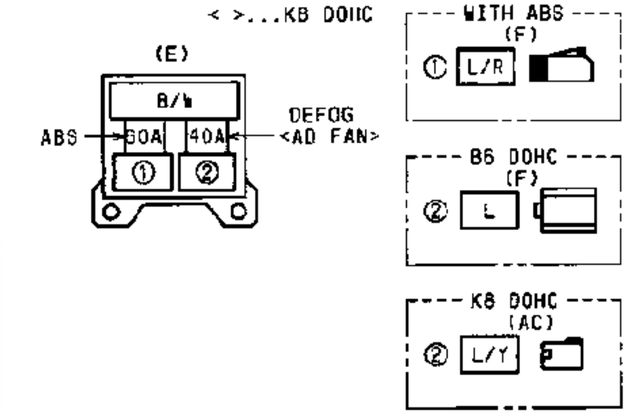
X-01 MAIN FUSE BLOCK

< >...K8 DOHC

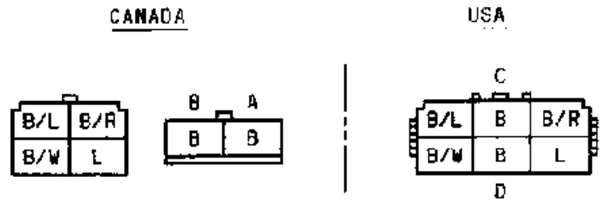


X-02 FUSE BLOCK

< >...K8 DOHC



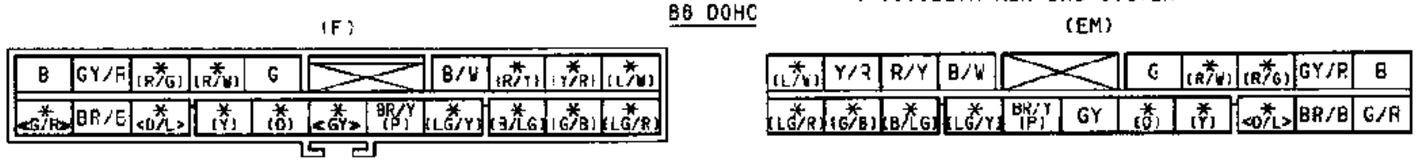
X-03 IGNITION SWITCH (F)



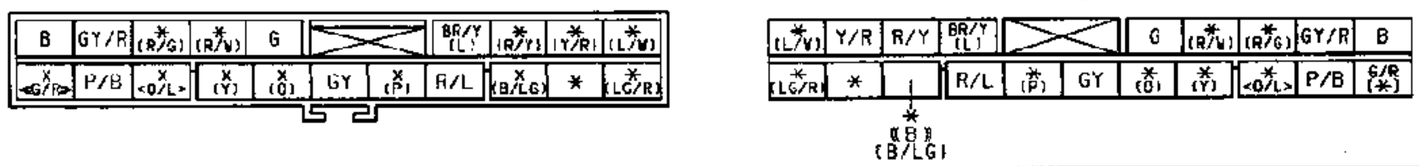
X-04 CONNECTOR BETWEEN FRONT(F) AND EMISSION(EM)

« »...CANADA MTX
( )...ATX < >...CANADA ≪ ≫...WITH ABS
{ }...WITH AIR BAG SYSTEN

B6 DOHC

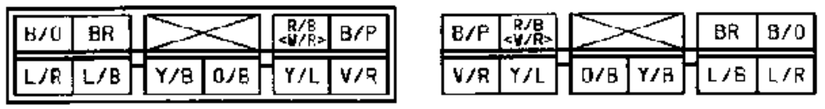


K8 DOHC



X-05 CONNECTOR BETWEEN FRONT(F) AND EMISSION(EM)

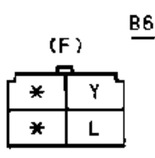
< >...K8 DOHC



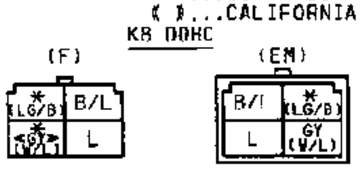
X-06 CONNECTOR BETWEEN FRONT(F) AND EMISSION(EM)

