SERVICE MANUAL

MODEL
L20A, L24 SERIES
ENGINES

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION EF

FUEL SYSTEM

EF

AIR CLEANER

DESCRIPTION

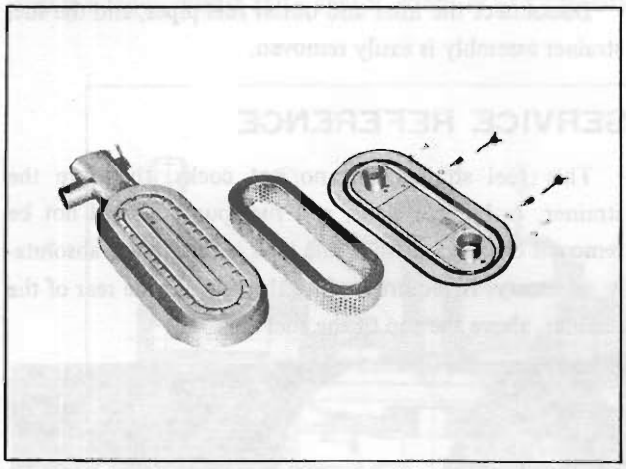


Fig. EF-1 Air cleaner for twin carburetor

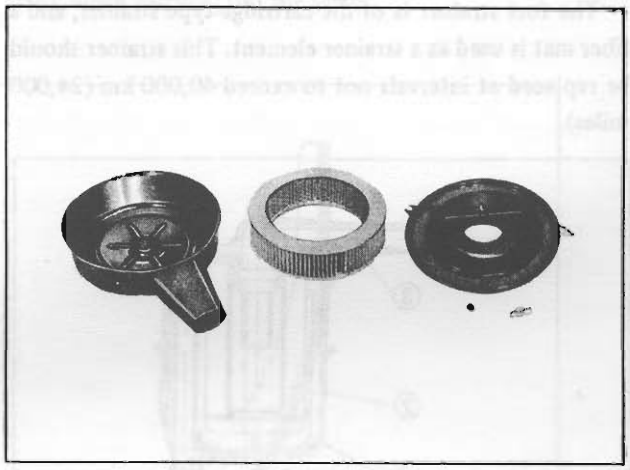


Fig. EF-2 Air cleaner for single carburetor

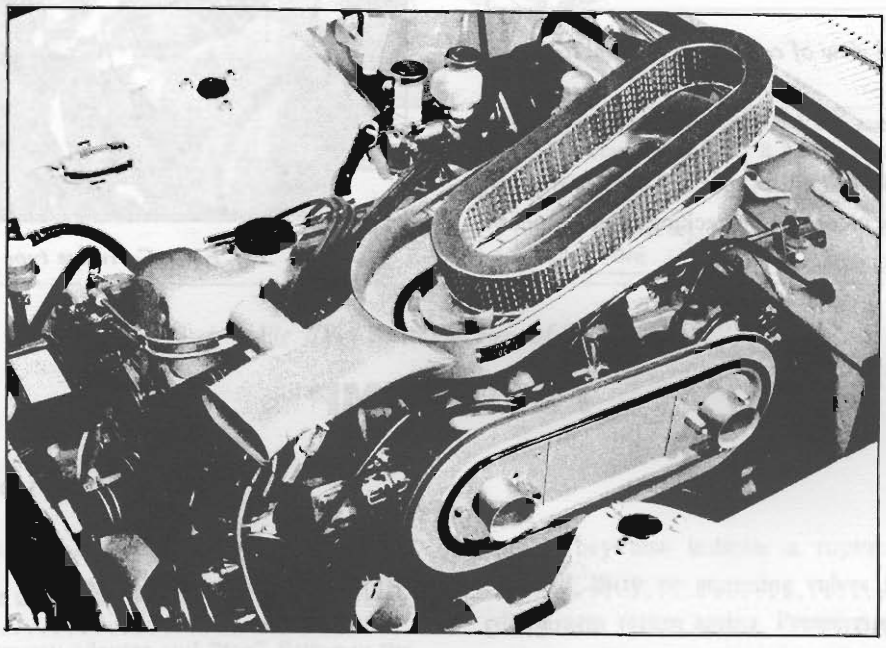


Fig. EF-3 Air cleaner for twin carburetor

The air filter elements used are viscous paper type elements and does not require any cleaning regardless of contamination until it is replaced at every 40,000 km (24,000 miles) of operation.

Note: Never treat the element by brushing or air blasting before the time for replacement!

FUEL STRAINER

DESCRIPTION

The fuel strainer is of the cartridge type strainer, and a fiber mat is used as a strainer element. This strainer should be replaced at intervals not to exceed 40,000 km (24,000 miles).

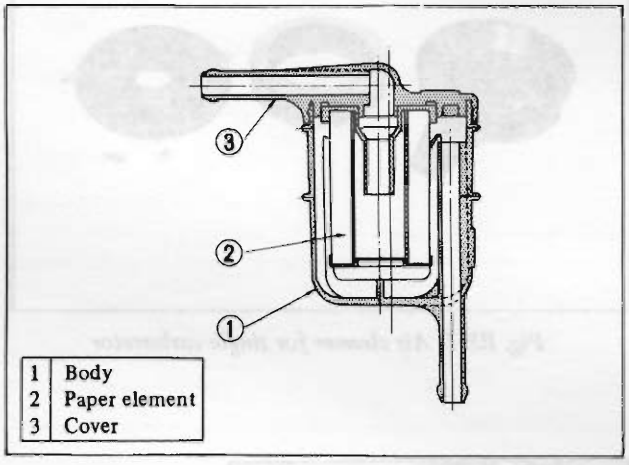


Fig. EF-4 Sectional view of cartridge type fuel strainer

The strainer element in both types can be seen through the bowl for convenience of checking the element's condition without removal.

REMOVAL

Disconnect the inlet and outlet fuel pipes, and the fuel strainer assembly is easily removed.

SERVICE REFERENCE

This fuel strainer has no pet cocks, therefore the strainer, carburetor lines, and fuel pump should not be removed or cleaned when the tank is full, unless absolutely necessary. If required, place the tube, at the rear of the strainer, above the top of the fuel tank.

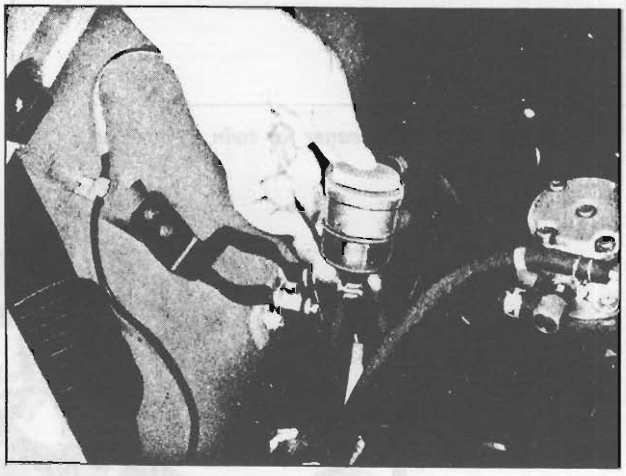


Fig. EF-5 Cartridge type fuel strainer

FUEL PUMP

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 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 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.

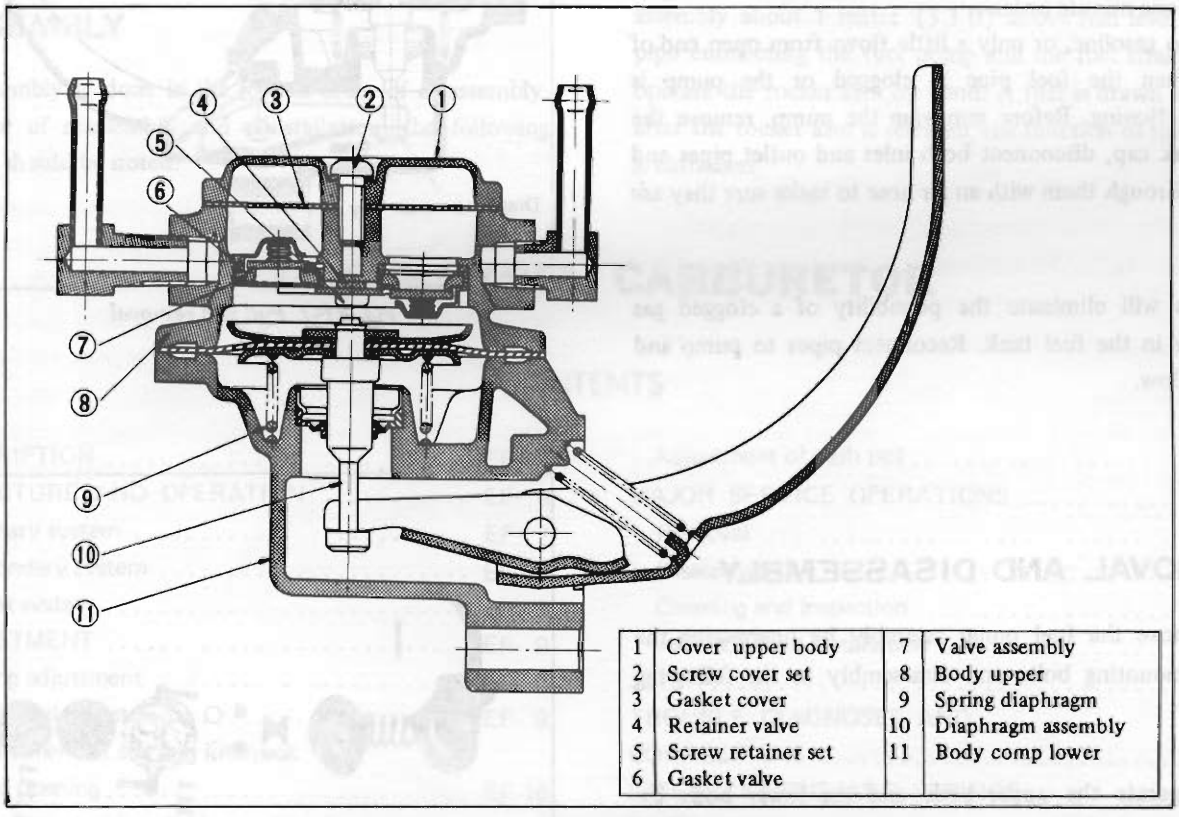


Fig. EF-6 Sectional view of fuel pump

Static pressure test

The static pressure test is made as follows:

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

0.24 to 0.30 kg/cm^2 (3.41 to 4.27 lb/sq in)

Pressure below the lower limit indicates extreme wear on one part or a small amount of wear on each working part. They also indicate 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 diaphragm return spring or a diaphragm that is too tight. Both of these conditions require the removal of the pump assembly for replacement or repair.

