

SECTION 4

FUEL SYSTEM

NOTE:

This section is applicable to vehicle not equipped with catalytic converter.

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4-1. CARBURETOR

GENERAL DESCRIPTION

General

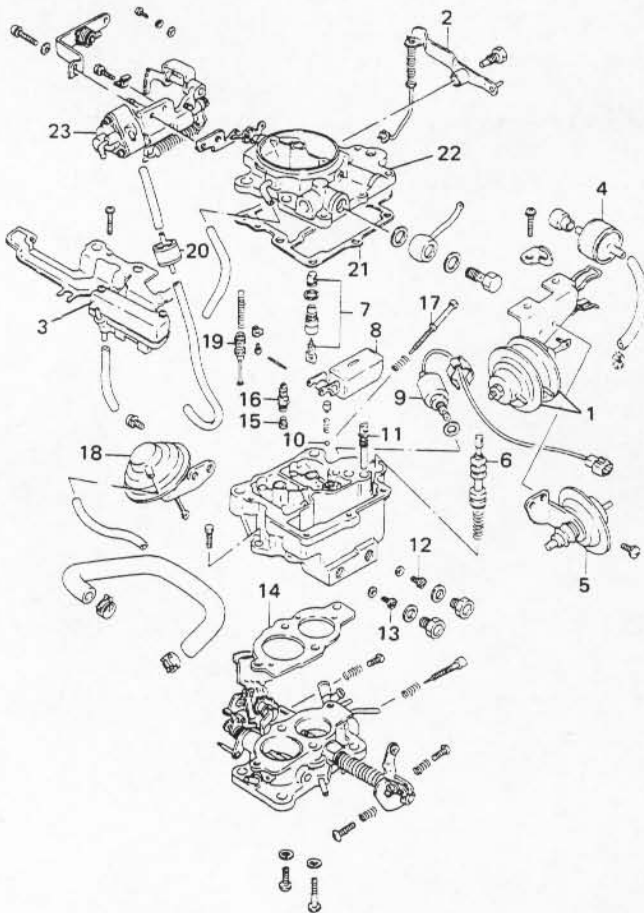
This carburetor is a 2-barrel downdraft type having a primary system and a secondary system. The primary system operates under normal driving condition, and the secondary system operates under high speed high load driving condition. In the primary system, a choke valve is incorporated.

NOTE:

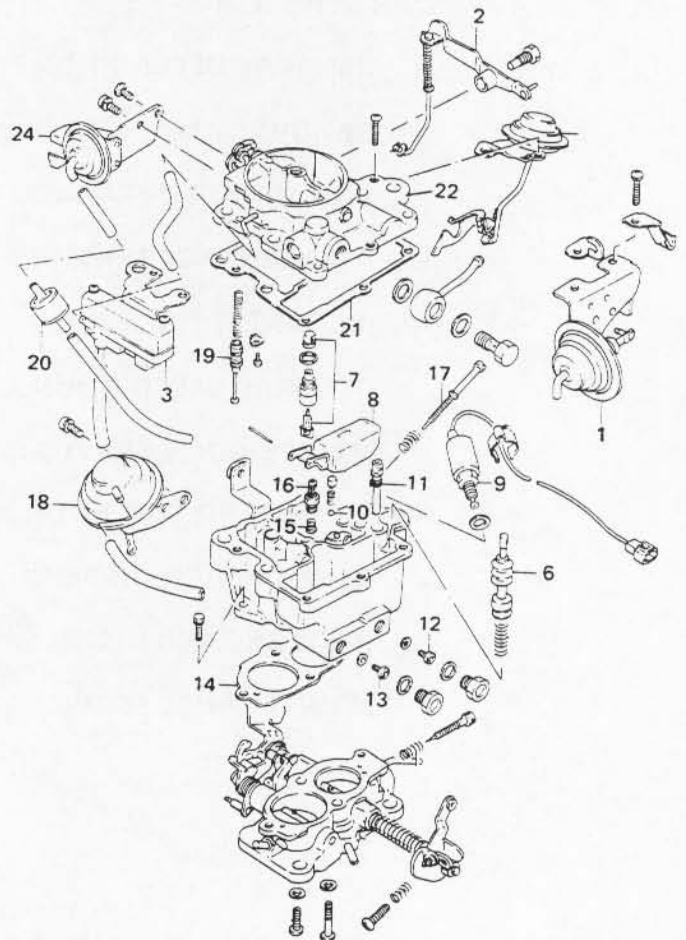
The following variations in system or parts are used depending on specifications.

- Choke system – 2 types: auto choke type and manual choke type.
- Idle up system operated by electric load – 2 types: 1-step idle up type (with one idle up actuator) and 2-step idle up type (with two idle up actuators).
- Dash pot system – Equipped and not equipped.

Auto Choke Type



Manual Choke Type



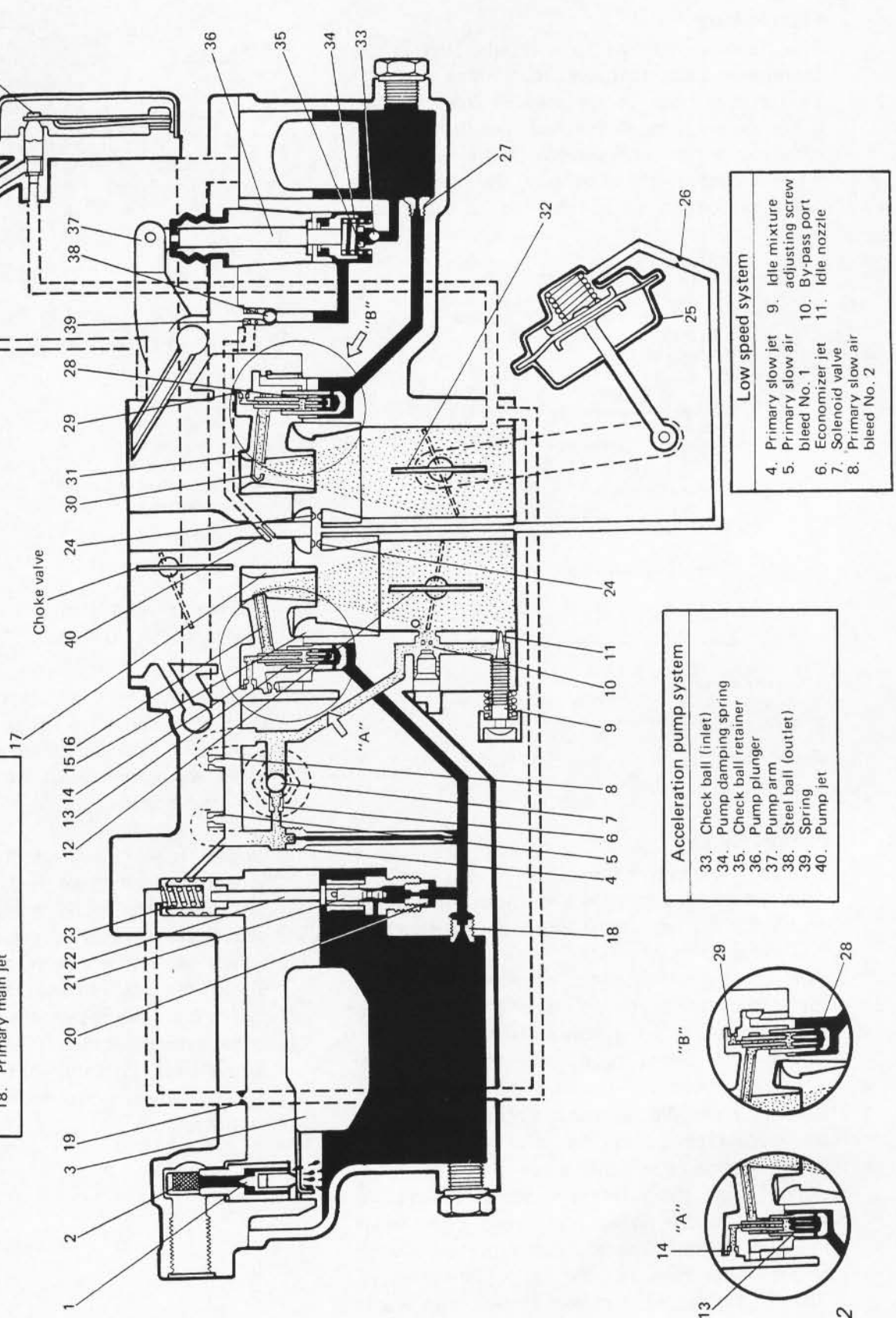
- | | | | |
|------------------------------------|----------------------------|--------------------------------|----------------------------------|
| 1. Idle up diaphragm | 7. Needle valve and seat | 14. Gasket | 21. Gasket |
| 2. Acceleration pump arm | 8. Float | 15. Power jet | 22. Air horn (upper cover) |
| 3. Hot idle compensator (HIC) | 9. Fuel cut solenoid valve | 16. Power valve | 23. Wax element and choke opener |
| 4. Vacuum transmitting valve (VTV) | 10. Steel ball | 17. Idle speed adjusting screw | 24. Choke opener |
| 5. Dash pot | 11. Primary slow jet | 18. Secondary actuator | |
| 6. Acceleration pump plunger | 12. Primary main jet | 19. Power piston | |
| | 13. Secondary main jet | 20. Choke opener jet | |

Fig. 4-1-1

Float system	
1.	Needle valve
2.	Strainer
3.	Float

Primary high speed system	
Power system	
12.	Throttle valve
13.	Main air bleed tube
14.	Main air bleed hole
15.	Large venturi
16.	Main nozzle
17.	Small venturi
18.	Primary main jet
19.	Cushion jet
20.	Power valve
21.	Power valve
22.	Power piston
23.	Power piston spring

Second high speed system	
24.	Vacuum bleed (air jet)
25.	Vacuum actuator
26.	Cushion jet
27.	Secondary main jet
28.	Main air bleed tube
29.	Main air bleed hole
30.	Second main nozzle
31.	Second small venturi
32.	Second throttle valve



Acceleration pump system	
33.	Check ball (inlet)
34.	Pump damping spring
35.	Check ball retainer
36.	Pump plunger
37.	Pump arm
38.	Steel ball (outlet)
39.	Spring
40.	Pump jet

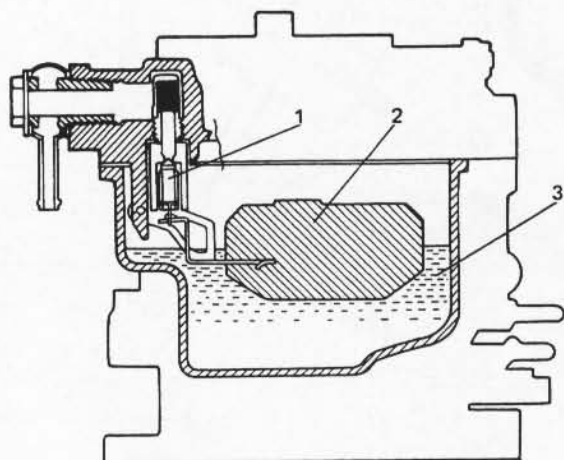
Low speed system	
4.	Primary slow jet
5.	Primary slow air bleed No. 1
6.	Economizer jet
7.	Solenoid valve
8.	Primary slow air bleed No. 2
9.	Idle mixture adjusting screw
10.	By-pass port
11.	Idle nozzle

Fig. 4-1-2

Float System

The float is designed to maintain fuel in the chamber at a constant level at all times.

Fuel pumped out under pressure from the fuel pump passes through the float needle valve and on into the float chamber. With the float movement caused by its buoyancy, the needle valve opens and closes to control fuel at a constant level.



1. Needle valve
2. Float
3. Float chamber

Fig. 4-1-3

Primary System

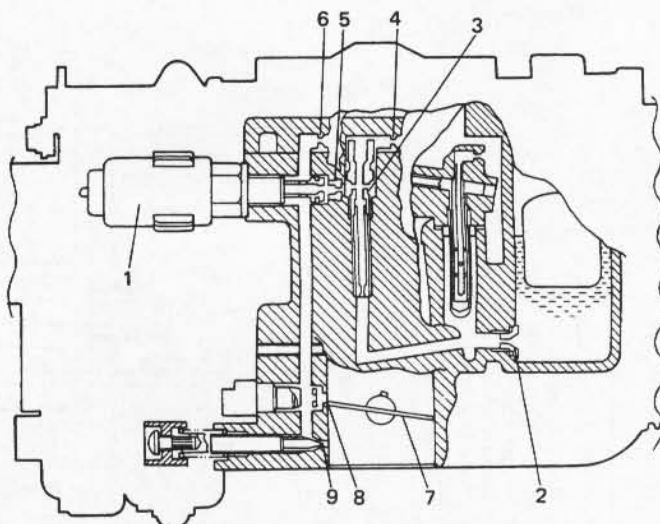
[Primary slow system]

This system incorporates a solenoid valve which opens the system circuit when the ignition key is ON and closes when OFF.

Fuel coming through the primary main jet is metered by the primary slow jet and mixed with the air metered by the slow air bleed No. 1.

The mixture passes through the economizer jet, is further mixed with the air coming through the slow air bleed No. 2 and is discharged through the bypass port and the idle nozzle located near the primary throttle valve.

While idling, the mixture is discharged mainly through the idle nozzle and mixed with the air in the main bore. Therefore, the mixture ratio is adjusted by the idle mixture adjusting screw. That is, tightening it makes the mixture leaner and loosening makes richer.



- | | |
|------------------------------|------------------------------|
| 1. Solenoid valve | 6. Slow air bleed No. 2 hole |
| 2. Primary main jet | 7. Primary throttle valve |
| 3. Primary slow jet | 8. By-pass port |
| 4. Slow air bleed No. 1 hole | 9. Idle nozzle |
| 5. Economizer jet | |

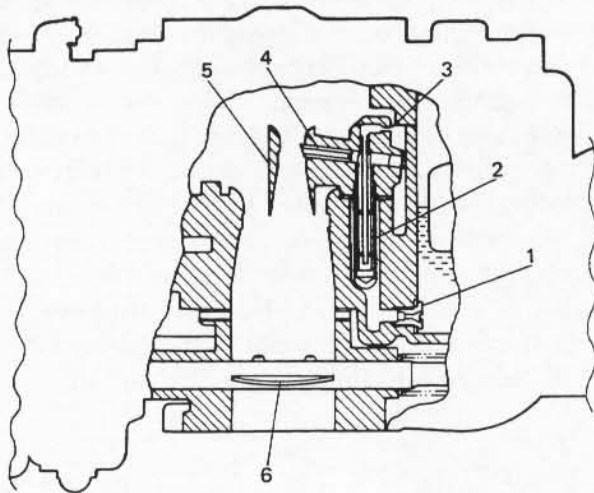
Fig. 4-1-4

[Primary main system]

There are two fuel lines.

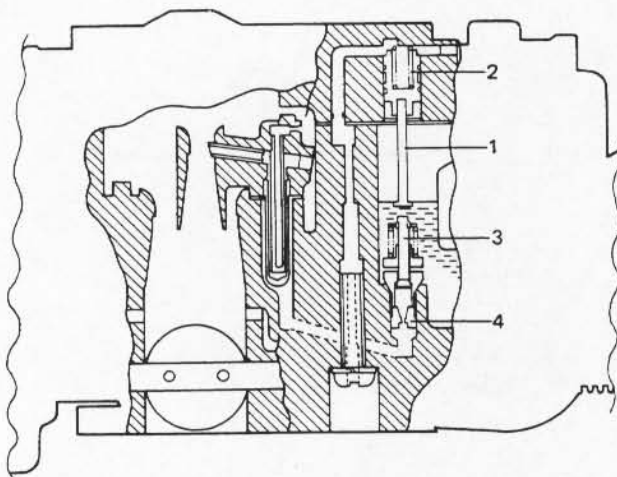
Ordinarily, the fuel metered by the primary main jet is mixed in the primary main air bleed tube with the air metered by the main air bleed and sprayed out into the venturi through the main nozzle.

