RX-7
Factory Service Material

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This includes

1993 Factory Service Manual
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1995 Printed Microfiche of all parts
1989 Printed Microfiche of all parts*
1990 Printed Microfiche of all parts*
1986 Printed Microfiche of all parts*
1987 Printed Microfiche of all parts*
1988 Printed Microfiche of all parts*

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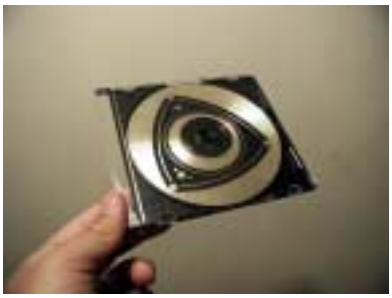
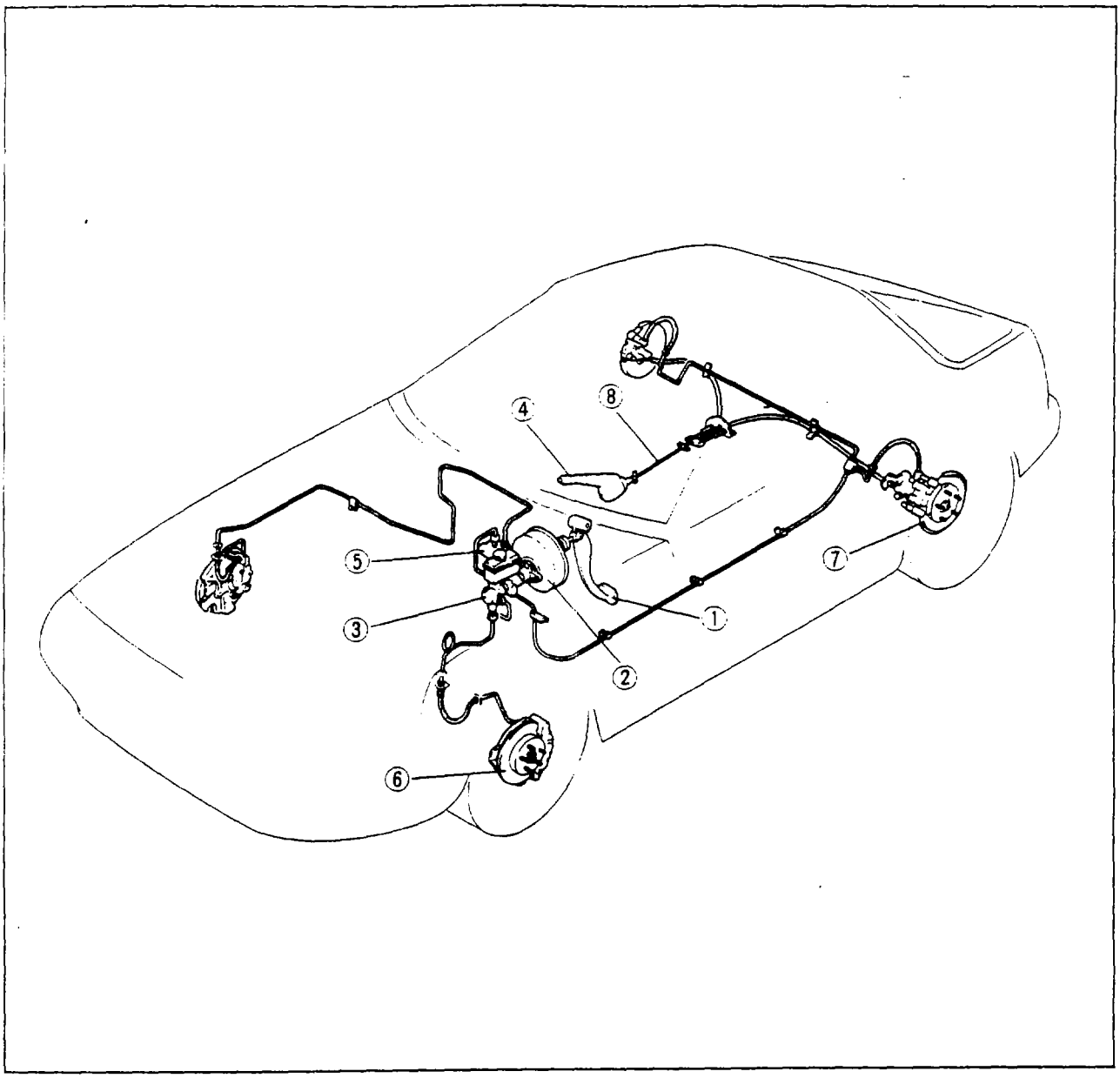


* These works are currently in process and may or not be readily available upon request. They will be hosted on the same link above and for download

BRAKING SYSTEM

OUTLINE

STRUCTURAL VIEW



67U11X-002

1. Brake pedal
2. Power brake unit
3. Brake master cylinder
4. Parking brake lever
5. Proportioning bypass valve
6. Front disc brake
7. Rear disc brake
8. Parking brake cable

SPECIFICATIONS

Item		Specifications
Brake pedal	Type	Suspended
	Pedal lever ratio	4.5
	Max. stroke mm (in)	136 (5.35)
Master cylinder	Type	Tandem (with level sensor)
	Bore mm (in)	22.22 (0.875)
Front disc brake	Type	Disc (ventilated)
	Cylinder bore mm (in)	50.80 (2.00) ..... 14 in. wheel vehicle 36.12 (1.42) .. Except 14 in. wheel vehicle
	Pad thickness mm (in)	9 (0.35). ..... 14 in. wheel vehicle 11 (0.43)..... Except 14 in. wheel vehicle
	Disc plate dimensions mm (in) (effective diameter x thickness)	204 x 22 (8.03 x 0.87) ..... 14 in. wheel vehicle 230 x 22 (9.06 x 0.87) Except 14 in. wheel vehicle
Rear disc brake	Type	Disc (solid)..... 14 in. wheel vehicle Disc (ventilated) ... Except 14 in. wheel vehicle
	Cylinder bore mm (in)	34.93 (1.38)
	Pad dimensions mm^2 x mm (area x thickness) $(in^2$ x in)	32 x 8 (1.26 x 0.31)
	Disc plate dimensions mm (in) (effective diameter x thickness)	225 x 10 (8.86 x 0.40) ..... 14 in. wheel vehicle 237 x 20 (9.33 x 0.79) .... Except 14 in. wheel vehicle
Power brake unit	Type	Vacuum multiplier
	Size mm (in)	203.3 (8)..... 14 in. wheel vehicle 228.6 (9) .. Except 14 in. wheel vehicle
Braking force control device	Type	Proportioning Bypass Valve (PBV)
Brake fluid		FMVSS 116, DOT-3 or DOT-4 or SAEJ1703
Parking brake	Type	Auto adjustment, rear brake
	Operation system	Lever

87U11X-002

TROUBLESHOOTING GUIDE

Problem	Possible cause	Remedy	Page
Poor braking	Leakage of brake fluid	Repair	
	Air in lines	Air bleed	11—10
	Worn pad	Replace	11—23,30,35
	Brake fluid, grease, oil or water on pad	Clean or replace	—
	Hardening of pad surface, or poor contact	Grind or replace	—
	Malfunction of disc brake piston	Replace	11—27,32,38
	Malfunction of master cylinder	Repair or replace	11—15
	Malfunction of power brake unit	Repair or replace	11—20
	Malfunction of check valve (vacuum hose)	Repair or replace	11—18
	Damaged vacuum hose	Replace	—
	Deterioration of flexible hose	Replace	—
	Malfunction of P.B.V.	Replace	11—24
Brakes pull to one side	Worn pad	Replace	11—23,30,35
	Brake fluid, grease, oil or water on pad	Clean or replace	—
	Hardening of pad surface, or poor contact	Grind or replace	—
	Abnormal wear, distortion or eccentricity of disc	Repair or replace	—
	Malfunction of automatic adjuster in rear brake	Replace	11—38
	Looseness or deformation of dust cover mounting bolt	Tighten or replace	—
	Malfunction disc brake piston	Repair or replace	11—27,32,38
	Malfunction of pad	Repair or replace	11—23,30,35
	Improper adjustment of wheel bearing preload, or wear	Refer to Section 9	
	Improper adjustment of wheel alignment	Refer to Section 10	
	Unequal tire air pressures	Refer to section 12	
Brakes do not release	No brake pedal play	Adjust	11— 6
	Improper adjustment of operating rod or push rod	Adjust	11— 6
	Clogged master cylinder return port	Clean	11—15
Brakes do not release	Pad does not return properly	Repair	11—27,32,38
	Improper return due to malfunction of piston seal of disc brakes	Replace	11—27,32,38
	Excessive runout of disc plate	Replace	11—26,31,36
	Improper return of parking brake cable, or improper adjustment	Repair or adjust	11—42
	Improper adjustment of wheel bearing preload	Refer to Section 9	
Pedal goes too far (Too much pedal stroke)	Air in system due to insufficient brake fluid	Add fluid and bleed air	11—10
	Improper adjustment of pedal play	Adjust	11— 6
	Worn pad	Replace	11—23,30,35
	Air in lines	Air bleed	11—10
	Abnormal wear of pad	Replace	11—23,30,35
Abnormal noise or vibration during braking	Worn pad	Replace	11—20,26
	Deterioration of pad surface	Grind or replace	11—23,30,35
	Brakes do not release	Repair	11—27,32,38
	Foreign material or scratches on disc plate contact surface	Clean	—
	Looseness of caliper mounting bolt(s)	Tighten	11—26,31,36
	Damage or deviation of disc contact surface	Replace	11—26,31,36
	Poor contact of pad	Repair or replace	11—27,32,38
	Insufficient grease on sliding parts	Apply grease	—
Parking brake does not hold well	Excessive lever stroke	Adjust	11— 6
	Brake cable stuck or damaged	Repair or replace	11—42
	Brake fluid or oil on pad	Clean or replace	11—23,30,35
	Hardening of pad surface, or poor contact	Grind or replace	11—23,30,35

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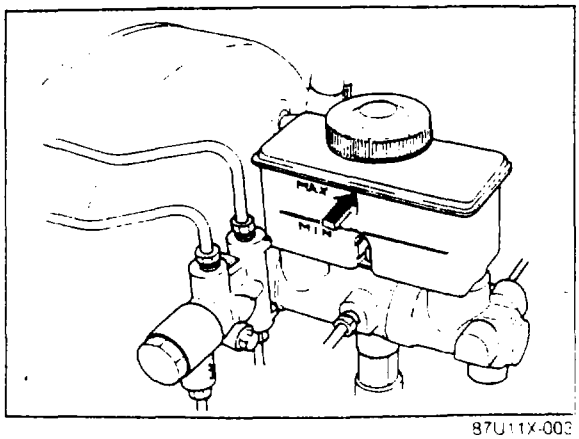


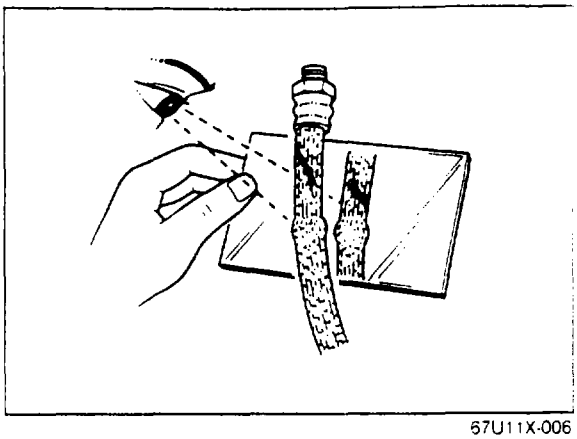
87U11X-003

ON-VEHICLE MAINTENANCE

BRAKE FLUID LEVEL

1. Clean the area around the reservoir and the reservoir cap.
2. Check the fluid level. If the level is near or below the "MIN" mark, add brake fluid to "MAX" mark.

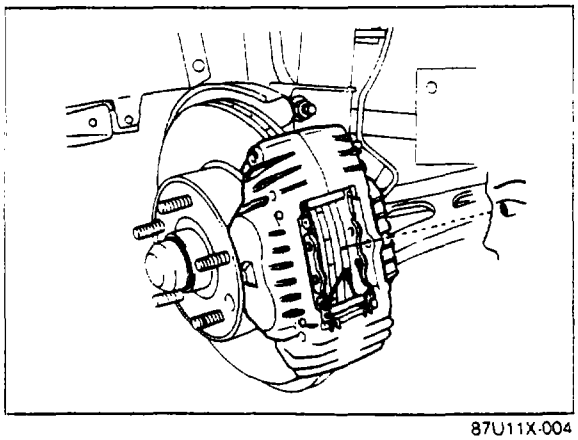
Fluid specification:
DOT-3 or DOT-4
(FMVSS 116, or SAEJ1703)



67U11X-006

BRAKE LINE

Check the points below. Replace parts if necessary.
1. Cracking, damage or corrosion of the brake hose.
2. Damage to the brake hose threads.
3. Scars, cracks or swelling of the flexible hose.
4. All lines for fluid leakage.

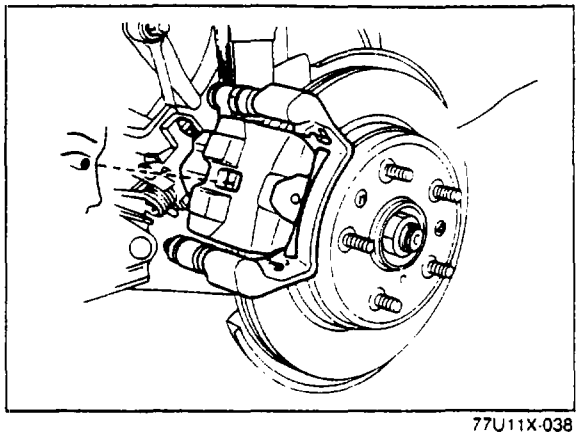


87U11X-004

SIMPLE INSPECTION OF DISC PAD

Front

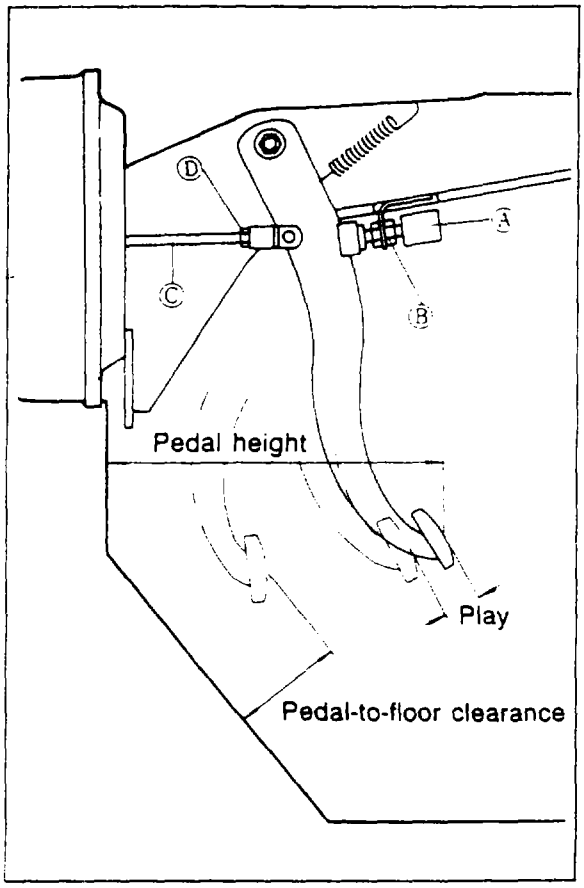
1. Jack up the front of the vehicle, and support it with safety stands.
2. Remove the wheels.
3. Check that the remaining pad thickness is more than **1 mm (0.04 in)** through the caliper hole.



77U11X-038

Rear

1. Jack up the rear of the vehicle, and support it with safety stands.
2. Remove the wheels.
3. Check that the remaining pad thickness is more than **1 mm (0.04 in)** through the caliper hole.



67U11X-009

PEDAL HEIGHT

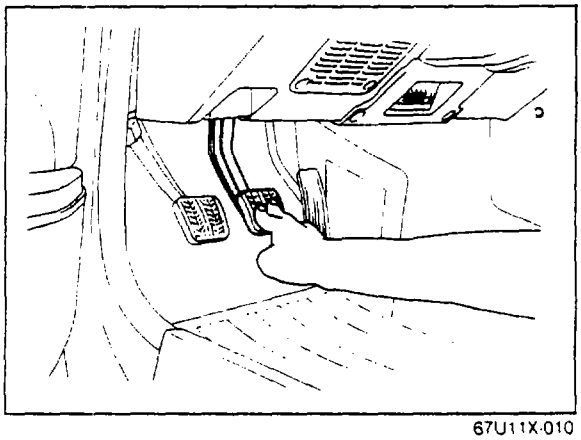
Inspection

Check that the distance from the center of the upper surface of the pedal pad to the firewall is as specified.

Pedal height: 205 $^{+5}_{0}$ mm (8.07 $^{+0.20}_{0}$ in)

Adjustment

1. Disconnect the connector of the stop switch.
2. Loosen lock nut Ⓑ, turn the switch Ⓐ so it does not contact the pedal.
3. Loosen lock nut Ⓓ, and turn rod Ⓒ to adjust the height.
4. Adjust the pedal free play and tighten operating rod lock nut Ⓓ.
5. Turn the stop switch until it contacts the pedal, and turn an additional 1/2 turn. Tighten the lock nut.



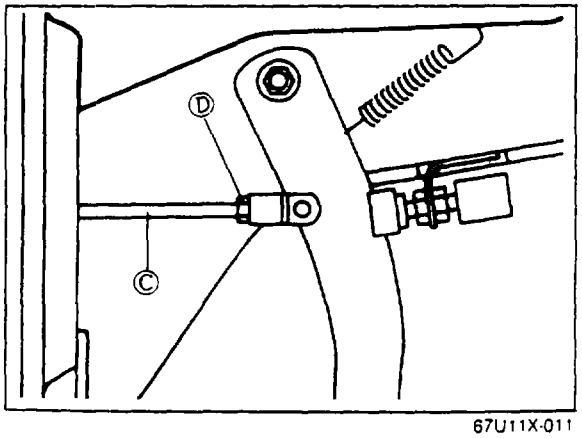
67U11X-010

PEDAL PLAY

Inspection

1. Depress the pedal a few times in order to eliminate the vacuum in the vacuum line.
2. Lightly depress the pedal by hand and check the free play.
   (Until the valve plunger contacts the stopper plate; until resistance is felt).

Pedal play: 4—7 mm (0.16—0.28 in)



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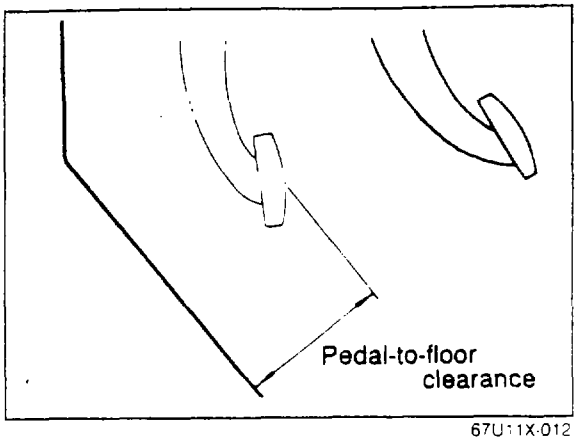
Adjustment

1. Loosen lock nut Ⓓ or rod Ⓒ, and turn the rod to adjust the free play.
2. Tighten lock nut Ⓓ.



67U11X-012

PEDAL-TO-FLOOR CLEARANCE

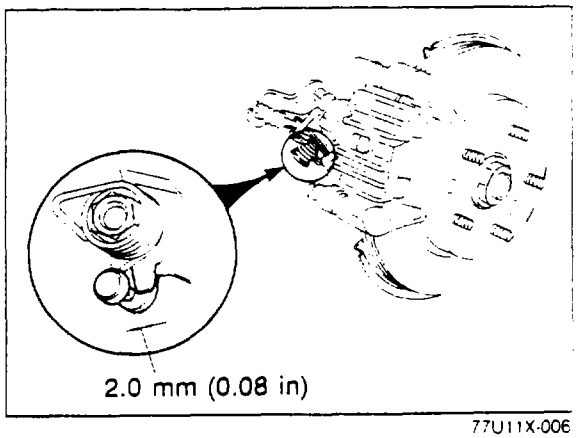
Inspection

Check that the distance from the floor panel to the center of the upper surface of the pedal pad is as specified when the pedal is depressed with a force of **588 N (60kg, 132 lb)**.

Pedal-to-floor clearance: 100 mm 3.94 (in) min.

If the distance is less than the standard value, check as described below.

1. Air in the brake system.
2. Malfunction of the automatic adjuster.



77U11X-006

PARKING BRAKE LEVER STROKE

Inspection

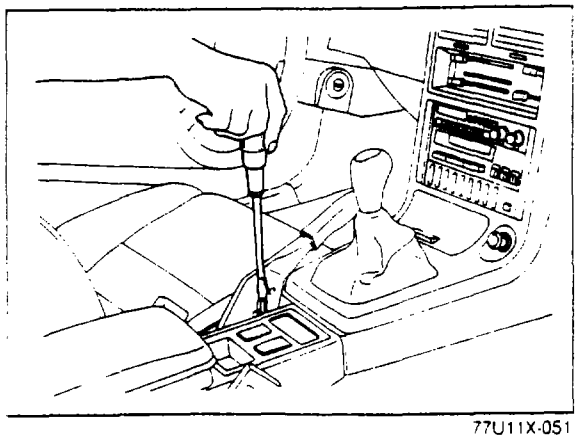
1. Depress the brake pedal several times.
2. Check that the clearance between the lever and stopper pin at the rear brake caliper is less than **2 mm (0.08 in.)**
   If the clearance is not less than **2 mm (0.08 in.)**, turn the adjust nut counterclockwise to lengthen the parking brake cable.
3. Check that the stroke is as specified when the parking brake lever is pulled with a force of **98 N (10 kg, 22 lb)**.

Stroke: 4—5 notches

Adjustment

1. Jack up the rear of the vehicle until the wheels are free to turn, then support it with stands.
2. Depress the brake pedal several times.
3. Turn the adjust nut to adjust.
4. Check that the parking brake warning light illuminates when the brake lever is pulled one notch.
5. Lower the vehicle.

Caution
Check that the brakes are not dragging before lowering the vehicle.

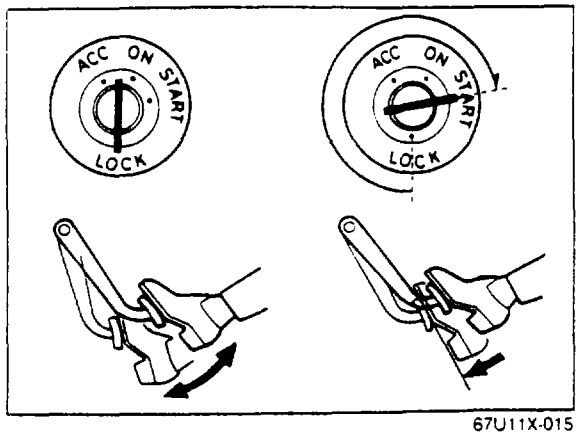


77U11X-051

POWER BRAKE UNIT

First Step

1. With the engine stopped, depress the pedal a few times.
2. With the pedal depressed, start the engine
3. If the pedal moves down slightly immediately after the engine starts, the unit is functioning.



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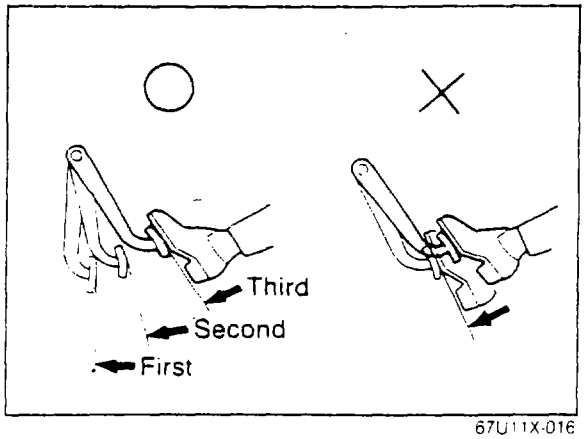
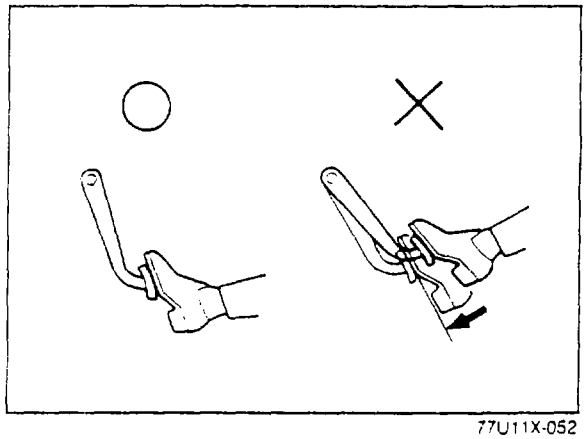


67U11X-016

Second Step

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 functioning.
5. If there is a problem, check for damage of the check valve or vacuum hose, and check for proper connection. Repair if necessary, and check once again.



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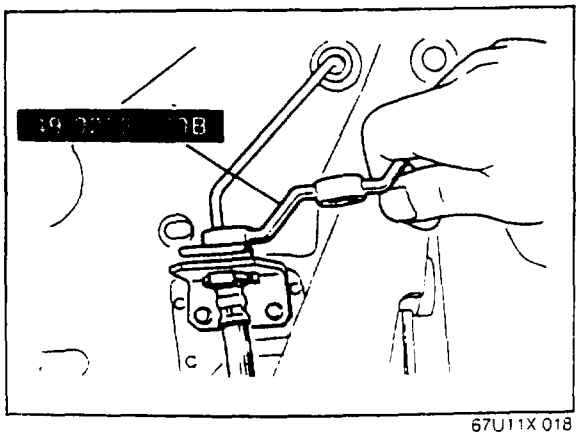
Third Step

1. Start the engine.
2. Depress the pedal with the usual force.
3. Stop the engine with the pedal still depressed.
4. Hold the pedal down for **about 30 seconds**.
5. If the pedal height does not change, the unit is functioning.
6. If there is a problem, check for damage of the check valve or vacuum hose, and check for proper connection. Repair if necessary, and check once again.

If the nature of the problem is still not clear after following the 3 steps above, follow the more detailed check described in "Method using a tester". See page 11—17.



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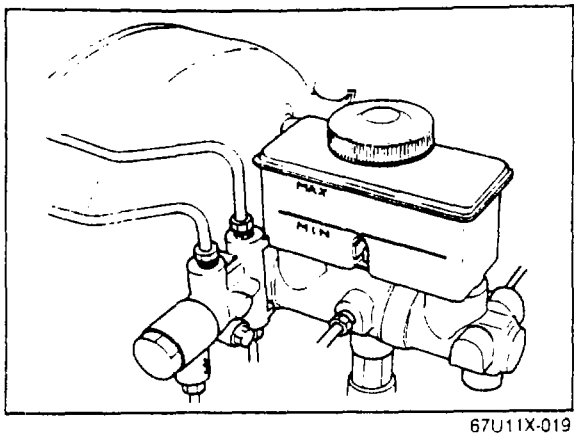

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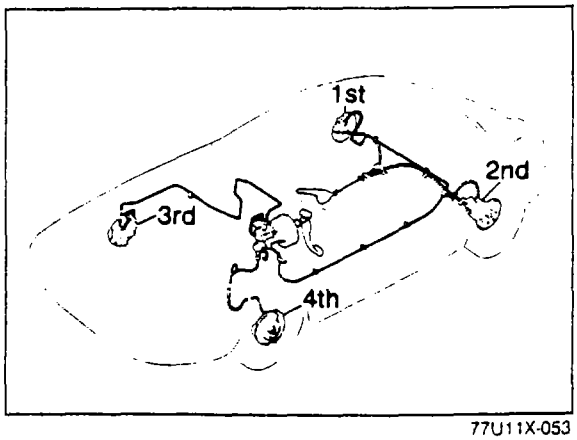


77U11X-053

BRAKE HYDRAULIC LINE

REMOVAL AND INSTALLATION

1. When disconnecting the flexible hose and brake line, remove the clip after loosening the flare nut.
2. When connecting the flexible hose, do not over tighten or twist.
3. Check that it does not contact other parts when the vehicle bounces, or when the steering wheel is turned all the way to the left or right.
4. Bleed the air from the brake system.

Caution
Do not allow the brake fluid to get on painted surfaces.

REPLACEMENT OF BRAKE FLUID

1. Suck the brake fluid from the reservoir using the suction pump.
2. Fill the reservoir with new brake fluid.
3. Attach a vinyl tube to the bleeder screw and place the other end of the vinyl tube in a container.
4. Pump out the old brake fluid by loosening the bleeder screws one by one and pumping the brake pedal.
5. Bleed air as described on page 11—10.

AIR BLEEDING

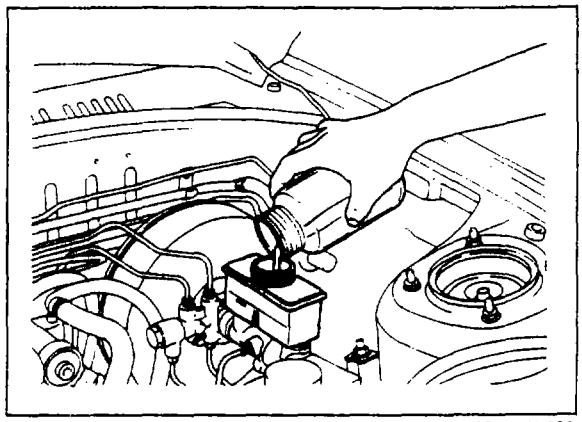
Air Bleeding Locations

After repairs, air bleed as follows:

Disassembled parts			Air bleeding locations			
			Front		Rear	
			Right side	Left side	Right side	Left side
Master cylinder			*	*	*	*
Caliper	Front	Right side	*	—	—	—
		Left side	—	*	—	—
	Rear	Right side	—	—	*	—
		Left side	—	—	—	*
Proportioning bypass valve (P.B.V)			*	—	*	*

* indicates locations where air bleeding is necessary.

