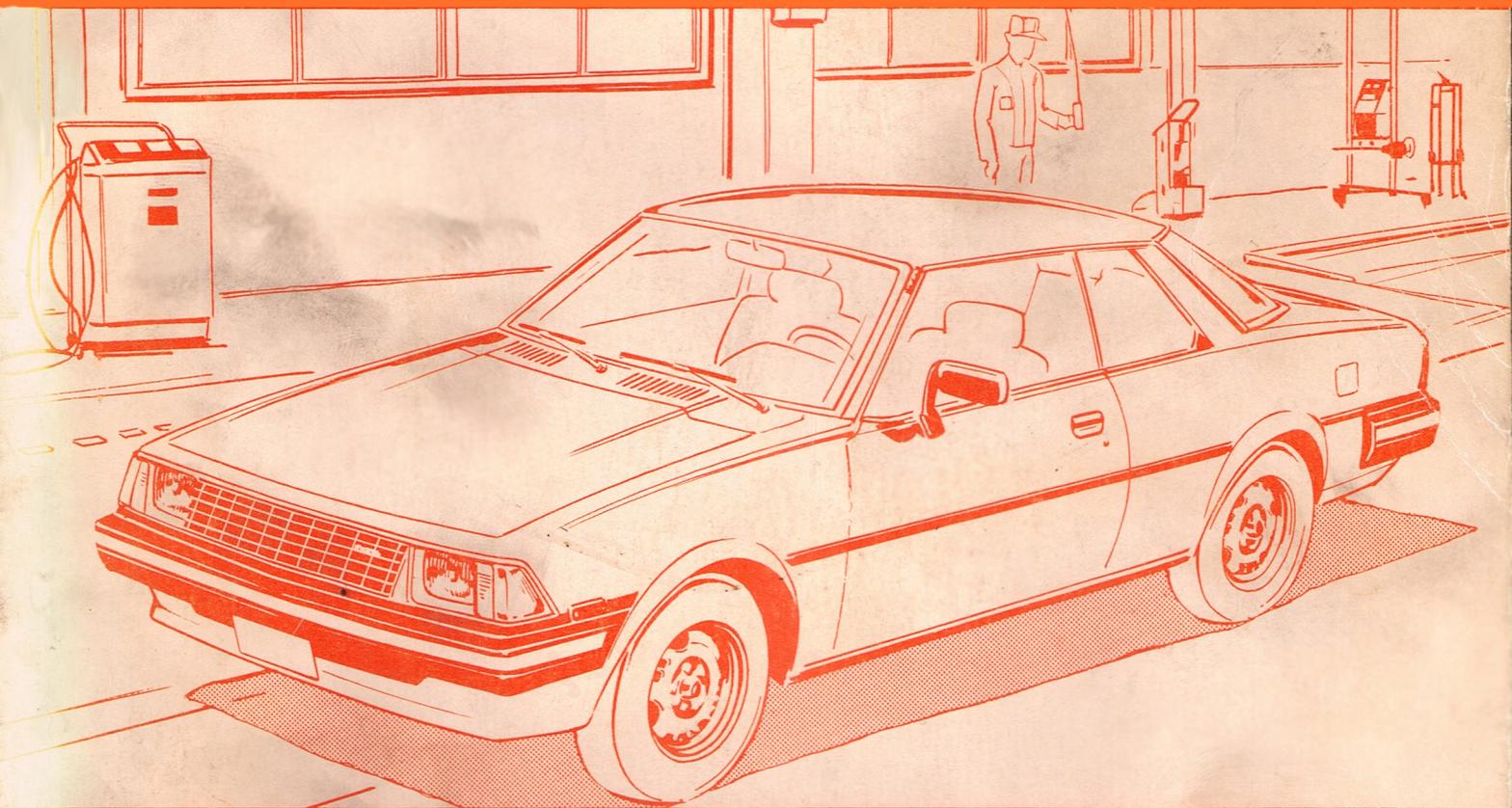


Mazda 626

1981 Workshop Manual



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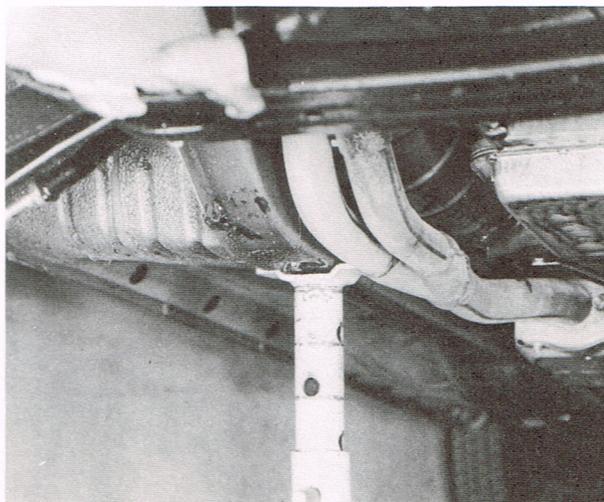
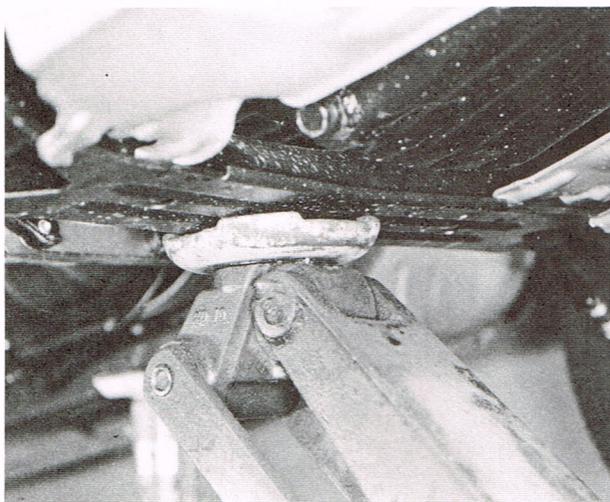
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Toyo Kogyo Co., Ltd.

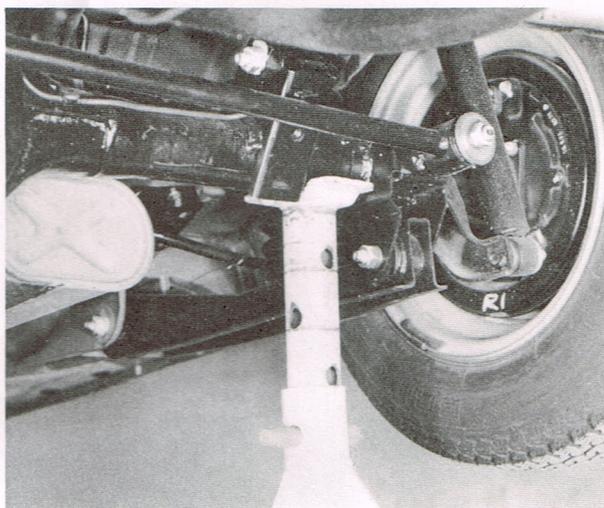
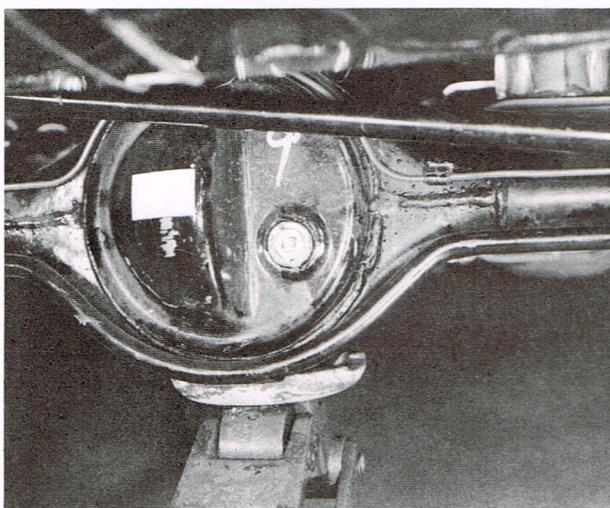
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JACK-UP AND SUPPORT LOCATIONS

FRONT



REAR



Note:

After jacking-up, adjust and place safety stands to support the vehicle approximately level, and lower the vehicle onto stands. When placing safety stands, take care not to damage the brake fluid and fuel pipes.

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 of 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 complicated place is to be disassembled, place punch marks, match marks, etc., at place that will not affect function in order to make re-assembly 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.

1981 Mazda 626 Workshop Manual

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 of this manual and at 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 obligation and advance notice.

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Emission Control System (U.S.A.)	1A
Emission Control System (Canada)	1B
Lubricating System	2
Cooling System	3
Fuel System (U.S.A.)	4
Fuel System (Canada)	4A
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Clutch	6
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Body and Frame	14
Electrical System (Body)	15
Technical Data	T
Special Tools	S

1-A. ENGINE REMOVAL

Remove and disconnect the following parts from the engine:

1. Battery
2. Battery negative cable
3. Cooling water (drain)

the radiator drain plug while the coolant is hot. Do not remove the radiator drain plug while the coolant is hot.

ENGINE



Fig. 1-1

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1-B. ENGINE DISASSEMBLY 1 : 3

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SPECIAL TOOLS 1 : 27

13. Air hoses
14. Vacuum hoses (three way solenoid valve)
15. Fuel hoses
16. Acceleration wire
17. Master and vacuum hose
18. Heater hoses
19. Engine mounting nut (left side)



Fig. 1-2

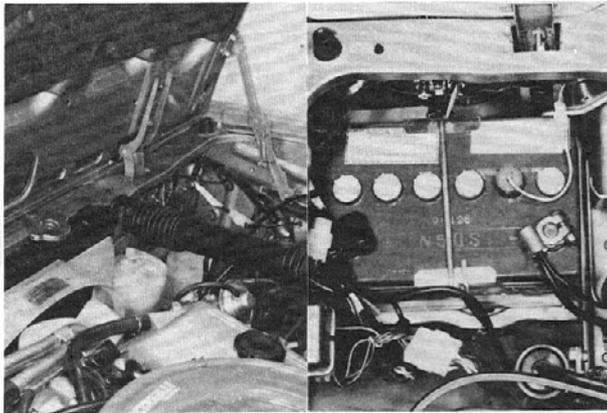


Fig. 1-1

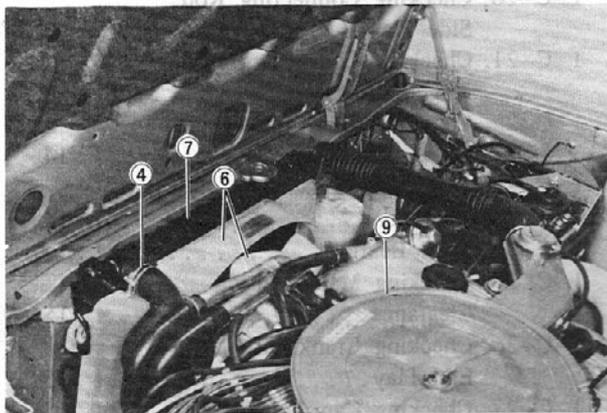


Fig. 1-2

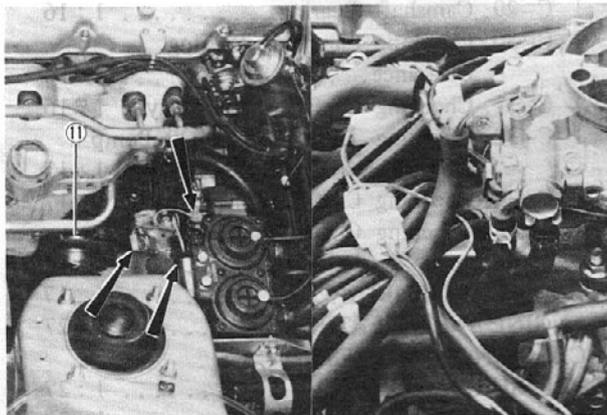


Fig. 1-3

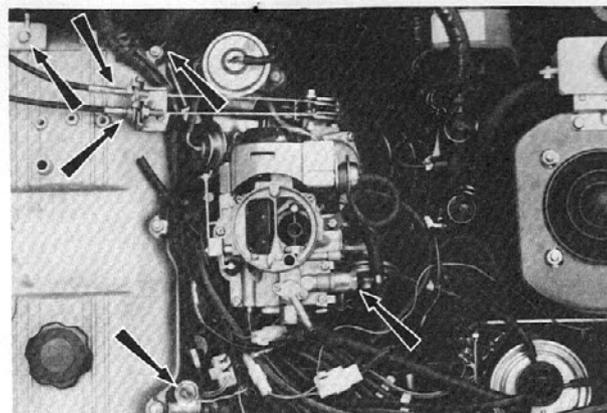


Fig. 1-4

1-A. ENGINE REMOVAL

Inside of engine compartment :

Remove and disconnect the following parts from the engine.

1. Bonnet
2. Battery negative cable
3. Cooling water (drain)

Note :

To avoid the danger of being burned up, do not remove the radiator drain plug while the coolant is hot.

4. Upper and lower water hoses
5. Fluid pipes (automatic transmission only)
6. Radiator cowl and cooling fan
7. Radiator
8. Air hoses from air cleaner
9. Air cleaner

Note :

After removing the air cleaner, cover the carburetor with a clean shop towel to prevent dust or dirt from entering.

10. Wiring for

- 1) Distributor primary
- 2) Hightension cord and condenser (IG. coil to distributor)
- 3) Pickup coil
- 4) Oil pressure switch
- 5) Alternator "B" terminal
- 6) Alternator wiring coupler
11. Engine mounting nut (right side)
12. Wiring for
 - 1) Water temperature gauge unit
 - 2) Fuel cut solenoid
 - 3) Air vent solenoid
 - 4) Automatic choke
 - 5) Starting motor
 - 6) Engine earth

13. Air hoses
14. Vacuum hoses (three way solenoid valve)
15. Fuel hoses
16. Acceleration wire
17. Master vac vacuum hose
18. Heater hoses
19. Engine mounting nut (left side)



Fig. 1-5

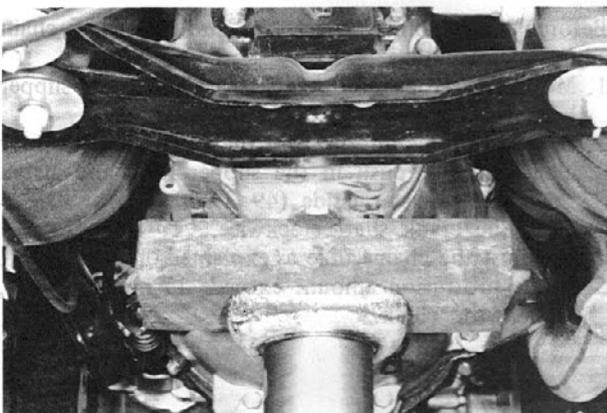


Fig. 1-6

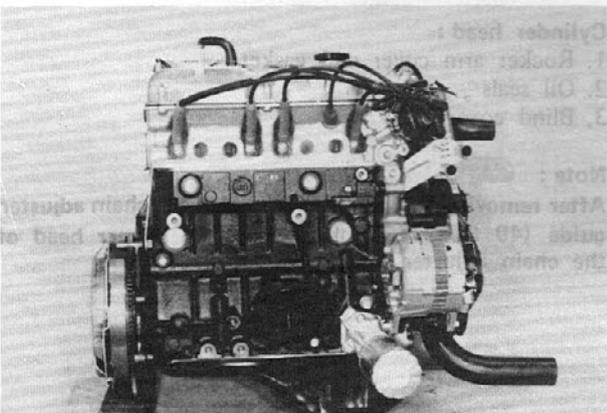


Fig. 1-7

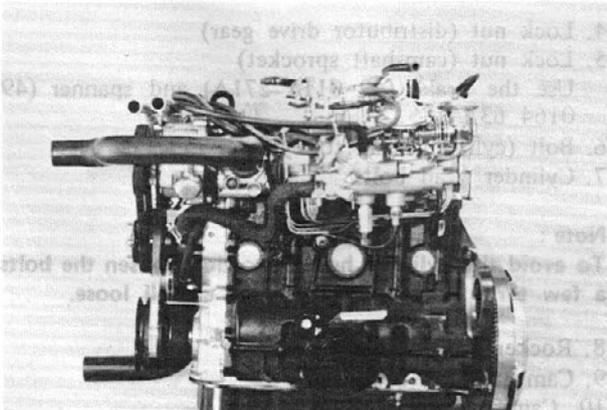


Fig. 1-8

Underside of vehicle :

Raise the front end of the vehicle and support with stands.

Remove and disconnect the following parts from the engine.

1. Under cover
2. Exhaust pipe
3. Clutch under cover plate and stays
4. Torque converter and driving plate support bolts (automatic transmission only)
5. Transmission supporting bolts and nuts

Note :

Support the transmission with a suitable jack.

6. Starting motor
7. Clutch release cylinder

Install a suitable lifting sling on the engine hanger. Attach the sling to the hoist or other lifting device and take up all slack.

Pull the engine forward until it clears the clutch shaft. Then, lift the engine from the vehicle.

Before installing the engine to the engine stand, remove the following parts from the engine.

1. E.G.R. pipe
2. Air injection pipe
3. Reed valve (Canada)
4. Air injection nozzle (U.S.A.)
5. Air injection pipe joint (Canada)
6. Exhaust manifold
7. Alternator
8. Engine mounting brackets

9. Emission control parts
 - 1) E.G.R. valve
 - 2) Air pump (U.S.A.)
 - 3) Water thermo valves
 - 4) Water thermo switch (Canada)
 - 5) Anti-afterburn valve (manual transmission only) (Canada)

Mount the engine on the engine stand (49 0107 680A and 49 0221 005A).

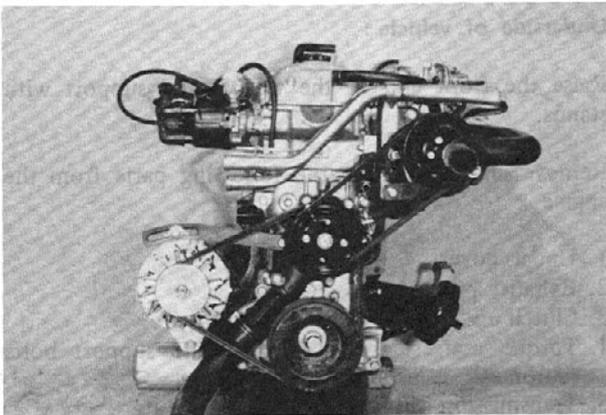


Fig. 1-9

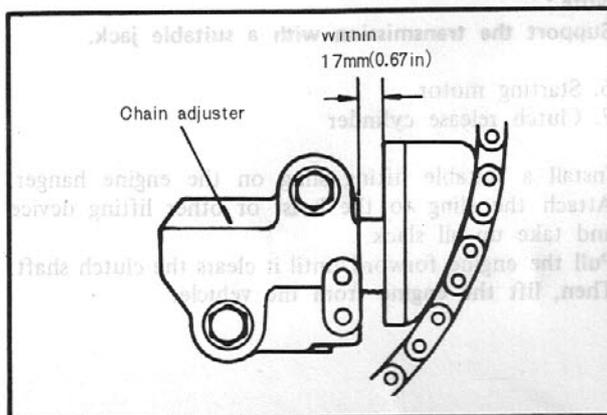


Fig. 1-10

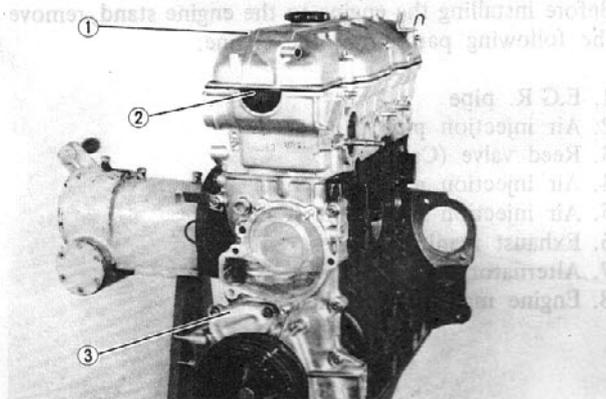


Fig. 1-11

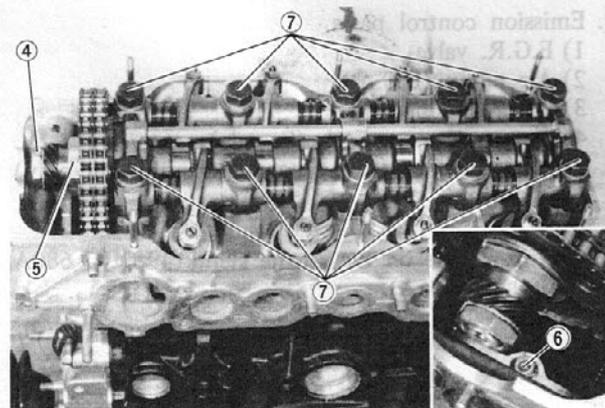


Fig. 1-12

1-B. ENGINE DISASSEMBLY

Remove the following parts from the engine.

1. Engine oil (drain)
2. Distributor
 - 1) Hightension cord
 - 2) Vacuum sensing tube
3. Alternator bracket
 - 1) Alternator strap
 - 2) "V" belt
4. Oil filter
5. Inlet manifold and carburetor
6. Water pump
7. Thermostat

Before disassembling, check the protrusion of chain adjuster as follows:

1. Move the stop lever of chain adjuster to slipper head side.
2. In the above condition, turn the crank shaft counter clockwise and push in the slipper head and install the **chain adjuster guide** (49 3953 260).
3. Turn the crank shaft clockwise.
4. Readjust the chain guide as explained on page 1 : 21.
5. If the protrusion amount exceeds 17 mm (0.67 in), replace the chain.

Cylinder head :

1. Rocker arm cover and gasket
2. Oil seals
3. Blind cover

Note :

After removing the blind cover, install the chain adjuster guide (49 3953 260) to prevent the slipper head of the chain adjuster from popping out.

4. Lock nut (distributor drive gear)
5. Lock nut (camshaft sprocket)
Use the **brake** (49 0118 271A) and **spanner** (49 0164 631A)
6. Bolt (cylinder head to cylinder block)
7. Cylinder head bolts

Note :

To avoid the cylinder head distortion, loosen the bolts a few turns at a time until they are all loose.

8. Rocker arm assembly
9. Camshaft and bearings
10. Camshaft sprocket

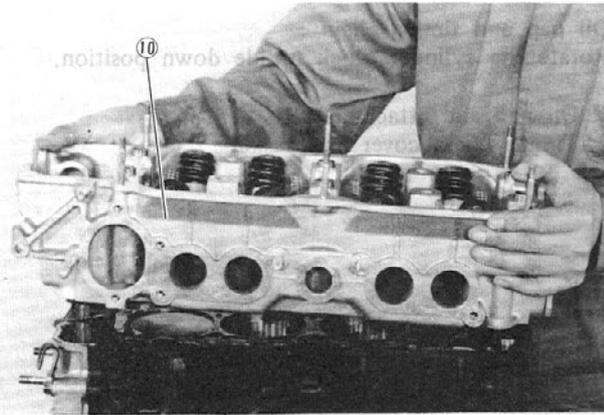


Fig. 1-13

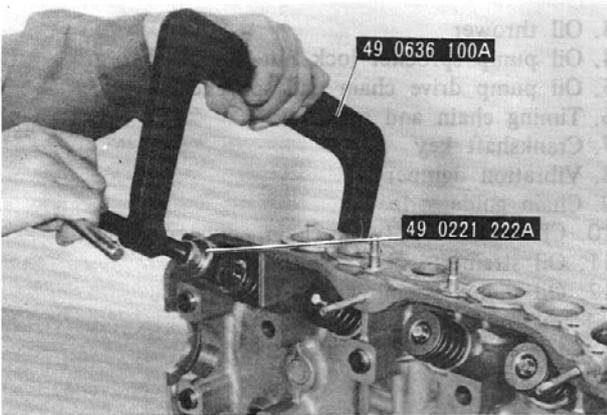


Fig. 1-14

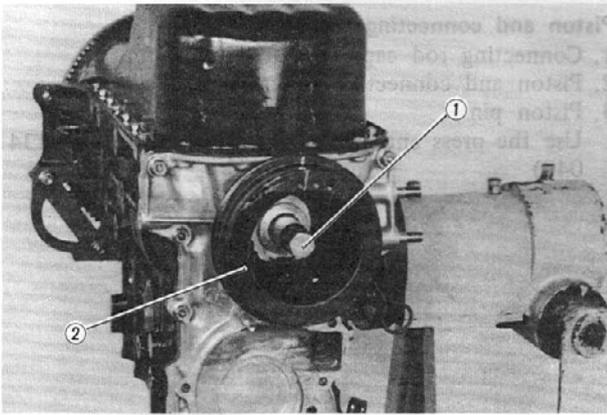


Fig. 1-15

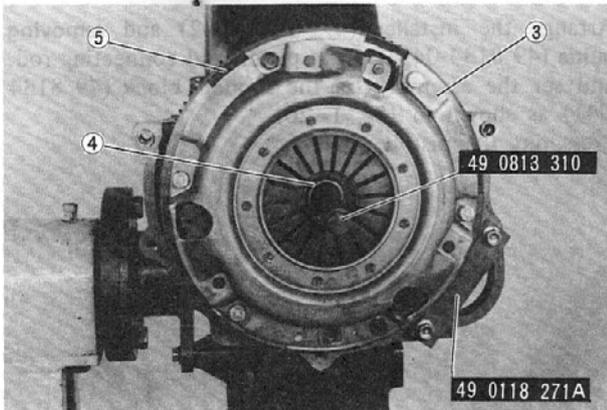


Fig. 1-16

11. Cylinder head and gasket

Note :

When removing only the camshaft or the cylinder head, the timing chain should be lifted upward to prevent the slipper head of the chain adjuster from flying out and causing a difficulty in adjusting the timing chain.

Valve and valve spring :

Remove the valve and valve spring, use the **valve spring lifter (49 0636 100A)** and **pivot (49 0221 222A)** and compress the valve spring.

1. Taper sleeves
2. Valve spring upper seats
3. Valve springs (outer and inner)
4. Valve spring lower seats
5. Valve (inlet and exhaust)

Note :

Place the taper sleeves, upper spring seats, valve springs, lower spring seats and valves in order in a suitable case for reassembling.

Crankshaft pulley and clutch assembly :

Remove the crankshaft pulley and clutch assembly, use the **brake (49 0118 271A)**.

1. Pulley bolt
2. Crankshaft pulley

3. Clutch cover and pressure plate assembly
4. Clutch disc
5. Flywheel (manual transmission)
Driving plate (automatic transmission)

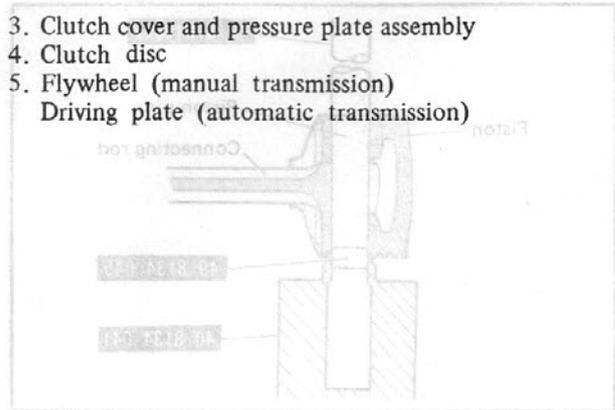


Fig. 1-17

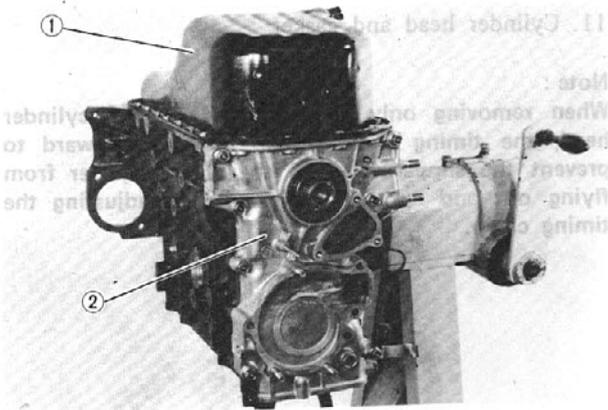


Fig. 1-17

Oil pan and timing chain :

Rotate the cylinder block upside down position.

1. Oil pan and attaching bolts
2. Timing chain cover and gasket



3. Oil thrower
4. Oil pump sprocket lock nut and washer
5. Oil pump drive chain and sprocket
6. Timing chain and sprocket
7. Crankshaft key
8. Vibration damper
9. Chain guide strip
10. Chain adjuster (with chain adjuster guide)
11. Oil strainer
12. Oil pump assembly

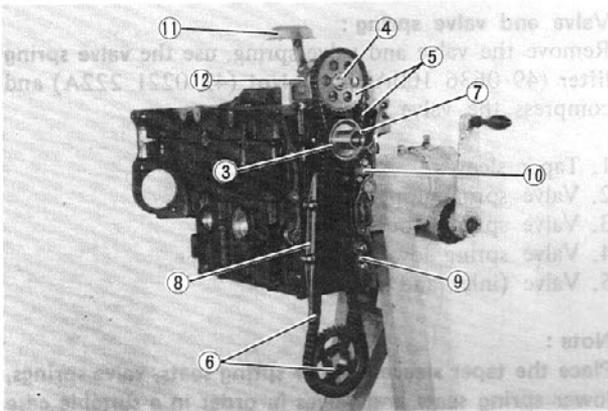


Fig. 1-18

Piston and connecting rod :

1. Connecting rod caps and bearings
2. Piston and connecting rod assemblies
3. Piston pin

Use the press and **piston pin setting tool (49 8134 040)**

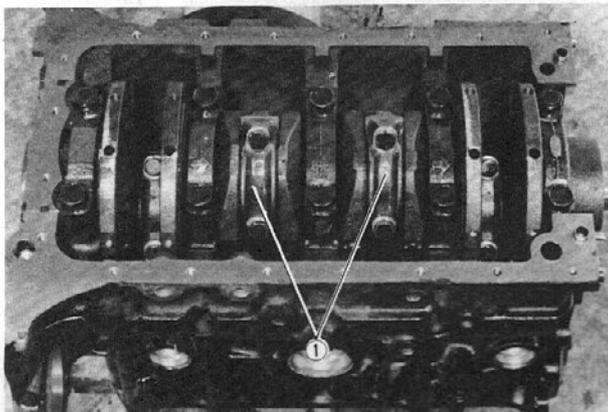


Fig. 1-19

Arrange the **installer (49 8134 042)** and **removing guide (49 8134 045)** on the piston and connecting rod, and set the assembly on the **support block (49 8134 041)** as shown in Fig. 1-20. Press out the piston pin.

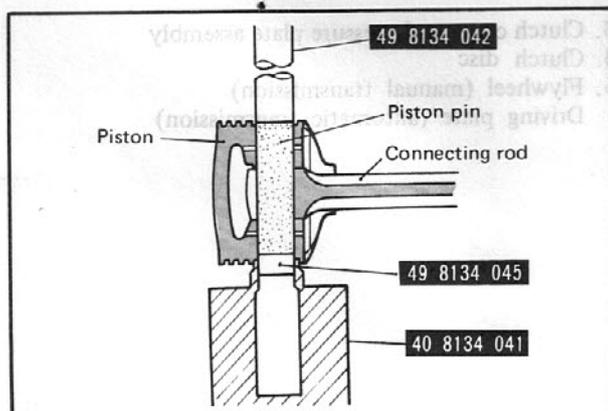


Fig. 1-20

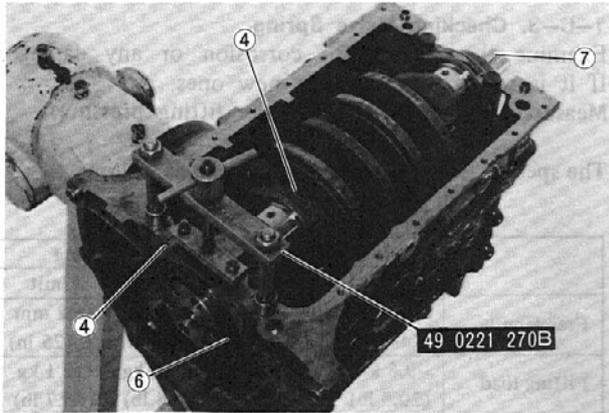


Fig. 1-21

- 4. Main bearing caps and side seals
Use the puller (49 0221 270B)
- 5. Main bearings and thrust bearings
- 6. Rear oil seal
- 7. Crankshaft

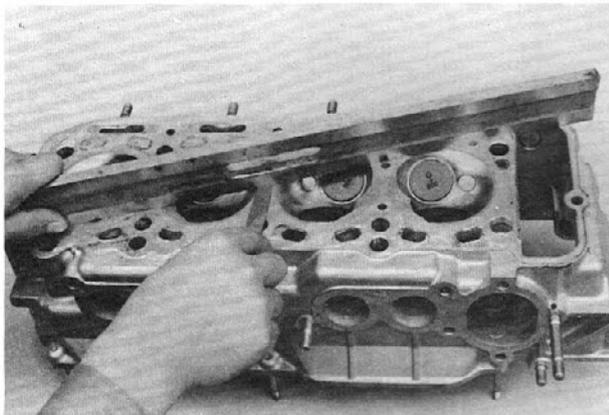


Fig. 1-22

1-C. ENGINE INSPECTION AND REPAIR

1-C-1. Checking Cylinder Head

Check to see the water passages are open. Inspect the tapped openings. Repair or replace any damaged threads or broken studs.

Check for cylinder head distortion by placing a straight edge on the cylinder head surface. Measure the clearance between the straight edge and the cylinder head surface with a feeler gauge.

If the distortion exceeds 0.15 mm (0.006 in), grind with a surface grinder or replace the head.

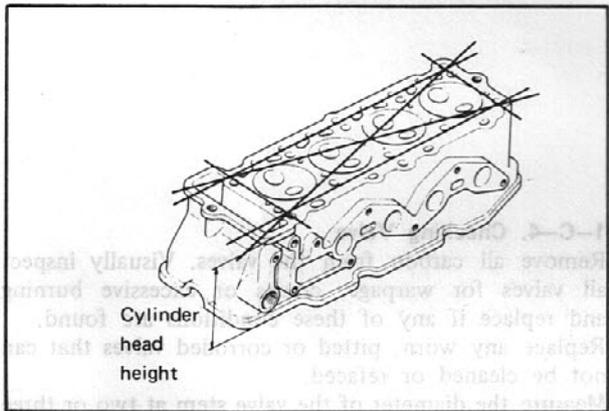


Fig. 1-23

Cylinder head height	109 ± 0.05 mm (4.291 ± 0.002 in)
Grinding Limit	0.20 mm (0.008 in)

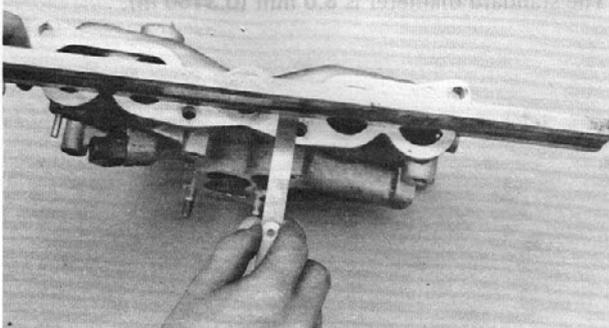


Fig. 1-24

1-C-2. Checking Manifold

Check the inlet and exhaust manifold for distortion. To check, place the straight edge on the manifold. Measure the clearance between the manifold and surface plate with a feeler gauge.

If excessive distortion is found, correct it by grinding.

Limit	0.15 mm (0.006 in)
-------	--------------------

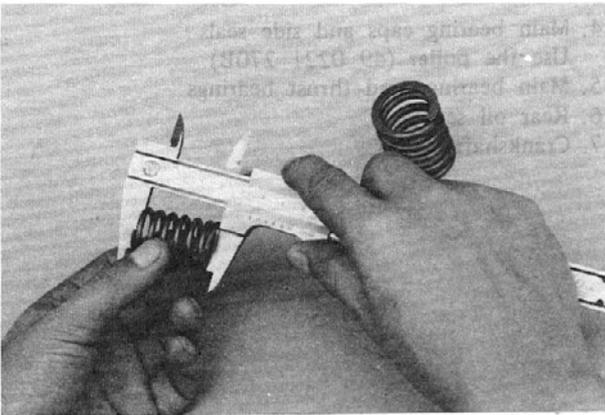


Fig. 1-25

1-C-3. Checking Valve Spring

Examine the springs for corrosion or any damage. If it is severe, replace with new ones. Measure the free length and the fitting pressure.

The specifications of the springs are as follows :

	Inner spring		Outer spring	
	Standard	Limit	Standard	Limit
Free length	36.8 mm (1.449 in)	35.7 mm (1.406 in)	37.3 mm (1.469 in)	36.2 mm (1.425 in)
Fitting load	9.5 kg (20.9 lb)	8.1 kg (17.9 lb)	14.25 kg (31.4 lb)	12.1 kg (26.7 lb)
Fitting length	32.0 mm (1.260 in)		34.0 mm (1.339 in)	



Fig. 1-26



Fig. 1-22

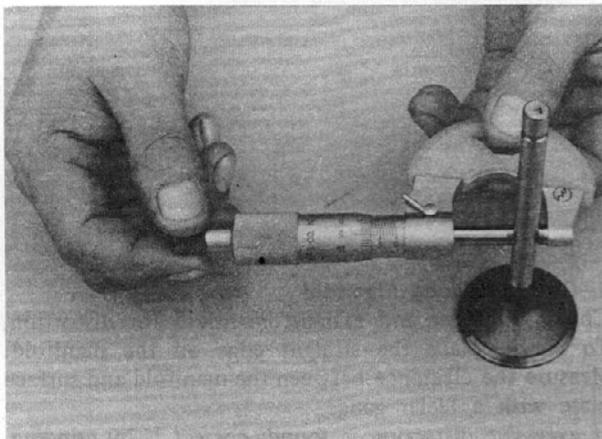
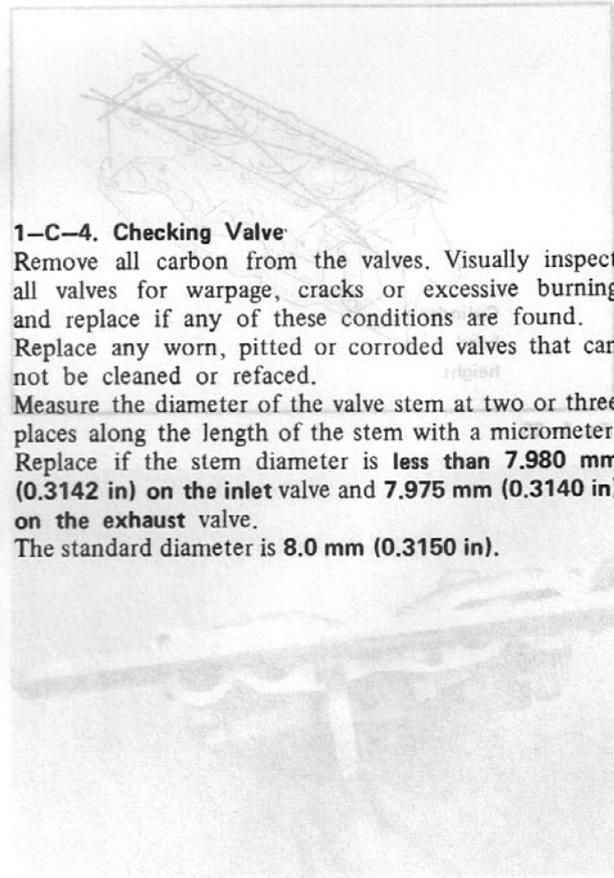


Fig. 1-27



1-C-4. Checking Valve

Remove all carbon from the valves. Visually inspect all valves for warpage, cracks or excessive burning and replace if any of these conditions are found. Replace any worn, pitted or corroded valves that can not be cleaned or refaced.

Measure the diameter of the valve stem at two or three places along the length of the stem with a micrometer. Replace if the stem diameter is less than 7.980 mm (0.3142 in) on the inlet valve and 7.975 mm (0.3140 in) on the exhaust valve.

The standard diameter is 8.0 mm (0.3150 in).

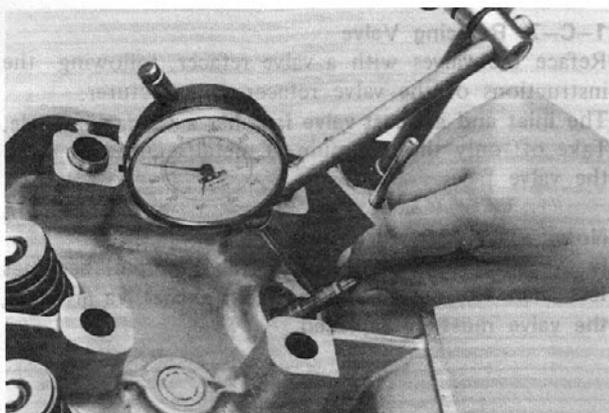


Fig. 1-28

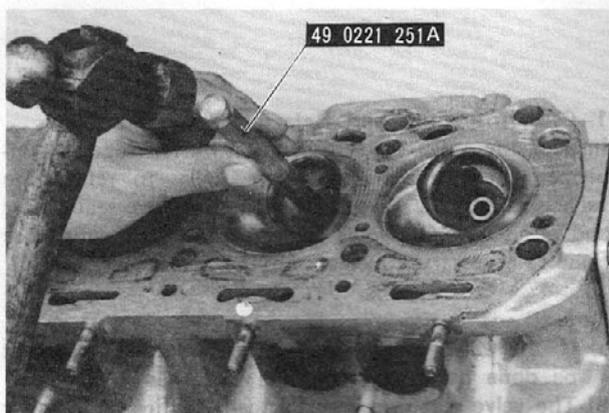


Fig. 1-29

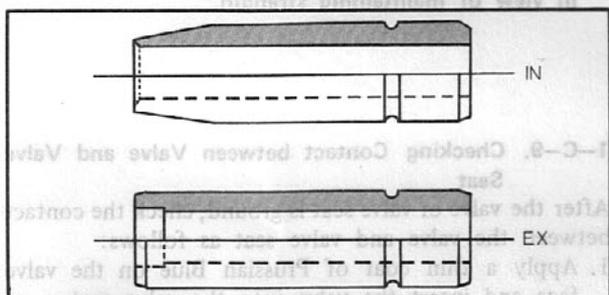


Fig. 1-30

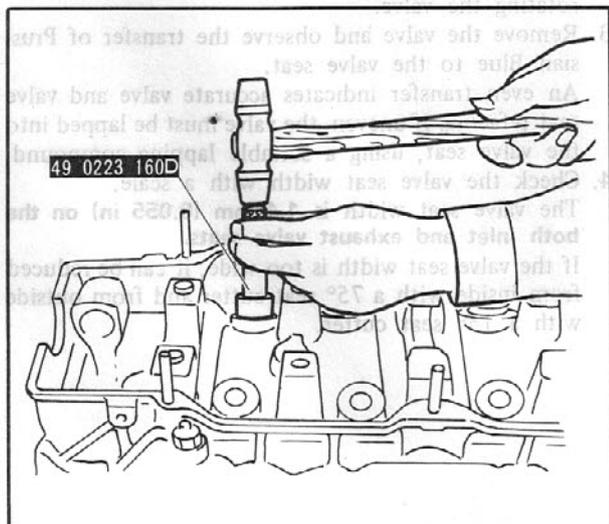


Fig. 1-31

1-C-5. Checking Valve Stem to Guide Clearance

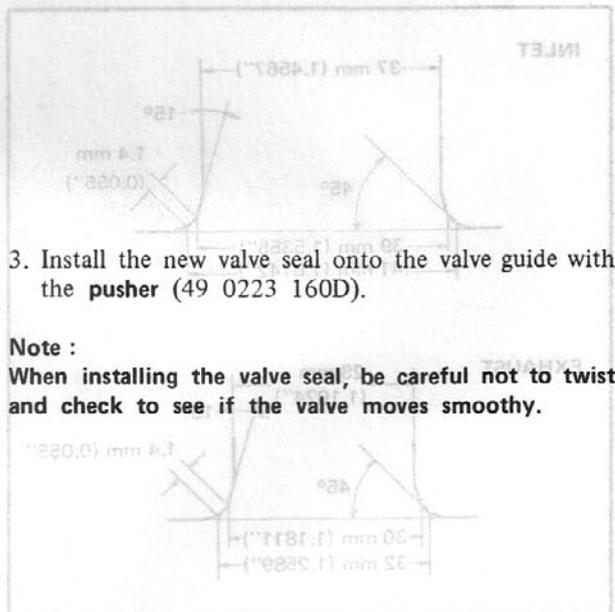
The standard clearance between the valve stem and guide should be, under the condition of the guide being fitted with the cylinder head, **0.018 ~ 0.053 mm (0.0007 ~ 0.0021 in) on the inlet side and 0.018 ~ 0.058 mm (0.0007 ~ 0.0023 in) on the exhaust side.** To check this clearance, place the valve in each guide. Check the clearance with a suitable mounted dial indicator, or feel the clearance by moving the stem back and forth. If the clearance is **0.20 mm (0.008 in) or more,** replace the valve guide and valve.



1-C-6. Replacing Valve Guide

1. Press out the old guide with the **puller & installer (49 0221 251A).**
2. Press in the new guide squarely with the same tool until the ring on the guide touches the cylinder head.

Note :
Inlet and exhaust valve guides are different as shown in Fig. 1-30.



3. Install the new valve seal onto the valve guide with the **pusher (49 0223 160D).**

Note :
When installing the valve seal, be careful not to twist and check to see if the valve moves smoothly.

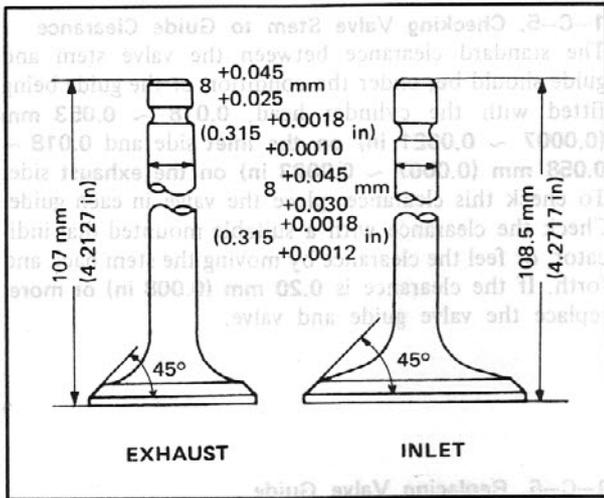


Fig. 1-32

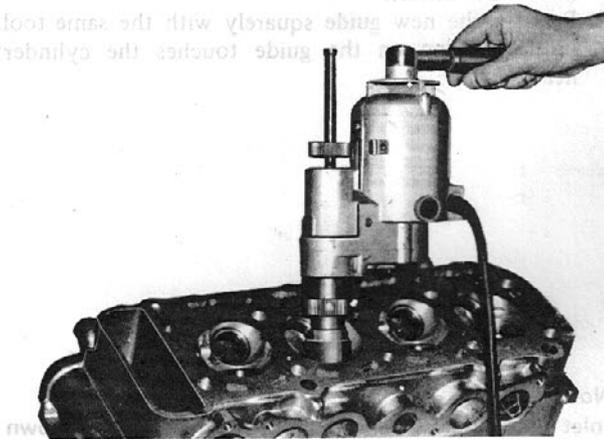


Fig. 1-33

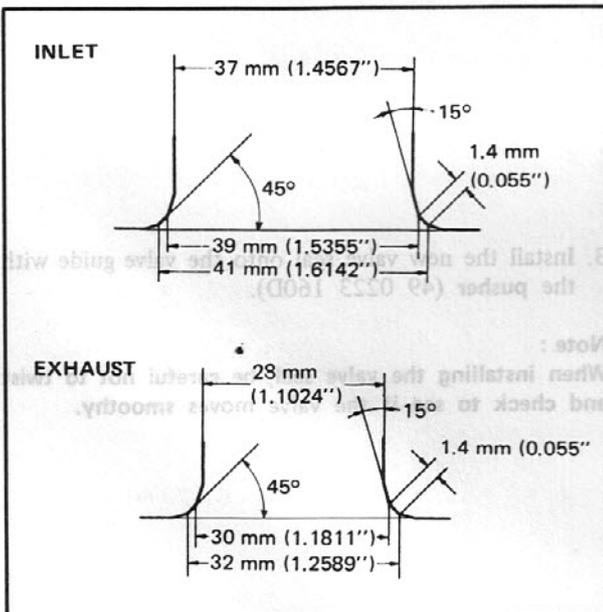


Fig. 1-34

1-C-7. Refacing Valve

Reface the valves with a valve refacer, following the instructions of the valve refacer manufacturer.

The inlet and exhaust valve face has a 45 degree angle. Take off only the minimum of metal required to clean the valve faces.

Note :

If the outer edge of the valve (valve margin) becomes less than 1.0 mm (0.039 in) from excessive grinding, the valve must be replaced.

1-C-8. Inspecting and Refacing Valve Seat

Inspect the valve seats for cracks, burrs, ridges or improper angle and width. If necessary to reface the valve seats, use a valve seat grinder or valve seat cutter and grind to a 45 degree angle. Do not grind any more than is necessary to clean up the valve seat.

Note :

- If the valve guides are to be replaced, this must be done before refacing the valve seat.
- The valve seat ring is shrinkage-fitted in the cylinder head. However, the seat ring cannot be replaced in view of maintaining strength.

1-C-9. Checking Contact between Valve and Valve Seat

After the valve or valve seat is ground, check the contact between the valve and valve seat as follows:

- Apply a thin coat of Prussian Blue on the valve face and insert the valve into the valve seat.
- Move the valve up and down with hand pressure, rotating the valve.
- Remove the valve and observe the transfer of Prussian Blue to the valve seat.
- Check the valve seat width with a scale.

An even transfer indicates accurate valve and valve seat refacing. If uneven, the valve must be lapped into the valve seat, using a suitable lapping compound.

The valve seat width is 1.4 mm (0.055 in) on the both inlet and exhaust valve seats.

If the valve seat width is too wide, it can be reduced from inside with a 75° seat cutter and from outside with a 15° seat cutter.

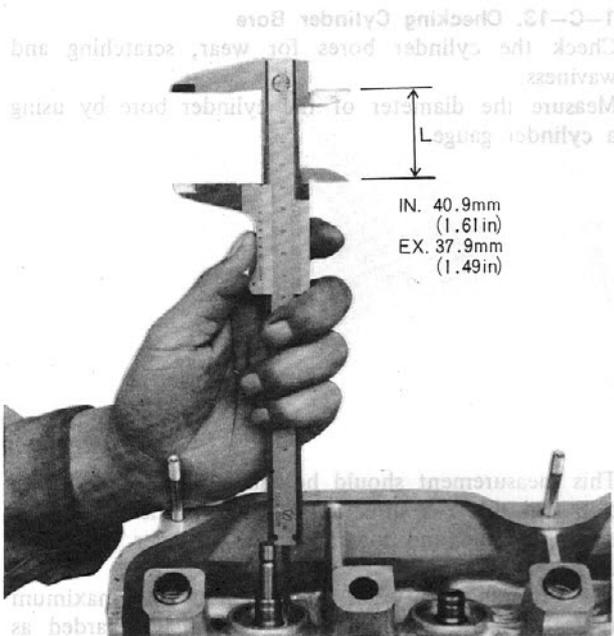


Fig. 1-35

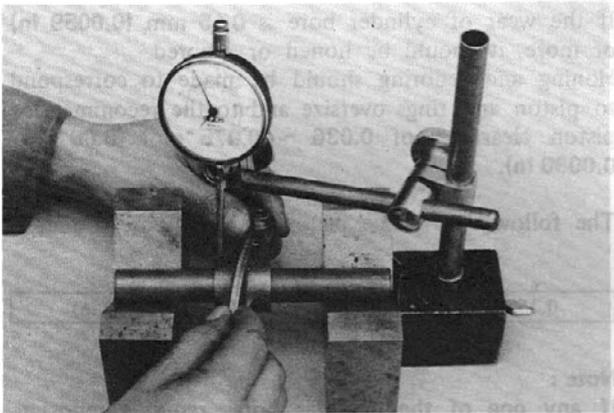


Fig. 1-36

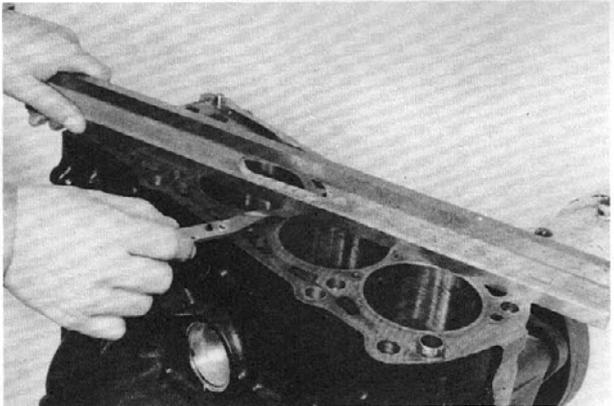
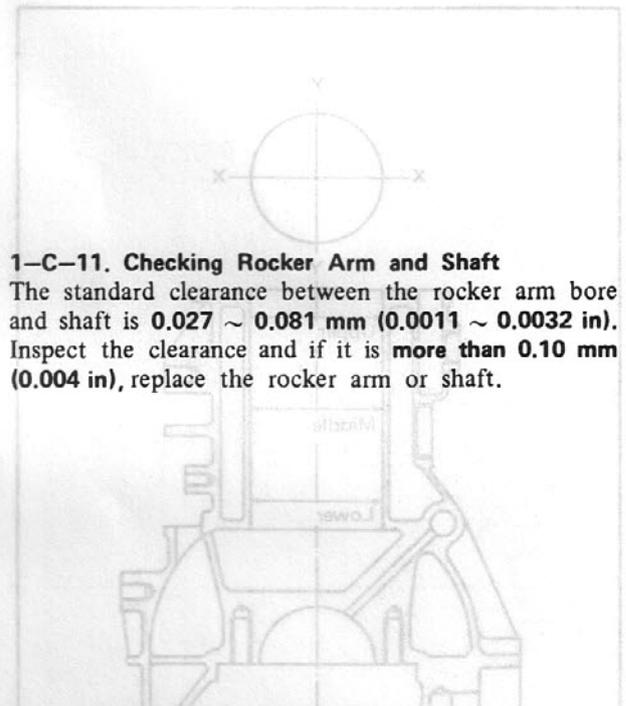


Fig. 1-37

1-C-10. Checking Valve Seat Sinking

Check the sinking of the valve seat by using a vernier calipers as shown in Fig. 1-35.

If the sinking exceeds **0.5 mm (0.020 in)**, washers of sufficient thickness to compensate the sinking must be placed under the springs so as to maintain the specified spring pressure. If it is more than **1.5 mm (0.059 in)**, replace the valve.



1-C-11. Checking Rocker Arm and Shaft

The standard clearance between the rocker arm bore and shaft is **0.027 ~ 0.081 mm (0.0011 ~ 0.0032 in)**. Inspect the clearance and if it is **more than 0.10 mm (0.004 in)**, replace the rocker arm or shaft.

1-C-12. Checking Cylinder Block

Clean the cylinder block with a suitable solvent. Special care must be taken when cleaning the oil passages, coolant passages and cylinder bore to remove all sludge, dirt and carbon deposit. After cleaning, use compressed air to dry the block thoroughly. Examine the cylinder block for crack and any damage. Examine all machined surfaces of the block for burrs and scores.

Check the cylinder block for distortion in the same way, as described in Par. 1-C-1.

Distortion limit 0.15 mm (0.006 in)

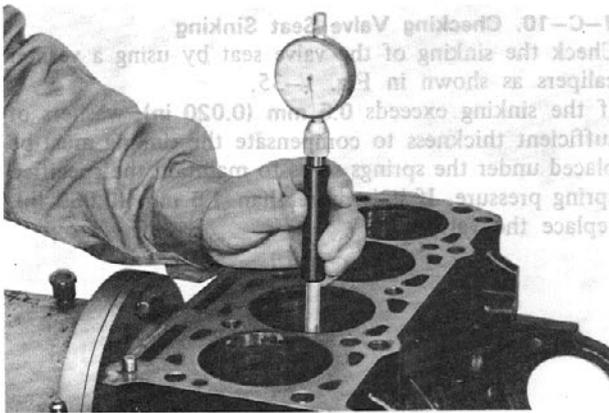


Fig. 1-38

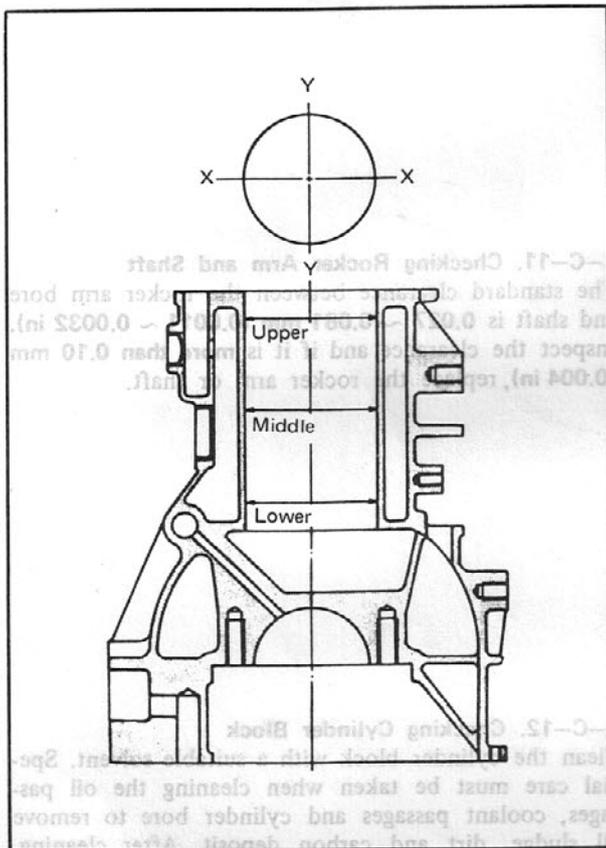


Fig. 1-39

1-C-13. Checking Cylinder Bore

Check the cylinder bores for wear, scratching and waviness.

Measure the diameter of the cylinder bore by using a cylinder gauge.

This measurement should be taken in the X-X direction and the Y-Y direction at each of the 3 sections, upper, middle and lower, of one cylinder, as shown in Fig. 1-39.

The difference between the minimum and maximum values out of the 6 measured values is regarded as the amount of wear.

If the wear of cylinder bore is **0.15 mm (0.0059 in) or more**, it should be honed or rebored.

Honing and reboring should be made to correspond to piston and rings oversize and to the recommended piston clearance of **0.036 ~ 0.075 mm (0.0014 ~ 0.0030 in)**.

The following oversize piston and rings are available:

0.25 mm (0.010 in)	0.50 mm (0.020 in)
--------------------	--------------------

Note :

If any one of the cylinder bores requires reboring, the remaining ones also require reboring.



Fig. 1-40

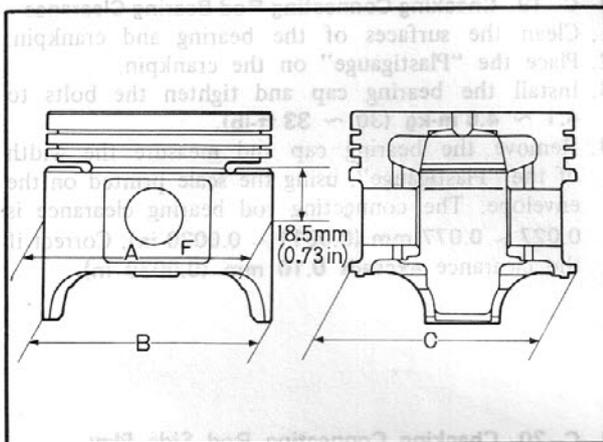


Fig. 1-41

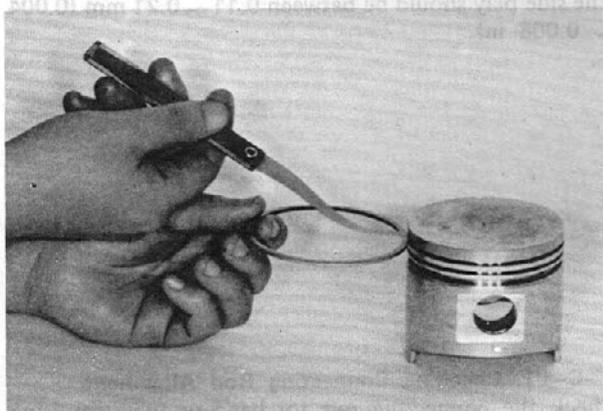


Fig. 1-42

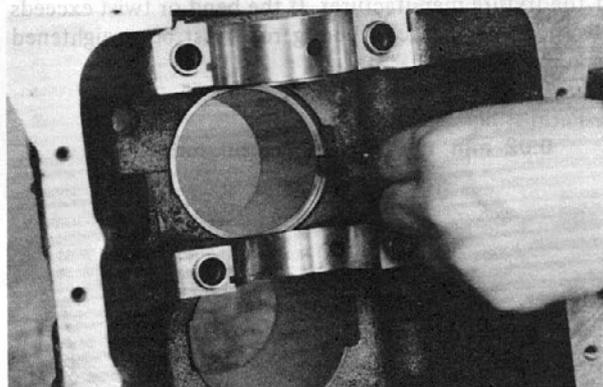


Fig. 1-43

1-C-14. Checking Piston

Carefully inspect the piston and replace if it is severely scored, scratched or burned.

Measure the diameter of the piston without the piston pin fitted by means of a micrometer.

The standard diameters are as shown in Fig. 1-41. If the wear is severe, replace the piston.

1-C-15. Checking Piston Clearance

Check the clearance between each piston and cylinder by measuring the diameter of the piston and cylinder. Measure the piston diameter at right angle to the piston pin and 18.5 mm (0.73 in) below the ring groove. The standard clearance is 0.036 ~ 0.075 mm (0.0014 ~ 0.0030 in).

If the clearance exceeds 0.15 mm (0.006 in), rebore the cylinders and use the oversize pistons and rings, referring to Par. 1-C-13.

A: 79.954 ± 0.01 mm (3.1478 ± 0.0004 in)

B: 79.980 mm (3.1489 in)

C: 79.550 mm (3.1319 in)

1-C-16. Checking Piston Ring Groove

Remove the carbon from the piston ring grooves by using a ring groove cleaner or a broken piece of piston ring. With a feeler gauge, check the side clearance of the piston rings at several places.

If it is improper, replace the piston rings.

Standard:

Top ring 0.030 ~ 0.070 mm
(0.0012 ~ 0.0028 in)

Second ring 0.030 ~ 0.064 mm
(0.0012 ~ 0.0025 in)

Limit 0.15 mm (0.006 in)

1-C-17. Checking Piston Ring End Gap

Place the piston ring in the cylinder bore below the ring travel, using a piston head to push the ring in squarely.

Check the piston ring end gap with a feeler gauge.

Standard :

Top & second ring 0.2 ~ 0.4 mm
(0.008 ~ 0.016 in)

Oil ring 0.3 ~ 0.9 mm
(0.012 ~ 0.035 in)

Limit 1.0 mm (0.039 in)

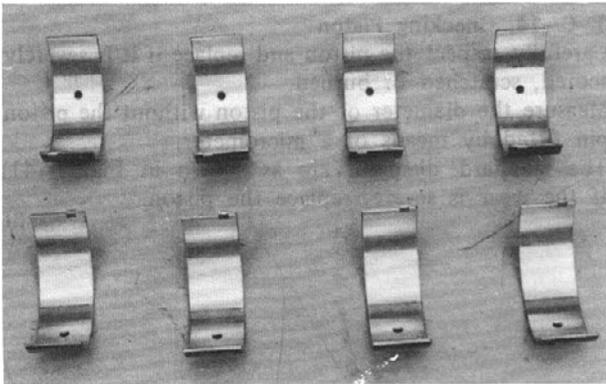


Fig. 1-44

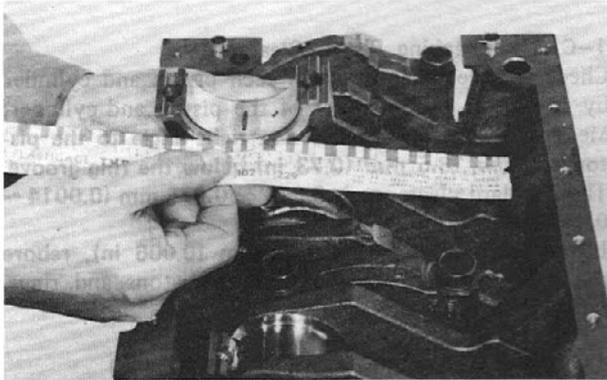


Fig. 1-45

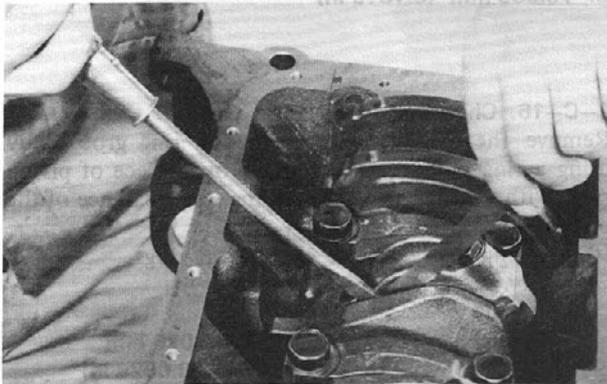


Fig. 1-46



Fig. 1-47

1-C-18. Connecting Rod Bearing

The connecting rod bearing sets are available in the standard size and undersize of **0.25, 0.50 and 0.75 mm (0.010, 0.020 and 0.030 in)**.

Inspect the bearing carefully and replace if it is worn, scored or flaked.

Each bearing consists of two halves and should be replaced as a set.

1-C-19. Checking Connecting Rod Bearing Clearance

1. Clean the surfaces of the bearing and crankpin.
2. Place the "Plastigauge" on the crankpin.
3. Install the bearing cap and tighten the bolts to **4.1 ~ 4.6 m·kg (30 ~ 33 ft·lb)**.
4. Remove the bearing cap and measure the width of the "Plastigauge", using the scale printed on the envelope. The connecting rod bearing clearance is **0.027 ~ 0.077 mm (0.0011 ~ 0.0030 in)**. Correct if the clearance exceeds **0.10 mm (0.0039 in)**.

1-C-20. Checking Connecting Rod Side Play

Check the connecting rod side play with a feeler gauge. The side play should be **between 0.11 ~ 0.21 mm (0.004 ~ 0.008 in)**.

1-C-21. Checking Connecting Rod Alignment

Check the connecting rod for bend or twist by using a suitable alignment fixture. Follow the instructions of the fixture manufacturer. If the bend or twist exceeds specifications, the connecting rod must be straightened or replaced.

Permissible deflection :

0.02 mm (0.0008 in) Per 50 mm (2 in)



Fig. 1-48

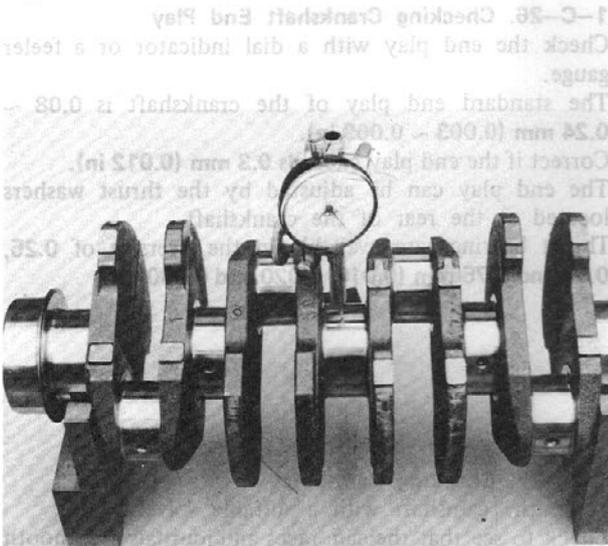


Fig. 1-49

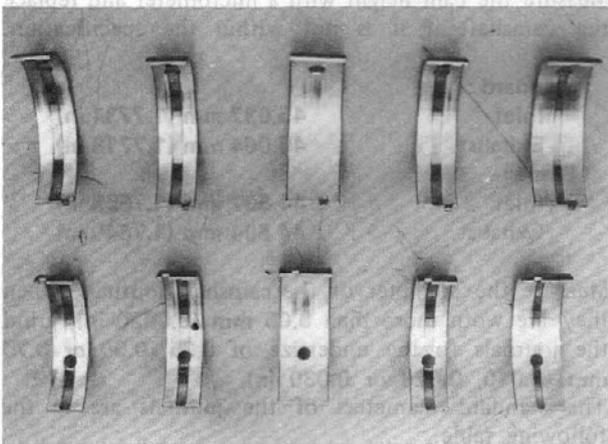


Fig. 1-50

From	42 - 0.040 mm (1.7317 - 0.0016 in)
Center	42 - 0.030 mm (1.2317 - 0.0020 in)
Rear	42 - 0.040 mm (1.7317 - 0.0016 in)

1-C-22. Checking Main Journal and Crankpin

Clean the crankshaft thoroughly with a suitable solvent and blow out the oil passages with compressed air.

Inspect the crankshaft for crack, scratch and the oil passages for clog.

Measure the diameter of each crankpin and main journal with a micrometer. If the wear is **more than 0.05 mm (0.0020 in)**, the crankshaft should be ground to the undersize of **0.25, 0.50 and 0.75 mm (0.010, 0.020 and 0.030 in)** or replaced.

The standard diameter of the crankpins and main journals are shown in the following table.

Crankpin	53 - 0.045 mm (2.0866 - 0.0018 in) - 0.060 mm (2.0866 - 0.0024 in)
Main journal	63 - 0.045 mm (2.4804 - 0.0018 in) - 0.060 mm (2.4804 - 0.0024 in)

1-C-23. Checking Crankshaft Alignment

To check alignment, mount the crankshaft on the "V" blocks and apply a dial indicator. Slowly rotate the crankshaft and note the reading on the dial indicator. The maximum allowable run-out is **0.03 mm (0.0012 in)**.

If it is not within specification, replace the crankshaft with new one.

1-C-24. Main Bearing

The main bearings are classified into 2 types according to the shape as shown in Fig. 1-50.

The main bearings are available in the standard size and undersize of **0.25, 0.50 and 0.75 mm (0.010, 0.020 and 0.030 in)**.

Inspect the bearings carefully for wear, scoring, flaking or any damage. If any of these conditions exists, replace with new bearings.

Each bearing consists of two halves and should be replaced as a set.

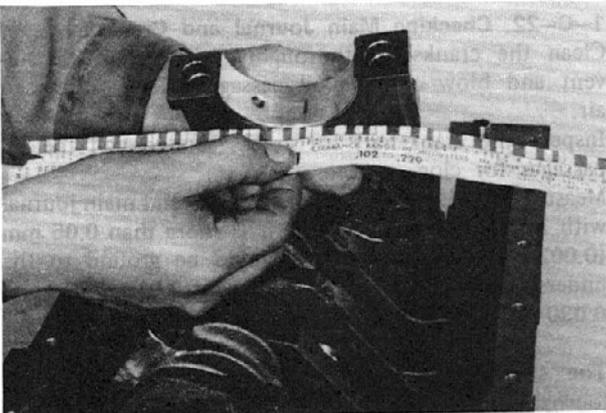


Fig. 1-51



Fig. 1-52

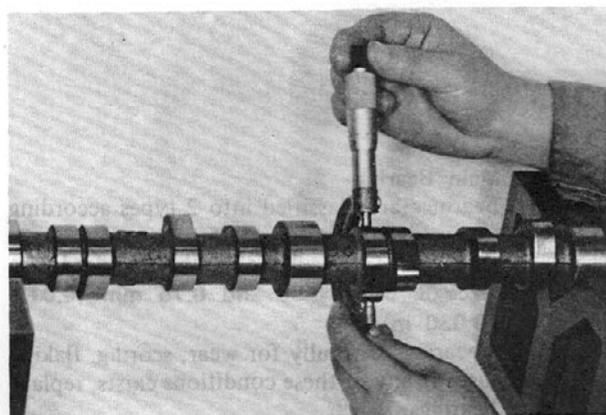


Fig. 1-53

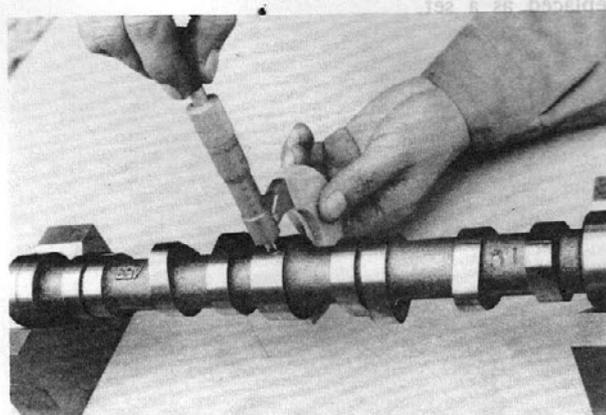


Fig. 1-54

1-C-25. Checking Main Bearing Clearance

Check the main bearing clearance in the same manner for the connecting rod bearing clearance.

Note the following differences :

1. The main bearing clearance is **0.031 ~ 0.050 mm (0.0012 ~ 0.0020 in)**.
Correct if the clearance **exceeds 0.08 mm (0.0031 in)**.
2. The tightening torque of the bearing cap bolts is **8.4 ~ 9.0 m-kg (61 ~ 65 ft-lb)**.

1-C-26. Checking Crankshaft End Play

Check the end play with a dial indicator or a feeler gauge.

The standard end play of the crankshaft is **0.08 ~ 0.24 mm (0.003 ~ 0.009 in)**.

Correct if the end play **exceeds 0.3 mm (0.012 in)**.

The end play can be adjusted by the thrust washers located at the rear of the crankshaft.

Thrust bearings are available in the oversize of **0.25, 0.50 and 0.75 mm (0.010, 0.020 and 0.030 in)**.

1-C-27. Checking Camshaft

Clean the camshaft with a suitable solvent.

Check to see that the cam faces and journals are smooth and are not scored or worn.

Measure the cam height with a micrometer and replace the camshaft if it is not within the specification.

Standard :

Inlet	45.037 mm (1.7731 in)
Exhaust	45.004 mm (1.7718 in)

Limit :

Inlet	44.837 mm (1.7653 in)
Exhaust	44.804 mm (1.7640 in)

Measure the diameter of the camshaft journals. When they are worn **more than 0.05 mm (0.0020 in)**, grind the journals to the undersize of **0.25, 0.50 or 0.75 mm (0.010, 0.020 or 0.030 in)**.

The standard diameters of the journals are in the following table.

Front	45 - 0.040 mm (1.7717 - 0.0016 in) - 0.055 mm (1.7717 - 0.0022 in)
Center	45 - 0.050 mm (1.7717 - 0.0020 in) - 0.065 mm (1.7717 - 0.0026 in)
Rear	45 - 0.040 mm (1.7717 - 0.0016 in) - 0.055 mm (1.7717 - 0.0022 in)

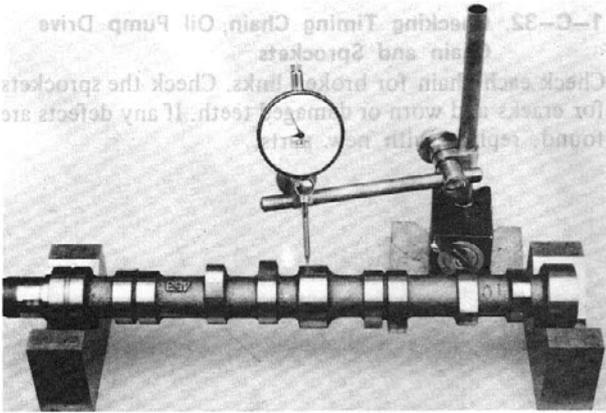


Fig. 1-55

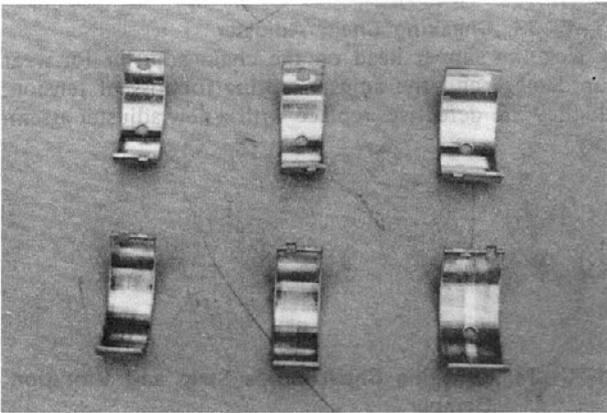


Fig. 1-56

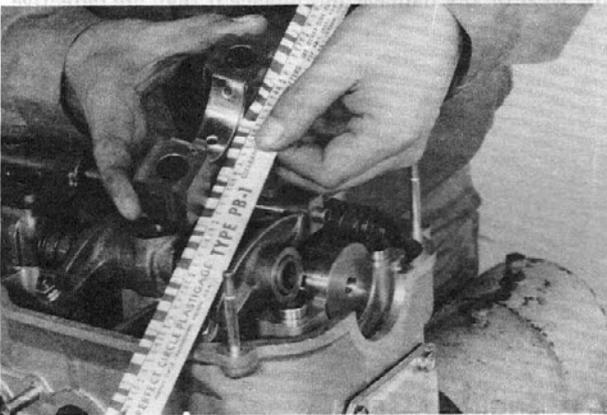


Fig. 1-57

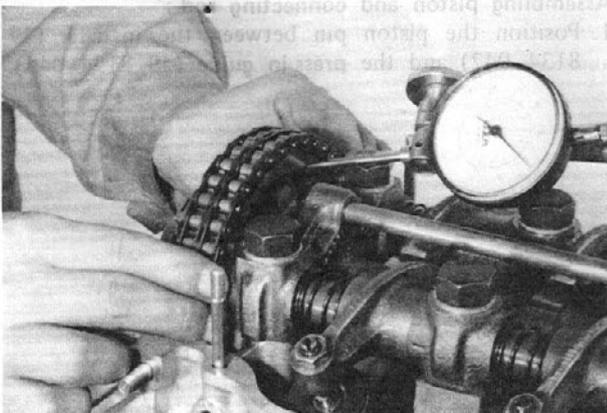


Fig. 1-58

1-C-28. Checking Camshaft Run-Out

Check the camshaft run-out with a dial indicator. The maximum permissible run-out is **0.03 mm (0.0012 in)**. If it is not within specification, replace the camshaft with new one.

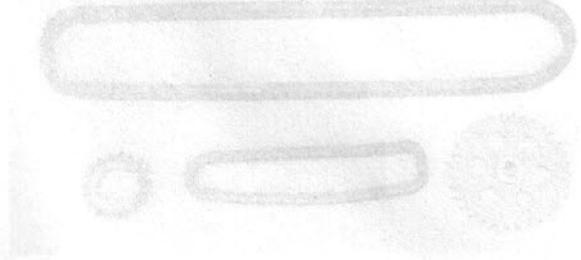


Fig. 1-28

1-C-29. Camshaft Bearing

The camshaft bearings are classified into 3 types. The camshaft bearings are available in the standard size and undersize of **0.25, 0.50 and 0.75 mm (0.010, 0.020 and 0.030 in)**.

Inspect the bearings carefully for wear, scoring, flaking or any damage. If any of these conditions exists, replace with new bearings.

Each bearing consists of two halves and should be replaced as a set.

Fig. 1-29

1-C-30. Checking Camshaft Bearing Clearance

Check the camshaft bearing clearance in the same manner for the connecting rod bearing clearance.

Note the following differences:

1. The standard camshaft bearing clearance are **0.019 ~ 0.069 mm (0.0007 ~ 0.0027 in)** for the front and rear, and **0.029 ~ 0.079 mm (0.0011 ~ 0.0031 in)** for the center.
Correct if the clearance exceeds **0.15 mm (0.0059 in)**.
2. The tightening torque of the bolts are **8.2 ~ 8.8 m·kg (59 ~ 64 ft·lb)**.

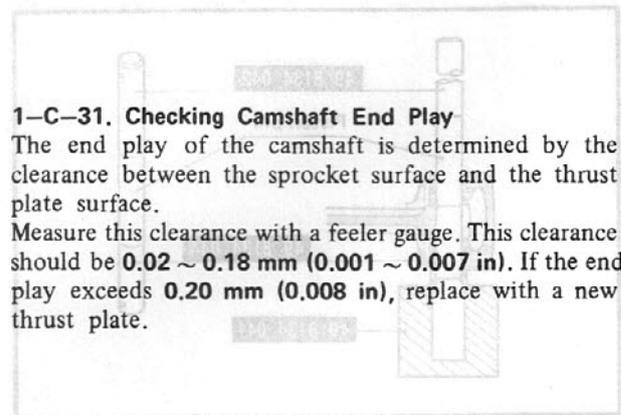


Fig. 1-31

1-C-31. Checking Camshaft End Play

The end play of the camshaft is determined by the clearance between the sprocket surface and the thrust surface.

Measure this clearance with a feeler gauge. This clearance should be **0.02 ~ 0.18 mm (0.001 ~ 0.007 in)**. If the end play exceeds **0.20 mm (0.008 in)**, replace with a new thrust plate.

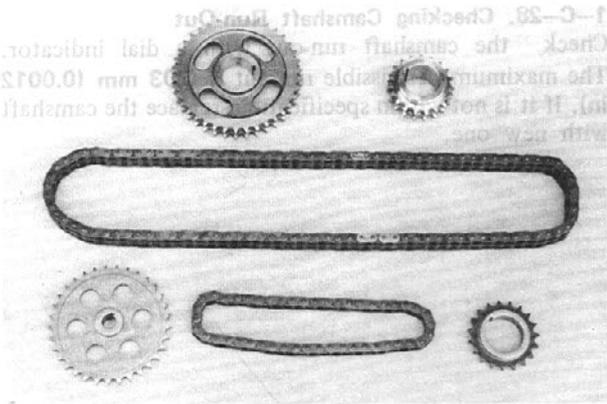


Fig. 1-59

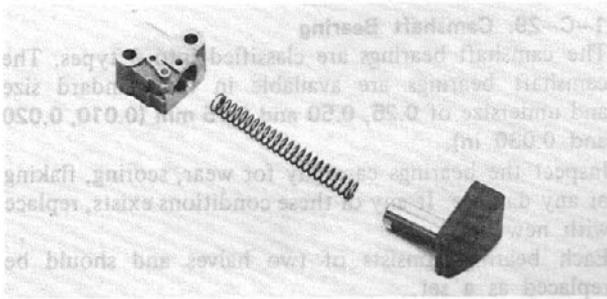


Fig. 1-60



Fig. 1-61

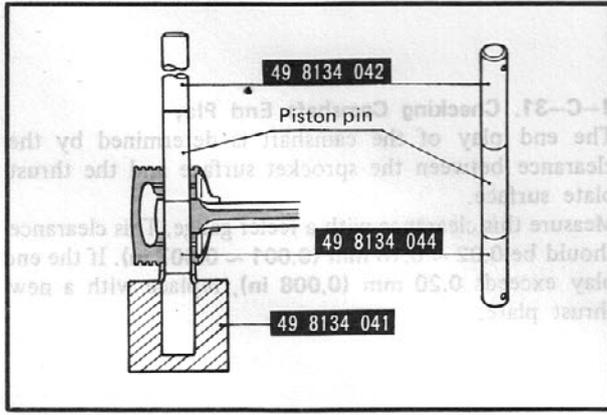


Fig. 1-62

1-C-32. Checking Timing Chain, Oil Pump Drive Chain and Sprockets

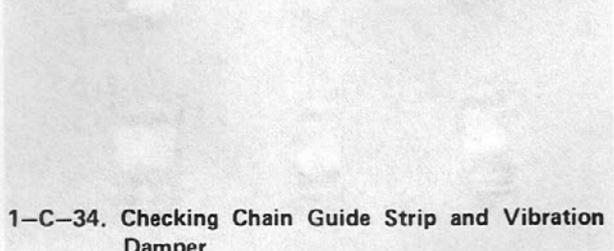
Check each chain for broken links. Check the sprockets for cracks and worn or damaged teeth. If any defects are found, replace with new parts.



Fig. 1-58

1-C-33. Checking Chain Adjuster

Check the slipper head on the chain adjuster for wear or damage and the adjuster spring for loss of tension. If they are defective, replace with a new adjuster assembly.



1-C-34. Checking Chain Guide Strip and Vibration Damper

Check the chain guide strip and chain vibration damper for wear or any damage and replace if they are defective.



Fig. 1-60

1-D. ENGINE ASSEMBLY

Assembling piston and connecting rod :

1. Position the piston pin between the installer (49 8134 042) and the press-in guide (49 8134 044).



Fig. 1-62

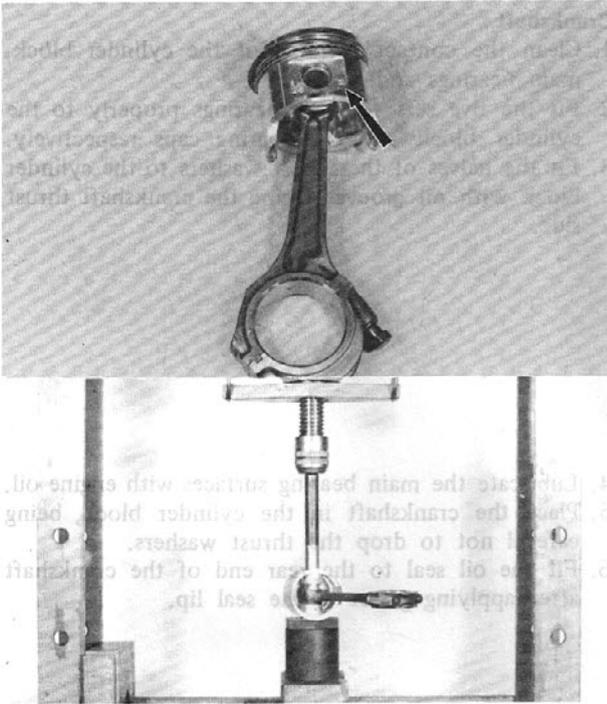


Fig. 1-63



Fig. 1-64



Fig. 1-65

2. In installing a piston pin make it sure that the piston and the connecting rod is connected as shown in Fig. 1-63 and in installing a piston, the "F" mark on it should face the front side of the engine.
3. Place the piston and connecting rod on the **support block** (49 8134 041) and insert the piston pin arranged in step 1.
4. Press in the piston pin until the lower end of press-in guide comes in contact with the bottom of support block.

Note :

- a) The piston hole, piston pin circumference and connecting rod small end hole should be lubricated with engine oil before installing the piston pin.
- b) Load for pressing in the piston pin is 500 ~ 1,500 kg (1,100 ~ 3,300 lb).
If it is not within the load, replace the connecting rod or piston pin.

Piston ring :

1. Fit the spacer in the bottom ring groove and install the guide rails on it.
2. Install the second ring and then the top ring with a suitable installer.

Note :

- a) Be sure to install the rings with the inscription mark upward as the faces of the top and second rings are tapered.
- b) Do not expand the rings more than necessary to install, also be careful not to burr the piston with the end of the rings.

Piston and connecting rod assembly :

1. Place the piston rings at about 120° apart so that the gap is not located on the thrust side and the piston pin side.
2. Lubricate the entire assembly with engine oil.
3. Using a suitable piston installer, insert the piston and connecting rod assembly from the top of the cylinder block by tapping the piston lightly with a plastic hammer.

Note :

Insert the piston and connecting rod assembly to the cylinder so that "F" mark on the piston is directed to the front of the engine.

4. Rotate the cylinder block upside down.



Fig. 1-66

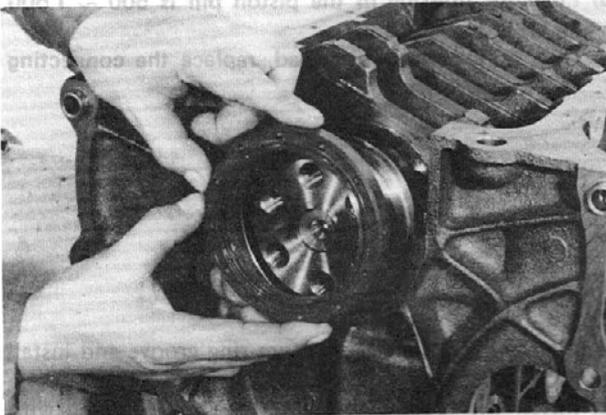


Fig. 1-67

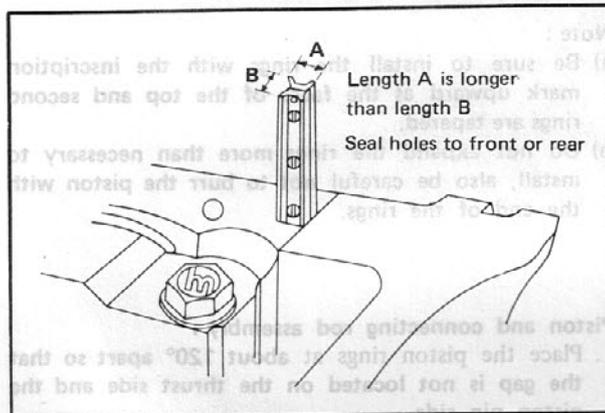


Fig. 1-68

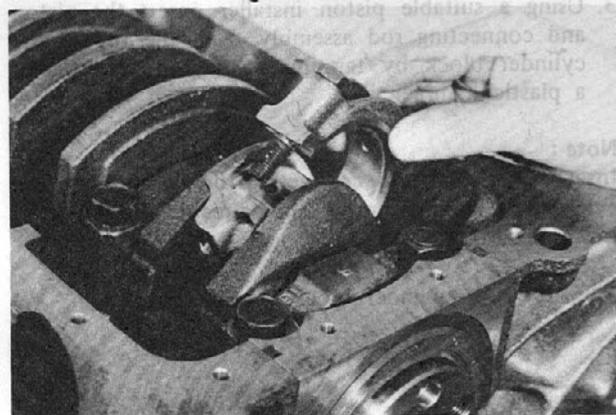


Fig. 1-69

Crankshaft :

1. Clean the contact surfaces of the cylinder block, main bearings and crankshaft.
2. Fit the five sets of main bearings properly to the cylinder block and the bearing caps respectively.
3. Fit the halves of the thrust washers to the cylinder block **with oil grooves facing the crankshaft thrust side.**

4. Lubricate the main bearing surfaces with engine oil.
5. Place the crankshaft in the cylinder block, being careful not to drop the thrust washers.
6. Fit the oil seal to the rear end of the crankshaft after applying grease to the seal lip.

7. Insert the rod-shaped oil seals (side seals) into the grooves on both sides of the rear main bearing cap.

Note :

The side seals should be installed as shown in Fig. 1-68.

8. Fit the halves of the thrust washers to the rear main bearing cap with oil grooves toward the crankshaft thrust side.
9. Install the main bearing caps.
10. Tighten the bolts to **8.4 ~ 9.0 m-kg (61 ~ 65 ft-lb).**

Note :

The main bearing caps are marked with a number which shows the order of their arrangement.

Connecting rod bearing cap :

1. Fit the connecting rod bearing halves into their respective caps.
2. Lubricate the connecting rod bearing surface with engine oil.
3. Install the caps to the connecting rods, ensuring that the **identification numbers are matched.**
4. Tighten the bolts to **4.1 ~ 4.6 m-kg (30 ~ 33 ft-lb).**
5. Turn the crankshaft and make sure that the rotation is light and smooth.

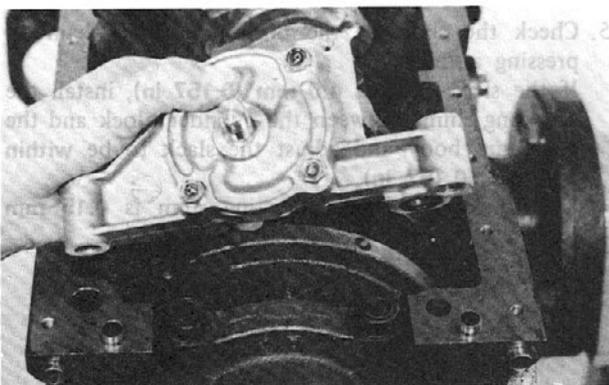


Fig. 1-70

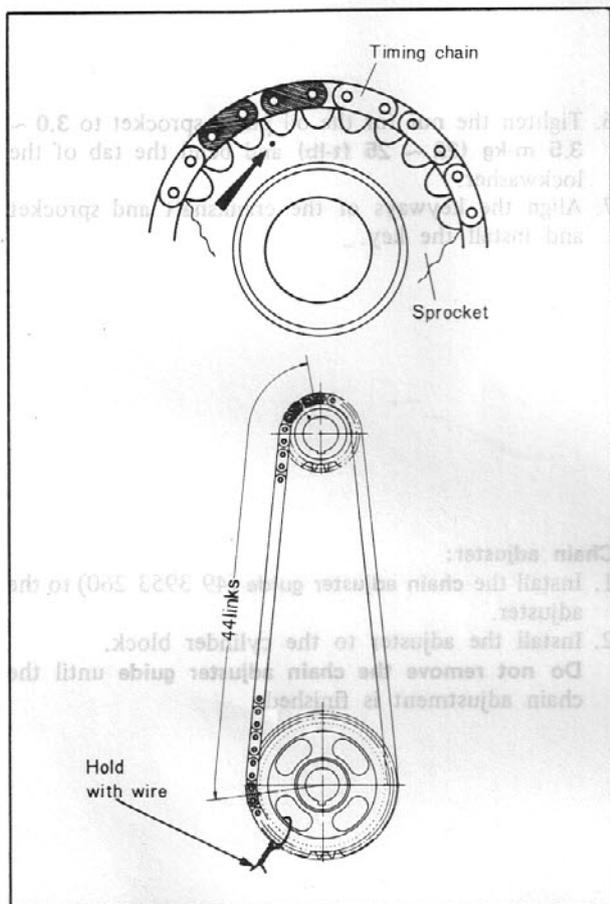


Fig. 1-71

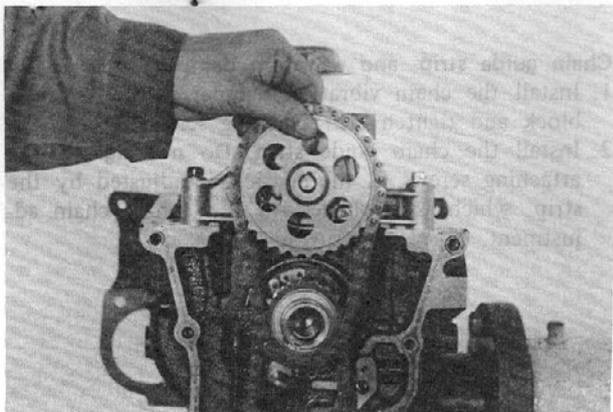


Fig. 1-72

Oil pump and strainer :

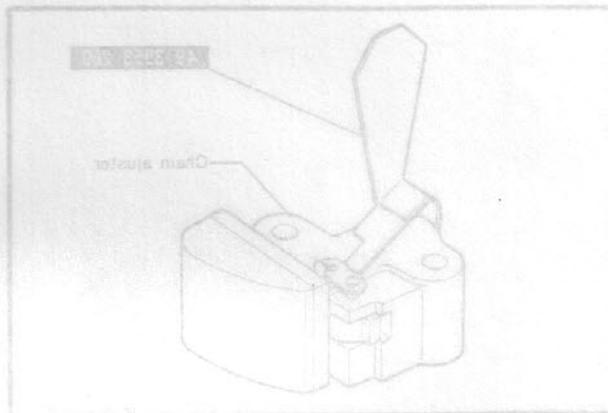
1. Fit the "O" ring to the outlet hole on the oil pump and install the oil pump to the cylinder block, aligning the dowel pins.
2. Tighten the attaching bolts.
3. Place the "O" ring on the oil pump and install the oil strainer to the oil pump. Tighten the bolts.

Timing chain, oil pump drive chain and sprockets :

1. Place the timing chain on the crankshaft sprocket and camshaft sprocket with the talley marks and nickel-plated links aligned.
2. Being careful not to change the relations of timing chain, camshaft sprocket and crankshaft sprocket, fit the crankshaft sprocket onto the crankshaft so as to flush the sprocket with the end of the crankshaft.
3. Install the key on the oil pump shaft.

Note:

Install the wire to the chain and camshaft sprocket so as not to change the relations of the chain and sprocket.



4. Fit the oil pump drive chain onto the oil pump sprocket and crankshaft sprocket, and then slide in the crankshaft sprocket, aligning the key on the oil pump shaft with the keyway of the pump sprocket.

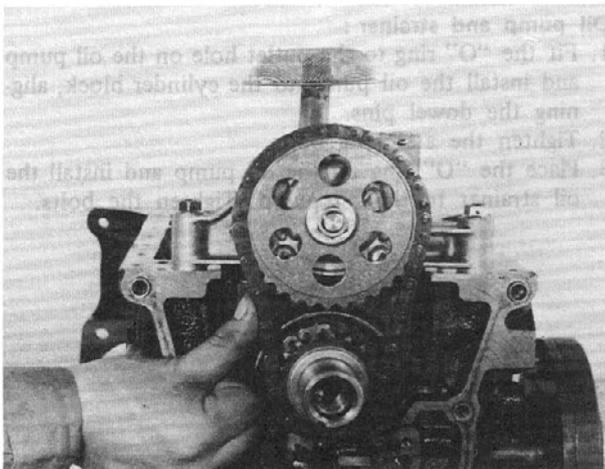


Fig. 1-73

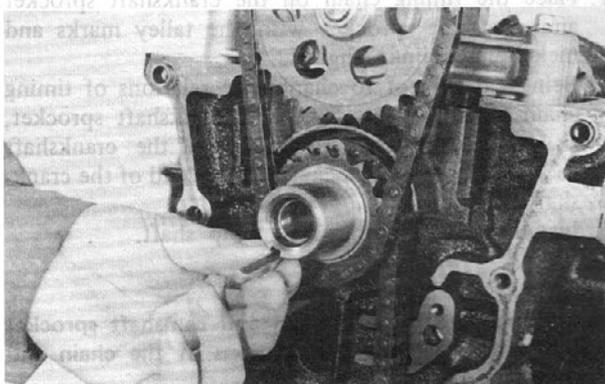


Fig. 1-74

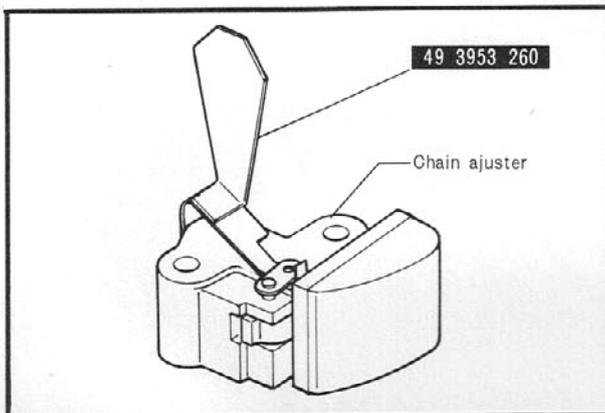


Fig. 1-75

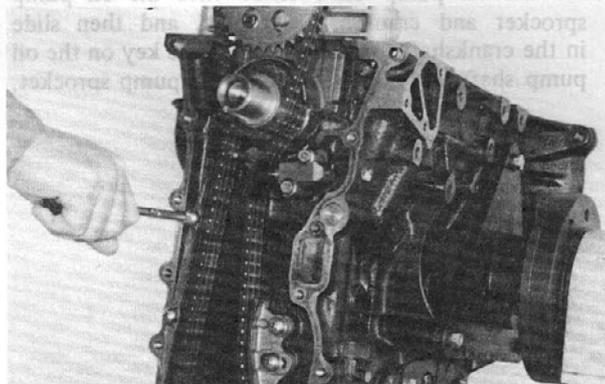


Fig. 1-76

5. Check the slack of the oil pump drive chain by pressing a finger.

If the slack **exceeds 4.0 mm (0.157 in)**, install the adjusting shims between the cylinder block and the oil pump body and adjust the slack to be **within 4.0 mm (0.157 in)**.

The thickness of the adjusting shim is **0.15 mm (0.006 in)**.

6. Tighten the nut for the oil pump sprocket to **3.0 ~ 3.5 m-kg (22 ~ 25 ft-lb)** and bend the tab of the lockwasher.
7. Align the keyways of the crankshaft and sprocket and install the key.

Chain adjuster:

1. Install the **chain adjuster guide (49 3953 260)** to the adjuster.
2. Install the adjuster to the cylinder block.
Do not remove the chain adjuster guide until the chain adjustment is finished.

Chain guide strip and vibration damper :

1. Install the chain vibration damper to the cylinder block and tighten the attaching screws.
2. Install the chain guide strip. **Do not tighten** the attaching screws as the tension is adjusted by the strip, which is explained to the timing chain adjustment.

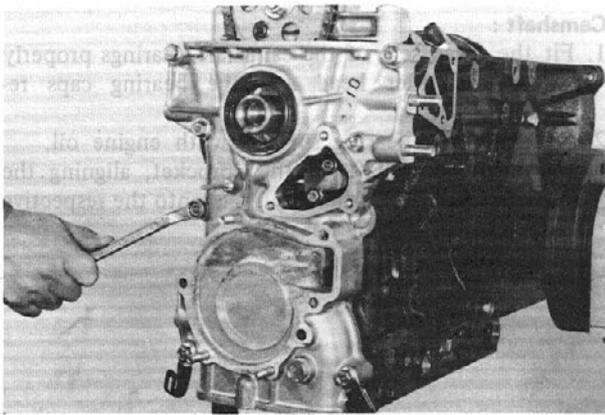


Fig. 1-77

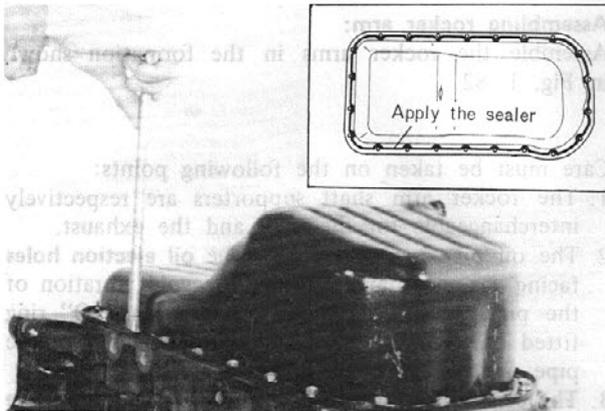


Fig. 1-78



Fig. 1-79

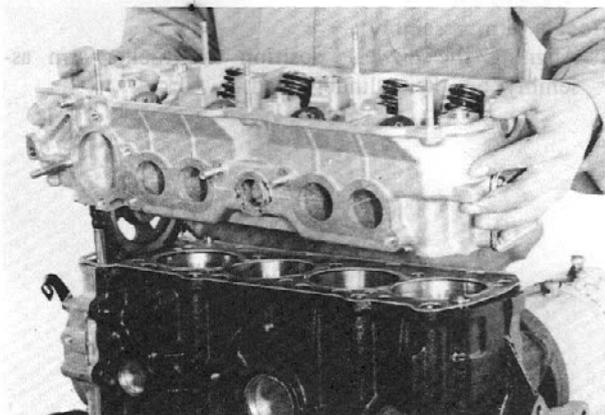


Fig. 1-80

Timing chain cover :

1. Fit the oil thrower to the crankshaft **with the edge turned outward.**
2. Fill the oil seal lip with grease.
3. Place the gaskets on the cylinder block and install the chain cover, aligning the dowel pins. Tighten the bolts.
4. Cut off excess gaskets along the mounting surfaces of the oil pan and cylinder head.

Oil pan:

1. Before installing the oil pan, make a final internal inspection.
2. Clean the mating surfaces of the block and oil pan.
3. Apply the sealer (8527 77 739), over the inner border of the mating surfaces of the block, and oil pan (i.e. inner periphery up to bolt hole).
4. Install the oil pan tighten the bolts little by little in turn.

Install the oil pan on the block with 30 minutes.

Note:

If cleaning of the mating surfaces is difficult, apply the sealer (8527 77 739) on the oil pan gasket and install the oil pan gasket in the block.

Flywheel and clutch :

Install the flywheel and clutch, as described in Par. 6-E.

Crankshaft pulley :

1. Lock the flywheel with the **brake** (49 0118 271A).
2. Install the crackshaft pulley to the crankshaft so that the key groove of the pulley aligns with the key on the crankshaft.
3. Tighten the pulley bolt to **14.0 ~ 15.0 m-kG (101 ~ 108 ft-lb).**

Cylinder head :

1. Hold the camshaft sprocket and chain securely with a hand and rotate the cylinder block upside down.
2. Place the sprocket and the chain on the top of the chain guide strip and vibration damper.

Note :

Ensure that the tally marks of both the camshaft sprocket and the chain are engaged properly.

3. Place a new gasket on the cylinder block.
4. Position the cylinder head on the cylinder block, aligning the dowels.

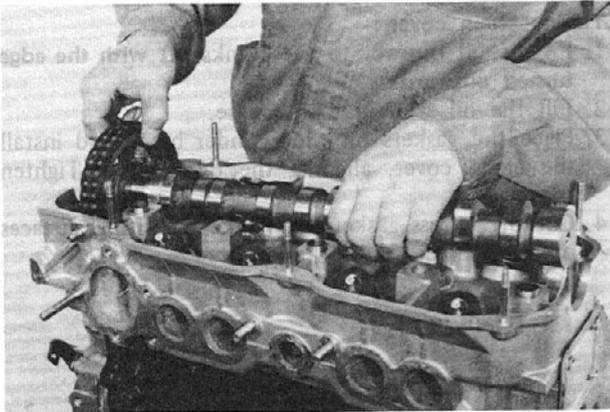


Fig. 1-81

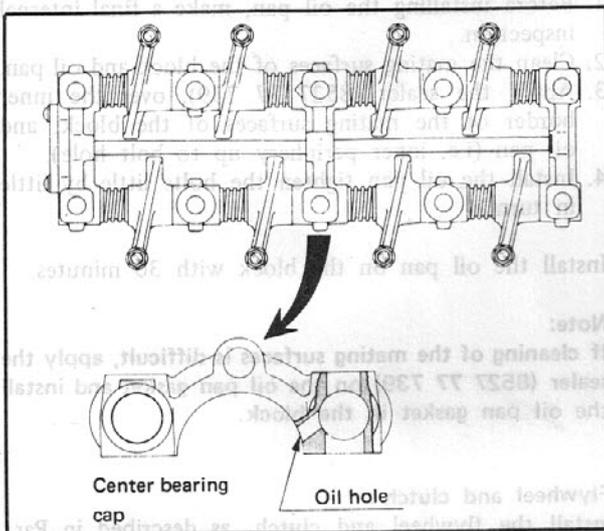


Fig. 1-82

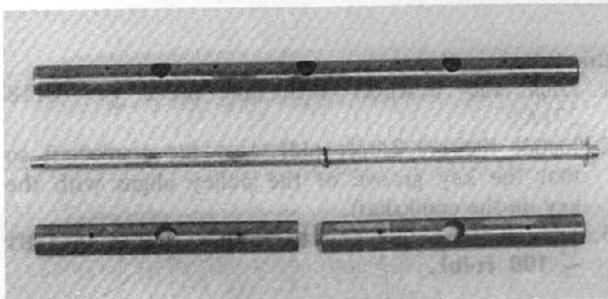


Fig. 1-83

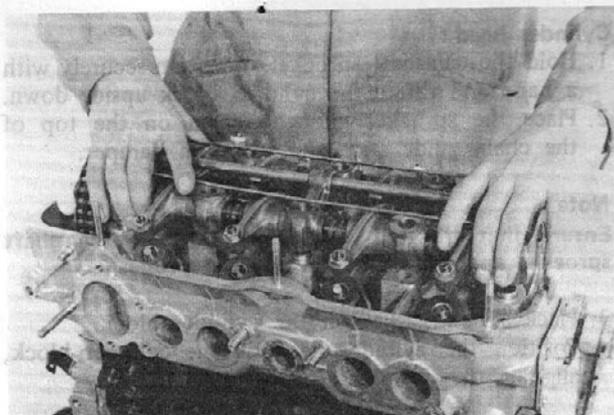


Fig. 1-84

Camshaft :

1. Fit the three sets of the camshaft bearings properly to the cylinder head and the bearing caps respectively.
2. Lubricate the bearing surfaces with engine oil.
3. Install the camshaft to the sprocket, aligning the key and fit the camshaft journals onto the respective bearings.

Assembling rocker arm:

Assemble the rocker arms in the formation shown in Fig. 1-82.

Care must be taken on the following points:

1. The rocker arm shaft supporters are respectively interchangeable for the inlet and the exhaust.
2. The oil pipe is installed with the **oil ejection holes facing the camshaft**. In order to avoid vibration of the pipe after it has been installed, the "O" ring fitted on the pipe is pressed into the hole for the pipe on the center bearing cap.
3. The center bearing cap is installed with the **oil hole facing toward the inlet side**.

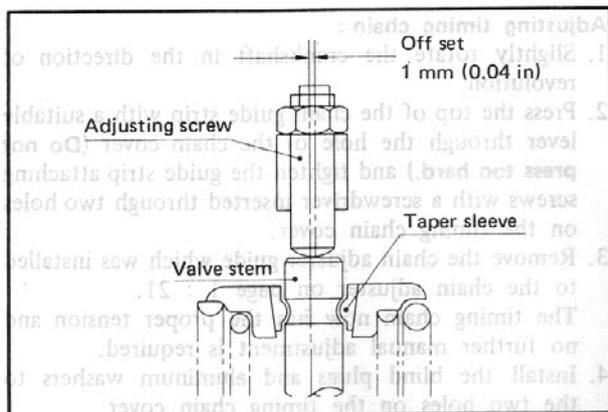


Fig. 1-85

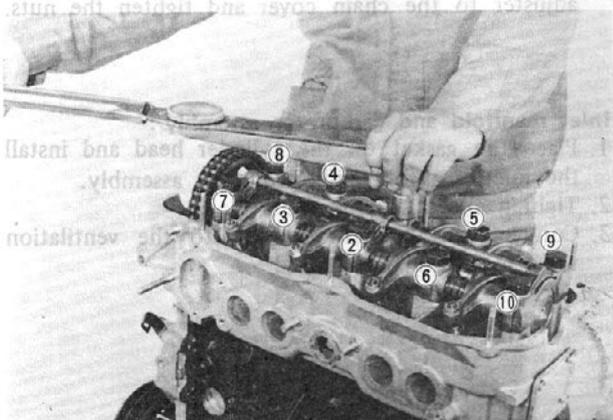


Fig. 1-86

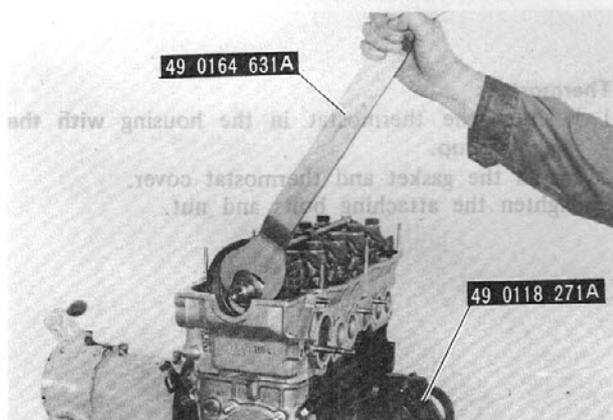


Fig. 1-87



Fig. 1-88

2. Tighten the cylinder head bolts temporarily.
3. Move the rocker arm supporters and **offset each of the rocker arms 1 mm (0.04 in)** from the valve stem center.

4. Tighten the cylinder head bolts **evenly to 8.2 ~ 8.8 m-kG (59 ~ 64 ft-lb)** in the sequence.
5. Tighten the bolt attaching the cylinder head to the cylinder block.

6. Lock the flywheel with the **brake (49 0118 271A)** and tighten the camshaft sprocket lock nut to **7.0 ~ 8.0 m-kG (51 ~ 58 ft-lb)** with the **spanner (49 0164 631A)**. Bend the tab of the lock washer.

7. Aligning the key groove with the pin, install the distributor drive gear to the camshaft. Tighten the lock nut to **7.0 ~ 8.0 m-kG (51 ~ 58 ft-lb)** and bend the tab of the lock washer.

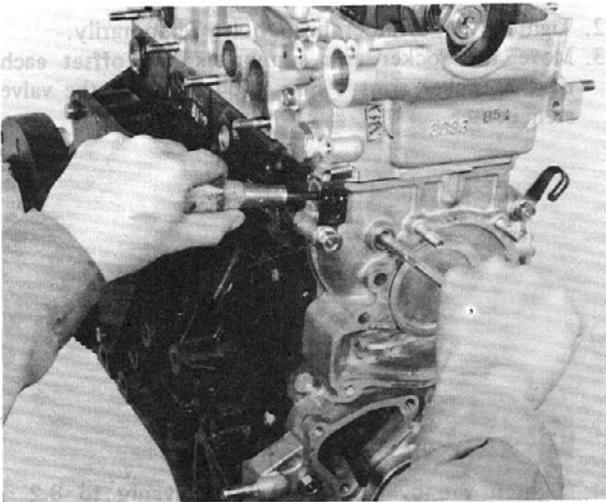


Fig. 1-89



Fig. 1-90

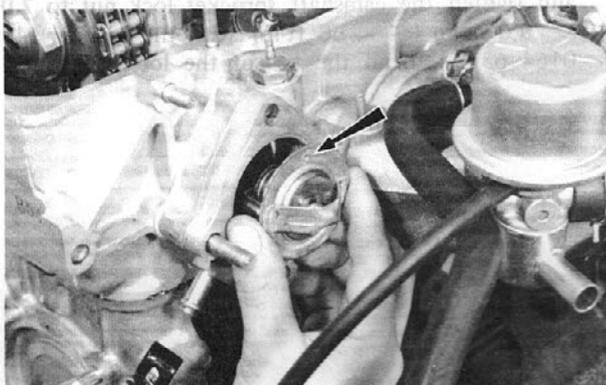


Fig. 1-91

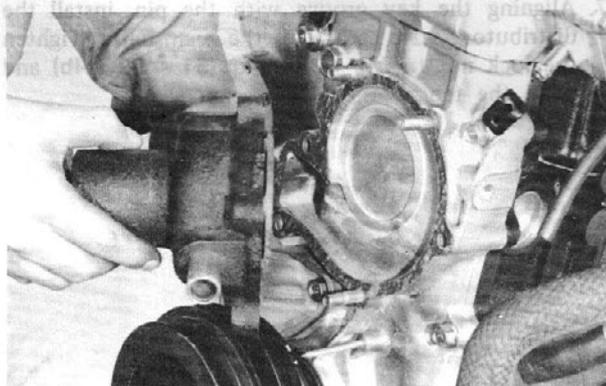


Fig. 1-92

Adjusting timing chain :

1. Slightly rotate the crankshaft in the direction of revolution.
2. Press the top of the chain guide strip with a suitable lever through the hole of the chain cover (**Do not press too hard.**) and tighten the guide strip attaching screws with a screwdriver inserted through two holes on the timing chain cover.
3. Remove the chain adjuster guide which was installed to the chain adjuster on page 1 : 21.
The timing chain now has the proper tension and no further manual adjustment is required.
4. Install the blind plugs and aluminum washers to the two holes on the timing chain cover.
5. Install the blind cover and gasket for the chain adjuster to the chain cover and tighten the nuts.

Inlet manifold and carburetor assembly :

1. Place the gasket on the cylinder head and install the inlet manifold and carburetor assembly.
2. Tighten the attaching nuts.
3. Connect the ventilation hose to the ventilation valve at the inlet manifold.

Thermostat :

1. Position the thermostat in the housing **with the jiggle pin up.**
2. Install the gasket and thermostat cover.
Tighten the attaching bolts and nut.

Water pump :

1. Position the gasket on the timing chain cover and install the water pump.
2. Install the alternator strap.
3. Tighten the attaching bolts and nuts.
4. Connect the water hose (water pump ~ inlet manifold) to the inlet manifold.
5. Connect the water bypass hose (water pump ~ thermostat housing) to the thermostat housing.



Fig. 1-93

Cooling fan and pulley :

Install the pulley and cooling fan onto the water pump boss and tighten the bolts.

Oil filter :

1. Apply oil onto the oil seal on the new filter cartridge.
2. Install the cartridge onto the cover and tighten the cartridge fully by hand.

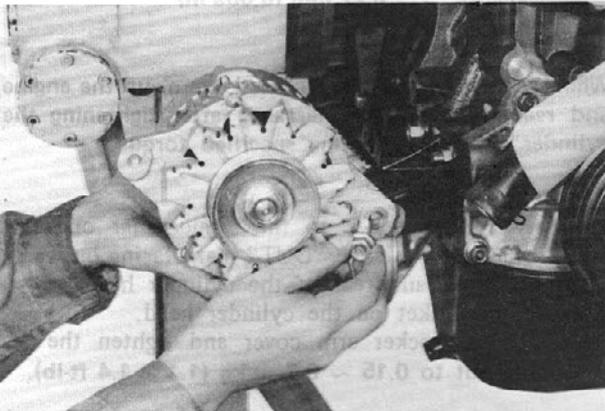


Fig. 1-94

Alternator :

1. Position the alternator to the mounting bracket and install the mounting-bolt.
Do not tighten.
2. Place the drive belt on the alternator pulley and install the alternator strap bolt.
3. Adjust the drive belt tension as described in Par. 3-E.

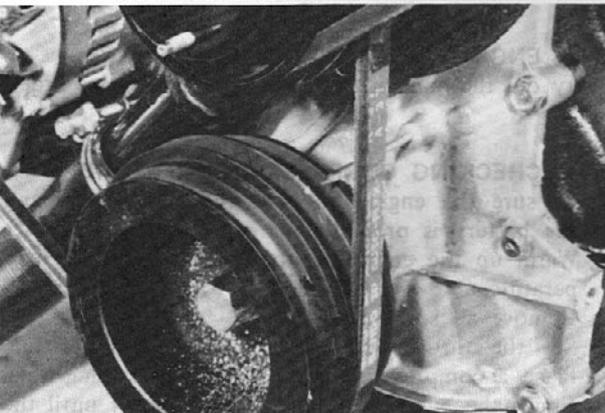


Fig. 1-95

Distributor :

1. Rotate the crankshaft in the direction of revolution until the No. 1 piston is coming up on compression stroke and the ignition timing mark on the crankshaft pulley is in line with the indicator pin on the timing chain cover.
2. **Align the tally marks** on the distributor housing and the driven gear, and install the distributor and lock nut.

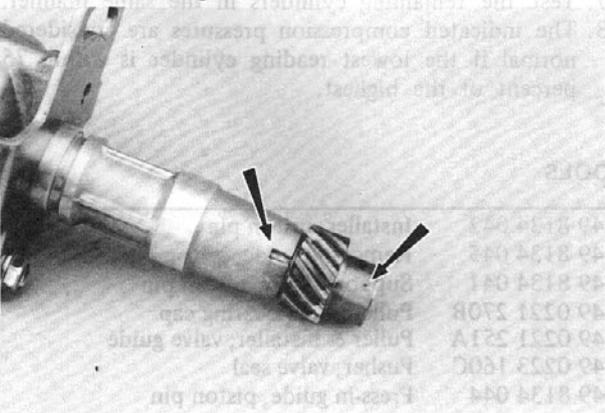


Fig. 1-96

Note :

Precise adjustment must be done by using the timing light, as instructed in Par. 5-E-7.

49 0107 680A	Engine stand
49 0221 002A	Longer engine stand
49 3923 260	Guide, chain adjuster
49 0118 271A	Brake ring gear
49 0104 631A	Spanner, front wheel spindle nut
49 0636 100A	Arm, valve spring lifter
49 0221 222A	Pivot, valve spring lifter
49 8134 040	Tool set, piston pin setting

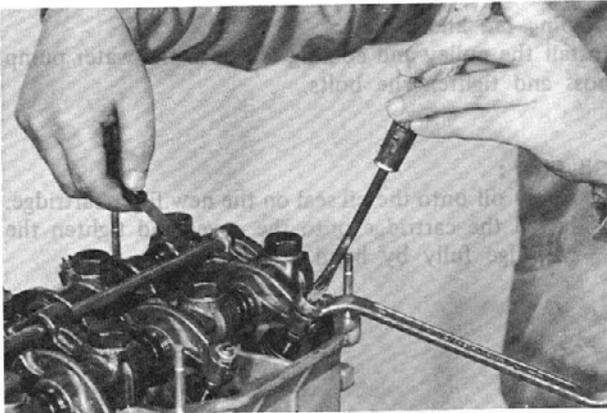


Fig. 1-97

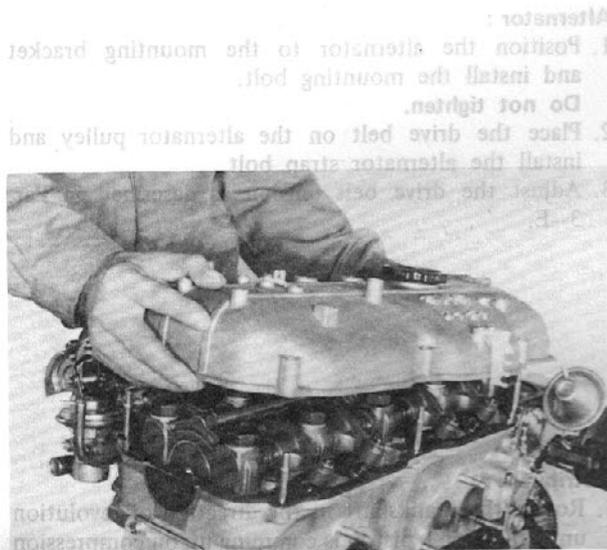


Fig. 1-98

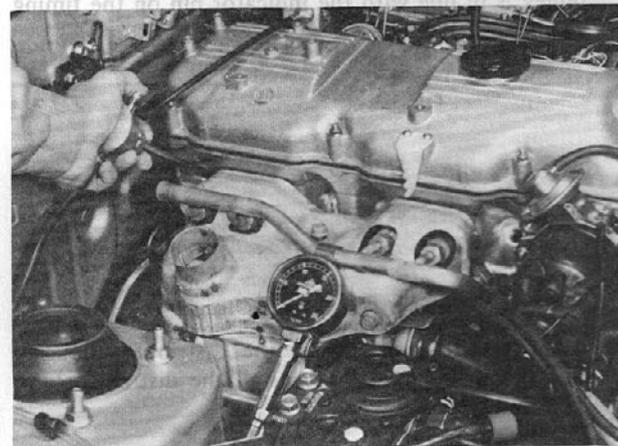


Fig. 1-99

Adjusting valve clearance :

To adjust the valve clearance, loosen the lock nut and insert the specified feeler gauge between the rocker arm and the valve stem or between the rocker arm and the cam.

Then, turn the adjusting screw until the proper clearance is obtained.

After adjustment, tighten the lock nut securely and recheck the clearance.

Valve side :

Inlet 0.30 mm (0.012 in)

Exhaust 0.30 mm (0.012 in)

Cam side :

Inlet 0.22 mm (0.009 in)

Exhaust 0.22 mm (0.009 in)

Note :

Whenever the engine is overhauled, warm up the engine and readjust the valve clearance after tightening the cylinder head bolts to the specified torque.

Rocker arm cover :

1. Apply rubber sealer to the semicircular oil seals and fit them, with the "OUT" mark facing outward, to the front and rear of the cylinder head.
2. Place the gasket on the cylinder head.
3. Install the rocker arm cover and tighten the attaching nut to 0.15 ~ 0.2 m·kg (1.1 ~ 1.4 ft·lb).

1-E. ENGINE INSTALLATION

Carry out the removing operations in the reverse order.

1-F. CHECKING COMPRESSION PRESSURE

1. Be sure the engine oil is at the proper level and the battery is properly charged.
2. Warm up the engine to the normal operating temperature.
3. Remove all spark plugs.
4. Set the throttle valve to the wide open position.
5. Place a compression gauge in the spark plug hole.
6. Crank the engine with the starting motor until the pressure reaches a maximum value.
7. Test the remaining cylinders in the same manner.
8. The indicated compression pressures are considered normal if the lowest reading cylinder is within 75 percent of the highest.

SPECIAL TOOLS

49 0107 680A	Engine stand	49 8134 042	Installer, piston pin
49 0221 005A	Hanger, engine stand	49 8134 045	Removing guide, piston pin
49 3953 260	Guide, chain adjuster	49 8134 041	Support block, piston pin
49 0118 271A	Brake, ring gear	49 0221 270B	Puller, main bearing cap
49 0164 631A	Spanner, front wheel spindle nut	49 0221 251A	Puller & installer, valve guide
49 0636 100A	Arm, valve spring lifter	49 0223 160C	Pusher, valve seal
49 0221 222A	Pivot, valve spring lifter	49 8134 044	Press-in guide, piston pin
49 8134 040	Tool set, piston pin setting		

EMISSION CONTROL SYSTEM

(U. S. A.)



1A

1A-A. AIR INJECTION CONTROL SYSTEM

- 1A-A-1. Air Pump 1A : 1
- 1A-A-2. Air Pump Drive Belt 1A : 2
- 1A-A-3. Check Valve (Secondary air) 1A : 2
- 1A-A-4. Air Injection Manifold 1A : 3
- 1A-A-5. Air Injection Nozzle 1A : 3
- 1A-A-6. Air Control Valve 1A : 3
- 1A-A-7. Vacuum Delay Valve 1A : 5
- 1A-A-8. Vacuum Check Valve 1A : 6
- 1A-A-9. Water Thermo Valve 1A : 6
- 1A-A-10. Three Way Solenoid Valve 1A : 7
- 1A-A-11. Engine Speed Unit 1A : 8
- 1A-A-12. Water Thermo Switch 1A : 8

1A-B. EXHAUST GAS RECIRCULATION (E.G.R.) SYSTEM

- 1A-B-1. Inspecting E.G.R. Control Valve 1A : 9
- 1A-B-2. Replacing E.G.R. Control Valve 1A : 9
- 1A-B-3. Vacuum Amplifier 1A : 10
- 1A-B-4. Water Thermo Valve 1A : 11
- 1A-B-5. Water Thermo Switch 1A : 11
- 1A-B-6. Engine Speed Unit (Only for Manual Transmission) 1A : 11
- 1A-B-7. Three Way Solenoid Valve 1A : 12

1A-C. OXIDIZING CATALYTIC CONVERTER SYSTEM

- 1A-C-1. Catalytic Converter 1A : 12

1A-D. DECELERATION CONTROL SYSTEM

- 1A-D-1. Air By-pass Valve 1A : 13
- 1A-D-2. Throttle Positioner System 1A : 13

1A-E. POSITIVE CRANKCASE VENTILATION (P.C.V.) SYSTEM

- 1A-E-1. P.C.V. Valve 1A : 16

1A-F. EVAPORATIVE EMISSION CONTROL SYSTEM

- 1A-F-1. Checking Evaporative Line 1A : 16
- 1A-F-2. Canister 1A : 16
- 1A-F-3. Check and Cut Valve 1A : 17
- 1A-F-4. Purge Control Valve 1A : 17
- 1A-F-5. Water Thermo Valve 1A : 18
- 1A-F-6. Air Vent Solenoid Valve 1A : 19

1A-G. HEAT HAZARD WARNING SYSTEM

- 1A-G-1. Checking Heat Hazard Warning System 1A : 19
- 1A-G-2. Checking Heat Hazard Sensor 1A : 19

1A-H. HOSES AND TUBES (All system)

- SPECIAL TOOLS 1A : 19

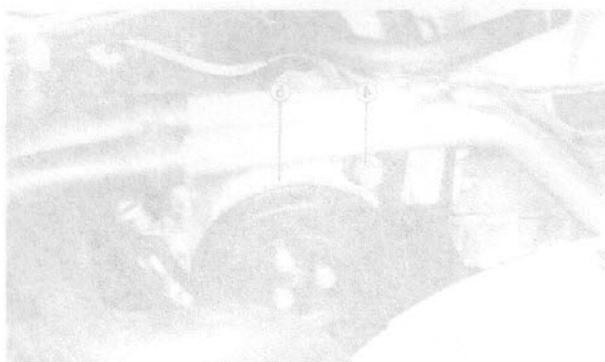


Fig. 1A-3

Fig. 1A-4

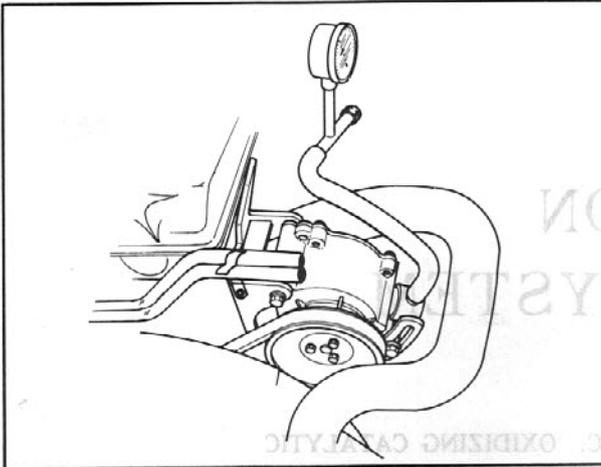


Fig. 1A-1

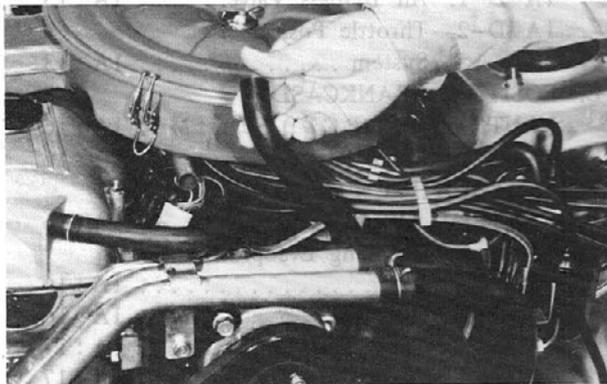


Fig. 1A-2

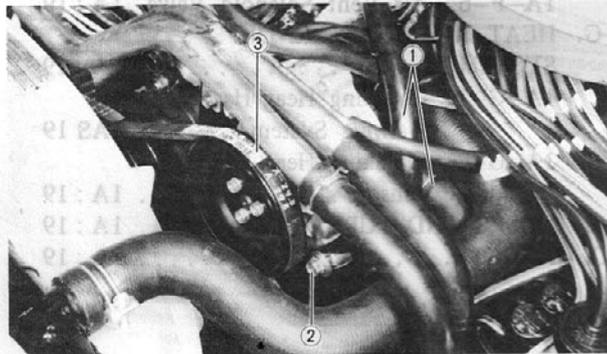


Fig. 1A-3

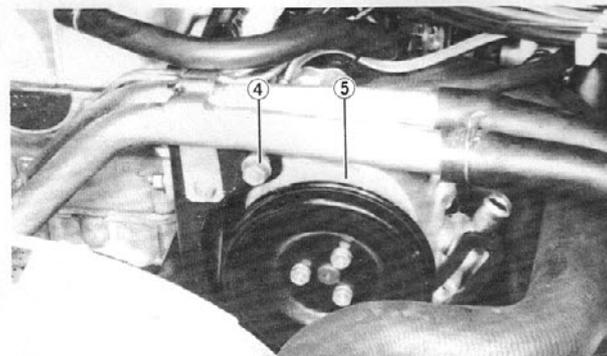


Fig. 1A-4

1A-A. AIR INJECTION CONTROL 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. Correct, if necessary, before checking the air pump.
2. Check the pump for noise. If excessive, replace the air pump.
3. Check air pump belt tension. Adjust to specification, if necessary.
4. Disconnect the hose from the air pump outlet.
5. Connect the **air pump gauge set** (49 2113 010B) to the air pump outlet, as shown in Fig. 1A-1.
6. Install a tachometer to the engine.
7. Run the engine at 1,500 rpm and take a reading of the gauge. If the reading is below **0.068 kg/cm² (1 psi)**, replace the pump assembly.

b. Checking relief valve

1. Operate the engine at idle speed.
2. Disconnect the hose from the air cleaner.
3. Check to see that no air should flow out from the relief valve.
4. Increase the engine speed to 4,500 rpm and make sure the air flows out from the relief valve. If any defects are found, replace the relief valve and air pump assembly.

c. Replacing air pump

Remove in the following order.

1. Inlet and outlet hoses (disconnect)
2. Strap bolt
3. Air pump drive belt

4. Mounting bolt and nut
5. Air pump

Install the air pump in the reverse order of removing and adjust the belt tension as described in Par. 1A-A-2.

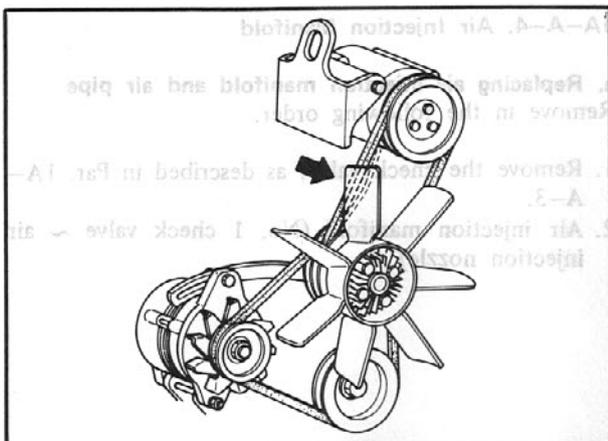


Fig. 1A-5

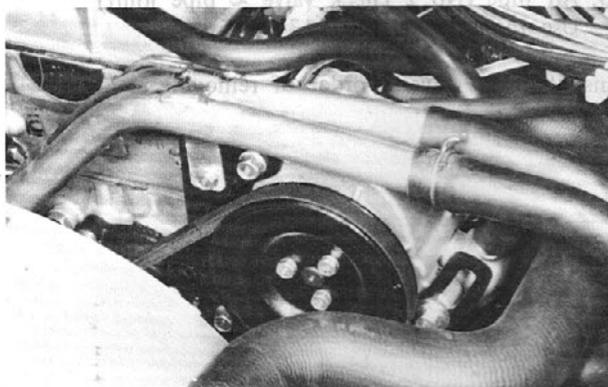


Fig. 1A-6

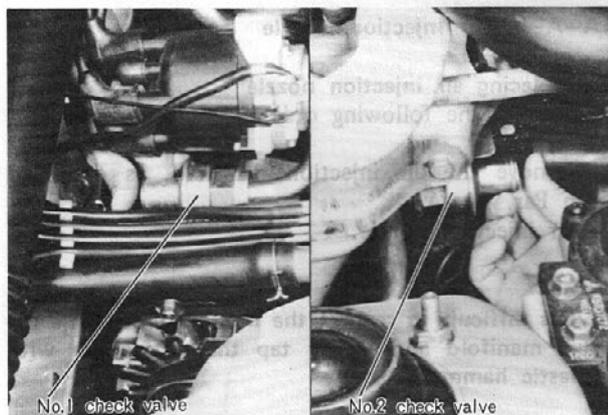


Fig. 1A-7

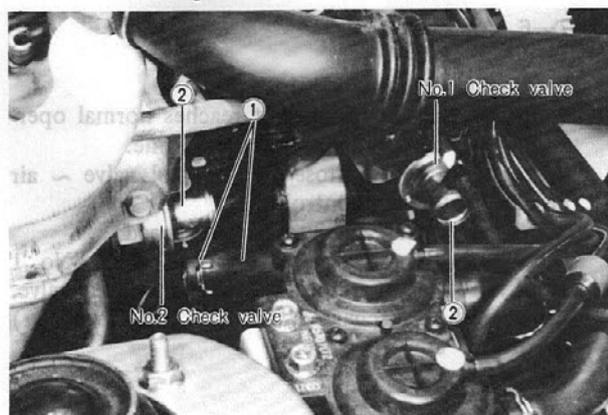


Fig. 1A-8

1A-A-2. Air Pump Drive Belt

a. Checking drive belt

If the belt is broken, glazed or worn, replace the belt with a new one. If the belt is stretched so that it cannot be tightened sufficiently, install a new belt. If the belt is noisy, check the tension of the belt. Also, check for misaligned pulleys.

b. Adjusting 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 tension is obtained.

Correct adjustment will permit the belt to flex 15 ~ 18 mm (0.6 ~ 0.7 in) by pressing with thumb (10 kg : 22 lb) midway between the air pump pulley and the water pump pulley.

For a new belt, it should be 11 ~ 14 mm (0.4 ~ 0.6 in).

3. Tighten the strap bolt and the air pump mounting bolt.

c. Replacing drive belt

1. Loosen the air pump strap bolt and mounting bolt, then move the air pump until the drive belt can be removed.
2. Install a new belt and adjust the belt tension as instructed in this paragraph.

1A-A-3. Check Valve (Secondary air)

a. Checking check valve

1. Warm up the engine until it reaches normal operating temperature and stop the engine.
2. Disconnect the air hoses (No. 1 check valve ~ air control valve, No. 2 check valve ~ air control valve) at the check valve.
3. Start the engine. Slowly increase the engine speed to 1,500 rpm and watch for exhaust gas leakage at the air inlet fitting on the check valve. If there is exhaust leakage, replace the check valve.

b. Replace check valves

Remove in the following order.

1. Clip and hoses (disconnect)
2. Check valves

Install in the reverse order of removing.

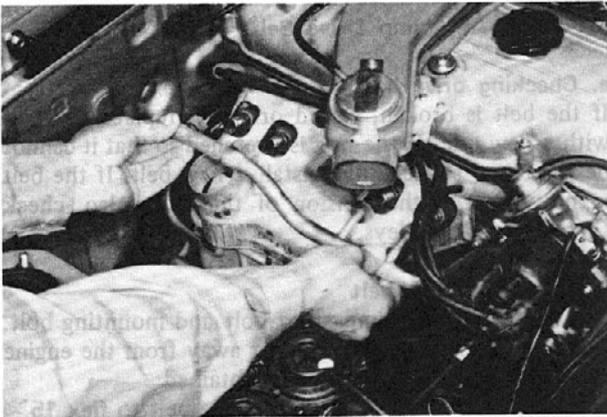


Fig. 1A-9

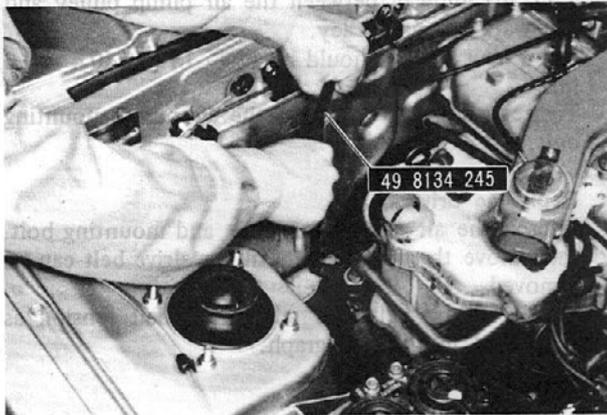


Fig. 1A-10

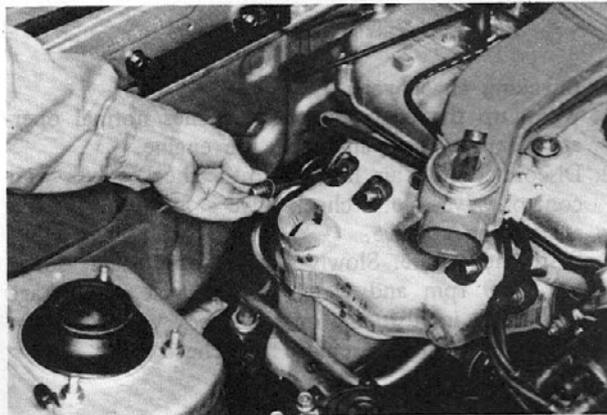


Fig. 1A-11

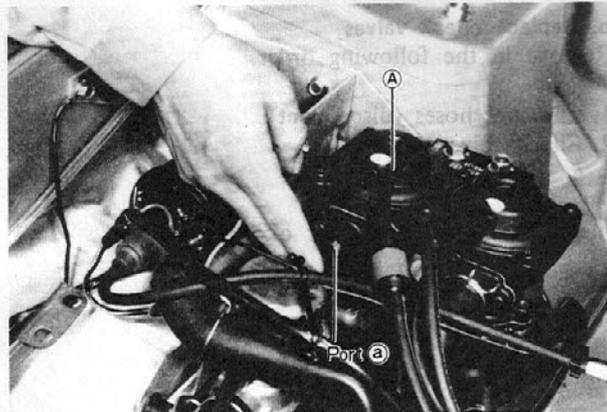


Fig. 1A-12

1A-A-4. Air Injection Manifold

a. Replacing air injection manifold and air pipe
Remove in the following order.

1. Remove the check valve, as described in Par. 1A-A-3.
2. Air injection manifold (No. 1 check valve ~ air injection nozzle)



3. Air pipe (No. 2 check valve ~ pipe joint)
Use the remover (49 8134 245)

Install in the reverse order of removing.



1A-A-5. Air Injection Nozzle

a. Replacing air injection nozzle
Remove in the following order.

1. Remove the air injection manifold, as described in Par. 1A-A-4.
2. Air injection nozzle.

Note:

If it is difficult to remove the nozzle, remove the exhaust manifold and lightly tap the nozzle out with a plastic hammer.

Install in the reverse order of removing.

1A-A-6. Air control valve

a. Checking air control valve

1. Warm up the engine until it reaches normal operating temperature and stop the engine.
2. Disconnect the air hose (air control valve ~ air pump) at the air control valve.
3. Start the engine and run at idle speed.
4. Disconnect the vacuum sensing tube (A) (No. 1 relief valve ~ inlet manifold) at the air control valve. Air should be discharged from the outlet port (a) of the air control valve.

Fig. 1A-12

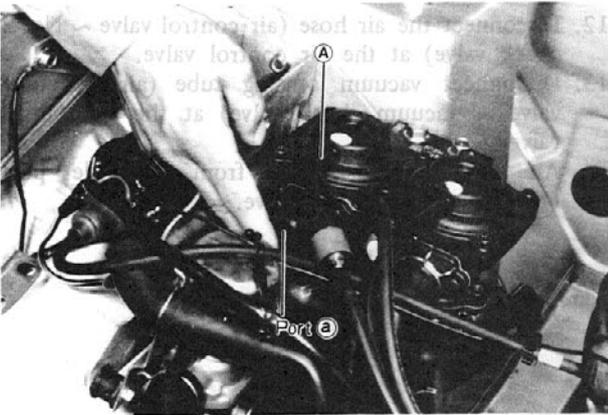


Fig. 1A-13

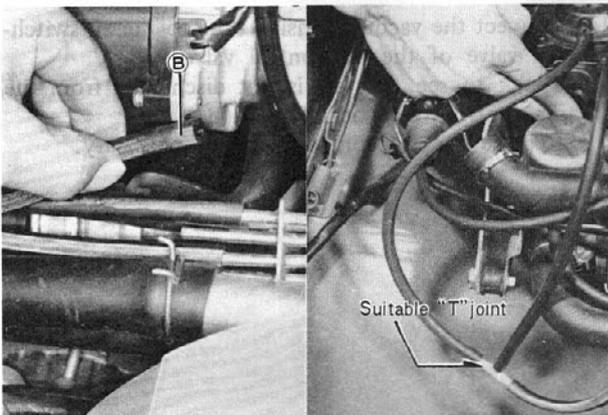


Fig. 1A-14

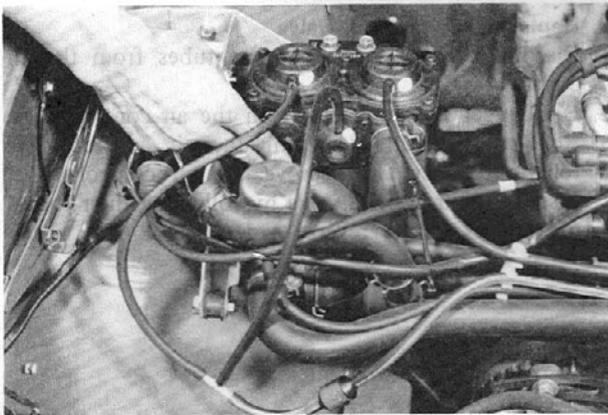


Fig. 1A-15

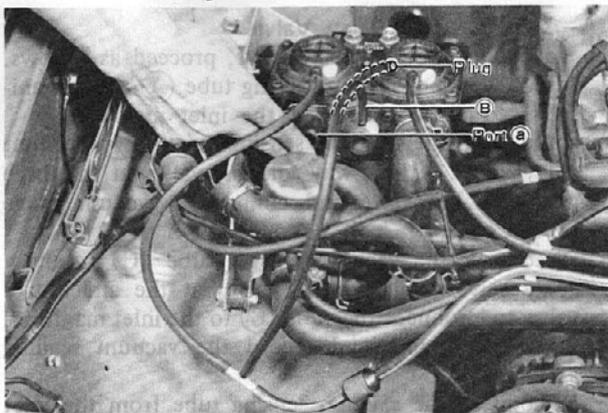


Fig. 1A-16 manifold and check the required time

5. Connect the vacuum sensing (A) to the No. 1 relief valve of the air control valve. Check to see that air is not discharged from the air control valve outlet port (a).

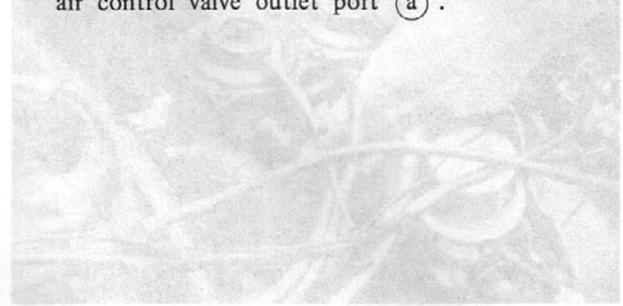


Fig. 1A-17

6. Disconnect the vacuum sensing tube (B) (No. 2 relief valve ~ vacuum pipe) at the vacuum pipe.
7. Disconnect the vacuum tube (No. 1 relief valve ~ inlet manifold) at the air control valve and connect the suitable "T" joint.

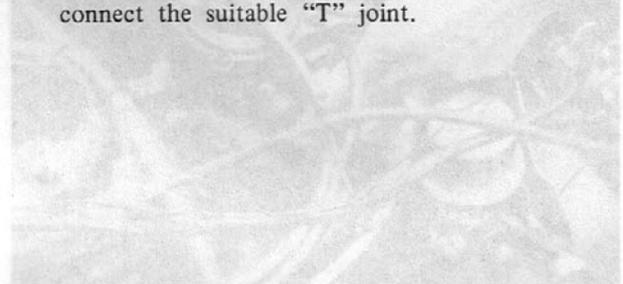


Fig. 1A-18

8. Connect the suitable tube between the No. 1 relief valve and suitable "T" joint.
9. Connect the disconnected tube in Step 6 to the suitable "T" joint so that the inlet manifold can be led directly to the No. 2 relief valve. Air should be discharged from the outlet port (a) of the air control valve.



Fig. 1A-19

10. Disconnect the vacuum sensing tube (B) from the No. 2 relief valve and plug the tube. Check to see that air is not discharged from the air control valve outlet port (a).

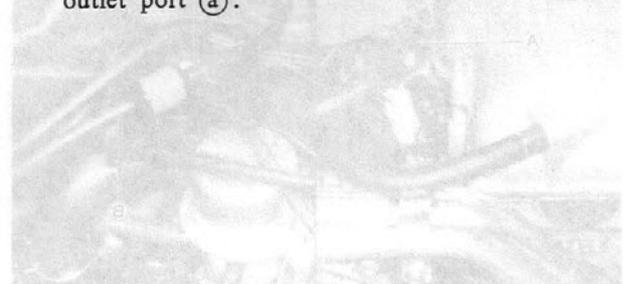


Fig. 1A-20

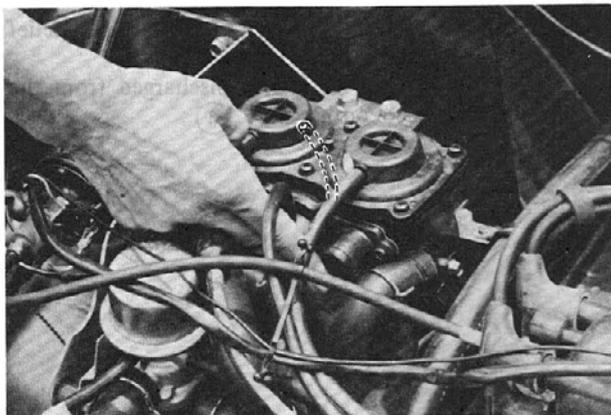


Fig. 1A-17

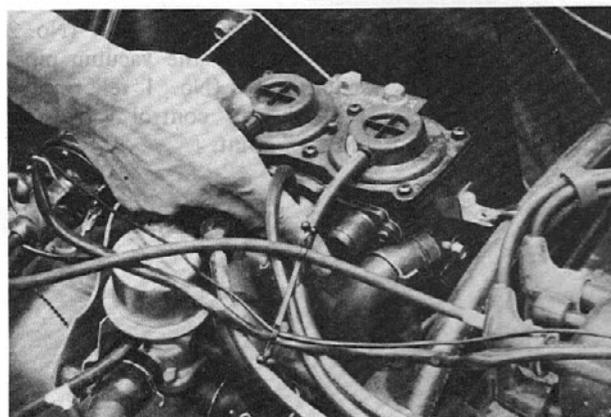


Fig. 1A-18

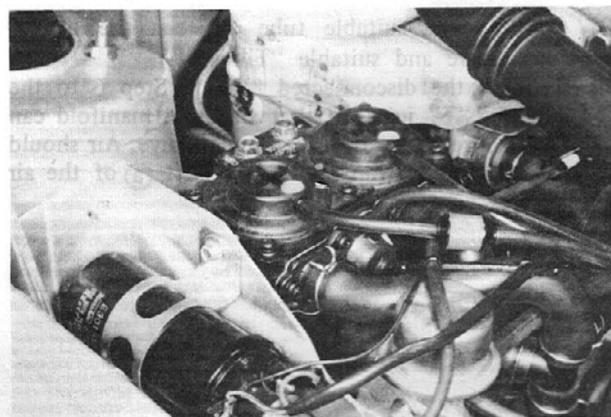


Fig. 1A-19

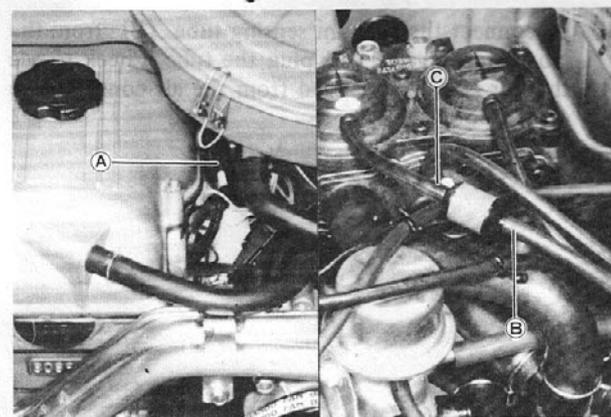


Fig. 1A-20

12. Disconnect the air hose (air control valve ~ No. 2 check valve) at the air control valve.
13. Disconnect vacuum sensing tube (air switching valve ~ vacuum check valve) at the air control valve.

Air should be discharged from the outlet port (b) of the air control valve.

14. Connect the vacuum sensing tube to the air switching valve of the air control valve.
Check to see that air is not discharged from the air control valve outlet port (b).
Replace the air control valve, if necessary.

b. Replacing air control valve

1. Disconnect the vacuum sensing tubes from the air control valve.
2. Disconnect the air hoses from the air control valve.
3. Remove the bolts attaching the air control valve to the bracket and remove the air control valve.
Install the air control valve by following the removal procedures in the reverse order.

1A-A-7. Vacuum Delay Valve

To check the vacuum delay valve, proceed as follows.

1. Disconnect the vacuum sensing tube (A) (inlet manifold ~ thermo sensor) at the inlet manifold.
2. Disconnect the vacuum sensing tube (B) (vacuum delay valve ~ three way solenoid valve) at the three way solenoid valve and connect a vacuum gauge to the tube.
3. Disconnect the vacuum sensing tube (C) (vacuum delay valve ~ air control valve) at the air control valve and connect the tube (C) to the inlet manifold.
4. Start the engine and record the vacuum reading at idle.
5. Disconnect the vacuum sensing tube from the inlet manifold and check the required time until the

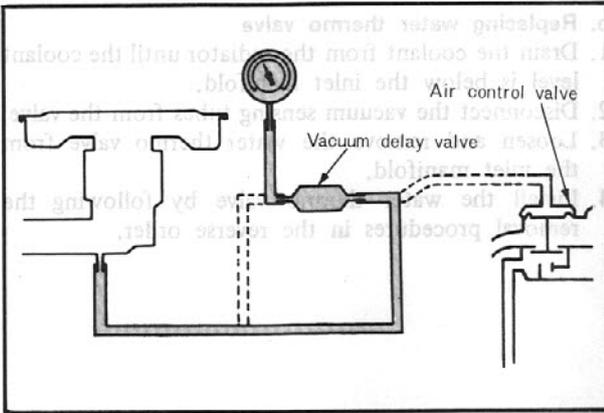


Fig. 1A-21

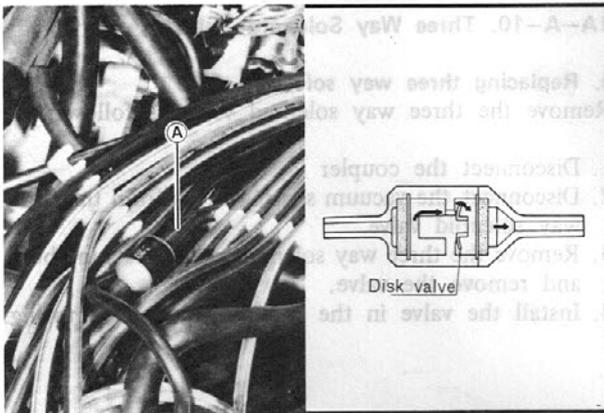


Fig. 1A-22

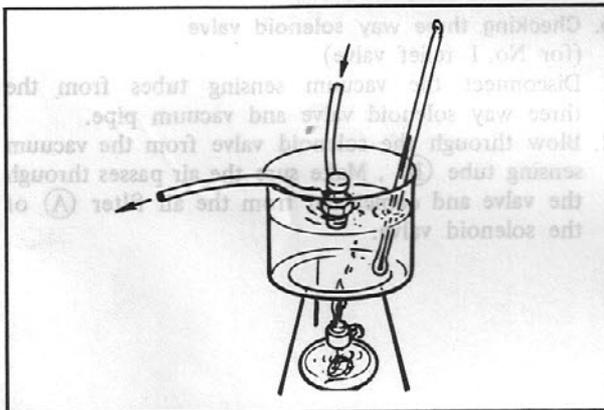


Fig. 1A-23

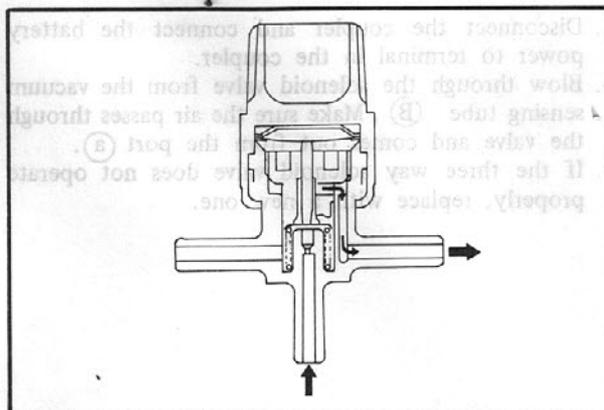


Fig. 1A-24

vacuum reading decreases by 300 mm-Hg (11.8 in-Hg) from the vacuum at idling.
The specified time are 16 ~ 24 seconds.

1A-A-8. Vacuum Check Valve

To check the vacuum check valve, proceed as follows.

1. Disconnect the vacuum sensing tube (A) (air control valve ~ vacuum check valve) from the vacuum check valve.
2. Make sure the air passes through the valve when only blowing.
If the air passes through the valve when sucking, replace the vacuum check valve.

1A-A-9. Water Thermo Valve

a. Checking water thermo valve

1. Remove the water thermo valve
2. Immerse the water thermo valve in a container.
3. Heat up the water gradually and observe the temperature.
4. Blow the valve and if air flows out 54°C (129°F) or above, the valve is satisfactory.

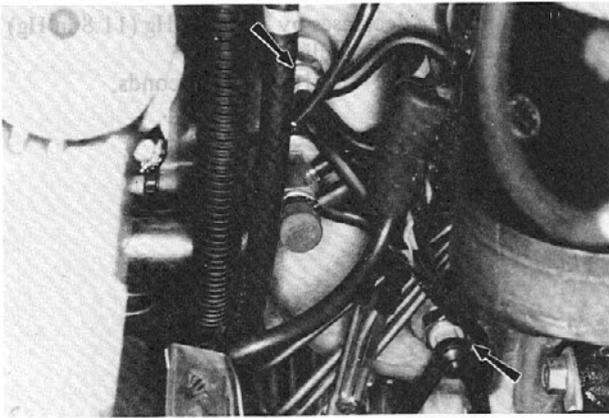


Fig. 1A-25

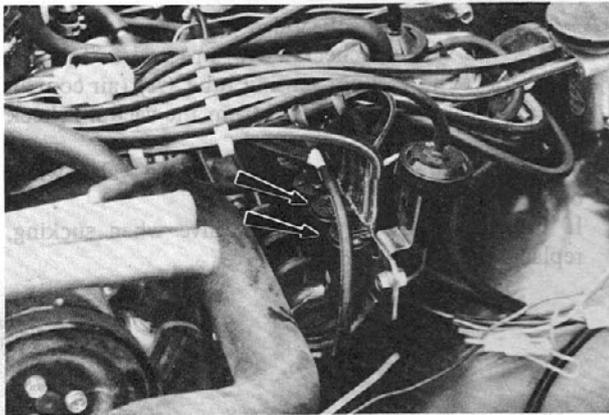


Fig. 1A-26

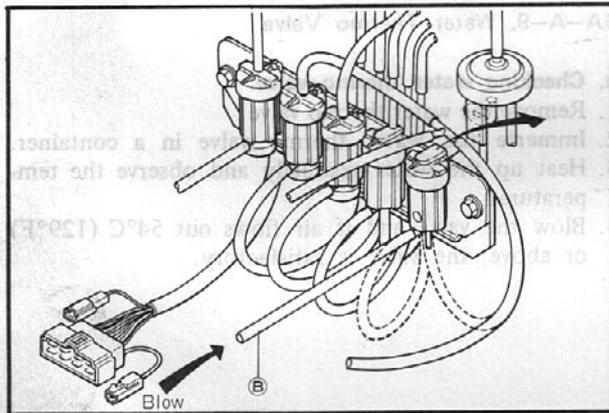


Fig. 1A-27

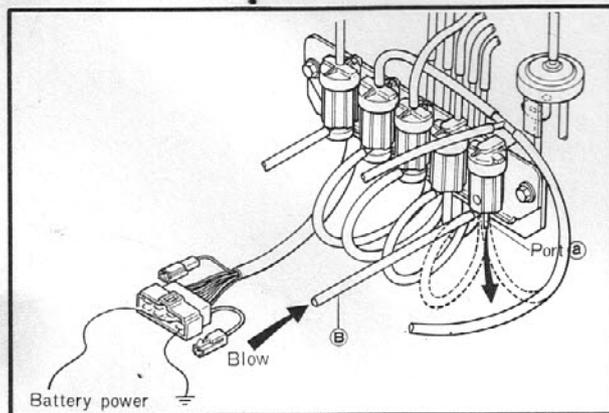


Fig. 1A-28

b. Replacing water thermo valve

1. Drain the coolant from the radiator until the coolant level is below the inlet manifold.
2. Disconnect the vacuum sensing tubes from the valve.
3. Loosen and remove the water thermo valve from the inlet manifold.
4. Install the water thermo valve by following the removal procedures in the reverse order.



Fig. 1A-25

1A-A-10. Three Way Solenoid Valve

a. Replacing three way solenoid valve

Remove the three way solenoid valve as follows:

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



Fig. 1A-26

b. Checking three way solenoid valve (for No. 1 relief valve)

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



Fig. 1A-27

3. Disconnect the coupler and connect the battery power to terminal in the coupler.
4. 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 (a).
5. If the three way solenoid valve does not operate properly, replace with a new one.

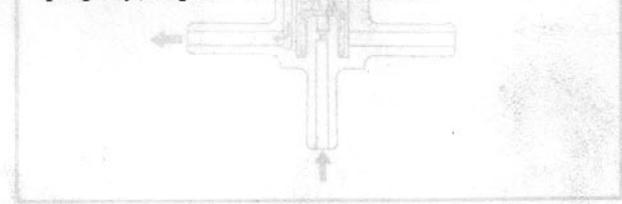


Fig. 1A-28

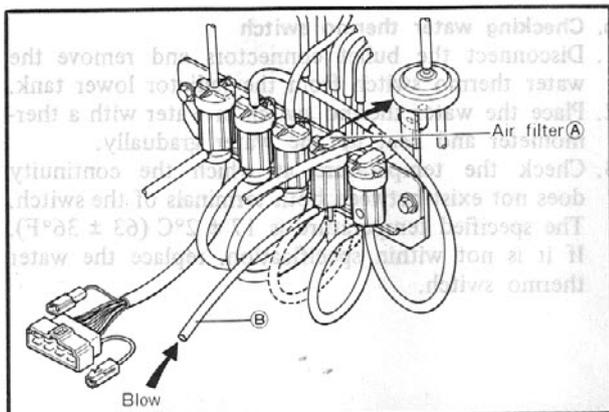


Fig. 1A-29

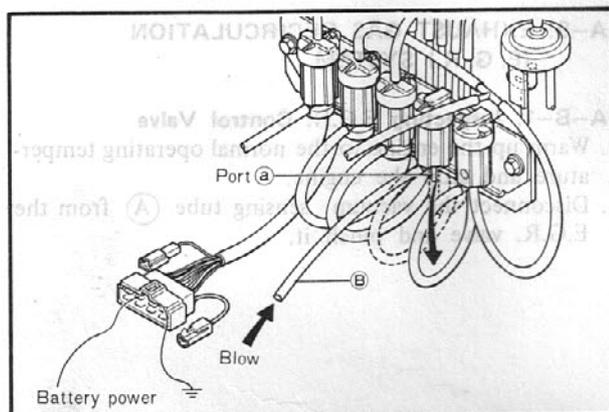


Fig. 1A-30

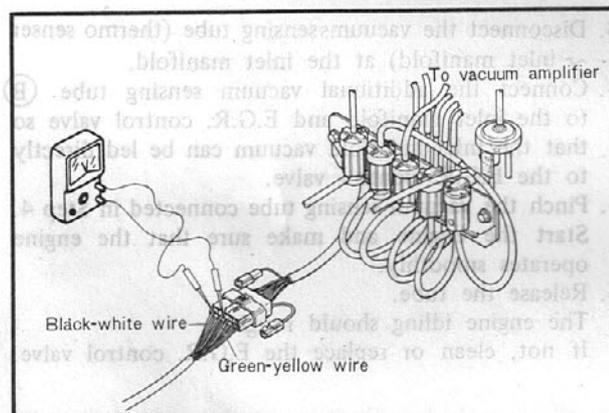


Fig. 1A-31



Fig. 1A-32

(for Air switching valve)

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

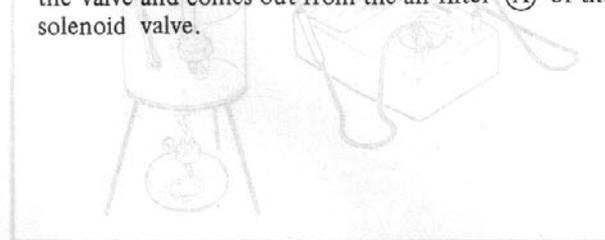


Fig. 1A-33

3. Start the engine and run it at $1,200 \pm 100$ rpm.
4. 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 (a).
5. If the three way solenoid valve does not operate properly, replace with a new one.

1A-A-11. Engine Speed Unit

a. Checking engine speed unit

1. Connect the voltmeter to the terminal as shown in figure.
2. Slowly increase the engine speed and record the engine speed at which the current flows to circuit. The engine speed should be $1,200 \pm 100$ rpm.
3. Slowly decrease the engine speed and record the engine speed at which the current does not flow to the circuit. The difference between the engine speed recorded in Step 2 and 3 should be $100 \sim 300$ rpm.
4. Replace the engine speed unit, if necessary.

1A-A-12. Water Thermo Switch

a. Replacing water thermo switch

1. Drain the coolant from the radiator.
2. Disconnect the bullet connectors from the switch.
3. Loosen and remove the water thermo switch from the radiator lower tank.
4. Install the water thermo switch by following the removal procedures in the reverse order.

Fig. 1A-38

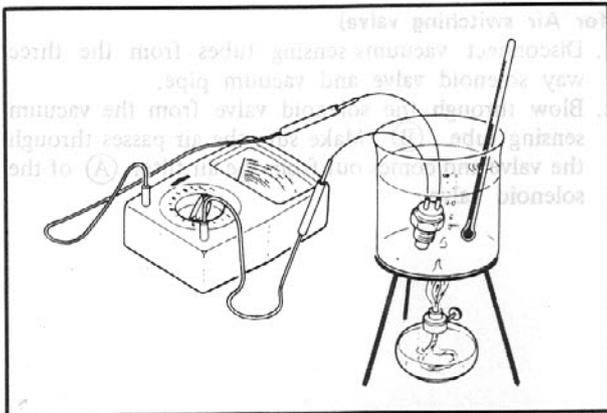


Fig. 1A-33

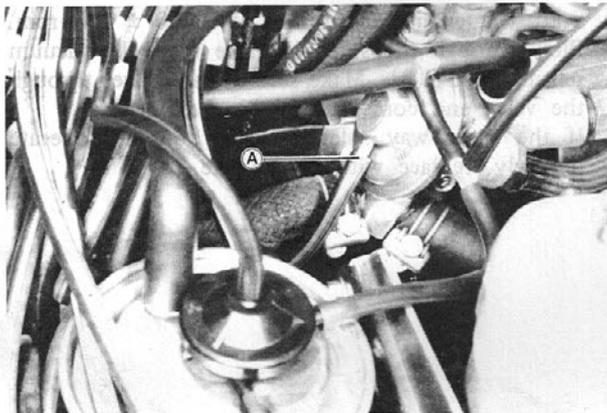


Fig. 1A-34

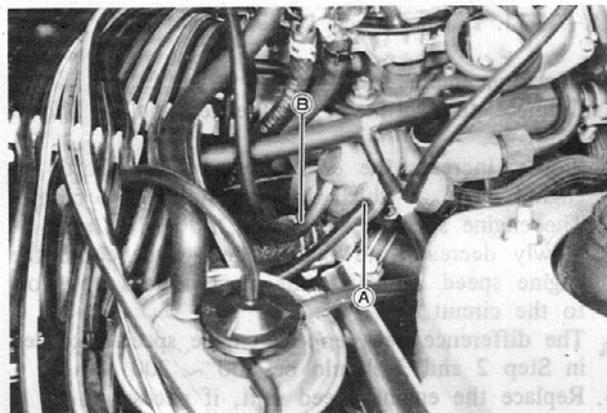


Fig. 1A-35

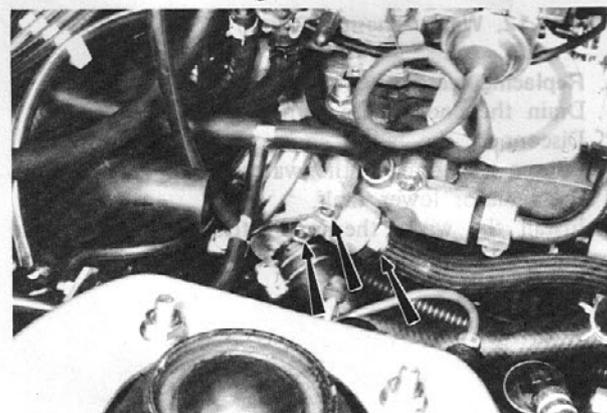


Fig. 1A-36

b. Checking water thermo switch

1. Disconnect the bullet connectors and remove the water thermo switch from the radiator lower tank.
2. Place the water thermo switch in water with a thermometer and heat up the water gradually.
3. Check the temperature at which the continuity does not exist between both terminals of the switch. The specified temperature is $17 \pm 2^\circ\text{C}$ ($63 \pm 36^\circ\text{F}$). If it is not within specification, replace the water thermo switch.

1A-B. EXHAUST GAS RECIRCULATION (E. G. R.) SYSTEM

1A-B-1. Inspecting E.G.R. Control Valve

1. Warm up the engine to the normal operating temperature and stop the engine.
2. Disconnect the vacuum sensing tube (A) from the E.G.R. valve and pinch it.

3. Disconnect the vacuum sensing tube (thermo sensor ~ inlet manifold) at the inlet manifold.
4. Connect the additional vacuum sensing tube (B) to the inlet manifold and E.G.R. control valve so that the inlet manifold vacuum can be led directly to the E.G.R. control valve.
5. Pinch the vacuum sensing tube connected in Step 4. Start the engine and make sure that the engine operates smoothly.
6. Release the tube.

The engine idling should roughen.
If not, clean or replace the E.G.R. control valve.

1A-B-2. Replacing E.G.R. Control Valve

Remove the E.G.R. control valve in the following order.

