

2-7. Engine

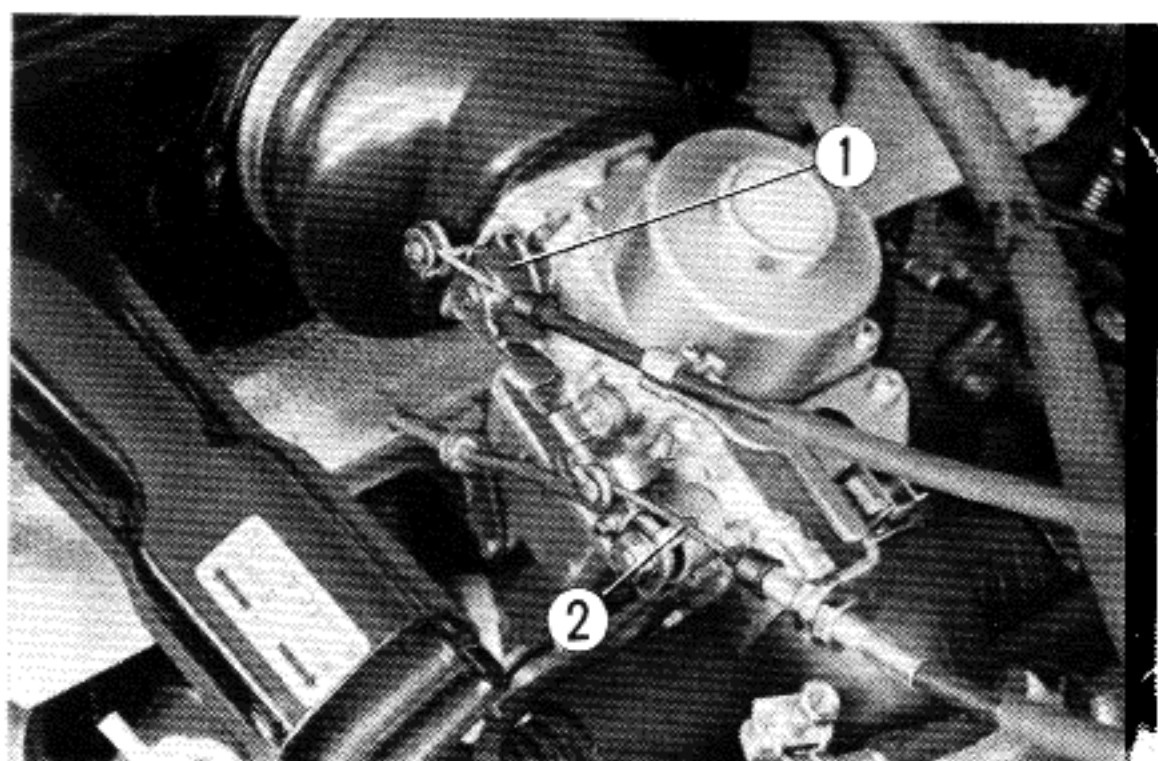


Fig. 2-68 ① Choke Cam ② Throttle Wire

A. Maintenance

1. Starting

Check the operation of the choke and throttle valves by operating the choke cam and throttle lever. Start the engine and note any difficulties in starting and/or any abnormal noise. If hard starting is encountered, refer to Section 2 in the HONDA 360/400/600 SEDAN Shop Manual. If abnormal noise is heard, check to see:

1. If the valve-tappet clearance is excessive.
2. If the cam chain is elongated.
3. If the carburetor intake manifold is leaking.

2. Low speed operation and acceleration

After the engine is warmed up, place the gear shift lever in the neutral position and check the engine idle. Then check it as it is gradually revved up from the idling speed. The accelerator pedal should move smoothly and the engine should neither stall or knock.

3. Exhaust gas condition

If abnormal performance or gas mileage is noticed, an inspection of the exhaust gases may indicate the problem area. Warm the engine, place the transmission in neutral, and note the exhaust color:

1. The exhaust gases will be colorless or light blue when combustion is complete.
2. If the exhaust is black in color throughout the rpm range, it is an indication of incomplete combustion.
3. If the exhaust gases are black when the engine is running at high speed, an improperly adjusted pilot screw and/or excessive fuel level in the float chamber is the probable cause.
4. If the exhaust gases are black at medium and high speeds, improper positioning of the needle jet, a worn main jet, and/or excessive fuel level in the float chamber may be the cause.
5. If the exhaust is a thick smoky blue, excessive oil in the crankcase, oil pumping, or oil leak-down is the probable cause. Check the oil level.
6. If the exhaust is a thick smoky blue, and the oil level is correct, worn cylinders, piston rings, or valve guides may be the cause. Check the compression.

4. Air cleaner element

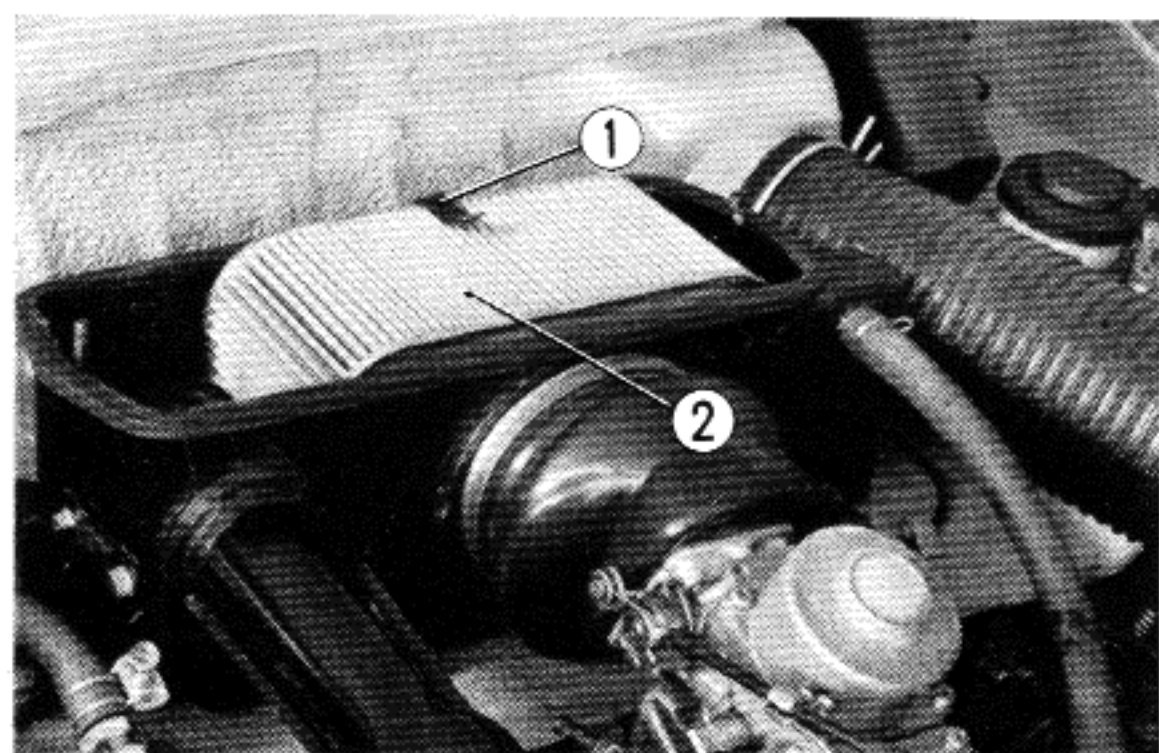


Fig. 2-69 ① Element Spring ② Element

The air cleaner is a paper element type. Clogging in the element will decrease the air flow and cause poor engine performance resulting in increased fuel consumption.

1. Lightly tap the air cleaner element on a wooden surface to knock the dirt off, then direct a blast of compressed air at the element from the inside. Replace if necessary.
2. Clean the air cleaner case and check the case cover seal and washers for deterioration.
3. Drain the oil from the breather chamber by

removing the rubber drain plug.

4. Replace dirty or damage parts.

5. Tightening of exhaust manifold and cylinder head

1. Check the exhaust manifold for loose nuts and exhaust gas leakage. Retighten the nuts if necessary.

| | Specified torque |
|--------------------------------|-----------------------------------|
| Exhaust manifold retaining nut | 2.0–2.4 kg-m (14.5–17.4 lb-ft) |

2. Check the intake manifold retaining bolts for tightness. Retighten the bolts if loose.

6. Compression Test

1. Remove the right and left spark plug.
2. Press the compression gauge into the spark plug hole so that gas cannot escape.
3. Open the throttle and choke valves fully. Turn the starter switch and run the engine until the compression gauge reads the maximum value.

| | |
|-----------------------|------------------------------------------------|
| Specified compression | 11.0 ± 0.5 kg/cm ² (156 ± 7 psi) |
|-----------------------|------------------------------------------------|

NOTE:

1. The compression pressure test should be performed after the valve clearance is adjusted and with the engine warmed up.
2. Be sure to open the throttle and choke valves fully by depressing the accelerator pedal to the floor and pushing the choke knob in.

If the compression pressure is above the specified value, carbonization is suspected in the combustion chamber or on the piston head. If the pressure is under the specified value, gas leakage from valves, piston rings or head gasket may be the cause.

7. Valve clearance

If the rocker arm to camshaft clearance is excessive, the valves will open late and close too soon, causing poor performance, an increase in fuel consumption, and noisy valve operation. Further, the cam lobes will wear quickly because the rocker arm will not make proper contact with the cam lobe, resulting in a shock contact. If the clearance is too small, the valves will open too soon and close too late, causing poor compression, rough engine idling, backfiring, and possible damage to valves and valve seats.

Inspection

Remove the camshaft housing cover. Rotate the crankshaft until the left intake and right exhaust valve rocker arms are raised the same amount. The left exhaust and right intake rockers should now be loose.

