This document is brought to you through the kind services of

Kevin Wright
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http://www.wankel.net/~krwright
who, well, didn't do much this time, since Paul Lee provided the thing already scanned and compiled into a PDF! (Thanks!). Go visit his website: http://www.iluvmyrx7.com/index.htm Lots of RX-7 goodness there.

There are several ways to get around in the document. I have provided Bookmarks to all the sections, and thumbnails are also provided in the Thumbnails side bar.
I have also included a label for the spine of a binder, for those who wish to print out all the pages and keep a dead-tree edition handy.☺

This version is provided as a service for owners of first generation Mazda RX-7s who are having a devil of a time locating the factory service manual for a reasonable price.
If you really want to send me money, email me and I'll tell you where to send it, but it's not necessary. Consider this payback for all the good advice and information gleaned from the various RX-7 email lists!

Subscribe to the Early Mazda Rotaries email list:
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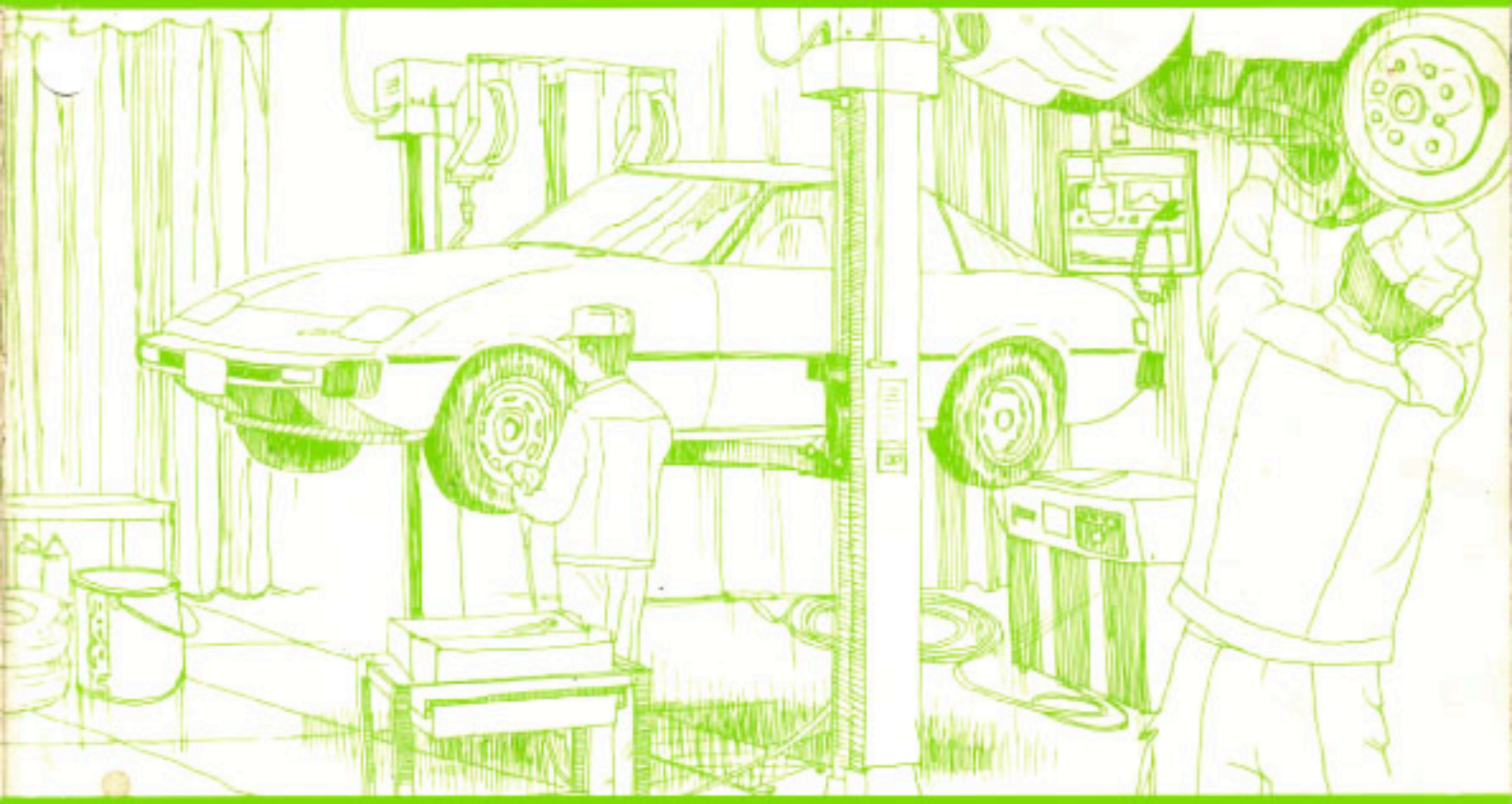
09/16/03

Mazda RX-7

1980 Workshop Manual



mazda

1980
Mazda RX-7
Workshop Manual

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FOREWORD

This workshop manual was prepared as reference material of the service personnel of authorized Mazda dealers to enable them to correctly carry out the task of rendering services and maintenance on Mazda vehicles.

In order to ensure that the customers are satisfied with Mazda products, proper servicing and maintenance must be provided. For this purpose, the service personnel must fully understand the contents for this manual and at the same time, are recommended to keep the manual in a place where reference can readily be made.

The information, photographs, drawings and specifications entered in this manual were the best available at the time of printing this manual. All alterations to this manual occurring as the result of modifications will be notified by the issuance of Service Informations or supplementary volumes. It is, therefore, requested that the manual be kept up to date by carefully maintaining a follow-up of these materials.

Toyo Kogyo reserves the right to alter the specifications and contents of this manual without any obligation and advance notice.

Toyo Kogyo Co.,Ltd.
HIROSHIMA JAPAN

PRINTED IN JAPAN AUG., '79
MAZDA ROTARY ENGINE;
LICENSE NSU-WANKEL
1038-10-79H LE-FUC

IMPORTANT INFORMATION

BASIC ASSUMPTIONS

This service manual assumes that you have and know how to properly use certain special tools which are necessary for the safe and efficient performance of service operations on Mazda vehicles. The manual also assumes that you are familiar generally with automobile systems and basic service and repair procedures. You should not attempt to use this manual unless these assumptions are correct and you understand the consequences described below.

SAFETY RISK

This manual contains certain **Cautions** which you should carefully read and follow in order to minimize the risk of **personal injury** to you or others and the risk of improper service methods which may damage your Mazda or render it unsafe. The fact that there are no **Cautions** with respect to any specific service method does not mean that there is no safety risk involved. YOU SHOULD SATISFY YOURSELF IN EVERY CASE THAT NEITHER PERSONAL SAFETY OR VEHICLE SAFETY WILL BE JEOPARDIZED BY THE SERVICE METHOD OR TOOLS YOU SELECT.

POSSIBLE LOSS OF WARRANTY

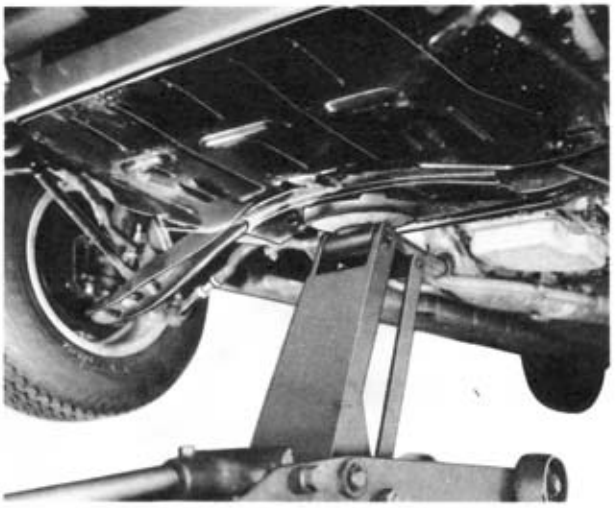
The manufacturer's warranty on Mazda vehicles and engines can be voided by improper service or repairs performed by persons other than an authorized Mazda dealer.
Strict compliance with the instructions in this manual is necessary to prevent loss of coverage under such warranties.

GENERAL SERVICE INSTRUCTIONS

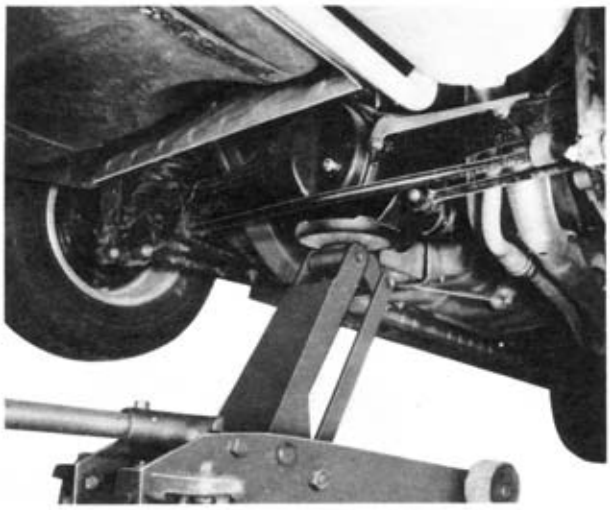
1. If a vehicle is to be jacked up only at the front or rear end, be sure to block wheels in order to ensure safety.
2. After a vehicle is jacked up, do not fail to support it with stands (rigid racks).
3. Use fender covers, seat covers and floor covers to keep vehicle clean and prevent any damage.
4. Before servicing an electrical system, always disconnect the negative cable at the battery (−) terminal.
5. Do not start to disassemble at once. Always make sure first whether the trouble is of the kind that requires disassembly.
6. If a complecated place is to be disassembled, place punch marks, match marks, etc., at place that will not affect function in order to make reassembly work easier.
7. Always replace the used gaskets, "O" rings and split pins with new ones.
8. Apply sealer or grease at the parts called for.
9. Tighten the bolts and nuts to specified torque using a torque wrench.
10. Some of the service operations require the special tool. Be sure to use the special tool where specified and follow the correct working procedure.

JACK-UP AND SUPPORT LOCATIONS

FLOOR JACK LIFT POINTS

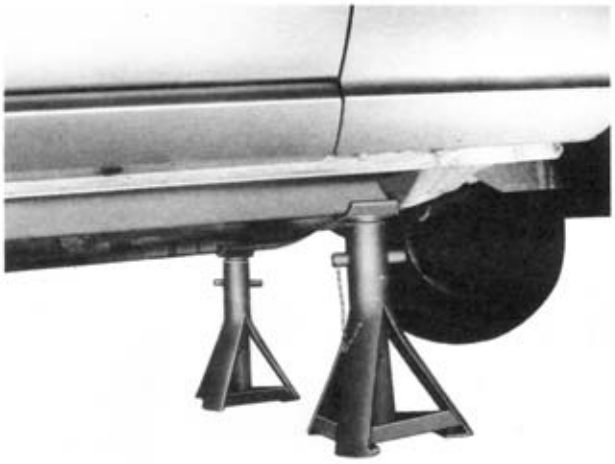


Front

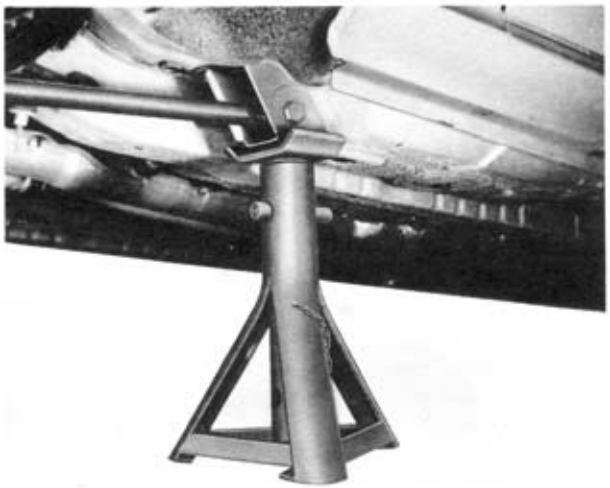


Rear

STAND LOCATIONS



Front



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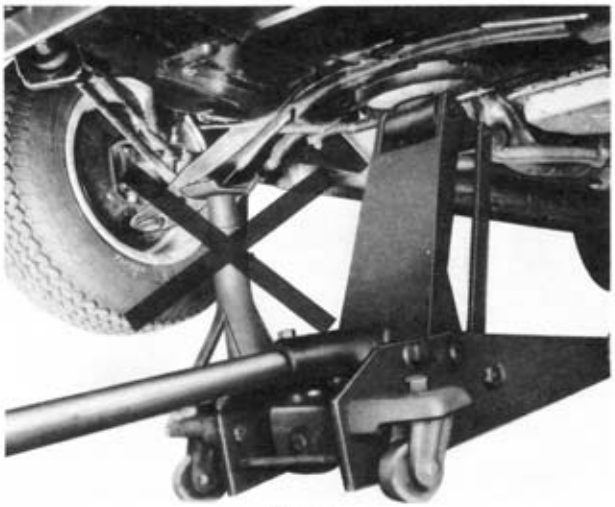

Wrong

Note:
After jacking-up, adjust and place safety stands to support the vehicle approximately level, and lower the vehicle onto stands.

ENGINE

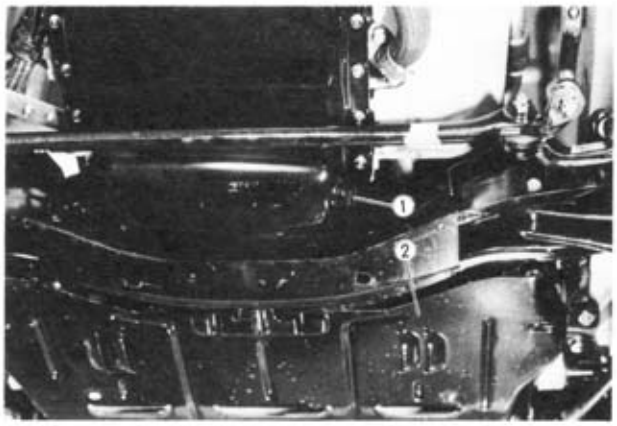

Fig. 1–1

1–A. ENGINE REMOVAL

The procedures for removing the engine from the vehicle are as follows:

Apply the parking brake and block the wheels.

1. Drain the lubricant from the engine.
   After draining, clean and reinstall the drain plug.
2. Remove the engine under cover.

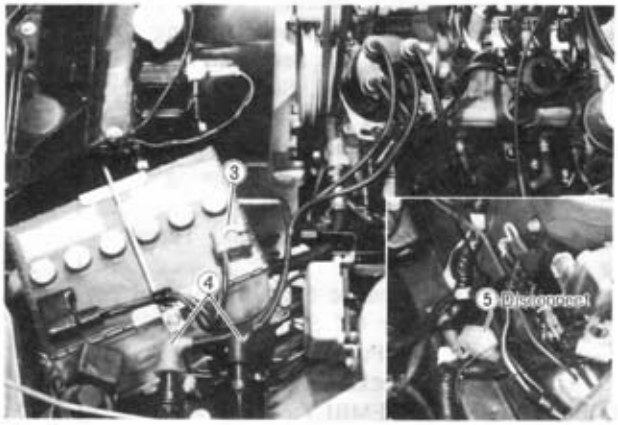

Fig. 1–2

3. Open the bonnet and disconnect the battery negative cable.
   Remove the bonnet referring to Par. 14–A.
4. Disconnect the hightension cords at the ignition coils.
5. Disconnect the couplers of pick-up coil wiring and condenser lead.

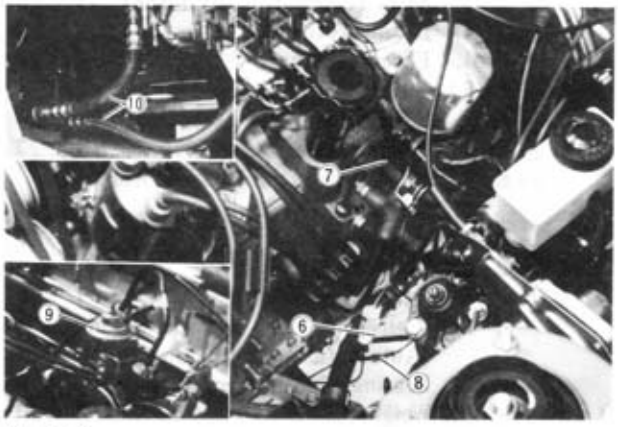

Fig. 1–3

6. Disconnect the coupler of the oil level sensor lead.
7. Disconnect the coupler from the water temperature gauge unit.
8. Disconnect the coupler from the oil thermo sensor (except for California).
9. Disconnect the vacuum sensing tube for vacuum switch (Automatic transmission and Calif. with manual transmission) and evaporative hose.
10. Disconnect the oil hoses from the oil cooler.

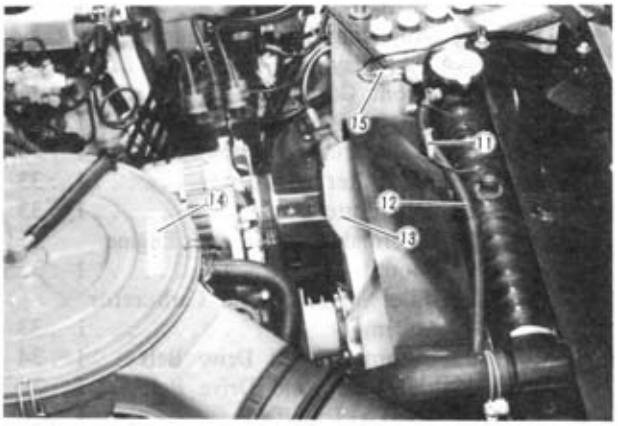

Fig. 1–4

11. Disconnect the coupler from coolant level sensor lead.
12. Disconnect the coolant reservoir hose.
13. Remove the cooling fan and fan drive assembly.
14. Remove the air cleaner assembly.
15. Disconnect the connectors from the No. 2 water temperature switch (Except for California and Canada).

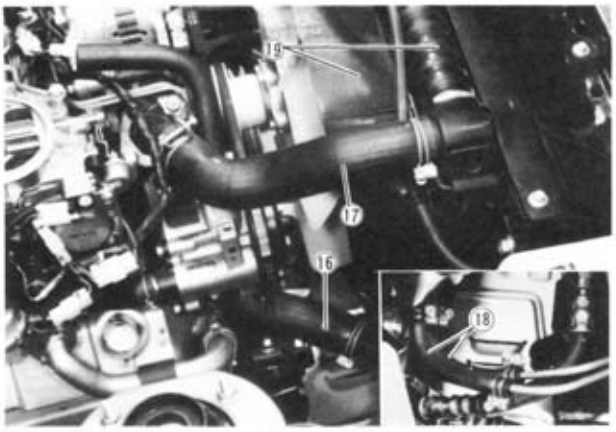

Fig. 1–5

16. Drain the cooling system by disconnecting the radiator lower hose from the radiator.
17. Disconnect the radiator upper hose from the radiator.
18. Disconnect the oil pipes from the radiator (automatic transmission only).
19. Remove the radiator and radiator shroud assembly.

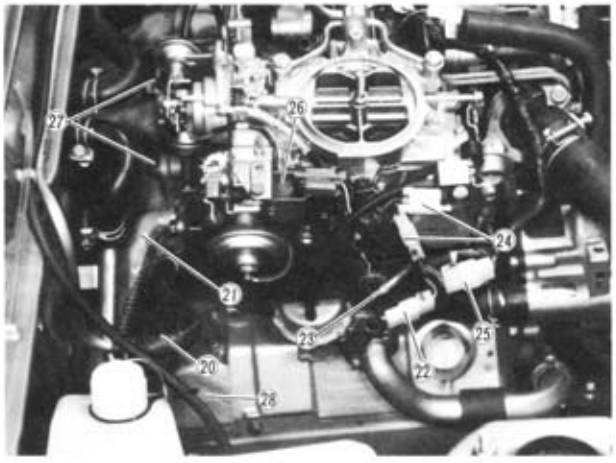

Fig. 1–6

20. Disconnect the vacuum hose for power brake assist.
21. Disconnect the heat exchanger pipe from the rear end of the inlet manifold.
22. Disconnect the coupler from the power valve solenoid (Except for Canada with manual transmission).
23. Disconnect the coasting richer connector (manual transmission).
24. Disconnect the couplers from the choke heater lead and anti-afterburn valve solenoid.
25. Disconnect the idle switch coupler (manual transmission).
26. Disconnect the coupler from the choke return solenoid valve (Except for Calif. and Canada).
27. Remove the bolts attaching the transmission to rear end of the engine.
28. Remove the thermal reactor rear cover.
29. Disconnect the accelerator cable, choke cable and hot start assist cable.
30. Disconnect the fuel main and return hoses.
31. Disconnect the sub-zero start assist fluid hose (Except for Calif.).
32. Disconnect the coupler and "B" terminal from the rear end of the alternator.
33. Disconnect the couplers from the No. 1 water temperature switch and air vent solenoid valve.
34. Disconnect the heater hose from the left side of the engine.

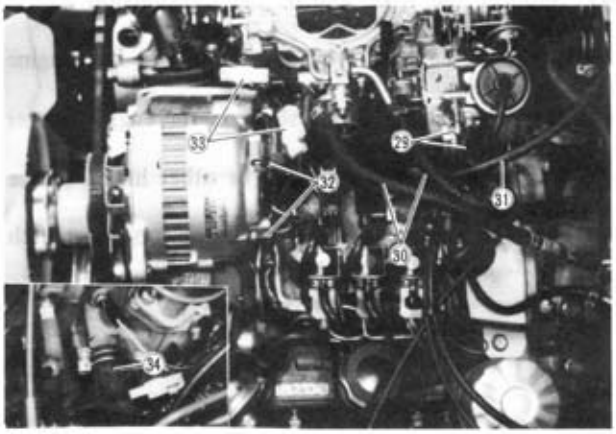

Fig. 1–7

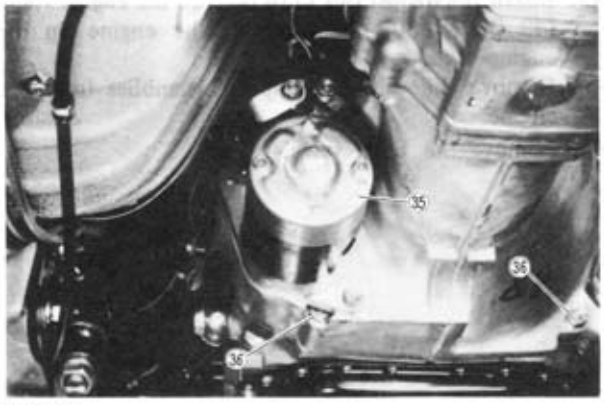

Fig. 1–8

Jack up the vehicle and support it with stands.

35. Disconnect the wirings and remove the starting motor.
36. Remove the bolts attaching the transmission to rear end of the engine.

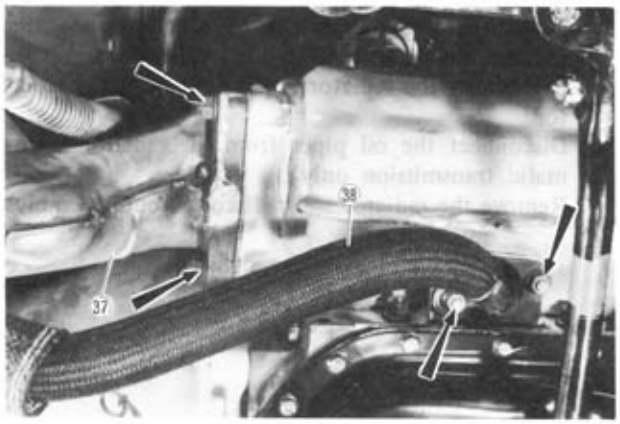

Fig. 1–9

37. Disconnect the air duct from the thermal reactor.
38. Remove the air pipe from the lower side of the thermal reactor.

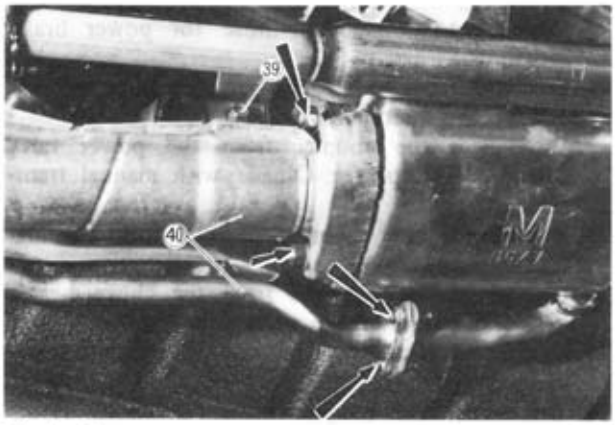

Fig. 1–10

39. Disconnect the air duct hanger.
40. Disconnect the air duct and heat exchanger pipe from the pre-silencer.

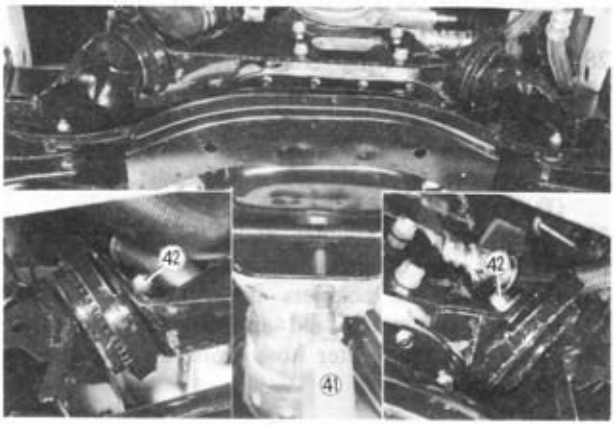

Fig. 1–11

41. Support the front end of the transmission with a suitable jack.
42. Remove the nuts from the right and left engine mountings.
43. Install a suitable lifting sling on the engine hanger brackets.
    Attach the sling to a hoist or other lifting device and take up all slack.
44. Pull the engine forward until it clears the clutch shaft. Then, lift the engine from the vehicle.

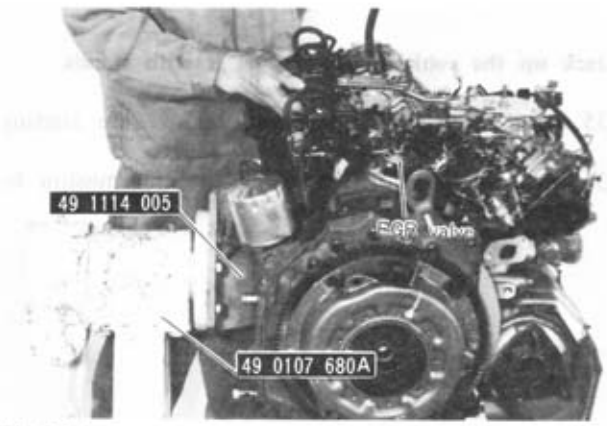

Fig. 1–12

45. Install the **hanger** (49 1114 005) to the **engine stand** (49 0107 680A) and mount the engine on the engine stand.
46. Remove the valve and piping assemblies from the engine.
47. Remove the EGR valve.

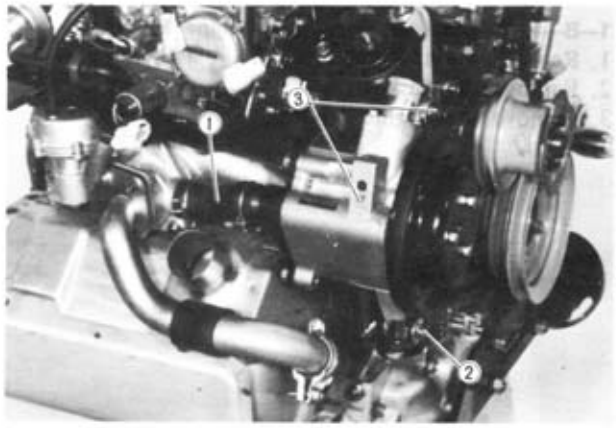

Fig. 1–13

1–B. ENGINE DISASSEMBLY

Remove the following component parts in sequences.

1–B–1. Air Pump and Drive Belt

1. Disconnect the air outlet hose.
2. Remove the air pump strap bolt.
3. Disengage the air pump drive belt and remove the air pump.

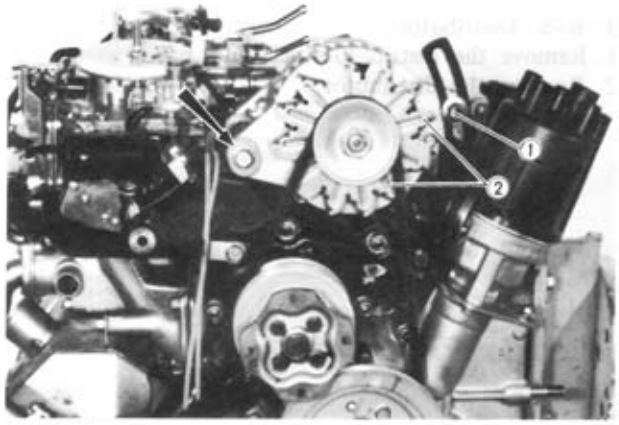

Fig. 1–14

1–B–2. Alternator

1. Remove the alternator strap bolt.
2. Disengage the alternator drive belt and remove the alternator.

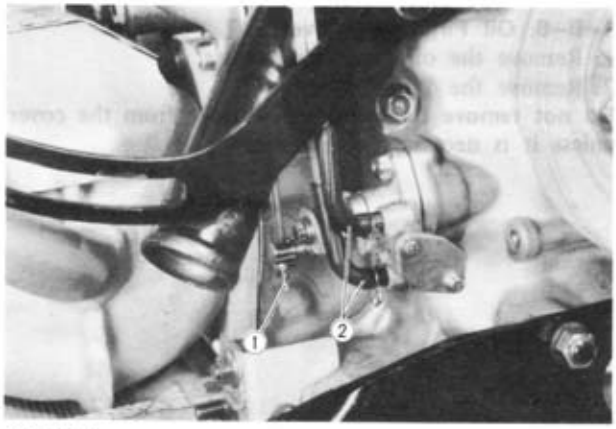

Fig. 1–15

1–B–3. Inlet Manifold and Carburetor Assembly

1. Disconnect the connecting rod at the metering oil pump.
2. Disconnect the oil hoses at the metering oil pump outlets.

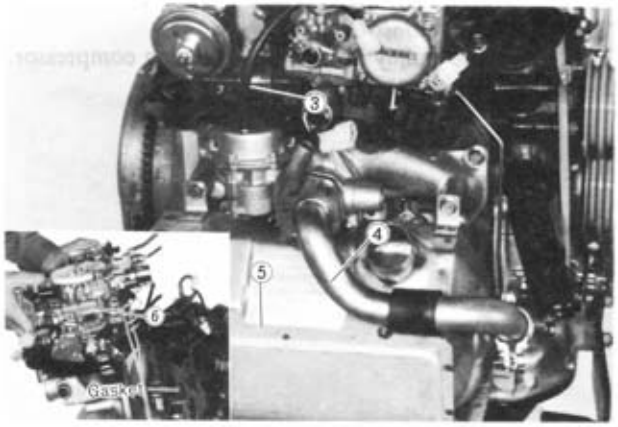

Fig. 1–16

3. Disconnect the vacuum sensing tube.
4. Disconnect the air outlet pipe.
5. Remove the thermal reactor cover.
6. Remove the inlet manifold and carburetor assembly.
   Remove the gasket and 'O" rings.

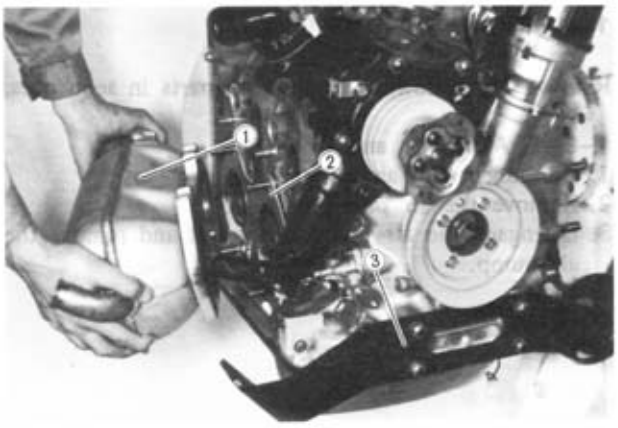

Fig. 1–17

1–B–4. Thermal Reactor and Engine Mount

1. Remove the thermal reactor.
2. Remove the gasket.
3. Remove the engine mount.

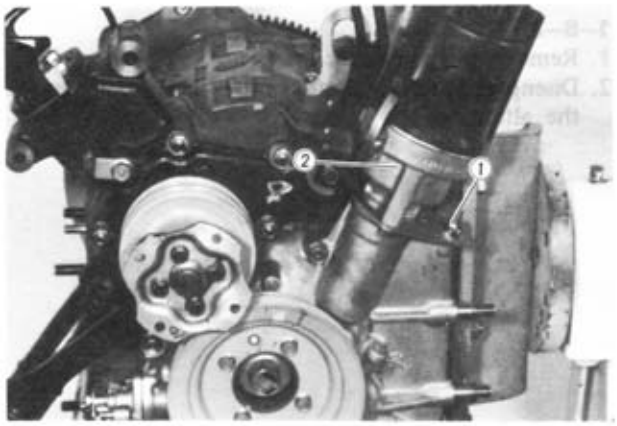

Fig. 1–18

1–B–5. Distributor

1. Remove the distributor lock nut.
2. Remove the distributor.

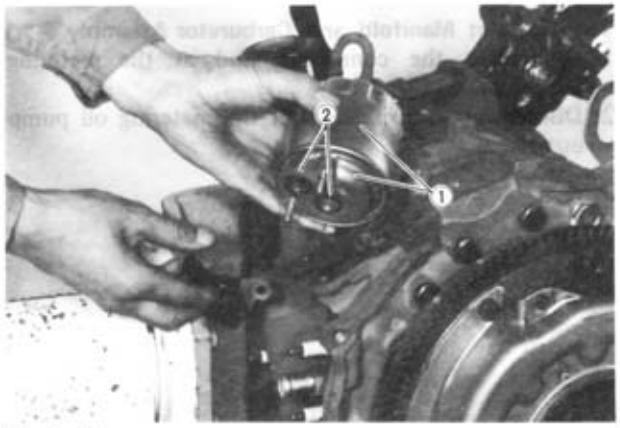

Fig. 1–19

1–B–6. Oil Filter and Cover

1. Remove the oil filter and cover.
2. Remove the "O" rings.

Do not remove the oil filter cartridge from the cover unless it is necessary to replace.

Fig. 1–20

1–B–7. Water Pump

1. Remove the pulley for air conditioning compressor.
2. Remove the water pump.

Fig. 1–21

1–B–8. Oil Pan and Oil Strainer

1. Remove the oil pan.
2. Remove the oil strainer and gasket.

To remove the oil pan, slowly drive the scraper of 30 mm (1.2 in) width and 1.5 ~ 2.0 mm (0.06 ~ 0.08 in) thickness with hummer, between the oil pan and rear housing.

Be careful not to damage the oil pan and housings.

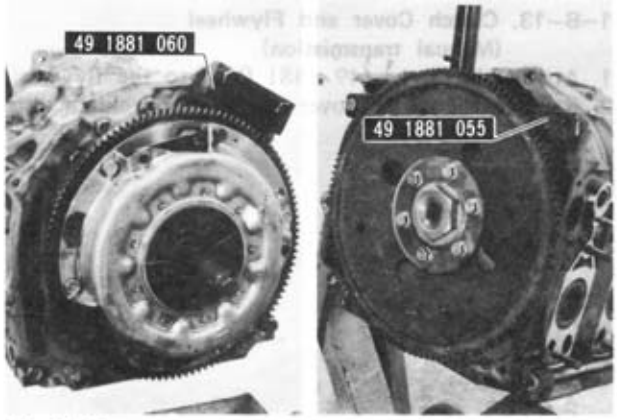

Fig. 1–22

1–B–9. Eccentric Shaft Pulley

1. On the engine equipped with manual transmission, attach the **brake** (49 1881 060) to the flywheel. On the engine equipped with automatic transmission, attach the **stopper** (49 1881 055) to the counter weight.
2. Remove the eccentric shaft pulley bolt and remove the pulley.

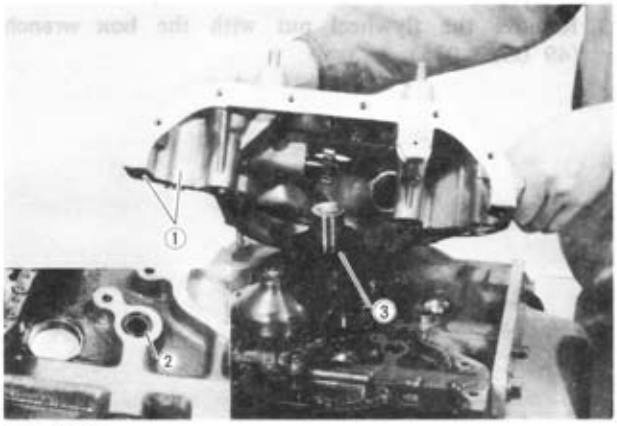

Fig. 1–23

1–B–10. Front Cover

1. Remove the front cover and gasket.
2. Remove the "O" ring on the oil passage.
3. Slide the distributor drive gear off the shaft.

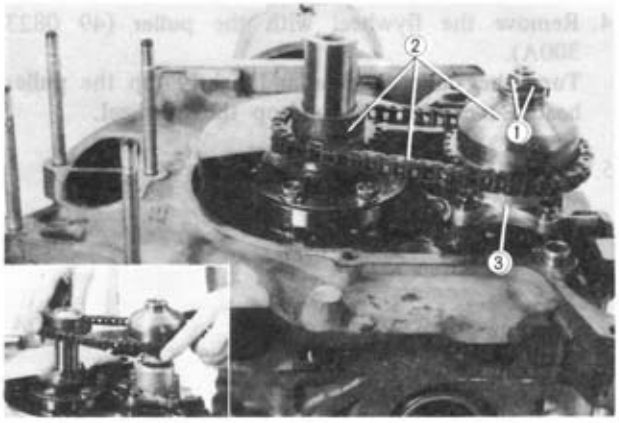

Fig. 1–24

1–B–11. Oil Pump Drive and Oil Pump

1. Straighten the lock washer tab and remove the nut and lock washer.
2. Slide the oil pump sprocket and eccentric shaft sprocket together with the drive chain off the eccentric shaft and oil pump shaft simultaneously.
3. Remove the oil pump.

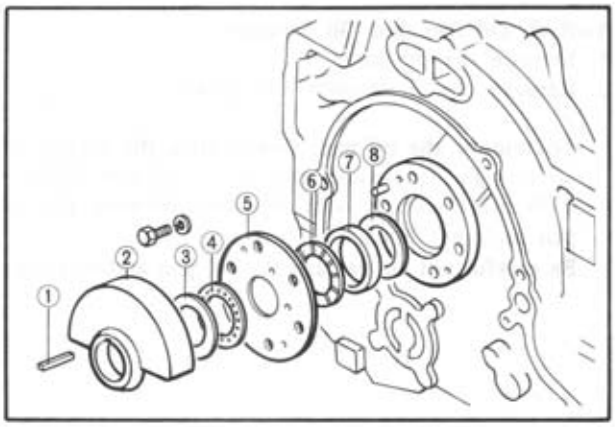

Fig. 1–25

1–B–12. Balance Weight and Bearing Housing

1. Remove the key, balance weight, thrust washer and needle bearing.
2. Remove the bearing housing, needle bearing, spacer and thrust plate.

1) Key
2) Balance weight
3) Thrust washer
4) Needle bearing
5) Bearing housing
6) Needle bearing
7) Spacer
8) Thrust plate

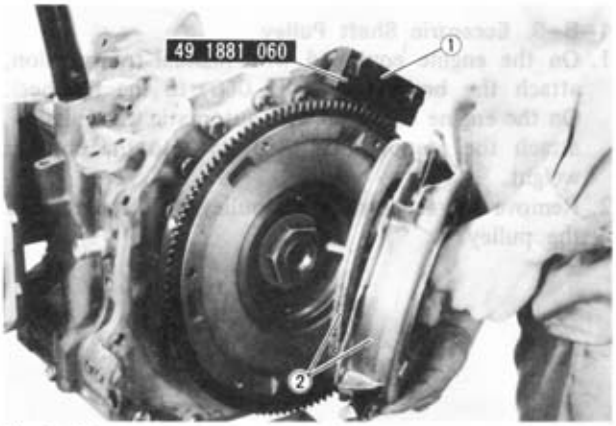

Fig. 1–26

1–B–13. Clutch Cover and Flywheel (Manual transmission)

1. Attach the **brake** (49 1881 060) to the flywheel.
2. Remove the clutch cover assembly and clutch disc.

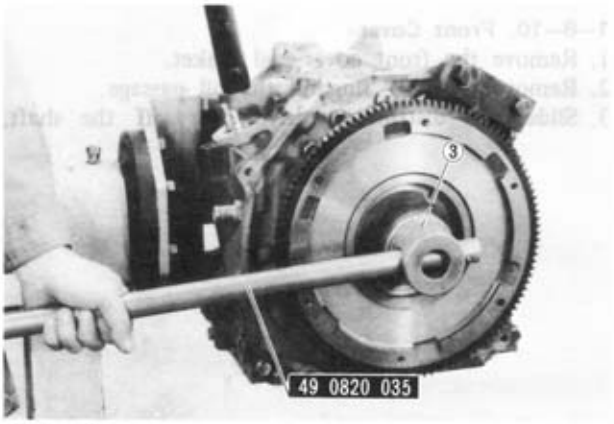

Fig. 1–27

3. Remove the flywheel nut with the **box wrench** (49 0820 035).

Fig. 1–28

4. Remove the flywheel with the **puller** (49 0823 300A).
   Turn the puller handle and lightly tap the puller head. **Be careful** not to drop the flywheel.
5. Remove the key.

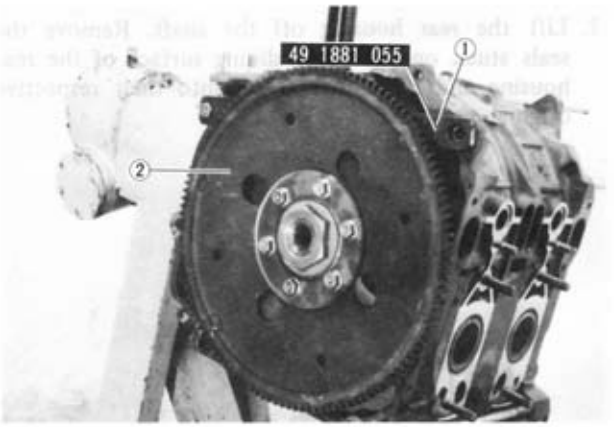

Fig. 1–29

1–B–14. Drive Plate and Counter Weight (Automatic transmission)

1. Attach the **stopper** (49 1881 055) to the rear housing.
2. Remove the drive plate.

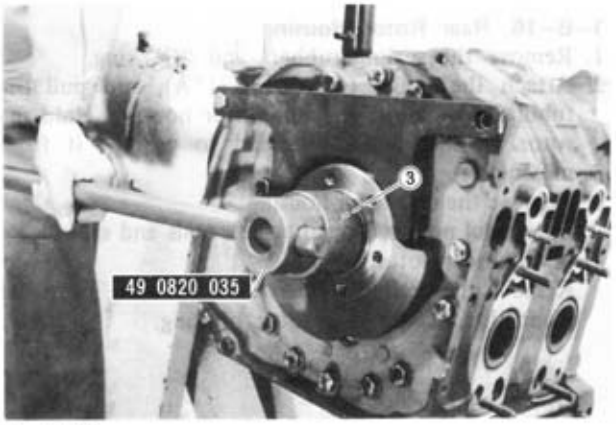

Fig. 1–30

3. Remove the counter weight nut with the **box wrench** (49 0820 035).

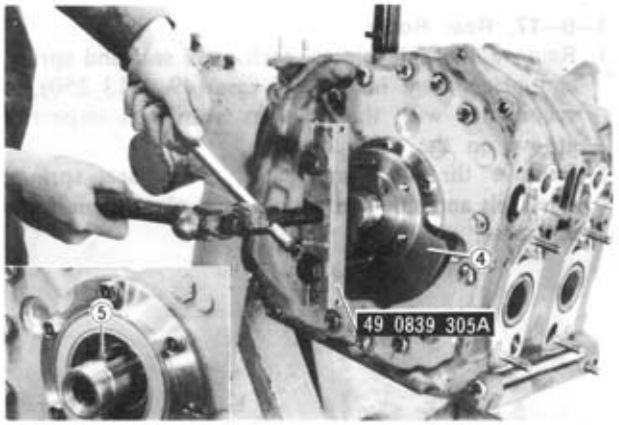

Fig. 1–31

4. Remove the counter weight by using the **puller** (49 0839 305A).
   Turn the puller handle and lightly tap the puller head. **Be careful** not to drop the counter weight.
5. Remove the key.

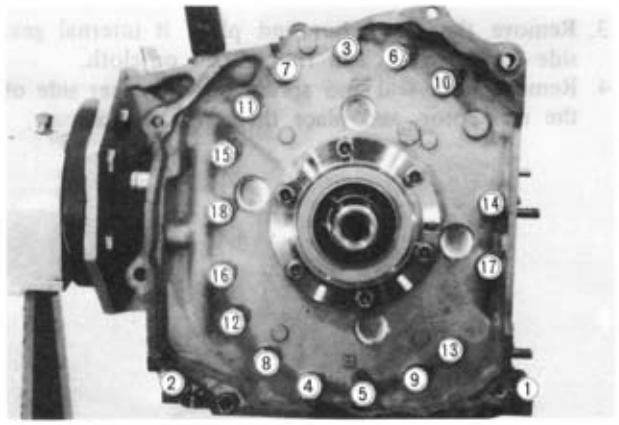

Fig. 1–32

1–B–15. Rear Housing

1. Remove the tension bolts.

Note :

a) Loosen the tension bolts in the sequence shown in figure.

b) Do not loosen the tension bolts at one time. Perform the removal in two or three procedures.

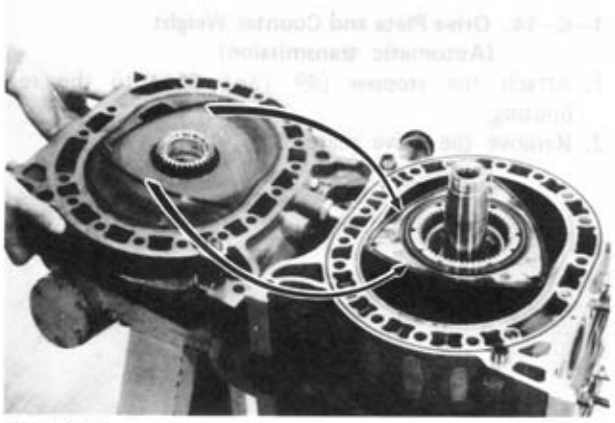

Fig. 1–33

2. Lift the rear housing off the shaft. Remove the seals stuck on the rotor sliding surface of the rear housing and place them back into their respective original positions.

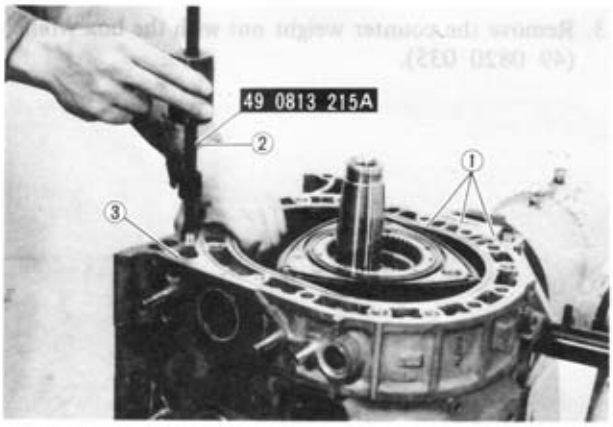

Fig. 1–34

1–B–16. Rear Rotor Housing

1. Remove the sealing rubbers and "O" ring.
2. Attach the **puller** (49 0813 215A), and pull the tubular dowels off the rear rotor housing. **Hold the** rotor housing down by hand to prevent it from moving up.
3. Remove the rear rotor housing.
   Be careful not to drop the apex seals and side pieces on the rear rotor.
   Remove the sealing rubbers and "O" ring from the front side of the rear rotor housing.

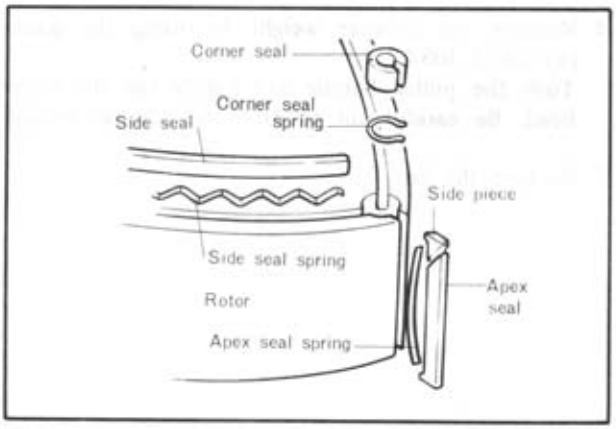

Fig. 1–35

1–B–17. Rear Rotor

1. Remove the side pieces, each apex seal and spring, and place them in the **seal case** (49 0813 250), in accordance with the numbers near each respective groove on the rotor face.
2. Remove the all corner seals, corner seal springs, side seals and side seal springs, and place them in the seal case.

Fig. 1–36

3. Remove the rear rotor and place it internal gear side down on a clean rubber pad or cloth.
4. Remove each seal and spring on the other side of the rear rotor, and place them in the seal case.

Fig. 1–37

5. Place a suitable protector onto the inner oil seal lip to protect the inner oil seal lip and remove the outer oil seal with **remover** (49 0813 225).
   Do not exert strong pressure at only one place to prevent deformation of the oil seal.
6. Remove the inner oil seal with oil seal remover.
7. Remove the oil seal springs from the each respective groove.
8. Remove the oil seals and springs on the other side of the rear rotor.

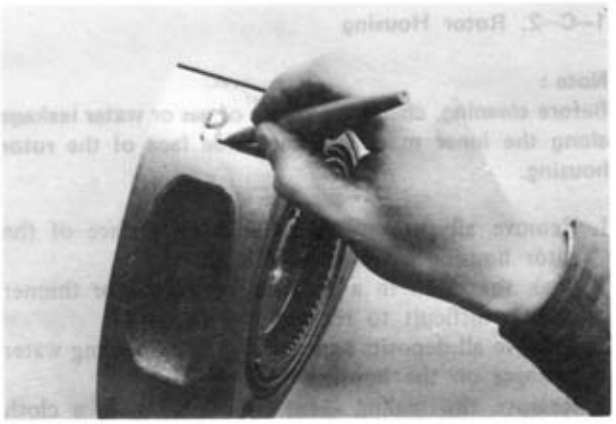

Fig. 1–38

9. Apply the identification mark onto the rear rotor so as to enable reinstalling to original location.

Fig. 1–39

1–B–18. Intermediate Housing and Eccentric Shaft

1. Attach the **puller** (49 0813 215A), and pull the tubular dowels off the intermediate housing.
   Hold the intermediate housing down by hand to prevent it from moving up.

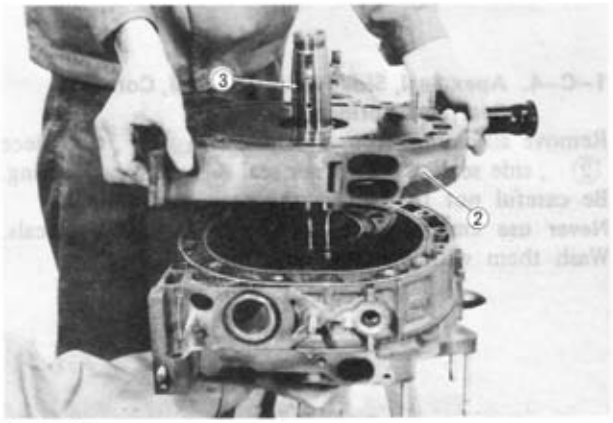

Fig. 1–40

2. Remove the intermediate housing.
   The intermediate housing should be removed by sliding it beyond the rear rotor journal on the eccentric shaft while holding the intermediate housing up and at the same time pushing up the eccentric shaft.
3. Remove the eccentric shaft.
   Be careful not to damage the rotor bearing and the main bearing.

1–B–19. Front Rotor Housing and Front Rotor

Remove the front rotor housing and the front rotor assembly referring to Par. 1–B–16 and 1–B–17.

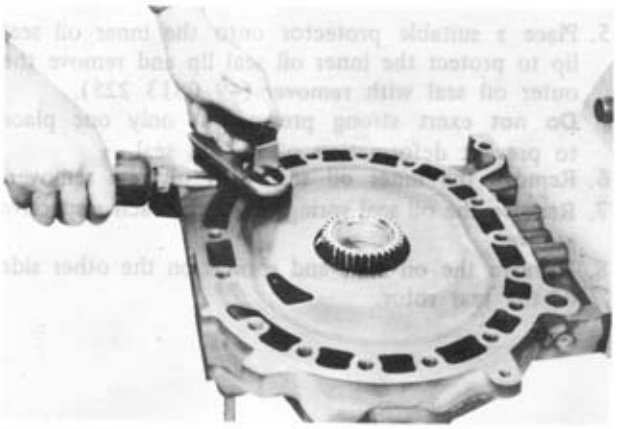

Fig. 1–41

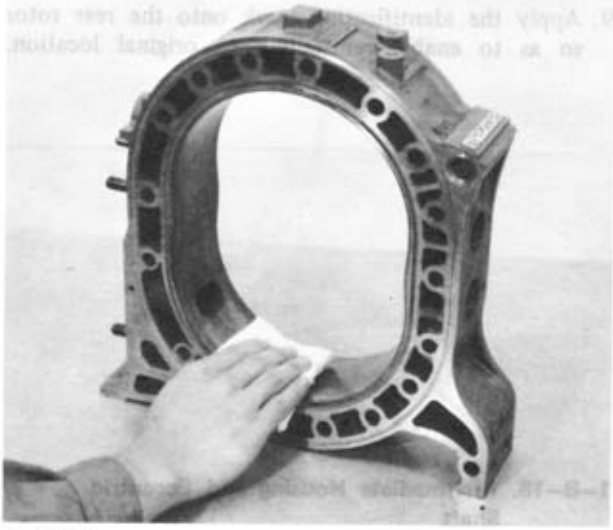

Fig. 1–42

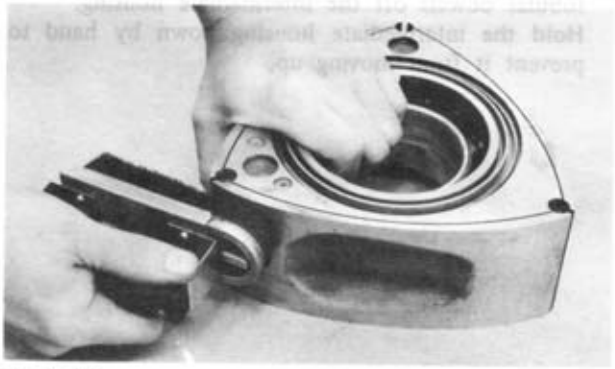

Fig. 1–43

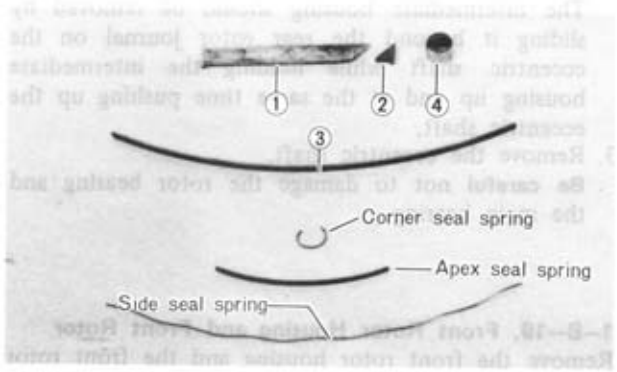

Fig. 1–44

1–C. CLEANING

1–C–1. Front, Intermediate and Rear Housings

1. Remove all carbon on the housings with an extra-fine emery paper.
   If using a carbon scraper, be careful not to damage the finished surfaces of the housings.
2. Remove the sealing agent on the housings by using a cloth or a brush soaked in a solution of ketone or thinner.

1–C–2. Rotor Housing

Note :
Before cleaning, check for traces of gas or water leakage along the inner margin of each side face of the rotor housing.

1. Remove all carbon from the inner surface of the rotor housing by wiping with cloth.
   Soak the cloth in a solution of ketone or thinner if it is difficult to remove the carbon.
2. Remove all deposits and rust from the cooling water passages on the housing.
3. Remove the sealing agent by wiping with a cloth or brush soaked in a solution of ketone or thinner.

1–C–3. Rotor

Remove the carbon on the rotor by using a carbon remover or emery paper.
Wash the rotor in cleaning solution and dry it by blowing with compressed air.

1–C–4. Apex Seal, Side Piece, Side Seal, Corner Seal and Springs

Remove all carbon from the apex seal ① , side piece ② , side seal ③ , corner seal ④ and each spring.
Be careful not to damage the seals and springs.
Never use emery paper as it will damage the seals.
Wash them with cleaning solution.

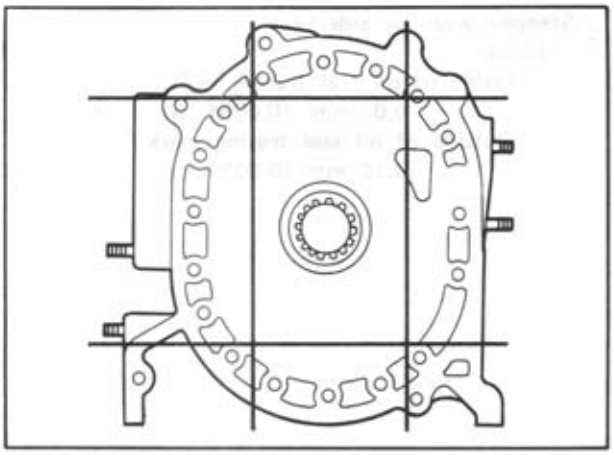

Fig. 1–45

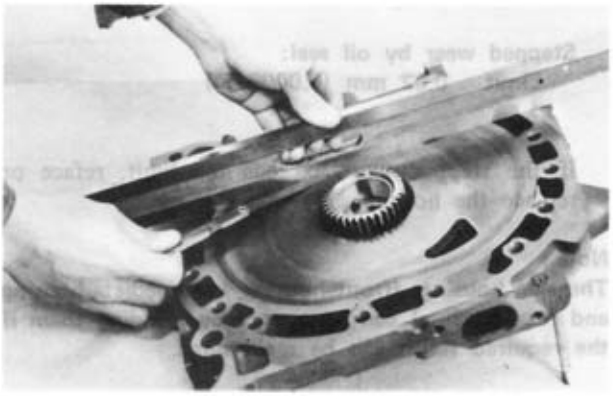

Fig. 1–46

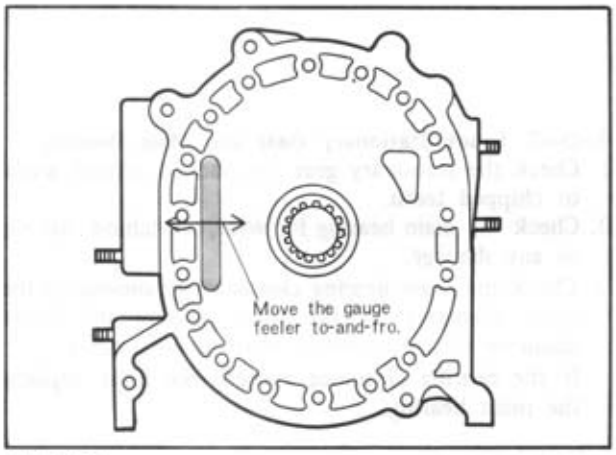

Fig. 1–47

Fig. 1–48

1–D. INSPECTION AND REPAIR

Inspect the following parts in sequences.

1–D–1. Front, Intermediate and Rear Housings

1. Check for housing warpage by placing a straight edge on the housing surface.
   If the warpage exceeds the limit, reface or replace the housing.

   Warpage limit: 0.04 mm (0.0016 in)

2. Check for stepped wear on the rotor sliding surfaces of the housing.
   To check, mount a dial indicator on the **gauge body** (49 0727 570) and slide the gauge body on the sliding surface of the housing.

   Stepped wear by side seal:
   Limit 0.10 mm (0.0039 in)

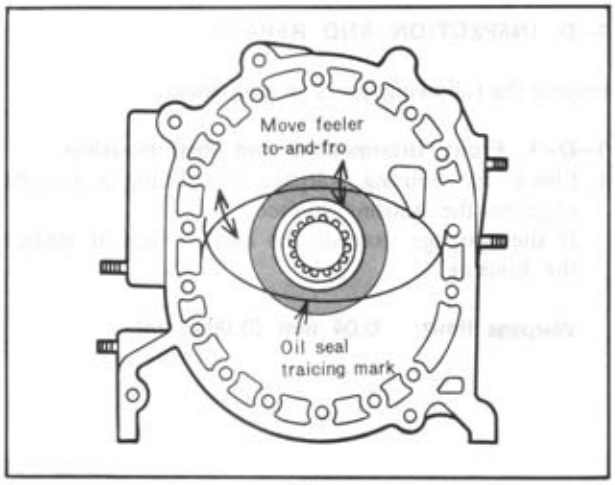

Fig. 1–49

Stepped wear by side seal:
Limit
Inside of oil seal tracing mark
0.01 mm (0.0004 in)
Outside of oil seal tracing mark
0.10 mm (0.0039 in)

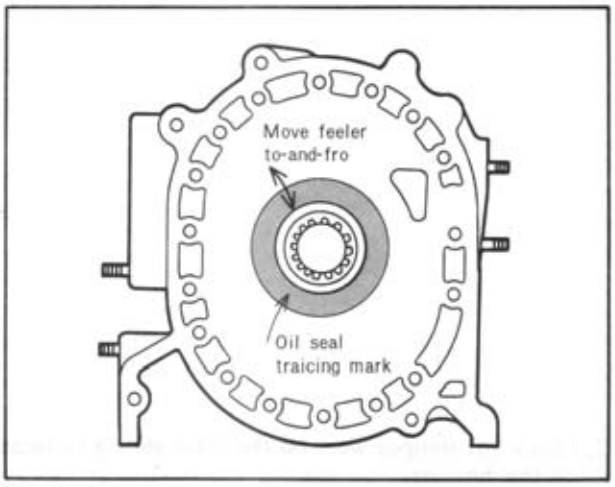

Fig. 1–50

Stepped wear by oil seal:
Limit 0.02 mm (0.0008 in)

If the stepped wear exceeds the limit, reface or replace the housing.

Note :
The side housings (front housing, intermediate housing and rear housing) can be reused by grinding them if the required finish can be maintained.

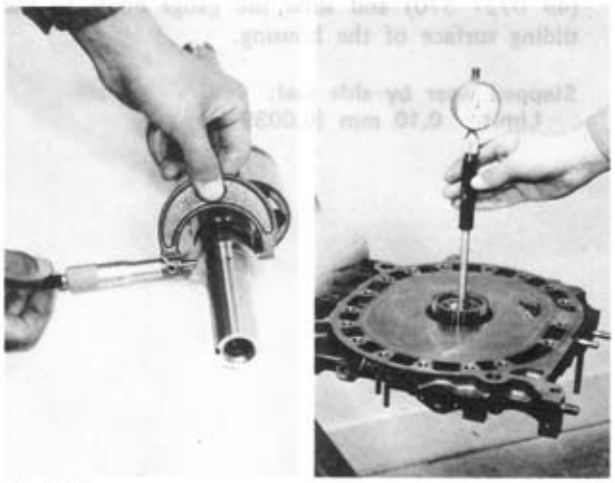

Fig. 1–51

1–D–2. Front Stationary Gear and Main Bearing

1. Check the stationary gear for cracked, scored, worn or chipped teeth.
2. Check the main bearing for wear, scratching, flaking or any damage.
3. Check the main bearing clearance by measuring the inner diameter of the main bearing and outer diameter of the eccentric shaft main journal.
   If the bearing clearance exceeds the limit, replace the main bearing.

Main bearing clearance:
Standard 0.04 ~ 0.07 mm (0.0016 ~ 0.0028 in)
Limit 0.10 mm (0.0039 in)

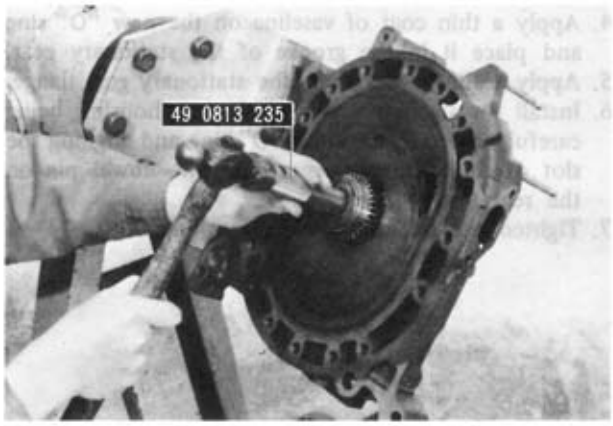

Fig. 1–52

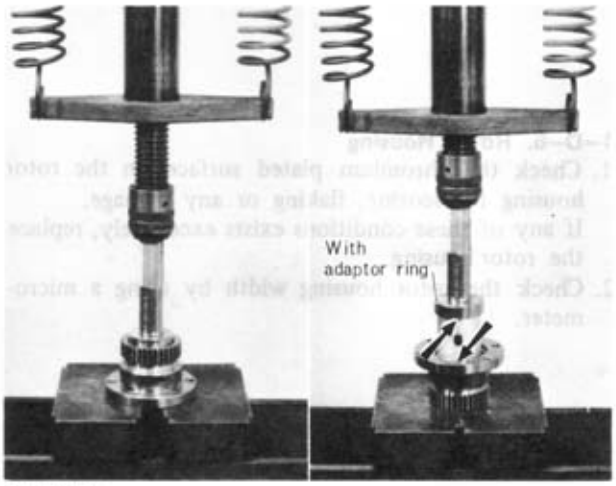

Fig. 1–53

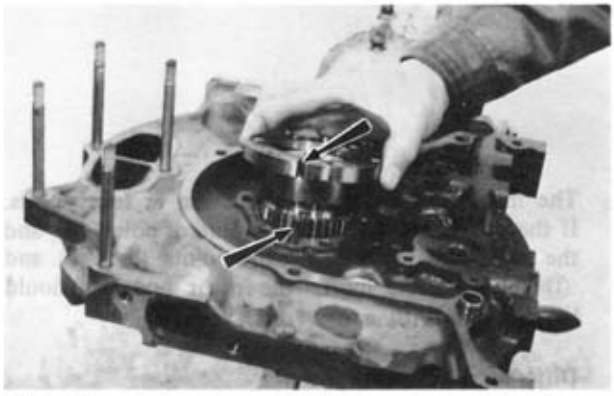

Fig. 1–54

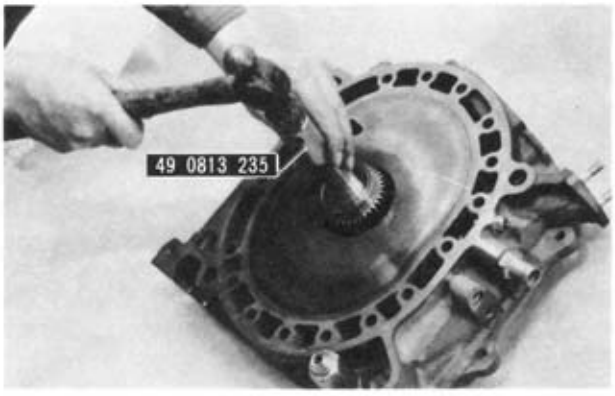

Fig. 1–55

1–D–3. Replacing Front Main Bearing

1. Remove the stationary gear and main bearing assembly, using the **puller & installer** (49 0813 235).
2. Using the puller & installer **without adaptor ring,** press out the main bearing.
3. Using the puller & installer **with adaptor ring,** and aligning the lug of the bearing and the slot of the stationary gear, press fit the main bearing into the stationary gear until the adaptor touches the stationary gear flange.
4. Install the stationary gear into the front housing, aligning the slot of the stationary gear flange and the dowel pin on the housing.

1–D–4. Rear Stationary Gear and Main Bearing

Check the rear stationary gear and main bearing as described in Par. 1–D–2.

1–D–5. Replacing Rear Main Bearing

1. Remove the stationary gear attaching bolts.
2. Using the **puller & installer** (49 0813 235), remove the stationary gear.
3. Replace the rear main bearing, referring to Steps 2 and 3 in Par. 1–D–3.

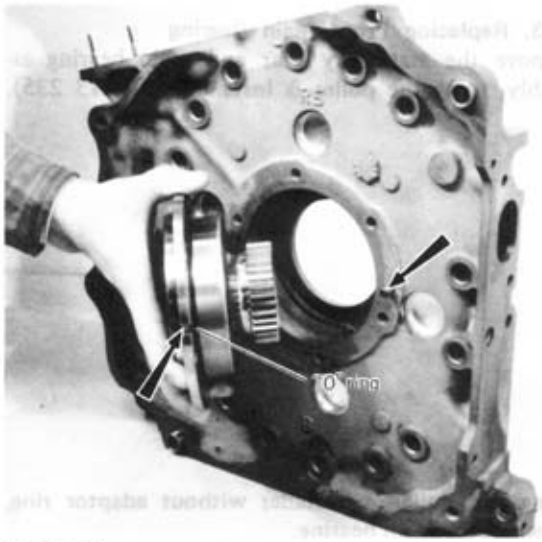

Fig. 1–56

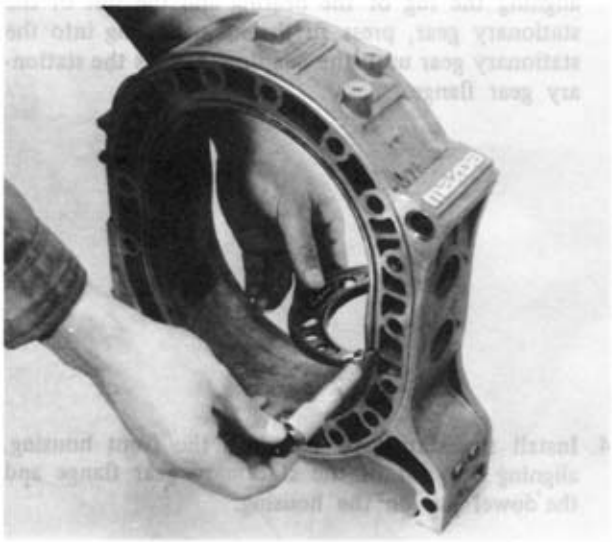

Fig. 1–57

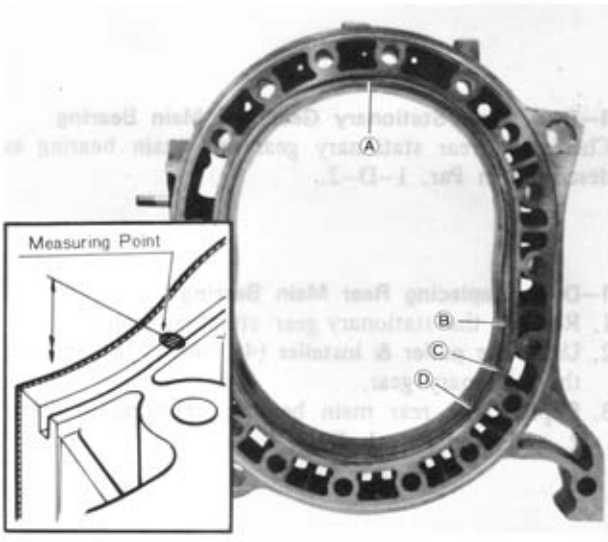

Fig. 1–58

4. Apply a thin coat of vaseline on the **new "O" ring** and place it in the groove of the stationary gear.
5. Apply sealing agent onto the stationary gear flange.
6. Install the stationary gear to the rear housing, being careful not to dámage the "O" ring and aligning the slot of the stationary gear with the dowel pin on the rear housing.
7. Tighten the stationary gear attaching bolts.

1–D–6. Rotor Housing

1. Check the chromium plated surface on the rotor housing for scoring, flaking or any damage.
   If any of these conditions exists excessively, replace the rotor housing.
2. Check the rotor housing width by using a micrometer.

The measurements should be **taken at four points.** If the difference between the value of point Ⓐ and the minimum value among the points Ⓑ , Ⓒ and Ⓓ exceeds the limit, the rotor housing should be replaced with a new one.

Difference of rotor width:
Limit 0.06 mm (0.0024 in)

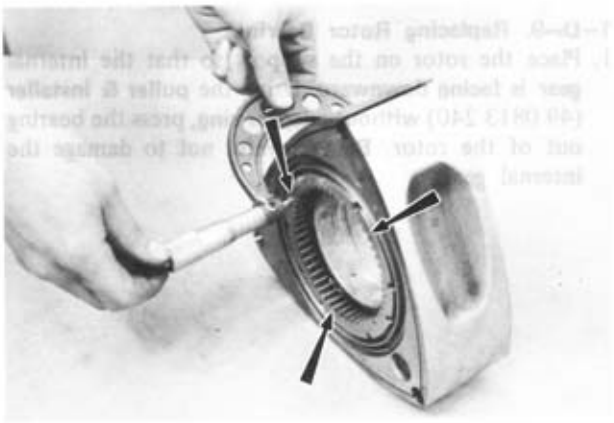

Fig. 1–59

Fig. 1–60

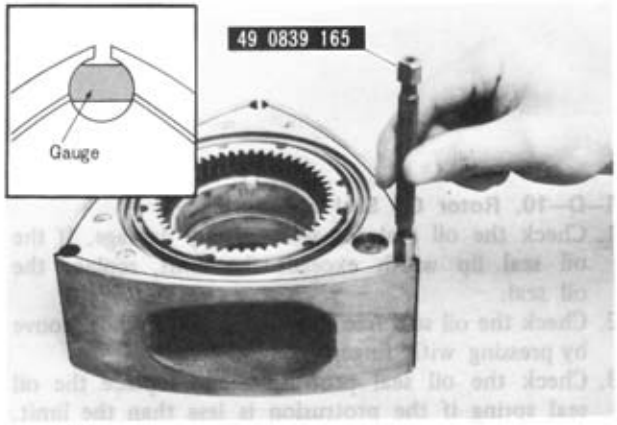

Fig. 1–61

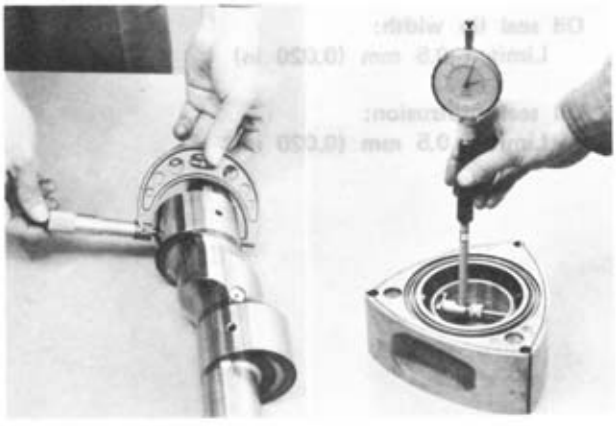

Fig. 1–62

1–D–7. Rotor

1. Carefully inspect the rotor and replace if it is severely worn or damaged.
2. Check the internal gear for cracked, scored, worn or chipped teeth.
3. Check the clearance between the side housing and rotor by measuring the rotor housing width Ⓐ (see Fig. 1–58) and the maximum rotor width. The rotor width should be measured at **three points.**

Clearance between the side housing and rotor:
Standard 0.12 ~ 0.18 mm (0.0047 ~ 0.0071 in)
Limit less than 0.10 mm (0.004 in)

If the clearance is more than the specification, replace the rotor assembly.
If the clearance is less than the specification, it indicates that the internal gear has come out, so strike the internal gear lightly with plastic hammer, being careful not to damage and recheck the clearance between the side housing and the rotor.

4. Check the corner seal bores for wear with the **gauge** (49 0839 165).
   a) If neither end of the gauge go into the bore, use the original corner seal.
   b) If the not-go-end of the gauge does not go into the bore while the go-end do, replace with a new corner seal.
   c) If both ends of the gauge go into the bore, replace the rotor.

1–D–8. Rotor Bearing

1. Check the rotor bearing for wear, flaking, scoring or any damage. If any of these conditions is found, replace the bearing.
2. Check the rotor bearing clearance by measuring the inner diameter of the rotor bearing and outer diameter of the eccentric shaft rotor journal.
   If the bearing clearance exceeds the limit, replace the rotor bearing.

Rotor bearing clearance:
Standard 0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in)
Limit 0.10 mm (0.0039 in)

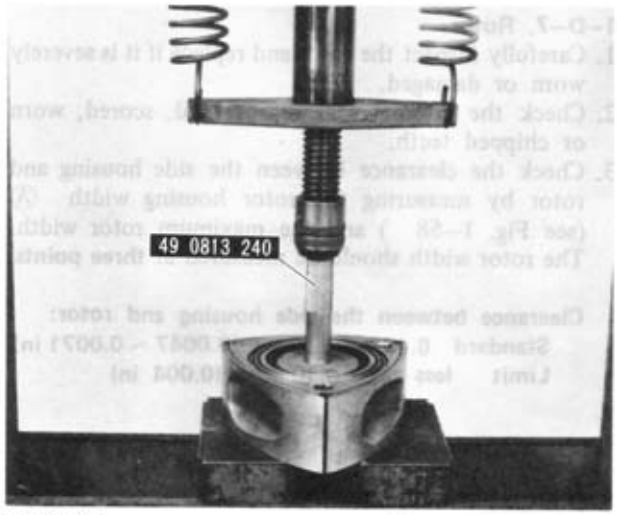

Fig. 1–63

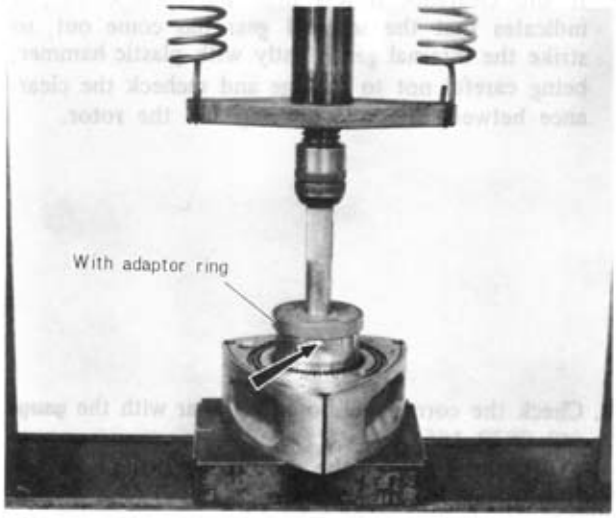

Fig. 1–64

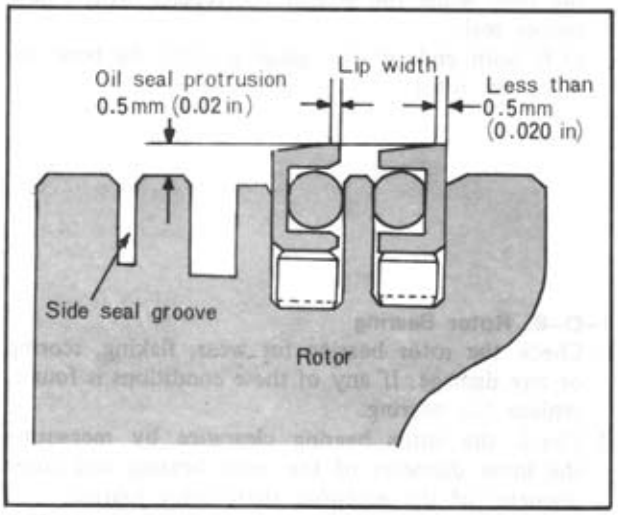

Fig. 1–65

1–D–9. Replacing Rotor Bearing

1. Place the rotor on the support so that the **internal gear is facing downward.** Using the **puller & installer** (49 0813 240) **without adaptor ring**, press the bearing out of the rotor. **Being careful** not to damage the internal gear.
2. Place the rotor on the support with **internal gear faced upward.**
3. Place the new rotor bearing on the rotor so that the bearing lug is in line with the slot of the rotor bore.
4. Remove the screws attaching the adaptor ring to the puller & installer. Using the puller & installer and adaptor ring, press fit the new bearing until the bearing is flush with the rotor boss.

1–D–10. Rotor Oil Seal and Spring

1. Check the oil seal for wear or any damage. If the oil seal lip width exceeds the limit, replace the oil seal.
2. Check the oil seal free movement in the rotor groove by pressing with finger.
3. Check the oil seal protrusion and replace the oil seal spring if the protrusion is less than the limit.

Oil seal lip width:
Limit 0.5 mm (0.020 in)

Oil seal protrusion:
Limit 0.5 mm (0.020 in)

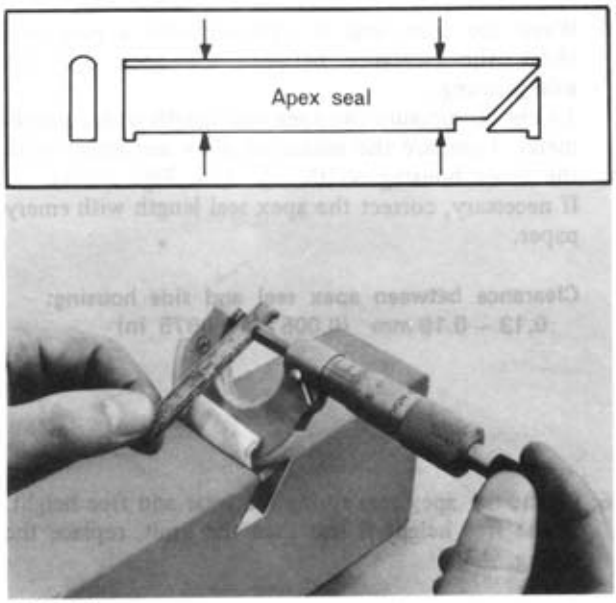

Fig. 1–66

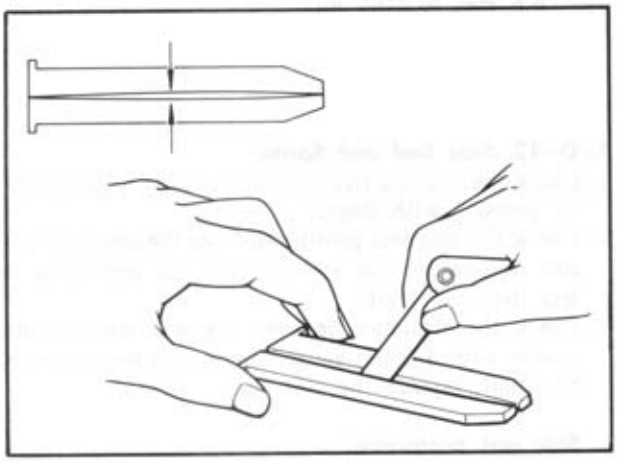

Fig. 1–67

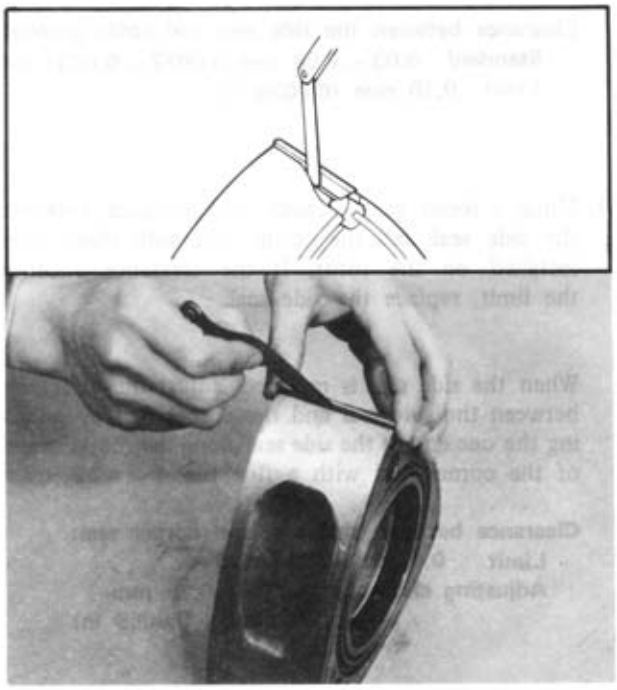

Fig. 1–68

1–D–11. Apex Seal, Side Piece and Spring

1. Check the apex seal and side piece for wear, crack or any damage.
   If any of these conditions is found, replace the seal.
2. Measure the apex seal height with a micrometer at two positions and replace if the height is less than the limit.

Apex seal height:

Standard	**8.5 mm (0.3347 in)**
Limit	**7.0 mm (0.2756 in)**

3. Check the apex seal for warpage by measuring the clearance between the top surface of apex seals picked out from three seals on a rotor.
   If the clearance exceeds the limit, replace all three apex seals on a rotor.

Apex seal warpage:

Limit	**0.06 mm (0.0024 in)**

4. Check the clearance between the apex seal and the groove. To check, place the apex seal in its respective groove on the rotor and measure the clearance between the apex seal and the groove with a feeler gauge.
   The feeler gauge should be inserted until the tip of the gauge reaches the bottom of the groove. If the clearance exceeds the limit, replace the apex seal.

Clearance between apex seal and rotor groove:

Standard	**0.05 ~ 0.09 mm (0.002 ~ 0.0035 in)**
Limit	**0.15 mm (0.0059 in)**

Fig. 1–69

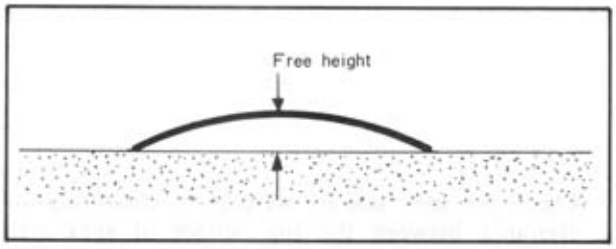

Fig. 1–70

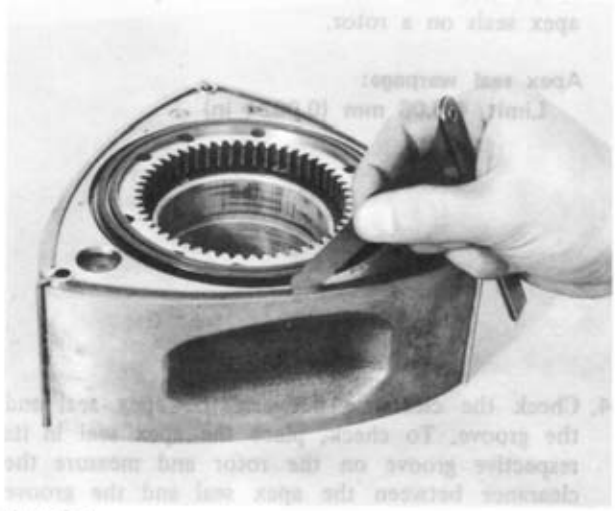

Fig. 1–71

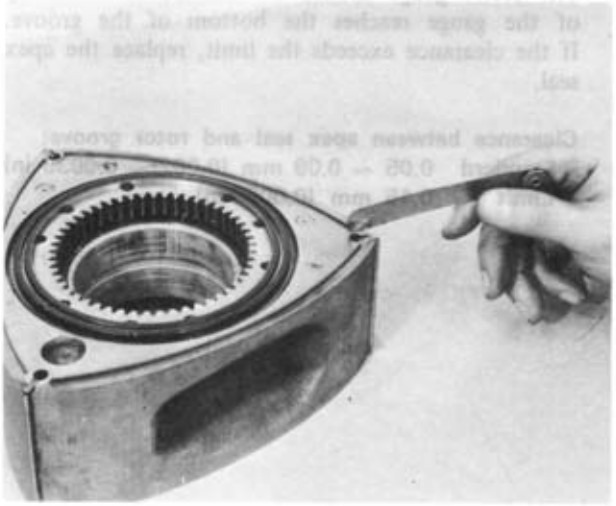

Fig. 1–72

5. When the apex seal is replaced with a new one, check the clearance between the apex seal and side housing.
   To check, measure the spex seal length with a micrometer. Compare the measured apex seal length with the rotor housing width Ⓐ (see Fig. 1–58).
   If necessary, correct the apex seal length with emery paper.

   Clearance between apex seal and side housing:
   0.13 ~ 0.19 mm (0.0051 ~ 0.0075 in)

6. Check the apex seal spring for wear and free height. If the free height is less than the limit, replace the spring.

   Free height limit:
   5.5 mm (0.2165 in)

1–D–12. Side Seal and Spring

1. Check the side seal free movement in the rotor groove by pressing with finger.
2. Check the side seal protrusion from the rotor surface and replace the side seal spring if the protrusion is less than the limit.
3. Check the clearance between the side seal and the groove with a feeler gauge. If the clearance exceeds the limit, replace the side seal.

   Side seal protrusion:
   Limit 0.5 mm (0.02 in)

   Clearance between the side seal and rotor groove:
   Standard 0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in)
   Limit 0.10 mm (0.0039 in)

4. Using a feeler gauge, check the clearance between the side seal and the corner seal with these seals installed on the rotor. If the clearance exceeds the limit, replace the side seal.

   When the side seal is replaced, adjust the clearance between the side seal and the corner seal by grinding the one end of the side seal along the round shape of the corner seal with a fine file.

   Clearance between side seal and corner seal:
   Limit 0.4 mm (0.0157 in)
   Adjusting clearance 0.05 ~ 0.15 mm (0.002 ~ 0.0059 in)

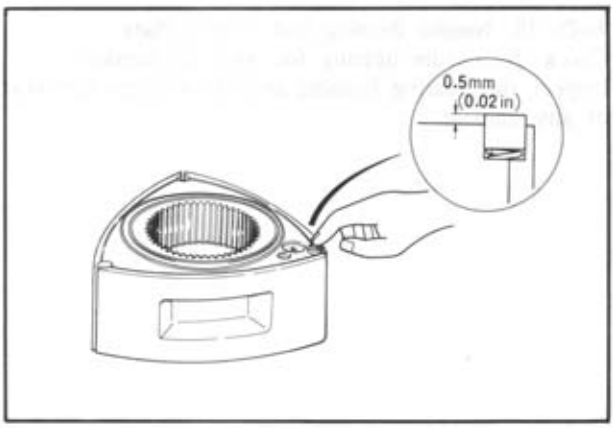

Fig. 1–73

1–D–13. Corner Seal and Spring

1. Check the corner seal for wear, crack or any damage. If any of these conditions is found, replace the seal.
2. Check the corner seal free movement in the rotor groove by pressing with finger.
3. Check the corner seal protrusion from the rotor surface. Replace the corner seal spring if the protrusion is less than the limit.
4. Check the corner seal spring for wear.

Corner seal protrusion:
Limit 0.5 mm (0.02 in)

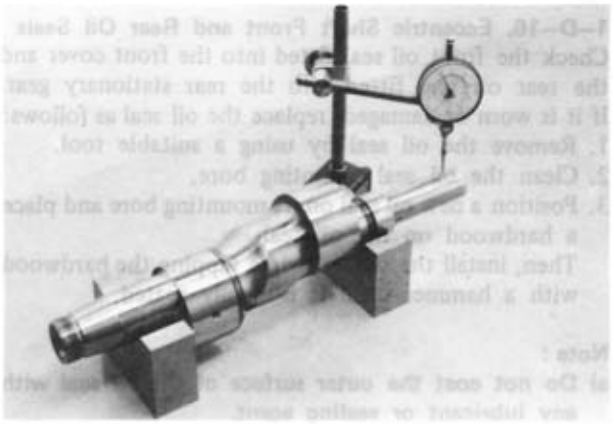

Fig. 1–74

1–D–14. Eccentric Shaft

1. Check the shaft for cracks, scratches, wear or any damage. Be sure that the oil passages are open.
2. Check the shaft for run-out.
   To check, use a dial indicator and turn the eccentric shaft, and take one-half of the largest difference shown by the dial indicator.
   If the run-out is more than the limit, replace the shaft with a new one.

Eccentric shaft run-out:
Limit 0.06 mm (0.0024 in)

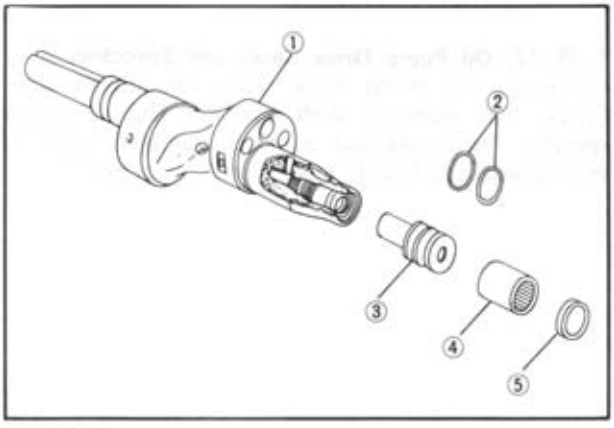

Fig. 1–75

3. Check the blind plug in the shaft end for oil leakage or looseness. If any oil leakage is found, remove the blind plug with a hexagonal allen key and replace the "O" ring.

1) Eccentric shaft
2) "O" ring
3) Blind plug
4) Bearing
5) Oil seal

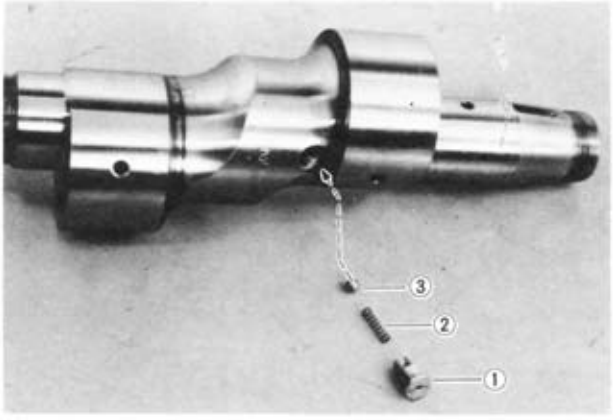

Fig. 1–76

4. Check the oil jet for spring weakness, stick or damage of the steel ball.

1) Plug
2) Spring
3) Steel ball

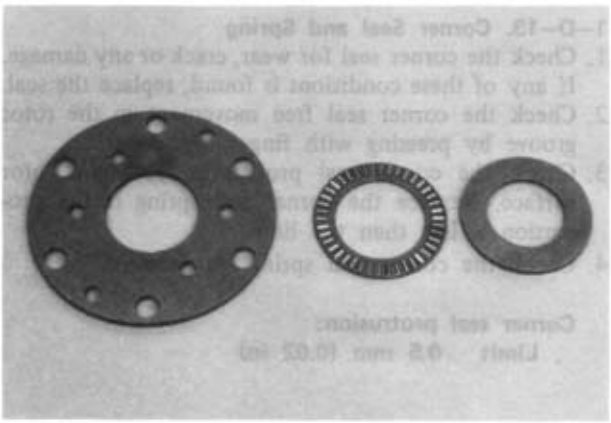

Fig. 1–77

1–D–15. Needle Bearing and Thrust Plate
Check the needle bearing for wear or damage.
Inspect the bearing housing and thrust plate for wear or any damage.

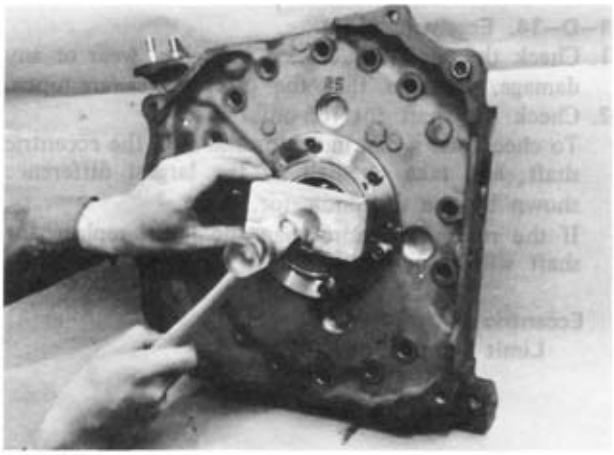

Fig. 1–78

1–D–16. Eccentric Shaft Front and Rear Oil Seals
Check the front oil seal fitted into the front cover and the rear oil seal fitted into the rear stationary gear. If it is worn or damaged, replace the oil seal as follows:
1. Remove the oil seal by using a suitable tool.
2. Clean the oil seal mounting bore.
3. Position a new oil seal on its mounting bore and place a hardwood on the oil seal.
   Then, install the oil seal while tapping the hardwood with a hammer until it is firmly seated.

Note :
a) Do not coat the outer surface of the oil seal with any lubricant or sealing agent.
b) Do not tap the oil seal directly with a hammer.

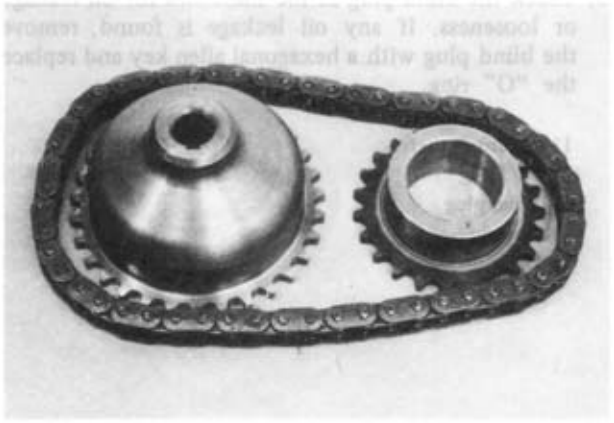

Fig. 1–79

1–D–17. Oil Pump Drive Chain and Sprockets
Check the oil pump drive chain for broken links. Check the eccentric shaft sprocket and oil pump sprocket for cracks and worn or damaged teeth. If any defects are found, replace with new parts.

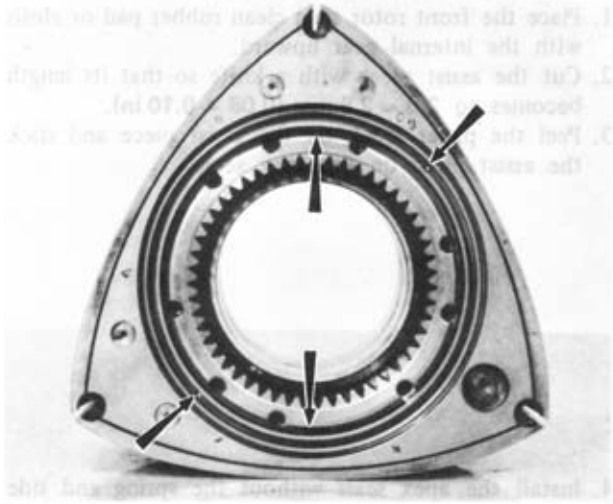

Fig. 1–80

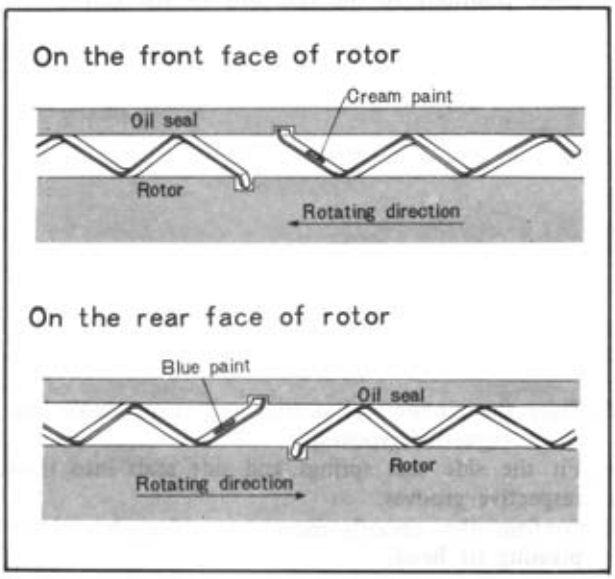

Fig. 1–81

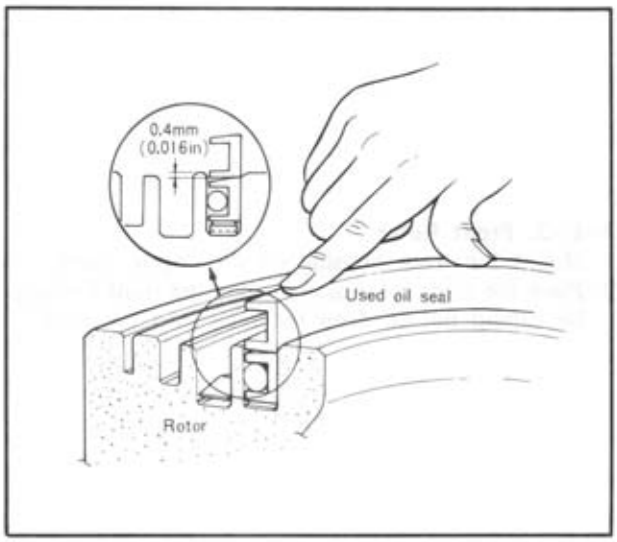

Fig. 1–82

1–E. ENGINE ASSEMBLY

Assemble the following component parts in sequences.

Note :
The "O" rings, rubber seals, and gaskets should be replaced with new ones.

1–E–1. Oil Seal

1. Place the rotor on a clean rubber pad or cloth.
2. Install the oil seal springs in their respective grooves on the rotor with each round edge of the spring fitted in the stopper hole in the oil seal grooves.

The oil seal springs have been painted in cream or blue color. The **cream-painted** springs should be fitted on the front faces of both front and rear rotors. While the **blue-painted** springs should be fitted on the rear faces.

3. Install a **new "O" ring** in each oil seal.
4. Place the inner oil seal to the oil seal groove so that the square edge of the spring fits in the stopper notch of the oil seal.

5. Press the inner oil seal by using a used inner oil seal so that the lip surface of the oil seal sinks into a position approximately **0.4 mm (0.016 in)** below the surface of the rotor.
6. Place the outer oil seal to the oil seal groove so that the square edge of the spring fits in the stopper notch of the oil seal.
7. Push the oil seal slowly with fingers.
   Confirm the smooth movement of each oil seal by pressing the oil seal.
8. Install the oil seal springs and oil seals on the other side of the rotor.

Note :
a) When replacing the oil seal, confirm the smooth movement of oil seal by placing the oil seal on the oil seal spring in the groove before inserting the "O" ring.
b) Be careful not to deform the lip of the oil seal.

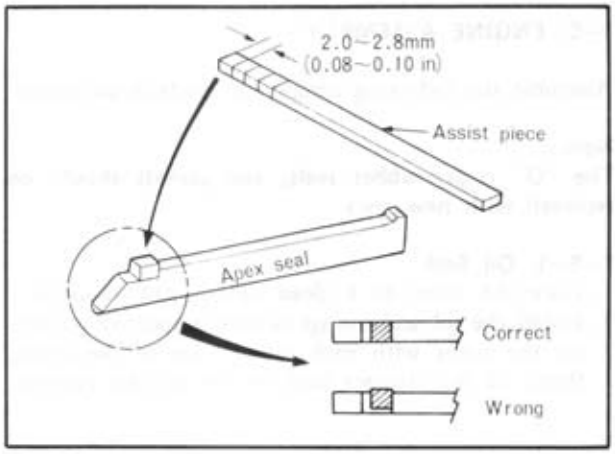

Fig. 1–83

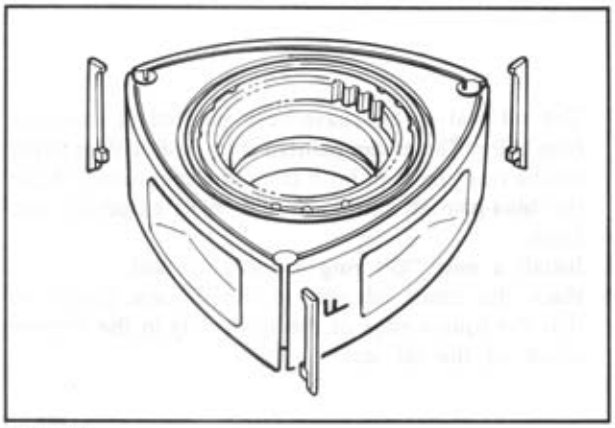

Fig. 1–84

Fig. 1–85

Fig. 1–86

1–E–2. Seals (Front side of rotor)

1. Place the front rotor on a clean rubber pad or cloth with the internal gear upward.
2. Cut the assist piece with a knife so that its length becomes to **2.0 ~ 2.8 mm (0.08 ~ 0.10 in).**
3. Peel the paper stuck on the assist piece and stick the assist piece on the apex seal.
4. Install the apex seals without the spring and side piece into their respective grooves so that the side piece positions to the rear side of the rotor.
5. Place the corner seal springs and corner seals into their respective grooves.
6. Fit the side seal springs and side seals into their respective grooves.
   Confirm the smooth movement of each seal by pressing its head.

1–E–3. Front Rotor

1. Mount the front housing on the engine stand.
2. Place the front rotor assembly on the front housing. Be careful not to drop the seals into the port.

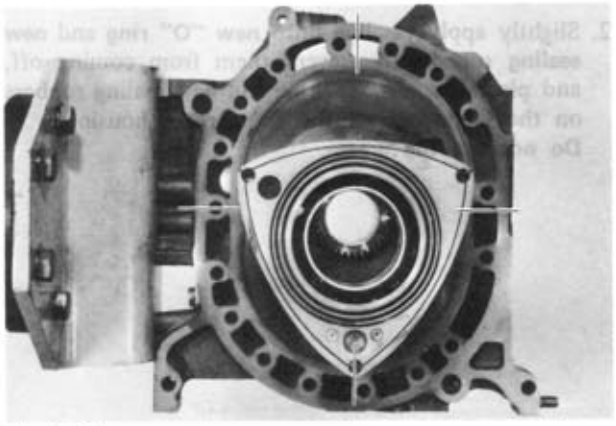

Fig. 1–87

3. Mesh the internal gear and stationary gear so that one of the rotor apexes is set to any one of the four places.

Fig. 1–88

1–E–4. Eccentric Shaft

1. Lubricate the front rotor journal and main journal on the shaft with engine oil.
2. Insert the eccentric shaft, being cereful not to damage the rotor bearing and main bearing.

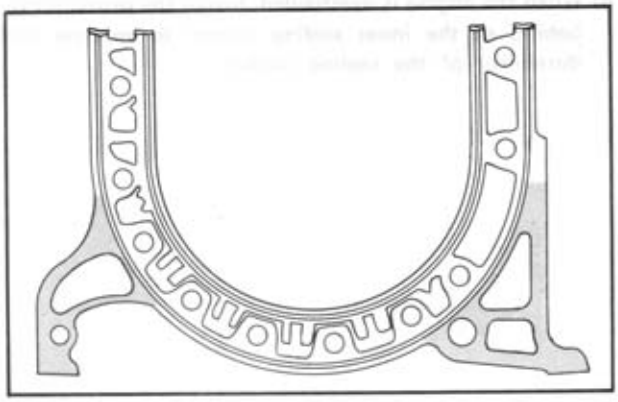

Fig. 1–89

1–E–5. Front Rotor Housing

1. Apply sealing agent onto the front side of the front rotor housing.

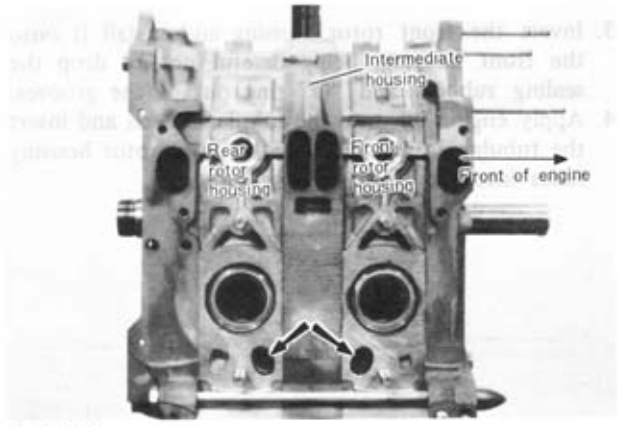

Fig. 1–90

Note :
The front and rear rotor housings are not interchangeable.
Install the rotor housing so that the each air injection hole goes toward the intermediate housing.

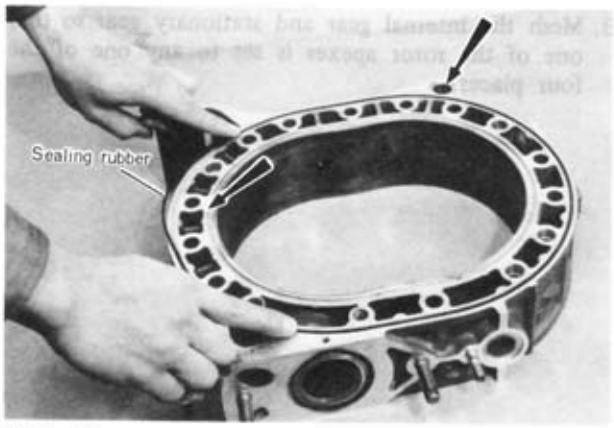

Fig. 1–91

2. Slightly apply vaseline onto **new "O" ring** and **new sealing rubbers** to prevent them from coming off, and place the new "O" ring and new sealing rubbers on the front side of the front rotor housing.
Do not use the grease.

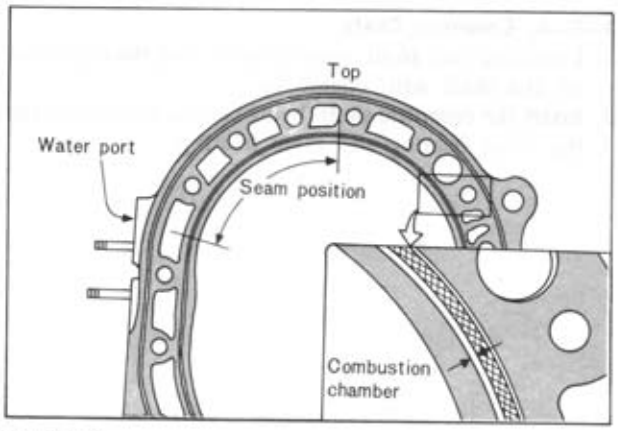

Fig. 1–92

Note :

a) The wider white line of the inner sealing rubber should face to combustion chamber and the seam of the sealing rubber should be placed at the position as shown in figure.
Do not stretch the sealing rubbers.

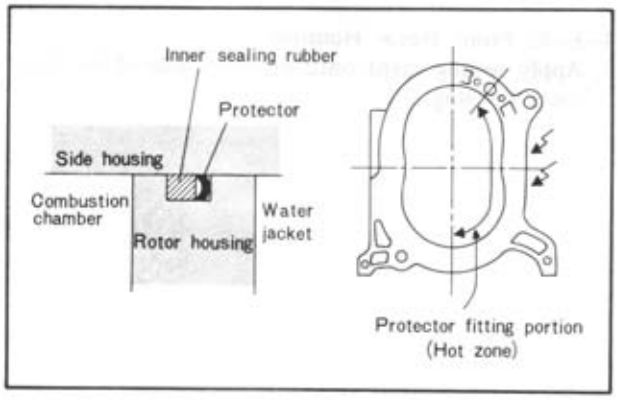

Fig. 1–93

b) When the engine is overhauled, install the protector to behind of the inner sealing rubber to improve the durability of the sealing rubber.

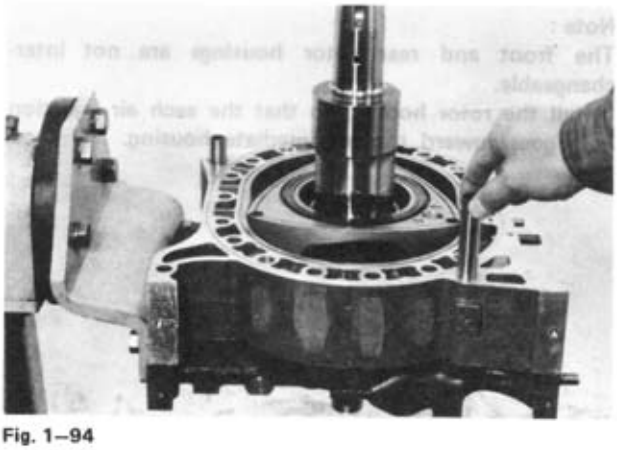

Fig. 1–94

3. Invert the front rotor housing and install it onto the front housing, being careful not to drop the sealing rubbers and "O" ring out of the grooves.
4. Apply engine oil onto the tubular dowels and insert the tubular dowels through the front rotor housing holes into the front housing holes.

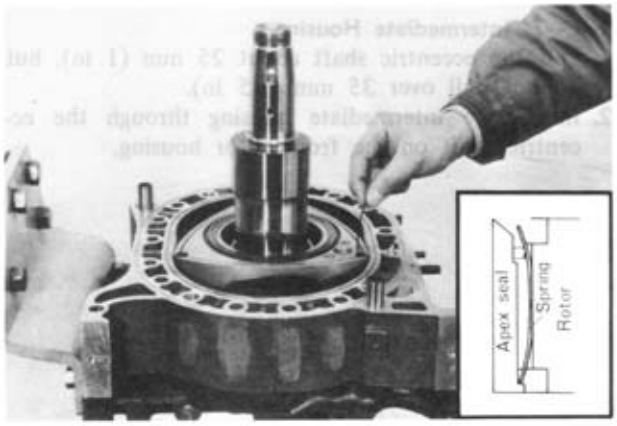

Fig. 1–95

1–E–6. Seals (Rear side of rotor)

1. Insert the each apex seal spring so that the both ends of the spring may support the back side of the apex seal.

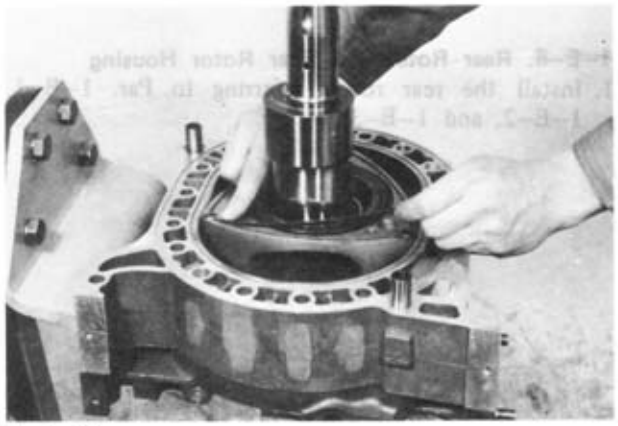

Fig. 1–96

2. Install the corner seal springs and corner seals into their respective grooves.
3. Install the side seal springs and side seals into their respective grooves.

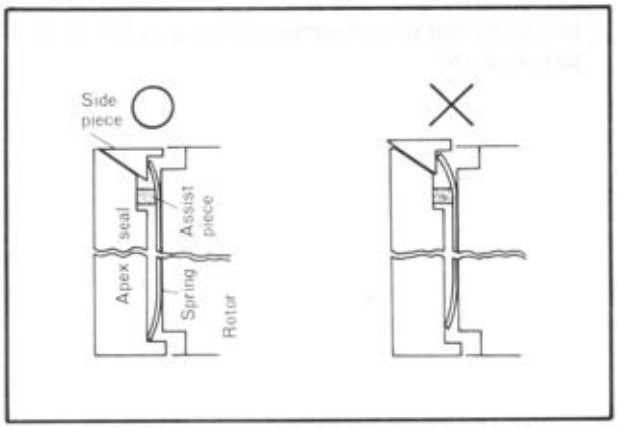

Fig. 1–97

4. Fit the each side piece to its original position. And confirm that the spring should be set correctly on the side piece.
5. Confirm the smooth movement of each seal by pressing its head.

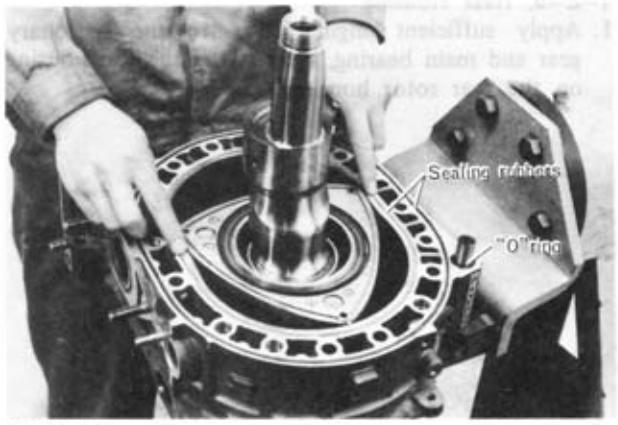

Fig. 1–98

6. Apply the sealing agent on the rear side of the front rotor housing and then, place the **new "O" ring, new sealing rubbers** and protector on the rear side of the front rotor housing, as instructed in Par. 1–E–5.
7. Apply engine oil onto the each seal and sliding surface of the front rotor housing. Make sure that the front rotor housing is free from any foreign matter.

Fig. 1–99

1–E–7. Intermediate Housing

1. Pull the eccentric shaft about 25 mm (1 in), but do not pull over 35 mm (1.5 in).
2. Install the intermediate housing through the eccentric shaft on the front rotor housing.

Fig. 1–100

1–E–8. Rear Rotor and Rear Rotor Housing

1. Install the rear rotor, referring to Par. 1–E–1, 1–E–2, and 1–E–3.

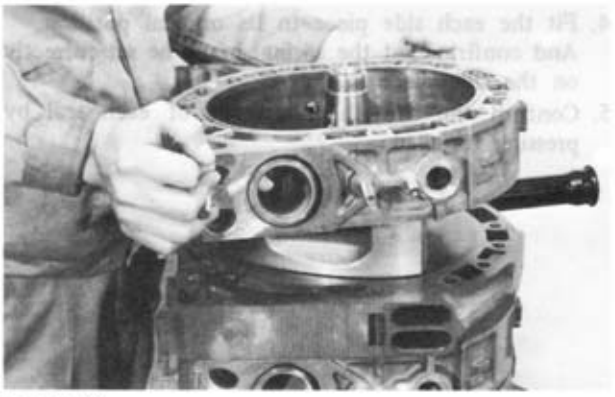

Fig. 1–101

2. Install the rear rotor housing, referring to Par. 1–E–5 and 1–E–6.

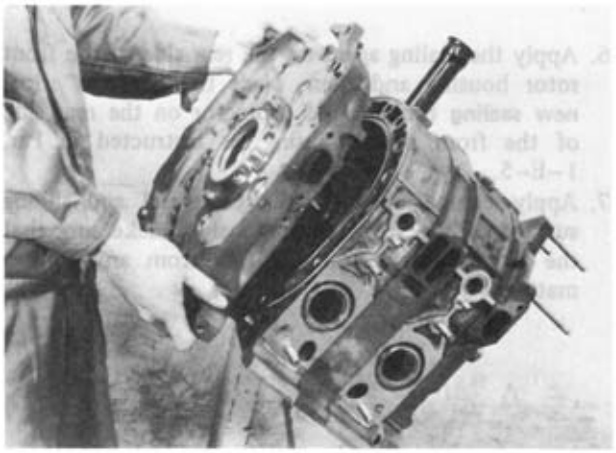

Fig. 1–102

1–E–9. Rear Housing

1. Apply sufficient engine oil onto the stationary gear and main bearing, then install the rear housing on the rear rotor housing.

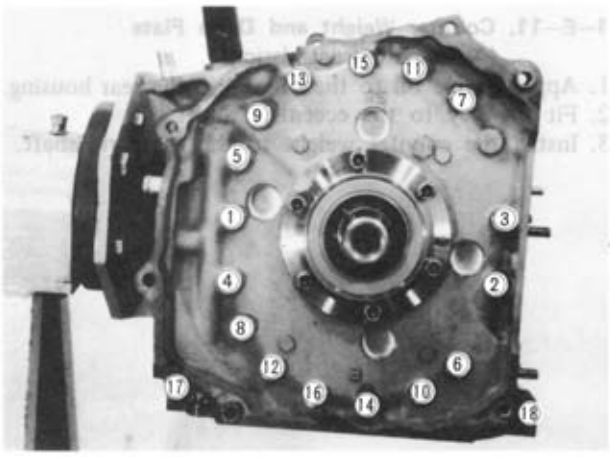

Fig. 1–103

2. Apply engine oil onto the thread of the bolt.
3. Fit the tension bolts and tighten the bolts in the order shown in figure.

Tension bolt tightening torque:
3.2 ~ 3.8 m-kg (23 ~ 27 ft-lb)

Note :
a) Replace the sealing washer in the tension bolt when the engine is overhauled.
b) Do not tighten the tension bolts at one time.

4. Turn the eccentric shaft and make sure that the rotation is light and smooth.

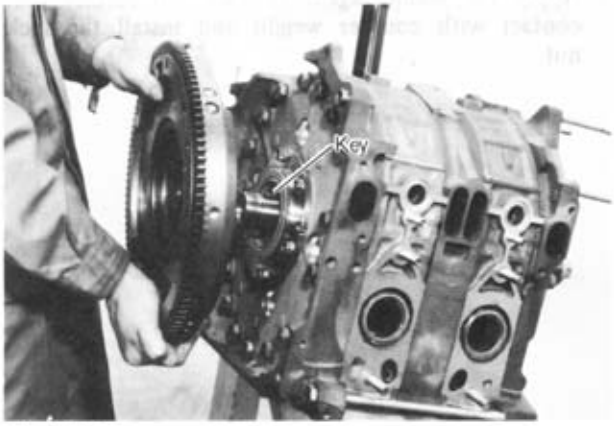

Fig. 1–104

1–E–10. Flywheel (Manual transmission)
1. Apply engine oil to the oil seal in the rear housing.
2. Fit the key to the eccentric shaft.
3. Install the flywheel to the eccentric shaft.

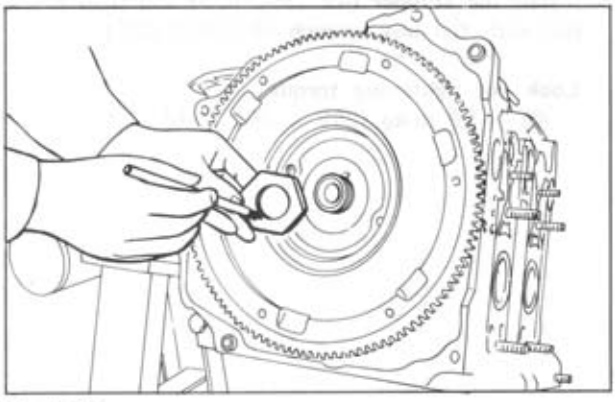

Fig. 1–105

4. Apply the sealing agent to lock nut surface that contact with flywheel and install the lock nut.

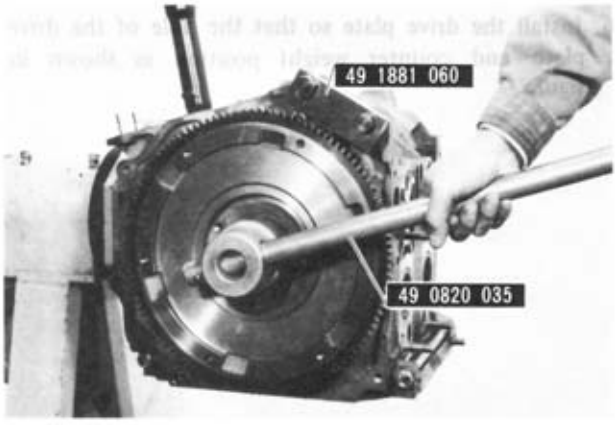

Fig. 1–106

5. Install the **brake** (49 1881 060) and tighten the nut with the **box wrench** (49 0820 035).

Lock nut tightening torque:
40 ~ 50 m-kg (289 ~ 362 ft-lb)

6. Install the clutch disc and clutch cover assembly as described in Par. 6–C.

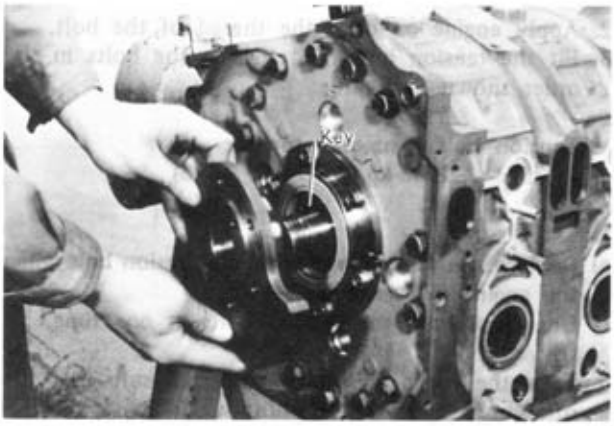

Fig. 1–107

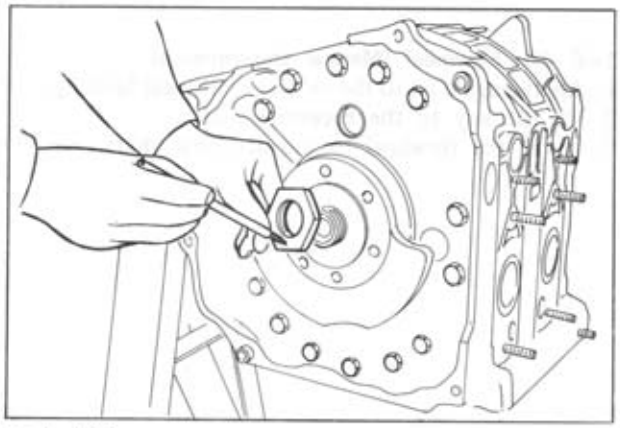

Fig. 1–108

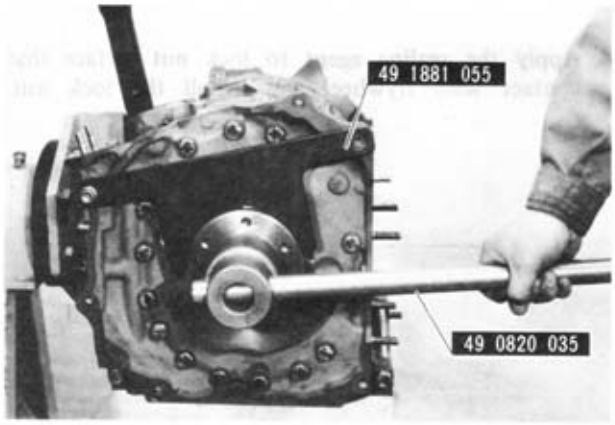

Fig. 1–109

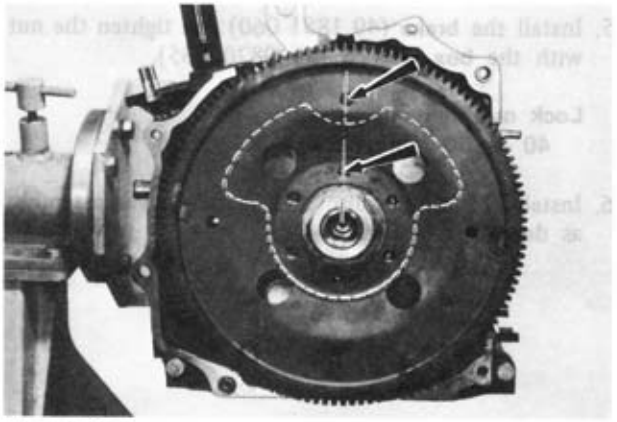

Fig. 1–110

1–E–11. Counter Weight and Drive Plate (Automatic transmission)

1. Apply engine oil to the oil seal in the rear housing.
2. Fit the key to the eccentric shaft.
3. Install the counter weight to the eccentric shaft.
4. Apply the sealing agent to lock nut surface that contact with counter weight and install the lock nut.
5. Install the **stopper** (49 1881 055) and tighten the nut with the **box wrench** (49 0820 035).

