

FUEL AND LUBRICATION SYSTEM

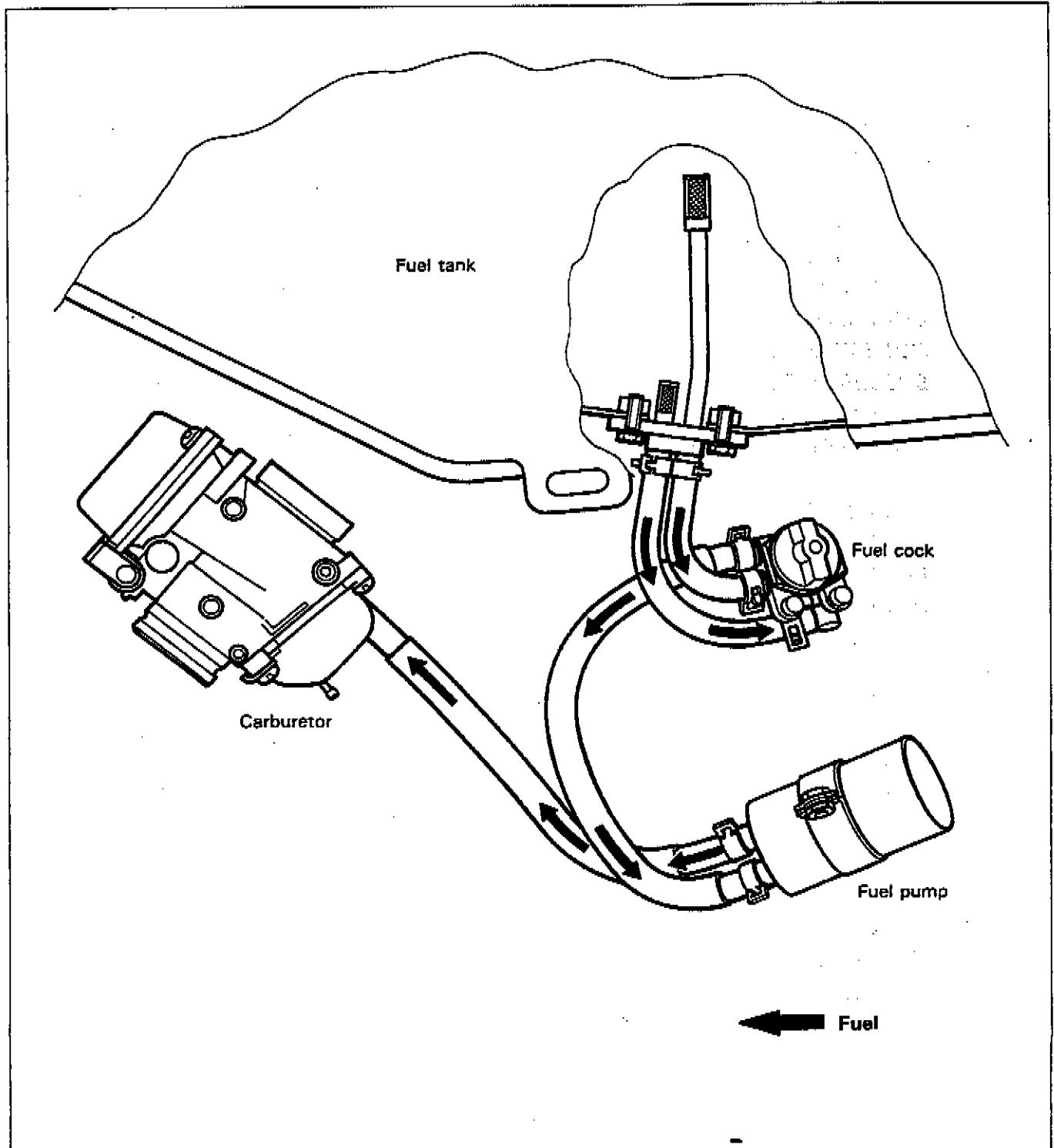
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4-1 FUEL AND LUBRICATION SYSTEM

FUEL SYSTEM

The fuel pump is operated by an electro-magnetic force and its electrical energy is supplied from the battery which is controlled by the fuel pump relay's control circuit. The fuel sent under pressure by the fuel pump flows into the float chamber when the float of the carburetor has dropped and the needle valve is open. When the needle valve closes, the pressure of the fuel in the hose connecting the carburetor and the fuel pump increases, and when the set pressure is reached, the operation of the fuel pump is stopped by the fuel pressure to prevent excessive supply.



FUEL PUMP

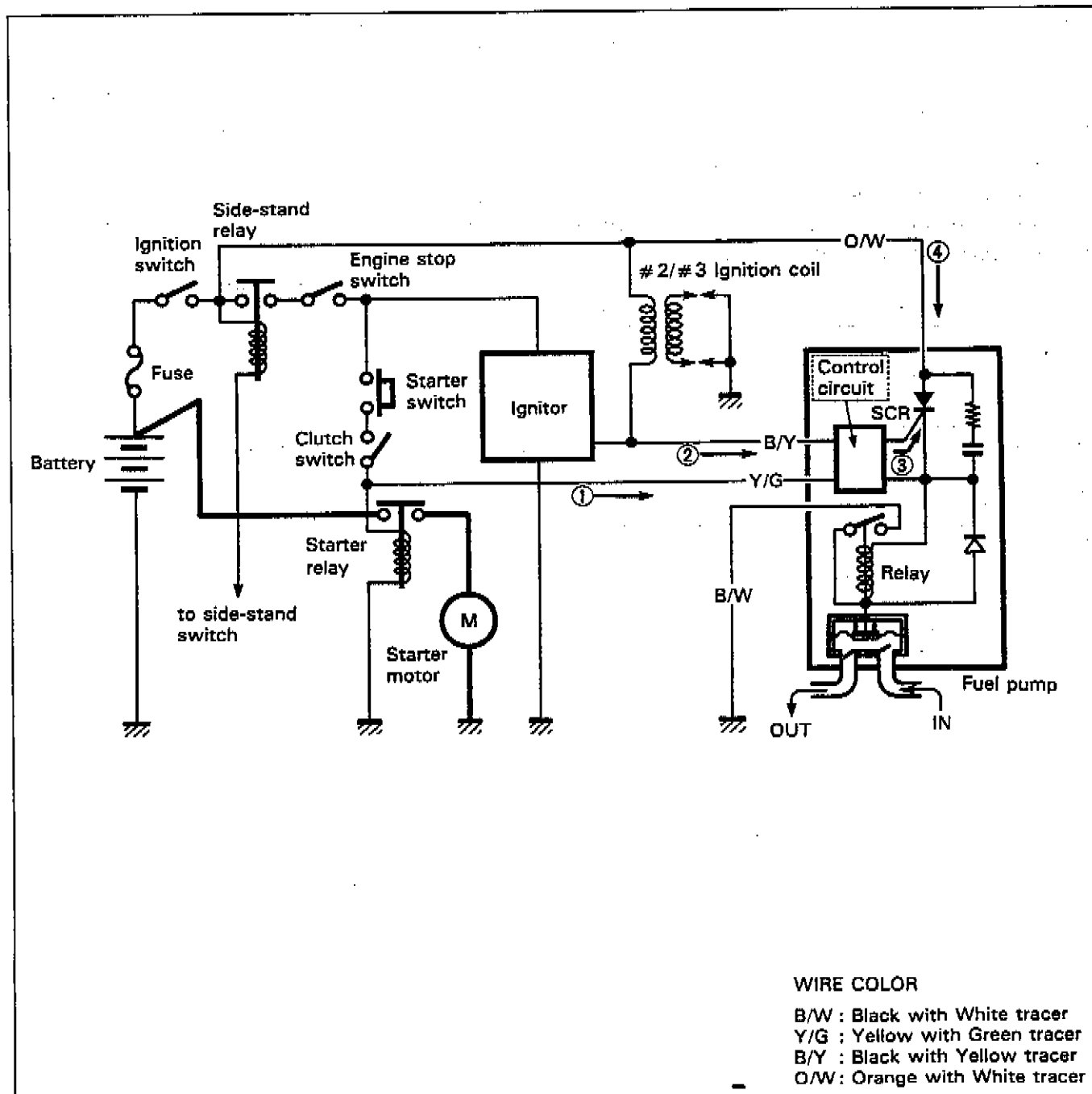
DESCRIPTION

Starting Engine:

In order to supplement fuel supply when starting the engine by turning the starter switch ON, current ① is sent directly from the battery and passes through the fuel pump relay, thus operating the fuel pump.

After start:

The current ② generated at coils No.2/No.3 flows to the fuel pump relay's control circuit. The control circuit receives this current ② and sends signal ③ to the SCR, turning it ON. When the SCR turns ON, current ④ is sent from the battery through the fuel pump relay, thus operating the fuel pump.