Capacity test

The capacity test is used only if the static pressure test is within specifications, and is made as follows:

1. Disconnect the fuel pipe at carburetor.

2. Place a suitable container at the end of the pipe.

3. Start the engine and run at 1,000 rpm of the camshaft.

4. The pump should deliver 1,600 cc (3⅜ U.S. qts.) of fuel in one minute or less.

If no gasoline, or only a little flows from open end of pipe then the fuel pipe is clogged or the pump is malfunctioning. Before removing the pump, remove the gas tank cap, disconnect both inlet and outlet pipes and blow through them with an air hose to make sure they are clean.

This will eliminate the possibility of a clogged gas strainer in the fuel tank. Reconnect pipes to pump and retest flow.

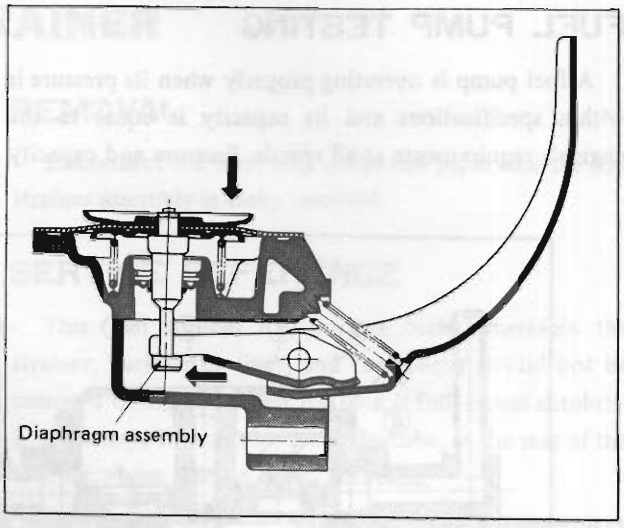


Fig. EF-7 Pull rod removal

REMOVAL AND DISASSEMBLY

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

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

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

3. Unscrew the elbow and the connector.

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

5. To remove the diaphragm, the diaphragm spring, the lower body seal washer and the lower body seal from the lower body, press down the diaphragm counter to the force of the diaphragm spring and while doing this, cant the diaphragm so that the rectangular part in the lower end of the pull rod is unhooked from the rocker arm link.

6. Drive out the rocker arm pin by using a press or hammer.

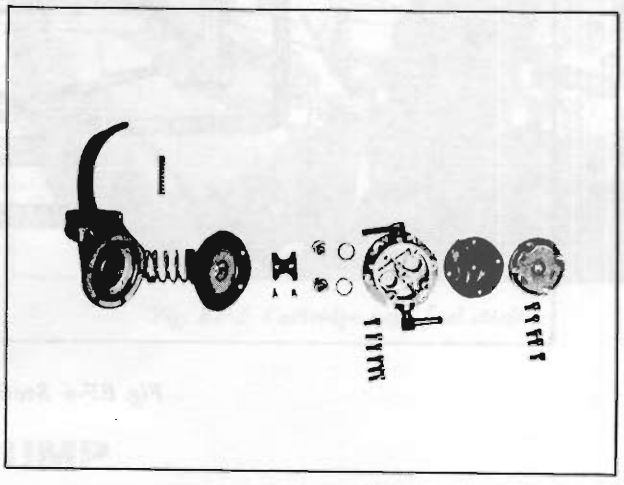


Fig. EF-8 Components of fuel pump

INSPECTION

1. Check the upper body and the lower body for cracks.

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

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

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

5. Check the 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 if the condition requires it.

ASSEMBLY

Assembly is done in the reverse order of disassembly. In case of reassembly and reinstallation, the following points should be noted.

1. Use new gaskets.

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

3. To test the function, position the fuel pump assembly about 1 meter (3.3 ft) above fuel level with a pipe connecting the fuel pump and the fuel strainer and operate the rocker arm by hand. If fuel is drawn up soon after the rocker arm is released, the function of the pump is sufficient.

TWO-BARREL CARBURETOR

CONTENTS

DESCRIPTION

Carburetor type	Applied engine and model
DAF342-6A	L24 on model 230
DAF342-12	L24 on model HGC10
DAF342-9A	L20 on model 230

As almost all the mechanism of these carburetors are quite similar, the general explanation is made in common except different points.

These are downdraft carburetors which were made aiming at the elevation of power and starting mechanism. These carburetors present several distinct features of importance to the car owner.

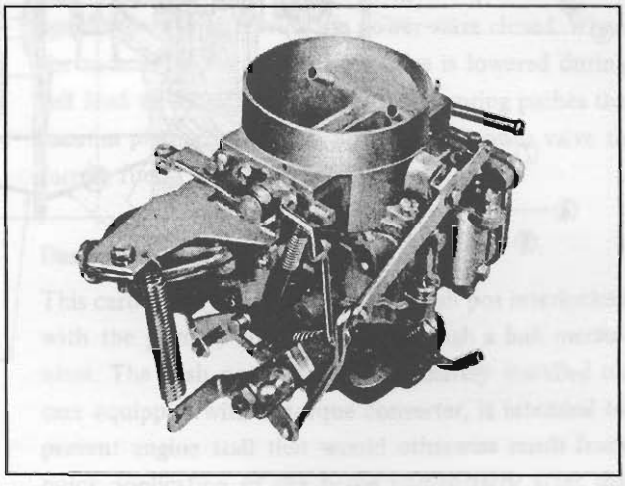


Fig. EF-9 Carburetor for vehicle with manual transmission

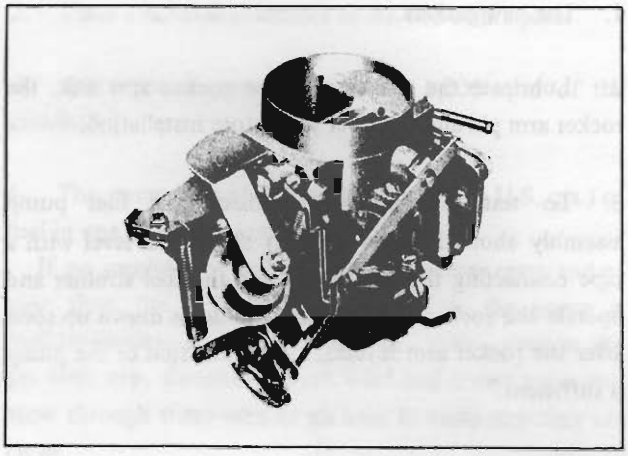


Fig. EF-10 Carburetor for vehicle with automatic transmission

Foremost among these features are:

1. Secondary throttle valve is operated by the diaphragm which is pulled by the venturi vacuum so that the high power and good acceleration are gained in comparison with the auxiliary valve type.

2. Accelerating pump gives excelent acceleration.

3. The power valve mechanism, so-called vacuum actuated boost type, makes the good high speed drive.

4. Slow economizer mechanism makes the smooth connection with acceleration or deceleration during light load running, and stable low speed performance is gained.

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 the primary and secondary systems use in common, the secondary switch over mechanism, the starting mechanism, accelerating mechanism, power valve mechanism, slow economizer system, etc. are also attached. The primary main system is of Solex type and the secondary main system is of Zenith Stronburg type.

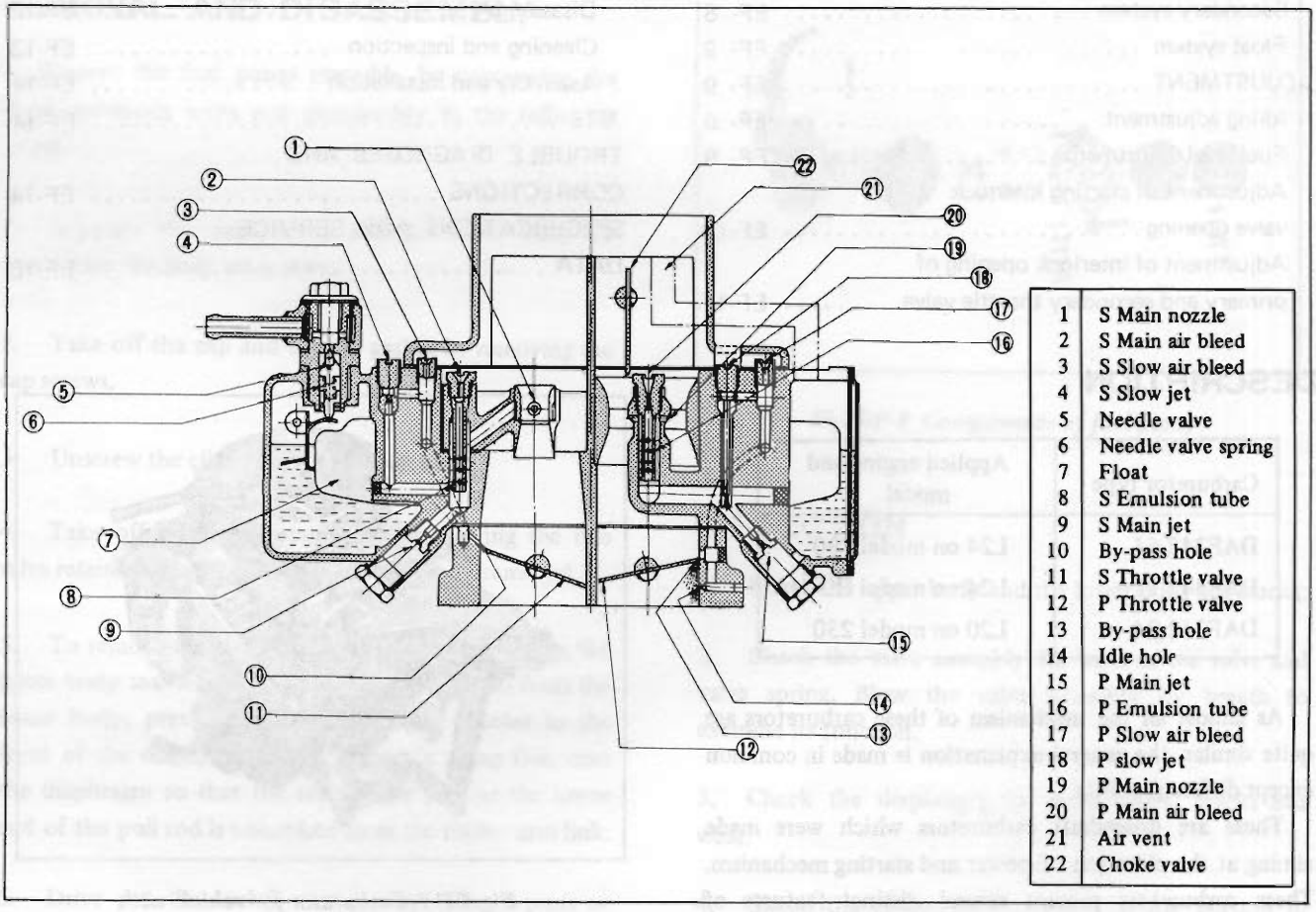


Fig. EF-11 Sectional view

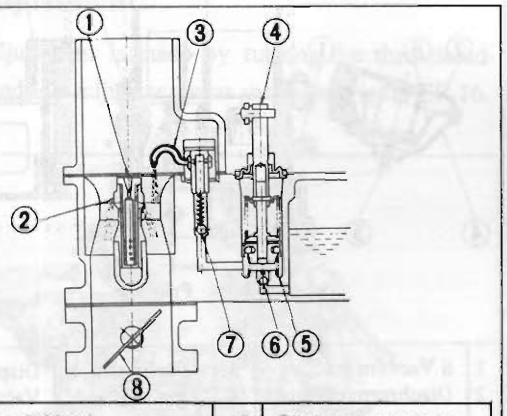
Primary system

Primary main system

Fuel flows, as shown in Figure EF-11 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 venturi through the main nozzle. The multi-holed main nozzle ensures a proper atomization of fuel and a low fuel consumption.

