SERVICE MANUAL

MODEL
J13, J15 & J16 SERIES
ENGINES

SECTION EF

ENGINE FUEL

EF

AIR CLEANER

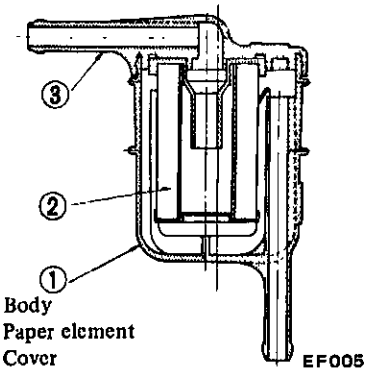
DESCRIPTION

The air cleaner is a dry paper type. It should be cleaned and replaced periodically. Available as an option is a viscous paper type air cleaner element which does not require any cleaning, regardless of contamination, until it is replaced in the designated period.

FUEL STRAINER

DESCRIPTION

The fuel strainer is a cartridge type. It uses paper element as strainer element which can be checked for condition from the outside. This strainer should be replaced every 20,000 km (12,000 miles) under normal conditions. See Figure EF-1.



1 Body
2 Paper element
3 Cover

Fig. EF-1 Sectional view of cartridge type fuel strainer

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.

FUEL PUMP-MECHANICAL

CONTENTS

DESCRIPTION

The fuel pump transfers gasoline from the tank to the carburetor in sufficient quantity to meet engine requirements at any speed or load.

The fuel pumps used on the model J13 and J15 engines are of the diaphragm type.

The fuel pump 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 with two metal discs and a pull rod.

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 the 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 with new parts as required.

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, with the pump mounted on the engine. Be sure that there is gasoline in the tank when conducting these tests.

STATIC PRESSURE TEST

The static pressure test is conducted as follows:

1. Disconnect carburetor fuel line at

carburetor.
2. Install the necessary adapter and "tee" fitting to fuel line and attach a suitable pressure gauge.
3. Start engine and run at varying speeds.
4. The reading on gauge is the static fuel pressure and this should remain within the following limits.

J13 Engine
0.18 kg/cm^2 (2.56 psi)
J15 Engine
0.21 kg/cm^2 (2.99 psi)

Pressure below the lower limit indicates extreme wear on one part or a small amount of wear on each working part.

This may also indicate a ruptured diaphragm, worn, warped, dirty or gumming valves and seats or weak diaphragm return spring. Pressure above the upper limit indicates an excessively strong diaphragm that is too tight.

This condition requires removal of fuel pump assembly for replacement or repair.

CAPACITY TEST

The capacity test is used only when the static pressure is within specifications. The capacity test is conducted as follows:

1. Disconnect fuel pipe at carburetor.
2. Place a suitable container at the end of pipe.
3. Start engine and run at 2,000 rpm.
4. On model J13 engine, pump should deliver 400 cc (24.4 cu in) of fuel in one minute or less.

On model J15 engine:
1,200 cc (73.2 cu in)

If no gasoline, or only a little flows from open end of pipe, fuel pipe is clogged or pump is malfunctioning. Before removing pump, remove gas tank cap, disconnect both inlet and outlet pipes and blow through them with an air hose to make sure that they are clear. This will eliminate possible clogged gas strainer in fuel tank. Reconnect pipes to pump and retest flow.

REMOVAL AND DISASSEMBLY

Remove fuel pump assembly by unscrewing two mounting nuts 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 screw.
3. Unscrew elbow and connector.
4. Take off the valve retainer by unscrewing two screws, and two valves are easily removed.
5. Press down diaphragm counter to the force of diaphragm spring and unlock the rectangular part in the low end of pull rod from rocker arm. Then remove diaphragm, diaphragm spring and lower body seal from lower body.
6. Drive out rocker arm pin by press or hammer.

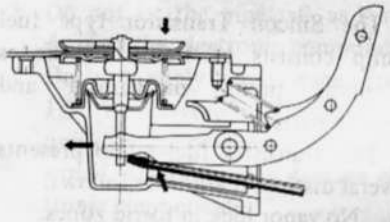


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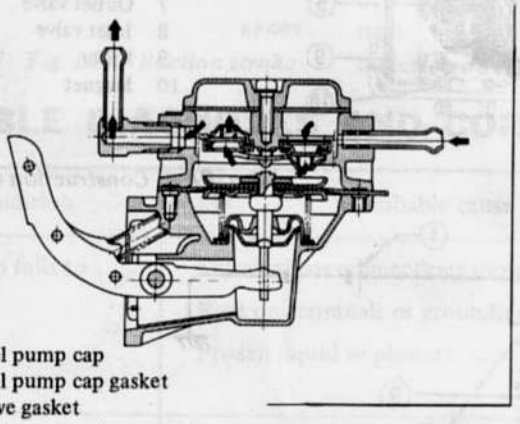
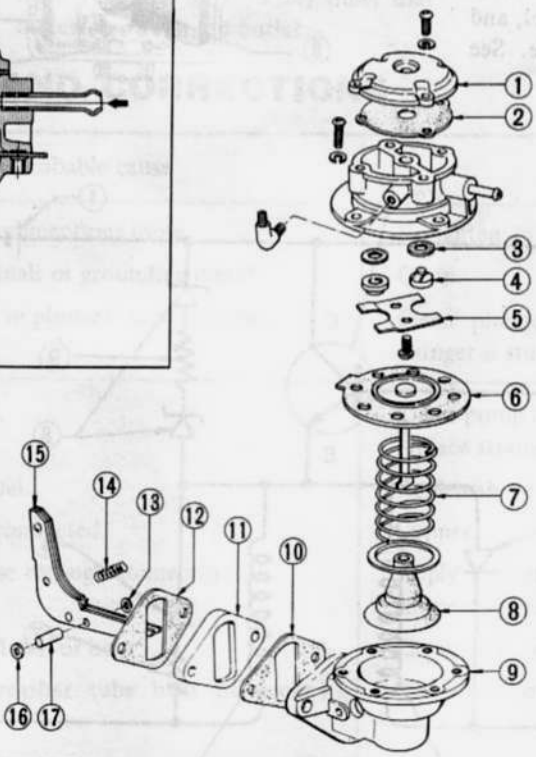
Fig. EF-2 Removal of pull rod





1 Fuel pump cap
2 Fuel pump cap gasket
3 Valve gasket
4 Fuel pump valve assembly
5 Valve retainer
6 Diaphragm assembly
7 Diaphragm spring
8 Lower body seal
9 Lower body
10 Fuel pump packing
11 Fuel pump spacer
12 Fuel pump packing
13 Rocker arm side spacer
14 Rocker arm spring
15 Rocker arm assembly
16 Rocker arm side spacer
17 Rocker arm pin

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Fig. EF-3 Structure of fuel pump

ASSEMBLY

Assembly is done in reverse order of disassembly. For reassembly and reinstallation, the following matters should be noted:

1. Use new gasket.
2. Lubricate rocker arm link, rocker arm pin and lever pin before installation.
3. To test the function, 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, the function of pump is satisfactory.

FUEL PUMP-ELECTRIC

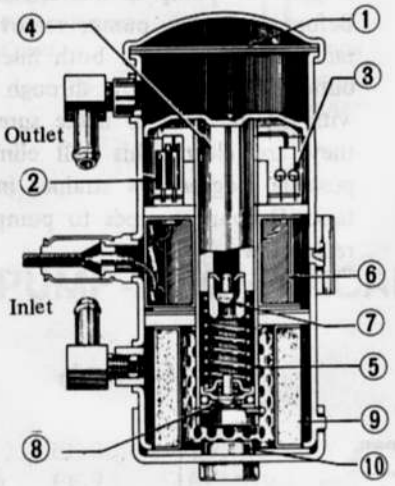
CONTENTS

DESCRIPTION

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

This transistor fuel pump presents several distinct features as follows:

1. No vapor lock in torrid zones.
2. Starts pumping immediately as the ignition switch is turned on.
3. Built-in filter and magnet keep out dust and iron filings of fuel, and add to pump and engine life. See Figure EF-4.