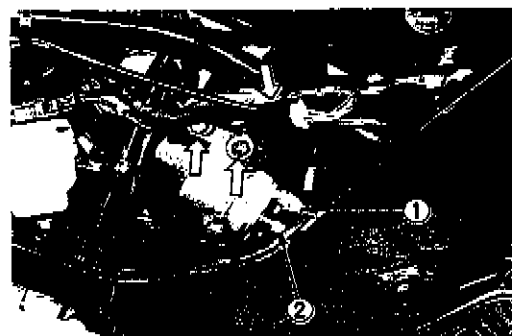
4-3 FUEL AND LUBRICATION SYSTEM

FUEL PUMP REMOVAL

- Remove the seats. (Refer to page 7-5.)
- Remove the frame cover assembly.
- Turn the fuel cock "OFF" position and disconnect the fuel hoses (① and ②) from the fuel pump.
- Disconnect the fuel pump lead wire coupler and remove the fuel pump mounting bolts.

①: Outlet hose

②: Inlet hose



FUEL PUMP INSPECTION

- Using the pocket tester (x k Ω range), measure the resistance between the lead wires in the following table. If the resistance checked is incorrect, replace the fuel pump.

09900-25002: Pocket tester

NOTE:

As capacitor, diodes, etc. are used inside this fuel pump, the resistance values will differ when an ohmmeter other than SUZUKI pocket tester is used.

(Approx. k Ω)

		⊕ Probe of tester to:			
		O/W	B/Y	Y/G	B/W
⊖ Probe of tester to:	O/W		∞	∞	∞
	B/Y	∞		∞	∞
	Y/G	∞	45-55		10-12
	B/W	∞	31-37	10-12	

WIRE COLOR

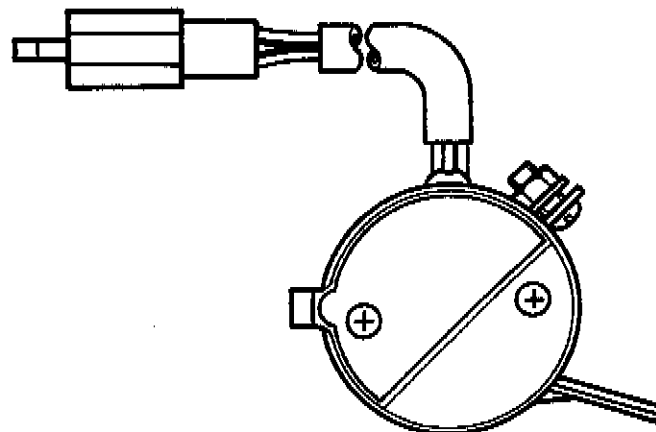
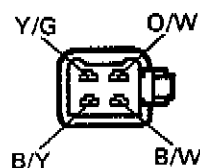
O/W: Orange with White tracer

B/Y : Black with Yellow tracer

Y/G : Yellow with Green tracer

B/W : Black with White tracer

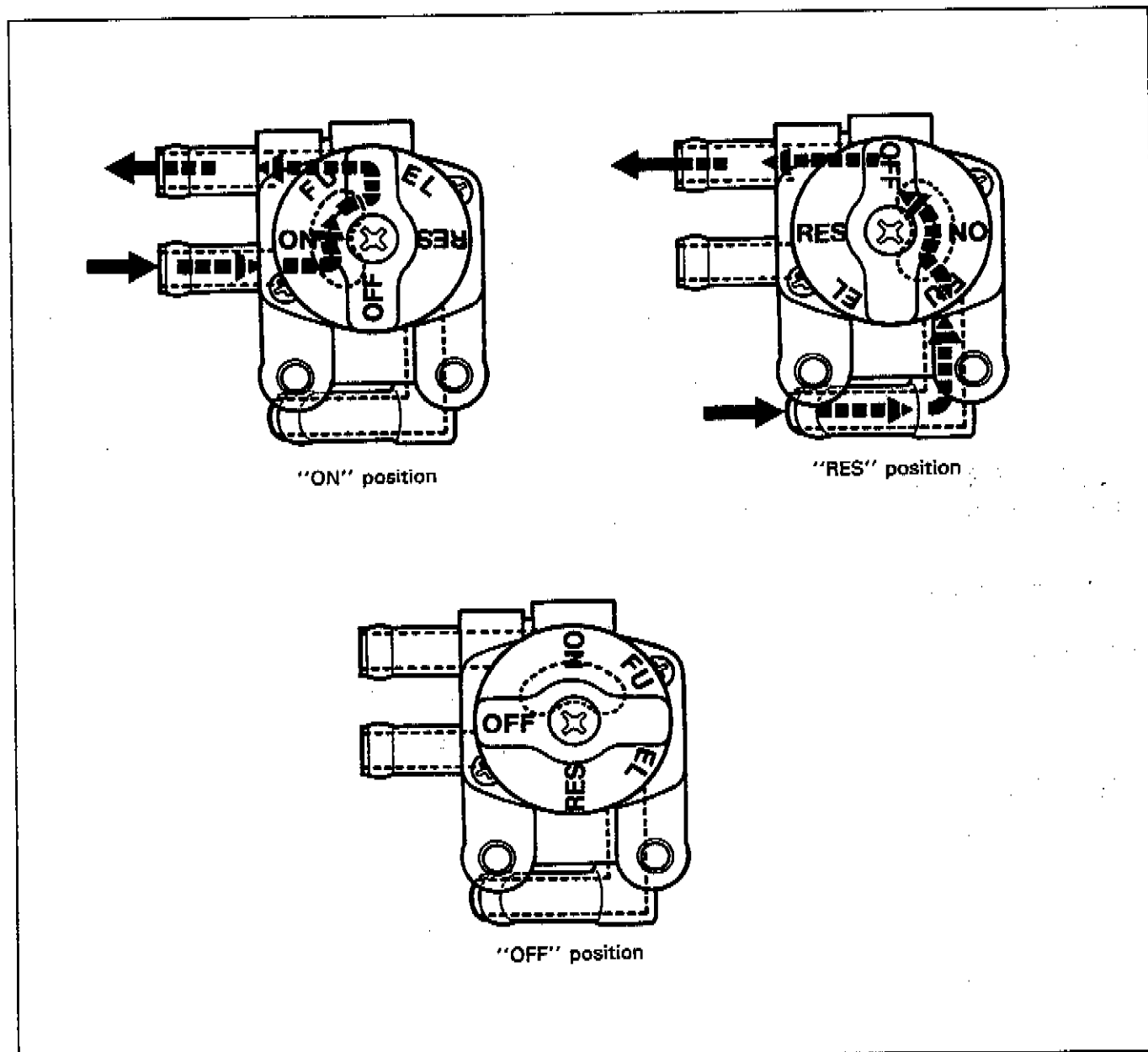
∞ : Infinity



FUEL COCK

FUEL COCK MECHANISM

A valve is provided at the end of the fuel cock lever and can switch over to "OFF", "ON" and "RES". With the valve "ON" (normal), the main passage opens. With the valve "OFF", both holes close.



FUEL COCK REMOVAL

- Remove the seats and frame cover assembly. (Refer to page 7-5.)
- Remove the fuel cock mounting screws.
- Bend the fuel hoses with a soft clip and disconnect the fuel hoses from the fuel cock.

WARNING:

Gasoline is very explosive. Extreme care must be taken.

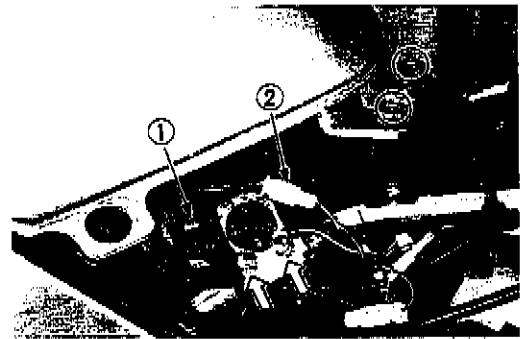


4-5 FUEL AND LUBRICATION SYSTEM

FUEL TANK AND FUEL FILTER

FUEL TANK REMOVAL

- Remove the seats and frame cover assembly. (Refer to page 7-5.)
- Turn the fuel cock to "OFF" position and disconnect the fuel cock outlet hose ①.
- Disconnect the fuel level indicator switch lead wire coupler ②.
- Remove the fuel cock mounting screws.
- Remove the fuel tank by removing the mounting bolts.



WARNING:

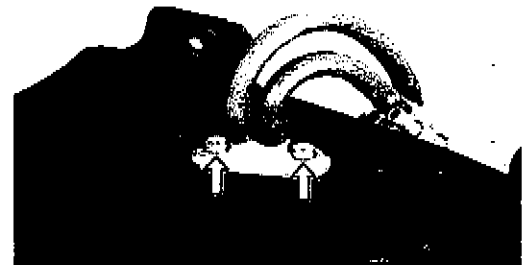
Gasoline is very explosive. Extreme care must be taken.

FUEL FILTER REMOVAL

- Remove the fuel filter assembly by removing the bolts.