Under high load conditions (when intake vacuum is less than about 17 cmHg), as the vacuum in the intake manifold falls, the power piston spring pushes down the power piston which causes the power valve to open the fuel line. Then the fuel in the float chamber is metered by the power jet and passes through the same passage as described above. The mixture sprayed out into the venturi through the main nozzle is even richer than the above described mixture.



- 1. Primary main jet
- 2. Primary main air bleed tube
- 3. Main air bleed hole
- 4. Main nozzle
- 5. Small venturi
- 6. Throttle valve

Fig. 4-1-5



- 1. Power piston
- 2. Power piston spring
- 3. Power valve
- 4. Power jet

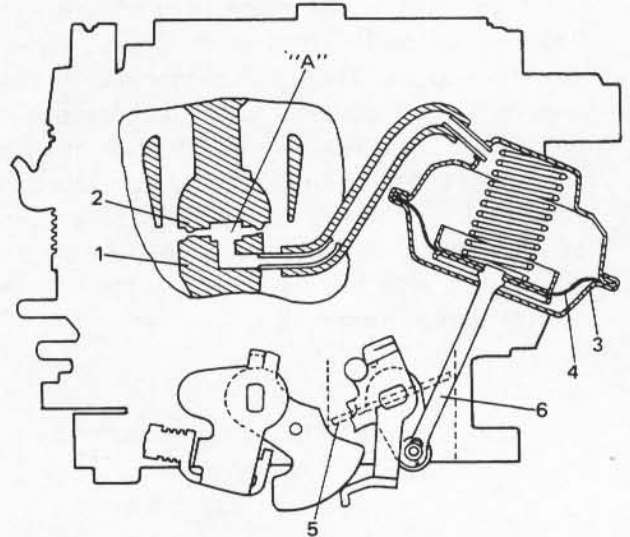
Fig. 4-1-6

Secondary System

[Secondary slow system]

This system operates during the transition period from the primary main system to the secondary main system. When the primary throttle valve is open nearly 51° and the vacuum in "A" as shown in the below figure exceeds -40mmAq , the diaphragm pulls up the rod.

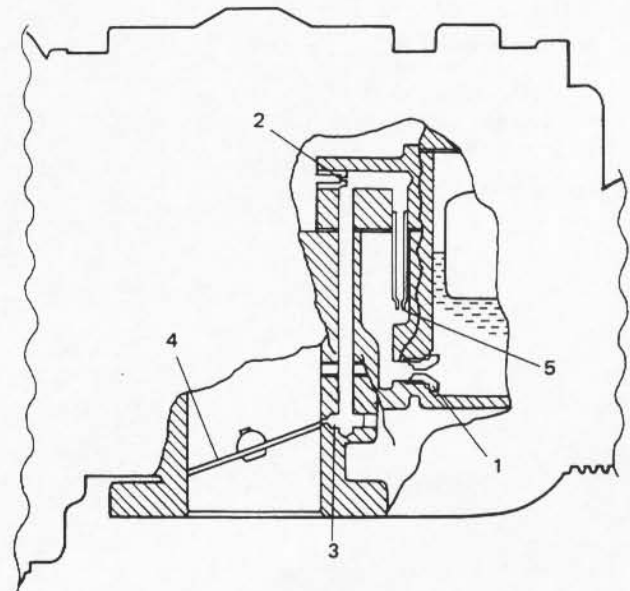
In this state, the secondary throttle valve is ready to open at any time when the primary throttle valve opens further.



- 1. Large venturi
- 2. Air jet
- 3. Actuator
- 4. Actuator diaphragm
- 5. Secondary throttle valve
- 6. Rod

Fig. 4-1-7

When the primary throttle valve opening is wider than 51° , fuel from the secondary main jet is mixed with the air coming through the slow air bleed and discharged through the by-pass port.

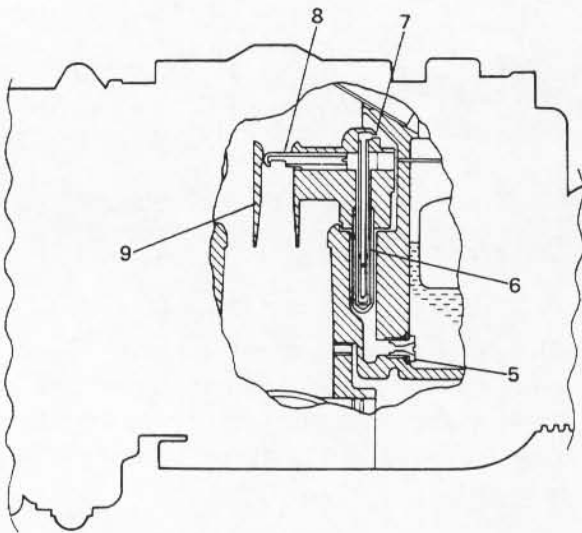


- 1. Secondary main jet
- 2. Slow air bleed hole
- 3. By-pass port
- 4. Secondary throttle valve
- 5. Slow jet

Fig. 4-1-8

[Secondary main system]

When the primary throttle valve opening is wider than when the slow system operates (when the accelerator pedal is depressed), the diaphragm is pulled further up due to the increased vacuum. Then the secondary throttle valve opens in accordance with the operation of the primary throttle valve. In this state, the fuel in the float chamber is metered by the secondary main jet, mixed in the main air bleed tube with the air metered by the main air bleed hole and sprayed out into the small venturi through the secondary main nozzle.

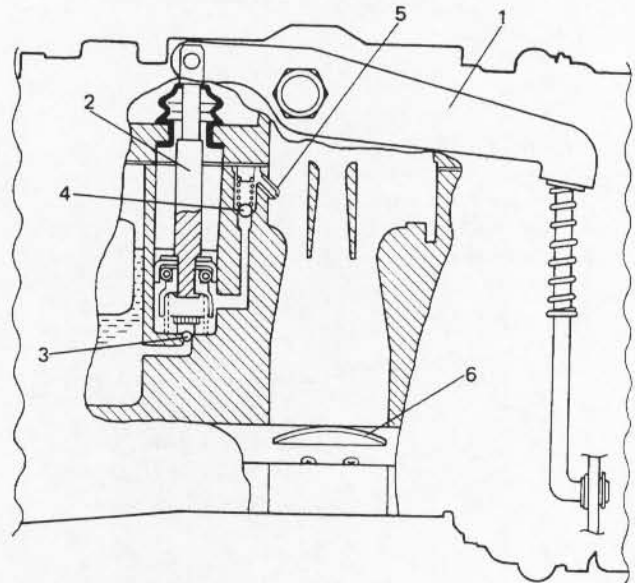


- 5. Secondary main jet
- 6. Main air bleed tube
- 7. Main air bleed hole
- 8. Secondary main nozzle
- 9. Small venturi

Fig. 4-1-9

Acceleration Pump System

When the accelerator pedal is depressed quickly during idling or low speed driving, the throttle valve opens but cannot discharge enough fuel for quick acceleration. Then the acceleration pump operates to add extra fuel. The acceleration pump arm is linked with the throttle shaft. When the throttle valve is opened by depressing the accelerator pedal, the pump arm pushes down the pump plunger to close the inlet check ball. Then the fuel in the pump chamber passes through the steel ball outlet and pump jet and is discharged into the primary side venturi.



- 1. Pump arm
- 2. Pump plunger
- 3. Inlet check ball
- 4. Steel ball outlet
- 5. Pump jet
- 6. Primary throttle valve

Fig. 4-1-10

Choke System

[Description of choke system given here is applicable to the vehicle equipped with the automatic choke system. Such vehicle has no choke knob in the instrument panel (dash panel)]

This choke system has a thermo-wax which operates depending on the heat transmitted from the engine coolant. According to the engine coolant temperature, the thermo-wax opens and closes the choke valve automatically. The fast idle system is also put into operation automatically.

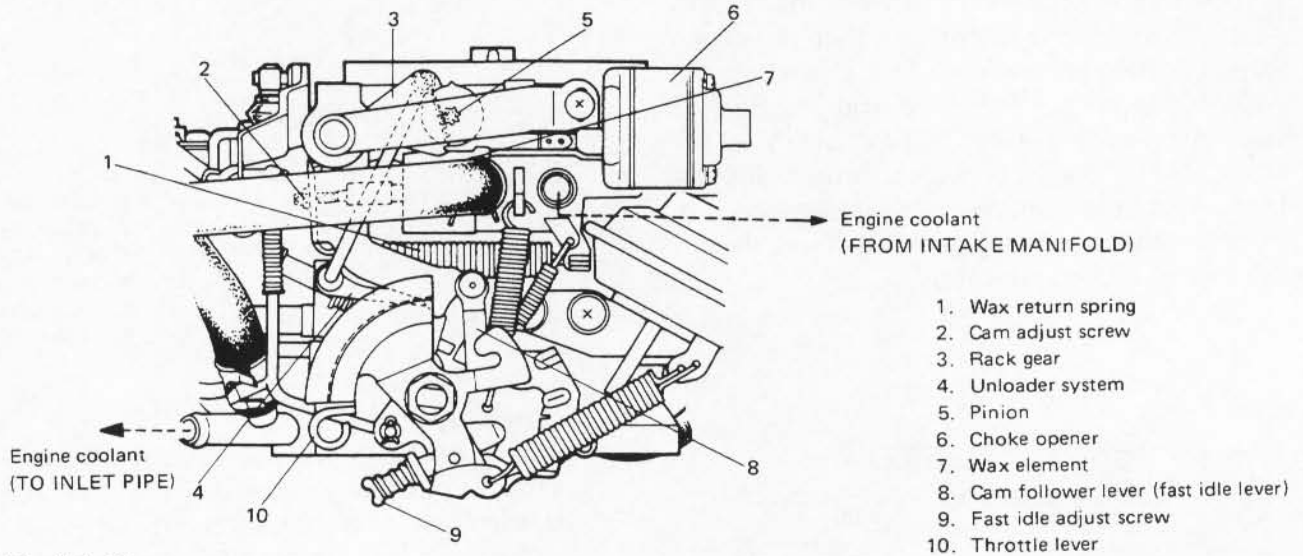


Fig. 4-1-11

[At cold engine start]

As the wax element is contracted at a low coolant temperature (below 28°C or 82°F), the rack gear pushed against the wax by the wax return spring causes the pinion gear to rotate clockwise. Then the choke valve is closed tight by the strangler spring force. At the same time, the cam follower lever (fast idle lever) holds the primary throttle valve at the optimum opening for the engine start.

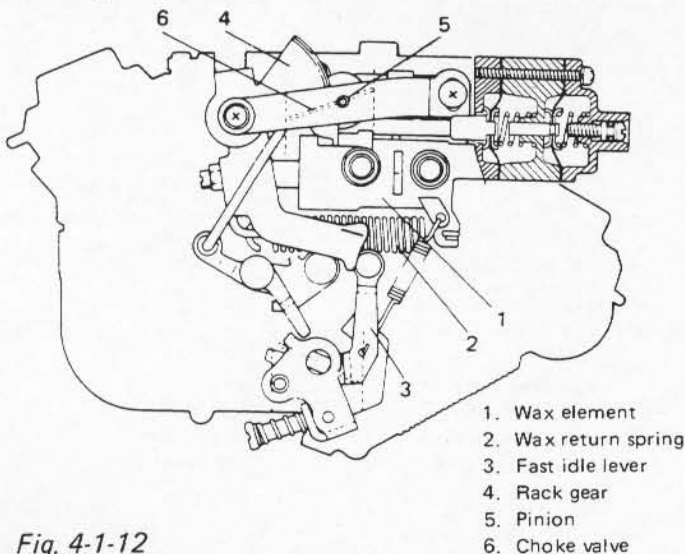


Fig. 4-1-12

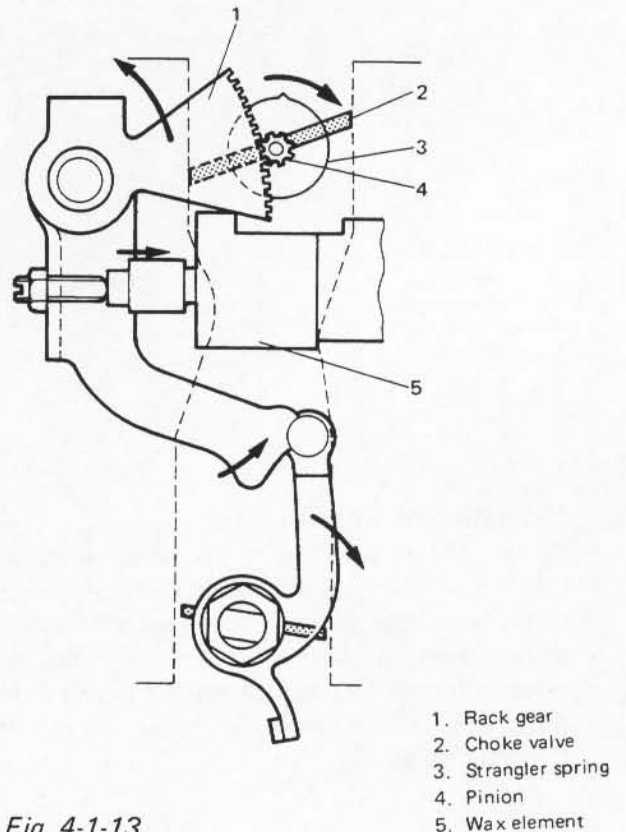


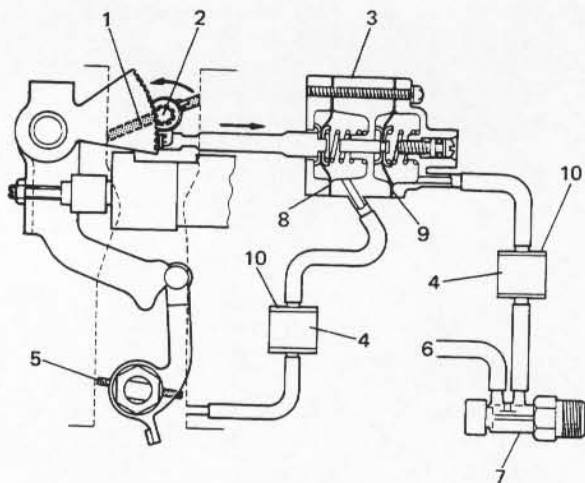
Fig. 4-1-13

[Immediately after engine start]

Once the engine has started, the intake manifold vacuum rises. Then the diaphragm 8 of the choke opener opens the choke valve a little (by forcing the choke lever linked with the choke shaft to rotate), thus preventing mixture from becoming too rich.

If the choke valve is opened rapidly, however, the engine revolution becomes unstable. To prevent this, a jet is added between the vacuum hoses of the choke opener so that the choke valve is opened gradually.

As the engine is warmed up and the cooling water temperature exceeds 24°C or 75°F, the hoses of BVSV are connected through and the intake manifold vacuum pulls the diaphragm 9. Thus the choke valve opens a little more than in the state described previously.



- | | |
|-------------------|-----------------------|
| 1. Choke valve | 6. To intake manifold |
| 2. Choke shaft | 7. BVSV (Yellow) |
| 3. Choke opener | 8. Diaphragm |
| 4. Jet | 9. Diaphragm |
| 5. Throttle valve | 10. Green |

Fig. 4-1-14

[Operation of unloader system]

During the engine warm up acceleration after the engine start, as the apartment plate moves along with the throttle lever at all times, the choke lever is pushed down and the choke valve is forced to open through the rod. In this way, too rich mixture is prevented to attain smooth acceleration.

