SERVICE MANUAL

DATSUN 260Z
MODEL S30 SERIES

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION EF

FUEL SYSTEM

EF

AIR CLEANER

CONTENTS

DESCRIPTION

The air cleaner element is a viscous paper type and does not require cleaning service between renewals.

Note: Never attempt to clean this element with a brush or air blast.

Air cleaner element

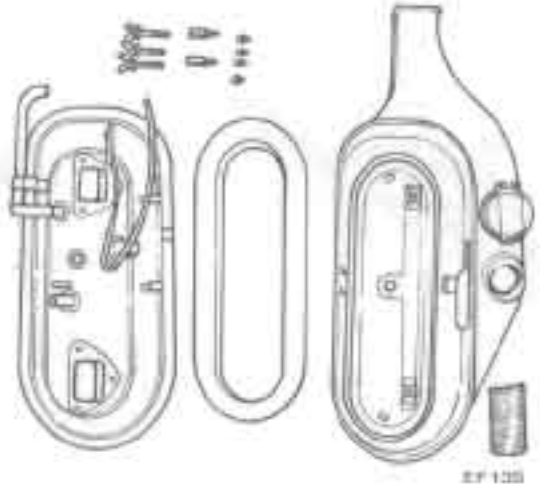
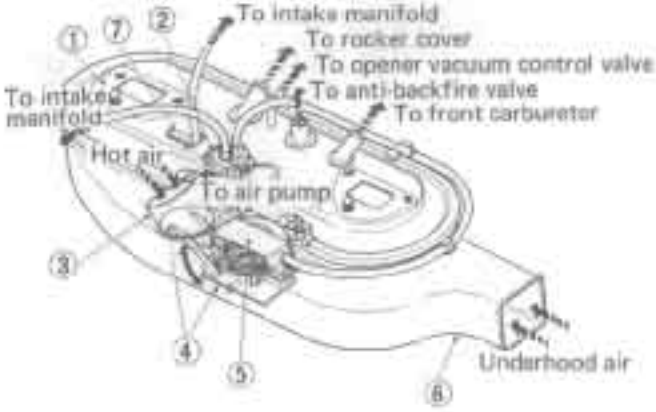


Fig. EF-1 Air cleaner

Automatic temperature control air cleaner

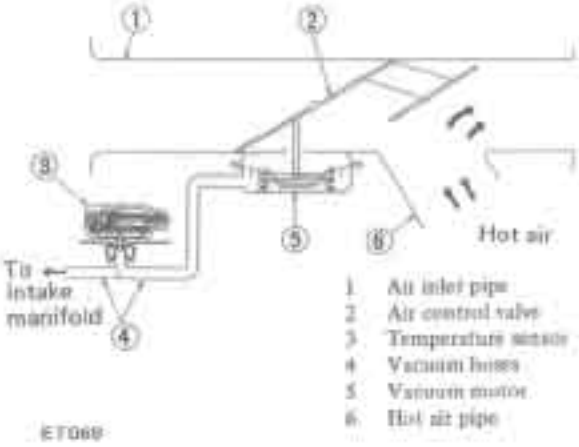
The automatic temperature control air cleaner is a special type provided with a temperature sensor and vacuum-operated valve. The vacuum acting upon the air control valve is controlled by the sensor (See Figure EF-2.).



1 Mounting flange to carburetor
2 Temperature sensor
3 Hot air pipe
4 Air control valve
5 Vacuum motor
6 Underhood air inlet pipe
7 Idle compensator

Fig. EF-2 Automatic temperature control air cleaner

If temperature of suction air is low when engine is running, valve close the underhood air inlet, and introduces hot air through the cover which is installed on the exhaust manifold (See Figure EF-3.).



1 Air inlet pipe
2 Air control valve
3 Temperature sensor
4 Vacuum hoses
5 Vacuum motor
6 Hot air pipe

Fig. EF-3 Hot-air delivery mode (during cold engine operation)

When the temperature of suction air around the sensor reaches 38°C (100°F) and above, sensor actuates to open the valve. When the temperature of suction air around the sensor further rises to above 55°C (130°F), the valve completely opens to prevent entrance of hot air, and allows underhood-air alone to be introduced into carburetor (See Figure EF-4.).

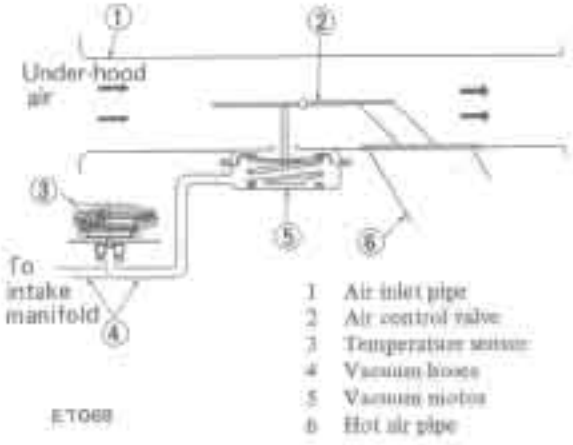


Fig. EF-4 Underhood-air delivery mode (during hot engine operation)

As the valve acts as described above, the temperature of suction air around the sensor is always kept about 46°C (115°F) (See Figure EF-5.).

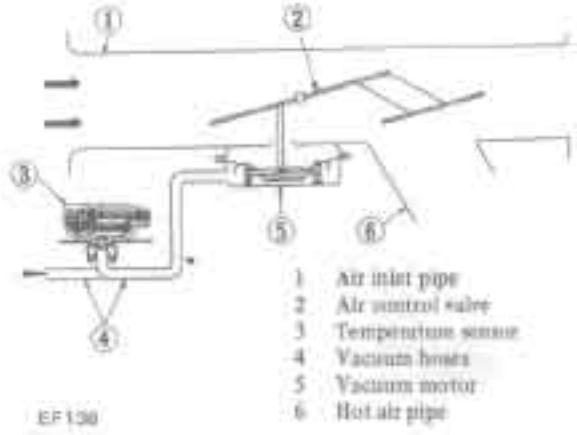


Fig. EF-5 Regulating air delivery mode

When the engine is operating under heavy load, the valve fully opens the underhood-air inlet to obtain full power regardless of temperature around sensor.

This control of carburetor air temperatures allows leaner carburetor calibration than conventional control with accompanying reduced emissions and elimination of carburetor icing.

REMOVAL AND INSTALLATION

1. Remove three thumbscrews and detach air cleaner cover.

2. Disconnect various hoses.

- Two air pump hoses
- Two air pump hoses
  (to anti-backfire valve and to air pump)
- Evaporation hose
  (to carbon canister)
- Slow air by-pass hose
  (to front carburetor)
- Idle compensator hose
  (to intake manifold)
- Temperature sensor hose
  (to intake manifold)
- Blow-by gas hose
  (to rocker cover)
- Throttle opener vacuum hose; automatic transmission model only
  (to opener control valve)
- Hot air duct hose
  (to exhaust manifold)

3. Remove six screws securing air cleaner flange to carburetor, and detach air cleaner flange.

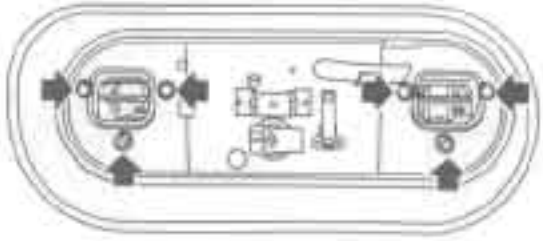


Fig. EF-6 Removing air cleaner flange

4. Install air cleaner assembly in the reverse order of removal.

Note: Be careful not to deform air duct when installing.

TEMPERATURE SENSOR

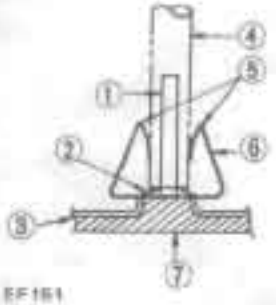
Removal and installation

Removal

1. Flatten the tabs of clip with pliers.
2. Pull out hoses.

Note: Note the respective positions of the hoses from which they were removed.

3. Pry the tab of clip with a screwdriver.
4. Take off sensor and clip.



1 Pipe
2 Catch
3 Fixed with adhesive
4 Hose
5 Tab
6 Clip
7 Gasket (rubber)

Fig. EF-7 Removing sensor

Installation

1. Install sensor and gasket assembly in their proper positions.

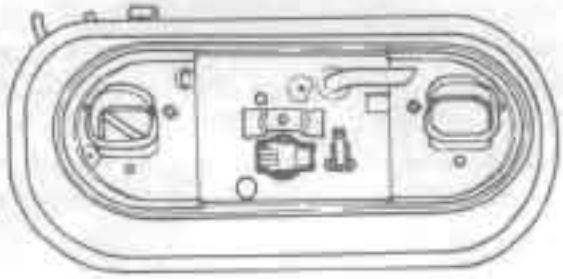


Fig. EF-8 Installing sensor

2. Insert clip. Be sure to hold sensor at the correct position to avoid damage.

3. Connect hoses to their proper positions.

Note: Use care not to damage sensor.

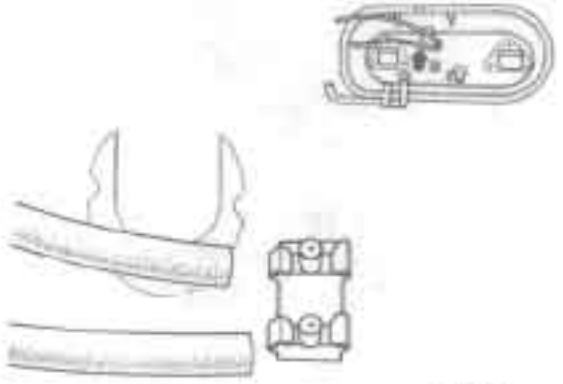


Fig. EF-9 Inserting clip

IDLE COMPENSATOR

DESCRIPTION

The idle compensator is essentially a thermostatic valve which compensates for excessive enriching of the mixture as a result of high idle temperatures. When under-the-hood temperatures are high, the bi-metal located in the air cleaner is heated by intake hot air and opens the valve. The idle compensator thermostatic valve opens partially at 60°C (140°F) and fully at 75°C (167°F).

If bi-metal does not function when it reaches specified operating temperature and valve does not open, or if valve opens before bi-metal reaches the operating temperature, erratic engine operation at idling may be the cause.

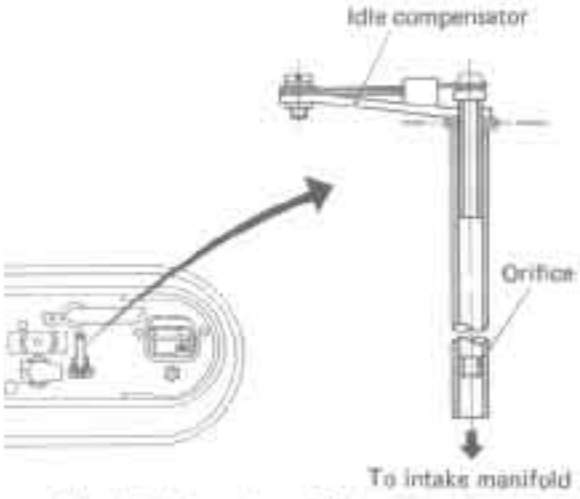


Fig. EF-10 Location of idle compensator

REMOVAL AND INSTALLATION

To remove idle compensator, detach air cleaner cover and loosen two screws securing compensator in place. To install, reverse the order of removal.

CHECKING IDLE COMPENSATOR

Note: Never attempt to disassemble this unit since it is sealed for tightness and properly adjusted for valve timing.

1. Make sure that valve is closed when bi-metal is held below specified operating temperature. To do so, inhale air in or out of tube as shown in Figure EF-11. If there is excessive air leakage at or around valve, renew valve.

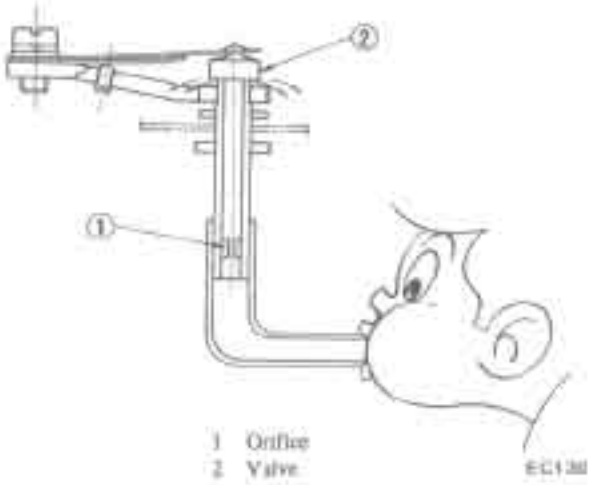


Fig. EF-11 Checking idle compensator

2. Visually check that valve is open when bi-metal is held at specified operating temperature. If valve does not open, replace.

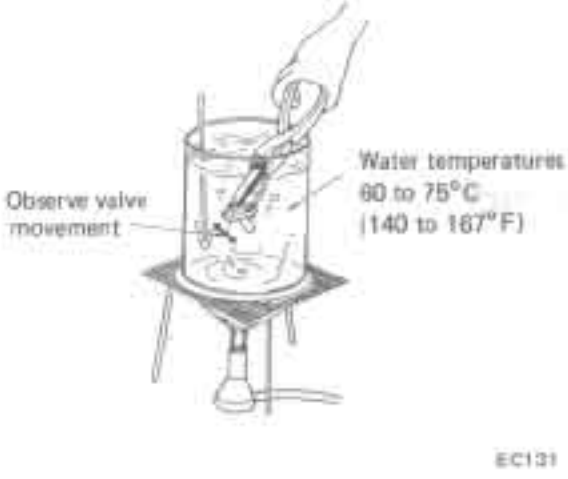


Fig. EF-12 Checking idle compensator

3. If checks given in steps 1 and 2 above reveals that valve is inoperative, renew valve.

FUEL STRAINER

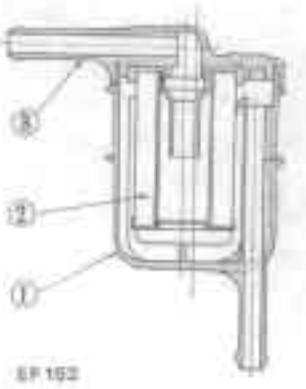
DESCRIPTION

The fuel strainer is of a cartridge type. It uses a paper element which can be checked for condition from the outside.

REMOVAL

Disconnect inlet and outlet fuel lines from fuel strainer, and remove fuel strainer.

Note: Before disconnecting fuel lines, use a container to receive the remaining fuel in lines.



1. Body
2. Paper element
3. Cover

Fig. EF-13 Sectional view of cartridge type fuel strainer

ELECTRIC FUEL PUMP

CONTENTS

DESCRIPTION

The electric fuel pump is connected in series with the mechanical fuel pump. It operates only when the engine is in the state shown in the following chart.

Ignition switch / Engine rpm	ON	Starter
below 400 rpm	OFF	OFF
above 400 rpm (normal engine revolution)	ON (operate)	OFF

The silicon transistor type fuel pump consists of transistor, diodes, solenoid, pump mechanism and strainer parts.