   Lock nut tightening torque:
   40 ~ 50 m-kg (289 ~ 362 ft-lb)
6. Install the drive plate so that the hole of the drive plate and counter weight position as shown in figure.

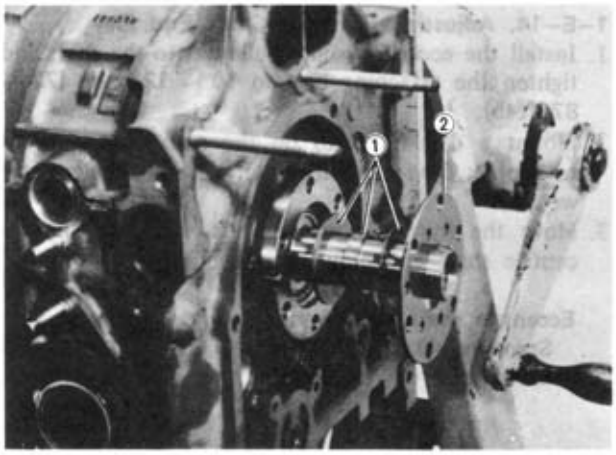

Fig. 1–111

1–E–12. Bearing Housing and Balance Weight

1. Place the thrust plate with the chamfer downward, and slide the spacer and needle bearing onto the eccentric shaft. Then apply sufficient engine oil onto them.
2. Place the bearing housing on the front housing, and tighten the attaching bolts .

Note :
If the bearing housing has not been removed from the front housing, special care should be taken, when installing the spacer, so that the center of the needle bearing in the bearing housing comes to the center of eccentric shaft, and the spacer should be seated to the thrust plate.

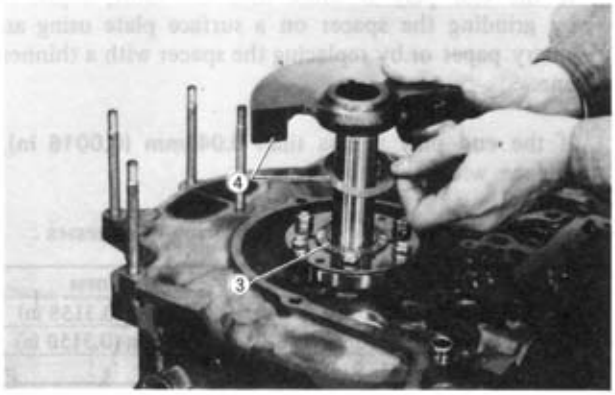

Fig. 1–112

3. Slide the needle bearing onto the shaft, and apply engine oil onto it.
4. Slide the balance weight together with the thrust washer onto the shaft.

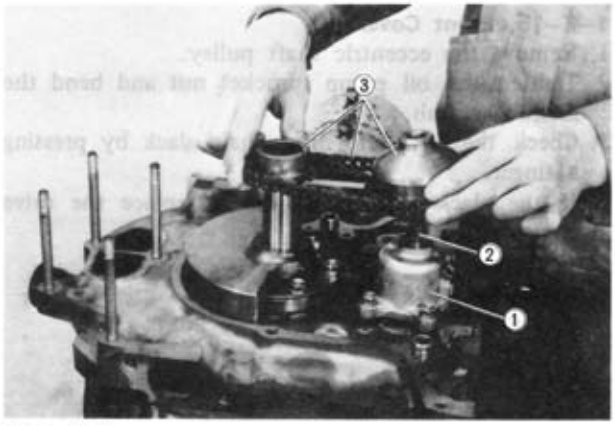

Fig. 1–113

1–E–13. Oil Pump and Oil Pump Drive

1. Install the oil pump assembly on the front housing.
2. Fit the key onto the oil pump shaft.
3. Fit the oil pump drive chain onto the oil pump sprocket and eccentric shaft sprocket, and install them to the eccentric shaft and oil pump shaft, aligning the key and keyway.

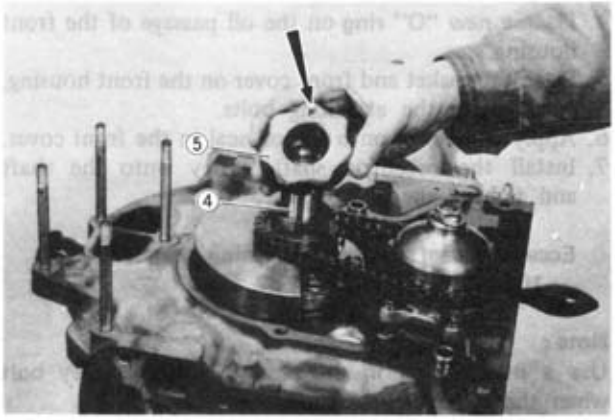

Fig. 1–114

4. Aligning the keyways of the eccentric shaft sprocket and balance weight, and install the key.
5. Slide the distributor drive gear onto the eccentric shaft with "F" mark toward the front of engine.

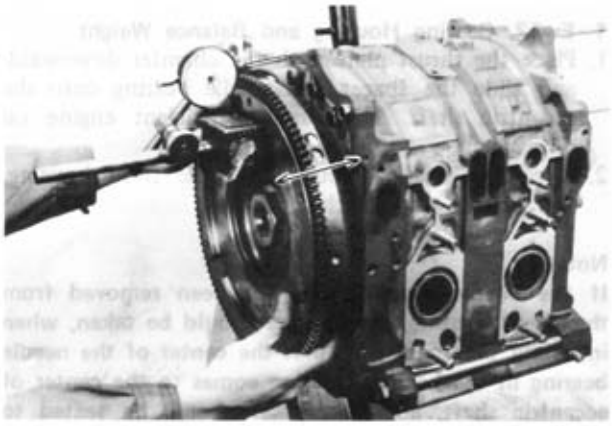

Fig. 1–115

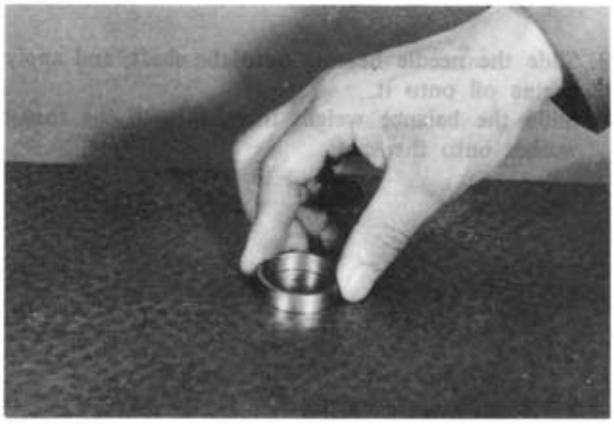

Fig. 1–116

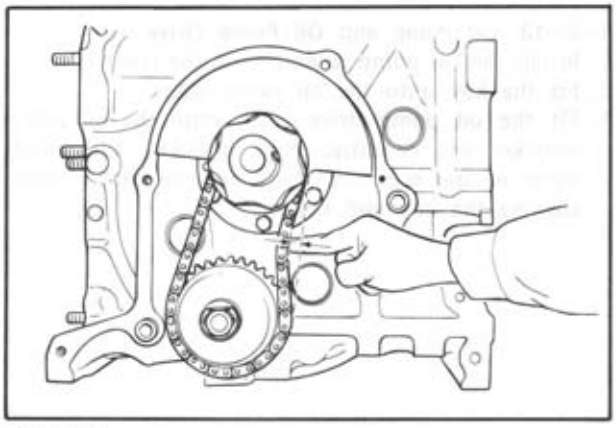

Fig. 1–117

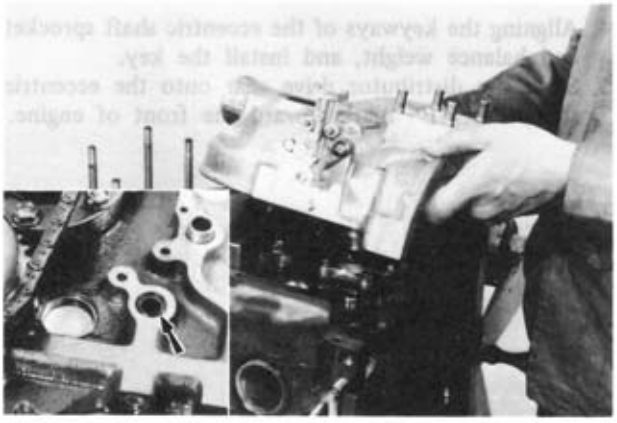

Fig. 1–118

1–E–14. Adjusting Eccentric Shaft End Play

1. Install the eccentric shaft pulley onto the shaft and tighten the attaching bolt to **10 ~ 12 m-kg (72 ~ 87 ft-lb)**.
2. Mount a dial indicator on the rear housing so as to contact the feeler with the flywheel or the counter weight.
3. Move the flywheel fore and aft, and read the eccentric shaft end play.

Eccentric shaft end play:
Standard 0.04 ~ 0.07 mm (0.0016 ~ 0.0028 in)
Limit 0.09 mm (0.0035 in)

If the end play is more than the limit, adjust it by grinding the spacer on a surface plate using an emery paper or by replacing the spacer with a thinner one.

If the end play is less than **0.04 mm (0.0016 in)**, replace with a thicker spacer.

The spacers are available in the following thicknesses :

Mark	Thickness	Mark	Thickness
X	8.08 mm (0.3181 in)	V	8.02 mm (0.3158 in)
K	8.06 mm (0.3173 in)	Z	8.00 mm (0.3150 in)
Y	8.04 mm (0.3165 in)		

1–E–15. Front Cover

1. Remove the eccentric shaft pulley.
2. Tighten the oil pump sprocket nut and bend the lockwasher tab.
3. Check the oil pump drive chain slack by pressing a finger.
   If the slack exceeds the limit, replace the drive chain with a new one.

Oil pump drive chain slack:
Limit 12 mm (0.47 in)

4. Place a **new "O" ring** on the oil passage of the front housing.
5. Place the gasket and front cover on the front housing, and tighten the attaching bolts.
6. Apply engine oil onto the oil seal in the front cover.
7. Install the eccentric shaft pulley onto the shaft and tighten the pulley bolt.

Eccentric shaft pulley tightening torque:
10 ~ 12 m-kg (72 ~ 87 ft-lb)

Note :
Use a new washer in the eccentric shaft pulley bolt when the pulley is removed.

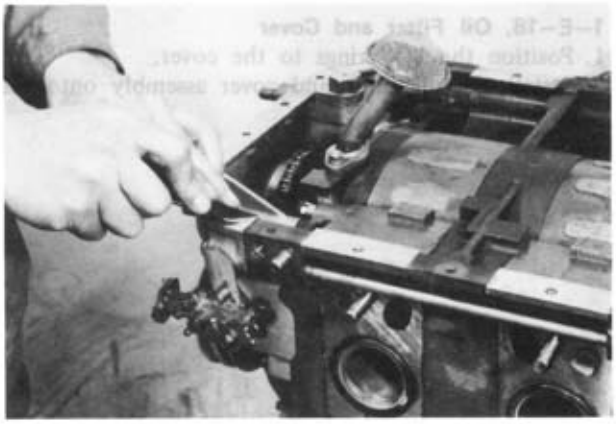

Fig. 1–119

1–E–16. Oil Strainer and Oil Pan

1. Install the oil strainer and gasket on the front housing.
2. Cut off the excess gaskets along the mounting surface of the oil pan.

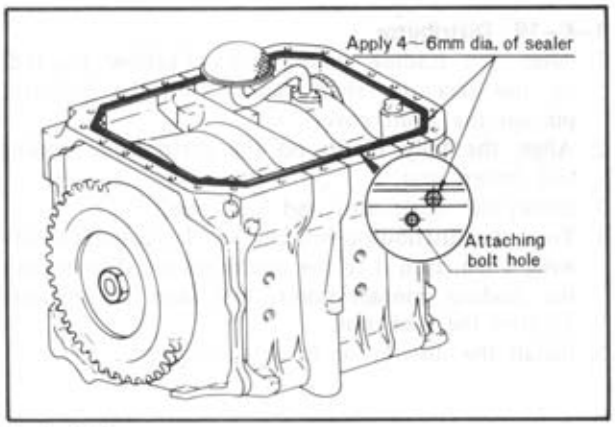

Fig. 1–120

3. Apply the **4 ~ 6 mm (0.16 ~ 0.24 in)** diameter continuous bead of sealer (Part No. 8527 77 739) on mounting surface of oil pan and place the gasket on it. The both ends of the sealer bead should be overlapped.

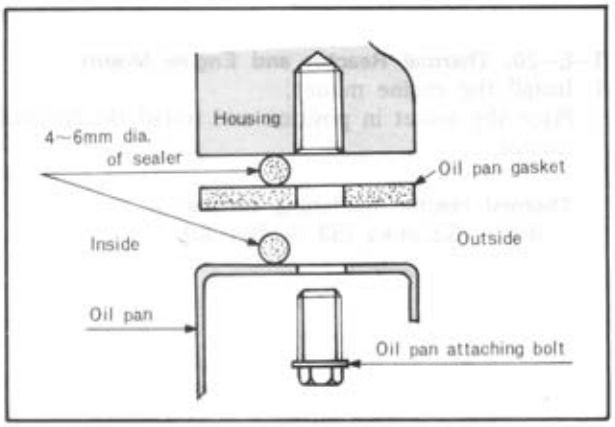

Fig. 1–121

4. Apply the sealer onto the gasket and install the oil pan.

Oil pan tightening torque:
0.8 ~ 1.1 m-kg (6 ~ 8 ft-lb)

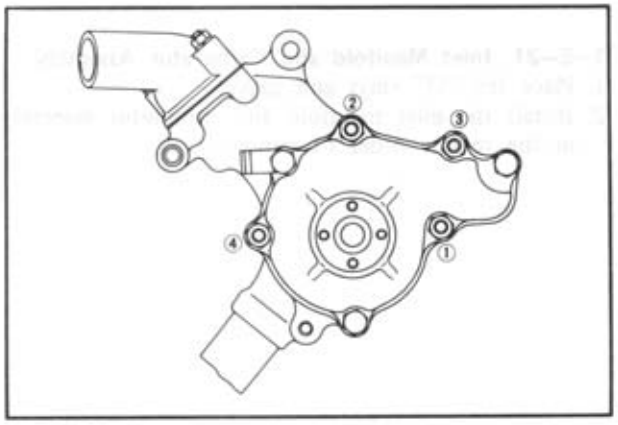

Fig. 1–122

1–E–17. Water Pump

Install the water pump and tighten the nuts in sequence as shown in figure.

Water pump tightening torque:
1.8 ~ 2.7 m-kg (13 ~ 20 ft-lb)

Fig. 1–123

1–E–18. Oil Filter and Cover

1. Position the "O" rings to the cover.
2. Install the oil filter and cover assembly onto the rear housing.

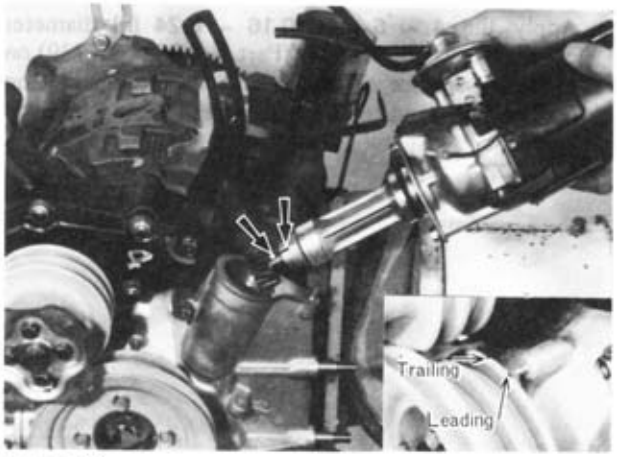

Fig. 1–124

1–E–19. Distributor

1. Align the leading timing mark (Yellow painted) on the eccentric shaft pulley with the indicator pin on the front cover.
2. Align the tally marks on the distributor housing and driven gear.
3. Install the distributor and lock nut.
4. Turn the distributor housing to the counter-clockwise. Then, turn it to the clockwise and stop it when the leading contact points just start to separate. Tighten the lock nut.
5. Install the distributor rotor and cap.

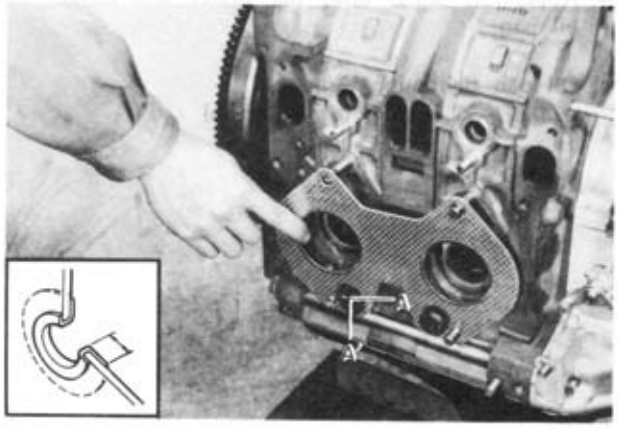

Fig. 1–125

1–E–20. Thermal Reactor and Engine Mount

1. Install the engine mount.
2. Place the gasket in position and install the thermal reactor.

Thermal reactor tightening torque:
4.5 ~ 5.5 m-kg (33 ~ 40 ft-lb)

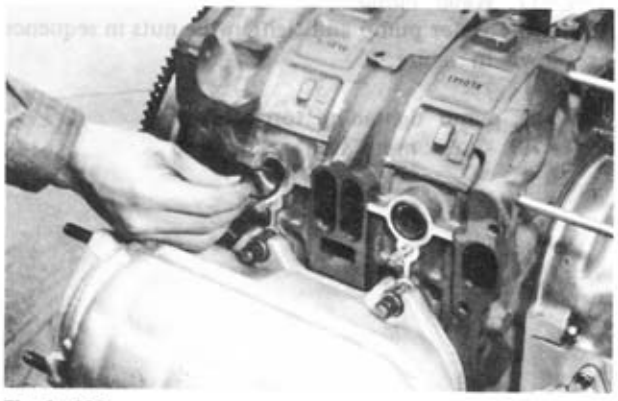

Fig. 1–126

1–E–21. Inlet Manifold and Carburetor Assembly

1. Place the "O" rings and gasket.
2. Install the inlet manifold and carburetor assembly in the reverse order of removing.

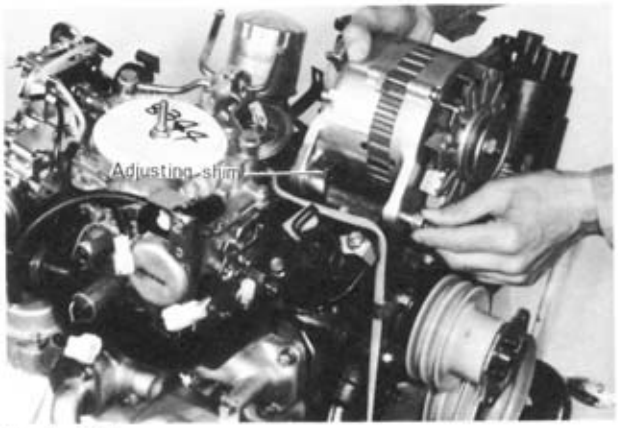

Fig. 1–127

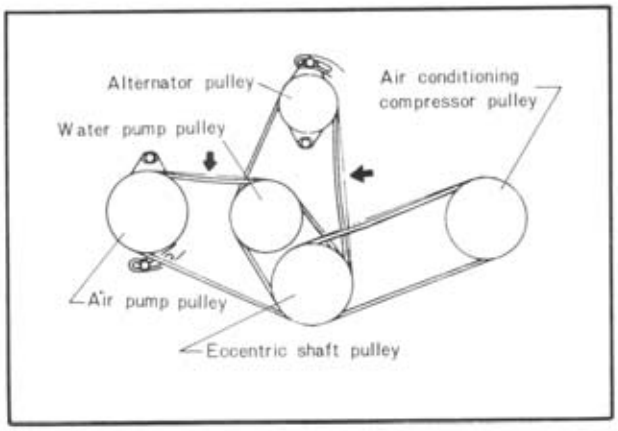

Fig. 1–128

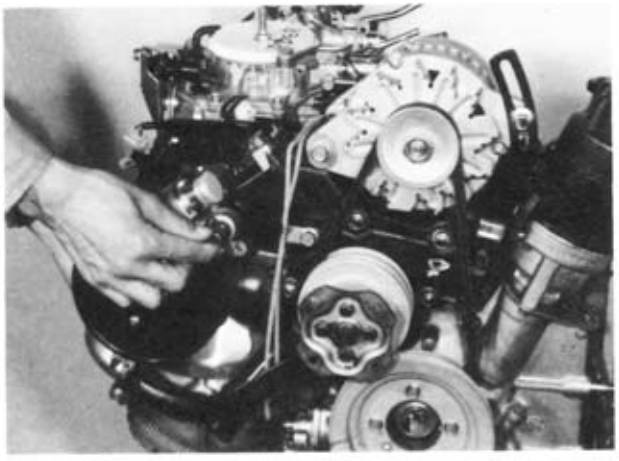

Fig. 1–129

1–E–22. Alternator and Drive Belt

1. Install the alternator to the bracket and check the clearance between the alternator support and bracket. If the clearance is more than the limit, adjust it by inserting the following adjust shim.

Clearance:
Limit 0.15 mm (0.0059 in)

Available adjusting shims

0.15 mm (0.0059 in)	0.3 mm (0.0118 in)
0.5 mm (0.0197 in)	

2. Install the drive belt and adjust the belt tension.

Alternator drive belt tension:
15 ± 2 mm (0.59 ± 0.08 in) When pressed at **10kg (22 lb)** between the alternator pulley and eccentric shaft pulley.

1–E–23. Air Pump and Drive Belt

Install the air pump and drive belt, and then, adjust the drive belt tension.

Air pump drive belt tension:
12 ± 1 mm (0.47 ± 0.04 in) when pressed at **10 kg (22 lb)** between the air pump pulley and water pump pulley.

1–F. ENGINE INSTALLATION

Carry out the removal operation in the reverse order.

After installing the engine, perform the following operations.

1. Refill the engine with coolant, and lubricant.
2. Tune up the engine.
3. Check and adjust the bonnet for proper closing.

EMISSION CONTROL SYSTEM

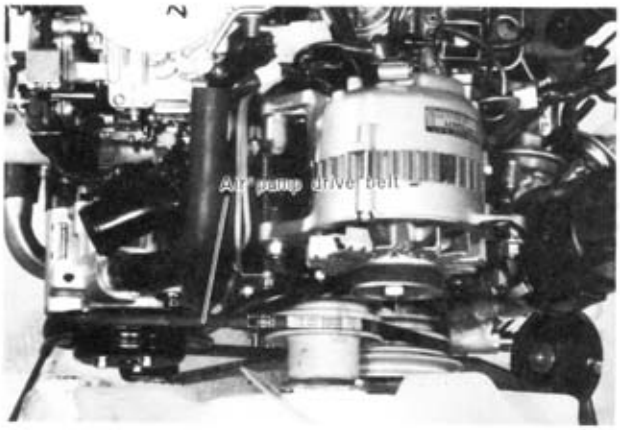

Fig. 1A–1

Fig. 1A–2

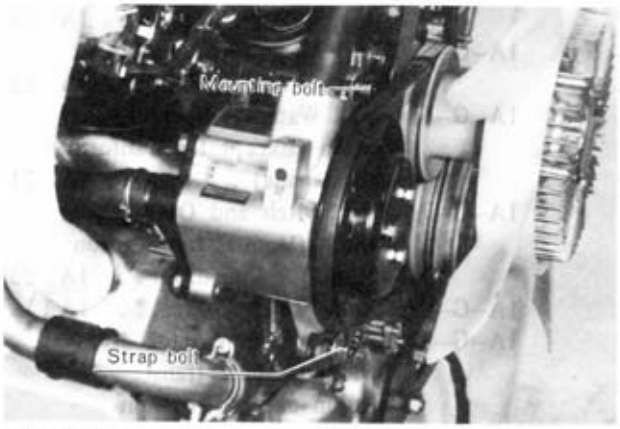

Fig. 1A–3

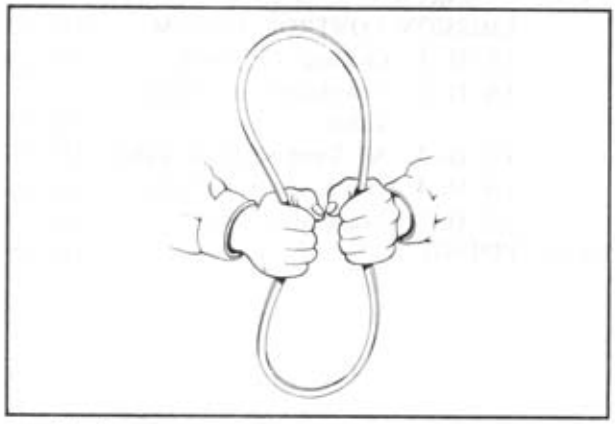

Fig. 1A–4

1A–A. AIR INJECTION AND THERMAL REACTOR SYSTEM

1A–A–1. Air Pump

a. Checking air pump

1. Warm up the engine until it reaches normal operating temperature.
   Inspect hoses and connections for leaks.
2. Check the air pump for noise, if excessive, replace the air pump.
3. Check the air pump drive belt tension. Adjust to specification, if necessary.
4. Disconnect the air hose (air pump ~ air control valve) at the air control valve.
5. Connect the **air pump gauge set** (49 2113 010B) to the air hose and clamp the hose securely to gauge.
6. Install a tachometer to the engine.
7. Start the engine and run it at idle speed.
8. Observe the pressure reading on test gauge. The pressure reading should be **more than 0.115 kg/cm² (1.64 lb/in²) at 800 rpm.**
9. If the pump pressure does not meet minimum specifications, replace the air pump and repeat test.

b. Replacing air pump

1. Remove the air cleaner.
2. Disconnect the air inlet and outlet hoses.
3. Remove the air pump strap bolt.
4. Remove the air pump mounting bolt.
5. Disengage the air pump drive belt and remove the air pump.
6. Install the air pump in the reverse order of removing and adjust the drive belt tension as described in Par. 1A–A–2.

1A–A–2. Air Pump Drive Belt

a. Checking air pump drive belt

1. Check the drive belt for cracked, deteriorated, stretched, or worn and adherence of oil or grease. Replace if necessary.
2. If the belt is noisy, check the tension of belt and for misaligned pulleys.

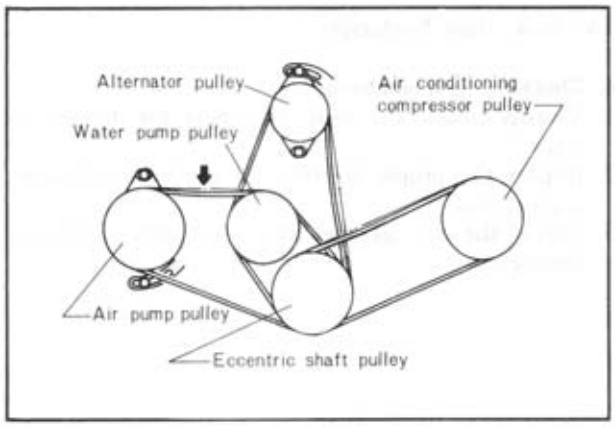

Fig. 1A–5

b. Adjusting air pump drive belt

1. Loosen the air pump strap bolt and mounting bolt.
2. Move the air pump toward or away from the engine until the correct belt tension is obtained.

Belt tension: 12 ± 1 mm(0.47 ± 0.04 in) when pressed at 10 kg (22 lb)

3. Tighten the pump mounting and strap bolts.

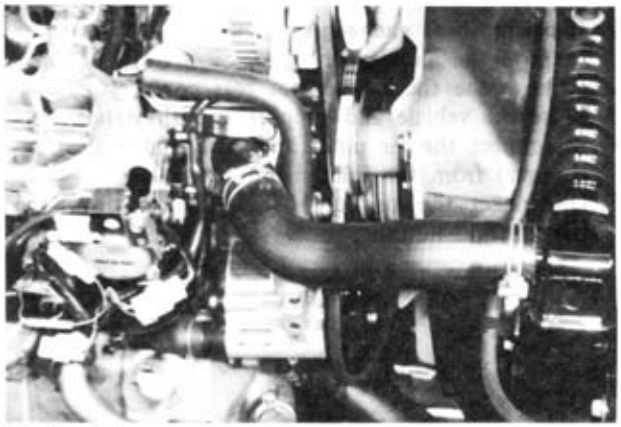

Fig. 1A–6

c. Replacing air pump drive belt

1. Loosen the air conditioning compressor mounting bolts and move the compressor until the drive belt can be removed (if equipped).
2. Loosen the air pump strap and mounting bolts, then move the air pump until the drive belt can be removed.
3. Install a new belt and adjust the belt tension as explained above.
4. Install the air conditioning compressor drive belt and adjust the belt tension.

Belt tension (air conditioning compressor): 9 ± 1mm (0.35 ± 0.04 in) when pressed at 10 kg (22 lb)

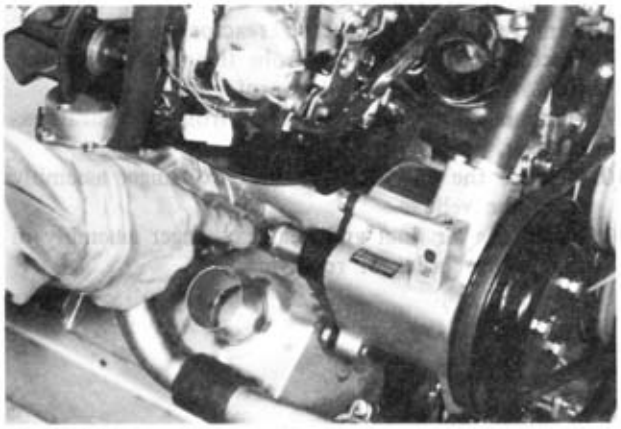

Fig. 1A–7

1A–A–3. Check Valve

a. Checking check valve

1. Warm up the engine until it reaches normal operating temperature, and connect a tachometer to engine.
2. Disconnect the air hose (air pump ~ air control valve) at the air control valve.
3. Slowly increase the engine speed to **1,500 rpm** and watch for exhaust gas leakage at the air inlet fitting on the air control valve. If there is exhaust gas leakage, replace the check valve.

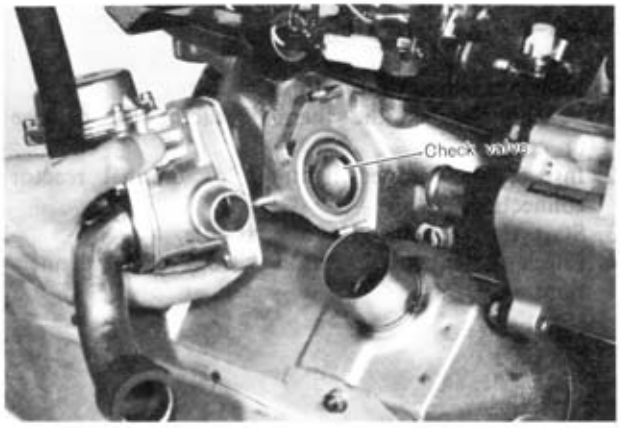

Fig. 1A–8

b. Replacing check valve

1. Remove the air control valve described in Par. 1A–B–2.
2. Remove the gasket and check valve.
3. Install the check valve in the reverse order of removing.

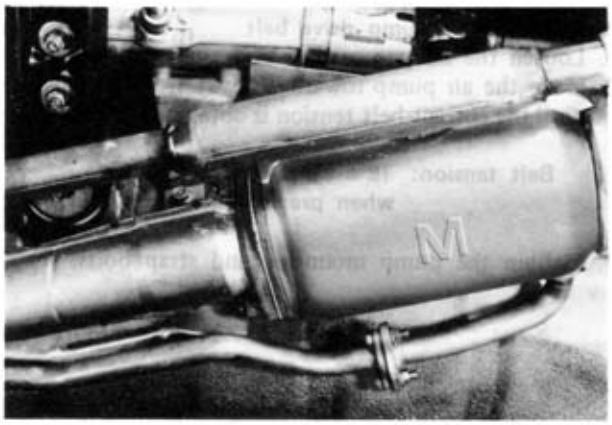

Fig. 1A–9

1A–A–4. Heat Exchanger

a. Checking heat exchanger

1. Visually check the heat exchanger for damage or crack.
2. Inspect the proper tightness of the heat exchanger connections.
3. Check the air leakage from the heat exchanger connections.

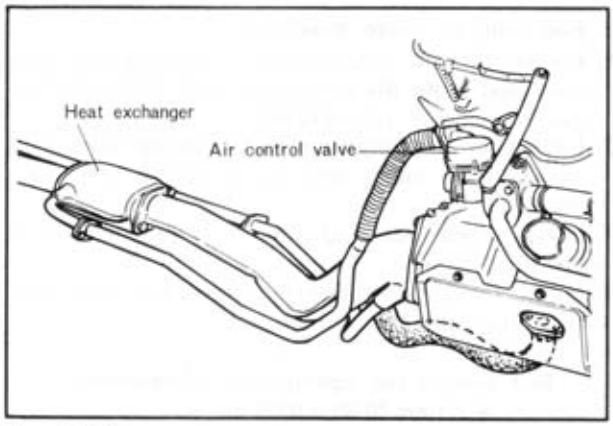

Fig. 1A–10

b. Replacing heat exchanger

1. Remove the air cleaner.
2. Remove the thermal reactor rear cover.
3. Raise the vehicle and support it with stands.
4. Disconnect the air pipe (inlet manifold ~ heat exchanger) from the inlet manifold.
5. Disconnect the air duct hanger bracket from the transmission housing.

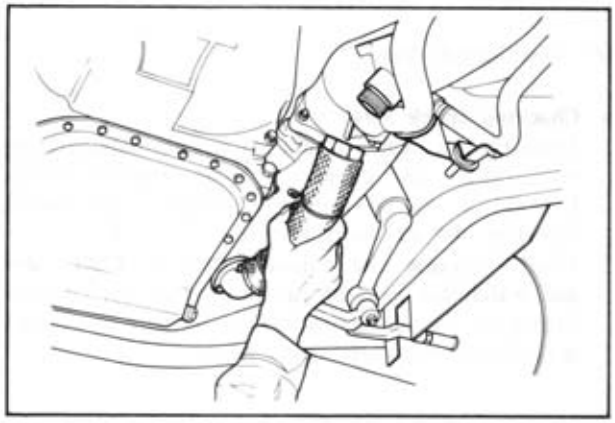

Fig. 1A–11

6. Remove the air pipe (thermal reactor ~ air duct).
7. Disconnect the air duct from the thermal reactor.
8. Remove the exhaust pipe protector.
9. Disconnect the main silencer from the heat exchanger.
10. Remove the air duct and heat exchanger assembly from the vehicle.
11. Install the air duct and heat exchanger assembly in the reverse order of removing.

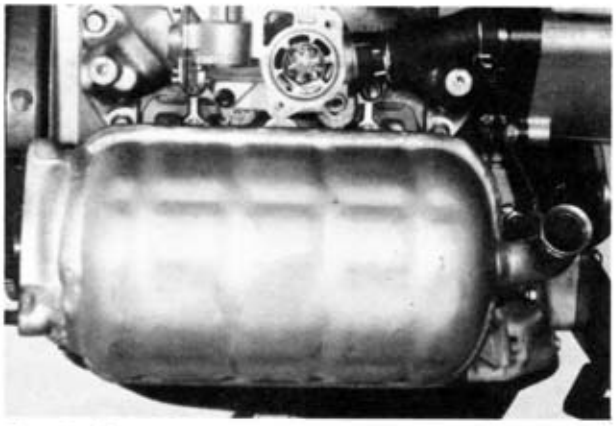

Fig. 1A–12

1A–A–5. Thermal Reactor

a. Inspecting thermal reactor

1. Visually inspect the thermal reactor for damage or crack.
2. Inspect the proper tightness of thermal reactor connection.
3. Start the engine and run it at idle.
4. Check the exhaust gas leakage from reactor connections.

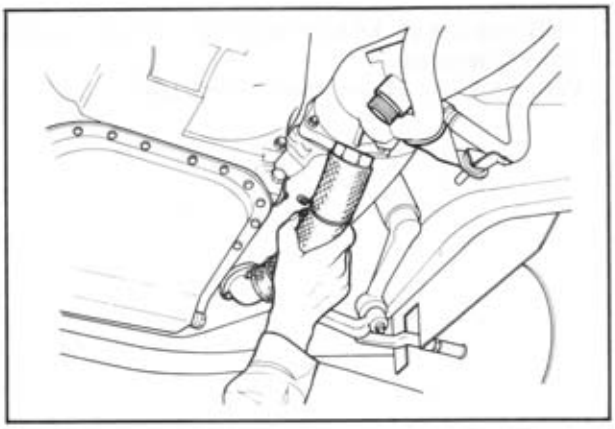

Fig. 1A–13

b. Replacing thermal reactor

1. Remove the air cleaner and hot air duct hose.
2. Disconnect the air pipe (thermal reactor ~ air control valve).
3. Remove the thermal reactor upper, lower and rear covers.
4. Remove the thermal reactor upper side nuts by using **remover** (49 8501 125).
5. Raise the vehicle and support it with stands.
6. Disconnect the air pipe (inlet manifold ~ heat exchanger) from the inlet manifold.
7. Remove the air pipe (thermal reactor ~ air duct).

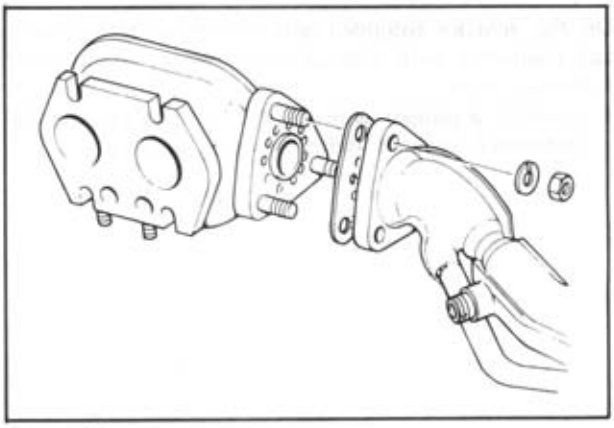

Fig. 1A–14

8. Disconnect the air duct hanger bracket from the transmission housing.
9. Disconnect the air duct from the thermal reactor.
10. Remove the thermal reactor lower side nuts.
11. Remove the thermal reactor.
12. Install the thermal reactor in the reverse order of removing.

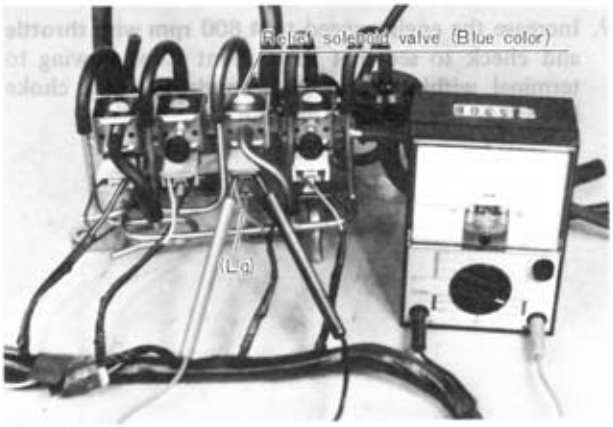

Fig. 1A–15

1A–B. SECONDARY AIR CONTROL SYSTEM

1A–B–1. Relief Solenoid Valve

a. Checking Signal for relief solenoid valve (U. S. A.)

1. Warm up the engine to the normal operating temperature and stop the engine.
2. Connect a tachometer to the engine.
3. Connect a voltmeter to terminal in the relief solenoid valve coupler.
4. On the vehicles equipped with automatic transmission and California with manual transmission, disconnect the coupler from the vacuum switch.

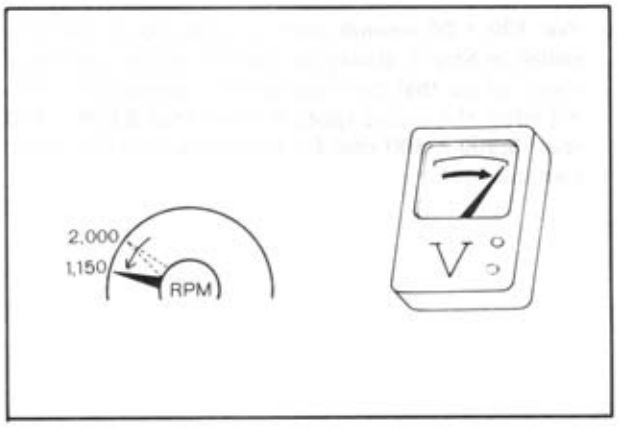

Fig. 1A–16

5. Start the engine and increase the engine speed to **2,000 rpm with throttle.**
   Slowly decrease the engine speed and record the engine speed at which the current begins flowing to terminal. The engine speed should be **1,150 ± 100 rpm.**
6. Slowly increase the engine speed from idle and check the engine speed at which the current stops flowing. The difference between the engine speeds recorded in Steps 5 and 6 should be **150 ± 70 rpm.**

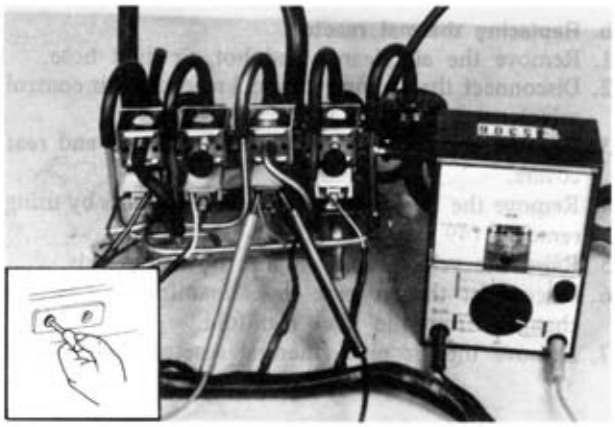

Fig. 1A–17

7. Fully pull the choke knob and make sure the current flows to terminal.
   Push back the choke knob completely.

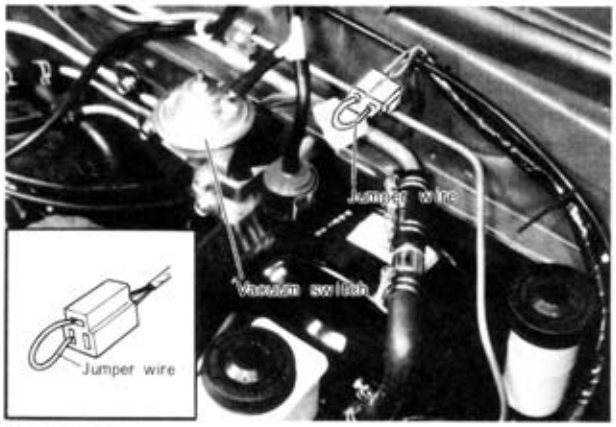

Fig. 1A–18

On the vehicles equipped with automatic transmission and California with manual transmission, conduct the following tests.

8. Connect a jumper wire to both terminals in the disconnected vacuum switch coupler in Step 4.

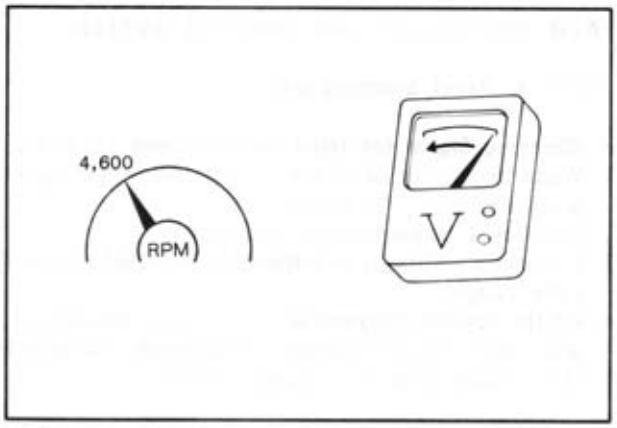

Fig. 1A–19

9. Increase the engine speed to **4,600 rpm with throttle** and check to see that the current stops flowing to terminal **within 130 ± 26 seconds** after the choke knob has been pulled in Step 7.

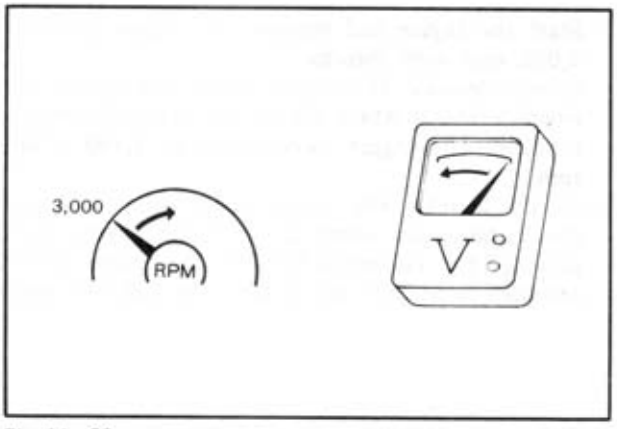

Fig. 1A–20

10. **Past 130 ± 26 seconds** after the choke knob has been pulled in Step 7, slowly increase the engine speed and check to see that the current stops flowing to terminal when the engine speed is **more than 3,000 ± 300 rpm (3,300 ± 300 rpm** for California with automatic transmission).

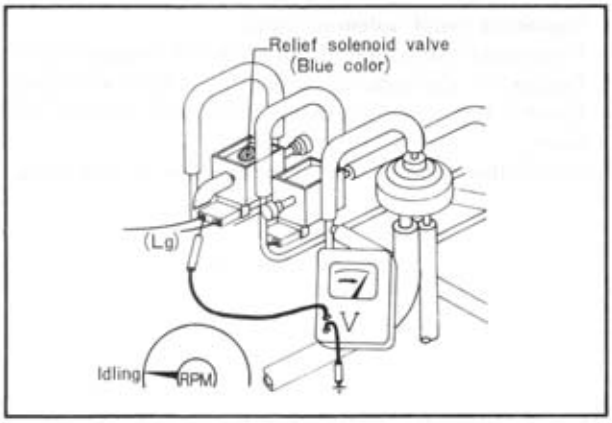

Fig. 1A–21

b. Checking signal for relief solenoid valve (Canada)

1. Warm up the engine to the normal operating temperature.
2. Connect a tachometer to the engine.
3. Connect a voltmeter to terminal (Lg) in the relief solenoid valve coupler.
4. Operate the engine at idle make sure the current flows to terminal.

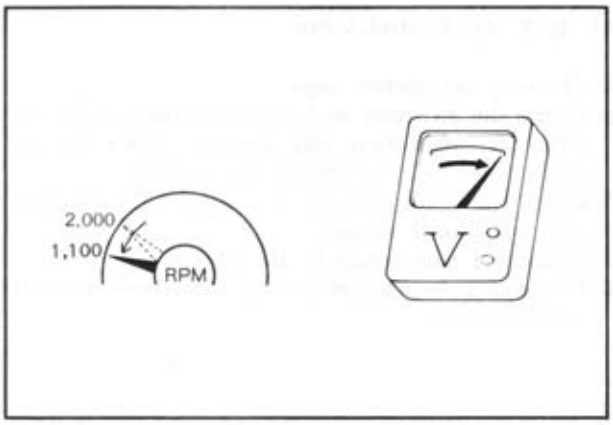

Fig. 1A–22

5. Increase the engine speed to **2,000 rpm with throttle.** Slowly decrease the engine speed and record the engine speed at which the current begins flowing to terminal. The engine speed should be **1,100 ± 100 rpm.**

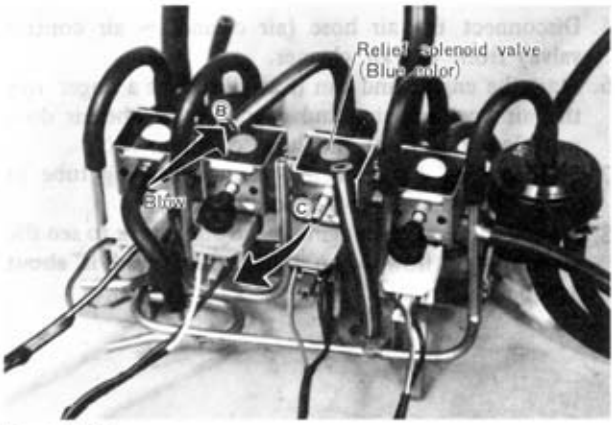

Fig. 1A–23

c. Checking relief solenoid valve

1. Disconnect the vacuum sensing tubes from the solenoid valve and vacuum pipe.
2. Blow through the solenoid valve from the vacuum sensing tube Ⓑ. Make sure the air passes through the valve and comes out from the port Ⓒ.

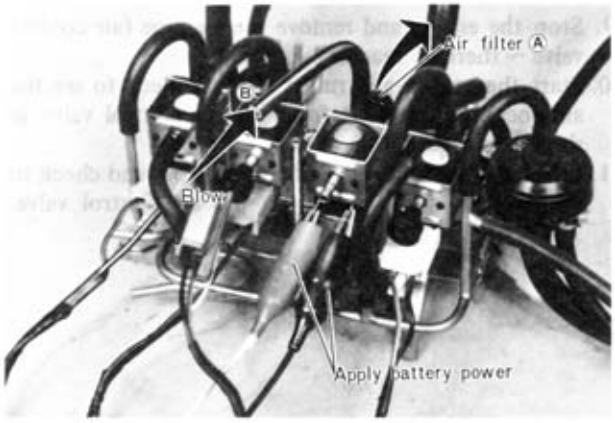

Fig. 1A–24

3. Disconnect the coupler from the relief solenoid valve and connect the battery power to terminals on the valve.
4. Blow through the valve from the vacuum sensing tube Ⓑ. Make sure the air passes through the valve and comes out from the air filter Ⓐ of the valve.

Fig. 1A–25

d. Replacing relief solenoid valve

1. Disconnect the coupler from the relief solenoid valve.
2. Disconnect the vacuum sensing tubes from the valve.
3. Loosen the valve attaching bolts and remove the valve.
4. Install the valve in the reverse order of removing.

Fig. 1A–26

1A–B–2. Air Control Valve

a. Checking air control valve

1. Check the all hoses and vacuum sensing tubes for improper connection and damage. Check the air pump drive belt for proper adjustment.
2. Check the carburetor and air control valve attaching nuts for proper torque.
3. Connect a tachometer to the engine.
4. Disconnect the vacuum sensing tube from the relief solenoid valve.

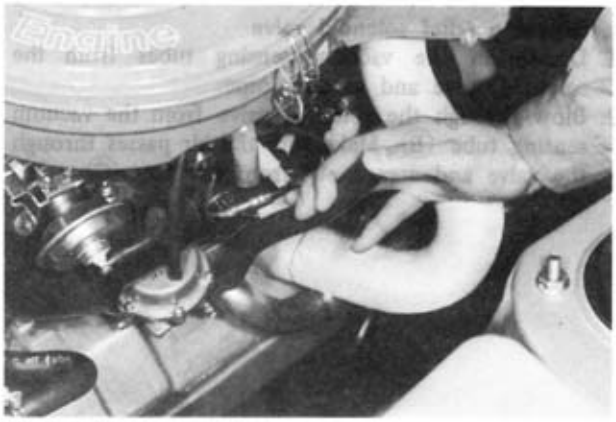

Fig. 1A–27

5. Disconnect the air hose (air cleaner ~ air control valve) from the air cleaner.
6. Start the engine and run it at idle. Place a finger over the air hose opening and check to see the air does not flow out from the hose opening.
7. Connect the disconnected vacuum sensing tube in Step 4 to the relief solenoid valve.
8. Slowly increase the engine speed and check to see the air starts to flow when the engine speed is **about 1,300 rpm.**

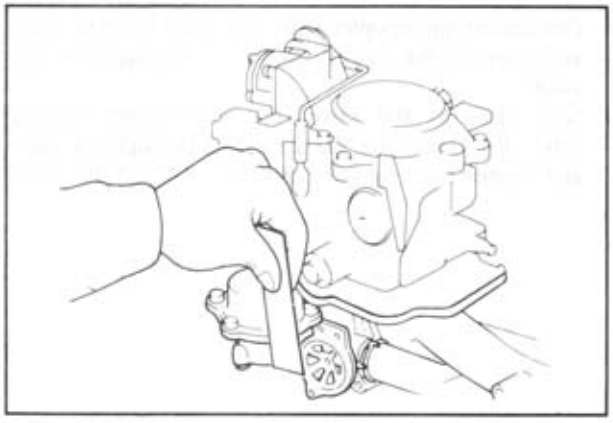

Fig. 1A–28

9. Stop the engine and remove the air pipe (air control valve ~ thermal reactor).
10. Start the engine and run it at idle. Check to see the air does not flow out from the air control valve as shown in figure.
11. Increase the engine speed to **4,500 rpm** and check to see the air flows out from the air control valve.

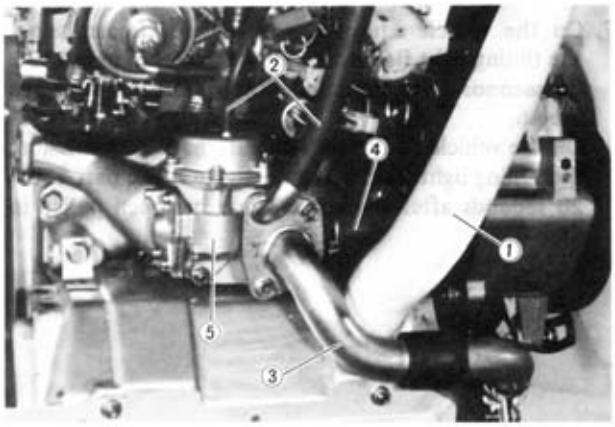

Fig. 1A–29

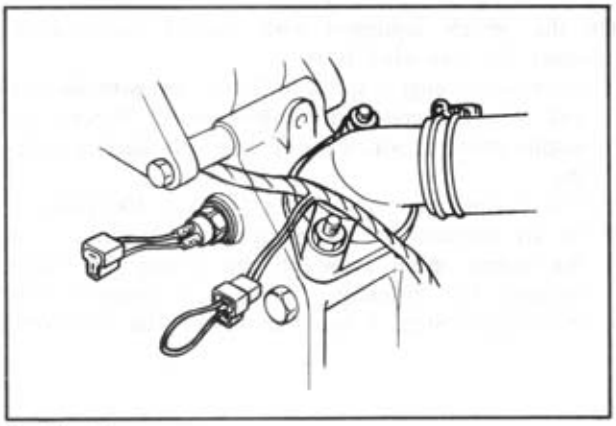

Fig. 1A–30

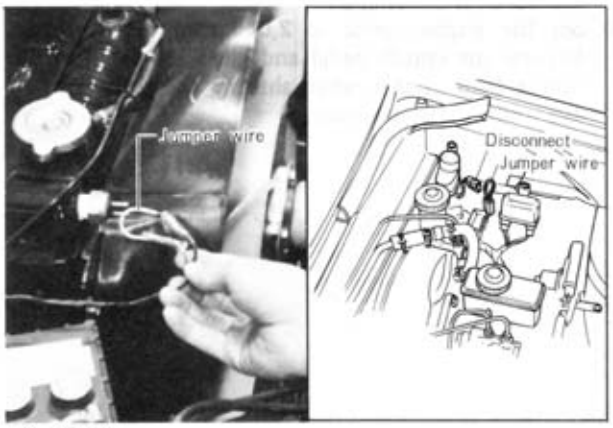

Fig. 1A–31

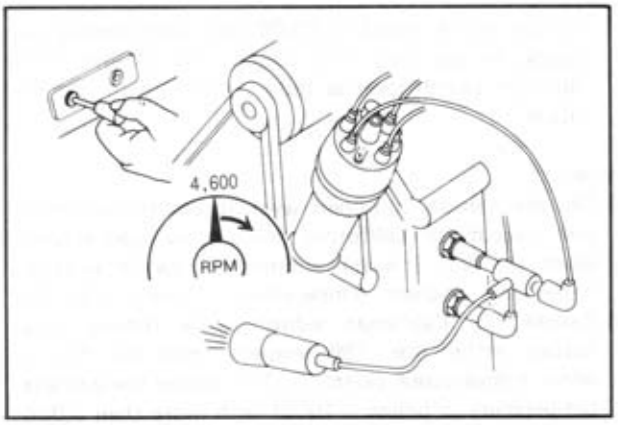

Fig. 1A–32

b. Replacing air control valve

1. Remove the hot air duct.
2. Disconnect the air hose and vacuum sensing tube.
3. Disconnect the air pipe.
4. Disconnect the air hose.
5. Remove the air control valve.
6. Install the air control valve in the reverse order of removing.

1A–B–3. Relative Parts

Check the following parts as described in Par. 1A–G.

1. Control unit, Choke switch
2. Full choke switch, Acceleration sensor
3. Idle switch, Top switch and Over-drive switch (Manual transmission)

1A–C. IGNITION CONTROL SYSTEM

1A–C–1. Ignition Control (U.S.A.)

a. Checking trailing ignition operation

1. Warm up the engine to the normal operating temperature.
2. Connect a tachometer to the engine.
3. Connect a timing light to the hightension cord for trailing spark plug on the front rotor housing.
4. Disconnect the coupler of the No. 1 water temperature switch and connect a jumper wire to both terminals in the coupler (wiring harness side).
5. Except for California vehicles, disconnect the coupler of the No. 2 water temperature switch and connect a jumper wire to both terminals.
   On the vehicle equipped with manual transmission except for California, disconnect the coupler of the altitude compensator switch and connect a jumper wire to both terminals.
6. Start the engine and set the engine speed to **2,000 rpm with the choke knob.**
   Slowly increase the engine speed with throttle and check to see that the timing light flashes when the engine speed is **more than 4,600 ± 400 rpm.**
   Push back the choke knob completely and check to see the timing light flashes.

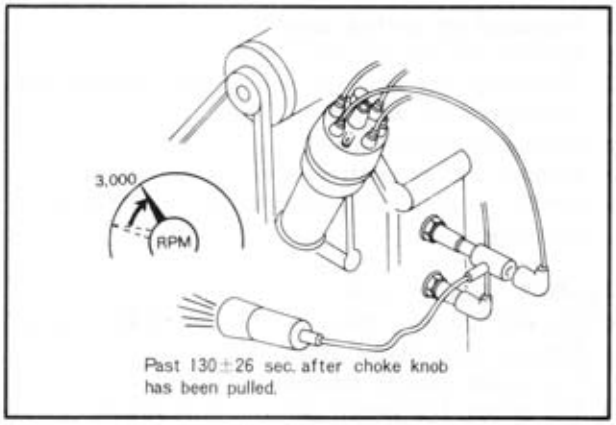

Fig. 1A–33

7. On the vehicle equipped with manual transmission, the timing light flashes at **3,000 ± 300 rpm past 130 ± 26 seconds** after the choke knob has been pulled in Step 6.
   On the vehicle equipped with automatic transmission, the timing light flashes at any engine speed **past 130 ± 26 seconds** after the choke knob has been pulled in Step 6.

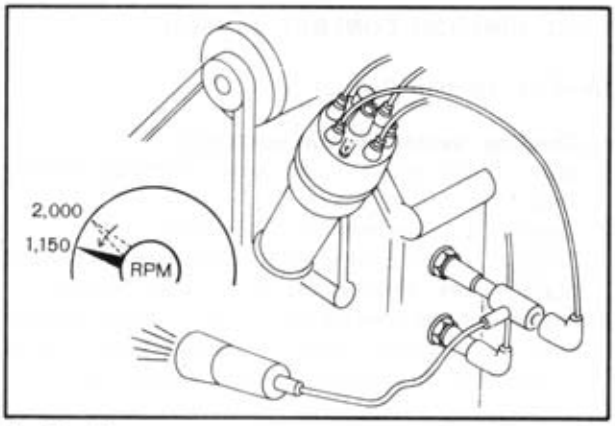

Fig. 1A–34

On the vehicle equipped with manual transmission, conduct the following tests.

8. Increase the engine speed to **2,000 rpm with throttle** and slowly decrease the engine speed. Record the engine speed at which the timing light starting flashing.
   The engine speed should be **1,150 ± 100 rpm.**
9. Slowly increase the engine speed again and record the engine speed at which the timing light stops flashing. The difference between the engine speeds recorded in Steps 8 and 9 should be **150 ± 70 rpm.**

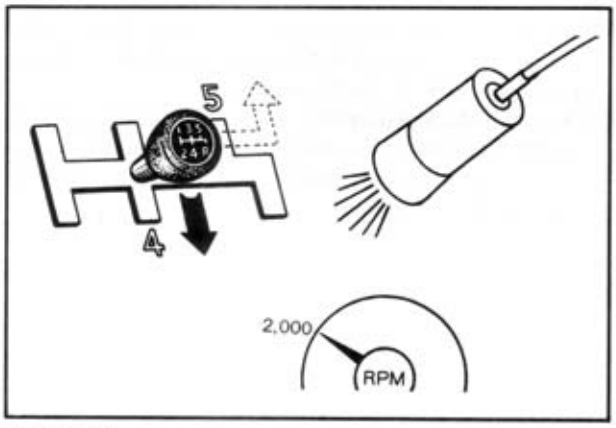

Fig. 1A–35

10. Set the engine speed to **2,000 rpm with throttle.** Depress the clutch pedal and check to see that the timing light flashes when shifting the shift lever to 4th and/or 5th position.

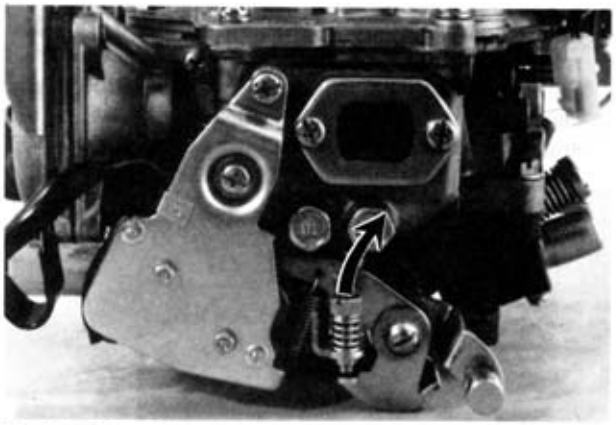

Fig. 1A–36

11. Set the engine speed to **2,500 rpm with throttle** and check to see that the timing light flashes when the idle switch lever is fully pushed up to idle position.

Note:

a) On the vehicle equipped with automatic transmission except for California, the timing light flashes when the No. 2 water temperature switch is OFF (when the coolant temperature is below –15°C).

b) Except for California vehicles, the timing light flashes within the 130 seconds when the No. 2 water temperature switch is OFF (when the coolant temperature is below –15°C) with more than 3,000 rpm of engine speed.

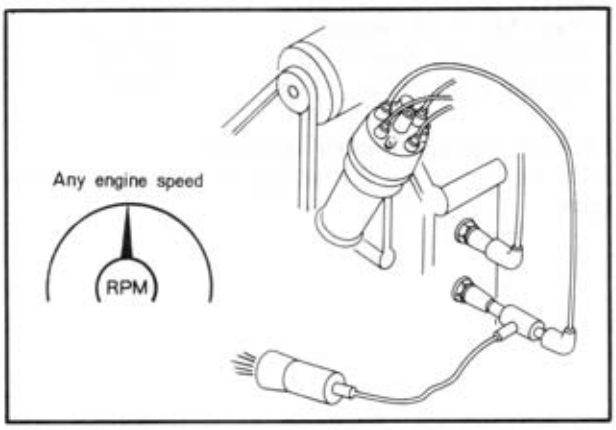

Fig. 1A–37

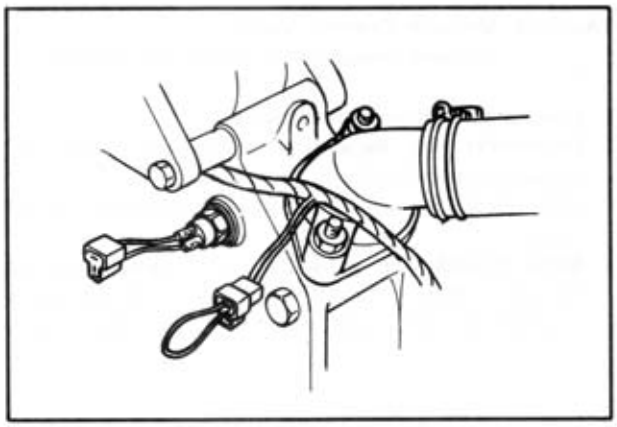

Fig. 1A–38

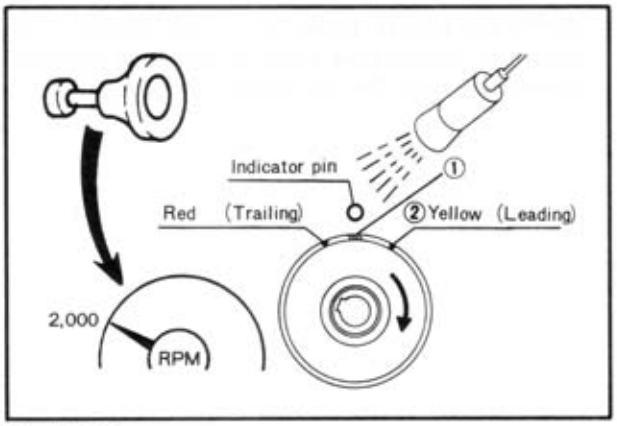

Fig. 1A–39

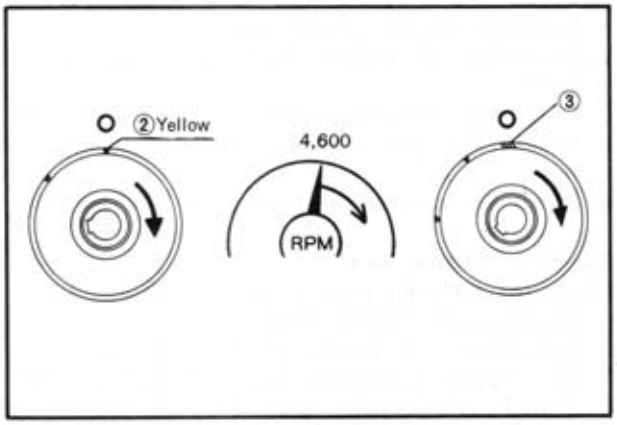

Fig. 1A–40

b. Checking leading ignition operation

1. Warm up the engine to the normal operating temperature.
2. Connect a tachometer to the engine.
3. Connect a timing light to the hightension cord for leading spark plug on the front rotor housing.
4. Disconnect the coupler of the No. 2 water temperature switch and connect a jumper wire to both terminals in the coupler (Except for California). On the vehicles equipped with manual transmission except for California, disconnect the coupler of the altitude compensator switch and connect a jumper wire to both terminals.
5. Start the engine and check to see the **timing light flashes at any engine speed.**
6. Stop the engine. Disconnect the coupler of the No. 1 water temperature switch and connect a jumper wire to both terminals in the coupler.
7. Start the engine and set the engine speed to **2,000 rpm with the choke knob.** Observe the timing marks on the eccentric shaft pulley, using a timing light. The timing indicator pin should point between the Yellow and Red marks on the pulley (Portion ①).
8. Increase the engine speed with throttle and check to see that the timing mark ② advances and portion ③ takes its position when the engine speed increases to **more than 4,600 ± 400 rpm.**

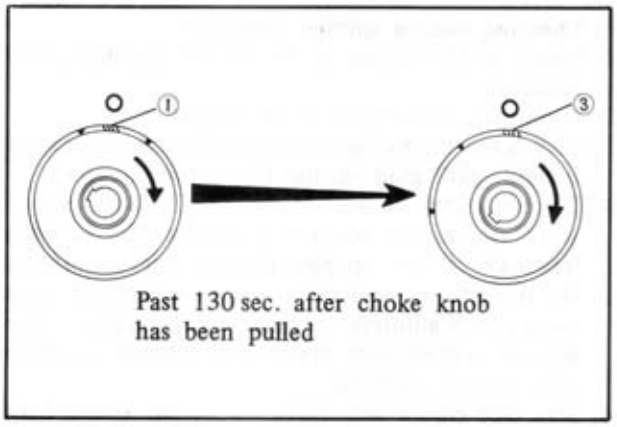

Fig. 1A–41

9. **Past 130 ± 26 seconds** after the choke knob has been pulled in Step 7, the portion (1) should advance quickly and portion (3) takes its position.

1A–C–2. Ignition Control (Canada)

Both the leading and the trailing spark plugs are always ignite.

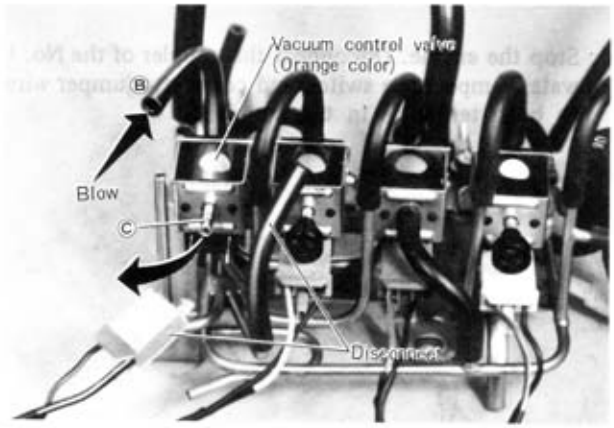

Fig. 1A–42

1A–C–3. Vacuum Control Valve (Manual transmission except for Canada)

a. Checking vacuum control valve

1. Disconnect the vacuum sensing tubes from the vacuum control valve and vacuum pipe.
2. Disconnect the coupler from the vacuum control valve.
3. Blow through the vacuum control valve from the vacuum sensing tube (B). Make sure the air passes through the valve and comes out from port (C).

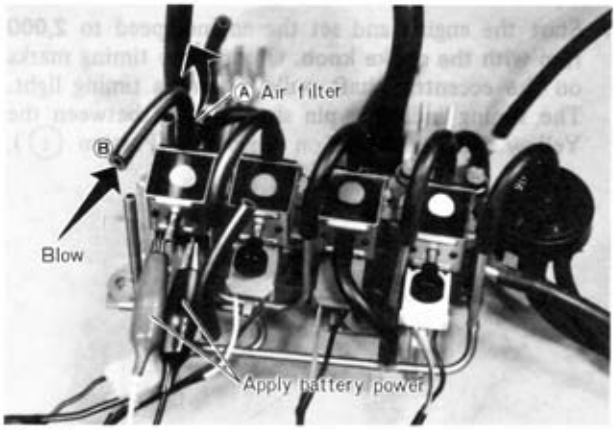

Fig. 1A–43

4. Apply the battery power to vacuum control valve and make sure the air passes through the valve and comes out from the air filter (A) of the valve.

Fig. 1A–44

b. Replacing vacuum control valve

1. Disconnect the coupler from the vacuum control valve.
2. Disconnect the vacuum sensing tubes from the valve.
3. Loosen the valve attaching bolts and remove the valve.
4. Install the valve in the reverse order of removing.

1A–C–4. Relative Parts

Check the follwoing parts as described in Par. 1A–G.

1. Chontrol unit, Choke switch
2. Idle switch, Top switch and Over-drive switch
3. No. 2 water temperature switch (Except for Calif.)
4. Altitude compensator switch (Manual transmission except for Calif.)

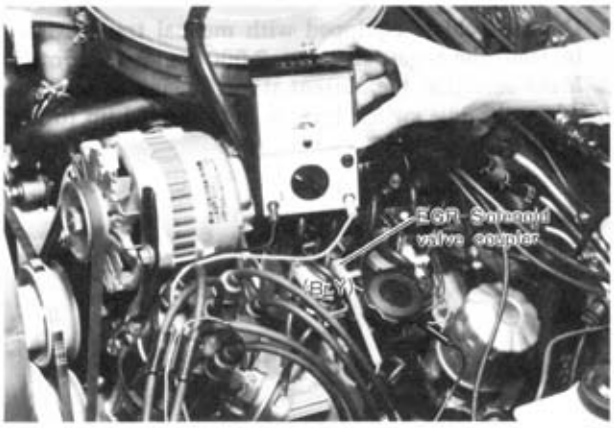

Fig. 1A–45

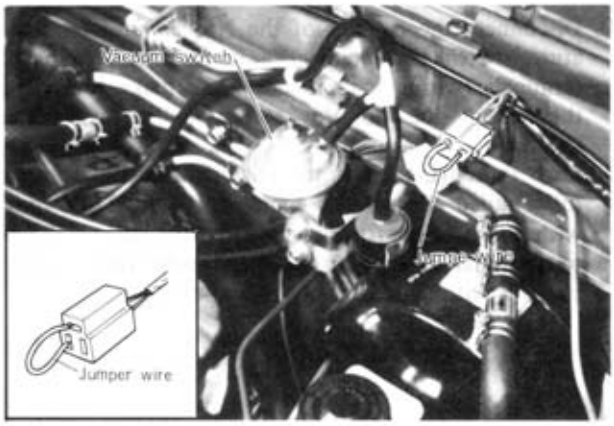

Fig. 1A–46

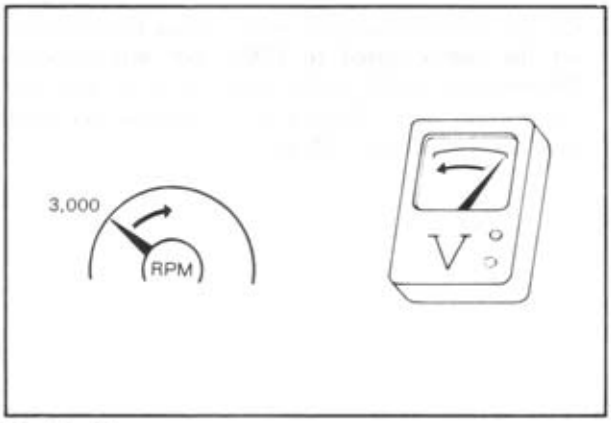

Fig. 1A–47

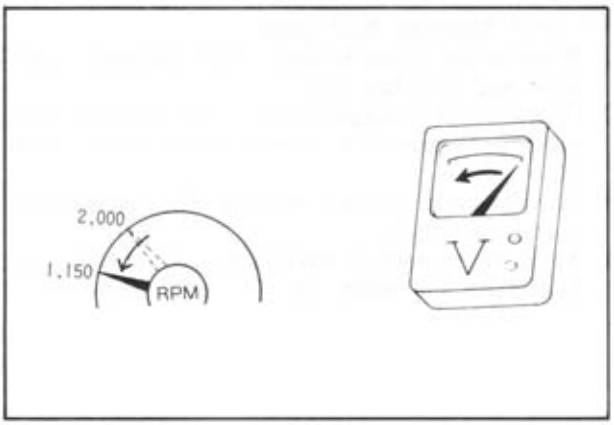

Fig. 1A–48

1A–D. EXHAUST GAS RECIRCULATION (EGR) SYSTEM (CALIFORNIA)

1A–D–1. Checking Signal for EGR Solenoid Valve

1. Warm up the engine to the normal operating temperature.
2. Connect a tachometer to the engine.
3. Connect a voltmeter to terminal (BrY) in the coupler of the EGR solenoid valve.
4. Start the engine and quickly increase the engine speed to **2,500 rpm with throttle.** Make sure that the current flows to terminal for a few seconds and then the current stops flowing.
5. Disconnect the coupler of the vacuum switch and connect a jumper wire to both terminal in the coupler.
6. Increase the engine speed with throttle and check to see that the current stops flowing to terminal when the engine speed is **more than 3,000 ± 300 rpm** for manual transmission and **3,300 ± 300 rpm** for automatic transmission.
7. Increase the engine to **2,000 rpm with throttle.** Slowly decrease the engine speed and record the engine speed at which the current stops flowing to terminal. The engine speed should be **1,150 ± 100 rpm.**
8. Slowly increase the engine speed from idle and check the engine speed at which the current begins flowing. The difference between the engine speeds recorded in Steps 7 and 8 should be **150 ± 70 rpm.**

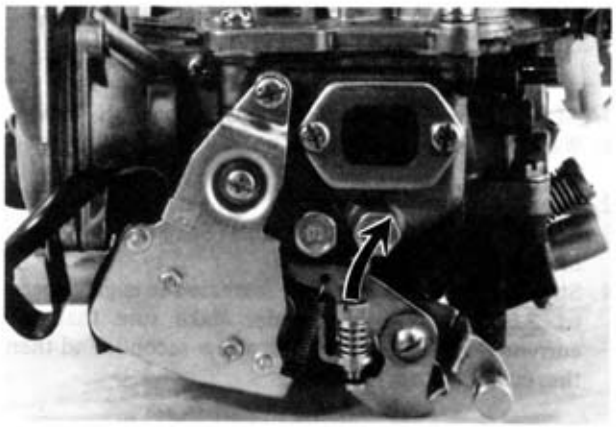

Fig. 1A–49

9. On the vehicle equipped with manual transmission, increase the engine speed to, **2,000 rpm with throttle.** Make sure that the current stops flowing to terminal when the idle switch lever is fully pushed up to idle position.

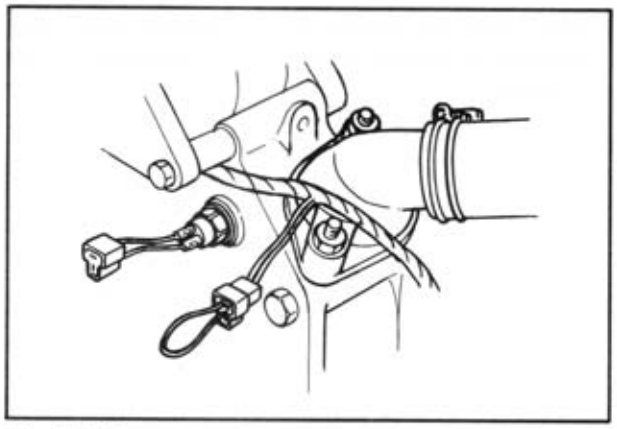

Fig. 1A–50

10. Disconnect the coupler of the No. 1 water temperature switch and connect a jumper wire to both terminals (wiring harness side), and make sure that the current does not flow to terminal at any engine speed.
11. Stop the engine. Start the engine with choke knob fully pulled and set the engine speed to **2,000 rpm with choke knob.** Check to see that the current flows to terminal **after 130 ± 26 seconds** from engine starting with choke knob fully pulled.

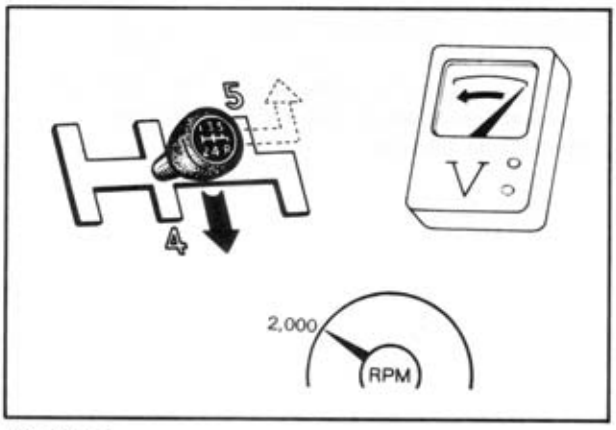

Fig. 1A–51

12. On the vehicle equipped with manual transmission, set the engine speed to **2,000 rpm with throttle.** Depress the clutch pedal and check to see that the current stops flowing when shifting the shift lever to 4th and/or 5th position.

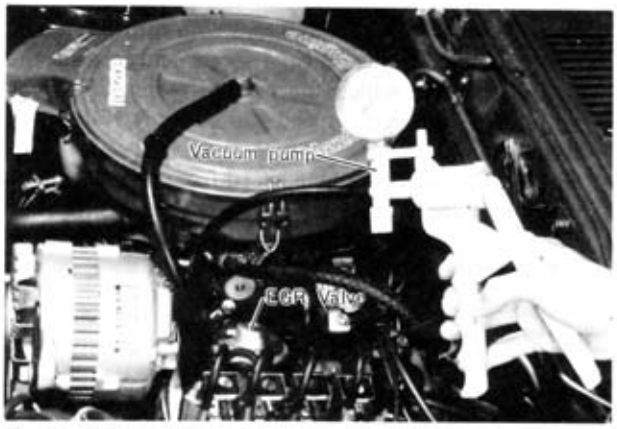

Fig. 1A–52

1A–D–2. Checking EGR Valve

1. Warm up the engine to the normal operating temperature and stop the engine.
2. Disconnect the vacuum sensing tube from the EGR valve and connect a vacuum pump to the EGR valve.
3. Start the engine and run it at idle. The engine should operate smoothly.
4. Apply the vacuum of 400 mm-Hg (15.7 in-Hg) to the EGR valve and make sure the engine stalls.

Fig. 1A–53

1A–D–3. Checking EGR Solenoid Valve

1. Disconnect the vacuum sensing tubes from the solenoid valve and vacuum pipe.

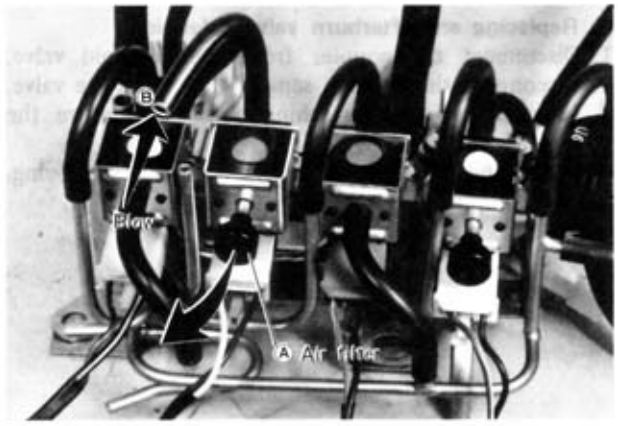

Fig. 1A–54

2. Blow through the solenoid valve from the vacuum tube (B).
   Make sure the air passes through the valve and comes out from the air filter (A) of the valve.

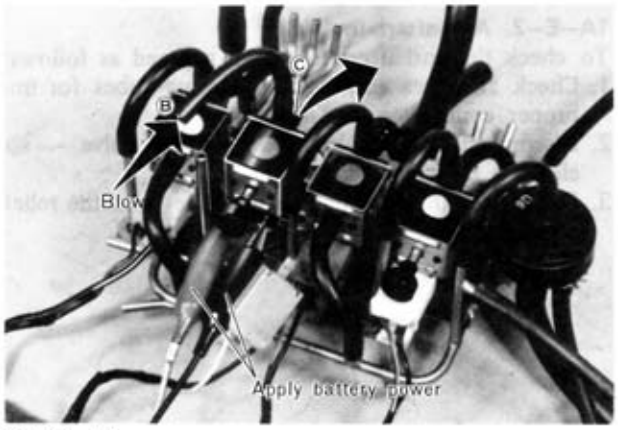

Fig. 1A–55

3. Disconnect the coupler from the solenoid valve and apply the battery power to terminals on the valve.
4. Blow through the valve from the vacuum tube (B). Make sure the air passes through the valve and comes out from the port (C).

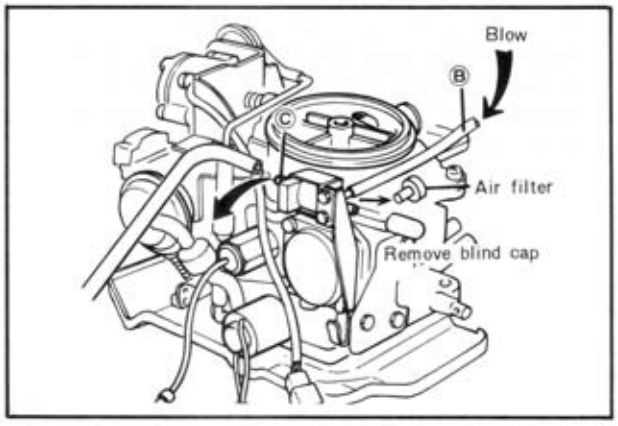

Fig. 1A–56

1A–E. DECELERATION CONTROL SYSTEM

1A–E–1. Anti-afterburn Valve Solenoid

a. Checking anti-afterburn valve solenoid

1. Remove the air filter from the anti-afterburn valve solenoid and connect a suitable tube (B) to the solenoid.
2. Disconnect the tube from the solenoid valve.
3. Blow through the solenoid valve from the vacuum sensing tube (B). Make sure the air passes through the valve and comes out from the port (C).

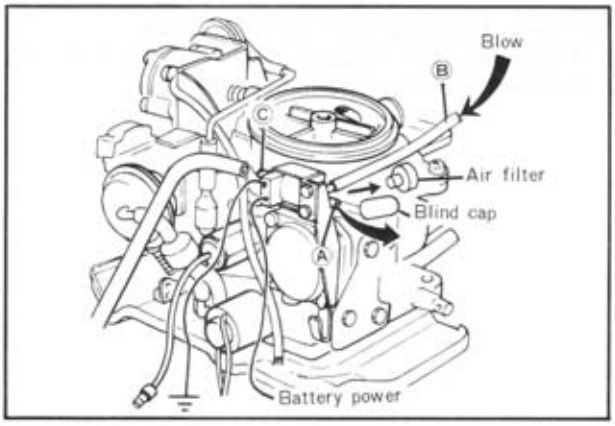

Fig. 1A–57

4. Disconnect the coupler from the relief solenoid valve and connect the battery power to terminals on the valve.
5. Blow through the valve from vacuum sensing tube (B).
   Make sure the air passes through the valve and comes out from port (A).

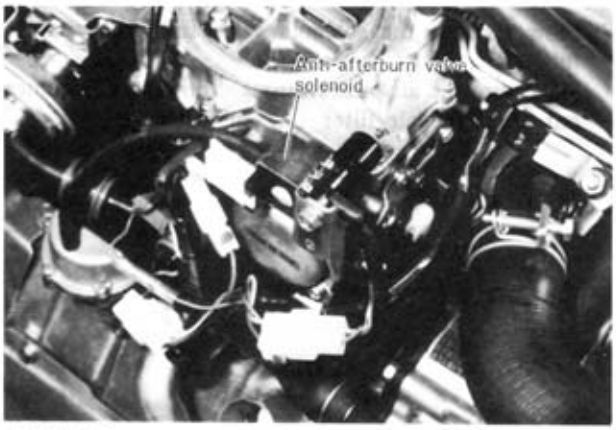

Fig. 1A–58

b. Replacing anti-afterburn valve solenoid

1. Disconnect the coupler from the solenoid valve.
2. Disconnect the vacuum sensing tube from the valve.
3. Loosen the valve attaching bolt and remove the valve.
4. Install the valve in the reverse order of removing.

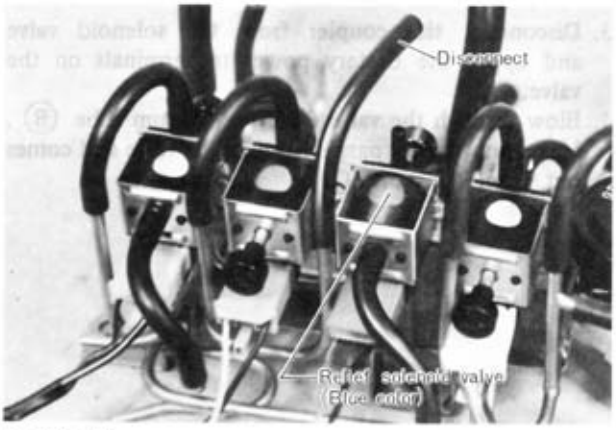

Fig. 1A–59

1A–E–2. Anti-afterburn Valve

To check the anti-afterburn valve, proceed as follows:

1. Check all hoses and vacuum sensing tubes for improper connection and damage.
2. Disconnect the air hose (air control valve ~ air cleaner) form the air cleaner.
3. Disconnect the vacuum sensing tube from the relief solenoid valve.

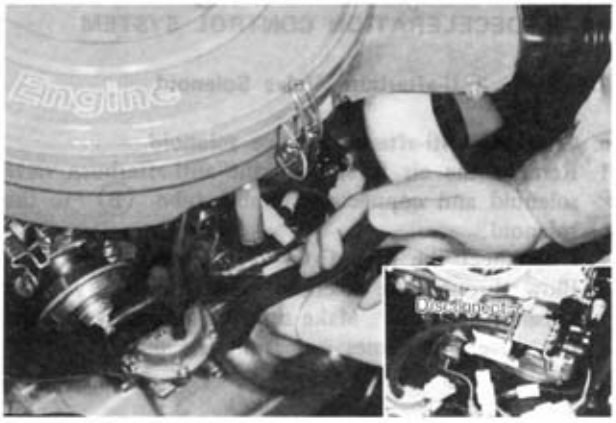

Fig. 1A–60

4. Start the engine and run it at idle.
   Place a finger over the air hose opening and check to see that air is not drawn into the air hose. But, air should be drawn when the coupler is disconnected from the anti-afterburn valve solenoid.

Fig. 1A–61

1A–E–3. Dash Pot (Manual transmission)

To check and adjust the dash pot, proceed as follows:

1. Remove the air cleaner.
2. Check that the dash pot rod does not keep the throttle lever from returning to the idle stop.
3. Quickly operate the throttle lever fully and make sure the dash pot rod extends quickly.
   Release the throttle lever and make sure that the throttle lever returns slowly to idle position after it has touched the dash pot rod.

Fig. 1A–62

4. Connect a tachometer to the engine.
5. Start the engine and warm up the engine to the normal operating temperature.
   Make sure the engine operates at specified idle speed.
   Operate the throttle lever until it is away from the dash pot rod.
6. Slowly decrease the engine speed and check the engine speed at which the throttle lever just touches the dash pot rod.
   The engine speed should be **3,500 ~ 3,900 rpm.** If the engine speed is not within the specification, loosen the lock nut and adjust the engine speed by turning the dash pot diaphragm.

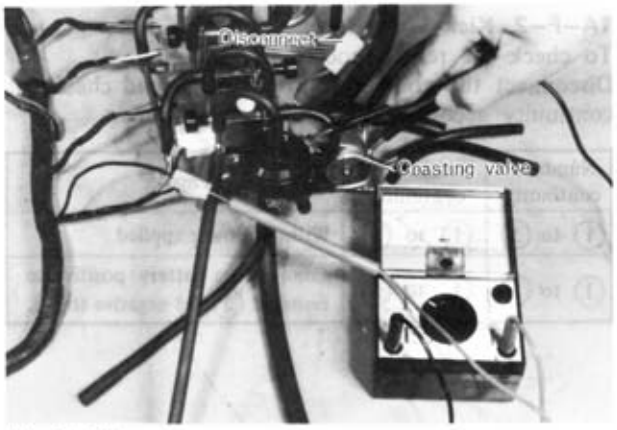

Fig. 1A–63

1A–E–4. Coasting Valve (Manual transmission)

a. Checking signal for coasting valve

1. Connect a tachometer to the engine.
2. Warm up the engine to normal operating temperature.
3. Disconnect the coupler from the coasting valve and connect a voltmeter to the terminal.
4. Start the engine and increase the engine speed to **3,000 rpm with the throttle.**
   Quickly release the throttle lever and check to see that the current stops flowing to the terminal. The engine speed should be **1,150 ± 100 rpm** for U.S.A. and **1,100 ± 100 rpm** for Canada vehicles.

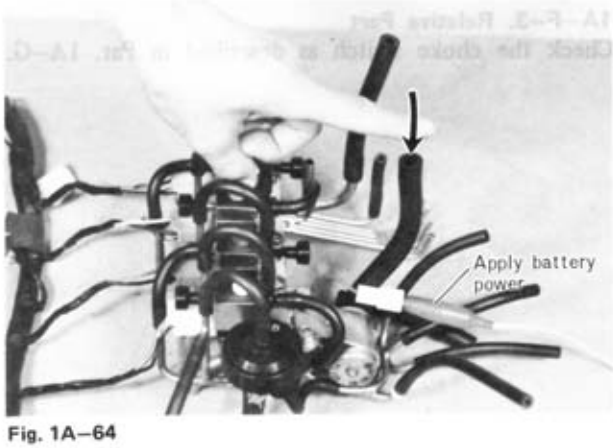

Fig. 1A–64

b. Checking coasting valve

1. Warm up the engine to the normal operating temperature and run the engine at idle.
2. Disconnect the coupler from the coasting valve solenoid.
3. Disconnect the air hose (coasting valve ~ air cleaner) from the air cleaner.
4. Place a finger over the air hose opening and check to see that the air is not sucked into the air hose. But, air should be sucked when the battery power is applied to the coasting valve solenoid.

Fig. 1A–65

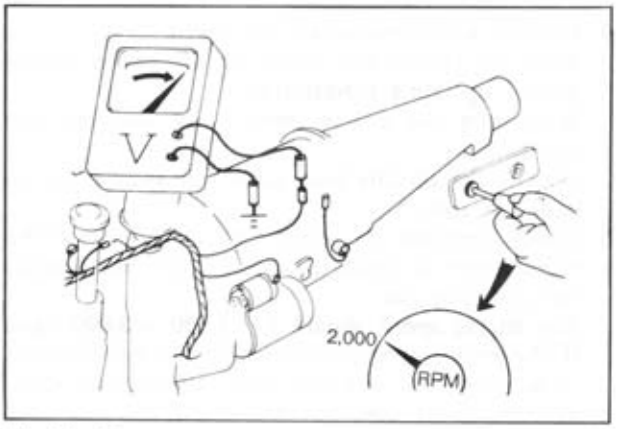

Fig. 1A–66

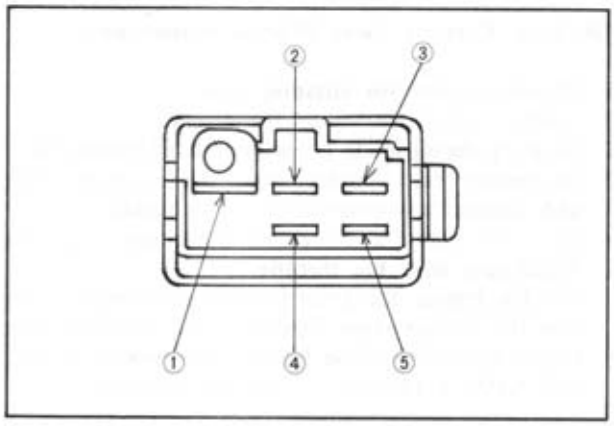

Fig. 1A–67

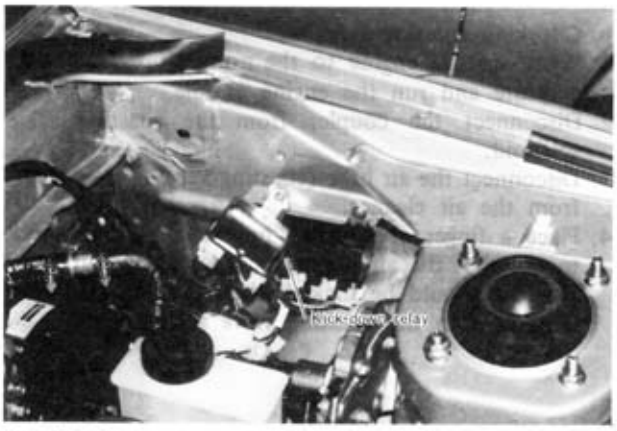

Fig. 1A–68

c. Replacing coasting valve

1. Disconnect the coupler from the coasting valve.
2. Disconnect the air hoses from the coasting valve.
3. Remove the coasting valve.
4. Install the coasting valve in the reverse order of removing.

1A–E–5. Relative Parts

Check the following parts as described in Par. 1A–G.

1. Control unit
2. Idle switch

1A–F. KICK-DOWN CONTROL SYSTEM (AUTOMATIC TRANSMISSION)

1A–F–1. Kick-down Operation

To check the kick-down operation, proceed as follows:

1. Disconnect the kick-down solenoid lead at the coupler.
2. Connect a voltmeter to the selenoid lead coupler.
3. Start the engine and run it at idle.
4. Set the engine speed to **2,000 rpm with choke knob** and check to see the current flows.

1A–F–2. Kick-down Relay

To check the relay, proceed as follows:
Disconnect the coupler form the relay and check for continuity according to the following table.

Numbers-continuity	Numbers-No continuity	Remarks
① to ⑤	① to ③	Without power applied
① to ③	① to ⑤	Connect the battery: positive to terminal ② and negative to ④.

1A–F–3. Relative Part

Check the choke switch as described in Par. 1A–G.

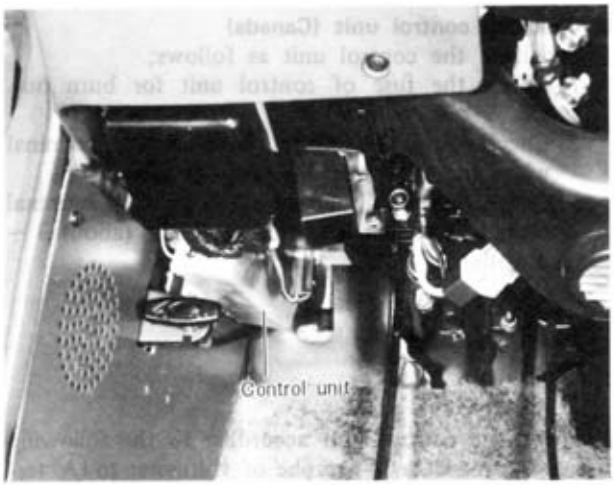

Fig. 1A–69

1A–G. AUXILIARY EMISSION CONTROL DEVICE

1A–G–1. Control Unit

a. Checking control unit (U.S.A.)

1. Pre-check the control unit as follows;
   1) Check the fuse of control unit for burn out. Use **5 ampere** fuse.
   2) Check to see the current flows to Ⓑ terminal when the engine is operating at idle.
   3) Check to see the current flows to Ⓐ terminal when the engine is operating at idle (about 3 ~ 8 volts).
2. Check the control unit according to the following table. Connect a ⊖ probe of voltmeter to Ⓟ terminal and ⊕ probe to each terminal.

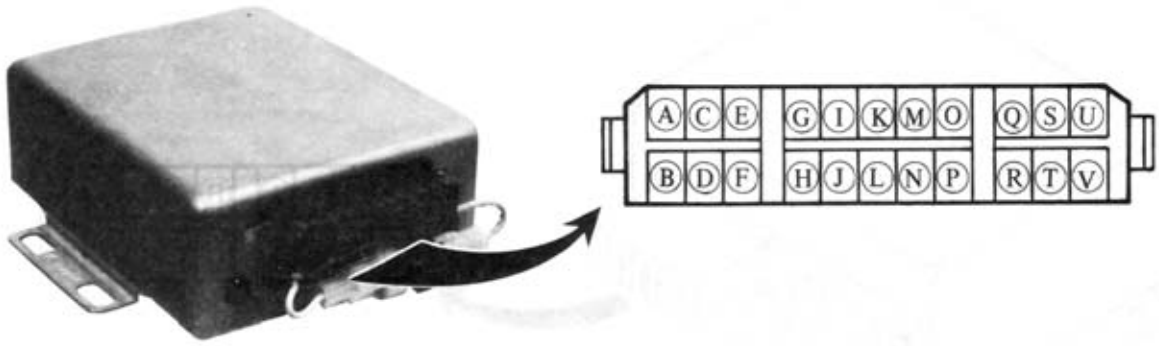

Fig. 1A–70

Terminal	12 V exists under the following condition	Engine condition
J	• Less than 1,150 ± 100 rpm of engine speed • When applying battery power to Ⓔ or Ⓣ terminals.	Decreasing engine speed Engine operating
K	• When applying battery power to Ⓞ or Ⓣ terminals.	Engine operating
L	• Less than 1,150 ± 100 rpm of engine speed	Decreasing engine speed
M	• Apply battery power to Ⓢ terminal. Less than 4,600 ± 400 rpm of engine speed within 130 ± 26 seconds after starting engine with choke knob fully pulled. • When applying battery power to Ⓔ terminal.	Increasing engine speed Engine operating
D	• Any time	Engine operating
Q	• Apply battery power to Ⓢ terminal. Less than 4,600 ± 400 rpm of engine speed within 130 ± 26 seconds after starting engine with choke knob fully pulled.	Increasing engine speed
R	• Apply battery power to Ⓢ terminal. Less than 3,000 ± 300 rpm of engine speed (Less than 3,300 ± 300 rpm for Calf. with automatic transmission) • Apply battery power to Ⓢ terminal. Less than 4,600 ± 400 rpm of engine speed within 130 ± 26 seconds after starting engine with choke knob fully pulled.	Increasing engine speed Engine operating
G	• More than 1,150 ± 100 rpm of engine speed	Decreasing engine speed
U	California: • Any time Except for California: • When ignition switch is ON and/or within 60 ± 12 seconds after starting the engine with choke knob fully pulled.	Engine operating Engine stall and/or operating
V	California only: • Apply battery power to Ⓢ terminal. Less than 4,600 ± 400 rpm of engine speed within 130 ± 26 seconds after starting engine with choke knob fully pulled. • When applying battery power to Ⓕ or Ⓞ terminals.	Engine operating Engine operating

Fig. 1A–71

b. Checking control unit (Canada)

1. Pre-check the control unit as follows;
   1) Check the fuse of control unit for burn out. Use **5 ampere** fuse.
   2) Check to see the current flows to Ⓟ terminal when the engine is operating at idle.
   3) Check to see the current flows to Ⓞ terminal when the engine is operating at idle (about 3 ~ 8 volts).

2. Check the control unit according to the following table. Connect a ⊖ probe of voltmeter to Ⓐ terminal and ⊕ probe to each terminal.

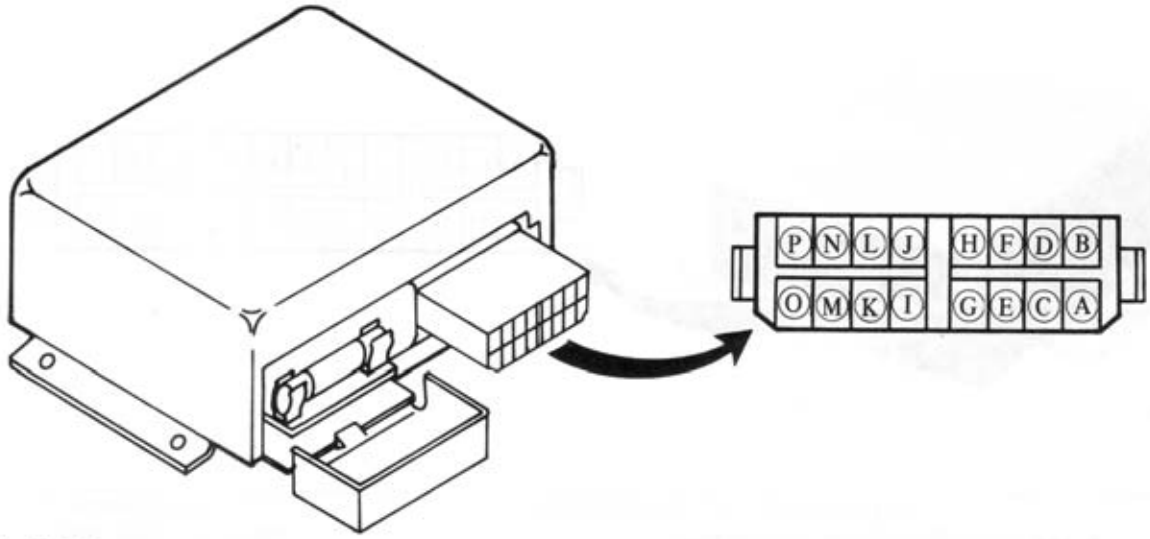

Fig. 1A–72

Terminal	12 V exists under the following condition	Engine condition
F, H	• Less than 1,100 ± 100 rpm of engine speed	Decreasing engine speed
K	• Any engine speed	Engine operating
I	• More than 1,100 ± 100 rpm of engine speed	Decreasing engine speed

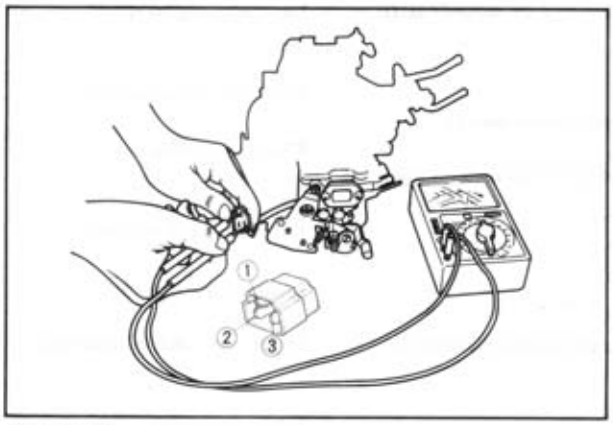

Fig. 1A–73

1A–G–2. Idle Switch (Manual transmission)

a. Checking idle switch

1. Disconnect the coupler from the idle switch.
2. Check the continuity between the numbered terminals in the coupler using an ohmmeter.

Numbers-continuity	Numbers-No continuity	Remarks
① – ③	① – ②	Run the engine at idle.
① – ②	① – ③	Increase the engine speed up to 1,000 ± 50 rpm with throttle.

Fig. 1A–74

b. Adjusting idle switch

1. Connect a tachometer to the engine.
2. Remove the limiter cap (plastic cap) from the idle switch adjusting screw.
3. Disconnect the coupler of idle switch and connect an ohmmeter to ① and ③ terminals in the coupler.
4. Start the engine and slowly increase the engine speed with throttle. Turn the adjusting screw so that the continuity between ① and ③ terminals does not exist when the engine speed is **1,000 ± 50 rpm.**
5. Reinstall the limiter cap so that the cap is positioned at the stopper pin, as shown in figure.

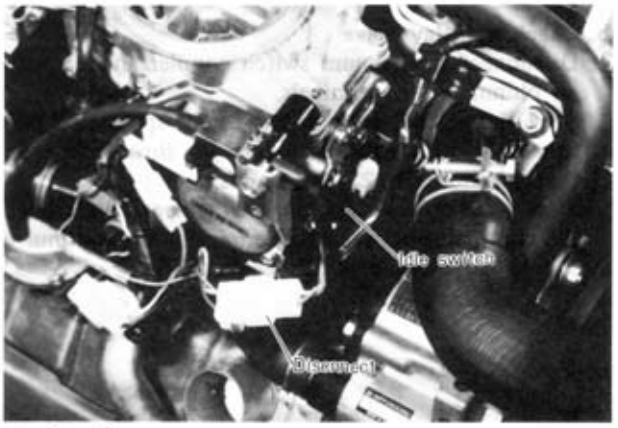

Fig. 1A–75

c. Replacing idle switch

1. Remove the air cleaner.
2. Disconnect the coupler of the idle switch.
3. Remove the screws attaching the idle switch and remove the idle switch.
4. Install the idle switch in the reverse order of removing and adjust the idle switch as explained above.

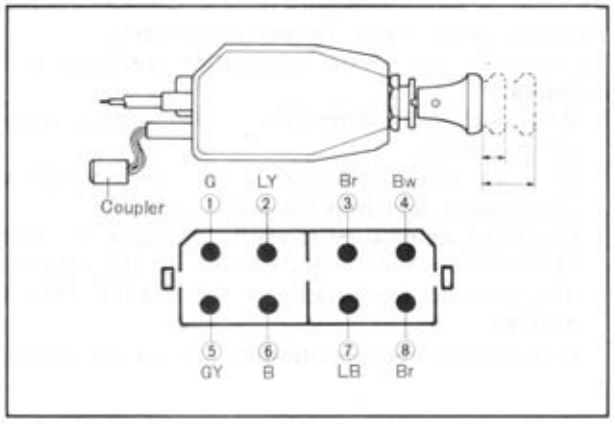

Fig. 1A–76

1A–G–3. Choke Switch and Full Choke Switch

To check the choke switch, proceed as follows:

1. Disconnect the coupler from the choke switch.
2. Check the continuity between the numbered terminals in the coupler using an ohmmeter.

U. S. A.

Choke knob pulled at	Numbers-continuity	
	Choke switch	Full choke switch
10 ± 2mm (0.4 ± 0.08in)	③ – ⑦	—
25.5 ± 1.5mm (1.0 ± 0.06in)	—	④ – ⑤

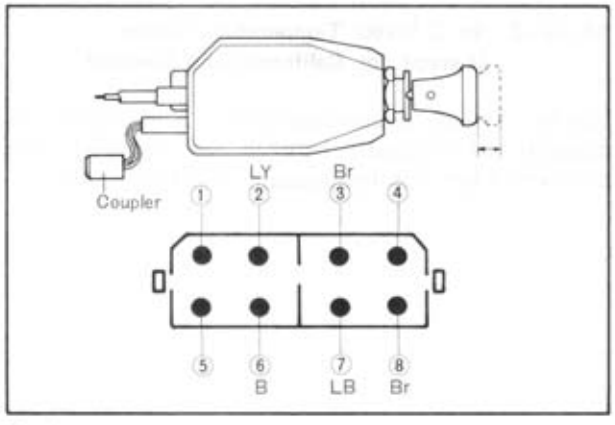

Fig. 1A–77

Canada

Choke knob pulled at	Numberes-continuity	
	Choke switch	Full choke switch
10 ± 2mm (0.4 ± 0.08in)	③ – ⑦	None

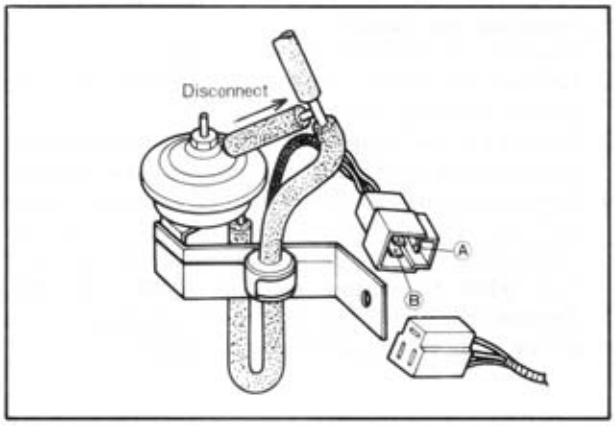

Fig. 1A–78

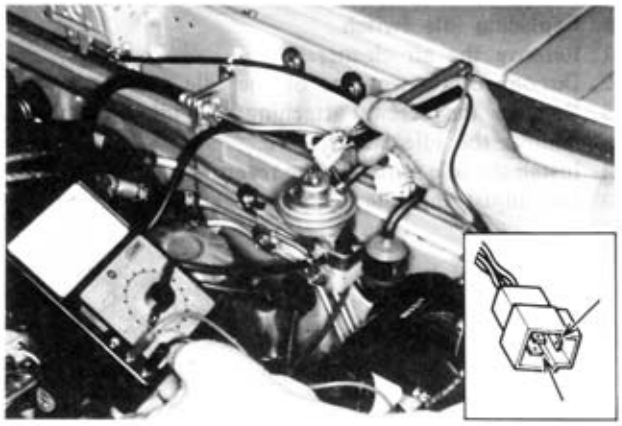

Fig. 1A–79

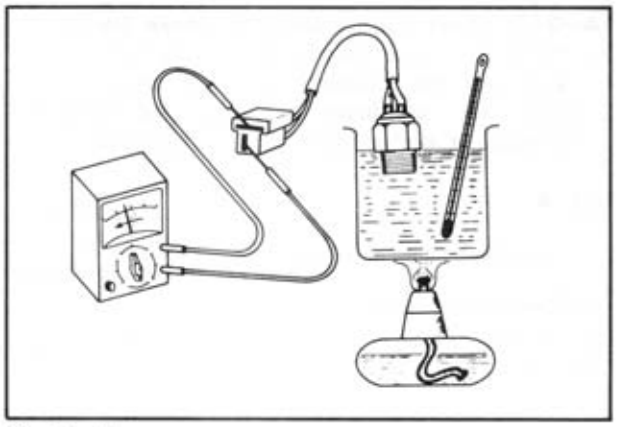

Fig. 1A–80

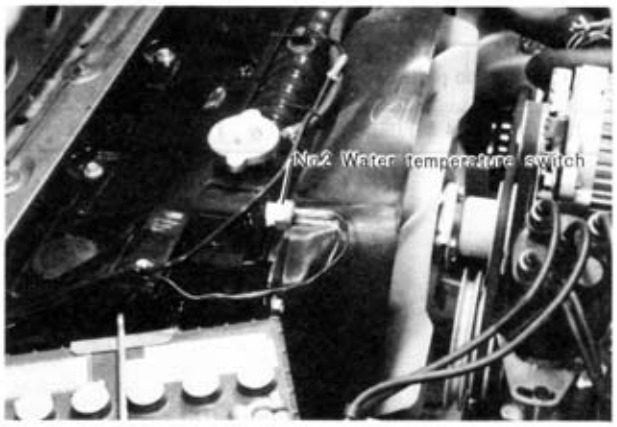

Fig. 1A–81

1A–G–4. Acceleration Sensor (Automatic transmission and California with manual transmission)

a. Checking vacuum switch

1. Disconnect the vacuum switch coupler and connect an ohmmeter to Ⓐ and Ⓑ terminals.
2. Start the engine and run it at idle. Make sure that continuity does not exist between both terminals.
3. Disconnect the vacuum sensing tube from the vacuum switch and make sure that continuity exists between both terminals.

b. Checking delay valve

1. Disconnect the vacuum switch coupler and connect an ohmmeter to terminals.
2. Start the engine. Increase the engine speed to **3,000 rpm with the throttle** and keep the throttle lever in that position for **2 ~ 3 seconds.**
   Then, quickly decrease the engine speed and check the continuity between the terminals. The continuity should exist for **3 ~ 25 seconds.**

1A–G–5. No. 1 Water Temperature Switch

To check the No. 1 water temperature switch, proceed as follows:

1. Remove the water temperature switch from the water pump housing.
2. Place the water temperature switch in water with a thermometer and heat the water gradually.
3. Check the temperature at which continuity does not exist between the both terminals in the coupler. The specified termperature is **70 ± 6.5°C (158 ± 11.7°F).**
   If it is not within specification, replace the switch.

1A–G–6. No. 2 Water Temperature Switch (Except for California and Canada)

The No. 2 water temperature switch is in normal condition if the continuity between both terminals does not exist when the temperature is below –18°C.

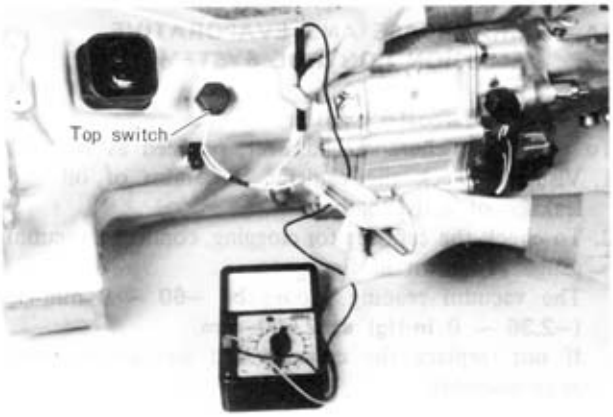

Fig. 1A–82

1A–G–7. Top Switch and Over-drive Switch (Manual transmission except for Canada)

a. Checking top switch

1. Raise the vehicle and support it with stands.
2. Disconnect the bullet connectors of the top switch on the transmission housing and connect an ohmmeter to both connectors (top switch side) as shown in figure.
3. Check to see that the continuity between both connectors does not exist when shifting the shift lever to 4th position.

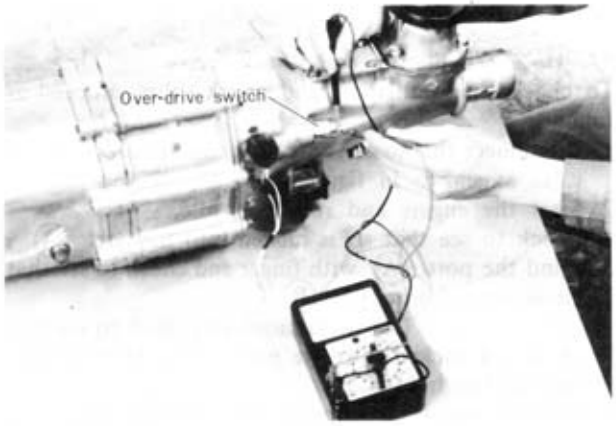

Fig. 1A–83

b. Checking over-drive switch

1. Raise the vehicle and support it with stands.
2. Disconnect the bullet connectors from the over-drive switch on the transmission extension housing and connect an ohmmeter to both terminals on the over-drive switch.
3. Check to see that the continuity between both terminals does not exist when shifting the shift lever to 5th position.

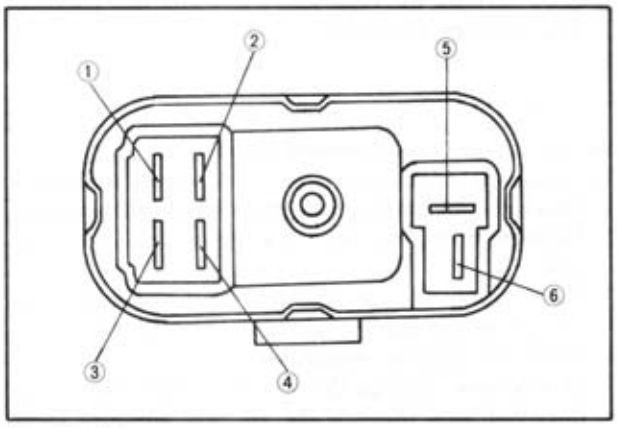

Fig. 1A–84

1A–G–8. Choke Relay

To check the relay, proceed as follows:

1. Disconnect the coupler from the relay.
2. Check the continuity between the numbered terminals using an ohmmeter.

Numbers-continuity	Numbers-No continuity	Remarks
① to ②	③ to ④	Without power applied
③ to ④	① to ②	Connect the battery: positive to terminal ⑥ and negative to ⑤.

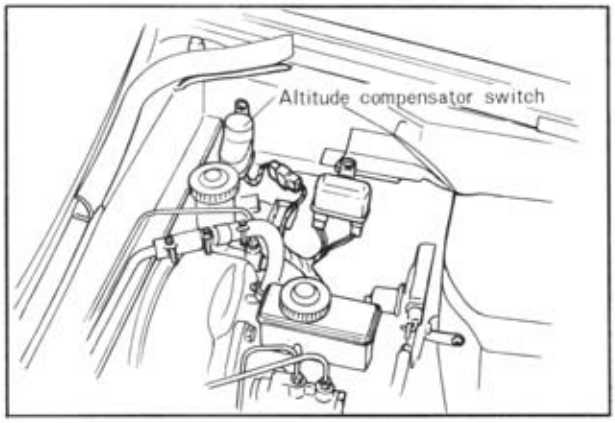

Fig. 1A–85

1A–G–9. Altitude Compensator Switch (Manual transmission except for Calif. and Canada)

The altitude compensator switch is in normal condition if the continuity between both terminals does not exist when the atomospheric pressure is below 675 ± 30 mm-Hg (26.6 ± 1.2 in-Hg).

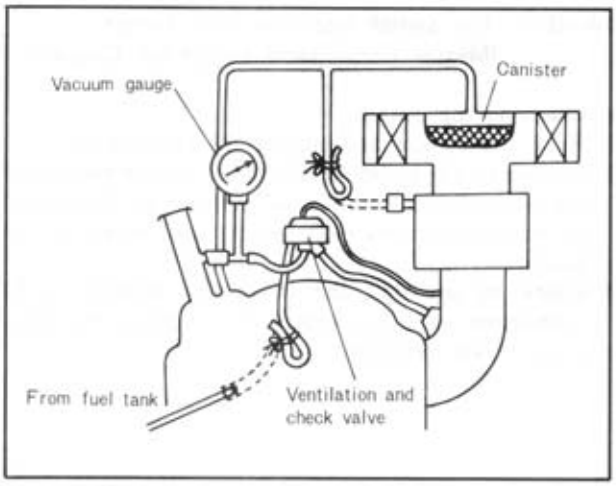

Fig. 1A–86

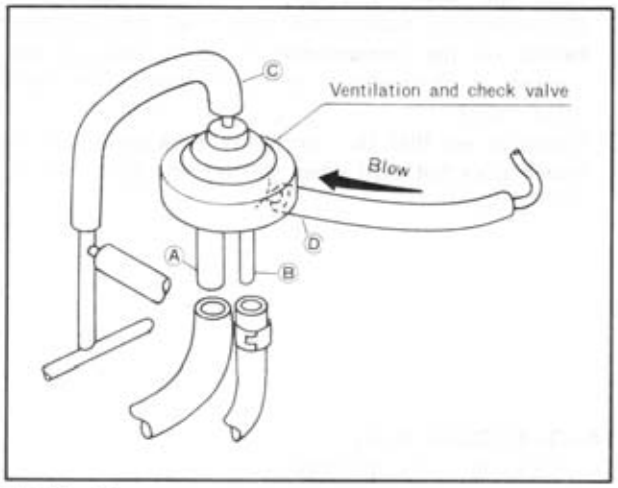

Fig. 1A–87

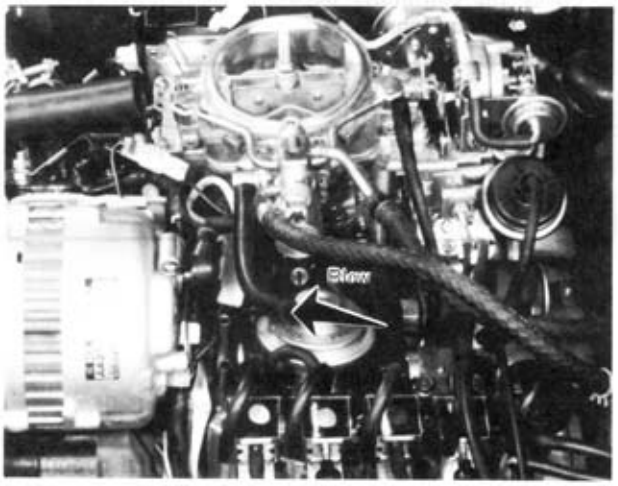

Fig. 1A–88

1A–H. CRANKCASE AND EVAPORATIVE EMISSION CONTROL SYSTEM

1A–H–1. Charcoal Chanister

To check the charcoal chanister, proceed as follows:

1. Visually check the canister for stains of oil and leakage of active carbon.
2. To check the canister for clogging, connect a vacuum gauge as shown in figure.
   The vacuum reading should be **–60 ~ 0 mm-Hg (–2.36 ~ 0 in-Hg) at 2,500 rpm.**
   If not, replace the canister and air cleaner cover as an assembly.

1A–H–2. Ventilation and Check Valve

To check the ventilation and check valve, proceed as follows:

1. Disconnect the hoses from the ventilation and check valve as shown in figure.
2. Start the engine and run it at idle.
   Check to see that air is sucked into the port (A) .
3. Blind the port (A) with finger and check to see that air is sucked into port (B) .
4. Blind the port (A) with finger and check to see that air is not sucked into the port (B) when disconnecting the hose (C) .
5. Stop the engine. Disconnect the hose (D) and attach the suitable hose instead.
   Blow through the valve and make sure that air is not pass through the valve.

1A–H–3. Air Vent Selenoid Valve

To check the air vent solenoid valve, proceed as follows:

1. Check the air vent hose for cracking or other damage.
2. Disconnect the air vent hose from the ventilation pipe.
3. Slowly blow through the hose and make sure that air passes through the air vent solenoid valve.
4. Turn the ignition switch on.
   Slowly blow through the hose and make sure the air does not pass through the air vent solenoid valve.