( )...ATX
< >...WITH ABS
« »...CALIFORNIA

B6 DOHC



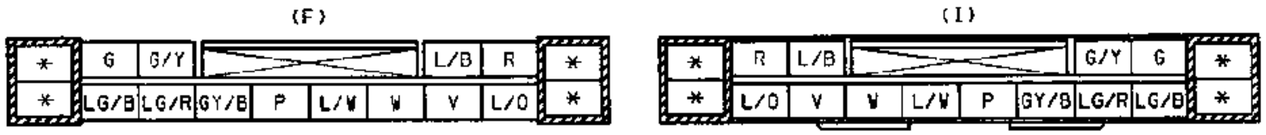
K8 DOHC



X-07 CONNECTOR BETWEEN FRONT(F) AND INSTRUMENT PANEL(I)

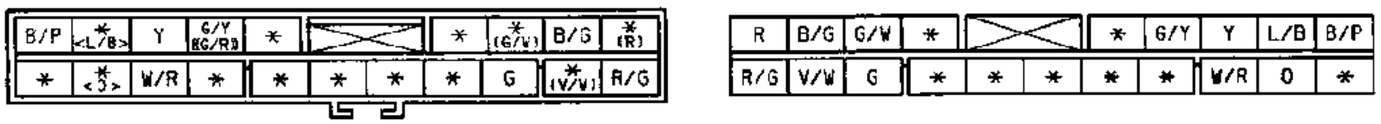
*...WITH LOGICAL MODE CONTROL « »...WITH CRUISE CONTROL

X-08 CONNECTOR BETWEEN FRONT(F) AND INSTRUMENT PANEL(I)

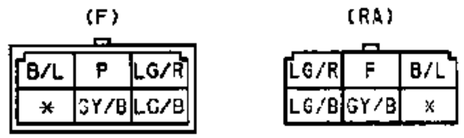


X-09 CONNECTOR BETWEEN FRONT(F) AND REAR A(RA)

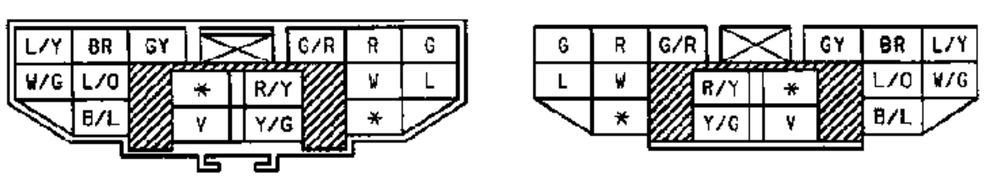
( )...ATX
« »...CANADA
< >...WITH REAR WIPER AND WASHER



X-10 CONNECTOR BETWEEN FRONT(F) AND REAR A(RA)

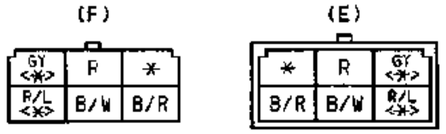


X-11 CONNECTOR BETWEEN FRONT(F) AND REAR A(RA)



X-12 CONNECTOR BETWEEN FRONT(F) AND ENGINE(E)

< >...K8 DOHC

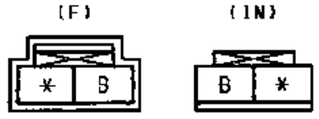


X-2 ■ COMMON CONNECTOR LIST

X-13 CONNECTOR BETWEEN FRONT(F) AND ENGINE(E)

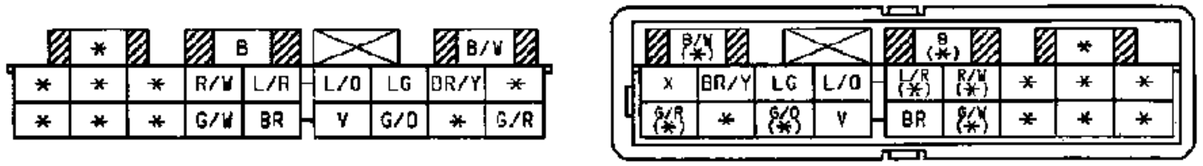
( )...WITH AIR BAG SYSTEM

X-14 CONNECTOR BETWEEN FRONT(F) AND INTERIOR LIGHT(IN)