At this position, check the valve clearance with

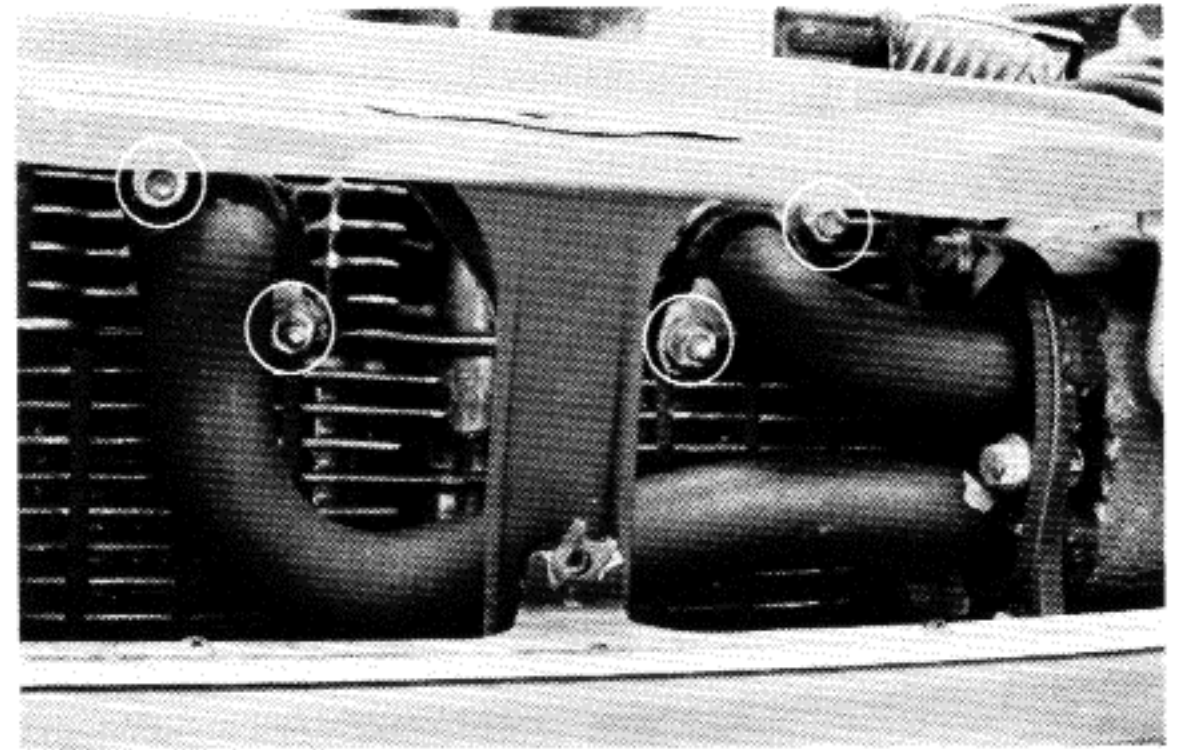


Fig. 2-70

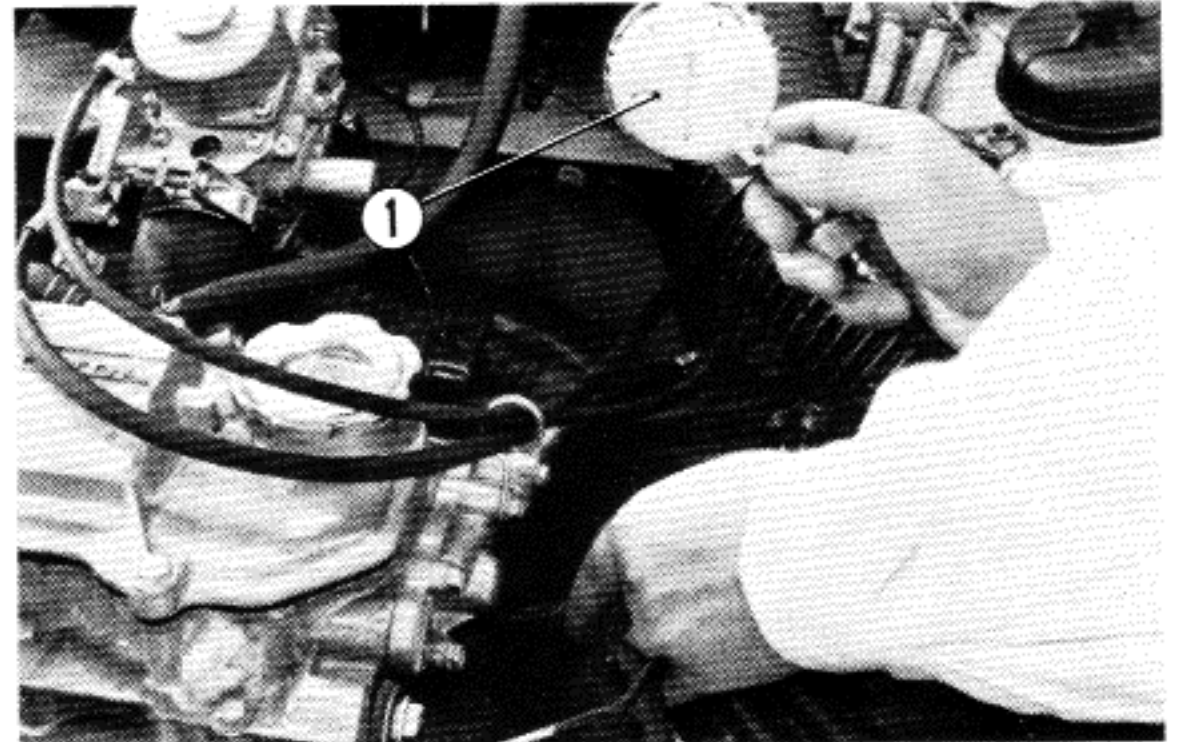


Fig. 2-71 ① Compression Gauge

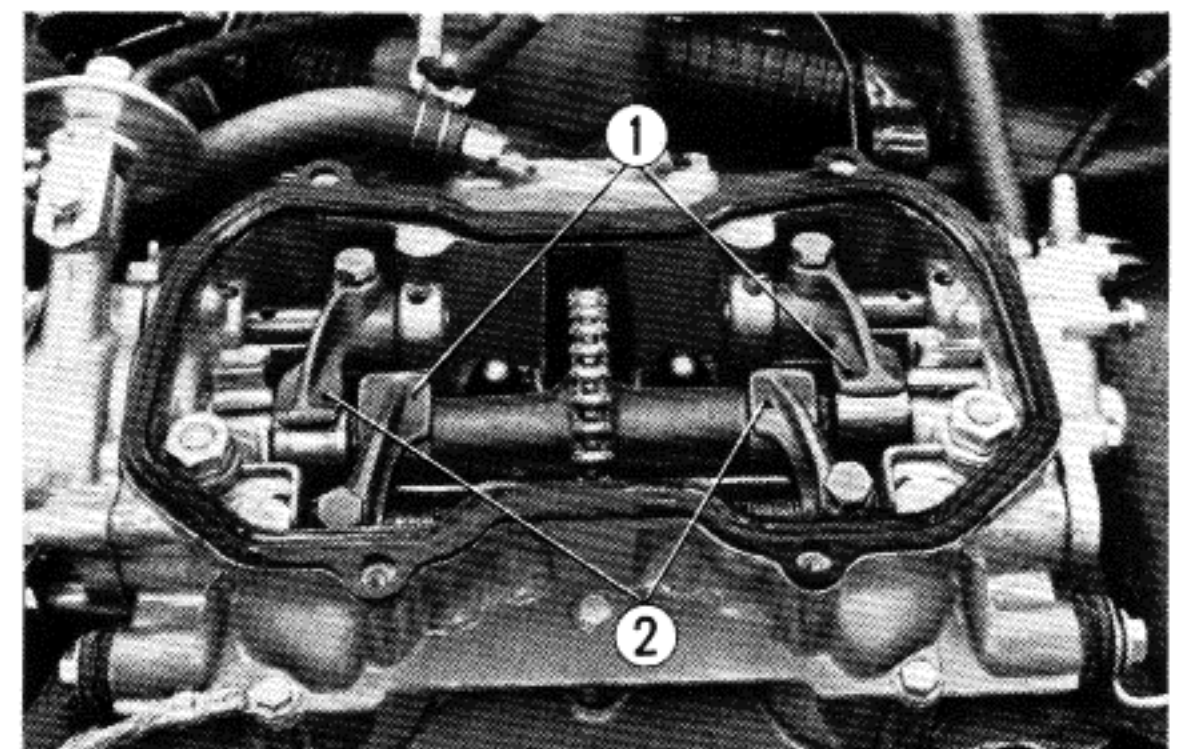


Fig. 2-72 ① Both Right and Left Valve Lifted
② Measure Clearance

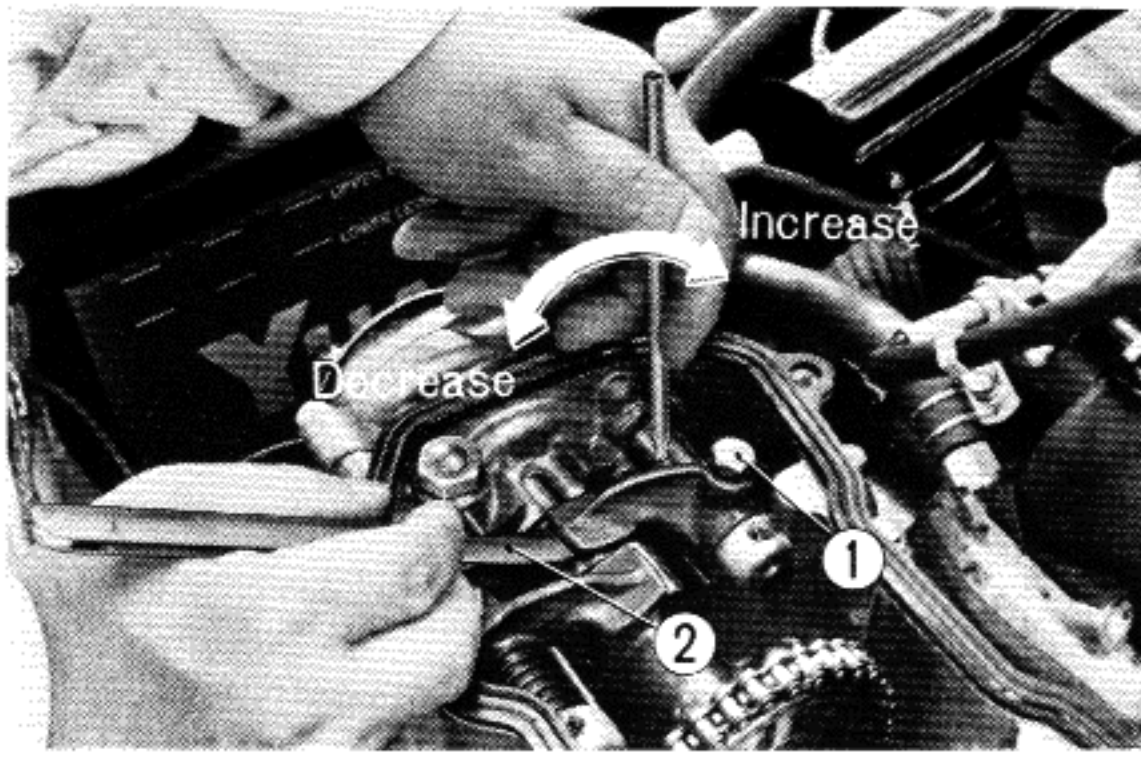


Fig. 2-73 ① Lock Bolt
② Thickness Gauge

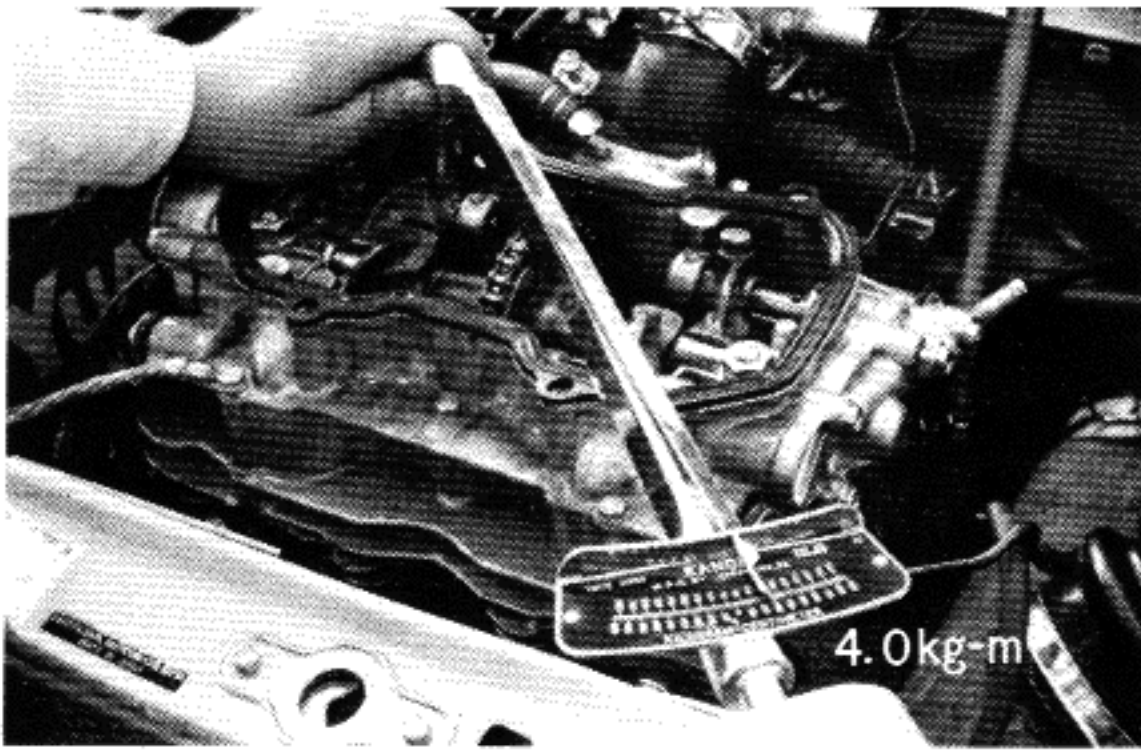


Fig. 2-74

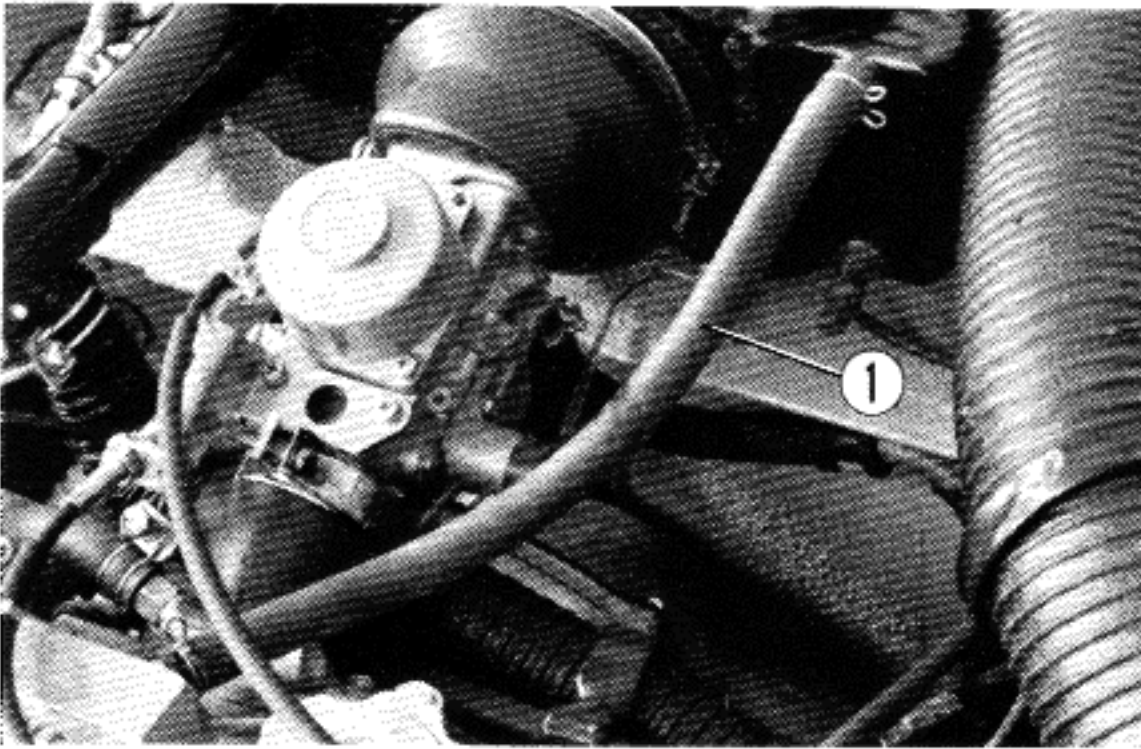


Fig. 2-75 Breather Tube

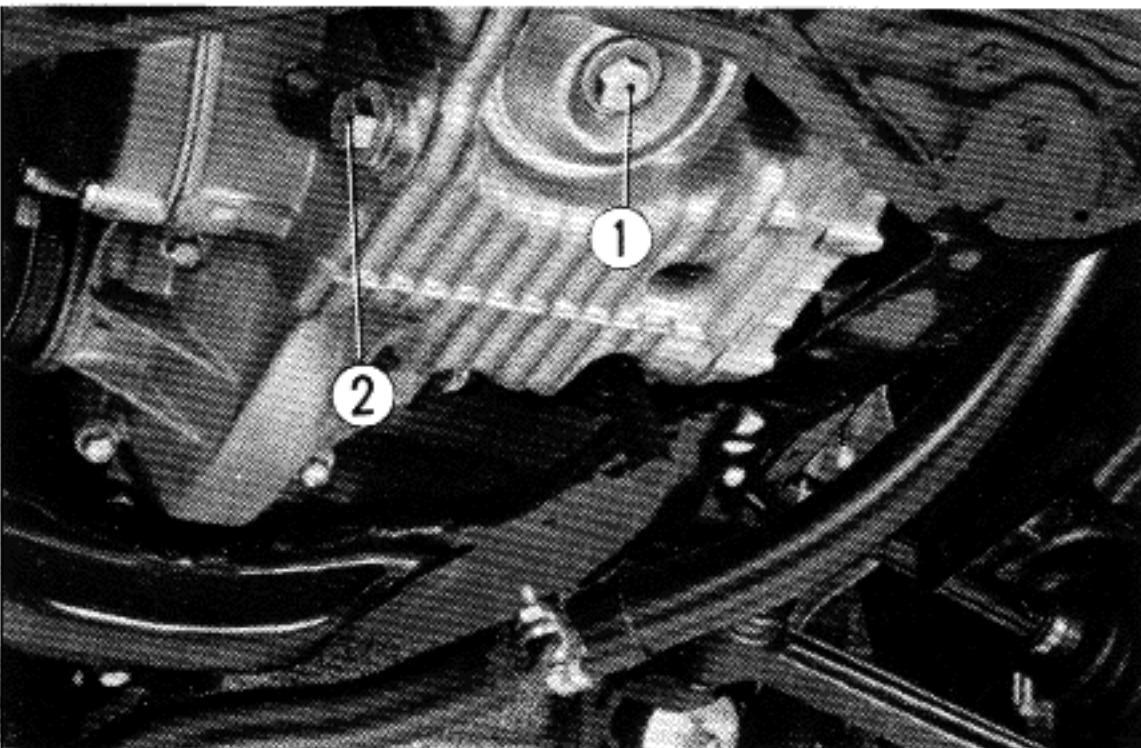


Fig. 2-76 ① Oil Filter Center Bolt
② Drain Plug

a thickness gauge as shown.

Now rotate the crankshaft until the right intake and left exhaust valve rocker arms are raised, and measure the clearance of the left intake and right exhaust valve rocker arms.

NOTE: The valve clearance adjustment must be performed only when the engine is cold, since the clearance will increase as engine temperature rises due to the difference in expansion of the aluminum cylinder head and the valves.

If adjustment is necessary, perform the following:

1. Loosen the rocker arm lock bolt. Turn the rocker arm shaft inward to decrease the valve clearance, or outward to increase it.
2. Tighten the lock bolt with a torque wrench to 3.5–4.0 kg-m (25.3–28.6 lb-ft) after completing adjustment.
3. Recheck valve clearances.

B. Positive Crankcase Ventilation

1. Remove the breather tube at both ends and check for any clogging or damage.
2. Remove the rubber drain plug from the air cleaner and drain any accumulation of oil.

C. Lubrication System

1. Checking the oil

(1) Leakage

Check the crankcase, cylinder head, cam case and side cover gaskets for leaks.

(2) Contamination

The most important item relating to satisfactory engine reliability is the condition of the oil. To ensure reliability the oil must be replaced every 3 months or 3,000 miles to keep the level of contaminants and viscosity deterioration within acceptable limits. If the oil is not properly maintained, the lubricating ability and cleaning capacity is seriously reduced, resulting in rapid wear of engine parts.

2. Changing oil

1. Drain the engine oil by removing the drain plug while the engine is warm. Removal of the filler cap will make oil draining easier.
2. Refill with fresh oil through the camshaft housing cover filler cap.

| | |
|-----------------------|------------------------------------------------------|
| Standard transmission | Capacity (including filter) 3.0 liters-3.2 quarts |
|-----------------------|------------------------------------------------------|

3. Replace the oil filter element according to the maintenance schedule. The element may be removed by removing the center bolt. At this time, clean the oil filter housing with solvent, and replace all oil seals (supplied with filter) in the order of removal. After mounting, check for oil leakage while running the engine. Recheck the oil level.

NOTE: Periodic replacement is necessary to prevent clogging of the filter element. Replace the oil filter element at 600 miles, 6,000 miles, and thereafter at 6,000 mile intervals.

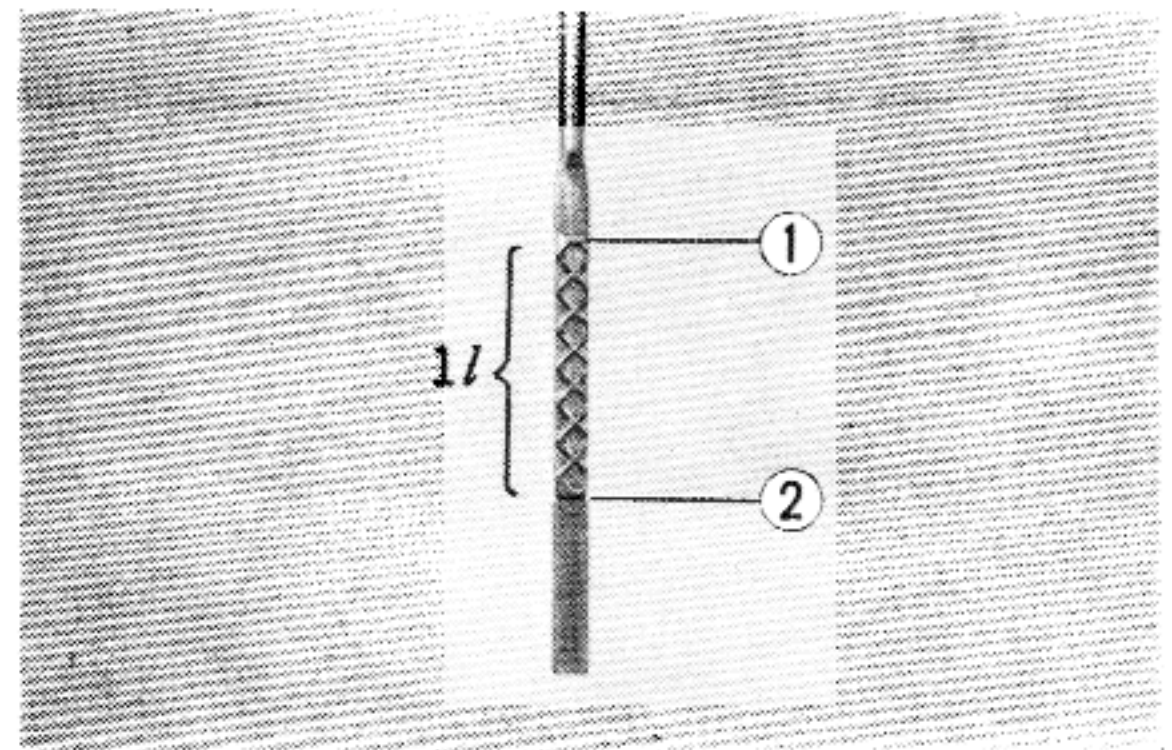


Fig. 2-77 ① Upper Level
② Lower Level

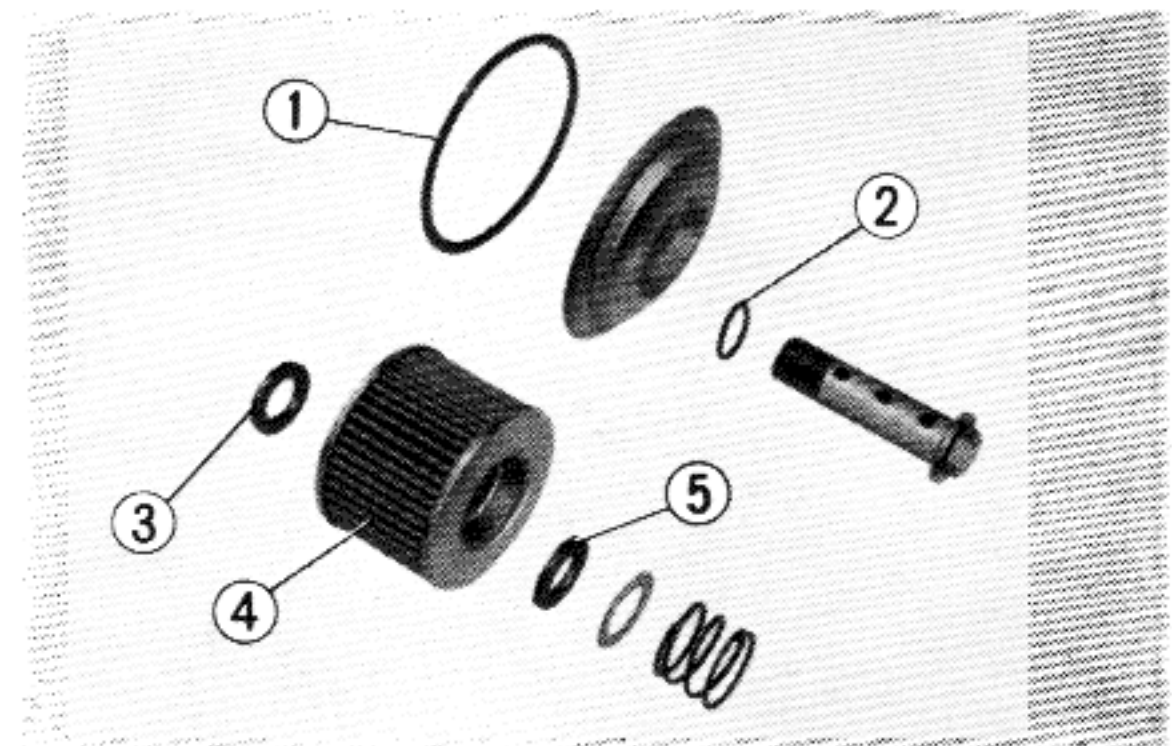


Fig. 2-78 ① 84×3.9 O Ring ④ Filter Element
② 17.4×2.4 O Ring ⑤ Element Seal
③ Element Seal B