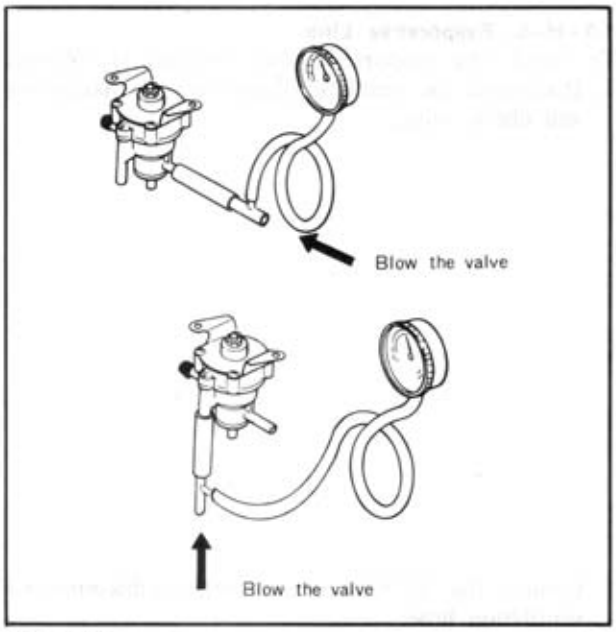

Fig. 1A–89

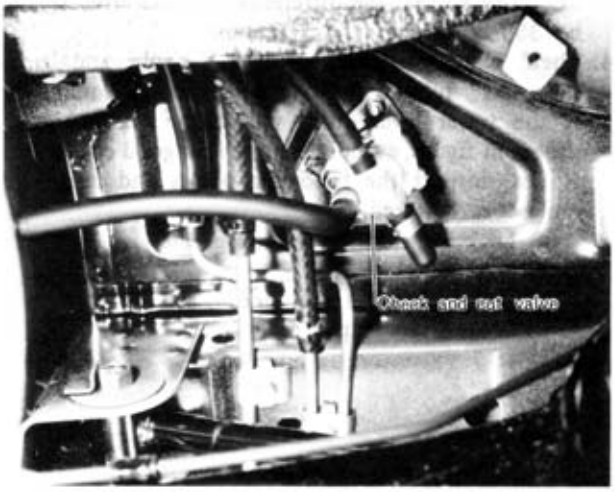

Fig. 1A–90

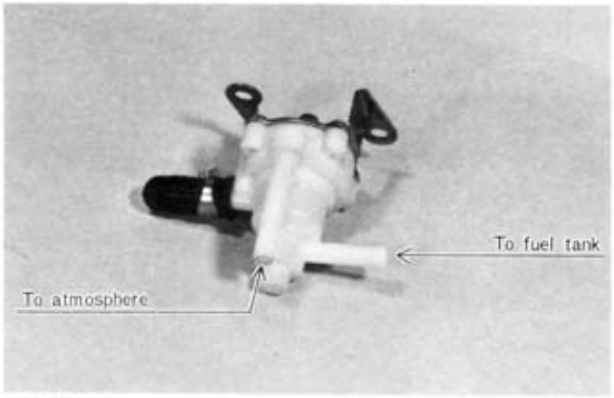

Fig. 1A–91

1A–H–4. Check and Cut Valve

a. Checking check and cut valve

1. Remove the check and cut valve.
2. Connect a pressure gauge to the passage to the fuel tank.
3. Blow through the valve. The valve should open with the pressure of **0.055 ~ 0.07 kg/cm² (0.78 ~ 1.0 lb/in²)**.
4. Remove the pressure gauge and connect it to the passage to atmosphere.
5. Blow through the valve and if the valve opens with the pressure of **0.01 ~ 0.05 kg/cm² (0.14 ~ 0.71 lb/in²)**, the valve is normal.

Note:
The test should be performed with the valve located horizontally. Otherwise the weight of the valve will move out of the position and cut the line.

b. Replacing check and cut valve

1. Raise the rear end of the vehicle and support it with stands.
2. Unfasten the hose bands and disconnect the evaporative hoses from the check and cut valve.
3. Remove the check and cut valve.
4. Install the check and cut valve in the reverse order of removing noting the hose position.

Note:

a) When installing the check and cut valve, fully push in the evaporative hoses to the valve and secure the hoses with bands.
b) When connecting the fuel hoses to the valve, note the direction of the valve fittings.

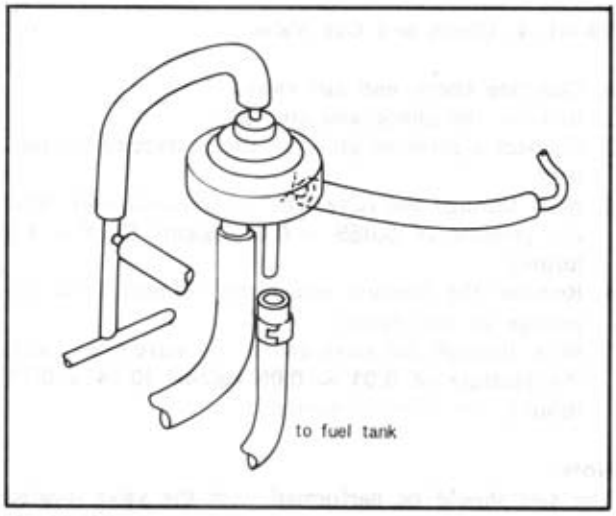

Fig. 1A–92

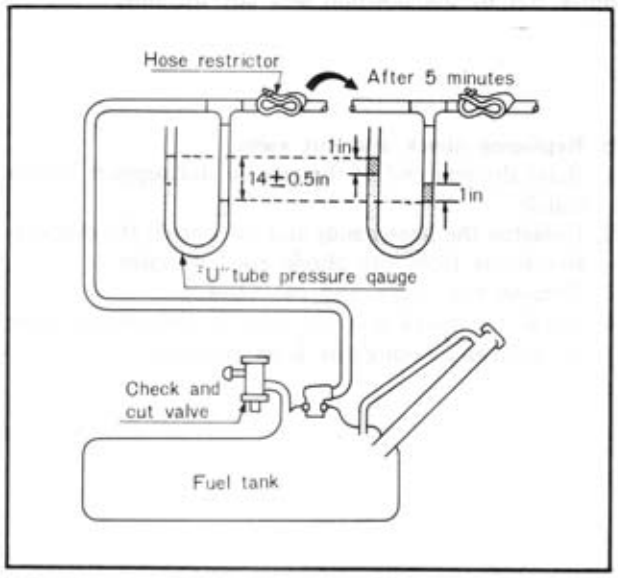

Fig. 1A–93

1A–H–5. Evaporative Line

To check the evaporative line, proceed as follows:

1. Disconnect the ventilation hose from the ventilation and check valve.
2. Connect the "U" tube pressure gauge to disconnected ventilation hose.
3. Gradually apply the low compressed air into the "U" tube so that the difference of water level should be **356 ± 12 mm (14 ± 0.5 in).**
4. Then, blind the inlet of the "U" tube and leave the "U" tube with inlet blind for five minutes. If the water level drops within the hatched lines shown in figure, evaporative line is in good condition. If not, inspect the following points and repair or replace as required.
   a) Leaky or loose evapolative line
   b) Leaky fuel tank
   c) Leaky or loose fuel line
   d) Leaky filler cap

1A–I. PIPINGS

California

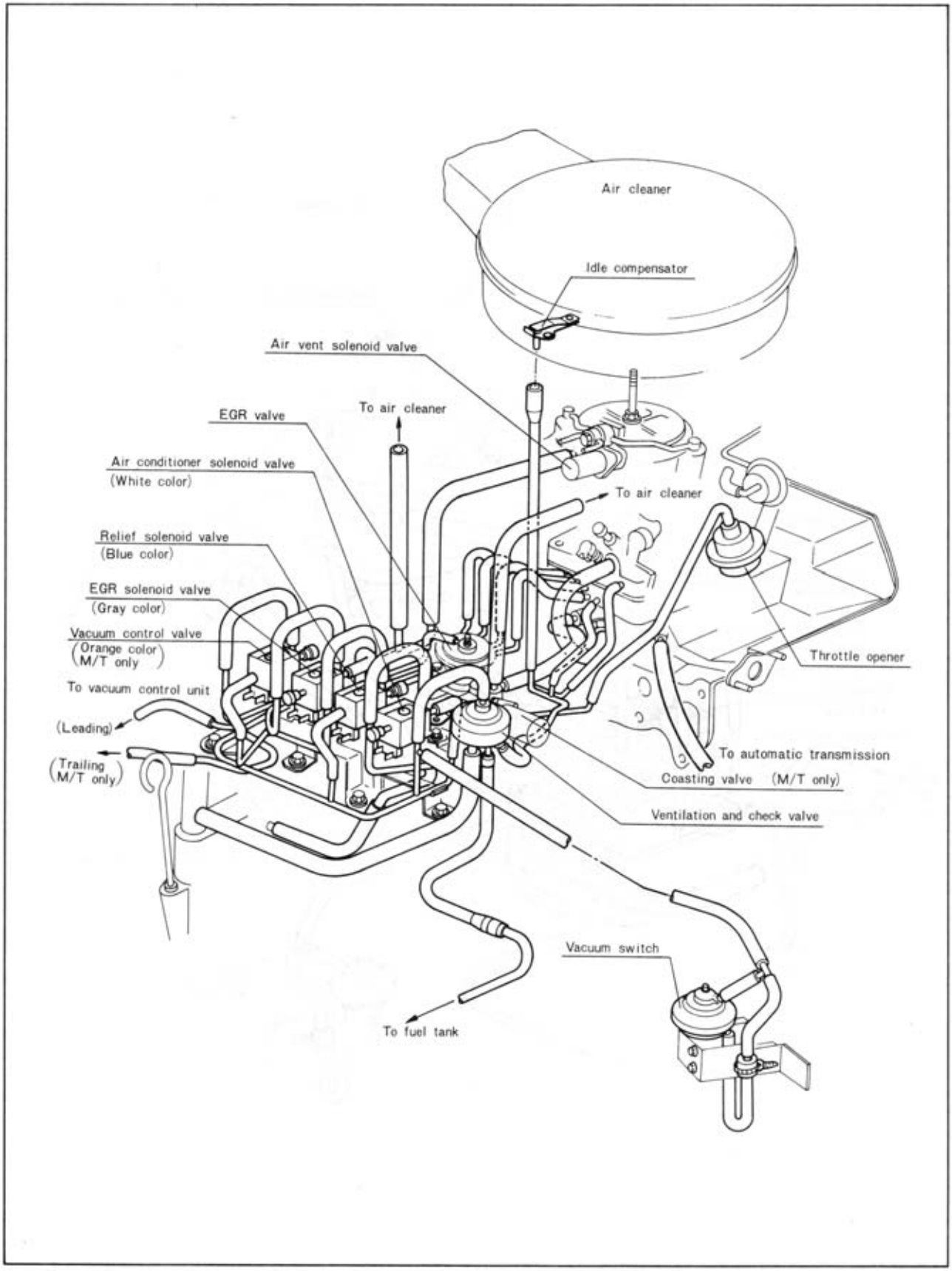

Fig. 1A–94

Except for California and Canada

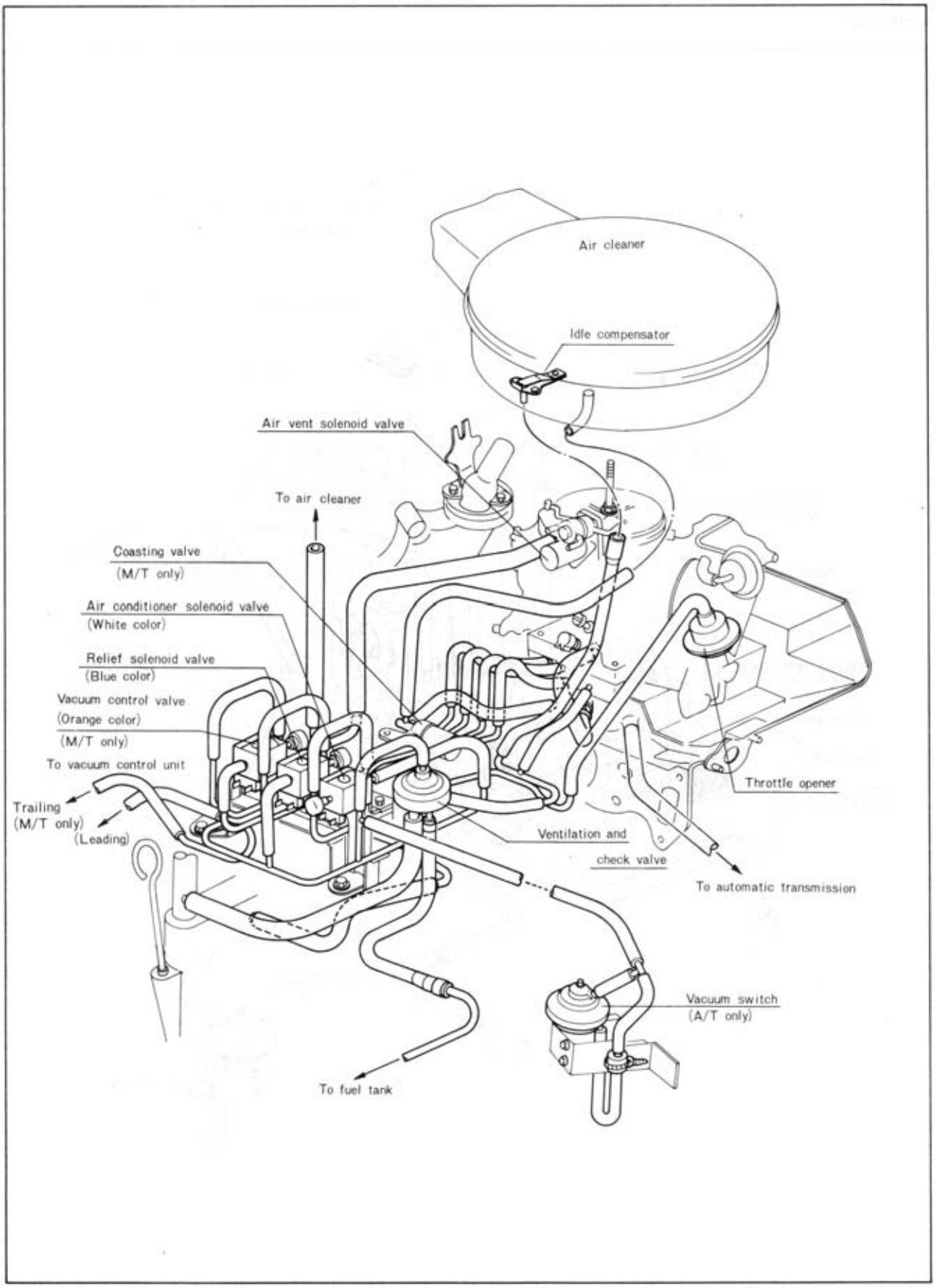

Fig. 1A–95

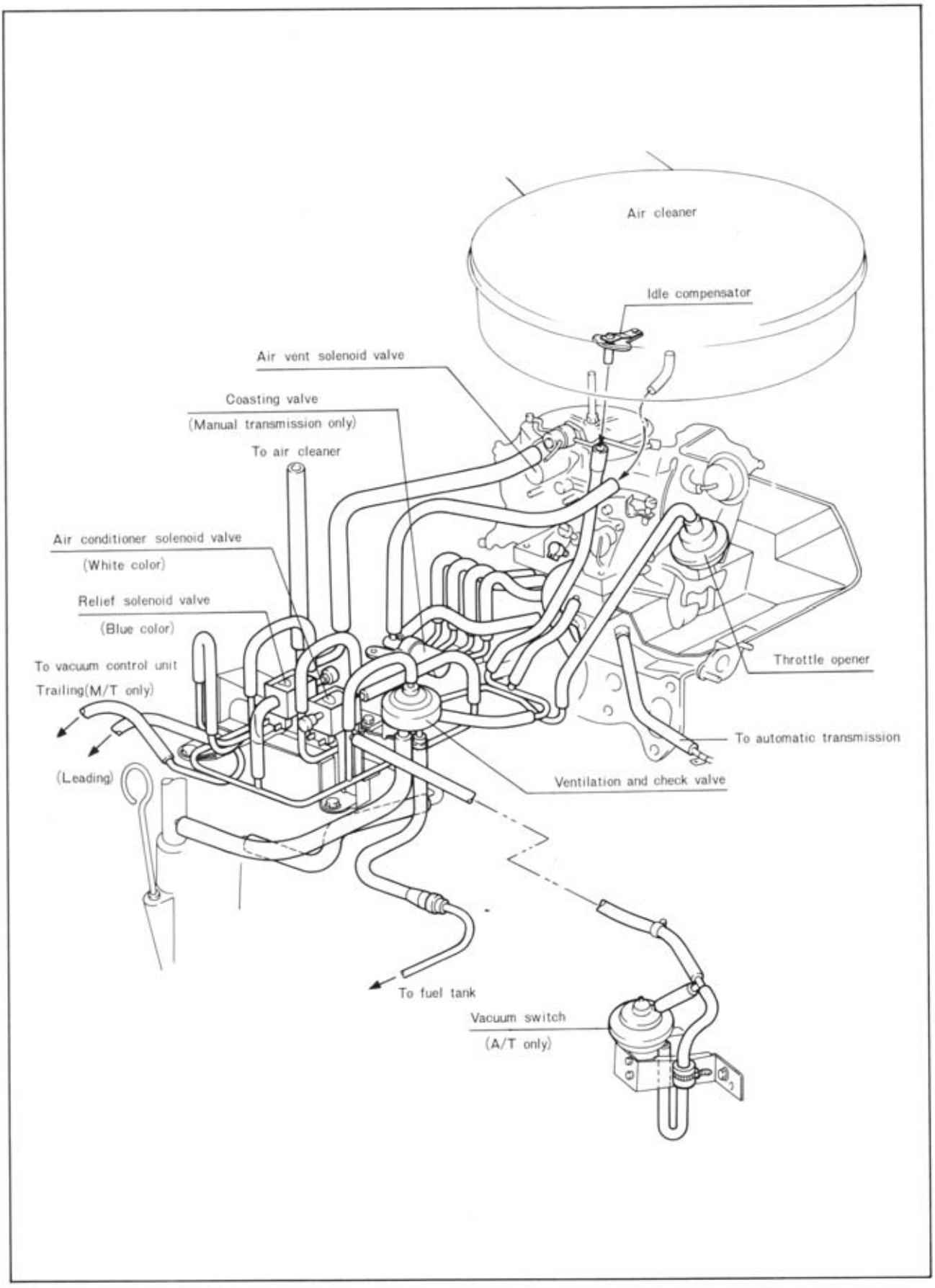
Air cleaner
Idle compensator
Air vent solenoid valve
Coasting valve
(Manual transmission only)
To air cleaner
Air conditioner solenoid valve
(White color)
Relief solenoid valve
(Blue color)
To vacuum control unit
Trailing(M/T only)
(Leading)
Throttle opener
To automatic transmission
Ventilation and check valve
To fuel tank
Vacuum switch
(A/T only)

Fig. 1A–96

LUBRICATING SYSTEM

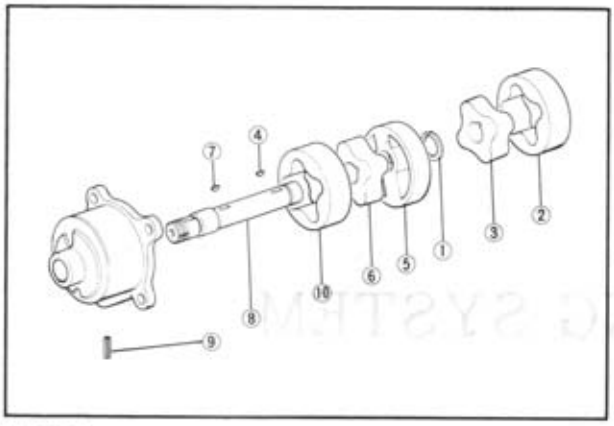

Fig. 2–1

2–A. OIL PUMP

2–A–1. Disassembling Oil Pump

1. Remove the oil pump from the front housing as described in Par. 1–B–11.
2. Disassemble the oil pump in the order numbered below.

1) Snap ring
2) Rear outer rotor
3) Rear inner rotor
4) Key
5) Middle plate
6) Front inner rotor
7) Key
8) Shaft
9) Spring pin (Drive out)
10) Front outer rotor

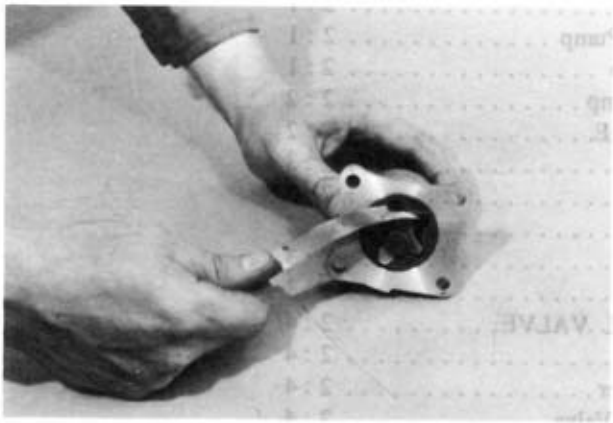

Fig. 2–2

2–A–2. Checking Oil Pump

1. Check the clearance between the lobes of the rotors with a feeler gauge. If the clearance exceeds the limit, replace both rotors.

Standard clearance:
0.01 ~ 0.09 mm (0.0004 ~ 0.0035 in)
Clearance limit:
0.15 mm (0.0059 in)

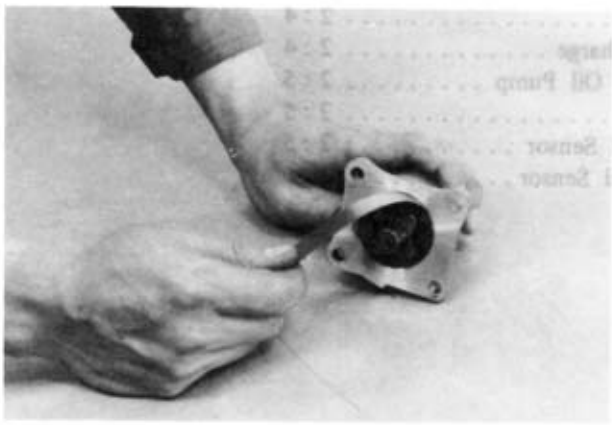

Fig. 2–3

2. Check the clearance between the outer rotor and the pump body with a feeler gauge. If the clearance exceeds the limit, replace the rotor or body.

Standard clearance:
0.20 ~ 0.25 mm (0.0079 ~ 0.098 in)
Clearance limit:
0.30 mm (0.0118 in)

Fig. 2–4

3. Check the end float of the rotors. Place a straight edge across the pump body and measure the clearance between the rotor and the straight edge.
Then place a straight edge across the matching surface of the front housing and measure the clearance between the straight edge and the front housing.
If the end float exceeds the limit, correct the pump body by grinding.

Standard end float:
0.03 ~ 0.13 mm (0.0012 ~ 0.0051 in)
End float limit:
0.15 mm (0.0059 in)

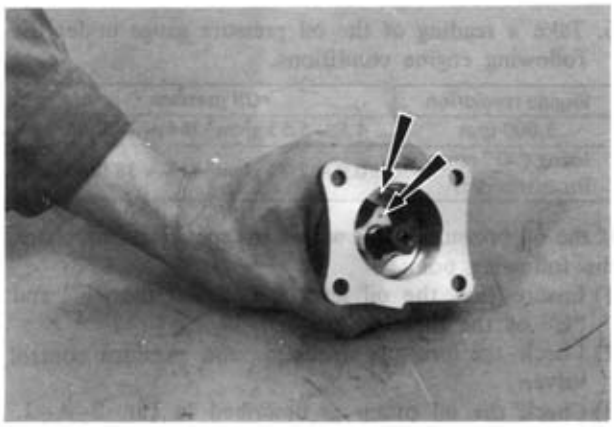

Fig. 2–5

2–A–3. Assembling Oil Pump

Assemble the oil pump in the reverse order of disassembling, **noting** the following points.

1. Install the inner rotor and shaft assembly, and the outer rotor into the pump body so that the tally marks on the rotors go toward the front housing.

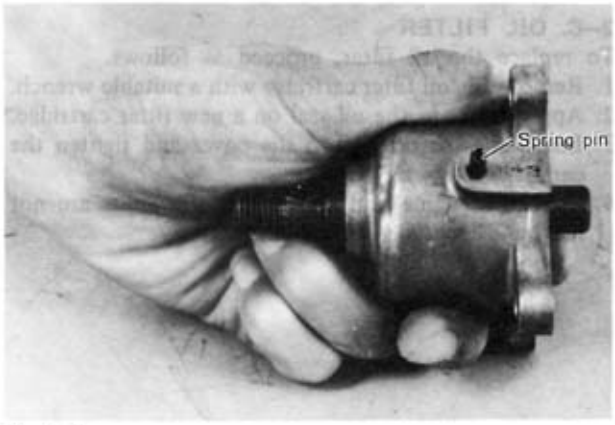

Fig. 2–6

2. Install the middle plate into the pump body. Drive in the spring pin to the body so that the spring pin aligns the recess portion of the middle plate. The spring pin slit should face toward the front or rear of engine.

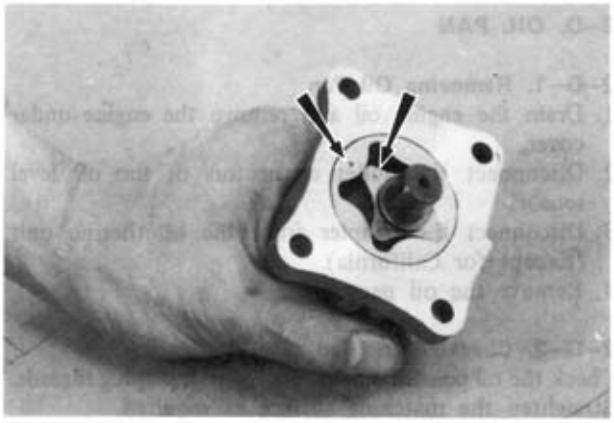

Fig. 2–7

3. Install the rear side inner and outer rotors into the pump body so that the tally marks on the rotors go toward the front housing.
   Fit the snap ring on the shaft.
4. Prime the oil pump with engine oil.
5. Mount the oil pump assembly on the front housing and fix it with bolts. Rotate the shaft by hand to see whether it rotates smoothly.
6. After installing, check the oil pressure as described in Par. 2–B.

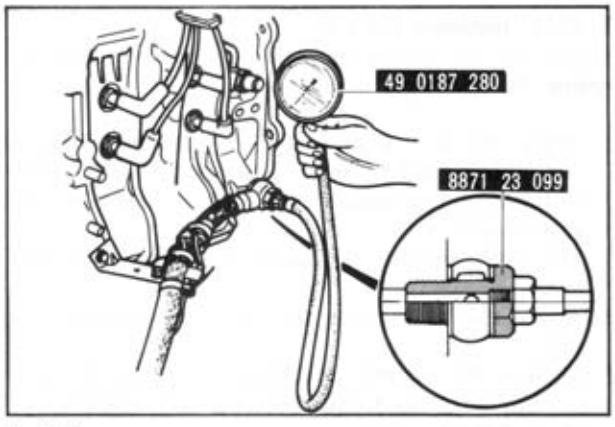

Fig. 2–8

2–B. CHECKING OIL PRESSURE

1. Drain the engine oil.
2. Remove the connecting bolt attaching the oil hose to the rear housing and install the oil pressure connector (8871 23 099) instead.
3. Connect the **oil pressure gauge** (49 0187 280) to the oil pressure connector.
4. Fill the engine with engine oil.
5. Start the engine and warm up the engine to the normal operating temperature.

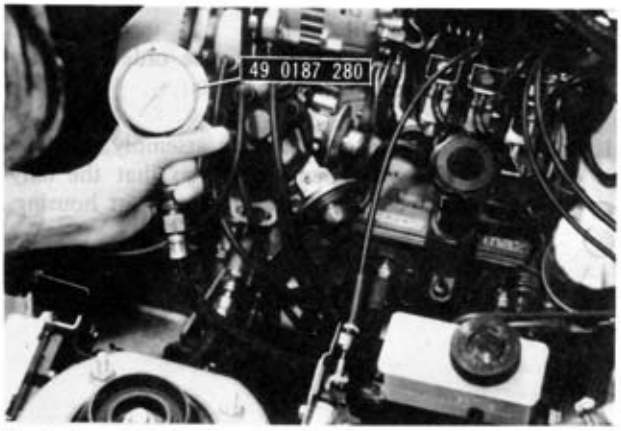

Fig. 2–9

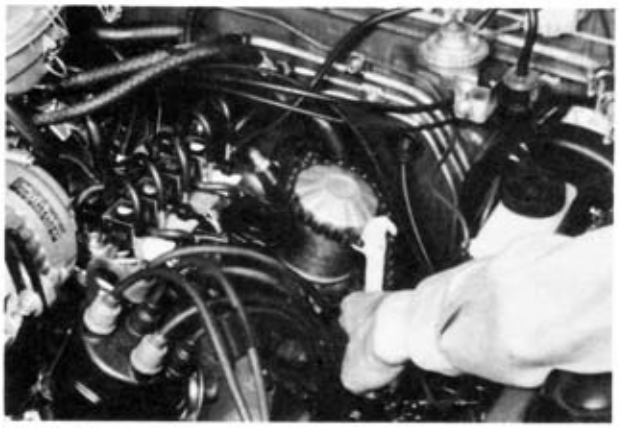

Fig. 2–10

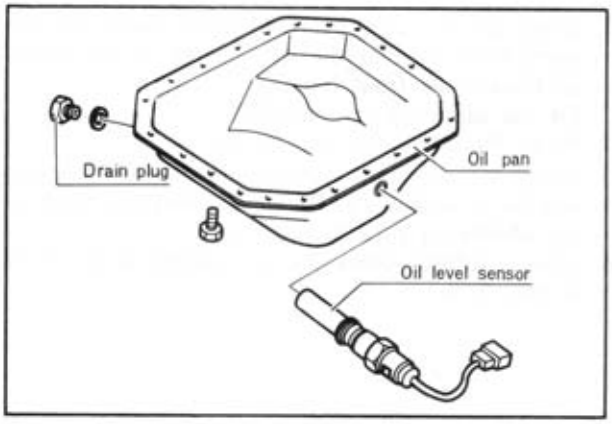

Fig. 2–11

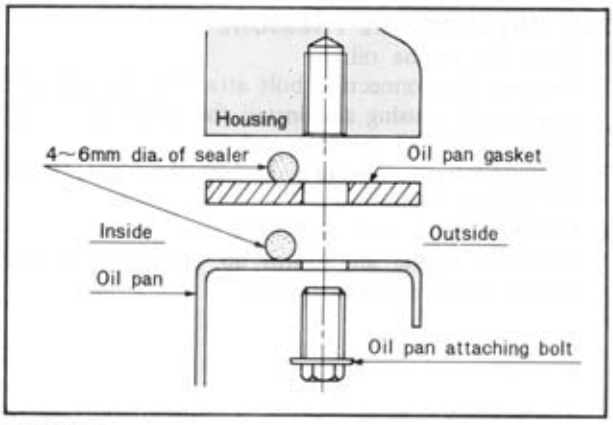

Fig. 2–12

6. Take a reading of the oil pressure gauge under the following engine conditions.

Engine revolution	Oil pressure
3,000 rpm	4.5 ~ 5.5 kg/cm² (64 ~ 79 lb/in²)
Idling ("D" range for automatic)	0.9 ~ 2.7 kg/cm² (13 ~ 38 lb/in²)

If the oil pressure is not within the specifications, check the following points.

1) Ensure that the oil level is between the "F" and "L" of the dipstick gauge.
2) Check the pressure regulator and pressure control valve.
3) Check the oil pump as described in Par. 2–A–2.

2–C. OIL FILTER

To replace the oil filter, proceed as follows.

1. Remove the oil filter cartridge with a suitable wrench.
2. Apply oil onto the oil seal on a new filter cartridge.
3. Install the cartridge onto the cover and tighten the cartridge **fully by hand.**
4. Start the engine and check that the joints are not leaking. Top up with oil if necessary.

2–D. OIL PAN

2–D–1. Removing Oil Pan

1. Drain the engine oil and remove the engine under cover.
2. Disconnect the bullet connectors of the oil level sensor.
3. Disconnect the coupler from the oil thermo unit (Except for California).
4. Remove the oil pan.

2–D–2. Checking Oil Pan

Check the oil pan for cracks, damaged drain plug threads. Straighten the matching surface as required.

2–D–3. Installing Oil Pan

Install the oil pan in the reverse order of removing, **noting** the following points.

1. Apply the **4 ~ 6 mm (0.16 ~ 0.24 in)** diameter continuous bead of sealer (Part No. 8527 77 739) to the mounting surface of the oil pan and place the gasket on it.
   The both ends of the sealer bead should be over lapped.
2. Apply the sealer onto the gasket as instructed in left.
3. Tighten the oil pan attaching bolts little by little in turn until the torque becomes **0.8 ~ 1.1 m-kg (6 ~ 8 ft-lb)** evenly.

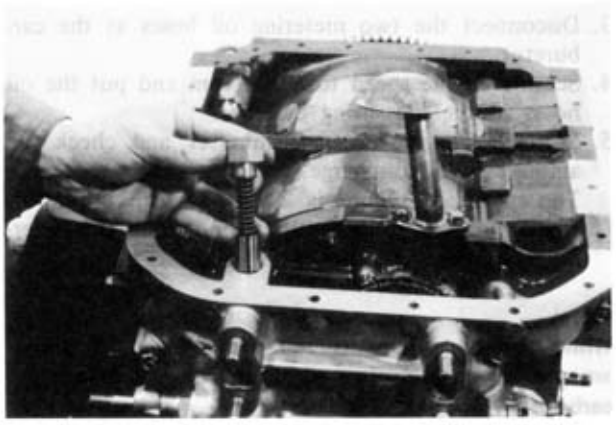

Fig. 2–13

2–E. OIL PRESSURE CONTROL VALVE

Remove the pressure control valve from the front cover. Examine the spring and the plunger for corrosion or any damage. If it is severe, replace with new ones. Measure the free length and replace with new spring if it is not in the specification.
The free length of the spring is **73 mm (2.874 in).**

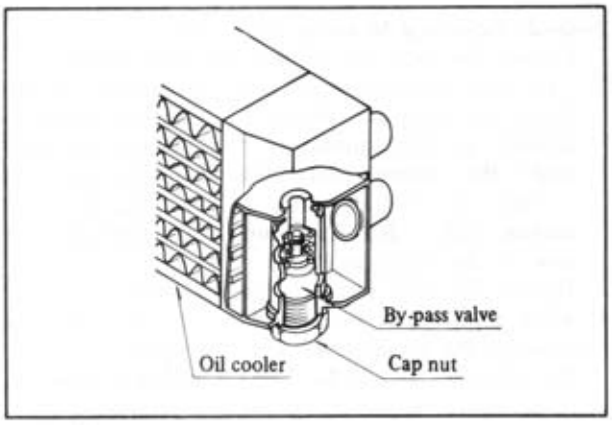

Fig. 2–14

2–F. OIL COOLER

2–F–1. Checking Oil Cooler

Visually inspect the oil cooler for damage, crack and leakage.
If any defects are found, repair it by aluminum welding or replace with new one.

2–F–2. Replacing By-pass Valve

1. Drain the engine oil.
2. Remove the engine under cover.
3. Remove the cap nut and pull out the by-pass valve.
4. Install the by-pass valve in the reverse order of removing.
5. Fill the engine with oil.
6. Start the engine and check that the oil is not leaking from the cap nut.

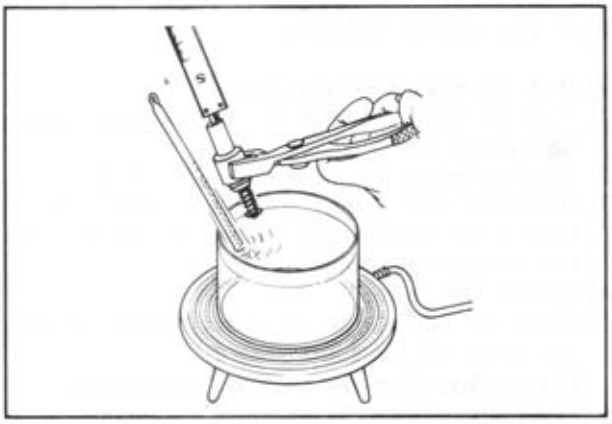

Fig. 2–15

2–F–3. Checking By-pass Valve

1. Remove the by-pass valve from bottom of the oil cooler.
2. Soak the by-pass valve in oil and heat up the oil gradually.
3. Check the protrusion of the valve when the oil temperature is **70°C (158°F).**

Protrusion: **More than 5 mm (0.2 in)**

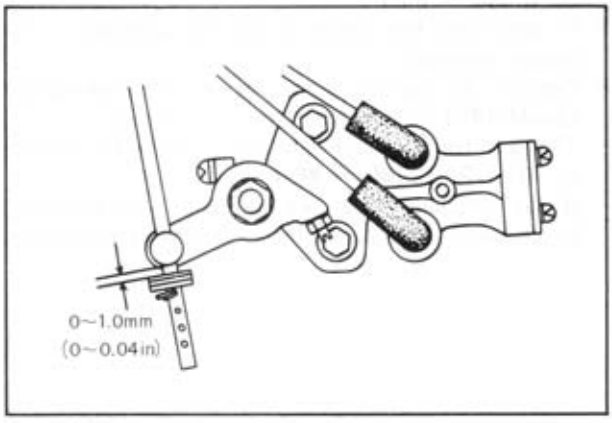

Fig. 2–16

2–G. METERING OIL PUMP

2–G–1. Measuring Oil Discharge

Before measuring the oil discharge, check the metering oil pump and oil hoses for leaks.
Make sure that the clearance between the metering oil pump lever and washer is **0 ~ 1.0 mm (0 ~ 0.04 in).**

1. Connect a tachometer to the engine.
2. Warm up the engine to the normal operating temperature.

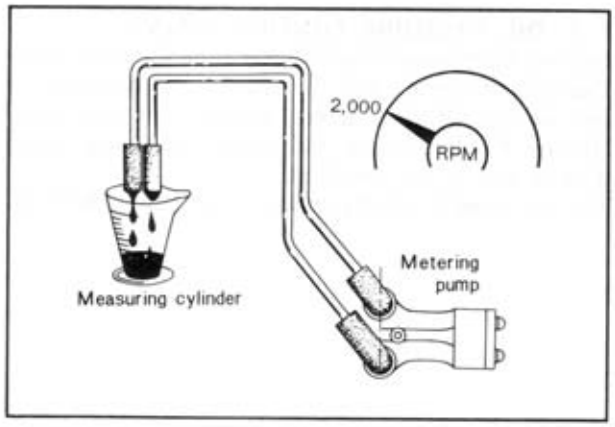

Fig. 2–17

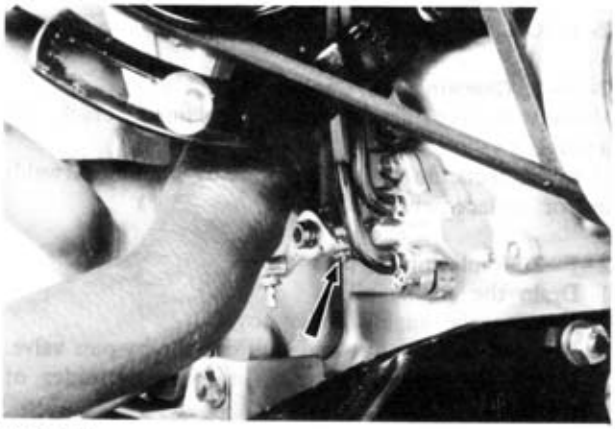

Fig. 2–18

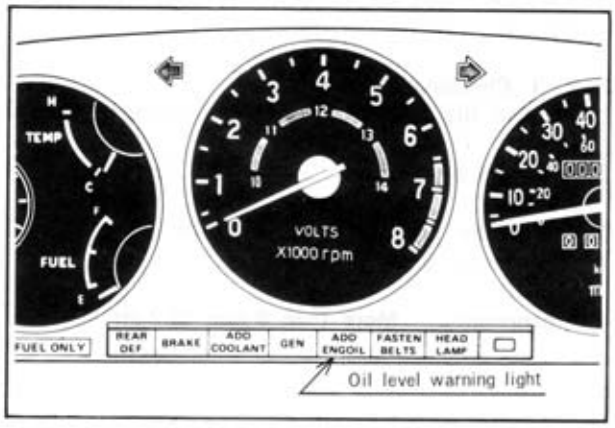

Fig. 2–19

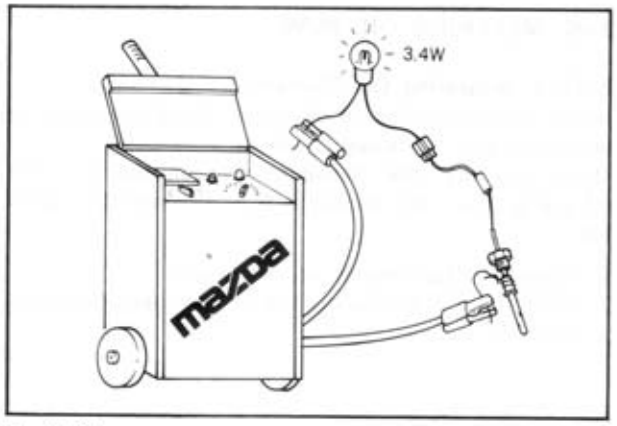

Fig. 2–20

3. Disconnect the two metering oil hoses at the carburetor.
4. Set the engine speed to **2,000 rpm** and put the oil hoses in the measuring cylinder.
5. Stop the engine **after 6 minutes** and check the amount of oil discharge.
   The specified amount is **2.0 ~ 2.5 cc/6 min.**
   If it is not within the specifications, adjust the metering oil pump.

Note:
While the measurements are being taken, a proper amount of clean engine oil should be added into the carburetor.

2–G–2. Adjusting Metering Oil Pump

1. Loosen the lock nut of the adjusting screw.
2. Turn the adjusting screw until the proper oil discharge is obtained. When the adjusting screw is screwed in, the amount of oil discharge increases while the amount decreases when the screw is screwed out. The amount of oil discharge alters by **approx. 0.2 ~ 0.3 cc/6 min./2,000 rpm per one turn** of the adjusting screw.
3. Tighten the lock nut of adjusting screw.
4. After adjusting is completed, check the clearance between the pump lever and the washer.
   The clearance should be **0 ~ 1.0 mm (0 ~ 0.04 in).**
   If necessary, adjust it by using a suitable washer.

2–H. OIL LEVEL SENSOR

2–H–1. Checking Oil Level Sensor

1. Turn the ignition switch on. The oil level warning light comes on.
2. Start the engine and the warning light should go off.
3. Disconnect the coupler from the oil level sensor. Ground the disconnected coupler and check to see the warning light comes on at idle.
4. Remove the sensor.
5. Check the oil holes of the sensor whether deposits pile up or oil holes are clogged.
   If necessary, clean the oil holes with solvent.
6. Check the resistance of the sensor with an ohmmeter.
   The specified resistance is **2 ~ 4 kiloohm at 10 ~ 30°C (50 ~ 86°F).**
7. Connect the test lamp of the **3.4 wattage** to the sensor terminal.
8. Connect the battery charger or rectifier **(the voltage should 14V)** to the test lamp and sensor.
   The test lamp should light up in **10 ~ 60 seconds at 10 ~ 30°C (50 ~ 86°F).**
   If the test lamp does not light up or it lights up immediately after the connection, replace the sensor.

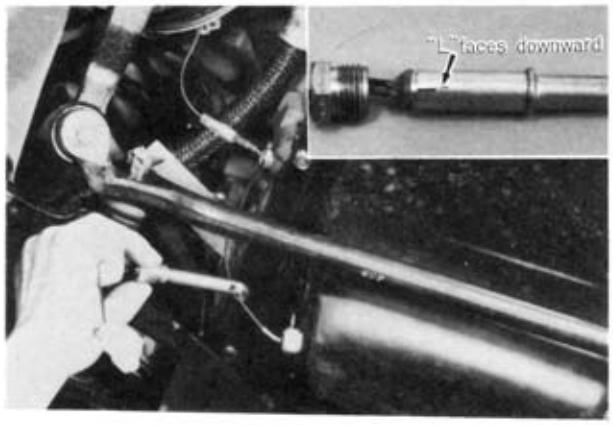

Fig. 2–21

2–H–2. Replacing Oil Level Sensor

1. Drain the engine oil.
2. Disconnect the coupler of the sensor.
3. Remove the sensor attaching nut and remove the sensor.
4. Place the gasket onto the sensor.
5. Install the sensor to the oil pan with "L" mark on the sensor downward.
6. Install the nut onto the sensor and tighten the nut to **2.5 ~ 3.0 m-kg (18 ~ 22 ft-lb).**
7. Connect the coupler of the sensor.
8. Fill the engine with engine oil.
9. Start the engine and check to see the oil is not leaking from the joining faces of the sensor.

COOLING SYSTEM

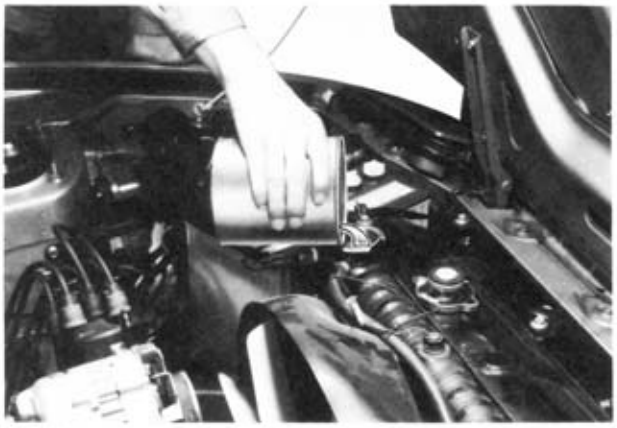

Fig. 3–1

3–A. ANTI-FREEZE SOLUTION

Use recommended mixture of 50% ethylene glycol anti-freeze solution for aluminum engine and 50% clean soft water (demineralized water).

For proper system protection in regions where the temperature goes below −29°C (−20°F), add the necessary amount of ethylene glycol base coolant recommended by the coolant manufacturer.

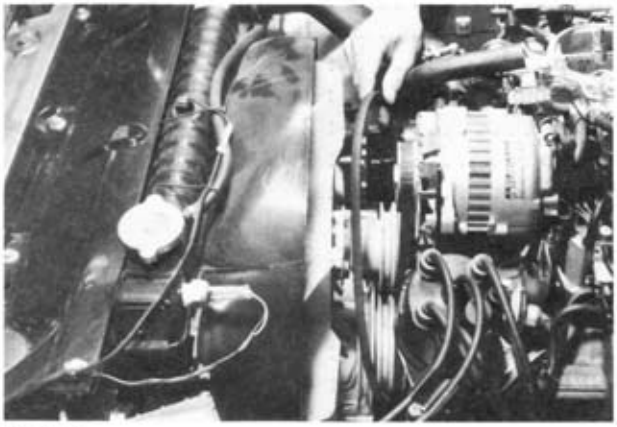

Fig. 3–2

3–B. WATER PUMP

3–B–1. Removing Water Pump

1. Remove the air cleaner.
2. Disconnect the coupler from the water temperature switch.
3. Disengage the drive belt for air conditioning compressor (if equipped).
4. Remove the air pump and disengage the drive belt.
5. Remove the alternator and disengage the drive belt.
6. Remove the cooling fan and fan drive assembly.

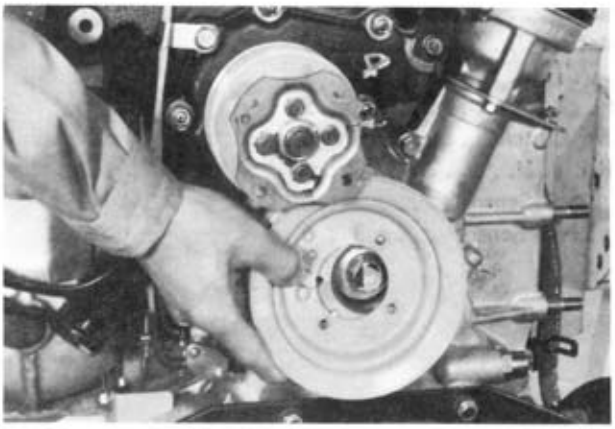

Fig. 3–3

7. Remove the pulley for air conditioning compressor.
8. Disconnect the radiator lower hose (drain the cooling system).
9. Disconnect the radiator upper hose.
10. Remove the water pump.

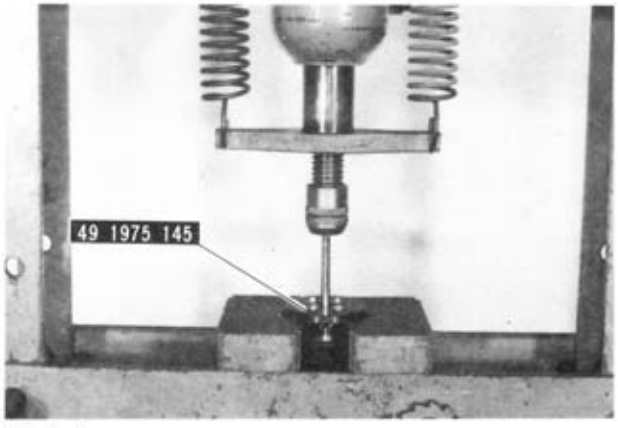

Fig. 3–4

3–B–2. Disassembling Water Pump

1. Attach the **adapter** (49 1975 145) on to the pulley boss and tighten the four bolts firmly.
2. Support the water pump pulley adapter on the press. Press the water pump shaft slowly and remove the pulley boss.

Fig. 3–5

3. Remove the snap ring.
4. Support the pump body and apply pressure to the rear end of the shaft to press the shaft, spacer and bearing assembly out through the front of the pump body.
5. Remove the impeller.
6. Remove the seal assembly from the pump body.
7. Remove the bearings and spacer form the shaft with a suitable puller.

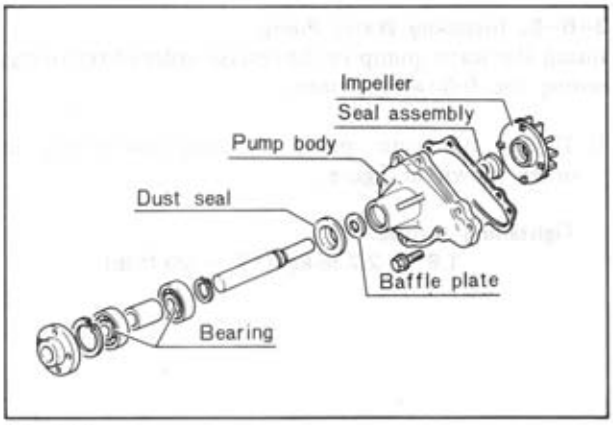

Fig. 3–6

3–B–3. Inspecting Water Pump

1. Inspect the bearing for roughness or excessive end play. Remove any rust or scale from the bearing shaft with an emery cloth.
2. Inspect the seat for seal on the impeller for pit marks or scoring. If the seat for the seal is scored or pitted, the impeller should be replaced.
3. Inspect the water pump body and the impeller for cracks and wear. Replace if defective.

Fig. 3–7

3–B–4. Assembling Water Pump

1. Install the stop ring into the groove on the shaft.
2. Place the dust seal plate on the shaft.
3. Drive the baffle plate onto the taper of the shaft.
4. Press in the rear bearing, with the sealed side rearward, to the shaft until it contacts with stop ring.
5. Press in the shaft and bearing assembly to the pump body.
6. Place the spacer on the shaft and fill grease (lithium base NLGI No. 2).
7. Install the front bearing with sealed side forward until the snap ring can be installed.
8. Install the snap ring.

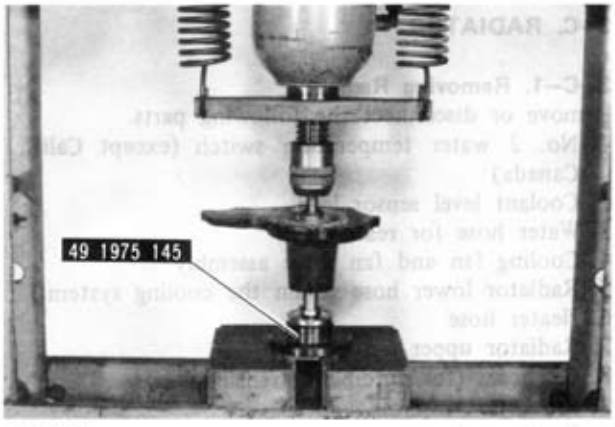

Fig. 3–8

9. Press the water pump pulley **adaptor** (49 1975 145) and pulley boss onto the shaft until the water pump shaft contacts with the adaptor.

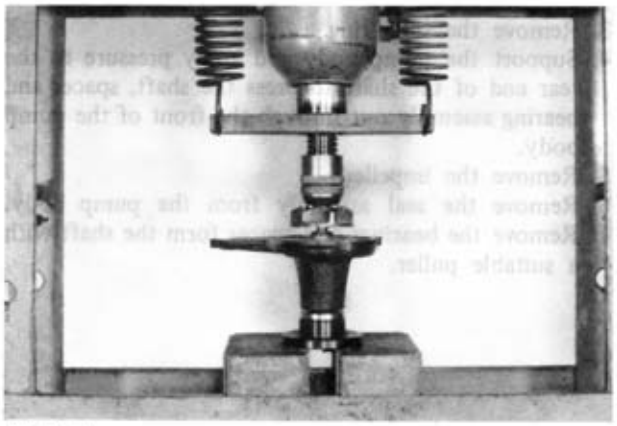

Fig. 3–9

10. Install the seal assembly into the body.
11. Press the impeller onto the shaft until it is flush with the end of the shaft.
    Rotate the shaft by hand to see whether it rotates smoothly.

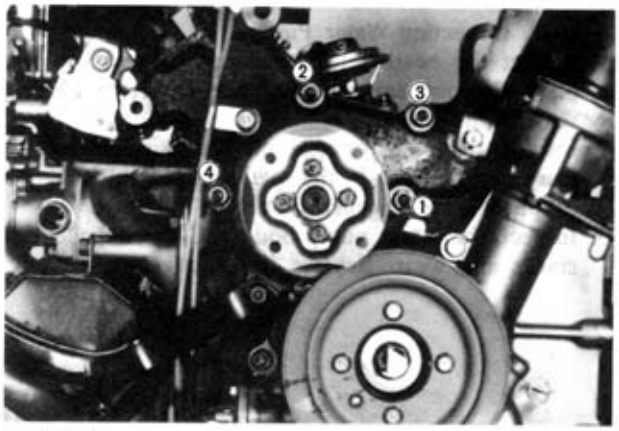

Fig. 3–10

3–B–5. Installing Water Pump

Install the water pump in the reverse order of removing, **noting** the following points.

1. Tighten the water pump attaching nuts evenly in order shown in figure.

   Tightening torque:
   1.8 ~ 2.7 m-kg (13 ~ 20 ft-lb)

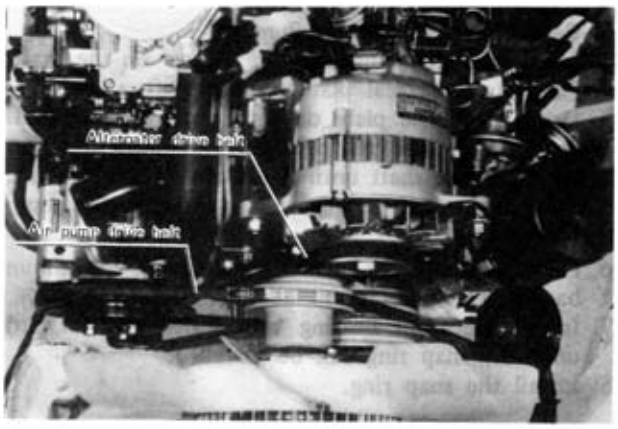

Fig. 3–11

2. Adjust the drive belts tension to the specifications.

Drive belts	Belt tension
Alternator drive belt	15 ± 2 mm (0.59 ± 0.08 in)
Air pump drive belt	12 ± 1 mm (0.47 ± 0.04 in)
Air conditioning compressor drive belt	9 ± 1 mm (0.35 ± 0.04 in)

3. Fill the cooling system with a mixture of 50% clean soft water (demineralized water) and 50% anti-freeze solution (ethylene glycol base for aluminum engine).

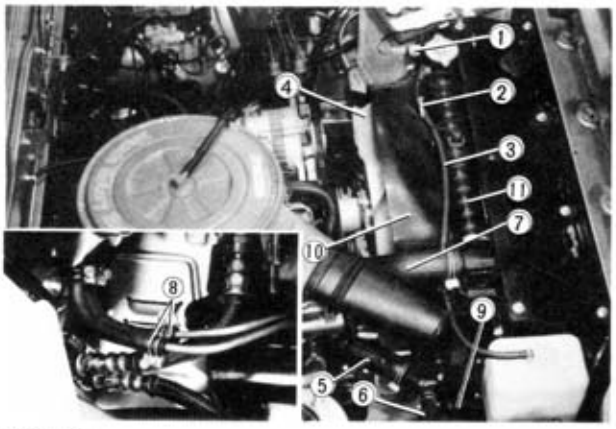

Fig. 3–12

3–C. RADIATOR

3–C–1. Removing Radiator

Remove or disconnect the following parts.

1. No. 2 water temperature switch (except Calif., Canada)
2. Coolant level sensor lead
3. Water hose for reservoir
4. Cooling fan and fan drive assembly
5. Radiator lower hose (drain the cooling system.)
6. Heater hose
7. Radiator upper hose
8. Oil hoses (for automatic transmission)
9. Brackets
10. Radiator shroud
11. Radiator

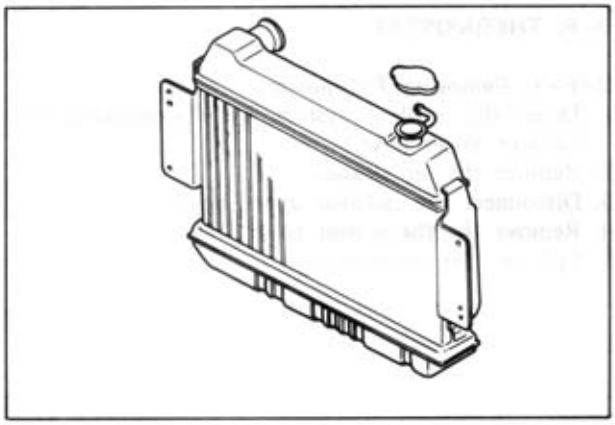

Fig. 3–13

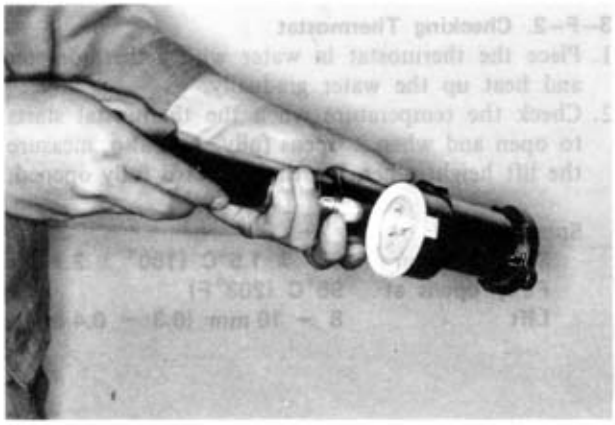

Fig. 3–14

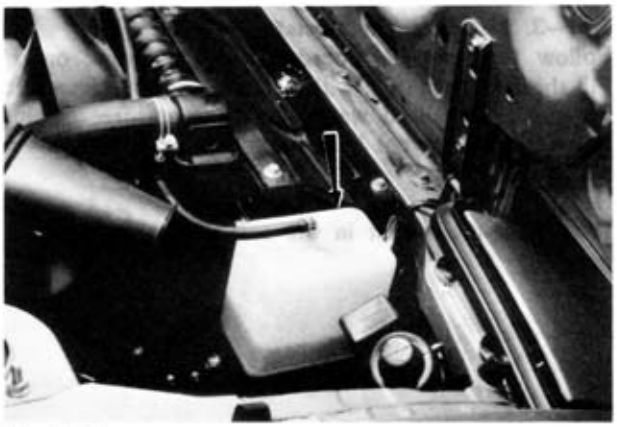

Fig. 3–15

Fig. 3–16

3–C–2. Checking Radiator

1. Examine the radiator carefully for leaks. If any leakage should be discovered, however small it may be, repair completely by soldering, or replace.
2. Clean the exterior of the radiator core by blowing out with compressed air.
3. Check the pressure cap rubber gasket. Replace the pressure cap if the rubber gasket is damaged.
4. Check the pressure cap function, To check, first wet the cap rubber gasket to insure an air tight seal and then attach a tester to the cap. The pressure valve should opened **within 0.9 ± 0.15 kg/cm² (13 ± 2 lb/in²)**.

3–C–3. Installing Radiator

Follow the removal procedures in the reverse order. Fill the cooling system with a mixture of 50% clean soft water (demineralized water) and 50% anti-freeze solution (ethylene glycol base for aluminum engine).

3–D. COOLANT RESERVOIR

Check the coolant reservoir for crack, damage and leakage.

To replace, proceed as follows:

1. Disconnect the water hose.
2. Remove the reservoir.
3. Install the reservoir in the reverse order of removing.

3–E. COOLING SYSTEM PRESSURE TEST

1. Remove the radiator cap. Refill the coolant full in the radiator if necessary.
2. Install the radiator cap tester to radiator.
3. Warm up the engine to the normal operating temperature.
4. Stop the engine. Pump up the system to **1.0 kg/cm² (14 lb/in²)** and observe the gauge about one minute. If the pressure drops, visually inspect all hoses and fittings for an external leak.

Note:

To remove the radiator pressure cap when the coolant temperature is high or boiling, place a cloth on the pressure cap and turn counter-clockwise one step. Keep it in this position until all pressure is released. Then, turn the cap further until it can be removed.

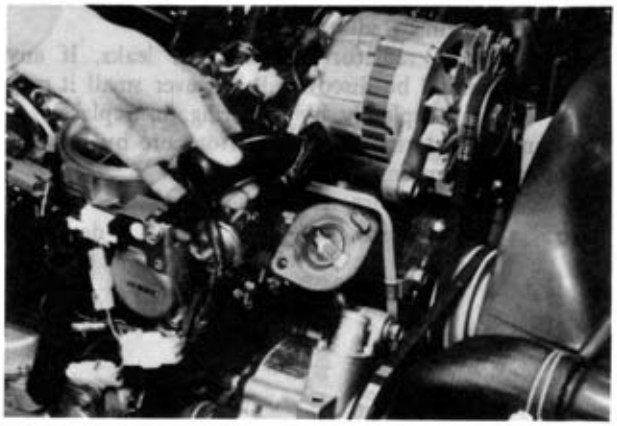

Fig. 3–17

3–F. THERMOSTAT

3–F–1. Removing Thermostat

1. Drain the cooling system by disconnecting the radiator lower hose.
2. Remove the air cleaner.
3. Disconnect the radiator upper hose.
4. Remove the thermostat cover.
5. Lift out the thermostat.

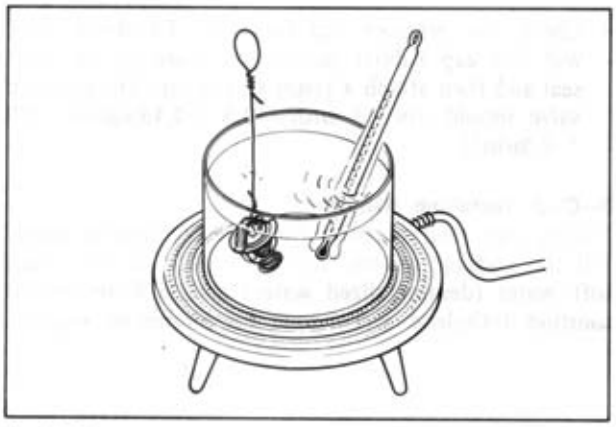

Fig. 3–18

3–F–2. Checking Thermostat

1. Place the thermostat in water with a thermometer and heat up the water gradually.
2. Check the temperature when the thermostat starts to open and when it opens fully. And also, measure the lift height when the thermostat is fully opened.

Specifications:

Start to open	**82° ± 1.5°C (180° ± 2.7°F)**
Fully opens at	**95°C (203°F)**
Lift	**8 ~ 10 mm (0.3 ~ 0.4 in)**

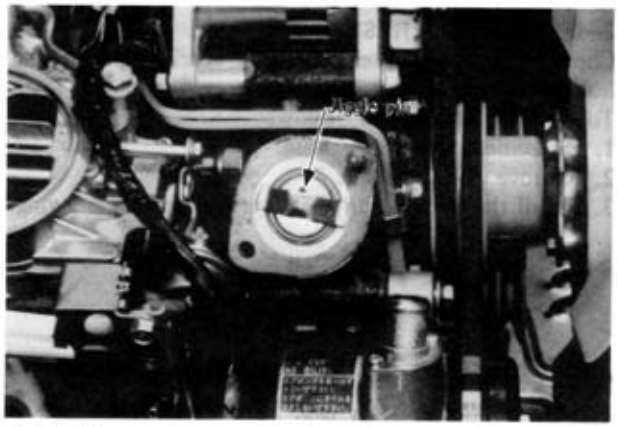

Fig. 3–19

3–F–3. Installing Thermostat

Follow the removal procedures in the reverse order. Fill the cooling system with a mixture of 50% clean soft water (demineralized water) and 50% anti-freeze solution (ethylene glycol base for aluminum engine).

Note:
Install the thermostat in the case with the jiggle pin up.

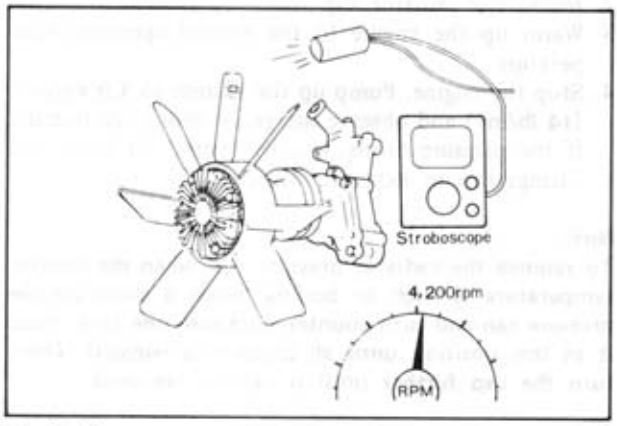

Fig. 3–20

3–G. FAN DRIVE

3–G–1. Testing Fan Drive

1. Using a suitable marker, mark the cooling fan.
2. Connect a tachometer to the engine.
3. Worm up the engine until it reaches the normal operating temperature.
4. Adjust the engine speed to **4,200 rpm.**
5. Using a stroboscope in accordance with the manufacturer's instruction, read the fan speed.
   The standard revolution is **1,400 ± 200 rpm.**
   If the fan speed is not within the specification, replace the fan drive clutch with a new one and perform the test again.

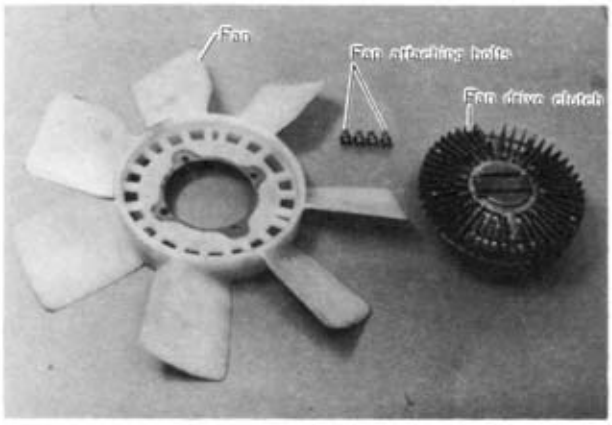

Fig. 3–21

3–G–2. Replacing Fan Drive Clutch

1. Remove the fan and fan drive assembly.
2. Remove the fan attaching bolts and separate the fan from the fan drive.
3. Assemble the fan and fan drive, and install them in the reverse order of removing.

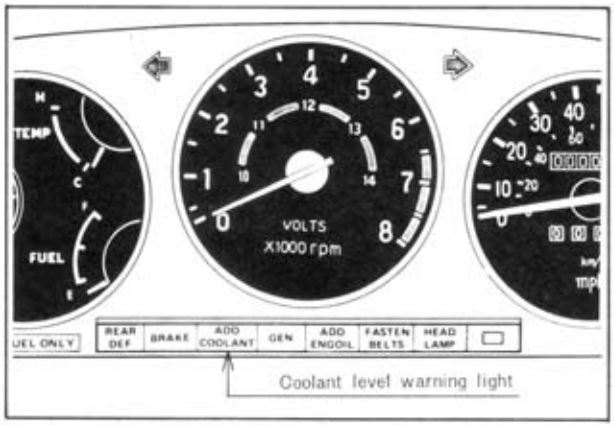

Fig. 3–22

3–H. COOLANT LEVEL SENSOR

3–H–1. Checking Coolant Level Sensor

1. Turn the ignition switch on.
   The coolant level warning light comes on.
2. Start the engine and the warning light should go off.
3. Disconnect the coupler from the level sensor and make sure the warning light comes on at idle.

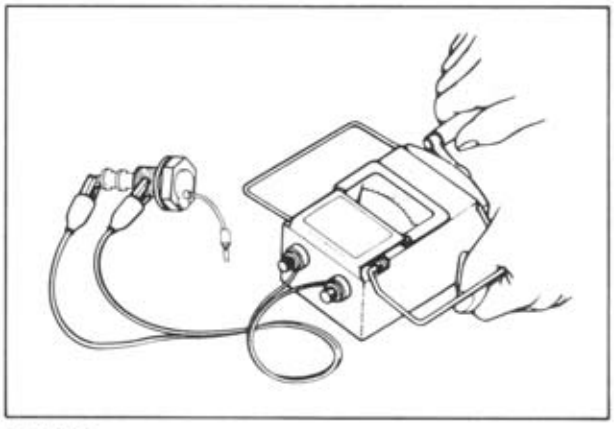

Fig. 3–23

4. Remove the radiator cap to relief the pressure in the radiator and remove the coolant level sensor from the radiator.
5. Carefully check the sensor on cracks and any damage.
6. Check the sensor for open circuit with an ohmmeter.
7. Check the insulator resistance of the sensor. The insulation resistance is **more than 1MΩ at 500 MV.**

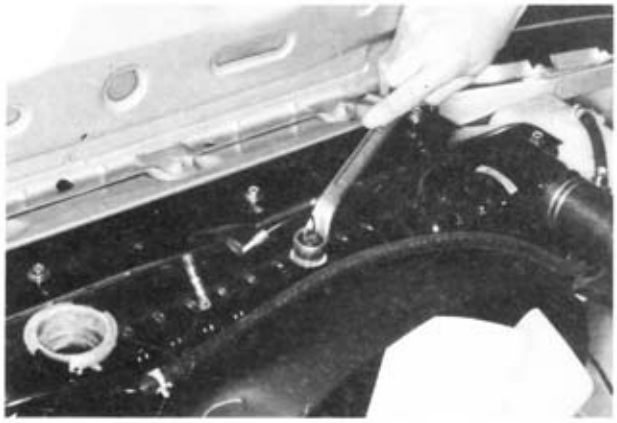

Fig. 3–24

3–H–2. Replacing Coolant Level Sensor

1. Disconnect the coupler from the sensor.
2. Remove the radiator cap, and then the sensor.
3. Install the sensor in the reverse order of removing.

Tightening torque:
15 ~ 30 cm-kg (13 ~ 26 in-lb)

4. Warm up the engine to the normal operating temperature and check to see the coolant is not leaking from the joining face of the sensor.

FUEL, INLET AND EXHAUST SYSTEM

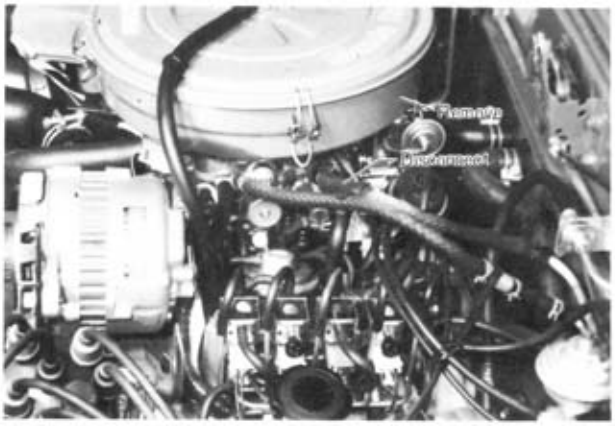

Fig. 4–1

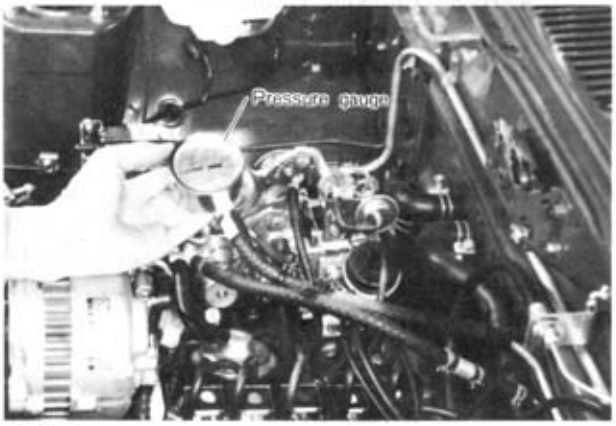

Fig. 4–2

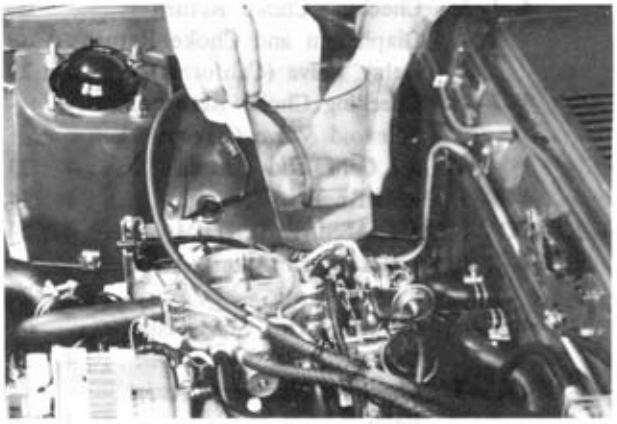

Fig. 4–3

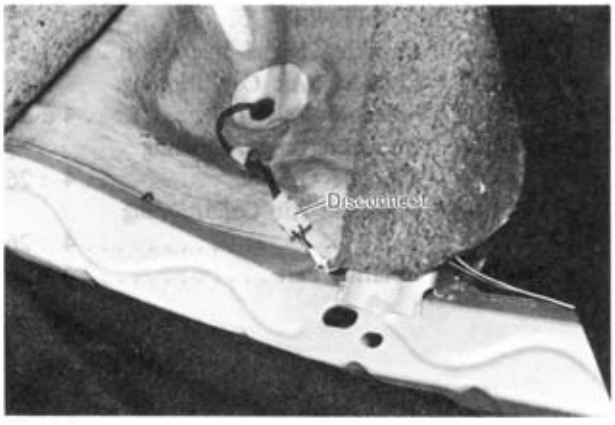

Fig. 4–4

4–A. FUEL PUMP

4–A–1. Testing Fuel Pump

Before the tests, make sure the fuel filter has been changed within the recommended maintenance mileage interval.

a. Pressure test

1. Remove the air cleaner assembly. Disconnect the fuel main hose at the carburetor.
   Use care to prevent combustion due to fuel spillage.
2. Connect a pressure gauge, a restrictor and flexible hoses so that the fuel can be discharged into a suitable graduated container.
3. Turn the ignition switch on and vent the system into the container by opening the hose restrictor momentarily.
4. Close the hose restrictor, allow the pressure to stabilize, and note the reading.

Fuel pressure:
0.26 ~ 0.33 Kg/cm² (3.7 ~ 4.7 lb/in²)

If the pump pressure is within the specifications, perform the test for volume.

b. Volume test

With the fuel pump pressure within specifications, test the volume as follows:

1. Turn the ignition switch on.
2. Open the hose restrictor and expel the fuel into the container, while observing the time required to expel **1,100 cc (1.16 U.S. quarts, 0.97 Imp. quarts).**
   Close the restrictor. **1,100 cc or more** of fuel should be expelled within **one minute.**

4–A–2. Replacing Fuel Pump

1. Remove the rear floor mat and floor plate.
2. Disconnect the coupler of the fuel pump.

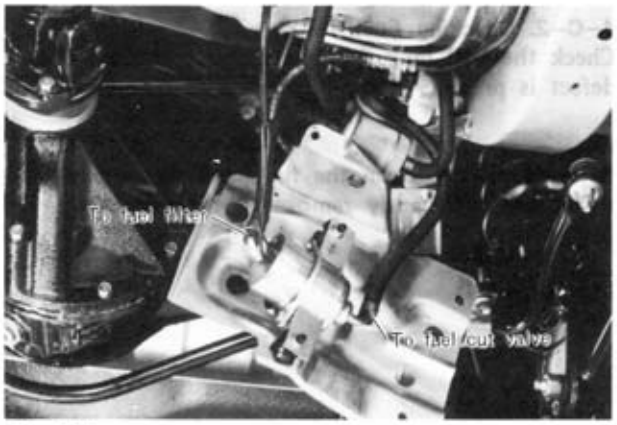

Fig. 4–5

3. Raise the rear end of the vehicle and support it with stands.
4. Remove the fuel pump protector cover.
5. Disconnect the inlet and outlet hoses from the fuel pump.
6. Remove the fuel pump.
7. Install the new fuel pump by following the removal procedures in the reverse order.

Note:
When installing, fully push in fuel hoses to the fuel inlet and outlet fittings of the pump, and secure the hoses with clips.

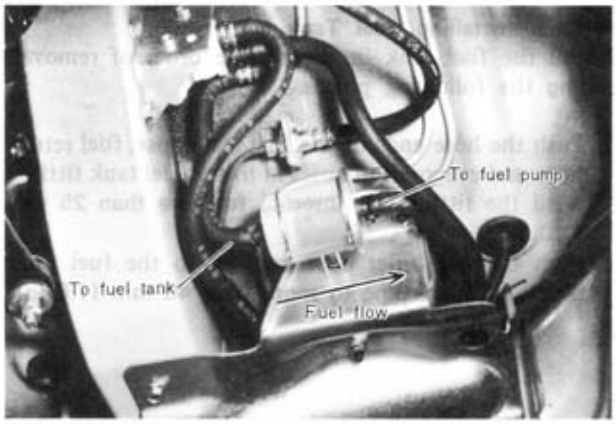

Fig. 4–6

4–B. FUEL FILTER

The fuel filter should be replaced at intervals, following the maintenance schedule.
To replace the fuel filter, proceed as follows:

1. Raise the rear end of the vehicle and support it with stands.
2. Loosen the clips at both ends of the filter and disconnect the fuel hoses.
3. Remove the fuel filter from the retainer.
4. Install a new filter and connect the fuel hoses.

Note:
When installing the filter, fully push in the fuel hoses to the fuel filter and secure the hoses with clips.

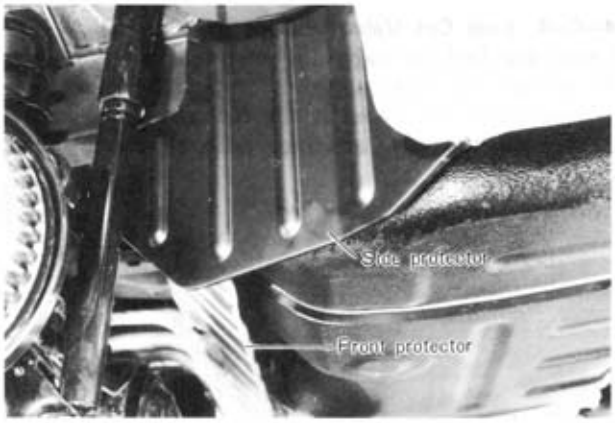

Fig. 4–7

4–C. FUEL TANK AND FUEL LINE

4–C–1. Removing Fuel Tank

1. Drain the fuel in the tank.
2. Raise the rear end of the vehicle and support it with stands.
3. Remove the tank protectors.

Note:
When removing the fuel tank, keep sparks, cigarettes and open flames away from the fuel tank.

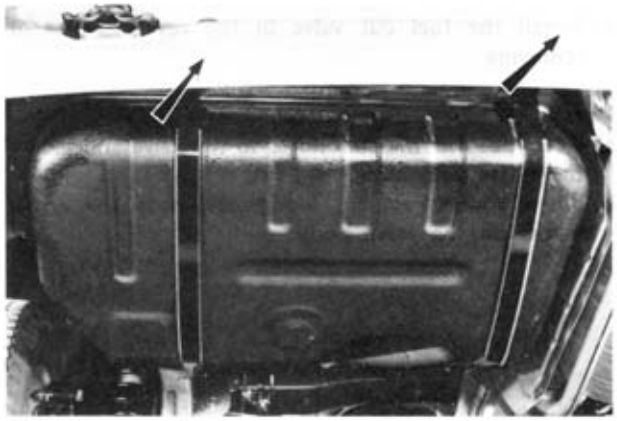

Fig. 4–8

4. Disconnect the fuel main hose, fuel return hose and evaporation hoses from the fuel tank.
5. Remove the fixing band attaching bolts and lower the fuel tank.

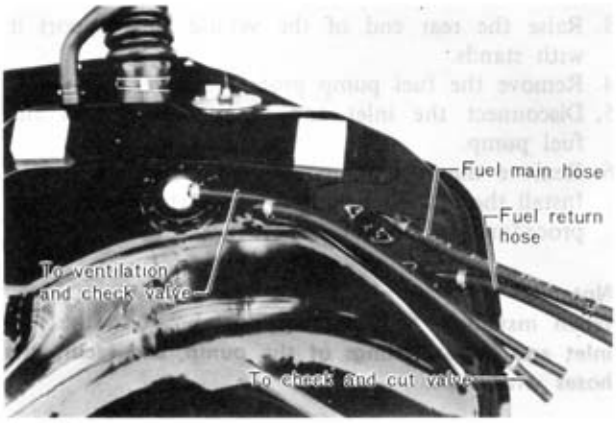

Fig. 4–9

4–C–2. Checking Fuel Tank

Check the fuel tank for cracks and corrosion. If any defect is present, repair or replace as necessary.

Note:

Before repairing, clean the fuel tank thoroughly with steam and sufficiently remove all explosive gas.

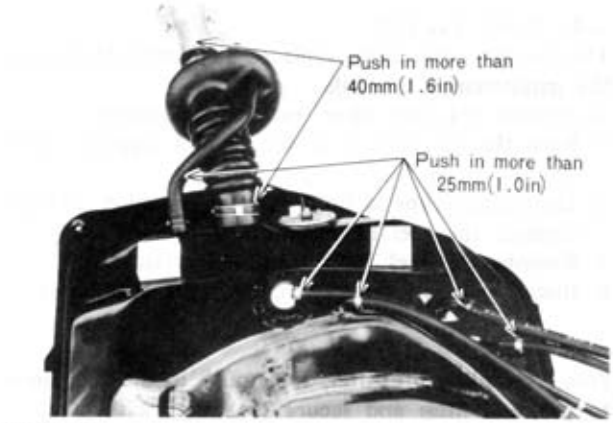

Fig. 4–10

4–C–3. Installing Fuel Tank

Install the fuel tank in the reverse order of removal, **noting** the following points.

1. Push the hose ends of the fuel main hose, fuel return hose and evaporation hoses in to the fuel tank fittings until the fittings are inserted to **more than 25 mm (1.0 in).**
2. Push the fuel filler hose ends in to the fuel tank pipe and filler pipe to **more than 40 mm (1.6 in).**

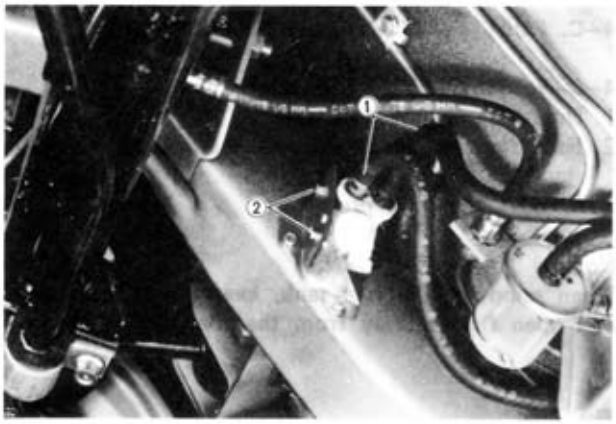

Fig. 4–11

4–C–4. Fuel Cut Valve (Except for Canada)

Check the fuel cut valve for cracks or damages.
To replace the fuel cut valve, proceed as follows:

1. Disconnect the hoses at the fuel cut valve.
2. Remove the valve attaching bolts and remove the fuel cut valve.

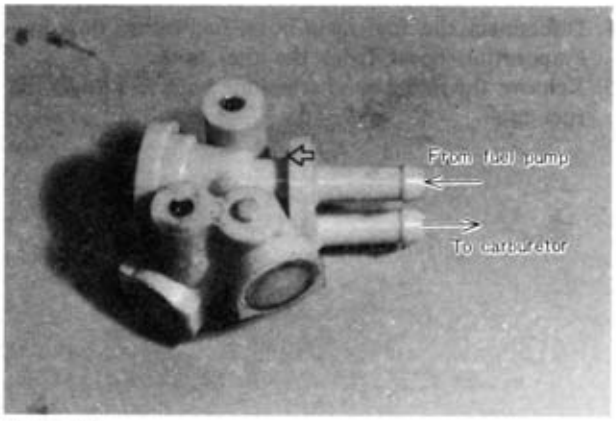

Fig. 4–12

3. Install the fuel cut valve in the reverse order of removing.

Note:

a) Fully push in the fuel hoses to the valve and secure the hoses with clips.
b) When connecting the fuel hoses, note the arrow marks on the valve body.

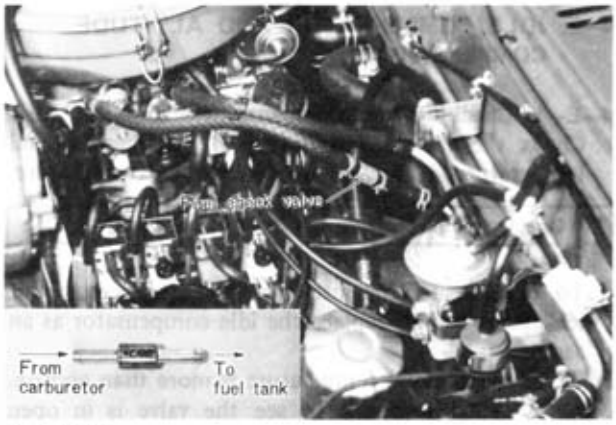

Fig. 4–13

4–C–5. Fuel Check Valve (Except for Canada)

Check the fuel check valve for cracks or damage. To replace the fuel check valve, proceed as follows:

1. Disconnect the hoses from the valve and remove the valve.
2. Install the valve in the reverse order of removing.

Note:

a) Fully push in the valve to the hose ends and secure it with clips.

b) Make sure that the arrow mark on the valve is directed as shown in figure.

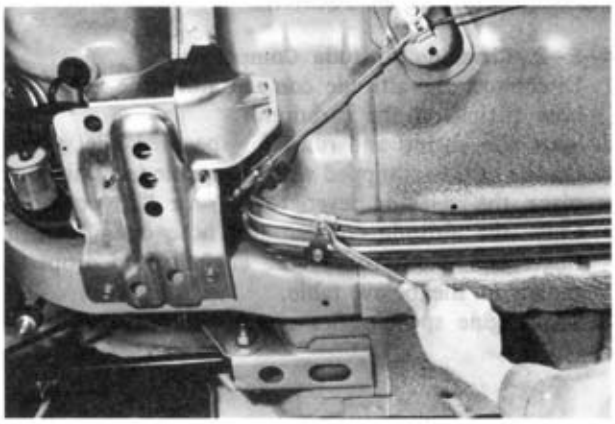

Fig. 4–14

4–C–6. Fuel Line

Inspect the fuel lines for leaks and tighten the fuel line connections to prevent leakage. It is important to keep the fuel system clean and free from water. If an excessive amount of dirt or water is found, drain the fuel tank and blow out the fuel lines with compressed air.

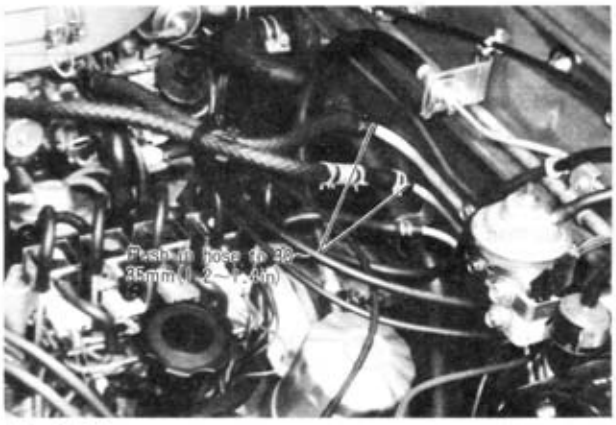

Fig. 4–15

When replacing the fuel hose, push in the fuel hose end to fuel pipe until the fuel pipe is inserted to **30 ~ 35 mm (1.2 ~ 1.4 in).**

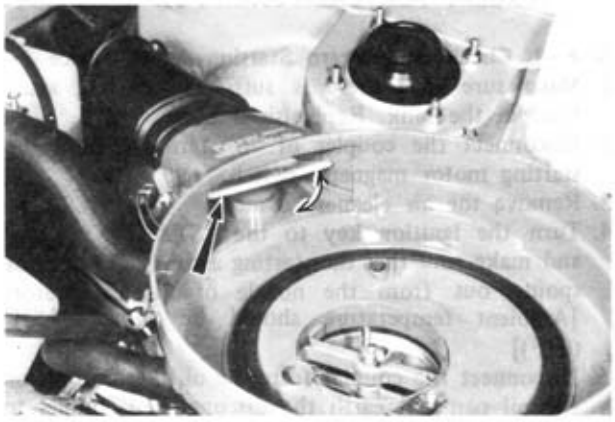

Fig. 4–16

4–D. INTAKE AIR TEMPERATURE CONTROL VALVE

The intake of fresh air and hot air is automatically controlled over by means of the bimetal and control valve installed in the air cleaner.

Move the control valve inside the air cleaner and if there is no difficulty to move and also the spring force of the bimetal is felt, it is in good order.

Fig. 4–17

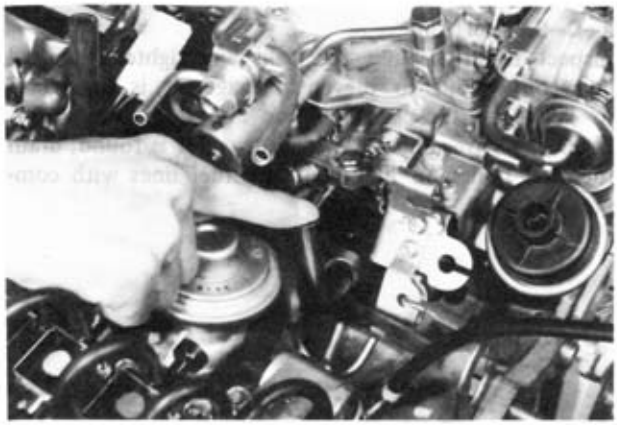

Fig. 4–18

Fig. 4–19

Fig. 4–20

4–E. IDLE COMPENSATOR AND ALTITUDE COMPENSATOR

4–E–1. Checking Idle Compensator

1. Check the valve is in closed position when bimetal temperature is lower than operating temperature.

Opening temperature	65 ± 4°C (149 ± 8°F)

To check, suck air into the tube. If excessive air leakage is found, replace the idle compensator as an assembly.

2. When the bimetal temperature is **more than approx. 69°C (159°F)**, check to see the valve is in open position. If the valve is not open, replace the idle compensator as an assembly.

4–E–2. Checking Altitude Compensator

1. Disconnect the altitude compensator hose from the hose fitting on the carburetor.
2. Start the engine and run it at specified idle speed. On the vehicle equipped with automatic transmission, place the selector lever to "N" or "P" position.
3. Close the altitude compensator hose opening with finger and check to see the engine speed drops as shown in the below table.
   The engine speed varies according to the altitude.

Specification:

Altitude	Drops of idle speed
0 ~ 1,000 m (0 ~ 3,280 ft)	10 ~ 100 rpm
1,000 ~ 2,000 m (3,280 ~ 6,560 ft)	50 ~ 200 rpm
More than 2,000 m (6,500 ft)	More than 100 rpm

4–F. SUB-ZERO STARTING ASSIST DEVICE (EXCEPT FOR CALIFORNIA)

4–F–1. Checking Sub-zero Starting Assist Device

1. Make sure that there is sufficient starting assist fluid in the tank. Replenish if necessary.
2. Disconnect the coupler of "S" terminal from the starting motor magnetic switch.
3. Remove the air cleaner cover.
4. Turn the ignition key to the "START" position and make sure that the starting assist fluid does not spouts out from the nozzle of the carburetor. [Ambient temperature should be above –18°C (0°F)]
5. Disconnect the coupler from the oil thermo unit on the oil pan and earth the disconnected coupler to the body.

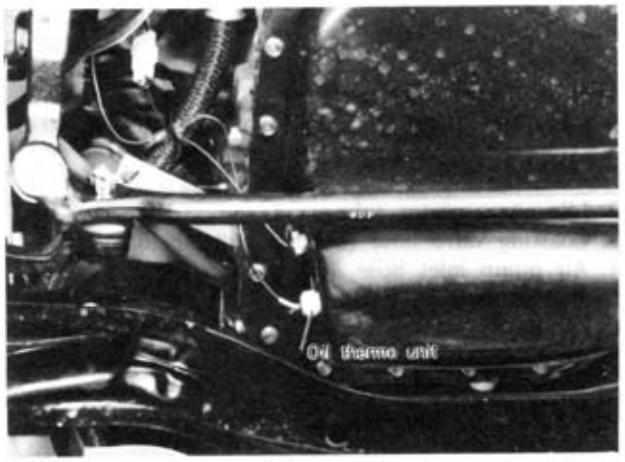

Fig. 4–21

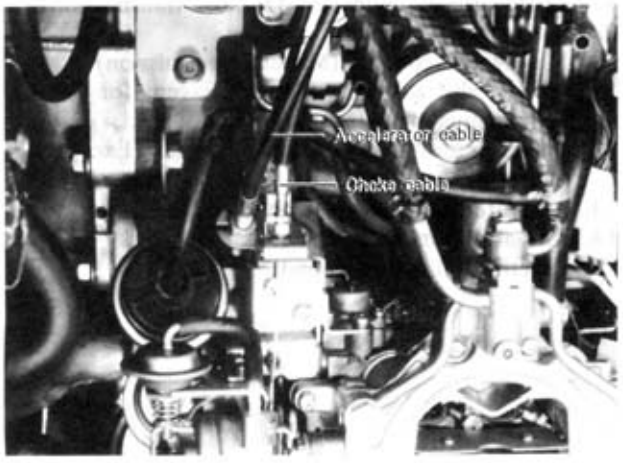

Fig. 4–22

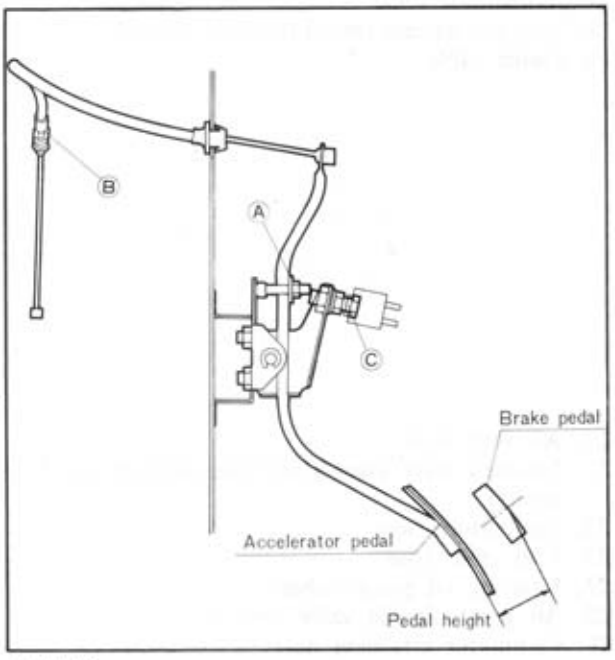

Fig. 4–23

6. Turn the ignition key to the "START" position with the air bleeding button of the tank kept pushed and make sure that the starting assist fluid spouts out from the nozzle of the carburetor.

4–F–2. Sub-zero Starting Assist Fluid

The mixture proportion of starting assist fluid should be 90% of high quality ethylene glycole anti-freeze solution plus 10% of water.

4–F–3. Checking Oil Thermo Unit

The oil thermo unit is in normal condition if it is energized below −18°C (0°F) and is not above it.

4–G. ACCELERATOR LINKAGE

4–G–1. Checking Accelerator Linkage

Remove the air cleaner and, with the accelerator pedal fully depressed, observe the position of the carburetor throttle valves. They should be vertical (wide open position).

Check the accelerator linkage to ensure there is no sticking or binding and for full return.

Examine the choke control for free operation.

4–G–2. Adjusting Accelerator Cable

1. Check the accelerator pedal position.
   The accelerator pedal height should be **42 ± 5 mm 1.7 ± 0.2 in)** lower than the brake pedal height.
   If necessary, adjust the nut Ⓐ to obtain the correct position.
2. Check the free play of the cable at the carburetor. It should be **1 ~ 3 mm.** If the free play is not within the specifications, adjust it by the nut Ⓑ.
3. Depress the accelerator pedal all the way down to the floor and check to see that the throttle valves are wide open. If necessary, adjust the stopper bolt Ⓒ.

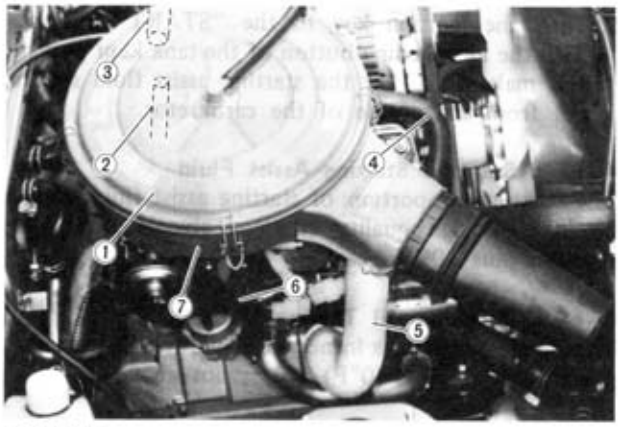

Fig. 4–24

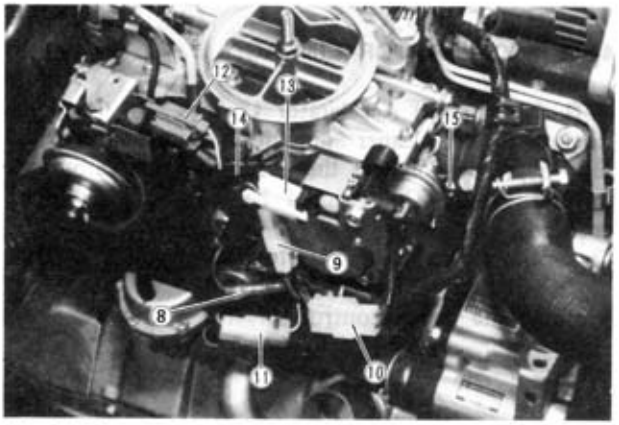

Fig. 4–25

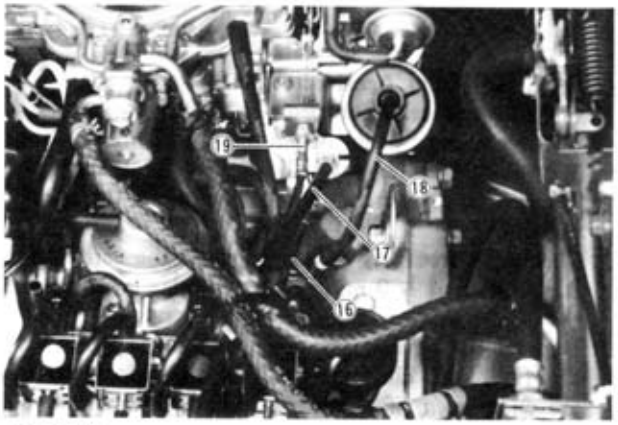

Fig. 4–26

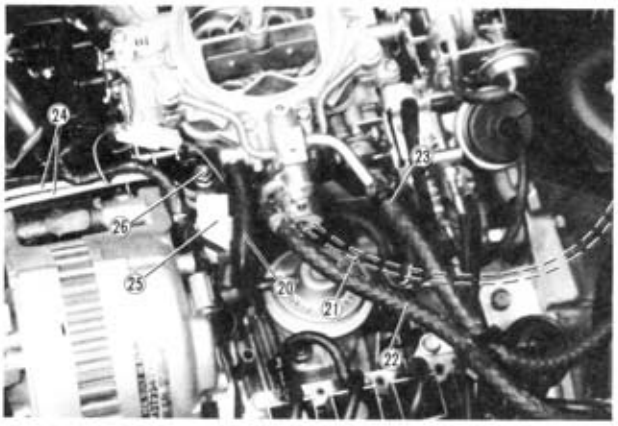

Fig. 4–27

4–H. CARBURETOR

4–H–1. Removing Carburetor

Remove and disconnect the following parts.

1. Air cleaner cover
2. Idle compensator tube
3. Coasting valve hose (Manual transmission)
4. Air pump inlet hose
5. Hot air hose
6. Air hose
7. Air cleaner
8. Coasting richer connector (Manual transmission)
9. Choke heater coupler
10. Idle switch coupler (Manual transmission)
11. Power valve solenoid coupler (Except for Canada with manual transmission)
12. Choke return solenoid valve coupler (Except for California and Canada)
13. Anti-afterburn valve solenoid coupler
14. Anti-afterburn valve solenoid tube
15. Metering oil pump connecting rod
16. Hot start assist cable
17. Accelerator cable
18. Vacuum sensing tube (Throttle opener)
19. Choke cable
20. Air vent hose
21. Sub-zero start assist fluid hose (Except for California)
22. Fuel return hose
23. Fuel main hose
24. Metering oil pump tubes
25. Air vent solenoid valve coupler
26. Carburetor attaching nuts

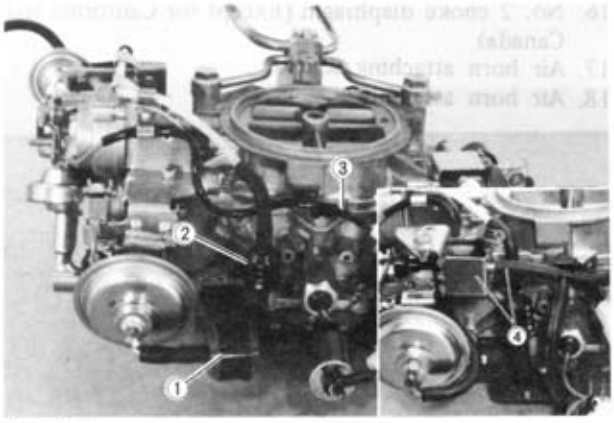

Fig. 4–28

4–H–2. Disassembling Carburetor

a. Bimetal spring housing assembly and air horn
Remove and disconnect the following parts.

1. Choke return delay valve (California)
2. Choke delay valve (Except for Canada)
3. Choke heater lead
4. Choke return solenoid valve (Except for California and Canada)

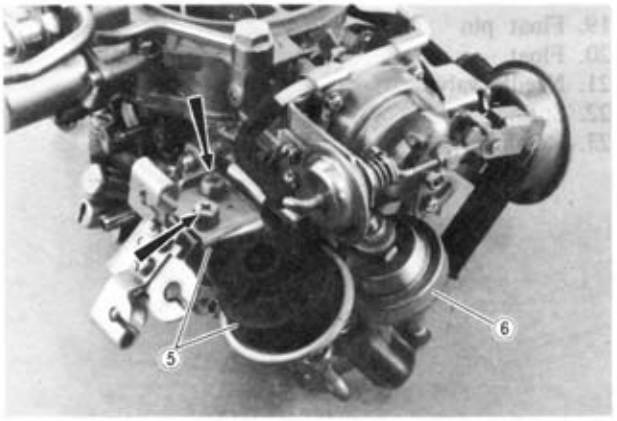

Fig. 4–29

5. Throttle opener and bracket assembly
6. Dash pot (Manual transmission)

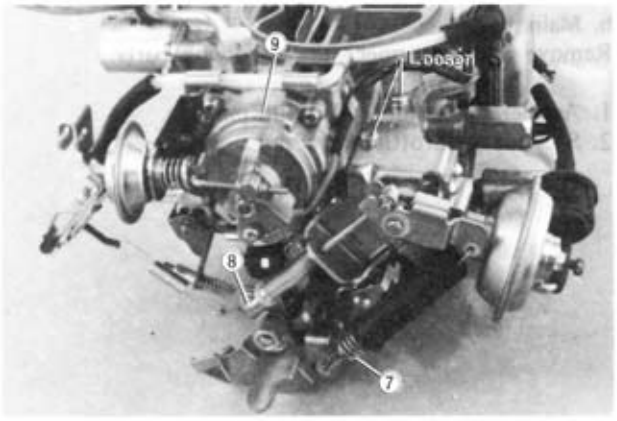

Fig. 4–30

7. Throttle return spring
8. Throttle sub-return spring
9. Bimetal spring housing assembly

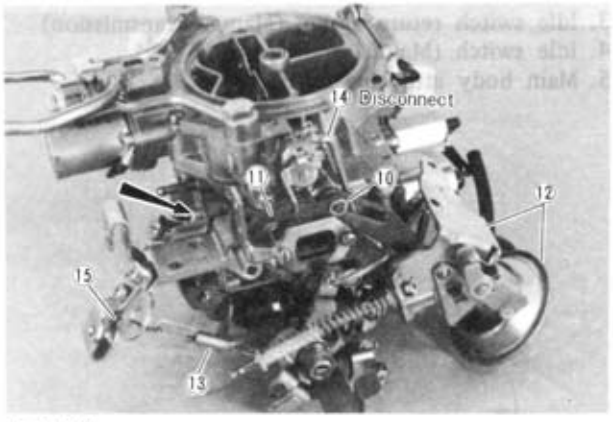

Fig. 4–31

10. Clip
11. Choke lever
12. Choke return diaphragm and bracket assembly (Except for Canada)
13. Hot start assist lever spring
14. Fast idle rod (split pin)
15. Bracket

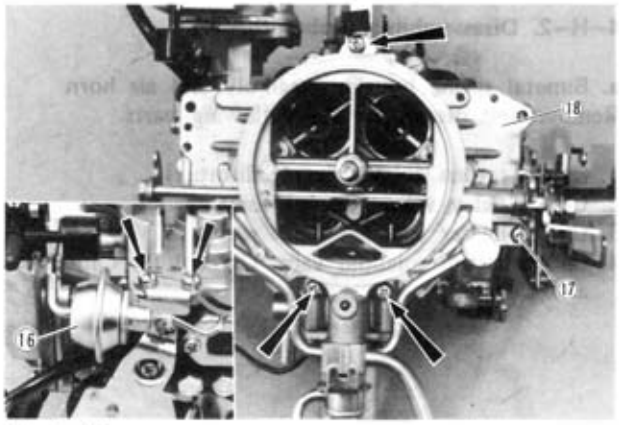

Fig. 4–32

16. No. 2 choke diaphragm (Except for California and Canada)
17. Air horn attaching screws
18. Air horn assembly

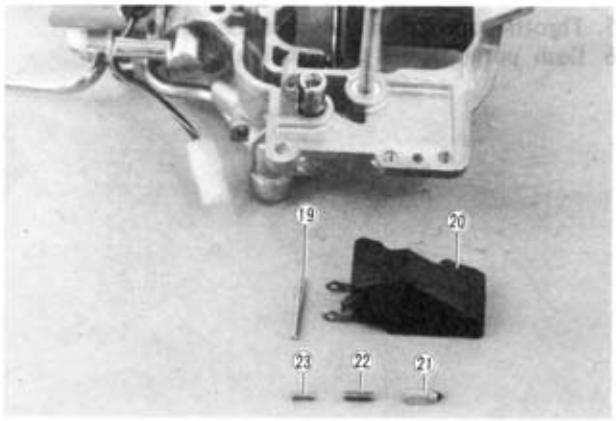

Fig. 4–33

19. Float pin
20. Float
21. Needle valve
22. Spring
23. Retainer

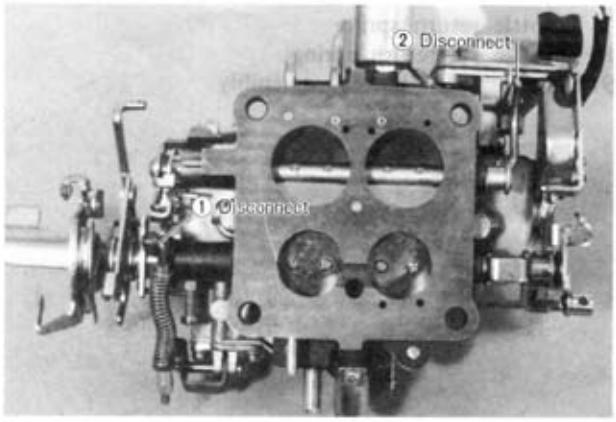

Fig. 4–34

b. Main body
Remove and disconnect the following parts.

1. Accelerator pump rod (split pin)
2. Secondary throttle valve rod

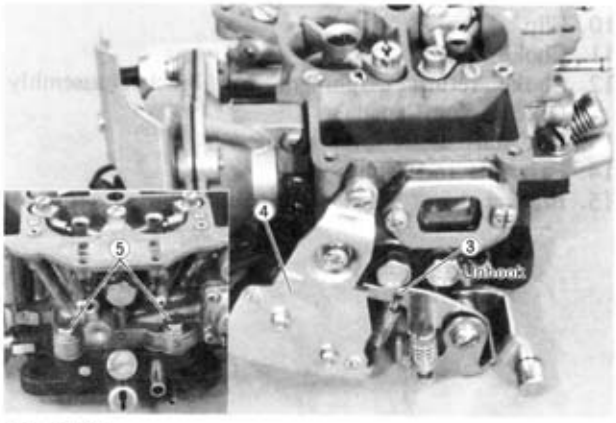

Fig. 4–35

3. Idle switch return spring (Manual transmission)
4. Idle switch (Manual transmission)
5. Main body attaching bolts.

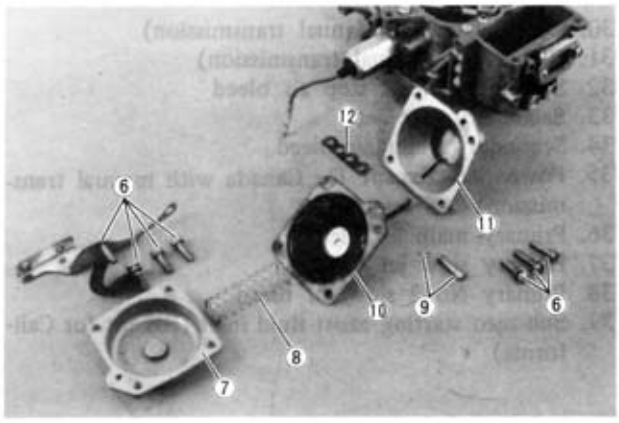

Fig. 4–36

6. Attaching screws
7. Cover
8. Return spring
9. Pin and clip
10. Diaphragm
11. Housing
12. Gasket

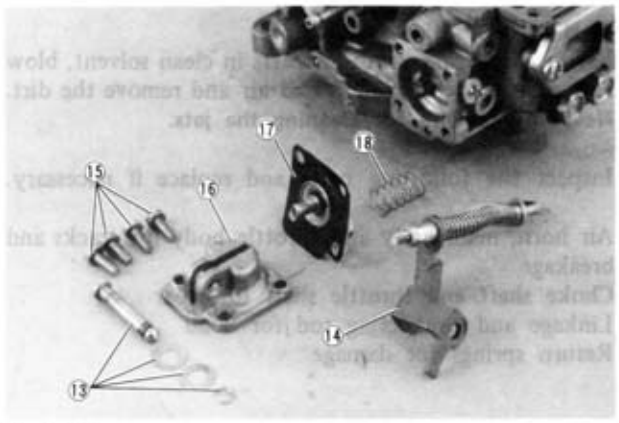

Fig. 4–37

13. Clip, washers and shaft
14. Accelerator pump lever
15. Attaching screws
16. Cover
17. Diaphragm
18. Return spring

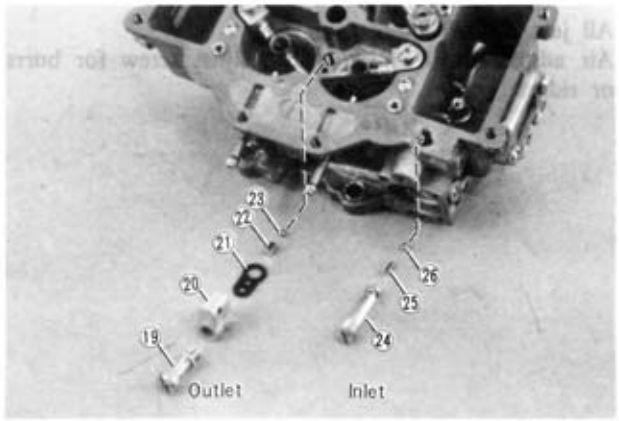

Fig. 4–38

19. Screw
20. Nozzle
21. Gasket
22. Weight
23. Outlet check valve
24. Check valve seat
25. Weight
26. Inlet check valve

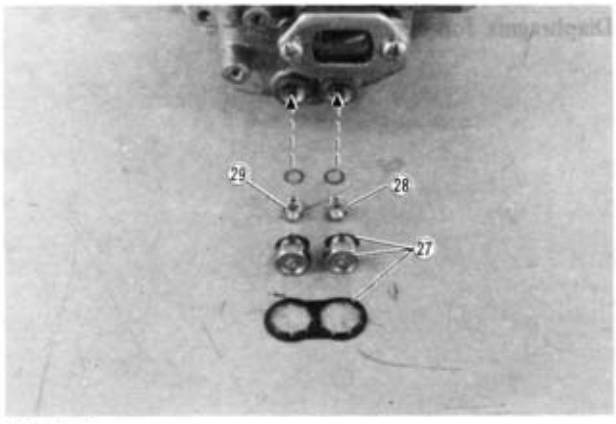

Fig. 4–39

27. Retainer, blind plug and washer
28. Primary main jet
29. Secondary main jet

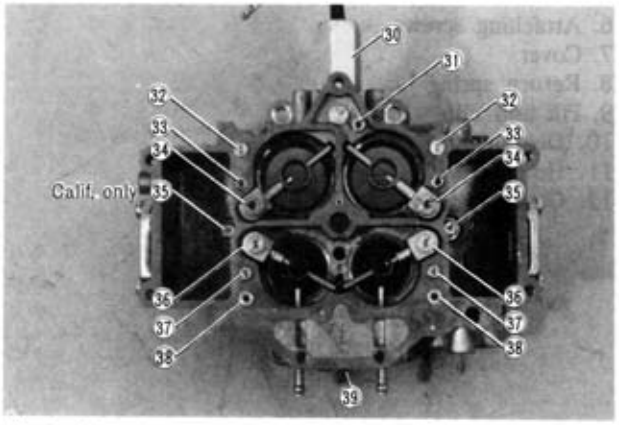

Fig. 4–40

30. Coasting richer (Manual transmission)
31. Richer jet (Manual transmission)
32. Secondary No. 2 step air bleed
33. Secondary step jet
34. Secondary main air bleed
35. Power jet (Except for Canada with manual transmission)
36. Primary main air bleed
37. Primary slow jet
38. Primary No. 2 slow air bleed
39. Sub-zero starting assist fluid inlet (Except for California)

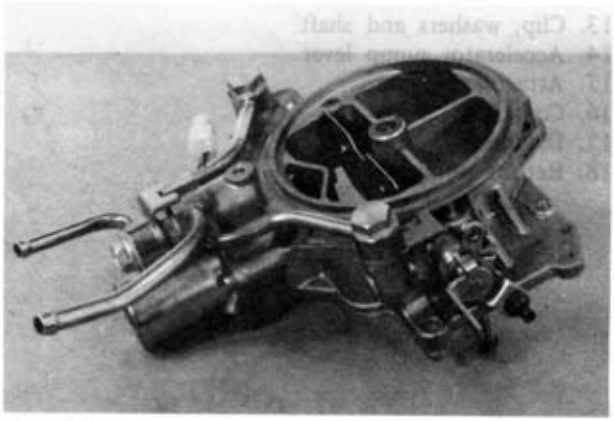

Fig. 4–41

4–H–3. Inspecting Carburetor

Before inspecting, wash all parts in clean solvent, blow fuel passages with compressed air and remove the dirt. **Never use a wire for cleaning the jets.**

Inspect the following parts and replace if necessary.

Air horn, main body and throttle body for cracks and breakage
Choke shaft and throttle shaft for wear
Linkage and connecting rod for bend
Return springs for damage

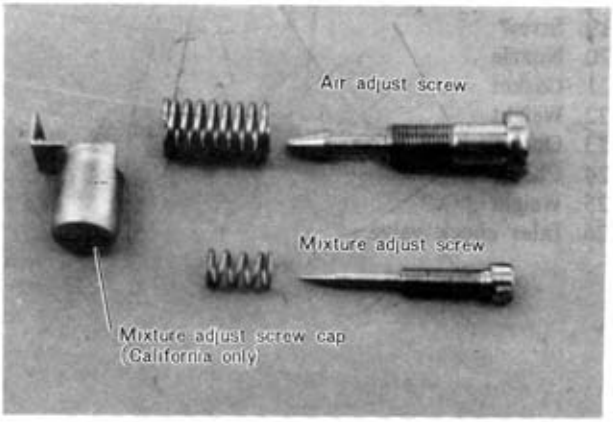

Fig. 4–42

All jets and air bleeds for clog
Air adjust screw and mixture adjust screw for burrs or ridges

Diaphragms for damage

Fig. 4–43

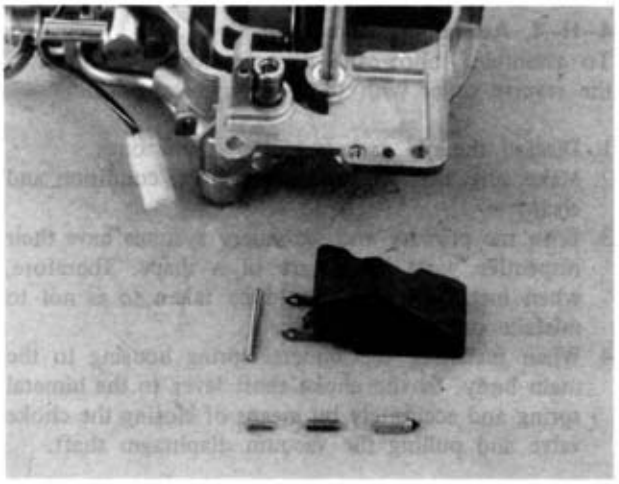

Fig. 4–44

Inspect the following parts and replace if necessary.

Float for damage
Needle valve and seat for wear or rust
Strainer for clog or rust

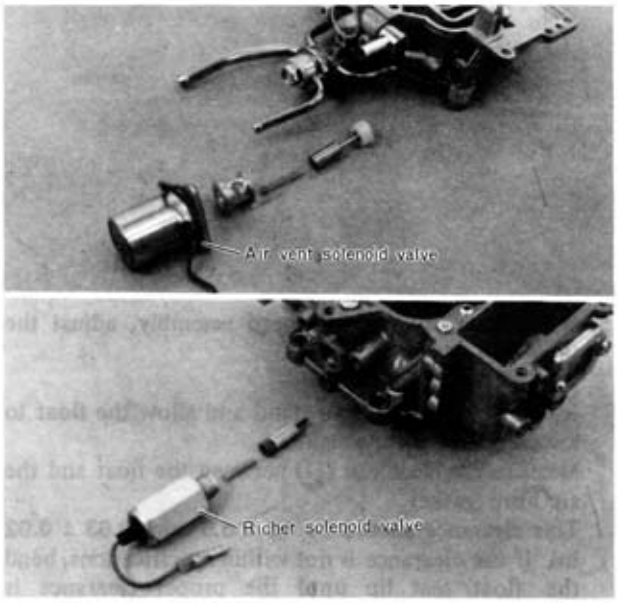

Fig. 4–45

Air vent solenoid valve
Richer solenoid valve (Manual transmission)
When battery power is applied to the solenoid valve, the valve stem should be pulled in to the valve body.

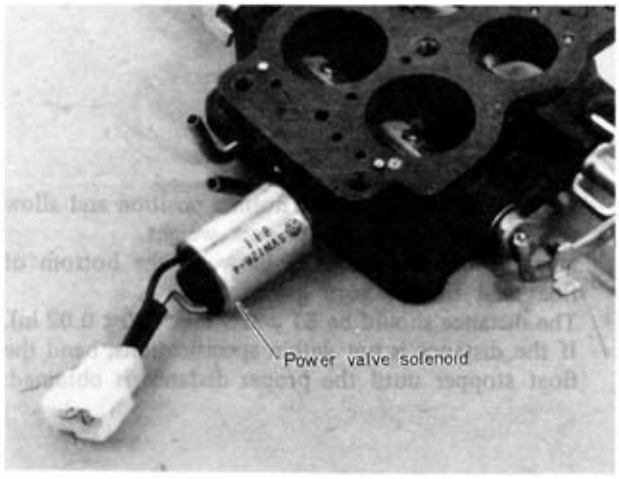

Fig. 4–46

Power valve solenoid (Except for Canada with manual transmission)
When battery power is applied to the solenoid valve, the valve stem should be come out from the valve body.

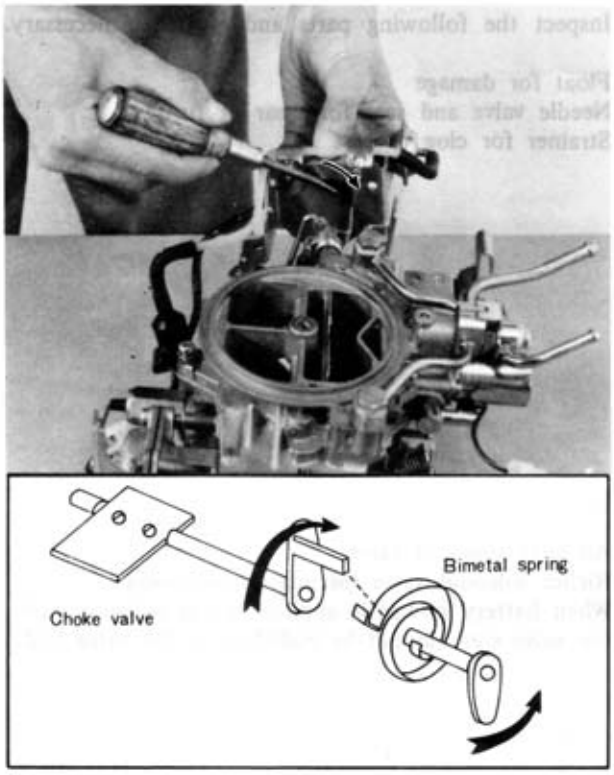

Fig. 4–47

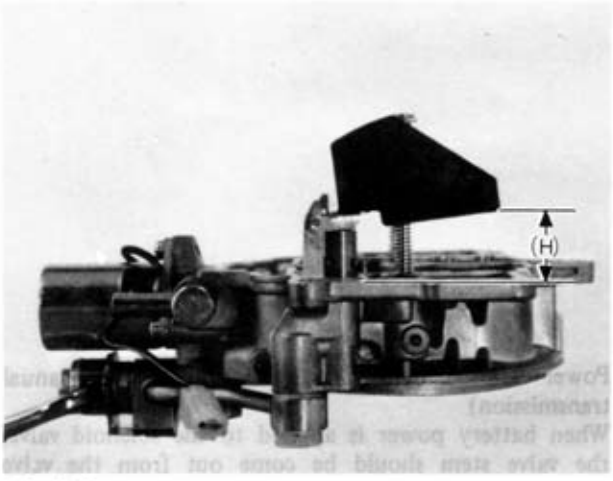

Fig. 4–48

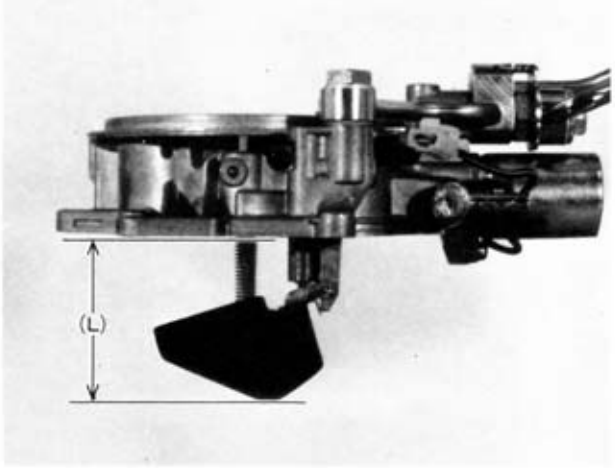

Fig. 4–49

4–H–4. Assembling Carburetor

To assemble, follow the disassembling procedures in the reverse order with the following cautions.

1. Discard the old gaskets and use new ones.
2. Make sure that all parts are in good condition and clean.
3. Both the primary and secondary systems have their respective parts which are of a shape. Therefore, when installing, care should be taken so as not to mistake one for the other.
4. When installing the bimetal spring housing to the main body, fit the choke shaft lever to the bimetal spring and accurately by means of closing the choke valve and pulling the vacuum diaphragm shaft.

5. Before installing the air horn assembly, adjust the float level as follows:

   Invert the air horn on a stand and allow the float to lower by its own weight.
   Measure the clearance (H) between the float and the air horn gasket.
   This clearance should be **16 ± 0.5 mm (0.63 ± 0.02 in)**. If the clearance is not within specifications, bend the float seat lip until the proper clearance is obtained.

   Turn the air horn to the normal position and allow the float to lower by its own weight.
   Measure the distance (L) between the bottom of float and the air horn gasket.
   The distance should be **51 ± 0.5 mm (2.0 ± 0.02 in)**.
   If the distance is not within specifications, bend the float stopper until the proper distance is obtained.