This transistor fuel pump present several distinct features such as follows:

1. No vapor lock in torrid zones.
2. Starts pumping immediately as the ignition switch is turned on.
3. Built-in type filter and magnet keep out dust and iron filings of fuel, and add to pump and engine life. See Figure EF-14.

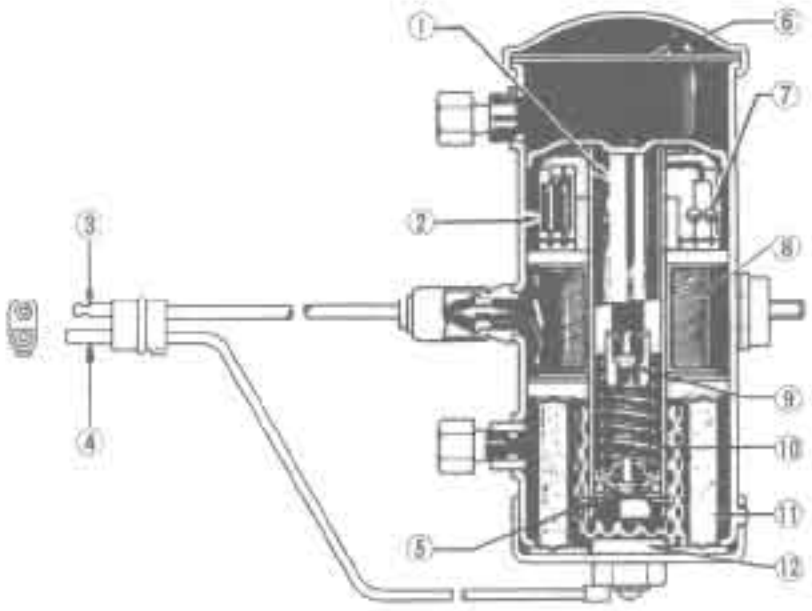


Fig. EF-14 Construction of fuel pump

OPERATION

Electric pump "ON" & "OFF" system

This system controls the operation of the electric fuel pump according to the engine speed. It receives the engine speed information from a voltage generated by the voltage regulator. When the engine is running below 400 rpm, the electric fuel pump cut relay No. 1 remains "OFF" and the pump will not be operated. While cranking the engine, the electric fuel pump cut relay No. 2 remains "OFF" and the pump will not be operated.

Under normal engine running condition, both the electric pump and the mechanical pump are operated.

These two relays are located on the relay bracket attached to the dash panel on the assist seat side in the passenger compartment.

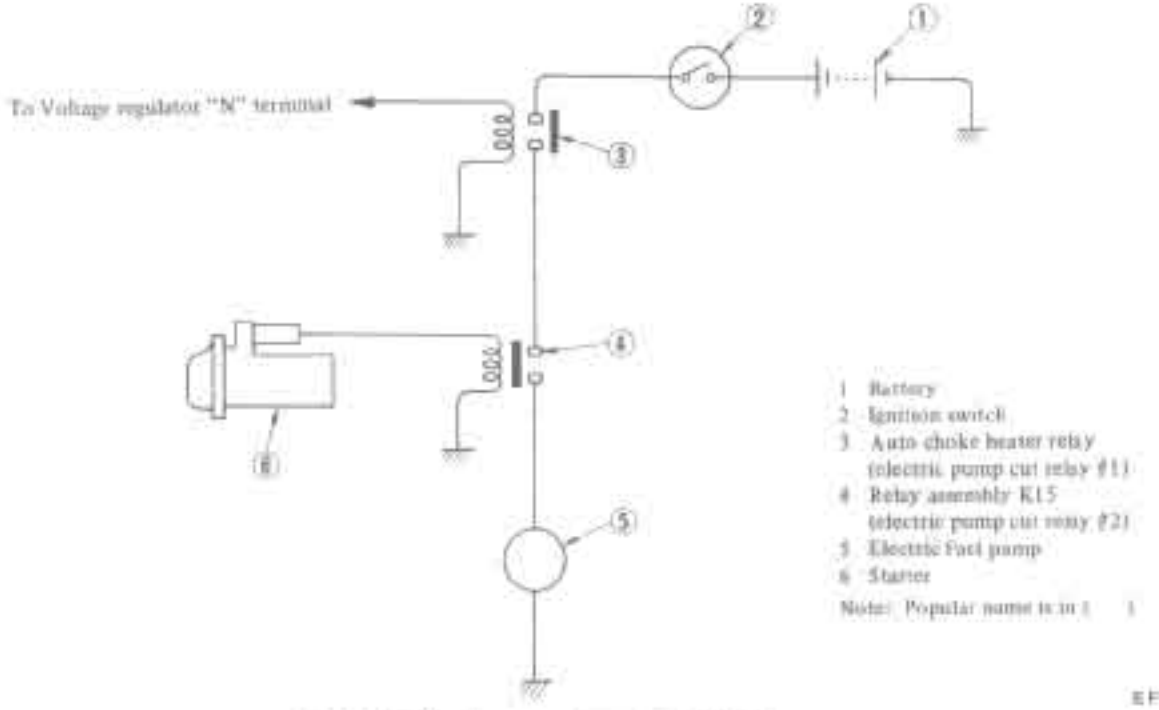


Fig. EF-15 Fuel pump system circuit diagram

Operation of electric pump

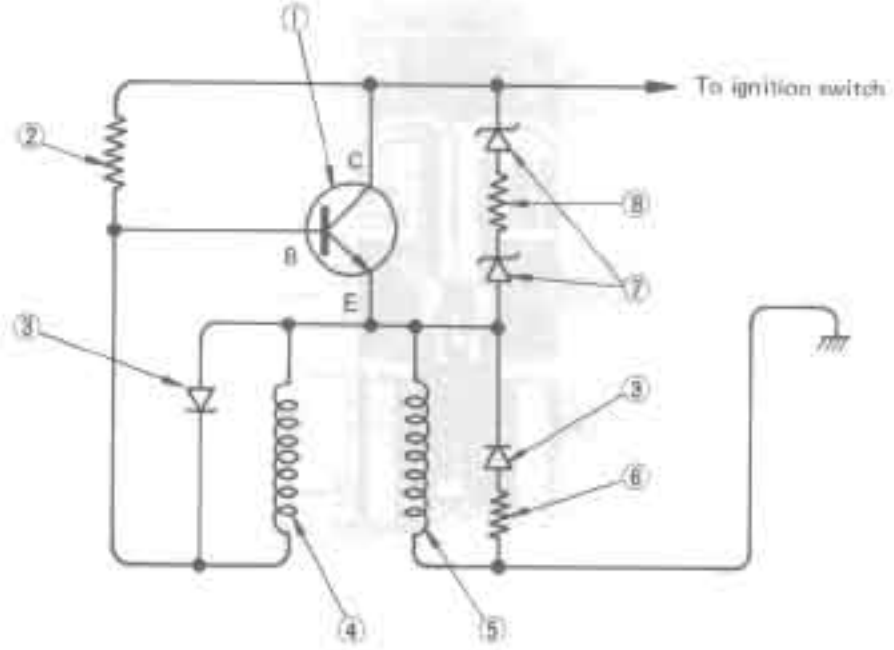


Fig. EF-16 Fuel pump circuit diagram

When the key switch is turned on, current flows through the coil and resistor (1) to the transistor.

The current further increases in strength as it passes through the signal coil.

When the current flows through the main coil, there is then a magnetic pull, pulling the plunger against the force of the return spring.

When the plunger is so pulled down, reverse current begins to flow through the signal circuit, cutting off the transistor. See Figures EF-15 and EF-16.

1. Suction stroke

When current flows through the main coil, the plunger is pulled down by magnetic force. As this takes place, fuel pushes up the outlet valve and enters the top end of the plunger. See Figure EF-17.

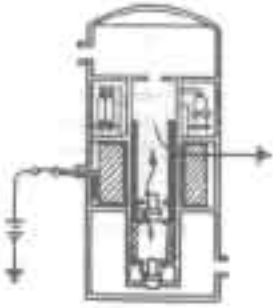


Fig. EF-17 Suction stroke

2. As the transistor is cut off, the plunger is pushed up by the return spring, forcing fuel out. Then the plunger sucks up fuel at the bottom end of the plunger through the inlet valve. See Figure EF-18.

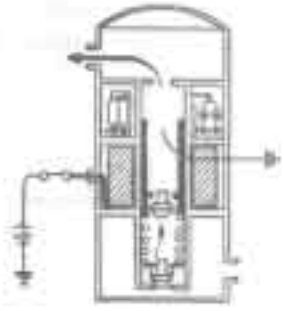


Fig. EF-18 Discharge stroke

The same sequence of events takes place to continue supplying fuel to the engine.

These processes 1 and 2 are repeated continuously.

TESTING

1. Disconnect fuel hose at pump outlet.

2. Connect a suitable hose [approximately 6 mm (0.236 in) inner diameter] to pump outlet.

Note: If diameter is too small, the following proper delivery capacity can not be obtained even if pump functions property.

3. With hose outlet in a higher position than pump, operate pump and check delivery capacity for more than 15 seconds.

4. The capacity should be 1,400 cc (85.43 cu in) in one minute or less.

If no gasoline, or only a little flows from open end of pipe with pump operated, or if pump does not work, perform the following diagnosis.

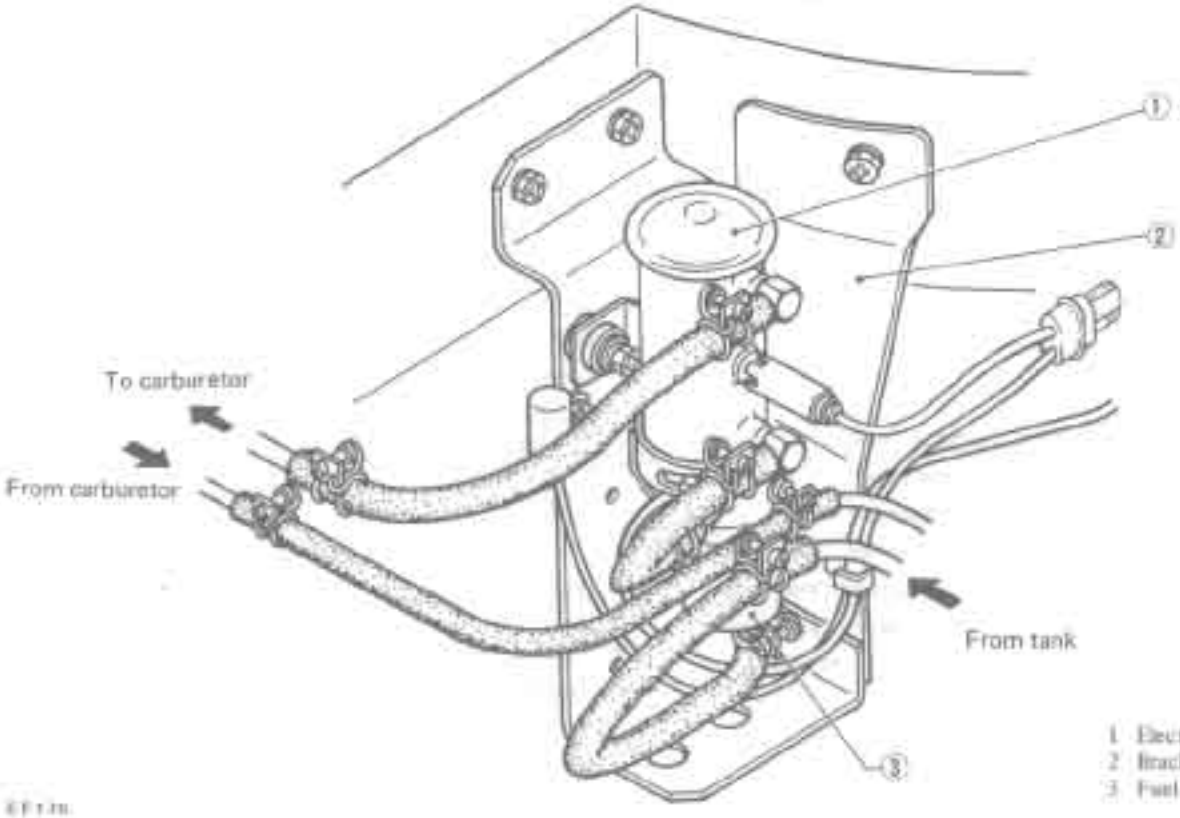
Notes: a. Do not connect battery in reverse polarity which, if left for a long time, would damage transistor circuit and disable the pump.

b. Do not let fall the pipe, as it may damage the electronic components.

c. Do not apply overvoltage (max. 18V). Overvoltage starting by quick charge or overvoltage running would deteriorate or damage electronic components.

Fuel pressure (maximum)
0.32 kg/cm² (4.6 psi)

REMOVAL AND INSTALLATION



1. Electric fuel pump
2. Bracket
3. Fuel strainer

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Fig. EF-19 Fuel pump and fuel strainer

Fuel pump is installed on bracket with two bolts. This bracket is located in the corner at intersection of differential mounting member with side member.

1. Remove inlet hose from fuel strainer. Also remove outlet hose running to engine. Receive fuel remaining in fuel hose in a suitable container.

2. Disconnect harness at positive and negative connections.

3. Remove bolts securing fuel pump to bracket, and detach fuel pump.

DISASSEMBLY AND ASSEMBLY

Do not disassemble unless pump is at fault.

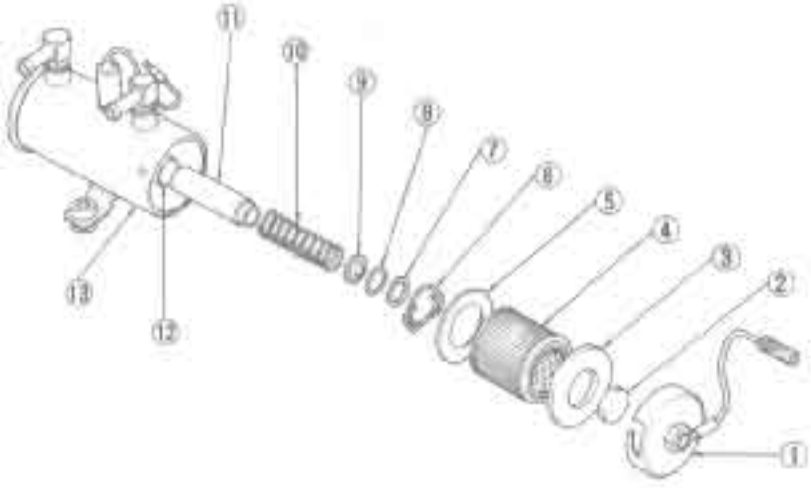
Disassembly

1. Remove cover with wrench and take out cover gasket, magnet, and filter from pump body.

2. When removing plunger, take out spring retainer from plunger tube.

3. Then, take out washer, O-seal ring, inlet valve, return spring and plunger from tube. See Figure EF-20.

Note: Do not disassemble electronic components. If necessary, replace with a new one.



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1. Cover
2. Magnet
3. Cover gasket
4. Filter
5. Gasket
6. Spring retainer
7. Washer
8. O-seal ring
9. Inlet valve
10. Return spring
11. Plunger
12. Plunger cylinder
13. Body

Fig. EF-20 Exploded view of fuel pump

Assembly

Before assembly, clean all parts with gasoline and compressed air completely.