1. Air cleaner
2. Vacuum sensing tubes (disconnect)
3. E.G.R. pipe attaching nut (No. 1 E.G.R. control valve)
4. No. 1 E.G.R. control valve supporting bolts
5. No. 1 E.G.R. control valve

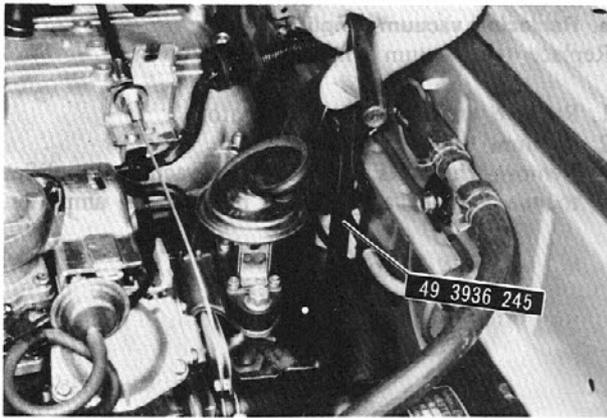


Fig. 1A-37

6. E.G.R. pipe attaching nuts (No. 2 E.G.R. control valve)
Use the **remover** (49 3936 245)
7. No. 2 E.G.R. control valve supporting bolts.
8. No. 2 E.G.R. control valve
9. E.G.R. pipe

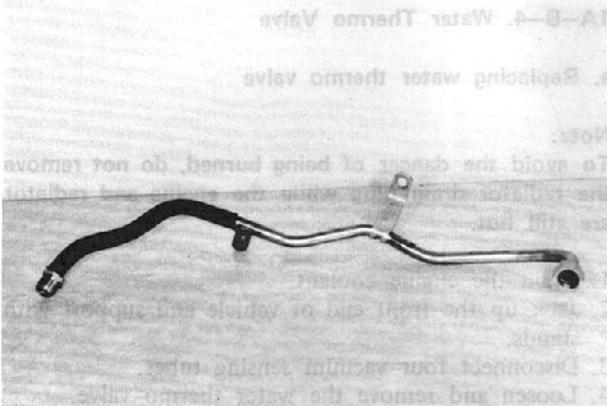


Fig. 1A-38

Note:

Remove any deposits from the E.G.R. control valve and E.G.R. pipes with a piece of wire or brush if necessary. Blow them with compressed air.

Install them in the exact reverse order of removal.

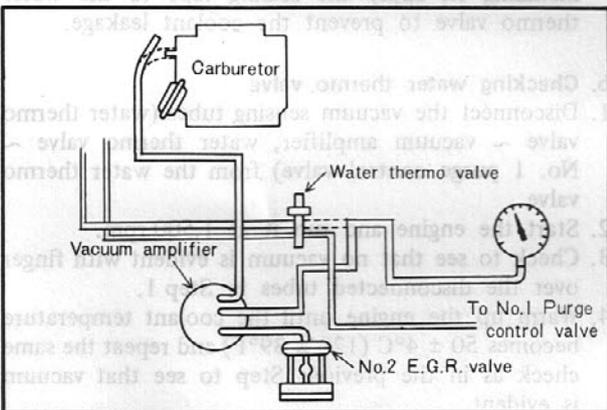


Fig. 1A-39

1A-B-3. Vacuum Amplifier

a. Checking vacuum amplifier

1. Remove the air cleaner.
2. Disconnect the vacuum sensing tube (vacuum amplifier ~ water thermo valve) from the water thermo valve and connect a vacuum gauge to the tube.
3. Run the engine at idle. Disconnect the vacuum sensing tube (carburetor ~ vacuum amplifier) from the carburetor and make sure that the vacuum reading shows 50 ± 10 mm-Hg (2.0 ± 0.4 in-Hg).
4. Connect the vacuum sensing tube (carburetor ~ vacuum amplifier) to the carburetor.
5. Gradually increase the engine speed to 3,500 rpm and make sure that the vacuum reading shows about 90 mm-Hg (3.6 in-Hg).
If the vacuum amplifier does not operate properly, replace the vacuum amplifier.

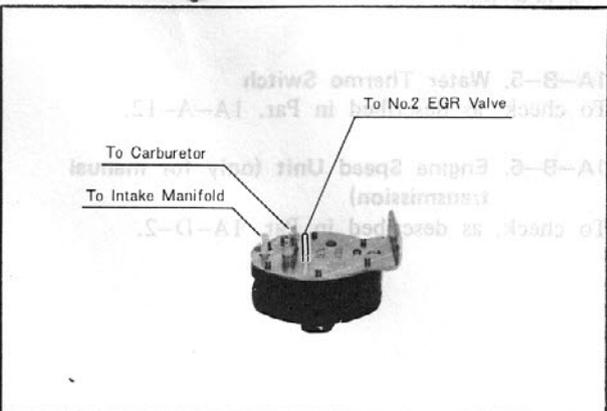


Fig. 1A-40

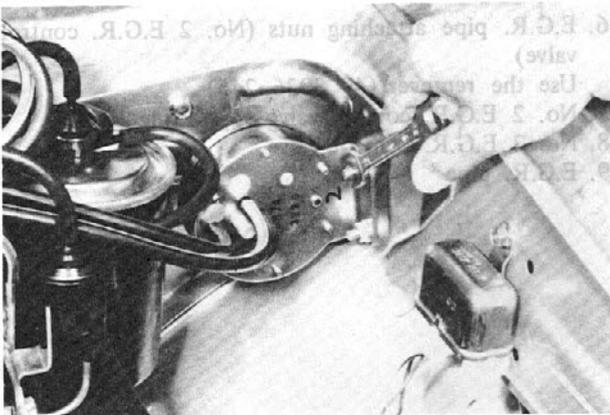


Fig. 1A-41

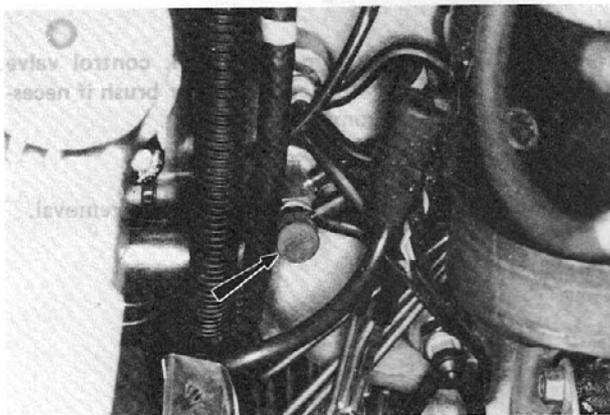


Fig. 1A-42

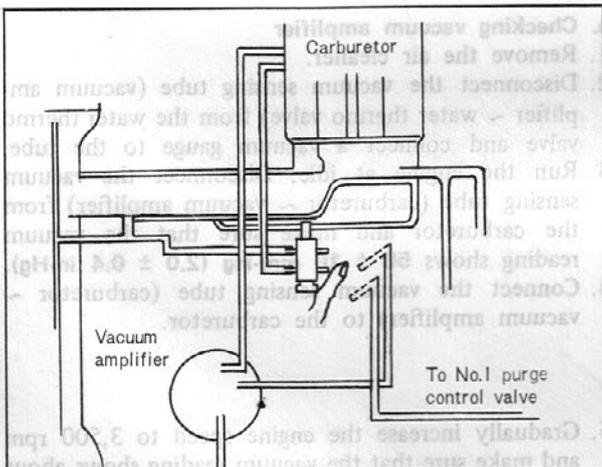


Fig. 1A-43

b. Replacing vacuum amplifier

Replace the vacuum amplifier as follows:

1. Remove the altitude compensator.
2. Vacuum tubes (disconnect)
3. Remove the nuts attaching the vacuum amplifier to the bracket and remove the vacuum amplifier.

1A-B-4. Water Thermo Valve

a. Replacing water thermo valve

Note:

To avoid the danger of being burned, do not remove the radiator drain plug while the engine and radiator are still hot.

1. Drain the engine coolant.
2. Jack up the front end of vehicle and support with stands.
3. Disconnect four vacuum sensing tubes.
4. Loosen and remove the water thermo valve.
5. To install, reverse the removal procedure. Before installing it, apply the sealing tape to the water thermo valve to prevent the coolant leakage.

b. Checking water thermo valve

1. Disconnect the vacuum sensing tubes (water thermo valve ~ vacuum amplifier, water thermo valve ~ No. 1 purge control valve) from the water thermo valve.
2. Start the engine and run it at 1,500 rpm.
3. Check to see that no vacuum is evident with finger over the disconnected tubes in Step 1.
4. Warm up the engine until the coolant temperature becomes $50 \pm 4^\circ\text{C}$ ($122 \pm 39^\circ\text{F}$) and repeat the same check as in the previous Step to see that vacuum is evident.
5. If necessary, replace the water thermo valve with a new one.

1A-B-5. Water Thermo Switch

To check, as described in Par. 1A-A-12.

1A-B-6. Engine Speed Unit (only for manual transmission)

To check, as described in Par. 1A-D-2.

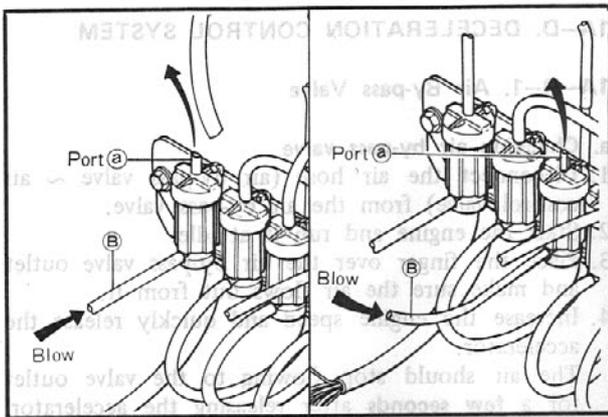


Fig. 1A-44

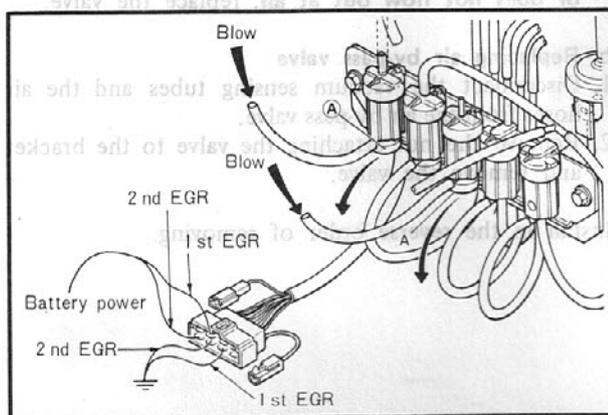


Fig. 1A-45

1A-B-7. Three Way Solenoid Valve

a. Checking three way solenoid valve

1. Disconnect the vacuum sensing tubes from three way solenoid valve and vacuum pipe.
2. 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 (a).
3. Disconnect the coupler and connect the battery power to terminal in the coupler.
4. Blow through the solenoid valve from the vacuum sensing tube (B). Make sure the air passes through the valve and comes out from the air filter (A) of the valve.
5. If the three way solenoid valve does not operate properly, replace with a new one.

Fig. 1A-47

Fig. 1A-48

1A-C. OXIDIZING CATALYTIC CONVERTER SYSTEM

1A-C-1. Catalytic converter

Visually inspect the catalytic converter for burned condition, cracks and corrosion.

To replace the catalytic converter, proceed as follows:

Raise the vehicle and support with stands.

1. Remove the heat insulator from the catalytic converter.
2. Remove the nuts at the front and rear flanges of the catalytic converter.

To install, reverse the removal procedure.

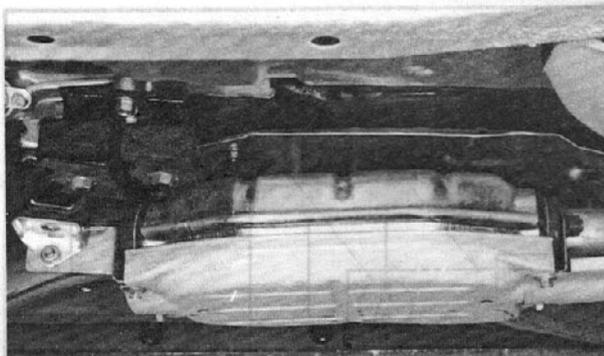


Fig. 1A-46

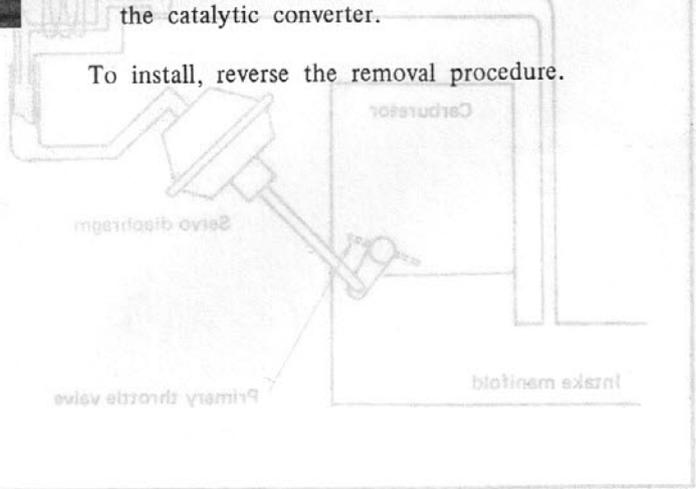
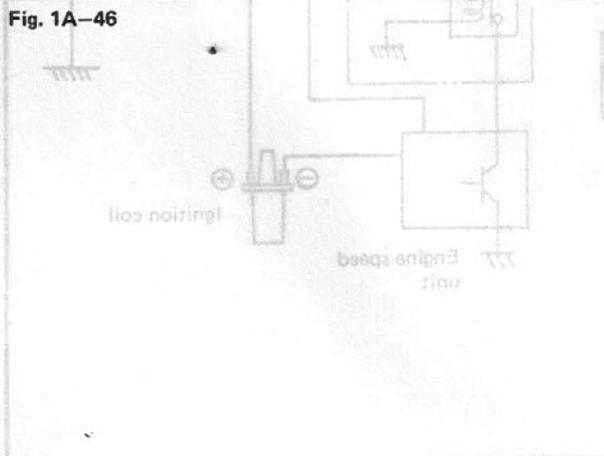


Fig. 1A-49

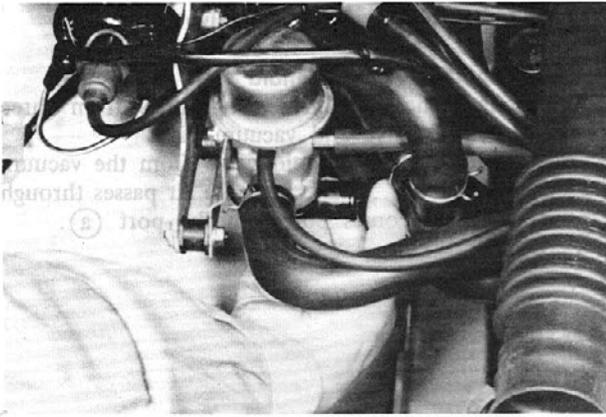


Fig. 1A-47

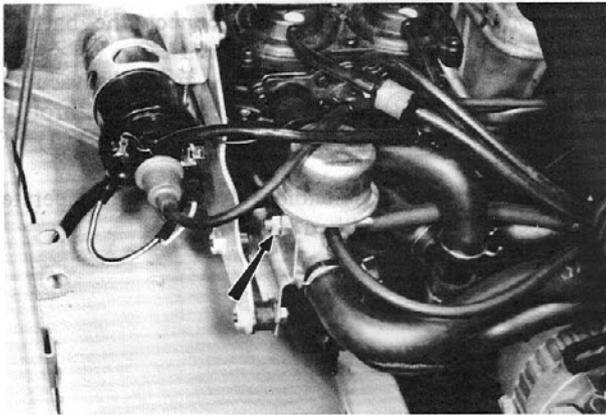


Fig. 1A-48

1A-D. DECELERATION CONTROL SYSTEM

1A-D-1. Air By-pass Valve

a. Checking air by-pass valve

1. Disconnect the air hose (air by-pass valve ~ air control valve) from the air by-pass valve.
2. Start the engine and run it at idle.
3. Place the finger over the air by-pass valve outlet and make sure the air flows out from it.
4. Increase the engine speed and quickly release the accelerator.

The air should stop flowing to the valve outlet for a **few seconds** after releasing the accelerator. If the air stops flowing for **more than three seconds** or **does not flow out at all**, replace the valve.

b. Replacing air by-pass valve

1. Disconnect the vacuum sensing tubes and the air hoses from the air by-pass valve.
2. Remove the nut attaching the valve to the bracket and remove the valve.

Install in the reverse order of removing.

1A-D-2. Throttle Positioner System

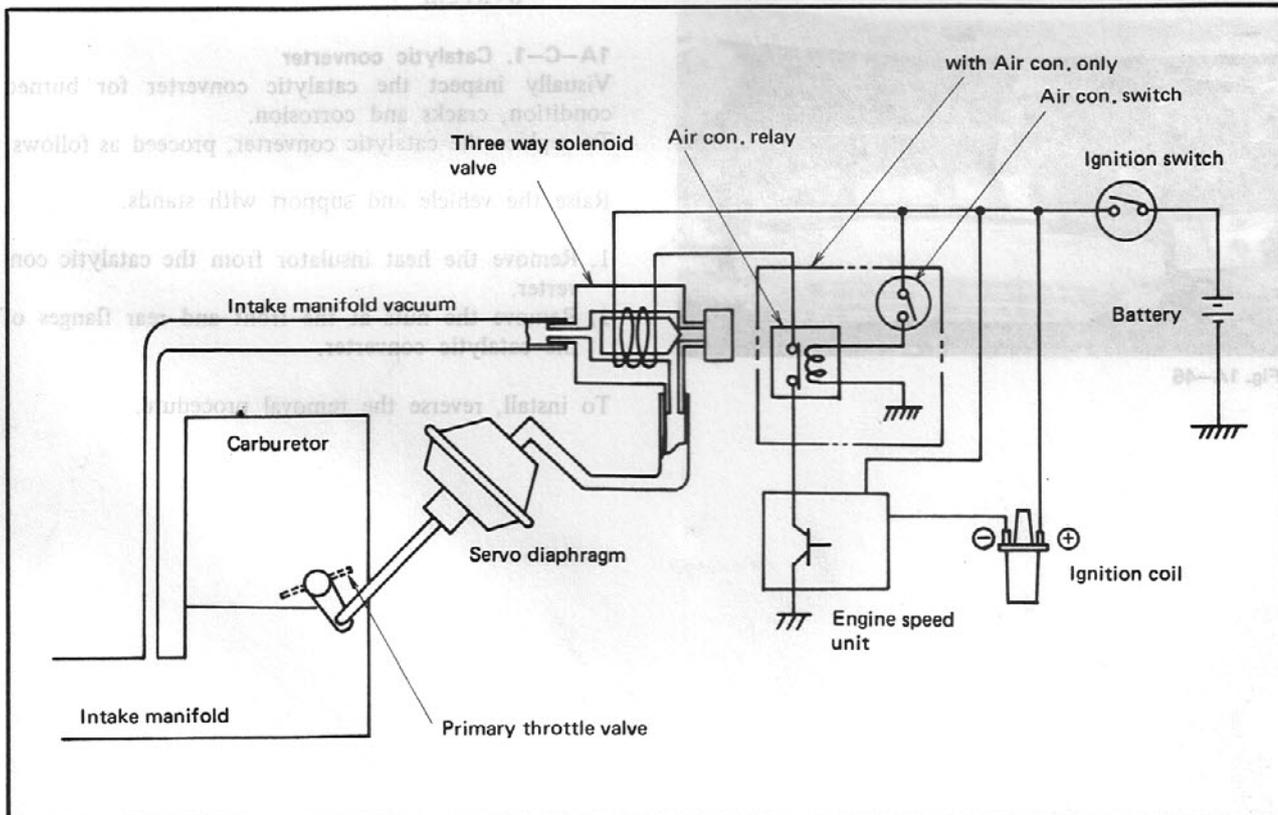


Fig. 1A-49

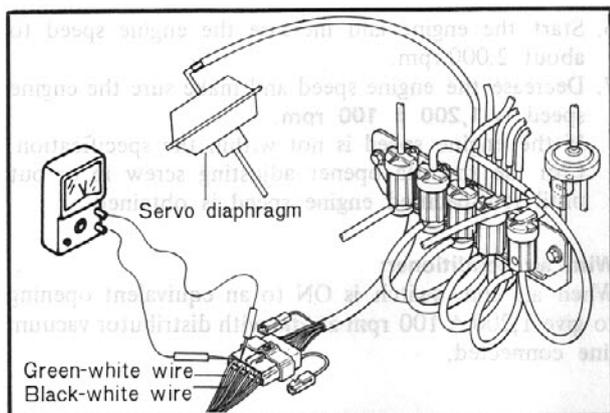


Fig. 1A-50

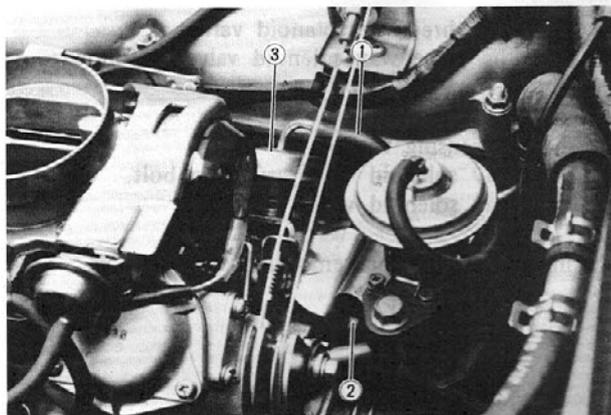


Fig. 1A-51

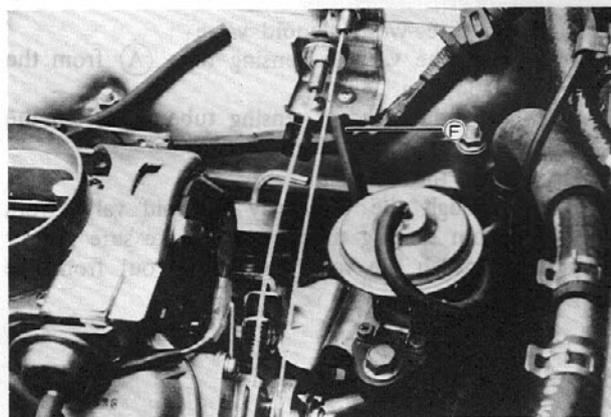


Fig. 1A-52

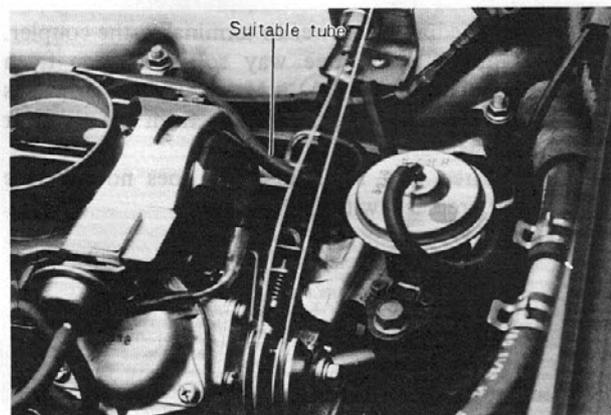


Fig. 1A-53

a. Checking engine speed unit

1. Connect the voltmeter to the terminal as shown in figure.
2. Increase the engine speed to 2,000 rpm and slowly decrease the engine speed.
Record the engine speed at which the current flows to circuit.
The engine speed should be $1,500 \pm 100$ rpm.
3. Slowly increase the engine speed again and record the engine speed at which the current does not flow to the circuit.
The difference between the engine speed recorded in Step 2 and 3 should be 50 ~ 250 rpm.
4. Replace the engine speed unit, if necessary.

b. Replacing servo diaphragm

Remove the air cleaner and remove the parts in the order numbered left.

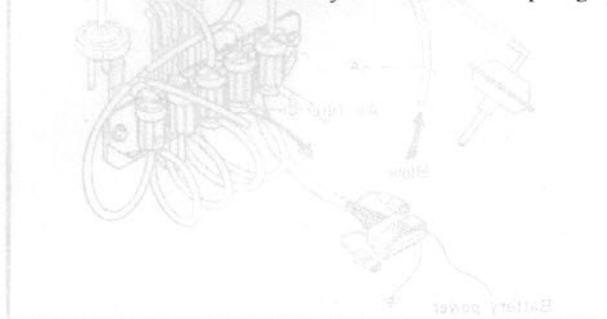
To install, reverse the removal procedure. After installing, check the operation of the servo diaphragm as described in item (c).

c. Checking servo diaphragm

1. Connect a tachometer to the engine.
2. Warm up the engine and make sure the engine operate at specified idling.
3. Stop the engine and remove the air cleaner.
4. Disconnect the vacuum sensing tube (F) (servo diaphragm ~ three way solenoid valve) at the servo diaphragm.



5. Connect the inlet manifold and the servo diaphragm with a suitable tube so that the inlet manifold vacuum can be led directly to the servo diaphragm.



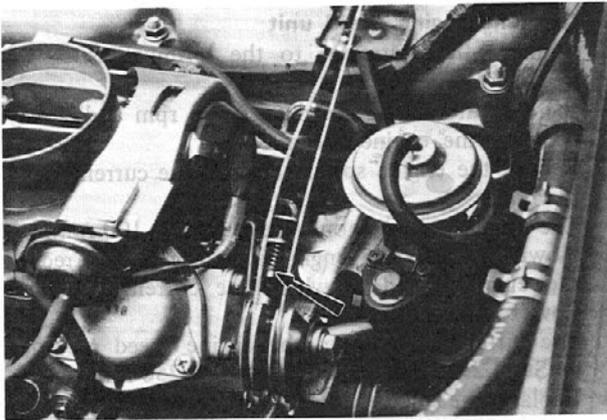


Fig. 1A-54

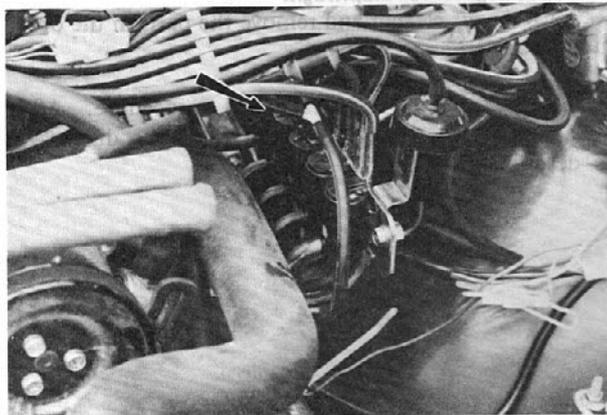


Fig. 1A-55

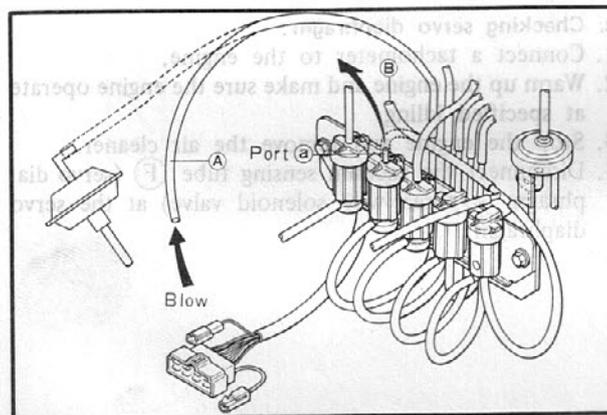


Fig. 1A-56

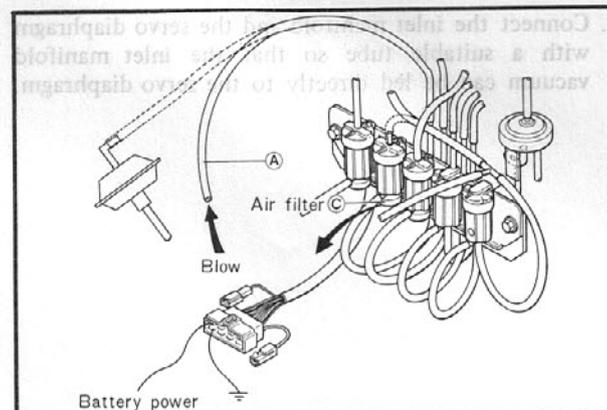


Fig. 1A-57

6. Start the engine and increase the engine speed to about 2,000 rpm.
7. Decrease the engine speed and make sure the engine speed is $1,200 \pm 100$ rpm.
If the engine speed is not within the specification, turn the throttle opener adjusting screw in or out until the specified engine speed is obtained.

With air conditioner:

When air con. switch is ON to an equivalent opening to give $1,200 \pm 100$ rpm at idle with distributor vacuum line connected.

e. Replacing three-way solenoid valve

Remove the three way solenoid valve as follows:

1. Coupler
2. Vacuum sensing tubes
3. Three-way solenoid valve attaching bolt.
4. Three-way solenoid valve

To install, reverse the removal procedure.

f. Checking three-way solenoid valve

1. Disconnect the vacuum sensing tube (A) from the servo diaphragm.
2. Disconnect the vacuum sensing tube (B) from the three-way solenoid valve.
3. Disconnect the coupler
4. Blow through the three-way solenoid valve from the vacuum sensing tube (A). Make sure the air passes through the valve and comes out from the port (a).

5. Connect the battery power to terminal in the coupler.
6. Blow through the three way solenoid valve from the disconnect tube (A). Make sure the air passes through the valve and comes out from the air filter (C) of the valve.
7. If the three way solenoid valve does not operate properly, replace with a new one.

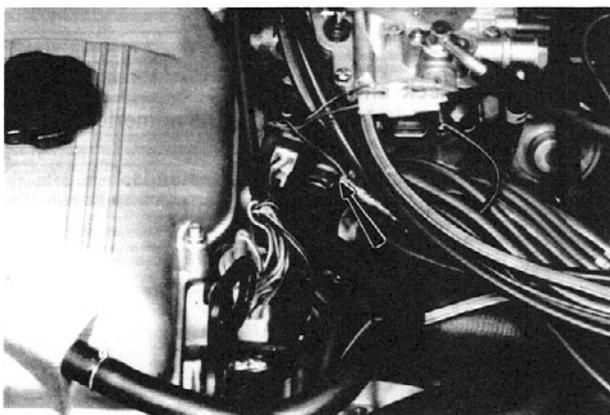


Fig. 1A-58

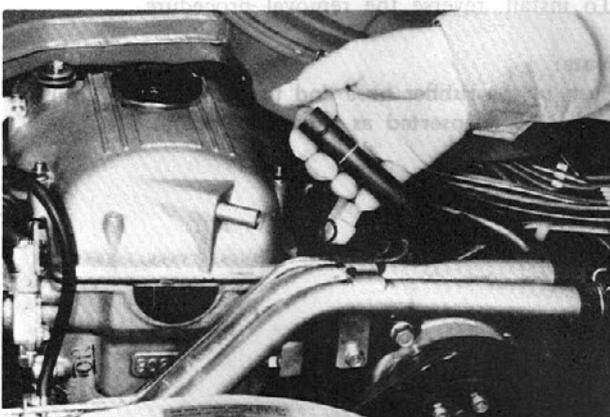


Fig. 1A-59

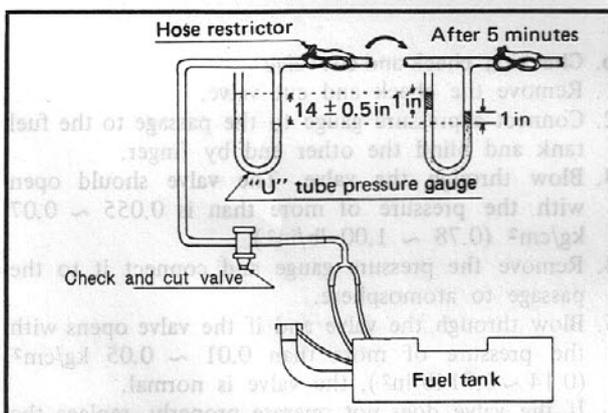


Fig. 1A-60

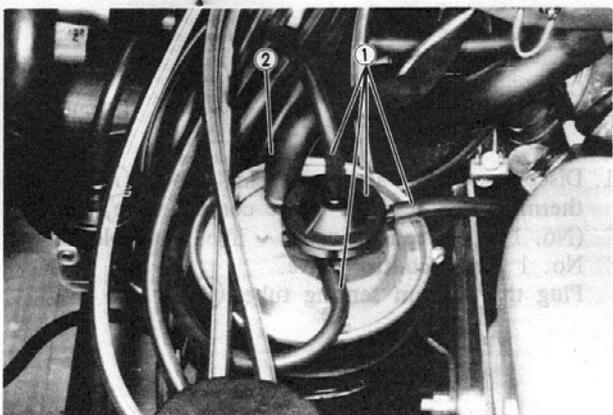


Fig. 1A-61

1A-E. POSITIVE CRANKCASE VENTILATION (P.C.V.) SYSTEM

1A-E-1. P.C.V. Valve

a. Replacing P.C.V. valve

Remove the positive crankcase ventilation valve as follows:

1. Air cleaner
2. Ventilation hose and clip (disconnect)
3. Positive crankcase ventilation valve

To install, reverse the removal procedure.

b. Checking P.C.V. valve

1. Warm up the engine until it reaches the normal operating temperature.
2. Disconnect the ventilation hose from the cylinder head cover.
3. Run the engine at idle.
4. Close the ventilation hose opening with finger. If the engine speed goes down, the ventilation valve is working properly. If the engine speed does not drop, replace the ventilation valve.

1A-F. EVAPORATIVE EMISSION CONTROL SYSTEM

1A-F-1. Checking Evaporative Line

1. Disconnect the evaporative hose from the canister.
2. Connect the disconnected hose to the "U" tube pressure gauge as shown in figure.
3. Gradually apply the low compressed air into the "U" tube so that the difference of water level should be $356 \pm 12 \text{ mm}$ ($14 \pm 0.5 \text{ in}$).
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.

1A-F-2. Canister

a. Replacing canister

Remove the canister in the numerical order.

1. No. 1 purge control valve and tubes (from canister)
2. Air vent hose (disconnect)
3. Canister attaching nuts
4. Canister (slip out from the bracket)

To install, reverse the removal procedure.

b. Checking canister

Visually check the canister for any leakage of the active carbon. Tap the canister with finger and no abnormal sound should be audible.

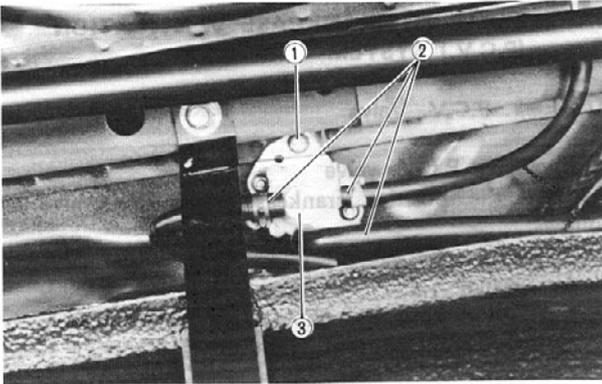


Fig. 1A-62

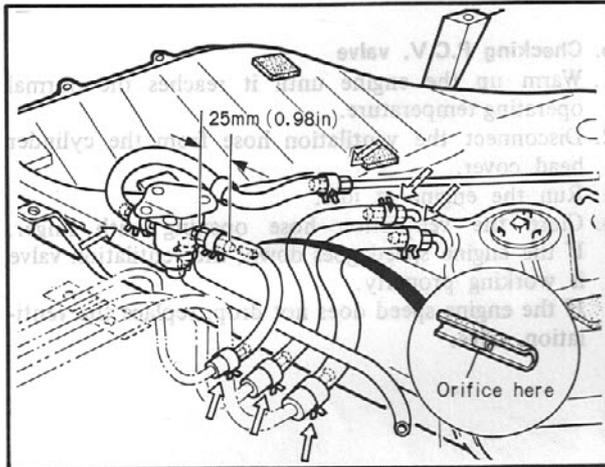


Fig. 1A-63

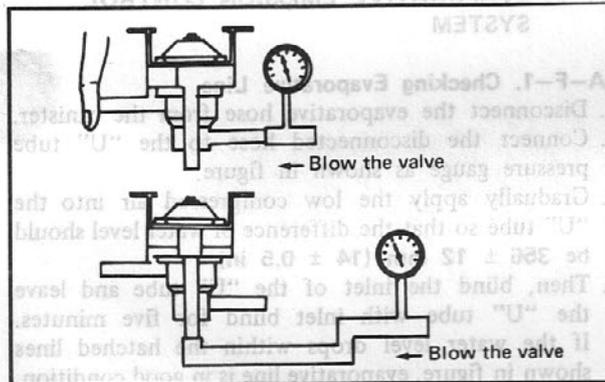


Fig. 1A-64

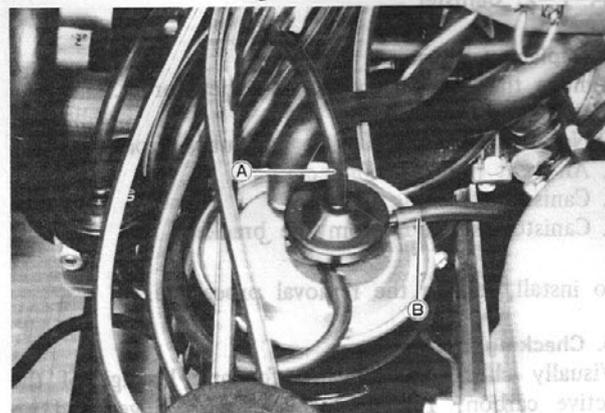


Fig. 1A-65

1A-F-3. Check and Cut Valve

a. Replacing check and cut valve

Remove the check and cut valve in the numerical order.

Raise the vehicle and support with stands.

1. Check and cut valve attaching bolt.
2. Fuel hoses
3. Check and cut valve

To install, reverse the removal procedure.

Note:

Push in the rubber hose end to the fuel pipe until the fuel pipe is inserted as shown in figure.

b. Checking check and cut valve

1. Remove the check and cut valve.
2. Connect a pressure gauge to the passage to the fuel tank and blind the other end by finger.
3. Blow through the valve. The valve should open with the pressure of more than is $0.055 \sim 0.07 \text{ kg/cm}^2$ ($0.78 \sim 1.00 \text{ lb/in}^2$).
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 more than $0.01 \sim 0.05 \text{ kg/cm}^2$ ($0.14 \sim 0.71 \text{ lb/in}^2$), the valve is normal. If the valve does not operate properly, replace the valve.

1A-F-4. Purge Control Valve

a. Checking purge control valve

No. 1 purge control valve

1. Disconnect the vacuum sensing tubes (A) (water thermo valve \sim No. 1 purge control valve) and (B) (No. 1 purge control valve \sim inlet manifold) at the No. 1 purge control valve. Plug the vacuum sensing tube (B).

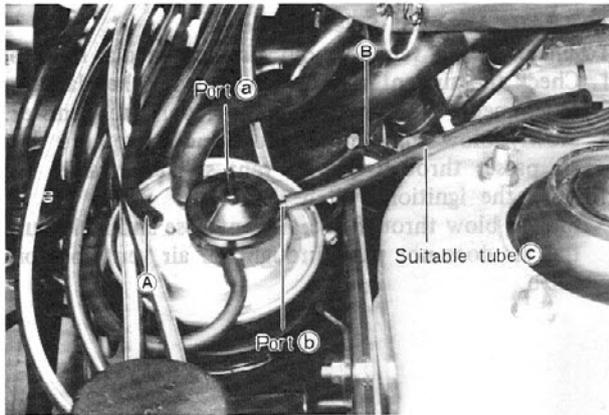


Fig. 1A-66

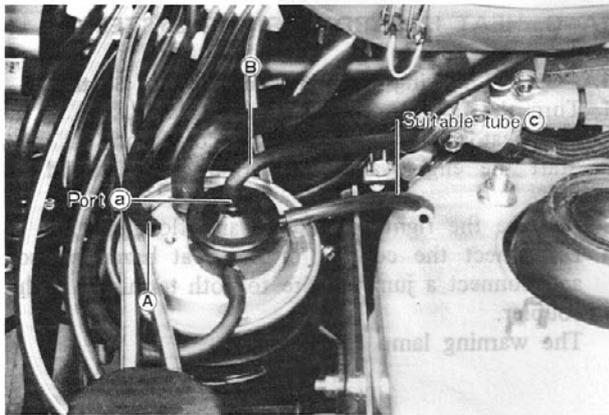


Fig. 1A-67

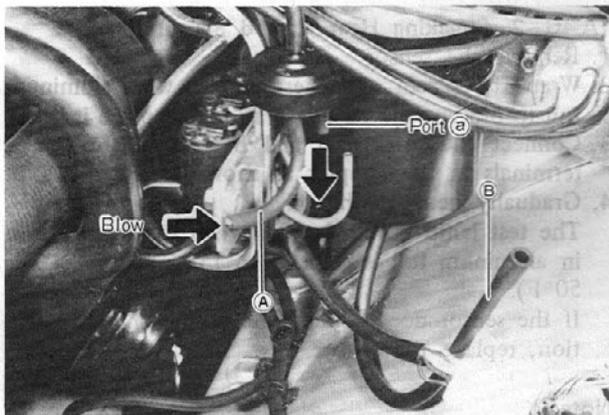


Fig. 1A-68

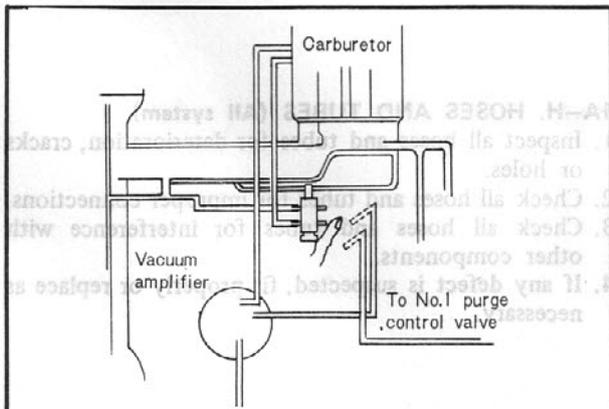


Fig. 1A-69

2. Start the engine and run it at idle.
3. Connect the suitable tube (c) to port (b) and blow slightly through this tube. Blow the valve through test tube and make sure the air does not pass at all.

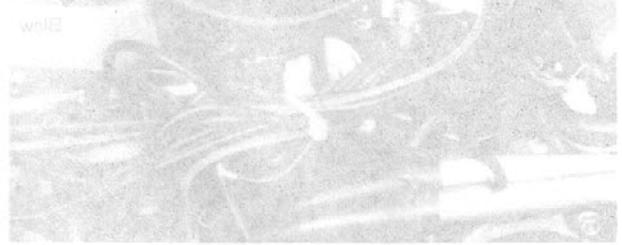


Fig. 1A-70

4. Unplug the vacuum sensing tube (B) and connect it to port (a). Blow slightly with the same manner as described in procedure 3. It is normal if the air passes.



Fig. 1A-71

No. 2 purge control valve

1. Disconnect the vacuum sensing tube (A) (No. 2 purge control valve ~ No. 1 purge control valve) at the No. 1 purge control valve.
2. Disconnect the vacuum sensing tube (B) from the No. 2 purge control valve.
3. Blow slightly the No. 2 purge control valve from the vacuum sensing tube (A) and make sure the air does not come out from the port (a).
4. Start the engine and run it at 2,000 rpm.
5. Blow the No. 2 purge control valve from the vacuum sensing tube (A) and make sure the air comes out from the port (a).

1A-F-5. Water Thermo Valve

To check, as described in Par 1A-B-4.

SPECIAL TOOL	
49 2113 0108	Gauge set, Air Pump
49 8134 242	Remover, E.G.R. Nut
49 3336 242	Remover, E.G.R. Nut

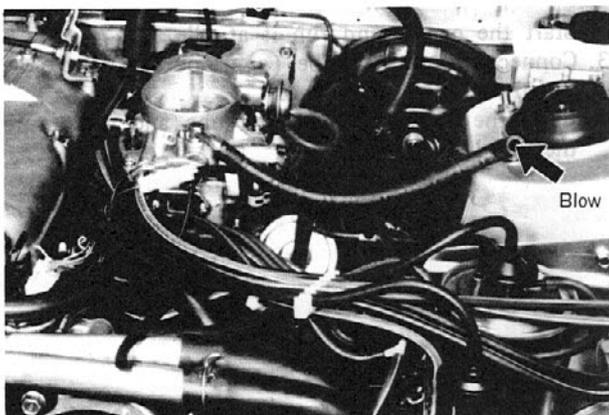


Fig. 1A-70

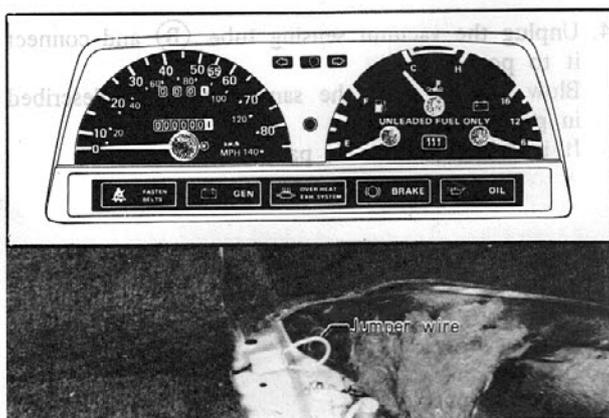


Fig. 1A-71

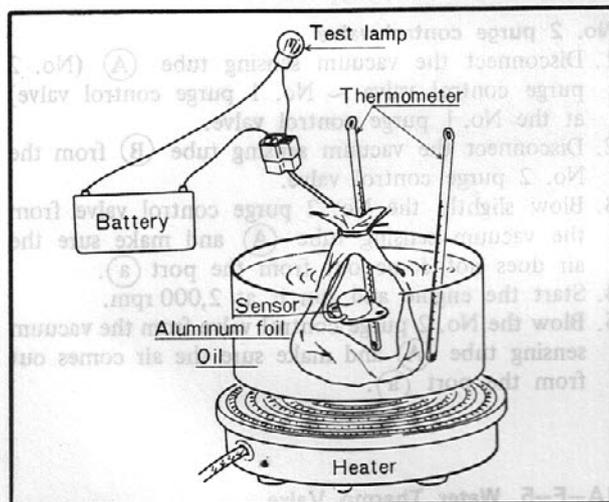


Fig. 1A-72

SPECIAL TOOL

49 2113 010B	Gauge set, Air Pump
49 8134 245	Remover, E.G.R. Nut
49 3936 245	Remover, E.G.R. Nut

1A-F-6. Air Vent Solenoid 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 canister.
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 air vent hose and make sure the air does not pass through the air vent solenoid valve.

1A-G. HEAT HAZARD WARNING SYSTEM

1A-G-1. Checking Heat Hazard Warning System

1. Turn the ignition switch on.
The heat hazard warning lamp comes on.
2. Start the engine and the warning lamp should go off.
3. Remove the right scarf plate and floor mat.
4. Disconnect the coupler of the heat hazard sensor and connect a jumper wire to both terminals in the coupler.
The warning lamp comes on.

1A-G-2. Checking Heat Hazard Sensor

1. Remove the sensor.
2. Wrap the sensor and thermometer with aluminum foil to prevent the oil penetration and place it in oil.
3. Connect the test lamp and battery to the sensor terminals in the coupler as shown in Fig. 1A-72.
4. Gradually heat up the oil.
The test lamp should be ON when the temperature in aluminum foil is reached to $150 \pm 10^\circ\text{C}$ ($302 \pm 50^\circ\text{F}$).
If the sensor does not operate within the specification, replace the sensor.

Note:

Do not heat up the oil more than 200°C (392°F).

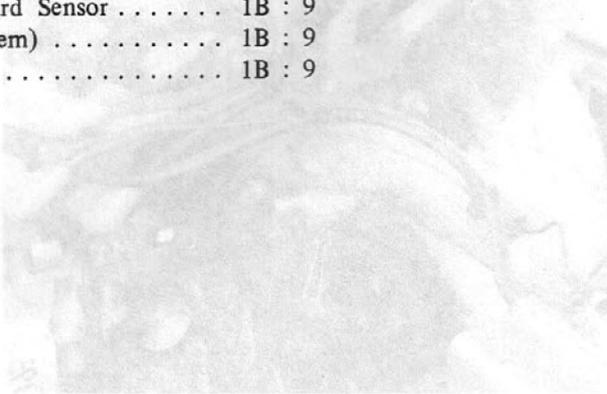
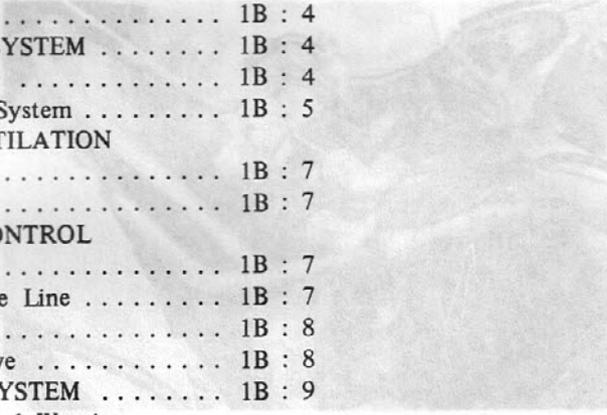
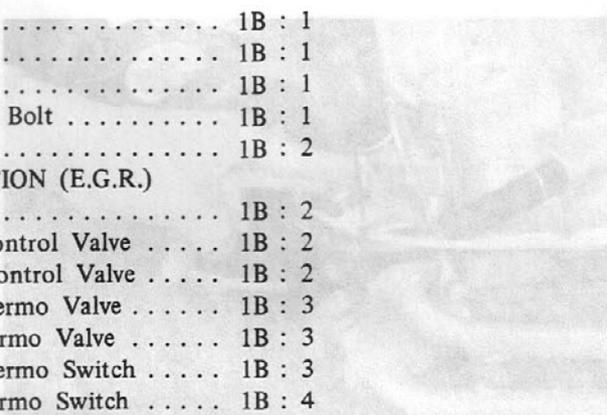
1A-H. HOSES AND TUBES (All system)

1. Inspect all hoses and tubes for deterioration, cracks or holes.
2. Check all hoses and tubes for improper connections.
3. Check all hoses and tubes for interference with other components.
4. If any defect is suspected, fit properly or replace as necessary.

EMISSION CONTROL SYSTEM

(Canada)

1B-A. AIR INJECTION SYSTEM	1B : 1
1B-A-1. Reed Valve	1B : 1
1B-A-2. Air Pipe	1B : 1
1B-A-3. Air Inlet Connector Bolt	1B : 1
1B-A-4. Air Silencer	1B : 2
1B-B. EXHAUST GAS RECIRCULATION (E.G.R.) SYSTEM	1B : 2
1B-B-1. Replacing E.G.R. Control Valve	1B : 2
1B-B-2. Inspecting E.G.R. Control Valve	1B : 2
1B-B-3. Replacing Water Thermo Valve	1B : 3
1B-B-4. Checking Water Thermo Valve	1B : 3
1B-B-5. Replacing Water Thermo Switch	1B : 3
1B-B-6. Checking Water Thermo Switch	1B : 4
1B-C. OXIDIZING CATALYTIC CONVERTER SYSTEM	1B : 4
1B-C-1. Catalytic Converter	1B : 4
1B-D. DECELERATION CONTROL SYSTEM	1B : 4
1B-D-1. Anti-afterburn Valve	1B : 4
1B-D-2. Throttle Positioner System	1B : 5
1B-E. POSITIVE CRANKCASE VENTILATION (P.C.V.) SYSTEM	1B : 7
1B-E-1. P.C.V. Valve	1B : 7
1B-F. EVAPORATIVE EMISSION CONTROL SYSTEM	1B : 7
1B-F-1. Checking Evaporative Line	1B : 7
1B-F-2. Canister	1B : 8
1B-F-3. Check and Cut Valve	1B : 8
1B-G. HEAT HAZARD WARNING SYSTEM	1B : 9
1B-G-1. Checking Heat Hazard Warning System	1B : 9
1B-G-2. Checking Heat Hazard Sensor	1B : 9
1B-H. HOSES AND TUBES (All system)	1B : 9
SPECIAL TOOL	1B : 9



1B-A. AIR INJECTION SYSTEM
 1B-A-1. Reed Valve
 a. Replacing reed valve
 Remove the reed valve in the numerical order.
 2. Reed valve
 To install, reverse the removal procedure.

1B-B. EXHAUST GAS RECIRCULATION (E.G.R.) SYSTEM
 1B-B-1. Replacing E.G.R. Control Valve
 1B-B-2. Inspecting E.G.R. Control Valve
 1B-B-3. Replacing Water Thermo Valve
 1B-B-4. Checking Water Thermo Valve
 1B-B-5. Replacing Water Thermo Switch
 1B-B-6. Checking Water Thermo Switch

1B-C. OXIDIZING CATALYTIC CONVERTER SYSTEM
 1B-C-1. Catalytic Converter

1B-D. DECELERATION CONTROL SYSTEM
 1B-D-1. Anti-afterburn Valve
 1B-D-2. Throttle Positioner System

1B-E. POSITIVE CRANKCASE VENTILATION (P.C.V.) SYSTEM
 1B-E-1. P.C.V. Valve

1B-F. EVAPORATIVE EMISSION CONTROL SYSTEM
 1B-F-1. Checking Evaporative Line
 1B-F-2. Canister
 1B-F-3. Check and Cut Valve

1B-G. HEAT HAZARD WARNING SYSTEM
 1B-G-1. Checking Heat Hazard Warning System
 1B-G-2. Checking Heat Hazard Sensor

1B-H. HOSES AND TUBES (All system)
 SPECIAL TOOL

Fig. 1B-1

Fig. 1B-2

Fig. 1B-3

Fig. 1B-4

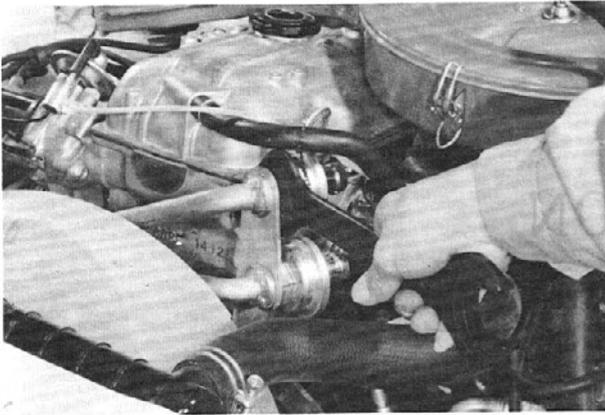


Fig. 1B-1

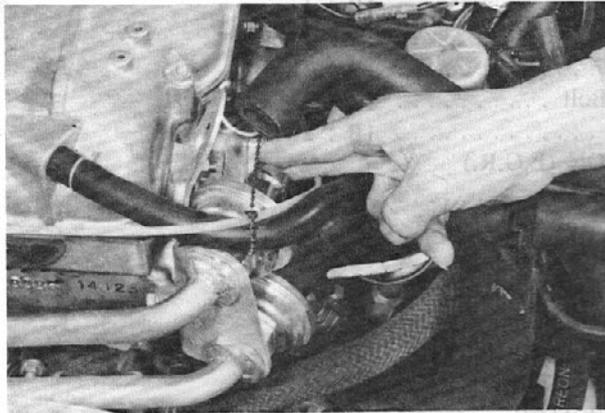


Fig. 1B-2

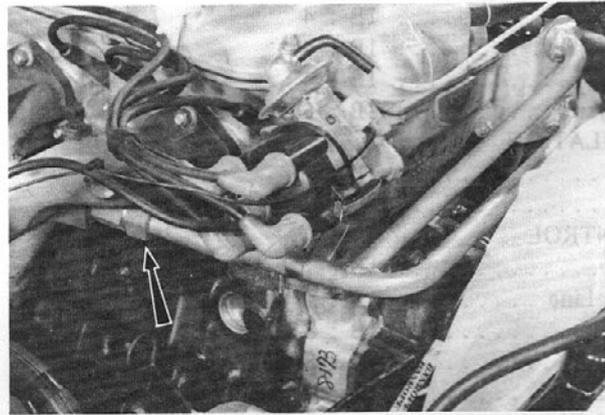


Fig. 1B-3

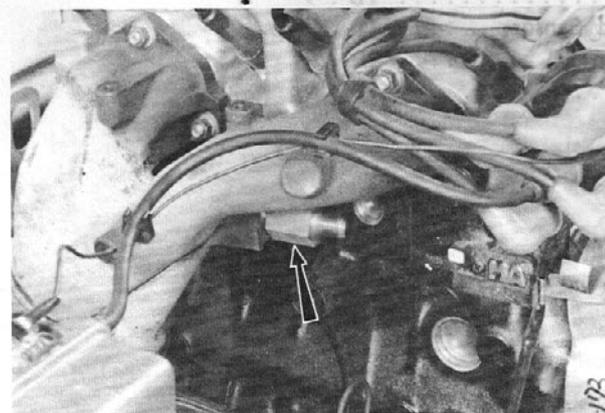


Fig. 1B-4

1B-A. AIR INJECTION SYSTEM

1B-A-1. Reed Valve

a. Replacing reed valve

Remove the reed valve in the numerical order.

1. Air hoses
2. Reed valves

To install, reverse the removal procedure.

b. Checking reed valve

1. Warm up the engine to the normal operating temperature and stop the engine.
2. Disconnect the air hose from the reed valve.
3. Start the engine and run it at idle. Place the finger over the reed valve inlet and make sure the air is sucked into the valve.
4. Increase the engine speed to 1,500 rpm and check the exhaust gas leakage at the air inlet fitting on the valve by placing a finger.

1B-A-2. Air Pipe

To replace the air pipe, proceed as follows:

1. Remove the reed valve, as described in Par 1B-A-1.
2. Loosen the nut attaching the air pipe to the air inlet connector bolt, then remove the air pipe.

To install, reverse the removal procedure.

1B-A-3. Air Inlet Connector Bolt

To replace the air inlet connector bolt, proceed as follows:

1. Remove the air pipe as described in Par 1B-A-2.
2. Remove the air inlet connector bolt from the exhaust manifold.

If necessary, remove the exhaust manifold and lightly tap the air inlet connector bolt out with a plastic hammer.

To install, reverse the removal procedure.

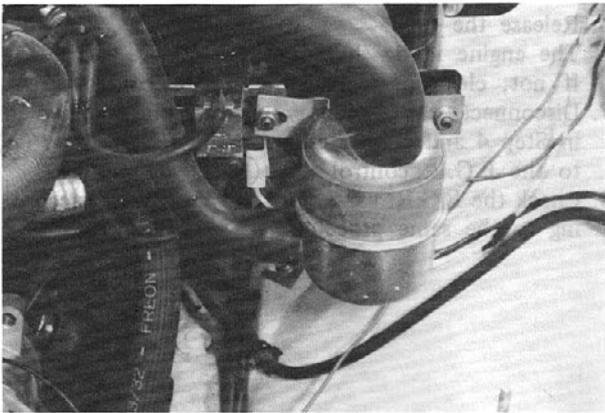


Fig. 1B-5

1B-A-4. Air Silencer

a. Replacing Air Silencer

Remove the air silencer in the numerical order.

1. Air hoses
2. Air silencer

Check for any cracking on the air silencer.

To install, reverse the removal procedure.

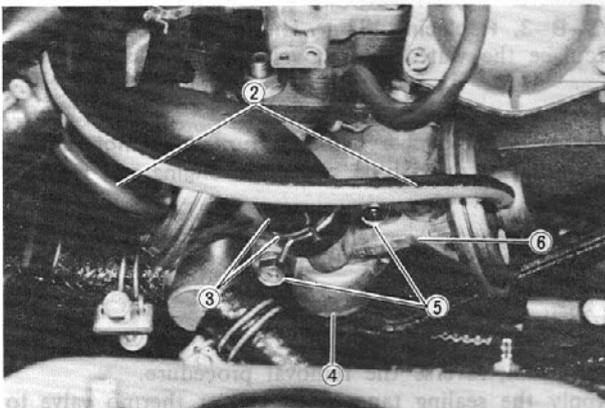


Fig. 1B-6

1B-B. EXHAUST GAS RECIRCULATION (E.G.R.) SYSTEM

1B-B-1. Replacing E.G.R. Control Valve

Remove the E.G.R. control valve in the numerical order.

1. Air cleaner
2. Vacuum sensing tubes (disconnect)
3. Clip and air hose
4. E.G.R. pipe attaching nut
Use the **remover** (49 3936 245)
5. E.G.R. control valve supporting bolts
6. E.G.R. control valve



Fig. 1B-7

Note:

Remove any deposits from the E.G.R. control valve and E.G.R. pipes with a piece of wire or brush if necessary. Blow them with compressed air.

Install them in the exact reverse order of removal.

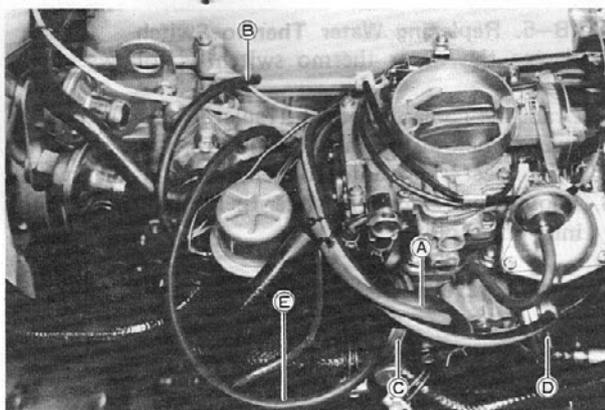
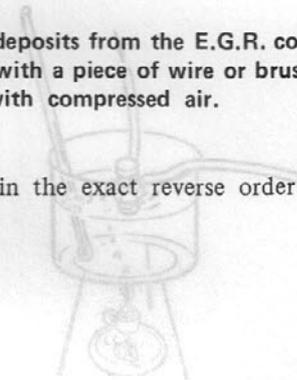


Fig. 1B-8

1B-B-2. Inspecting E.G.R. Control Valve

1. Warm up the engine to the normal operating temperature and stop the engine.
2. Disconnect the vacuum sensing tube (A) from the E.G.R. valve (C) (1st stage valve) and pinch it.
3. Disconnect the vacuum sensing tube (B) (anti-afterburn valve ~ inlet manifold) at the inlet manifold.
4. Connect the additional vacuum sensing tube (E) to the inlet manifold and E.G.R. control valve so that the inlet manifold vacuum can be led directly to the E.G.R. control valve.
5. Pinch the vacuum sensing tube connected in Step 4. Start the engine and make sure that the engine operates smoothly.

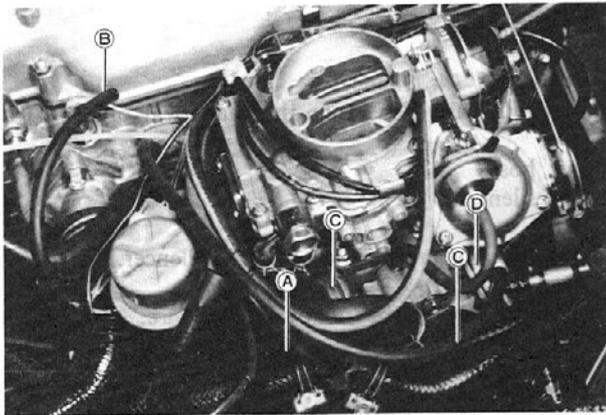


Fig. 1B-9

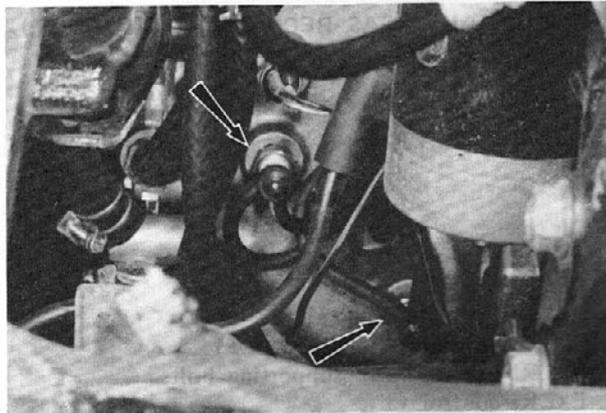


Fig. 1B-10

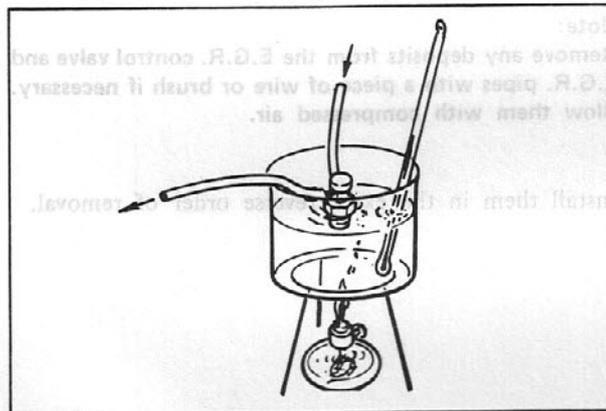


Fig. 1B-11

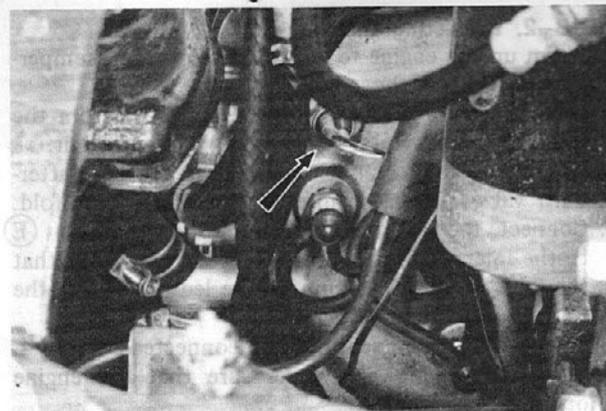


Fig. 1B-12

6. Release the tube.
The engine idling should roughen.
If not, clean or replace the E.G.R. control valve.
7. Disconnect the vacuum sensing tube connected in Step 4 and connect the vacuum sensing tube (A) to the E.G.R. control valve (C).
8. Check the E.G.R. valve (D) (2nd stage valve) according to the same procedure.

1B-B-3. Replacing Water Thermo Valve

Replace the water thermo valve as follows:

Note:

To avoid the danger of being burned, do not remove the radiator drain plug while the engine and radiator are still hot.

1. Engine coolant (drain)
2. Vacuum tubes
3. Water thermo valves

To install, reverse the removal procedure.

Apply the sealing tape to the water thermo valve to prevent the coolant leakage.

1B-B-4. Checking Water Thermo Valve

1. Remove the water thermo valve.
2. Immerse the water thermo valve in a container.
3. Heat up the water gradually and observe the temperature.
4. Blow the valve and if air flows out at 59°C (138°F) or above, the valve is satisfactory.

1B-B-5. Replacing Water Thermo Switch

Replacing the water thermo switch as follows:

1. Drain the coolant from the radiator until the coolant level is below the inlet manifold.
2. Disconnect the bulle connectors from the switch.
3. Loosen and remove the water thermo switch from the inlet manifold.

To install, reverse the removal procedure.

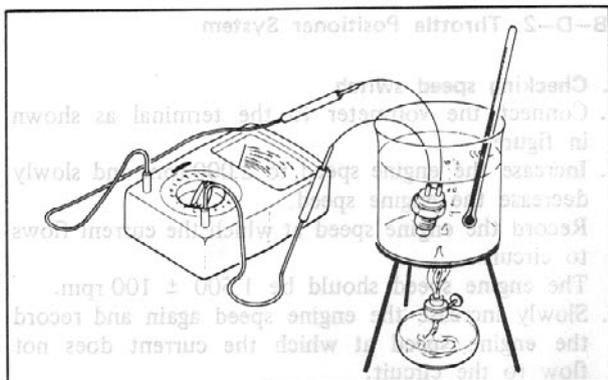


Fig. 1B-13

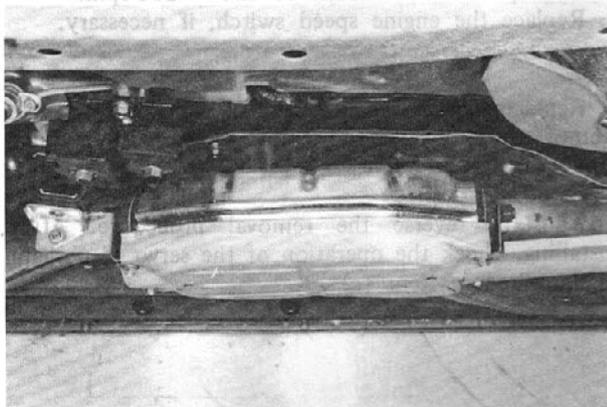


Fig. 1B-14

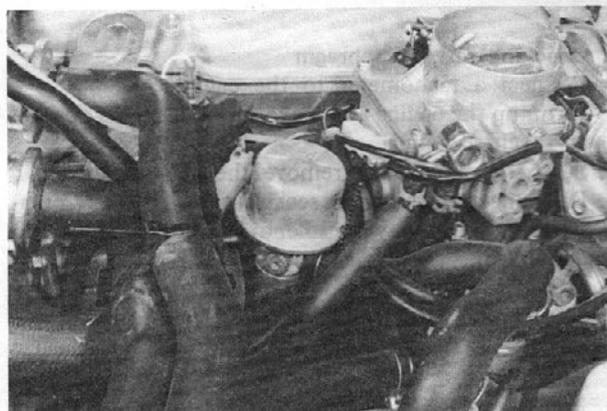


Fig. 1B-15

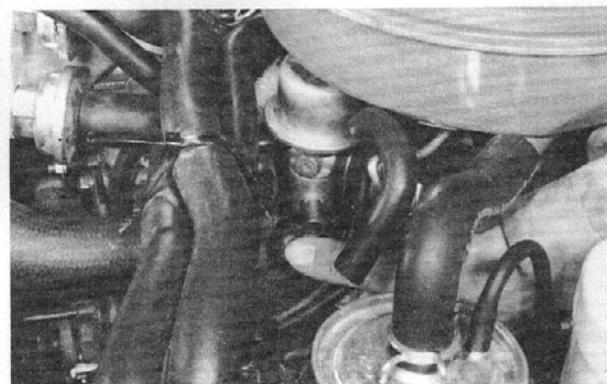


Fig. 1B-16

1B-B-6. Checking Water Thermo Switch

1. Remove the water thermo switch as described in Par. 1B-B-5.
2. Place the water thermo switch in water with a thermometer and heat up the water gradually.
3. Check the temperature at which the continuity does not exist between both terminals of the switch. The specified temperature is $50^{\circ} \pm 2^{\circ}\text{C}$ ($122 \pm 4^{\circ}\text{F}$) or above. If it is not within specification, replace the switch.

1B-C. OXIDIZING CATALYTIC CONVERTER SYSTEM**1B-C-1. Catalytic converter**

Visually inspect the catalytic converter for burned condition, cracks and corrosion.

To replace the catalytic converter, proceed as follows:

Raise the vehicle and support with stands.

1. Remove the heat insulator from the catalytic converter.
2. Remove the nuts at the front and rear flanges of the catalytic converter.

To install, reverse the removal procedure.

1B-D. DECELERATION CONTROL SYSTEM**1B-D-1. Anti-afterburn Valve****a. Replacing anti-afterburn valve**

Remove the anti-afterburn valve as follows:

1. Air cleaner
2. Vacuum sensing tube
3. Air hoses (disconnect)
4. Anti-afterburn valve

To install, reverse the removal procedure.

b. Checking anti-afterburn valve

1. Disconnect the air hose (anti-afterburn valve ~ air cleaner) from the anti-afterburn valve.
2. Operate the engine at idle. Close the air inlet with finger and make sure the engine speed does not change.
3. Increase the engine speed and quickly release the accelerator.

The excessive air should be sucked into the anti-afterburn valve for a **few seconds** after releasing the accelerator. If the air is sucked for **more than a few seconds** or is not sucked at all, replace the anti-afterburn valve.

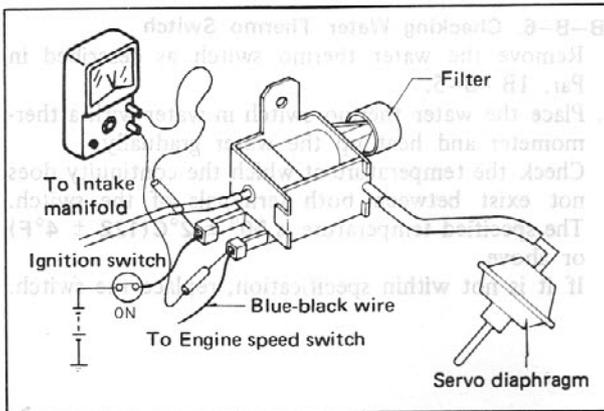


Fig. 1B-17

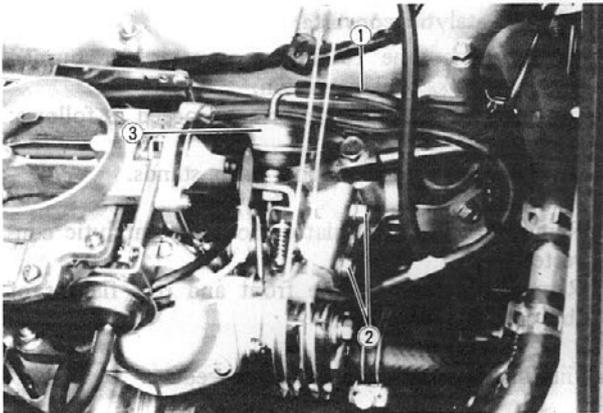


Fig. 1B-18

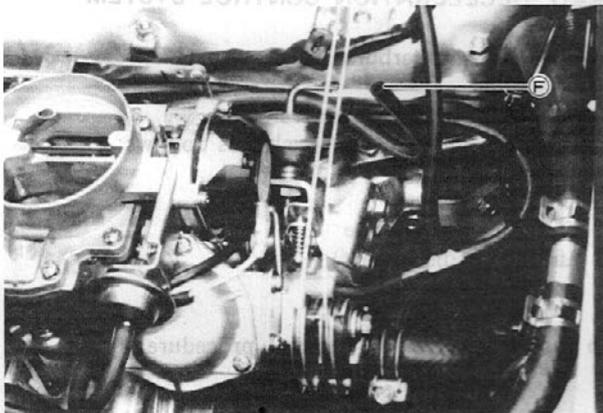


Fig. 1B-19

1B-D-2. Throttle Positioner System

a. Checking speed switch

1. Connect the voltmeter to the terminal as shown in figure.
2. Increase the engine speed to 2,000 rpm and slowly decrease the engine speed. Record the engine speed at which the current flows to circuit. The engine speed should be $1,500 \pm 100$ rpm.
3. Slowly increase the engine speed again and record the engine speed at which the current does not flow to the circuit.

The difference between the engine speed recorded in Step 3 and 4 should be 150 ~ 250 rpm.

4. Replace the engine speed switch, if necessary.

b. Replacing servo diaphragm

Remove the air cleaner and remove the parts in the order numbered left.

To install, reverse the removal procedure. After installing, check the operation of the servo diaphragm as described in item (c).

c. Checking servo diaphragm

1. Connect a tachometer to the engine.
2. Warm up the engine and make sure the engine operate at specified idling.
3. Stop the engine and remove the air cleaner.
4. Disconnect the vacuum sensing tube (F) (servo diaphragm ~ three way solenoid valve) at the servo diaphragm.

d. Checking anti-stall valve
 1. Disconnect the air hose (anti-stall valve ~ air cleaner) from the anti-stall valve.
 2. Operate the engine at idle.
 Close the air filter with finger and make sure the engine speed does not change.
 3. Increase the engine speed and quickly release the accelerator.
 The excessive air should be sucked into the anti-stall valve for a few seconds after releasing the accelerator. If the air is sucked for more than a few seconds or is not sucked at all, replace the anti-stall valve.

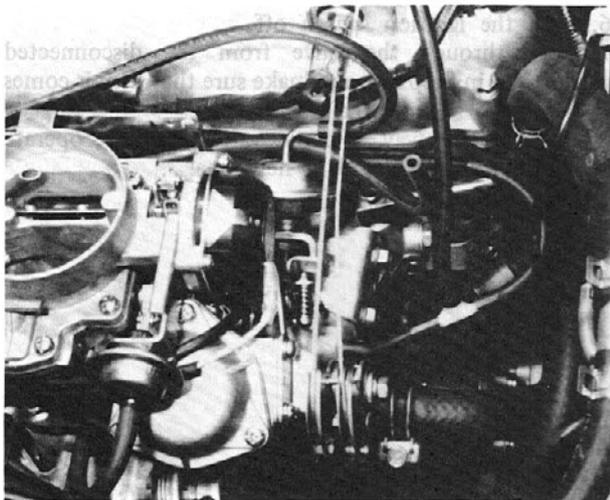


Fig. 1B-20

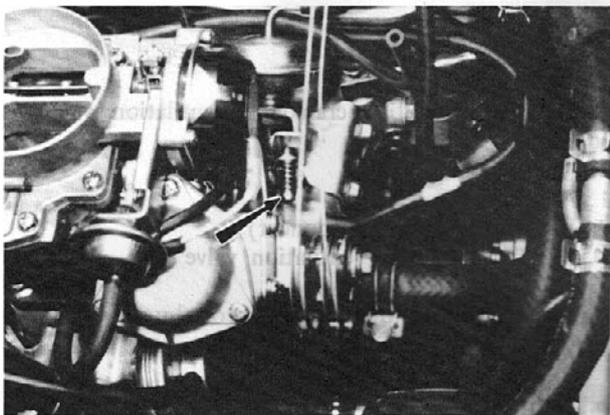


Fig. 1B-21

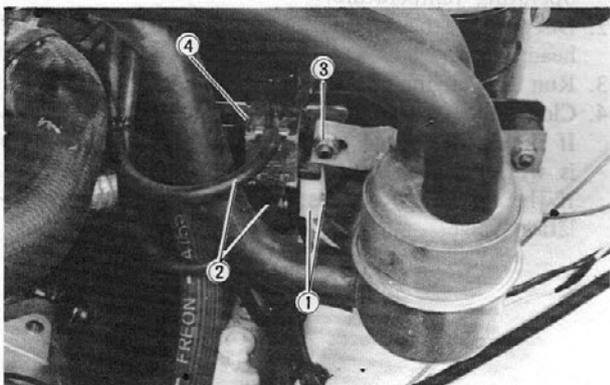


Fig. 1B-22

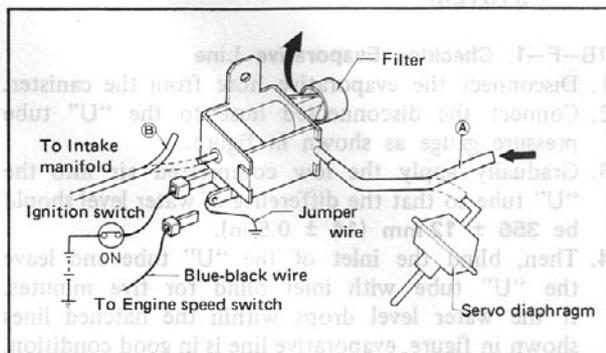


Fig. 1B-23

5. Connect the inlet manifold and the servo diaphragm with a suitable tube so that the inlet manifold vacuum can be led directly to the servo diaphragm.
6. Disconnect the vacuum sensing tube (carburetor ~ distributor) at the distributor and plug the tube.



Fig. 1B-24

7. Start the engine and increase the engine speed to about 2,000 rpm.
8. Decrease the engine speed and make sure the engine speed is $1,100 \pm 100$ rpm.
If the engine speed is not within the specification, turn the throttle opener adjusting screw in or out until the specified engine speed is obtained.

With cooler

When air con. switch is ON to an equivalent opening to give $1,200 \begin{smallmatrix} +0 \\ -50 \end{smallmatrix}$ rpm at idle with vacuum advance.

e. Replacing three-way solenoid valve

Remove the three way solenoid valve as follows:

1. Couplers
2. Vacuum sensing tubes
3. Three-way solenoid valve attaching nuts
4. Three-way solenoid valve

To install, reverse the removal procedure.

f. Checking three-way solenoid valve

1. Disconnect the vacuum sensing tube (A) from the servo diaphragm.
2. Disconnect the vacuum sensing tube (B) from the three-way solenoid valve.
3. Disconnect the coupler (Blue-black wire) from the engine speed switch and ground the three-way solenoid valve using a jumper wire.
4. Turn the ignition switch on.
5. Blow through the three way solenoid valve from the disconnected tube in Step (1), and make sure that the air comes out from the air filter of the valve.

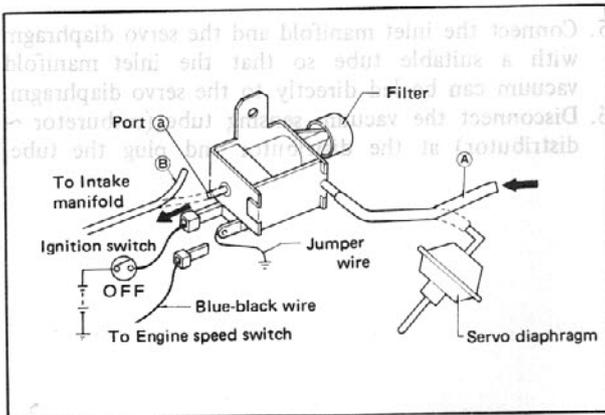


Fig. 1B-24



Fig. 1B-25

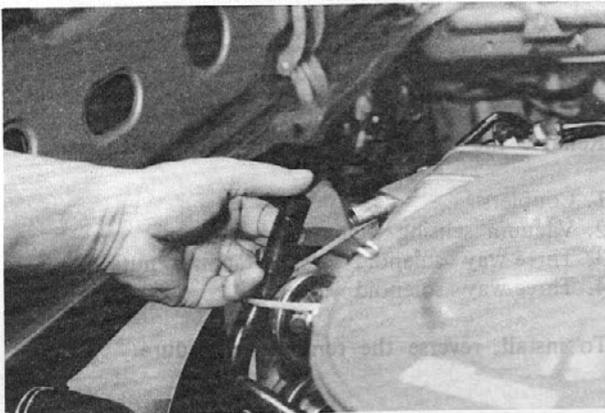


Fig. 1B-26

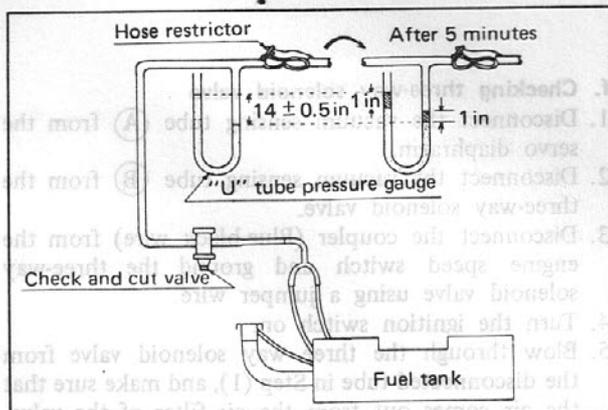


Fig. 1B-27

6. Turn the ignition switch off.
7. Blow through the valve from the disconnected tube (A) in Step (1), and make sure that the air comes out from the port (a).
8. If the three way solenoid valve does not operate properly, replace with a new one.

1B-E. POSITIVE CRANKCASE VENTILATION (P.C.V.) SYSTEM

1B-E-1. P.C.V. Valve

a. Replacing P.C.V. valve

Remove the positive crankcase ventilation valve as follows:

1. Air cleaner
2. Ventilation hose (disconnect)
3. Positive crankcase ventilation valve

To install, reverse the removal procedure.

b. Checking P.C.V. valve

1. Warm up the engine until it reaches the normal operating temperature.
2. Disconnect the ventilation hose from the cylinder head cover.
3. Run the engine at idle.
4. Close the ventilation hose opening with finger. If the engine speed goes down, the ventilation valve is working properly. If the engine speed does not drop, replace the ventilation valve.

1B-F. EVAPORATIVE EMISSION CONTROL SYSTEM

1B-F-1. Checking Evaporative Line

1. Disconnect the evaporative hose from the canister.
2. Connect the disconnected hose to the "U" tube pressure gauge as shown in figure.
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.

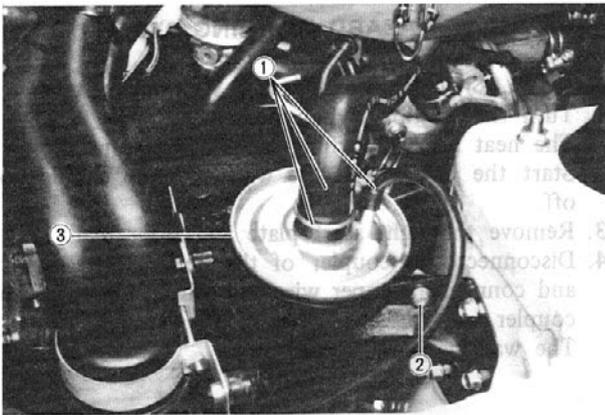


Fig. 1B-28

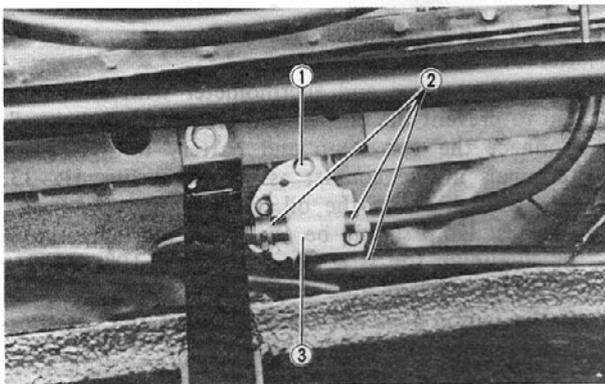


Fig. 1B-29

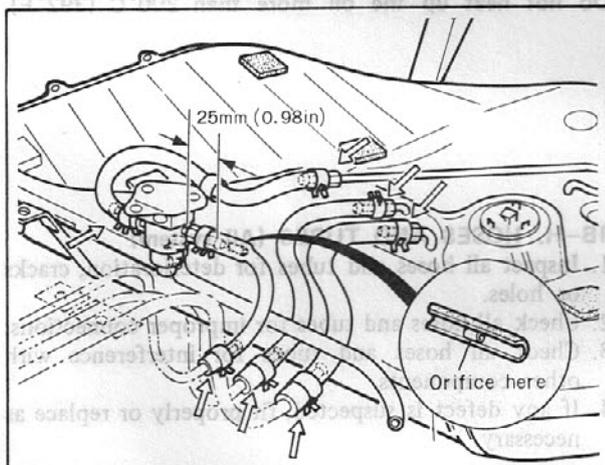


Fig. 1B-30

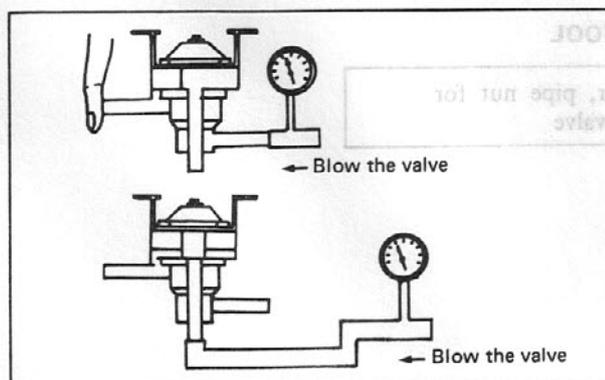


Fig. 1B-31

1B-F-2. Canister

a. Replacing canister

Remove the canister in the numerical order.

1. Clip and hoses (from canister)
2. Canister attaching screws
3. Canister (slip out from the bracket)

To install, reverse the removal procedure.

b. Checking canister

Visually check the canister for any leakage of the active carbon. Tap the canister with finger and no abnormal sound should be audible.

1B-F-3. Check and Cut Valve

a. Replacing check and cut valve

Remove the check and cut valve in the numerical order.

Raise the vehicle and support with stands.

1. Check and cut valve attaching bolt
2. Fuel hoses
3. Check and cut valve

To install, reverse the removal procedure.

Note:

Push in the rubber hose end to the fuel pipe until the fuel pipe is inserted as shown in figure.

b. Checking check and cut valve

1. Remove the check and cut valve.
2. Connect a pressure gauge to the passage to the fuel tank and blind the other end by finger.
3. Blow through the valve. The valve should open with the pressure of more than is $0.055 \sim 0.07 \text{ kg/cm}^2$ ($0.78 \sim 1.00 \text{ lb/in}^2$).
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 more than $0.01 \sim 0.05 \text{ kg/cm}^2$ ($0.14 \sim 0.71 \text{ lb/in}^2$), the valve is normal. If the valve does not operate properly, replace the valve.

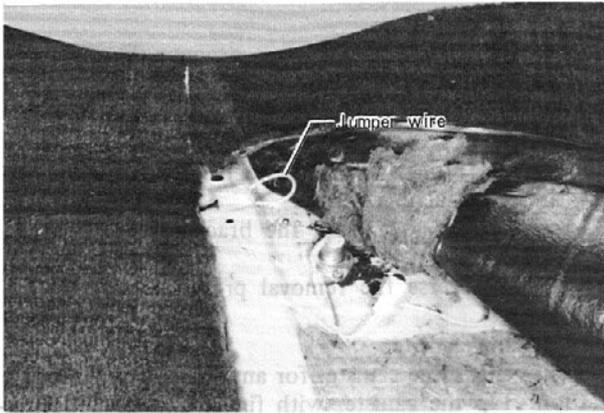


Fig. 1B-32

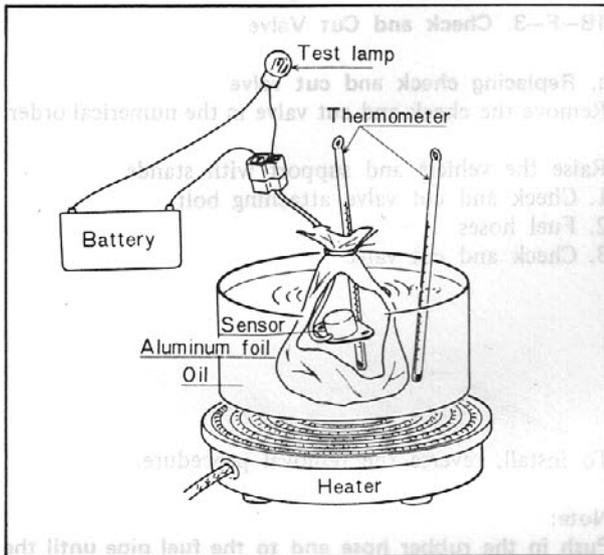


Fig. 1B-33

1B-G. HEAT HAZARD WARNING SYSTEM

1B-G-1. Checking Heat Hazard Warning System

1. Turn the ignition switch on.
The heat hazard warning lamp comes on.
2. Start the engine and the warning lamp should go off.
3. Remove the right scarf plate and floor mat.
4. Disconnect the coupler of the heat hazard sensor and connect a jumper wire to both terminals in the coupler.
The warning lamp comes on.

1B-G-2. Checking Heat Hazard Sensor

1. Remove the sensor.
2. Wrap the sensor and thermometer with aluminum foil to prevent the oil penetration and place it in oil.
3. Connect the test lamp and battery to the sensor terminals in the coupler as shown in Fig. 1B-33.
4. Gradually heat up the oil.
The test lamp should be ON when the temperature in aluminum foil is reached to $150 \pm 10^\circ\text{C}$ ($302 \pm 18^\circ\text{F}$).
If the sensor does not operate within the specification, replace the sensor.

Note:

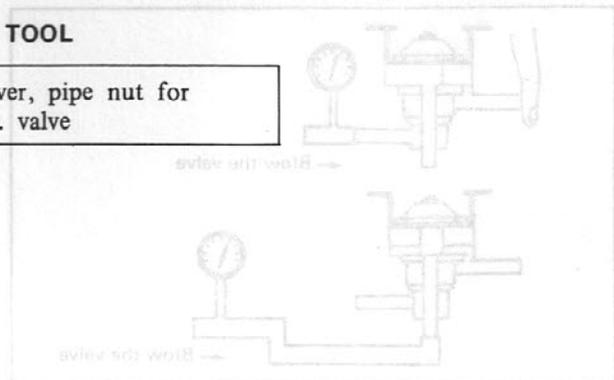
Do not heat up the oil more than 200°C (392°F).

1B-H. HOSES AND TUBES (All system)

1. Inspect all hoses and tubes for deterioration, cracks or holes.
2. Check all hoses and tubes for improper connections.
3. Check all hoses and tubes for interference with other components.
4. If any defect is suspected, fit properly or replace as necessary.

SPECIAL TOOL

49 3936 245 Remover, pipe nut for E.G.R. valve



LUBRICATING SYSTEM

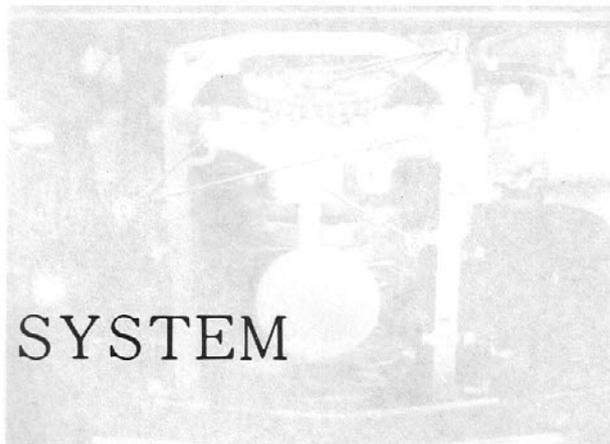


Fig. 2-1

2-A. OIL PUMP	2 : 1
2-A-1. Removing Oil Pump	2 : 1
2-A-2. Disassembling Oil Pump	2 : 1
2-A-3. Checking Oil Pump	2 : 2
2-A-4. Assembling Oil Pump	2 : 3
2-A-5. Installing Oil Pump	2 : 3
2-B. CHECKING OIL PRESSURE	2 : 3
2-C. OIL FILTER	2 : 3
2-D. OIL PAN	2 : 4
2-D-1. Removing Oil Pan	2 : 4
2-D-2. Checking Oil Pan	2 : 4
2-D-3. Installing Oil Pan	2 : 4
SPECIAL TOOL	2 : 4

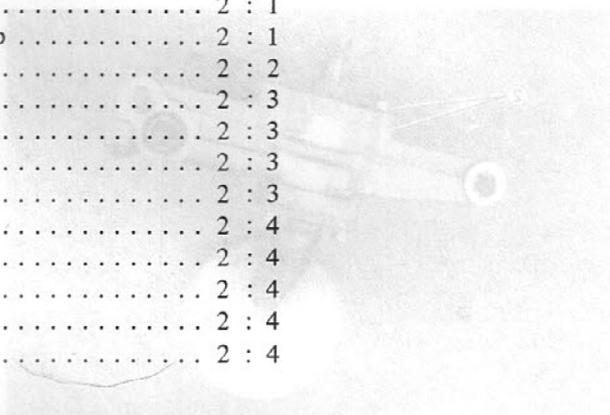


Fig. 2-2



Fig. 2-3



Fig. 2-4

2-A. OIL PUMP
 2-A-1. Removing Oil Pump
 After draining the oil and removing the under cover and oil pan, remove the following parts in sequence:
 1. Lock washer, nut, spacers and chain
 2. Oil pump attaching bolts and adjusting shim
 3. Oil pump assembly

3. Inner rotor and shaft assembly
 4. Outer rotor

5. Spring and plunger
 6. Spring cap
 7. Split pin

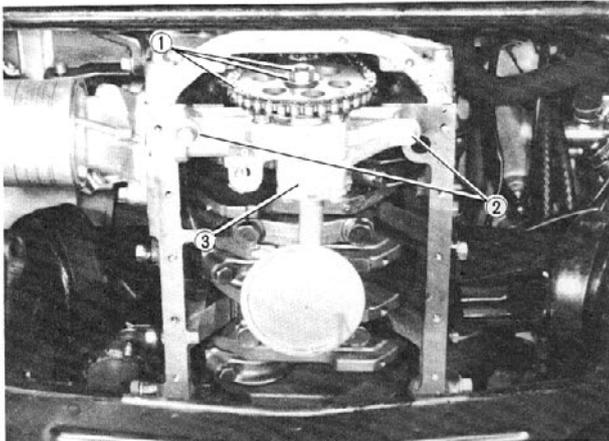


Fig. 2-1

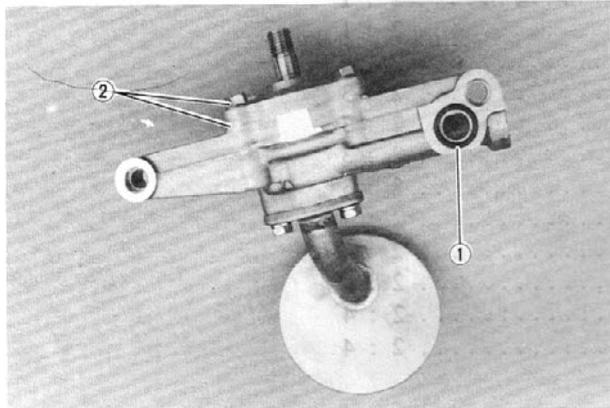


Fig. 2-2

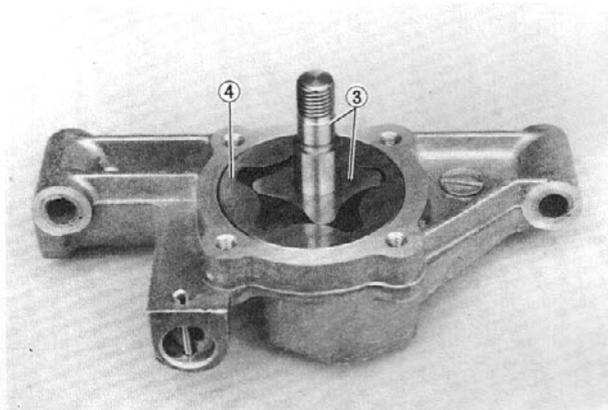


Fig. 2-3

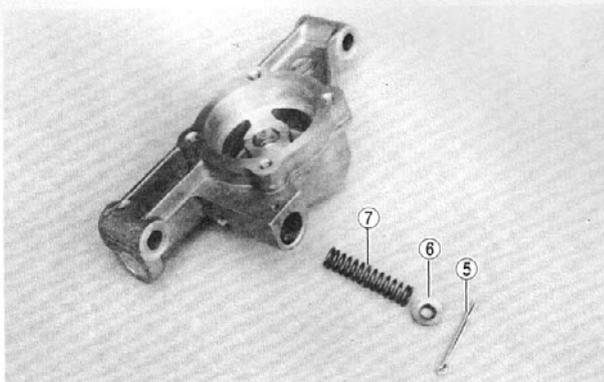


Fig. 2-4

2-A. OIL PUMP

2-A-1. Removing Oil Pump

After draining the oil and removing the under cover and oil pan, remove the following parts in sequence.

1. Lock washer, nut, sprockets and chain
2. Oil pump attaching bolts and adjusting shims
3. Oil pump assembly

2-A-2. Disassembling Oil Pump

Disassemble the oil pump in the numerical order.

1. "O" ring
2. Cover attaching bolts and cover

3. Inner rotor and shaft assembly
4. Outer rotor

5. Split pin
6. Spring seat
7. Spring and plunger

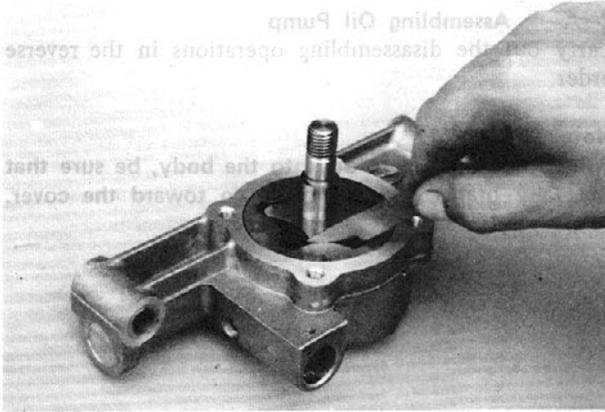


Fig. 2-5

2-A-3. Checking Oil Pump

1. Check the clearance between the lobes of the rotors.
If the clearance exceeds limit, replace both rotors.

Standard	0.04 ~ 0.15 mm (0.002 ~ 0.006 in)
Limit	0.25 mm (0.010 in)

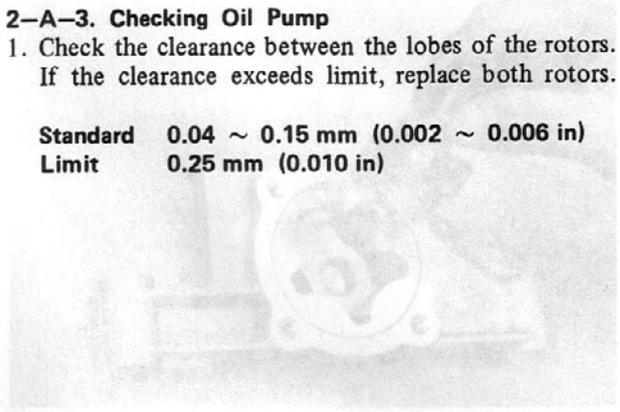


Fig. 2-6

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

Standard	0.14 ~ 0.25 mm (0.006 ~ 0.010 in)
Limit	0.30 mm (0.012 in)



Fig. 2-7

3. Check the end float of the rotors.

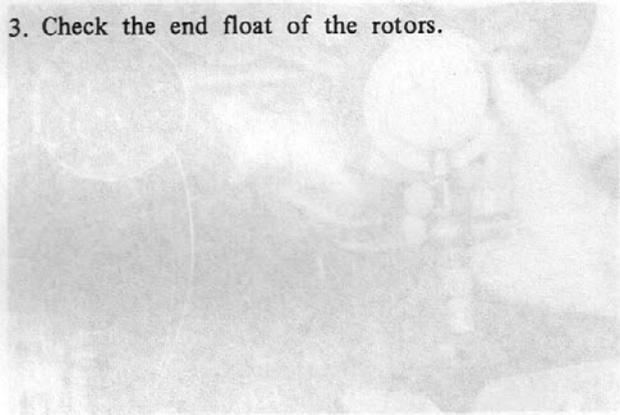


Fig. 2-8

Then, measure the clearance between the straight edge and the cover, as shown in Fig. 2-8. If the sum of these values measured exceed limit, correct the pump cover or pump body, or replace.

Standard	0.04 ~ 0.10 mm (0.002 ~ 0.004 in)
Limit	0.15 mm (0.006 in)



Fig. 2-8

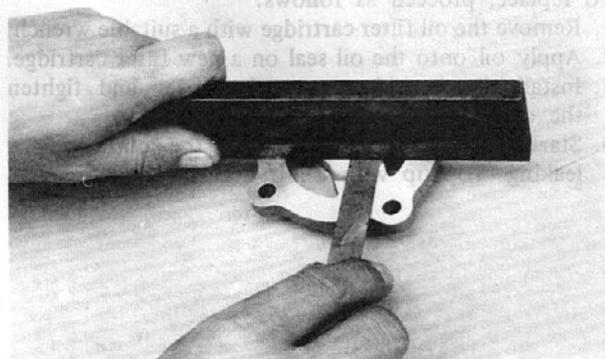


Fig. 2-8

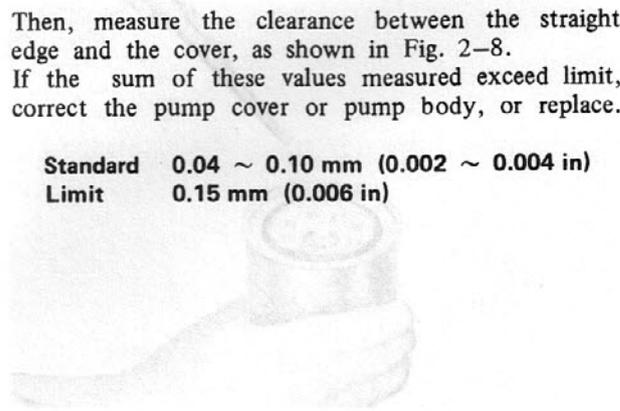


Fig. 2-8

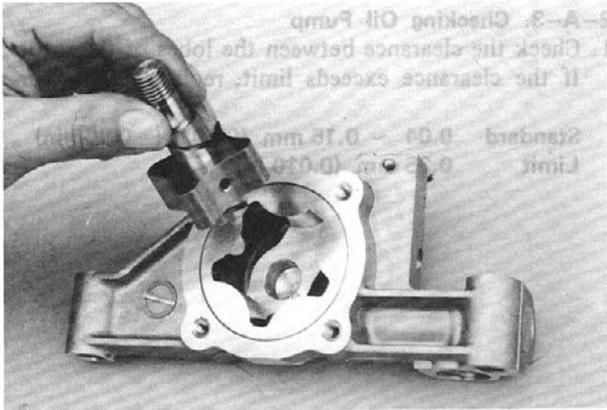


Fig. 2-9

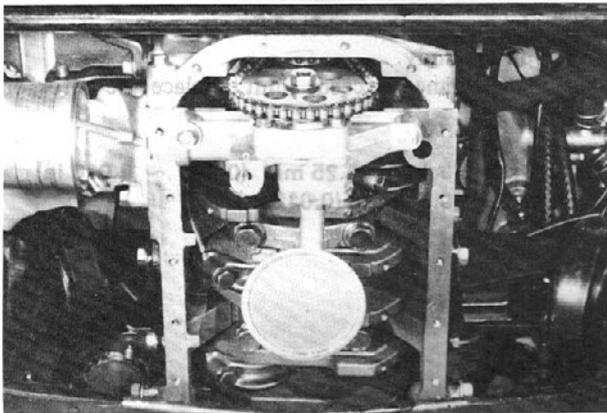


Fig. 2-10

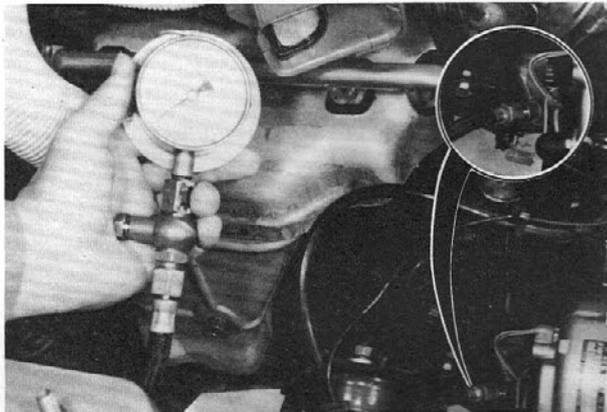


Fig. 2-11



Fig. 2-12

2-A-4. Assembling Oil Pump

Carry out the disassembling operations in the reverse order.

Note:

When installing the rotors into the body, be sure that the tally marks on the rotors go toward the cover.

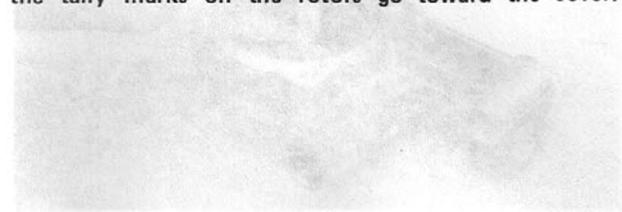


Fig. 2-8

2-A-5. Installing Oil Pump

Install the oil pump in the reverse order of removing.

Adjust the slack of chain as shown in Fig. 1-71.



Fig. 2-6

2-B. CHECKING OIL PRESSURE

Warm up the engine to the normal operating temperature. Remove the oil pressure switch and connect the oil pressure gauge (49 0187 280) instead.

The normal oil pressure is as follows:

Oil Pressure 3.5 ~ 4.5 kg/cm² (50 ~ 64 lb/in²)
at 3,000 rpm of engine

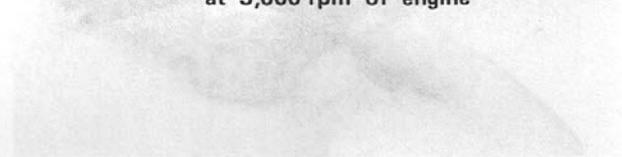


Fig. 2-7

2-C. OIL FILTER

To replace, 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.

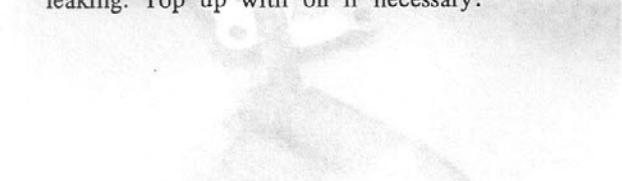


Fig. 2-5

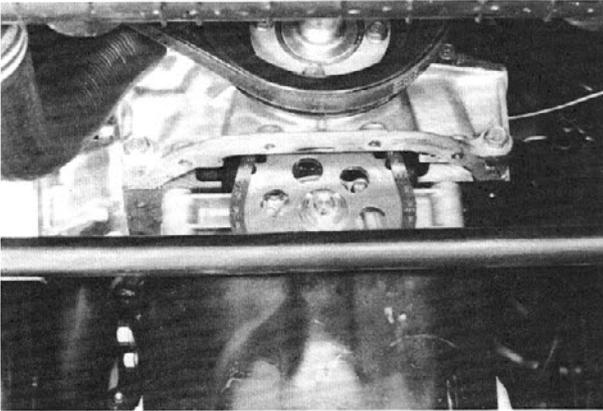


Fig. 2-13

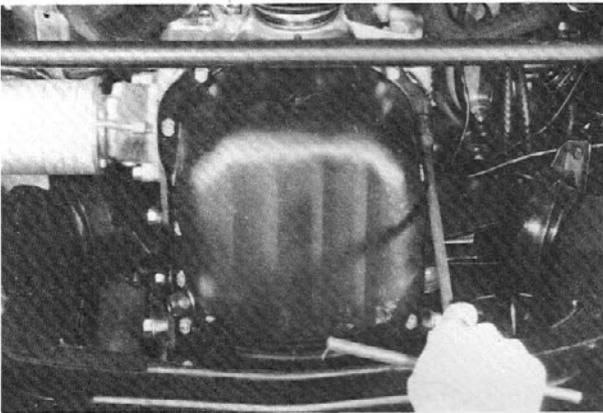


Fig. 2-14

2-D. OIL PAN

2-D-1. Removing Oil Pan

Raise the front end of the vehicle and support with stands.

After draining engine oil, remove the following parts in sequence.

1. Under cover
2. Lift the engine
3. Oil pan and strainer

2-D-2. Checking Oil Pan

Check the oil pan for cracks, damaged drain plug threads.

Straighten surface as required.

2-D-3. Installing Oil Pan

Install the oil pan in the reverse order of removing.

Note:

- a) Apply the sealer (8527 77 739), over the inner border of the mating surfaces of the block, and oil pan (i.e. inner periphery up to bolt hole).
- b) When installing oil pan, install a new gasket instead of the used liquid sealer.
- c) Operate the engine and check for leaks.

SPECIAL TOOL

49 0187 280	Oil pressure gauge
-------------	--------------------

3-A. RADIATOR

3-A-1. Removing Radiator
 After draining the cooling system, remove and dis-
 connect the following parts in sequence.

Note:
 To avoid the danger of being burned, do not remove
 the radiator drain plug while the engine and radiator
 are still hot.

1. Radiator cap (radiator sub tank)
2. Upper and lower hoses
3. Cooling fan and fan drive assembly
4. Radiator cooling

3-A. RADIATOR.....	3 : 1
3-A-1. Removing Radiator.....	3 : 1
3-A-2. Inspecting Radiator.....	3 : 1
3-A-3. Installing Radiator.....	3 : 1
3-B. WATER PUMP.....	3 : 1
3-B-1. Removing Water Pump.....	3 : 1
3-B-2. Disassembling Water Pump.....	3 : 2
3-B-3. Checking Water Pump.....	3 : 2
3-B-4. Assembling Water Pump.....	3 : 2
3-B-5. Installing Water Pump.....	3 : 2
3-C. THERMOSTAT.....	3 : 3
3-C-1. Removing Thermostat.....	3 : 3
3-C-2. Checking Thermostat.....	3 : 3
3-C-3. Installing Thermostat.....	3 : 3
3-D. FAN DRIVE.....	3 : 3
3-D-1. Checking Fan Drive.....	3 : 3
3-E. COOLING SYSTEM PRESSURE TEST.....	3 : 4
3-F. "V" BELT AND TENSION ADJUSTMENT.....	3 : 4
3-G. ANTIFREEZE SOLUTION.....	3 : 4
3-H. CLEANING COOLING SYSTEM.....	3 : 5
SPECIAL TOOLS.....	3 : 5

1. Cooling fan and fan drive assembly
2. Radiator cooling
3. Air pump drive belt (U.S.A.)
4. "V" belt
5. Fan pulley

6. Water pump assembly
7. Bypass hose
8. Heater hose (if equipped)
9. Lower hose



Fig. 3-1

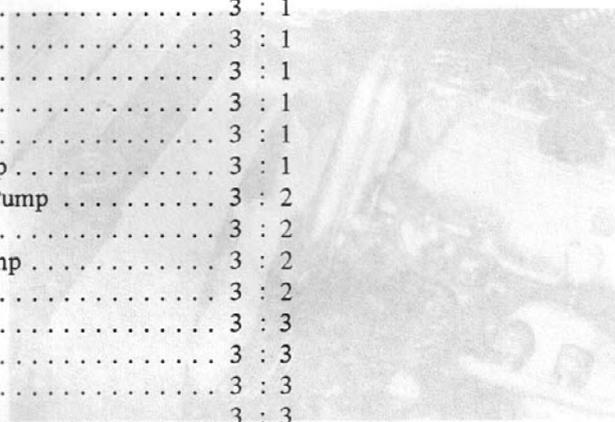


Fig. 3-2

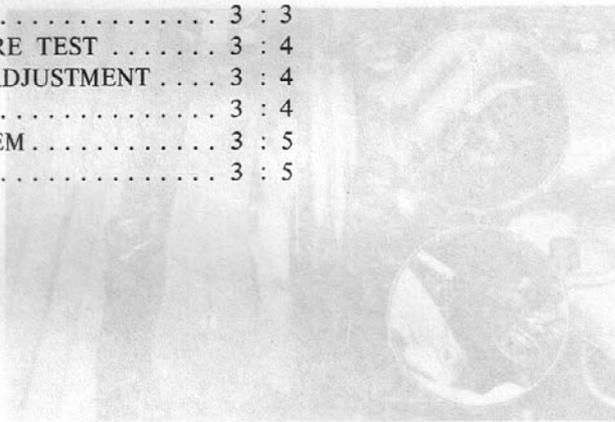


Fig. 3-3

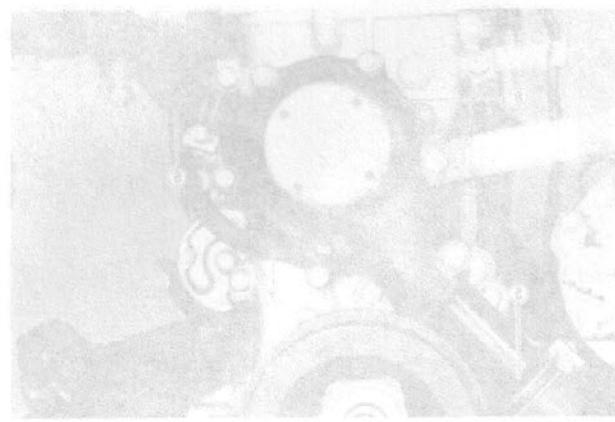


Fig. 3-4

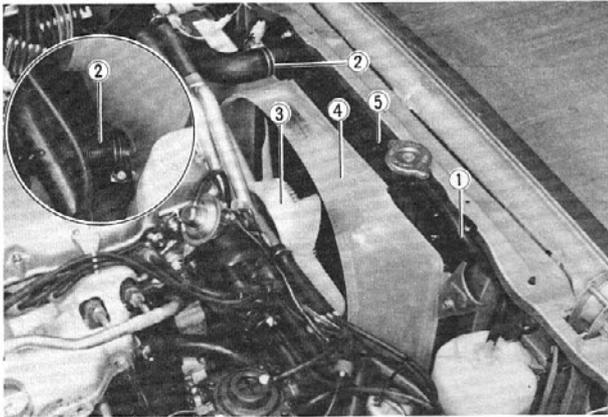


Fig. 3-1

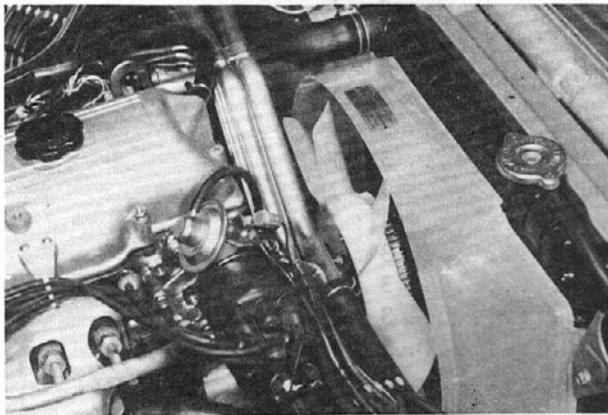


Fig. 3-2

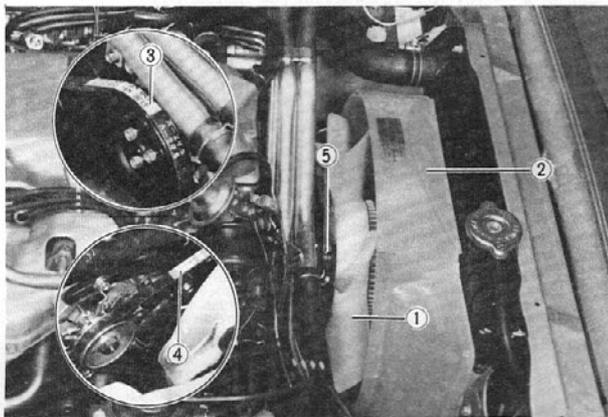


Fig. 3-3

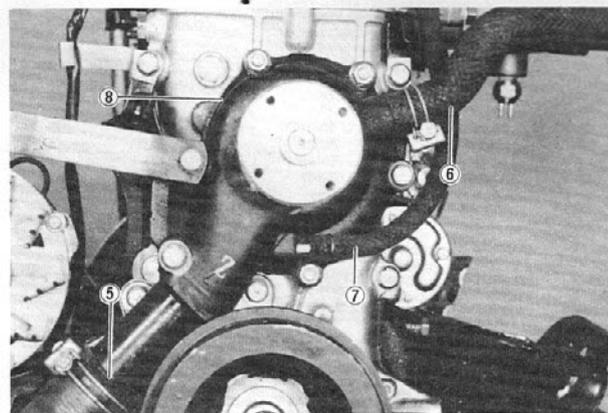


Fig. 3-4

3-A. RADIATOR

3-A-1. Removing Radiator

After draining the cooling system, remove and disconnect the following parts in sequence.

Note:

To avoid the danger of being burned, do not remove the radiator drain plug while the engine and radiator are still hot.

1. Water hose (radiator to radiator sub tank)
2. Upper and lower hoses
3. Cooling fan and fan drive assembly
4. Radiator cowling
5. Radiator

3-A-2. Inspecting Radiator

Inspect the radiator, and clean or repair, if excessively dirty, clogged with dust, or damaged.

3-A-3. Installing Radiator

Follow the removal procedures in the reverse order.

Note:

Fill the cooling system with a mixture of clean soft water (demineralized water) and anti-freeze solution or anti-corrosive solution according to the season and maker's instruction.

3-B. WATER PUMP

3-B-1. Removing Water Pump

After draining the cooling system, remove the following parts in the numerical order.

1. Cooling fan and fan drive assembly
2. Radiator cowling
3. Air pump drive belt (U.S.A.)
4. "V" belt
5. Fan pulley

5. Lower hose
6. Heater hose (If equipped)
7. By-pass hose
8. Water pump assembly

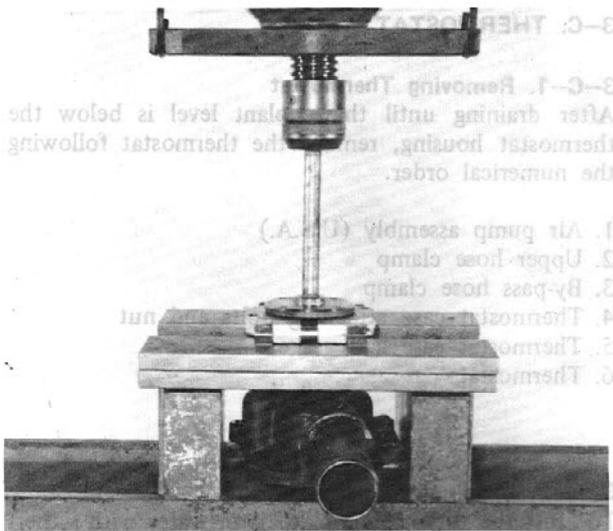


Fig. 3-5 After draining until the coolant level is below the thermostat housing, remove the thermostat following the numerical order:

1. Air pump assembly (1. A.)
2. Upper hose clamp
3. By-pass hose clamp
4. Thermostat nut
5. Thermostat
6. Thermostat housing

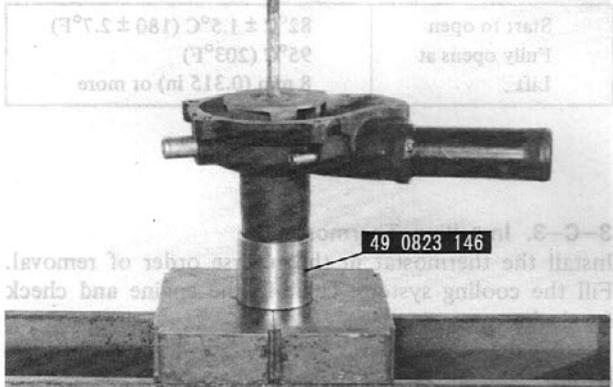


Fig. 3-6 When installing the thermostat into the housing, ensure that the hole pin is positioned upward.

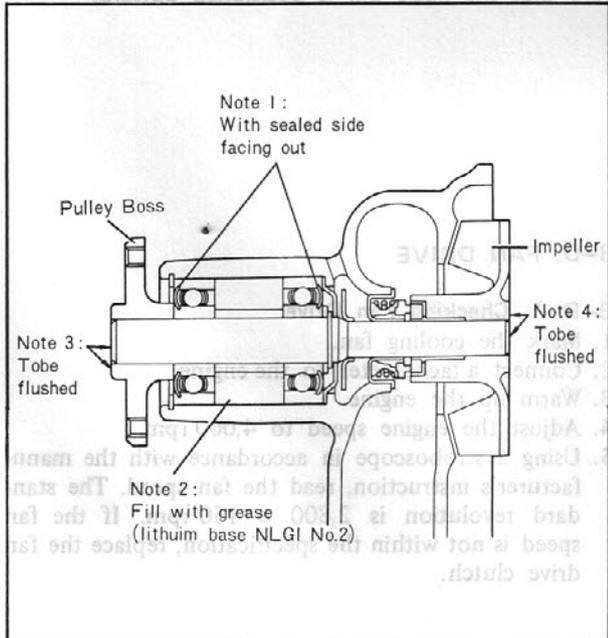


Fig. 3-7

3-B-2. Disassembling Water Pump

Disassemble the water pump in the numerical order.

1. Pulley boss (using puller 49 0636 145)
2. Snap ring



Fig. 3-8

3. Impeller (pressing rear end of shaft out)
4. Seal assembly
5. Shaft and bearing assembly (using support block 49 0823 146)

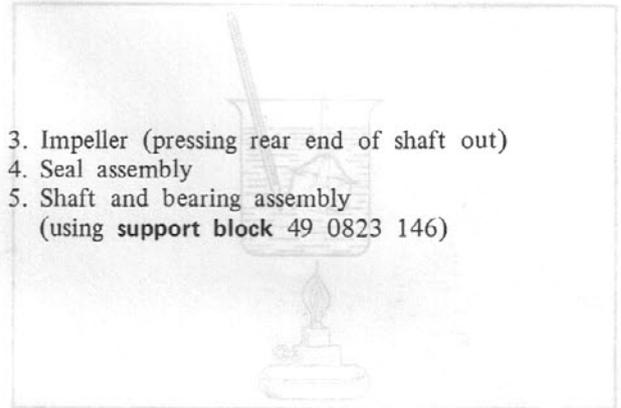


Fig. 3-9

3-B-3. Checking Water Pump

1. Check each part for damage, rust and wear, and replace them if necessary.
2. Check the bearing for abnormal noise and sluggish rotation.

Note:

If the coolant is leaking, replace the seal assembly with a new one.

3-B-4. Assembling Water Pump

Assemble the water pump in the reverse order of disassembly, taking care the caution in Fig. 3-7.

3-B-5. Installing Water Pump

Install the water pump in the reverse order of removal.

Note:

- a) Adjust the belt tension, as described in Par. 3-F.
- b) Fill the cooling system. Operate the engine and check for leaks.

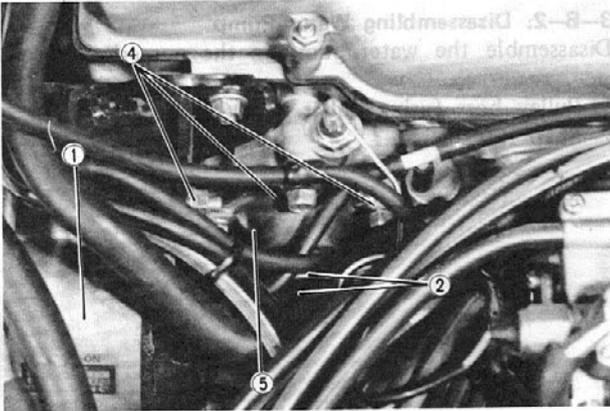


Fig. 3-8

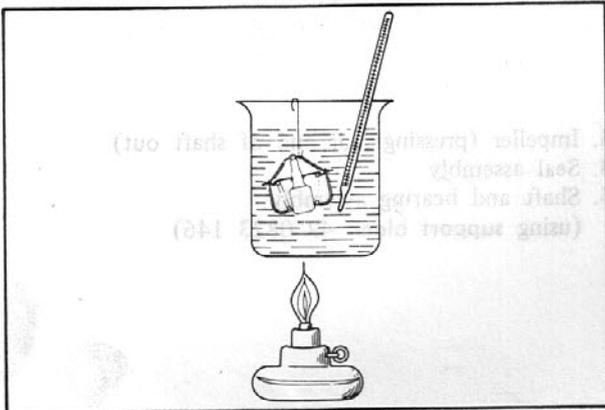


Fig. 3-9

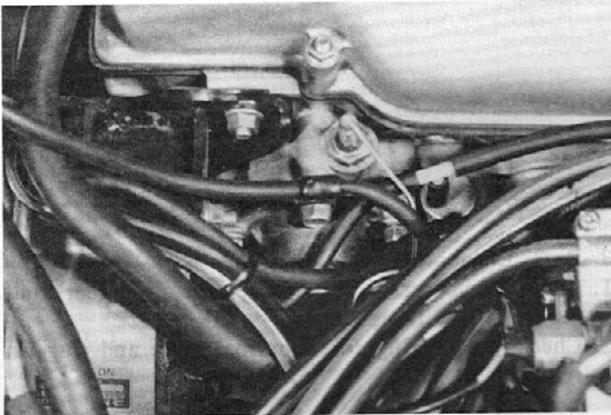


Fig. 3-10

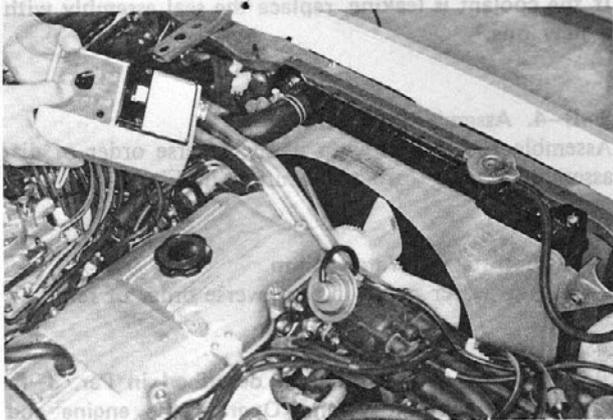


Fig. 3-11

3-C. THERMOSTAT

3-C-1. Removing Thermostat

After draining until the coolant level is below the thermostat housing, remove the thermostat following the numerical order.

1. Air pump assembly (U.S.A.)
2. Upper hose clamp
3. By-pass hose clamp
4. Thermostat case attaching bolts and nut
5. Thermostat case and gasket
6. Thermostat

3-C-2. Checking Thermostat

To test the thermostat, place it in water with a thermometer and heat up the water gradually. 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. If the reading shows a large difference from the specifications, replace with a new thermostat.

Start to open	82°C ± 1.5°C (180 ± 2.7°F)
Fully opens at	95°C (203°F)
Lift	8 mm (0.315 in) or more

3-C-3. Installing Thermostat

Install the thermostat in the reverse order of removal. Fill the cooling system. Operate the engine and check for leaks.

Note:

When installing the thermostat into the housing, make sure that the jiggle pin is positioned upward.

3-D. FAN DRIVE

3-D-1. Checking Fan Drive

1. Mark the cooling fan.
2. Connect a tachometer to the engine.
3. Warm up the engine.
4. Adjust the engine speed to 4,000 rpm.
5. Using a stroboscope in accordance with the manufacturer's instruction, read the fan speed. The standard revolution is 2,800 ± 150 rpm. If the fan speed is not within the specification, replace the fan drive clutch.

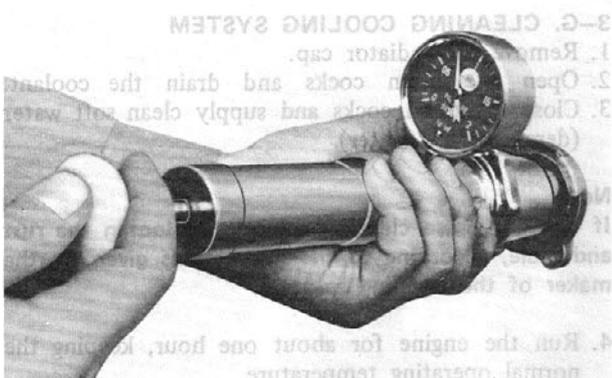


Fig. 3-12

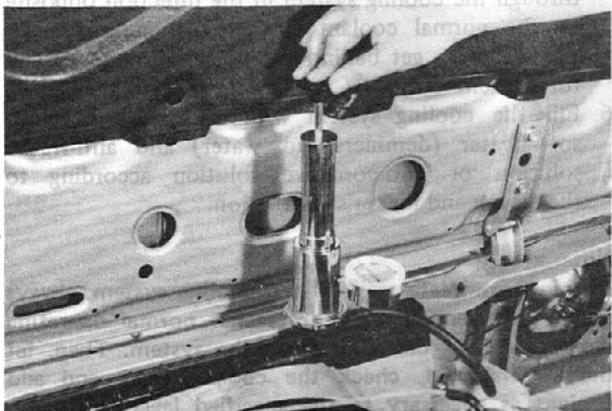


Fig. 3-13

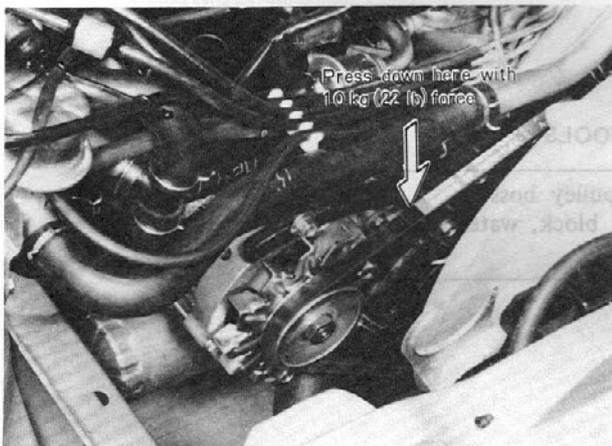


Fig. 3-14

Protection	Mixture percentage (Volume)		Specific gravity of mixture at 20°C (68°F)
	Solution	Water	
Above -26°C (-15°F)	45	55	1.066
Above -40°C (-40°F)	55	45	1.078

3-E. COOLING SYSTEM PRESSURE TEST

1. 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. Pump the tester to the specified pressure. If the pressure drops rapidly and excessively, replace the cap.

Standard valve opening pressure:
 $0.9 \pm 0.15 \text{ kg/cm}^2$ ($13 \pm 2 \text{ lb/in}^2$)

2. Inspect the cooling system for leaks.
 - 1) Attach a tester in place of radiator pressure cap.
 - 2) Run the engine until it reaches normal operating temperature.
 - 3) With the engine running and tester installed, pump up the system to approx. $0.9 \pm 0.1 \text{ kg/cm}^2$ ($13 \pm 1 \text{ lb/in}^2$) and observe the gauge.

Note:

Never allow the pressure to build up to more than 1.0 kg/cm^2 (14 lb/in^2).

If the pressure drops rapidly, inspect all external parts for leaks. If no external leaks appear and the pressure continues to drop, inspect the engine oil to determine whether or not coolant is leaking into the crankcase due to a cracked cylinder block or damaged head gasket.

3-F. "V" BELT AND TENSION ADJUSTMENT

1. If the belt is broken, glazed, or worn, replace the belt with a new one. If the belt is stretched so that it cannot be tightened sufficiently, install a new belt.
2. If the belt is noisy, check the tension of the belt. Also, check for misaligned pulleys.
3. When the belt is pressed down with 10 kg (22 lb) force, the belt should deflect the specified amount.

For new belt	9 ~ 11 mm (0.3 ~ 0.4 in)
For used belt	12 ~ 14 mm (0.5 ~ 0.6 in)

3-G. ANTIFREEZE SOLUTION

To prevent freezing, it is recommended to use MAZDA genuine long life solution.

The mixing rate of water and MAZDA genuine long life solution is shown in the left table.

Note:

- a) Always use soft water (demineralized water) in the cooling system.
- b) If the MAZDA genuine long life solution is not available, use antifreeze solution (for aluminum engine, Ethylene-Glycol based) or anti-corrosive solution on the market in accordance with the season and the maker's instruction.

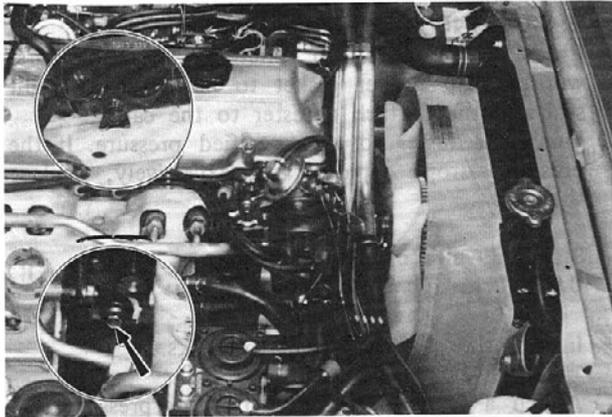


Fig. 3-15

3-G. CLEANING COOLING SYSTEM

1. Remove the radiator cap.
2. Open the drain cocks and drain the coolant.
3. Close the drain cocks and supply clean soft water (demineralized water).

Note:

If necessary, use cleaning solution to loosen the rust and scale, according to the instructions given by the maker of the cleaning solution.

4. Run the engine for about one hour, keeping the normal operating temperature.
5. Drain the coolant completely and flush clean water through the cooling system in the direction opposite to the normal coolant flow. This action causes the water to get behind the corrosive deposits and force them out.
6. Fill the cooling system with a mixture of clean soft water (demineralized water) and anti-freeze solution or anti-corrosive solution according to the season and maker's instruction.

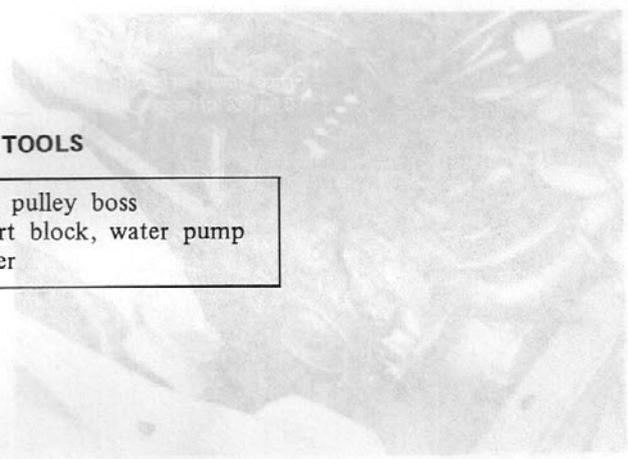
Note:

During a complete refill of the cooling system, always operate the engine until it reaches normal operating temperature to bleed air from the system. Then, let the system cool, check the coolant level, and add coolant as necessary to the specified level.

SPECIAL TOOLS

49 0636 145	Puller, pulley boss
49 0823 146	Support block, water pump impeller

For new belt	9 - 11 mm (0.3 - 0.4 in)
For used belt	12 - 14 mm (0.5 - 0.5 in)



3-G. ANTIFREEZE SOLUTION
To prevent freezing, it is recommended to use MAZDA genuine long life solution.
The mixing rate of water and MAZDA genuine long life solution is shown in the table.

Protection of mixture at 10°C (50°F)	Mixture percentage (Volume)		Specific gravity
	Solution	Water	
Above -20°C (-12°F)	45	55	1.066
Above -40°C (-40°F)	55	45	1.078

Note:
Always use soft water (demineralized water) in the cooling system.
If the MAZDA genuine long life solution is not available, use antifreeze solution (for aluminum engine, Ethylene-Glycol based) or anti-corrosive solution on the market in accordance with the season and the maker's instruction.

4-A. CARBURETOR

Note:
Use caution when working with fuel. Always work
away from spark or open flames.

4-A-1. Removing Carburetor
Remove and disconnect the following parts:

1. Battery negative cable

FUEL SYSTEM

(U. S. A.)



Fig. 4-1

4-A. CARBURETOR	4 : 1
4-A-1. Removing Carburetor	4 : 1
4-A-2. Disassembling Carburetor	4 : 5
4-A-3. Inspecting Carburetor	4 : 6
4-A-4. Assembling Carburetor	4 : 6
4-A-5. Adjusting Carburetor	4 : 8
4-A-6. Checking Secondary Throttle Valve	4 : 10
4-A-7. Installing Carburetor	4 : 10
4-A-8. Adjusting Idle Speed and Idle Mixture	4 : 10
4-B. CARBURETOR LINKAGE	4 : 12
4-B-1. Checking Carburetor Linkage	4 : 12
4-B-2. Checking Accelerator Linkage	4 : 13
4-C. FUEL PUMP	4 : 13
4-C-1. Testing Fuel Pump	4 : 13
4-C-2. Replacing Fuel Pump	4 : 14
4-D. FUEL FILTER	4 : 14
4-D-1. Replacing Fuel Filter	4 : 14
4-E. FUEL TANK	4 : 14
4-F. FUEL CUT VALVE	4 : 15
4-G. FUEL LINE	4 : 15
4-H. FUEL CHECK VALVE	4 : 16
4-I. ALTITUDE COMPENSATOR	4 : 16
4-I-1. Checking Altitude Compensator	4 : 16
4-I-2. Replacing Altitude Compensator	4 : 16
4-J. IDLE COMPENSATOR	4 : 16
4-K. INTAKE AIR TEMPERATURE CONTROL SYSTEM	4 : 17
SPECIAL TOOLS	4 : 17



Fig. 4-2



Fig. 4-3

4-A-2. Disassembling Carburetor
Disassemble the carburetor in the numerical order:

1. Vacuum tube
2. Accelerating pump connecting rod and lever
3. Control spring
4. Spread the clip (automatic choke heater lead, slow fuel cut solenoid valve lead).
5. Choke rod (disconnect)
6. Fuel inlet fitting filter and packing
7. Air vent solenoid valve



Fig. 4-4

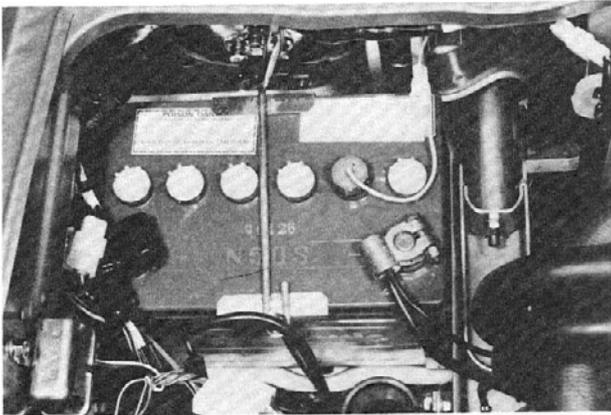


Fig. 4-1

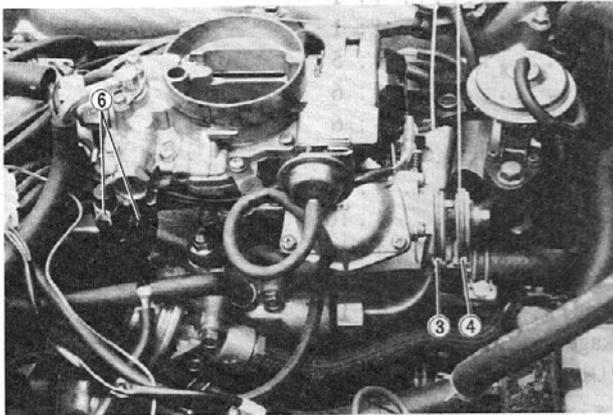


Fig. 4-2

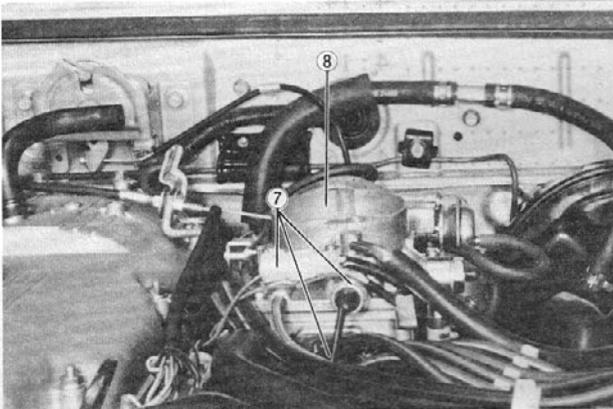


Fig. 4-3

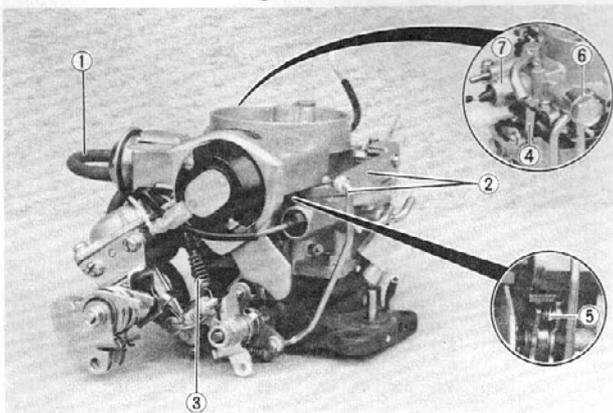


Fig. 4-4

4-A. CARBURETOR

Note:

Use caution when working with fuel. Always work away from spark or open flames.

4-A-1. Removing Carburetor

Remove and disconnect the following parts.

1. Battery negative cable
2. Air cleaner

3. Accelerator cable
4. Cruise control cable (if necessary)
5. Vacuum sensing tubes
6. Fuel hoses

7. Wiring coupler and bullet connector (disconnect)
8. Carburetor

Note:

After removing the carburetor, cover the inlet manifold port with a clean shop towel to prevent dust or dirt from entering.

4-A-2. Disassembling Carburetor

Disassemble the carburetor in the numerical order.

Air horn and Automatic choke:

1. Vacuum tube
2. Accelerating pump connecting rod and lever
3. Connect spring
4. Spread the clip (automatic choke heater lead, slow fuel cut solenoid valve lead).
5. Choke rod (disconnect)
6. Fuel inlet fitting, filter and packing
7. Air vent solenoid valve

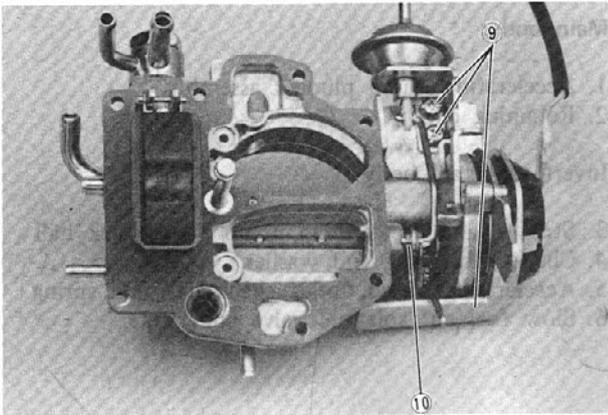


Fig. 4-5

8. Separate the air horn and automatic choke assembly from main body.
9. Choke cover attaching screws and cover
10. Choke diaphragm rod from choke lever (disconnect)

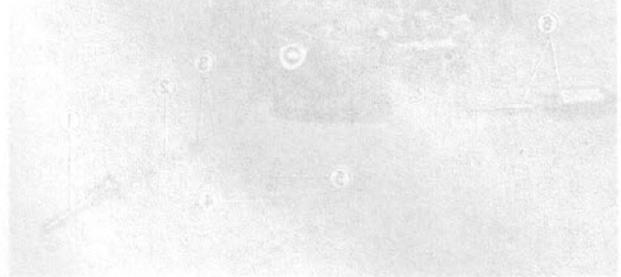


Fig. 4-6

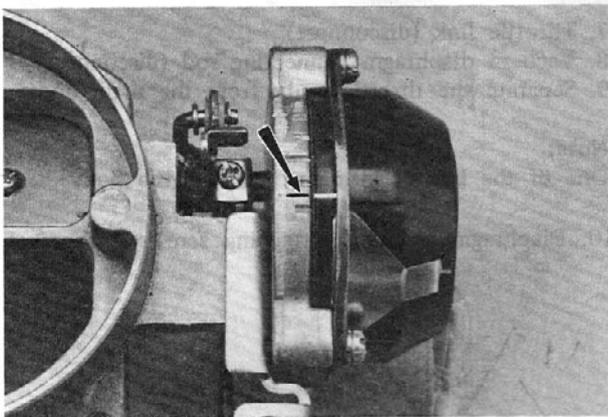


Fig. 4-6

Note:

Mark the position of the bi-metal cover index mark on the choke housing as shown in the figure.



Fig. 4-7

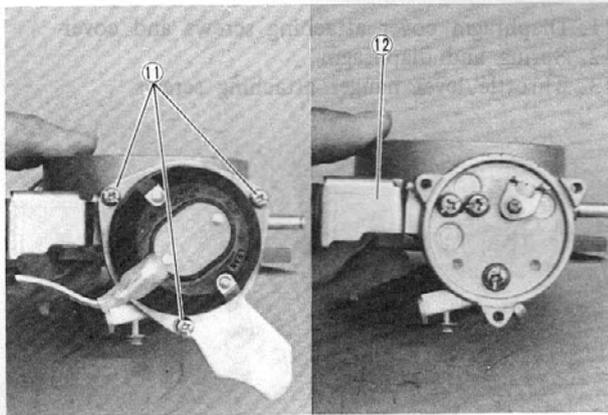


Fig. 4-7

11. Choke heater attaching screws and choke heater
12. Choke diaphragm and bracket assembly

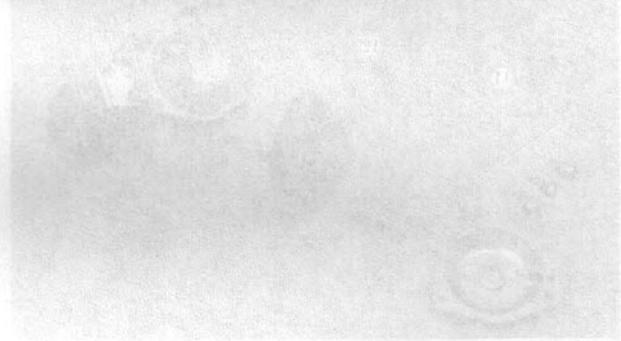


Fig. 4-8

a. Needle valve and float

1. Float, pin and gasket
2. Needle valve assembly

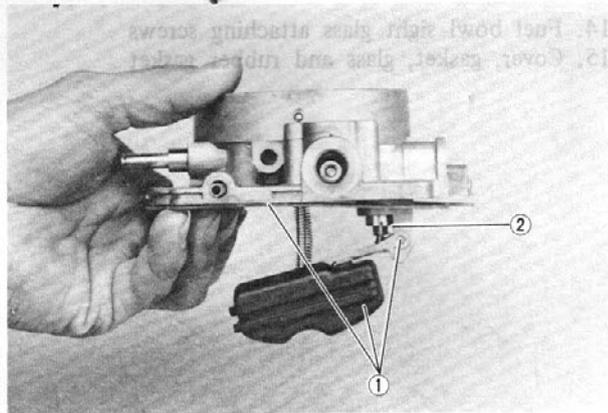


Fig. 4-8

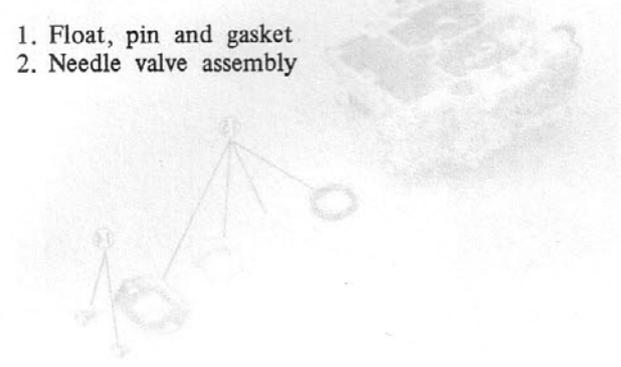


Fig. 4-9

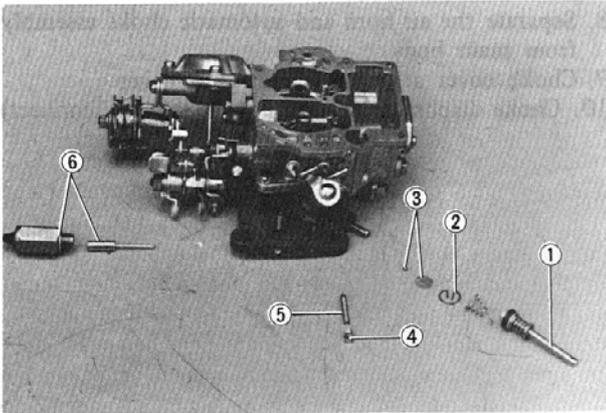


Fig. 4-9

Main body:

1. Accelerating pump plunger assembly
2. Retaining clip

Invert the main body.

3. Strainer and accelerating pump inlet check ball
4. Check valve plug and washer
5. Accelerating pump outlet check ball and spring
6. Slow fuel cut solenoid valve and gasket

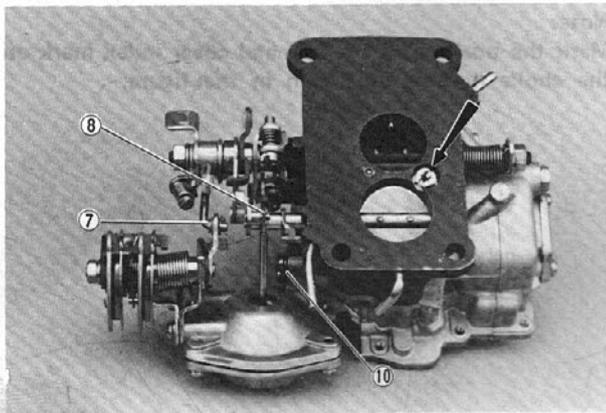


Fig. 4-10

7. Throttle link (disconnect)
8. Vacuum diaphragm connecting rod (disconnect)
9. Separate the throttle body from the main body.

Note:

One of the bolt is inside of the throttle body

10. Diaphragm assembly attaching screws and gasket

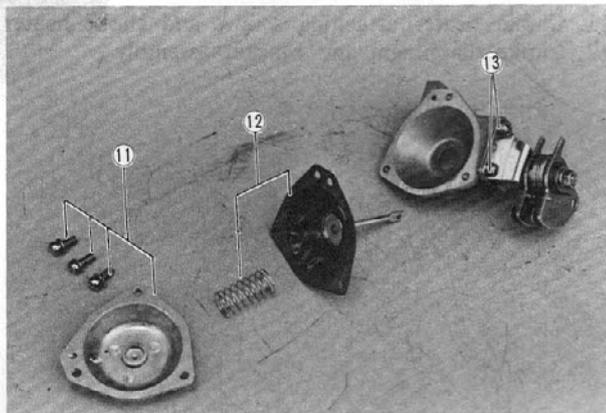


Fig. 4-11

11. Diaphragm cover attaching screws and cover
12. Spring and diaphragm
13. Throttle lever hanger attaching screws

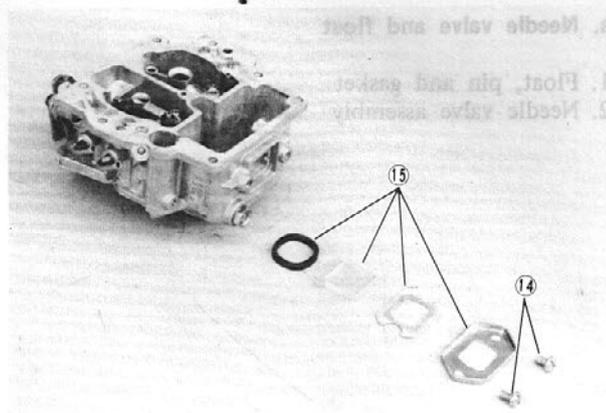


Fig. 4-12

14. Fuel bowl sight glass attaching screws
15. Cover, gasket, glass and rubber gasket

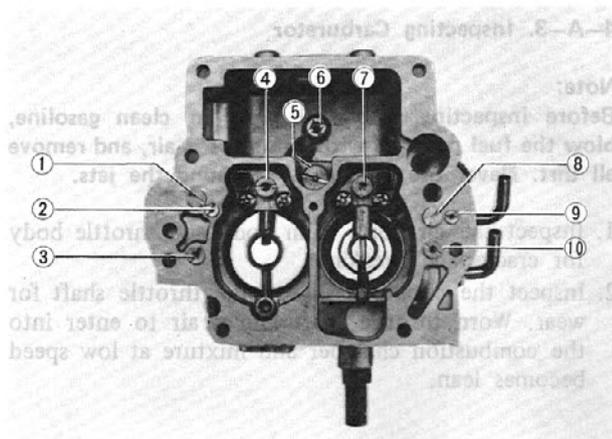


Fig. 4-13

a. Air bleeds and jets:

1. Step jet and plug
2. Secondary step air bleed (No. 1)
3. Secondary step air bleed (No. 2)
4. Secondary main air bleed
5. Power valve
Use the drive (49 0118 870A)
6. Secondary main jet
7. Primary main air bleed
8. Slow jet and plug
9. Primary slow air bleed (No. 1)
10. Primary slow air bleed (No. 2)

Note:

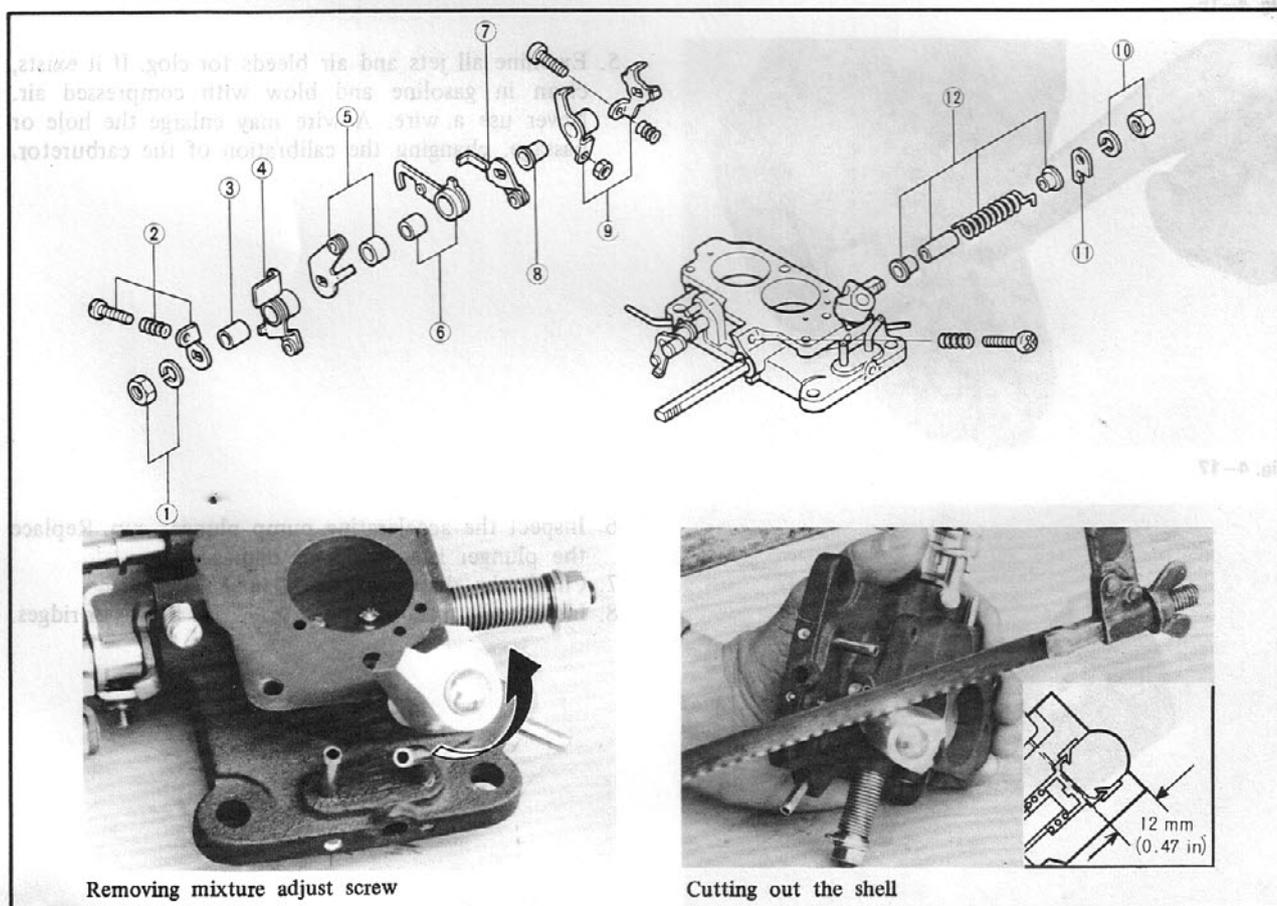
Note the size of all jets and air bleeds so they may be installed in the correct position.

Throttle body:

Disassembly the throttle body following the order numbered in figure.

Note:

- a) In removing the mixture adjust screw, pull out the whole shell while turning it, or as shown in the figure, cut out the shell by a saw. A new mixture adjust screw, a new mixture adjust screw spring and a new shell must be fitted in place.
- b) Do not remove the throttle valve and shaft, venturi and choke valve and shaft.



Removing mixture adjust screw

Cutting out the shell

Fig. 4-14

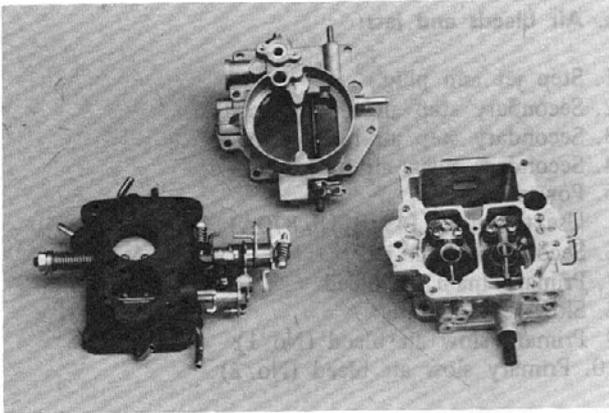


Fig. 4-15

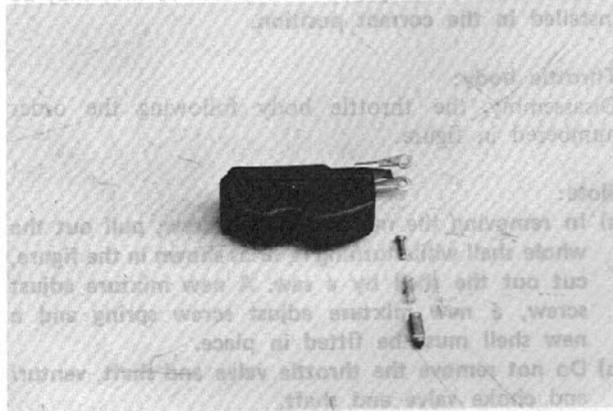


Fig. 4-16

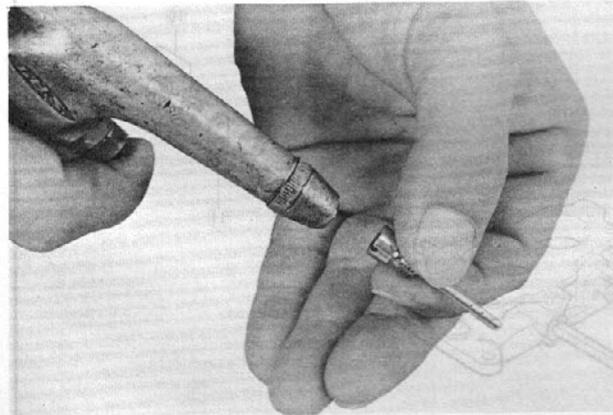


Fig. 4-17

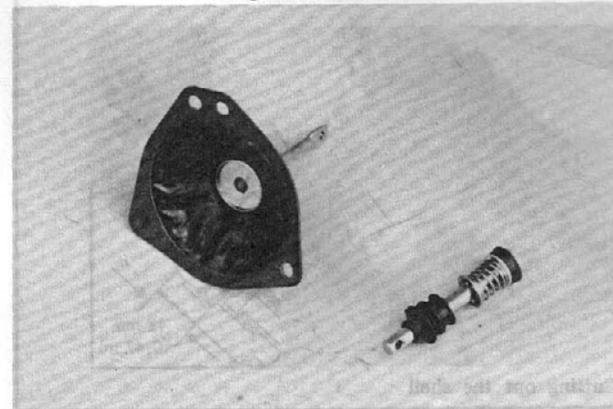


Fig. 4-18

4-A-3. Inspecting Carburetor

Note:

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

1. Inspect the air horn, main body and throttle body for cracks and breakage.
2. Inspect the choke shaft and the throttle shaft for wear. Worn throttle shaft allows air to enter into the combustion chamber and mixture at low speed becomes lean.
3. Check the float needle and seat for wear or rust.
4. Check the float for damage.

5. Examine all jets and air bleeds for clog. If it exists, clean in gasoline and blow with compressed air. Never use a wire. A wire may enlarge the hole or passage, changing the calibration of the carburetor.

6. Inspect the accelerating pump plunger cup. Replace the plunger it is worn or damaged.
7. Check the diaphragm for damage.
8. Inspect the mixture adjust screw for burres or ridges.

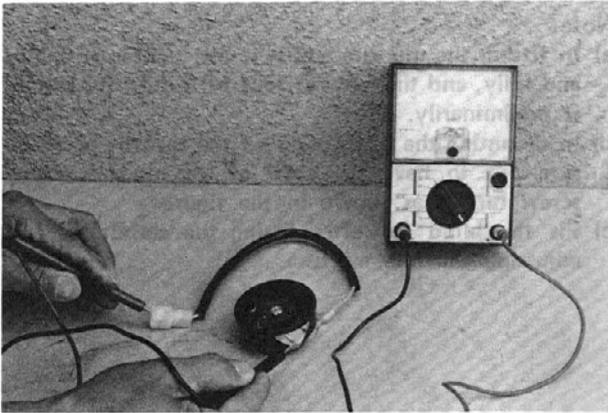


Fig. 4-19

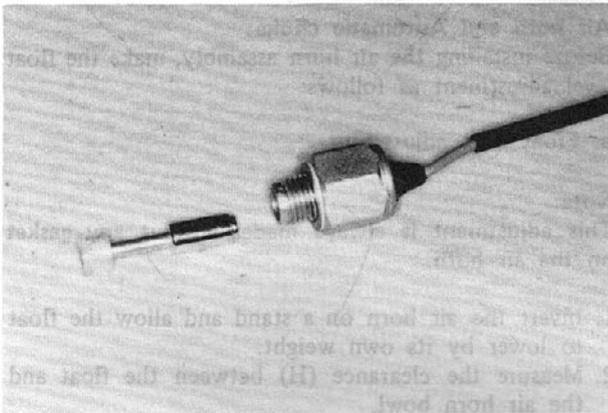


Fig. 4-20

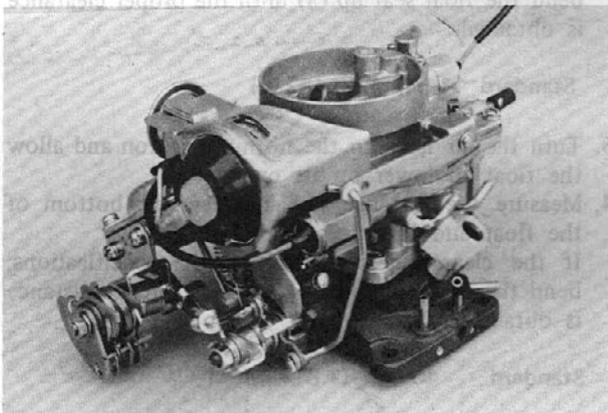


Fig. 4-21

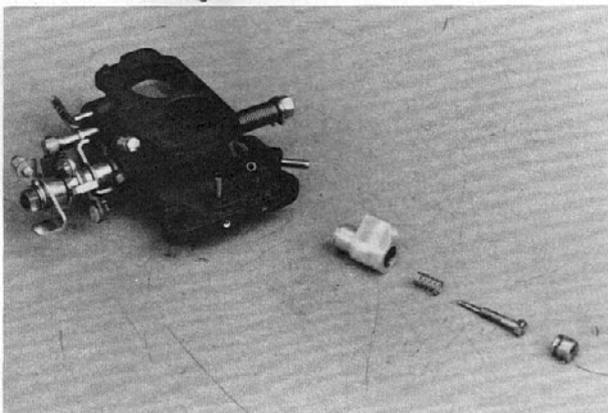


Fig. 4-22

9. Check the solenoid for operation. To check, connect the solenoid to the battery positive terminal and ground the body.

When current is applied to the solenoid, the valve stem should be pulled into the valve body. If the valve does not operate properly, replace the solenoid.

10. Check the continuity between the coupler and choke heater earth with an ohmmeter.

If there is no continuity, replace the choke heater.

11. When battery power is applied to the solenoid valve, the valve stem should be pulled into the valve body.

4-A-4. Assembling Carburetor

Assemble the carburetor in the reverse order of disassembling.

Note:

- a) Discard the old gaskets and use new ones.
- b) Make sure that all parts are in good condition and clean.
- c) Both the primary and secondary barrels have their respective parts which are of the same shape. Therefore, when installing, care should be taken so as not to mistake one for the other.

Throttle body:

Install the shell, spring and mixture adjust screw on to the throttle body as shown in the figure.

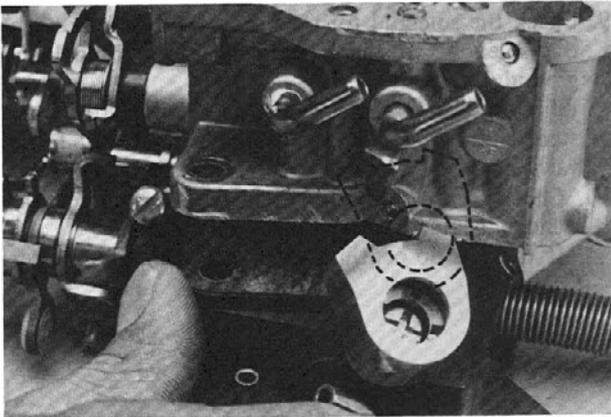


Fig. 4-23

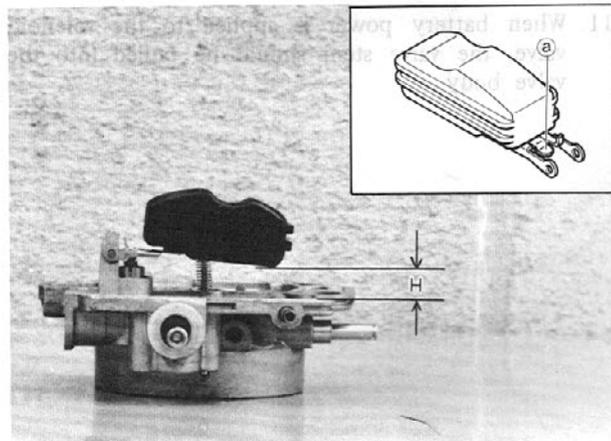


Fig. 4-24

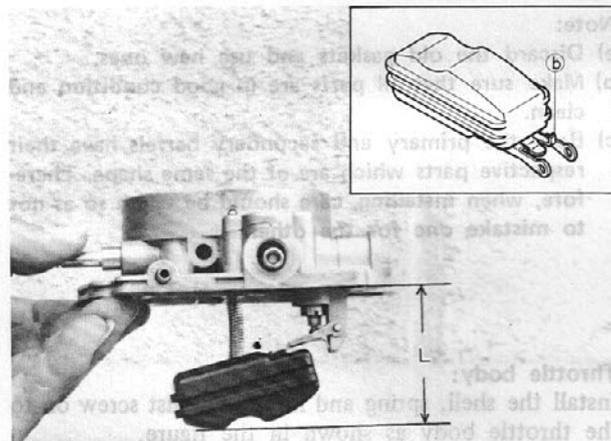


Fig. 4-25

Note:

- a) In fitting the mixture adjust screw, tighten it lightly and fully, and then give it four (4) return for setting it preliminarily.
- b) In mounting the main body on the throttle body, be sure not to have the shell of the mixture adjust screw turned as shown in the figure.
- c) Fit the blind cap after fitting the carburetor and adjusting the idle mixture.

Air horn and Automatic choke:

Before installing the air horn assembly, make the float level adjustment as follows:

a. Float level adjustment**Note:**

This adjustment is always made without any gasket on the air horn.

1. Invert the air horn on a stand and allow the float to lower by its own weight.
2. Measure the clearance (H) between the float and the air horn bowl.