The throttle valve is opened at a small angle when idling and in slow speed running, with a large negative pressure prevailing down-stream of the fuel system. This negative pressure acts on the slow speed system. Through this action, fuel, measured through the jet section of the slow jet located immediately behind the main jet shown in Figure EF-11, and air coming from the slow air bleed are mixed and atomized. The atomized mixture is supplied to the engine from the idle hole and by-pass hole via the slow speed system line. As a result, there is an excellent linkage between the slow speed system and the main system, and the resultant stable slow speed performance is ensured.

Accelerating mechanism



1	Main air bleed	5	Piston return spring
2	Main nozzle	6	Inlet valve
3	Pump injector	7	Outlet valve
4	Piston		

Fig. EF-12 Accelerating system

The carburetor is equipped with the piston type accelerating mechanism linked to the throttle valve. When the primary throttle valve, shown in Figure EF-12, 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 fuel is forced out through the injector. The piston return spring in the cylinder not only assures the smooth movements of the linkage but also serves to place inlet valve in position so that the piston goes down quickly and fuel is forced out through the injector.

Starting mechanism

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

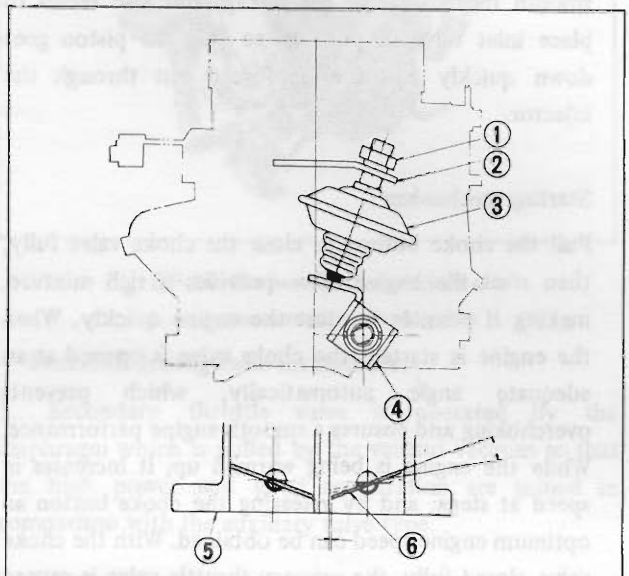
Power valve mechanism

The power valve mechanism, so-called vacuum actuated boost type, makes use of the downward pulling force of the air stream 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 vaccum piston upward against the spring, leaving the power valve closed. When the vacuum below the throttle valve is lowered during full load or accelerating running, the spring pushes the vacuum piston downward, opening the power valve to furnish fuel.

Dash pot device

This carburetor is equipped with a dash pot interlocked with the primary throttle valve through a link mechanism. The dash pot, which is exclusively installed on cars equipped with a torque converter, is intended to prevent engine stall that would otherwise result from quick application of the brake immediately after the car running, or from the quick release of the accelerator pedal after giving only small pressure.

When the primary throttle valve is closed near full angle (1,800 to 2,000 rpm in engine speed), a throttle lever strikes the dash pot stem shown in Figure EF-13, making the primary throttle valve gradually open, and keeping the engine running.



1	Lock nut	4	Throttle lever
2	Chok wire arm	5	Throttle chamber
3	Dash pot	6	Throttle valve

Fig. EF-13 Dash pot mechanism

Secondary system

Secondary main system

The secondary main system is of Zenith Strongburg type.

Fuel-air 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 through the main nozzle into the small venturi.

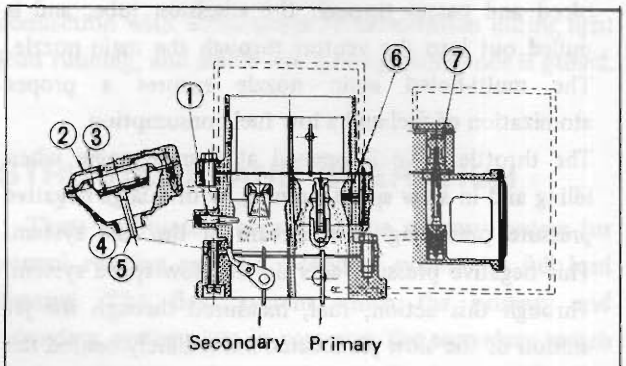
Due to the double venturi of the secondary system, the higher velocity air current passing through the main nozzle promotes the fuel atomization.

Step system

The construction of this system may correspond to the idling and slow system of the primary system.

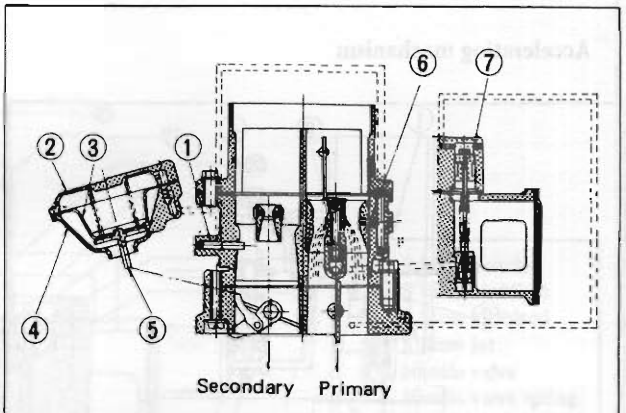
This system aims in the proper filling up of the gap when fuel supply is transferred from the primary system to the secondary one. The step port is located near the secondary throttle valve in its fully closed state.

Secondary switch over mechanism



1	S Vacuum jet	4	Diaphragm chamber
2	Diaphragm chamber cover	5	Diaphragm rod
		6	P Vacuum jet
3	Diaphragm	7	Vacuum piston

Fig. EF-14 Full throttle at high speed



1	S Vacuum jet	3	Diaphragm	5	Diaphragm rod
2	Diaphragm chamber cover	4	Diaphragm chamber	6	Vacuum jet Vacuum piston

Fig. EF-15 Full throttle at low speed

The secondary throttle valve is linked to the diaphragm which is actuated by the vacuum created in the venturi. A vacuum jet is provided at each of the primary and secondary venturies, and the composite vacuum of these jets actuates the diaphragm.

As the linkage, shown in Figure EF-15, causes the secondary throttle valve not to open until the primary

throttle valve opening reaches approximately 50, fuel consumption during normal operation is not excessive. During high speed running, as shown in Figure EF-14, as the vacuum at the venturi is increased, the diaphragm is pulled against the diaphragm spring force, and then secondary throttle valve is opened.

The atmospheric side in the diaphragm chamber is connected to the atmosphere.

Float system

There is only one float chamber while two carburetor systems, primary and secondary, are provided.

Fuel fed from the fuel pump flows through the filter and needle valve into the float chamber. A constant fuel level is maintained by the float and needle valve.

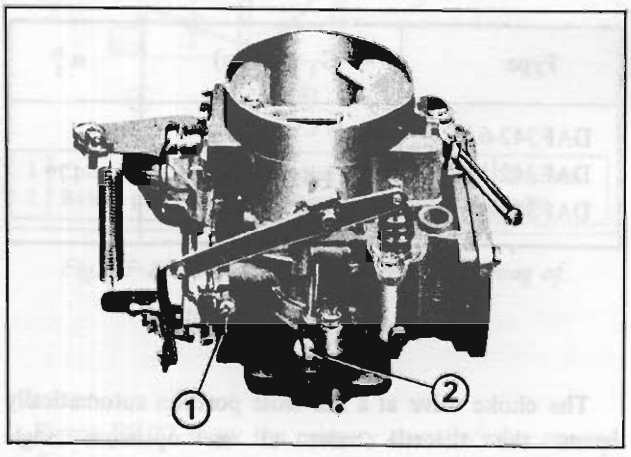
Because of the air vent type of the float chamber ventilation, the fuel consumption will not influenced by some dirt accumulated in the air cleaner.

The needle valve is made of special hard steel and will not wear for all its considerably long use.

ADJUSTMENT

Idling adjustment

Idling adjustment is made by turning the throttle adjust screw and idle adjust screw as shown in Figure EF-16.



1	Throttle adjust screw	2	Idle adjust screw

Fig. EF-16 Idling adjustment

1. Give the idle adjust screw approximately three turns, starting from the fully closed position. Screw in the throttle adjust screw two or three turns and start the engine.

2. Screw out the throttle adjust screw gently until the engine is about to rotate unevenly after the engine speed gradually drops.

3. Screw in the idle adjust screw until the engine runs smoothly at the highest speed.

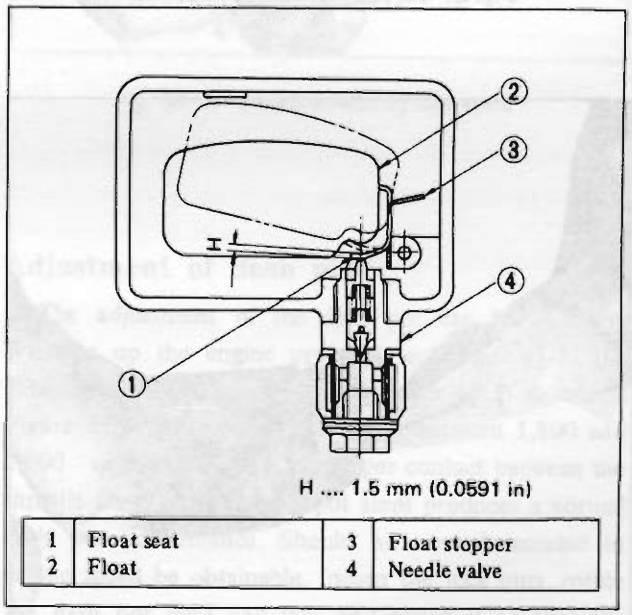
4. Re-adjust the throttle screw to drop the engine speed.