Notes: a. If gasket and filter are faulty, replace.
b. Clean magnet and cover for fault.
c. Take care not to deform thin tube.
d. Assemble plunger, return spring, inlet valve, O-ring washer and set spring retainer in that order.
e. Assemble filter, gasket and cover with magnet.
f. Tighten cover with wrench to the stopper.

INSPECTION

If component parts are dirty after disassembly, clean as follows:

- Wash filter and strainer with clean gasoline and blow with compressed air. When cleaning parts, check filter and gasket. If faulty, replace.
- Wash plunger, plunger tube and inlet valve with clean gasoline, and blow dust off with compressed air.

2. Check component parts for wear or damage.
If they are found faulty, replace them.

3. Insert plunger assembly into plunger tube of body and apply electric current to it.
Move the assembly up and down.
If the assembly does not move, it shows that the electric unit is faulty, and it must be replaced.

TROUBLE DIAGNOSES AND CORRECTIONS

Condition	Probable cause	Corrective action
Fuel pump fails to operate.	Terminals or connections loose. Rust on terminals or grounding metal. Frozen liquid in plunger or pump.	Retighten. Clean. Clean plunger assembly. Replace pump if plunger is stuck or seized.

Condition	Probable cause	Corrective action
Fuel pump fails to discharge sufficient flow.	Clogged filter.	Clean pump interior. Clean and, if necessary, replace strainer.
Insufficient fuel discharge during high speed travelling. Low float level at idling.	Insufficient fuel.	Replenish.
	Fuel hose disconnected.	Connect.
	Air in fuel hose through connections.	Apply a coating of end sealing compound to connections, and retighten.
	Hose necked down or bent.	Check and correct.
	Fuel tank breather tube bent or necked down.	Check and correct.
	Weakened return spring.	Replace.
Fuel pump actuates more frequently than under normal condition.	Air sucked through connection (fuel hose and fuel pump joint).	Apply a coating of end sealing compound to connection, and retighten.
	Fuel hose (on suction side) bent.	Check and correct.
	Clogged strainer.	Clean or replace strainer.
Rattling noise	Mounting bolts loose.	Retighten.

MECHANICAL FUEL PUMP

CONTENTS

DESCRIPTION

The fuel pump transfers fuel from the tank to the carburetor in sufficient quantity to meet engine requirements at any speed or load. The fuel pump is of a pulsating type designed for easy maintenance. It consists of a body, rocker arm and link assembly, fuel diaphragm, fuel diaphragm spring, seal, inlet and outlet valves.

The fuel diaphragm consists of specially treated rubber, which is not affected by gasoline, held together by two metal discs and a pull rod.

FUEL PUMP TESTING

A fuel pump is operating properly when its pressure is within specifications and its capacity is equal to the engine's requirements at all speeds. Pressure and capacity must be determined by two tests, while the pump is still mounted on the engine. Be sure there is gasoline in the tank when carrying out the tests.

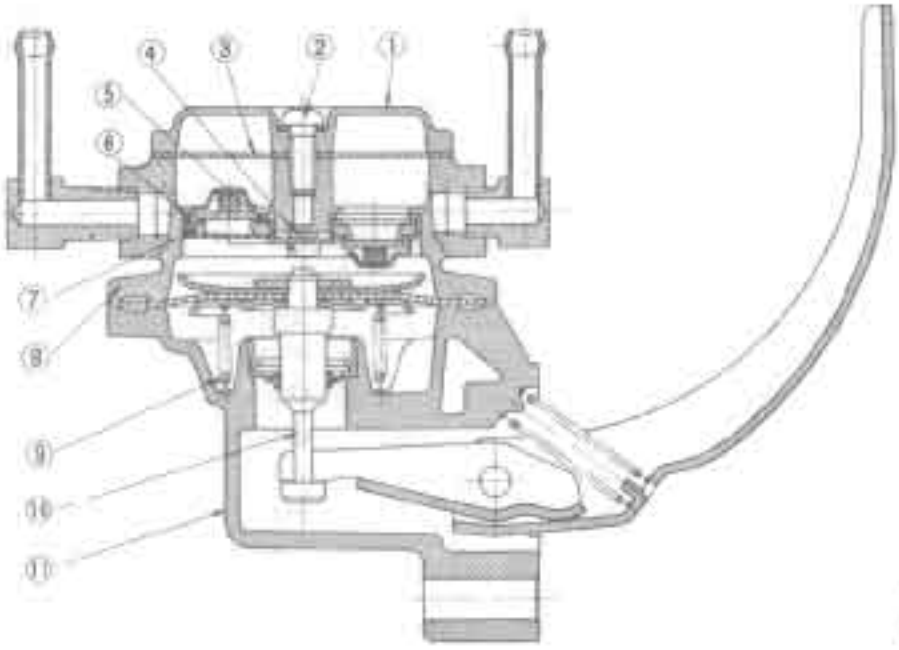


Fig. EF-21 Sectional view of fuel pump

Static pressure test

The static pressure test should be conducted as follows:

1. Disconnect fuel line between carburetor and fuel pump.

2. Connect a rubber hose to each open end of a T-connector, and connect this connector-hose assembly between carburetor and fuel pump.

Note: Locate T-connector as close to carburetor as possible.

3. Connect a suitable pressure gauge to the opening of T-connector, and securely fasten hose between carburetor and T-connector with a clip.

4. Run the engine at varying speeds.

5. The pressure gauge indicates static fuel pressure in the line. The gauge reading should be within the following range.

0.24 to 0.30 kg/cm² (3.41 to 4.27 psi)

Note: If fuel in carburetor float chamber has run out and engine has stopped, remove clip and pour fuel into carburetor. Fasten clip securely and repeat static pressure test.

Pressure below the lower limit indicates extreme wear on one part or a small amount of wear on each working part. It also indicates a ruptured diaphragm; worn, warped, dirty or gumming valves and seats, or a weak diaphragm return spring. Pressure above the upper limit indicates an excessively strong tension of diaphragm return spring or a diaphragm that is too tight. Both of these conditions require removal of pump assembly for replacement or repair.

Capacity test

The capacity test is conducted only when the static pressure is within the specification. To conduct this test, proceed as follows:

1. Disconnect pressure gauge from T-connector and, in its vacant place, install a suitable container as a fuel sump.

2. Start engine and run at 1,000 rpm.

3. Pump should deliver 1,600 cc (97.63 cu in) of fuel in one minute or less.

If little or no fuel flows from the open end of pipe, it is an indication that fuel line is clogged or pump is malfunctioning.

REMOVAL AND DISASSEMBLY

Remove fuel pump assembly by unscrewing three mounting bolts and disassemble in the following order.

1. Separate upper body and lower body by unscrewing body set screws.

2. Take off cap and cap gasket by removing cap screws.

3. Unscrew elbow and connector.

4. Take off valve retainer by unscrewing two valve retainer screws and two valves are easily removed.

5. To remove diaphragm, diaphragm spring, lower body seal washer and lower body seal from lower body, press down diaphragm counter to force of diaphragm spring with diaphragm pressed down, tilt it until the end of pull rod touches the inner wall of body. Then, release diaphragm to unhook push rod. Use care during this operation not to damage diaphragm or oil seal.

6. Drive rocker arm pin out with a press or hammer.

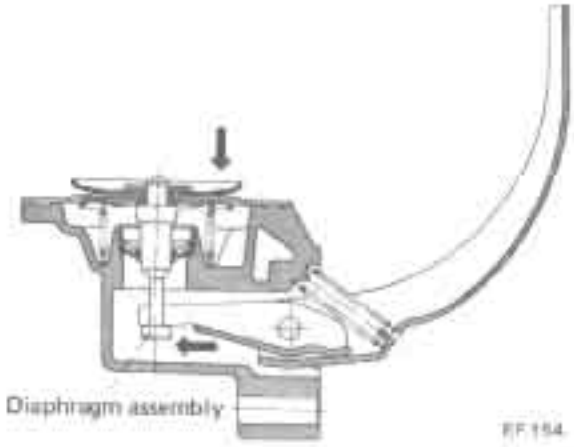
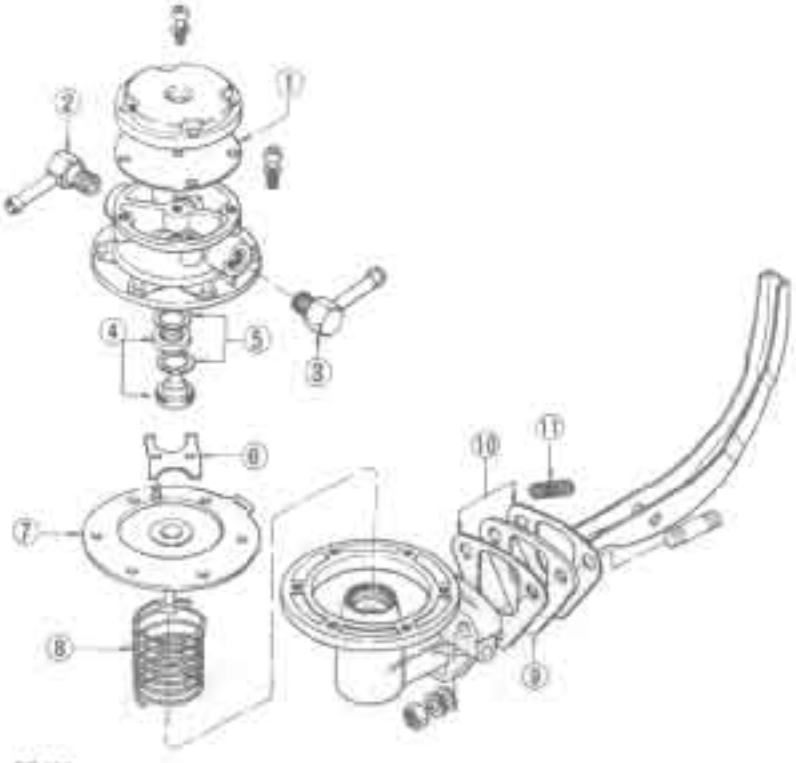


Fig. EF-22 Pull rod removal



1 Gasket
2 Inlet pipe
3 Outlet pipe
4 Valve assembly
5 Valve gasket
6 Valve retainer
7 Diaphragm
8 Diaphragm spring
9 Spacer
10 Gasket
11 Rocker arm spring

Fig. EF-23 Components of fuel pump

INSPECTION

1. Check upper body and lower body for cracks.

2. Check valve assembly for wear of valve and valve spring. Blow valve assembly by breath to examine its function.

3. Check diaphragm for small holes, cracks and wear.

4. Check rocker arm for wear at the portion in contact with camshaft.

5. Check rocker arm pin for wear since a worn pin may cause oil leakage.

6. Check all other components for any abnormalities and replace if necessary.

ASSEMBLY

Assembly is in the reverse order of disassembly. When reassembling and reinstalling, the following points should be noted.

1. Use new gaskets.

2. Lubricate rocker arm, rocker arm link, rocker arm pin and lever pin before installation.

3. To perform functional tests, position fuel pump assembly about 1 meter (3.3 ft) above fuel level with a pipe connecting fuel pump and fuel strainer and operate rocker arm by hand. If fuel is drawn up soon after rocker arm is released, pump is functioning properly.

HEAT SHIELD MATERIAL FOR FUEL LINES

DESCRIPTION

For increased heat resistance, the fuel tube in the engine compartment is wrapped with heat shield material of glass fiber. Refer to Figure EF-24.

INSPECTION

Check for tightness of clamp retaining heat shield material.

Replace fuel tube assembly if heat shield material is cracked or deteriorated.

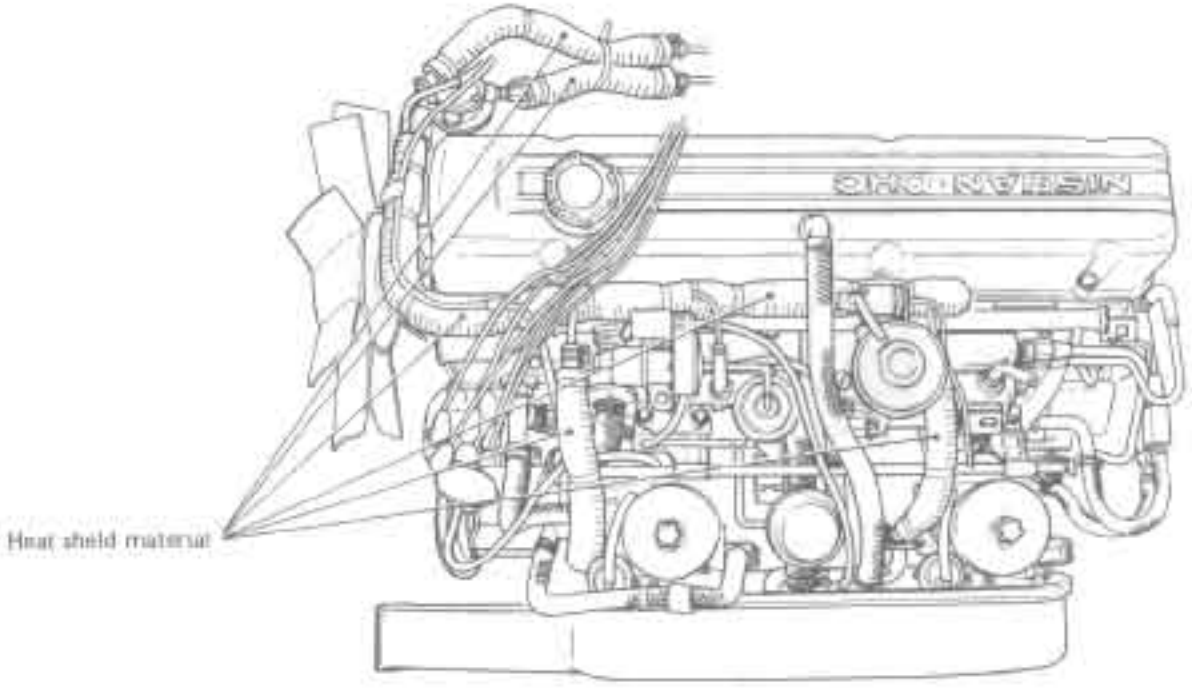


Fig. EF-24 Heat shield material for fuel line

SU TYPE TWIN CARBURETOR

CONTENTS

DESCRIPTION

The model HMB46W-4 carburetor is of a horizontal, variable venturi type. This carburetor is designed to keep constant flow of intake air through the venturi under all engine speeds. That is, the venturi opening is automatically adjusted by sliding the suction piston in accordance with change in the volume of intake air.

