FUEL SYSTEM

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FUEL SYSTEM

The fuel system consists of the fuel tank, the fuel lines, fuel filter, fuel pump, the carburettor and the air cleaner.

The capacity of the fuel tank is 65.5 liters (17.3 U.S. gallons, 14.5 Imp. gallons). The operating fuel is regular gasoline.

4–A. CARBURETTOR

RX–2 is equipped with a 2–stage 4–barrel Zenith Stromberg carburettor. This carburettor comprises two sets each of primary barrels (for normal use) and a secondary barrels (for high output). In addition, a float circuit and a transfer system for the primary and secondary stages are attached. The primary barrel is equipped with a choke circuit, a low speed circuit, an auxiliary slow circuit and an accelerating circuit.

4–A–1. Carburettor Function

a. Fuel return circuit

This system incorporates a bimetal type fuel return valve to prevent percolation. When the fuel temperature reaches 55°C (131°F), the valve begins to open to return the fuel to the fuel tank.

b. Float circuit

The float chamber is equipped with a float and a needle valve to keep the fuel level constant under all operating conditions. Especially, as a needle valve material the special rubber is adopted more to prevent the fuel overflowing.

An oil level gauge is provided in the float chamber for easy inspection of the fuel level.

The ventilation system of the float chamber is of the inner circulation type.