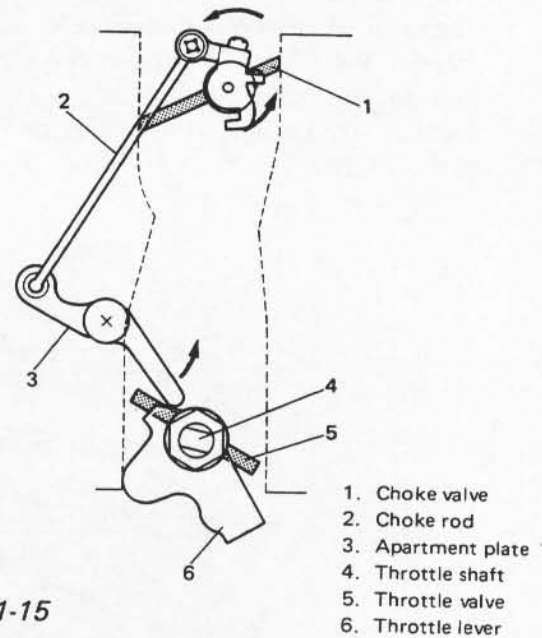
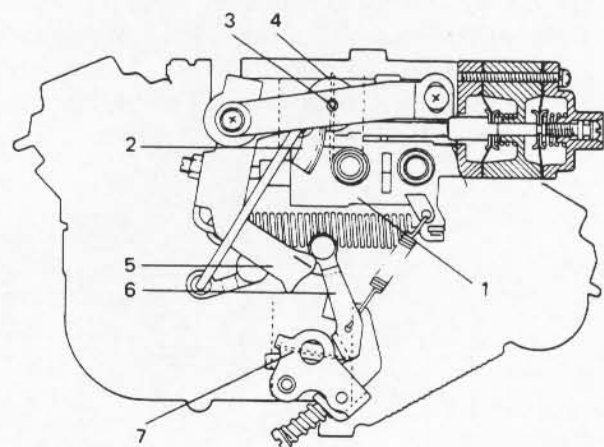


Fig. 4-1-15

[Choke opening]

As the engine is warmed up, the wax element expands gradually according to the coolant temperature rise. This causes, through the rack gear, the pinion gear to turn counter-clockwise to open the choke valve gradually. (The choke valve opens fully at 65°C coolant temperature.) At the same time, the cam follower lever moves away from the cam and the throttle valve returns to the ordinary idle speed position.



- | | |
|----------------|---|
| 1. Wax element | 5. Cam |
| 2. Rack gear | 6. Cam follower lever (fast idle lever) |
| 3. Pinion | 7. Throttle valve |
| 4. Choke valve | |

Fig. 4-1-16

Idle Up System

NOTE:

There are two types of this system, one is 1-step idle up type (with one idle up actuator) and the other is 2-step idle up type (with 2 idle up actuators). Which one is used depends on specifications. The following figure shows the latter. If only BVSV and the actuator "B" are omitted, the figure would show the 1-step idle up type.

The system operates to stabilize the engine idle speed when one of the following electric circuit is ON.

- Headlight and small light
- Heater blower
- Rear defogger (if equipped)

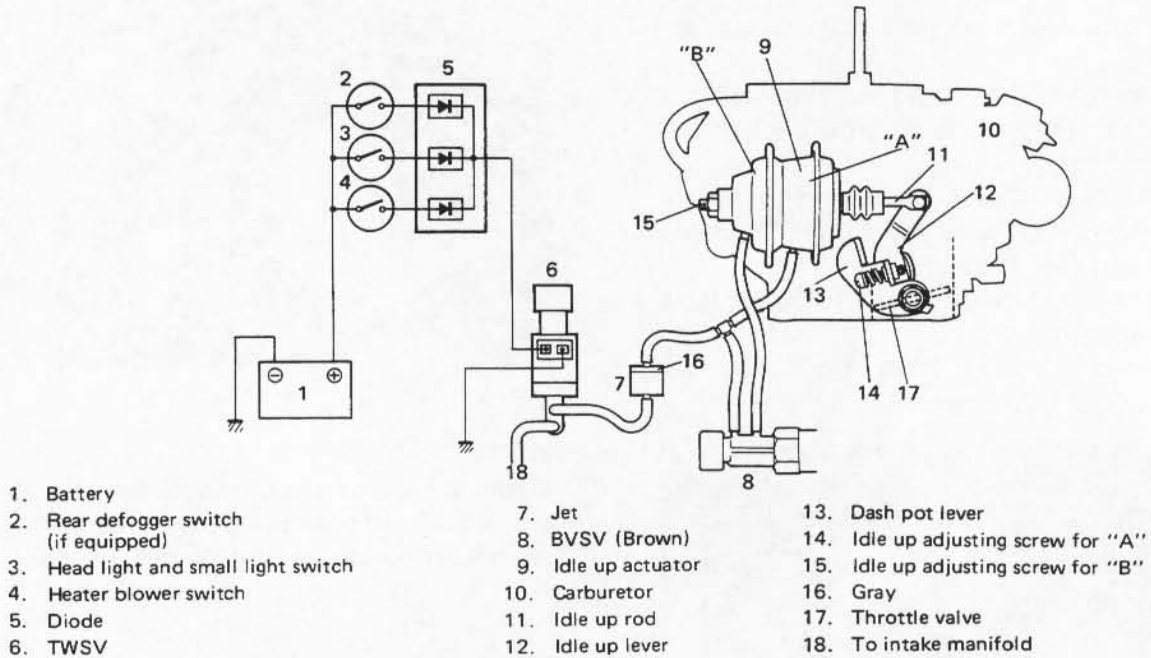


Fig. 4-1-17

When the electric load of one of the above circuit is transmitted to the TWSV (Three Way Solenoid Valve) through a signal, the TWSV opens the vacuum passage. Then vacuum from the intake manifold pulls up the diaphragm of the idle up actuator "A". In accordance with the diaphragm movement, the idle up rod and the idle up lever move and push up the throttle lever a little further than the ordinary idle speed position, thereby opening the throttle valve by the amount corresponding to the throttle lever movement (about 3.5°), which results in the idle up state. (When headlight switch turns on, engine runs at 900 – 1000 r/min.).

However, with the carburetor provided with 2-step idle up system (in which the actuator "B" is equipped), the BVSV vacuum passage is open when the engine coolant temperature is below 55°C (131°F). So the intake vacuum is also applied to the actuator "B", resulting in a little wider opening of the throttle valve (about 3°) than in the above description.

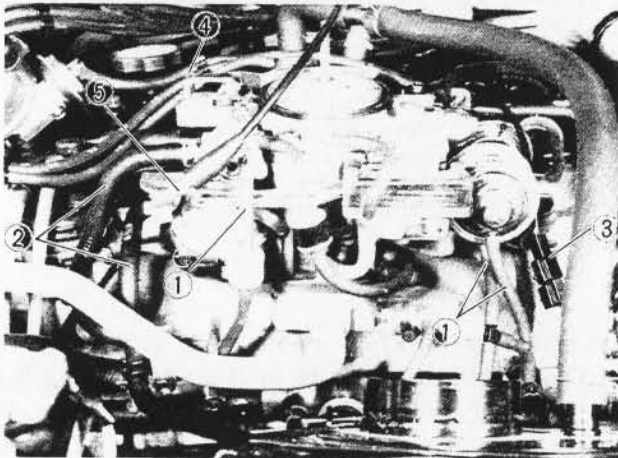
When the engine is warmed up and the cooling water temperature exceeds 77°C (170°F), the vacuum passage of BVSV closes and the air flows into "B". Thus the diaphragm returns to its above position. That is, only the actuator "A" performs idle up operation.

When the TWSV stops operating (no electric load from the above circuits), air is introduced into the idle up actuator "A" and "B" (or only "A"). Then the diaphragm and the rod move down and the idle up lever leaves the throttle lever to release the idle up state. The idle up engine speed is adjusted by turning the idle up adjusting screws.

REMOVAL AND INSTALLATION

Removal

- 1) Disconnect negative battery cord from battery.
- 2) Drain coolant if equipped with auto choke system.
- 3) Remove air intake case from carburetor.
- 4) Disconnect coupler of carburetor solenoid coil lead wire.
- 5) Disconnect fuel inlet hose from carburetor inlet pipe.
- 6) Disconnect water inlet and outlet hoses from carburetor (Applicable to auto choke type carburetor).
- 7) Disconnect accelerator cable and/or choke cable (no choke cable for automatic choke system) from carburetor.
- 8) Disconnect distributor vacuum advance hose from carburetor.
- 9) Disconnect vacuum hose from idle up actuator and choke opener.



1. Vacuum hose
2. Water hose
3. Solenoid lead wire coupler
4. Distributor vacuum advance hose
5. Accelerator cable

Fig. 4-1-18

- 10) Check all around carburetor for any other parts required to be removed or disconnected for removal of carburetor and remove or disconnect whatever necessary.
- 11) Then remove carburetor from intake manifold.

WARNING:

Removal or disassembly of carburetor must be carried out in a well-ventilated place where no fire is used around.

Install

Install in the reverse order of removal.

When installing air intake case to carburetor, turn air intake case counterclockwise until intake case contact with carburetor, and tighten intake case nut.

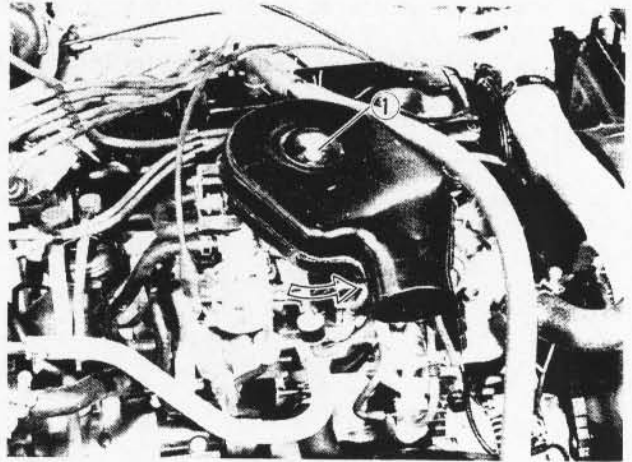


Fig. 4-1-18-1 1. Intake case nut

NOTE:

Upon completion of installation, be sure to check each part for evidence of fuel leakage and for proper operation. If defective, correct.

UNIT REPAIR OVERHAUL

This section outlines procedure to be used for overhauling carburetor as removed from engine. For removal and installation of carburetor from and to engine, refer to the previous page.

NOTE:

- Be sure to replace gaskets as well as worn or damaged parts.
- While disassembling and assembling carburetor, use special care not to deform levers on throttle valve shaft or cause damage to any other parts.
- Don't disassemble solenoid valve and accelerator pump piston.

WARNING:

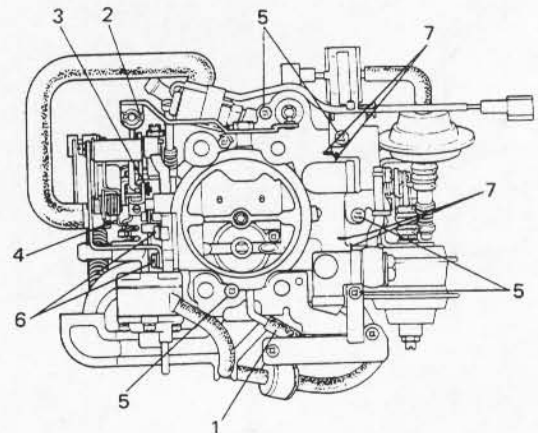
When servicing carburetor, keep lighted cigarette and any other fire off near carburetor as it contains gasoline.

Disassembly

- 1) To remove air horn from float chamber, remove or disconnect hose 1, clips 2, 3, spring 4 and screws 5, 6.

Scribe match marks on idle up actuator bracket and air horn before loosening screws 5 and 6.

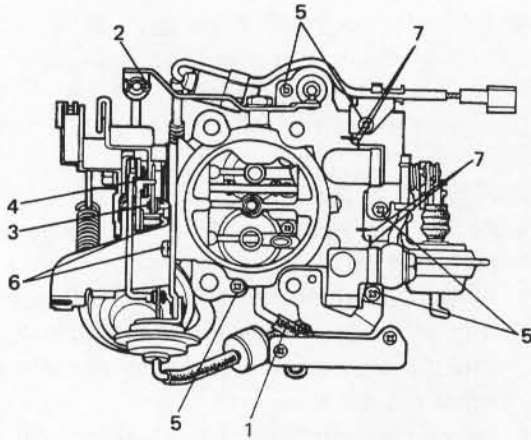
[Auto choke type]



1. HIC Vacuum hose
2. Acceleration pump rod clip
3. Choke shaft bracket clip
4. Choke valve strangler spring
5. Screws
6. Choke wax element mounting screw
7. Match mark

Fig. 4-1-19

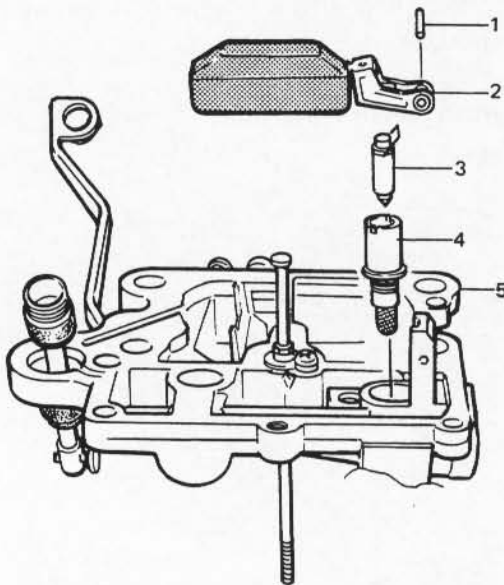
[Manual choke type]



1. HIC vacuum hose
2. Acceleration pump rod clip
3. Choke shaft bracket clip
4. Choke valve strangler spring
5. Screw
6. Choke opener bracket mounting screw
7. Match mark

Fig. 4-1-20

2) Remove float and needle valve and then needle valve seat and filter.



1. Float pin
2. Float
3. Needle valve
4. Needle valve seat and filter
5. Air horn

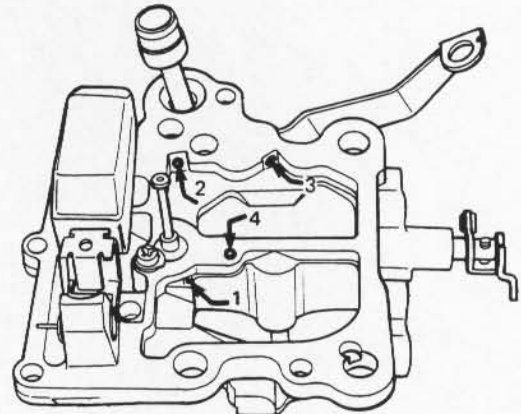
Fig. 4-1-21

Cleaning

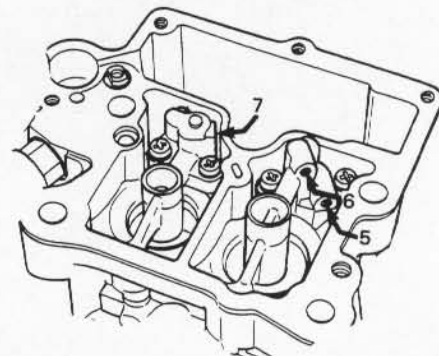
- 1) Wash below listed items in carburetor cleaner and then clean them by blowing compressed air.
 - All air bleed hole and fuel jets.
 - Needle valve, valve seat and filter, and float.
- 2) Blow compressed air into all passages to clean.
- 3) Clean bottom of float chamber.

NOTE:

1. Don't immerse following parts in carburetor cleaner.
 - Fuel cut solenoid valve.
 - Accelerator pump piston.
 - Secondary diaphragm, choke diaphragm and idle-up actuator.
 - Rubber parts and gaskets.
 - Thermo-wax (thermo element)
- 2) Don't put drills or wires into fuel passages and metering jets for cleaning. It causes damages in passages and jets.



1. Labyrinth hole
2. Primary slow air bleed hole No. 1
3. Primary slow air bleed hole No. 2
4. Power cushion jet



5. Secondary slow air bleed hole
6. Secondary main air bleed hole
7. Primary main air bleed hole

Fig. 4-1-22

Inspection

- 1) Check choke valve and throttle valves for smooth operation.
- 2) Check needle valve and valve seat for wear.