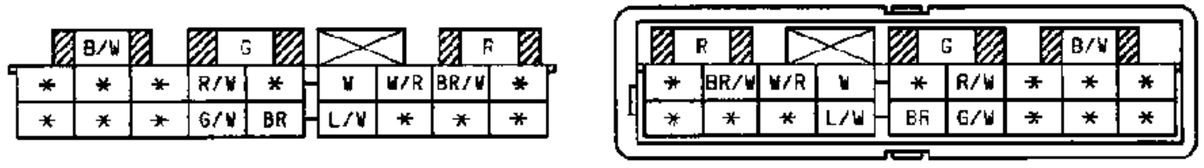


X-15 CONNECTOR BETWEEN FRONT(F) AND DOOR NO.1(DR1)

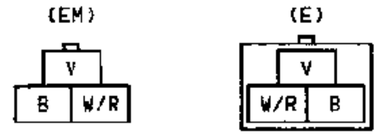
( )...WITH POWER WINDOW AND POWER DOOR LOCK



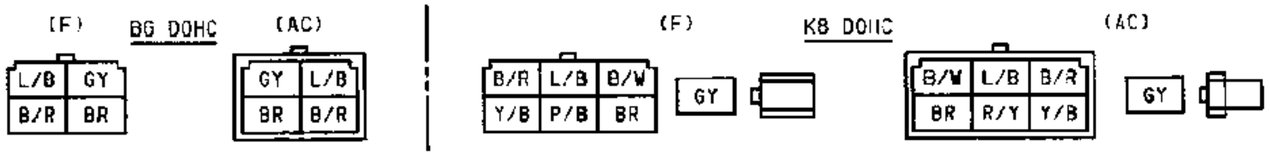
X-16 CONNECTOR BETWEEN FRONT(F) AND DOOR NO.2(DR2)



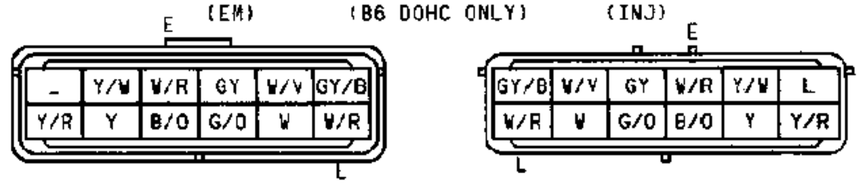
X-18 CONNECTOR BETWEEN EMISSION(EM) AND ENGINE(E)



X-17 CONNECTOR BETWEEN FRONT(F) AND A/C(AC)

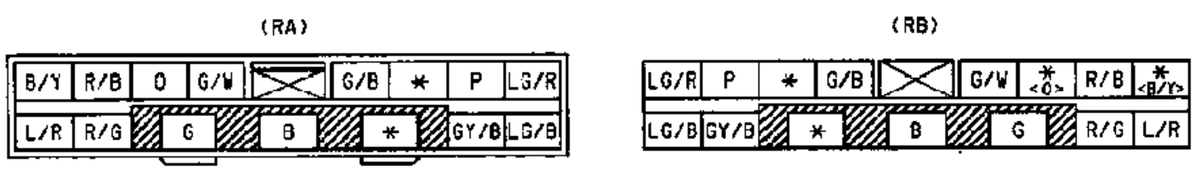


X-19 CONNECTOR BETWEEN EMISSION(EM) AND INJECTION(INJ)

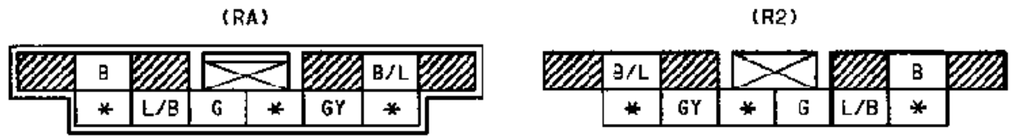


X-20 CONNECTOR BETWEEN REAR A(RA) AND REAR B(RB)