Thus the fuel consumption is not influenced even if

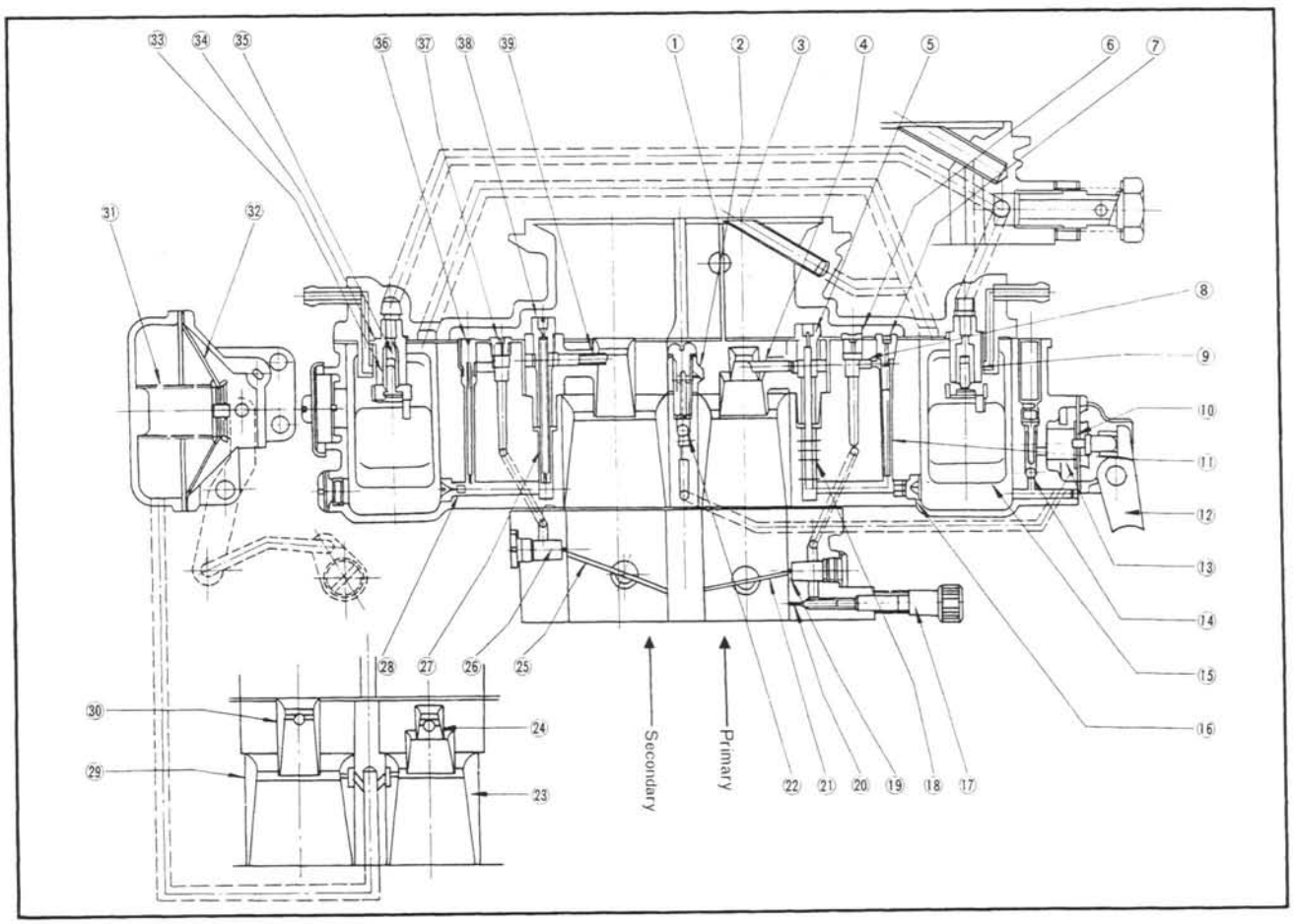

Fig. 4–1 Carburettor

1. Choke valve
2. Pump nozzle
3. Air vent pipe
4. Primary main nozzle
5. Primary main air bleed
6. No. 2 slow air bleed
7. No. 1 slow air bleed
8. Slow economizer
9. Needle valve
10. Accelerating diaphragm
11. Slow jet
12. Pump lever
13. Return spring
14. Inlet check valve
15. Float
16. Primary main jet
17. Idle adjust screw
18. Primary emultion tube
19. Bypass hole
20. Idle hole
21. Primary throttle valve
22. Outlet check valve
23. Primary large venturi
24. Primary small venturi
25. Secondary throttle valve
26. Bypass hole
27. Secondary emulsion tube
28. Secondary main jet
29. Secondary large venturi
30. Secondary small venturi
31. Diaphragm spring
32. Diaphragm
33. Valve spring
34. Valve seat
35. Needle valve
36. Secondary slow jet
37. Secondary slow air bleed
38. Secondary main air bleed
39. Secondary main nozzle

the air cleaner is clogged to a certain extent.

C. Low speed circuit

During idling and early part-throttle operation, the fuel is measured in the low speed circuit.
The fuel passes through the slow jet fitted in a branch passage of the main jet.
Then the fuel is mixed with air from the No. 1 slow air bleed and metered by the slow econonizer. And again it is mixed with air from the No. 2 slow air bleed.
The air-fuel mixture then flows through the low speed passage and is ejected from the idle hole or the bypass hole.

d. Auxiliary slow circuit

This circuit has been installed to privent misfiring and knocking which are liable to occur at low load and high revolution due to lean mixture.
This is of the structure that a diaphragm responsive to the negative pressure of the secondary side is provided halfway on the circuit with its valve designed to open at a certain extent of the negative pressure, allowing the fuel led from the secondary step system to pass and proceed to the auxiliary slow jet and then finally the fuel is ejected through the auxiliary slow port to the primary venturi

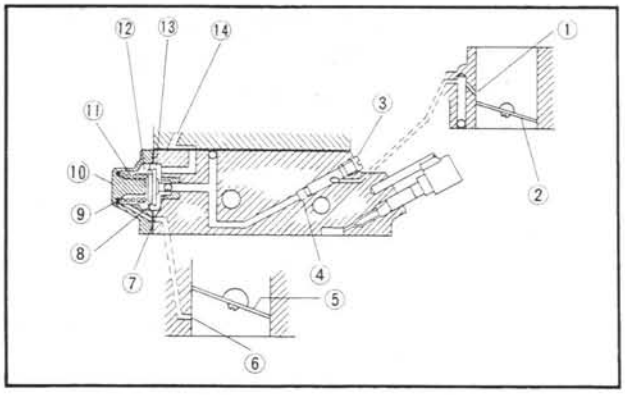

Fig. 4–2 Auxiliary slow circuit

1. Auxiliary slow hole
2. Primary throttle valve
3. Plug
4. Auxiliary slow jet
5. Secondary throttle valve
6. Vacuum hole
7. Ball valve
8. Diaphragm
9. Shim
10. Cover
11. Diaphragm spring
12. Vacuum chamber
13. Fuel chamber
14. From step circuit

e. Primary height speed circuit

During operation at part-throttle or full-throttle, the fuel is supplied through the high speed circuit. The fuel in the float chamber flows through the main jet, is mixed in the emulsion tube with the air from the main air bleed, and is sprayed through the main nozzle to the venturi.

f. Accelerating circuit

The accelerating circuit measures and supplies fuel for the rapid acceleration and smooth engine operation when the throttle valve is opened at lower speed. The accelerating pump is connected to the primary throttle valve by a link. When the primary throttle valve is closed, the diaphragm of the accelerating pump is pushed forward by a return spring. Then the fuel in the float chamber is sucked up into the accelerating pump diaphragm chamber through the inlet check valve.
When the primary throttle valve is opened, the diaphragm is pushed backward, the inlet check valve is closed, and the outlet check valve is opened. Then, the fuel in the accelerating pump is sprayed through the pump nozzle to the venturi.