If the clearance is not within the specifications, bend the float seat lip (a) until the proper clearance is obtained.

Standard 11.5 mm (0.453 in)

3. Turn the air horn to the normal position and allow the float to lower by its own weight.
4. Measure the distance (L) between the bottom of the float and the air horn bowl.

If the clearance is not within the specifications, bend the float stopper (b) until the proper distance is obtained.

Standard 46 mm (1.811 in)

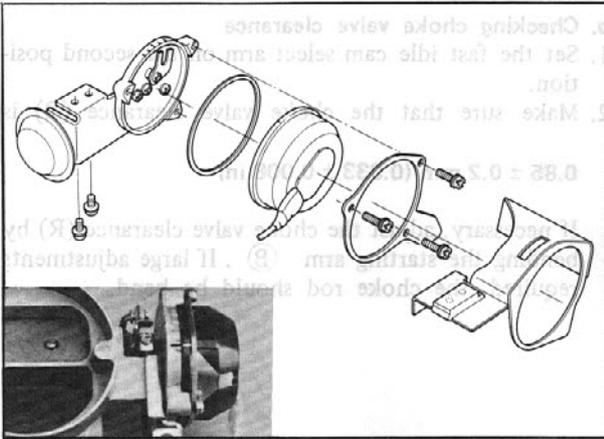


Fig. 4-26

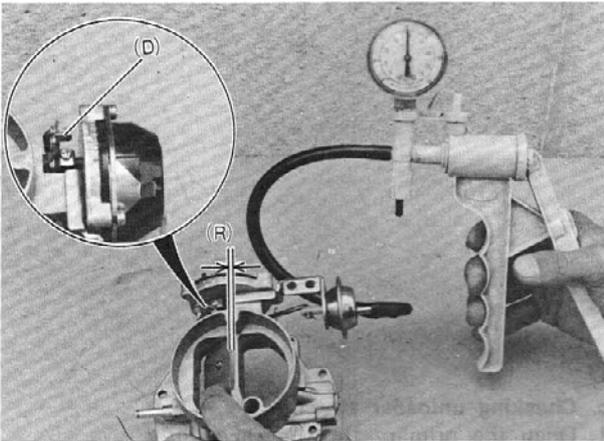


Fig. 4-27

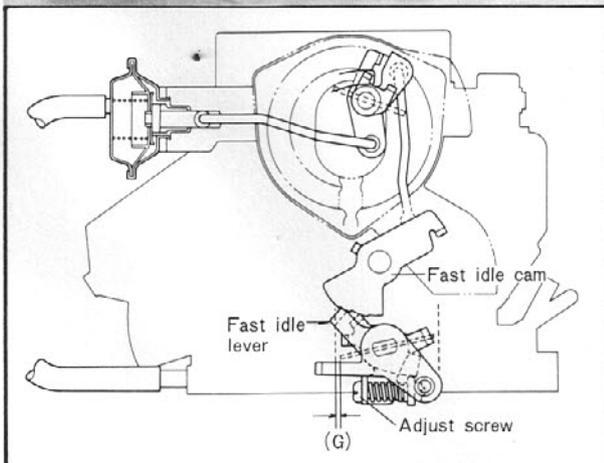
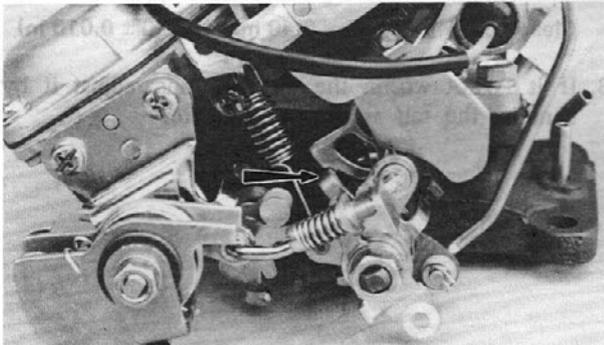


Fig. 4-28

b. Setting bi-metal

1. Hook the choke arm with bi-metal hook, and install the thermostat cover.
2. Confirm the correct operation of choke valve by turning the thermostat cover.
3. Set the index mark of the thermostat cover on the position marked in the choke housing when disassembling.
4. Tighten the attaching screws.

c. Checking choke diaphragm

1. Apply vacuum about 400 mm-Hg (15.7 in-Hg) from vacuum pump (choke diaphragm vacuum tube).
2. Push the choke valve lightly by a finger in the direction of closing it, and concurrently check the clearance (R) of the choke valve.

Clearance (R) : 1.70 ± 0.25 mm (0.067 ± 0.010 in)

3. If it is not within the specifications, adjust it by bending the choke lever (D).

After checking, install the bi-metal cover

4-A-5. Adjusting Carburetor

a. Adjusting fast idle cam

1. Set the fast idle cam on the second position.
2. Adjust the throttle valve clearance (G) by turning the adjust screw.
(Turning the screw clockwise, the opening angle becomes large)

Clearance (G) : 0.45 ~ 0.75 mm (0.018 ~ 0.030 in)

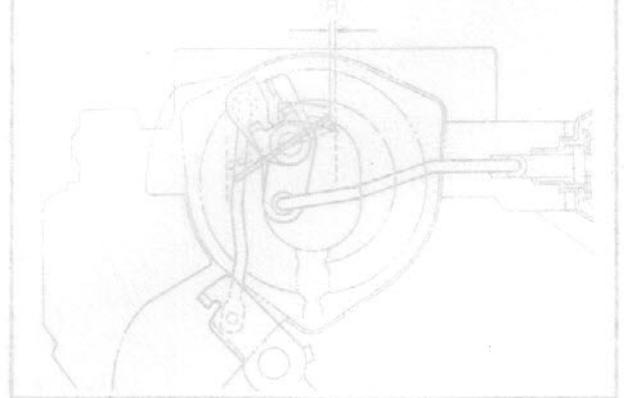


Fig. 4-29

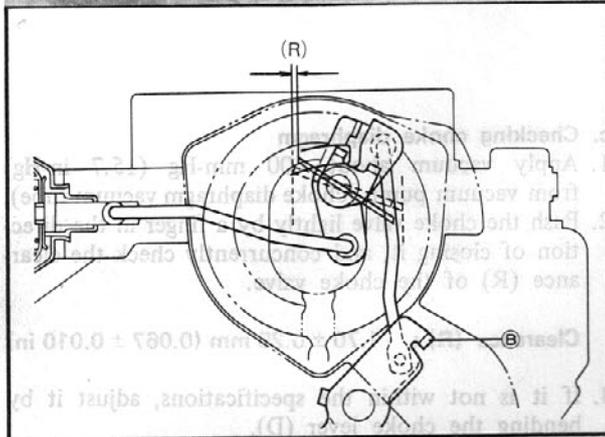
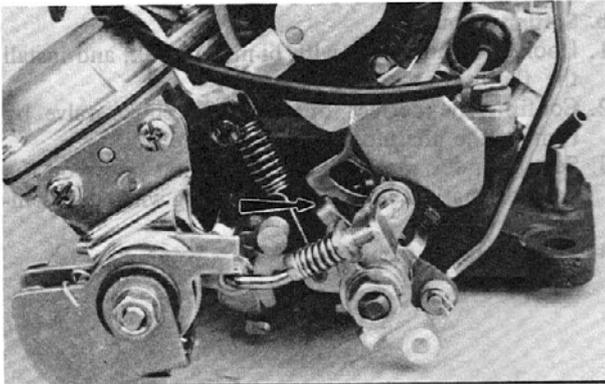


Fig. 4-29 After checking, install the bi-metal cover.

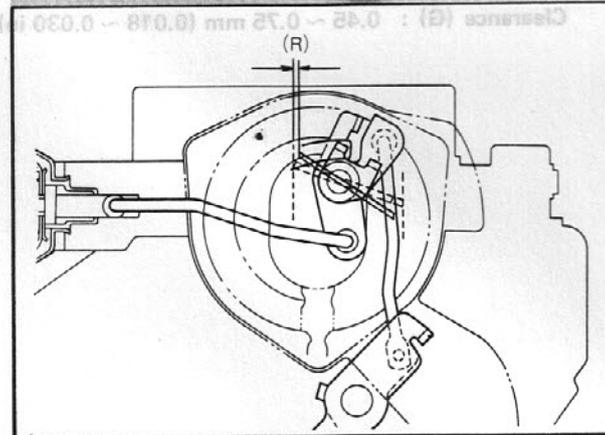
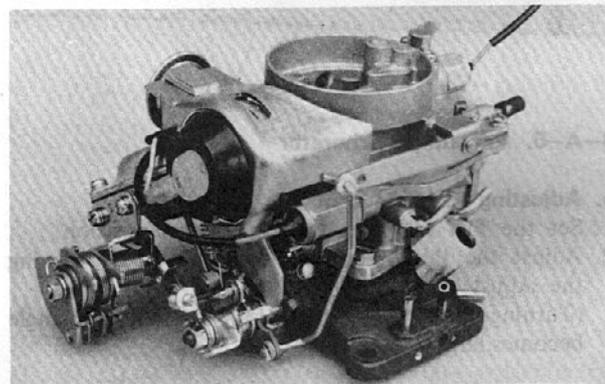


Fig. 4-30

b. Checking choke valve clearance

1. Set the fast idle cam select arm on the second position.
2. Make sure that the choke valve clearance (R) is

$0.85 \pm 0.2 \text{ mm (0.033} \pm 0.008 \text{ in)}$

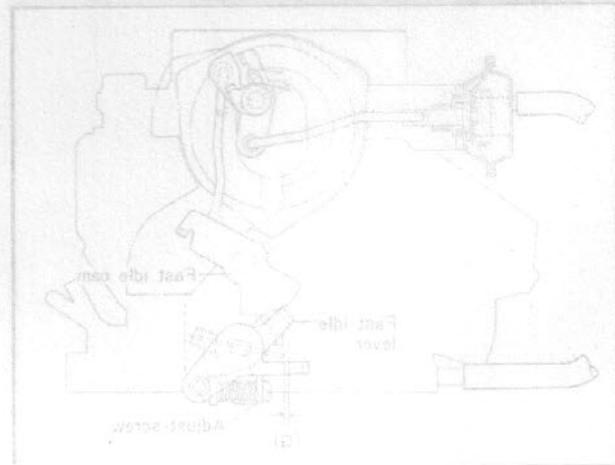
If necessary, adjust the choke valve clearance (R) by bending the starting arm (B). If large adjustments required, the choke rod should be bend.

c. Checking unloader system

1. Open the primary throttle valve fully.
2. At the time, measure the choke valve clearance (R).

Clearance (R) : $3.05 \pm 0.40 \text{ mm (0.120} \pm 0.016 \text{ in)}$

3. If it is not within the specifications, adjust it by bending the tab as shown in figure.



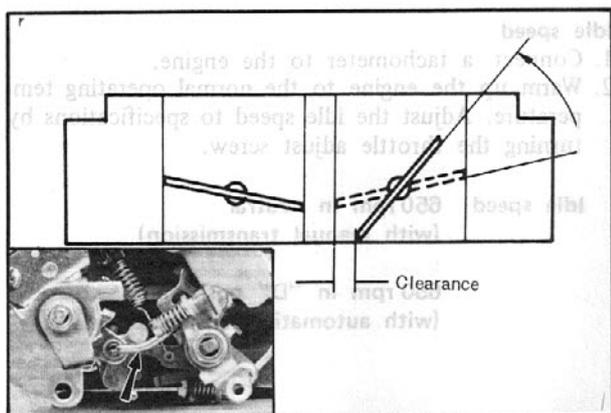


Fig. 4-31

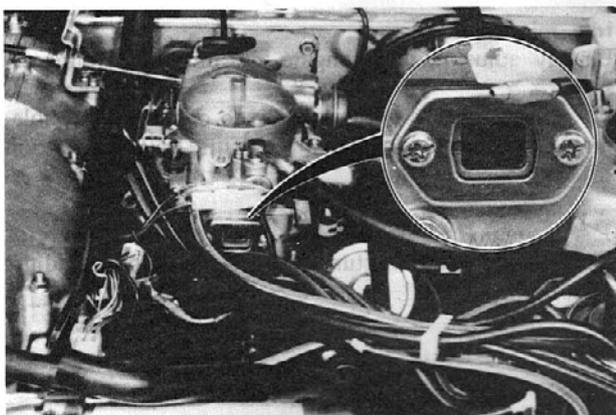


Fig. 4-32

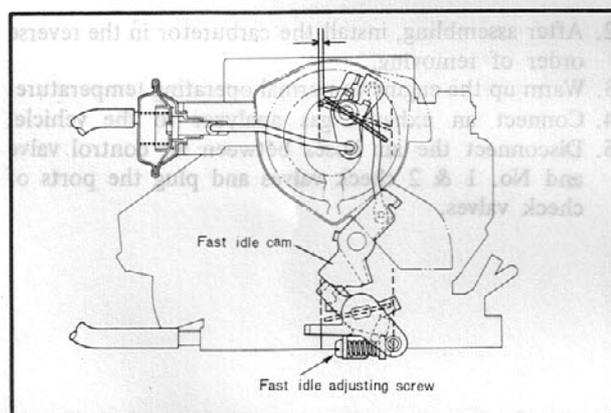


Fig. 4-33

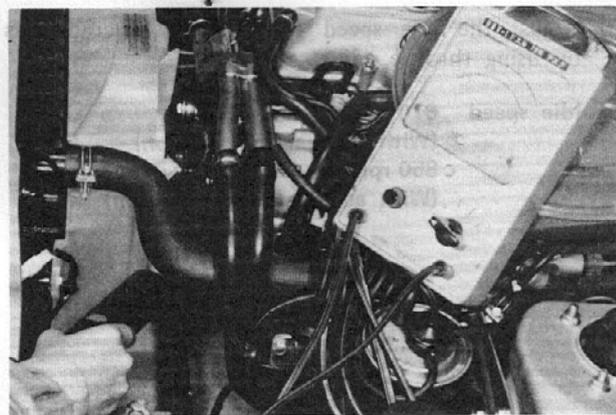


Fig. 4-34

4-A-6. Checking Secondary Throttle Valve

1. The secondary throttle valve starts to open when the primary throttle valve opens 52 ± 2 degrees and completely opens at the same time when the primary throttle valve fully opens.
2. Check the clearance between the primary throttle valve and the wall of the throttle bore when the secondary throttle valve starts to open.
3. If the clearance is not within the specification, bend the throttle arm until the proper clearance is obtained.

Standard clearance 6.2 ~ 7.2 mm
(0.244 ~ 0.283 in)

4-A-7. Installing Carburetor

Install the carburetor in the reverse order of removing. After installing, **note the followings.**

- a) Start the engine and check for leaks.
- b) With the engine operating, check the fuel level. The fuel level should be in the specified mark in the sight glass.
- c) Make the idle adjustment as instructed in Par. 4-A-8.

d) After idle adjustment is completed, check the fast idle speed as follows.

1. Fully depress the accelerator pedal.
2. Warm up the engine to normal operating temperature.
3. Stop engine and remove the air cleaner.
4. While holding the throttle valve slightly open, push the choke valve to fully close it, and release the choke valve after releasing the throttle valve.
5. Start engine, but do not touch accelerator pedal.
6. Check to see that the engine speed increases to 3,000 ~ 4,000 rpm.

If the engine speed is not within the specification turn the fast idle adjusting screw.

4-A-8. Adjusting Idle Speed and Idle Mixture

Precheck:

Be sure the ignition timing, spark plugs, carburetor float level and etc., are in normal condition.

Preconditions for idle adjustment

1. Apply the parking brake and block the wheels.
2. Turn off all lights and other unnecessary electrical loads.

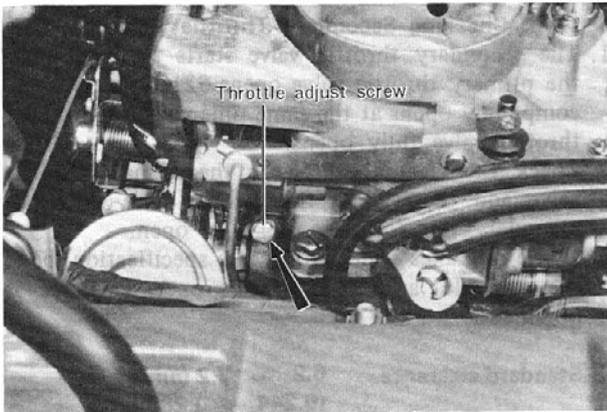


Fig. 4-35

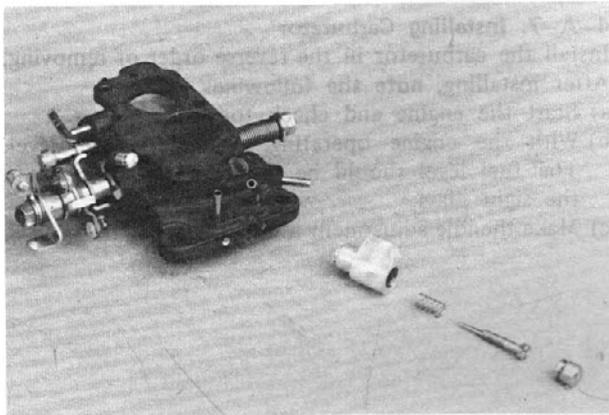


Fig. 4-36

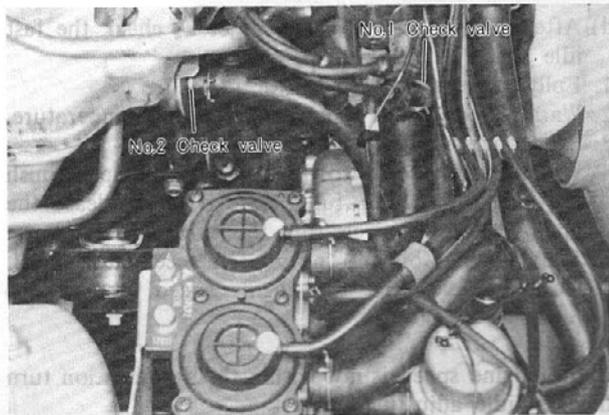


Fig. 4-37

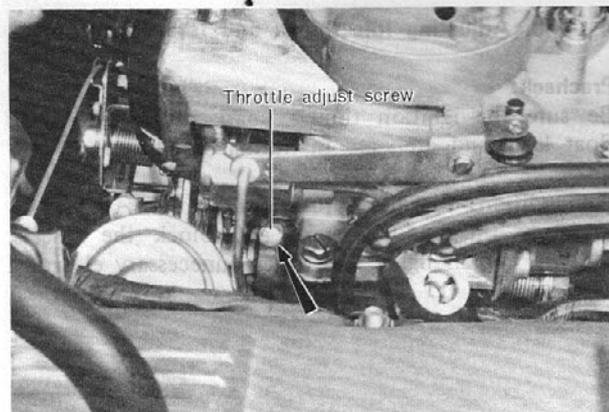


Fig. 4-38

Idle speed

1. Connect a tachometer to the engine.
2. Warm up the engine to the normal operating temperature. Adjust the idle speed to specifications by turning the throttle adjust screw.

Idle speed 650 rpm in neutral
(with manual transmission)

650 rpm in "D" position
(with automatic transmission)

Idle mixture:

Usually adjustment of engine idle mixture is unnecessary.

In case overhaul is necessary due to carburetor trouble, make adjustment of engine idle mixture paying attention to the following points.

1. Remove the throttle chamber of the carburetor and replace the mixture adjust screw, mixture adjust spring and shell.

2. After assembling, install the carburetor in the reverse order of removing.
3. Warm up the engine to normal operating temperature.
4. Connect an exhaust gas analyzer to the vehicle.
5. Disconnect the air hoses between air control valve and No. 1 & 2 check valves and plug the ports of check valves.

6. Adjust the idle speed to following specifications by using throttle adjust screw.

Idle speed 670 rpm in neutral
(With manual transmission)
850 rpm in "N" range
(With automatic transmission)

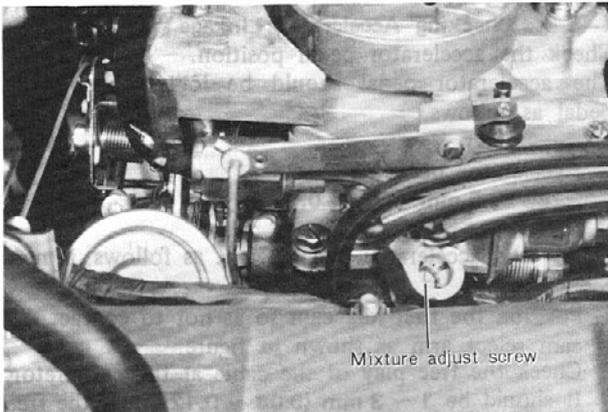


Fig. 4-39



Fig. 4-40

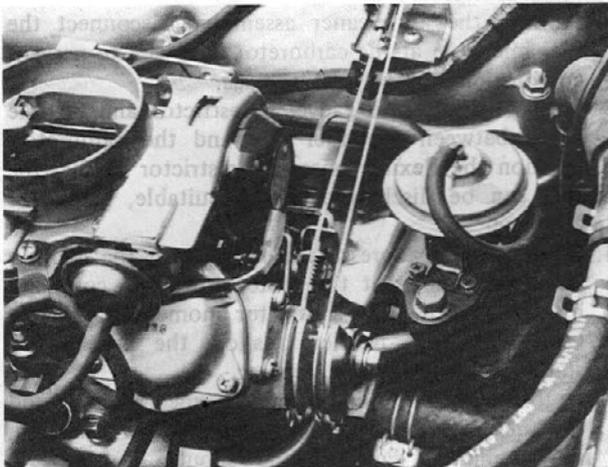


Fig. 4-41

7. Turn the mixture adjust screw to set the idle rpm at the highest.
8. Re-adjust the idle speed to following specifications by using throttle adjust screw.

Idle speed 670 rpm in neutral
 (With manual transmission)
 850 rpm in "N" range
 (With automatic transmission)

9. Turn the mixture adjust screw clockwise until the following specifications.

650 rpm in neutral (with manual transmission)
820 rpm in "N" range (with automatic transmission)

10. Check co concentration. If it is less than 1%, turn the mixture adjust screw counter-clockwise 1/4 turn.
11. Reconnect the air hoses and check the idle speed to be at following specifications. If not, set the idle speed to 650 rpm by using throttle adjust screw.

650 rpm in neutral (with manual transmission)
650 rpm "D" range (with automatic transmission)

12. Fit a blind plug to the mixture adjust screw.

Note:

All accessories should be OFF.

4-B. CARBURETOR LINKAGE

4-B-1. Checking Carburetor Linkage

Check the throttle linkage, accelerator linkage and choke linkage for proper operation. Examine the choke control for free operation.

Fig. 4-42

Standard pressure 0.20 ~ 0.25 kg/cm²
 (2.8 ~ 3.6 lb/in²)

Volume More than 300 cc (0.8 U.S. quart, 0.7 imp quart) within one minute

Volume test Turn the ignition switch on, open the hose restrictor and expel the fuel into the container.

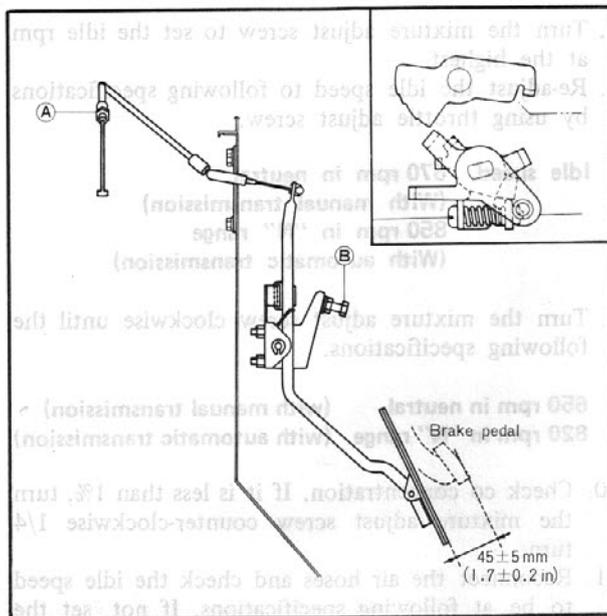


Fig. 4-42

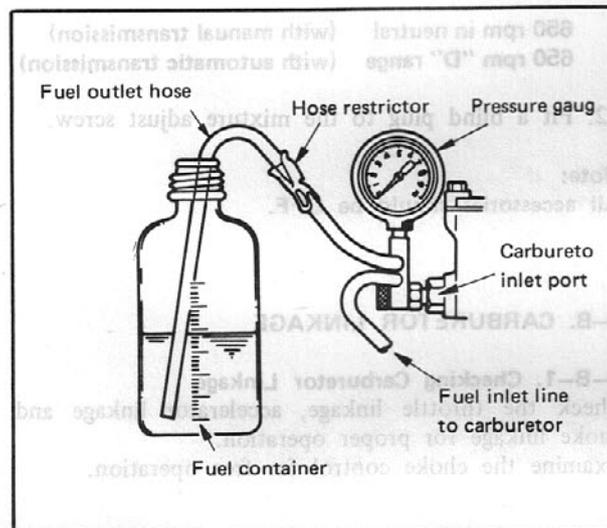


Fig. 4-43

4-B-2. Checking Accelerator Linkage

Check the accelerator pedal position.

The accelerator pedal should be lower than brake pedal as follows.

Accelerator pedal height:

$45 \pm 5 \text{ mm (1.7} \pm 0.2 \text{ in)}$

Adjust the accelerator pedal height as follows, if necessary.

1. Position the first idle cam so as not to contact the cam select arm as shown in figure.
2. Check the free play of the cable at the carburetor. It should be $1 \sim 3 \text{ mm (0.04} \sim 0.12 \text{ in)}$. If the free play is not within the specifications, adjust by the adjust nut **A** on the cylinder head cover.
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 **B**.

4-C. FUEL PUMP

4-C-1. Testing Fuel Pump

The tests are performed with the pump installed on the car.

Before the tests, make sure the fuel filter has been changed with the recommended maintenance mileage interval. When in doubt, install a new filter.

a. Pressure test

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

If the reading is not within the specification, and the fuel lines and filter are in satisfactory condition, the pump is damaged and should be replaced. If the pump pressure is within the specifications, perform the test for volume.

Standard pressure $0.20 \sim 0.25 \text{ kg/cm}^2$
 $(2.8 \sim 3.6 \text{ lb/in}^2)$

b. Volume test

Turn the ignition switch on, open the hose restrictor and expel the fuel into the container.

Volume **More than 800 cc (0.8 U.S. quart, 0.7 Imp. quart) within one minute**

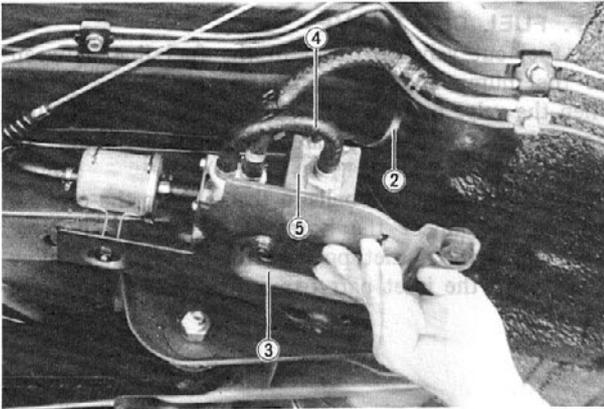


Fig. 4-44

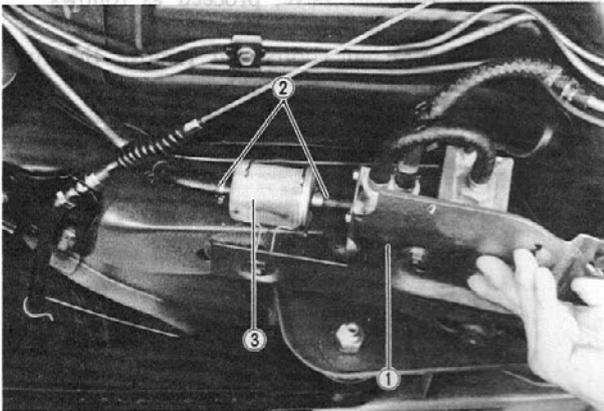


Fig. 4-45

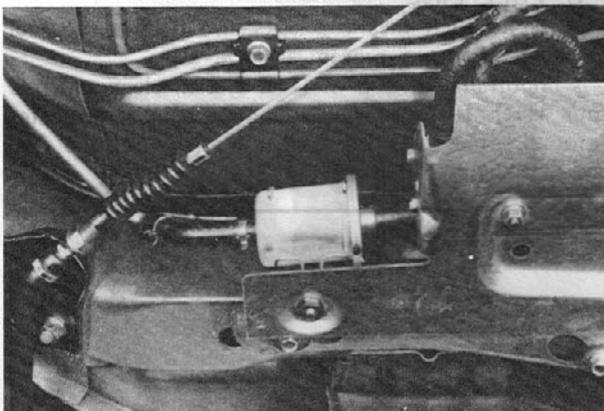


Fig. 4-46

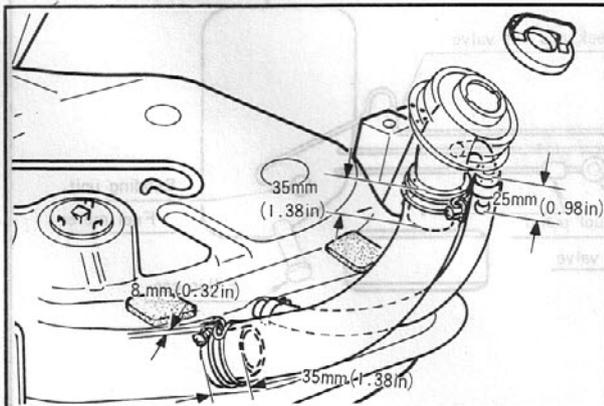


Fig. 4-47

4-C-2. Replacing Fuel Pump

Remove the fuel pump in the numerical order.

1. Battery negative cable
2. Fuel pump lead wire (in the luggage compartment)

Raise the vehicle and support with stands.

3. Fuel pump bracket
4. Fuel inlet and outlet hoses
5. Fuel pump

Install the fuel pump in the reverse order of removing.

Fig. 4-48

4-D. FUEL FILTER

4-D-1. Replacing Fuel Filter

Remove the fuel filter in the numerical order.

Raise the vehicle and support with stands.

1. Fuel pump bracket
2. Fuel inlet and outlet hose
3. Fuel filter

Fig. 4-49

Install the fuel filter in the reverse order of removing.

Note:

When installing, however note the fuel hose connections.

4-E. FUEL TANK

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

Note:

When repairing the fuel tank, clean the fuel tank thoroughly with steam to remove all explosive gas.

Push in the rubber hose end to the fuel pipe until the fuel pipe is inserted as shown in figure.

Fig. 4-50

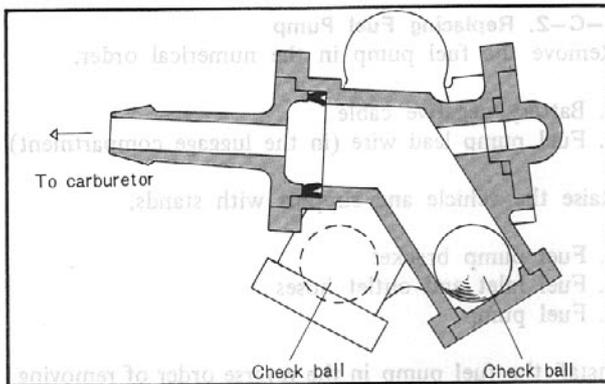


Fig. 4-48

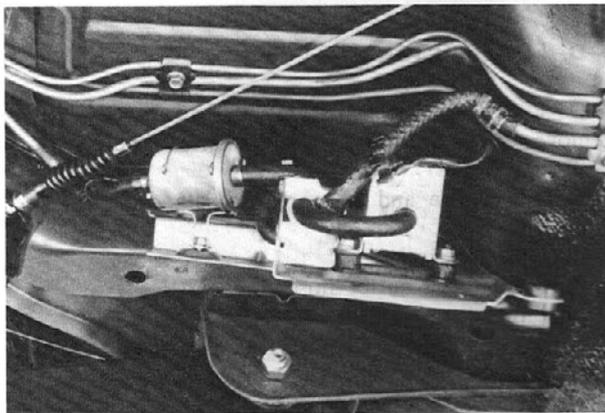


Fig. 4-49

4-F. FUEL CUT VALVE

The fuel cut valve is fitted in the fuel line between the fuel pump and the carburetor.

When the valve body is inclined more than 60° laterally, the fuel cut valve is operated and the fuel supply to the carburetor is cut.

To set back the check balls in the valve to the original position disconnect the hoses at the valve and blow in air from the outlet port of the valve. Then, blow in air from the inlet part to confirm that the passage is open.

To replace the fuel cut valve, proceed as follows:

1. Raise the vehicle and support with stands.
2. Remove the attaching bolts and remove the fuel cut valve and bracket assembly.
3. Disconnect the hoses at the fuel cut valve and remove the valve.

4-G. 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.

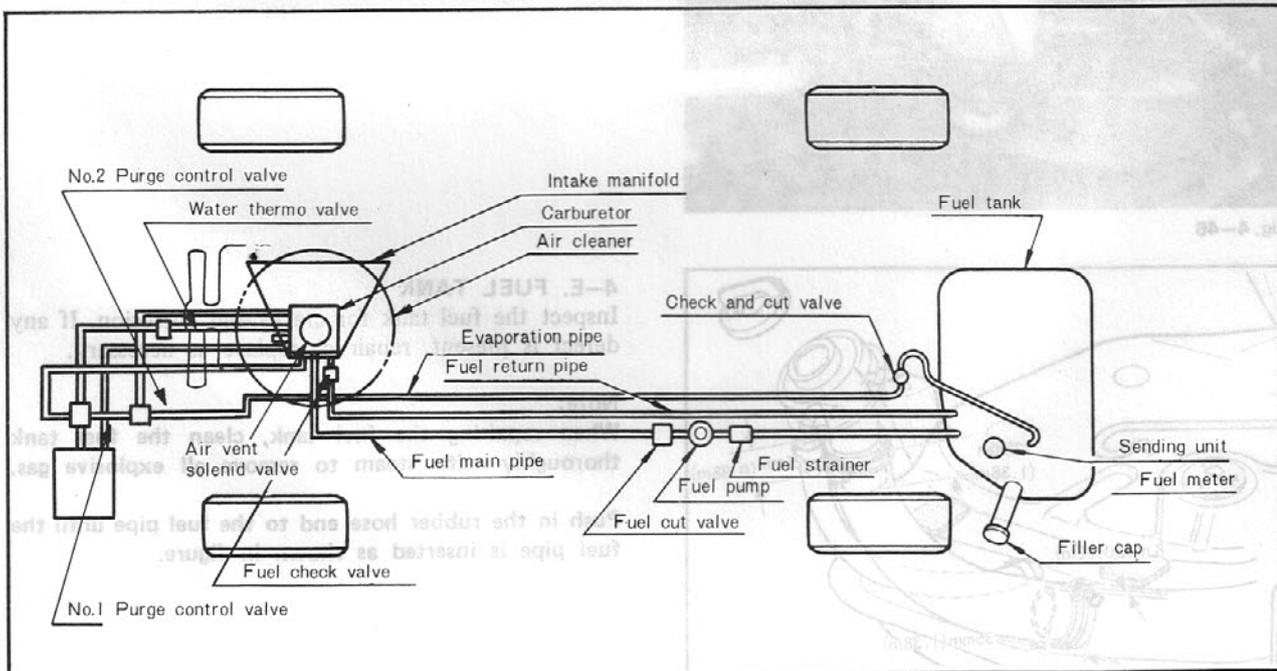


Fig. 4-50

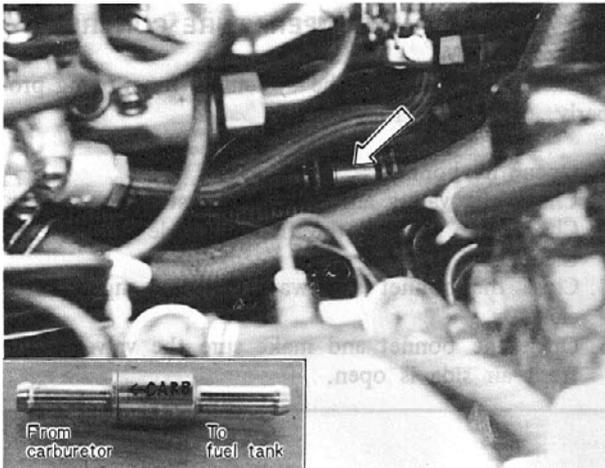


Fig. 4-51

4-H. FUEL CHECK VALVE

The fuel check valve is fitted in the fuel return line between the carburetor and the fuel tank.

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

1. Disconnect the hoses from the valve and remove the valve.
2. Install the valve by following the removal procedures in the reverse order.

Note:

When installing, make sure that the arrow make on the valve is directed as shown in Fig. 4-51.

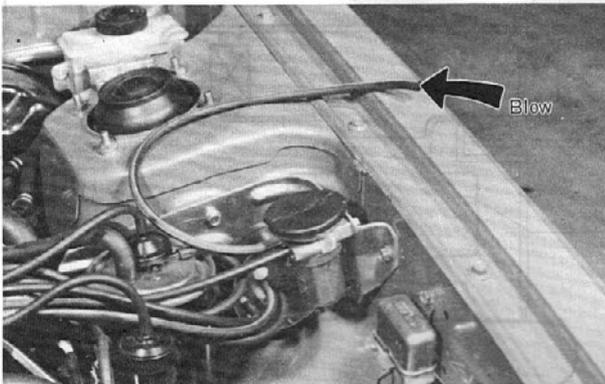


Fig. 4-52

4-I. ALTITUDE COMPENSATOR

4-I-1. Checking Altitude Compensator

Check the altitude compensator by blowing it, as shown in Fig. 4-52. Replace if necessary.

Air passes	more than 700 m (2295 ft) (High altitude)
Air does not passes	Less than 300 m (984 ft) (Low altitude)

Note:

The operation of altitude compensator will be changed by the atmospheric pressure.

4-I-2. Replacing Altitude Compensator

Remove the altitude compensator in the numerical order.

1. Vacuum tubes (disconnect)
2. Altitude compensator bracket
3. Screws
4. Altitude compensator

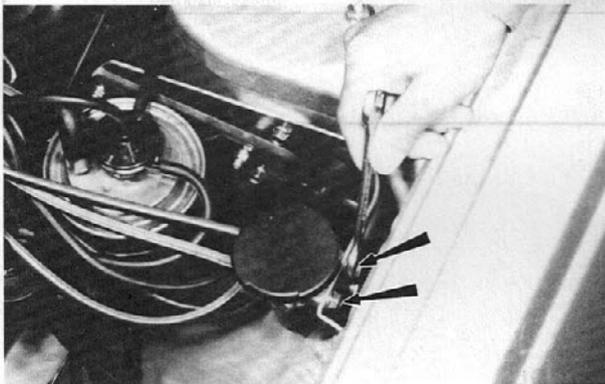


Fig. 4-53



Fig. 4-54

4-J. IDLE COMPENSATOR

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

Opening temperature: $67^{\circ} \pm 4^{\circ} \text{C}$

To check such 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 (156°F), check to see the valve is in open position. If the valve is not open, replace the idle compensator as an assembly.

4-H. FUEL CHECK VALVE
 The fuel check valve is fitted in the fuel return line between the carburetor and the fuel tank.
 Check the fuel check valve for cracks or damages.
 To replace the fuel check valve, proceed as follows:
 1. Disconnect the hoses from the valve and remove the valve.
 2. Install the valve by following the removal procedure in the reverse order.

Note:
 When installing, make sure that the arrow marks on the valve is directed as shown in Fig. 4-51.

4-K. INTAKE AIR TEMPERATURE CONTROL SYSTEM

To determine whether the system is functioning properly, proceed as follows:

1. Open the bonnet.
2. Check the valves and linkage for sticking or wear.
3. Check the valve at the fresh air side closes when the engine is cold.
4. Close the bonnet and warm up the engine sufficiently.
5. Open the bonnet and make sure the valve at the fresh air side is open.

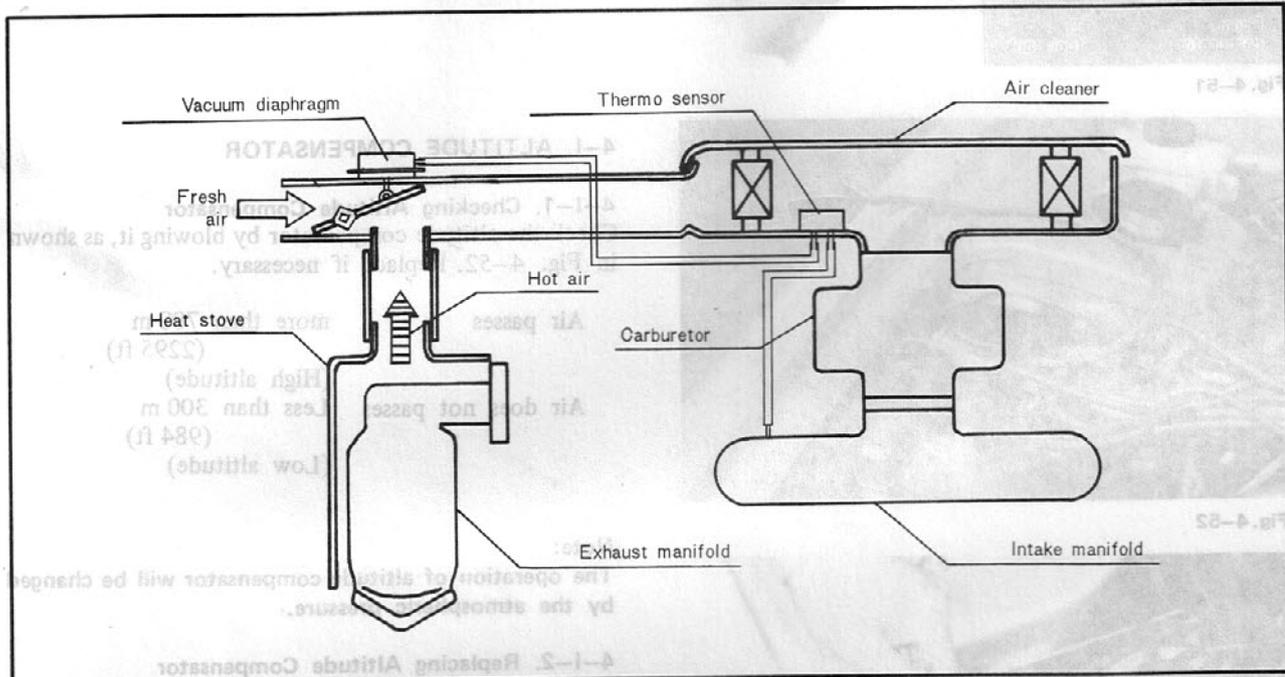


Fig. 4-55

SPECIAL TOOLS

49 0118 870A	Driver, power valve
--------------	---------------------

4-1-2 Replacing Altitude Compensator
 Remove the altitude compensator in the reverse order.
 1. Vacuum tubes (disconnect)
 2. Altitude compensator bracket
 3. Screws
 4. Altitude compensator

4-1-3 Checking Altitude Compensator
 The operation of altitude compensator will be changed by the sensor's accuracy.
 Air does not pass (low altitude)
 Less than 300 m (984 ft)
 High altitude (2297 ft)
 Air passes (high altitude)

Opening temperature: $87 \pm 4^\circ\text{C}$

1. Check the valve is in closed position when bimetal temperature is lower than operating temperature.
 2. When the bimetal temperature is more than approx. 60°C (156°F), check to see the valve is in open position. If the valve is not open, replace the idle compensator as an assembly.
 To check such an into the tube. If excessive air leakage is found, replace the idle compensator as an assembly.

4A-A. CARBURETOR

Notes:
Use caution when working with fuel. Always work away from spark or open flames.

4A-A-1. Removing Carburetor
Remove and disconnect the following parts:

1. Battery negative cable
2. Air cleaner

FUEL SYSTEM

(Canada)

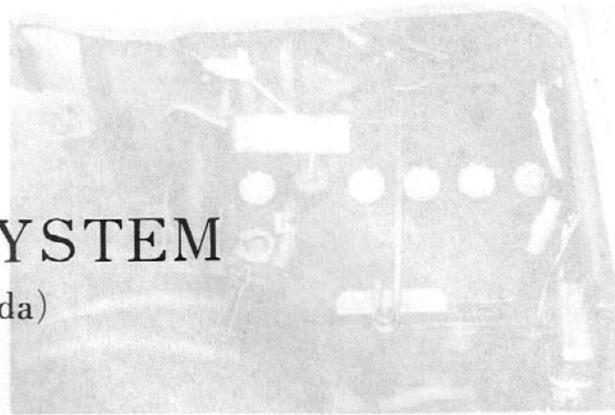


Fig. 4A-1

4A-A. CARBURETOR	4A : 1
4A-A-1. Removing Carburetor	4A : 1
4A-A-2. Disassembling Carburetor	4A : 1
4A-A-3. Inspecting Carburetor	4A : 3
4A-A-4. Assembling Carburetor	4A : 5
4A-A-5. Automatic Choke	4A : 6
4A-A-6. Adjusting Secondary Throttle Valve	4A : 7
4A-A-7. Installing Carburetor	4A : 8
4A-A-8. Adjusting Idle Speed and Mixture	4A : 8
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4A-E. FUEL FILTER	4A : 11
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4A-F. FUEL TANK	4A : 11
4A-G. FUEL CUT VALVE	4A : 12
4A-H. FUEL LINE	4A : 12
4A-I. FUEL CHECK VALVE	4A : 13
4A-J. AIR CLEANER	4A : 13
4A-K. INTAKE AIR TEMPERATURE CONTROL SYSTEM	4A : 13
SPECIAL TOOL	4A : 13

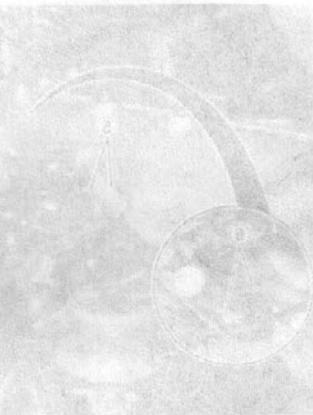


Fig. 4A-2



Fig. 4A-3

Main body:

1. Accelerating pump plunger assembly
2. Retaining clip

Invert the main body.

3. Strainer and accelerating pump inlet check ball
4. Check valve plug and washer
5. Accelerating pump outlet check ball and spring
6. Show fuel cut solenoid valve and gasket



Fig. 4A-4

4A

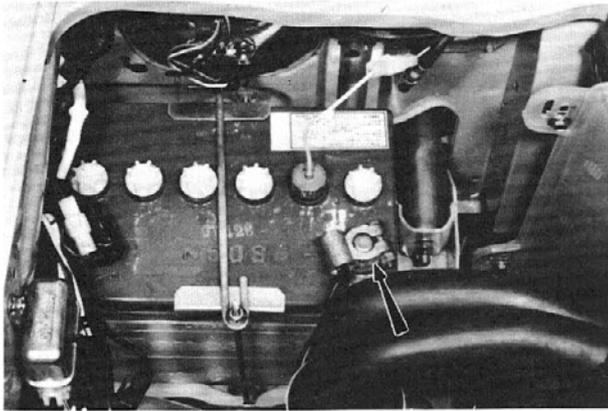


Fig. 4A-1

4A-A. CARBURETOR

Note:

Use caution when working with fuel. Always work away from spark or open flames.

4A-A-1. Removing Carburetor

Remove and disconnect the following parts.

1. Battery negative cable
2. Air cleaner

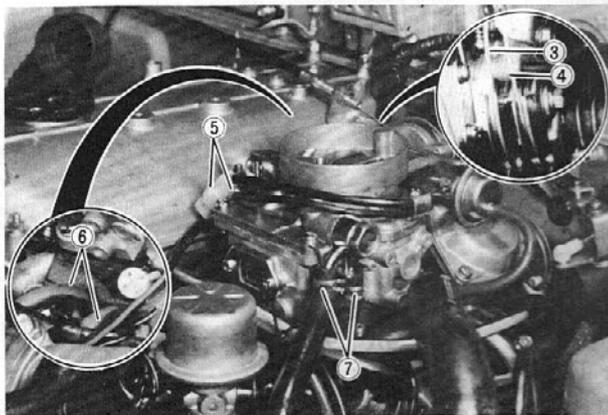


Fig. 4A-2

3. Accelerator cable
4. Cruise control cable (if necessary)
5. Wiring coupler and bullet connector (disconnect)
6. Vacuum sensing tubes
7. Fuel hoses
8. Carburetor

Note:

After removing the carburetor, cover the inlet manifold port with a clean shop towel to prevent dust or dirt from entering.

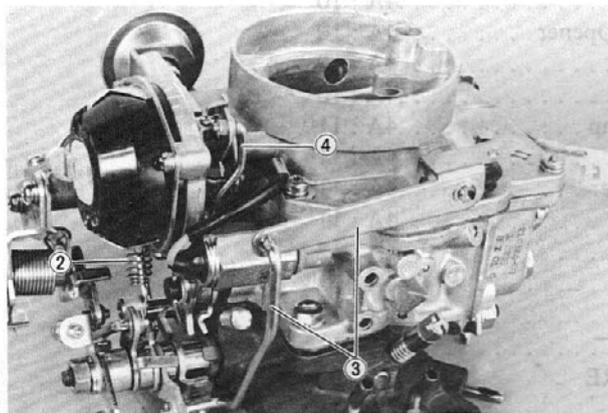


Fig. 4A-3

4A-A-2. Disassembling Carburetor

Disassemble the carburetor in the numerical order.

Automatic choke and Air hone:

1. Vacuum tube (disconnect)
2. Return spring
3. Accelerating pump connecting rod and arm
4. Choke rod
5. Air hone, automatic choke and gasket
6. Fuel inlet fitting

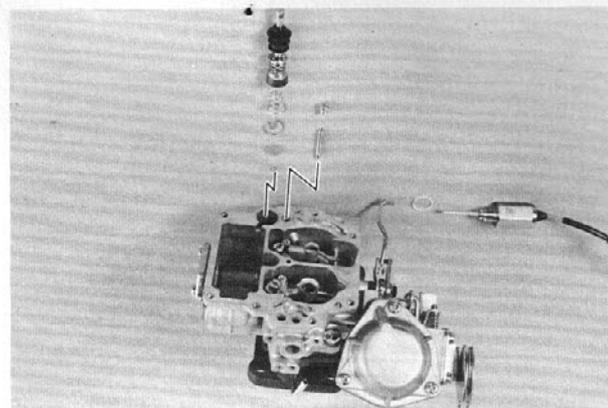


Fig. 4A-4

Main body:

1. Accelerating pump plunger assembly
2. Retaining clip

Invert the main body.

3. Strainer and accelerating pump inlet check ball
4. Check valve plug and washer
5. Accelerating pump outlet check ball and spring
6. Slow fuel cut solenoid valve and gasket

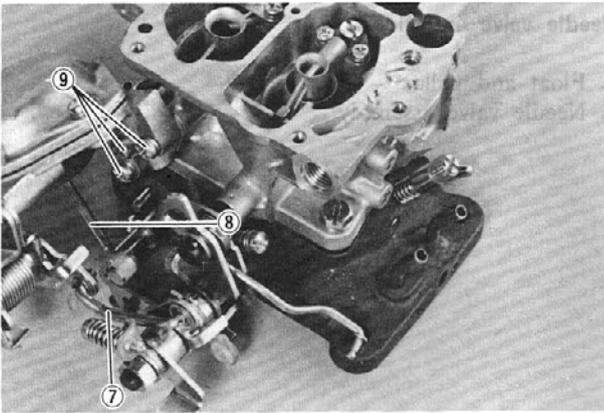


Fig. 4A-5

7. Throttle link (disconnect)
8. Vacuum diaphragm connecting rod (disconnect)
9. Diaphragm attaching screws and gasket

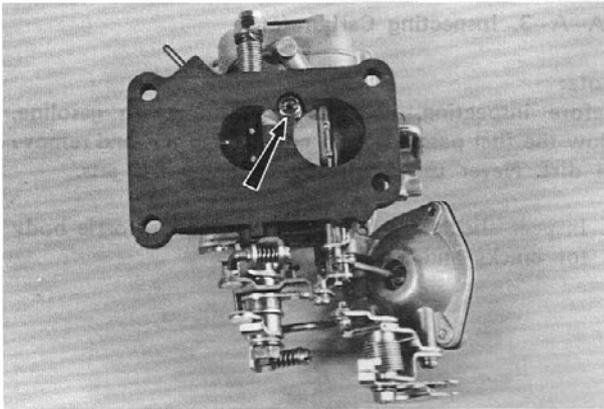


Fig. 4A-6

10. Main body

Note:

One of the bolt is inside of the throttle body.

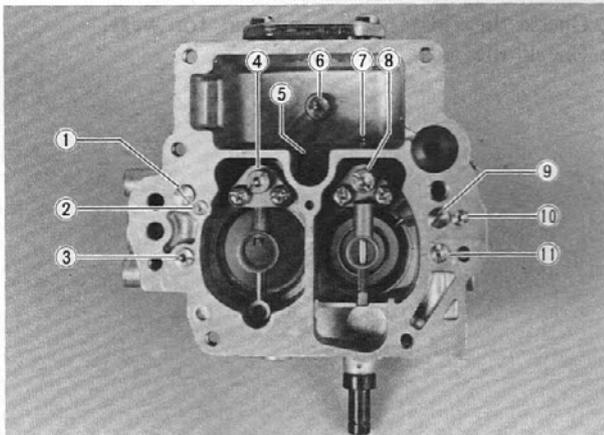


Fig. 4A-7

Air bleeds and jets:

1. Step jet and plug
2. Secondary step air bleed (No.1)
3. Secondary step air bleed (No.2)
4. Secondary main air bleed
5. Power valve
Use the **driver** (49 0118 870A)
6. Secondary main jet
7. Primary main jet
8. Primary main air bleed
9. Slow jet and plug
10. Primary slow air bleed (No.1)
11. Primary slow air bleed (No.2)

Note:

Note the size of all jets and air bleeds so they may be installed in the correct position.

Throttle body:

1. Throttle hanger

Note:

Do not remove the throttle valve and shaft, venturi and choke valve and shaft.

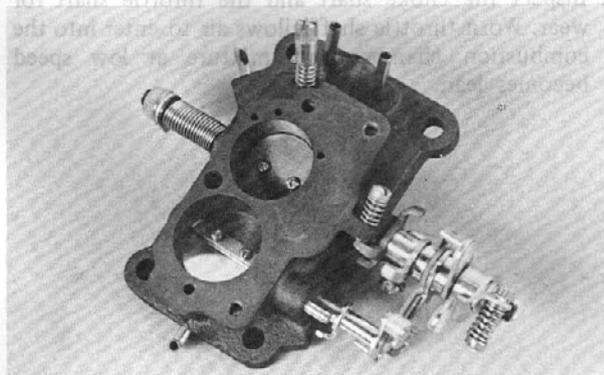


Fig. 4A-8

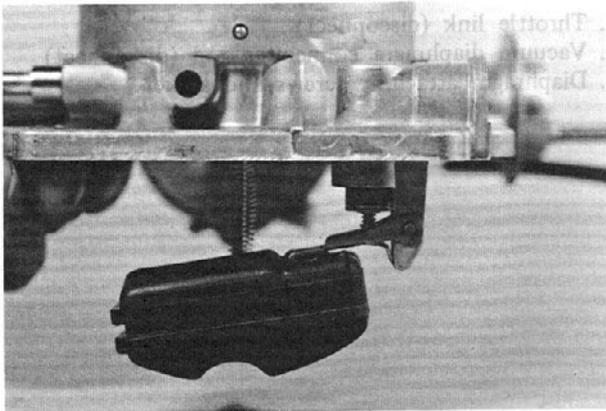


Fig. 4A-9

Needle valve and float:

1. Float and collar
2. Needle valve assembly

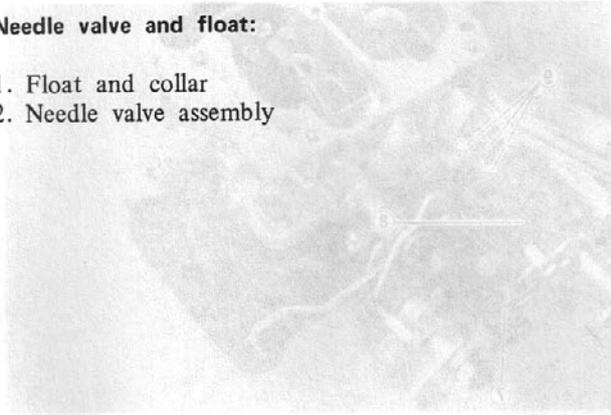


Fig. 4A-8

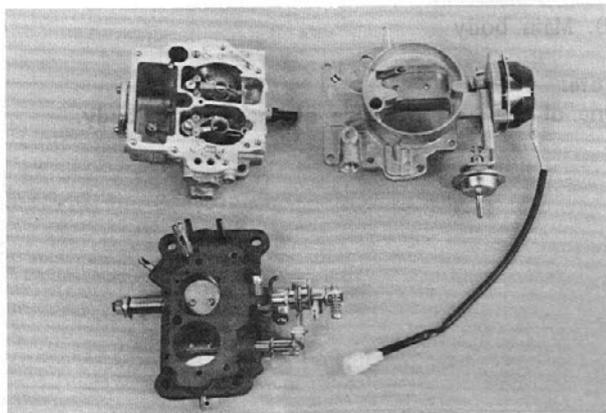


Fig. 4A-10

4A-A-3. Inspecting Carburetor

Note:

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

1. Inspect the air horn, main body and throttle body for cracks and breakage

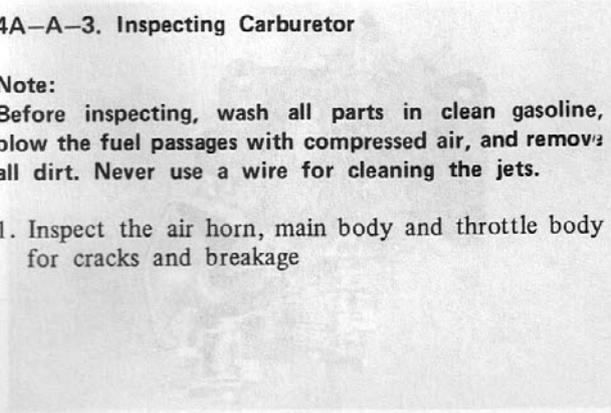


Fig. 4A-6

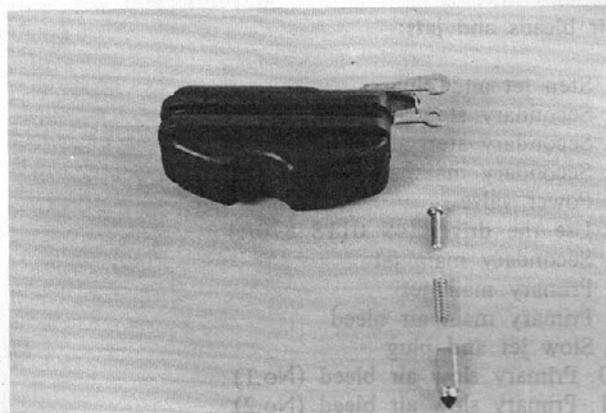


Fig. 4A-11

2. Check the float needle and seat for wear.
3. Check the float for damage.

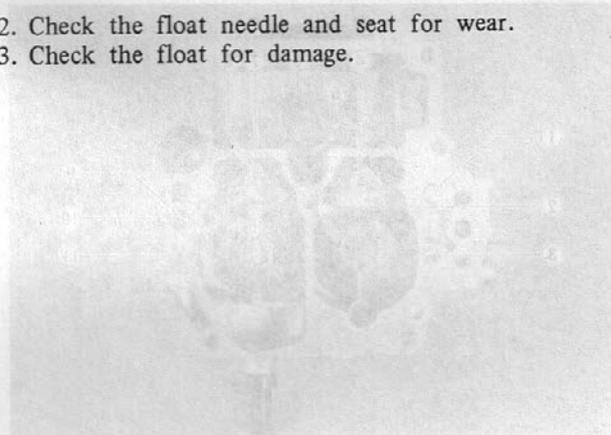


Fig. 4A-7

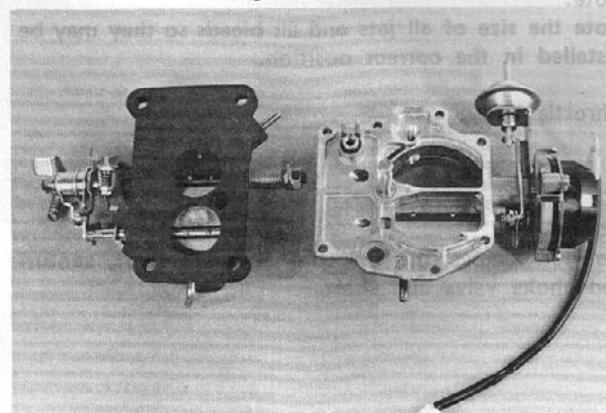


Fig. 4A-12

4. Inspect the choke shaft and the throttle shaft for wear. Worn throttle shaft allows air to enter into the combustion chamber and mixture at low speed becomes lean.

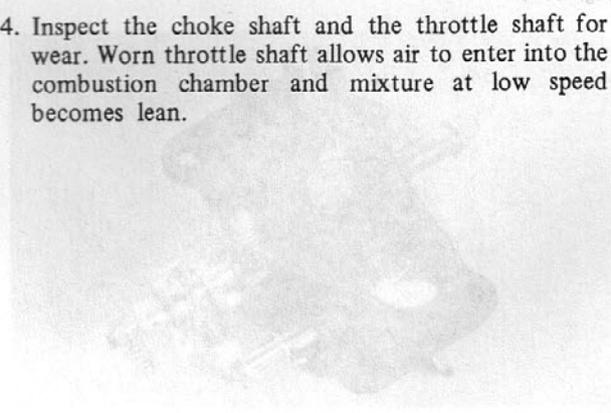


Fig. 4A-5

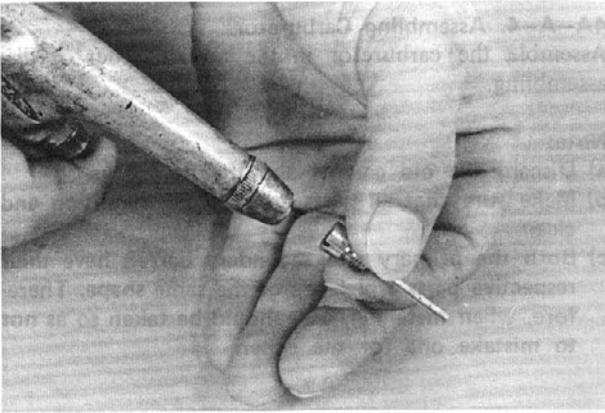


Fig. 4A-13

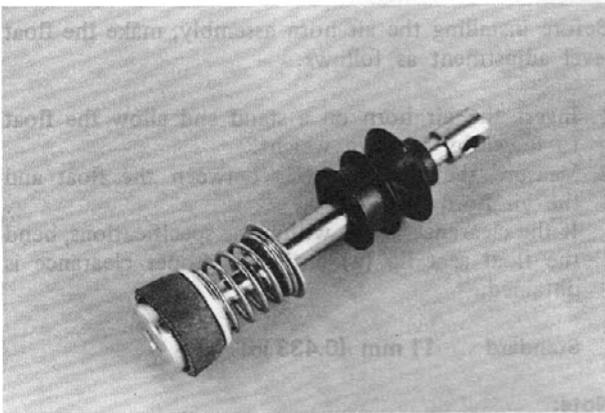


Fig. 4A-14

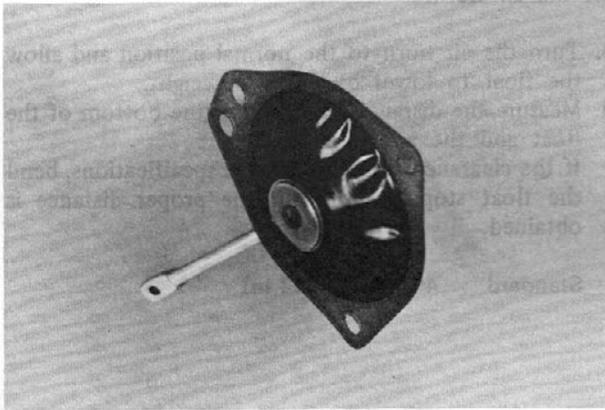


Fig. 4A-15

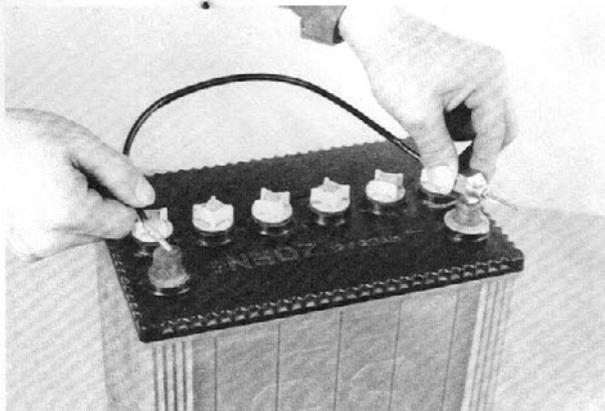


Fig. 4A-16

5. Examine all jets and air bleeds for clog. If it exists, clean in gasoline and blow with compressed air. Never use a wire. A wire may enlarge the hole or passage, changing the calibration of the carburetor.



Fig. 4A-17

6. Inspect the accelerating pump plunger cup. Replace the plunger if it is worn or damaged.

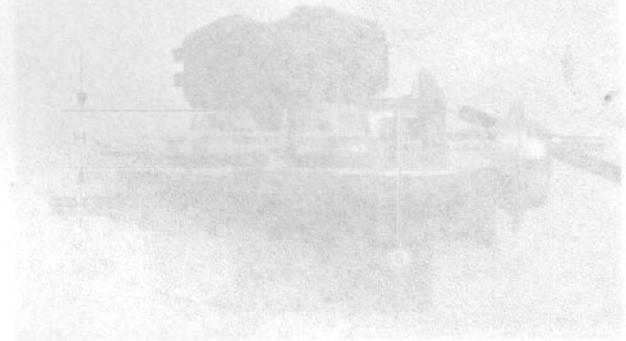


Fig. 4A-18

7. Check the diaphragm for damage.
8. Inspect the mixture adjust screw for burres or ridges.



Fig. 4A-19

9. Check the solenoid for operation. To check, connect the solenoid to the battery positive terminal and ground the body. When current is applied to the solenoid, the valve stem should be pulled into the valve body. If the valve does not operate properly, replace the solenoid.

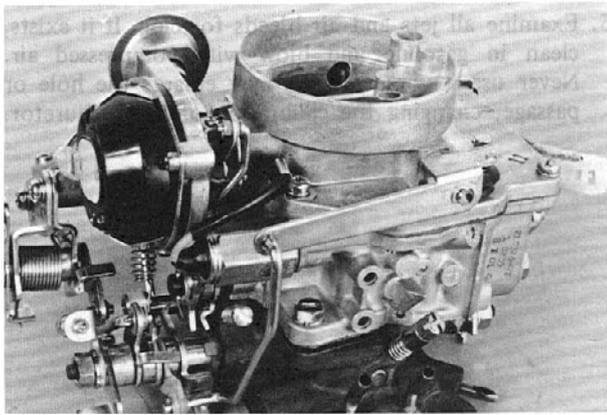


Fig. 4A-17

4A-A-4. Assembling Carburetor

Assemble the carburetor in the reverse order of disassembling.

Note:

- a) Discard the old gaskets and use new ones.
- b) Make sure that all parts are in good condition and clean.
- c) Both the primary and secondary barrels have their respective parts which are of the same shape. Therefore, when installing, care should be taken so as not to mistake one for the other.

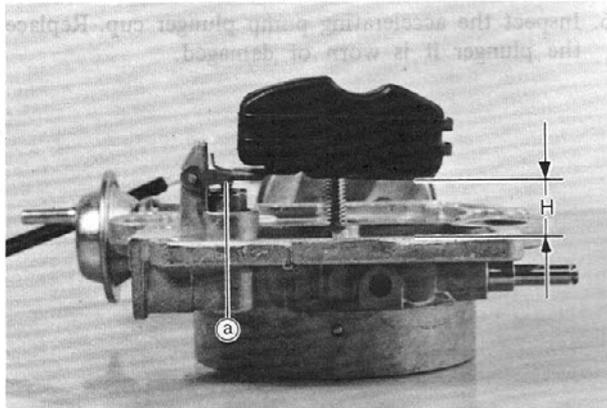


Fig. 4A-18

Before installing the air horn assembly, make the float level adjustment as follows:

1. Invert the air horn on a stand and allow the float to lower by its own weight.
2. Measure the clearance (H) between the float and the air horn bowl.
If the clearance is not within the specifications, bend the float seat lip (a) until the proper clearance is obtained.

Standard 11 mm (0.433 in)

Note:

This adjustment is always made without any gasket on the air horn.

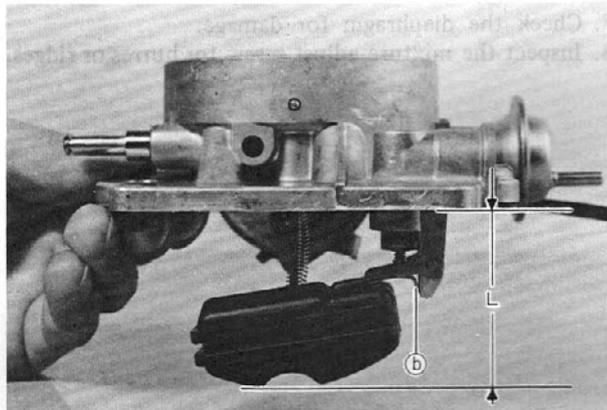


Fig. 4A-19

3. Turn the air horn to the normal position and allow the float to lower by its own weight.
4. Measure the distance (L) between the bottom of the float and the air horn bowl.
If the clearance is not within the specifications, bend the float stopper (b) until the proper distance is obtained.

Standard 46 mm (1.811 in)

9. Check the solenoid for operation. To check, connect the solenoid to the battery positive terminal and ground the body. When current is applied to the solenoid, the valve stem should be pulled into the valve body. If the valve does not operate properly, replace the solenoid.



Fig. 4A-20

4A-A-5. Automatic choke

a. Checking automatic choke

1. Before starting engine, fully depress accelerator pedal to ensure that choke valve closes properly.
2. Push choke valve with a finger, and check for binding.
3. Check to be sure that bi-metal cover index mark is set at the center of choke housing index mark as shown in the figure.

Note:

Do not set bi-metal cover index mark at any position except the center of choke housing index mark.

4. Check automatic choke heater source wiring for proper connection, then start engine.
5. After warming up the engine, see that choke valve is fully open.
6. If automatic choke heater source wiring is normal and choke valve does not operate after warm-up, replace bi-metal cover.

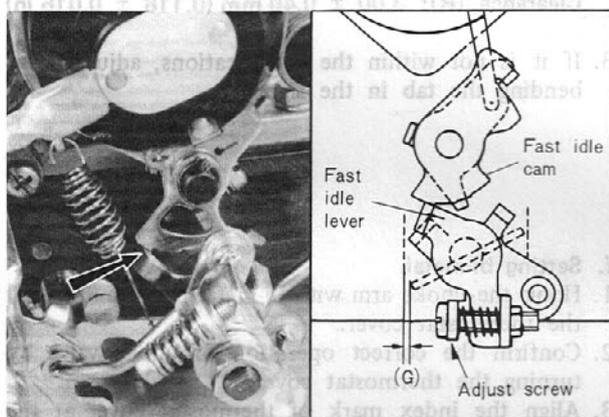


Fig. 4A-21

b. Adjusting automatic choke

Fast idle cam

1. Close the choke valve fully.
2. Confirm the position of fast idle cam. It should be on the first position.
3. Adjust the throttle valve opening angle or clearance (G) by turning the adjust screw. (Turning the screw clockwise, the opening angle becomes large)

Clearance (G): 1.0 ± 0.1 mm (0.039 ± 0.004 in)

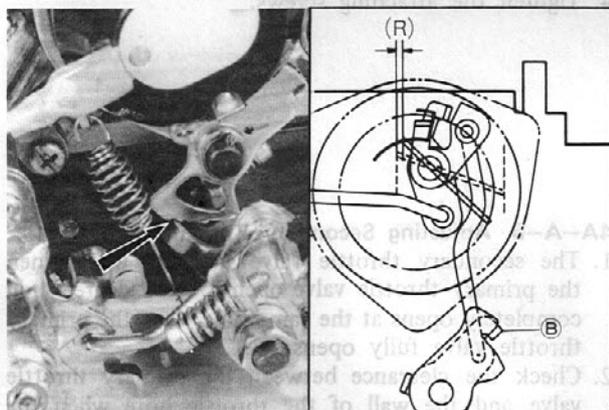


Fig. 4A-22

c. Check throttle valve opening angle

1. Confirm the fast idle cam adjustment has been made properly.
2. Place the fast idle cam select arm on the second position.
3. Adjust the choke valve opening angle or clearance (R) by bending the starting arm (B). If large adjustment is required, the choke rod should be bent.

Choke valve opening angle: $10^\circ \pm 2^\circ$

Clearance (R): $0.75 \begin{matrix} +0.20 \\ -0.15 \end{matrix}$ mm ($0.030 \begin{matrix} +0.008 \\ -0.006 \end{matrix}$ in)

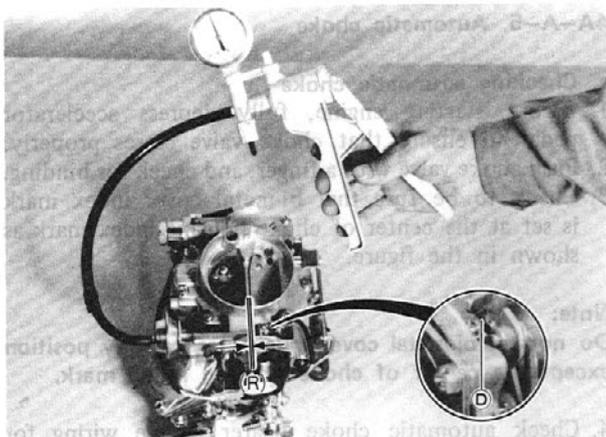


Fig. 4A-23

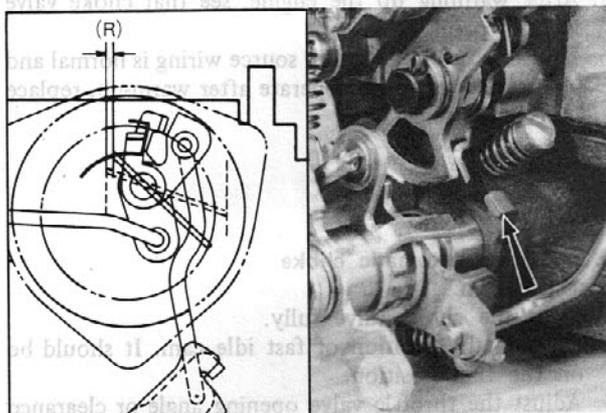


Fig. 4A-24



Fig. 4A-25

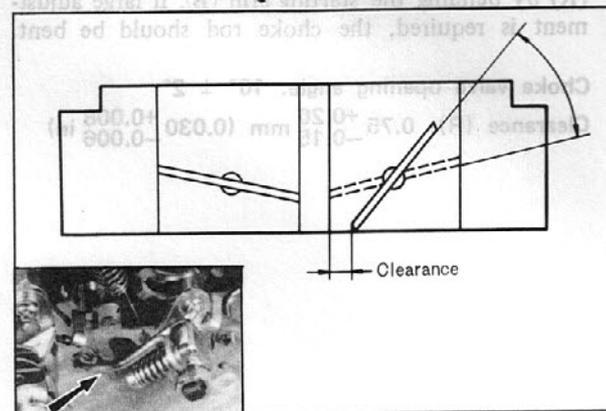


Fig. 4A-26

d. Choke diaphragm

1. Apply vacuum about 400 mm-Hg (15.7 in-Hg) from the manifold vacuum passage (choke diaphragm vacuum tube).
2. Confirm the position of fast idle cam (It should be fast position).
3. Press the choke valve slightly by finger, and check the choke valve opening angle or clearance (R).

Choke valve opening angle: $13^\circ \pm 2^\circ$

Clearance (R): $1.05 \begin{matrix} +0.20 \\ -0.15 \end{matrix}$ mm ($0.041 \begin{matrix} +0.008 \\ -0.006 \end{matrix}$ in)

4. If it is not within the specifications, adjust it by bending the choke lever (D).

e. Unloader system

1. Close the choke valve fully, then open the primary throttle valve fully.
2. At the time, measure the choke valve opening angle or clearance (R).

Choke valve opening angle: $30^\circ \pm 3^\circ$

Clearance (R): 3.00 ± 0.40 mm (0.118 ± 0.016 in)

3. If it is not within the specifications, adjust it by bending the tab in the figure.

f. Setting bi-metal

1. Hook the choke arm with bi-metal hook, and install the thermostat cover.
2. Confirm the correct operation of choke valve by turning the thermostat cover.
3. Align the index mark of thermostat cover at the center of the choke housing.
4. Tighten the attaching screws.

4A-A-6. Adjusting Secondary Throttle Valve

1. The secondary throttle valve starts to open when the primary throttle valve opens 52 ± 2 degrees and completely opens at the same time when the primary throttle valve fully opens.
2. Check the clearance between the primary throttle valve and the wall of the throttle bore when the secondary throttle valve starts to open.
3. If the clearance is not within the specification, bend the connecting rod until the proper clearance is obtained.

Standard clearance 6.75 mm (0.266 in)

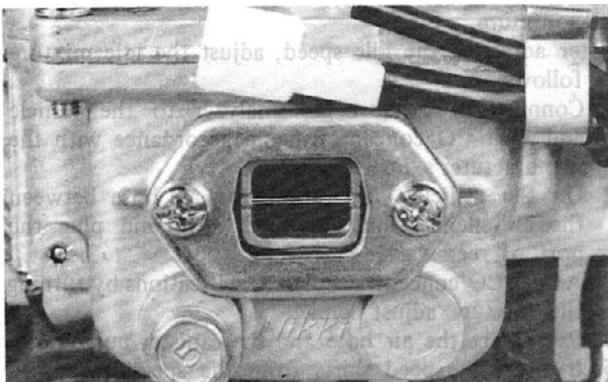


Fig. 4A-27

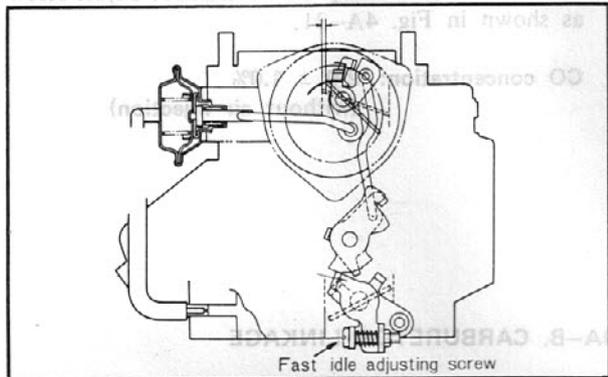


Fig. 4A-28

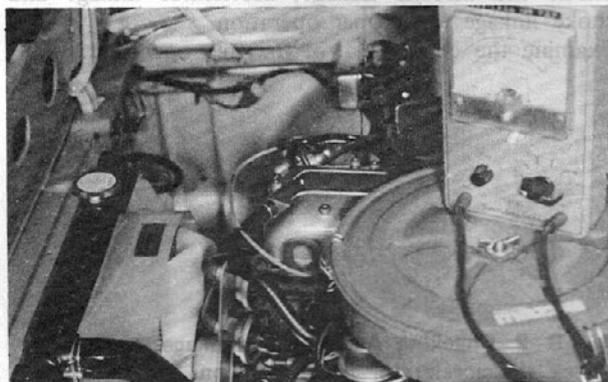


Fig. 4A-29

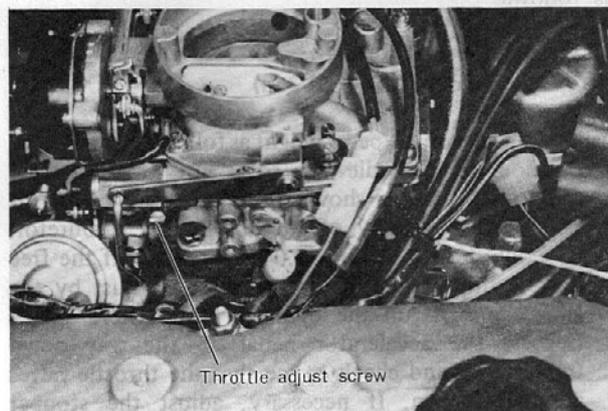


Fig. 4A-30

4A-A-7. Installing Carburetor

Install the carburetor in the reverse order of removing. After installing, **note the followings.**

- Start the engine and check for leaks.
- With the engine operating, check the fuel level. The fuel level should be in the specified mark in the sight glass.
- Make the idle adjustment as instructed in Par. 4A-A-8.

d) After idle adjustment is completed, check the fast idle speed as follows.

- Fully depress the accelerator pedal.
- Warm up the engine to normal operating temperature.
- Stop engine and remove the air cleaner.
- While holding the throttle valve slightly open, push the choke valve to fully close it, and release the choke valve after releasing the throttle valve.
- Start engine, but do not touch accelerator pedal.
- Check to see that the engine speed increases to 3,000 ~ 4,000 rpm.

If the engine speed is not within the specification turn the fast idle adjusting screw.

4A-A-8. Adjusting Idle Speed and Mixture

Precheck:

Be sure the ignition timing, spark plugs, carburetor float level and etc., are in normal condition.

Preconditions for idle adjustment

- Apply the parking brake and block the wheels.
- Turn off all lights and other unnecessary electrical loads.
- Set the transmission in Neutral or "D" position.

Idle speed

- Connect a tachometer to the engine.
- Disconnect the EGR vacuum hoses from the EGR valve, and plug them.
- Warm up the engine to the normal operating temperature and run it about three minutes at 2,000 rpm in neutral.
- Reconnect the EGR vacuum hoses and disconnect the canister purge hose between canister and air cleaner.
- Adjust the idle speed to specifications by turning the throttle adjust screw.

Idle speed 650 ± 50 rpm in neutral
(with manual transmission)

650 ± 50 rpm in "D" position
(with automatic transmission)

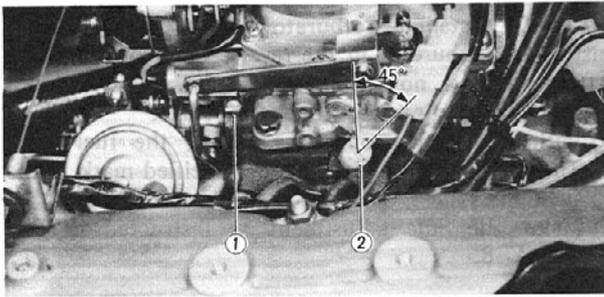


Fig. 4A-31

1. Throttle adjust screw
2. Mixture adjust screw

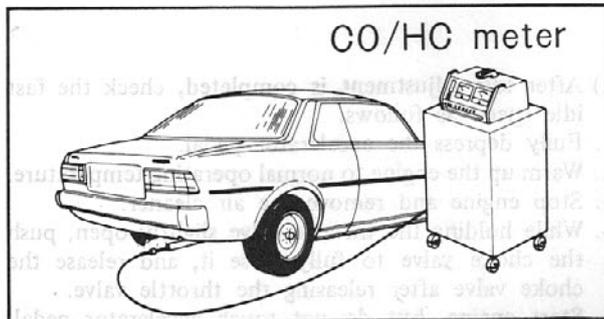


Fig. 4A-32

Idle mixture

After adjusting the idle speed, adjust the idle mixture as follows.

1. Connect an exhaust gas analyzer to the vehicle and read CO concentration in accordance with the manufacturer's instruction.
2. On the vehicles, disconnect the air hose between the air silencer and the reed valve and plug the port of reed valve.
3. Adjust CO concentration to specifications by turning the mixture adjust screw.
4. Reconnect the air hose and the canister purge hose.
5. If the idle speed shifts from the specifications as the result of the above, repeat the above procedures.
6. Fit the idle limiter cap on the mixture adjust screw as shown in Fig. 4A-31.

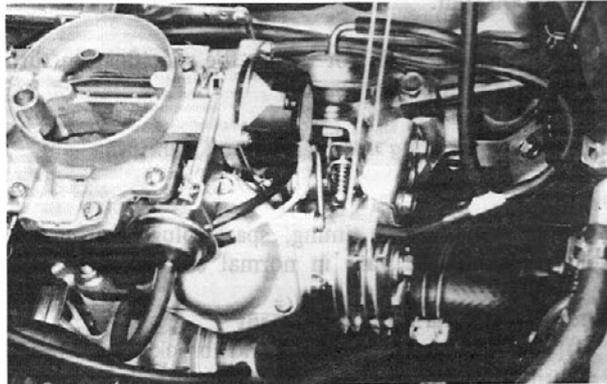
CO concentration: $2.0 \pm 1.0\%$
(without air injection)

4A-B. CARBURETOR LINKAGE

4A-B-1. Checking Carburetor Linkage

Check the throttle linkage, accelerator linkage and choke linkage for proper operation.

Examine the choke control for free operation.



4A-B-2. Checking Accelerator Linkage

Check the accelerator pedal position.

The accelerator pedal should be lower than brake pedal as follows.

Accelerator pedal height:
 $45 \pm 5 \text{ mm}$ ($1.7 \pm 0.2 \text{ in}$)

Adjust the accelerator pedal height as follows, if necessary.

1. Position the first idle cam so as not to contact the cam select arm as shown in figure.
2. Check the free play of the cable at the carburetor. It should be $1 \sim 3 \text{ mm}$ ($0.04 \sim 0.12 \text{ in}$). If the free play is not within the specifications, adjust by the adjust nut (A) on the cylinder head cover.
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 (B).

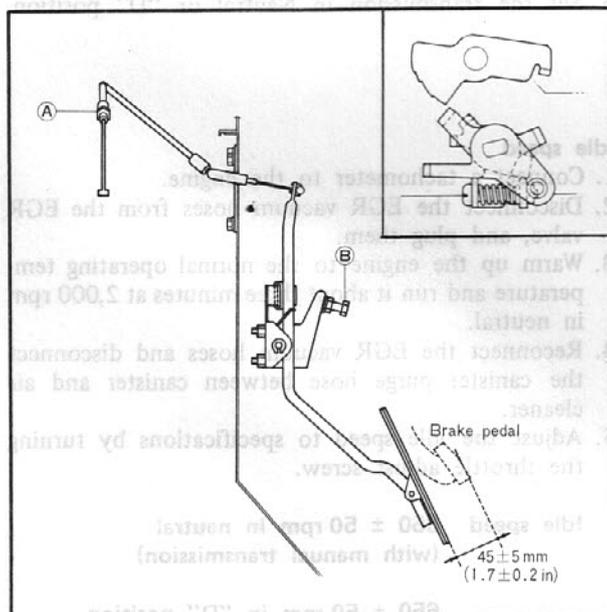


Fig. 4A-34

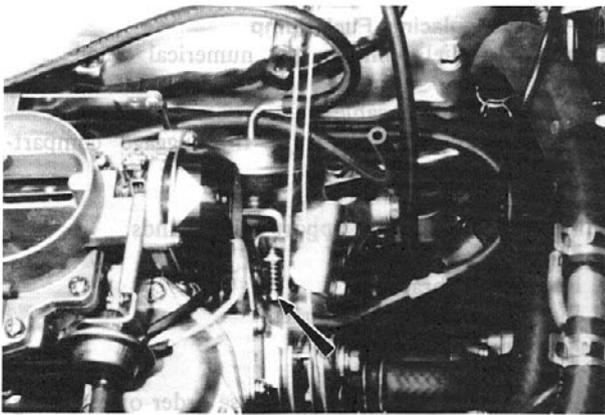


Fig. 4A-35

4A-C. THROTTLE OPENER SYSTEM (Air conditioning)

4A-C-1. Checking Throttle Opener

1. Connect a tachometer to the engine.
2. Warm up the engine and run it at idle.
3. Stop the engine and remove the air cleaner.
4. Disconnect the vacuum sensing tube (servo diaphragm ~ three way solenoid valve) at the servo diaphragm.
5. Connect the inlet manifold and the servo diaphragm with a suitable tube so that the inlet manifold vacuum can be led directly to the servo diaphragm.
6. Disconnect the vacuum sensing tube (carburetor ~ 1st stage valve) at the EGR valve.
7. Disconnect the vacuum sensing tube (carburetor ~ distributor) at the distributor.
8. Start the engine and increase the engine speed to about 2,000 rpm.
9. Decrease the engine speed and make sure the engine speed is $1,200 \pm 50$ rpm.
If the engine speed is not within the specification, turn the throttle opener adjusting screw in or out until the specified engine speed is obtained.

4A-D. FUEL PUMP

4A-D-1. Testing Fuel Pump

The tests are performed with the pump installed on the car.

Before the tests, make sure the fuel filter has been changed with the recommended maintenance mileage interval. When in doubt, install a new filter.

a. Pressure test

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

If the reading is not within the specification, and the fuel lines and filter are in satisfactory condition, the pump is damaged and should be replaced.

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

Standard pressure $0.20 \sim 0.25 \text{ kg/cm}^2$
($2.84 \sim 3.56 \text{ lb/in}^2$)

b. Volume test

Turn the ignition switch on, open the hose restrictor and expel the fuel into the container.

Volume — More than 800 cc (0.8 U.S. quart,
0.7 Imp. quart) within one minute

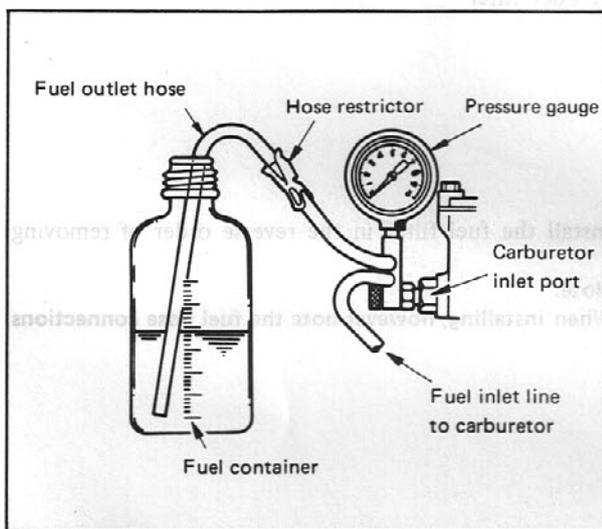


Fig. 4A-36

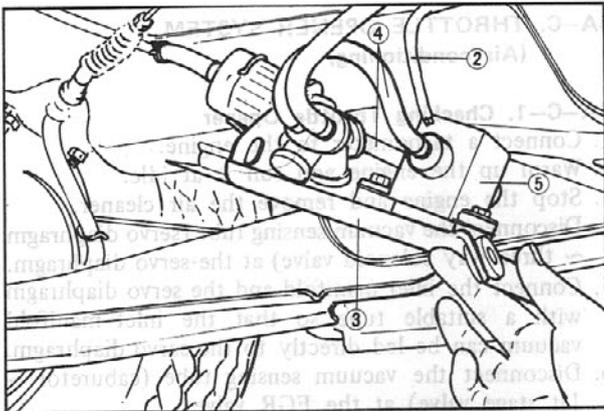


Fig. 4A-37

4A-D-2. Replacing Fuel Pump

Remove the fuel pump in the numerical order.

1. Battery negative cable
2. Fuel pump lead wire (in the luggage compartment)

Raise the vehicle and support with stands.

3. Fuel pump bracket
4. Fuel inlet and outlet hoses
5. Fuel pump

Install the fuel pump in the reverse order of removing.

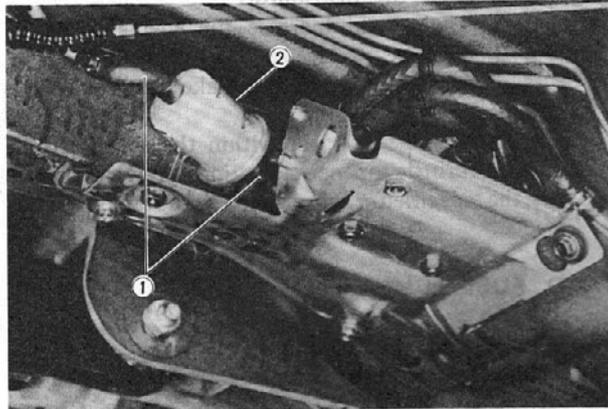


Fig. 4A-38

4A-E. FUEL FILTER

4A-E-1. Replacing Fuel Filter

Remove the fuel filter in the numerical order.

Raise the vehicle and support with stands.

1. Fuel inlet and outlet hose
2. Fuel filter

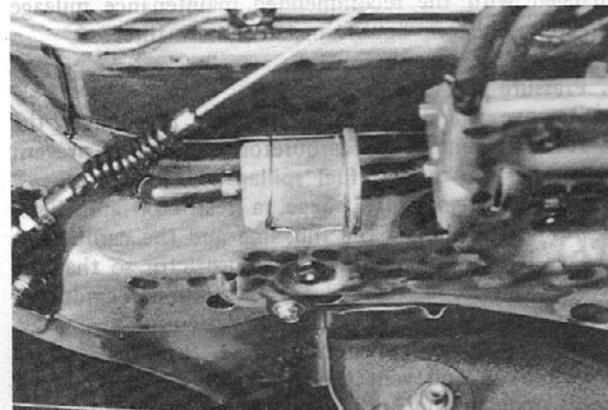


Fig. 4A-39

Install the fuel filter in the reverse order of removing.

Note:
When installing, however note the fuel hose connections.

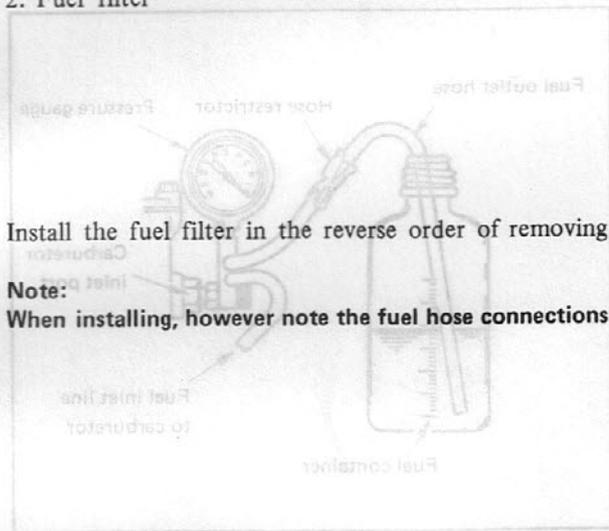


Fig. 4A-38

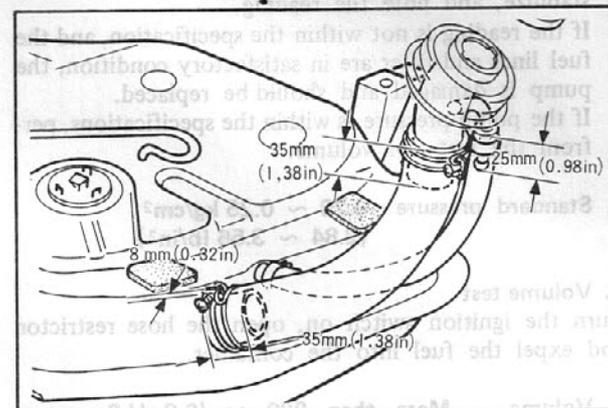


Fig. 4A-40

4A-F. FUEL TANK

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

Note:
When repairing the fuel tank, clean the fuel tank thoroughly with steam to remove all explosive gas.

Push in the rubber hose end to the fuel pipe until the fuel pipe is inserted as shown in figure.

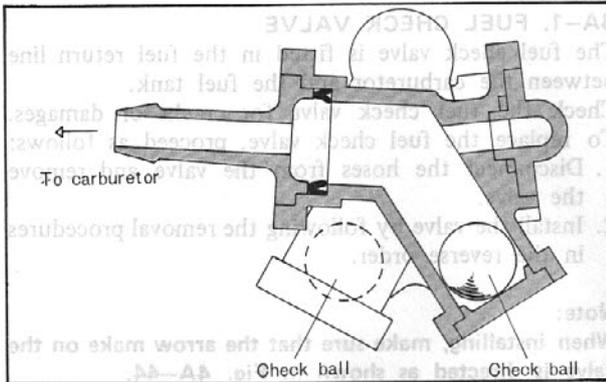


Fig. 4A-41

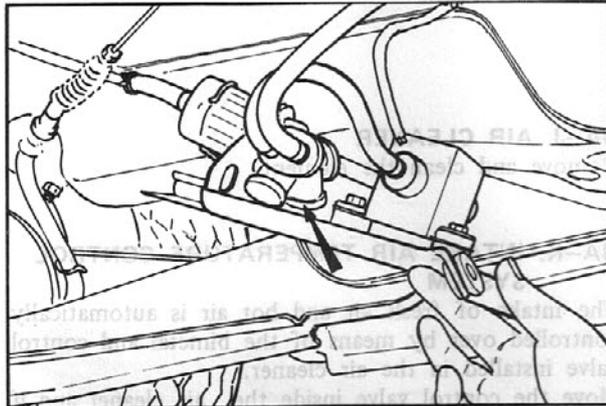


Fig. 4A-42

4A-G. FUEL CUT VALVE

The fuel cut valve is fitted in the fuel line between the fuel pump and the carburetor.

When the valve body is inclined more than 60° laterally, the fuel cut valve is operated and the fuel supply to the carburetor is cut.

To set back the check balls in the valve to the original position disconnect the hoses at the valve and blow in air from the outlet port of the valve. Then, blow in air from the inlet part to confirm that the passage is open.

To replace the fuel cut valve, proceed as follows:

1. Raise the vehicle and support with stands.
2. Remove the attaching bolts and remove the fuel cut valve and bracket assembly.
3. Disconnect the hoses at the fuel cut valve and remove the valve.

4A-H. 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.

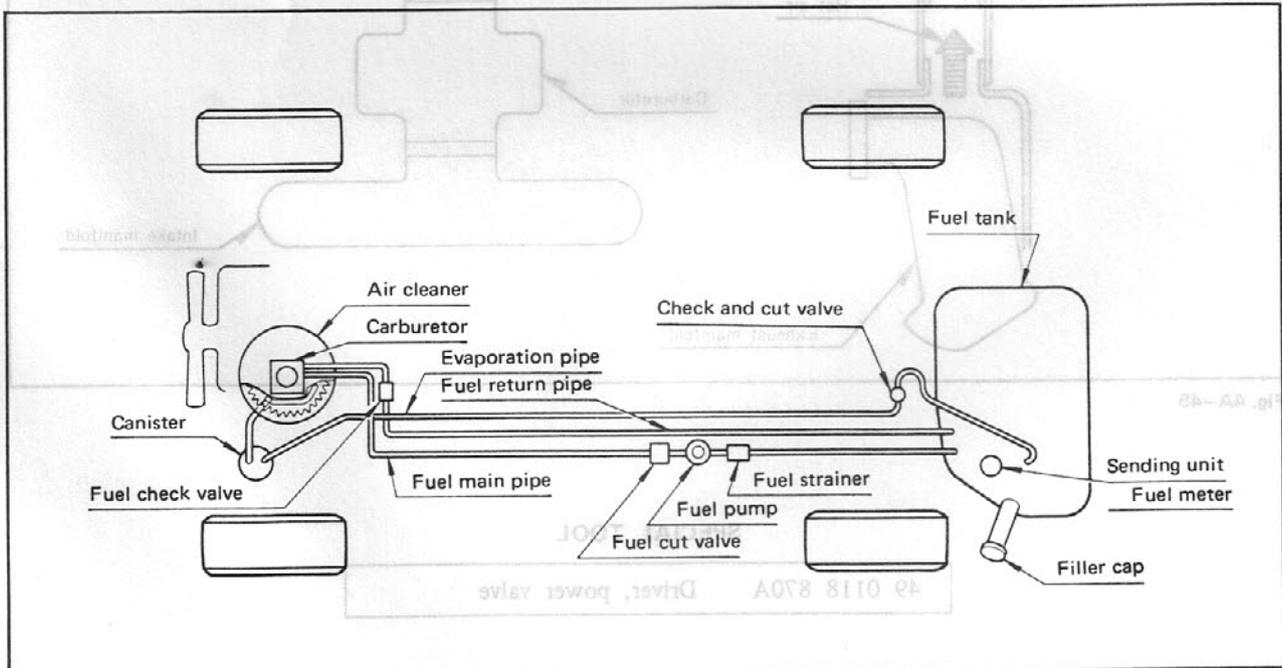


Fig. 4A-43

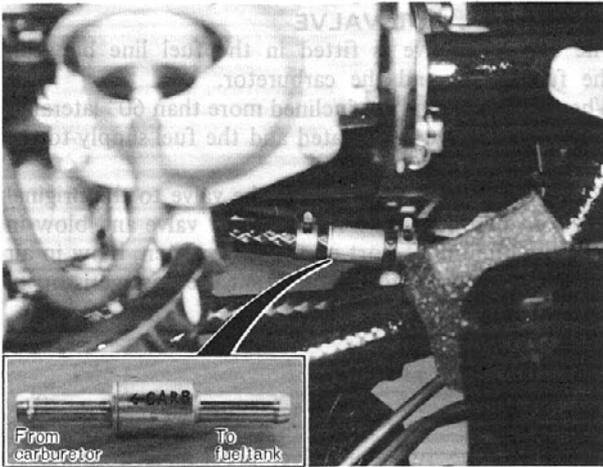


Fig. 4A-44

4A-1. FUEL CHECK VALVE

The fuel check valve is fitted in the fuel return line between the carburetor and the fuel tank.

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

1. Disconnect the hoses from the valve and remove the valve.
2. Install the valve by following the removal procedures in the reverse order.

Note:

When installing, make sure that the arrow make on the valve is directed as shown in Fig. 4A-44.

4A-J. AIR CLEANER

Remove and clean the element.

4A-K. INTAKE AIR TEMPERATURE CONTROL SYSTEM

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.

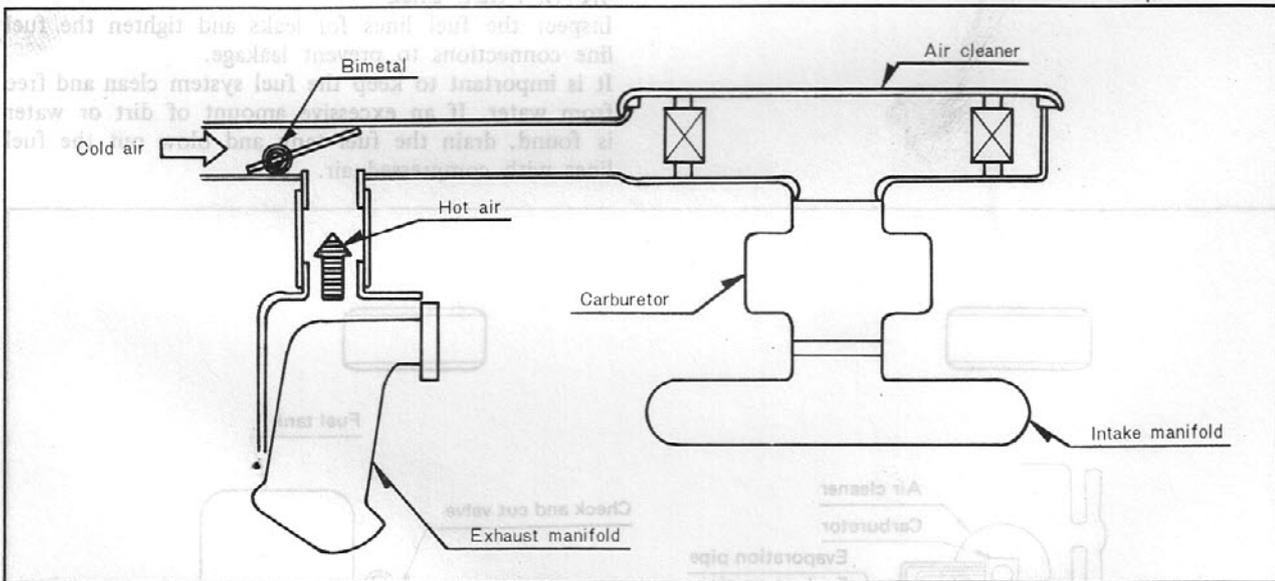


Fig. 4A-45

SPECIAL TOOL

49 0118 870A	Driver, power valve
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5-A. BATTERY

Check the following points periodically and always keep the battery in perfect condition.

Avoid contact sulphuric acid with skin, eyes, clothing or car.

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.

ELECTRICAL SYSTEM



2. Check the tightness of the terminals to ensure good contact. If the reading is below the specification, the battery requires recharging.

3. Check the tightness of the terminals to ensure good contact.

5-A. BATTERY 5 : 1

 5-A-1. Checking Battery 5 : 1

 5-A-2. Charging Battery 5 : 1

5-B. ALTERNATOR AND REGULATOR 5 : 2

 5-B-1. Precautions on Service 5 : 2

 5-B-2. Checking Charging System on Car 5 : 2

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 5-B-4. Disassembling Alternator 5 : 3

 5-B-5. Inspecting Alternator 5 : 4

 5-B-6. Assembling Alternator 5 : 5

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5-C. STARTING MOTOR 5 : 5

 5-C-1. Checking Starting Circuit 5 : 5

 5-C-2. Removing Starting Motor 5 : 5

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 5-C-5. Inspecting Starting Motor 5 : 7

 5-C-6. Magnetic Switch Test 5 : 9

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5-D. SPARK PLUG 5 : 10

 5-D-1. Removing Spark Plug 5 : 10

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5-E. DISTRIBUTOR (U.S.A.) 5 : 11

 5-E-1. Removing Distributor 5 : 11

 5-E-2. Disassembling Distributor 5 : 11

 5-E-3. Inspecting Distributor 5 : 13

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 5-E-7. Adjusting Ignition Timing 5 : 15

5-F. SPARK TIMING CONTROL SYSTEM 5 : 15

 5-F-1. Checking Water Thermo Valve 5 : 15

5-G. DISTRIBUTOR (Canada) 5 : 16

 5-G-1. Removing Distributor 5 : 16

 5-G-2. Disassembling Distributor 5 : 16

 5-G-3. Checking Distributor 5 : 17

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5-J. HIGHTENSION CORD 5 : 20

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d. Fast charge

As a fast charge causes both the temperature and the level of the electrolyte to rise suddenly, it does not have a favorable effect on the battery. Therefore, this should not be performed unless in the case of an emergency. To charge with a fast charger, follow the instructions of the manufacturer.

Note:

a) Ensure that the cables are removed from the battery terminals before the charge is applied. If this is neglected, it could cause a damage to the diodes on the alternator.

b) The battery should be kept cool by the use of cooling water to prevent the temperature of the electrolyte from exceeding 55°C (131°F), otherwise the charging should be discontinued temporarily when the temperature rises above this point.

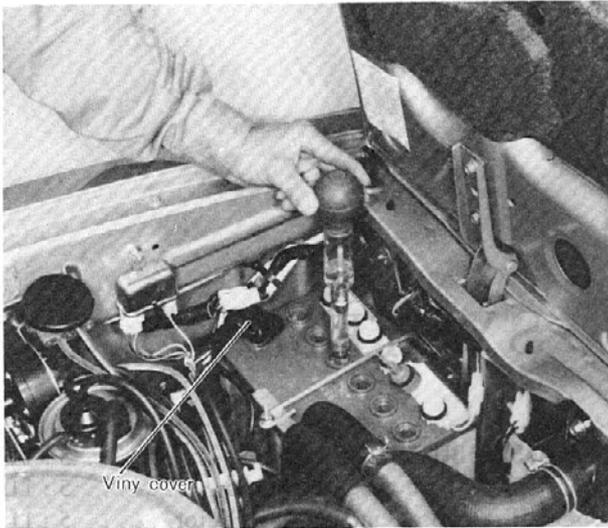


Fig. 5-1



Fig. 5-2

5-A. BATTERY

5-A-1. Checking Battery

Check the following points periodically and always keep the battery in perfect condition.

Avoid contact sulphuric acid with skin, eyes, clothing or car.

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.
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. Position the vinyl cover on positive (+) terminal of battery firmly.

5-A-2. Charging Battery

When charging the battery, keep all fire away from the top of open battery cells.

a. Constant current charge

1. If the exterior of the battery is dirty with sulphuric acid or dust and dirt, wash these off with clean water and dry thoroughly before charging the battery.
2. Check the electrolyte level and add distilled water if necessary.

Note:

If addition of distilled water is neglected, the plates and separators will become exposed to air, causing a sulphation to occur on the plates.

Do not add dilute sulphuric acid unless the electrolyte has overflowed or leaked out.

3. Connect the battery to the charger, ensuring that the polarities are correct.
4. To charge, apply an electric current of approximately **5 amperes** until the specific gravity of the electrolyte reaches **1.26 ~ 1.28**.

b. Fast charge

As a fast charge causes both the temperature and the level of the electrolyte to rise suddenly, it does not have a favorable effect on the battery. Therefore, this should not be performed unless in the case of an emergency. To charge with a fast charger, follow the instructions of the manufacturer.

Note:

- a) Ensure that the cables are removed from the battery terminals before the charge is applied. If this is neglected, it could cause a damage to the diodes on the alternator.
- b) The battery should be kept cool by the use of cooling water to prevent the temperature of the electrolyte from exceeding **55°C (131°F)**, otherwise the charging should be discontinued temporarily when the temperature rises above this point.

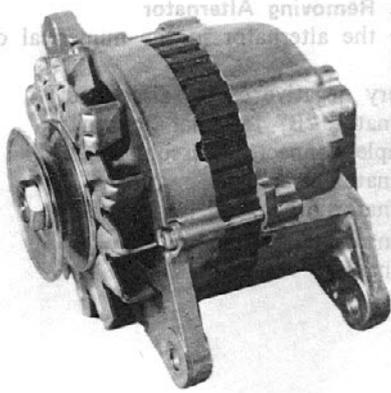


Fig. 5-3

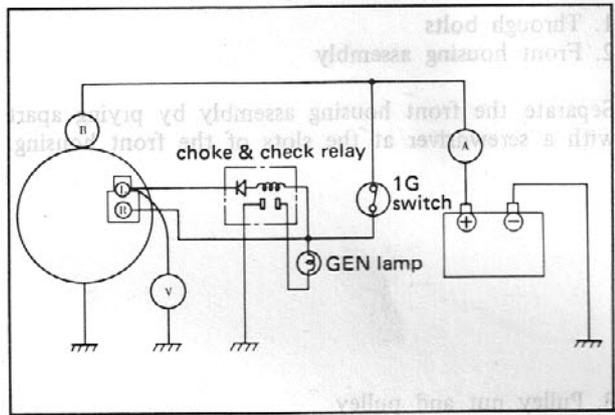


Fig. 5-4

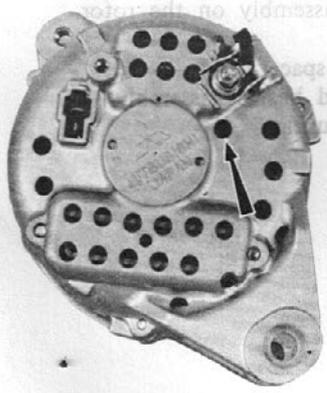


Fig. 5-5

5-B. ALTERNATOR AND REGULATOR

5-B-1. Precautions on Service

When servicing the charging system, observe the following precautions. If not followed, the result will be in serious damage of the system.

1. **Do not** short across or ground any of the terminals on the alternator.
2. When installing the battery, always make sure that the negative post of the battery is attached securely to the negative cable.
3. **Never** reverse battery cables, even for an instant, as the reverse polarity current flow will damage the diodes in the alternator.
4. When charging the battery with a fast charger, disconnect the positive cable at the battery.
5. Check the drive belt tension and adjust it to specification if necessary.

5-B-2. Checking Charging System on Car

1. Connect the voltmeter between the "R" terminal of the alternator and the ground, and take a reading of the "R" terminal voltage.
Take a reading of the "L" terminal voltage similarly. If either of the aforementioned voltmeter readings is not zero, the alternator is defective.

Note:
During the measurement the ignition switch should be switched off.

2. Switch the ignition switch on and take a reading of the "L" terminal voltage. If the reading of the voltmeter is zero, both the alternator and the IC regulator are defective.
3. If the aforementioned voltmeter reading is close to the battery voltage, short-circuit the "F" terminal and the rear bracket of the alternator, and then take a reading of the "L" terminal voltage.
If the reading of the voltmeter then becomes lower than that of the battery terminal, the IC regulator is defective.

Note:
The "F" terminal is neither exposed on the surface of the alternator rear bracket non marked for its location. It is located at a depth of 20 mm (0.79 in) in a hole which is near the mark of "B" terminal.

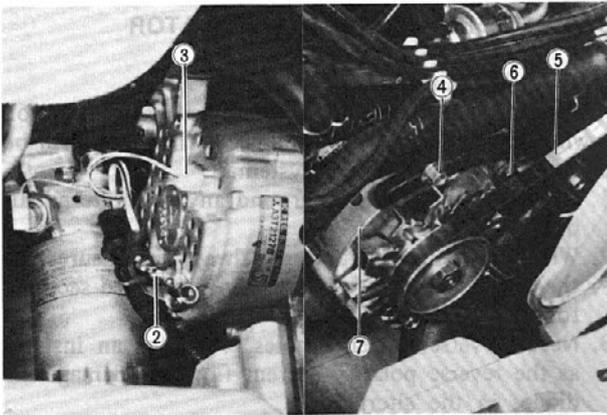


Fig. 5-6

5-B-3. Removing Alternator

Remove the alternator in the numerical order.

1. Battery negative cable (disconnect)
2. Alternator "B" terminal (loosen)
3. Multiple connector (disconnect)
4. Alternator strap bolt
5. Alternator drive belt
6. Alternator mounting bolt
7. Alternator

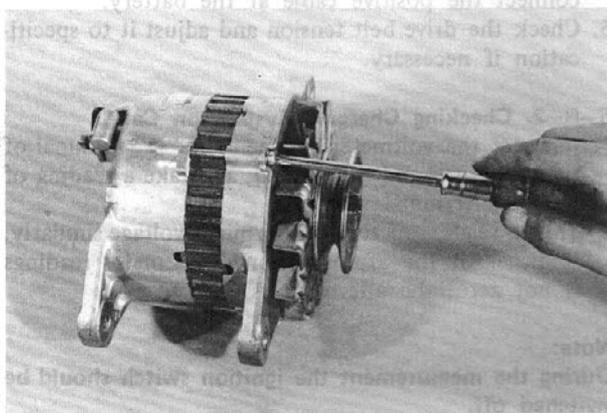


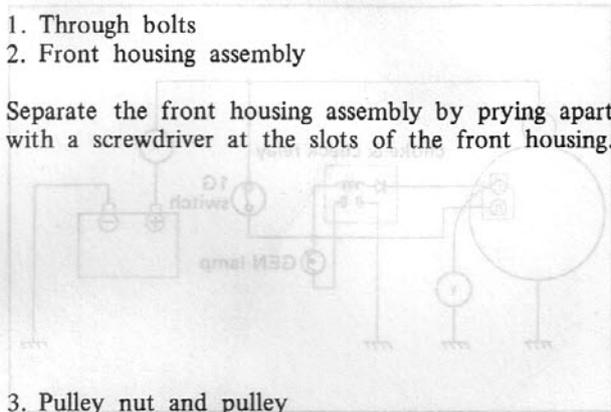
Fig. 5-7

5-B-4. Disassembling Alternator

Disassemble the alternator in the numerical order.

1. Through bolts
2. Front housing assembly

Separate the front housing assembly by prying apart with a screwdriver at the slots of the front housing.



3. Pulley nut and pulley

Place the front housing and rotor assembly in a vise. Clamp the assembly on the rotor.

4. Fan and spacer
5. Rotor and bearing assembly
6. Front housing.

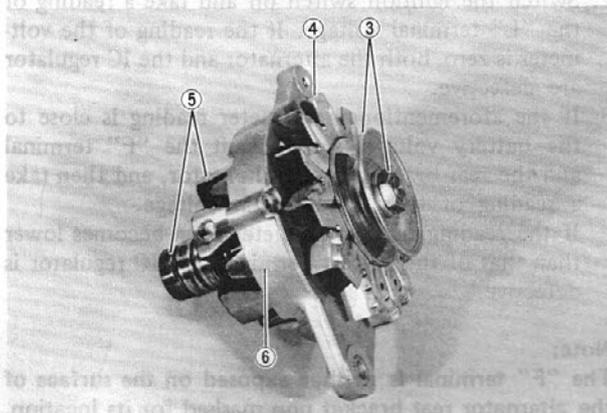


Fig. 5-8

7. Stator

Unsolder the stator leads from the rectifier assembly. Hold the stator lead with a longnozed plier to prevent rectifier from heating up.

8. Condenser
9. IC regulator and brush holder assembly

Unsolder the plate "L" and plate "B" from the rectifier assembly.

10. Rectifier assembly

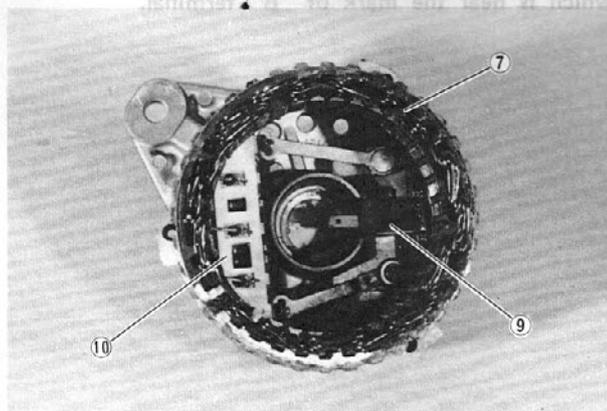


Fig. 5-9

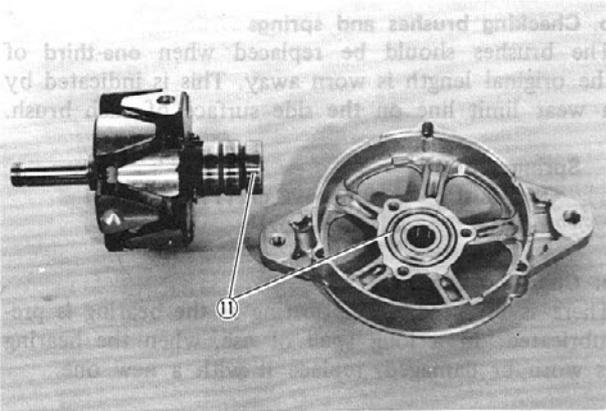


Fig. 5-10

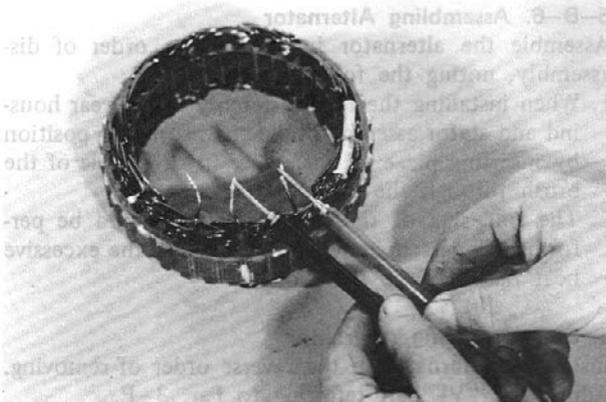


Fig. 5-11



Fig. 5-12

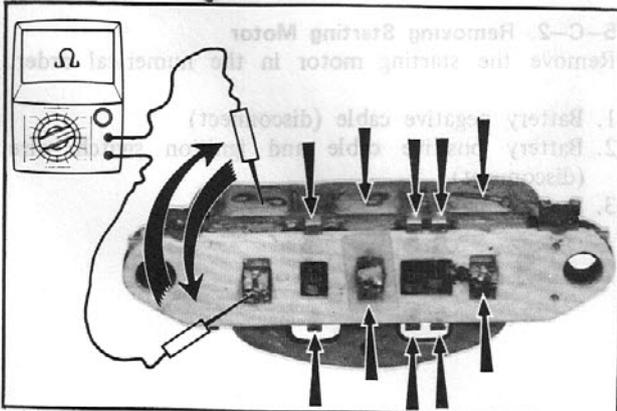


Fig. 5-13

11. Rear bearing and front bearing (if necessary)



5-B-5. Inspecting Alternator

a. Checking stator coil

Ground test:

Connect one prod to the core and the other to each lead wire. If a ground is present, the current will flow and the stator coil must be replaced.

Short circuit test:

Connect the prods to each of the two leads. If there is no flow of current, the coil is open circuit and must be replaced.

b. Checking rotor

Ground test:

Connect one prod to the slip ring and other prod to the core. If the current flows the rotor must be replaced.

Short circuit test:

Place both prods of an ohmmeter on the slip rings. If the reading is 3 to 6 ohms, there is no trouble in the rotor.

c. Checking diode (rectifier assembly)

Diodes for use in the alternator are available in two different types, the positive diode which allows current to flow from the lead wire to the case but not from the case to the lead wire and the negative diode which has the opposite properties.

To check the diode, read the resistance between the terminal and case with a tester. Then reverse the tester leads and note the reading. If both readings are very low or high, the diode is defective.

A good diode will give one low reading and one high reading.

Note:

The diodes and heat sink are serviced as rectifier assembly only.

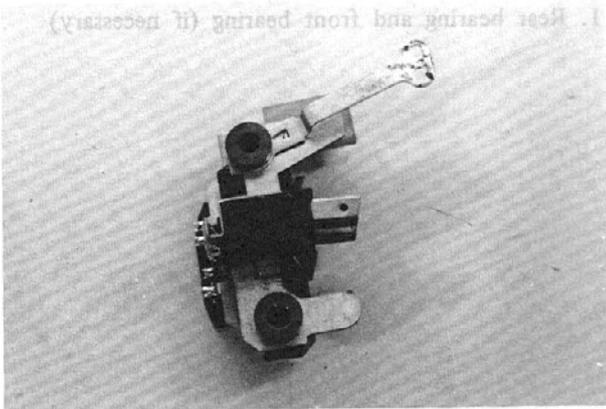


Fig. 5-14



Fig. 5-15

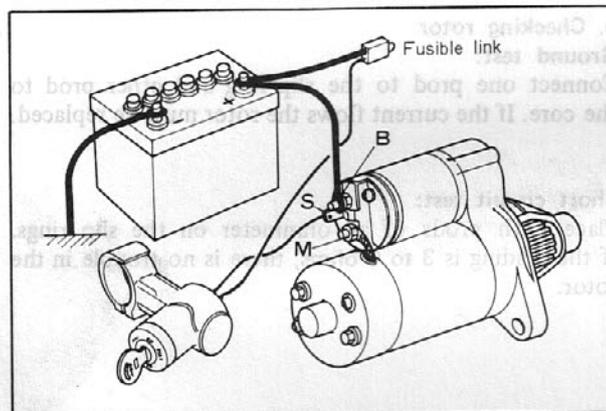
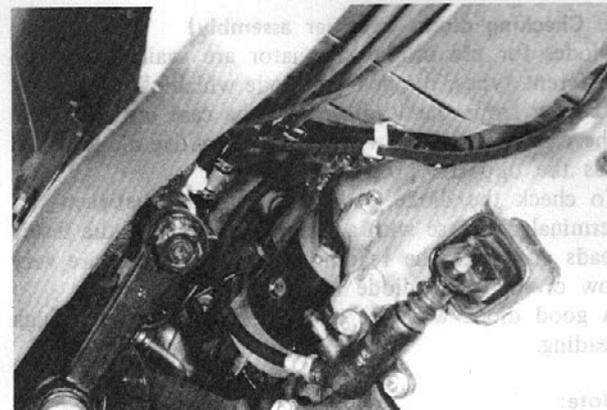


Fig. 5-16

Fig. 5-17
The diodes and heat sink are serviced separately only.

b. Checking 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 surface of each brush.

Spring tension:

Standard	316 ~ 426 gr (11 ~ 15 oz)
Limit	210 gr (7 oz)

e. Checking 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 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 diodes.

5-B-7. Installing Alternator

Install the alternator in the reverse order of removing. Adjust the "V" belt referring to Par. 3-E.

5-C. STARTING MOTOR

5-C-1. Checking Starting Circuit

When the starting motor fails to operate or does not satisfactorily operate, check the following points before removing the starting motor:

1. Weak battery
2. Corroded or loose battery terminal
3. Loose starting motor terminal
4. Broken or loose wires of the starting circuit
5. Faulty ignition switch

5-C-2. Removing Starting Motor

Remove the starting motor in the numerical order.

1. Battery negative cable (disconnect)
2. Battery positive cable and ignition switch wire (disconnect)
3. Starting motor

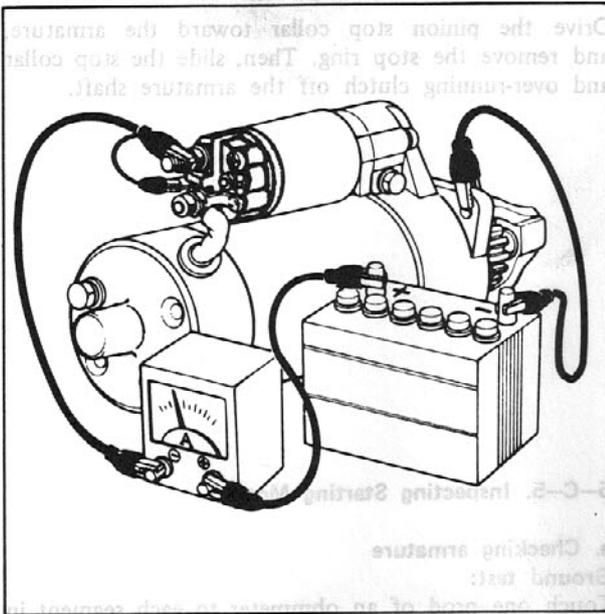


Fig. 5-18

5-C-3. Testing Starting Motor

a. Free running test

1. Place the starting motor in a vise equipped with soft jaws and apply the battery voltage adjusted to 11.5 volts to the starting motor.
2. Connect an ammeter between the "B" terminal of the starting motor and the battery.
3. Operate the starting motor and take a reading.

Specified current:

Manual transmission	53A or less at 6,800 rpm or more
Automatic transmission	60A or less at 6,600 rpm or more

b. Lock resistance test

1. Install the starting motor on a test bench.
2. Test the lock resistance of the starting motor, following the instructions of the test equipment manufacturer.

Manual transmission

Voltage	5 volts
Current	310A or less
Torque	0.75 m-kp (5.4 ft-lb) or more

Automatic transmission

Voltage	5 volts
Current	500A or less
Torque	1.15 m-kp (8.3 ft-lb) or more

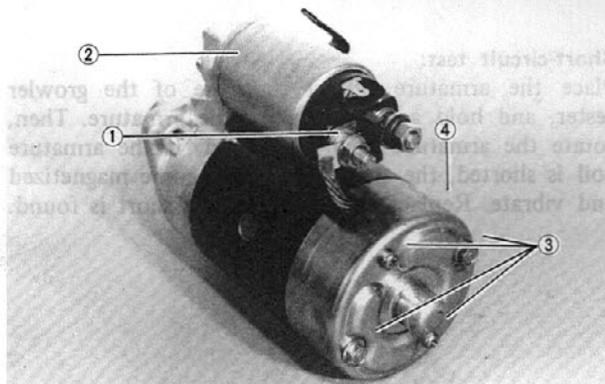
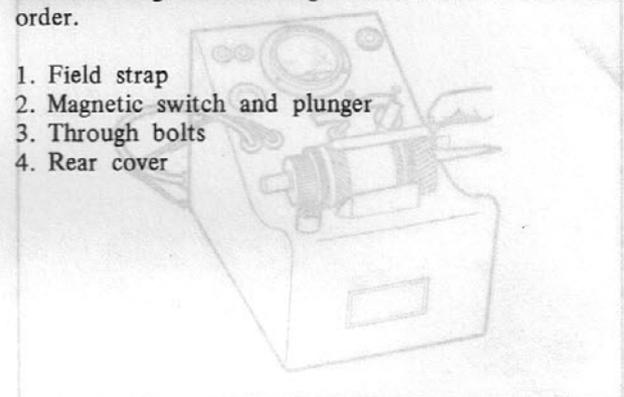


Fig. 5-19

5-C-4. Disassembling Starting Motor

Disassembling the starting motor in the numerical order.

1. Field strap
2. Magnetic switch and plunger
3. Through bolts
4. Rear cover



5. Brush holder assembly
6. Yoke assembly
7. Driving lever and spring
8. Armature assembly
9. Stop ring and stop collar
10. Pinion and over-running clutch

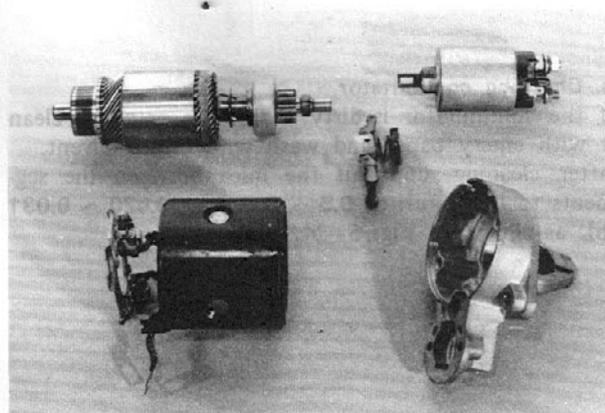
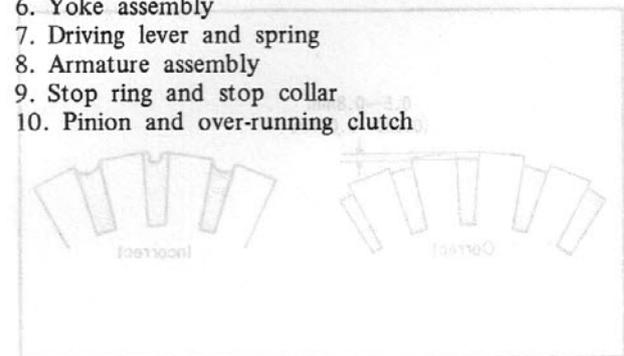


Fig. 5-20



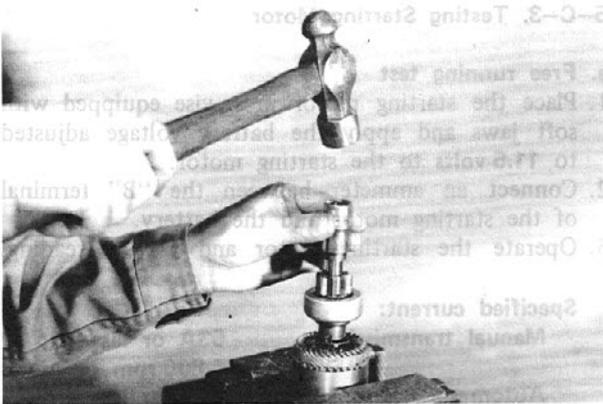


Fig. 5-21

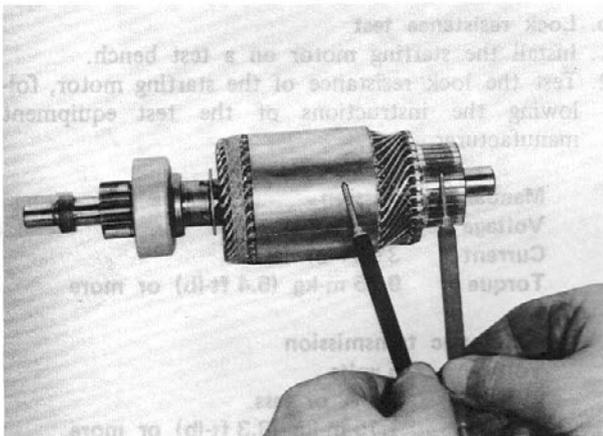


Fig. 5-22

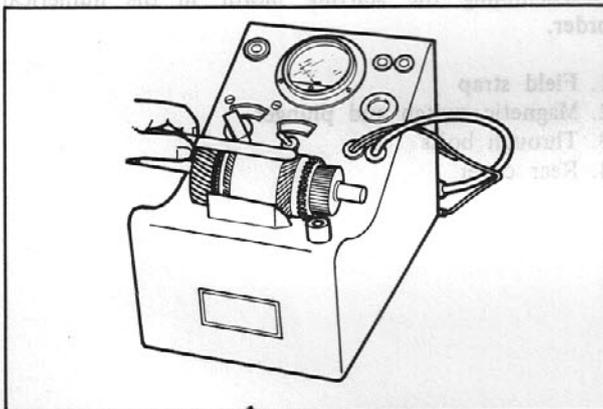


Fig. 5-23

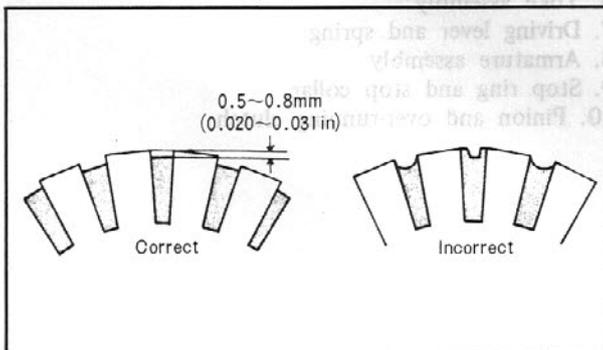
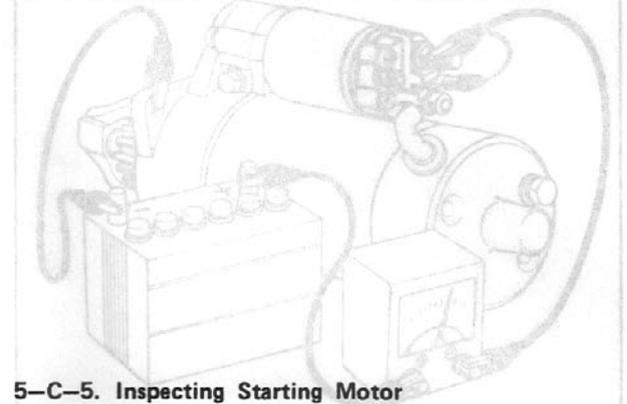


Fig. 5-24

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.



5-C-5. Inspecting Starting Motor

a. Checking armature

Ground test:

Touch one prod of an ohmmeter to each segment in order and the other prod to the core or shaft. An infinite reading should be obtained for each segment. If the meter reading is not infinite, the armature must be replaced.

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.

b. Checking commutator

If the commutator is dirty, discolored or worn, clean it with emery paper and wash with clean solvent. After cleaning, undercut the mica between the segments to the depth of 0.5 ~ 0.8 mm (0.020 ~ 0.031 in), as shown in Fig. 5-24.

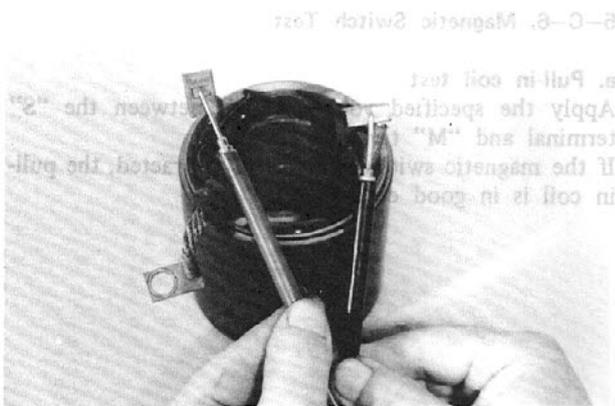


Fig. 5-25

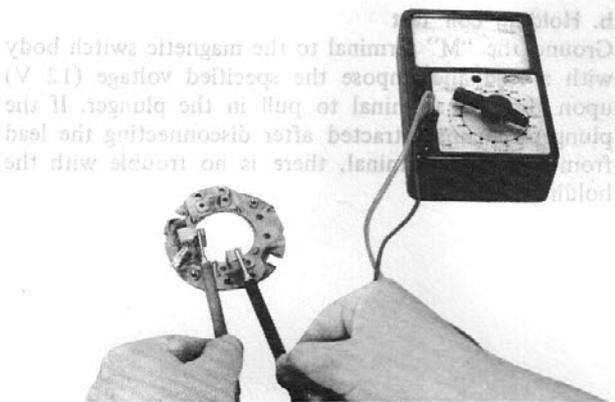


Fig. 5-26

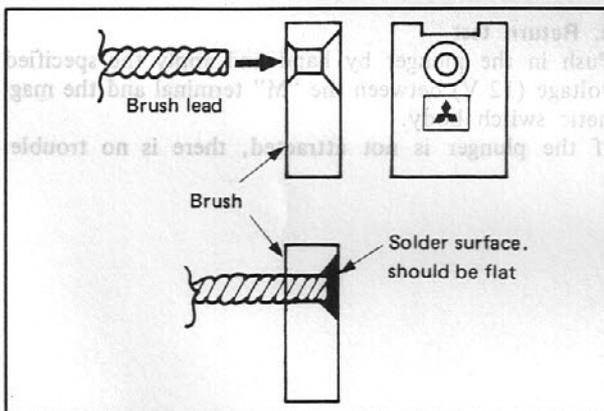


Fig. 5-27

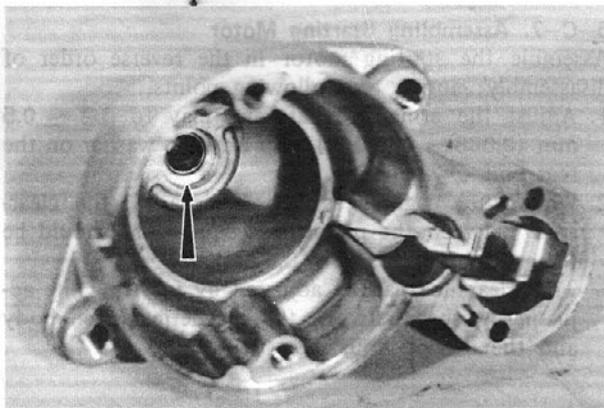


Fig. 5-28

c. Checking field coil

Ground test:

To test the field coil for ground with an ohmmeter, place one prod on the yoke or pole core and the other prod to the field terminal.

An infinite meter reading should be obtained. If a reading other than infinite is found, replace the field coil and yoke assembly.

Short circuit test:

Connect the prods to each of the two leads.

If there is no flow of current, the coil is open circuit and must be replaced.

d. Checking brush holder

Check the brush holder for ground. Touch one prod of an ohmmeter to the insulated brush holder and the other prod to the brush holder frame.

If the meter reading is other than infinite, the brush holder assembly is shorted and must be replaced. Repeat this test for the other insulated brush holder. **Do not** use this test on the two grounded brush holders.

e. Checking brushes and brush springs

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

Otherwise, the brush spring tension will be reduced, leading to an increase in the brush-commutator contact resistance. This will lower the torque and cause the burnt commutator surface.

The spring tension is 1.3 ~ 1.7 kg (46 ~ 60 oz).

If the tension is too low, replace the springs.

To replace the brush, proceed as follows:

1. Remove the brush from the holder.
2. Smash the old brush by tapping it with small hammer 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.

f. Checking bushes

Check the clearance between the armature shaft and the bush. If it exceeds 0.2 mm (0.008 in), replace the bush.

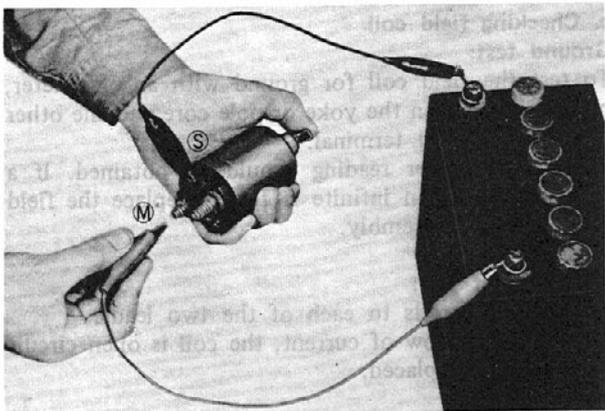


Fig. 5-29

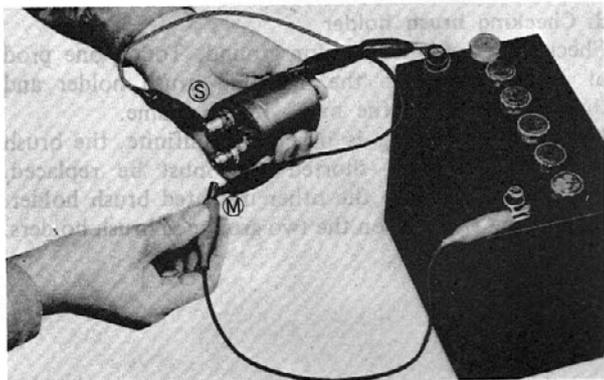


Fig. 5-30

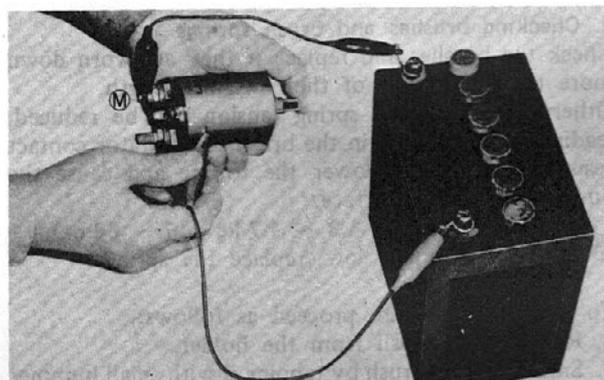


Fig. 5-31

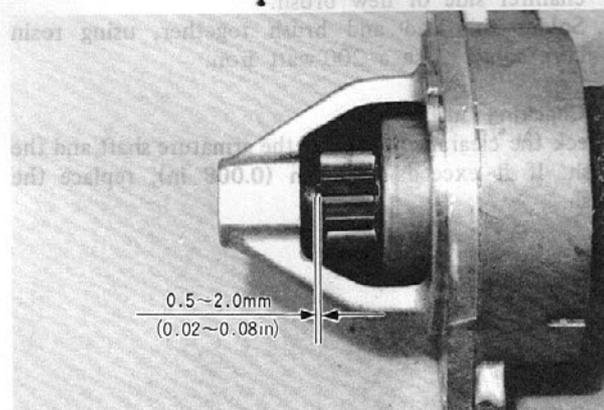


Fig. 5-32

5-C-6. Magnetic Switch Test

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.

b. Holding coil test

Ground the "M" terminal to the magnetic switch body with a lead and impose the specified voltage (12 V) 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.

c. Return test

Push in the plunger by hand and apply the specified voltage (12 V) between the "M" terminal and the magnetic switch body. If the plunger is not attracted, there is no trouble.

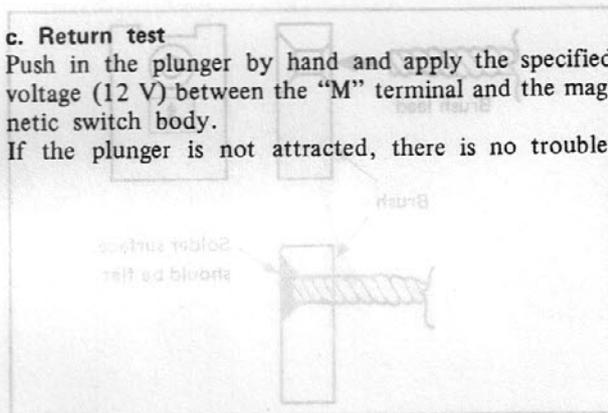


Fig. 5-27

5-C-7. 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 0.2 ~ 0.5 mm (0.008 ~ 0.020 in) with a thrust washer on the rear end of the shaft.
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.

Fig. 5-28

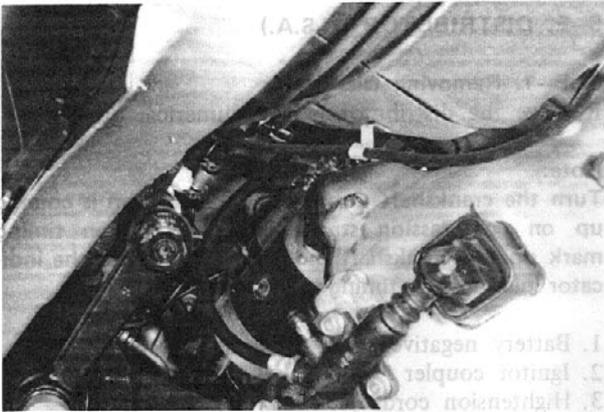


Fig. 5-33

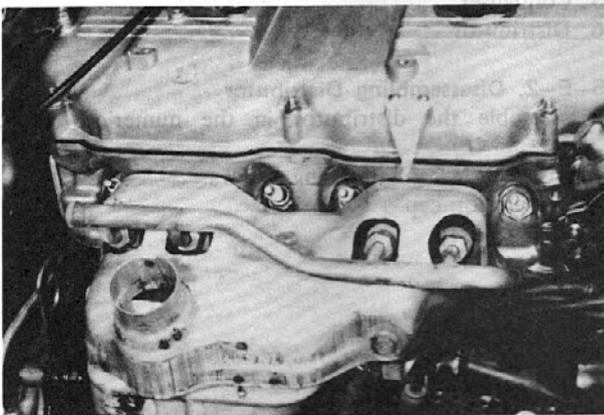


Fig. 5-34

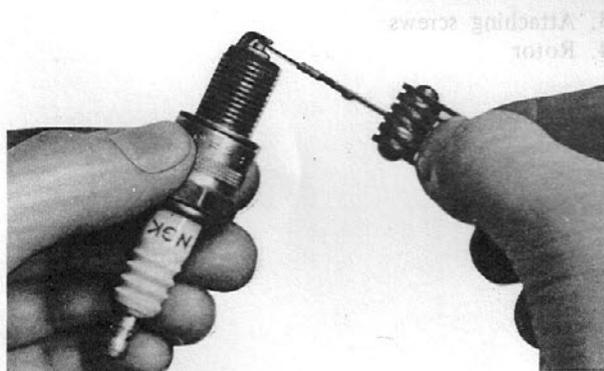


Fig. 5-35

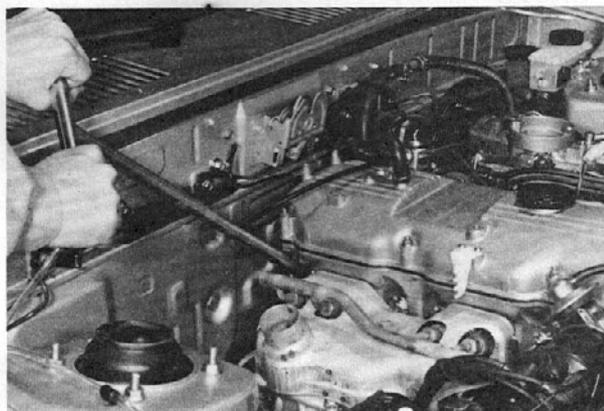
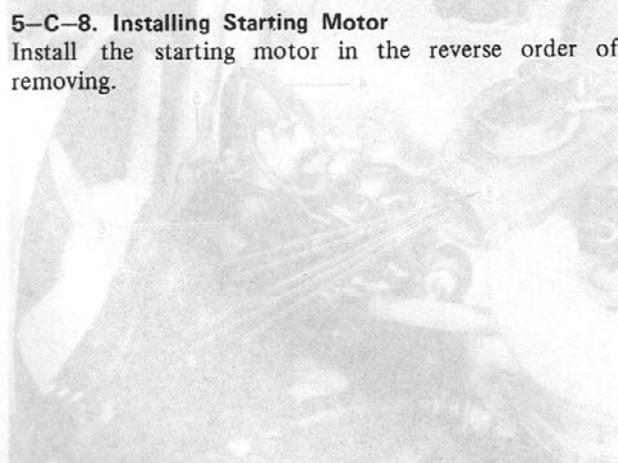


Fig. 5-36

5-C-8. Installing Starting Motor

Install the starting motor in the reverse order of removing.



5-D. SPARK PLUG

5-D-1. Removing Spark Plug

Note:

When removing the hightension cords from the spark plugs, grasp, twist and pull the moulded cap only. Do not pull on the cords because the wire connection inside the cap may become separated.

1. Disconnect the hightension cord from each spark plug.
2. After loosening each spark plug one or two turns, clean the area around each spark plug port with compressed air, then remove the spark plugs.

5-D-2. Checking Spark Plug

Check the spark plugs for burned and eroded electrode, black deposits, fouling, and cracked porcelain. 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. Measure the electrode gap of each spark plug with a wire gauge. If it is improper, adjust the gap to the specification by bending the outer electrode.

Spark plug gap	0.80 ± 0.05 mm (0.031 ± 0.002 in)
----------------	--------------------------------------

5-D-3. Installing Spark Plug

1. Apply a small amount of anti-seize compound or molybdenum based thread lubricant on the first few threads to prevent the threads from damaging.
2. Thread the spark plugs into the head finger tight until the gaskets contact the head.
If the plugs cannot be installed with finger pressure, clean the threads with a suitable greased thread chaser.
3. Tightening torque of the spark plug is 1.5 ~ 2.3 m·kg (11 ~ 17 ft·lb).
4. Connect the hightension cords to each spark plug.

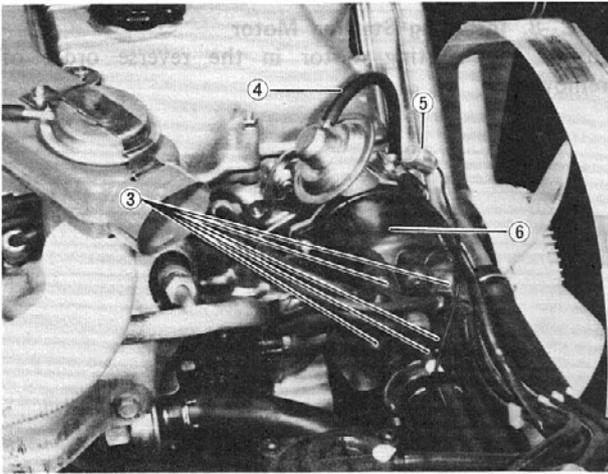


Fig. 5-37



Fig. 5-38

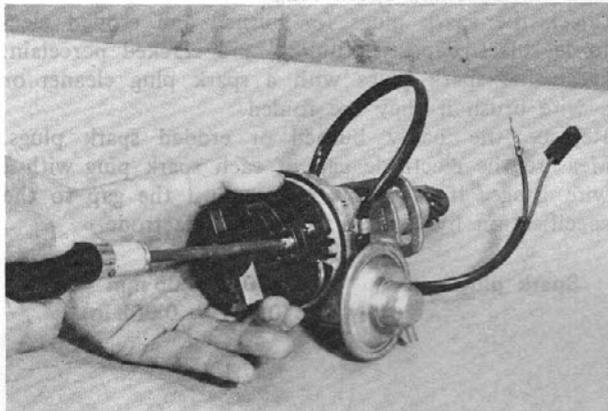


Fig. 5-39

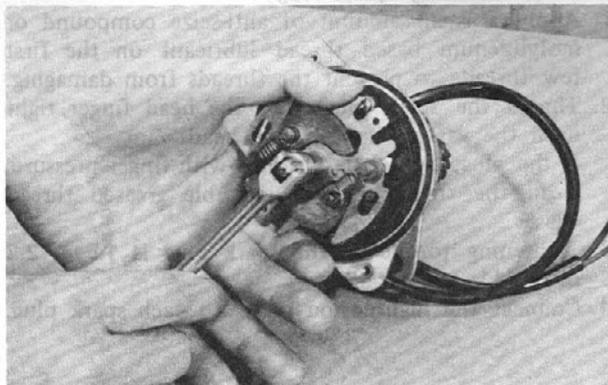


Fig. 5-40

5-E. DISTRIBUTOR (U.S.A.)

5-E-1. Removing Distributor

Remove the distributor in the numerical order.

Note:

Turn the crankshaft until the No. 1 position is coming up on compression stroke and the ignition timing mark on the crankshaft pulley is in line with the indicator pin on the timing chain cover.

1. Battery negative cable (disconnect)
2. Ignitor coupler
3. Hightension cords (disconnects)
4. Vacuum sensing tube (disconnect)
5. Condenser
6. Distributor

5-E-2. Disassembling Distributor

Disassemble the distributor in the numerical order.

1. Distributor cap attaching screws
2. Distributor cap

3. Attaching screws
4. Rotor

5. Governor set

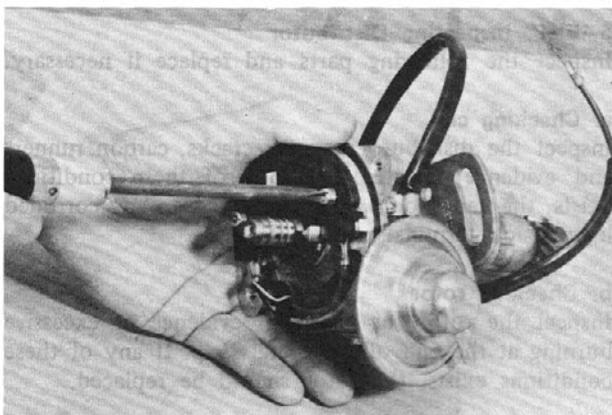


Fig. 5-41

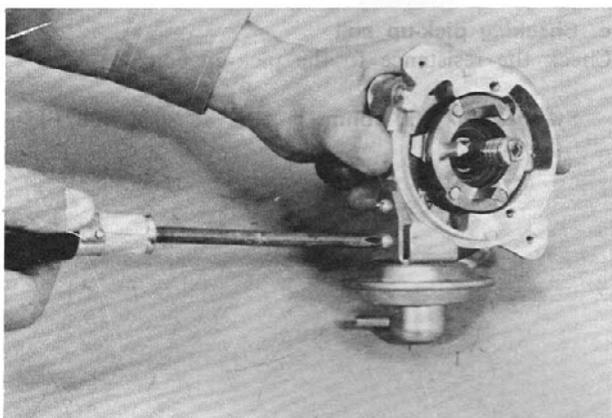


Fig. 5-42

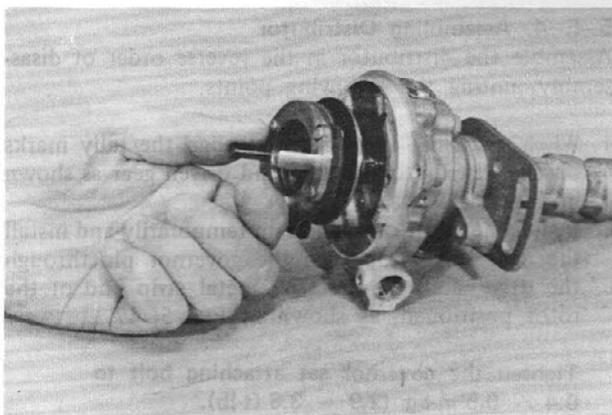


Fig. 5-43

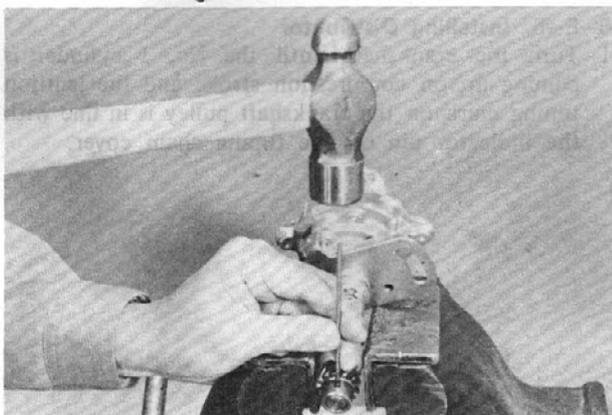


Fig. 5-44

6. Pick-up coil and ignitor assembly.

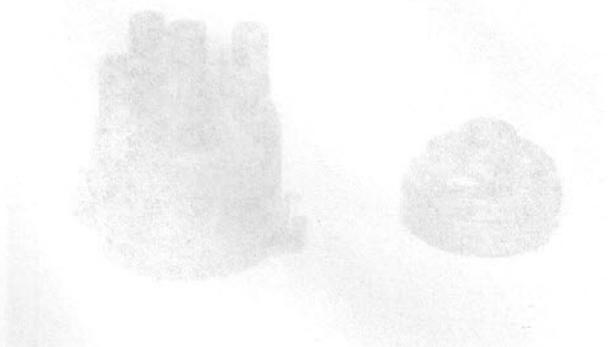


Fig. 5-45

7. Remove the clip holding the vacuum diaphragm link. Then, remove the screws attaching the vacuum control unit to the housing and remove the vacuum control unit.

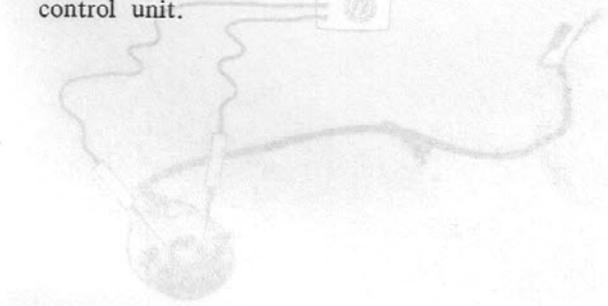


Fig. 5-46

8. Loosen the screws attaching the signal plate and remove the signal plate.



Fig. 5-47

9. Loosen the screws attaching plate and remove the plate.

10. Drive the retaining pin out of the driver gear with a drift and remove the gear.

11. Remove the drive shaft assembly through the top of the distributor housing.

12. Oil seal



Fig. 5-48

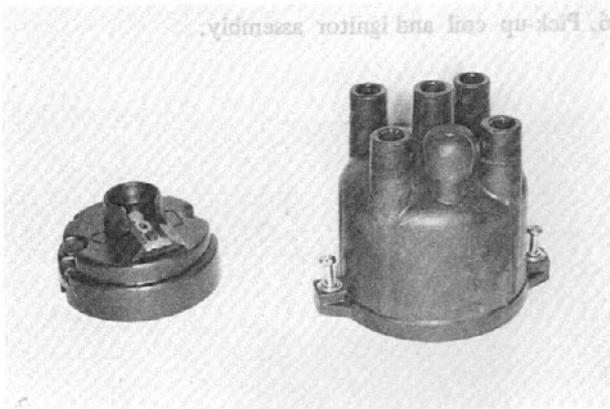


Fig. 5-45

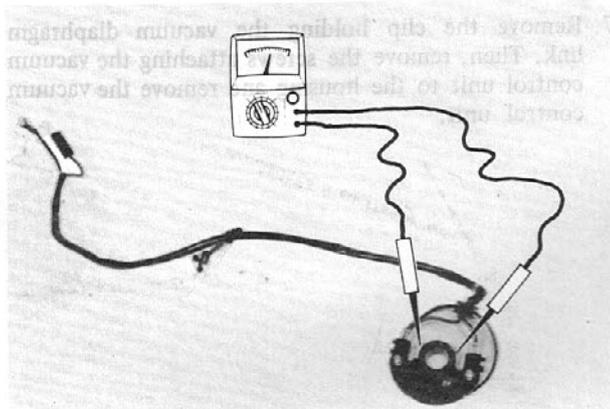


Fig. 5-46

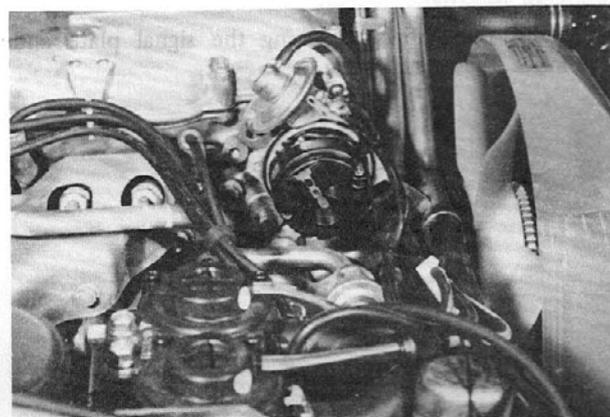


Fig. 5-47

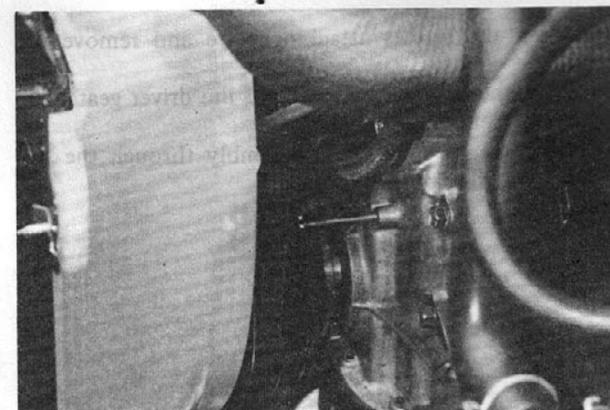


Fig. 5-48

5-E-3. Inspecting Distributor

Inspect the following parts and replace if necessary.

a. Checking cap

Inspect the distributor cap for cracks, carbon runners and evidence of arcing. If any of these conditions exists, the cap should be replaced. Clean any corroded hightension terminals.

b. Checking rotor

Inspect the rotor for cracks or evidence of excessive burning at the end of the metal strip. If any of these conditions exists, the rotor should be replaced.

c. Checking pick-up coil

Check the resistance to the pick-up coil.

Standard 1,050 ohms \pm 10% at 20°C (68°F)

5-E-4. Assembling Distributor

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

1. When installing the cam, first align the tally marks on the distributor housing and driven gear as shown in Fig. 5-49.
Install the rotor onto the cam temporarily and install the cam and rotor onto the governor pin through the drive shaft so that the metal strip end of the rotor positioned, as shown in Fig. 5-47.

Tighten the governor set attaching bolt to 0.4 ~ 0.5 m·kg (2.9 ~ 3.6 ft·lb).

5-E-5. Installing Distributor

1. Turn the crankshaft until the No. 1 cylinder is coming up on compression stroke and the ignition timing mark on the crankshaft pulley is in line with the indicator pin on the timing chain cover.

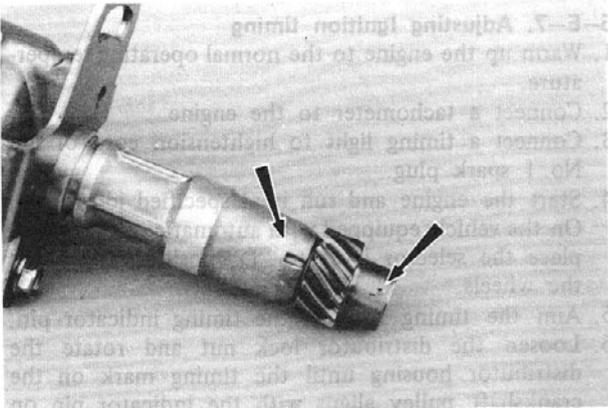


Fig. 5-49

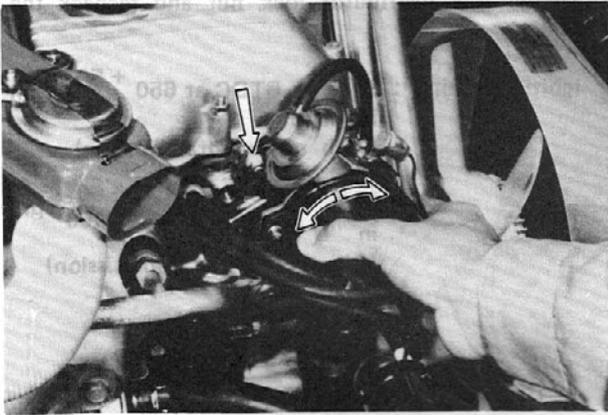
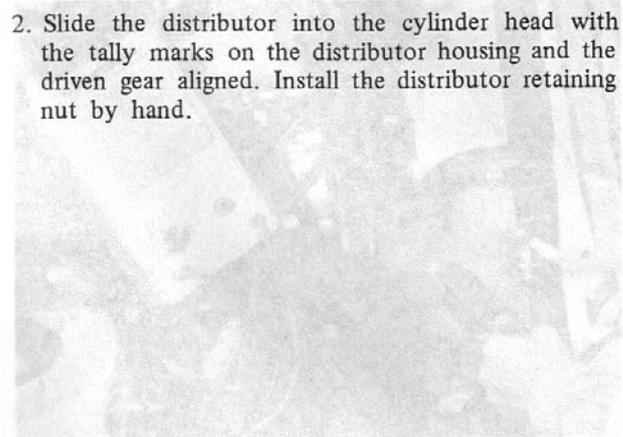


Fig. 5-50

2. Slide the distributor into the cylinder head with the tally marks on the distributor housing and the driven gear aligned. Install the distributor retaining nut by hand.



3. Install the distributor cap.
4. Install the high-tension cords and connect the primary wire coupler.
5. Connect the vacuum sensing tube to the vacuum control unit.
6. Adjust the ignition timing as described in Par. 5-E-7, then tighten the distributor attaching nut.

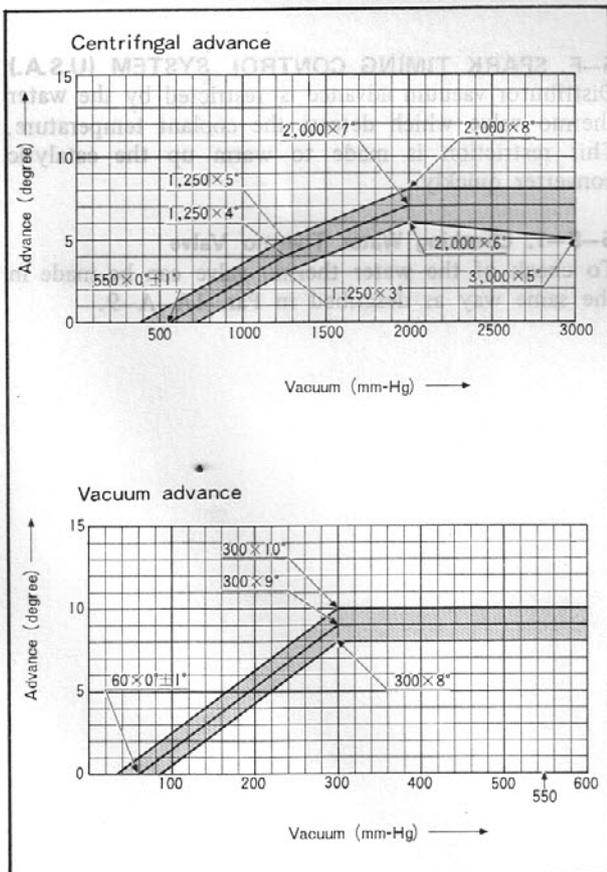
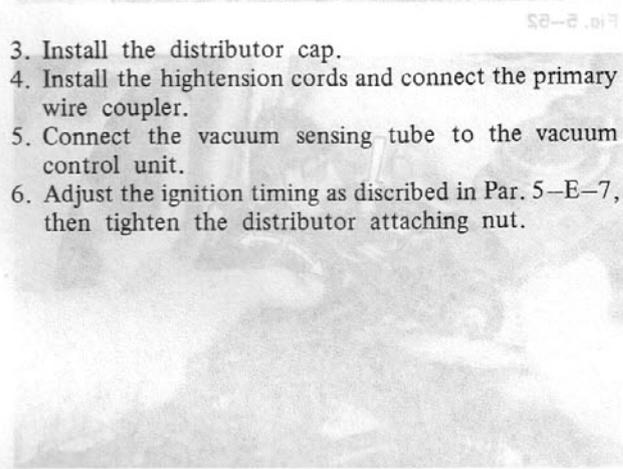


Fig. 5-51

5-E-6. Testing Distributor

a. Advance test

To test the ignition advancing characteristic of the distributor tester. The advancing characteristic of distributor should be within the range shown in Fig. 5-51.

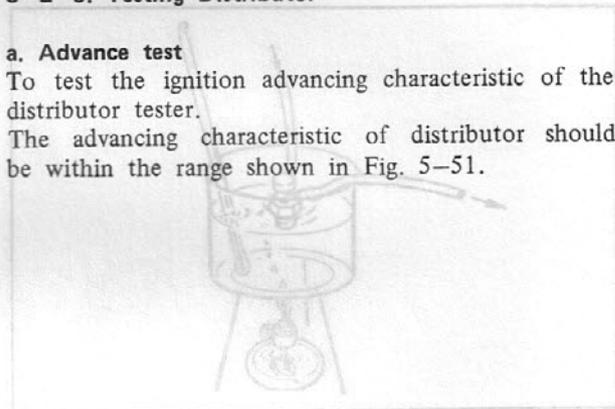


Fig. 5-52

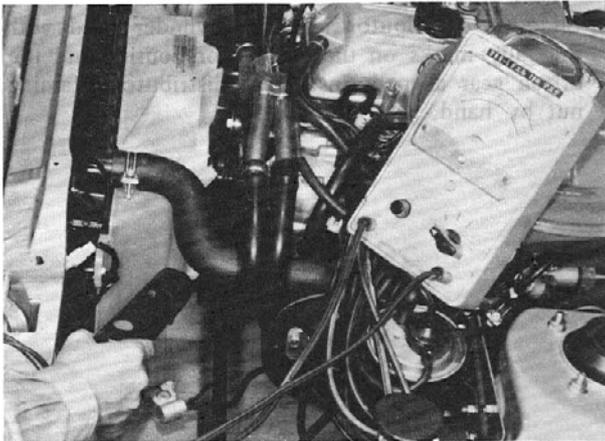


Fig. 5-52

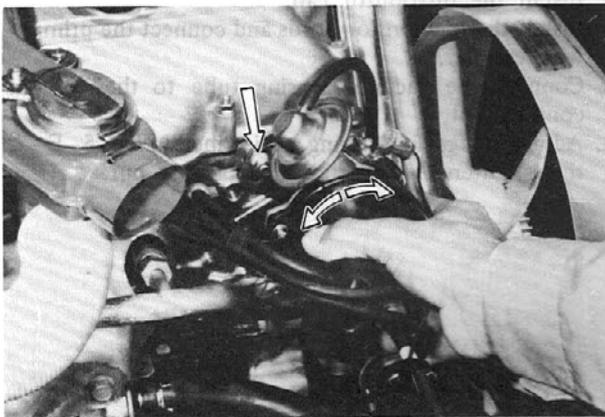


Fig. 5-53

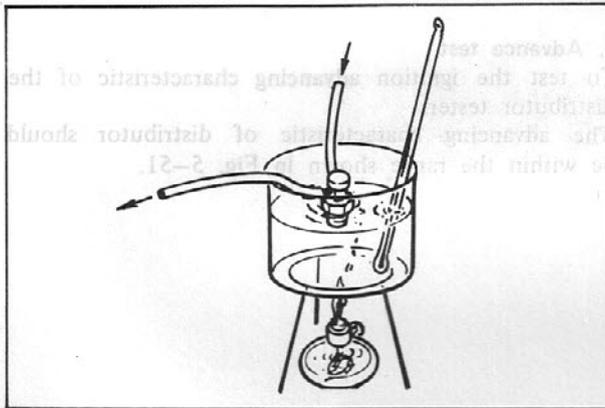


Fig. 5-54

5-E-7. Adjusting Ignition timing

1. Warm up the engine to the normal operating temperature.
2. Connect a tachometer to the engine.
3. Connect a timing light to hightension cord of the No. 1 spark plug.
4. Start the engine and run it at specified idle speed. On the vehicle equipped with automatic transmission, place the selector lever to "D" position and block the wheels.
5. Aim the timing light at the timing indicator pin.
6. Loosen the distributor lock nut and rotate the distributor housing until the timing mark on the crankshaft pulley aligns with the indicator pin on the timing chain cover.
7. Tighten the distributor lock nut and recheck the timing.