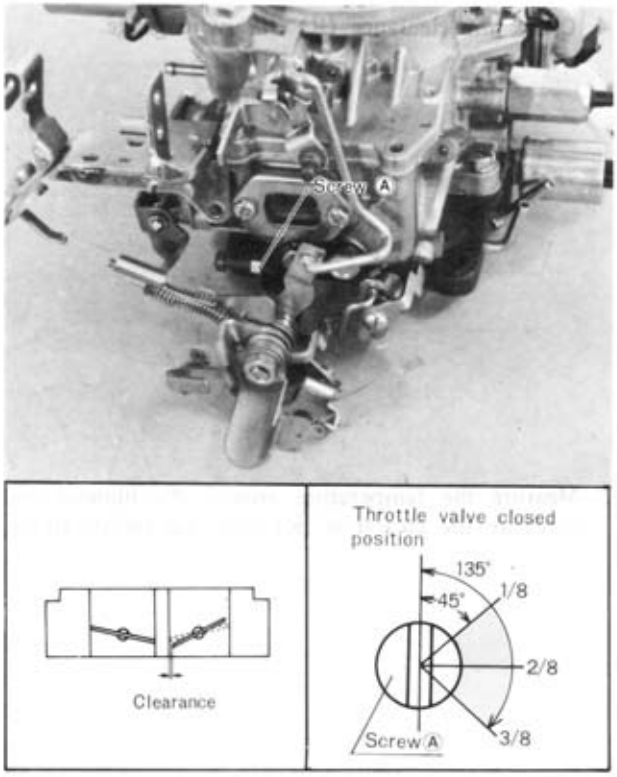

Fig. 4–50

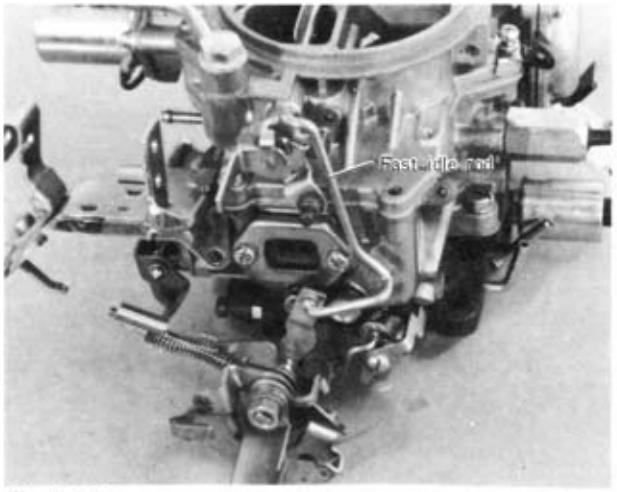

Fig. 4–51

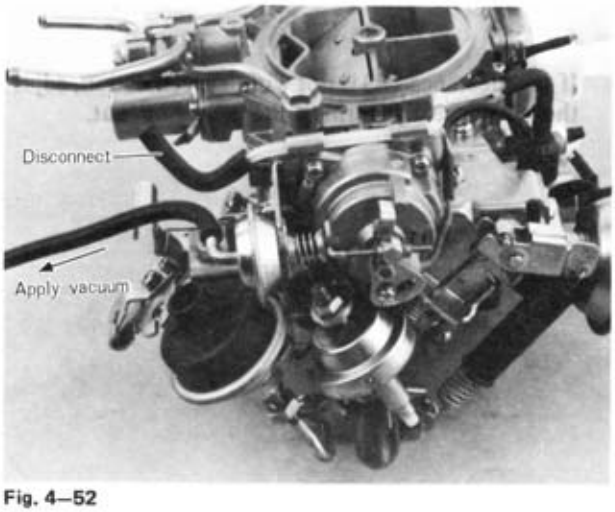

Fig. 4–52

4–H–5. Adjusting Carburetor

a. Primary throttle valve initial opening angle

1. Loosen the lock nut and unscrew the screw (A)
2. Close the throttle valve completely and gradually screw in the screw (A) until the screw just touches the throttle lock lever. Then, further screw in the screw (A) which is is the above position by **1/8 ~ 3/8 turns.**
3. Tighten the lock nut.

Clearance: 0.05 mm (0.002 in)
Initial opening angle: 1°

Note:
The above adjustment should be done when the throttle body, throttle lock lever and screw (A) have been changed.

b. Fast idle opening angle

With the choke valve fully closed, measure the clearance between the primary throttle valve and the wall of the throttle bore.

Clearance:

U.S.A.	1.30 ~ 1.50 mm (0.051 ~ 0.059 in)
Canada	0.90 ~ 1.10 mm (0.035 ~ 0.04 in)

If the clearance is not within specification, bend the fast idle rod until the proper clearance is obtained.

c. Choke valve opening angle

1. Disconnect the vacuum sensing tube from the vacuum diaphragm.
2. Fully pull out the choke lever link and keep its position.
3. Apply the vacuum of **more than 500 mm-Hg (19.7 in-Hg)** to vacuum diaphragm.

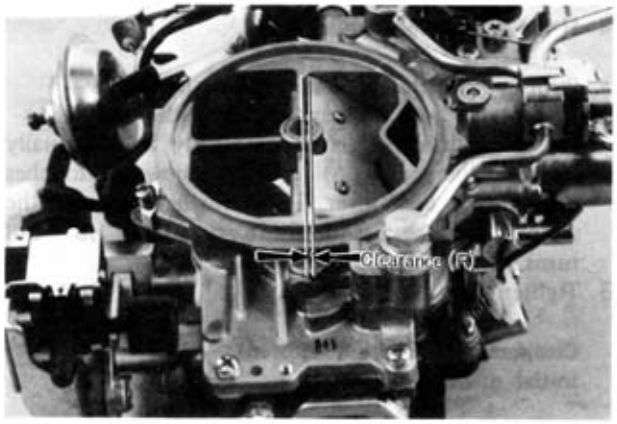

Fig. 4–53

4. Check the clearance (R) with wire gauge.

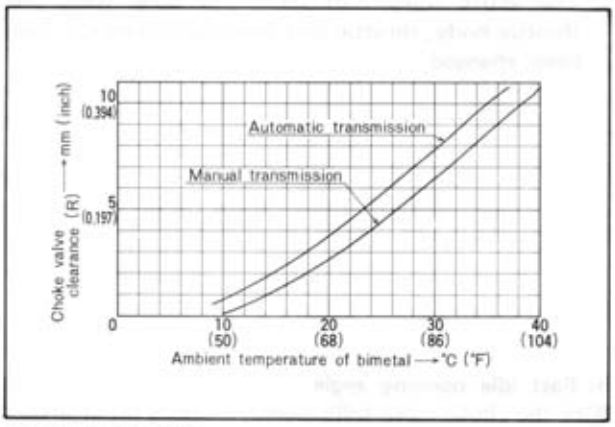

Fig. 4–54 California

5. Measure the temperature around the bimetal and compare the clearance (R) with the specifications.

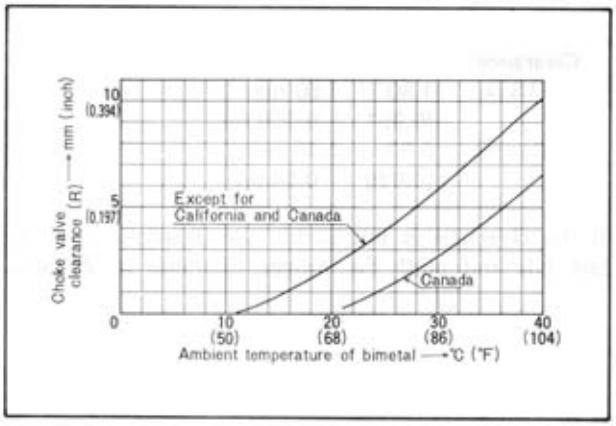

Fig. 4–55 Canada and except for California

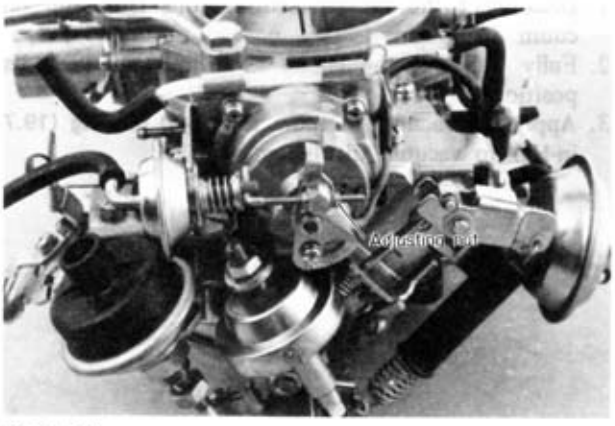

Fig. 4–56

If the clearance (R) is not within specification, adjust the clearance by turning the adjusting nut.

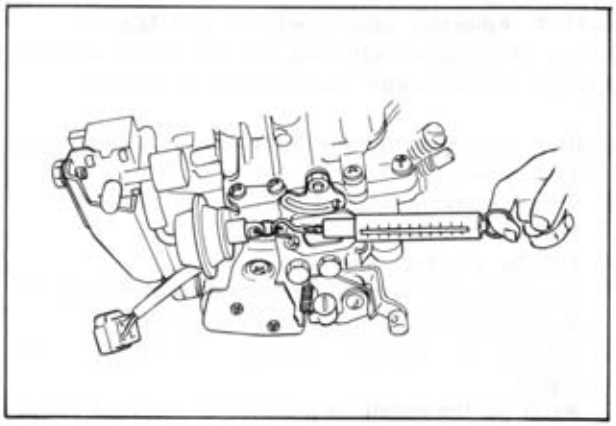

Fig. 4–57

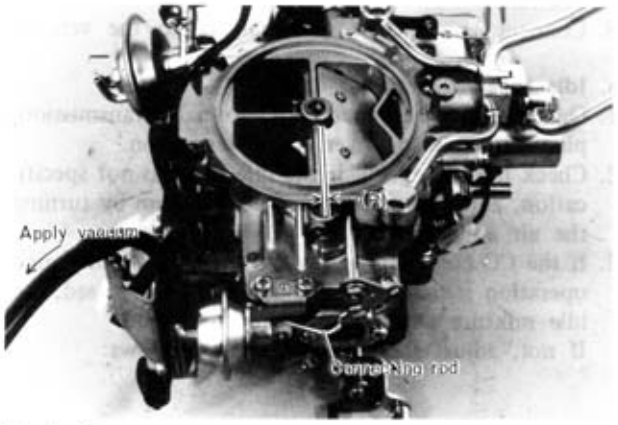

Fig. 4–58

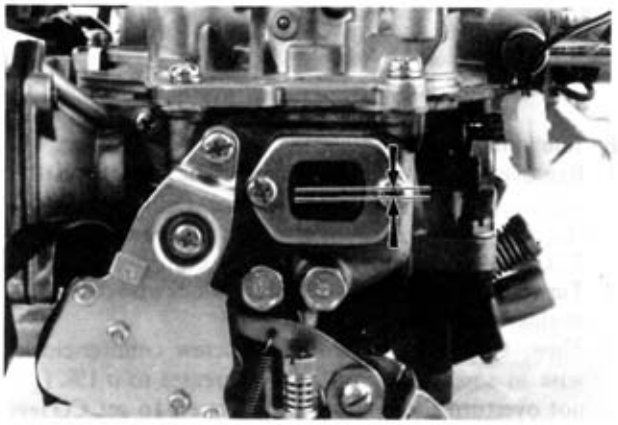

Fig. 4–59

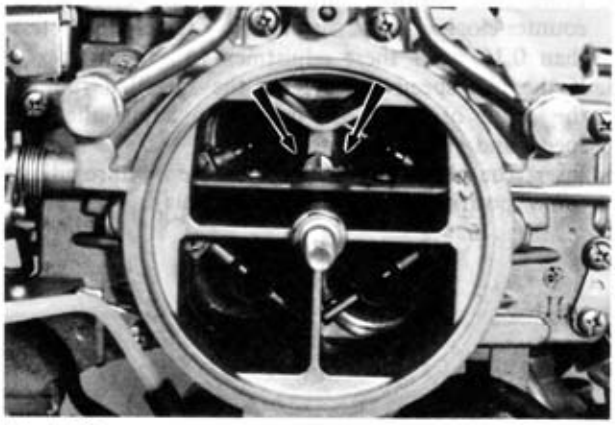

Fig. 4–60

d. No. 2 Choke diaphragm (except for Calif. and Canada)

1. Disconnect the connecting rod of the No. 2 choke diaphragm and hook the spring scale onto the diaphragm shaft.
2. Slowly pull the spring scale and take a reading of the spring scale when the diaphragm shaft just starts come out.
   The reading should be **34 ~ 52 gr (1.2 ~ 1.8 oz).**
3. Pull out the diaphragm shaft about 3.3 ± 0.3 mm (0.13 ± 0.01 in) and make sure the reading of the spring scale is **54 ~ 82 gr (1.9 ~ 2.9 oz).**
4. Reconnect the connecting rod of the No. 2 choke diaphragm.
   Fully pull out the choke lever link and keep its position.

5. Apply the vacuum of **more than 450 mm-Hg (17.7 in-Hg)** to the No. 2 choke diaphragm and fully push in the diaphragm shaft (plastic shaft) with finger. Check the clearance (R) with wire gauge. The clearance (R) is **1.78 ~ 2.94 mm (0.070 ~ 0.116 in).**
   Next, pull out the diaphragm shaft (plastic shaft) with finger and check the clearance (R). The clearance (R) is **1.02 ~ 1.38 mm (0.040 ~ 0.054 in).**

4–H–6. Installing Carburetor

Install the carburetor in the reverse order of removing.

Note:
Push in the hose ends of the fuel main and fuel return hoses to the carburetor fittings until the fittings are inserted to 30 ~ 35 mm (1.2 ~ 1.4 in).

After installing, **note** the followings.

1. Start the engine and check for fuel leakage.
2. With the engine operating, check the fuel level. The fuel level should be in the specified mark in the sight glass.

3. Inspect the accelerator pump as follows.

1) Place the vehicle on a level ground.
2) Remove the air cleaner cover.
3) Start the engine and check if the fuel level is to the specified mark in the sight glass.
4) Stop the engine. Operate the throttle valve and check to see that the fuel is discharged from the nozzles of the pump.

4. Adjust the idle speed and idle mixture as instructed in Par. 4–H–7.

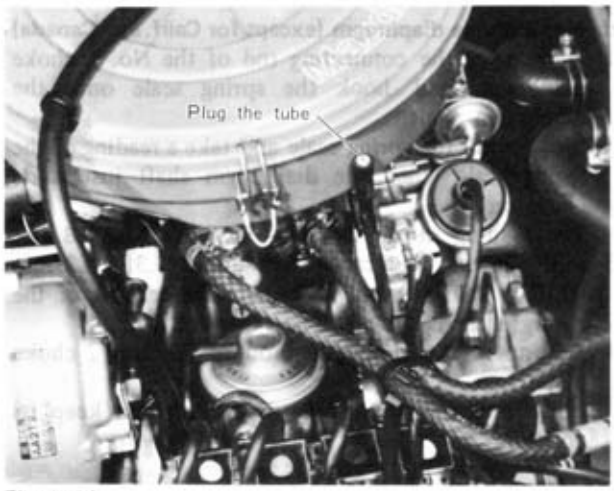

Fig. 4–61

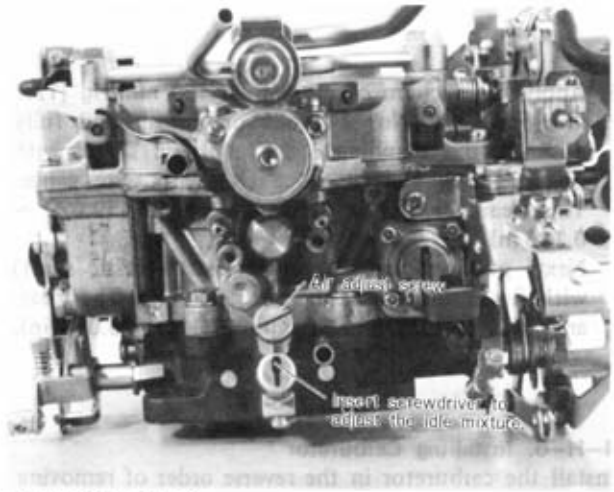

Fig. 4–62 California

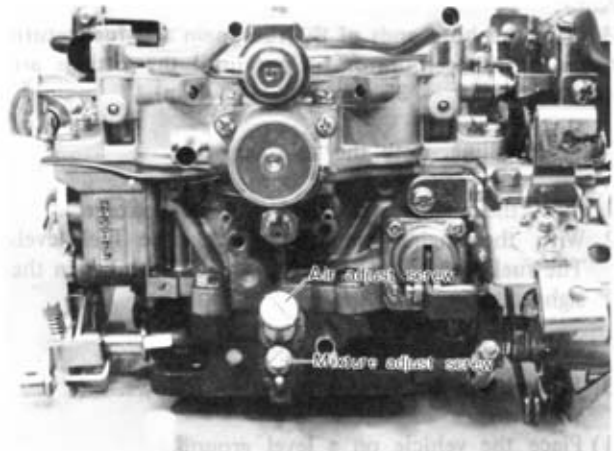

Fig. 4–63 Except for California

Idle speed:

Manual transmission	750 ± 25 rpm in neutral
Automatic transmission	750 ± 25 rpm in "D" range

CO concentration (with air injection):

All vehicles	Less than 0.1%

4–H–7. Adjusting Idle Speed and Idle Mixture

Before checking or adjusting the idle speed and idle mixture, the following items should be made.

1. Blow the engine room with the additional cooling fan if available.
2. Set the parking brake and block the wheels.
3. Switch off the all accessaries.
4. Remove the fuel filler cap.
5. Disconnect the tube at the idle compensator in the air cleaner and plug the end of the tube.
6. Connect an accurate reading tachometer to the engine.
7. Warm up the engine to the normal operating temperature and run it three minutes at **2,000 rpm** in neutral.
8. Connect an exhaust gas analyzer to the vehicle.

a. Idle speed

1. On the vehicle equipped with automatic transmission, place the selector lever to "D" position.
2. Check the idle speed. If the idle speed is not specification, adjust the idle speed to **750 rpm** by turning the air adjust screw.
3. If the CO concentration is less than 0.1% and engine operation is stable after adjusting the idle speed, the idle mixture adjustment is not required.
   If not, adjust the idle mixture as follows:

b. Idle mixture

1. Remove the idle limiter cap (Plastic cap) from the mixture adjust screw (Except for California).
   On the California vehicles, use a **screwdriver** (49 8343 869) to adjust the idle mixture.
2. Turn the mixture adjust screw clockwise until the engine hunts severely.
3. Then, turn the mixture adjust screw counter-clockwise in small steps until CO decreases to 0.1%. (Do not overturn the mixture adjust screw to get CO less than 0.1%.)
4. From that position, turn the mixture adjust screw counter-clockwise 1/2 turn. (Idle CO should be less than 0.1% after these adjustments.)
5. If the idle speed shifts from the specified rpm as the result of the above procedure, adjust the idle speed and repeat the procedure 2 ~ 5.
6. Insert the idle limiter cap to fix the mixture adjust screw position (Except for California).

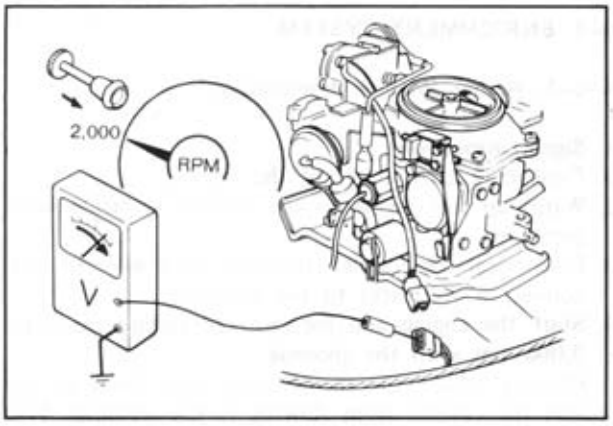

Fig. 4–64

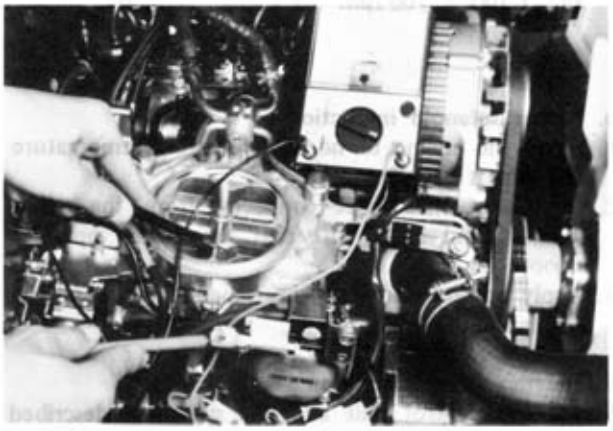

Fig. 4–65

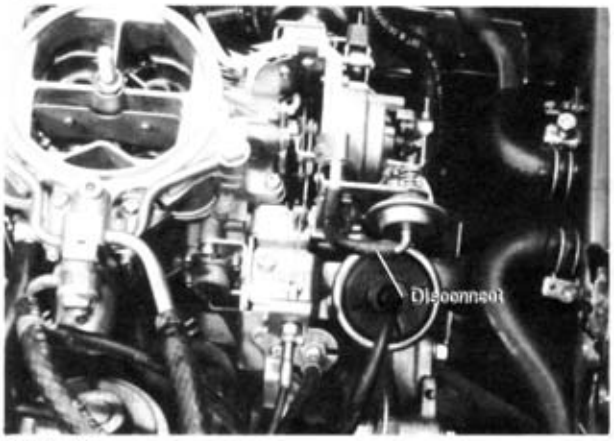

Fig. 4–66

Fig. 4–67

4–H–8. Checking Carburetor Heater

1. Disconnect the coupler of the No. 1 water temperature switch and connect a jumper wire to both terminals in the coupler.
2. Connect a tachometer to the engine.
3. Disconnect the carburetor heater coupler and connect a voltmeter to the coupler.
4. Start the engine and set engine speed to **2,000 rpm with choke knob.**
   See that current flows to the carburetor heater lead, but it does not flow when the choke knob is pushed back completely.
5. Connect one probe of an ohmmeter to the carburetor heater lead and the other to the carburetor body. If there is no meter movement, the carburetor heater is open circuit and must be replaced.

4–H–9. Checking No. 1 Choke Diaphragm

1. Remove the air cleaner assembly.
2. Start the engine and run it at idle.
3. Disconnect the vacuum sensing tube from the No. 1 choke diaphragm.
   The diaphragm shaft should be come out from the No. 1 choke diaphragm.

4–H–10. Checking Choke Delay Valve (Except for Canada)

1. Warm up the engine to the normal operating temperature.
2. Stop the engine and remove the air cleaner assembly.
3. Disconnect the vacuum sensing tube from the No. 1 choke diaphragm.
4. Start the engine and run it at idle. Check to see that the diaphragm shaft is fully pulled in to the diaphragm in **10 ~ 20 seconds** after connecting the disconnected vacuum sensing tube to the No. 1 choke diaphragm.

Note:

On the vehicle equipped with automatic transmission, place the selector lever to "N" position.

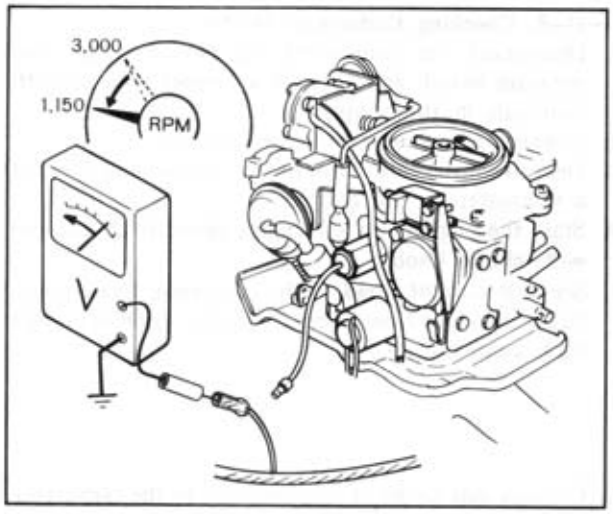

Fig. 4–68

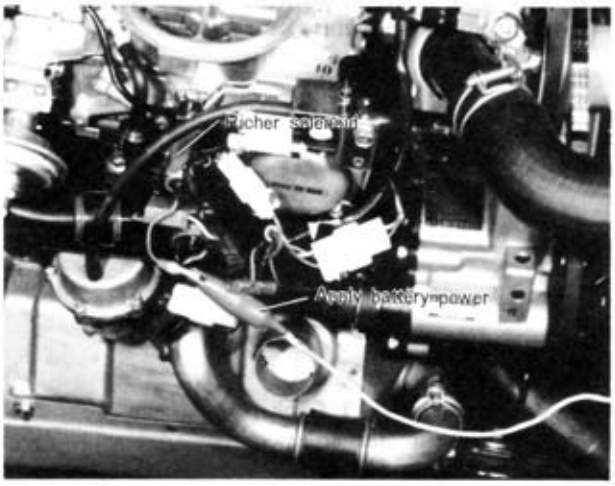

Fig. 4–69

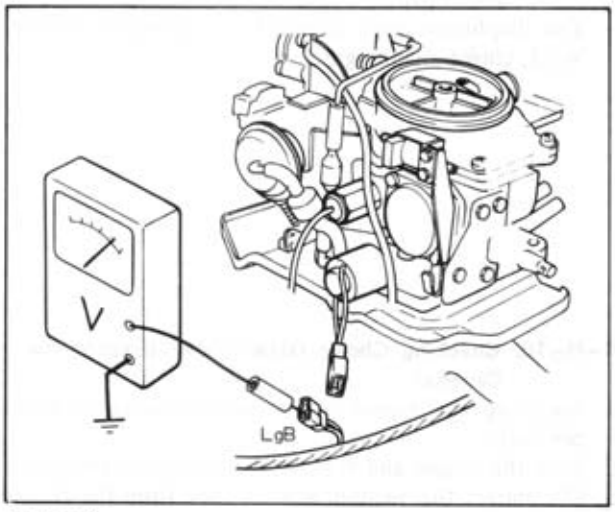

Fig. 4–70

4–I. ENRICHMENT SYSTEM

4–I–1. Richer (Manual transmission)

a. Signal inspection

1. Connect a tachometer to the engine.
2. Warm up the engine to the normal operating temperature.
3. Disconnect the coupler from the richer solenoid and connect a voltmeter to the terminal.
4. Start the engine and increase the engine speed to **3,000 rpm with the throttle.**
   Quickly release the throttle lever and check to see that the current stops flowing to the terminal. The engine speed should be **1,150 ± 100 rpm** for U.S.A. and **1,100 ± 100 rpm** for Canada vehicles.

b. Richer solenoid inspection

1. Warm the engine to normal operating temperature and run it at idle.
2. Disconnect the bullet connector from the richer solenoid and make sure that the engine operates smoothly.
3. Apply battery power to the richer solenoid and the engine should hunt or die.

c. Relative parts inspection

Check the control unit and idle switch as described in Par. 1A–G.

4–I–2. Power Valve

a. Signal inspection (U.S.A.)

1. Warm the engine to normal operating temperature and stop the engine.
2. Disconnect the coupler from the power valve solenoid and connect a voltmeter to the terminal.
3. Disconnect the coupler from the vacuum switch (Automatic transmission and California with manual transmission).

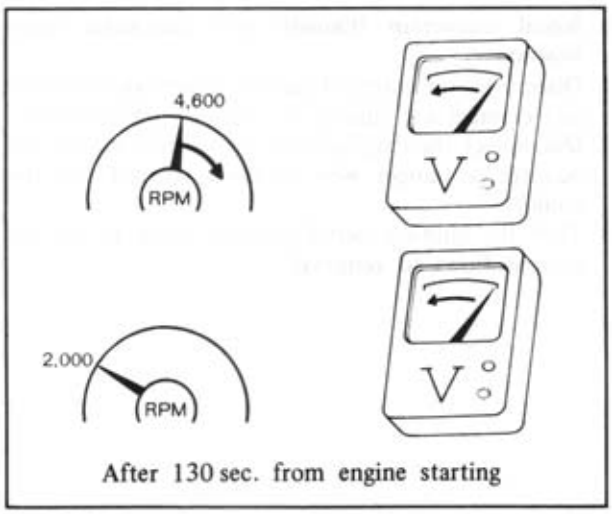

Fig. 4–71

4. Start the engine with choke knob fully pulled and push back the choke knob completely.
5. Increase the engine speed from **2,000 rpm** and check to see that current stops flowing to terminal when the engine speed is **more than 4,600 ± 400 rpm.**

6. Increase the engine speed to **2,000 rpm with the throttle** and check to see that the current stops flowing to terminal **after 130 ± 26 seconds** from engine starting in Step 4.

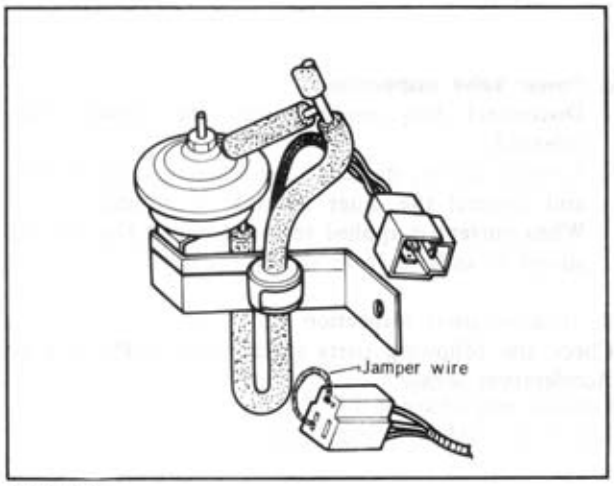

Fig. 4–72

7. Connect a jumper wire to both terminals in the disconnected vacuum switch coupler in Step 3 (Automatic transmission and California with manual transmission).

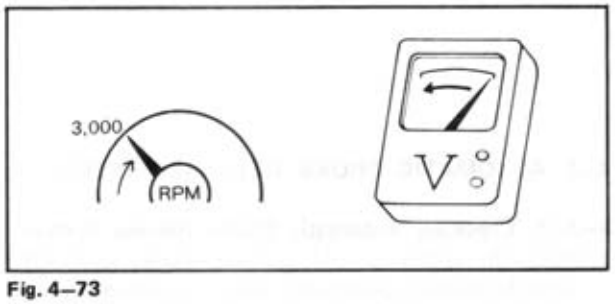

Fig. 4–73

8. Slowly increase the engine speed and check to see that current stops flowing to terminal when the engine speed is **more than 3,000 ± 300 rpm** and **3,300 ± 300 rpm** for California with automatic transmission.

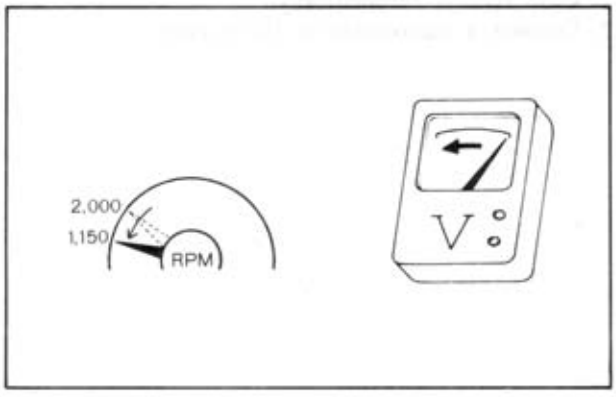

Fig. 4–74

9. Increase engine speed to **2,000 rpm with throttle.** Slowly decrease engine speed and record the engine speed at which current stops flowing to terminal. The engine speed should be **1,150 ± 100 rpm.**
10. Slowly increase the engine speed from idle and check the engine speed at which current begins flowing. The difference between the engine speeds recorded in Steps 9 and 10 should be **150 ± 70 rpm.**

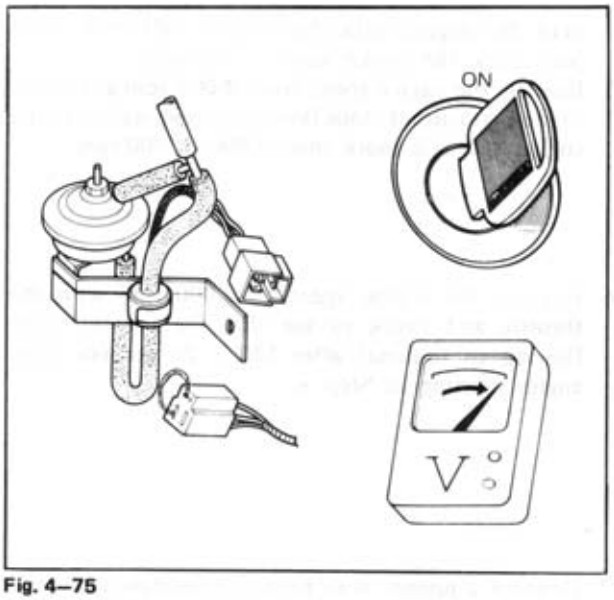

Fig. 4–75

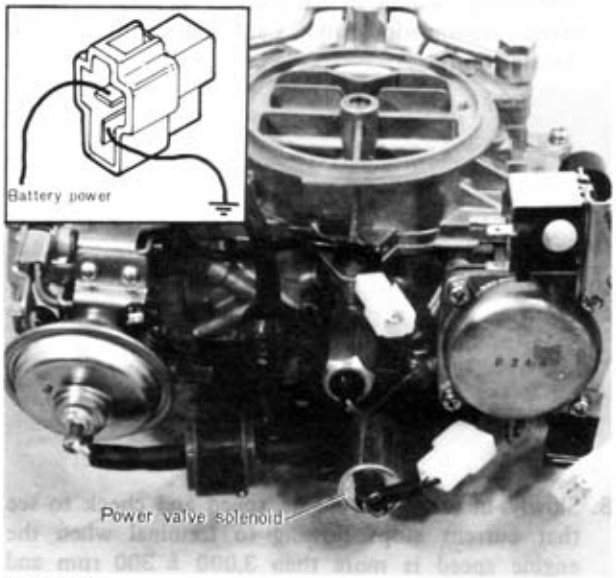

Fig. 4–76

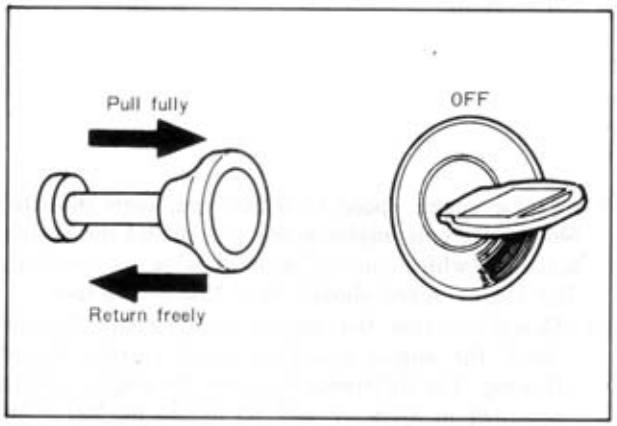

Fig. 4–77

b. Signal inspection (Canada with automatic transmission)

1. Disconnect the coupler from the power valve solenoid and connect a voltmeter to terminal in the coupler.
2. Disconnect the coupler from the vacuum switch and connect a jumper wire to both terminals in the coupler.
3. Turn the ignition switch on and check to see the current flows to terminal.

c. Power valve inspection

1. Disconnect the coupler from the power valve solenoid.
2. Connect battery power to the teminal in the coupler, and connect the other terminal to ground.
   When current is applied to the solenoid, the clicking sound is audible from the solenoid.

d. Relative parts inspection

Check the following parts as described in Par. 1A–G.
Acceleration sensor
Control unit (Except for Canada)
Idle switch (Manual transmission)

4–J. AUTOMATIC CHOKE RELEASE SYSTEM

4–J–1. Checking Automatic Choke Release System

1. When the engine is cold, pull the choke knob fully with the ignition switch off, and check that the choke knob returns automatically.
2. Connect a tachometer to the engine.

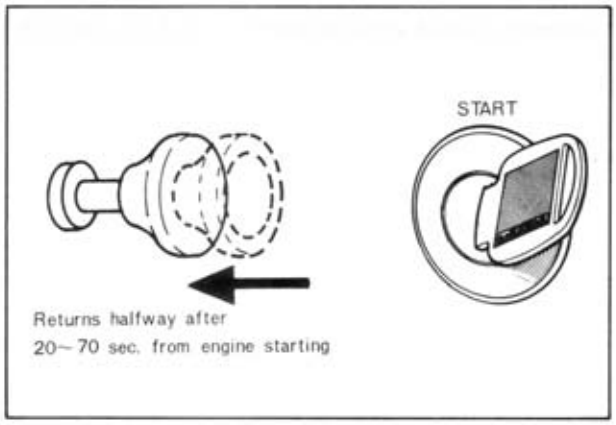

Fig. 4–78

3. On the U.S.A. vehicles, start the engine with the choke knob fully pulled and see taht the choke knob automatically returns halfway **within the specifications after engine starting.**

Specifications:
California 20 ~ 70 seconds
Except for California 48 ~ 72 seconds

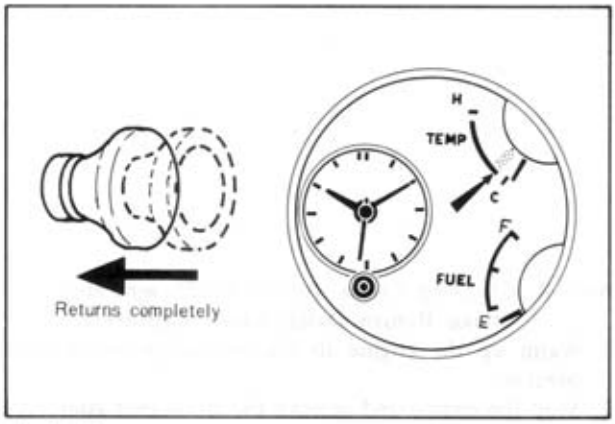

Fig. 4–79

4. Set engine speed to **2,000 rpm with choke knob.**
5. Leave the engine running and see that the choke knob automatically returns completely when the temperature gauge indicates the range shown in figure.

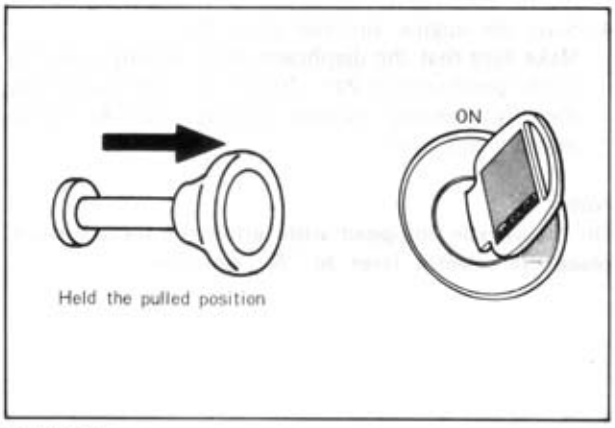

Fig. 4–80

6. On the U.S.A. vehicles, stop the engine.
Pull the choke knob fully with the ignition switch on.
The choke knob should be held the pulled position.

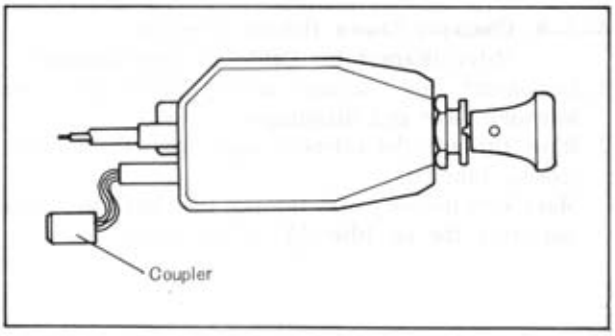

Fig. 4–81

4–J–2. Checking Choke Magnet

1. Disconnect the coupler from the choke switch.
2. Check the continuity between the numbered terminals in the coupler using an ohmmeter.

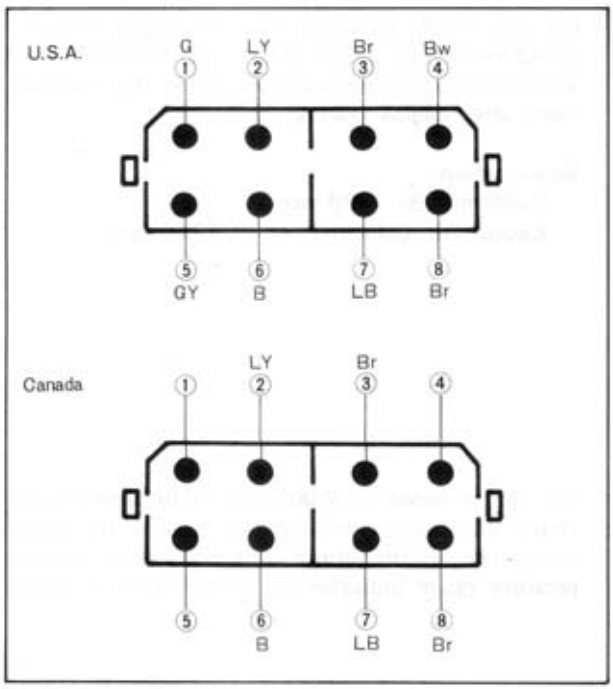

Fig. 4–82

Continuity should exist between ⑧ and ⑥ terminals.

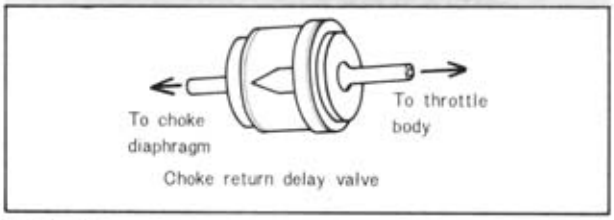

Fig. 4–83

4–J–3. Checking Choke Return Diaphragm and Choke Return Delay Valve (California)

1. Warm up the engine to the normal operating temperature.
2. Stop the engine and remove the air cleaner assembly.
3. Disconnect the vacuum sensing tube from the choke return diaphragm.
4. Start the engine and run it at idle.
   Make sure that the diaphragm shaft is fully pulled in to the diaphragm in **20 ~ 70 seconds** after connecting the disconnected vacuum sensing tube to choke return diaphragm.

Note:
On the vehicle equipped with automatic transmissions, place the selector lever to "N" position.

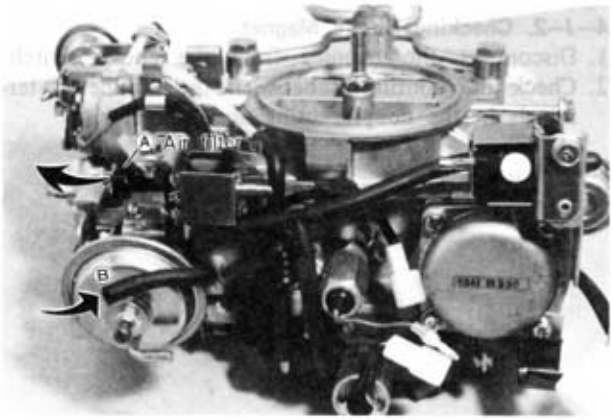

Fig. 4–84

4–J–4. Checking Choke Return Solenoid Valve (Except for California and Canada)

1. Disconnect the vacuum sensing tubes from the solenoid valve and diaphragm.
2. Blow through the solenoid valve from the vacuum sensing tube Ⓑ.
   Make sure the air passes through the valve and comes out from the air filter Ⓐ of the valve.

Fig. 4–85

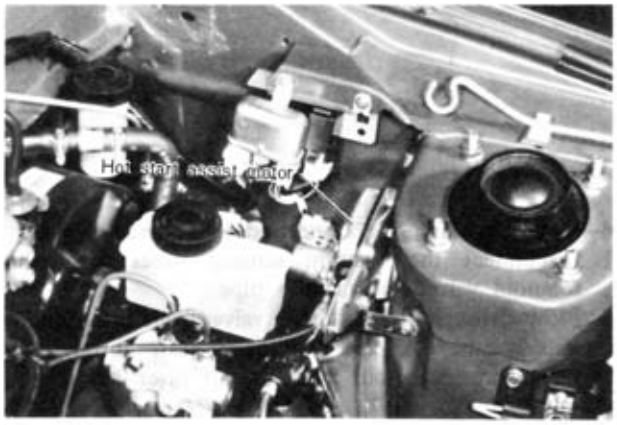

Fig. 4–86

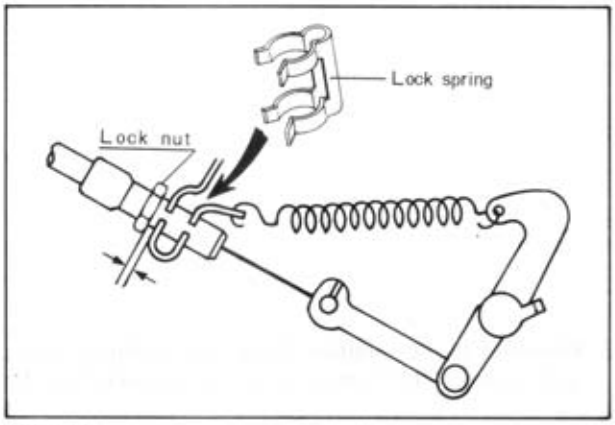

Fig. 4–87

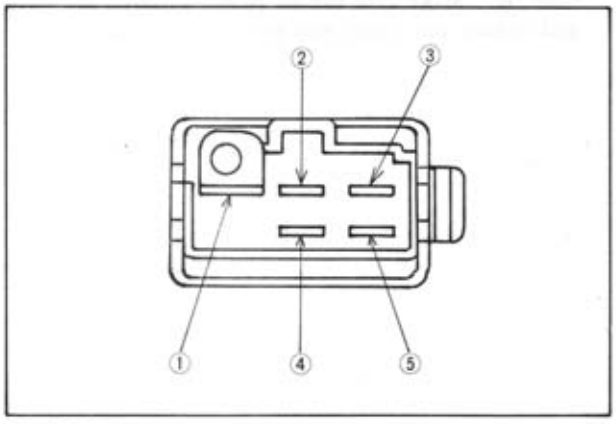

Fig. 4–88

3. Disconnect the coupler from the solenoid valve and connect the battery power to terminal on the valve.
4. Blow through the valve from the vacuum sensing tube (B).
   Make sure the air passes through the valve and comes out from the port (C).

4–J–5. Relative Parts

Check the following parts as described in Par. 1A–G.
Water temperature switch
Full choke switch (Except for Canada)
Control unit (Except for California and Canada)

4–K. HOT START ASSIST SYSTEM

4–K–1. Checking Hot Start Assist System

1. Inspect the hot start assist linkage for proper installation, no sticking or binding, and full return.
2. Warm the engine to normal operating temperature and stop the engine.
3. Disconnect the couplers for leading and trailing primary wires from the distributor.
4. Crank the engine. Check to see that the hot start lever operates and throttle valves open.

4–K–2. Adjusting Hot Start Assist Cable

1. Remove the lock spring of the hot start assist cable from the cable bracket.
2. Slowly pull the outer cable until the hot start lever just touches the stopper lever. Then check the clearance between the cable bracket and the lock nut of the cable. The clearance should be **1.25 ± 0.75 mm (0.05 ± 0.03 in)**. If the clearance is not within the specification, adjust it by turning the lock nut.
3. Install the lock spring of the cable securely.

4–K–3. Checking Hot Start Assist Relay

1. Disconnect the coupler from the relay.
2. Check the continuity, referring to the following table.

Numbers-continuity	Numbers-No continuity	Remarks
① to ⑤	① to ③	Without power applied
① to ③	① to ⑤	Connect the battery: positive to terminal ② and negative to ④.

4–K–4. Relative Part

Check the water temperature switch as described in Par. 1A–G.

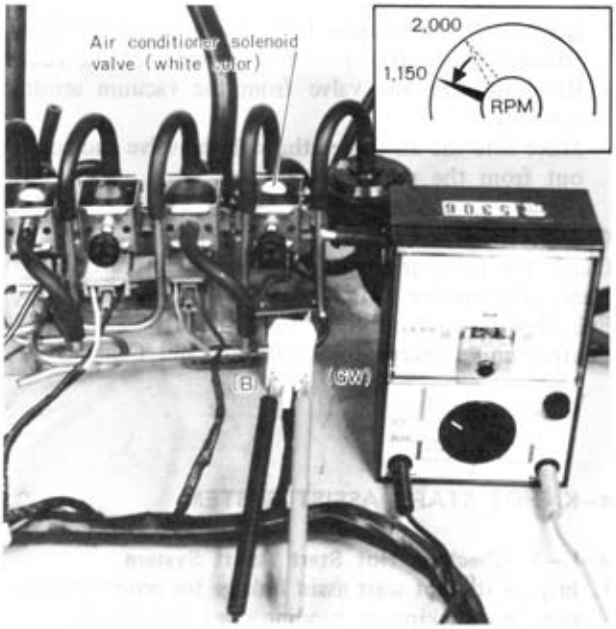

Fig. 4–89

4–L. THROTTLE OPENER

4–L–1. Checking Signal Inspection

1. Warm the engine to the normal operating temperature and stop the engine.
2. Connect a tachometer to the engine.
3. Disconnect the coupler from the air conditioner solenoid valve and connect a voltmeter to the terminal.
4. Start the engine and turn on the air conditioner compressor switch.
5. Increase the engine speed to **2,000 rpm with throttle.** Slowly decrease the engine speed and make sure that the current starts to flow when the engine speed is **1,150 ± 100 rpm.**

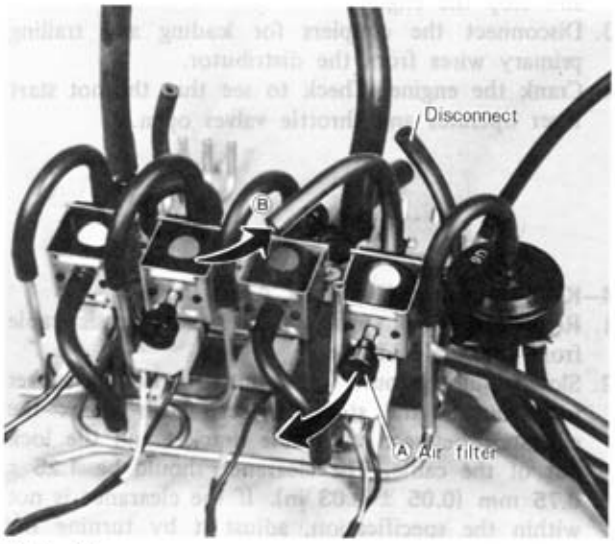

Fig. 4–90

4–L–2. Checking Air Conditioning Solenoid Valve

1. Disconnect the vacuum sensing tubes from the solenoid valve and vacuum pipe.
2. Blow through the solenoid valve from the vacuum sensing tube Ⓑ. Make sure the air passes through the valve and comes out from the air filter Ⓐ of the valve.

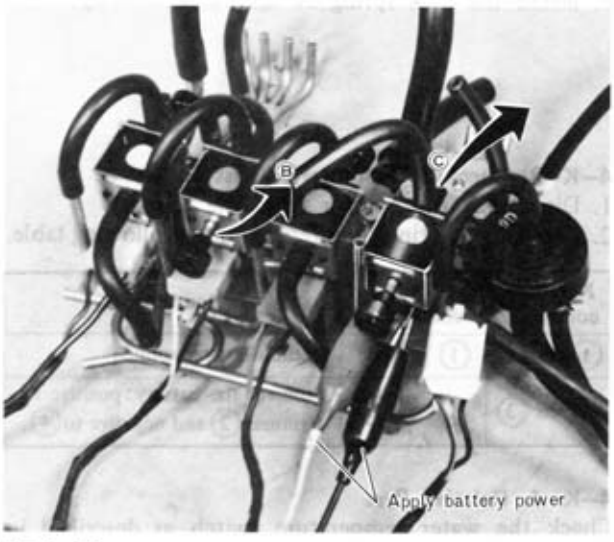

Fig. 4–91

3. Disconnect the coupler from the solenoid valve and connect the battery power to terminal on the valve.
4. Blow through the valve from the vacuum sensing tube Ⓑ. Make sure the air passes through the valve and comes out from the port Ⓒ.

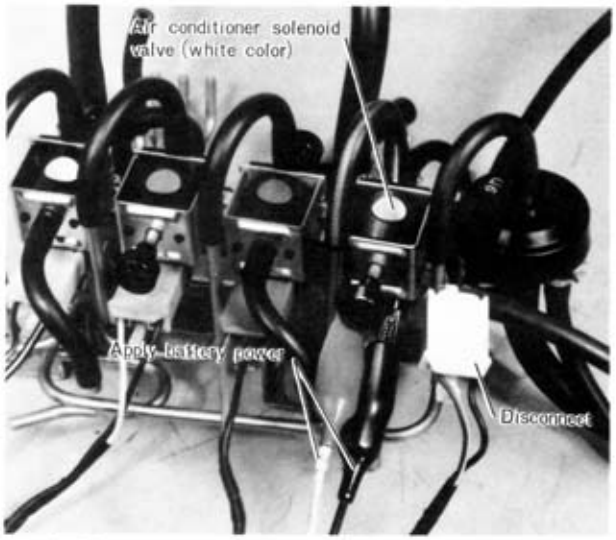

Fig. 4–92

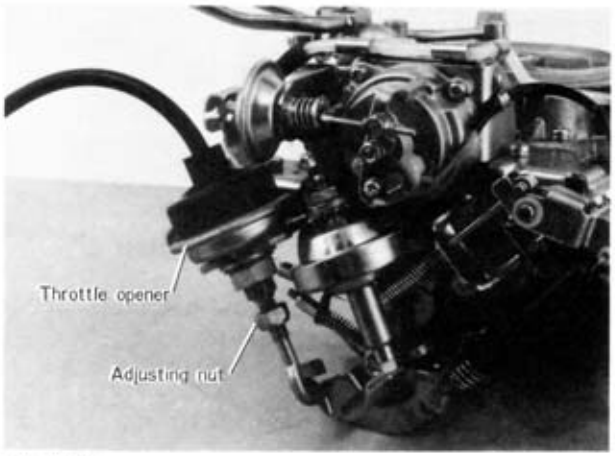

Fig. 4–93

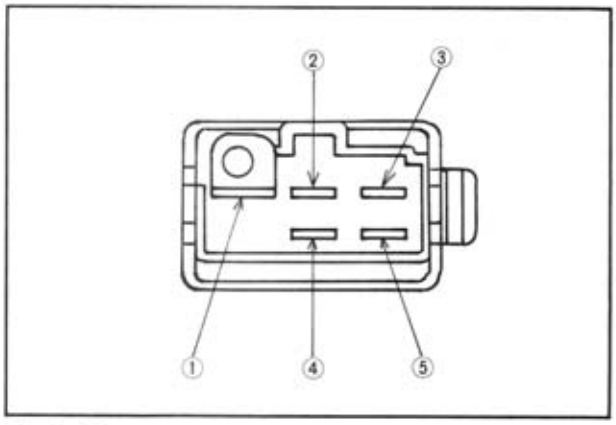

Fig. 4–94

4–L–3. Inspecting and Adjusting Throttle Opener

1. Switch off the all accessaries.
2. Disconnect the tube at the idle compensator in the air cleaner and plug the end of the tube.
3. Connect a tachometer to the engine and warm the engine to the normal operating temperature.
4. Turn off the air conditioner switch.
5. Disconnect the coupler from air conditioner solenoid valve. Connect the battery power to the terminal in the coupler, and connect the other terminal to ground. Check to see that the throttle opener operates and engine speed increases to **1,200 ± 50 rpm in neutral.**
6. If the engine speed is not within the specification, adjust it by turning the adjusting nut.

4–L–4. Checking Air Conditioning Relay

1. Disconnect the coupler from the relay.
2. Check the continuity, referring to the following table.

Numbers-continuity	Numbers-No continuity	Remarks
① to ⑤	① to ③	Without power applied
① to ③	① to ⑤	Connect the battery: positive to terminal ② and negative to ④.

4–L–5. Relative Part

Check the control unit as described in Par. 1A–G.

ELECTRICAL SYSTEM (ENGINE)

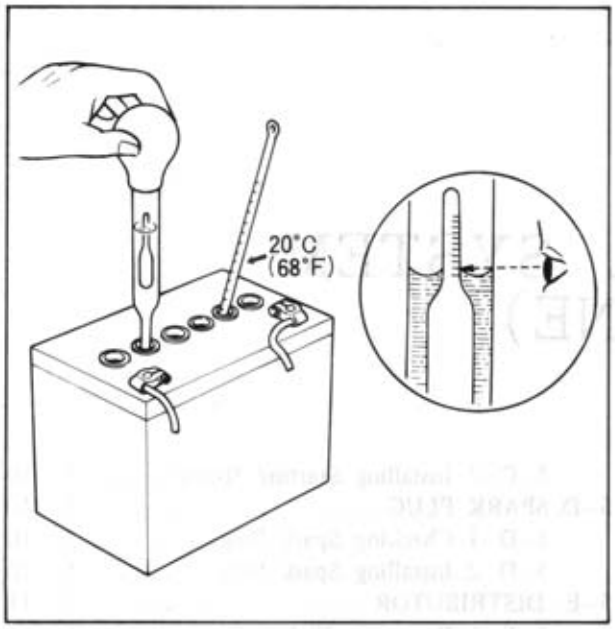

Fig. 5–1

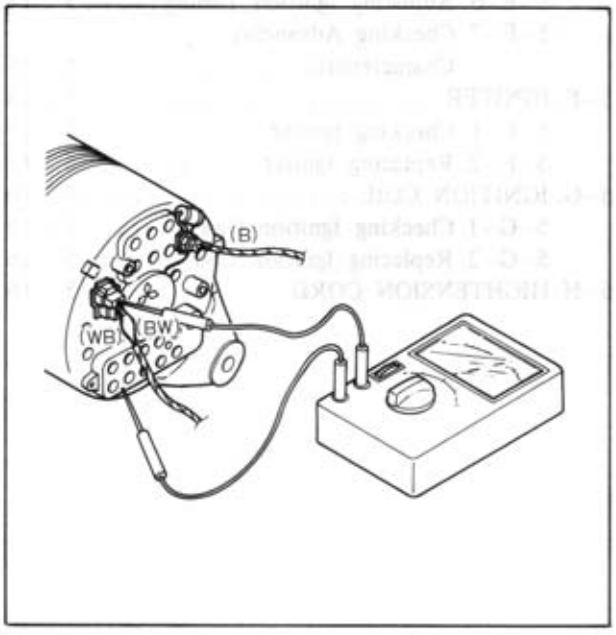

Fig. 5–2

5–A. BATTERY

5–A–1. Checking Battery

1. Check the electrolyte level in each cell of the battery, and add distilled water to the **upper level line** marked on the battery. **Do not** overfill.
2. Check the specific gravity of the electrolyte with a hydrometer.
   If the reading is below the specification, the battery requires recharging.

Note:

a) Always disconnect the battery cable when charging the battery.
b) Keep all fire away from the top of open battery cells when charging the battery.
c) Avoid contact sulphuric acid with skin, eyes, clothing or car.

3. Check the tightness of the terminals to ensure good electrical connections. Clean the terminals and coat the terminals with grease.
4. Inspect for corroded or frayed battery cables.
5. Check the rubber protector on the positive terminal for proper coverage.

5–B. ALTERNATOR

5–B–1. Precautions on Service

When servicing the charging system, observe the following precautions.

1. **Do not** short across or ground any of the terminals on the alternator.
2. **Never** reverse battery cables, even for an instant, as the reverse polarity current flow will damage the diodes in the alternator.
3. Check the drive belt tension and adjust it to specification if necessary.

5–B–2. Checking Charging System on Car

If the charging system is not charging properly, it is advisable to determine whether the trouble is in the alternator or regulator.

1. Check the voltage of the "B" terminal on the alternator and compare it with the battery voltage. Make sure that no difference exists between both voltages.
2. Check the "R" terminal (BW) voltage and "L" terminal (WB) voltage.
   If either of the aforementioned voltage readings is not zero, the alternator is defective.

Note:

The ignition switch should be switched off during above measurements.

3. Switch on the ignition switch and check the "L" terminal (WB) voltage. The voltage is about 0.5 volt.
   If the voltage is zero, both the alternator and the IC regulator are defective.

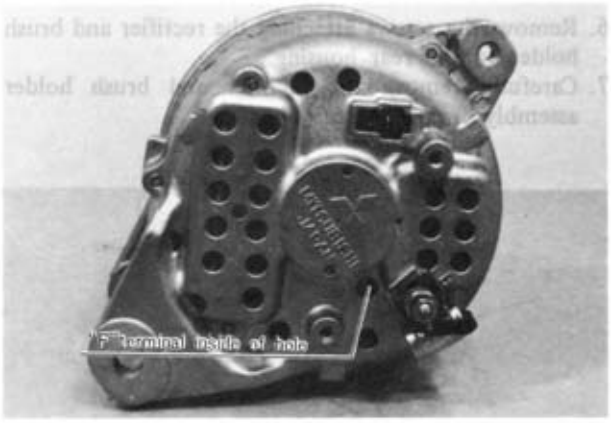

Fig. 5–3

4. If the aforementioned voltage (step 3) is close to the battery voltage, short-circuit the "F" terminal and the rear bracket of the alternator, and then read the "L" terminal (WB) voltage.
   If the voltage is lower than that of the battery, the IC regulator is defective.
   If the voltage is the similar to battery voltage, the alternator is defective.

Note:
The "F" terminal is located at a depth of 20 mm (0.79 in) in a hole which is near the "B" terminal.

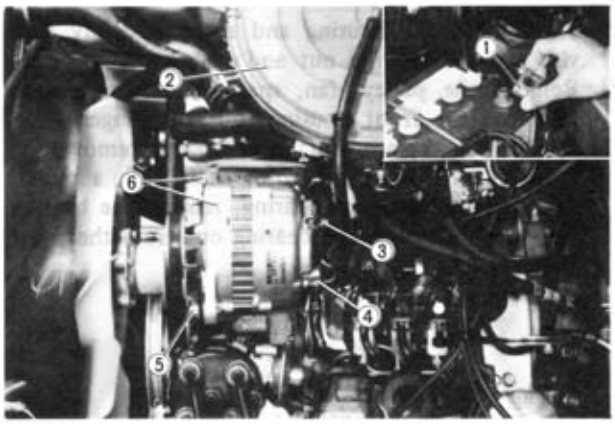

Fig. 5–4

5–B–3. Removing Alternator

1. Disconnect the battery negative cable.
2. Remove the air cleaner.
3. Disconnect a wire at the alternator "B" terminal.
4. Pull the multiple connector out from the alternator.
5. Remove the alternator strap bolt and disengage the drive belt.
6. Remove the alternator mounting bolt and remove the alternator.

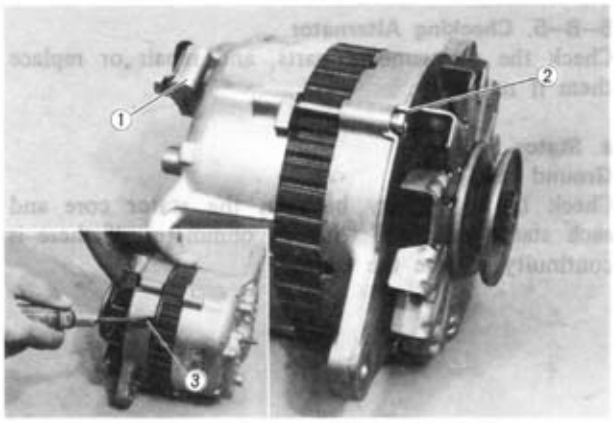

Fig. 5–5

5–B–4. Disassembling Alternator

1. Remove the radio noise suppression condenser and insulator from the "B" terminal.
2. Remove the through bolts.
3. Separate the front housing assembly by prying apart with a screwdriver at the slots of the front housing.

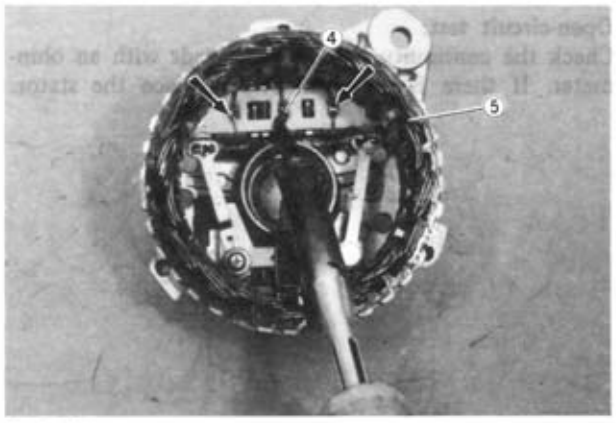

Fig. 5–6

4. Unsolder the stator leads from the rectifier.

Note:
The unsoldering of the stator leads should be performed in less than twenty seconds as the excessive heat may damage the rectifier.

5. Remove the stator from the rear housing.

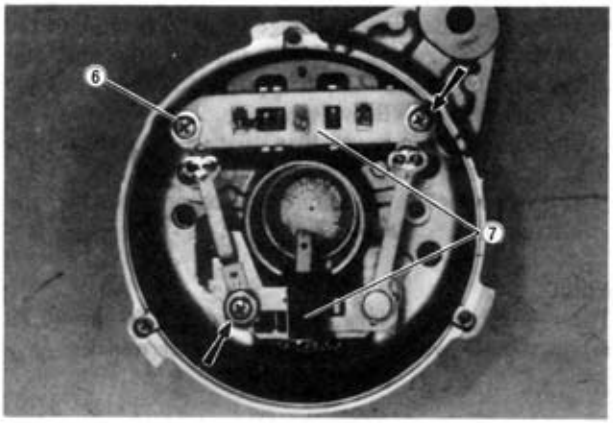

Fig. 5–7

6. Remove the screws attaching the rectifier and brush holder to the rear housing.
7. Carefully remove the rectifier and brush holder assembly from the rear housing.

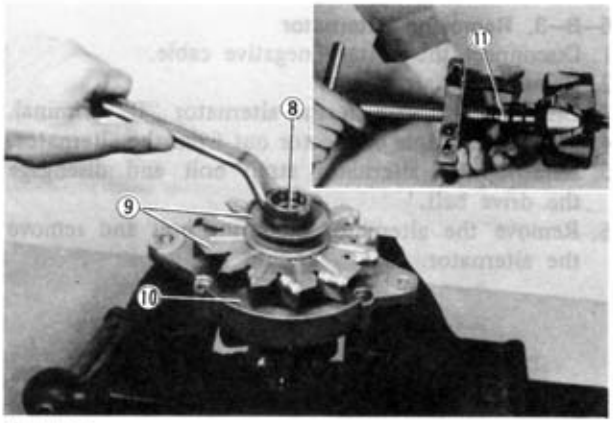

Fig. 5–8

8. Place the front housing and rotor assembly in a vise and remove the nut and washer.
9. Remove the pulley, fan, spacer and front slinger.
10. Remove the front housing and rear slinger.
11. If bearing replacement is necessary, remove the rear bearing from the rotor shaft with a puller. To replace the front bearing, remove the bearing retainer and press the bearing out from the front housing.

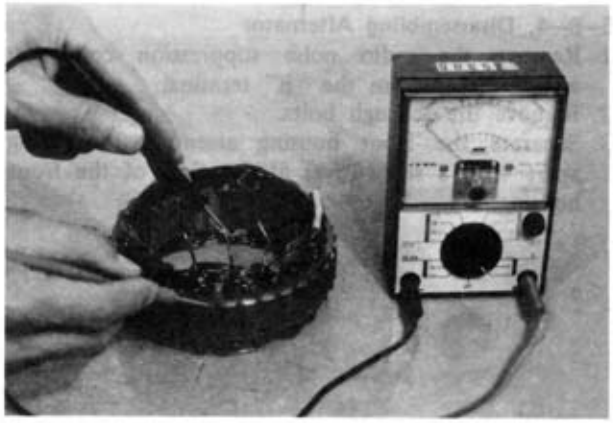

Fig. 5–9

5–B–5. Checking Alternator

Check the disassembled parts, and repair or replace them if necessary.

a. Stator

Ground test:

Check the continuity between the stator core and each stator coil lead with an ohmmeter. If there is continuity, replace the stator.

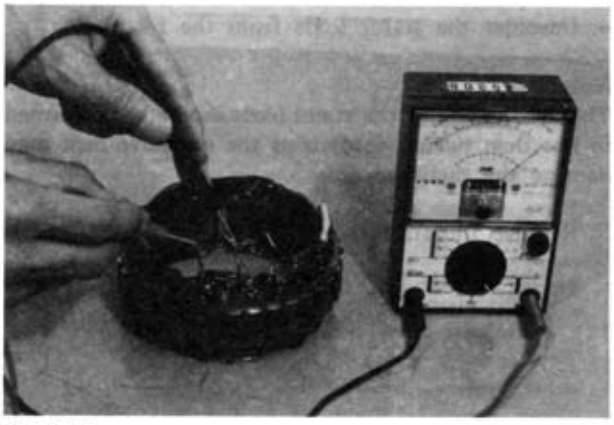

Fig. 5–10

Open-circuit test:

Check the continuity between the leads with an ohmmeter. If there is no continuity, replace the stator.

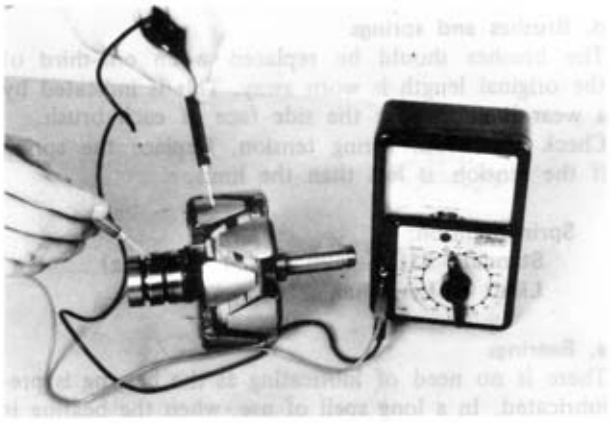

Fig. 5–11

b. Rotor

Ground test:

Check the continuity between the rotor and each slip ring with an ohmmeter. If there is continuity, replace the rotor.

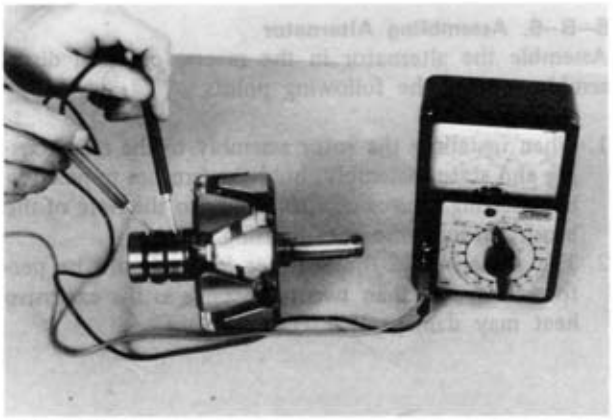

Fig. 5–12

Open-circuit test:

Check the continuity between the slip rings with an ohmmeter. If the reading is **5 ~ 6 ohms**, there is no trouble in the rotor.

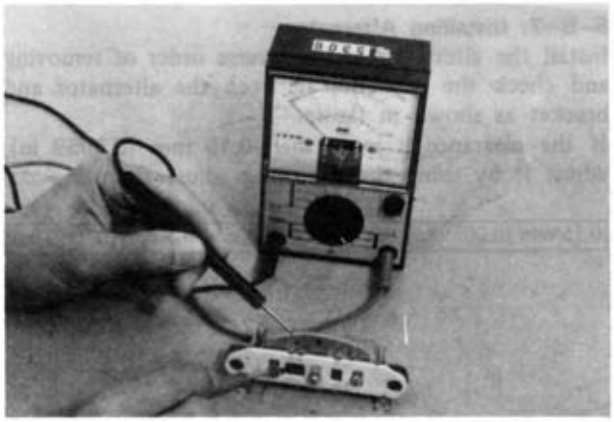

Fig. 5–13

c. Rectifier assembly

Positive side:

1. Connect an ohmmeter (+) lead to the rectifier holder, and the (–) lead to the each rectifier teminal. If there is no continuity, replace the rectifier assembly.

2. Reverse polarity of an ohmmeter leads and check again. If there is continuity, replace the rectifier assembly.

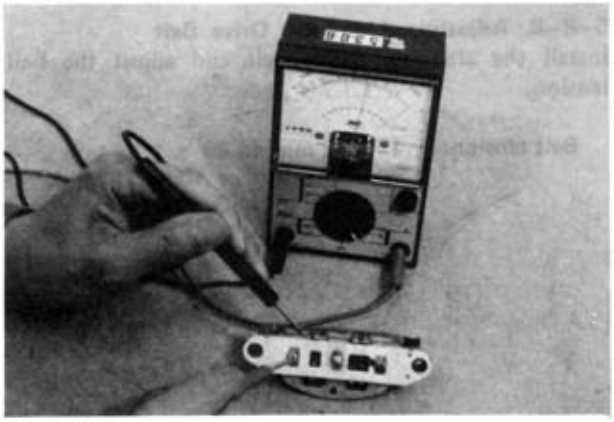

Fig. 5–14

Negative side:

1. Connect an ohmmeter (+) lead to the each rectifier terminal, and (–) lead to the rectifier holder. If there is no continuity, replace the rectifier assembly.

2. Reverse polarity of an ohmmeter leads and check again. If there is continuity, replace the rectifier assembly.

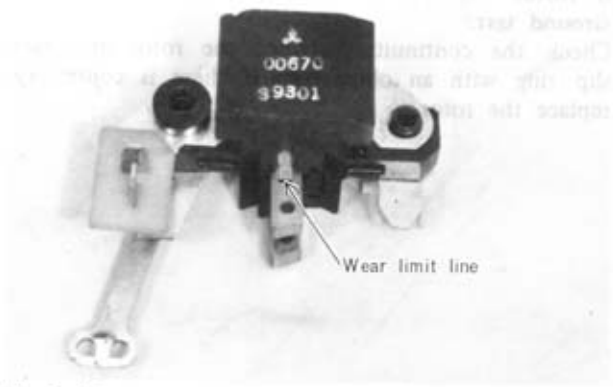

Fig. 5–15

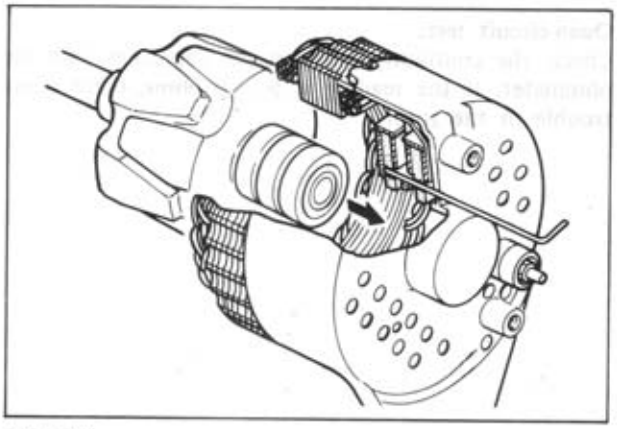

Fig. 5–16

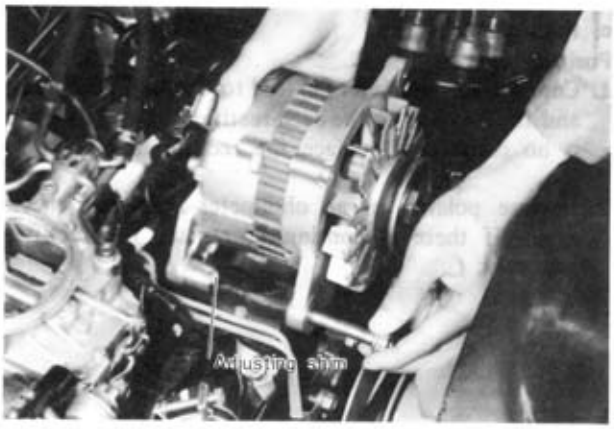

Fig. 5–17

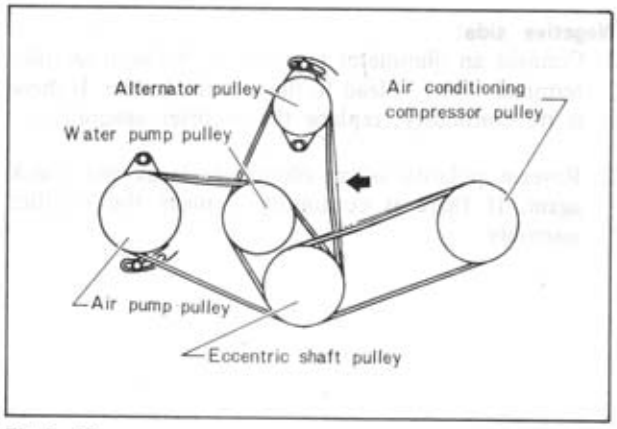

Fig. 5–18

d. Brushes and springs

The brushes should be replaced when **one-third** of the original length is worn away. This is indicated by a wear limit line on the side face of each brush.

Check the brush spring tension. Replace the spring if the tension is less than the limit.

Spring tension:
Standard 315 ~ 426 gr (11 ~ 15 oz)
Limit Less than 210 gr (7 oz)

e. Bearings

There is no need of lubricating as the bearing is pre-lubricated. In a long spell of use, when the bearing is worn or damaged, replace it with a new one.

5–B–6. Assembling Alternator

Assemble the alternator in the reverse order of disassembly, **noting** the following points.

1. When installing the rotor assembly to the rear housing and stator assembly, hold the brushes in position by inserting a piece of stiff wire into the hole of the brush through the rear housing.
2. The soldering of the rectifier leads should be performed in **less than twenty seconds** as the excessive heat may damage the rectifier.

5–B–7. Installing Alternator

Install the alternator in the reverse order of removing and check the clearance between the alternator and bracket as shown in figure.

If the clearance is **more than 0.15 mm (0.0059 in)**, adjust it by using the following adjust shims.

0.15 mm (0.0059 in)	0.3 mm (0.0118 in)	0.5 mm (0.0197 in)

5–B–8. Adjusting Alternator Drive Belt

Install the alternator drive belt and adjust the belt tension.

Belt tension: 15 ± 2 mm (0.59 ± 0.08 in)
When pressed at 10 kg (22 lb)

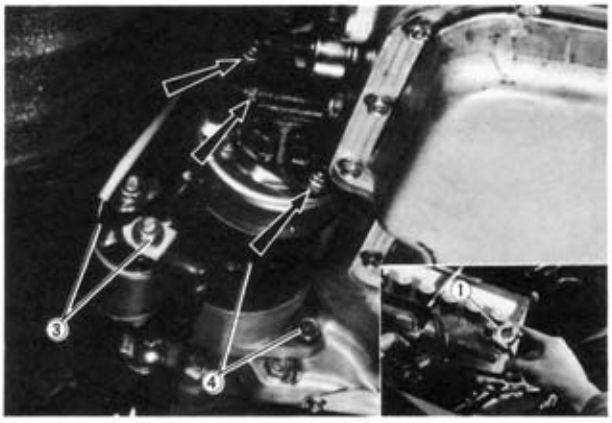

Fig. 5–19

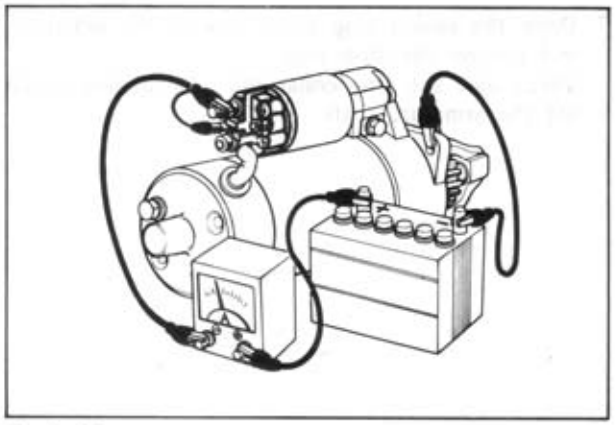

Fig. 5–20

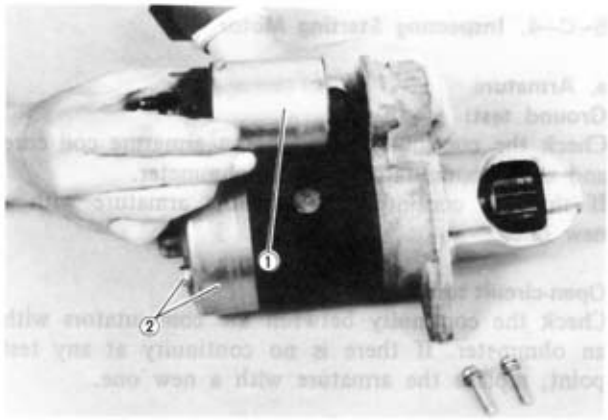

Fig. 5–21

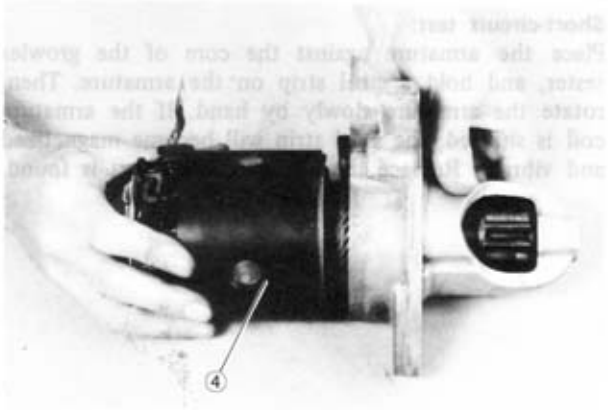

Fig. 5–22

5–C. STARTING MOTOR

5–C–1. Removing Starting Motor

1. Disconnect the battery negative cable.
2. Raise the vehicle and support it with stands.
3. Disconnect the battery cable from the magnetic switch "B" terminal, and ignition switch wire from the magnetic switch "S" terminal.
4. Remove the starting motor attaching bolts and remove the starting motor.
   On the vehicle equipped with automatic transmission, remove the starting motor bracket, then remove the starting motor attaching bolts and remove the starting motor.

5–C–2. Testing Starting Motor (No-load)

1. Connect an ammeter as shown in figure.
2. Apply the battery voltage **adjusted to 11.5 volts** to the starting motor.
3. Operate the starting motor and take a reading.

Specified current:

Manual transmission	**Less than 50 amp.**
Automatic transmission	**Less than 100 amp.**

5–C–3. Disassembling Starting Motor

1. Disconnect the field strap and remove the magnetic switch, spring, plunger and washer.
2. Remove the through bolts and brush holder attaching screws, and then remove the rear cover.
3. Remove the insulator and washers from the rear end of the armature shaft.
4. Separate the yoke and brush holder assembly from the driving housing.

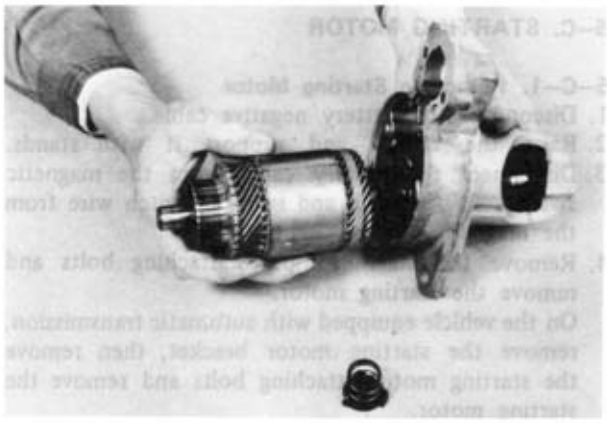

Fig. 5–23

6. Remove the armature, driving lever and over running clutch assembly from the driving housing.

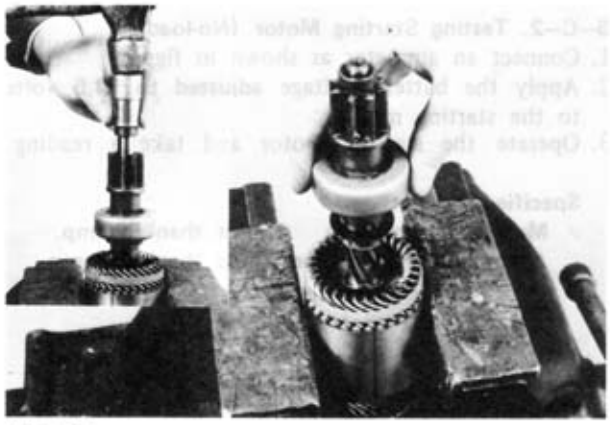

Fig. 5–24

7. Drive the pinion stop collar toward the armature, and remove the stop ring.
   Then, slide the stop collar and over-running clutch off the armature shaft.

Fig. 5–25

5–C–4. Inspecting Starting Motor

a. Armature

Ground test:

Check the continuity between the armature coil core and each commutator with an ohmmeter.
If there is continuity, replace the armature with a new one.

Open-circuit test:

Check the continuity between the commutators with an ohmmeter. If there is no continuity at any test point, replace the armature with a new one.

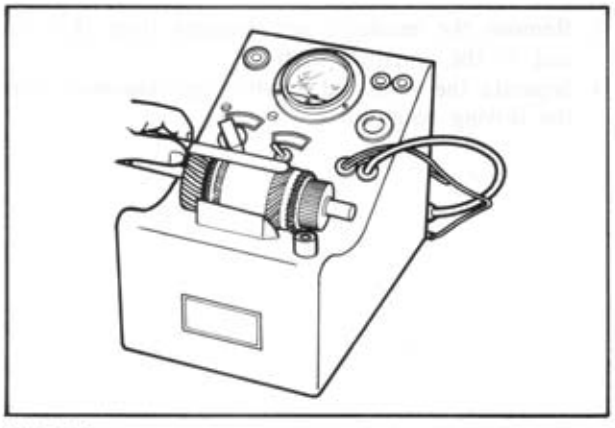

Fig. 5–26

Short-circuit test:

Place the armature against the core of the growler tester, and hold a steel strip on the armature. Then, rotate the armature slowly by hand. If the armature coil is shorted, the steel strip will become magnetized and vibrate. Replace the armature if a short is found.

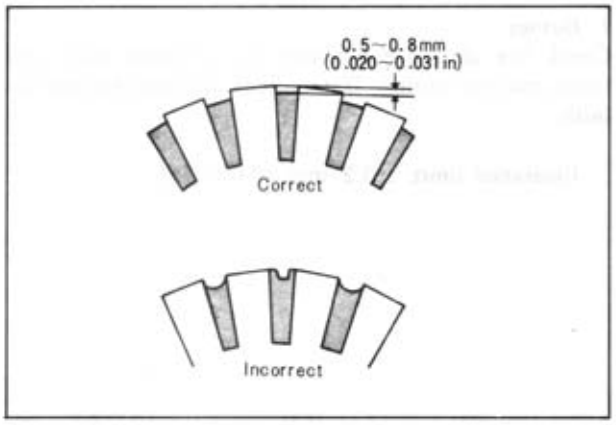

Fig. 5–27

b. Commutator

If the commutator is dirty, discolored or worn, clean it with emery paper. After cleaning, undercut the mica between the commutators to the depth of **0.5 ~ 0.8 mm (0.020 ~ 0.031 in)** as shown in figure.

Fig. 5–28

c. Field coil

Ground test:

Check the continuity between the field terminal and yoke with an ohmmeter.

If there is continuity, replace the field coil and yoke assembly with new one.

Open-circuit test:

Check the continuity between the field terminal and each field coil brush with an ohmmeter. If there is no continuity, replace the field coil and yoke assembly with new one.

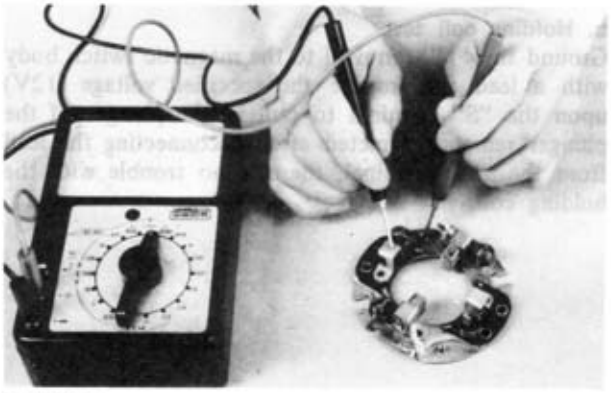

Fig. 5–29

d. Brush holder

Check the continuity between the each brush holder and brush holder frame with an ohmmeter. If there is continuity, replace the brush holder assembly with new one.

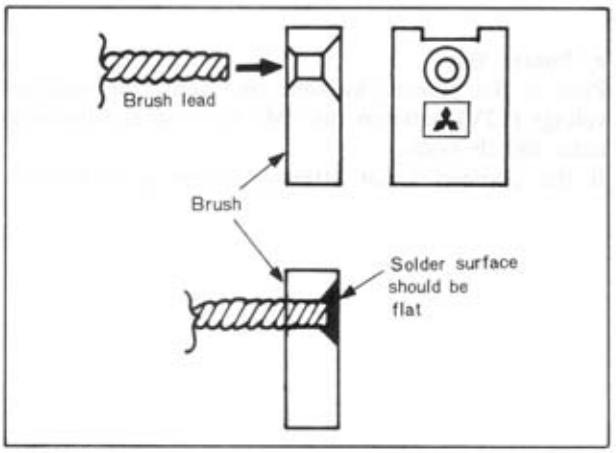

Fig. 5–30

e. Brushes and brush springs

Check the brushes and replace if they are worn down more than **one third** of their original length.

Check the spring tension, replace the spring if the tension is too low.

Standard spring tension :
1.4 ~ 1.8 kg (49 ~ 63 oz)

To replace the brush, proceed as follows:

1. Remove the brush from the holder.
2. Smash the old brush by tapping it with small hummer or pinching with pliers.
3. Clean the brush lead and insert the lead to small chamfer side of new brush.
4. Solder the lead and brush together, using rosin core solder. Use a 200-watt iron.

Fig. 5–31

f. Bushes

Check the clearance between the armature shaft and front and rear bushes. If it exceeds the limit, replace the bush.

Clearance limit : 0.2 mm (0.008 in)

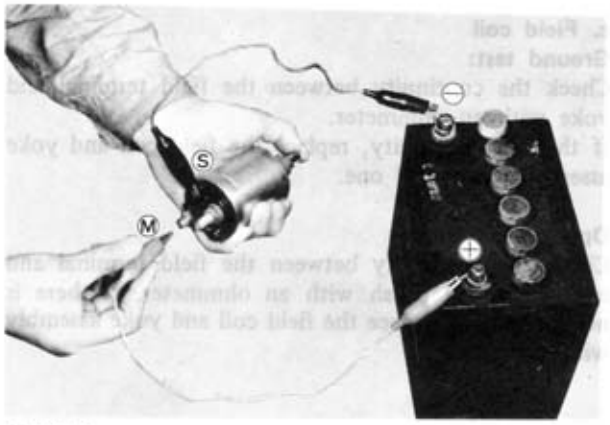

Fig. 5–32

5–C–5. Testing Magnetic Switch

a. Pull-in coil test

Apply the specified voltage (12V) between the "S" terminal and "M" terminal.

If the magnetic switch is forcefully attracted, the pull-in coil is in good condition.

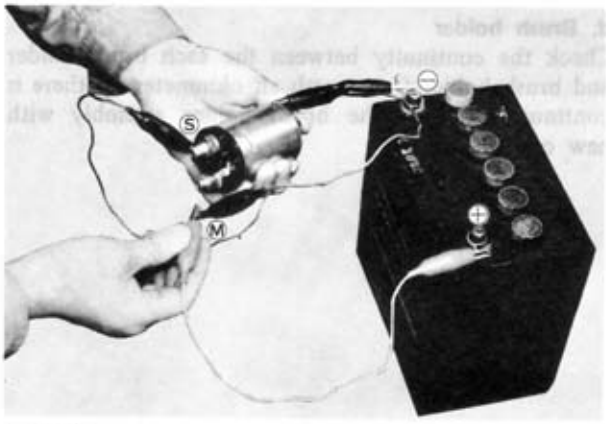

Fig. 5–33

b. Holding coil test

Ground the "M" terminal to the magnetic switch body with a lead and impose the specified voltage (12V) upon the "S" terminal to pull in the plunger. If the plunger remains attracted after disconnecting the lead from the "M" terminal, there is no trouble with the holding coil.

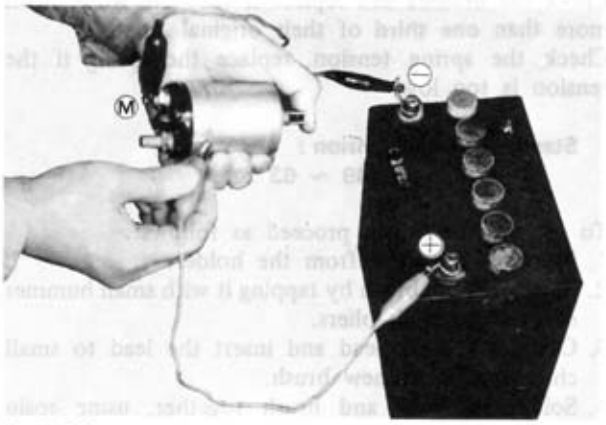

Fig. 5–34

c. Return test

Push in the plunger by hand and apply the specified voltage (12V) between the "M" terminal and the magnetic switch body.

If the plunger is not attracted, there is no trouble.

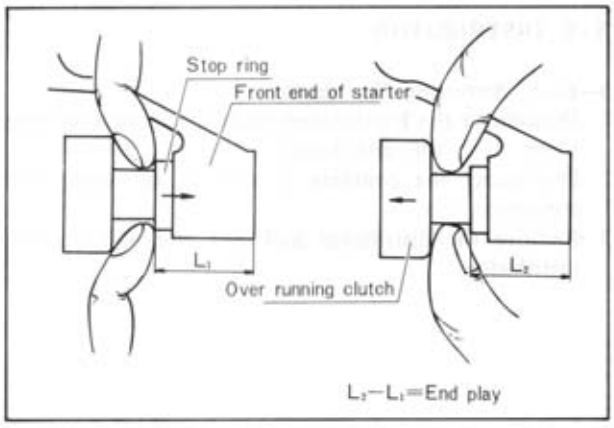

Fig. 5–35

5–C–6. Assembling Starting Motor
Assemble the starting motor in the reverse order of disassembly, **noting** the following points.

1. Adjust the armature shaft end play to **0.1 ~ 0.4 mm (0.004 ~ 0.016 in)** with a thrust washer on the rear end of the shaft.

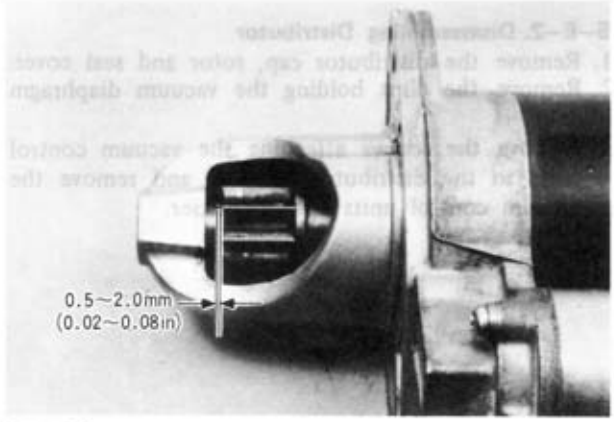

Fig. 5–36

2. When the magnetic switch is engaged, the clearance between the pinion and stop collar should be **0.5 ~ 2.0 mm (0.02 ~ 0.08 in).**
   This clearance can be adjusted by inserting the adjusting washer between the magnetic switch body and the driving housing.

5 –C–7. Installing Starting Motor
Install the starting motor in the reverse order of removing.

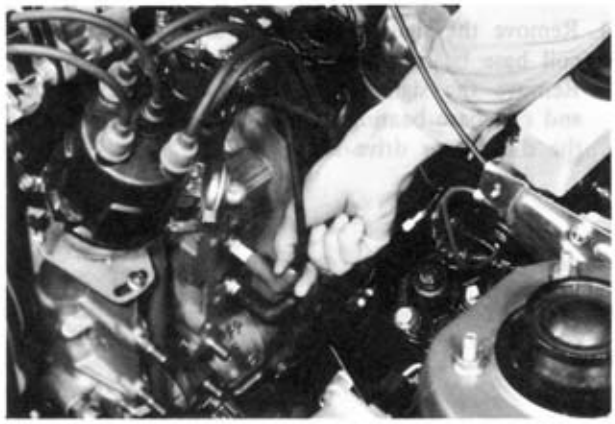

Fig. 5–37

5–D. SPARK PLUG

5–D–1. Checking Spark Plug
1. Disconnect the hightension cord and remove the spark plug.
   Do not pull on the cords because the wire connection inside the cap may become separated.
2. Check the spark plugs for burned and eroded electrode, black deposits, fouling, and cracked porcelain.
3. Clean the spark plugs with a spark plug cleaner or a wire brush if they are fouled.
   Replace the badly burned or eroded spark plugs.

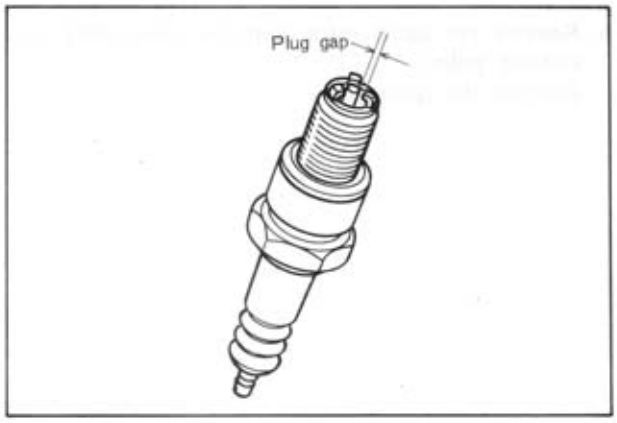

Fig. 5–38

4. Measure the electrode gap of each spark plug with a wire gauge. If it is improper, replace the spark plug.

   Standard spark plug gap (initial):
   1.05 ± 0.05 mm (0.041 ± 0.002 in)

5–D–2. Installing Spark Plug
Install the spark plug, **noting** following points.

1. Apply moly paste (0259 77 767A or 0259 77 768A) to the threads of spark plugs.
2. Torque each spark plug to **1.3 ~ 1.8 m-kg (9 ~ 13 ft-lb).**

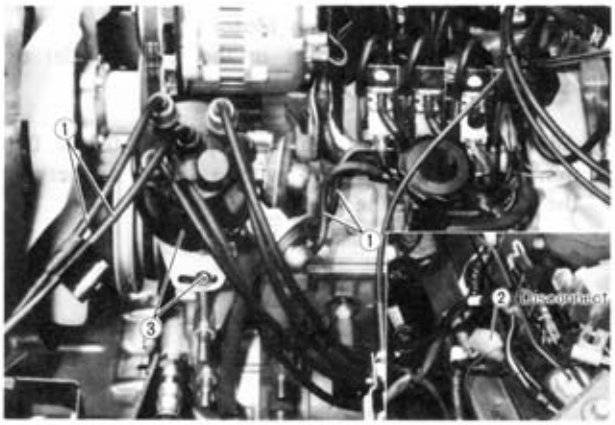

Fig. 5–39

5–E. DISTRIBUTOR

5–E–1. Removing Distributor

1. Disconnect the hightension cords and vacuum sensing tubes from the distributor.
2. Disconnect the couplers of pick-up coil wiring and condenser lead.
3. Remove the distributor lock nut and pull out the distributor.

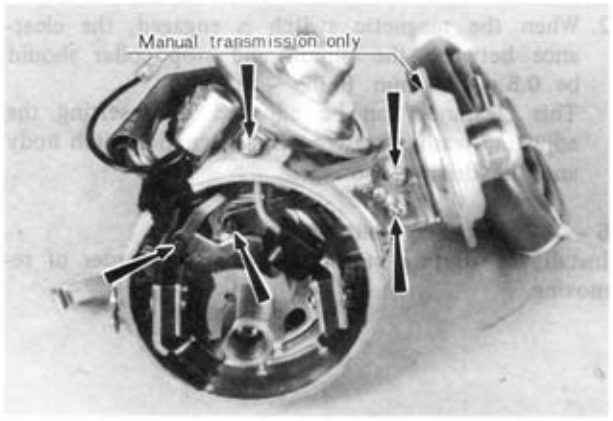

Fig. 5–40

5–E–2. Disassembling Distributor

1. Remove the distributor cap, rotor and seal cover.
2. Remove the clips holding the vacuum diaphragm links.
3. Remove the screws attaching the vacuum control units to the distributor housing, and remove the vacuum control units and condenser.

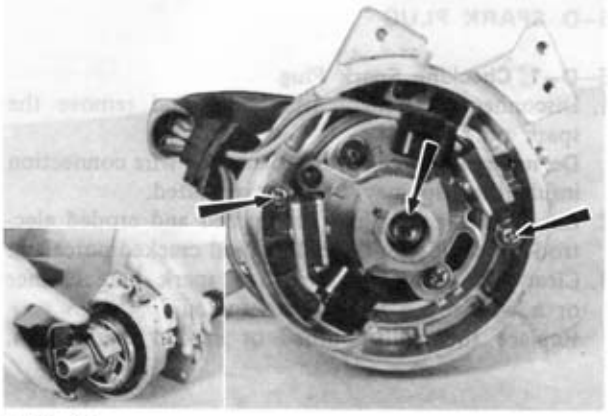

Fig. 5–41

4. Remove the signal rotor shaft attaching screw and coil base bearing attaching screws.
5. Remove the signal rotor, rotor shaft, pick-up coil and coil base bearing assembly throught the top of the distributor drive shaft.

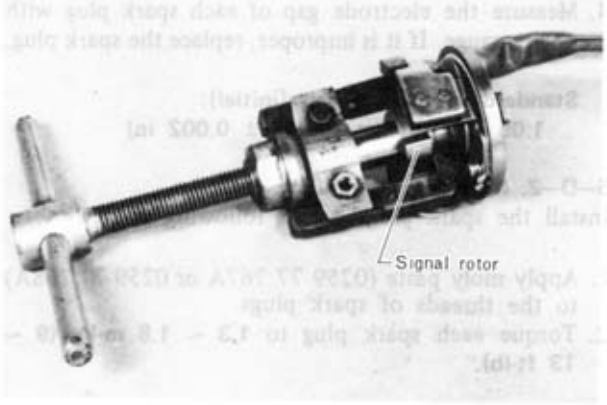

Fig. 5–42

6. Remove the signal rotor from the rotor shaft with suitable puller.
   Remove the spring pin.

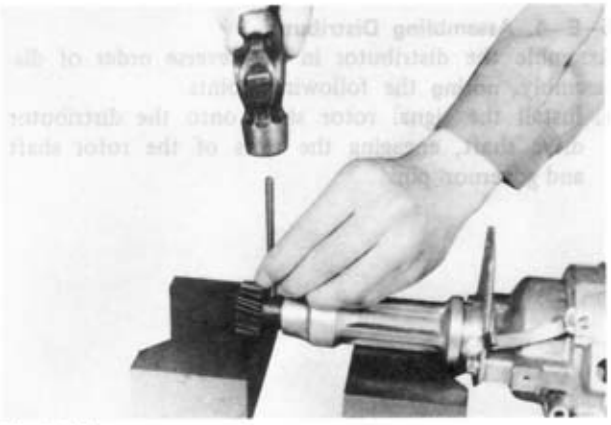

Fig. 5–43

7. Remove the governors by removing the springs.
8. Drive the lock pin out of the driven gear with a small drift and remove the gear and washers.
9. Remove the shaft through the top of the distributor housing.

Fig. 5–44

5–E–3. Inspecting Distributor

Inspect the following parts and replace if necessary.

a. Distributor cap

Inspect the distributor cap for cracks, carbon tracks, burnt and corroded terminals.
Check center contact for wear.

b. Rotor

Inspect the rotor for cracks and evidence of excessive burning at the end of the metal strip.

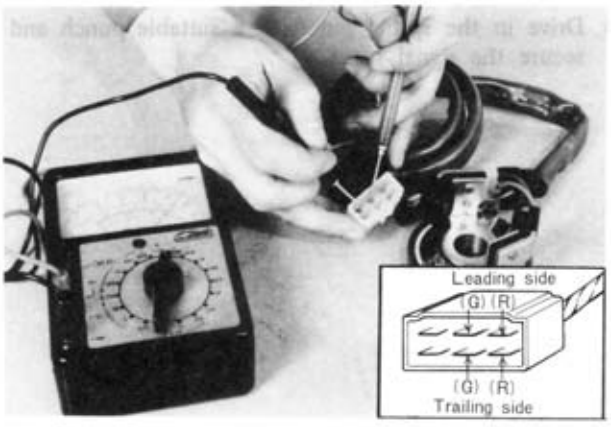

Fig. 5–45

c. Pick-up coiles

1. Connect an ohmmeter to terminals in the coupler and check the resistance of the pick-up coile.
   The standard resistances are **650 ± 50 Ω at 20°C (68°F)** on both trailing and leading coiles.
2. Connect an ammeter (maximum graduation is DC 1 mA.) to terminals in the coupler and place a screwdriver on the magnet core of the pick-up coil.
   Make sure that the indicator of the meter moves when the screwdriver is quickly separated from the core.
   The above test should be done on each trailing and leading coiles.

Fig. 5–46

d. Bearing

Inspect the bearing for roughness by slowly turning the outer race with hand.

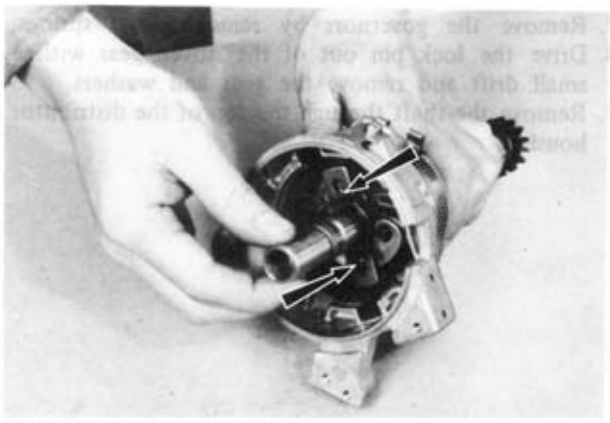

Fig. 5–47

5–E–4. Assembling Distributor

Assemble the distributor in the reverse order of disassembly, **noting** the following points.

1. Install the signal rotor shaft onto the distributor drive shaft, engaging the slots of the rotor shaft and governor pins.

Fig. 5–48

2. Install the pick-up coil and coil base bearing assembly, and tighten the attaching screws.
3. Install the signal rotor onto the rotor shaft.

Fig. 5–49

4. Drive in the spring pin with a suitable punch and secure the signal rotor.

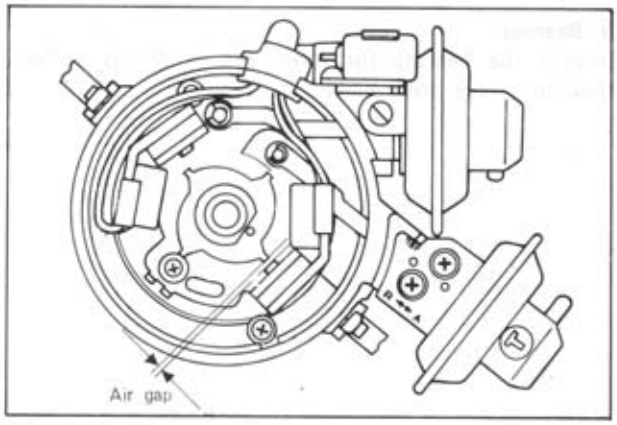

Fig. 5–50

5. Turn the distributor drive shaft until the protrusion of the signal rotor aligns with the core of the pick-up coil.
   Check the air gap with a feeler gauge.
   If the air gap is not within the specifications, replace the pick-up coil and bearing assembly or the distributor drive shaft.

Standard air gap:
0.2 ~ 0.6 mm (0.008 ~ 0.024 in)

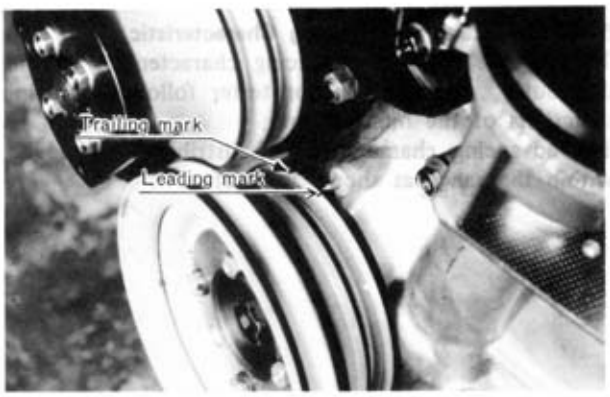

Fig. 5–51

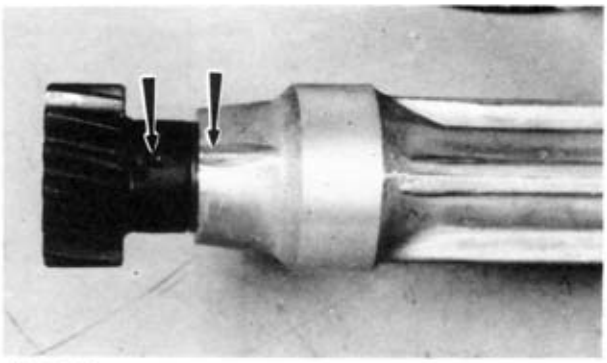

Fig. 5–52

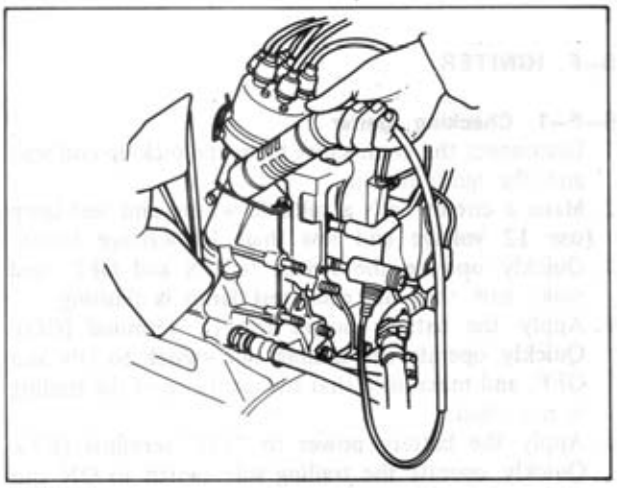

Fig. 5–53

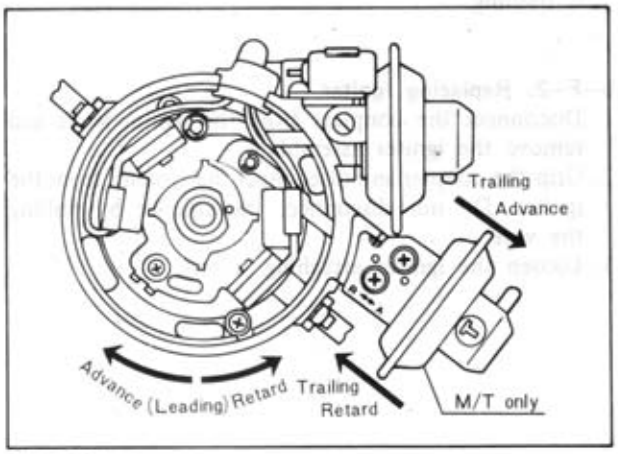

Fig. 5–54

5–E–5. Installing Distributor

1. Align the leading timing mark (yellow pained) on the eccentric shaft pulley with the indicator pin on the front cover.
2. Align the tally marks on the distributor housing and driven gear.
3. Install the distributor and lock nut.
4. Turn the distributor housing until the protrusion of the signal rotor aligns with the core of the pick-up coil.
   Tighten the lock nut.
5. Connect the hightension cords, pick-up coil wiring coupler and condenser lead.
6. Connect the vacuum sensing tubes.
7. Adjust the ignition timing as described in Par. 5–E –6.

5–E–6. Adjusting Ignition Timing

1. Warm up the engine to the normal operating temperature.
2. Connect a tachometer to the engine.
3. Connect a timing lignt to hightension cord of the leading spark plug on the front.
4. Start the engine and run it at specified idle speed.
5. Aim the timing light at the timing indicator pin on the front cover.
6. If the leading timing is not correct, loosen the distributor lock nut and rotate the distributor housing until the correct leading timing is obtained.
7. Tighten the distributor lock nut, and recheck the leading timing.
8. Connect a timing light to hightension cord of the trailing spark plug on the front.
9. Check the trailing timing.
10. If the trailing timing is not correct, loosen the vacuum unit attaching screws of trailing and move the vacuum unit until the correct trailing timing is obtained.
11. Tighten the vacuum unit attaching screws and recheck the trailing timing.

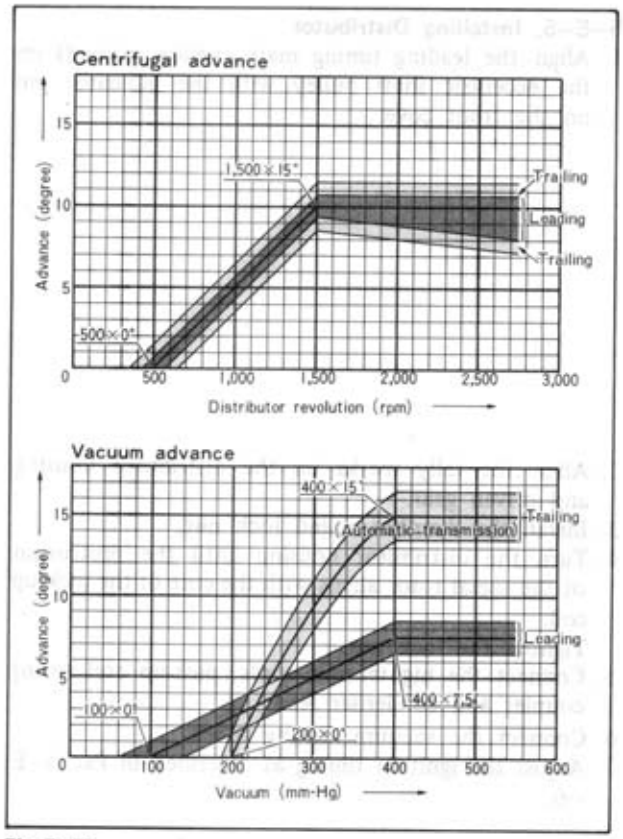

Fig. 5–55

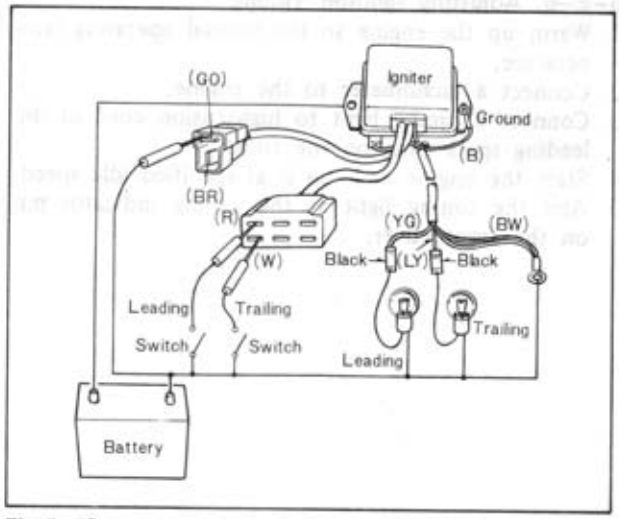

Fig. 5–56

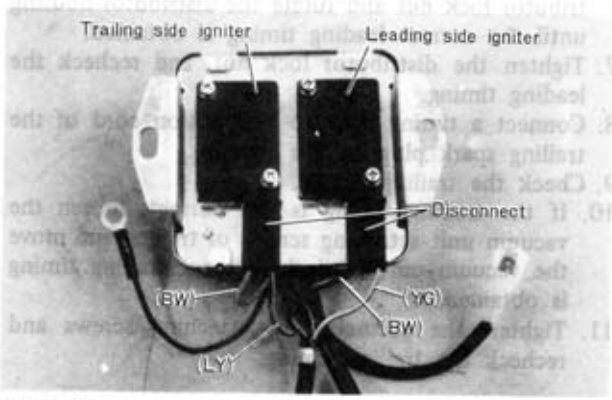

Fig. 5–57

5–E–7. Checking Advancing Characteristic

To test the ignition advancing characteristic of the distributor, use a distributor tester following the instructions of the manufacturer.

The advancing characteristic of distributor should be **within the range** as shown in figure.

5–F. IGNITER

5–F–1. Checking Igniter

1. Disconnect the connectors from the pick-up coil lead and the ignition coils.
2. Make a circuit with a suitable wiring and test lamp (use 12 voltage and less than 10 wattage bulb).
3. Quickly operate the switch to ON and OFF, and make sure that the each test lamp is flashing.
4. Apply the battery power to "L" terminal (GO). Quickly operate the trailing side switch to ON and OFF, and make sure that the test lamp of the trailing is not flash.
5. Apply the battery power to "LR" terminal (BR). Quickly operate the trailing side switch to ON and OFF, and make sure that the test lamp of the leading is flashing.

5–F–2. Replacing Igniter

1. Disconnect the couplers from the igniter leads and remove the igniter assembly.
2. Grip the coupler and disconnect the coupler from the igniter. Do not disconnect the coupler by pulling the wire.
3. Loosen the igniter attaching screws.

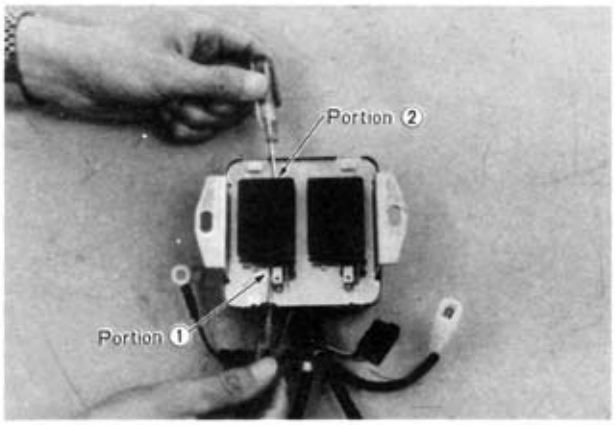

Fig. 5–58

4. Insert a screwdriver between the igniter and aluminum plate (portion ①), and slightly pry up the igniter.
   Next, insert a screwdriver to portion ② and pry up the igniter.
   The igniter should be pryed up with a screwdriver alternatively little by little until it can be removed.
5. Clean the mounting faces of igniter and aluminum plate and install the ingiter in position.
   Tighten the igniter attaching screws to 12 ~ 20 cm-kg (10 ~ 17 in-lb).
6. Install the igniter assembly and connect the couplers of the igniter leads.

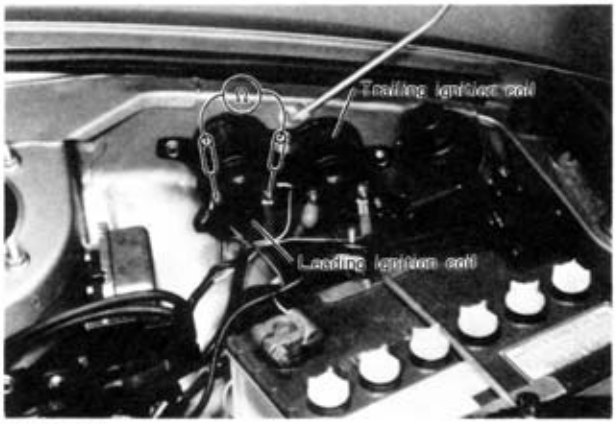

Fig. 5–59

5–G. IGNITION COIL

5–G–1. Checking Ignition Coil

Before testing the coil, always heat the coil to normal operating temperature.
Check the primary resistance with an ohmmeter.
It should be **1.35 ± 10% ohms** on both the leading and trailing ignition coils.

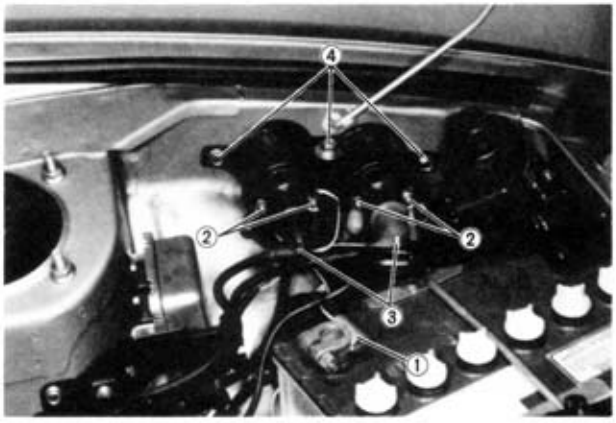

Fig. 5–60

5–G–2. Replacing Ignition Coil

1. Disconnect the negative cable from the battery.
2. Disconnect the couplers from the negative terminals of the ignition coils. Loosen the nuts from the positive terminals and remove the wire terminals.
3. Remove the hightension cords from the leading and trailing ignition coils.
4. Remove the bracket attaching bolt and remove the coils.
5. Install the coils by following the removal procedures in the reverse order.

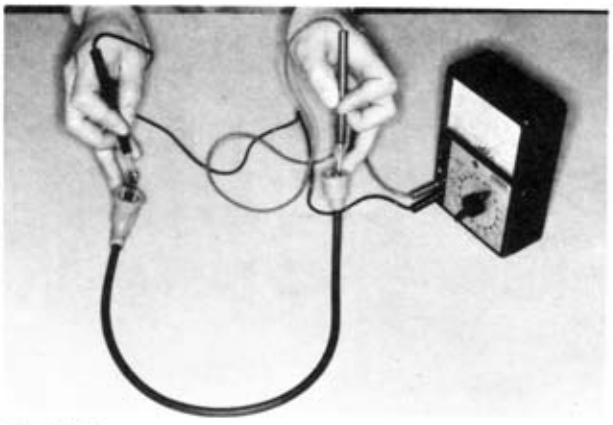

Fig. 5–61

5–H. HIGHTENSION CORD

Check the resistance of each hightension cord. The resistance should not exceed **16,000 ohms ± 40% per 1 m (39.37 in).**

Note:

a) When checking the resistance of the cords or setting ignition timing, do not puncture the cords with a probe.

b) When removing the cords from the spark plugs, grasp and twist the moulded cap, then pull the cap off the spark plug. Do not pull on the cord because the wire connection inside the cap may become separated or the insulator may be damaged.

CLUTCH

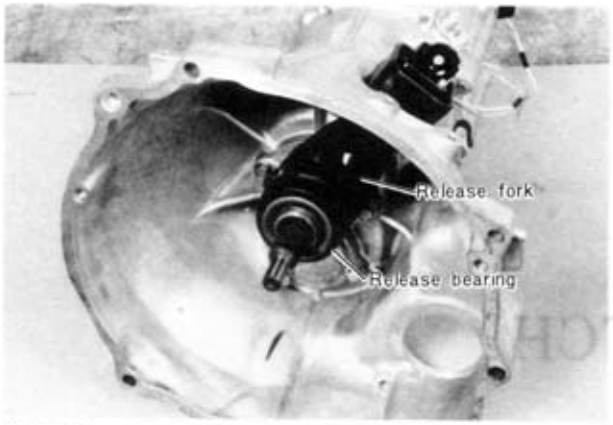

Fig. 6–1

6–A. CLUTCH REMOVAL

1. Remove the transmission as described in Par. 7–A.
2. Remove the release fork and release bearing.

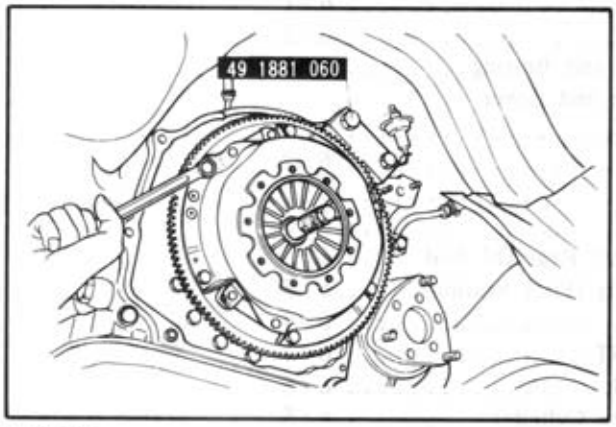

Fig. 6–2

3. Lock the flywheel with the **brake** (49 1881 060).
4. Remove the clutch pressure plate and cover assembly, and clutch disc.

Note :
Take care not to get oil or grease on the clutch disc linings, and the pressure plate and flywheel surface that contact on the clutch disc.

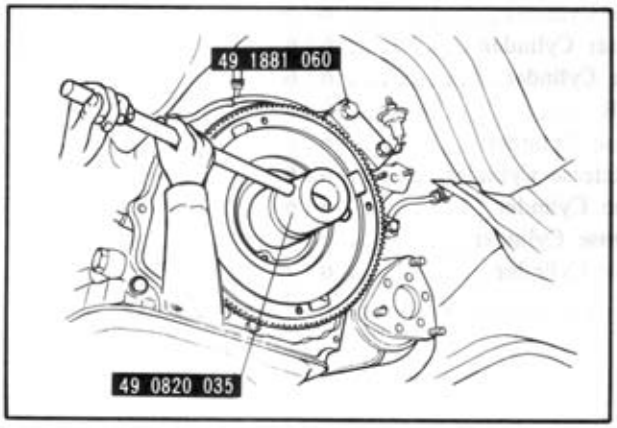

Fig. 6–3

5. Loosen the lock nut by using the **box wrench** (49 0820 035).

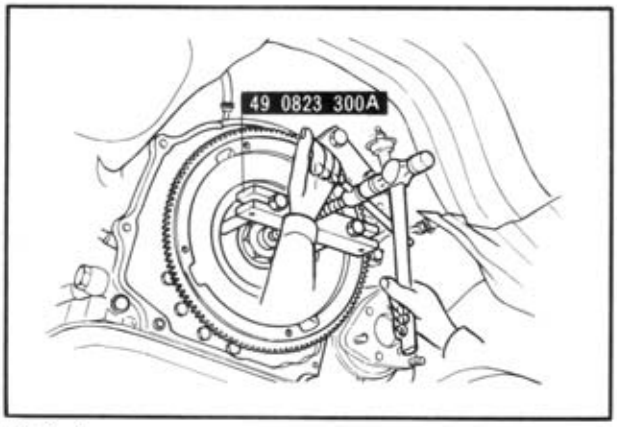

Fig. 6–4

6. Remove the flywheel with the **puller** (49 0823 300A), turning the puller handle and lightly hitting the puller head.
   Be careful not to drop the flywheel.