67U11X-021



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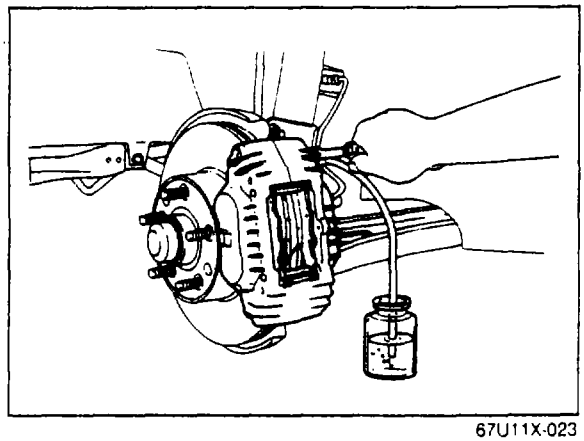


67U11X-023

Air Bleeding Procedure

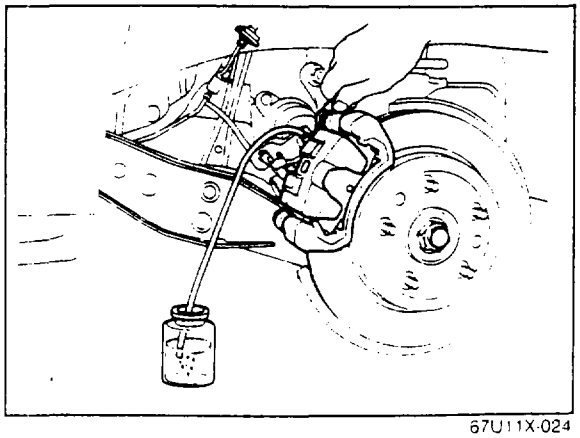
Caution

a) The fluid in the reservoir must be maintained at the 3/4 level or higher during air bleeding.

b) Be careful not to spill brake fluid onto painted surfaces.

Front brake

1. Jack up the vehicle and support it with 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 container and keep the tube end immersed in brake fluid during air bleeding.
4. Pump the brake pedal several times.
5. While the brake pedal is depressed, loosen the bleeder screw to let fluid and air escape.
6. Repeat steps 4 and 5 until there are no air bubbles in the fluid.
7. Check for correct brake operation.
8. Check that there is no fluid leakage. Be sure to clean away any spilled fluid with rags.
9. After bleeding the air, add brake fluid to the reservoir up to the specified level.



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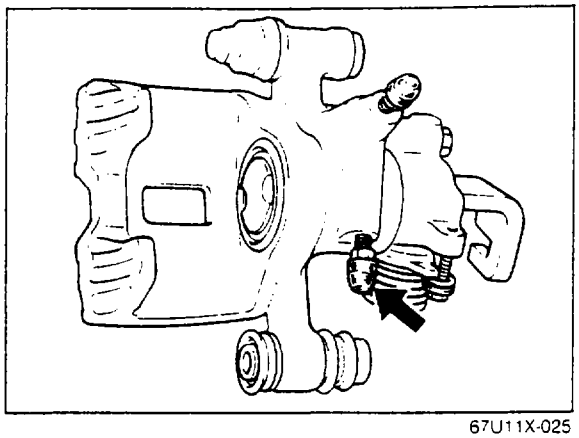
Rear brake

After brake fluid replacement:
Bleed air by using the upper bleeder screw.
Air bleeding procedure is done in the same manner as the air bleeding of the front brakes.



67U11X-025

After disassembling the caliper:
Bleed air by using the lower bleeder screw.
Air bleeding procedure is done in the same manner as the air bleeding of the front brakes.

BRAKE PEDAL

REMOVAL AND INSTALLATION

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.
3. After installation, check and adjust the pedal height and play.

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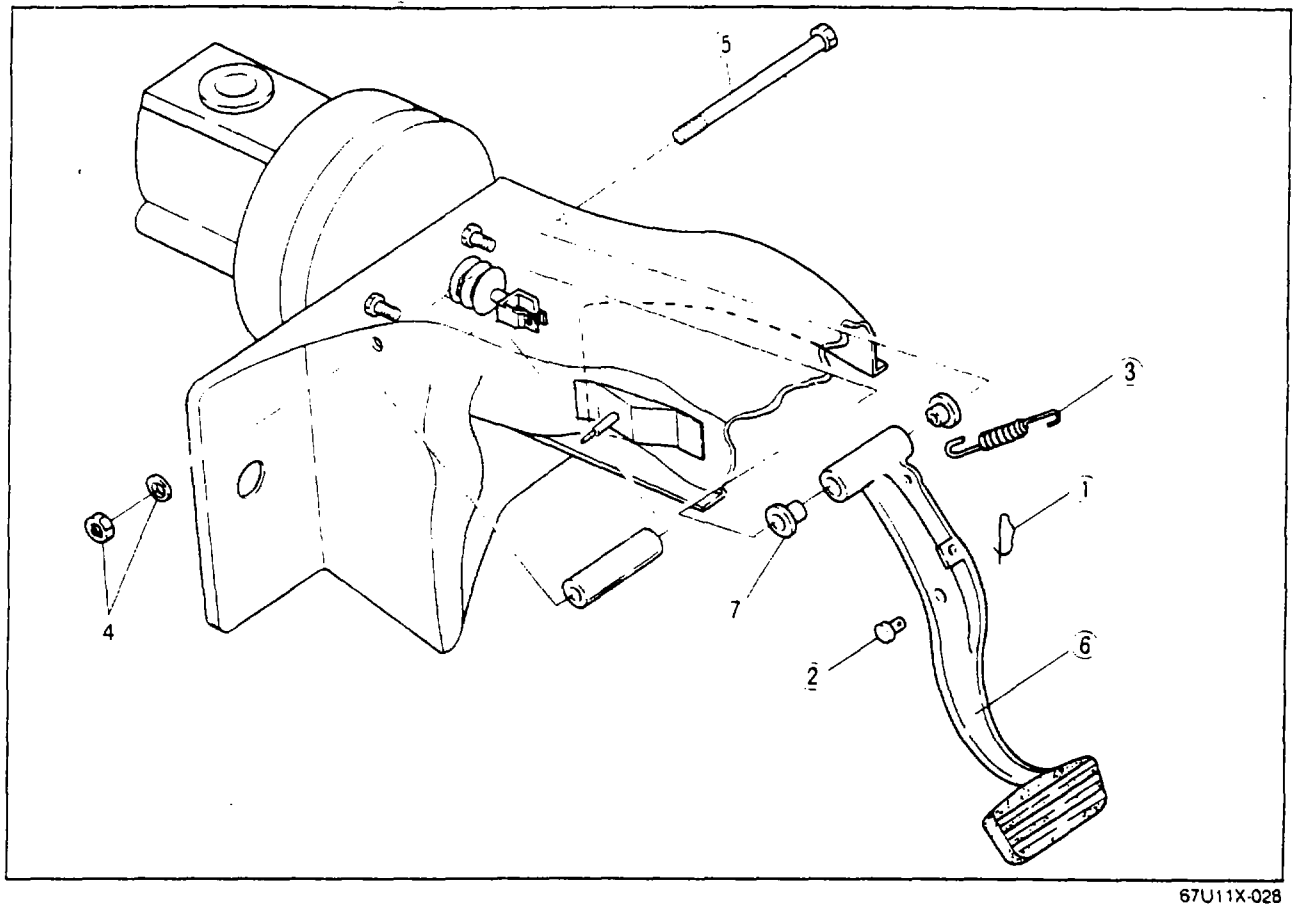

67U11X-028

1. Cotter pin
2. Clevis pin
3. Return spring
4. Nut
5. Bolt
6. Pedal
7. Bushing

Caution
Apply grease to the inner surface of the bushing, and to the contact surfaces of the clevis pin and spring.

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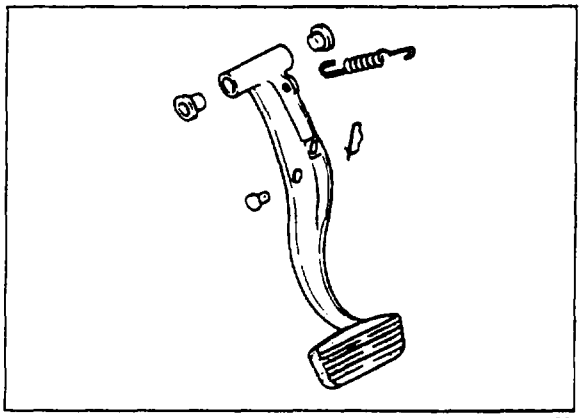

67U11X-029

INSPECTION

Check the following points. Replace parts if necessary.

1. Bushing for wear.
2. Pedal for bending.
3. Pedal pad for wear or damage.
4. Bolt for bending.
5. Return spring for weakness or damage.
6. Pedal pad for wear.

MASTER CYLINDER

REMOVAL AND INSTALLATION

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.
3. After installation, fill with brake fluid and bleed the air, then check each part for fluid leakage.

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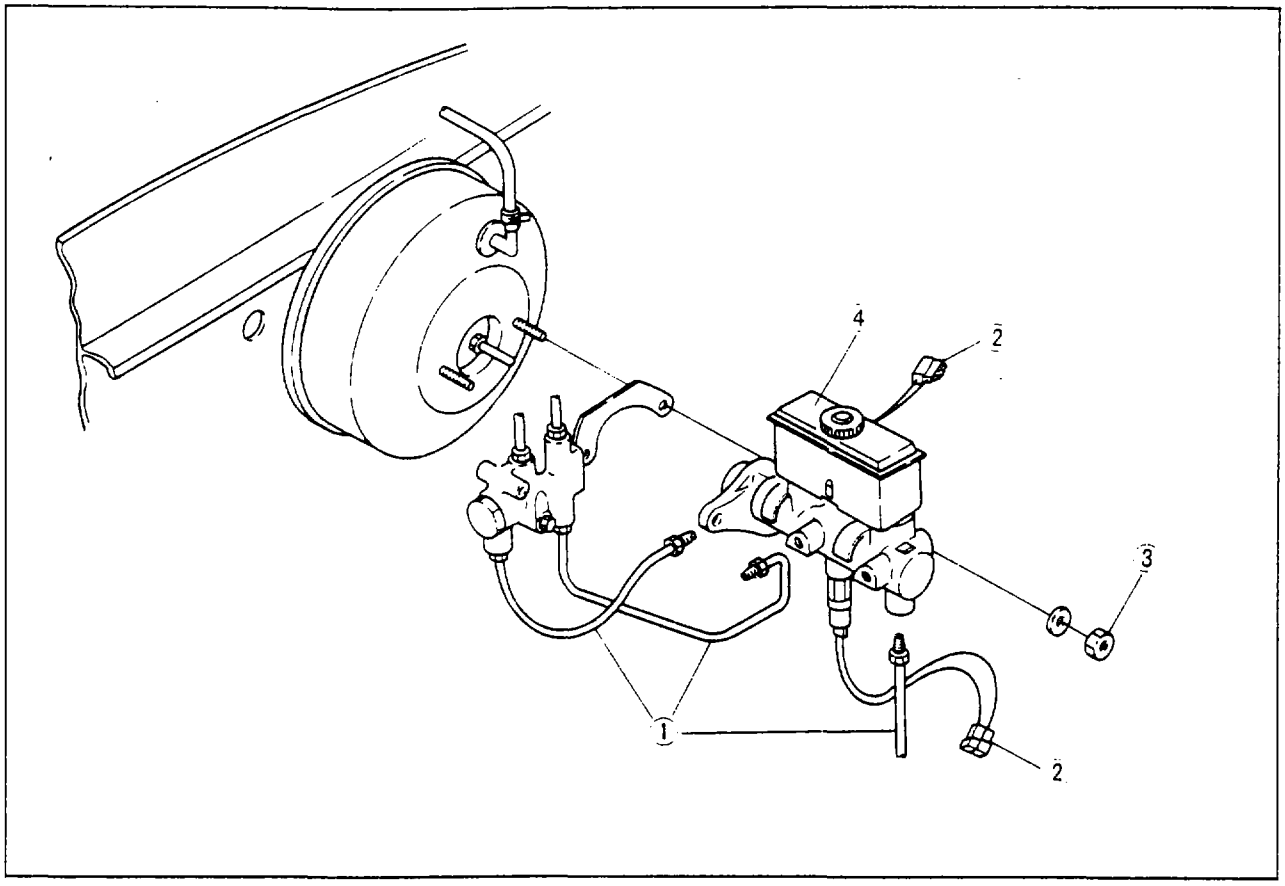

67U11X-031

1. Brake pipe
2. Harness coupler
3. Nut
4. Reservoir and master cylinder

Caution
Brake fluid will damage painted surfaces. If it does get on a painted surface, wipe it off immediately.

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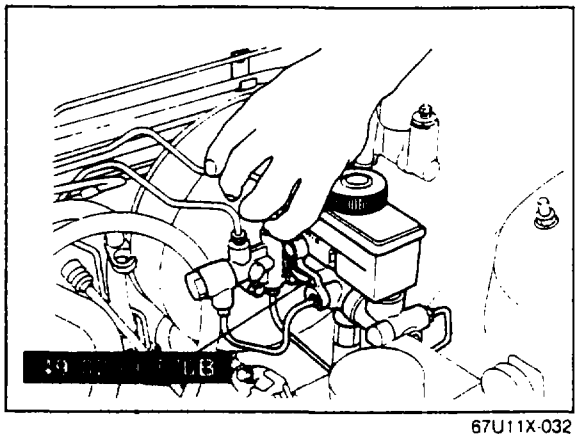
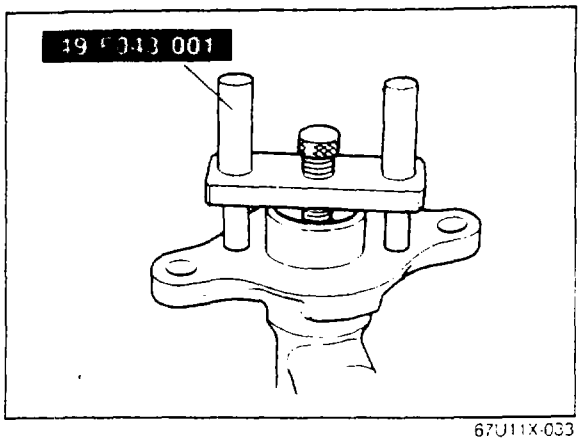


67U11X-032

Brake pipe

1. Place rags under the master cylinder to avoid dripping brake fluid on painted surfaces.
2. Disconnect the brake pipe from the master cylinder using **flare nut wrench** (49 0259 770B).



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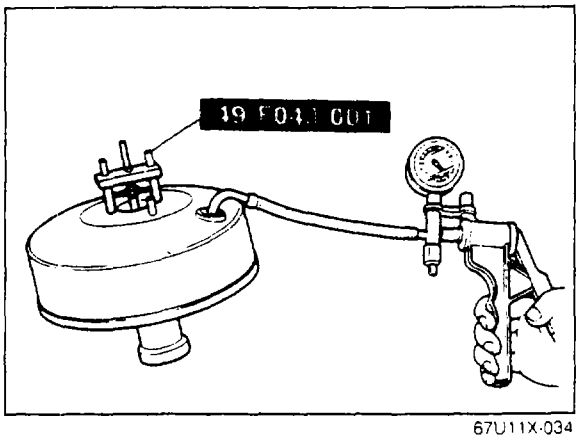


67U11X-034

Master Cylinder

Check the clearance between the push rod of the power brake unit and the piston of the master cylinder.

1. Place the **adjustment gauge** (49 F043 001) on top of the master cylinder, and then turn the adjust bolt until it contacts the bottom of the push rod hole in the piston.
2. Apply **500 mm-Hg (19.7 in-Hg)** vacuum using a vacuum pump.
3. Invert the adjustment gauge used in step 1, and place it on the power brake unit.
4. Check the clearance between the end of the adjust bolt and the push rod of the power brake unit. If it is not **0 mm**, loosen the push rod lock nut, and turn the push rod to adjust.

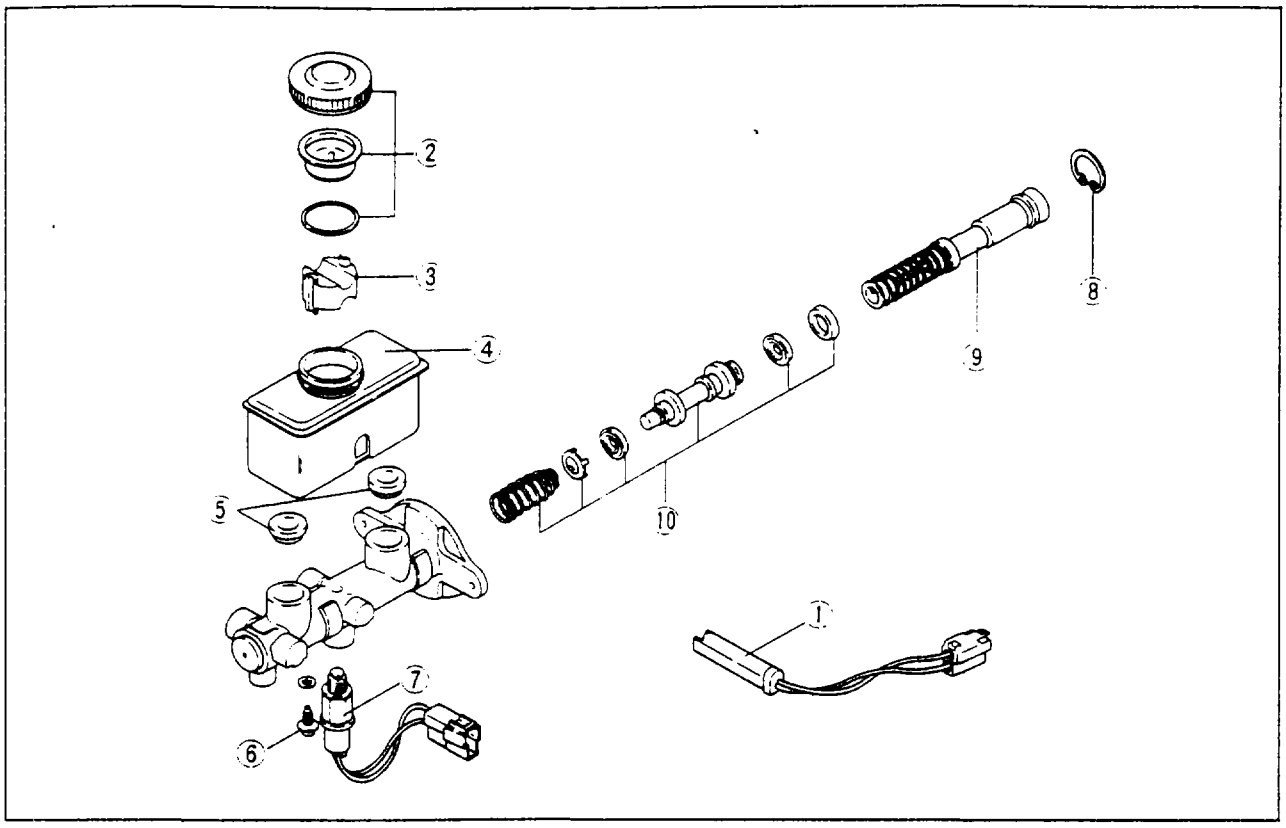
Caution

The checking of power brake unit must be performed on the vehicle.

DISASSEMBLY AND ASSEMBLY

1. Drain the brake fluid, then disassemble in the sequence shown in the figure.
2. Assemble in the reverse order of removal.

77U11X-008



67U11X-036

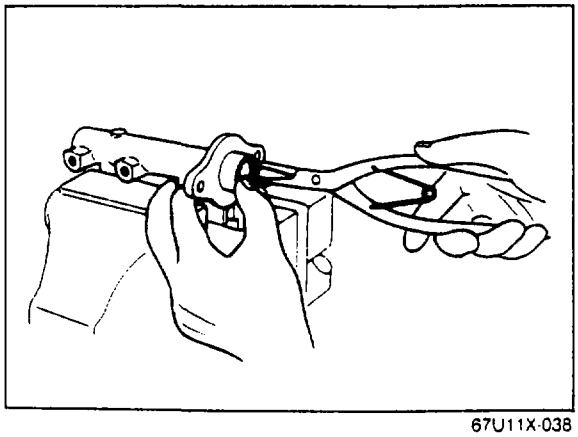
1. Fluid level sensor
2. Reservoir cap assembly
3. Float
4. Reservoir
5. Bushing
6. Stopper screw
7. Brake fluid pressure switch
8. Snap ring
9. Primary piston assembly
10. Secondary piston assembly

Caution

a) Use a new piston cup and "0" ring. Note that the primary side is replaced as the piston assembly.

b) Be careful not to let foreign material in, and do not scratch the piston or the inside of the cylinder.

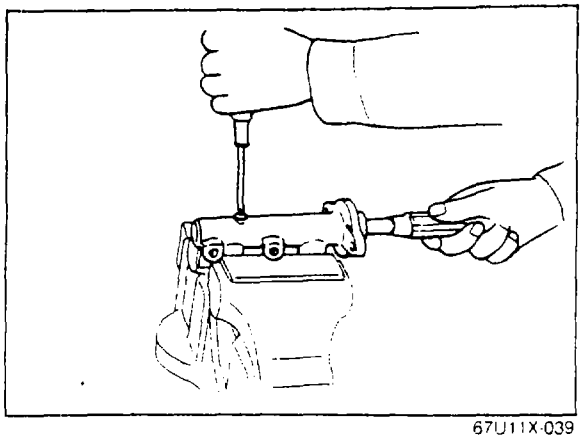
67U11X-037



67U11X-038

Stop Ring

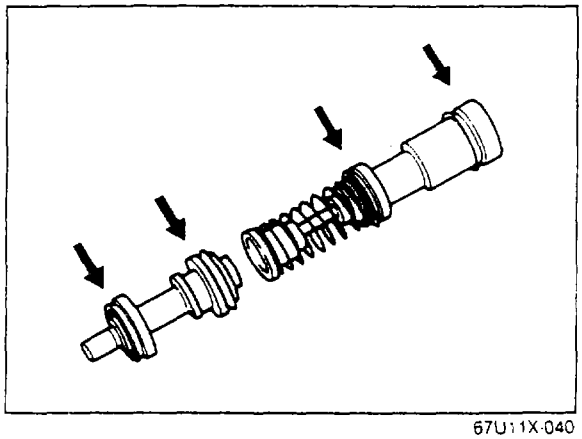
Push the piston by hand, remove and install the stop ring using snap ring pliers.



67U11X-039

Stopper Screw

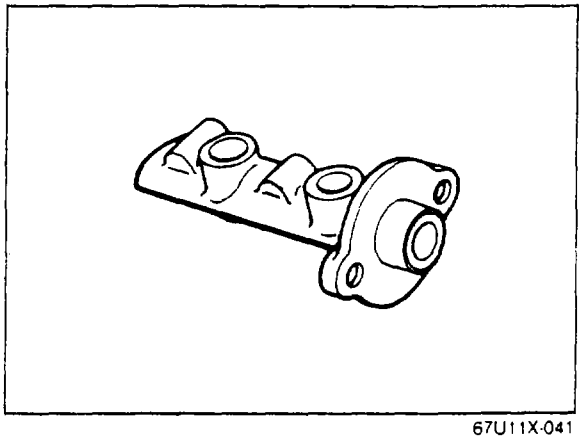
1. When installing the stopper screw, use a cross-tipped screwdriver to push the secondary piston assembly all the way in.
2. Tighten the stopper screw.
3. Move the secondary piston with the screwdriver to check that the secondary piston stops correctly at the stopper screw.



67U11X-040

Piston Cylinder and Piston Cup

Apply brake fluid to the cylinder bore and the piston cup, and then assemble them.

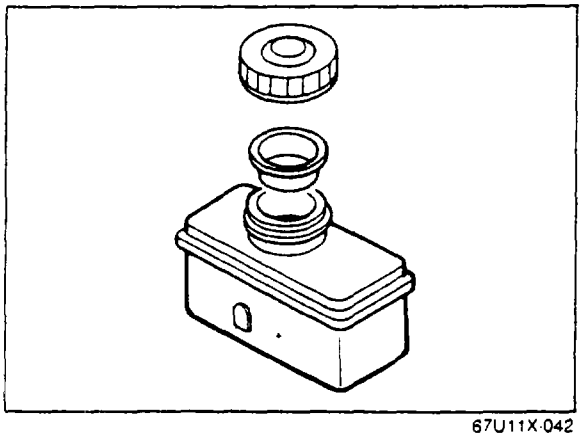


67U11X-041

INSPECTION

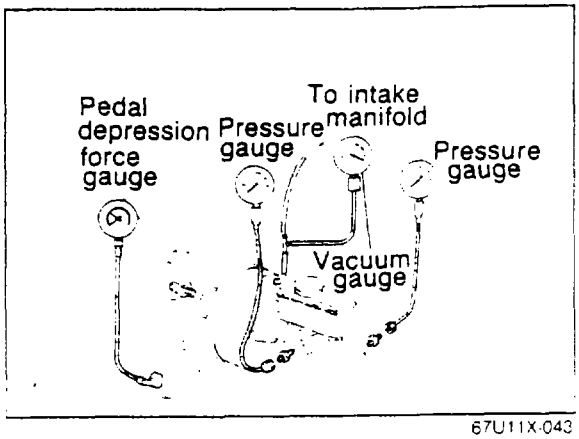
Check the following points. Replace parts if necessary.

1. Piston and the cylinder bore for abnormal wear, rust or damage.
2. Springs for weakness or damage.

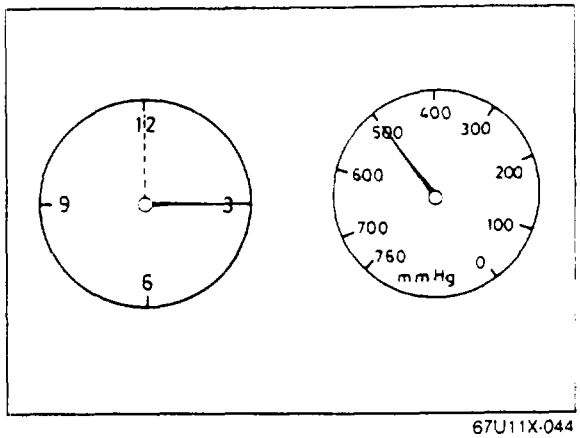


67U11X-042

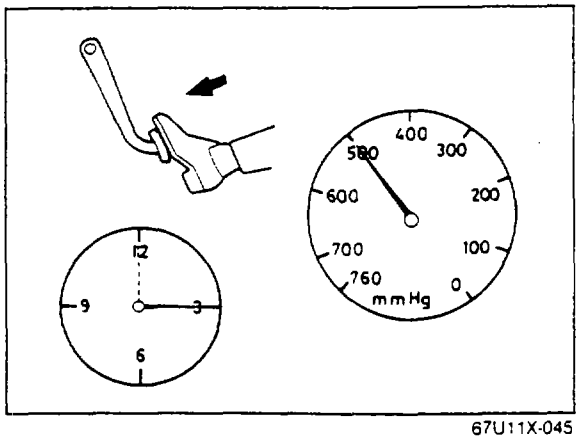
3. Reservoir for damage, or deformation.



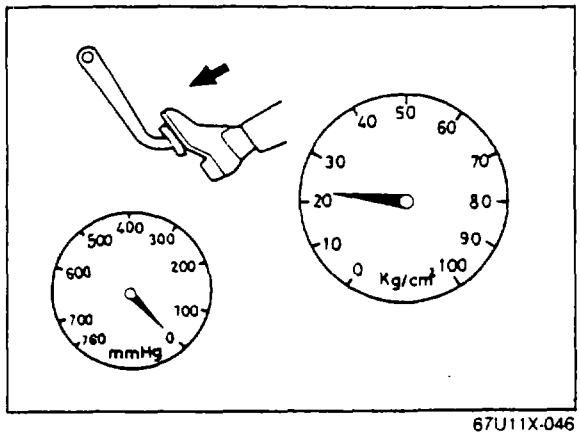
67U11X-043



67U11X-044



67U11X-045



67U11X-046

POWER BRAKE UNIT

ON-VEHICLE INSPECTION

Method Using a Tester

Connect a pressure gauge, vacuum gauge and pedal depression force gauge as shown in the figure. After bleeding the air from the pressure gauge, conduct the test as described in the 3 steps below.

Note
Use commercially available gauges and pedal depression force gauge.

Checking for Vacuum Loss at Unloaded Condition

1. Start the engine.
2. Stop the engine when the vacuum gauge reading reaches **500 mm-Hg (19.7 in-Hg)**.
3. Observe the vacuum gauge for **15 seconds**. If the gauge shows **475—500 mm-Hg (18.7—19.7 in-Hg)**, the unit is functioning.

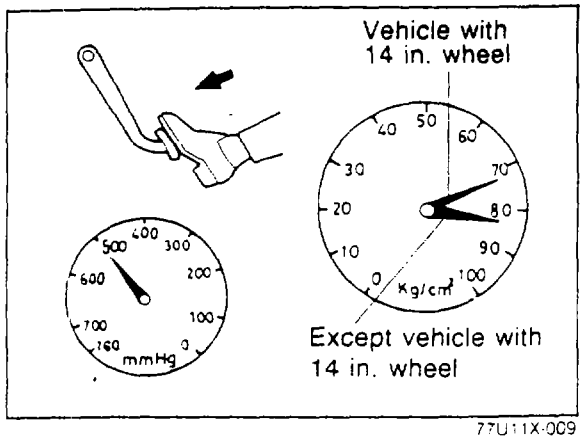
Checking for Vacuum Loss at Loaded Condition

1. Start the engine.
2. Depress the brake pedal with a force of **196 N (20 kg, 44 lb)**.
3. With the brake pedal depressed, stop the engine when the vacuum gauge reading reaches **500 mm-Hg (19.7 in-Hg)**.
4. Observe the vacuum gauge for **15 seconds.** If the gauge shows **475—500 mm-Hg (18.7—19.7 in-Hg),** the unit is functioning.

Checking for Hydraulic Pressure

1. If with the engine stopped (when the vacuum is 0), the relationship between the pedal force and fluid pressure is as specified, the unit is functioning.

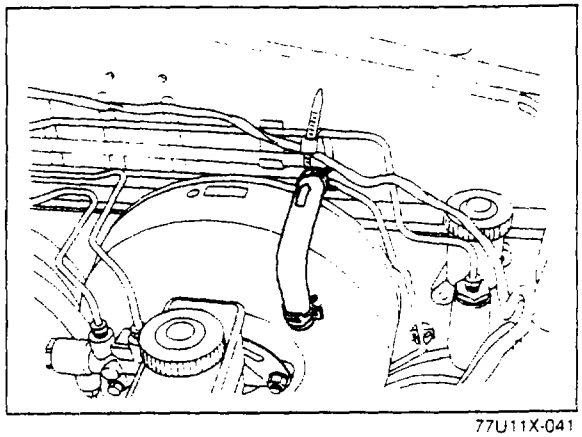
Pedal force	Fluid pressure
196 N (20 kg, 44 lb)	2158 kPa (22 kg/cm², 312 psi) or more



77U11X-009

2. Start the engine. Depress the brake pedal when the vacuum reaches **500 mm-Hg (19.7 in-Hg)**. If the relationship between the pedal force and fluid pressure is as specified, the unit is functioning.