Ignition timing : $5^{\circ} \pm 1^{\circ}$ BTDC at $650 \begin{matrix} + 50 \\ -100 \end{matrix}$ rpm
in neutral
(with manual transmission)

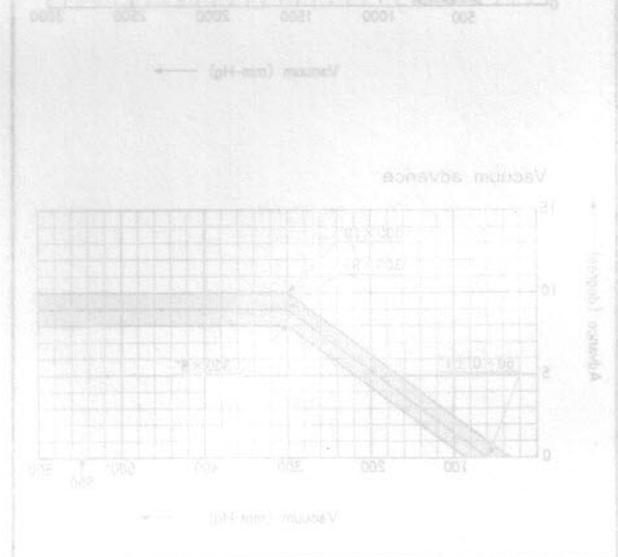
$5^{\circ} \pm 1^{\circ}$ BTDC at $650 \begin{matrix} + 50 \\ -100 \end{matrix}$ rpm
in "D" position
(with automatic transmission)

5-F. SPARK TIMING CONTROL SYSTEM (U.S.A.)

Distributor vacuum advance is restricted by the water thermo valve which detects the coolant temperature. This restriction is made to warm up the catalytic converter quickly.

5-F-1. Checking Water Thermo Valve

To check of the water thermo valve can be made in the same way as described in Par. 1A-A-9.



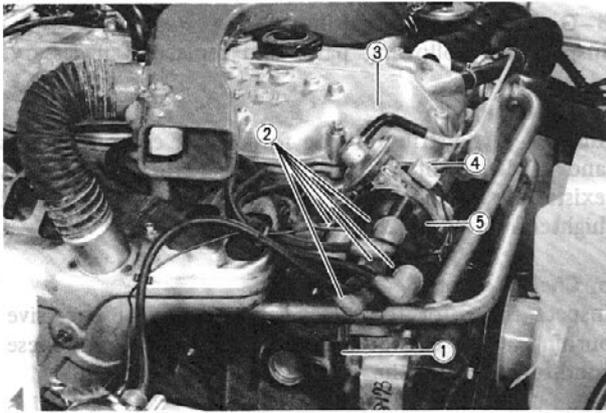


Fig. 5-55

5-G. DISTRIBUTOR (Canada)

5-G-1. Removing Distributor

Remove the distributor in the numerical order.

1. Pick-up coil coupler (disconnect)
2. Hightension cords (disconnect)
3. Vacuum sensing tube (disconnect)
4. Condenser
5. Distributor

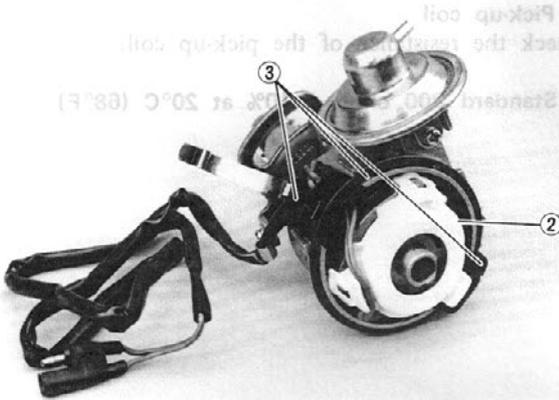


Fig. 5-56

5-G-2. Disassembling Distributor

Disassemble the distributor in the numerical order.

1. Distributor cap and rotor
2. Cover
3. Rubber seal and grommet

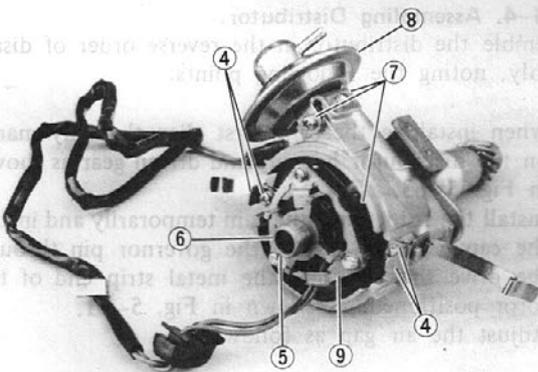


Fig. 5-57

4. Retaining clips and screws
5. Retaining pin
6. Signal rotor
7. Clip and screws (vacuum control unit)
8. Vacuum control unit
9. Pick-up coil assembly

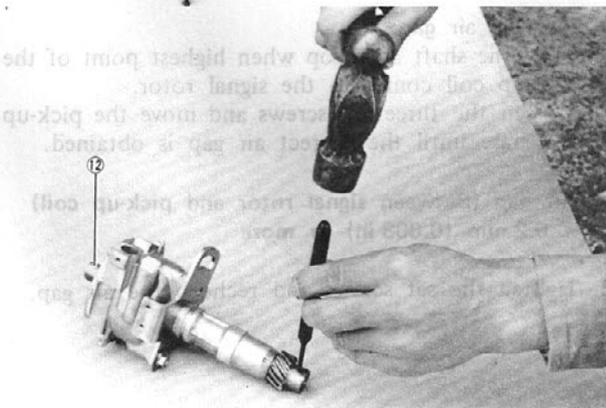


Fig. 5-58

10. Retaining pin
11. Driven gear
12. Governor and drive shaft assembly

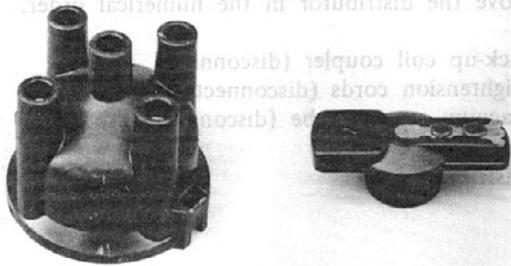


Fig. 5-59

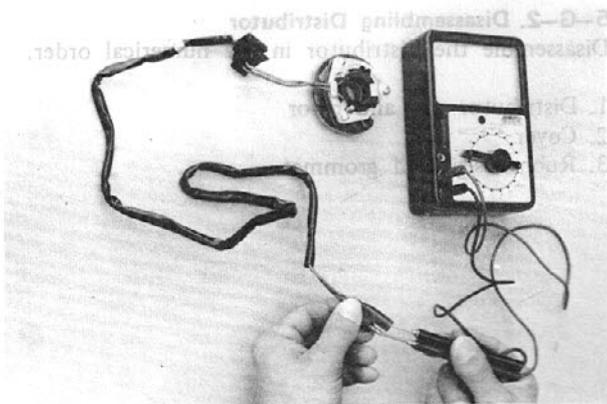


Fig. 5-60

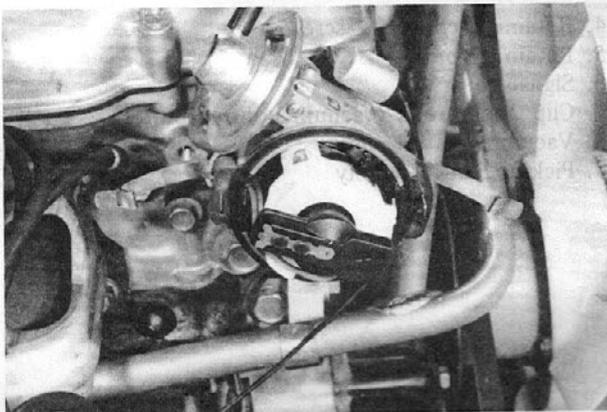


Fig. 5-61

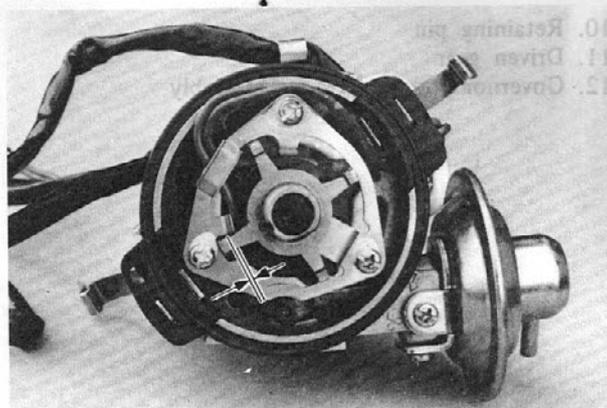


Fig. 5-62

5-G-3. Inspecting Distributor

Inspect the following parts and replace if necessary.

a. Checking cap

Inspect the distributor cap for cracks, carbon runners and evidence of arcing. If any of these conditions exists, the cap should be replaced. Clean any corroded hightension terminals.

b. Checking rotor

Inspect the rotor for cracks or evidence of excessive burning at the end of the metal strip. If any of these conditions exists, the rotor should be replaced.

c. Pick-up coil

Check the resistance of the pick-up coil.

Standard 800 ohms \pm 10% at 20°C (68°F)

5-G-4. Assembling Distributor

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

1. When installing the cam, first align the tally marks on the distributor housing and driven gear as shown in Fig. 5-63. Install the rotor onto the cam temporarily and install the cam and rotor onto the governor pin through the drive shaft so that the metal strip end of the rotor positioned, as shown in Fig. 5-61.
2. Adjust the air gap as follows:

Adjust the air gap:

1. Turn the shaft and stop when highest point of the pick-up coil comes to the signal rotor.
2. Loosen the three set screws and move the pick-up coil base until the correct air gap is obtained.

Air gap (Between signal rotor and pick-up coil)
0.2 mm (0.008 in) or more

3. Tighten the set screws and recheck the air gap.

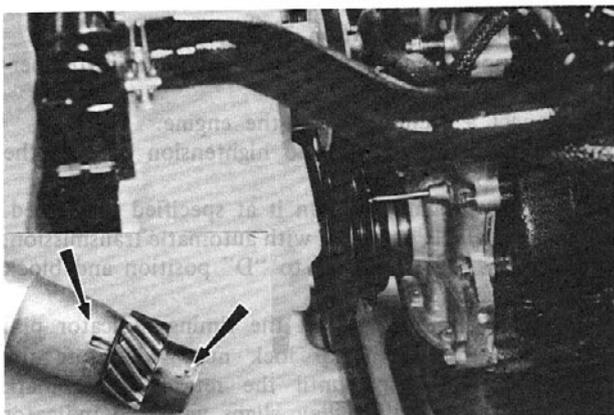


Fig. 5-63

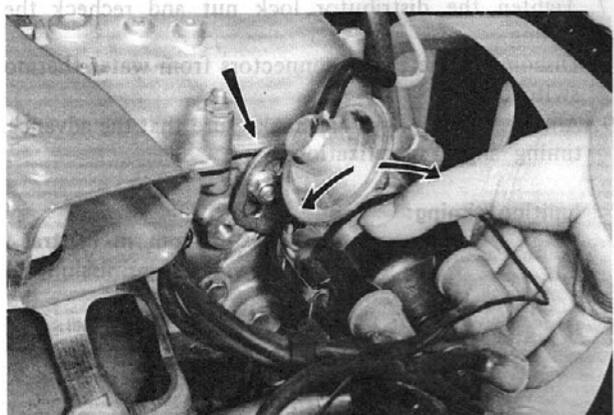


Fig. 5-64

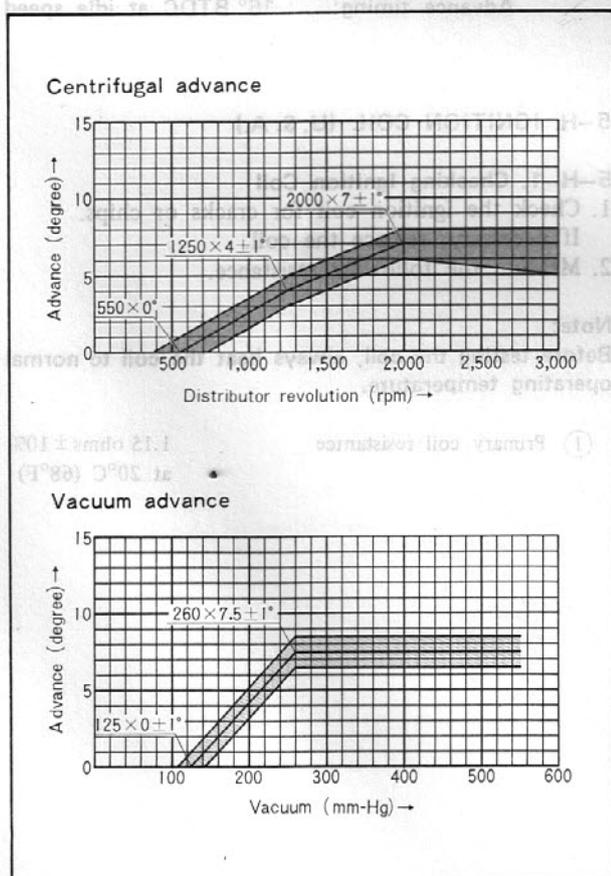


Fig. 5-65

5-G-5. Installing Distributor

1. Turn the crankshaft until the No. 1 cylinder is coming up on compression stroke and the ignition timing mark on the crankshaft pulley is in line with the indicator pin on the timing chain cover.
2. Slide the distributor into the cylinder head with the tally marks on the distributor housing and the driven gear aligned. Install the distributor retaining nut by hand.

3. Install the distributor rotor and cap.
4. Install the hightension cords and connect the primary wire coupler.
5. Connect the vacuum sensing tube to the vacuum control unit.
6. Adjust the ignition timing as described in Par. 5-G-7, then tighten the distributor attaching nut.

5-G-6. Testing Distributor

a. Advance test

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

The advancing characteristic of distributor should be **within the range** shown in Fig. 5-65.

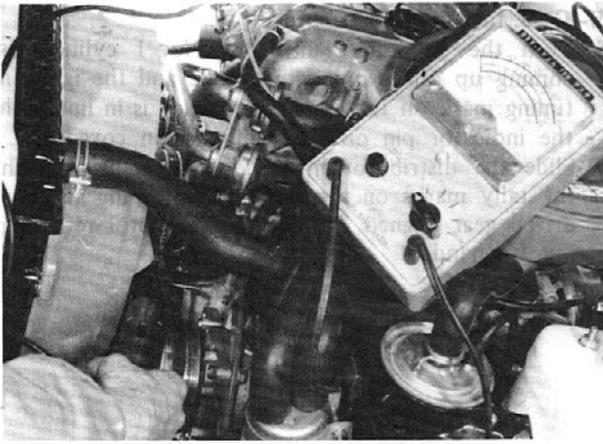


Fig. 5-66

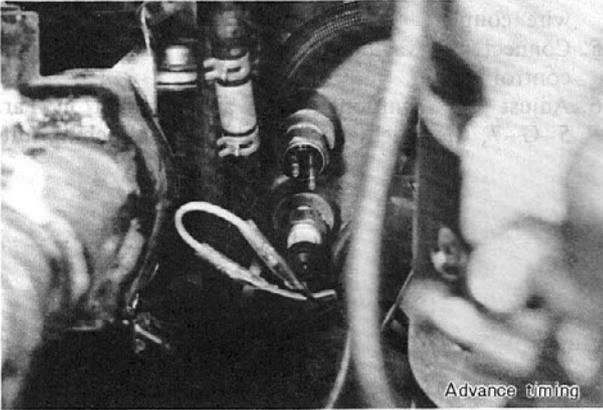


Fig. 5-67

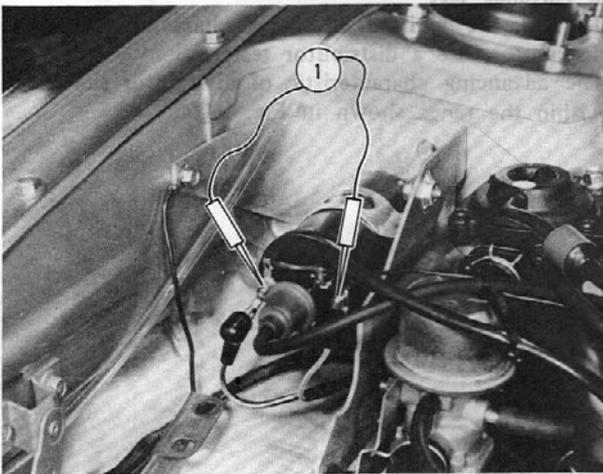


Fig. 5-68

5-G-7. Adjusting Ignition Timing

1. Warm up the engine to the normal operating temperature.
2. Connect a tachometer to the engine.
3. Connect a timing light to high-tension cord of the No. 1 spark plug.
4. Start the engine and run it at specified idle speed. On the vehicle equipped with automatic transmission, place the selector lever to "D" position and block the wheels.
5. Aim the timing light at the timing indicator pin.
6. Loosen the distributor lock nut and rotate the distributor housing until the retard timing mark on the crankshaft pulley aligns with the indicator pin on the timing chain cover.
7. Tighten the distributor lock nut and recheck the timing.
8. Disconnect the bullet connectors from water thermo switch.
9. Aim the timing light and make sure that the advance timing aligns specifications.

Ignition timing: $8^{\circ} \pm 1^{\circ}$ BTDC
 at 650 ± 50 rpm in neutral
 (with manual transmission)

$8^{\circ} \pm 1^{\circ}$ BTDC
 at 650 ± 50 rpm in "D"
 position
 (with automatic transmission)

Advance timing: 16° BTDC at idle speed

5-H. IGNITION COIL (U. S. A.)

5-H-1. Checking Ignition Coil

1. Check the ignition coil for cracks or chips. If necessary, replace the coil.
2. Measure the following resistance.

Note:

Before testing the coil, always heat the coil to normal operating temperature.

- ① Primary coil resistance $1.15 \text{ ohms} \pm 10\%$
 at 20°C (68°F)

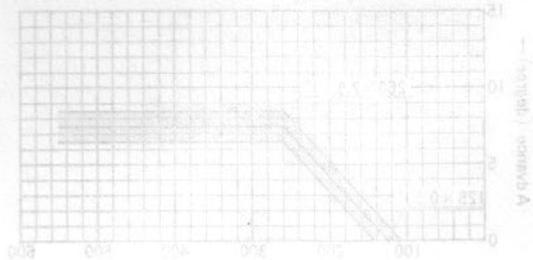


Fig. 5-65

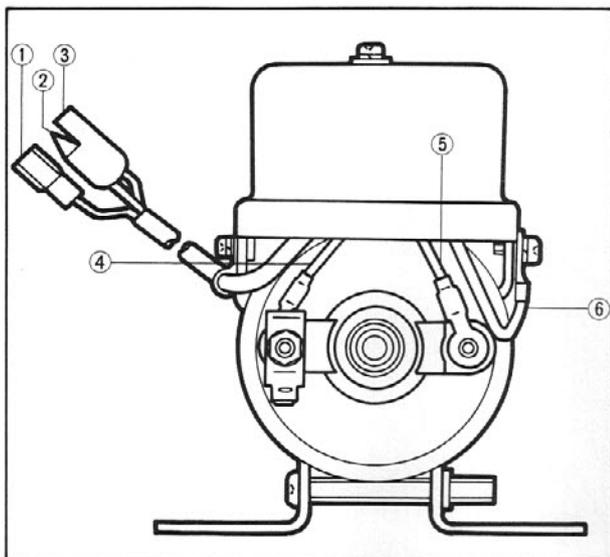


Fig. 5-69

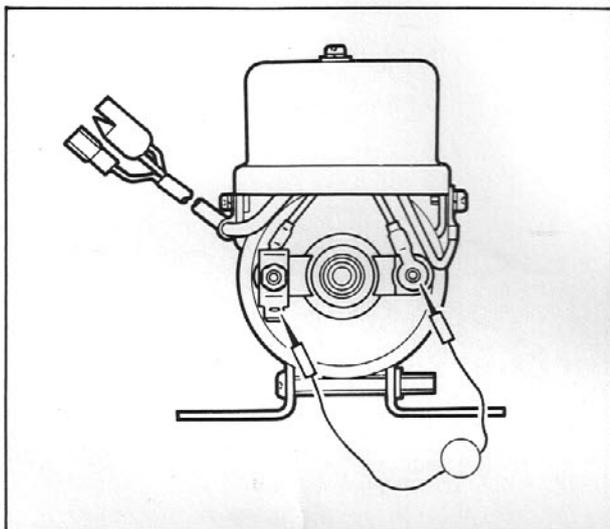


Fig. 5-70

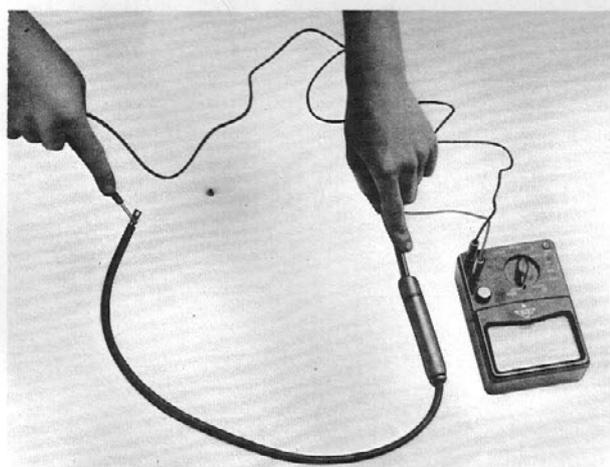


Fig. 5-71

5-I. IGNITION COIL & IGNITOR (Canada)

5-I-1. Wire connections

No.	Color code	Connections
①	L	To water thermo switch
②	R	To distributor (+)
③	G	To distributor (-)
④	Y	To ignition coil (-)
⑤	R/W	To fuse (1G) ignition coil (+)
⑥	B	Earth

5-I-2. Checking Ignition Coil

1. Check the ignition coil for cracks or chips.
If necessary, replace the coil.
2. Measure the following resistance.

Note :

Before testing the coil, always heat the coil to normal operating temperature.

① Primary coil resistance	0.9 ohms \pm 10%
---------------------------	--------------------

5-J. HIGHTENSION CORD

5-J-1. Checking Resistance

Check the resistance of each high-tension cord.
The resistance should not exceed 16,000 ohms \pm 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. The probe may cause a separation in the conductor.
- 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 cords because the wire connection inside the cap may become separated or the insulator may be damaged.

CLUTCH

6-A. CLUTCH PEDAL	6 : 1
6-A-1. Removing Clutch Pedal	6 : 1
6-A-2. Checking Clutch Pedal	6 : 1
6-A-3. Installing Clutch Pedal	6 : 1
6-A-4. Adjusting Clutch Pedal	6 : 1
6-B. CLUTCH REMOVAL	6 : 2
6-C. CLUTCH INSPECTION	6 : 2
6-C-1. Checking Release Bearing and Fork	6 : 2
6-C-2. Checking Pressure Plate and Cover Assembly	6 : 2
6-C-3. Checking Clutch Disc	6 : 3
6-C-4. Checking Flywheel	6 : 3
6-C-5. Replacing Ring Gear	6 : 3
6-C-6. Checking Pilot Bearing	6 : 3
6-D. CLUTCH INSTALLATION	6 : 4
6-E. CLUTCH MASTER CYLINDER	6 : 4
6-E-1. Removing Clutch Master Cylinder	6 : 4
6-E-2. Disassembling Clutch Master Cylinder	6 : 4
6-E-3. Checking Clutch Master Cylinder	6 : 5
6-E-4. Assembling Clutch Master Cylinder	6 : 5
6-E-5. Installing Clutch Master Cylinder	6 : 5
6-F. CLUTCH RELEASE CYLINDER	6 : 5
6-F-1. Removing Clutch Release Cylinder	6 : 5
6-F-2. Disassembling Clutch Master Cylinder	6 : 6
6-F-3. Checking Clutch Master Cylinder	6 : 6
6-F-4. Assembling Clutch Master Cylinder	6 : 6
6-F-5. Installing Clutch Master Cylinder	6 : 6
6-G. AIR BLEEDING	6 : 6
SPECIAL TOOLS	6 : 6

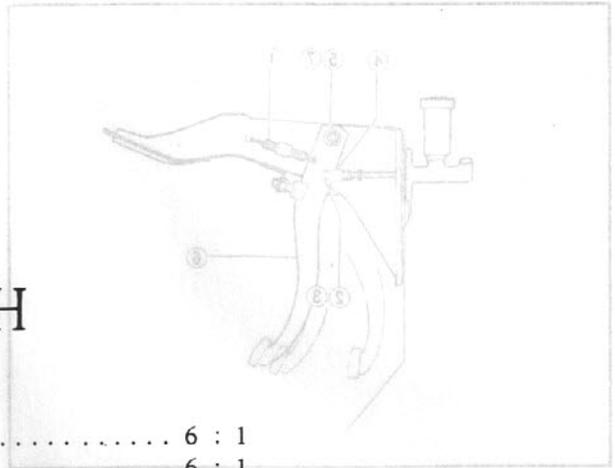


Fig. 6-1

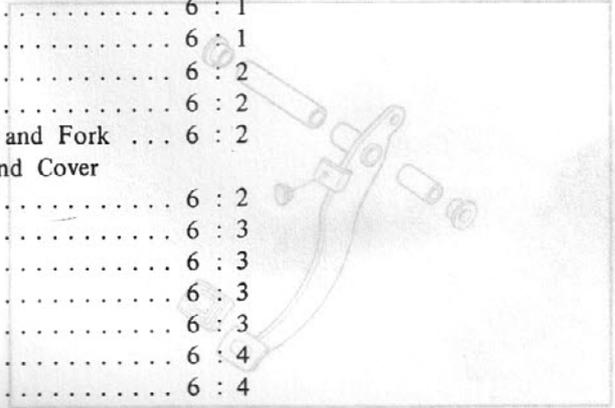


Fig. 6-2

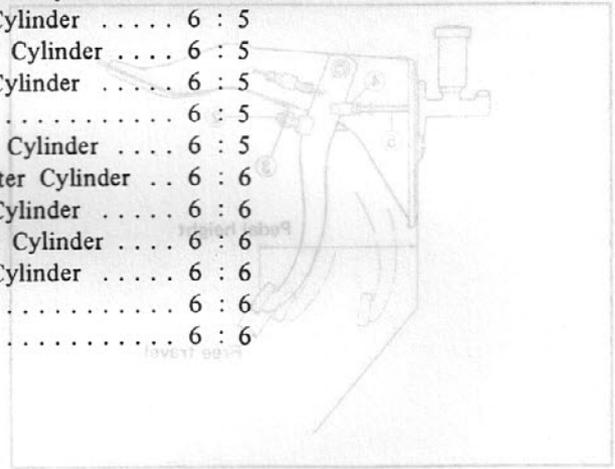


Fig. 6-3

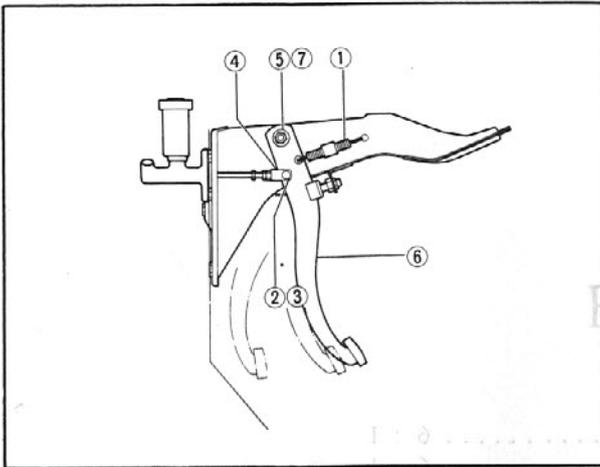


Fig. 6-1

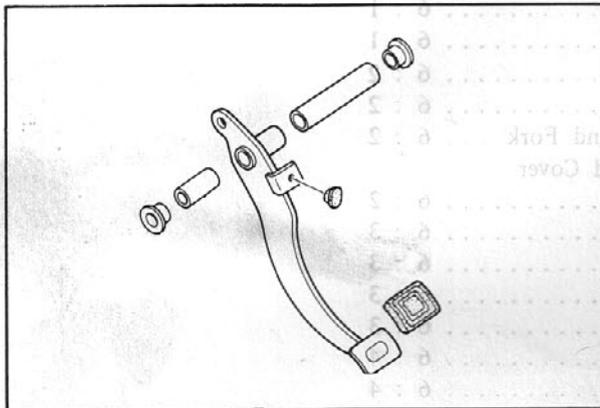


Fig. 6-2

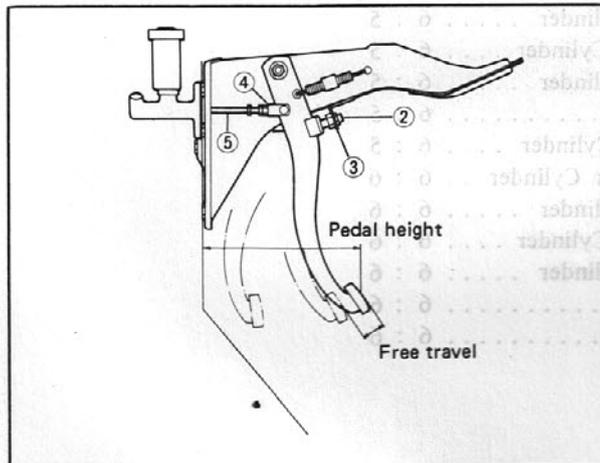


Fig. 6-3

6-A. CLUTCH PEDAL

6-A-1. Removing Clutch Pedal

Remove the following parts.

1. Return spring
2. Split pin
3. Joint pin
4. Fork end (disconnect)
5. Nut
6. Clutch pedal
7. Bushings

6-A-2. Checking Clutch Pedal

Check the clutch pedal and bushings for wear or damage. If necessary, repair or replace.

6-A-3. Installing Clutch Pedal

Install the clutch pedal in the reverse order of removing.

Note:

Before installing clutch pedal, apply grease on the bushings.

6-A-4. Adjusting Clutch Pedal

To adjust the pedal height, loosen the lock nut (3) and turn the stopper bolt (2) until the proper adjustment is made.

Tighten the lock nut after adjustment is completed.

$$\text{Pedal height } 193 \begin{matrix} +5 \\ -0 \end{matrix} \text{ mm } \left(7.60 \begin{matrix} +0.2 \\ -0 \end{matrix} \text{ in} \right)$$

To adjust the pedal free travel between the master cylinder push rod and piston, loosen the lock nut (4) and turn the push rod (5) until the proper adjustment is made.

Tighten the lock nut after adjustment is completed.

$$\text{Pedal free travel } 0.5 \sim 3.0 \text{ mm } (0.02 \sim 0.12 \text{ in}) \\ \text{(at the pedal pad)}$$

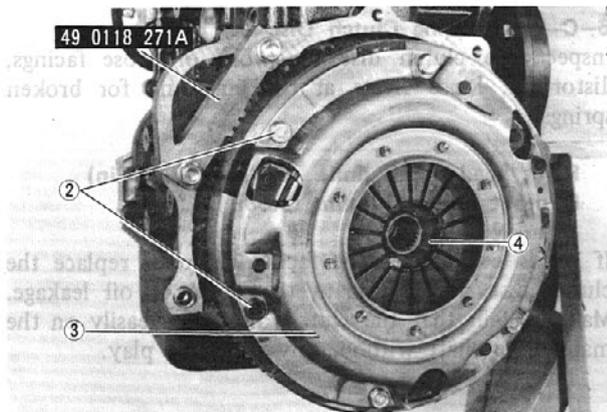


Fig. 6-4

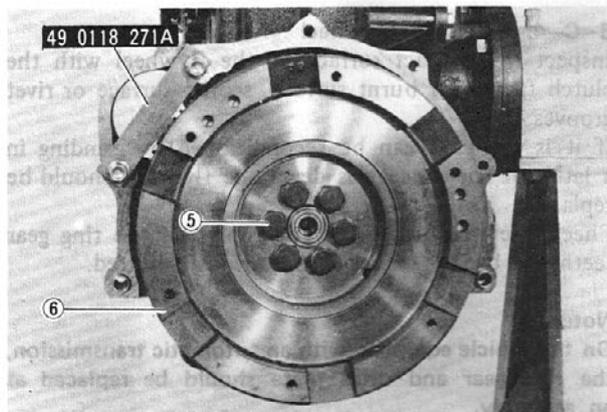


Fig. 6-5



Fig. 6-6

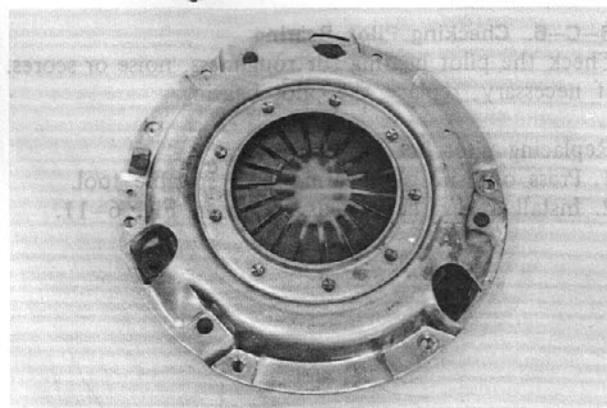


Fig. 6-7

6-B. CLUTCH REMOVAL

Remove the following parts in the numerical order.

1. Transmission (refer to Par. 7A-A)
2. Four bolts and two reamer bolts
Use the **brake** (49 0118 271A)
3. Pressure plate and cover assembly
4. Clutch disc

5. Flywheel attaching bolts
6. Flywheel
7. Release fork and bearing

6-C. CLUTCH INSPECTION

6-C-1. Checking Release Bearing and Fork

Note:

The release bearing is prelubricated 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 clutch fork for crack or bend. If necessary, replace the clutch fork.

6-C-2. Checking Pressure Plate and Cover Assembly

Check the contact surfaces of the pressure plate with the clutch facing for wear, damage or warpage.

If it is slight, correct it by lapping with compound or by turning a lathe. But if 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.

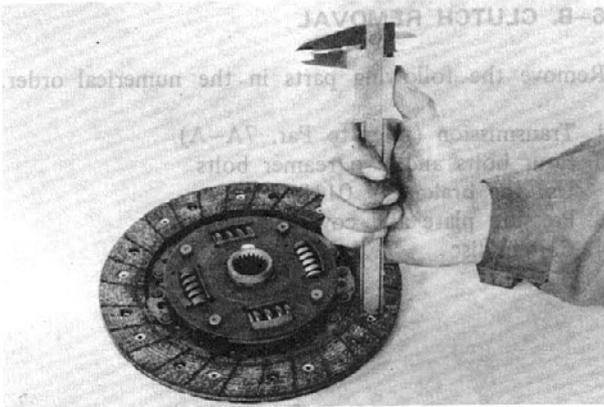


Fig. 6-8



Fig. 6-9

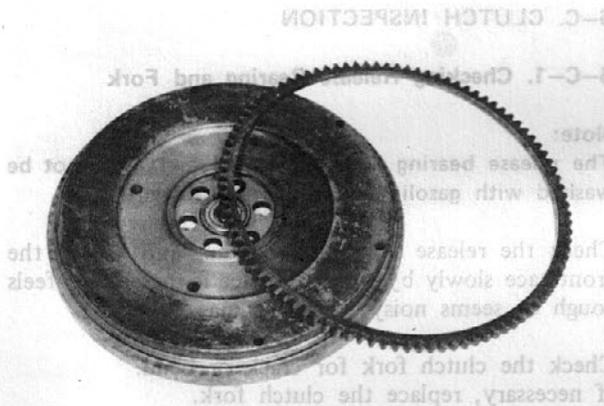


Fig. 6-10

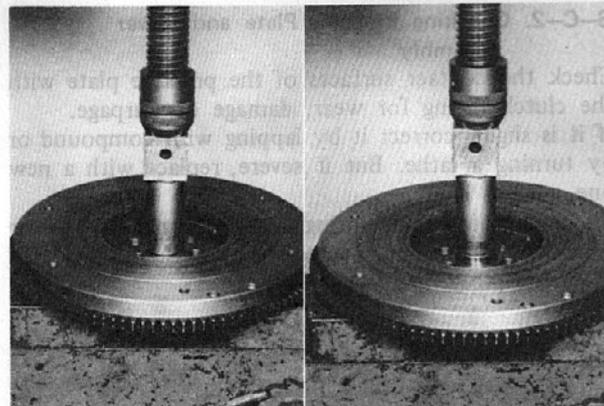


Fig. 6-11

6-C-3. Checking Clutch Disc

Inspect the clutch disc for worn or loose facings, 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.

6-C-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 in 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.

Note:

On the vehicle equipped with an automatic transmission, the ring gear and drive plate should be replaced as an assembly.

6-C-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 engine.
4. Allow the ring gear to cool slowly to shrink it onto the flywheel.

6-C-6. Checking Pilot Bearing

Check the pilot bearing for roughness, noise or scores. If necessary, replace the pilot bearing.

Replacing pilot bearing as follows.

1. Press out the old bearing with suitable tool.
2. Install a new bearing as shown in Fig. 6-11.

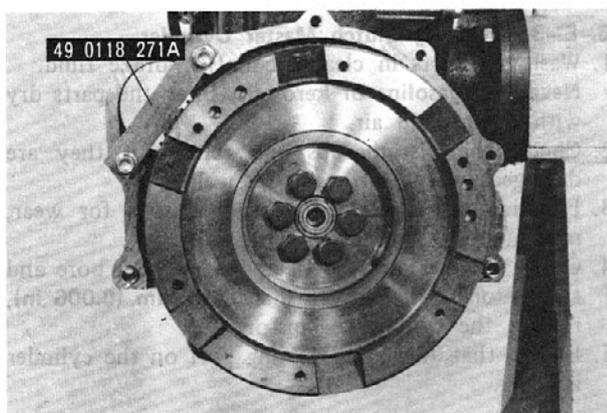


Fig. 6-12



Fig. 6-13

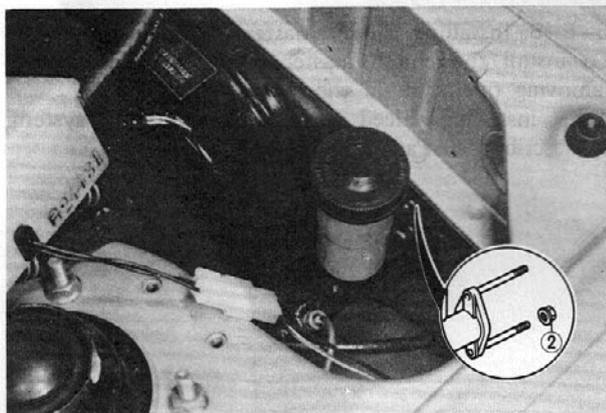


Fig. 6-14

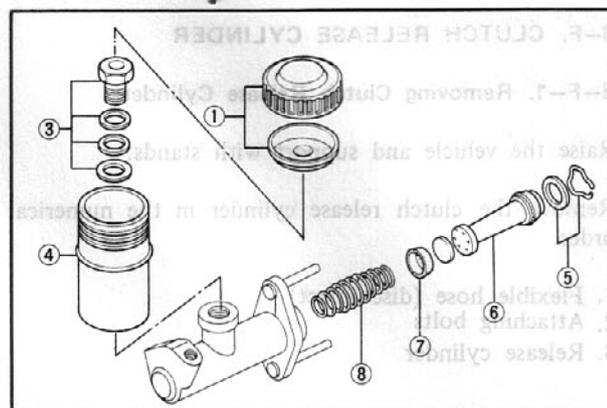


Fig. 6-15

6-D. CLUTCH INSTALLATION

Install the clutch in the reverse order of removal.

When tightening the bolts, use a ring gear brake (49 0118 271A) to lock the flywheel.

Tightening torque 15.5 ~ 16.3 m·kg
(112 ~ 117 ft·lb)

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

Install the clutch cover and pressure plate assembly, aligning the reamer hole on the flywheel and the pilot bolt hole (marked by a small hole) on the clutch cover and install the 2 reamer bolts and 4 standard bolts finger tight. Then torque the bolts to specifications.

6-E. CLUTCH MASTER CYLINDER

6-E-1. Removing Clutch Master Cylinder

Remove the following parts in the numerical order.

1. Fluid pipe
Use the spanner (49 0259 770A)
2. Attaching nuts
3. Clutch master cylinder

Note:

Never allow the fluid to drop on any painted surface.

6-E-2. Disassembling Clutch Master Cylinder

Disassemble the clutch master cylinder in the numerical order.

1. Reservoir cap and fluid baffle
2. Brake fluid (drain)
3. Connector bolt and washers
4. Reservoir tank
5. Piston stop ring and washer
6. Piston and secondary cup assembly
7. Primary piston cup
8. Return spring

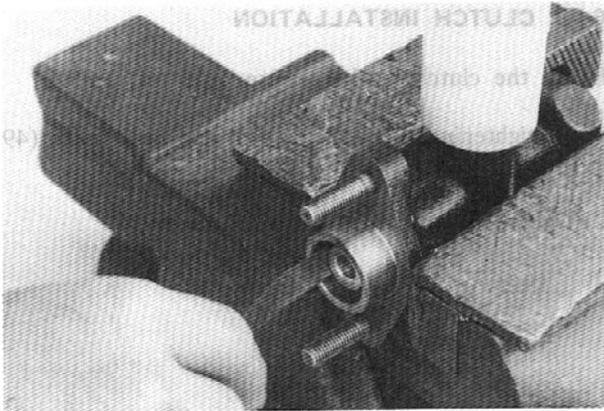


Fig. 6-16

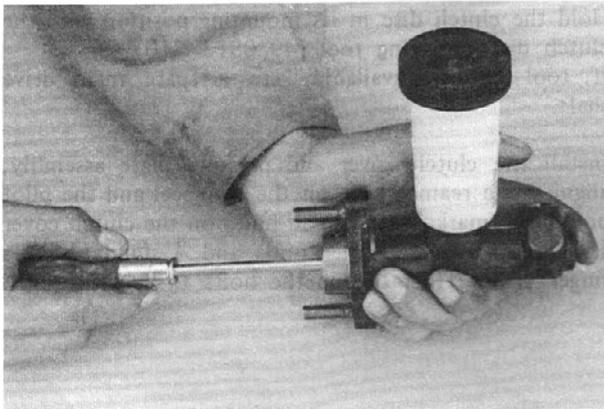


Fig. 6-17



Fig. 6-18

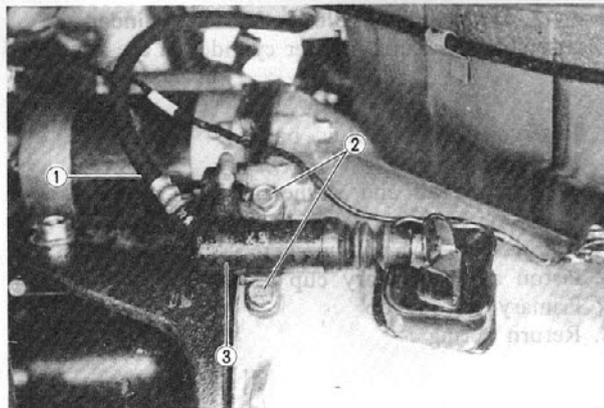


Fig. 6-19

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 piston for wear, roughness or scoring.
4. Check the clearance between the cylinder bore and the piston. If it is **more than 0.15 mm (0.006 in)**, replace the cylinder or piston.
5. Ensure that the compensating port on the cylinder is open.

Fig. 6-15

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 with brake fluid and operate the piston with a screwdriver until the fluid is ejected at the outlet.

Fig. 6-13

6-E-5. Installing Clutch Master Cylinder

To install the clutch master cylinder, carry out the removing operation in the reverse order. After installing, bleed the clutch hydraulic system, as described in Par. 6-G.



Fig. 6-17

6-F. CLUTCH RELEASE CYLINDER

6-F-1. Removing Clutch Release Cylinder

Raise the vehicle and support with stands.

Remove the clutch release cylinder in the numerical order.

1. Flexible hose (disconnect)
2. Attaching bolts
3. Release cylinder

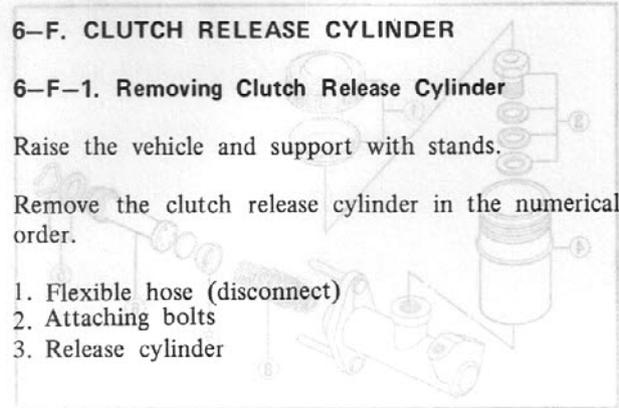


Fig. 6-18

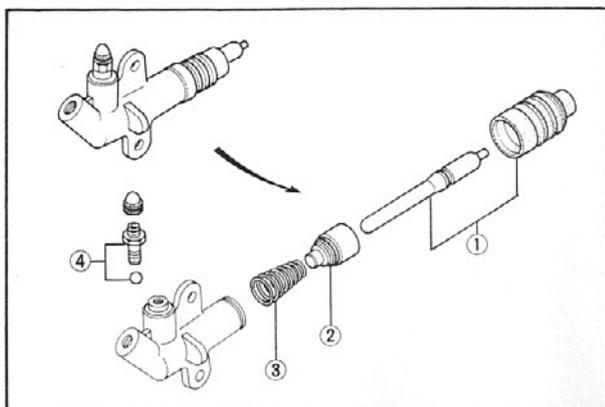


Fig. 6-20

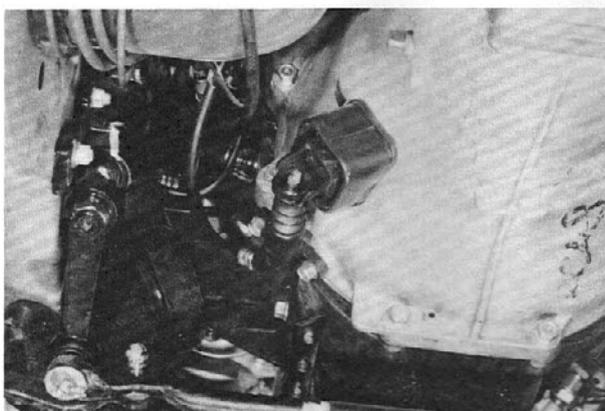


Fig. 6-21

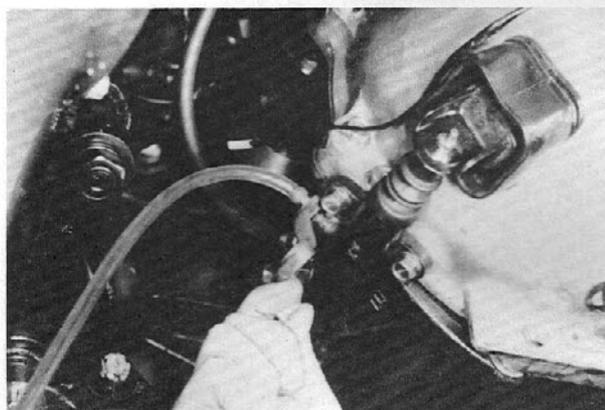


Fig. 6-22

SPECIAL TOOLS

49 0118 271A	Brake, ring gear
49 0813 310	Centering tool, clutch disc
49 0259 770A	Spanner, flare nut

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

Refer to Par. 6-E-3 and inspect the clutch release cylinder.

6-F-4. Assembling Clutch Release Cylinder

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

6-F-5. Installing Clutch Release Cylinder

To install the clutch release cylinder, carry out the removing operation in the reverse order. After installing, bleed the clutch hydraulic system, as described in Par. 6-G.

6-G. AIR BLEEDING

To bleed the clutch hydraulic system, proceed as follows:

1. Raise the vehicle and support 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 tube in the glass jar and submerge in brake fluid.
4. Open the bleeder valve. Depress the clutch pedal and allow it to return slowly. Continue this pumping action and watch the flow of fluid in the jar.
5. When air bubbles cease to appear, close the bleeder valve, remove the vinyl tube and fit the cap to the bleeder screw.
6. 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.
- c) Do not mix low temperature brake fluid with the specified fluid during the bleeding operation.

7A-A. TRANSMISSION REMOVAL

Remove and disconnect the following parts:

1. Gearshift lever knob
2. Console box
3. Gearshift lever boot and gearshift lever
4. Battery negative cable

Raise the vehicle and support with stands.



Fig. 7A-1

TRANSMISSION

(Five-speed)

7A-A. TRANSMISSION REMOVAL.....	7A : 1
7A-B. TRANSMISSION DISASSEMBLY.....	7A : 1
7A-C. TRANSMISSION INSPECTION.....	7A : 5
7A-C-1. Checking Transmission Case and Housing.....	7A : 5
7A-C-2. Checking Bearings.....	7A : 5
7A-C-3. Checking Gears.....	7A : 5
7A-C-4. Checking Main Shaft and Main Drive Shaft.....	7A : 5
7A-C-5. Checking Counter Shaft.....	7A : 6
7A-C-6. Checking Reverse Idle Gear and Shaft...	7A : 6
7A-C-7. Checking Synchronizer Mechanism.....	7A : 6
7A-C-8. Checking Control Lever, Shift Forks and Rods.....	7A : 6
7A-D. TRANSMISSION ASSEMBLY.....	7A : 7
7A-E. TRANSMISSION INSTALLATION.....	7A : 11
SPECIAL TOOLS.....	7A : 11

Remove the oil pan with a block of wood.

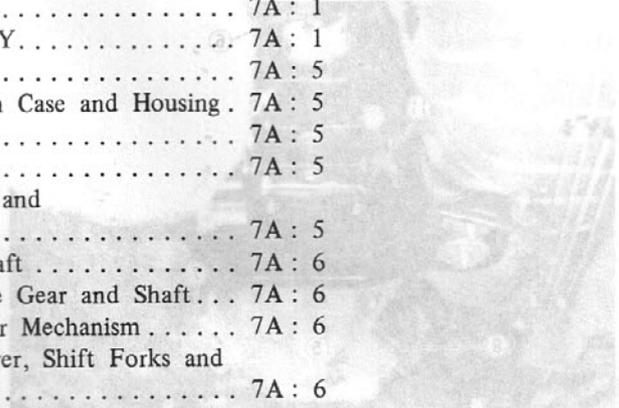


Fig. 7A-2

Disassemble the transmission in the numerical order.

Transmission case:

1. Clutch release bearing
2. Clutch release fork



Fig. 7A-3

3. Front cover and oil seal
4. Adjust shim(s)
5. Snap ring



Fig. 7A-4

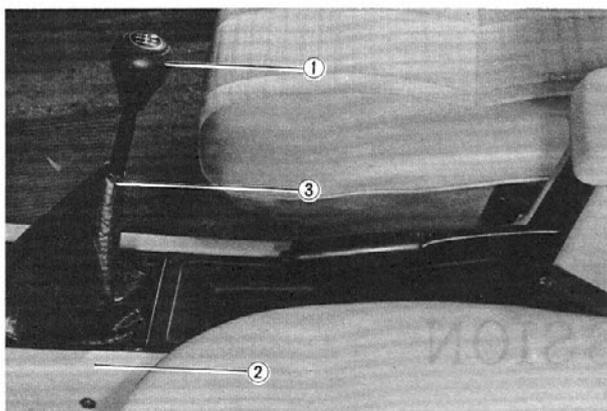


Fig. 7A-1

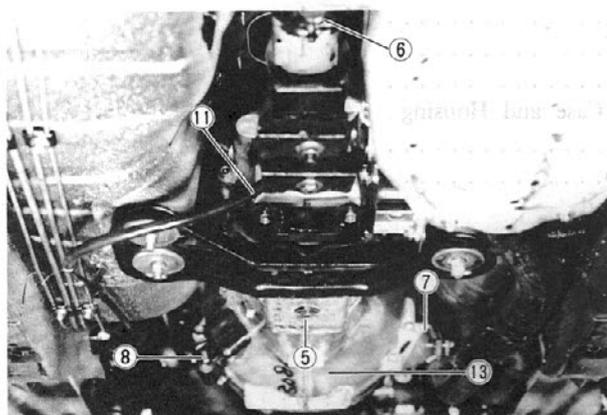


Fig. 7A-2

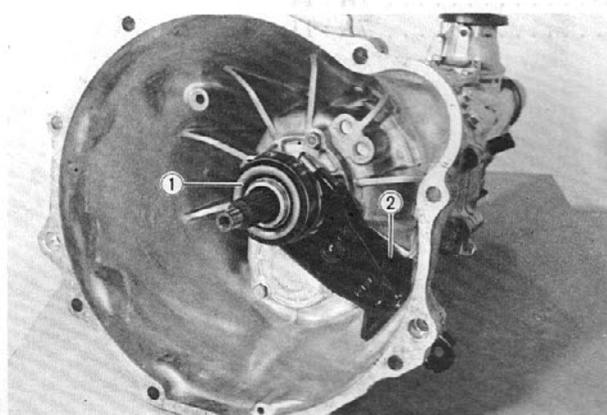


Fig. 7A-3

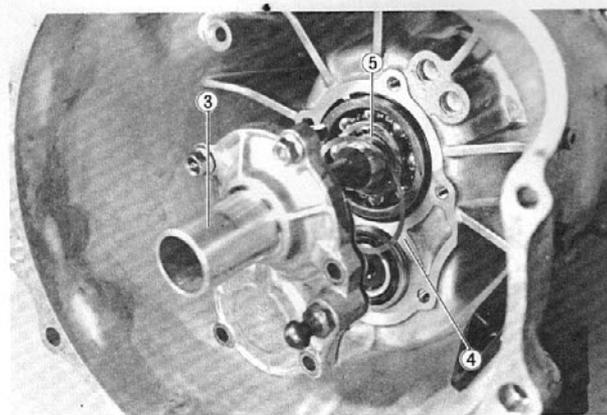


Fig. 7A-4

7A-A. TRANSMISSION REMOVAL

Remove and disconnect the following parts.

1. Gearshift lever knob
2. Console box
3. Gearshift lever boot and gearshift lever
4. Battery negative cable

Raise the vehicle and support with stands.

5. Transmission lubricant (drain)
6. Propeller shaft (refer to Par. 8-A)
7. Exhaust pipe hanger
8. Clutch release cylinder
9. Starting motor
10. Wire (back-up light switch)
11. Speedometer cable
12. Transmission attaching bolts
13. Transmission

Note:
Before remove the transmission, place a jack under the engine, protecting the oil pan with a block of wood.

7A-B. TRANSMISSION DISASSEMBLY

Disassemble the transmission in the numerical order.

Transmission case:

1. Clutch release bearing
2. Clutch release fork

3. Front cover and oil seal
4. Adjust shim(s)
5. Snap ring

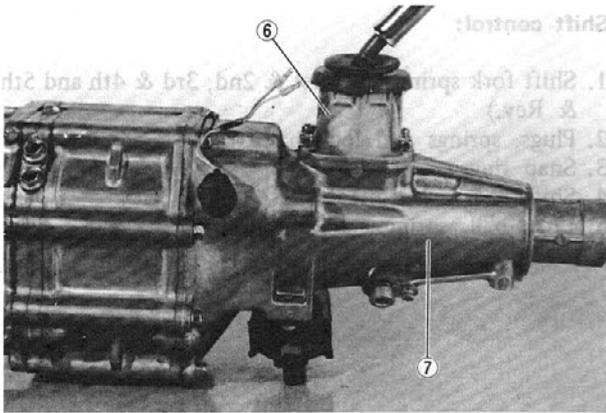


Fig. 7A-5

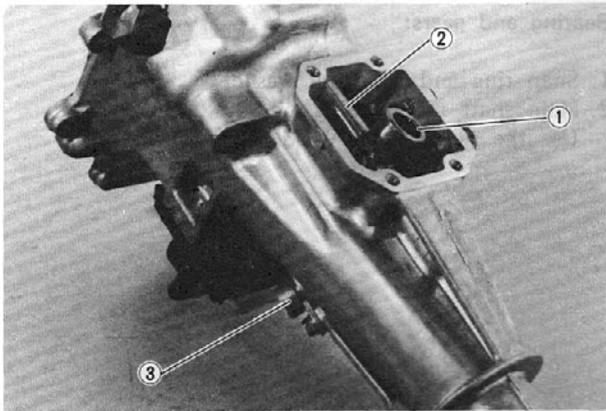


Fig. 7A-6

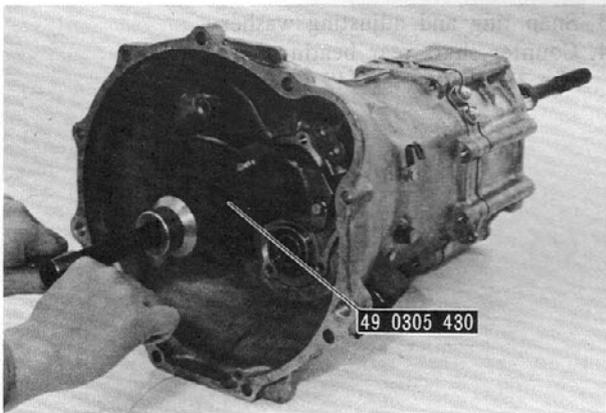


Fig. 7A-7

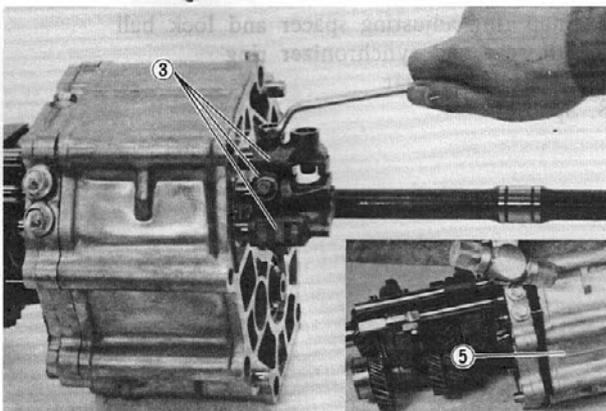
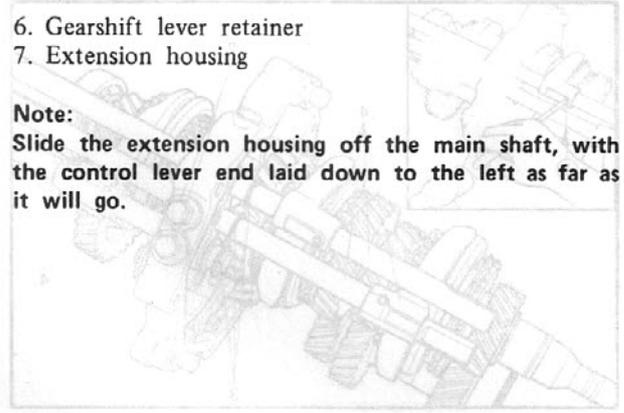


Fig. 7A-8



- 6. Gearshift lever retainer
- 7. Extension housing

Note:
Slide the extension housing off the main shaft, with the control lever end laid down to the left as far as it will go.

Fig. 7A-9

Extension housing:

- 1. Control lever end
- 2. Control lever
- 3. Speedometer driven gear assembly

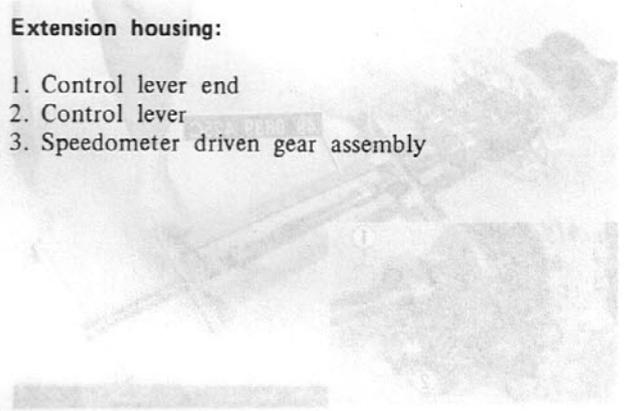


Fig. 7A-10

Intermediate housing:

- 1. Intermediate housing and gear assembly
Use the **pusher** (49 0305 430)

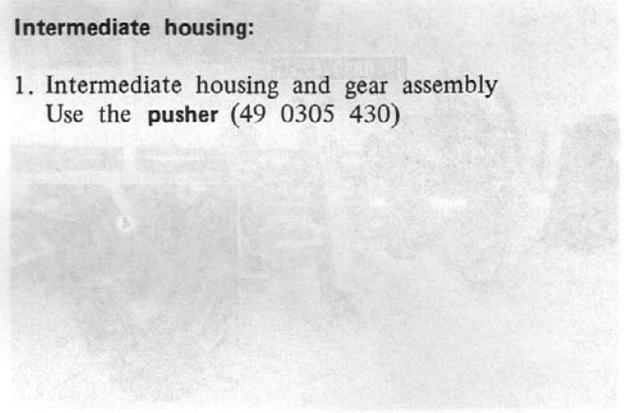


Fig. 7A-11

- 2. Snap ring
- 3. Speedometer drive gear, steel ball and snap ring
- 4. Spring pins and shift rod ends (1st & 2nd, 3rd & 4th and 5th & Rev.)
- 5. Intermediate housing

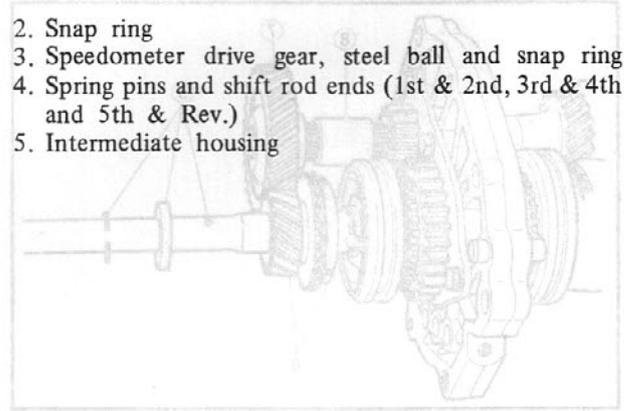


Fig. 7A-12

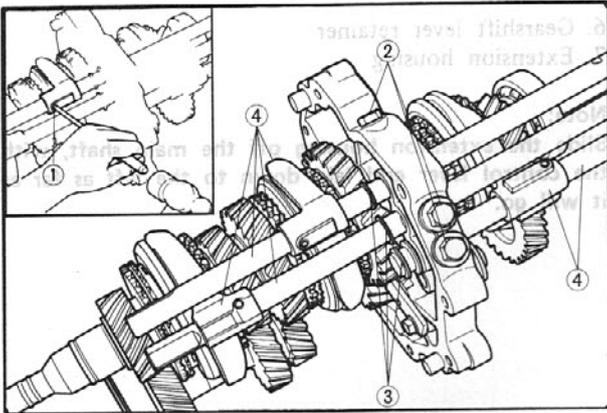


Fig. 7A-9

Shift control:

1. Shift fork spring pins (1st & 2nd, 3rd & 4th and 5th & Rev.)
2. Plugs, springs and lock balls
3. Snap rings
4. Shift rods and shift forks
5. Lock ball, spring and interlock pins

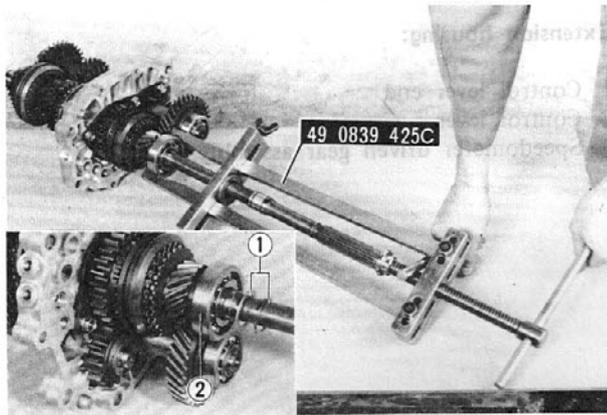


Fig. 7A-10

Bearing and gears:

1. Snap ring and adjusting washer
2. Main shaft rear bearing
Use the **puller set** (49 0839 425C).

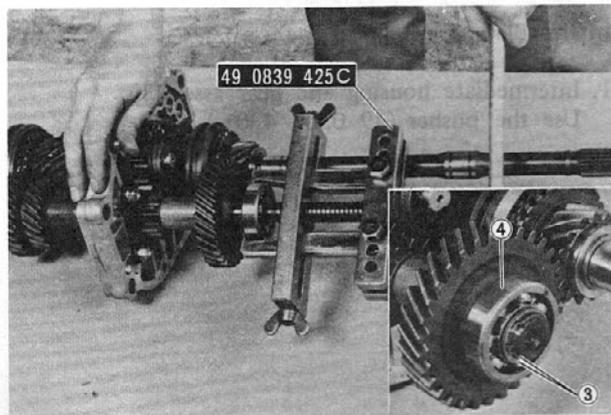


Fig. 7A-11

3. Snap ring and adjusting washer
4. Counter shaft rear bearing
Use the **puller set** (49 0839 425C)

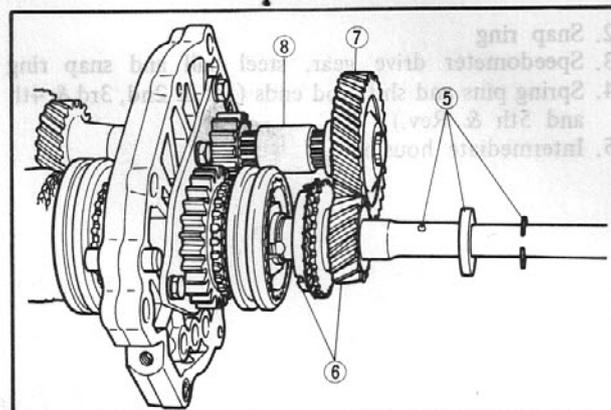


Fig. 7A-12

5. Snap ring, adjusting spacer and lock ball
6. 5th gear and synchronizer ring
7. Counter 5th gear
8. Spacer

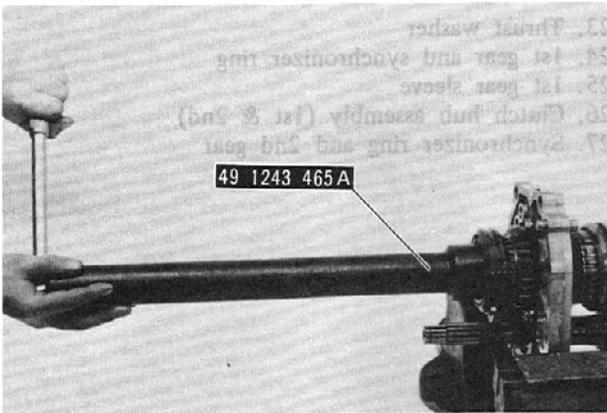


Fig. 7A-13

9. Lock nut

Note:

- a) Slide the clutch sleeves into 1st gear and reverse gear to lock the rotation of the main shaft.
- b) Straighten the calking of the lock nut.
- c) Loosen the lock nut by using the wrench (49 1243 465A).
- d) Discard the lock nut.

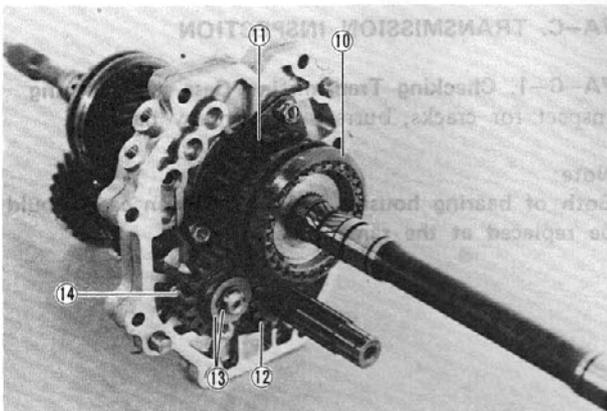


Fig. 7A-14

10. Clutch hub assembly (5th & Rev.)

11. Reverse gear, needle bearing, sleeve and thrust washer
12. Counter reverse gear
13. Snap ring and thrust washer
14. Reverse idle gear and thrust washer

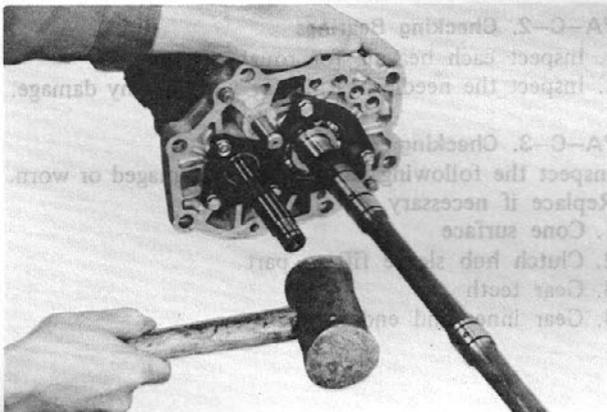


Fig. 7A-15

15. Counter and main shaft

Note:

Tap the rear end of the main shaft and counter shaft in turn with a plastic hammer.

16. Bearing cover
17. Counter and main shaft center bearing

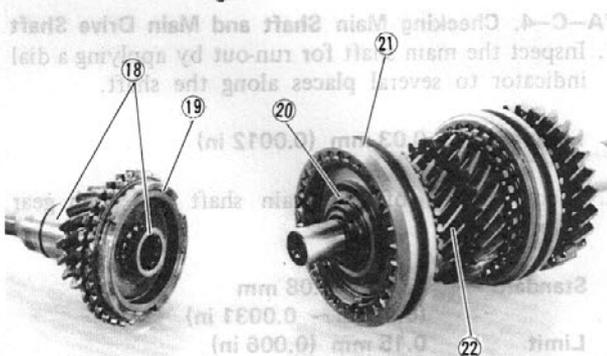


Fig. 7A-16

18. Main drive shaft and needle bearing
19. Synchronizer ring
20. Snap ring
21. Clutch hub assembly (3rd & 4th)
22. Synchronizer ring and 3rd gear

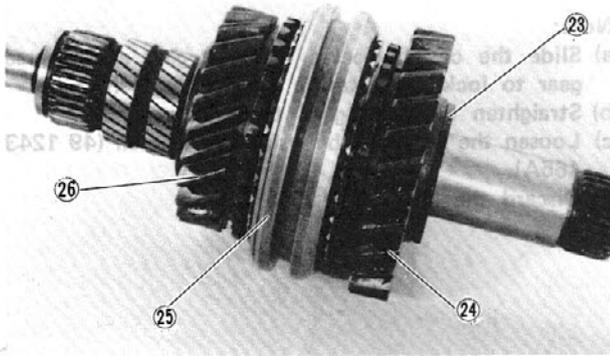


Fig. 7A-17

- 23. Thrust washer
- 24. 1st gear and synchronizer ring
- 25. 1st gear sleeve
- 26. Clutch hub assembly (1st & 2nd)
- 27. Synchronizer ring and 2nd gear

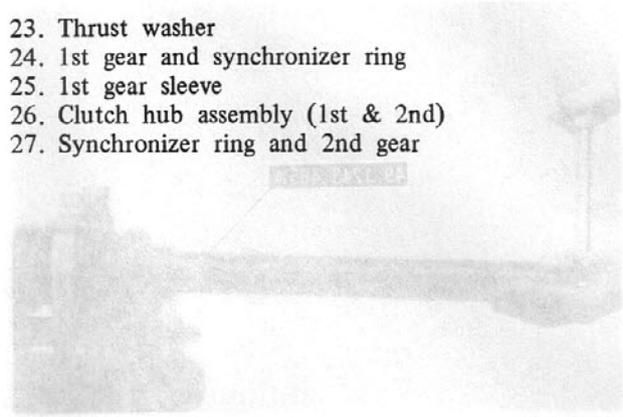


Fig. 7A-18

7A-C. TRANSMISSION INSPECTION

7A-C-1. Checking Transmission Case and Housing
Inspect for cracks, burrs, nicks or any damages.

Note:

Both of bearing housing and transmission case should be replaced at the same time.

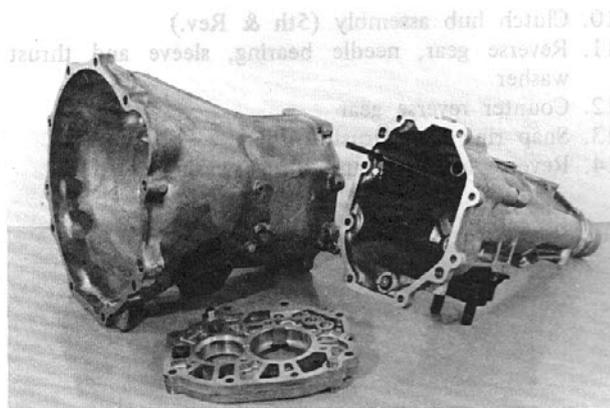


Fig. 7A-18

7A-C-2. Checking Bearings

1. Inspect each bearing for roughness.
2. Inspect the needle bearing for wear of any damage.

7A-C-3. Checking Gears

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

1. Cone surface
2. Clutch hub sleeve fitting part
3. Gear teeth
4. Gear inner and end surface

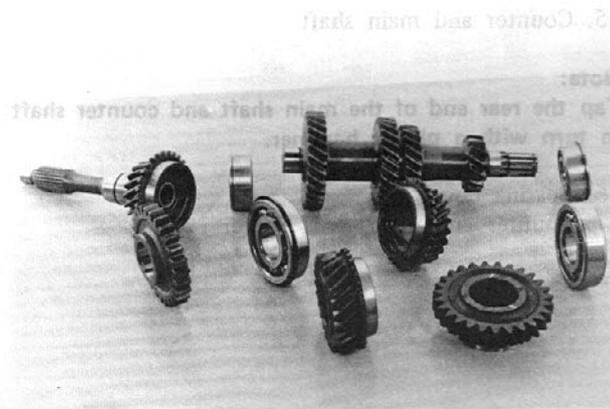


Fig. 7A-19

7A-C-4. Checking Main Shaft and Main Drive Shaft

1. Inspect the main shaft for run-out by applying a dial indicator to several places along the shaft.

Limit 0.03 mm (0.0012 in)

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

Standard 0.03 ~ 0.08 mm
(0.0012 ~ 0.0031 in)

Limit 0.15 mm (0.006 in)

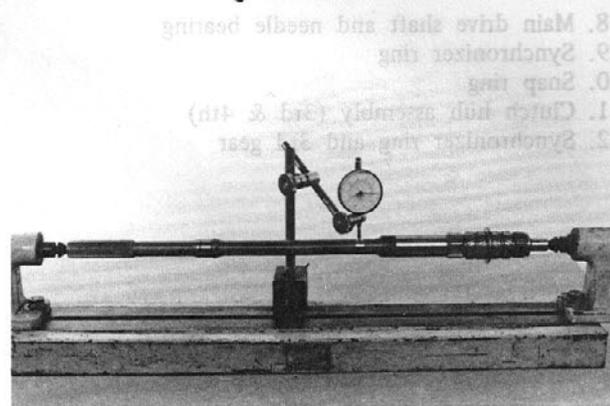


Fig. 7A-20

3. Replace the main drive shaft if the spline is damaged or the teeth are chipped, worn or broken.

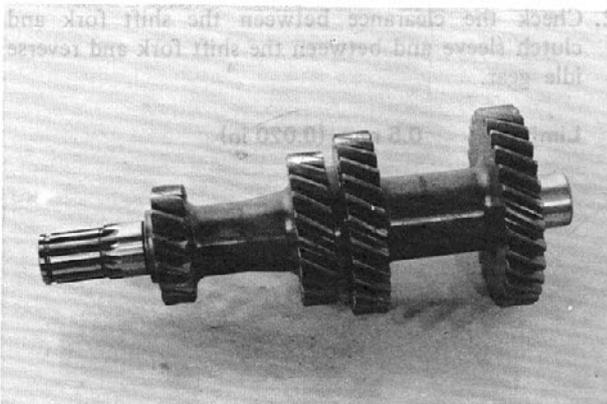


Fig. 7A-21

7A-C-5. Checking Counter Shaft

Inspect the counter gears for wear and damage.

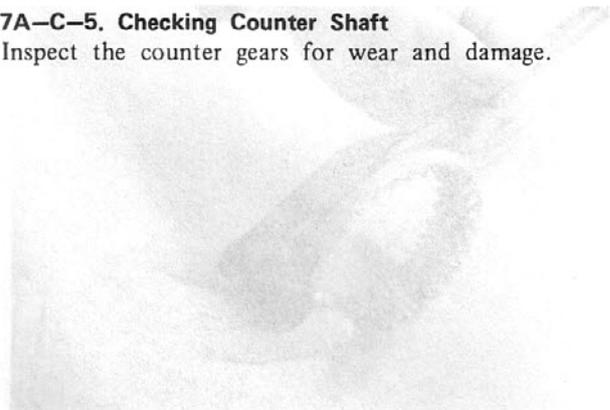


Fig. 7A-22

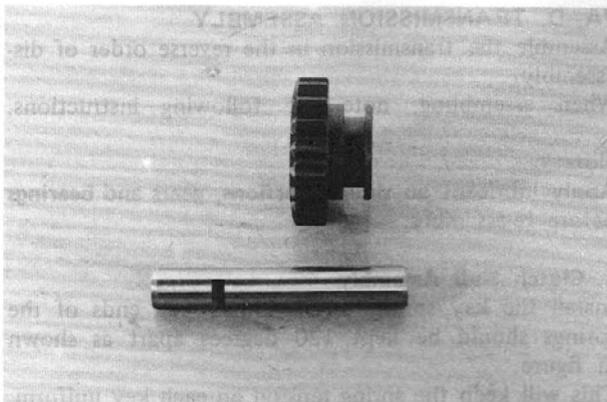


Fig. 7A-22

7A-C-6. 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	0.02 ~ 0.05 mm (0.0008 ~ 0.0020 in)
Limit	0.15 mm (0.006 in)

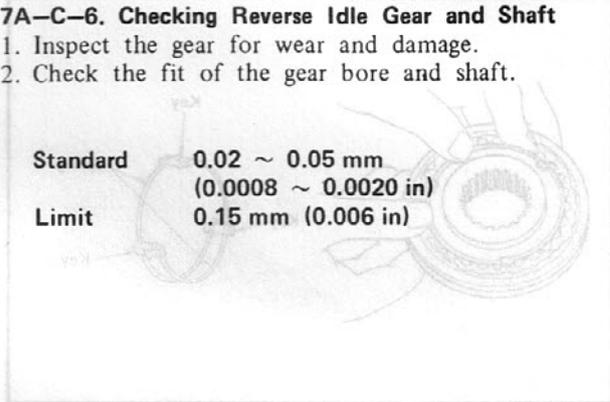


Fig. 7A-23



Fig. 7A-23

7A-C-7. Checking Synchronizer Mechanism

1. Inspect the following parts to see if damaged or worn.
 - 1) Gear teeth on synchronizer ring
 - 2) Synchronizer ring tapered surface
 - 3) Clutch sleeve and hub
 - 4) Key
 - 5) Spring (for tension)
2. Check the clearance between the side faces of the synchronizer ring and gear.

Standard	1.5 mm (0.059 in)
Limit	0.8 mm (0.031 in)

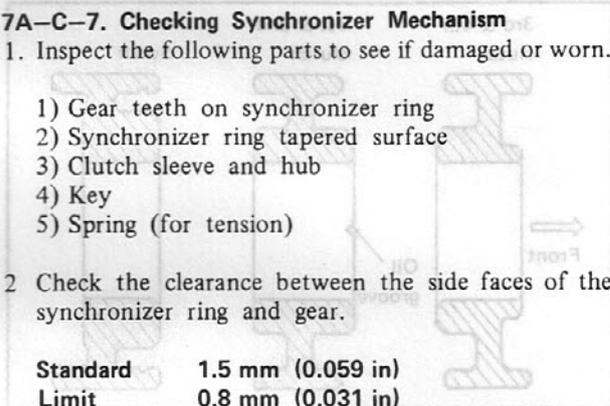


Fig. 7A-24

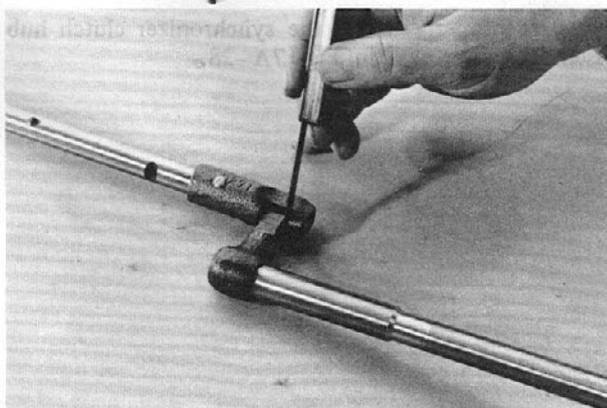


Fig. 7A-24

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

7A-C-8. Checking Control Lever, Shift Forks and Rods

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

Limit	0.8 mm (0.031 in)
-------	-------------------

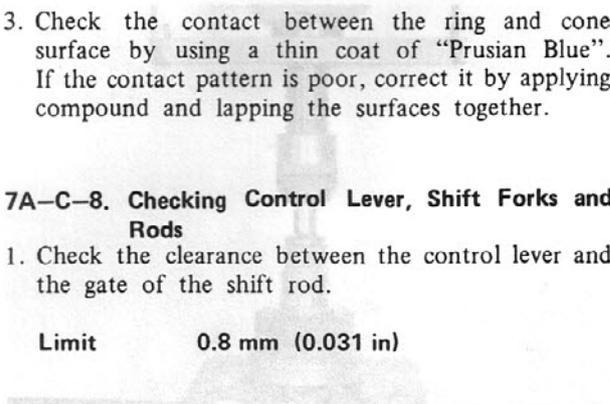


Fig. 7A-25

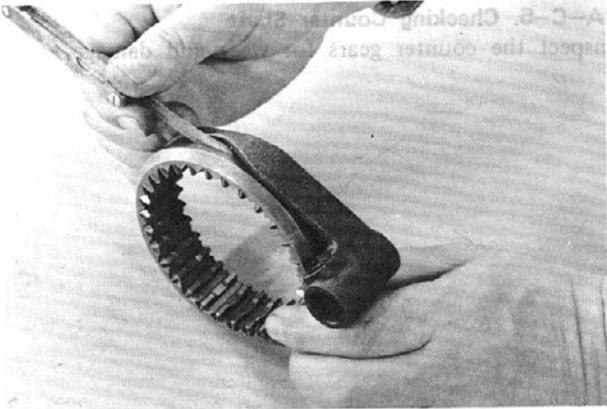


Fig. 7A-25

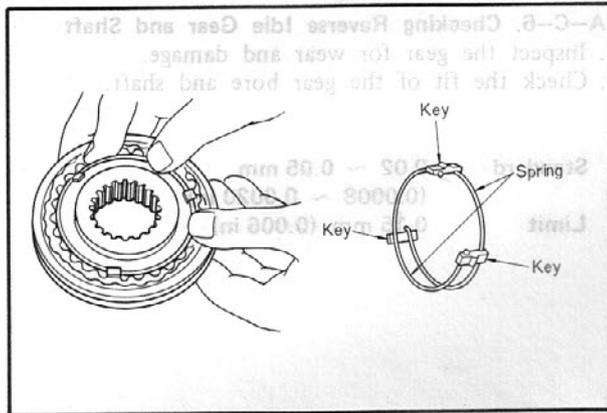


Fig. 7A-26

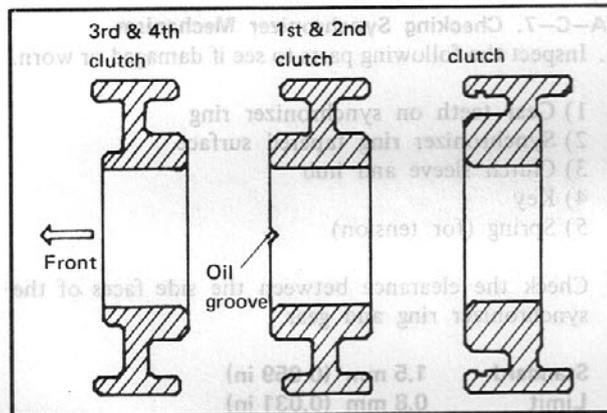


Fig. 7A-27

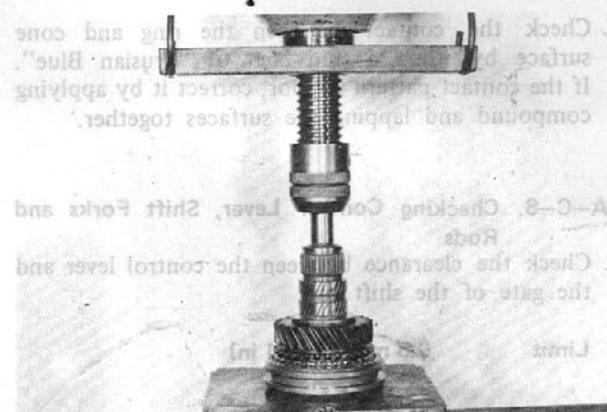


Fig. 7A-28

2. Check the clearance between the shift fork and clutch sleeve and between the shift fork and reverse idle gear.

Limit 0.5 mm (0.020 in)



Fig. 7A-29

7A-D. TRANSMISSION ASSEMBLY

Assemble the transmission in the reverse order of disassembly.

When assembling, note the following instructions.

Note:

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. 7A-22

When assembling each clutch hub assembly, note their directions.



Fig. 7A-23

Use care properly install the synchronizer clutch hub assemblies as shown in Fig. 7A-28.



Fig. 7A-24

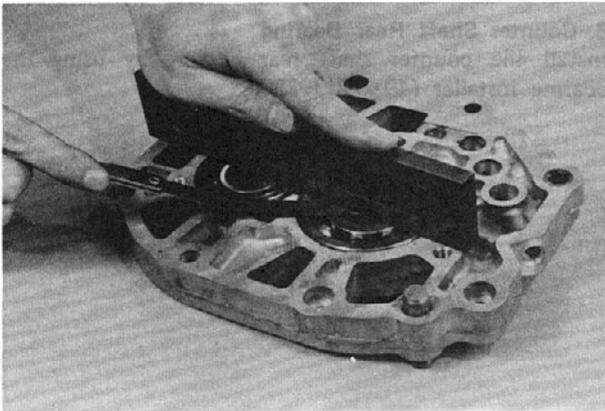


Fig. 7A-29

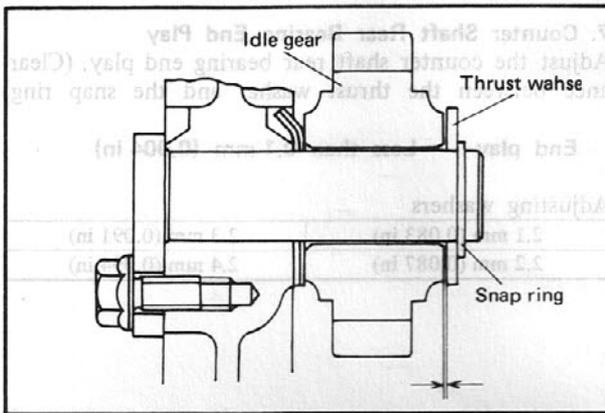


Fig. 7A-30

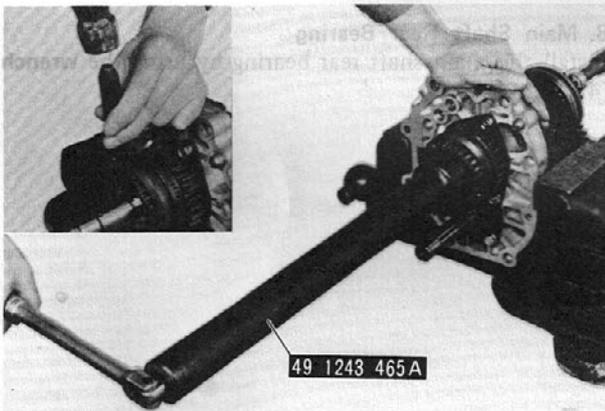


Fig. 7A-31

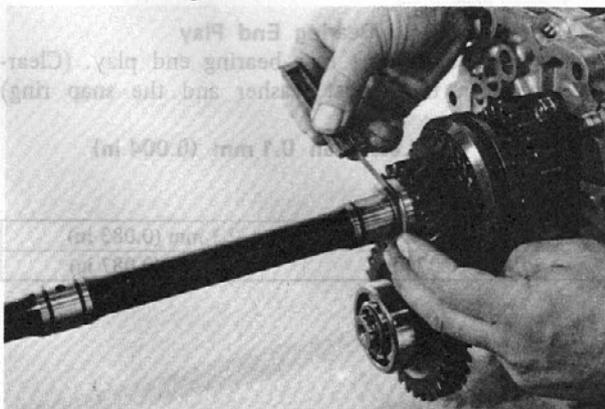


Fig. 7A-32

2. Bearing Housing and Bearing Clearance

Adjust the main shaft bearing and counter shaft center bearing clearance.

Clearance $0 \pm 0.05 \text{ mm}$ ($0 \pm 0.002 \text{ in}$)

Adjusting shims

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

3. Reverse Idle Gear End Play

Adjust the reverse idle gear end play. (Clearance between the adjusting washer and the snap ring)

End play $0.1 \sim 0.3 \text{ mm}$
($0.004 \sim 0.012 \text{ in}$)

Adjusting washers

2.6 mm (0.106 in)	3.0 mm (0.118 in)
2.8 mm (0.110 in)	

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:

$13 \sim 21 \text{ m}\cdot\text{kg}$ ($94 \sim 152 \text{ ft}\cdot\text{lb}$)

Note:

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

5. 5th Gear End Play

Adjust the 5th gear end play. (Clearance between the thrust washer and the snap ring)

When checking the end play, push the snap ring toward the front side of the main shaft with fingers.

End play $0.1 \sim 0.3 \text{ mm}$
($0.004 \sim 0.012 \text{ in}$)

Adjusting 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)

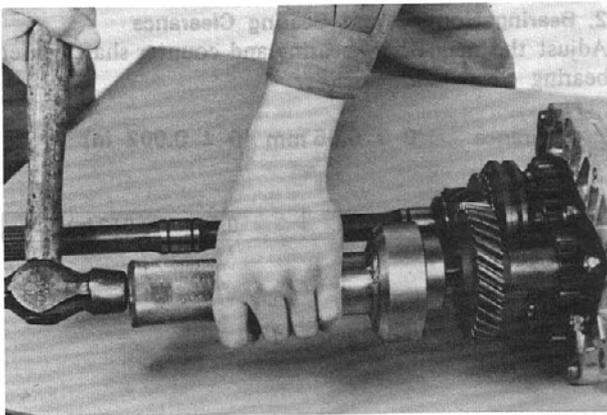


Fig. 7A-33

6. Counter Shaft Rear Bearing

Install the counter shaft rear bearing by using the bearing installer (49 0500 330).

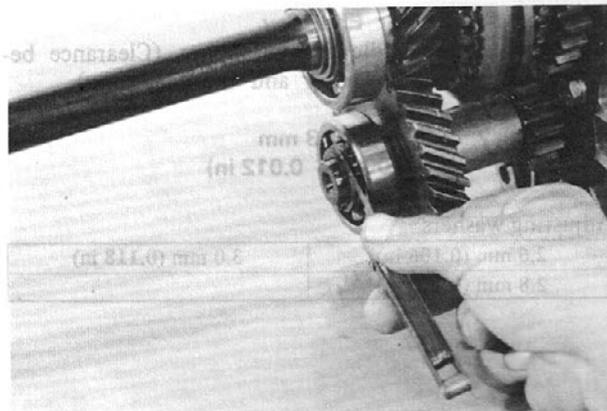


Fig. 7A-34

7. Counter Shaft Rear Bearing End Play

Adjust the counter shaft rear bearing end play. (Clearance between the thrust washer and the snap ring)

End play — Less than 0.1 mm (0.004 in)

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. 7A-35

8. Main Shaft Rear Bearing

Install the main shaft rear bearing by using the wrench (49 1243 465A).

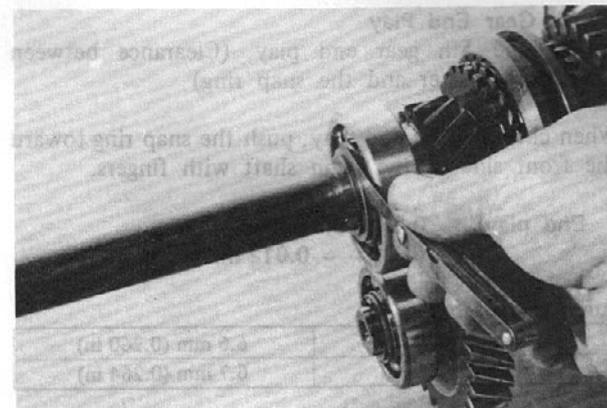


Fig. 7A-36

9. Main Shaft Rear Bearing End Play

Adjust the main shaft rear bearing end play. (Clearance between the thrust washer and the snap ring)

End play — Less than 0.1 mm (0.004 in)

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)

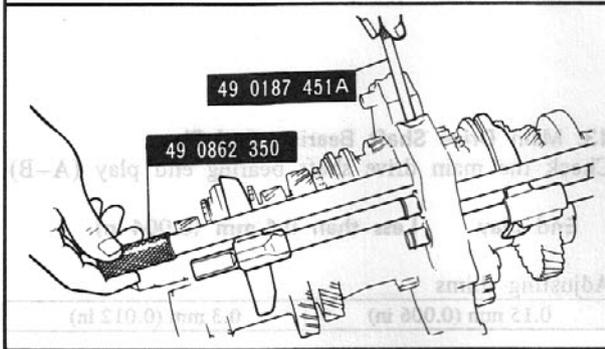
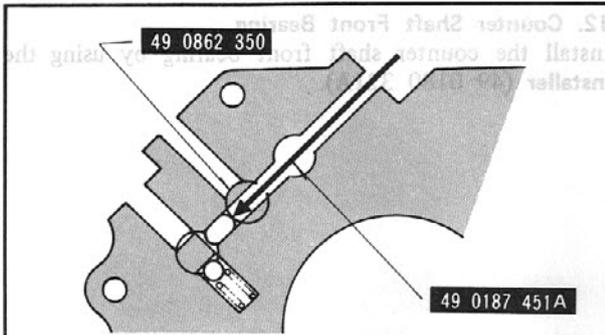


Fig. 7A-37

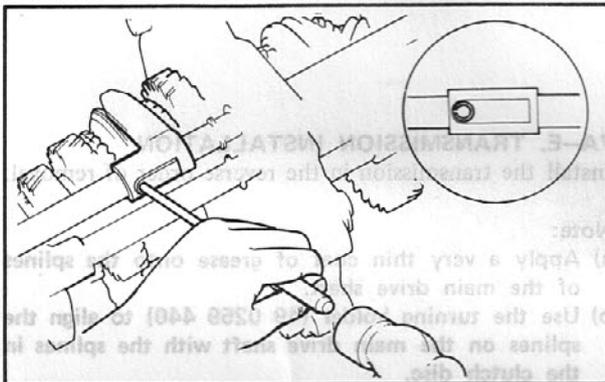


Fig. 7A-38



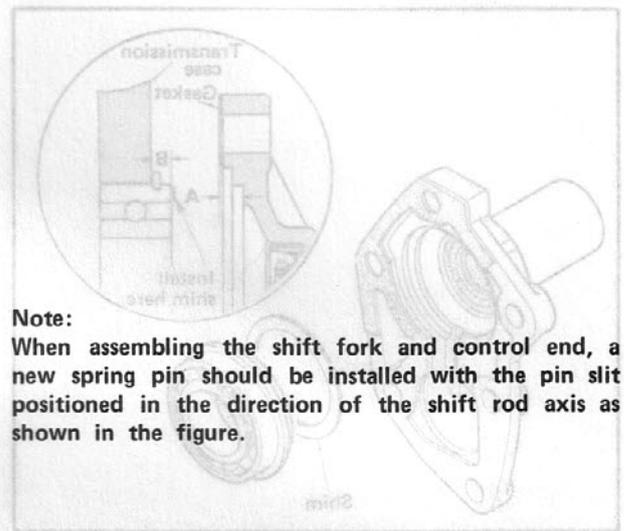
Fig. 7A-39

10. 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.

Tightening torque:

Spring cap bolts 1.0 ~ 1.5 m·kg
(7 ~ 11 ft·lb)



Note:

When assembling the shift fork and control end, a new spring pin should be installed with the pin slit positioned in the direction of the shift rod axis as shown in the figure.

11. Main Drive Shaft Bearing

Install the main drive shaft bearing by using the installer (49 0500 330).

SPECIAL

49 0839 432C	Puller
49 0259 440	Turning
49 1243 462A	Wrench
49 0302 430	Puller
49 0710 520	Puller
49 0862 350	Guide
49 0187 451A	Guide
49 0180 321A	Installer
49 0500 330	Installer, transmission bearing

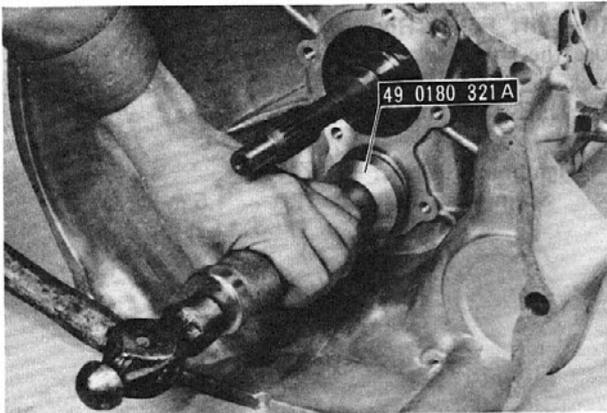


Fig. 7A-40

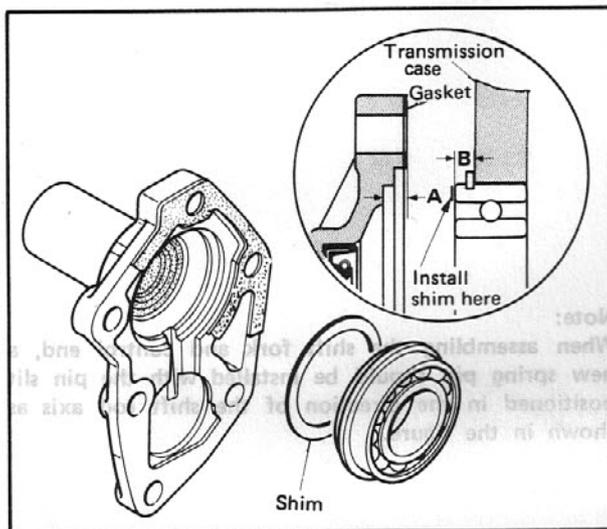


Fig. 7A-41

12. Counter Shaft Front Bearing

Install the counter shaft front bearing by using the installer (49 0180 321A).

13. Main Drive Shaft Bearing End Play

Check the main drive shaft bearing end play (A-B).

End play **Less than 0.1 mm (0.004 in)**

Adjusting shims

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

7A-E. TRANSMISSION INSTALLATION

Install the transmission in the reverse order of removal.

Note:

- Apply a very thin coat of grease onto the splines of the main drive shaft.
- Use the turning holder (49 0259 440) to align the splines on the main drive shaft with the splines in the clutch disc.
- Fill the transmission with a correct grade and quantity lubricant.

SPECIAL TOOLS

49 0839 425C	Puller set, bearing
49 0259 440	Turning holder, main shaft
49 1243 465A	Wrench, main shaft lock nut
49 0305 430	Pusher, main drive shaft
49 0710 520	Puller, bearing
49 0862 350	Guide, shift fork rod
49 0187 451A	Guide, interlock pin
49 0180 321A	Installer, main drive gear bearing
49 0500 330	Installer, transmission bearing

AUTOMATIC TRANSMISSION

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7B-B. TRANSMISSION DISASSEMBLY	7B : 1
7B-C. OVERHAUL OF MAIN COMPONENTS	7B : 4
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7B-C-2. Rear Clutch	7B : 5
7B-C-3. Low and Reverse Brake	7B : 6
7B-C-4. Servo	7B : 8
7B-C-5. Governor and Oil Distributor	7B : 9
7B-C-6. Oil Pump	7B : 9
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7B-C-9. Internal Drive Flange	7B : 13
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7B-G-7. Inhibitor Switch	7B : 20
7B-G-8. Selector Lever	7B : 20
SPECIAL TOOLS	7B : 21



Fig. 7B-1

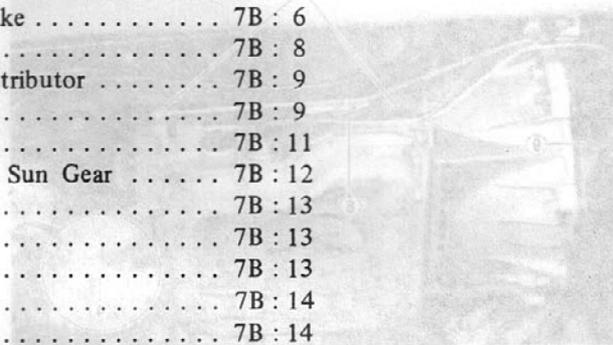


Fig. 7B-2

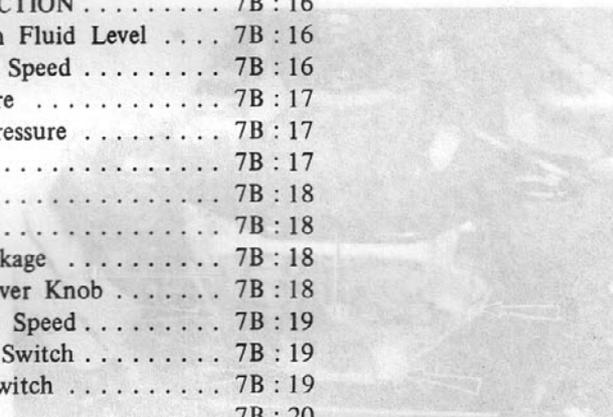


Fig. 7B-3

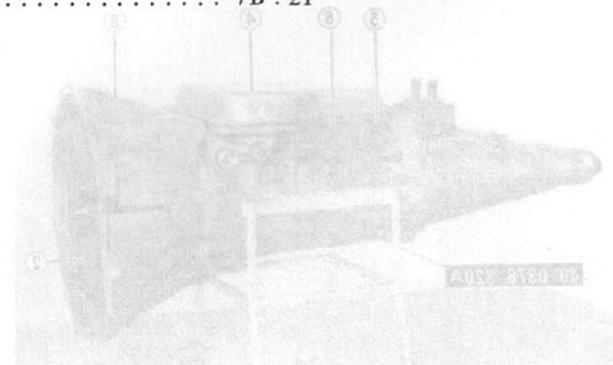


Fig. 7B-4

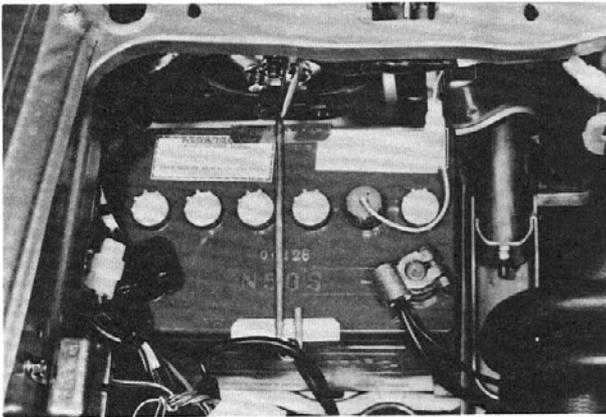


Fig. 7B-1

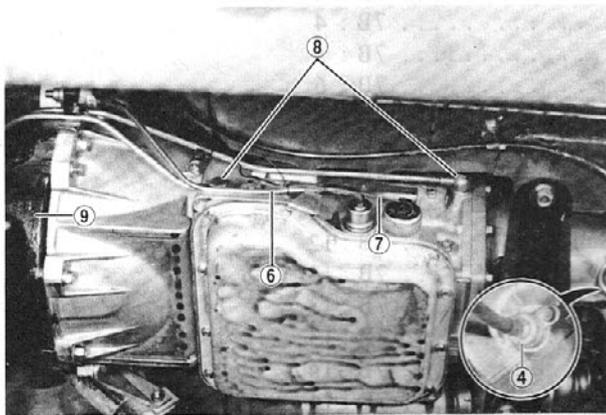


Fig. 7B-2

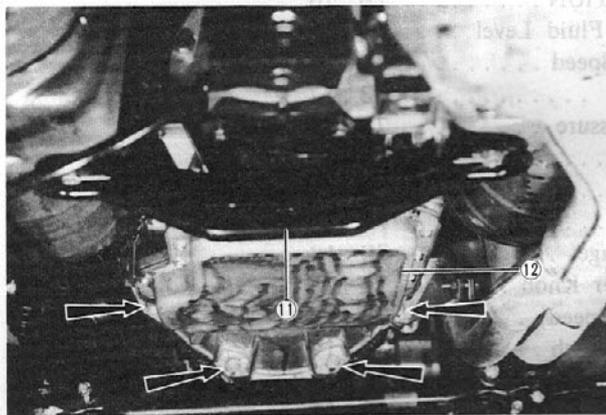


Fig. 7B-3

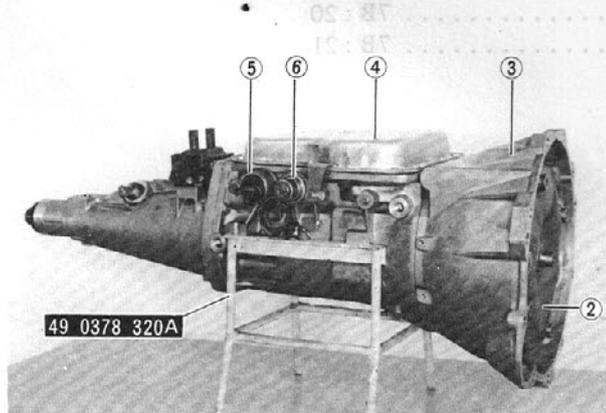


Fig. 7B-4

7B-A. TRANSMISSION REMOVAL

Remove and disconnect the following parts in the numerical order.

1. Battery negative cable

Note:

Position the vinyl cover on positive (+) terminal of battery firmly.

Raise the vehicle and support with stands.

2. Heat insulator
3. Propeller shaft (refer to Par. 8-A)
4. Speedometer cable
5. Shift rod
6. Vacuum hose
7. Down shift solenoid wire
8. Oil pipes
9. Clutch under cover and stays

10. Torque converter attaching bolts

Place a jack under the engine, protecting the engine oil pan with a block of wood.

11. Cross member
12. Transmission assembly

Note:

When removing the transmission from the engine, be careful not to drop out the torque converter from the transmission.

7B-B. TRANSMISSION DISASSEMBLY

When disassembling the transmission, use the stand (49 0378 320A).

1. Automatic fluid (drain)
2. Torque converter
3. Converter housing
4. Oil pan
5. Down shift solenoid
6. Vacuum diaphragm unit and vacuum diaphragm rod

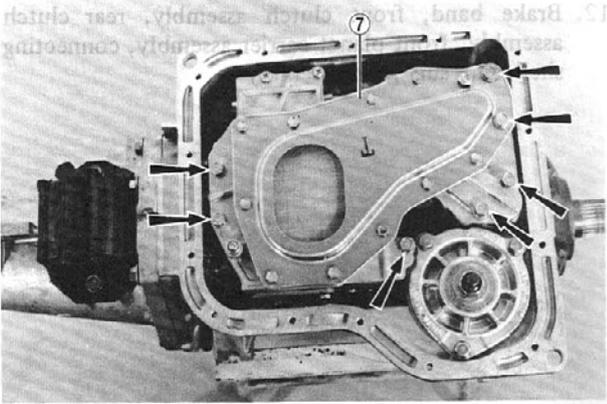


Fig. 7B-5

- 7. Control valve body
- 8. Input shaft

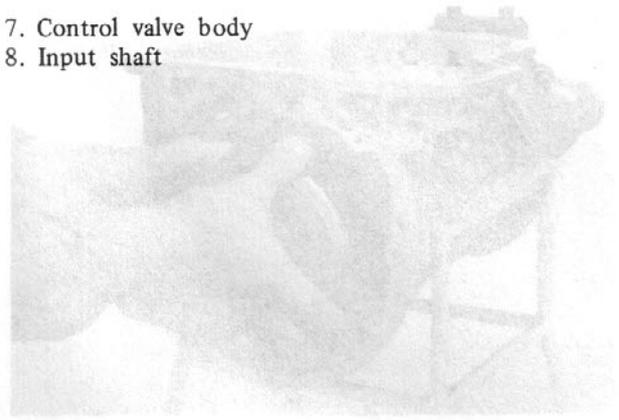


Fig. 7B-9

- 9. Loosen the brake band piston stem lock nut and tighten the piston stem to prevent the front clutch drum from falling when the oil pump is removed.

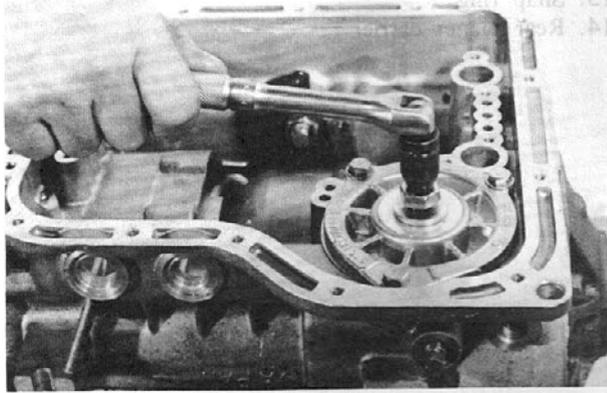


Fig. 7B-6



Fig. 7B-10

- 10. Oil pump
Use the **puller** (49 0378 390)

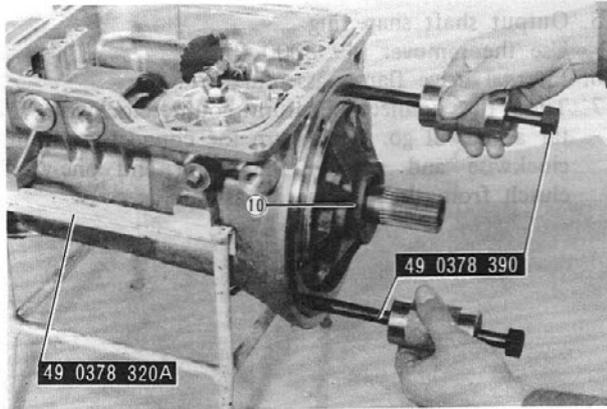


Fig. 7B-7

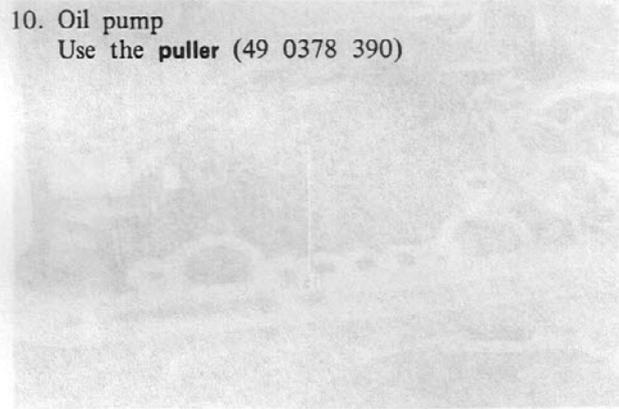


Fig. 7B-11

- 11. Loosen the piston stem and remove the band strut.

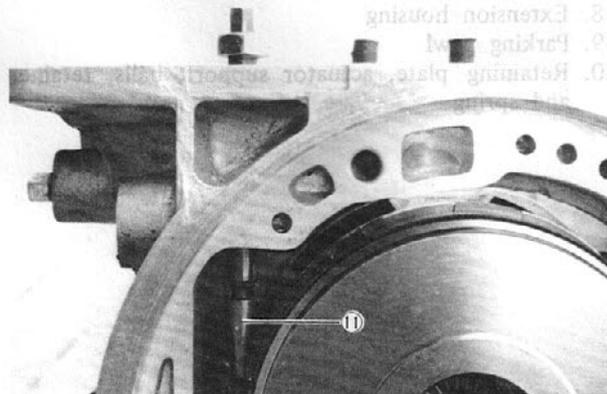


Fig. 7B-8

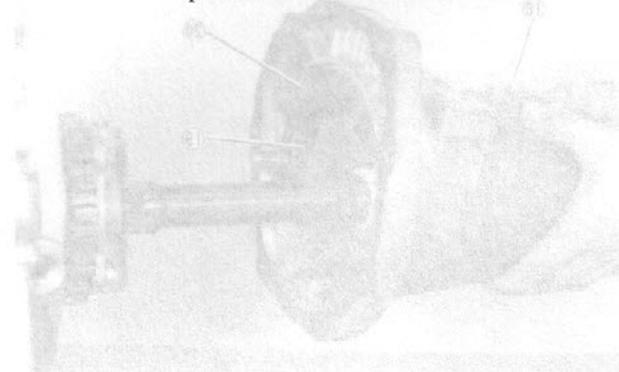


Fig. 7B-12

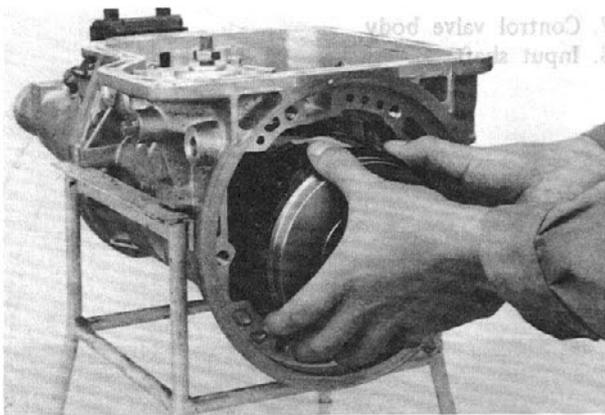


Fig. 7B-9

- 12. Brake band, front clutch assembly, rear clutch assembly, front planet carrier assembly, connecting shell and sun gear assembly



Fig. 7B-8

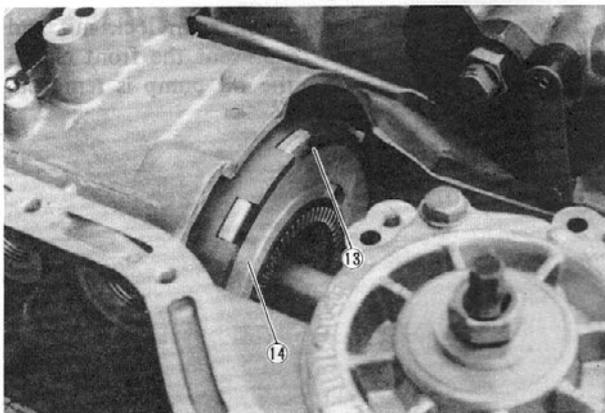


Fig. 7B-10

- 13. Snap ring
- 14. Rear planet carrier

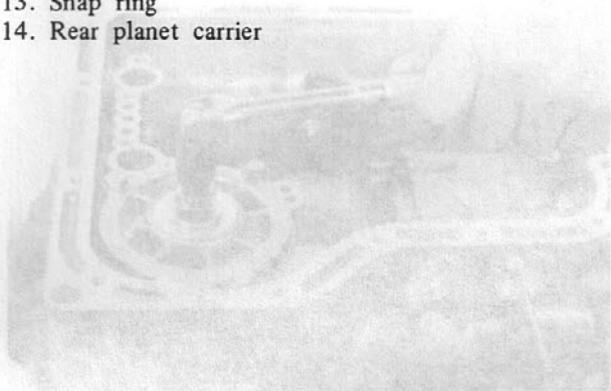


Fig. 7B-6

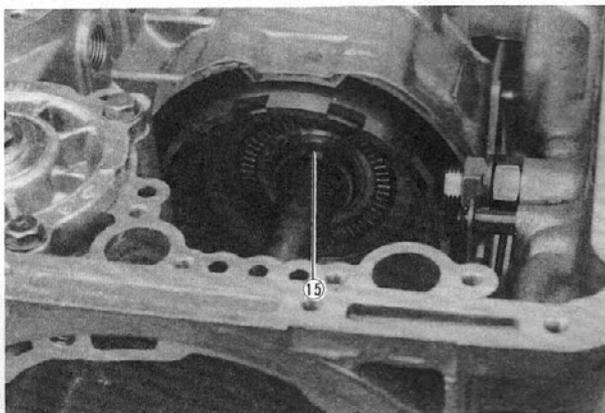


Fig. 7B-11

- 15. Output shaft snap ring
Use the **remover** (49 8000 015)
- 16. Internal drive flange assembly
- 17. Turn the connecting drum counterclockwise as far as it will go. Then, turn the connecting drum clockwise and remove the drum and one-way clutch from the case as an assembly.



Fig. 7B-7

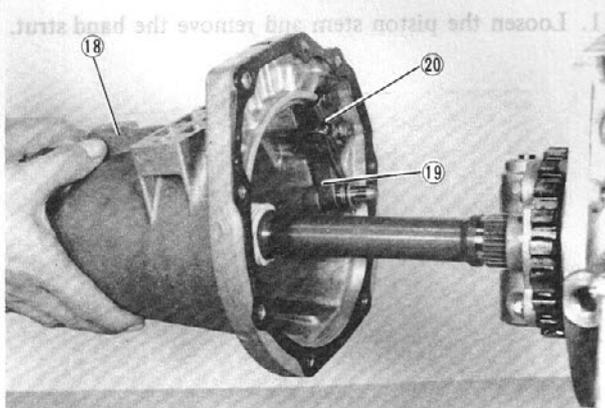


Fig. 7B-12

- 18. Extension housing
- 19. Parking pawl
- 20. Retaining plate, actuator support, balls, retainer and spring

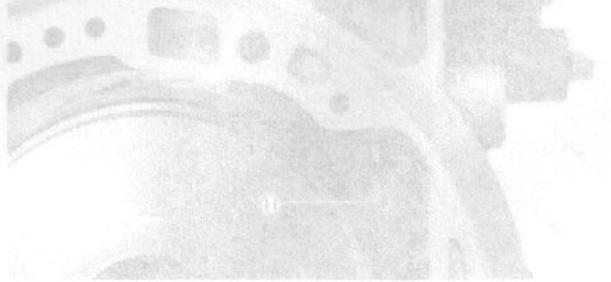


Fig. 7B-5

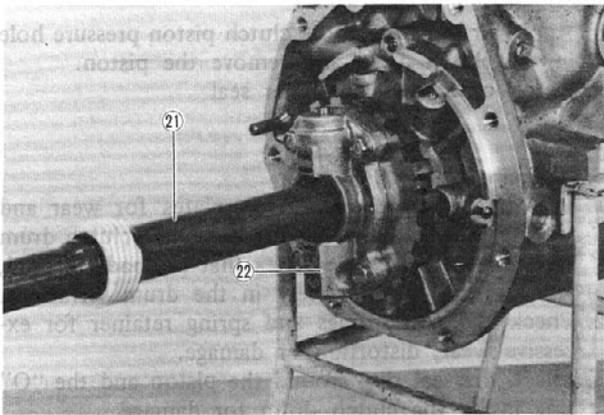


Fig. 7B-13 Replace the seals that are damaged.

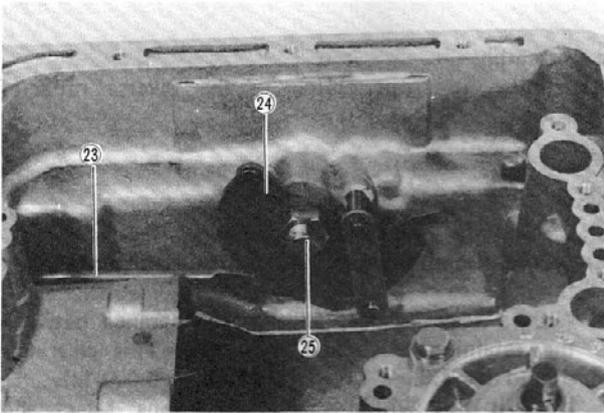


Fig. 7B-14 Install the correct size retaining plate.

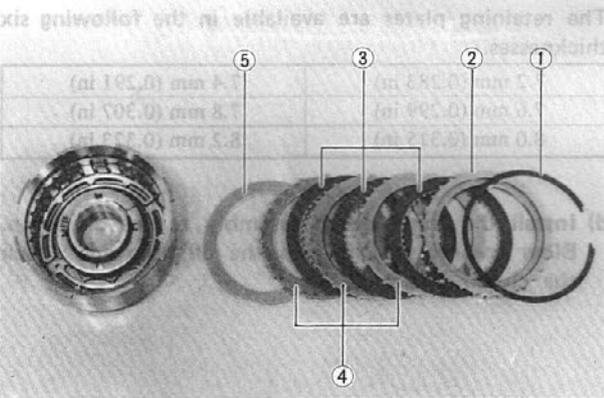


Fig. 7B-15

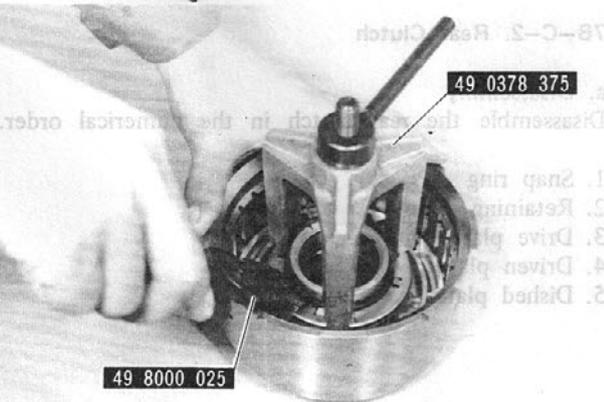


Fig. 7B-16

21. Output shaft
22. Governor valve assembly, bearing race and needle bearing



Fig. 7B-17

23. Parking brake rod
24. Manual plate and spacer
25. Manual shaft

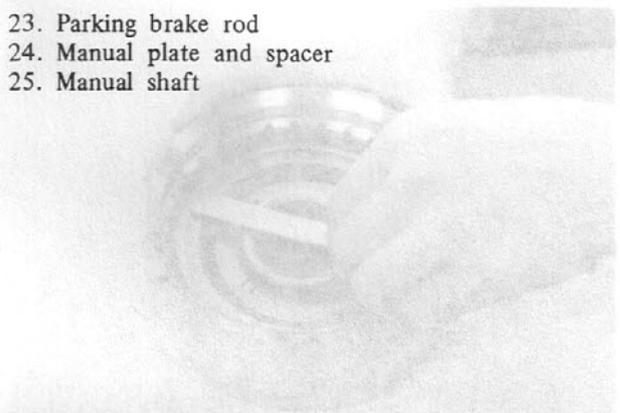


Fig. 7B-18

7B-C. OVERHAUL OF MAIN COMPONENTS

7B-C-1. Front Clutch

a. Disassembly

Disassemble the front clutch in the numerical order.

1. Snap ring
2. Retaining plate
3. Drive plates
4. Driven plates
5. Dished plate

6. Using the **compressor** (49 0378 375), compress the coil springs and remove the snap ring with the **remover** (49 8000 025).
7. Coil spring retainer and springs



Fig. 7B-20



Fig. 7B-17

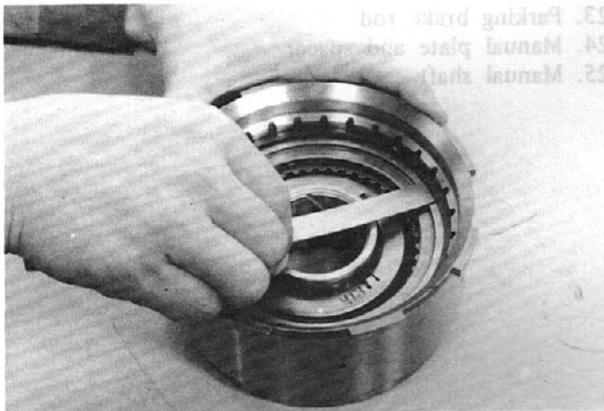


Fig. 7B-18

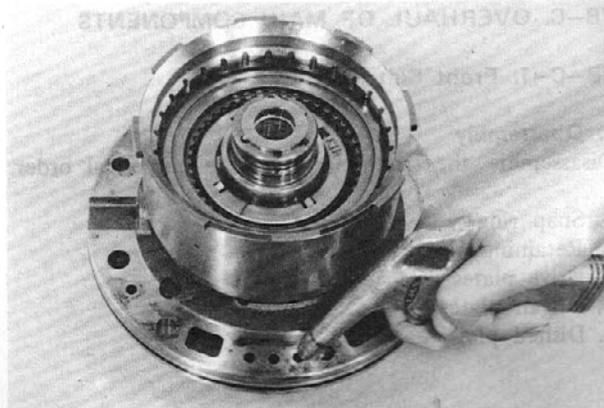


Fig. 7B-19

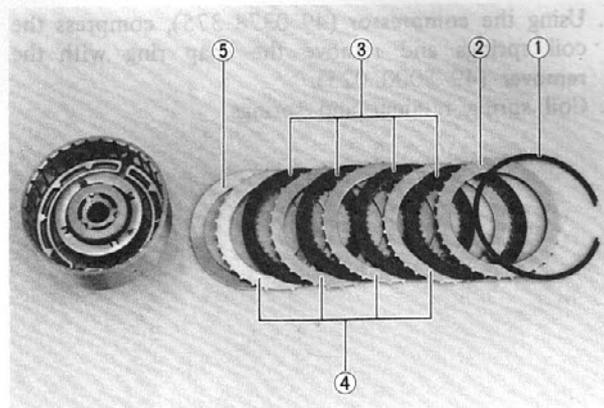


Fig. 7B-20

8. Apply air pressure to the clutch piston pressure hole in the clutch drum and remove the piston.
9. Piston outer seal and inner seal

b. Checking

1. Inspect the drive and driven plates for wear and scoring. Check the plates for fit on the clutch drum serrations. Replace all plates that are badly scored, worn or do not fit freely in the drum serrations.
2. Check the coil springs and spring retainer for excessive wear, distortion or damage.
3. Check the seal ring around the piston and the "O" ring inside the clutch drum for damage. Replace the seals that are damaged.

c. Assembly

Assemble the front clutch in the reverse order of disassembly.

Note:

- a) Discard the old seals and use new seals.
- b) Before assembling, dip all parts in clean transmission fluid.
- c) With a feeler gauge, check the clearance between the retaining plate and snap ring. This clearance should be 1.6 ~ 1.8 mm (0.063 ~ 0.071 in). If it is not within the specifications, select and install the correct size retaining plate.

The retaining plates are available in the following six thicknesses.

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

- d) Install the front clutch assembly to the oil pump. Blow compressed air into the oil hole and check the clutch operation.

7B-C-2. Rear Clutch

a. Disassembly

Disassemble the rear clutch in the numerical order.

1. Snap ring
2. Retaining plate
3. Drive plates
4. Driven plates
5. Dished plate

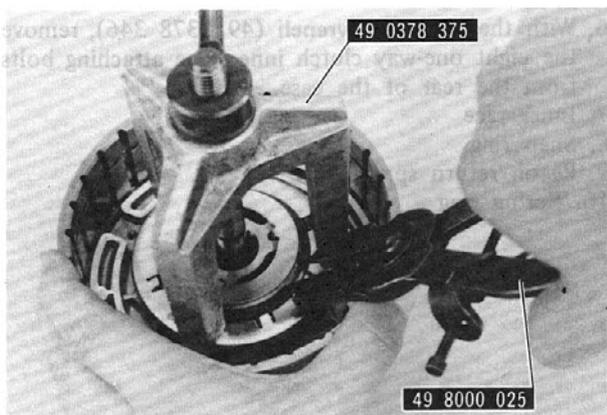


Fig. 7B-21

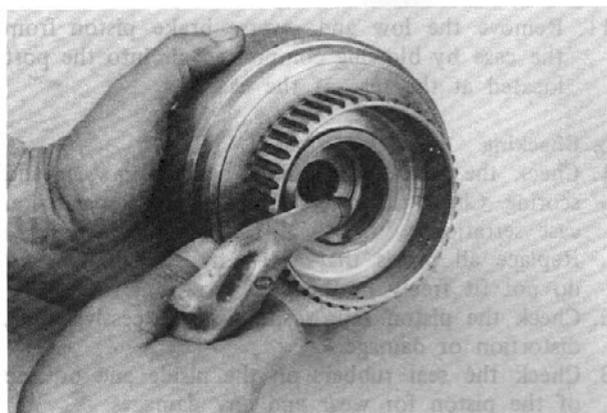


Fig. 7B-22

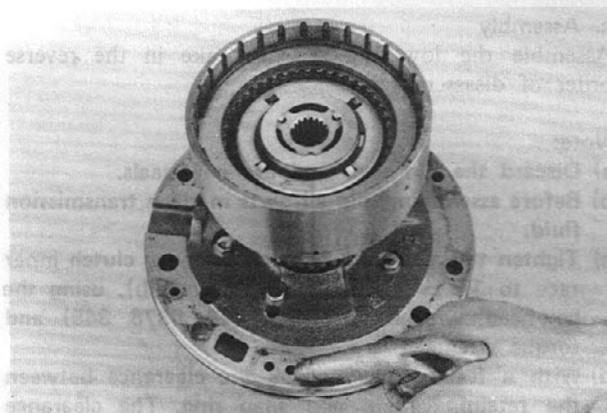


Fig. 7B-23

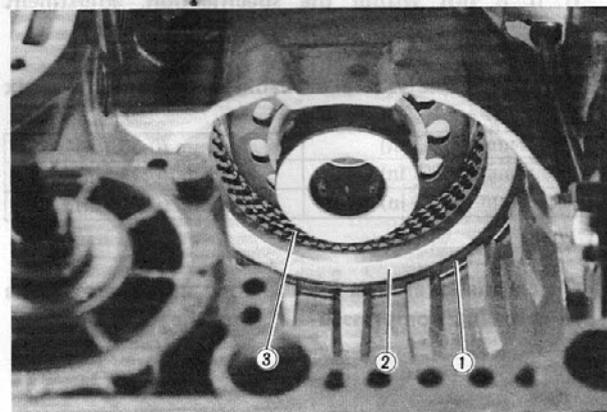


Fig. 7B-24

6. Using the **compressor** (49 0378 375), compress the coil springs and remove the snap ring with the **remover** (49 8000 025).
7. Coil spring retainer and springs

8. Apply air pressure to the clutch piston pressure hole in the clutch drum and remove the piston.
9. Piston outer seal and inner seal

b. Checking

Check the rear clutch in the same manner for the front clutch.

c. Assembly

Assemble the rear clutch in the reverse order of disassembly.

Note:

- a) Discard the old seals and use new seals.
- b) Before assembling, dip all parts in clean transmission fluid.
- c) With a feeler gauge, check the clearance between the retaining plate and snap ring. This clearance should be 0.8 ~ 1.5 mm (0.031 ~ 0.059 in).
- d) Install the rear clutch assembly to the oil pump. Blow compressed air into the oil hole and check the clutch operation.

7B-C-3. Low and Reverse Brake

a. Disassembly

Disassemble the low and reverse brake in the numerical order.

1. Snap ring
2. Retaining plate
3. Drive plates
4. Driven plates
5. Dished plate

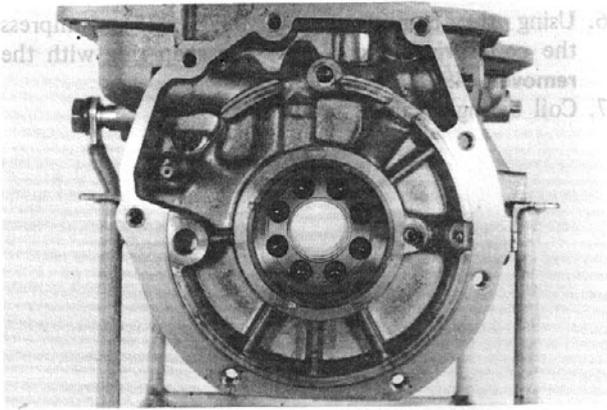


Fig. 7B-25

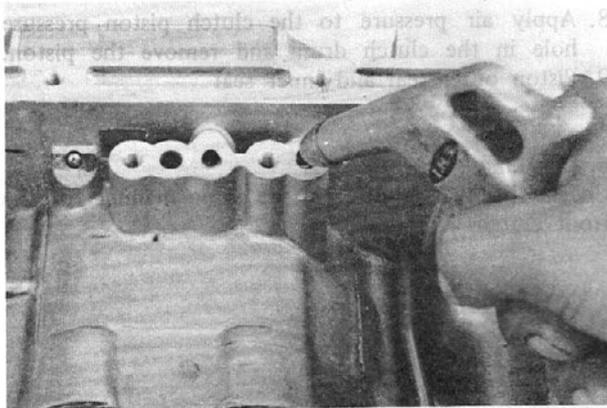


Fig. 7B-26

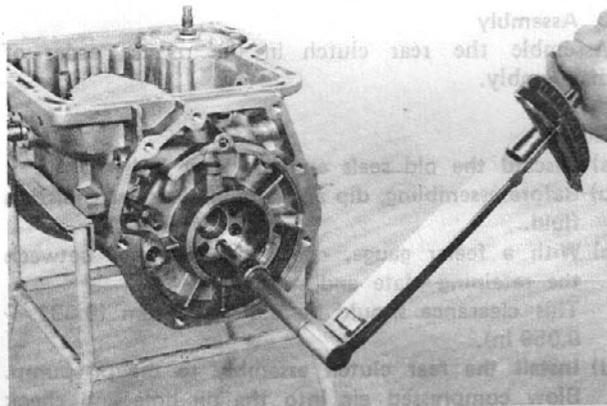


Fig. 7B-27

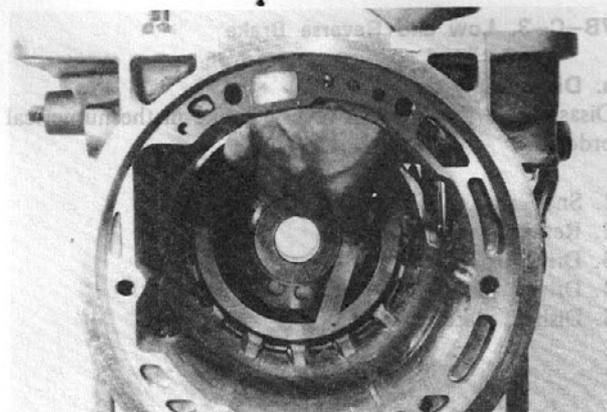


Fig. 7B-28

6. With the **hex-head wrench** (49 0378 346), remove the eight one-way clutch inner race attaching bolts from the rear of the case.

7. Inner race
8. Snap ring
9. Piston return spring
10. Spring ring

11. Remove the low and reverse brake piston from the case by blowing compressed air into the port located at the rear of the case.

b. Checking

1. Check the friction and steel 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 fit freely in the case serrations.
2. Check the piston return spring for excessive wear, distortion or damage.
3. Check the seal rubbers on the inside and outside of the piston for wear and any damages.

c. Assembly

Assemble the low and reverse brake in the reverse order of disassembly.

Note:

- a) Discard the old seals and use new seals.
- b) Before assembling, dip all parts in clean transmission fluid.
- c) Tighten the attaching bolts of one-way clutch inner race to 1.3 ~ 1.8 m-kg (9 ~ 13 ft-lb), using the hex-head wrench extension (49 0378 345) and torque wrench.
- d) With a feeler gauge, check the clearance between the retaining plate and snap ring. The clearance should be 0.8 ~ 1.05 mm (0.031 ~ 0.041 in). If it is not within the specification, adjustment can be made with selective retaining plate.

The retaining plates are available in the following six thicknesses:

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)

- e) Check the operation of the low and reverse brake by blowing compressed air into the oil hole.

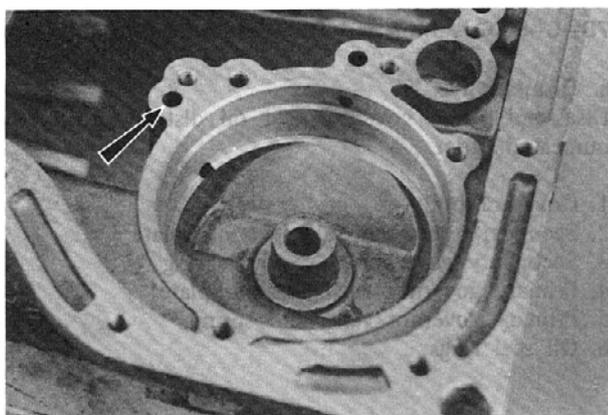


Fig. 7B-29

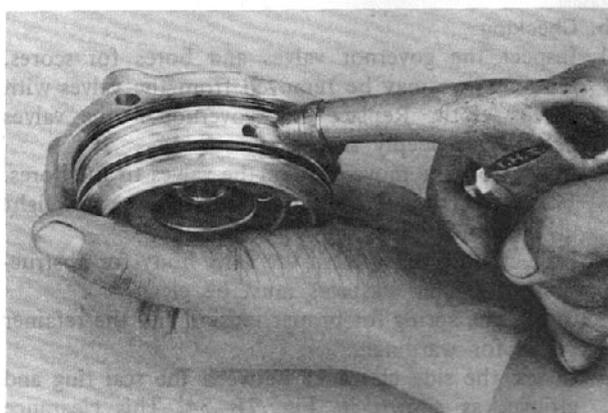


Fig. 7B-30

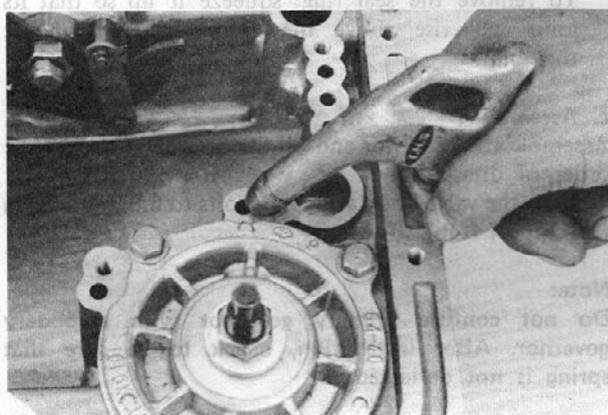


Fig. 7B-31

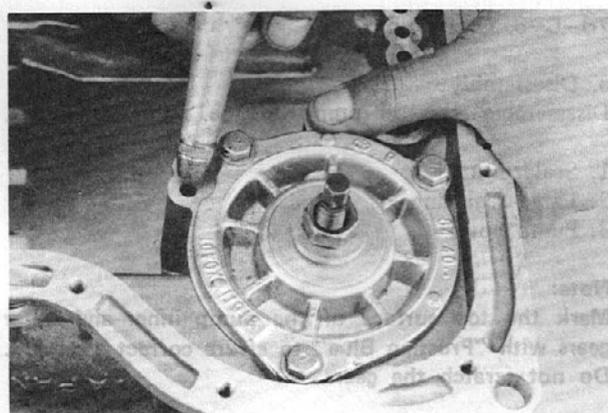


Fig. 7B-32

7B-C-4. Servo

a. Disassembly

Disassemble the servo in the numerical order.

1. Servo retainer assembly

If it is difficult to remove the servo retainer assembly from the case, apply air pressure from the fluid passage.

2. Return spring

3. Piston and seal assembly

Apply air pressure to the port in the servo retainer to remove the piston.

b. Checking

1. Inspect the servo bore for cracks and the piston bore and piston stem for scores. Check fluid passages for obstructions.
2. Check the piston stem for free movement and wear. Inspect the adjusting screw threads for damage.
3. Check the servo spring for distortion.
4. Inspect the band lining for excessive wear and damage.
5. Inspect the piston seal ring for damage.
6. Inspect the retainer seals and gasket sealing surface for damage.

c. Assembly

Assemble the servo in the reverse order of disassembly.

Note:

- a) Discard the old seals and use new seals.
- b) Before assembling, dip all parts in clean transmission fluid.

Blow compressed air into the oil hole on the servo piston apply side to make sure that the piston operates properly.

Apply compressed air into the oil hole on the servo piston release side.

If the retainer rises by the extent of bolt backing off, the piston operation on release is normal.

Tightening torque of the servo retainer is 0.7 ~ 0.9 m·kg (5.1 ~ 6.5 ft·lb).

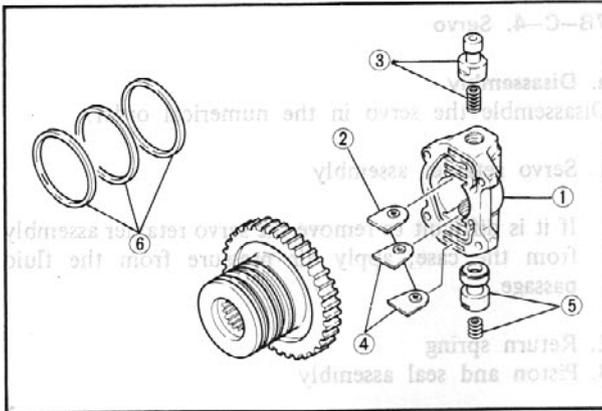


Fig. 7B-33

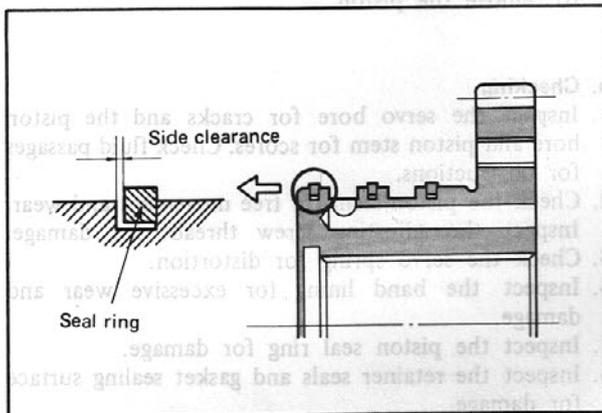


Fig. 7B-34

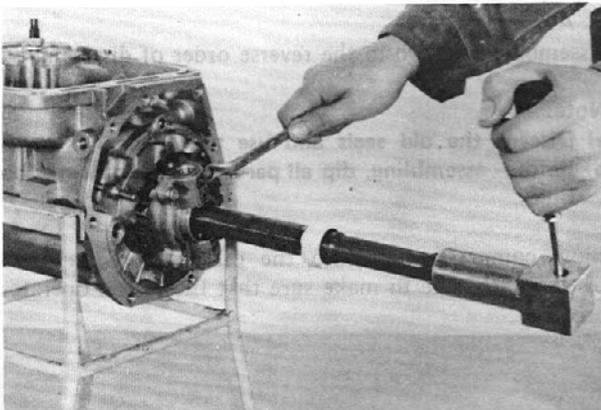


Fig. 7B-35

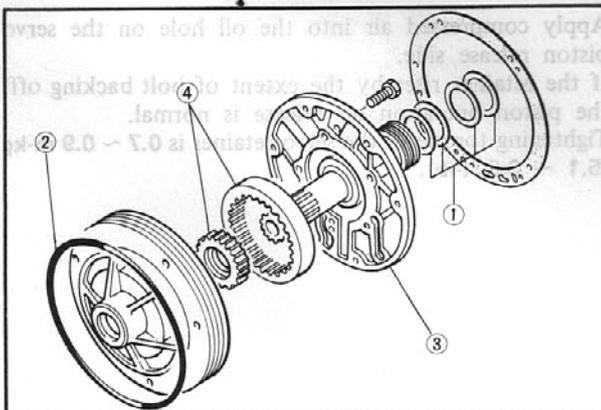


Fig. 7B-36

7B-C-5. Governor and Oil Distributor

a. Disassembly

Disassemble the governor and oil distributor in the numerical order.

1. Governor body
2. Secondary governor valve retainer plate
3. Secondary governor valve and spring
4. Primary governor valve retainer plate
5. Primary governor valve and spring
6. Oil seal rings

b. Checking

1. Inspect the governor valves and bores for scores. Minor scores may be removed from the valves with crocus cloth. Replace the governor if the valves or body is deeply scored.
2. Check for free movement of the valves to the bores. The valves should slide freely of their own weight in the bores when dry. Inspect fluid passages in the valve body for obstructions. All fluid passages must be clean.
3. Check the spring for proper tension and the retainer plates for warping.
4. Check the side clearance between the seal ring and groove, as shown in Fig. 7B-34. This clearance should be $0.04 \sim 0.16$ mm ($0.002 \sim 0.006$ in). To remove the seal ring, squeeze it up so that its joint will rise above the groove and disconnect the joint.

c. Assembling

Assemble the governor and oil distributor in the reverse order of disassembly.

Tighten the valve body attaching bolts to $0.5 \sim 0.7$ m-kg ($3.6 \sim 5.1$ ft-lb).

Note:

Do not confuse primary governor with secondary governor. After installation, check to be sure that spring is not deflected.

7B-C-6. Oil Pump

a. Disassembly

Disassemble the oil pump in the numerical order.

1. Seal rings
2. Large seal ring
3. Pump cover

Note:

Mark the top surface of the pump inner and outer gears with "Prussian Blue" to assure correct assembly. Do not scratch the gears.

4. Inner and outer gear

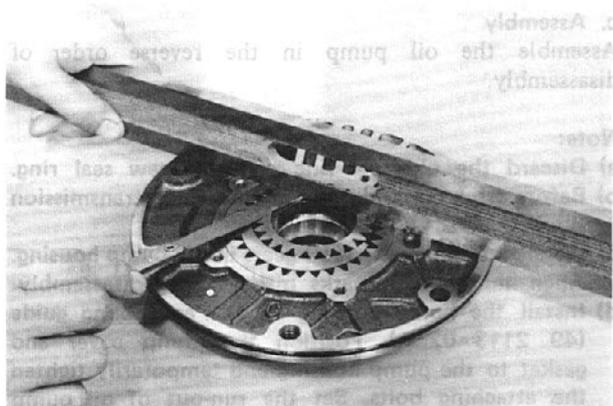


Fig. 7B-37

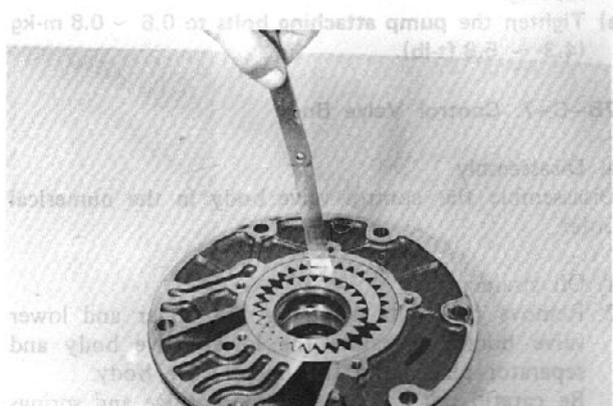


Fig. 7B-38

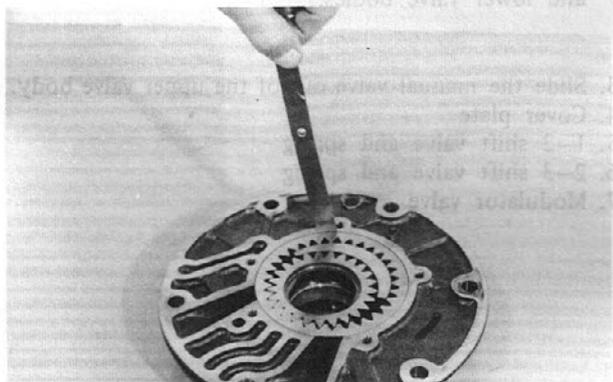


Fig. 7B-39

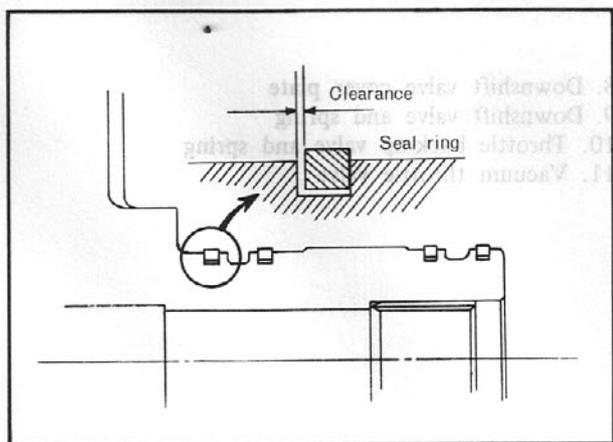


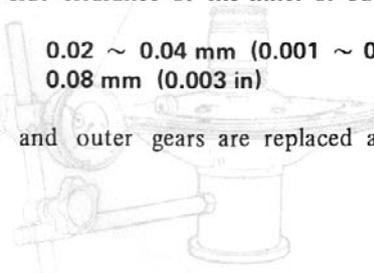
Fig. 7B-40

b. Checking

1. Inspect the inner and outer gears for worn or damaged teeth.
2. Check the side clearance of the inner or outer gear.

Standard	0.02 ~ 0.04 mm (0.001 ~ 0.002 in)
Limit	0.08 mm (0.003 in)

The inner and outer gears are replaced as a set.



3. Check the clearance between the outer gear teeth and crescent.

Standard	0.14 ~ 0.21 mm (0.006 ~ 0.008 in)
Limit	0.25 mm (0.010 in)

4. Check the 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)

5. Inspect the large seal ring groove on the pump housing for damage.
6. Inspect the pump housing and cover for damage. Minor burrs or scores may be removed with crocus cloth.

7. Check the clearance between the seal ring and ring groove, as shown in Fig. 7B-40. This clearance should be 0.04 ~ 0.16 mm (0.002 ~ 0.006 in).

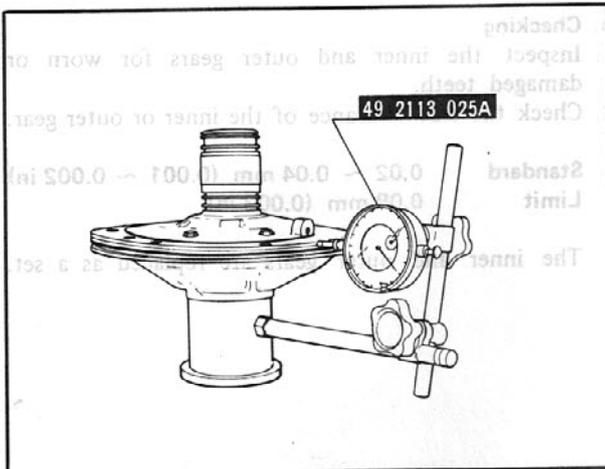


Fig. 7B-41 Check the clearance between the outer and inner gears.

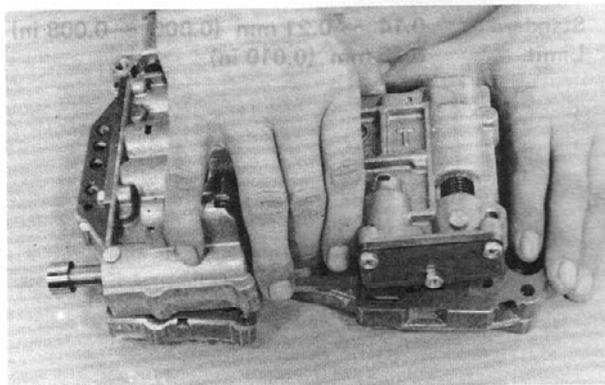


Fig. 7B-42 Check the clearance between the outer and inner gears.

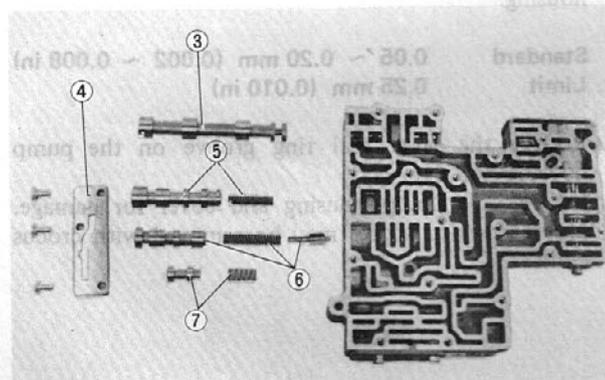


Fig. 7B-43 Check the clearance between the seal ring and the housing.

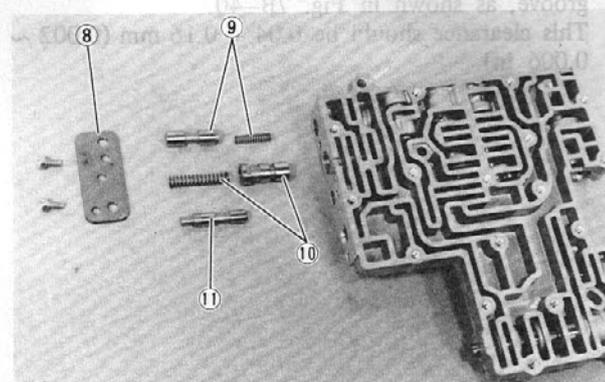


Fig. 7B-44

c. Assembly

Assemble the oil pump in the reverse order of disassembly.

Note:

- a) Discard the old seal ring and use new seal ring.
- b) Before assembling, dip all parts in clean transmission fluid.
- c) Install the inner and outer gears in the pump housing. Align the mating marks made during disassembly.
- d) Install the pump housing on the assembling guide (49 2113 025A). Position the pump cover and gasket to the pump housing and temporarily tighten the attaching bolts. Set the run-out of oil pump cover within 0.07 mm (0.0028 in) total indicator reading.
- e) Tighten the pump attaching bolts to 0.6 ~ 0.8 m-k_g (4.3 ~ 5.8 ft-lb).

7B-C-7. Control Valve Body

a. Disassembly

Disassemble the control valve body in the numerical order.

1. Oil strainer
2. Remove the bolts attaching the upper and lower valve bodies. Separate the lower valve body and separator plate from the upper valve body. Be careful not to lose the check valve and springs in the lower valve body when separating the upper and lower valve bodies.
3. Slide the manual valve out of the upper valve body.
4. Cover plate
5. 1-2 shift valve and spring
6. 2-3 shift valve and spring
7. Modulator valve

8. Downshift valve cover plate
9. Downshift valve and spring
10. Throttle back-up valve and spring
11. Vacuum throttle valve

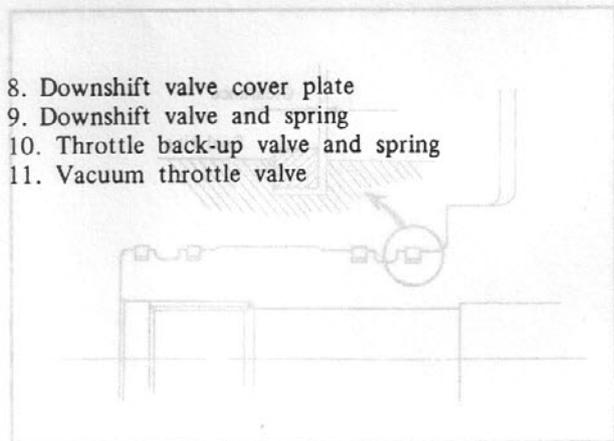


Fig. 7B-45

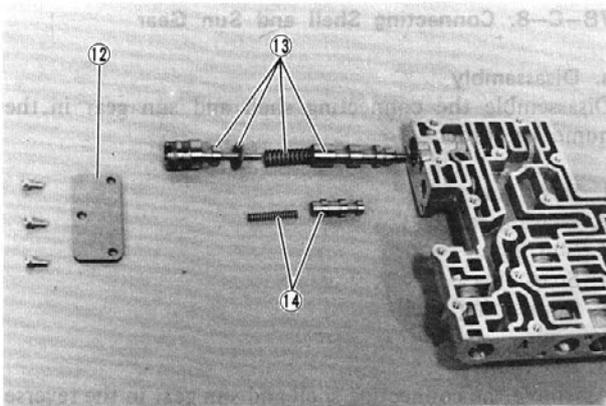


Fig. 7B-45

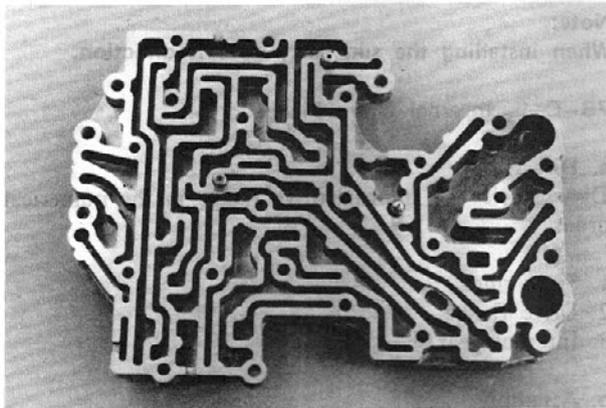


Fig. 7B-46

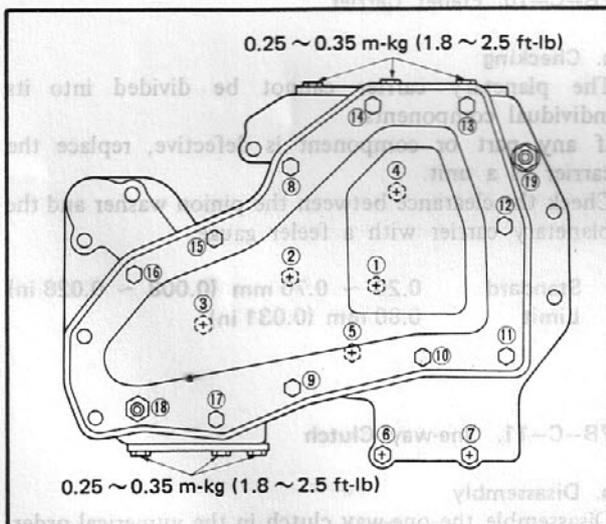


Fig. 7B-47

1. Snap ring
2. Snap ring
3. One-way clutch
4. Snap ring
5. Outer race
6. Connecting drum

12. Pressure regulator valve cover plate
13. Pressure regulator valve sleeve, plug, spring seat, spring and valve
14. Second lock valve

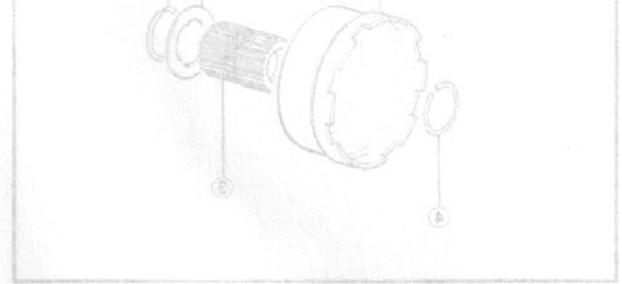


Fig. 7B-48

b. Checking

1. Clean all parts thoroughly in clean solvent, and then blow them dry with moisture-free compressed air.
2. Inspect all valve and plug bores for scores. Check all fluid passages for obstructions. Inspect the check valve for free movement. Inspect all mating surfaces for burrs or distortion. Inspect all plugs and valves for burrs and scores.
Crocus cloth can be used to polish valves and plugs if care is taken to avoid rounding the sharp edges of the valves and plugs.
3. Inspect all springs for distortion. Check all valves and plugs for free movement in their respective bores. Valves and plugs, when dry, must fall from their own weight in their respective bores.
4. Roll the manual valve on a flat surface to check it for a bent condition.

c. Assembly

Assemble the control valve body in the reverse order of disassembly.

Note:

- a) Before assembling, dip all parts in clean transmission fluid.
- b) Using the torque driver (49 8000 021), torque the attaching screws in the sequence as shown in Fig. 7B-47.

Tightening torque:

- | | |
|-------|------------------------------------|
| ① ~ ⑦ | 0.25 ~ 0.35 m·kg (1.8 ~ 2.5 ft·lb) |
| ⑧ ~ ⑱ | 0.3 ~ 0.4 m·kg (2.2 ~ 2.9 ft·lb) |
| ⑱ | 0.55 ~ 0.75 m·kg (4.0 ~ 5.4 ft·lb) |

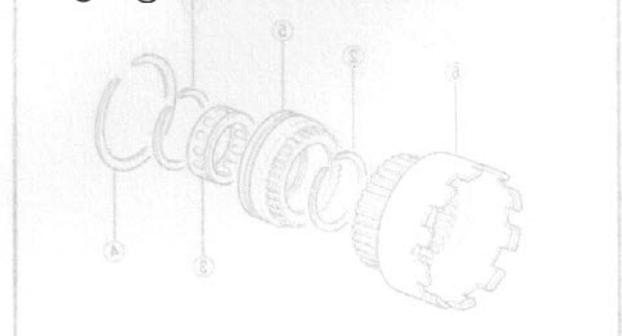


Fig. 7B-51

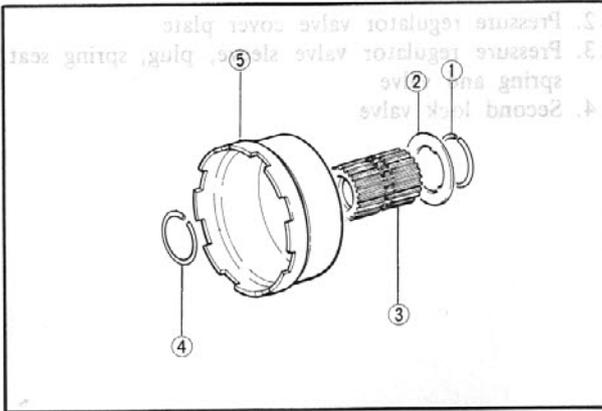


Fig. 7B-48

7B-C-8. Connecting Shell and Sun Gear

a. Disassembly

Disassemble the connecting shell and sun gear in the numerical order.

1. Snap ring
2. Bearing race
3. Sun gear
4. Snap ring
5. Connecting shell

b. Assembly

Assemble the connecting shell and sun gear in the reverse order of disassembly.

Note:

When installing the sun gear, note its direction.

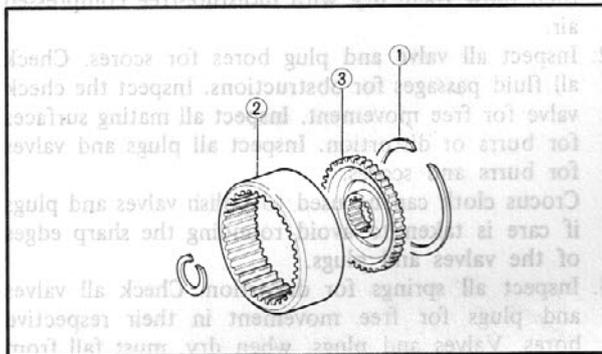


Fig. 7B-49

7B-C-9. Internal Drive Flange

a. Disassembly

Disassemble the internal drive flange in the numerical order.

1. Snap ring
2. Drive flange
3. Internal gear

b. Assembly

Assemble the internal drive flange in the reverse order of disassembly.

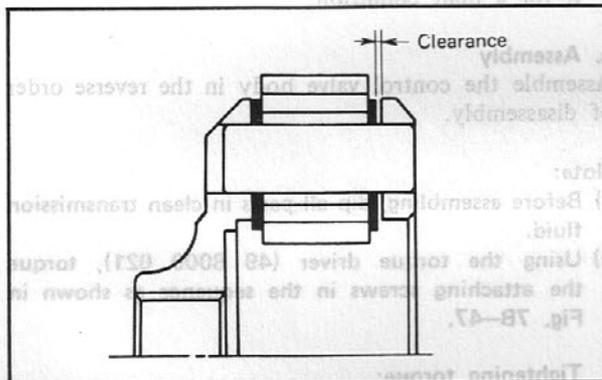


Fig. 7B-50

7B-C-10. Planet Carrier

a. Checking

The planetary carrier cannot be divided into its individual components.

If any part or component is defective, replace the carrier as a unit.

Check the clearance between the pinion washer and the planetary carrier with a feeler gauge.

Standard	0.20 ~ 0.70 mm (0.008 ~ 0.028 in)
Limit	0.80 mm (0.031 in)

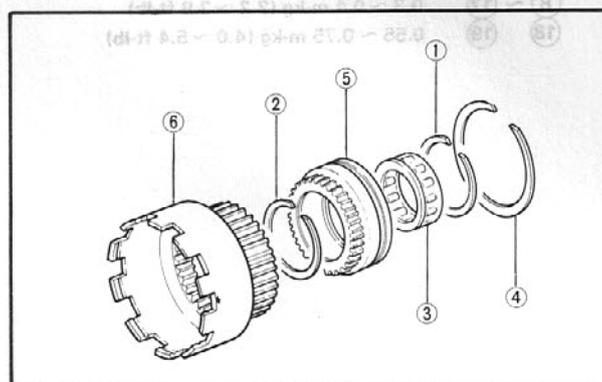


Fig. 7B-51

7B-C-11. One-way Clutch

a. Disassembly

Disassemble the one-way clutch in the numerical order.

1. Snap ring
2. Snap ring
3. One-way clutch
4. Snap ring
5. Outer race
6. Connecting drum



Fig. 7B-52

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.

c. Assembly

Assemble the one-way clutch in the reverse order of disassembly.

Note:

When installing the one-way clutch on the connecting drum, be sure the arrow stamped on the one-way clutch is pointed toward the front of the vehicle.

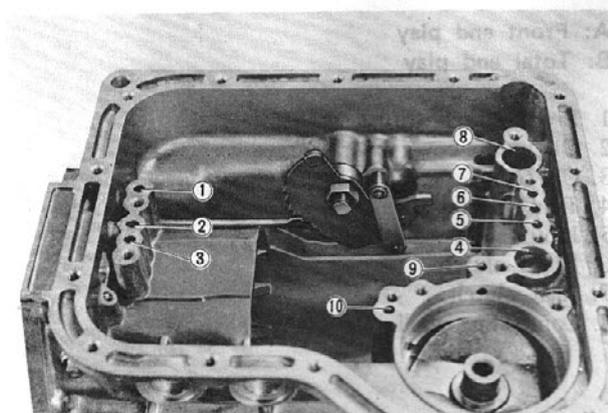


Fig. 7B-53

7B-C-12. Air Pressure Checks

To make the air pressure checks, drain the transmission fluid and remove the oil pan and the control valve body assembly. The inoperative units can be located by introducing air pressure into the various transmission case passages (Fig. 7B-53).

- | | |
|------------------------------------|--------------------------|
| 1. Low & reverse
brake pressure | 6. Rear clutch pressure |
| 2. Governor feed pressure | 7. Front clutch pressure |
| 3. Governor pressure | 8. Pump in |
| 4. Pump out | 9. Servo release |
| 5. Torque converter pressure | 10. Servo apply |

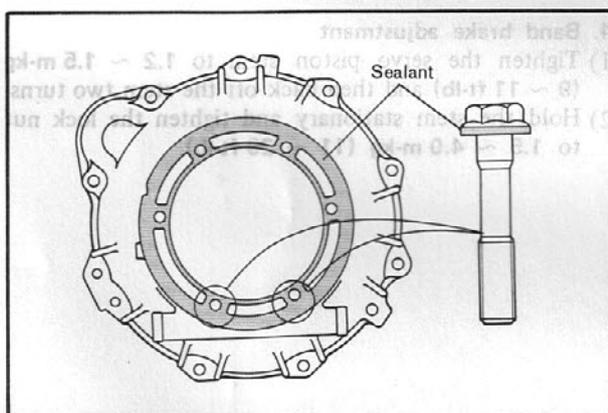


Fig. 7B-54

7B-D. TRANSMISSION ASSEMBLY

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

1. Apply sealant on the converter housing and two attaching bolts flange, as shown in Fig. 7B-54.

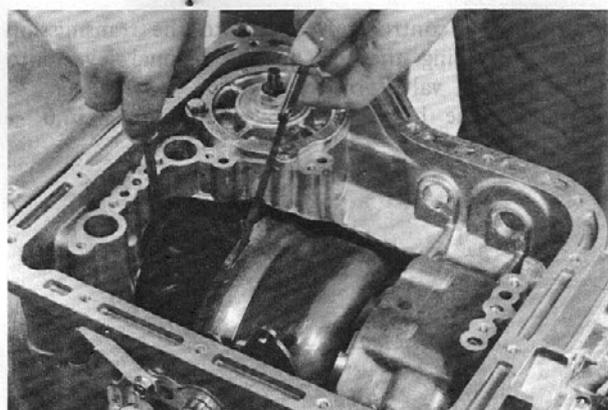


Fig. 7B-55

2. End play of front clutch drum

(Clearance between the front clutch drum and the connecting shell.)