< >...WITH REAR WIPER AND WASHER

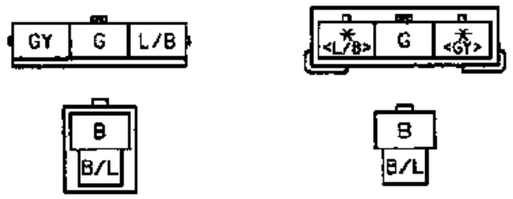


X-2' CONNECTOR BETWEEN REAR A(RA) AND REAR NO.2(R2)

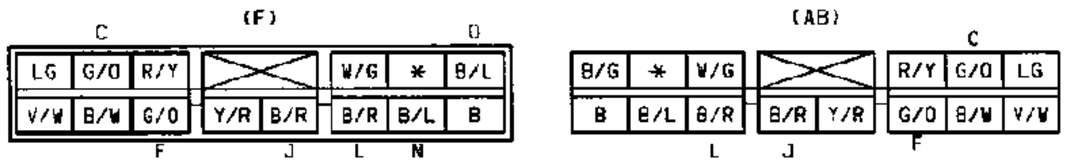


X-22 CONNECTOR BETWEEN REAR NO.2(R2) AND REAR NO.3(R3)

< >...WITH REAR WIPER AND WASHER



X-28 CONNECTOR BETWEEN FRONT(F) AND AIR BAG(AB)



X-24 JOINT CONNECTOR (F)

( )...ATX

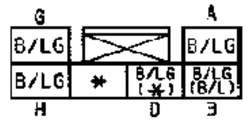
* D...WITH CRUISE CONTROL

X-25 JOINT CONNECTOR (I)

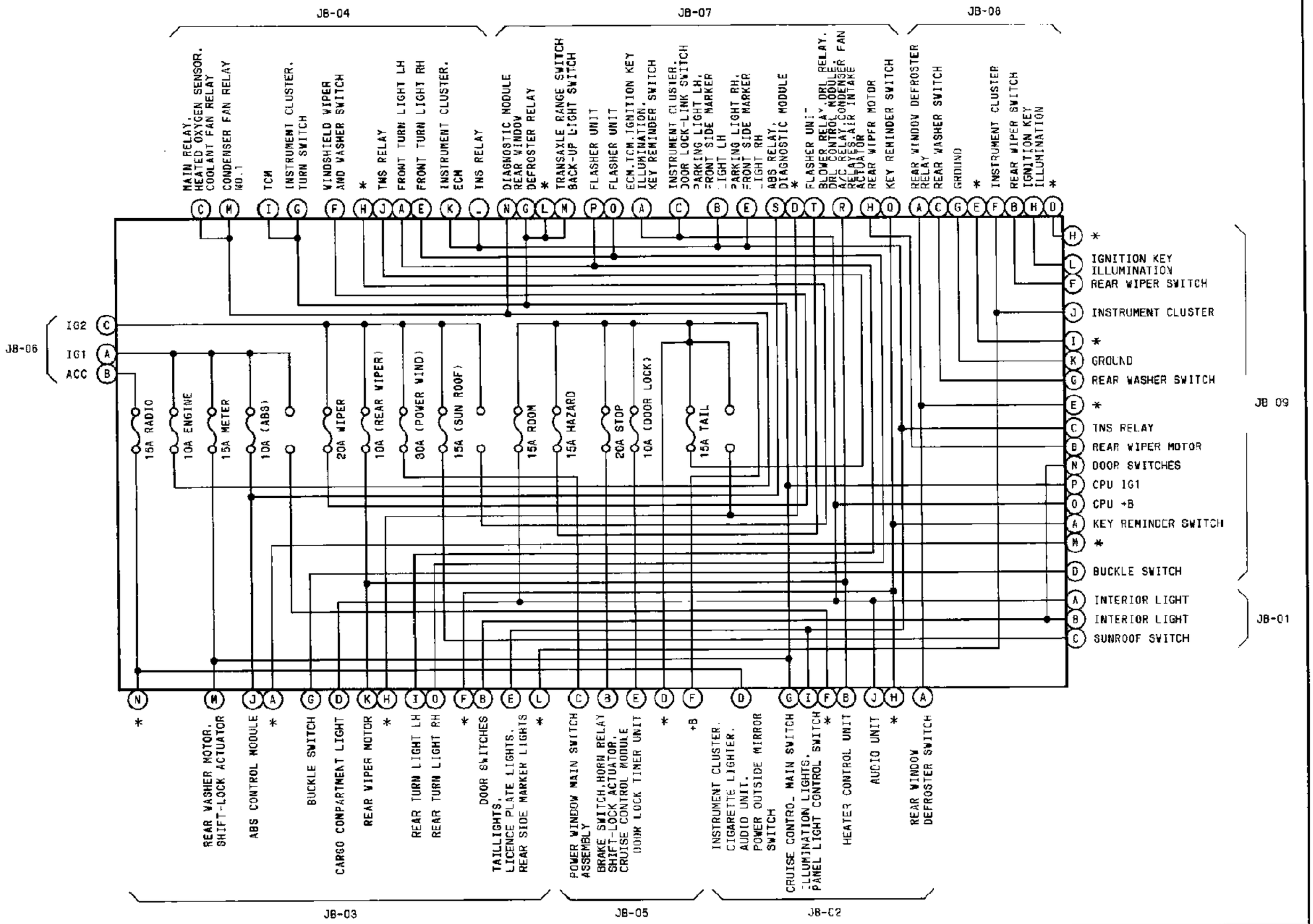
X-26 JOINT CONNECTOR (EM)