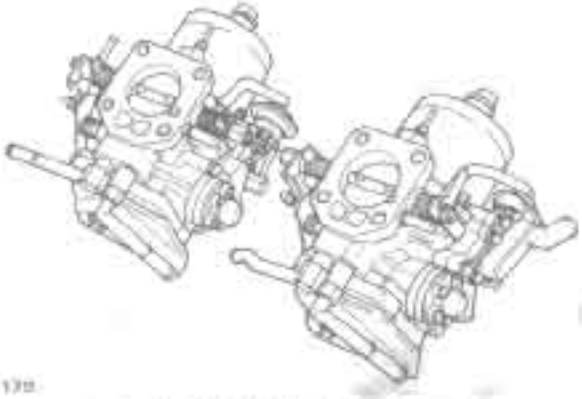


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Fig. EF-25 HMB46W-4 carburetor

Metering calibration of main system is accomplished by the jet needle fixed into the suction piston. Then, the related situation between the taper jet needle and nozzle gives the correct air-fuel mixture. A power valve is provided to improve the performance during the acceleration from the medium speed.

When starting the engine, choke valve is closed by pulling the choke knob and excess fuel is drawn from auxiliary nozzle at the intake side of each carburetor. Consequently, an enriched air-fuel mixture is obtained. Under normal running, a proper mixture is supplied by sliding the jet needle, and vacuum in the suction chamber operates the suction piston.

This carburetor has the following characteristics:

1. Air flows fast in the venturi even when the engine runs at low speeds. Therefore, fuel is fully turned into spring, so that good driveability can be obtained.

2. As the venturi opens wide at high speed running, with the use of two carburetors, high output can be provided to reduce air intake resistance.

3. Idle control system assures stable idling. And two adjusting screws (idle speed adjusting screw on the balance tube and idle mixture adjusting screw at the front carburetor) permit easy access for servicing.

4. Float chamber just beneath the nozzle ensures better starting, stopping or turning round a curve.

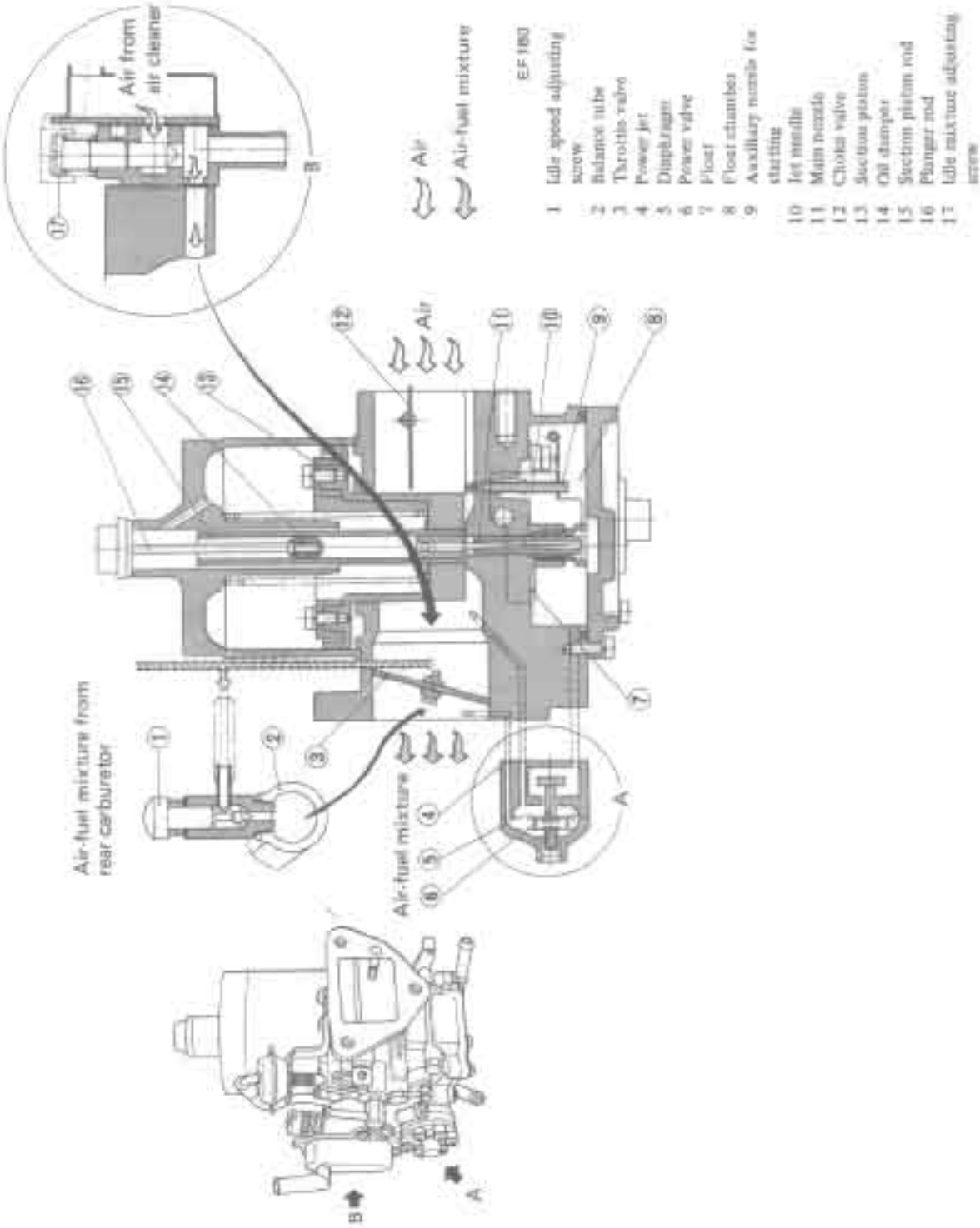


Fig. EF-26 Sectional view of front carburetor

Float system

The float circuit is a dual float construction where two floats are symmetrically arranged around the nozzle. The float bowl is positioned just beneath the nozzle so that the level of fuel in the float bowl is kept constant when the car is accelerated or decelerated, or when it is turning a corner. See Figure EF-26.

Venturi control system

The suction chamber is mounted above the venturi, and the suction piston slides vertically within the suction chamber, changing the venturi opening area.

Venturi vacuum pressure operates on the upper surface of the suction piston through the suction port, and atmospheric pressure is applied to the bottom of the suction piston through the air hole from the air cleaner. The difference between the upper vacuum pressure and lower atmospheric pressure moves the suction piston up and down. The suction piston stops at a balanced condition exists between the pressure difference and the piston weight plus spring tension. The vacuum pressure is produced by the air flow velocity. For instance, when the throttle valve is opened by depressing the accelerator pedal, the flow velocity of the intake air increases. This also increases vacuum pressure in the venturi, and the suction piston is lifted until the piston is balanced, and the venturi opening area enlarges.

When the throttle valve is closed by releasing the accelerator pedal, the flow velocity of the engine intake air in the venturi is reversely decreased. The piston goes down and the venturi opening area becomes small. The intake air flow velocity recovers as the venturi opening decreases. The piston stops going down because of a balance between the upper and the lower forces operating the suction piston.

Thus, the opening area is adjusted automatically to keep the flow of the intake air at constant velocity in the venturi. Consequently, the venturi opening is optimum for any engine operating conditions. In addition, the suction piston rod is equipped with an oil damper to prevent the piston coming up quickly as a result of sharp throttle opening. As the plunger rod positioned in an oil well operates on a fluid brake on rapid rising stroke but exerts no restriction on its fall, it provides an approximate degree of enrichment for acceleration.

Fuel system

Air velocity through the venturi (vacuum pressure) causes fuel to be sprayed from the float chamber, through the opening between the nozzle and jet needle into the venturi.

The jet needle below the suction piston moves up and down in the nozzle according to the motion of the suction piston. Fuel flow changes automatically due to the tapered shape of the jet needle.

Moreover, operating conditions under various driving conditions from idling to fully-opened maximum speed are shown in Figures EF-27 and EF-30.

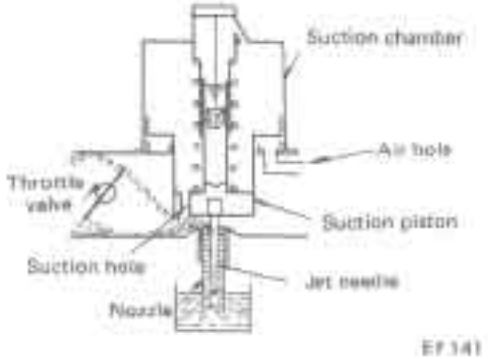
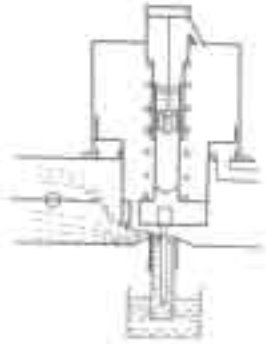


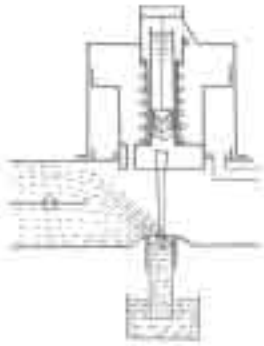
Fig. EF-27 Idling

Fig. EF-28 Intermediate and low speed



EF143

Fig. EF-29 Fully-opened low speed

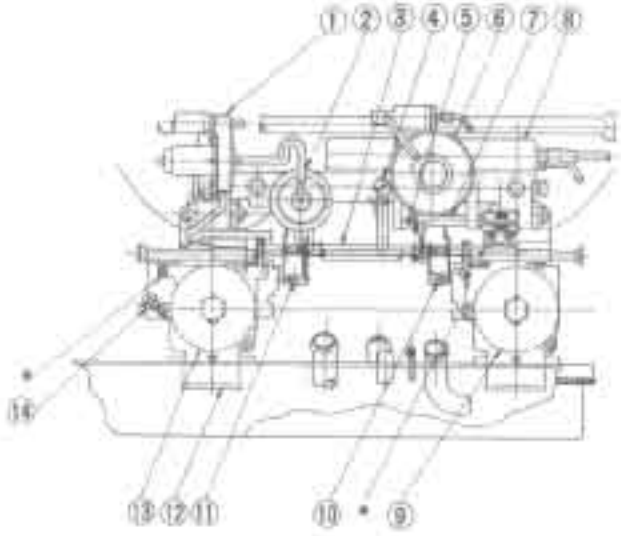


EF144

Fig. EF-30 Fully-opened high speed

CONTROL AND ADJUSTMENT

Adjusting engine idle rpm, mixture ratio and ignition timing



1 Throttle opener control valve assembly (Manual transmission model only)
2 Servo diaphragm
3 Throttle shaft
4 Idle speed adjusting screw
5 Fast idle setting screw
6 E.G.R. control valve
7 Auxiliary throttle shaft
8 Balance tube
9 Rear carburetor
10 Balance adjusting screw
11 Throttle opener adjusting screw
12 Air horn
13 Front carburetor
14 Idle mixture adjusting screw (Idle limiter cap)

EF049

Fig. EF-31 Carburetor linkage

Notes: a. Idle limiter cap equipped with idle mixture adjusting screw must not be removed.
b. Screws marked "*" is properly adjusted at factory and requires no further adjustment.

1. Warm up engine by driving car more than 20 minutes at a speed about 48 km (30 mph).

2. Remove air cleaner cover and oil dampet cap, raise suction piston with a suitable soft bar. Make sure that suction piston is raised smoothly.

3. Check damper oil level and add oil (MS #20 or 10W-30) if necessary.

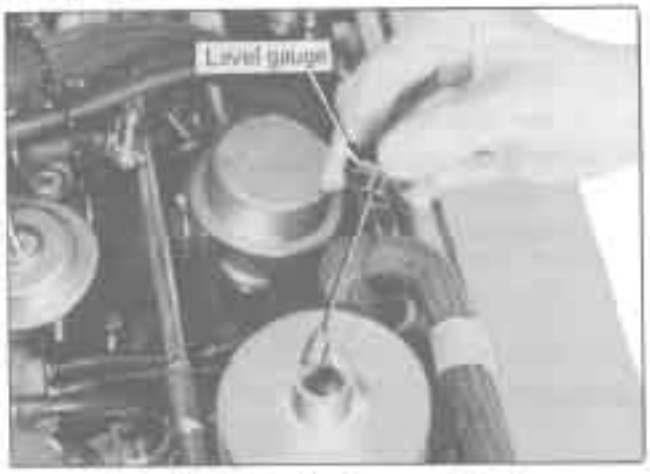


Fig. EF-32 Checking damper oil level

4. Loosen balance adjusting screw and throttle opener adjusting screw completely.

Note: Make sure that front carburetor is separated from rear one in operation.

5. Connect engine tachometer and timing light in proper position.

6. Adjust idling speed to 750 rpm by turning idle speed adjusting screw.

Cautions:

a. When selector lever is shifted to "D" position, be sure to apply parking brake and to block both front and rear wheels with chocks.

b. Hold brake pedal while stepping down on accelerator pedal. Otherwise car will rush out dangerously.

c. After engine idling has been made for one or two minutes or more, race engine at least two times.

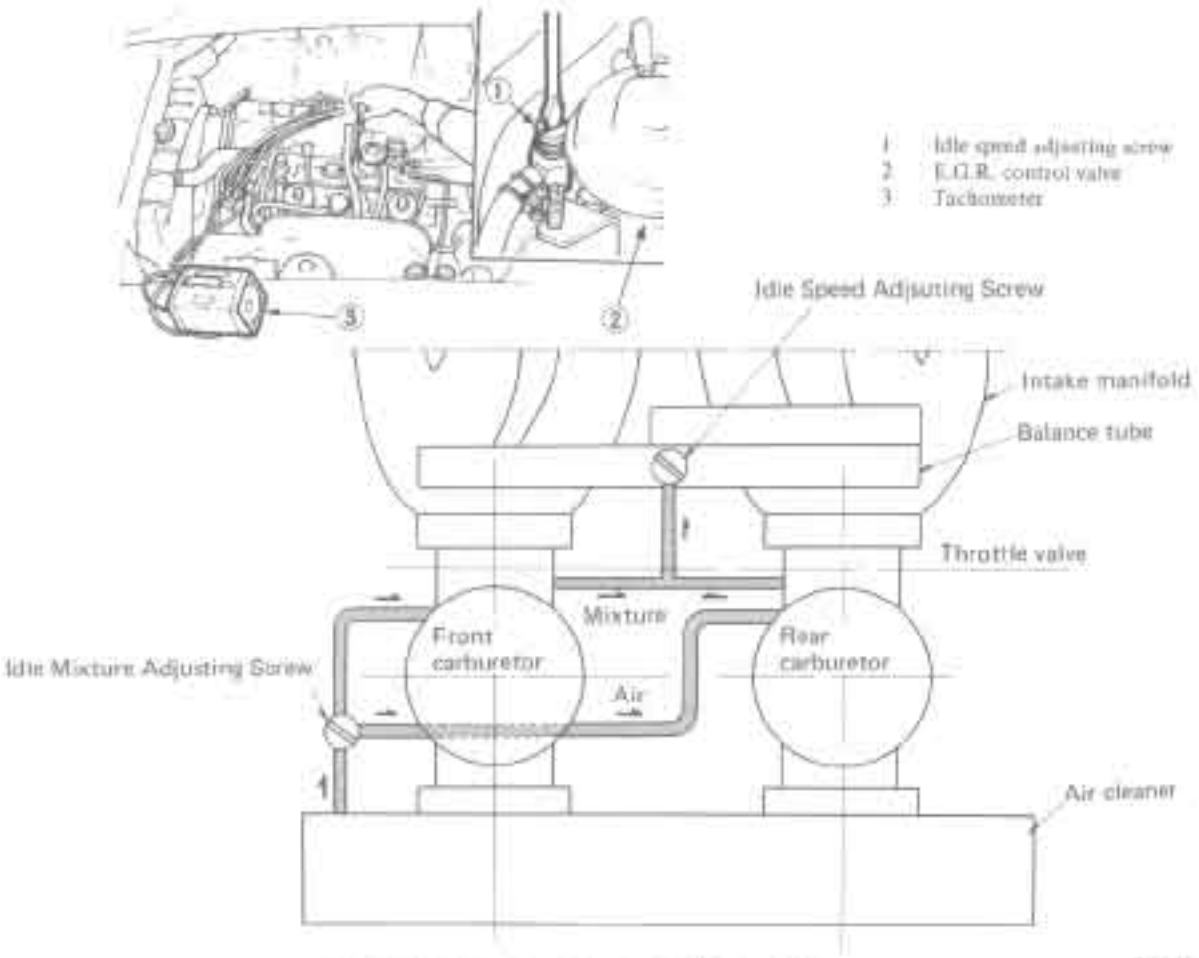


Fig. EF-33 Adjusting idle speed adjusting screw

Notes: a. When idle speed adjusting screw is turned clockwise, idling speed decreases, and it increases when the screw is turned counterclockwise.

b. When idle speed adjusting screw is turned fully clockwise during the above adjustment and engine speed cannot be reduced below 750 rpm, other adjusting screws such as throttle opener adjusting screw may have been tightened excessively or the accelerator linkage adjusted incorrectly. Under the normal condition, the auxiliary throttle shaft and throttle shaft should have a slight play during engine operation under the idling speed. In other words, the auxiliary throttle shaft should be provided with a play "θ" which corresponds to the clearance Ta − Tb as shown in Figure EF-29.

c. When adjusting in idling condition for 1 to 2 minutes or more, make sure to race the engine beforehand.