D. Fuel System

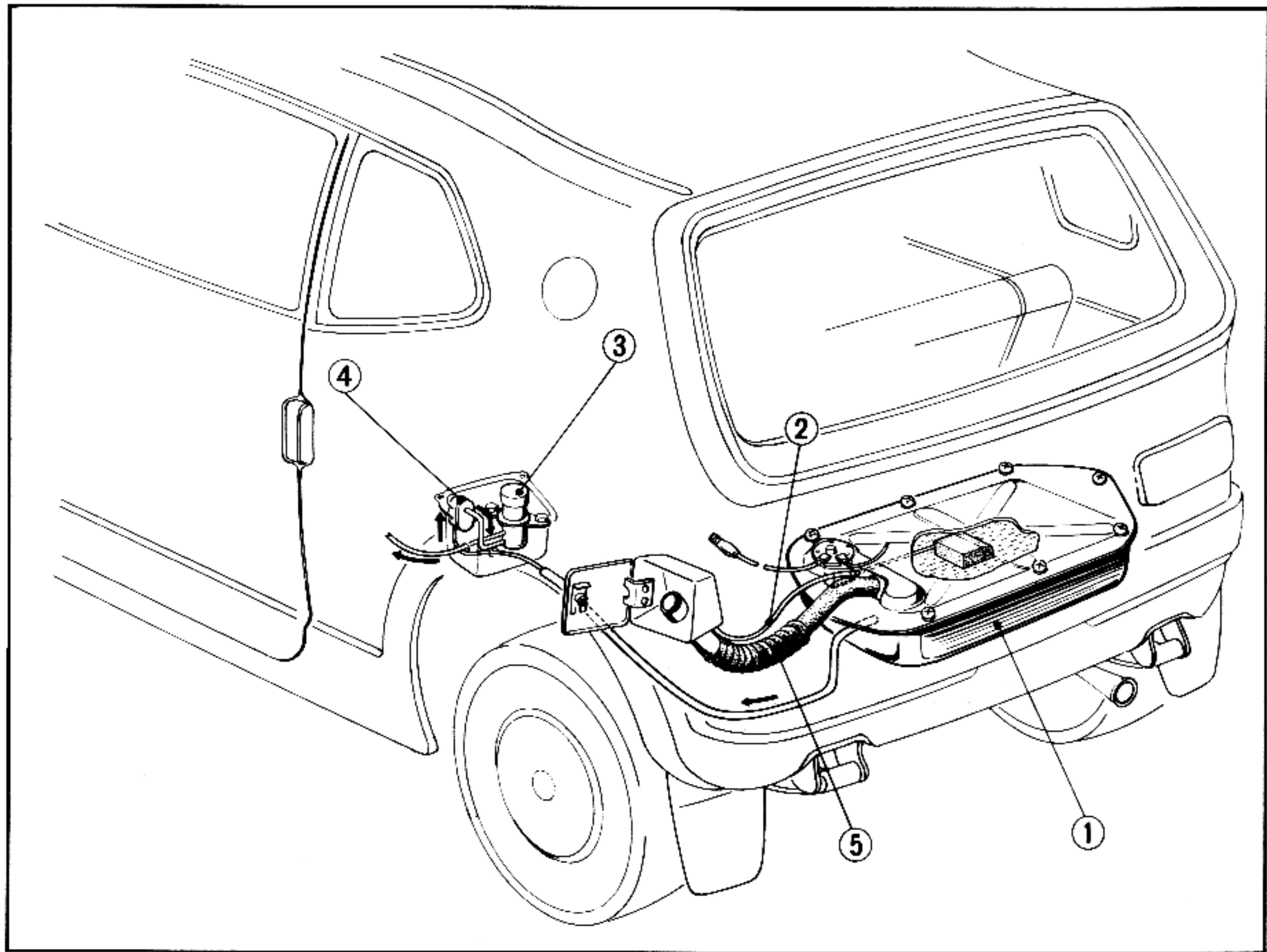


Fig. 2-79 ① Fuel Tank ③ Fuel Pump ⑤ Filler Neck Connecting Tube
② Breather Tube ④ Fuel Strainer

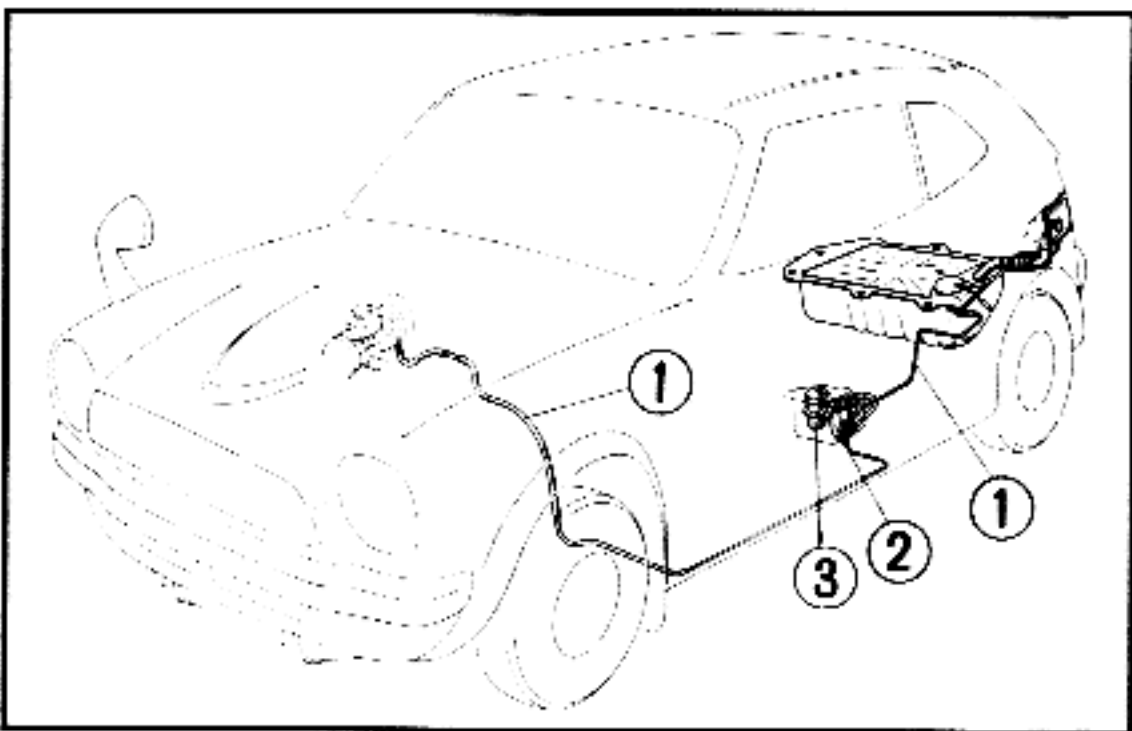


Fig. 2-80 ① Fuel Tube
② Fuel Strainer
③ Fuel Pump

1. Fuel leakage

Periodically inspect all connections, joints, and fuel lines for leaks or damage. Check the fuel filler cap for leaks by noting any gas spillage when the car is driven with a full tank of gas.

2. Checking the carburetor

Check the carburetor for leaks or damage. Disassemble and clean if contaminated.

NOTE: If a carburetor cleaner is used, the manufacturers directions must be followed. Improper use of such cleaner may damage the parts involved.

3. Carburetor linkage inspection

1. Check the throttle valve, choke valve and fast idle system for damage.
2. Check the throttle cable for wear and other damage.

4. Checking the throttle and choke valves

1. Check to see if the throttle valve is fully opened when the accelerator pedal is completely depressed.
2. Check to see if the relief valve will fully open (by hand) with the choke valve butterfly closed.
3. Check the shafts of the throttle valve and choke valve for damage.

5. Checking float level

Poor fuel combustion, black sooty exhaust, and fuel overflow are indications of improper float level.

To check the level, remove the carburetor from the engine and proceed as follows:

1. Set up the carburetor as shown.
2. Move the float up and down by hand so that the end of the valve comes into slight contact with the float arm, or there is an approximately 0.1 mm clearance between them.
3. Measure the height of "h" as shown Fig. 7-16 with a float level gauge.
4. Correct the level, if necessary, by bending the float arm.

NOTE:

1. Be careful not to push in the float valve spring when checking the float valve and arm.
2. When measuring the height "h", place the float level gauge so that it is next to the mark on the edge of the float bowl casting.

| | |
|----------|----------------------------------|
| "h"..... | 20.5 mm ± 0.5 (0.82 ± 0.002 in.) |
|----------|----------------------------------|

6. Carburetor adjustment

1. Idling adjustment.

Warm the engine and adjust the throttle stop screw to maintain an engine idle of 1150 rpm. Next, adjust the idle mixture by adjusting the pilot screw. Turning the pilot screw in will decrease the amount of fuel in the mixture, and turning it out will increase it. To correctly adjust the idle mixture, a CO meter should be used. The adjustment is correct when the CO concentration is less than 4.5%. After adjusting the pilot screw, re-adjust the throttle stop screw to maintain an idle of 1150 rpm.