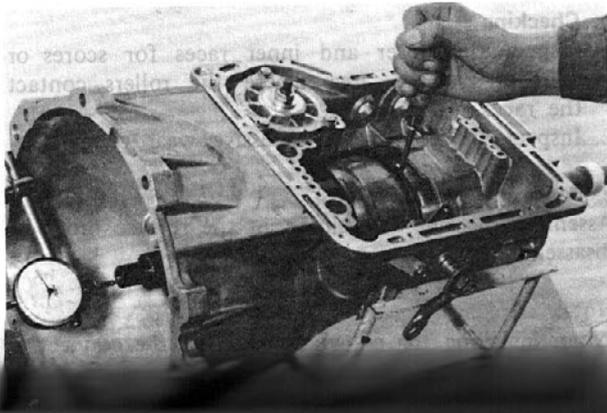
End play 0.5 ~ 0.8 mm (0.020 ~ 0.031 in)

Select the thrust washer (Fig. 7B-57 ①) of the thickness that will allow specified end play.

Thrust washer thickness

1.3 mm (0.051 in)	2.1 mm (0.083 in)
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)

7B



3. Transmission total end play

Using a dial indicator, check the end play by moving behind the connecting shell.

End play 0.25 ~ 0.50 mm (0.010 ~ 0.020 in)

From the table below, select the bearing race (Fig. 7B-57 ②) of the thickness that will allow specified end play.

Bearing race thickness

1.2 mm (0.047 in)	1.6 mm (0.063 in)
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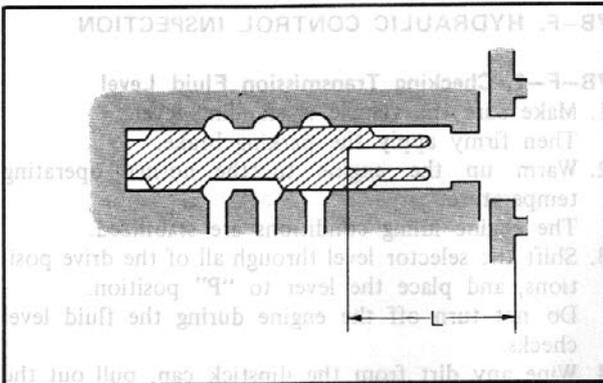


Fig. 7B-60

6. If the control valve body, transmission case or vacuum diaphragm unit was replaced, a new length diaphragm rod must be used.

With the vacuum throttle valve fully pushed, measure the depth of the throttle valve bore ("L" shown in Fig. 7B-60).

According to this measurement "L" and the following table, select the correct diaphragm rod.

Measurement "L"	Length of the rod to be used
Under 25.55 mm (1.006 in)	29.0 mm (1.142 in)
25.65 ~ 26.05 mm (1.010 ~ 1.026 in)	29.5 mm (1.161 in)
26.15 ~ 26.55 mm (1.030 ~ 1.045 in)	30.0 mm (1.181 in)
26.65 ~ 27.05 mm (1.049 ~ 1.065 in)	30.5 mm (1.201 in)
Over 27.15 mm (1.069 in)	31.0 mm (1.220 in)

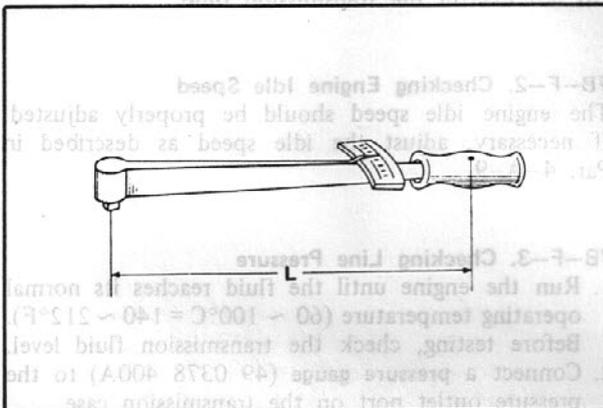


Fig. 7B-61

7B-E. TRANSMISSION INSTALLATION

Install the transmission in the reverse order of removal, noting the following points.

1. Tighten the bolts attaching the converter to the drive plate to 3.5 ~ 5.0 m·kg (25 ~ 36 ft·lb). To tighten to the specification, use the wrench (49 0877 435) and install a torque wrench to the center hole of the wrench. Then, tighten the bolts until the reading on the torque wrench comes to the value to be obtained by the undermentioned formula.

$$\frac{5L \text{ cm}}{10 + L \text{ cm}} \text{ m·kg} \left(\frac{35L \text{ in}}{4 + L \text{ in}} \text{ ft·lb} \right)$$

2. Fill the transmission to the proper fluid lever with the specified fluid.
3. Check the followings and adjust if necessary.
 - Manual linkage
 - Inhibitor switch
 - Engine idle
 - Kick-down switch
 - Downshift solenoid
4. Perform stall test, road test and hydraulic test.

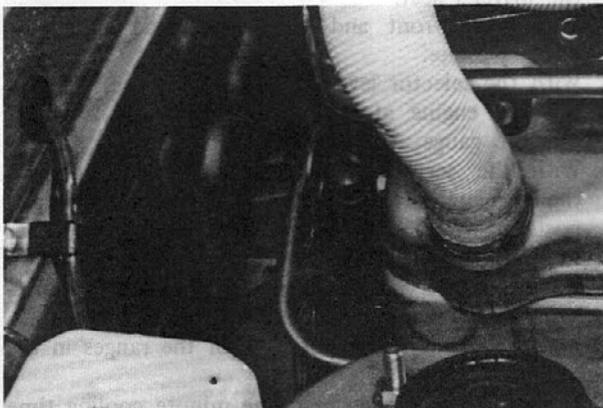


Fig. 7B-62

Manual Range	Line Pressure	
	Engine idling	Stall
"R"	4.0 ~ 7.0 kg/cm ² (57 ~ 100 lb/in ²)	14.0 ~ 19.0 kg/cm ² (228 ~ 270 lb/in ²)
"D"	3.0 ~ 4.0 kg/cm ² (43 ~ 57 lb/in ²)	9.0 ~ 11.0 kg/cm ² (128 ~ 156 lb/in ²)
"3"	8.0 ~ 12.0 kg/cm ² (114 ~ 171 lb/in ²)	8.0 ~ 12.0 kg/cm ² (114 ~ 171 lb/in ²)
"1"	3.0 ~ 4.0 kg/cm ² (43 ~ 57 lb/in ²)	9.0 ~ 11.0 kg/cm ² (128 ~ 156 lb/in ²)

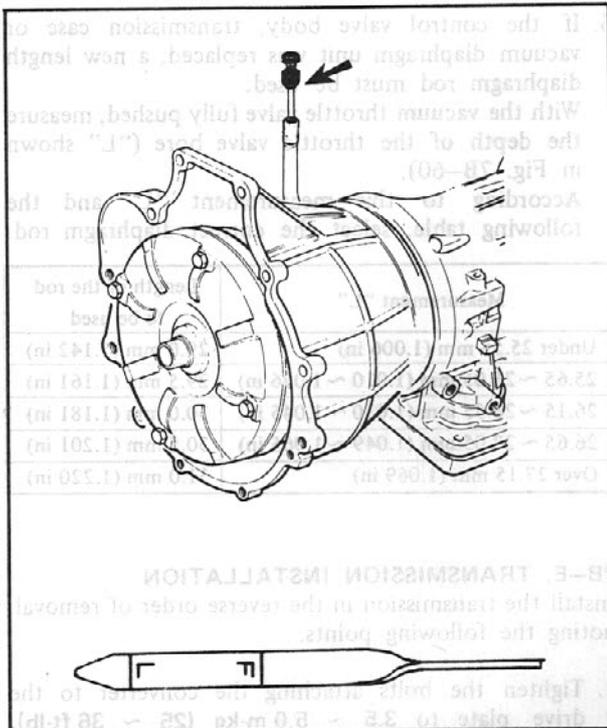


Fig. 7B-63

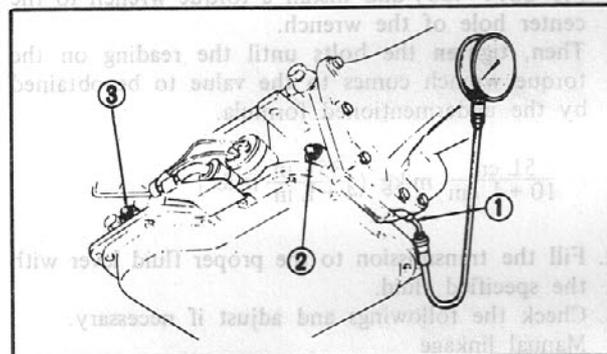


Fig. 7B-64

1. For line pressure in forward range
2. For governor pressure
3. For line pressure in "R" range

Line Pressure

Manual Range	Line Pressure	
	Engine Idling	Stall
"R"	4.0 ~ 7.0 kg/cm ² (57 ~ 100 lb/in ²)	16.0 ~ 19.0 kg/cm ² (228 ~ 270 lb/in ²)
"D"	3.0 ~ 4.0 kg/cm ² (43 ~ 57 lb/in ²)	9.0 ~ 11.0 kg/cm ² (128 ~ 156 lb/in ²)
"2"	8.0 ~ 12.0 kg/cm ² (114 ~ 171 lb/in ²)	8.0 ~ 12.0 kg/cm ² (114 ~ 171 lb/in ²)
"1"	3.0 ~ 4.0 kg/cm ² (43 ~ 57 lb/in ²)	9.0 ~ 11.0 kg/cm ² (128 ~ 156 lb/in ²)

7B-F. HYDRAULIC CONTROL INSPECTION

7B-F-1. Checking Transmission Fluid Level

1. Make sure the vehicle is standing level. 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 level through all of the drive positions, and place the lever to "P" position. Do not turn off 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. Check the fluid level. The fluid level should be between the "F" and "L" marks on the gauge.

Note:

Do not overfill the transmission fluid.

7B-F-2. Checking Engine Idle Speed

The engine idle speed should be properly adjusted. If necessary, adjust the idle speed as described in Par. 4-A-9.

7B-F-3. Checking Line Pressure

1. Run the engine until the fluid reaches its normal operating temperature (60 ~ 100°C = 140 ~ 212°F). Before testing, check the transmission fluid level.
2. Connect a **pressure gauge** (49 0378 400A) to the pressure outlet port on the transmission case. Be sure to place the gauge where it is visible from the driver's seat.
3. Chock the front and rear wheels and apply the parking brake.
4. With the selector lever in the range to be checked, run the engine at engine idle speed and read the pressure gauge.
5. With the service brakes firmly applied, depress the accelerator pedal gradually to the wide open position. 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. Measure line pressure for each of the ranges in the same manner.

Be sure to allow at least one minute cooling time between tests at 1,200 rpm with the transmission in the "P" or "N" position.

Governor Pressure

Driving speed	Standard governor pressure	
	kg/cm ²	lb/in ²
20 mile/h	0.9 ~ 1.4	12.8 ~ 19.9
35 mile/h	1.9 ~ 2.6	27.0 ~ 37.0
55 mile/h	4.0 ~ 5.0	56.9 ~ 71.1

Stall Revolution

Before break in	After break in
1,950 ~ 2,200 rpm	2,000 ~ 2,250 rpm

Shift Speed

Throttle condition	Gear shift	Shift speed
		mile/h
Wide open throttle (0 ~ 100 mm-Hg) (0 ~ 3.94 in-Hg)	D ₁ → D ₂	29 ~ 40
	D ₂ → D ₃	51 ~ 65
	D ₃ → D ₂	44 ~ 57
	D ₂ → D ₁	20 ~ 30
Half throttle (200 ± 10 mm-Hg) (7.87 ± 0.39 in-Hg)	D ₁ → D ₂	8 ~ 17
	D ₂ → D ₃	16 ~ 35
Fully closed throttle	D ₃ → D ₁	6 ~ 13
Manual 1	1 ₂ → 1 ₁	23 ~ 30

7B-F-4. Checking Governor Pressure

Before testing, check the transmission fluid level.

1. Connect a **pressure gauge** (49 0378 400A) as shown in Fig. 7B-64.
2. Read the pressure with the vehicle running at the speeds specified in the specification section. If pressures are not within specifications, disassemble and check the governor valve.

7B-F-5. Stall Test

1. Start the engine to allow it to reach its normal operation temperature. Before testing, check the transmission fluid level.
2. Connect a tachometer to the engine. Be sure to place the tachometer where it is visible from the driver's seat.
3. Chock the front and rear wheels. Then apply both the parking and service brakes while making this test. Be sure to depress the brake pedal firmly with the left foot before depressing the accelerator pedal.
4. Shift the selector lever to "D" position.
5. Slowly depress the accelerator pedal until the throttle valve is fully opened. Quickly read and record the engine revolution at stall condition and then release the accelerator pedal.

Note:

The test time from starting accelerator depression to its release must not exceed 5 seconds.

6. Shift the selector lever to "N" position and operate the engine at idling for more than one minute to cool down the torque converter oil and coolant.
7. Make similar stall tests in "2", "1" and "R".

7B-F-6. Checking Shift Point

1. In "D" position, gear changes, D₁ → D₂ → D₃ are effected. In "R" position, the speed does not increase.
2. The kickdown operates properly.
3. By shifting the selector lever from "D" to "2" "1", gear changes D₃ → 2(1₂) → 1₁ are effected. In the ranges "1₂" and "1₁", the engine braking works properly.
4. In "1" position, the speed does not increase.
5. Should be quickly fixed at "2" position.
6. In "P" position, vehicle can be parked properly.
7. Check the shift points according to the specifications.

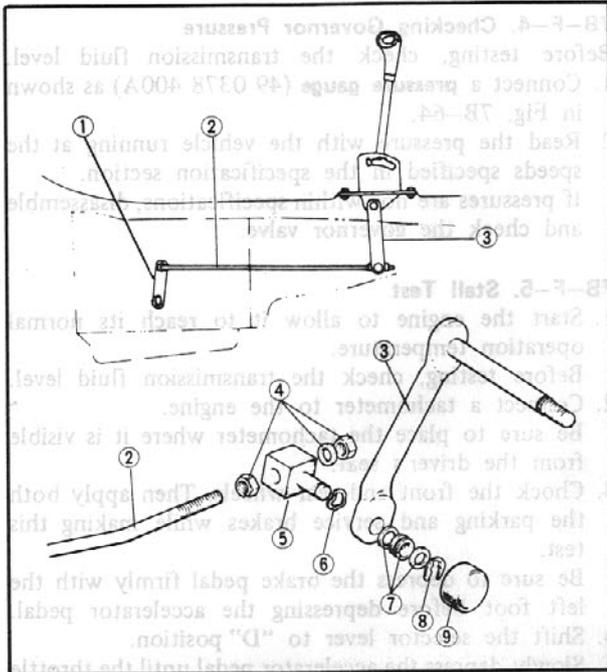


Fig. 7B-65

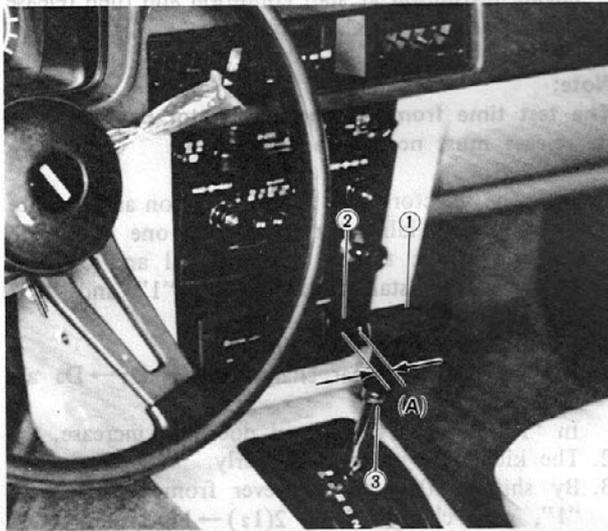


Fig. 7B-66

- 1. Knob
- 2. Push button
- 3. Lock nut

7B-G. SHIFT CONTROL LINKAGE

Before the linkage is adjusted, be sure the engine idle speed is properly adjusted. Refer to Par. 4-A-9 for the procedure.

7B-G-1. Adjusting Manual Linkage

1. Place the transmission selector lever in the "N" position.
2. Raise the vehicle and support with stands.
3. Disconnect the T-joint from the lower end of the selector lever operating arm.
4. Move the transmission manual lever to the "N" position, third detent position from the back of the transmission.
5. Loosen the T-joint retaining nuts and adjust the T-joint so that it freely enters the hole of the selector lever operating arm. Tighten the retaining nuts to secure the adjustment.
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.

7B-G-2. Adjustment Selector Lever Knob

When the selector lever knob is removed, it should be adjusted properly in the following manner.

1. Position the selector lever at "N" or "D" position.
2. Loosen the lock nut of the selector lever knob and screw in the selector lever knob until the no play of the push button is obtained.
3. Screw in the selector lever knob one turn to the position where the push button is on the driver's side.
4. Push the push button and confirm that the selector lever can be shifted to "P" position.
 - If the selector lever cannot be shifted to "P" position, screw in the selector lever knob by one turn.
 - Repeat the above procedure until the selector lever can be shifted to "P" position smoothly.
5. Confirm that the selector lever cannot, without pushing the push button, be shifted from "N" to "R" or from "D" to "2" position.
 - If the selector lever can be shifted to "R" or "2" position without pushing the push button, it means that the selector lever knob is excessively screwed in and so screw out the knob.
6. After the adjustment is completed, check the push button protrusion (A) as shown in Fig. 7B-66. The protrusion should be $6.0 \pm 1.5 \text{ mm}$ ($0.24 \pm 0.06 \text{ in}$) at "N" or "P" position.
7. Make final confirmation on whether the operation of the push button is perfect when shifting the selector lever to each position.
8. Tighten the selector lever knob lock nut. The tightening torque is $1.5 \sim 2.0 \text{ m}\cdot\text{kg}$ ($10.8 \sim 14.5 \text{ ft}\cdot\text{lb}$).

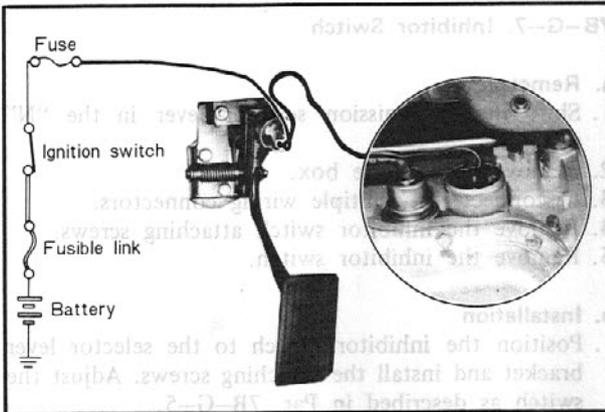


Fig. 7B-67

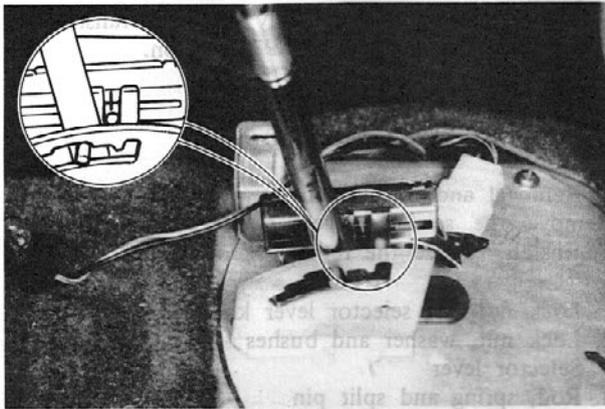


Fig. 7B-68

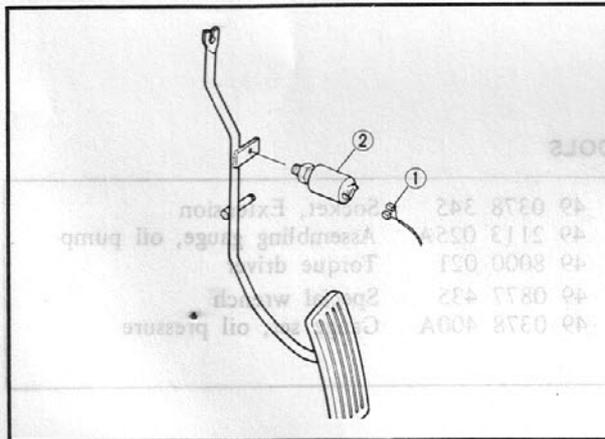


Fig. 7B-69

7B-G-3. Adjusting Engine Idle Speed

Adjust the engine idle speed as described in Section 4.

7B-G-4. Adjusting Kick-down Switch

1. Disconnect the wiring connectors from the kick-down switch.
2. 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.

7B-G-5. Adjusting Inhibitor Switch

1. Shift the selector lever to "N" range.
2. Loosen the inhibitor switch attaching screws.
3. Correctly position the manual shaft in "N" position by adjusting the range select lever. The proper "N" position is where the slot of the manual shaft is positioned vertically and detent works to position in the shaft correctly with a click sound.
4. Move the inhibitor switch so that the identification marks on the switch body and sliding plate is aligned.
5. Tighten the inhibitor switch attaching screws securely.
6. Slide the select lever "P" position and make sure that the engine is started when the select lever moves fore and aft in moval range of "P" position.
7. Check the operation of the switch in each detent position of selector. The engine should started only with the transmission selector lever in "N" and "P" position.

7B-G-6. Kick-down Switch

a. Removal and Installation

Remove the kick-down switch in the numerical order. To install, reverse the removal procedure.

1. Wire connectors
2. Kick-down switch

After installing, adjust the kick-down switch as described in Par. 7B-G-4.

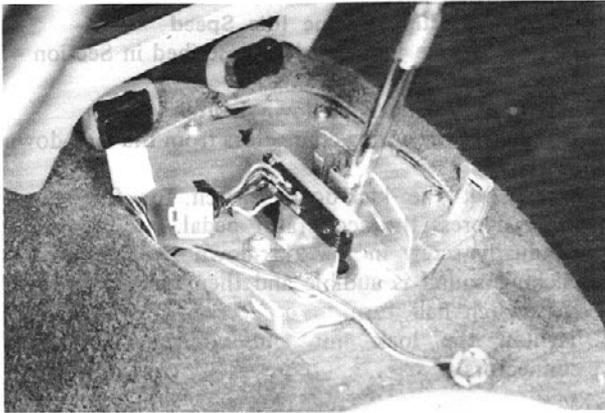


Fig. 7B-70

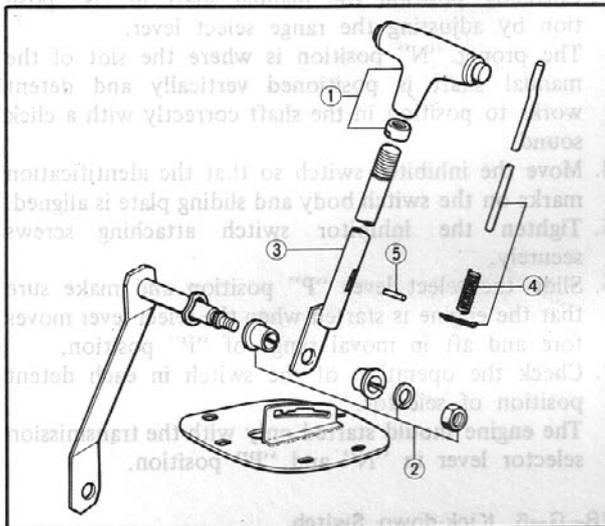


Fig. 7B-71

7B-G-7. Inhibitor Switch

a. Removal

1. Shift the transmission selector lever in the "N" position.
2. Remove the console box.
3. Disconnect the multiple wiring connectors.
4. Remove the inhibitor switch attaching screws.
5. Remove the inhibitor switch.

b. Installation

1. Position the inhibitor switch to the selector lever bracket and install the attaching screws. Adjust the switch as described in Par. 7B-G-5.
2. Check the operation of the switch in each detent position.
The engine should start only with the transmission selector lever in "N" or "P" position.
3. Install the console box.

7B-G-8. Selector Lever

a. Removal and Installation

Remove the selector lever in the numerical order. To install, reverse the removal procedure.

1. Lock nut and selector lever knob
2. Lock nut, washer and bushes
3. Selector lever
4. Rod, spring and split pin
5. Guide pin

After installing, adjust the selector lever knob as described in Par. 7B-G-2.

SPECIAL TOOLS

49 0378 320A	Stand, transmission case	49 0378 345	Socket, Extension
49 0378 390	Puller, oil pump	49 2113 025A	Assembling gauge, oil pump
49 8000 015	Remover, snap ring	49 8000 021	Torque driver
49 0378 375	Compressor, clutch spring	49 0877 435	Special wrench
49 8000 025	Remover, snap ring	49 0378 400A	Gauge set, oil pressure
49 0378 346	Hex-head wrench		

8-A. PROPELLER SHAFT REMOVAL

Raise the rear end of the vehicle and support with stands.

Note:

To maintain drive line balance, mark the mating parts of the companion flange and propeller shaft so they can be reassembled in their original positions.

PROPELLER SHAFT

1. Remove the bolts that attach the propeller shaft to the companion flange of the rear axle. Remove the propeller shaft from the under

8-A. PROPELLERSSHAFT REMOVAL	8 : 1
8-B. PROPELLER SHAFT INSPECTION	8 : 2
8-C. UNIVERSAL JOINT DISASSEMBLY	8 : 3
8-D. UNIVERSAL JOINT INSPECTION	8 : 3
8-E. UNIVERSAL JOINT ASSEMBLY	8 : 4
8-F. PROPELLER SHAFT INSTALLATION	8 : 4
SPECIAL TOOL	8 : 5

into (0250 440) lubricant from



Fig 8-1

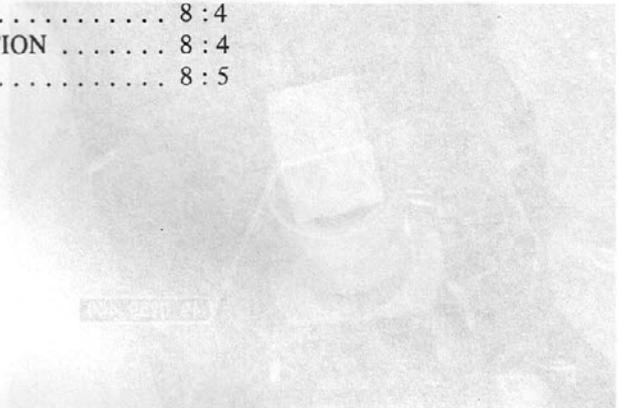


Fig 8-2

4. Remove the bolts attaching the bracket to the center bearing support and remove the bracket.
5. Remove the universal joints, as described in Fig 8-C.

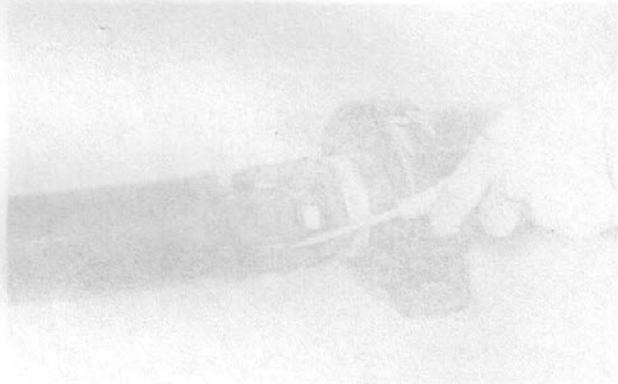


Fig 8-3

6. Remove the nut attaching the yoke and bearing to the front propeller shaft. Remove the yoke and bearing support.

Note:

Do not remove the oil seals and bearing from the support unless they are defective.



Fig 8-4

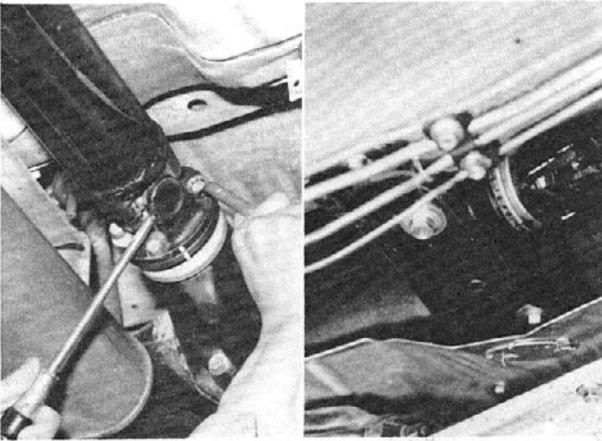


Fig. 8-1

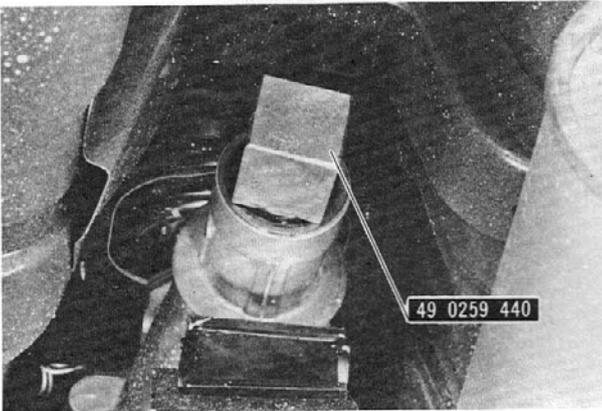


Fig. 8-2

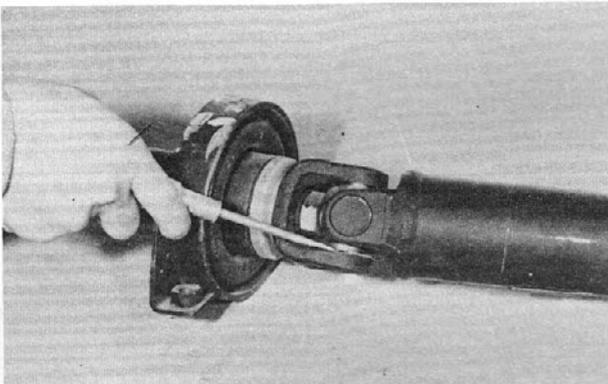


Fig. 8-3

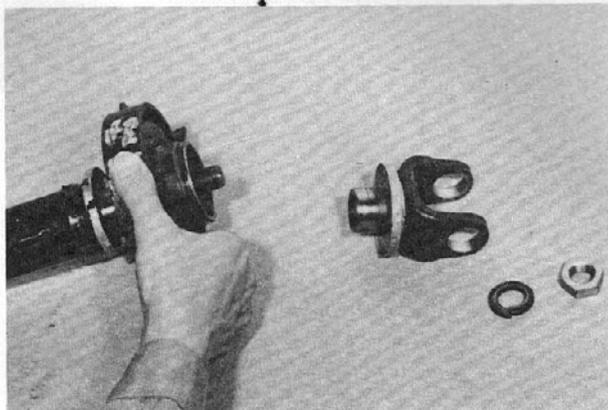


Fig. 8-4

8-A. PROPELLER SHAFT REMOVAL

Raise the rear end of the vehicle and support 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.

1. Remove the bolts that attach the propeller shaft to the companion flange of the rear axle.
2. Remove the center bearing bracket from the under body.
3. Install the main shaft holder (49 0259 440) into the extension housing to prevent lubricant from leaking out of the housing.

4. Remove the bolts attaching the bracket to the center bearing support and remove the bracket.
5. Remove the universal joints, as described in Par. 8-C.

6. Remove the nut attaching the yoke and bearing to the front propeller shaft. Remove the yoke and bearing support.

Note:

Do not remove the oil seals and bearing from the support unless they are defective.

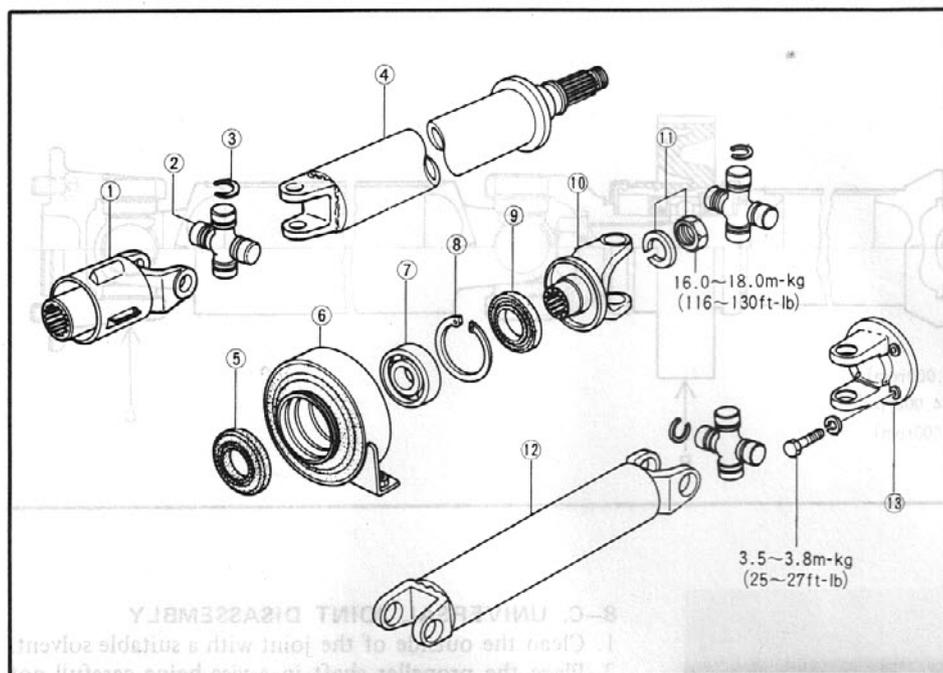


Fig. 8-5

1. Yoke
2. Universal joint
3. Snap ring
4. Front propeller shaft
5. Oil seal
6. Support
7. Ball bearing
8. Clip
9. Oil seal
10. Yoke
11. Washer and nut
12. Rear propeller shaft
13. Universal joint yoke

Fig. 8-7

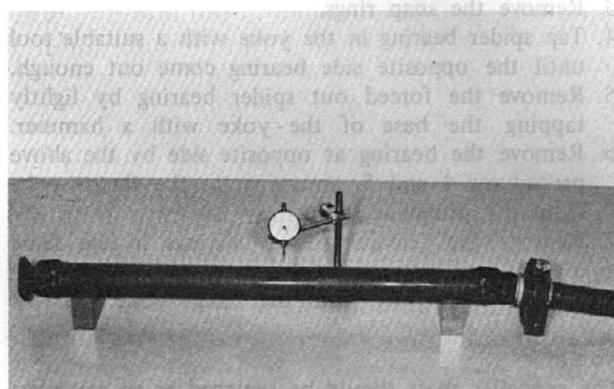


Fig. 8-6

	Max. permissible unbalance at 4,000 rpm
At front	20 cm-gr (0.28 in-oz)
At center	12.5 cm-gr (0.17 in-oz)
At rear	20 cm-gr (0.28 in-oz)

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)

Fig. 8-8

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.

Note:

As the looseness on the front universal joint may cause the increase of the unbalance, resulting the seizure of the extension housing bush, the front universal joint and propeller shaft should be replaced as an assembly. But, if the unbalance of the propeller shaft assembly can be checked and corrected within the specifications, the front universal joint only may be disassembly or replaced.

3. Check the center bearing for wear, looseness or any damage.

Fig. 8-10

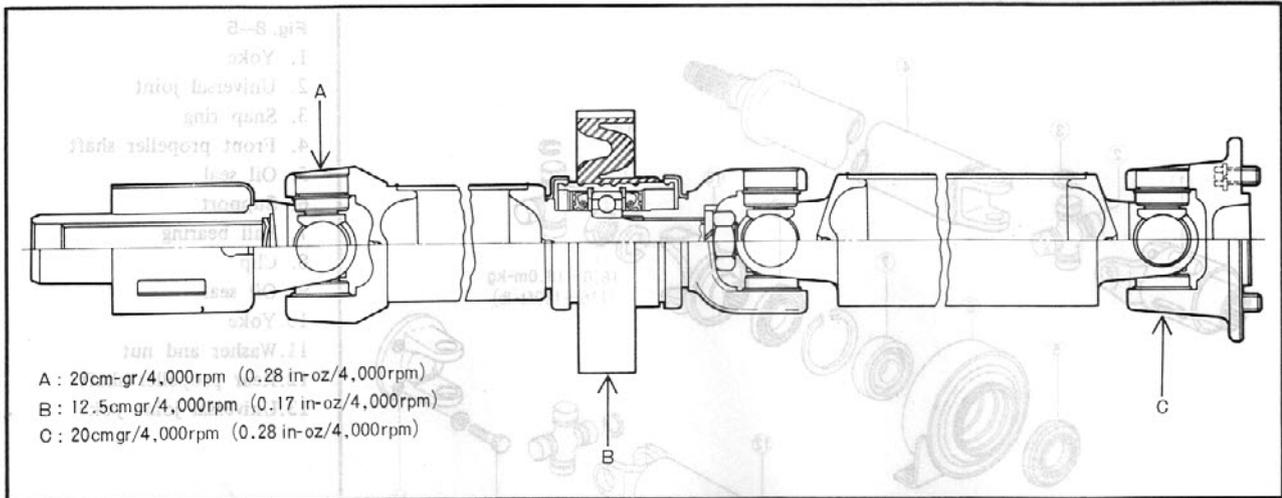


Fig. 8-7

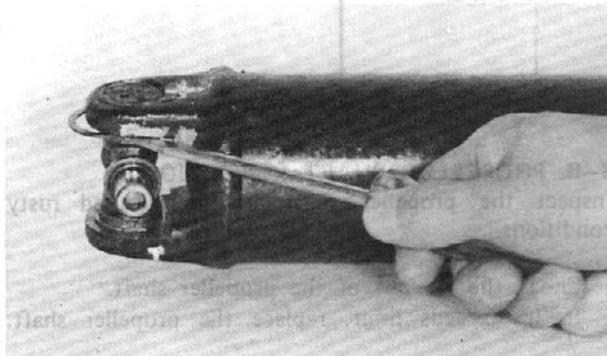


Fig. 8-8

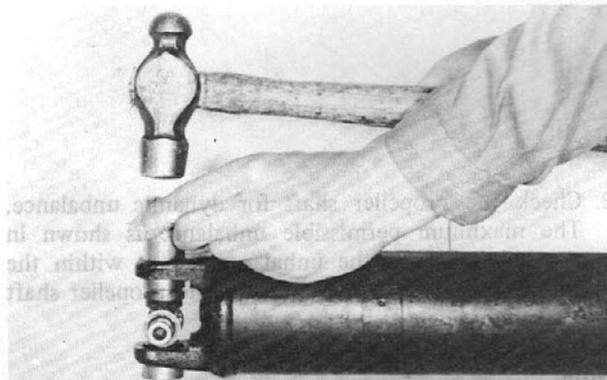


Fig. 8-9

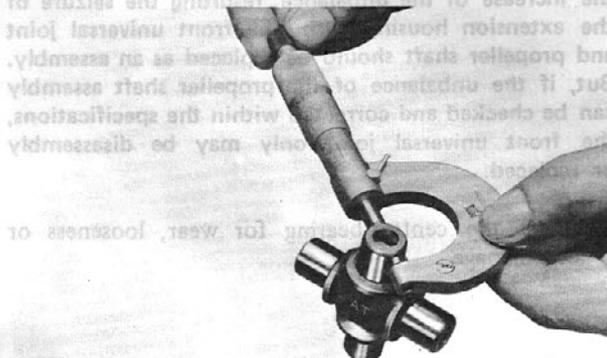


Fig. 8-10

8-C. UNIVERSAL JOINT DISASSEMBLY

1. Clean the outside of the joint with a suitable solvent.
2. Place the propeller shaft in a vise being careful not to damage it.
3. Remove the snap rings.
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.

Note:

The propeller shaft should be replaced as an assembly only. But, if the unbalance of the propeller shaft assembly can be checked and corrected within the specifications, the front universal joint only may be disassembled or replaced.

At front	20 cm-gr (0.28 in-oz)
At center	12.5 cm-gr (0.17 in-oz)
At rear	20 cm-gr (0.28 in-oz)

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 **under 14.595 mm (0.5746 in)**, replace with a new universal joint assembly.

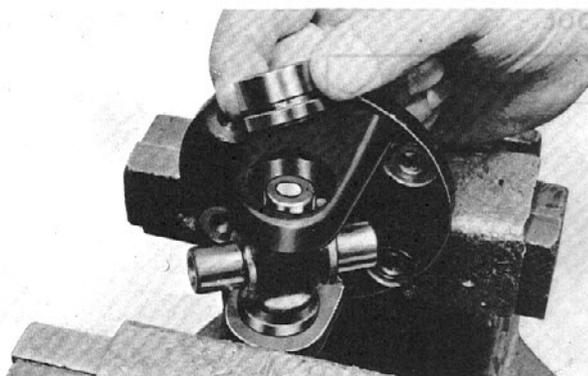


Fig. 8-11



Fig. 8-12

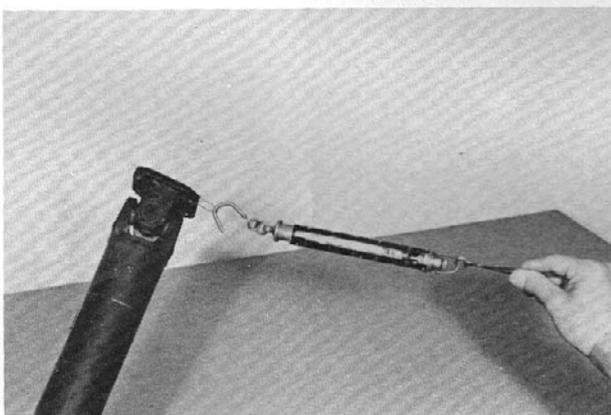


Fig. 8-13

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)	

Yoke to rear axle companion flange	3.5 ~ 3.8 m-kg (25 ~ 27 ft-lb)
Yoke to front propeller shaft	16.0 ~ 18.0 m-kg (116 ~ 130 ft-lb)
Center bearing support	3.8 ~ 5.3 m-kg (27 ~ 38 ft-lb)

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.
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.
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).

Check the swinging torque with a spring scale.

Swinging torque: 3 ~ 8 cm-kg (2.6 ~ 6.9 in-lb)

If the reading is not within the specifications, adjust the swinging torque by changing the snap ring.

Snap rings are available in 9 thicknesses as shown in the left table.

8-F. PROPELLER SHAFT INSTALLATION

Install the propeller shaft in the reverse order of removal, noting the following points.

1. Be sure to observe location marks on the companion flange, yokes and propeller shaft for correct assembly.
2. Tightening torques are as shown in the left table.

SPECIAL TOOL

49 0259 440 Turning holder, main shaft

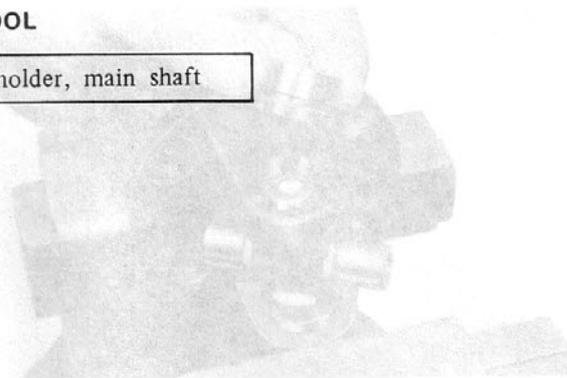


Fig. 8-11

as instructed above.
 K. Install the sliding yoke (or flange yoke) and spider
 7. Remove the pusher and install the snap ring.
 The spider is at the center of the yoke.
 6. Position the pusher and press in the bearing until
 the bearing is in the bore at other side of yoke.
 5. Place the bearing in the bore at other side of yoke.
 4. Remove the pusher and install the snap ring
 in the bearing to sufficient depth.
 3. Position a suitable pusher on the bearing and press
 the sliding yoke or companion flange yoke)
 2. Position the spider and one bearing on the flange
 yoke. (sliding yoke or companion flange yoke)
 1. Position the spider and one bearing on the flange
 yoke. (sliding yoke or companion flange yoke)
 1. Position the spider and one bearing on the flange
 yoke. (sliding yoke or companion flange yoke)

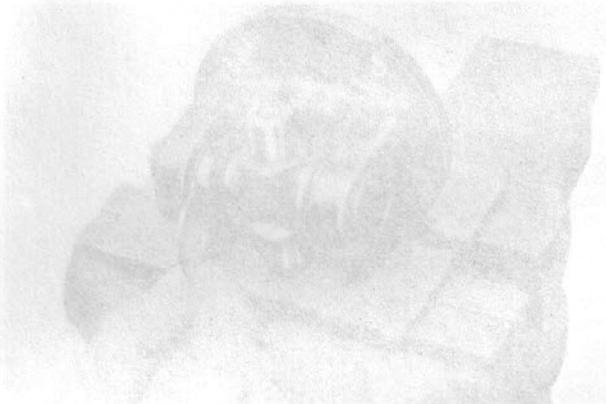


Fig. 8-12

Notes:
 a) Avoid reusing the old snap rings.
 b) Use snap rings of same thickness at both sides of
 the 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).

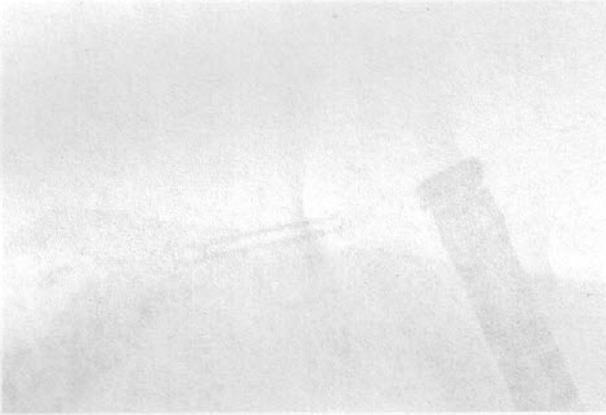


Fig. 8-13

Check the swinging torque with a spring scale.
 Swinging torque: 3 ~ 8 cm-kg (2.8 ~ 8.9 in-lb)
 If the reading is not within the specifications, adjust
 the swinging torque by changing the snap ring.

Snap rings are available in 9 thicknesses as shown in
 the left table.

1.32 mm (0.0480 in)	1.32 mm (0.0520 in)
1.34 mm (0.0488 in)	1.34 mm (0.0528 in)
1.36 mm (0.0496 in)	1.36 mm (0.0532 in)
1.38 mm (0.0504 in)	1.38 mm (0.0543 in)
1.40 mm (0.0512 in)	

Center bearing support	3.8 ~ 5.3 m-kg (17 ~ 28 ft-lb)
Yoke to front propeller shaft	11.0 ~ 13.0 m-kg (4.9 ~ 5.9 m-kg)
Yoke to rear yoke companion flange	14.0 ~ 18.0 m-kg (6.3 ~ 8.1 m-kg)

8-F. PROPELLER SHAFT INSTALLATION
 Install the propeller shaft in the reverse order of re-
 moval, noting the following points.
 1. Be sure to observe location marks on the companion
 flange, yoke and propeller shaft for correct
 assembly.
 2. Tightening torques are as shown in the left table.

REAR AXLE

- 9-A. REAR AXLE SHAFT 9 : 1
 - 9-A-1. Removing Rear Axle Shaft 9 : 1
 - 9-A-2. Disassembling Rear Axle Shaft 9 : 1
 - 9-A-3. Assembling Rear Axle Shaft 9 : 2
 - 9-A-4. Installing Rear Axle Shaft 9 : 2
- 9-B. REAR AXLE REMOVAL 9 : 3
- 9-C. REAR AXLE DISASSEMBLY 9 : 3
 - 9-C-1. Removing Differential 9 : 3
 - 9-C-2. Disassembling Differential 9 : 4
 - 9-C-3. Removing Drive Pinion 9 : 4
- 9-D. REAR AXLE INSPECTION 9 : 4
 - 9-D-1. Checking Drive Pinion and Ring Gear 9 : 4
 - 9-D-2. Checking Differential Gears 9 : 5
 - 9-D-3. Checking Bearings 9 : 5
 - 9-D-4. Replacing Pinion Bearing Outer Race 9 : 5
 - 9-D-5. Checking Collapsible Spacer 9 : 5
 - 9-D-6. Checking Oil Seal 9 : 5
 - 9-D-7. Checking Companion Flange 9 : 5
- 9-E. REAR AXLE ASSEMBLY 9 : 6
 - 9-E-1. Adjusting Drive Pinion 9 : 6
 - 9-E-2. Adjusting Pinion Bearing Preload 9 : 7
 - 9-E-3. Assembling Differential 9 : 8
 - 9-E-4. Installing Differential 9 : 9
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- 9-F. REAR AXLE INSTALLATION 9 : 11
- SPECIAL TOOLS 9 : 11

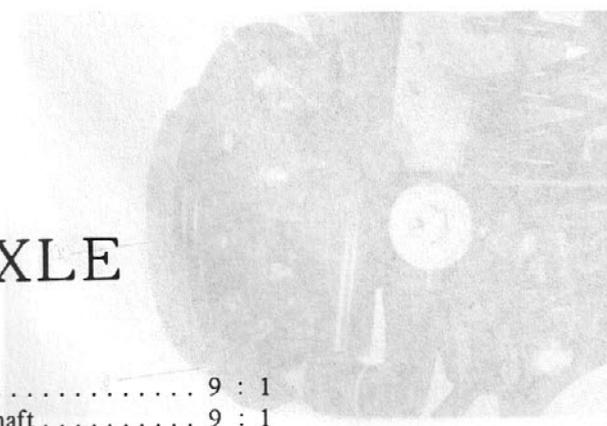


Fig. 9-1

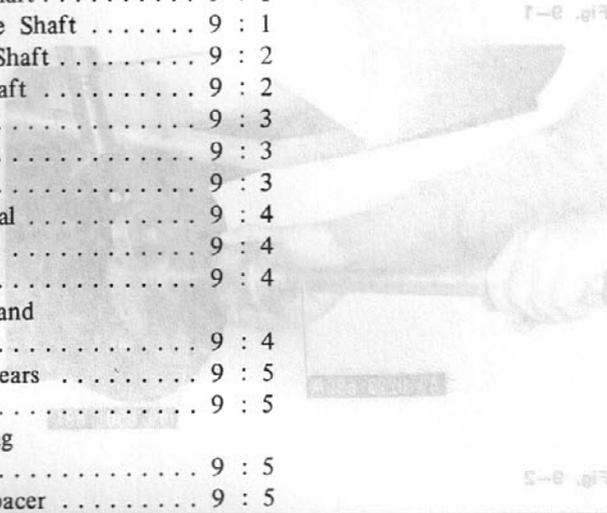


Fig. 9-2

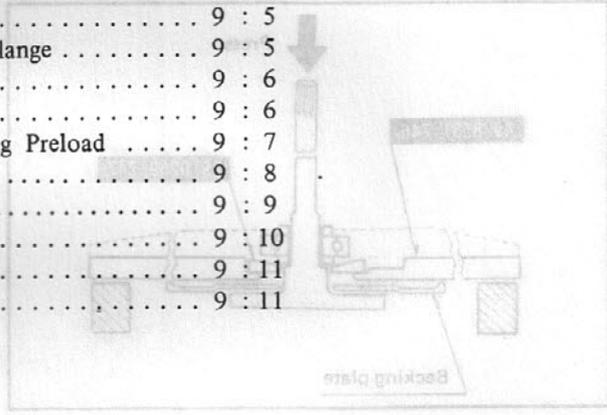


Fig. 9-3

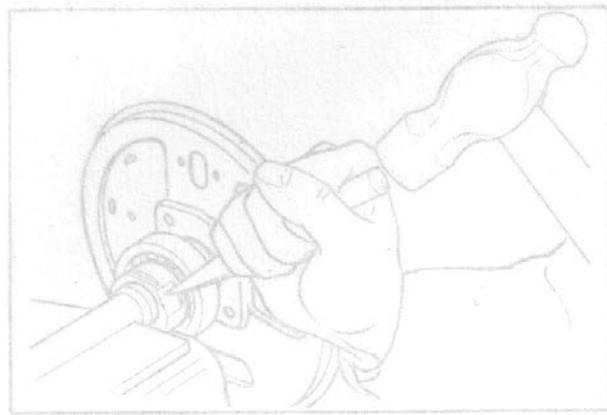


Fig. 9-4

Note:
In case the pressure necessary to press out the axle shaft exceeds 10 tons (22,000 lb) or if the bearing is not available, grind off the part of bearing retaining collar and cut it with a chisel, taking care not to damage the axle shaft.

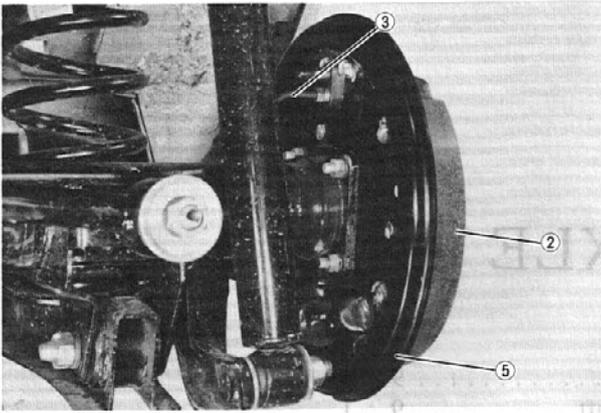


Fig. 9-1

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.

After removing the wheel and tire, remove and disconnect the following parts in the numerical order.

1. Brake drum
2. Brake shoe assembly
3. Brake fluid pipe
4. Parking brake cable
5. Axle shaft and backing plate
6. Oil seal (if necessary)

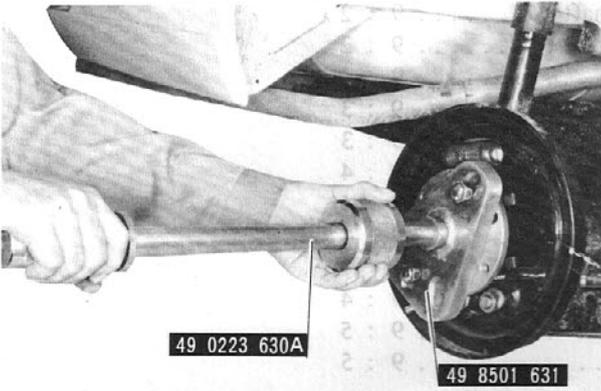


Fig. 9-2

Extract the axle shaft and backing plate assembly using the puller (49 0223 630A and 49 8501 631).

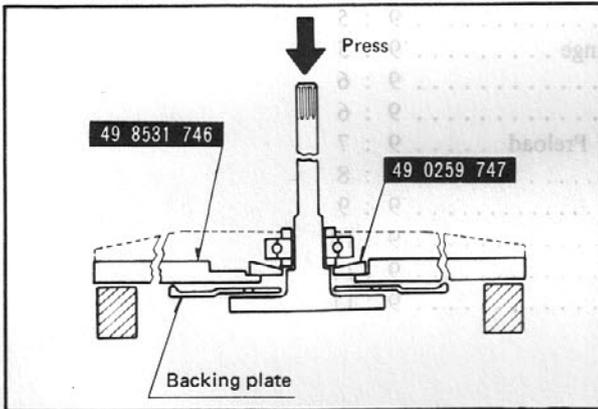


Fig. 9-3

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.

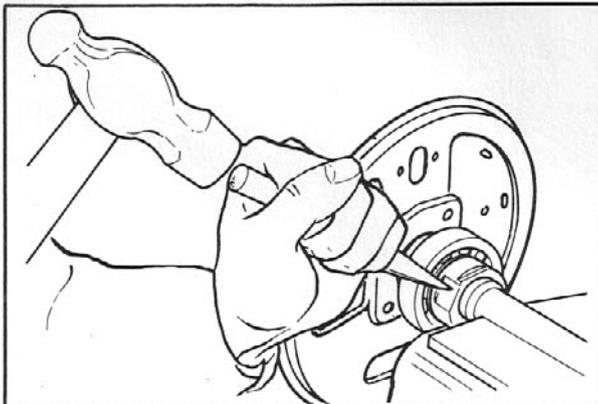


Fig. 9-4

Note:

In case the pressure necessary to press out the axle shaft exceeds 10 tons (22,000 lb) or if the bearing replacer is not available, grind off the part of bearing retaining collar and cut it with a chisel, taking care not to damage the axle shaft.

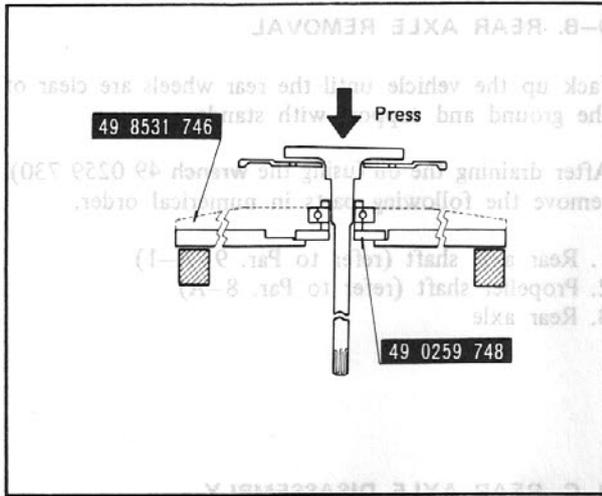


Fig. 9-5

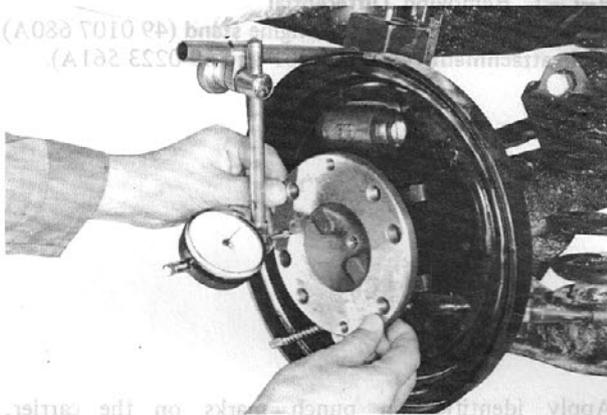


Fig. 9-6

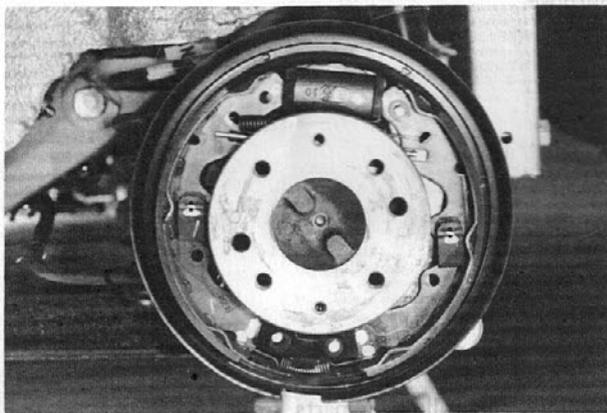


Fig. 9-7

1. Adjuster lock plates and bolts
2. Bearing caps and bolts
3. Adjusters
4. Differential assembly and bearings

Note:
Make certain that each bearing outer race remains with its respective bearing.

9-A-3. Assembling Rear Axle Shaft

1. Clean the collar and collar mounting part of the axle shaft.

Note:

Never apply the oil.

2. Press the bearing retaining collar onto the axle shaft using the attachment (49 0259 748) until it is firm contact with the bearing inner race.

Note:

If the bearing retaining collar is press-fitted with less than 2.7 tons (5,900 lb), replace the collar with a new one.

9-A-4. Installing Rear Axle Shaft

1. Oil seal (if necessary)
2. Apply grease to the oil seal lip.
3. Axle shaft and backing plate
4. Mount a dial indicator and make sure the axle shaft end play is 0 ~ 0.1 mm (0 ~ 0.004 in).

5. Parking brake cable
6. Brake shoe assembly
7. Brake drum
8. Brake fluid pipe
9. Wheel and tire

Note:

Bleed the brake system, referring to Par. 11-J.

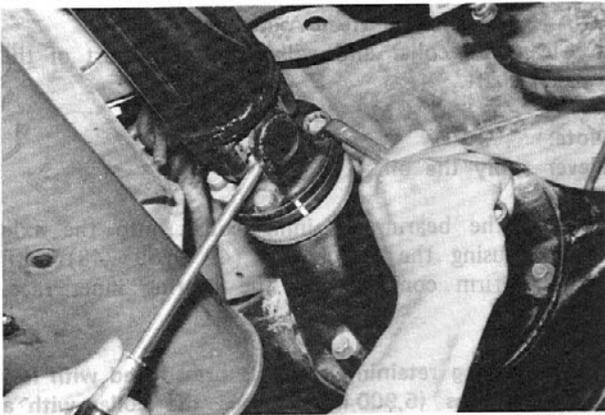


Fig. 9-8



Fig. 9-9



Fig. 9-10

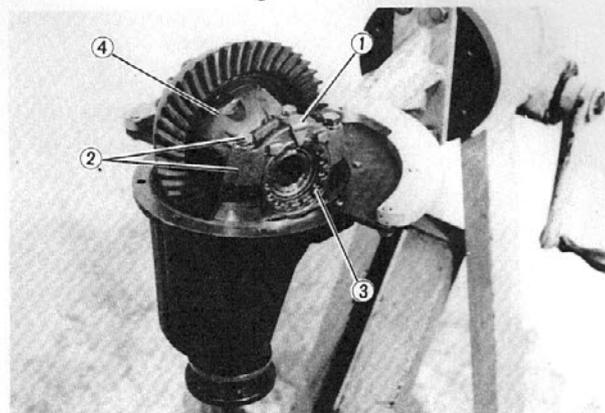


Fig. 9-11

9-B. REAR AXLE REMOVAL

Jack up the vehicle until the rear wheels are clear of the ground and support with stands.

After draining the oil (using the wrench 49 0259 730), remove the following parts in numerical order.

1. Rear axle shaft (refer to Par. 9-A-1)
2. Propeller shaft (refer to Par. 8-A)
3. Rear axle

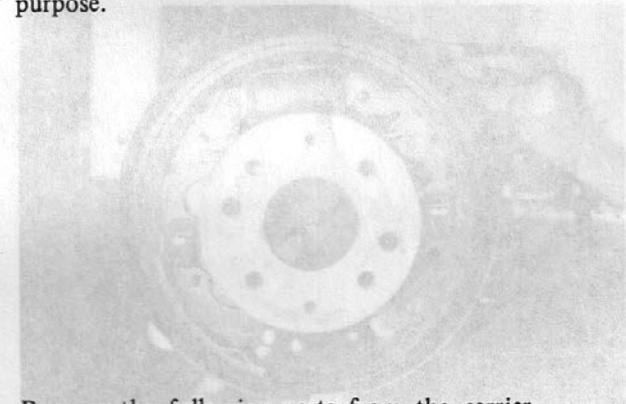
9-C. REAR AXLE DISASSEMBLY

9-C-1. Removing Differential

Mount the rear axle on the engine stand (49 0107 680A) with attachment (49 0419 561 and 49 0223 561A).



Apply identification punch marks on the carrier, differential bearing caps and adjusters for reassembly purpose.



Remove the following parts from the carrier.

1. Adjuster lock plates and bolts
2. Bearing caps and bolts
3. Adjusters
4. Differential assembly and bearings

Note:

Make certain that each bearing outer race remains with its respective bearing.

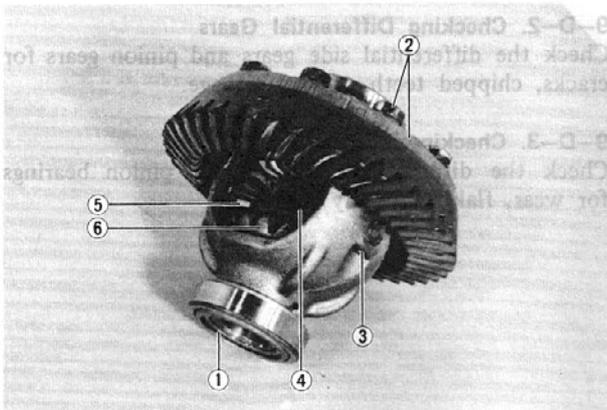


Fig. 9-12



Fig. 9-13



Fig. 9-14

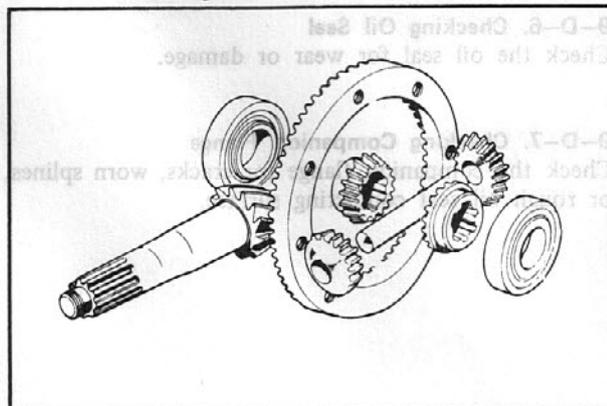


Fig. 9-15

9-C-2. Disassembling Differential

Disassemble the following parts from the gear case.

1. Side bearings (use a suitable puller)
2. Bolts and ring gear
3. Lock pin
4. Pinion shaft
5. Pinion gears
6. Side gears and thrust washers

9-C-3. Removing Drive Pinion

Hold the companion flange with the holder (49 0259 710A) and remove the drive pinion nut.

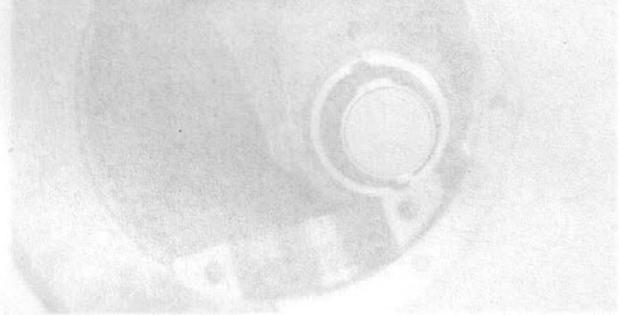


Fig. 9-17

Remove the following parts from the carrier.

1. Companion flange
2. Drive pinion
3. Rear bearing and adjusting washer
4. Collapsible spacer
5. Oil seal and front bearing

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. 9-17

Fig. 9-18

Fig. 9-19



Fig. 9-16

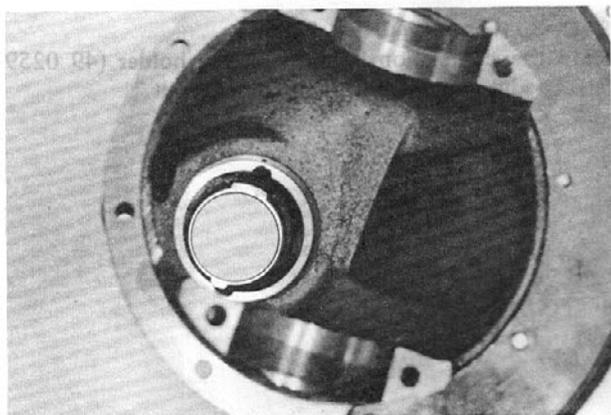


Fig. 9-17

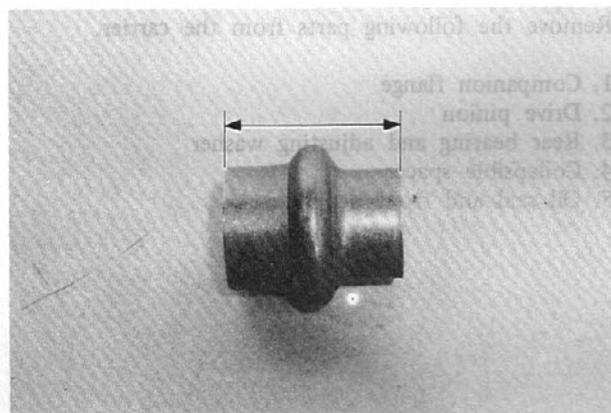


Fig. 9-18



Fig. 9-19

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.

9-D-4. Replacing Pinion Bearing Outer Race

1. Remove the old outer race from the carrier by using a drift in slots (Fig. 9-17) provided for this purpose.
2. Install a new outer race into the carrier.

9-D-5. Checking Collapsible Spacer

Measure the length of the collapsible spacer with a micrometer. The standard length is 57 ± 0.15 mm (2.244 ± 0.006 in).

9-D-6. Checking Oil Seal

Check the oil seal for wear or damage.

9-D-7. Checking Companion Flange

Check the companion flange for cracks, worn splines, or rough oil seal contacting surface.

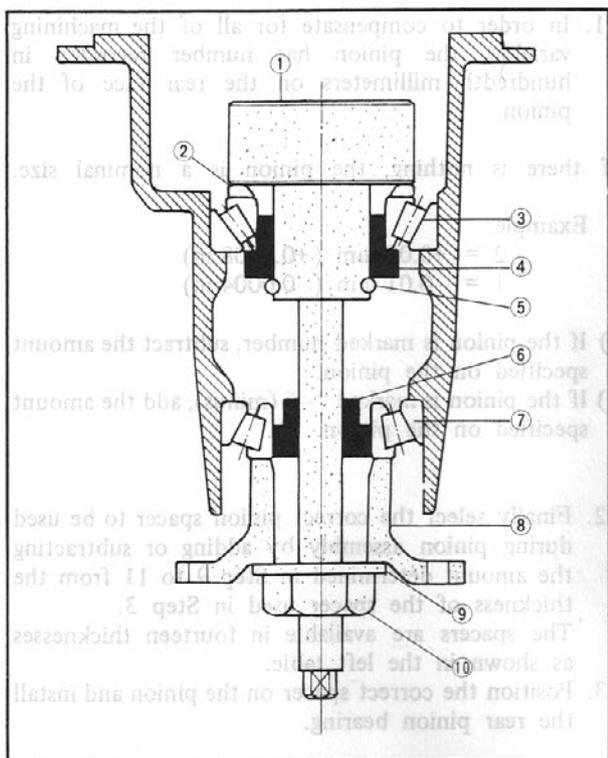


Fig. 9-20

- 1. Drive pinion model (49 8531 565)
- 2. Spacer
- 3. Rear bearing
- 4. Coller B (49 8531 568)
- 5. "O" ring
- 6. Coller A (49 8531 567)
- 7. Front bearing
- 8. Companion flange
- 9. Washer
- 10. Nut

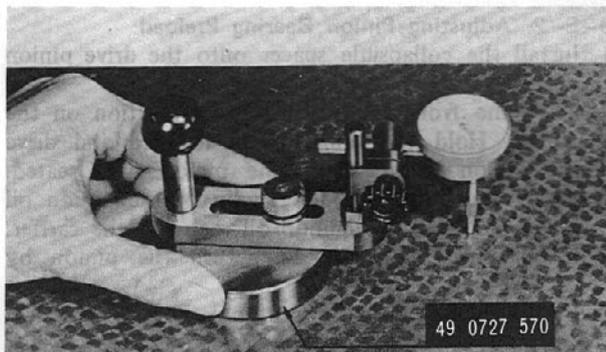


Fig. 9-21

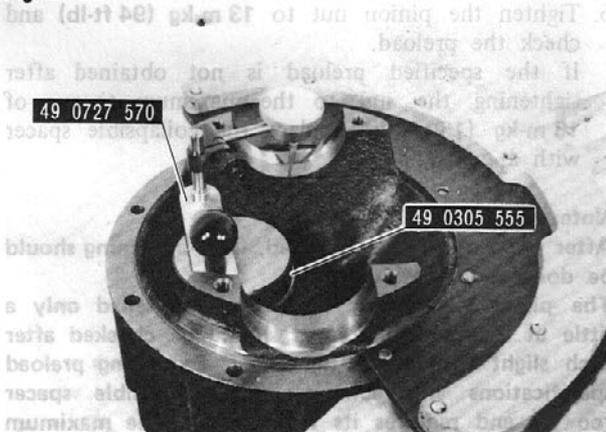


Fig. 9-22

9-E. REAR AXLE ASSEMBLY

9-E-1. Adjusting Drive Pinion

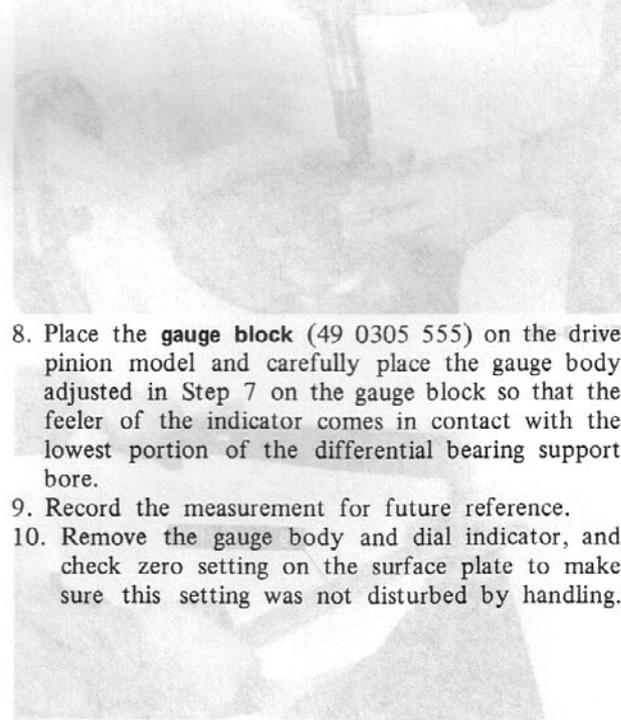
To adjust the drive pinion position, use the **drive pinion model** (49 8531 565) and **gauge block** (49 0305 555) and proceed as follows:

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 (2), rear bearing (3) and **coller B** (49 8531 568) on the pinion model (49 8531 565) and put the "O" ring (5) positioning coller B.
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 (7), **coller A** (49 8531 567), companion flange (8) and washer (9).
 6. Tighten the nut (10) so that the drive pinion model turns smoothly.

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.



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.
9. Record the measurement for future reference.
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.

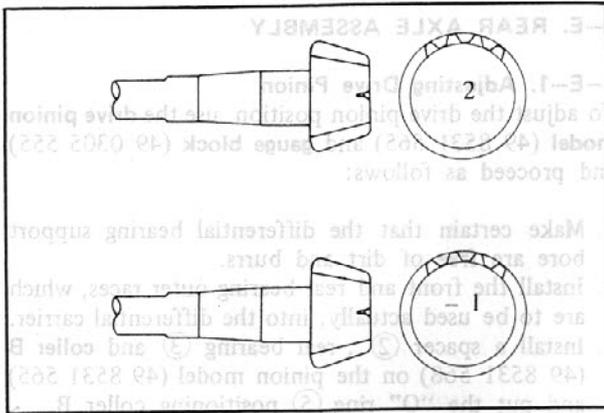


Fig. 9-23

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)



Fig. 9-24

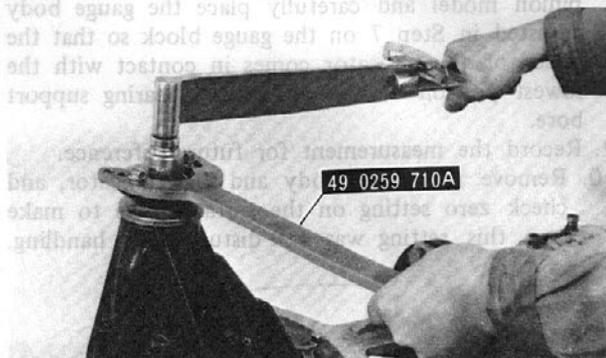


Fig. 9-25

- In order to compensate for all of the machining variable, the pinion has number recorded in hundredth millimeters on the rear face of the pinion.

If there is nothing, the pinion is a nominal size.

Example:

$$2 = +0.02 \text{ mm } (+0.0008 \text{ in})$$

$$-1 = -0.01 \text{ mm } (-0.0004 \text{ in})$$

- If the pinion is marked number, subtract the amount specified on the pinion.
- If the pinion is marked “-” (minus), add the amount specified on the pinion.

- Finally select the correct pinion spacer to be used during pinion assembly by adding or subtracting the amount determined in Step 9 to 11 from the thickness of the spacer used in Step 3. The spacers are available in fourteen thicknesses as shown in the left table.
- Position the correct spacer on the pinion and install the rear pinion bearing.

9-E-2. Adjusting Pinion Bearing Preload

- Install the collapsible spacer onto the drive pinion and install them in the carrier.
- Place the front pinion bearing in position on the pinion. Hold the pinion fully forward and drive the pinion bearing over the pinion until seated.
- Apply gear lubricant to the lip of the pinion oil seal and install the pinion oil seal into the carrier.
- Install the companion flange on the pinion by tapping with a plastic hammer.
- 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.
- Tighten the pinion nut to **13 m-kg (94 ft-lb)** and check the preload.

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.

Note:

After preload has been checked, final tightening should be done very cautiously.

The pinion nut should be further tightened only a little at a time and preload should be checked after each slight amount of tightening. Exceeding preload specifications will compress the collapsible spacer too far and requires its replacement. The maximum tightening torque of the nut is **18 m-kg (130 ft-lb)**.

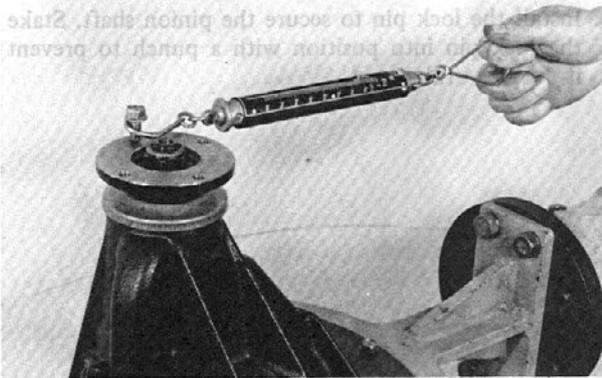


Fig. 9-26

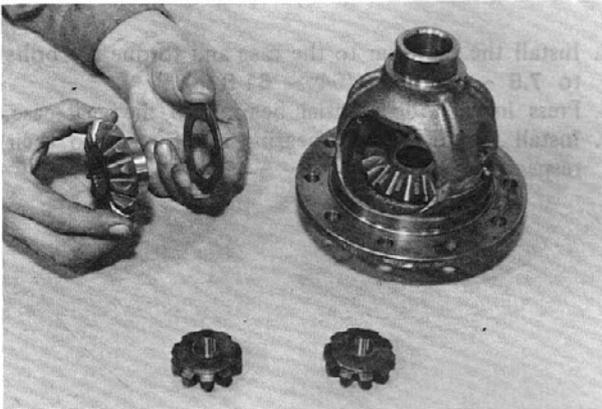


Fig. 9-27



Fig. 9-28

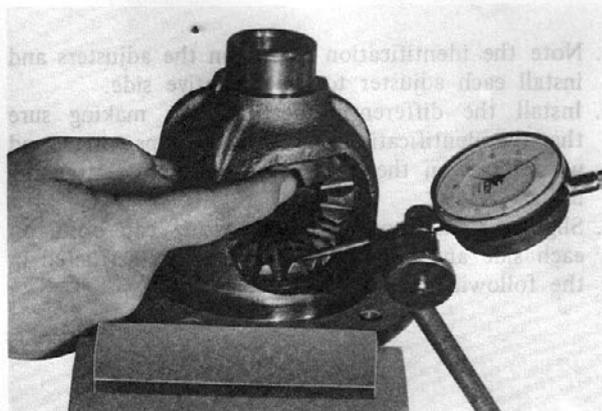


Fig. 9-29

7. While observing the preceding note, carefully set the preload drag at 9 ~ 14 cm-kg (7.8 ~ 12.2 in-lb) plus the oil seal drag determined in Step 5.

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.

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.

5. Check the backlash of the side gear and pinion gear.

Standard 0 ~ 0.1 mm (0 ~ 0.004 in)
Limit 0.1 mm (0.008 in)

If it exceeds limit, adjustment can be made with the side gear thrust washers.

Thrust washer thickness

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)

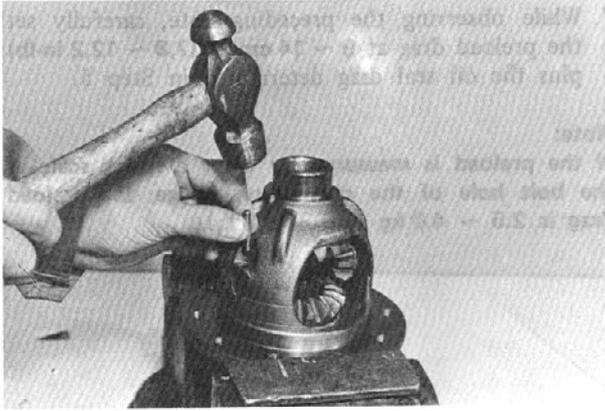


Fig. 9-30

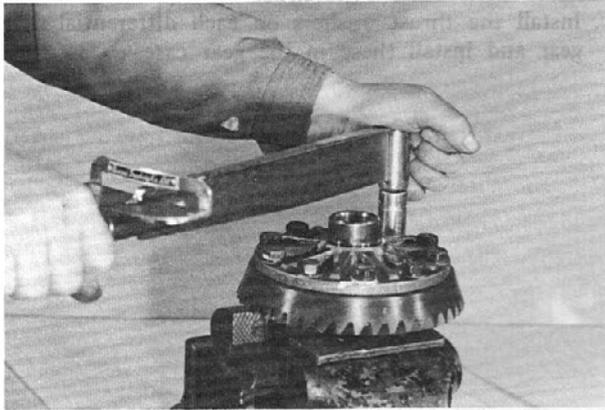


Fig. 9-31



Fig. 9-32

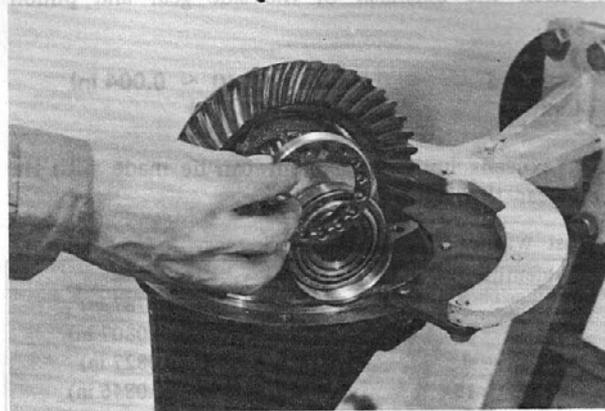


Fig. 9-33

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. 9-36

7. Install the ring gear to the case and torque the bolts to 7.5 ~ 8.5 m-kg (54 ~ 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. 9-37

9-E-4. Installing Differential

1. Place the differential gear assembly in the carrier, making ensure that the marks on the face of the pinion and ring gear tooth are in alignment.



Fig. 9-38

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. 9-39

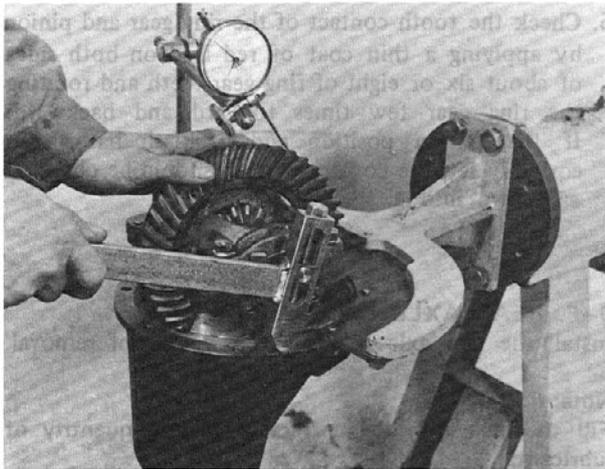


Fig. 9-34

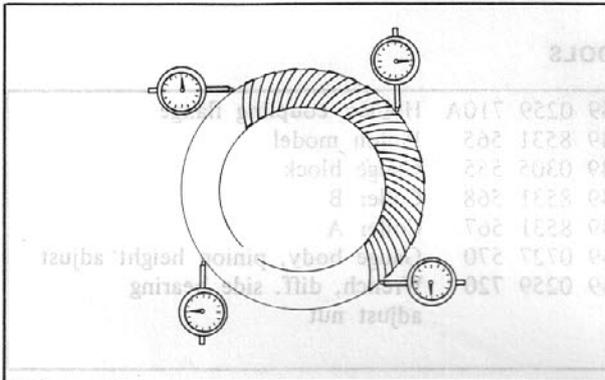


Fig. 9-35

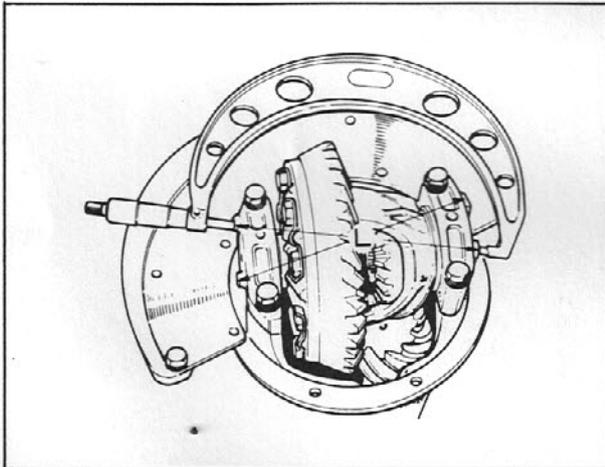


Fig. 9-36

9-E-5. Adjusting Backlash

1. Divide the ring gear into quarter-sect and apply the marks onto the divided portions with suitable marker.
2. Set a dial indicator to one of the marked points so that the feeler comes in contact at right angles with the ring gear teeth.
3. Adjust the backlash between the ring gear and drive pinion and the bearing preload as follows.

- a) Tighten the bearing adjuster of the back side of the ring gear so that the backlash comes within specification.

Standard backlash

0.09 ~ 0.11 mm (0.0035 ~ 0.0043 in)

- b) Check the backlash of the other marked points.

Note:

- Maximum difference of backlash between the quarter-sect must be less than 0.07 mm (0.0028 in).
- However minimum backlash should be more than 0.05 mm (0.0020 in).

- c) Check the preload on the side bearings by measuring the distance between both pilot sections on bearing cap. If the preload is out of specification, adjust the preload by turning the opposite side bearing adjuster.

Distance (standard preload)

185.428 ~ 185.5 mm
(7.3004 ~ 7.3033 in)

Note:

When adjusting the preload, care must be take not to affect the backlash of the drive pinion and ring gear.

- d) After adjusting the preload, recheck the backlash. If it differ from the standard backlash, adjust the backlash by turning bearing adjusters equally with the wrench (49 0259 720).

4. Tighten the bearing cap bolts to a torque of 3.8 ~ 5.3 m-kg (27 ~ 38 ft-lb).

5. Install the adjuster lock plates on the bearing caps to prevent the adjusters from loosening.

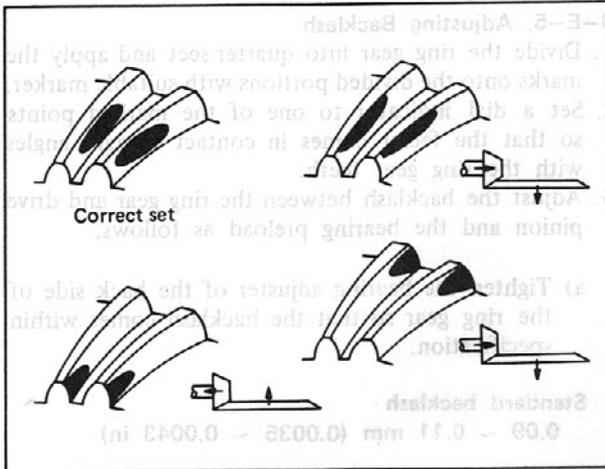


Fig. 9-37

6. 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 Fig. 9-37.

9-F. REAR AXLE INSTALLATION

Install the rear axle in the reverse order of removal.

Note:

Fill the axle with the correct grade and quantity of lubricant.

SPECIAL TOOLS

49 0107 680A	Engine stand	49 0259 710A	Holder, coupling flange
49 0223 630A	Puller, rear axle shaft	49 8531 565	Pinion model
49 8501 631	Attachment, axle shaft puller	49 0305 555	Gauge block
49 8531 746	Separator, axle bearing	49 8531 568	Coller B
49 0259 747	Attachment, bearing separator	49 8531 567	Coller A
49 0259 748	Attachment, bearing separator	49 0727 570	Gauge body, pinion height adjust
49 0259 730	Wrench, drain plug	49 0259 720	Wrench, diff. side bearing adjust nut
49 0223 561A	Attachment, work stand		
49 0419 561	Attachment, engine stand		

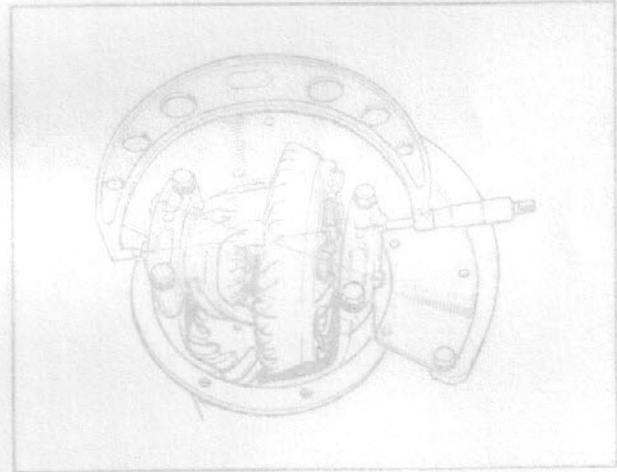


Fig. 9-38

(c) Check the preload on the side bearings by measuring the distance between both pilot sections on bearing cap. If the preload is out of specification, adjust the preload by turning the opposite side bearing adjuster.

Distance (standard preload)
 188.428 - 188.5 mm
 (7.3904 - 7.3938 in)

Note:
 When adjusting the preload, care must be taken not to affect the backlash of the drive pinion and ring gear.

(d) After adjusting the preload, recheck the backlash. If it differs from the standard backlash, adjust the backlash by turning bearing adjusters equally with the wrench (49 0259 720).

4. Tighten the bearing cap bolts to a torque of 3.8 - 5.3 m·kg (27 - 38 ft·lb).
 5. Install the adjuster lock plates on the bearing caps to prevent the adjusters from loosening.

STEERING

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Fig 10-1

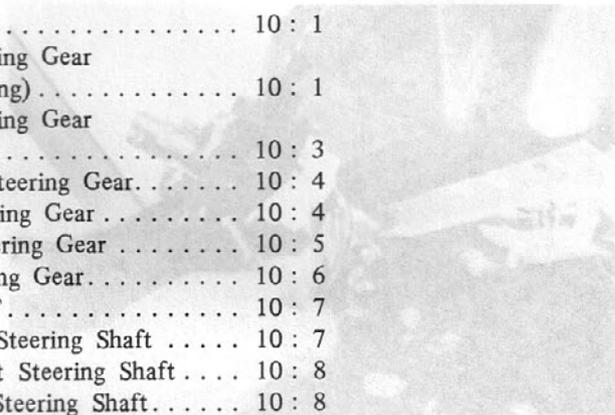


Fig 10-2

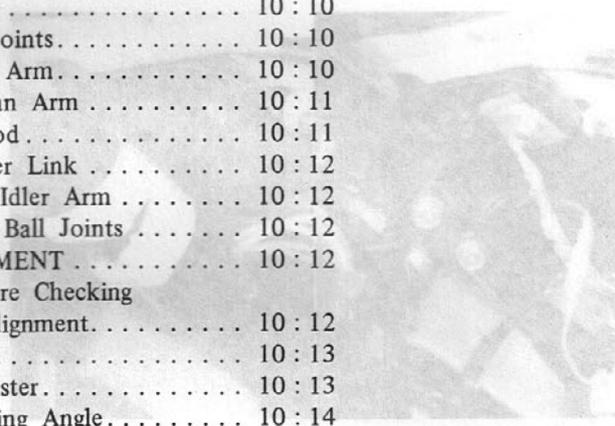


Fig 10-3

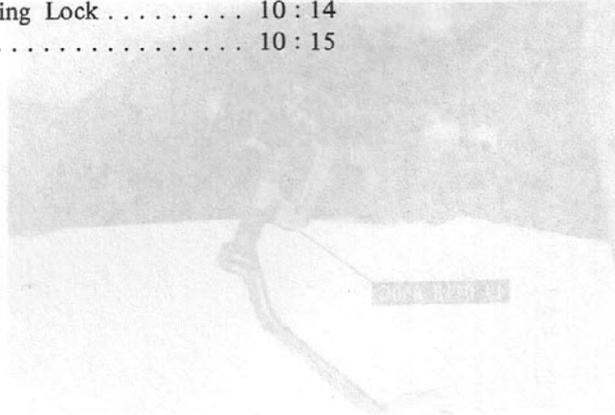


Fig 10-4

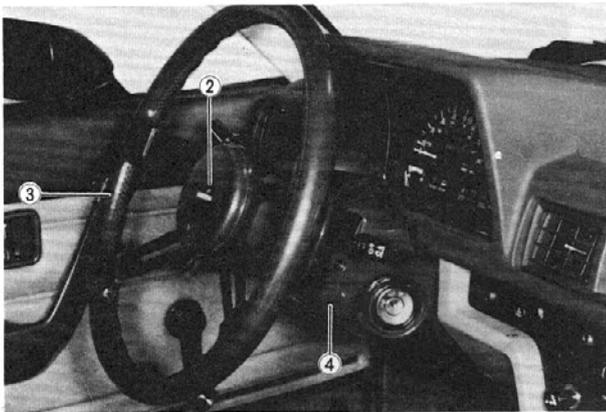


Fig. 10-1

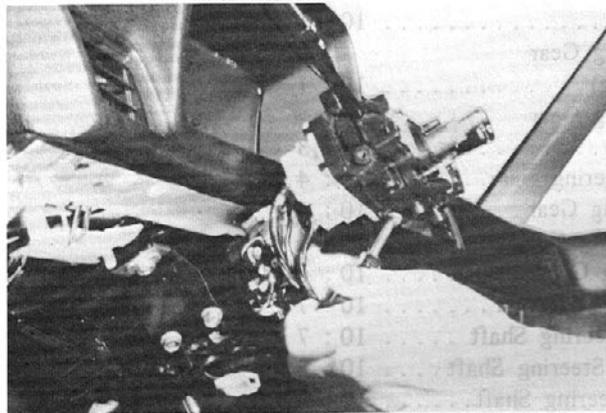


Fig. 10-2

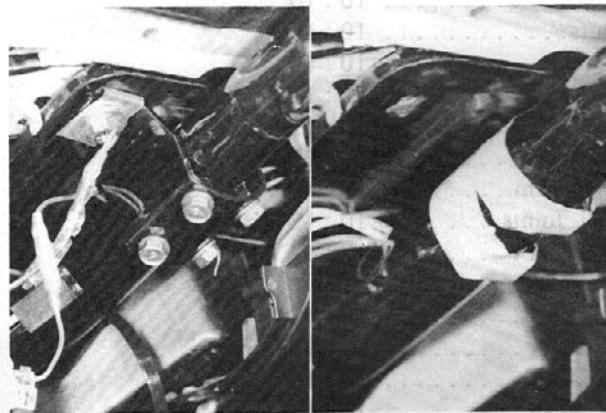


Fig. 10-3



Fig. 10-4

10-A. STEERING GEAR

10-A-1. Removing Steering Gear (Standard steering)

Remove the steering gear in the numerical order.

1. Disconnect the negative cable at the battery.
2. Horn cap
3. Steering wheel

Note:

Mark the identification mark on to the steering wheel and steering shaft.

4. Column covers

5. Switch panel
6. Coupler for combination switch (disconnect)
7. Combination switch assembly

8. Fixing bracket

Note:

Wrap the bolt holes of the column jacket with tape to prevent lubricant from leaking out of the jacket.

9. Air duct

Raise the front end of the vehicle and support with stands.

10. Ball joint (disconnect)
Use the puller (49 0118 850C)

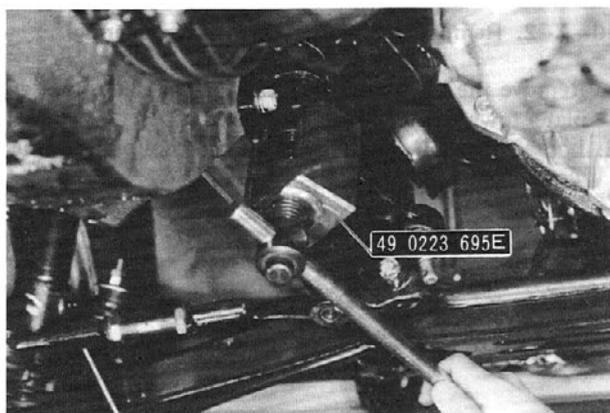
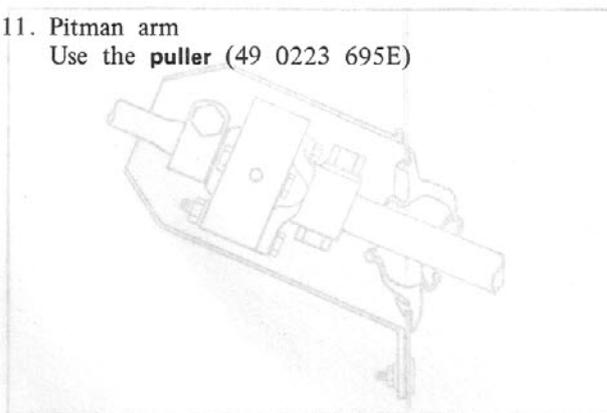


Fig. 10-5

11. Pitman arm
Use the **puller** (49 0223 695E)



6-01.gif

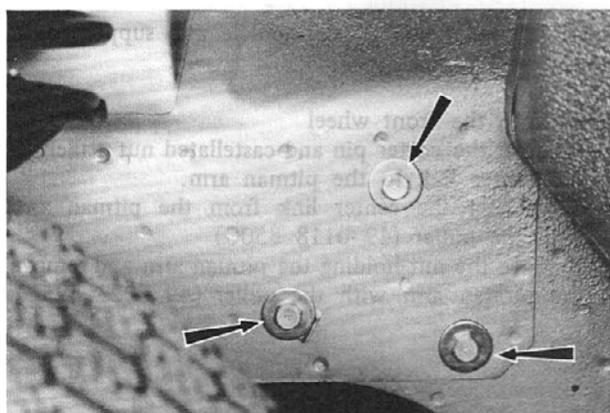


Fig. 10-6

12. Remove the bolts and nuts retaining the steering gear housing to the body.

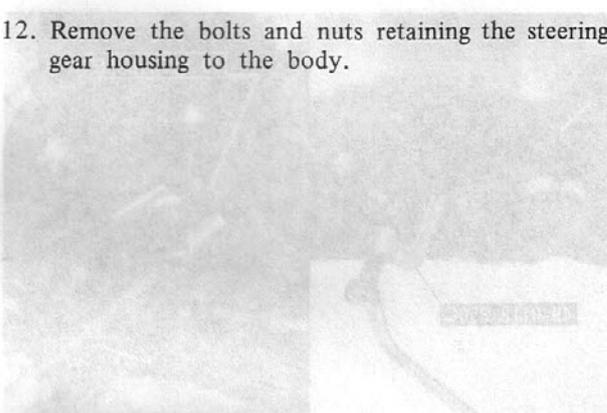


Fig. 10-10

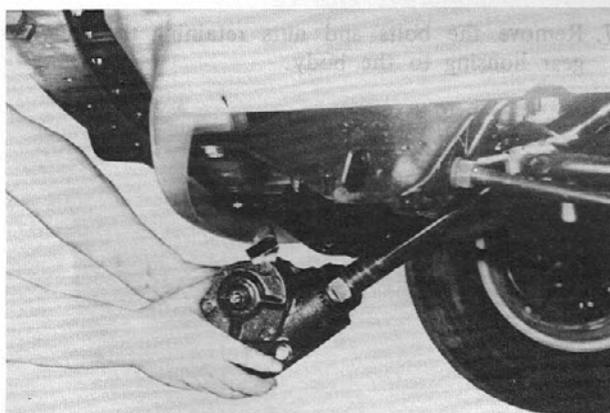


Fig. 10-7

13. Under cover
14. Engine mounting
15. Stabilizer bar
16. Steering gear box assembly

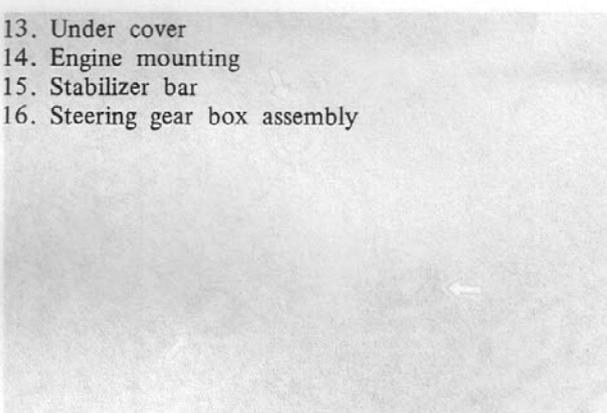


Fig. 10-11

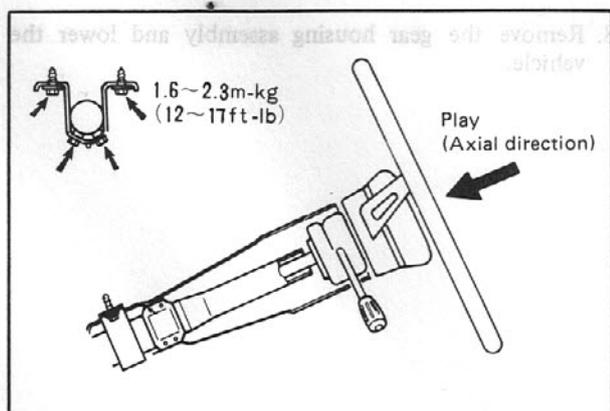


Fig. 10-8

(With collapsible steering models)

If the car has been involved in a light collision, check the steering wheel for axial play before removing. When steering shaft is crushed, axial play occurs. Replace if necessary.

Note:

The collapsible steering column and shaft are serviced as an assembly only.

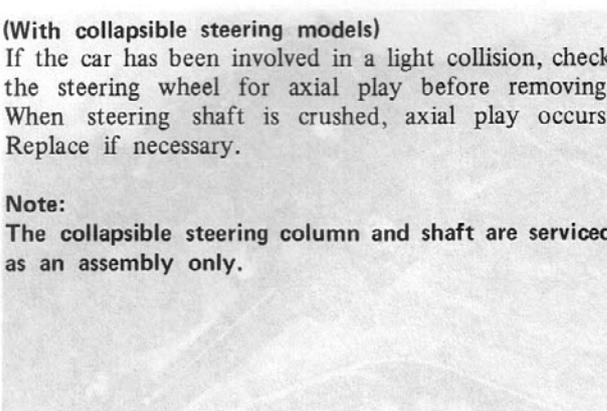


Fig. 10-12

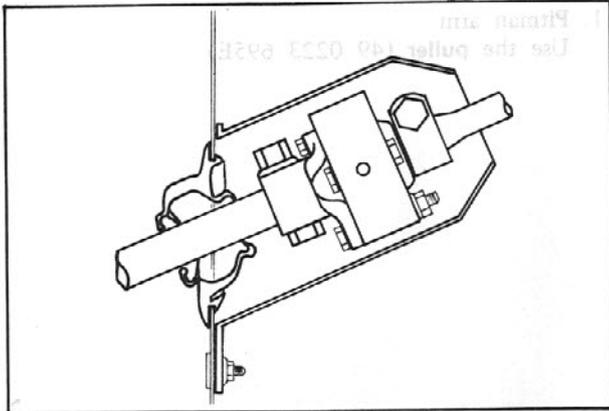


Fig. 10-9

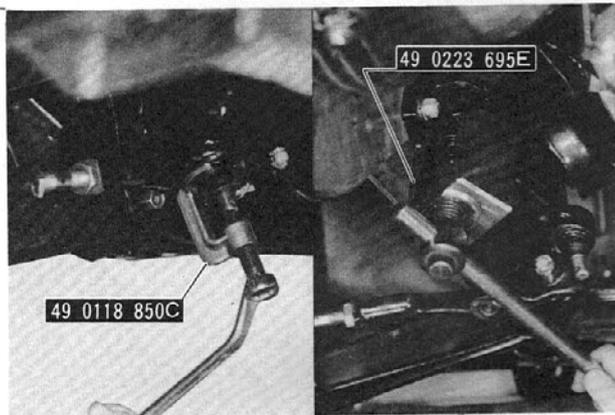


Fig. 10-10

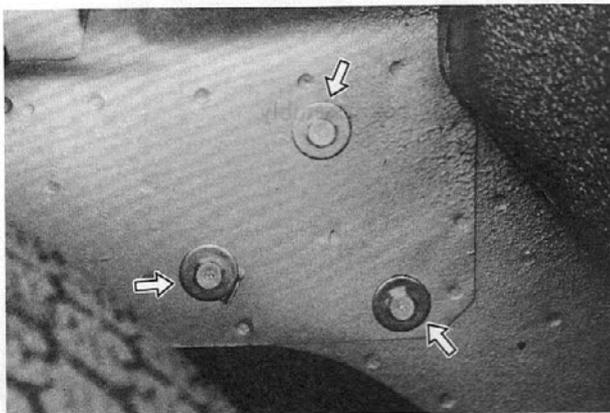


Fig. 10-11

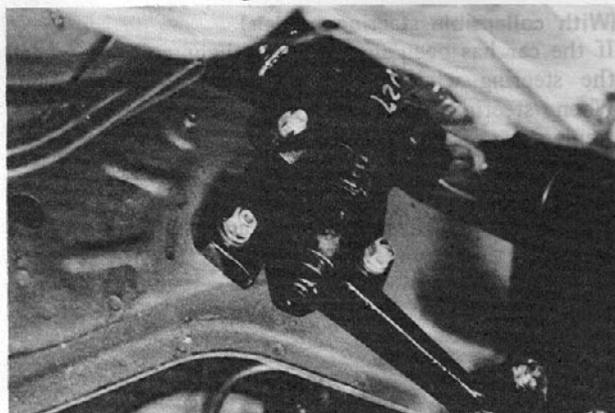


Fig. 10-12

10-A-2. Removing Steering Gear (Tilt steering)

1. Remove the set plate attaching nut and slides the set plate toward the steering wheel.
2. Loosen the bolt securing the flexible coupling to the worm shaft.



Fig. 10-5

Raise the front end of the vehicle and support with stands.

3. Remove the front wheel
4. Remove the cotter pin and castellated nut attaching the center link to the pitman arm.
5. Disconnect the center link from the pitman arm with the puller (49 0118 850C)
6. Remove the nut holding the pitman arm and remove the pitman arm with the puller (49 0223 695E).



Fig. 10-6

7. Remove the bolts and nuts retaining the steering gear housing to the body.

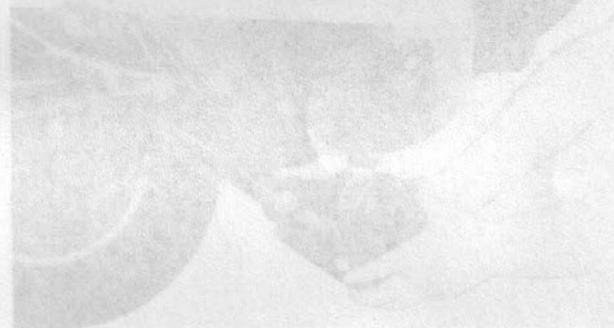


Fig. 10-7

8. Remove the gear housing assembly and lower the vehicle.

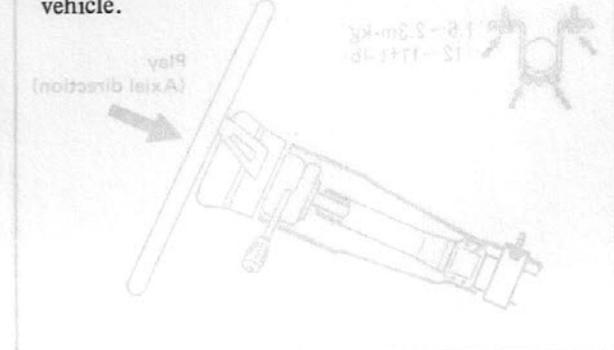


Fig. 10-8



Fig. 10-13

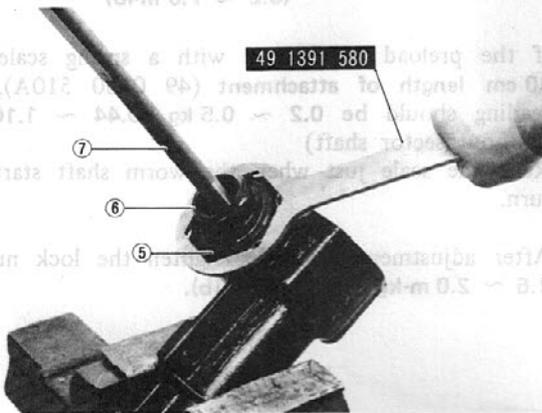


Fig. 10-14



Fig. 10-15



Fig. 10-16

10-A-3. Disassembling Steering Gear

Drain the lubricant and disassemble the steering gear in the numerical order.

Hold the steering gear housing in a vise.

1. Adjust screw lock nut
2. Side cover

Remove the side cover by turning the adjusting screw clockwise through the cover.

3. Adjusting screw and shim
4. Sector shaft
5. Adjusting screw lock nut
Use the **wrench** (49 1391 580 & 49 8545 585)
6. Adjusting screw
Use the **spanner** (49 0164 631A)
7. Worm shaft and ball nut assembly
8. Oil seal (if necessary)

10-A-4. Inspecting Steering Gear

Wash the disassembled parts and inspect them on the following points. Replace any part found defective.

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, the ball nut and worm shaft assembly should be replaced.

Note:

The worm shaft and ball nut are serviced as an assembly only.

2. Check the worm bearings and cups for wear or any damage. If defective, replace with new ones.
3. Check the clearance between the sector shaft and the housing bore.
If it exceeds specifications, replace the steering gear assembly.

Limit 0.1 mm (0.004 in)

4. Check the oil seal for wear, flaw or any damage. If there is any possibility of oil leakage replace the oil seal.



Fig. 10-17



Fig. 10-18

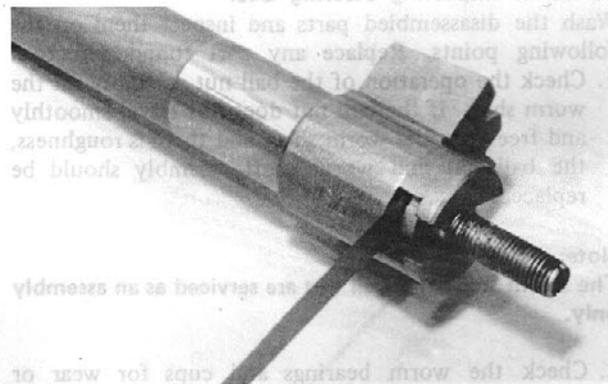


Fig. 10-19

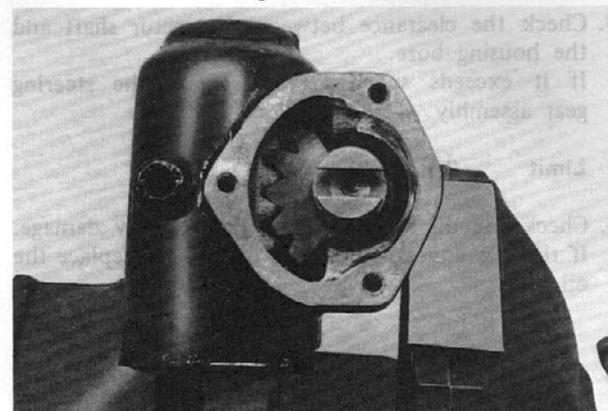


Fig. 10-20

10-A-5. Assembling Steering Gear

Follow the disassembling procedures in the reverse order.

Note the followings:

1. Adjust the worm bearing preload by turning the adjuster plug.

Specified preload

Without sector shaft: 2 ~ 5 cm-kg
(1.7 ~ 4.3 in-lb)

With sector shaft: 6 ~ 12 cm-kg
(5.2 ~ 10.4 in-lb)
6 ~ 9 cm-kg (with tilt steering)
(5.2 ~ 7.8 in-lb)

If the preload is checked with a spring scale and 10 cm length of attachment (49 0180 510A), the reading should be 0.2 ~ 0.5 kg (0.44 ~ 1.10 lb). (without sector shaft)

Read the scale just when the worm shaft starts to turn.

After adjustment is made, tighten the lock nut to 1.6 ~ 2.0 m-kg (12 ~ 14 ft-lb).

2. 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)

3. Turn the worm shaft and place the rack in the center position of the worm in the gear housing. Insert the sector shaft and adjusting screw into the gear housing, being careful not to damage the oil seal, and ensuring that the center of the sector gear is in alignment with the center of the rack.



Fig. 10-21

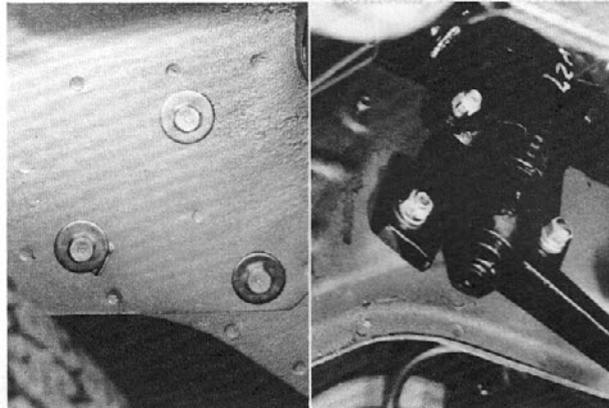


Fig. 10-22

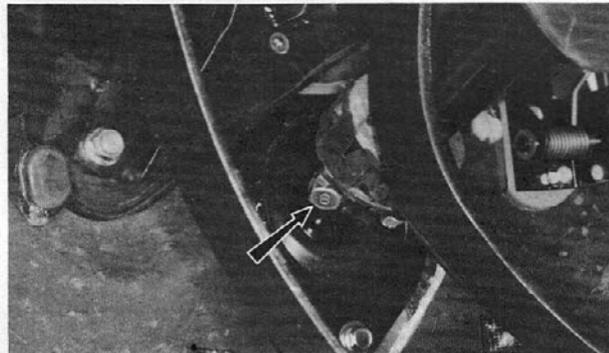


Fig. 10-23

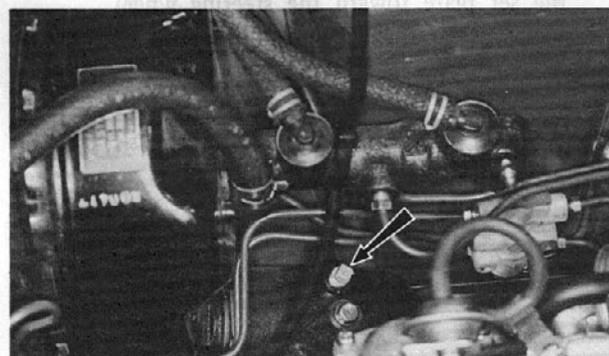


Fig. 10-24

4. Adjust the backlash between the sector gear and rack, proceed as follows.

- 1) Set a dial indicator as shown in Fig. 10-21.
- 2) Turn the worm shaft gently and stop it at the center position.
- 3) Loosen the lock nut of the adjusting screw and screw in or out the adjusting screw until the correct adjustment is obtained.

Standard backlash 0 ~ 0.1 mm (0 ~ 0.004 in)

This is equivalent to a movement of about 3 degrees of the worm shaft.

- 4) Tighten the adjusting screw lock nut to 3.2 ~ 4.7 m-kg (23 ~ 34 ft-lb).
- 5) Rotate the worm shaft and check to ensure that the sector shaft turns 40° smoothly to the right and left.

10-A-6. Installing Steering Gear

Install the steering gear in the reverse order of removing.

Note:

- a) Place the shim in original position between the steering gear housing and the frame to obtain proper shaft alignment.
- b) The tightening torque for the bolts and nuts attaching the gear housing to the frame is 4.4 ~ 5.5 m-kg (32 ~ 40 ft-lb).

- c) The tightening torque for the bolt attaching the flexible coupling to the worm shaft is 4.4 ~ 5.5 m-kg (32 ~ 40 ft-lb).

- d) Install the pitman arm onto the sector shaft, aligning the identification marks of the pitman arm and sector shaft, and tighten the pitman arm attaching nut to 8 ~ 12 m-kg (58 ~ 87 ft-lb).
- e) When installing the steering wheel, align the marks on the steering wheel and column shaft, and tighten the steering wheel nut to 5.0 ~ 6.0 m-kg (36 ~ 43 ft-lb).
- f) Fill the gear housing with lubricant (A.P.I. Service GL-4, SAE 90).

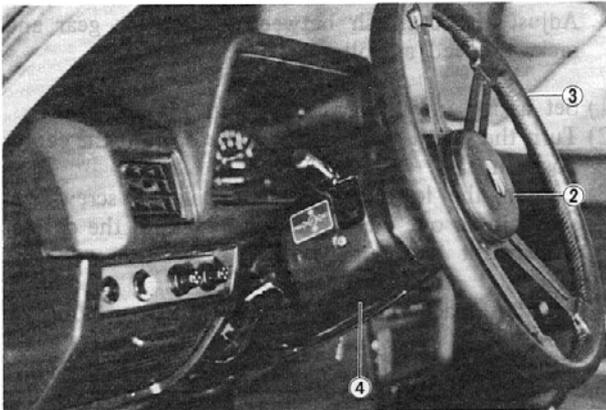


Fig. 10-25

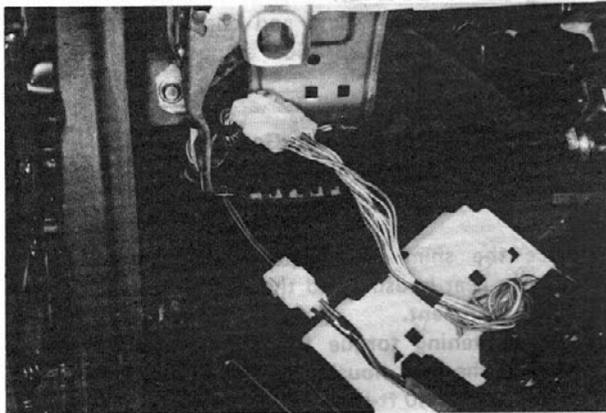


Fig. 10-26

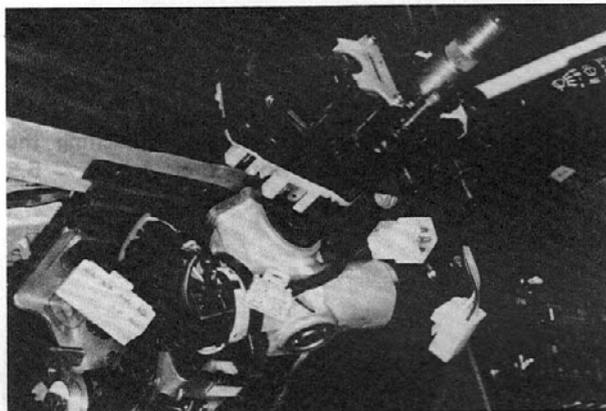


Fig. 10-27

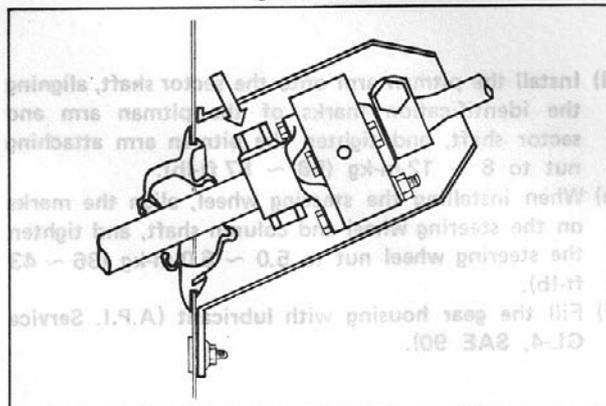


Fig. 10-28

10-B. TILT STEERING SHAFT

10-B-1. Removing Tilt Steering Shaft

Remove the steering shaft in the numerical order.

1. Disconnect the negative cable at the battery
2. Horn cap
3. Steering wheel

Note:

Mark the identification mark on to the steering wheel and steering shaft.

4. Column cover
5. Switch panel attaching screw
6. Disconnect the wiring couplers from the switch panel.
7. Switch panel assembly

8. Coupler for combination switch (disconnect)
9. Combination switch assembly
10. Coupler for ignition switch (disconnect)

11. Remove the set plate attaching nut and slides the set plate toward the steering wheel.
12. Loosen the bolt securing the flexible coupling yoke to the steering shaft.

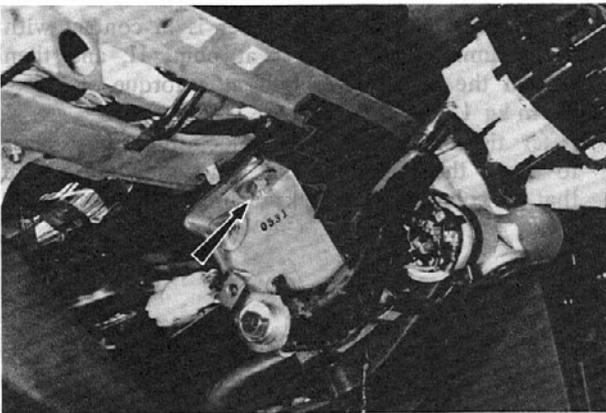


Fig. 10-29

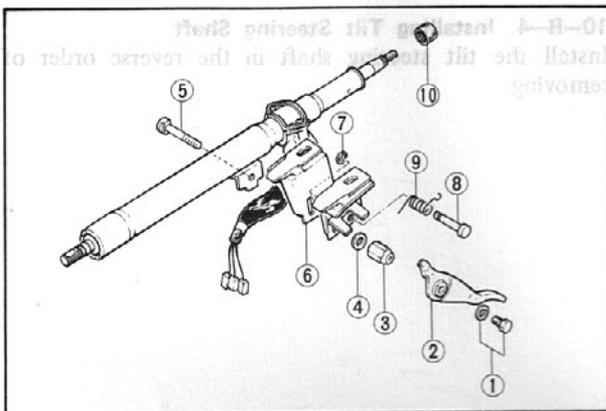


Fig. 10-30

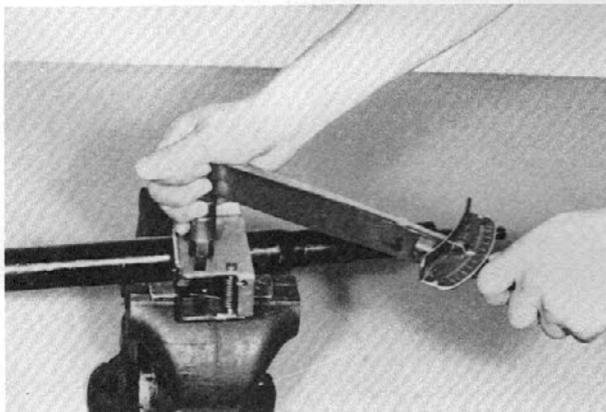


Fig. 10-31

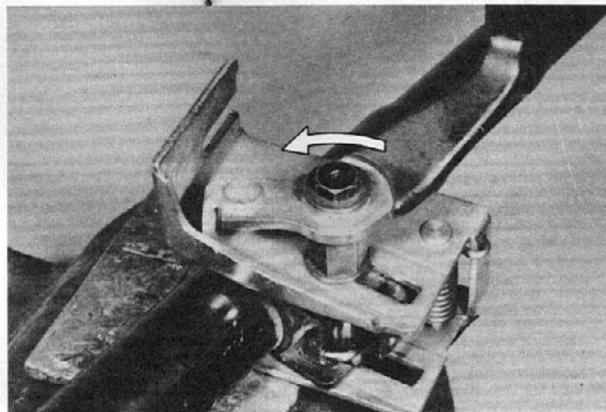


Fig. 10-32

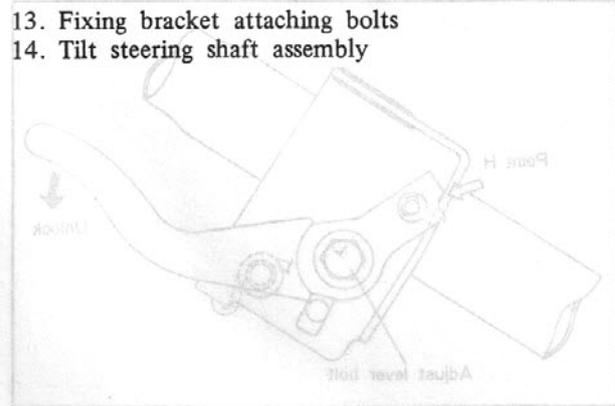
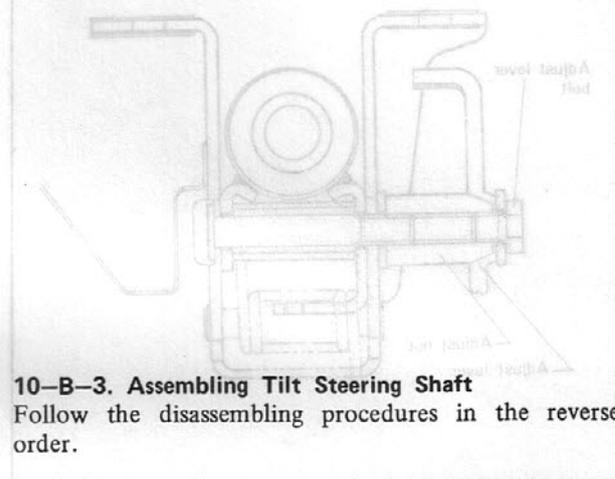


Fig. 10-33

- 13. Fixing bracket attaching bolts
- 14. Tilt steering shaft assembly

10-B-2. Disassembling Tilt Steering Shaft

Disassemble the tilt steering shaft in the numerical order.



10-B-3. Assembling Tilt Steering Shaft

Follow the disassembling procedures in the reverse order.

1. Tighten the adjust nut at the specified torque.

Tightening torque: 50 cm-kg (43 in-lb)

2. Fit the adjust lever and the washer on the adjust nut, and then, tighten it temporarily by the adjust lever bolt.

Bear in mind that the bolt has left-hand thread.

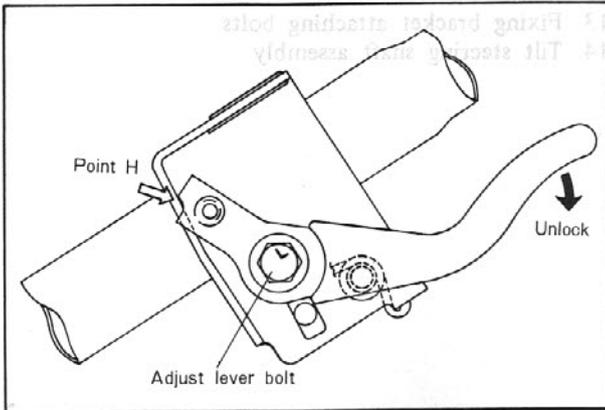


Fig. 10-33

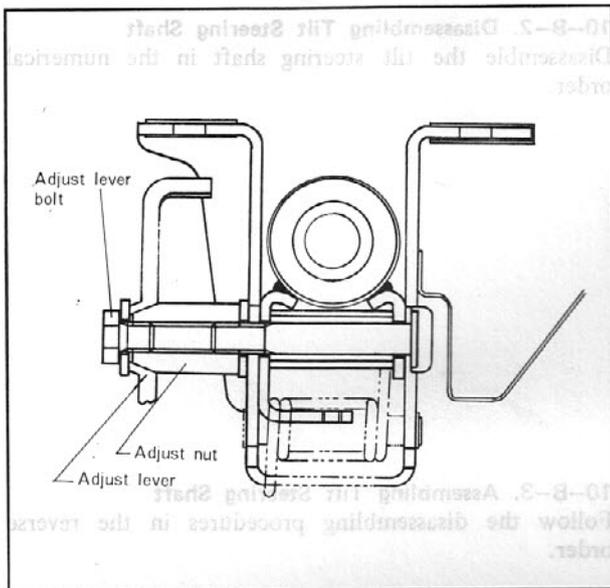


Fig. 10-34

3. Make sure that the adjust lever is in contact with the column adjust bracket at point H, and then tighten the adjust lever bolt at a torque of 1.7 ~ 2.8 m·kg (12 ~ 20 ft·lb).
4. After tightening the bolt, unlock the adjust lever to move the column jacket, and then make sure that the column jacket locks securely when locking it.

10-B-4. Installing Tilt Steering Shaft

Install the tilt steering shaft in the reverse order of removing.

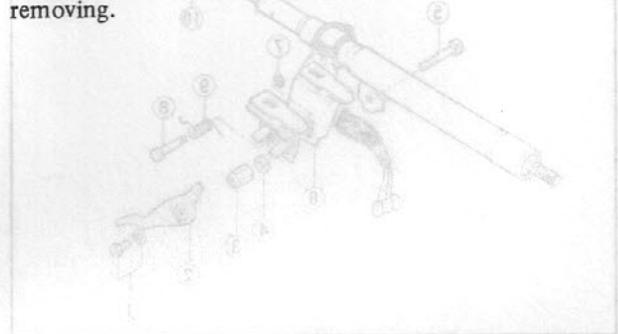


Fig. 10-30



Fig. 10-31



Fig. 10-32

2. Fit the adjust lever and the washer on the adjust nut, and then tighten it temporarily by the adjust lever bolt.

Bear in mind that the bolt has left-hand thread.

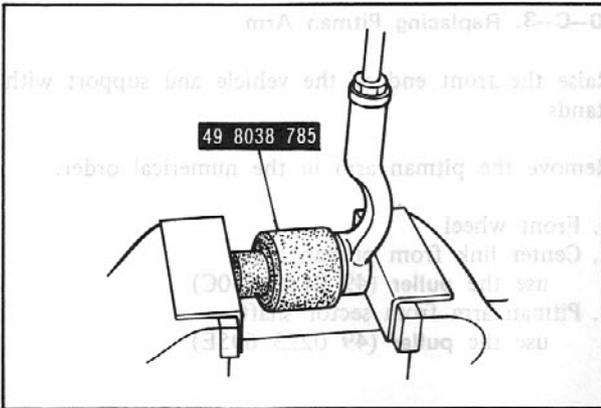


Fig. 10-35

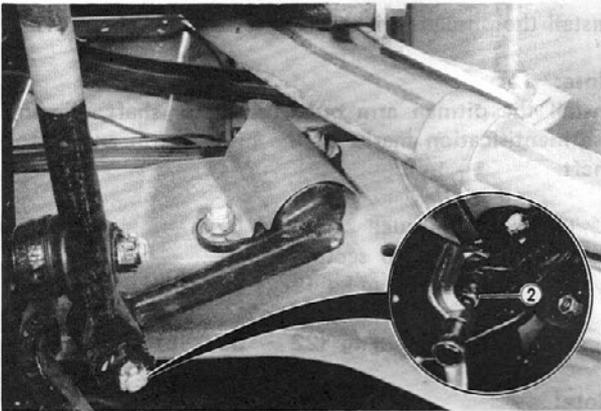


Fig. 10-36

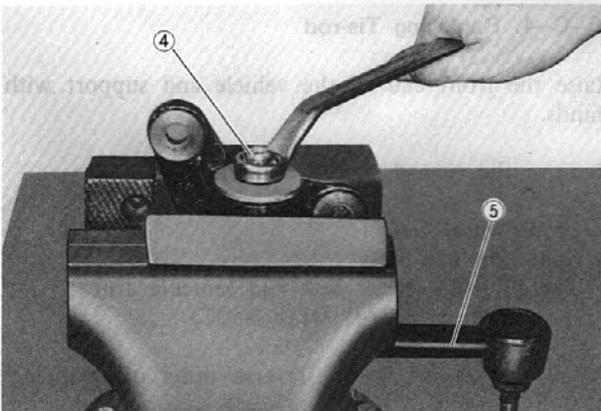


Fig. 10-37

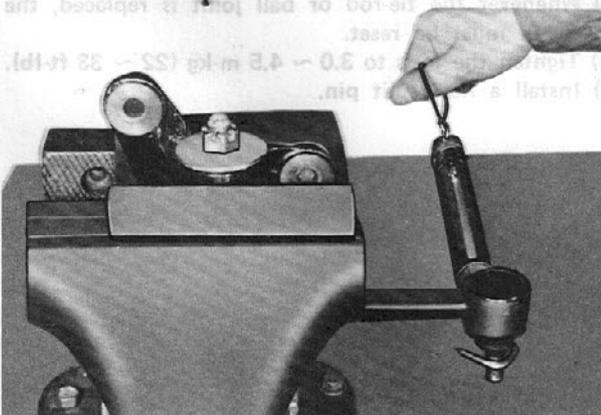


Fig. 10-38

10-C. STEERING LINKAGE

10-C-1. Checking Ball Joints

1. Check the dust seal for wear, flaw or any damage. If the dust seal is defective, replace it with the installer (49 8038 785).
2. Inspect the ball joint for wear. If defective, replace the ball joint in its assembled form.

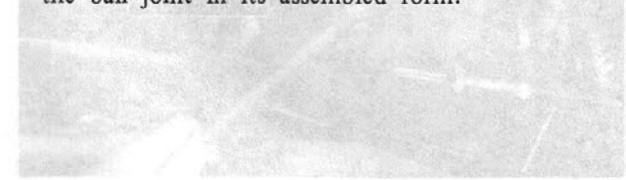


Fig. 10-39

10-C-2. Replacing Idler Arm

Raise the front end of the vehicle and support with stands.

Remove the idler arm in the numerical order.

1. Front wheel
2. Center link (disconnect)
Use the puller (49 0118 850C)
3. Idler arm assembly



Fig. 10-40

Hold the assembly in a vise.

4. Split pin and lock nut
5. Idler arm
6. Bushes

Check the bushes and replace if they are worn excessively.

Install the idler arm in the reverse order of removing.

Note:

- a) Clean the disassembled parts with solvent to remove all old grease.
- b) When assembling, supply the lithium grease to the idler arm housing and bushes.

Check the revolving torque of the idler arm by using a spring scale. The reading should be 1 ~ 5 kg (2.2 ~ 11.0 lb).

If the specified reading is not obtained, replace the bushes.

Note:

Install a new split pin.

Tightening torque:

- Idler arm assembly to the frame:
4.4 ~ 5.5 m·kg (32 ~ 40 ft·lb)
- Idler arm to center link:
2.5 ~ 3.5 m·kg (18 ~ 25 ft·lb)

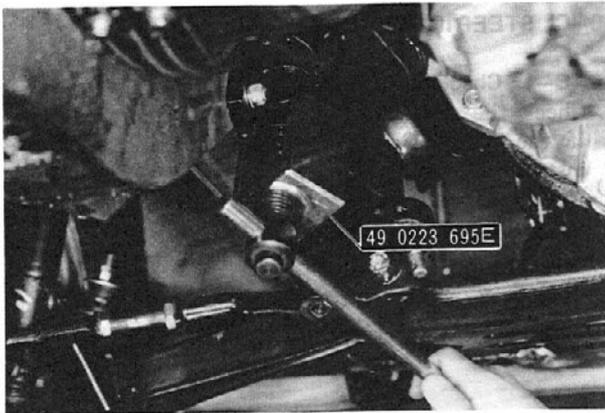


Fig. 10-39

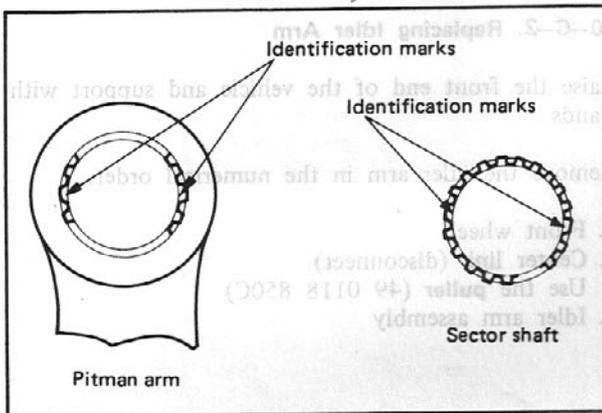


Fig. 10-40

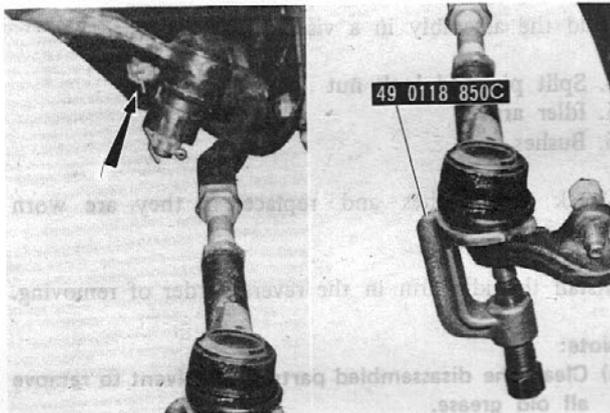


Fig. 10-41

10-C-3. Replacing Pitman Arm

Raise the front end of the vehicle and support with stands.

Remove the pitman arm in the numerical order.

1. Front wheel
2. Center link from pitman arm
use the puller (49 0118 850C)
3. Pitman arm from sector shaft
use the puller (49 0223 695E)

Install the pitman arm in the reverse order of removing.

Note:

Install the pitman arm onto the sector shaft, aligning the identification marks of the pitman arm and sector shaft.

Tightening torque:

- Pitman arm to sector shaft:
8.0 ~ 12.0 m-kG (58 ~ 87 ft-lb)
- Pitman arm to center link:
3.0 ~ 4.5 m-kG (22 ~ 33 ft-lb)

Note:

Install a new split pin.

10-C-4. Replacing Tie-rod

Raise the front end of the vehicle and support with stands.

Remove the tie-rod in the numerical order.

1. Front wheel
2. Split pins and nuts
3. Tie-rod from center link and knuckle arm
use the puller (49 0118 850C)

Install the tie-rod in the reverse order of removing.

Note:

- a) Whenever the tie-rod or ball joint is replaced, the toe-in must be reset.
- b) Tighten the nuts to 3.0 ~ 4.5 m-kG (22 ~ 33 ft-lb).
- c) Install a new split pin.

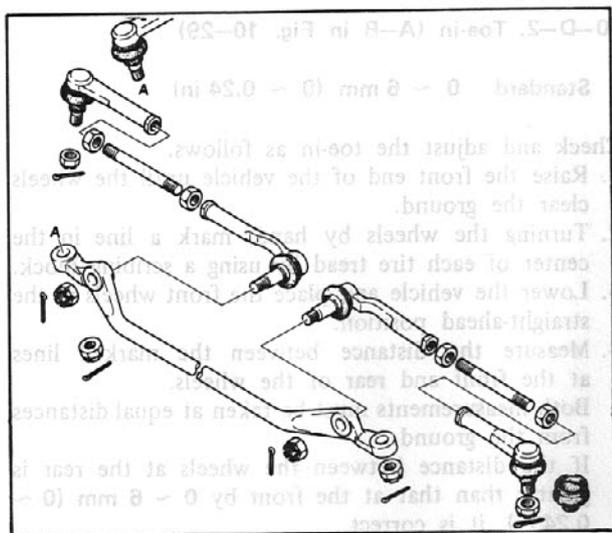


Fig. 10-42

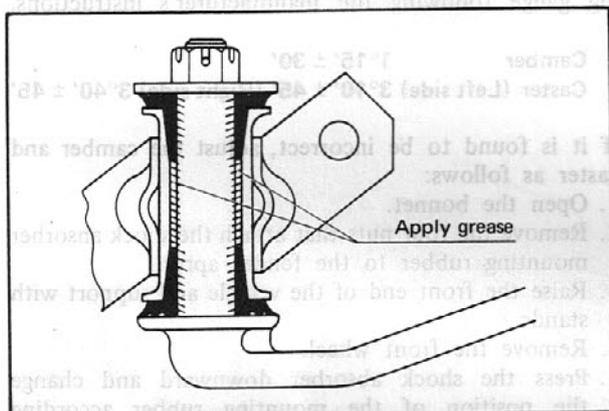


Fig. 10-43

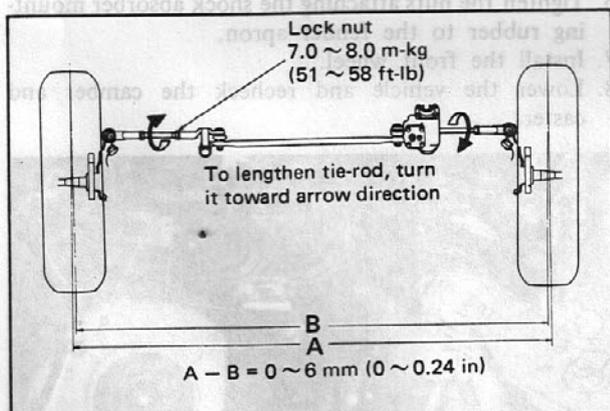


Fig. 10-44

10-C-5. Replacing Center Link

Raise the front end of the vehicle and support with stands.

Remove the center link in the numerical order.

When replace the center link, use the puller (49 0118 850C).

1. Split pins and nuts
2. Idler arm from center link
3. Pitman arm from center link
4. Tie-rods from center link
5. Center link

Install the center link in the reverse order of removing.

Note:

- a) Tighten the nuts to 3.0 ~ 4.5 m-kG (22 ~ 33 ft-lb) (center link to idler arm : 2.5 ~ 3.5 m-kG or 18 ~ 25 ft-lb).
- b) Install a new split pin.

10-C-6. Lubrication of Idler Arm

The idler arm requires the lubrication only when the idler arm has been disassembled.

When lubricating the idler arm supply lithium grease to the idler arm housing and bushes  portion in Fig. 10-28.

10-C-7. Lubrication on Ball Joints

The ball joints for the steering linkage are filled with lithium grease and are completed sealed which require no lubrication service.

10-D. FRONT WHEEL ALIGNMENT

10-D-1. Inspection Before Checking Front Wheel Alignment

Before checking or correcting the front wheel alignment, the following points which will affect steering should be inspected.

1. Check the tire inflation and bring to recommended pressure.
2. Inspect the front wheel bearing adjustment 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.

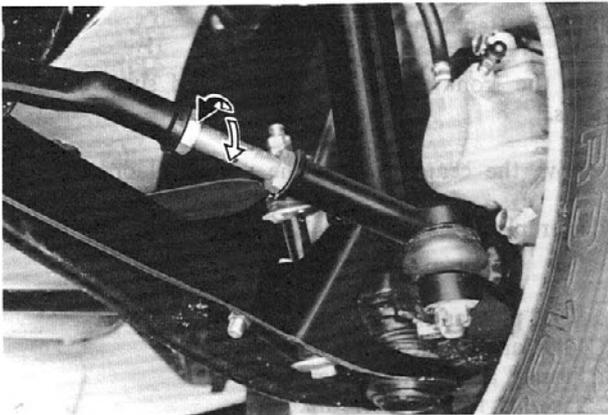


Fig. 10-45

10-D-2. Toe-in (A-B in Fig. 10-29)

Standard 0 ~ 6 mm (0 ~ 0.24 in)

Check and adjust the toe-in as follows.

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 loosening the lock nuts and turning the tie rods.

Position	Variation	
	Camber	Caster
90° (B1)	0	+28'
180° (B2)	+28'	+28'
-90° (B3)	+28'	0°

10-D-3. Camber and Caster

To check the camber and caster, use a wheel aligning gauge following the manufacturer's instructions.

Camber 1°15' ± 30'

Caster (Left side) 3°10' ± 45' (Right side) 3°40' ± 45'

If it is found to be incorrect, adjust the camber and caster as follows:

1. Open the bonnet.
2. Remove the four nuts that attach the shock absorber mounting rubber to the fender apron.
3. Raise the front end of the vehicle and support with stands.
4. Remove the front wheel.
5. Press the shock absorber downward and change the position of the mounting rubber according to the following table.
6. Tighten the nuts attaching the shock absorber mounting rubber to the fender apron.
7. Install the front wheel.
8. Lower the vehicle and recheck the camber and caster.

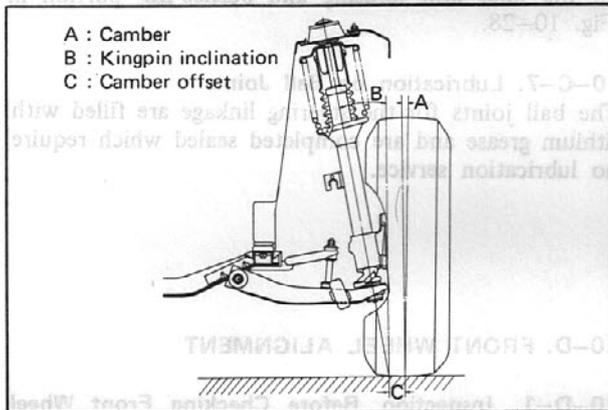


Fig. 10-46

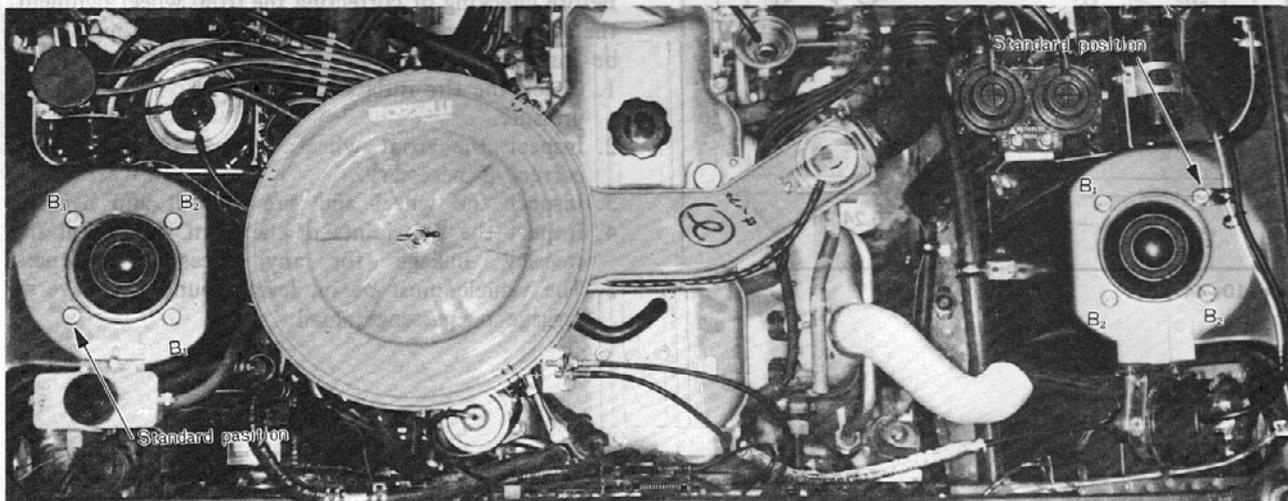


Fig. 10-47

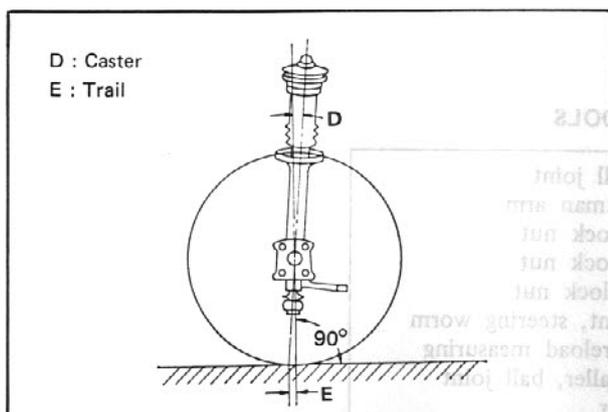


Fig. 10-48

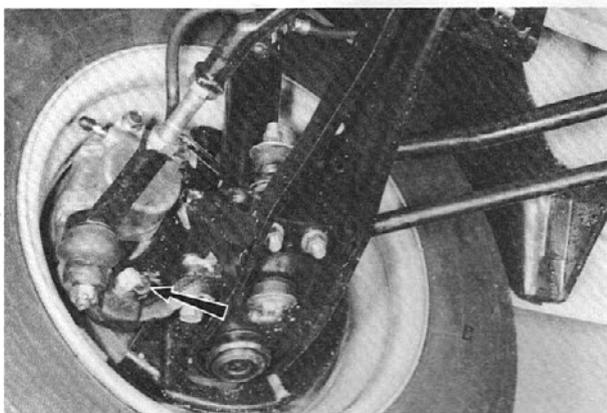


Fig. 10-49

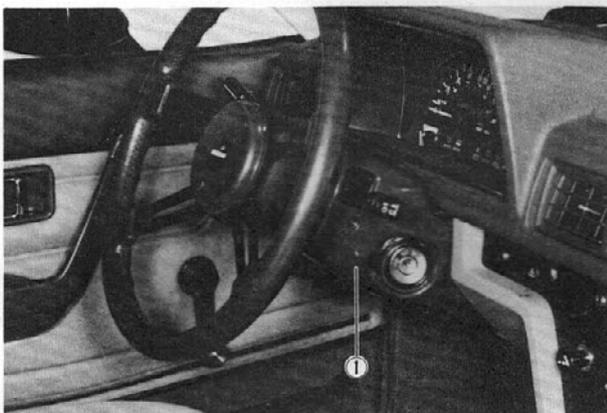


Fig. 10-50

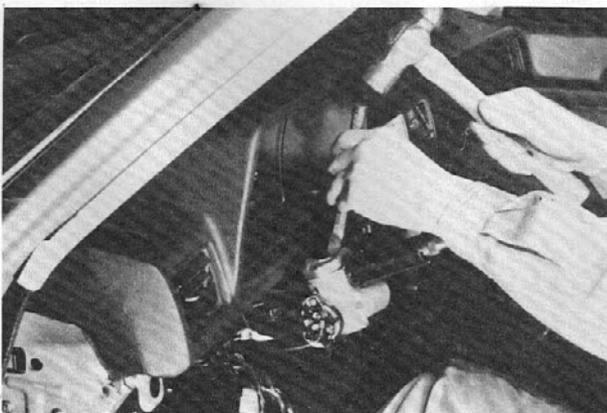


Fig. 10-51

9. Tighten the wheel bolts to 9.0 ~ 11.0 m-kg (65 ~ 80 ft-lb).

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 onto the knuckle arm so that the front wheels turn $40^\circ \pm 2^\circ$ inward and $33^\circ 50' \pm 2^\circ$ outward.

10-E. STEERING LOCK

10-E-1. Replacing Steering Lock

Remove the steering lock in the numerical order.

1. Column cover

2. Coupler for ignition switch (disconnect)

Make a groove on the head of the bolts attaching the steering lock body to the column shaft by using a saw so that the screw driver can be used to loosen the screws.

3. Steering lock assembly

Install the steering lock in the numerical order of removing.

Note:

Position a new steering lock to the column shaft and tighten the bolts until the head of bolts snaps-off.

80 ft-lb. Tighten the wheel bolts to 9.0 ~ 11.0 m.kg (62 ~ 80 ft-lb).

correct adjustment can not be obtained by the all parts of front suspension and repair or replace if necessary.

SPECIAL TOOLS

49 0118 850C	Puller, ball joint
49 0223 695E	Puller, pitman arm
49 1391 580	Wrench, lock nut
49 8545 585	Wrench, lock nut
49 0164 631A	Spanner, lock nut
49 0180 510A	Attachment, steering worm bearing preload measuring
49 8038 785	Boot installer, ball joint dust cover

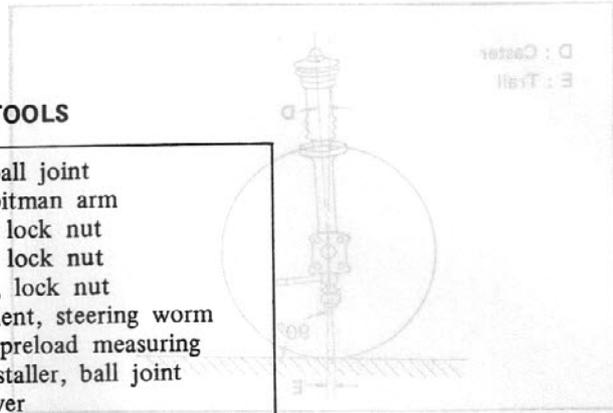


Fig. 10-48

10-D-4. Adjusting Steering Angle
Adjust the steering angle with the adjusting bolt fitted onto the knuckle arm so that the front wheels turn 40° ± 2° inward and 33°50' ± 2° outward.



Fig. 10-49

10-E. STEERING LOCK

10-E-1. Replacing Steering Lock
Remove the steering lock in the numerical order.

1. Column cover



Fig. 10-50

2. Coupler for ignition switch (disconnect)

Make a groove on the head of the bolts attaching the steering lock body to the column shaft by using a saw so that the screw driver can be used to loosen the screws.

3. Steering lock assembly

Install the steering lock in the numerical order of removing.

Note:

Position a new steering lock to the column shaft and tighten the bolts until the head of bolts snaps-off.



Fig. 10-51

POWER STEERING

10A-A. GENERAL STEERING SERVICE	10A : 1
10A-A-1. Measurement of Steering Effort	10A : 1
10A-A-2. Pump Fluid Pressure Check	10A : 1
10A-A-3. Exchange of Fluid	10A : 1
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Service except the power steering gear is explained in Section 10 (Manual Steering).

10A-A. GENERAL STEERING SERVICE

10A-A-1. Measurement of Steering Effort

1. Apply the parking brakes.
2. Run the engine at idle and give the steering wheel several stationary swings (for about two minutes) to raise the temperature of the steering fluid. In this case, turn the wheel to a spring balance one.
3. Hook a spring balance one to the steering effort by turning the wheel.

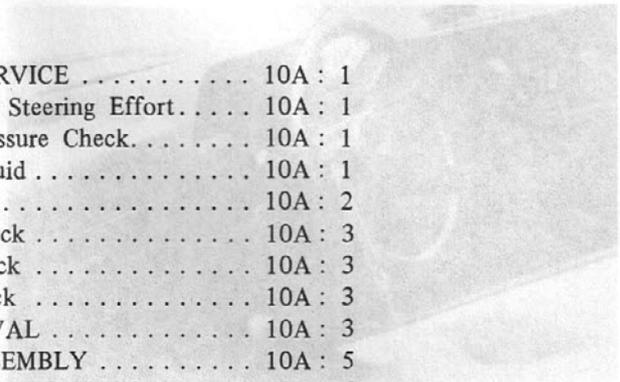


Fig. 10A-1

The steering effort is measured when taking the measurement one rotation clockwise from the straight ahead position.

10A-A-2. Pump Fluid Pressure Check

1. Install a power steering gauge set (49 1232 670) between the oil pump outlet and the gear and pump inlet. Be sure to bleed air after the installation.

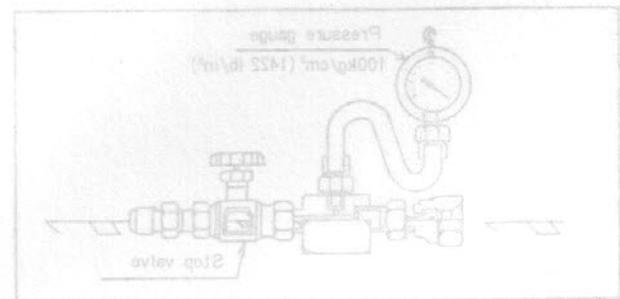


Fig. 10A-2

2. After the engine has been warmed up, open the stop valve to the full with the engine run at about

1500 rpm and record the oil pressure when the steering wheel is fully turned clockwise and counterclockwise respectively.

Oil pressure to be generated

Not less than 65 kg/cm² (924 lb/in²)
Oil temperature 50 ~ 60°C (122 ~ 140°F)

If the oil pressure is smaller than 65 kg/cm² (924 lb/in²) there is something wrong with either the oil pump or the steering gear.

Note:

Do not leave the steering wheel fully turned for a long time, or the oil temperature will rise, having adverse effect on the gears in the oil lines, such as the oil pump.

Run at about 1500 rpm and when closing the stop valve

generated
Not less than 65 kg/cm² (924 lb/in²)
Oil temperature 50 ~ 60°C (122 ~ 140°F)

If the oil pressure is smaller than 65 kg/cm² (924 lb/in²) there is something wrong with the

stop valve for more cause the oil temperature effect on the

is not more than 65 test in (2) and is 65 in the test in (3). You may consider that there is something wrong with the inside of the gear and pitman.

The oil pressure should be 65 kg/cm² (924 lb/in²) clockwise and counterclockwise.
The maximum oil pressure should be 65 kg/cm² (924 lb/in²) or more when the stop valve is closed while looking at the oil pressure gauge.

10A-A-3. Exchange of Fluid

1. Jack up the front of the car.
2. Remove the hose on the pressure side from the pump and receive the outflowing fluid in a receptacle.
3. Remove the fluid from the pump by turning the engine several times by the starter motor. Then turn the steering wheel clockwise and counterclockwise to the full to draw off the fluid until no more fluid runs out of the hose.

Note:

Do not start the engine. Do not run the starter for a long time, either.

Servicing except the power steering gear is explained in Section 10 (Manual Steering).

10A-A. GENERAL STEERING SERVICE

10A-A-1. Measurement of Steering Effort

1. Apply the parking brakes.
2. Run the engine at idle and give the steering wheel several stationary swings (for about two minutes) to raise the temperature of the steering fluid. In this case, turn the wheel from stopper to stopper.
3. Hook a spring balance onto the wheel and measure the steering effort by turning the wheel.

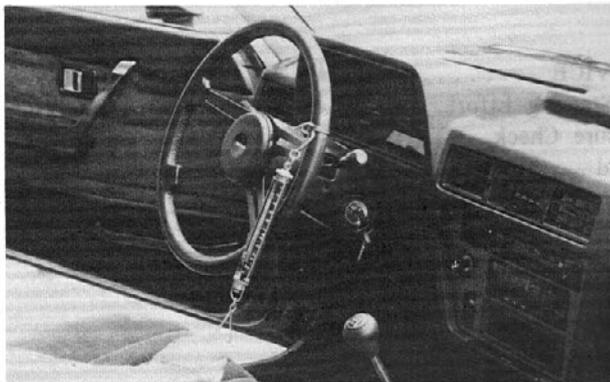


Fig. 10A-1

The steering effort should be less than 4 kg (8.8 lb) when taking the measurement by giving the wheel one rotation clockwise and counterclockwise respectively from the straight forward direction.

Standard steering effort ---
No more than 4 kg (8.8 lb)

If the measurement is more than the specified value, the conceivable causes are lack of fluid, incomplete air bleeding, leakage of oil from the return hose connections, slippage of the V belt, improper function of the oil pump and power steering gear, and lack of the tire air pressure among others.

10A-A-2. Pump Fluid Pressure Check

1. Install a power steering gauge set (49 1232 670) between the oil pump outlet and the gear and pitman inlet. Be sure to bleed air after the installation.

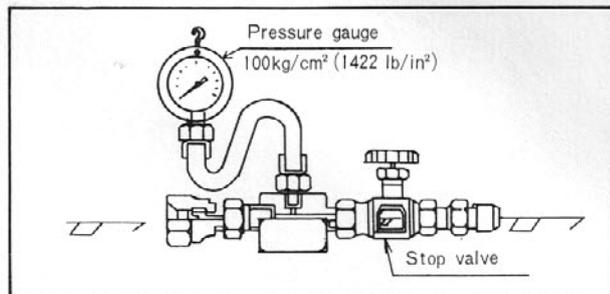


Fig. 10A-2

2. After the engine has been warmed up, open the stop valve to the full with the engine run at about

1500 rpm and record the oil pressure when the steering wheel is fully turned clockwise and counterclockwise respectively.

Oil pressure to be generated ---

Not less than 65 kg/cm² (924 lb/in²)

Oil temperature 50 ~ 60°C (122 ~ 140°F)

If the oil pressure is smaller than 65 kg/cm² (924 lb/in²) there is something wrong with either the oil pump or the gear and pitman.

Note:

Do not leave the steering wheel fully turned for a long time, or the oil temperature will rise, having adverse effect on the parts in the oil line, such as the oil pump, piping and gear.

3. Next, keep the engine run at about 1500 rpm and record the oil pressure when closing the stop valve little by little.

Oil pressure to be generated ---

Not less than 65 kg/cm² (924 lb/in²)

Oil temperature 50 ~ 60°C (122 ~ 140°F)

If the oil pressure generated is smaller than 65 kg/cm² (924 lb/in²), there is something wrong with the oil pump.

Note:

Take care so as not to close the stop valve for more than 15 seconds, because this will cause the oil temperature to rise, bringing about adverse effect on the oil pump.

4. If the oil pressure generated is not more than 65 kg/cm² (924 lb/in²) in the test in (2) and is 65 kg/cm² (924 lb/in²) or more in the test in (3), you may consider that there is something wrong with the inside of the gear and pitman.

The oil pressure should be 65/kg/cm² (924 lb/in²) or more when the steering wheel is fully turned clockwise and counterclockwise.

The maximum oil pressure should be 65 kg/cm² (924 lb/in²) or more when the stop valve is closed while looking at the oil pressure gauge.

10A-A-3. Exchange of Fluid

1. Jack up the front of the car.
2. Remove the hose on the pressure side from the pump and receive the outflowing fluid in a receptacle.
3. Remove the fluid from the pump by turning the engine several times by the starter motor. Then, turn the steering wheel clockwise and counterclockwise to the full to draw off the fluid until no more fluid gets out of the hose.

Note:

Do not start the engine. Do not run the starter for a long time, either.

4. Reinstall the hose onto the pump, refill Mazda
arrow ATF and air-bleed the steering gear.

10A-A-4. Air Bleeding

1. Jack up the front of the car.
2. Refill the fluid. Since the oil level goes down as the steering wheel is turned from stopper to stopper several times, refill the fluid further.
3. With the steering wheel turned to the full clockwise and counterclockwise respectively, turn the starter while carefully looking at the oil level. Do not start the engine.
4. If the amount of oil is normal, start the engine and turn the steering wheel two to three times clockwise and counterclockwise to each stopper.
5. Let the car down and turn the steering wheel two to three times to the stopper clockwise and counterclockwise. In this case, a noise may sometimes come out of the oil line, and this is an indication that the air bleeding has not yet been complete.
6. When turning the engine off with the steering wheel placed in the straight forward direction, the oil level in the pump should not go up. If the level goes up too much, the air bleeding performed so far has been incomplete. So, bleed air again as in (5).
7. Check the amount of oil and confirm that there is no fluid leaking.

Note:

If the air bleeding is incomplete, raise the oil temperature to about 50 ~ 80°C (122 ~ 176°F) (the oil temperature will rise by turning the steering wheel clockwise and counterclockwise), stop the engine, and perform the operation as in (5) in five to ten minutes. Air can be completely bled by repeating this operation a couple of times.



Fig. 10A-3



Fig. 10A-4



Fig. 10A-5

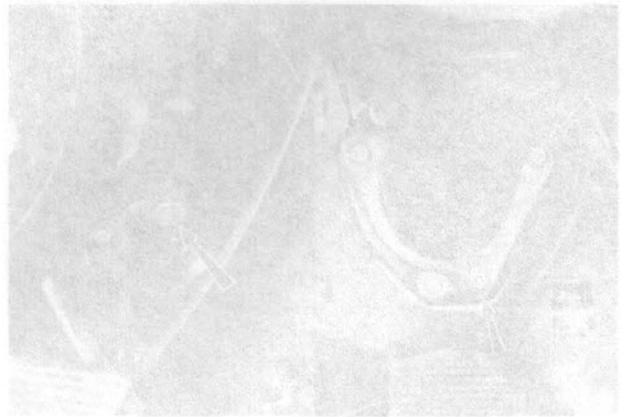


Fig. 10A-6

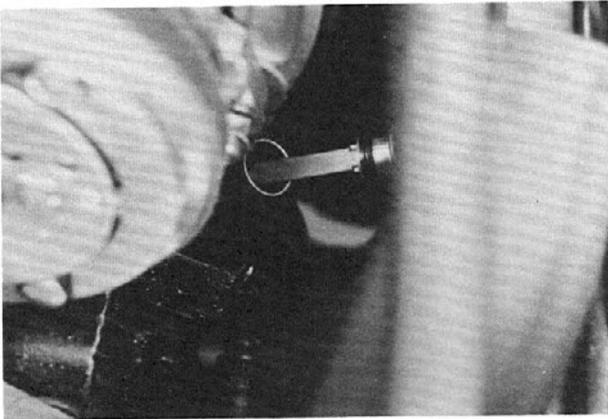


Fig. 10A-3

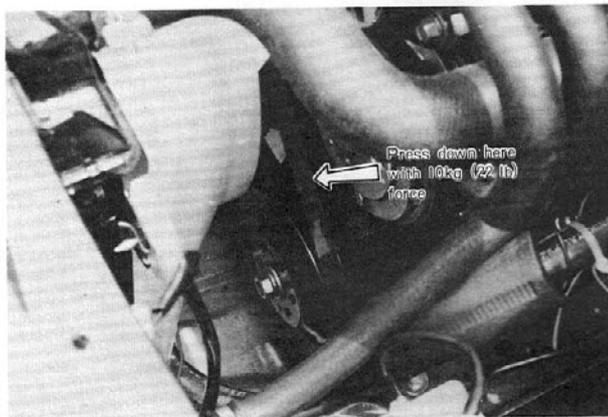


Fig. 10A-4



Fig. 10A-5

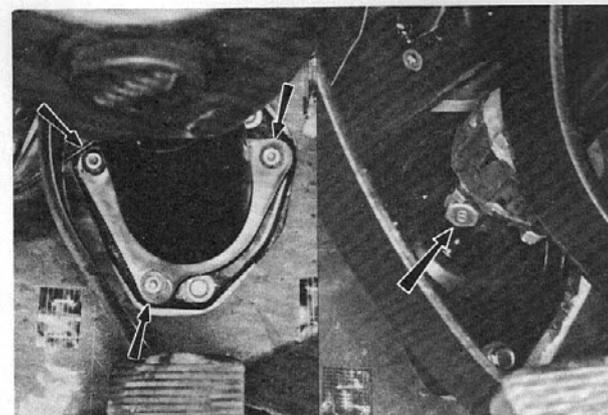


Fig. 10A-6

10A-A-5. Fluid Level Check

Check the fluid level in the power steering reservoir. The level must show between the "FULL" and "LOW" level marks on the reservoir. Add fluid meeting specifications if necessary. **Do not** overfill.

10A-A-6. Fluid Leak Check

1. With the engine idling, turn the steering wheel left to right several times. Check all possible leakage points.
2. Torque all loose fittings to specification. Replace damaged lines and seats.

10A-A-7. Pump Belt Check

1. If the belt is broken, glazed, or worn, replace the belt with a new one.
2. If the belt is noisy, check the tension of the belt. Also, check for misaligned pulleys.
3. When the belt is pressed down with **10 kg (22 lb)** force, the belt should deflect the specified amount.

For new belt	8 ~ 10 mm (0.31 ~ 0.39 in)
For used belt	11 ~ 13 mm (0.43 ~ 0.51 in)

10A-B. STEERING GEAR REMOVAL

Remove the power steering gear in the numerical order.

1. Disconnect the negative battery cable from the battery.
2. Column cover and switch panel.
3. Fixing bracket bolts.
4. Remove the set plate attaching nuts and slides the set plate toward the steering wheel.
5. Loosen the bolt securing the flexible coupling to the worm shaft.

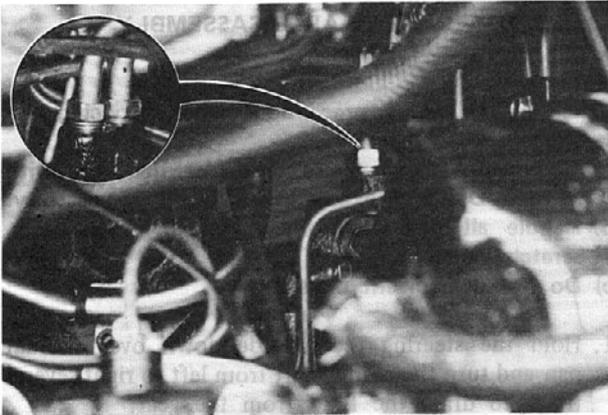


Fig. 10A-7



Fig. 10A-8

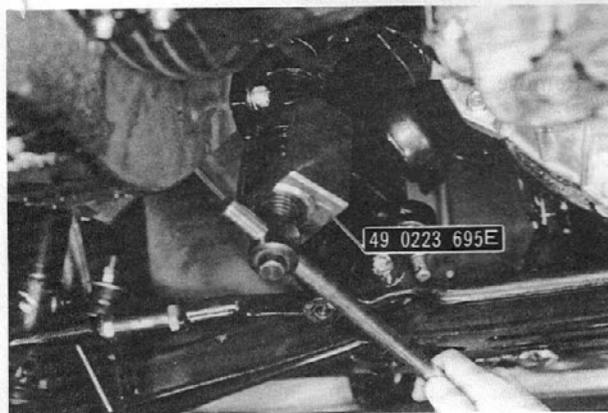


Fig. 10A-9

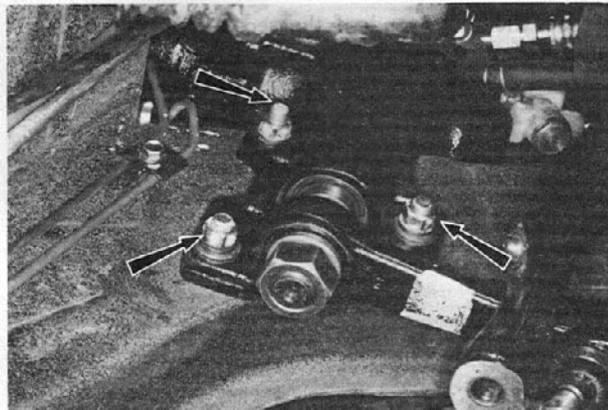


Fig. 10A-10

6. Tag the pressure and return lines future identification.
7. Disconnect the pressure and return lines from the steering gear. Plug the lines and port in the gear to prevent entry of dirt.

Raise the front end of the vehicle and support with stands.