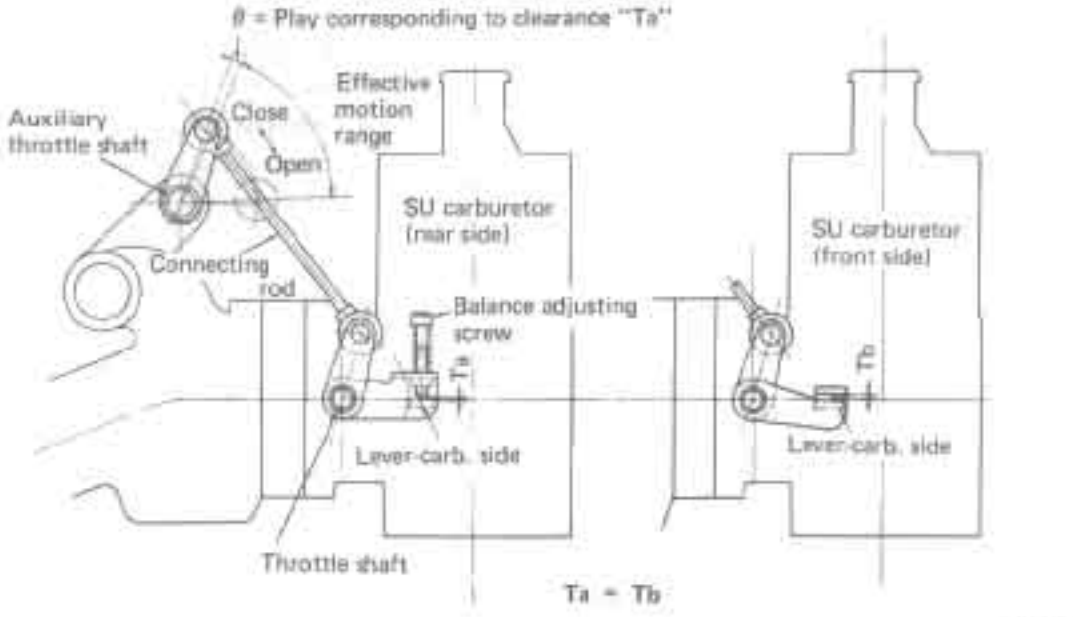


Fig. EF-34 Carburetor linkage

7. Set ignition timing to the specifications by adjusting distributor as shown below.

After ignition timing is adjusted properly, return selector lever to "N" position.

	Ignition timing
With manual transmission	8° B.T.D.C./750 rpm
With automatic transmission (in "D" range)	8° B.T.D.C./600 rpm (Retarded) 15° B.T.D.C./600 rpm (Advanced)

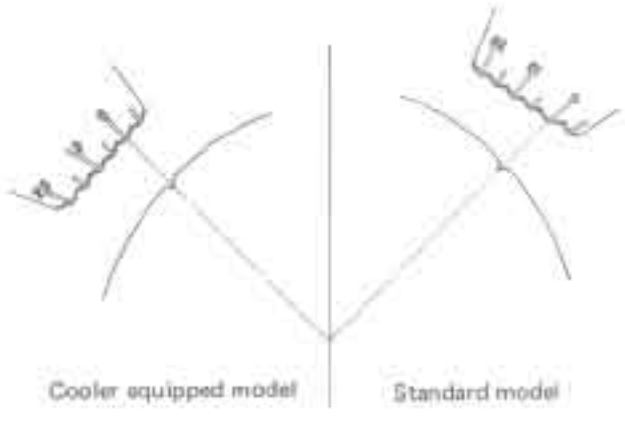


Fig. EF-35 Checking ignition timing (Crankshaft)

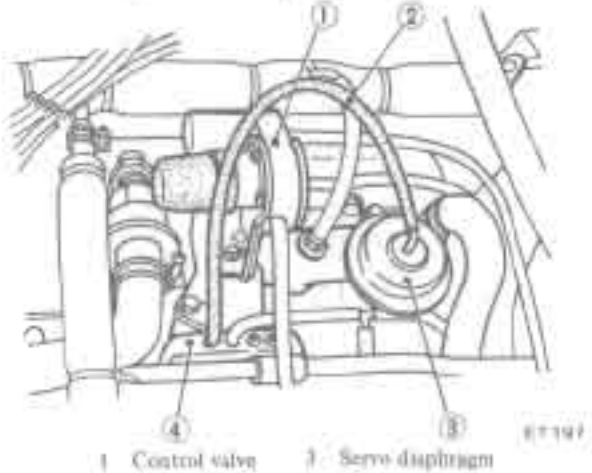
8. If engine speed changes after ignition timing is adjusted, repeat steps 6 and 7 above. Steps 1 through 8 apply to both automatic and manual transmission models.

MANUAL TRANSMISSION MODEL equipped with throttle opener

9. Disconnect vacuum hose between vacuum control valve and servo diaphragm and also disconnect vacuum hose between vacuum control valve and intake manifold.

10. Connect servo diaphragm to intake manifold connector directly with another suitable hose without laying through vacuum control valve.

11. Turn in throttle opener adjusting screw until engine speed is set at approx. 1,400 rpm.



1 Control valve 3 Servo diaphragm
2 Connecting hose 4 Intake manifold

Fig. EF-36 Connecting servo diaphragm to intake manifold with a hose

12. Use a flow meter and adjust balance adjusting screw properly so that front and rear carburetor intake air volume is balanced under the condition described in step 10 above.

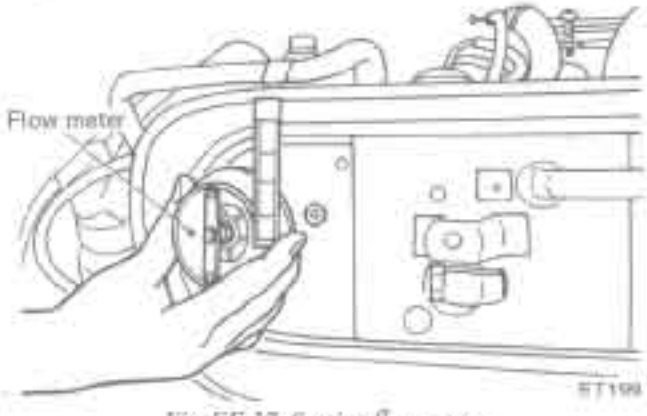
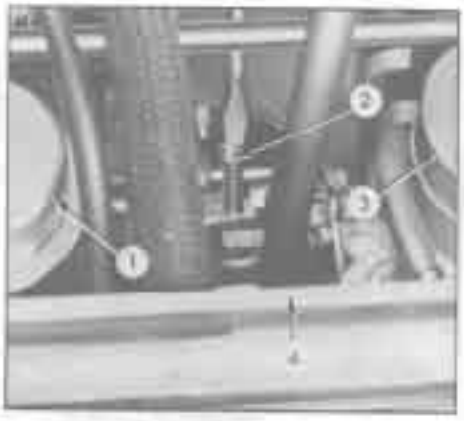


Fig. EF-37 Setting flow meter



1 Anti-backfire valve 3 Carburetor
2 Balance adjusting screw 4 Air cleaner

Fig. EF-38 Adjusting balance screw

Notes: a. Attach flow meter to the front side air horn of air cleaner, turn air flow adjusting screw of flow meter, and align the upper end of float in glass tube with scale.
Then attach flow meter to the rear side air horn of air cleaner. (Do not move air flow adjusting screw of flow meter.) If flow meter float is not aligned with front carburetor scale, turn balance adjusting screw and align float with front carburetor scale.
b. Stand flow meter float vertically.
c. The flow meter is used to hinder engine from intaking air, it is therefore recommended that the flow meter be used for a very short period of time (one to two seconds).
It should not be used continuously.

13. Connect vacuum motor to temperature sensor with vacuum hose and install air cleaner cover in position.

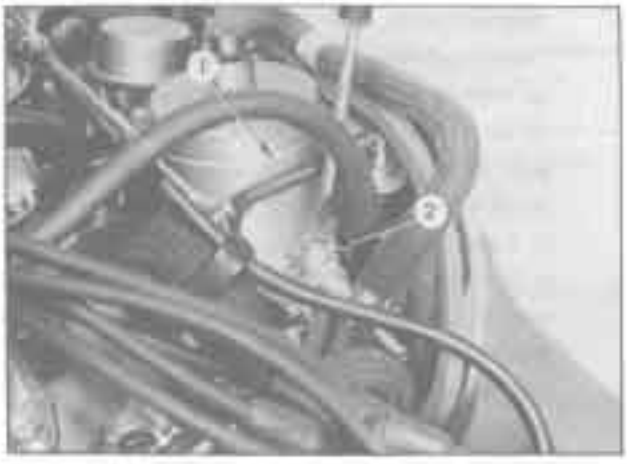
14. Raise engine speed to 1,400 rpm by turning throttle opener adjusting screw.

Note: Before adjusting engine speed, first race engine at 3,000 rpm. Then raise the engine speed again to 1,700 rpm with opener adjusting screw, and gradually decrease the engine speed to 1,400 rpm.

1 Servo diaphragm
2 Throttle opener adjusting screw
3 Anti-backfire valve

Fig. EF-39 Adjusting throttle opener adjusting screw

15. First, disconnect check valve inlet hose and plug check valve. Using "CO" meter, adjust "CO" percentage to specifications by turning idle mixture adjusting screw.



1 Carburetor
2 Idle mixture adjusting screw

Fig. EF-40 Adjusting idle mixture adjusting screw

With manual transmission	1.0 to 1.6%

Note: When idle mixture adjusting screw is turned clockwise, "CO" percent becomes rich, and it becomes lean when idle mixture adjusting screw is turned counterclockwise.

16. Disconnect servo diaphragm vacuum tube for two or three seconds and then connect it again. At this time, make sure that engine speed is increased to 1,400 rpm from idling speed. If not, repeat steps 11 to 15 above.

17. Connect servo diaphragm and opener control valve vacuum hoses and check valve inlet hose to original position.

18. Measure "CO" percent at idle speed using CO-meter. Ascertain that it is below 2.7%.

This measurement should be made under the operation of air injection.

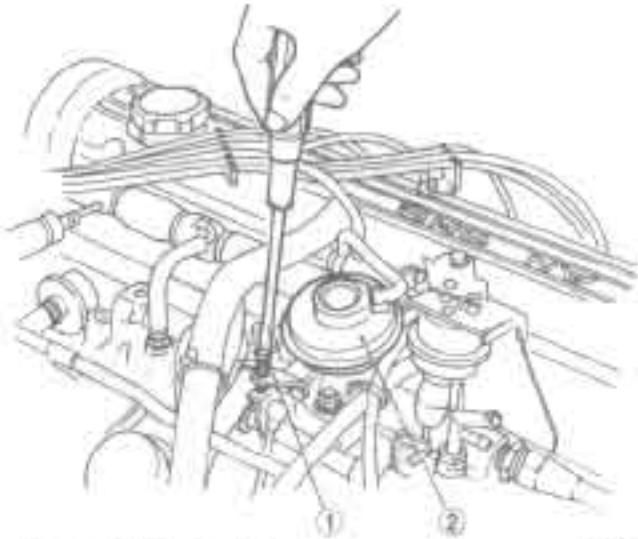
AUTOMATIC TRANSMISSION MODEL

not equipped with throttle opener

Note: For adjustment procedures of ignition timing (that is step 8) and the preceding items, use the same steps as described in Pages EF-15 to 18.

9. Adjust fast idle setting screw until engine runs at 1,400 rpm or thereabout.

Note: Adjust fast idle setting screw on automatic transmission models only.



1 Fast idle setting screw
2 E.G.R. control valve

ET190

Fig. EF-41 Adjusting fast idle setting screw

10. Using a flow meter, adjust balance adjusting screw so that front and rear carburetor intake air volumes are balanced

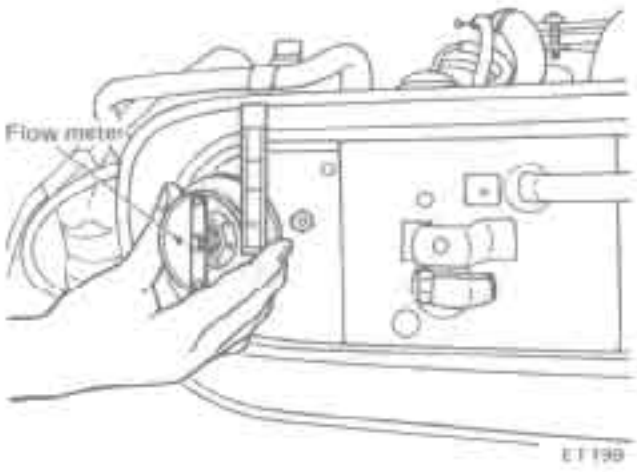
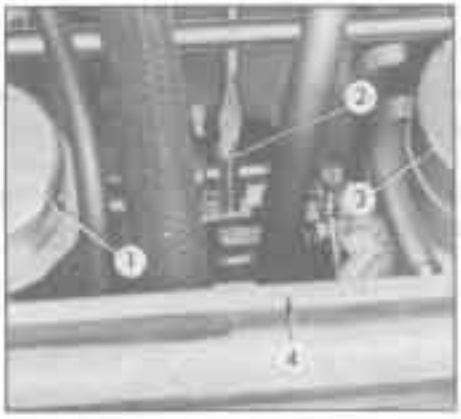


Fig. EF-42 Setting flow meter



1 Anti-backfire valve
2 Balance adjusting screw
3 Carburetor
4 Air cleaner

Fig. EF-43 Adjusting balance screw

Notes: a. Attach flow meter to the front side air horn of air cleaner, turn air flow adjusting screw of flow meter, and align the upper end of float in glass tube with scale.
Then attach flow meter to the rear side air horn of air cleaner. (Do not adjust air flow adjusting screw of flow meter.) If flow meter float is not aligned with front carburetor scale, turn balance adjusting screw and align float with front carburetor scale.
b. Stand flow meter float vertically.
c. The flow meter is used to hinder engine from intaking air, it is therefore recommended that the flow meter be used for a very short period of time (one to two seconds).
It should not be used continuously.