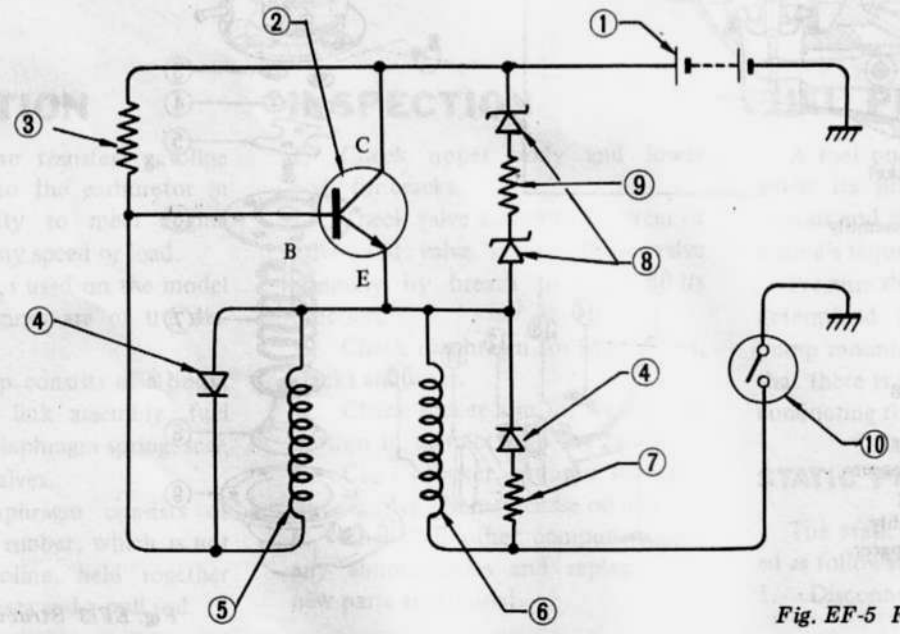


1 Diaphragm
2 Transistor
3 Diode
4 Plunger
5 Return spring
6 Magnet coil
7 Outlet valve
8 Inlet valve
9 Filter
10 Magnet

EF059

Fig. EF-4 Construction of fuel pump

OPERATION



1 Battery
2 Transistor
3 Resistor
4 Diode
5 Signal coil
6 Main coil
7 Resistor (3)
8 Zener diode
9 Resistor (2)
10 Key swich

EF060

Fig. EF-5 Fuel pump circuit diagram

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

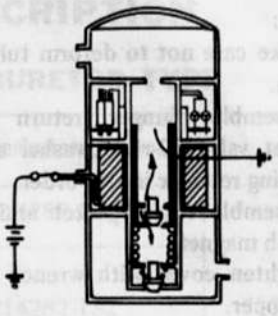
The current further increases in strength as it passes through the signal coil.

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-3 and EF-4.

(1) Suction stroke

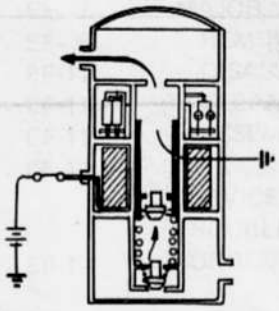
When current flows through the main coil, this causes the plunger to be pulled down by the magnetic force. As this takes place, fuel pushes up the outlet valve and enters the top end of the plunger, Figure EF-5.



EF061

Fig. EF-6 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-7.



EF062

Fig. EF-7 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 (0.0236 in) inner diameter] to the pump outlet.

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

3. With the hose outlet in the higher position than pump, operate pump and check the delivery capacity for more than 15 seconds.
4. The capacity should be 1,400 cc (85.4 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, follow the following diagnosis.

Notes:

a. Do not connect battery in reverse polarity, as this would damage transistor circuit and disable the pump.
b. Do not let the pipe fall, as it may damage the electronic components.
c. Do not apply overvoltage. (max. 1.8 V) Overvoltage starting by quick charge or overvoltage running would deteriorate or damage electronic components.

TROUBLE DIAGNOSES AND CORRECTIONS

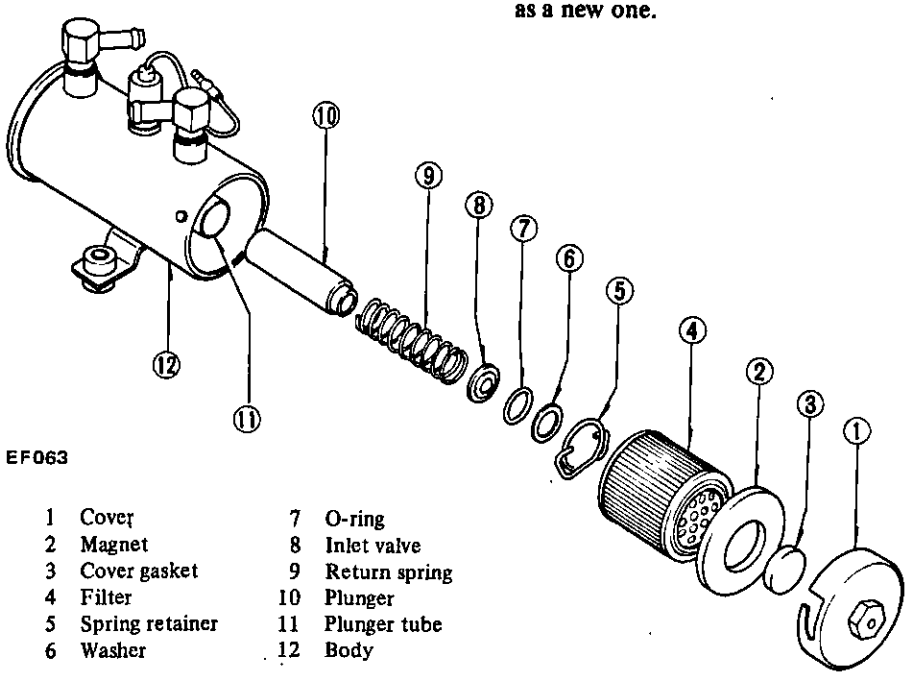
Condition	Probable cause	Corrective action
Fuel pump fails to operate.	Terminals or connections loose.	Retighten.
	Rust on terminals or grounding metal.	Clean.
	Frozen liquid in plunger stick or pump.	Clean plunger assembly. Replace pump if plunger is stuck or seized.
Fuel pump fails to discharge sufficient flow.	Clogged filter.	Clean pump interior. Clean and, if necessary, replace strainer.
	Insufficient fuel.	Replenish.
Insufficient fuel discharge during high speed travelling.	Fuel hose disconnected.	Connect.
	Air in fuel hose through connections.	Apply a coating of end sealing compound to connections, and retighten.
Low float level at idling.	Hose necked down or bent.	Check and correct.
	Fuel tank breather tube bent or necked down.	Check and correct.
	Weakened return spring.	Replace.

Condition	Probable cause	Corrective action
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.

DISASSEMBLY AND ASSEMBLY

DISASSEMBLY

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



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

Fig. EF-8 Exploded view of fuel pump

2. When removing plunger, take out spring retainer from plunger tube.
3. Then, take out washer, O-ring, inlet valve, return spring and plunger from tube. See Figure EF-8.

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

ASSEMBLY

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

Notes:
a. **If gasket or filter is defective, replace it with a new one.**
b. **Especially clean magnet and cover for defect.**

Notes:

Take care not to deform tube as it is thin.

a. **Assemble plunger, return spring, inlet valve, O-ring, washer and set spring retainer in this order.**
b. **Assemble filter, gasket and cover with magnet.**
c. **Tighten cover with wrench to the stopper.**

INSPECTION

1. Wash filter and strainer with clean gasoline and blow dust off with a blast of air. When cleaning the parts, check filter and gasket. If defective, replace.

Note: Filter must be cleaned every 10,000 km (6,000 miles).

2. Wash plunger, plunger tube and inlet valve with clean gasoline, and blow dust off with a blast of air. Check them for wear and defect.

If they are found defective, 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 defective, and it must be replaced.

TWO-BARREL CARBURETOR

CONTENTS

DESCRIPTION

CARBURETOR TYPE

Carburetor type	Applied engine	Car.s body number
214282-124	J15 with manual transmission	N620U, GN620U
214282-132		NL620, GNL620, UNL620, NL620T, GNL620T
214282-141		PA321, VPA321, GKPA321
214282-171	J16 with manual transmission	T20U, VT20U, T20HU
214282-181		LT20, LT20H
214260-122	J13 with manual transmission	620U, G620U, U620U
214260-132		L620, LG620, UL620, L620T, LG620T
214260-171		A321

*The differences in performance are explained in the following specification table.

As almost all the mechanisms of these carburetors are quite similar, the general explanation applies to all except for minor variations.

These are downdraft types and are designed to increase power and fuel economy.

These carburetors present several distinct features of importance to the vehicle owners.