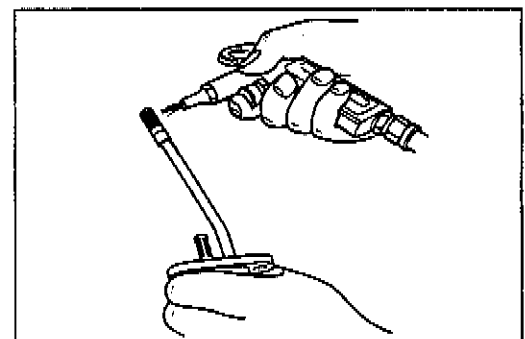
WARNING:

Gasoline is very explosive. Extreme care must be taken. Gaskets and O-ring must be replaced with new ones to prevent fuel leakage.

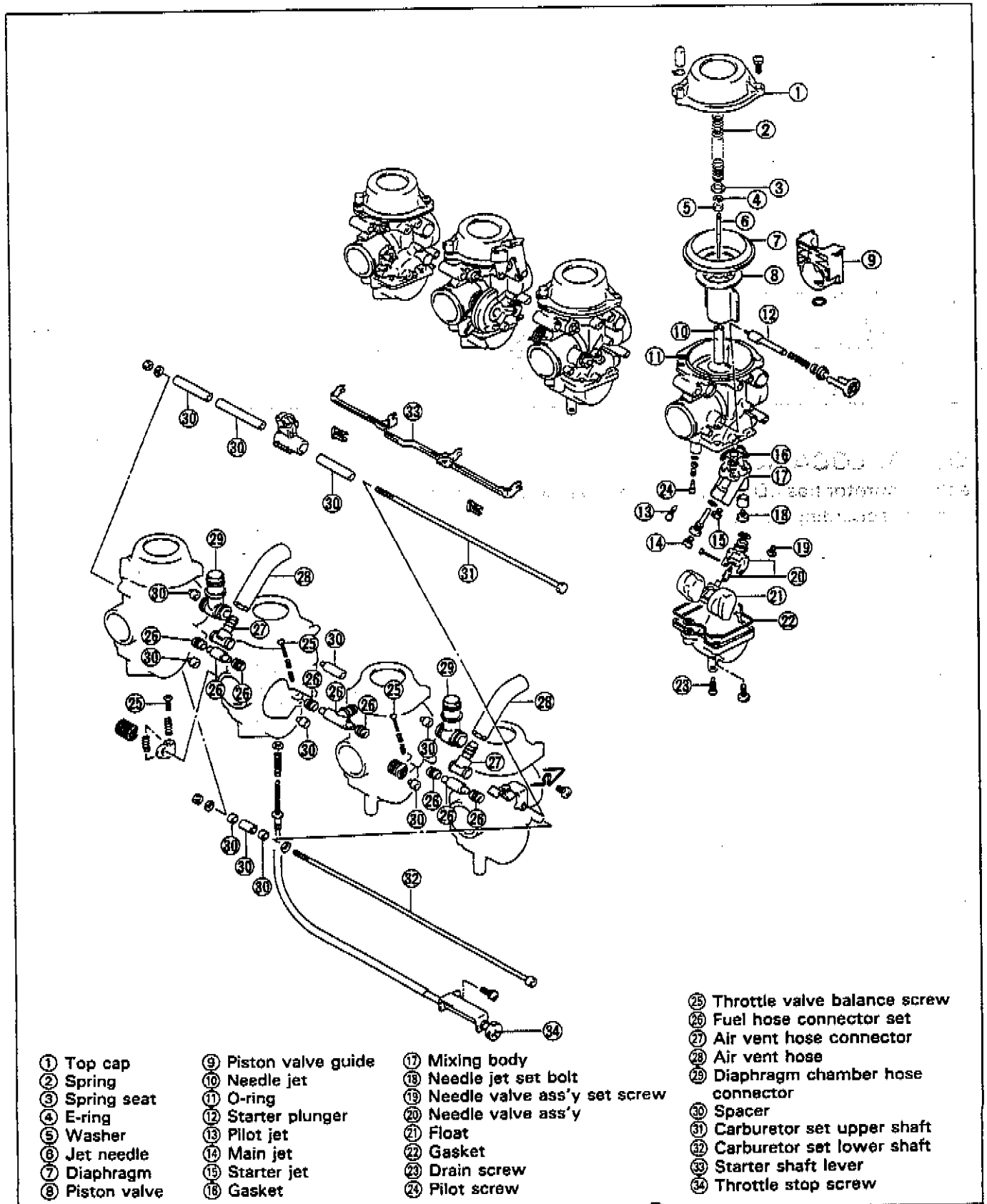


INSPECTION AND CLEANING

If the fuel filter is dirty with sediment or rust, fuel will not flow smoothly and loss in engine power may result. Clean the fuel filter with compressed air.



CARBURETOR CONSTRUCTION

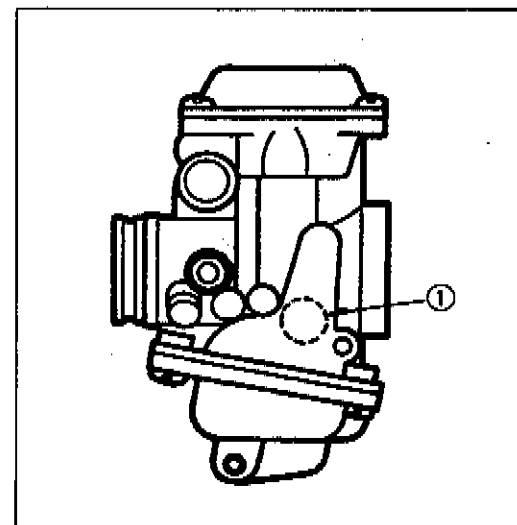


4-7 FUEL AND LUBRICATION SYSTEM**SPECIFICATIONS**

ITEM	SPECIFICATION	
	E-03, U.S.A.	E-33, U.S.A. (Calif. model)
Carburetor type	MIKUNI BDST36SS	MIKUNI BDST33SS
Bore size	36 mm	33 mm
I.D. No.	21E4	21E5
Idle r/min.	1 300 ± 100 r/min	1 350 ± 100 r/min
Float height	6.9 ± 1.0 mm (0.27 ± 0.04 in)	←
Main jet (M.J.)	#112.5	#107.5
Main air jet (M.A.J.)	0.6 mm	←
Jet needle (J.N.)	5E97	5E95
Needle jet (N.J.)	0-9	0-8
Throttle valve (Th.V.)	#120	←
Pilot jet (P.J.)	#15	#10
Starter jet (G.S.)	#47.5	←
Pilot screw (P.S.)	PRE-SET	←
Throttle cable play	0.5–1.0 mm (0.02–0.04 in)	

I.D. NO. LOCATION

Each carburetor has I.D. Number ① printed on the carburetor body according to its specification.

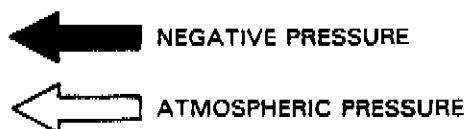
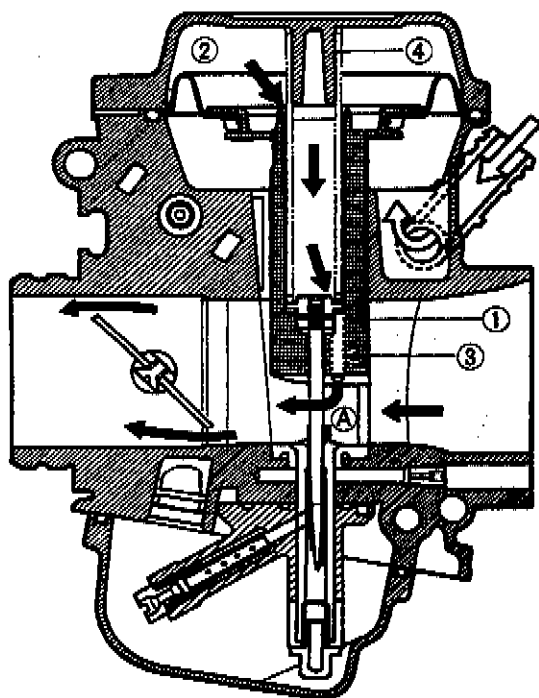


DIAPHRAGM AND PISTON OPERATION

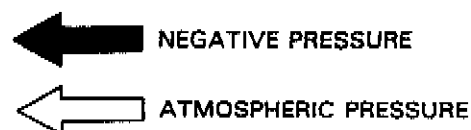
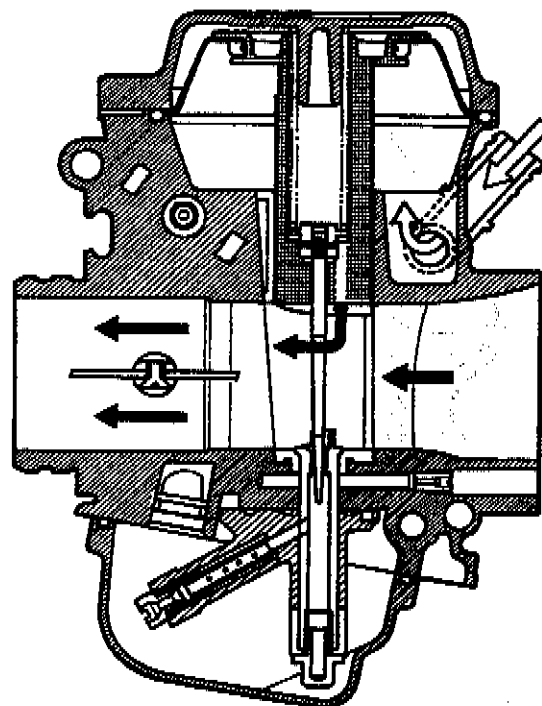
The carburetor is a variable-venturi type, whose venturi cross section area is increased or decreased automatically by the piston valve ① which moves according to the negative pressure present on the downstream side of the venturi A. Negative pressure is admitted into the diaphragm chamber ② through two orifices ③ provided in the piston valve ①.