g. Choke circuit

For easy starting and warming-up, the mixture ratio of air and fuel is controlled by the choke valve. The choke valve is an offset spring loaded type and prevents excessive choking.
When the choke valve is fully closed, the throttle valve is automatically opened to 15° by the choke connecting rod so as to obtain the most suitable mixture for starting-up of the engine.

h. Step circuit

The step circuit corresponds to the low speed circuit of the primary barrel and improves the connection between the primary and secondary barrels.
The fuel-flow in the secondary slow jet is mixed with air from the secondary slow air bleed, passes through the secondary low speed passage, and is ejected through a bore located near the fully-closed position of the secondary throttle valve.

i. Secondary high speed circuit

The secondary high speed circuit corresponds to the primary high speed circuit.
The secondary throttle valve is constructed so as to react to negative pressure in the venturi.
The vacuum jets are provided in the venturi sections of the primary and secondary stages. The average negative pressure of both jets acts in the diaphragm chamber and moves the diaphragm. The diaphragm and the secondary throttle valve are connected by a link to open the throttle valve according to the negative pressure.
However, the secondary throttle valve cannot be opened until the primary throttle valve is opened to 50° since the liable range of the secondary throttle valve

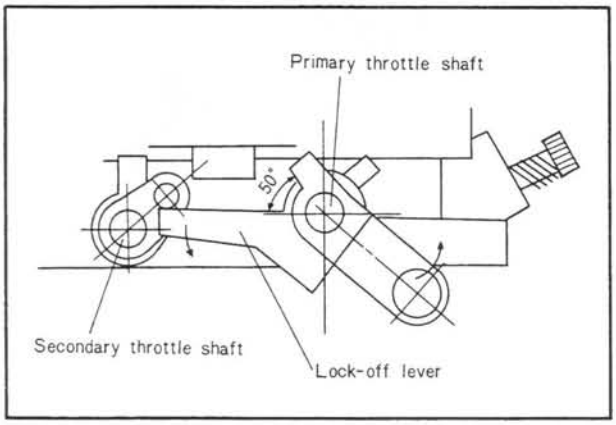

Fig. 4–3 Lock-off system

to open or close is controled with a connection between the lock-off lever installed on the primary shaft and the stopper on the secondary shaft.
When the opening of the primary throttle valve exceeds 50°, the secondary throttle valve opens in proportion to the negative pressure. Then the fuel from the main jet is mixed with air from the main air bleed and sprayed from the main nozzle into the venturi.

4–A–2. Disassembling the Carburettor

The carburettor should be disassembled in the following way :

1. Remove the choke connecting rod from the choke lever.
2. Remove the screws which are fixing the air horn to the main body and remove the throttle wire bracket.
3. Remove the bolt tightening the air cleaner to the carburettor and remove the air horn from the main body.

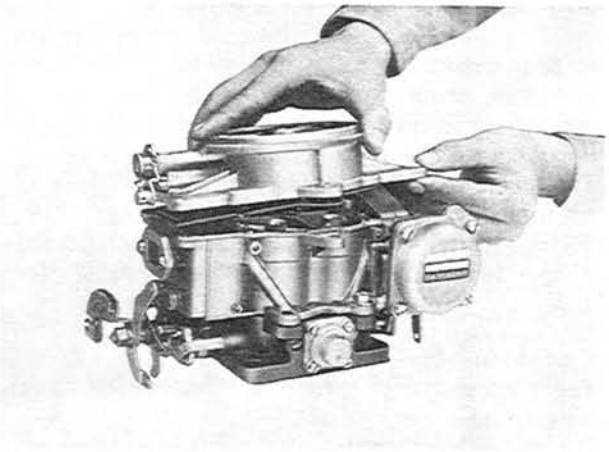

Fig. 4–4 Removing of air horn

4. Take out the float pin and remove the float.
5. Remove the needle valve assembly.

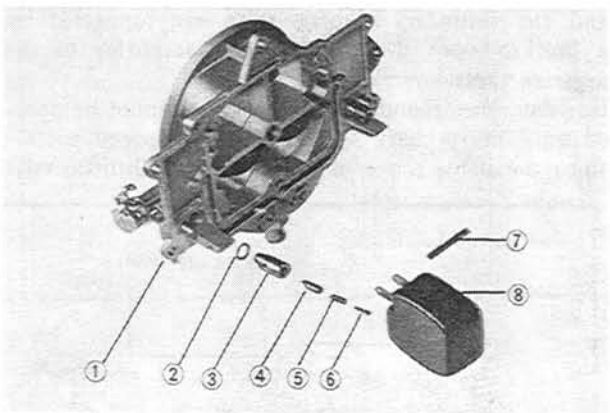

Fig. 4–5 Needle valve assembly

1. Air horn	4. Needle valve	7. Float pin
2. Shim	5. Spring	8. Float
3. Valve seat	6. Retainer	

6. Remove the screw fixing the choke valve to the shaft, and dismantle choke valve and shaft from the air horn.
7. Disconnect the vacuum control rod from the secondary throttle lever by removing a clip.
8. Remove the connecting rod of accelerating pump from the accelerator pump arm by removing a clip.
9. Remove the screws which are fixing the throttle body to the main body, and disconnect the throttle body from the main body.
10. Remove the cover and take out the accelerating pump diaphragm and the return spring.
Remove the inlet check ball by removing the plug.
11. Remove the accelerator nozzle and the outlet check ball.
12. Remove the slow jets of the primary and secondary stages and all air bleed connections from the main body.
13. Remove the main jets by removing the plugs from the main body.