	Pedal force	Fluid pressure
Except vehicle with 14 in. wheel	196 N (20 kg, 44 lb)	8339 kPa (85 kg/cm², 1209 psi) or more
Vehicle with 14 in. wheel		7063 kPa (72 kg/cm², 1024 psi) or more



77U11X-041

CHECK VALVE

Inspection

1. Disconnect the vacuum hose from the engine side.
2. Apply suction and pressure to the hose from the engine side. Check that air flows only toward the engine.
   If the air passes both ways or not at all, replace the check valve with the hose.

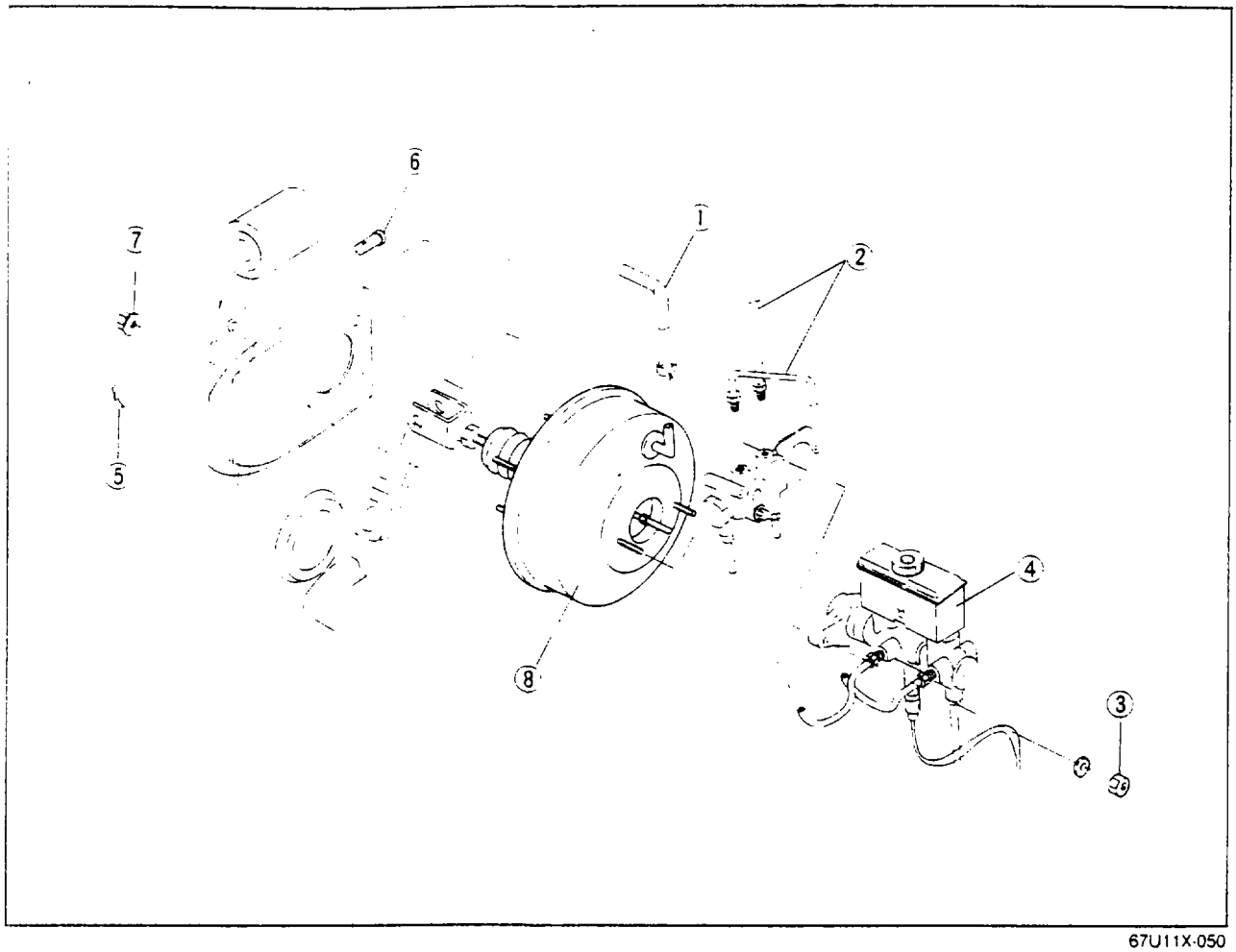
Note

The check valve is pressed into the vacuum hose, and there is an arrow on the hose surface to indicate the installation direction.

REMOVAL AND INSTALLATION

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.
3. Take the following steps after installation:
   (1) Check and adjust the push rod and piston clearance.
   (2) Add fluid and bleed the air.
   (3) Check all parts for fluid leakage.
   (4) Make an on-vehicle check of the unit.
   (5) Check that the vacuum hose does not contact other parts.

77U11X-042



67U11X-050

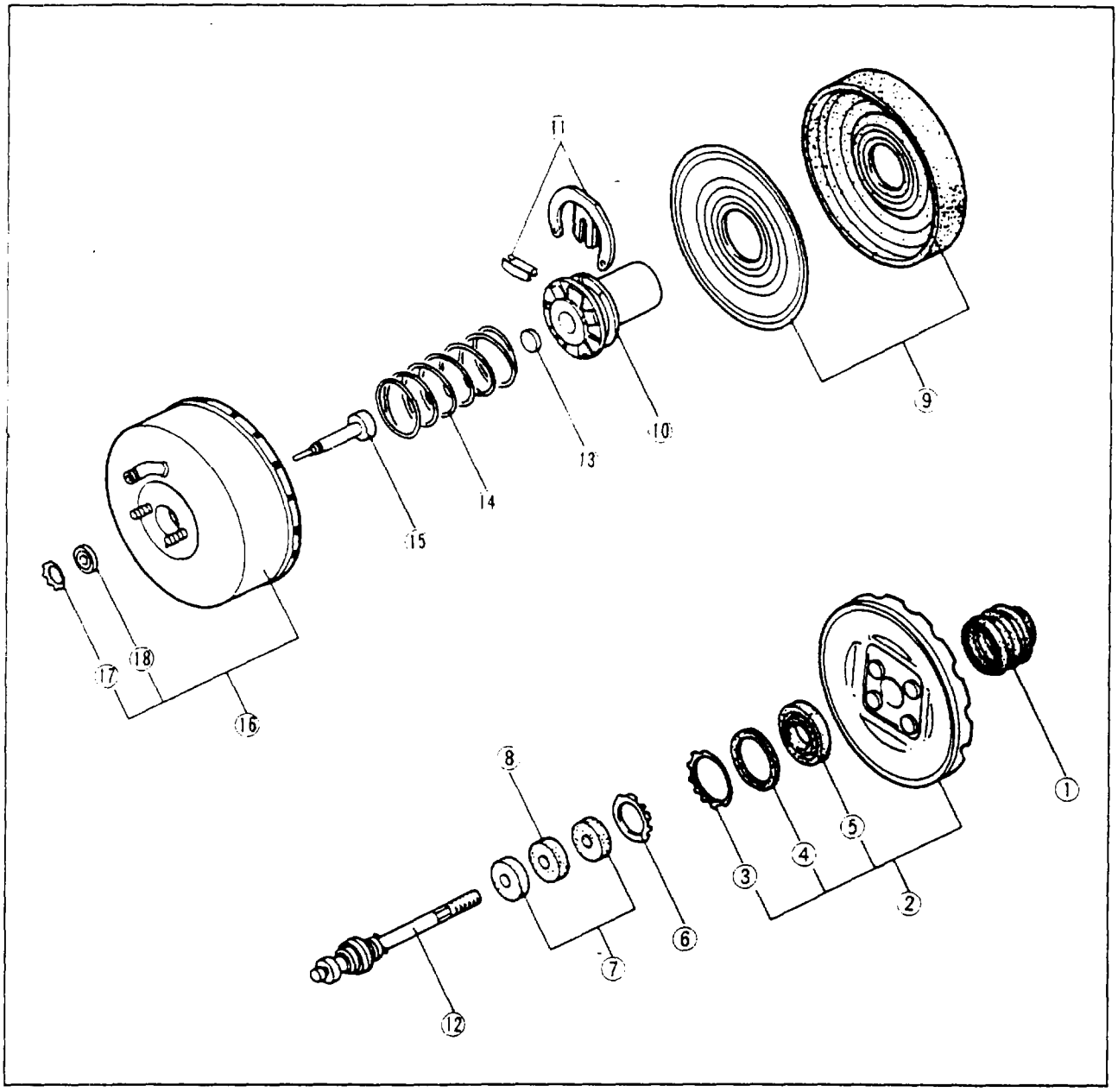
1. Vacuum hose
2. Brake pipe
3. Nut
4. Master cylinder assembly
5. Cotter pin
6. Clevis pin
7. Nut
8. Power brake unit

Caution
Apply grease to the clevis pin.

4BG11X-633

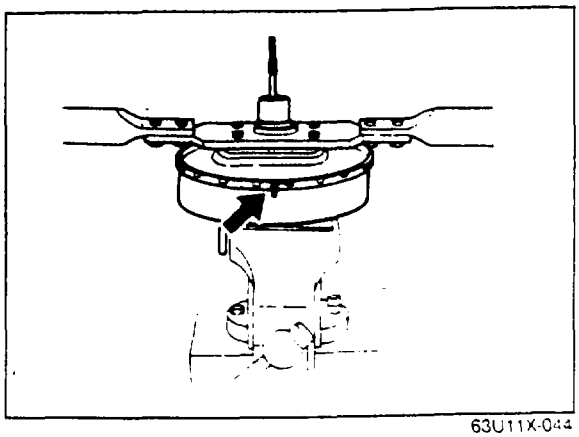
DISASSEMBLY

Disassemble in the sequence shown in the figure.



77U11X-043

1. Dust boot
2. Rear shell assembly
3. Retainer
4. Bearing
5. Dust seal
6. Retainer
7. Air filter
8. Air silencer
9. Diaphragm and plate
10. Power piston assembly
11. Retainer key
12. Valve rod and plunger assembly
13. Reaction disc
14. Spring
15. Push rod
16. Front shell assembly
17. Retainer
18. Seal

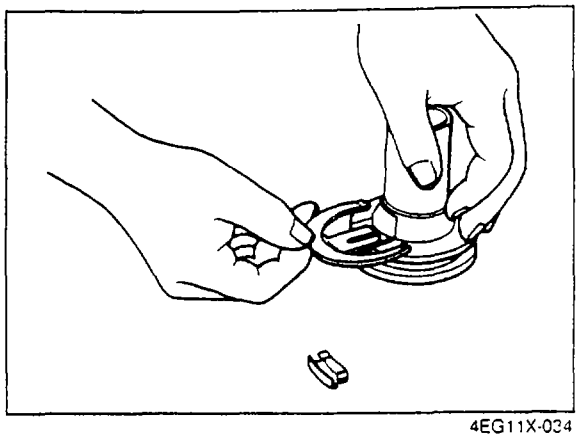


63U11X-044

Rear Shell

1. Before separating the front and rear shells, make mating marks to be used for reassembly.
2. Fit a wrench onto the studs of the rear shell, rotate the rear shell counterclockwise to unlock.

Caution
The rear shell is spring loaded; loosen it carefully.

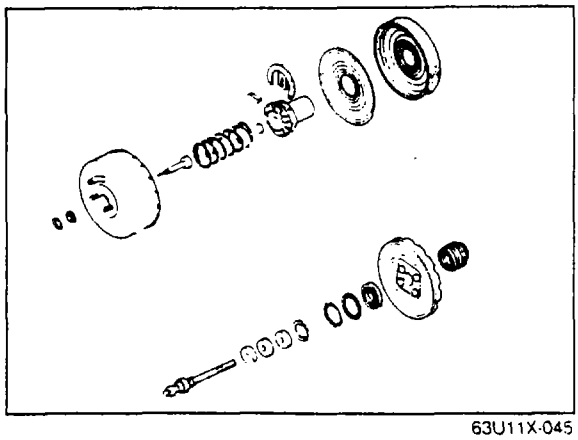


4EG11X-034

Retainer Key

Press the valve rod in to allow removal of the valve retainer key.
Remove the valve rod and plunger assembly.

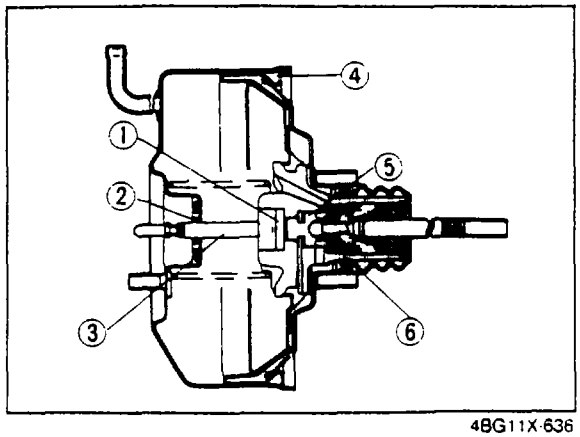
Caution
The valve rod and plunger must be replaced as an assembly, if necessary.



63U11X-045

INSPECTION

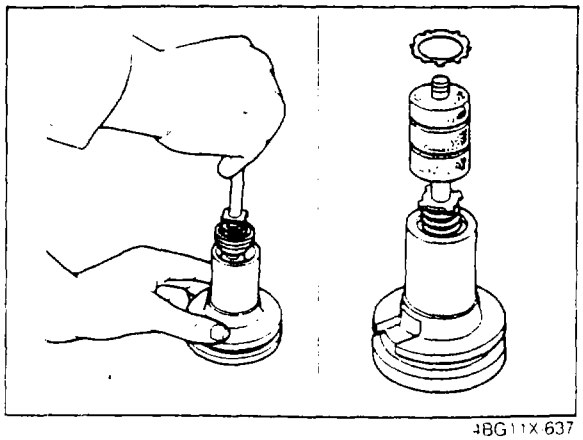
1. Inspect all rubber parts. Wipe free of fluid and carefully inspect all rubber parts for cuts, nicks, or other damage.
2. Check the power piston for cracks, distortion, chipping, or damaged seats.
3. Inspect the reaction disc rubber for deterioration.
4. Check that the seats of the valve rod and plunger are smooth and free of nicks and dents. Replace if defective.
5. Inspect the front and rear shells for scratches, scores, pits, dents, or other damage.
6. Check the diaphragm for cuts or other damage.



48G11X-636

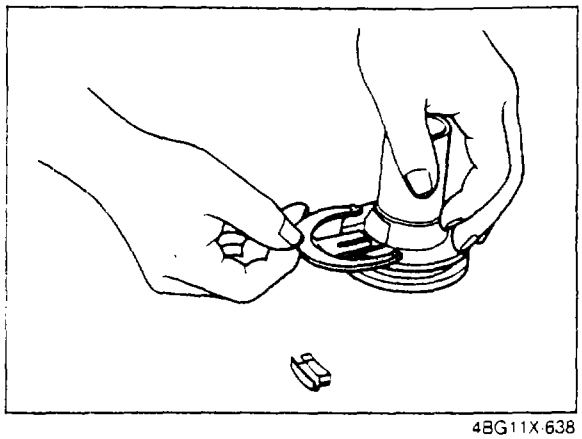
ASSEMBLY

1. Coat the parts shown in the figure with silicon grease.
   (1) Entire surface of reaction disc.
   (2) Dust seal lip.
   (3) Push rod.
   (4) Diaphragm to shell contacting surfaces.
   (5) Power piston.
   (6) Valve plunger oil seal.



4BG11X-637

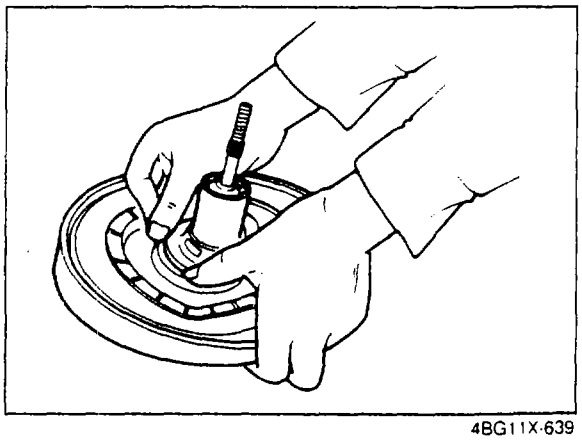
2. Install the valve rod and plunger assembly.
3. Install the air filter and silencer.
4. Install the retainer.



4BG11X-638

5. Install the retainer key.

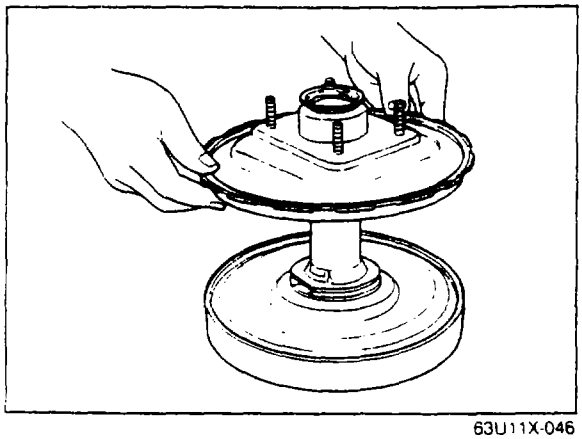
Caution
Push down the valve rod, align the groove in the valve plunger with the slot of the power piston, and then insert the valve retainer key.



4BG11X-639

6. Connect the diaphragm to the power piston and plate.

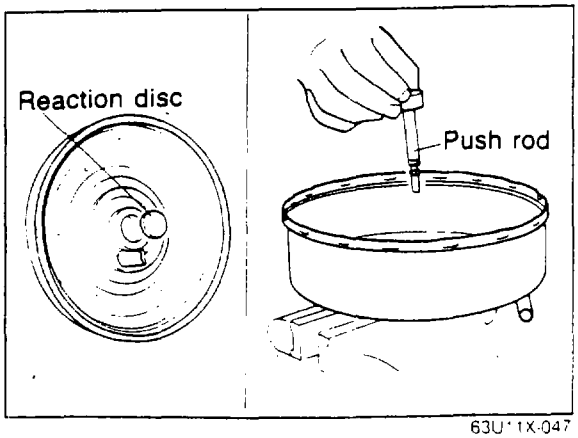
Caution
Make certain that the diaphragm is well seated in the groove.



63U11X-046

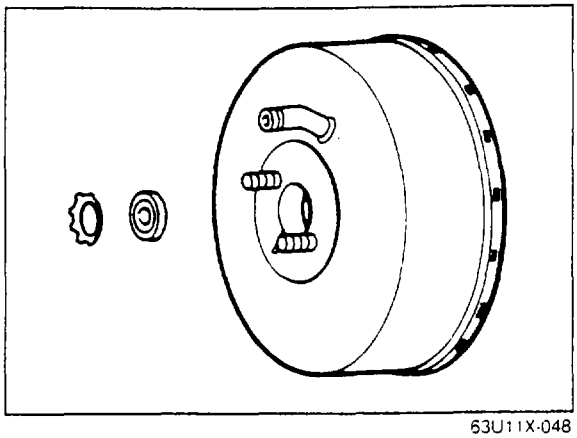
7. Assemble the rear shell assembly.

Caution
Carefully guide the tube end of the power piston through the seal in the rear shell.



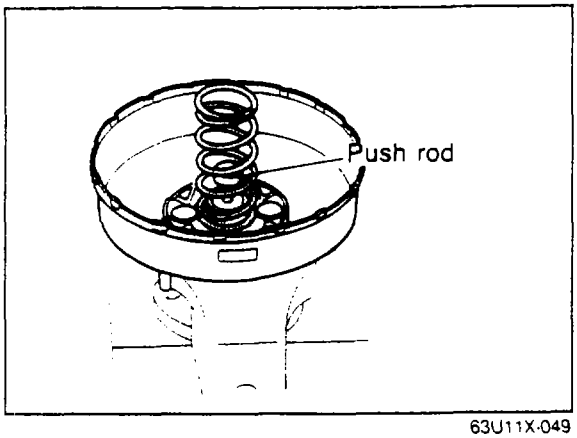
63U11X-047

8. Push the reaction disc into the power piston using the push rod.


63U11X-048

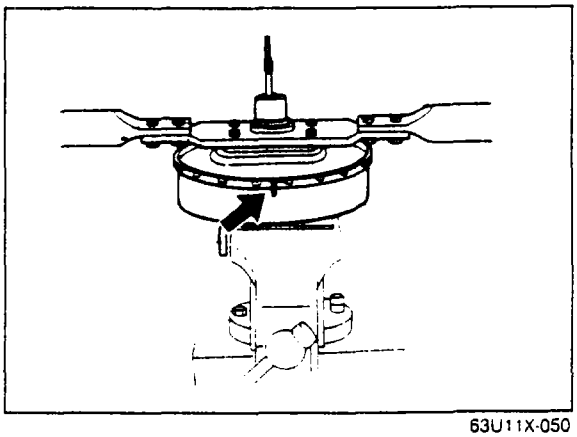
9. Put the dust seal and retainer into the front shell.

Caution
Place the front shell assembly in a vise to complete the following operations.

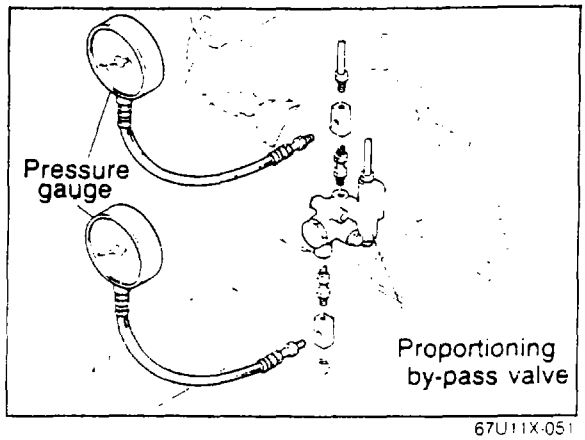


63U11X-049

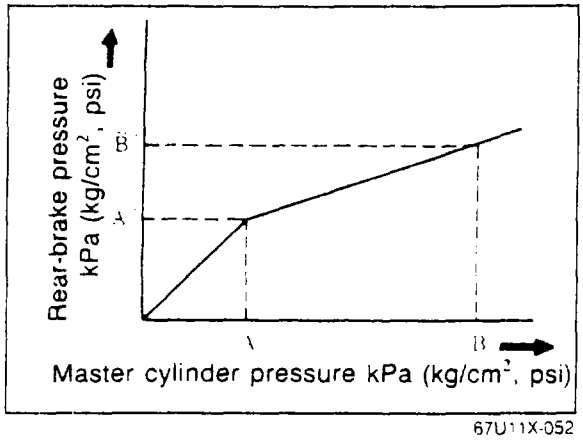
10. Install the push rod.
11. Install the return spring.


63U11X-050

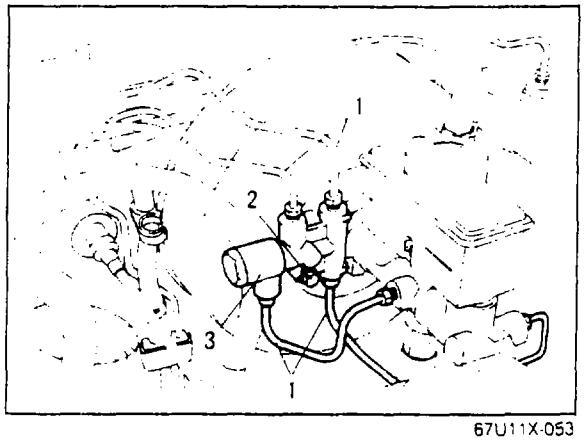
12. Press the rear shell down and rotate it clockwise until the mating marks are aligned using a suitable wrench.
13. Put the dust boot on to the rear shell.



67U11X-051



67U11X-052



67U11X-053

PROPORTIONING BYPASS VALVE

FUNCTION CHECK

Caution
If there is a malfunction of the valve, replace it as an assembly.

1. Connect two pressure gauges [9,810 kPa (100 kg/cm², 1,422 psi)] to the pipes.
2. Measure the fluid pressure of the master cylinder and the rear brake line.

Specification:

Fluid pressure kPa (kg/cm², psi)			
A	A'	B	B'
2,943 (30,426)	2,600—3,286 (26.5—33.5, 377—476)	7,848 (80,1138)	5,052—5,739 (51.5—58.5, 732—832)

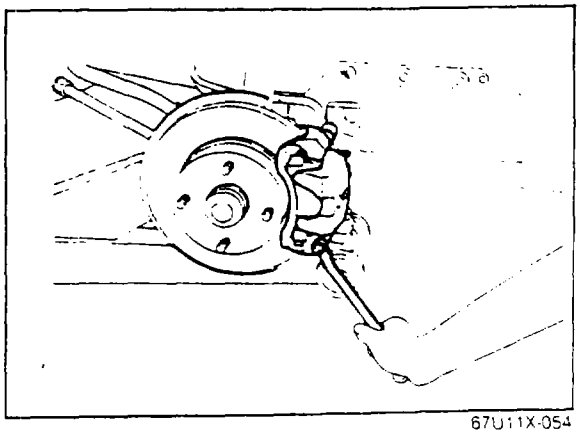
REMOVAL AND INSTALLATION

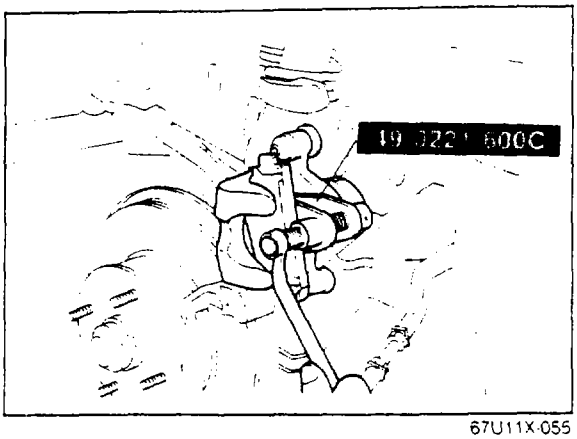
Remove in the sequence shown in the figure. Install in the reverse order of removal.

1. Brake line pipes
2. Bolts
3 Valve assembly

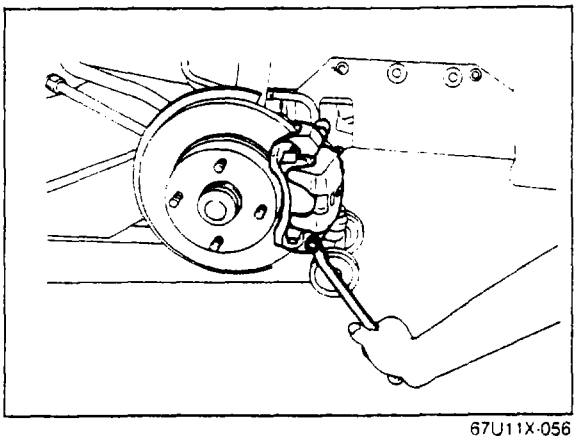
After installation:

1 Bleed air from the brake lines.


67U11X-054



67U11X-055


67U11X-056

FRONT BRAKE (VEHICLE WITH 14 IN. WHEEL)

REPLACEMENT OF DISC PAD

Caution
Replace the left and right pads at the same time.

1. Jack up the front of the vehicle, and support it with safety stands.
2. Remove the wheels.
3. Remove the lock pin bolt and lift the caliper.
4. Remove the pads.
5. Push the piston inward using **expand tool** (49 0221 600C).
6. Install the new pads in the mounting support.
7. Lower the caliper assembly onto the mounting support.
8. Tighten the lock bolt to the specified torque.

Tightening torque:
31—41 N·m (3.2—4.2 m-kg, 23—30 ft-lb)

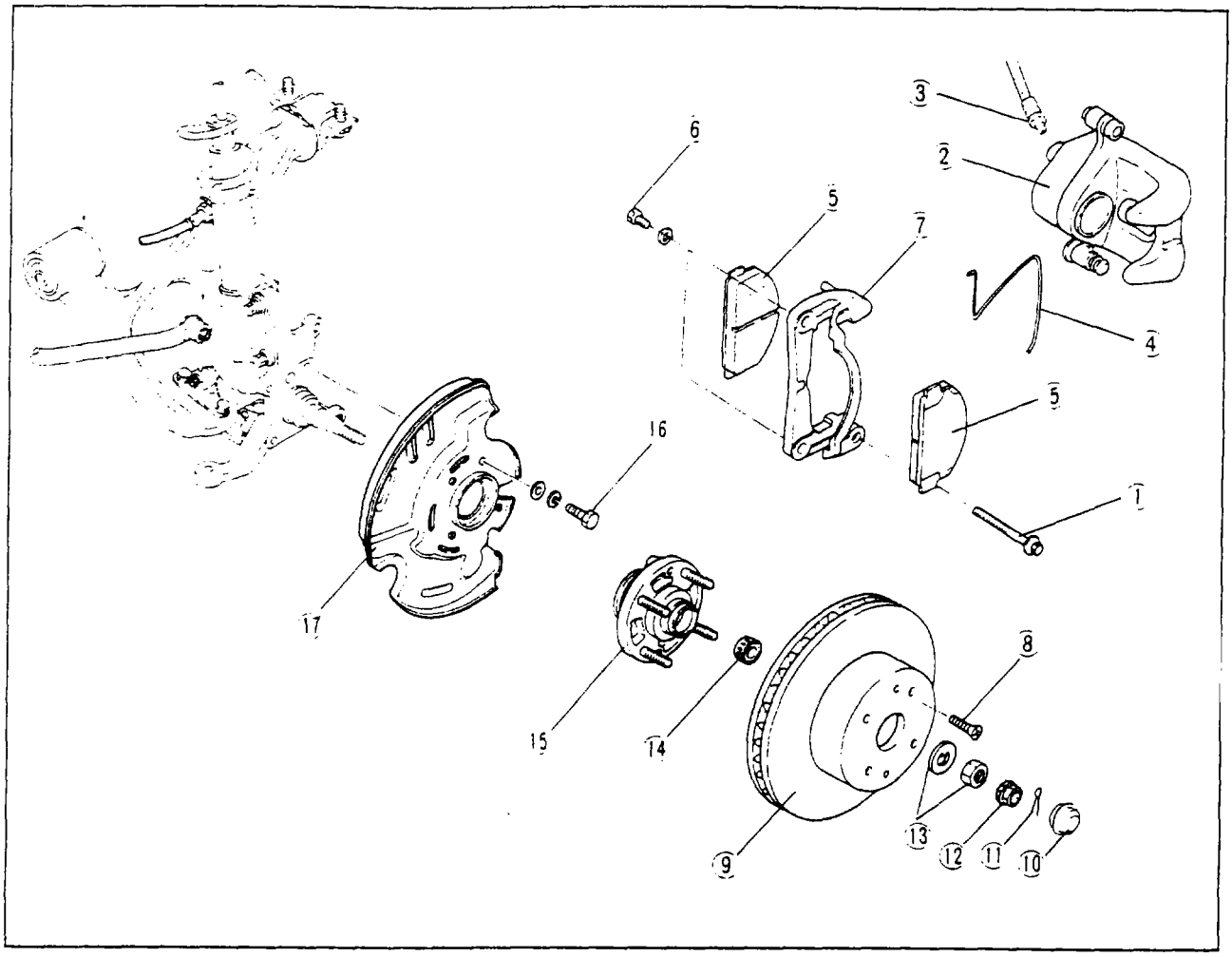
9. Mount the wheels and lower the vehicle.