11. Connect vacuum motor to temperature sensor with vacuum hose and install air cleaner cover in position.

12. Set engine speed at 1,400 rpm.

Note: Before adjusting engine speed, first race engine at 3,000 rpm. Then raise the engine speed to 1,700 rpm again with fast idle setting screw, and gradually decrease the engine speed to 1,400 rpm.

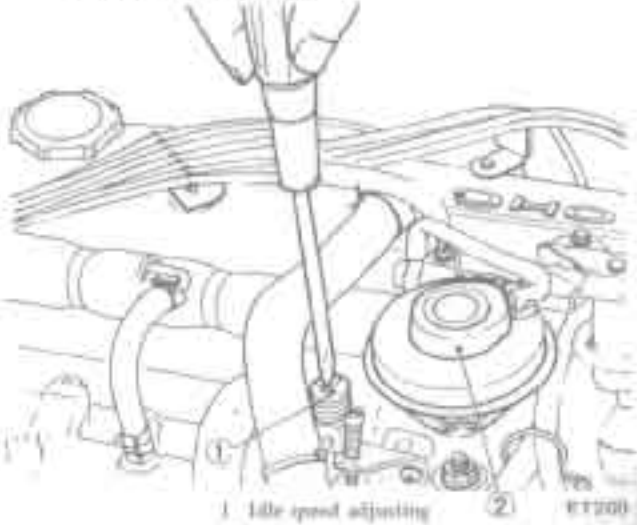
13. First, disconnect check valve inlet hose and plug check valve. Using "CO" meter, adjust "CO" percentage to specifications by turning idle mixture adjusting screw.

With automatic transmission (in "N" range)	0.6 to 1.2%

Note: When idle mixture adjusting screw is turned clockwise, "CO" percent becomes rich, and it becomes lean when idle mixture adjusting screw is turned counterclockwise.

14. Turn out completely fast idle setting screw until engine runs at the specified idle speed. If necessary, adjust idle speed with idle speed adjusting screw. After adjustment, race engine two or three times to ensure that the specified idle speed is obtained at each time.

Note: Make sure that there is a clearance of 2 mm (0.078 in) between lever and tip of screw when fast idle setting screw is turned out.
Do not turn fast idle setting screw excessively to prevent it from falling.



1 Idle speed adjusting screw
2 E.G.R. control valve

Fig. EF-44 Adjusting idle speed adjusting screw

15. Connect check valve inlet hose to original position.

16. Measure "CO" percent at idle speed using CO-meter. Ascertain that it is below 2.7%.

This measurement should be made under the operation of air injection.

Idle limiter cap (Manual and automatic transmission models)

Idle limiter cap is attached to idle mixture adjusting screw.

Do not remove this idle limiter cap unless necessary. If this unit is removed, it is necessary to re-adjust it at the time of installation.

To adjust, proceed as follows:

1. Make sure that the percentage of "CO" contents satisfies the specifications.

2. Install idle limiter cap in position, making sure that adjusting screw can further turn 1/8 rotation in the "CO-RICH" direction.

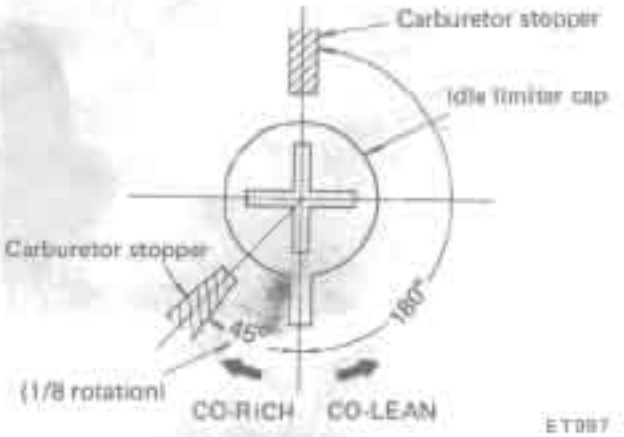
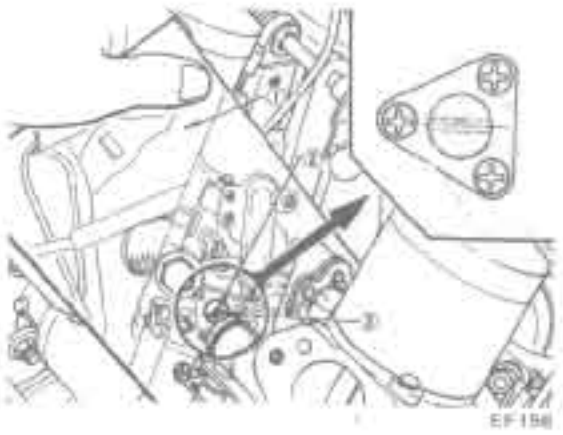


Fig. EF-45 Idle limiter cap

Inspection of float level

The level of fuel in the float chamber can be checked through a circular window located behind carburetor.

It is necessary to use a mirror to inspect the fuel level.



1. Mirror
2. Float level point
3. Float level window

Fig. EF-46 Checking float level

Adjustment of float level

If it is necessary to adjust the float level, float lever should be bent as required.

1. Remove carburetor assembly from intake manifold, and remove float chamber cover from carburetor.

2. Place the carburetor top side down to check the position of float lever.

Refer to Figure EF-47. Ensure that both floats touch the inner wall of carburetor when carburetor is turned upside down on a float surface.

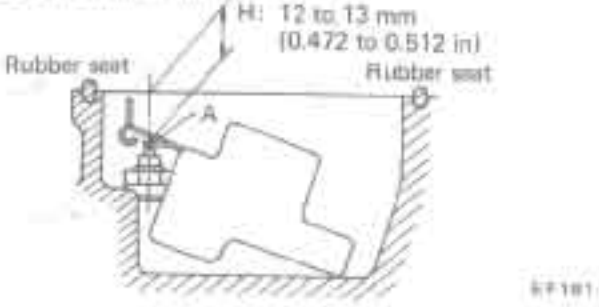
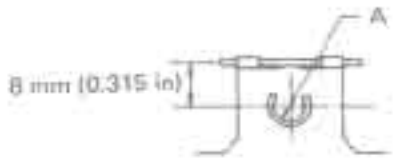


Fig. EF-47 "H" dimension of float lever

3. Measure the dimension "H" between the end face of the float chamber and float lever tongue which contact with needle valve.

The standard dimension is
12 to 13 mm (0.472 to 0.512 in).

Measure the "H" dimension at point "A" of float lever. If it is not held within the specified value, adjust the tongue by bending its root as required.



EF182

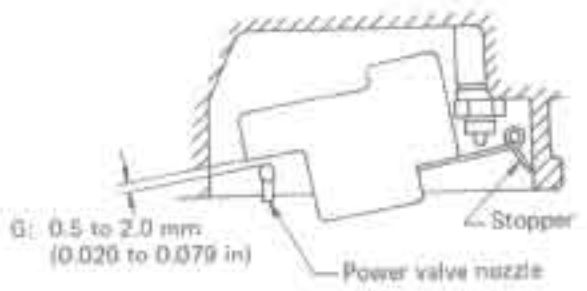
Fig. EF-48 Measuring "H" dimension at point A

Place the carburetor top side up

Then, measure the gap "G" between the power valve nozzle and float.

The standard gap is between 0.5 mm (0.020 in) and 2 mm (0.079 in). If the gap is not held within the specified range, adjust by bending the stopper as required. The above adjustment is particularly necessary to prevent mutual interference between the float and power valve.

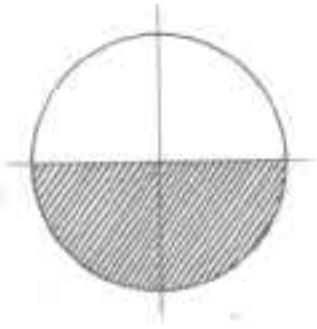
Note: Whenever the stopper is bent for adjustment, check the dimension "H" to ensure that it is held within the specified range.



EF183

Fig. EF-49 "G" dimension of float

5 After adjusting the tongue of float lever, install float chamber cover on carburetor float chamber and install carburetor on engine.



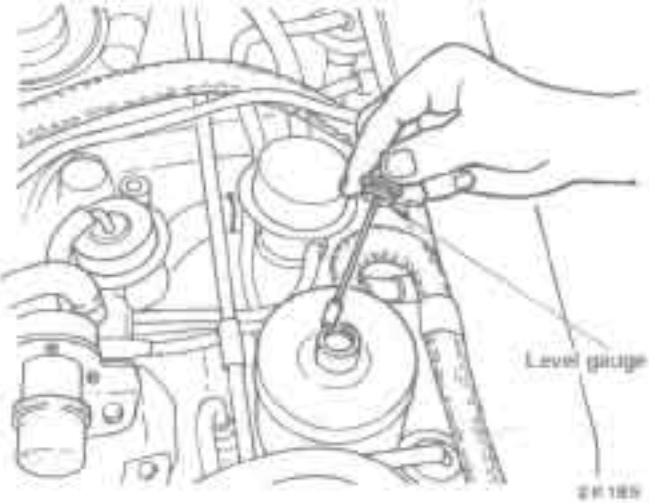
EF184

Fig. EF-50 Float level

The normal fuel level is even with the center line of the float level window.

The float level adjustment should be made only when an erratic engine operation due to incorrect fuel level is noted.

Checking the damper oil



EF185

Fig. EF-51 Checking damper oil

When there is not a sufficient amount of damper oil, acceleration and other operating performance features became sluggish. When new carburetors are installed on the engine, or when overhaul is performed, damper oil must be added without fail. Use engine oil MS #20 or SAE 10W-30 for damper oil. Do not use lower or higher weight oils.

To check damper oil level, remove oil cap nut and check oil level marking on the two grooves on plunger rod. No difficulty will be encountered and there is no damper until the oil level reaches the lower line. If the oil level drops below the lower line, add oil. Slowly fill damper oil to upper line.

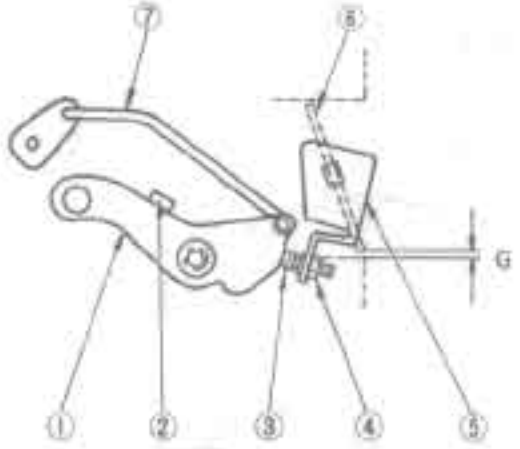
When removing and replacing oil cap nut, be careful not to bend rod. If oil cap nut is loose, it may fall off. Be sure that it is sufficiently tightened by hand.

Fast idle adjustment

Choke valve at fully closed position automatically opens throttle valve at an optimum angle for starting engine through a link mechanism.

After reassembly, or in a check on inter lock opening angle, place upper side of fast idle screw on the first step

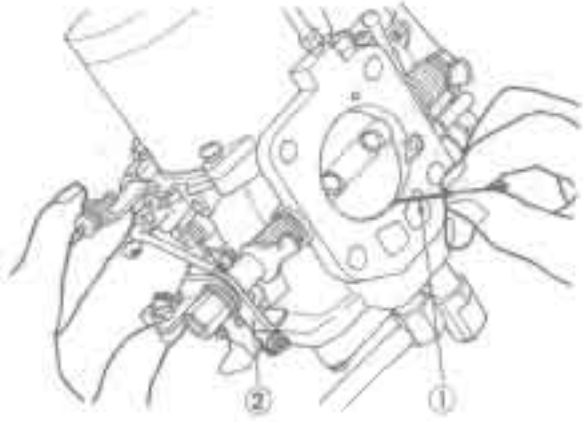
of choke lever. Then adjust fast idle adjusting screw in such a way that the clearance of throttle valve (shown at "G" in Figure EF-52) is held within 0.59 to 0.64 mm (0.023 to 0.025 in). When it is not correct, adjust by turning fast idle screw in or out as necessary.



1 Choke lever
2 Choke lever stopper
3 Fast idle screw
4 Lock nut
5 Fast idle lever
6 Throttle valve
7 Connecting rod

EF186

Fig. EF-52 Adjusting fast idle opening



1 Gauge
2 Choke lever

EF187

Fig. EF-53 Measuring fast idle opening

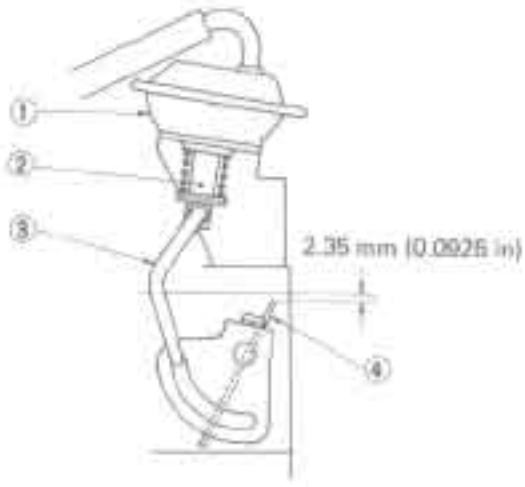
Choke piston adjustment

1. Completely close choke valve.

2. Close choke valve by stretching a suitable rubber band between choke lever which is connected to choke wire, and stationary part of carburetor.

3. Grip diaphragm rod with pliers, and pull straight fully.

4. Under this condition, adjust the gap between choke valve and carburetor body to 2.35 mm (0.0925 in) by bending choke piston rod. See Figure EF-49.



1 Choke piston
2 Diaphragm rod
3 Choke piston rod
4 Choke valve

EF188

Fig. EF-54 Choke piston adjustment

Periodic inspection of suction chamber and suction piston

Periodic inspection is required to constantly maintain the suction chamber and suction piston in proper operating condition. This is due to the fact that dust in the air is drawn into chamber and accumulates on the sliding portion of suction piston.