Rising negative pressure overcomes the spring ④ force, causing the piston valve ① to rise to increase the said area and thus prevent the air velocity from increasing. Thus, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and for securing optimum ratio of fuel/air mixture.

LOWER POSITION OF PISTON VALVE



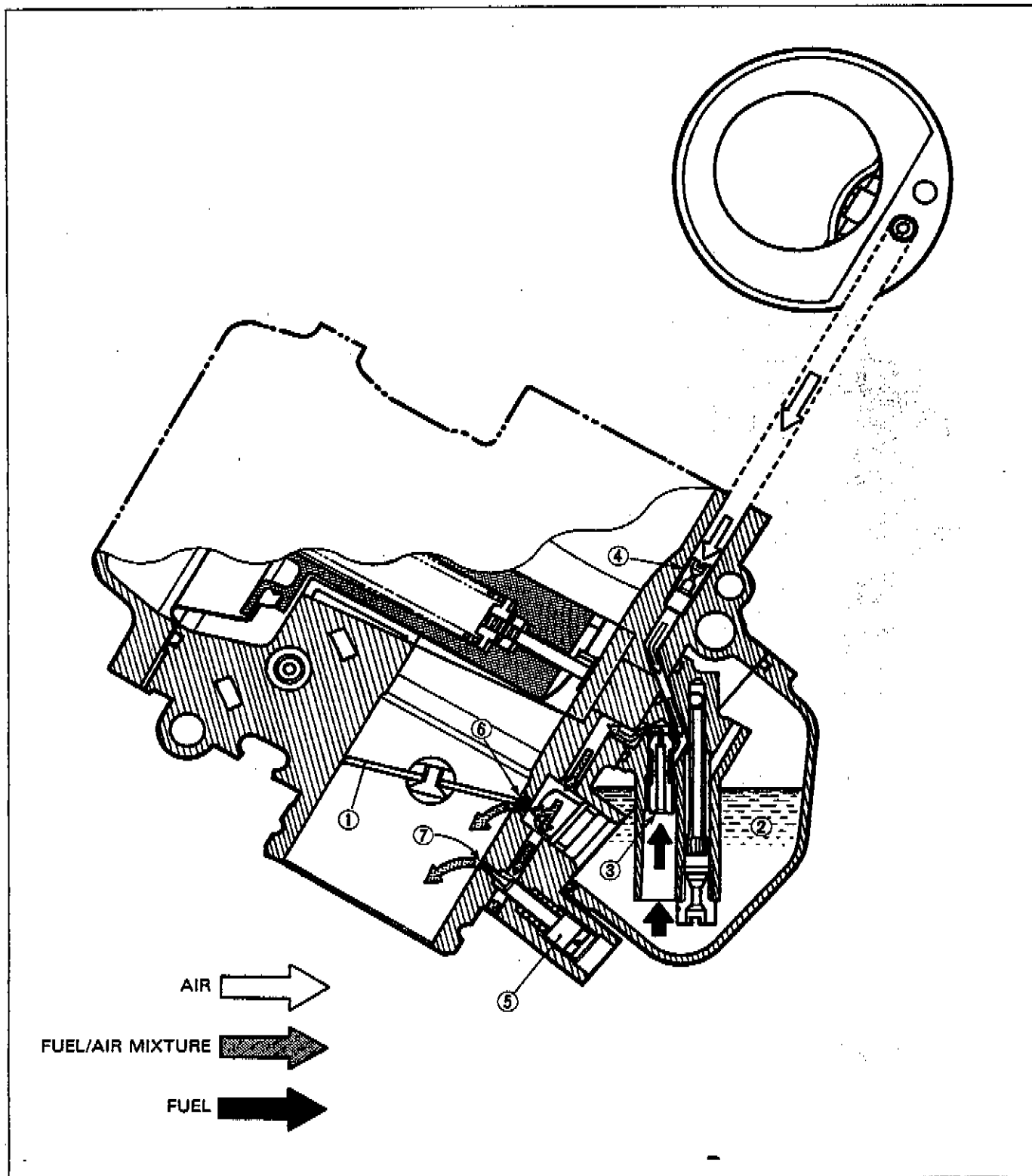
UPPER POSITION OF PISTON VALVE



4-9 FUEL AND LUBRICATION SYSTEM

SLOW SYSTEM

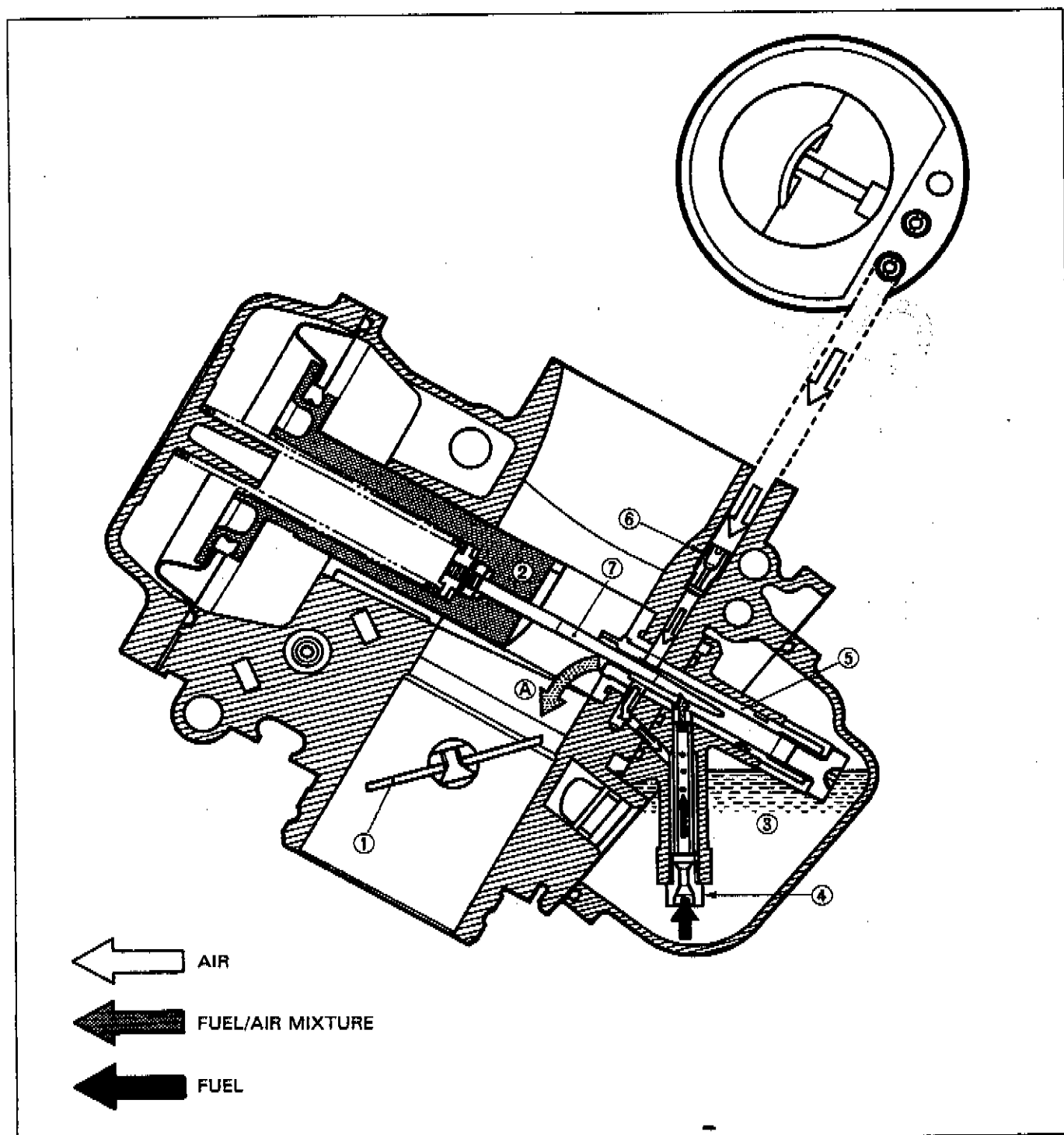
This system supplies fuel during engine operation with throttle valve ① closed or slight opened. The fuel from float chamber ② is metered by pilot jet ③ where it mixes with air coming in through pilot air jet ④. This mixture, rich with fuel, then goes up through pilot passage to pilot screw ⑤. A part of the mixture is discharged into the main bore out of bypass ports ⑥. The remainder is then metered by pilot screw ⑤ and sprayed out into the main bore through pilot outlet ⑦.