11 FRONT BRAKE (VEHICLE WITH 14 IN. WHEEL)

REMOVAL AND INSTALLATION

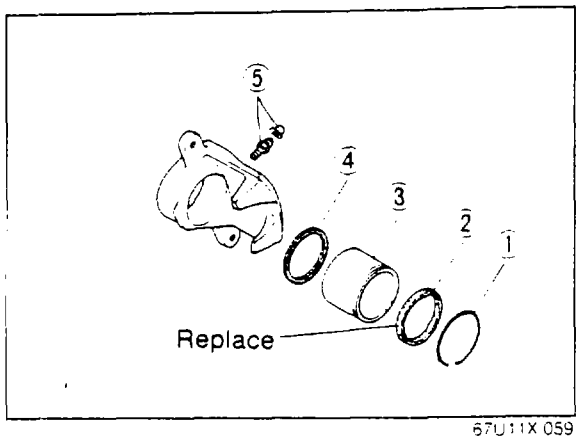
1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels, then remove in the sequence shown in the figure.
3. Install in the reverse order of removal.

77U11X-044



67U11X-058

1. Lock bolt
2. Brake caliper assembly
3. Brake hose
4. Spring
5. Pads
6. Bolt
7. Mounting support
8. Screw
9. Disc plate
10. Hub cap
11. Cotter pin
12. Set cover
13. Nut
14. Bearing
15. Hub assembly
16. Bolt
17. Dust cover

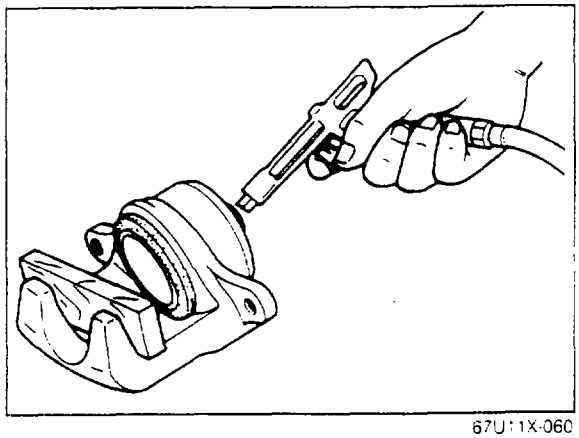


67U11X-059

DISASSEMBLY

Disassemble the caliper in the sequence shown in the figure.

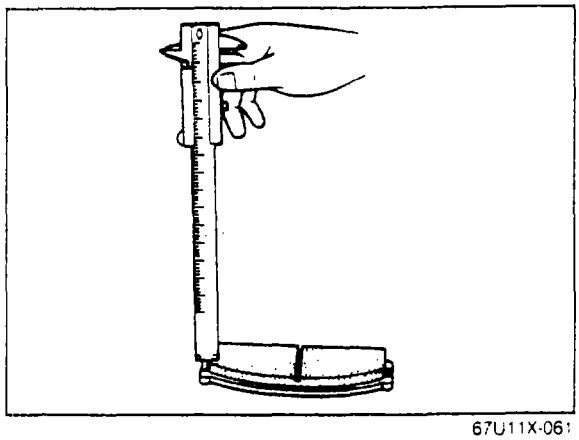
1. Clip
2. Dust seal
3. Piston
4. Piston seal
5. Cap and bleeder screw


67U11X-060

Piston

Place a piece of wood in the caliper, and then blow compressed air through the flexible hose connection hole to force the piston out of the caliper.

Caution
Blow the compressed air a little at a time to prevent the piston from jumping out.


67U11X-061

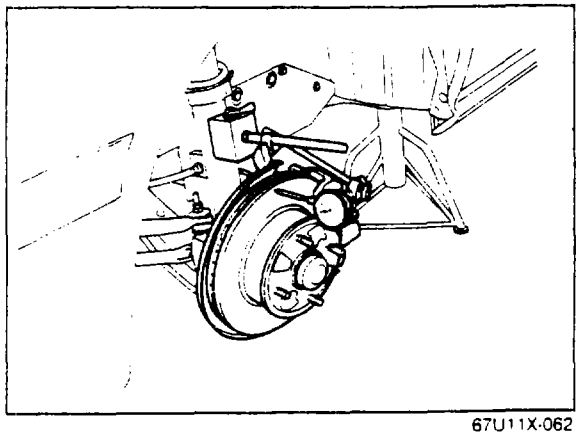
INSPECTION

Inspect each part, and if necessary replace parts.

Disc Pad

1. Oil or grease on facing.
2. Abnormal wear or cracks.
3. Deterioration or damage by heat.
4. Remaining lining thickness.

Thickness limit: 1 mm (0.04 in) min.

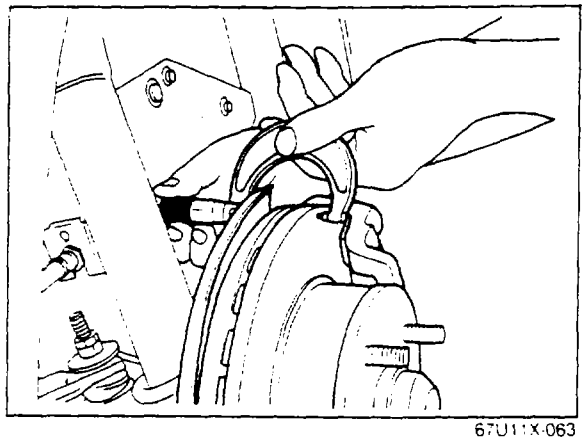

67U11X-062

Disc Plate

1. Runout

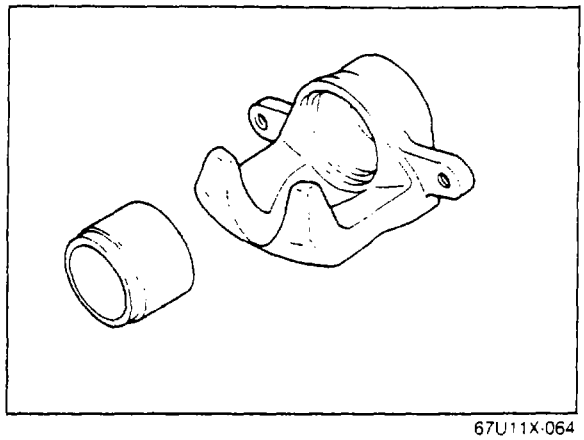
Runout limit: 0.1 mm (0.004 in) max.

Caution
a) There must be no wheel bearing looseness.
b) The measurement location is the outer periphery of the disc plate surface.

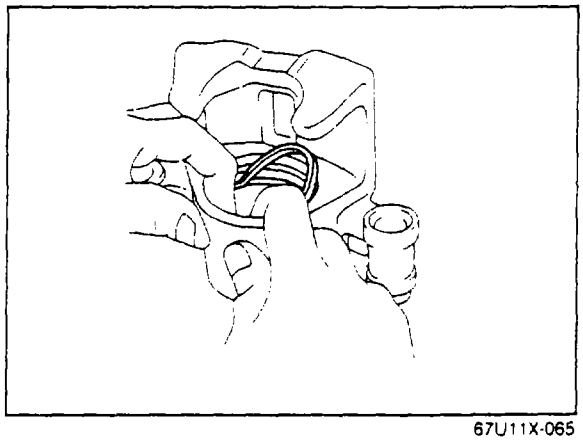

67U11X-063

2. Wear or damage.

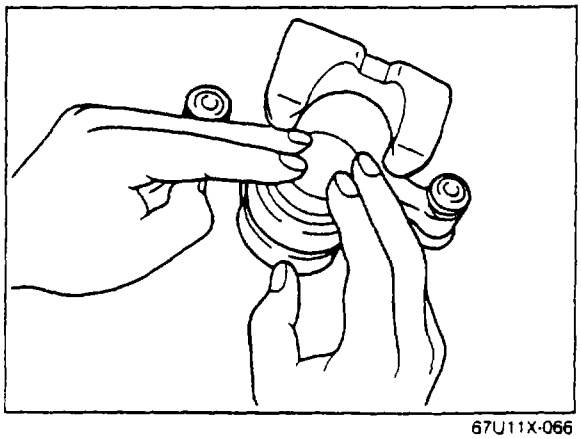
Thickness
Standard: 22 mm (0.87 in)
Limit: 20 mm (0.79 in) min.


67U11X-064

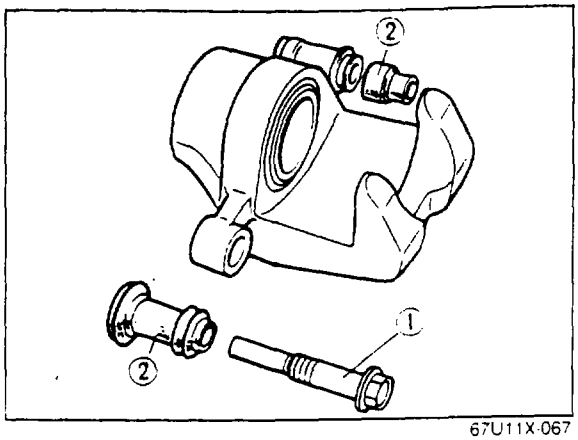
Caliper
1. Cylinder and piston for wear or rust.
2. Caliper body for damage or cracks.
3. Boot for damage or poor sealing.


67U11X-065

ASSEMBLY
1. Coat the piston seal with the grease supplied in the seal kit and install it to the caliper.

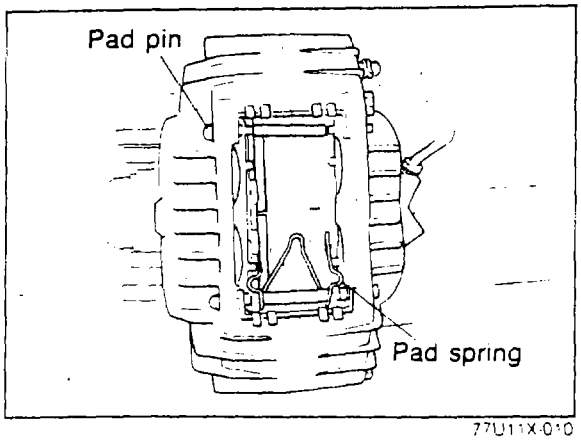

67U11X-066

2. Coat the piston and the cylinder with brake fluid, and insert the piston straight into the cylinder.
3. Install the dust seal.

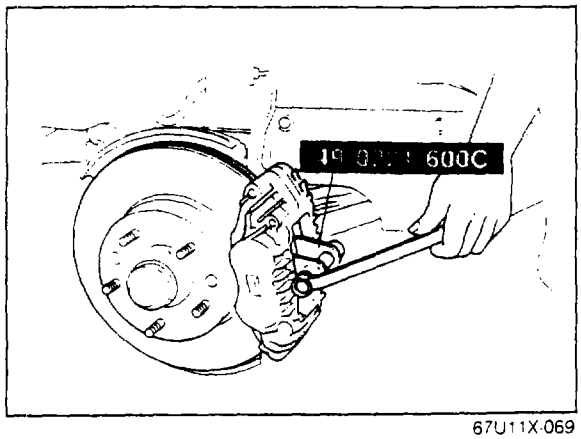


67U11X-067

4. Coat the following parts with the grease supplied in the seal kit.
   (1) Lock bolt
   (2) Boots
5. Fit the boot to the caliper.



77U11X-010



67U11X-069

FRONT BRAKE (EXCEPT VEHICLE WITH 14 IN. WHEEL)

REPLACEMENT OF DISC PAD

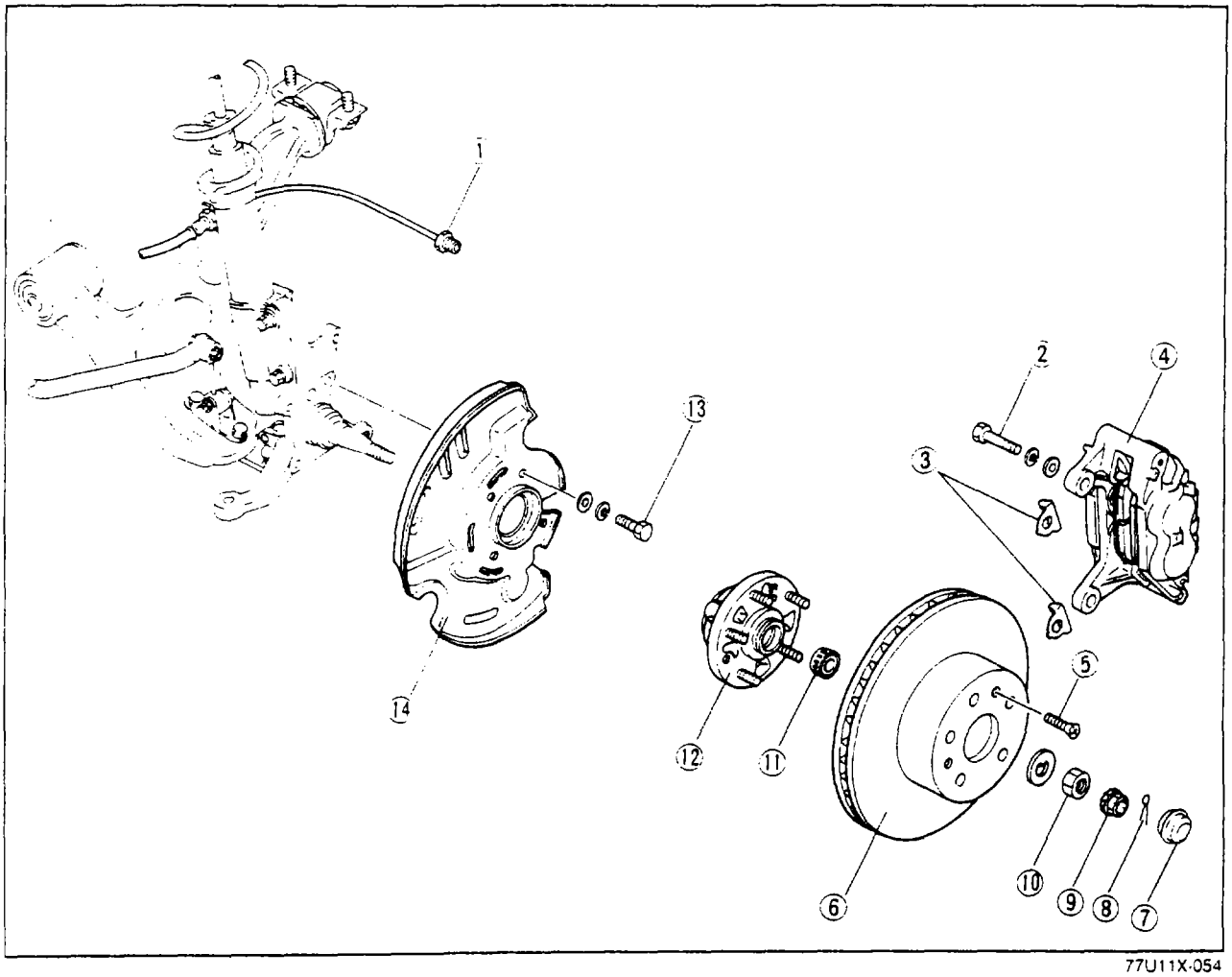
Note
If a squealing noise occurs from the front brakes while driving, check the pad wear indicator. If there are traces of the indicator contacting the disc plate, the disc pad should be replaced.

Caution
Replace the left and right pads at the same time.

1. Jack up the front of the vehicle, and support it with safety stands.
2. Remove the wheels.
3. Remove the clip, the pad pins and the pad spring.
4. Remove the pads.
5. Push the piston inward using **expand tool** (49 0221 600C).
6. Install the new pads, the pad spring, the pad pins and the clip.

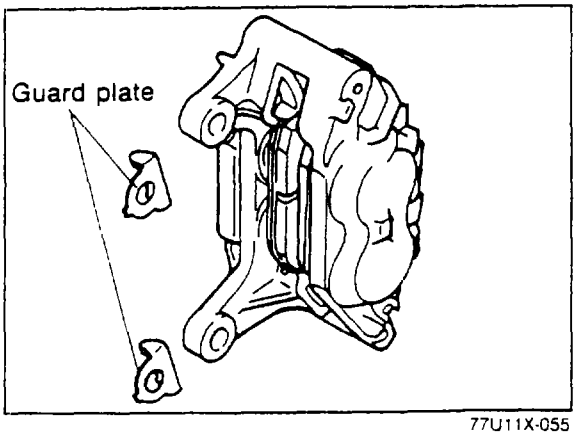
REMOVAL AND INSTALLATION

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels, then remove in the sequence shown in the figure.
3. Install in the reverse order of removal.



77U11X-054

1. Brake pipe
2. Bolt
3. Guard plates
4. Brake caliper assembly
5. Screw
6. Disc plate
7. Hub cap
8. Cotter pin
9. Set cover
10. Nut
11. Bearing
12. Hub assembly
13. Bolt
14. Dust cover



77U11X-055

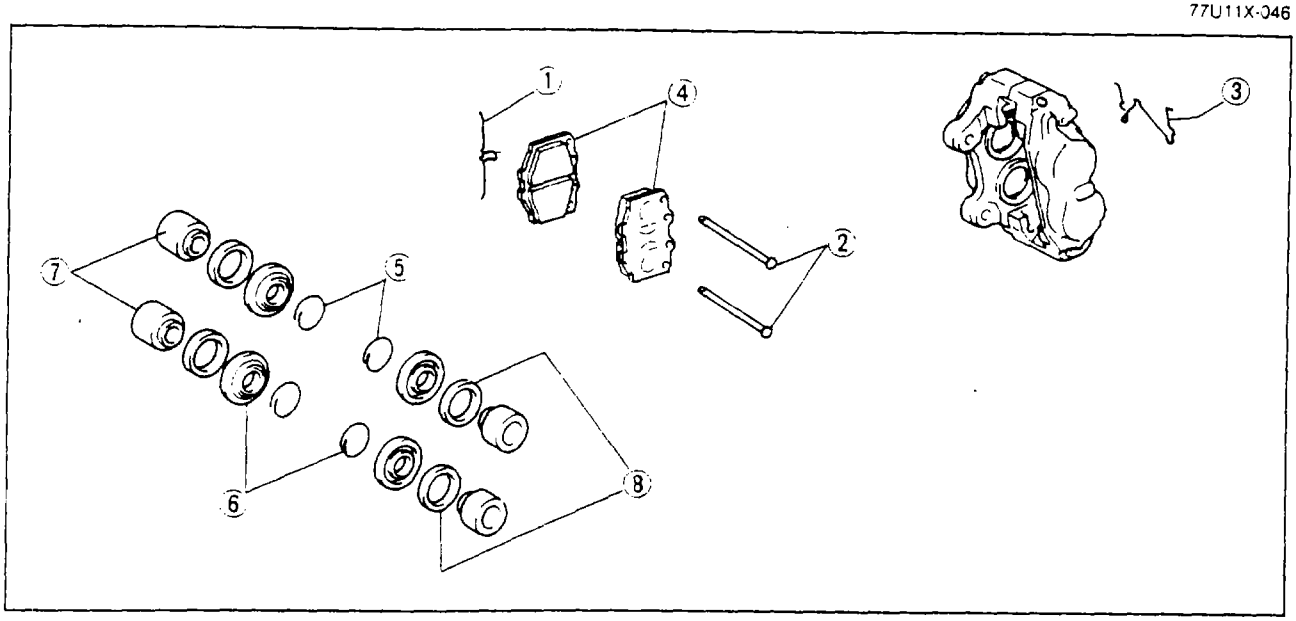
Guard Plates

Install the guard plates between the caliper and the knuckle.

DISASSEMBLY

Disassemble the caliper in the sequence shown in the figure.

77U11X-046



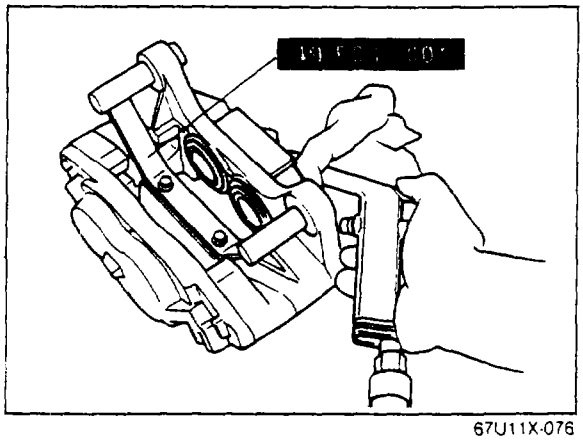
67U11X-074

1. Clip
2. Pad pins
3. Pad spring
4. Pads
5. Retainers
6. Dust seals
7. Pistons
8. Piston seals

Caution

Do not loosen or remove the bridge bolts connecting the two halves of the caliper body.

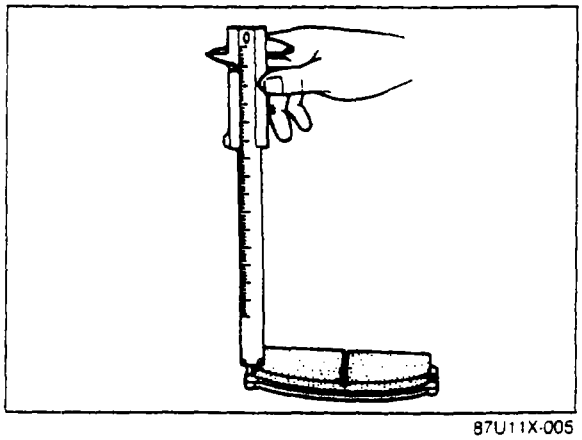
67U11X-075



67U11X-076

Piston

1. Place the **disc brake piston stopper** (49 F033 001) in the caliper.
2. Blow compressed air through the flexible hose connection hole to force the pistons out of the caliper.



87U11X-005

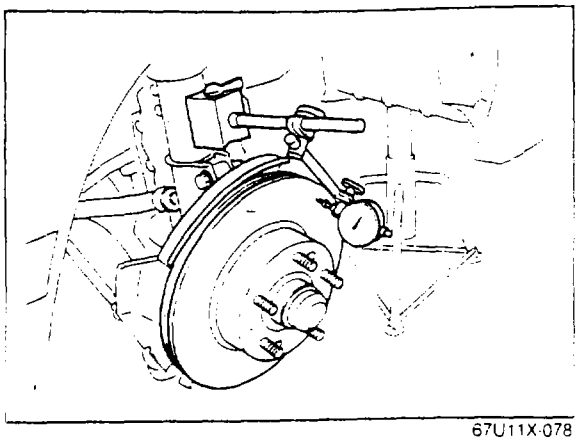
INSPECTION

Inspect each part. If necessary, replace parts.

Disc Pad

1. Oil or grease on facing.
2. Abnormal wear or cracks.
3. Deterioration or damage by heat.
4. Remaining lining thickness.

Thickness: 1 mm (0.04 in) min.



67U11X-078

Disc Plate

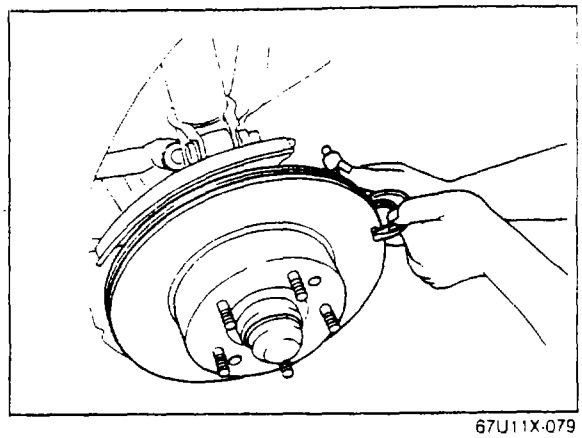
1. Runout.

Runout: 0.1 mm (0.004 in) max.

Caution

a) There must be no wheel bearing looseness.

b) The measurement location is the outer periphery of the disc plate surface.



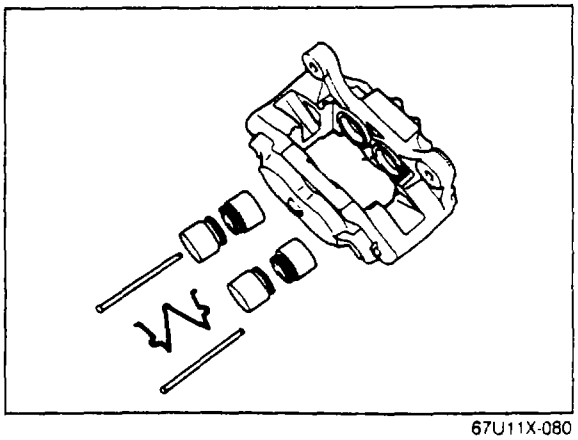
67U11X-079

2. Wear or damage.

Thickness

Standard: 22 mm (0.87 in)

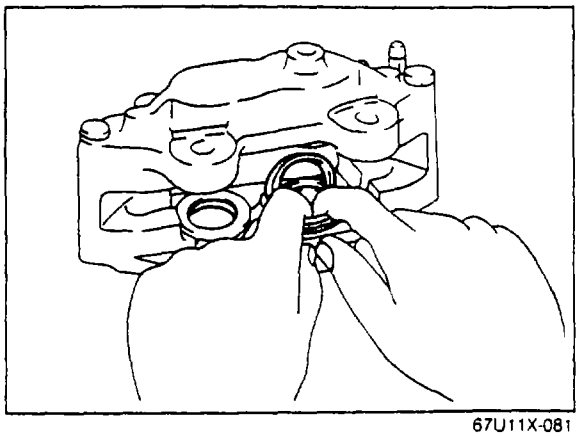
Limit: 20 mm (0.79 in) min.



67U11X-080

Caliper

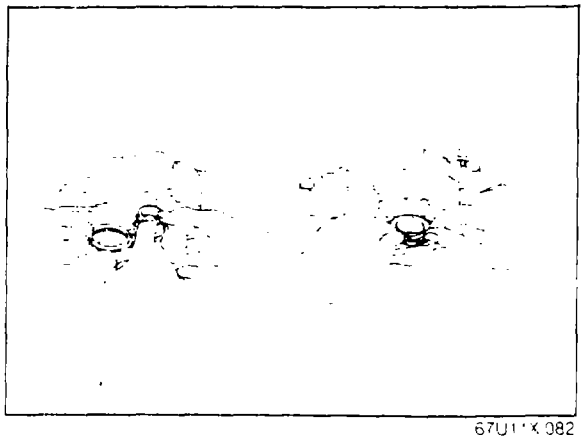
1. Cylinders and pistons for wear or rust.
2. Caliper body for damage or cracks.
3. Pad spring for weakness.
4. Pad pins for wear or rust.



67U11X-081

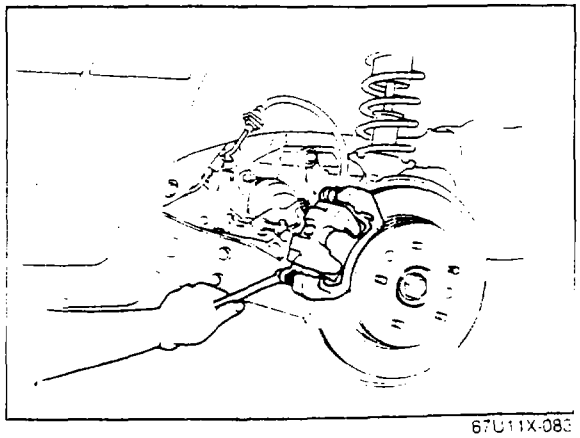
ASSEMBLY

1. Install the piston seal to the caliper.



67U1*X082

2. Coat the pistons and the cylinders with brake fluid, and insert the pistons straight into the cylinder
3. Coat the dust seals with the grease supplied in seal kit and install them to the caliper.

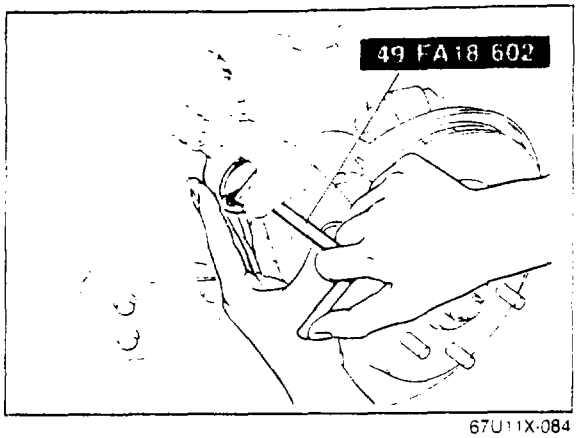

67U11X-083

REAR BRAKE

REPLACEMENT OF DISC PAD

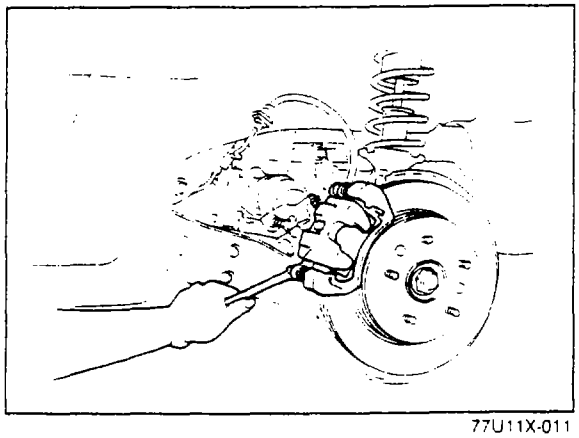
Caution
Replace the left and right pads at the same time.

1. Jack up the rear of the vehicle, and support it with safety stands.
2. Remove the wheels.
3. Remove the lock pin bolt and lift the caliper.



67U11X-084

4. Remove the V-spring and the pads.
5. Rotate the piston clockwise using **disc brake piston wrench** (49 FA18 602).
6. Install the new pads and V-spring in the mounting support.