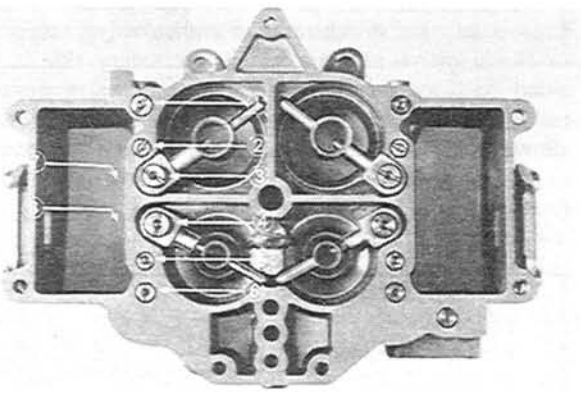

Fig. 4–6 Removing jets and air bleeds

1. Secondary slow air bleed	5. Primary slow jet
2. Secondary slow jet	6. Primary slow air bleed
3. Secondary main air bleed	7. Secondary main jet
4. Primary main air bleed	8. Primary main jet

14. Remove the screws fixing the sub-slow diaphragm cover and take out the diaphragm, return spring and adjust shim. Remove the sub-slow jet by removing the plug.
15. Remove the cover and take out diaphragm and the return spring.

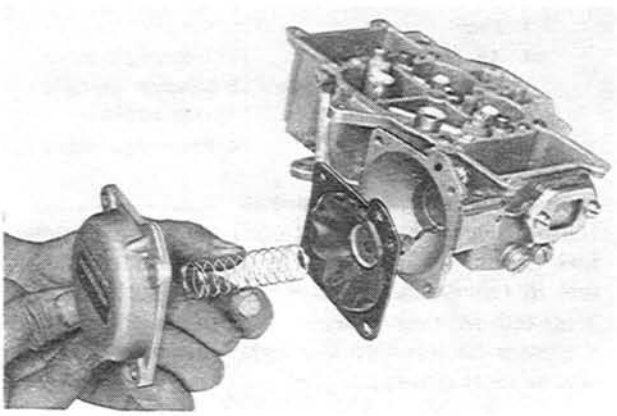

Fig. 4–7 Removing of diaphragm

16. Tap the venturi from the bottom for dismantling.
17. Remove the lever by removing the fixing nut of the primary throttle lever on the shaft.

Remove the throttle valve and the shaft by removing screws fixing the throttle valve.
18. Remove the set screws of the secondary throttle valve and dismantle the secondary throttle valve and the shaft.

Note: Do not dismantle venturi, throttle valve and shaft, and the choke valve and shaft, except when they have to be veplaced on account of wear or damage.

4–A–3. Carburettor Inspection

After disassembly, inspect the carburettor as follows:
1. Wash all parts in clean detergent and dry with compressed air. All passages of the carburettor must be blown very carefully.
2. Inspect the air horn and the main body for cracks and damages, also inspect the choke shaft for wear.
3. Inspect the throttle valve for wear.
4. Inspect all jets for clogging. If clogged, wash the jets in detergent. Do not use the wire.
5. Inspect the float needle and seat for wear.
6. Inspect the pump diaphragm and the auxiliary slow diaphragm. If damaged, replace them.
7. Inspect the valves of the pump to see whether they function under all operating conditions.
8. Check the diaphragm of secondary control for damage.
9. Inspect the idle adjusting needle for burrs and ridges.
10. When assembling, only new gaskets should be used.

4–A–4. Assembling the Carburettor

The carburettor can be assembled by reversing the disassembling procedure. The following points should be kept in mind:
1. The parts of the primary barrel are similar in shape to those of the secondary barrel. Do not interchange any parts.
2. When mounting the valve, be careful to eliminate the clearance between the throttle valve and the throttle chamber wall.