Note :
After removing the flywheel, inspect for oil leaking through the eccentric shaft rear oil seal.

Fig. 6–5

6–B. CLUTCH INSPECTION

6–B–1. Checking Release Fork and Bearing

Note :
The release bearing is pre-lubricated and must not be washed with gasoline or any other solvent.

Check the release bearing by pressing and turning the front race slowly by hand. Replace if the bearing feels rough or seems noisy when turning.

Check the release fork for crack or bend.
If necessary, replace the release fork.

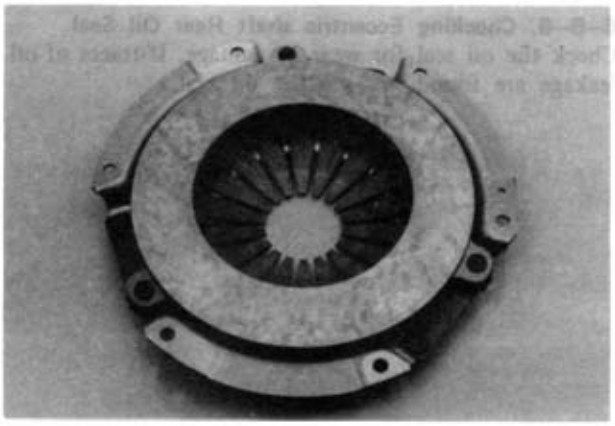

Fig. 6–6

6–B–2. Checking Pressure Plate and Cover Assembly

Check the contact surface of the pressure plate for wear, damage or warp.
If the warp is slight, correct it by lapping with compound or by turning a lathe. But if they are severe, replace with a new one.
Check the diaphragm spring and cover and if any wear or damage is found, replace the pressure plate and cover assembly.

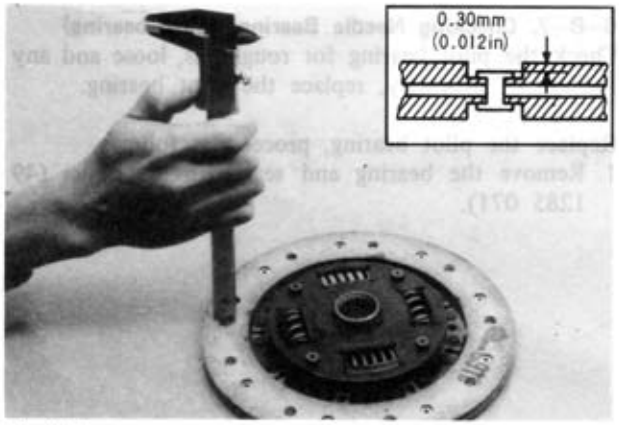

Fig. 6–7

6–B–3. Checking Clutch Disc

Inspect the clutch disc for worn or loose facing, distortion, loose rivets at the hub, and for broken springs.

Rivet head depth limit: 0.3 mm (0.012 in)
Run-out limit: 1.0 mm (0.039 in)

If oil is evident on the facing, clean or replace the clutch disc and eliminate the cause of oil leakage. Make certain that the clutch disc slides easily on the main drive shaft without any excessive play.

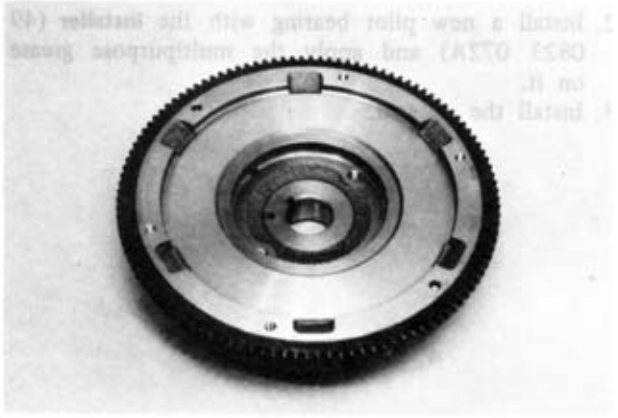

Fig. 6–8

6–B–4. Checking Flywheel

Inspect the contact surface of the flywheel with the clutch facing for burnt surface, scored surface or rivet grooves.
If it is slight, it can be reconditioned by grinding or by turning a lathe. If the damage is deep, the flywheel should be replaced.
Check the ring gear teeth and replace if the ring gear teeth are broken, cracked or seriously burred.

Fig. 6–9

6–B–5. Replacing Ring Gear

1. Heat the old ring gear and remove it from the flywheel.
2. Heat a new ring gear **evenly 250 ~ 300°C (480 ~ 570°F).**
3. Place the ring gear on the cold flywheel, making sure that the **chamfer on the teeth is faced to the transmission.**
4. Allow the ring gear to cool slowly to shrink it onto the flywheel.

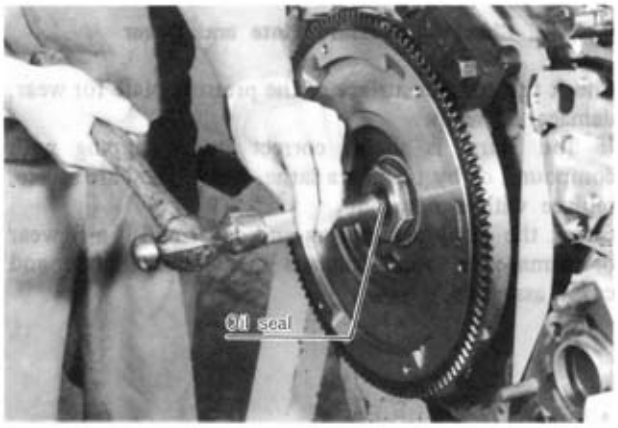

Fig. 6–10

6–B–6. Checking Eccentric shaft Rear Oil Seal

Check the oil seal for wear or damage. If traces of oil leakage are found, replace the oil seal.

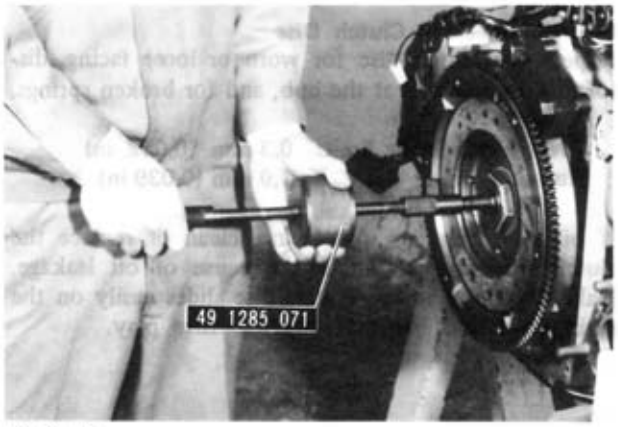

Fig. 6–11

6–B–7. Checking Needle Bearing (Pilot bearing)

Check the pilot bearing for roughness, loose and any damage. If necessary, replace the pilot bearing.

Replace the pilot bearing, proceed as follows.

1. Remove the bearing and seal with the **puller** (49 1285 071).

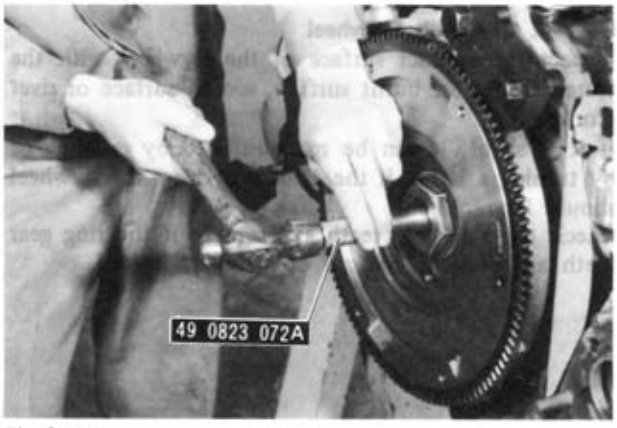

Fig. 6–12

2. Install a new pilot bearing with the **installer** (49 0823 072A) and apply the multipurpose grease on it.
3. Install the oil seal.

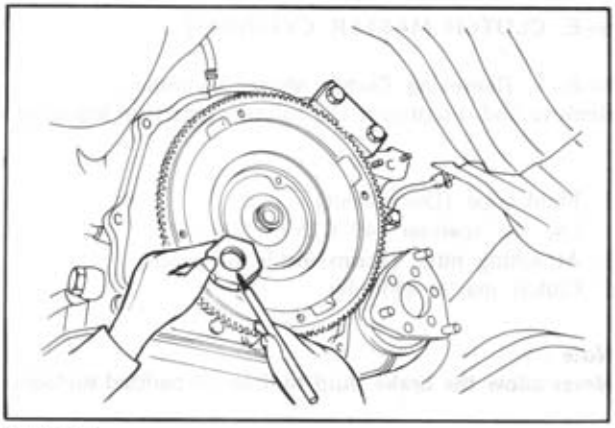

Fig. 6–13

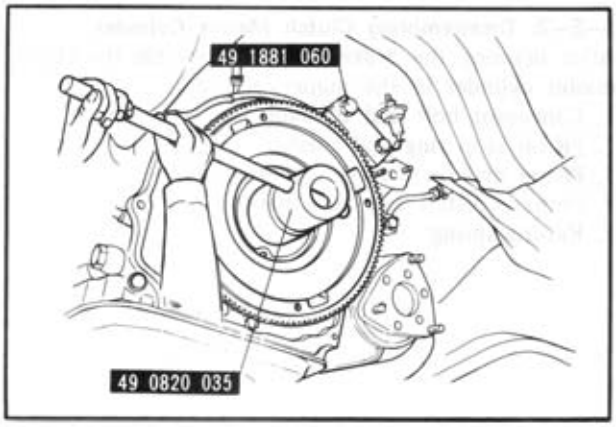

Fig. 6–14

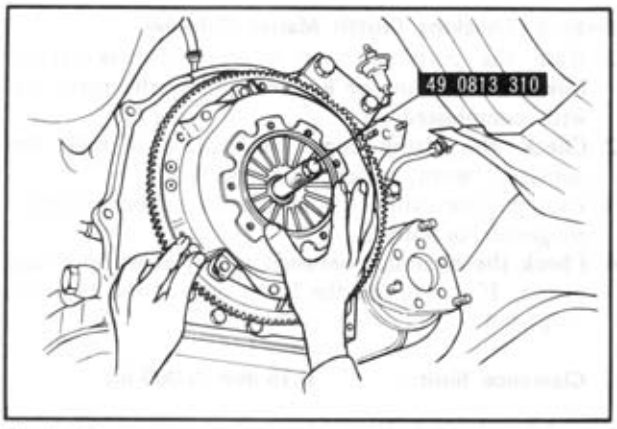

Fig. 6–15

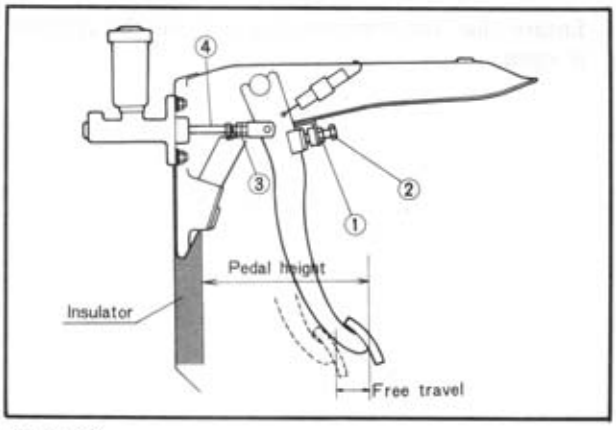

Fig. 6–16

6–C. CLUTCH INSTALLATION

Install the clutch in the reverse order of removal, **noting** the followings.

1. Apply the sealing agent to lock nut surface that contact with flywheel and install the lock nut.

2. Attach the **brake** (49 1881 060) and tighten the lock nut to the specifications with the **box wrench** (49 0820 035).

   Flywheel tightening torque:
   40 ~ 50 m-kg (289 ~ 362 ft-lb)

3. Hold the clutch disc in its mounting position with the **centering tool** (49 0813 310).
   If the tool is not available, use a spare main drive shaft.

4. Install the pressure plate and cover assembly, **aligning the "O" mark** (small hole) of the clutch cover and reamer bolt hole on the flywheel, and install the 4 standard and 2 reamer bolts finger tight. To avoid pressure plate cover distortion, tighten the bolts a few turns at a time until they are all tight. Then torque the bolts to specifications.

   Tightening torque: 1.8 ~ 2.7 m-kg (13 ~ 20 ft-lb)

6–D. CLUTCH PEDAL ADJUSTMENT

1. Adjust the pedal height by loosening the lock nut (1) and turning the stopper bolt (2).

   Pedal height: $190\ ^{+5}_{-0}$ **mm** $(7.5\ ^{+0.2}_{-0}$ **in)**

2. Adjust the free travel by loosening the lock nut (3) and turning the push rod (4).

   Free travel: **0.6 ~ 3.1 mm (0.02 ~ 0.12 in) at pedal pad**

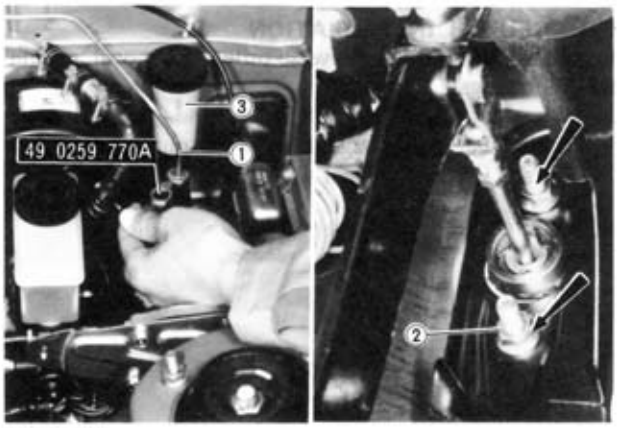

Fig. 6–17

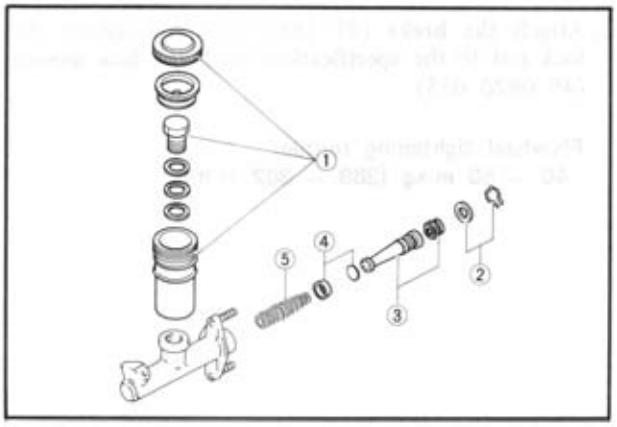

Fig. 6–18

Fig. 6–19

Fig. 6–20

6–E. CLUTCH MASTER CYLINDER

6–E–1. Removing Clutch Master Cylinder

Remove and disconnect the following parts in sequence.

1. Fluid pipe (Disconnect)
   Use the **spanner** (49 0259 770A).
2. Attaching nuts (From inside of cabin)
3. Clutch master cylinder

Note :
Never allow the brake fluid to drop on painted surfaces.

6–E–2. Disassembling Clutch Master Cylinder

After draining the brake fluid, disassemble the clutch master cylinder in the numerical order.

1. Connector bolt and reservoir
2. Piston stop ring and washer
3. Piston and secondary cup assembly
4. Primary piston cup and spacer
5. Return spring

6–E–3. Checking Clutch Master Cylinder

1. Wash the parts in clean alcohol or brake fluid. **Never use gasoline or kerosene.** Blow the parts dry with compressed air.
2. Check the piston cups and replace if they are damaged, worn, softened, or swelled.
3. Examine the cylinder bore and the piston for wear, roughness, or scoring.
4. Check the clearance between the cylinder bore and piston. If it exceeds the limit, replace the cylinder or piston.

   Clearance limit: **0.15 mm (0.006 in)**

5. Ensure that the compensating port on the cylinder is open.

Fig. 6–21

6–E–4. Assembling Clutch Master Cylinder

Assemble the clutch master cylinder in the reverse order of disassembly.

Note :

a) Before assembling, dip the piston and cups in clean brake fluid.

b) After assembling, fill the cylinder with brake fluid and operate the piston with a screwdriver until the fluid is ejected at the outlet.

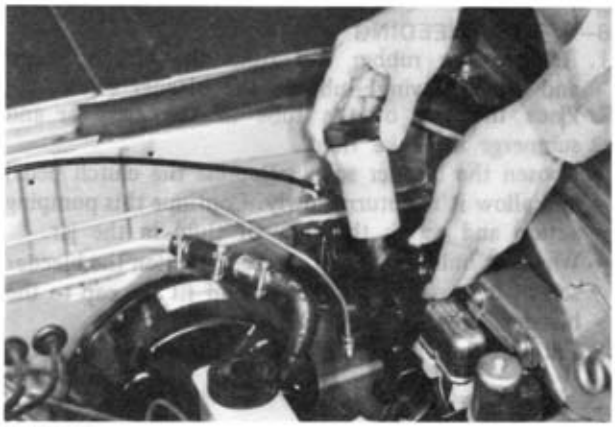

Fig. 6–22

6–E–5. Installing Clutch Master Cylinder

To install the clutch master cylinder, carry out the removal operations in the reverse order.
After installing, bleed the clutch hydraulic system, as described in Par. 6–G.

Fig. 6–23

6–F. CLUTCH RELEASE CYLINDER

6–F–1. Removing Clutch Release Cylinder

Remove the following parts.
1. Connecting bolt and flexible hose
2. Attaching nuts
3. Release cylinder

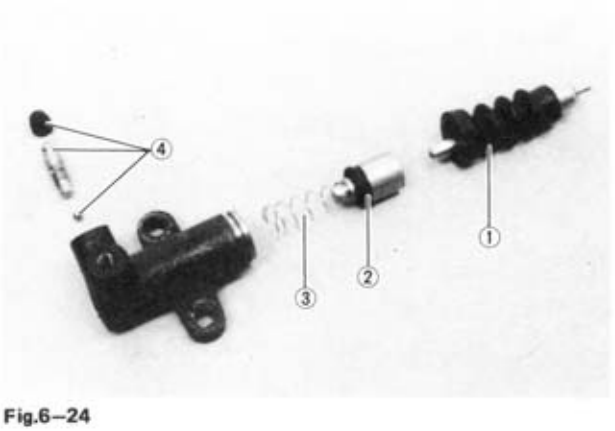

Fig.6–24

6–F–2. Disassembling Clutch Release Cylinder

Disassemble the clutch master cylinder in the numerical order.

1. Dust boot and release rod
2. Piston and cup assembly
3. Spring
4. Bleeder screw and valve (steel ball)

6–F–3. Checking Clutch Release Cylinder

Check the clutch release cylinder in the same manner for the clutch master cylinder.

Fig. 6–25

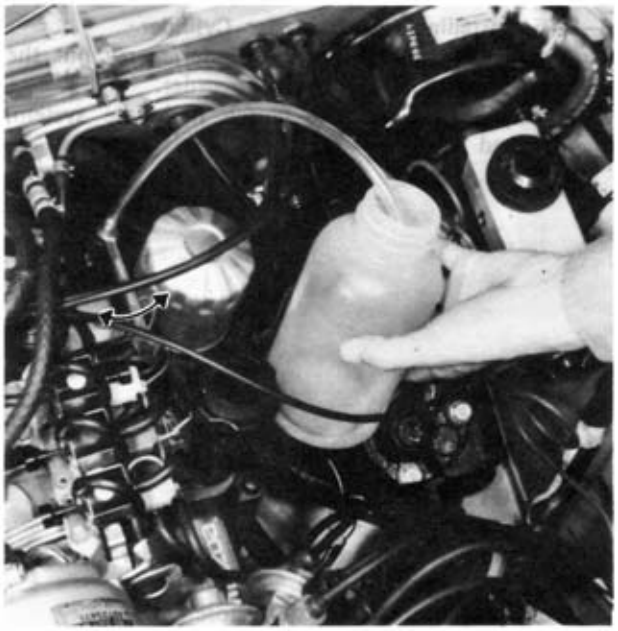

Fig. 6–26

6–F–4. Assembling Clutch Release Cylinder
Assemble the clutch release cylinder in the reverse order of disassembly.

Note :
Before assembling, dip the piston and cups in the clean brake fluid.

6–F–5. Installing Clutch Release Cylinder
Install the clutch release cylinder in the reverse order of removing and bleed the hydraulic system as described in Par. 6–G.

6–G. AIR BLEEDING

1. Remove the rubber cap from the bleeder screw and attach a vinyl tube to the bleeder screw.
2. Place the end of the tube in the glass jar and submerge in brake fluid.
3. Loosen the bleeder screw. Depress the clutch pedal and allow it to return slowly. Continue this pumping action and watch the flow of fluid in the jar.
4. When air bubbles cease to appear, tighten the bleeder screw, remove the vinyl tube and fit the cap to the bleeder screw.
5. Fill the fluid reservoir and fit the filler cap.

Note :

a) During bleeding operation, the reservoir of the master cylinder must be kept at least 3/4 full of the brake fluid.

b) Never re-use the brake fluid which has been drained from the clutch hydraulic system.

MANUAL TRANSMISSION

Fig. 7–1

7–A. TRANSMISSION REMOVAL

The procedures for removing the transmission from the vehicle are as follows:

Apply the parking brake and block the wheels.

1. Open the bonnet and disconnect the battery negative cable.

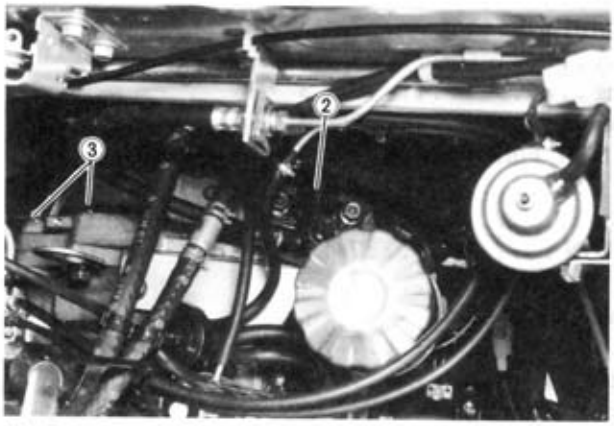

Fig. 7–2

2. Remove the clutch release cylinder.
3. Remove the bolts attaching the transmission to rear end of the engine.

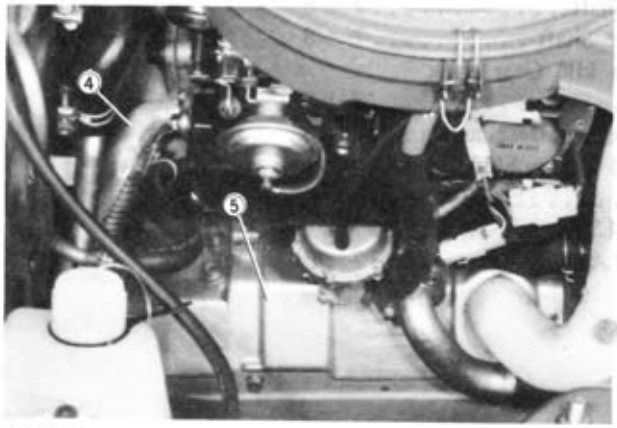

Fig. 7–3

4. Remove the nuts and disconnect the air pipe.
5. Remove the thermal reactor cover.

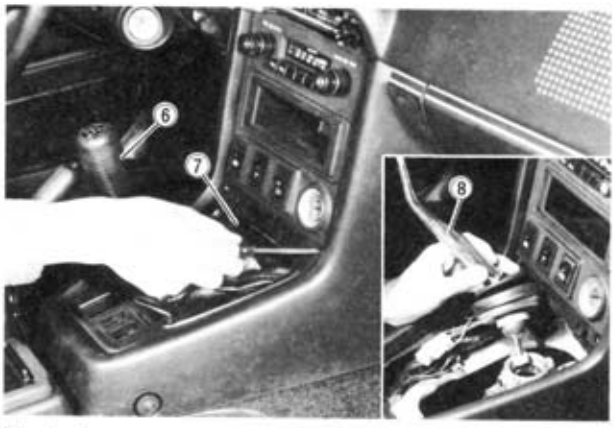

Fig. 7–4

6. Unscrew and remove the gear shift lever knob.
7. Remove the gear shift lever boot and boot plate.
8. Remove the gear shift lever, rubber boot, retaining plate and shim assembly.

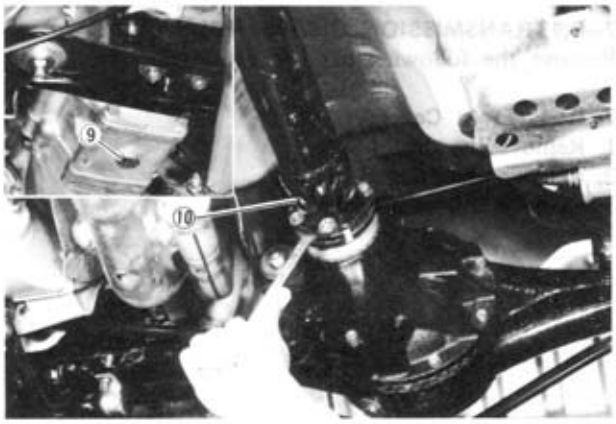

Fig. 7–5

Jack up the vehicle and support it with stands.

9. Drain the lubricant from the transmission. After draining, clean and reinstall the drain plug.
10. Remove the propeller shaft referring to Par. 8–A.

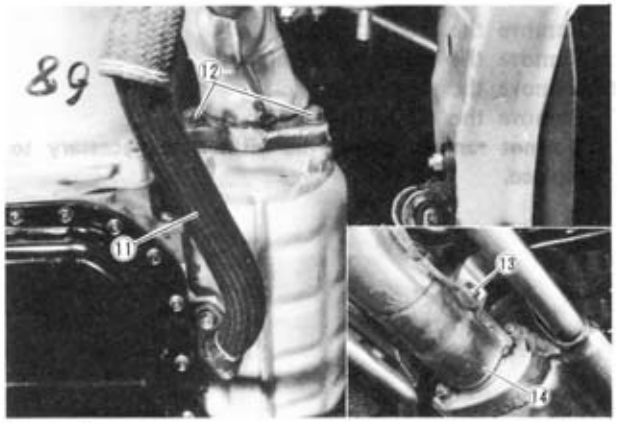

Fig. 7–6

11. Remove the air pipe (thermal reactor ~ air duct).
12. Remove the nuts and disconnect the air duct from the thermal reactor.
13. Disconnect the air duct hanger.
14. Disconnect the air duct from the silencer.

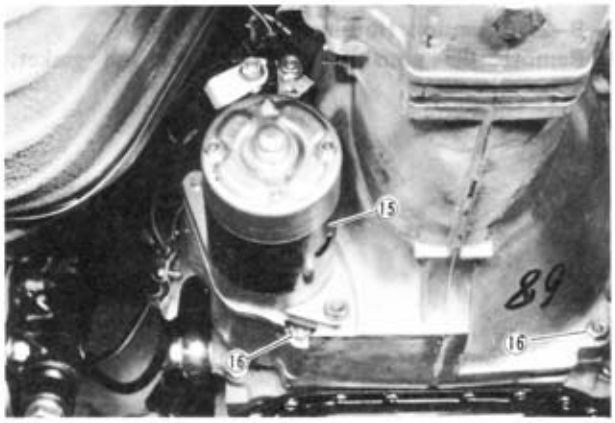

Fig. 7–7

15. Disconnect the wirings and remove the starting motor.
16. Remove the bolts attaching the transmission to rear end of the engine.
17. Disconnect the couplers from the back-up lamp switch, top switch and over-drive switch.

Fig. 7–8

18. Place the jacks under the transmission and the engine, and support them securely.
19. Disconnect the speedometer cable.
20. Remove the nuts attaching the transmission support to the body.
21. Slide the transmission rearward until the main drive shaft clears the clutch disc and carefully remove the transmission from under the vehicle.

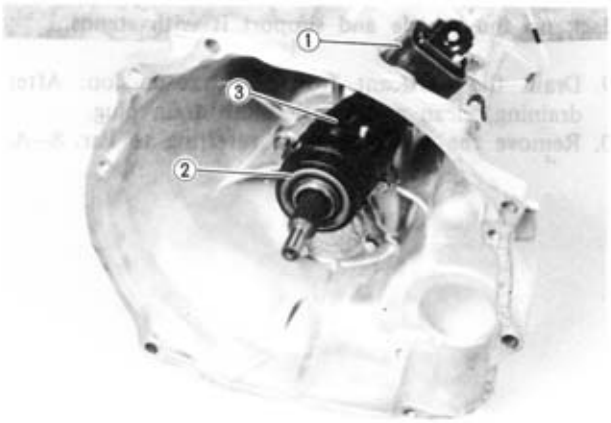

Fig. 7–9

7–B. TRANSMISSION DISASSEMBLY

Remove the following parts in sequence.

7–B–1. Front Cover

1. Remove the dust boot.
2. Remove the release bearing.
3. Remove the shift fork.

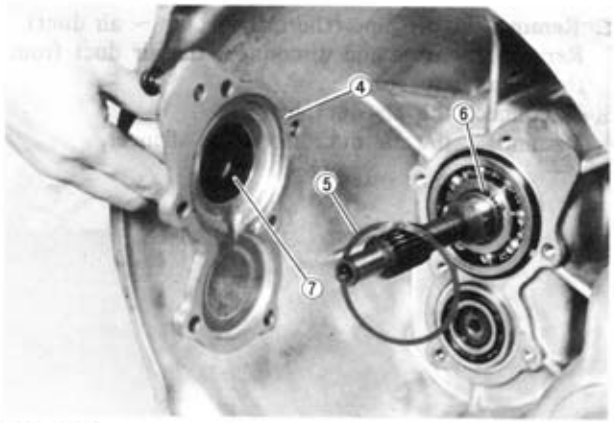

Fig. 7–10

4. Remove the front cover.
5. Remove the adjusting shim(s).
6. Remove the snap ring.
7. Remove the oil seal.
   Do not remove unless the oil seal is necessary to replace.

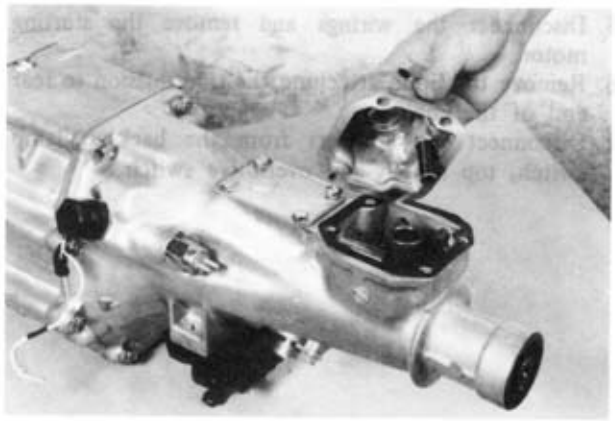

Fig. 7–11

7–B–2. Extension Housing

1. Remove the gearshift lever retainer and gasket.

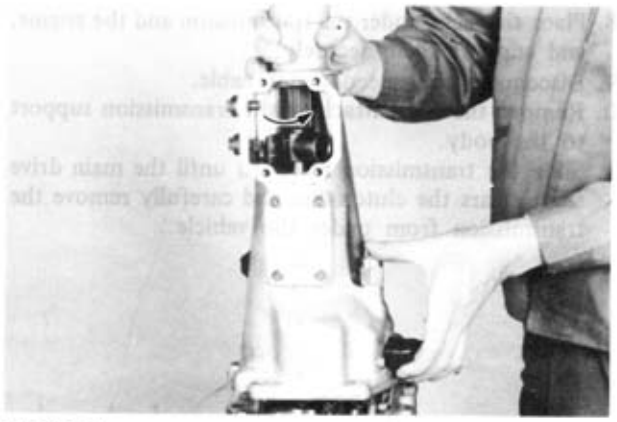

Fig. 7–12

2. Remove the extension attaching bolts.
3. Remove the extension housing, with the control rod end laid down to the left as far as it will go.

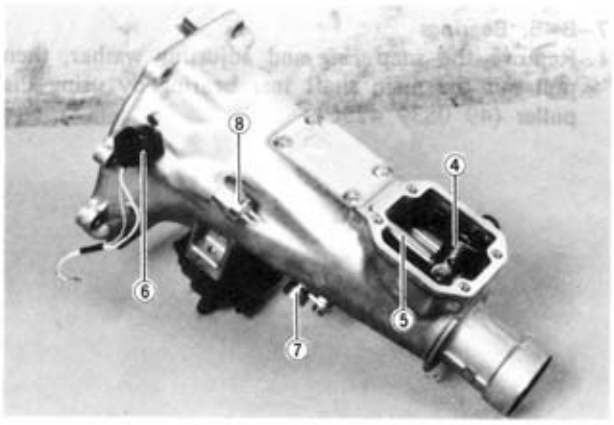

Fig. 7–13

4. Remove the control rod end.
5. Remove the control rod.
6. Remove the back-up light switch.
7. Remove the speedometer driven gear assembly.
8. Remove the over-drive switch.
   (5-speed transmission only)

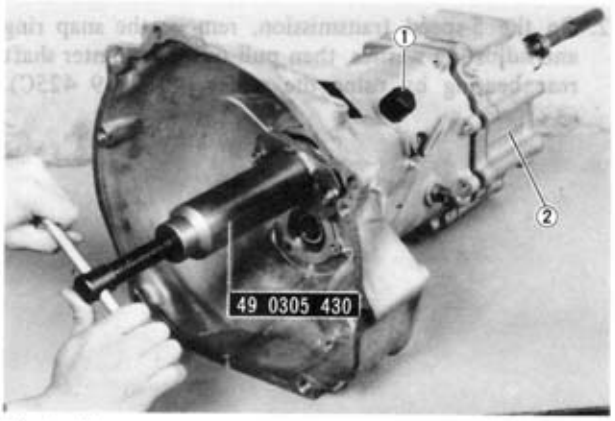

Fig. 7–14

7–B–3. Transmission Case

1. Remove the top switch (except for Canada)
2. Remove the bearing housing and gear assembly by using the **pusher** (49 0305 430) or tapping the main drive shaft with a plastic hammer.

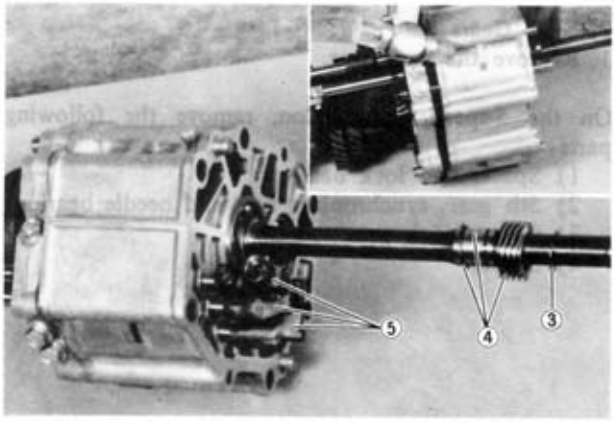

Fig. 7–15

3. Remove the snap ring.
4. Remove the speedometer drive gear, steel ball and snap ring.
5. Remove the shift rod end attaching bolts and shift rod ends.
6. Remove the intermediate housing by lightly tapping the intermediate housing with a plastic hammer.

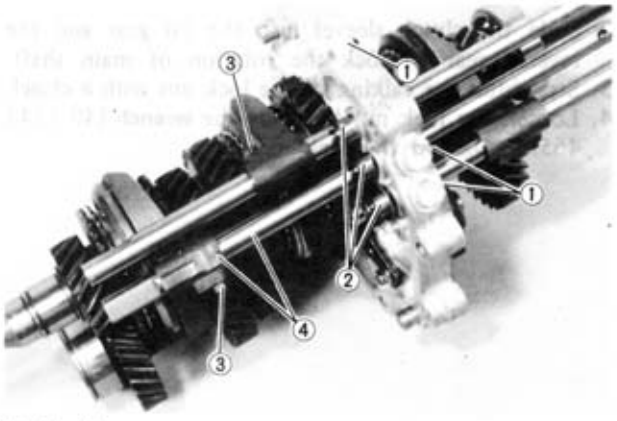

Fig. 7–16

7–B–4. Shift Forks and Shift Fork Rods

1. Remove the cap bolts, springs and lock balls.
2. Remove the snap rings on the shift rods.
3. Remove the shift fork attaching bolts.
4. Remove the shift fork rods and shift forks.
   When removing the 5th and reverse shift rod (or reverse shift rod), be carefull not to loss the lock ball.
5. Remove the lock ball, spring and interlock pins.

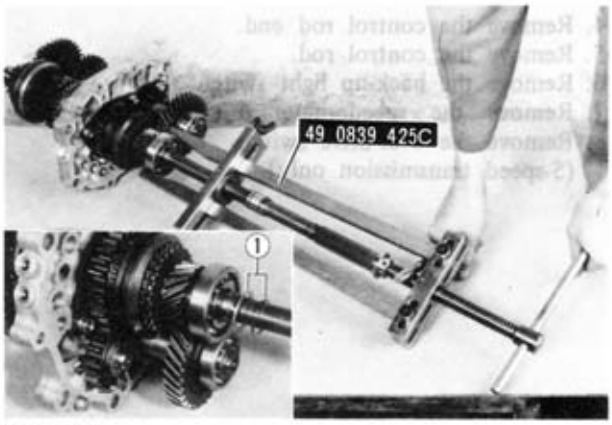

Fig. 7–17

7–B–5. Bearings

1. Remove the snap ring and adjusting washer, then pull out the main shaft rear bearing by using the **puller** (49 0839 425C).

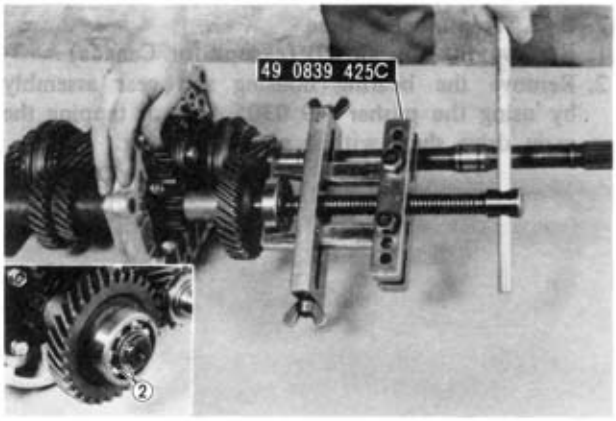

Fig. 7–18

2. On the 5-speed transmission, remove the snap ring and adjusting washer, then pull out the counter shaft rear bearing by using the **puller** (49 0839 425C).

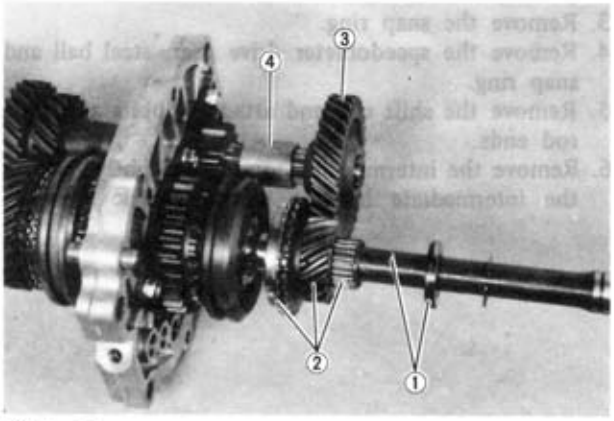

Fig. 7–19

7–B–6. Gears

1. Remove the snap ring.

On the 5-speed transmission, remove the following parts.

1) Spacer and lock ball
2) 5th gear, synchronizer ring and needle bearing
3) Counter 5th gear
4) Spacer

Fig. 7–20

2. Slide the clutch sleeves into the 1st gear and the reverse gear to lock the rotation of main shaft.
3. Straighten the calking of the lock nut with a chisel.
4. Loosen the lock nut by using the **wrench** (49 1243 465A). **Discard the lock nut.**

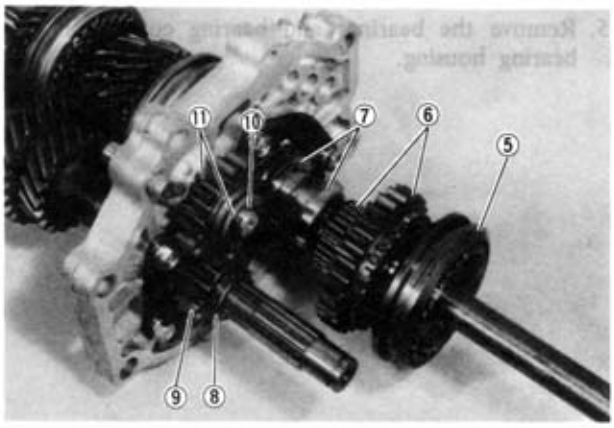

Fig. 7–21

5. Remove the clutch hub assembly.
6. Remove the reverse gear and needle bearing.
7. Remove the inner race and thrust washer.
8. Remove the snap ring. (4-speed transmission only)
9. Remove the counter reverse gear.
10. Remove the snap ring.
11. Remove the thrust washers and reverse idle gear.

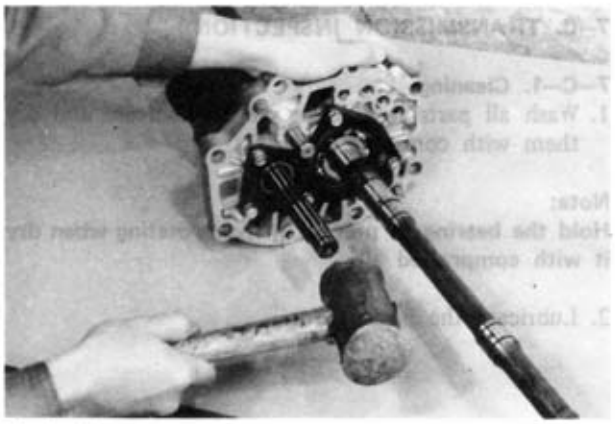

Fig. 7–22

12. Remove the main shaft and counter shaft from the bearing housing.
    Tap the rear end of the main shaft and counter shaft in turn with a plastic hammer.

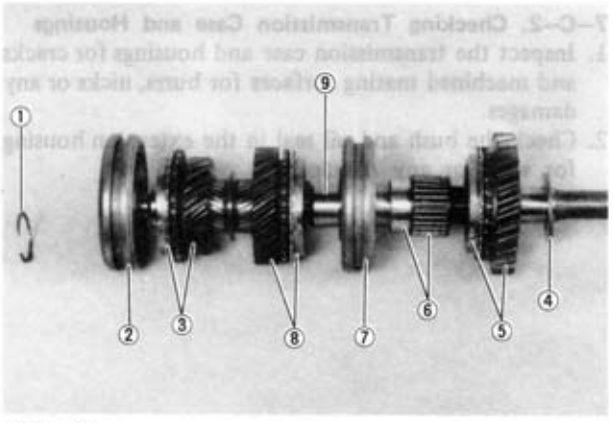

Fig. 7–23

13. Remove the following parts from the main shaft.
    1) Snap ring
    2) Clutch hub assembly (press out)
    3) Synchronizer ring and 3rd gear
    4) Thrust washer
    5) Synchronizer ring and 1st gear
    6) Needle bearing and inner race
    7) Clutch hub assembly (press out)
    8) Synchronizer ring and 3rd gear
    9) Main shaft

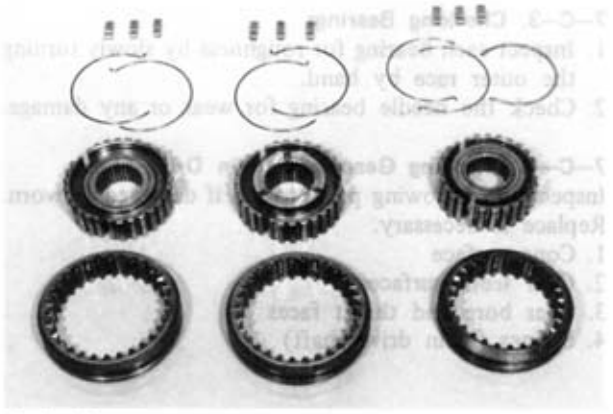

Fig. 7–24

14. Disassemble the clutch hub assemblies, being carefull not to mix up the parts.

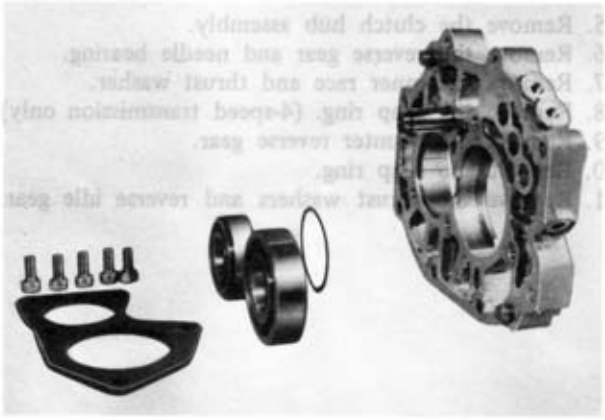

Fig. 7–25

15. Remove the bearings and bearing cover from the bearing housing.

Fig. 7–26

7–C. TRANSMISSION INSPECTION

7–C–1. Cleaning

1. Wash all parts in suitable cleaning solvent and dry them with compressed air.

Note:
Hold the bearing to prevent it from rotating when dry it with compressed air.

2. Lubricate the bearings.

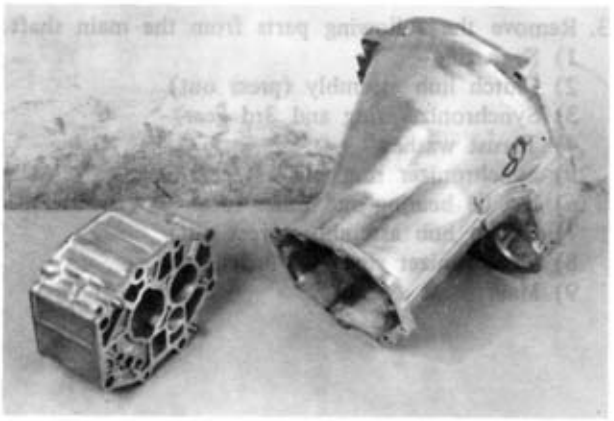

Fig. 7–27

7–C–2. Checking Transmission Case and Housings

1. Inspect the transmission case and housings for cracks and machined mating surfaces for burrs, nicks or any damages.
2. Check the bush and oil seal in the extension housing for wear or any damage.

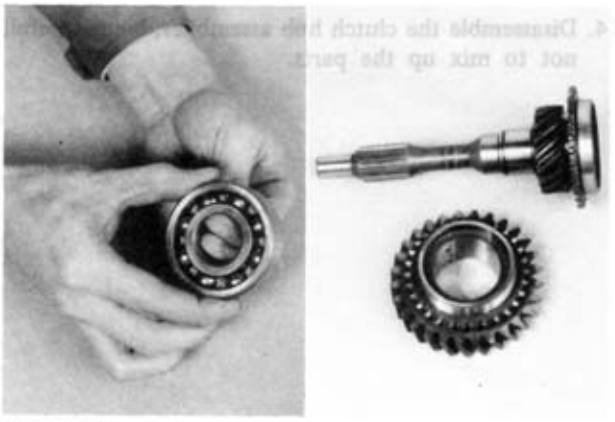

Fig. 7–28

7–C–3. Checking Bearings

1. Inspect each bearing for roughness by slowly turning the outer race by hand.
2. Check the needle bearing for wear or any damage.

7–C–4. Checking Gears and Main Drive Shaft

Inspect the following parts to see if damaged or worn. Replace if necessary.

1. Cone surface
2. Gear teeth surfaces
3. Gear bore and thrust faces
4. Splines (main drive shaft)

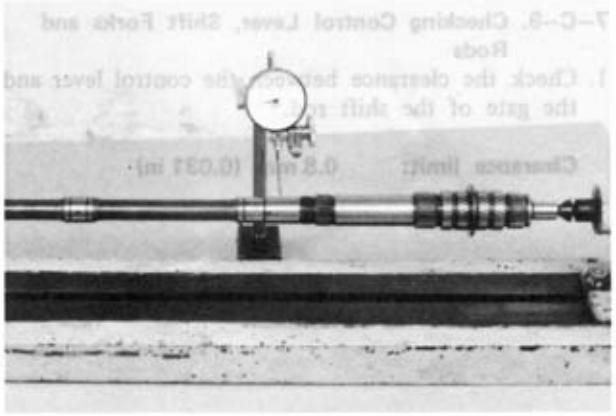

Fig. 7–29

7–C–5. Checking Main Shaft

1. Inspect the main shaft for run-out by applying a dial indicator.

Run-out limit:	**0.03 mm (0.0012 in)**

2. Check the fit of the main shaft and each gear bore.

Standard clearance:	**0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in)**
Limit:	**0.15 mm (0.006 in)**

Fig. 7–30

7–C–6. Checking Counter Shaft

Inspect the teeth surfaces and splines of the counter shaft for wear and damage.

7–C–7. Checking Reverse Idle Gear and Shaft

1. Inspect the gear for wear and damage.
2. Check the fit of the gear bore and shaft.

Standard clearance:	**0.02 ~ 0.05 mm (0.0008 ~ 0.0020 in)**
Limit:	**0.15 mm (0.006 in)**

Fig. 7–31

7–C–8. Checking Synchronizer Mechanism

1. Inspect the gear teeth on the synchronizer ring for wear and damage.
2. Check the clearance between the side faces of the synchronizer ring and gear.

Standard clearance:	**1.5 mm (0.059 in)**
Limit:	**0.8 mm (0.031 in)**

3. Check the contact between the synchronizer ring and gear cone surface by using a thin coat of "red lead". If the contact pattern is poor, correct it by applying compound and lapping the surfaces together.

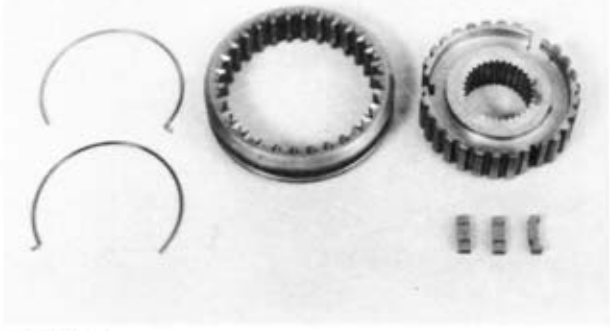

Fig. 7–32

4. See if the clutch sleeve slides easily on the clutch hub.
5. Check the synchronizer key, the inner surface of the clutch sleeve, and the key groove on the clutch hub for wear.
6. Check the synchronizer key spring for tension.

Fig. 7–33

7–C–9. Checking Control Lever, Shift Forks and Rods

1. Check the clearance between the control lever and the gate of the shift rod.

Clearance limit: **0.8 mm (0.031 in)**

Fig. 7–34

2. Check the clearance between the shift fork and clutch sleeve.

Clearance limit: **0.5 mm (0.020 in)**

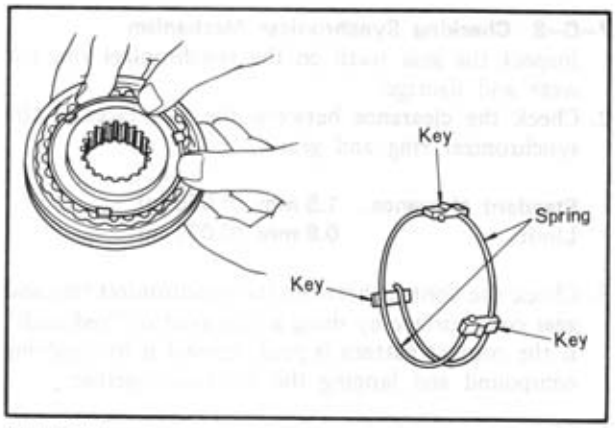

Fig. 7–35

7–D. TRANSMISSION ASSEMBLY

Assemble the transmission in the reverse order of disassembly.
When assembling, **note** the following instructions.

Apply lubricant on sliding portions, gears and bearings before re-assembly.

1. Clutch Hub Assembly

Install the key springs so that the open ends of the springs should be kept 120 degrees apart as shown in figure.
This will keep the spring tension on each key uniform.

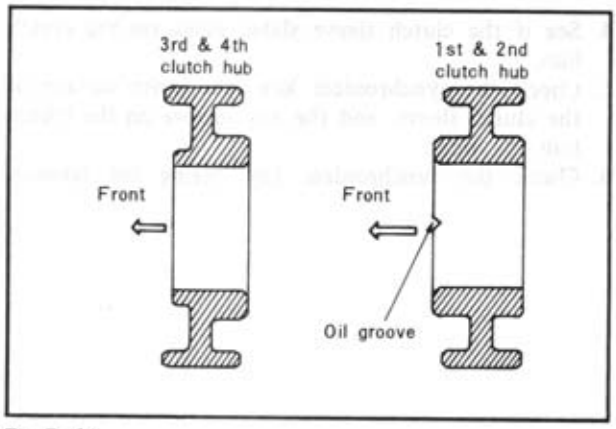

Fig. 7–36

Press in each clutch hub assembly to the main shaft noting its direction.

Fig. 7–37

2. Bearing Housing and Bearing Clearance
Place a straight edge across the bearing housing, and measure the clearance between the straight edge and each bearing with a feeler gauge.
If the clearance is not within the specification, adjust it with a shim.

Clearance: 0 ± 0.05 mm (0 ± 0.002 in)

Available shims

0.1 mm (0.004 in)	0.3 mm (0.012 in)

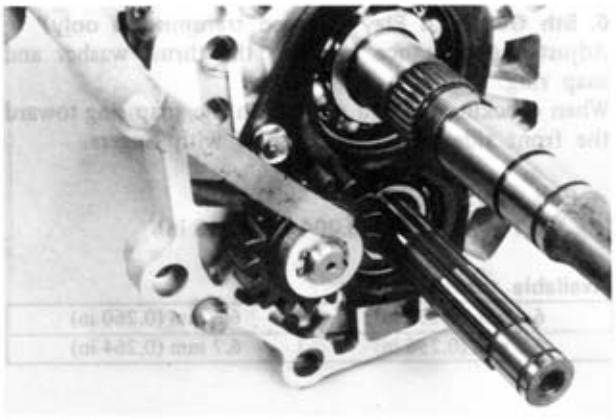

Fig. 7–38

3. Reverse Idle Gear End Play
Check the clearance between the snap ring and thrust washer. If the clearance is not within the specification, adjust it with a thrust washer.

End play:
0.1 ~ 0.3 mm (0.004 ~ 0.012 in)

Available thrust washers

2.8 mm (0.110 in)	3.0 mm (0.118 in)

Fig. 7–39

4. Main Shaft Lock Nut
After installing the clutch hub assembly, slide the clutch sleeves into 1st gear and reverse gear to lock the rotation of the main shaft.
Using the **wrench** (49 1243 465A), tighten a new lock nut to the specified torque.

Tightening torque:
13 ~ 21 m-kg (94 ~ 152 ft-lb)

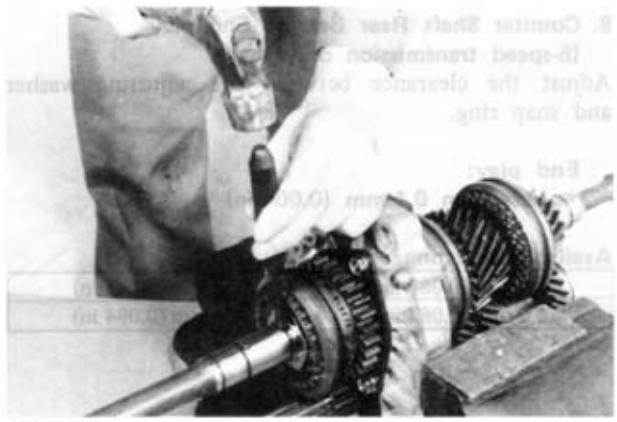

Fig. 7–40

After tightening the main shaft lock nut, calk the lock nut securely with a chisel.

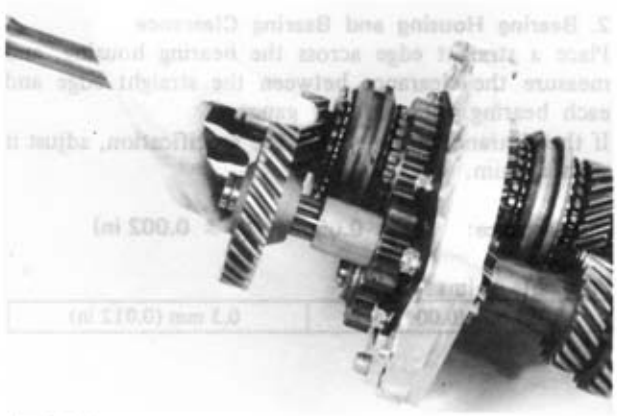

Fig. 7–41

5. 5th Gear (5-speed transmission only)
Install the 5th gear to the counter shaft gear with use care its direction shown in figure.

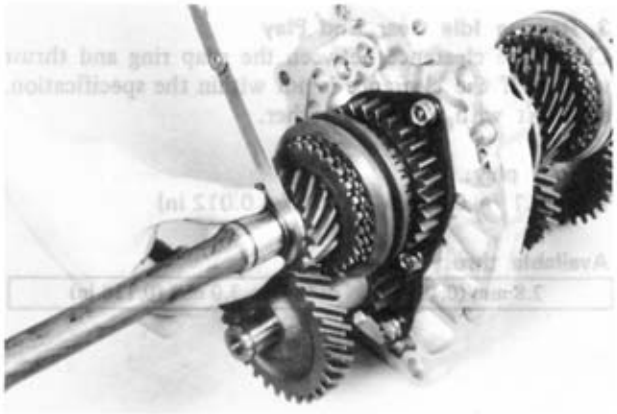

Fig. 7–42

6. 5th Gear End Play (5-speed transmission only)
Adjust the clearance between the thrust washer and snap ring.
When checking the end play, push the snap ring toward the front side of the main shaft with fingers.

End play:
0.1 ~ 0.3 mm (0.004 ~ 0.012 in)

Available thrust washers

6.4 mm (0.252 in)	6.6 mm (0.260 in)
6.5 mm (0.256 in)	6.7 mm (0.264 in)

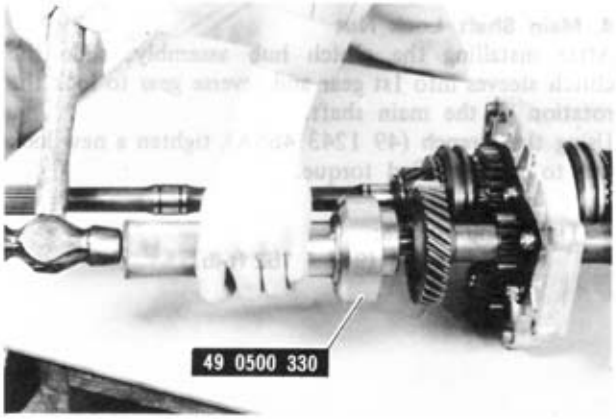

Fig. 7–43

7. Counter Shaft Rear Bearing (5-speed transmission only)
Install the counter shaft rear bearing by using the bearing **installer** (49 0500 330).

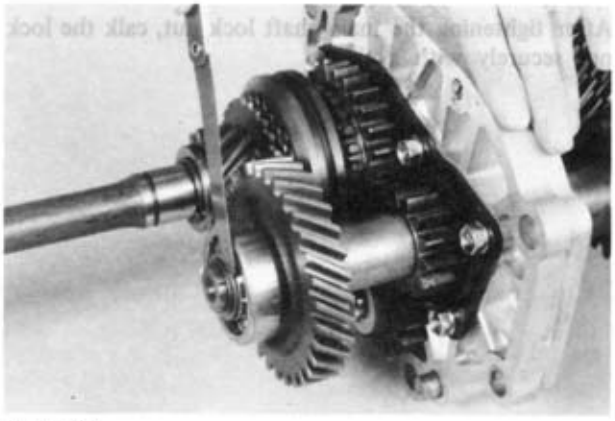

Fig. 7–44

8. Counter Shaft Rear Bearing End play (5-speed transmission only)
Adjust the clearance between the adjusting washer and snap ring.

End play:
Less than 0.1 mm (0.004 in)

Available adjusting washers

2.1 mm (0.083 in)	2.3 mm (0.091 in)
2.2 mm (0.087 in)	2.4 mm (0.094 in)

Fig. 7–45

9. Main Shaft Rear Bearing
Install the main shaft rear bearing by using the **wrench** (49 1243 465A).

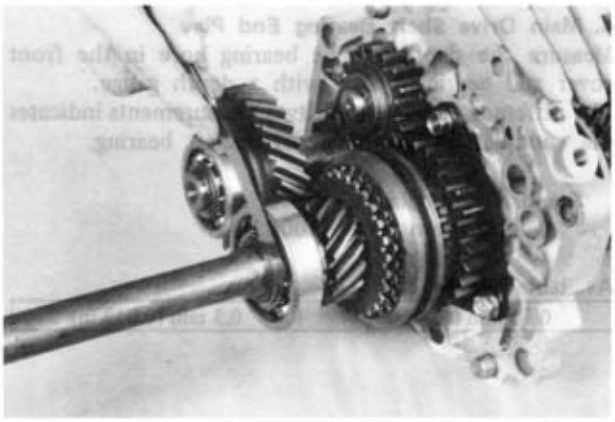

Fig. 7–46

10. Main Shaft Rear Bearing End play
Adjust the clearance between the adjusting washer and snap ring.

End play:
Less than 0.1 mm (0.004 in)

Available adjusting washers

1.9 mm (0.075 in)	2.1 mm (0.083 in)
2.0 mm (0.079 in)	2.2 mm (0.087 in)

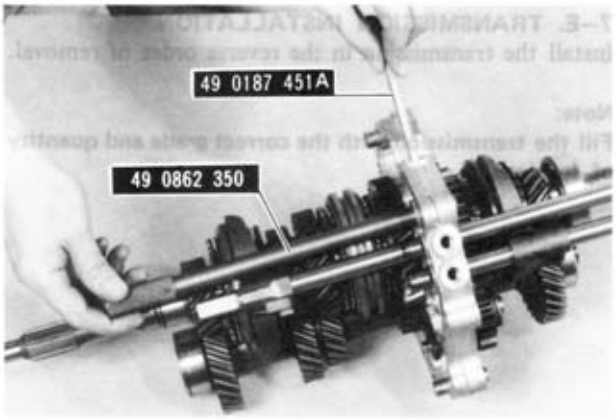

Fig. 7–47

11. Shift Forks, Rods and Interlock Pins
Use the shift fork rod **guide** (49 0862 350) and interlock pin **guide** (49 0187 451A) to assist in installing the shift fork rods and interlock pins.

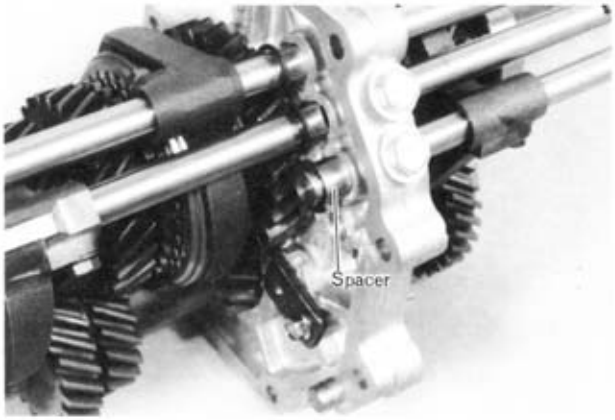

Fig. 7–48

Note:
On the 4-speed transmission, make sure that the spacer must be installed in position on the reverse shift fork rod.

When installing the shift fork lock bolts, apply locking agent on the threads.

Tightening torque:	
Shift fork attaching bolts	**1.2 ~ 1.6 m-kg (9 ~ 12 ft-lb)**
Spring cap bolts	**1.0 ~ 1.5 m-kg (7 ~ 11 ft-lb)**

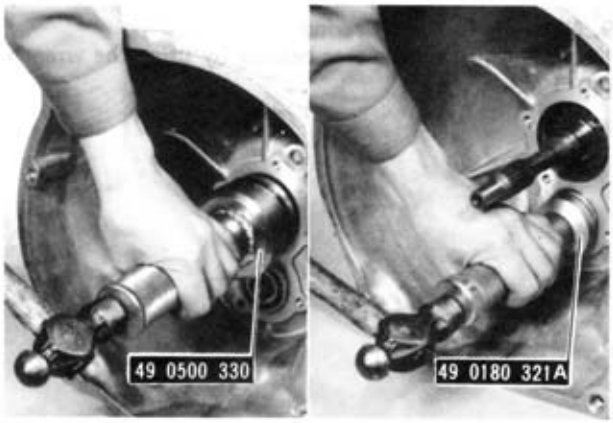

Fig. 7–49

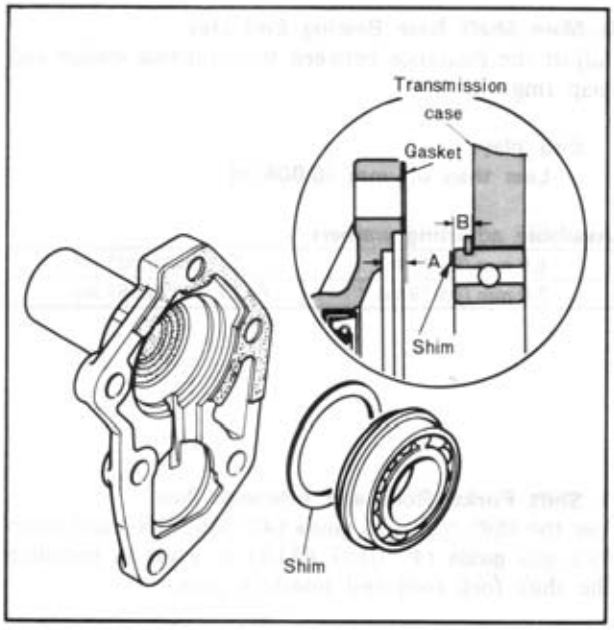

Fig. 7–50

12. Main Drive Shaft Bearing
Install the main drive shaft bearing by using the **installer** (49 0500 330).

13. Counter Shaft Front Bearing
Install the counter shaft front bearing by using the **installer** (49 0180 321A).

14. Main Drive Shaft Bearing End Play
Measure the depth of the bearing bore in the front cover and bearing height with a depth gauge.
The difference between the two measurements indicates the end play of the main drive shaft bearing.

Standard end play(A–B):
0 ~ 0.1 mm (0 ~ 0.004 in)

Available shims

0.15 mm (0.006 in)	0.3 mm (0.012 in)

7–E. TRANSMISSION INSTALLATION

Install the transmission in the reverse order of removal.

Note:
Fill the transmission with the correct grade and quantity of lubricant.

AUTOMATIC TRANSMISSION

Fig. 7A–1

7A–A. TRANSMISSION REMOVAL

The procedures for removing the transmission from the vehicle are as follows:

Apply the parking brake and block the wheels.

1. Open the bonnet and disconnect the battery negative cable.

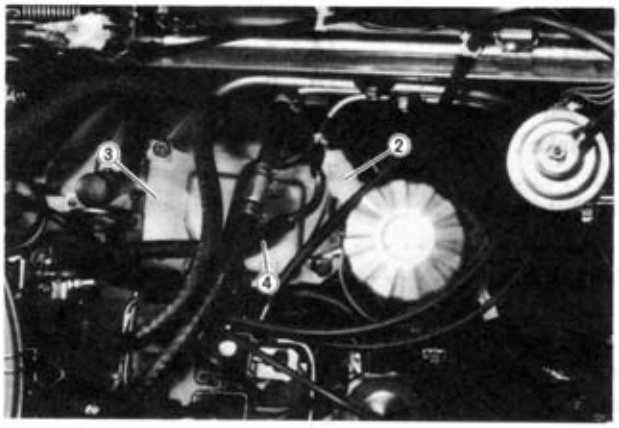

Fig. 7A–2

2. Disconnect the inhibitor switch coupler.
3. Remove the converter housing upper cover.
4. Disconnect the vacuum sensing tube of the vacuum diaphragm.

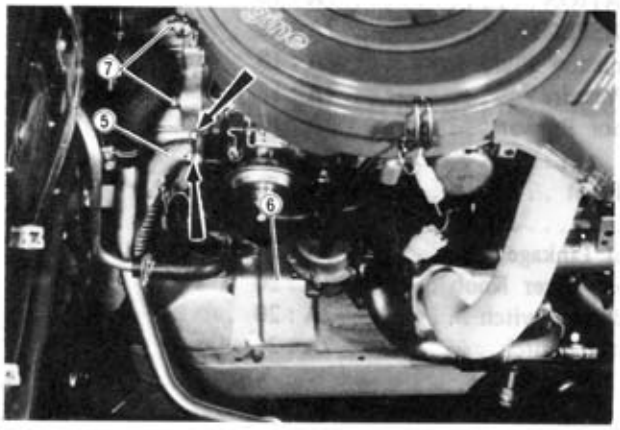

Fig. 7A–3

5. Remove the nuts and disconnect the air pipe.
6. Remove the thermal reactor cover.
7. Remove the bolts attaching the transmission to rear end of the engine.

Fig. 7A–4

Jack up the vehicle and support it with stands.

8. Remove the propeller shaft referring to Par. 8–A. Install the **turning holder** (49 0259 440) into the extension housing to prevent lubricant from leaking out of the housing.

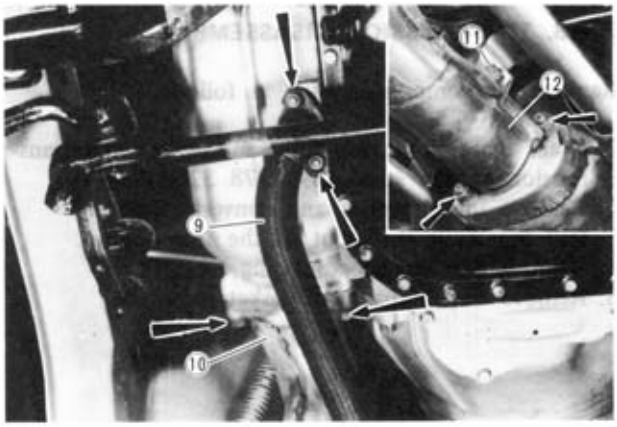

Fig. 7A–5

9. Remove the air pipe (thermal reactor ~ air duct).
10. Remove the nuts and disconnect the air duct from the thermal reactor.
11. Disconnect the air duct hanger.
12. Disconnect the air duct from the silencer.

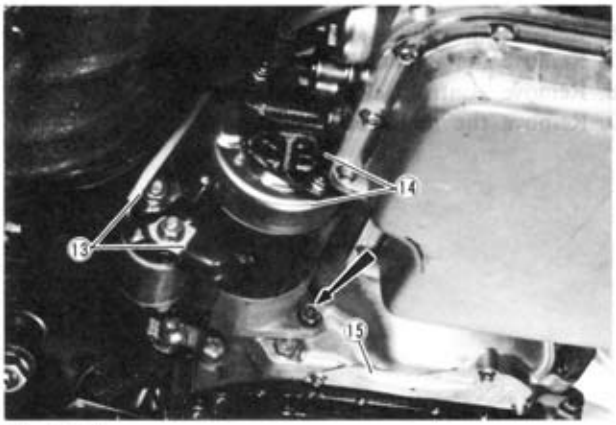

Fig. 7A–6

13. Disconnect the starting motor wirings.
14. Remove the bracket and then, the starting motor.
15. Remove the converter housing lower cover.

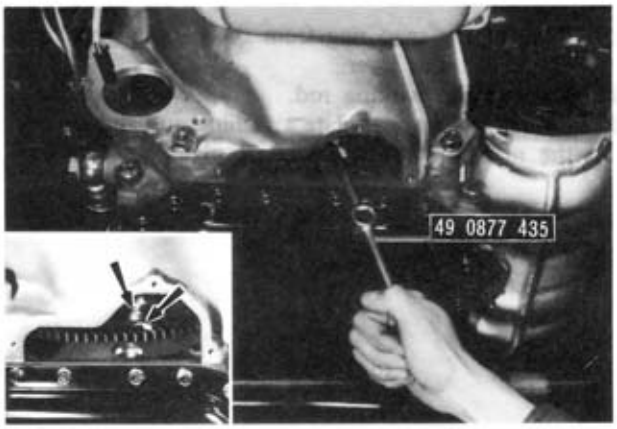

Fig. 7A–7

16. Mark the drive plate and torque converter for correct realignment during re-installation. Using the **wrench** (49 0877 435), remove the bolts attaching the torque converter to the drive plate.
17. Remove the bolts attaching the transmission to rear end of the engine.

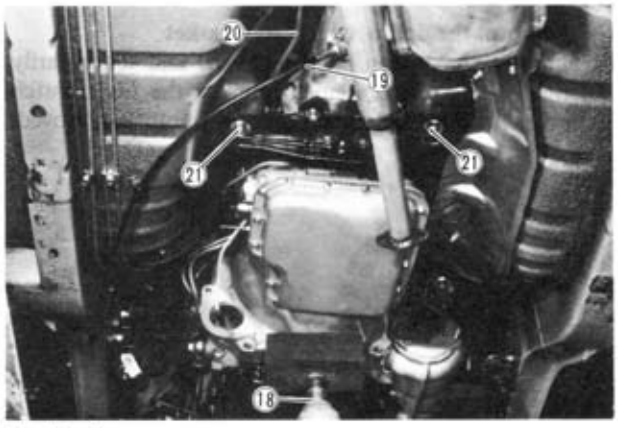

Fig. 7A–8

18. Place the jack under the transmission and the engine, and support them securely.
19. Disconnect the speedometer cable.
20. Disconnect the select rod at the select lever.
21. Remove the nuts attaching the transmission support to the body.
22. Lower the transmission enough to disconnect the fluid pipes and disconnect the fluid pipes from the transmission housing.
23. Slide the transmission rearward until the input shaft clears the rear end of the eccentric shaft and carefully remove the transmission and torque converter assembly from under the vehicle.

Fig. 7A–9

7A–B. TRANSMISSION DISASSEMBLY

Remove the component parts as follows.

1. Drain the transmission fluid and mount the transmission on the **stand** (49 0378 320A).
2. Remove the converter and converter housing.
3. Pull the input shaft out of the front pump.
4. Remove the extension housing.
5. Remove the oil pan and gasket.

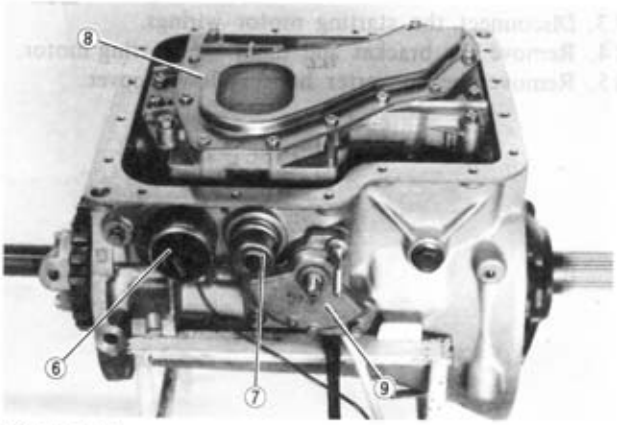

Fig. 7A–10

6. Remove the down shift solenoid.
7. Remove the vacuum diaphragm and diaphragm rod.
8. Remove control valve body assembly.
9. Remove the inhibitor switch.

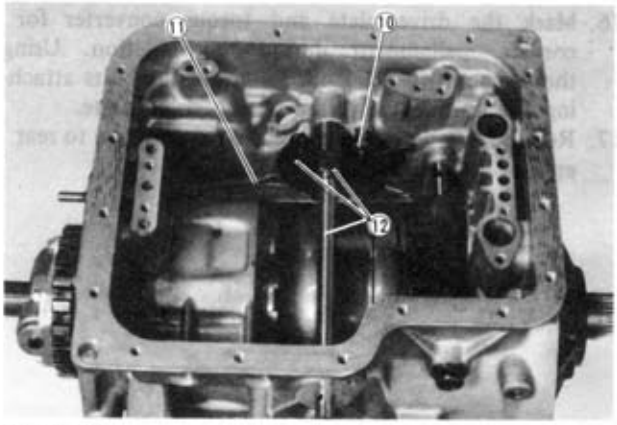

Fig.7A–11

10. Remove the snap ring from the parking lever and disconnect the lever.
11. Remove the parking rod.
12. Loosen the manual plate attaching nut, and remove the manual shaft and manual plate.

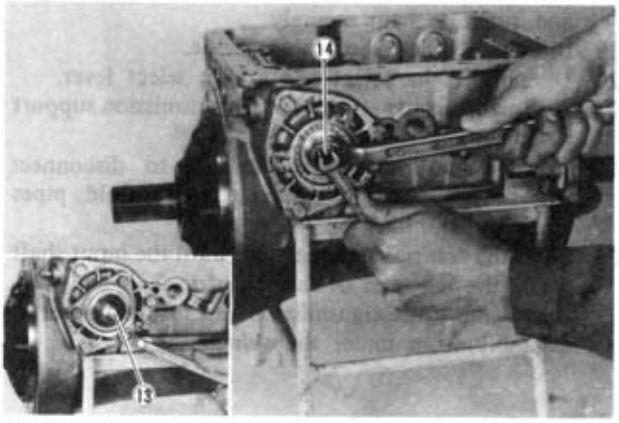

Fig. 7A–12

13. Remove the servo cover and gasket.
14. Loosen the piston stem lock nut and temporarily tighten the piston stem to prevent the front clutch drum from falling when the oil pump is removed.

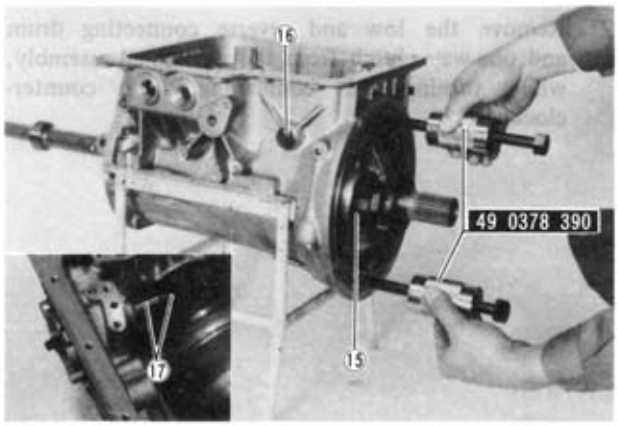

Fig. 7A–13

15. Remove the oil pump using the **puller** (49 0378 390).
16. Remove the band retaining bolt.
17. Loosen the piston stem and remove the band strut.

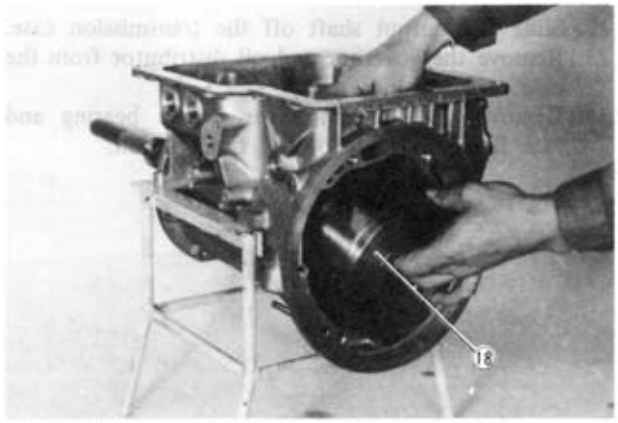

Fig. 7A–14

18. Remove the band, front clutch assembly, rear clutch assembly, front planet carrier assembly and sun gear as an assembly.

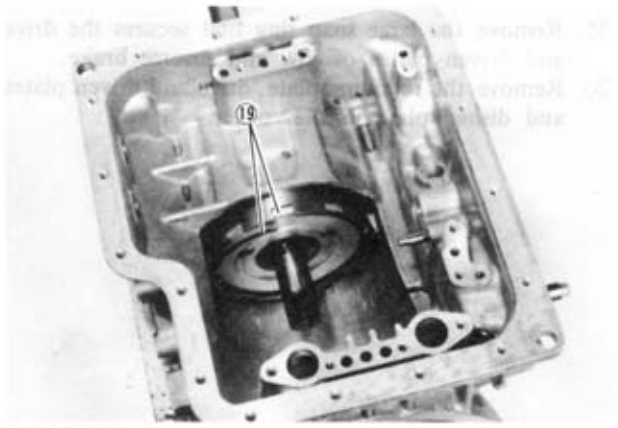

Fig. 7A–15

19. Remove the large snap ring that secures the rear planet carrier to the connecting drum. Remove the rear planet carrier from the drum.

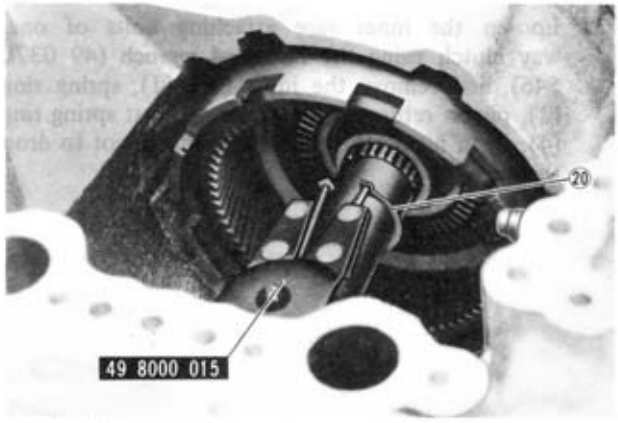

Fig.7A–16

20. Remove the snap ring on the output shaft using the **pliers** (49 8000 015), and remove the internal drive flange.

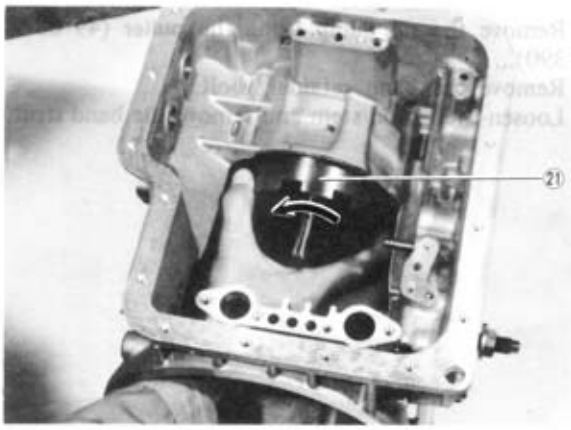

Fig. 7A–17

21. Remove the low and reverse connecting drum and one-way clutch from the case as an assembly, while turning the connecting drum counter-clockwise.

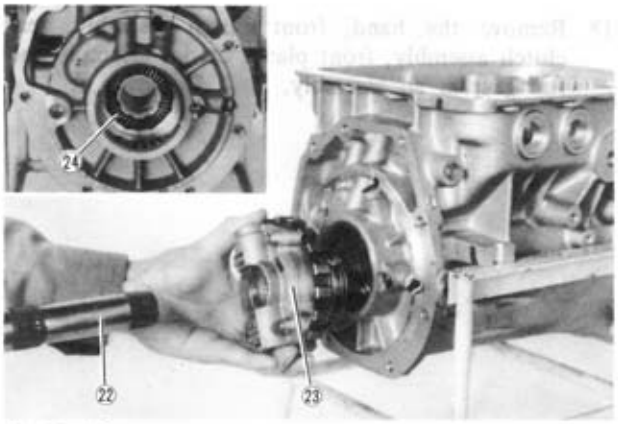

Fig. 7A–18

22. Slide the output shaft off the transmission case.
23. Remove the governor and oil distributor from the case.
24. Remove the oil distributor needle bearing and race from rear side of the transmission.

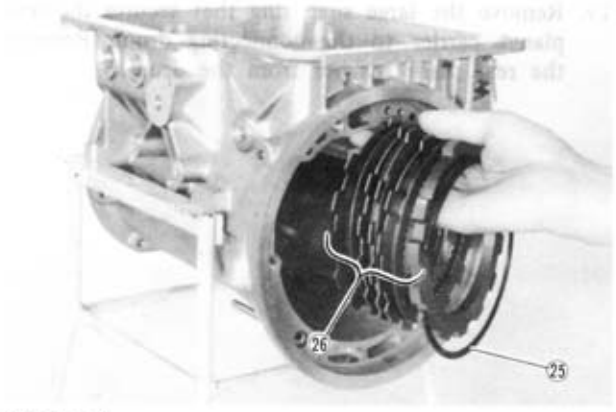

Fig. 7A–19

25. Remove the large snap ring that secures the drive and driven plates of low and reverse brake.
26. Remove the retaining plate, drive and driven plates and dished plate in that order.

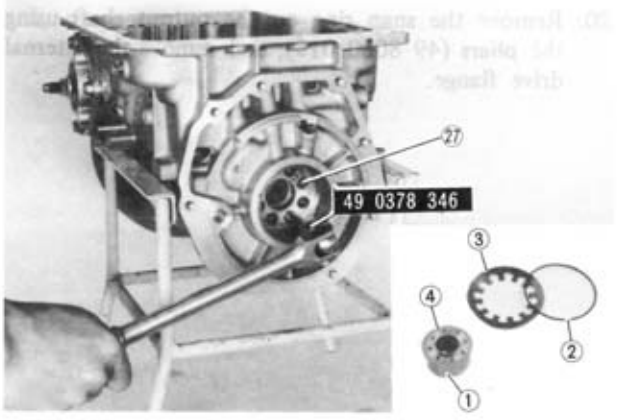

Fig. 7A–20

27. Loosen the inner race attaching bolts of one-way clutch using the **hex-head wrench** (49 0378 346), and remove the inner race (1), spring ring (2), piston return spring (3) and thrust spring ring (4), from inside the case being careful not to drop them.

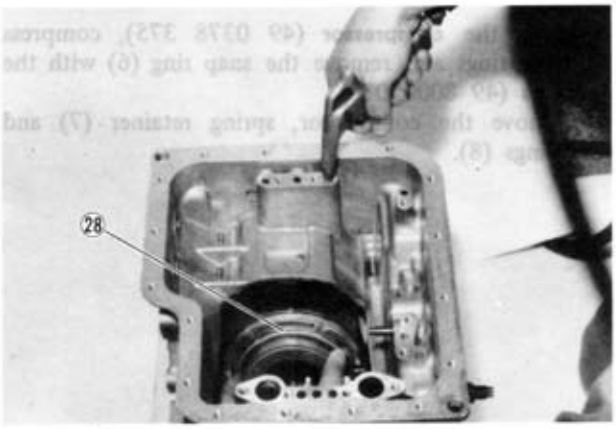

Fig. 7A–21

28. Blow the compressed air into the oil passage located at the rear of the case and remove the low and reverse brake piston.

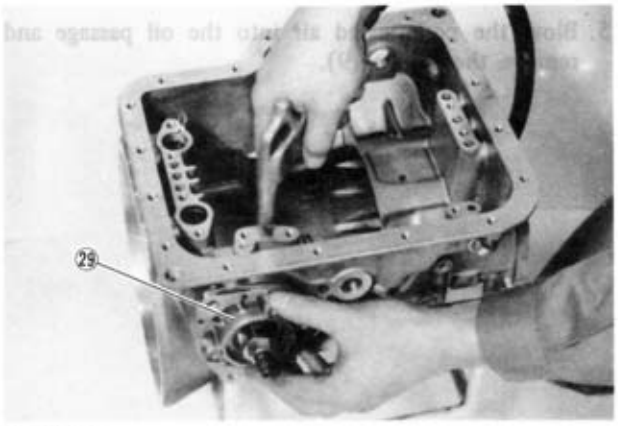

Fig. 7A–22

29. Remove the servo retainer attaching bolts. Blow the compressed air into the oil passage and remove the servo assembly from the case.

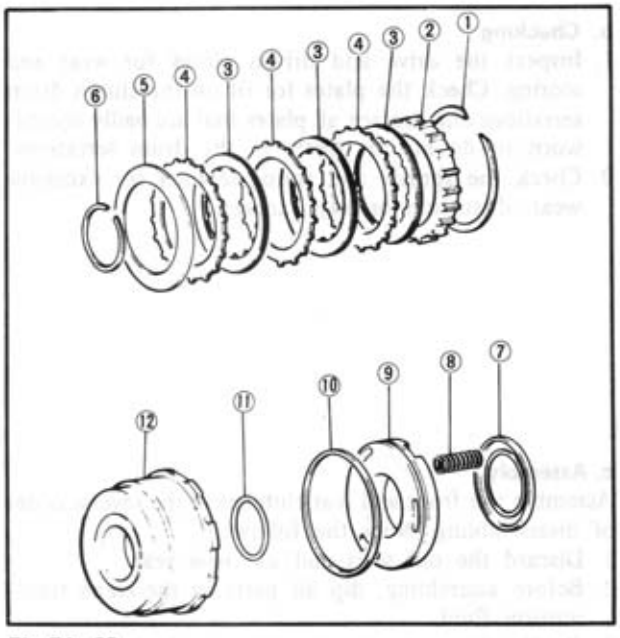

Fig. 7A–23

7A–C. COMPONENT PARTS SERVICE

7A–C–1. Front Clutch and Rear Clutch

a. Disassembly

1. Remove the snap ring (1).
2. Remove the retaining plate (2), drive plates (3), driven plates (4) and dished plate (5).

1) Snap ring
2) Retaining plate
3) Drive plates
4) Driven plates
5) Dished plate
6) Snap ring
7) Spring retainer
8) Spring
9) Piston
10) Outer seal
11) Inner seal
12) Clutch drum

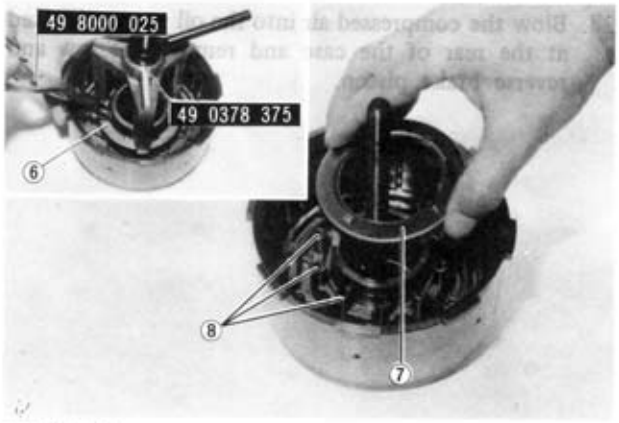

Fig. 7A–24

3. Using the **compressor** (49 0378 375), compress the springs and remove the snap ring (6) with the **pliers** (49 8000 025).
4. Remove the compressor, spring retainer (7) and springs (8).

Fig. 7A–25

5. Blow the compressed air into the oil passage and remove the piston (9).

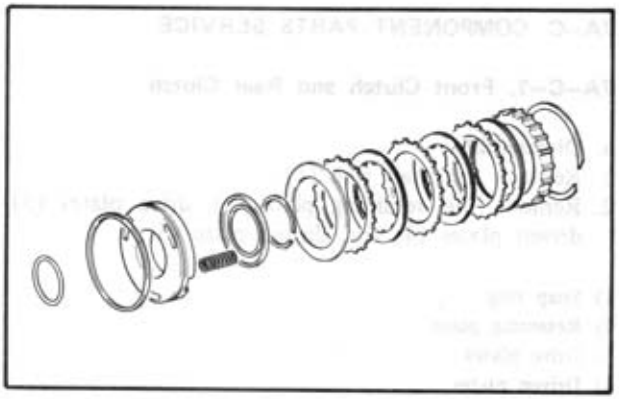

Fig. 7A–26

b. Checking

1. Inspect the drive and driven plates for wear and scoring. Check the plates for fit on the clutch drum serrations and replace all plates that are badly scored, worn or do not fit freely in the drum serrations.
2. Check the springs and spring retainer for excessive wear, distortion or any damage.

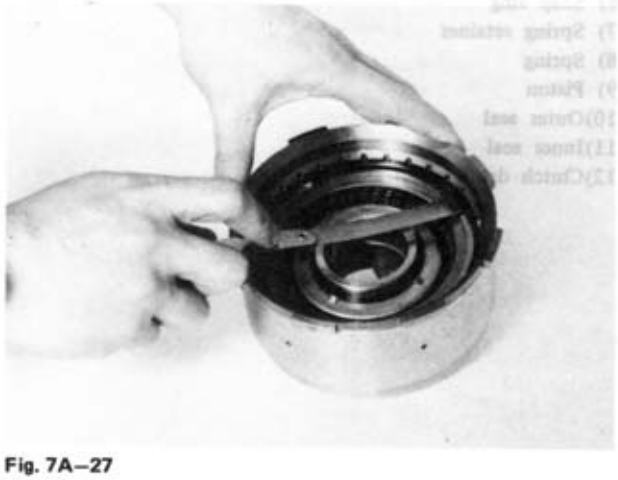

Fig. 7A–27

c. Assembly

Assemble the front and rear clutches in the reverse order of disassembling. **Note** the follows.

1. Discard the old seals and use **new** seals.
2. Before assembling, dip all parts in the clean transmission fluid.
3. On the front clutch assembly, check the clearance between the retaining plate and snap ring with a feeler gauge. If the clearance is not within the specifications, adjust it with correct retaining plate.

Clearance: 1.6 ~ 1.8 mm (0.063 ~ 0.071 in)

Available retaining plates (for front clutch)

7.2 mm (0.283 in)	7.6 mm (0.299 in)	8.0 mm (0.315 in)
7.4 mm (0.291 in)	7.8 mm (0.307 in)	8.2 mm (0.323 in)

Fig.7A–28

On the rear clutch assembly, check the clearance between the retaining plate and snap ring.
If the clearance is not within the specifications, replace the all drive and driven plates.

Clearance: 0.8 ~ 1.5 mm (0.031 ~ 0.059 in)

Fig. 7A–29

4. Install the front clutch assembly onto the oil pump assembly. Blow the compressed air into the oil passage and check the front clutch operation.

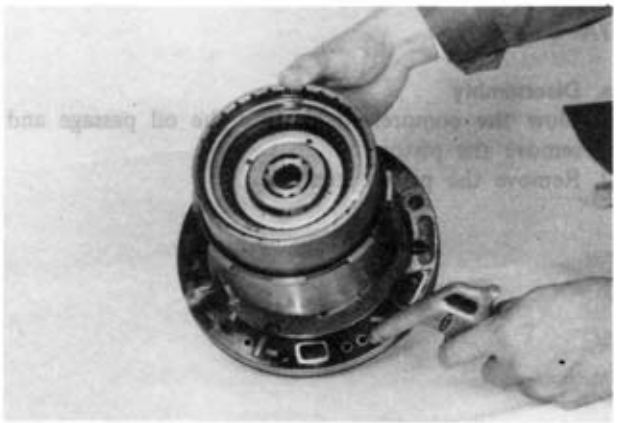

Fig. 7A–30

5. Install the rear clutch assembly onto the oil pump assembly with front clutch assembly installed. Blow the compressed air into the oil passage and check the rear clutch operation.

Fig. 7A–31

7A–C–2. Low and Reverse Brake

a. Disassembly

To disassembly, follow the Steps 25 ~ 28 as discribed in Par. 7A–B.

b. Checking

1. Check the drive and driven plates for wear and scoring. Check the plates for fit on the transmission case serrations.
   Replace all plates that are badly scored, worn or do not slide freely in the case serrations.
2. Check the piston return spring and piston for excessive wear, distortion or any damage.

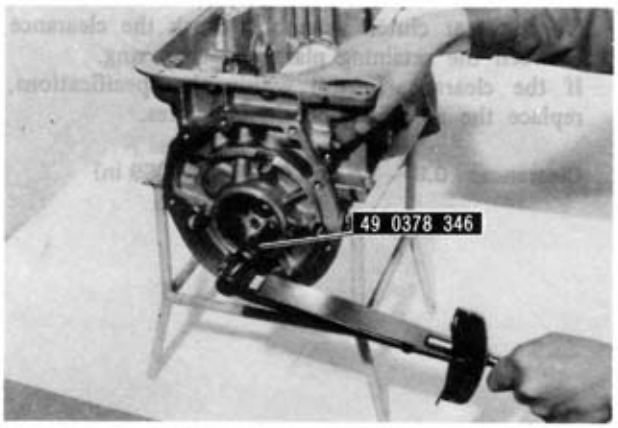

Fig. 7A–32

c. Assemble

Assemble the low and reverse brake in the reverse order of disassembling. **Note** the follows.

1. Discard the old seals and use **new** seals.
2. Before assembling, dip all parts in clean transmission fluid.
3. Tighten the one-way clutch inner race attaching bolts to **1.3 ~ 1.8 m-kg (9 ~ 13 ft-lb)**, using the **hex-head wrench** (49 0378 346).

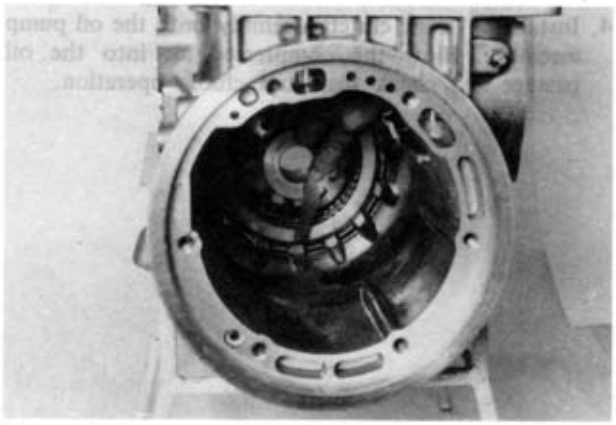

Fig.7A–33

4. Check the clearance between the retaining plate and snap ring with a feeler gauge.
   If the clearance is not within the specification, adjust it with correct retaining plate.

   Clearance: 0.8 ~ 1.05 mm (0.031 ~ 0.041 in)

Available retaining plates

7.8 mm (0.307 in)	8.4 mm (0.331 in)
8.0 mm (0.315 in)	8.6 mm (0.339 in)
8.2 mm (0.323 in)	8.8 mm (0.346 in)

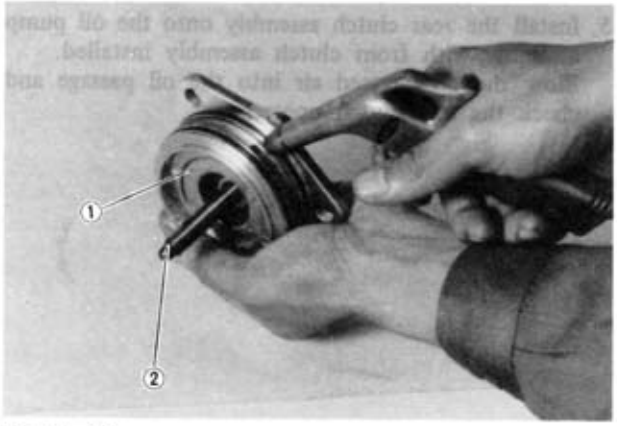

Fig. 7A–34

7A–C–3. Servo

a. Disassembly

1. Blow the compressed air into the oil passage and remove the piston.
2. Remove the piston stem.

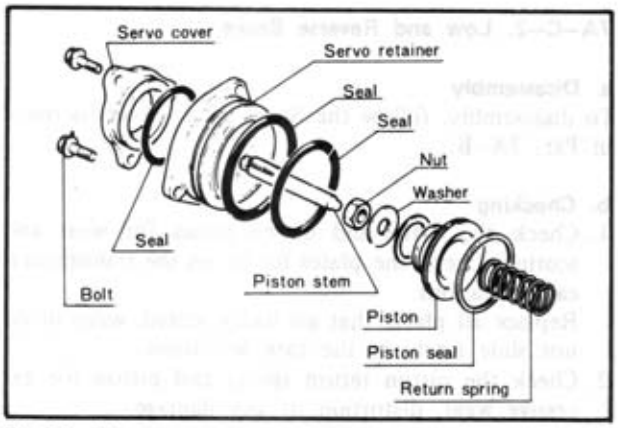

Fig. 7A–35

b. Checking

1. Inspect the servo bore for cracks, and the piston bore and piston stem for scores.
2. Check the piston stem for free movement and wear.
3. Check the servo spring for weakness.
4. Inspect the band lining for excessive wear and damage.

c. Assembly

Assemble the servo in the reverse order of disassembling. **Note** the follows.

1. Discard the old seals and use **new** seals.
2. Before assembling, dip all parts in clean transmission fluid.

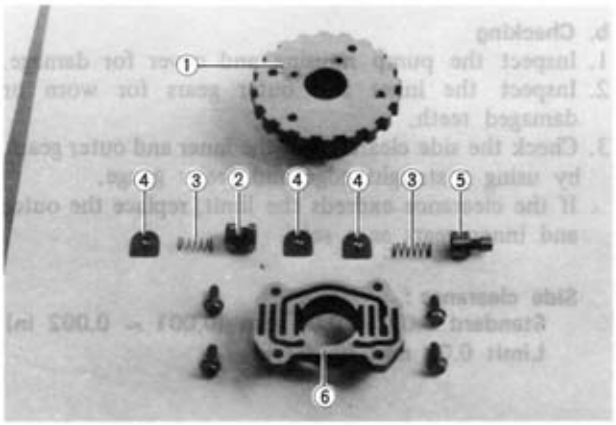

Fig. 7A–36

Fig. 7A–37

Fig.7A–38

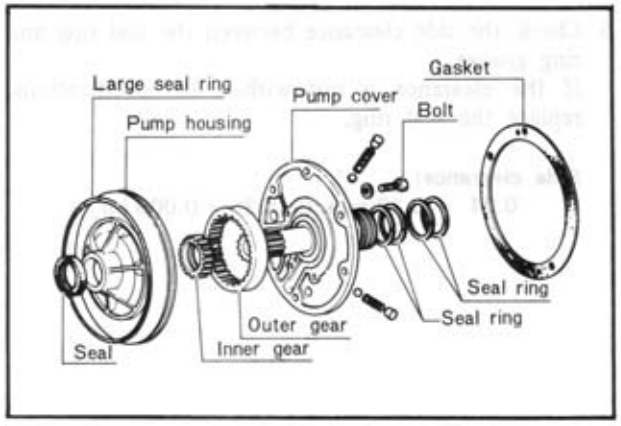

Fig. 7A–39

7A–C–4. Governor and Oil Distributor

a. Disassembly

1. Remove the governor valve body from the oil distributor.
2. Remove the valve retaining plates, and remove the primary and secondary governor valves and springs.

1) Oil distributor
2) Primary valve
3) Spring
4) Retaining plate
5) Secondary valve
6) Valve body

b. Checking

1. Inspect the governor valves and bores for scores.
2. Check for free movement of the valves. The valves should slide freely of their own weight in the bores when dry.
3. Check the spring for proper tension and the retaining plates for warpage.
4. Inspect the oil passages in the oil distributor for clog.
5. Check the side clearance between the seal ring and ring groove. If the clearance is not within the specification, replace the seal ring.

Side clearance : 0.04 ~ 0.16 mm (0.002 ~ 0.006 in)

c. Assembly

Assemble the governor and oil distributor in the reverse order of disassembling. **Note** the follows:

1. Before assembling, dip the all parts in clean transmission fluid.
2. Do not confuse the governor springs. The secondary govenor spring is stronger than primary governor spring.
3. Install the governor body assembly to the oil distributor and tighten the bolts to **0.5 ~ 0.7 m-kg (3.6 ~ 5.1 ft-lb).**

7A–C–5. Oil Pump

a. Disassembly

1. Remove the seal rings.
2. Remove the large seal ring from the pump housing.
3. Remove the pump cover attaching bolts and remove the pump cover.
4. Apply the marks onto the top surface of the pump inner and outer gears and remove the gears. **Do not** scratch the gear to mark.

Fig. 7A–40

b. Checking

1. Inspect the pump housing and cover for damage.
2. Inspect the inner and outer gears for worn or damaged teeth.
3. Check the side clearance of the inner and outer gears, by using a straight edge and feeler gauge.
   If the clearance exceeds the limit, replace the outer and inner gears as a set.

Side clearance :
Standard 0.02 ~ 0.04 mm (0.001 ~ 0.002 in)
Limit 0.08 mm (0.003 in)

Fig. 7A–41

4. Check the clearance between the outer gear teeth and crescent.
   If the clearance exceeds the limit, replace the outer and inner gears as a set.

Clearance between the outer gear and crescent:
Standard 0.14 ~ 0.21 mm (0.006 ~ 0.008 in)
Limit 0.25 mm (0.010 in)

Fig. 7A–42

5. Check the clearance between the outer gear and housing. If the clearance exceeds the limit, replace the outer and inner gears as a set.

Clearance between the outer gear and housing:
Standard 0.05 ~ 0.20 mm (0.002 ~ 0.008 in)
Limit 0.25 mm (0.010 in)

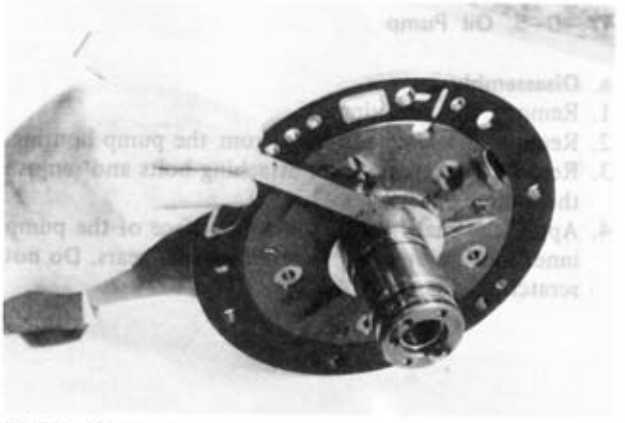

Fig.7A–43

6. Check the side clearance between the seal ring and ring groove.
   If the clearance is not within the specifications, replace the seal ring.

Side clearance:
0.04 ~ 0.16 mm (0.002 ~ 0.006 in)

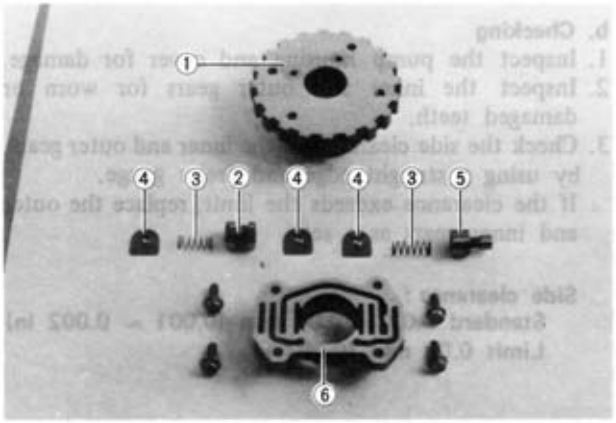

Fig. 7A–36

Fig. 7A–37

Fig.7A–38

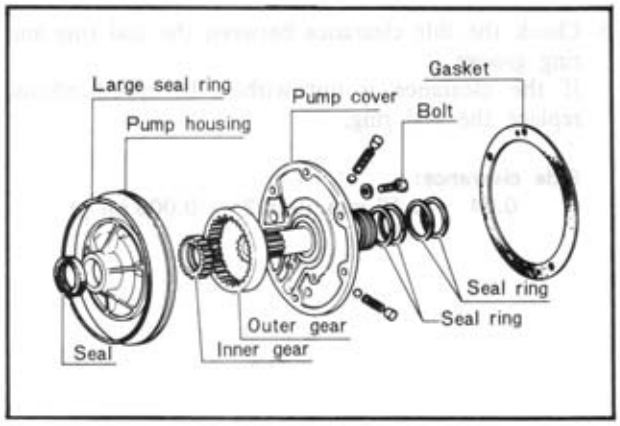

Fig. 7A–39

7A–C–4. Governor and Oil Distributor

a. Disassembly

1. Remove the governor valve body from the oil distributor.
2. Remove the valve retaining plates, and remove the primary and secondary governor valves and springs.

1) Oil distributor
2) Primary valve
3) Spring
4) Retaining plate
5) Secondary valve
6) Valve body

b. Checking

1. Inspect the governor valves and bores for scores.
2. Check for free movement of the valves. The valves should slide freely of their own weight in the bores when dry.
3. Check the spring for proper tension and the retaining plates for warpage.
4. Inspect the oil passages in the oil distributor for clog.
5. Check the side clearance between the seal ring and ring groove. If the clearance is not within the specification, replace the seal ring.

Side clearance : 0.04 ~ 0.16 mm (0.002 ~ 0.006 in)

c. Assembly

Assemble the governor and oil distributor in the reverse order of disassembling. **Note** the follows:

1. Before assembling, dip the all parts in clean transmission fluid.
2. Do not confuse the governor springs. The secondary govenor spring is stronger than primary governor spring.
3. Install the governor body assembly to the oil distributor and tighten the bolts to **0.5 ~ 0.7 m-kg (3.6 ~ 5.1 ft-lb).**

7A–C–5. Oil Pump

a. Disassembly

1. Remove the seal rings.
2. Remove the large seal ring from the pump housing.
3. Remove the pump cover attaching bolts and remove the pump cover.
4. Apply the marks onto the top surface of the pump inner and outer gears and remove the gears. **Do not** scratch the gear to mark.

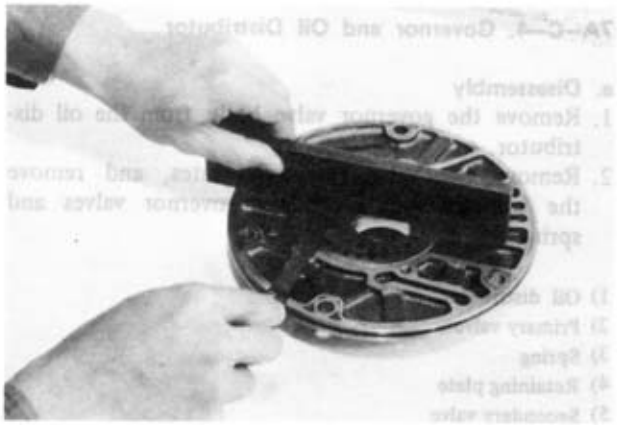

Fig. 7A–40

b. Checking

1. Inspect the pump housing and cover for damage.
2. Inspect the inner and outer gears for worn or damaged teeth.
3. Check the side clearance of the inner and outer gears, by using a straight edge and feeler gauge.
   If the clearance exceeds the limit, replace the outer and inner gears as a set.

Side clearance :
Standard 0.02 ~ 0.04 mm (0.001 ~ 0.002 in)
Limit 0.08 mm (0.003 in)

Fig. 7A–41

4. Check the clearance between the outer gear teeth and crescent.
   If the clearance exceeds the limit, replace the outer and inner gears as a set.

Clearance between the outer gear and crescent:
Standard 0.14 ~ 0.21 mm (0.006 ~ 0.008 in)
Limit 0.25 mm (0.010 in)

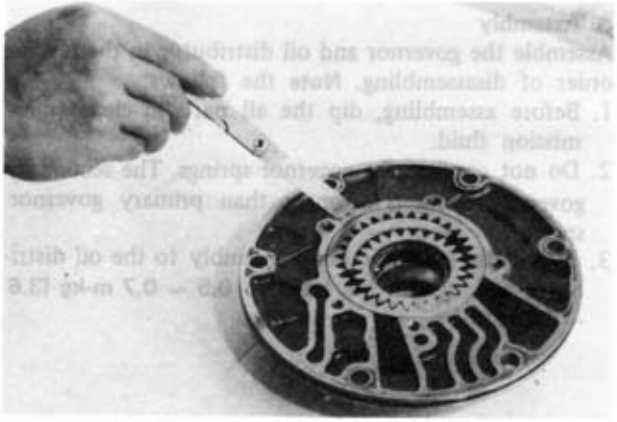

Fig. 7A–42

5. Check the clearance between the outer gear and housing. If the clearance exceeds the limit, replace the outer and inner gears as a set.

Clearance between the outer gear and housing:
Standard 0.05 ~ 0.20 mm (0.002 ~ 0.008 in)
Limit 0.25 mm (0.010 in)

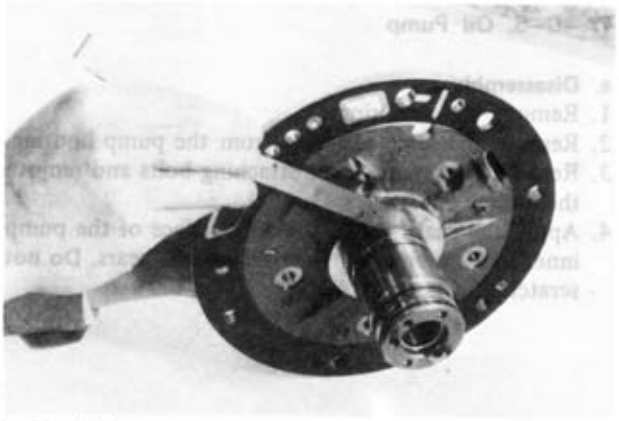

Fig.7A–43

6. Check the side clearance between the seal ring and ring groove.
   If the clearance is not within the specifications, replace the seal ring.

Side clearance:
0.04 ~ 0.16 mm (0.002 ~ 0.006 in)

Fig. 7A–44

c. Assembly

Assemble the oil pump in the reverse order of disassembling.

Note the follows.

1. Discard the old seal ring and use **new** seal ring.
2. Before assembling, dip all parts in clean transmission fluid.
3. Install the inner and outer gears into the pump housing aligning the mating marks made during disassembly.
4. Install the pump housing on the **assembling guide** (49 2113 025A).

Fig. 7A–45

5. Position the pump cover onto the pump housing and temporarily tighten the attaching bolts.
6. Check the run-out of the oil pump cover with a dial indicator. If the run-out is not within the **0.07 mm (0.0028 in)**, adjust it by lightly tapping the cover with a plastic hammer.
7. Tighten the pump cover attaching bolts and recheck the run-out.

Pump cover tightening torque:
0.6 ~ 0.8 m-kg (4.3 ~ 5.8 ft-lb)

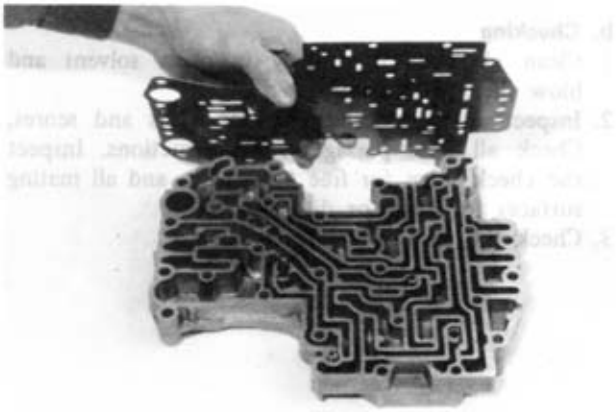

Fig. 7A–46

7A–C–6. Control Valve Body

a. Disassembly

1. Remove the oil strainer attaching bolts and remove the oil strainer.
2. Remove the valve body attaching bolts.
   Separate the lower valve body, separator plate and upper valve body, being careful not to lose the check valves and springs in the lower valve body.

Note:
It is recommended to loosen the above attaching bolts with wrench.

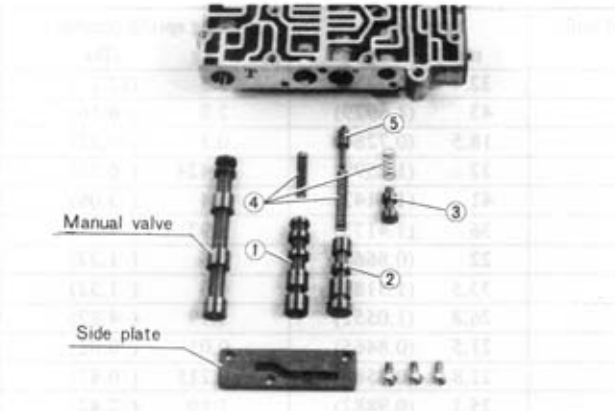

Fig. 7A–47

3. Slide the manual valve off the body.
4. Remove the side plate and take out the following parts.

   1) 1st-2nd shift valve
   2) 2nd-3rd shift valve
   3) Pressure modifier valve
   4) Valve springs
   5) 2nd-3rd shift plug

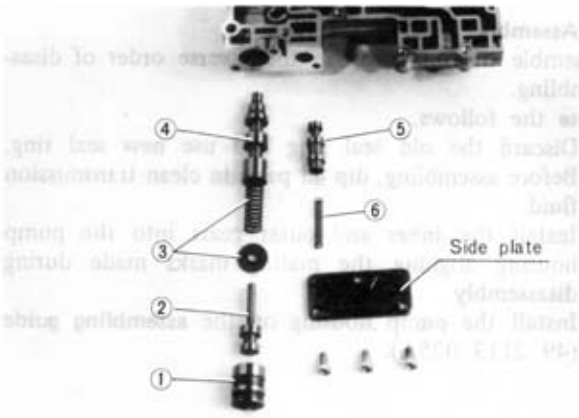

Fig.7A–48

5. Remove the side plate and pull out the following parts.

1) Pressure regulator sleeve
2) Pressure regulator plug
3) Spring seat/spring
4) Pressure regulator valve
5) Second lock valve
6) Spring

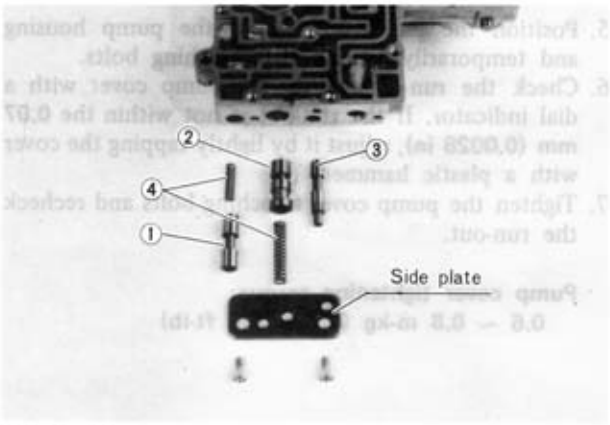

Fig. 7A–49

6. Remove the side plate and take out the following parts.

1) Selenoid down shift valve
2) Throttle back-up valve
3) Vacuum throttle valve
4) Valve springs

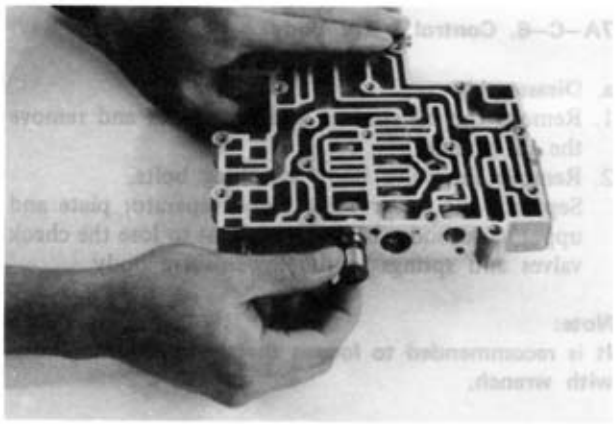

Fig. 7A–50

b. Checking

1. Clean all parts thoroughly in clean solvent and blow them with compressed air.
2. Inspect all valve and bores for burrs and scores. Check all fluid passages for obstructions. Inspect the check valve for free movement, and all mating surfaces for burrs or distortion.
3. Check the each spring for weakness.

Valve spring specification

Valve spring	Coil outer dia. mm	(in)	Number of coil	Free length mm	(in)	Fitting spring constant kg	(lb)
Manual detent	7.3	(0.2874)	15	32.4	(1.2756)	5.5	(12.1)
Pressure regulator	11.7	(0.4606)	13	43	(1.6929)	2.8	(6.16)
Pressure modifier	8.4	(0.3307)	5	18.5	(0.7284)	0.1	(0.22)
1st-2nd shift	6.55	(0.2579)	16.7	32	(1.2599)	0.424	(0.93)
2nd-3rd shift	6.9	(0.2717)	18	41	(1.6142)	1.4	(3.08)
Throttle back-up	7.3	(0.2874)	14	36	(1.4173)	1.92	(4.22)
Solenoid downshift	5.55	(0.2185)	12	22	(0.8662)	0.6	(1.32)
Second lock	5.55	(0.2185)	16	33.5	(1.3189)	0.6	(1.32)
Throttle relief	6.5	(0.2559)	14	26.8	(1.0551)	2.19	(4.82)
Orifice check	5.0	(0.1969)	15	21.5	(0.8465)	0.01	(0.02)
Primary governor	8.75	(0.3445)	5	21.8	(0.8583)	0.215	(0.47)
Secondary governor	9.2	(0.3622)	5.5	25.1	(0.9882)	1.10	(2.42)

Fig. 7A–44

c. Assembly

Assemble the oil pump in the reverse order of disassembling.

Note the follows.

1. Discard the old seal ring and use **new** seal ring.
2. Before assembling, dip all parts in clean transmission fluid.
3. Install the inner and outer gears into the pump housing aligning the mating marks made during disassembly.
4. Install the pump housing on the **assembling guide** (49 2113 025A).

Fig. 7A–45

5. Position the pump cover onto the pump housing and temporarily tighten the attaching bolts.
6. Check the run-out of the oil pump cover with a dial indicator. If the run-out is not within the **0.07 mm (0.0028 in)**, adjust it by lightly tapping the cover with a plastic hammer.
7. Tighten the pump cover attaching bolts and recheck the run-out.

Pump cover tightening torque:
0.6 ~ 0.8 m-kg (4.3 ~ 5.8 ft-lb)

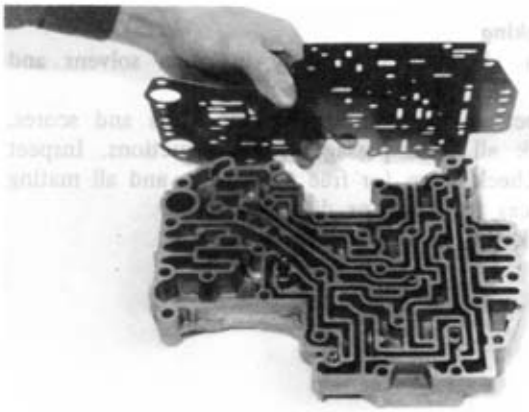

Fig. 7A–46

7A–C–6. Control Valve Body

a. Disassembly

1. Remove the oil strainer attaching bolts and remove the oil strainer.
2. Remove the valve body attaching bolts.
   Separate the lower valve body, separator plate and upper valve body, being careful not to lose the check valves and springs in the lower valve body.

Note:
It is recommended to loosen the above attaching bolts with wrench.

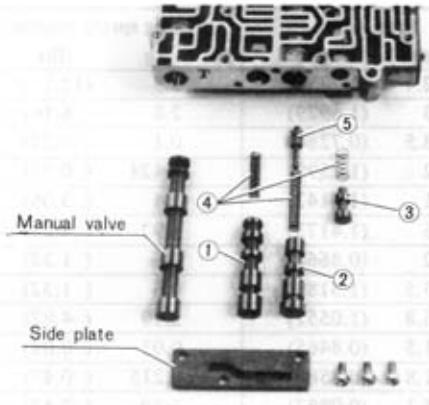

Fig. 7A–47

3. Slide the manual valve off the body.
4. Remove the side plate and take out the following parts.

   1) 1st-2nd shift valve
   2) 2nd-3rd shift valve
   3) Pressure modifier valve
   4) Valve springs
   5) 2nd-3rd shift plug

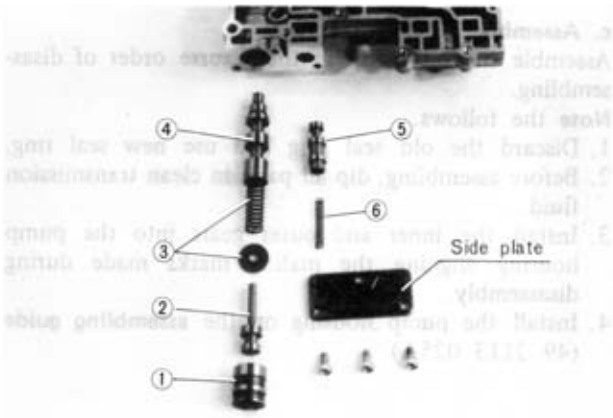

Fig.7A–48

5. Remove the side plate and pull out the following parts.

1) Pressure regulator sleeve
2) Pressure regulator plug
3) Spring seat/spring
4) Pressure regulator valve
5) Second lock valve
6) Spring

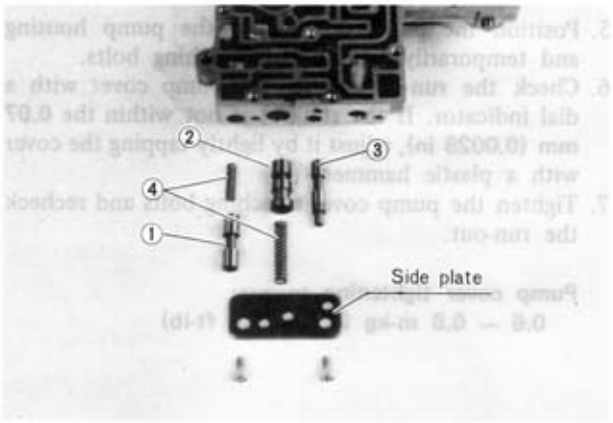

Fig. 7A–49

6. Remove the side plate and take out the following parts.

1) Selenoid down shift valve
2) Throttle back-up valve
3) Vacuum throttle valve
4) Valve springs

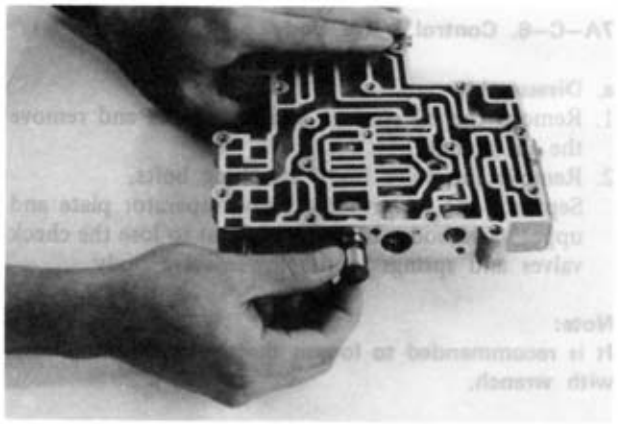

Fig. 7A–50

b. Checking

1. Clean all parts thoroughly in clean solvent and blow them with compressed air.
2. Inspect all valve and bores for burrs and scores. Check all fluid passages for obstructions. Inspect the check valve for free movement, and all mating surfaces for burrs or distortion.
3. Check the each spring for weakness.