8. Ball joint (disconnect)
Use the puller (49 0118 850C)

9. Pitman arm
Use the puller (49 0223 695E)

10. Remove the bolts and nuts retaining the steering gear housing to the body.
Slide the gear off the coupling and remove the gear.

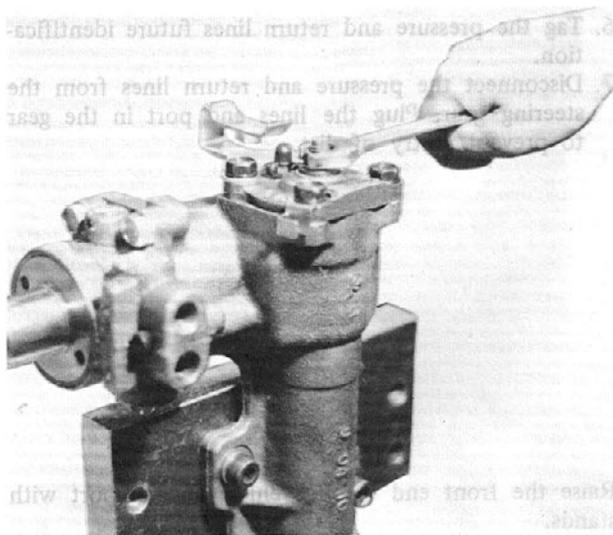


Fig. 10A-11

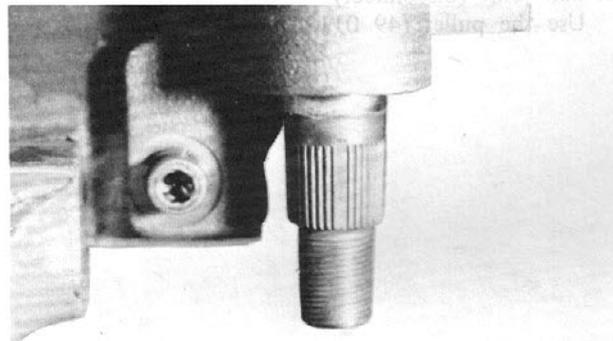


Fig. 10A-12

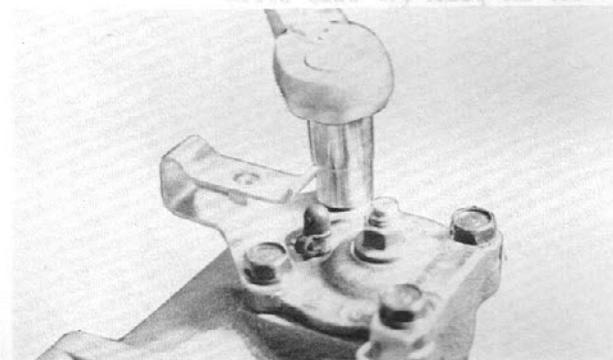


Fig. 10A-13

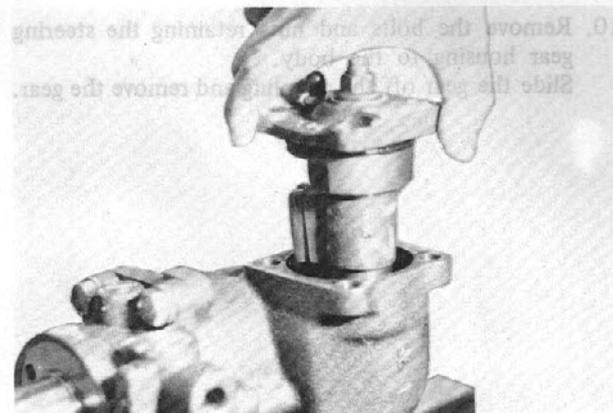


Fig. 10A-14

10A-C. STEERING GEAR DISASSEMBLY

Note:

Take the following precautions when servicing the steering gear.

- a) Thoroughly clean the exterior of the unit with solvent. Drain all excess hydraulic oil, if necessary.
- b) Handle all parts carefully to avoid nicks, burrs, scratches and dirt.
- c) Do not use solvent on seals.

1. Hold the steering gear upside down over a drain pan and turn the worm shaft from left to right several times to drain the fluid from the gear.
2. Secure the gear on the work stand.
3. Loosen the sector shaft adjusting screw lock nut.

4. To center the gear, turn the worm shaft until the identification mark is positioned as shown in Fig. 10A-12.

5. Remove the side cover attaching bolts.

6. Tap the lower end of the sector shaft with a soft-hammer to loosen it, then lift the cover and shaft as an assembly from the housing. Discard the O-ring.

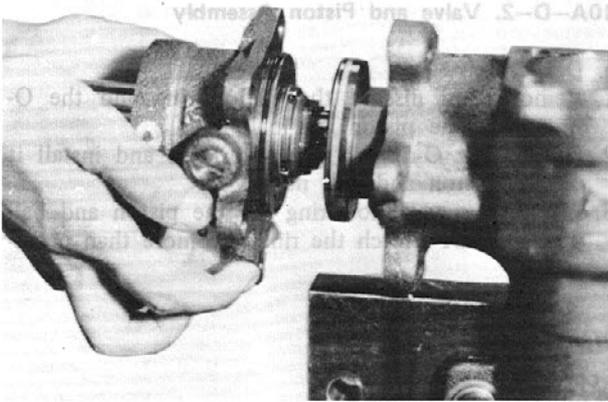


Fig. 10A-15

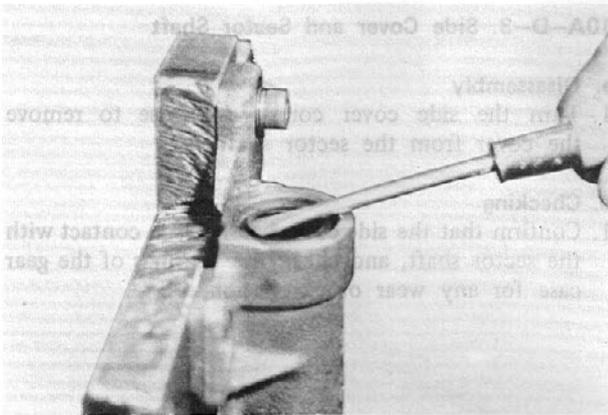


Fig. 10A-16

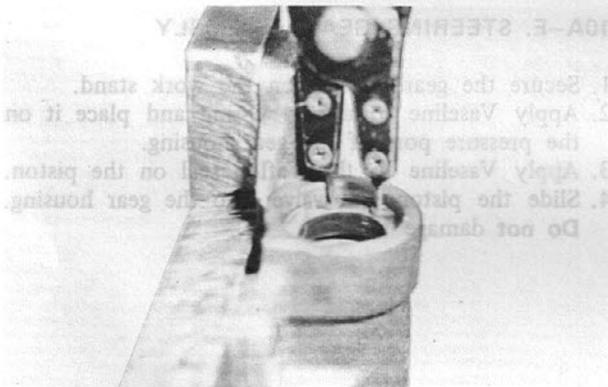


Fig. 10A-17

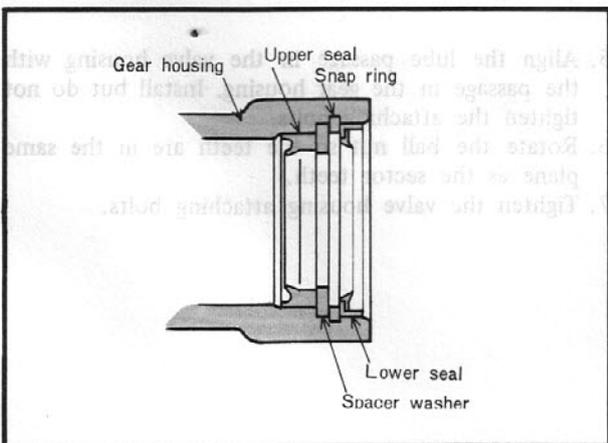


Fig. 10A-18

- Remove the valve housing attaching bolts and separate the valve and piston assembly from the steering gear housing.
Discard the O-ring.

Note:

Do not put the ball nut apart more than 40 mm (1.57 in) from the valve housing. Further, if the valve and piston assembly is faced downward with the piston set free, the piston will fall down by its own weight and will be damaged or lost. Therefore, be sure to pay attention so as not to face the valve and piston assembly downward.

10A-D. OVERHAUL OF MAIN COMPONENTS

10A-D-1. Steering Gear Housing

a. Disassembly

- Remove the lower seal from the lower end of the housing.

- Remove the snap ring, spacer washer and upper seal.

b. Checking

- Clean the housing thoroughly in clean solvent, and then blow it dry with moisture-free compressed air.
- Inspect the housing for scores in the area where the ball nut and seal moves.

c. Assembly

- Dip the seals in gear lubricant.
- Apply lubricant to the seal bore of the housing. Place the upper seal in the housing with the lip facing inward.
- Install the spacer washer and snap ring in the housing.
- Place the lower seal in the housing with the rubber side facing out, and press into place.

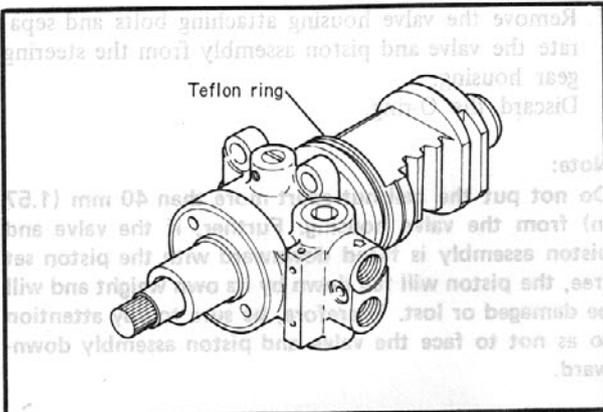


Fig. 10A-19

10A-D-2. Valve and Piston Assembly

a. Disassembly

1. Remove and discard the Teflon ring and the O-ring from the piston and ball nut.
2. Dip a **new** O-ring in gear lubricant and install it on the piston and ball nut.
3. Install a **new** Teflon ring on the piston and ball nut. **Do not** stretch the ring any more than necessary.

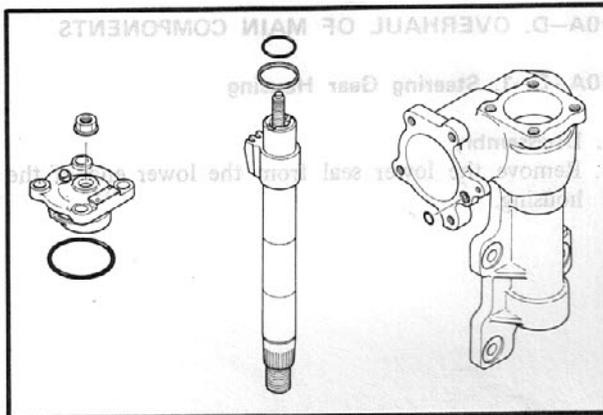


Fig. 10A-20

10A-D-3. Side Cover and Sector Shaft

a. Disassembly

1. Turn the side cover counterclockwise to remove the cover from the sector shaft.

b. Checking

1. Confirm that the side cover bearing is in contact with the sector shaft, and check the bearings of the gear case for any wear or exfoliation.

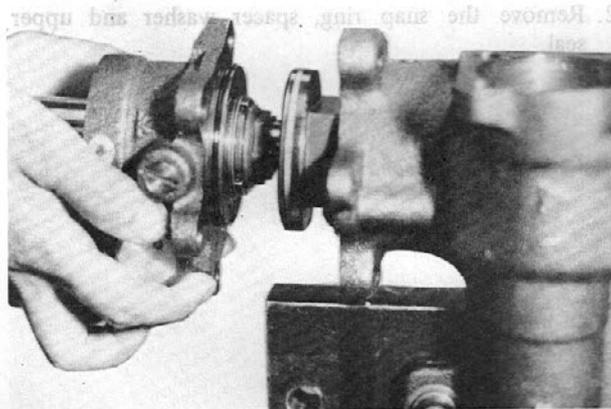


Fig. 10A-21

10A-E. STEERING GEAR ASSEMBLY

1. Secure the gear housing on the work stand.
2. Apply Vaseline to a **new** O-ring and place it on the pressure port of the gear housing.
3. Apply Vaseline to the Teflon seal on the piston.
4. Slide the piston and valve into the gear housing. **Do not** damage the seal.

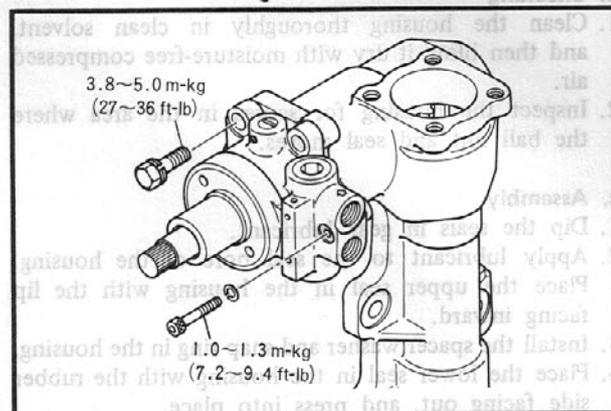


Fig. 10A-22

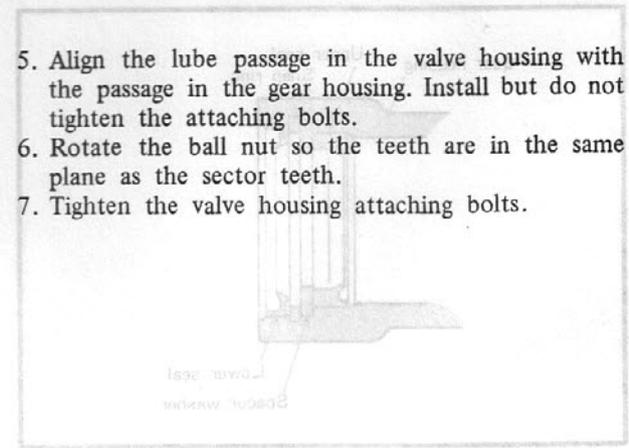


Fig. 10A-17

5. Align the lube passage in the valve housing with the passage in the gear housing. Install but do not tighten the attaching bolts.
6. Rotate the ball nut so the teeth are in the same plane as the sector teeth.
7. Tighten the valve housing attaching bolts.

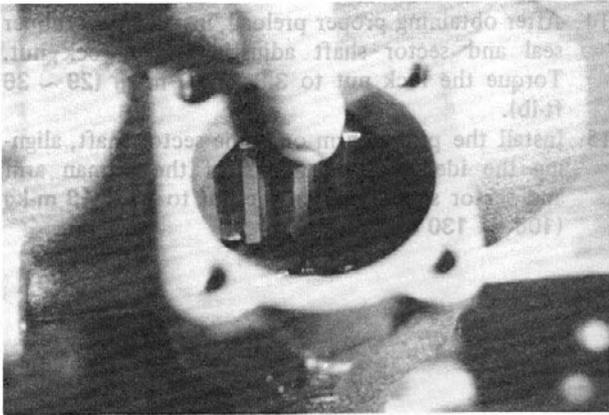


Fig. 10A-23

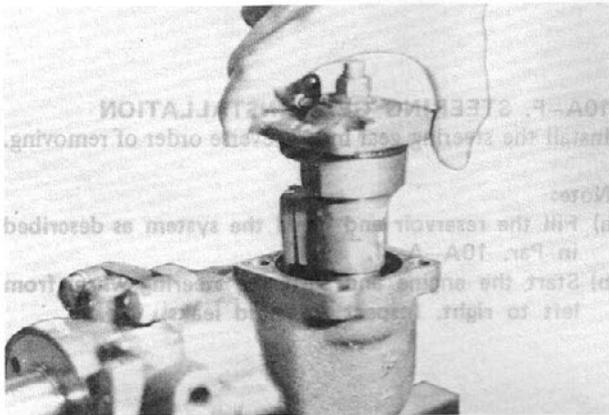


Fig. 10A-24

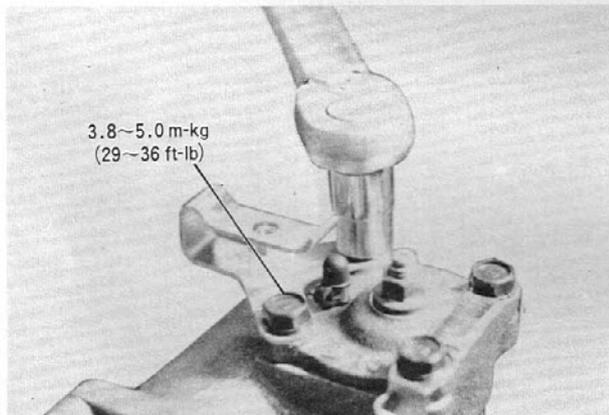


Fig. 10A-25

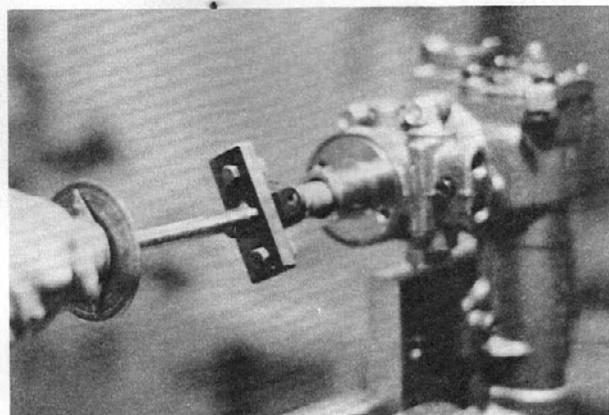
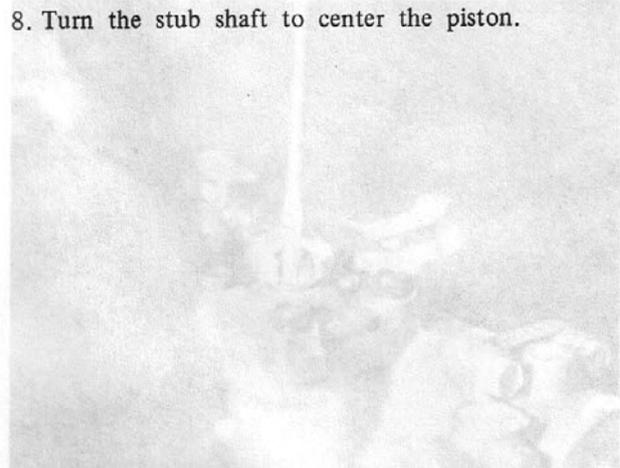


Fig. 10A-26

8. Turn the stub shaft to center the piston.



9. Thread the side cover on the adjusting screw of the sector shaft until it bottoms, then loosen it one and one-half turns.

10. Apply Vaseline to the sector shaft bearing and journal. Install the sector shaft so the center gear tooth meshes with the center groove in the rack-piston. Be sure the cover O-ring is in place before pushing the cover down on the housing.

11. Install the side cover attaching bolts and lock washers. Torque to 3.8 ~ 5.0 m-kg (29 ~ 36 ft-lb).

12. Confirm that the stub shaft makes more than $1\frac{3}{4}$ turns both clockwise and counterclockwise. Also confirm that the rotation torque of the stub shaft is less than 6 cm-kg (5.2 in-lb) in the entire range.

13. In the condition that the sector shaft is in the central position, tighten the adjust bolt and adjust the revolution torque so that it may become less than 10 cm-kg (8.8 in-lb) when adding 3 ~ 4 cm-kg (2.6 ~ 3.5 in-lb) to the value in the preceding item.

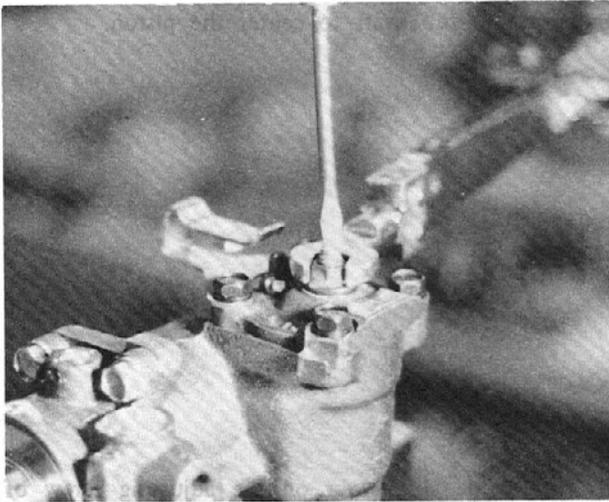


Fig. 10A-27

10. Apply Vaseline to the sector shaft bearing and journal. Install the sector shaft to the center gear tooth mesh with the center groove in the rack-piston. Be sure the cover O-ring is in place before pushing the cover down on the housing.

11. Install the side cover attaching bolts and lock washers. Torque to 3.8 ~ 5.0 m-kp (29 ~ 38 ft-lb).

12. Confirm that the stop shaft makes more than 1 1/2 turns both clockwise and counterclockwise. Also confirm that the rotation torque of the stop shaft is less than 6 cm-kp (5.2 in-lb) in the entire range.

13. In the condition that the sector shaft is in the central position, tighten the adjust bolt and adjust the revolution torque so that it may become less than 10 cm-kp (8.8 in-lb) when adding 3 ~ 4 cm-kp (2.7 ~ 3.2 in-lb) to the value in the preceding item.

14. After obtaining proper preload, install a new rubber seal and sector shaft adjusting screw lock nut. Torque the lock nut to 3.8 ~ 5.0 m-kp (29 ~ 38 ft-lb).
15. Install the pitman arm onto the sector shaft, aligning the identification marks of the pitman arm and sector shaft. Tighten the nut to 15 ~ 18 m-kp (108 ~ 130 ft-lb).



Fig. 10A-28

10A-F. STEERING GEAR INSTALLATION

Install the steering gear in the reverse order of removing.

Note:

- a) Fill the reservoir and bleed the system as described in Par. 10A-A-4.
- b) Start the engine and turn the steering wheel from left to right. Inspect for fluid leaks.



Fig. 10A-29



Fig. 10A-30

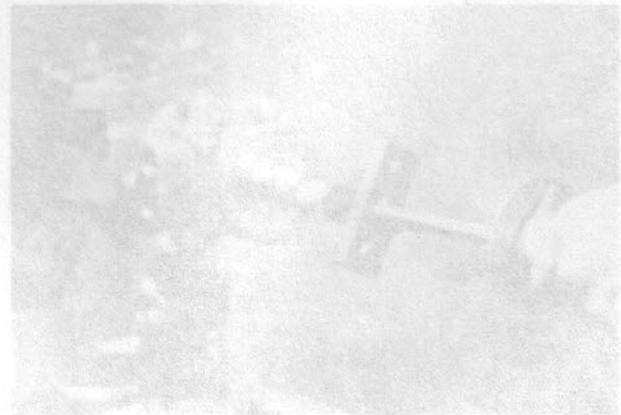


Fig. 10A-31

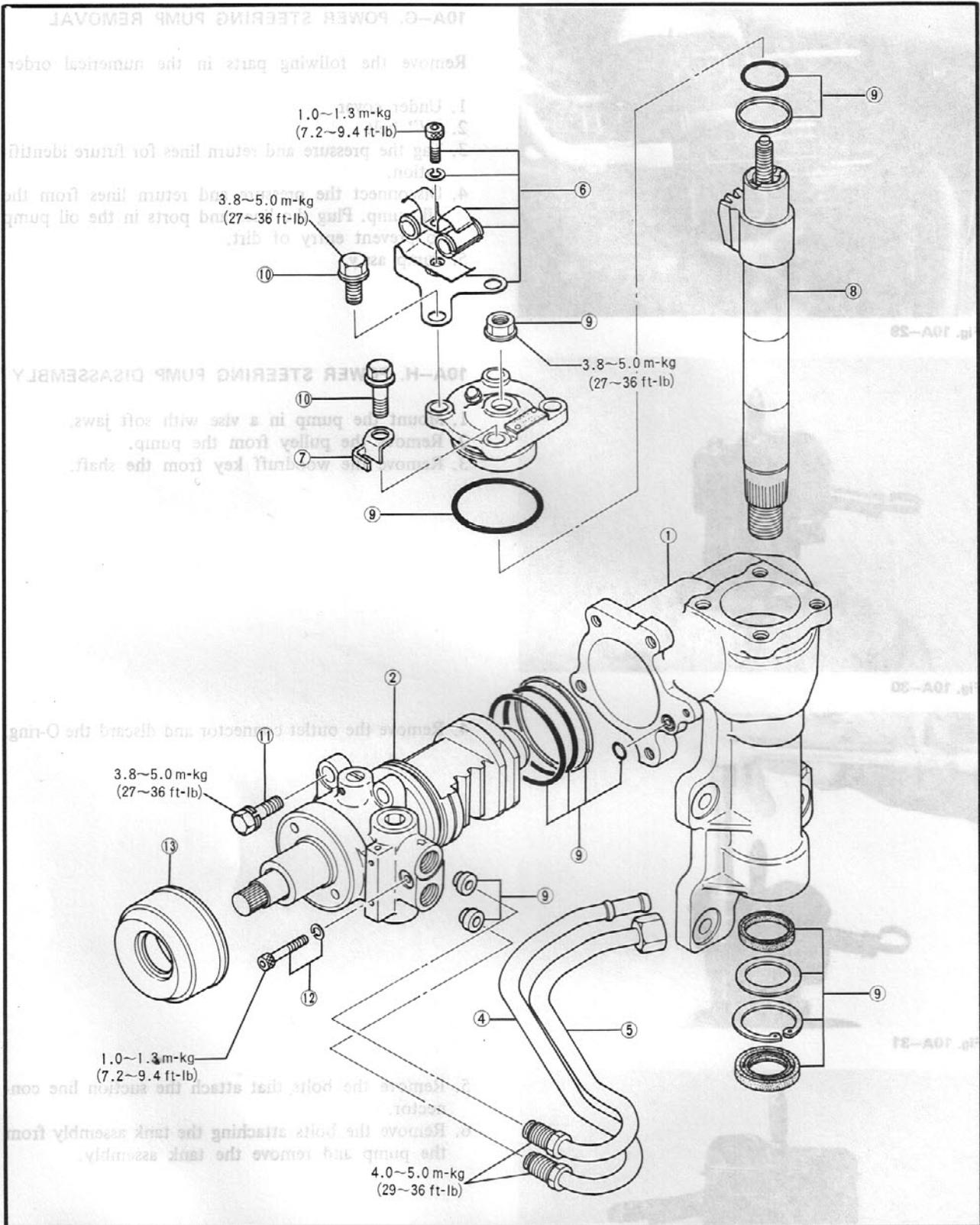


Fig. 10A-28

- | | | | |
|---------------------------|-----------------------|----------------------|----------------|
| 1. Gear housing ass'y | 5. Return pipe | 9. Seal kit | 13. Dust cover |
| 2. Valve and piston ass'y | 6. Pipe bracket ass'y | 10. Bolt with washer | |
| 3. Side cover ass'y | 7. Clip | 11. Bolt with washer | |
| 4. Pressure pipe | 8. Sector shaft ass'y | 12. Bolt and washer | |

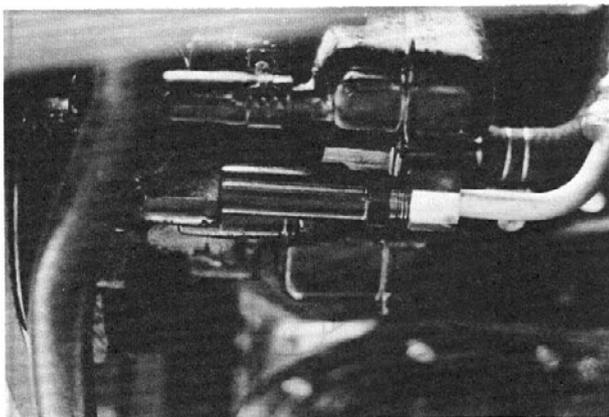


Fig. 10A-29

10A-G. POWER STEERING PUMP REMOVAL

Remove the following parts in the numerical order.

1. Under cover
2. "V" belt
3. Tag the pressure and return lines for future identification.
4. Disconnect the pressure and return lines from the oil pump. Plug the lines and ports in the oil pump to prevent entry of dirt.
5. Pump ass'y

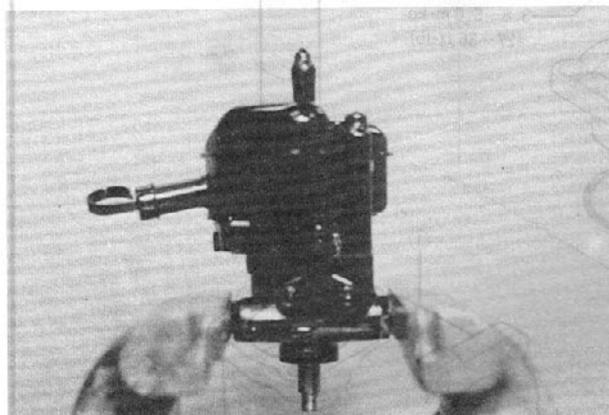


Fig. 10A-30

10A-H. POWER STEERING PUMP DISASSEMBLY

1. Mount the pump in a vise with soft jaws.
2. Remove the pulley from the pump.
3. Remove the woodruff key from the shaft.

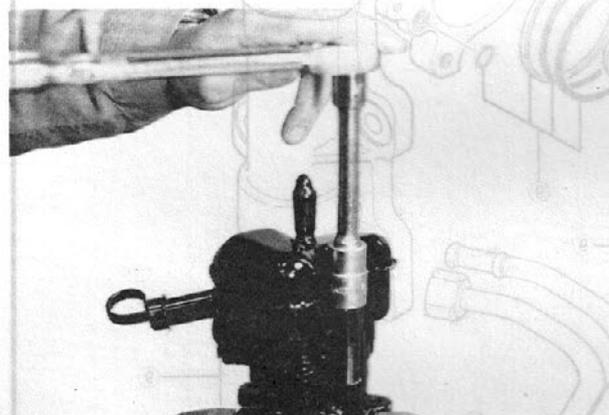


Fig. 10A-31

4. Remove the outlet connector and discard the O-ring.

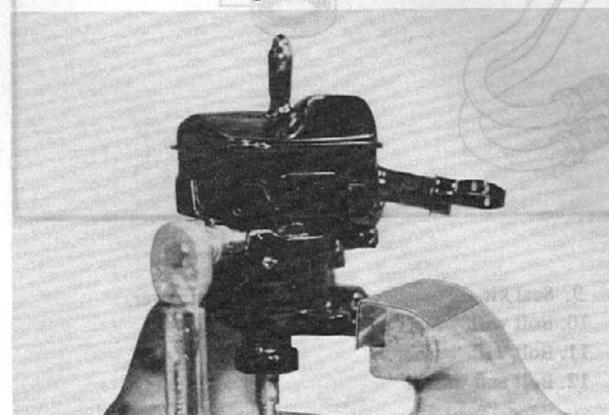


Fig. 10A-32

5. Remove the bolts that attach the suction line connector.
6. Remove the bolts attaching the tank assembly from the pump and remove the tank assembly.

Fig. 10A-28

1. Gear housing ass'y
2. Valve and piston ass'y
3. Side cover ass'y
4. Pressure pipe
5. Return pipe
6. Pipe bracket ass'y
7. Clip
8. Sector shaft ass'y

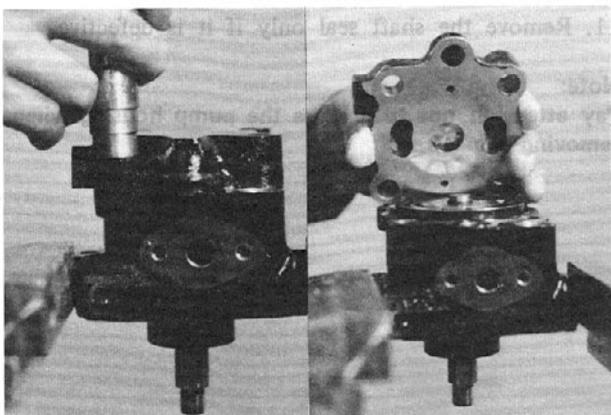


Fig. 10A-33

7. Take off the 3 bolts to fix the cover and remove the cover by tapping it gently with a plastic hammer.



Fig. 10A-37

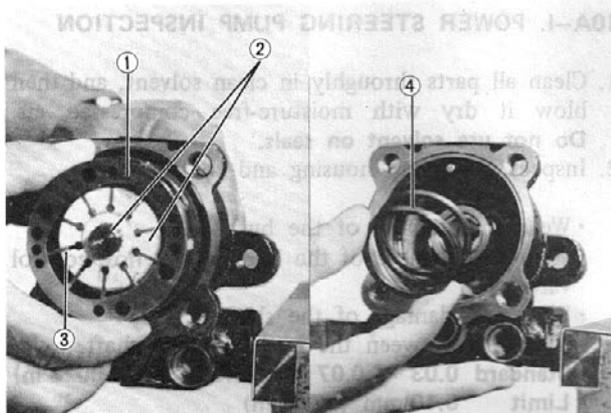


Fig. 10A-34

8. Remove the following parts from the body.

- ① Cam ring
- ② Rotor and shaft assembly
- ③ Vanes
- ④ Spring

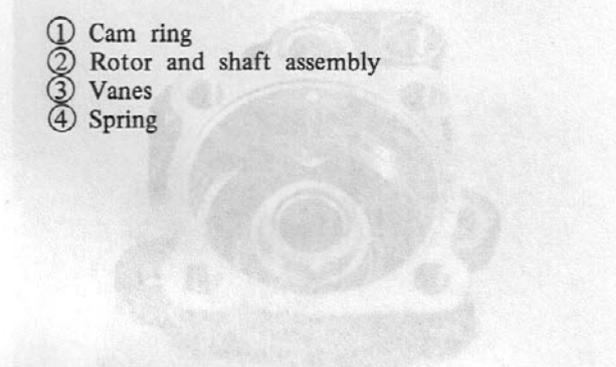


Fig. 10A-38

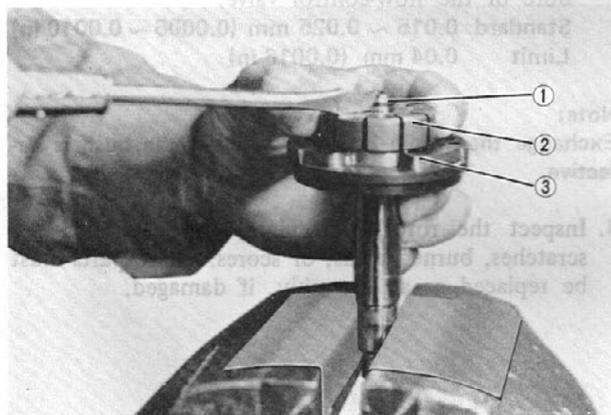


Fig. 10A-35

9. Remove the following parts from the rotor and shaft assembly in the numerical order.

- ① Snap ring
- ② Rotor
- ③ Side plate

Note:

Fix the shaft on a vice with soft cloth so as not to damage the shaft.

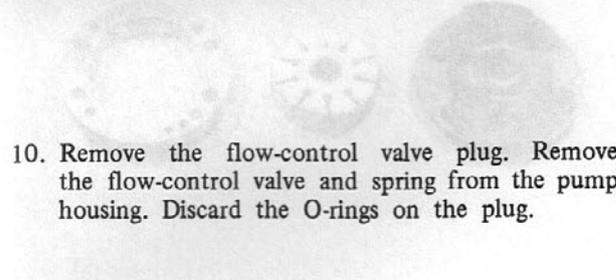


Fig. 10A-39

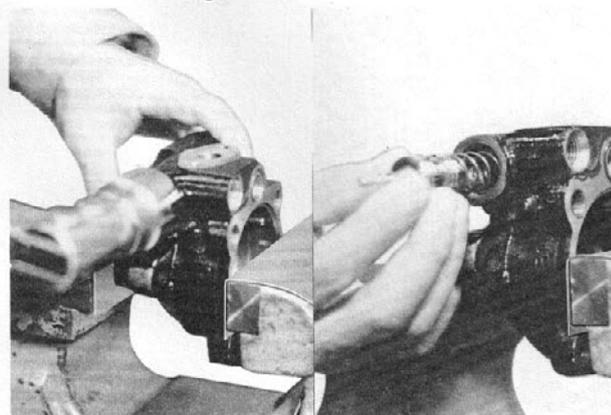


Fig. 10A-36

10. Remove the flow-control valve plug. Remove the flow-control valve and spring from the pump housing. Discard the O-rings on the plug.



Fig. 10A-37

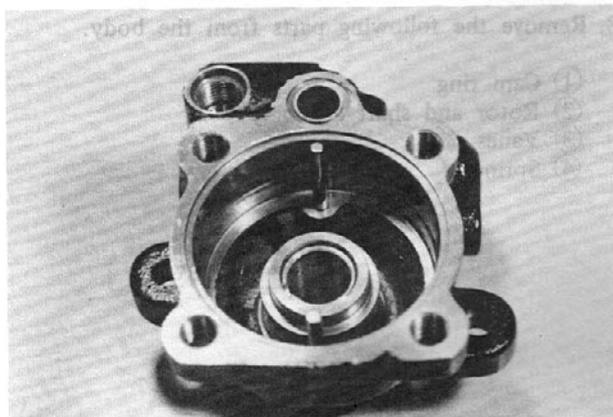


Fig. 10A-38

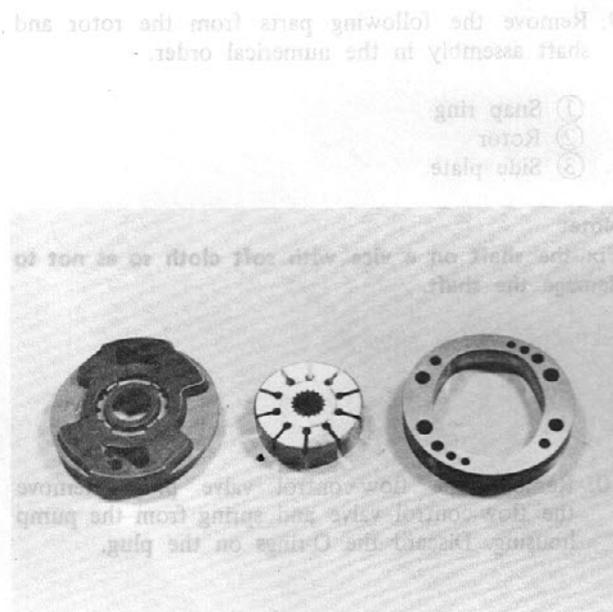


Fig. 10A-39

11. Remove the shaft seal only if it is defective.

Note:

Pay attention not to damage the pump housing when removing the oil seal.

10A-I. POWER STEERING PUMP INSPECTION

1. Clean all parts thoroughly in clean solvent, and then blow it dry with moisture-free compressed air. **Do not use solvent on seals.**
2. Inspect the pump housing and shaft.

- Wear and damage of the bush.
- Wear and damage of the bore of the flow-control valve.
- Wear and damage of the shaft.
- Clearance between the bush and the shaft.
Standard 0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)
Limit 0.10 mm (0.004 in)
- Clearance between the flow-control valve and the bore of the flow-control valve.
Standard 0.015 ~ 0.025 mm (0.0006 ~ 0.0010 in)
Limit 0.04 mm (0.0016 in)

Note:

Exchange the whole body assembly if the bush is defective.

3. Inspect the rotor, side plate, and cam ring for scratches, burned areas, or scores. These parts must be replaced as an assembly, if damaged.

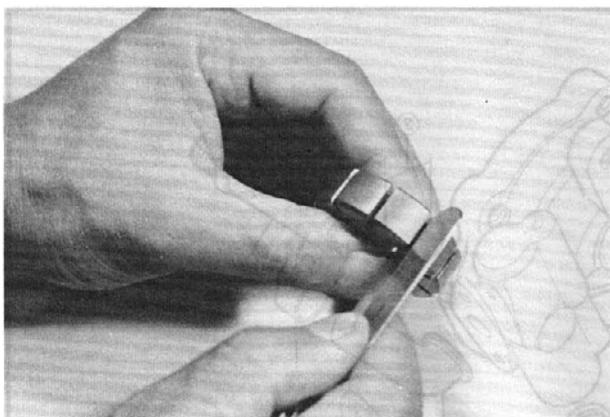


Fig. 10A-40

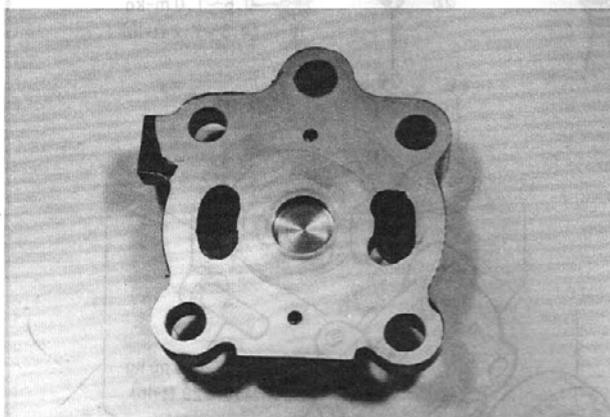


Fig. 10A-41

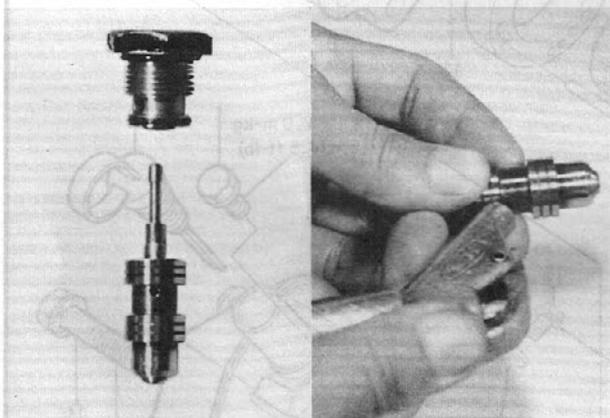


Fig. 10A-42

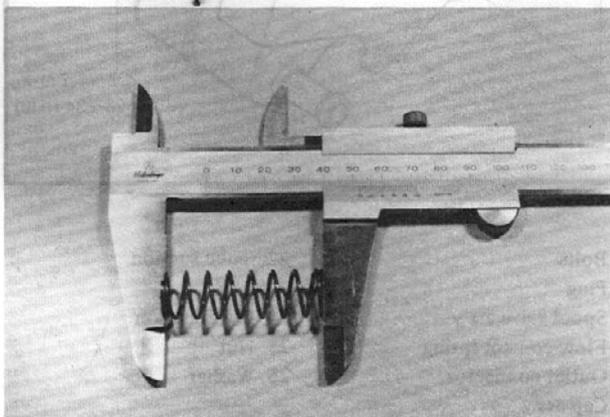


Fig. 10A-43

4. Inspect the vanes for cracks and wear.

- Clearance of vanes and rotor grooves
Standard 0.01 mm (0.0004 in)
Limit 0.06 mm (0.0024 in)

5. Inspect the cover for wear or damage.

- Wear and damage of the with which the rotor is in contact surface of the cover

6. Inspect the flow-control valve

- Wear and damage of the outer circumference of the flow-control valve
- Wear and damage of the plug orifice
- Close one end of the hole of the flow-control valve with a finger. When air of approximately 4 ~ 5 kg/cm² (57 ~ 71 lb/in²) is blown from the other end of the hole, the valve is acceptable if there is not any air leakage from the small hole at the rear end.

- Flow-control spring length
Standard 52.5 mm (2.07 in)
Limit 49.5 mm (1.95 in)

Fig. 10A-44

- 1. Felt key
- 2. Oil seal "O" ring
- 3. Woodruff key
- 4. Shaft
- 5. Body Assy
- 6. Spring
- 7. Side plate
- 8. Dowel pin
- 9. Rotor
- 10. Vane
- 11. Cam ring
- 12. Snap ring
- 13. End cover
- 14. Bracket Assy
- 15. Pin
- 16. Pin
- 17. Spring
- 18. Pin
- 19. Pin
- 20. Pin
- 21. Oil tank Assy

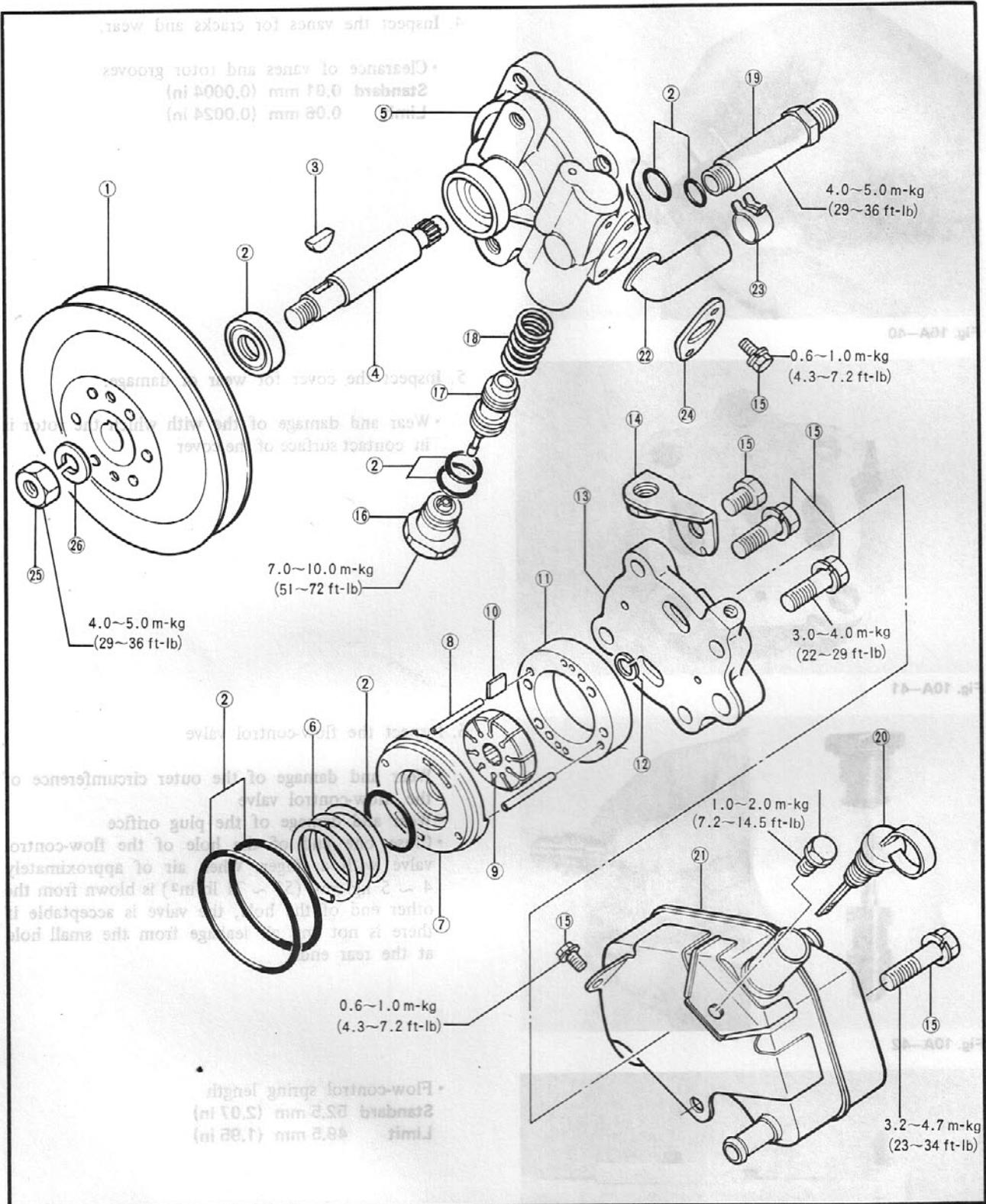


Fig. 10A-44

- 1. Pulley
- 2. Oil seal "O" ring
- 3. Woodruff key
- 4. Shaft
- 5. Body ass'y
- 6. Spring
- 7. Side plate

- 8. Dowel pin
- 9. Rotor
- 10. Vane
- 11. Cam ring
- 12. Snap ring
- 13. End cover
- 14. Bracket ass'y

- 15. Bolts
- 16. Plug
- 17. Spool valve ass'y
- 18. Flow-control spring
- 19. Outlet connector
- 20. Cap ass'y
- 21. Oil tank ass'y

- 22. Tube suction
- 23. Clip
- 24. Plate suction
- 25. Nut
- 26. Washer

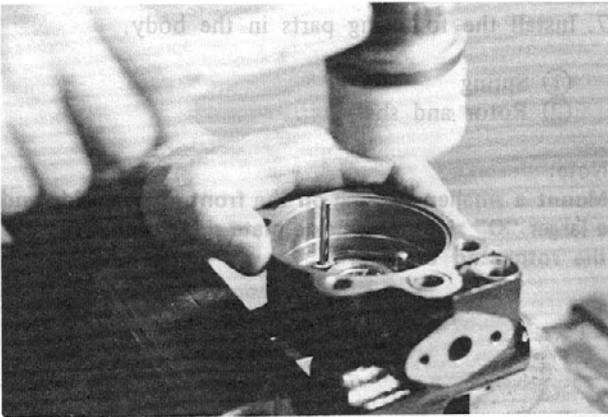


Fig. 10A-45

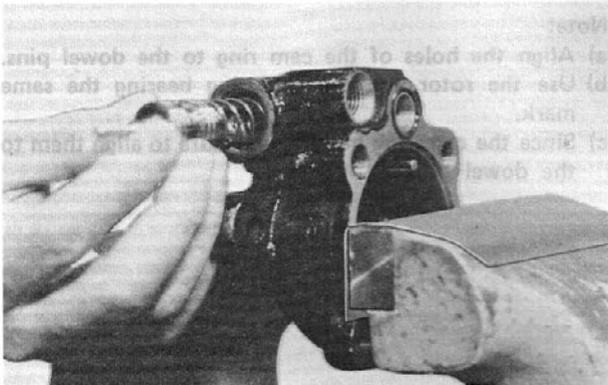


Fig. 10A-46

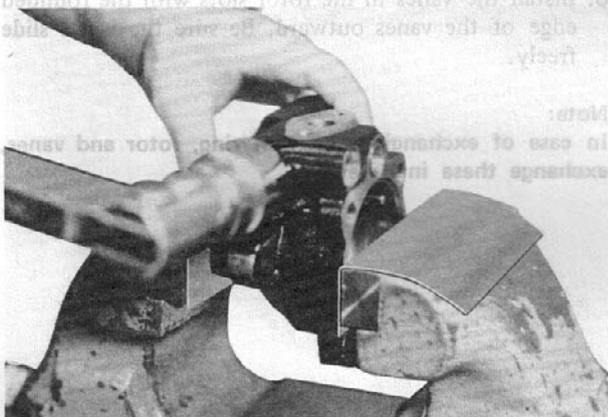


Fig. 10A-47



Fig. 10A-48

10A-J. POWER STEERING PUMP ASSEMBLY

Note:

All of the oil seals and "O" rings should be changed to new ones.

1. Fit the dowel pins into the body by tapping them slightly.

Note:

Pay attention not to incline the dowel pins when fitting.

2. If the shaft seal was removed, install a new seal with the metal backing facing the pump end of the shaft, using suitable installer. Tap the installer lightly with a small hammer until the seal is properly seated in the shaft hub.

3. Place the flow-control valve spring in its hole and insert the spool valve with the pin end toward the plug.

4. Lubricate the new O-ring with power steering fluid and install them on the plug.

5. Install the control valve plug on the housing and torque it to 7 ~ 10 m·kg (50 ~ 72 ft·lb).

Note:

- a) When inserting the plug, pay attention not to damage the rod at the tip of the spool valve assembly.
- b) In case of exchanging the body assembly and the spool valve, use parts bearing the same mark.

6. Install the side plate, rotor, and snap ring on the shaft.

Note:

- a) Install the rotor so that the chamfered side of the spline of the rotor may face to the front.
- b) Use a new snap ring at all times.

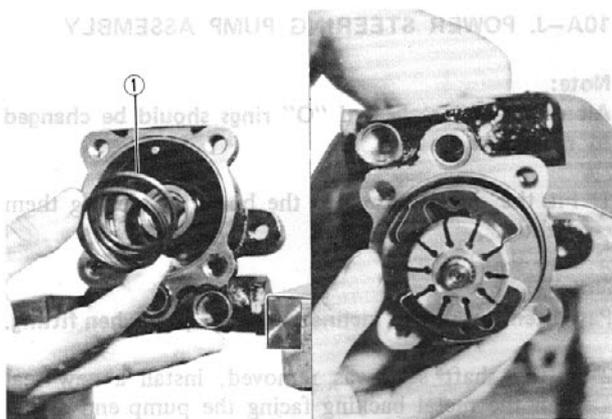


Fig. 10A-49

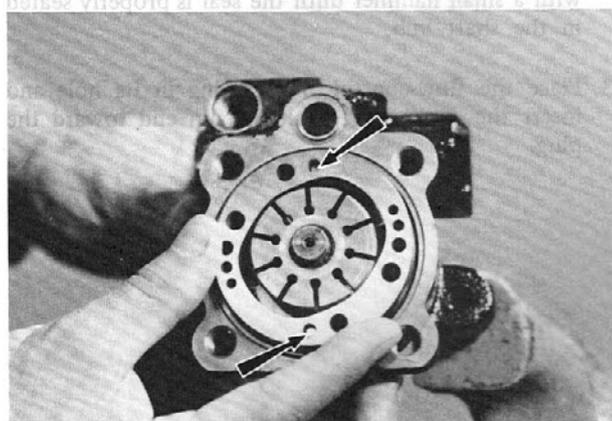


Fig. 10A-50

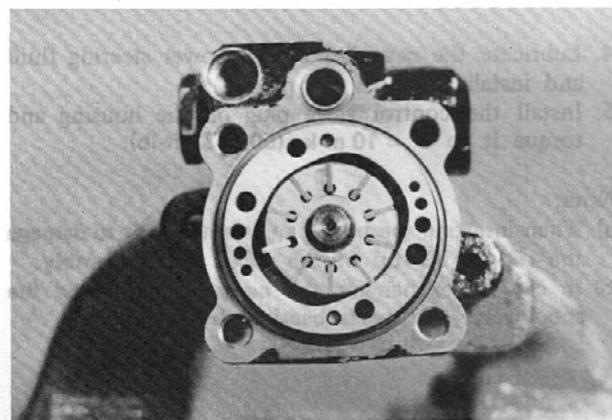


Fig. 10A-51

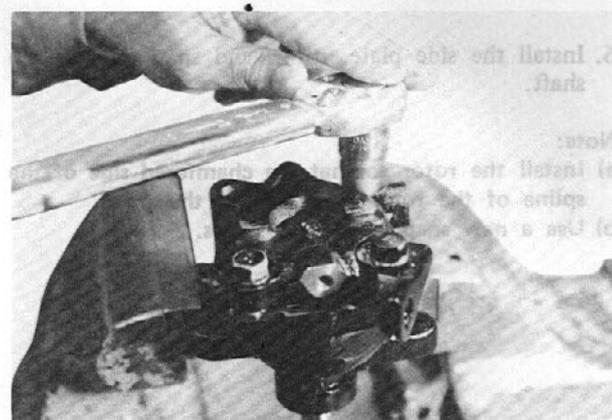


Fig. 10A-52

7. Install the following parts in the body.

- ① Spring
- ② Rotor and shaft

Note:

Mount a smaller 'O' ring on the front housing side and a larger "O" ring on the side plate side. Then, assemble the rotor and the shaft.

- ③ Cam ring

Note:

- a) Align the holes of the cam ring to the dowel pins.
- b) Use the rotor and the cam ring bearing the same mark.
- c) Since the cam ring has holes, be sure to align them to the dowel pins.

8. Install the vanes in the rotor slots with the rounded edge of the vanes outward. Be sure the vanes slide freely.

Note:

In case of exchanging the cam ring, rotor and vanes, exchange these in a set.

9. Lubricate the new O-rings with power steering fluid and install them on the housing.

10. Install the end cover and attaching bolts.

Torque the bolts to 3 ~ 4 m-kg (22 ~ 29 ft-lb).

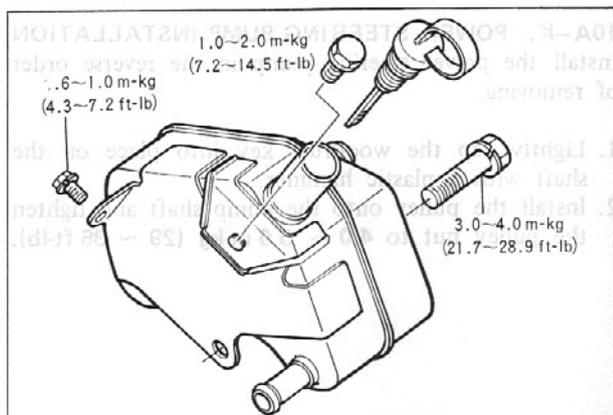


Fig. 10A-53

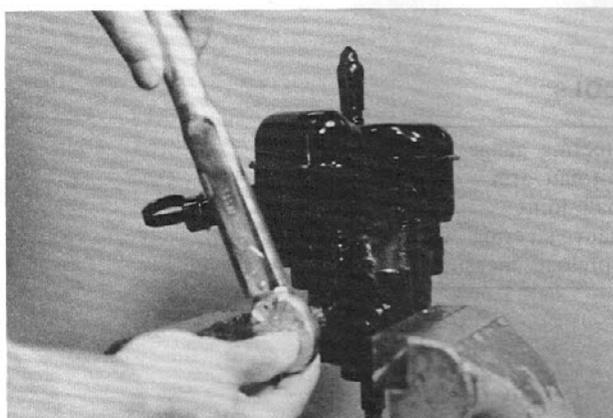


Fig. 10A-54

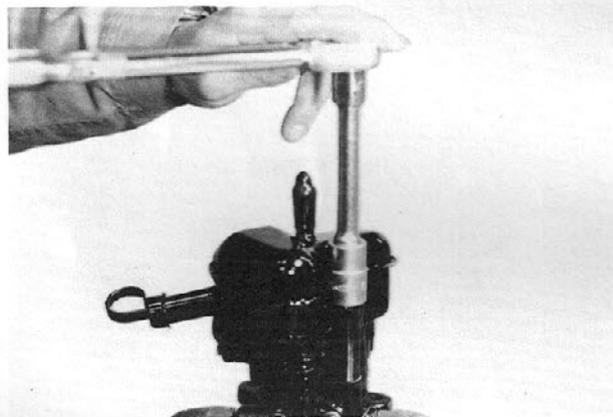


Fig. 10A-55

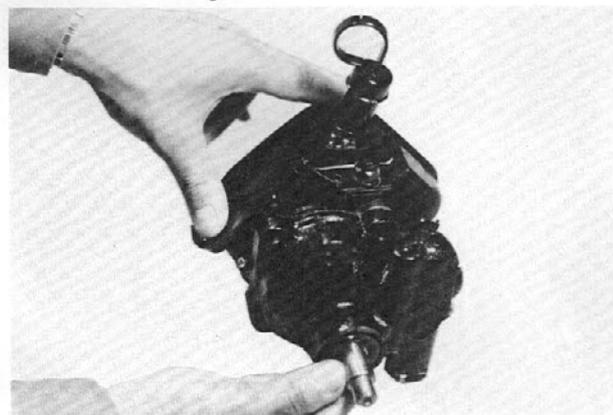


Fig. 10A-56

11. Mount the tank assembly on the body housing.

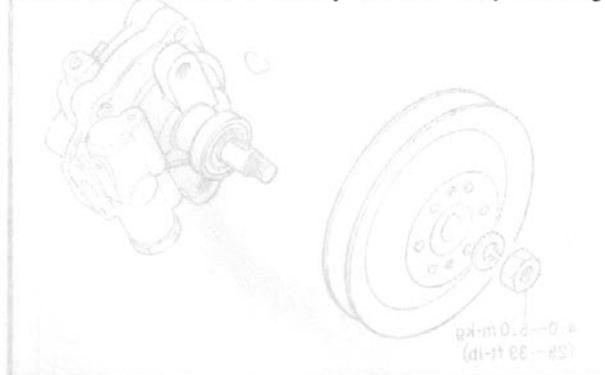


Fig. 10A-57

12. Install the suction connector on the housing and torque the attaching bolts to **0.6 ~ 1.0 m·kg (4.3 ~ 7.2 ft·lb)**.

Note:
Clamp the suction connector without twisting the rubber part.

13. Lubricate a new O ring with power steering fluid and install it on the pressure connector.

14. Install the outlet connector on the housing and torque it to **4 ~ 5 m·kg (29 ~ 36 ft·lb)**.

15. Confirm that the shaft rotates smoothly without any catch.

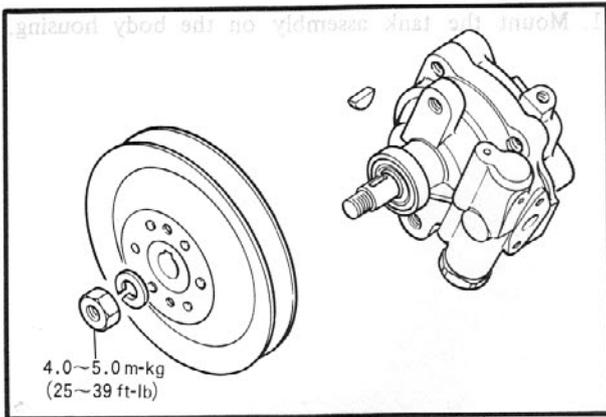


Fig. 10A-57

10A-K. POWER STEERING PUMP INSTALLATION

Install the power steering pump in the reverse order of removing.

1. Lightly tap the woodruff key into place on the shaft with a plastic hammer.
2. Install the pulley onto the pump shaft and tighten the pulley nut to 4.0 ~ 5.0 m·kg (29 ~ 36 ft·lb).

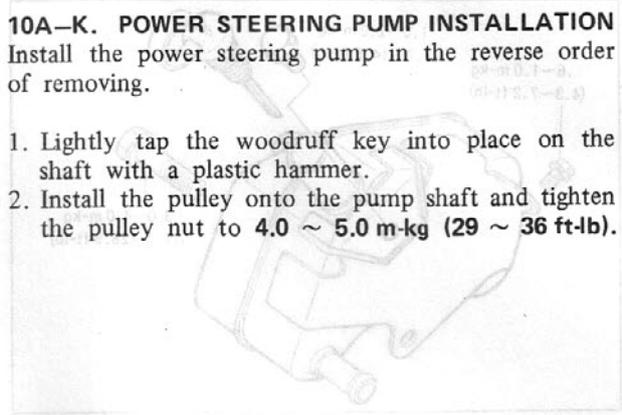


Fig. 10A-58

SPECIAL TOOLS

49 1232 670	Power steering gauge set
49 0223 695E	Puller, pitman arm
49 0118 850C	Puller, ball joint
49 0180 510A	Attachment, steering worm bearing preload measuring

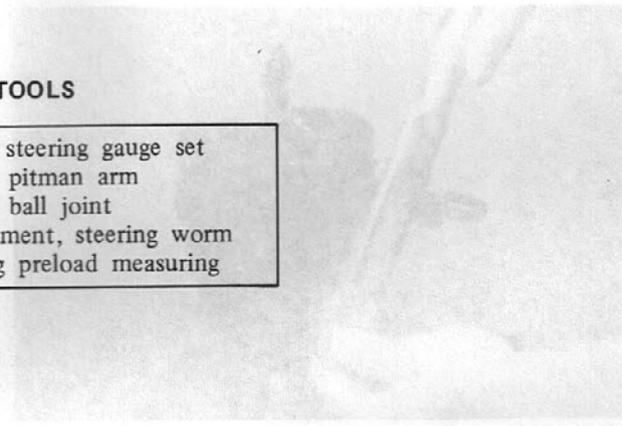


Fig. 10A-59

13. Lubricate a new O ring with power steering fluid and install it on the pressure connector.
14. Install the outlet connector on the housing and torque it to 4 ~ 5 m·kg (29 ~ 36 ft·lb).

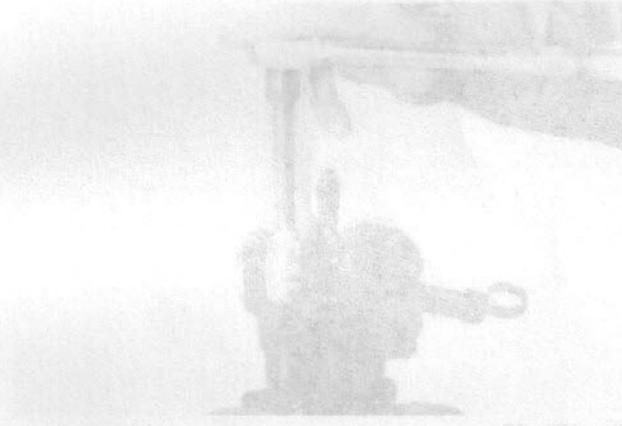


Fig. 10A-60

15. Confirm that the shaft rotates smoothly without any catch.

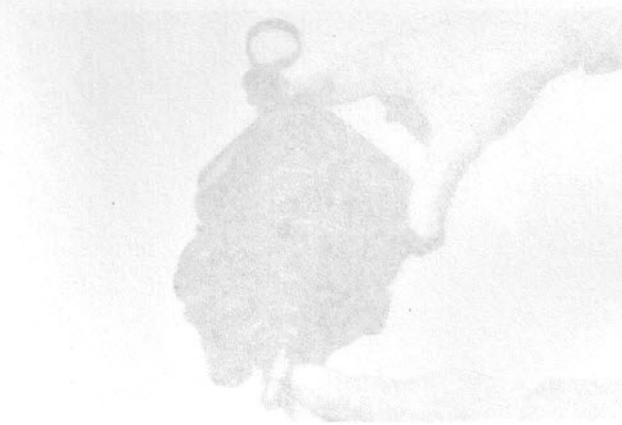
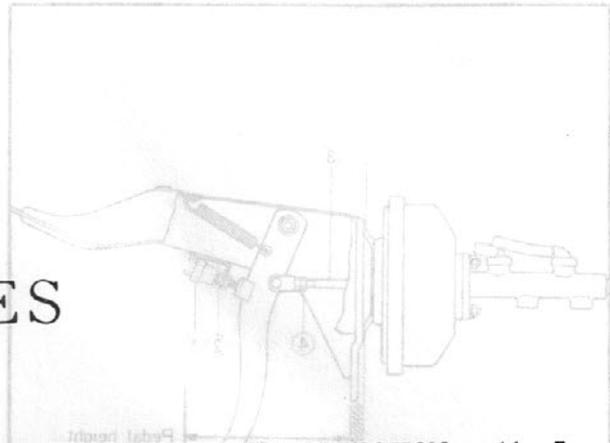


Fig. 10A-61

BRAKES



11-A. BRAKE PEDAL 11 : 1

11-A-1. Adjusting Brake Pedal Height 11 : 1

11-A-2. Adjusting Free Travel 11 : 1

11-B. BRAKE MASTER CYLINDER 11 : 1

11-B-1. Removing Brake Master Cylinder 11 : 1

11-B-2. Disassembling Brake Master Cylinder 11 : 1

11-B-3. Checking Brake Master Cylinder 11 : 2

11-B-4. Assembling Brake Master Cylinder 11 : 2

11-B-5. Installing Brake Master Cylinder 11 : 3

11-C. POWER BRAKE UNIT 11 : 3

11-C-1. Removing Power Brake Unit 11 : 3

11-C-2. Disassembling Power Brake Unit 11 : 4

11-C-3. Checking Power Brake Unit 11 : 5

11-C-4. Assembling Power Brake Unit 11 : 5

11-C-5. Installing Power Brake Unit 11 : 6

11-C-6. Checking Check Valve 11 : 7

11-D. BRAKE FLUID LEVEL SENSOR 11 : 7

11-D-1. Checking Brake Fluid Level Sensor 11 : 7

11-E. HYDRAULIC LINES INSPECTION 11 : 7

11-F. DIFFERENTIAL PROPORTIONING VALVE 11 : 8

11-G. FRONT BRAKE 11 : 8

11-G-1. Replacing Disc Brake Pads 11 : 8

11-G-2. Removing Caliper 11 : 9

11-G-3. Disassembling Caliper 11 : 10

11-G-4. Checking Caliper 11 : 11

11-G-5. Assembling Caliper 11 : 11

11-G-6. Installing Caliper 11 : 11

11-G-7. Checking Brake Disc 11 : 11

11-G-8. Removing Brake Disc 11 : 12

11-G-9. Installing Brake Disc 11 : 12

11-H. REAR BRAKE 11 : 13

11-H-1. Removing Rear Brake Shoes 11 : 13

11-H-2. Inspecting Rear Brake 11 : 13

11-H-3. Installing Rear Brake Shoes 11 : 14

11-H-4. Removing and Disassembling Rear Wheel Cylinder 11 : 14

11-H-5. Checking Rear Wheel Cylinder 11 : 15

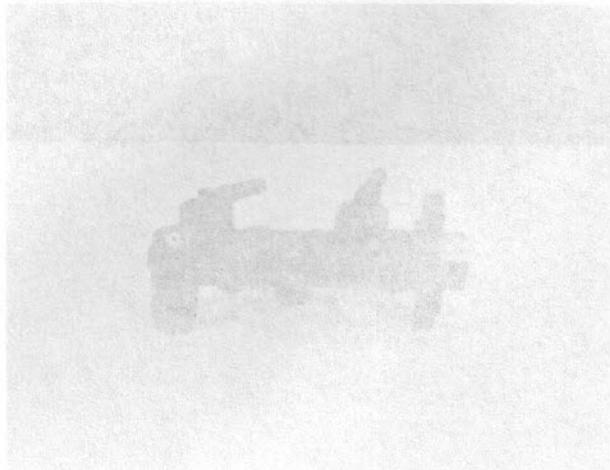
11-H-6. Assembling and Installing Rear Wheel Cylinder 11 : 15

11-I. REAR BRAKE ADJUSTMENT 11 : 15

11-J. AIR BLEEDING 11 : 16

11-K. PARKING BRAKE ADJUSTMENT 11 : 17

SPECIAL TOOLS 11 : 17



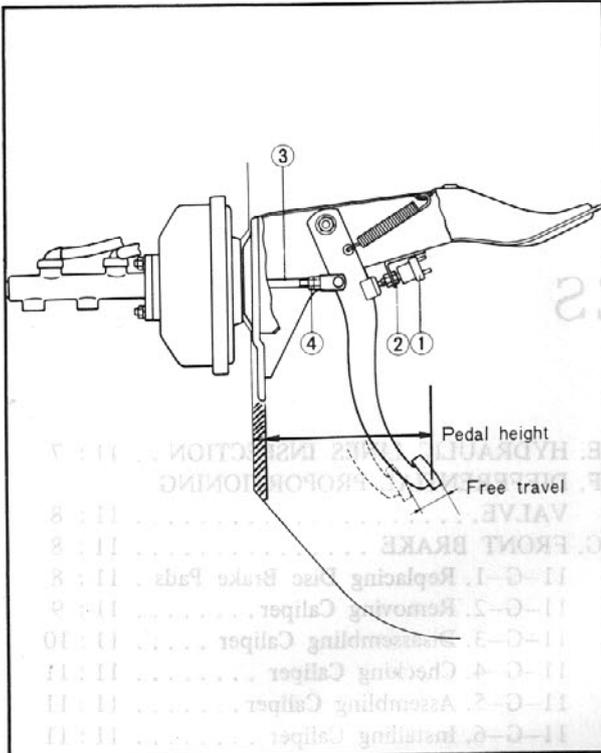


Fig. 11-1

11-A. BRAKE PEDAL

11-A-1. Adjusting Brake Pedal Height

1. To adjust the pedal height, loosen the lock nut (2) and turn the stop light switch (1) until the correct pedal height is obtained.
2. Tighten the lock nut (2).

Pedal height 193^{+5}_{-0} mm ($8.00^{+0.2}_{-0}$ in)

11-A-2. Adjusting Free Travel

1. To adjust the free travel, 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 (4).

Free travel 7 ~ 9 mm (0.28 ~ 0.35 in)
(before the piston in the power brake unit operates)

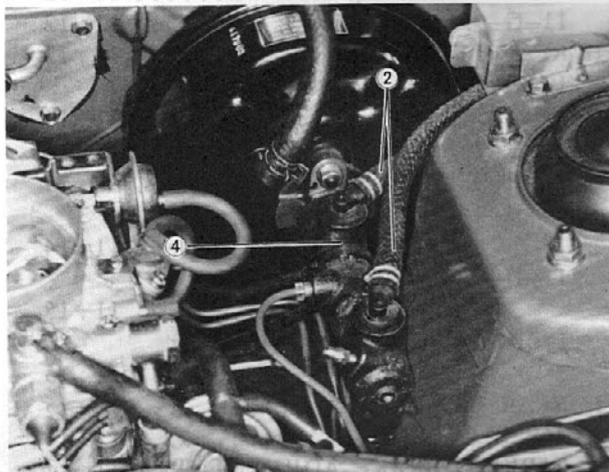


Fig. 11-2

11-B. BRAKE MASTER CYLINDER

11-B-1. Removing Brake Master Cylinder

Remove the brake master cylinder in the numerical order.

1. Air cleaner
2. Disconnect the fluid hoses at the brake master cylinder, and plug the end of the hoses to prevent fluid leakage.
3. Fluid pipes (disconnect)
Use the spanner (49 0259 770A)
4. Brake master cylinder assembly

Note:

Never allow the brake fluid to drop on any painted surface.

11-B-2. Disassembling Brake Master Cylinder

Disassemble the brake master cylinder in the numerical order.

Clean the outside of the master cylinder thoroughly.

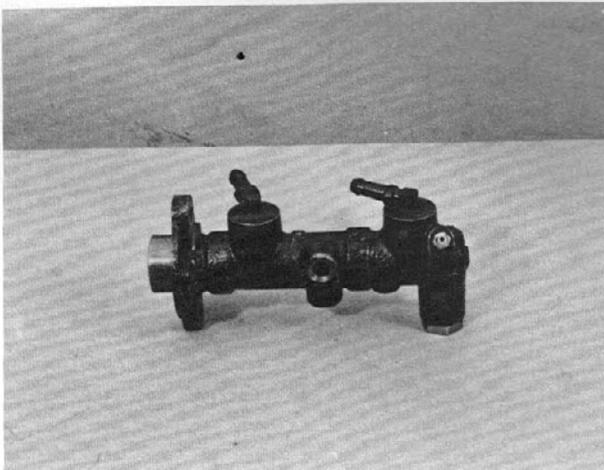


Fig. 11-3

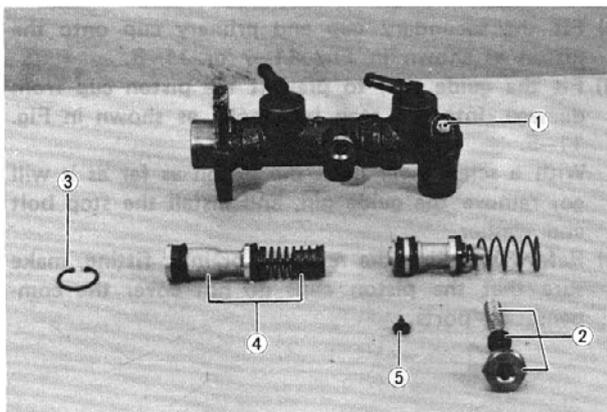


Fig. 11-4

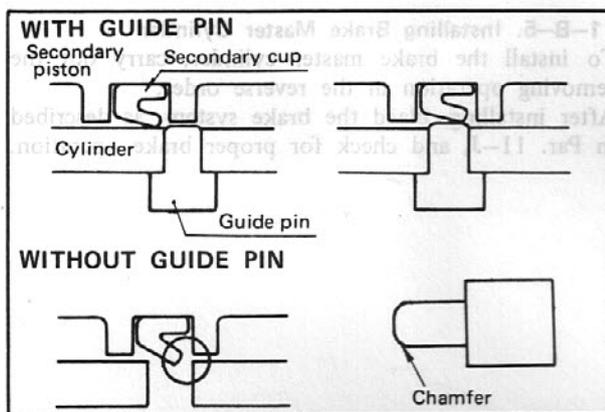


Fig. 11-5

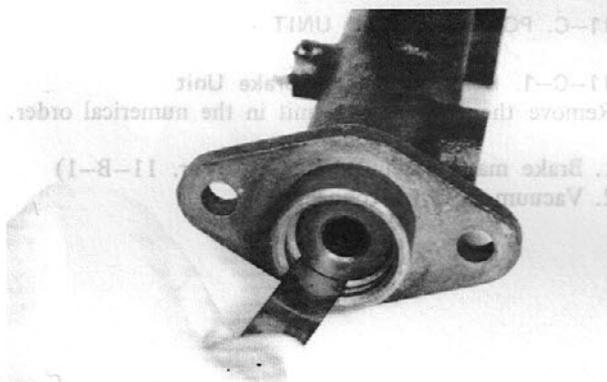


Fig. 11-6

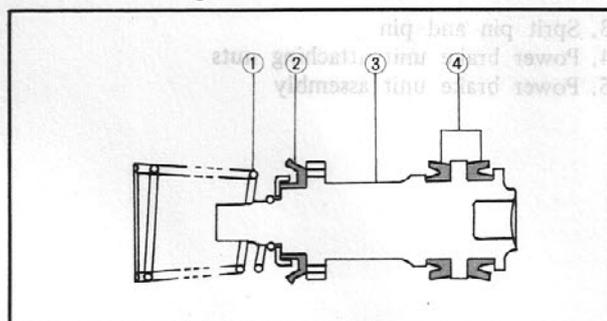


Fig. 11-7

- | | |
|----------------------------|---------------------|
| 1. Secondary return spring | 3. Secondary piston |
| 2. Primary cup | 4. Secondary cups |

1. Bleeder screw
2. Check valve and spring
3. Piston stop ring
4. Primary piston and cups assembly and spring
5. Secondary piston stop bolt (loosen)
6. Secondary piston and cups assembly and spring



To remove the secondary piston; Pushing in the secondary piston with a screwdriver, remove the stop bolt and insert the guide pin in its place to prevent the piston cup from damage. Then, gradually take out the screwdriver and remove the secondary piston and cups assembly and return spring from the cylinder. If necessary, blow out with compressed air from the outlet hole.

11-B-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.

Limit	0.15 mm (0.006 in)
-------	--------------------

5. Ensure that the compensating ports on the cylinder are open.

11-B-4. Assembling Brake Master Cylinder

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

Note:

- a) Before assembling, dip the pistons and cups in clean brake fluid.
- b) Fit the check valve springs and check valves into the outlet holes. Install the fluid pipe joint bolts with gasket.

Tightening torque	6.0 ~ 7.0 m-kg (43 ~ 51 ft-lb)
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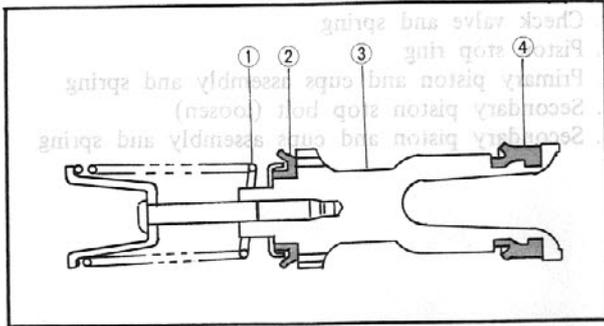


Fig. 11-8

- | | |
|--------------------------|-------------------|
| 1. Primary return spring | 3. Primary piston |
| 2. Primary cup | 4. Secondary cup |

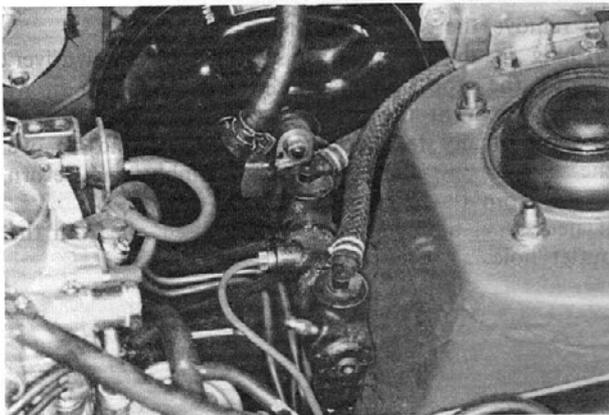


Fig. 11-9

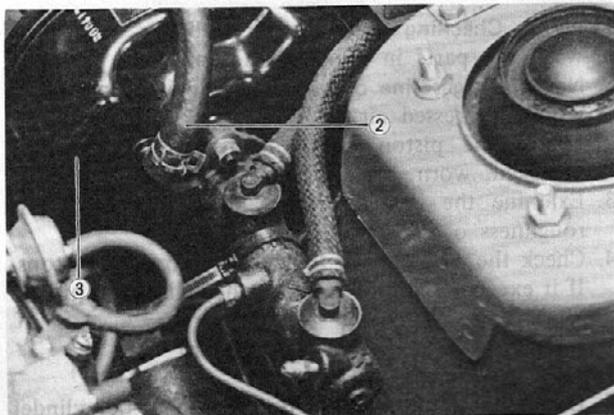


Fig. 11-10



Fig. 11-11

c) Fit the secondary cup and primary cup onto the piston as shown in Fig. 11-7 or 11-8.

d) Fit the guide pin, to prevent the piston cup from damage, into the stop bolt hole, as shown in Fig. 11-5.

With a screwdriver push the piston as far as it will go, remove the guide pin, and install the stop bolt and washer.

e) Before installing the reservoir or inlet fitting, make sure that the piston cups do not cover the compensating ports.

11-B-5. Installing Brake Master Cylinder

To install the brake master cylinder, carry out the removing operation in the reverse order.

After installing, bleed the brake system, as described in Par. 11-J, and check for proper brake operation.

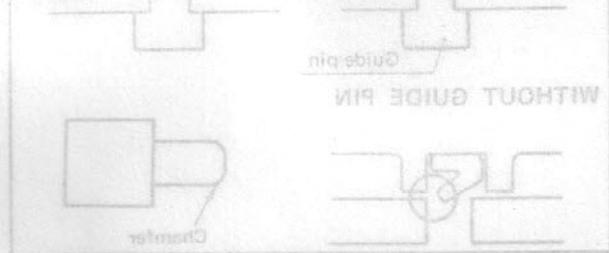


Fig. 11-5

11-C. POWER BRAKE UNIT

11-C-1. Removing Power Brake Unit

Remove the power brake unit in the numerical order.

1. Brake master cylinder (refer to Par. 11-B-1)
2. Vacuum hose (disconnect)

3. Sprit pin and pin
4. Power brake unit attaching nuts
5. Power brake unit assembly

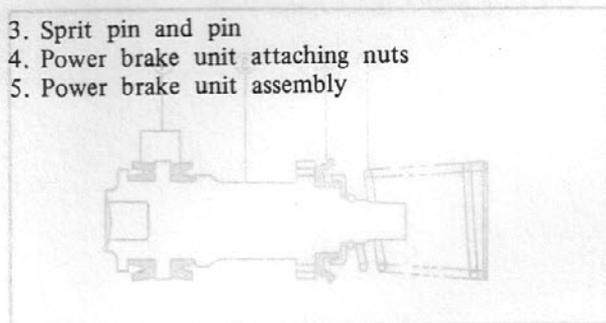


Fig. 11-7

- | | |
|----------------------------|---------------------|
| 1. Secondary return spring | 3. Secondary piston |
| 2. Primary cup | 4. Secondary cups |

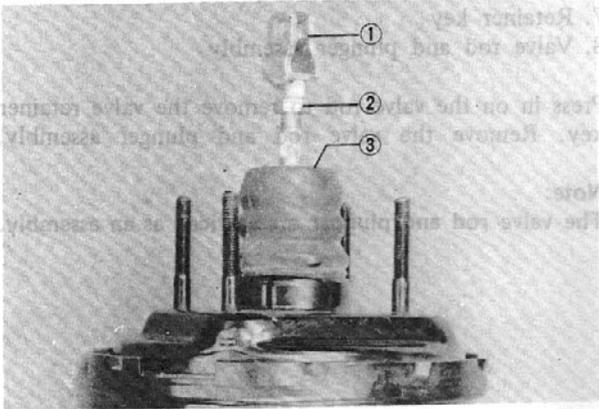


Fig. 11-12

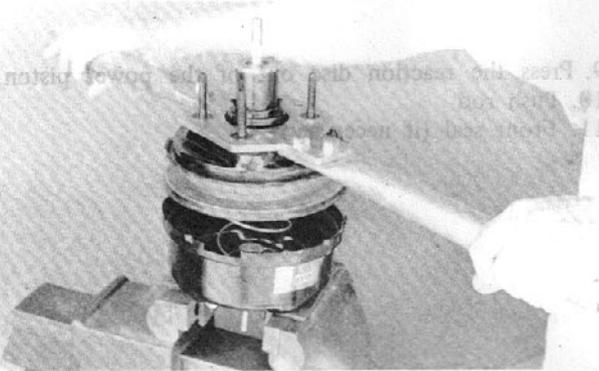


Fig. 11-13

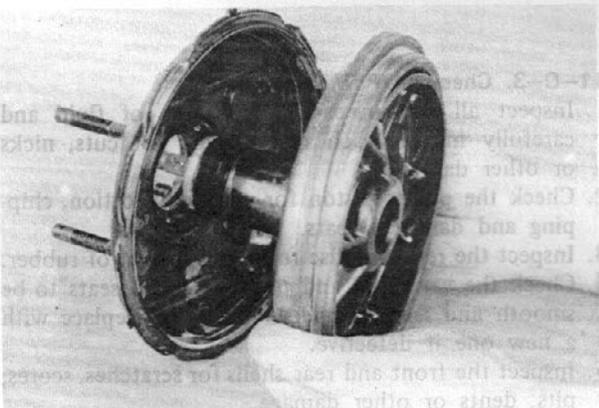


Fig. 11-14

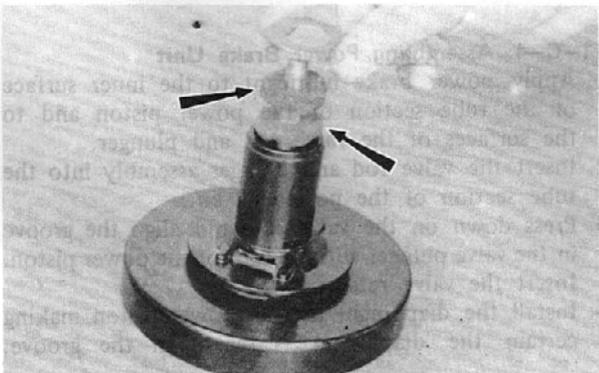


Fig. 11-15

11-C-2. Disassembling Power Brake Unit

Disassemble the power brake unit in the numerical order.

1. Fork end
2. Lock nut
3. Dust boot and rear shell

Note:

Scribe a mark on the bottom center of the front and rear shells to facilitate reassembly.

Attach the suitable wrench to the studs of the rear shell. Rotate the rear shell clockwise to unlocked position.

Note:

Loosen the rear shell carefully as it is spring-loaded.

4. Diaphragm and power piston assembly

Note:

Do not remove the rear seal from the rear shell unless the seal is defective and a new seal is available. To remove the rear seal, support the rear shell and drive out the rear seal with a punch or a screwdriver.

5. Air silencer
6. Air filter

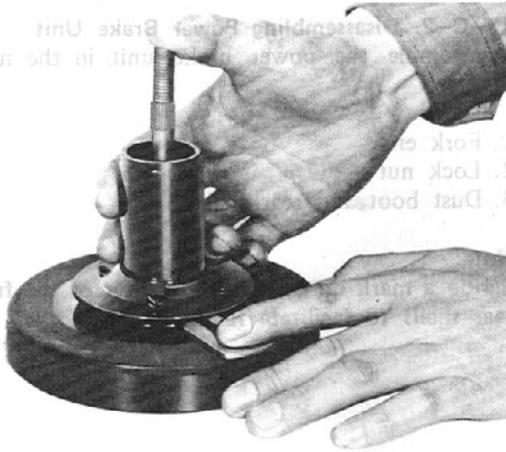


Fig. 11-16

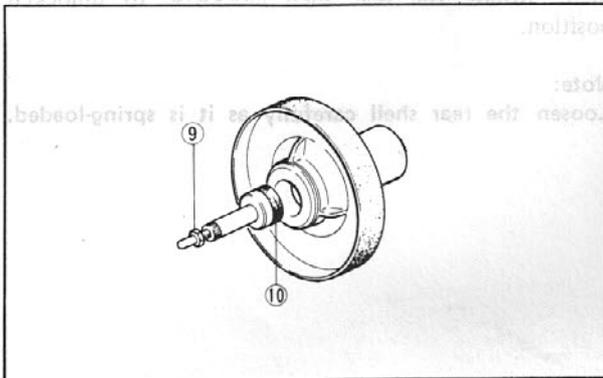


Fig. 11-17

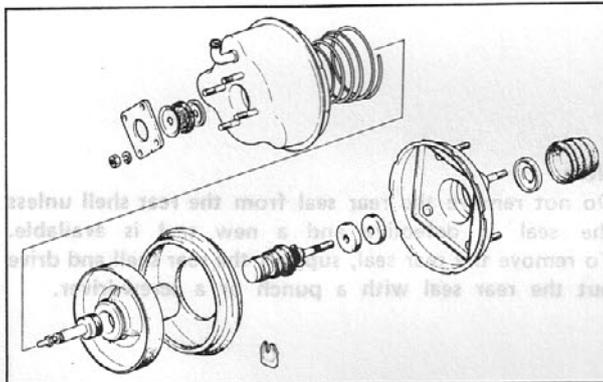


Fig. 11-18

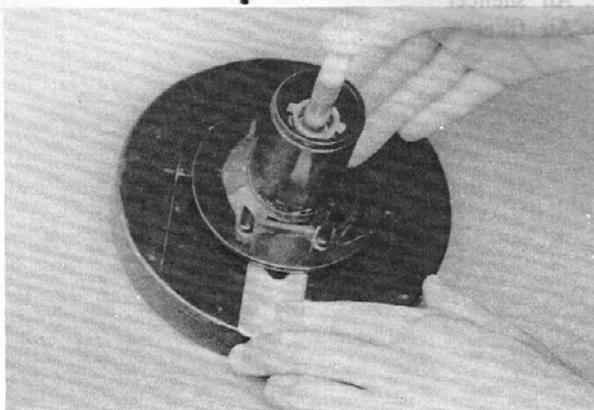


Fig. 11-19

7. Retainer key
8. Valve rod and plunger assembly

Press in on the valve rod to remove the valve retainer key. Remove the valve rod and plunger assembly.

Note:

The valve rod and plunger are serviced as an assembly.

9. Press the reaction disc out of the power piston.
10. Push rod
11. Front seal (if necessary)

11-C-3. Checking Power Brake Unit

1. Inspect all rubber parts. Wipe free of fluid and carefully inspect each rubber part for cuts, nicks or other damage.
2. Check the power piston for cracks, distortion, chipping and damaged seats.
3. Inspect the reaction disc for deterioration of rubber.
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.

11-C-4. Assembling Power Brake Unit

1. Apply power brake lubricant to the inner surface of the tube section of the power piston and to the surfaces of the valve rod and plunger.
2. Insert the valve rod and plunger assembly into the tube section of the power piston.
3. Press down on the valve rod and align the groove in the valve plunger with the slot of the power piston. Insert the valve retainer key.
4. Install the diaphragm on the power piston making certain the diaphragm is seated in the groove.

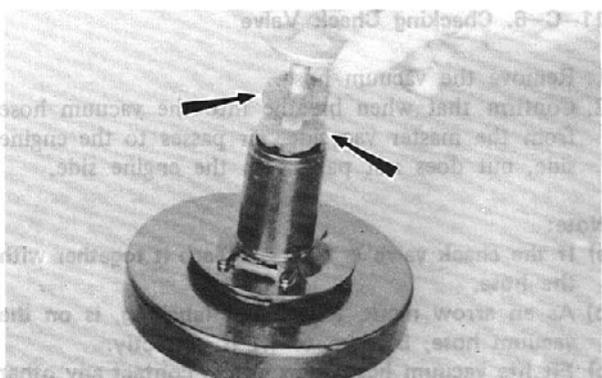


Fig. 11-20



Fig. 11-21

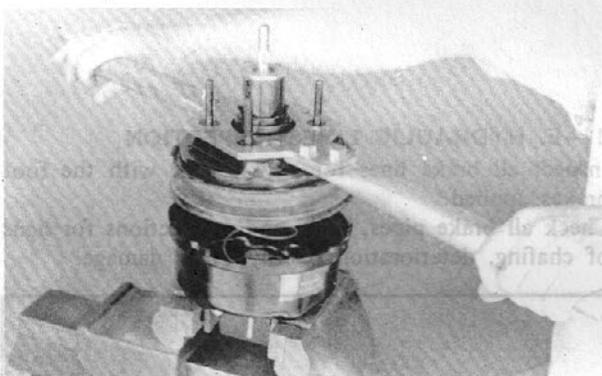


Fig. 11-22

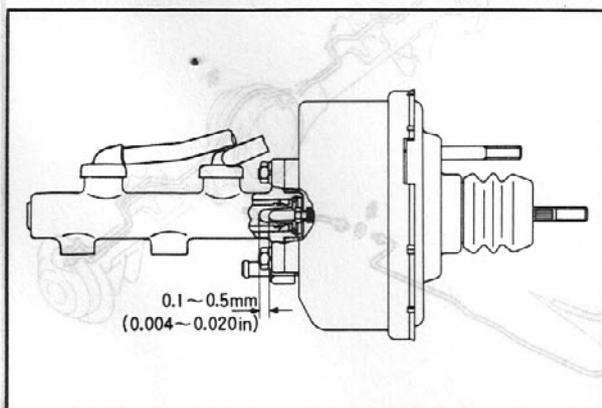


Fig. 11-23

5. Assemble the air filter and the air silencer over the rod and position in the power piston.



6. Apply power brake lubricant liberally to the entire surface of the reaction disc and install the reaction disc into the power piston.
7. Coat the outer bead of the diaphragm with power brake lubricant where it bears against the outer rims of the front and rear shells to aid in assembly.
8. Apply power brake lubricant to the seal in the rear shell and carefully guide the tube end of the power piston, through the seal in the rear shell.
9. Install the push rod to the front of the power piston.
10. Install the return spring on the front shell.

11. Install the rear shell assembly onto the front shell by using the wrench to rotate the rear shell counter-clockwise until scribe marks align.

Note:

Press the rear shell down firmly, maintaining a pressure until the shell flanges are fully locked.

12. Install the dust boot down against the rear shell.
13. Install the fork end and lock nut.

11-C-5. Installing Power Brake Unit

Install the power brake unit in the reverse order of removing.

After installing, bleed the brake system, as described in Par. 11-J, and check for proper brake operation.

Note:

The clearance between the primary piston and the push rod of the power brake unit should be 0.1 ~ 0.5 mm (0.004 ~ 0.020 in). If the original push rod remains in the original unit, adjustment is not required. If the parts are replaced with new ones, adjust the clearance by loosening the lock nut and turning the push rod.

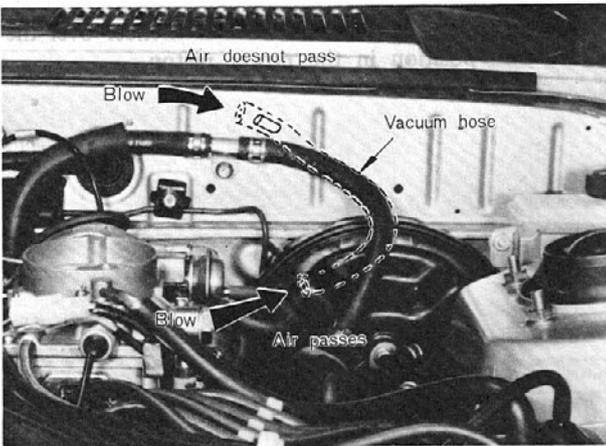


Fig. 11-24

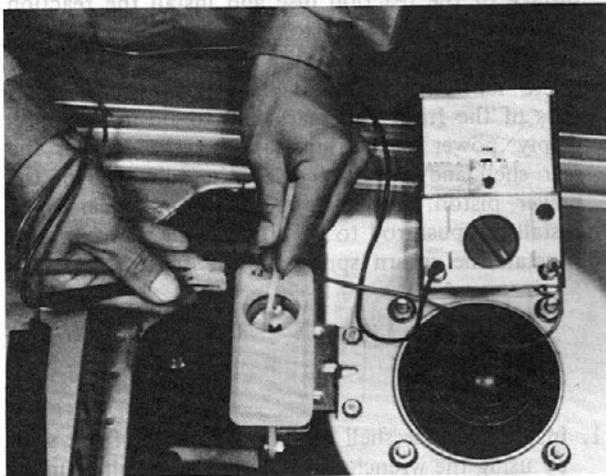


Fig. 11-25

11-C-6. Checking Check Valve

1. Remove the vacuum hose.
2. Confirm that when breathe into the vacuum hose from the master vac side, air passes to the engine side, but does not pass from the engine side.

Note:

- a) If the check valve is faulty, replace it together with the hose.
- b) As an arrow mark, () labelling, is on the vacuum hose, be sure to fit it correctly.
- c) Fit the vacuum hose so as not to contact any other part due to engine vibrations.

Fig. 11-20

11-D. BRAKE FLUID LEVEL SENSOR

11-D-1. Checking 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, as shown in Fig. 11-25.

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.

Fig. 11-21

11-E. 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.

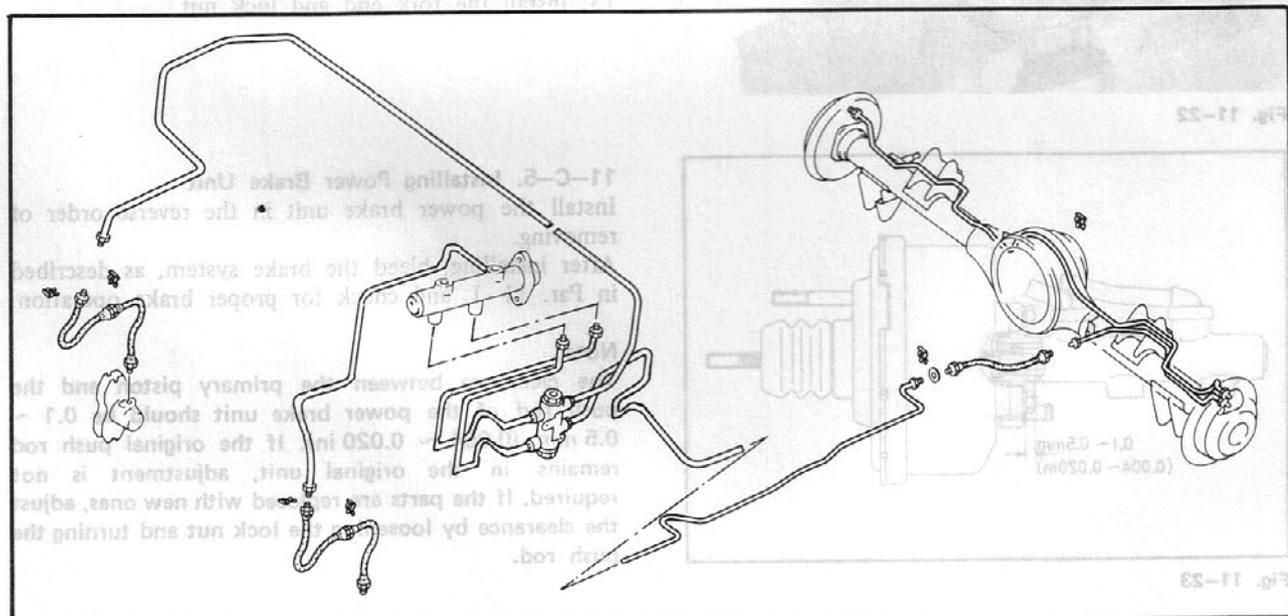


Fig. 11-26

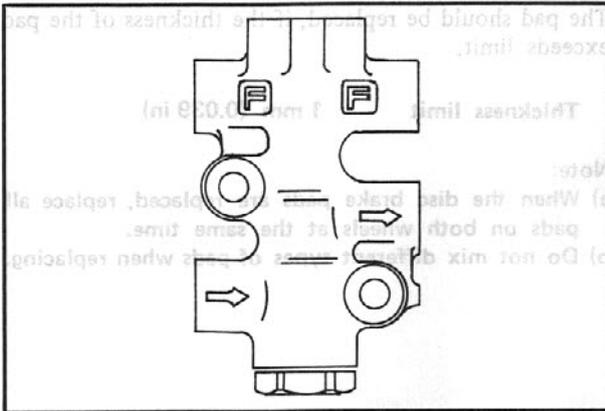


Fig. 11-27

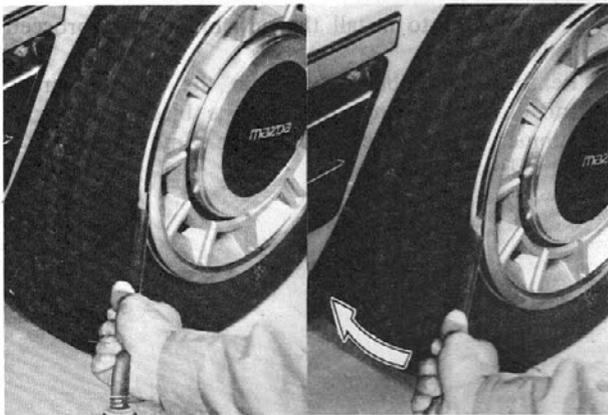


Fig. 11-28

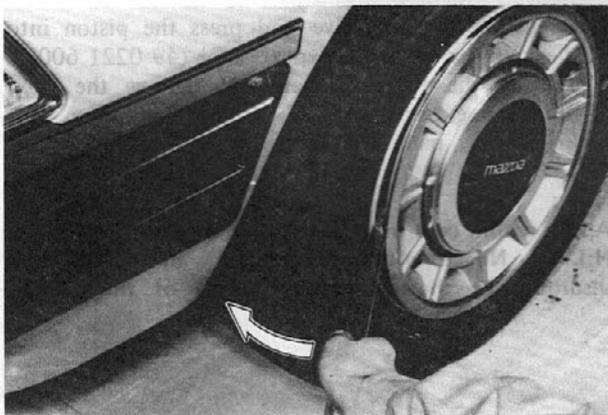


Fig. 11-29

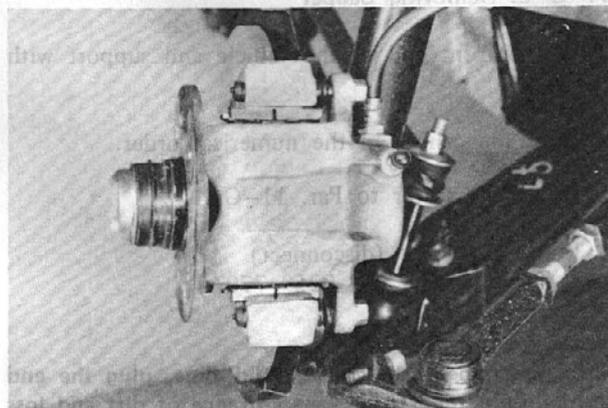


Fig. 11-30

11-F. DIFFERENTIAL PROPORTIONING VALVE

The proportioning valve regulates the rear brake system hydraulic pressure and is located between the rear brake system inlet and outlet ports.

Valve can be removed easily by the attaching bolts. When installing, however, note the following: connect brake lines with "F" mark toward front brake side and with arrow mark toward the rear brake side.

Note:

Identification for inlet and outlet is facilitated by an arrow mark.

11-G. FRONT BRAKE

11-G-1. Replacing Disc Brake Pads

Raise the front end of the vehicle and support with stands.

Remove the disc brake pads in the numerical order.

1. Insert the top end of the hub nut wrench between the wheel and wheel cap so as to provide a clearance.
2. Insert the top end of the hub nut wrench into the illustrated position and pry it against the tire so that the hub nut wrench fully gets in between the wheel and wheel cap.
3. As illustrated, fully insert and pry the hub nut wrench against the tire.

Note:

- a) Do not use hands to remove the wheel cap so as to prevent fingers from getting hurt.
- b) Do not use any tool other than the hub nut wrench.
- c) Do not drop the brake fluid on plastic wheel cap.

4. Front wheel
5. Slide pins
6. Caliper and springs
7. Coupler for wear indicator (if so equipped)
8. Brake pads and shims

Install the disc brake pads in the reverse order of removing.

Note:

Tighten the slide pin to a torque of 4.5 ~ 5.5 m·kg (33 ~ 40 ft·lb).

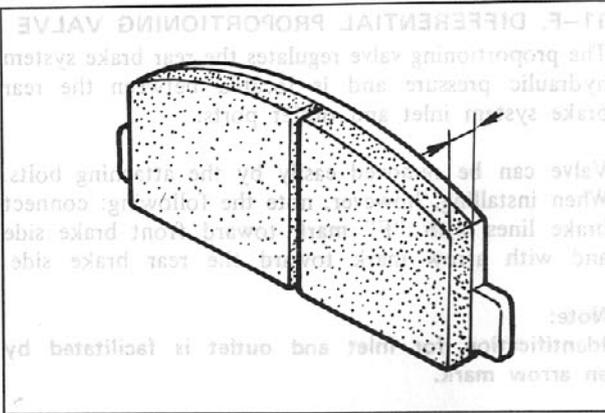


Fig. 11-31

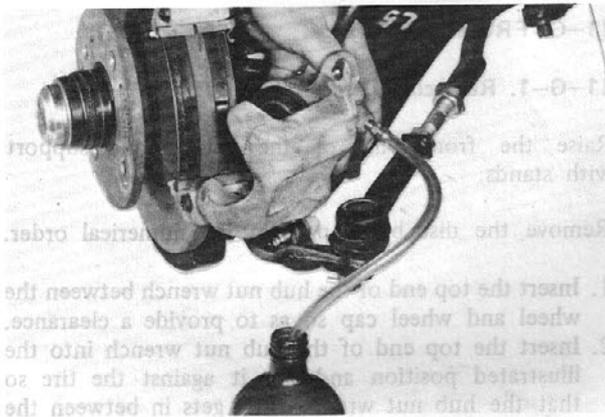


Fig. 11-32

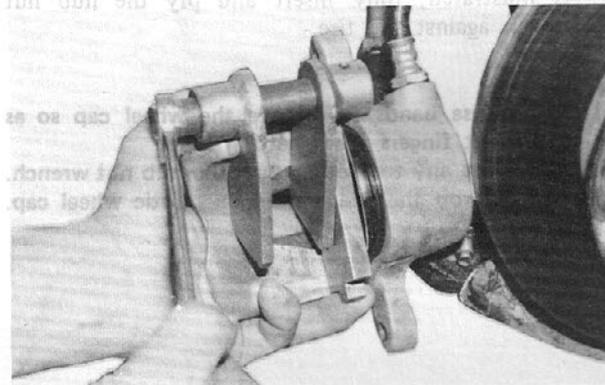


Fig. 11-33

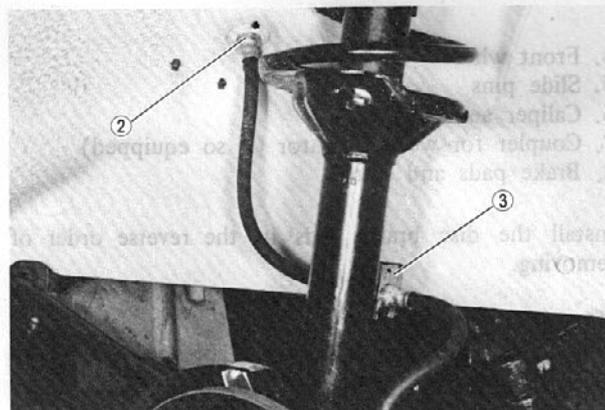


Fig. 11-34

The pad should be replaced, if the thickness of the pad exceeds limit.

Thickness limit 1 mm (0.039 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.

If it is difficult to install the new brake pads, proceed as follows:

1. Remove the rubber cap from the bleeder screw, and connect a vinyl tube to the bleeder screw. Submerge the other end of the vinyl tube into a suitable container.

2. Open the bleeder valve 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 new pads and shims.

Note:

Apply a thin coat of grease (Lithium soap based grease N.L.G.I. No. 2 with more than 5% of molybdenum disulfide) to the contacting surface of the caliper.

11-G-2. Removing Caliper

Raise the front end of the vehicle and support with stands.

Remove the caliper in the numerical order.

1. Wheel cap (refer to Par. 11-G-1.)
2. Front wheel
3. Brake fluid pipe (disconnect)
Use the **spanner** (49 0259 770A)

Note:

After disconnect the brake fluid pipe, plug the end of the fluid pipe to prevent entrance of dirt and loss of the fluid.

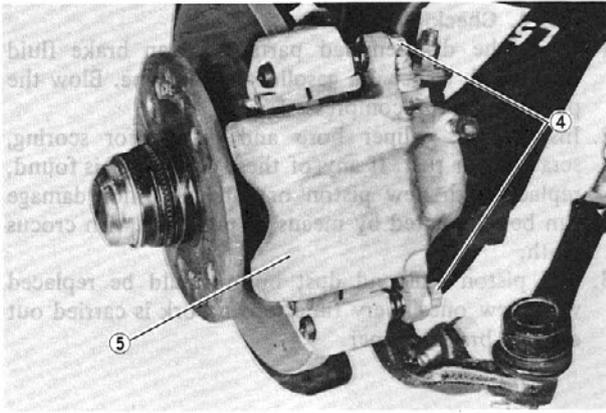


Fig. 11-35

- 4. Clips
- 5. Slide pins
- 6. Caliper



Fig. 11-38

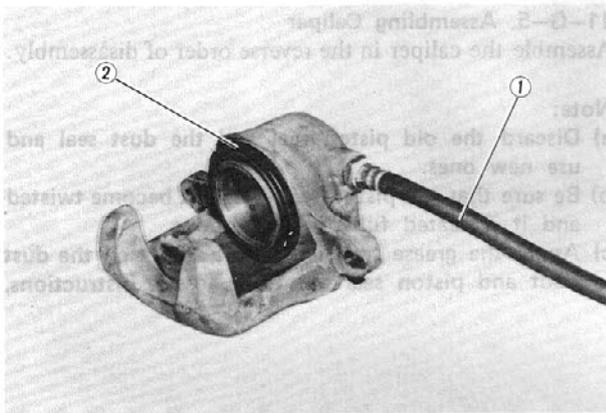


Fig. 11-36

11-G-3. Disassembling Caliper

Disassemble the caliper in the numerical order.

- 1. Brake hose
- 2. Dust boot

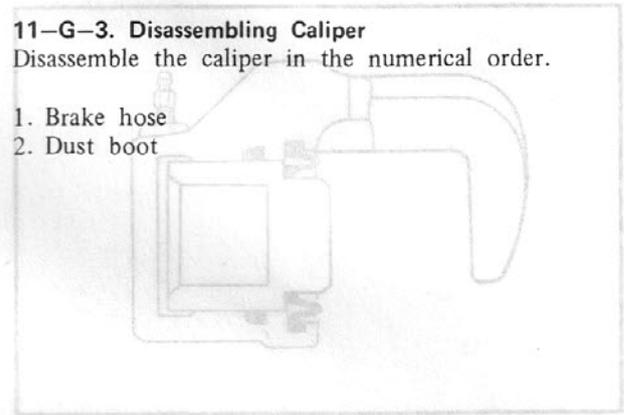


Fig. 11-40

Place a hardwood in the caliper pit in order to avoid damage, gradually blow compressed air from the fluid pipe hole.

- 3. Piston

Note:

If the piston is seized and cannot be forced from the caliper, tap lightly around the piston while applying air pressure.



Fig. 11-37

- 4. Piston seal
Use the air out tool (49 0208 701A)
- 5. Bleeder screw (if necessary)

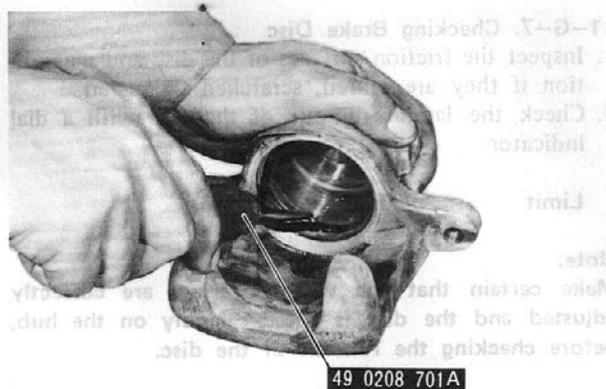


Fig. 11-38

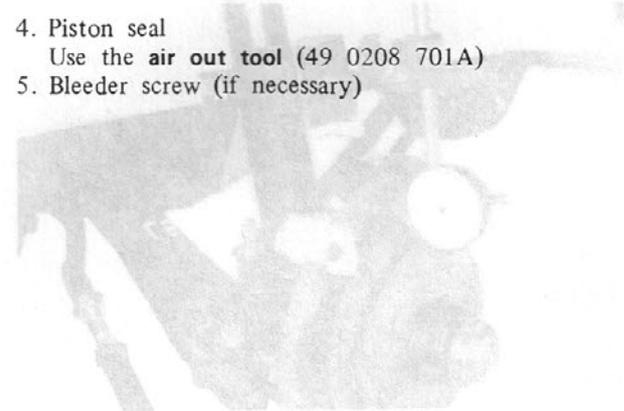


Fig. 11-41

Fig. 11-42

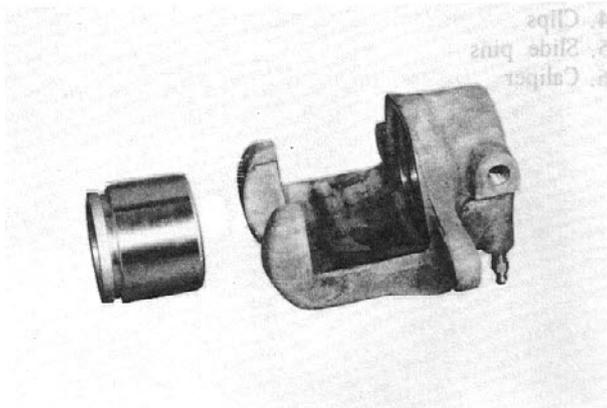


Fig. 11-39

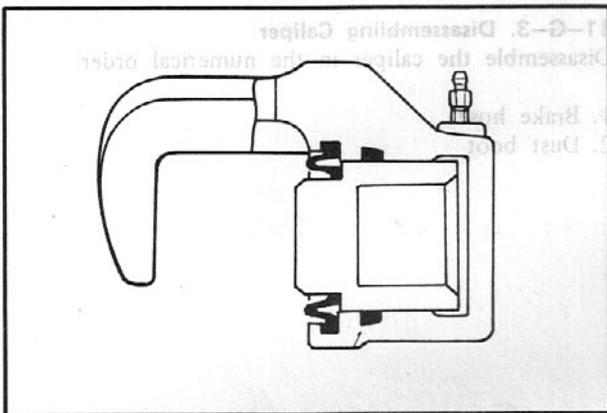


Fig. 11-40

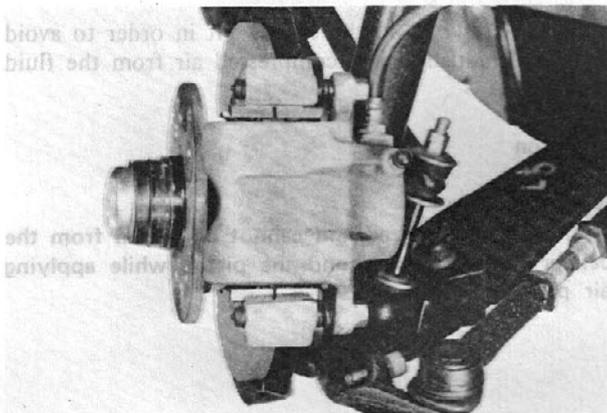


Fig. 11-41

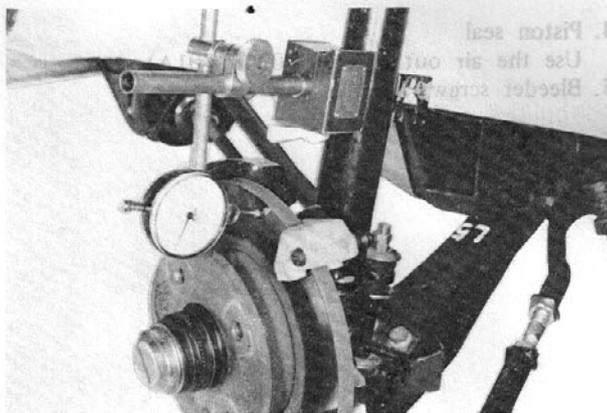


Fig. 11-42

11-G-4. 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 is found, replace with new piston or caliper. Minor damage can be eliminated by means of polishing with crocus cloth.
3. The piston seal and dust boot should be replaced with new ones every time repair work is carried out on the brake caliper.

11-G-5. 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) Apply the grease supplied in the seal it on the dust boot and piston seal according to the instructions.

11-G-6. Installing Caliper

To install the caliper, carry out the removing operation in the reverse order.

After installing, bleed the brake system, as described in Par. 11-J, and check for proper brake operation.

11-G-7. Checking Brake Disc

1. Inspect the friction surfaces of the disc and recondition if they are scored, scratched or rusted.
2. Check the lateral run-out of the disc with a dial indicator.

Limit 0.1 mm (0.004 in)

Note:

Make certain that the wheel bearings are correctly adjusted and the disc is fitted securely on the hub, before checking the run-out of the disc.

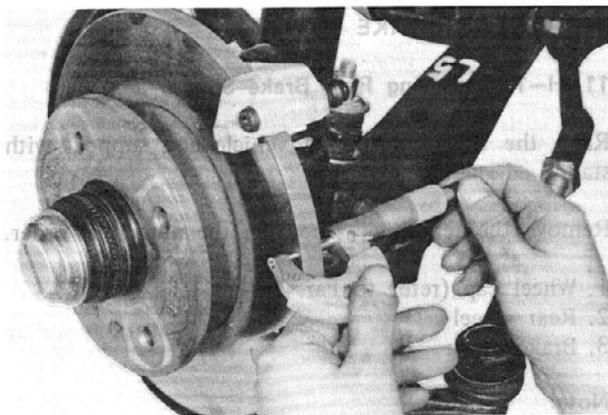


Fig. 11-43

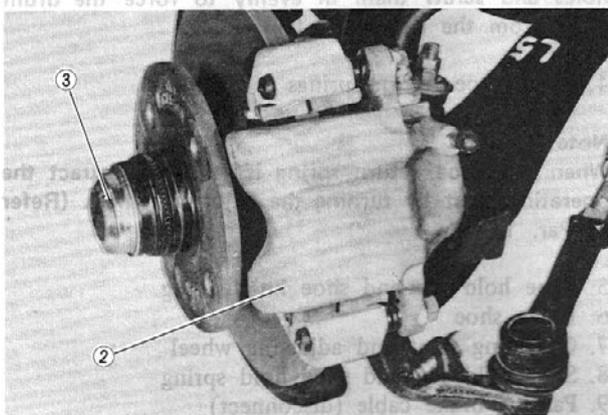


Fig. 11-44

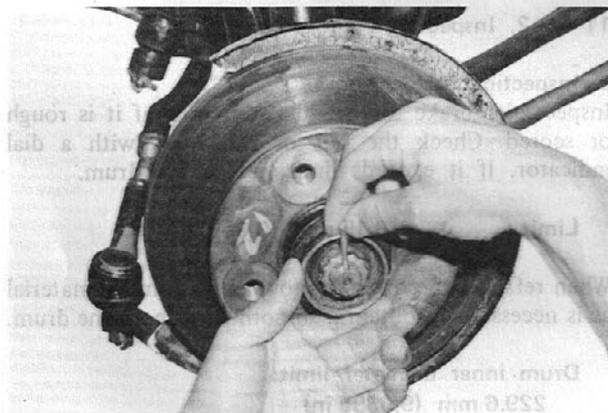


Fig. 11-45

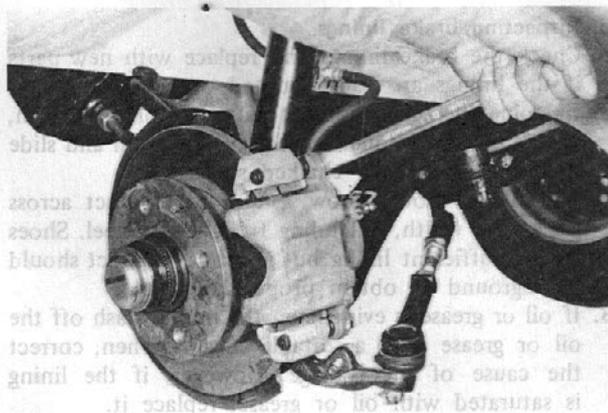


Fig. 11-46

When refacing the disc, remove only so much material as is necessary to clean up the disc.

Thickness of disc:

Standard 13 mm (0.5118 in)

Limit after refacing

12 mm (0.4724 in)

11-G-8. Removing Brake Disc

Raise the front end of the vehicle and support with stands.

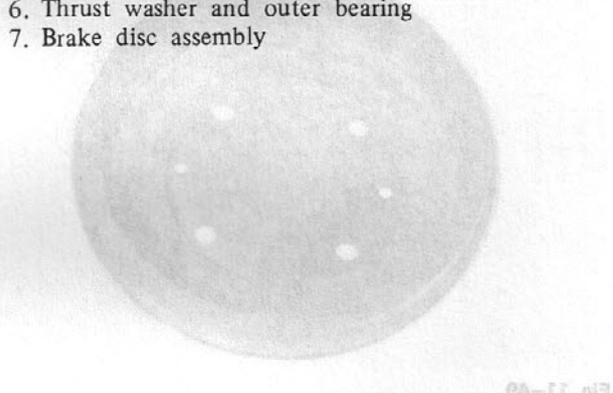
Remove the brake disc in the numerical order.

1. Wheel cap (refer to Par. 11-G-1.)
2. Front wheel
3. Caliper assembly (refer to Par. 11-G-2)
4. Grease cap

Note:

Never allow the caliper assembly to hang from the brake pipe, as damage may occur.

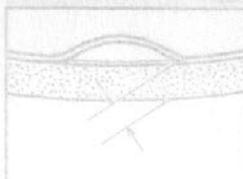
5. Sprit pin, nut lock and nut
6. Thrust washer and outer bearing
7. Brake disc assembly



11-G-9. Installing Brake Disc

To install the brake disc, carry out the removing operation in the reverse order.

After installing, adjust the bearing preload, as instructed in Par. 12-E-5.



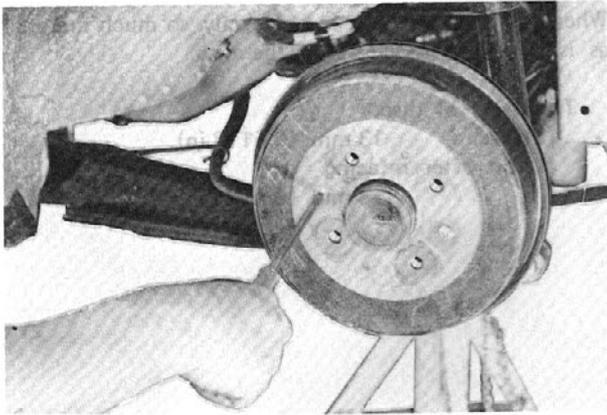


Fig. 11-47

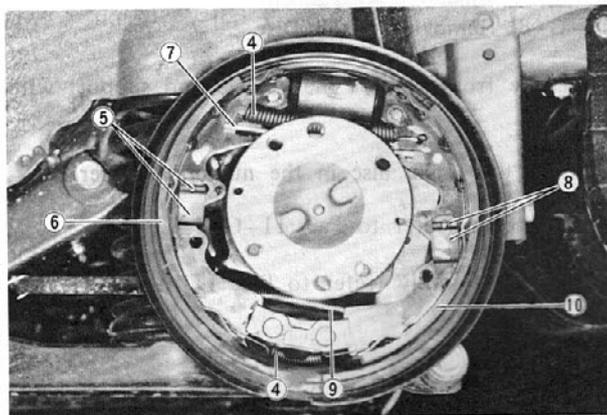


Fig. 11-48

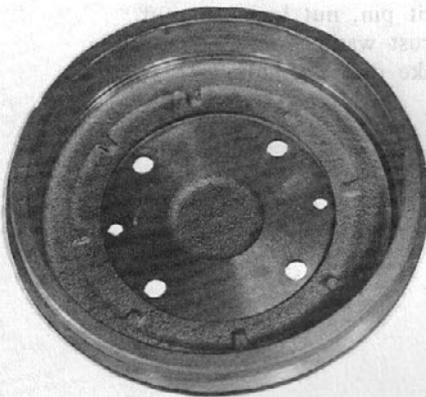


Fig. 11-49

Lining thickness:
Limit 1.0mm (0.039 in)
Standard 4.3mm (0.169 in)

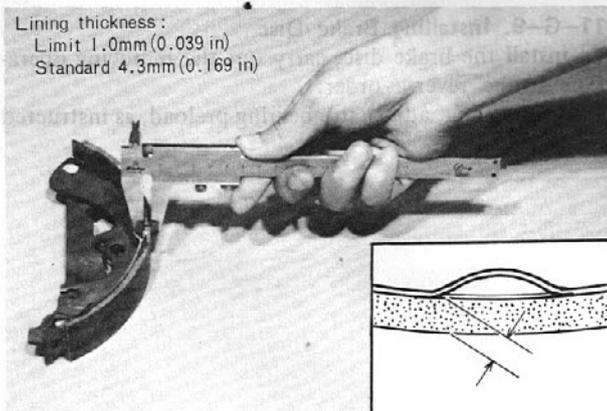


Fig. 11-50

11-H. REAR BRAKE

11-H-1. Removing Rear Brake Shoes

Raise the rear end of the vehicle and support with stands.

Remove the rear brake shoes in the numerical order.

1. Wheel cap (refer to Par. 11-G-1.)
2. Rear wheel
3. Brake drum

Note:

Fit the brake drum attaching screws into the tapped holes and screw them in evenly to force the drum away from the axle shaft flange.

4. Brake shoe return springs

Note:

When the shoe return spring is removed, retract the operating strut by turning the adjusting wheel. (Refer to Par. 11-1).

5. Shoe hold pin and shoe hold spring
6. Brake shoe
7. Operating strut and adjusting wheel
8. Shoe hold pin and shoe hold spring
9. Parking brake cable (disconnect)
10. Brake shoe

11-H-2. Inspecting Rear Brake

a. Inspecting brake drum

Inspect the brake drum and recondition if it is rough or scored. Check the out of roundness with a dial indicator. If it exceeds limit, reface the drum.

Limit 0.15 mm (0.006 in)

When refacing the drum, remove only so much material as is necessary to obtain a smooth surface on the drum.

Drum inner diameter limit:

229.6 mm (9.0395 in)

b. Inspecting brake linings

1. Check the brake linings and replace with new parts if the linings are badly burned or worn.
2. Examine the lining contact pattern. For inspection, chalk the entire inner surface of the drum and slide the lining along the chalked surface.
The lining should show a uniform contact across the entire width, extending from toe to heel. Shoes having sufficient lining but improper contact should be reground to obtain proper contact.
3. If oil or grease is evident on the lining, wash off the oil or grease with a suitable solvent. Then, correct the cause of the leakage. However, if the lining is saturated with oil or grease, replace it.

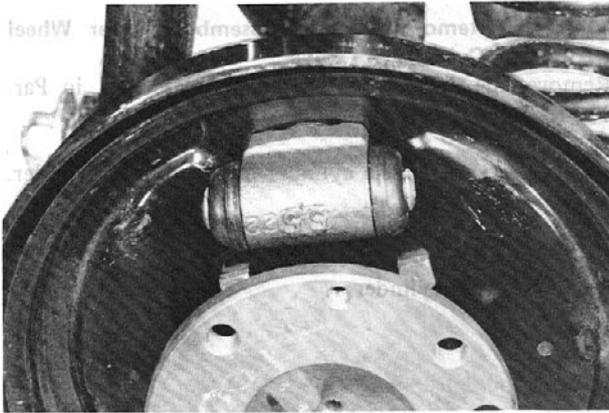


Fig. 11-51

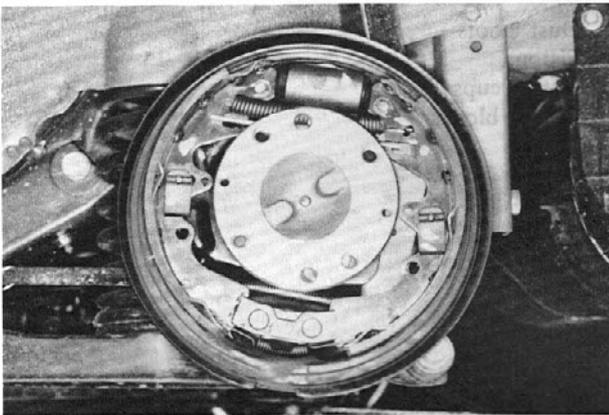


Fig. 11-52

c. Inspecting wheel cylinders

1. Examine the cylinder bore and piston for wear, roughness or scoring.
2. Inspect the piston cups for wear, softening, swelling or any damage. If any of these conditions exists, replace the cups.

11-H-3. Installing Rear Brake Shoes

Install the rear brake shoes in the reverse order of removing.

Note:

Adjust the brake shoe clearance as described in Par. 11-1.

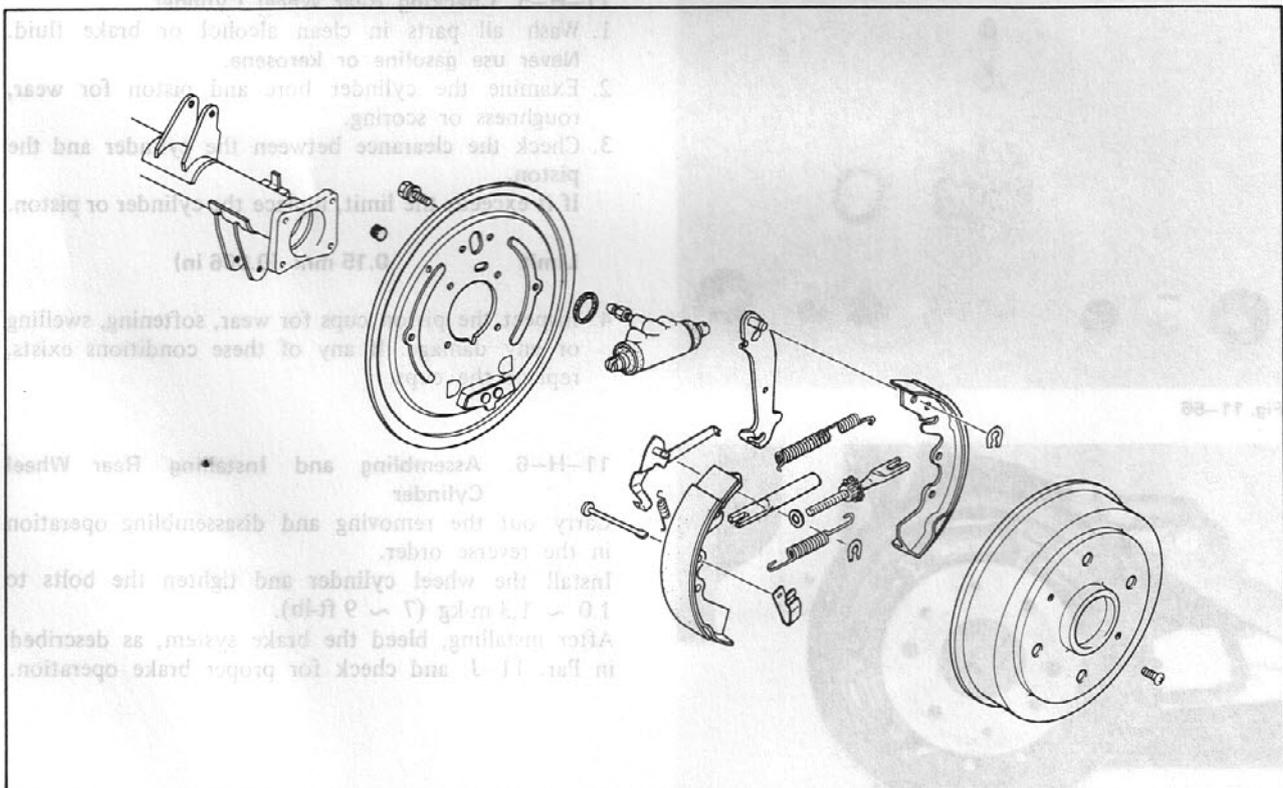


Fig. 11-53

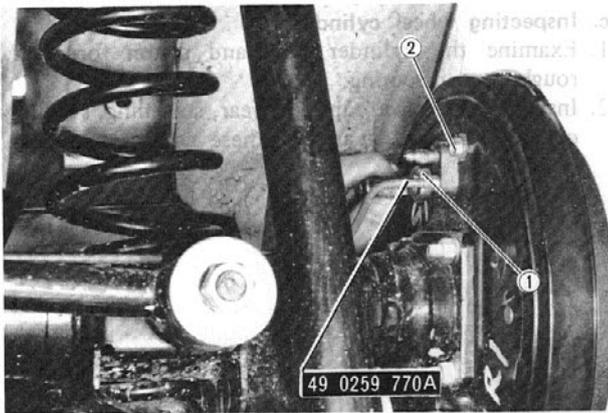


Fig. 11-54

11-H-4. Removing and Disassembling Rear Wheel Cylinder

Remove the rear brake shoes, as described in Par. 11-H-1.

Remove the rear wheel cylinder in the numerical order.

1. Brake fluid pipe (disconnect)
Use the **spanner** (49 0259 770A)
2. Rear wheel cylinder

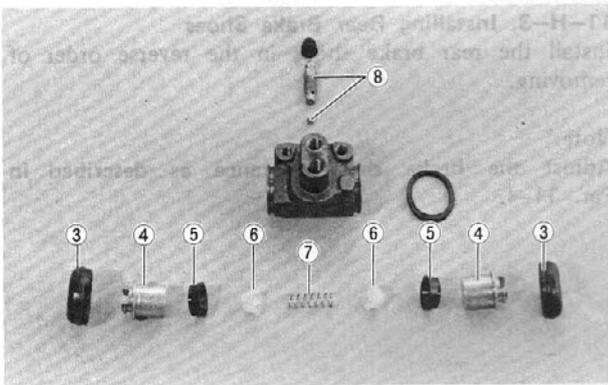


Fig. 11-55

3. Dust boots
4. Pistons
5. Piston cups
6. Filling blocks
7. Spring
8. Bleeder screw

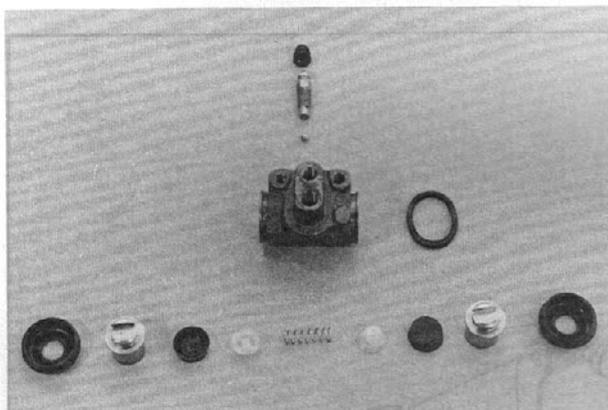


Fig. 11-56

11-H-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.

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.

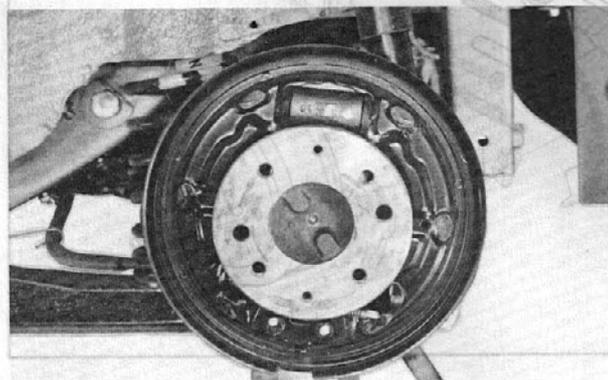


Fig. 11-57

11-H-6. Assembling and Installing Rear Wheel Cylinder

Carry out the removing and disassembling operation in the reverse order.

Install the wheel cylinder and tighten the bolts to 1.0 ~ 1.3 m·kg (7 ~ 9 ft·lb).

After installing, bleed the brake system, as described in Par. 11-J, and check for proper brake operation.

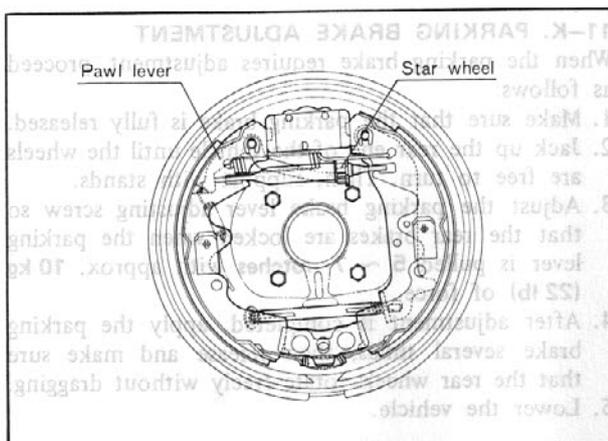


Fig. 11-58

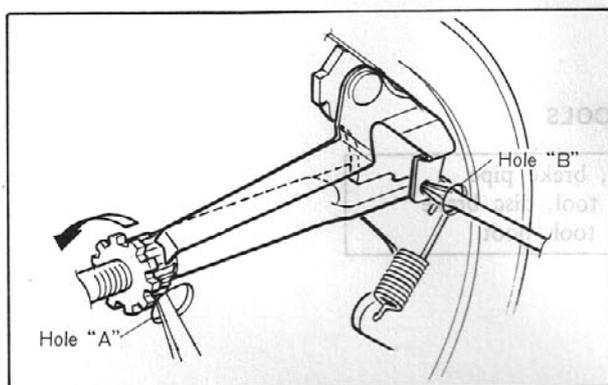


Fig. 11-59

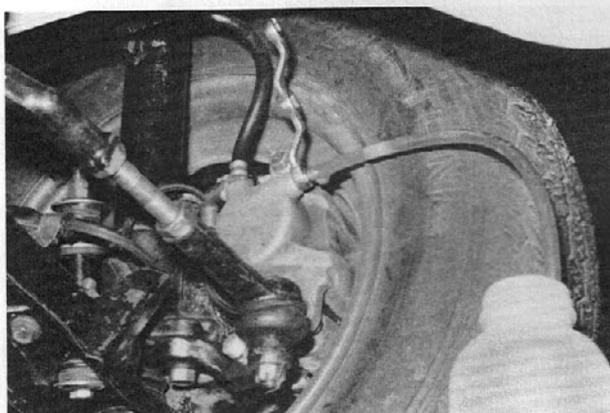


Fig. 11-60

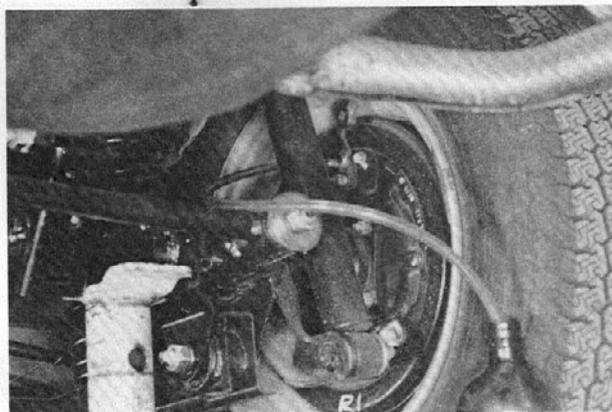


Fig. 11-61

11-I. REAR BRAKE ADJUSTMENT

The rear brakes are self-adjusting and require a manual adjustment only after the brake shoes have been replaced, or when the length of the adjusting rod has been changed while performing some other service operation.

To adjust the rear brake shoes, proceed as follows:

1. Jack up the rear end of the vehicle until the wheels are free to turn and support with stands. Block the front wheels.
2. Make sure that the parking brake is fully released.
3. Remove the shoe adjusting hole plug from the back of the backing plate.
4. Through the hole "A", turn the star wheel toward the arrow direction (⇒) marked on the backing plate until the wheel is locked.
5. Through the hole "B", push the pawl lever of the self-adjuster with a suitable screw driver to turn the adjusting wheel in reverse direction of the arrow make and hold it.
6. Back off the star wheel about 3 ~ 4 notches so that the wheel rotates freely without drag.
7. Repeat the above adjustment on the other side rear wheel. The adjustments must be same on both rear wheels.
8. Adjust the parking brake, as described in Par. 11-K.
9. Install the adjusting hole plugs onto the backing plate.

11-J. AIR BLEEDING

If a pressure bleeding equipment is available, it would be easier to use. The front and rear hydraulic brake systems are individual and are bleed separately.

Note:

- a) During bleeding operation, the reservoir of the master cylinder must be kept at least 3/4 full of the brake fluid.
- b) Do not mix low temperature brake fluid with the specified fluid during the bleeding operation.
- c) Never re-use brake fluid which has been drained from the hydraulic system.
- d) Do not use the secondary piston stop bolt, located on the side of the master cylinder to bleed the brake system.

Loosening or removing this bolt could result in damage to the secondary piston or stop bolt.

To air bleed the brake systems, proceed as follows:

1. Raise the vehicle and support 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. Open the bleeder valve. Depress the brake pedal a 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, close the bleeder valve, remove the vinyl tube and fit the cap to the bleeder screw.

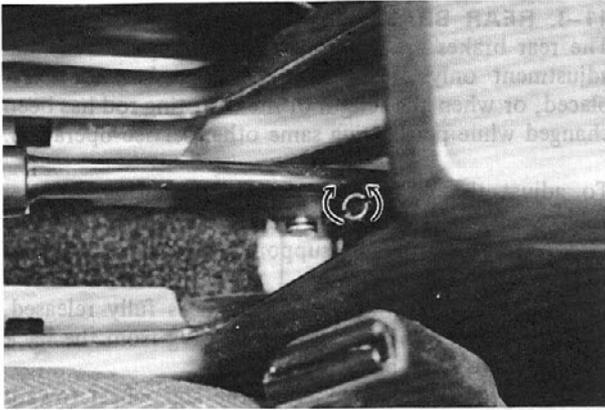


Fig. 11-62

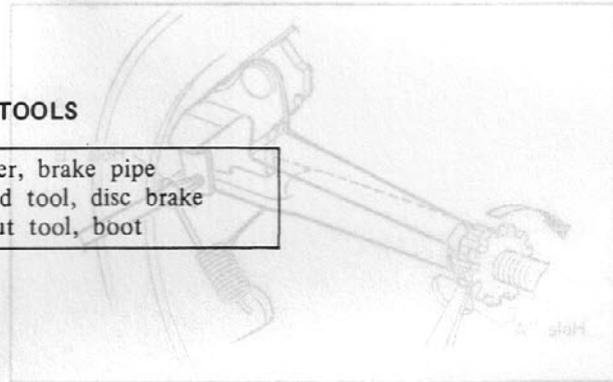
11-K. PARKING BRAKE ADJUSTMENT

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 with stands.
3. Adjust the parking brake lever adjusting screw so that the rear brakes are locked when the parking lever is pulled 5 ~ 7 notches with 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.

SPECIAL TOOLS

49 0259 770A	Spanner, brake pipe
49 0221 600C	Expand tool, disc brake
49 0208 701A	Air out tool, boot

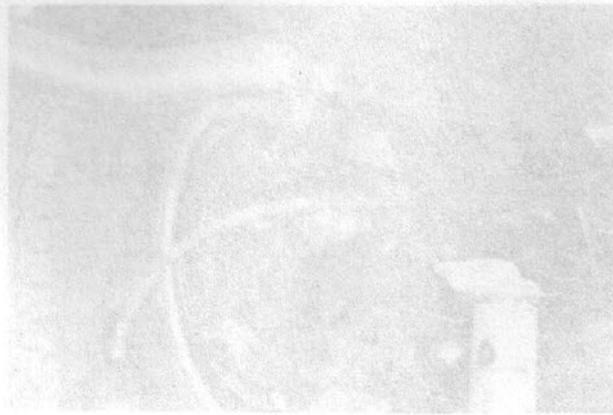


the arrow direction (↻) marked on the plate until the wheel is locked.
 2. Through the hole "B", push the pawl lever of the self-adjuster with a suitable screw driver to turn the adjusting wheel in reverse direction of the arrow make and hold it.
 3. Turn the star wheel about 3 ~ 4 notches so that the wheel rotates freely without drag.
 4. Repeat the adjustment on the other side.
 5. Adjust the parking brake, as described in Part 11-K.
 6. Install the adjusting hole plugs onto the backing plate.

11-L. AIR BLEEDING
 If a pressure bleeding equipment is available, it would be easier to use. The front and rear hydraulic brake systems are individual and are bled separately.

Note:
 a) During bleeding operation, the reservoir of the master cylinder must be kept at least 3/4 full of the brake fluid.
 b) Do not mix low temperature brake fluid with the specified fluid during the bleeding operation.
 c) Never reuse brake fluid which has been drained from the hydraulic system.
 d) Do not use the secondary piston stop bolt, located on the side of the master cylinder to bleed the brake system.
 Loosening or removing this bolt could result in damage to the secondary piston or stop bolt.

To air bleed the brake system, proceed as follows:
 1. Raise the vehicle and support 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. Open the bleeder valve. Depress the brake pedal a 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, close the bleeder valve, remove the vinyl tube and fit the cap to the bleeder screw.



12-A. INFLATION OF TIRES
 Check the inflation pressure with a reliable gauge when the tires are cold.
 The standard pressure is shown in the left table.
 The snow tires should always be inflated 4 psi above the recommended pressures shown on the tire pressure chart.

Recommended Cold Tire Inflation Pressure		
Tire size	Front	Rear
P185 SR 13	26 p.s.i.	26 p.s.i.
P185/70 SR 13	26 p.s.i.	26 p.s.i.
T123/70 D14	60 p.s.i.	

Check the temporary spare tire inflation pressure at least once a month and at 60 psi.

WHEELS AND TIRES

When using the temporary spare, the following precautions must be observed:

12-A. INFLATION OF TIRES
 12-B. TIRE ROTATION
 12-C. WHEEL AND TIRE RUN-OUT
 12-D. WHEEL BALANCING
 12-E. FRONT WHEEL BEARINGS
 12-E-1. Checking Front Wheel Bearing
 on Car
 12-E-2. Removing Front Wheel Bearings
 12-E-3. Inspecting Front Wheel Bearings
 12-E-4. Installing Front Wheel Bearings
 12-E-5. Adjusting Front Wheel Bearings
 12-F. REAR WHEEL BEARING

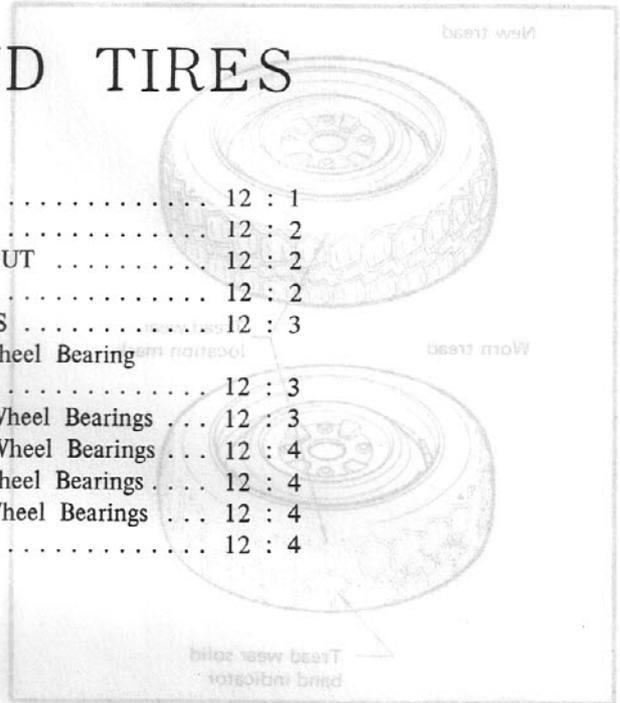


Fig. 12-1

Recommended Cold Tire Inflation Pressure		
Tire size	Front	Rear
165 SR 13	26 p.s.i.	26 p.s.i.
185/70 SR 13	26 p.s.i.	26 p.s.i.
T125/70 D14	60 p.s.i.	

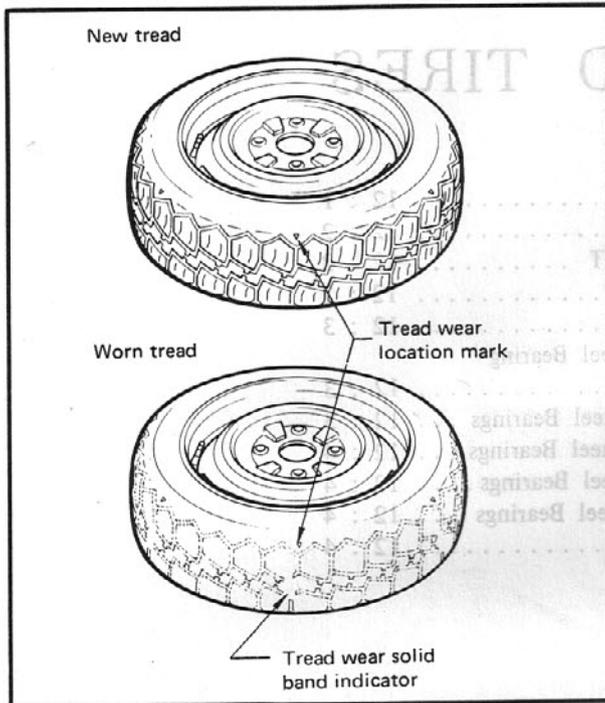


Fig. 12-1

12-A. INFLATION OF TIRES

Check the inflation pressure with a reliable gauge when the tires are cold.

The standard pressure is shown in the left table.

The snow tires should always be inflated 4 psi above the recommended pressures shown on the tire pressure chart.

Check the temporary spare tire inflation pressure at least once a month and maintain at 60 psi.

When using the temporary spare, the following precautions must be observed:

- Use for limited mileage, temporary emergency use only. This tire is identified by the distinctive wording "TEMPORARY USE ONLY" molded into the side wall. Any continuous road use of this tire could cause result in tire failure, loss of vehicle control and possible personal injury.
- Do not exceed 80 km/h (50 mph) under any circumstances.
- Because the spare tire's diameter is smaller than the regular tire, the ground clearance is reduced by approximately 25 mm (1 in). Avoid driving over obstacles. Also, do not take the car through an automatic car wash when the temporary spare is installed.
- Avoid road hazards, such as chuck holes etc.
- Because this tire has been designed especially for your car, do not use it on any other vehicle.
- Do not use tire chains with this tire.
- The temporary spare tire has a tread life of up to 3,000 km (2,000 miles), depending on road conditions and your driving habits. When the tread wear solid band indicator appears across the tread, replace with the same type temporary spare. To conserve the tire tread life, the temporary spare should be returned to the luggage compartment as soon as the regular tire can be repaired and replaced.
- Do not exceed the vehicle maximum load rating or load carrying capacity moulded into the side wall of the temporary spare tire.

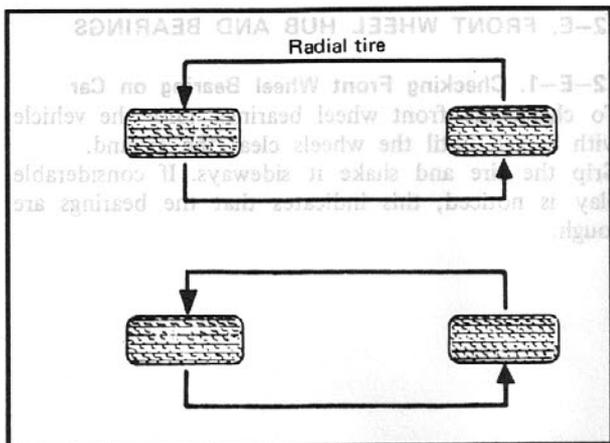


Fig. 12-2

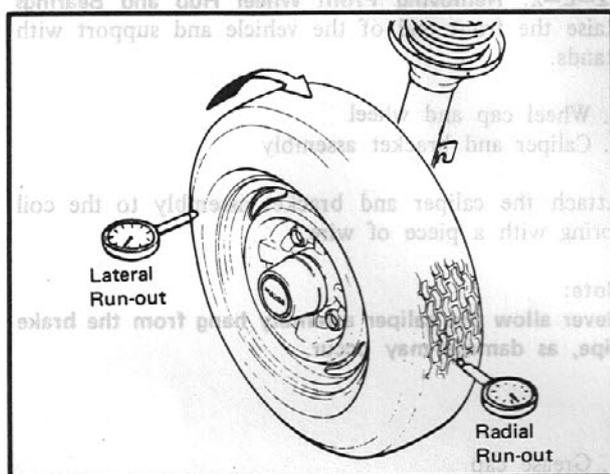


Fig. 12-3

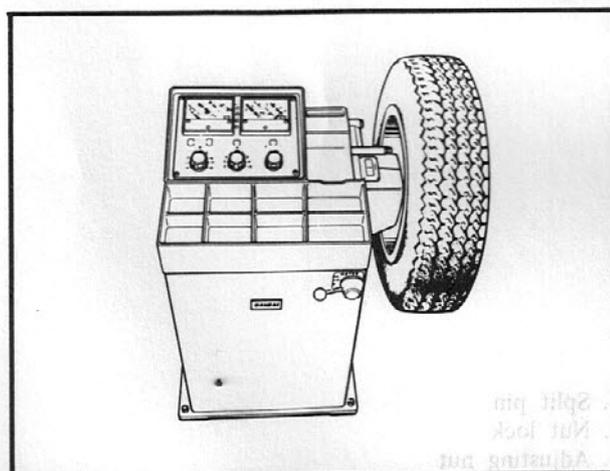


Fig. 12-4

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 Fig. 12-2.

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 bolts
 9.0 ~ 11.0 m·kg (65 ~ 80 ft·lb)

12-C. WHEEL AND TIRE RUN-OUT

Wheel and tire should be measured for both radial and lateral run-out.

Limit

Radial run-out	Less than 2.0 mm (0.08 in)
Lateral run-out	Less than 2.5 mm (0.10 in)

12-D. WHEEL BALANCING

The allowable unbalance is 360 cm·gr (5.0 in·oz), which is less than 20 gr (0.7 oz) at the rim.

If unbalance exceeds 360 cm·gr (5.0 in·oz) 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 manufacturer's instructions.

Fig. 12-2

Fig. 12-3

Fig. 12-4

Fig. 12-8

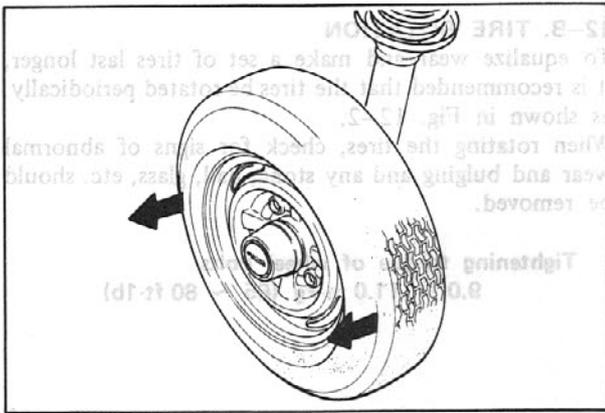


Fig. 12-5

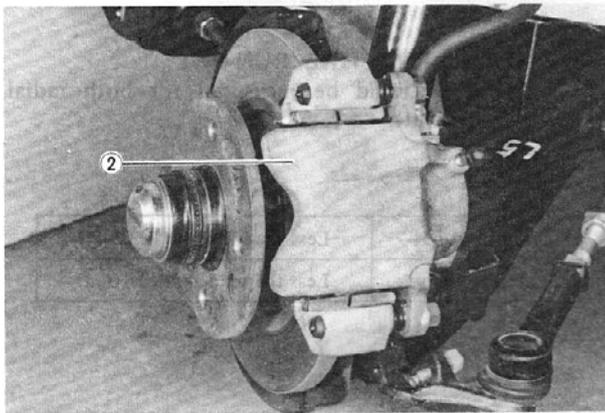


Fig. 12-6

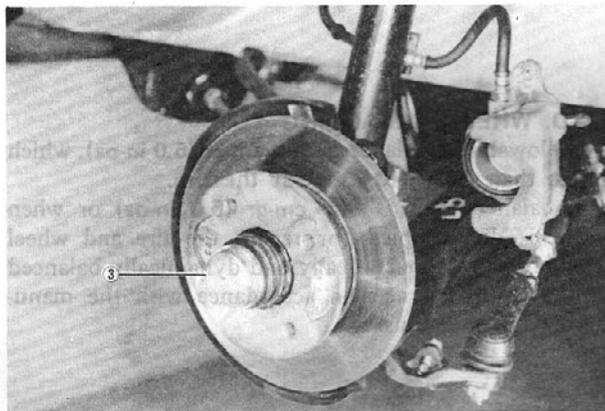


Fig. 12-7

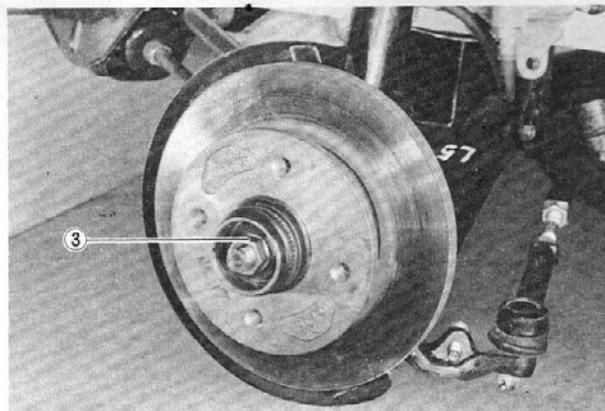


Fig. 12-8

12-E. FRONT WHEEL HUB AND BEARINGS

12-E-1. Checking Front Wheel Bearing on Car

To check the front wheel bearings, raise the vehicle with a jack until the wheels clear the ground.

Grip the tire and shake it sideways. If considerable play is noticed, this indicates that the bearings are rough.



12-E-2. Removing Front Wheel Hub and Bearings

Raise the front end of the vehicle and support with stands.

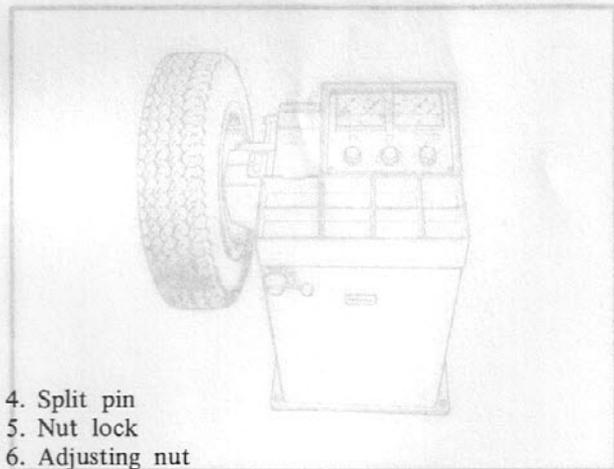
1. Wheel cap and wheel
2. Caliper and bracket assembly

Attach the caliper and bracket assembly to the coil spring with a piece of wire.

Note:

Never allow the caliper assembly hang from the brake pipe, as damage may occur.

3. Grease cap



4. Split pin
5. Nut lock
6. Adjusting nut
7. Thrust washer and outer bearing

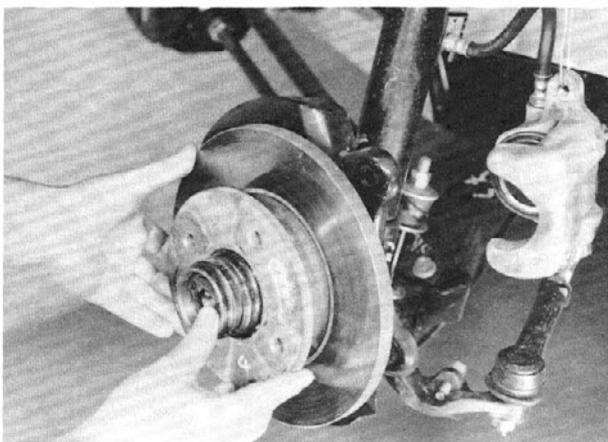


Fig. 12-9

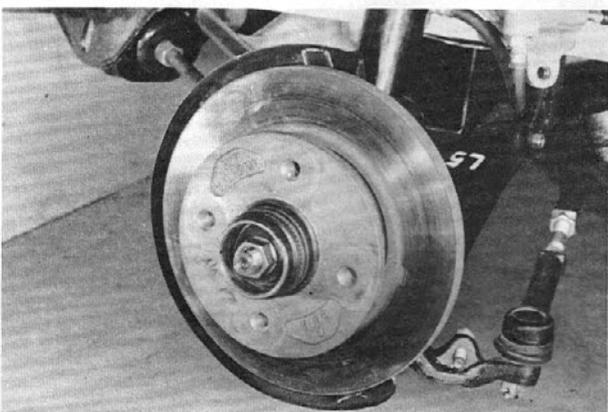


Fig. 12-10

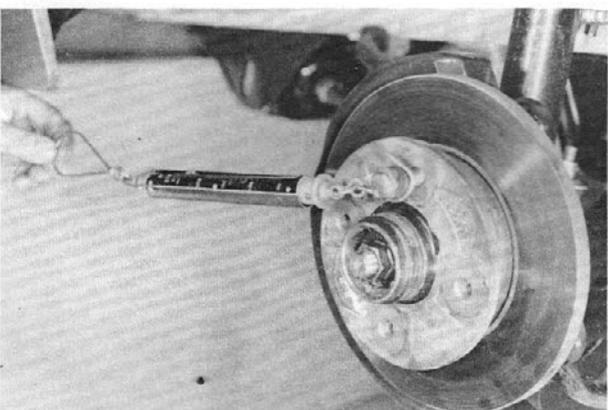


Fig. 12-11

8. Brake disc assembly
9. Grease seal and inner bearing

12-E-3. Inspecting Front Wheel Hub and Bearings

After cleaning all disassembled parts, inspect them as instructed below. Replace all parts that are found defective.

1. Inspect the outer races for scratches, pits excessive wear and other damage. If the outer race replacement is necessary, drive out the outer race, using a suitable drift in the slots provided for this purpose. Install a new outer race into the hub with a suitable too. Be sure to seat the outer race properly in the hub.
2. Inspect the cones and rollers for damage, wear, deformation, and other defects. Replace them if necessary.

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. **Do not** overpack.
2. Fill the hub cavity with lithium grease.
3. Adjust the bearing preload, as instructed in the following paragraph.

12-E-5. Adjusting Front Wheel Bearings

1. Torque the adjusting nut to 2.0 to 2.5 m-kg (14 to 18 ft-lb).
2. Rotate the brake disc a few turns clockwise and counterclockwise to seat bearings. Then, loosen the adjusting nut.
3. Adjust the preload by tightening the adjusting nut.

Spring scale reading at wheel bolt
0.35 ~ 0.87 kg (0.77 ~ 1.92 lb)

Note:

Read the scale just when the brake disc starts to turn.

4. Fit the nut lock onto the adjusting nut and align the slots of the nut lock with the hole of the spindle. Install a new split pin.

12-F. REAR WHEEL BEARING

Servicing the rear wheel bearings is explained in Par. 9-A.

13-A. FRONT SHOCK ABSORBER
 13-A-1. Removing Front Shock Absorber
 Remove the front shock absorber in the numerical order.
 Note:
 After the vehicle is jacked up, do not fail to support it with stands.



Fig. 13-1

SUSPENSION

13-A. FRONT SHOCK ABSORBER 13 : 1
 13-A-1. Removing Front Shock Absorber 13 : 1
 13-A-2. Inspection before Disassembling Front Shock Absorber 13 : 2
 13-A-3. Disassembling Front Shock Absorber 13 : 2
 13-A-4. Inspecting Front Shock Absorber 13 : 2
 13-A-5. Assembling Front Shock Absorber 13 : 3
 13-A-6. Installing Front Shock Absorber 13 : 4
 13-B. FRONT SUSPENSION ARM 13 : 4
 13-B-1. Removing Front Suspension Arm 13 : 4
 13-B-2. Inspecting Front Suspension Arm 13 : 5
 13-B-3. Replacing Ball Joint Dust Boot 13 : 5
 13-B-4. Installing Front Suspension Arm 13 : 6
 13-B-5. Inspecting Front Suspension Arm Ball Joint 13 : 6
 13-C. TENSION ROD AND STABILIZER BAR 13 : 6
 13-C-1. Removing Tension Rod and Stabilizer Bar 13 : 6
 13-C-2. Inspecting Tension Rod and Stabilizer Bar 13 : 7

13-C-3. Installing Tension Rod and Stabilizer Bar 13 : 7
 13-D. REAR SHOCK ABSORBER 13 : 8
 13-D-1. Removing Rear Shock Absorber 13 : 8
 13-D-2. Installing Rear Shock Absorber 13 : 9
 13-E. REAR SPRING 13 : 9
 13-E-1. Removing Rear Spring 13 : 9
 13-E-2. Inspecting Rear Spring 13 : 10
 13-E-3. Installing Rear Spring 13 : 10
 13-F. REAR SUSPENSION UPPER LINK 13 : 11
 13-F-1. Removing Upper Link 13 : 11
 13-F-2. Inspecting Upper Link 13 : 11
 13-F-3. Installing Upper Link 13 : 11
 13-G. REAR SUSPENSION LOWER ARM 13 : 11
 13-G-1. Removing Lower Arm 13 : 11
 13-G-2. Inspecting Lower Arm 13 : 12
 13-G-3. Installing Lower Arm 13 : 12
 13-H. LATERAL ROD 13 : 12
 13-H-1. Removing Lateral Rod 13 : 12
 13-H-2. Inspecting Lateral Rod 13 : 12
 13-H-3. Installing Lateral Rod 13 : 12
 13-I. STABILIZER BAR (IF EQUIPPED) 13 : 13
 13-I-1. Removing Stabilizer Bar 13 : 13
 13-I-2. Inspecting Stabilizer Bar 13 : 13
 13-I-3. Installing Stabilizer Bar 13 : 13
 SPECIAL TOOLS 13 : 13

Using the coil spring compressor (49 0233 6400 and 49 0370 6411), compress the coil spring.
 Lock nut and washer
 Mounting block and coil spring

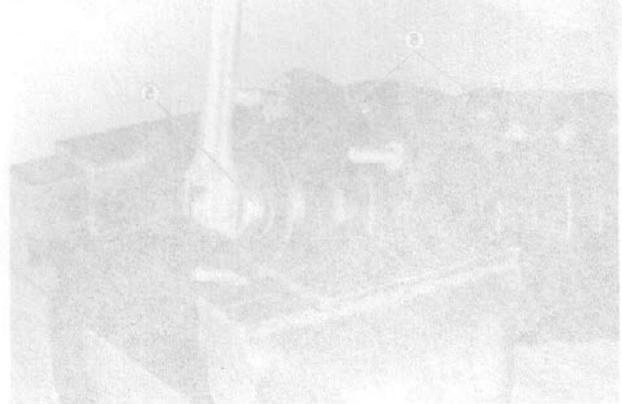


Fig. 13-4

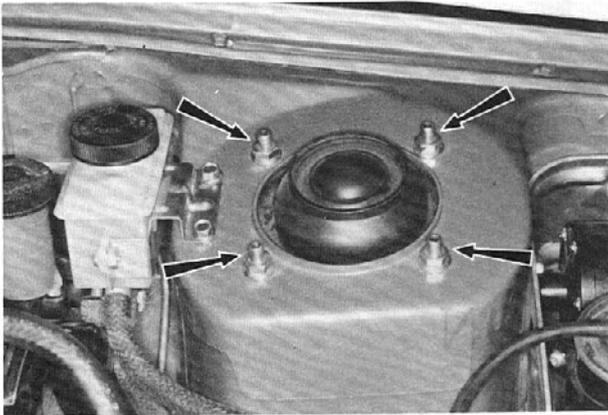


Fig. 13-1

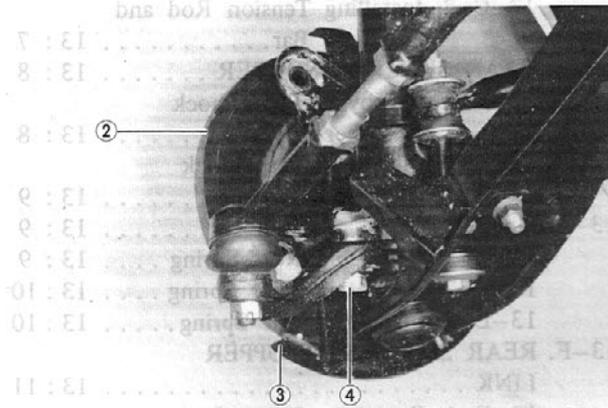


Fig. 13-2

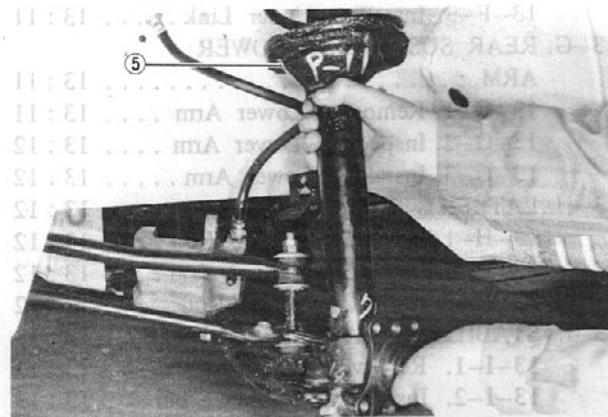


Fig. 13-3

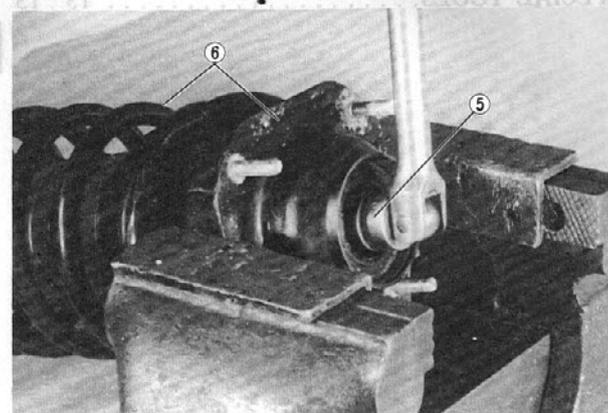


Fig. 13-4

13-A. FRONT SHOCK ABSORBER

13-A-1. Removing Front Shock Absorber

Remove the front shock absorber in the numerical order.