77U11X-011

7. Lower the caliper to the mounting support.
8. Tighten the lock bolts to the specified torque.

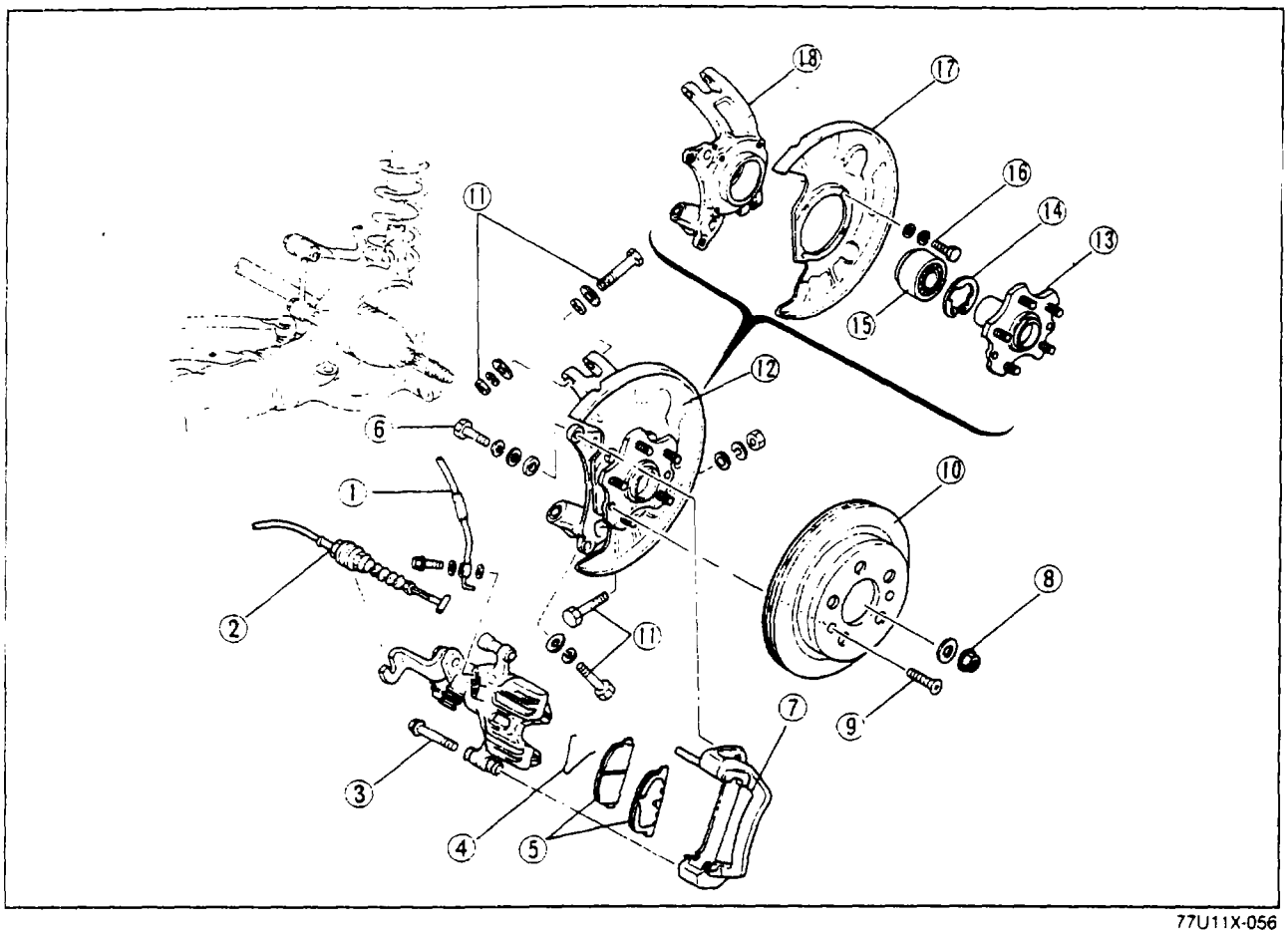
Tightening torque:
29—41 N·m (3.0—4.2 m-kg, 22—30 ft-lb)

9. Mount the wheels and lower the vehicle.
10. Depress the brake pedal for adjusting the parking brake cable play (Refer to page 11—7).

REMOVAL AND INSTALLATION

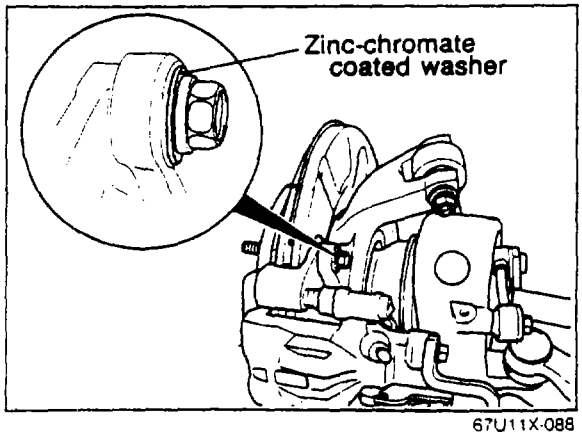
1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels, then remove in the sequence shown in the figure.
3. Install in the reverse order of removal.

77U11X-047



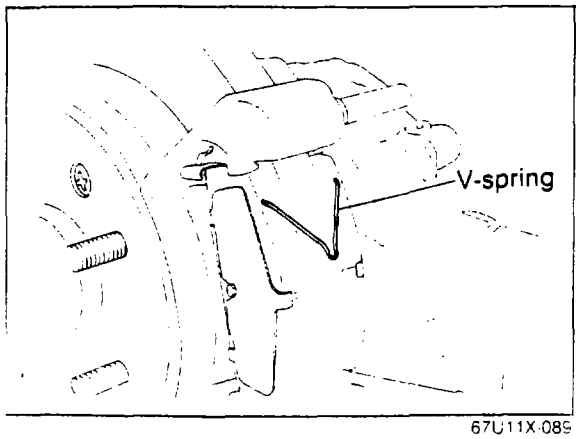
77U11X-056

1. Brake hose
2. Parking brake cable
3. Lock bolt
4. V-spring
5. Pads
6. Bolt
7. Mounting support
8. Lock nut
9. Screw
10. Disc plate
11. Bolts and nuts
12. Triaxial floating hub outer assembly
13. Flange
14. Snap ring
15. Bearing
16. Bolt
17. Dust cover
18. Triaxial floating hub (outer)



67U11X-088

Mounting Support Attaching Washer
Use the zinc-chromate coated washer for the mounting support.



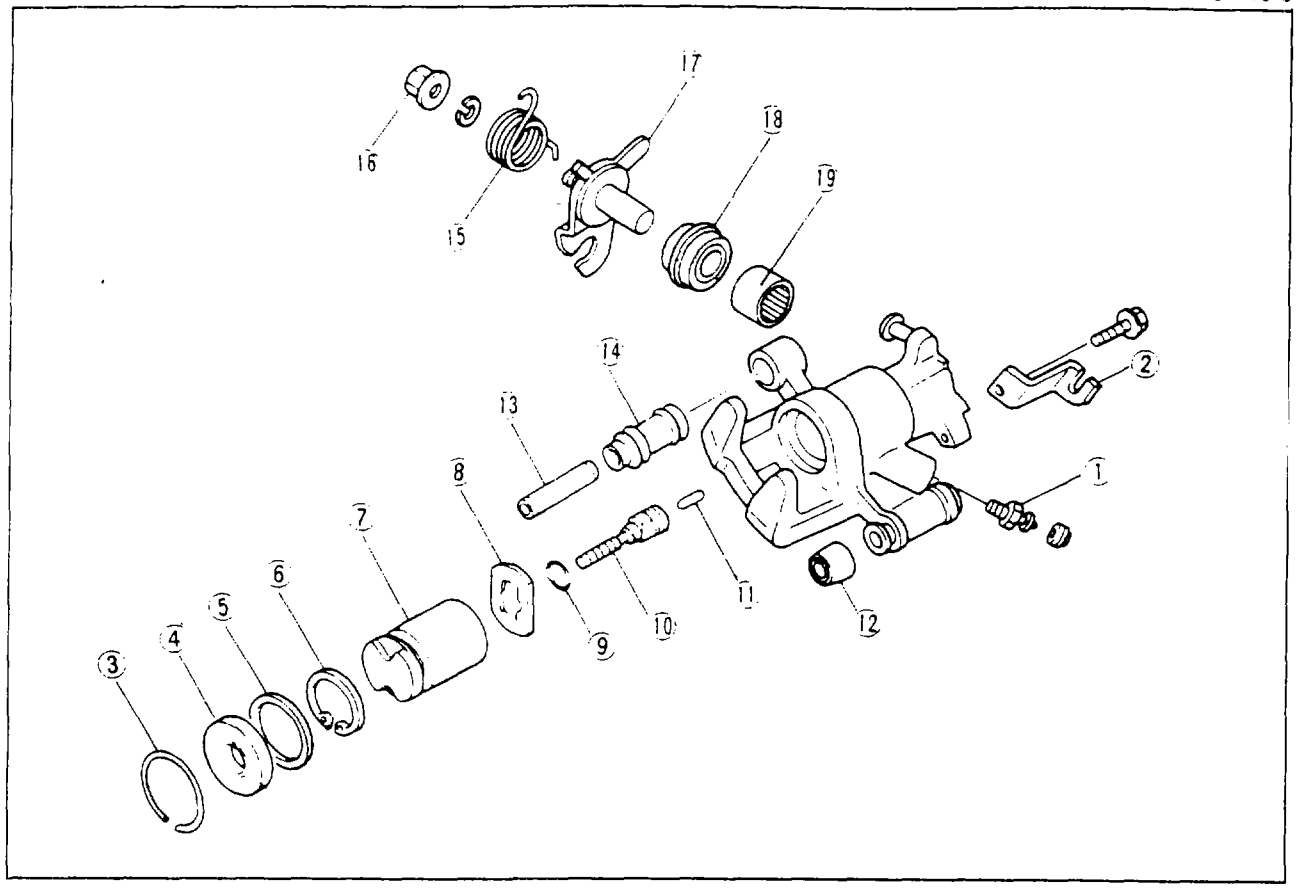
67U11X-089

V-Spring
Install the V-spring to the pads as shown.

DISASSEMBLY

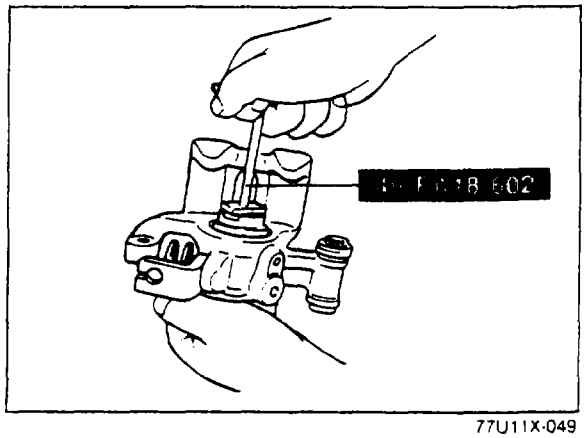
Disassemble the caliper in the sequence shown in the figure.

77U11X-048



67U11X-091

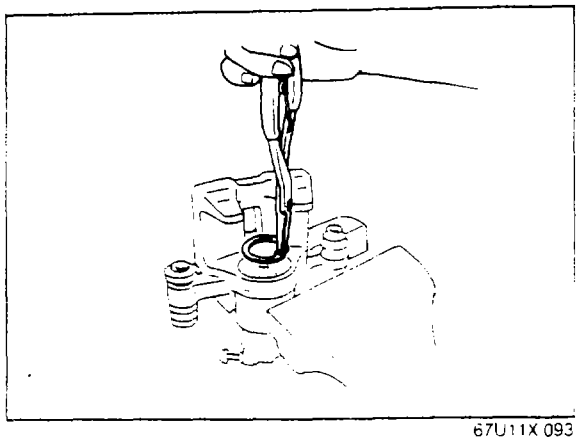
1. Air bleeder screw
2. Parking brake cable bracket
3. Clip
4. Dust seal
5. Piston
6. Piston seal
7. Snap ring
8. Stopper
9. "O" ring
10. Adjuster spindle
11. Connecting link
12. Sleeve boot
13. Guide pin
14. Guide pin boot
15. Spring
16. Nut
17. Spindle lever
18. Dust boot
19. Bearing



77U11X-049

Piston

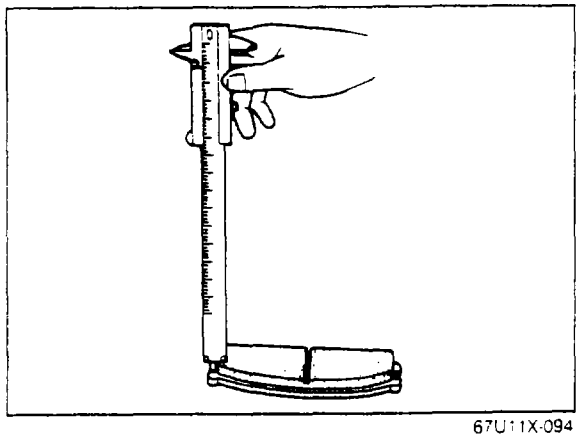
1. Clean the exposed part of the piston.
2. Remove the retainer and the dust seal.
3. Turn the piston counterclockwise with **disc brake piston wrench** (49 FA18 602) and screw out the piston.



67U11X 093

Snap Ring
Remove the snap ring from the caliper using snap ring pliers.

Caution
Do not scratch the cylinder.

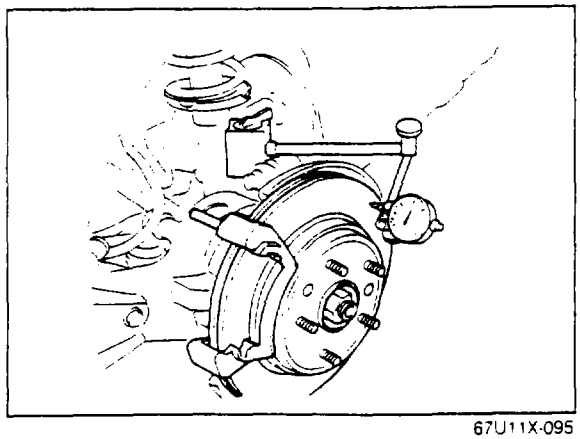


67U11X-094

INSPECTION
Inspect each part. If necessary, replace parts.

Disc Pad
1. Oil or grease on facing.
2. Abnormal wear or cracks.
3. Deterioration of damage by heat.
4. Remaining lining thickness.

Thickness: 1 mm (0.04 in) min.

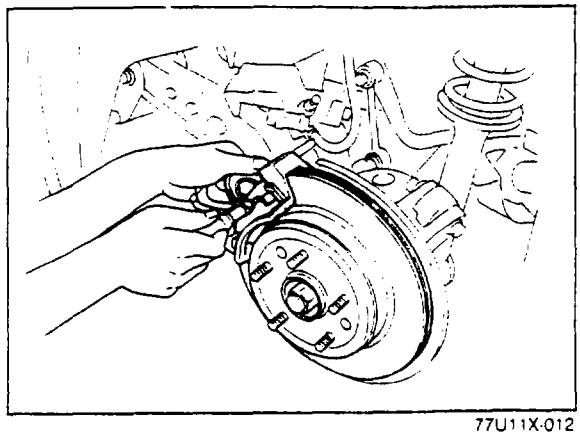


67U11X-095

Disc Plate
1. Runout

Runout: 0.1 mm (0.004 in) max.

Caution
a) There must be no wheel bearing looseness.
b) The measure location is the outer periphery of the disc plate surface.

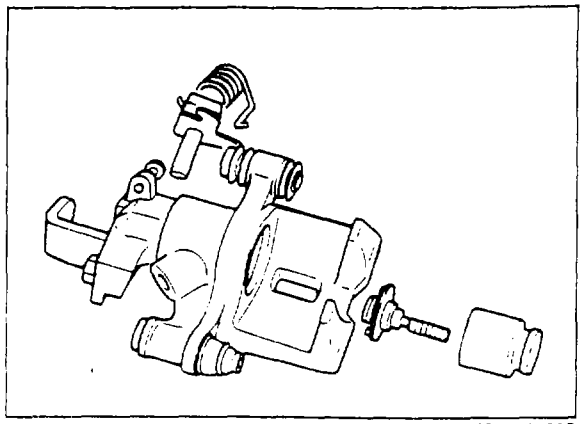


77U11X-012

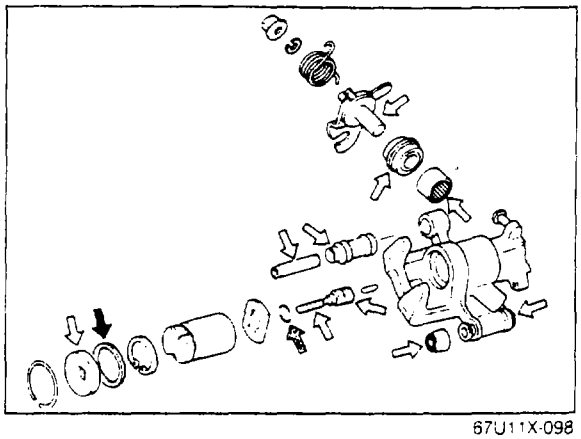
2. Wear or damage

Thickness
Vehicle with 14 in. wheel
Standard: 10 mm (0.39 in)
Limit: 8 mm (0.31 in) min.

Except vehicle with 14 in. wheel
Standard: 20 mm (0.79 in)
Limit: 18 mm (0.71 in) min.


67U11X-097

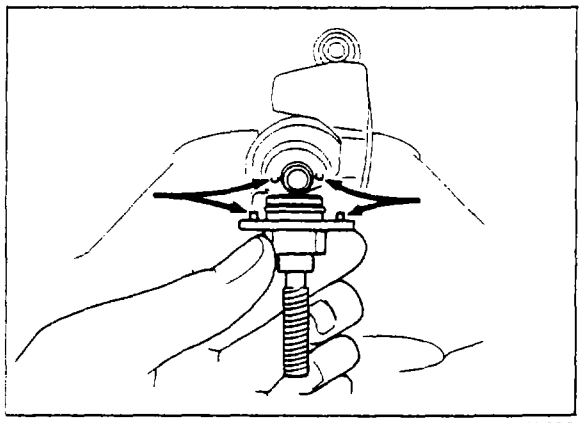
Caliper
1. Cylinder and piston for wear or rust.
2. Caliper body for damage or cracks.
3. Guide pin boot and dust seal for damage or poor sealing.
4. Guide pin for corrosion or wear.
5. Needle bearing for damage or wear.
6. V-spring for weakness.


67U11X-098

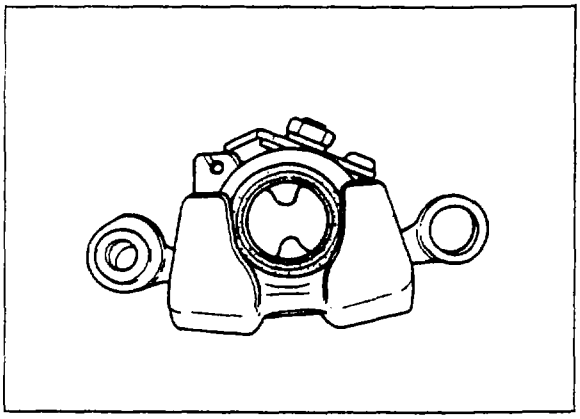
ASSEMBLY

Note
Apply the grease supplied in the seal kit to the places shown in the figure.

⇨: Orange colored grease
⇨: White colored grease
➡: Red colored grease


67U11X-099

Stopper
Install the stopper in the caliper by aligning the pins of the stopper with the holes of the caliper.


67U11X-100

Piston
Rotate the piston clockwise using **disc brake piston wrench** (49 FA18 602) until it stops.

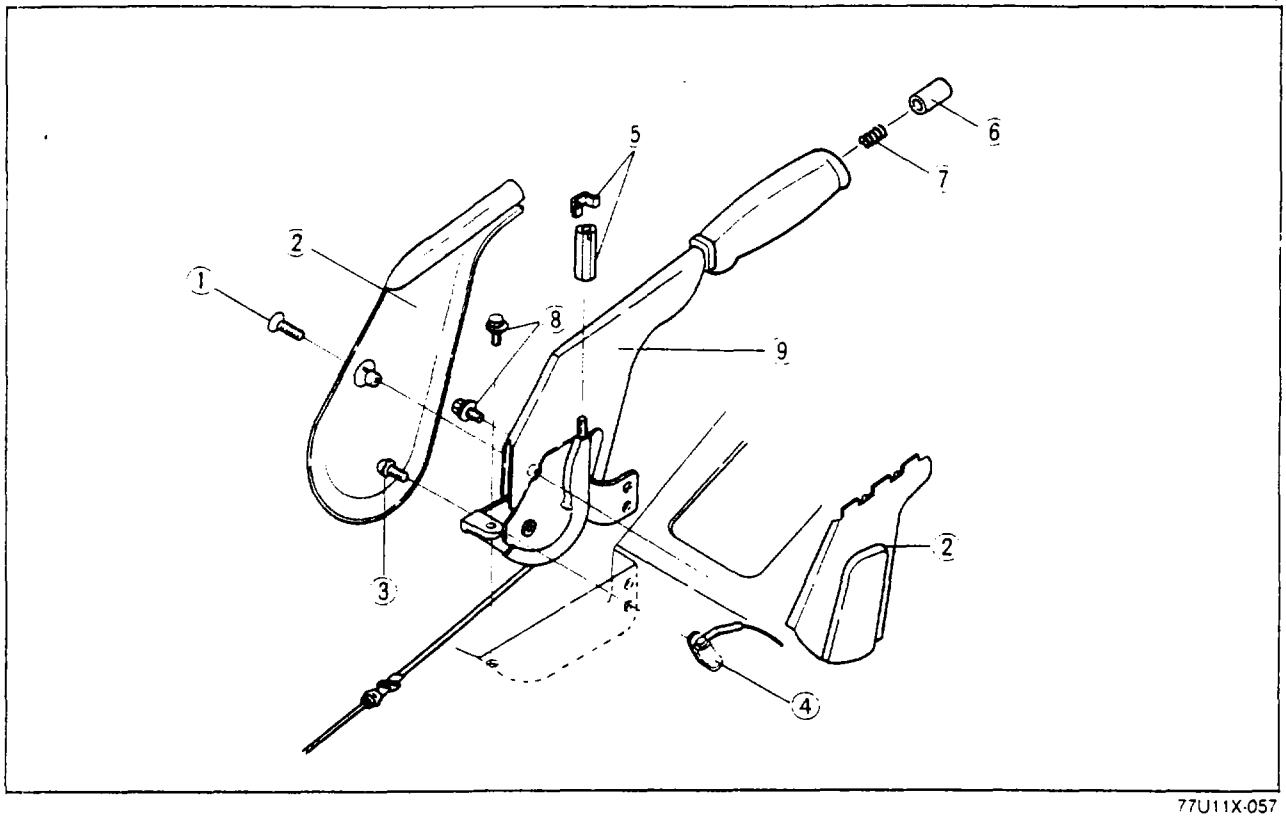
Note
Check that the stopper groove of the piston is in the position shown in the figure.

PARKING BRAKE LEVER

REMOVAL AND INSTALLATION

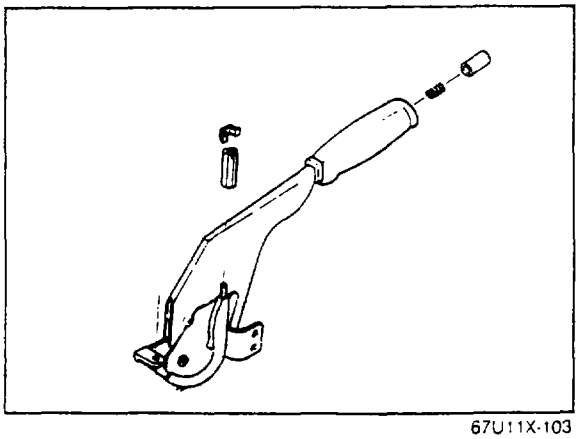
1. Block the wheels firmly.
2. Remove in the sequence shown in the figure.
3. Install in the reverse order of removal.
4. Adjust the stroke after installation. (See page 11—7).

77U11X-050



77U11X-057

1. Screw
2. Brake lever cover
3. Screw
4. Parking brake switch
5. Adjust nut
6. Push button
7. Spring
8. Bolts
9. Parking brake lever



67U11X-103

INSPECTION

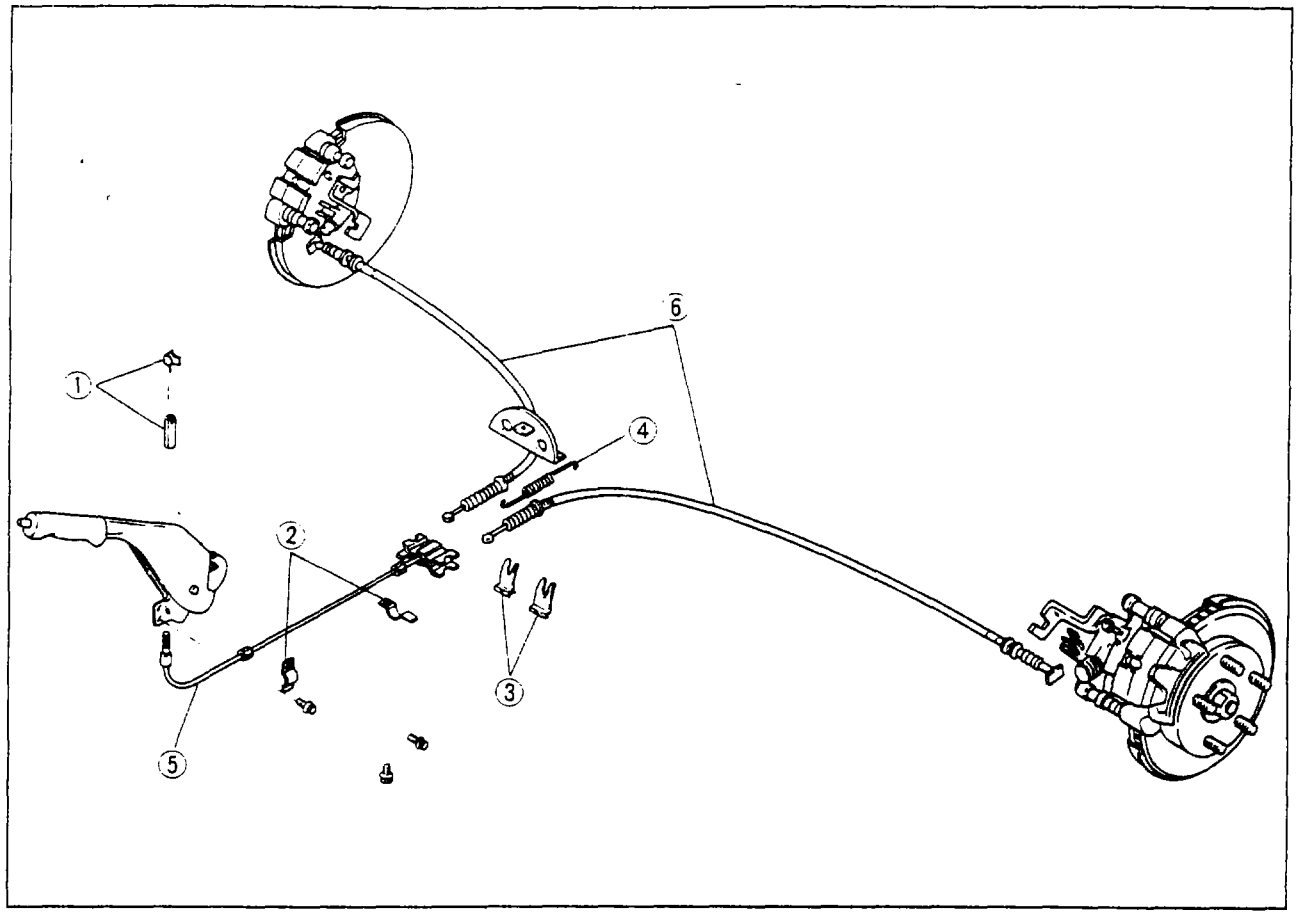
1. Lever and ratchet pawl for wear or damage
2. Spring for weakness or breakage.

PARKING BRAKE CABLE

REMOVAL AND INSTALLATION

1. Jack up the vehicle and support it with safety stands.
2. Remove in the sequence shown in the figure.
3. Install in the reverse order of removal.