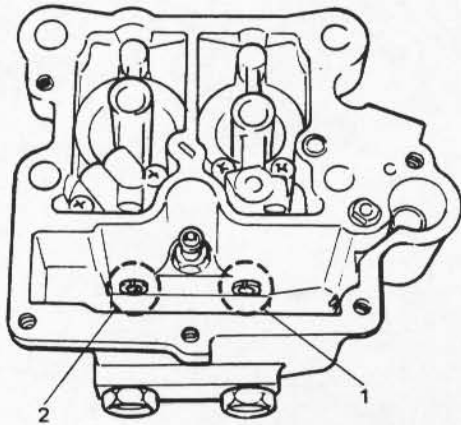
Assembly

[PRIMARY AND SECONDARY MAIN JETS]

Each of the jets has its jet number stamped on its head. When re-installing them, refer to the below figure for their proper positions.

NOTE:

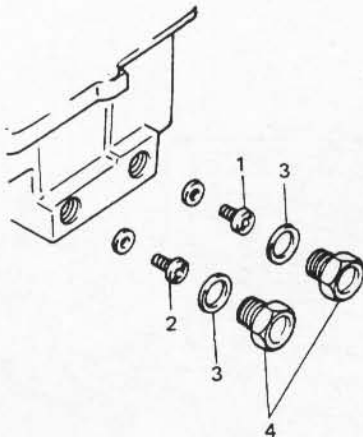
- When replacing the jet, be sure to use the jet with same number as the one being replaced.
- The number (size) of the primary main jet should be smaller than that of the secondary main jet.



1. Primary main jet
2. Secondary main jet

Fig. 4-1-23

Install gaskets and drain plugs as shown, after installing main jets.



1. Primary main jet
2. Secondary main jet
3. Gaskets
4. Drain plugs

Fig. 4-1-24

[AIR HORN (Float chamber upper cover)]

- 1) Install gasket on carburetor body.

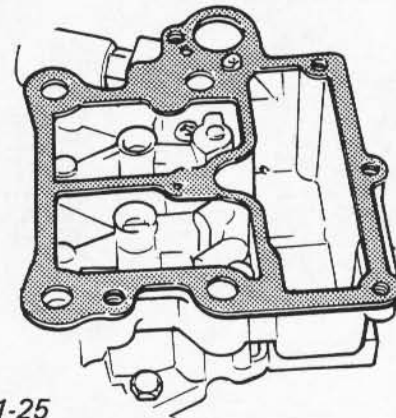
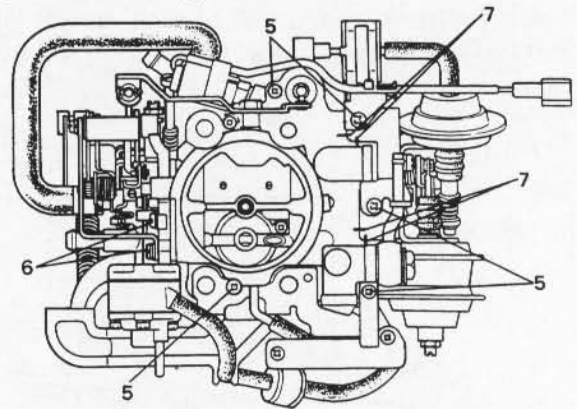


Fig. 4-1-25

- 2) Install air horn (upper cover) on gasket, using care not to cause gasket to slip out of place.
- 3) Tighten screws indicated by 5 and 6 in the figure.

Align match marks 7 on air horn and idle up actuator bracket scribed before disassembly.

[Auto choke type]



[Manual choke type]

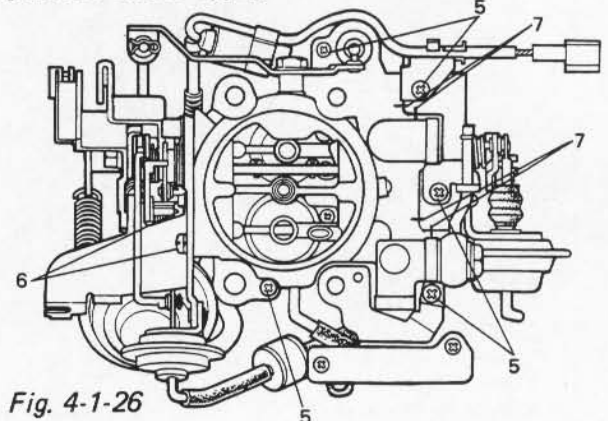
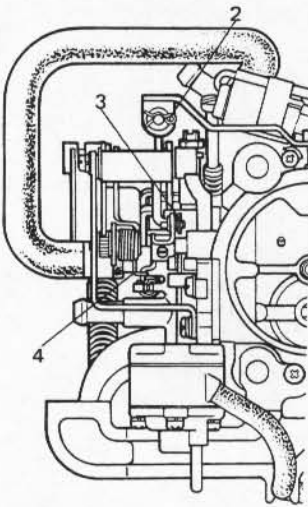


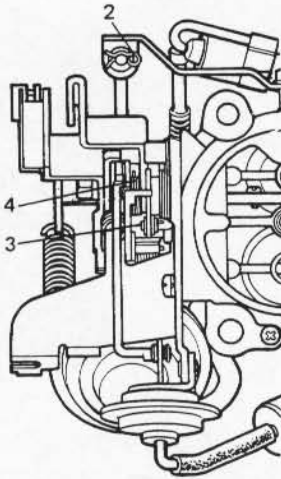
Fig. 4-1-26

- 4) Install or reconnect clips 2 and 3, choke valve return spring 4 and then HIC vacuum hose.

[Auto choke type]



[Manual choke type]



- 2. Acceleration pump rod clip
- 3. Choke shaft bracket clip
- 4. Choke valve strangler spring

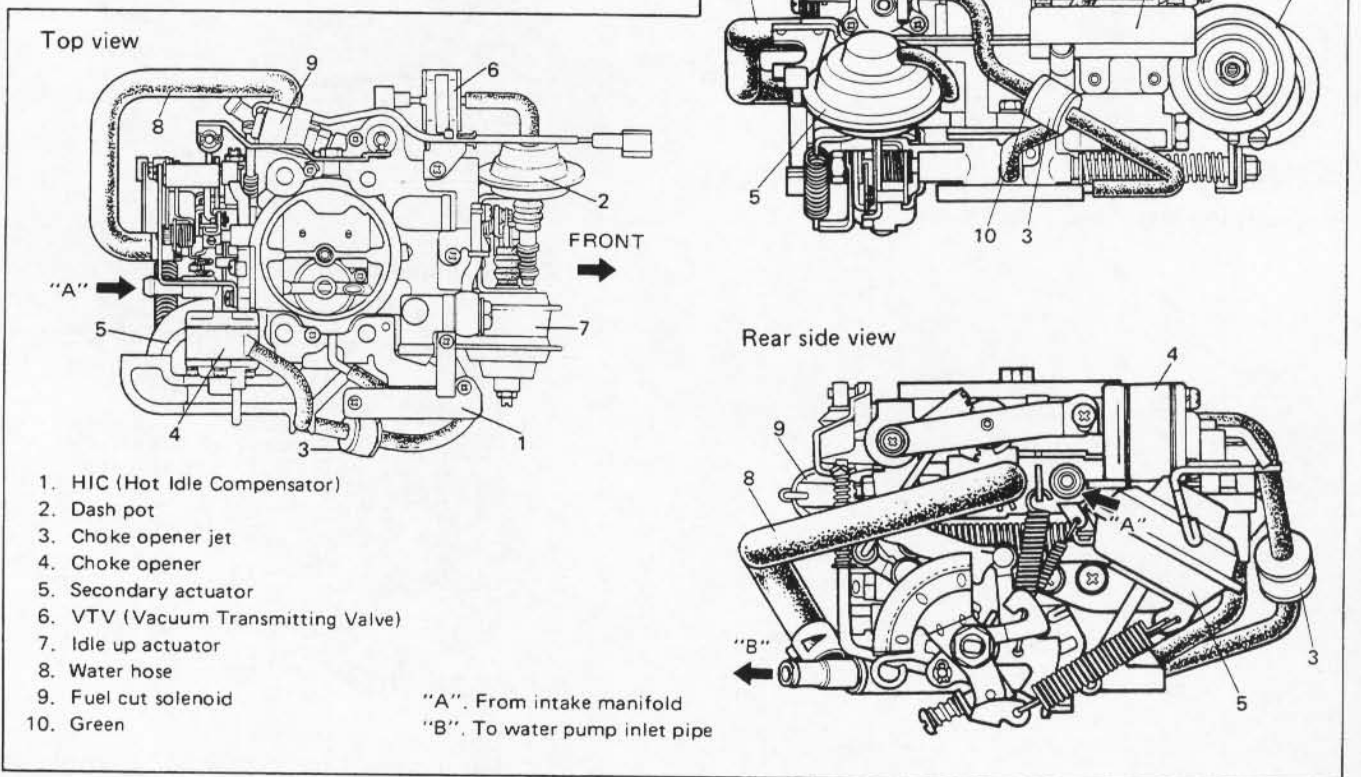
Fig. 4-1-27

5) Install carburetor to intake manifold upon completion of carburetor assembly. After installation, check each carburetor system for operation.

Others

For installation and layout of each vacuum hose and linkage of carburetor, refer to the following figures.

1) Auto choke type



Top view

Front side view

Left side view

Right side view

Rear side view

- 1. HIC (Hot Idle Compensator)
- 2. Dash pot
- 3. Choke opener jet
- 4. Choke opener
- 5. Secondary actuator
- 6. VTV (Vacuum Transmitting Valve)
- 7. Idle up actuator
- 8. Water hose
- 9. Fuel cut solenoid
- 10. Green

"A". From intake manifold
 "B". To water pump inlet pipe

Fig. 4-1-28

2) Manual choke type

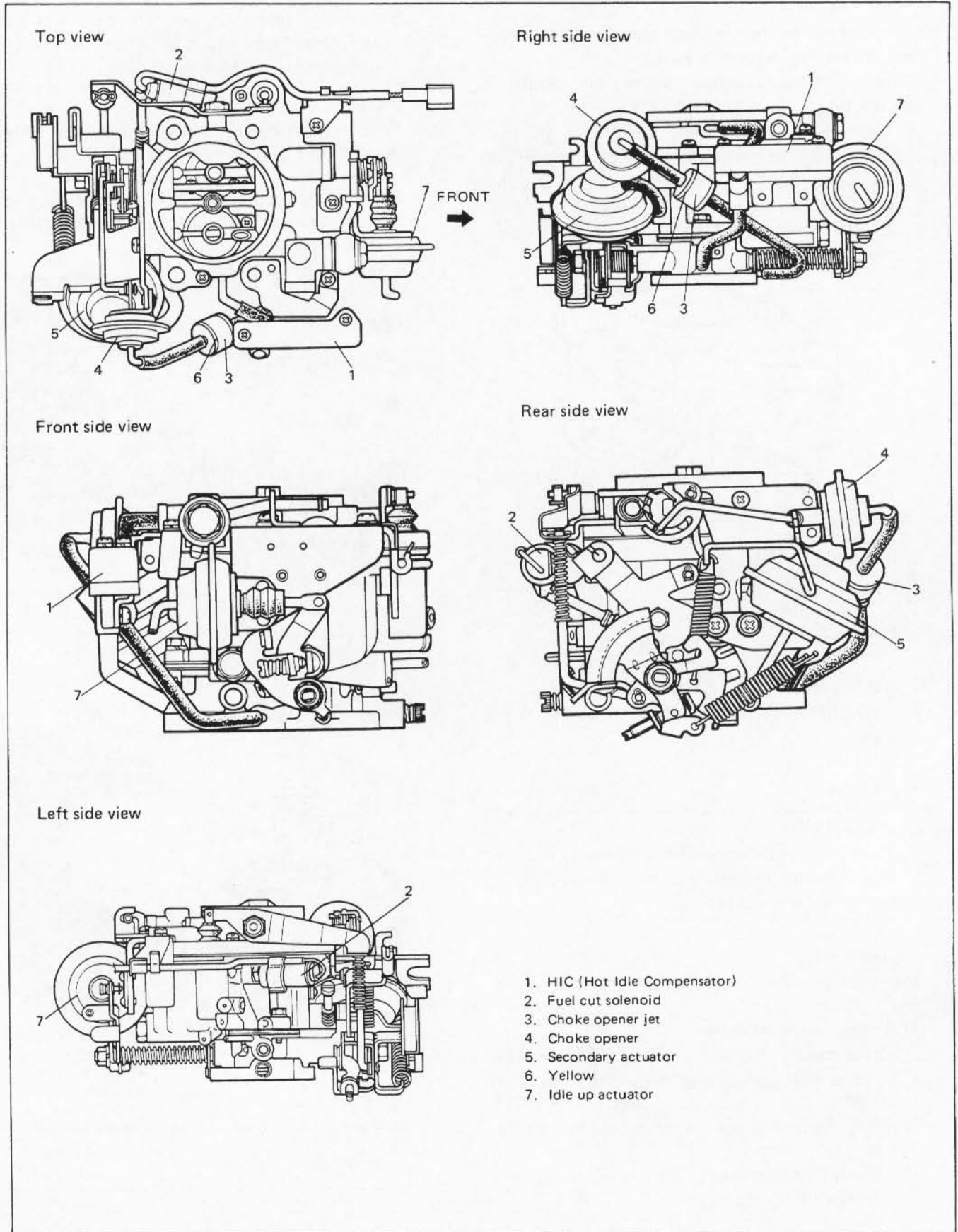


Fig. 4-1-29

MAINTENANCE SERVICES

Accelerator Cable

(Applicable to the vehicle equipped with the automatic choke type carburetor)

Check accelerator cable for play and adjust if necessary.

- 1) Cable play "A" should be 10 – 15 mm (0.4 – 0.6 in.) when carburetor and coolant are cold (confirm that choke valve is fully closed).

If not within specification, adjust by loosening lock nut.

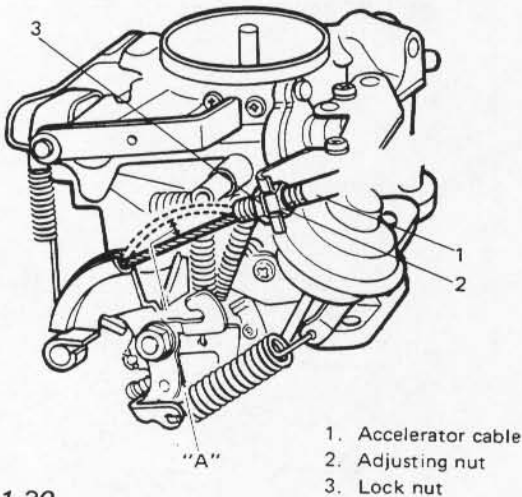


Fig. 4-1-30

- 2) Cable play "A" should be 3 – 5 mm (0.12 – 0.20 in) when carburetor and coolant are warm.

Float Level

WARNING:

Float level inspection and adjustment must be performed in well-ventilated place where no fire is used around.

[Inspection]

Inspect float level as follows by using special tool.

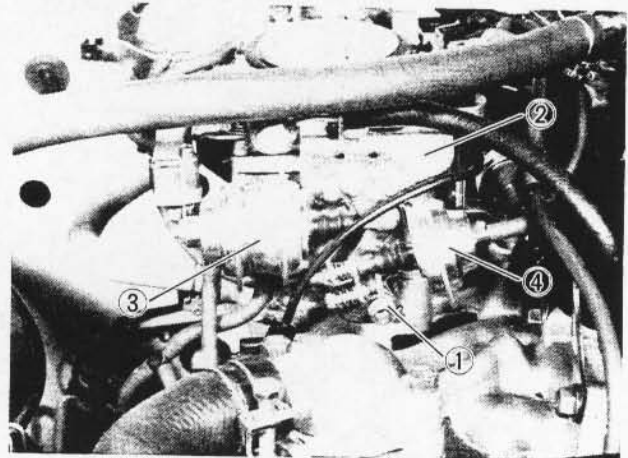
- 1) Remove air intake case.
- 2) Scribe match marks on bracket and air horn for the sake of reassembly. Refer to Fig. 4-1-26.
- 3) Remove idle up lever after loosening accelerator valve shaft nut.
- 4) Remove bracket with idle up actuator and dash pot (if equipped).