Repeat these operations until a smooth engine speed of approximately 550 rpm has been attained.

Note: Do not attempt to screw down the idle adjust screw completely to avoid damage to the tip, which will tend to cause malfunctions.

Fuel level adjustment

A constant fuel level is maintained by the float and needle valve.



1	Float seat	3	Float stopper
2	Float	4	Needle valve

Fig. EF-17 Fuel level adjustment

If the fuel level is in accord with the level gauge line,

the float level is properly set. If the float level is not correct, adjust it by bending the float seat as shown in Figure EF-17. Approximately *H mm is required as the effective stroke of the needle valve. So adjust the gap between the valve stem and the float seat to *H mm with the float fully lifted up by bending the float stopper.

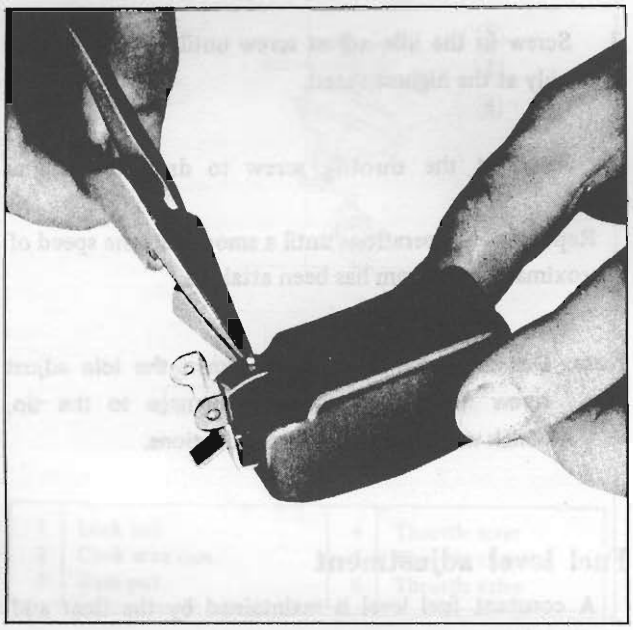


Fig. EF-18 Adjustment of float seat

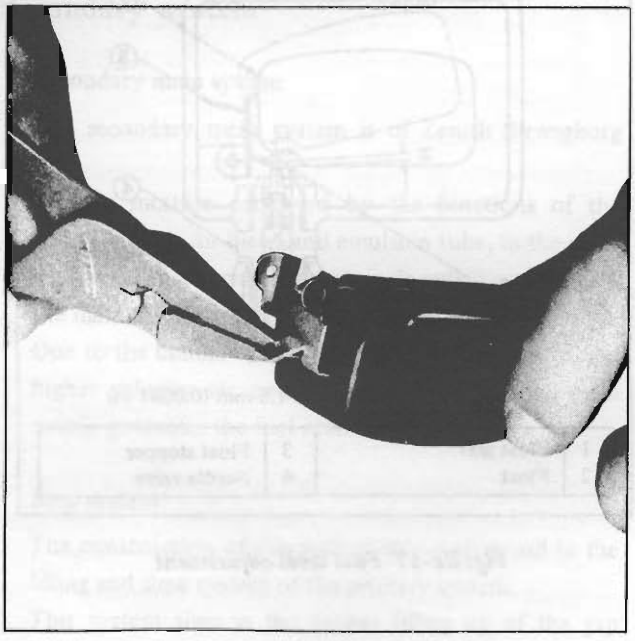
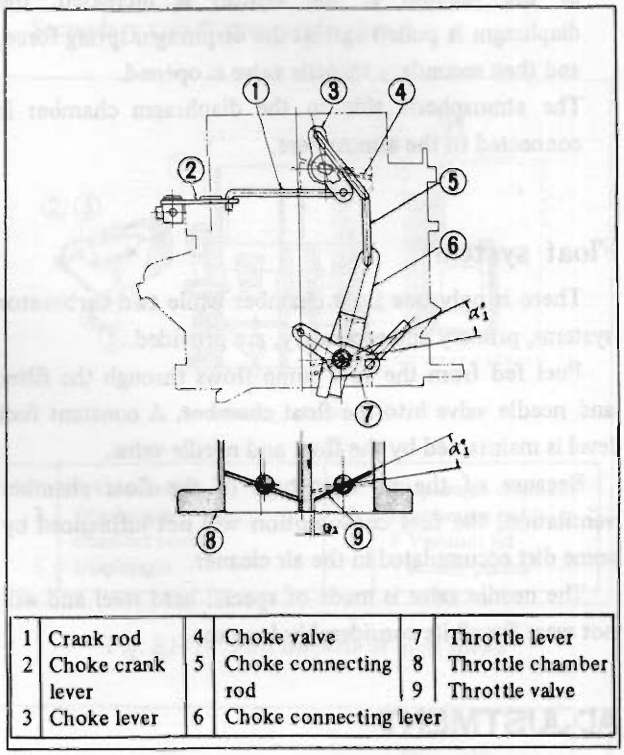


Fig. EF-19 Adjustment of float stopper

Adjustment of starting interlock valve opening



1	Crank rod	4	Choke valve	7	Throttle lever
2	Choke crank lever	5	Choke connecting rod	8	Throttle chamber
3	Choke lever	6	Choke connecting lever	9	Throttle valve

Fig. EF-20 Adjustment of starting interlock valve opening

Type	G_1 mm (in)	α_1°
DAF342-6A DAF342-12 DAF342-9A	1.45 (0.06)	17°

The choke valve at a full close position automatically opens the throttle valve at an optimum angle approximately 17°for starting the engine through a link mechanism. After reassembly, or in a check on the interlocked opening angle, bend the choke connecting rod for adjustment so that a fully closed choke valve will bring the clearance G_1 shown in Figure EF-20 to 1.45 mm (0.06 in).

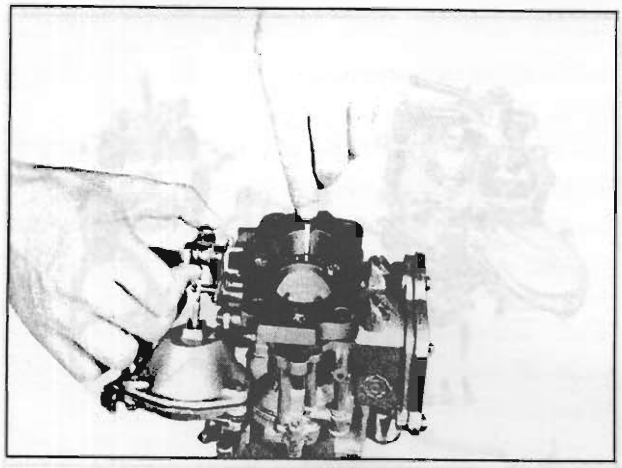
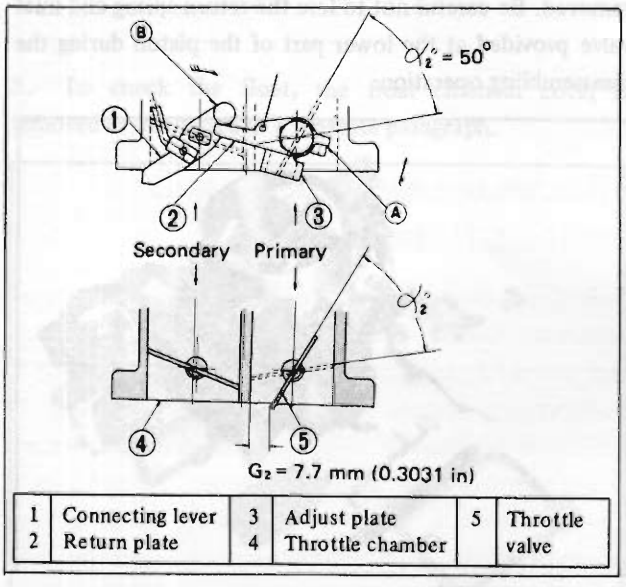


Fig. EF-21 Measurement of clearance of starting interlock valve opening

Adjustment of interlock opening of primary and secondary throttle valves



1	Connecting lever	3	Adjust plate	5	Throttle valve
2	Return plate	4	Throttle chamber		

Fig. EF-22 Adjustment of interlock opening of throttle valve

Figure EF-22 show the primary throttle valve opened $*\alpha_2^\circ$. When the adjust plate fixed to the primary throttle valve is open $*\alpha_2^\circ$, it comes to contact with the connecting lever at Ⓐ. When the throttle valve is further opened, the point Ⓑ, where the connecting lever is in contact with the stopper, is detached, permitting the secondary system to start actuating.

The linkage between the primary and secondary throttles operates properly if the distance between the throttle valve and inner wall of the throttle chamber, G_2, amounts to specifications as shown below. The adjustment is made by bending the point Ⓐ of the adjusting plate.

Type	G_2 mm (in)	α_2°
DAF342-6A DAF342-12 DAF342-9A	7.7 (0.3)	50°

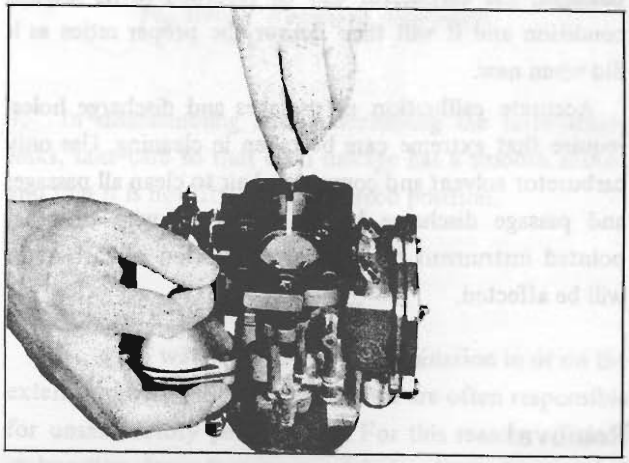


Fig. EF-23 Measurement of clearance

Adjustment of dash pot

The adjustment of the dash pot can be done by warming up the engine properly and checking if the throttle lever will touch the dash pot stem shown in Figure EF-13 as the engine reaches between 1,800 and 2,000 rpm under no load. Proper contact between the throttle lever and the dash pot stem produces a normal dash pot performance. Should no normal increase in engine speed be obtainable, loosen the lock nuts, rotate the dash pot right and left, and adjust it so that the throttle lever will hit the stem at between 1,800 and 2,000 rpm Then, fasten the loosened lock nuts. Note that the angle when the throttle valve is in contact with the throttle chamber.

Type	Throttle valve setting angle
DAF342-6A	8°
DAF342-12	8°
DAF342-9A	9°

MAJOR SERVICE OPERATIONS

The perfect carburetor delivers the proper gasoline and air 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.