4–A–5. Carburettor Adjustment

a. Float level adjustment

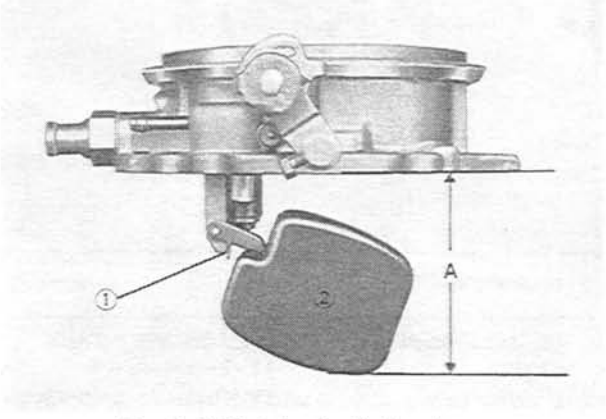

Fig. 4–8 Float level adjustment
1. Float seat lip 2. Float

Adjust the maximum fuel quantity coming in through the needle valve by bending the float seat lip so that the distance (A) between the lowest part of the float and the lower face of the air horn is 55 ~ 56 mm (2.1 ~ 2.2 in), as shown in Fig. 4–8.
Then adjust the fuel level by means of the washer at the fuel inlet, so that the distance (B) between the upper face of the float and the lower face of the air horn is 46 ~ 47 mm (1.8 ~ 1.9 in), as shown in Fig. 4–9. Under this condition, fuel level is kept at the center of the bowl cover.

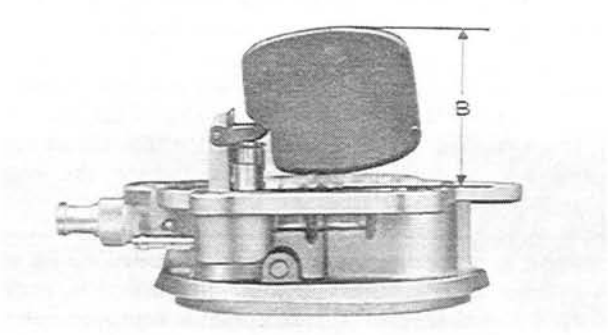

Fig. 4–9 Float level adjustment

b. Fast idling adjustment

When the choke valve is fully closed, the throttle valve opens to 15° by action of the connecting rod and provides easy starting–up. At this moment, the clearance between the throttle valve and the throttle chamber wall is 1.12 mm (0.045 in).
Adjust by bending the connecting rod until the proper clearance is obtained.

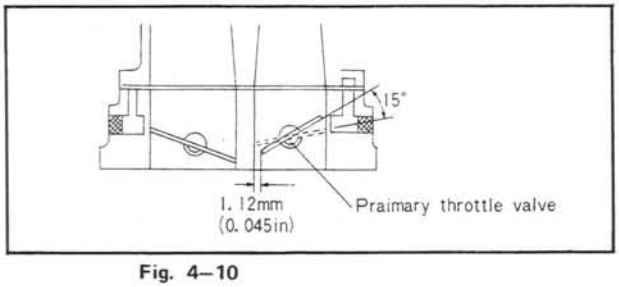

Fig. 4–10

The choke lever is provided with two holes for hanging the choke valve return spring. The return spring is normally hung in the upper hole, but in the cold districts it is hung in the lower hole to improve the engine startability.

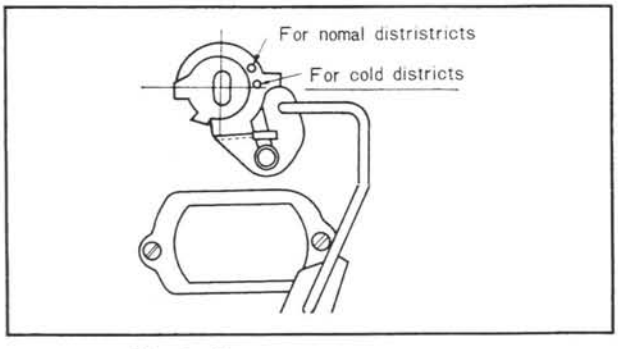

Fig. 4–11

c. Idling adjustment

Adjust the idling speed with the engine sufficiently warmed up and the choke valve fully opened.

1. Set the idling to the regular speed with the throttle adjusting screw.
2. Adjust the idle adjust screw until the smooth idling is obtained. When the idle adjusting screw is screwed in, the mixture of the fuel and air becomes lean. When the screw is loosened, the mixture becomes rich.
3. Adjust the idling so that the engine revolution will be 700 r p m in the above manner of (1) and (2).
4. Screw in the idle adjust screw from the position adjusted as above until the engine stalls. In this case, if it is less than $^3/_4$ turn, unscrew the idle adjust screw to the position previously settled, if it is more than $^3/_4$ turn, unscrew the idle adjust screw by $^3/_4$ turn from the position where the engine stalls.

Note: (1) To measure the engine revolution, be sure to use a revolution counter intended for general servicing instead of the tachometer equipped on the vehicle.
(2) Set the idle adjust screw lightly to avoid damaging the needle.