- 5) Mount 2 screws removed in the above 4) back to air horn and tighten them.
- 6) Remove secondary jet replacing bolt and in the hole from which bolt has been removed, connect special tool (A) as shown.

NOTE:

When removing bolt, hold a container or cloth beneath the bolt so as not to spill fuel.

- 7) Start engine, keep it at idle speed and inspect float level which should be within "H" as shown below.



1. Accelerator valve shaft nut
2. Bracket
3. Idle up actuator
4. Dash pot

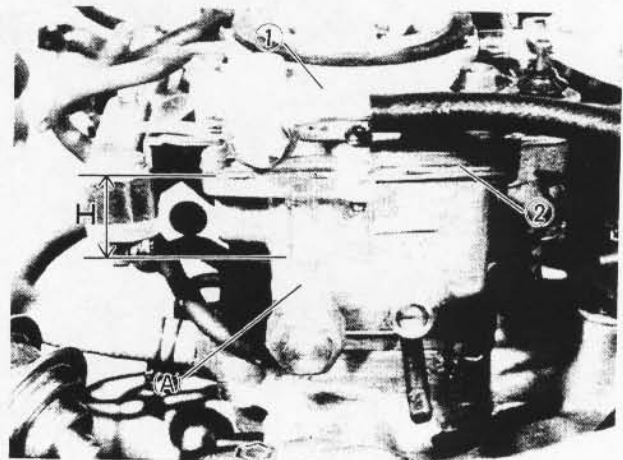


Fig. 4-1-31

1. Carburetor upper cover
 2. Gasket
- (A) Float level gauge
(09932-28210)

Float level "H"

20.5 – 23.5 mm
(0.81 – 0.92 in.)

If fuel level (float level) is within specification, install them according to reverse order of removal 1) – 4).

When reinstalling bracket with idle up actuator and dash pot, align match marks on air horn and bracket scribed before disassembly.

If fuel level is not within specification, adjust it. Refer to following [Adjustment].

[Adjustment]

Remove carburetor assembly from intake manifold (see corresponding description of Carburetor Removal) and then remove carburetor air horn (refer to item of "UNIT REPAIR OVERHAUL").

1) Re-check float height "H'" as shown below.

NOTE:

- Check float height with float weight applied to needle valve.
- Height "H'" should not include gasket.
- As a gauge for checking height "H'", use something whose thickness measurement is the same as specified "H'" measurement (such as a drill or carburetor mounting bolt) after confirming thickness with vernier calipers.

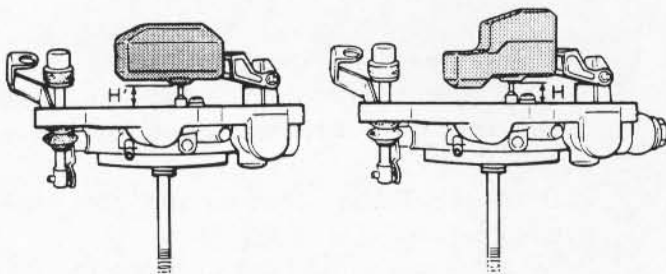
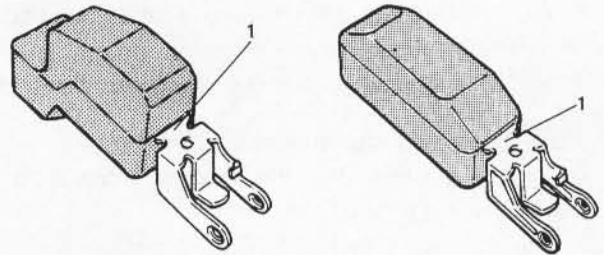


Fig. 4-1-32

Float height H'	7 mm (0.275 in.)
-----------------	------------------

2) If float height is not within specification, adjust by bending neck of the float.



1. Float neck

Fig. 4-1-33

3) Check needle valve for wear and dust. Also, check to ensure that no fuel is in float by shaking it.

Upon completion of check or adjustment, reinstall air horn referring to item of "UNIT REPAIR OVERHAUL" and install carburetor referring to "REMOVAL AND INSTALLATION".

After installing carburetor to intake manifold, start engine and check each part for fuel leakage or air entry. Also, check each link system and each part, referring to corresponding description in item of MAINTENANCE SERVICE in this section for details.

Idle Speed and Idle Mixture

NOTE:

- Requires external tachometer.
- 1) As preliminary steps, check to be sure that:
- Coolant temperature should be within the below indicated range.

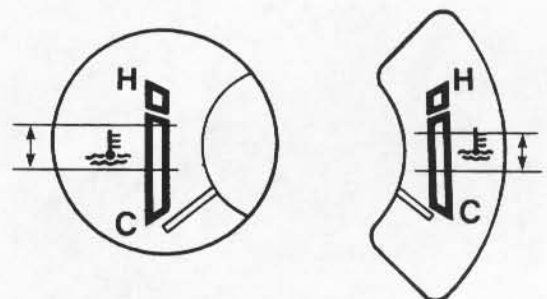


Fig. 4-1-34

- Choke valve is in full-open position.
- All accessories (wipers, heater, lights, etc.) are out of service.
- Ignition timing is within specification.
- Air cleaner has been properly installed and is in good condition.
- Engine valve clearance is within specification.

[Idle speed and idle mixture adjustment]

Adjust idle speed and idle mixture according to the following procedure.

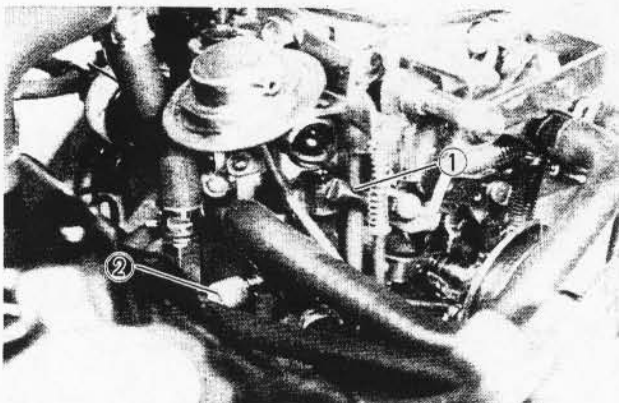
- 1) Adjust idle speed to 880 r/min (rpm) by repositioning (turning) idle speed adjusting screw ①.
- 2) With engine idling at 880 r/min (rpm), turn idle mixture adjusting screw ② to the right or left and set it where the highest engine speed is obtained. (This is the best idle position).
- 3) Perform above 1) and 2) once again, and then readjust idle speed to 880 r/min (rpm) with idle speed adjusting screw ①.
- 4) Upon completion of the work so far, readjust engine idle speed to the below specification by turning idle mixture adjusting screw ② slowly to the right (close).

All cars of this model now manufactured are delivered with their CO% factory adjusted as follows.

Engine idle mixture CO%	1.5 ± 0.5
Engine idle speed r/min (rpm)	840 – 850

In the country with the statutory requirements for the exhaust gas (CO%), be sure to adjust the idle mixture adjusting screw so that the CO% indicated on the exhaust gas tester will meet the above specification.

Special tool ① is necessary to turn the idle mixture adjusting screw ②.



1. Idle speed adjusting screw
2. Idle mixture adjusting screw

Fig. 4-1-35

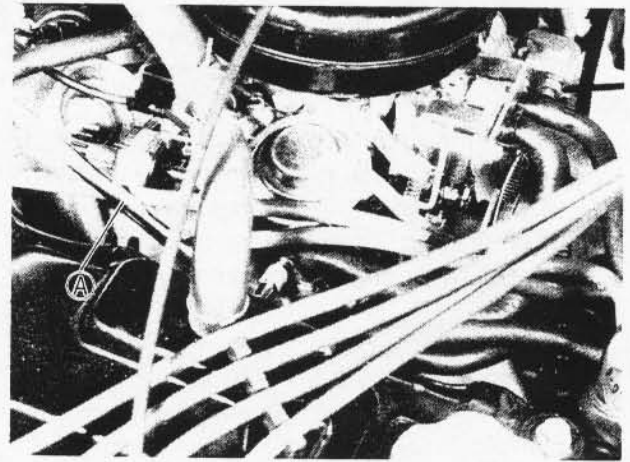


Fig. 4-1-35-1 ① Special Tool (Carburetor Adjuster 09918-38310)

Idle Up

[Inspection]

- 1) Adjust idle speed to specification by referring to [Idle speed and idle mixture adjustment] and maintain engine at that speed.
- 2) Turn ON head light. If engine idle speed rises a little higher than specified idle speed, that proves normal function of the idle up.

If found faulty, check following parts individually according to each procedure.

[TWSV (Three Way Solenoid Valve)]

- 1) Make sure that head light, small light, heater fan and rear defogger (optional) are all turned OFF.
- 2) Disconnect TWSV vacuum hoses from intake manifold and jet.
- 3) By blowing air into hose disconnected from jet, make sure there is no continuity between these hoses.
- 4) Turn ON head light and by blowing air into the hose disconnected from jet, make sure that there is continuity between hoses.

If found defective in item 3) and 4), replace hoses, wiring harness or TWSV.

[Actuator]

- 1) Disconnect hose from actuator.
- 2) Pull actuator rod by hand all the way up and apply finger to the joint from which actuator hose has been disconnected.
- 3) In the state of 2), take hand off rod. If actuator rod stays up, it is normal. If defective, replace.

NOTE:

With 2-step idle up type actuator, pull up actuator rod by hand, close pipes ① and ② with fingers as shown and check actuator rod for the following. When hand is taken off the rod while with pipes closed, it remains as it is. When finger is taken off pipe ①, it moves back a little, and when finger is taken off pipe ②, it returns to its original position.

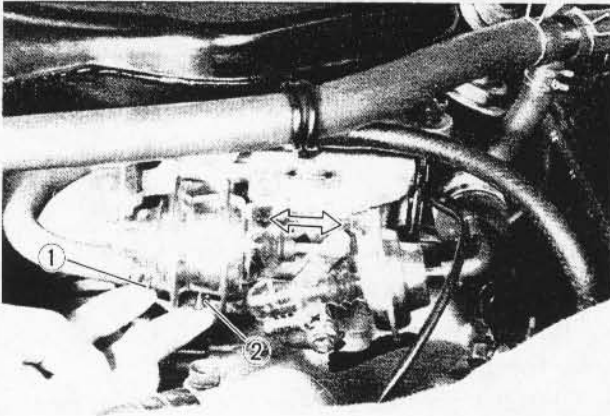


Fig. 4-1-36

[Jet]

- 1) Remove jet with vacuum hose.
- 2) With one side of jet closed with finger as shown, apply -50cmHg vacuum by means of vacuum pump. Then check that vacuum is relieved gradually when finger is taken off. Replace if defective.

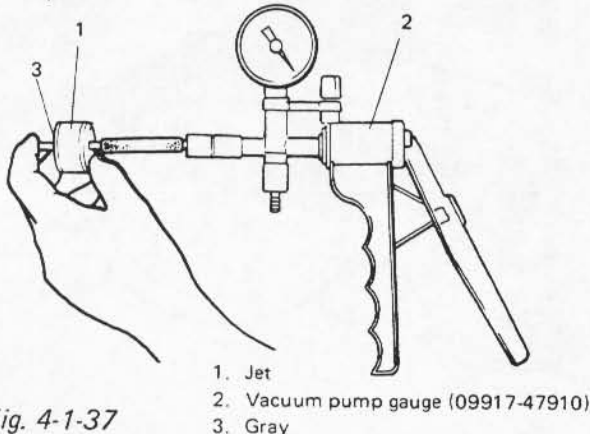


Fig. 4-1-37

1. Jet
2. Vacuum pump gauge (09917-47910)
3. Gray

[BVSV (Bi-metal Vacuum Switching Valve)]

This check is applicable to those cars with 2-step type idle up system equipped with BVSV.

- 1) Disconnect vacuum hoses from idle up actuator "B" and 3 way joint.
- 2) With cold engine (coolant temperature is lower than 52°C or 125°F), air blown through port ② of BVSV should not come out of filter ③ but out of port ①.
- 3) With warmed up engine (coolant temperature is above 79°C or 174°F), air blown through port ② should not come out of port ① but out of filter ③.

If found defective in 2) or 3), change BVSV.

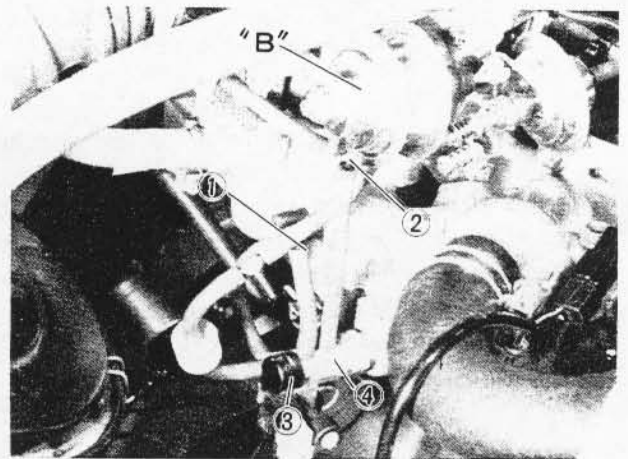


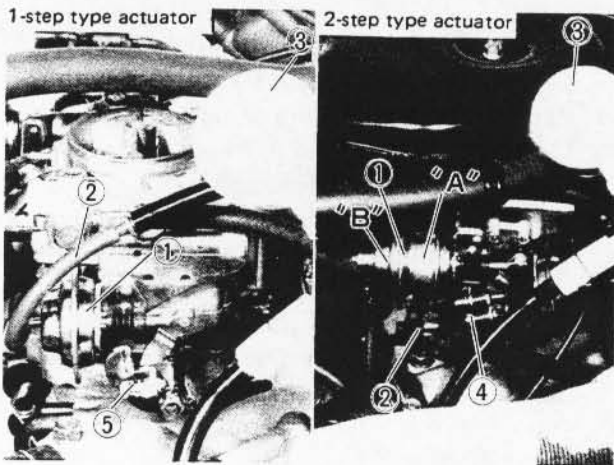
Fig. 4-1-38

1. Port to TWSV
2. Port to actuator
3. Filter
4. BVSV (Brown)

[Adjustment]

If TWSV, actuator, hose, wiring harness and battery capacity are normal and yet idle up speed is not attained, adjust as follows.

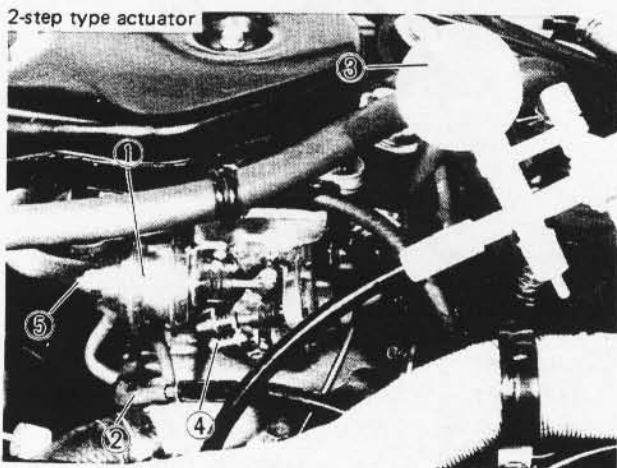
- 1) Disconnect vacuum hose connected to actuator from TWSV and connect special tool (Vacuum pump gauge) to the same hose as shown below.
- 2) Using vacuum pump gauge, apply -50 cmHg vacuum into actuator when engine is running at specified idle speed after warmed up. If actuator is 2-step type, apply vacuum to actuator "A" only.
- 3) Then turn ON head light. The engine speed in this state should be within $900 - 1000\text{ r/min (rpm)}$. If not within specification, adjust with idle up adjusting screw 4.