A summary of features is as follows:

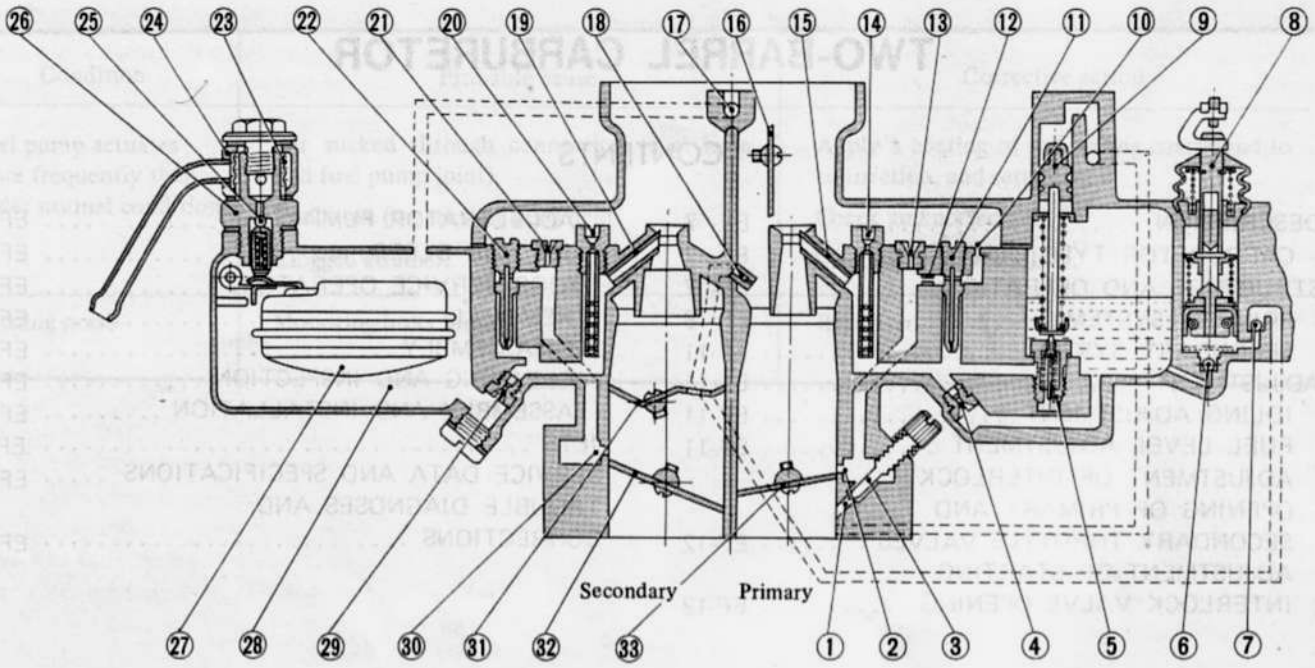
- The secondary switchover system is the mechanical throttle valve type which uses the auxiliary valve.
- The power valve mechanism, so-called vacuum piston type, affords high speed performance.
- Accelerating pump gives excellent acceleration.

STRUCTURE AND OPERATION

These carburetors consist of the primary system for normal running and the secondary system for full load running.

The float system which is commonly used by primary and secondary systems, the secondary switchover mechanism, the starting mechanism, accelerating mechanism, etc. are also attached.

On these carburetor, both primary and secondary systems adopt zenith stromberg type nozzle.



1	Idle port	13	Secondary slow air bleed	23	Strainer
2	Slow port	14	Primary main air bleed	24	Fuel union
3	Idle adjust screw	15	Primary main nozzle (Primary small venturi)	25	Ball valve
4	Primary main jet	16	Choke valve	26	Float valve seat
5	Power jet	17	Air vent	27	Float ass'y
6	Inlet check valve	18	Accelerator pump nozzle	28	Float chamber
7	Outlet check valve	19	Secondary main nozzle (Secondary small venturi)	29	Secondary main jet
8	Accelerator pump piston	20	Secondary main air bleed	30	Step port
9	Vacuum piston	21	Step air bleed	31	Auxiliary valve
10	Primary slow air bleed	22	Step jet	32	Secondary throttle valve
11	Slow jet			33	Primary throttle valve
12	Slow economizer				

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Fig. EF-9 Sectional view of carburetor

PRIMARY SYSTEM

Primary system

The primary system is of zenith stromberg type. Fuel flows as shown in Figure EF-10 through the main jet, mixing with air which comes in from the main air bleed and passes through the emulsion tube, and is pulled out into the small venturi through the main nozzle. Due to the small venturi, the higher velocity air current passing through the main nozzle promotes the fuel atomization.

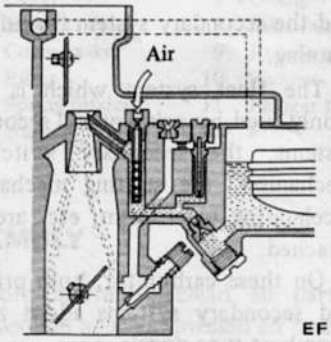

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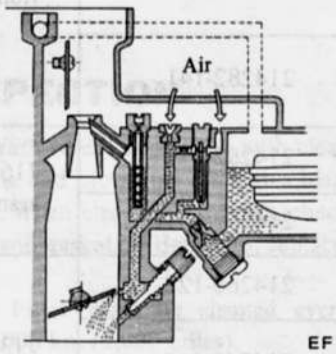
Fig. EF-10 Primary main system

Idling and slow system

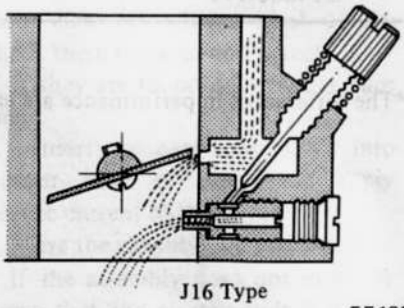
During low engine speed, as shown in Figure EF-11, fuel flows through the slow jet, mixing with air comming from the 1st slow air bleed, and passes through the slow economizer jet, again mixing with air coming from the 2nd slow air bleed and then is pulled out into the engine through the idle hole (or the idle nozzle) and by-pass hole.

Model-214282-171 and -181 are equipped with the idle nozzle as shown in Figure EF-12. Through this nozzle, idling mixture is further atomized by air stream below throttle valve and ensures stable idling.



EF192

Fig. EF-11 Idling and slow system



J16 Type

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Fig. EF-12 Idle nozzle system

The 1st slow air bleed on the 214282-171 and -181 (J16) type carburetors is different from other types (J15 and J13).

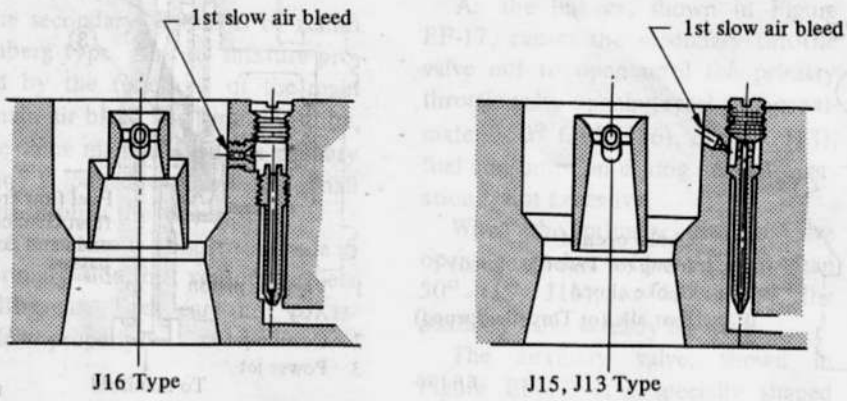
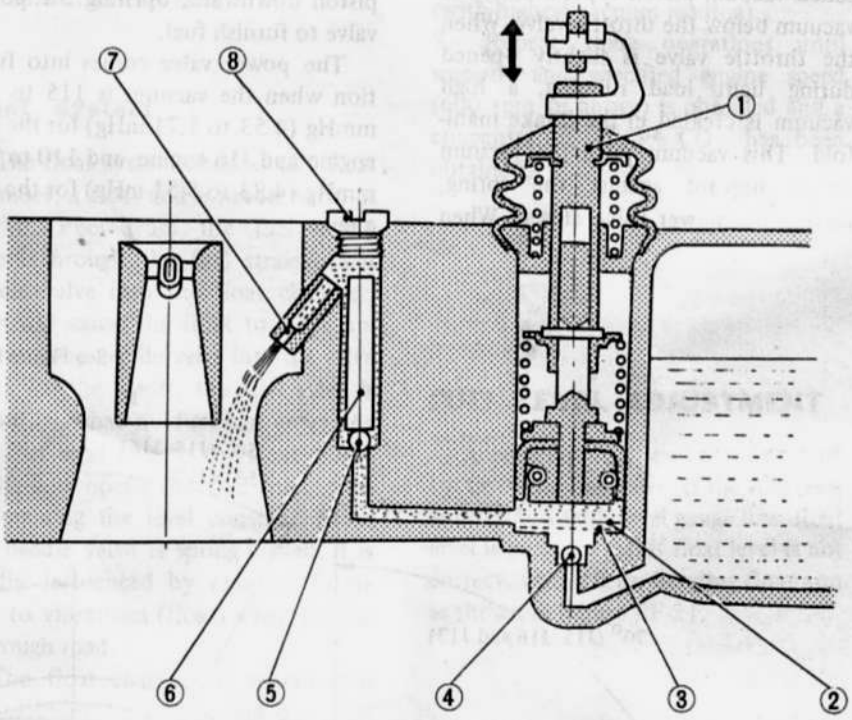


Fig. EF-13 1st slow air bleed

Slow economizer system is useful to obtain smooth deceleration at high speed.