77U11X-051

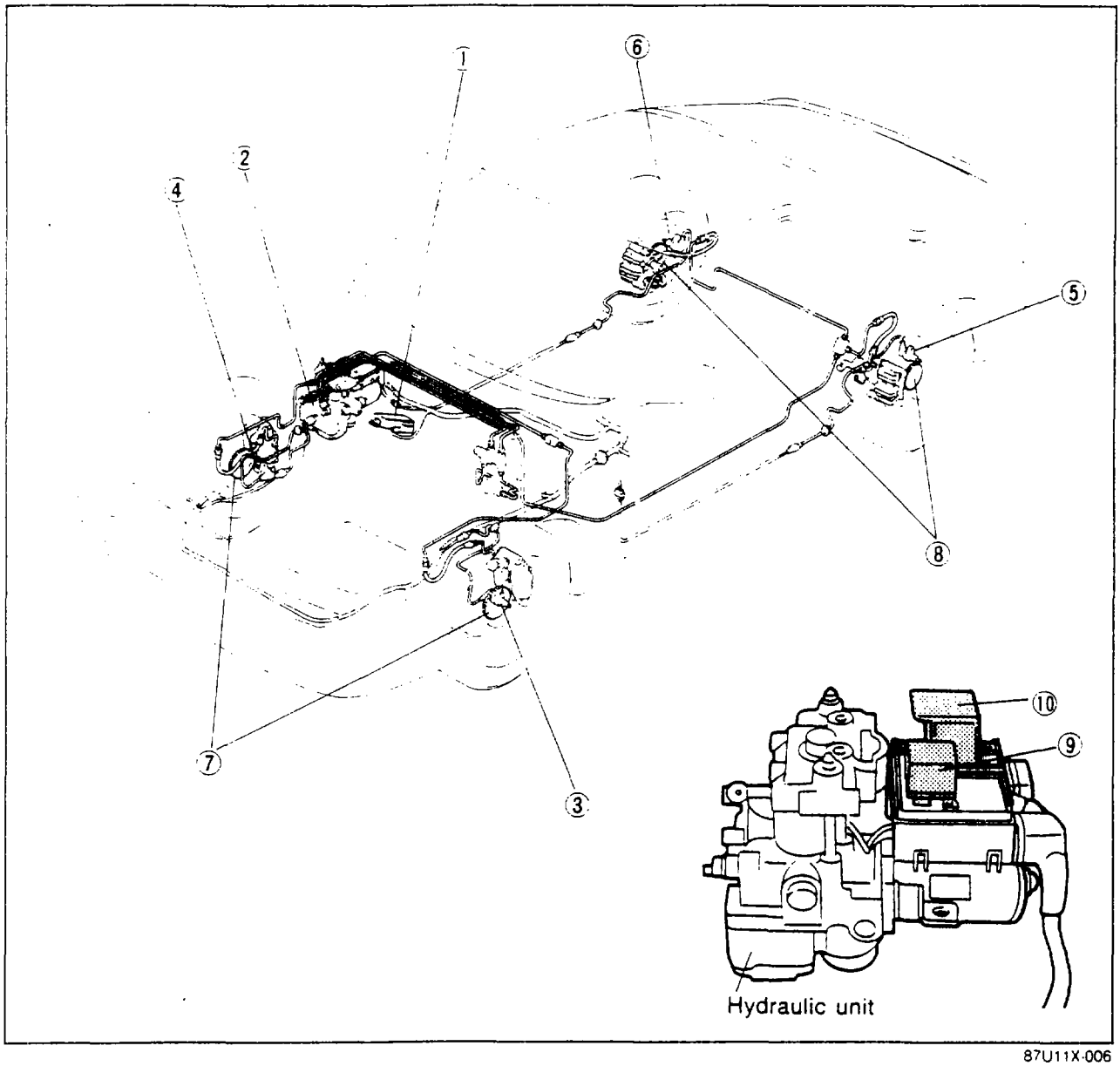


67U11X-105

1. Adjust nut
2. Bands
3. Clips
4. Spring
5. Front brake cable
6. Rear brake cables

ANTI-LOCK BRAKE SYSTEM (ABS)

STRUCTURAL VIEW



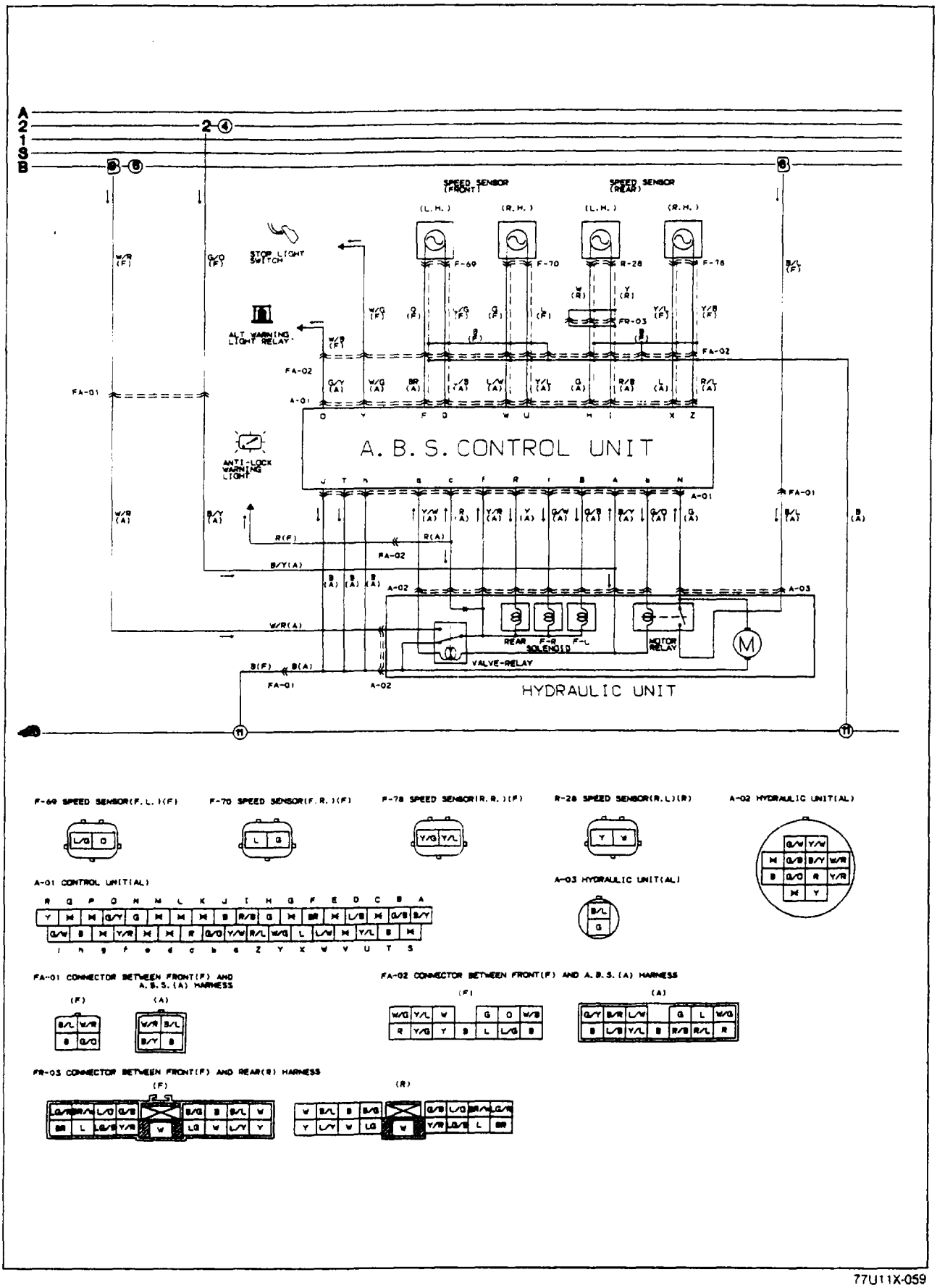
87U11X-006

1. Anti-lock brake control unit
2. Hydraulic unit
3. Speed sensor (LF)
4. Speed sensor (RF)
5. Speed sensor (RR)
6. Speed sensor (LR)
7. Rotors
8. Rotors
9. Valve relay
10. Motor relay

Note

1. **Because the pump motor briefly operates after the vehicle speed reaches approx. 6 km/h (3.8 mph) for diagnosis of the pump motor, the operating sound of the motor is heard momentarily.**
2. **When vehicles equipped with ABS are compared to vehicles that do not have ABS, the following distinctive characteristics will be found, which in no way indicate an abnormality. When the brakes are applied forcefully 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.**

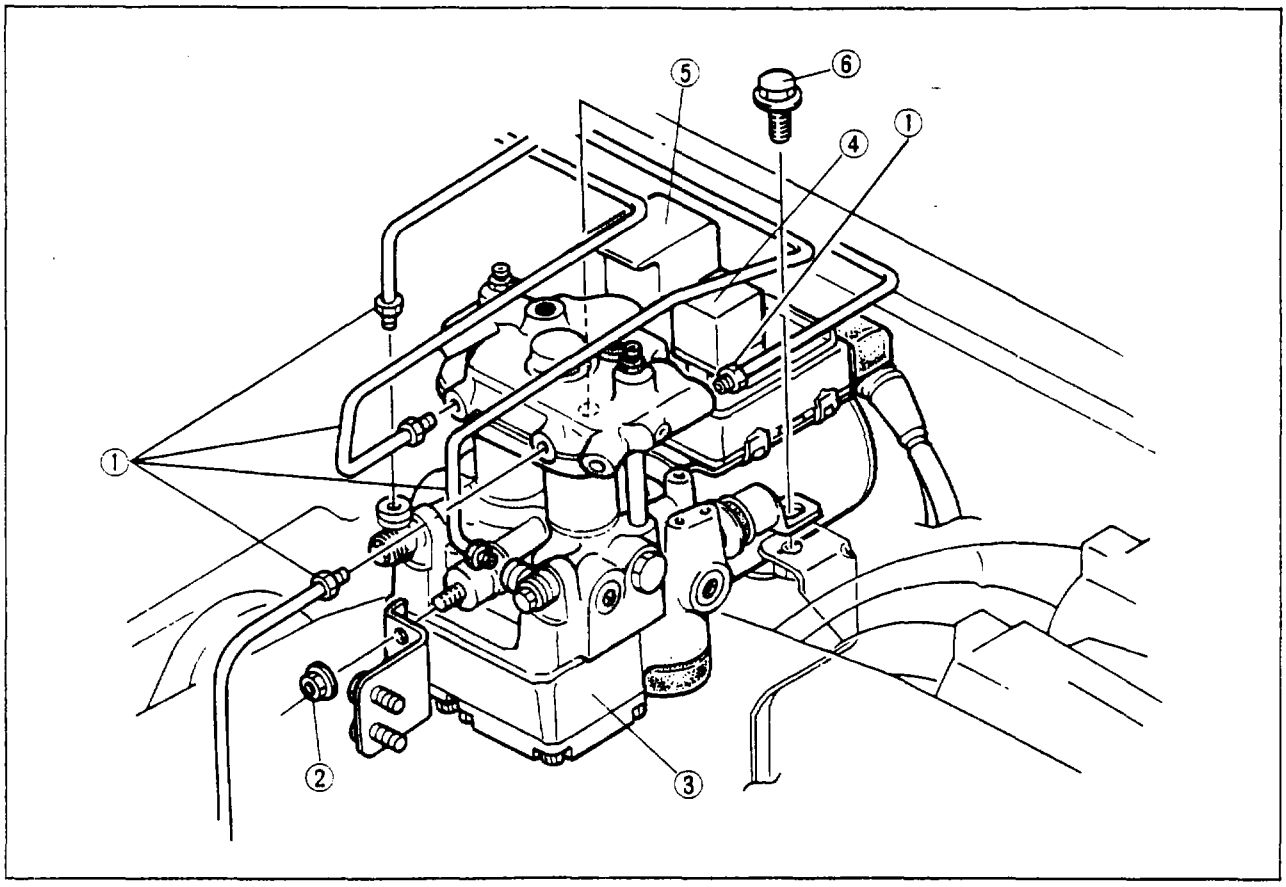
CIRCUIT DIAGRAM



77U11X-059

HYDRAULIC UNIT

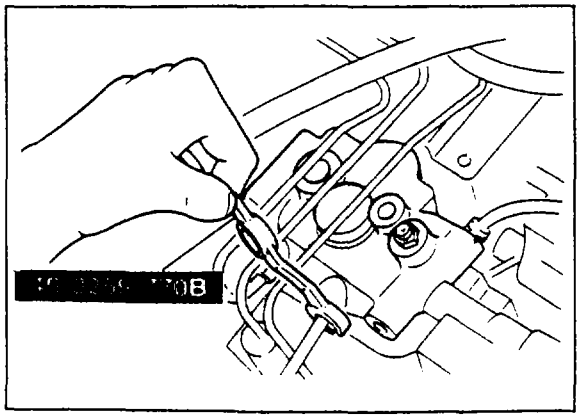
STRUCTURAL VIEW



87U11X-007

1. Brake pipes
2. Nuts
3. Hydraulic unit assembly
4. Valve relay
5. Motor relay
6. Bolt

Note:
The only serviceable parts of the hydraulic unit are the valve relay and the pump motor relay; if there is a failure of any other part, the hydraulic unit must be replaced as an assembly.

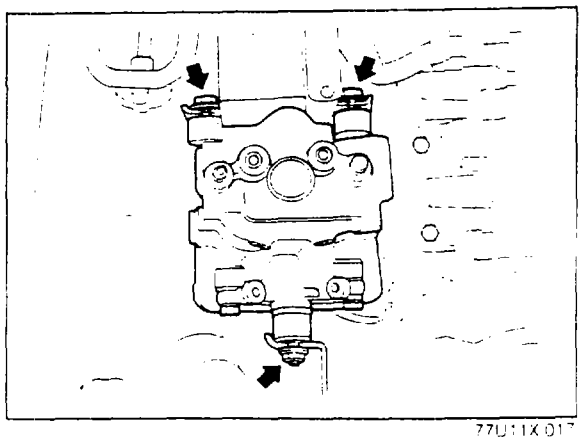


77U11X-016

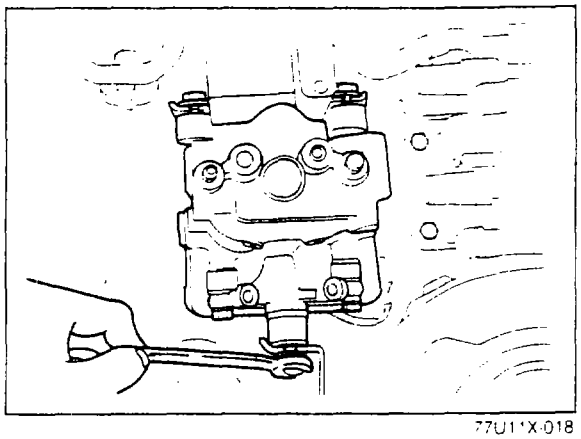
REMOVAL

Brake Pipes

1. Remove the brake pipes from the hydraulic unit using **flare nut wrench** (49 0259 770B).

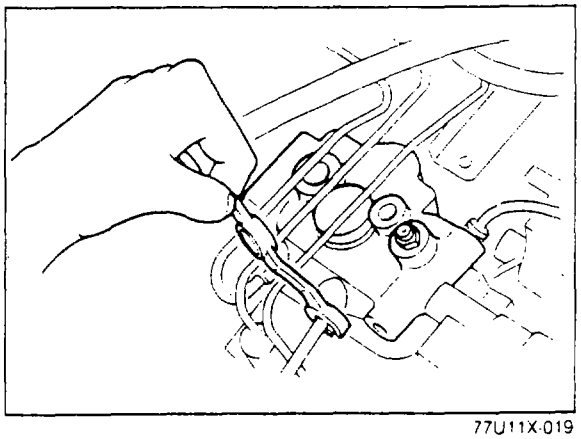

77U11X-017

2. Disconnect the hydraulic unit connector.
3. Remove the nuts, and then remove the hydraulic unit assembly.


77U11X-018

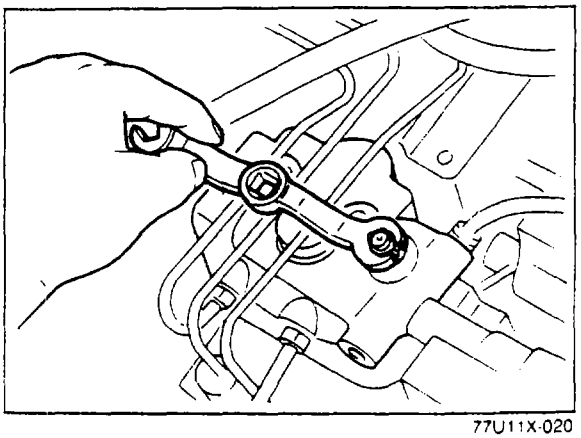
INSTALLATION

1. Mount the new hydraulic unit assembly on the bracket.
2. Tighten the nuts.
3. Connect the hydraulic unit connector.


77U11X-019

4. Connect the brake pipes to the hydraulic unit assembly using **flare nut wrench** (49 0259 770B).

Caution
When installing the hydraulic unit assembly, do not remove the caps on the unit until connecting the brake pipes.


77U11X-020

AIR BLEEDING

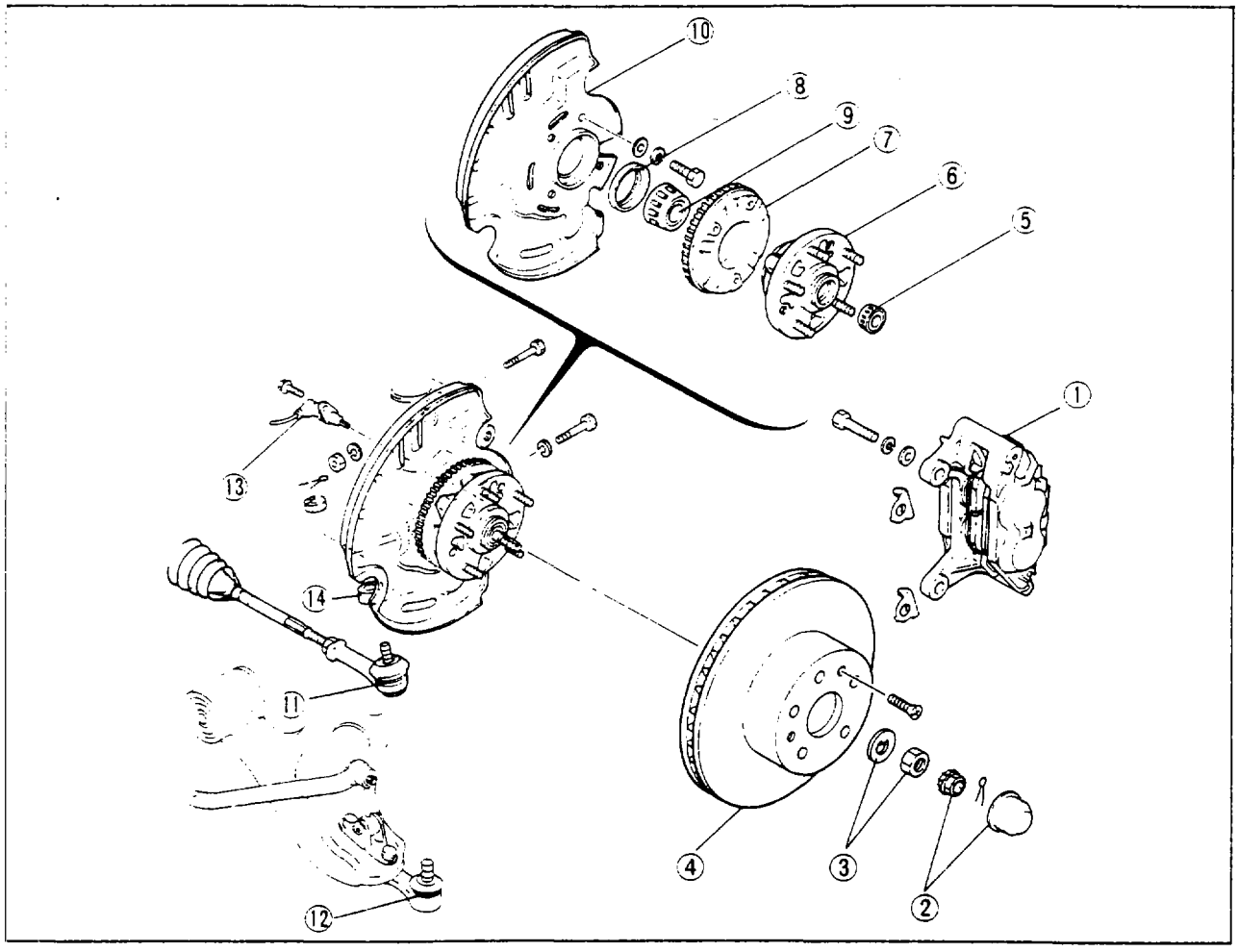
When replacing the hydraulic unit, bleed the air in the following order.

1. Rear wheel cylinders
2. Front wheel cylinders
3. Hydraulic unit

SPEED SENSOR AND ROTOR

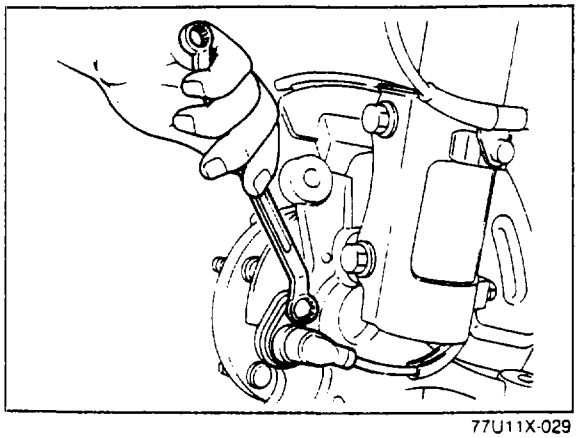
REMOVAL AND INSTALLATION (FRONT)

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.



77U11X-061

1 Caliper
2. Hub cap and set cover
3 Hub nut and washer
4 Disc plate
5 Wheel bearing (outer)
6. Wheel hub
7. Rotor
8. Oil seal
9. Wheel bearing (inner)
10. Dust cover
11. Tie-rod end
12. Lower arm ball joint
13. Speed sensor
14. Knuckle spindle

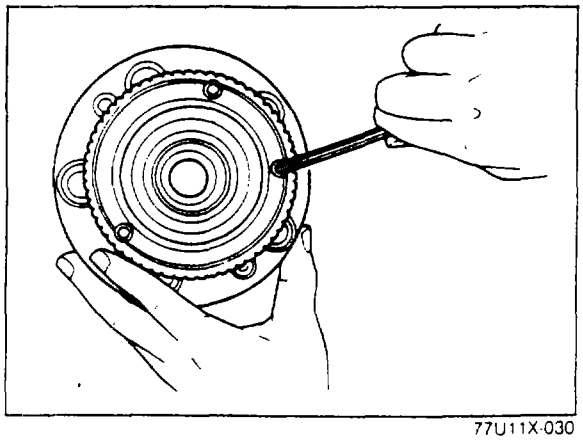


77U11X-029

Removal of Speed Sensor

Remove the attaching bolt and remove the speed sensor from the knuckle.

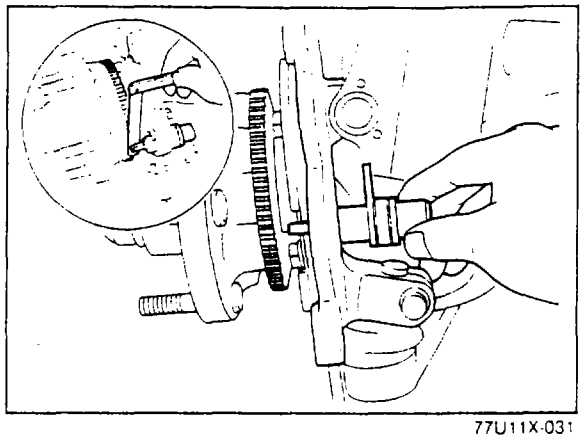
11 SPEED SENSOR AND ROTOR



77U11X-030

Removal of Rotor

1. Remove the front wheel hub.
2. Remove the bolts using a hex wrench and remove the rotor from the front hub.



77U11X-031

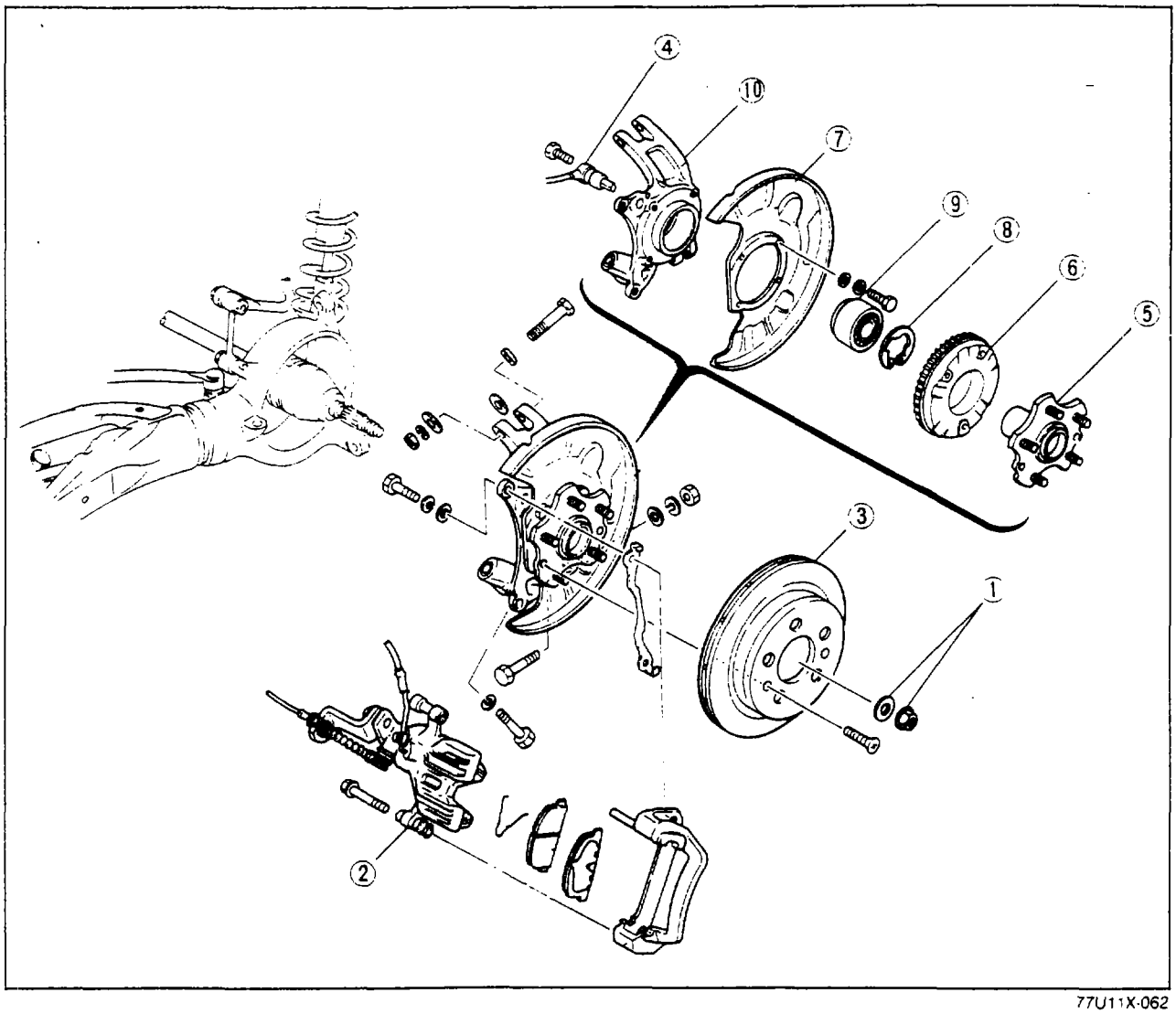
Installation of Speed Sensor

1. Install the speed sensor with the attaching bolt.
2. Check the clearance between rotor and pick-up of the speed sensor.

Clearance: 0.4—1.0 mm (0.0157—0.0394 in)

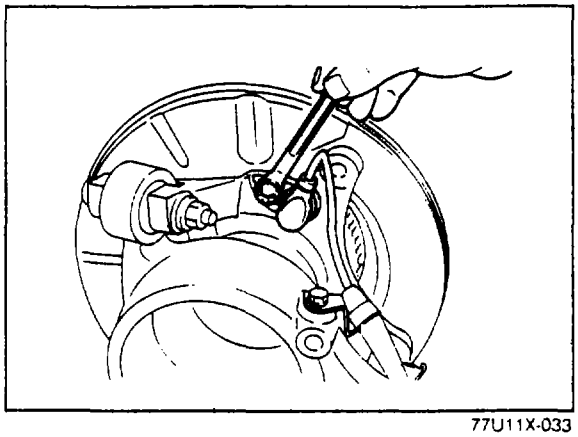
REMOVAL AND INSTALLATION (REAR)

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.



77U11X-062

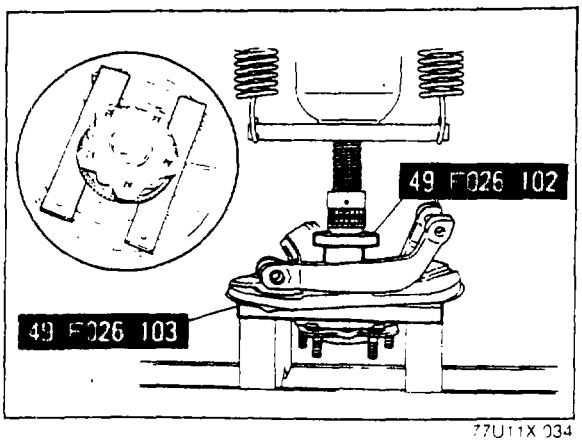
1. Lock nut and washer
2. Caliper assembly
3. Disc plate
4. Speed sensor
5. Wheel hub
6. Rotor
7. Dust cover
8. Retaining ring
9. Wheel bearing
10. Toe control hub (outer)



77U11X-033

Removal of Speed Sensor

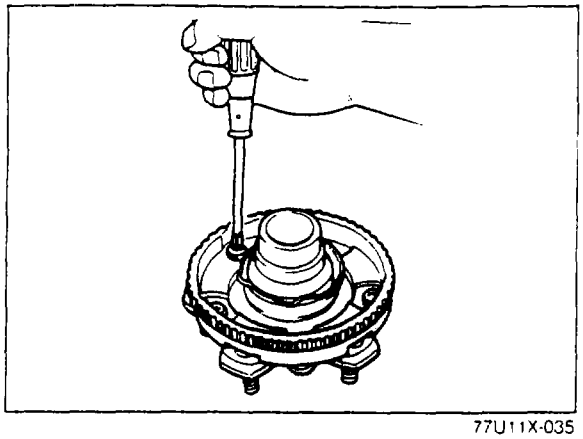
1. Remove the attaching bolt and remove the speed sensor from the outer toe control hub.



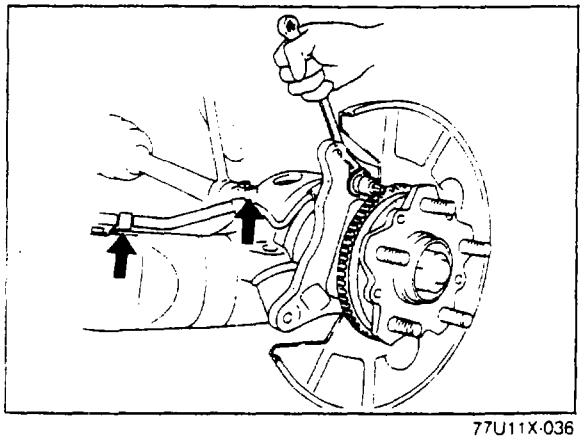
77U11X-034

Removal of Rotor

1. Remove the wheel hub from the outer toe control hub using **wheel hub puller** (49 F026 103) and **bearing installer** (49 F026 102).