1. Actuator
2. Hose
3. Vacuum pump gauge (09917-47910)
4. Idle up adjusting screw for "A"
5. Idle up adjusting screw

Fig. 4-1-39-1

4) If actuator is 2-step type, after checking and/or adjusting as described in above 3), apply -50 cmHg vacuum to both actuators "A" and "B" and turn ON head light. Then engine speed should be 1,450 – 1,550 r/min. If out of this specified range, adjust with adjusting screw 5.



1. Actuator
2. Hose
3. Vacuum pump gauge (09917-47910)
4. Idle up adjusting screw for "A"
5. Idle up adjusting screw for "B"

Fig. 4-1-39-2

Choke System (Applicable to automatic choke type carburetor)

[Inspection]

- 1) Remove air intake case.
- 2) Check to ensure that choke valve is fully closed when the engine is cold and ambient temperature is below 28°C (82°F). Then check choke valve for smooth operation by pushing choke valve lightly with finger.

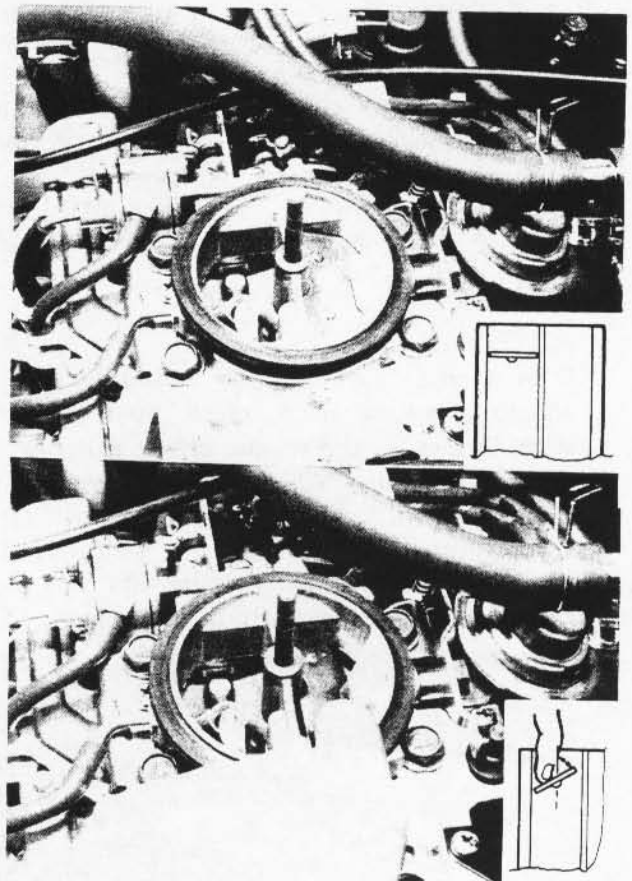


Fig. 4-1-40

- 3) After step 2), start and run engine at idle speed.

And immediately, visually check for clearance between choke valve and carburetor body (indicated as "A" in figure). If valve is open slightly from its fully closed position, vacuum control parts are in good condition.

NOTE:

When engine is warm, clearance "A" becomes larger, varying with temperatures.

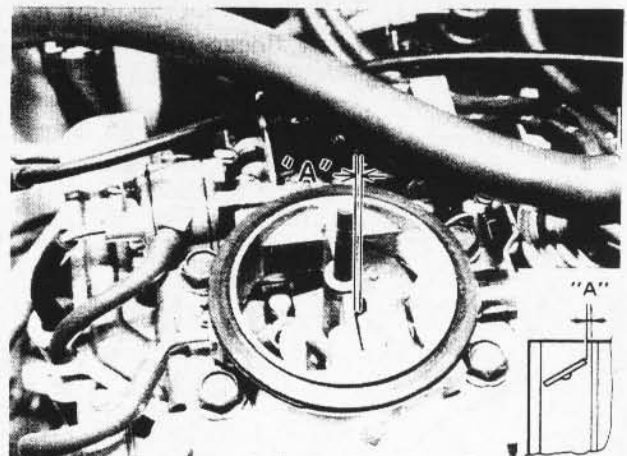


Fig. 4-1-41

- 4) Stop engine. After installing air intake case, start engine again and warm it up fully.
- 5) Stop engine when it is warmed up and remove air cleaner inlet case again, and then check to ensure that choke valve is fully open.

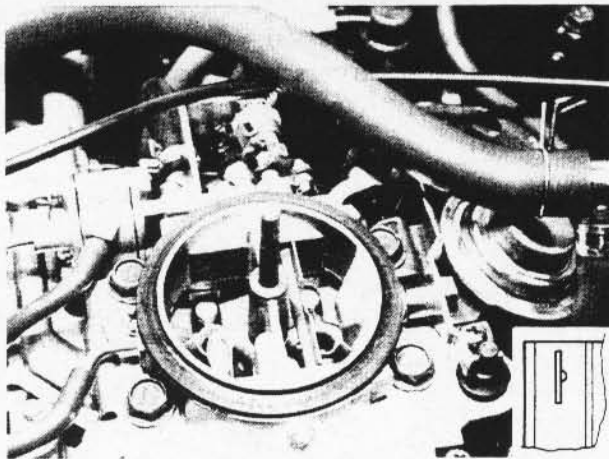


Fig. 4-1-42

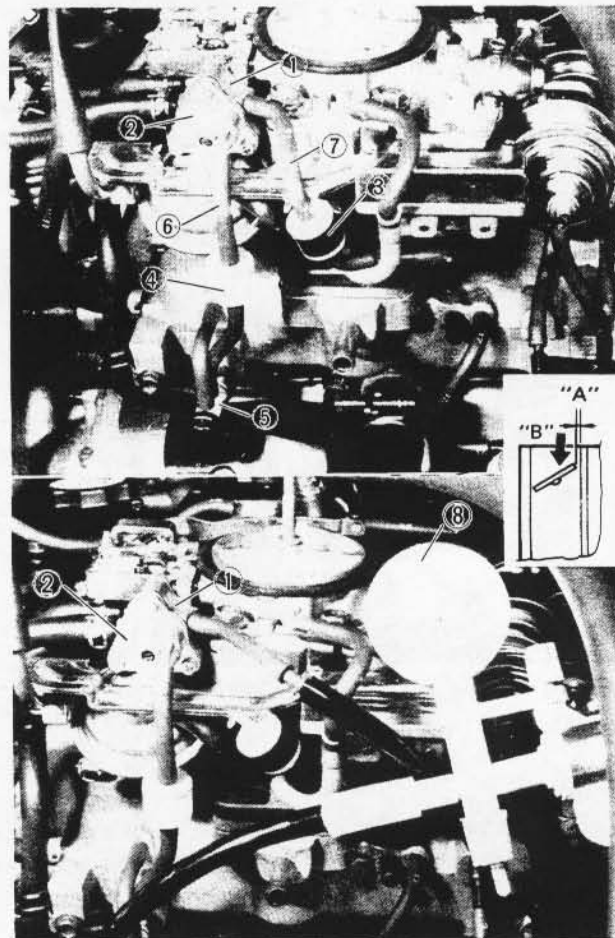
- 6) If nothing was found faulty in the above check, install air cleaner inlet case.
- 7) If step 3) check result is unsatisfactory, check following parts according to each procedure.

[Choke opener] (Water temperature must be below 28°C or 82°F.)

- ① Disconnect hose from choke opener jet 3.
- ② Connect vacuum pump gauge (special tool) to the disconnected hose 5.
- ③ Confirm the following.
 - When -50 cmHg vacuum is applied by using vacuum pump gauge, clearance "A" is within 1.3 - 1.6 mm (0.051 - 0.063 in.) while pushing the choke valve.
 - When pumping is stopped, gauge indicator remains at -50 cmHg position.

If both are checked all right, parts between choke opener 1 (primary side) and choke valve are in good condition, but if not, correct or replace.

Clearance is corrected by bending lever at the end of diaphragm rod.



1. Choke opener (primary side)
2. Choke opener (secondary side)
3. Jet (Green)
4. Jet (Green)
5. BVSV (Yellow)
6. Vacuum hose
7. Vacuum hose
8. Vacuum pump gauge (09917-47910)

"A": Clearance
 "B": Push slightly

Fig. 4-1-43

- ④ After the check and/or correction as described in ③, disconnect vacuum hose 6 coming from secondary side at jet 4.
- ⑤ Apply -50 cmHg vacuum to choke openers (primary and secondary sides) and check for the following.
 - Clearance "C" should be within 2.0 - 2.5 mm (0.079 - 0.098 in) while pushing the choke valve.
 - When pushing is stopped, gauge indicator remains at -50 cmHg position.

If any defect is found, correct or replace.

In this case, clearance "C" can be adjusted by means of adjusting screw 9.

NOTE:

This adjustment must follow confirmation that primary side choke opener is in good condition. This adjusting screw 9 can't adjust primary side choke opener.

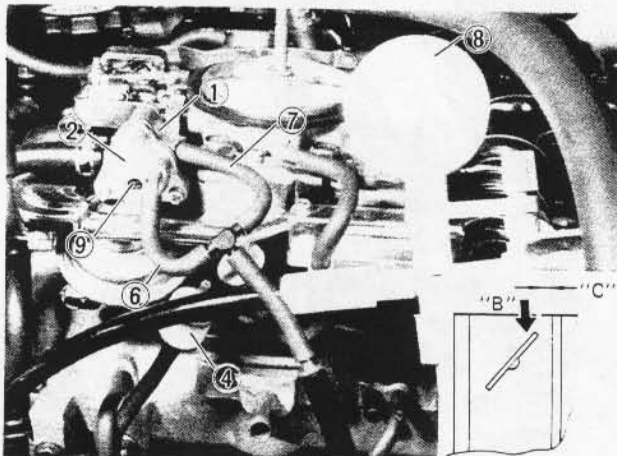


Fig. 4-1-44 "B": Push slightly "C": Clearance
9. Adjusting screw for opener 2

[Jet]

- ① Remove jets 3 and 4 with vacuum hose.
- ② Close one side of jet with finger as shown and apply -50 cmHg vacuum by means of vacuum pump. Then check that vacuum is relieved gradually when finger is taken off. Replace if defective.

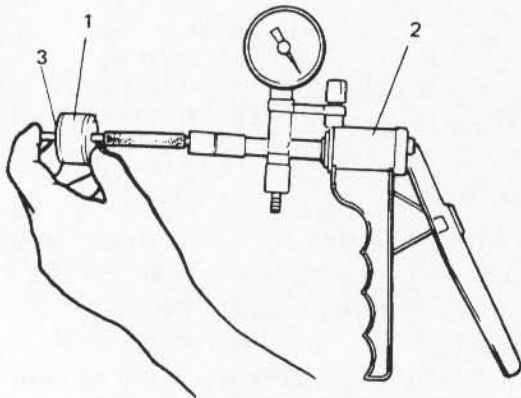


Fig. 4-1-45

1. Jet
2. Vacuum pump gauge (09917-47910)
3. Green

NOTE:

Jets 3 and 4 are the same.
Face green side of jet toward choke opener for installation.

- 8) If, in step 5) check, choke valve doesn't open fully, defect lies in wax-element or its link system.

To locate defect, remove wax-element and link system together from carburetor body and inspect them.

Replace defective part(s).

For this work, try as much as possible, not to loosen nut "A" which fastens lever to wax-element.

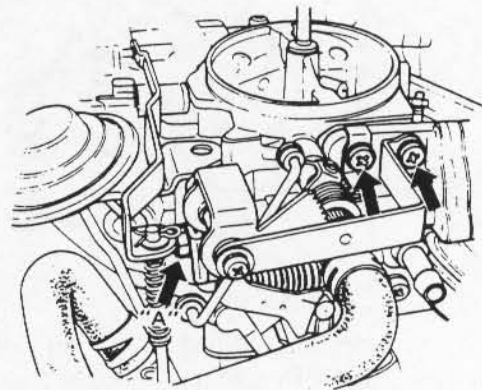


Fig. 4-1-46

Fast Idle

Auto choke type carburetor

[Inspection]

- 1) With air intake case removed, make sure that choke valve is fully closed. (Coolant temperature must be below 25°C or 77°F.)
- 2) Start engine and immediately read engine tachometer. If reading is 1,500 – 2,500 r/min (rpm), fast idle speed is normal.

[Adjustment]

If above inspection result is unsatisfactory, adjust to specification by turning fast idle adjusting screw.

NOTE:

Above each work (whether inspection or adjustment) should be performed quickly as wax-element of choke is affected by temperature.

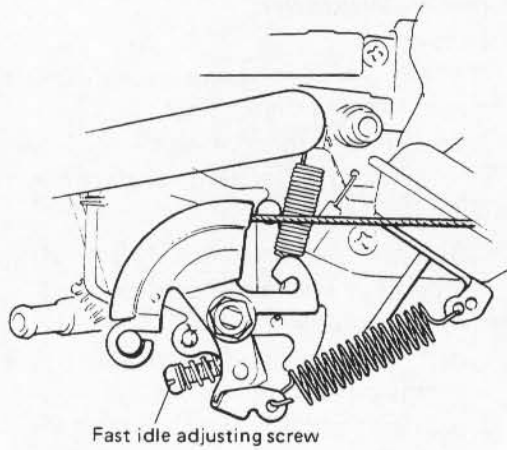


Fig. 4-1-47

Fast idle speed (at less than 25° C or 77° F water temperature)	1,500 – 2,500 r/min (rpm)
---	---------------------------

Manual choke type carburetor
[Inspection]

- 1) Start engine and warm it up to normal operating temperature.
 - 2) Pull choke knob fully and read engine tachometer.
- If reading is below specified speed, fast idle speed is normal.

[Adjustment]

If above inspection result is unsatisfactory, adjust to specification by turning fast idle adjusting screw.

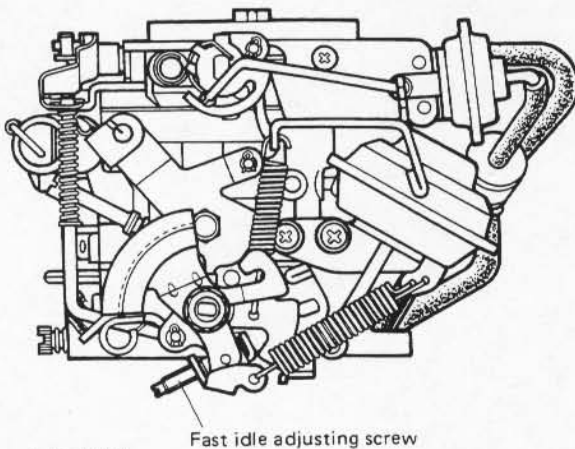


Fig. 4-1-47-1

Fast idle speed at normal operating temperature	4,000 – 4,500 r/min (rpm)
---	---------------------------

Unloader System
(Applicable to Auto Choke Type Carburetor)
[Inspection]

This inspection must be performed when engine is cool (at less than 25° C or 77° F water temperature) and not running.

- 1) Remove air intake case.
- 2) Make sure that choke valve is fully closed.
- 3) Open throttle valve fully. If choke valve opens about half way of its stroke then, unloader system is in good condition.