Make sure that suction piston installed on the engine operates smoothly by proceeding as follows:

1. First, remove oil cap nut and air cleaner.

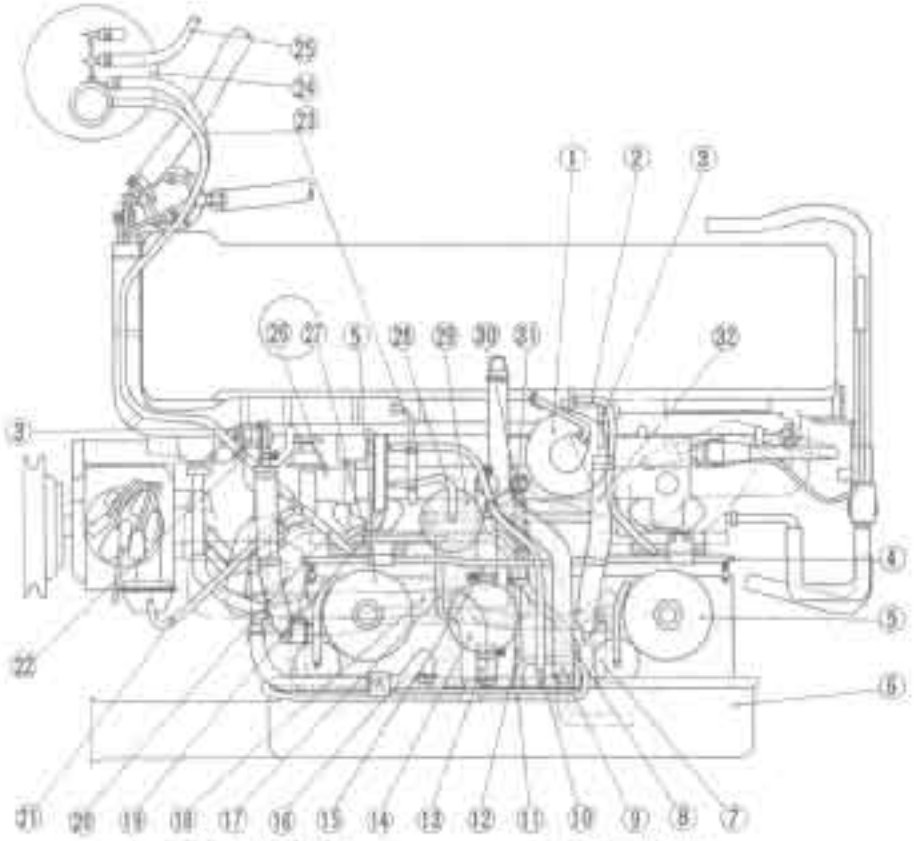
2. Gradually raise suction piston with a suitable bar.

3. Release your finger from suction piston. Suction piston will drop, and the sound of suction running against venturi will be heard.

The conditions of piston and chamber are satisfactory if suction piston rises smoothly.

To check for bend of plunger rod, raise suction piston with your finger tip with oil cap nut attached to the assembly, and let piston drop freely. Suction piston will offer strong resistance when lifted since oil damper is actuated. Under satisfactory conditions, piston will drop smoothly when your finger is removed from suction piston.

REMOVAL AND INSTALLATION



1 E.G.R. control valve
2 E.G.R. vacuum signal hose
3 Fuel inlet hose
4 I.S.S. tube
5 Carburetor
6 Air cleaner
7 Air by-pass hose
8 Idle compensator hose
9 Crankcase ventilation hose
10 Throttle opener hose (from throttle opener solenoid to air cleaner)
11 Temp. sensor hose (from temp. sensor to vacuum motor)
12 Temp. sensor hose (from temp. sensor to intake manifold)
13 A.B. valve hose (from air cleaner to A.B. valve)
14 Anti backfire (A.B.) valve
15 A.B. valve hose (from A.B. valve to balance tube)
16 Air by-pass hose (from air cleaner to front carburetor)
17 A.B. valve vacuum signal hose
18 Air pump inlet hose
19 A.B. valve and temp. sensor vacuum signal hose
20 Distributor and canister vacuum signal hose
21 Distributor vacuum signal hose
22 Canister vacuum signal hose
23 Canister purge hose
24 Carbon canister
25 Vapor vent hose
26 Throttle opener control valve
27 Throttle opener vacuum signal hose
28 Throttle opener servo diaphragm hose
29 Throttle opener servo diaphragm
30 Balance tube
31 Idle speed adjusting screw
32 Heat shield material

EF180

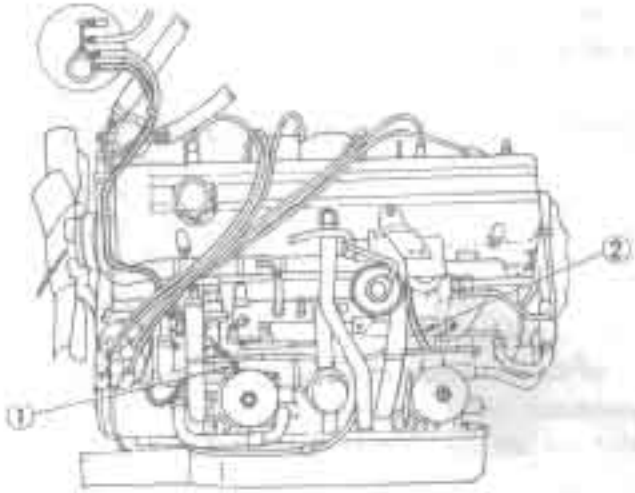
Fig. EF-55 Carburetor and air cleaner component piping

1. Refer to the instructions under Air Cleaner.

2. Remove fuel inlet hoses and ISS hoses from front and rear carburetors, and remove air by-pass hose from front carburetor.

3. Remove vacuum hose for carbon canister and distributor from front carburetor.

4. Remove E.G.R. vacuum hose from rear carburetor.

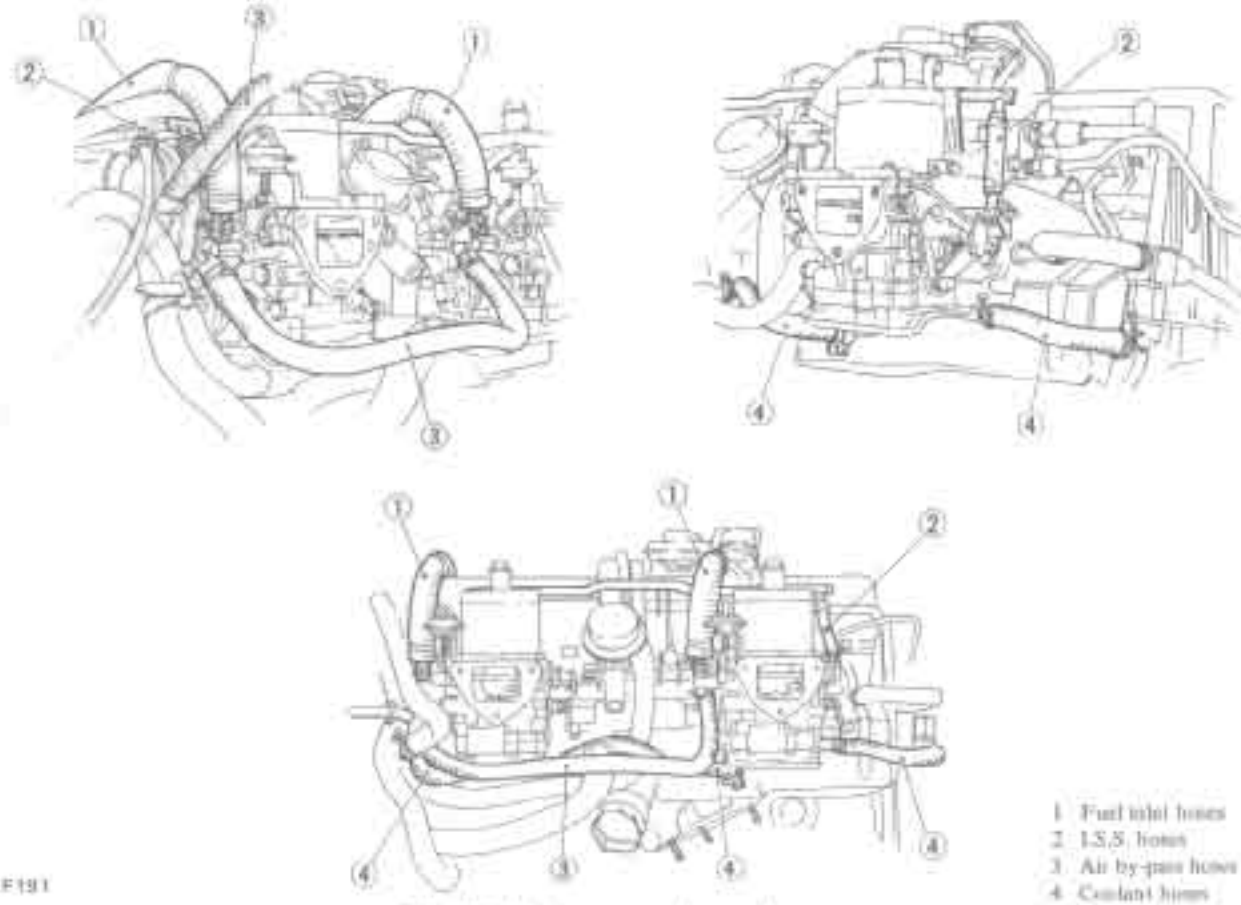


1 Distributor and carbon canister vacuum tubes
2 E.G.R. vacuum tube

EF190

Fig. EF-56 Removing vacuum tube

5. Remove coolant inlet hose from front carburetor. Remove coolant outlet hose from rear carburetor.



1. Fuel inlet hoses
2. I.S.S. hoses
3. Air by-pass hoses
4. Coolant hoses

Fig. EF-57 Removing carburetor hoses

6. Remove four carburetor attaching nuts, and detach front and rear carburetors as an assembly from intake manifold.

To remove these carburetors separately, it is necessary to remove air by-pass hose and coolant hose between front and rear carburetors.

DISASSEMBLY AND REASSEMBLY

The components of this carburetor are assembled with an utmost care at the factory. The adjustment of the fuel metering system, especially jet needle, is almost impossible without using the proper metering equipment, and this will greatly affect the emission control system.

So the disassembly of the carburetor should be strictly prohibited. Only the following are allowed to be disassembled and adjusted. Otherwise, replace the whole carburetor assembly.

Float chamber cover

1. Remove seven screws securing float chamber cover in place, and remove float chamber cover.

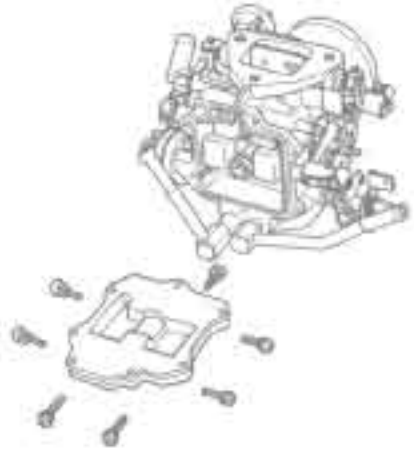


Fig. EF-58 Disassembling float chamber cover

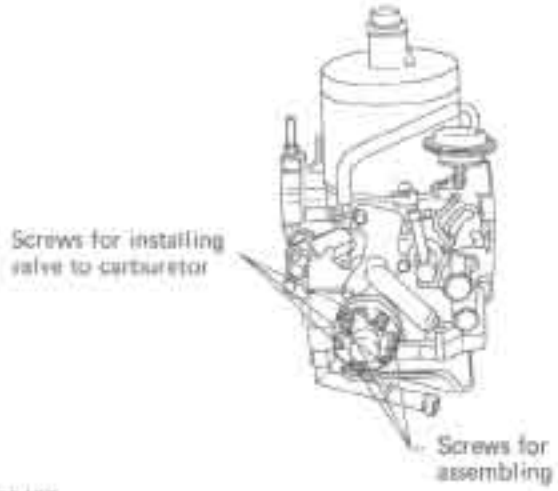
2. Assemble float chamber cover in the reverse order of disassembly.

Note: The float and needle valve parts cannot be removed.

Power valve

If the exhaust "CO" will be found abnormally rich at idling and no other cause will be found in the carburetor adjustment, the power valve should be checked for proper functioning.

The six fixing screws are used for this valve, three for assembling valve and three for fixing valve to carburetor.



EF193

Fig. EF-59 Power valve unit

Remove power valve from carburetor and disassemble valve to check diaphragm. If any abnormality is found in diaphragm, replace valve unit.

EF194

Fig. EF-60 Removing power valve

Link and related components

To disassemble and reassemble interlock link and related components, be careful not to bend or deform any of components.

Before disassembly, mark links and levers so that they can be placed back to their original positions.

After assembly, check to be sure that they operate smoothly.

SPECIFICATIONS

Item \ Carburetor model		HMB46W-4
Make		HITACHI
Type		SU type side draft
Venturi diameter	mm (in)	42 (1.65)
Bore diameter	mm (in)	46 (1.81)
Suction piston lift	mm (in)	34 (1.34)
Nozzle jet diameter	mm (in)	2.54 (0.100)
Suction spring		# 50
Suction hole diameter x Number	mm (in)	7.5 x 2 (0.295 x 2)
Fast idle throttle valve opening	mm (in)	0.59 to 0.64 (0.0232 to 0.0252)
Float venting		Inner vent type
Oil damper plunger diameter	mm (in)	8.86 (0.349)
Power jet		#40
Fuel pressure	kg/cm² (psi)	0.32 (4.6)

TROUBLE DIAGNOSES AND CORRECTIONS

The causes of failure and appropriate corrective actions are shown on table to permit immediate repair of carburetor in the event carburetor malfunction develops.

Improper engine operation can be attributed to many different causes. Although carburetor may be normal, if the electrical system is inoperative, the cause sometimes may be in carburetor. If engine does not operate satisfactorily, first check electrical system before attempting to adjust carburetor.

Condition	Probable cause	Corrective action
Overflow	Leakage from float, or float bent or damaged.	Replace carburetor assembly.
	Dirty needle valve seat.	Clean valve seat.
	Loose needle valve.	Retighten.
	Scratches or wear on needle valve seat.	Refit or replace.
	Excessive fuel pump pressure.	Repair pump.
	Fuel pump drawing in air.	Repair pump.

Condition	Probable cause	Corrective action
Excessive fuel consumption	Overflow. Faulty suction piston operation. Leakage from power valve. Improper idling adjustment.	Described above. Described below. Replace valve assembly. Readjust.
Insufficient output	Throttle valve does not open fully. Faulty suction piston operation	Readjust. Described below.
Improper idling	Faulty suction piston operation. Improper adjustment of idle adjusting screw and idle mixture adjusting screw. Worn throttle valve shaft. Air leakage due to damaged packing between manifold and carburetor.	Described below. Readjust. Replace carburetor assembly. Replace gasket.
Engine operation is irregular or erratic	Malfunction of suction piston. Insufficient damper oil, or improper oil used. Improper idling adjustment.	Described below. Replenish or replace. Readjust.
Engine does not start.	Overflow No fuel fed to the engine. Improper idling adjustment Malfunction of suction piston.	Described above. Check pump, fuel line, and needle valve. Readjust. Described below.
Faulty suction piston operation	Sticking due to deformation (bulging or caving) of suction chamber or suction piston. Bent jet needle. Bent plunger rod.	Replace carburetor assembly. Replace carburetor assembly. Replace.

EVAPORATIVE EMISSION CONTROL SYSTEM

CONTENTS

DESCRIPTION

This system is utilized to prevent fuel vapors from evaporating into the atmosphere.