MAIN SYSTEM

As throttle valve ① is opened, engine speed rises, and this increases negative pressure in the venturi A. Consequently the piston valve ② moves upward.

Meanwhile, the fuel in float chamber ③ is metered by main jet ④, and the metered fuel enters needle jet ⑤, in which it mixes with the air admitted through main air jet ⑥ to form an emulsion. The emulsified fuel then passes through the clearance between needle jet ⑤ and jet needle ⑦, and is discharged into the venturi A, in which it meets main air stream being drawn by the engine. Mixture proportioning is accomplished in needle jet ⑤; the clearance through which the emulsified fuel must flow in large or small, depending ultimately on throttle position.

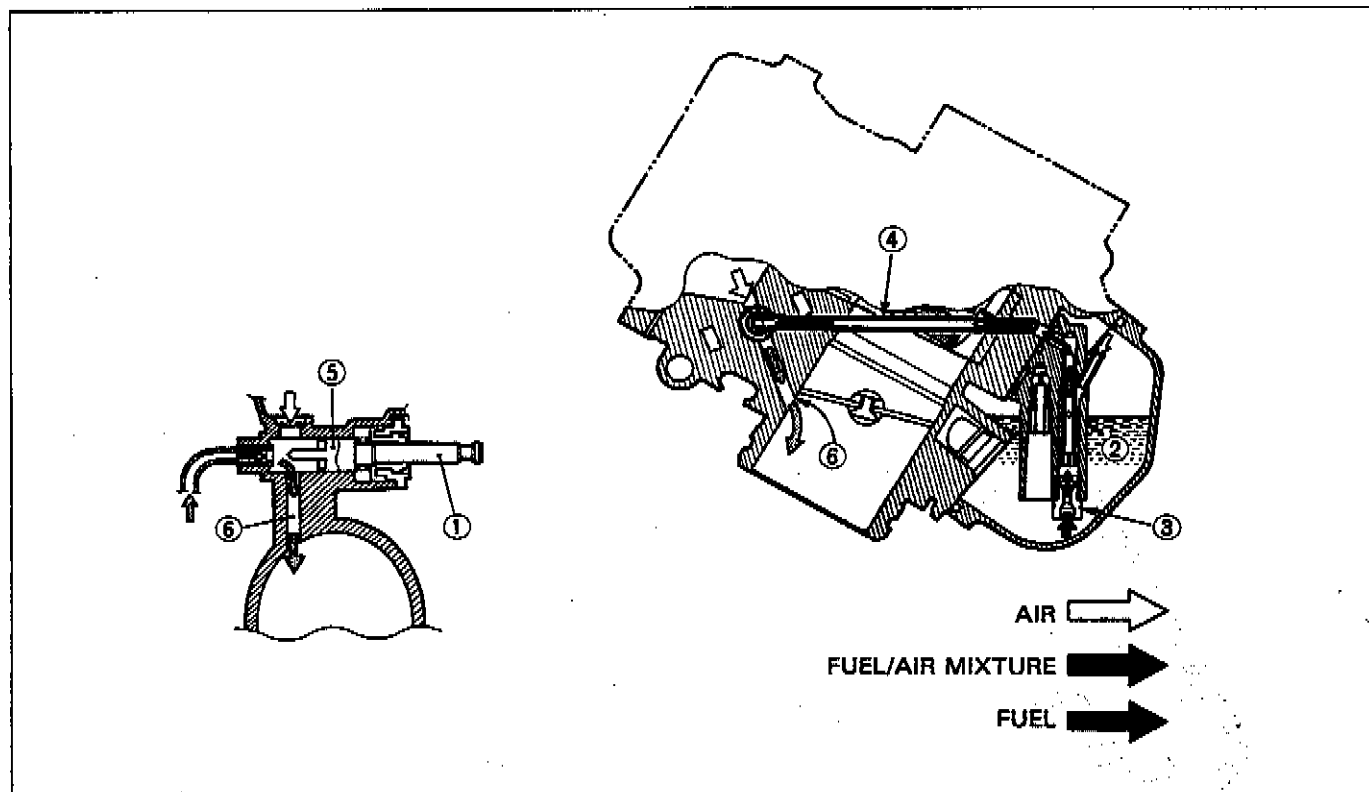


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STARTER SYSTEM

Pulling up the starter shaft ①, fuel is drawn into the starter circuit from the float chamber ②. Starter jet ③ meters this fuel, which then flows into starter pipe ④ and mixes with the air coming from the float chamber ②. The mixture, rich in fuel content, reaches starter plunger ⑤ and mixes again with the air coming through a passage extending from behind the diaphragm.

The two successive mixings of fuel with air are such that proper fuel/air mixture for starting is produced when the mixture is sprayed out through starter outlet ⑥ into the main bore.



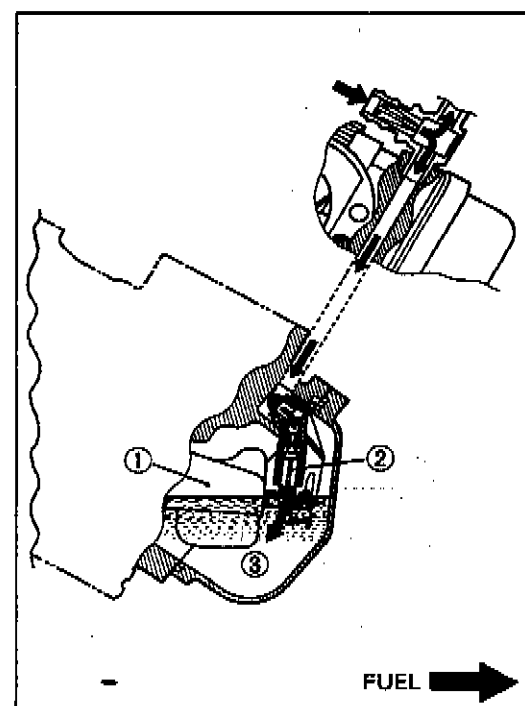
FLOAT SYSTEM

Floats ① and needle valve ② are associated with the same mechanism, so that, as the floats ① move up and down, the needle valve ② too moves likewise.

When fuel level is up in float chamber ③, floats ① are up and needle valve ② remains pushed up against valve seat. Under this condition, no fuel enters the float chamber ③.

As the fuel level falls, floats ① go down and needle valve ② unseats itself to admit fuel into the chamber ③.

In this manner, needle valve ② admits and shuts off fuel alternately to maintain a practically constant fuel level inside the float chamber ③.

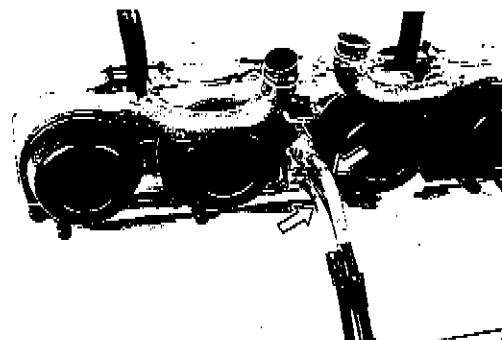


REMOVAL

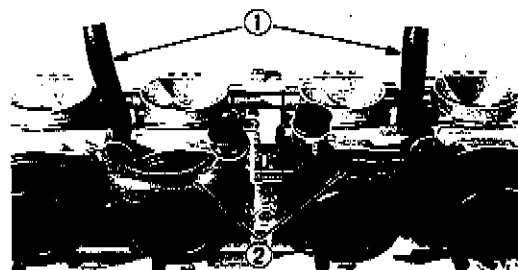
Refer to page 3-3.

DISASSEMBLY

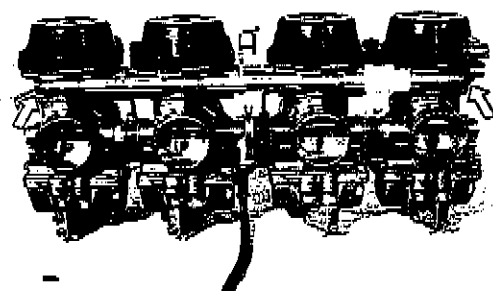
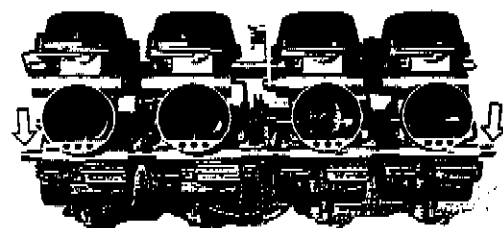
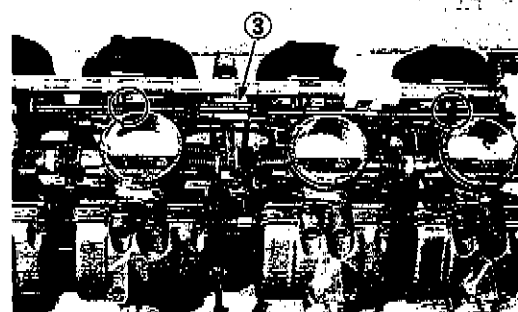
- Remove the throttle cables from the throttle lever.
- Disconnect the air vent hoses ① and diaphragm chamber air cleaner hoses ② .