( )...K8 DOHC

( )...B6 DOHC MTX



INTERCONNECTING DIAGRAM OF JOINT BOX



JB ■ JOINT BOX

JB-01 INTERIOR LIGHT HARNESS (IN)

C	B	A
G/O	R/W	L/R

JB-02 INSTRUMENT PANEL HARNESS (I)

( )...WITH CRUISE CONTROL

J	I	G		E	C	A
L/R	R/B	*(B/Y)		*	*	Y
*	*	*	*	L/B		GY
K	H		F	D		B

JB-03 REAR A HARNESS (RA)

< >...WITH ABS

N	L	K	I		G	E	C	A
*	*	GY	G/B		L/W	R/B	*	*
G/W	B/Y	*(R/W)		*	*		L/R	R/W
O	M	J		H	F		D	B

JB-04 FRONT HARNESS (F)

( )...ATX
< >...88 DOHC

L	K	I		G	E	C	A
R/B	R/B	*(B/Y)		B/Y	G/W	B/W	G/B
*(B/W)							
M	J		H	F		D	B

JB-05 FRONT HARNESS (F)

E	C	A
W/G	B/W	*
W/R	*	G/W
F	D	B

JB-06 FRONT HARNESS (F)

C	B	A
B/R	B/W	L

JB-07 FRONT HARNESS (F)

( )...WITH AIR BAG SYSTEM
< >...WITH REAR WIPER AND WASHER

S	Q	O	M				G	E	C	A
*(LG)	W	G/W	B/Y				B/Y	R/B	L/R	L/R
B/R	GY	G/B	*(B/W)	*	*	*<L/B>	*	*		R/B
T	R	P	N	L	J	H	F	D		B

JB-08 FRONT HARNESS (F)