This is accomplished by a closed system between the fuel tank, carbon canister and carburetors. The major system components are:

1. Fuel tank with positive sealing filler cap
2. Vapor-liquid separator
3. Vapor vent line
4. Carbon canister
5. Vacuum signal line

The fuel vapors from the sealed fuel tank are led into the canister which is filled with activated carbon and stored there when the engine is not running.

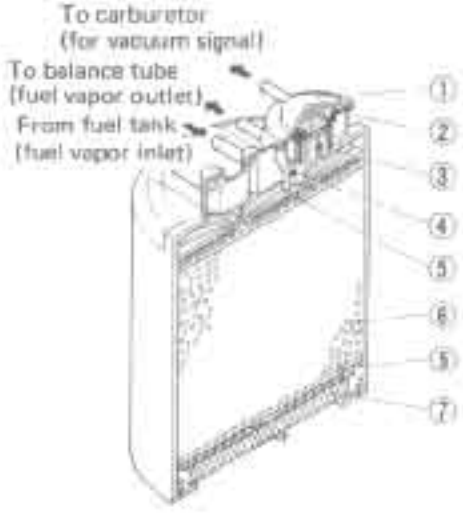
During the periods of idle, vacuum pressure from the vacuum signal line remains inactivated and the purge control valve is closed. Under this condition, fuel vapor goes along the periphery of the diaphragm in the purge control valve through a small orifice and is then drawn into the intake manifold through the canister purge line.

As the throttle valve opens and car speed increases, vacuum pressure in the vacuum signal line forces the purge control valve to open and admits a large orifice to intake manifold and fuel vapor is then drawn into the intake manifold through the canister purge line.

During the periods of idle, a small amount of air is drawn into the carbon canister through the filter on the bottom of the carbon canister and purges hydrocarbons from activated carbon. Under normal driving condition, a large amount of air is sucked into the canister. An orifice, provided in the vapor vent line on the front of the carbon canister, prevents excessive evaporative fuel from being sucked into the carburetor, and prevents an erroneous engine operation.

CARBON CANISTER

The carbon canister is fabricated from resin and contains activated carbon. It is vented to the atmosphere through the filter located on the bottom. The purge control valve is located on the top of the carbon canister. It controls the amount of fuel vapor to be sucked into the engine through a small or large orifice, according as at idling or normal driving speed.



EF195

1. Purge control valve
2. Diaphragm
3. Large orifice
4. Small orifice
5. Screen
6. Activated carbon
7. Filter

Fig. EF-61 Carbon canister

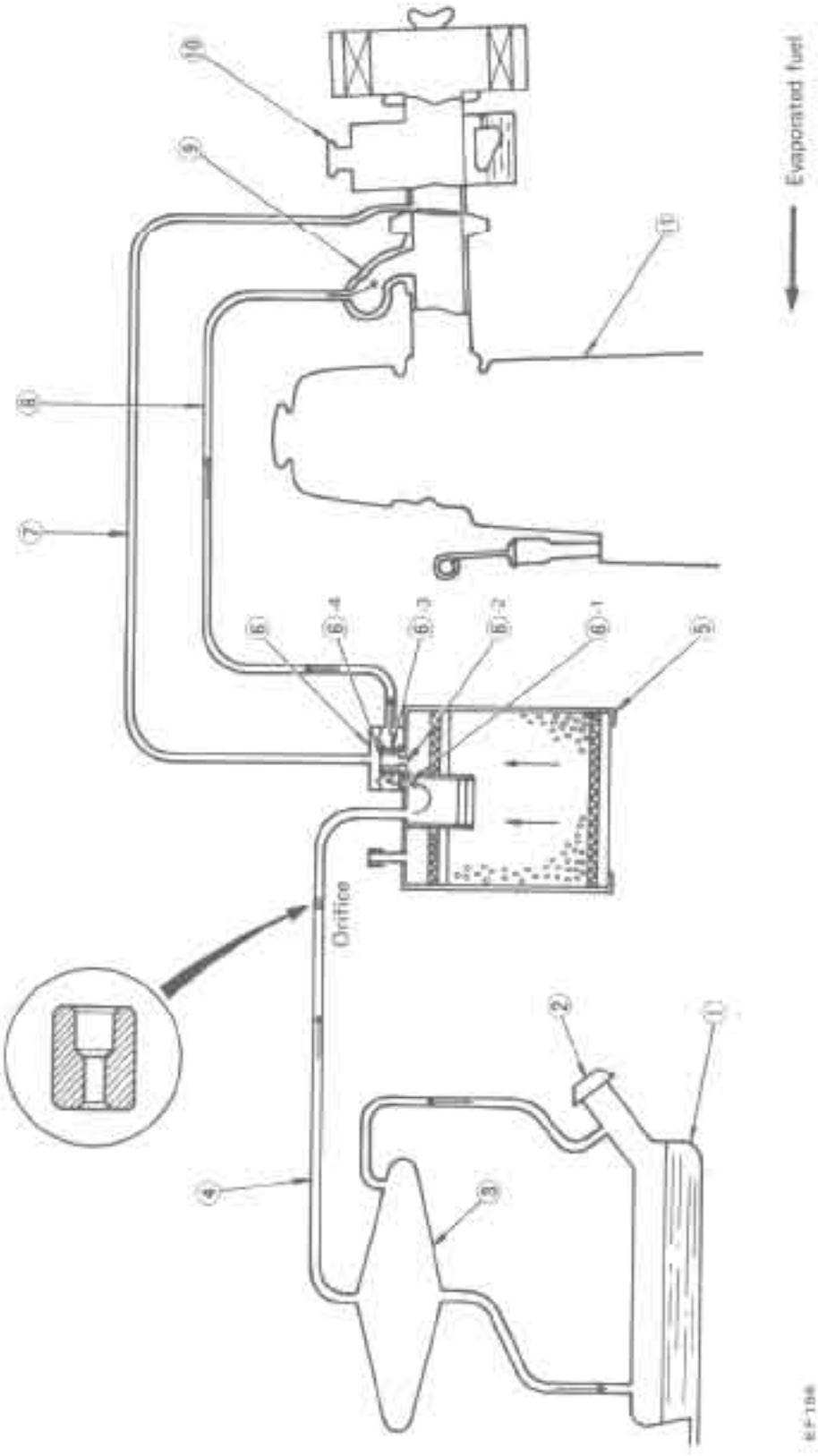


Fig. EF-62 Evaporative emission control system (Fuel vapor flow at idling or coasting)

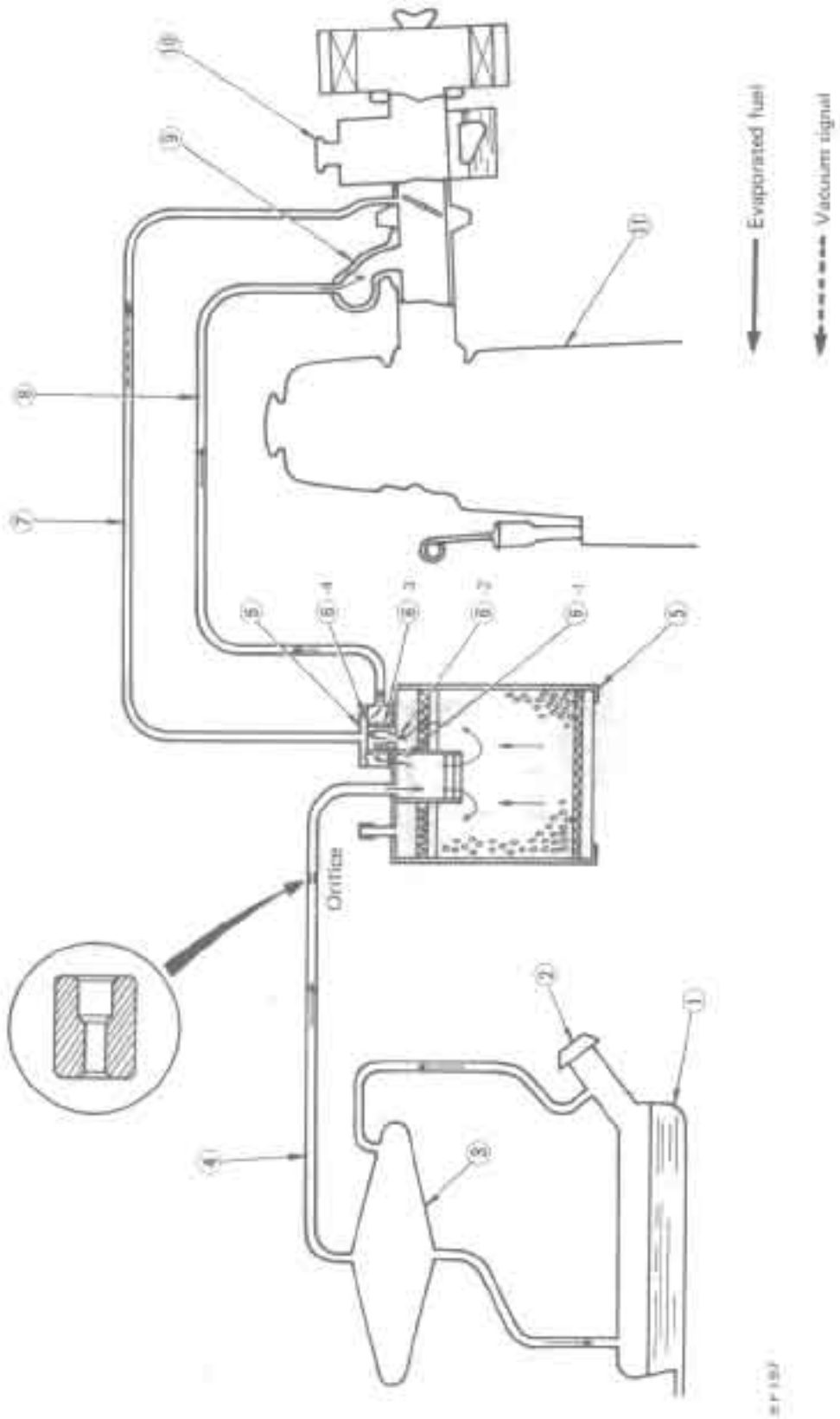


Fig. EF-63 Evaporative emission control system (Fuel vapor flow at running)

CHECKING VAPOR LINES AND FUEL VAPOR CONTROL VALVE

Checking fuel tank, vapor liquid separator and vapor vent line

1. Check all hoses and fuel tank filler cap.

2. Disconnect the vapor vent line connecting carbon canister to vapor-liquid separator.

3. Connect a 3-way connector, a manometer and a cock (or an equivalent 3-way charge cock) to the end of the vent line.

4. Supply fresh air into the vapor vent line through the cock little by little until pressure becomes 368 mmAq. (14.5 inAq.).

5. Shut the cock completely and leave it unattended.

6. After 2.5 minutes, measure the height of the liquid in the manometer.

7. Variation of height should remain within 25 mmAq (1.0 inAq.).

8. When filler cap does not close completely, the height should drop to zero in a short time.

9. If the height does not drop to zero in a short time when filler cap is removed, it is the cause of a stuffy hose.

Note: In case the vent line is stuffy, the breathing in fuel tank is not thoroughly made, thus causing insufficient delivery of fuel to engine or vapor lock. It must, therefore, be repaired or replaced.

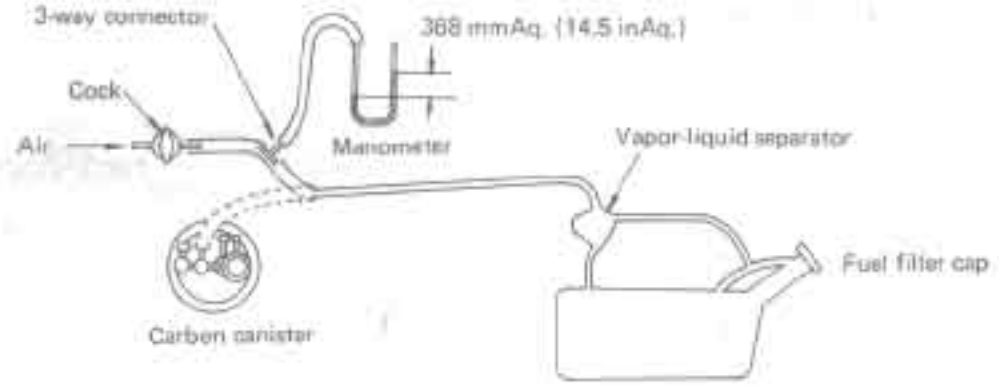


Fig. EF-64 Checking evaporative emission control system

Checking carbon canister purge control valve

Check for fuel vapor leakage, in the distributor VC line, at diaphragm of carbon canister purge control valve.

To check for leakage, proceed as follows:

1. Disconnect rubber hose, in the line, between T connector and carbon canister at T-connector.

2. Inhale air into the opening of rubber hose running to VC hole in carbon canister and ensure that there is no leak.

Fig. EF-65 Checking carbon canister purge control valve

3. If there is a leak, remove top cover from purge control valve and check for dislocated or cracked diaphragm. If necessary, replace diaphragm kit (which is made up of a retainer, diaphragm and spring).

EF200

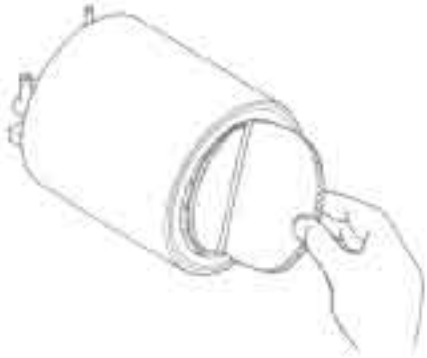
1 Cover
2 Diaphragm
3 Retainer
4 Diaphragm spring

Fig. EF-66 Carbon canister purge control valve

REPLACE CARBON CANISTER FILTER

Check for a contaminated element.

Element can be removed at the bottom of canister installed on car body.



EF201

Fig. EF-67 Replacing carbon canister filter

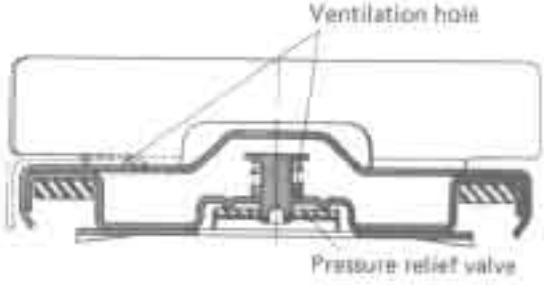
CHECKING FUEL TANK VACUUM RELIEF VALVE OPERATION

Remove fuel filler cap and see it functions properly.

1. Wipe clean valve housing and have it in your mouth.

2. Inhale air. A slight resistance accompanied by valve indicates that valve is in good mechanical condition. Note also that, by further inhaling air, the resistance should be disappeared with valve clicks.

3. If valve is clogged, or if no resistance is felt, replace cap as an assembled unit.



ETG72

Fig. EF-68 Fuel filler cap

SPECIAL SERVICE TOOL

No.	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or Figure No.
1.	EG16700000 Flow meter	For balancing the SU twin carburetor  SE19B	SU carburetor	Fig. ET-22