4–B. FUEL PUMP

4–B–1. Fuel Pump Test

If the fuel pump does not supply the proper amount of fuel to the carburettor, the following tests should be made prior to disassembly of the pump.

a. Pressure test

Connect the fuel pressure tester to the discharge port of the pump to test the fuel pressure. Feeding pressure should be 0.2 to 0.3 kg/cm² (2.8 to 4.3 lb/in²). If it is out of specifications, adjust it by means of the adjust screw. If still defective, disassemble the pump for inspection.

b. Volume test

Conduct a volume test of the fuel pump. The fuel pump should supply more than 900 cc (0.23 U.S. gallon, 0.20 Imp. gallon) of fuel per minute. If defective, disassemble the pump for inspection.

4–B–2. Disassembling the Fuel Pump

Observe the following procedure to disassemble the fuel pump:

1. Provide the matching marks on the air chamber, valve chamber and base so that the locations of the

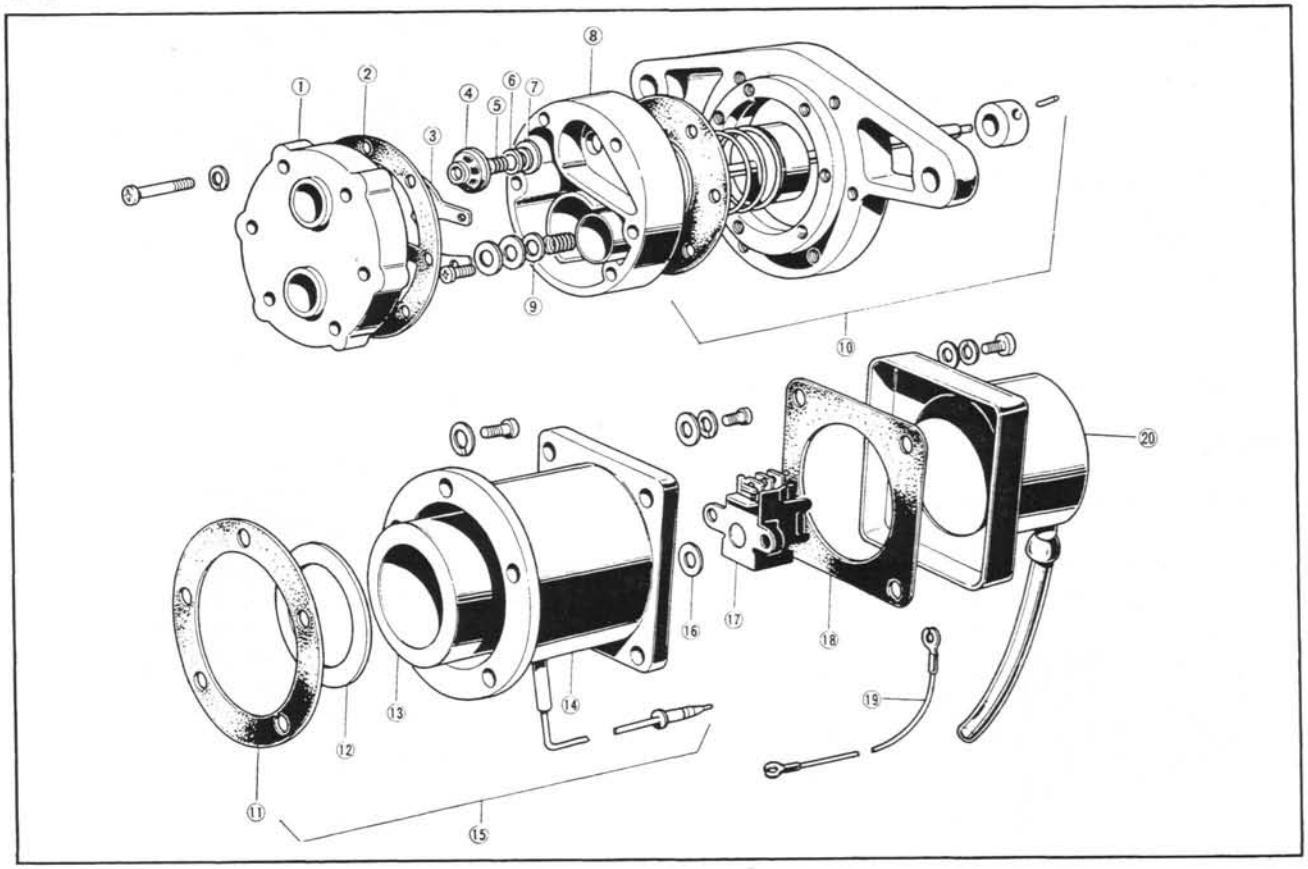

Fig. 4–12 Fuel pump assembly

1. Air chamber
2. Gasket
3. Valve retainer
4. Valve seat holder
5. Valve spring
6. Outlet valve
7. Valve seat
8. Valve chamber
9. Inlet valve
10. Diaphragm ass'y
11. Adjusting plate
12. Plate
13. Coil ass'y
14. Body
15. Body ass'y
16. Adjusting washer
17. Switch ass'y
18. Gasket
19. Earth wire
20. Cover