Note:

After the vehicle is jacked up, do not fail to support it with stands.

1. Mounting block attaching nuts

2. Brake disc assembly (See Par. 11-G-8)

3. Backing plate

4. Front shock absorber attaching bolts

5. Front shock absorber and coil spring assembly

Note:

Remove the shock absorber and coil spring assembly, after marking on the suspension tower for correct relocation.

Hold the shock absorber and coil spring assembly in a vise.

Using the coil spring compressor (49 0223 640A and 49 0370 641), compress the coil spring.

6. Lock nut and washer

7. Mounting block and coil spring

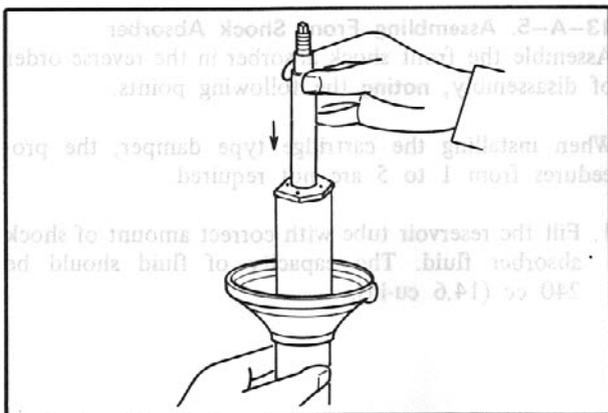


Fig. 13-5

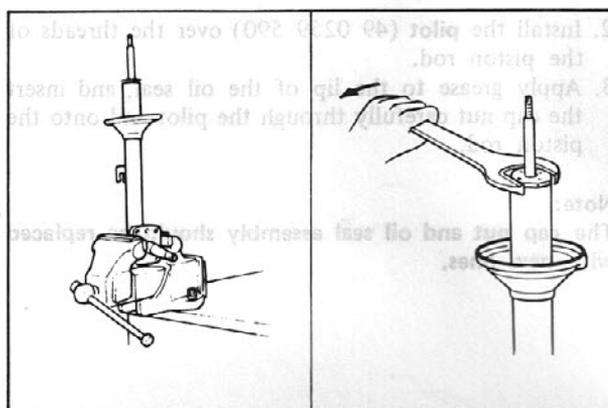


Fig. 13-6

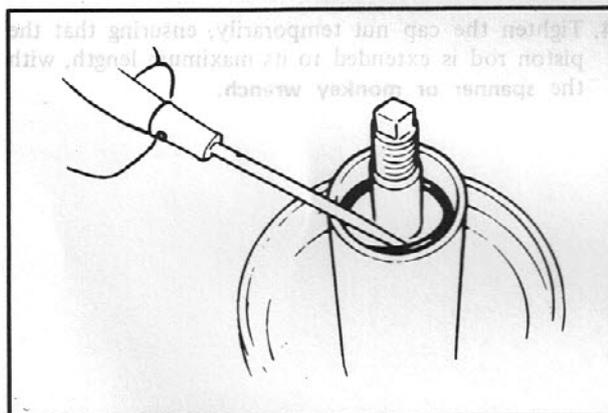


Fig. 13-7

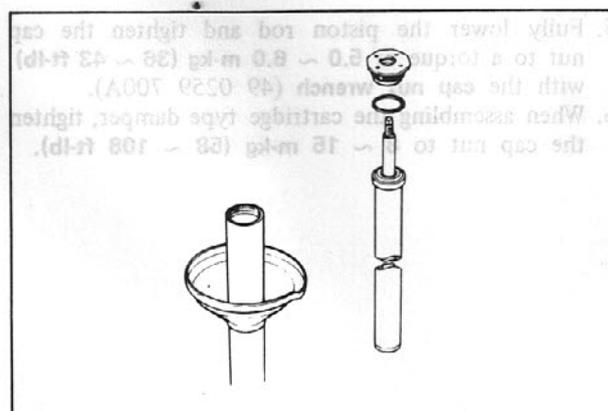


Fig. 13-8

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.

13-A-3. Disassembling Front Shock Absorber

1. Clamp the reservoir tube in a vise equipped with soft jaws.
2. Using a spanner 52 mm (2.05 in) or monkey wrench, remove the cap nut and seal assembly from the reservoir tube.

3. Remove the "O" ring installed on the piston rod guide with a suitable tool.
4. Pull out the piston rod and pressure tube assembly from the reservoir tube.

Note:

Does not remove the base valve from the pressure tube and piston from the piston rod.

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.

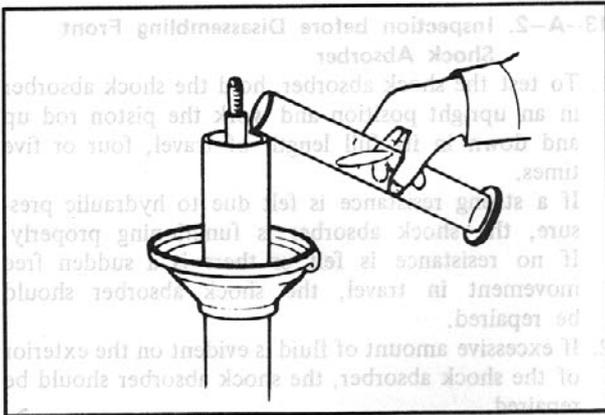


Fig. 13-9

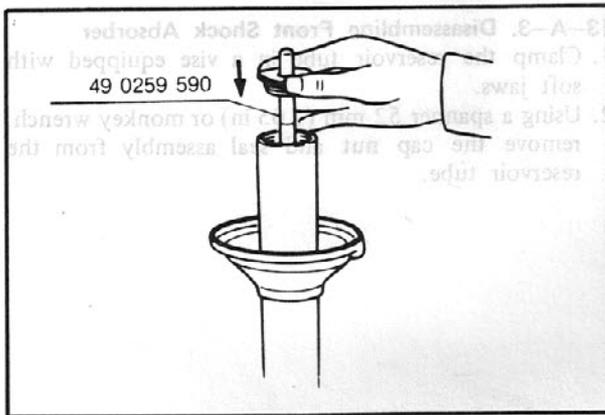


Fig. 13-10

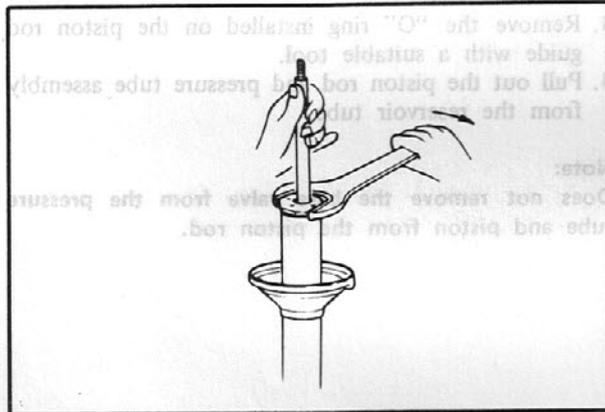


Fig. 13-11

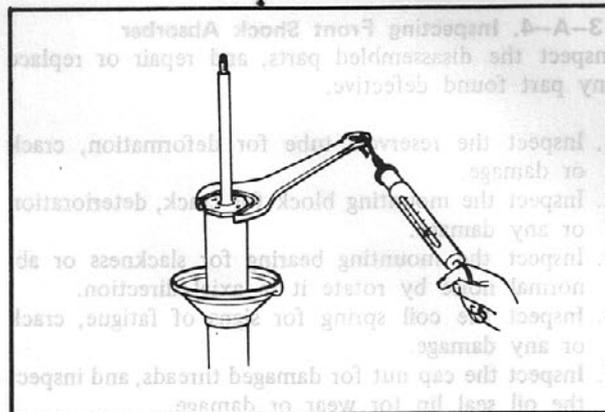


Fig. 13-12

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 240 cc (14.6 cu-in).

2. Install the **pilot** (49 0259 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.

Note:

The cap nut and oil seal assembly should be replaced with new ones.

4. Tighten the cap nut temporarily, ensuring that the piston rod is extended to its maximum length, with the **spanner or monkey wrench**.

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)**.

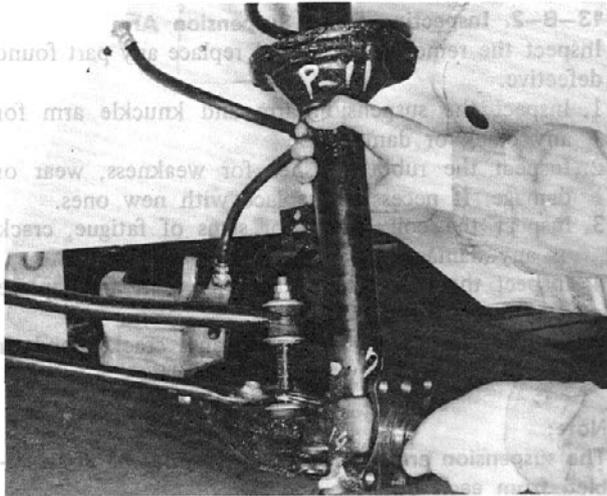


Fig. 13-13



Fig. 13-14

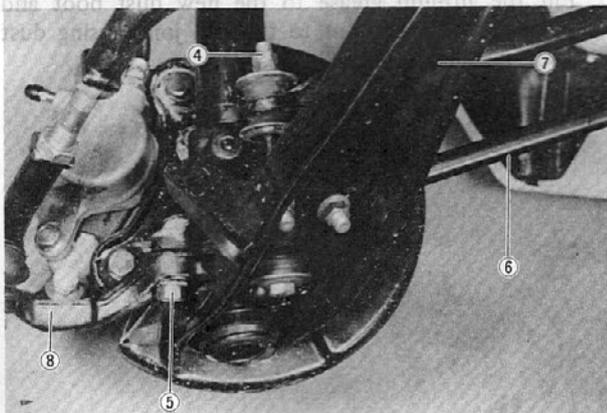


Fig. 13-15

13-A-6. Installing Front Shock Absorber

Install the front shock absorber in the reverse order of removal.

Note:

- When replacing the coil spring, install a suitable coil spring and adjusting plate to get equal road clearance both on the right and left. Do not use more than two adjusting plates at one side.
- After installing the brake disc, adjust the wheel bearing preload, as described in Par. 12-E-5.

Tightening torque:

Front suspension arm to frame:

2.3 ~ 3.0 m-kg (17 ~ 22 ft-lb)

Piston rod to mounting block:

6.5 ~ 8.2 m-kg (47 ~ 59 ft-lb)

Front suspension arm to knuckle arm:

6.4 ~ 9.5 m-kg (46 ~ 69 ft-lb)

13-B. FRONT SUSPENSION ARM

13-B-1. Removing Front Suspension Arm

Remove the suspension arm in the numerical order.

Note:

After the vehicle is jacked, do not fail to support it with stands.

- Front wheel
- Split pin and nut
- Tie-rod from knuckle arm
Use the puller (49 0118 850C)

- Control rod assembly
- Front shock absorber attaching bolt
- Tension rod
- Front suspension arm assembly
- Knuckle arm from suspension arm
Use the puller (49 0727 575)

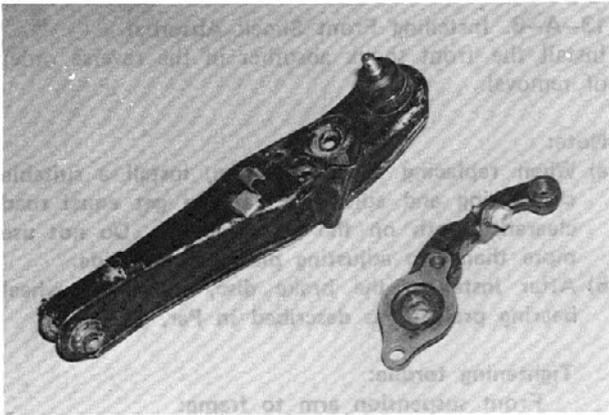


Fig. 13-16

Front suspension arm to knuckle arm: 8.4 ~ 8.2 m-kg (48 ~ 89 ft-lb)
 Front suspension arm to mounting block: 8.8 ~ 8.5 m-kg (47 ~ 89 ft-lb)
 Piston rod to mounting block: 5.3 ~ 3.0 m-kg (17 ~ 22 ft-lb)



Fig. 13-17

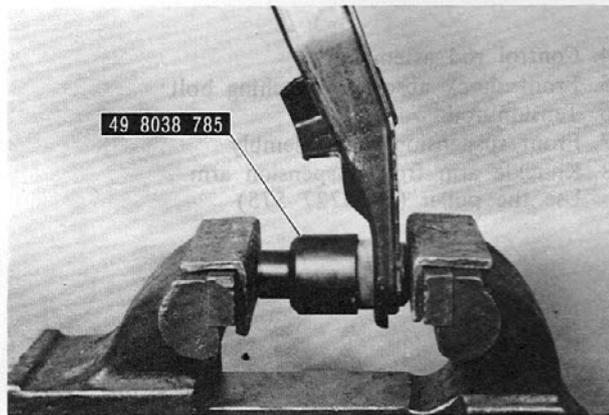


Fig. 13-18

13-B-2. Inspecting Front Suspension Arm

Inspect the removed parts, and replace any part found defective.

1. Inspect the suspension arm and knuckle arm for any crack or damage.
2. Inspect the rubber bushes for weakness, wear or damage. If necessary, replace with new ones.
3. Inspect the coil spring for signs of fatigue, crack or any damage.
4. Inspect the dust seal of the ball joint and replace it if it is defective.
5. Inspect the control rod for any crack, bend or torsion. If necessary, repair or replace.

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.

13-B-3. Replacing Ball Joint Dust Boot

1. Remove the just 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).

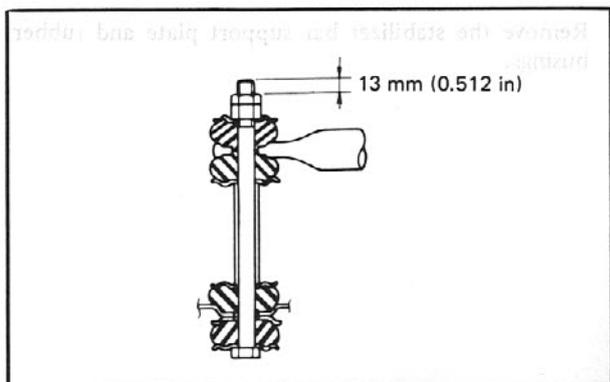


Fig. 13-19

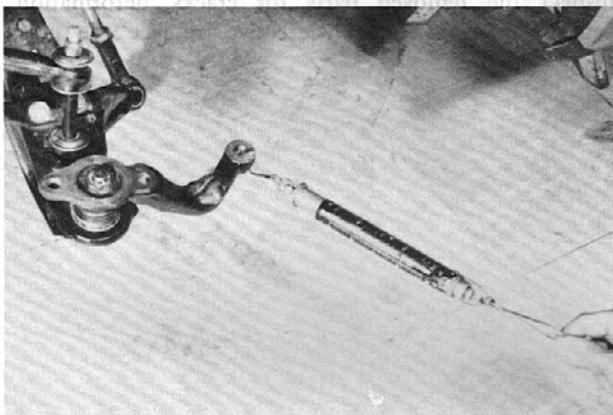


Fig. 13-20

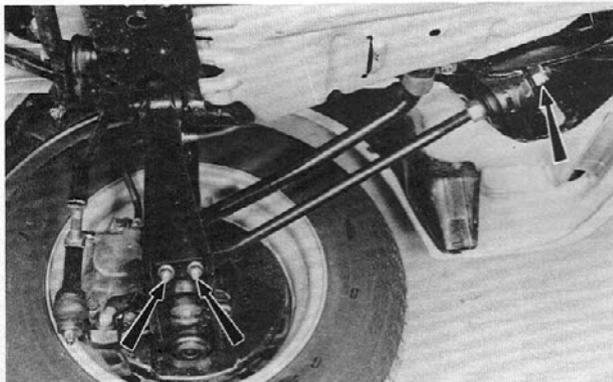


Fig. 13-21



Fig. 13-22

13-B-4. Installing Front Suspension Arm

Install the suspension arm in the reverse order of removing.

Note:

Tighten the control rod lock nuts to the dimension as shown in the figure.

Tightening torque:

Ball joint to knuckle arm:

6.4 ~ 9.5 m-kg (46 ~ 69 ft-lb)

Lower arm to cross member:

4.0 ~ 5.5 m-kg (29 ~ 40 ft-lb)

Tension rod to lower arm:

6.6 ~ 8.0 m-kg (48 ~ 58 ft-lb)

Knuckle arm to steering knuckle:

6.4 ~ 9.5 m-kg (46 ~ 69 ft-lb)

13-B-5. Inspecting Front Suspension Arm Ball Joint

After disconnect the front shock absorber from the steering knuckle, inspect the ball joint as follows.

1. Rotate the ball stud for few turns to allow the stud to snug down.
2. Hook the spring scale in the hole of the knuckle arm for connecting the tie-rod and support the knuckle arm by placing a finger.
3. Pull the spring scale and take a reading. If the reading is lower than 0.4 kg (14.1 oz), replace the ball joint in its assembled form.

13-C. TENSION ROD AND STABILIZER BAR

13-C-1. Removing Tension Rod and Stabilizer Bar

Note:

After the vehicle is jacked, do not fail to support it with stands.

1. Tension rod attaching nuts from the suspension arm
2. Remove the nuts, washers and rubber bushes holding tension rod to the tension rod bracket.
3. Tension rod

4. Control rod assembly

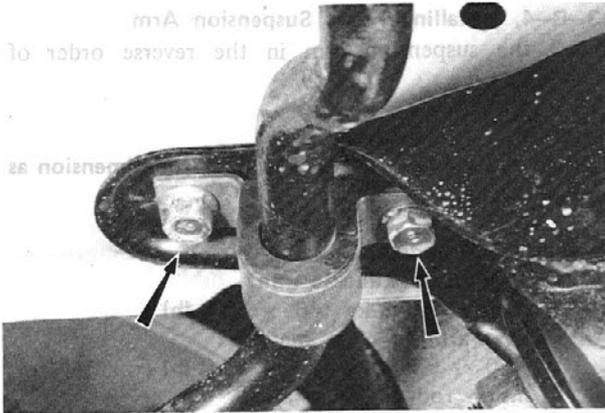


Fig. 13-23

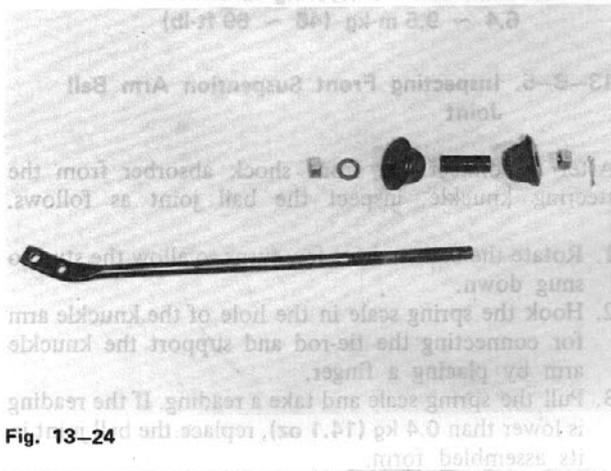


Fig. 13-24

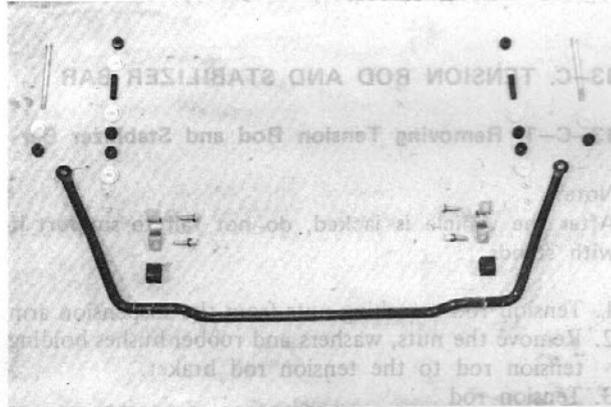


Fig. 13-25

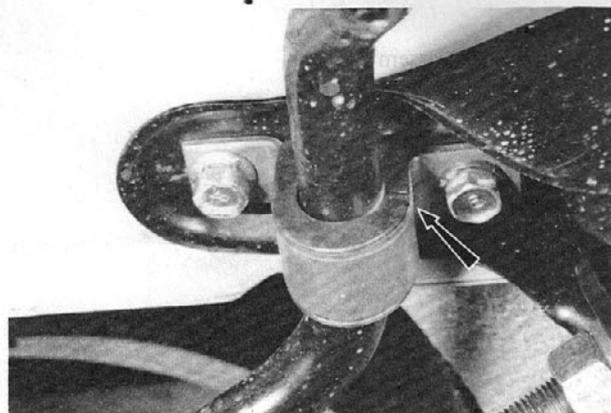


Fig. 13-26

5. Remove the stabilizer bar support plate and rubber bushings.

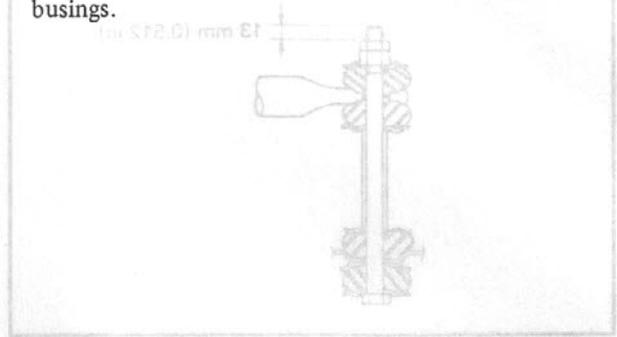


Fig. 13-19

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.

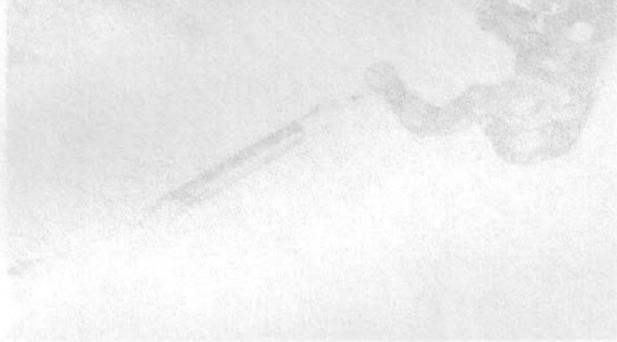


Fig. 13-30



Fig. 13-31

13-C-3. Installing Tension Rod and Stabilizer Bar
Install the stabilizer bar and tension rod in the reverse order of removal.

Note:
When installing the stabilizer rubber bushing with the support plate, place the open end of the bushing toward the front.

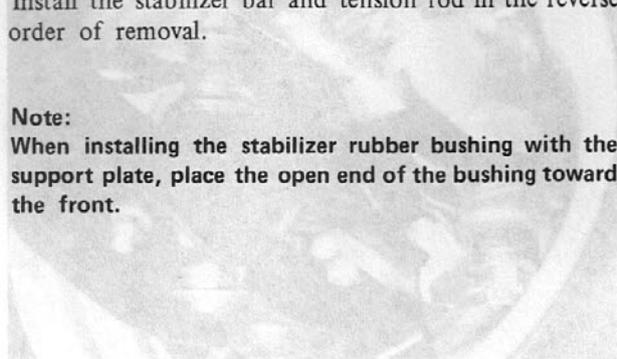


Fig. 13-32

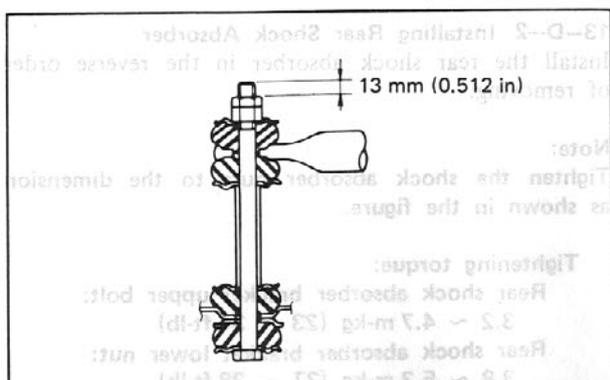


Fig. 13-27

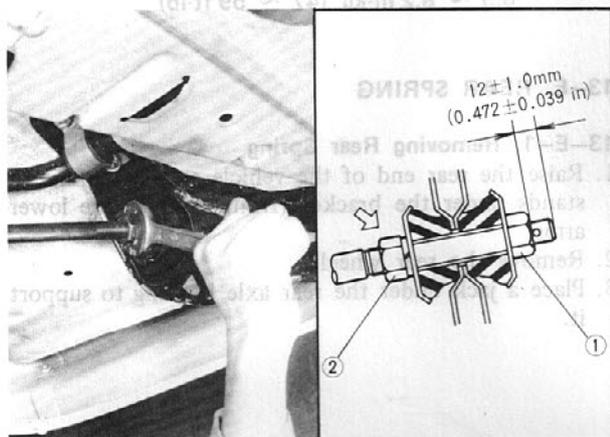


Fig. 13-28

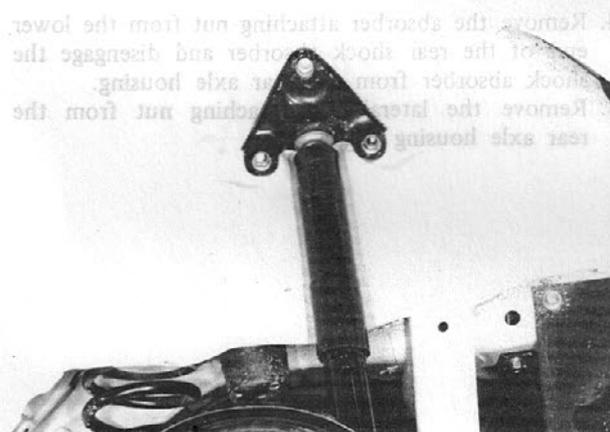


Fig. 13-29

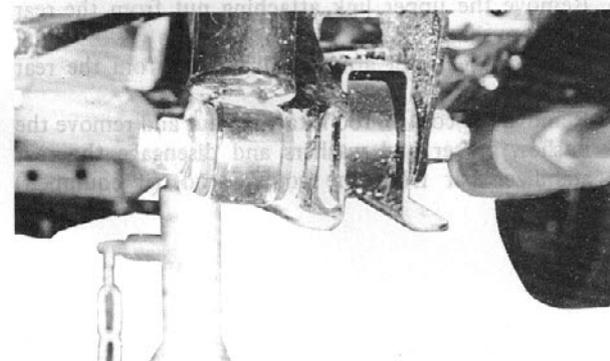


Fig. 13-30

Tighten the control rod nut until the dimension between the nut and bolt end is 13 mm (0.512 in) as shown in Fig. 13-27.

Lower the vehicle and finally tighten the support plate bolts to 5.1 ~ 6.2 m-k (37 ~ 45 ft-lb).

Note:
When installing the stabilizer bar to the lower arm, tighten the nut to the specification in the illustration.

Install the front end of the tension rod to the bracket. Tighten the front nut to the specification as per illustration.

Tightening torque:
Lock nut: 11.0 ~ 15.0 m-k (80 ~ 108 ft-lb)

Install the rear end of the tension rod to the lower arm.

Tightening torque:
Tension rod to lower arm:
6.6 ~ 8.0 m-k (48 ~ 58 ft-lb)

Note:
When installing the rubber bushing on the tension rod, face the flat surface toward the bracket.

13-D. REAR SHOCK ABSORBER

The gas sealed type shock absorbers should not be disassembled as it contains a highly compressed gas. If it is found to be defective, replace it as assembly.

13-D-1. Removing Rear Shock Absorber

1. Raise the rear end of the vehicle and support with stands under the bracket (front side) of the lower arms.
2. Remove the rear wheel.
3. Remove the bracket attaching nuts from the upper end of the shock absorber.
4. Remove the nut that secures the lower end of the shock absorber to the rear axle casing, and remove the shock absorber from the vehicle.
5. Remove the bracket from the shock absorber.

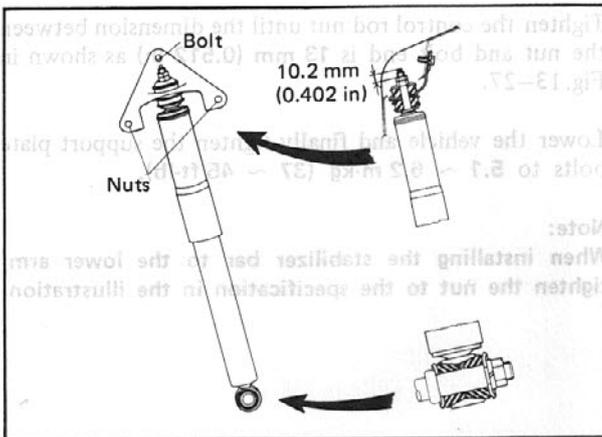


Fig. 13-31

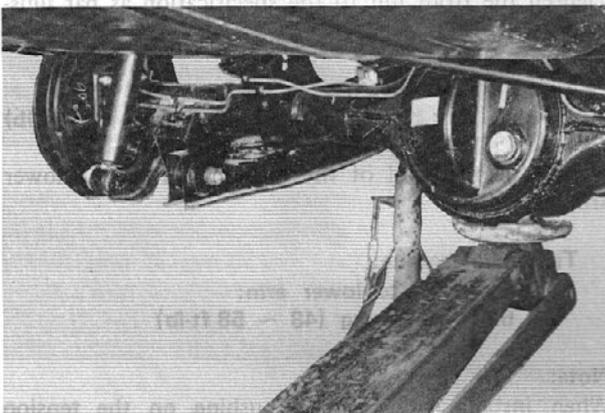


Fig. 13-32

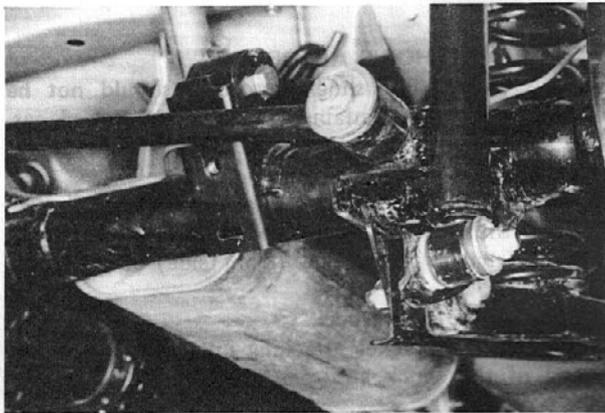


Fig. 13-33

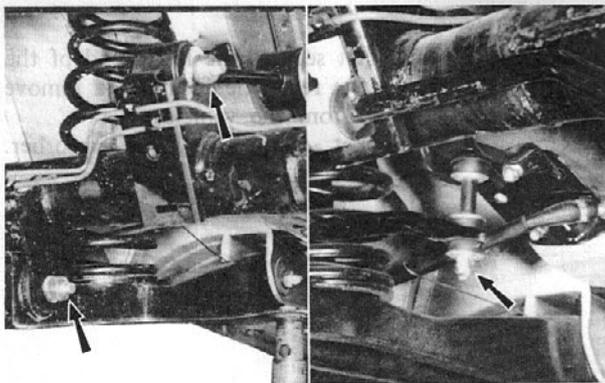


Fig. 13-34

13-D-2 Installing Rear Shock Absorber

Install the rear shock absorber in the reverse order of removing.

Note:

Tighten the shock absorber nuts to the dimension as shown in the figure.

Tightening torque:

Rear shock absorber bracket upper bolt:

3.2 ~ 4.7 m-kg (23 ~ 34 ft-lb)

Rear shock absorber bracket lower nut:

3.8 ~ 5.3 m-kg (27 ~ 38 ft-lb)

Rear shock absorber attaching nut:

6.5 ~ 8.2 m-kg (47 ~ 59 ft-lb)

13-E. REAR SPRING

13-E-1. Removing Rear Spring

1. Raise the rear end of the vehicle and support with stands under the bracket (front side) of the lower arms.
2. Remove the rear wheel.
3. Place a jack under the rear axle housing to support it.

4. Remove the absorber attaching nut from the lower end of the rear shock absorber and disengage the shock absorber from the rear axle housing.
5. Remove the lateral rod attaching nut from the rear axle housing (right side).

6. Remove the upper link attaching nut from the rear axle housing.
7. Remove the lower arm attaching nut from the rear axle housing.
8. Remove the control rod attaching nut and remove the bushes, spacer and washers and disengage the rear stabilizer bar from the control rod. (if equipped)



Fig. 13-35

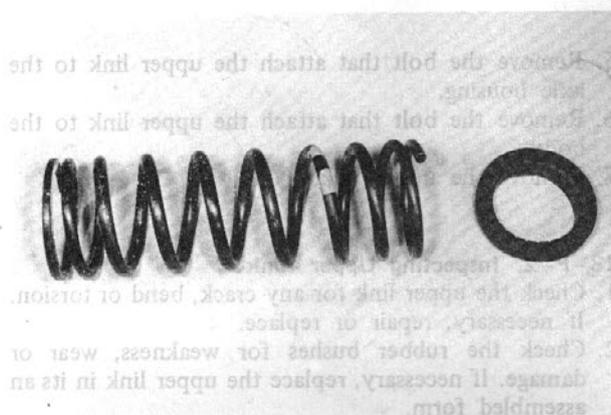


Fig. 13-36

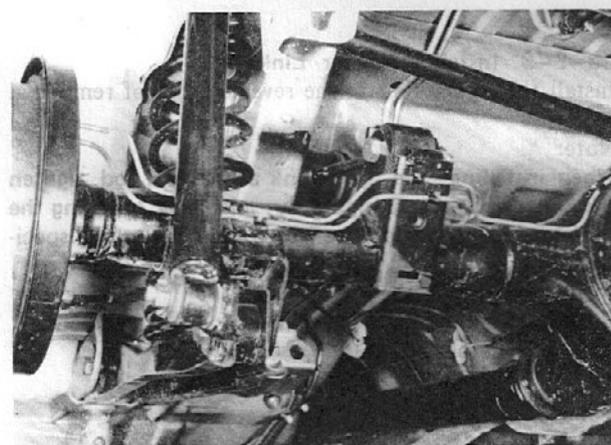


Fig. 13-37

Note:

Carefully and slowly, lower the jack to relieve the spring pressure on the lower arm, then remove the spring and rubber seat.

9. Rear coil spring

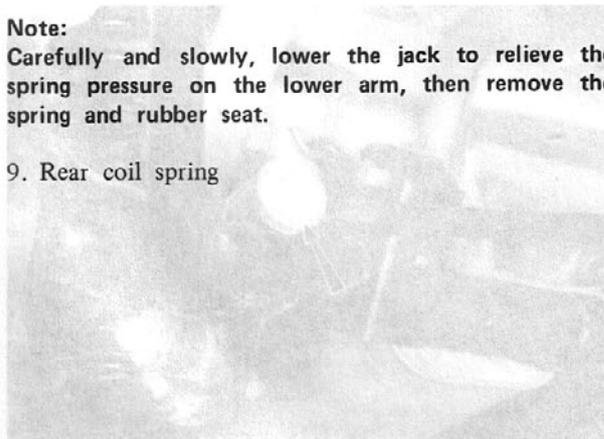


Fig. 13-38

13-E-2. Insprcting Rear Spring

1. Check the coil spring for signs of fatigue, crack or any damage. If any of these conditions exists, replace the coil spring.
2. Check the rubber bushes for weakness, wear or damage. If necessary, replace with new ones.

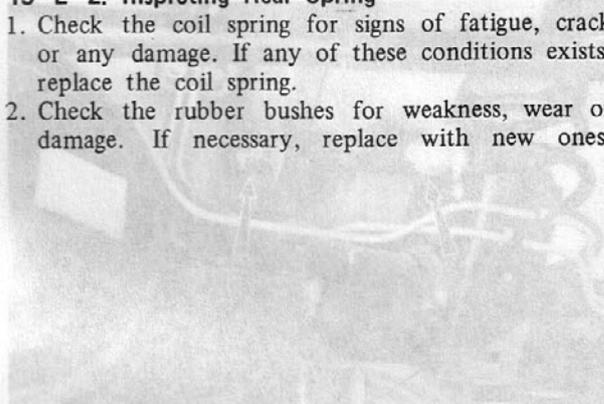


Fig. 13-39

13-E-3. Installing Rear Spring

Install the rear spring in the reverse order of removing.

Note:

- a) Install the coil spring so that the open end of the spring is face to the rear axle housing.
- b) When installing the upper link, lower arm rear shock absorber lower end and lateral rod, tighten the bolts and nuts temporarily, and after lowering the vehicle, finally tighten the bolts and nuts to the specified torque.

Tightening torque:

- Upper link and lower arm to axle housing
7.7 ~ 10.5 m·kg (56 ~ 76 ft·lb)
- Lateral rod to axle housing
7.7 ~ 10.5 m·kg (56 ~ 76 ft·lb)

- c) Install the front end of the stabilizer bar to the control rod. Refer to Par. 13-1-3.

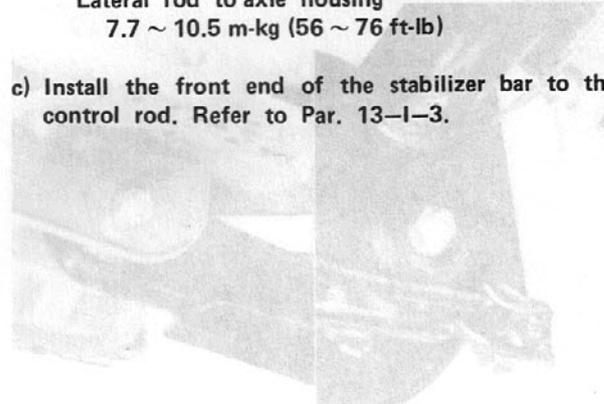


Fig. 13-41

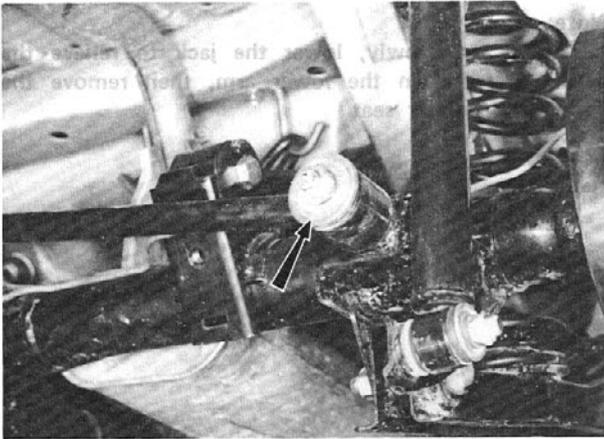


Fig. 13-38

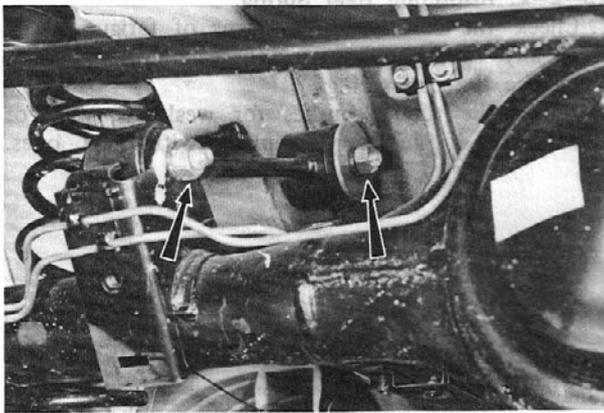


Fig. 13-39



Fig. 13-40

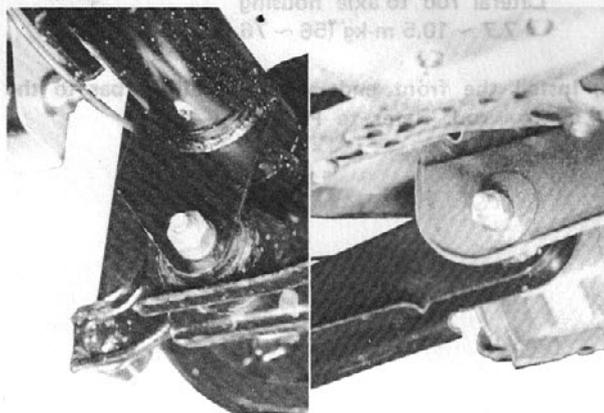


Fig. 13-41

13-F. REAR SUSPENSION UPPER LINK

13-F-1. Removing Upper Link

1. Raise the rear end of the vehicle and support with stands under the bracket (front side) of the lower arms.
2. Remove the rear wheel.
3. Place a jack under the rear axle housing to support it.
4. Remove the lateral rod attaching nut from the axle housing and disengage the lateral rod.

5. Remove the bolt that attach the upper link to the axle housing.
6. Remove the bolt that attach the upper link to the body.
7. Remove the upper link.

13-F-2. Inspecting Upper Link

1. Check the upper link for any crack, bend or torsion. If necessary, repair or replace.
2. Check the rubber bushes for weakness, wear or damage. If necessary, replace the upper link in its assembled form.

13-F-3. Installing Upper Link

Install the upper link in the reverse order of removing.

Note:

When installing the upper link and lateral rod, tighten the bolts and nuts temporarily, and after lowering the vehicle, finally tighten the bolts and nuts to the specified torque.

Tightening torque:

Pivot bolt and nut
7.7 ~ 10.5 m·kg (56 ~ 76 ft·lb)

13-G. REAR SUSPENSION LOWER ARM

13-G-1. Removing Lower Arm

1. Raise the rear end of the vehicle and support with stands under the bracket (front side) of the lower arms.
2. Remove the rear wheel.
3. Place a jack under the rear axle housing to support it.
4. Remove the coil spring. (refer to Par. 13-E-1)
5. Remove the lower arm attaching bolts and nuts, and remove the lower arm.



Fig. 13-42



Fig. 13-43

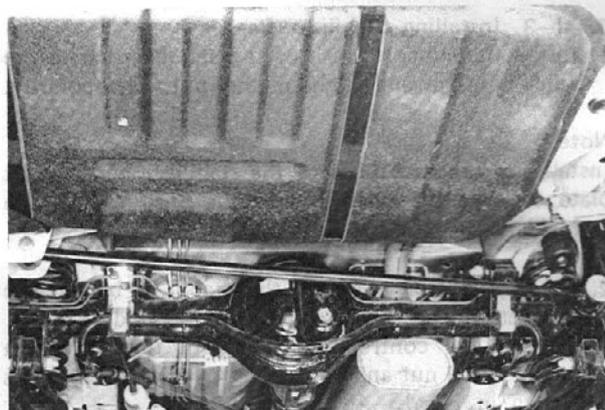


Fig. 13-44

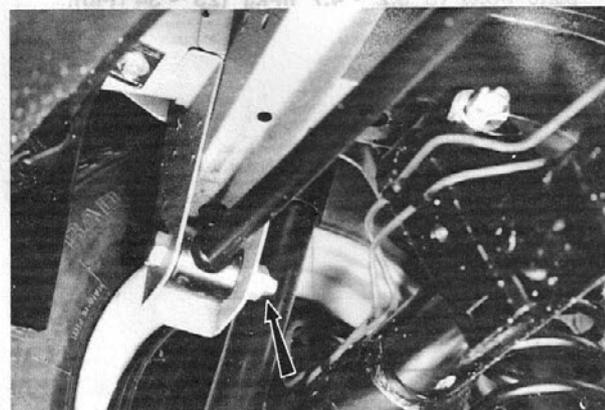


Fig. 13-45

13-G-2. Inspecting Lower Arm

1. Check the lower arm for signs of fatigue, crack or any damage. If any of these conditions exists, replace the lower arm.
2. Check the rubber bushes for weakness, wear or damage. If necessary, replace the lower arm in its assembled form.

13-G-3. Installing Lower Arm

Install the lower arm in the reverse order of removing.

Note:

When installing the lower arm, tighten the bolt and nut temporarily, and after lowering the vehicle, finally tighten the bolt and nut to the specified torque.

13-H. LATERAL ROD

13-H-1. Removing Lateral Rod

1. Raise the rear end of the vehicle and support with stands under the bracket (front side) of the lower arms.
2. Remove the lateral rod attaching nut from the axle housing.
3. Remove the lateral rod attaching nut from the body. Then, remove the lateral rod.

13-H-2. Inspecting Lateral Rod

1. Check the lateral rod for any crack, bend or torsion. If necessary, repair or replace.
2. Check the rubber bushes for weakness, wear or damage. If necessary, replace the lateral rod in its assembled form.

13-H-3. Installing Lateral Rod

Install the lateral rod in the reverse order of removing.

Note:

When installing the lateral rod, tighten the bolt and nut temporarily, and after lowering the vehicle, finally tighten the bolt and nut to 7.7 ~ 10.5 m·kg (56 ~ 76 ft·lb).

When attaching the bolt, face the head towards the fuel tank.

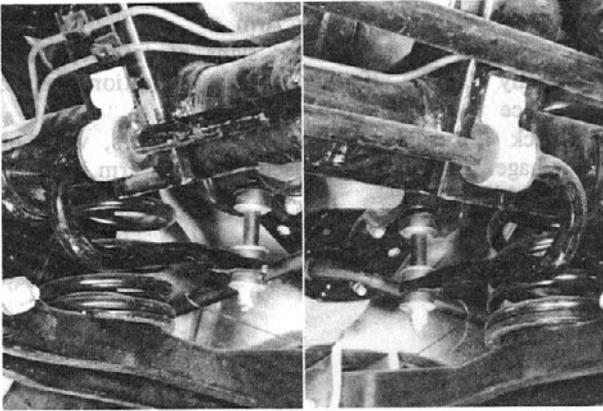


Fig. 13-46

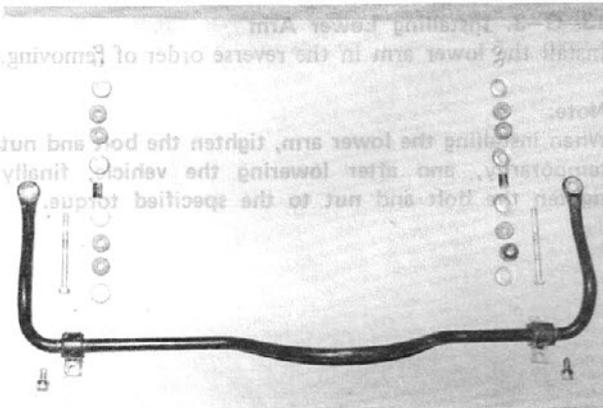


Fig. 13-47

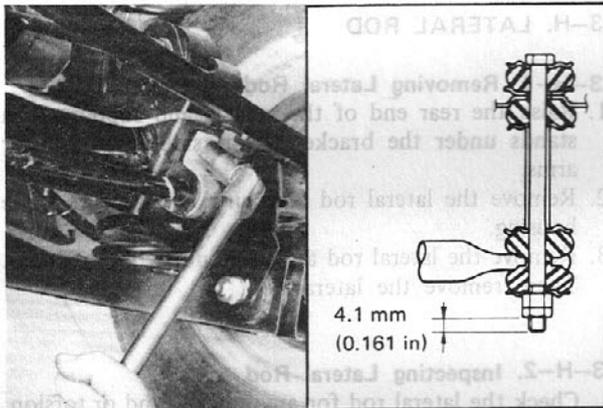


Fig. 13-48

13-1. STABILIZER BAR (IF EQUIPPED)

13-1-1. Removing Stabilizer Bar

1. Raise the rear end of the vehicle and support with stands under the bracket (front side) of the lower arms.
2. Remove the control rod attaching nut and remove the bushes, spacer and washers.
3. Remove the support plate attaching bolts from the axle housing and remove the stabilizer bar.

13-1-2. Inspecting Stabilizer Bar

1. Check the stabilizer bar for any crack, bend or torsion. If necessary, repair or replace.
2. Check the rubber bushes for weakness, wear or damage. If necessary, replace with new ones.

13-1-3. Installing Stabilizer Bar

1. Install the support plate of the stabilizer bar to the axle housing and tighten the bolts temporarily.

Note:

Install the rubber bushes of the stabilizer bar support plate so that the open end of the bush toward the rear side.

2. Install the front end of the stabilizer bar to the bracket of the stabilizer bar on the body.
3. Tighten the control rod nut until the dimension between the nut and bolt end is 4.1 mm (0.161 in) as shown in Fig. 13-48.
4. Lower the vehicle and finally tighten the support plate bolts to 3.2 ~ 4.7 m-kg (23 ~ 34 ft-lb).

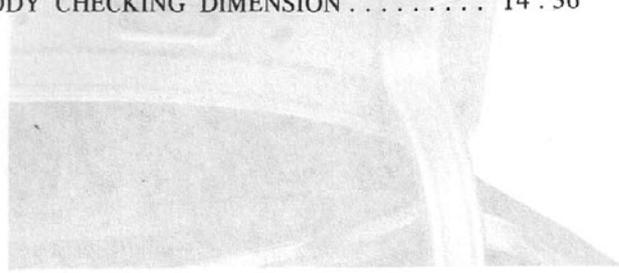
SPECIAL TOOLS

49 0118 850C	Puller, ball joint
49 0223 640A	Arm, coil spring compressor
49 0370 641	Screw, coil spring compressor
49 0259 590	Pilot, oil seal
49 0727 575	Puller, socket joint
49 8038 785	Installer, dust boot

BODY AND FRAME



14-A. BONNET.....	14: 1	14-L. QUARTER WINDOW (Hardtop)	14: 16
14-A-1. Replacing Bonnet.....	14: 1	14-L-1. Removing Quarter Window	
14-A-2. Adjusting Bonnet.....	14: 1	Regulator and Glass.....	14: 16
14-B. TRUNK LID.....	14: 1	14-L-2. Quarter Window Adjust-	
14-B-1. Replacing Trunk Lid.....	14: 1	ment.....	14: 16
14-B-2. Adjusting Trunk Lid.....	14: 2	14-M. COMBINATION METER.....	14: 17
14-C. FRONT BUMPER.....	14: 2	14-M-1. Removing Combination	
14-C-1. Removing Front Bumper... .	14: 2	Meter.....	14: 17
14-C-2. Checking Shock Absorber.. .	14: 3	14-M-2. Installing Combination	
14-C-3. Installing Front Bumper... .	14: 3	Meter.....	14: 17
14-D. REAR BUMPER.....	14: 3	14-N. CENTER PANEL.....	14: 18
14-D-1. Removing Rear Bumper... .	14: 3	14-N-1. Removing Center Panel... .	14: 18
14-D-2. Checking Shock Absorber.. .	14: 4	14-N-2. Installing Center Panel... .	14: 18
14-D-3. Installing Shock Absorber.. .	14: 4	14-O. SWITCH PANEL.....	14: 18
14-E. WINDSHIELD GLASS.....	14: 4	14-O-1. Removing Switch Panel... .	14: 18
14-E-1. Removing Windshield Glass.. .	14: 4	14-O-2. Installing Switch Panel... .	14: 18
14-E-2. Installing Windshield Glass.. .	14: 5	14-P. GLOVE BOX.....	14: 19
14-F. REAR WINDOW GLASS.....	14: 8	14-P-1. Removing Glove Box... .	14: 19
14-F-1. Replacing Rear Window		14-P-2. Installing Glove Box... .	14: 19
Glass.....	14: 8	14-Q. INSTRUMENT PANEL.....	14: 19
14-G. FRONT SEAT.....	14: 9	14-Q-1. Removing Instrument Panel	
14-G-1. Replacing Front Seat... .	14: 9	Assembly.....	14: 19
14-G-2. Inspecting Seat Adjuster... .	14: 9	14-Q-2. Installing Instrument Panel	
14-G-3. Replacing Seat Lifter... .	14: 9	Assembly.....	14: 20
(If equipped)		14-R. TOP CEILING (Full Roof).....	14: 21
14-H. REAR SEAT.....	14: 10	14-R-1. Removing Top Ceiling... .	14: 21
14-H-1. Replacing Rear Seat... .	14: 10	14-R-2. Installing Top Ceiling... .	14: 23
14-I. DOOR.....	14: 11	14-S. TOP CEILING (with sliding	
14-I-1. Adjusting Door... .	14: 11	sunroof).....	14: 25
14-I-2. Replacing Door		14-S-1. Replacing Top Ceiling... .	14: 25
Weatherstrip.....	14: 12	14-T. SLIDING SUNROOF.....	14: 28
14-J. FRONT DOOR.....	14: 13	14-T-1. Removing Sliding Sunroof.. .	14: 29
14-J-1. Front Door Window		14-T-2. Installing Sliding Sunroof.. .	14: 31
Regulator and Glass... .	14: 13	SPECIAL TOOL.....	14: 35
14-K. REAR DOOR.....	14: 15	BODY CHECKING DIMENSION.....	14: 36
14-K-1. Rear Door Window			
Regulator and Glass... .	14: 15		



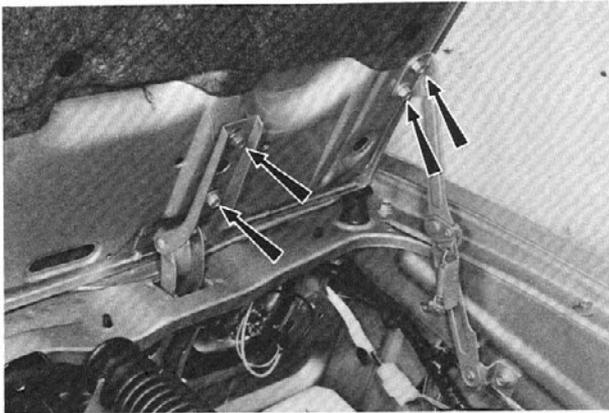


Fig. 14-1

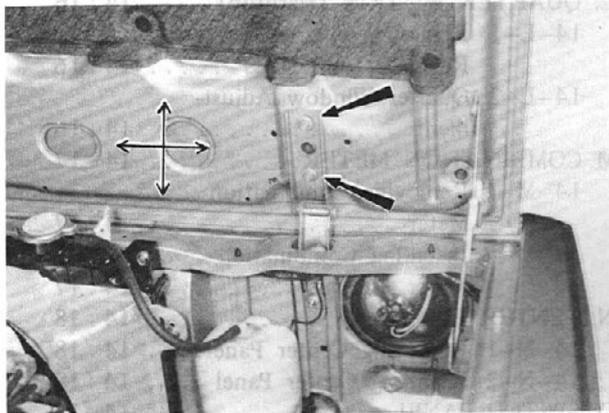


Fig. 14-2

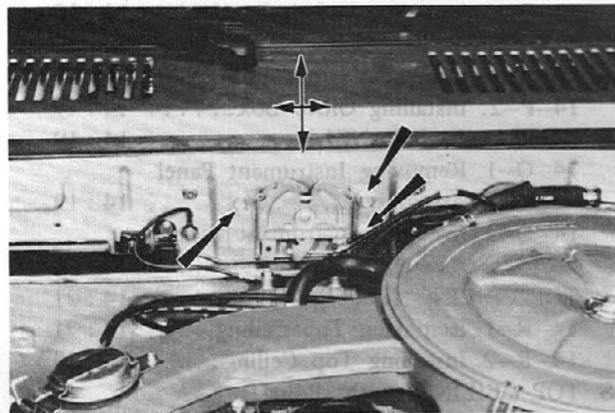


Fig. 14-3

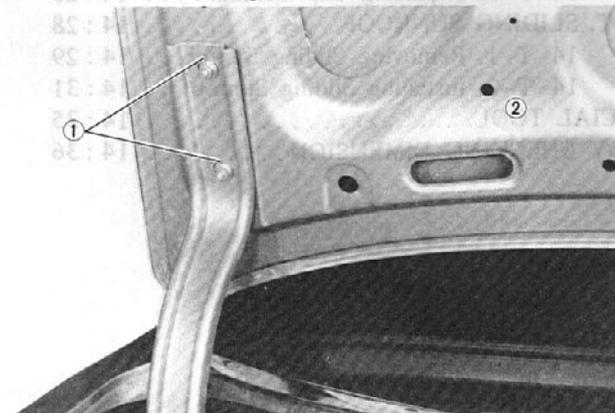


Fig. 14-4

14-A. BONNET

14-A-1. Replacing Bonnet

Remove the bonnet in the numerical order.
Open the bonnet.

Mark the bonnet hinge locations on the bonnet for proper reinstallation.

1. Bonnet support attaching bolts
2. Bonnet attaching bolts
3. Bonnet

Install the bonnet in the reverse order of removal.
Adjust the bonnet if necessary. (Refer to Par 14-A-2)

14-A-2. Adjusting Bonnet

1. Adjust the bonnet fore-and-aft and side-to-side by loosening the bonnet attaching bolts.
2. Adjust the bonnet up-and-down by loosening the hinge attaching bolts.

3. Adjust the bonnet lock mechanism after the bonnet has been aligned. The bonnet lock female part can be moved fore-and-aft and side-to-side to align it with the bonnet lock male part by loosening the attaching bolts.

14-B. TRUNK LID

14-B-1. Replacing Trunk Lid

Remove the trunk lid in the numerical order.
Open the trunk lid.

Mark the trunk lid hinge locations on the trunk lid for proper reinstallation.

1. Trunk lid hinge attaching nuts
2. Trunk lid

Install the trunk lid in the reverse order of removal.
Adjust the trunk lid if necessary (See Par. 14-B-2)

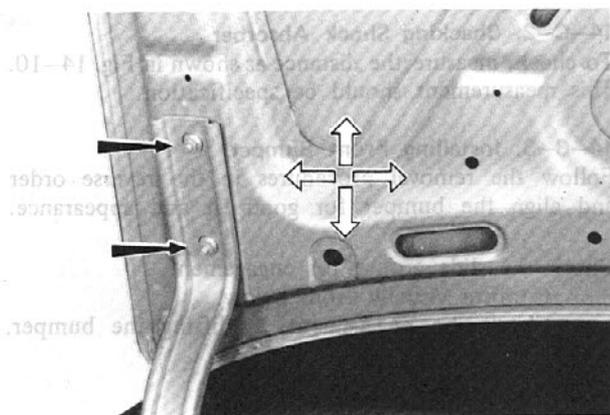


Fig. 14-5

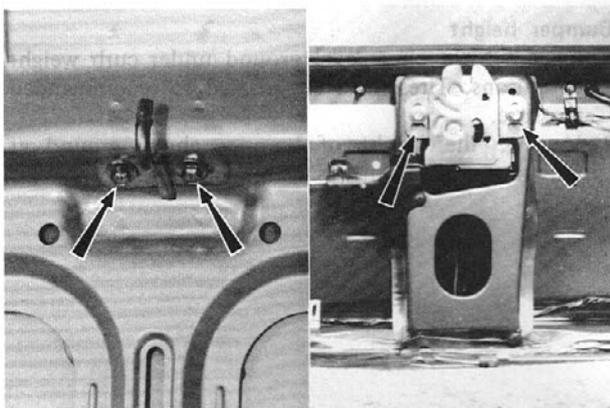


Fig. 14-6



Fig. 14-7

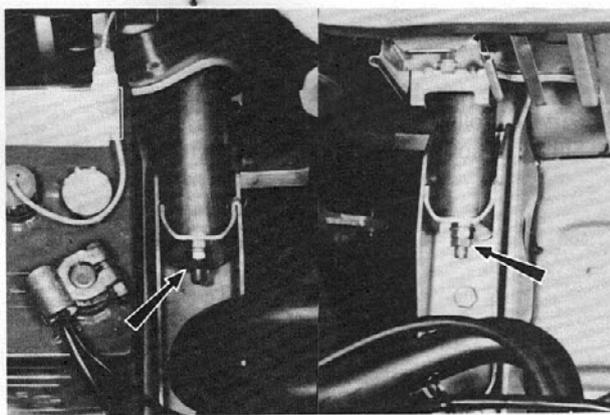


Fig. 14-8

14-B-2. Adjusting Trunk Lid

1. To make the to-and-fro or up-and-down adjustment, loosen the trunk lid attaching nuts, and move the lid as required.

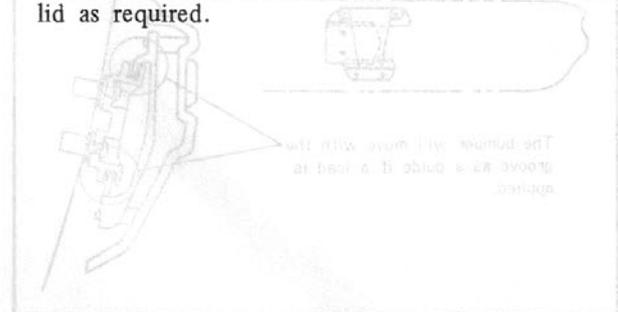
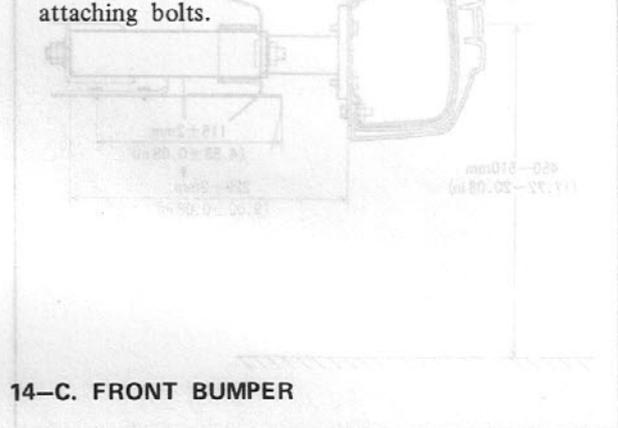


Fig. 14-9

2. To adjust the lid lock alignment, loosen the lid lock striker and lid lock attaching bolts, and move the striker or lid lock as required, then tighten the attaching bolts.



14-C. FRONT BUMPER

14-C-1. Removing Front Bumper

Remove the front bumper in the numerical order.

Note:

After the vehicle is jacked up, support it with stands.

1. Shock absorber attaching nuts.

2. Shock absorber piston rod end attaching nuts.



Fig. 14-10

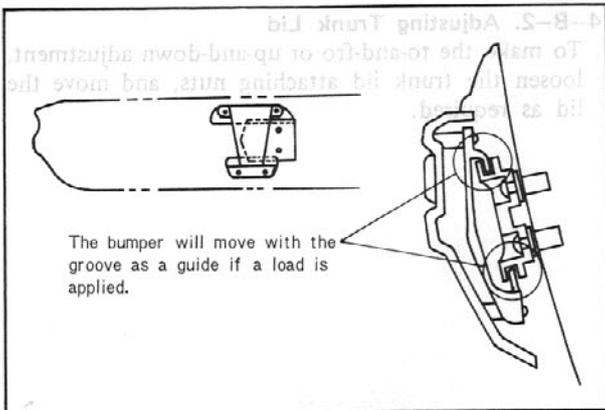


Fig. 14-9

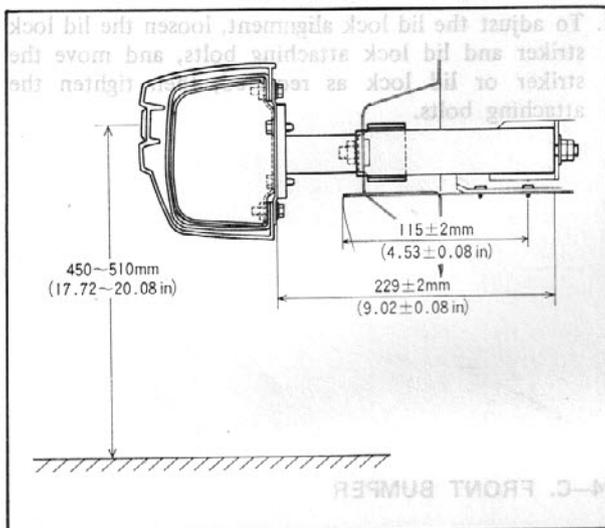


Fig. 14-10

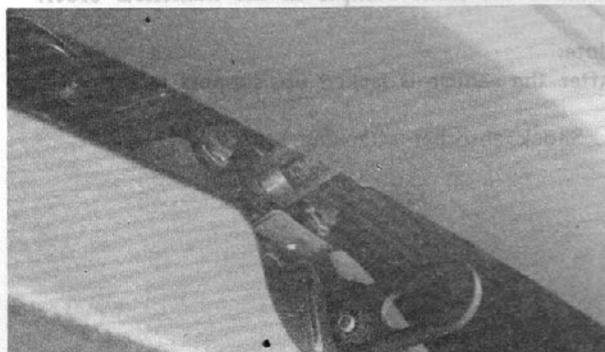


Fig. 14-11

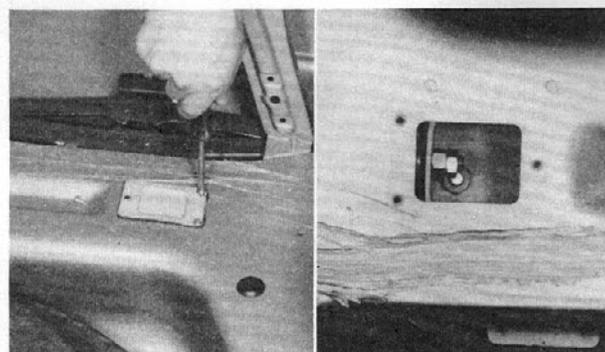


Fig. 14-12

14-C-2. Checking Shock Absorber

To check, measure the distance as shown in Fig. 14-10. This measurement should be specification.

14-C-3. Installing Front Bumper

Follow the removal procedures in the reverse order and align the bumper for good fit and appearance.

Check the slide groove for engagement.

- Confirm visually from below.
- Check the engagement by lifting the bumper.

Bumper height

- 1) Place vehicle on a level ground under curb weight conditions. Tires must be inflated to recommended pressure.
- 2) Measure the height of bumper above ground at two mounting locations as shown in figure.

14-D. REAR BUMPER

Note:

After the vehicle is jacked up, support it with stands.

1. Shock absorber attaching nuts.

2. Open the trunk lid.
3. Service hole cover attaching screws.
4. Shock absorber piston rod end attaching nuts.

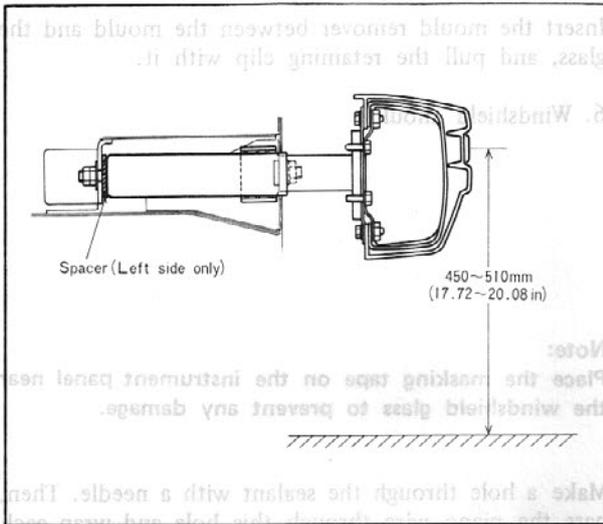


Fig. 14-13

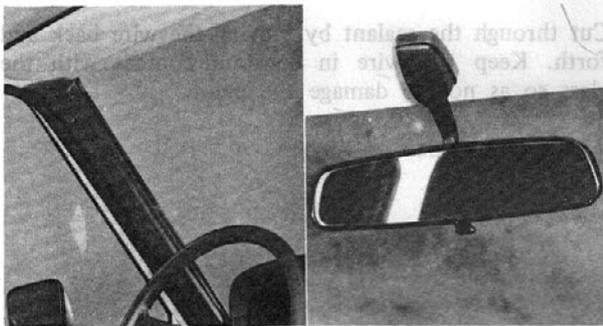


Fig. 14-14

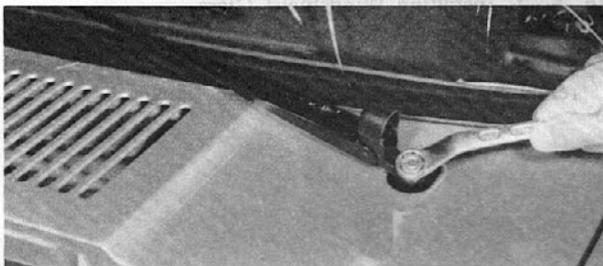


Fig. 14-15

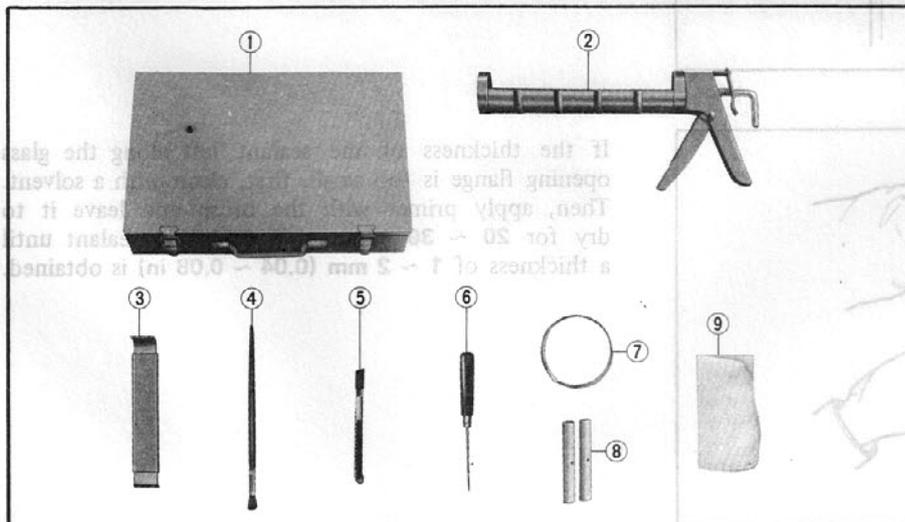


Fig. 14-16

1. Tool box
2. Sealant gun
3. Mould remover
4. Brush
5. Cutting knife
6. Needle
7. Piano wire
8. Bar
9. Gauze

14-D-2. Checking Shock Absorber

Check the shock absorber referring to Par. 14-C-2.

14-D-3. Installing Rear Bumper

Follow the removal procedures in the reverse order and align the bumper for good fit and appearance.

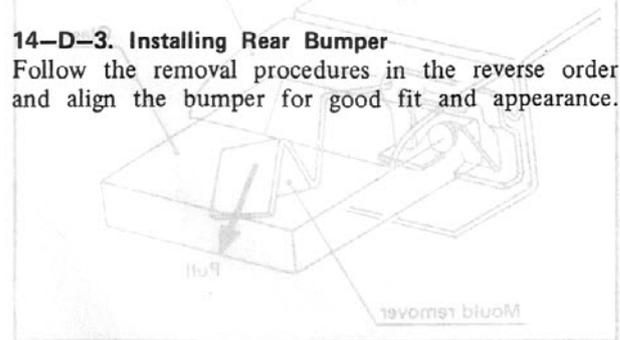


Fig. 14-17

14-E. WINDSHIELD GLASS

14-E-1. Removing Windshield Glass

For remove the windshield glass, use the tool set (49 0305 870A) as shown in Fig. 14-16.

Remove the windshield glass in the numerical order.

1. Rear view mirror and front pillar trims

2. Wiper arms and wiper blades
3. Cowl grille attaching screws and fasteners.
4. Disconnect the washer hoses from the washer nozzle.
5. Cowl grille

When removing the lower mould, remove the cowl grille and lower mould screws.

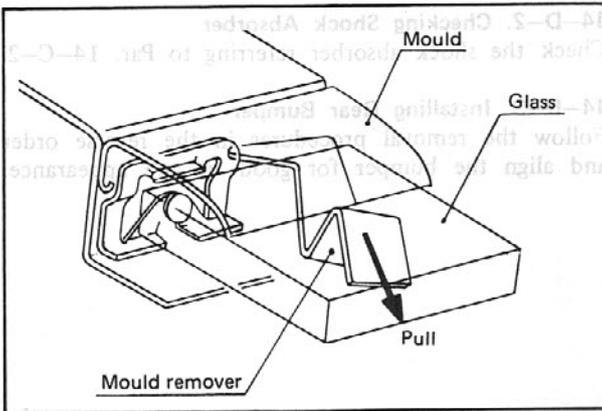


Fig. 14-17

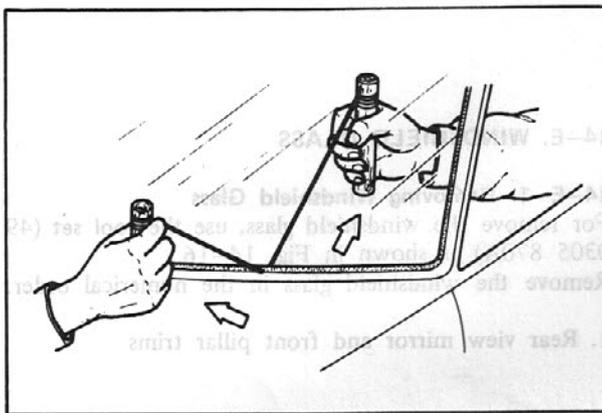


Fig. 14-18

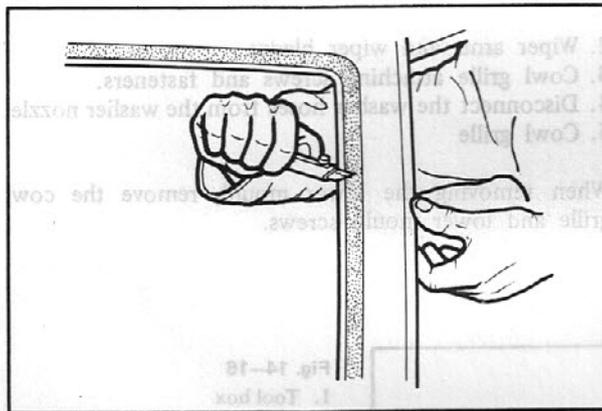


Fig. 14-19

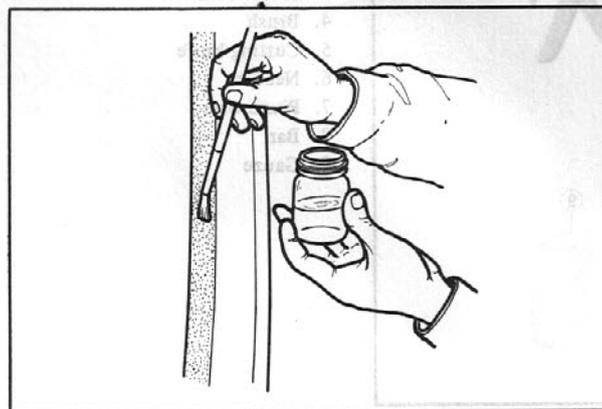
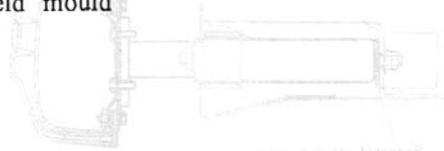


Fig. 14-20

Insert the mould remover between the mould and the glass, and pull the retaining clip with it.

6. Windshield mould



Note:

Place the masking tape on the instrument panel near the windshield glass to prevent any damage.

Make a hole through the sealant with a needle. Then, pass the piano wire through this hole and wrap each end round a bar.

Cut through the sealant by moving the wire back and forth. Keep the wire in constant contact with the glass so as not to damage the paint.

7. Windshield glass

14-E-2. Installing Windshield Glass

1. Using the cutting knife, cut the sealant off smoothly so that 1 ~ 2 mm (0.04 ~ 0.08 in) of the sealant remains along the glass opening flange.

If the thickness of the sealant left along the glass opening flange is too small, first, clean with a solvent. Then, apply primer with the brush and leave it to dry for 20 ~ 30 minutes. Then, apply sealant until a thickness of 1 ~ 2 mm (0.04 ~ 0.08 in) is obtained.

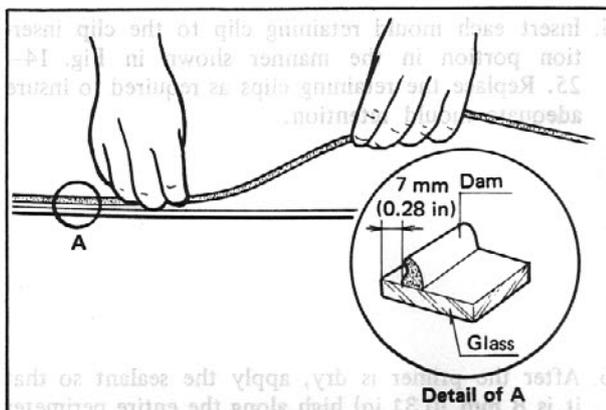


Fig. 14-21

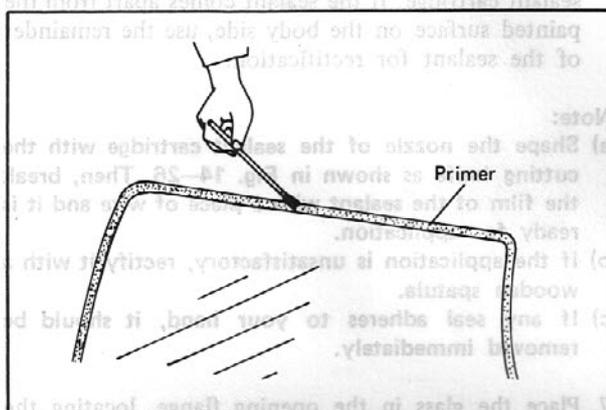


Fig. 14-22

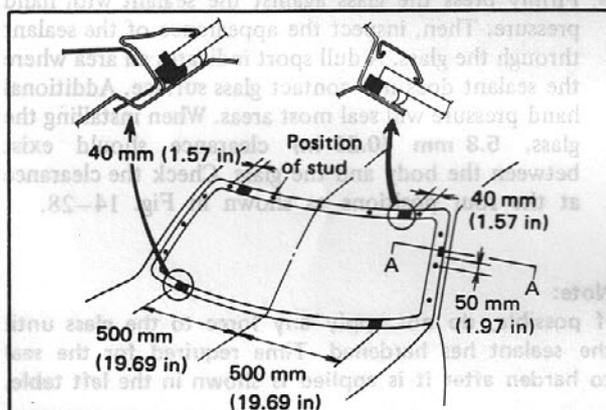


Fig. 14-23

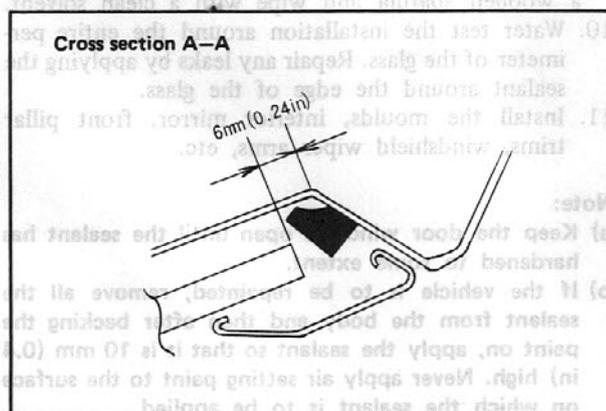


Fig. 14-24

2. Clean the glass thoroughly and bond the dam with bonding agent parallel to the edge of the glass at a position 7 mm (0.28 in) away from it. Bond the dam in the direction shown in Fig. 14-21.

Note:
Securely bond the dam so that it is straight and will not come apart.

3. Apply primer around the entire perimeter of the glass in the area that will contact the sealant. Clean the glass opening flange and apply primer to the entire perimeter of the sealant on the glass opening flange. Allow the primer to dry 30 minutes before installation of glass.

Note:

- a) Apply as thin the sealant coating as possible to the glass.
- b) Do not allow any dust, water, oil, etc. to get on the coating surface and also do not touch the coating surface with hand.

4. Bond each spacer to the glass opening flange with bonding agent. Fig. 14-23 shows the directions and positions of each spacer. There are two kinds of spacer.

No.	Part No.	Name of Part
1	8173 63 907	Spacer A
2	8167 70 447 (Sedan) 8173 70 447 (Hardtop)	Spacer B
3	0839 70 449	Spacer C

Although the spacer is bonded on both the right and the left hand sides of the windshield glass in Fig. 14-24, the spacer on only one side of the glass should be sufficient.

Summer (20°C or 68°F)	2 hours
Winter (5°C or 41°F)	24 hours

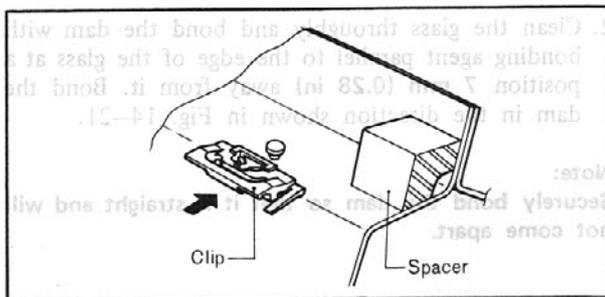


Fig. 14-25

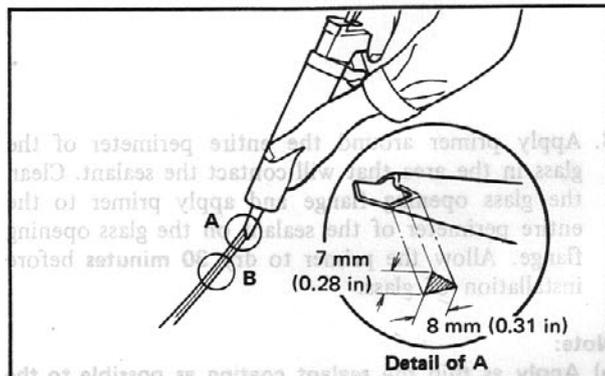


Fig. 14-26

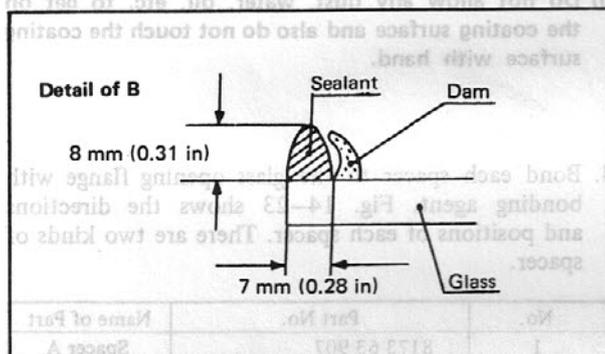


Fig. 14-27

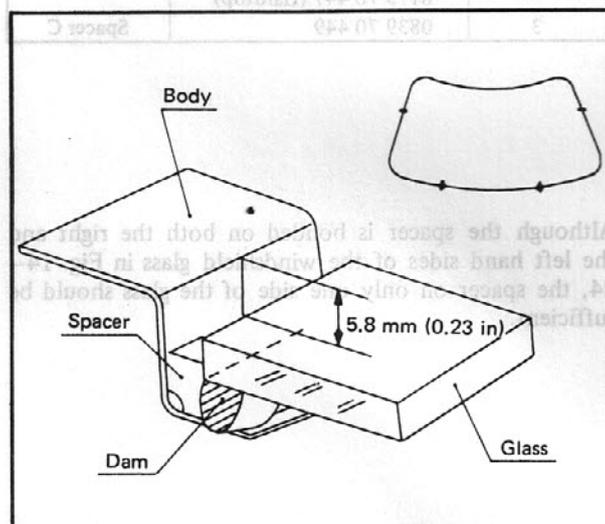
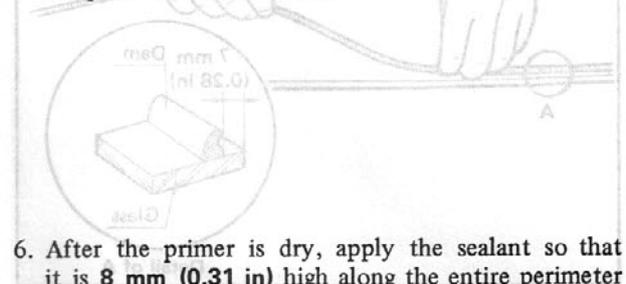


Fig. 14-28

Summer (20°C or 68°F)	5 hours
Winter (5°C or 41°F)	24 hours

5. Insert each mould retaining clip to the clip insertion portion in the manner shown in Fig. 14-25. Replace the retaining clips as required to insure adequate mould retention.



6. After the primer is dry, apply the sealant so that it is 8 mm (0.31 in) high along the entire perimeter of the glass with the sealant gun fitted with the sealant cartridge. If the sealant comes apart from the painted surface on the body side, use the remainder of the sealant for rectification.

Note:

- a) Shape the nozzle of the sealant cartridge with the cutting knife as shown in Fig. 14-26. Then, break the film of the sealant with a piece of wire and it is ready for application.
- b) If the application is unsatisfactory, rectify it with a wooden spatula.
- c) If any seal adheres to your hand, it should be removed immediately.

7. Place the glass in the opening flange, locating the best position for equal sealant contact.
8. Firmly press the glass against the sealant with hand pressure. Then, inspect the appearance of the sealant through the glass. A dull spot indicates an area where the sealant does not contact glass surface. Additional hand pressure will seal most areas. When installing the glass, 5.8 mm (0.23 in) clearance should exist between the body and the glass. Check the clearance at the four positions as shown in Fig. 14-28.

Note:

If possible, do not apply any force to the glass until the sealant has hardened. Time required for the seal to harden after it is applied is shown in the left table.

9. Remove any excess primer from the glass with a wooden spatula and wipe with a clean solvent.
10. Water test the installation around the entire perimeter of the glass. Repair any leaks by applying the sealant around the edge of the glass.
11. Install the moulds, interior mirror, front pillar trims, windshield wiper arms, etc.

Note:

- a) Keep the door windows open until the sealant has hardened to some extent.
- b) If the vehicle is to be repainted, remove all the sealant from the body and then after backing the paint on, apply the sealant so that it is 10 mm (0.4 in) high. Never apply air setting paint to the surface on which the sealant is to be applied.

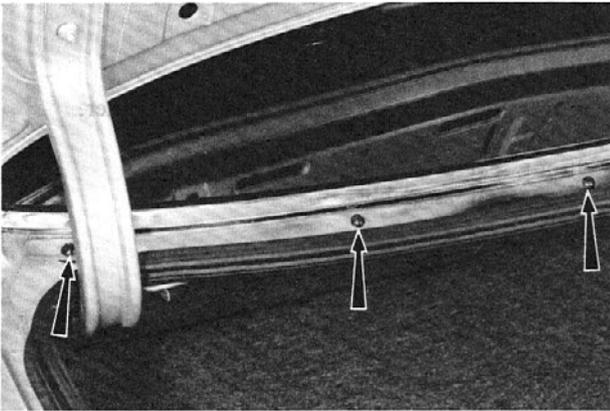


Fig. 14-29

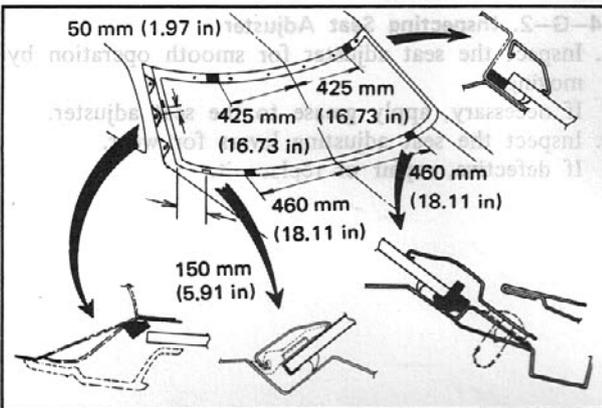


Fig. 14-30

Hardtop

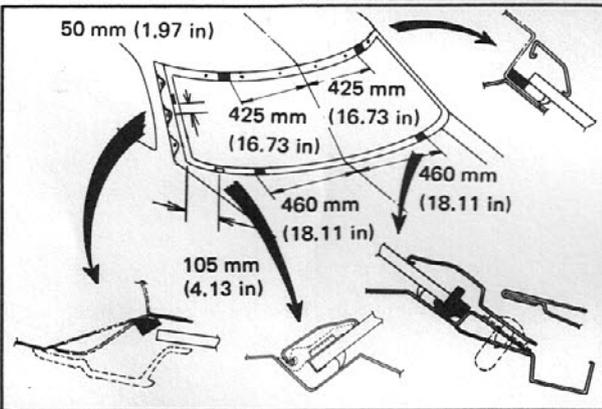


Fig. 14-31

Sedan

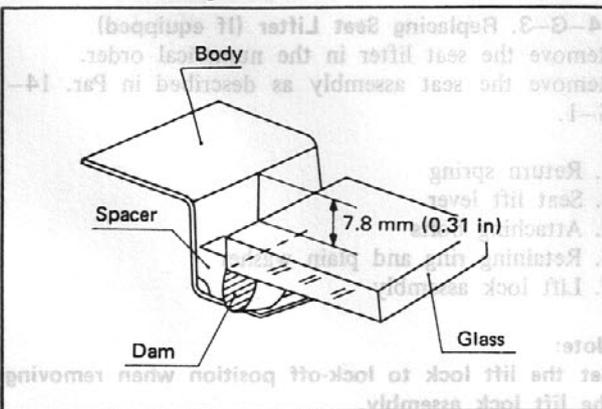


Fig. 14-32

14-F. REAR WINDOW GLASS

14-F-1. Replacing Rear Window Glass

To replace the rear window glass, see Par. 14-E and noting the following points.

1. Open the trunk lid.
2. When remove the lower mould, remove the lower mould supporting screws.
3. In case of a vehicle equipped with a rear window defroster, perform the works of disconnection and connection of the relevant wiring.
4. The directions and positions each spacer to be bonded are shown in Fig. 14-30 and 14-31.
5. When installing the glass, 7.8 mm (0.31 in) clearance should exist between the body and the glass. Check the clearance at the four portions shown in Fig. 14-32.

Fig. 14-29

Fig. 14-30

Fig. 14-31

Fig. 14-32

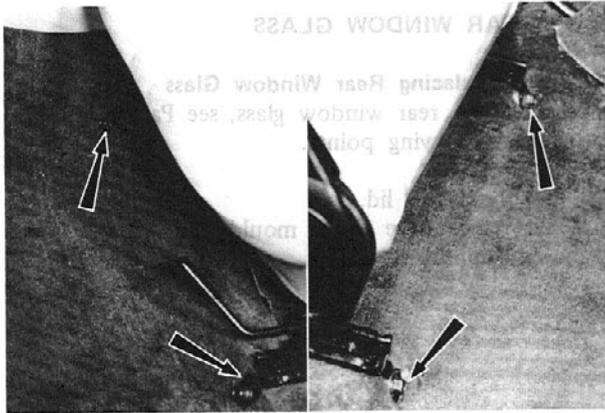


Fig. 14-33

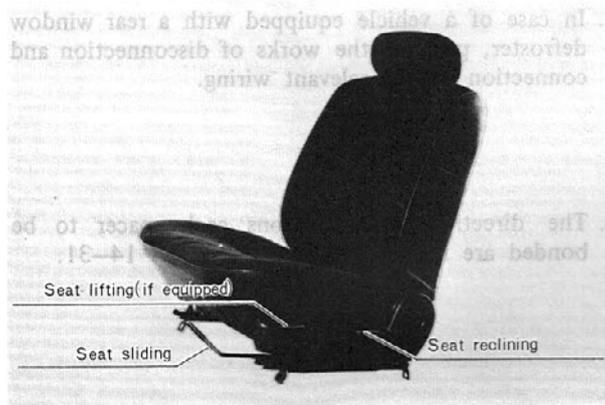


Fig. 14-34

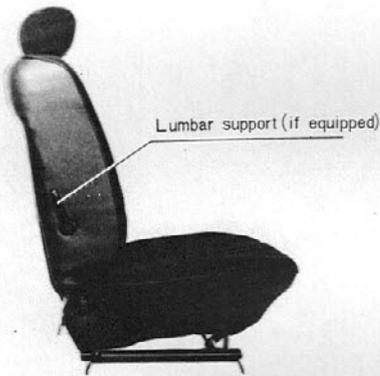


Fig. 14-35

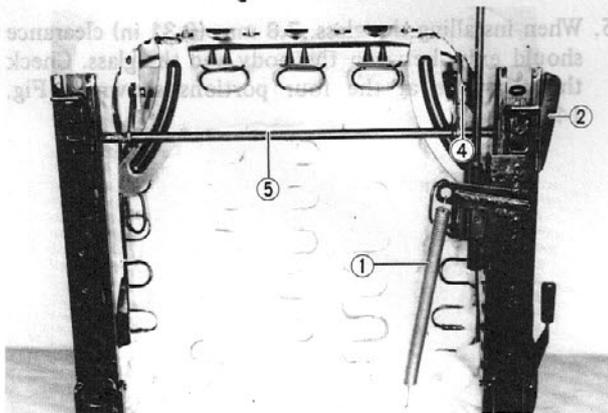


Fig. 14-36

14-G. FRONT SEAT

14-G-1. Replacing Front Seat

Remove the front seat in the numerical order.

1. Front seat attaching bolts
2. Front seat assembly

To install, reverse the removal procedure.

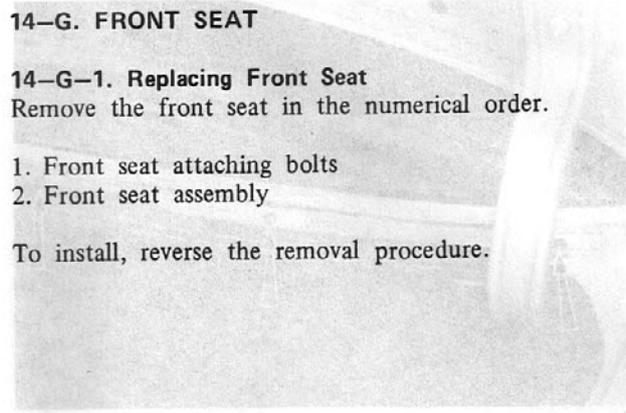


Fig. 14-32

14-G-2. Inspecting Seat Adjuster

1. Inspect the seat adjuster for smooth operation by moving.
If necessary, apply grease to the seat adjuster.
2. Inspect the seat adjusting levers for wear.
If defective, repair or replace it.

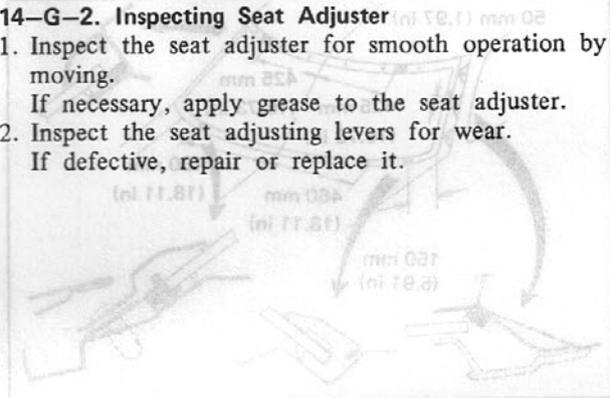


Fig. 14-30

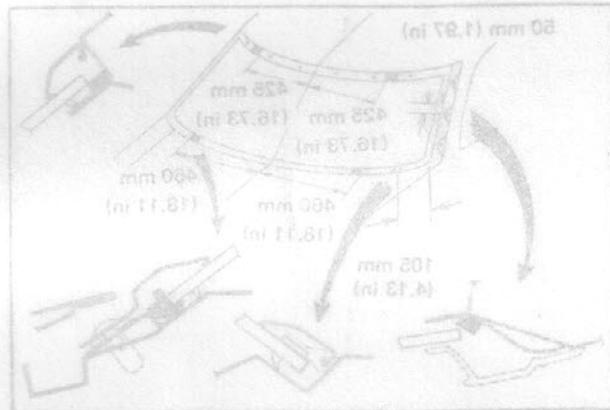


Fig. 14-31

14-G-3. Replacing Seat Lifter (If equipped)

Remove the seat lifter in the numerical order.

Remove the seat assembly as described in Par. 14-G-1.

1. Return spring
2. Seat lift lever
3. Attaching bolts
4. Retaining ring and plain washer
5. Lift lock assembly

Note:

Set the lift lock to lock-off position when removing the lift lock assembly.

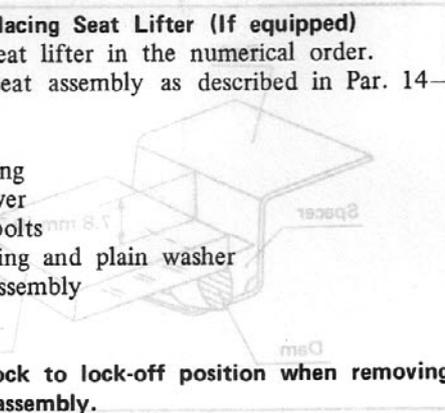


Fig. 14-33

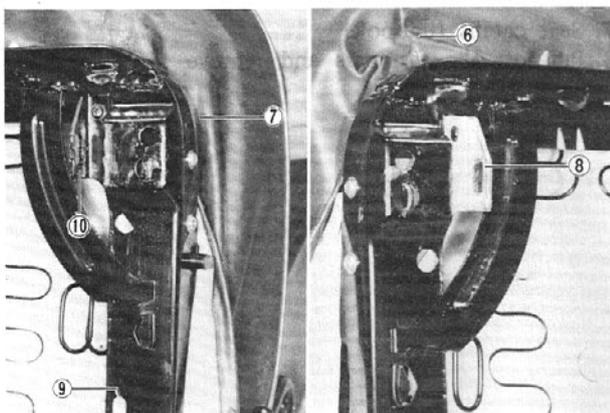


Fig. 14-37

- 6. Clips
- 7. Seat cushion trim
- 8. Lift bracket left
- 9. Lock spring
- 10. Lift lock bracket assembly

To install, reverse the removal procedure.

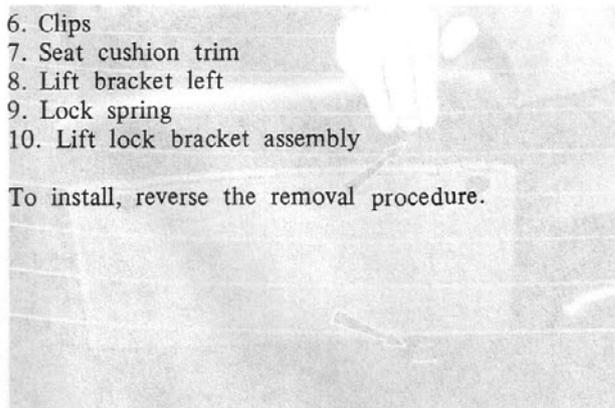


Fig. 14-37

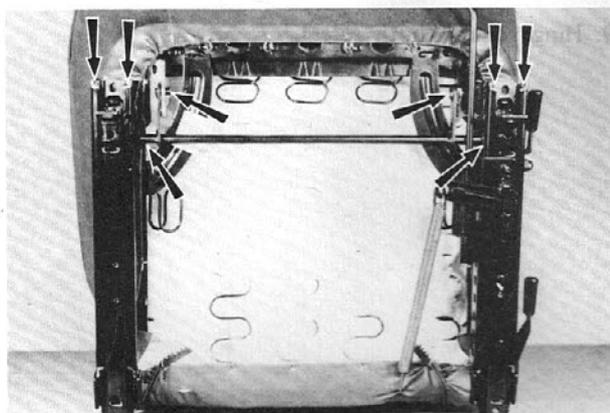


Fig. 14-38

Note:
Apply grease, as shown in Fig. 14-38.

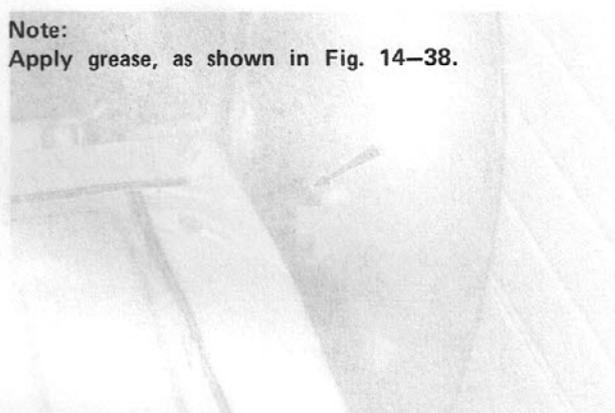


Fig. 14-38

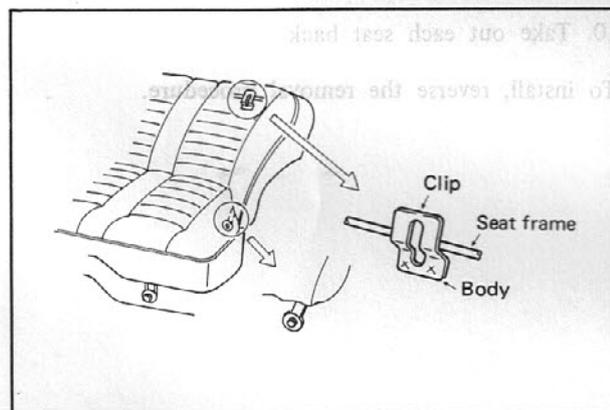


Fig. 14-39

14-H. REAR SEAT

14-H-1. Replacing Rear Seat

Remove the rear seat in the numerical order.

- 1. Seat cushion attaching bolts
- 2. Seat cushion
- 3. Seat back attaching bolts
- 4. Seat back

To install, reverse the removal procedure.

Install the rear seat back so that the seat frame fits into the clip of the body, as shown in Fig. 14-39.

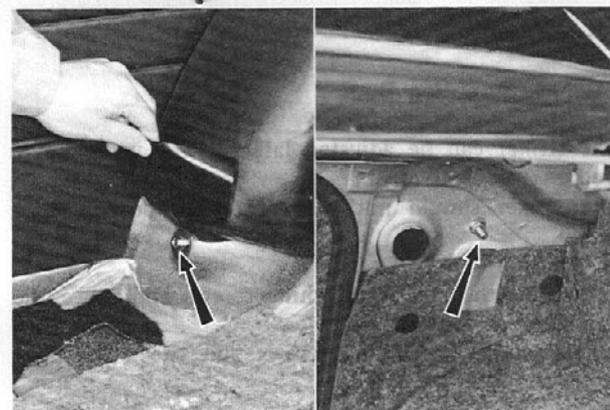


Fig. 14-40

Split Fold-down Rear Seat (If equipped)

- 1. Seat cushion attaching bolts
- 2. Seat cushion
- 3. Side seat back attaching bolts
- 4. Open the trunk lid
- 5. Side seat back attaching nuts
- 6. Side seat back

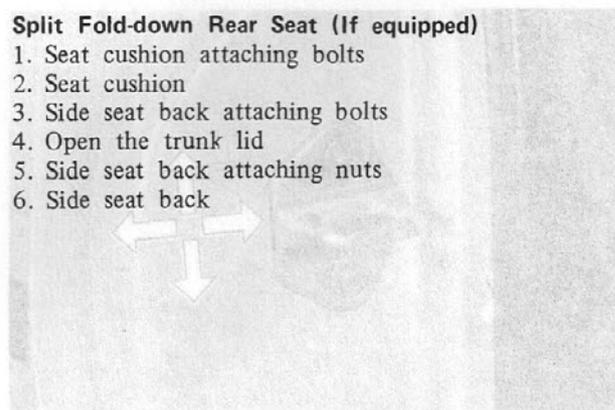


Fig. 14-40

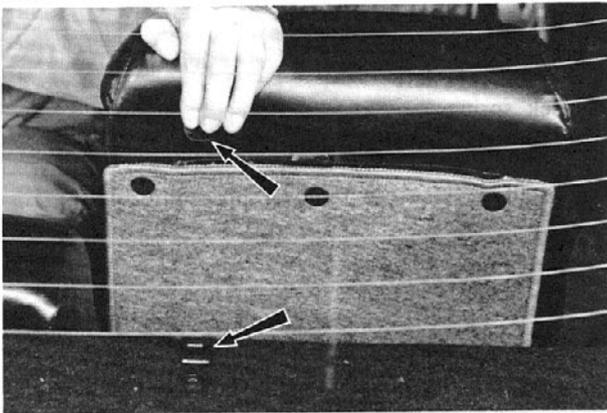


Fig. 14-41

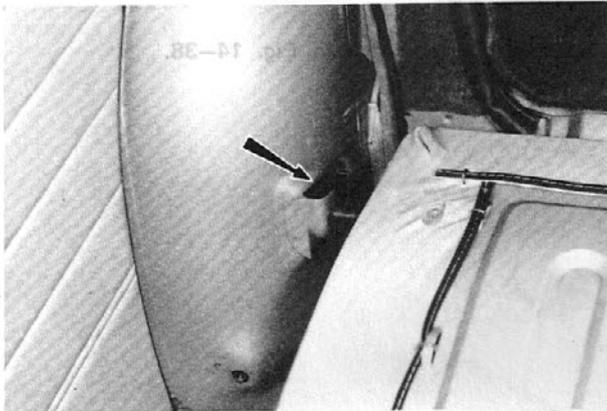


Fig. 14-42

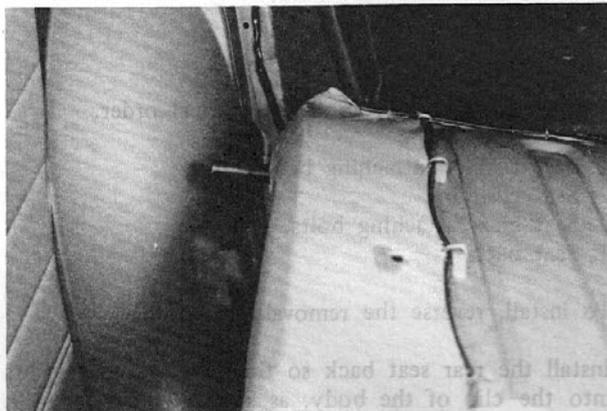


Fig. 14-43

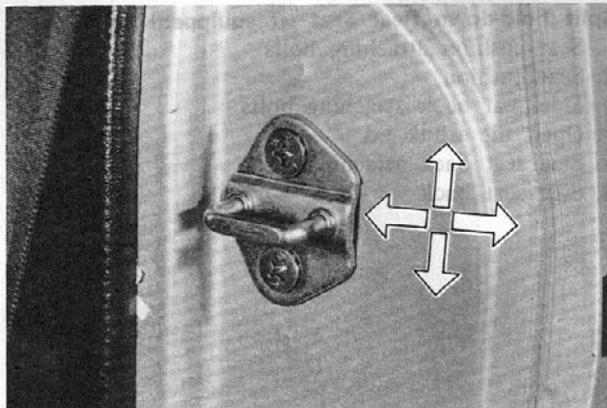


Fig. 14-44

7. Seat catches (unhook)
8. Pull off the fasteners and remove the floor mat.

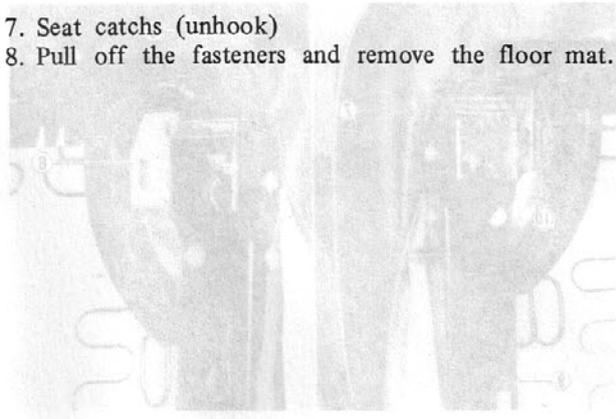


Fig. 14-37

9. Hinge bushes (both sides)



Fig. 14-38

10. Take out each seat back

To install, reverse the removal procedure.

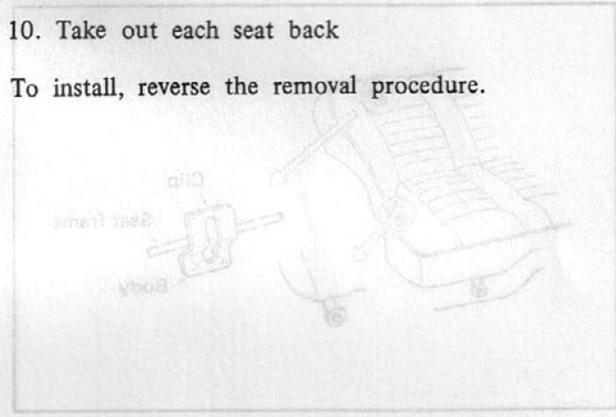


Fig. 14-39

14-I. DOOR

14-I-1. Adjusting Door Adjusting door lock striker

The striker can be adjusted laterally and vertically as well as fore and aft. The striker should not be adjusted to correct door sag.

1. Loosen the striker attaching screws and move the striker as required.
2. Tighten the attaching screws and check the door fit.

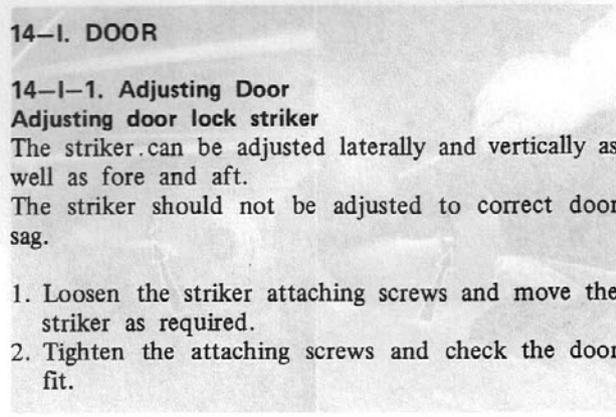


Fig. 14-40

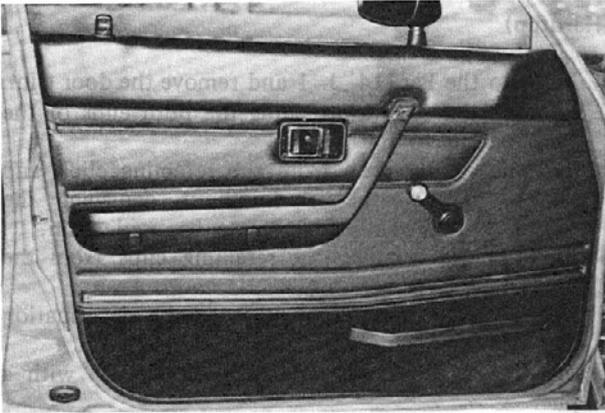


Fig. 14-45

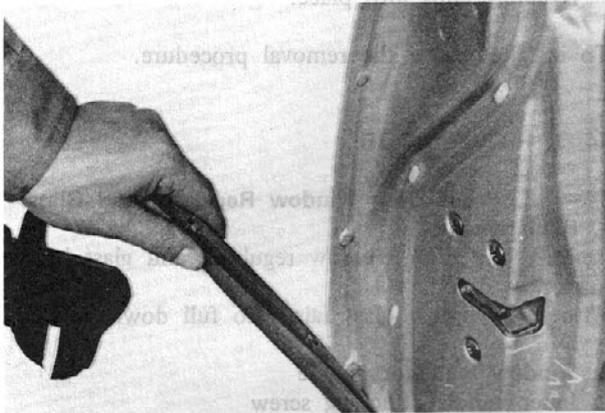


Fig. 14-46



Fig. 14-47

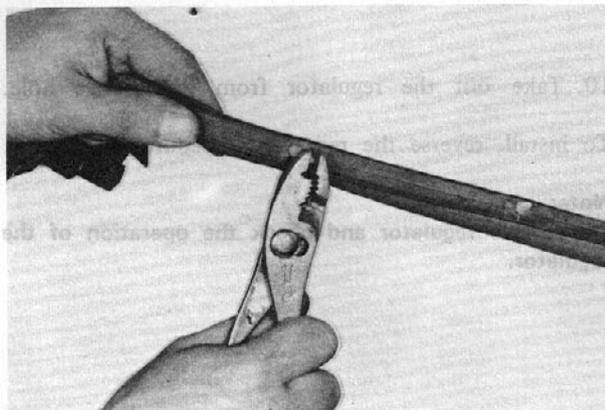


Fig. 14-48

14-1-2. Replacing Door Weatherstrip

Remove the door weatherstrip in the numerical order.

Sedan

1. Pull the weatherstrip from the retaining clips, and remove the weatherstrip without damaging the rubber if the weatherstrip is to be used again.

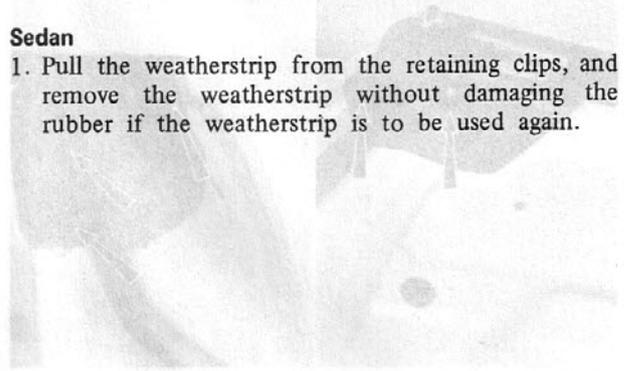


Fig. 14-49

2. Remove the weatherstrip retaining clips from the door.
3. Inspect the weatherstrip for crack, deformation and damage. If defective, replace it.



Fig. 14-50

4. Fit the retaining clips to the weatherstrip with a plier.



5. Position the weatherstrip to the door and fit the retaining clips into place.

To install, reverse the removal procedure.

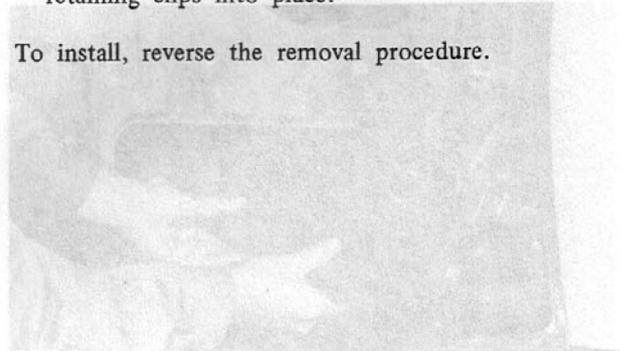


Fig. 14-52

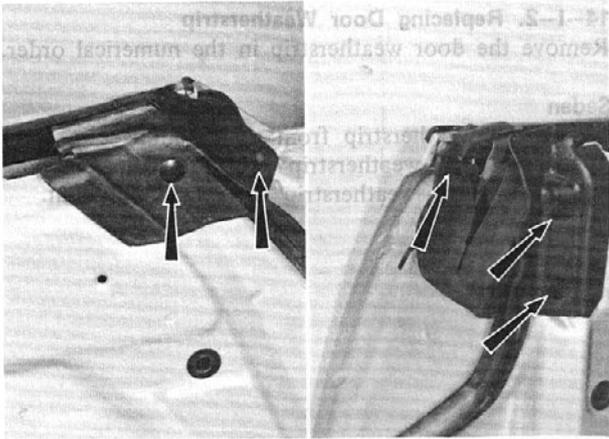


Fig. 14-49

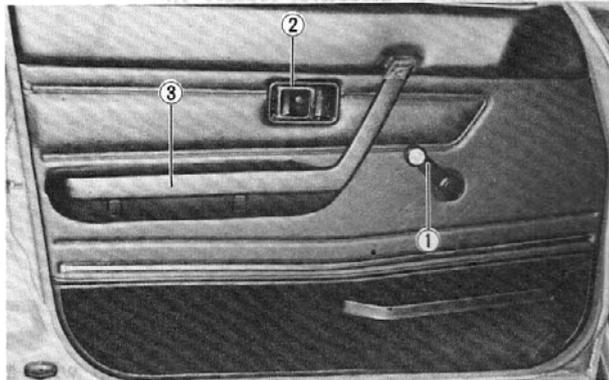


Fig. 14-50

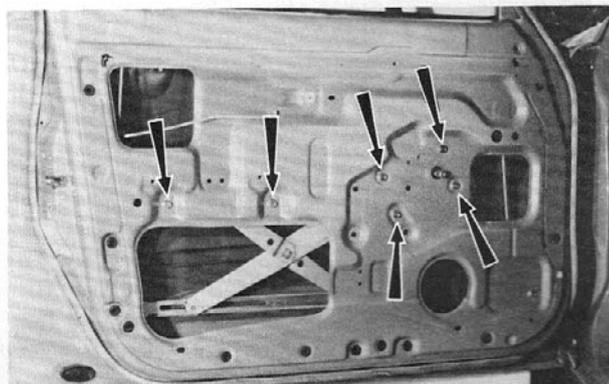


Fig. 14-51



Fig. 14-52

(Hardtop)

1. Refer to the Par. 14-J-1 and remove the door trim.
2. Remove the screws attaching the both ends of the weatherstrip to the door.
3. Pull the weatherstrip from the retaining clips, and remove the weatherstrip without damaging the rubber if the weatherstrip is to be used again.
4. Remove the weatherstrip retaining clips from the door.
5. Inspect the weatherstrip for crack, deformation and damage. If defective, replace it.
6. Fit the retaining clips to the weatherstrip with a plier.
7. Position the weatherstrip to the door and fit the retaining clips into place.

To install, reverse the removal procedure.

14-J. FRONT DOOR

14-J-1. Front Door Window Regulator and Glass

a. Replacement

Remove the door window regulator and glass in the numerical order.

With the window glass raised to full down position.

1. Window regulator handle
2. Inner handle attaching screw
3. Arm rest
4. Door trim
5. Door screen
6. Glass stopper (Hardtop only)
7. Weatherstrip (inner and outer)
8. Door glass attaching bolts and nuts
9. Remove the window glass assembly from the regulator and take it upward.

10. Take out the regulator from the service hole.

To install, reverse the removal procedure.

Note:

Adjust the regulator and check the operation of the regulator.

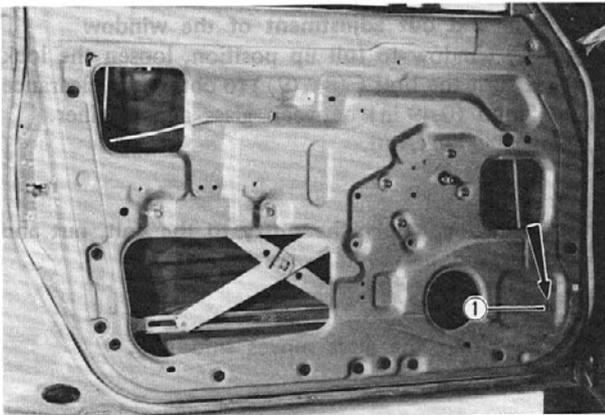


Fig. 14-53

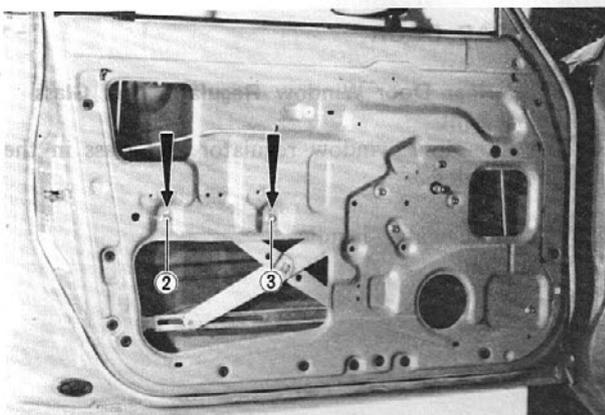


Fig. 14-54

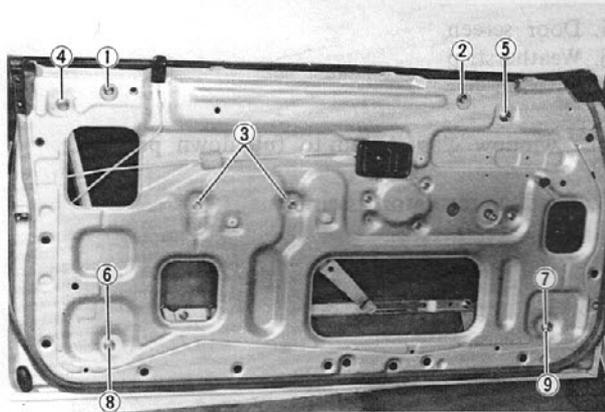


Fig. 14-55

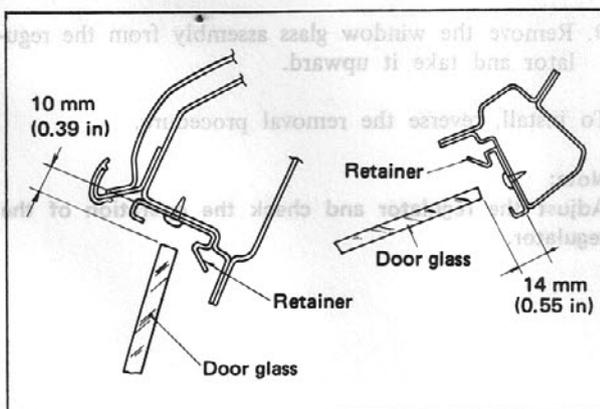


Fig. 14-56

b. Adjustment

Sedan

Check the window glass operation.

If the glass is loose, adjust it by loosening the bolt (1).

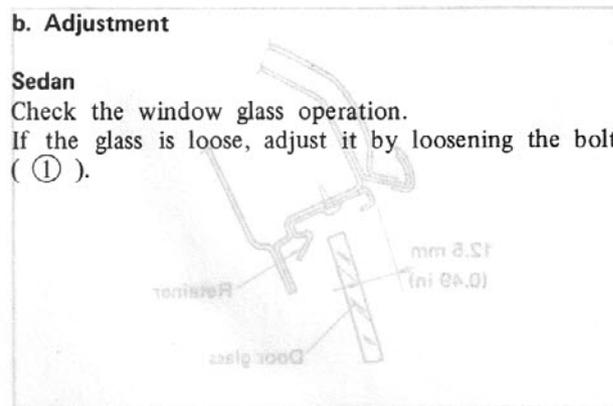


Fig. 14-57

a) Horizontal adjustment of the window

Loosen the regulator guide bolts (2, 3) and make the horizontal adjustment of the glass by moving the regulator guide up or down. And tighten the regulator guide bolts.

Note:

Make sure that the glass moves smoothly.

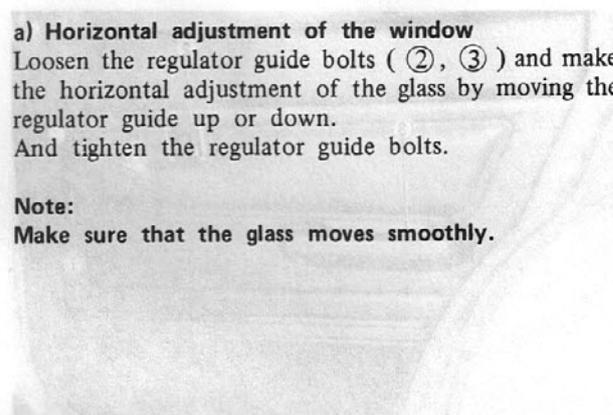


Fig. 14-58

Hardtop

Remove the weatherstrip (Body side)

a) Horizontal adjustment of the window

Loosen the regulator guide bolts (3) and make the horizontal adjustment of the glass by moving the regulator guide up or down. And tighten the regulator guide bolts. Make sure that the regulator guide (3) is parallel with the standard line.

Note:

Make sure that the glass moves smoothly.

b) Vertical adjustment of the window

Raise the window to full up position, adjust the up stoppers (1, 2).

Note:

Make sure that the regulator touches both up stoppers. The clearance between the top of the glass and weatherstrip retainer is 10 mm (0.39 in).

c) The fore and aft adjustment of the window

Raise the window to full up position. Adjust the following clearance by adjusting the bolts (4, 5) and the lock nuts (6, 7).

Note:

Make sure that the glass does not play back and forth. The clearance between the glass and weatherstrip retainer is 14 mm (0.55 in).

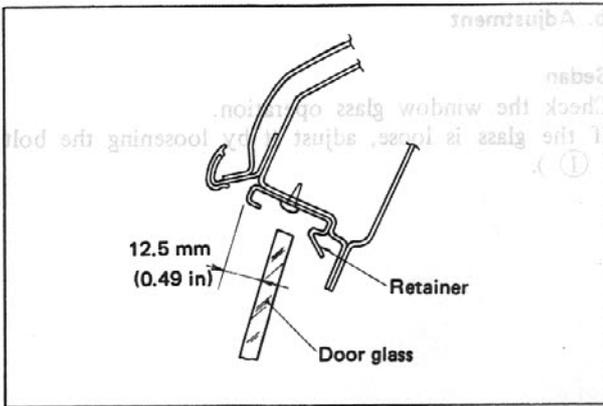


Fig. 14-57

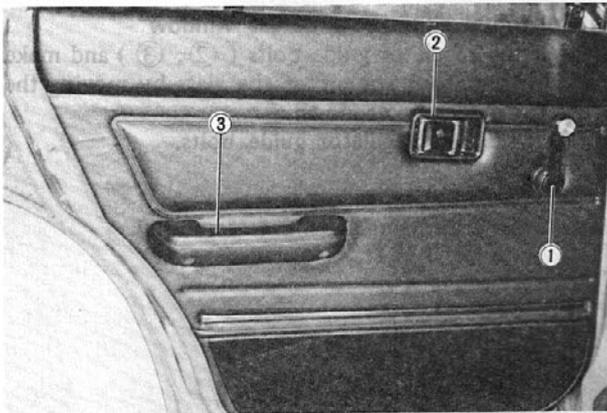


Fig. 14-58

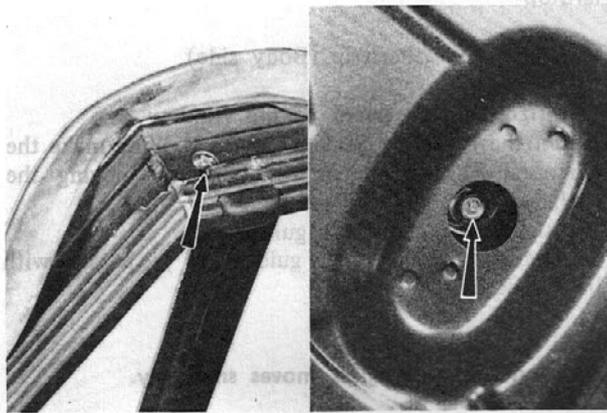


Fig. 14-59



Fig. 14-60

d) **The in and out adjustment of the window**
 Raise the window to full up position, loosen the lock nut and turn the bolt (⑧, ⑨) to obtain the clearance of 12.5 mm (0.49 in) between glass and retainer.
 Tighten the lock nut.

Note:
 After adjusting, apply the putty to the bolt, nut and long hole and paste the watershield.

Note:
 Make sure that the glass moves smoothly.

14-K. REAR DOOR

14-K-1. Rear Door Window Regulator and Glass
 a. Replacement

Remove the door window regulator and glass in the numerical order.

1. Window regulator handle
2. Inner handle
3. Arm rest
4. Door trim

5. Door screen
6. Weatherstrip
7. Division bar

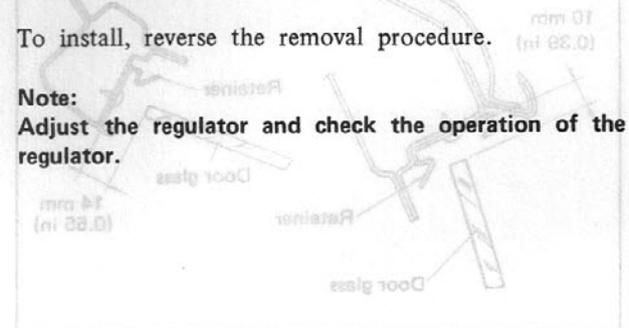
The window glass raised to full down position.

8. Window regulator assembly

9. Remove the window glass assembly from the regulator and take it upward.

To install, reverse the removal procedure.

Note:
 Adjust the regulator and check the operation of the regulator.



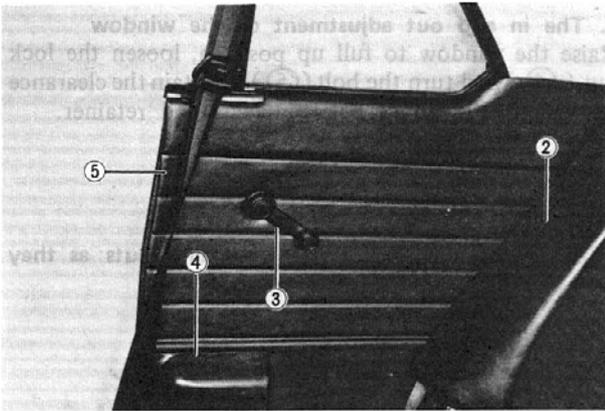


Fig. 14-61

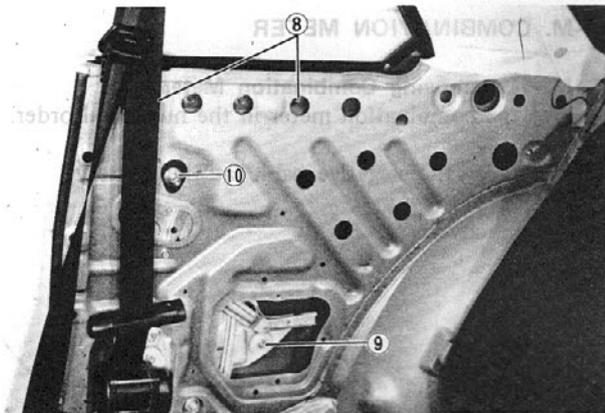


Fig. 14-62

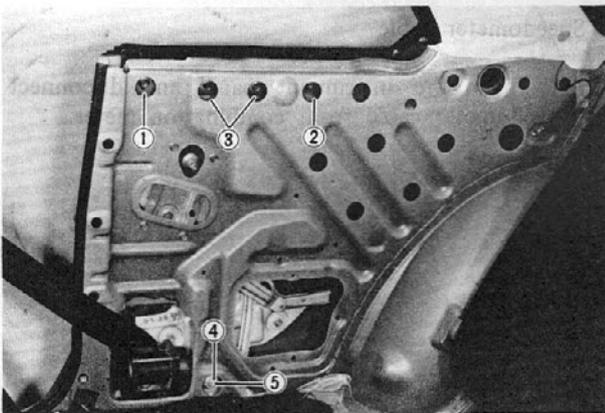


Fig. 14-63

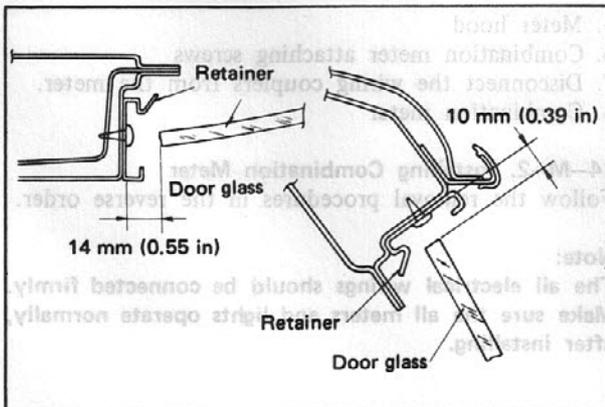


Fig. 14-64

14-L. QUARTER WINDOW (Hardtop)

14-L-1. Removing Quarter Window Regulator and Glass

Remove the quarter window regulator and glass in the numerical order.

1. Seat cushion
2. Side seat back
3. Regulator handle
4. Seat belt retractor cover
5. Quarter trim

6. Screen
7. Weatherstrip
8. Up stopper
9. Glass guide attaching bolts

Remove the window glass assembly from the regulator and take it upward.

10. Window regulator assembly

To install, reverse the removal procedure.

Note:

Adjust the regulator and check the operation of the regulator.

14-L-2. Quarter Window Adjustment

Remove the weatherstrip (Body side)

a. Vertical adjustment of the window

Raise the window glass to full up position and adjust the up stoppers (①, ②) so that the clearance between the top of the glass and weatherstrip retainer is 10 mm (0.39 in).

Note:

Make sure that the regulator holder touches both up stoppers.

Lower the glass and check to see that glass holder slides smoothly on the glass guide.

If the glass holder does not slide, loosen the adjusting bolts (③) and lock nut (④).

Move the regulator guide fore and aft until the glass holder slides smoothly.

Tighten the lock nut.

b. Horizontal adjustment of the window

Raise the window glass to full up position.

Adjust the following clearance by adjusting the bolts (③) and the lock nut (④).

Note:

Make sure that the glass moves smoothly.

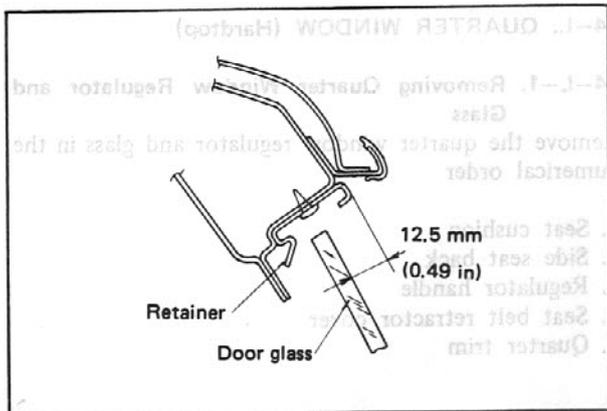


Fig. 14-65

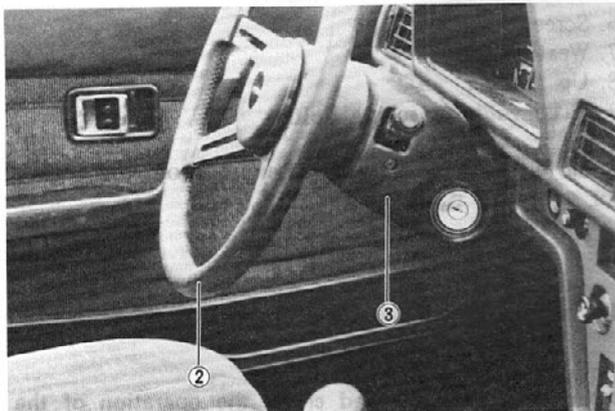


Fig. 14-66

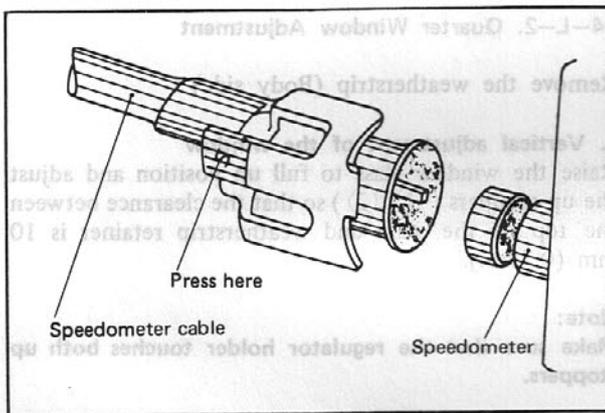


Fig. 14-67



Fig. 14-68

c. The in and out adjustment of the window
 Raise the window to full up position, loosen the lock nut (4) and turn the bolt (5) to obtain the clearance of 12.5 mm (0.49 in) between glass and retainer.

Tighten the lock nut.

Note:

After adjustment, putty the bolts and nuts as they were before.

Note:

Make sure that the glass moves smoothly.

14-M. COMBINATION METER

14-M-1. Removing Combination Meter

Remove the combination meter in the numerical order.

1. Disconnect the negative cable at the battery.
2. Steering wheel
3. Column cover

4. Speedometer cable

Reach under the instrument panel and disconnect the speedometer cable from combination meter.

5. Meter hood
6. Combination meter attaching screws
7. Disconnect the wiring couplers from the meter.
8. Combination meter

14-M-2. Installing Combination Meter

Follow the removal procedures in the reverse order.

Note:

The all electrical wirings should be connected firmly. Make sure the all meters and lights operate normally, after installing.



Fig. 14-69

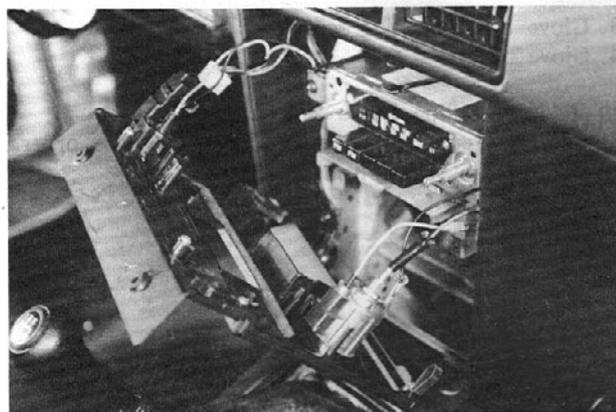


Fig. 14-70



Fig. 14-71

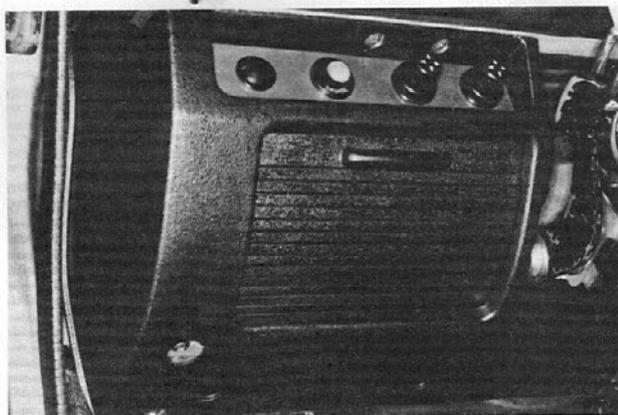


Fig. 14-72

14-N. CENTER PANEL

14-N-1. Removing Center Panel

Remove the center panel in the numerical order.

1. Disconnect the negative cable at the battery.
2. Panel control switch
3. Radio switch knob
4. Heater control lever knob
5. Fan control switch knob

6. Center panel attaching screws

Note:

Pull the center panel assembly rearward by about 20 cm (8 in), then disconnect the whole of the electrical leads from the center panel assembly.

7. Center panel assembly.

14-N-2. Installing Center Panel

Follow the removal procedures in the reverse order.

14-O. SWITCH PANEL

14-O-1. Removing Switch Panel

Remove the switch panel in the numerical order.

1. Disconnect the negative cable at the battery
2. Steering wheel
3. Column cover
4. Remote control switch
5. Cruise control switch

6. Switch panel attaching screws
7. Disconnect the wiring couplers from the switch panel.
8. Switch panel assembly

14-O-2. Installing Switch Panel

Follow the removal procedures in the reverse order.

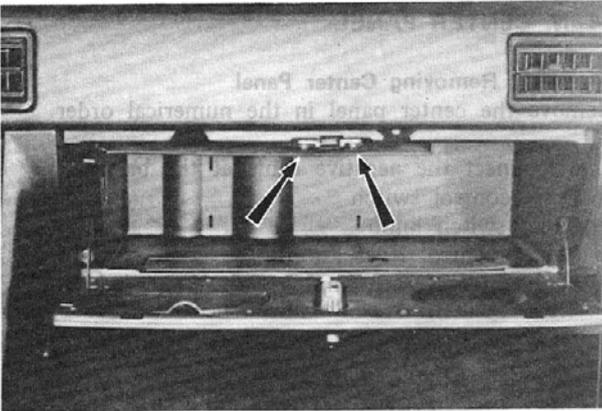


Fig. 14-73

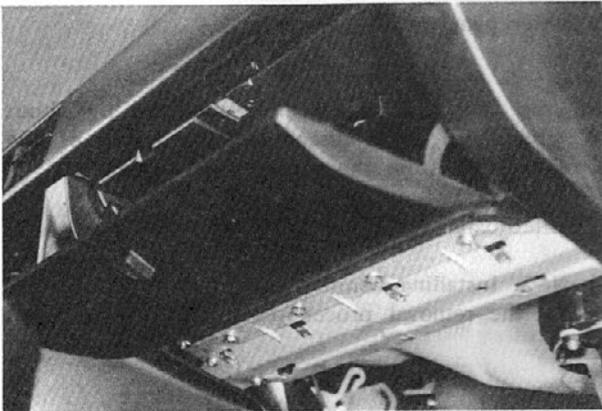


Fig. 14-74

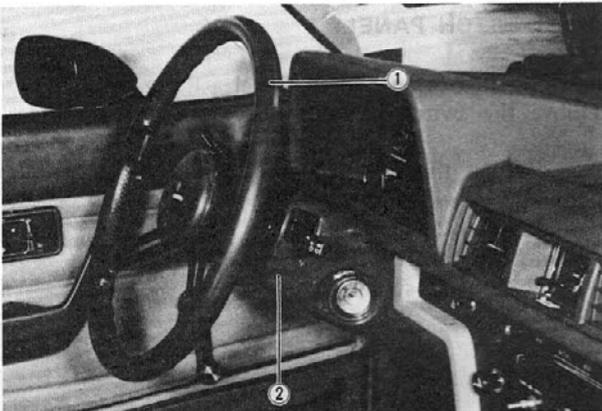


Fig. 14-75

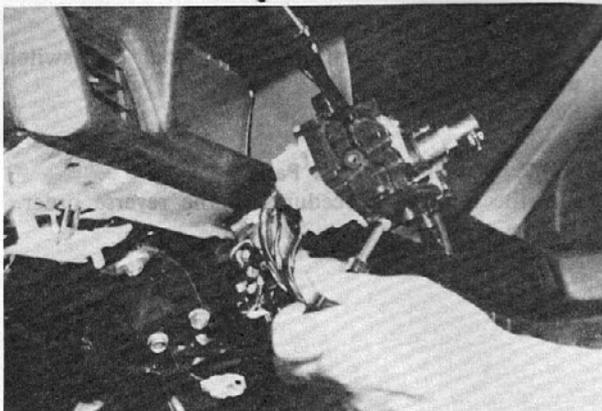


Fig. 14-76

14-P. GLOVE BOX

14-P-1. Removing Glove Box

Remove the glove box in the numerical order.

1. Glove lid lock striker attaching screws
2. Under cover

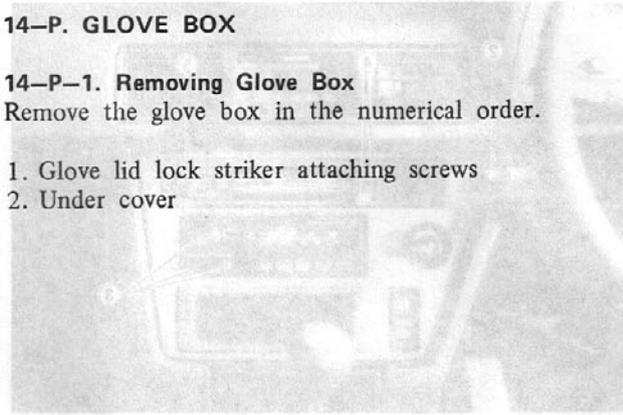


Fig. 14-73

3. Glove box attaching screws
4. Glove box

14-P-2. Installing Glove Box

Follow the removal procedures in the reverse order. Adjust the glove box if necessary.

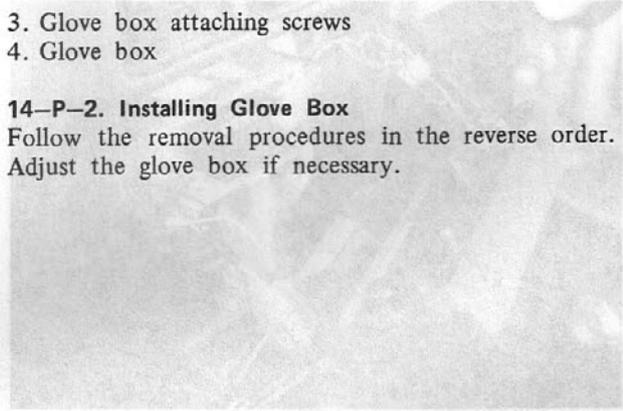


Fig. 14-74

14-Q. INSTRUMENT PANEL

14-Q-1. Removing Instrument Panel Assembly

Remove the instrument panel assembly in the numerical order.

1. Disconnect the negative cable at the battery.
2. Steering wheel
3. Column cover

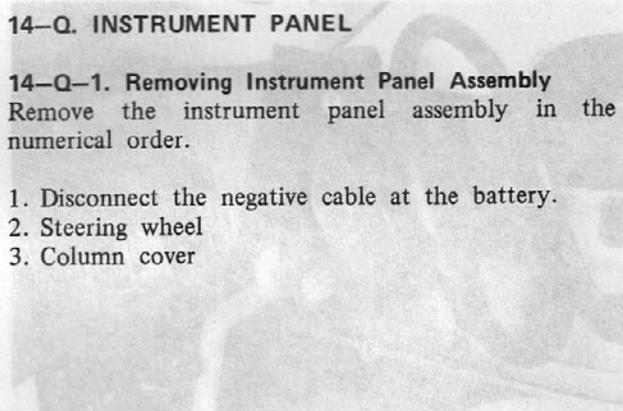


Fig. 14-75

4. Combination switch
5. Steering shaft attaching bolts
6. Combination meter
7. Glove box (See Par 14-P-1)
8. Switch panel (See Par 14-O-1)
9. Center panel (See Par 14-N-1)
10. Rear console
11. Center console
12. Air duct

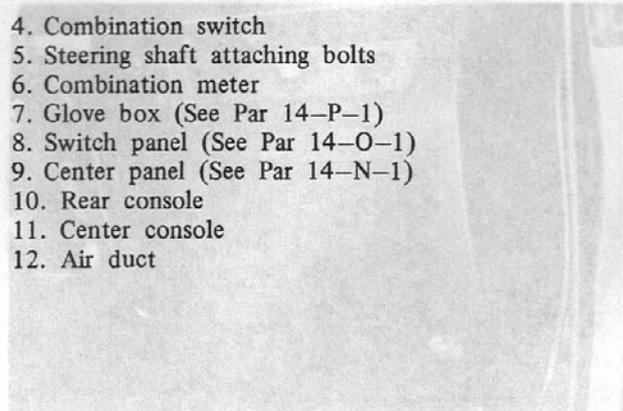


Fig. 14-76

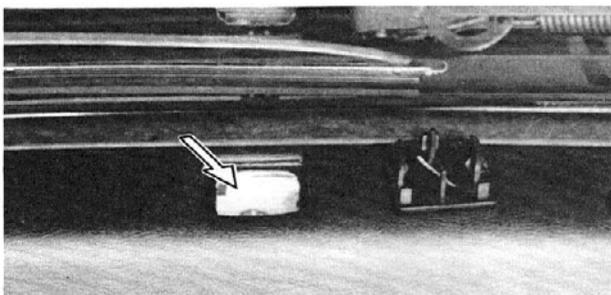


Fig. 14-77

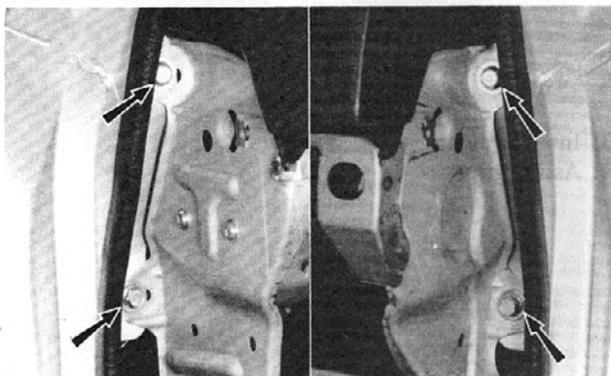


Fig. 14-78

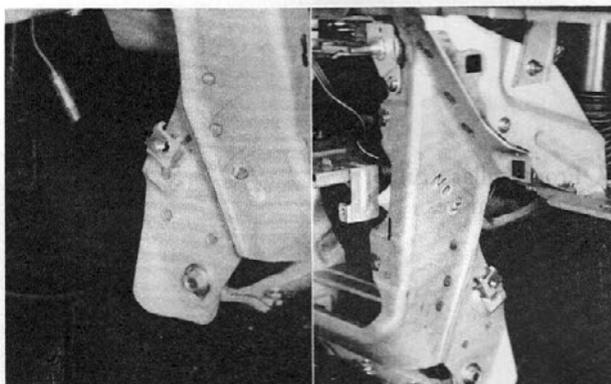


Fig. 14-79

13. Upper garnish attaching screw

14. Instrument panel attaching bolts

15. Pull the instrument panel assembly rearward by about 20 cm (6 in), then disconnect the whole of the electrical leads from the instrument panel assembly.

16. Instrument panel assembly

14-Q-2. Installing Instrument Panel Assembly

Follow the removal procedures in the reverse order.

Note:

- a) The all electrical wirings should be connected firmly. Make sure the all meters and lights operate normally, after installing.
- b) When reinstall the defroster hose, make sure that the hose is properly fitted and fix the bottom hose with fastener.

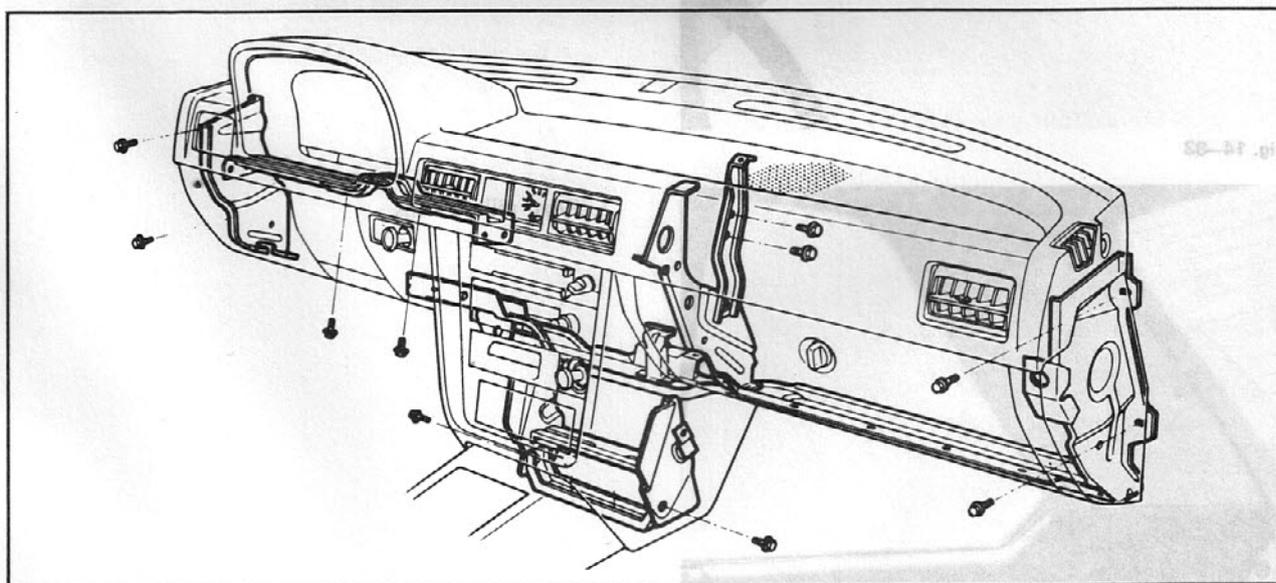


Fig. 14-80

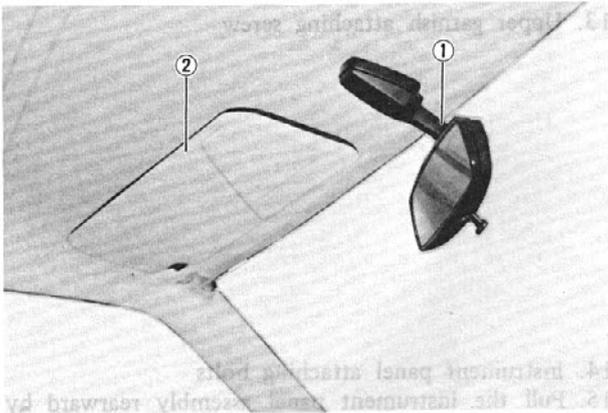


Fig. 14-81

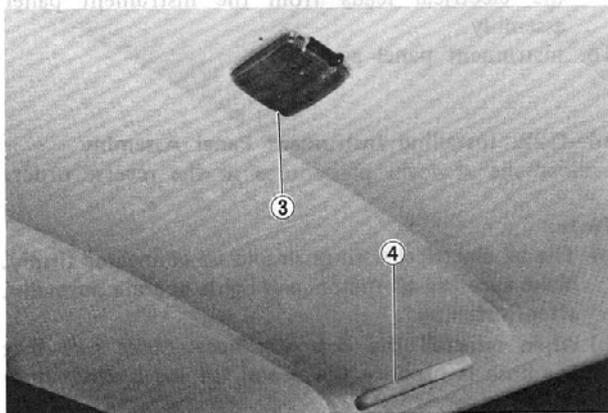


Fig. 14-82

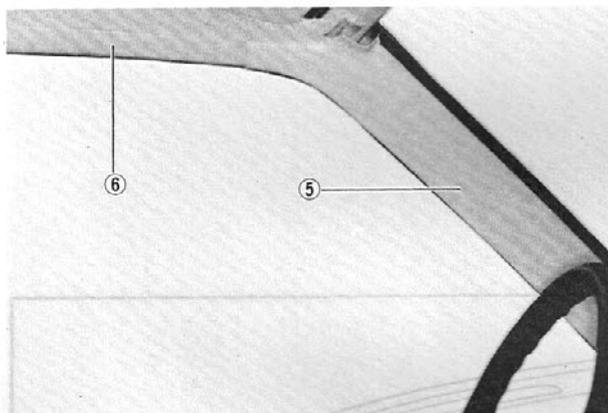


Fig. 14-83

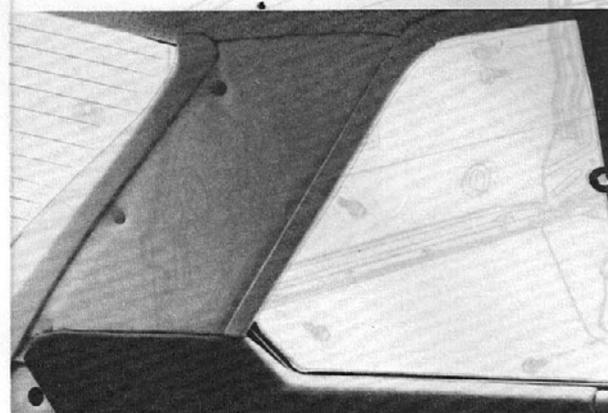


Fig. 14-84

14-R. TOP CEILING (full roof)

14-R-1. Removing Top Ceiling

Remove the top ceiling in the numerical order.

1. Rear view mirror
2. Sun visors

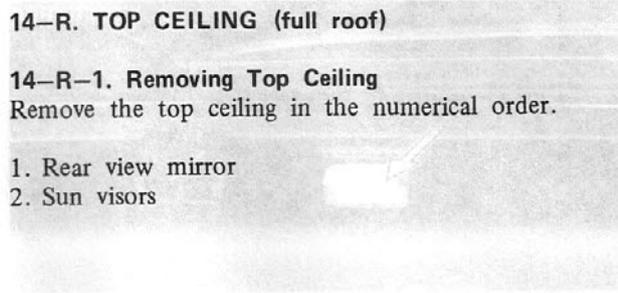
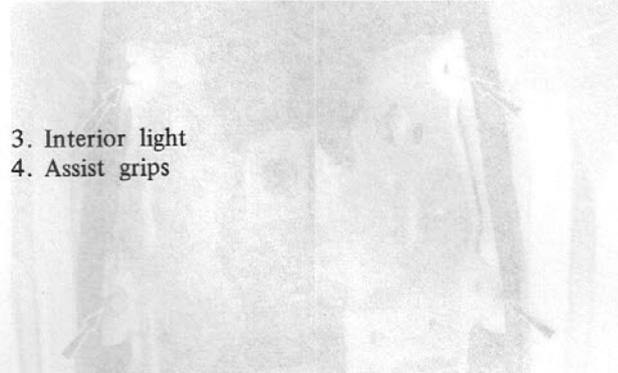
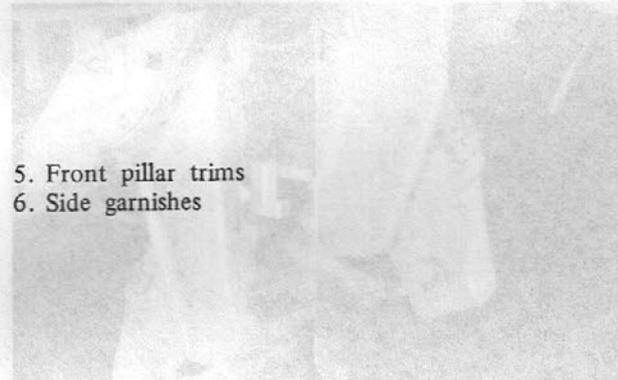


Fig. 14-77



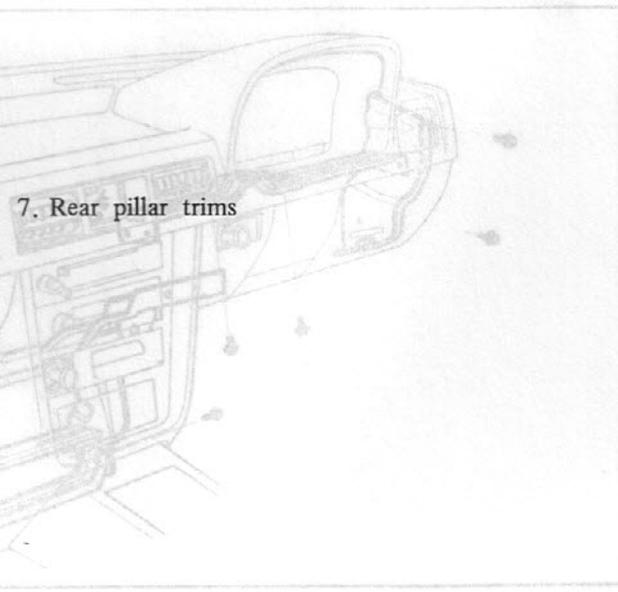
3. Interior light
4. Assist grips

Fig. 14-78



5. Front pillar trims
6. Side garnishes

Fig. 14-79



7. Rear pillar trims

Fig. 14-80

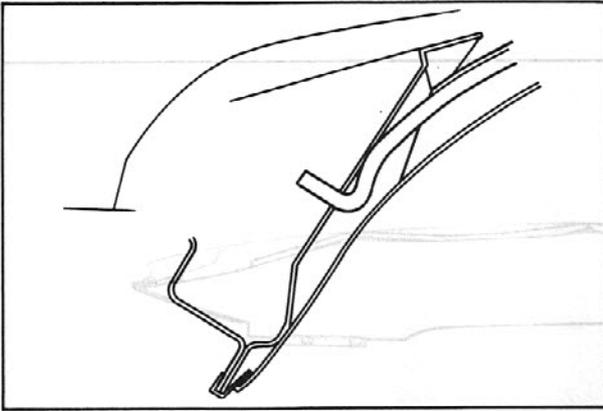


Fig. 14-85

8. Remove the polyethylene plates on both sides of top ceiling.

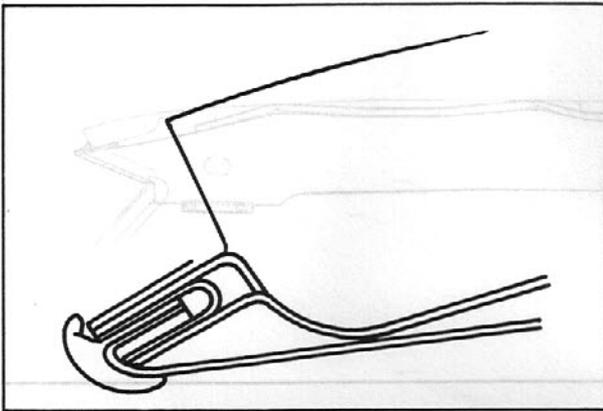


Fig. 14-86

9. Remove the polyethylene plates of the top ceiling from the inserting points of the body.

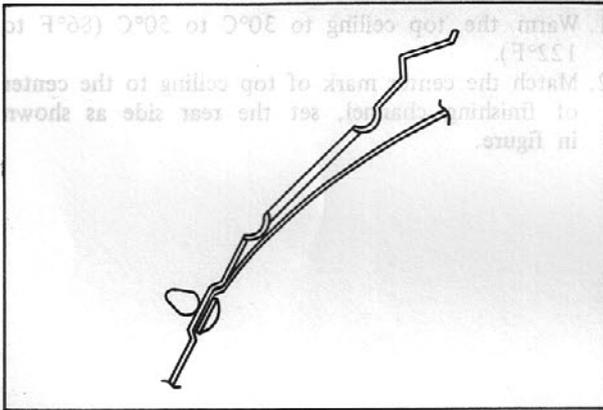


Fig. 14-87

10. Remove the top ceiling by removing the fasteners on the rear both side.

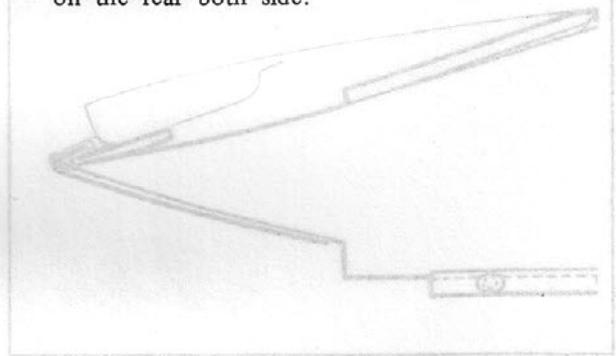


Fig. 14-88

Fig. 14-88

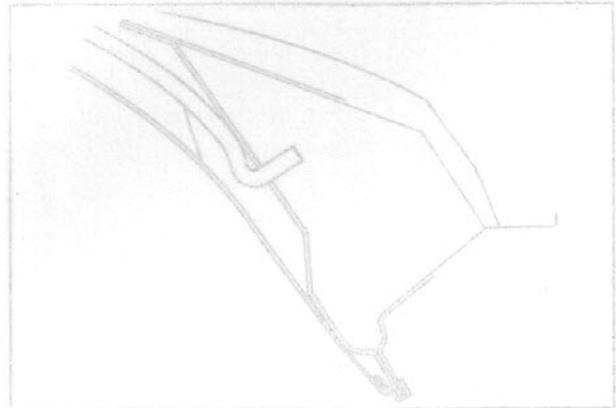


Fig. 14-89

3. Insert both ends of the lating wire to their respective positions in successive order beginning from the rear. When doing so, be careful that the wires do not swing down.

14-R-2. Installing Top Ceiling

8. Remove the polyethylene top ceiling

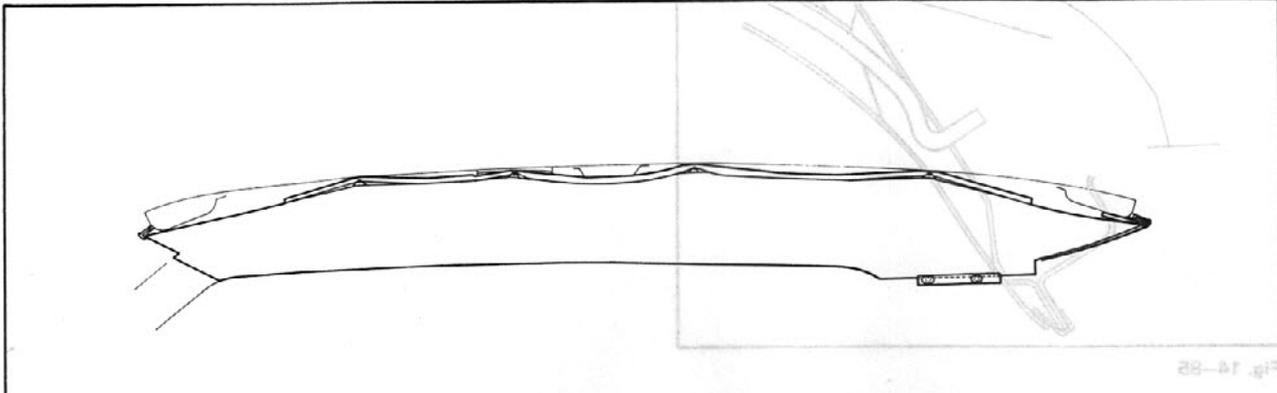


Fig. 14-88

9. Remove the polyethylene plates of the top ceiling from the inserting points of the body.

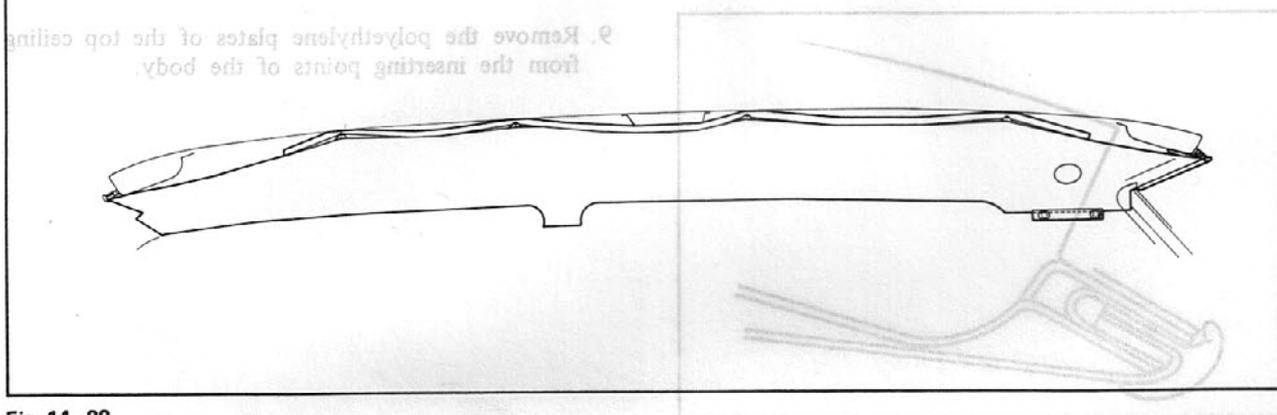


Fig. 14-88

Fig. 14-88

10. Remove the top ceiling by removing the fasteners on the rear both side.

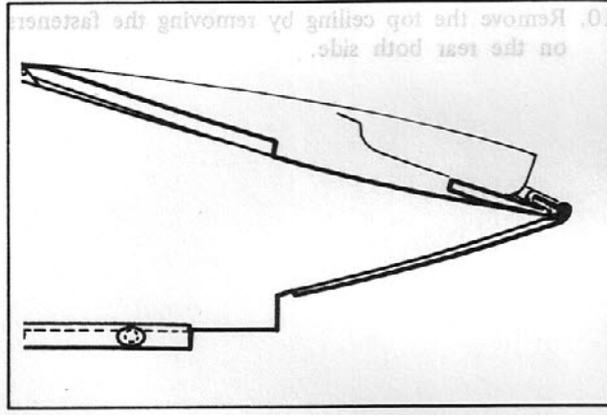


Fig. 14-89

1. Warm the top ceiling to 30°C to 50°C (86°F to 122°F).
2. Match the center mark of top ceiling to the center of finishing channel, set the rear side as shown in figure.

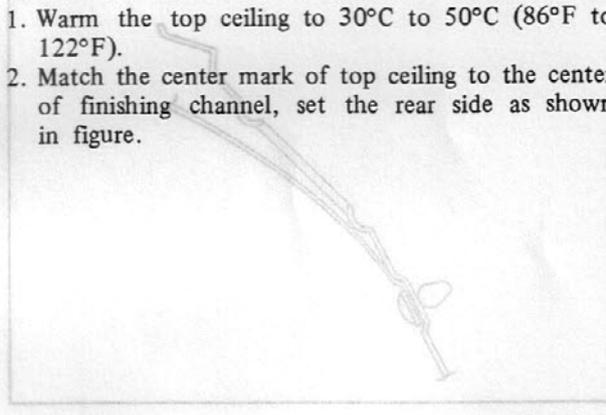


Fig. 14-87

3. Insert both ends of the listing wire to their respective positions in successive order beginning from the rear. When doing so, be careful that the wires do not swing down.