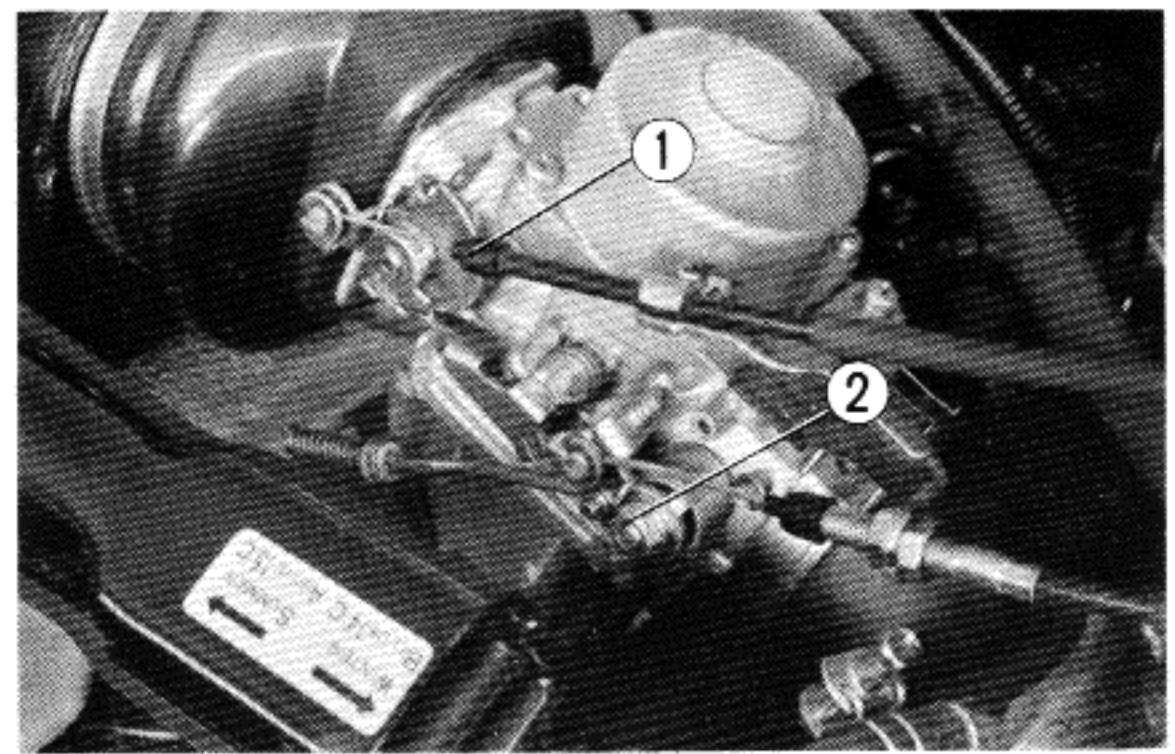


Fig. 2-81 ① Boots
② Throttle Valve Shaft

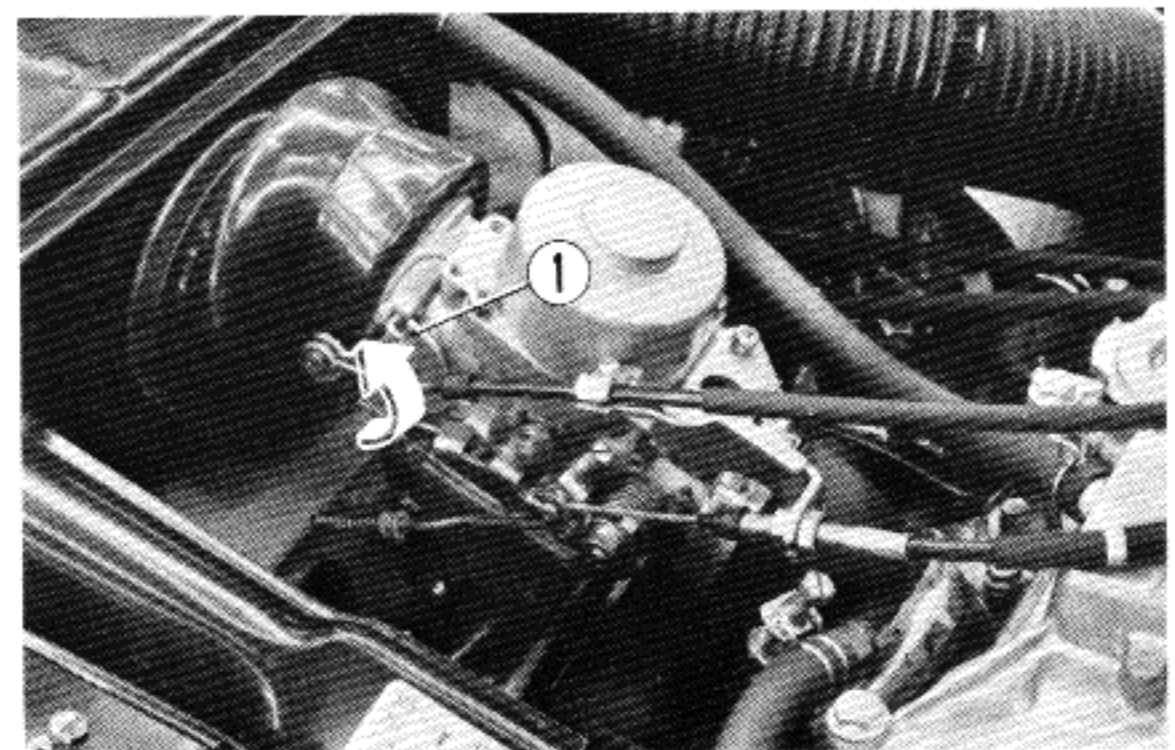


Fig. 2-82 ① Relief Valve Lever

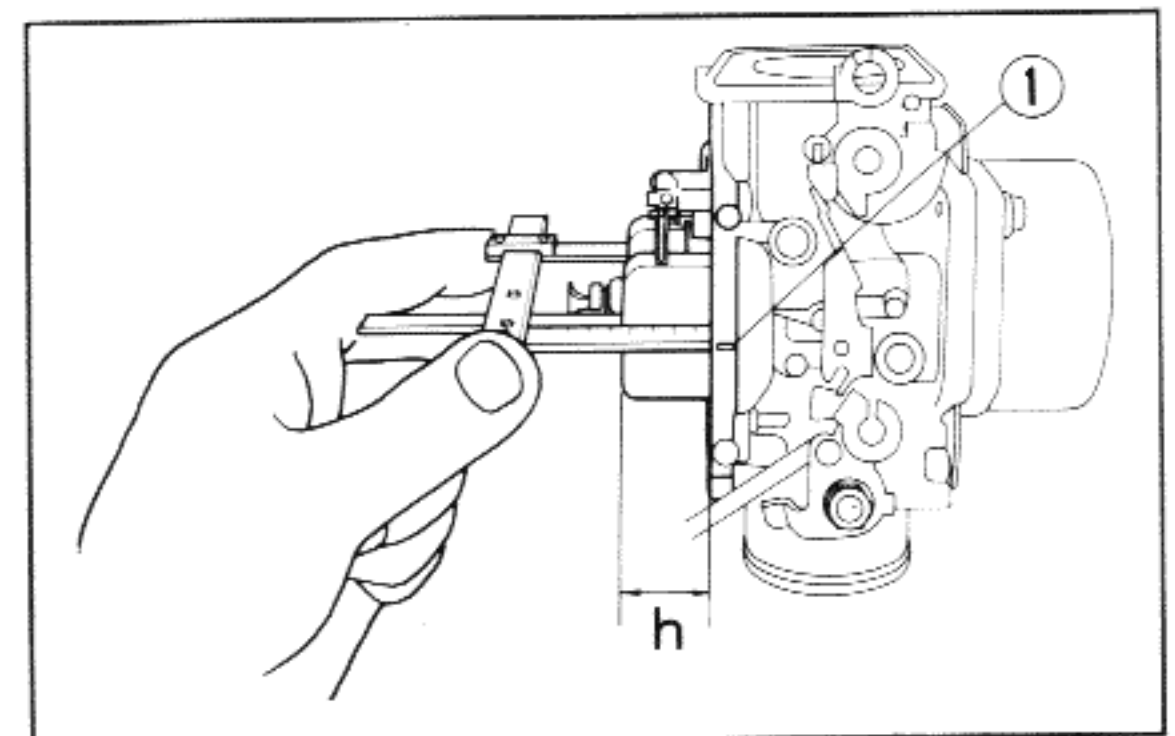


Fig. 2-83 ① Gauge Match Mark

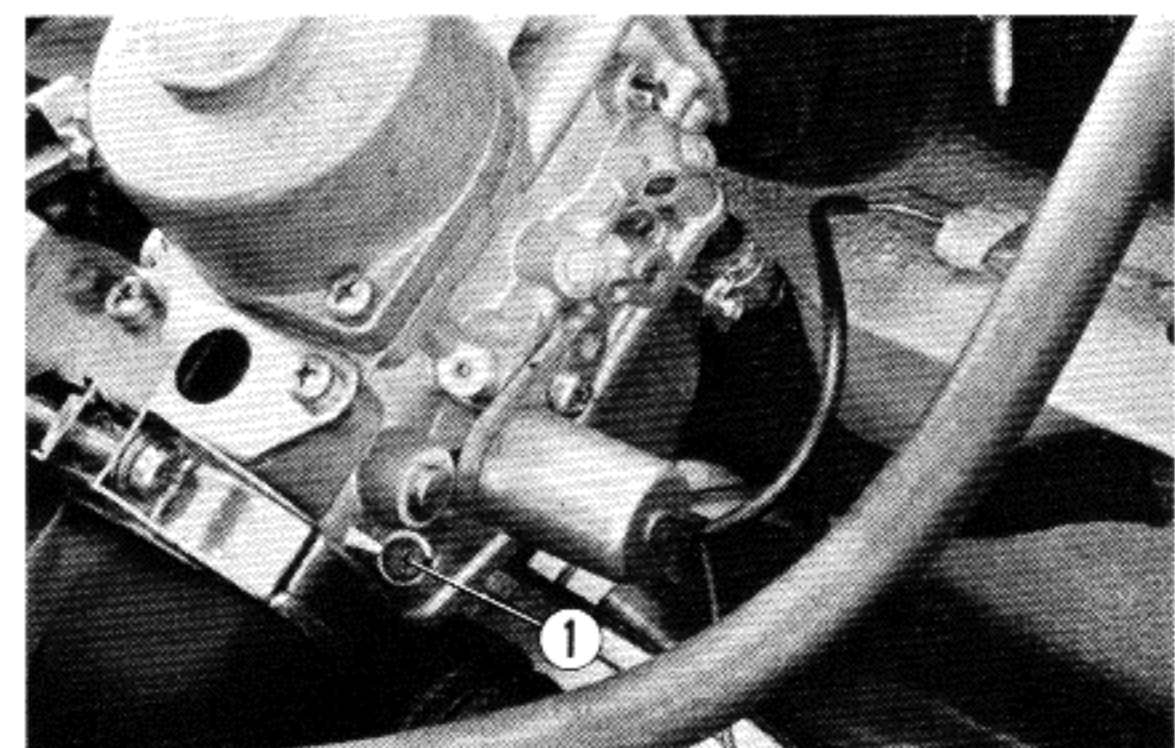


Fig. 2-84 ① Pilot Screw

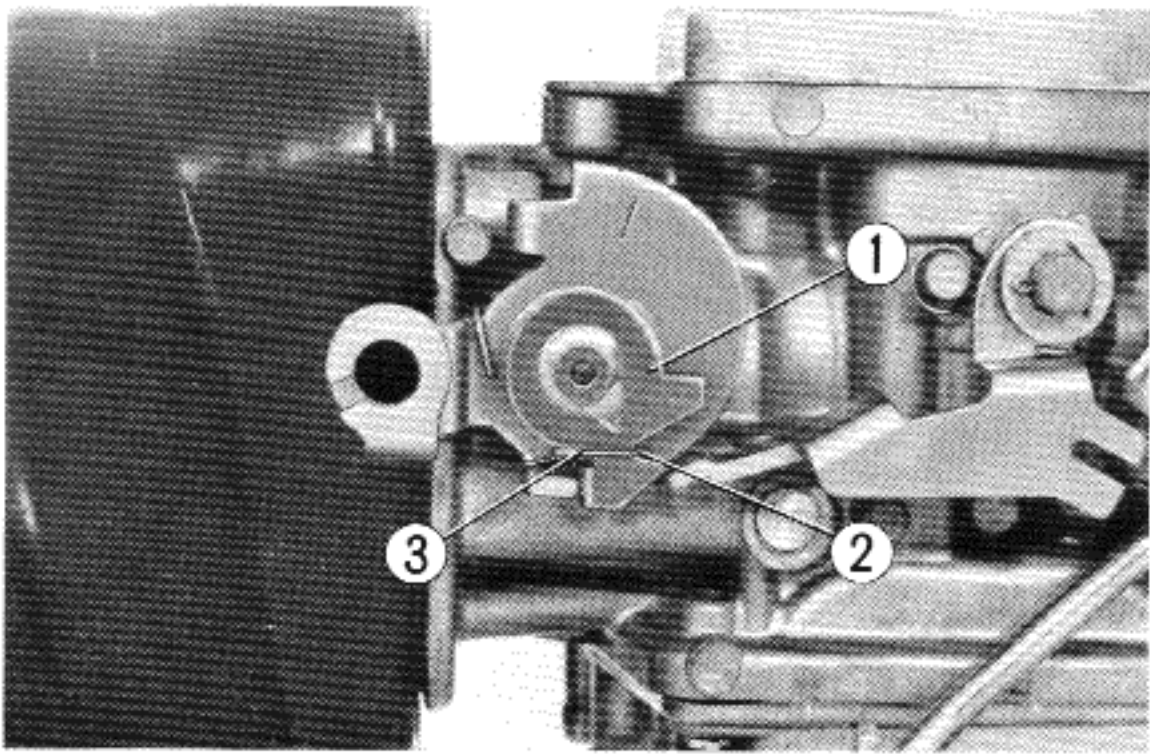


Fig. 2-85 ① Arctic Area
② Standard
③ Relief Spring

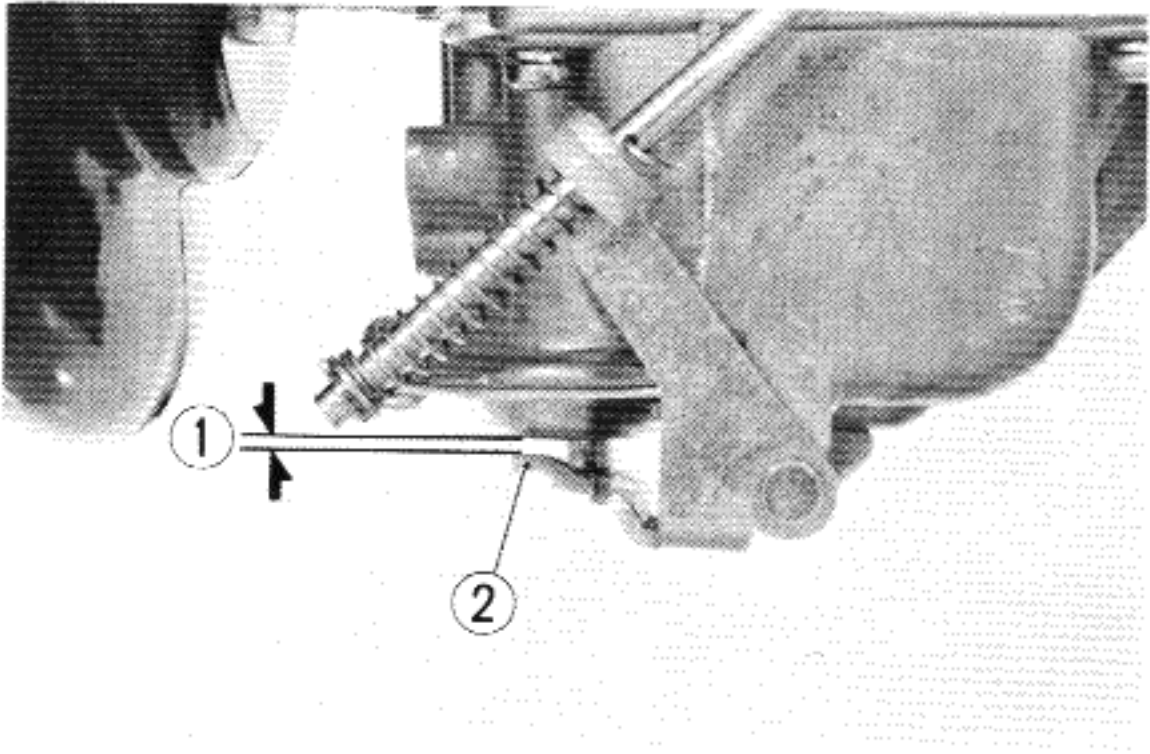


Fig. 2-86 ① Stroke
② Rocker Arm

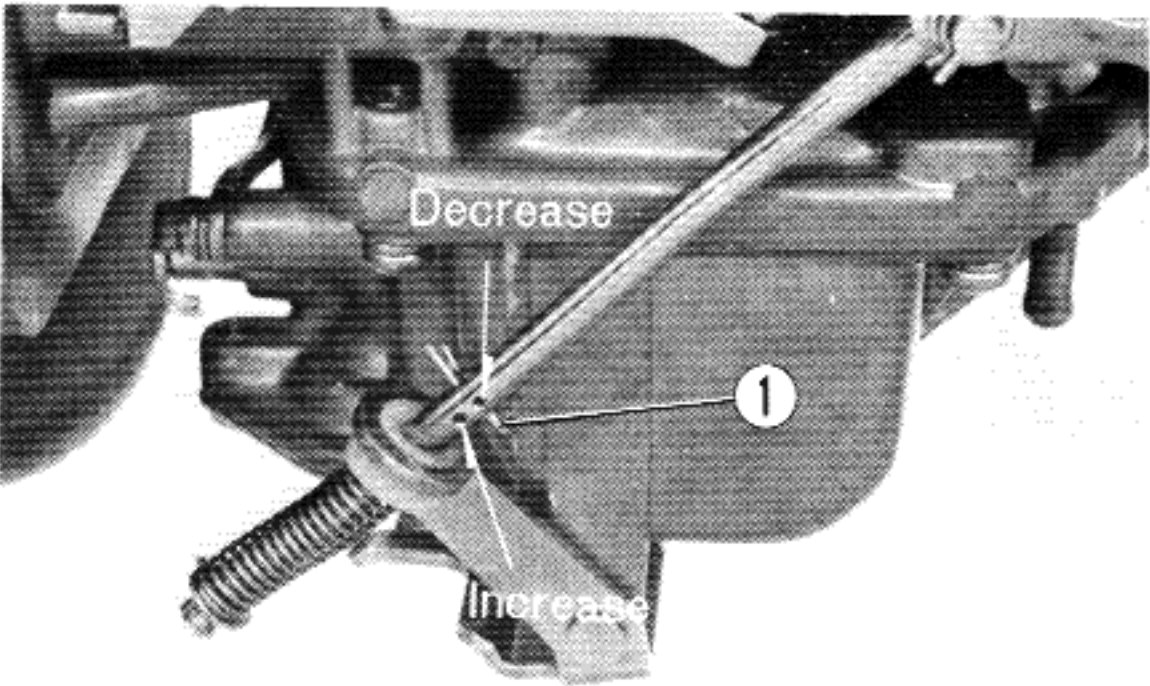


Fig. 2-87 ① Adjusting Clip

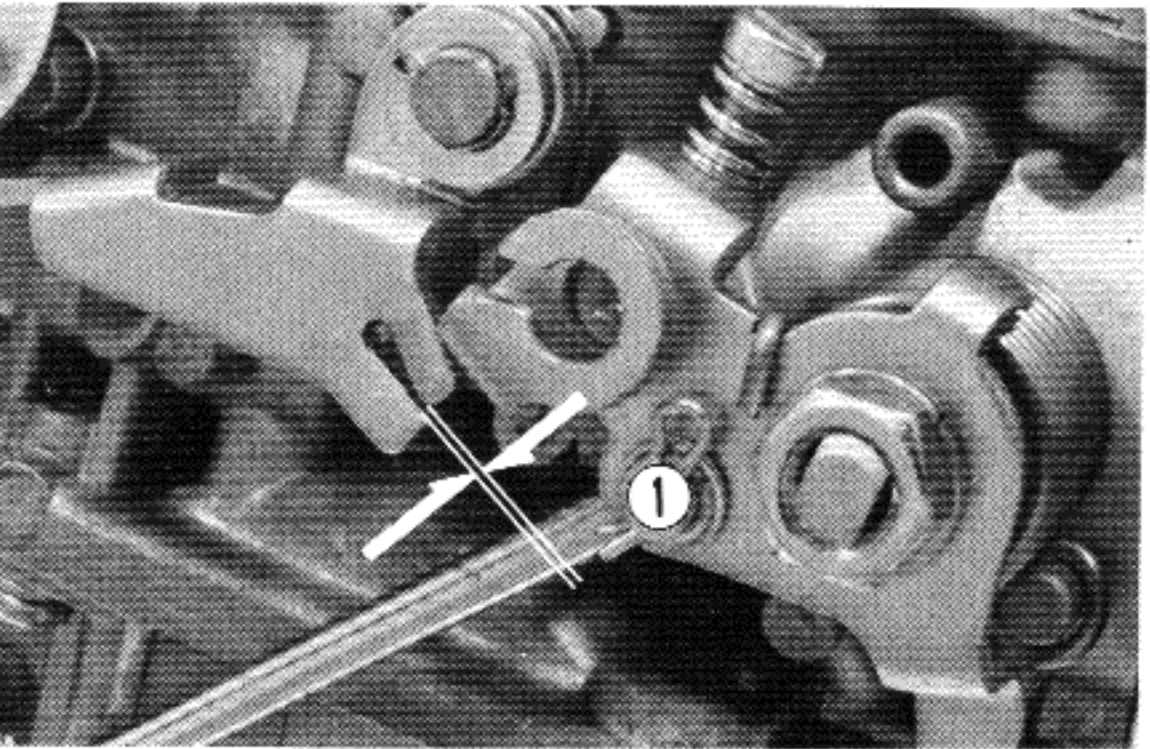


Fig. 2-88 ① The Point to be Adjusted

- 2. Chock relief valve
When the engine is hard to start or driving is impossible with the choke closed, reposition the relief spring to increase the spring tension.

NOTE: The spring must be securely hooked.

- 3. Accelerator pump discharge rate
 - 1) Turn the idle stop screw out until the screw no longer contacts the throttle stop plate to completely close the throttle butterfly.
 - 2) Measure the clearance between the rocker arm and pump cover with a thickness gauge. This clearance corresponds to the pump stroke.
 - 3) Relocate the clip along the pump rod to adjust the pump stroke to 0.25–0.45 mm (0.010–0.018 in.)

| Clip position | Pump stroke |
|---------------|-------------|
| Lower | Increase |
| Upper | Decrease |

- 4) When the specified stroke cannot be obtained by repositioning the clip, readjust the stroke by bending the end of the rocker arm.
- 4. Fast idling
If the engine fails to run properly, or if the engine over-revs with the choke knob pulled out in cold weather, the idle system should be adjusted. To adjust, proceed as follows:
 - 1) Open the choke valve completely.
 - 2) Close the throttle valve fully by backing off the throttle stop screw.
 - 3) After the engine has reached normal operating temperature, pull the choke knob out. The engine should be idle at 4,000 rpm.
 - 4) To adjust the fast idle speed, bend the tip of the throttle link plate with a screw driver to obtain the necessary amount of clearance between the lever and the fast idle cam.

7. Fuel Filter Replacement

A cartridge type fuel filter is used and it can not be disassembled for cleaning. Disconnect the fuel feed tubes and remove the filter together with the fuel pump. Replace the filter if necessary.

NOTE: When installing the filter, be sure that the inlet and outlet tubes are correctly connected.

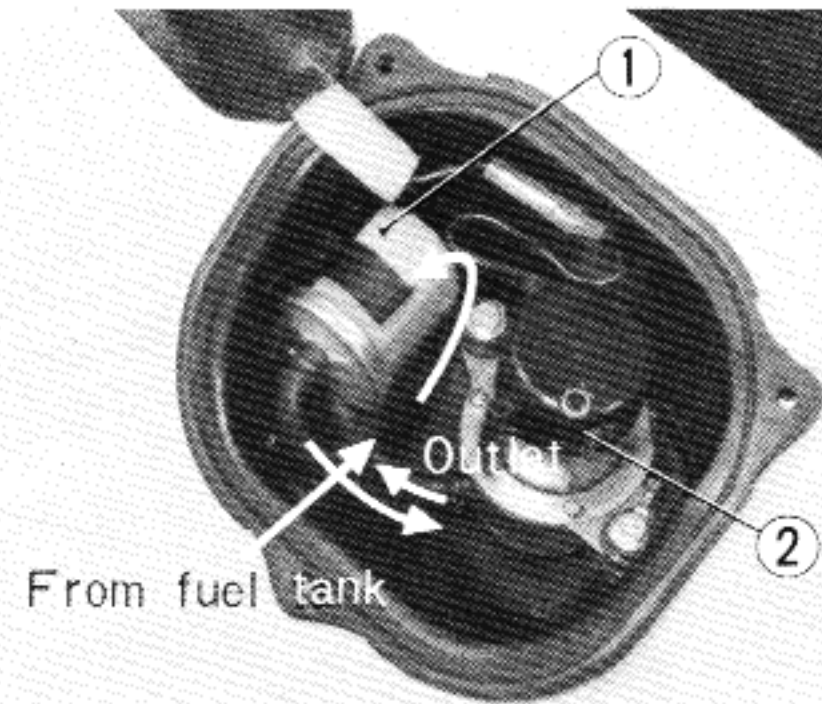


Fig. 2-89 ① Fuel Strainer
② Fuel Pump

8. Fuel Pump Operation

To check the fuel pump, disconnect the fuel tube from the carburetor, turn the ignition switch to the "ON" position, and allow the fuel to flow into a container. When the fuel pump is functioning properly the delivery rate will be 250cc (0.25 qts.) or more per minute. When installing the fuel pump, ground the fuel pump properly and connect the fuel tubes securely.

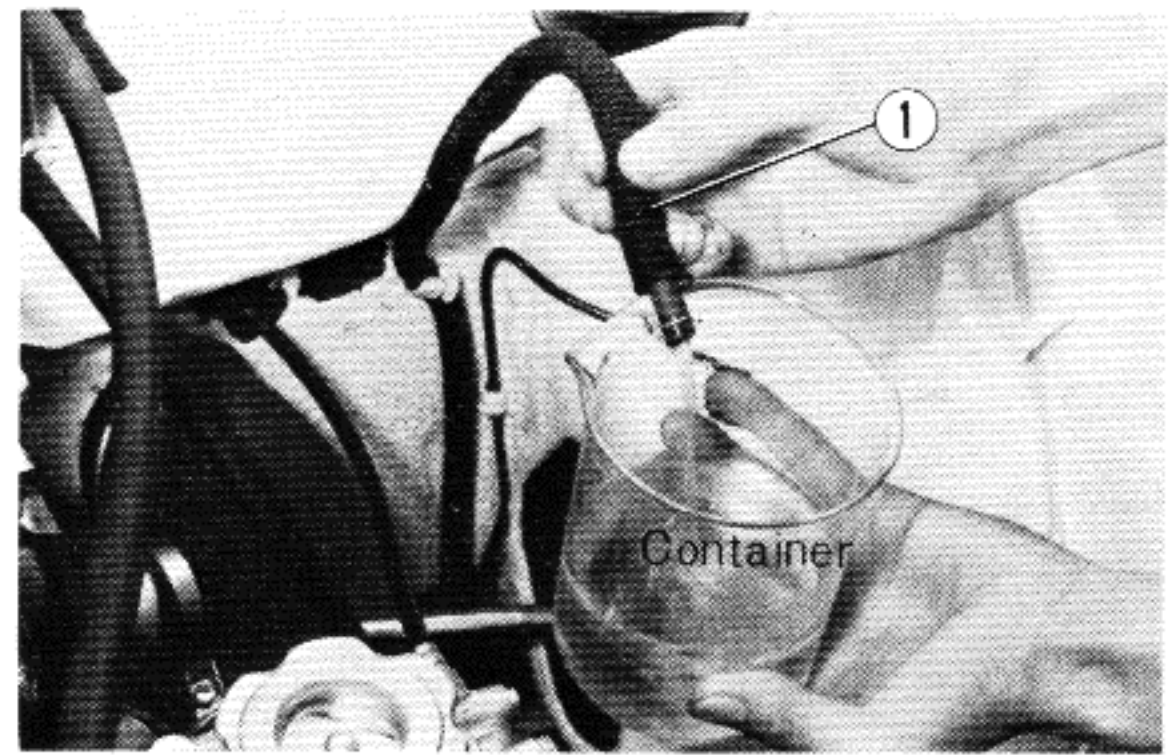


Fig. 2-90 ① Fuel Tube

9. Inspection of the fuel tube

Check the fuel tube for any damage or crack. Pay particular attention to the tube at the carburetor inlet.