Valve spring specification

Valve spring	Coil outer dia. mm	(in)	Number of coil	Free length mm	(in)	Fitting spring constant kg	(lb)
Manual detent	7.3	(0.2874)	15	32.4	(1.2756)	5.5	(12.1)
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Pressure modifier	8.4	(0.3307)	5	18.5	(0.7284)	0.1	(0.22)
1st-2nd shift	6.55	(0.2579)	16.7	32	(1.2599)	0.424	(0.93)
2nd-3rd shift	6.9	(0.2717)	18	41	(1.6142)	1.4	(3.08)
Throttle back-up	7.3	(0.2874)	14	36	(1.4173)	1.92	(4.22)
Solenoid downshift	5.55	(0.2185)	12	22	(0.8662)	0.6	(1.32)
Second lock	5.55	(0.2185)	16	33.5	(1.3189)	0.6	(1.32)
Throttle relief	6.5	(0.2559)	14	26.8	(1.0551)	2.19	(4.82)
Orifice check	5.0	(0.1969)	15	21.5	(0.8465)	0.01	(0.02)
Primary governor	8.75	(0.3445)	5	21.8	(0.8583)	0.215	(0.47)
Secondary governor	9.2	(0.3622)	5.5	25.1	(0.9882)	1.10	(2.42)

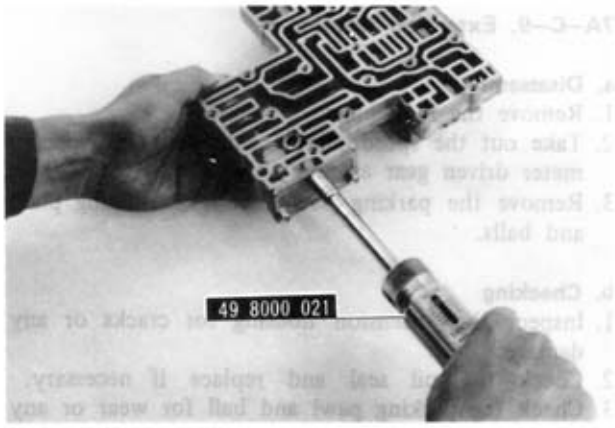


Fig. 7A–51

c. Assembly

Assemble the control valve body in the reverse order of disassembling.

Note the follows:

1. Before installing, dip all parts in clean transmission fluid.
2. Tighten the screws by using the **torque driver** (49 8000 021).

Tightening torque:
0.25 ~ 0.35 m-kg (1.8 ~ 2.5 ft-lb)

Reamer bolts tightening torque:
0.5 ~ 0.7 m-kg (3.6 ~ 5.1 ft-lb)

Fig. 7A–52

7A–C–7. Planet Carrier

Checking

Check the clearance between pinion washer and planetary carrier with a feeler gauge.

If the clearance exceeds the limit, replace the carrier as a unit.

Clearance:
Standard 0.2 ~ 0.7 mm (0.008 ~ 0.028 in)
Limit 0.8 mm (0.031 in)

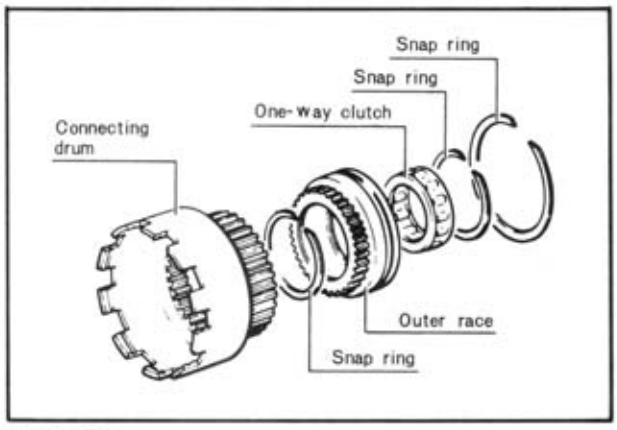


Fig.7A–53

7A–C–8. One-way Clutch

a. Disassembly

1. Remove the snap rings and remove the one-way clutch from the outer race.
2. Remove the large snap ring and remove the outer race from the connecting drum.

b. Checking

1. Inspect the outer and inner races for scores or damaged surface area where the rollers contact the races.
2. Inspect the rollers for excessive wear or damage.

Fig. 7A–54

c. Assembly

Assemble the one-way clutch in the reverse order of disassembling.

Be sure the arrow mark on the one-way clutch is toward the front of the vehicle.

The one-way clutch should be free to rotate only in clockwise direction.

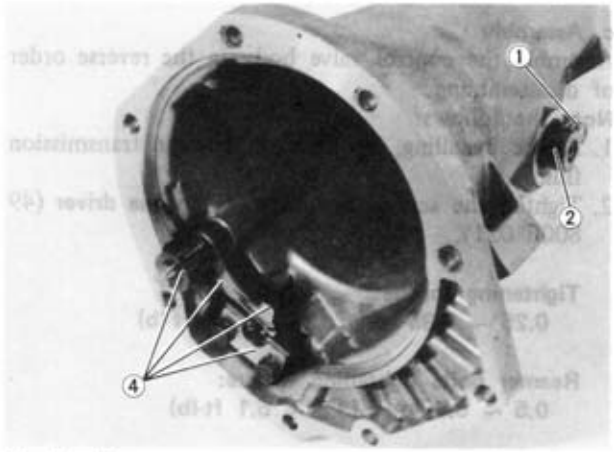


Fig. 7A–55

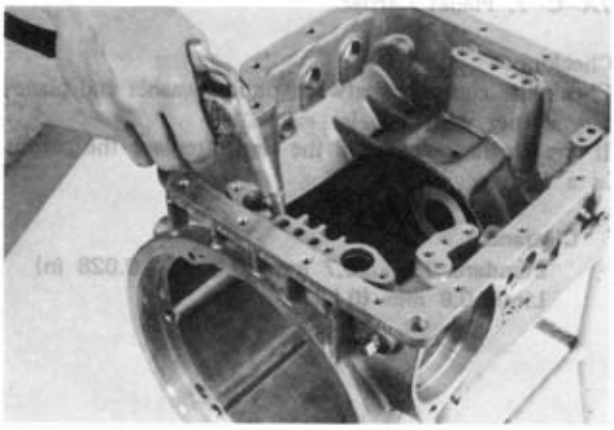


Fig. 7A–56

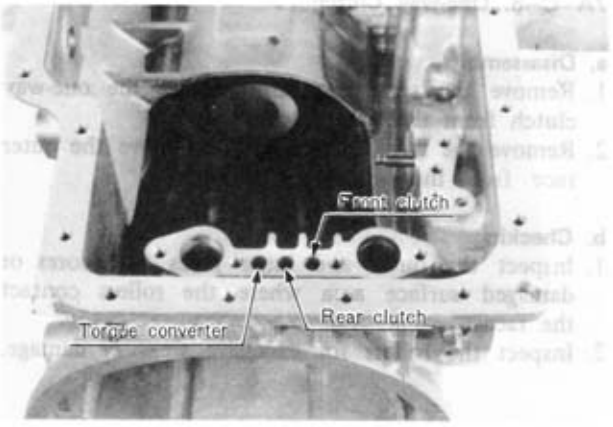


Fig. 7A–57

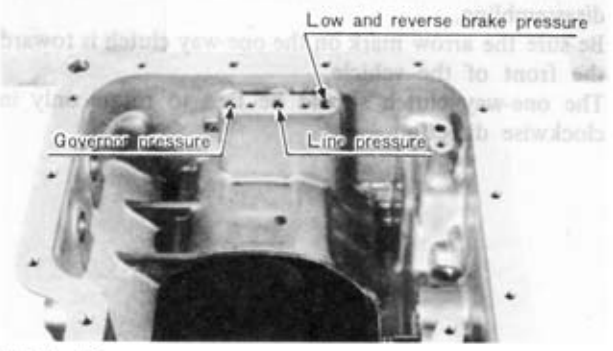


Fig.7A–58

7A–C–9. Extension Housing

a. Disassembly

1. Remove the lock plate.
2. Take out the speedometer cable joint and speedometer driven gear assembly.
3. Remove the parking pawl, springs, retaining plate and balls.

b. Checking

1. Inspect the extension housing for cracks or any damage.
2. Check the oil seal and replace if necessary.
3. Check the parking pawl and ball for wear or any damage.

7A–C–10. Transmission Case

Thoroughly clean the transmission case and dry it with compressed air.

Inspect the case for cracks and machined surfaces for burrs, nicks or any damage.

Check each oil passage of the case for clog by blowing the compressed air to the passages.

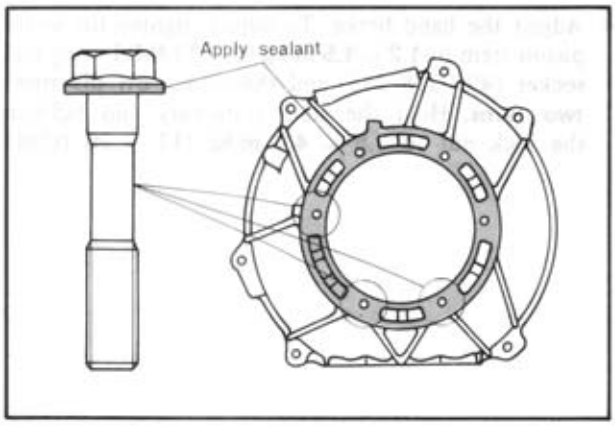


Fig. 7A–59

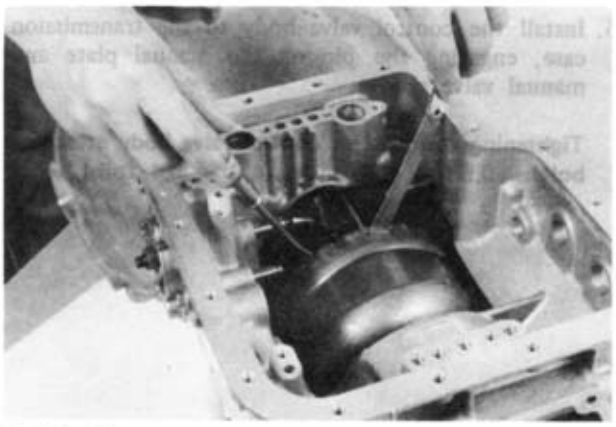


Fig. 7A–60

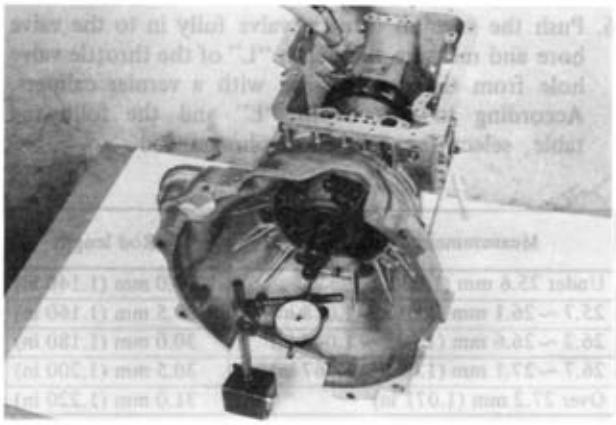


Fig. 7A–61

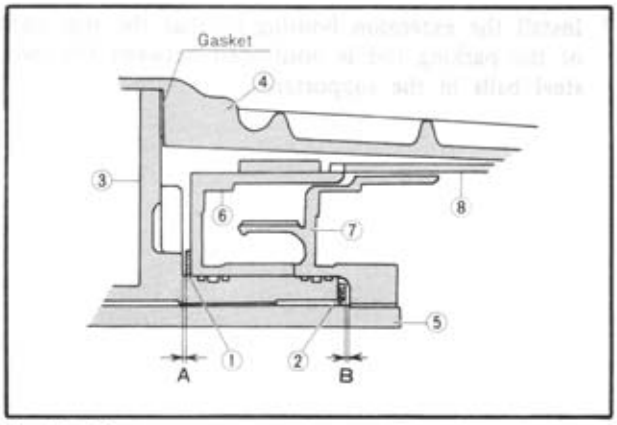


Fig. 7A–62

7A–D. TRANSMISSION ASSEMBLY

Assemble the transmission in the reverse order of disassembling, noting the following points.

1. Apply the sealant on the mounting surface of the converter housing and three attaching bolt flanges.

   Tightening torque of converter attaching bolts: 4.5 ~ 5.5 m-kg (33 ~ 40 ft-lb)

2. Check the end play of the front clutch drum by checking the clearance between the front clutch drum and connecting shell using a feeler gauge. If the end play is not within the specifications, select and install the correct thrust washer (See Fig. 7A–62 ①).

   End play: 0.5 ~ 0.8 mm (0.020 ~ 0.031 in)

Available thrust washers

1.5 mm (0.059 in)	2.3 mm (0.091 in)
1.7 mm (0.067 in)	2.5 mm (0.098 in)
1.9 mm (0.075 in)	2.7 mm (0.106 in)
2.1 mm (0.083 in)	

3. Check the total end play with a dial indicator. To check, insert a screwdriver behind of the connecting shell, and move the connecting shell fore and aft and take a indicator reading on the input shaft. If the total end play is not within the specifications, select and install the correct bearing race (See Fig. 7A–62 ②).

   Total end play: 0.25 ~ 0.50 mm (0.01 ~ 0.02 in)

Available bearing races

1.2 mm (0.047 in)	1.8 mm (0.071 in)
1.4 mm (0.055 in)	2.0 mm (0.079 in)
1.6 mm (0.063 in)	2.2 mm (0.087 in)

A: Front clutch drum end play
B: Total end play

1) Front clutch thrust washer
2) Oil pump cover bearing race
3) Oil pump
4) Transmission case
5) Input shaft
6) Front clutch
7) Rear clutch
8) Connecting shell

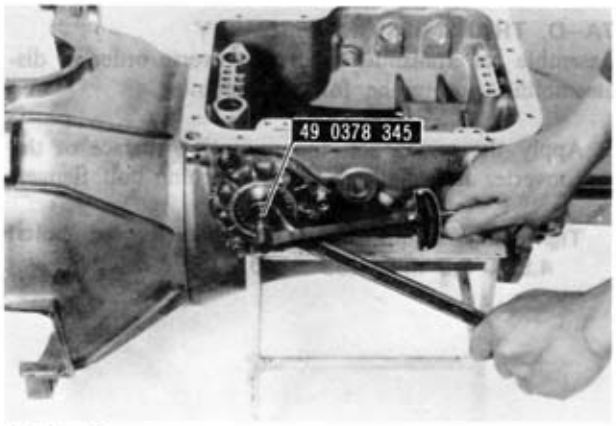


Fig.7A–63

4. Adjust the band brake. To adjust, tighten the servo piston stem to **1.2 ~ 1.5 m-kg (9 ~ 11 ft-lb)** using the **socket** (49 0378 345) and then, **back off the stem two turns.** Hold the stem stationary and tighten the lock nut to **1.5 ~ 4.0 m-kg (11 ~ 29 ft-lb).**

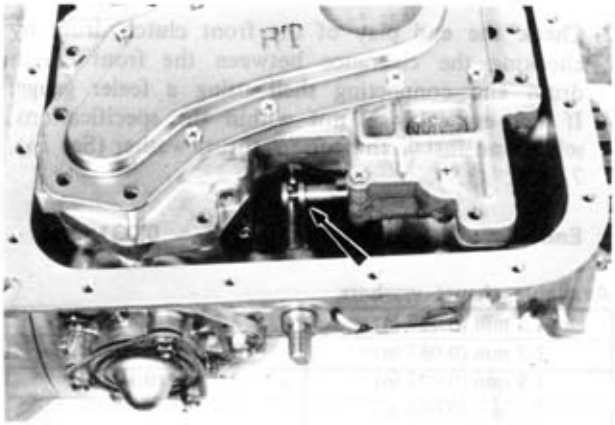


Fig. 7A–64

5. Install the control valve body to the transmission case, engaging the pin on the manual plate and manual valve groove.

Tightening torque of control valve body attaching bolts: 0.55 ~ 0.75 m-kg (4.0 ~ 5.4 ft-lb).

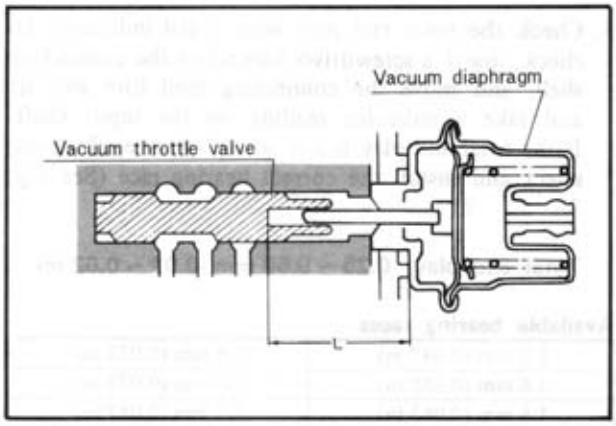


Fig. 7A–65

6. Push the vacuum throttle valve fully in to the valve bore and measure the depth "L" of the throttle valve hole from the case surface with a vernier calipers. According to this depth "L" and the following table, select the correct diaphragm rod.

Measurement depth "L"	Rod length
Under 25.6 mm (1.008 in)	29.0 mm (1.140 in)
25.7 ~ 26.1 mm (1.012 ~ 1.028 in)	29.5 mm (1.160 in)
26.2 ~ 26.6 mm (1.032 ~ 1.047 in)	30.0 mm (1.180 in)
26.7 ~ 27.1 mm (1.051 ~ 1.067 in)	30.5 mm (1.200 in)
Over 27.2 mm (1.071 in)	31.0 mm (1.220 in)

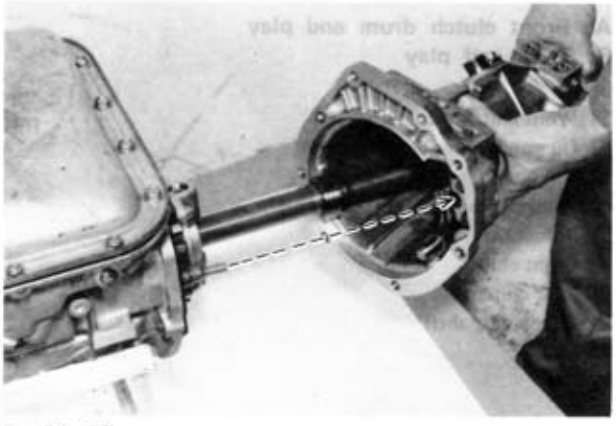


Fig. 7A–66

7. Install the extension housing so that the rear end of the parking rod is positioned between the two steel balls in the supporter.

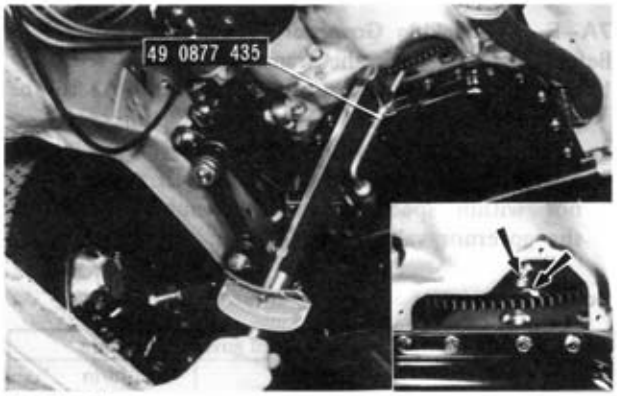


Fig. 7A–67

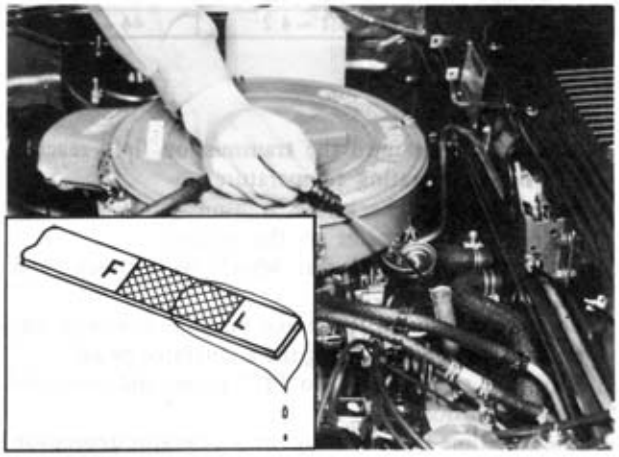


Fig.7A–68

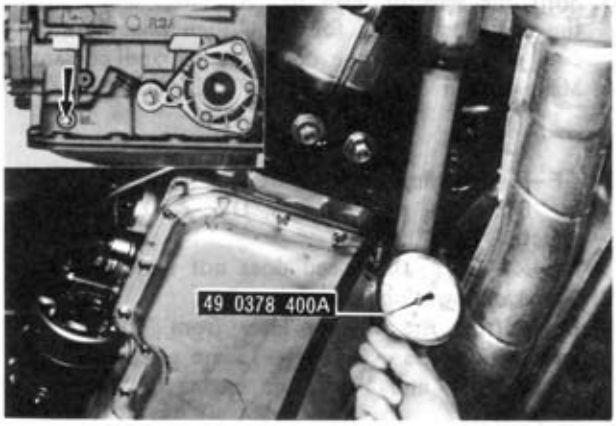


Fig. 7A–69

Line pressure

Manual Range	Engine idling condition	Engine stall condition
"R"	4.0 ~ 7.0 kg/cm² (57 ~ 100 lb/in²)	16.0 ~ 19.0 kg/cm² (228 ~ 270 lb/in²)
"D"	3.0 ~ 4.0 kg/cm² (43 ~ 57 lb/in²)	9.0 ~ 11.0 kg/cm² (128 ~ 156 lb/in²)
"2"	8.0 ~ 12.0 kg/cm² (114 ~ 171 lb/in²)	8.0 ~ 12.0 kg/cm² (114 ~ 171 lb/in²)
"1"	3.0 ~ 4.0 kg/cm² (43 ~ 57 kg/cm²)	9.0 ~ 11.0 kg/cm² (128 ~ 156 lb/in²)

7A–E. TRANSMISSION INSTALLATION

Install the transmission in the reverse order of removing.
Note the follows:

1. Align the mating marks painted on the torque converter and drive plate during disassembly process. Tighten the bolts attaching the converter-to-drive plate to **3.5 ~ 5.0 m-kg (25 ~ 36 ft-lb).**
2. Fill the transmission to the proper fluid level with the specified fluid.
3. Perform the stall test, road test and hydraulic test.

7A–F. HYDRAULIC CONTROL INSPECTION

7A–F–1. Checking Transmission Fluid Level

1. Make sure the vehicle is on the level ground. Then firmly apply the parking brake.
2. Warm up the engine to the normal operating temperature.
   The engine idling conditions are stabilized.
3. Shift the selector lever through all of the drive positions and place the lever to "P" position. Do not stop the engine during the fluid level checks.
4. Wipe any dirt from the dipstick cap, pull out the dipstick, wipe clean and reinsert fully.
5. Pull out again, and check the level. The fluid level should be maintained between the "L" and "F" marks on the gauge.

7A–F–2. Checking Line Pressure

1. Run the engine until the transmission fluid reaches its normal operating temperature.
   Before testing, make sure that the transmission fluid level and engine idle speed are within the specifications.
2. Install the **pressure gauge** (49 0378 400A) to the pressure outlet port at the right rear of the transmission case.
   Be sure to place the gauge where it is visible from the driver's seat.
3. Block the front and rear wheels with chocks and apply the parking brake.
   Be sure to depress the brake pedal firmly with the left foot before depressing the accelerator pedal.
4. Shift the selector lever into the "D" range.
   Run the engine at idling speed and read the pressure gauge.
5. Slowly depress the accelerator pedal until the throttle valve is fully opened.
   While checking whether the pressure rises smoothly, read the pressure gauge at the stall condition. The test time from starting accelerator depression to its release **must not exceed 5 seconds.**
6. Shift the selector lever to "N" range and operate the engine at idling for **more than one minute** to cool down the torque converter oil and coolant.
7. Measure line pressure for each range in the same manner.

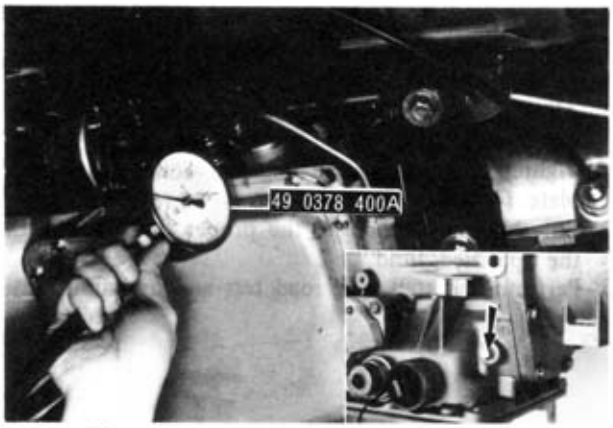


Fig. 7A–70

Stall revolution

Before break in	After break in
2,250 ~ 2,500 rpm	2,300 ~ 2,550 rpm

Shift point speeds

Throttle condition	Gear shift	Vehicle speed mph
Wide open throttle	D1 → D2	32 ~ 45
(Kick-down)	D2 → D3	59 ~ 77
(0 ~ 100 mm-Hg / 0 ~ 3.94 in-Hg)	D3 → D2	51 ~ 65
	D2 → D1	14 ~ 30
Half throttle	D1 → D2	9 ~ 21
(200 ± 10 mm-Hg / 7.87 ± 0.39 in-Hg)	D2 → D3	18 ~ 40
Fully closed throttle	D3 → D1	6 ~ 12
Manual "1"	12 → 11	24 ~ 33

7A–F–3. Checking Governor Pressure

Before testing, check the transmission fluid level.

1. Connect a **pressure gauge** (49 0378 400A) to the pressure outlet port on the transmission case.
2. Read the pressure with the vehicle running at the speeds specified in the table below. If pressures are not within specifications, disassemble and check the governor valve.

Governor pressure

Vehicle speed	Standard governor pressure	
	kg/cm²	lb/in
20 mph	0.8 ~ 1.3	11 ~ 18
35 mph	1.6 ~ 2.3	23 ~ 33
55 mph	3.1 ~ 4.2	44 ~ 60

7A–F–4. Stall Test

1. Run the engine until the transmission fluid reaches its normal operating temperature.
   Before testing, check the transmission fluid level.
2. Connect a tachometer to the engine.
3. Block the front and rear wheels with chocks and apply the parking brake.
   Be sure to depress the brake pedal firmly with the left foot before depressing the accelerator pedal.
4. Shift the seletor lever to "D" range and read the stall revolution.
   The test time from starting the accelerator depression to its release **must not exceed 5 seconds.**
5. Shift the selector lever to "N" range and operate the engine at idling for **more than one minute** to cool down the torque converter oil and coolant.
6. Make similar stall tests in "2", "1" and "R".

7A–F–5. Checking Shift Point

1. In "D" range, gear changes, D1 → D2 → D3 are effected.
   In "R" range, the speed does not increase.
2. The kickdown operates properly.
3. By shifting the selector lever from "D" to "1", gear changes D3 → 2 (12) → 11 are effected. In the ranges "12" and "11", the engine braking works properly.
4. In "1" range, the speed does not increase.
5. In "2" range, the gear fixed at 2 range.
6. In "P" range, vehicle can be parked properly.
7. Check the shift points according to the specifications.

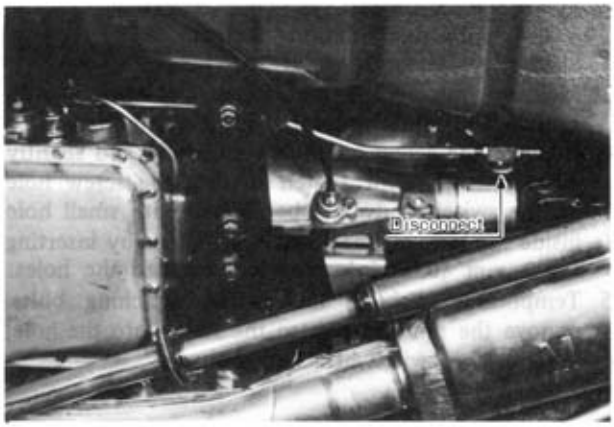


Fig. 7A–71

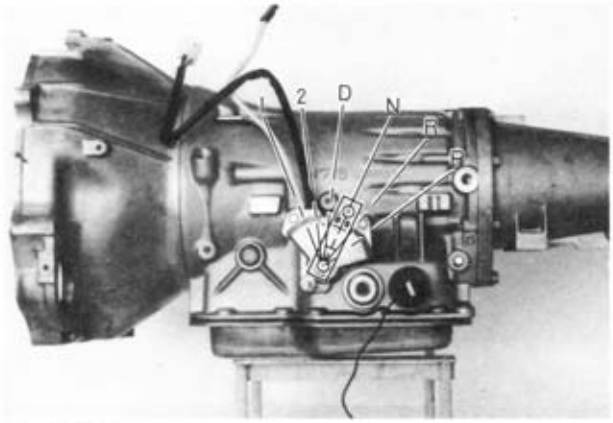


Fig. 7A–72

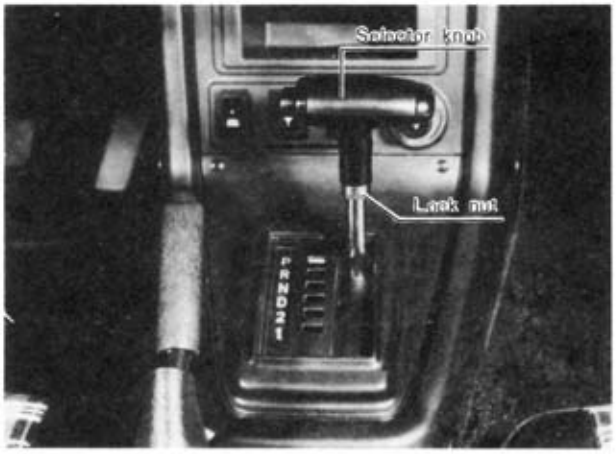


Fig.7A–73

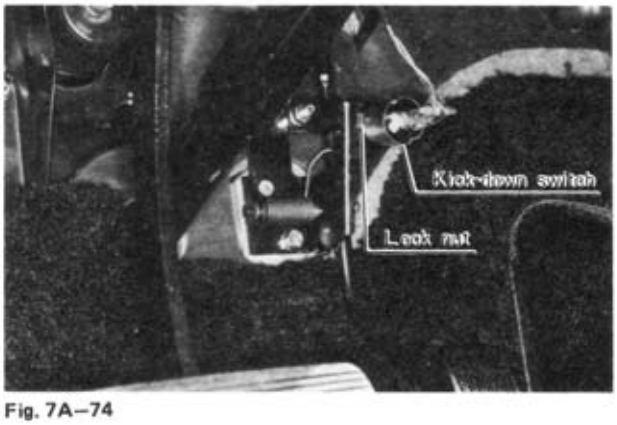


Fig. 7A–74

7A–G. SHIFT CONTROL LINKAGE

Before the linkage is adjusted, be sure the engine idle speed is properly adjusted.

7A–G–1. Adjusting Manual Linkage

1. Shift the selector lever to "N" position.
2. Raise the vehicle and support it with stands.
3. Disconnect the T-joint from the lower end of the selector lever operating arm.
4. Move the transmission selector range lever to the "N" position, third detent position from the rear side of the transmission.
5. Loosen the T-joint attaching nuts and adjust the T-joint so that it freely enters the hole of the selector lever operating arm. Tighten the attaching nuts.
6. Connect the T-joint to the selector lever operating arm and secure the T-joint.
7. Lower the vehicle and check the operation of the transmission in each selector lever position.

7A–G–2. Adjusting Selector Lever Knob

1. Position the selector lever to "N" or "D" range.
2. Loosen the lock nut of the selector lever knob and lightly screw in the selector lever knob in its fully stroke.
3. Screw out the selector lever knob one turn so that the push button faces to driver's side.
4. Push the push button and confirm that the selector lever can be shifted to "P" range.
   If the selector lever cannot be shifted to "P" range, screw in the selector lever knob by one turn.
5. Confirm that the selector lever cannot, without pushing the push button, be shifted from "N" to "R" or from D to "2" range.
   If the selector lever can be shifted to "R" or "2" range without pushing the push button, screw out the knob.
6. Tighten the lock nut to **1.5 ~ 2.0 m-kg (10.8 ~ 14.5 ft-lb).**
7. Operate the ignition switch and make sure that the starting motor operates only at "N" and "P" position.

7A–G–3. Adjusting Kick-down Switch

1. Disconnect the wiring connectors from the kick-down switch.
2. Loosen the lock nut and screw out the kick-down switch for few turns.
3. Fully depress the accelerator pedal.
4. Gradually screw in the kick-down switch until the clicking sound is audible and then further screw in the switch half turn.
5. Tighten the lock nut and connect the wiring connectors.

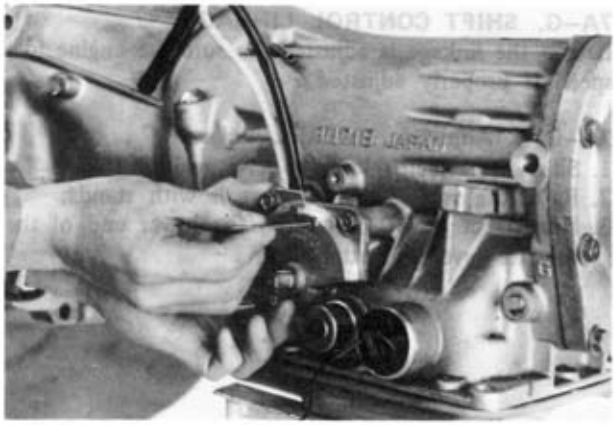


Fig. 7A–75

7A–G–4. Adjusting Inhibitor Switch

1. Shift the selector lever to "N" range.
2. Jack up the vehicle and support it with stands.
3. Loosen the inhibitor switch attaching bolts.
4. Remove the screw on the switch body and slightly move the inhibitor switch so that the screw hole on the switch body will be aligned with small hole inside the switch. Check their alignment by inserting a **2.0 mm (0.08 in)** diameter pin into the holes.
5. Temporarily tighten the switch attaching bolts, remove the pin and tighten the screw into the hole.
6. Tighten the switch attaching bolts.

PROPELLER SHAFT

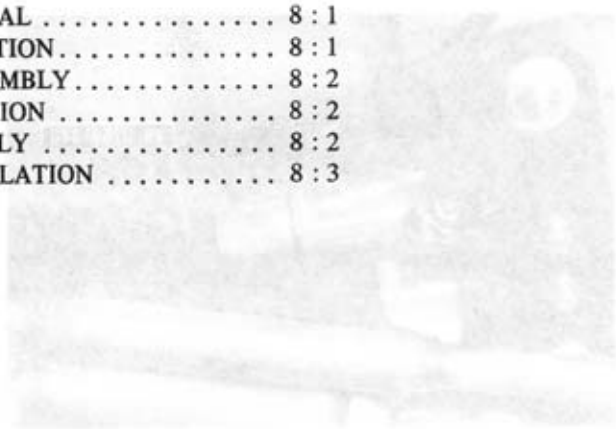


Fig. 8–1

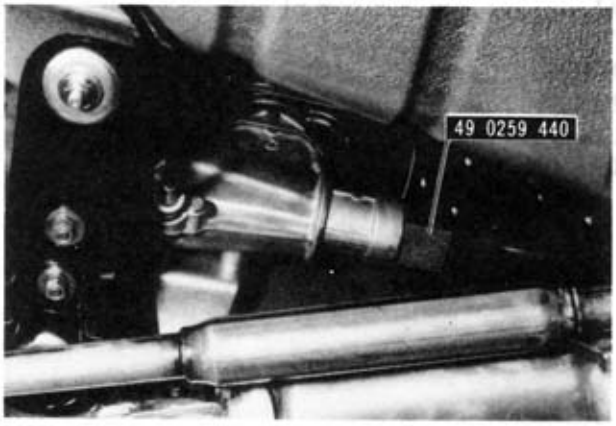


Fig. 8–2

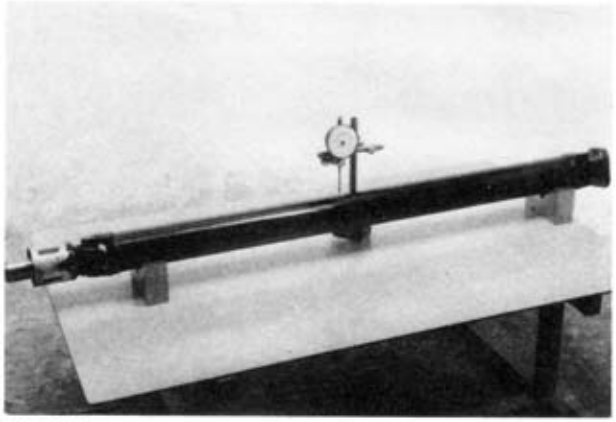


Fig. 8–3

	Max. permissible unbalance at 4,000 rpm
At front	15 cm-gr (0.21 in-oz)
At rear	15 cm-gr (0.21 in-oz)

8–A. PROPELLER SHAFT REMOVAL

Raise the rear end of the vehicle and support it with stands.

Note :
To maintain drive line balance, mark the mating parts of the companion flange, yokes and propeller shaft so that they may be reinstalled in their original positions.

Remove the following parts.

1. Attaching bolts
2. Propeller shaft assembly

After removing the propeller shaft, install the **turning holder** (49 0259 440) into the extension housing to prevent lubricant from leaking out of the housing.

8–B. PROPELLER SHAFT INSPECTION

Inspect the propeller shaft for damage and rusty conditions.

1. Check the run-out of the propeller shaft.
   If it exceeds limit, replace the propeller shaft.

   Run-out limit: 0.4 mm (0.016 in)

2. Check the propeller shaft for dynamic unbalance. The maximum permissible unbalance is shown in the left table. If the unbalance is not within the specifications, correct or replace the propeller shaft assembly.

Fig. 8–4

8–C. UNIVERSAL JOINT DISASSEMBLY

The propeller shaft should be replaced as an assembly only. But, if the unbalance of the propeller shaft aseembly can be checked and corrected within the specifications, the universal joint only may be replaced.

1. Clean the outside of the universal joint with a suitable solvent.
2. Place the propeller shaft in a vise being carefull not to damage it.
3. Remove the snap rings.

Fig. 8–5

4. Tap spider bearing in the yoke with a suitable tool until the opposite side bearing come out enough.
5. Remove the forced out spider bearing by lightly tapping the base of the yoke with a hammer.
6. Remove the bearing at opposite side by the above procedures 4 and 5, and separate the flange yoke from the propeller shaft.
7. Remove the remaining two bearings in the same manner.
8. Remove the spider from the flange yoke.

Fig. 8–6

8–D. UNIVERSAL JOINT INSPECTION

1. Examine the bearing surfaces of the spider. They should be smooth and free from pits.
2. Measure the diameter of the spider. If it is **less than the limit**, replace with a new universal joint assembly.

Spider diameter:
Limit 24.908 mm (0.9806 in)

Fig. 8–7

8–E. UNIVERSAL JOINT ASSEMBLY

1. Apply grease on the bearing rollers and cup inner surface, and assemble them.
2. Position the spider and one bearing on the flange yoke. (sliding yoke or companion flange yoke)
3. Position a suitable pusher on the bearing and press in the bearing to sufficient depth.
4. Remove the pusher and install the snap ring.
5. Place the bearing in the bore at other side of yoke.

Fig. 8–8

6. Position the pusher and press in the bearing until the spider is at the center of the yoke.
7. Remove the pusher and install the snap ring.

Fig. 8–9

8. Install the sliding yoke (or flange yoke) and spider assembly to the propeller shaft in the same manner as instructed above.

Note :

a) Avoid reusing the old snap rings.

b) Use snap rings of same thickness at both sides of yoke.

c) Select snap rings so as to place the spider at the center of the yoke and to give a suitable slight drag fit (not binding).

1.22 mm (0.0480 in)	1.32 mm (0.0520 in)
1.24 mm (0.0488 in)	1.34 mm (0.0528 in)
1.26 mm (0.0496 in)	1.36 mm (0.0535 in)
1.28 mm (0.0504 in)	1.38 mm (0.0543 in)
1.30 mm (0.0512 in)	

Snap rings are available in 9 thicknesses as shown in the left table.

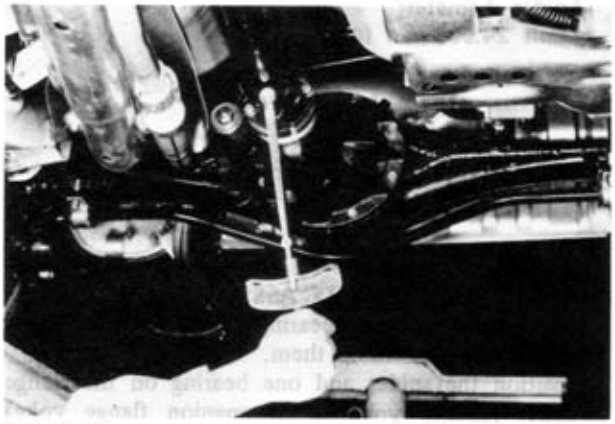


Fig. 8–10

8–F. PROPELLER SHAFT INSTALLATION

Install the propeller shaft in the reverse order of removing.

Note :

Be sure to observe location marks on the companion flange, yokes and propeller shaft for correct assembly.

REAR AXLE

Fig. 9–1

Fig. 9–2

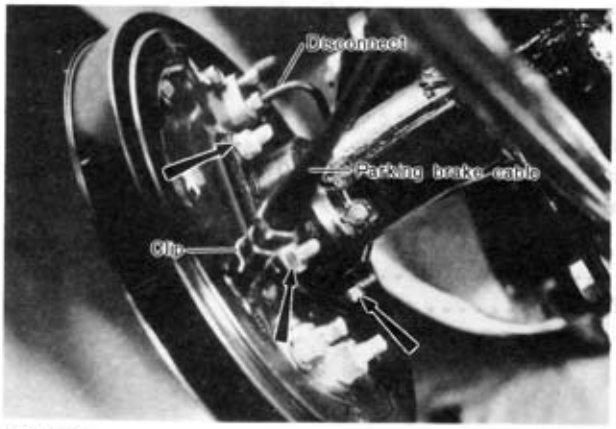


Fig. 9–3

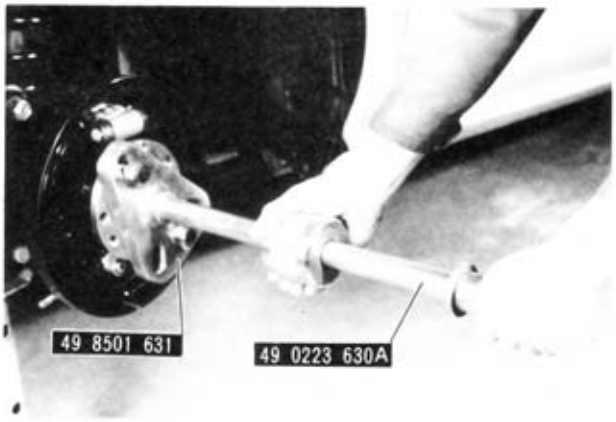


Fig. 9–4

9–A. REAR AXLE SHAFT

9–A–1. Removing Rear Axle Shaft

Raise the rear end of the vehicle and support the rear axle housing with stands.

1. Remove the wheel.
2. Remove the brake drum.

Mount a dial indicator and check the bearing side play by measuring the axle shaft end play.

Standard side play: 0 ~ 0.1 mm (0 ~ 0.004 in)

3. Remove the brake shoe return springs.
4. Remove the brake shoe assembly.
5. Remove the backing plate attaching nuts.
6. Remove the parking brake cable clip.
7. Disconnect the parking brake cable.
8. Disconnect the brake pipe.
9. Remove the axle shaft and backing plate assembly by using the **puller** (49 0223 630A) and **attachment** (49 8501 631).

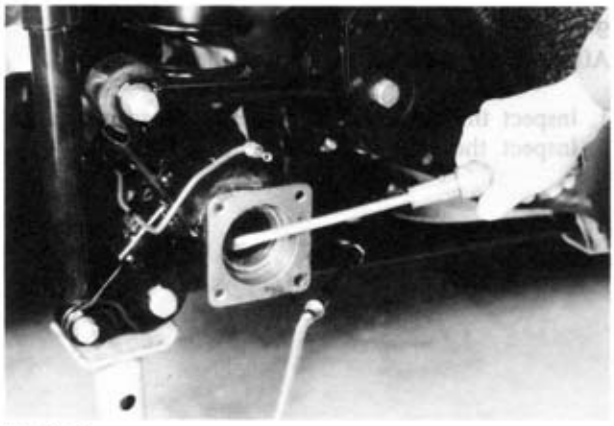


Fig. 9–5

10. Remove the oil seal.
Do not remove unless the oil seal is necessary to replace.

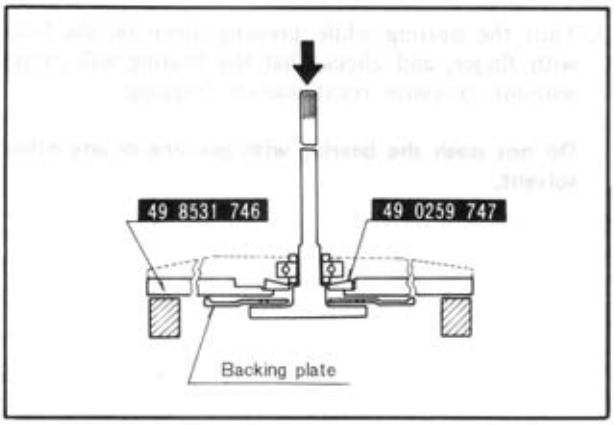


Fig. 9–6

9–A–2. Disassembling Rear Axle Shaft
Using the **bearing separator** (49 8531 746) and **attachment** (49 0259 747), support the spacer and press the axle shaft out of the collar and bearing.

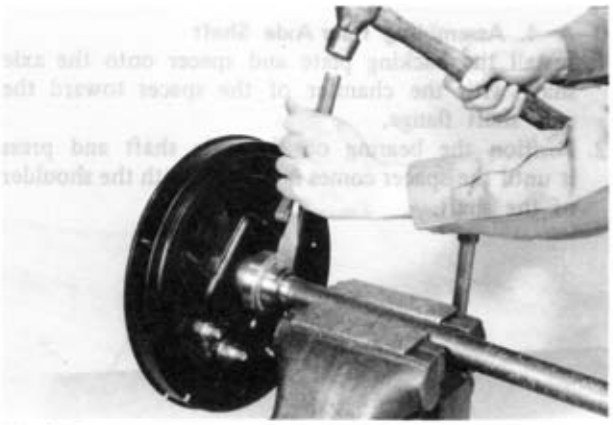


Fig. 9–7

Note :
a) If the bearing separator and attachment are not available, grind off the part of bearing retaining collar and cut it with a chisel, taking care not to damage the axle shaft.

Fig. 9–8

b) Remove the bearing with the bearing puller (49 0187 520).

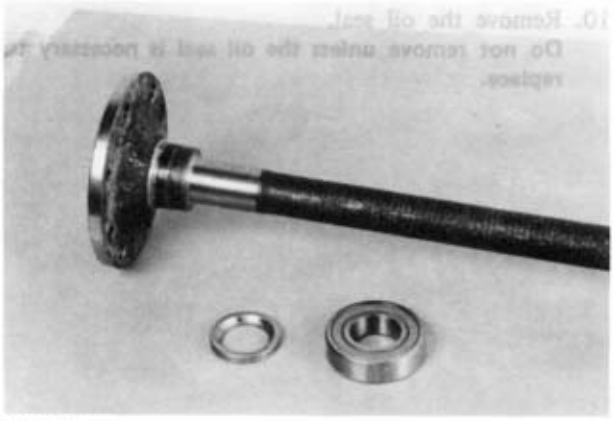


Fig. 9–9

9–A–3. Inspecting Rear Axle Shaft and Bearing

After cleaning the parts, inspect them as follows.

1. Inspect the shaft end for excessive wear or damage.
2. Inspect the axle shaft for bend.

Fig. 9–10

3. Turn the bearing while pressing down on the balls with finger, and check that the bearing will rotate without excessive resistance or dragging.

   Do not wash the bearing with gasoline or any other solvent.

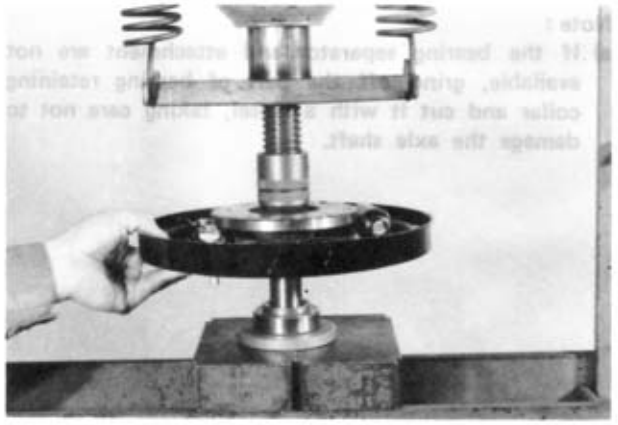


Fig. 9–11

9–A–4. Assembling Rear Axle Shaft

1. Install the backing plate and spacer onto the axle shaft with the chamfer of the spacer toward the axle shaft flange.
2. Position the bearing on the axle shaft and press it until the spacer comes in contact with the shoulder of the shaft.

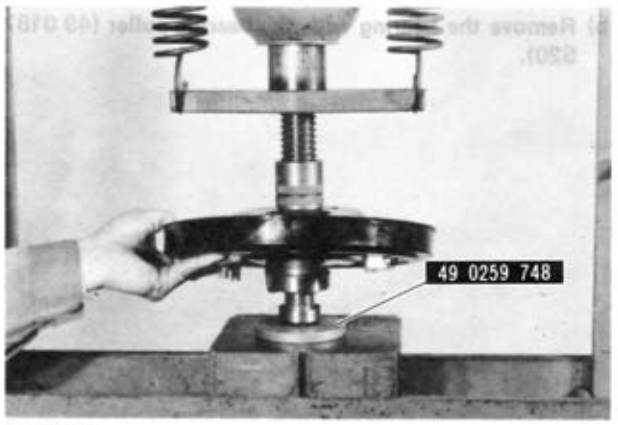


Fig. 9–12

3. Clean the collar and collar mounting part of the axle shaft.

   Never apply the oil or grease to collar and axle shaft.
4. Press the new bearing retaining collar onto the axle shaft using the **attachment** (49 0259 748) until it is firm contact with the bearing inner race.

Note :

a) The bearing retaining collar should be replaced with new one.

b) If the bearing retaining collar is pressfitted with less than 2.7 tons (5.900 lb), replace the collar with a another one.

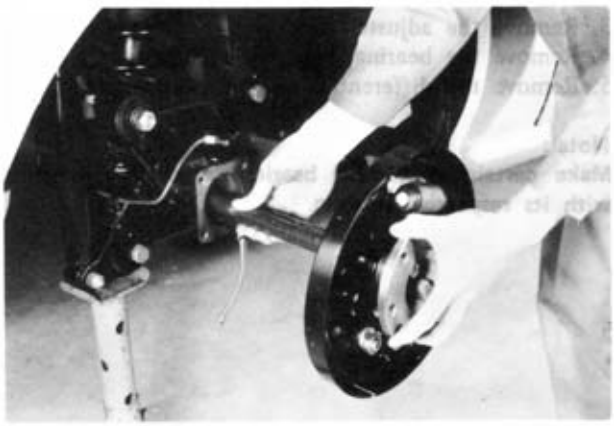


Fig. 9–13

9–A–5. Installing Rear Axle Shaft

1. Install the oil seal into the axle housing with **installer** (49 0180 321A).
2. Apply the grease to oil seal lip.
3. Install the rear axle shaft assembly in the reverse order of removing, being careful not to damage the oil seal lip.

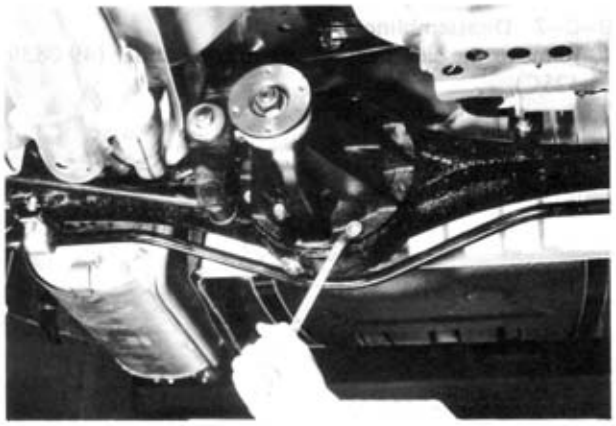


Fig. 9–14

9–B. REAR AXLE REMOVAL

Jack up the vehicle until the rear wheels are clear the ground and support it with stands.

After draining the oil with the **wrench** (49 0259 730), remove the following parts.

1. Rear axle shaft (refer to Par. 9–A–1)
2. Propeller shaft (refer to Par. 8–A)
3. Rear axle

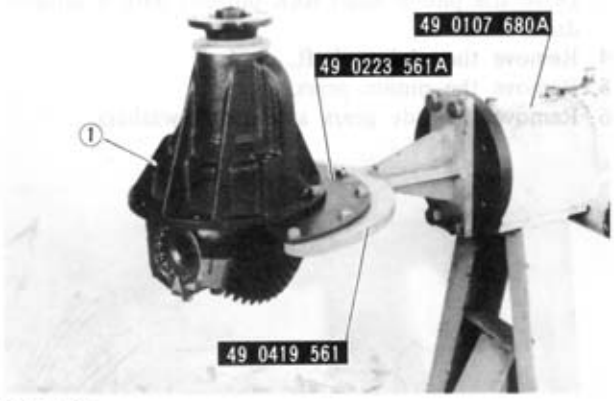


Fig. 9–15

9–C. REAR AXLE DISASSEMBLY

9–C–1. Removing Differential Assembly

1. Mount the rear axle assembly on the **engine stand** (49 0107 680A) and the **attachments** (49 0419 561 and 49 0223 561A).

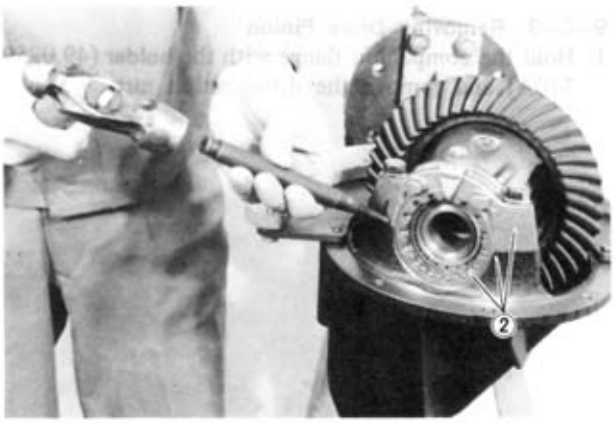


Fig. 9–16

2. Apply identification punch marks on the carrier, differential bearing caps and adjusters for reassembly purpose.

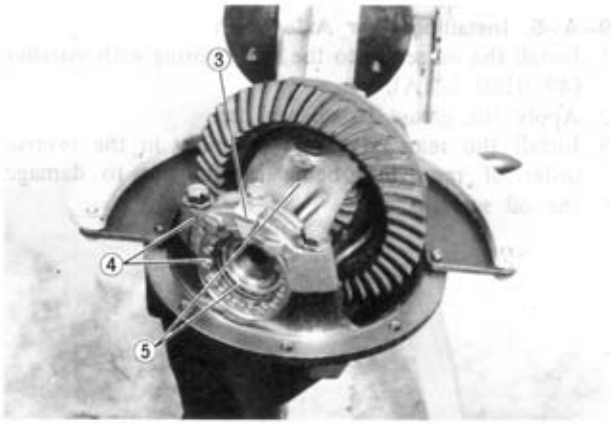


Fig. 9–17

3. Remove the adjuster lock plates.
4. Remove the bearing caps and adjusters.
5. Remove the differential assembly and bearings.

Note :
Make certain that each bearing outer race remains with its respective bearing.

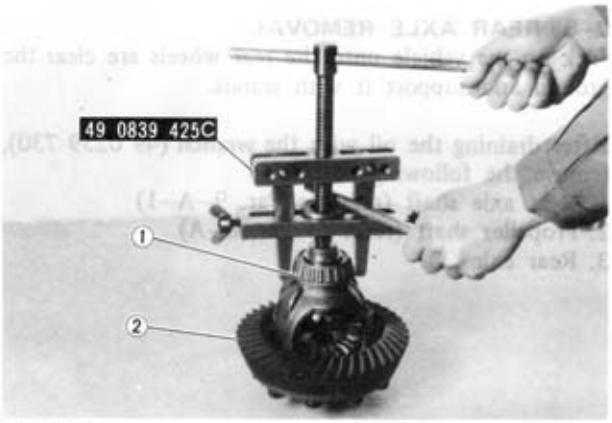


Fig. 9–18

9–C–2. Disassembling Differential

1. Remove the side bearings by using a **puller** (49 0839 425C).
2. Remove the ring gear.

Fig. 9–19

3. Drive the pinion shaft lock pin out with a suitable drift.
4. Remove the pinion shaft.
5. Remove the pinion gears.
6. Remove the side gears and thrust washers.

Fig. 9–20

9–C–3. Removing Drive Pinion

1. Hold the companion flange with the **holder** (49 0259 710A) and remove the drive pinion nut.

Fig. 9–21

2. Remove the companion flange.
3. Remove the drive pinion, spacer, rear bearing and collapsible spacer assembly from the carrier.
4. Remove the oil seal and front bearing.

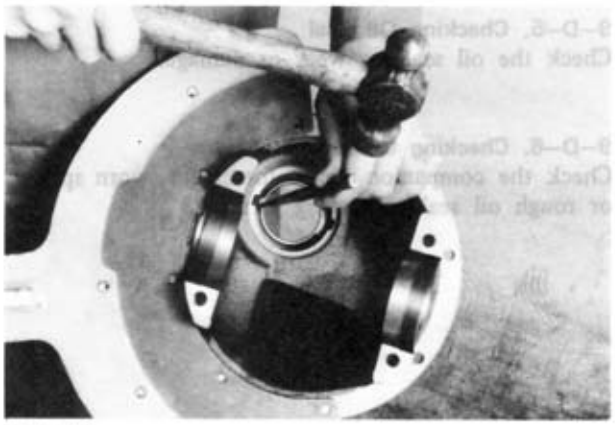


Fig. 9–22

5. If necessary, remove the bearing outer races by using a drift in slots provided for this purpose.

9–D. REAR AXLE INSPECTION

Wash the disassembled parts and inspect them on the following points. Replace any part found defective.

9–D–1. Checking Drive Pinion and Ring Gear

Check the drive pinion for damaged or excessively worn teeth, damaged bearing journals and splines. Inspect the ring gear for worn or chipped teeth. If any of above conditions is found, replace both drive pinion and ring gear as they are available only in set.

Fig. 9–23

9–D–2. Checking Differential Gears

Check the differential side gears and pinion gears for cracks, chipped teeth or any damage.

9–D–3. Checking Bearings

Check the differential bearings and pinion bearings for wear, flaking or any damage.

Fig. 9–24

Fig. 9–25

9–D–4. Checking Collapsible Spacer

Measure the length of the collapsible spacer with a micrometer.

Standard length: 57 ± 0.15 mm (2.244 ± 0.006 in)

9–D–5. Checking Oil Seal

Check the oil seal for wear or damage.

Fig. 9–26

9–D–6. Checking Companion Flange

Check the companion flange for cracks, worn splines, or rough oil seal contacting surface.

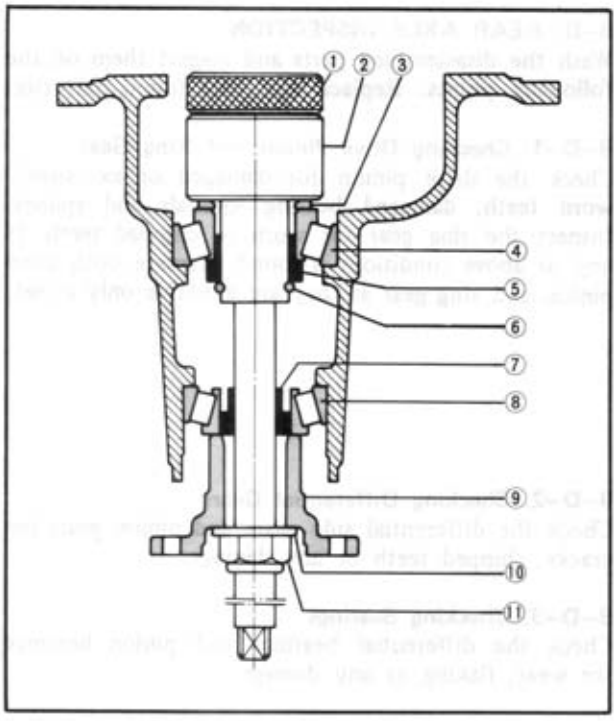


Fig. 9–27

1. Gauge block (49 0305 555)
2. Drive pinion model (49 8531 565)
3. Spacer
4. Rear bearing
5. Coller B (49 8531 568)
6. "O" ring
7. Coller A (49 8531 567)
8. Front bearing
9. Companion flange
10. Washer
11. Nut

9–E. REAR AXLE ASSEMBLY

9–E–1. Adjusting Drive Pinion

1. Make certain that the differential bearing support bore are free of dirt and burrs.
2. Install the front and rear bearing outer races, which are to be used actually, into the differential carrier.
3. Install a spacer (3), rear bearing (4) and **coller B** (49 8531 568) on the **drive pinion model** (49 8531 565) and secure them with "O" ring (6).
4. Install them in the carrier.

Note :

a) Never use the collapsible spacer.

b) The head portion of the drive pinion model is screw in type, so you make sure that the head has no looseness.

5. Install the front bearing (8), **coller A** (49 8531 567), companion flange (9) and washer (10).
6. Tighten the nut so that the drive pinion model turns smoothly.

Fig. 9–28

Fig. 9–29

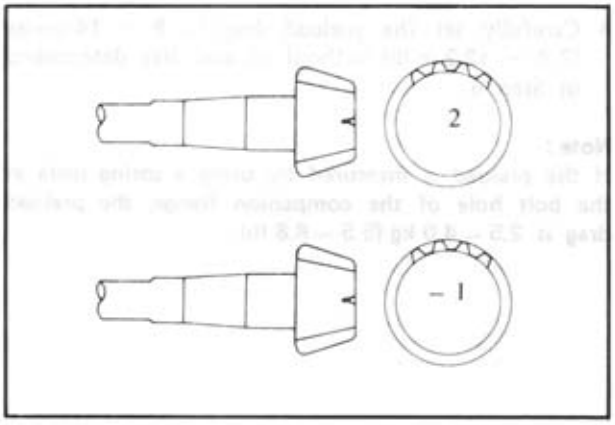


Fig. 9–30

Identification mark	Thickness
08	3.08 mm (0.1213 in)
11	3.11 mm (0.1224 in)
14	3.14 mm (0.1236 in)
17	3.17 mm (0.1248 in)
20	3.20 mm (0.1260 in)
23	3.23 mm (0.1271 in)
26	3.26 mm (0.1283 in)
29	3.29 mm (0.1295 in)
32	3.32 mm (0.1307 in)
35	3.35 mm (0.1319 in)
38	3.38 mm (0.1331 in)
41	3.41 mm (0.1343 in)
44	3.44 mm (0.1354 in)
47	3.47 mm (0.1366 in)

7. Install a dial indicator to the **gauge body** (49 0727 570). Place the gauge body on the surface plate and set up the dial indicator to "Zero".

8. Place the **gauge block** (49 0305 555) on the drive pinion model and carefully place the gauge body adjusted in Step 7 on the gauge block so that the feeler of the indicator comes in contact with the lowest portion of the differential bearing support bore.
   The measurement should be taken on each bearing support bore.
9. Record an average of readings.
   1) If the average is on plus (+) side, use a spacer which is thicker by the plus value than the spacer used in Step 3.
   2) If the average is on minus (–) side, use a spacer which is thinner by the minus value than the spacer used in Step 3.
10. Remove the gauge body and dial indicator, and check zero setting on the surface plate to make sure this setting was not disturbed by handling.
11. In order to compensate for all of the machining variables, the pinion has number recorded in hundredth millimeters on the pinion face of tapered end.

    Example :
    2 = + 0.02 mm (+ 0.0008 in)
    –1 = – 0.01 mm (–0.0004 in)

    1) If the pinion is marked a number, subtract the specified amount on the pinion face of tapered end from the amount determined in Step 9.
    2) If the pinion is marked "–" (minus) number, add the specified amount on the pinion face of tapered end to the amount determind in Step 9.
12. Finary select the pinion spacer within the tolerance of ± **0.03 mm (± 0.0012 in)** from the left table.

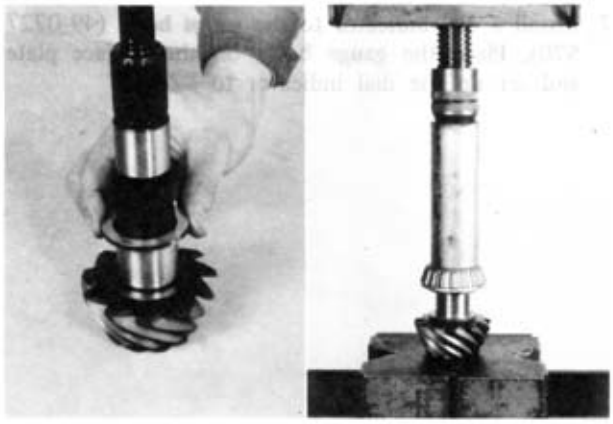


Fig. 9–31

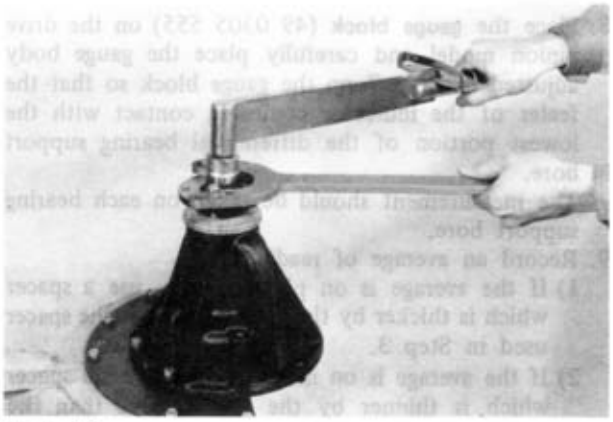


Fig. 9–32

Fig. 9–33

Fig. 9–34

9–E–2. Assembling Drive Pinion

1. Position the selected spacer on the drive pinion and press in the pinion rear bearing on the drive pinion.
2. Install the collapsible spacer onto the drive pinion and install them in the carrier.
3. Install the pinion front bearing on the front end of the drive pinion.
4. Apply gear lubricant to the pinion oil seal lip and install the pinion oil seal into the carrier.
5. Install the companion flange on the pinion by tapping with a plastic hammer.
6. Install the pinion washer and nut. Before tightening the nut (when the pinion preload is zero), check the drag of the oil seal by using a torque wrench.
7. Tighten the pinion nut to **13 m-kg (94 ft-lb)** and check the preload.

Note :
The pinion nut should be tightened only a little at a time and preload should be checked after each slight amount of tightening. The maximum tightening torque of the nut is 18 m-kg (130 ft-lb).
If the specified preload is not obtained after tightening the nut to the maximum torque of 18 m-kg (130 ft-lb), replace the collapsible spacer with a new one.

8. Carefully set the preload drag to **9 ~ 14 cm-kg (7.8 ~ 12.2 in-lb)** without oil seal drag determined in Step 6.

Note :
If the preload is measured by using a spring scale at the bolt hole of the companion flange, the preload drag is 2.5 ~ 4.0 kg (5.5 ~ 8.8 lb).

9–E–3. Assembling Differential

1. Install the thrust washers on each differential side gear and install these in the gear case.

Fig. 9–35

2. Through the openings of the gear case, insert each of two pinion gears exactly **180** degrees opposite each other.
3. Rotate the gears **90** degrees so that the pinion shaft holes of the case come into alignment with the holes in the pinion gears.
4. Insert the pinion shaft through the case and pinion gears.

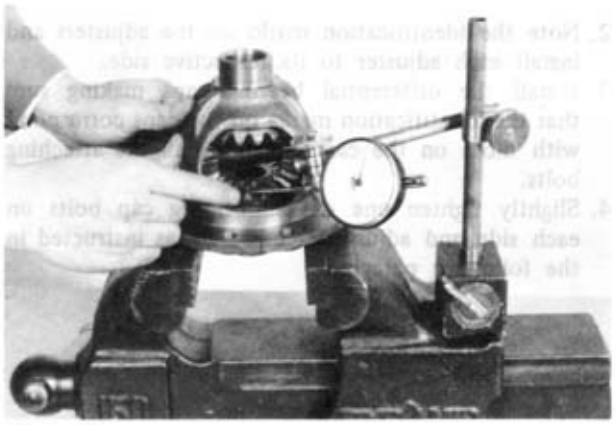


Fig. 9–36

5. Check and adjust the backlash of the side gear and pinion gear by inserting a proper thickness of thrust washer.

Standard backlash: 0 ~ 0.1 mm (0 ~ 0.004 in)

Thrust washer thicknesses:

Identification mark	Thickness
0	2.0 mm (0.0787 in)
05	2.05 mm (0.0807 in)
1	2.1 mm (0.0827 in)
15	2.15 mm (0.0846 in)
2	2.2 mm (0.0866 in)

Fig. 9–37

6. Install the lock pin to secure the pinion shaft. Stake the lock pin into position with a punch to prevent it from working out.

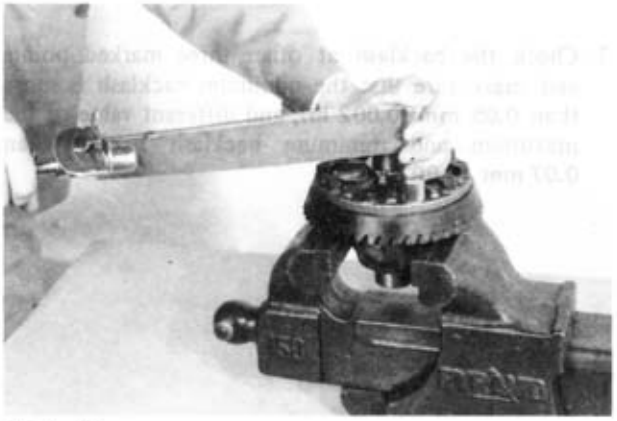


Fig. 9–38

7. Install the ring gear to the case and torque the bolts to **7.0 ~ 8.5 m-kg (51 ~ 61 ft-lb)**.
8. Press in each differential bearing to the gear case.
9. Install the differential bearing outer races to their respective bearings.

Fig. 9–39

9–E–4. Installing Differential

1. Install the differential gear assembly in the carrier.

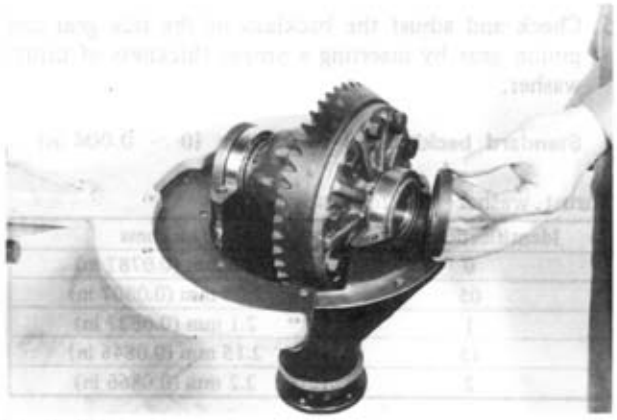


Fig. 9–40

2. Note the identification marks on the adjusters and install each adjuster to its respective side.
3. Install the differential bearing caps making sure that the identification marks on the caps correspond with those on the carrier and install the attaching bolts.
4. Slightly tighten one of the bearing cap bolts on each side and adjust the backlash, as instructed in the following paragraph.

Fig. 9–41

9–E–5. Adjusting Backlash

1. Mark the ring gear at four points at approx. 90° intervals gear and mount a dial indicator to the carrier so that the feeler comes in contact at right angle with one of the ring gear teeth.
2. Turn the both bearing adjusters equally until the backlash becomes **0.09 ~ 0.11 mm (0.0035 ~ 0.0043 in)** by using the **wrench** (49 0259 720).

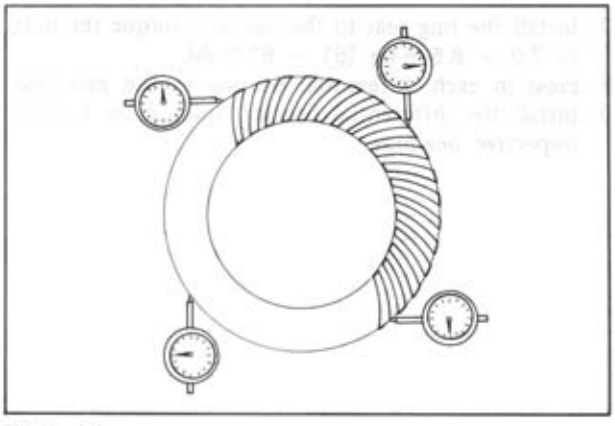


Fig. 9–42

3. Check the backlash at other three marked points and make sure that the minimum backlash is more than **0.05 mm (0.002 in),** and different value of the maximum and minimum backlash is less than **0.07 mm (0.0028 in).**

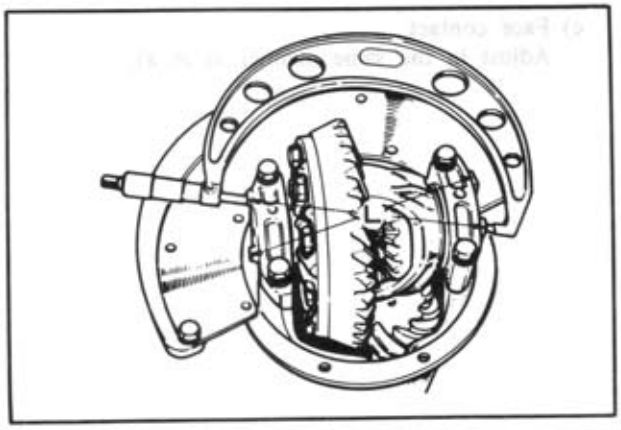


Fig. 9–43

4. After adjusting the backlash, tighten the adjusters equally until the distance between both pilot sections on bearing caps becomes **185.428 ~ 185.5 mm (7.3004 ~ 7.3033 in).**

Note :
When adjusting the differential bearing preload, care must be taken not to affect the backlash of the drive pinion and ring gear.

5. Tighten the bearing cap bolts to a torque of **3.8 ~ 5.3 m-kg (27 ~ 38 ft-lb).**
6. Install the adjuster lock plates on the bearing caps to prevent the adjusters from loosening.

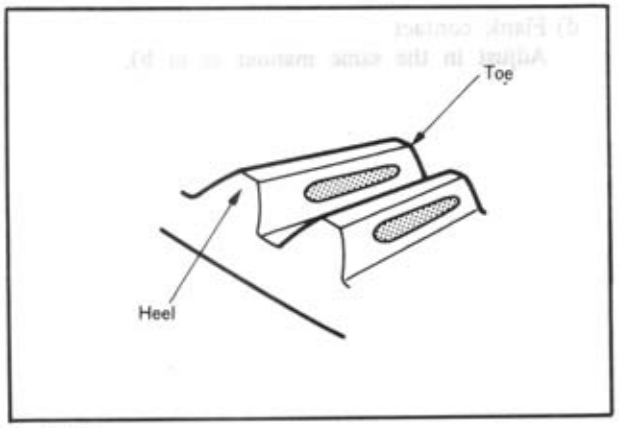


Fig. 9–44

7. Check the tooth contact of the ring gear and pinion by applying a thin coat of red lead on both sides of about six or eight of ring gear teeth and rotating the ring gear few times forward and backward. If the pinion position and backlash have been correctly set, the contact pattern should be obtained as shown in figure.

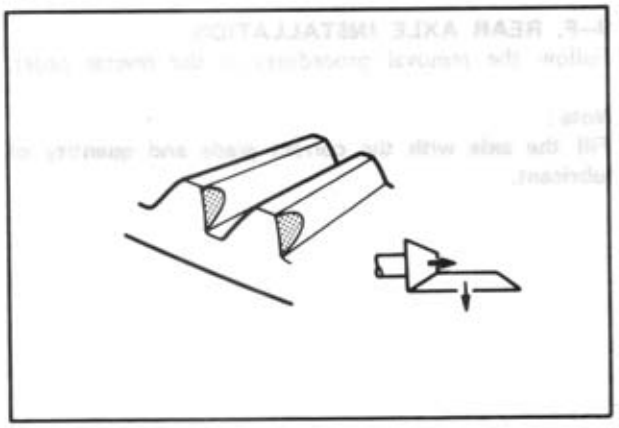


Fig. 9–45

If faulty tooth contact pattern is obtained, it can be adjusted in the following manners.

a) Heel contact
Select pinion spacer that will bring the drive pinion closer to ring gear.

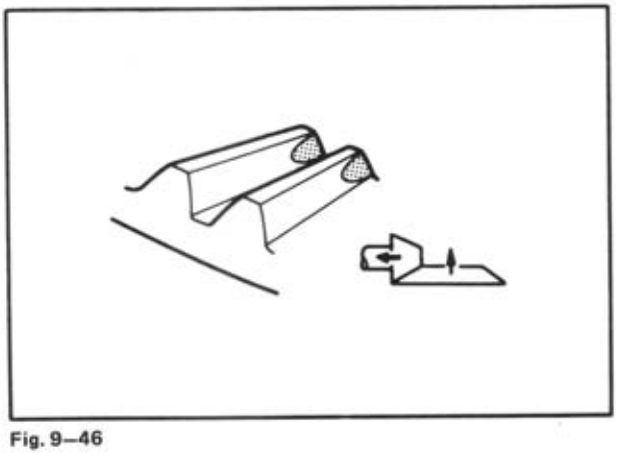


Fig. 9–46

b) Toe contact
Select pinion spacer that will shift the drive pinion away from ring gear.

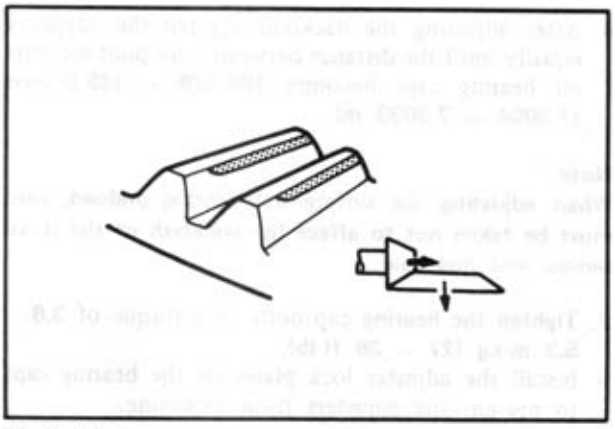


Fig. 9–47

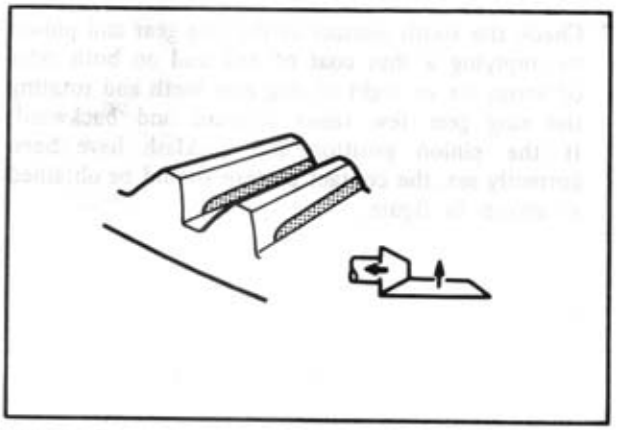


Fig. 9–48

c) Face contact
Adjust in the same manner as in a).

d) Flank contact
Adjust in the same manner as in b).

9–F. REAR AXLE INSTALLATION

Follow the removal procedures in the reverse order.

Note :
Fill the axle with the correct grade and quantity of lubricant.

STEERING

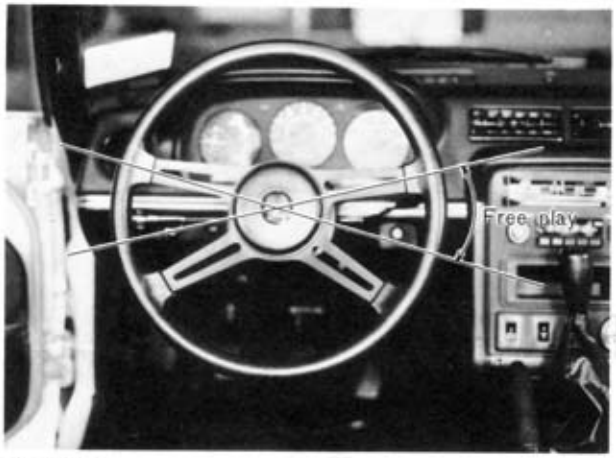


Fig. 10–1

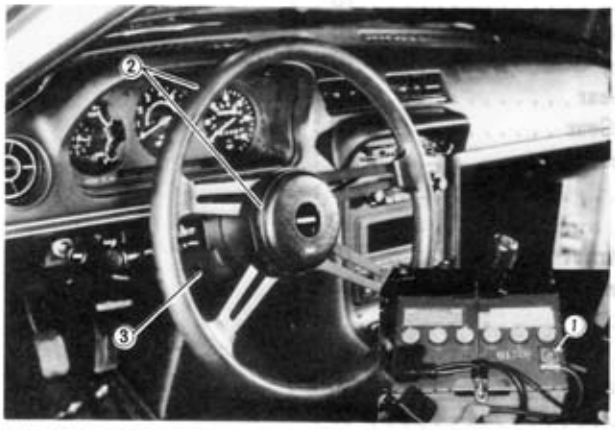


Fig. 10–2

Fig. 10–3

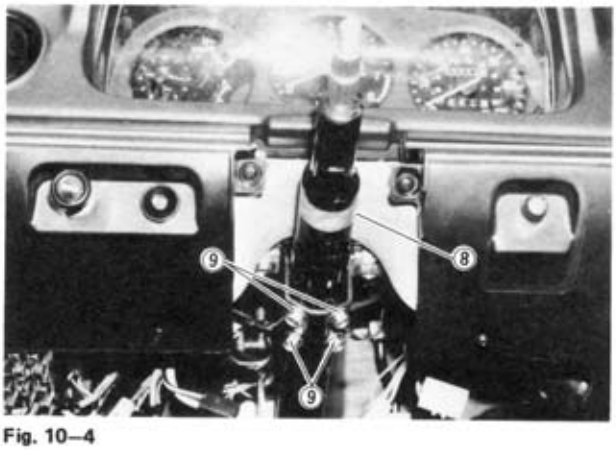


Fig. 10–4

10–A. STEERING WHEEL PLAY

Check the free play at the circumference of the steering wheel.

Standard free play: 5 ~ 20 mm (0.2 ~ 0.8 in)

To check the free play, place the front wheels straight ahead and turn the steering wheel slowly.
The free play is taken when the front wheel begins to move.
If excessive play is found, the following points should be carefully checked.

1. Fitting condition of the center link ball joints
2. Looseness of the idler arm bushes
3. Looseness of the wheel bearing
4. Backlash between the sector shaft and ball nut

10–B. STEERING GEAR

10–B–1. Removing Steering Gear

1. Disconnect the battery negative cable.
2. Remove the horn cap and steering wheel.

Note:

a) Before removing the steering wheel, apply identification marks on the steering column shaft and steering wheel.

b) Do not strike the steering column shaft end with a hummer. Striking shaft will damage the bearing or collapsible shaft.

3. Remove the steering column covers.
4. Remove the air duct and disconnect the couplers of the combination switch.
5. Remove the stop ring, cancel cam and spring.
6. Remove the combination switch assembly.
7. Remove the steering lock assembly referring to Par. 10–E.

8. Wrap the steering lock hole on the column jacket with tape to prevent lubricant from leaking out of the jacket.
9. Remove the column jacket fixing bracket.

Fig. 10–5

10. Mark the bonnet hinge locations on the bonnet and remove the bonnet.
11. Raise the front end of the vehicle and support it with stands.
12. Disconnect the center link from the pitman arm with **puller** (49 0118 850C).

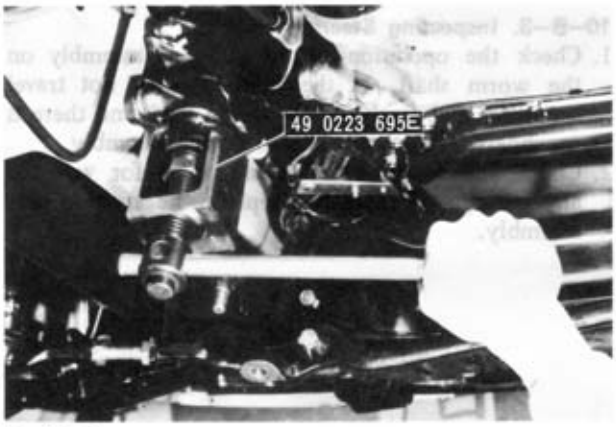


Fig. 10–6

13. Remove the pitman arm from sector shaft with **puller** (49 0223 695E).
14. Remove the steering gear housing attaching bolts and remove the steering gear housing assembly through the engine compartment.

Note:
If the car has any collision, check the steering wheel for axial play before removing the steering gear assembly. If the steering column shaft is crushed or axial play occures, replace the steering gear and column shaft as an assembly.

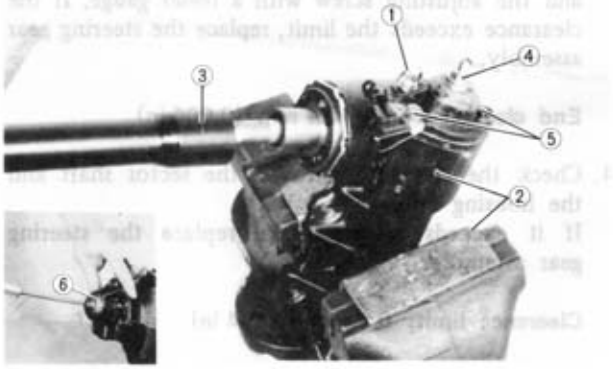


Fig. 10–7

10–B–2. Disassembling Steering Gear

1. Drain the lubricant.
2. Hold the steering gear housing in a vise.
3. Slide the column jacket off the column shaft.
4. Loosen the adjusting screw lock nut.
5. Remove the side cover attaching bolts.
6. Remove the side cover by turning the adjusting screw clockwise through the cover.

Fig. 10–8

7. Remove the sector shaft from the gear housing, being careful not to damage the shaft.

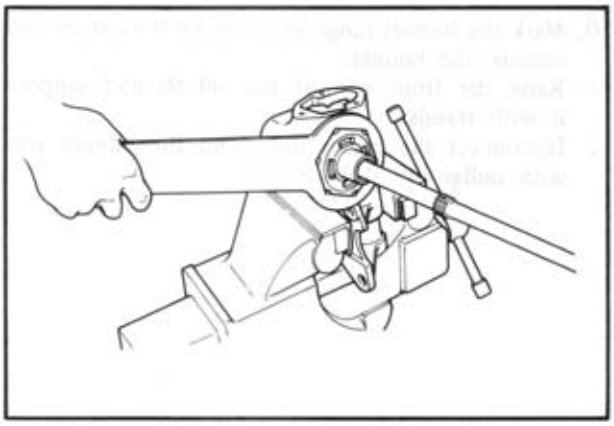


Fig. 10–9

8. Unscrew the end cover lock nut with the suitable wrench.
9. Loosen the end cover.
10. Remove the worm shaft and ball nut assembly. **Do not disassemble the worm shaft and ball nut assembly.**
11. Remove the oil seal with suitable tool. **Do not remove** unless the oil seal is necessary to replace.

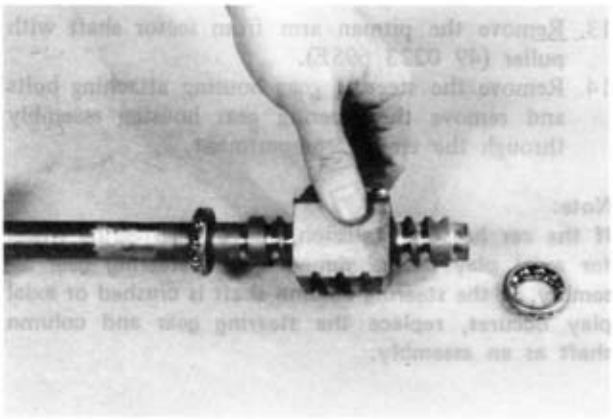


Fig. 10–10

10–B–3. Inspecting Steering Gear

1. Check the operation of the ball nut assembly on the worm shaft. If the ball nut does not travel smoothly and freely on the worm shaft and there is roughness, replace the steering gear assembly.
2. Check the worm bearings and cups for wear or any damage. If defective, replace the steering gear assembly.

Fig. 10–11

3. Check the end clearance between the sector shaft and the adjusting screw with a feeler gauge. If the clearance exceeds the limit, replace the steering gear assembly.

   End clearance limit: 0.1 mm (0.004 in)

4. Check the clearance between the sector shaft and the housing bore.
   If it exceeds specifications, replace the steering gear assembly.

   Clearance limit: 0.1 mm (0.004 in)

Fig. 10–12

5. Check the oil seal for wear, flaw or any damage. If there is any possibility of oil leakage, replace the oil seal.

Note:
When installing, do not tap the oil seal directly with a hammer.

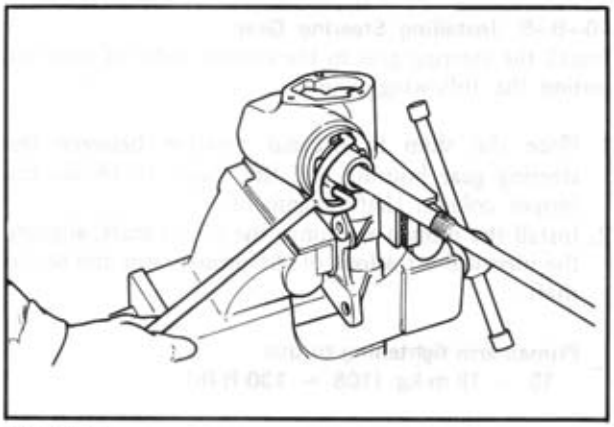


Fig. 10–13

10–B–4. Assembling Steering Gear

1. Install the oil seal with suitable tool (if removed). **When installing, do not tap the oil seal directly with a hammer.**
2. Install the worm shaft and ball nut assembly into the gear housing.
3. Screw in the end cover until the preload of the worm shaft becomes **0.2 ~ 0.5 kg (0.44 ~ 1.1 lb).**

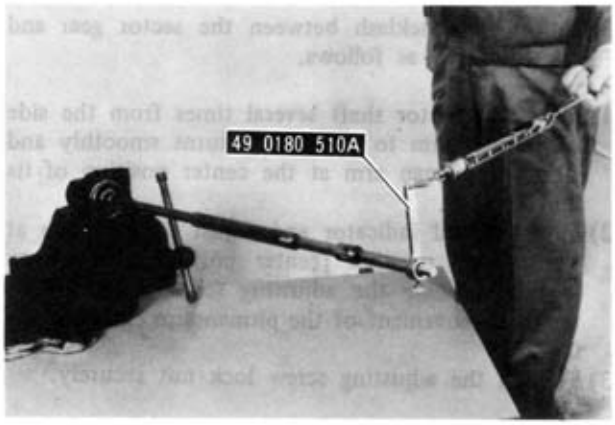


Fig. 10–14

To measure the preload, attach the **attachment** (49 0180 510A) to the column shaft end and pull the spring scale sequarly and then, take a reading of the scale when the shaft starts to turn.

4. After adjusting the preload, tighten the end cover lock nut with suitable wrench and recheck the preload.

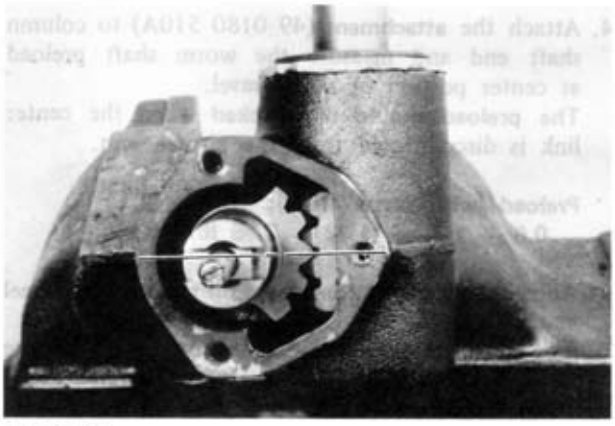


Fig. 10–15

5. Turn the worm shaft and place the rack in the center position of the worm.
6. Install the adjusting screw and shim into the slot at the end of the sector shaft, and install them into the gear housing, being careful not to damage the oil seal.
   Make sure the center of the sector gear is in alignment with the center of the worm shaft rack.

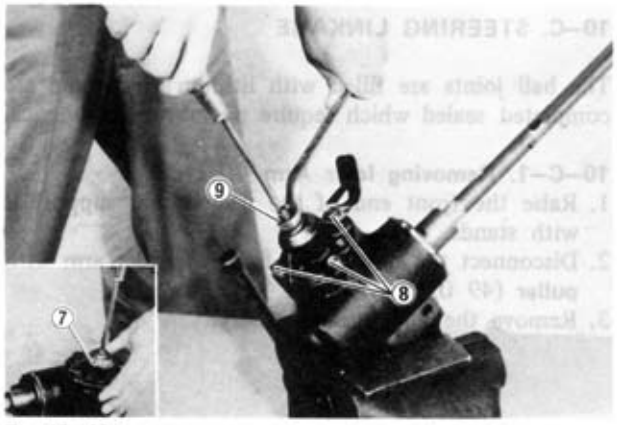


Fig. 10–16

7. Apply sealing agent to side cover and place the side cover onto the adjusting screw, then turn the adjusting screw counter-clockwise until it is screwed into proper position.
8. Tighten the side cover attaching bolts.
9. Temporarily tighten the adjusting screw lock nut. The adjustment of the backlash between the sector gear and rack is explained in Par. 10–B–5.
10. Install the column jacket onto the end cover.

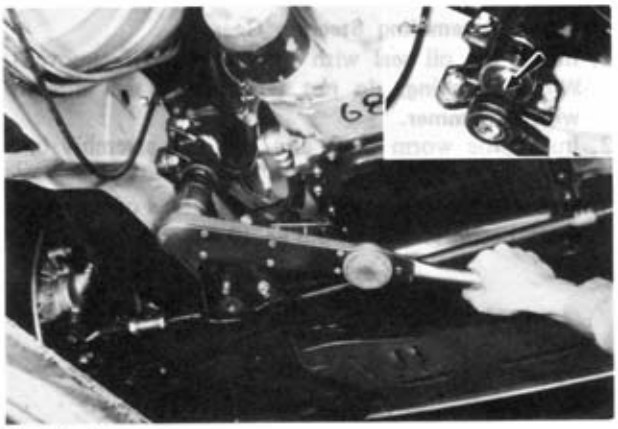


Fig. 10–17

10–B–5. Installing Steering Gear

Install the steering gear in the reverse order of removal, **noting** the following points.

1. Place the shim in original position between the steering gear housing and the frame to obtain the proper column shaft alignment.
2. Install the pitman arm onto the sector shaft, aligning the identical serrations of the pitman arm and sector shaft.

Pitman arm tightening torque:
15 ~ 18 m-kg (108 ~ 130 ft-lb)

Fig. 10–18

3. Adjust the backlash between the sector gear and rack, proceed as follows.

1) Move the sector shaft several times from the side of pitman arm to see that it turns smoothly and stop the pitman arm at the center position of its moval range.
2) Mount a dial indicator and adjust the backlash at the neutral position (center position) of pitman arm by turning the adjusting screw in or out so that the movement of the pitman arm end becomes **0 mm.**
3) Tighten the adjusting screw lock nut securely.

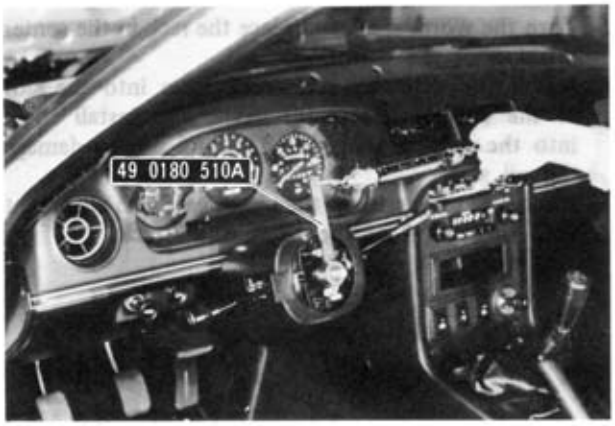


Fig. 10–19

4. Attach the **attachment** (49 0180 510A) to column shaft end and measure the worm shaft preload at center portion of shaft travel.
The preload should be checked when the center link is disconnected from the pitman arm.

Preload (with sector shaft):
0.6 ~ 1.2 kg (1.32 ~ 2.65 lb)

5. Align the identification marks on the steering wheel and column shaft.
6. Fill the gear housing with lubricant (A.P.I. Service GL-4, SAE 90).

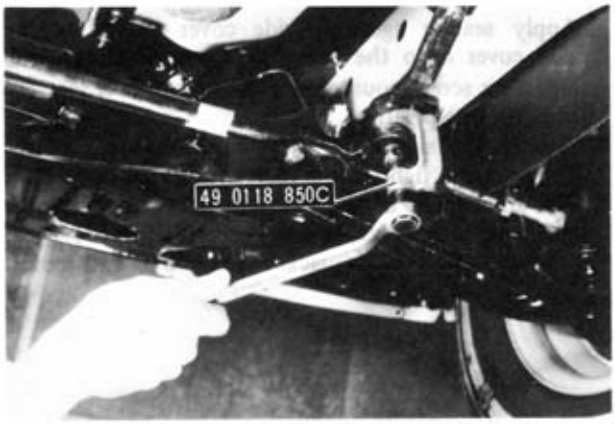


Fig. 10–20

10–C. STEERING LINKAGE

The ball joints are filled with lithium grease and are completed sealed which require no lubrication service.

10–C–1. Removing Idler Arm

1. Raise the front end of the vehicle and support it with stands.
2. Disconnect the center link from the idler arm with **puller** (49 0118 850C).
3. Remove the idler arm assembly.

Fig. 10–21

10–C–2. Disassembling Idler Arm

1. Hold the idler arm assembly in a vise.
2. Remove the split pin, nut and washer.
3. Remove the idler arm and bushes from the bracket.
4. Check the bushes and replace if they are worn excessively.

Fig. 10–22

10–C–3. Assembling Idler Arm

1. Position the bush on the idler arm spindle and fill grease (Lithium base NLGI No. 2) to bush and spindle.
2. Install the idler arm to bracket and pack the grease into the bracket.
3. Position the bush and washer.
4. Tighten the spindle nut and install the new split pin.

Fig. 10–23

5. Check the revolving torque of the idler arm by using a spring scale. The reading should be **within 2 ~ 6 kg (4.4 ~ 13.2 lb).**
   If the specified reading is not obtained, replace the idler arm bushes.

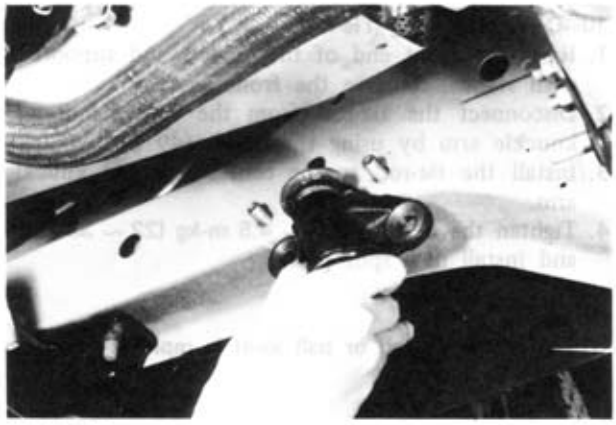


Fig. 10–24

10–C–4. Installing Idler Arm

1. Install the idler arm assembly to the frame and tighten the attaching bolts to **4.4 ~ 5.5 m-kg (32 ~ 40 ft-lb).**
2. Connect the center link to the idler arm.
   Tighten the nut to **2.5 ~ 3.5 m-kg (18 ~ 25 ft-lb)** and install a new split pin.

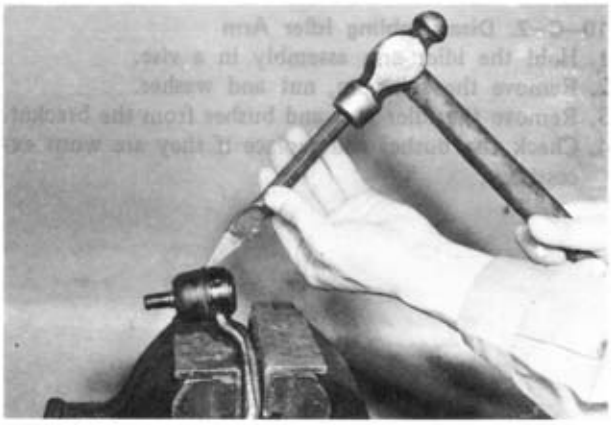


Fig. 10–25

10–C–5. Checking Ball Joint

1. Inspect the ball joint for wear. If defective, replace the ball joint in its assembled form.
2. Check the dust seal for wear, flaw or any damage. If the dust seal is defective, replace it with new one.
   To replace the dust seal, remove the ball joint and hold it in a vise.
   Remove the dust seal with suitable tool.

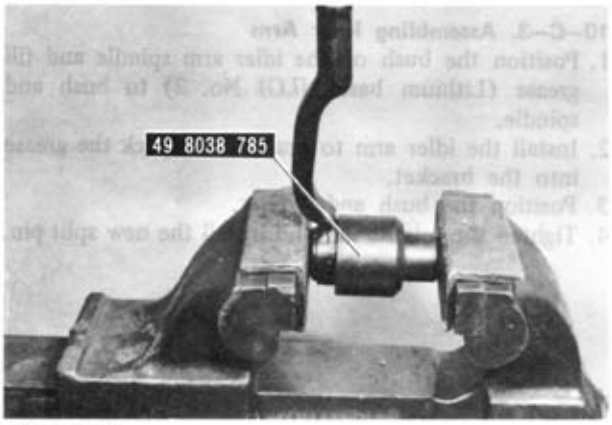


Fig. 10–26

Pack the small amount of grease (Lithium base NLGI No. 2) to dust seal and install the dust seal with **boot installer** (49 8038 785).

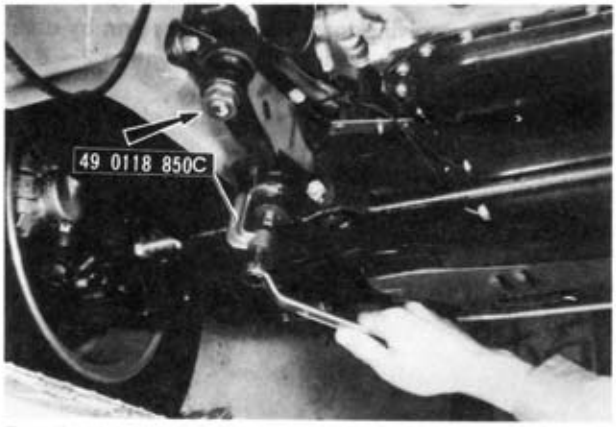


Fig. 10–27

10–C–6. Replacing Pitman Arm

1. Raise the front end of the vehicle and support it with stands.
2. Disconnect the center link from the pitman arm with **puller** (49 0118 850C).
3. Loosen the nut and remove the pitman arm from the sector shaft with **puller** (49 0223 695E).
4. Install the pitman arm onto the sector shaft, aligning the identical serrations of the pitman arm and sector shaft. Tighten the nut to **15 ~ 18 m-kg (108 ~ 130 ft-lb).**
5. Connect the center link to the pitman arm and tighten the nut to **3.0 ~ 4.5 m-kg (22 ~ 33 ft-lb).** Install a new split pin.

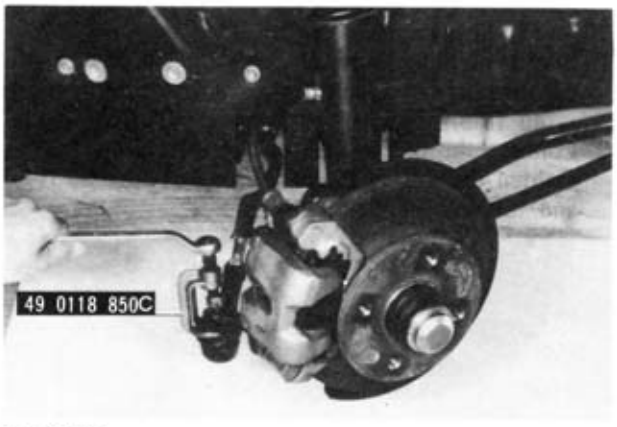


Fig. 10–28

10–C–7. Replacing Tie-rod

1. Raise the front end of the vehicle and support it with stands. Remove the front wheel.
2. Disconnect the tie-rod from the center link and knuckle arm by using the **puller** (49 0118 850C).
3. Install the tie-rod to the center link and knuckle arm.
4. Tighten the nuts to **3.0 ~ 4.5 m-kg (22 ~ 33 ft-lb)** and install new split pins.

Note:
Whenever the tie-rod or ball joint is replaced, the toe-in must be reset.

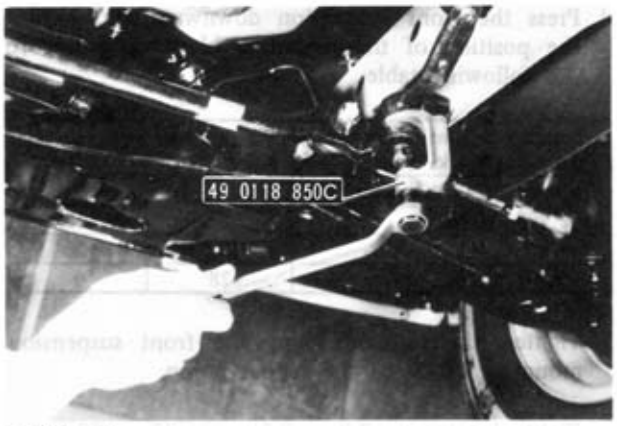


Fig. 10–29

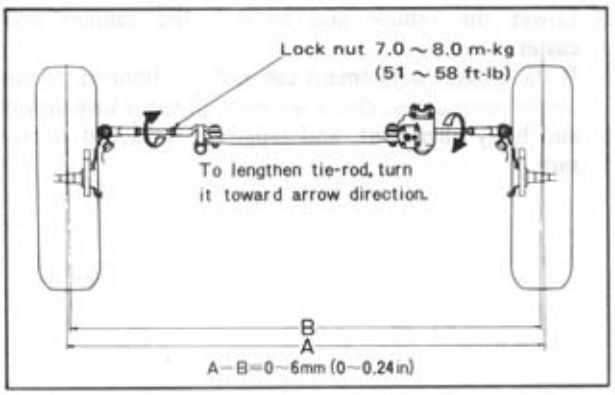


Fig. 10–30

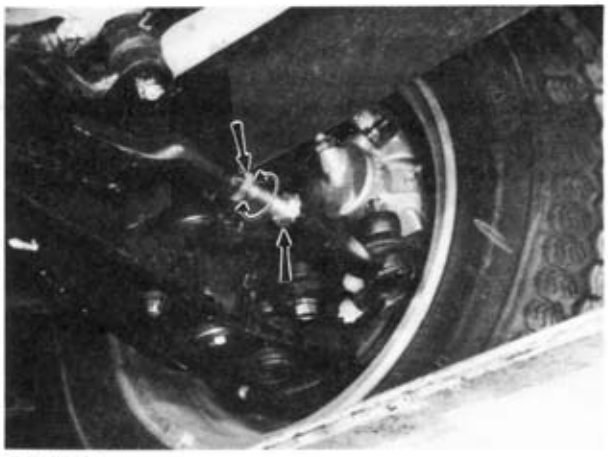


Fig. 10–31

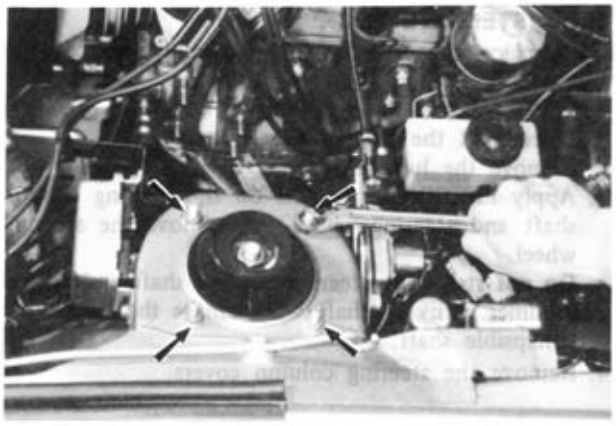


Fig. 10–32

10–C–8. Replacing Center Link

1. Raise the front end of the vehicle and support it with stands.
2. Remove the center link from both tie-rods, pitman arm and idler arm by using the **puller** (49 0118 850C).
3. Install the center link to the pitman arm, idler arm and tie-rods.
4. Install and tighten the nuts to specifications. Install new split pins.

Tightening torque:
Center link to idler arm
2.5 ~ 3.5 m-kg (18 ~ 25 ft-lb)
Other ball joints 3.0 ~ 4.5 m-kg (22 ~ 33 ft-lb)

10–D. FRONT WHEEL ALIGNMENT

10–D–1. Inspection Before Checking Front Wheel Alignment

1. Check the tire inflation and bring to recommended pressure.
2. Inspect the front wheel bearing play and correct if necessary.
3. Inspect the wheel and tire run-out and balance.
4. Inspect the ball joints of the front suspension and steering linkage for any excessive looseness.
5. The vehicle must be on level ground and have no luggage or passenger load.

10–D–2. Checking Toe-in

1. Raise the front end of the vehicle until the wheels clear the ground.
2. Turning the wheels by hand, mark a line in the center of each tire tread by using a scribing block.
3. Lower the vehicle and place the front wheels in the straight-ahead position.
4. Measure the distance between the marked lines at the front and rear of the wheels.
   Both measurements must be taken at equal distances from the ground.
   If the distance between the wheels at the rear is greater than that at the front by **0 ~ 6 mm (0 ~ 0.24 in)**, it is correct.
   If it is found to be incorrect, adjust the toe-in by turning the tie-rods by equal amounts.

10–D–3. Checking Camber and Caster

To check the camber and caster, use a wheel aligning gauge following the manufacturer's instructions.

Camber: 1°10′ ± 30′
Caster: 4°30′ ± 30′ **(Right hand side)**
4°00′ ± 30′ **(Left hand side)**

If it is found to be incorrect, adjust the camber and caster as follows:

1. Raise the front end of the vehicle and support it with stands.
2. Open the bonnet.
3. Remove the four nuts attaching the front suspension mounting block to the fender apron.

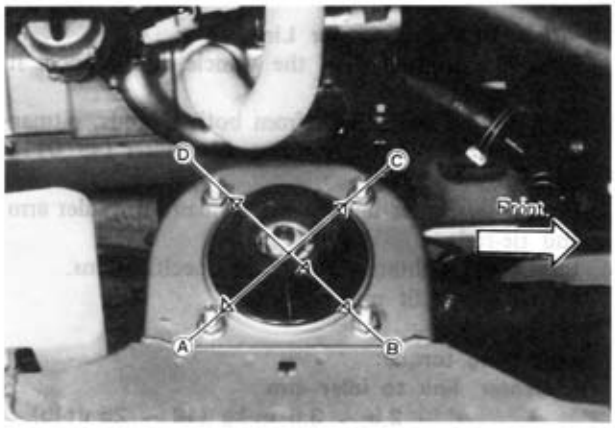


Fig. 10–33

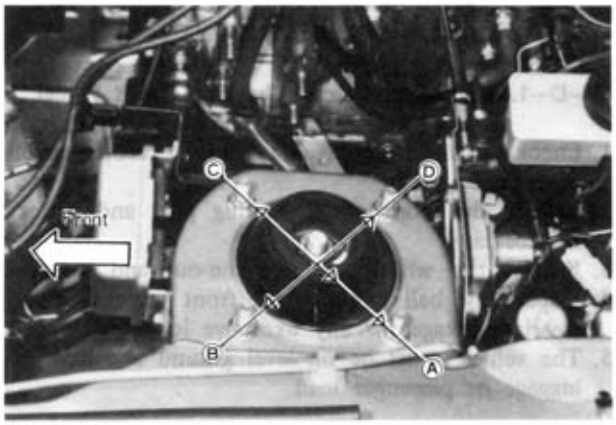


Fig. 10–34

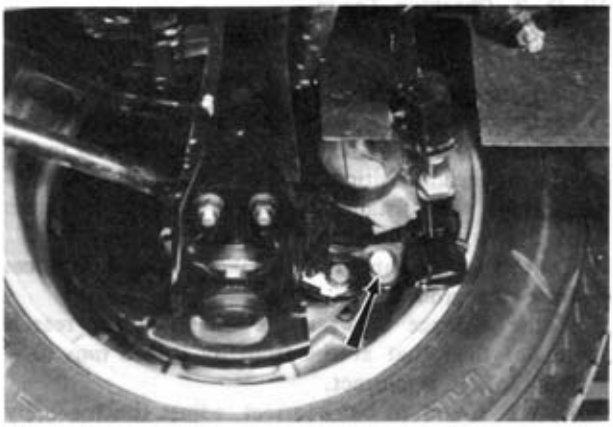


Fig. 10–35

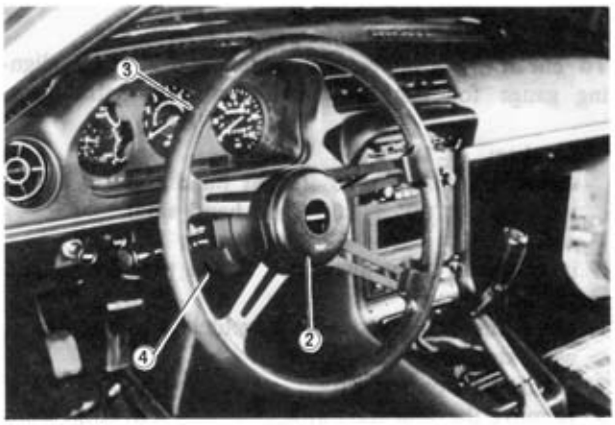


Fig. 10–36

4. Press the front suspension downward and change the position of the mounting block according to the following table.

Position of front suspension mounting block	Variation	
	Camber	Caster
0° (A) "Original"	0	0
90° (B)	0	+28′
180° (C)	+28′	+28′
270° (D)	+28′	0

5. Tighten the nuts attaching the front suspension mounting block to the fender apron.

   Tightening torque 2.3 ~ 3.0 m-kg (17 ~ 22 ft-lb)

6. Lower the vehicle and recheck the camber and caster.
   If the correct adjustment can not be obtained by the above procedures, check all parts of front suspension and body alignment, and repair or replace if necessary.

10–D–4. Adjusting Steering Angle

Adjust the steering angle with the adjusting bolt fitted on the steering knuckle arm so that the front wheels turn **39°40′** ± **2°** inward and **32°14′** ± **2°** outward.

10–E. STEERING LOCK

To replace the steering lock assembly, proceed as follows.

1. Disconnect the battery negative cable.
2. Remove the horn cap.
3. Apply identification marks on the steering column shaft and steering wheel, and remove the steering wheel.
   Do not strike the steering column shaft end with a hummer. Striking shaft will damage the bearing or collapsible shaft.
4. Remove the steering column covers.

Fig. 10–37

5. Remove the air duct and disconnect the couplers of the combination switch.
6. Remove the stop ring, cancel cam and spring.
7. Remove the combination switch assembly.

Fig. 10–38

8. Make a groove on the head of the bolts attaching the steering lock body to the column jacket by using a chisel so that the screwdriver can be used to loosen the screws.
9. Position a new steering lock assembly to the column jacket and tighten the bolts until the head of the bolts snaps-off.
10. Install the combination switch, column covers and steering wheel in the reverse order of removal.

BRAKES

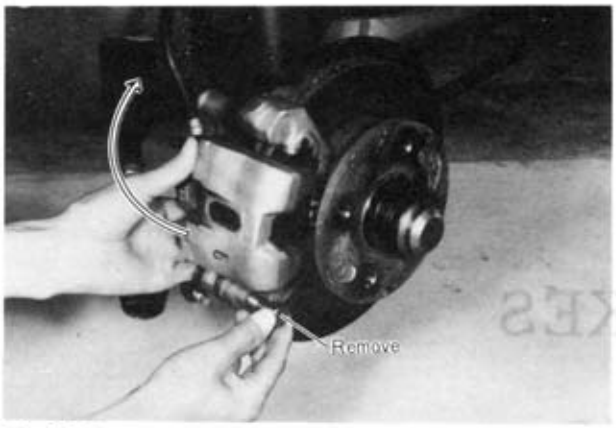


Fig. 11–1

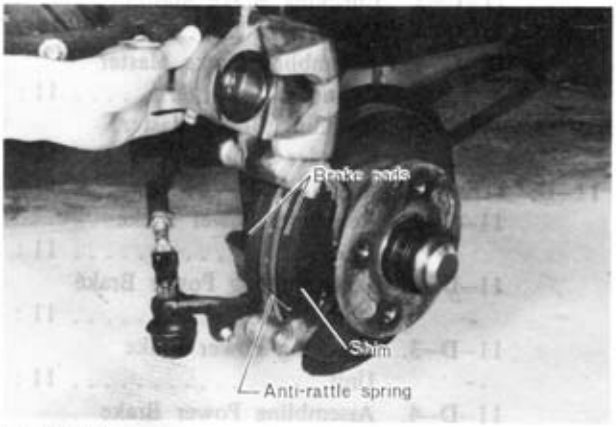


Fig. 11–2

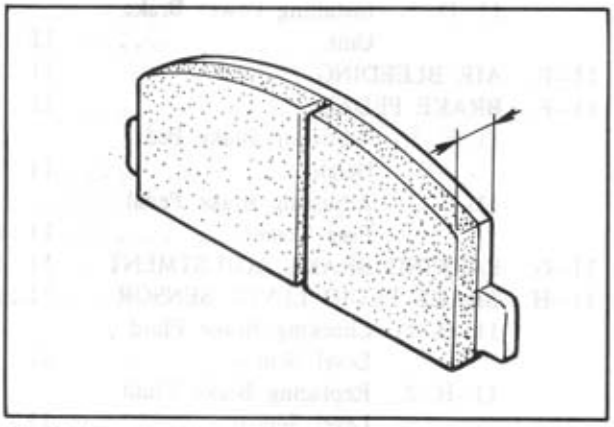


Fig. 11–3

Fig. 11–4

11–A. FRONT BRAKE

11–A–1. Removing Disc Brake Pads

1. Raise the front end of the vehicle and support it with stands.
2. Remove the front wheel.
3. Remove the caliper attaching bolt (lower side).
4. Lift up the lower side of the caliper.
5. Remove the anti-rattle spring.
6. Remove the disc brake pads and the shims.

11–A–2. Checking Disc Brake Pads

Measure the thickness of the shoe and lining. If it exceeds limit, replace the disc brake pad with a new one.

Thickness limit: 6 mm (0.236 in)

Note:

a) When the disc brake pads are replaced, replace all pads on both wheels at the same time.

b) Do not mix different types of pads when replacing.

11–A–3. Installing Disc Brake Pads

Install the disc brake pads in the reverse order of removing.

Note:

When installing the caliper, coat the grease that contained in a brake pad kit or 8175 49 248 onto the caliper mounting pins.

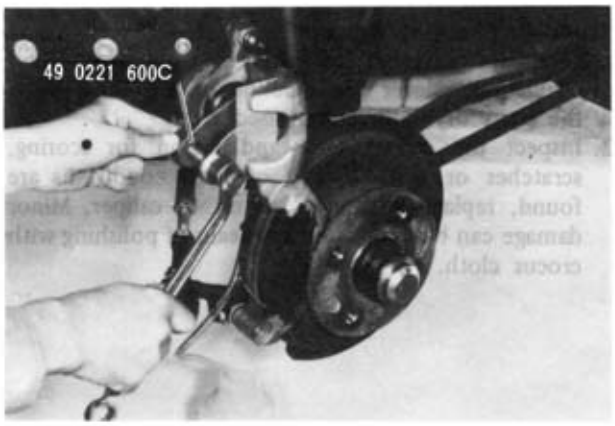


Fig. 11–5

If it is difficult to install the caliper, conduct the followings.

1. Remove the rubber cap from the bleeder screw and attach a vinyl tube to the bleeder screw. Submerge the other end of the vinyl tube into a suitable container.
2. Loosen the bleeder screw and press the piston into the cylinder with the **expand tool** (49 0221 600C).
3. Tighten the bleeder screw and remove the vinyl tube and expand tool.
4. Install the caliper.

Fig. 11–6

11–A–4. Removing Caliper

1. Raise the front end of the vehicle and support it with stands.
2. Remove the front wheel.
3. Temporarily loosen the brake flexible hose at the caliper.
4. Remove the caliper attaching bolt (lower side) and lift up the caliper.
5. Slide out the caliper toward the inside of the vehicle and remove the caliper.
6. Disconnect the flexible hose from the caliper and plug the end of the flexible hose.

Fig. 11–7

11–A–5. Disassembling Caliper

1. Clean the out side of the caliper.
2. Remove the dust boot retainer and dust boot.
3. Remove the piston.
   Place a hard wood in the caliper pit and gradually blow compressed air from the fluid hole.

Note:
If it is difficult to remove the piston, lightly tap around the piston while applying air pressure.

Fig. 11–8

4. Remove the piston seal by using the suitable tool.
5. Remove the bleeder cap and screw.

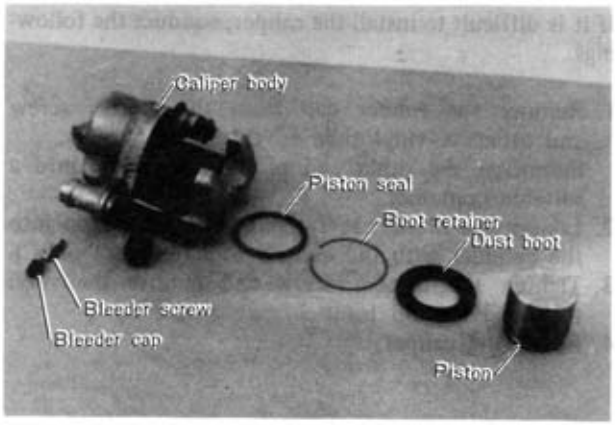


Fig. 11–9

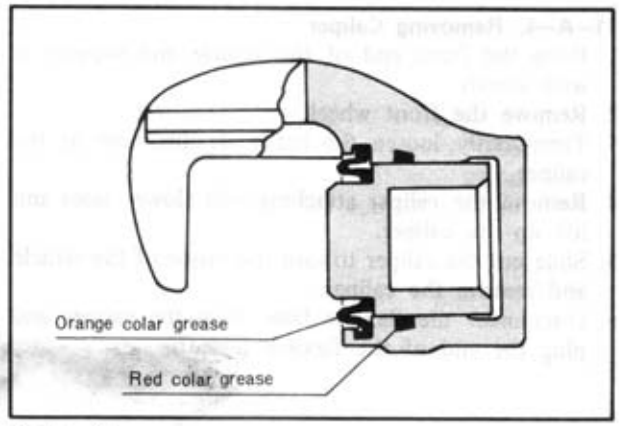


Fig. 11–10

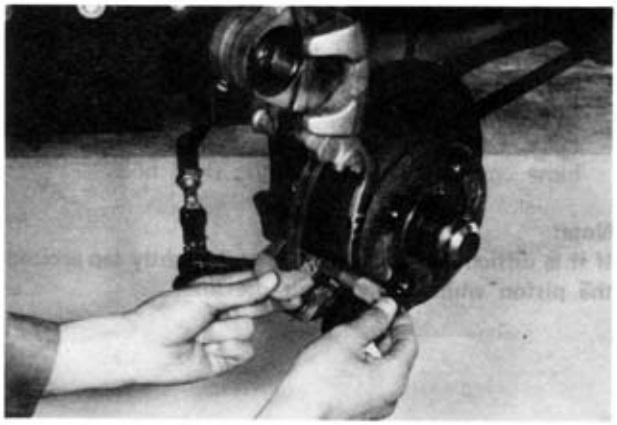


Fig. 11–11

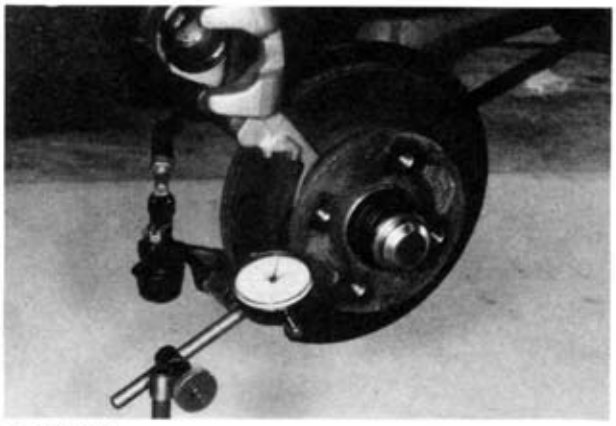


Fig. 11–12

11–A–6. Checking Caliper

1. Clean the disassembled parts in clean brake fluid or alcohol. **Never use gasoline or kerosene.** Blow the parts dry with compressed air.
2. Inspect the caliper bore and piston for scoring, scratches or rust. If any of these conditions are found, replace with new piston or caliper. Minor damage can be eliminated by means of polishing with crocus cloth.