Accelerating mechanism

The carburetor is equipped with the piston type accelerating mechanism linked to the throttle valve. When the primary throttle valve, shown in Figure EF-14, is closed, the piston goes up, and fuel flows from the float chamber through the inlet valve into the space under the piston. When the throttle valve is opened, the piston goes down, opening the outlet valve, and then fuel is sprayed against the side wall of the small venturi, broken up into small droplets, and supplies additional fuel to enrich the air-fuel mixture. The amount of fuel to be sprayed can be adjusted by changing the position of the pump rod on the pump arm.



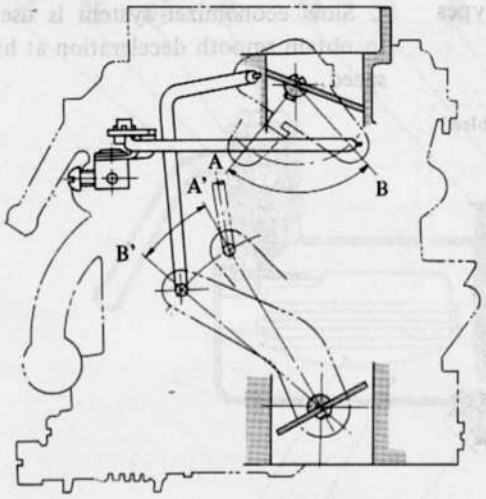
1 Accelerator pump piston
2 Clip
3 Strainer
4 Inlet valve
5 Outlet valve
6 Weight
7 Pump jet
8 Plug

Fig. EF-14 Acceleration mechanism

Starting mechanism

Pull the choke knob to close the choke valve fully, then start the engine. This provides a rich mixture, making it possible to start the engine quickly. When the engine is started, the choke valve is opened at an adequate angle automatically, which prevents overchoking and ensures smooth engine performance.

While the engine is being warmed up, it increases in speed at steps, and by releasing the choke knob an optimum engine speed can be obtained. With the choke valve closed fully, the primary throttle valve is caused to open through a link mechanism at an angle best suited for starting.



A : Choke opened
A' : Idling (or Throttle closed)
B : Choke closed
B' : Fast idle (or Throttle opened)

EF 196

Fig. EF-15 Starting mechanism

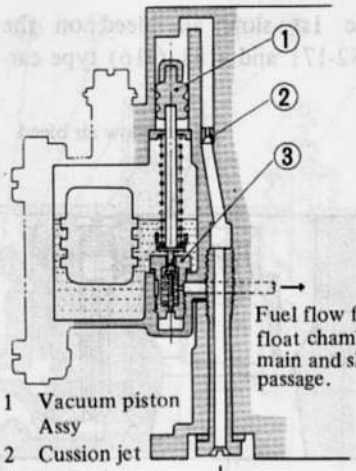


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Fig. EF-16 Power valve mechanism

Power valve mechanism

The power valve mechanism, so-called vacuum piston type, utilizes the vacuum below the throttle valve. When the throttle valve is slightly opened during light load running, a high vacuum is created in the intake manifold. This vacuum pulls the vacuum piston upward against the spring, leaving the power valve closed. When the vacuum below the throttle valve is lowered during full load or acceleration the spring pushes the vacuum piston downward, opening the power valve to furnish fuel.

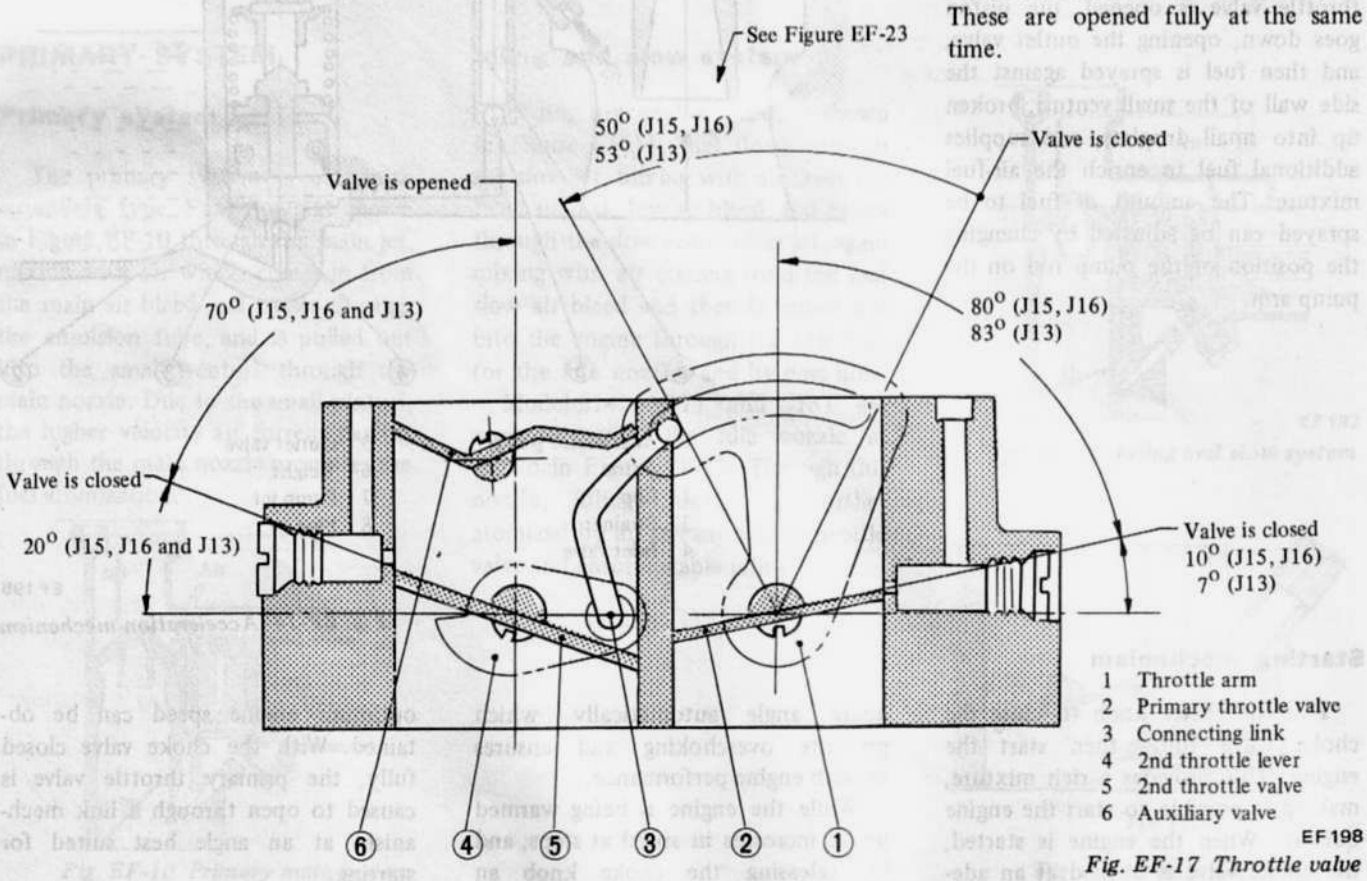
The power valve comes into function when the vacuum is 115 to 145 mmHg (4.53 to 5.71 inHg) for the J15 engine and J16 engine, and 110 to 140 mmHg (4.33 to 5.51 inHg) for the J13 engine.