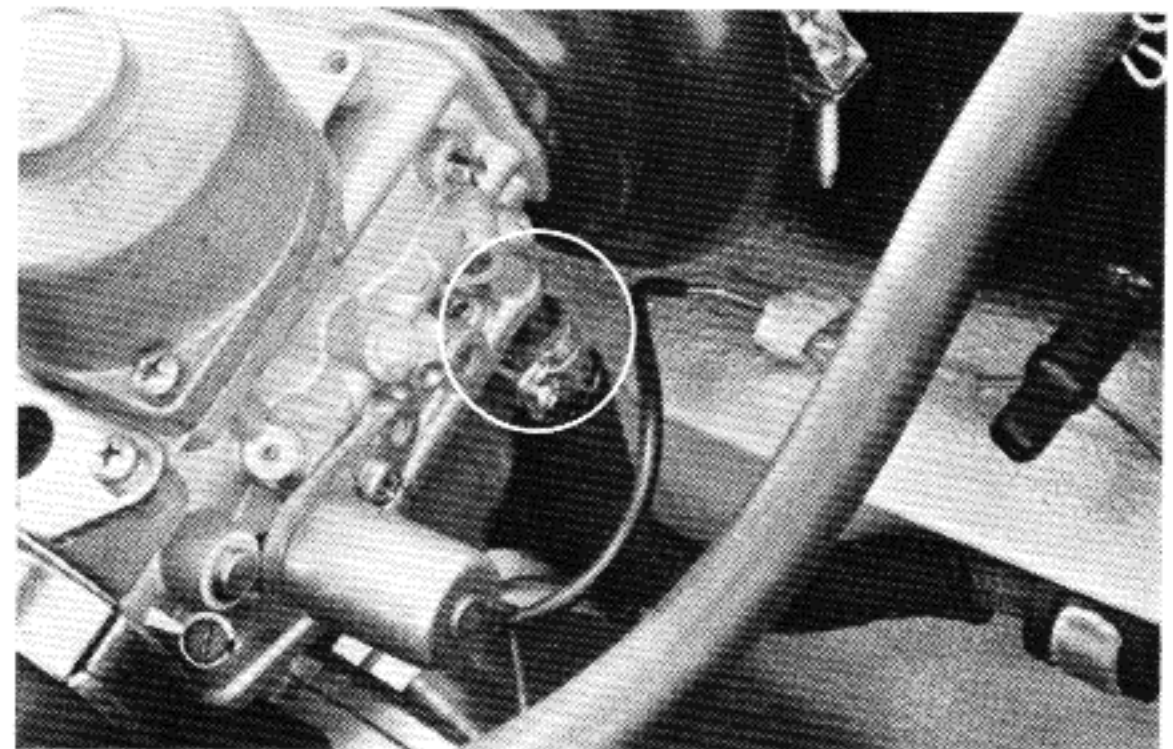


Fig. 2-91

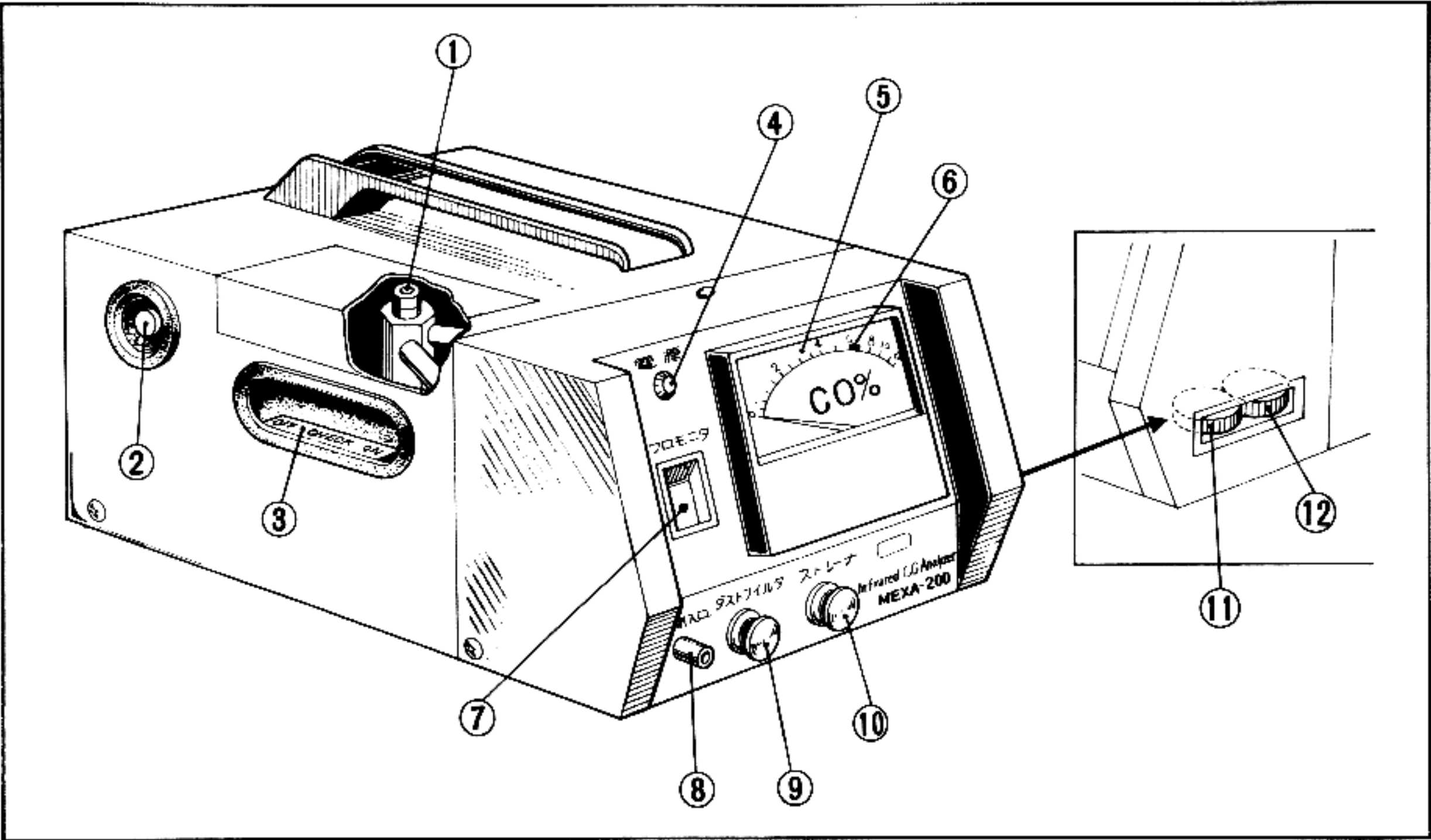


Fig. 2-92 ① Span Gas Inlet (Reference Gas) ⑤ Indicator
② Check Knob ⑥ Green belt
③ Measurement Switch ⑦ Flow Mounting
④ Pilot Lamp

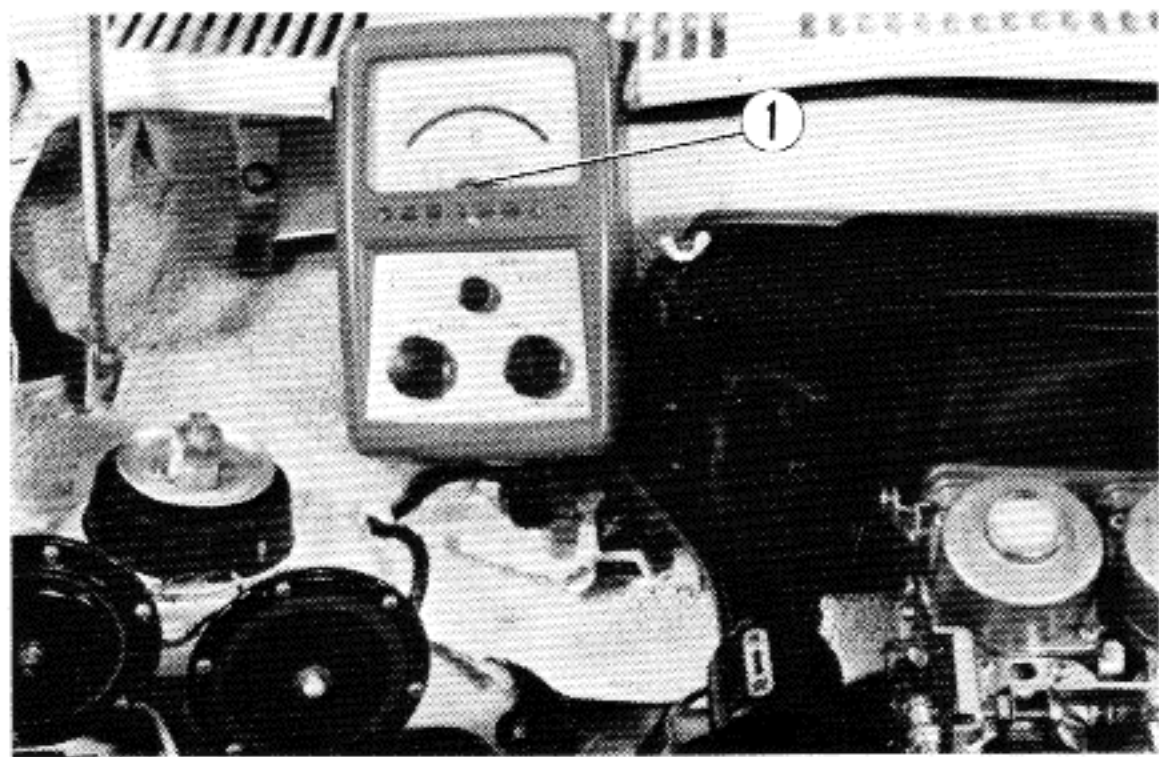


Fig. 2-93 ① Thermometer
the mechanical and vacuum advance units.

2. How to measure and control CO

1. Preliminary steps

Before measuring the CO concentration in the exhaust, functionally check the following items:

- 1) Air cleaner element.
- 2) Ignition timing (including operation of

| Oil temperature (°C) | Specified RPM | CO concentration (%) |
|----------------------|---------------|----------------------|
| 60-80°C (140-177°F) | 1150±50 | 2.0-4.5 |

- 3) Spark plug electrodes.
- 4) Carburetor.
- 5) Valve clearances.
- 6) Breather tube and drain tube.
- 7) Air intake heating control change-over valve (set according to season).

2. Adjustment of the idle mixture screw

To measure and control CO in exhaust gases when the engine is running at idling speed, proceed as follows:

- 1) Insert a thermometer into the oil level gauge (dipstick) hole, and seal the end. Start the engine and warm it up until the oil temperature reaches the range between 60° and 80°C (140°-170°F). Make certain that the thermometer is inserted the same length as the dipstick.

- 2) After the engine is warmed, connect a tachometer and adjust the idle speed.
 - a) Adjust the throttle stop screw to run the engine at the specified rpm, and adjust the pilot screw to obtain maximum rpm. Then readjust the throttle stop screw to obtain the specified rpm.
 - b) Repeat the above procedures and check with a tachometer to insure that the optimum setting is reached.

3. Measurement and adjustment of CO

1. When the oil temperature rises to within range (60–80°C: 140–170°F), close the hood and run the engine at idling speed for several minutes.
2. Plug the muffler condensation drain hole.
3. Depress the accelerator pedal to rev the engine to 2,000 rpm for about five seconds and then slow the engine down to idling speed just before inserting the sampling probe of the CO meter into the tail pipe.
4. Insert the sampling probe into the tail pipe at least 40 cm (16 in).
5. Read the CO meter when the meter pointer steadies. The correct CO value is 2–4.5%. If the value is higher than 4.5%, proceed as follows:

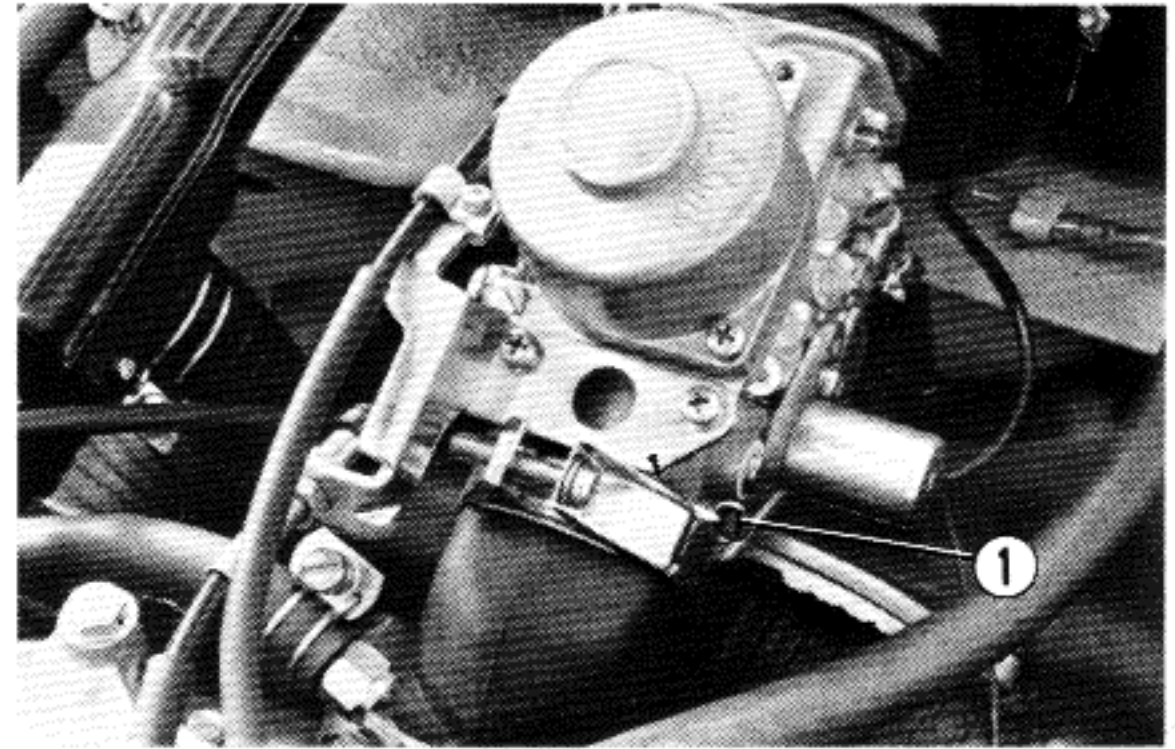


Fig. 2-94 ① Pilot Screw

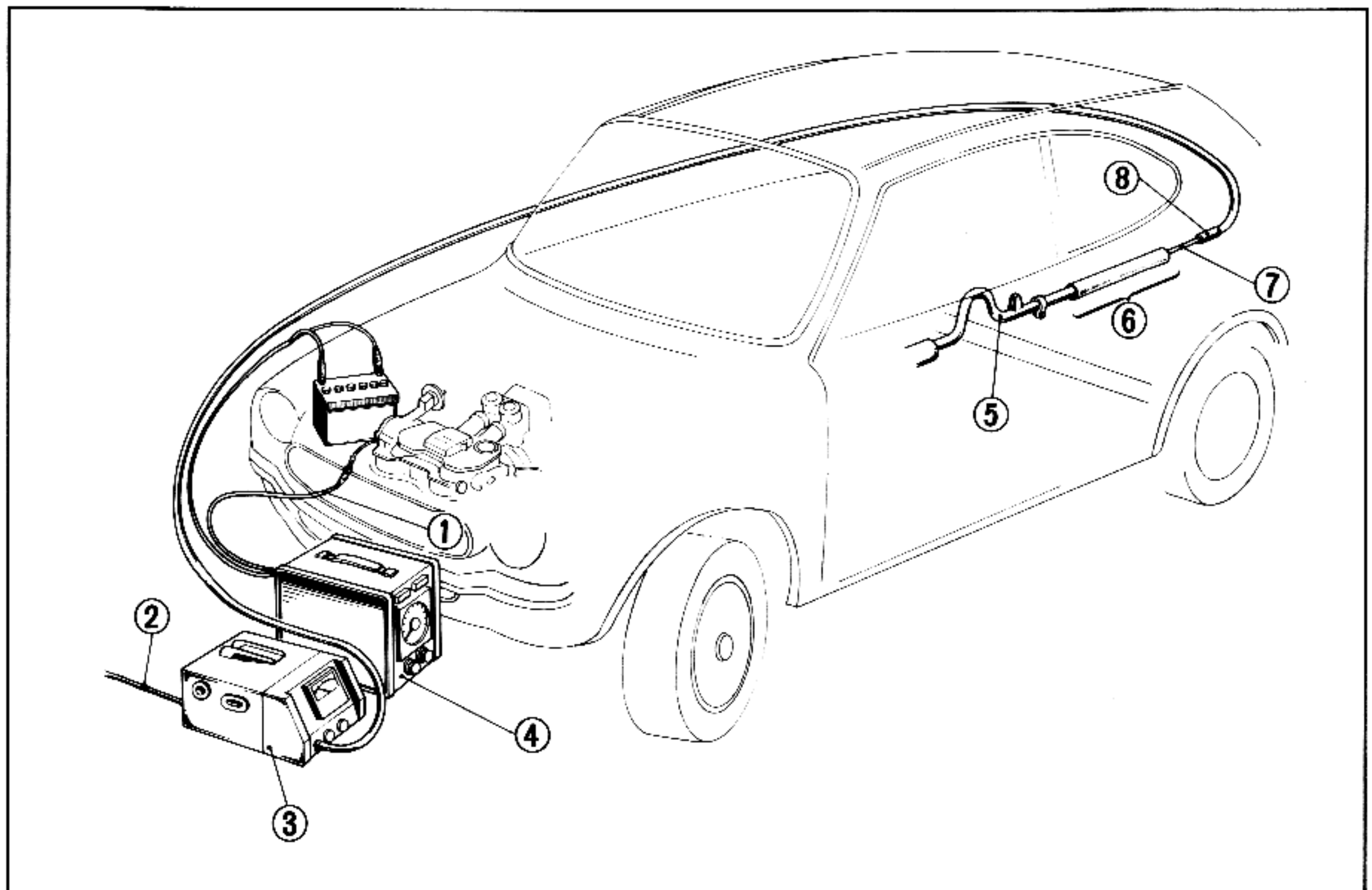


Fig. 2-95 ① Primary Lead Wire
② Power Supply
③ Co Meter
④ Tachometer

⑤ Tail Pipe
⑥ Pipe Attachment (600 mm long)
⑦ Collector Tube
⑧ Filter

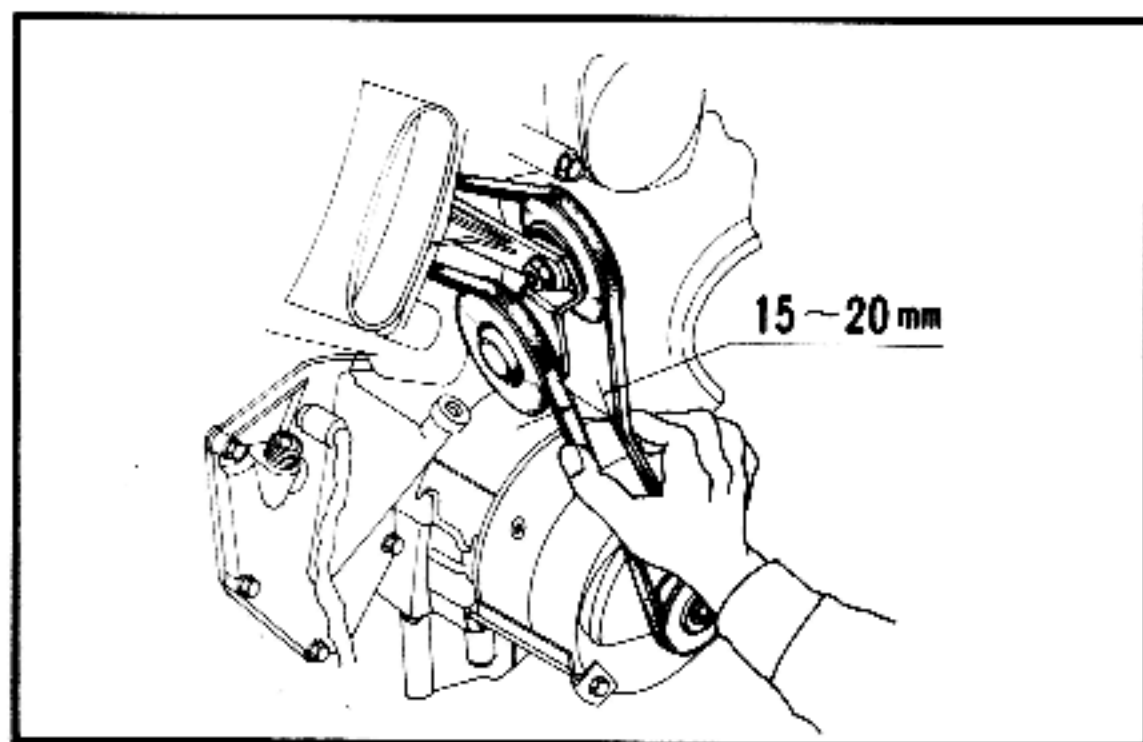


Fig. 2-96

Turn the pilot screw in $1/16$ turn and adjust the engine speed to the specified rpm with the throttle stop screw. Then read the meter. Repeat the procedure until the value indicates less than 4.5%. If the measured value is not within the range of 4.5% or less, or if the car accelerates poorly even though CO concentration is within the allowable range, check the inspection and adjustment items and measuring conditions prescribed above, and take the measurement again.

F. Cooling System

1. Check the fan belt tension by pressing both sides of the belt together as shown. The proper distance between the inner faces of the belts is 15-20 mm (0.59-0.78 in).
2. Adjustment of the tension is made by loosening the tension pulley nut and moving the pulley along the bracket in either direction.