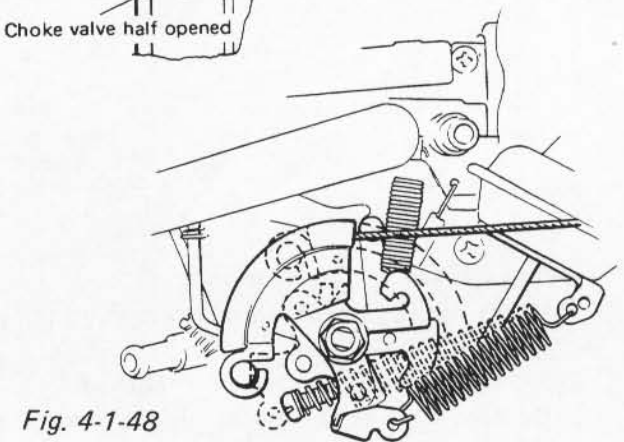
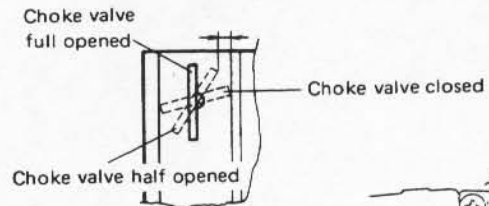


Fig. 4-1-48

[Adjustment]

If found faulty in above inspection, adjust to specification by bending lever "B".

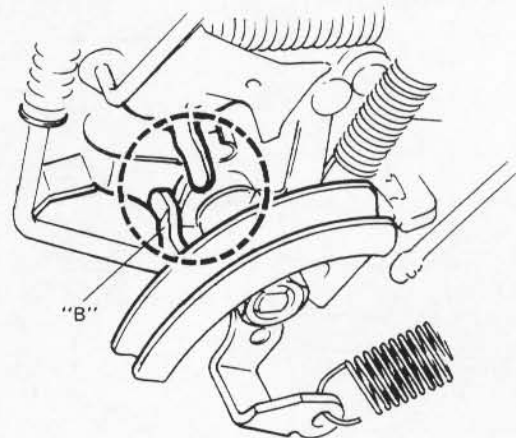
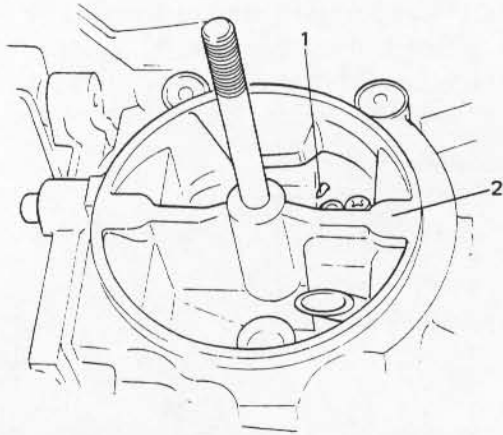


Fig. 4-1-49

Accelerator Pump

[Inspection]

- 1) Remove air intake case.
- 2) Make sure that fuel comes out of pump discharge nozzle when accelerator pedal is depressed.



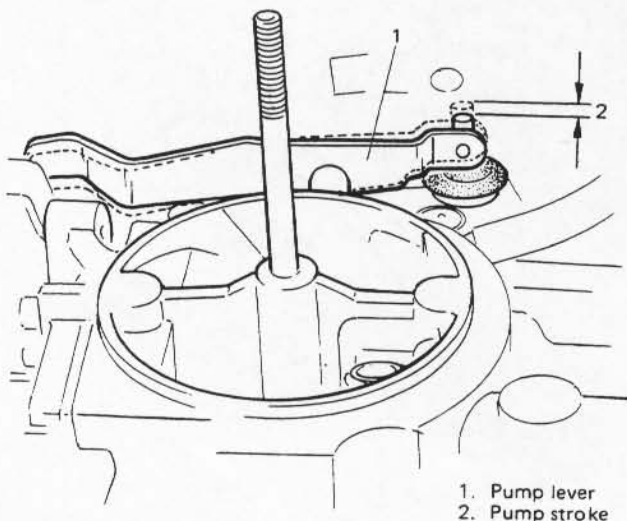
1. Pump nozzle
2. Carburetor

Fig. 4-1-50

[Pump stroke]

- 1) Warm up engine to normal operating temperature.
- 2) Stop engine and remove air intake case.
- 3) Depress accelerator pedal all the way from idle position and take measurement of pump stroke. Pump stroke should be within the specification. If the stroke is out of specification, adjust it by bending the rod.

Pump stroke specification	3.8–4.2 mm (0.15–0.17 in.)
---------------------------	-------------------------------



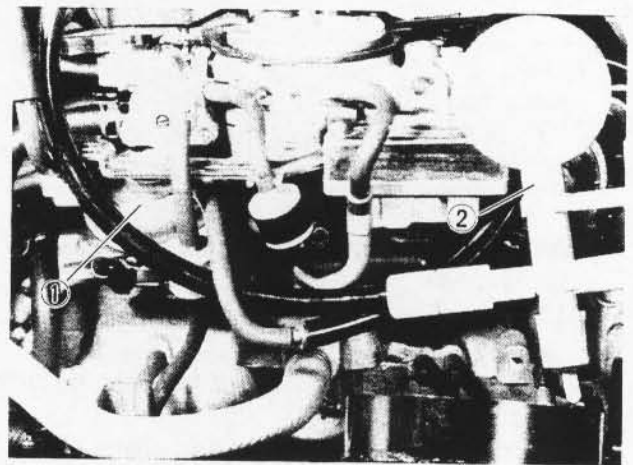
1. Pump lever
2. Pump stroke

Fig. 4-1-51

Secondary Diaphragm

[Inspection]

- 1) Connect Vacuum pump gauge (special tool) to secondary actuator hose.
 - 2) Open primary throttle valve fully and apply 5 – 10 cmHg vacuum, and check for the following.
 - Actuator rod is smoothly pulled up when vacuum is applied to actuator.
 - Rod remains in the same position for over 10 seconds when vacuum pump gauge operation is stopped.
- If rod isn't pulled up or doesn't stay in the same position, replace actuator.



1. Secondary actuator
(diaphragm)
2. Vacuum pump gauge
(0991 7-47910)

Fig. 4-1-52

Fuel Cut System

[Inspection]

- 1) Check to ensure that carburetor fuel cut solenoid makes "clicking" sound when ignition switch key is turned "ON" and "OFF" (without starting engine).

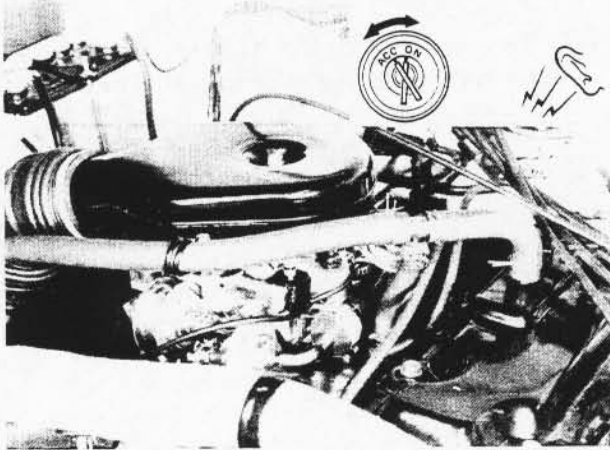


Fig. 4-1-53

If anything faulty was found in step 1), check connector for proper connection and also check by using a voltmeter if electric current is obtained at the coupler of solenoid lead wire when ignition key is turned "ON". Correct or replace if defective.

4-2. AIR CLEANER

GENERAL DESCRIPTION

In the air cleaner case, a dry-type air cleaner element is provided for filtering out dirt and dust from air being drawn into the engine for combustion.

A damaged element must be replaced with a new one, since it allows dust particles to enter the engine if used as it is. Such dust particles could cause wear to the engine inner parts and this further results in decreased output.

Also, the element must be cleaned periodically. Dusty and dirty element causes decrease in output and increase in fuel consumption. The dusty element even after cleaning should be replaced with a new one.

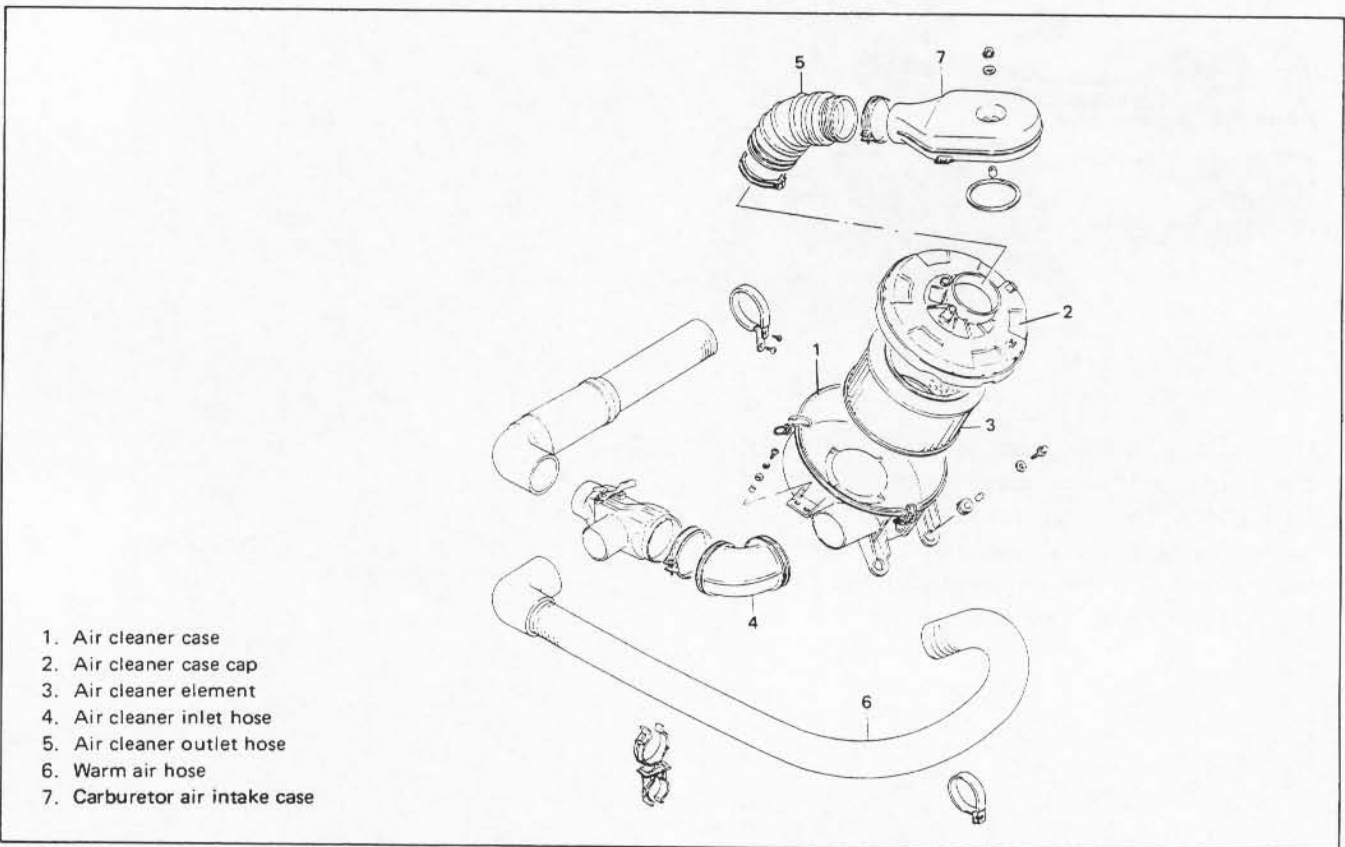


Fig. 4-2-1

MAINTENANCE SERVICES

Air Cleaner Element

Air cleaner element should be cleaned or replaced periodically according to following method.

[Cleaning]

- 1) Remove air cleaner outlet hose and case cap.
If equipped with TCAC system, disconnect vacuum hoses from case cap.

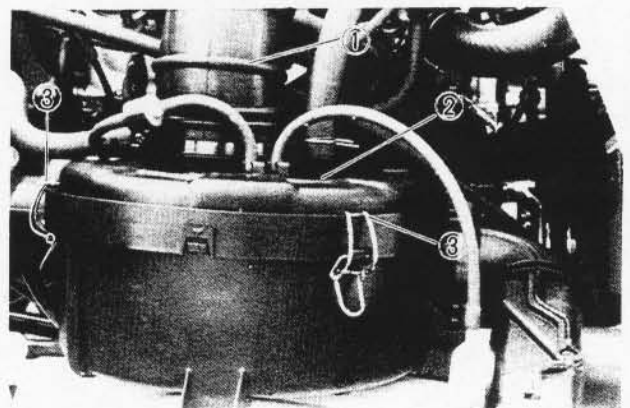


Fig. 4-2-2

1. Air cleaner outlet hose
2. Air cleaner case cap
3. Clamp

- 2) Take out air cleaner element from air cleaner case and blow off dust with compressed air from inside of element.

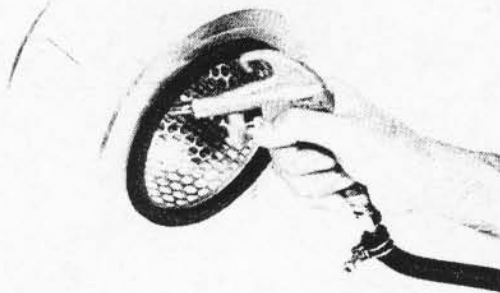


Fig. 4-2-3

- 3) Install element and cap by fitting cap groove to case securely, and be sure to clamp cap. If equipped with TCAC system, connect vacuum hoses.
- 4) Install air cleaner outlet hose.

[Replacement]

- 1) Remove air cleaner outlet hose and case cap. If equipped with TCAC system, disconnect vacuum hoses.
- 2) Remove air cleaner element.

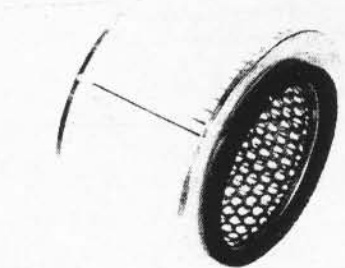


Fig. 4-2-4

- 3) Install new element and cap by fitting cap groove to case securely, and be sure to clamp cap.

Connect TCAC vacuum hoses (if equipped).

- 4) Install air cleaner outlet hose.

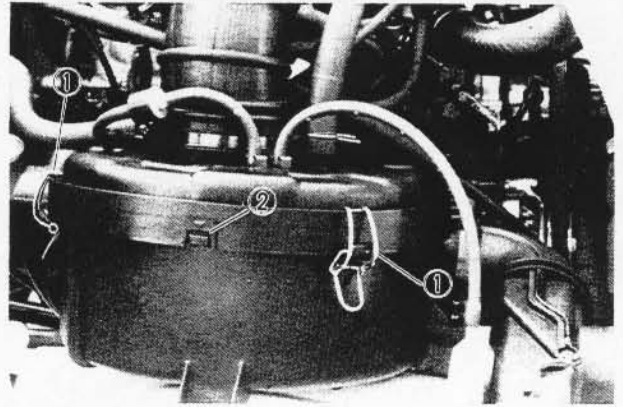


Fig. 4-2-4-1

1. Clamp
2. Groove

4.3. FUEL PUMP, FILTER AND LINES

GENERAL DESCRIPTION

The main components of the fuel system are fuel tank, fuel pump and fuel filter and it includes three lines; fuel feed line, fuel return line and fuel vapor line. Whether equipped with a canister, fuel separator or 2-way check valve in the fuel vapor line or not depends on the vehicle specifications.