Throttle valve

The primary throttle valve operates through 80° for the J15 and J16 engine, and 83° for J13 engine.

The secondary throttle valve operates through 70° for J15, J16 and J13 engine.

It is connected to the choke valve, accelerator pump through the system linkage. The design is such that when the primary throttle valve is opened 50° (J15, J16), or 53° (J13), the secondary throttle valve starts to open. These are opened fully at the same time.



1 Throttle arm
2 Primary throttle valve
3 Connecting link
4 2nd throttle lever
5 2nd throttle valve
6 Auxiliary valve

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Fig. EF-17 Throttle valve

SECONDARY SYSTEM

Secondary system

The secondary system is of zenith stromberg type. Air-fuel mixture produced by the functions of the main jet, main air bleed and emulsion tube, in the same manner as in the primary system, is pulled out into the small venturi through the main nozzle.

The structure is almost the same as the primary side, but venturi and jets are different. Take care not to assemble improperly.

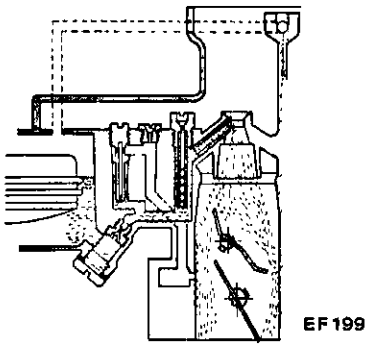


Fig. EF-18 Secondary main system

Step system

The construction of this system may correspond to the slow system of the primary system. This system aims at the proper filling up of the gap when fuel supply is transferred from the primary system to the secondary one. The step port is located near the secondary throttle valve edge in its fully closed state.

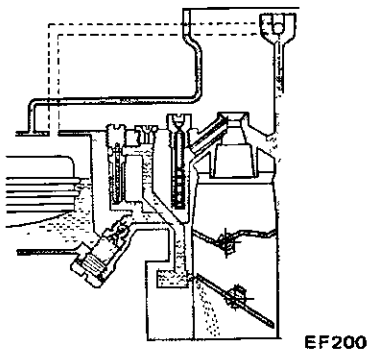


Fig. EF-19 Secondary step system

Secondary switchover mechanism

As the linkage, shown in Figure EF-17, causes the secondary throttle valve not to open until the primary throttle valve opening reaches approximately 50° (J15, J16), or 53° (J13), fuel consumption during normal operation is not excessive.

When the primary throttle valve opening reaches wider position than 50° (15, J16), or 53° (J13), the auxiliary valve is ready to open.

The auxiliary valve, shown in Figure EF-17, is a specially shaped butterfly valve and is eccentrically mounted above the throttle valve. It is connected to the valve arm which incorporates a weight. The valve opens and closes automatically to provide the correct air-fuel ratio.

Float system

The float system consists of a float chamber, a float and a needle valve as shown. Fuel from the fuel pump enters through the fuel strainer and needle valve into the float chamber. This will cause the float to move up, pushing the needle valve into the valve seat. As the result, the fuel inlet is closed, so that no fuel can enter. As the fuel level lowers, the float moves down and opens the fuel inlet, thus maintaining the level constant. Since the needle valve is spring-loaded, it is hardly influenced by external forces due to vibrations (float) when driving on rough road.

The float chamber is vented into the carburetor air horn and does not open to the atmosphere. In other words, air pressure is the same in the float chamber and air horn. This eliminates the effect of a clogged air cleaner, which otherwise would bleed too much fuel due to increased manifold negative pressure.

ADJUSTMENT

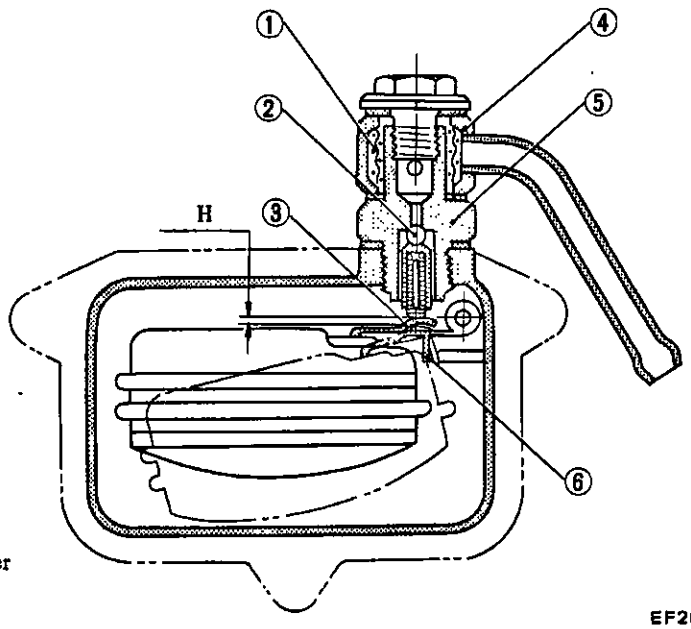
IDLING ADJUSTMENT

Idling adjustment is made by throttle, adjust screw and idle adjust screw.

1. Check to be sure that float level is correct while running engine at idle speed.
2. Using a suitable screwdriver starting from fully closed position, turn out idle adjust screw approximately 2 (J15) or 1¾ (J16) or 2⅞ (J13) turns. Turn in throttle adjust screw two or three turns and start engine.
3. Turn throttle adjust screw gently in or out until specified engine idle speed is approximately obtained.
4. Turn idle adjust screw in or out until engine runs smoothly at the highest speed.
5. Turn out throttle adjust screw until specified engine speed is obtained.
6. Readjust idle screw until engine runs smoothly at the highest speed (with highest vacuum reading).
7. Repeat these operations until smooth and specified engine speed (600 rpm or above) is obtained and a concentration of 3% CO has been obtained.

FUEL LEVEL ADJUSTMENT

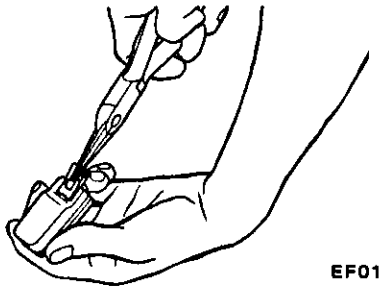
A constant fuel level is maintained by float and ball valve. If the fuel level is in accord with level gauge line, float level is properly set. If float level is not correct, adjust it by bending float arm as shown in Figure EF-21.



1 Stainer
2 Ball valve
3 Flort arm
4 Fuel union
5 Valve seat
6 Float stopper

EF201

Fig. EF-20 Fuel level adjustment

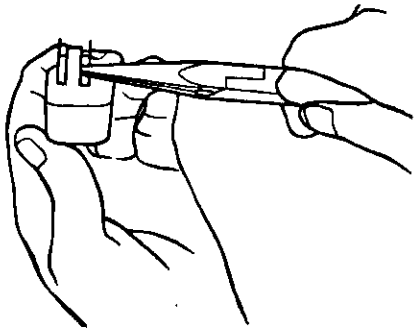


EF017

Fig. EF-21 Float arm adjustment

Approximately *H mm is required for effective stroke of ball valve. So adjust gap between valve stem and float arm to *H mm with float fully lifted up by bending float stopper.

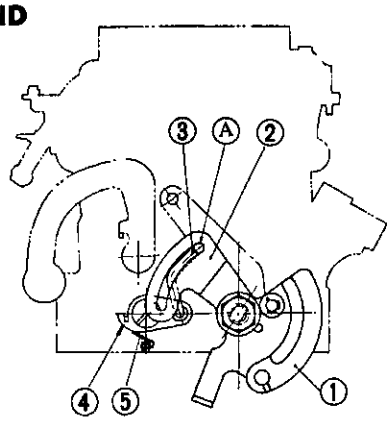
*H: 1.0 mm (0.0394 in)



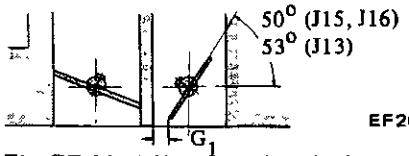
EF018

Fig. EF-22 Float stopper adjustment

ADJUSTMENT OF INTERLOCK OPENING OF PRIMARY AND SECONDARY THROTTLE VALVES



1 Throttle lever
2 Throttle arm
3 Connecting link
4 2nd throttle lever
5 Return spring



EF202

Fig. EF-23 Adjustment interlock opening

Figure EF-23 shows that primary throttle valve opens 50° (J15, J16) or 53° (J13). When primary throttle valve opens 50° or 53°, connecting link is contacted with right hand end of a groove on primary throttle arm (A).