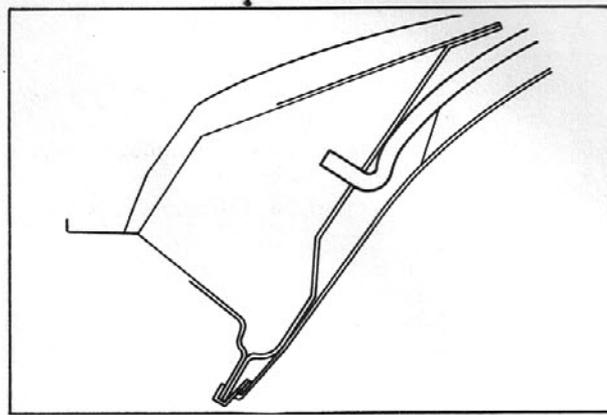


Fig. 14-90

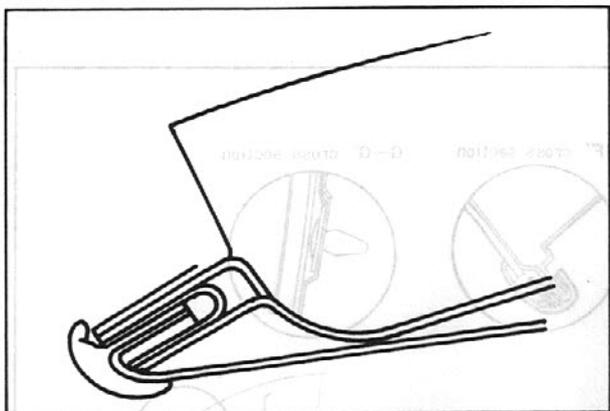


Fig. 14-91

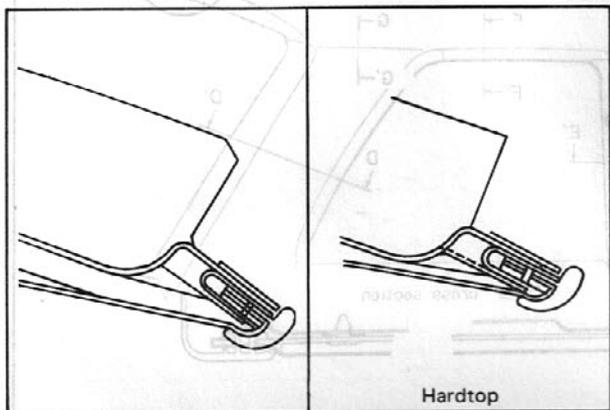


Fig. 14-92

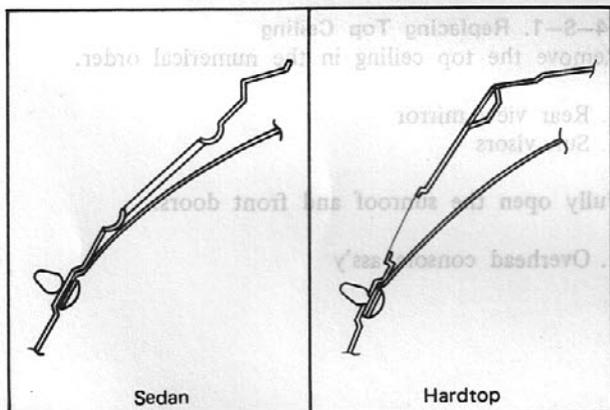


Fig. 14-93

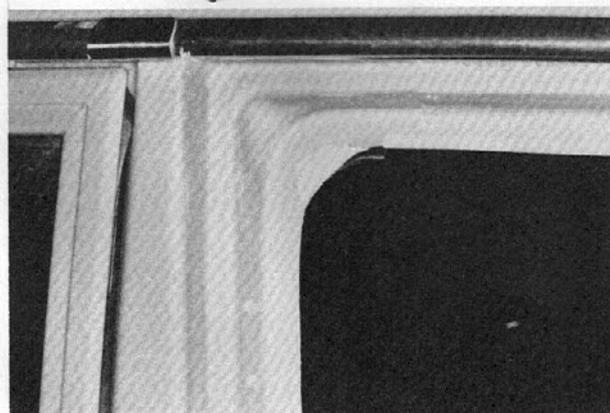


Fig. 14-94

4. Insert the front and rear polyethylene plates of the top ceiling to the respective inserting point of the body.

5. Attach the polyethylene plates on both sides
6. Installing the fasteners

6. Bond the double-sided bonding tape to the body flange.
7. Bond the top ceiling to the body flange while pulling on the inner to eliminate wrinkles.
8. When the top ceiling is bonded without wrinkles, cut off any remaining material.
9. Install the parts concerned in the reverse order of removing.

14-S. TOP CEILING (with sliding sunroof)

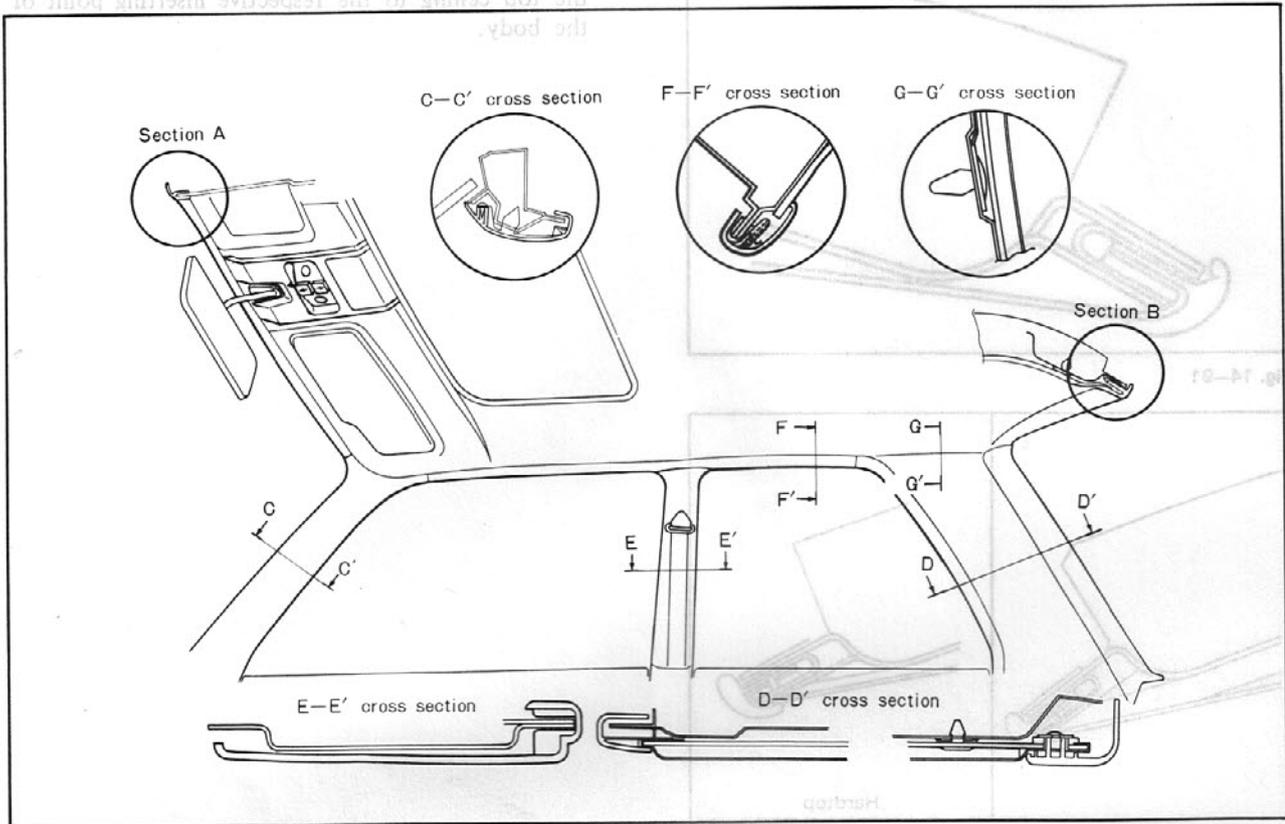


Fig. 14-95

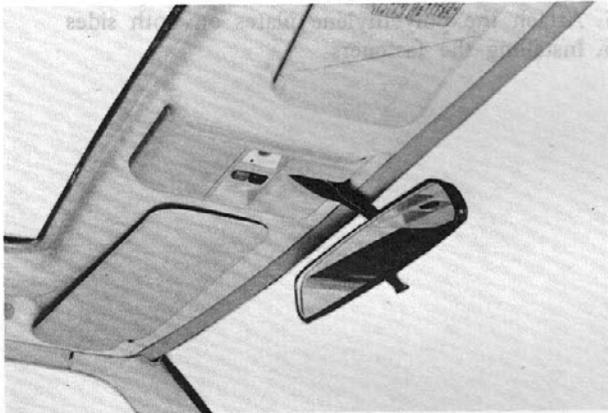


Fig. 14-96

14-S-1. Replacing Top Ceiling

Remove the top ceiling in the numerical order.

1. Rear view mirror
2. Sun visors

Fully open the sunroof and front doors.

3. Overhead console ass'y

4. Interior light
5. Assist grips

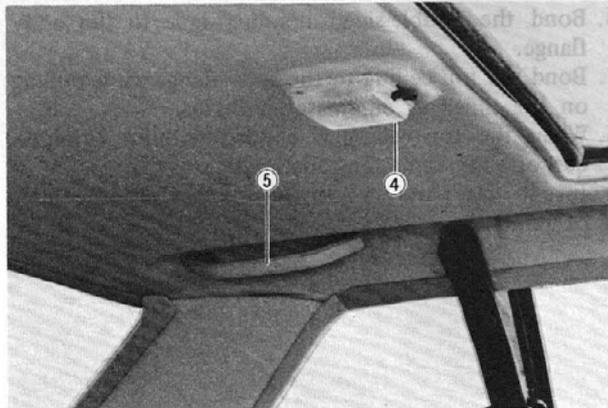


Fig. 14-97

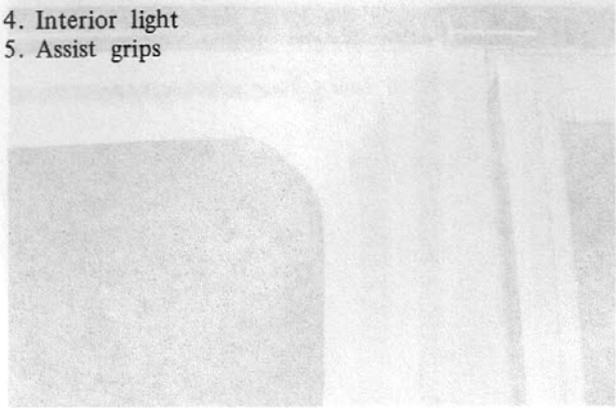


Fig. 14-98

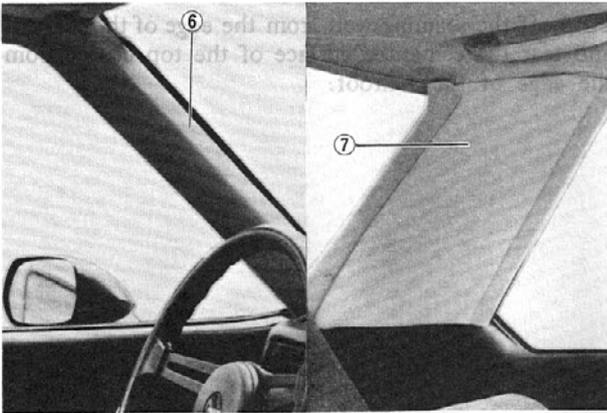


Fig. 14-98

- 6. Front pillar trims
- 7. Rear pillar trims

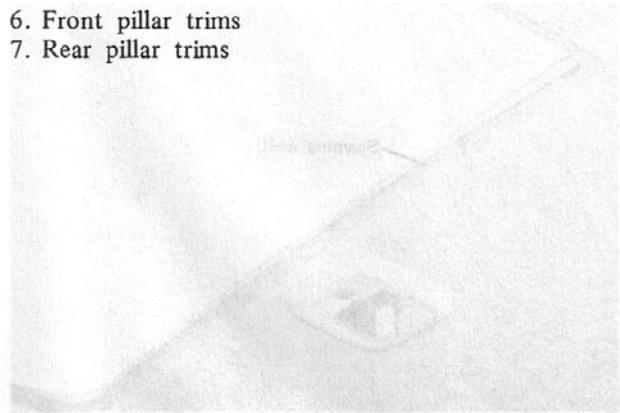


Fig. 14-102

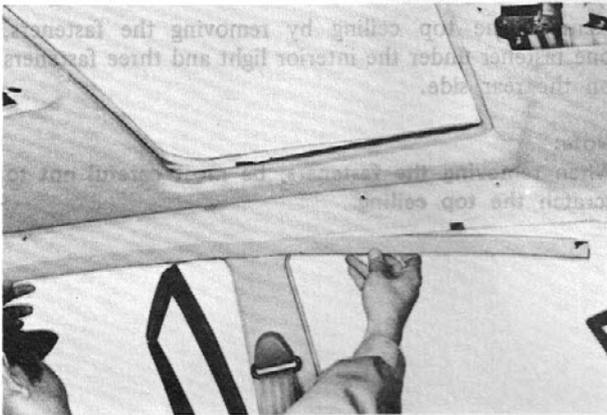


Fig. 14-99

- 8. Side garnishes

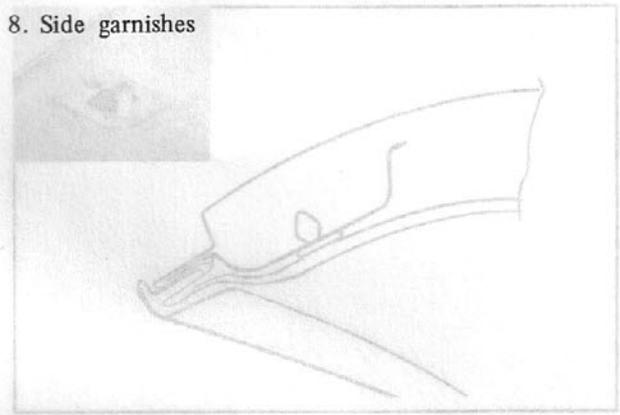


Fig. 14-103

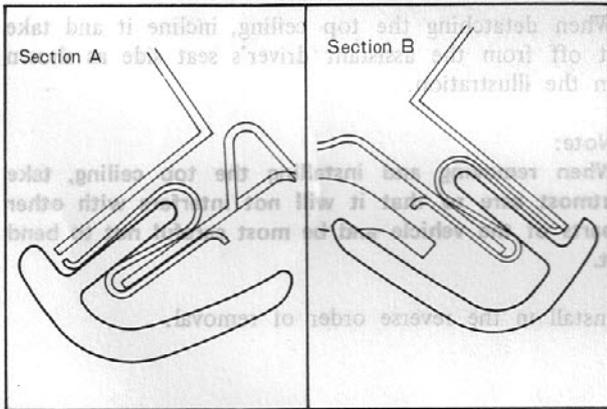


Fig. 14-100

- 9. Front top garnishes
- 10. Rear top garnishes

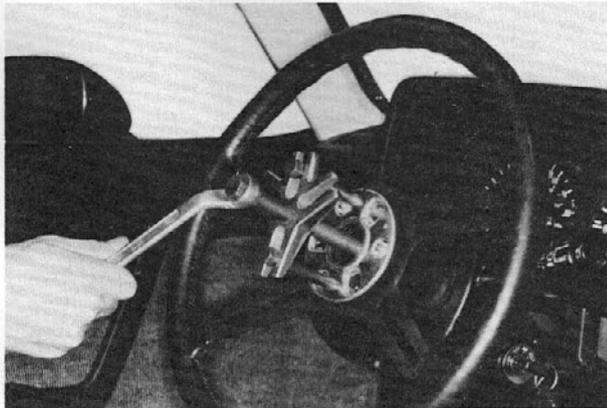
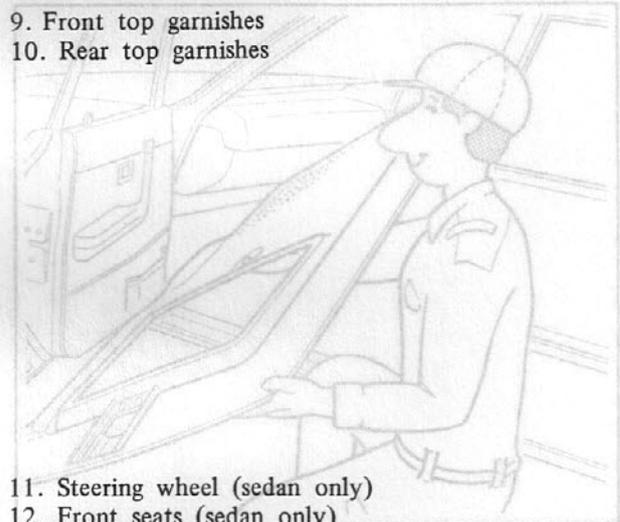


Fig. 14-101

- 11. Steering wheel (sedan only)
- 12. Front seats (sedan only)
- 13. Position the gear shift lever at 5th position. (sedan only)
- 14. Release the parking brake fully release and block the wheel (sedan only)

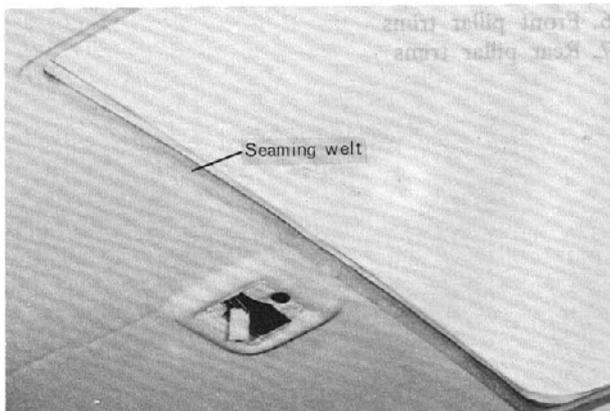


Fig. 14-102

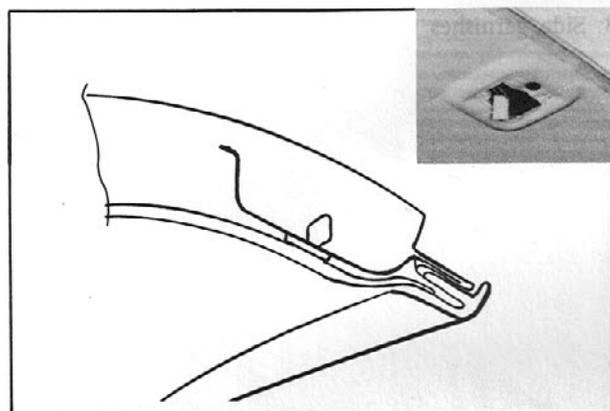


Fig. 14-103



Fig. 14-104

Strip off the seaming welt from the edge of the sunroof and tear the cemented surface of the top ceiling from the edge of the sunroof.

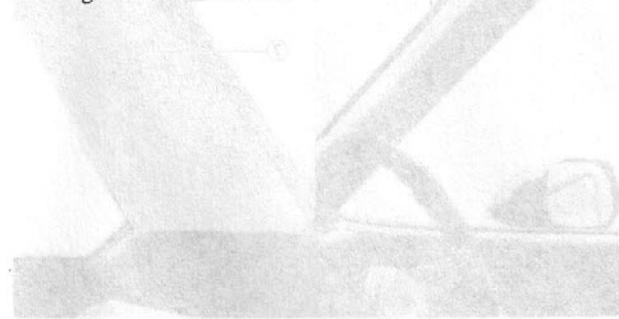


Fig. 14-98

Remove the top ceiling by removing the fasteners, one fastener under the interior light and three fasteners on the rear side.

Note:
When removing the fasteners, be most careful not to scratch the top ceiling.

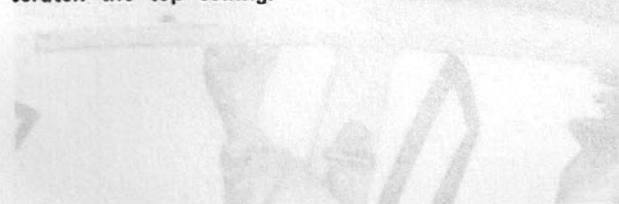


Fig. 14-99

When detaching the top ceiling, incline it and take it off from the assistant driver's seat side as shown in the illustration.

Note:
When removing and installing the top ceiling, take utmost care so that it will not interfere with other parts of the vehicle and be most careful not to bend it.

Install in the reverse order of removal.



Fig. 14-100



Fig. 14-101

14-T. SLIDING SUNROOF

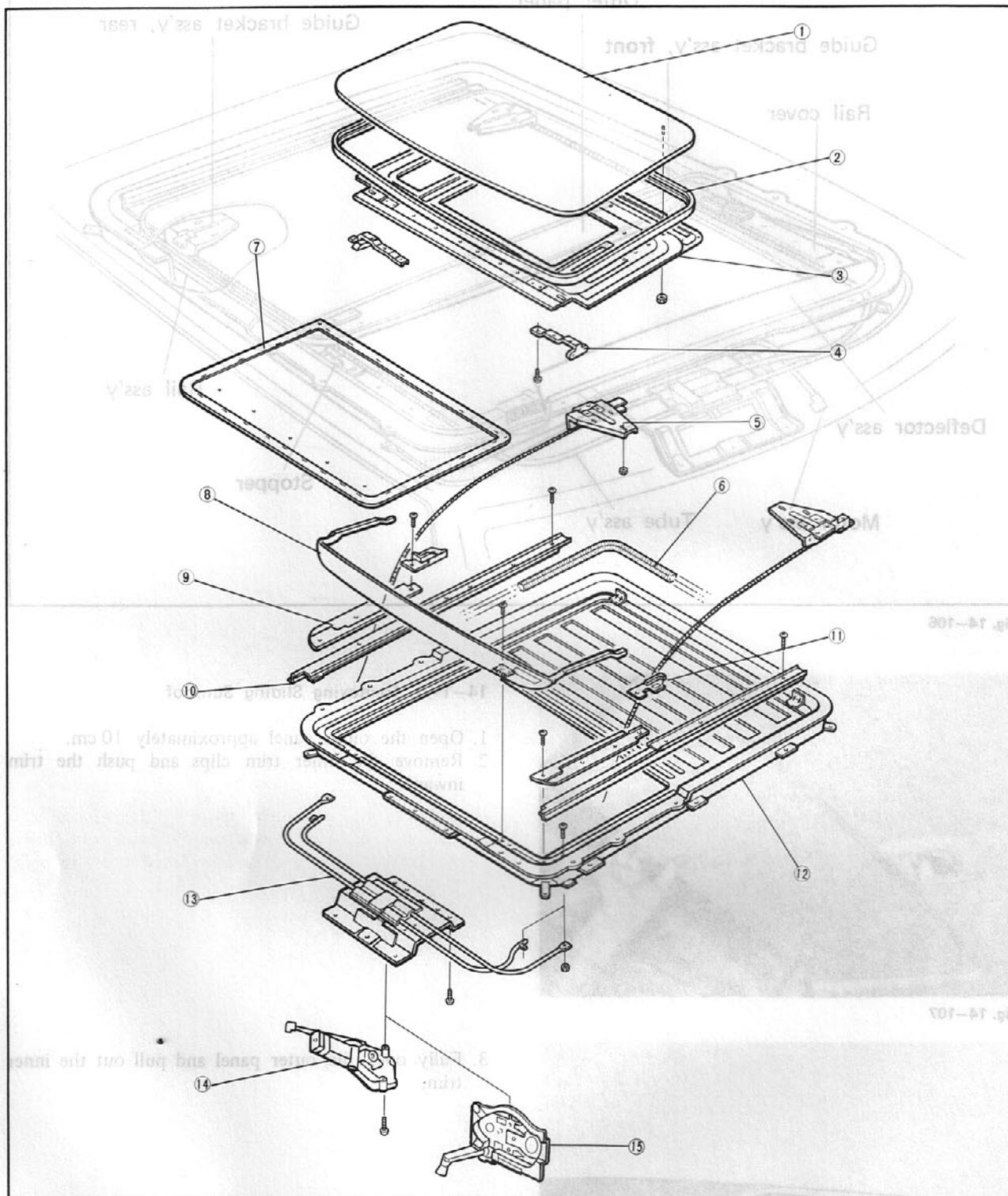


Fig. 14-105 Structural view of sliding sunroof

- | | | |
|------------------------|---------------------|---------------------|
| 1. Outer panel | 6. Packing | 11. Stopper |
| 2. Weatherstrip | 7. Inner trim ass'y | 12. Frame ass'y |
| 3. Lower panel ass'y | 8. Deflector ass'y | 13. Tube ass'y |
| 4. Front guide bracket | 9. Rail cover | 14. Motor ass'y |
| 5. Rear guide bracket | 10. Rail ass'y | 15. Regulator ass'y |

Fig. 14-105

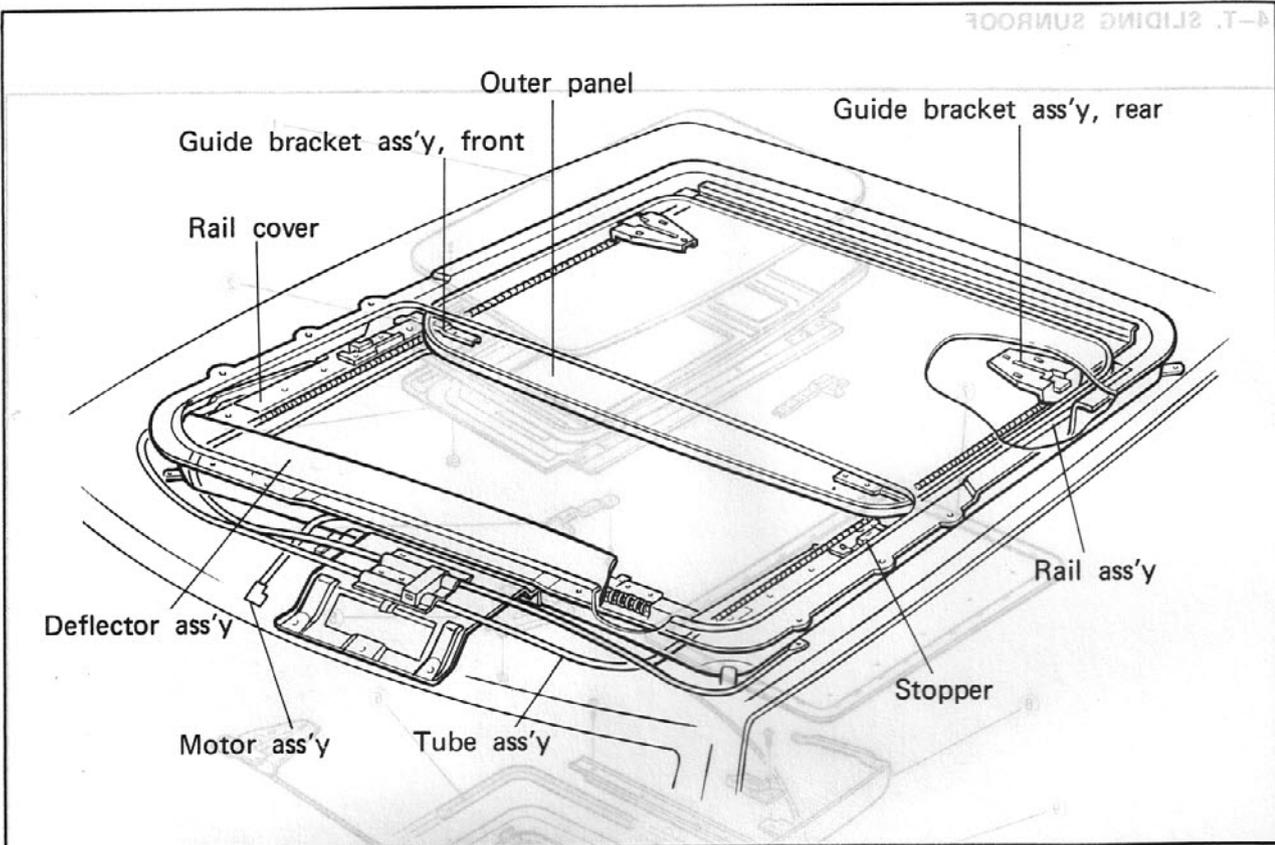


Fig. 14-106

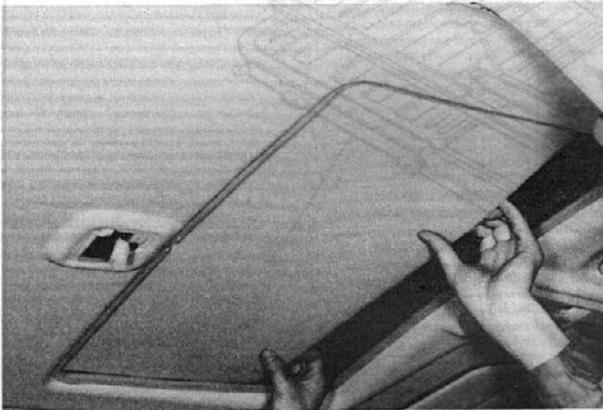


Fig. 14-107

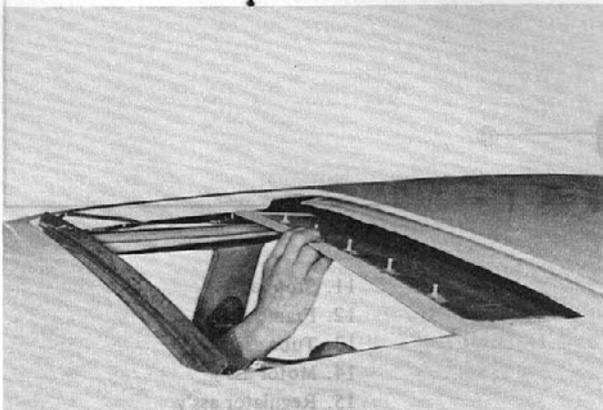


Fig. 14-108

14-T-1. Removing Sliding Sunroof

1. Open the outer panel approximately 10 cm.
2. Remove the inner trim clips and push the trim inward.

3. Fully open the outer panel and pull out the inner trim.

Fig. 14-108 Structural view of sliding sunroof

1. Outer panel
2. Weatherstrip
3. Lower panel ass'y
4. Front guide bracket
5. Rear guide bracket
6. Packing
7. Inner trim ass'y
8. Deflector ass'y
9. Rail cover
10. Rail ass'y



Fig. 14-109

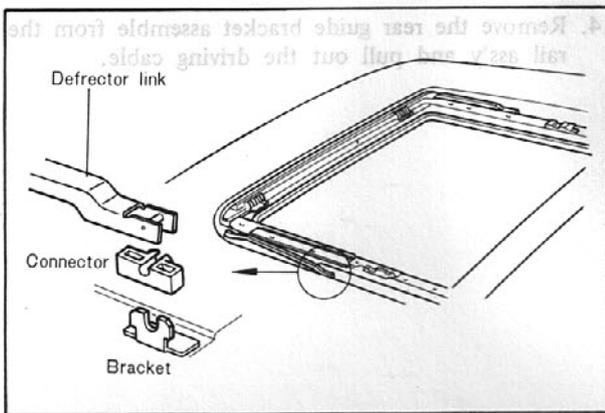


Fig. 14-110

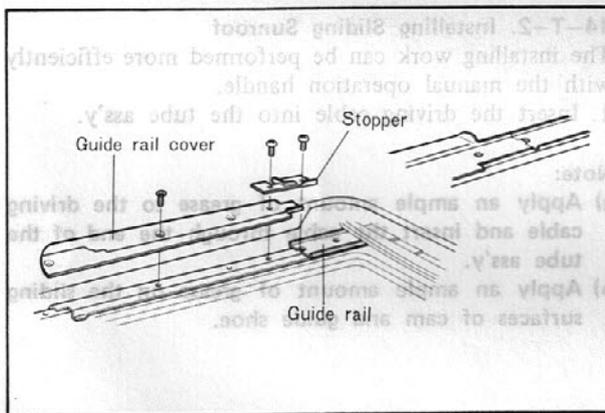


Fig. 14-111

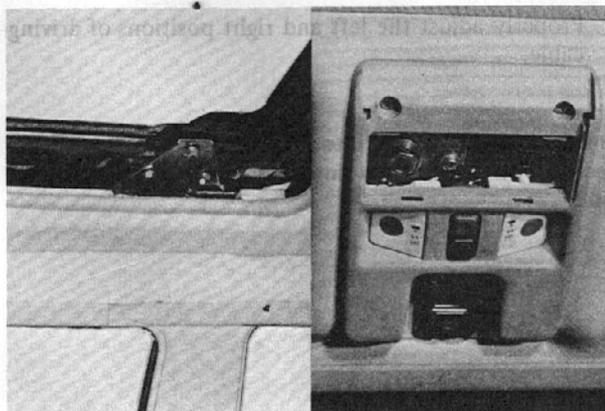


Fig. 14-112

4. Completely close the outer panel and remove the nuts holding the lower panel.
5. Remove the outer panel by pushing it upward from the inside of car.
6. Fully open the lower panel.



Fig. 14-113

7. Remove the deflector link and remove the window deflector.

Note:

The deflector is always pushed toward the opening direction by a spring. Hold the deflector by hand, preventing it from hitting the roof panel and pull out the deflector link connector.



Fig. 14-114

8. Remove the stopper.
9. Remove the rail cover.
10. Close the panel, leaving an open space of approximately 47 mm (1.85 in) between the front end of lower panel and the roofpanel.

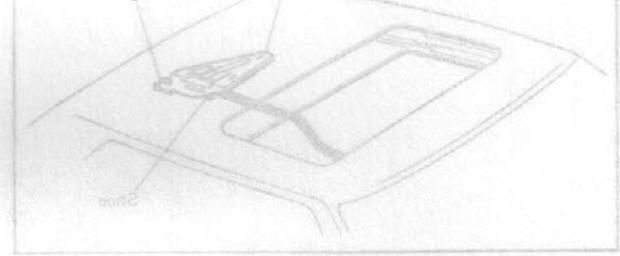


Fig. 14-115

11. Remove the rear bracket mounting-nut and lift out the lower panel upward.
12. Remove the overhead console ass'y.

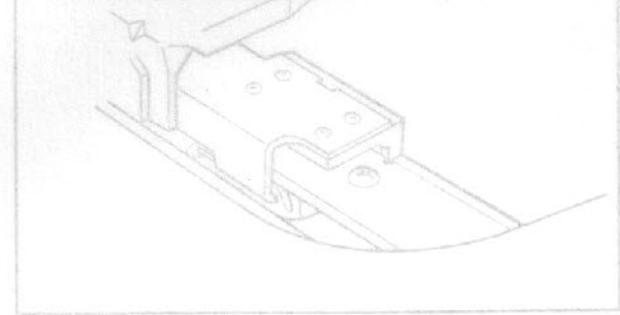


Fig. 14-116



Fig. 14-113

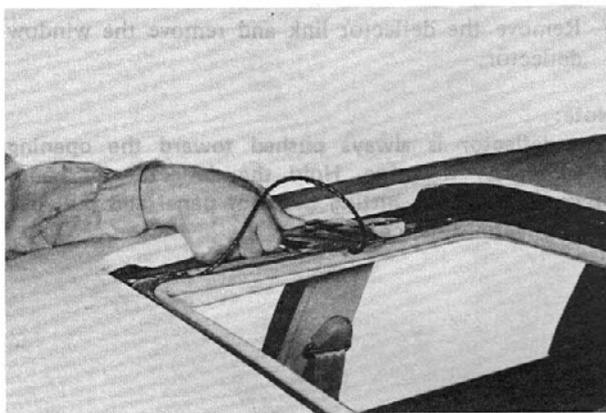


Fig. 14-114

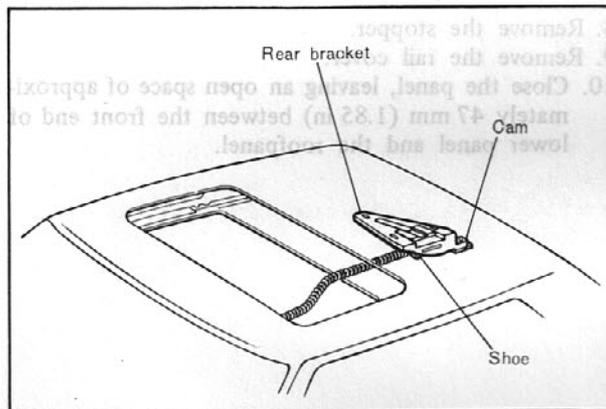


Fig. 14-115

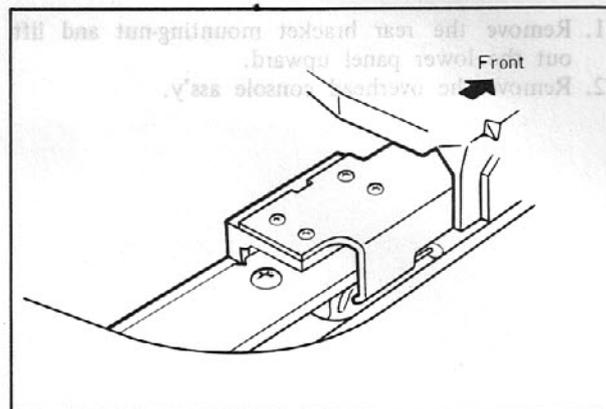


Fig. 14-116

13. Remove the motor attaching screws and remove the motor.



Fig. 14-108

14. Remove the rear guide bracket assembly from the rail ass'y and pull out the driving cable.

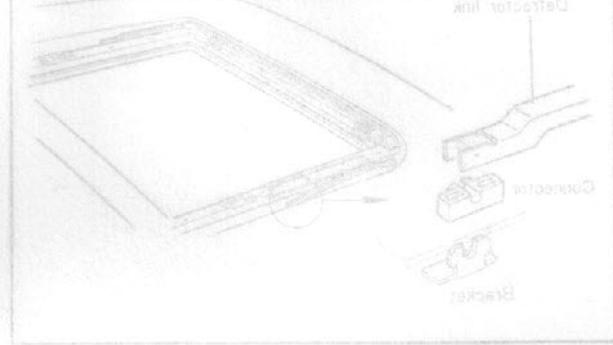


Fig. 14-110

14-T-2. Installing Sliding Sunroof

The installing work can be performed more efficiently with the manual operation handle.

1. Insert the driving cable into the tube ass'y.

Note:

- a) Apply an ample amount of grease to the driving cable and insert the cable through the end of the tube ass'y.
- b) Apply an ample amount of grease on the sliding surfaces of cam and guide shoe.

2. Properly adjust the left and right positions of driving cable.

Note:

Insert the guide rail into its bracket, and insert the rearend of the bracket into the notch at the rear of rail.

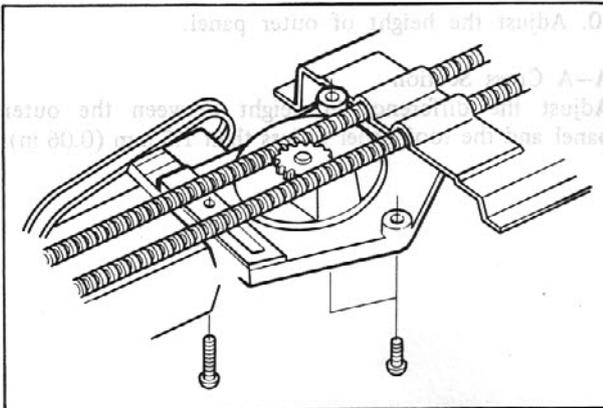


Fig. 14-117

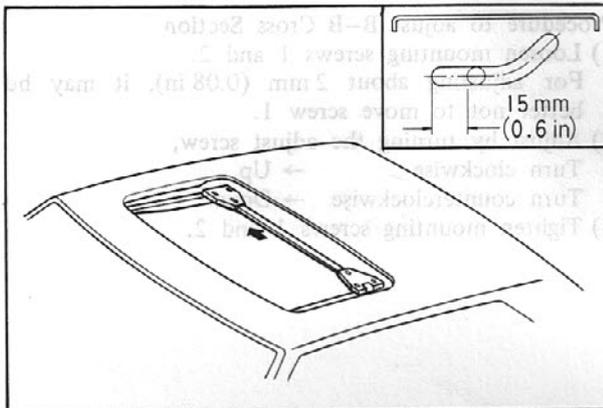


Fig. 14-118

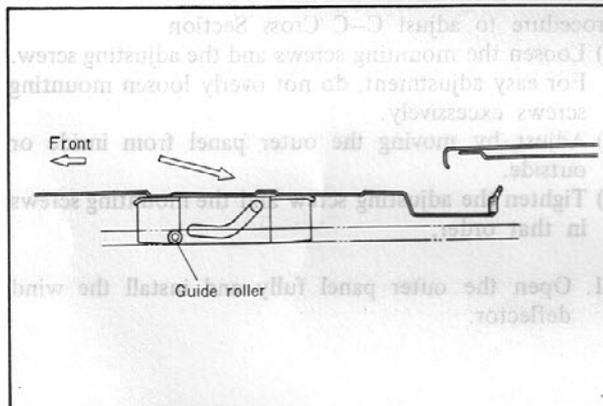


Fig. 14-119

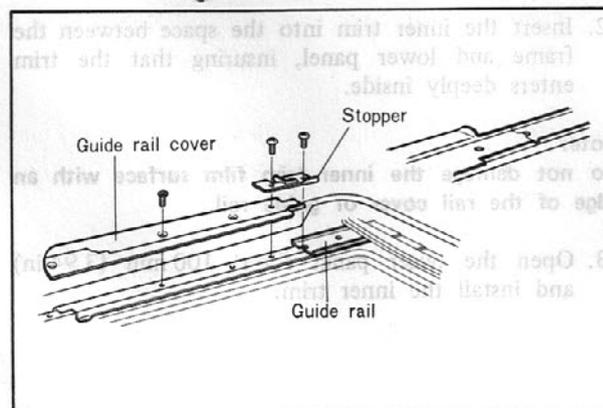


Fig. 14-120

3. Install the motor or drive gear ass'y.

Note:

There are two types of mounting screws, long and short. Be sure to use them properly.

4. Install the overhead console assembly.

Note:

Set the left, right and rear positions of bracket as shown in the figure at right.

5. Insert the lower panel into the rear bracket.

6. Open the lower panel fully by operating the motor or the regulator handle.

Note:

a) When opening the lower panel, the roof panel and lower panel may interfere with each other. Make sure that the guide rollers are in the guide rails completely.

b) When opening the lower panel, push on the roof panel at a slightly inclined angle, but do not to allow the cable to protrude from the rail.

7. Remove the rail cover and stopper.

Note:

Install the stopper according to the markings shown on the reverse side.

R Right side

L Left side

⇐ Direction pointed out by the arrow is the front side.

8. Close the panel, leaving about 47 mm (1.85 in) of open space between the front of the lower panel and the roof panel.

9. Install the outer panel by inserting it from the outside the roof panel.

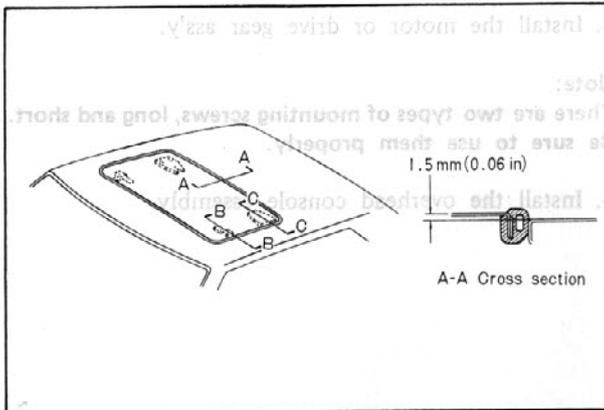


Fig. 14-121

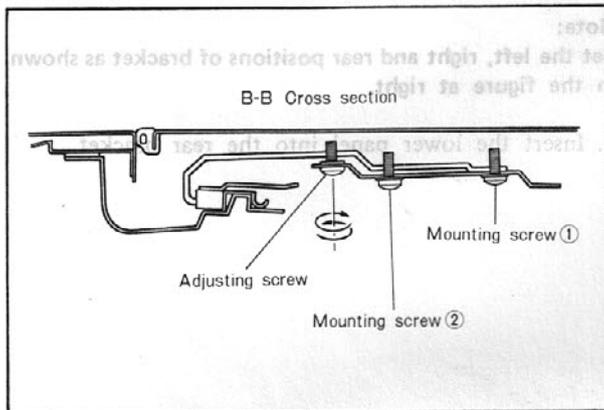


Fig. 14-122

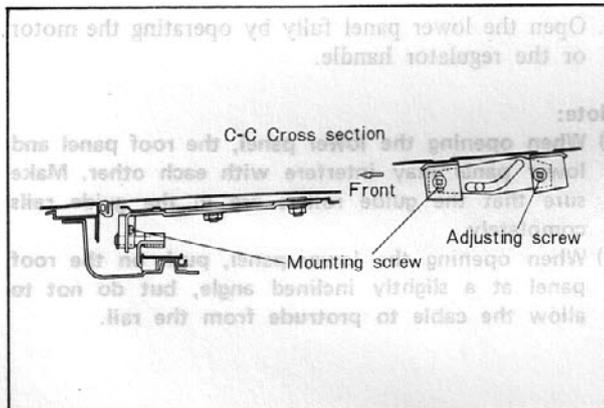


Fig. 14-123

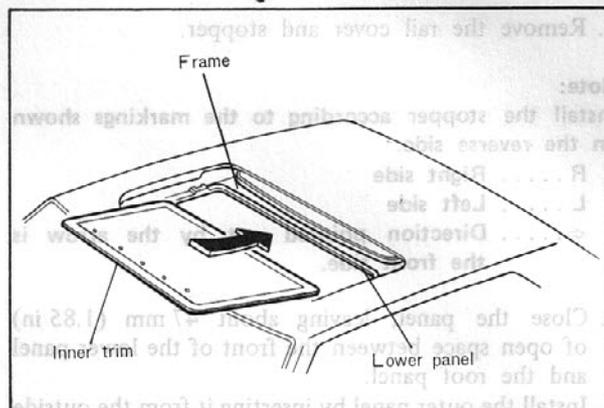


Fig. 14-124

10. Adjust the height of outer panel.

A-A Cross Section

Adjust the difference in height between the outer panel and the roof panel to less than 1.5 mm (0.06 in).

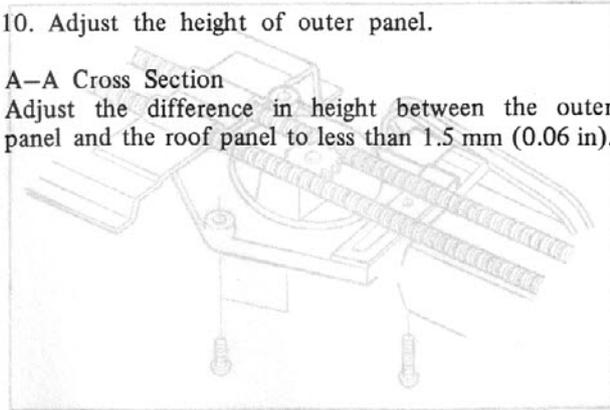


Fig. 14-117

Procedure to adjust B-B Cross Section

- 1) Loosen mounting screws 1 and 2.
For adjusting about 2 mm (0.08 in), it may be better not to move screw 1.
- 2) Adjust by turning the adjust screw,
Turn clockwise → Up
Turn counterclockwise → Down
- 3) Tighten mounting screws 1 and 2.

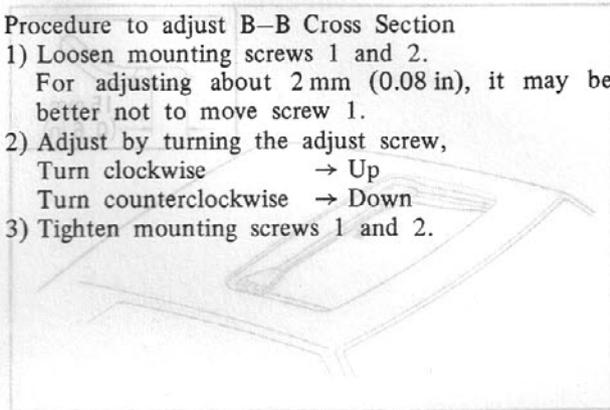


Fig. 14-118

Procedure to adjust C-C Cross Section

- 1) Loosen the mounting screws and the adjusting screw.
For easy adjustment, do not overly loosen mounting screws excessively.
- 2) Adjust by moving the outer panel from inside or outside.
- 3) Tighten the adjusting screw and the mounting screws in that order.

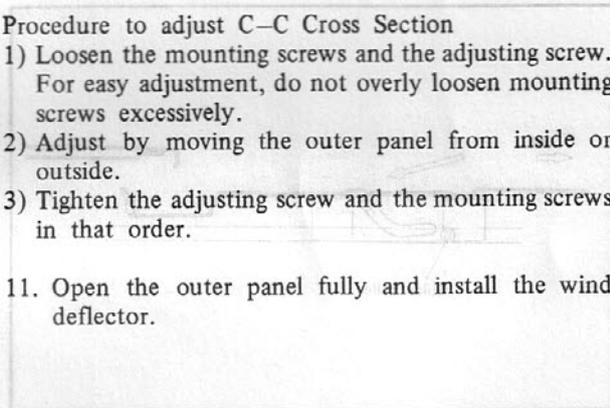


Fig. 14-119

11. Open the outer panel fully and install the wind deflector.

12. Insert the inner trim into the space between the frame and lower panel, insuring that the trim enters deeply inside.

Note:

Do not damage the inner trim film surface with an edge of the rail cover or guide rail.

13. Open the outer panel about 100 mm (3.94 in) and install the inner trim.

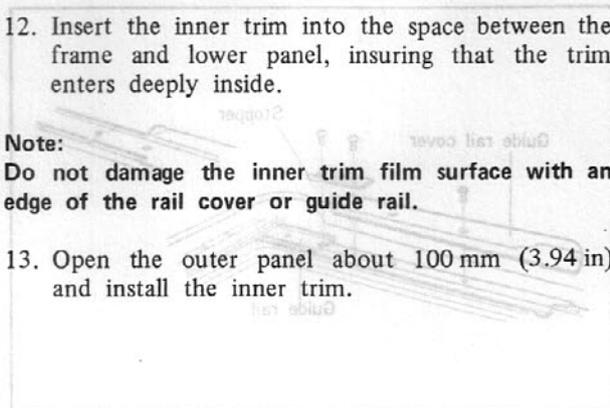


Fig. 14-120

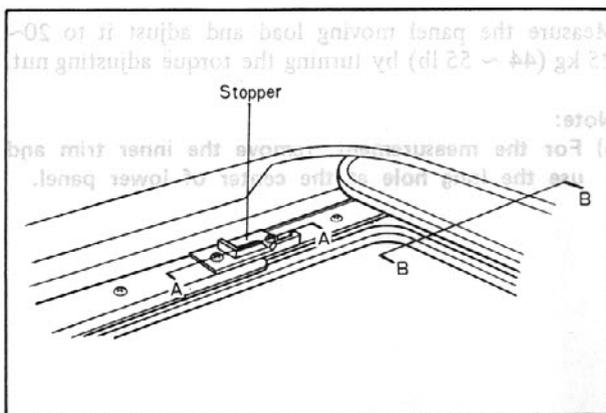


Fig. 14-125

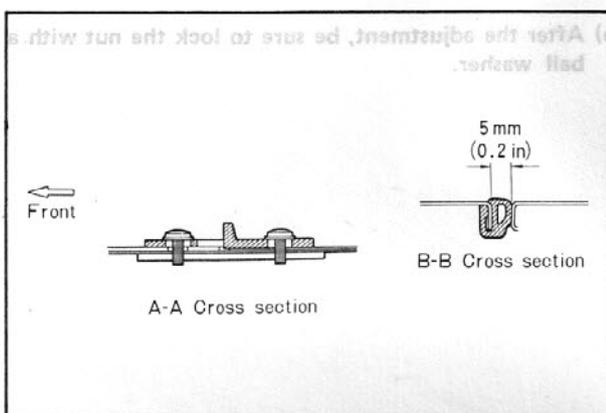


Fig. 14-126

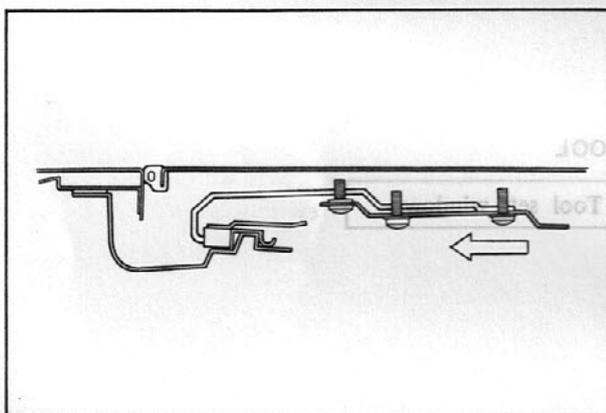


Fig. 14-127

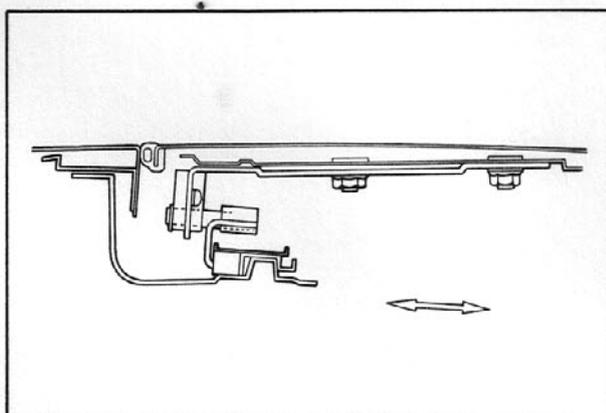


Fig. 14-128

14. Check operating condition after installation. If the panel movement is hard, check and adjust.

- a) Make sure the battery voltage is normal.
- b) Make sure that the sunroof sliding unit is free of foreign material.
- c) Make sure that, when the outer panel opens, the rear portion of panel does not interfere excessively with the roof panel. If interfering, fully open the outer panel and move the stopper forward.

Note:

If the stopper is moved forward too far, it may cause a malfunction or leaks. Make sure the gap between the outer panel and roof panel is not more than 5 mm (0.20 in).

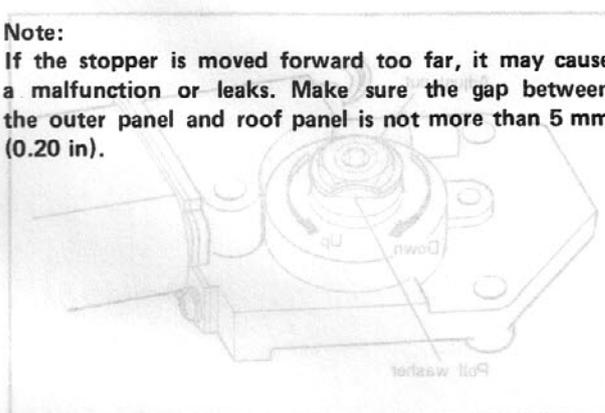


Fig. 14-129

Widthwise adjustment of guide front bracket and guide rails.
Move both of them, left and right about 1 mm (0.04 in) outward.

Widthwise adjustment of guide rear bracket and guide rails.
Move both of them, left and right, about 1 mm (0.04 in) outward or inward.

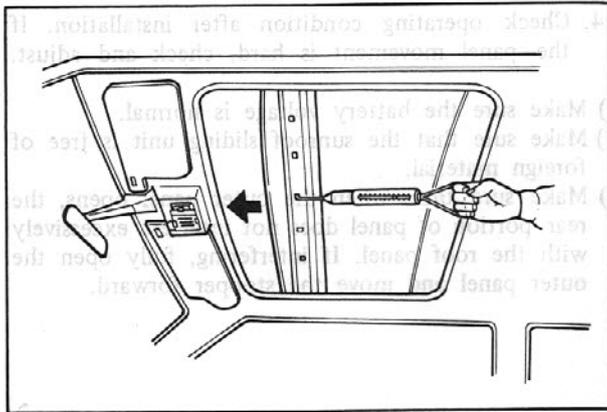


Fig. 14-129

Measure the panel moving load and adjust it to 20~25 kg (44 ~ 55 lb) by turning the torque adjusting nut.

Note:

- a) For the measurement, remove the inner trim and use the long hole at the center of lower panel.

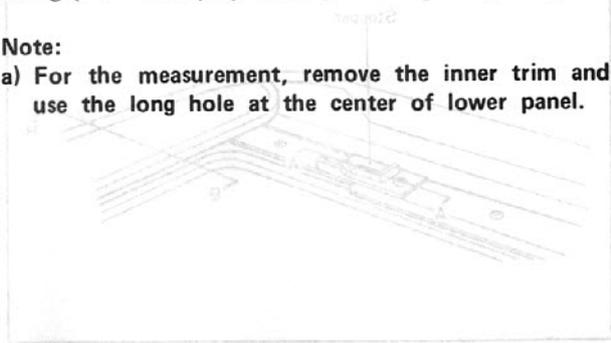


Fig. 14-128

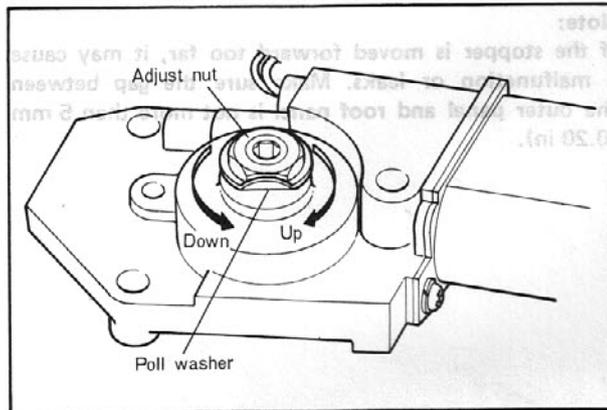


Fig. 14-130

- b) After the adjustment, be sure to lock the nut with a ball washer.

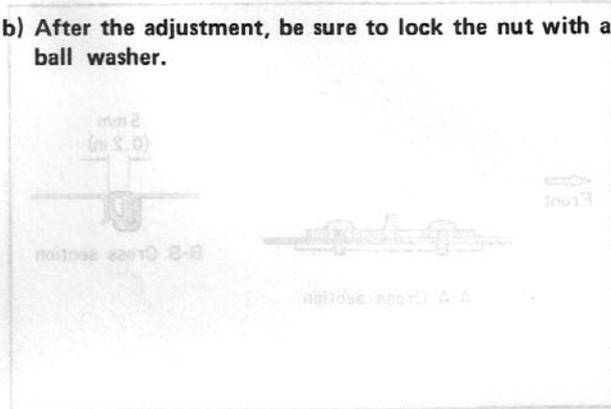


Fig. 14-126

SPECIAL TOOL

49 0305 870A	Tool set, window
--------------	------------------

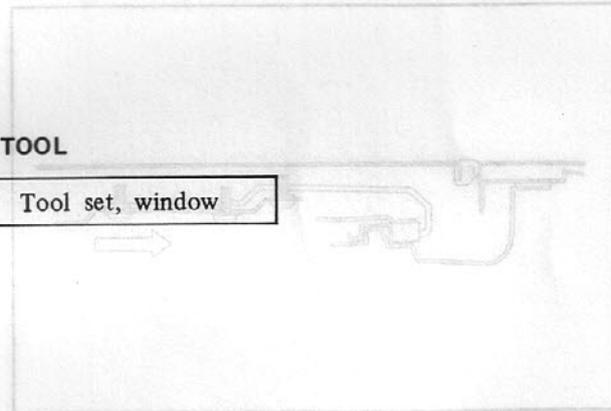


Fig. 14-127

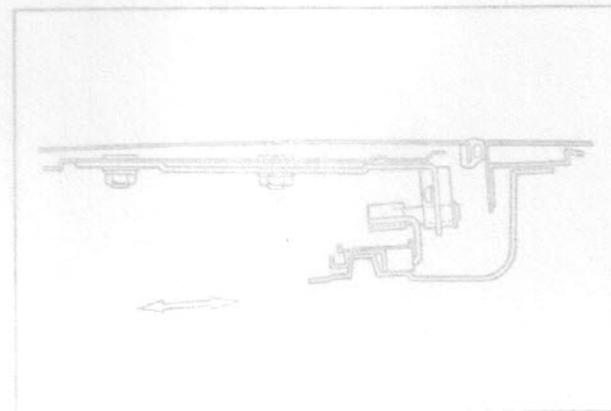
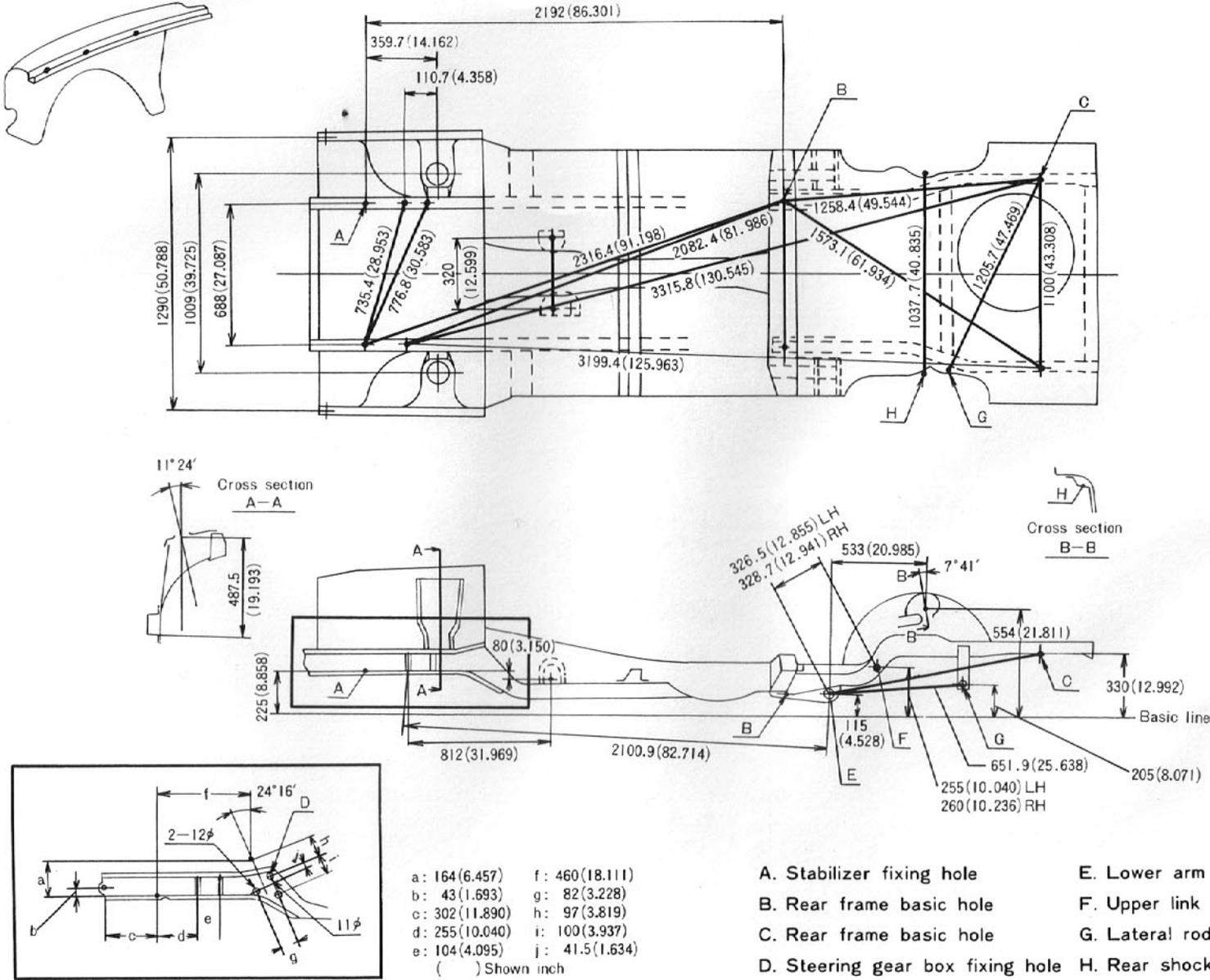
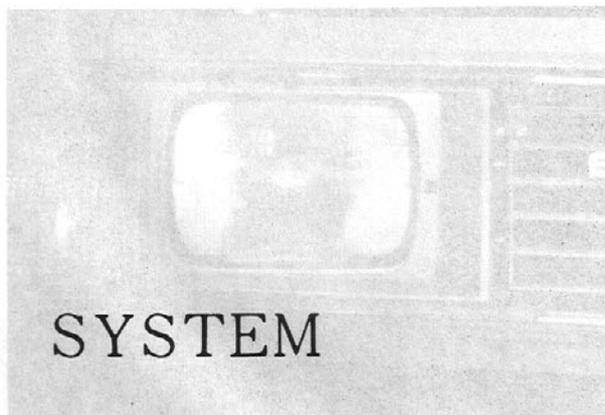


Fig. 14-125



15-A. HEAD LIGHT ADJUSTMENT
 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 headlight to meet the regulation of each state. To adjust, turn the two spring loaded screws of the light until the headlights are properly aimed.



ELECTRICAL SYSTEM (BODY)

15-A. HEADLIGHT ADJUSTMENT	15 : 1	
15-B. BULBS	15 : 1	BULB WATTAGE
15-C. FUEL AND WATER TEMPERATURE GAUGE	15 : 2	Headlight
15-C-1. Replacing Fuel Gauge and Water Temperature Gauge	15 : 2	Front turn signal and parking
15-C-2. Checking Fuel Gauge	15 : 2	Rear combination
15-C-3. Replacing Water Temperature Gauge Unit	15 : 5	Turn and tail signal light
15-C-4. Checking Water Temperature Gauge	15 : 5	Stop light
15-D. IGNITION SWITCH	15 : 6	Back-up light
15-D-1. Replacing Ignition Switch Contact Housing	15 : 6	License light
15-D-2. Checking Ignition Switch	15 : 6	Glove box light
15-E. COMBINATION SWITCH	15 : 7	Trunk room light
15-E-1. Removing Combination Switch	15 : 7	Interior light
15-E-2. Checking Combination Switch	15 : 7	Spot light
15-F. REAR WINDOW DEFOGGER	15 : 8	Indicator & Warning light
15-F-1. Checking Rear Window Defogger	15 : 8	Turn signal
15-G. WINDSHIELD WIPER	15 : 9	High beam
15-G-1. Replacing Wiper Motor	15 : 9	Off level
15-G-2. Checking Wiper Motor	15 : 10	Horn hazard (without tachometer)
15-G-3. Adjustment	15 : 11	(with tachometer)
15-H. HEATER	15 : 11	Brake
15-H-1. Checking Heater Fan Switch and Blower	15 : 11	Seat belt
15-I. REMOTE CONTROL MIRROR (If equipped)	15 : 12	Automatic select lever
15-I-1. Checking Remote Control Mirror Switch	15 : 12	Alternator
15-J. INHIBITOR SWITCH	15 : 12	Stop
15-J-1. Checking Inhibitor Switch	15 : 12	Tail
15-K. CRUISE CONTROL	15 : 13	Washer level
15-K-1. Checking Cruise Control	15 : 13	Battery
15-L. METER SET	15 : 14	Fuel
15-L-1. Checking Meter Set Print Panel	15 : 14	Illumination light
SPECIAL TOOLS	15 : 15	Motor
		Heater
		Cigar lighter and ashtray
		Stets
		Radio
		Auto clock

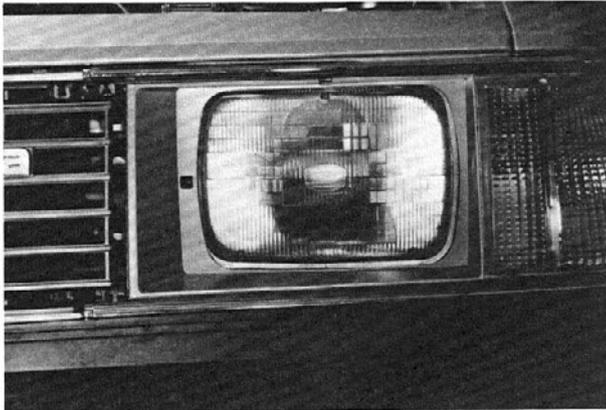


Fig. 15-1

15-A. HEAD LIGHT ADJUSTMENT

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 headlight to meet the regulation of each state. To adjust, turn the two spring loaded screws of the light until the headlights are properly aimed.

ELECTRICAL
(BODY)

BULB WATTAGE W	
Headlight	65/55
Front turn signal and parking	27/8
Rear combination:	
Turn and tail signal light	27/8
Stop light	27
Back-up light	27
License light	6
Glove box light	3.4
Trunk room light	5
Interior light	5
Spot light	6
Indicator & Warning light:	
Turn signal	3.4
High beam	3.4
Oil level	3.4
Heat hazard (without tachometer)	3.4
(with tachometer)	1.4
Brake	3.4
Seat belt	3.4
Automatic select lever	3.4
Alternator	3.4
Stop	1.4
Tail	1.4
Washer level	1.4
Battery	1.4
Fuel	3.4
Illumination light:	
Meter	3.4
Heater	1.4
Cigar lighter and ashtray	3.4
Stereo	1.4
Radio	3.4
Auto clock	3.4

15-B. BULBS

The left table shows bulb capacity.

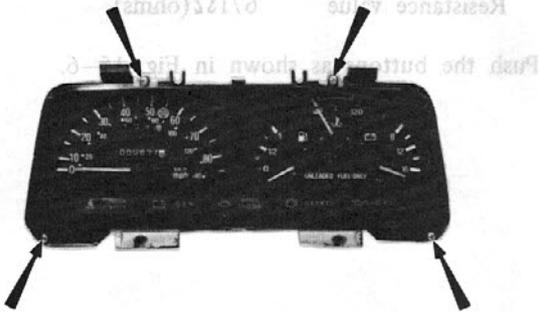


Fig. 15-2

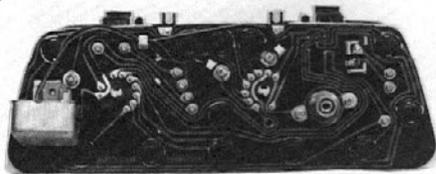


Fig. 15-3

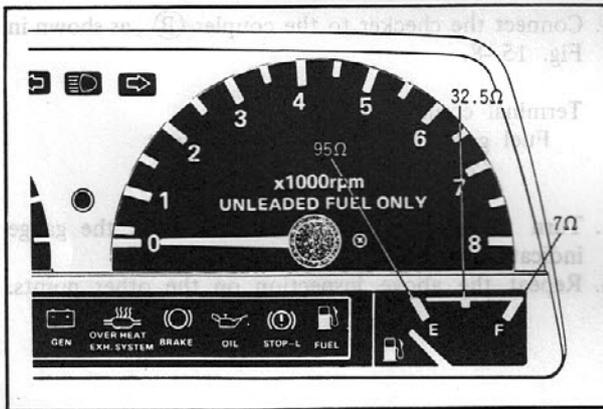


Fig. 15-4

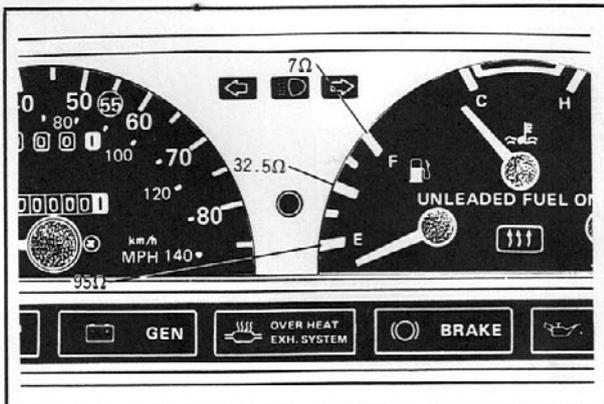


Fig. 15-5

15-C. FUEL AND WATER TEMPERATURE GAUGE

15-C-1. Replacing Fuel Gauge and Water Temperature Gauge

Replacing the fuel gauge and water temperature gauge in the numerical order.

1. Combination meter (See Par 14-M-1)
2. Meter cover

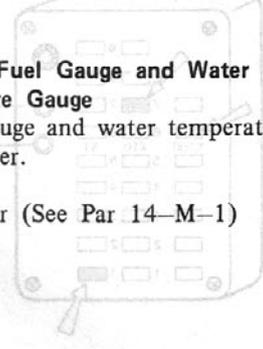


Fig. 15-6

3. Fuel gauge and water temperature gauge attaching nuts
4. Fuel gauge and water temperature gauge

To install, reverse the removal procedure.

Note:

The all electrical wirings should be connected firmly. Make sure the all meters and lights operate normally after installing.

15-C-2. Checking Fuel Gauge

a. Fuel Gauge

1. Use the checker (49 0839 285).
2. Set the checker to the specified resistance valve as shown in Fig. 15-4 and Fig. 15-5.

Fig. 15-8

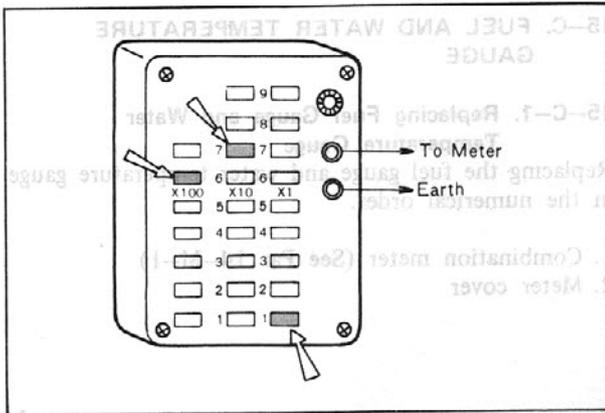


Fig. 15-6

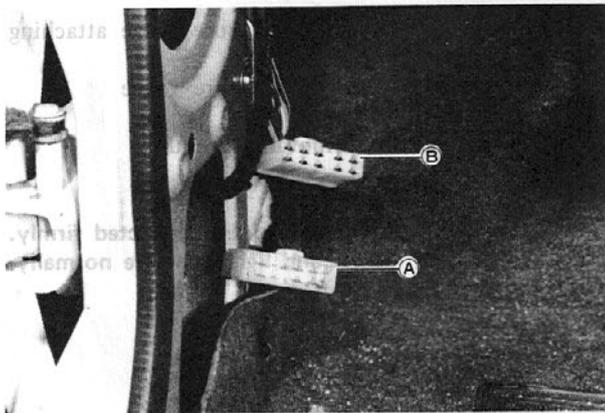


Fig. 15-7

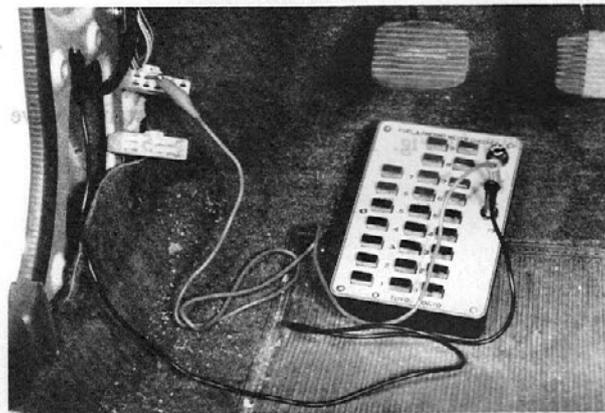


Fig. 15-8

Example:

Resistance value 671Ω(ohms)

Push the buttons as shown in Fig. 15-6.



Fig. 15-5

3. Disconnect the coupler under the left side instrument panel.



Fig. 15-4

4. Connect the checker to the coupler (B), as shown in Fig. 15-8.

Terminal connection

Fuel gauge "U" ~ Fuel gauge unit
Colored (Y)

5. Turn the ignition switch on and check the gauge indication.
6. Repeat the above inspection on the other points.

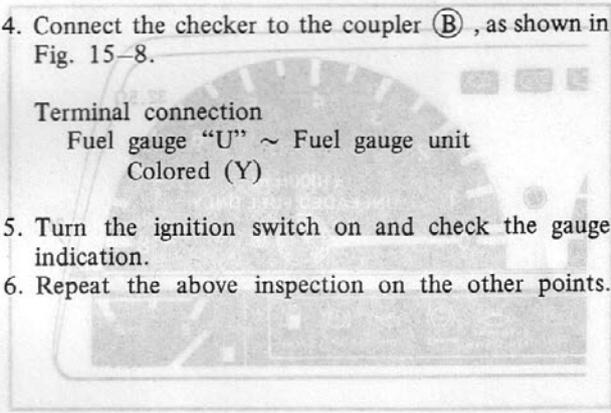


Fig. 15-3

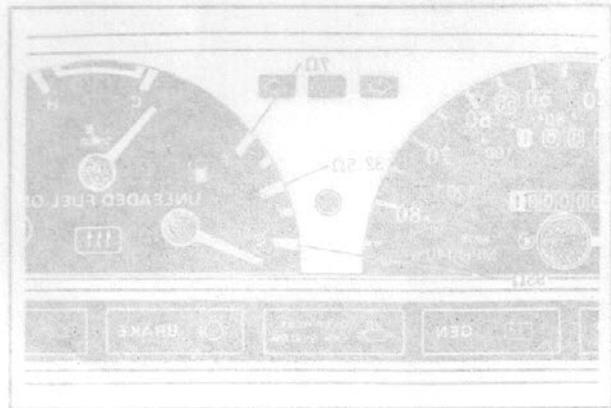


Fig. 15-2

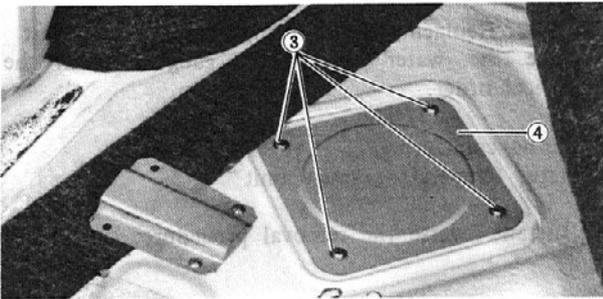


Fig. 15-9

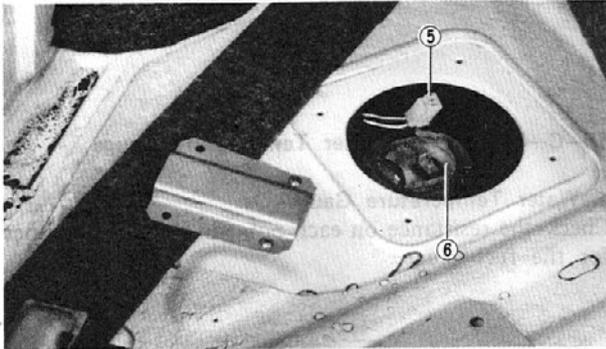


Fig. 15-10

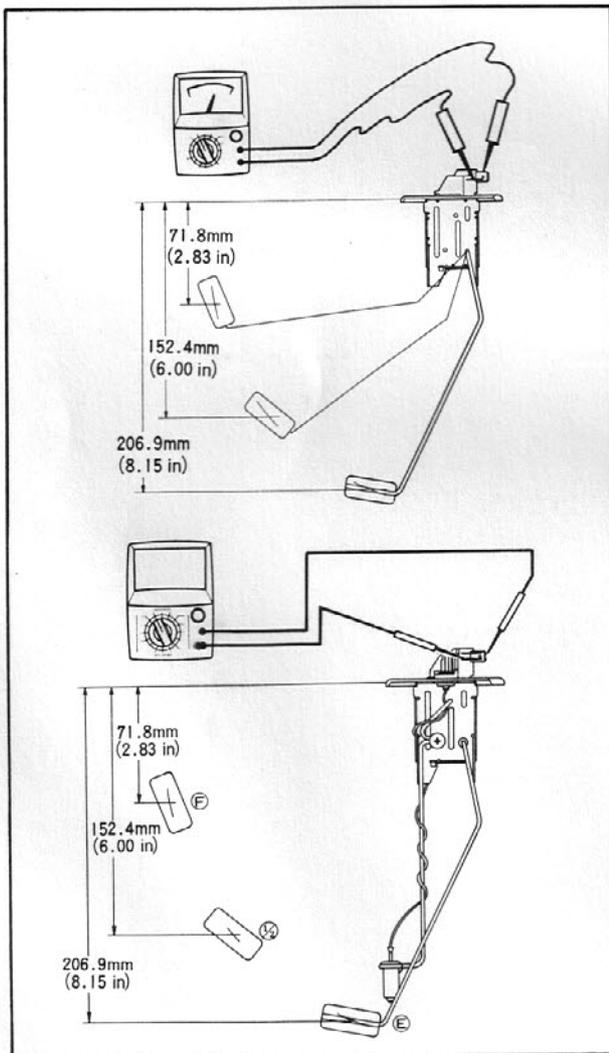


Fig. 15-11

b. Fuel Tank Gauge Unit

To check the fuel gauge unit, it must be removed from the fuel tank as follows:

1. Disconnect the negative cable at the battery.
2. Open the trunk lid
3. Service hole cover attaching screws.
4. Service hole cover

5. Wire coupler (disconnect)
6. Fuel gauge unit

Use the **hook wrench** (49 1345 875B)

Measure the resistance between the \oplus terminal and \ominus terminal on the fuel gauge unit with an ohmmeter. The resistance should change smoothly when the float arm is moved, and be of the values when in the table.

Float position	Resistance (Ω)
F	$3^{+2}_{-2.5}$
$\frac{1}{2}$	32.5 ± 4
E	110 ± 7

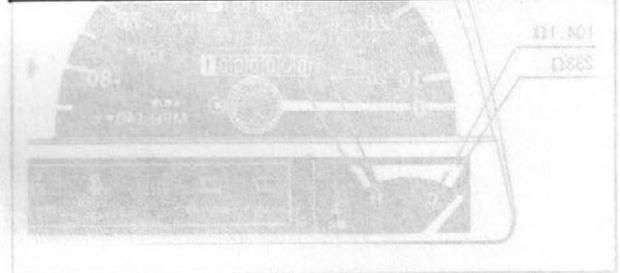


Fig. 15-14

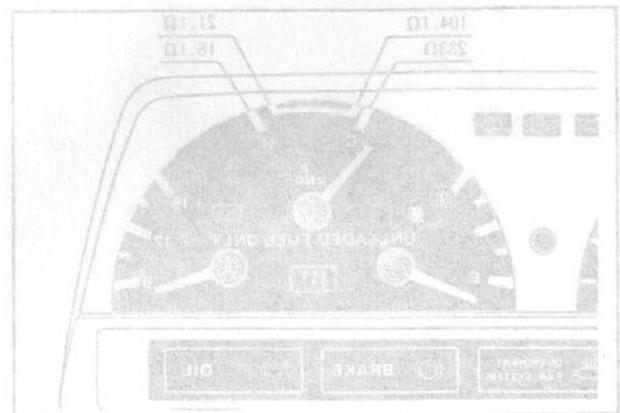


Fig. 15-15

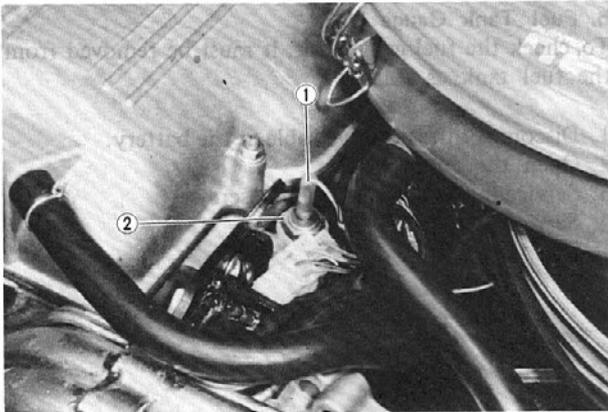


Fig. 15-12

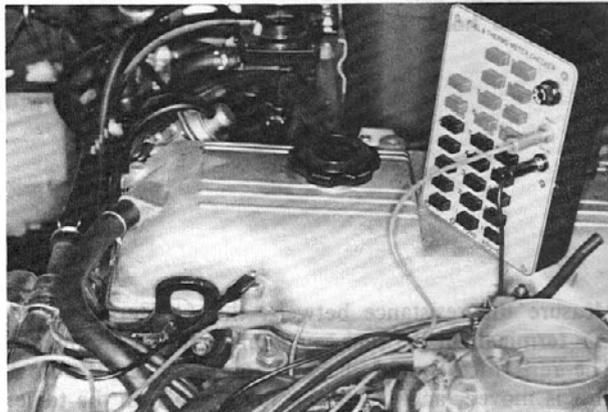


Fig. 15-13

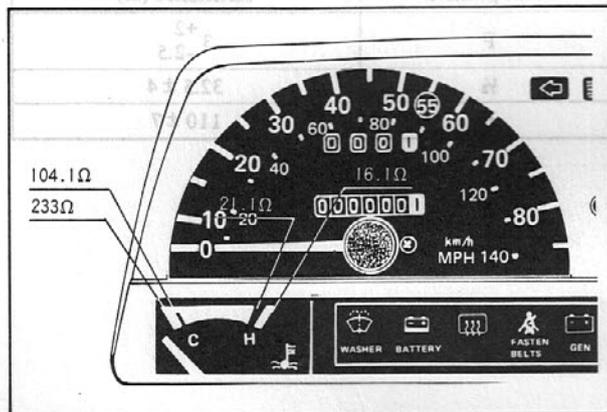


Fig. 15-14

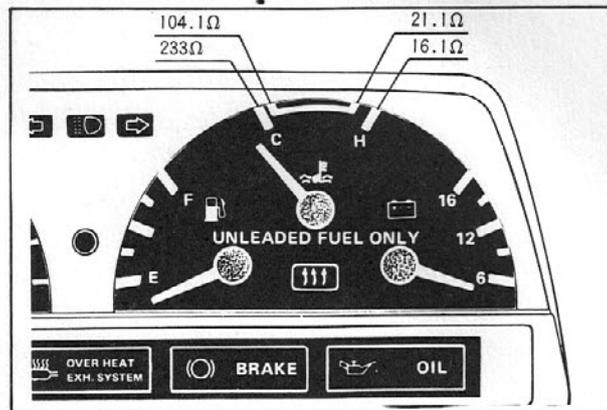
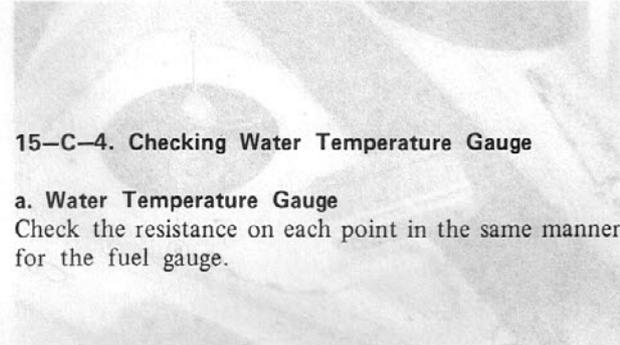


Fig. 15-15

15-C-3. Replacing Water Temperature Gauge Unit
 Replace the water temperature gauge unit in the numerical order.

1. Wiring connector
2. Water temperature gauge unit

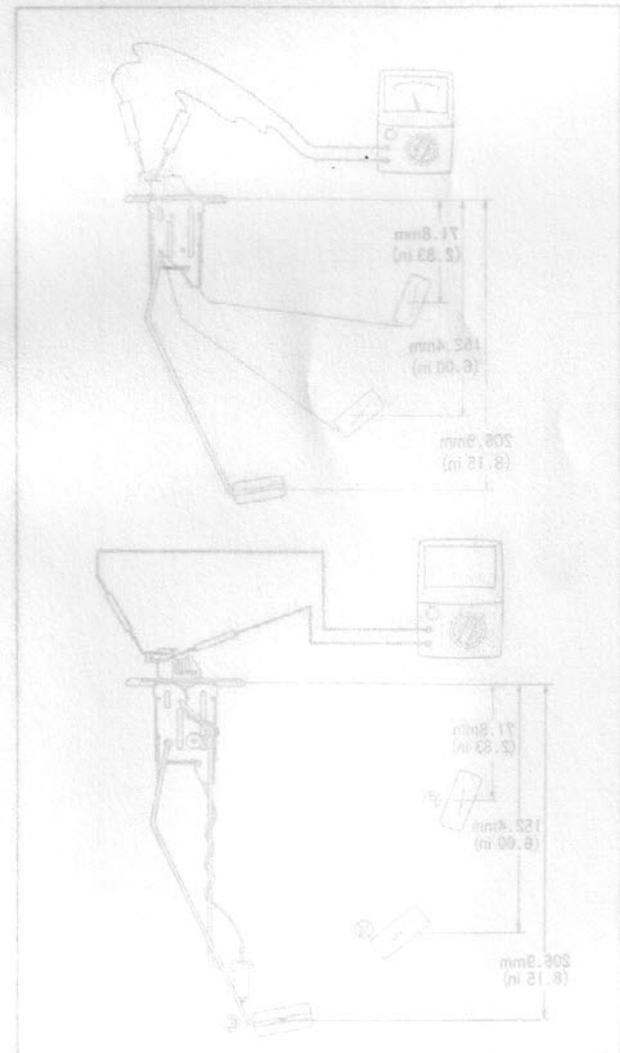
To Install, reverse the removal procedure.



15-C-4. Checking Water Temperature Gauge

a. Water Temperature Gauge

Check the resistance on each point in the same manner for the fuel gauge.



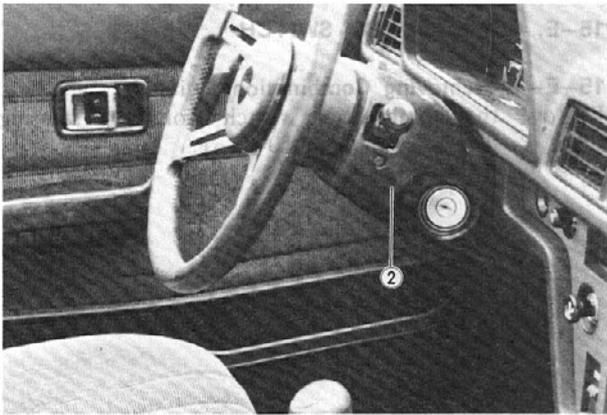


Fig. 15-16



Fig. 15-17

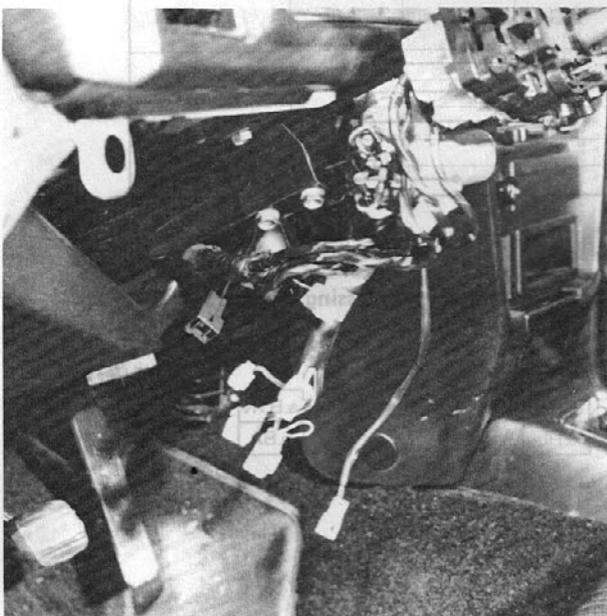


Fig. 15-18

15-D. IGNITION SWITCH

15-D-1. Replacing Ignition Switch Contact Housing
Replacing the ignition switch contact housing as follows

1. Disconnect the negative cable at the battery
2. Column covers

3. Wire couplers (disconnect)
4. Ignition switch contact housing

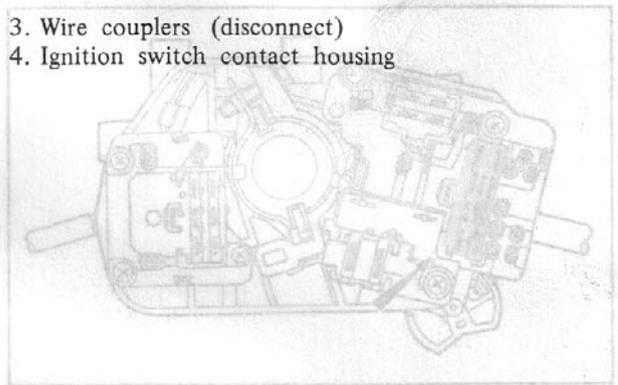


Fig. 15-20

15-D-2. Checking Ignition Switch

Check the continuity between the switch terminals using the circuit tester.

Terminal connections () Color code

Switch Position Terminal	LOCK	ACC	ON	START
B (WR)		•	•	•
ACC (L)		•	•	•
IG1 (BY)			•	•
IG2 (BW)			•	•
ST (BR)				•
L (RB)				•
E (B)				•
K1 (RY)	•	•	•	•
K2 (G)	•	•	•	•

Fig. 15-21

	HL	HL	BA	TNS	RTN	Terminal Switch Position
Light	•	•	•	•	•	OFF
	•	•	•	•	•	Tail Side Number
Dimmer	•	•	•	•	•	Head light
	•	•	•	•	•	Upper
Parking	•	•	•	•	•	Low
	•	•	•	•	•	OFF
	•	•	•	•	•	ON



Fig. 15-19

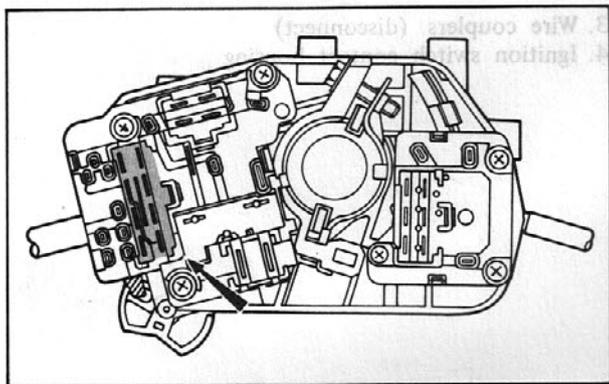


Fig. 15-20

15-E. COMBINATION SWITCH

15-E-1. Removing Combination Switch

Remove the combination switch from the steering shaft, as described in Par. 10-A-1.

15-E-2. Checking Combination Switch

Check the continuity between the switch terminals using the circuit tester.

Turn Signal and Hazard Switch

g.TL	e.TIG	c.FB	a.HBA
h.FU	f.TR	d	b

Terminal Switch Position	FU	TL	TR	TIG	HBA	FB	
Left Turn	●	●		●		●	Turn signal
Neutral				●		●	
Right Turn	●		●	●		●	
OFF							Hazard
ON	●	●			●	●	

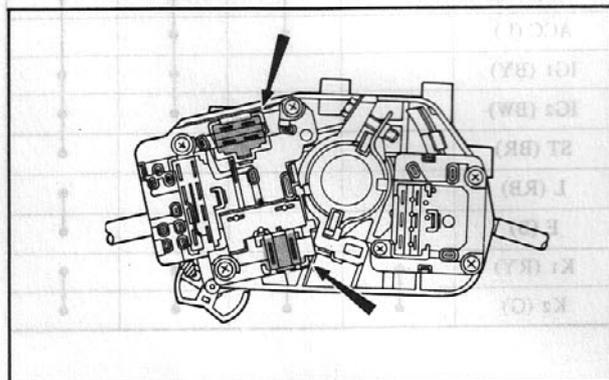


Fig. 15-21

Light, Dimmer and Passing Switch

c.TNS	d.HO
a.HL	b.HU

a.BTN
b.BA

Terminal Switch Position	BTN	TNS	BA	HL	HU	
OFF			●		●	Light
Tail, Side, Number	●	●	●		●	
Head light	●	●	●	●	●	
Upper			●			Dimmer
Low	●	●	●	●		
OFF						Passing
ON	●	●	●		●	

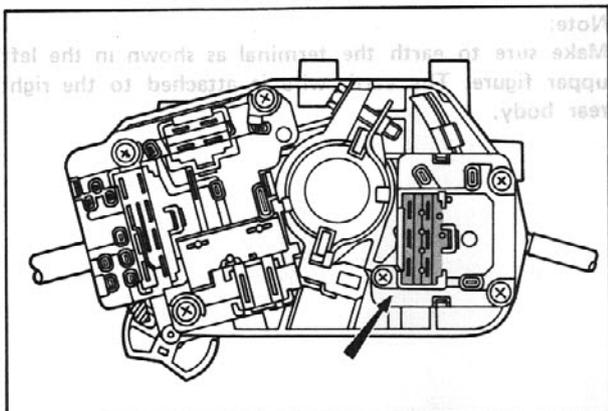


Fig. 15-22

Wiper and Washer Switch

- a. E Earth
- b. SWH Wiper motor HI ~ Combination switch
- c. INT Intermittent relay ~ Combination switch
- d. AS Intermittent relay ~ Combination switch
- e. SW Washer motor ~ Combination switch
- f. SWL Wiper motor LOW ~ Combination switch

e.SW	c.INT	a.E
f.SWL	d.AS	b.SWH

Terminal	AS	SWL	SWH	INT	SW	E	
One Touch							
Switch Position							
OFF	OFF	ON					Wiper
INTERMITTENT	ON						
LOW							
HIGH							Washer
OFF							
ON							

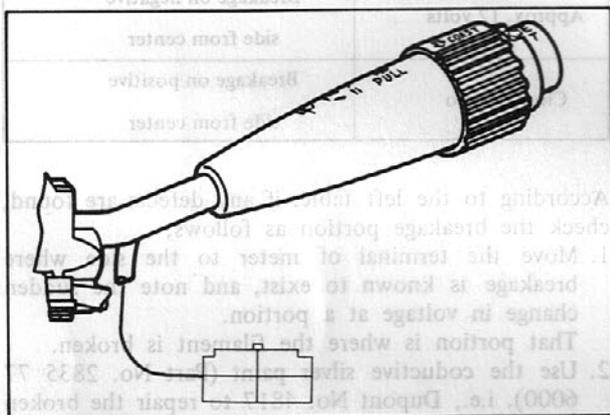


Fig. 15-23

Cruise Control

Terminal	SE	RE	CO	E
Switch Position				
OFF				
SET	ON			
RESUME		ON		
COAST			ON	

- A : Cruise con. box (i) ~ Combination switch SET (R)
- B : Cruise con. box (j) ~ Combination switch COAST (L)
- C : Cruise con. box (k) ~ Combination switch RESUME (Y)
- D : Earth (B)

A.SE	C.RE
B.CO	D.E

15-F. REAR WINDOW DEFROSTER

15-F-1. Checking Rear Window Defroster Switch
Check the continuity between the switch terminals, using a circuit tester.

Terminal	a	b	d
Switch Position			
OFF	ON		
ON		ON	

⊙ : Indicator light

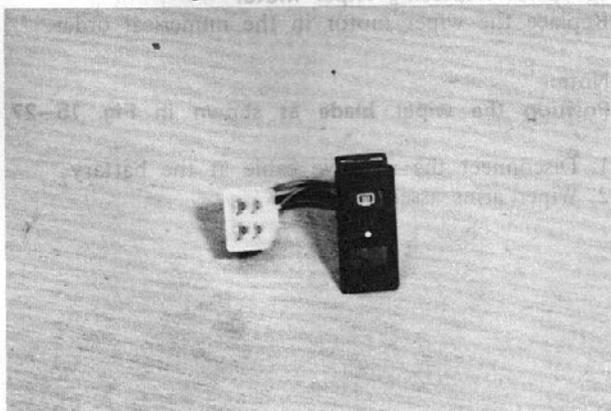


Fig. 15-24

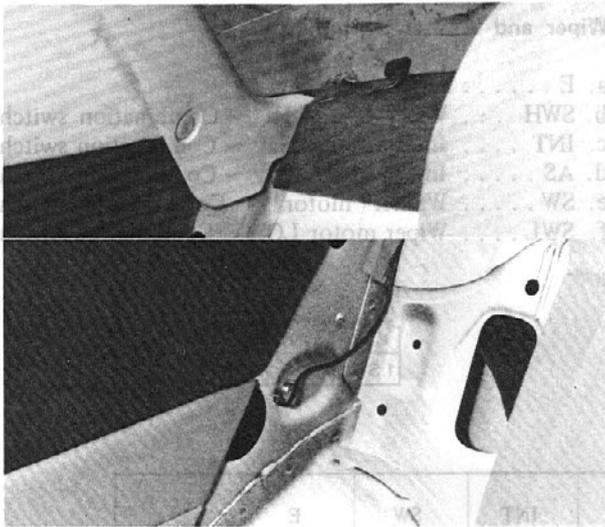


Fig. 15-25

Note:
Make sure to earth the terminal as shown in the left upper figure. The earth wire is attached to the right rear body.

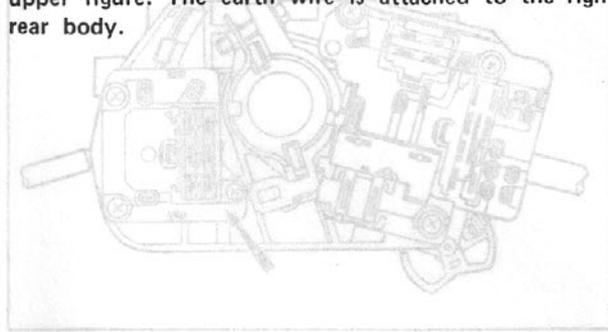


Fig. 15-25

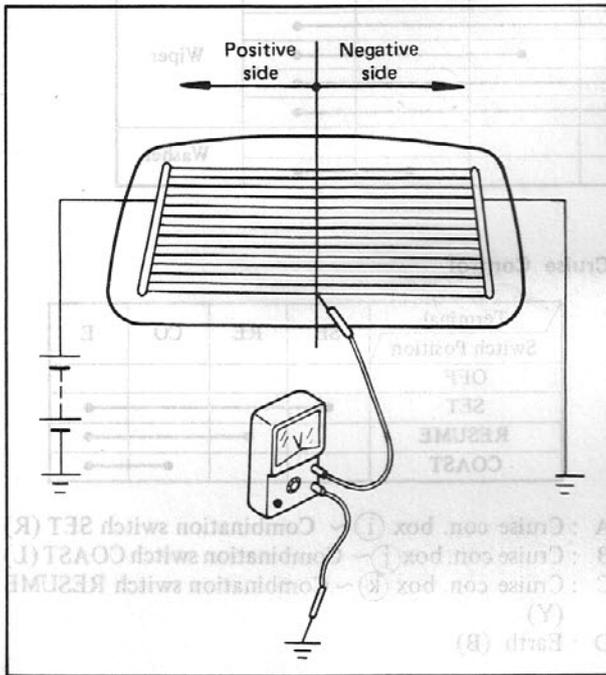


Fig. 15-26

b. Rear Window Defroster

Turn the ignition switch to "IG" position. The defroster switch on, check the voltage on the center.

Voltage	Filament
Approx. 6 volts	Normal
Approx. 12 volts	Breakage on negative side from center
Close to zero	Breakage on positive side from center

According to the left table, if any defects are found, check the breakage portion as follows;

1. Move the terminal of meter to the side where breakage is known to exist, and note the sudden change in voltage at a portion. That portion is where the filament is broken.
2. Use the conductive silver paint (Part No. 2835 77 6000), i.e., Dupont No. 4817 to repair the broken section.

Fig. 15-26

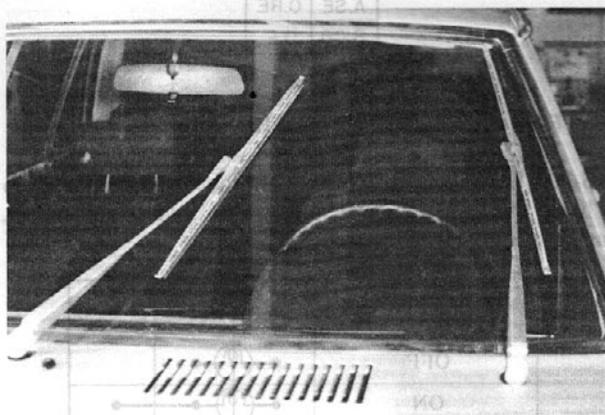


Fig. 15-27

15-G. WINDSHIELD WIPER

15-G-1. Replacing Wiper Motor

Replace the wiper motor in the numerical order.

Note:

Position the wiper blade as shown in Fig. 15-27.

1. Disconnect the negative cable at the battery
2. Wiper arms assembly

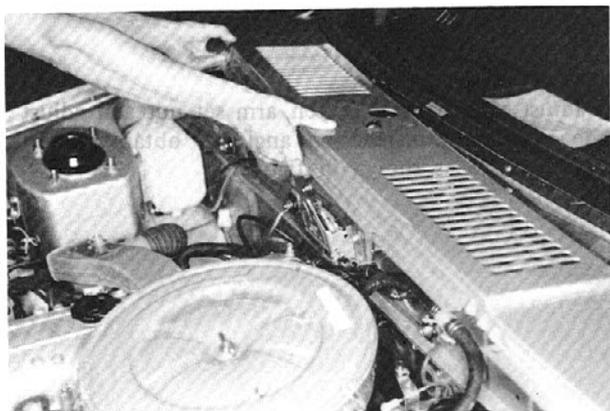


Fig. 15-28

3. Cowl grille attaching screws and fasteners
4. Disconnect the washer hoses from the washer nozzle.
5. Cowl grille
6. Wire coupler (disconnect)
7. Wiper motor and link assembly

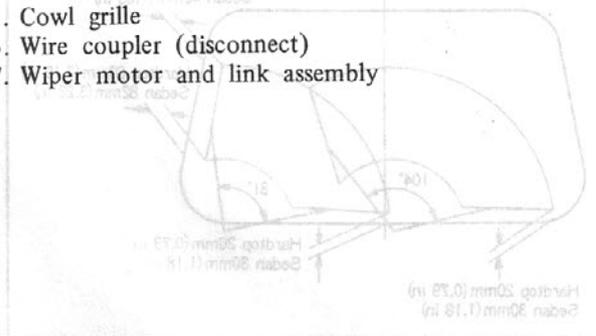


Fig. 15-29

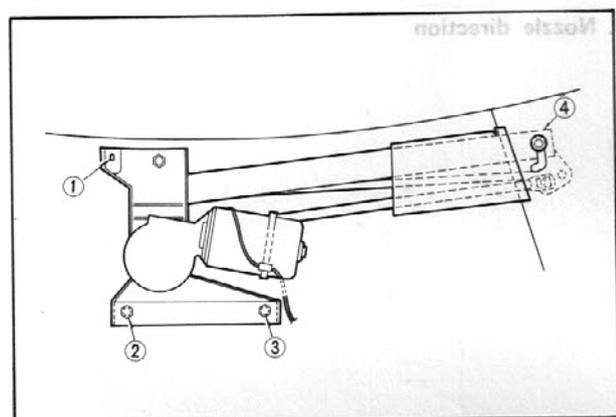


Fig. 15-29

Note:

Tighten the bolts attaching the wiper motor assembly in numerical order as shown in Fig. 15-29.

To install, reverse the removal procedure.

Note:

Install the wiper blades after installing the wiper motor verifying the autostop position.

Tightening torque:

Wiper arm assembly lock nut
1.0 ~ 1.2 kg-m (7.2 ~ 8.7 ft-lb)

Fig. 15-30

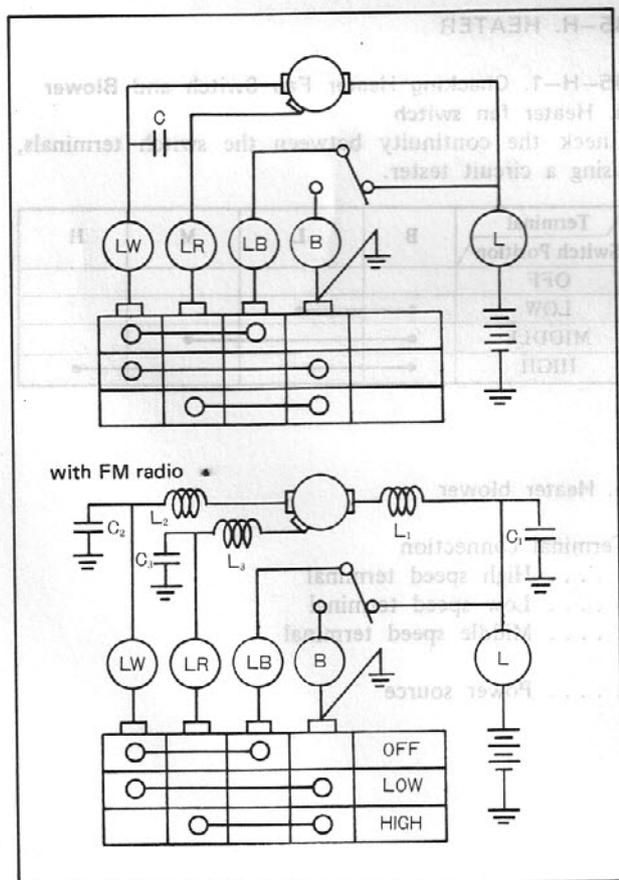
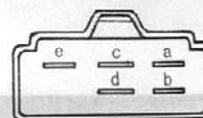


Fig. 15-30

15-G-2. Checking Wiper Motor

1. Earth the motor earth wire.
2. Connect a ohmmeter between the "L" terminal and battery (+) terminal.
3. Earth the "LW" or "LR" terminal and check the number of wiping revolutions and note the amperage.

	Wiping revolution	Amperage (no load)
LOW	50 ~ 60 rpm	3A or less
HIGH	69 ~ 95 rpm	3A or less



- a : Wiper Motor LOW ~ Combination switch SWL (LW)
- b : Fuse box ~ Wiper motor (L)
- c : Wiper motor HI ~ Combination switch SWH (LR)
- d : Intermittent wiper relay ~ Wiper motor AS (LB)
- e : Earth (B)

Fig. 15-31

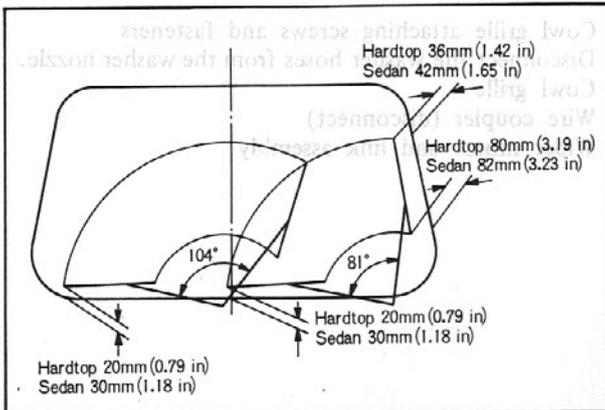


Fig. 15-31

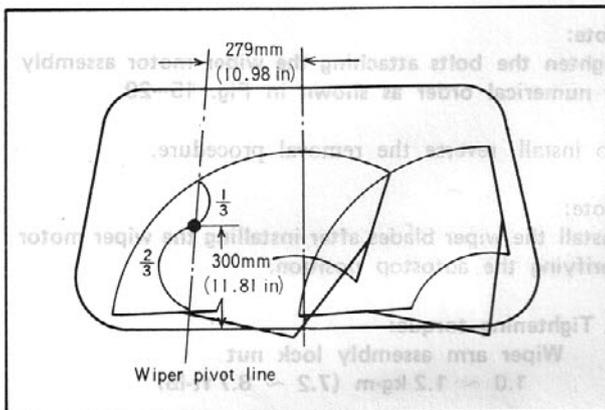


Fig. 15-32

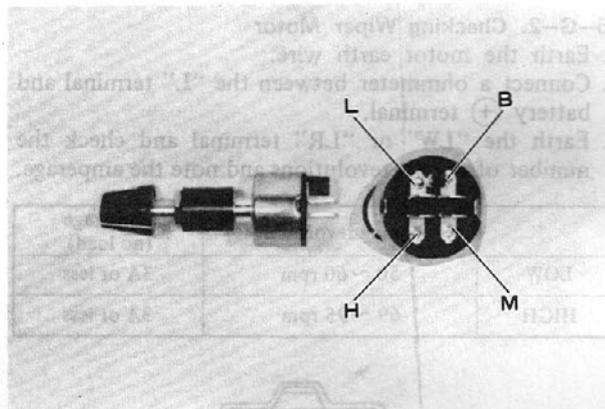


Fig. 15-33

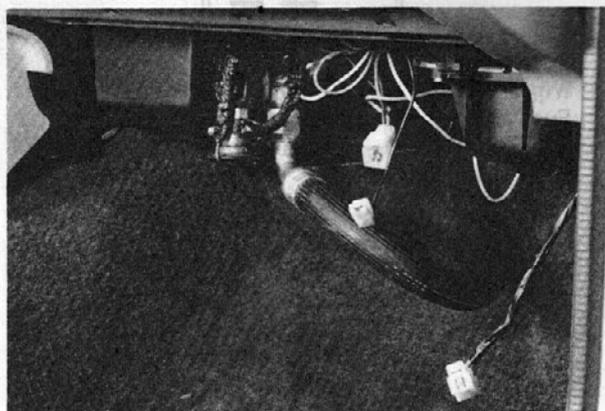


Fig. 15-34

15-G-3. Adjustment

a. Wiping area

To adjust wiping area, loosen arm set nut and adjust blade to correct installation angle to obtain correct sweeping zone as shown in figure.

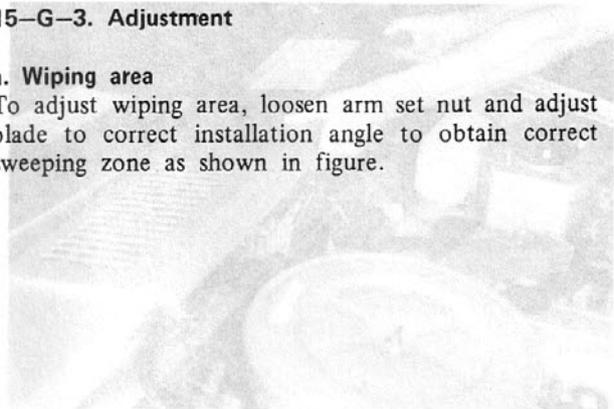


Fig. 15-35

b. Nozzle direction

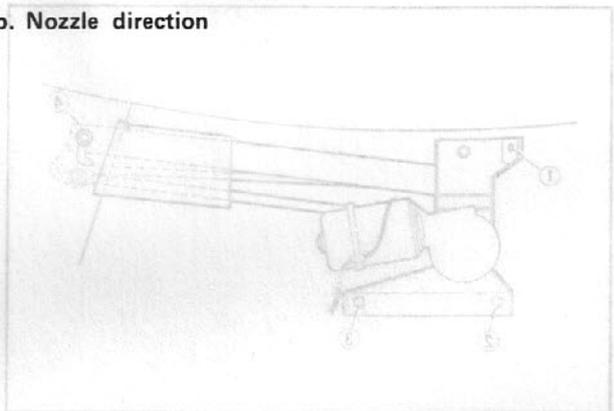


Fig. 15-36

15-H. HEATER

15-H-1. Checking Heater Fan Switch and Blower

a. Heater fan switch

Check the continuity between the switch terminals, using a circuit tester.

Terminal Switch Position	B	L	M	H
OFF				
LOW	●	●		
MIDDLE	●	●	●	
HIGH	●			●

b. Heater blower

Terminal connection

- a High speed terminal
- b Low speed terminal
- c Middle speed terminal
- a Power source

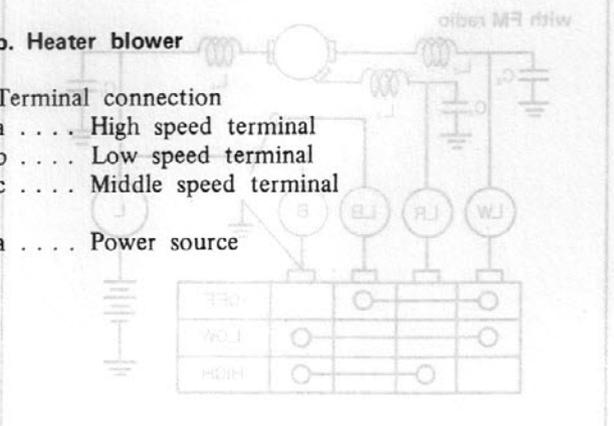


Fig. 15-37

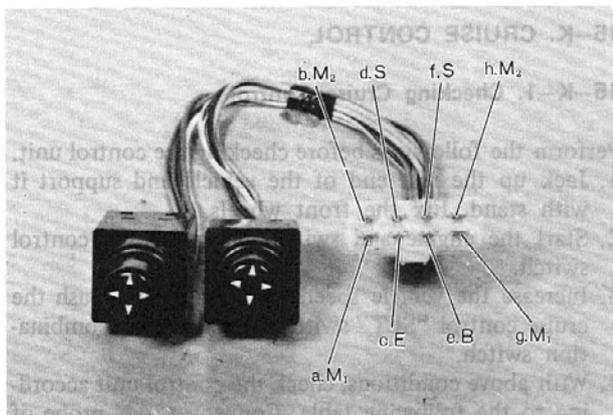


Fig. 15-35

15-I. REMOTE CONTROL MIRROR

15-I-1. Checking Remote Control Mirror Switch

Check the continuity between the switch terminals, using a circuit tester.

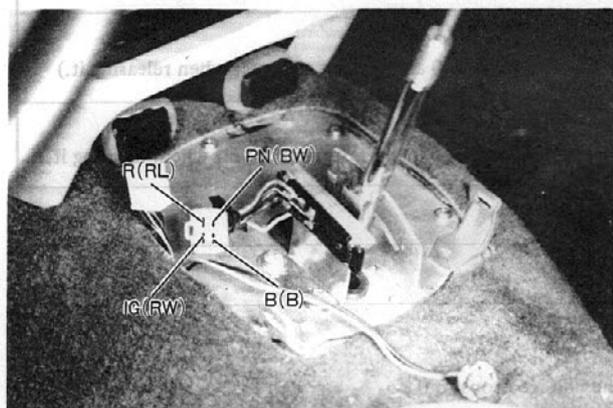
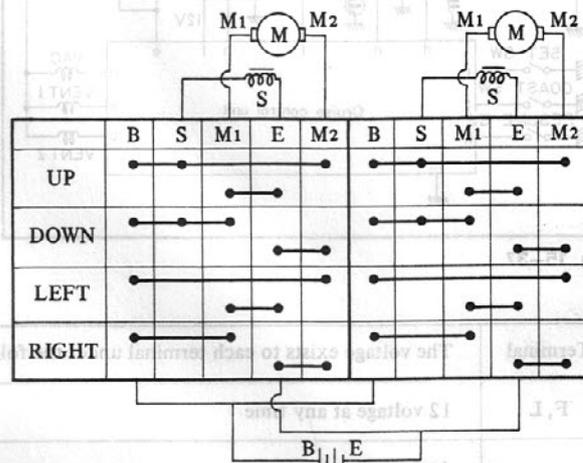


Fig. 15-36

15-J. INHIBITOR SWITCH

15-J-1. Checking Inhibitor Switch

Check the continuity between the switch terminals using the circuit tester.

Terminal Switch Position	B(B)	P.N(BW)	IG(RW)	R(RL)
P	●	●		
R			●	●
N	●	●		

Note:
Dotted lines show the connection for starting circuit.

- a : R . . . Inhibitor switch ~ Rear combination lamp (RL)
- b : P.N . . . Inhibitor switch ~ Starter (BW)
- c : IG . . . Fuse box ~ Inhibitor switch (RW)
- d : B . . . Steering lock ~ Inhibitor switch (B)

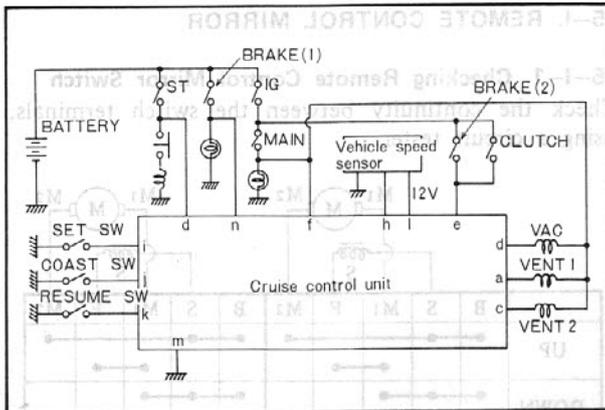


Fig. 15-37

15-K. CRUISE CONTROL

15-K-1. Checking Cruise Control

Perform the followings before checking the control unit.

1. Jack up the rear end of the vehicle and support it with stand. Fix the front wheels.
2. Start the engine and switch ON the cruise control switch.
3. Increase the vehicle speed to 30 mph and push the cruise control "SET" switch button on the combination switch.
4. With above conditions, check the control unit according to the following table. Connect a \ominus probe of voltmeter to (M) terminal and \oplus probe to each terminal.

Terminal	The voltage exists to each terminal under the following condition.
F, L	12 voltage at any time
I	Approx. 8 volt (During pushing "SET" switch button, the voltage drops to 0 and returns to 8 volt when releasing it.)
J	Approx. 8 volt (During turning "COAST" switch to arrow direction, the voltage drops to 0 and returns to 8 volt when releasing it.)
K	Approx. 8 volt (During turning "RESUME" switch to arrow direction, the voltage drops to 0 and returns to 8 volt when releasing it.)
E	12 volt during depressing the brake pedal or clutch pedal
N	12 volt during depressing the brake pedal
D	Automatic transmission only 12 volt (During shifting the shift lever to "P" or "N" position, the voltage drops to 0.)
B	When push "SET" switch button, the voltage drops to 0 and returns to 12 volt again.
A	When turn "COAST" switch to arrow direction, the voltage drops to 0 and returns to 12 volt again.
C	When depress clutch pedal, the voltage drops to 0 and returns to 12 volt again.
H	Perform followings. 1) Stop the engine. 2) Block the one side of wheel and turn the ignition switch ON. 3) Turn the other side of wheel by hand. The needle of voltmeter moves between 12 volt and 0 continuously.

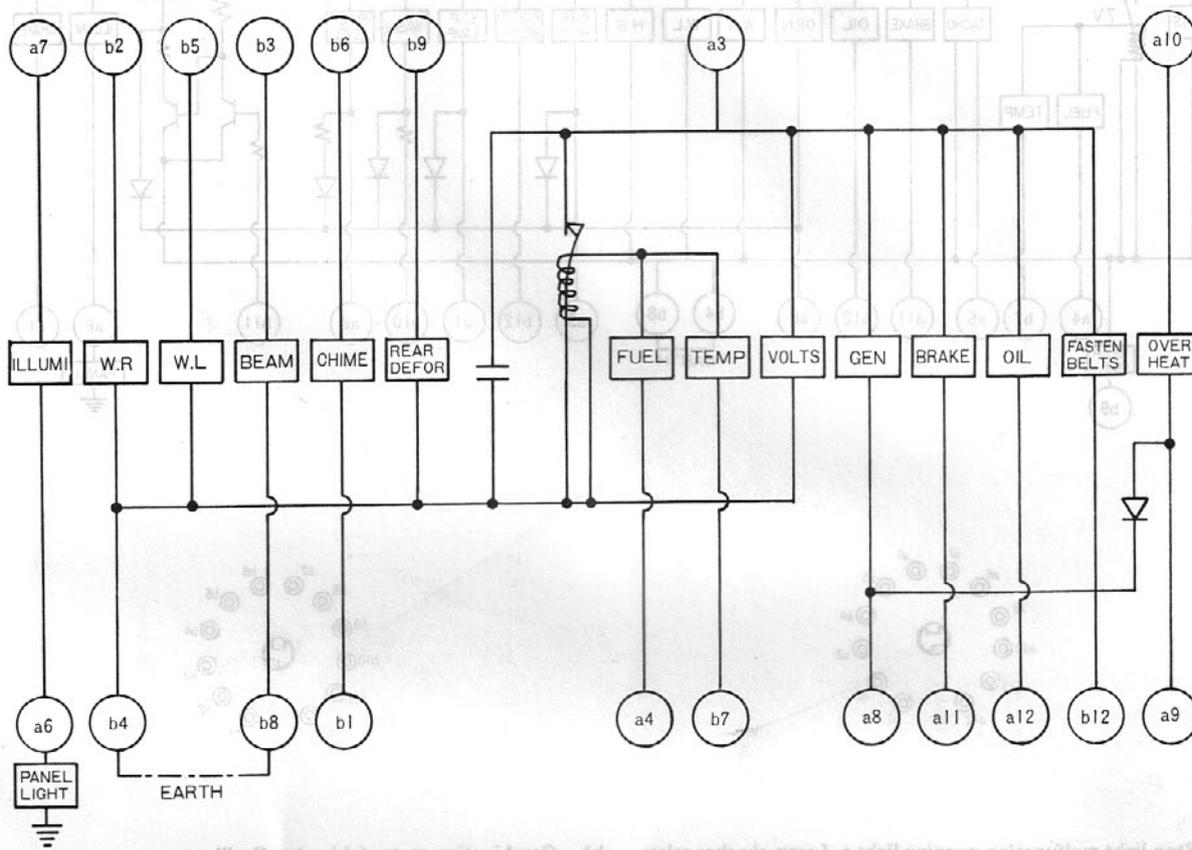
15-L. METER SET

Type B (With tachometer)

15-L-1. Checking Meter Set Print Panel

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 a circuit tester.

Type A (Without tachometer)



- | | |
|---|--|
| a1 Vacant | b1 Combination meter (chime) ~ Oscillator |
| a2 Vacant | b2 Combination switch TR ~ Turn signal indicator light RH (GW) |
| a3 Fuse box ~ Combination meter (GY) | b3 Head light ~ High beam indicator light (RW) |
| a4 Fuel tank unit ~ Fuel gauge (Y) | b4 Earth (B) |
| a5 Vacant | b5 Combination switch TL ~ Turn signal indicator light LH (GB) |
| a6 Earth (B) | b6 Fuse box ~ Combination meter (chime) (LB) |
| a7 Panel illumination control ~ Meter illumination (LY) | b7 Water thermo unit ~ Water temperature gauge (YB) |
| a8 Check relay ~ Alternator warning light (YL) | b8 Earth (B) |
| a9 Heat hazard warning light ~ Floor sensor (YL) | b9 Rear defroster switch ~ Rear defroster warning light (BL) |
| a10 Fuse box ~ Heat hazard warning light (BW) | b10 Vacant |
| a11 Steering lock L ~ Brake system warning light (RB) | b11 Vacant |
| a12 Oil pressure switch ~ Oil pressure warning light (YR) | b12 Seat belt warning light ~ Timer buzzer (GR) |

GENERAL INFORMATION

SPECIAL TOOLS

The letters A and B in the Priority Column indicate the degree of importance of each tool.

A Indispensable

The tools ranked "A" in this list are indispensable for your performing operations satisfactorily, easily and efficiently and so it would be advisable for you to provide your service shops with these tools by all means.

B Selective

The degree of necessity of the tools in this list are not so high as that of the tools in A, but please provide your service shops with the tools in B if possible, in order to easily perform operations.

2

GENERAL INFORMATION

SPECIAL TOOLS

The Letters, A and B in the Priority Column indicate the degree of importance of each tool.

A Indispensable

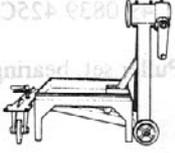
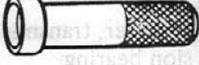
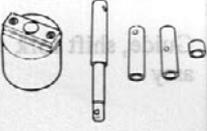
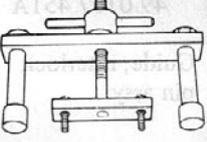
The tools ranked "A" in this list are indispensable for your performing operations satisfactorily, easily and efficiently and so it would be advisable for your to provide your service shops with these tools by all means.

B Selective

The degree of necessity of the tools in this list are not so high as that of the tools in A, but please provide your service shops with the tools in B if possible, in order to easily perform operations.

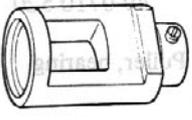
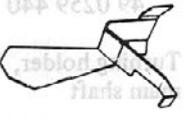
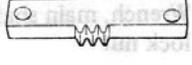
2

ENGINE GROUP

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0107 680A Engine stand	A A	
49 0636 100A Arm, valve spring lifter	A A	
49 0223 160D Pusher, valve seal	A A	
49 8134 040 Tool set, piston pin setting	A B	
49 0221 270B Puller, main bearing cap	B B	
49 4120 110 Remover, chain ring	B	

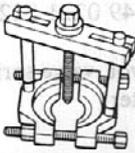
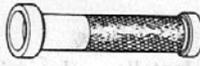
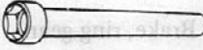
COOLING GROUP

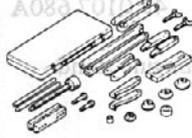
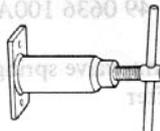
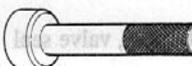
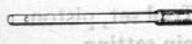
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0636 145 Puller, fan pulley boss	A A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0221 005A Hanger, engine stand	A A	
49 0221 222A Pivot, valve spring lifter	A A	
49 0221 251A Remover & Installer, valve guide	A A	
49 3953 260 Guide, chain adjuster	A B	
49 0118 271A Brake, ring gear	A A	
49 0164 631A Spanner, lock nut	B B	

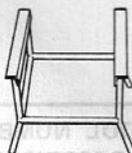
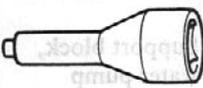
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0823 146 Support block, water pump impeller	A A	

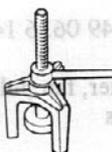
CLUTCH and TRANSMISSION (Manual) GROUP

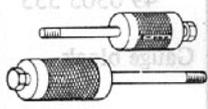
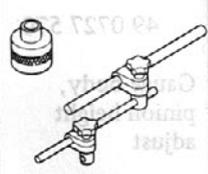
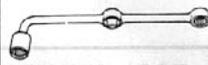
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0813 310 Centering tool, clutch disk	AA	
49 0710 520 Puller, bearing	AA	
49 0180 321A Installer main drive gear bearing	AA	
49 0259 440 Turning holder, main shaft	BA	
49 1243 465A Wrench, main shaft lock nut	AA	

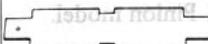
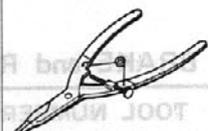
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0839 425C Puller set, bearing	AA	
49 0305 430 Pusher, main drive shaft	AA	
49 0500 330 Installer, transmission bearing	AA	
49 0862 350 Guide, shift fork assy	BA	
49 0187 451A Guide, interlock pin assy	BA	

AUTOMATIC TRANSMISSION GROUP

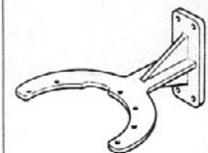
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0378 320A Stand, transmission case	B	
49 0378 346 Hex-head wrench	AA	

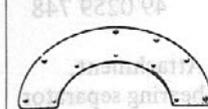
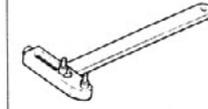
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0378 345 Socket, extension	A	
49 0378 375 Compressor, clutch spring	AA	

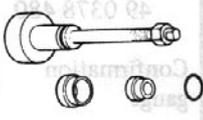
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0378 390 Puller, oil pump	A	
49 2113 025A Assembling gauge, oil pump	A	
49 0877 435 Special wrench	A	
49 8000 021 Torque driver	B	
49 8000 031 Hexagon	B	

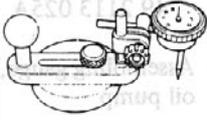
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0378 400A Gauge set, oil pressure	A	
49 0378 480 Confirmation gauge	B	
49 8000 015 Remover, snap ring	B	
49 8000 025 Remover, snap ring	B	
49 8000 035 Spinner handle	B	

DIFFERENTIAL GROUP

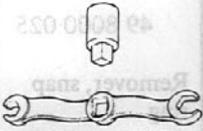
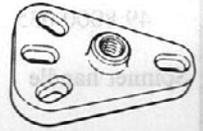
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0419 561 Attachment, engine stand	A	
49 0259 710A Holder, coupling flange	B	

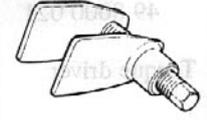
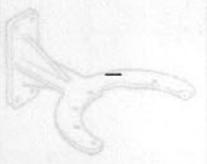
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0223 561A Attachment, diff. work	A	
49 0259 720 Wrench, diff. side bearing adjust nut	B	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0259 730 Wrench, drain plug	B	
49 8531 565 Pinion model	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0305 555 Gauge block	A	
49 0727 570 Gauge body, pinion height adjust	A	

BRAKE and REAR AXLE GROUP

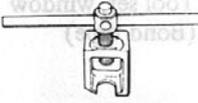
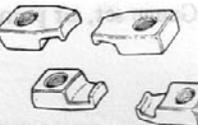
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0259 770A Spanner, flare nut	A	
49 8501 631 Attachment, rear axle shaft puller	B	
49 8531 746 Separator, bearing	B	
49 0259 748 Attachment, bearing separator	B	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0221 600C Expand tool, disk brake	B	
49 0223 630A Puller, rear axle shaft	B	
49 0259 747 Attachment, bearing separator	B	
	A	

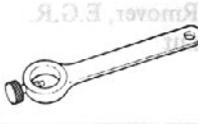
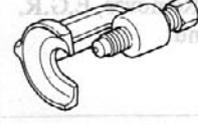
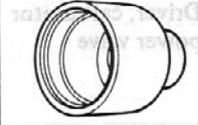
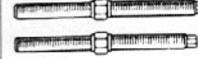
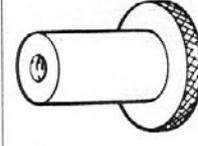
	B	
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	B	
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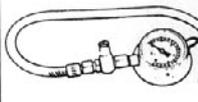
STEERING and SUSPENSION GROUP

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 1391 580 Lock nut wrench, manual steering gear box	A	
49 0223 695E Puller, pitman arm	B	
49 0727 575 Puller, socket joint	B	
49 0223 640A Arm, coil spring compressor	A	
49 0259 590 Pilot, oil seal	B	
49 1232 670 Gauge set, power steering	A	

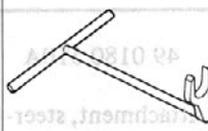
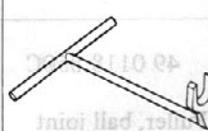
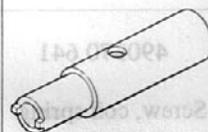
STEERING and SUSPENSION GROUP

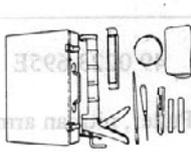
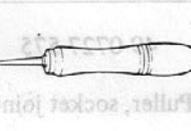
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0180 510A Attachment, steering worm bearing preload measuring	B	
49 0118 850C Puller, ball joint	B	
49 8038 785 Boot installer, ball joint dust cover	B	
490370 641 Screw, coil spring compressor	A	
49 1205 605 Adapter, caster camber gauge	B	
49 8545 585 Adjust wrench, manual steering gear box	A	

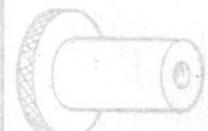
TESTER and OTHER GROUP

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0187 280 Oil pressure gauge	B	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0839 285 Checker, fuel thermometer	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 8134 245 Remover, E.G.R. nut	B	
49 3936 245 Remover, E.G.R. nut	B	
49 0118 870A Driver, carburetor power valve	B	
49 8531 855 Nut wrench	B	

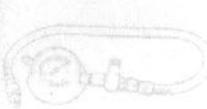
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 1345 875A Hook wrench, fuel gauge tank unit	A	
49 0305 870A Tool set, window (Bond type)	A	
49 0208 701A Air out tool, boot	B	
49 2113 010B Gauge set, air pump	A	

	B	49 1202 602 Adapter, caster camber gauge
	A	49 8242 282 Adjustable wrench, manual steering gear box

	B	49 0222 290 Pilot, oil seal
	A	49 1232 670 Gauge set, power steering

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0839 282 Checker, fuel thermometer	A	

TESTER and OTHER GROUP

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0187 280 Oil pressure gauge	B	

TECHNICAL DATA

ENGINE		Type	
Standard	Standard	Four cylinder four stroke engine in line, water cooled, overhead camshaft	Four cylinder four stroke engine in line, water cooled, overhead camshaft
Compression ratio	8.6 : 1	1.970 cc (150.5 cu in)	80 mm (3.15 in)
Piston displacement	1.970 cc (150.5 cu in)	98 mm (3.86 in)	98 mm (3.86 in)
Stroke	80 mm (3.15 in)	15.0 kg/cm ² (171 lb/in ²) at 280 rpm	15.0 kg/cm ² (171 lb/in ²) at 280 rpm
Bore	80 mm (3.15 in)	2.0 kg/cm ² (28 lb/in ²)	2.0 kg/cm ² (28 lb/in ²)
Max. permissible difference	2.0 kg/cm ² (28 lb/in ²)	3.0 kg/cm ² (42 lb/in ²)	3.0 kg/cm ² (42 lb/in ²)
Valve clearance (warm engine)	0.18 ~ 0.028 mm (0.007 ~ 0.003 in)	0.18 ~ 0.028 mm (0.007 ~ 0.003 in)	0.18 ~ 0.028 mm (0.007 ~ 0.003 in)
Valve side	0.50 mm (0.008 in)	0.50 mm (0.008 in)	0.50 mm (0.008 in)
Intake	0.50 mm (0.008 in)	0.50 mm (0.008 in)	0.50 mm (0.008 in)
Exhaust	0.50 mm (0.008 in)	0.50 mm (0.008 in)	0.50 mm (0.008 in)
Cylinder head	0.50 mm (0.008 in)	0.50 mm (0.008 in)	0.50 mm (0.008 in)
Permissible distortion of cylinder head surface	0.15 mm (0.006 in)	0.15 mm (0.006 in)	0.15 mm (0.006 in)
Valve seat	45°	45°	45°
Valve seat angle	45°	45°	45°
Intake	1.4 mm (0.055 in)	1.4 mm (0.055 in)	1.4 mm (0.055 in)
Exhaust	1.4 mm (0.055 in)	1.4 mm (0.055 in)	1.4 mm (0.055 in)
Valve guide	20.2 mm (1.988 in)	20.2 mm (1.988 in)	20.2 mm (1.988 in)
Length	14 + 0.04 mm	14 + 0.04 mm	14 + 0.04 mm
Outer diameter	14 + 0.03 mm	14 + 0.03 mm	14 + 0.03 mm
Inner diameter	8 + 0.03 mm	8 + 0.03 mm	8 + 0.03 mm
Valve - Intake	108.2 mm (4.271 in)	108.2 mm (4.271 in)	108.2 mm (4.271 in)
Overall length	45 ± 0.1 mm	45 ± 0.1 mm	45 ± 0.1 mm
Head diameter	1.8236 ± 0.0039 mm	1.8236 ± 0.0039 mm	1.8236 ± 0.0039 mm
Face angle	45°	45°	45°
Valve margin	1.0 mm (0.039 in)	1.0 mm (0.039 in)	1.0 mm (0.039 in)
Wear limit	8 + 0.045 mm	8 + 0.045 mm	8 + 0.045 mm
Stem diameter	7.980 mm (0.3142 in)	7.980 mm (0.3142 in)	7.980 mm (0.3142 in)
Valve stem to guide clearance	0.018 ~ 0.023 mm	0.018 ~ 0.023 mm	0.018 ~ 0.023 mm
Standard	0.007 ~ 0.0021 mm (0.0008 in)	0.007 ~ 0.0021 mm (0.0008 in)	0.007 ~ 0.0021 mm (0.0008 in)
Wear limit	0.50 mm (0.008 in)	0.50 mm (0.008 in)	0.50 mm (0.008 in)
Center	45 - 0.082 mm	45 - 0.082 mm	45 - 0.082 mm
Front and rear	45 - 0.040 mm	45 - 0.040 mm	45 - 0.040 mm
Journal diameter	11.317 - 0.0020 mm	11.317 - 0.0020 mm	11.317 - 0.0020 mm
Camshaft	0.10 mm (0.004 in)	0.10 mm (0.004 in)	0.10 mm (0.004 in)
Wear limit	0.027 ~ 0.081 mm (0.0011 ~ 0.0032 in)	0.027 ~ 0.081 mm (0.0011 ~ 0.0032 in)	0.027 ~ 0.081 mm (0.0011 ~ 0.0032 in)
Clearance in rocker arm	0.027 ~ 0.081 mm (0.0011 ~ 0.0032 in)	0.027 ~ 0.081 mm (0.0011 ~ 0.0032 in)	0.027 ~ 0.081 mm (0.0011 ~ 0.0032 in)
Exhaust	336 mm (13.229 in)	336 mm (13.229 in)	336 mm (13.229 in)
Intake	159 mm (6.260 in)	159 mm (6.260 in)	159 mm (6.260 in)
Length	19 - 0.007 mm	19 - 0.007 mm	19 - 0.007 mm
Outer diameter	19 - 0.028 mm	19 - 0.028 mm	19 - 0.028 mm
Rocker arm shaft	19 + 0.023 mm	19 + 0.023 mm	19 + 0.023 mm
Inner diameter	19 + 0.020 mm	19 + 0.020 mm	19 + 0.020 mm
Rocker arm bush	8.1 kg (17.9 lb)	8.1 kg (17.9 lb)	8.1 kg (17.9 lb)
Limit	8.1 kg (17.9 lb)	8.1 kg (17.9 lb)	8.1 kg (17.9 lb)
Standard	14.25 kg (31.4 lb)	14.25 kg (31.4 lb)	14.25 kg (31.4 lb)
Limit	12.1 kg (26.7 lb)	12.1 kg (26.7 lb)	12.1 kg (26.7 lb)
Standard	34.0 mm (1.339 in)	34.0 mm (1.339 in)	34.0 mm (1.339 in)
Fitting load	34.0 mm (1.339 in)	34.0 mm (1.339 in)	34.0 mm (1.339 in)
Limit	36.7 mm (1.443 in)	36.7 mm (1.443 in)	36.7 mm (1.443 in)
Standard	37.3 mm (1.469 in)	37.3 mm (1.469 in)	37.3 mm (1.469 in)
Free length	37.3 mm (1.469 in)	37.3 mm (1.469 in)	37.3 mm (1.469 in)
Outer coil diameter	35.9 mm (1.413 in)	35.9 mm (1.413 in)	35.9 mm (1.413 in)
Wire diameter	4.3 mm (0.169 in)	4.3 mm (0.169 in)	4.3 mm (0.169 in)
Valve spring - Outer	0.50 mm (0.008 in)	0.50 mm (0.008 in)	0.50 mm (0.008 in)
Wear limit	0.018 ~ 0.028 mm (0.0007 ~ 0.0011 in)	0.018 ~ 0.028 mm (0.0007 ~ 0.0011 in)	0.018 ~ 0.028 mm (0.0007 ~ 0.0011 in)
Stem to guide clearance	0.018 ~ 0.028 mm (0.0007 ~ 0.0011 in)	0.018 ~ 0.028 mm (0.0007 ~ 0.0011 in)	0.018 ~ 0.028 mm (0.0007 ~ 0.0011 in)
Wear limit	7.975 mm (0.3140 in)	7.975 mm (0.3140 in)	7.975 mm (0.3140 in)
Standard	8 + 0.025 mm	8 + 0.025 mm	8 + 0.025 mm
Valve margin	1.0 mm (0.039 in)	1.0 mm (0.039 in)	1.0 mm (0.039 in)
Wear limit	107.0 mm (4.213 in)	107.0 mm (4.213 in)	107.0 mm (4.213 in)
Head diameter	45 ± 0.1 mm	45 ± 0.1 mm	45 ± 0.1 mm
Overall length	107.0 mm (4.213 in)	107.0 mm (4.213 in)	107.0 mm (4.213 in)

ENGINE		Valve-Exhaust	
Type	Four cylinder four stroke engine in line, water cooled, overhead camshaft	Overall length	107.0 mm (4.2127 in)
Bore	80 mm (3.15 in)	Head diameter	33 ± 0.1 mm (1.2992 ± 0.0039 in)
Stroke	98 mm (3.86 in)	Face angle	45°
Piston displacement	1,970 cc (120.2 cu-in)	Valve margin	
Compression ratio	8.6 : 1	Wear limit	1.0 mm (0.039 in)
Compression pressure		Stem diameter	
Standard	12.0 kg/cm ² (171 lb/in ²) at 260 rpm	Standard	8 + 0.045 mm + 0.025
Limit	9.0 kg/cm ² (128 lb/in ²)	Wear limit	(0.3150 + 0.0018 in) + 0.0010
Max. permissible difference	2.0 kg/cm ² (28 lb/in ²)	Stem to guide clearance	7.975 mm (0.3140 in)
Valve clearance (warm engine)		Standard	0.018 ~ 0.058 mm (0.0007 ~ 0.0023 in)
Valve side		Wear limit	0.20 mm (0.008 in)
Inlet	0.30 mm (0.012 in)	Valve spring-Outer	
Exhaust	0.30 mm (0.012 in)	Wire diameter	4.3 mm (0.169 in)
Cam side		Outer coil diameter	32.9 mm (1.295 in)
Inlet	0.22 mm (0.009 in)	Free length	
Exhaust	0.22 mm (0.009 in)	Standard	37.3 mm (1.469 in)
Cylinder head		Limit	36.2 mm (1.425 in)
Permissible distortion of cylinder head surface	0.15 mm (0.006 in)	Fitting length	34.0 mm (1.339 in)
Valve seat		Fitting load	
Valve seat angle		Standard	14.25 kg (31.4 lb)
Inlet	45°	Limit	12.1 kg (26.7 lb)
Exhaust	45°	Valve spring-Inner	
Valve seat width		Wire diameter	3.0 mm (0.118 in)
Inlet	1.4 mm (0.055 in)	Outer coil diameter	23.1 mm (0.909 in)
Exhaust	1.4 mm (0.055 in)	Free length	
Valve guide		Standard	36.8 mm (1.449 in)
Length	50.5 mm (1.988 in)	Limit	35.7 mm (1.406 in)
Outer diameter	14 + 0.044 mm + 0.033	Fitting length	32.0 mm (1.260 in)
	(0.5512 + 0.0017 in) + 0.0013	Fitting load	
Inner diameter	8 + 0.083 mm + 0.063	Standard	9.5 kg (20.9 lb)
	(0.3150 + 0.0033 in) + 0.0025	Limit	8.1 kg (17.9 lb)
Valve-Inlet		Rocker arm bush	
Overall length	108.5 mm (4.2717 in)	Inner diameter	19 + 0.053 mm + 0.020
Head diameter	42 ± 0.1 mm (1.6536 ± 0.0039 in)		(0.7480 + 0.0021 in) + 0.0008
Face angle	45°	Rocker arm shaft	
Valve margin		Outer diameter	19 - 0.007 mm - 0.028
Wear limit	1.0 mm (0.039 in)		(0.7480 - 0.0003 in) - 0.0011
Stem diameter		Length	
Standard	8 + 0.045 mm + 0.030	Inlet	159 mm (6.260 in)
	(0.3150 + 0.0018 in) + 0.0012	Exhaust	336 mm (13.229 in)
Wear limit	7.980 mm (0.3142 in)	Clearance in rocker arm	
Valve stem to guide clearance		Standard	0.027 ~ 0.081 mm (0.0011 ~ 0.0032 in)
Standard	0.018 ~ 0.053 mm (0.0007 ~ 0.0021 in)	Wear limit	0.10 mm (0.004 in)
Wear limit	0.20 mm (0.008 in)	Camshaft	
		Journal diameter	
		Front and rear	45 - 0.040 mm - 0.055
			(1.7717 - 0.0016 in) - 0.0022
		Center	45 - 0.050 mm - 0.065
			(1.7717 - 0.0020 in) - 0.0026

Wear limit of journal	0.05 mm (0.0020 in)	Ring groove width	
Basic circle of cam	38 ± 0.05 mm (1.4961 ± 0.0020 in)	Top	1.2 + 0.040 + 0.020 mm (0.0472 + 0.0016 + 0.0008 in)
Cam elevation		Second	1.5 + 0.034 + 0.020 mm
Inlet	45.037 mm (1.7731 in)	Oil	4 + 0.032 + 0.020 mm (0.1575 + 0.0013 + 0.0008 in)
Exhaust	45.004 mm (1.7718 in)	Ring groove depth	3.91 ~ 4.00 mm (0.1539 ~ 0.1575 in)
Wear limit of cam elevation		Piston and cylinder clearance	Standard 0.036 ~ 0.075 mm (0.0014 ~ 0.0030 in)
Inlet	44.837 mm (1.7653 in)	Wear limit	0.15 mm (0.0059 in)
Exhaust	44.804 mm (1.7640 in)	Available oversize piston	0.25 mm (0.010 in)
Camshaft end play		Piston ring	Width
Standard	0.02 ~ 0.18 mm (0.001 ~ 0.007 in)	Top	1.2 - 0.01 - 0.03 mm (0.0472 - 0.0004 - 0.0012 in)
Wear limit	0.20 mm (0.008 in)	Second	1.5 - 0.01 - 0.03 mm (0.0591 - 0.0004 - 0.0012 in)
Camshaft run-out		Thickness	Top 3.6 ± 0.1 mm (0.1417 ± 0.0039 in)
Limit	0.03 mm (0.0012 in)	Second	3.6 ± 0.1 mm (0.1417 ± 0.0039 in)
Camshaft bearing		Oil	3.6 ± 0.2 mm (0.1417 ± 0.0079 in)
Bearing clearance		Side clearance	Top 0.030 ~ 0.070 mm (0.0012 ~ 0.0028 in)
Front and rear	0.019 ~ 0.069 mm (0.0007 ~ 0.0027 in)	Second	0.030 ~ 0.064 mm (0.0012 ~ 0.0025 in)
Center	0.029 ~ 0.079 mm (0.0011 ~ 0.0031 in)	End gap	Top & Second 0.2 ~ 0.4 mm (0.008 ~ 0.016 in)
Limit of bearing clearance	0.15 mm (0.0059 in)	Oil	0.3 ~ 0.9 mm (0.012 ~ 0.035 in)
Available undersize	0.25 mm (0.010 in)	Limit	1.0 mm (0.039 in)
	0.50 mm (0.020 in)	Available oversize piston	0.25 mm (0.010 in)
	0.75 mm (0.030 in)	ring	0.50 mm (0.020 in)
Camshaft drive		Piston pin	Length 65 mm (2.5591 in)
Type	Chain and sprockets	Diameter	20 - 0.012 - 0.024 mm (0.7874 - 0.0005 - 0.0009 in)
Number of chain links	106	Clearance between piston	0 ~ 0.022 mm (0 ~ 0.0009 in)
Number of sprocket teeth		and pin	
Camshaft sprocket	38	Main journal diameter	Standard 63 - 0.045 - 0.060 mm (2.4804 - 0.0018 - 0.0024 in)
Crankshaft sprocket	19		
Protrusion of adjuster sliper head limit	13 mm (0.512 in)		
Valve timing			
Inlet valve opens	10° BTDC		
Inlet valve closes	57° ABDC		
Exhaust valve opens	54° BBDC		
Exhaust valve closes	13° ATDC		
Connecting rod			
Length (Center to center)	166 ± 0.05 mm (6.5355 ± 0.0020 in)		
Permissible bend or twist	0.02 mm per 50 mm (0.0008 in per 1.9685 in)		
Side clearance	0.11 ~ 0.21 mm (0.004 ~ 0.008 in)		
Small end			
Inner diameter	20 - 0.039 - 0.052 mm (0.7874 - 0.0015 - 0.0020 in)		
Connecting rod bearing			
Bearing clearance			
Standard	0.027 ~ 0.077 mm (0.0011 ~ 0.0030 in)		
Wear limit	0.10 mm (0.0039 in)		
Available undersize bearing	0.25 mm (0.010 in)		
	0.50 mm (0.020 in)		
	0.75 mm (0.030 in)		
Piston			
Diameter measured at 90° to the pin bore axis and 18.5 mm (0.73 in) be- low the oil ring groove	79.954 ± 0.010 mm (3.1478 ± 0.0004 in)		
Piston pin hole bore	20 - 0.002 - 0.012 mm (0.7874 - 0.0001 - 0.0005 in)		

<p>Wear limit of main journal Crankpin diameter Standard 53 - 0.045 mm - 0.060 mm (2.0866 - 0.0018 in) - 0.0024 in)</p> <p>Wear limit of crankpin Crankshaft run-out Limit Crankshaft end play Standard 0.05 mm (0.0020 in) 0.03 mm (0.0012 in) 0.08 ~ 0.24 mm (0.003 ~ 0.009 in) Limit 0.30 mm (0.012 in)</p> <p>Thrust bearing Available oversize bearing 0.25 mm (0.010 in) 0.50 mm (0.020 in) 0.75 mm (0.030 in)</p> <p>Main bearing Bearing clearance Standard 0.031 ~ 0.050 mm (0.0012 ~ 0.0020 in)</p> <p>Wear limit Available undersize bearing 0.08 mm (0.0031 in) 0.25 mm (0.010 in) 0.50 mm (0.020 in) 0.75 mm (0.030 in)</p> <p>Cylinder block Bore 80 + 0.019 mm - 0 mm (3.1497 + 0.0007 in) - 0 in)</p> <p>Wear limit of bore Boring size 0.15 mm (0.0059 in) or more 0.25 mm (0.010 in) 0.50 mm (0.020 in)</p>	<p>Oil pressure at 3,000 rpm of engine Safe minimum pressure at idle Oil filter Type Relief valve opens at</p> <p>Lubricant Classification 30°C or over (85°F or over) 15°C ~ 30°C (60°F ~ 85°F) 0°C ~ 15°C (32°F ~ 60°F) -10°C ~ 15°C (15°F ~ 60°F) -10°C ~ 40°C (15°F ~ 100°F) -10°C ~ 50°C (15°F ~ 120°F) -18°C ~ 0°C (0°F ~ 32°F) -18°C ~ 30°C (0°F ~ 85°F) -18°C ~ 40°C (0°F ~ 100°F) -18°C ~ 50°C (0°F ~ 120°F) -18°C or below (0°F or below)</p> <p>Oil capacity</p>	<p>3.5 ~ 4.5 kg/cm² (50 ~ 64 lb/in²) 0.3 kg/cm² (4.3 lb/in²) Full flow, cartridge 0.8 ~ 1.2 kg/cm² (11 ~ 17 lb/in²) A.P.I. Service SD or SE SAE 40 SAE 30 SAE 20 SAE 20W-20 SAE 20W-40 SAE 20W-50 SAE 10W SAE 10W-30 SAE 10W-40 SAE 10W-50 SAE 5W-20 or 5W-30 3.9 liters (4.1 U.S. quarts) (3.4 Imp. quarts)</p>	
<p>LUBRICATING SYSTEM</p> <p>Oil pump Type Feeding capacity at 2,000 rpm of engine Oil pump driven by Number of chain links Number of sprocket teeth Outer rotor and body clearance Standard Wear limit Clearance between rotor lobes Standard Wear limit Rotor end float Standard Wear limit Clearance between pump shaft and body Standard Wear limit</p>	<p>Rotor 13 liters/min (13.7 U.S. quarts) (12.1 Imp. quarts)</p> <p>Chain and sprockets 46 33 0.14 ~ 0.25 mm (0.006 ~ 0.010 in) 0.30 mm (0.012 in) 0.04 ~ 0.15 mm (0.002 ~ 0.006 in) 0.25 mm (0.010 in) 0.04 ~ 0.10 mm (0.002 ~ 0.004 in) 0.15 mm (0.006 in) 0.006 ~ 0.051 mm (0.0002 ~ 0.0020 in) 0.10 mm (0.004 in)</p>	<p>COOLING SYSTEM</p> <p>Cooling capacity With heater Without heater</p> <p>Water pump Type Pump driven by Pulley ratio of crankshaft and pump</p> <p>Fan Fan diameter Number of blades</p> <p>Fan drive Standard revolution of fan Fan belt tension (Slack) New belt Used belt</p> <p>Thermostat Type Starts to open Fully opens at Lift</p> <p>Radiator Type Pressure cap opens at</p>	<p>7.5 liters (7.9 U.S. quarts) (6.6 Imp. quarts) 6.9 liters (7.3 U.S. quarts) (6.1 Imp. quarts) Centrifugal impeller "V" belt 1 : 1.3 350 mm (13.8 in) 7 2,800 ± 150 rpm at 4,000 rpm of engine 9 ~ 11 mm (0.3 ~ 0.4 in) 12 ~ 14 mm (0.5 ~ 0.6 in) Wax pellet 82 ± 1.5°C (180 ± 2.7°F) 95°C (203°F) 8 mm (0.315 in) or more Corrugated fin with expansion tank 0.9 ± 0.15 kg/cm² (13 ± 2 lb/in²)</p>

FUEL SYSTEM		Automatic (U.S.A.) (Canada)	650 ⁺⁵⁰ -100 rpm in "D" position 650 ± 50 rpm in "D" position
Fuel tank capacity	55 liters (14.5 U.S. gallons) (12.1 Imp. gallons)		
Fuel pump			
Type	Electrical		
Fuel pressure	0.20 ~ 0.25 kg/cm ² (2.8 ~ 3.6 lb/in ²)		
Fuel feeding capacity	800 cc/min (0.8 U.S. quart/min) (0.7 Imp. quart/min)		
Fuel filter			
Type	Cartridge, paper element		
Carburetor			
Type	Down draft, two barrel		
Throat diameter			
Primary	32 mm (1.26 in)		
Secondary	34 mm (1.34 in)		
Venturi diameter			
Primary (U.S.A.)	23 x 15 x 8 mm (0.91 x 0.59 x 0.31 in)		
(Canada)	24 x 15 x 8 (0.94 x 0.59 x 0.31 in)		
Secondary	29 x 10 mm (1.14 x 0.39 in)		
Main nozzle			
Primary	2.6 mm (0.1024 in)		
Secondary	2.8 mm (0.1102 in)		
Main jet			
Primary (U.S.A.)	#107		
(Canada)	#112		
Secondary (U.S.A.)	#145		
(Canada)	#155		
Main air bleed			
Primary	#50		
Secondary	#50		
Slow jet			
Primary (U.S.A.)	#48		
(Canada)	#46		
Secondary	#90		
Slow air bleed			
Primary No. 1	#100		
Primary No. 2	#170		
Secondary No. 1	#50		
Secondary No. 2	#120		
Power jet	#35		
Secondary throttle valve adjustment	6.3 ~ 7.2 mm (0.248 ~ 0.283 in)		
<p>Clearance between primary throttle valve and bore when secondary throttle valve starts to open</p>			
Fast idle adjustment	0.5 ~ 0.65 mm (0.019 ~ 0.026 in)		
<p>Clearance between primary throttle valve and bore when choke valve is fully closed</p>			
Float level adjustment			
Float level	11.5 mm (0.453 in)		
Float drop	46 mm (1.811 in)		
Idle speed			
Manual (U.S.A.)	650 ⁺⁵⁰ -100 rpm in neutral		
(Canada)	650 ± 50 rpm in neutral		
ELECTRICAL SYSTEM			
Battery			
Type	G60-5, Y60-5, N50-S, K60-5		
Voltage	12 volt		
Capacity (20 hour rate)	45 amp. hr		
Terminal ground	Negative		
Specific gravity at 20°C (68°F)			
Recharge at Fully charged	1.20 1.26		
Alternator			
Ground polarity	Negative		
Load test			
Voltage	13.5 volt	13.5 volt	
Current	42 amp.	18 amp.	
Revolution	2,500 rpm or less	1,300 rpm or less	
Number of brushes	2		
Brush length			
Standard	18 mm (0.71 in)		
Wear limit	8 mm (0.31 in)		
Brush spring pressure	315 ~ 426 gr (11 ~ 15 oz)		
Slip ring diameter			
Standard	33 ± 0.2 mm (1.299 ± 0.008 in)		
Limit	32.2 mm (1.268 in)		
Pulley ratio	1 : 1.9		
Starting motor			
Manual transmission			
Capacity	0.8 kw		
Lock test			
Voltage	5.0 volt		
Current	310 amp. or less		
Torque	0.75 m-k (5.4 ft-lb) or more		
Free running test			
Voltage	11.5 volt		
Current	53 amp. or less		
Speed	6,800 rpm or more		
Automatic transmission			
Capacity	0.9 kw		
Lock test			
Voltage	5.0 volt		
Current	500 amp. or less		
Torque	1.15 m-k (8.3 ft-lb) or more		
Free running test			
Voltage	11.5 volt		
Current	60 amp. or less		
Speed	6,600 rpm or more		
Number of brushes	3		
Brush length			
Standard	17.0 mm (0.67 in)		
Wear limit	11.5 mm (0.45 in)		
Brush spring pressure	1.3 ~ 1.7 kg (46 ~ 60 oz)		
Control switch	Solenoid		
Voltage required to close solenoid contacts	8 volt or less		
Distributor			
Driven by	Camshaft		

<p>Gap between retractor and pick-up coil (Canada)</p> <p>Pick-up coil resistance (U.S.A.) (Canada)</p> <p>Vacuum advance Starts (U.S.A.) (Canada)</p> <p>Maximum (U.S.A.) (Canada)</p> <p>Firing order</p> <p>Ignition timing (U.S.A.) (Canada)</p> <p>Timing mark location</p> <p>Spart plug Type NGK</p> <p>Spark plug gap</p> <p>Ignition coil Primary resistance (U.S.A.) (Canada)</p> <p>Hightension cord</p>	<p>0.20 mm (0.008 in) or more</p> <p>1,050Ω ± 10% at 20°C (68°F) 800Ω ± 10% at 20°C (68°F)</p> <p>0° ± 1° at 60 mm-Hg (2.36 in-Hg) 0° ± 1° at 125 mm-Hg (4.92 in-Hg) 9° ± 1° at 300 mm-Hg (11.81 in-Hg) 7.5 ± 1° at 260 mm-Hg (10.24 in-Hg)</p> <p>1-3-4-2 5° ± 1° BTDC 8° ± 1° BTDC</p> <p>Carnkshaft pulley</p> <p>BP5ES, BPR5ES BP6ES, BPR6ES</p> <p>0.80 ± 0.05 mm (0.031 ± 0.002 in)</p> <p>1.15 ohms at 20°C (68°F) 0.9 ohms at 20°C (68°F)</p> <p>16 kΩ/m ± 40% per/m</p>	<p>Oil capacity 5 speed</p> <p>Main shaft Max. permissible run-out Clearance between main shaft and gear (or bush) Wear limit</p> <p>Reverse idle gear Clearance between reverse idle gear bush and shaft Wear limit</p> <p>Shift fork and rod Clearance between shift fork and clutch sleeve Wear limit Clearance between shift rod gate and control lever Wear limit</p> <p>Synchronizer ring Clearance between synchronizer ring and side of gear when fitted Standard Wear limit</p> <p>Lubricant Above -18°C (0°F) Below -18°C (0°F)</p>	<p>1.7 liters (1.8 U.S. quarts) (1.5 Imp. quarts)</p> <p>0.03 mm (0.0012 in)</p> <p>0.15 mm (0.006 in)</p> <p>0.15 mm (0.006 in)</p> <p>0.5 mm (0.020 in)</p> <p>0.8 mm (0.031 in)</p> <p>1.5 mm (0.059 in) 0.8 mm (0.031 in)</p> <p>A.P.I. Service GL-4 or GL-5 SAE 90 A.P.I. Service GL-4 or GL-5 SAE 80</p>
<p>CLUTCH</p>		<p>AUTOMATIC TRANSMISSION</p>	
<p>Type</p> <p>Pressure plate Permissible lateral run-out</p> <p>Clutch disc Lateral run-out of clutch disc Limit</p> <p>Clutch release mechanism</p> <p>Clutch pedal free play at pedal pad</p> <p>Master cylinder bore</p> <p>Clearance between piston and master cylinder bore Standard</p> <p>Wear limit</p> <p>Release cylinder bore</p> <p>Clearance between piston and release cylinder bore Standard</p> <p>Wear limit</p>	<p>Single dry plate, diaphragm spring</p> <p>0.05 mm (0.0020 in)</p> <p>1.0 mm (0.039 in)</p> <p>Hydraulic</p> <p>0.5 ~ 3.0 mm (0.02 ~ 0.12 in)</p> <p>15.87 mm (5/8 in)</p> <p>0.032 ~ 0.102 mm (0.0013 ~ 0.0040 in)</p> <p>0.15 mm (0.006 in)</p> <p>19.05 mm (3/4 in)</p> <p>0.04 ~ 0.125 mm (0.0016 ~ 0.0049 in)</p> <p>0.15 mm (0.006 in)</p>	<p>Model</p> <p>Gear ratio Low Second Top Reverse</p> <p>Torque converter Type</p> <p>Stall torque ratio</p> <p>Fluid type</p> <p>Fluid capacity</p> <p>Drive plate run-out Standard Limit</p> <p>Oil pump Side play of inner gear and outer gear Standard Limit</p>	<p>JATCO 3N71B</p> <p>2.458 1.458 1.000 2.181</p> <p>Symmetrical 3-element 1-stage 2-phase torque converter coupling</p> <p>2.0 : 1</p> <p>M2C33F (Type F) 6.2 liters (6.6 U.S. quarts) (5.5 Imp. quarts)</p> <p>Less than 0.3 mm (0.012 in) 0.5 mm (0.020 in)</p> <p>0.02 ~ 0.04 mm (0.001 ~ 0.002 in) 0.80 mm (0.031 in)</p>
<p>MANUAL TRANSMISSION</p>		<p>Standard</p>	
<p>Type</p> <p>Gear ratio First Second Third Fourth Fifth Reverse</p>	<p>5-speed manual transmission</p> <p>3.214 1.818 1.296 1.000 0.860 3.461</p>	<p>Limit</p>	

Clearance between outer gear and crescent Standard	0.14 ~ 0.21 mm (0.006 ~ 0.008 in)
Limit	0.25 mm (0.010 in)
Clearance between outer gear and housing Standard	0.05 ~ 0.20 mm (0.002 ~ 0.008 in)
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	
Number of drive plates or driven plates	3
Thickness of drive plate	1.60 mm (0.063 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	
Number of drive plates or driven plates	3
Thickness of drive plate	1.6 mm (0.063 in)
Total clearance measured between retaining plate and snap ring	0.8 ~ 1.5 mm (0.031 ~ 0.059 in)
Governor	
Type	38 type
Low and reverse brake	
Number of friction plate or steel plates	4
Thickness of friction plate	2.0 mm (0.079 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	
Standard	0.2 ~ 0.7 mm (0.008 ~ 0.028 in)
Limit	0.8 mm (0.031 in)
Engine stall speed	
In break-in period	1,950 ~ 2,200 rpm
After break-in period	2,000 ~ 2,250 rpm

Shift speed

Throttle condition (Manifold vacuum)	Gear shift	Shift speed (mile/h)
Wide open throttle (0 ~ 100 mm-Hg) (0 ~ 3.94 in-Hg)	D1 → D2	29 ~ 40
	D2 → D3	51 ~ 65
	D3 → D2	44 ~ 57
	D2 → D1	20 ~ 30
Half throttle (200 ± 10 mm-Hg) (7.87 ± 0.39 in-Hg)	D1 → D2	8 ~ 17
	D2 → D3	16 ~ 35
Fully closed throttle	D3 → D1	6 ~ 13
Manual 1	12 → 11	23 ~ 30

Governor pressure

Driving speed	Standard governor pressure	
	kg/cm ²	lb/in ²
20 mile/h	0.9 ~ 1.4	12.8 ~ 19.9
35 mile/h	1.9 ~ 2.6	27.0 ~ 37.0
55 mile/h	4.0 ~ 5.0	56.9 ~ 71.1

Line pressure

Manual range	Engine idling condition		Engine stall condition	
	kg/cm ²	lb/in ²	kg/cm ²	lb/in ²
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	20 cm-gr (0.28 in-oz)
At center	12.5 cm-gr (0.17 in-oz)
At rear	20 cm-gr (0.28 in-oz)
Universal joint	
Spider diameter	14.72 mm (0.5795 in)
Wear limit	14.595 mm (0.5746 in)
Journal swinging torque	3 ~ 8 cm-kg (2.6 ~ 6.9 in-lb)

REAR AXLE

Type	Semi-floating, hypoid gears
Reduction ratio	3.636
Number of gear teeth	40 : 11
Backlash of ring gear and pinion	0.09 ~ 0.11 mm (0.0035 ~ 0.0043 in)
Max. allowable variation of backlash	0.07 mm (0.0028 in)
Min. allowable variation of backlash	0.05 mm (0.0020 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 ~ 0.10 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

DIMENSIONS		Wheel base	2,510 mm (99 in)
Overall length	4,415 mm (174 in)	Tread	
Overall width	1,690 mm (67 in)	Front	1,370 mm (54 in)
Overall height		Rear	1,380 mm (54 in)
Sedan	1,380 mm (54 in)	Min. road clearance	163 mm (6 in)
Hardtop	1,355 mm (53 in)	Min. turning radius	4.8 m (15 ft 7 in)
TIGHTNING TORQUE			
	m-kg	ft-lb	
Engine			Reamer bolt of control valve body
Main bearing caps	8.4 ~ 9.0	61 ~ 65	Oil strainer
Connecting rod caps	4.1 ~ 4.6	30 ~ 33	Governor valve body to oil distributor
Oil pump sprocket	3.0 ~ 3.5	22 ~ 25	Oil pump cover
Oil pan	0.7 ~ 1.0	5 ~ 7	Inhibitor switch
Cylinder head			Manual shaft lock nut
Cold engine	8.2 ~ 8.8	59 ~ 64	Oil cooler pipe set bolt
Warm engine	9.5 ~ 10.0	69 ~ 72	Oil pressure test plug
Camshaft sprocket	7.0 ~ 8.0	51 ~ 58	Actuator for parking rod to extension housing
Distributor drive gear	7.0 ~ 8.0	51 ~ 58	Propeller shaft
Valve rocker arm cover	0.15 ~ 0.2	1.1 ~ 1.4	Yoke to rear axle companion flange
Crankshaft pulley	14.0 ~ 15.0	101 ~ 108	Center yoke to front propeller shaft
Inlet manifold	1.9 ~ 2.6	14 ~ 19	Center bearing support
Exhaust manifold	2.2 ~ 2.9	16 ~ 21	Center bearing support member
Spark plugs	1.5 ~ 2.3	11 ~ 17	Rear axle
Oil pressure switch	1.2 ~ 1.8	9 ~ 13	Ring gear
Temperature gauge unit	0.5 ~ 1.0	4 ~ 7	Differential side bearing caps
Radiator	0.7 ~ 1.0	5 ~ 7	Companion flange to pinion
Engine mount rubber	3.2 ~ 4.7	23 ~ 34	Steering
Clutch			Steering wheel nut
Flywheel	15.5 ~ 16.3	112 ~ 118	Steering gear housing to frame
Clutch cover	1.8 ~ 2.7	13 ~ 20	Pitman arm to sector shaft
Transmission			Idler arm bracket to frame
Shift lock spring cap	1.0 ~ 1.5	7 ~ 11	Idler arm to center link
Plug for interlock pin hole	1.0 ~ 1.5	7 ~ 11	Pitman arm to center link
Control lever to control rod end	2.8 ~ 3.4	20 ~ 25	Tie-rod to center link
Shift fork set bolts	1.2 ~ 1.6	9 ~ 12	Tie-rod to knuckle arm
Main shaft lock nut			Tie-rod lock nut
5 speed	13.0 ~ 21.0	94 ~ 152	Oil pump bracket
Reverse lamp switch	3.0 ~ 4.0	22 ~ 29	Oil pump pulley
Automatic transmission			Wheels
Drive plate to crankshaft	15.5 ~ 16.3	112 ~ 118	Wheel bolt
Drive plate to torque converter	3.7 ~ 5.0	28 ~ 36	Suspension
Converter housing to engine	3.2 ~ 4.7	23 ~ 34	Suspension arm to cross member
Converter housing to transmission case	4.0 ~ 5.0	29 ~ 36	Knuckle arm to shock absorber
Extension housing to transmission case	2.0 ~ 2.5	14 ~ 18	Suspension arm ball joint to knuckle arm
Oil pan	0.5 ~ 0.7	3.6 ~ 5.1	Front shock absorber
Piston stem (when adjusting band brake)	1.2 ~ 1.5	9 ~ 11	Piston rod to mounting block
Piston stem lock nut	1.5 ~ 4.0	11 ~ 29	
Servo piston retainer	0.7 ~ 0.9	5.1 ~ 6.5	
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	