- Remove the starter shaft lever ③ .

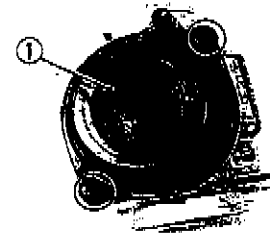


- Remove the upper and lower carburetor set shafts.
- Separate the carburetor assembly.

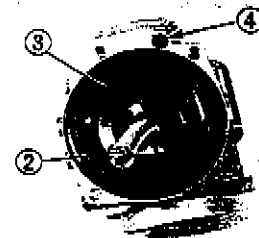


4-13 FUEL AND LUBRICATION SYSTEM

- Remove the carburetor top cap ① .



- Remove the piston valve return spring ② and piston valve with diaphragm ③ .
- Remove the O-ring ④ .

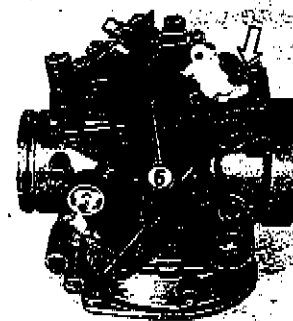


- Remove the float chamber body ⑤ .

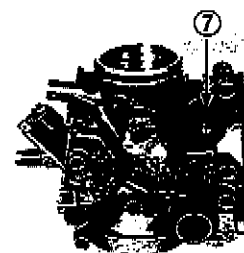
09900-09003: Impact driver set



- Remove the float assembly ⑥ .



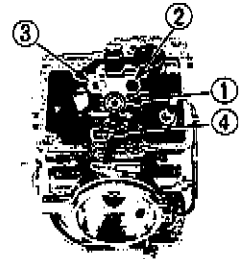
- Remove the starter plunger assembly ⑦ .



- Remove the main jet ① , pilot jet ② and starter jet ③ .

CAUTION:

Do not remove the pilot screw ④. This component is **PRE-SET** at the factory by the very specialized equipment.



- Remove two throttle valve screws ⑤ and pull out throttle valve plate.

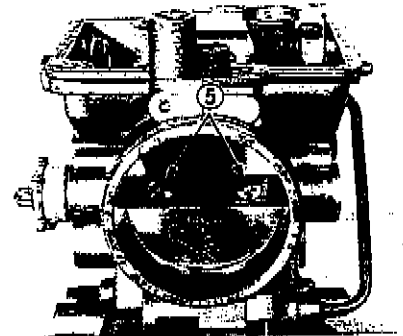
CAUTION:

These two screws are locked by punching these ends. Once removing the screws, they will be damaged.

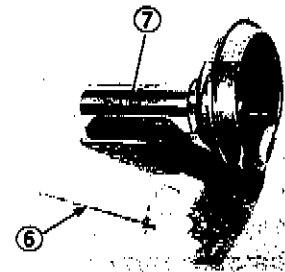
NOTE:

When reinstalling the throttle valve plate, apply a small quantity of the **THREAD LOCK "1342"** to its screws ⑤.

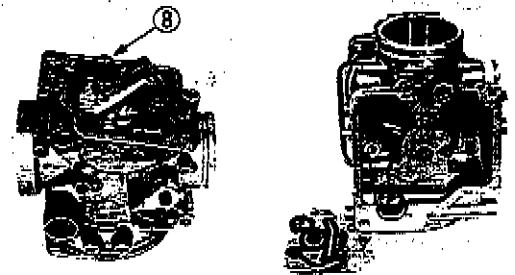
99000-32050: THREAD LOCK "1342"



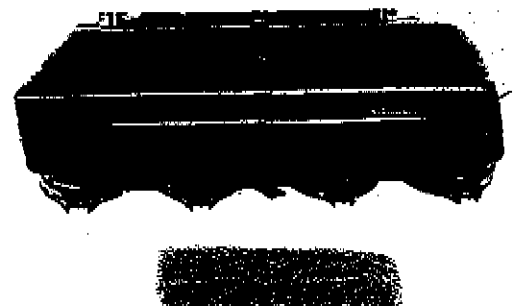
- Remove the jet needle ⑥ from the piston valve ⑦ .



- Remove the mixing body by removing the bolt ⑧ .



- Remove the carb. diaphragm chamber air cleaner element.



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Cleaning of Carb. diaphragm chamber air cleaner element

- Immerse the element in the cleaning solvent and wash it clean.
- Squeeze the cleaning solvent out of the washed element by pressing it between the palms of both hands.
- Immerse the element in motor oil, and squeeze the oil out of the element leaving it slightly wet with oil.

INSPECTION AND ADJUSTMENT

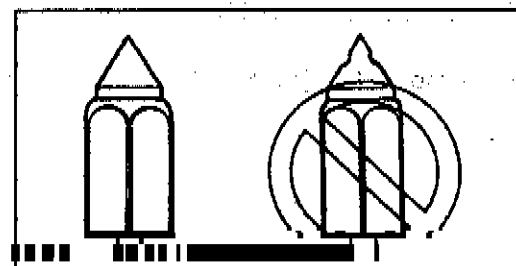
Check following items for any damage or clogging.

- | | |
|--------------------------------|----------------------------------|
| * Pilot jet | * Needle valve |
| * Main jet | * Starter jet |
| * Main air jet | * Gasket and O-ring |
| * Pilot air jet | * Throttle shaft oil seal |
| * Needle jet air bleeding hole | * Diaphragm |
| * Float | * Pilot outlet and by-pass holes |

NEEDLE VALVE INSPECTION

If foreign matter is caught between the valve seat and the needle, the gasoline will continue flowing and cause it to overflow. If the seat and needle are worn beyond the permissible limits, similar trouble will occur. Conversely, if the needle sticks, the gasoline will not flow into the float chamber. Clean the float chamber and float parts with gasoline.

Washing chamber with compressed air.

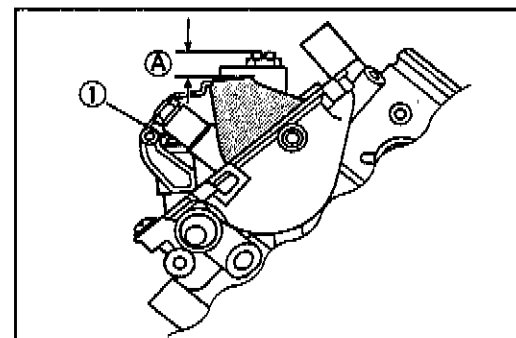


FLOAT HEIGHT ADJUSTMENT

To check the float height, invert the carburetor body, with the float arm kept free, measure the height **A** while float arm is just in contact with needle valve by using calipers. Bend the tongue **1** as necessary to bring the height **A** to this value.

Float height **A**: 6.9 ± 1.0 mm (0.27 ± 0.04 in)

09900-20102: Vernier calipers

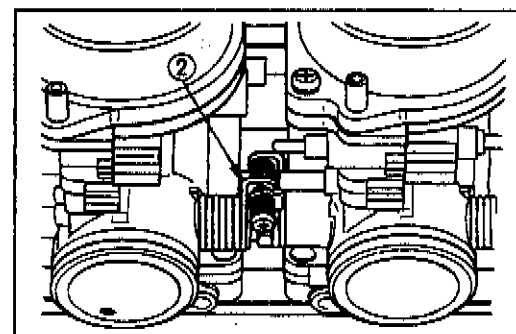


REASSEMBLY AND REMOUNTING

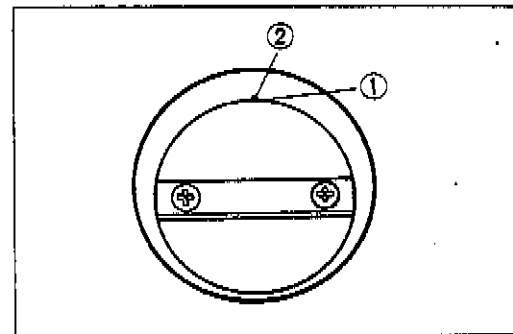
Reassemble and remount the carburetor assembly in the reverse order of disassembly and removal.

Pay attention to the following points:

- When engaging two carburetors, position the throttle valve control lever **2** correctly.



- Set each throttle valve in such a way that its top end ① meets the foremost by-pass ②. This is accomplished by turning the throttle stop screw and throttle valve balance screw.



- After all work is completed, mount the carburetors on the engine and the following adjustments are necessary.
 - * Engine idle r/min Page 2-10
 - * Throttle cable play Page 2-10
 - * Balancing carburetors Page 4-17

BALANCE OF CARBURETORS

Check the four carburetors for balancing movement according to the following procedures.