When throttle valve further opens, secondary throttle valve begins to open. Linkage between primary and secondary throttles will operate properly if clearance G_1 between throttle valve and inner wall of throttle chamber, amounts to specifications as shown below:

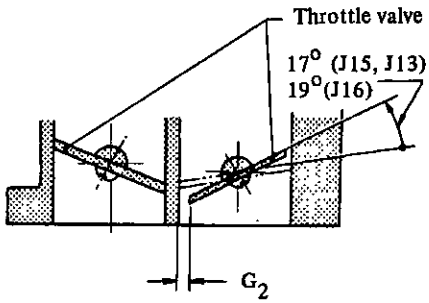
Engine type	G_1 dimention mm (in)
J15	6.89 (0.271)
J16	6.89 (0.271)
J13	6.45 (0.254)

Adjustment is made by bending connecting link.

ADJUSTMENT OF STARTING INTERLOCK VALVE OPENING

Adjustment should be performed with choke valve fully closed. Without disturbing above setting, check to determine if clearance between primary throttle valve and inner wall of throttle chamber is held within specified limits. Also see if opening angle of primary throttle valve is 17° (J15, J13) or 19° (J16).

If necessary, bend choke connecting rod as required so that clearance "G_2" falls within specified tolerances, as shown in Figure EF-24.



(See Fig. EF-15) EF203

Fig. EF-24 Measuring starting interlock valve opening

Engine type	G_2 dimention mm (in)
J15	1.33 (0.052)
J16	1.57 (0.062)
J13	1.03 (0.041)

ACCELERATOR PUMP

Accelerator pump can be checked with engine stationary and air cleaner removed. To test pump, open throttle valve fully at a stretch and see how much fuel pump will feed. Be sure to repeat this procedure 10 to 20 times to obtain average reading:

Engine type	Hole in pump arm near the pump arm shaft	Other hole
J15	0.72 cc	0.54 cc
J16	0.6 cc	0.42 cc
J13	0.6 cc	0.42 cc

Depending on position of connecting rod in holes in pump arm.

JET, AIR BLEED, ETC.

All jets, air bleed holes etc., should be cleaned with approved solvent and checked for clogging and sign of damage. They should never be cleaned with wires, for this will enlarge the openings.

MAJOR SERVICE OPERATION

The perfect carburetor delivers the proper air and fuel ratios for all speeds of the particular engine for which it was designed. By completely disassembling at regular intervals, which will allow cleaning of all parts and passages, the carburetor can be returned to its original condition and it will then deliver the proper ratios as it did when new.

To maintain the accurate calibration of passages and discharge holes, extreme care must be taken in cleaning. Use only carburetor solvent and compressed air to clean all passages and discharge holes. Never use wire or other pointed instrument to clean as the calibration of carburetor will be affected.

REMOVAL

1. Remove air cleaner
2. Disconnect the vacuum pipe connecting to the distributor.
3. Disconnect fuel line.
4. Remove throttle and choke wire.
5. Remove four nuts and washers retaining carburetor to manifold.
6. Life carburetor off manifold.
7. Remove the gasket used between carburetor and manifold. Replace it, if necessary.

DISASSEMBLY

General instructions

Use wrenches and drivers of sizes well fitted to the nuts, screws and jets, to avoid damage to them.

The small parts disassembled or removed should be kept arranged according to the individual system and be checked for wear and damage. Replace the defective parts with new ones.

Clean all the parts with gasoline, blow air through the small holes in the parts and dry them by air.

If the threads of the parts and other fitting parts of the throttle shaft and choke shaft are too tight, clean them well with gasoline before assembling them.

All the parts of these carburetors, including the small venturi, can be disassembled and care should be taken to identify very similar parts for the primary side and for the secondary side.

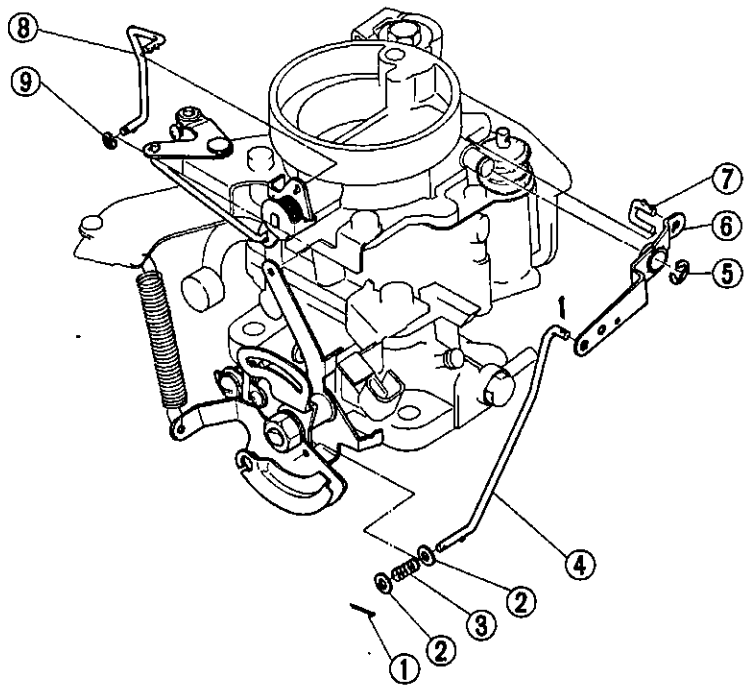
When disassembling the carburetor, it is easy to divide the work into the following six groups.

1. Linkages and rod around the carburetor.
2. Accelerator pump parts.
3. Air horn parts.
4. Body parts.
5. Float parts
6. Flange parts.

Among the above groups, the float and accelerator pump parts are relatively easy to disassemble independently.

Linkage parts

1. Take off the clip at the pump arm and disconnect the pump connecting rod from the primary throttle lever.
2. Disconnect the starting connecting rod from the starting throttle lever.



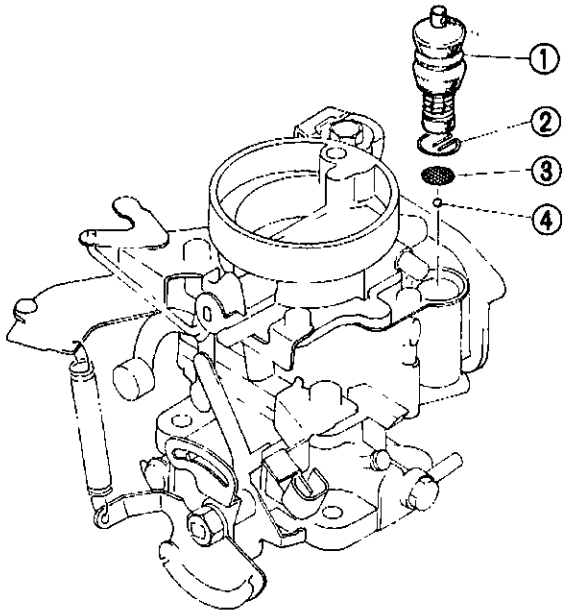
1 Cotter pin (1 dia.)
2 Plain washer (4 dia.)
3 Rod spring
4 Pump rod
5 E-ring (4 dia.)
6 Pump lever
7 Pump rod
8 Starting lever connecting rod
9 E-ring (1.9 dia.)

EF204

Fig. EF-25 Linkage part disassemble

Accelerating pump

By disconnecting the linkage the pump plunger assembly can be taken out. Take out the pump strainer and the ball inlet valve by removing the strainer clip.



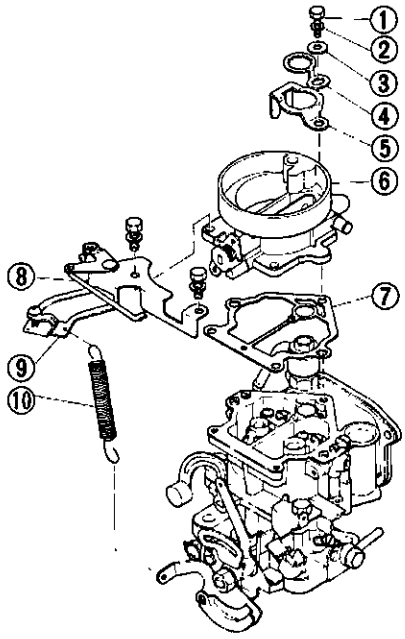
1 Accelerator pump piston
2 Clip
3 Strainer
4 Inlet valve (Ball)

EF205

Fig. EF-26 Removal of accelerating pump

Air horn

By taking off three bolts holding the air horn to the body, the choke wire holder, air horn, clamp etc., and gasket are removed.