inlet and outlet valves are marked for assembling.
2. Remove the set screws of air chamber and valve chamber from the base. Remove the air chamber, gasket and valve chamber.
3. Attach the valve retainer and remove the screw. Remove the retainer and the valve assembly from the valve chamber.
4. Remove the cover by removing the screws which hold the cover to the body.
5. Disconnect the wiring from the switch assembly.
6. Remove the screws and dismantle the switch assembly from the body.
7. Remove the screws which are fixing the body to the base, and dismantle the body from the base.

4–B–3. Fuel Pump Inspection

1. Inspect the air chamber, valve chamber and base for cracks and damages.
2. Inspect the diaphragm for damage and deterioration.
3. Inspect the inlet and outlet valves. If they do not function normally, replace them.
4. Inspect the points of the switch assembly for wear, burning, fusing, etc. Clean the points with a file or oil stone if defects are not serious. If serious, replace the points.

4–B–4. Assembling and Adjusting the Pump

To assemble the fuel pump, reverse the procedure for disassembling and observe the following points.

a. Inspecting the diaphragm shaft stroke

After the body is attached to the base, place a dial indicator on the diaphragm shaft as illustrated.
Push in the diaphragm by hand and read the graduation of the dial indicator. The reading should be 2.8 ~ 3.0 mm (0.11 ~ 0.12 in). When the stroke is above 3.0 mm (0.12 in), remove the adjusting plate which is located between the body and the base.
When the stroke is below 0.28 mm (0.11 in), insert additional adjusting plate.
Three kinds of adjusting plate are available:
0.1 mm (0.004 in), 0.25 mm (0.010 in), 0.5 mm (0.020 in).

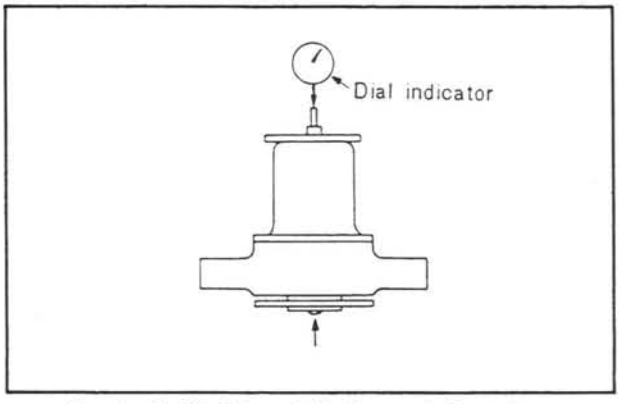

Fig. 4–13 Checking of diaphragm shaft stroke

b. Inspecting the switch point

After the switch assembly is attached to the body, place the dial indicator on the diaphragm shaft as illustrated.
Move the diaphragm shaft by hand and see whether the point of the switch assembly opens and closes at a distance of 0.5 ~ 1.0 mm (0.020 ~ 0.039 in) from the end of each stroke of the shaft.

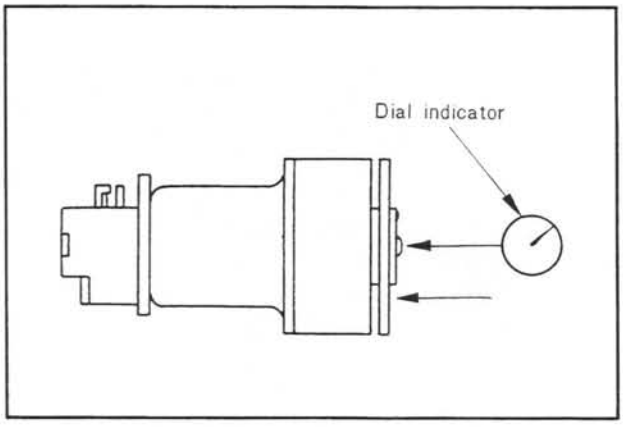

Fig. 4–14 Checking of switch

If defective, adjust in either of the following two ways of whitch the methoed (1) is for a big adjustment and the methoed (2) is for a small one.
1. Adjustment with washers
If the point opens too early or closes too late, decrease the number of washers at the tip of the shaft. If it opens too late and closes too early, increase the number of washers. There are two types of adjusting washers : 0.25 and 0.6 mm (0.010 and 0.024 in).