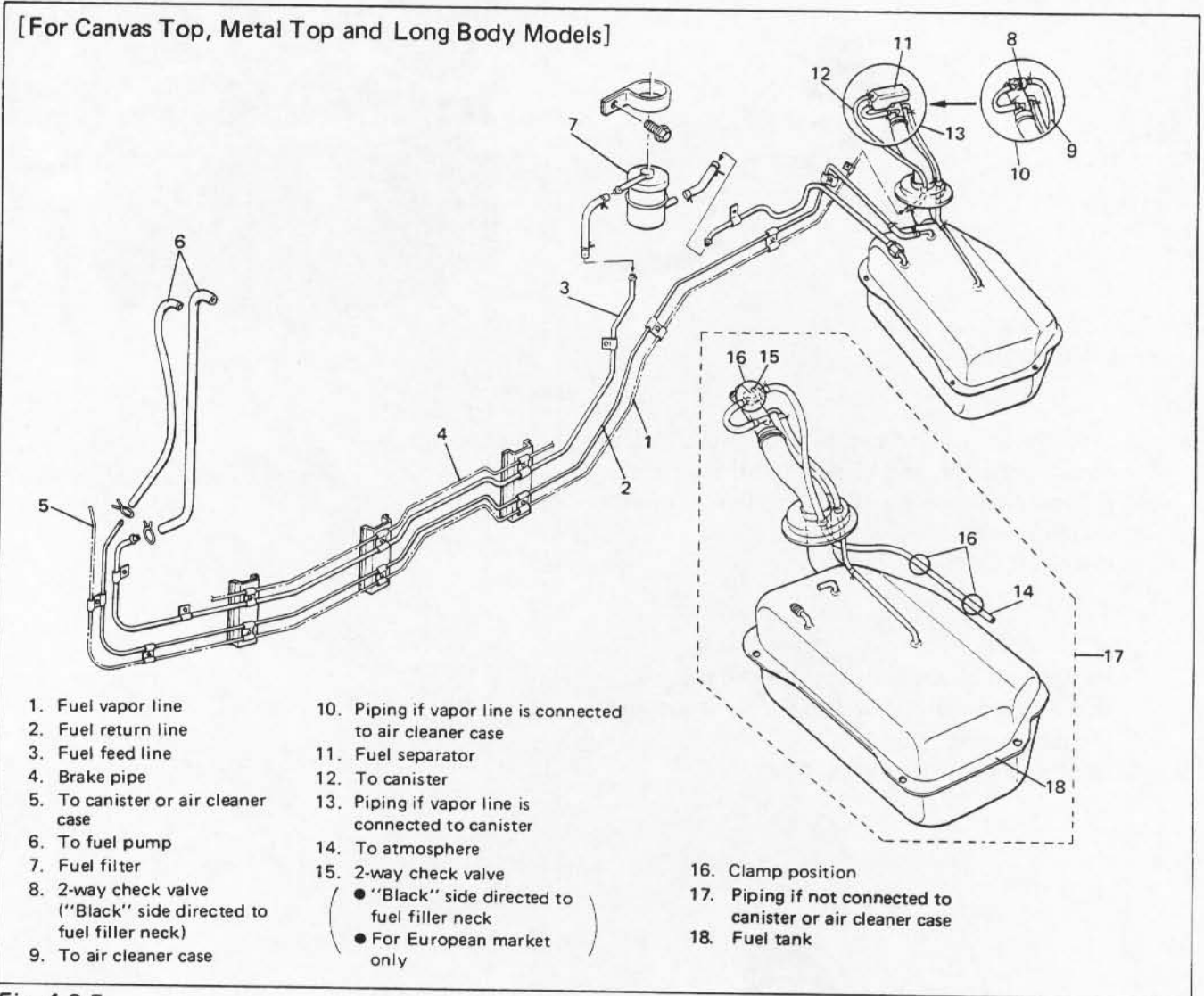
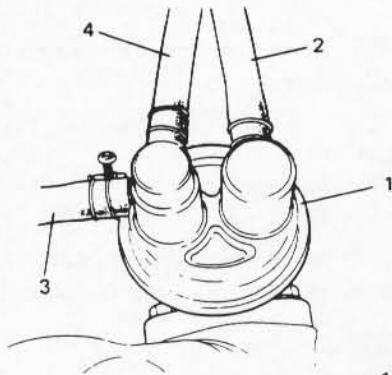


Fig. 4-2-5

Fuel Pump

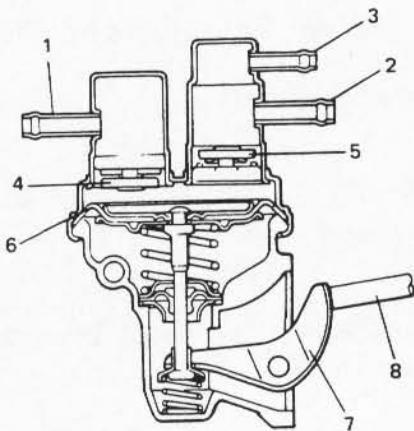
A mechanical fuel pump is mounted on the cylinder head.

The diaphragm in fuel pump is actuated from the cam on the engine camshaft, through a fuel pump rod and a rocker arm of fuel pump. A rocker arm rides on the cam through the fuel pump rod and moves the pump diaphragm up and the fuel pump feeds the fuel into carburetor. A fuel return circuit is provided in this pump in order to avoid "vapor lock". When the float chamber refuses to admit fuel, a slight pressure buildup occurs on the discharge side of the pump and this buildup causes the fuel to flow through the return circuit to the fuel tank. In other words, the fuel pump is kept in action as long as the engine is running, so that the constant flow of fuel through the pump keeps it cool.



1. Fuel pump
2. Inlet hose
3. Outlet hose
4. Return hose

Fig. 4-2-6



1. Inlet
2. Outlet
3. Return tube
4. Inlet valve
5. Outlet valve
6. Diaphragm
7. Rocker arm
8. Fuel pump rod

Fig. 4-2-7

Fuel Filter

Fuel filter is located at the front part of fuel tank, inside the right-hand side of chassis.

Fuel enters the filter through its inlet hole and, after passing through filtering element, comes out of its outlet hole communicated to the fuel pump. This filter is not meant to be disassembled. It is of cartridge type, consisting of a filtering element in a plastic case.

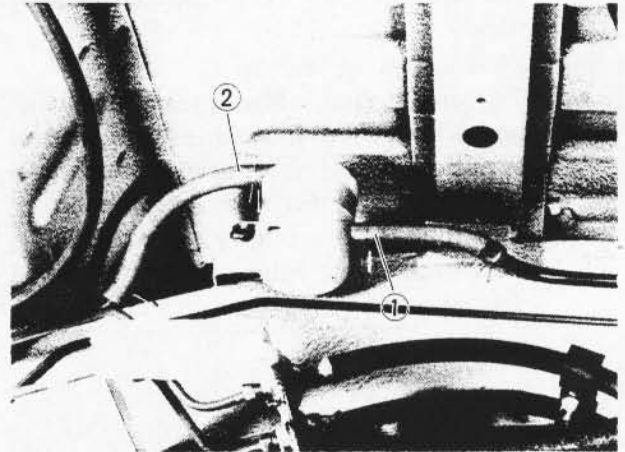
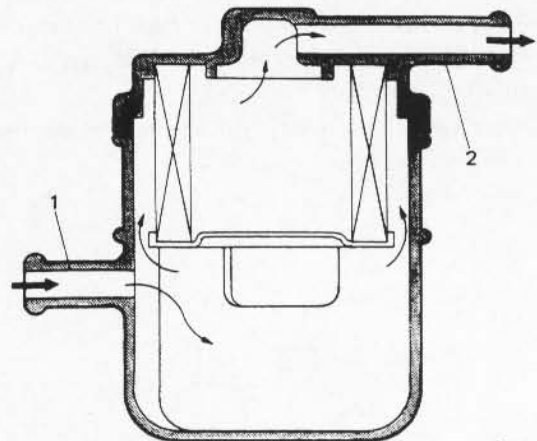


Fig. 4-2-8



1. Inlet
2. Outlet

Fig. 4-2-9

REMOVAL AND INSTALLATION

WARNING:

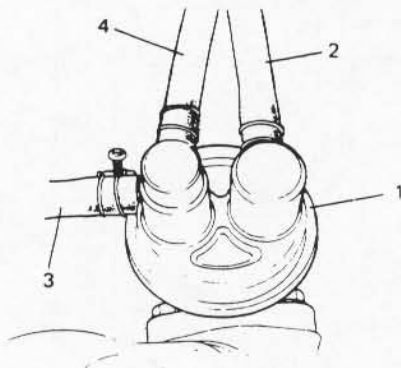
Before attempting service of any type on fuel system, the following cautions should be always observed.

- Disconnect negative cable at battery.
- DO NOT smoke, and place "NO SMOKING" signs near work area.
- Be sure to have CO₂ fire extinguisher handy.
- Wear safety glasses.
- To release fuel vapor pressure in fuel tank, remove fuel filler cap from fuel filler neck and then reinstall it. If pressure in fuel tank is not released beforehand, fuel in fuel tank may come out of fuel hoses due to the pressure when they are disconnected.

Fuel Pump

[Removal]

- 1) Disconnect negative cable from battery.
- 2) Remove fuel filler cap from fuel filler neck to release fuel vapor pressure in fuel tank. After releasing, reinstall the cap.
- 3) Disconnect fuel inlet, outlet and return hoses from fuel pump.



1. Fuel pump
2. Inlet hose
3. Outlet hose
4. Return hose

Fig. 4-2-10

- 4) Remove fuel pump from cylinder head.
- 5) Remove fuel pump rod from cylinder head.

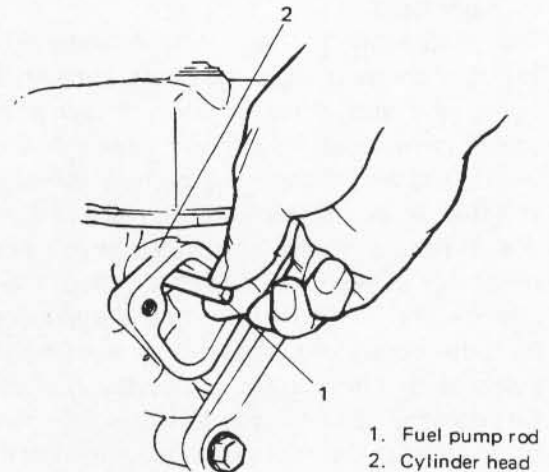


Fig. 4-2-11

[Installation]

Reverse removal procedure for installation using care for the following.

- After oiling it, install fuel pump rod to cylinder head.
- Use new fuel pump gasket.
- Make sure for proper hose connection.
- Upon completion of installation, start engine and check fuel hose or its joints for leaks.

Fuel Filter

[Removal]

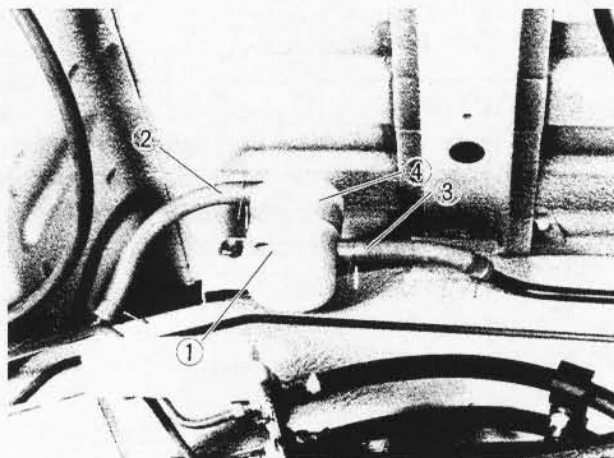
- 1) Disconnect negative cable from battery.
- 2) Remove fuel filler cap to release fuel vapor pressure in fuel tank. After releasing, reinstall the cap.
- 3) Disconnect inlet and outlet hoses from fuel filter.
- 4) Remove fuel filter with clamp.

[Installation]

- 1) Install filter and clamp, and connect inlet and outlet hoses to fuel filter.

NOTE:

The top connection is for outlet hose, the lower one for inlet hose.



1. Fuel filter 3. From fuel tank
2. To fuel pump 4. Clamp

Fig. 4-2-12

- 2) Connect negative cable to battery.
- 3) After installation, start engine and check it for leaks.

Fuel Tank

[Removal]

- 1) Disconnect negative cable from battery.
- 2) Disconnect fuel level gauge lead wire.
- 3) To release the pressure in fuel tank, remove fuel filler cap and then, reinstall it.
- 4) Raise car on hoist.
- 5) Drain fuel by removing drain plug.
- 6) Remove filler hose protector.
- 7) Disconnect filler hose from fuel tank.
- 8) Disconnect fuel hoses from fuel tank.
- 9) Remove fuel tank.

[Fuel Tank Purging Procedure]

WARNING:

This purging procedure will NOT remove all fuel vapor. Do not attempt any repair on tank where heat or flame is required, as an explosion resulting in personal injury could occur.

The following procedure is used for purging the fuel tank.

- 1) After removing fuel tank, remove all hoses, fuel level gauge from fuel tank.
- 2) Drain all remaining fuel from tank.
- 3) Move tank to flushing area.

- 4) Fill tank with warm water or tap water, and agitate vigorously and drain. Repeat this washing until inside of tank is clean. Replace tank if inside is rusty.
- 5) Completely flush out remaining water after washing.

[Installation]

Reverse removal procedure for installation using care for the following.

Refer to Fig. 4-2-5 for piping and clamp positions.

- Make sure for correct hose-to-pipe connection.
- Clamp hoses securely.
- Upon completion of installation, start engine and check hose joints for leaks.

MAINTENANCE SERVICES

Fuel Lines

Visually inspect fuel lines and connections for evidence of fuel leakage, hose cracking, and damage. Make sure all clamps are secure.

Repair leaky joints, if any.

Replace hoses that are suspected of being cracked.

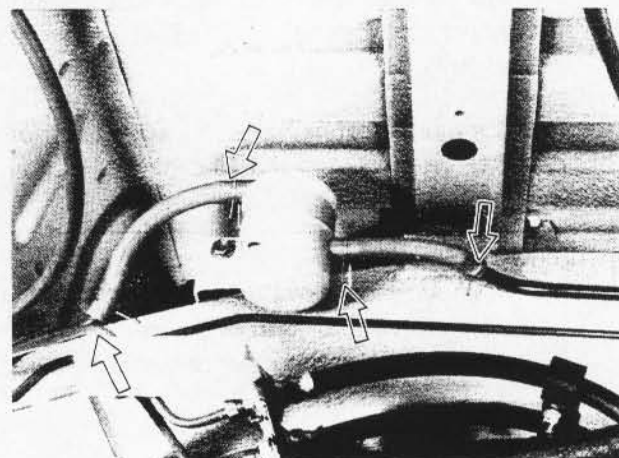


Fig. 4-2-13

Fuel Filler Cap

Visually inspect packing of fuel tank cap.
If it is damaged or deteriorated, replace tank cap with new one.

NOTE:

If cap requires replacement, only a cap with the same features should be used. Failure to use correct cap can result in a serious malfunction of the system.



Fig. 4-2-14

1. Fuel filler cap
2. Fuel filler cap gasket

Fuel filter

As said before, this filter does not permit disassembly: it is to be replaced with a new one periodically.

Replace fuel filter referring to previous item of "Fuel Filter Removal and Installation".

WARNING:

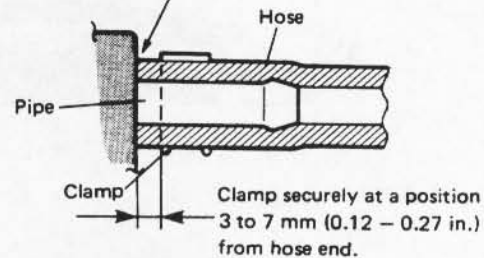
The above procedure must be performed in a well ventilated area and away from any open flames (such as gas hot water heaters).

Fuel Hose Connection

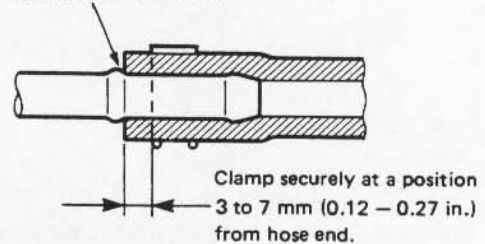
CAUTION:

- Note that fuel hose connection varies with each type of pipe. Be sure to connect and clamp each hose correctly referring to the following.

With following type pipe, fit hose as far as it reaches pipe joint as shown.



With following type pipe, fit hose as far as its peripheral projection as shown.



With following type pipe, fit hose as far as its bent part as shown or till pipe is about 20 to 30 mm (0.79 - 1.18 in.) into the hose.