11–A–7. Assembling Caliper

Assemble the caliper in the reverse order of disassembly.

Note:

a) Discard the old piston seal and the dust seal, and use new ones.
b) Be sure that the piston seal does not become twisted and it is seated fully in the groove.
c) Two kinds of grease contained in a seal kit must be used as shown in figure.
d) Lubricate the piston and caliper bore with brake fluid.

11–A–8. Installing Caliper

Install the caliper in the reverse order of removing and bleed the hydraulic system referring to Par. 11–E.

11–A–9. Checking Brake Disc

1. Remove the disc brake pads and caliper as described in Par. 11–A–1.
2. Inspect the surface of the disc for scoring, scratches, rust and excessive wear.
   Reface the disc as necessary.

Brake disc thickness:
Standard 18 mm (0.7087 in)
Thickness limit 17 mm (0.6693 in)

3. Check the lateral run-out of the disc with a dial indicator.

Run-out limit: 0.1 mn (0.0039 in)

Note:
Make certain that the wheel bearing preload is correctly adjusted, before checking the run-out of the disc.

11–A–10. Replacing Brake Disc

To remove or replace the brake disc and wheel hub assembly, refer to Par. 12–E–2.

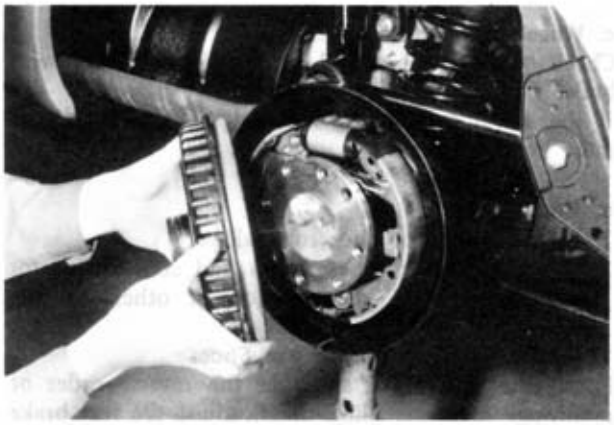


Fig. 11–13

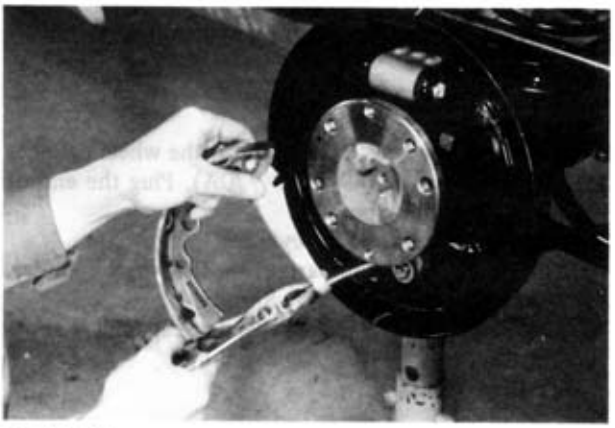


Fig. 11–14

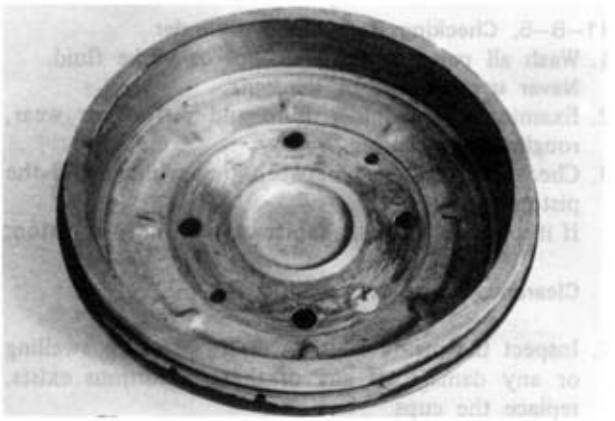


Fig. 11–15

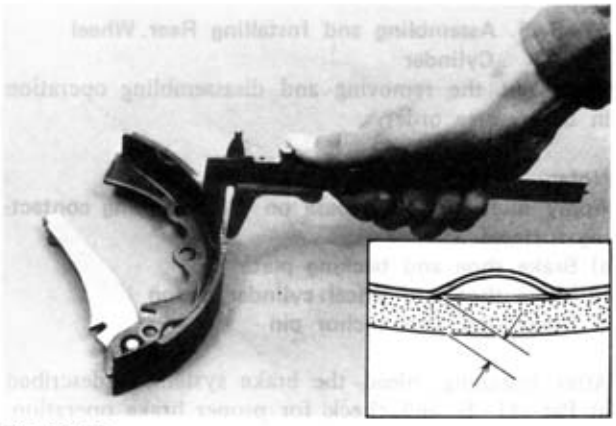


Fig. 11–16

11–B. REAR BRAKE

11–B–1. Removing Rear Brake Shoes

1. Raise the rear end of the vehicle and support the rear axle housing with stands.
2. Remove the rear wheel.
3. Remove the brake drum attaching screws.
4. Fully release the parking brake and remove the brake drum.
5. Remove the return springs and parking brake strut rod.
6. Remove the brake shoe retaining springs and guide pins.
7. Remove the brake shoes.
8. Remove the parking brake cable from the operating lever on the brake shoe.

11–B–2. Inspecting Rear Brake

Check the following parts and repair or replace any part if found defective.

a. Brake drum

Inspect the brake drum for damage, wear and scores.

Roughness limit: 0.15 mm (0.006 in)

Drum inner diameter limit:
201 mm (7.9135 in)
Standard diameter:
200 mm (7.8741 in)

b. Brake linings

Inspect the brake lining for wear, damage and deformation.

Lining thickness:
Limit 1.0 mm (0.039 in)
Standard 4.0 mm (0.1575 in)

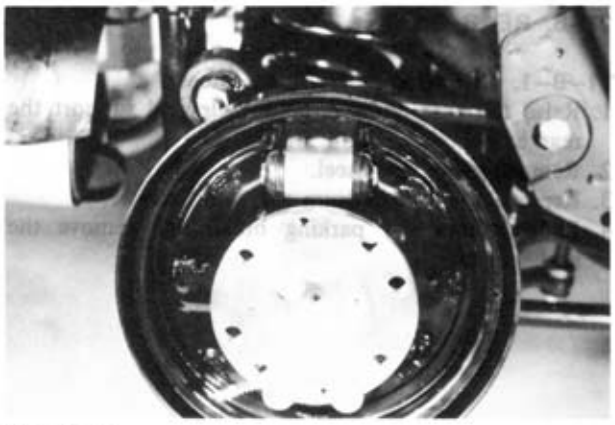


Fig. 11–17

Fig. 11–18

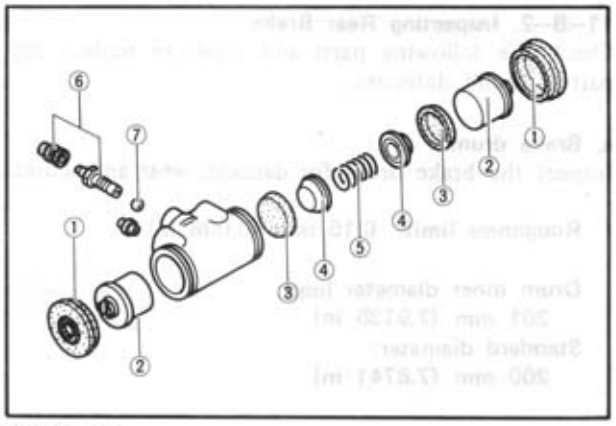


Fig. 11–19

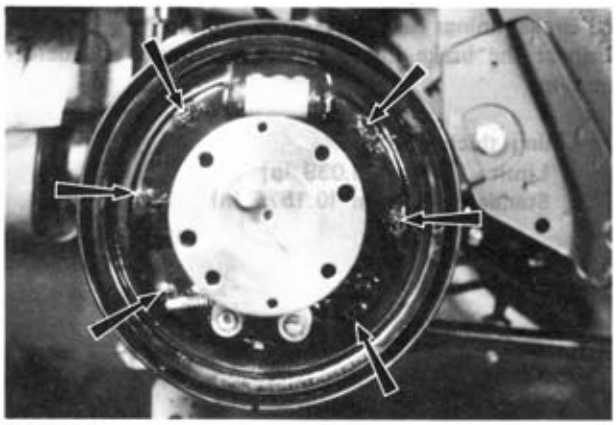


Fig. 11–20

c. Wheel cylinders

Check whether the wheel cylinder boot is wet with brake fluid.

If the wheel cylinder boot is wet, the wheel cylinder must be overhauled.

d. Brake lines

1. Inspect all brake lines for leakage.
2. Check all brake pipes, hoses and connections for signs of chafing, deterioration or other damage.

11–B–3. Installing Rear Brake Shoes

Install the rear brake shoes in the reverse order of removing. After installing them, adjust the rear brake as described in Par. 11–B–7.

11–B–4. Removing and Disassembling Rear Wheel Cylinder

1. Remove the rear brake shoes, as described in Par. 11–B–1.
2. Disconnect the brake fluid pipe at the wheel cylinder using the **spanner** (49 0259 770A). Plug the end of the brake fluid pipe.
3. Remove the rear wheel cylinder.
4. Remove the following parts from the wheel cylinder.
   1) Dust boots
   2) Pistons
   3) Piston cups
   4) Filling blocks
   5) Spring
   6) Bleeder cap and screw
   7) Steel ball

11–B–5. Checking Rear Wheel Cylinder

1. Wash all parts in clean alcohol or brake fluid. **Never use gasoline or kerosene.**
2. Examine the cylinder bore and piston for wear, roughness or scoring.
3. Check the clearance between the cylinder and the piston.
   If it exceeds the limit, replace the cylinder or piston.

   Clearance limit: 0.15 mm (0.006 in)

4. Inspect the piston cups for wear, softening, swelling or any damage. If any of these conditions exists, replace the cups.

11–B–6. Assembling and Installing Rear Wheel Cylinder

Carry out the removing and disassembling operation in the reverse order.

Note:

Apply multi-purpose grease on the following contacting surfaces.

a) Brake shoe and backing plate
b) Brake shoe and wheel cylinder piston
c) Brake shoe and anchor pin

After installing, bleed the brake system as described in Par. 11–E, and check for proper brake operation.

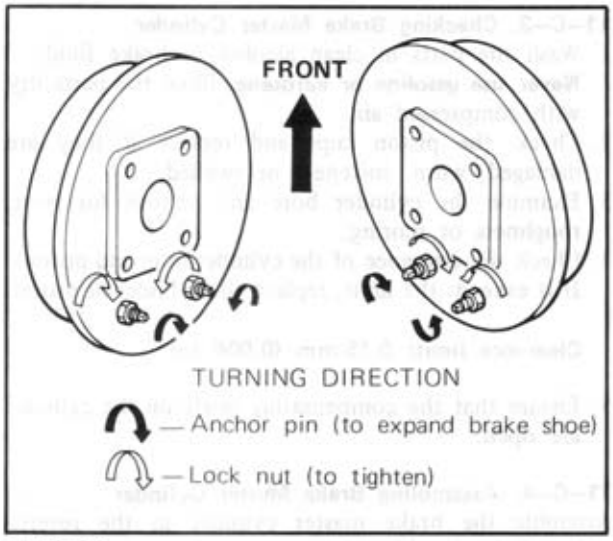


Fig. 11–21

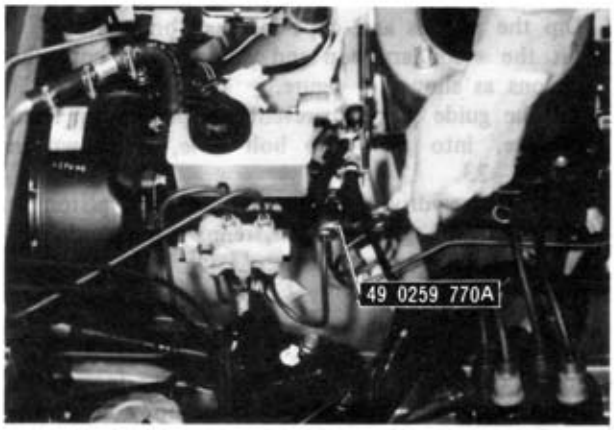


Fig. 11–22

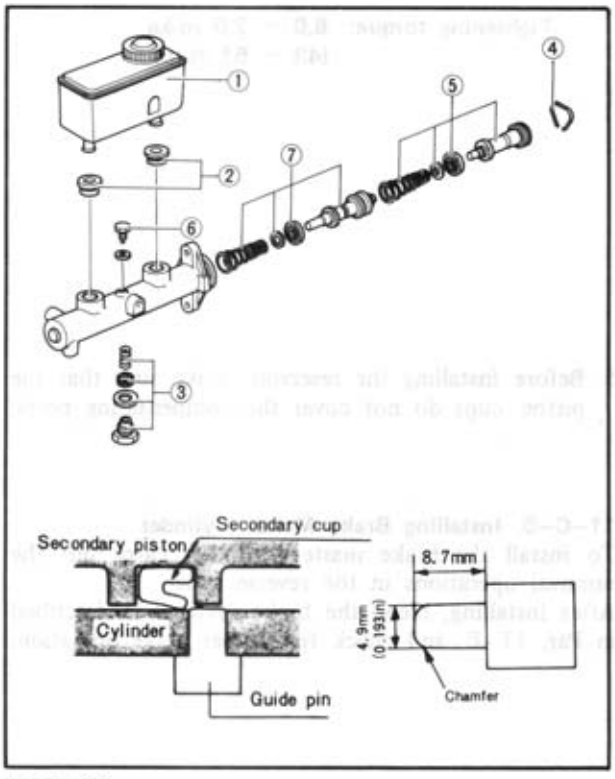


Fig. 11–23

11–B–7. Adjusting Rear Brake

1. Raise the rear end of the vehicle until the wheels are free to turn and support it with stands.
2. Release the parking brake fully.
3. Loosen the anchor pin lock nut.
4. Hold the lock nut and turn the anchor pin in the allow direction until the wheel is locked.
5. Back off the anchor pin until the wheel just turns freely.
6. Hold the anchor pin in position and tighten the lock nut.
7. Repeat the above procedure on the other side brake shoes.
8. Lower the vehicle.

11–C. BRAKE MASTER CYLINDER

11–C–1. Removing Brake Master Cylinder

1. Disconnect the oil level sensor coupler.
2. Disconnect the fluid pipes at the master cylinder outlets using the **spanner** (49 0259 770A).
3. Remove the proportioning by-pass valve attaching bolt.
4. Remove the brake master cylinder assembly.

Note:
Never allow the brake fluid to drop on any painted surface.

11–C–2. Disassembling Brake Master Cylinder

After draining the brake fluid, remove the following parts.

1) Reservoir
2) Bushes
3) Joint bolt, check valve and spring
4) Stop ring
5) Primary piston assembly and spring
6) Secondary piston stop bolt and washer
7) Secondary piston assembly and spring

To remove the secondary piston;
Push in the secondary piston with a screwdriver and then, remove the stop bolt and insert the guide pin in its place to prevent the piston cup from damage.

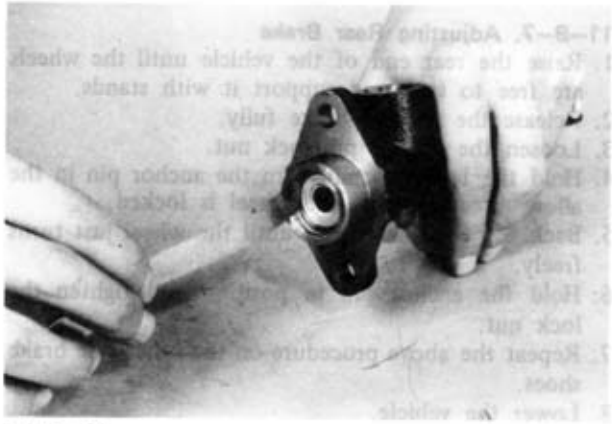


Fig. 11–24

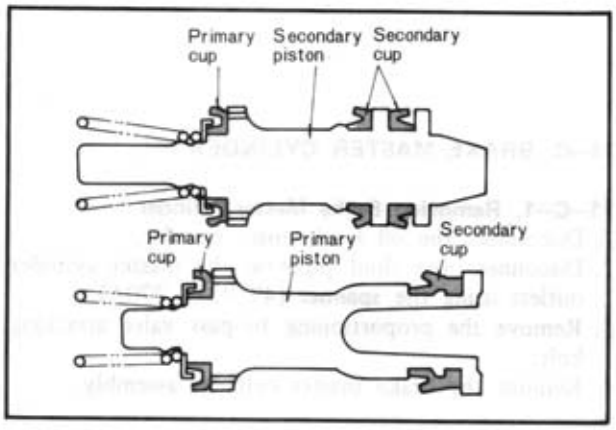


Fig. 11–25

Fig. 11–26

Fig. 11–27

11–C–3. Checking Brake Master Cylinder

1. Wash the parts in clean alcohol or brake fluid. **Never use gasoline or kerosene.** Blow the parts dry with compressed air.
2. Check the piston cups and replace if they are damaged, worn, softened, or swelled.
3. Examine the cylinder bore and pistons for wear, roughness or scoring.
4. Check the clearance of the cylinder bore and pistons. If it exceeds the limit, replace the cylinder or piston.

   Clearance limit: 0.15 mm (0.006 in)

5. Ensure that the compensating ports on the cylinder are open.

11–C–4. Assembling Brake Master Cylinder

Assemble the brake master cylinder in the reverse order of disassembly, **noting** the following points.

1. Dip the pistons and cups in clean brake fluid.
2. Fit the secondary cup and primary cup onto the pistons as shown in figure.
3. Fit the guide pin, to prevent the piston cup from damage, into the stop bolt hole, as shown in Fig. 11–23.
   With a screwdriver, push the secondary piston as far as it will go, and then, remove the guide pin and install the stop ring.
4. Install the check valve so that the valve face which has six holes directs the cylinder body as shown in figure and tighten the joint bolt.

   Tightening torque: 6.0 ~ 7.0 m-kg (43 ~ 51 ft-lb)

5. Before installing the reservoir, make sure that the piston cups do not cover the compensating ports.

11–C–5. Installing Brake Master Cylinder

To install the brake master cylinder, carry out the removal operations in the reverse order.
After installing, bleed the brake system, as described in Par. 11–E, and check for proper brake operation.

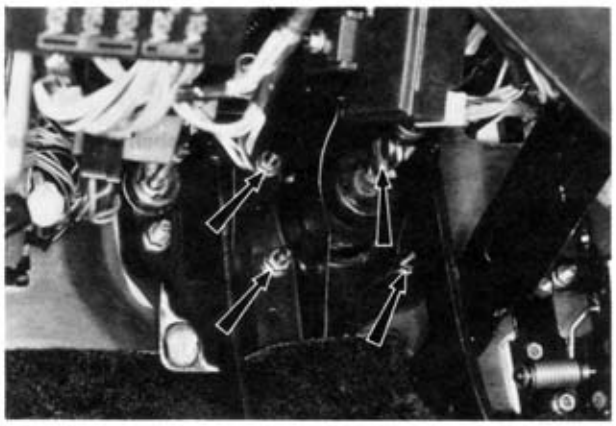


Fig. 11–28

11–D. POWER BRAKE UNIT

11–D–1. Removing Power Brake Unit

1. Remove the brake master cylinder, as described in Par. 11–C–1.
2. Disconnect the vacuum hose at the power brake unit.
3. Disconnect the push rod fork from the brake pedal.
4. Remove the power brake unit.

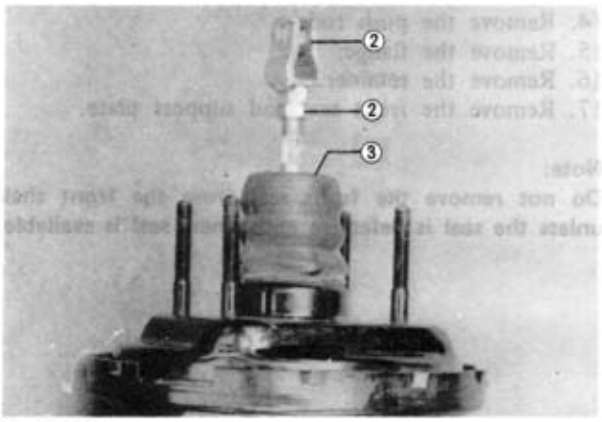


Fig. 11–29

11–D–2. Disassembling Power Brake Unit

1. Apply mating marks on the rear shell and front shell to facilitate reassembly.
2. Remove the fork end and lock nut.
3. Remove the dust boot.

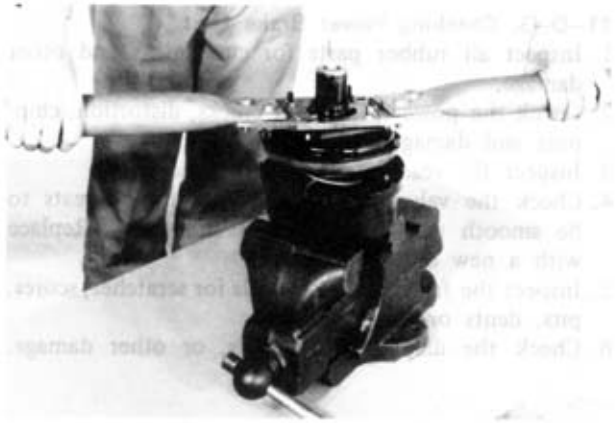


Fig. 11–30

4. Remove the rear shell assembly.
   Attach the suitable wrench to the studs of the rear shell. Press down the rear shell and rotate the rear shell clockwise to unlocked position.

Note:
Loosen the rear shell carefully as it is spring-loaded.

5. Remove the spring.

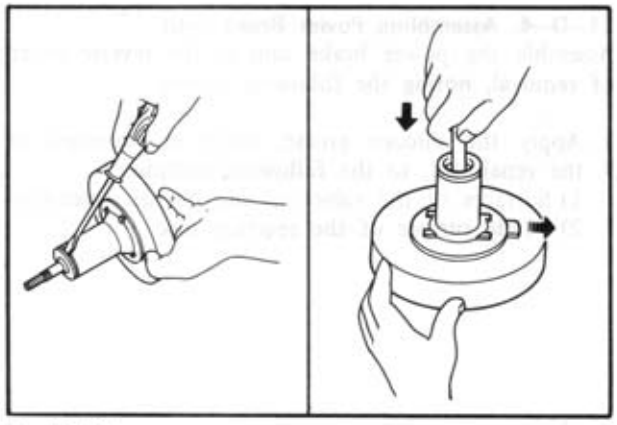


Fig. 11–31

6. Remove the air silencer retainer.
7. Remove the power piston, valve rod and plunger assembly from the rear shell.
8. Remove the diaphragm.
9. Press in the valve rod and remove the valve retainer key.
10. Remove the valve rod and plunger assembly.
11. Remove the air silencer and filter.

Note:
The valve rod and plunger are serviced as an assembly only.

12. Remove the reaction disc.

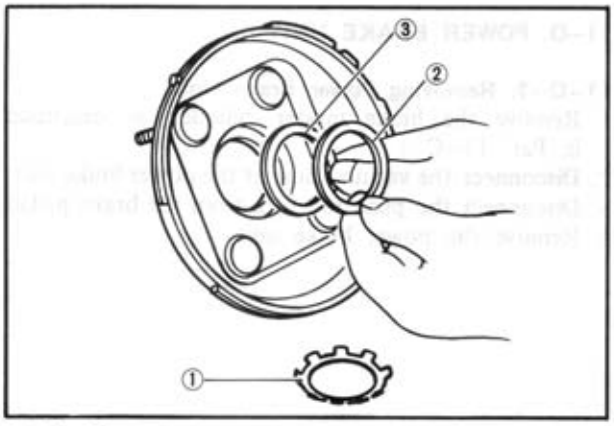


Fig. 11–32

13. Remove the retainer (1), bearing (2) and rear seal (3).

Note:
Do not remove the rear seal from the shell unless the seal is defective and a new seal is available.

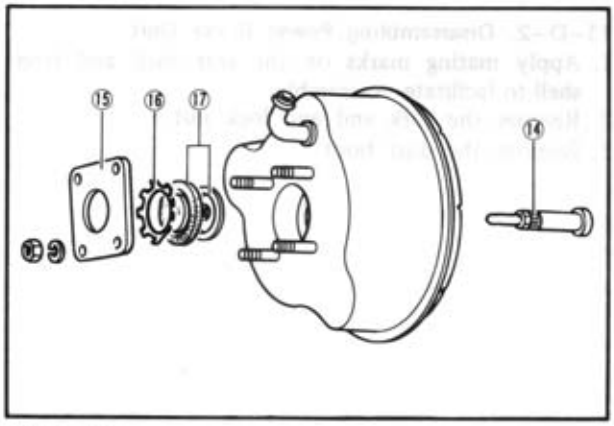


Fig. 11–33

14. Remove the push rod.
15. Remove the flange.
16. Remove the retainer.
17. Remove the front seal and support plate.

Note:
Do not remove the front seal from the front shell unless the seal is defective and a new seal is available.

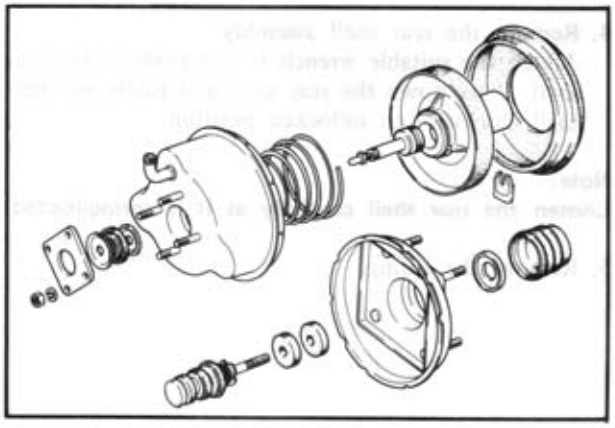


Fig. 11–34

11–D–3. Checking Power Brake Unit
1. Inspect all rubber parts for cuts, nicks and other damage.
2. Check the power piston for cracks, distortion, chipping and damaged seats.
3. Inspect the reaction disc for deterioration.
4. Check the valve rod and plunger for all seats to be smooth and free of nicks and dents. Replace with a new one 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.

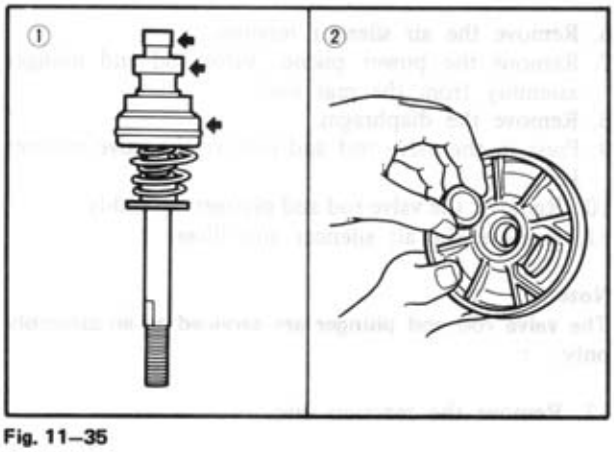


Fig. 11–35

11–D–4. Assembling Power Brake Unit
Assemble the power brake unit in the reverse order of removal, **noting** the following points.

1. Apply the silicone grease, which is furnished in the repair kit, to the following portion.
   1) Surfaces of the valve rod and plunger assembly
   2) Whole surface of the reaction disc

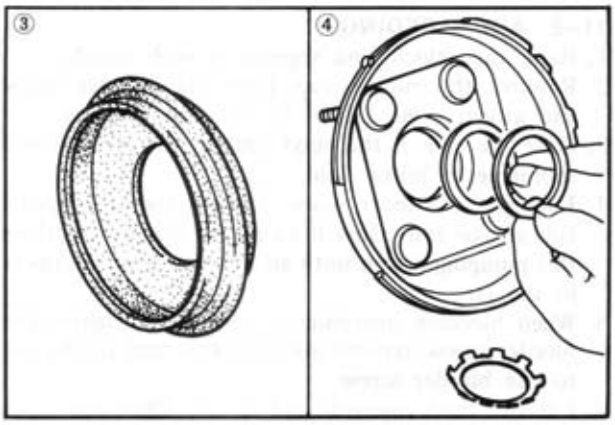


Fig. 11–36

3) Outer bead of the diaphragm
4) Front and rear seal lips

Fig. 11–37

2. To install the valve retainer key, press down the valve rod and align the groove on the valve rod with the slot of the power piston.

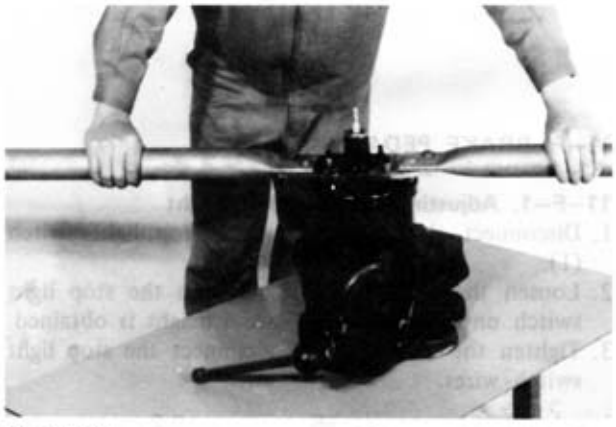


Fig. 11–38

3. Install the rear shell assembly onto the front shell by using the wrench to rotate the rear shell counter-clockwise until mating marks aligned.

Note:
Press the rear shell down firmly, maintaining a pressure until the shell flanges are fully locked.

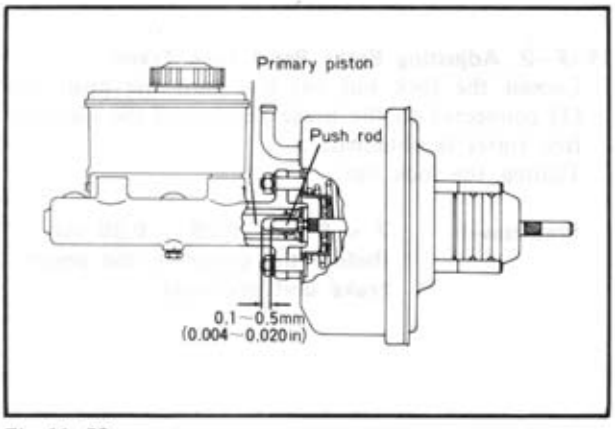


Fig. 11–39

11–D–5. Installing Power Brake Unit

Install the power brake unit in the reverse order of removal.

Note:
Before installing the power brake unit, adjust the push rod length so that the proper clearance between the primary piston and the push rod is obtained.

Standard clearance:
0.1 ~ 0.5 mm (0.004 ~ 0.020 in)

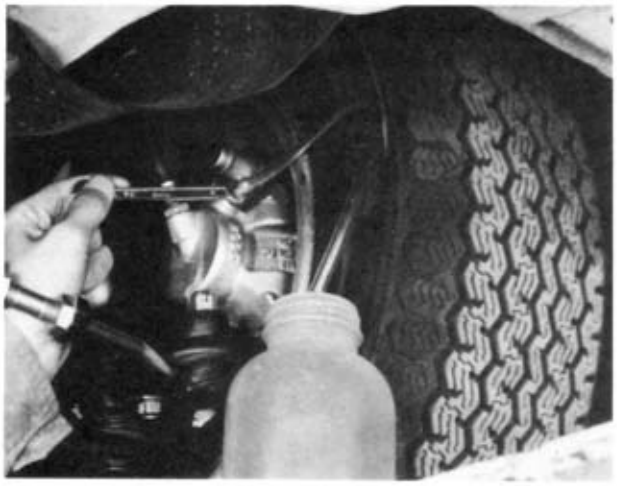


Fig. 11–40

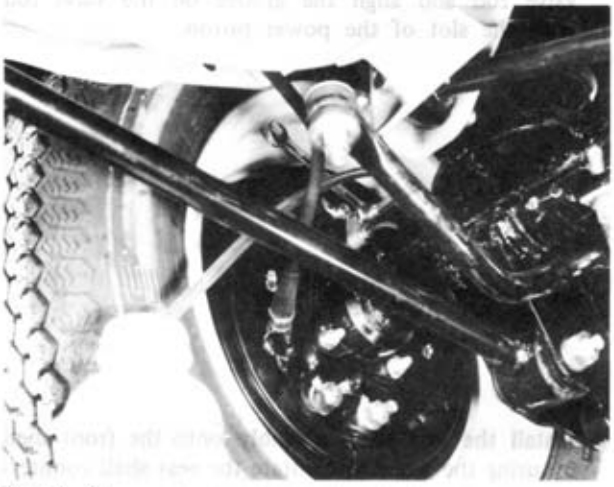


Fig. 11–41

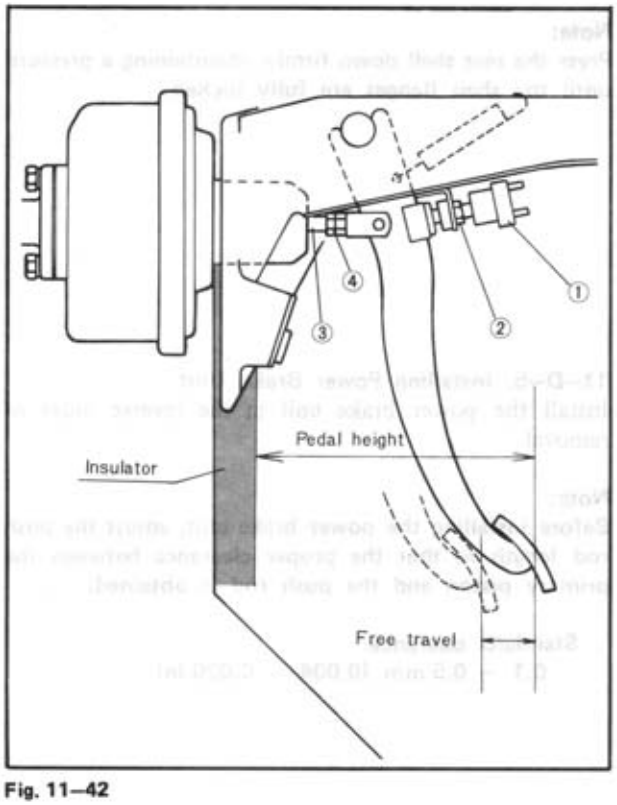


Fig. 11–42

11–E. AIR BLEEDING

1. Raise the vehicle and support it with stands.
2. Remove the rubber cap from the bleeder screw and attach a vinyl tube to the bleeder screw.
3. Place the end of the vinyl tube in the glass jar and submerge in brake fluid.
4. Loosen the bleeder screw. Depress the brake pedal full stroke and allow it to return slowly. Continue this pumping action until air bubbles cease to appear in the jar.
5. When bleeding operation is completed, tighten the bleeder screw, remove the vinyl tube and fit the cap to the bleeder screw.
6. Fill the fluid reservoir and fit the filler cap.

Note:

a) The air bleeding should be performed on the front and rear hydraulic brake systems separately.

b) During bleeding operation, the reservoir of the master cylinder must be kept at least 3/4 full of the brake fluid.

c) Never re-use brake fluid which has been drained from the hydraulic system.

11–F. BRAKE PEDAL

11–F–1. Adjusting Brake Pedal Height

1. Disconnect the wires from the stop light switch (1).
2. Loosen the lock nut (2) and turn the stop light switch until the specified pedal height is obtained.
3. Tighten the lock nut and reconnect the stop light switch wires.

Pedal height: $190\ ^{+5}_{-0}$ mm ($7.5\ ^{+0.2}_{-0}$ in)

11–F–2. Adjusting Brake Pedal Free Travel

1. Loosen the lock nut (4) and turn the push rod (3) connected to the brake pedal until the specified free travel is obtained.
2. Tighten the lock nut.

Free travel: **7 ~ 9 mm (0.28 ~ 0.35 in) (before the piston in the power brake unit operates)**

Fig. 11–43

11–G. PARKING BRAKE ADJUSTMENT

When the parking brake requires adjustment, proceed as follows.

1. Make sure that the parking brake is fully released.
2. Jack up the rear end of the vehicle until the wheels are free to turn. Then, support it with stands.
3. Adjust the parking brake lever adjusting screw so that the rear brakes are locked at **3 ~ 7 notchs** when the parking brake lever is pulled by approx. **10 kg (22 lb)** of force.
4. After adjustment is completed, apply the parking brake several times, then, release and make sure that the rear wheels rotate freely without dragging.
5. Lower the vehicle.
6. Adjust the parking brake warning light switch so that the light comes on with the parking brake lever pulled out 1 notch and turns off when the lever is fully released.

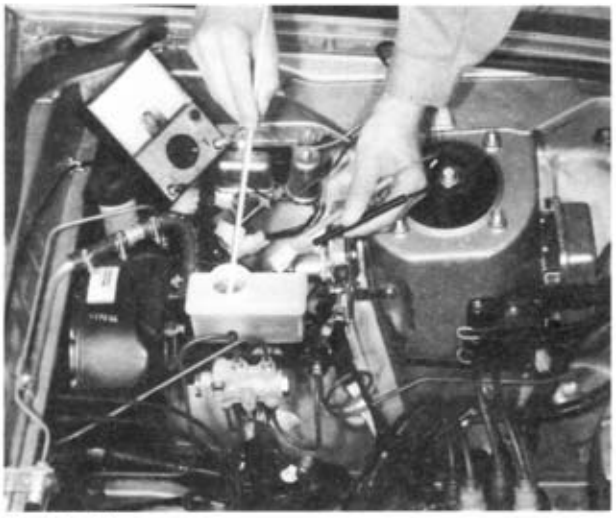


Fig. 11–44

11–H. BRAKE FLUID LEVEL SENSOR

11–H–1. Checking Brake Fluid Level Sensor

1. Disconnect the coupler of the sensor.
2. Connect a circuit tester to the coupler and check the continuity by moving the float up and down. When the float is below "MIN" mark, the tester should show a continuity while the tester should not show any continuity when the float is above "MIN" mark. If it is found not to be so, replace the fluid level sensor.

11–H–2. Replacing Brake Fluid Level Sensor

1. Disconnect the coupler of the sensor.
2. Pull out the fluid sensor from the reservoir.
3. Install a new fluid level sensor and connect the coupler.

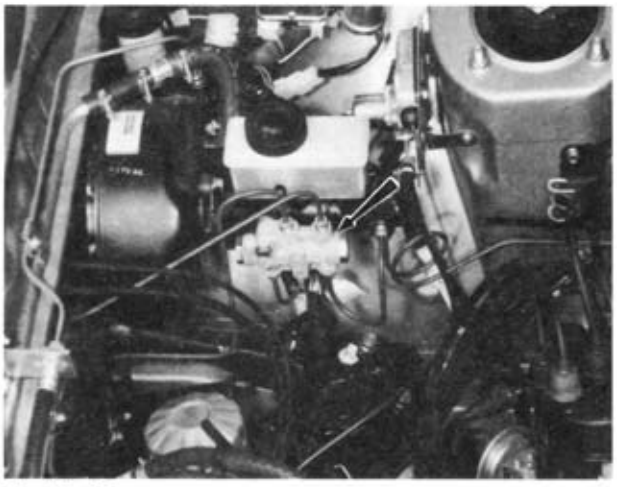


Fig. 11–45

11–I. PROPORTIONING BYPASS VALVE

To replace the proportioning bypass valve, proceed as follows.

1. Disconnect the fluid pipes at the proportioning bypass valve.
2. Remove the proportioning bypass valve.
3. Install the new proportioning bypass valve.
4. Connect the fluid pipes to the proportioning bypass valve, noting the identification markd on the valve body.
5. Bleed the brake system, as described in Par. 11–E.

Note:

Never allow the brake fluid to drop on any painted surface.

11–J. HYDRAULIC LINES INSPECTION

Inspect all brake lines for any leakage with the foot brakes applied.

Check all brake pipes, hoses and connections for signs of chafing, deterioration or any other damage.

WHEELS AND TIRES

Fig. 12–1

12–A. INFLATION OF TIRES

Check the inflation pressure with a reliable gauge when tires are cold. The recommended cold tire inflation pressure are as follows.

Tire size	Front	Rear
185/70 HR 13	1.8 kg/cm² (26 psi)	1.8 kg/cm² (26 psi)
165 HR 13	1.8 kg/cm² (26 psi)	1.8 kg/cm² (26 psi)

Snow tires should always be inflated 4 psi above the recommended inflation pressures shown on the table.

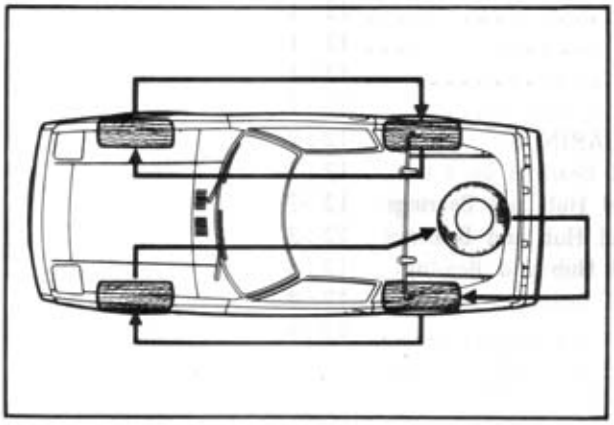


Fig. 12–2

12–B. TIRE ROTATION

To equalize wear and make a set of tires last longer, it is recommended that the tires be rotated periodically, as shown in figure.

When rotating the tires, check for signs of abnormal wear and bulging and any stone, nail, glass, etc. should be removed.

Tightening torque of wheel nut :
9 ~ 11 m-kg (65 ~ 80 ft-lb)

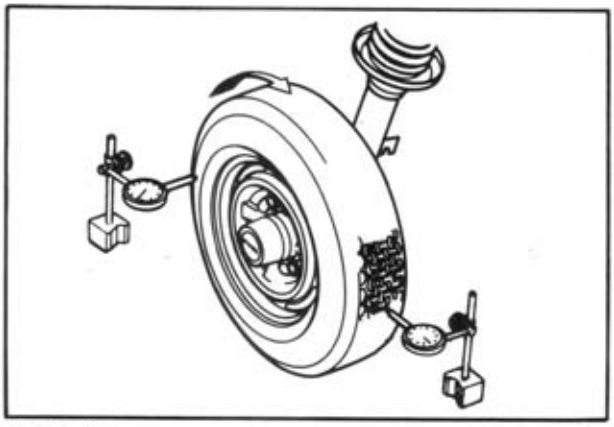


Fig. 12–3

12–C. WHEEL AND TIRE RUN-OUT

Wheel and tires should be measured for both radial and lateral run-out.

To measure the radial run-out, apply a dial indicator against the center rib of the tire tread and rotate the wheel slowly.

Run-out limit: 2.0 mm (0.08 in)

To measure the lateral run-out, position a dial indicator against the side of the tire.

Run-out limit: 2.5 mm (0.10 in)

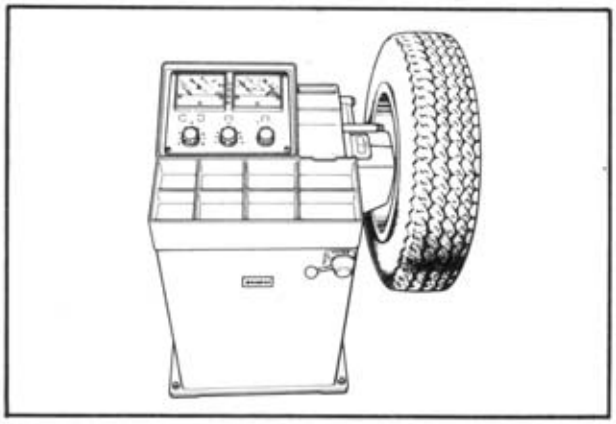


Fig. 12–4

12–D. WHEEL BALANCING

The allowable unbalance is less than **20 gr (0.70 oz)** at the rim.

Excessive wheel unbalance causes shimmy at high speed.

If unbalance exceeds the specification or when a tire is disassembled for repair, the tire and wheel assembly should be statically and dynamically balanced with a wheel balancer in accordance with the manufacture's instructions.

Fig. 12–5

12–E. FRONT WHEEL HUB AND BEARINGS

12–E–1. Checking Front Wheel Bearings on Car

Raise the front end of the vehicle until the wheels clear the ground and support it with stand.
Grip the tire and shake it sideways. If considerable play is noticed, this indicates that the bearings are rough.

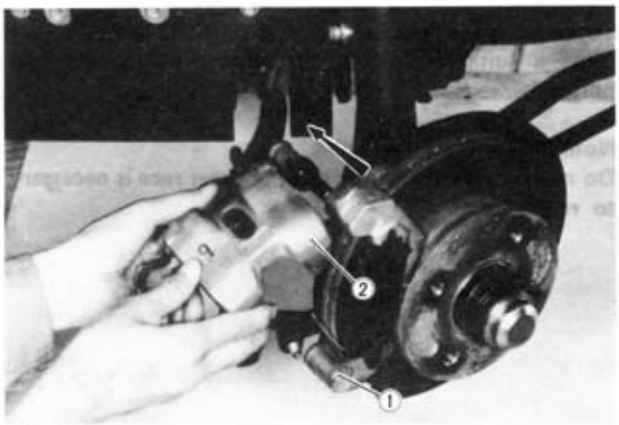


Fig. 12–6

12–E–2. Removing Front Wheel Hub and Bearings

Raise the front end of the vehicle and support it with stands, and remove the front wheel.

Remove the following parts.

1. Caliper attaching bolt (lower side)
2. Caliper

Attach the caliper assembly to the coil spring with a piece of wire.
Never allow the caliper assembly to hang from the brake pipe, as damage may occur.

Fig. 12–7

3. Anti-rattle spring
4. Disc brake pads and shims
5. Caliper bracket

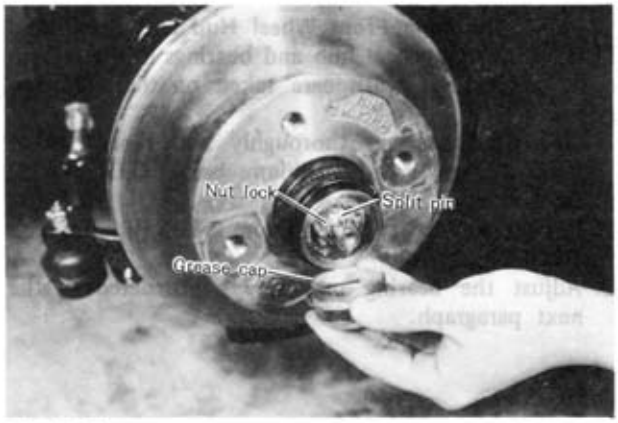


Fig. 12–8

6. Grease cap, split pin, nut lock and adjusting nut
7. Washer and outer bearing

Fig. 12–9

8. Grease seal
9. Inner bearing

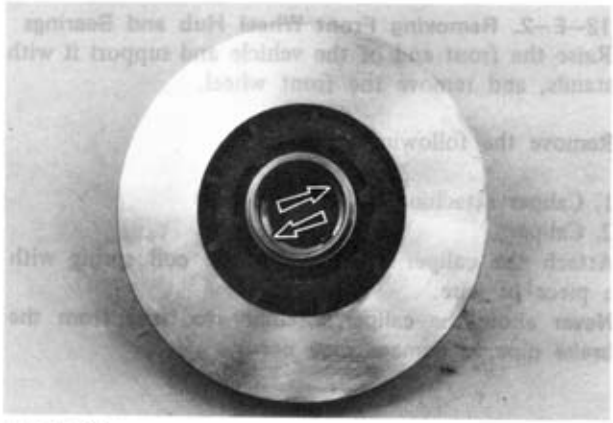


Fig. 12–10

To remove the bearing outer race, drive out the race using a suitable drift in the slots provided for this purpose.

Note :
Do not remove unless the bearing outer race is necessary to replace.

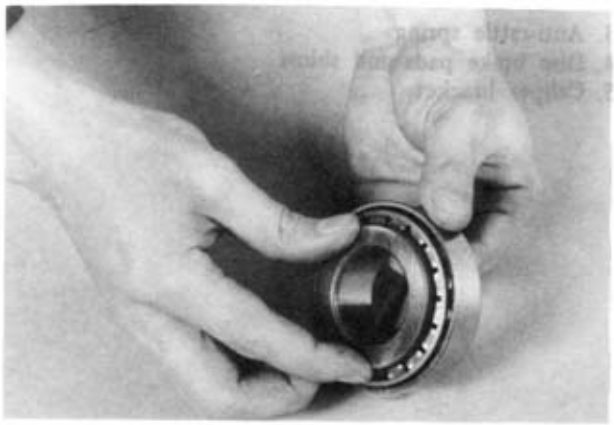


Fig. 12–11

12–E–3. Inspecting Front Wheel Hub and Bearings

1. Clean the lubricant off the inner and outer bearing outer races with solvent and inspect the outer races for scratches, pits, excessive wear and other damage.
2. Thoroughly clean the bearing with solvent and dry it thoroughly.

Note :
Do not spin the bearings with compressed air.

3. Inspect the bearing rollers for damage, wear and other defects. Replace the bearing if necessary.
4. Clean the spindle and inside of the hub with solvent to remove all old grease.

Fig. 12–12

12–E–4. Installing Front Wheel Hub and Bearings

Install the front wheel hub and bearings in the reverse order of removal, with care taken on the following points.

1. Clean the bearings thoroughly and repack them with lithium grease (lithium base NLGI No. 2) **Do not** overpack.
2. Fill the hub cavity with lithium grease (lithium base NLGI No. 2).
3. Adjust the bearing preload, as instructed in the next paragraph.

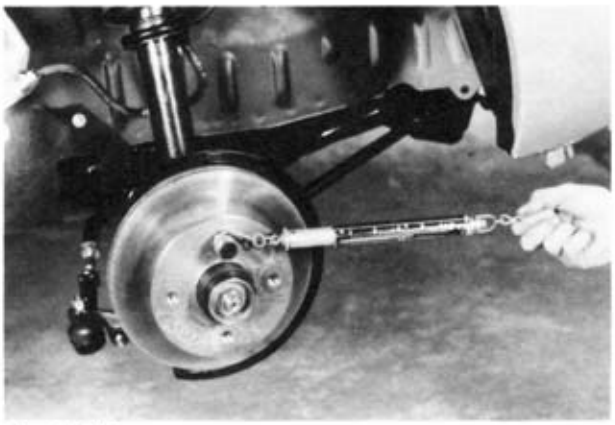


Fig. 12–13

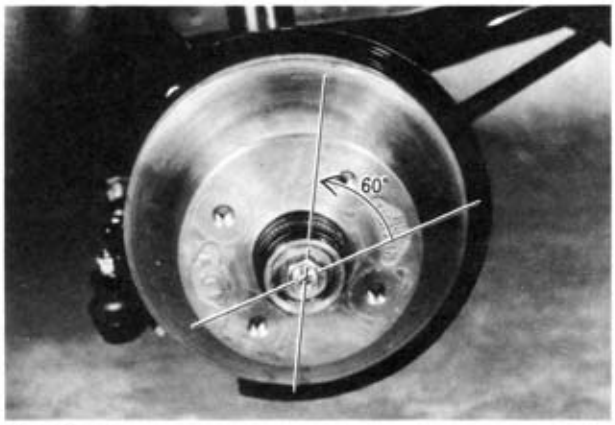


Fig. 12–14

12–E–5. Adjusting Front Wheel Bearings

1. Tighten the adjusting nut to lock the wheel hub and back off the adjusting nut until the wheel hub turns smoothly.
2. Rotate the hub back and forth about three times to snug down the bearings.
3. Hook a spring scale on the hub bolt.
   Pull the spring scale squarely and take a reading on the scale when the hub starts to run. The reading should be within the **0.45 ~ 0.65 kg (0.99 ~ 1.43 lb).**
4. Adjust the reading by turning the adjusting nut.
5. Fit the nut lock onto the adjusting nut and align the slots of the nut lock with the hole of the spindle. Install the split pin and the grease cap.

Note :
If a spring scale is not available, adjust the preload as follows:
Rotate the hub and tighten the adjusting nut until the hub binds.
Then, back off the adjusting nut about one-sixth of a turn, making sure that the hub rotates freely without any sidewise stroke.

12–F. REAR WHEEL BEARING

Servicing the rear wheel bearing is explained in Par. 9–A.

SUSPENSION

Fig. 13–1

13–A. FRONT SHOCK ABSORBER

13–A–1. Removing Front Shock Absorber

1. Raise the front end of the vehicle and support it with stands.
2. Remove the wheel hub assembly from the front shock absorber as described in Par. 12–E–2.
3. Remove the backing plate.

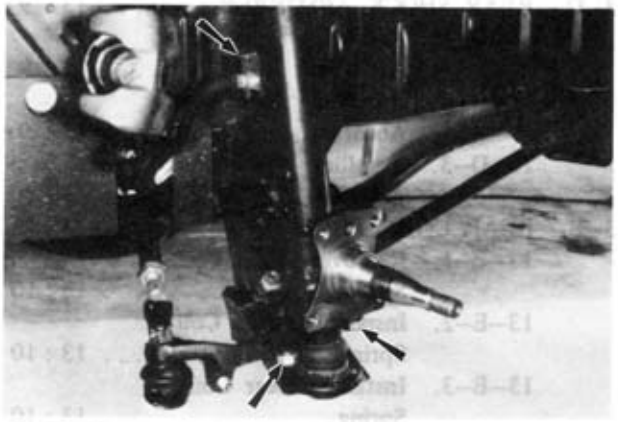


Fig. 13–2

4. Remove the flexible hose attaching clip.
5. Remove the bolts attaching the knuckle arm to absorber.

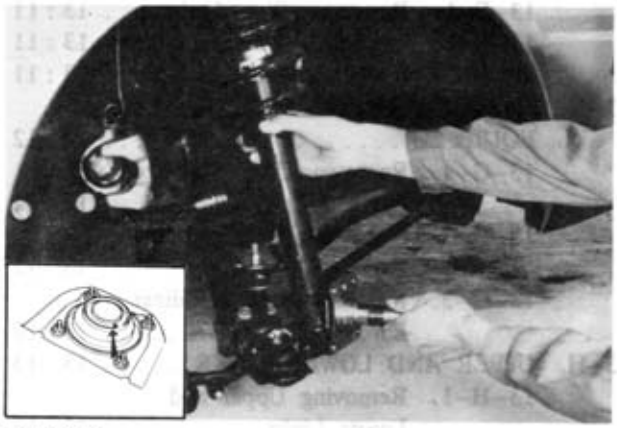


Fig. 13–3

6. Remove the absorber mounting block attaching nuts and remove the shock absorber assembly.

Note:
Before loosening the attaching nuts, note the triangle marked position.

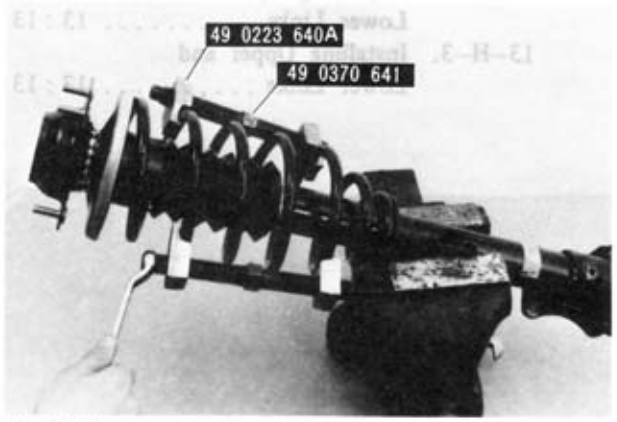


Fig. 13–4

7. Hold the shock absorber mounting block in a vise and loosen the lock nut few turns. **Do not remove it.**
8. Compress the coil spring using the **coil spring compressor** (49 0223 640A and 49 0370 641).

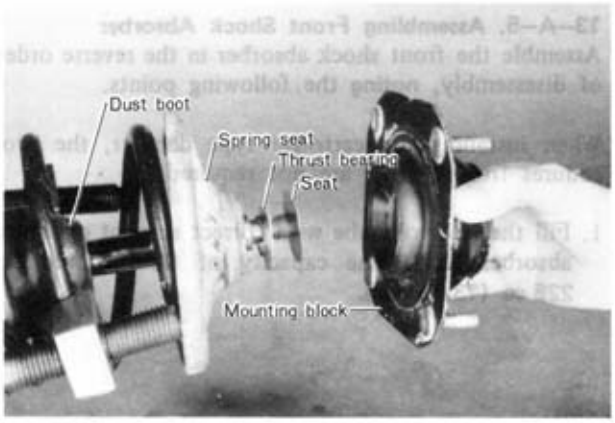


Fig. 13–5

9. Remove the following parts from the shock absorber.
   1) Lock nut and washer
   2) Mounting block and adjusting plate
   3) Seat
   4) Thrust bearing
   5) Spring upper seat
   6) Coil spring
   7) Dust boot
   8) Bound bumper

Fig. 13–6

13–A–2. Inspection before Disassembling Front Shock Absorber

1. To test the shock absorber, hold the shock absorber in an upright position and work the piston rod up and down in its full length of travel, four or five times.
   If a strong resistance is felt due to hydraulic pressure, the shock absorber is functioning properly. If no resistance is felt or there is a sudden free movement in travel, the shock absorber should be repaired.
2. If excessive amount of fluid is evident on the exterior of the shock absorber, the shock absorber should be repaired.

Fig. 13–7

13–A–3. Disassembling Front Shock Absorber

1. Hold the reservoir tube in a vise.
2. Remove the cap.
3. Remove the cap nut and seal assembly using the **cap nut wrench** (49 0259 700A).
4. Remove the "O" ring installed on the piston rod guide with a suitable tool.
5. Pull out the piston rod and pressure tube assembly from the reservoir tube.

Note:
Do not remove the piston rod, guide and base valve from the pressure tube as they are available only in set.

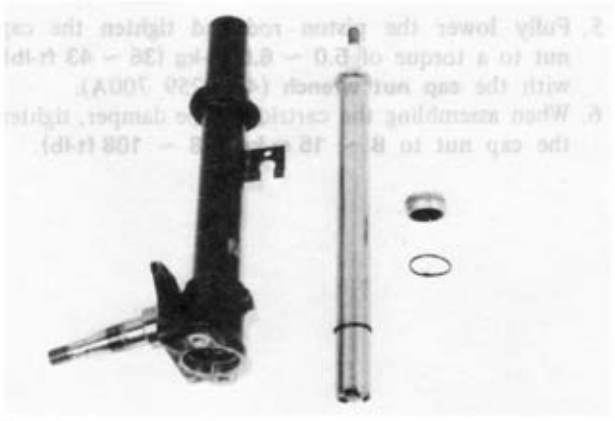


Fig. 13–8

13–A–4. Inspecting Front Shock Absorber

Inspect the disassembled parts, and repair or replace any part found defective.

1. Inspect the reservoir tube for deformation, crack or damage.
2. Inspect the mounting block for crack, deterioration or any damage.
3. Inspect the mounting bearing for slackness or abnormal noise by rotate it in axial direction.
4. Inspect the coil spring for signs of fatigue, crack or any damage.
5. Inspect the cap nut for damaged threads, and inspect the oil seal lip for wear or damage.

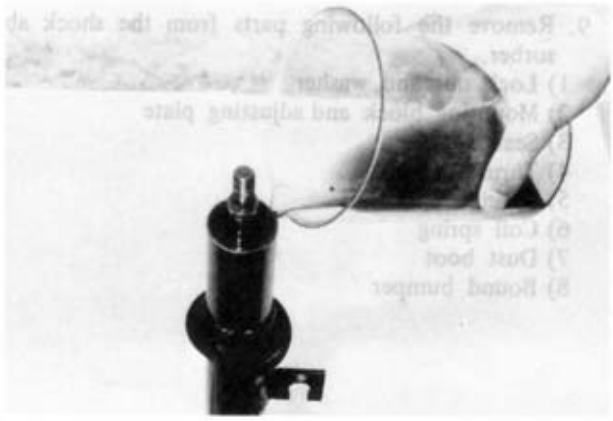


Fig. 13–9

13–A–5. Assembling Front Shock Absorber
Assemble the front shock absorber in the reverse order of disassembly, **noting** the following points.

When installing the cartridge type damper, the procedures from 1 to 5 are not required.

1. Fill the reservoir tube with correct amount of shock absorber fluid. The capacity of fluid should be **225 cc (13.7 cu-in).**

Fig. 13–10

2. Install the **pilot** (49 0370 590) over the threads of the piston rod.
3. Apply grease to the lip of the oil seal, and insert the cap nut carefully through the pilot and onto the piston rod.

Fig. 13–11

4. Tighten the cap nut temporarily, ensuring that the piston rod is extended to its maximum length, with the **wrench** (49 0259 702).

Fig. 13–12

5. Fully lower the piston rod and tighten the cap nut to a torque of **5.0 ~ 6.0 m-kg (36 ~ 43 ft-lb)**, with the **cap nut wrench** (49 0259 700A).
6. When assembling the cartridge type damper, tighten the cap nut to **8 ~ 15 m-kg (58 ~ 108 ft-lb)**.

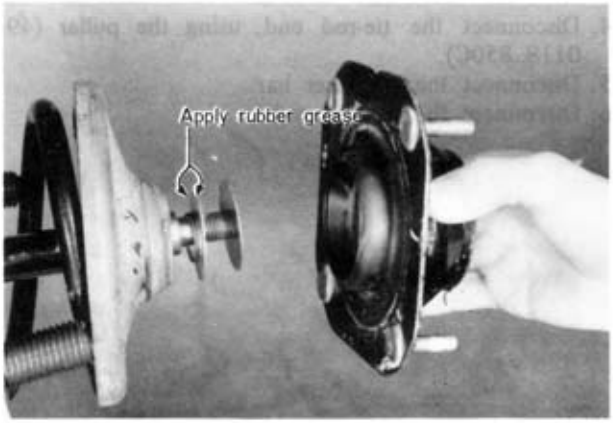


Fig. 13–13

13–A–6. Installing Front Shock Absorber

Install the shock absorber in the reverse order of removing, **noting** the following points.

1. When installing the thrust bearing, apply a thin coat of rubber grease to the bearing on both sides.
2. When installing the mounting block to the vehicle, place the triangle mark to its original position. If the mounting block is replaced, adjust the wheel alignment as described in Par. 10–D.
3. The lower end of the coil spring should be butt against the formed shoulder in the spring seat.

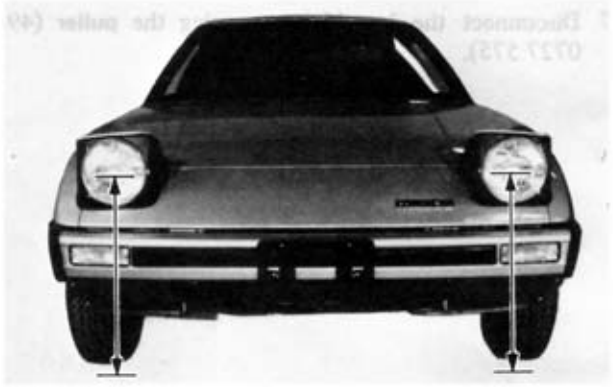


Fig. 13–14

4. After installing the front shock absorber to the vehicle, measure the distance between the level ground and head light on both sides.
   The both difference should be **within 15 mm (0.59 in).**
   If it is not within the specification, adjust the difference by inserting the adjusting plate between the mounting block and suspension tower.

Note:
Do not use more than two adjusting plates at one side.

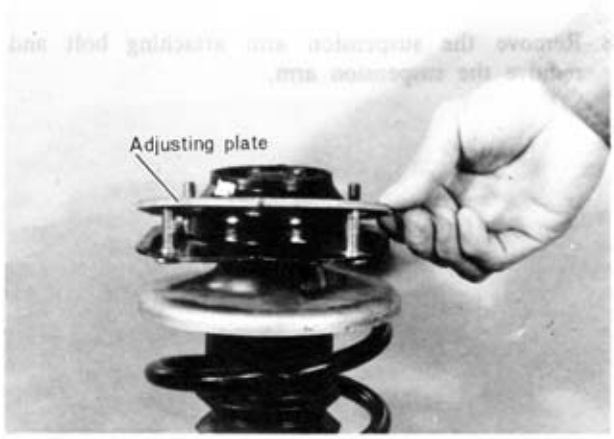


Fig. 13–15

5. Adjust the front wheel bearing preload to specified value.

Specified tightening torques:
Piston rod to mounting block
6.5 ~ 8.2 m-kg (47 ~ 59 ft-lb)
Mounting block to suspension tower
2.3 ~ 3.0 m-kg (17 ~ 22 ft-lb)
Steering knuckle to caliper mounting adaptor
3.5 ~ 4.5 m-kg (25 ~ 33 ft-lb)
Caliper mounting adaptor to caliper bracket
4.5 ~ 5.5 m-kg (33 ~ 40 ft-lb)
Knuckle arm to shock absorber
6.0 ~ 7.0 m-kg (43 ~ 51 ft-lb)

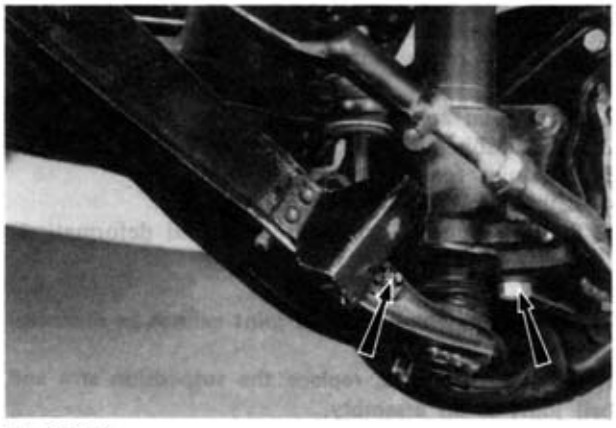


Fig. 13–16

13–B. FRONT SUSPENSION ARM

13–B–1. Removing Front Suspension Arm

1. Raise the front end of the vehicle and support it with stands.
2. Remove the front wheel.
3. Remove the knuckle arm attaching bolts to the steering knuckle.

Fig. 13–17

4. Disconnect the tie-rod end, using the **puller** (49 0118 850C).
5. Disconnect the stabilizer bar.
6. Disconnect the tension rod.

Fig. 13–18

7. Disconnect the knuckle arm, using the **puller** (49 0727 575).

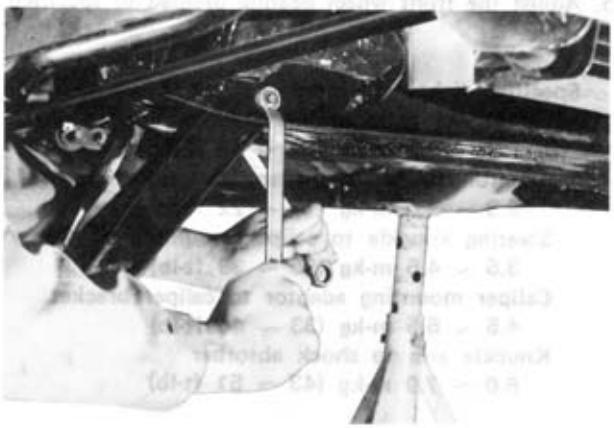


Fig. 13–19

8. Remove the suspension arm attaching bolt and remove the suspension arm.

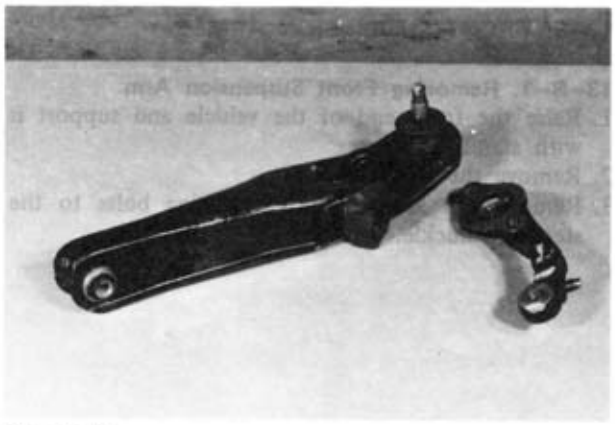


Fig. 13–20

13–B–2. Inspecting Front Suspension Arm

Inspect the removed parts, and replace any part found defective.

1. Suspension arm for damage or deformation
2. Arm bushing for deformation or damage
3. Ball joint for looseness or damage
4. Ball joint dust cover for damage
5. Steering knuckle arm for cracks and deformation

Note:
The suspension arm and ball joint cannot be disassembled from each other.
If either is defective, replace the suspension arm and ball joint as an assembly.

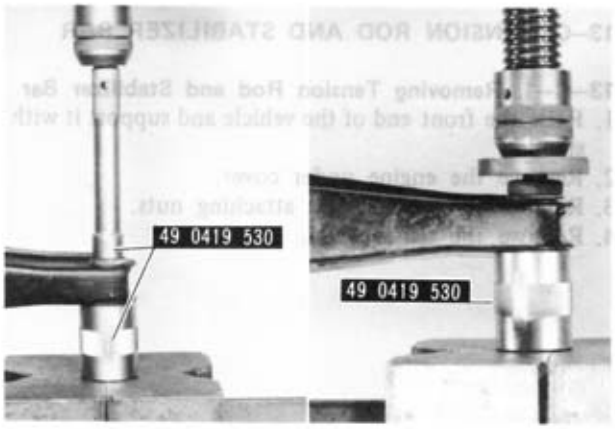


Fig. 13–21

13–B–3. Replacing Front Suspension Arm Bushing

1. Press out the bushing toward the front using the **puller and installer** (49 0419 530).
2. Press in the new bushing into the suspension arm from front side, using the **puller and installer** (49 0419 530).

Note:
When pressing in the bushing, there must be no lubricant on the bushing or suspension arm bore.

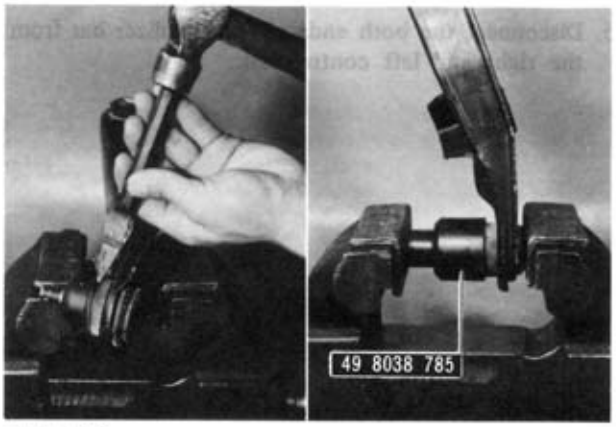


Fig. 13–22

13–B–4. Replacing Ball Joint Dust Boot

1. Remove the dust boot, using the suitable tool.
2. Fill the lithium grease to the new dust boot and press in the dust boot to the ball joint, using **dust boot installer** (49 8038 785).

Fig. 13–23

13–B–5. Installing Front Suspension Arm

Install the front suspension arm in the reverse order of removal, **noting** the following points.

1. When installing the suspension arm to the cross member, tighten the bolt lightly, and after lowering the vehicle, jounce it few times to allow the suspension to settle down, and then tighten the bolt to the specified torque.
2. The tightening torques are as follows:
   Ball joint to knuckle arm
   6.0 ~ 7.0 m-kg (43 ~ 51 ft-lb)
   Suspension arm to cross member
   4.0 ~ 5.5 m-kg (29 ~ 40 ft-lb)
   Tension rod to suspension arm
   5.5 ~ 6.9 m-kg (40 ~ 50 ft-lb)
   Knuckle arm to shock absorber
   6.0 ~ 7.0 m-kg (43 ~ 51 ft-lb)
3. When installing the stabilizer bar to the suspension arm, tighten the nut to the specification in the illustration.

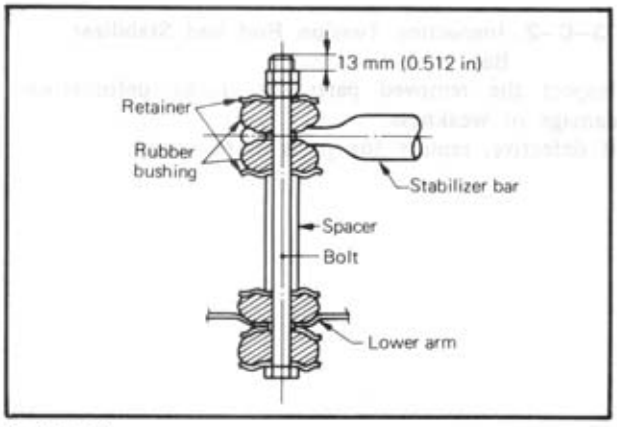


Fig. 13–24

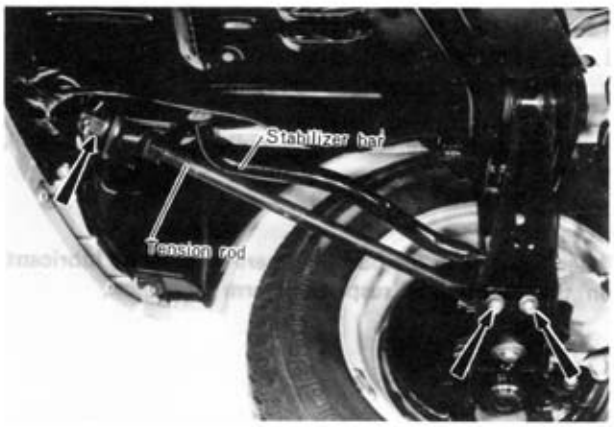


Fig. 13–25

Fig. 13–26

Fig. 13–27

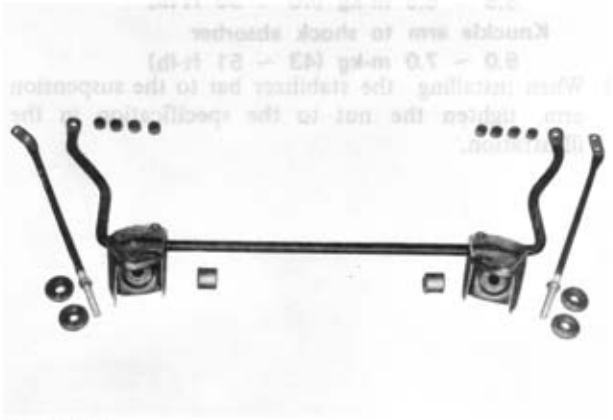


Fig. 13–28

13–C. TENSION ROD AND STABILIZER BAR

13–C–1. Removing Tension Rod and Stabilizer Bar

1. Raise the front end of the vehicle and support it with stands.
2. Remove the engine under cover.
3. Remove the tension rod attaching nuts.
4. Remove the tension rod.
5. Disconnect the both ends of the stabilizer bar from the right and left control link.
6. Remove the stabilizer bar support plates and rubber bushings.
7. Remove the right and left brackets mounting the tension rod and stabilizer bar, together with the stabilizer bar.

13–C–2. Inspecting Tension Rod and Stabilizer Bar

Inspect the removed parts for cracks, deformation, damage or weakness.
If defective, replace the parts as necessary.

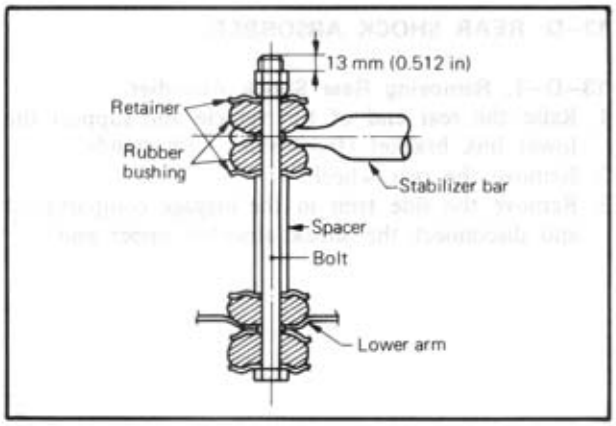


Fig. 13–29

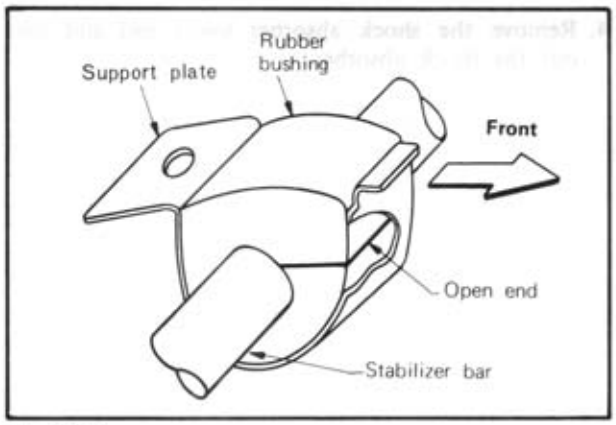


Fig. 13–30

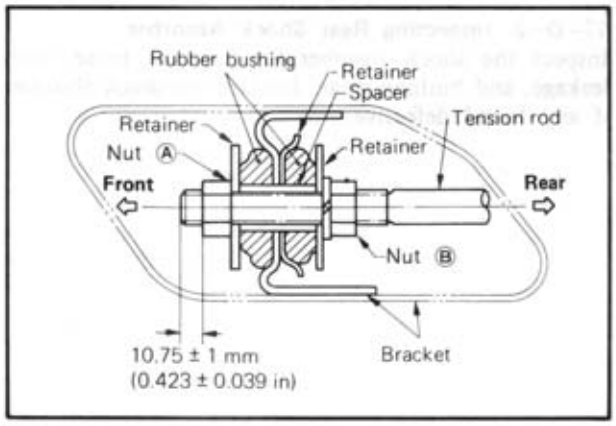


Fig. 13–31

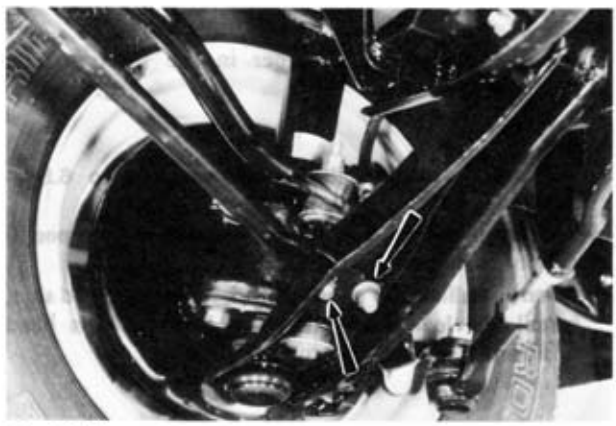


Fig. 13–32

13–C–3. Installing Tension Rod and Stabilizer Bar

Install the tension rod and stabilizer bar in the reverse order of removing, **noting** the following points.

1. Install the brackets to the frame together with the stabilizer bar and tighten the bracket attaching bolts.
2. Install the both ends of the stabilizer bat to the control link and tighten the nuts to the specification as shown in figure.

3. Install the stabilizer rubber bushing with the support plate, so that the open end of the bushing toward the front.
   Tighten the support plate attaching bolt temporalily.

4. Install the front end of the tension rod to the bracket and tighten the nut Ⓐ to the specification as shown in figure.
   Then, tighten the nut Ⓑ to the specified torque. When installing the rubber bushing on the tension rod, face the flat surface of the bushing toward the bracket.

   Tightening torque of nut Ⓑ:
   11 ~ 15 m-kg (80 ~ 108 ft-lb)

5. Install the rear end of the tension rod to the suspension arm and tighten the nuts to the specification.

   Tightening torque:
   5.5 ~ 6.9 m-kg (40 ~ 50 ft-lb)

6. Lower the vehicle and jounce it few times. Then, finally tighten the support plate of the stabilizer bar.

   Tightening torque:
   5.5 ~ 6.9 m-kg (40 ~ 50 ft-lb)

Fig. 13–33

13–D. REAR SHOCK ABSORBER

13–D–1. Removing Rear Shock Absorber

1. Raise the rear end of the vehicle and support the lower link bracket (front side) with stands.
2. Remove the rear wheel.
3. Remove the side trim in the luggage compartment and disconnect the shock absorber upper end.

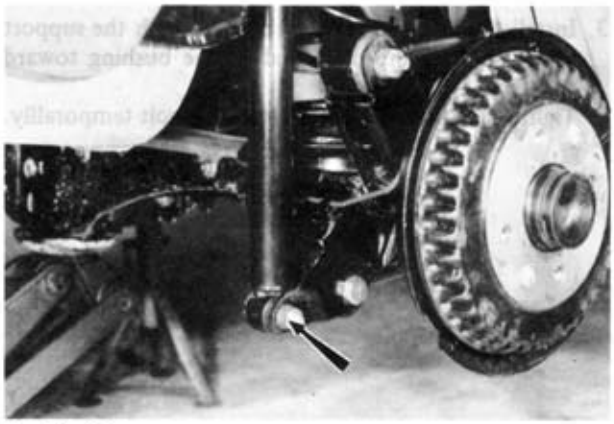


Fig. 13–34

4. Remove the shock absorber lower end and take out the shock absorber.

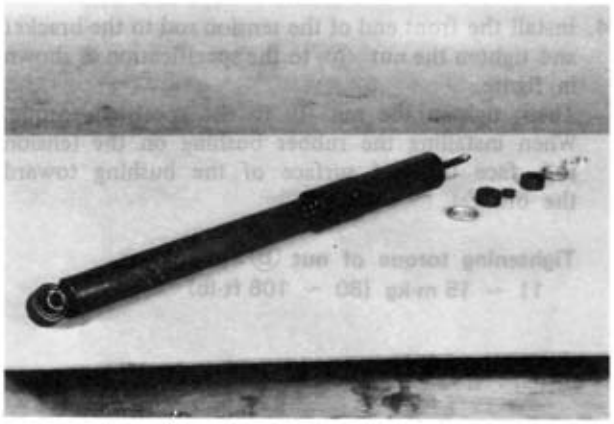


Fig. 13–35

13–D–2. Inspecting Rear Shock Absorber

Inspect the shock absorber for function, noise, fluid leakage, and bushing wear. Replace the shock absorber if any found defective.

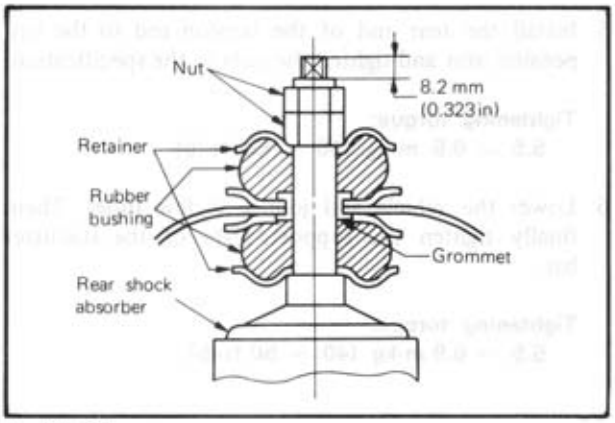


Fig. 13–36

13–D–3. Installing Rear Shock Absorber

Install the rear shock absorber in the reverse order of removal.

Note:

a) Tighten the shock absorber lower end to 6.5 ~ 8.2 m-kg (47 ~ 59 ft-lb).

b) Tighten the shock absorber upper end to the specification as shown in figure.

c) When installing the shock absorber on left hand side, install the lower side attaching bolt with its head positioned toward the inside.

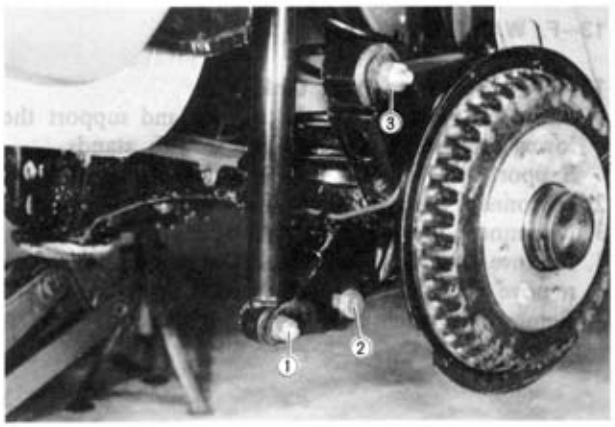


Fig. 13–37

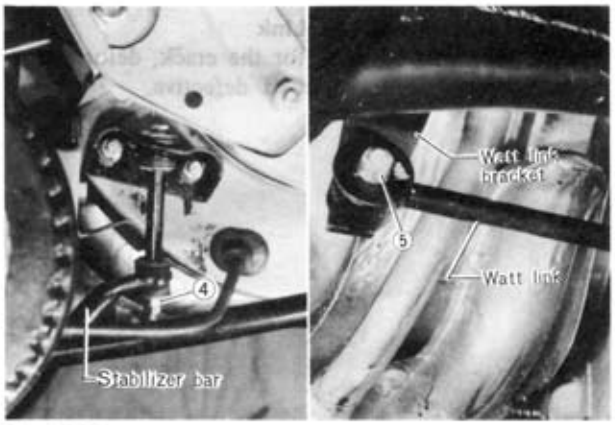


Fig. 13–38

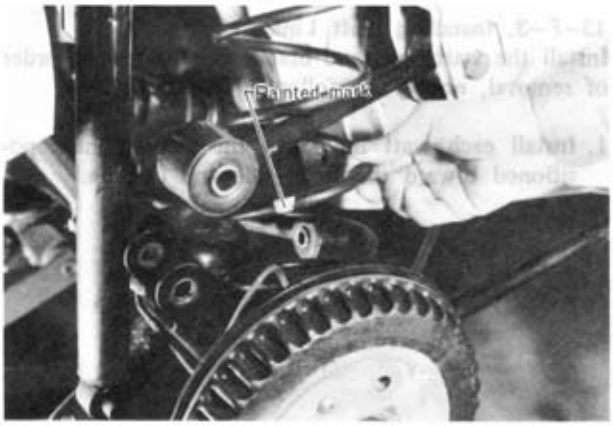


Fig. 13–39

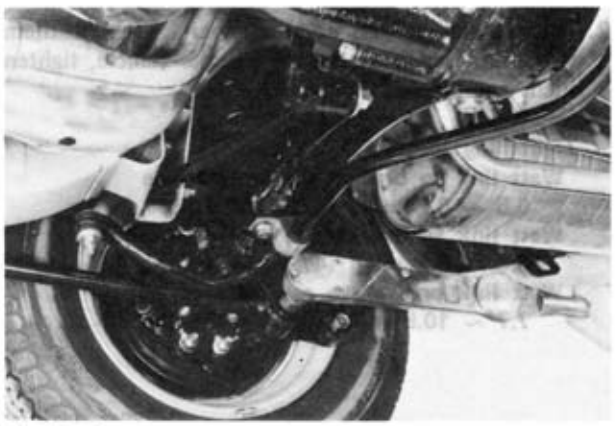


Fig. 13–40

13–E. REAR COIL SPRING

13–E–1. Removing Rear Coil Spring

1. Raise the rear end of the vehicle and support the lower link brackets (front sides) with stands. Support the rear axle casing with a jack.
2. Remove the rear wheel.
3. Disconnect the following portions from the rear axle casing.
   1) Shock absorber lower end
   2) Lower link rear end
   3) Upper link rear end
   4) Stabilizer bar front ends (if equipped)
   5) Right and left watt links at rear axle casing
4. Carefully lower the rear axle casing on the jack and remove the coil spring and rubber seat.

13–E–2. Inspecting Rear Coil Spring

Check the coil spring for crack or any damage. If necessary, replace the coil spring with new one.

13–E–3. Installing Rear Coil Spring

Install the rear coil spring in the reverse order of removal, **noting** the following points.

1. Install the coil spring with the painted mark positioned toward the rear axle casing.
2. Tighten the front ends of the stabilizer bar to the specifications as shown in Fig. 13–29.
3. When installing the shock absorber on left hand side, install the lower side attaching bolt with its head positioned toward the inside.
4. When installing the upper link, lower link, rear shock absorber lower end and watt links, tighten the bolts and nuts temporarily, and after lowering the vehicle, tighten them at specified torque.

Tightening torque:
Upper and lower links to bracket
7.7 ~ 10.5 m-kg (56 ~ 76 ft-lb)
Watt link to bracket on rear axle casing
6.5 ~ 8.2 m-kg (47 ~ 59 ft-lb)
Rear shock absorber lower end to bracket
6.5 ~ 8.2 m-kg (47 ~ 59 ft-lb)

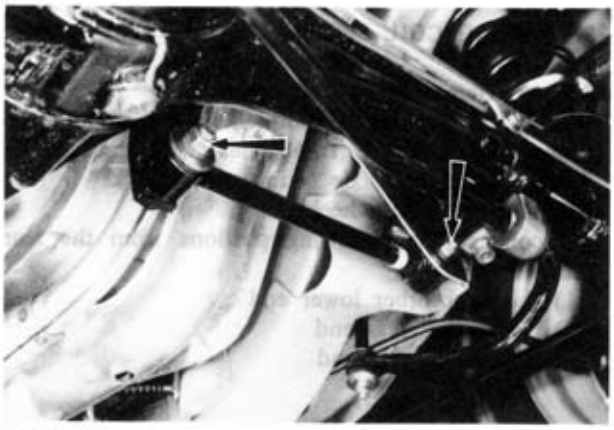


Fig. 13–41

13–F. WATT LINK

13–F–1. Removing Watt Link

1. Raise the rear end of the vehicle and support the lower link brackets (front sides) with stands. Support the rear axle casing with a jack.
2. Disconnect the right watt link from the body frame.
3. Disconnect the left watt link from the body frame.
4. Remove the watt link bracket attaching nut. Then remove the bracket together with both links.
5. Remove the each link from the bracket.

Fig. 13–42

13–F–2. Inspecting Watt Link

Inspect the removed parts for the crack, deformation, or any damage, and replace if defective.

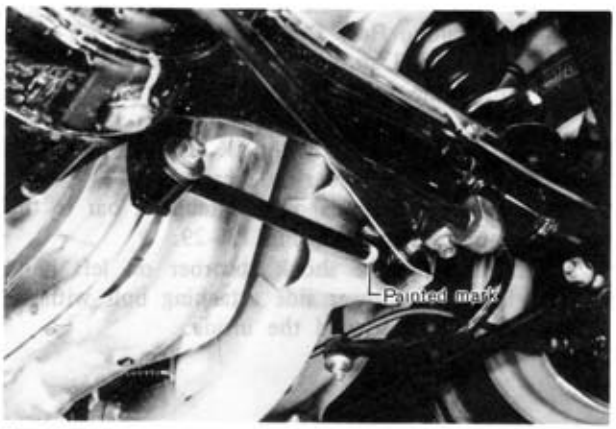


Fig. 13–43

13–F–3. Installing Watt Link

Install the watt links and bracket in the reverse order of removal, **noting** the following points.

1. Install each watt link with the painted mark positioned toward the front side and outside.

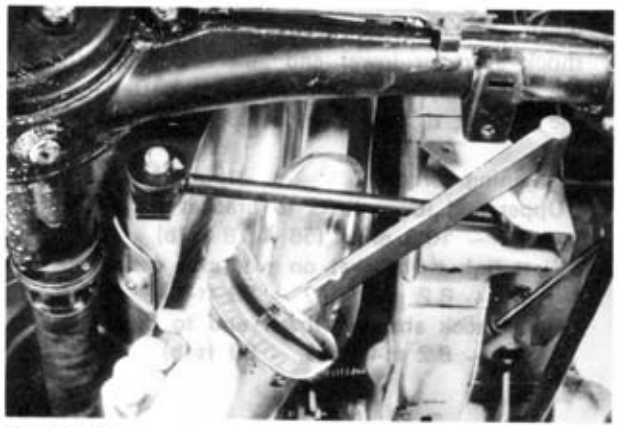


Fig. 13–44

2. When installing the removed parts, tighten them temporarily, and after lowering the vehicle, tighten them to specified torque.

Tightening torque:
Watt link to bracket on body frame
6.5 ~ 8.2 m-kg (47 ~ 59 ft-lb)
Watt link to bracket on rear axle casing
6.5 ~ 8.2 m-kg (47 ~ 59 ft-lb)
Watt link bracket to rear axle casing
7.7 ~ 10.5 m-kg (56 ~ 76 ft-lb)

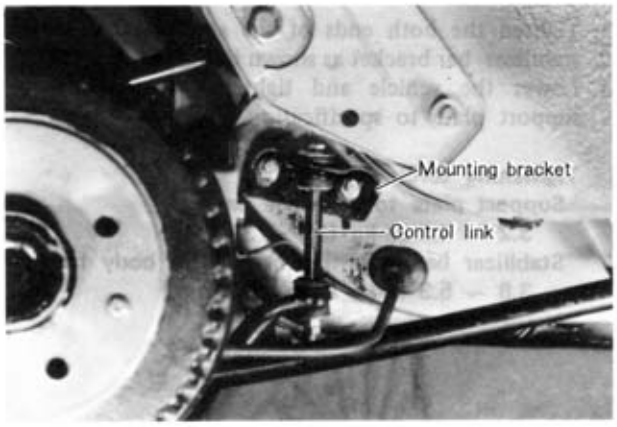


Fig. 13–45

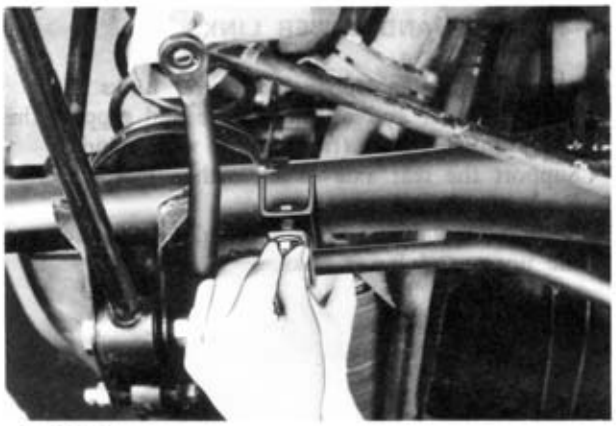


Fig. 13–46

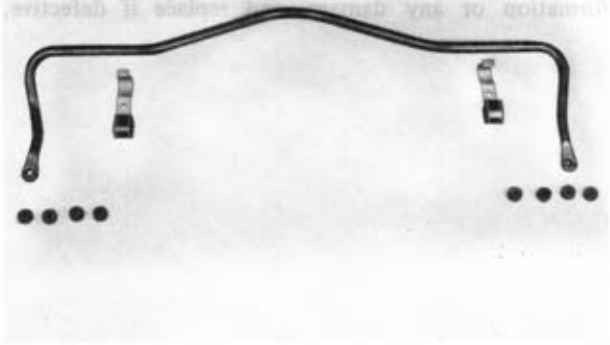


Fig. 13–47

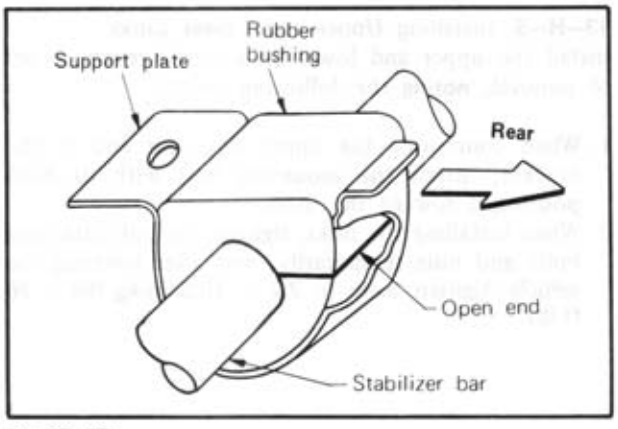


Fig. 13–48

13–G. REAR STABILIZER BAR (IF EQUIPPED)

13–G–1. Removing Rear Stabilizer Bar

1. Raise the rear end of the vehicle and support the lower link brackets (front sides) with stands. Support the rear axle casing with a jack.
2. Disconnect the stabilizer bar both ends.
3. If nessessary, remove the stabilizer bar mounting bracket.
4. Remove the stabilizer bar support plates and rubber bushings.
5. Remove the stabilizer bar.

13–G–2. Inspecting Rear Stabilizer Bar

Inspect the removed parts for crack, deformation or any damage, and replace if defective.

13–G–3. Installing Rear Stabilizer Bar

Install the rear stabilizer bar in the reverse order of removal, **noting** the following points.

1. Install the rubber bushing with the support plate so that the open end of the bushing toward the rear.
2. Temporalily tighten the support plate attaching bolt.

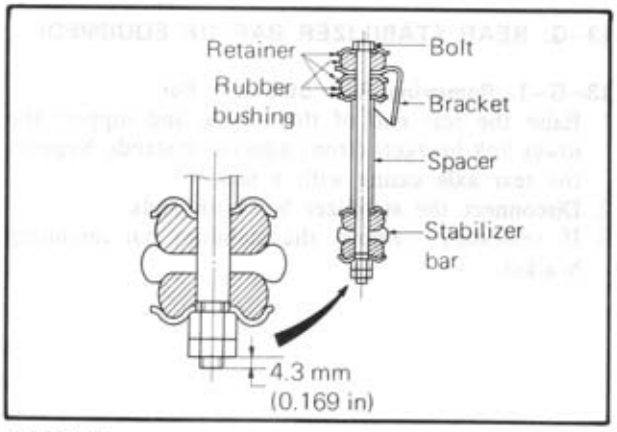


Fig. 13–49

3. Tighten the both ends of the stabilizer bar to the stabilizer bar bracket as shown in figure.
4. Lower the vehicle and tighten the stabilizer bar support plate to specification.

Tightening torques:
Support plate to rear axle casing
3.2 ~ 4.7 m-kg (23 ~ 34 ft-lb)
Stabilizer bar mounting bracket to body frame
3.8 ~ 5.3 m-kg (27 ~ 38 ft-lb)

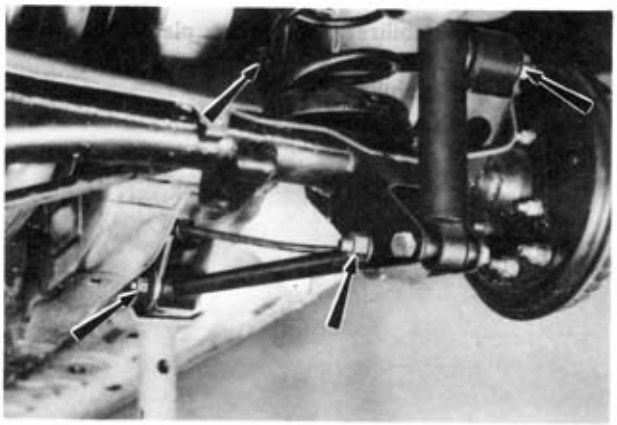


Fig. 13–50

13–H. UPPER AND LOWER LINKS

13–H–1. Removing Upper and Lower Links

1. Raise the rear end of the vehicle and support the lower link brackets (front sides) with stands. Support the rear axle casing with a jack.
2. Remove the rear wheel.
3. Remove the link attaching bolts and nuts, and remove the upper and lower links.

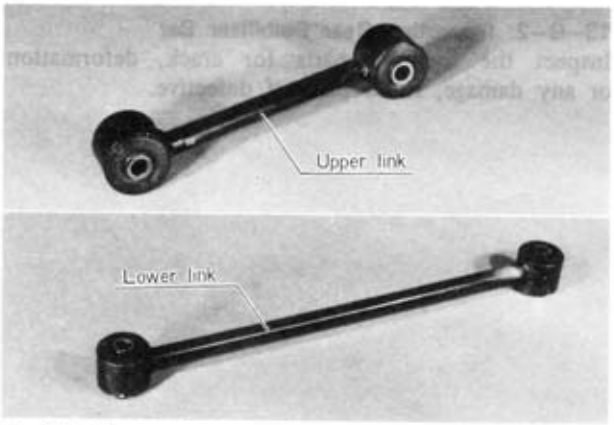


Fig. 13–51

13–H–2. Inspecting Upper and Lower Links

Inspect the upper and lower links for cracks, deformation or any damage, and replace if defective.

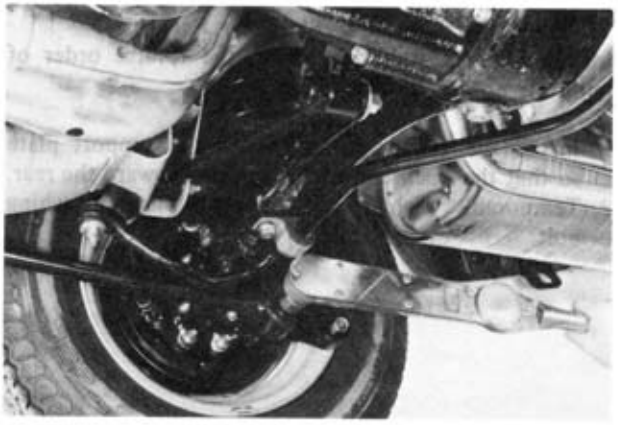


Fig. 13–52

13–H–3. Installing Upper and Lower Links

Install the upper and lower links in the reverse order of removal, **noting** the following points.

1. When connecting the upper link rear end to the bracket, install the mounting bolt with its head positioned toward the inside.
2. When installing the links, tighten the link attaching bolts and nuts temporarily, and after lowering the vehicle, tighten them to **7.7 ~ 10.5 m-kg (56 ~ 76 ft-lb)**.

BODY

Fig. 14–1

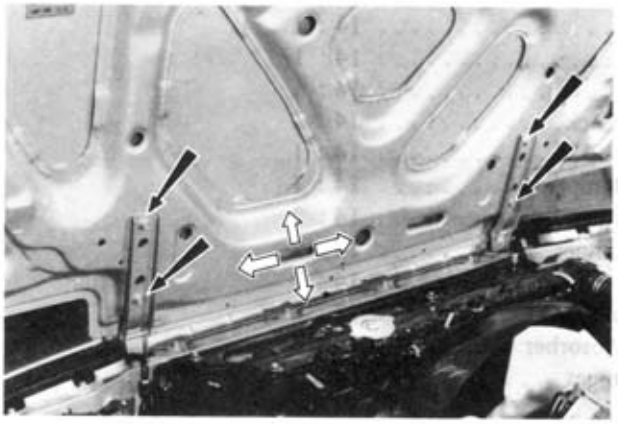


Fig. 14–2

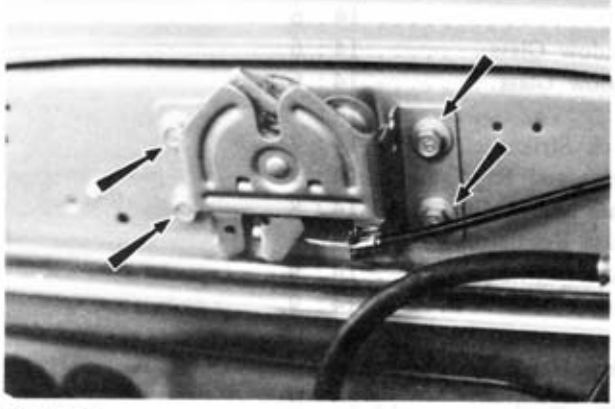


Fig. 14–3

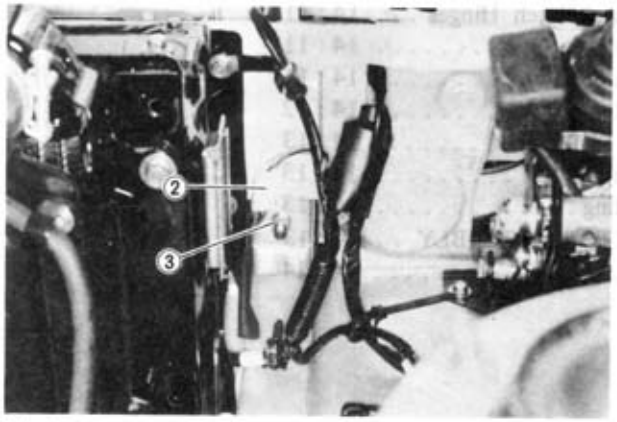


Fig. 14–4

14–A. BONNET

14–A–1. Removing Bonnet

1. Open the bonnet and mark the bonnet hinge locations on the bonnet.
2. Remove the bonnet stay.
3. With an assistant supporting one side of the bonnet, remove the bonnet mounting bolts.
4. Lift the bonnet off the vehicle.

14–A–2. Installing Bonnet

Follow the removal procedures in the reverse order.

14–A–3. Adjusting Bonnet

Make the to-and-fro, side-to-side and up-and-down adjustments by loosening the bonnet mounting bolts.

14–A–4. Adjusting Bonnet Lock

To adjust the bonnet lock, loosen the bonnet lock attaching bolts and move the lock as required to align with a striker.

14–B. FRONT BUMPER

14–B–1. Removing Front Bumper

1. Remove the battery.
2. Disconnect the wire connectors from the front turn signal lights.
3. Remove the nuts attaching the piston rod end of the shock absorber to the body.
   Raise the front end of the vehicle and support it with stands.

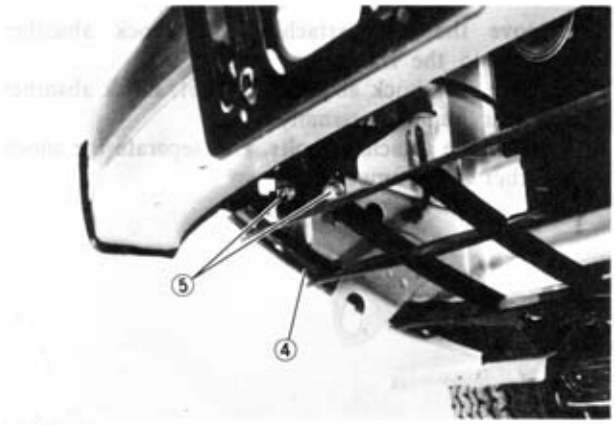


Fig. 14–5

4. Remove the radiator grille.
5. Remove the bolts attaching the shock absorber bracket to the frame.
   Then, remove the shock absorber bracket, shock absorber and bumper assembly.
6. Remove the attaching bolts, and separate the shock absorber and bumper.

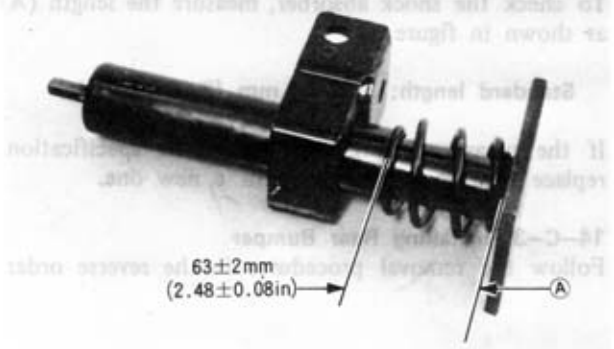


Fig. 14–6

14–B–2. Inspecting Shock Absorber

To check the shock absorber, measure the length (A) as shown in figure.

Standard length: 63 ± 2 mm (2.48 ± 0.08 in)

If the measurement is not within the specification, replace the shock absorber with a new one.

14–B–3. Installing Front Bumper

Follow the removal procedures in the reverse order.

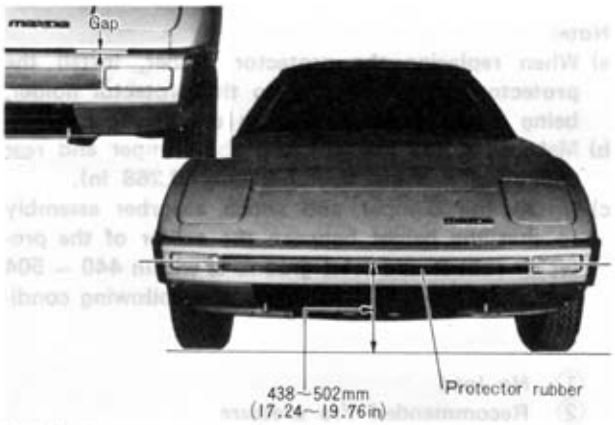


Fig. 14–7

Note:

a) When replacing the protector rubber, install the protector rubber properly to the protector holder, being carefully not to broken the plastic fastener.

b) Make sure the gap between the bumper and front nose is more than 6.9 mm (0.272 in).

c) Install the bumper and shock absorber assembly so that the height between the center of the protector rubber and level ground is within 438 ~ 502 mm (17.24 ~ 19.76 in) under the following conditions.

① No load
② Recommended tire pressure
③ Fully fuel tank with fuel

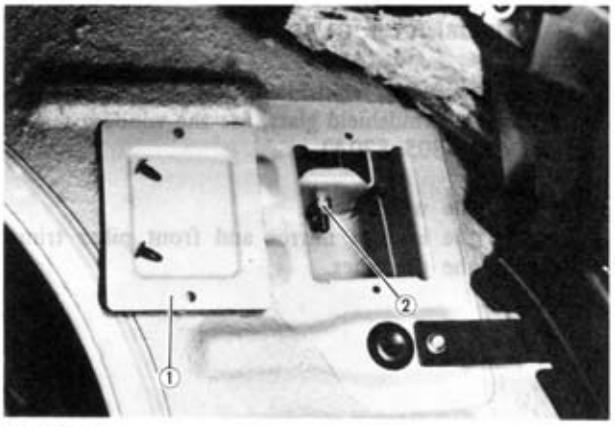


Fig. 14–8

14–C. REAR BUMPER

14–C–1. Removing Rear Bumper

1. Open the rear glass hatch and remove the service hole cover.
2. Remove the nuts attaching the piston rod end of the shock absorber to the frame.
3. Raise the rear end of the vehicle and support it with stands.

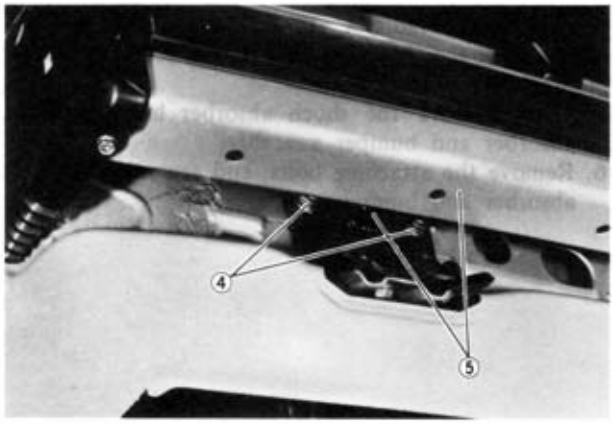


Fig. 14–9

4. Remove the nuts attaching the shock absorber bracket to the frame.
5. Remove the shock absorber bracket, shock absorber and rear bumper assembly.
6. Remove the attaching bolts, and separate the shock absorber and bumper.

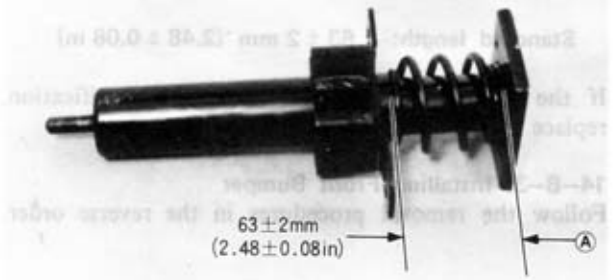


Fig. 14–10

14–C–2. Inspecting Shock Absorber

To check the shock absorber, measure the length (A) as shown in figure.

Standard length: 63 ± 2 mm (2.48 ± 0.08 in)

If the measurement is not within the specification, replace the shock absorber with a new one.

14–C–3. Installing Rear Bumper

Follow the removal procedures in the reverse order.

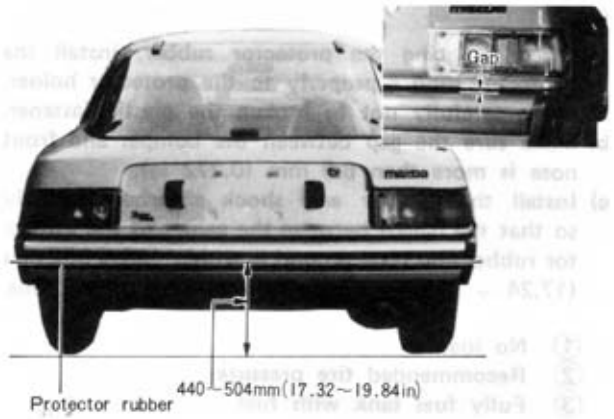


Fig. 14–11

Note:

a) When replacing the protector rubber, install the protector rubber properly to the protector holder, being carefully not to broken the plastic fastener.

b) Make sure the gap between the bumper and rear end panel is more than 6.8 mm (0.268 in).

c) Install the bumper and shock absorber assembly so that the height between the center of the protector rubber and level ground is within 440 ~ 504 mm (17.32 ~ 19.84 in) under the following conditions.

① No load
② Recommended tire pressure
③ Fully fuel tank with fuel

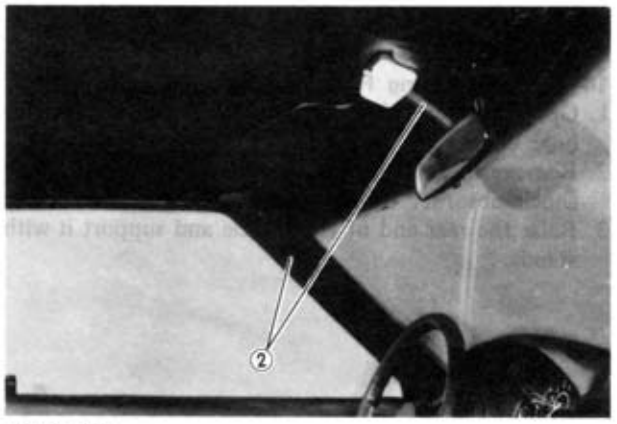


Fig. 14–12

14–D. WINDSHIELD GLASS

14–D–1. Removing Windshield Glass

To replace the windshield glass, use the **window service tool set** (49 0305 870A).

1. Remove the wiper arms.
2. Remove the interior mirror and front pillar trims.
3. Remove the garnishes.

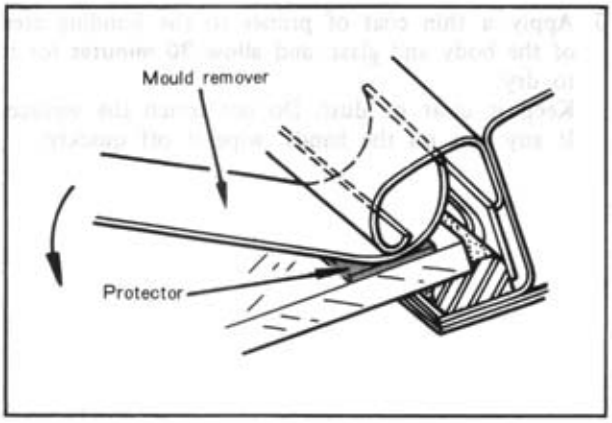


Fig. 14–13

4. Insert the suitable protector and remove the mould using the mould remover as shown in figure.

Note:
Before removing the mould, apply adhesive tape to protect the body from damage.

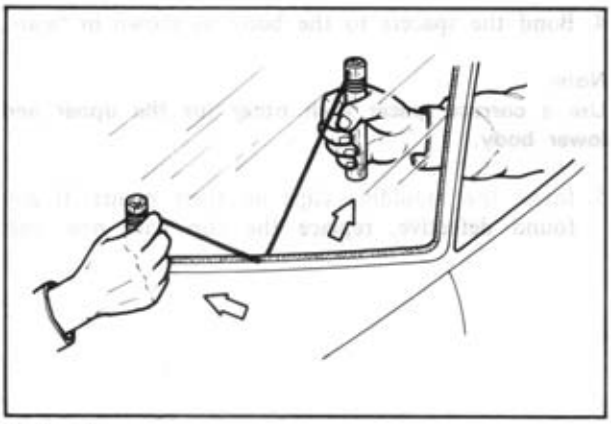


Fig. 14–14

5. Drill a small hole to the sealant.
6. Pass a piano wire through the hole.
7. Wind the each end of wire round a bars.
8. Pull the wire to and fro, and saw through the sealant round the edge of the glass. Then remove the glass.

Note:
a) Use a long sawing action to spread the work over the whole length of wire lest it break.
b) Take care the wire does not rub on the car paint.

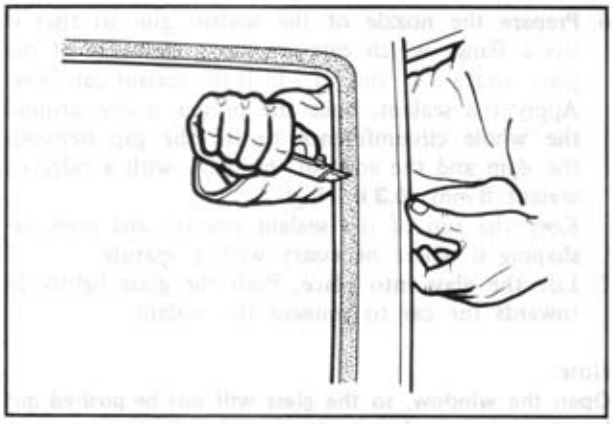


Fig. 14–15

14–D–2. Installing Windshield Glass

1. With a sharp knife cut away the old sealant, so that **1 to 2 mm (0.04 to 0.08 in)** thickness of sealant remains around the circumference of the frame. If all the sealant has come off in place, apply some primer after degreasing, and allow it 30 minutes to dry. Then put on sealant to **build up the 2 mm (0.08 in) layer.**

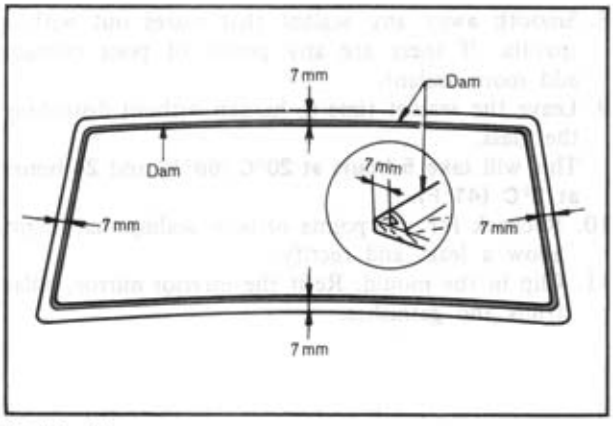


Fig. 14–16

2. Bond the new dam to the glass with bonding agent. It should be positioned with its outer edge **7 mm (0.3 in)** from the glass edge, and the lip outermost.

Note:
Securely bond the dam so that it is straight and will not come apart.

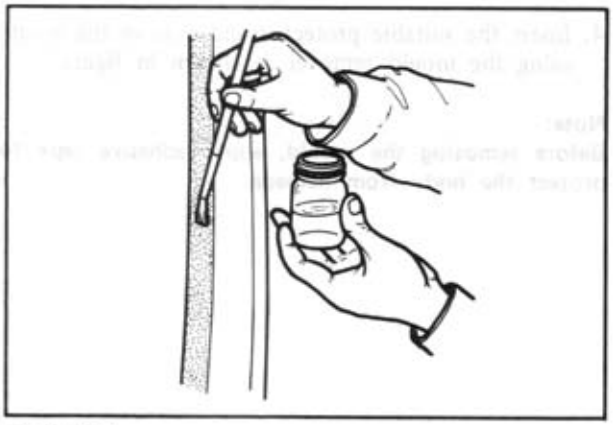


Fig. 14–17

3. Apply a thin coat of primer to the bonding area of the body and glass, and **allow 30 minutes** for it to dry.
   Keep it clear of dust. Do not touch the surface. If any gets on the hands, wipe it off quickly.

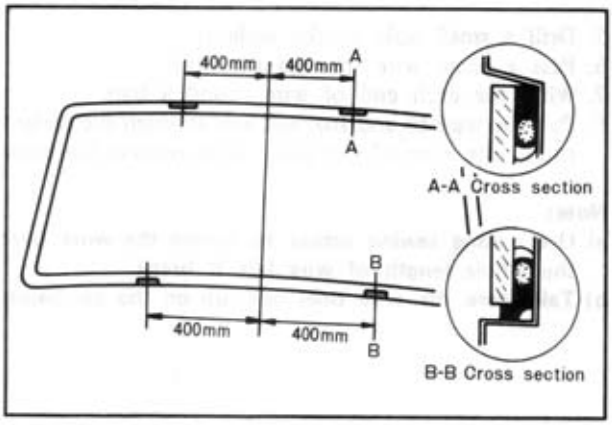


Fig. 14–18

4. Bond the spacers to the body as shown in figure.

Note:
Use a correct spacer each other for the upper and lower body.

5. Insert the moulding clips on their points. If any found defective, replace the clip with new one.

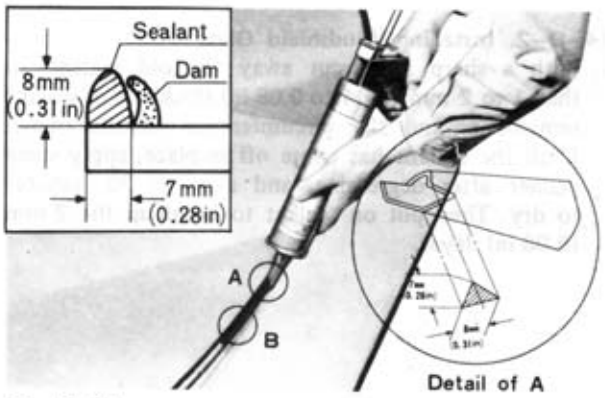


Fig. 14–19

6. Prepare the nozzle of the sealant gun so that it has a flange which can run along the edge of the glass, and a "V" out of which the sealant can flow. Apply the sealant, once the primer is dry, around the whole circumference to fill the gap between the dam and the edge of the glass, with a ridge of sealant **8 mm (0.3 in)** high.
   Keep the run of the sealant smooth and even, re-shaping it where necessary with a spatula.
7. Lift the glass into place. Push the glass lightly in towards the car to squeeze the sealant.

Note:
Open the window, so the glass will not be pushed out by air pressure when a door is closed.

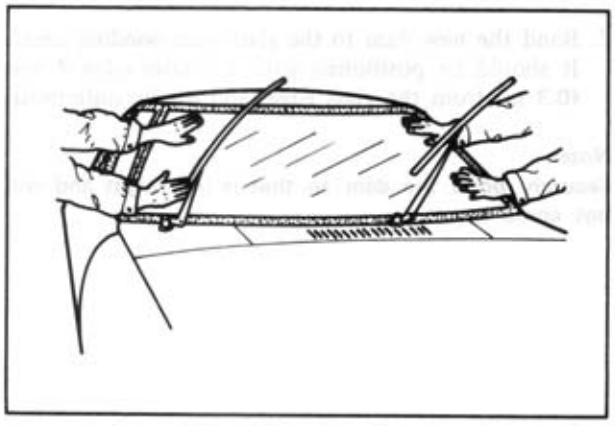


Fig. 14–20

8. Smooth away any sealant that oozes out with a spatula. If there are any points of poor contact add more sealant.
9. Leave the sealant time to harden without disturbing the glass.
   This will take **5 hours at 20°C (68°F)** and **24 hours at 5°C (41°F).**
10. Recheck for any points of poor sealing that might allow a leak, and rectify.
11. Clip in the mould. Refit the interior mirror, pillar trims and garnishes.

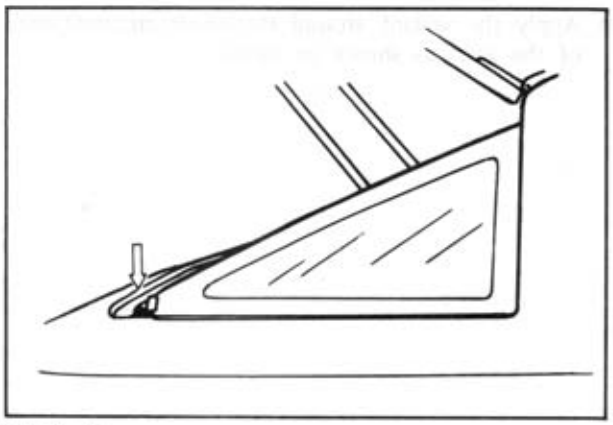


Fig. 14–21

14–E. SIDE WINDOW GLASS

14–E–1. Removing Side Window Glass

1. Remove the garnish and remove the glass plate attaching screw.

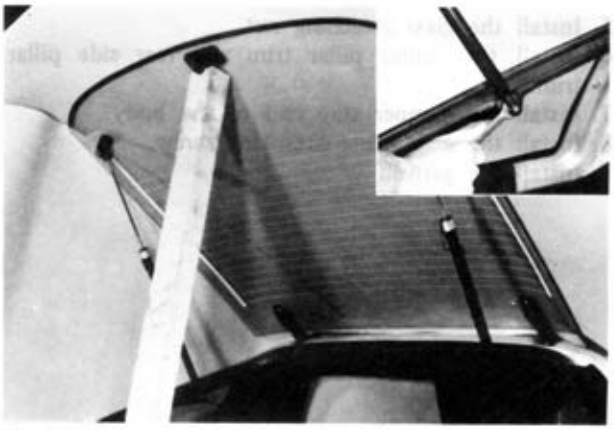


Fig. 14–22

2. Open the rear glass hatch and disconnect the electrical connector from the rear pillar.
3. Remove the rear pillar trims, and remove the glass attaching nut.
4. Disconnect the damper stay end from rear pillar and hold the rear glass hatch.
5. Remove the side glass referring to the Step 5 to 8 in Par. 14–D–1.