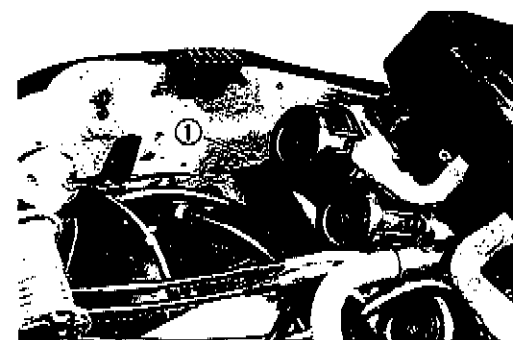
NOTE:

When balancing the carburetors, remove the fuel tank and fuel should be supplied by a separate fuel tank (A).



CALIBRATING EACH GAUGE

- Start up the engine and run it in idling condition for warming up.
- Stop the warmed-up engine.
- Remove the vacuum inlet cap ① for No.1 or No.4 cylinder.



- Connect one of the four rubber hoses of balancer gauge to this inlet.

09913-13121: Carburetor balancer

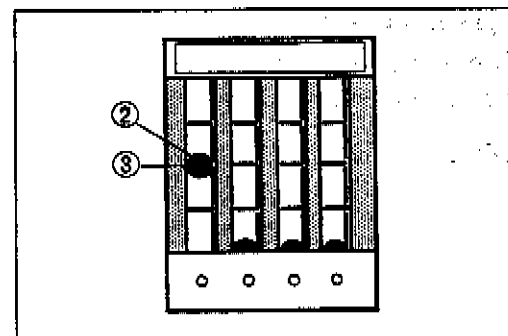
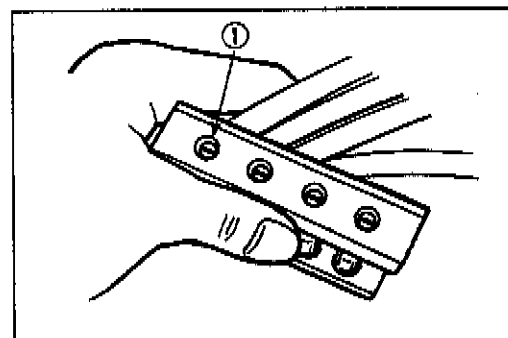


4-17 FUEL AND LUBRICATION SYSTEM

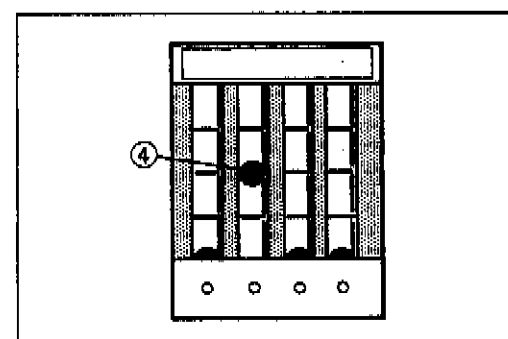
- Start up the engine and keep it running at 1 750 r/min by turning throttle stop screw.



- Turn the air screw ① of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball ② in the tube to the center line ③.



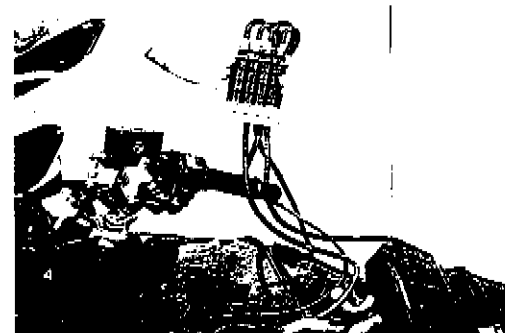
- After making sure that the steel ball stays steady at the center line, disconnect the hose from inlet and connect the next hose to the inlet.
- Turn air screw to bring the other steel ball ④ to the center line.
- Repeat the above process on the third and fourth hoses. The balancer gauge is now ready for use in balancing the carburetors.



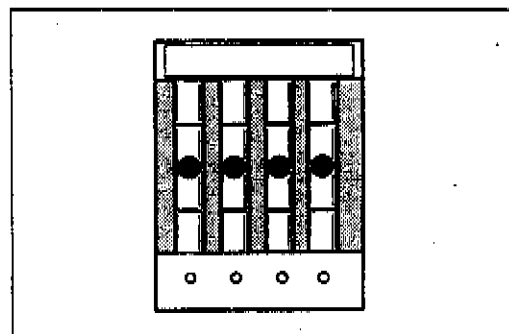
BALANCING CARBURETORS

For balancing all the carburetor movement, remove all the vacuum inlet caps from each carburetor. Connect the balancer gauge hoses to these vacuum inlets and adjust the balance of four carburetors as follows:

- Start up the engine and keep it running at 1 750 r/min to see engine tachometer reading.



A correctly adjusted carburetor has the steel balls in the Nos. 1 through 4 tubes at the same level.



- If the steel balls are not in correct positions, adjust the throttle valve balance screws correctly.
- Adjusting order is as follows.



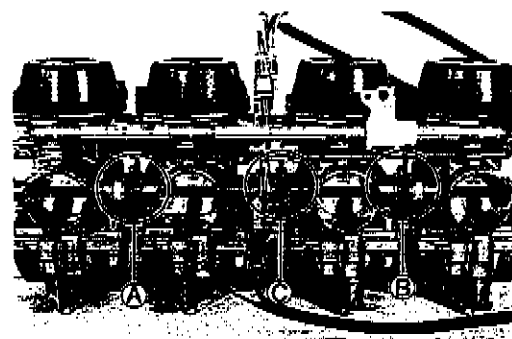
- After balancing the carburetors, set there speed between 1200 and 1400 r/min. by turning the throttle stop screw referring engine tachometer reading.

Idle r/min: 1300 ± 100 r/min ... E-03

Idle r/min: 1350 ± 100 r/min ... E-33

CAUTION:

Do not disturb the pilot screw. This component is PRE-SET at the factory by the very specialized equipment.



LUBRICATION SYSTEM

OIL PRESSURE

Refer to page 2-22.

OIL FILTER

Refer to page 2-9.

OIL SUMP FILTER

When you wash the oil pan, check to be sure that the oil sump filter is free from any sign of rupture, also wash the filter clean periodically.

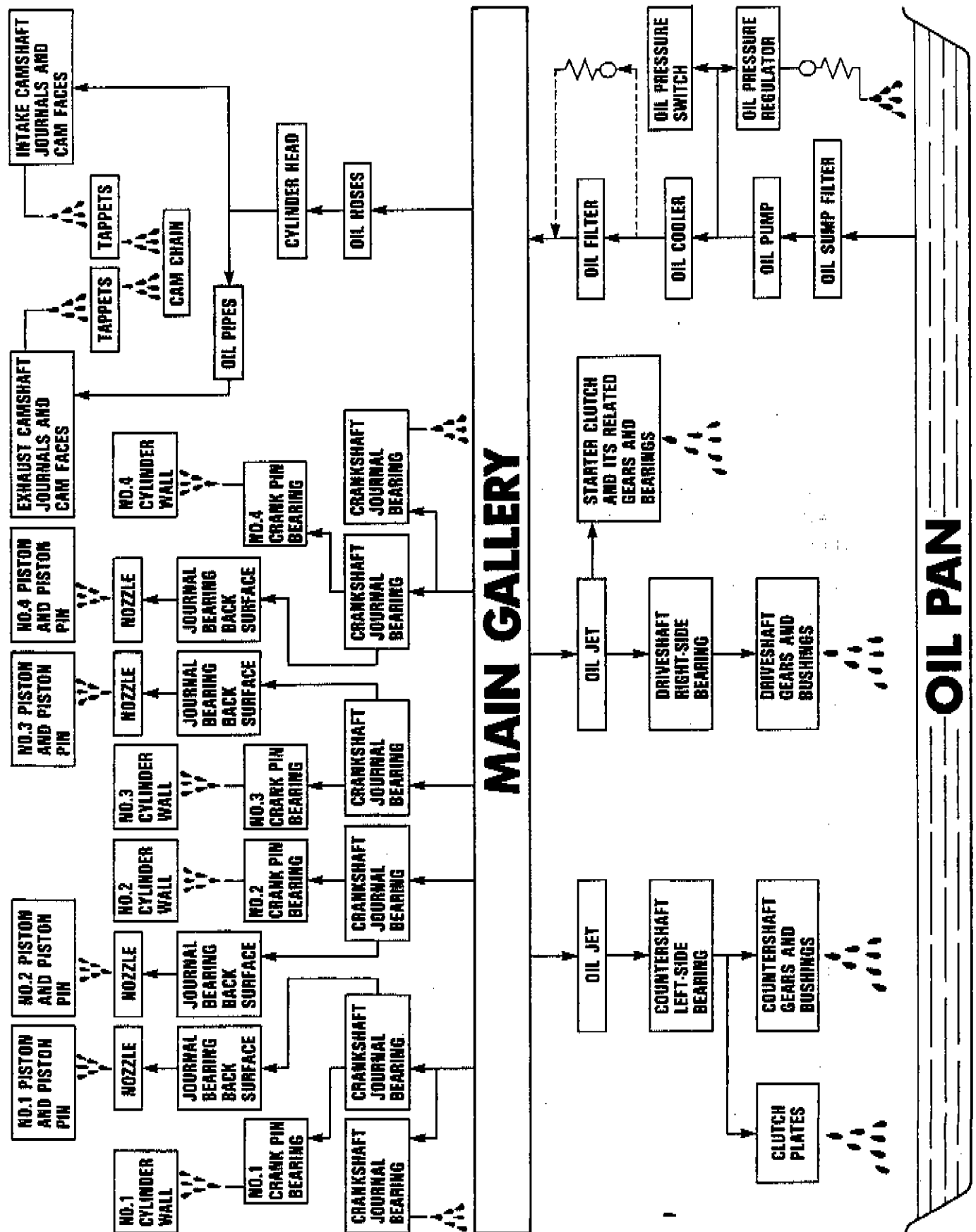
CAUTION:

Replace the oil pan gasket with a new one to prevent oil leakage.