1 Screw
2 Spring washer
3 Plain washer
4 Union bolt clamp
5 Fuel union clamp
6 Air horn ass'y
7 Body gasket
8 Choke lever rod
9 Choke wire holder
10 Throttle return spring

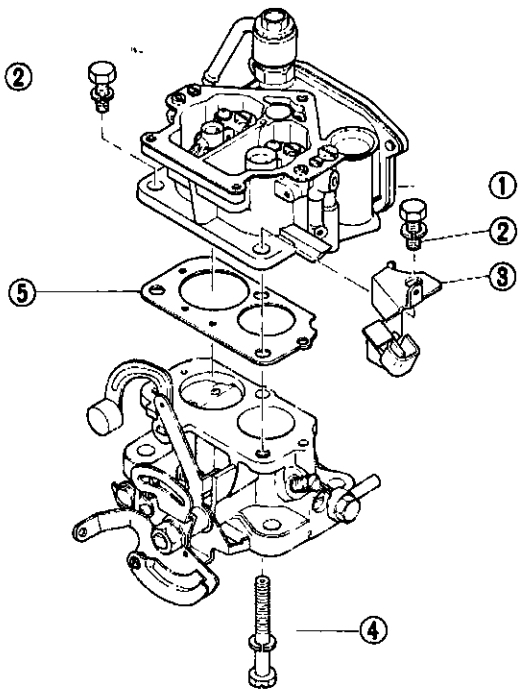
EF206

Fig. EF-27 Removal of air horn

Note: The vacuum piston assembly for the power jet, the choke valve, the choke shaft, choke lever and spring are installed in the air horn assembly. Be careful not to damage them, and do not remove them from air horn.

Body

1. By taking off three bolts which hold the body to the flange, the body is removed. Two of these bolts are tightened from the body side and one is from the flange side.



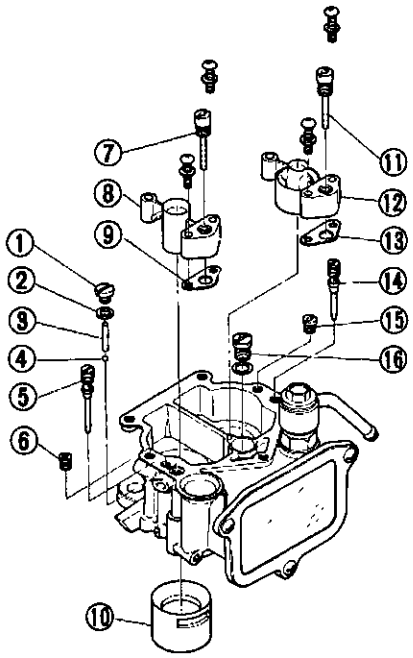
1 Body
2 Screw
3 Throttle wire holder
4 Screw
5 Flange gasket

EF207

Fig. EF-28 Removal of body

2. Remove the jets and air bleed jets installed on the upper surface of the body.

Model 214282-171, 181, by removing the slow passage plug at the upper surface of the body, the slow jet is taken out and then by removing the 1st slow air bleed plug at the wall of the primary side body, the 1st slow air bleed jet is taken out.



1 Plug
2 Gasket
3 Pump weight
4 Outlet valve (Ball)
5 Slow jet
6 Secondary slow air bleed jet
7 Primary main air bleed jet
8 Primary small venturi
9 Gasket
10 Primary large venturi
11 Secondary main air bleed jet
12 Secondary small venturi
13 Gasket
14 Step jet
15 Step air bleed jet
16 Power jet

EF208

Fig. EF-29 Removal of jet etc.

3. By removing the pump passage plug, the pump weight and the pump outlet valve (ball) are taken out.

Do not remove the pump nozzle fixed into the body.

4. Remove the small venturi by taking off two screws.

5. Be careful not to damage the valve tip of the power jet valve assembly with the driver.

6. Take off the main jet after removing the main passage plug at the bottom surface of the body.

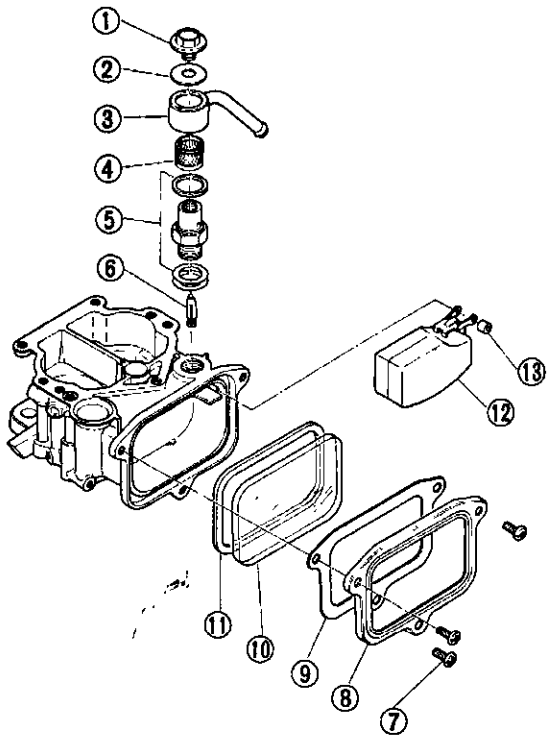
Float

1. Loosen three screws holding the level gauge glass and take off the float.

At float pin, there is a collar for keeping float position.

Pay attention to the small related parts which may come off at removal of the float.

2. Remove the bolt holding the union nipple, by removing the nipple, the ball valve seat is removed.



1 Fuel nipple set screw
2 Plain washer (8 dia.)
3 Fuel nipple
4 Filter
5 Float valve seat
6 Float valve
7 Screw
8 Level gauge cover
9 Float chamber gasket
10 Level gauge
11 Rubber seal
12 Float
13 Coller

EF209

Fig. EF-30 Removal of float

Flange

Primary side

1. Remove idle adjust screw and its spring. By taking off the primary throttle shaft nut, the throttle shaft lever, the throttle shaft arm and the starting throttle lever are removed.

2. Remove the plug of primary slow port.

3. Model 214282-171, 181, take off the idle nozzle and its gasket after removing the idle nozzle plug.

4. Do not remove the primary throttle valve and throttle shaft from flange.

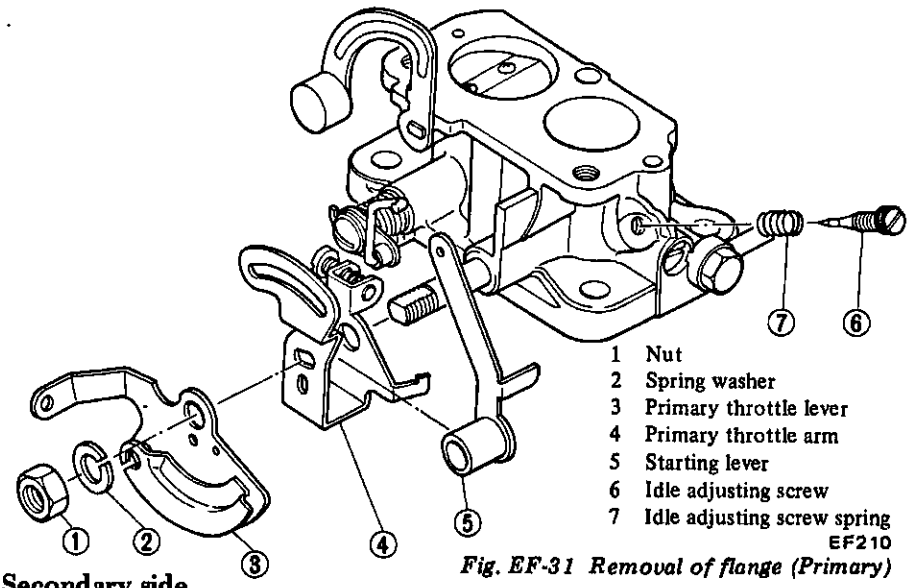


Fig. EF-31 Removal of flange (Primary)

Secondary side

1. By taking off the throttle lever set screw, the secondary throttle lever and the spring are removed from the secondary throttle shaft.
2. Remove the plug of the secondary step port.
3. Do not remove the secondary throttle valve, its shaft, auxilialy valve and its shaft assembly from flange.