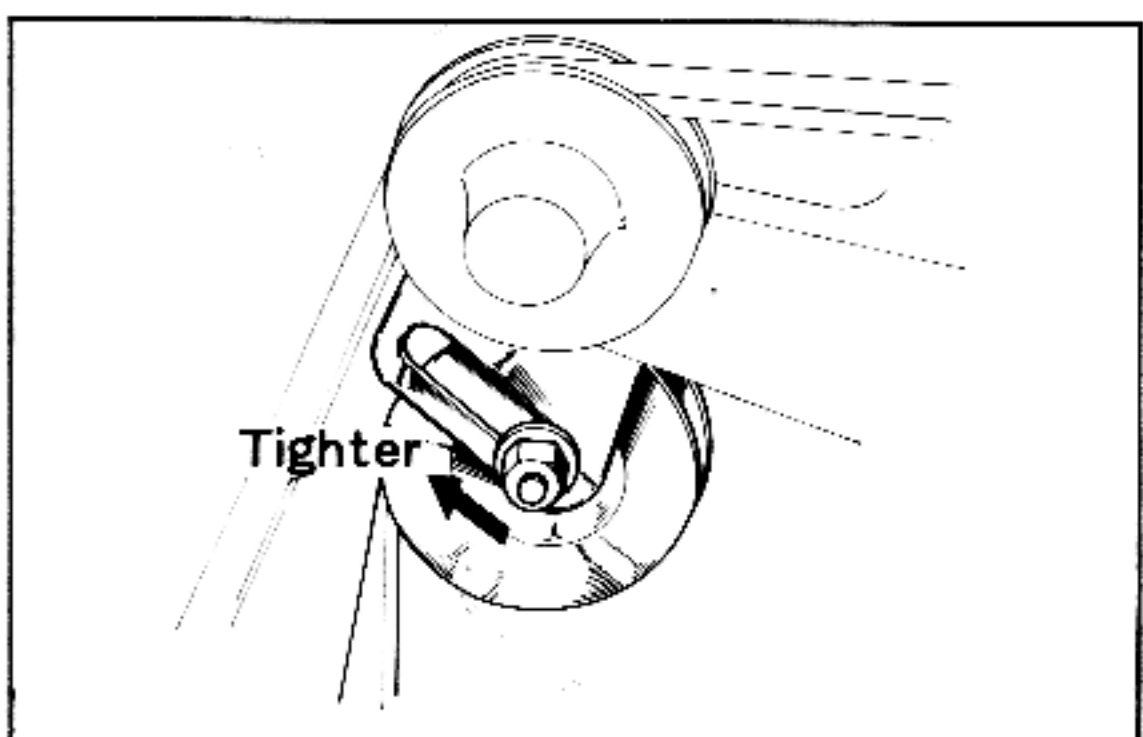


Fig. 2-97

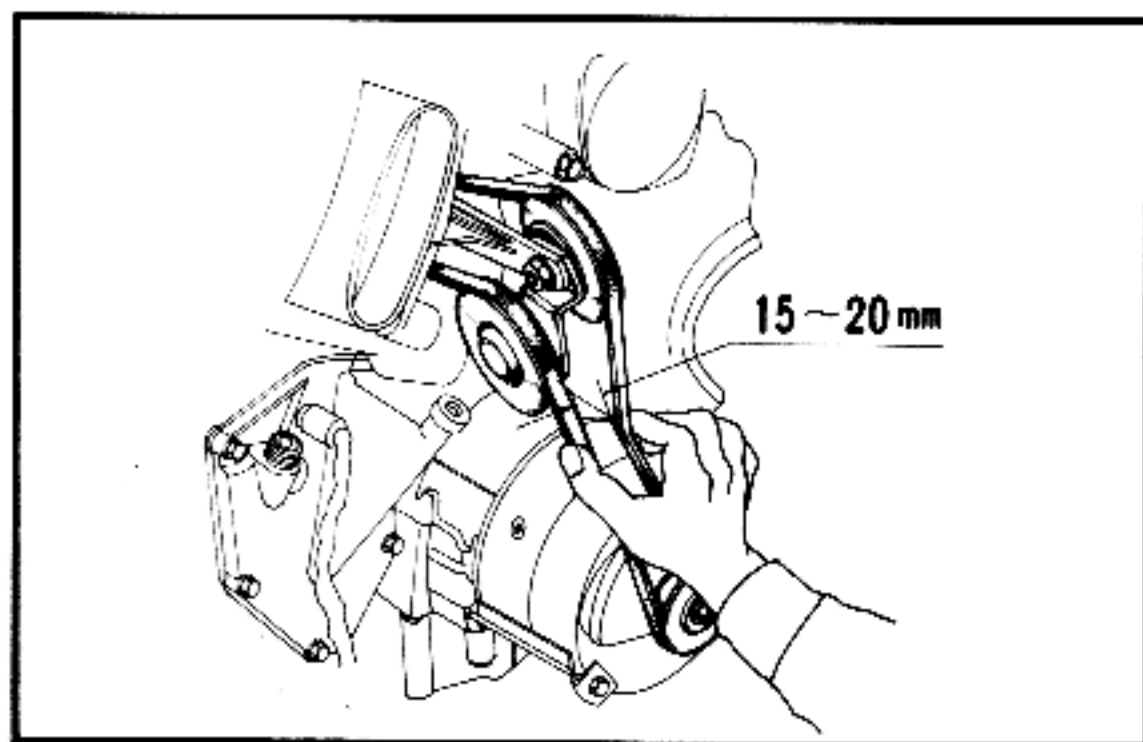


Fig. 2-96

Turn the pilot screw in $1/16$ turn and adjust the engine speed to the specified rpm with the throttle stop screw. Then read the meter. Repeat the procedure until the value indicates less than 4.5%. If the measured value is not within the range of 4.5% or less, or if the car accelerates poorly even though CO concentration is within the allowable range, check the inspection and adjustment items and measuring conditions prescribed above, and take the measurement again.

F. Cooling System

1. Check the fan belt tension by pressing both sides of the belt together as shown. The proper distance between the inner faces of the belts is 15-20 mm (0.59-0.78 in).
2. Adjustment of the tension is made by loosening the tension pulley nut and moving the pulley along the bracket in either direction.

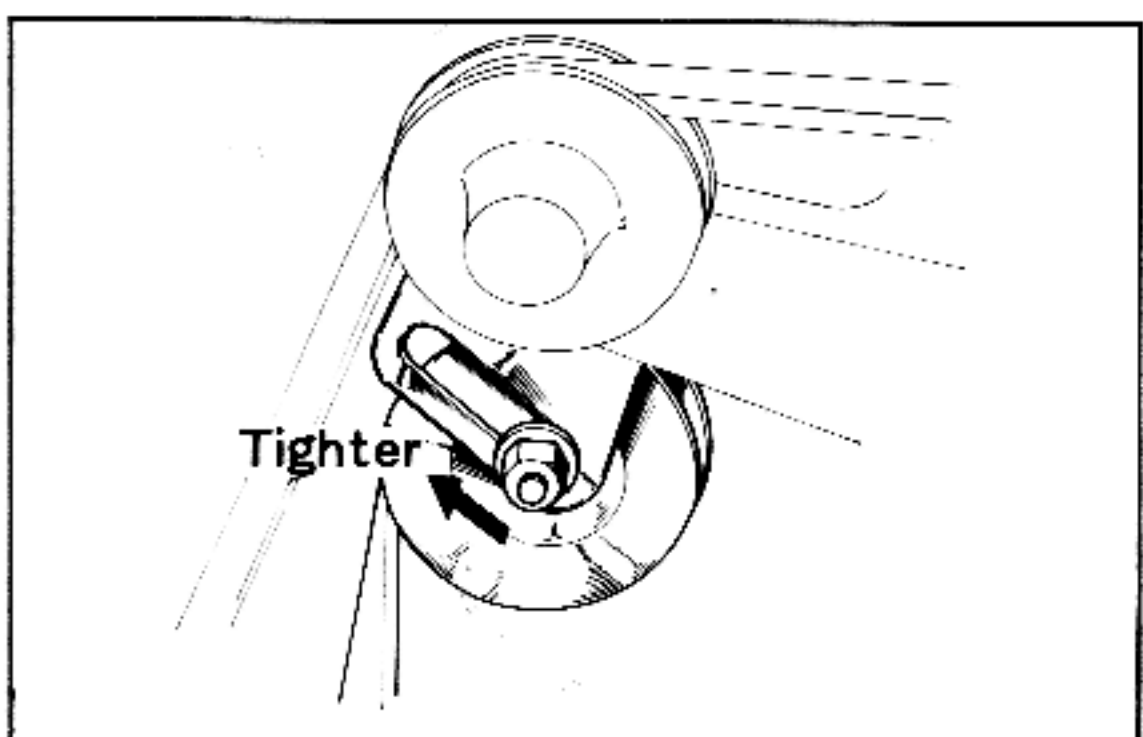


Fig. 2-97

2-8. Miscellaneous

A. Lighting Equipment

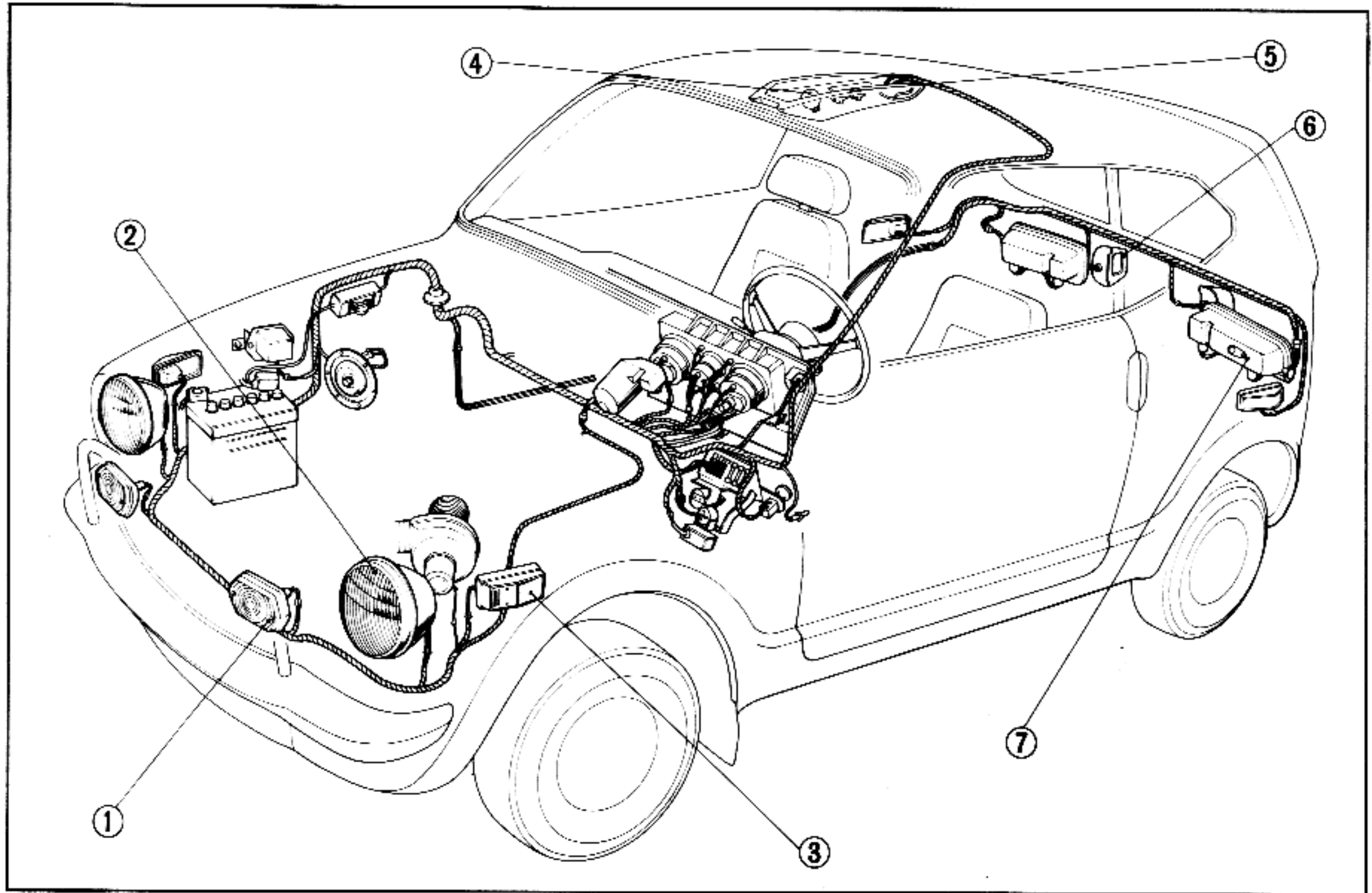


Fig. 2-98 ① Front Combination Light ⑤ Room Lamp
 ② Head Light ⑥ License Light
 ③ Front Side Marker Light ⑦ Rear Combination Light
 ④ Spot Light

1. Function

1. Turn on the headlights (high and low beams), parking lights, backup lights, side marker lights, interior lights (room light), instrument lights, hazard warning lights, turn signals, and brake lights, to insure that they are functioning properly. Replace any defective bulbs.

NOTE: If the flashing frequency of the turn signal lamps is less than 50 times per minute, the turn signal relay should be replaced.