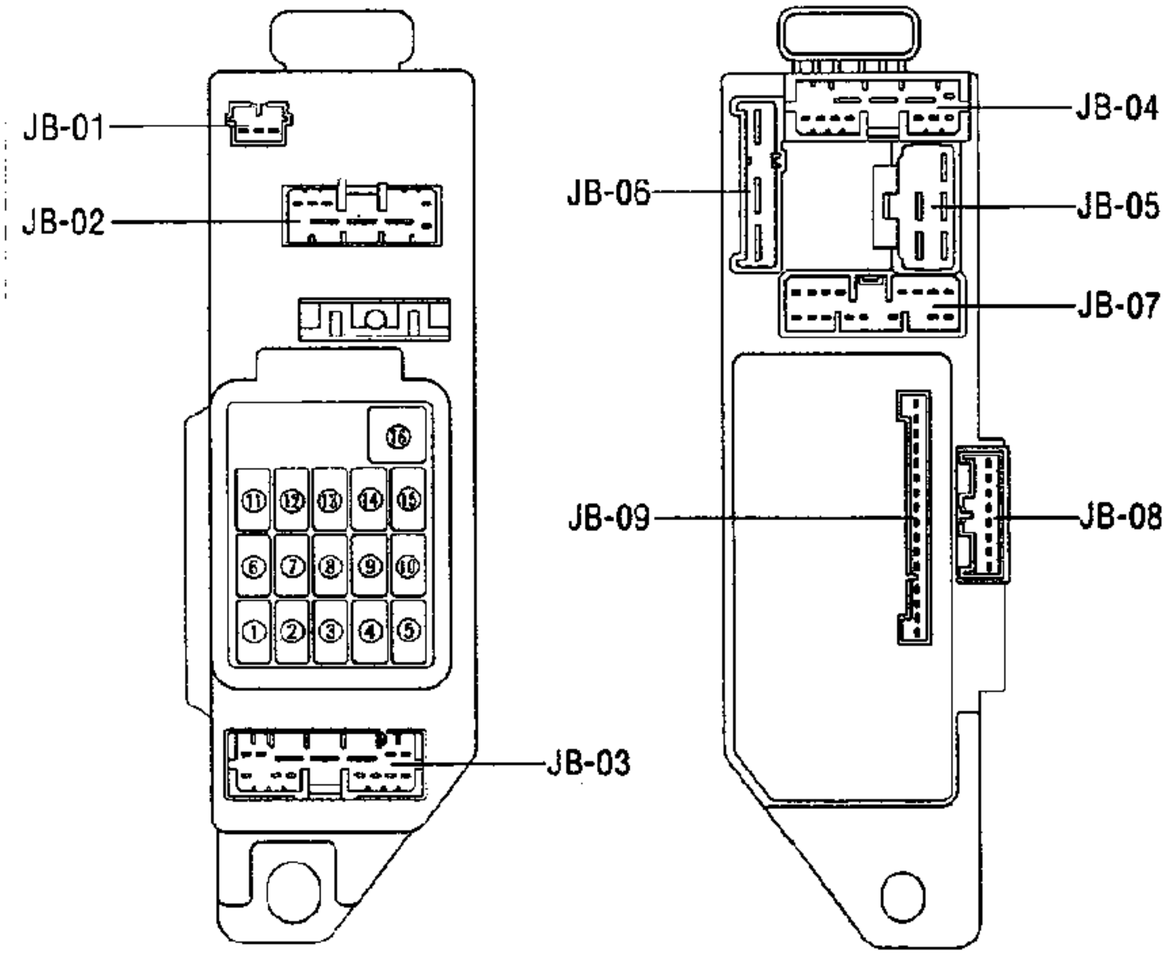
< >...WITH REAR WIPER AND WASHER

H	G	F	E	D	C	B	A
V	B	LG/R	*	*	*<O>	*<Y/R>	Y

JB-09 CPU (IN THE JOINT BOX)

P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A

JB



No.	CIRCUIT NAME	FUSE	COLOR CODE	No.	CIRCUIT NAME	FUSE	COLOR CODE
①	(REAR WIPER)	10A	R	⑨	METER	15A	L
②	HAZARD	15A	L	⑩	WIPER	20A	Y
③	ROOM	15A	L	⑪	STOP	20A	Y
④	ENGINE	10A	R	⑫	TAIL	15A	L
⑤	RADIO	15A	L	⑬	(SUN ROOF)	15A	L
⑥	(DOOR LOCK)	10A	R	⑭	(ABS)	10A	R
⑦	——	—	—	⑮	——	—	—
⑧	(POWER WIND)	30A	G	⑯	——	—	—

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