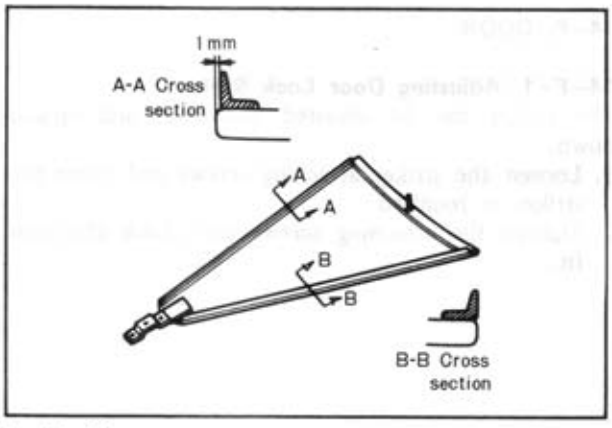


Fig. 14–23

14–E–2. Installing Side Window Glass

Install the side window glass referring to the Step 1 to 10 in the Par. 14–D–2, **noting** the following points.

1. Bond the new dam to the glass with bonding agent. It should be positioned as shown in figure.

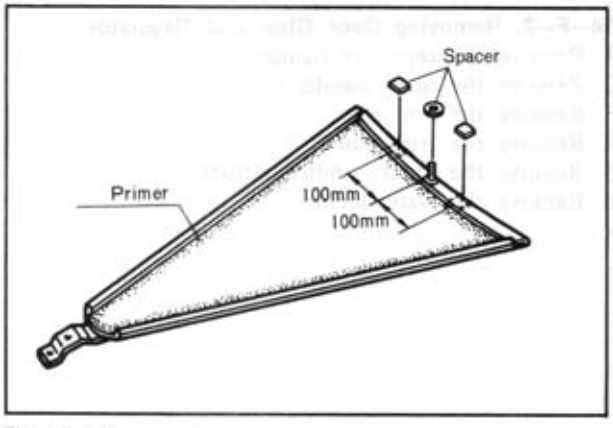


Fig. 14–24

2. Apply a thin coat of primer to the bonding area of the body and glass as shown in figure.
3. Bond the spacers to the glass as shown in figure.

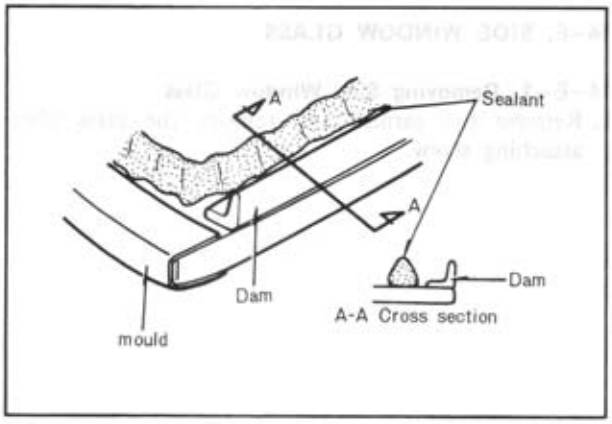


Fig. 14–25

4. Apply the sealant around the whole circumference of the glass as shown in figure.

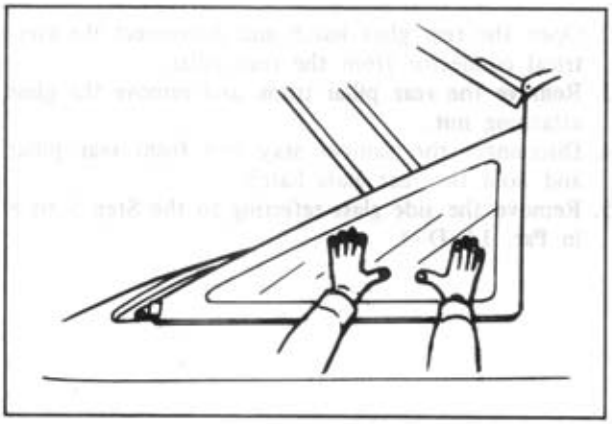


Fig. 14–26

5. Install the glass attaching nut.
6. Install the center pillar trim and rear side pillar trim.
7. Install the damper stay end to the body.
8. Install the glass plate attaching screw.
9. Install the garnish.

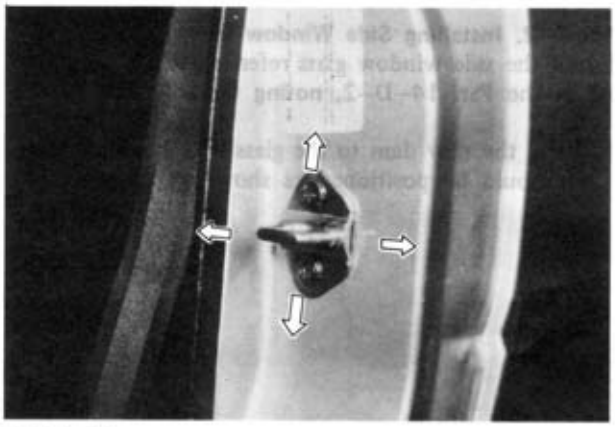


Fig. 14–27

14–F. DOOR

14–F–1. Adjusting Door Lock Striker

The striker can be adjusted in-and-out and up-and down.

1. Loosen the striker attaching screws and move the striker as required.
2. Tighten the attaching screws and check the door fit.

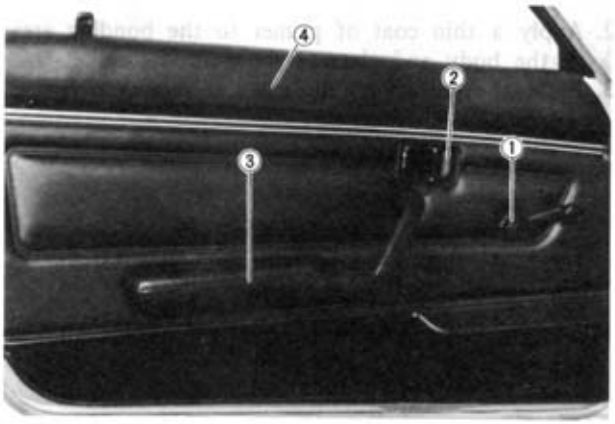


Fig. 14–28

14–F–2. Removing Door Glass and Regulator

1. Remove the regulator handle.
2. Remove the inner handle cover.
3. Remove the arm rest.
4. Remove the trim panel.
5. Remove the inner handle assembly.
6. Remove the watershield.

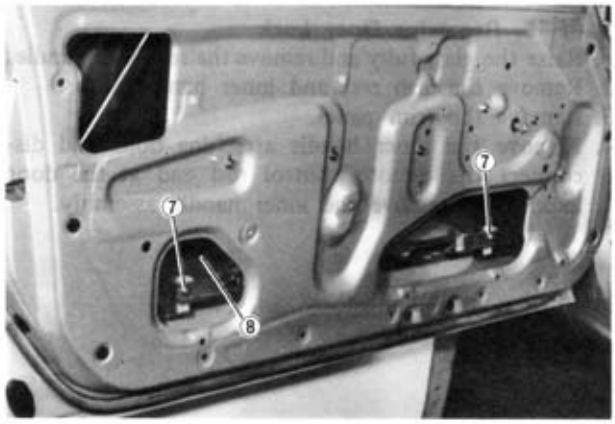


Fig. 14–29

7. Remove the screws attaching the glass and regulator. Then remove the screw grommets.
8. Remove the glass.

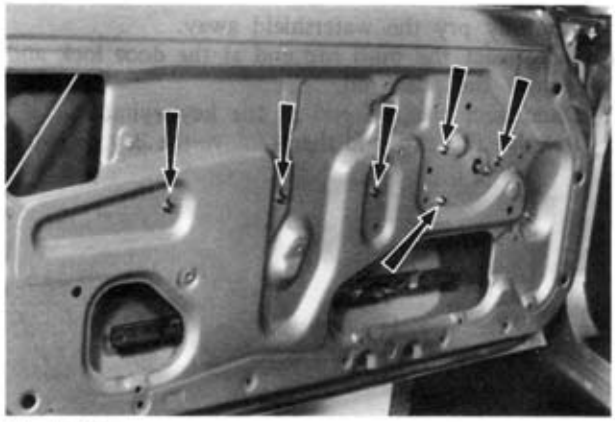


Fig. 14–30

9. Remove the regulator attaching bolts, and take out the regulator assembly through the service hole.

14–F–3. Installing Door Glass and Regulator

Follow the removal procedures in the reverse order. Adjust the regulator if necessary.

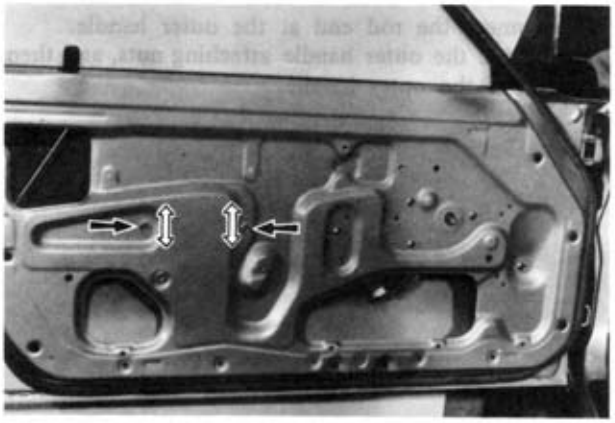


Fig. 14–31

14–F–4. Adjusting Door Glass Regulator

a. Horizontal adjustment

1. Raise the window to full up position.
2. Make the horizontal adjustment of the glass by moving the regulator guide up or down.
3. Make sure that the glass moves smoothly.

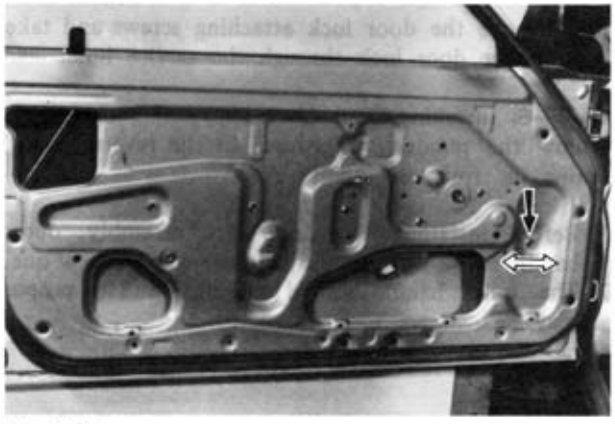


Fig. 14–32

b. Fore and aft adjustment

1. Loosen the adjusting bolt and move the glass guide as required.
2. Tighten the adjusting bolt.

Note:
Make sure that the glass does not play back and forth.

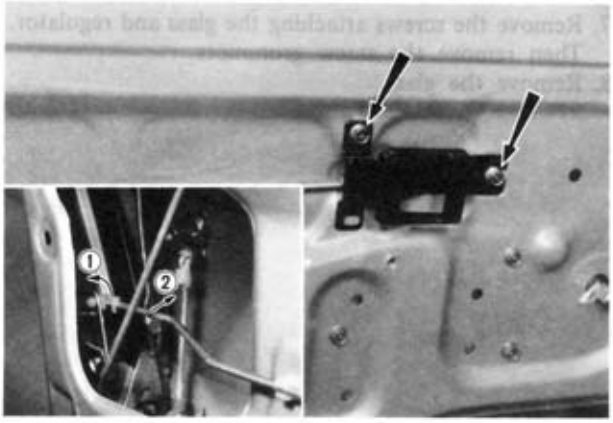


Fig. 14–33

14–F–5. Removing Door Lock

1. Raise the glass fully and remove the regulator handle.
2. Remove the arm rest and inner handle cover.
3. Remove the trim panel.
4. Remove the inner handle attaching bolts and disconnect the remote control rod end at the door lock. Then remove the inner handle assembly.

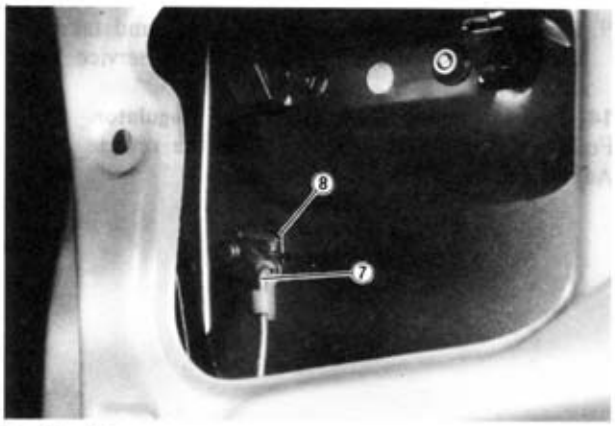


Fig. 14–34

5. Carefully pry the watershield away.
6. Disconnect the push rod end at the door lock and remove the push rod.
7. Disconnect the rod end at the key cylinder.
8. Remove the clip, and then remove the key cylinder.

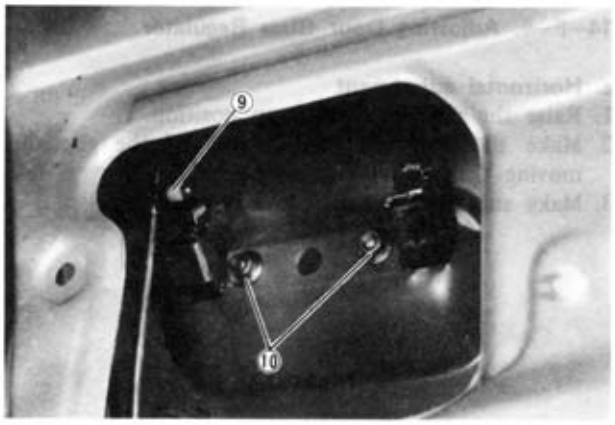


Fig. 14–35

9. Disconnect the rod end at the outer handle.
10. Remove the outer handle attaching nuts, and then remove the outer handle.

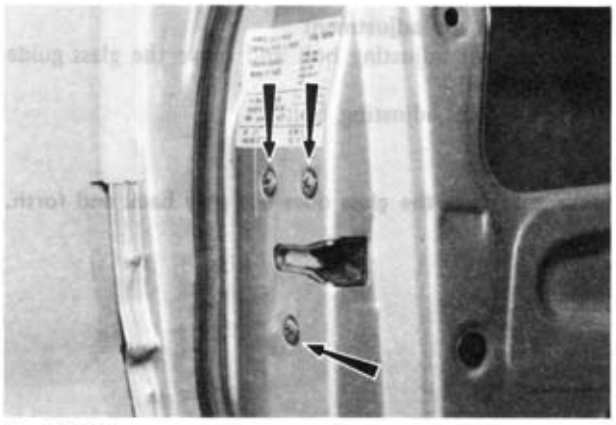


Fig. 14–36

11. Remove the door lock attaching screws and take out the door lock through the service hole.

14–F–6. Installing Door Lock

Follow the removal procedures in the reverse order, **noting** the following points.

1. Before installing the door lock assembly, outer handle nylon bush should be changed with new one.
2. The inner handle should be adjusted to proper play.

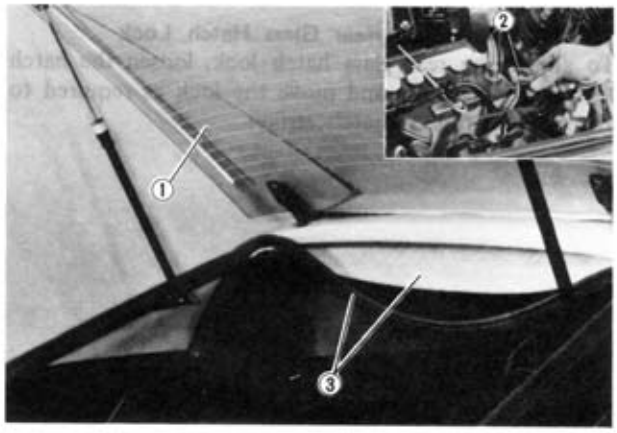


Fig. 14–37

14–G REAR GLASS HATCH

14–G–1. Removing Rear Glass Hatch

1. Open the rear glass hatch.
2. Disconnect the battery negative cable.
3. Remove the weatherstrip and top ceiling at the rear end of the roof.

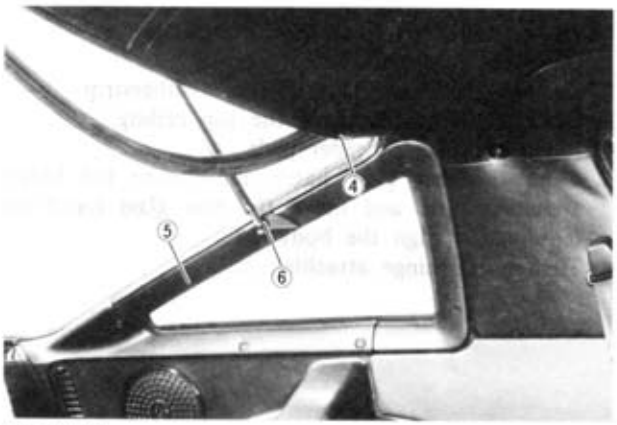


Fig. 14–38

4. Disconnect the electrical connector for rear defroster from the rear pillar.
5. Remove the rear side pillar trim.
6. Disconnect the damper stay at the body.
7. Close the rear glass hatch.

Note:
Be careful not to damaged the filament on the rear glass hatch during the servicing.

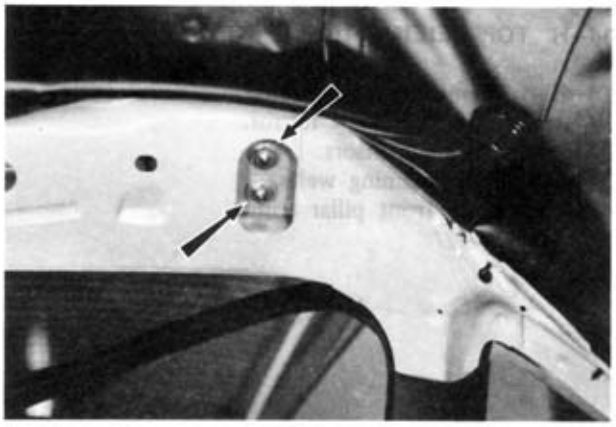


Fig. 14–39

8. Remove the glass hatch hinges attaching nuts.
9. Release the glass hatch lock and remove the glass hatch with the hinge attached.
10. If necessary, remove the damper stays, hinges and glass hatch lock striker from the glass.

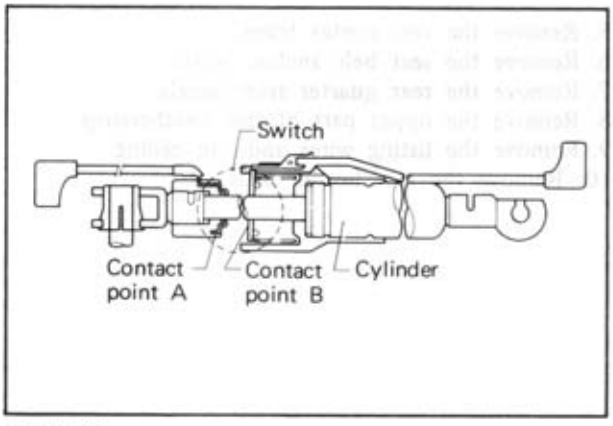


Fig. 14–40

Note:
a) Do not disassemble the damper stay as it is filled with gas and oil.
b) When the damper stay is replaced, before discarding the old one, drill a 2 or 3 mm (0.079 ~ 0.118 in) hole at the lower end of cylinder and allow the high pressure gas to escape.
Take care when venting it out as the drill cuttings and oil might fly out with considerable force.

14–G–2. Installing Rear Glass Hatch

Follow the removal procedures in the reverse order.

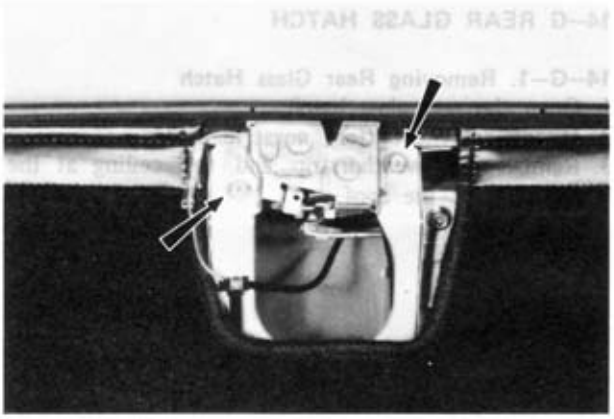


Fig. 14–41

14–G–3. Adjusting Rear Glass Hatch Lock

To adjust the rear glass hatch lock, loosen the hatch lock attaching bolts and move the lock as required to align the rear glass hatch striker.

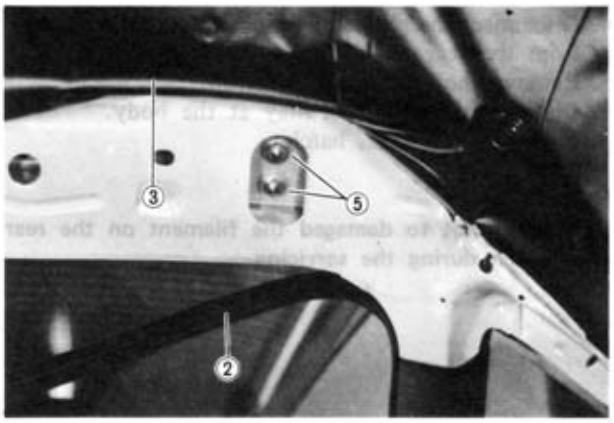


Fig. 14–42

14–G–4. Adjusting Rear Glass Hatch Hinges

1. Open the rear glass hatch.
2. Remove the upper part of the weatherstrip.
3. Remove the rear end of the top ceiling.
4. Remove the rear header pads.
5. Close the rear glass hatch and loosen the hinge attaching nuts and move the rear glass hatch as required to align the body.
6. Tighten the hinge attaching nuts.

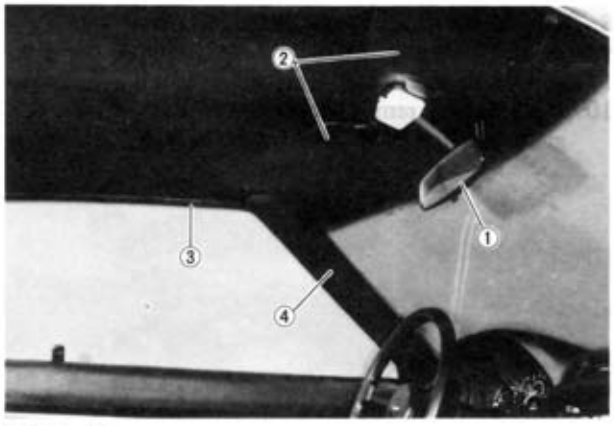


Fig. 14–43

14–H. TOP CEILING (FULL ROOF)

14–H–1. Removing Top Ceiling

1. Remove the rear view mirror.
2. Remove the sun visors.
3. Remove the seaming welts.
4. Remove the front pillar trims.

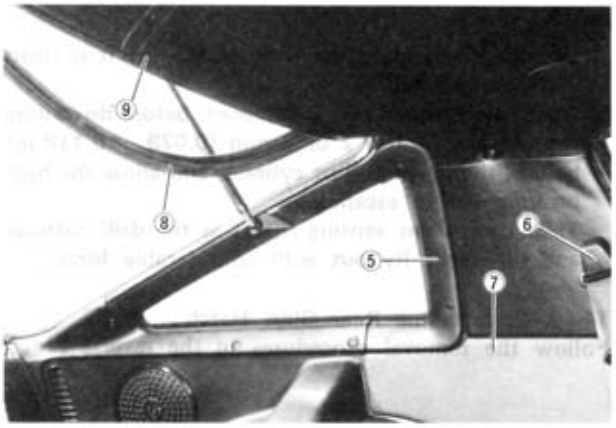


Fig. 14–44

5. Remove the rear center trims.
6. Remove the seat belt anchor bolts.
7. Remove the rear quarter trim panels.
8. Remove the upper part of the weatherstrip.
9. Remove the listing wires and top ceiling.
10. Remove the rear header pads.

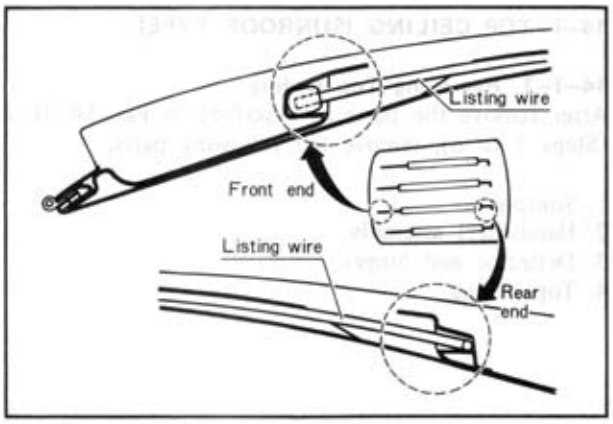


Fig. 14–45

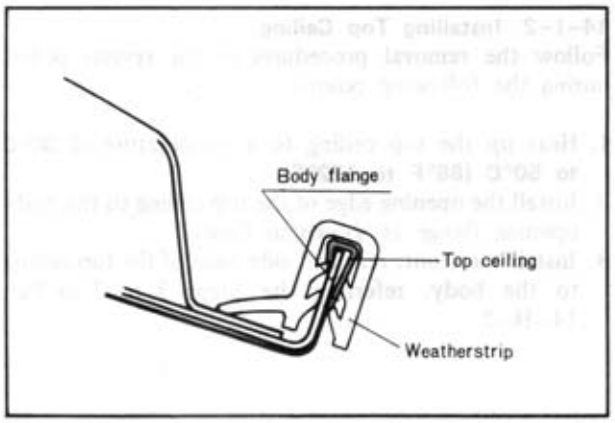


Fig. 14–46

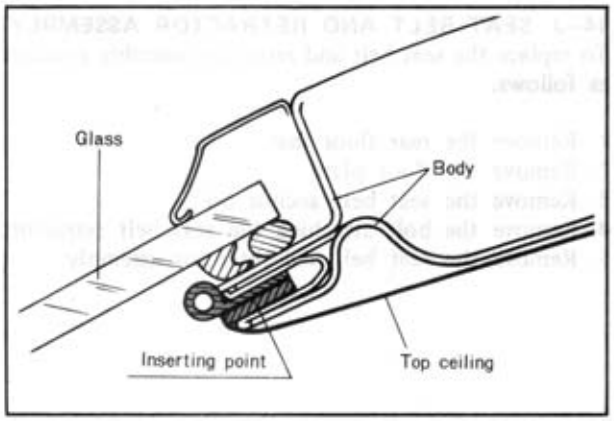


Fig. 14–47

Fig. 14–48

14–H–2. Installing Top Ceiling

Follow the removal procedures in the reverse order, **noting** the following points.

1. Heat up the top ceiling to a temperature of **30°C to 50°C (86°F to 122°F).**
2. Insert both ends of the listing wires to their respective position in successive order beginning from the center.
3. Install the rear end of the top ceiling to the body flange as shown in figure.
4. Insert the front end of the top ceiling to the inserting point of the body as shown in figure.
5. Apply double-sided adhesive tape to the outside of the body flange.
6. Pull the top ceiling from both side to avoid any slackening and glue both side onto the body flange.
7. After the top ceiling is properly attached to the body flange, clip off the all protruding edges.

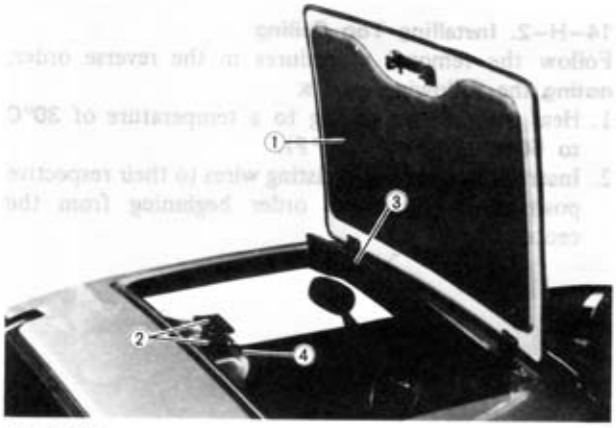


Fig. 14–49

14–I. TOP CEILING (SUNROOF TYPE)

14–I–1. Removing Top Ceiling

After remove the parts as described in Par. 14–H–1 (Steps 1 to 8), remove the following parts.

1. Sunroof
2. Handwheel assembly
3. Deflector and hinges
4. Top ceiling

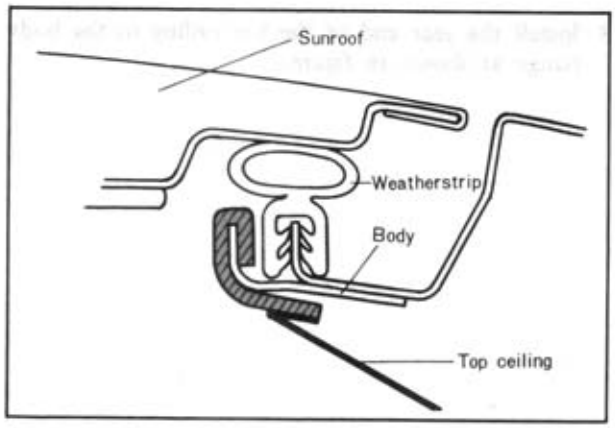


Fig. 14–50

14–I–2. Installing Top Ceiling

Follow the removal procedures in the reverse order, **noting** the following points.

1. Heat up the top ceiling to a temperature of **30°C to 50°C (86°F to 122°F).**
2. Install the opening edge of the top ceiling to the body opening flange as shown in figure.
3. Install the front, rear and side ends of the top ceiling to the body, referring the Steps 3 to 7 in Par. 14–H–2.

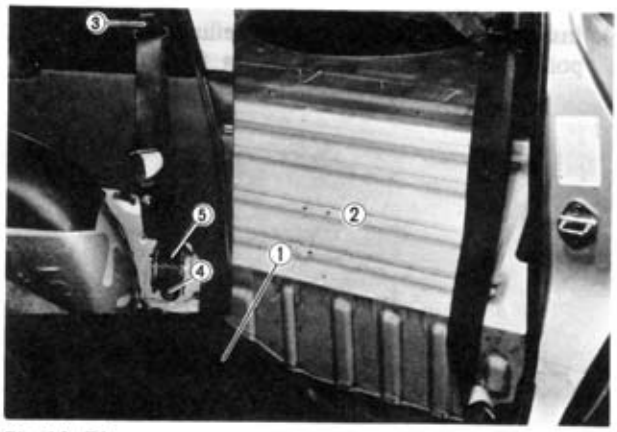


Fig. 14–51

14–J. SEAT BELT AND RETRACTOR ASSEMBLY

To replace the seat belt and retractor assembly proceed as follows.

1. Remove the rear floor mat.
2. Remove the floor plate.
3. Remove the seat belt anchor bolt.
4. Remove the bolt attaching the seat belt retractor.
5. Remove the seat belt and retractor assembly.

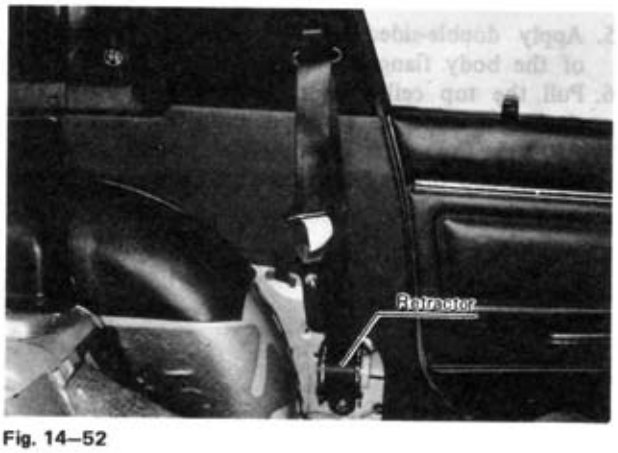
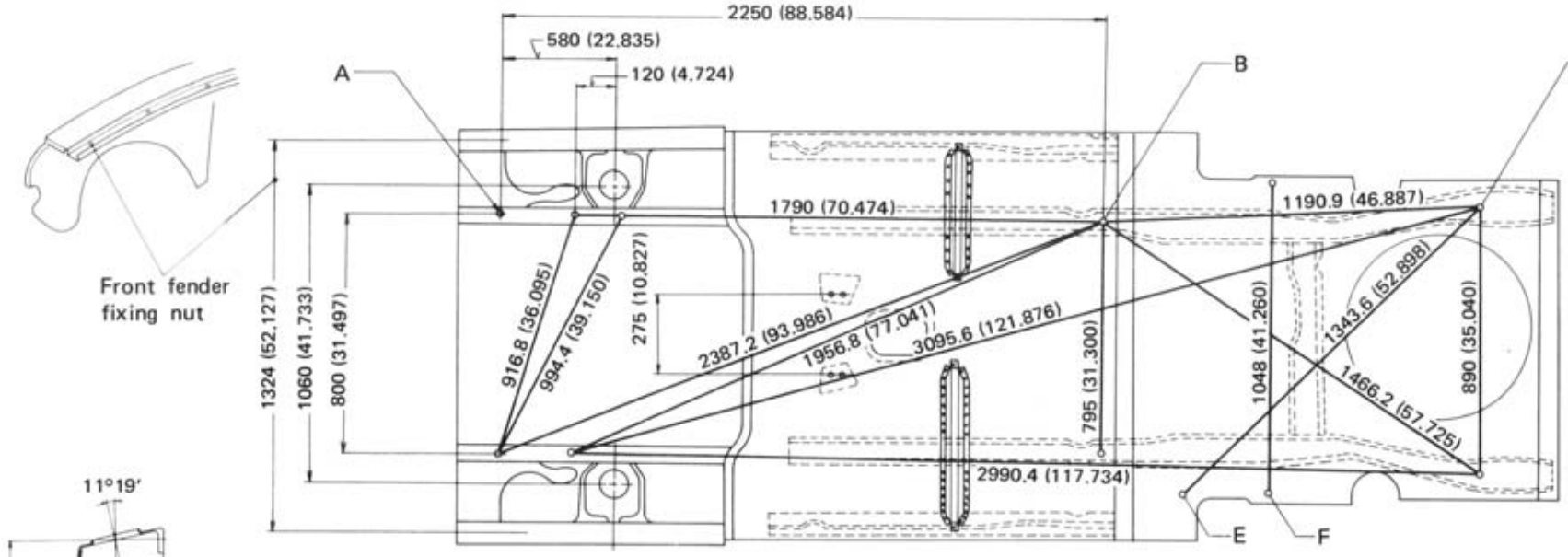
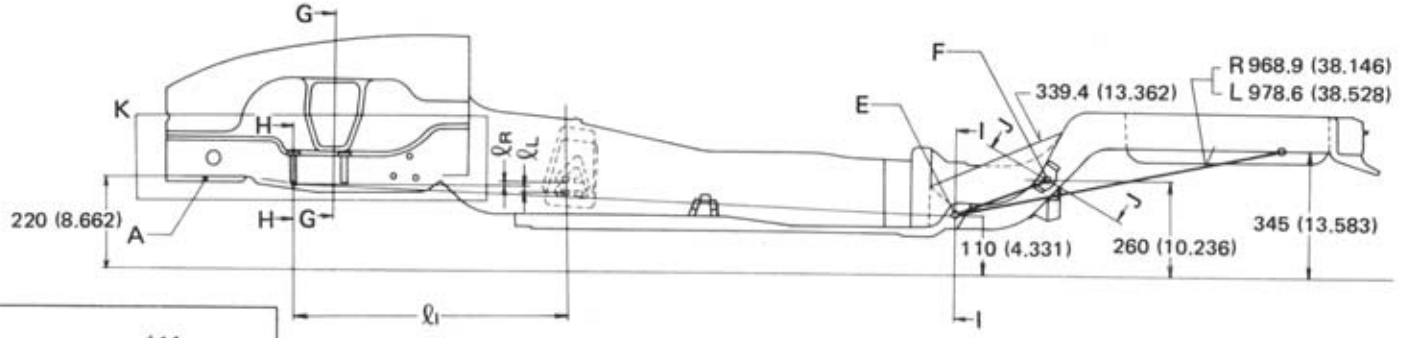


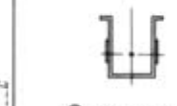
Fig. 14–52

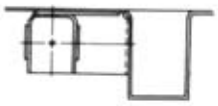
6. Install the seat belt and retractor assembly in the reverse order of removing.

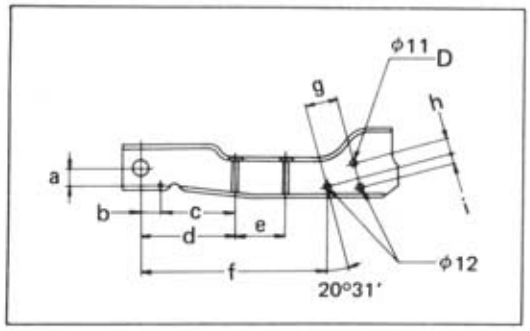
Note:
Tighten the retractor attaching bolt so that the retractor positioned vertically.











Detail of portion K

a : 45 (1.772)
b : 107 (4.213)
c : 283 (11.142)
d : 390 (15.355)
e : 140 (5.512)
f : 680 (26.772)
g : 82 (3.228)
h : 52 (2.047)
i : 33 (1.299)

A. Front frame basic hole
B. Rear frame basic hole
C. Rear frame basic hole
D. Steering gear box fixing hole
E. Lower arm fixing hole
F. Upper arm fixing hole

Transmission		ℓI	ℓR, ℓL
Automatic	Right	897.3 (35.327)	ℓR = 10.9 (0.429)
	Left	910 (35.827)	ℓL = 32.1 (1.264)
Manual	Right	932.3 (36.705)	ℓR = 8 (0.315)
	Left	945 (37.205)	ℓL = 35 (1.378)

Note: All dimensions are shown in mm. (the parenthesized figures are shown in inch.)

ELECTRICAL SYSTEM (BODY)

Fig. 15–1

15–A. RETRACTABLE HEADLIGHT

15–A–1. Replacing Retractable Headlight

1. Turn on the headlight retractor switch to raise the headlight in position.

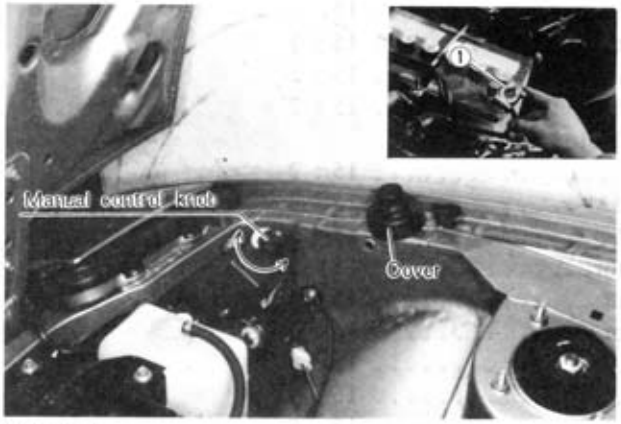


Fig. 15–2

Note:
Should the retractor do not operate automatically after the retractor switch has turned on, raise the headlight manually as follows;

1. **Disconnect the battery negative cable.**
2. **Remove the cover and turn the manual control knob on the retractor motor shaft until the headlight is fully raised.**

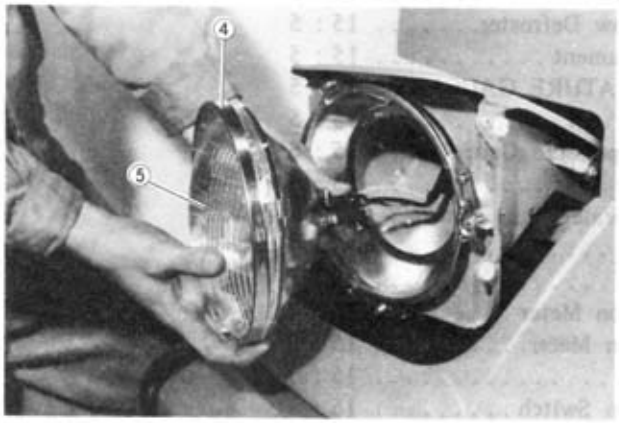


Fig. 15–3

2. Disconnect the battery negative cable.
3. Remove the headlight bezel.
4. Loosen the headlight retaining ring attaching screws. Rotate the retaining ring counterclockwise and remove it while holding the headlight.
5. Take out the headlight and disconnect the electrical connector. Remove the headlight.
6. Install a new headlight in the reverse order of removing.
7. Adjust the headlight aim, referring to Par. 15–A–2.

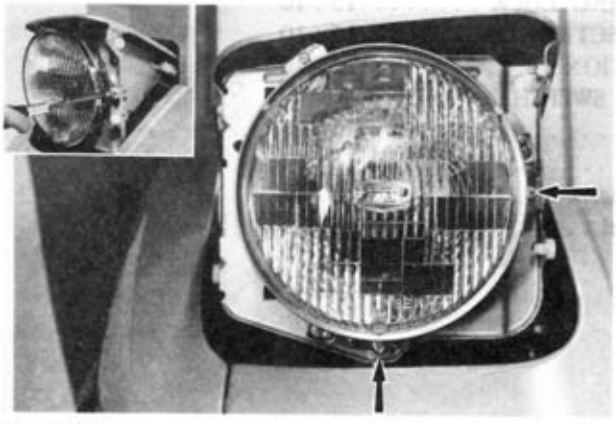


Fig. 15–4

15–A–2. Adjusting Headlight Aim

Before adjusting the headlights, make sure that the tires are inflated uniformly to recommended pressure and the vehicle is on the level ground without load. Adjust the headlights to meet the regulation of your country.

To adjust the headlights, turn the two adjusting screws until the headlight is properly aimed.

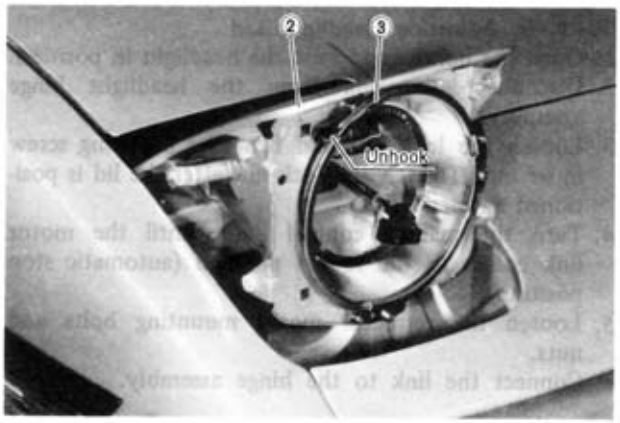


Fig. 15–5

15–A–3. Replacing Retractor Hinge

1. Remove the headlight, referring to the Par. 15–A–1.
2. Remove the headlight lid.
3. Unhook the spring from the headlight mounting ring and take out the mounting ring.

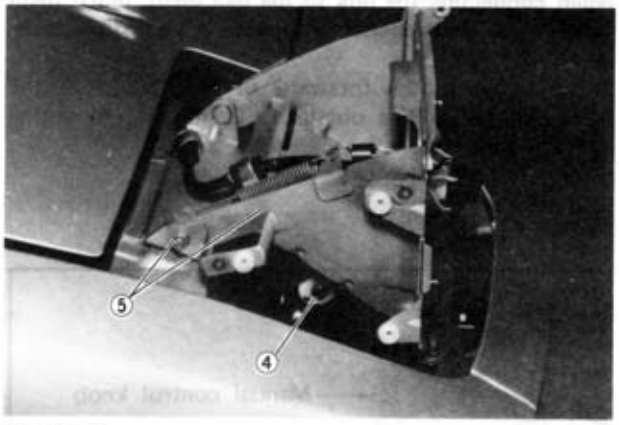


Fig. 15–6

4. Disconnect the link from hinge assembly.
5. Remove the hinge mounting nut and take out the hinge assembly.
6. Install the hinge assembly in the reverse order of removing.

Note:

a) When connecting the link to the ball pivot, pinch them with fingers (not pliers) until there is an audible click.

b) Whenever the retractor hinge assembly is replaced, make the up-down adjustment of the headlight lid, referring to Par. 15–A–5.

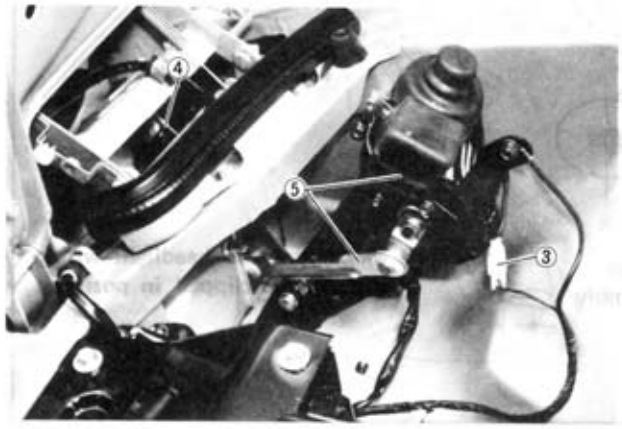


Fig. 15–7

15–A–4. Replacing Retractor Motor and Linkage Assembly

1. Open the bonnet and raise the headlight in position.
2. Remove the headlight bezel.
3. Disconnect the electrical connector.
4. Disconnect the link from headlight hinge assembly.
5. Remove the retractor motor and linkage assembly.

Fig. 15–8

5. If necessary, disassemble the retractor motor and linkage assembly.
6. Install the retractor motor and linkage assembly in the reverse order of removing.

Note:

Whenever the retractor motor and linkage assembly is replaced, make the up-down adjustment of the headlight, referring to the Par. 15–A–5.

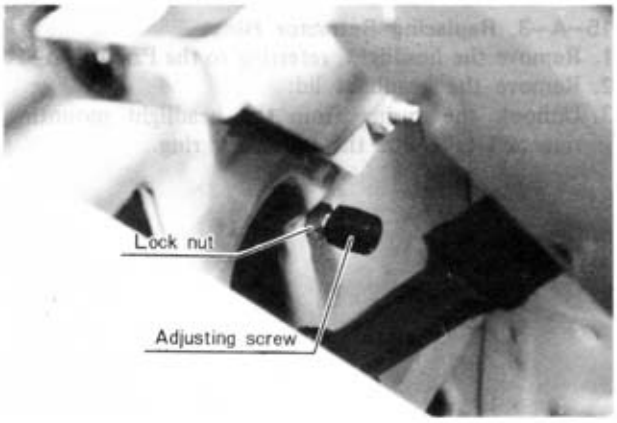


Fig. 15–9

15–A–5. Adjusting Headlight Lid

1. Open the bonnet and raise the headlight in position.
2. Disconnect the link from the headlight hinge assembly.
3. Loosen the lock nut and turn the adjusting screw in or out. Tighten the lock nut after the lid is positioned properly.
4. Turn the manual control knob until the motor link comes to the lowest position (automatic stop position).
5. Loosen the retractor motor mounting bolts and nuts.
6. Connect the link to the hinge assembly.

Note:
When connecting the link to the ball pivot, pinch them with fingers (not pliers) until there is an audible click.

7. Move the motor foreward or rearward until the desired position is obtained. Tighten the mounting bolts and nuts.

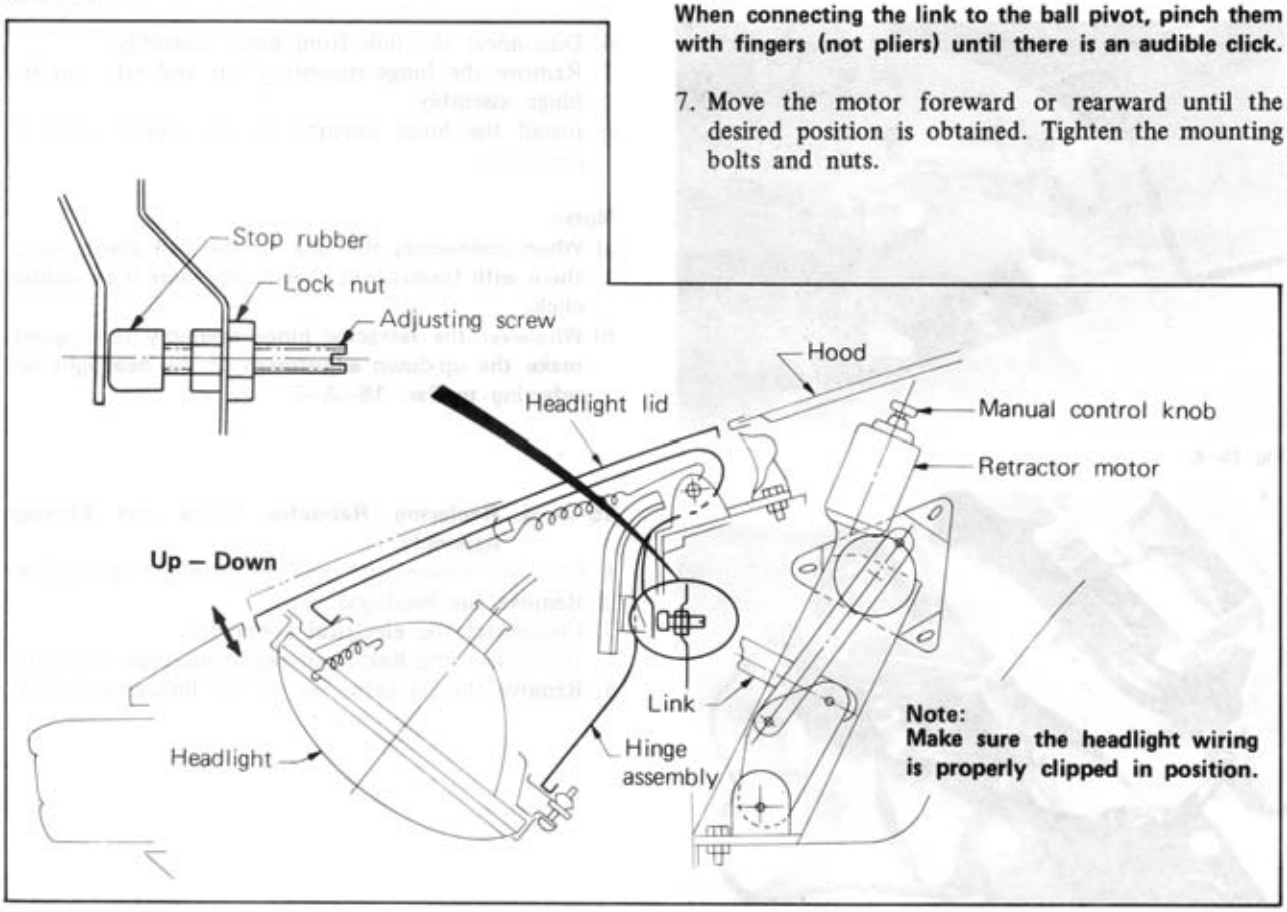


Fig. 15–10

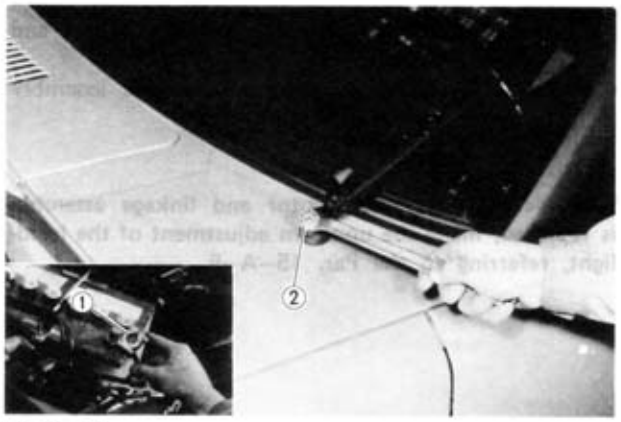


Fig. 15–11

15–B. WINDSHIELD WIPER MOTOR

15–B–1. Removing Wiper Motor

1. Operate the wiper motor and stop it so that the wiper blades stops at upper position by disconnect the battery negative cable.
2. Remove the wiper arms.
3. Remove the seal caps and then remove the nuts on the wiper linkage shaft.
4. Remove the cup washers and outer bushes.

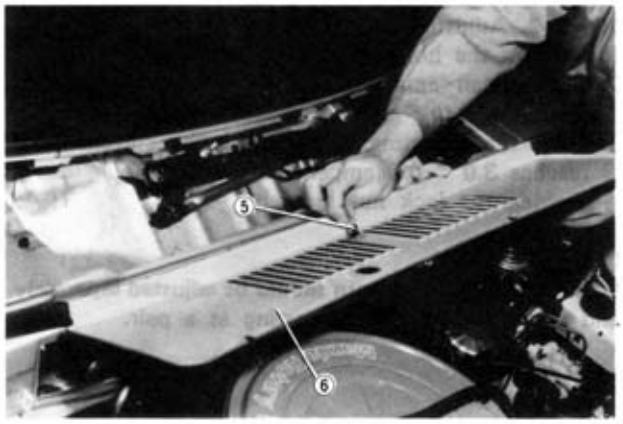


Fig. 15–12

5. Remove the cowl plate attaching screws and disconnect the washer hose at the washer nozzle.
6. Take out the cowl plate.

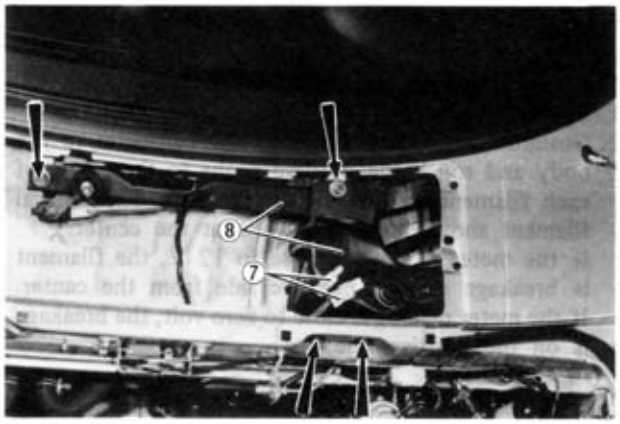


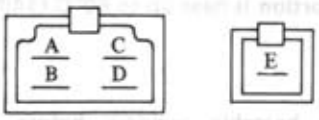
Fig. 15–13

7. Disconnect the wiring connectors at the wiper motor.
8. Remove the wiper motor and link assembly.

15–B–2. Installing Wiper Motor

Follow the removal procedures in the reverse order.

Wiper motor operation	Terminal ground	Battery positive power to	Remarks
High speed	A	D	Connect an ammeter between the battery and terminal D.
Low speed	C	D	
Auto stop	E	D	Connect jumper wire between terminal B and C.



A : LR E : B
B : LB
C : LW
D : L

15–B–3. Checking Wiper Motor

Connect the wiper motor, ammeter and battery according to the left table, and check the number of wiping revolutions and amperage.

	Wiping number	Amperage (No load)
LOW	43 ~ 60 rpm.	Less than 4A
HIGH	62 ~ 95 rpm.	Less than 4A

Note:

a) The difference in number of revolutions between LOW and HIGH should be more than 15 RPM.

b) To check the auto stop circuit, stop the wiper motor so that the blades stops at upper position when checking the low speed circuit.

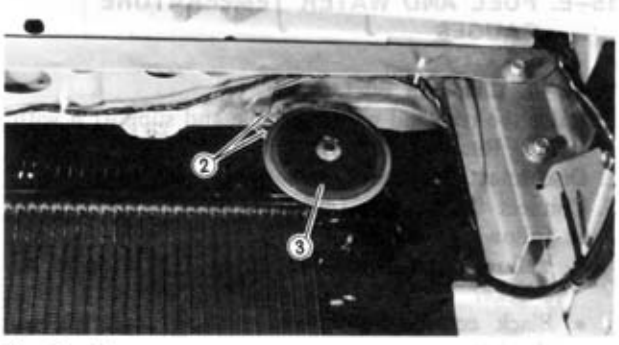


Fig. 15–14

15–C. HORN

15–C–1. Removing Horn

1. Remove the radiator grille.
2. Disconnect the connectors at the horn.
3. Remove the horn.

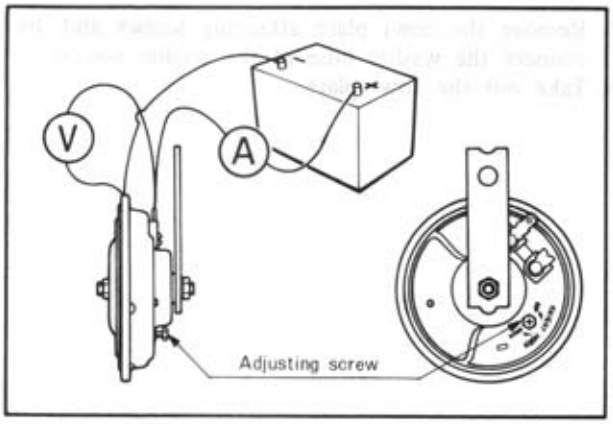


Fig. 15–15

15–C–2. Adjusting Horn

1. Remove the horn.
2. Connect an ammeter and voltmeter as shown in figure.
3. Turn the adjusting screw until the current flow reaches **3.0 ± 0.5 amperes at 12 volts.** Tighten the lock nut securely.

Note:
When adjusting, each horn should be adjusted separately and check for tone by operating as a pair.

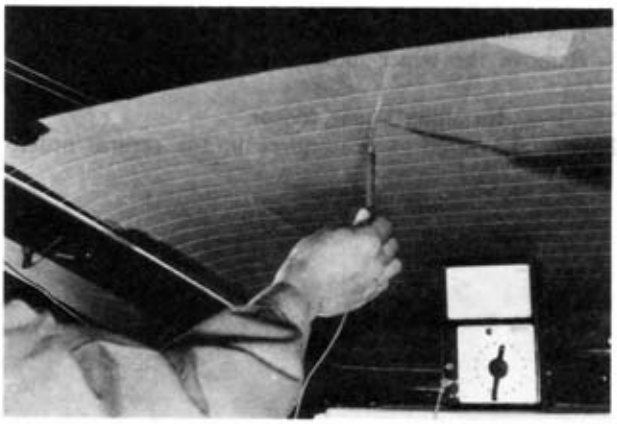


Fig. 15–16

15–D. REAR WINDOW DEFROSTER

15–D–1. Checking Rear Window Defroster

1. Switch on the defroster switch.
2. Ground the negative probe of the voltmeter to the body and touch the positive probe to the center of each filament to measure the voltage. The normal filament shows approx. 6 volts at the center.
   If the meter reading is close to 12 V, the filament is breakage on the negative side from the center.
   If the meter reading is close to zero volt, the breakage is on the positive side.

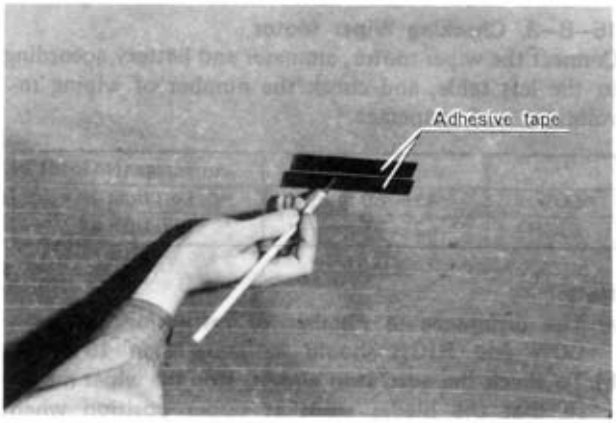


Fig. 15–17

15–D–2. Repairing Printed Filament

1. Clean the broken portion with solvent.
2. Apply an adhesive tape to the glass as shown in figure.
3. By using a small brush or drawing pen, coat conductive silver paint (Part No. 2835 77 600), i.e., Dupont No. 4817 to the broken portion.
4. Dry the painted portion completely by leaving it intact for **24 hours at 20°C (68°F) (for 30 minutes when the painted portion is heat up to 60°C (140°C) with a dryer).**

Note:
a) Never operate the heatable window before the paint has completely dried.
b) Do not use any alkaline chemical cleanser to clean the portion thus repaired.

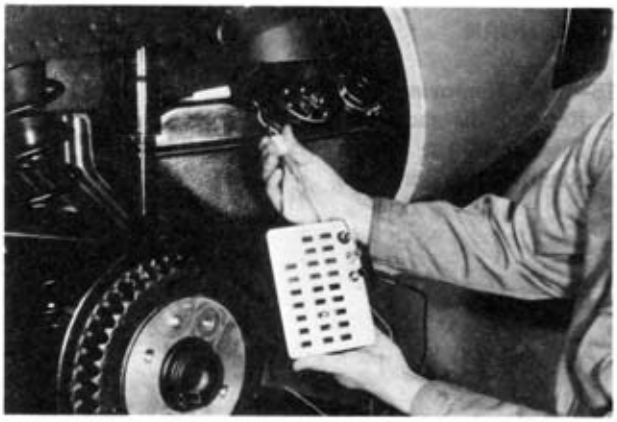


Fig. 15–18

15–E. FUEL AND WATER TEMPERATURE GAUGES

15–E–1. Checking Fuel Gauge

1. Raise the rear end of the vehicle and support it with stands. Remove the rear left tire.
2. Disconnect the connector from the gauge unit.
3. Connect the **checker** (49 0839 285) to the coupler as following manner.
   - Yellow color wire terminal to ⊕ terminal on checker
   - Black color wire terminal to ⊖ terminal on checker

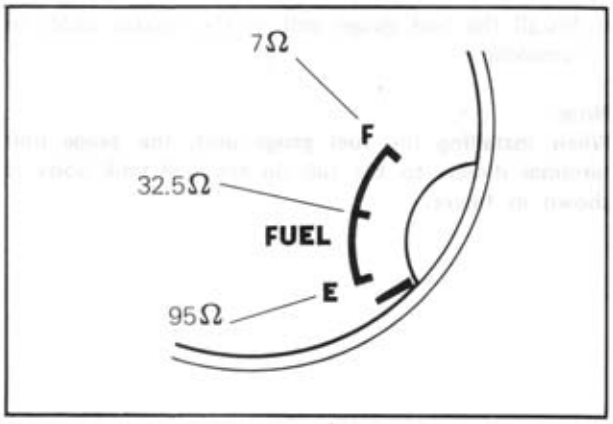


Fig. 15–19

4. Set the checker to specified resistance value as shown in figure.
5. Turn the ignition switch on and check whether the gauge needle point properly.
   If the gauge needle points properly, the trouble is in the gauge unit while the trouble is in the meter, if the gauge indicates inaccurate.

Note:
a) Wait for about 2 minutes before judgement.
b) The tolerance is roughly ± 2 widths of needle.

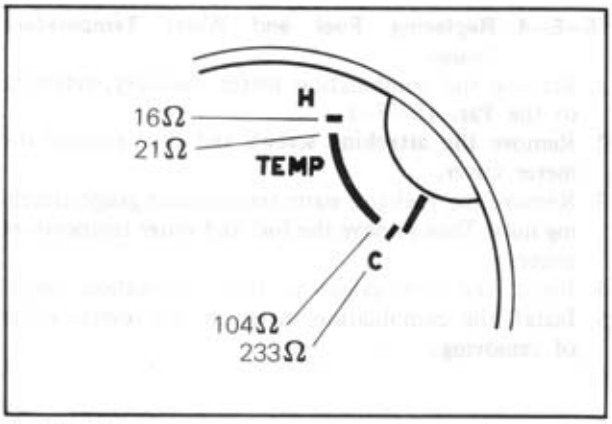


Fig. 15–20

15–E–2. Checking Water Temperature Gauge

1. Disconnect the connector from the water thermo unit.
2. Connect a ⊕ probe of the **checker** (49 0839 285) to the connector and ⊖ probe to earth connection.
3. Set the checker to specified resistance value and check the gauge in the same manner for the fuel gauge.

Note:
a) Wait for about 2 minutes before judgement.
b) The tolerance is roughly ± 2 widths of needle.

Fig. 15–21

15–E–3. Checking Fuel Gauge Unit

1. Disconnect the battery negative cable.
2. Raise the rear end of the vehicle and support it with stands. Remove the rear left tire.
3. Remove the fuel tank cover.
4. Disconnect the connector from the gauge unit.
5. Remove the fuel gauge unit.

Note:
When the fuel gauge unit is removed, keep sparks, cigarettes and open flames away from the fuel tank.

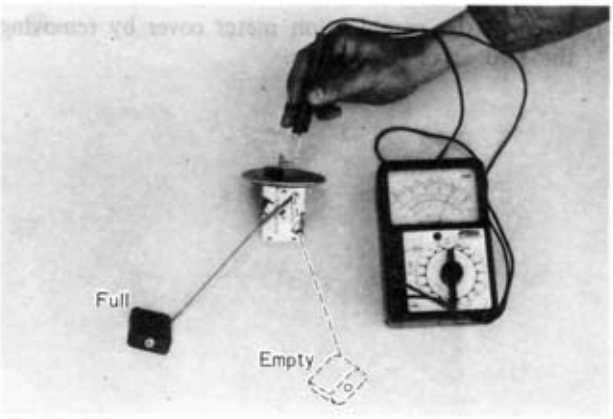


Fig. 15–22

6. Connect an ohmmeter to the fuel tank gauge unit terminals.
7. Slowly move the unit arm to Full or Empty positions until the unit arm contact with the stopper on the unit body.
   If the reading is only slightly off from standard value, correct it by bending the unit arm.
   The standard resistance is as follows.

Full position :	$3^{+2}_{-3}\ \Omega$
Empty position:	$110^{+11}_{-7}\ \Omega$

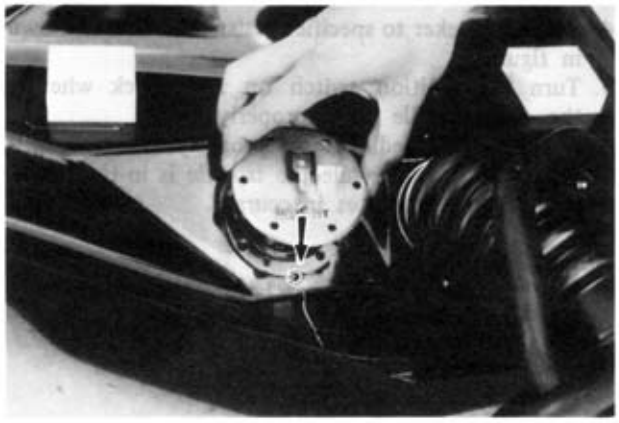


Fig. 15–23

6. Install the fuel gauge unit in the reverse order of removing.

Note:
When installing the fuel gauge unit, the gauge unit terminal directs to the rub on the fuel tank body as shown in figure.

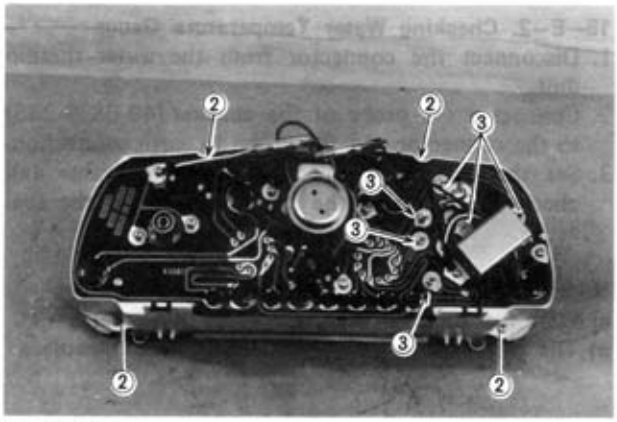


Fig. 15–24

15–E–4. Replacing Fuel and Water Temperature Gauge

1. Remove the combination meter assembly, referring to the Par. 15–F–1.
2. Remove the attaching screws and then remove the meter cover.
3. Remove the fuel and water temperature gauge attaching nuts. Then remove the fuel and water temperature gauges.
4. Install the new gauges to the combination meter.
5. Install the combination meter in the reverse order of removing.

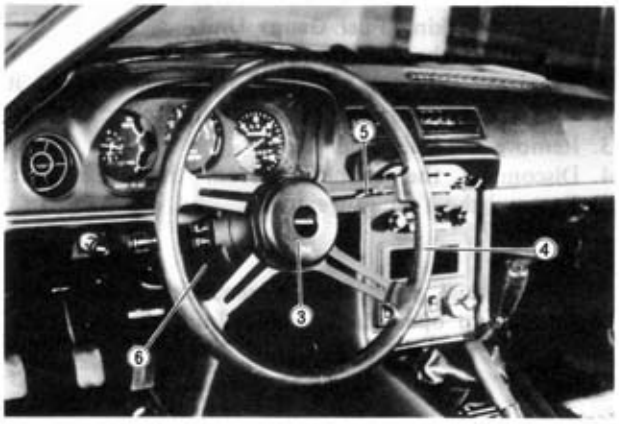


Fig. 15–25

15–F. COMBINATION METER

15–F–1. Removing Combination Meter

1. Disconnect the battery negative cable.
2. Disconnect the speedometer cable.
3. Pull out the steering wheel center cap.
4. Remove the steering wheel.
5. Pull the light switch knob off the shaft.
6. Remove the steering column cover.

Note:
Before taking the column cover (left) out of the combination switch lever, detach the hole cover from the column cover.

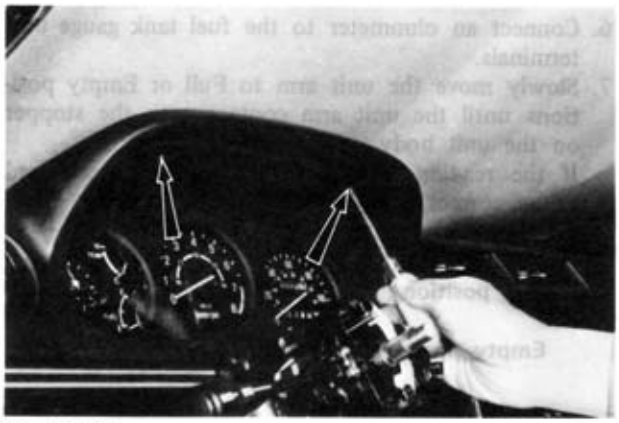


Fig. 15–26

7. Remove the combination meter cover by removing the two attaching screws.

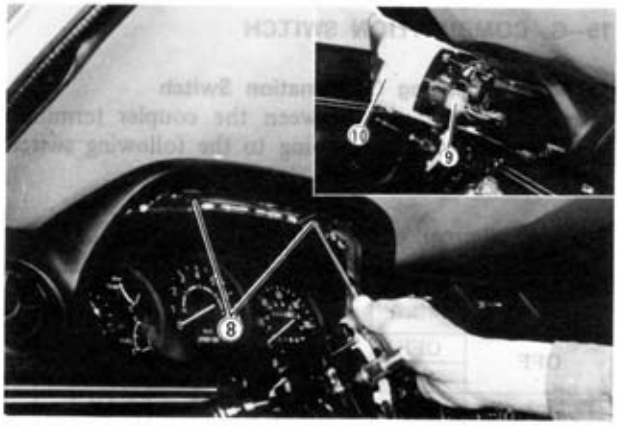
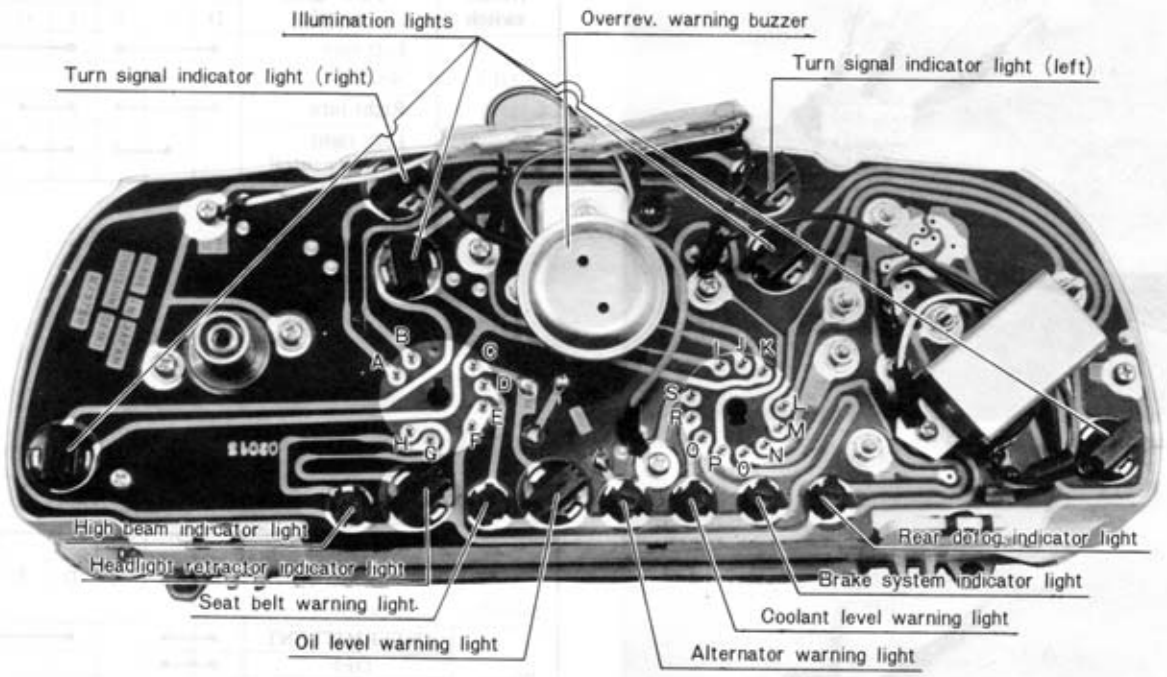


Fig. 15–27

8. Remove the combination meter assembly attaching screws.
9. Draw out the combination meter assembly, and disconnect the multiple connectors.
10. Take out the combination meter assembly.

15–F–2. Checking Combination Meter

1. Visually inspect the print panel for any damage and rust.
2. Check the continuity between the connector pin and indicator light, and that between connector pin and gauge using an ohmmeter.



A. Turn signal indicator light (right)
B. Turn signal indicator light (left)
C. Oil level warning light
D. Seat belt warning light
E. Earth
F. Earth
G. High beam indicator light
H. Headlight retractor indicator light
I. Tachometer
J. Illumination lights
K. Illumination lights
L. Water temperature gauge
M. Auto clock
N. Fuel gauge
O. Rear defogger indicator light
P. Power source (Ig. terminal)
Q. Brake system warning light
R. Coolant level warning light
S. Alternator warning light

Fig. 15–28

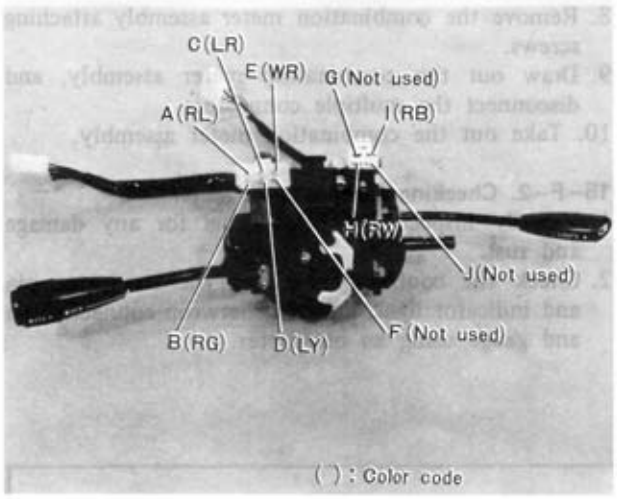


Fig. 15–29

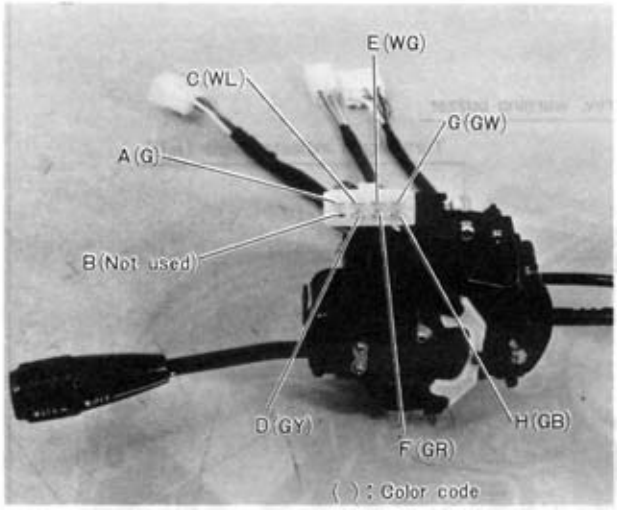


Fig. 15–30

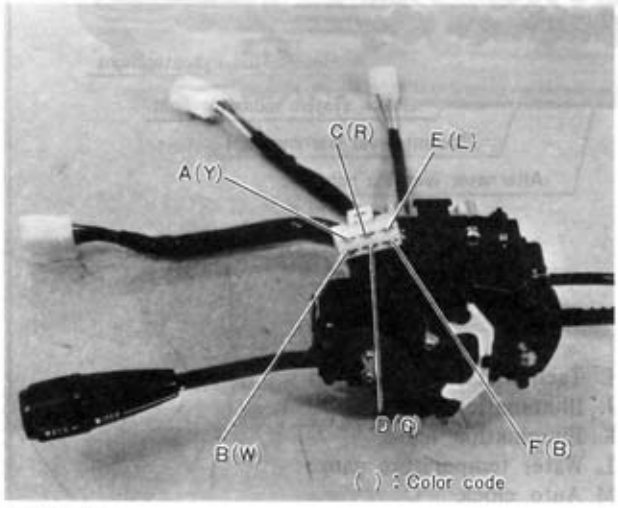


Fig. 15–31

15–G. COMBINATION SWITCH

15–G–1. Checking Combination Switch

Check the continuity between the coupler terminals using an ohmmeter according to the following switch interconnection diagram.

1. Light, dimmer and passing switch

Light switch	Passing switch	Dimmer switch	Terminal						
			E	C	A	B	D	H	I
OFF	OFF				•		•		
	ON		•		•		•	•	
Parking, Marker lights	OFF				•		•		
	ON		•		•		•	•	
Head light		LOW	•	•	•				•
		HIGH	•		•			•	

2. Turn signal and hazard switch

Hazard switch	Turn signal switch	Terminal					
		D	C	E	F	G	H
OFF	Left turn	•		•	•		•
	Neutral	•		•			
	Right turn	•		•	•		
ON	Left, right turn or neutral		•	•	•	•	•

3. Wiper and washer switch

Switch	Terminal / Switch position	A	B	C	D	E	F
Wiper	INTERMITTENT	•	•		•		•
	OFF	•	•				
	LOW		•				•
	HIGH			•			•
Washer	OFF						
	ON					•	•

15–G–2. Replacing Combination Switch

1. Disconnect the battery negative cable.
2. Remove the steering wheel.
3. Remove the column covers.
4. Disconnect the wire connectors.
5. Remove the stop ring from the column shaft.
6. Remove the combination switch.
7. Install the new combination switch in the reverse order of removing.

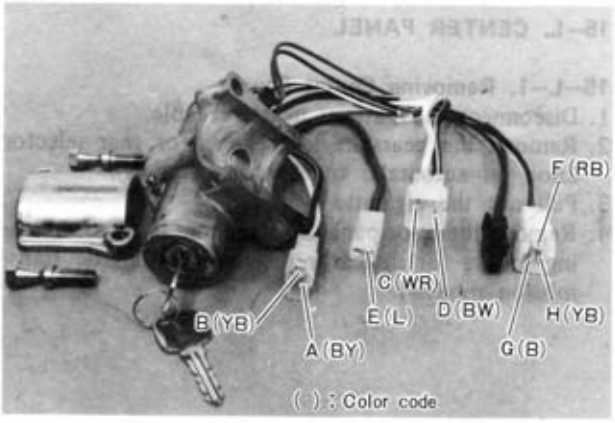


Fig. 15–32

15–H. IGNITION SWITCH & STEERING LOCK

Check the continuity between the coupler terminals using an ohmmeter according to the following switch interconnection diagram.

Terminal / Key position	C	D	A	E	B	F	H	G
ACC	●			●				
ON	●	●		●		●	●	
START	●	●	●		●	●		●

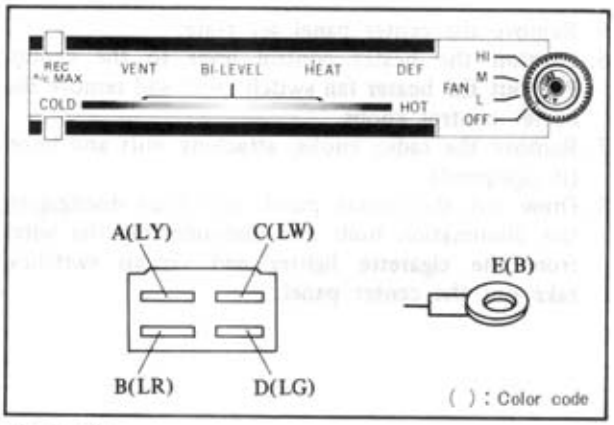


Fig. 15–33

15–I. HEATER FAN SWITCH INSPECTION

Check the continuity between the coupler terminals using an ohmmeter according to the following switch interconnection diagram.

Terminal / Switch position	A	B	C	E
High	●			●
Medium		●		●
Low			●	●

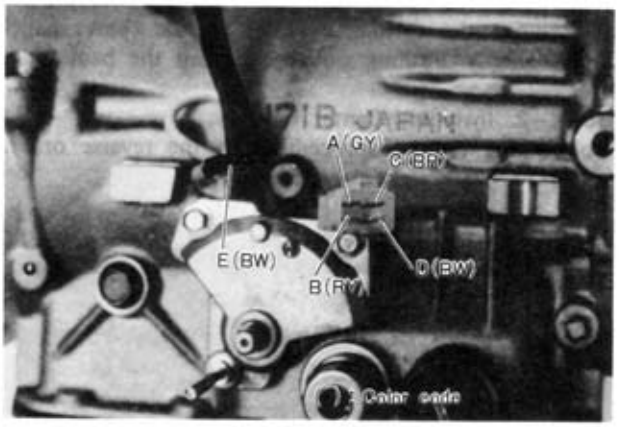


Fig. 15–34

15–J. INHIBITOR SWITCH INSPECTION

Check the continuity between the coupler terminals using an ohmmeter according to the following switch interconnection diagram.

Terminal / Switch position	A	B	C	E
P			●	●
R	●	●		
N			●	●

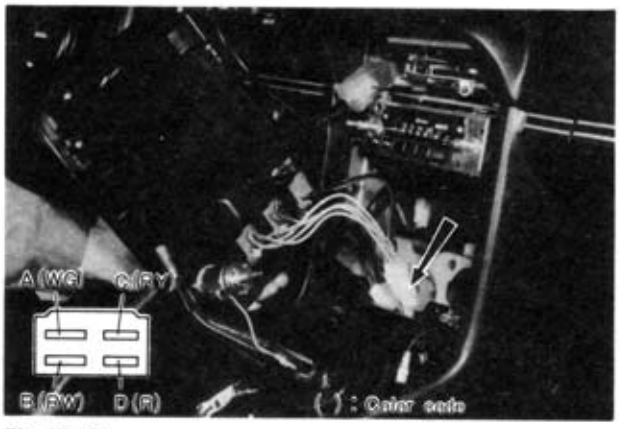


Fig. 15–35

15–K. RETRACTABLE HEADLIGHT SWITCH INSPECTION

Check the continuity between the coupler terminals using an ohmmeter according to the following switch interconnection diagram.

Terminal / Switch position	A	B	C	D
ON	●			●
OFF		●	●	

Fig. 15–36

Fig. 15–37

Fig. 15–38

15–L. CENTER PANEL

15–L–1. Removing Center Panel

1. Disconnect the battery negative cable.
2. Remove the gearshift lever knob (or gear selector knob on automatic transmission models).
3. Pull out the cigarette lighter.
4. Remove the boot panel by removing the two attaching screws (or indicator panel on automatic transmission models).
5. Remove the center panel set plate.
6. Position the heater control lever to the center. Pull out the heater fan switch knob and remove the heater control knobs.
7. Remove the radio knobs, attaching nuts and bezel (if equipped).
8. Draw out the center panel, and after disengaging the illumination bulb and disconnecting the wires from the cigarette lighter and various switches, take out the center panel.
9. Remove the various switches on the center panel by simply pushing out them from the back side.

15–L–2. Installing Center Panel

Follow the removal procedures in the reverse order.

TECHNICAL DATA

ENGINE

Displacement	573 cc (35.0 cu-in) x 2 rotors
Compression ratio	9.4 : 1
Compression pressure	
Limit	6.0 kg/cm² (85 lb/in²) at 250 rpm
Max. permissible difference between chambers	1.5 kg/cm² (21 lb/in²)
Port timing	
Intake opens	32° ATDC
Intake closes	40° ABDC
Exhaust opens	75° BBDC
Exhaust closes	38° ATDC
Side housings (Front, intermediate and rear housings)	
Width standard	
Front	40 mm (1.575 in)
Intermediate	50 mm (1.969 in)
Rear	60 mm (2.362 in)
Limit of distortion	0.04 mm (0.0016 in)
Limit of wear	
Sliding surface	0.10 mm (0.0039 in)
Rotor housing	
Width	70 mm (2.7559 in)
Max. permissible difference in width	0.06 mm (0.0024 in)
Rotor	
Width	69.85 mm (2.750 in)
Clearance of side housing and rotor (△R)	
Standard	0.12 ~ 0.18 mm (0.0047 ~ 0.0071 in)
Limit	0.10 mm (0.004 in)
Apex seal	
Length	69.85 mm (2.750 in)
Width	3.0 mm (0.1181 in)
Height	
Standard	8.5 mm (0.3347 in)
Limit	7.0 mm (0.2756 in)
Clearance of apex seal and side housing (△S)	
Standard	0.13 ~ 0.19 mm (0.0051 ~ 0.0075 in)
Clearance of apex seal and rotor groove (△G)	
Standard	0.05 ~ 0.09 mm (0.0020 ~ 0.0035 in)
Limit	0.15 mm (0.0059 in)
Apex seal spring	
Free height	
Standard	6.9 mm (0.2717 in) or more
Limit	5.5 mm (0.2165 in)
Side seal	
Thickness	1.0 mm (0.0394 in)
Height	3.5 mm (0.1378 in)
Clearance of side seal and rotor groove (△W)	
Standard	0.03 ~ 0.08 mm (0.0012 ~ 0.0031 ir
Limit	0.10 mm (0.0039 in)
Clearance of side seal and corner seal (△E)	
Standard	0.05 ~ 0.15 mm (0.0020 ~ 0.0059 in)
Limit	0.40 mm (0.0157 in)
Side seal protrusion	More than 0.5 mm (0.0197 in)
Oil seal	
Height	5.6 mm (0.2205 in)
Contact width of oil seal lip	Less than 0.5 mm (0.020 in)
Oil seal protrusion	More than 0.5 mm (0.020 in)
Corner seal	
Outer diameter	11.0 mm (0.4331 in)
Height	7.0 mm (0.2756 in)
Corner seal protrusion	More than 0.5 mm (0.020 in)
Main bearing clearance	
Standard	0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in)
Wear limit	0.10 mm (0.0039 in)
Rotor bearing clearance	
Standard	0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in)
Wear limit	0.10 mm (0.0039 in)
Eccentric shaft	
Eccentricity of rotor journal	15.0 mm (0.5906 in)
Main journal diameter	43 mm (1.6929 in)
Rotor journal diameter	74 mm (2.9134 in)
Max. permissible run-out	0.06 mm (0.0024 in)
End play	
Standard	0.04 ~ 0.07 mm (0.0016 ~ 0.0028 in)
Limit	0.09 mm (0.0035 in)
Alternator belt tension (slack) (Between alternator and eccentric shaft pulleys)	
Belt deflection	15 ± 2 mm (0.59 ± 0.08 in)
Air pump belt tension (slack) (Between air pump and water pump pullys)	
Belt deflection	12 ± 1 mm (0.47 ± 0.04 in)

LUBRICATING SYSTEM

Oil pump	
Type	Rotor
Feeding capacity at 1,000 rpm of engine	5.0 liters/min. (5.3 U.S. quarts/min. 4.4 Imp. quarts/min.)
Oil pump driven by	Chain and sprockets
Limit of chain slack	12 mm (0.47 in)
Outer rotor and body clearance	
Standard	0.20 ~ 0.25 mm (0.0079 ~ 0.0098 in)
Wear limit	0.30 mm (0.0118 in)
Clearance between rotor lobes	
Standard	0.01 ~ 0.09 mm (0.0004 ~ 0.0035 in)
Wear limit	0.15 mm (0.0059 in)
Rotor end float	
Standard	0.03 ~ 0.13 mm (0.0012 ~ 0.0051 in)
Wear limit	0.15 mm (0.0059 in)
Oil pressure at 3,000 rpm of engine	4.5 ~ 5.5 kg/cm² (64 ~ 78 lb/in²)

Oil pressure at idle speed of engine	0.9 ~ 2.7 kg/cm² (13 ~ 38 lb/in²)
Pressure regulator valve (Rear housing)	
Operating pressure	5.0 kg/cm² (71.1 lb/in²) at 3,000 rpm of engine
Free length of spring	46.4 mm (1.8267 in)
Pressure control valve (Front cover)	
Operating pressure	11.0 kg/cm² (156 lb/in²)
Free length of spring	73.0 mm (2.874 in)
By-pass valve (Oil cooler)	
Starts to close	50 ~ 55°C (122 ~ 131°F)
Fully closes	60 ~ 65°C (140 ~ 149°F)
Opening pressure	3.56 kg/cm² at 60°C (50.6 lb/in² at 140°F)
Oil filter	
Type	Full flow, cartridge
Relief valve opens at	0.8 ~ 1.2 kg/cm² (11 ~ 17 lb/in²)
Oil metering pump	
Feeding capacity of 2,000 rpm of engine	2.0 ~ 2.5 cc/6 min. (0.068 ~ 0.085 U.S. oz/6 min.)
Lubricant	
Classification	A.P.I. Service SD or SE
−10°C ~ 40°C (15°F ~ 100°F)	SAE 20W-40
−10°C ~ 50°C (15°F ~ 120°F)	SAE 20W-50
−18°C ~ 30°C (0°F ~ 85°F)	SAE 10W-30
−18°C ~ 40°C (0°F ~ 100°F)	SAE 10W-40
−18°C ~ 50°C (0°F ~ 120°F)	SAE 10W-50
Below −18°C (0°F)	SAE 5W-20 or 5W-30
Oil capacity	
Full capacity	5.2 liters (5.5 U.S. quarts / 4.6 Imp. quarts)
Oil pan capacity	4.2 liters (4.4 U.S. quarts / 3.7 Imp. quarts)

COOLING SYSTEM

Water pump	
Type	Centrifugal impeller
Feeding capacity at 6,500 rpm of engine	150 ~ 160 liters/min. (39.6 ~ 42.3 U.S. gal/min. / 33.0 ~ 35.2 Imp. gal/min.)
Pump driven by	"V" belt
Pulley ratio of eccentric shaft and pump	1 : 1.18
Fan	
Fan diameter	410 mm (16.1 in)
Number of fan blades	7
Fan drive	
Standard revolution of fan	1,400 ± 200 rpm at 4,200 rpm of engine
Thermostat	
Type	Wax pellet
Starts to open	82 ± 1.5°C (180 ± 2.7°F)
Fully opens at	95°C (203°F)
Lift	8 ~ 10 mm (0.3 ~ 0.4 in)
Radiator	
Type	Corrugated fin, with expansion tank
Pressure cap opens at	0.9 ± 0.15 kg/cm² (13.0 ± 2 lb/in²)
Cooling capacity	
With heater	9.5 liters (10 U.S. quarts / 8.4 Imp. quarts)
Without heater	8.5 liters (9.0 U.S. quarts / 7.5 Imp. quarts)

FUEL SYSTEM

Fuel tank capacity	55 liters (14.5 U.S. gal / 12.1 Imp. gal)
Fuel pump	
Type	Electrical, plunger
Fuel pressure	0.26 ~ 0.33 kg/cm² (3.70 ~ 4.70 lb/in²)
Feeding capacity	More than 1,100 cc/min. (1.16 U.S. quarts/min. / 0.97 Imp. quart/min.)
Fuel filter	Cartridge, paper element
Carburetor	
Type	Down draft, 2 stage 4 barrel
Throat diameter	
Primary	28 mm (1.10 in)
Secondary	34 mm (1.34 in)
Venturi diameter	
Primary	20 X 13 X 6.5 mm (0.79 X 0.51 X 0.26 in)
Secondary	28 X 10 mm (1.10 X 0.39 in)

	Manual transmission	Automatic transmission
Main jet		
Primary Calif.	#94	#95
Primary Except Calif.	#93	#93
Secondary	#160	#160
Main air bleed		
Primary	#90	#90
Secondary		
U.S.A.	#160	#160
Canada	#140	#140
Slow jet		
Primary		
Calif., Canada	#46	#46
Except for Calif., Canada	#48	#46
Secondary		
Calif.	#80	#80
Except for Calif.	#100	#100
Canada	#120	#120
Slow air bleed		
Primary No. 1	#70	#70
No. 2	#150	#150
Secondary No. 1	#160	#160
No. 2	#60	#60
Richer jet	#40	—
Richer air bleed	#140	—
Power jet		
California	#45	#45
Except for California	#50	#50

Vacuum jet		
Primary	1.8 mm (0.0709 in)	1.8 mm (0.0709 in)
Secondary	1.0 mm (0.0394 in)	1.0 mm (0.0394 in)
Fast idle adjustment (Clearance between primary throttle valve and bore when choke knob is fully pulled)	U.S.A. 1.30 ~ 1.50 mm (0.051 ~ 0.059 in) Canada 0.90 ~ 1.10 mm (0.035 ~ 0.043 in)	
Float level (from surface of gasket)	16.0 ± 0.5 mm (0.63 ± 0.020 in)	
Float drop (from surface of gasket)	51 ± 0.5 mm (2.0 ± 0.02 in)	
Idle speed		
Manual transmission	750 ± 25 rpm	
Automatic transmission ("D" range)	750 ± 25 rpm	
CO. concentration at idle	Less than 0.1%	
Sub-zero starting assist fluid	Anti-freeze 90% Water 10%	

ELECTRICAL SYSTEM

Battery		
Type		
California	G60-5, Y60-5, N50-S, K60-5	
Except for California		
Manual transmission	G60-5, Y60-5, N50-S, K60-5	
Automatic transmission	NS70S	
Canada	NS70S	
Capacity (20hour rate)	55 amp. NS70S 45 amp. G60-5, Y60-5, N50-S, K60-5	
Voltage	12 Volt	
Terminal ground	Negative	
Specific gravity at 20°C (68°F)	G60-5, Y60-5, N50-S, K60-5	NS70S
Fully charged	1.260	1.280
Recharged at	1.200	1.220
Distributor		
Air gap	0.2 ~ 0.6 mm (0.008 ~ 0.024 in)	
Centrifugal advance		
Leading	Starts: 0° at 500 rpm Maximum: 10° at 1,500 rpm	
Trailing	Starts: 0° at 500 rpm Maximum: 10° at 1,500 rpm	
Vacuum advance		
Leading	Starts: 0° at −100 mm-Hg Maximum: 7.5° at −400 mm-Hg	
Trailing	Starts: 0° at −200 mm-Hg Maximum: 15° at −400 mm-Hg	
Condenser capacity	0.24 ~ 0.30μF	
Firing order	1−2	
Ignition timing		
Leading	0 ± 1° ATDC	
Trailing	20 ± 2°ATDC	
Timing mark location	Eccentric shaft pulley	
Spark plug		
Type	NGK: BR7ET, BR8ET, BR9ET NIPPON DENSO: W22EBR W25EBR W27EBR	
Initial gap	1.05 ± 0.05 mm (0.041 ± 0.002 in)	
Alternator		
Ground	Negative	
Rated output	12V 55A	
Number of poles	12	
Load test		
Voltage	13.5V	
Current	39amp.	
Revolution	Less than 2,500 rpm	
Number of brushes	2	
Brush length	18 mm (0.71 in)	
Wear limit	8 mm (0.31 in)	
Brush spring pressure	315 ~ 426 gr (11 ~ 15 oz)	
Pulley ratio of eccentric shaft and alternator	1 : 1.82	
Ignition coil (Leading)		
Type	LB-84 or FTC-3	
Primary resistance	0.9 ± 0.09Ω at 20°C (68°F)	
Ignition coil (Trailing)		
Type	LB-84 or FTC-3	
Primary resistance	0.9 ± 0.09Ω at 20°C (68°F)	

	Manual transmission	Automatic transmission
Starting motor		
Capacity	1.2KW	2.0KW
Lock test		
Voltage	5.0 volt	5.0 volt
Current	Less than 600 amp.	Less than 1,050 amp.
Torque	0.96 m-kg (6.9 ft-lb)	2.2 m-kg (15.9 ft-lb)
Free running test		
Voltage	11.5 volt	11.5 volt
Current	Less than 50 amp.	Less than 100 amp.
Speed	More than 5,600 rpm	More than 6,600 rpm
Number of brushes	4	4
Brush length	18.5 mm (0.73 in)	18.5 mm (0.73 in)
Wear limit	11.5 mm (0.45 in)	11.5 mm (0.45 in)

Brush spring pressure	1.4 ~ 1.8 kg (49 ~ 63 oz)	1.4 ~ 1.8 kg (49 ~ 63 oz)
Control switch	Solenoid	Solenoid
Voltage required to close solenoid contacts	Less than 8 volt	Less than 8 volt
Undercutting mica	0.5 ~ 0.8mm (0.020 ~ 0.031 in)	0.5 ~ 0.8mm (0.020 ~ 0.031 in)
Clearance between armature shaft and bush	Less than 0.2 mm (0.008 in)	Less than 0.2 mm (0.008 in)
Armature shaft end play	0.1 ~ 0.4mm (0.004 ~ 0.016 in)	0.1 ~ 0.4mm (0.004 ~ 0.016 in)
Clearance between pinion and stop collar	0.5 ~ 2.0mm (0.020 ~ 0.079 in)	0.5 ~ 2.0mm (0.020 ~ 0.079 in)

CLUTCH

Clutch pedal	
Free play (at pedal pad)	0.6 ~ 3.1 mm (0.024 ~ 0.122 in)
Engagement height (from floor)	More than 75 mm (2.95 in)
Master cylinder	
Bore	15.87 mm (0.625 in)
Clearance between piston and bore	
Standard	0.032 ~ 0.102 mm (0.0013 ~ 0.0040 in)
Limit	0.15 mm (0.006 in)
Release cylinder	
Bore	19.05 mm (0.750 in)
Clearance between piston and bore	
Standard	0.040 ~ 0.125 mm (0.0016 ~ 0.0049 in)
Limit	0.15 mm (0.006 in)
Clutch disc	
Thickness limit	7.0 mm (0.276 in)
Rivet depth limit	0.3 mm (0.012 in)
Lateral run-out limit	1.0 mm (0.039 in)
Diaphragm	
Finger out of alignment	
Limit	1.0 mm (0.039 in)
Finger groove wear dipth	
Limit	1.0 mm (0.039 in)

MANUAL TRANSMISSION

Gear ratio	4-Speed	5-Speed
First	3.674	3.674
Second	2.217	2.217
Third	1.432	1.432
Fourth	1.000	1.000
Reverse	3.542	3.542
Fifth		0.825

Oil capacity	1.7 liters (1.8 U.S. quarts / 1.5 Imp quarts)
Main shaft	
Max. permissible run-out	0.03 mm (0.0012 in)
Clearance between main shaft and gear (or bush)	
Wear limit	0.15 mm (0.006 in)
Reverse idle gear	
Clearance between reverse idle gear bush and shaft	
Wear limit	0.15 mm (0.006 in)
Shift fork and rod	
Clearance between shift fork and clutch sleeve	
Wear limit	0.5 mm (0.020 in)
Clearance between shift rod gate and control lever	
Wear limit	0.8 mm (0.031 in)
Synchronizer ring	
Clearance between synchronizer ring and side of gear when fitted	
Standard	1.5 mm (0.059 in)
Wear limit	0.8 mm (0.031 in)
Lubricant	
Above −18°C (0°F)	A.P.I. Service GL-4 or GL-5 SAE90
Below −18°C (0°F)	A.P.I. Service GL-4 or GL-5 SAE80

AUTOMATIC TRANSMISSION

Gear ratio	
Low	2.458
Second	1.458
Top	1.000
Reverse	2.181
Fluid type	M2C33F (Type F)
Fluid capacity	6.2 liters (6.6 U.S. quarts / 5.5 Imp. quarts)
Drive plate run-out	
Limit	0.5 mm (0.020 in)
Oil pump	
Side play of inner gear and outer gear	
Limit	0.08 mm (0.003 in)
Clearance between outer gear and crescent	
Limit	0.25 mm (0.010 in)
Clearance between outer gear and housing	
Limit	0.25 mm (0.010 in)
Side clearance between oil seal ring and groove on oil pump cover	0.04 ~ 0.16 mm (0.002 ~ 0.006 in)
Front clutch	
Thickness of drive plate	
Limit	1.4 mm (0.055 in)
Total clearance measured between retaining plate and snap ring	1.6 ~ 1.8 mm (0.063 ~ 0.071 in)
End play of front clutch drum	0.5 ~ 0.8 mm (0.020 ~ 0.031 in)

Rear clutch	
Thickness of drive plate	
Limit	1.4 mm (0.055 in)
Total clearance measured between retaining plate and snap ring	0.8 ~ 1.5 mm (0.031 ~ 0.059 in)
Low and reverse brake	
Thickness of friction plate	
Limit	1.8 mm (0.071 in)
Total clearance measured between retaining plate and snap ring	0.8 ~ 1.05 mm (0.031 ~ 0.041 in)
Gear assembly	
Total end play	0.25 ~ 0.50 mm (0.010 ~ 0.020 in)
Planetary gear side play	
Limit	0.8 mm (0.031 in)
Engine stall speed	
In break-in period	2,250 ~ 2,500 rpm
After break-in period	2,300 ~ 2,550 rpm

	Wire diameter	Free length
Valve body spring		
Pressure regulator valve	1.20 ± 0.03 mm (0.047 ± 0.001 in)	43.0 ± 1.0 mm (1.69 ± 0.039 in)
1st–2nd shift valve	0.55 ± 0.015 mm (0.022 ± 0.0006 in)	32.0 ± 2.0 mm (1.260 ± 0.079 in)
2nd–3rd shift valve	0.70 ± 0.015 mm (0.028 ± 0.0006 in)	41.0 ± 1.0 mm (1.61 ± 0.039 in)
Pressure modifier valve	0.40 ± 0.01 mm (0.016 ± 0.0004 in)	18.5 ± 1.0 mm (0.73 ± 0.039 in)
Throttle back-up valve	0.80 ± 0.015 mm (0.031 ± 0.0006 in)	36.0 ± 1.0 mm (1.42 ± 0.039 in)
Solenoid down shift valve	0.55 ± 0.015 mm (0.022 ± 0.0006 in)	21.9 ± 1.0 mm (0.86 ± 0.039 in)
2nd lock valve	0.55 ± 0.015 mm (0.022 ± 0.0006 in)	33.5 ± 1.0 mm (1.32 ± 0.039 in)
Throttle relief valve	0.90 ± 0.03 mm (0.035 ± 0.001 in)	26.8 ± 1.0 mm (1.06 ± 0.039 in)
Orifice check valve	0.23 ± 0.01 mm (0.009 ± 0.0004 in)	15.5 ± 2.0 mm (0.61 ± 0.079 in)

Shift speed

Throttle condition (Manifold vacuum)		mph
Kick-down (0 ~ 100 mm-Hg / 0 ~ 3.94 in-Hg)	$D_1 \rightarrow D_2$	32 ~ 45
	$D_2 \rightarrow D_3$	59 ~ 77
	$D_3 \rightarrow D_2$	51 ~ 65
	$D_2 \rightarrow D_1$	14 ~ 30
Half throttle (200 ± 10 mm-Hg / 7.87 ± 0.39 in-Hg)	$D_1 \rightarrow D_2$	9 ~ 21
	$D_2 \rightarrow D_3$	18 ~ 40
Fully closed throttle	$D_3 \rightarrow D_1$	6 ~ 12
Manual 1	$1_2 \rightarrow 1_1$	24 ~ 33

Governor pressure

Driving speed	Output shaft speed	Governor pressure	
mph	rpm	kg/cm²	lb/in²
20	1,070 ~ 1,170	0.8 ~ 1.3	11 ~ 18
35	1,900 ~ 2,030	1.6 ~ 2.3	23 ~ 33
55	3,000 ~ 3,170	3.1 ~ 4.2	44 ~ 60

Line pressure

Manual range	Engine idling condition		Engine stall condition	
	kg/cm²	lb/in²	kg/cm²	lb/in²
R	4.0 ~ 7.0	57 ~ 100	16.0 ~ 19.0	228 ~ 270
D	3.0 ~ 4.0	43 ~ 57	9.0 ~ 11.0	128 ~ 156
2	8.0 ~ 12.0	114 ~ 171	8.0 ~ 12.0	114 ~ 171
1	3.0 ~ 4.0	43 ~ 57	9.0 ~ 11.0	128 ~ 156

PROPELLER SHAFT

Max. permissible run-out	0.4 mm (0.016 in)
Max. permissible unbalance at 4,000 rpm	
At front	15 cm-gr (0.21 in-oz)
At rear	15 cm-gr (0.21 in-oz)
Universal joint	
Spider diameter	$25\ ^{+0.021}_{+0.008}$ mm ($0.9843\ ^{+0.0008}_{+0.0003}$ in)
Wear limit	24.908 mm (0.9806 in)
Journal swinging torque	3 ~ 8 cm-kg (2.6 ~ 6.9 in-lb)

REAR AXLE

Reduction ratio	3.909
Backlash of ring gear and pinion	0.09 ~ 0.11 mm (0.0035 ~ 0.0043 in)
Pinion bearing preload (Without pinion oil seal)	9 ~ 14 cm-kg (7.8 ~ 12.2 in-lb)
Differential side bearing preload (Without pinion)	6 ~ 21 cm-kg (5.2 ~ 18.2 in-lb)
Backlash of side gear and pinion gear	0 ~ 0.1 mm (0 ~ 0.004 in)
Rear wheel bearing end play	0 ~ 0.1 mm (0 ~ 0.004 in)
Lubricant	
Above –18°C (0°F)	A.P.I. Service GL-5 SAE 90
Below –18°C (0°F)	A.P.I. Service GL-5 SAE 80
Oil capacity	1.2 liters (1.3 U.S. quarts / 1.1 Imp. quarts)
"L" (Case spread)	185.428 ~ 185.500 mm (7.3004 ~ 7.3033 in)

STEERING

Reduction ratio	17.0 ~ 20.0 : 1
Free play of steering wheel (Turning direction)	
Limit	40 mm (1.57 in)
Backlash between rack and sector gear	Adjust to 0 mm
Worm bearing preload	
Without sector shaft and column bush	2 ~ 5 cm-kg (1.7 ~ 4.3 in-lb)
With sector shaft and column bush	6 ~ 12 cm-kg (5.2 ~ 10.4 in-lb)
Clearance between sector shaft and housing bush	
Wear limit	0.1 mm (0.004 in)
End clearance of adjusting screw and sector shaft	0 ~ 0.1 mm (0 ~ 0.004 in)
Lubricant	A.P.I. Service GL-4 SAE 90
Oil capacity	290 cc (0.31 U.S. quarts / 0.26 Imp. quarts)
Max. Wheel angle on full lock	
Wheel on inside of curve	39°40' ± 2°
Wheel on outside of curve	32°14' ± 2°
Idler arm revolving torque	2 ~ 6 kg/135 mm (4.4 ~ 13.2 lb/5.315 in)
Knuckle arm ball stud revolving torque	5 ~ 12cm-kg (4.3 ~ 10.4 in-lb)
Steering geometry	
King pin inclination	10°44'
Camber	1° 10' ± 30'
Max. permissible difference in camber between sides	± 30'
Camber offset	38 mm (1.50 in)
Caster	Right-hand side 4° 30' ± 30' Left-hand side 4° 00' ± 30'
Max. permissible difference in caster between sides	± 40'
Caster trail	20 mm (0.79 in)
Toe-in	0 ~ 6 mm (0 ~ 0.24 in)

BRAKES

Brake pedal free travel	
Before power brake piston operates	7 ~ 9 mm (0.28 ~ 0.35 in)
Brake pedal height (from floor)	190^{+5}_{-0} mm ($7.48^{+0.20}_{-0}$ in)
Master cylinder	
Bore	20.64 mm (0.813 in)
Clearance between piston and bore	
Standard	0.040 ~ 0.125 mm (0.0016 ~ 0.0049 in)
Wear limit	0.15 mm (0.006 in)
Power brake unit	
Clearance between piston and push rod	0.1 ~ 0.5 mm (0.004 ~ 0.020 in)
Front disc brake	
Thickness of brake disc	
Standard	18 mm (0.7087 in)
Limit	17 mm (0.6693 in)
Max. allowable lateral run-out of brake disc	0.1 mm (0.0039 in)
Thickness of lining	
Standard	14 mm (0.5512 in)
Wear limit	6 mm (0.236 in)
Wheel cylinder bore	50.80 mm (2.0 in)
Rear drum brake	
Drum diameter	
Standard	200 mm (7.8741 in)
Limit	201 mm (7.9135 in)
Thickness of lining	
Standard	4.0 mm (0.1575 in)
Wear limit	1.0 mm (0.039 in)
Wheel cylinder bore	19.05 mm (0.750 in)
Clearance between piston and bore	
Standard	0.040 ~ 0.125 mm (0.0016 ~ 0.0049 in)
Limit	0.15 mm (0.006 in)
Remaining pressure	0.5 ~ 1.0 kg/cm² (7.1 ~ 14.2 lb/in²)
Clearance between drum and lining	0.1 ~ 0.15 mm (0.004 ~ 0.006 in)
Parking brake	
Drum diameter	
Standard	200 mm (7.8741 in)
Limit	201 mm (7.9135 in)
Thickness of lining	
Standard	4.0 mm (0.1575 in)
Limit	1.0 mm (0.039 in)
Lever travel	3 ~ 7 notches at 10kg (22lb)

WHEELS AND TIRES

Wheel disc	
Front	5-J x 13WDC 5½-JJ x 13WDC (Aluminum)
Rear	5-J x 13WDC 5½-JJ x 13WDC (Aluminum)
Run-out limit	
Radial	1.0 mm (0.04 in) 0.5 mm (0.020 in) Aluminum
Lateral	1.0 mm (0.04 in) 0.5 mm (0.020 in) Aluminum
Tire	
Front	185/70 HR 13 165 HR 13
Rear	185/70 HR 13 165 HR 13
Inflation pressure	
Front	1.8 kg/cm² (26 psi)
Rear	1.8 kg/cm² (26 psi)
Run-out limit (with wheel disc)	
Radial	2.5 mm (0.098 in)
Lateral	3.0 mm (0.118 in)
Front wheel bearing preload (at wheel set bolt)	0.45 ~ 0.65 kg (0.99 ~ 1.43 lb)

SUSPENSION

Front coil spring	
Spring constant	2.16 ± 0.15 kg/mm
Free length	
Standard Left	334.5 mm (13.17 in)
Right	325 mm (12.80 in)
Front shock absorber	
Fluid capacity	$225\ ^{+5}_{-0}$ cc ($0.23\ ^{+0.05}_{-0}$ U.S. quarts)
Rear coil spring	
Spring constant	1.8 ± 0.13 kg/mm
Free length	
Standard	323.5 mm (12.74 in)

DIMENSION

Overall length	4,285 mm (169 in)
Overall width	
(Without side protector)	1,650 mm (65 in)
(With side protector)	1,675 mm (66 in)
Overall height	1,260 mm (50 in)
Distance between wheel center and fender line	
Front	364 ± 20 mm (14.3 ± 0.8 in)
Rear	358 ± 20 mm (14.0 ± 0.8 in)
Wheel base	2,420 mm (95 in)
Tread	
Front	1,420 mm (56 in)
Rear	1,400 mm (55 in)
Minimum road clearance	160 mm (6 in)
Minimum turning radius	4.8 m (15ft 9 in)
Seating capacity	2

TIGHTENING TORQUE

	m-kg	ft-lb
Engine		
Oil pump sprocket	3.0 ~ 3.5	22 ~ 25
Oil pan	0.8 ~ 1.1	6 ~ 8
Inlet manifold	1.9 ~ 2.6	14 ~ 19
Thermal reactor	4.5 ~ 5.5	33 ~ 40
Spark plugs	1.3 ~ 1.8	9 ~ 13
Eccentric shaft pulley	10 ~ 12	72 ~ 87
Temperature gauge unit	0.7 ~ 0.8	5 ~ 6
Tension bolts	3.2 ~ 3.8	23 ~ 27
Water temperature switch	1.0 ~ 1.8	7 ~ 13
Clutch		
Flywheel	40.0 ~ 50.0	289 ~ 362
Clutch cover	1.8 ~ 2.7	13 ~ 20
Transmission		
Plug for interlock pin hole	1.0 ~ 1.5	7 ~ 11
Control lever to control rod end	0.8 ~ 1.2	6 ~ 9
Shift fork set bolts	1.2 ~ 1.6	9 ~ 12

TIGHTENING TORQUE

	m-kg	ft-lb
Shift rod end	0.8 ~ 1.2	6 ~ 9
Main shaft lock nut	13.0 ~ 21.0	94 ~ 152
Top switch	2.5 ~ 3.5	18 ~ 25
Overdrive switch	2.5 ~ 3.5	18 ~ 25
Back-up light switch	2.5 ~ 3.5	18 ~ 25
Speedometer driven gear	0.8 ~ 1.1	6 ~ 8
Automatic transmission		
Drive plate to converter weight	4.2 ~ 6.3	30 ~ 46
Drive plate to torque converter	3.5 ~ 5.0	25 ~ 36
Converter housing to engine	3.2 ~ 4.7	23 ~ 34
Converter housing to transmission case	4.5 ~ 5.5	33 ~ 40
Extension housing to transmission case	2.0 ~ 2.5	14 ~ 18
Oil pan	0.5 ~ 0.7	3.6 ~ 5.1
Piston stem (when adjusting band brake)	1.2 ~ 1.5	9 ~ 11
Piston stem lock nut	1.5 ~ 4.0	11 ~ 29
Servo piston retainer	1.0 ~ 1.5	7 ~ 11
Servo cover	0.5 ~ 0.7	3.6 ~ 5.1
One-way clutch inner race	1.3 ~ 1.8	9 ~ 13
Control valve body to transmission case	0.55 ~ 0.75	4.0 ~ 5.4
Lower valve body to upper valve body	0.25 ~ 0.35	1.8 ~ 2.5
Side plate to control valve body	0.25 ~ 0.35	1.8 ~ 2.5
Reamer bolt of control valve body	0.5 ~ 0.7	3.6 ~ 5.1
Oil strainer	0.3 ~ 0.4	2.2 ~ 2.9
Governor valve body to oil distributor	0.5 ~ 0.7	3.6 ~ 5.1
Oil pump cover	0.6 ~ 0.8	4.3 ~ 5.8
Inhibitor switch	0.5 ~ 0.7	3.6 ~ 5.1
Manual shaft lock nut	3.0 ~ 4.0	22 ~ 29
Oil cooler pipe set bolt	1.6 ~ 2.4	12 ~ 17
Oil pressure test plug	0.5 ~ 1.0	3.6 ~ 7.2
Actuator for parking rod to extension housing	0.8 ~ 1.1	5.8 ~ 8.0
Propeller shaft		
Yoke to rear axle companion flange	3.5 ~ 3.8	25 ~ 27
Rear axle		
Ring gear	7.0 ~ 8.5	51 ~ 61
Differential side bearing caps	3.8 ~ 5.3	27 ~ 38
Companion flange to pinion	13 ~ 18	94 ~ 130
Steering		
Steering wheel nut	3.0 ~ 4.0	22 ~ 29
Steering gear housing to frame	4.4 ~ 5.5	32 ~ 40
Pitman arm to sector shaft	15 ~ 18	108 ~ 130
Idler arm bracket to frame	4.4 ~ 5.5	32 ~ 40
Idler arm to center link	2.5 ~ 3.5	18 ~ 25
Pitman arm to center link	3.0 ~ 4.5	22 ~ 33
Tie rod to center link	3.0 ~ 4.5	22 ~ 33

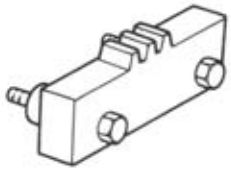
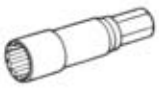
TIGHTENING TORQUE

	m-kg	ft-lb
Tie rod to knuckle arm	3.0 ~ 4.5	22 ~ 33
Tie rod lock nut	7.0 ~ 8.0	51 ~ 58
Steering gear box end cover lock nut	23 ~ 26	166 ~ 188
Brake		
Master cylinder union bolt	1 ~ 1.6	7 ~ 12
Master cylinder outlet plug	6 ~ 7	43 ~ 50
Brake tube union nut	1.3 ~ 2.2	9 ~ 16
Flexible hose union	2.2 ~ 2.7	16 ~ 20
Wheel cylinder union bolt	0.7 ~ 1.0	5 ~ 7
Wheels		
Wheel bolts	9 ~ 11	65 ~ 80
Suspension		
Suspension arm to cross member	4.0 ~ 5.5	29 ~ 40
Knuckle arm to shock absorber	6.4 ~ 9.5	46 ~ 69
Suspension arm ball joint to knuckle arm	6 ~ 8	43 ~ 58
Front shock absorber		
Piston rod to mounting block	6.5 ~ 8.2	47 ~ 59
Seal cap nut	5.0 ~ 6.0	36 ~ 43
Tension rod to lower suspenison arm	5.5 ~ 6.9	40 ~ 50
Tension rod to bracket	11 ~ 15	80 ~ 108
Tension rod bracket to frame	7.6 ~ 9.5	55 ~ 69
Stabilizer bar to suspension lower arm	2.4 ~ 3.5	17 ~ 25

	m-kg	ft-lb
Front stabilizer support plate	3.8 ~ 4.7	27 ~ 34
Shock absorber to axle housing	6.5 ~ 8.2	47 ~ 59
Upper link to axle housing	7.7 ~ 10.5	56 ~ 76
Upper link to frame	7.7 ~ 10.5	56 ~ 76
Lower link to axle housing	7.7 ~ 10.5	56 ~ 76
Lower link to frame	7.7 ~ 10.5	56 ~ 76
Shock absorber upper	1.3 ~ 2.5	9 ~ 18
Watt link bracket	7.7 ~ 10.5	56 ~ 76
Watt link to axle housing	6.5 ~ 8.2	47 ~ 59
Watt link to bracket	6.5 ~ 8.2	47 ~ 59
Rear stabilizer support plate	3.2 ~ 4.7	23 ~ 34
Stabilizer lock nut	1.0 ~ 1.6	7 ~ 12
Unless otherwise specified		
6T		
6 mm bolt/nut	0.7 ~ 1.0	5 ~ 7
8 mm bolt/nut	1.6 ~ 2.3	12 ~ 17
10 mm bolt/nut	3.2 ~ 4.7	23 ~ 34
12 mm bolt/nut	5.6 ~ 8.2	41 ~ 59
14 mm bolt/nut	7.7 ~ 10.5	56 ~ 76
8T		
6 mm bolt/nut	0.8 ~ 1.2	6 ~ 9
8 mm bolt/nut	1.8 ~ 2.7	13 ~ 20
10 mm bolt/nut	3.7 ~ 5.5	27 ~ 40
12 mm bolt/nut	6.4 ~ 9.5	46 ~ 69
14 mm bolt/nut	10.4 ~ 14.0	75 ~ 101

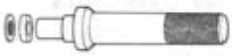
SPECIAL TOOLS

ENGINE GROUP

TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0107 680A Engine stand	
49 0813 215A Puller, tubular dowel & A/T oil pump	
49 0813 250 Seal case	
49 0813 240 Puller & installer, rotor bush	
49 0820 035 Box wrench, flywheel	
49 1881 060 Brake, ring gear	
49 0823 300A Puller, flywheel	
49 1011 120 Remover, P.C.V. valve	

TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 1114 005 Hanger, engine stand	
49 0813 225 Remover, oil seal	
49 0813 235 Puller & installer, main bearing	
49 0839 165 Gauge, corner seal	
49 1881 055 Stopper, counter weight	
49 0839 305A Puller, counter weight	
49 0839 095 Wrench, plug	
49 8501 125 Remover, thermal reactor nut	

TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 1285 071 Puller, eccentric shaft bearing	

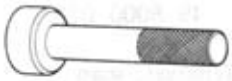
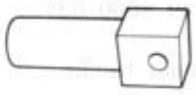
TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0823 072A Installer, eccentric shaft bearing	

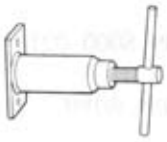
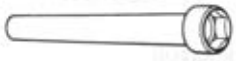
COOLING GROUP

TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 1975 145 Adapter, water pump pulley	

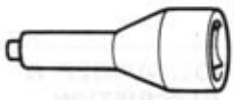
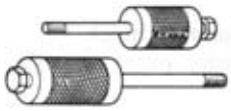
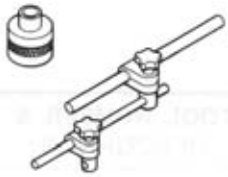
TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0823 146 Support block, water pump impeller	

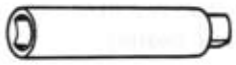
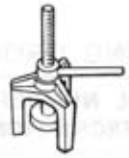
CLUTCH and TRANSMISSION (Manual) GROUP

TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0813 310 Centering tool, clutch disk	
49 0500 330 Installer, transmission bearing	
49 0259 440 Turning holder, main shaft	
49 0862 350 Guide, shift fork ass'y	

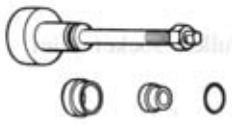
TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0839 425C Puller set, bearing	
49 0305 430 Pusher, main drive shaft	
49 1243 465A Wrench, main shaft lock nut	
49 0187 451A Guide, interlock pin ass'y	

AUTOMATIC TRANSMISSION GROUP

TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0378 320A Stand, transmission case	
49 0378 346 Hex-head wrench	
49 0378 390 Puller, oil pump	
49 2113 025A Assembling gauge, oil pump	
49 0877 435 Special wrench	
49 8000 021 Torque driver	
49 8000 031 Hexagon	

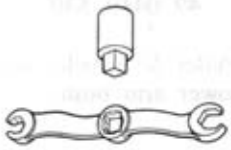
TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0378 345 Socket, extension	
49 0378 375 Compressor, clutch spring	
49 0378 400A Gauge set, oil pressure	
49 0378 480 Confirmation gauge	
49 8000 015 Remover, snap ring	
49 8000 025 Remover, snap ring	
49 8000 035 Spinner handle	

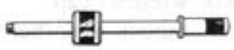
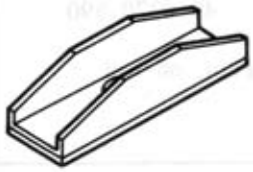
DIFFERENTIAL GROUP

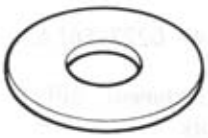
TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0419 561 Attachment, engine stand	
49 0259 710A Holder, coupling flange	
49 0259 730 Wrench, drain plug	
49 8531 565 Pinion model	

TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0223 561A Attachment, diff. work	
49 0259 720 Wrench, diff. side bearing adjust nut	
49 0305 555 Gauge block	
49 0727 570 Gauge body, pinion height adjust	

BRAKE and REAR AXLE GROUP

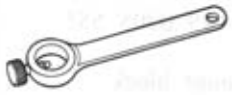
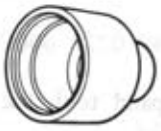
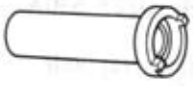
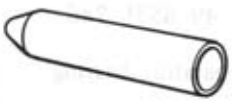
TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0259 770A Spanner, flare nut	
49 0111 531B Spanner, brake shoe anchor pin adjust	
49 8501 631 Attachment, rear axle shaft puller	

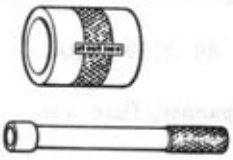
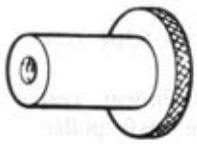
TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0221 600C Expand tool, disc brake	
49 0223 630A Puller, rear axle shaft	
49 8531 746 Separator, bearing	

TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0259 748 Attachment, bearing separator	

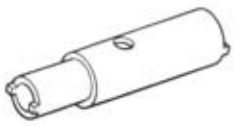
TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0259 747 Attachment, bearing separator	

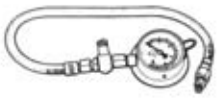
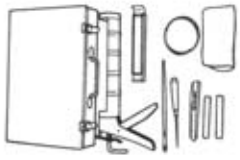
STEERING and SUSPENSION GROUP

TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0180 510A Attachment, steering worm bearing preload measuring	
49 0118 850C Puller, ball joint	
49 0223 640A Arm, coil spring compressor	
49 8038 785 Boot installer, ball joint dust cover	
49 0259 700A Box wrench, cap nut – shock absorber	
49 0370 590 Pilot, oil seal	

TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0223 695E Puller, pitman arm	
49 0727 575 Puller, socket joint	
49 0370 641 Screw, coil spring compressor	
49 0419 530 Puller & installer set, lower arm bush	
49 0259 702 Remover, damper hook nut	
49 8531 605 Adapter, caster camber gauge	

TESTER and OTHER GROUP

TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 2113 010B Gauge set, air pump	
49 0820 280K Compression tester	
49 0419 775A Push tool set	
49 8531 855 Nut wrench	
49 8343 869 Driver, M.A.S. adjuster	

TOOL NUMBER & DESCRIPTION	ILLUSTRATION
49 0187 280 Oil pressure gauge	
49 0839 285 Checker, fuel thermometer	
49 0305 870A Tool set, window (Bond type)	
49 0208 701A Air out tool, boot	

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