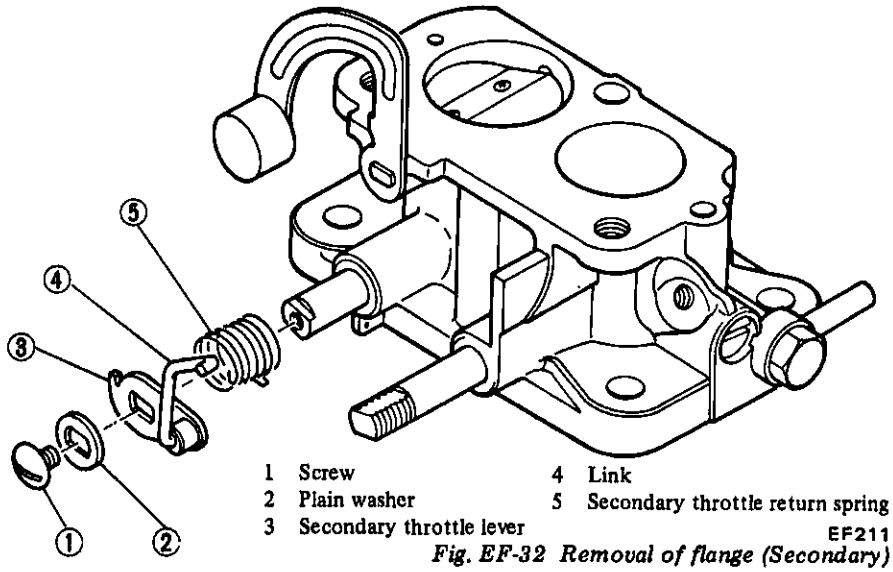


Fig. EF-32 Removal of flange (Secondary)

Note: In the flange, two throttle valves are installed.
Be careful not to damage them and do not remove them from flange.
Otherwise, stable idling and slow speed performance will not be obtained.

CLEANING AND INSPECTION

Dirt, gum, water or carbon contamination in or on the exterior moving parts of carburetor are often responsible for unsatisfactory performance.

For this reason, efficient carburetion depends upon careful cleaning and inspection while servicing.

Blow all passages and castings with compressed air and blow off all parts until dry.

Note: Do not pass drills or wires through calibrated jets or passages as this may enlarge orifice and seriously affect carburetor calibration.

Check all parts for wear. Replace worn parts. Especially the following matters should be checked:

1. Check float valve (ball) and seat for wear. Replace assembly, if worn.
2. Check throttle and choke bore for wear.
3. Inspect idle adjusting screw for burrs or ridges. Replace as required.

Inspect gaskets whether they appear hard or brittle, or whether edges are torn or distorted. If any such condition is detected, they must be replaced.

Check filter screen for clogging. Clean and replace if it is distorted or remains plugged.

Check venturi clusters for loose or worn parts. If damage or looseness exists, replace cluster assembly.

Check linkage for operating condition.

Inspect the operation of accelerating pump. Pour gasoline into float chamber and operate throttle lever.

Check condition of gasoline injection from accelerating nozzle.

ASSEMBLY AND INSTALLATION

Assemble and install the carburetor in reverse sequence of disassembly and removal.

Replace gaskets, if necessary.

When disassembling and assembling interlock link and related components, be careful not to bend or deform the components.

Reassemble carefully and correctly so that all interlock links operate smoothly.

JETS

The carburetor performance depends on jets and air bleeds. That is why these components are manufactured with utmost care.

To clean them, use cleaning solvent and blow air on them. Larger numbers stamped on the jets indicate larger diameters. Accordingly, main and slow jet with larger numbers provide richer mixture, and the smaller numbers provide the leaner mixture.

Inversely, the main and slow air bleed, which air passes through, makes fuel mixture leaner if they bear larger numbers, and the smaller numbers the richer fuel mixture.

Replacement of designated jets to meet the service condition of the car, must be carried out with the above directions in mind. To cite a practical example, when it becomes necessary

to economize fuel at the limited sacrifice of output to meet frequent light-load operation, use smaller main jets or slow jets, or larger main air bleeds or slow air bleeds than regularly specified.

This should meet the purpose.

Inversely, when increasing output at the sacrifice of fuel consumption, use larger main jets or slow jets, or smaller main air bleeds or slow air bleeds. This will bring a satisfactory result.

SERVICE DATA AND SPECIFICATIONS

Carburetor model		214282-124, 132, 141		214282-171, 181		214260-122, 132, 171	
Applied engine		J15		J16		J13	
		Primary	Secondary	Primary	Secondary	Primary	Secondary
Inlet diameter	mm (in)	65 (2.559)		65 (2.559)		65 (2.559)	
Outlet diameter	mm (in)	28 (1.102)	32 (1.260)	28 (1.102)	32 (1.260)	26 (1.024)	30 (1.181)
Venturi diameter							
Large	mm (in)	21 (0.827)	27 (1.063)	23 (0.906)	29 (1.142)	20 (0.787)	27 (1.063)
Medium	mm (in)	———	14 (0.551)	14 (0.551)	14 (0.551)	———	14 (0.551)
Small	mm (in)	8 (0.315)	7 (0.276)	7 (0.276)	7 (0.276)	8 (0.315)	7 (0.276)
Main nozzle	mm (in)	2.2 (0.087)	2.5 (0.098)	2.3 (0.091)	2.5 (0.098)	2.3 (0.091)	2.5 (0.098)
Main jet		# 100	# 150	# 102	# 160	# 88	# 145
Slow jet		# 46	# 70	# 46	# 60	# 48	# 70
Main air bleed		# 60	# 60	# 60	# 60	# 60	# 80
1st slow air bleed		# 100	———	# 100	———	# 100	———
2nd slow air bleed		# 200	# 220	# 200	# 200	# 240	# 190
Power jet		# 45		# 45		# 50	
Float lever (distance from upper surface of body)	mm (in)	21.5 (0.846)		21.5 (0.846)		21.5 (0.846)	
Fuel pressure	kg/cm^2 (psi)	0.24 (3.414)		0.24 (3.414)		0.18 (2.560)	
Throttle valve closed angle		10°	20°	10°	20°	7°	20°
Secondary throttle valve opening angle		50°		50°		53°	
Choke valve closed angle		10°		10°		10°	

(example) # 200 represents 200/100 = 2.00 mm (0.0787) diameter

TROUBLE DIAGNOSES AND CORRECTIONS

In the following table, the symptons and causes of carburetor troubles and remedies for them are listed to facilitate quick repairs.

There are various causes of engine troubles. It sometimes happens that the completely effective carburetor seems apparently to have some troubles when the electric system is defective. Therefore, whenever the engine has troubles the electric system must be checked first before adjusting the carburetor.

Condition	Probable cause	Corrective action
Overflow	Dirt accumlated on float valve.	Clean float valve.
	Fuel pump pressure too high float valve seat improper.	Repair pump. Lap or replace.
Excessive fuel consumption	Fuel overflow.	See above.
	Each main jet, slow jet too large.	Replace.
	Each main air bleed clogged.	Clean.
	Choke valve does not open.	Adjust.
	Outlet valve seat of accelerator pump improper.	Lap.
	Linked opening of secondary throttle valve too easy.	Adjust.
Power shortage	Each main jet clogged.	Clean.
	Each throttle valve does not fully open.	Adjust.
	Fuel pump operated improperly.	Repair.
	Fuel strainer clogged.	Clean.
	Vacuum jet clogged.	Clean.
	Air cleaner clogged.	Clean.
	Power valve operating improperly.	Adjust.
Improper idling	Slow jet clogged.	Clean.
	Each throttle valve does not close.	Adjust.
	Each throttle valve shaft wear.	Replace.
	Packing between manifold/carburetor defective.	Replace packing.
	Manifold/carburetor tightening improper.	Correct tightening.
	Fuel overflow.	See the first item.
Engine hesitation	Each main jet, slow jet clogged.	Clean.
	By-pass hole, idle passage clogged.	Clean.
	Emulsion tube clogged.	Clean.
	Idling adjustment incorrect.	Correct adjustment.
	Secondary throttle valve and auxiliary valve operate improperly.	Overhaul and clean.

Condition	Probable cause	Corrective action
Engine does not start	Fuel over flow.	See the first item.
	No fuel.	Check pump, fuel pipe and float valve.
	Idling adjustment incorrect.	Correct adjustment.
	Fast idle adjustment incorrect.	Correct adjustment.
	Choke valve operates improperly.	Overhaul, clean.