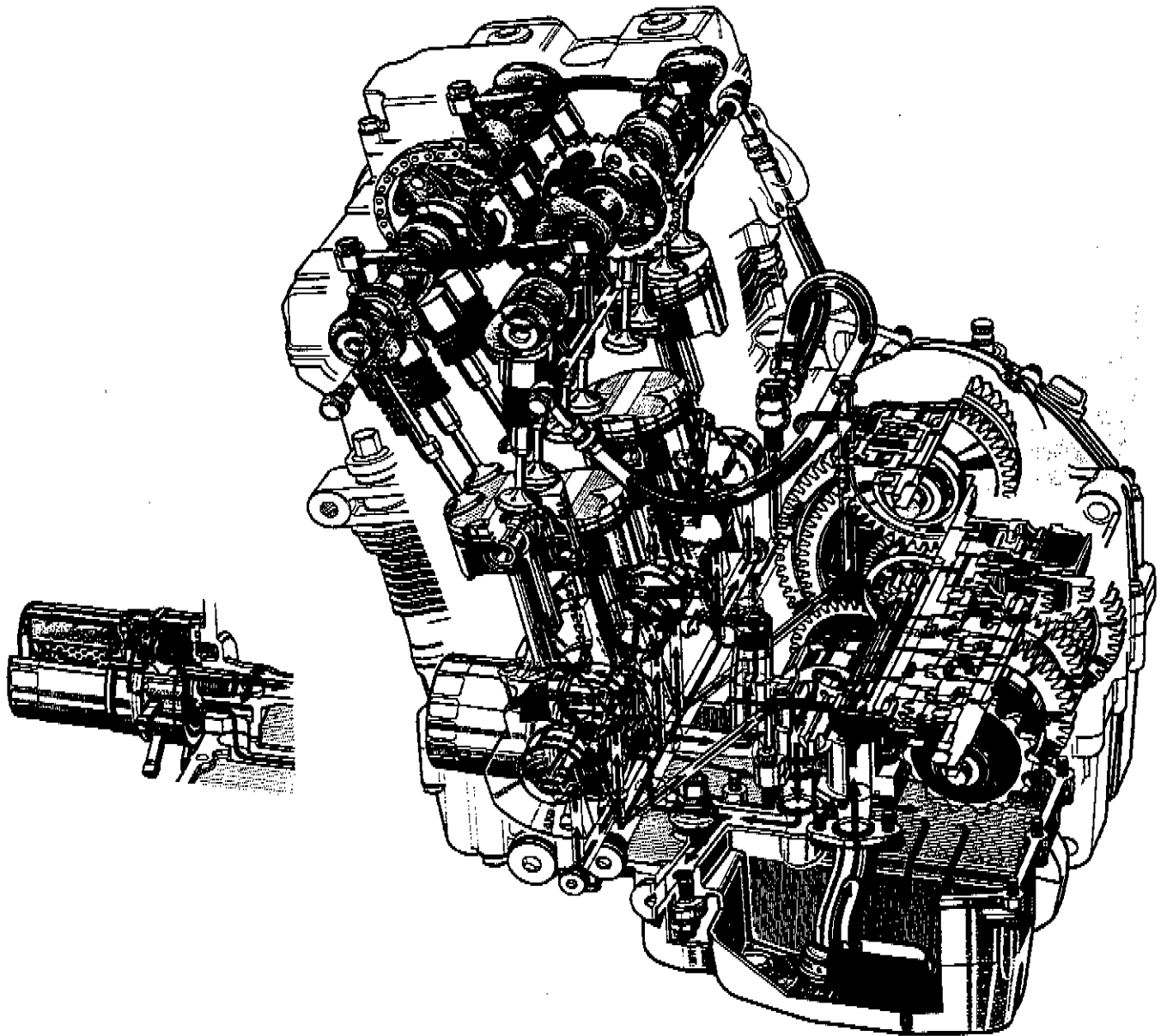
(Refer to pages 3-50 and 3-51.)

4-19 FUEL AND LUBRICATION SYSTEM

ENGINE LUBRICATION SYSTEM CHART

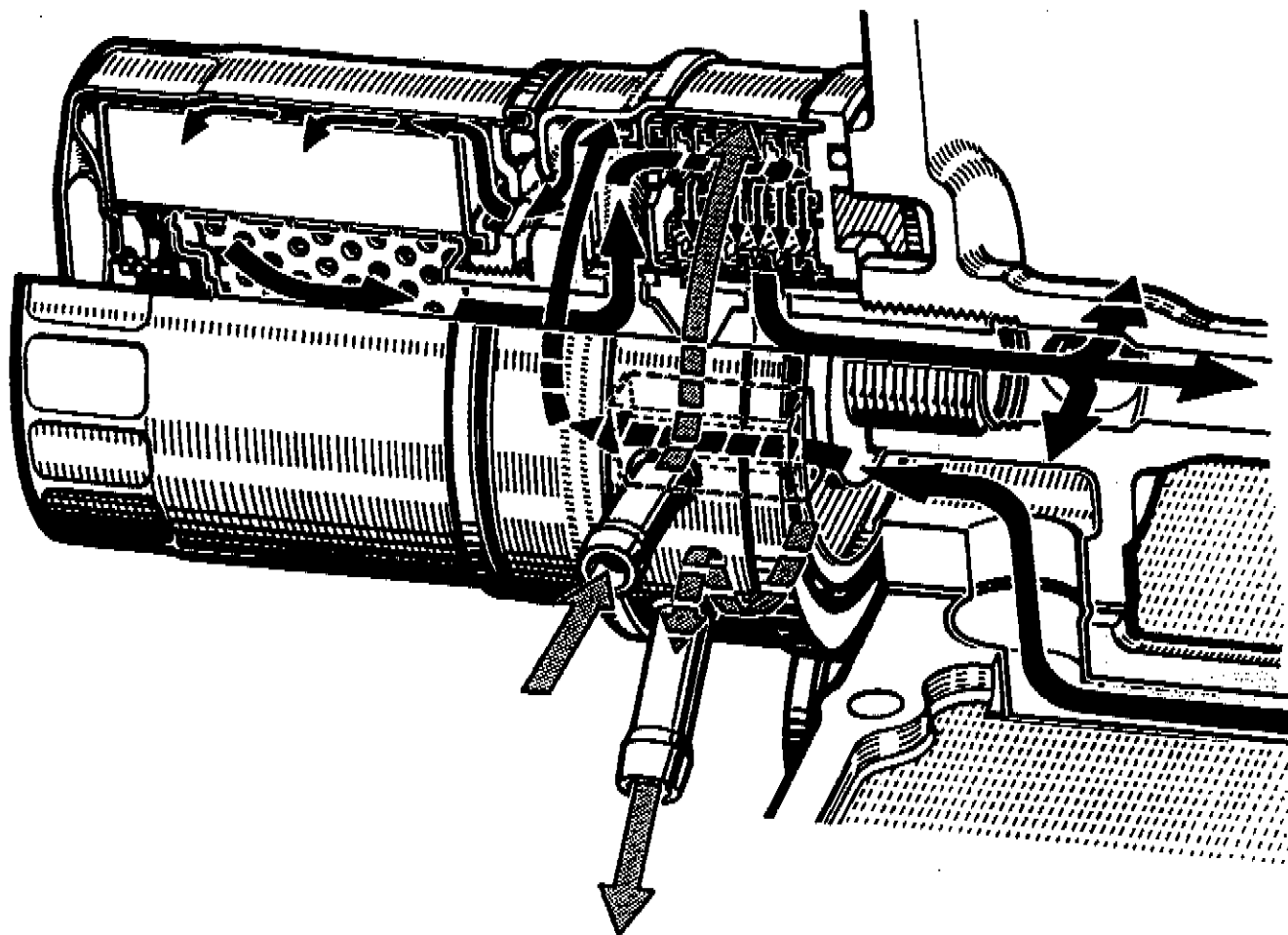


ENGINE LUBRICATION SYSTEM



4-21 FUEL AND LUBRICATION SYSTEM

ENGINE OIL COOLING SYSTEM



← WATER FLOW
← OIL FLOW