Accurate calibration of passages and discharge holes, require that extreme care be taken in cleaning. Use only carburetor solvent and compressed air to clean all passages and passage discharge holes. Never use wire or other pointed instrument to clean as calibration of carburetor will be affected.

Removal

1. Remove air cleaner.

2. Disconnect fuel line, vacuum line and choke wire from carburetor.

3. Remove the throttle lever.

4. Remove four nuts and washers retaining carburetor to manifold.

5. Lift carburetor off manifold.

6. Remove and discard carburetor to manifold gasket.

Disassembly

1. The main jets, slow jets and needle valves on both primary and secondary sides are accessible from outside the carburetor for disassembly.

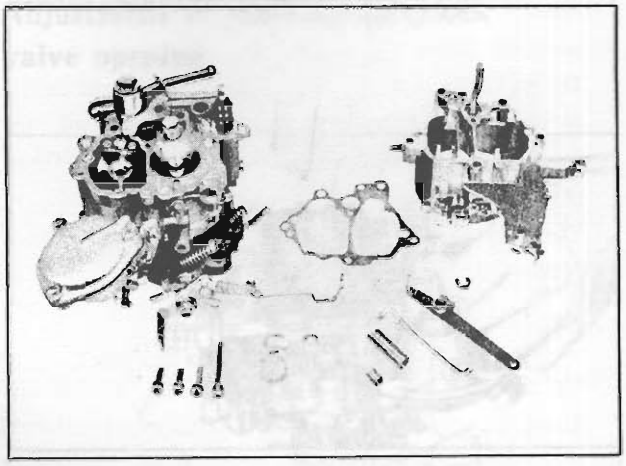


Fig. EF-24 Removing air horn from carburetor body

2. The primary and secondary emulsion tubes can be disassembled for a check by removing the main air bleeds on the respective sides.

3. To check the accelerator pump, the cylinder cover is removed. Be careful not to lose the return spring and inlet valve provided at the lower part of the piston during the disassembling operation.

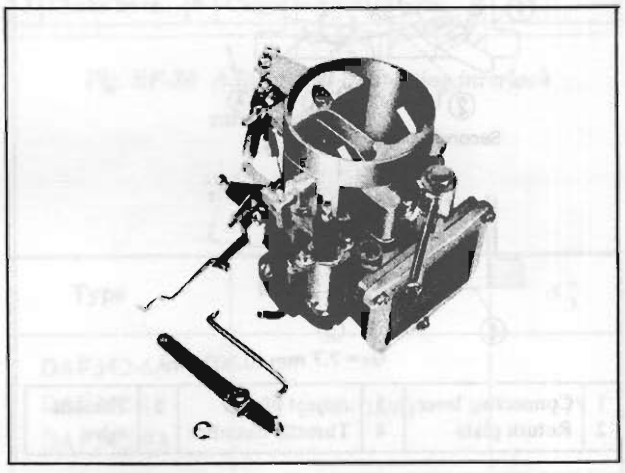


Fig. EF-25 Removing accelerator pump

4. The throttle chamber can be detached from the float chamber by removing the rod linking the diaphragm with the secondary throttle valve, and four set screws that hold it.

It is preferable to leave the throttle valve intact unless otherwise required. If a disassembled valve is required to remedy a defect, it should be installed so that the secondary throttle valve particularly will be gap-free. Otherwise, stable idling and slow speed performance will not be obtained.

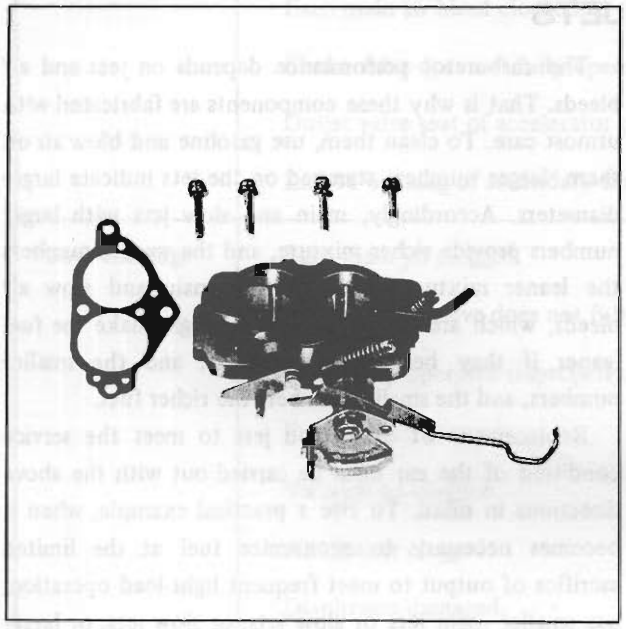


Fig. EF-26 Separating throttle chamber from carburetor body

5. To check the float, the float chamber cover is removed as instructed in a separate paragraph.

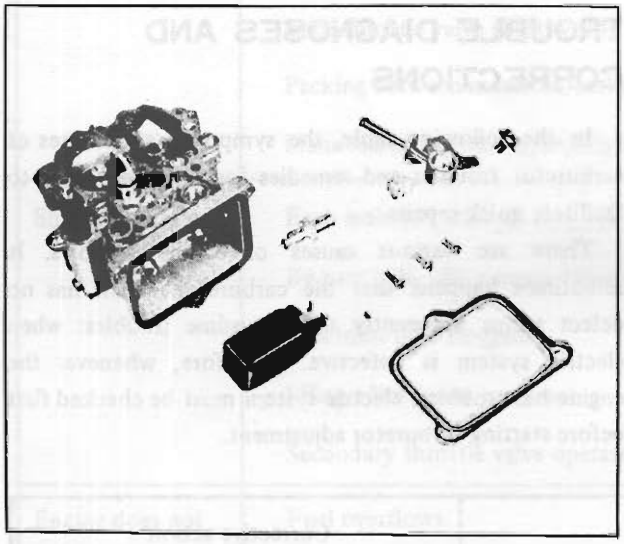


Fig. EF-27 Disassembling float chamber

6. The diaphragm can be disassembled by removing three set screws that hold the diaphragm chamber and another three set screws that hold the diaphragm chamber cover. In reassembling it, take care so that the edge of the diaphragm will not be turned up.

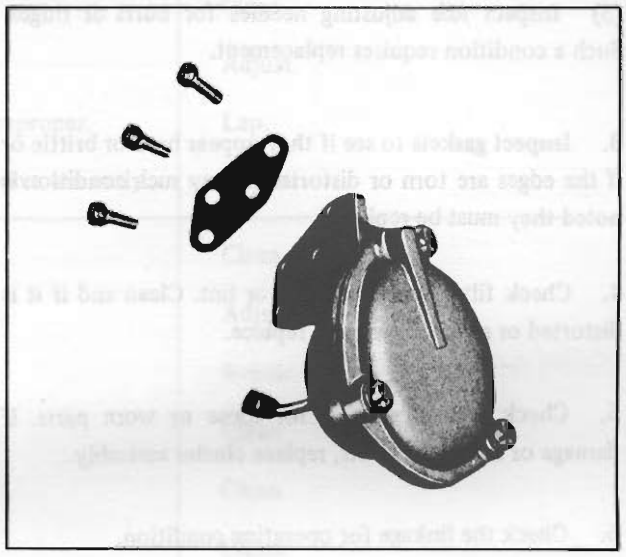


Fig. EF-28 Removing diaphragm

7. In disassembling and reassembling the interlocking links, take care so that each linkage has a smooth action, and that it is not fitted in any forced position.

Cleaning and inspection

Dirt, gum, water or carbon contamination in or on the exterior moving parts of a carburetor are often responsible for unsatisfactory performance. For this reason, efficient carburetion depends upon careful cleaning and inspection while servicing.

1. 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!

2. Check all parts for wear. If wear is noted defective parts must be replaced. Note especially the following:

(1) Check float needle and seat for wear. If wear is noted the assembly must be replaced.

(2) Check throttle and choke shaft bores in throttle body and cover castings for wear or out of round.

(3) Inspect idle adjusting needles for burrs or ridges. Such a condition requires replacement.

3. Inspect gaskets to see if they appear hard or brittle or if the edges are torn or distorted. If any such condition is noted they must be replaced.

4. Check filter screen for dirt or lint. Clean and if it is distorted or remains plugged, replace.

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

6. Check the linkage for operating condition.

7. Inspect the operation of accelerating pump. Put in the gasoline in the float chamber and make the throttle lever operate. And check the injection condition of the gasoline from the accelerating nozzle.

8. Push in the connecting rod of diaphragm chamber and block the passage of vacuum by finger. And when free the connecting rod, check the leakage of air and the damage of diaphragm.

Assembly and installation

Follow the disassembly and removal procedure in reverse.

Replace the gaskets, if necessary.

In disassembling and reassembling the interlock link and related components, be careful not to bend or deform any of the components. Reassemble so that all interlock links operate smoothly.

JETS

The carburetor performance depends on jets and air bleeds. That is why these components are fabricated with utmost care. To clean them, use gasoline and blow air on them. larger numbers stamped on the jets indicate larger diameters. Accordingly, main and slow jets with larger numbers provide richer mixture, and the smaller numbers the leaner mixture. Inversely, the main and slow air bleeds, which are for air to pass through, make the fuel leaner if they bear larger numbers, and the smaller numbers, and the smaller numbers the richer fuel.

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 slow jets, or larger main air bleeds or slow air bleeds than regularly specified. This should meet the purpose. Inversely, when increase in output is desired at the limited sacrifice of fuel consumption, use larger main jets or slow jets, or smaller main air bleeds or slow air bleeds, and that should bring a satisfactory result.

TROUBLE DIAGNOSES AND CORRECTIONS

In the following table, the symptoms 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 carburetor which has no defect seems apparently to have some troubles: when electric system is defective. Therefore, whenever the engine has troubles, electric system must be checked first before starting carburetor adjustment.

Condition	Probable cause	Corrective action
Overflow	Dirt accumulated on needle valve.	Clean needle valve.
	Fuel pump pressure too high.	Repair pump.
	Needle valve seat improper.	Lap or replace.
Excessive fuel consumption	Fuel overflow	See above item
	Each main jet, slow jet too large.	Replace.