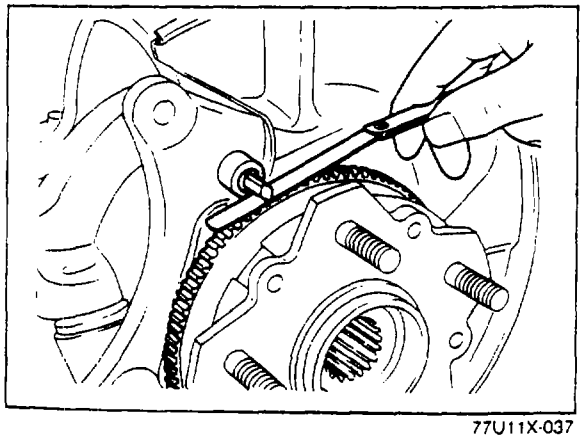

77U11X-035

3. Remove the screws and remove the rotor from the wheel hub.


77U11X-036

Installation of Speed Sensor

1. Install the speed sensor wiring harness on the rear arm.
2. Install the speed sensor with the attaching bolt.


77U11X-037

2. Check the clearance between rotor and pick-up of the speed sensor.

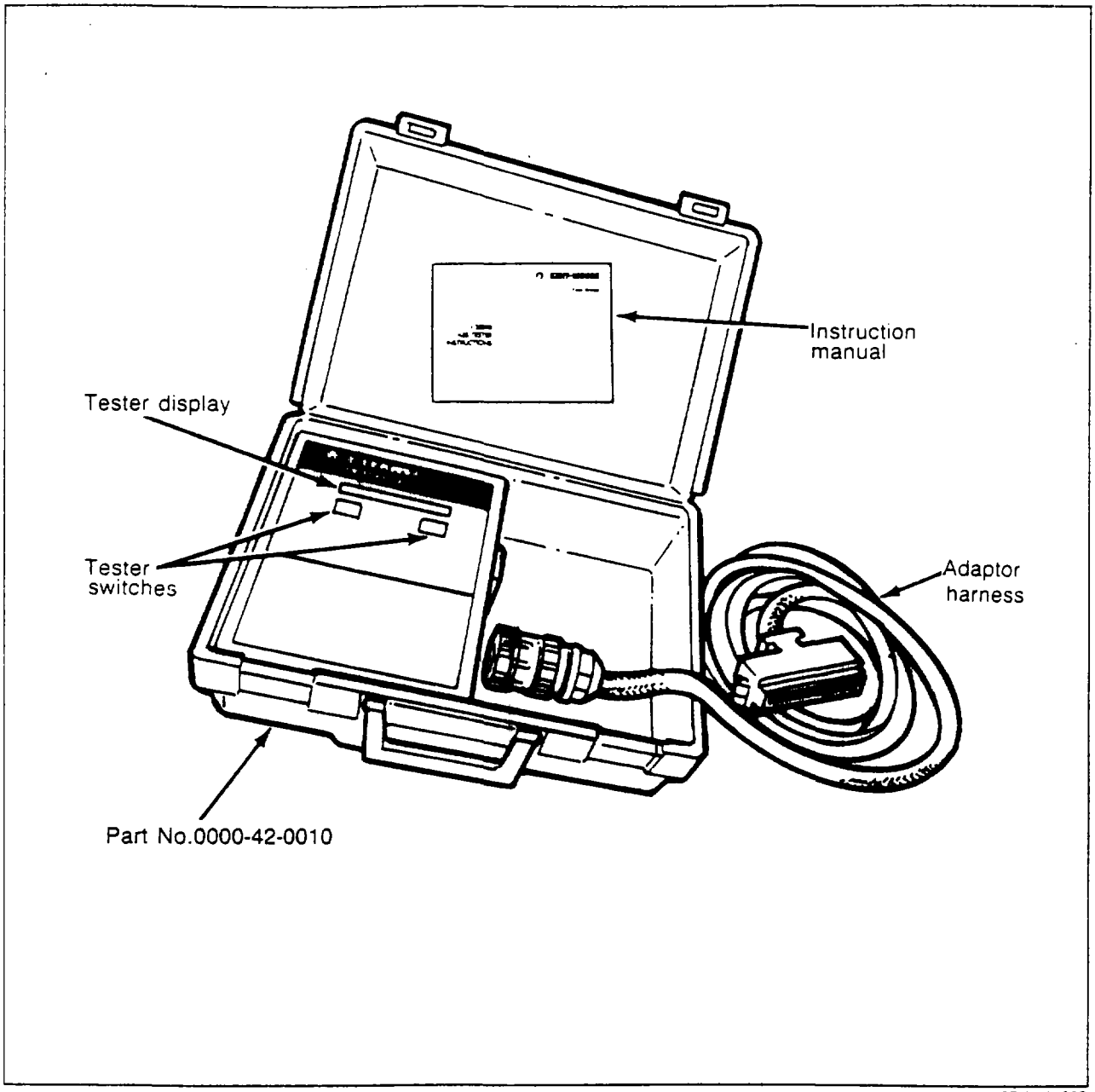
Clearance: 0.4—1.0 mm (0.0157—0.0394 in)

ANTI-LOCK BRAKE SYSTEM (ABS) TESTER

OUTLINE

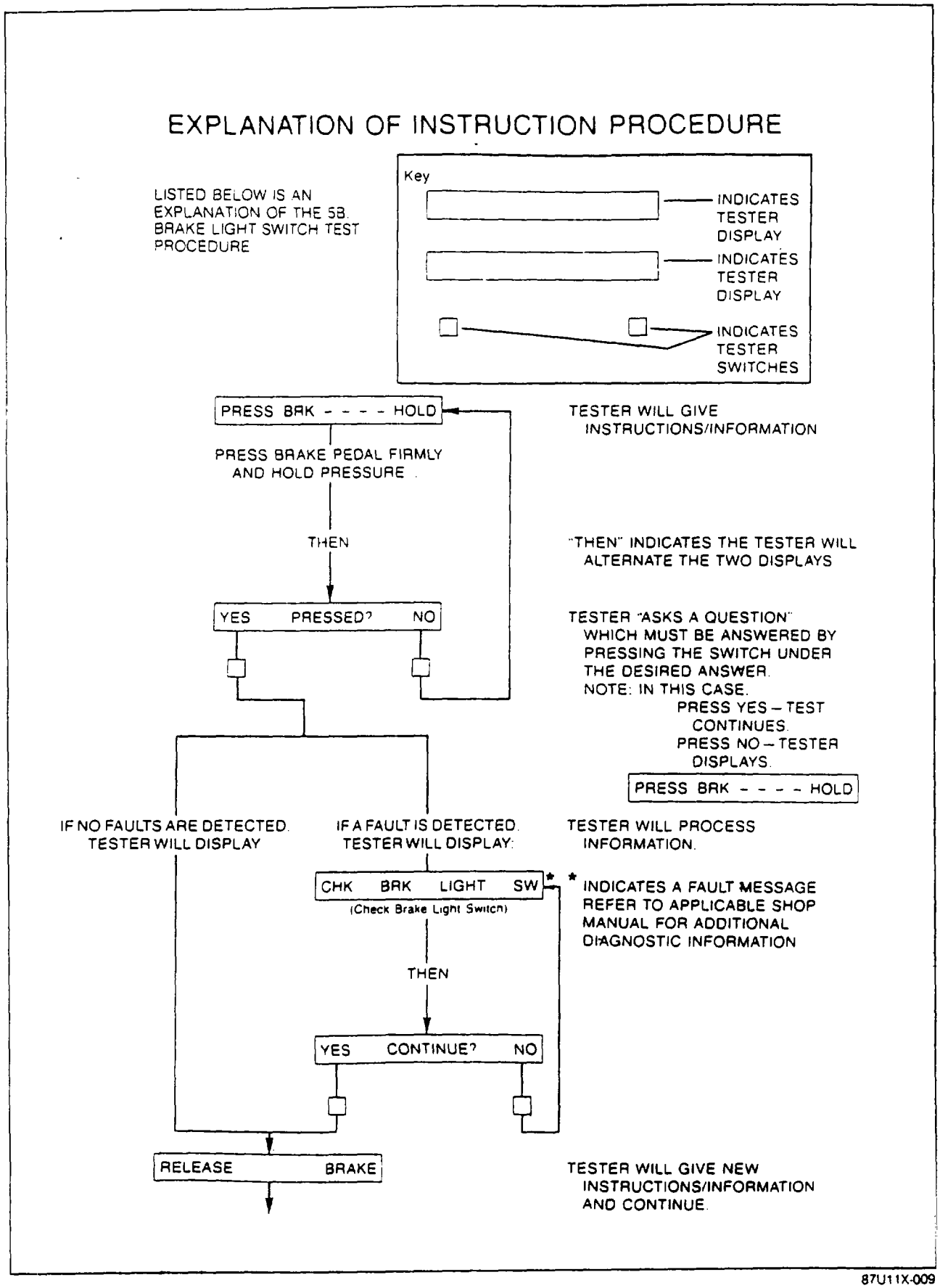
By retaining or reducing the hydraulic fluid pressure in the hydraulic unit, the ABS tester is used to locate the cause of a problem within the anti-lock brake system.
Because there is no way to check the ABS control unit itself, replace the control unit assembly only after first confirming that the other electrical parts operate normally.

STRUCTURAL VIEW



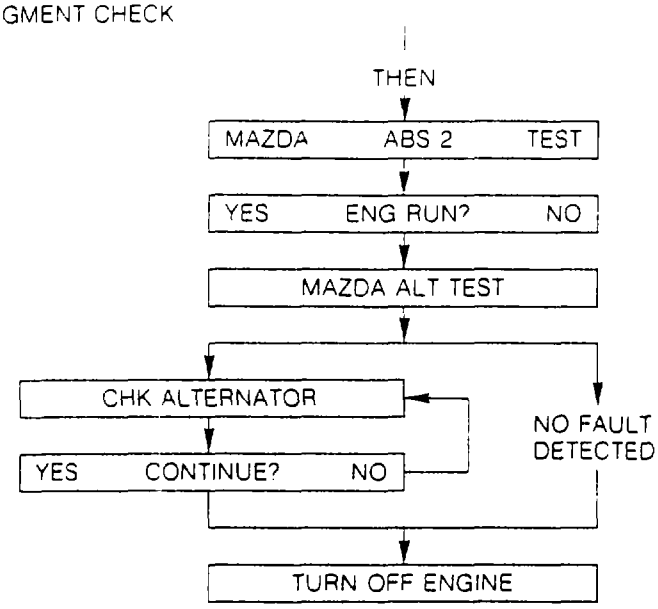
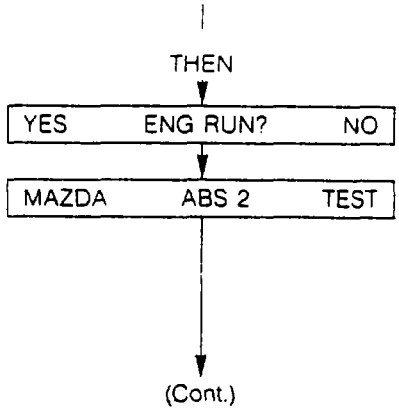
87U11X-008

EXPLANATION OF INSTRUCTION PROCEDURE



87U11X-009

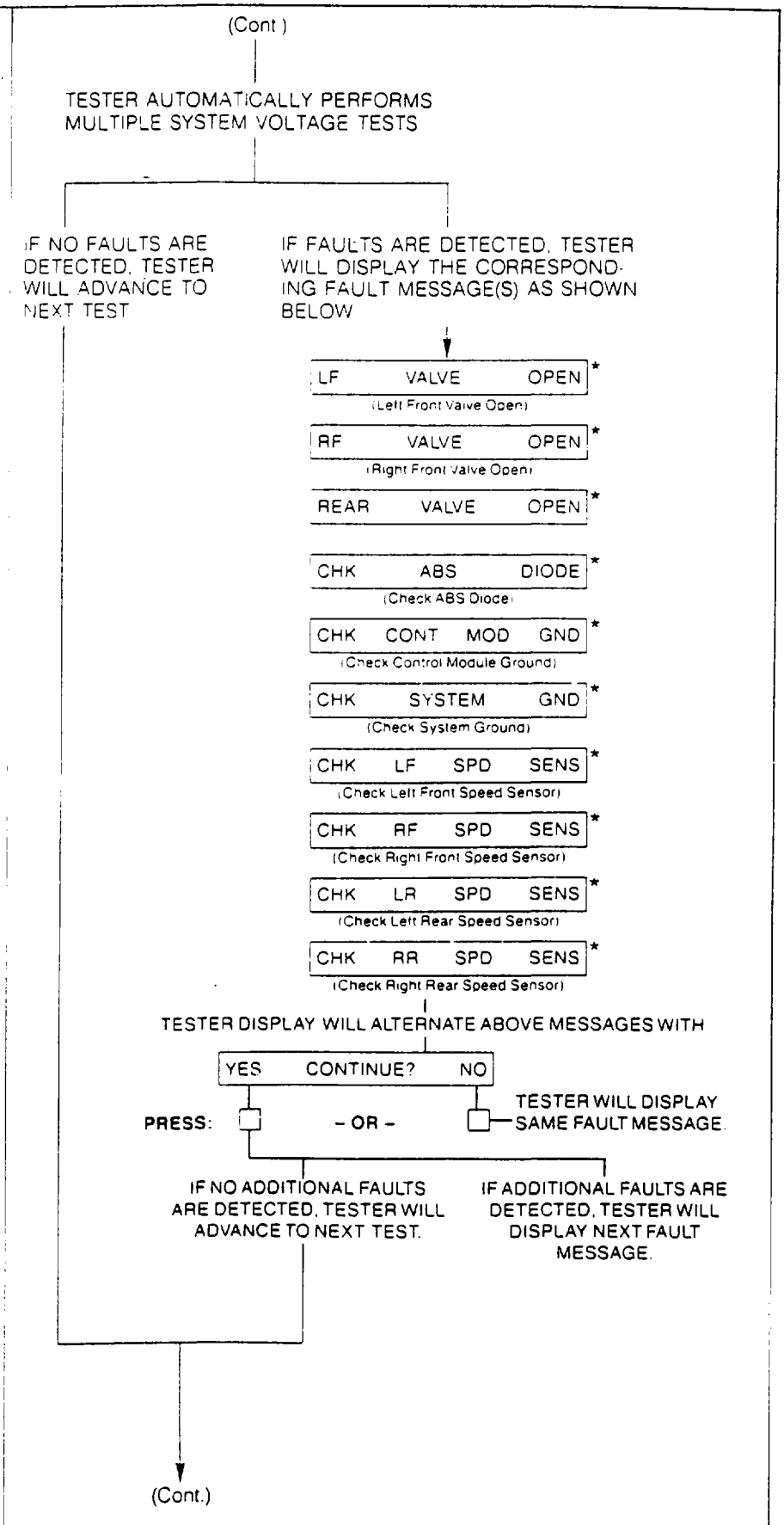
TESTING PROCEDURE

ITEM	
1. CONNECTION/POWER-UP	1. LOCATE ABS CONTROL UNIT. 2 DISCONNECT CONTROL UNIT HARNESS CONNECTOR FROM CONTROL UNIT. 3 CONNECT ABS TESTER HARNESS TO CONTROL UNIT HARNESS CONNECTOR. 4 TURN IGNITION KEY TO ON POSITION.
2. ALTERNATOR TEST START ENGINE (ALTERNATOR TESTED BY RUNNING ENGINE)	TESTER WILL RAPIDLY DISPLAY SEVERAL MESSAGES DURING AN INITIAL SEGMENT CHECK 
3. ABS SYSTEM TEST TURN IGNITION KEY ON (DO NOT RUN ENGINE)	TESTER WILL RAPIDLY DISPLAY SEVERAL MESSAGES DURING AN INITIAL SEGMENT CHECK. 

87U11X-010

4. SYSTEM VOLTAGE CHECKS

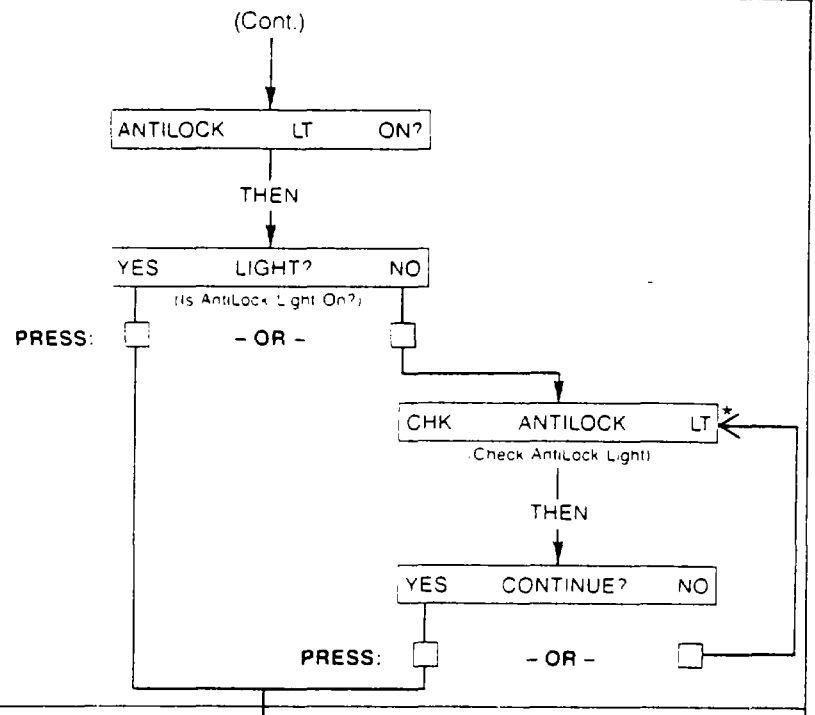
* AFTER DISPLAY INDICATES A FAULT MESSAGE, REFER TO APPLICABLE SHOP MANUAL FOR ADDITIONAL DIAGNOSTIC INFORMATION



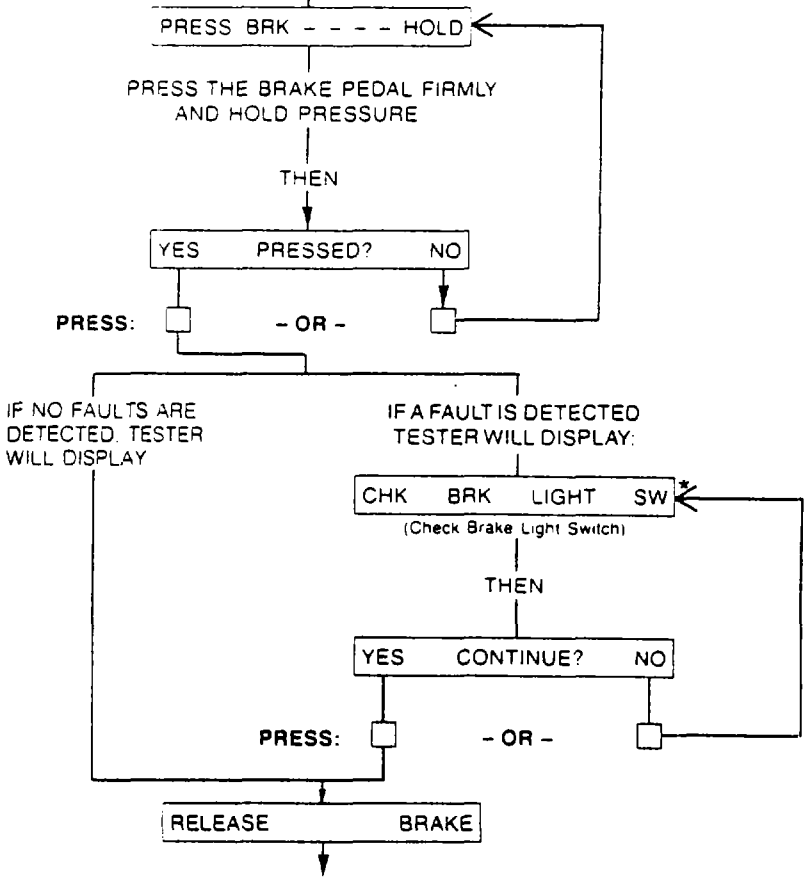
87U11X-011

5. STATIC TESTS

5A. ANTI-LOCK LIGHT TEST

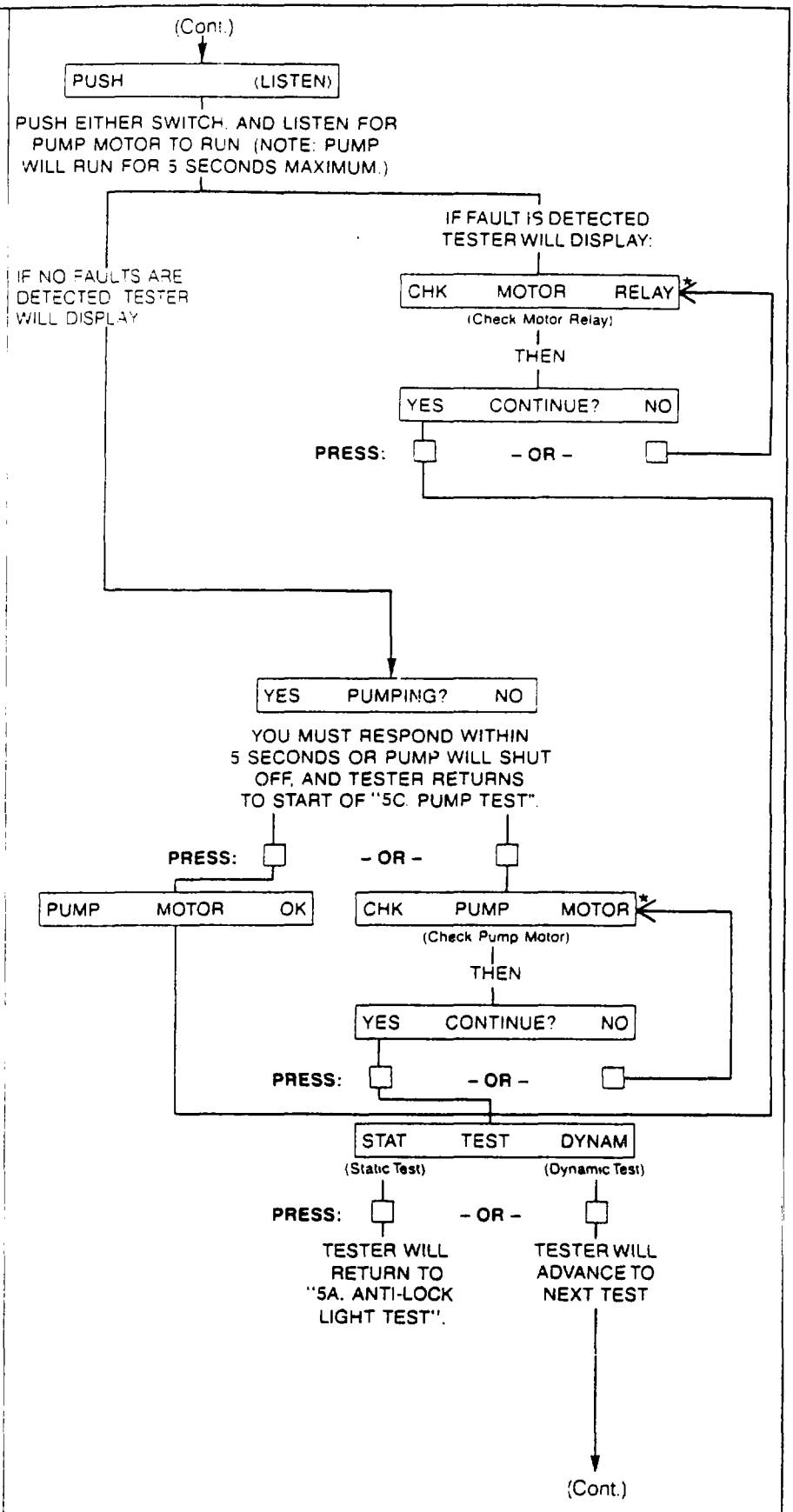


5B. BRAKE LIGHT SWITCH TEST



87U11X-012

5C. PUMP TEST



87U11X-013

6. DYNAMIC TESTS

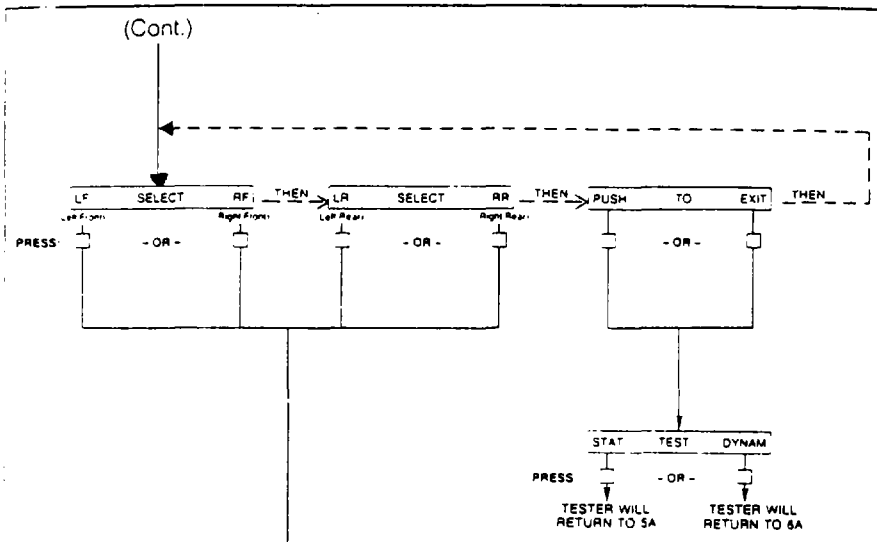
6A. WHEEL SELECTION OR EXIT

THESE THREE MESSAGES WILL ALTERNATE ON THE DISPLAY SCREEN AT 3 1/2 SECOND INTERVALS. NOW, SELECT ONE OF THE FOUR WHEELS TO BEGIN THE DYNAMIC TEST SEQUENCE

OR

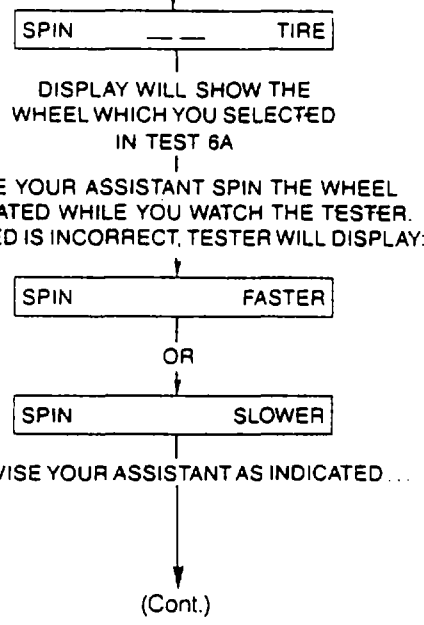
PRESS EITHER SWITCH UNDER "PUSH TO EXIT" DISPLAY TO RETURN TO "STAT TEST DYNAM" SELECTION.

IMPORTANT:
WHEN ENTERING THE DYNAMIC TEST SEQUENCE, YOU WILL SELECT ONE OF FOUR WHEELS TO BEGIN. WHEN YOU HAVE FINISHED WITH THAT WHEEL TEST, YOU SHOULD RETURN TO 6A "WHEEL SELECTION", TO SELECT ANOTHER WHEEL, AND REPEAT THESE TEST PROCEDURES FOR ALL FOUR WHEELS.



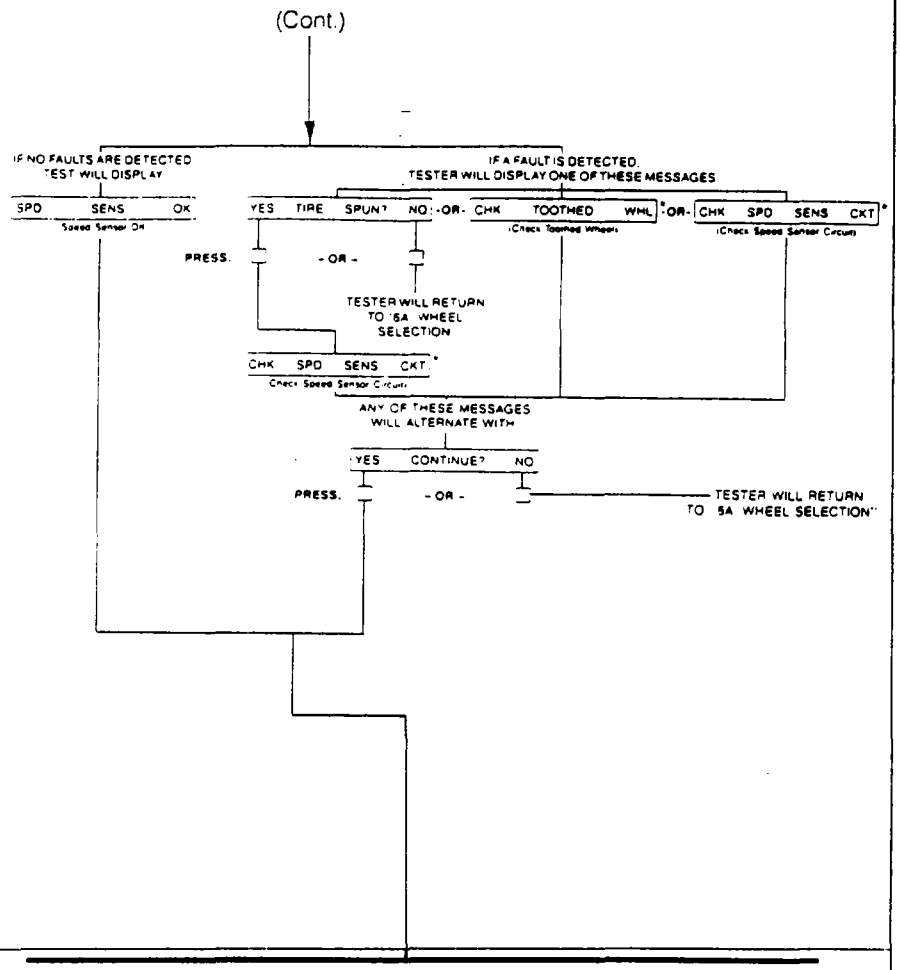
NOTE: FOR EACH OF THE WHEEL TESTS, IT IS NECESSARY TO RAISE THE WHEEL(S) BEING TESTED OFF THE FLOOR. (WHEN TESTING REAR WHEELS, BOTH WHEELS MUST BE RAISED OFF THE FLOOR.) AN ASSISTANT WILL BE REQUIRED TO SPIN THE WHEELS.