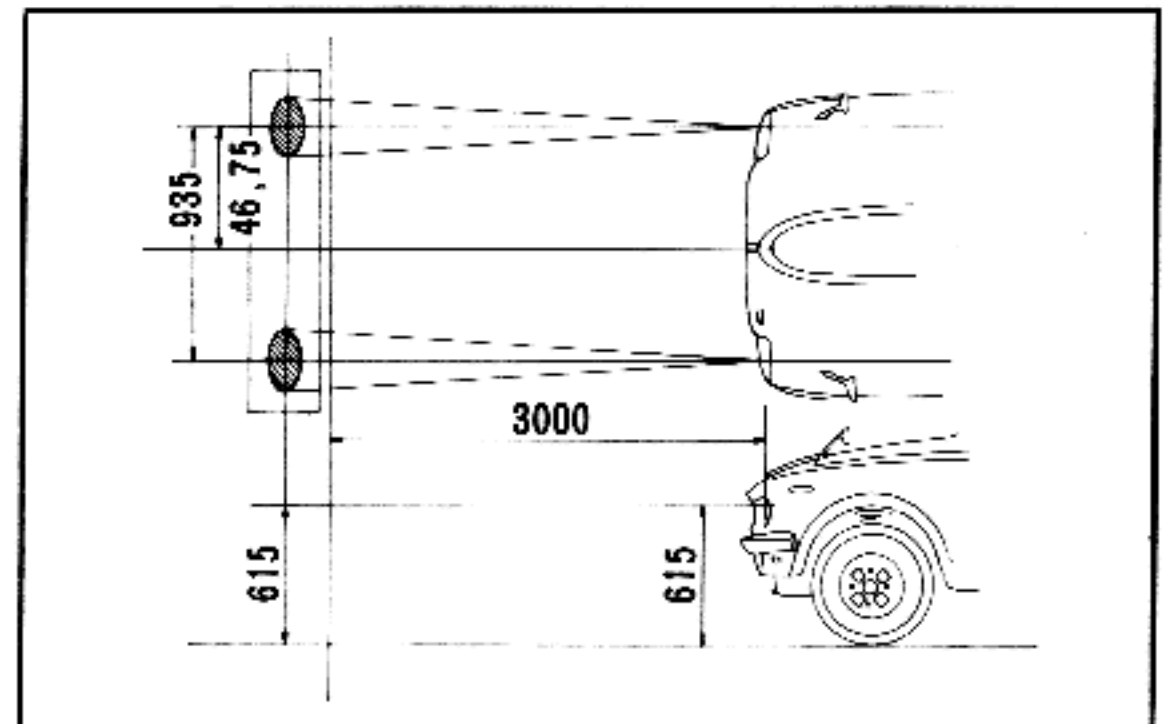


Fig. 2-99

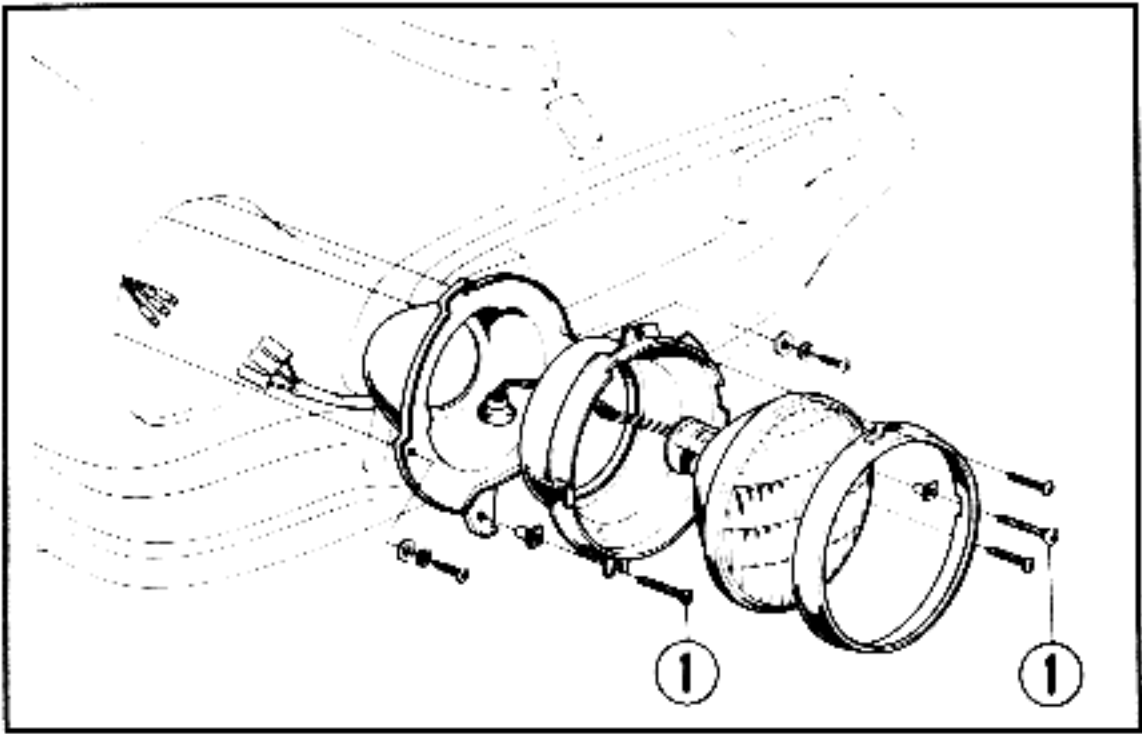


Fig. 2-100 ① Focus Adjusting Screw

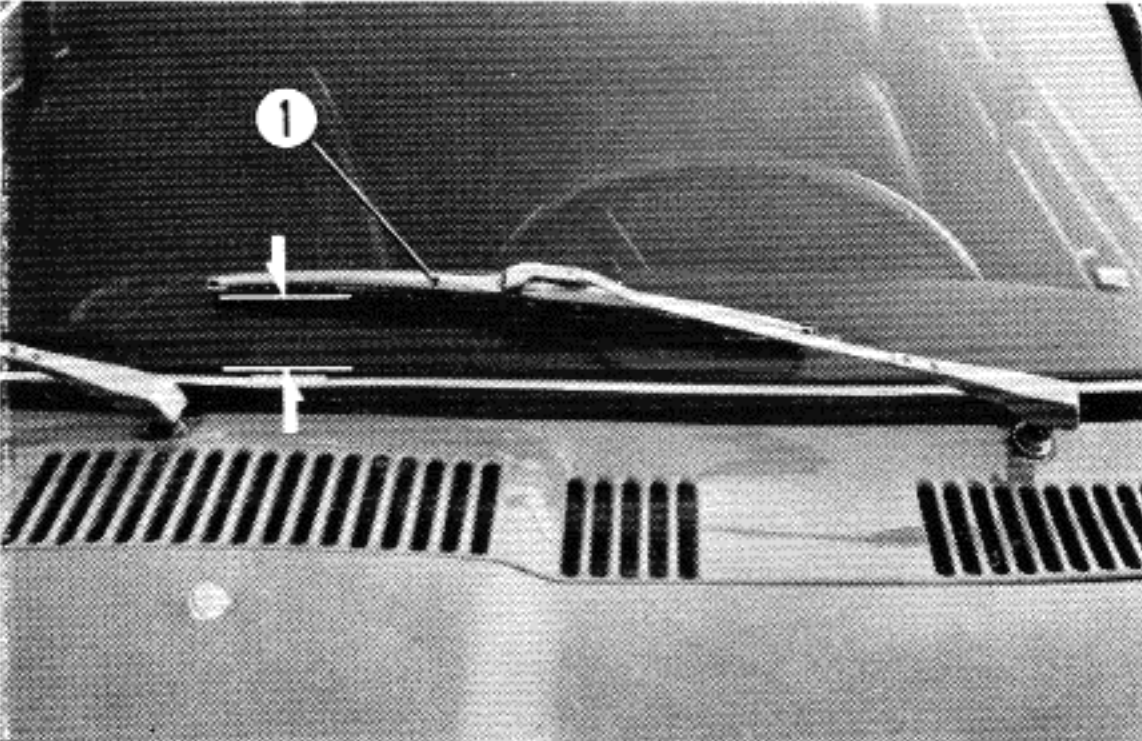


Fig. 2-101 ① Windshield Wiper

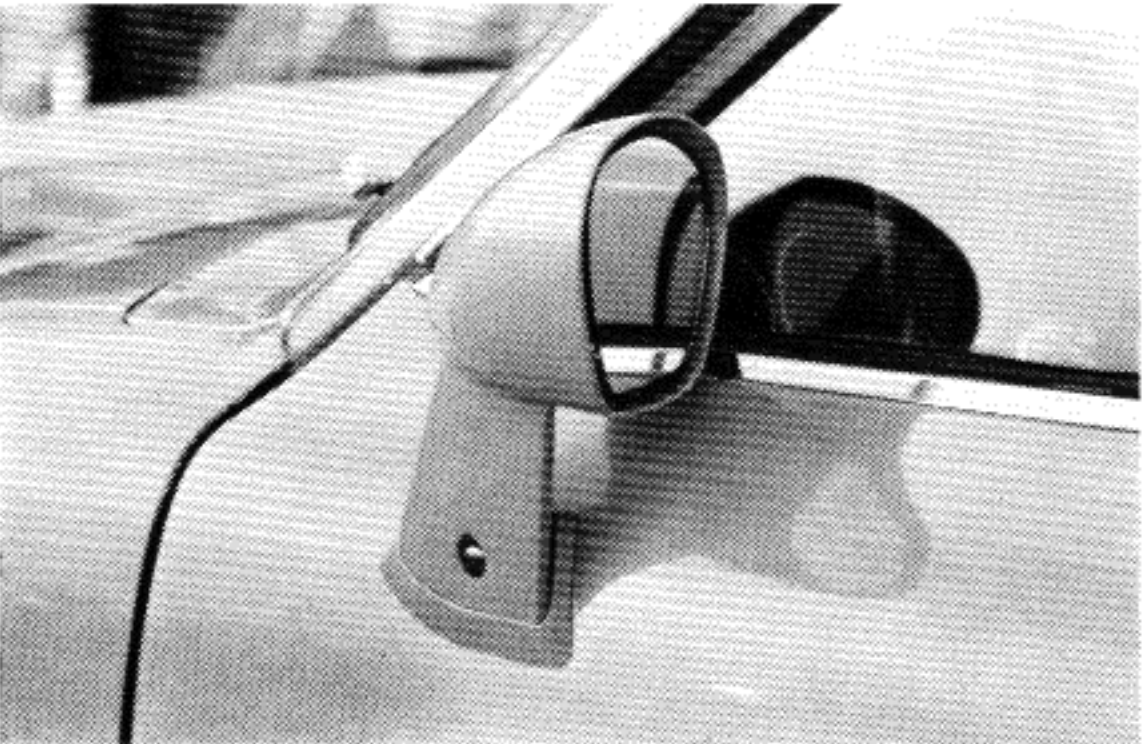


Fig. 2-102

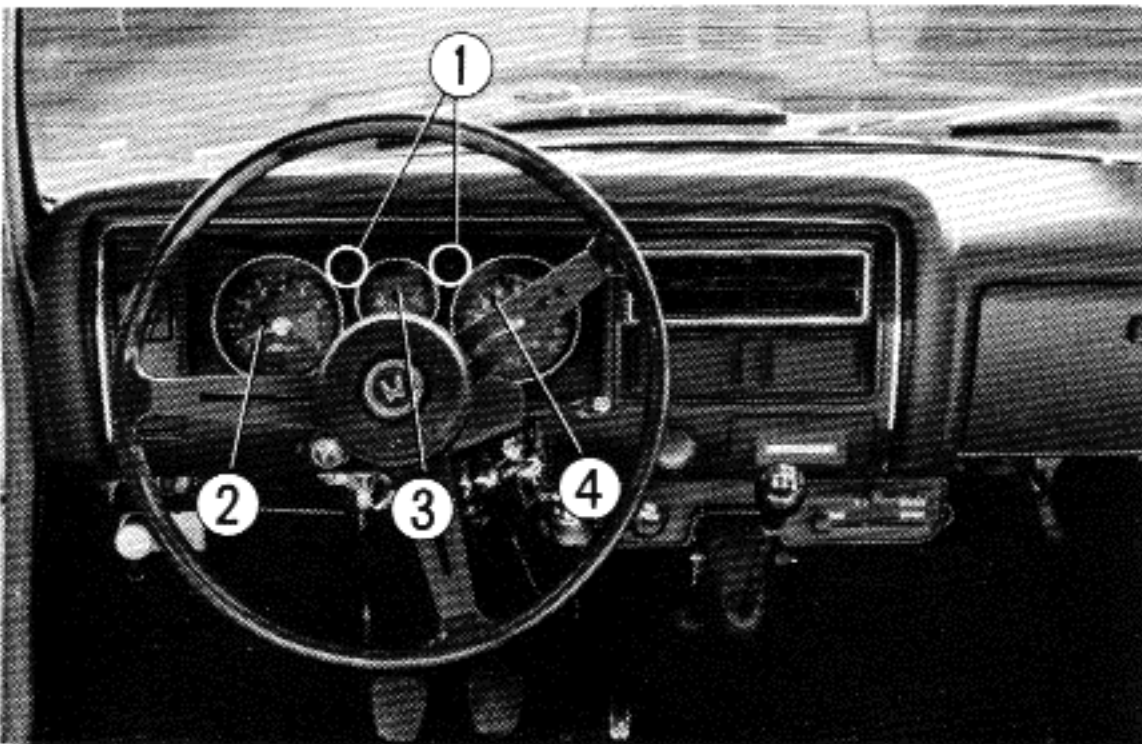


Fig. 2-103 ① Turn Signal Indicator Lamp
② Tachometer
③ Fuel meter
④ Speedometer

2. Headlight maintenance and adjustment

1. If replacement of a sealed beam is necessary, the lamp may be replaced by removing the two retaining ring screws, the retainer, and the connector terminal from the lamp.
2. Headlight adjustment can be accomplished by means of two screws located behind the headlight retainer (on the mounting ring.) For correct alignment procedure, refer to the HONDA 360/400/600 Sedan Shop Manual, section 17, page 35-1. For specifications, refer to state and local regulations.

B. Windshield Wiper Operation

The rest position of the windshield wiper arm should be 10-20mm (0.39-0.78in) above the upper edge of the weather strip when it stops. If the arm stops at any other position, adjust it by changing the position of the arm on the shaft.

NOTE: Do not operate the windshield wiper without wetting the windshield, otherwise the glass and wiper blades may be damaged and the motor may overheat.

C. Rear View Mirrors

1. Check interior and outside rear view mirrors for loose mounting and/or vibration.
2. Check the mirror surfaces for any oil and rust, and clean if necessary.

D. Operation of Instruments

1. Turn the ignition switch to the "ON" position and check if the charge lamp and the parking brake warning lamp (with the parking brake engaged) come on. If one or both lamps do not operate, check for blown fuses, burned out bulbs, or improper wiring.
2. Start the engine. The charge lamp (discharge warning lamp) should go off when the engine is at idle. If the lamp remains on, the charging system should be checked. Refer to section 6-7 in this manual.
3. Check the operation of the speedometer:
Allowable error of speedometer

| | | | |
|-----------------------|---------|--------------|------|
| When the car speed is | 35 km/h | +15% | -10% |
| | | (32-40 km/h) | |
| | 22 mph | +15% | -10% |
| | | (25-20 mph) | |

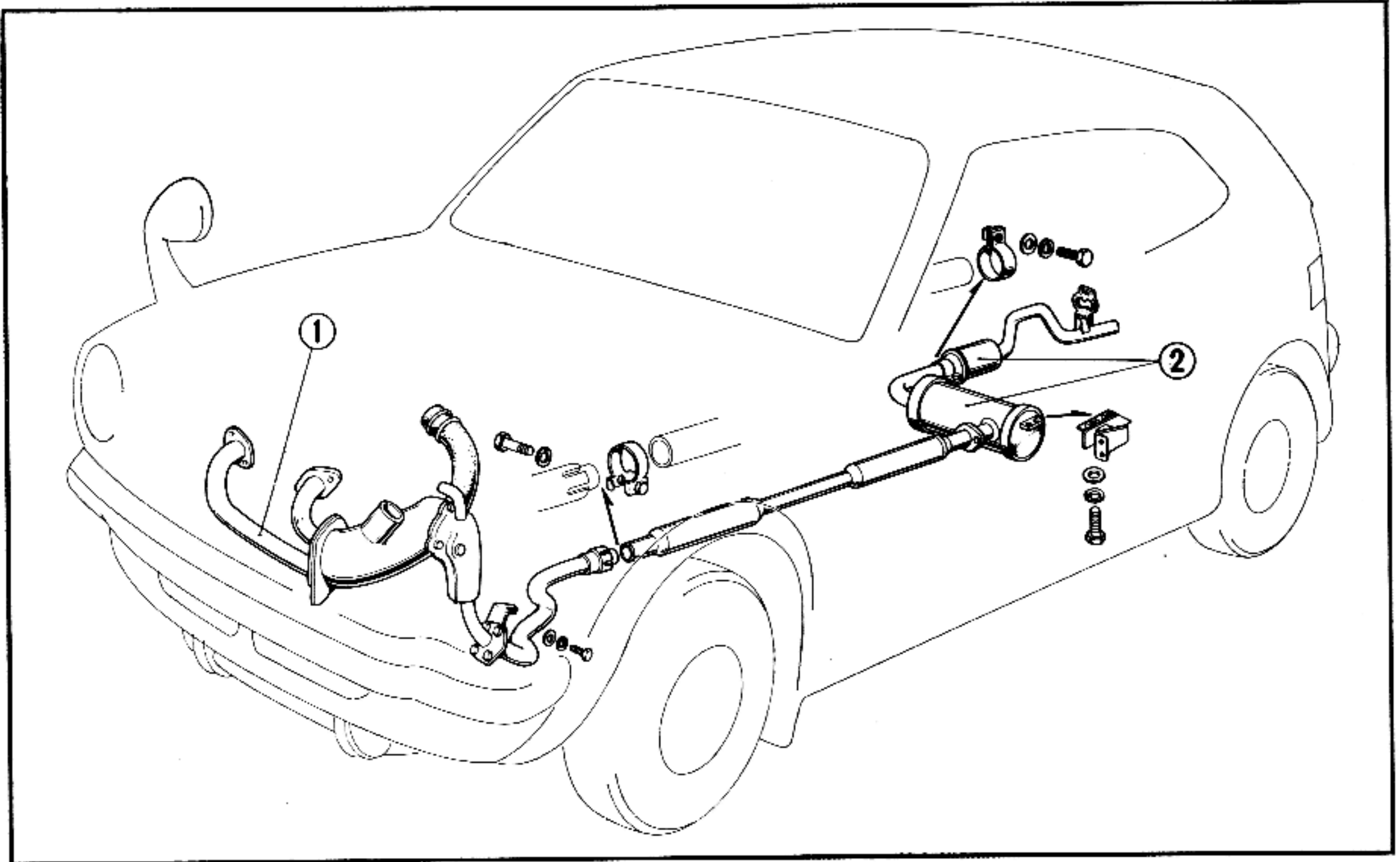
E. Exhaust Pipes and Exhaust Silencers

Fig. 2-104 ① Exhaust Pipe ② Silencer

1. Exhaust system inspection

1. Check the exhaust pipes for loose mountings, clamps, cracks or other damage.
2. Check the exhaust silencer A for damage.
3. Check the exhaust silencer B and mounting rubber for damage.

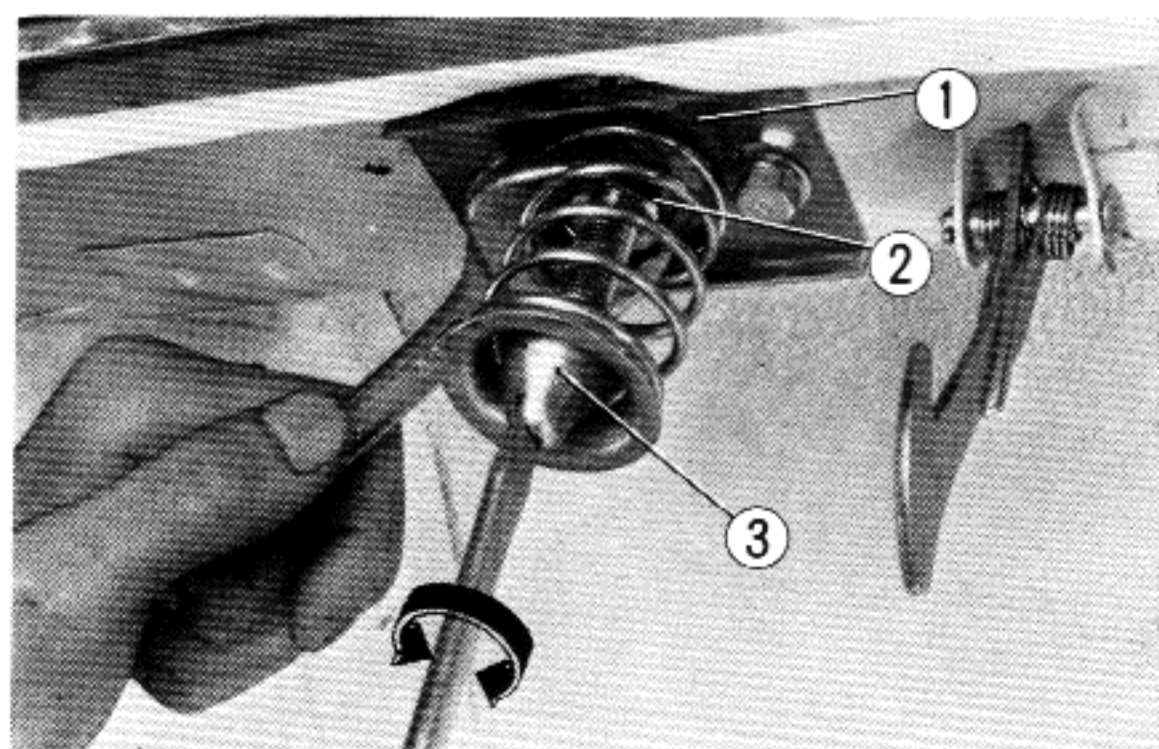


Fig. 2-105 ① Striker Bracket
② Lock Nut
③ Striker

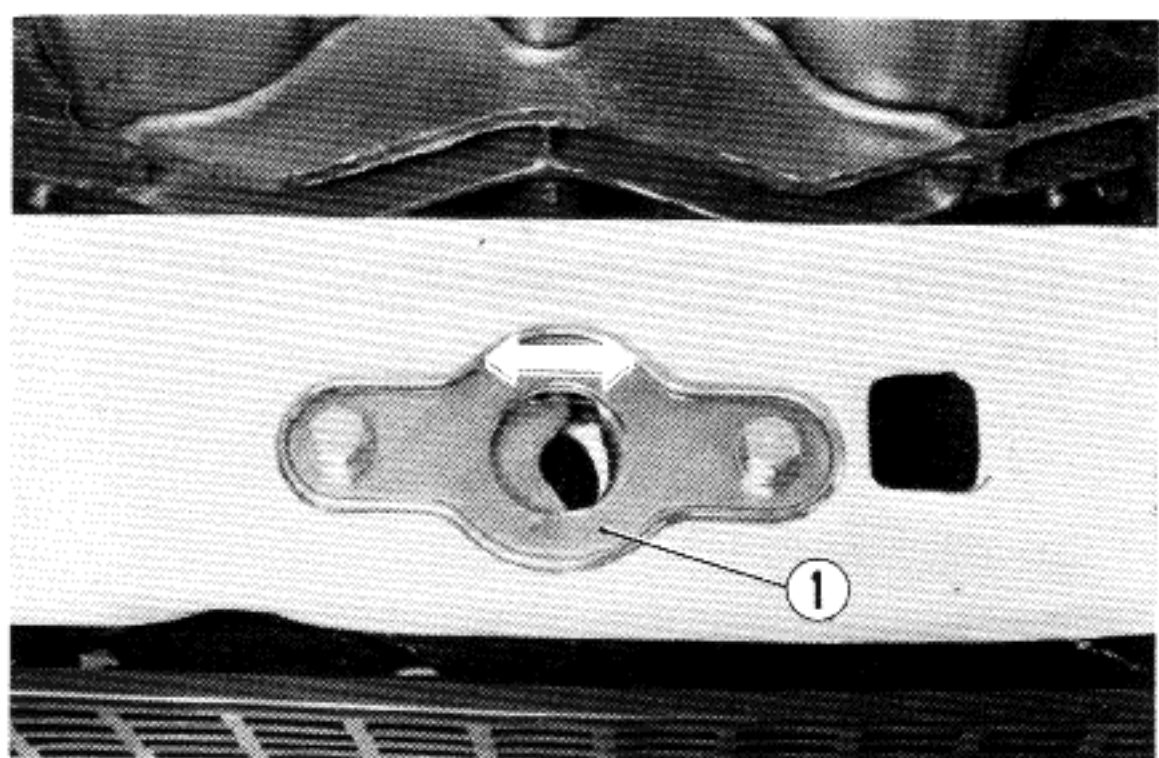


Fig. 2-106 ① Bonnet Striker Guide Plate

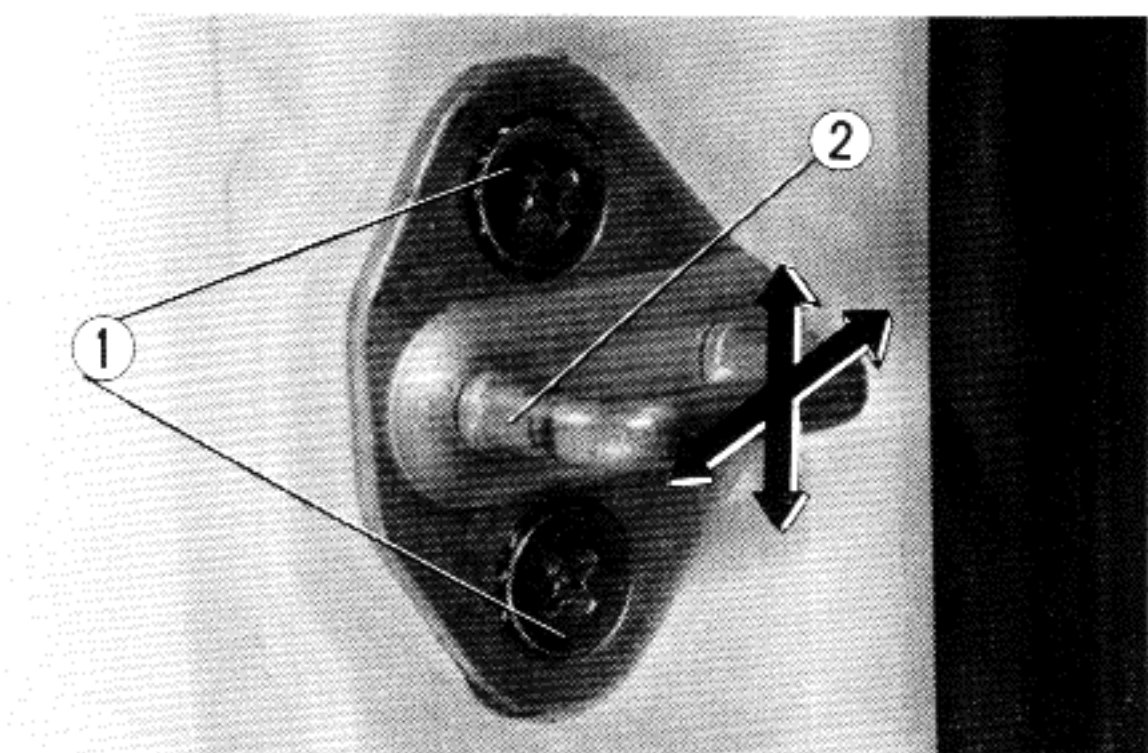


Fig. 2-107 ① Bolt
② Door Lock Striker

F. Hood and Hood Latch

1. Inspection

Check the hood, hood latch, and safety latch for proper alignment and operation.