	Each main air bleed clogged.	Clean.
	Choke valve does not fully open.	Adjust.
	Outlet valve seat of accelerator pump improper.	Lap.
	Linked opening of secondary throttle valve too early.	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.
	Diaphragm damaged.	Replace.
	Power valve operated improperly.	Adjust.
Improper idling	Slow jet clogged.	Clean.
	Each throttle valve does not close.	Adjust.
	Secondary throttle valve operated improperly.	Overhaul and clean.
	Each throttle valve shaft worn	Replace.
	Packing between manifold/carburetor defective.	Replace packing.
	Manifold/carburetor tightening improper.	Correct tightening.
Engine hesitation	Each main jet, slow jet clogged.	Clean.
	By-pass hole, idle passage clogged.	Clean tube.
	Emulsion tube clogged.	Clean.
	Idling adjustment incorrect.	Correct adjustment.
	Secondary throttle valve operated improperly.	Overhaul and clean.
Engine does not start.	Fuel overflows.	See the first
	No fuel.	Check pump, fuel pipe and needle valve.
	Gauge plate adjustment incorrect.	Correct adjustment.
	Idling adjustment incorrect.	Correct adjustment.
	Fast idle adjustment incorrect.	Correct adjustment.
	Bimetal rod in contact with bimetal case.	Adjust.

SPECIFICATIONS AND SERVICE DATA

Item \ Carburetor model	DAF342-6A Manual choke		DAF342-12 Manual choke		DAF342-9A Manual choke	
Applied engine	L24		L24		L20	
Applied model	230		HGC10		230	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Outlet diameter mm (in)	32 (1.2598)	34 (1.3386)	32 (1.2598)	34 (1.3386)	32 (1.2598)	34 (1.3386)
Venturi diameter mm (in)	25 (0.9843)	28 (1.1024)	25 (0.9843)	28 (1.1024)	24 (0.9449)	28 (1.1024)
Main jet	# 129	# 160	# 129	# 160	# 119	# 160
Main air bleed	# 240	# 70	# 240	# 70	# 240	# 70
Slow jet	# 48	# 90	# 48	# 90	# 45	# 90
Slow air bleed	# 210	# 50	# 210	# 50	# 210	# 50
Power jet	# 70		# 70		# 65	
Float level mm (in)	22 to 24 (0.8661 to 0.9449)		22 to 24 (0.8661 to 0.9449)		22 to 24 (0.8661 to 0.9449)	
Fuel pressure kg/cm² (psi)	0.24 (3.4)		0.24 (3.4)		0.24 (3.4)	
Weight kg (lb)	2.8 (6.37)		2.8 (6.37)		2.8 (6.37)	

≪ Main jet variation ≫

ALTITUDE / CARBURETOR TYPE		0m Jet	0m Parts No.	1000 m (3,300 ft) Jet	1000 m (3,300 ft) Parts No.	2,000 m (6,600 ft) Jet	2,000 m (6,600 ft) Parts No.	3,000 m (10,000 ft) Jet	3,000 m (10,000 ft) Parts No.	4,000 m (13,300 ft) Jet	4,000 m (13,300 ft) Parts No.
DAF342-9A	P	# 119	16033 E4110	# 115	16033 23015	J# 112	16033 23016	# 108	16033 23017	# 105	16033 23018
	S	# 160	16043 19915	# 155	16054 23015	# 150	16034 21615	# 145	16054 21015	# 140	16043 25715
DAF342-6A DAF342-12	P	# 129	16033 E4310	# 125	16054 18016	# 121	16033 E4313	# 118	16033 E4311	# 114	16033 E4312
	S	# 160	16043 19915	# 155	16054 23015	# 150	16034 21615	# 145	16054 21015	# 140	16043 25715

P ..... primary S ..... secondary

SU TYPE TWIN CARBURETOR

CONTENTS

DESCRIPTION

Note: The photographs in this section show the carburetor with the emission control system for U.S.A. & CANADA.

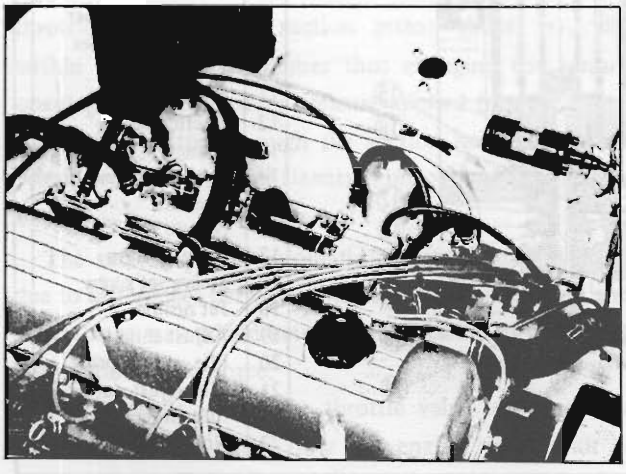


Fig. EF-29 Model HJG 46W carburetor

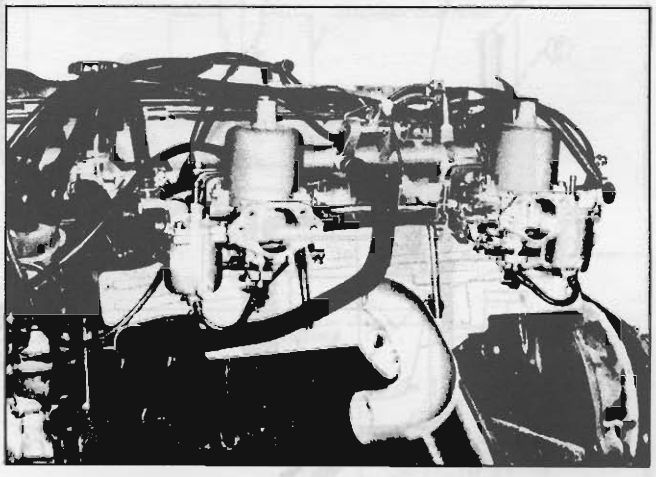


Fig. EF-30 Model HJG 46W carburetor

This carburetor variable venturi type suitable for 6-cylinder engine. Two parallel synchronized carburetors (dual carburetors) are used as a set.

The carburetor in the front facing forward (hereinafter refer to as F) applies to the 1st, 2nd and 3rd cylinders, and the other rear carburetor (hereinafter refer to as R) applies to the 4th, 5th and 6th cylinders. The operation of these two carburetors is identical except for the positioning arrangement of the vacuum nipple and float chamber.

The needle valve is made of specially hardened steel and, therefore, is not appreciably worn even when used over long periods of time.

The needle valve tip of the 1972 year type carburetor HJG 46W-8A, 9A, is made of rubber improving sealing performance.

Carburetor features are as follows:

1. The venturi area is automatically changed according to engine air intake. Thus, the speed of the air flowing through the Venturi is nearly constant under all engine operating conditions.

2. Thus, air flow speed in the Venturi is high even when the engine is operated at low speed, fuel spray is satisfactory, and fuel is distributed to the individual engine cylinders evenly. Vehicle fuel consumption is minimized, and the driving features such as acceleration and deceleration, are highly superior.

3. During high speed operation, the Venturi opens wide. Thereby reducing intake resistance to provide high output.

4. Moreover, engine output and vehicle accelerating characteristics are greatly improved by the use of two parallel carburetors.

5. None of the various fuel systems such as those required in conventional stationary Venturi carburetors are required. Individual fuel system operations of idling, deceleration, acceleration, and output are accomplished using a single nozzle. Thus, the construction is extremely simple.

STRUCTURE AND OPERATION

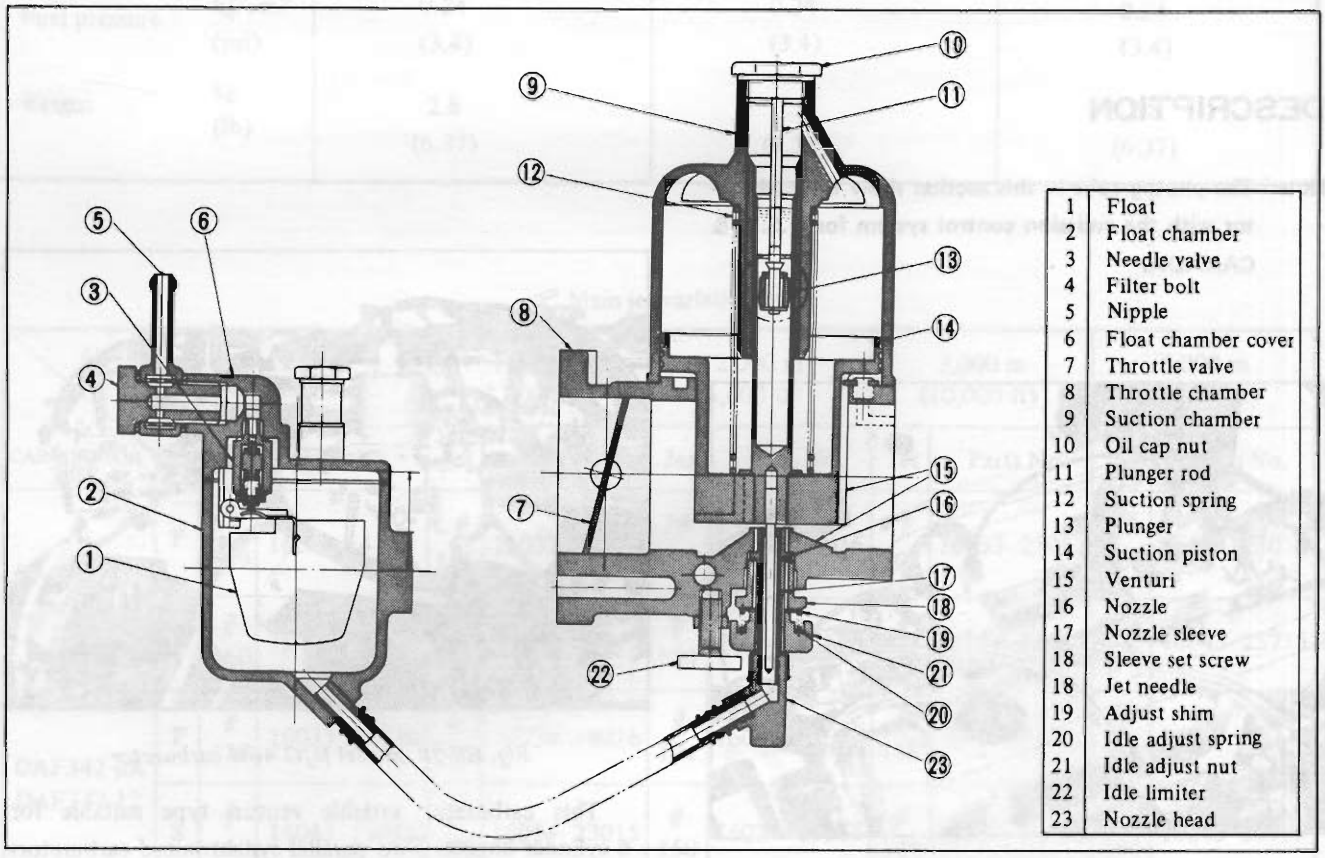
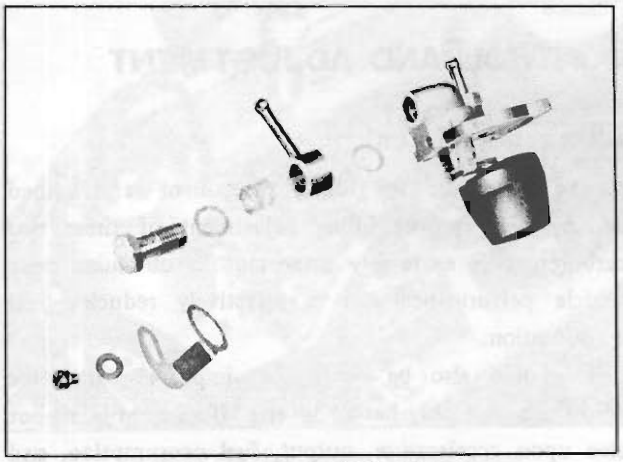


Fig. EF-31 Sectional view

Structure of these carburetors are shown in Figure EF-31

Float chamber

Fuel fed from the fuel pump enters the float chamber through the needle valve. The fuel in the float chamber is maintained in the rated level by the combined operation of the needle valve and float.