2. Adjustment with stoppers

If the point opens too early, bend the upper stopper upward. If too late, bend the stopper downward. If the closing action of the point is too late, bend the lower stopper upward. If too early, bend it downward. Actually, when the point opens early, the closing position becomes late. When the opening position is late, it must close early. Then it is necessary to adjust the upper and lower stoppers simultaneously. The point gap is 1.0 mm (0.039 in) when the points are opened.

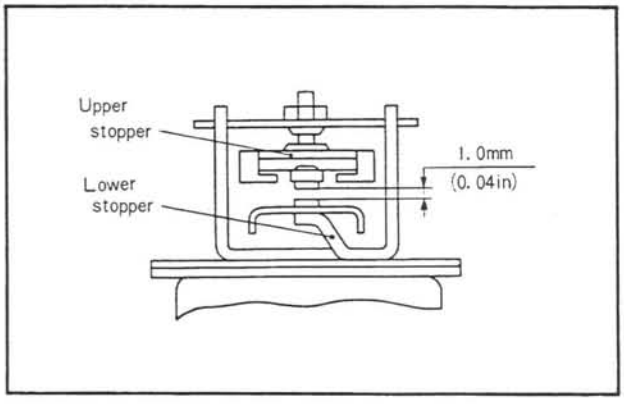

Fig. 4–15 Point gap

4–C. FUEL FILTER

The fuel filter is of the cartridge type with an integrated element and housing.

The fuel filter cartridge is held by the clamp which is attached to the lower side of the service hole cover of the luggage compartment.
Both ends of the cartridge are connected by rubber pipes.
The cartridge should be replaced at intervals of 18,000 km (12,000 miles).

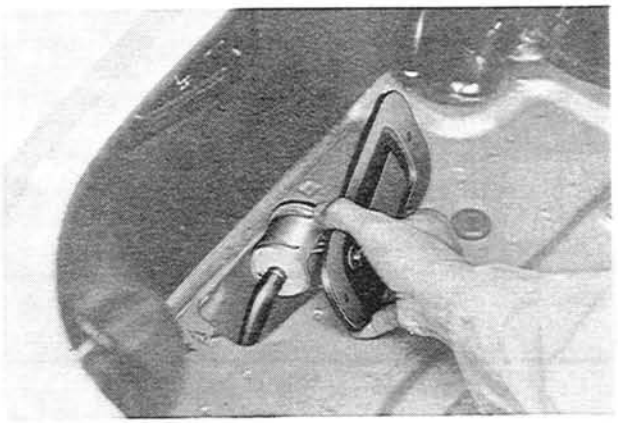

Fig. 4–16 Fuel filter

4–D. AIR CLEANER

The air cleaner is of the paper element suction type. The air cleaner element should be cleaned every 3,000 km (2,000 miles) and replaced every 36,000 km (24,000 miles). Under sub-standard road conditions, the cleaner element should be cleaned every 1,5000 km (1,000 miles) and replaced every 18,000 km (12,000 miles).
On the air cleaner, the intake of fresh air and hot air are automatically switched over by means of the thermo-valve and control diaphragm installed in the air cleaner.
The control diaphragm is installed at the bottom of the fresh air duct. When the ambient temperature drops below 40°C (104°F), the control diaphragm operates the air shutters, by utilizing the engine negative pressure avilable through the thermo-valve.
This diaphragm starts functioning at negative pressure exceeds −100 mm-Hg and reaches the maximum stroke of 8 mm when the negative pressure exceeds −200 mm-Hg. Under such a condition, the fresh air shutter is perfectly closed, while the hot air shutter linked to the fresh air is fully opened.
When the ambient temperature exceeds 40°C (104°F), the engine negative pressure working on the control diaphragm is cut by the thermo-valve, whereby the fresh air shutter is fully opened and the hot air shutter is completely closed.
Check the thermo-valve every six months as to whether it functions normally at ambient temperature over 40°C (104°F).

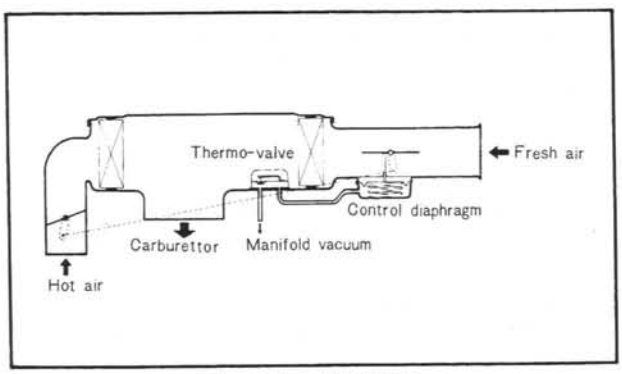

Fig. 4–17 Air cleaner