2. Adjustment

1. Check the alignment of the hood, and if necessary, adjust by loosening the four hinge bolts and moving the hood left, right, up or down.
2. Lock the hood latch and check if it is properly latched. Also check for proper release. To adjust, loosen the lock nut on the hood lock dowel and turn the dowel inward to decrease free-play, and outward to increase free-play. Retighten the lock nut.
3. If difficulty is experienced when opening or closing the hood due to misalignment of the hood latch striker, there are two adjustments that can be performed:
 - 1) Loosen the bolts holding the striker bracket and adjust the bracket by moving it in the axial direction.
 - 2) Loosen the bolts holding the hood striker guide plate and adjust the guide plate by moving it in the lateral direction.
4. Check for correct operation of the hood safety latch. Repair or replace as necessary.
5. Apply grease to the striker upon completion of the adjustments.

G. Door Lock Operation

1. Inspection

Check the engagement of the door lock and the door lock striker. There should be no indication of rattling when the door is closed.

2. Adjustment

If lock engagement is not satisfactory, loosen the two striker plate screws and adjust the striker plate.

1. If the door does not close completely and firmly, slide the striker plate inward to increase the door closing stroke.
2. If the door is hard to close, slide the striker plate outward.
3. If door alignment is normal, but there is contact at the bottom (top) of the striker, lower (raise) the striker plate slightly.
4. If the door is misaligned, and the door closing action is poor, adjust with shims and/or hinge bolts.

H. Tail Gate Operation

1. Check the clearance and alignment between the tail gate and body, and if necessary adjust the location of the tail gate hinges with the retaining bolts loosened.
2. With the tail gate door closed, lightly push against the door to insure that the lock is operating correctly. Note any door movement when locked and adjust accordingly:
 - 1) Loosen the two bolts holding the striker to adjust for misalignment in the vertical direction.
 - 2) Loosen the two bolts holding the latch assembly to adjust for misalignment in the lateral direction.

I. Seats

1. Seat belts

1. Check to see if the tongue plate and buckle can be securely engaged. Also, check the belt straps for damage.
2. Check the seat belt anchor bolts for looseness. Retighten if loose.

2. Head rest

1. Check the mounting of the head rest to see if it can be securely locked in the elevated positions.
2. Shake the head rest back and forth to see if there is any rattle.
3. The correct height for the head rest is when it comes to the ear-level of the seat occupant.

J. Dashboard Grommets

1. Mounting condition

If the grommets are not correctly fitted, water and dust will enter the interior. Check the seating position of the grommets. Replace them if the rubber is cracked. If the fit of the grommet to the hole is loose, seal the opening with weatherstrip cement.

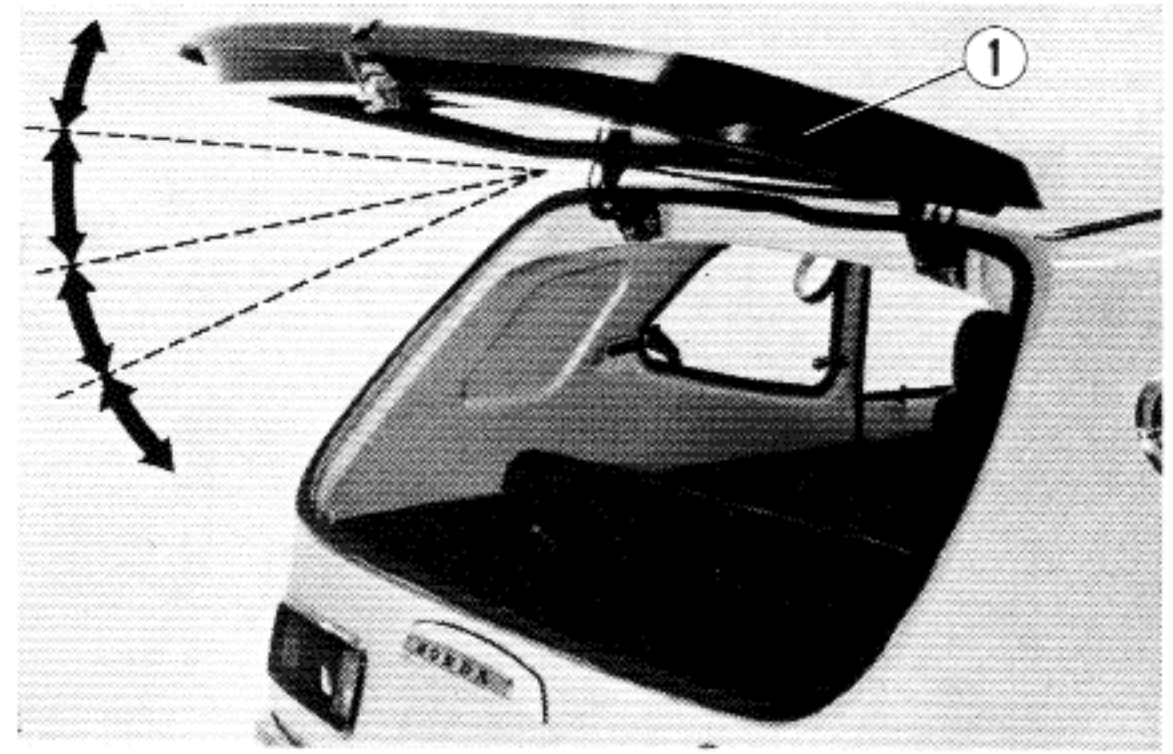


Fig. 2-108 ① Tail Gate

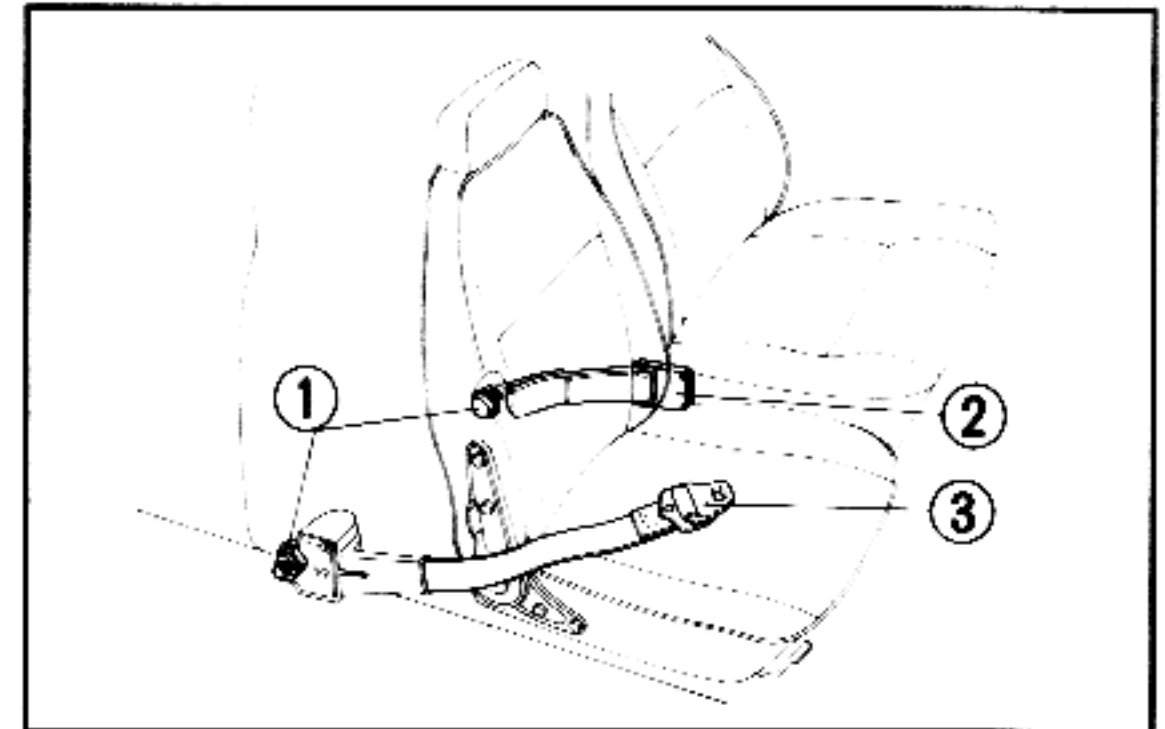


Fig. 2-109 ① Seat Belt Anchor Bolt
② Buckle
③ Tongue Plate

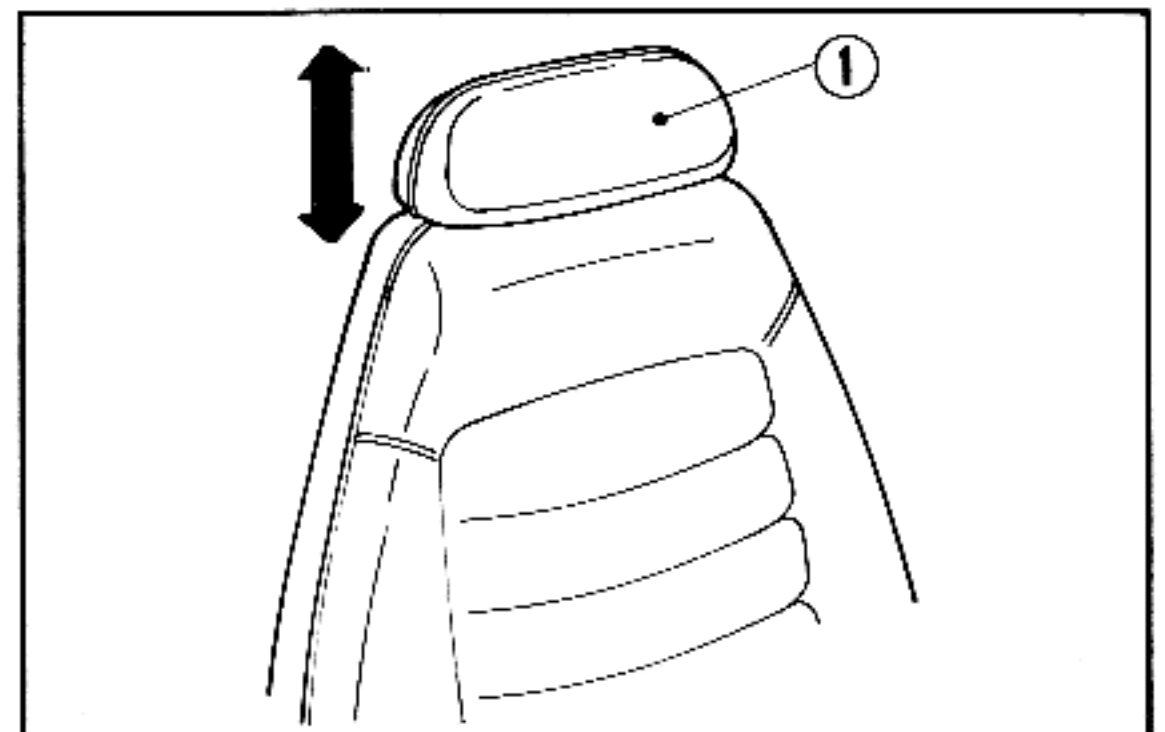


Fig. 2-110 ① Head Rest

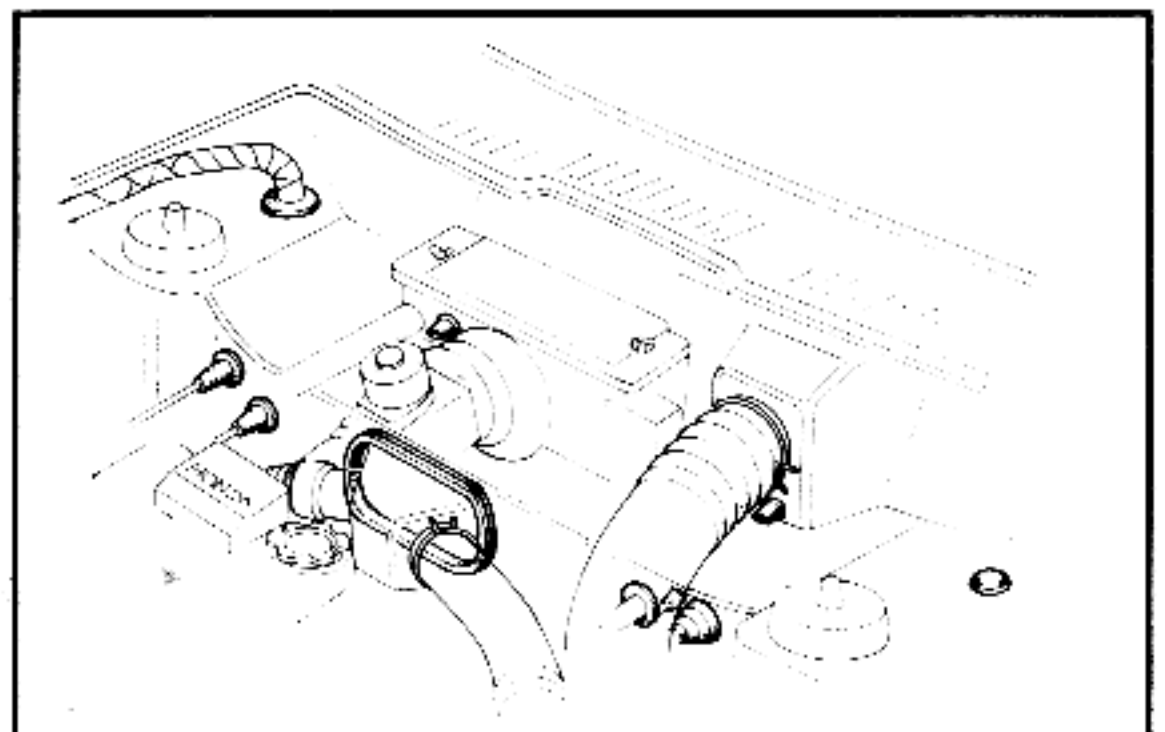


Fig. 2-111

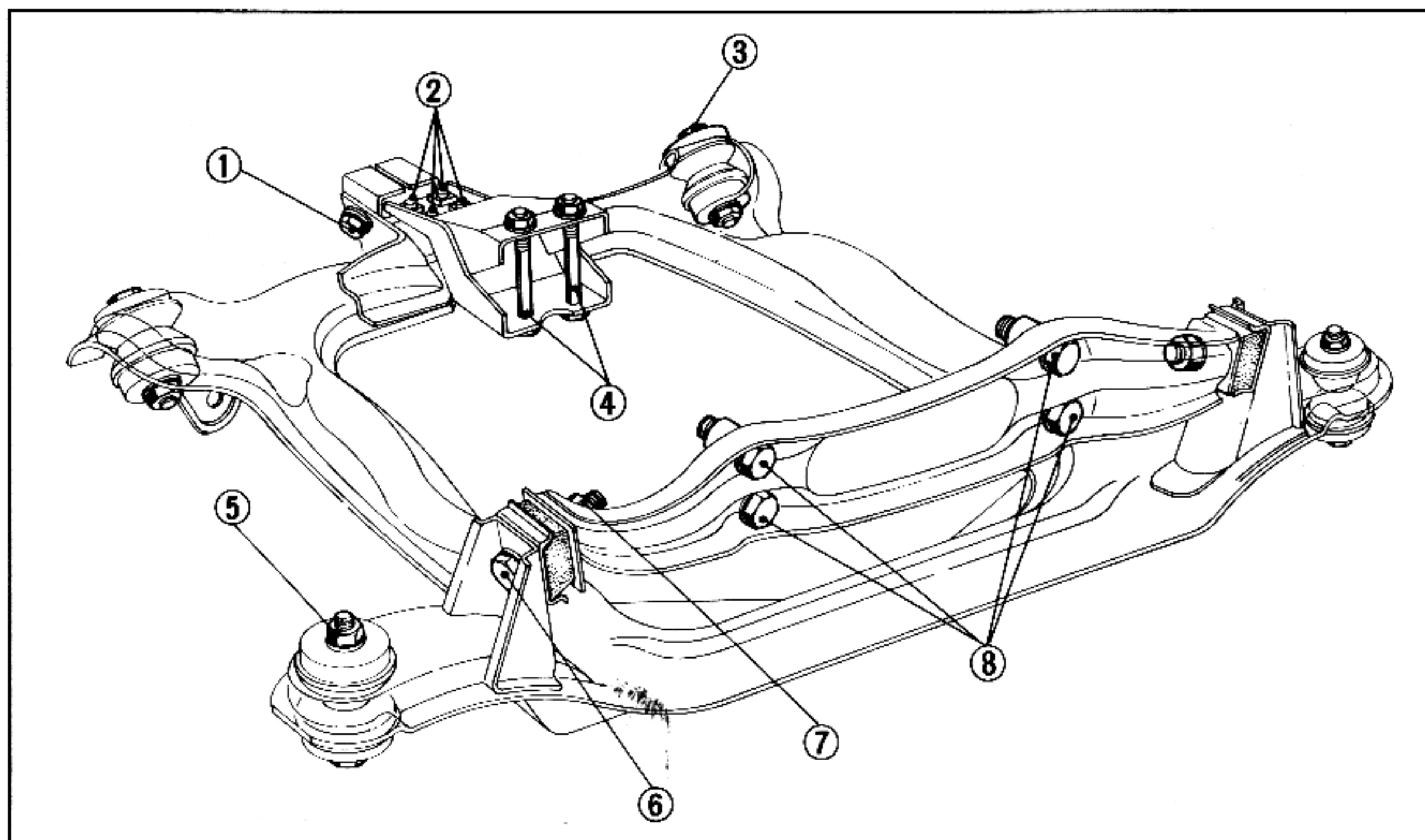
K. Body, Sub-Frame and Engine Mounting Bolts

Fig. 2-112

- ① Rear Engine Mount Rubber-Sub Frame 2.0-2.4 kg-m
- ② Rear Engine Mount Rubber-Bracket 0.8-1.0 kg-m
- ③ Sub Frame Rear-Body 4.0-4.8 kg-m
- ④ Bracket Crankcase 2.0-2.4 kg-m
- ⑤ Sub Frame Front Body 4.0-4.8 kg-m
- ⑥ Engine Mount Rubber-Sub Frame 2.1-2.5 kg-m
- ⑦ Front Extension-Crankcase 3.0-3.5 kg-m

Check the body, sub-frame and engine mounting bolts for looseness or damage. Retighten any loose bolts. Replace any damaged bolts.