1	Filter	2	Float

Fig. EF-32 Fuel return system

Fuel return system

This is a device which prevent vapor lock or percolation and to ensure a constantly stable idling in a hot engine compartment.

Venturi control system

The suction chamber is located in the upper part of the throttle chamber, the suction piston slides vertically within the suction chamber thus changing the venturi opening. Venturi vacuum pressure applied to the head of the suction piston through the suction hole, and atmospheric pressure in the air cleaner is introduced through the air hole.

The suction piston automatically moves up and down due to differences between upper and lower pressures, and the balance maintained between the pressure of the piston and suction spring force.

For example, when the throttle valve is opened for increased output, the flow of engine intake air is increased. Thus, vacuum pressure of the Venturi increases, the suction piston is lifted until the piston is balanced with the pressure, and the Venturi opening enlarged.

When the throttle valve is closed to reduce output, the flow of engine intake air is decreased. Thus, vacuum pressure of the Venturi is reduced, the suction piston lowers until the piston is balanced with the pressure, and the Venturi is constricted. The pressure of the suction piston and suction spring force are properly calibrated so that the Venturi opening is optimum for any engine operating conditions.

In addition, the suction piston rod is equipped with an oil damper to improve vehicle acceleration performance. The oil damper protects the suction piston from opening too suddenly during 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 the fully opened, maximum speed are shown in Figures EF-33 through 36.

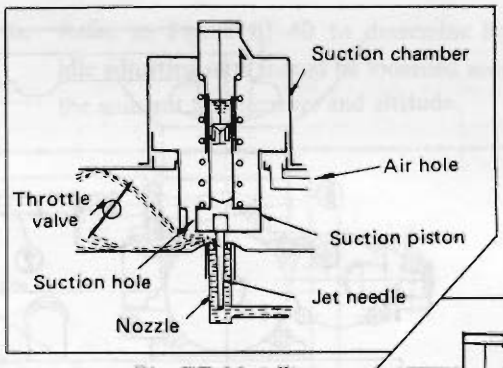


Fig. EF-33 Idling

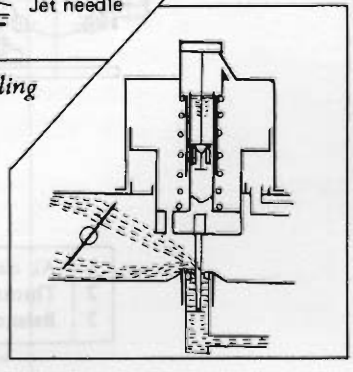


Fig. EF-34 Intermediate and low speed

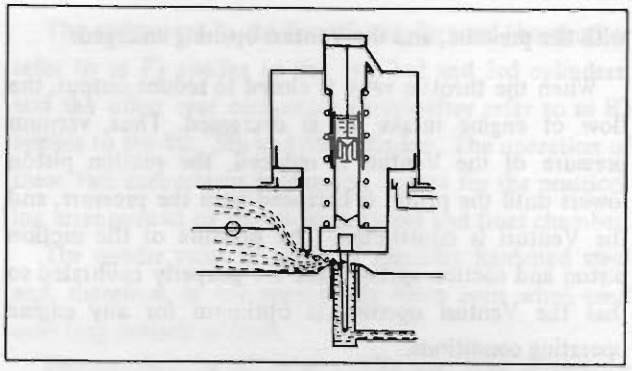


Fig. EF-35 Fully-opened low speed

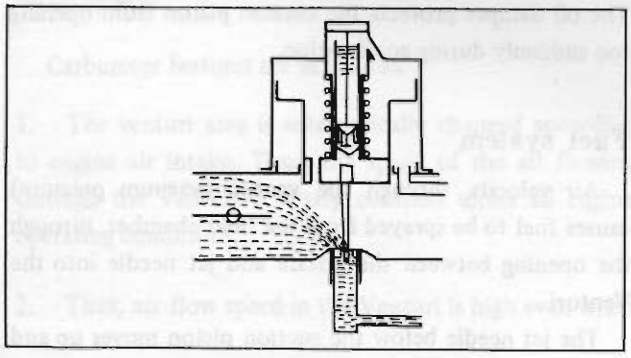


Fig. EF-36 Fully-opened high speed

1. Throttle valve synchronization adjustment (using a flow meter) and idling adjustment.

Starting mechanism

By pulling the choke knob, the starting lever is moved, and the nozzle is drawn down by a link mechanism. As a result, the clearance between the nozzle and jet needle is increased, and an increased amount of fuel required for starting is fed to the system. Moreover, the throttle valve is automatically set to proper opening for starting (approximately 6°) by the connecting linkage.

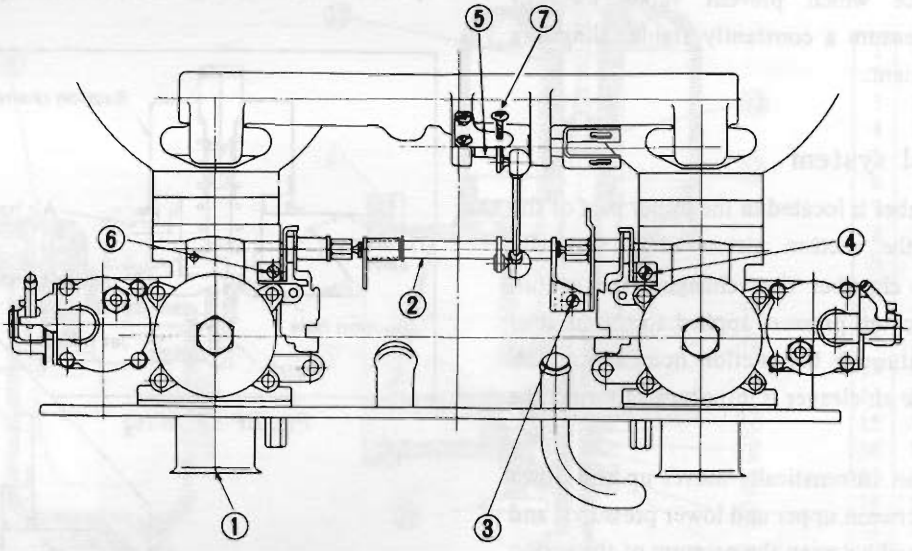
CONTROL AND ADJUSTMENT

Idling adjustment

The procedure for idling adjustment is described herein, since proper idling adjustment of these two carburetors is extremely important in obtaining peak vehicle performance and in effectively reducing fuel consumption.

It should also be noted that improper carburetor adjustment not only has an adverse affect upon idling but also upon acceleration, output, fuel consumption, and other vehicle performance factors.

≪Throttle Valve Shaft Interlock and Throttle valve Full Closing Adjustment≫



1	Air cleaner, air horn	4	Throttle adjusting screw	7	First idle settingw screw
2	Throttle shaft	5	Auxiliary throttle shaft		
3	Balance screw	6	Throttle adjusting screw		

Fig. EF-37 Throttle valve synchronization and idling adjustment

Operating procedure	Precautions and confirmation
1. Remove air cleaner.	a. Before adjustment, allow the engine to idle until it reaches operating temperature.
2. Loosen balance and fast idle setting screw.	a. Make sure that front and rear carburetors are disconnected.

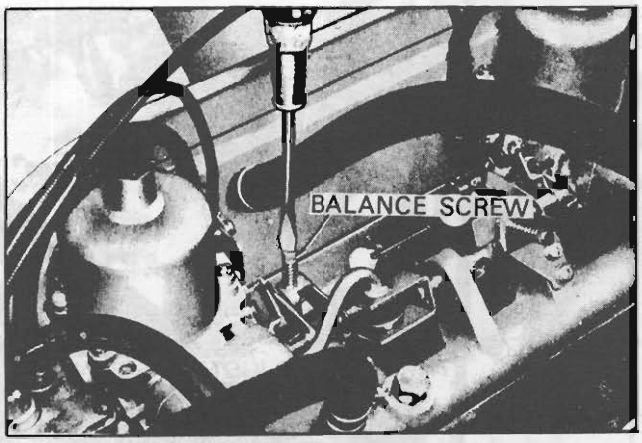


Fig. EF-38 Loosening balance screw

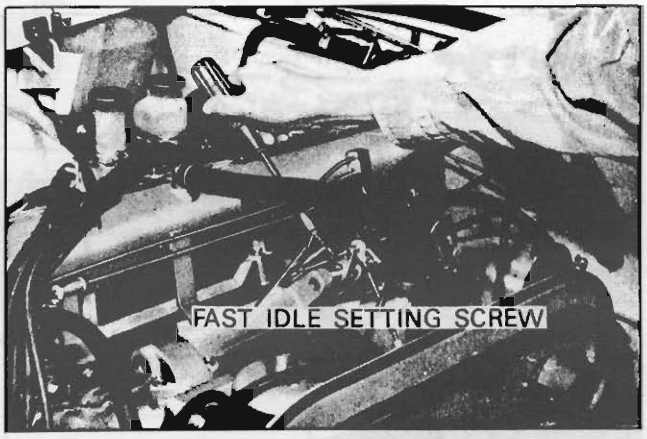


Fig. EF-39 Loosening fast idle setting screw

Operating procedure	Precautions and confirmation
3. Tighten front and rear idle adjusting nuts until they no longer go. Then, loosen these nuts as required to meet the ambient temperature and altitude.	a. Turning out idle adjusting nut one full turn causes nozzle head to the position 1 mm (0.039 in) below jet bridge. b. Refer to Figure EF-40 to determine how much idle adjusting nuts should be loosened according to the ambient temperature and altitude.