6B. WHEEL SENSOR TEST



87U11X-014

6B. WHEEL SENSOR TEST



6C. SOLENOID TEST

NOTE: EACH OF THE TWO SOLENOID TESTS FOR EACH WHEEL CAN BE CONDUCTED FOR A MAXIMUM OF 15 SECONDS. IF TIME LIMIT IS EXCEEDED, TESTER WILL DISPLAY:

TIMEOUT EXPIRED

THEN

TRY TEST AGAIN

PUSH TEST 1

PUSH EITHER SWITCH TO START THIS TEST. TESTER WILL DISPLAY:

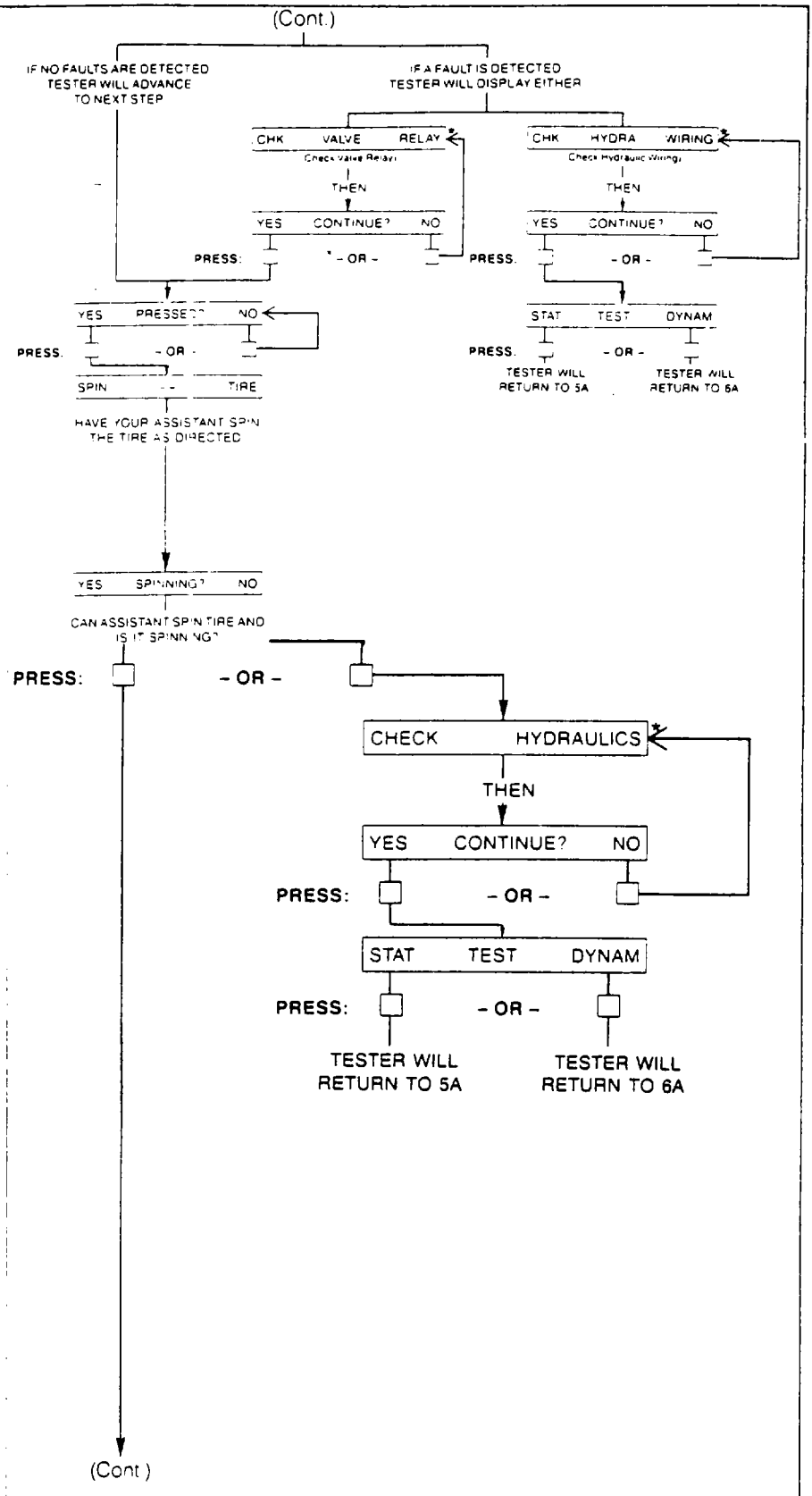
PRESS BRK... HOLD

APPLY FIRM PRESSURE TO BRAKE PEDAL, AND HOLD FIRMLY THROUGH SOLENOID TEST 1 AND TEST 2.

(Cont.)

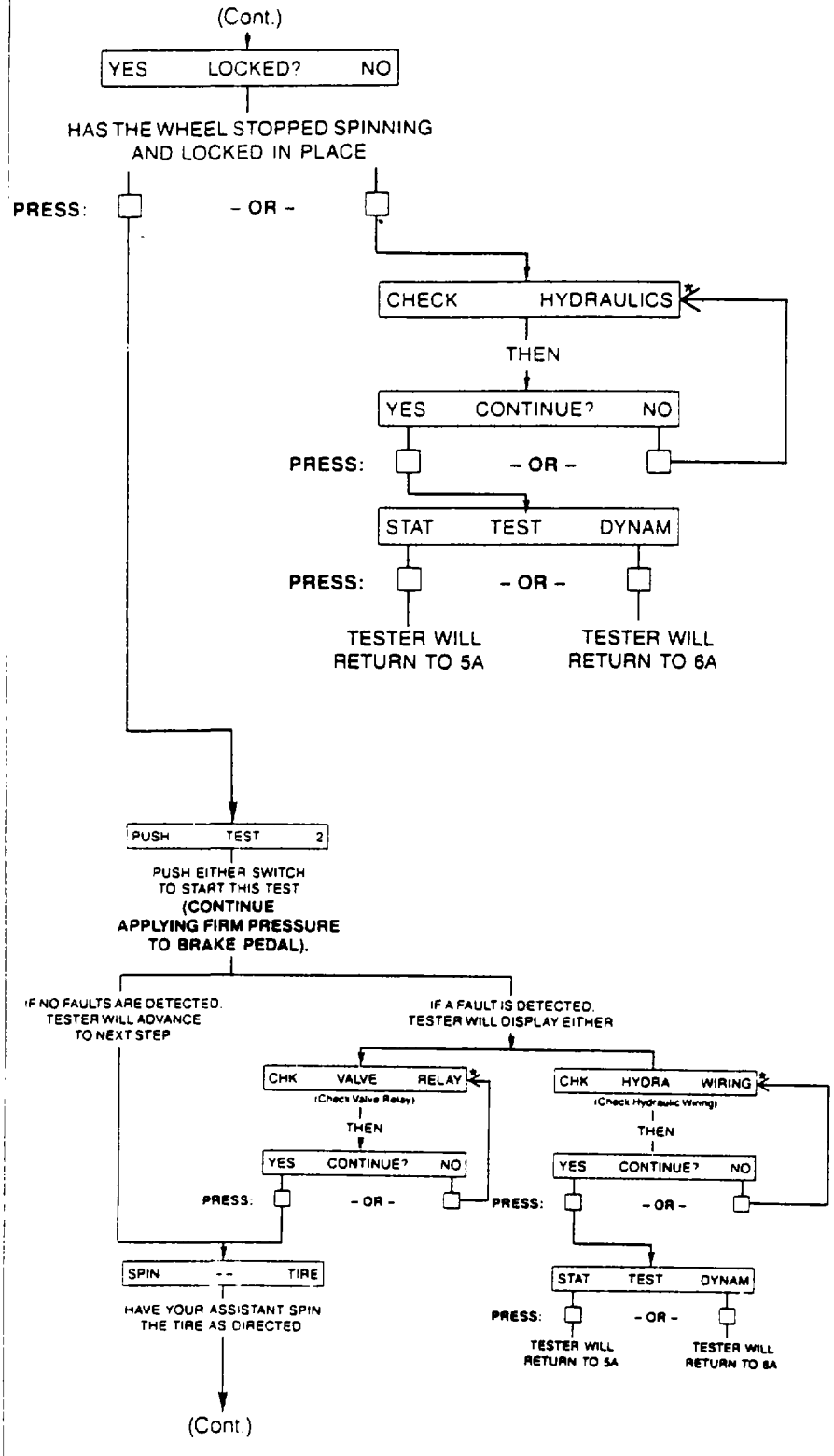
87U11X-015

6C. SOLENOID TEST



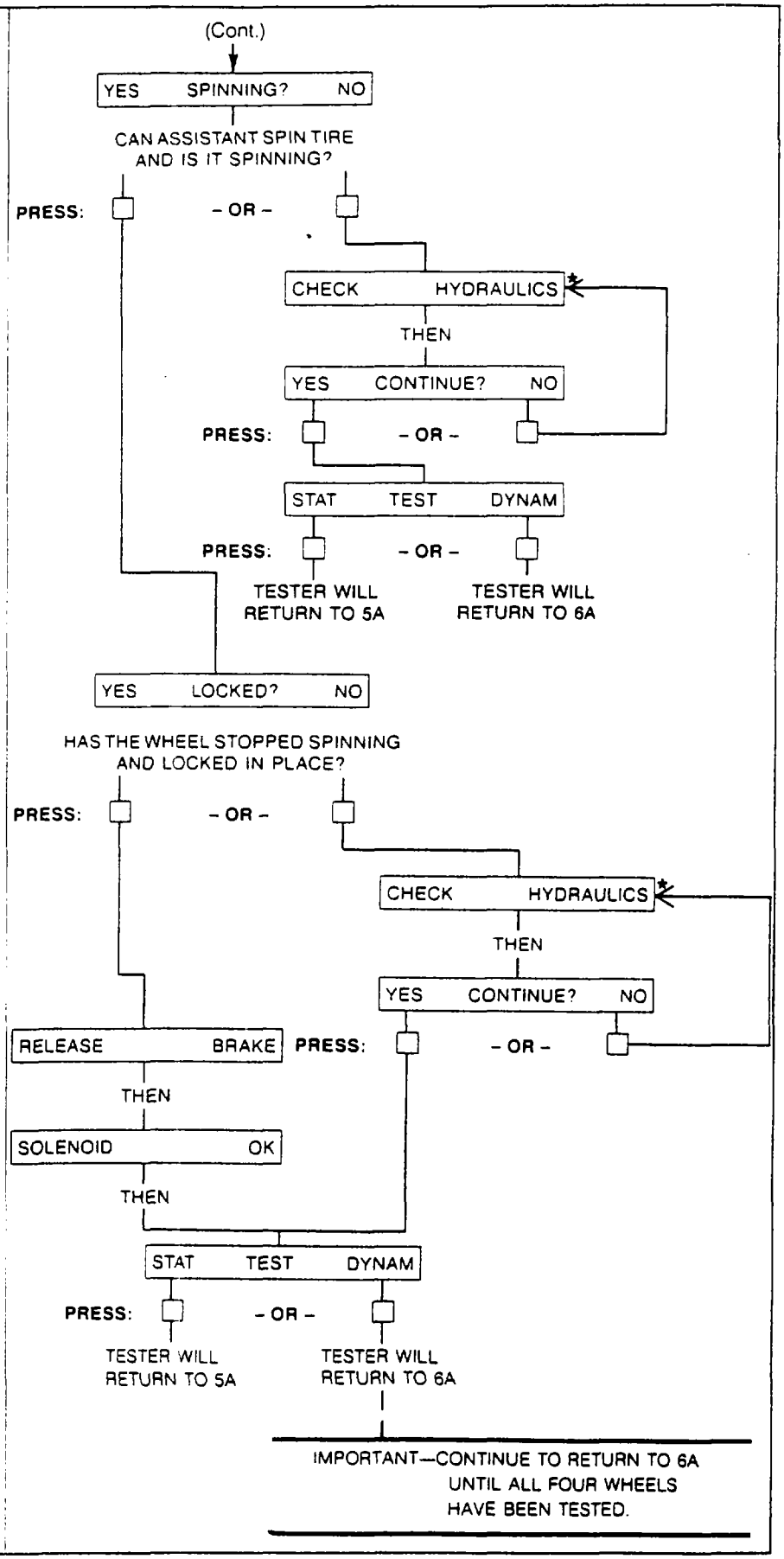
87U11X-016

6C. SOLENOID TEST

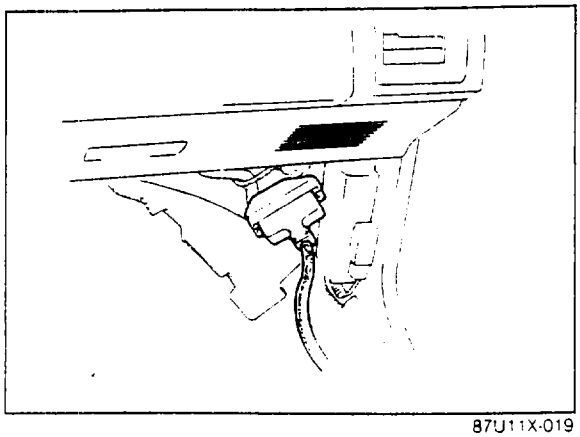


87U11X-017

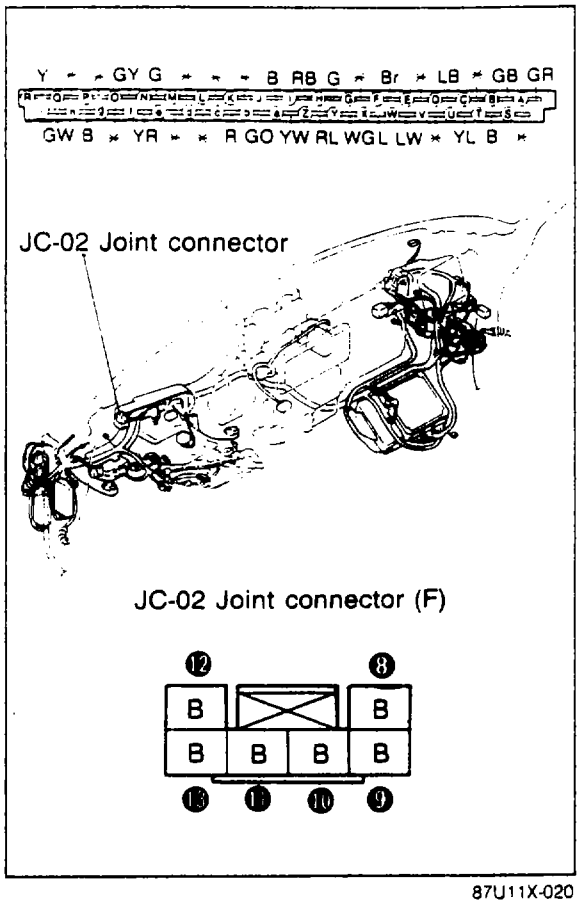
6C. SOLENOID TEST



87U11X-018



87U11X-019



87U11X-020

CHECKING ABS SYSTEM

PROCEDURE

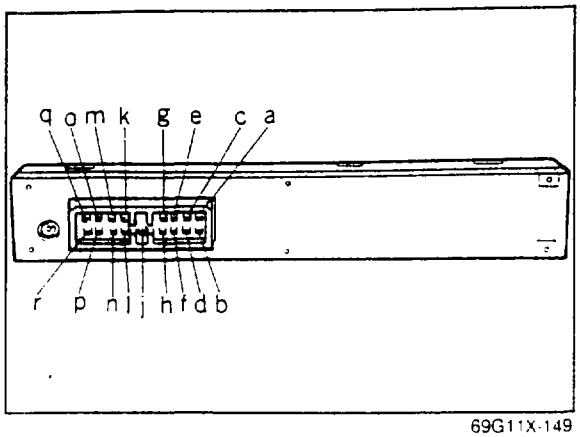
1. Remove the scuff plate and front side trim.
2. Connect the ABS control unit connector after switching the ignition switch OFF.
3. Connect the ABS Tester to the control unit connector at the harness side.

Note
If the tester does not operate, check
a) Fuse
b) Ignition switch and circuit

System Ground

Check for an open in (B) wire from terminal T of the control unit to the JC-02 joint connector.

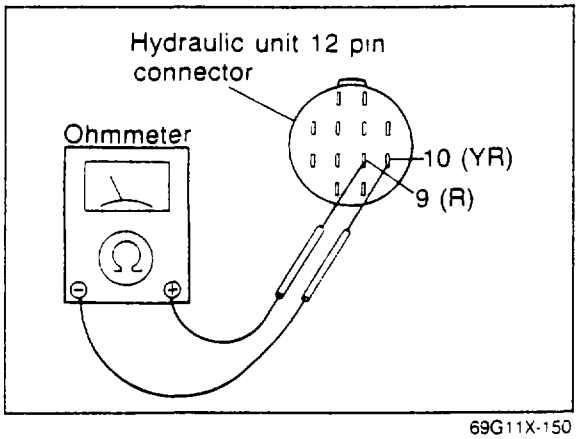
Caution
When checking each control unit terminal, do not use ordinary tester pins. Use only very thin pins to prevent damage to the terminals.



69G11X-149

Check Anti-Lock Warning Light

1. Remove the clock bezel assembly.
2. Slide the warning and clock unit out from the instrument panel.
3. Connect terminal (R) wire to a body ground.
4. Start the engine and check that the ABS warning light illuminates.
5. If there is no illumination, check the meter fuse, bulb, and wiring harness.
6. If OK, check the wiring harness between the warning light and control unit or hydraulic unit.

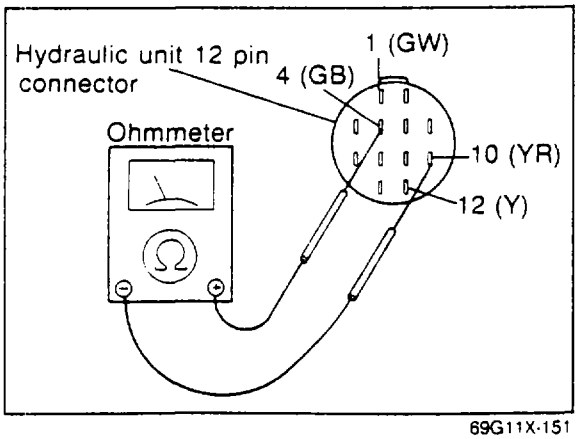


69G11X-150

Check ABS Diode

1. Check the meter fuse, bulb, and wiring harness.
2. Check the wiring harness between the warning light and control unit or hydraulic unit.
3. Disconnect the hydraulic unit 12 pin connector.
4. Using an ohmmeter, check for continuity of the terminals.

Terminal	Continuity
9(R) 10(YR)	Yes
10(YR) 9(R)	No



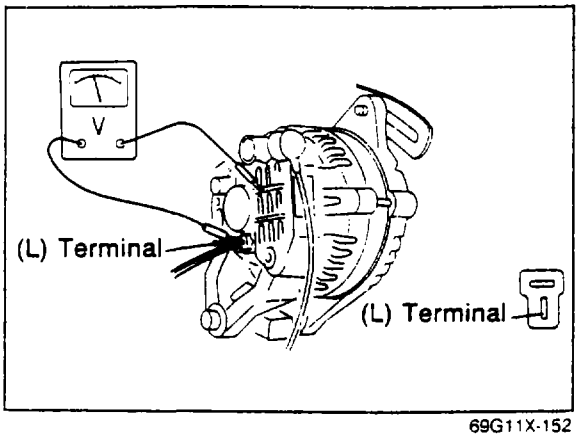
69G11X-151

Check Left Front and Rear Valves

1. Disconnect the hydraulic unit 12-pin connector.
2. Using an ohmmeter, check for resistance of the terminals.

	Resistance (Ω)
4(GB)-10(YR)(Left Front Valve)	Approx. 1.0—1.2
(GW)-10(YR)(Right Front Valve)	Approx. 1.0—1.2
12(Y)-10(YR)(Rear Valve)	Approx. 1.0—1.2

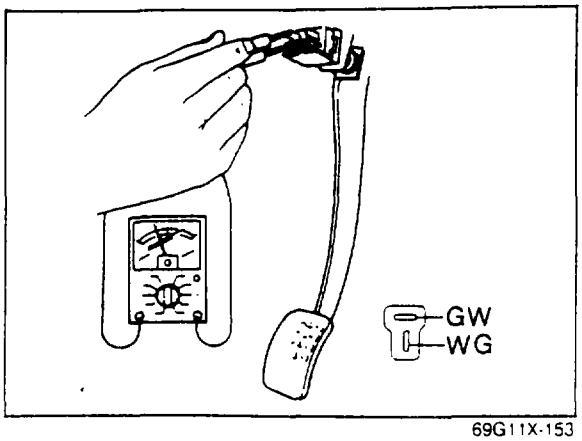
3. If resistance is as specified, check the wiring harness between the hydraulic unit and ABS control unit.



69G11X-152

Check Alternator

Refer to section 5 in the Workshop Manual.



69G11X-153

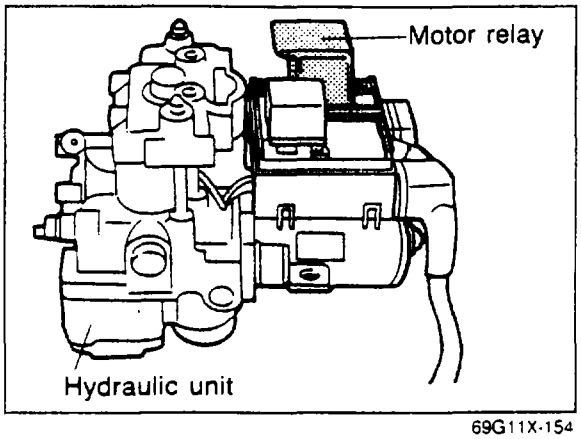
Check Brake Light Switch

1. Disconnect the brake light switch connector.
2. Check for continuity between the terminals of the switch.

	a(GW)	b(WG)
Depressed brake pedal	○—○	
Released brake pedal		

○—○: Indicates continuity

3. If the continuity is not as specified, check the STOP fuse and wiring harness between the brake light switch and control unit.



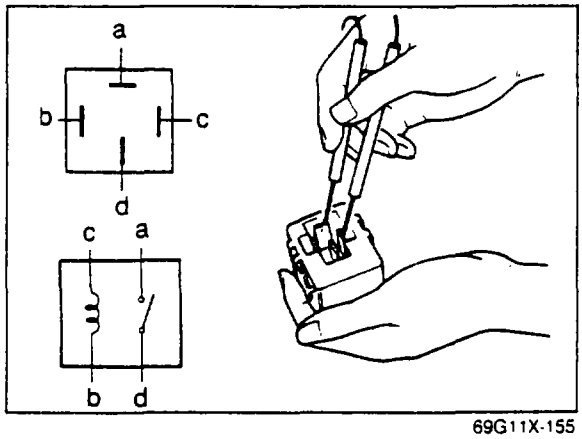
69G11X-154

Check Motor Relay

1. Disconnect the negative battery cable.
2. Release the motor relay lock from the hydraulic unit and remove the motor relay.
3. Connect an ohmmeter and check for continuity at the relay terminals.

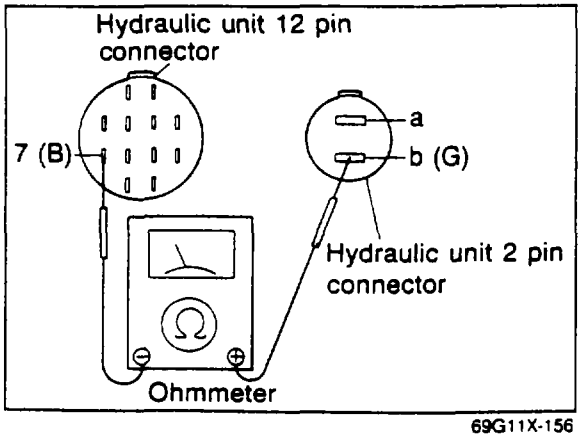
Connect to		a	b	c	d
12V	Ground				
—	—		○—○		
c	b	○			○

○—○: Indicates continuity



69G11X-155

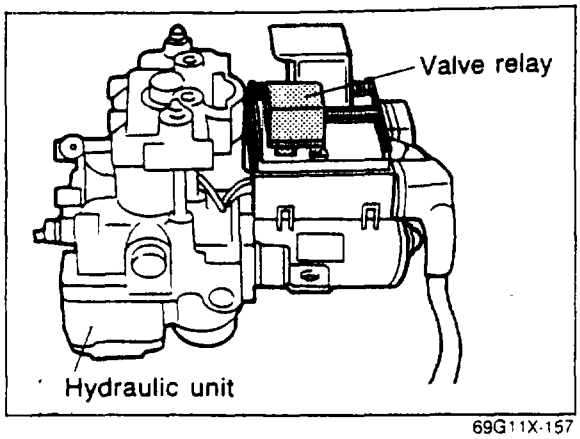
4. If continuity is not as specified, replace the motor relay.
5. If OK, check the wiring harness between the motor relay and control unit main fuse (ABS 60A).



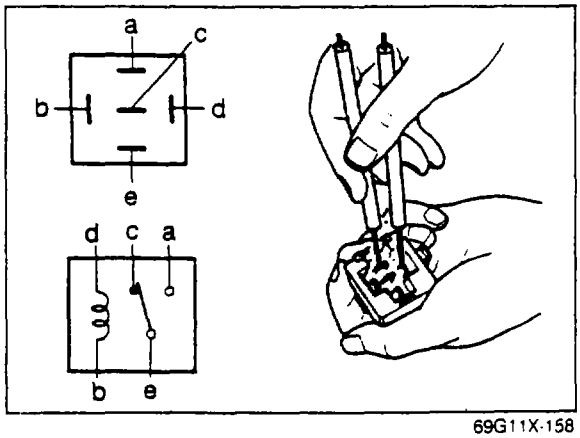
69G11X-156

Check Pump Motor

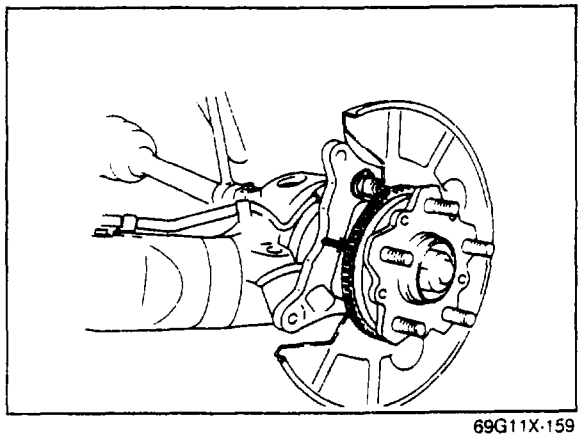
1. Disconnect the hydraulic unit 12-pin connector.
2. Check for continuity between terminal 7 (B) wire of 12-pin connector and ground.
3. If OK, check for continuity between terminal 7 (B) wire of 12-pin connector and terminal b (G) wire of 2-pin connector.
4. If OK, connect the hydraulic unit connectors.
5. Disconnect the control unit connector and check for continuity between terminal b (G) wire and ground.
6. If OK, check for poor connection of the control unit connector or faulty control unit.



69G11X-157



69G11X-158



69G11X-159

Check Valve Relay

1. Disconnect the negative battery cable.
2. Release the valve relay locks from the hydraulic unit and remove the valve relay.
3. Using an ohmmeter, check continuity of the relay terminals.

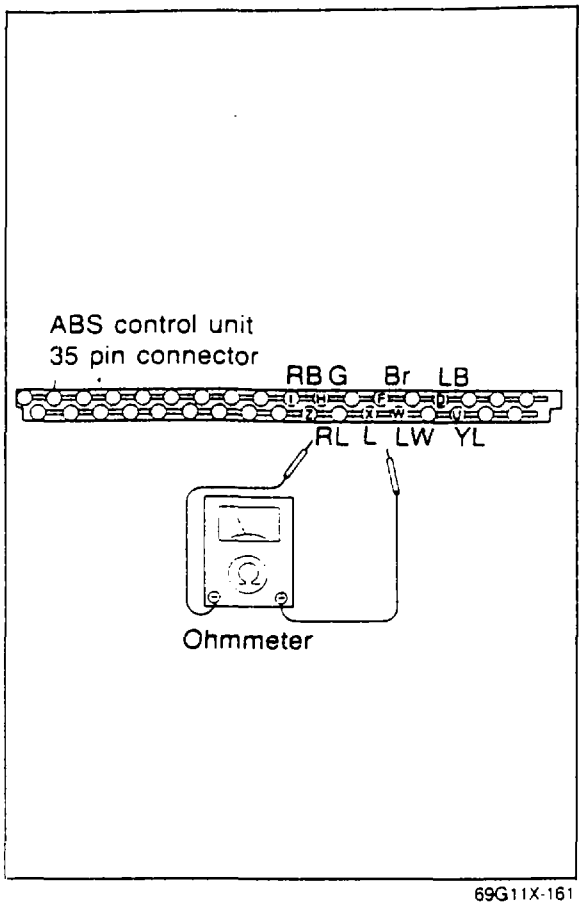
Connect to		a	b	c	d	e
12V	Ground					
—	—		○	○	○	○
b	d	○				○

○—○: Indicates continuity

4. If continuity is not as specified, replace the valve relay.

Check Rotor

Check the rotor for missing or damaged teeth.



69G11X-161

Check Wheel Speed Sensor

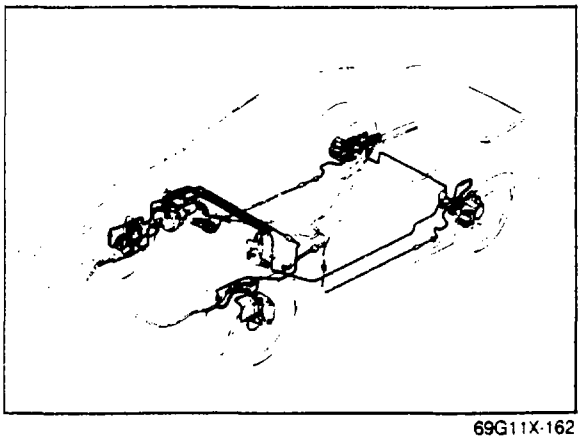
1. Using an ohmmeter, check for continuity at the control unit connector terminals.

Sensor \ Terminal	D	F	H	I	U	W	X	Z
Left front	○—○							
Right front					○—○			
Left rear			○—○					
Right rear							○—○	

○—○: Indicates continuity

2. If the continuity is not as specified, check the wiring harness between the wheel speed sensor and control unit.
3. If the continuity is OK, check voltage between D and F, H and I, U and W, and X and Z while rotating the wheel one rotation per second by hand.
4. If voltage is not approx. 50 mV—60 mV, the wheel speed sensor is faulty.
5. If voltage is approx. 50 mV—60 mV, the control unit is faulty.

Caution
When checking each control unit terminal, do not use ordinary tester pins. Use only very thin pins to prevent damage to the terminals.



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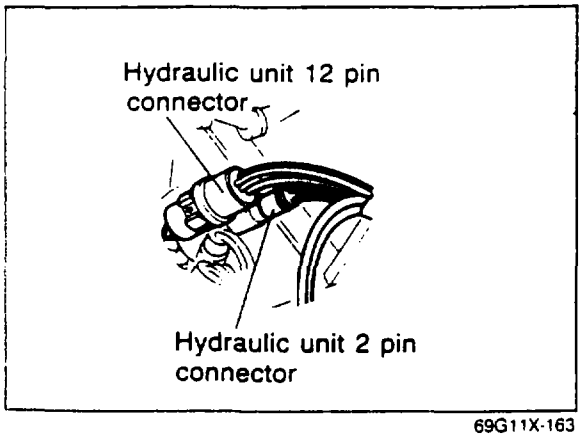
Check Hydraulics

Check that all brake fluid connections are tight and that no fluid is leaking.



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Check Hydraulic Unit Wiring

1. Check that the hydraulic unit connectors are properly secured.
2. Check that the valve relay and motor relay are properly secured.