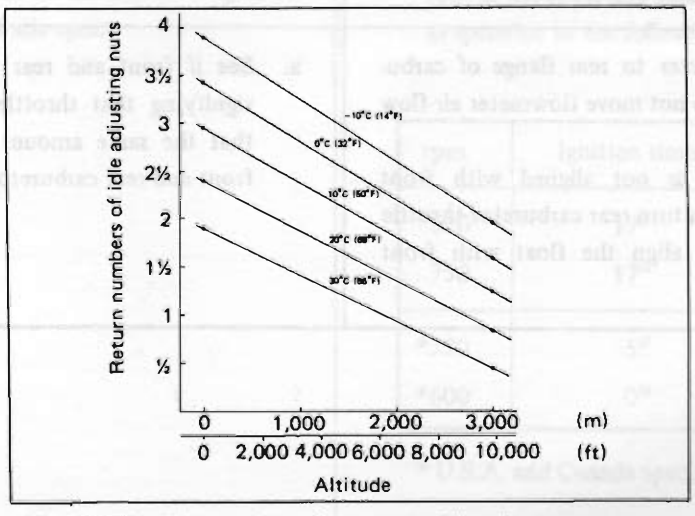


Fig. EF-40 The number of returns in idle adjusting nuts

Operating procedure	Precautions and confirmation
4. Start the engine and adjust front and rear throttle adjusting screws until the engine runs at an idle speed of 600 to 700 rpm.	a. Reduce the engine speed low enough to maintain stable idling. b. Throttle valves should be opened when throttle adjusting screws are turned clockwise.

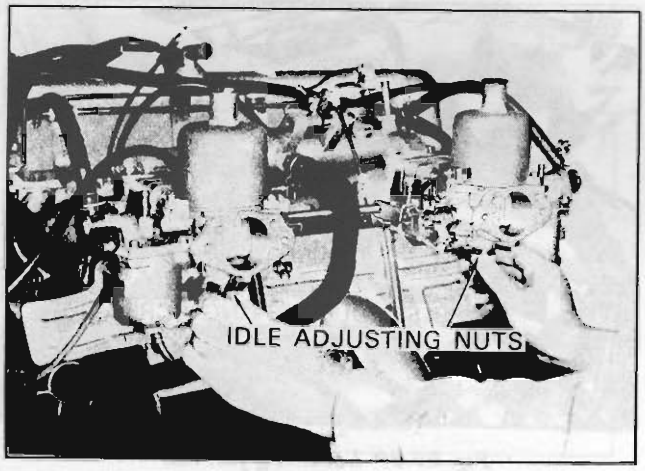


Fig. EF-41 Idle adjusting nut

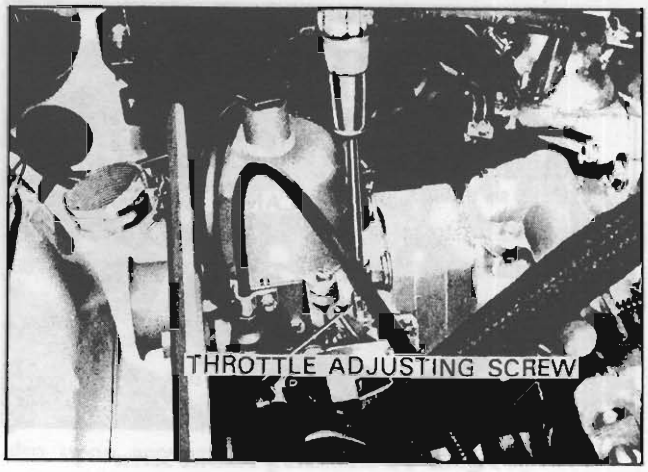


Fig. EF-42 Throttle adjusting screw

Operating procedure	Precautions and confirmation
5. Attach the flowmeter to front flange of carburetor air cleaner. Turn in or out air-flow adjusting screw of the flowmeter until the upper end of float in glass tube aligns with the scale in glass tube.	a. Standard glass tube of flowmeter upright. b. If it takes more than two minutes to adjust float position, be sure to race the engine every 1 to 2 minutes.
6. Then, attach flowmeter to rear flange of carburetor air cleaner. (Do not move flowmeter air-flow adjusting screw.) If flowmeter float is not aligned with front carburetor scale, then turn rear carburetor throttle adjusting screw and align the float with front carburetor scale.	a. See if front and rear floats are at equal height, signifying that throttle valves open equally and that the same amount of air is flowing through front and rear carburetors.

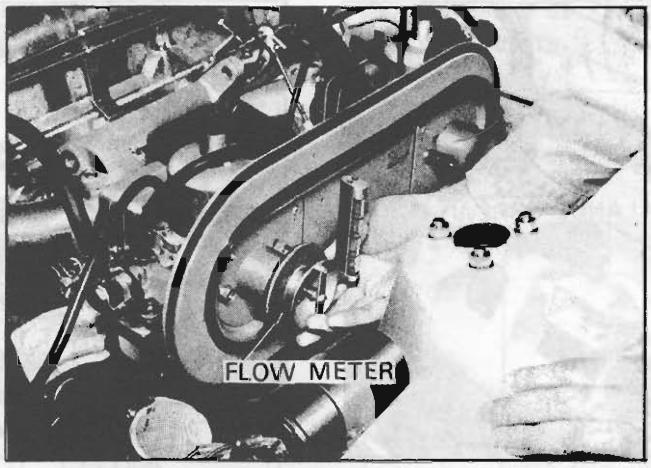


Fig. EF-43 Setting flowmeter

Operating procedure	Precautions and confirmation
7. Tighten or loosen front and rear idle adjusting nuts about 1/8 turn. Be sure to turn these nuts by the equal amount at the same time. Stop turning screws when engine rotates at the fastest and most stable idle speed. If the correct adjustment cannot be made, turn in or out idle adjusting screws in their original positions and then loosen or tighten front and rear nuts about 1/8 turn. until the above speed is obtained.	a. To reduce the amount of fuel drawn through carburetor, turn idle adjusting nuts clockwise. To increase fuel, turn the nuts counterclockwise. b. Idle adjusting nut should be adjusted within the range from zero to 1/2 of a full turn. c. Front and rear idle adjusting nuts should be turned by equal amount.
8. Tighten or loosen front and rear throttle adjusting screws by using the flowmeter and set engine so that it runs at the rated idle rpm.	a. Repeat steps 5 to 8 above, and set engine so that it runs at the rated idle rpm. The rated idling speed is as specified in the following chart.

rpm	Ignition timing	Transmission
650	17°	Manual
750	17°	Automatic
*750	5°	Manual
*600	0°	Automatic

* U.S.A. and Canada specifications

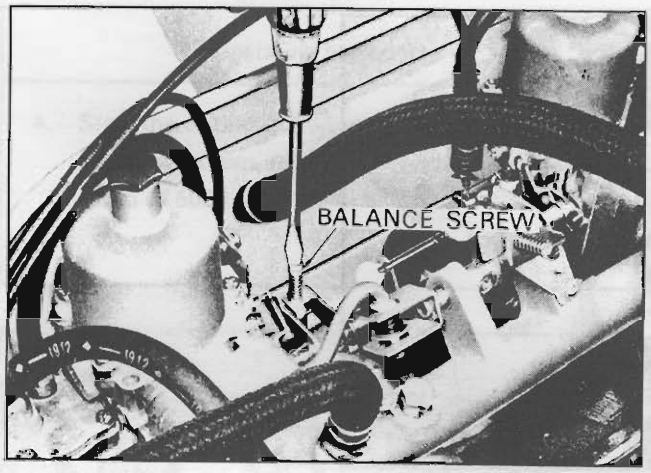


Fig. EF-44 Balance screw

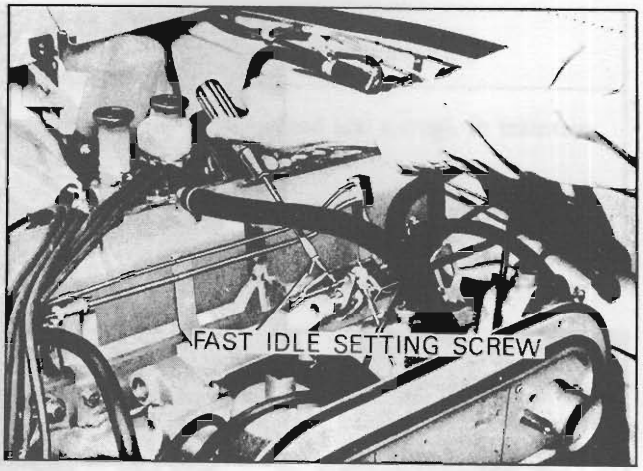


Fig. EF-45 Fast idle setting screw

Operating procedure	Precautions and confirmation
9. Adjust balance screw by looking at suction piston so that front and rear throttle valves open at the same time.	a. Race the engine a few times by operating throttle lever. Make sure that idling speed does not change.
10. Turn in fast idle setting screw to raise the engine speed from 1,000 to 1,500 rpm, and install flowmeter to front and rear carburetors to determine if floats are at equal height. If not, turn in or out balance screw as required.	
11. Turn out fast idle setting screw and race the engine. Check to see that engine runs at the rated idle speed. At the same time, see if the equal amount of air is flowing through front and rear carburetors.	a. When loosening fast idle setting screw, make sure that there exists 1 to 2 mm (0.039 to 0.079 in) of clearance at the tip of fast idle setting screw by pushing balance screw. b. If the amount of air flow through front and rear carburetors differs from each other, repeat steps 5 to 11.
12. Stop engine. Install air cleaner and duct in place.	

Adjustment of float level

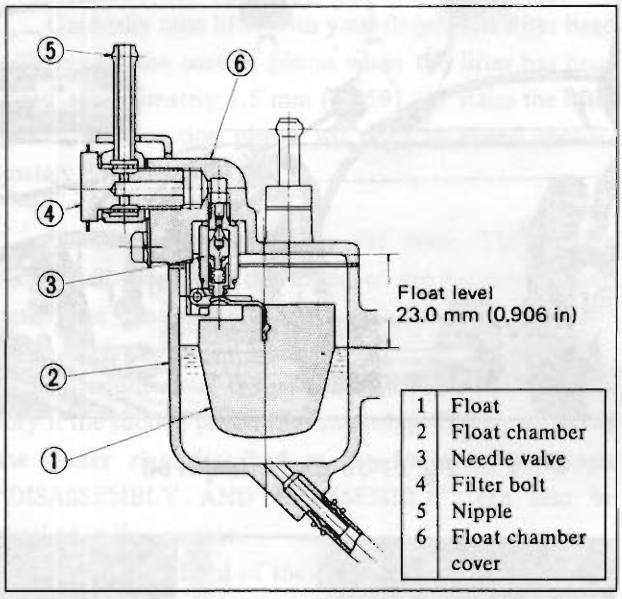


Fig. EF-46 Adjustment of float level

1. Remove the four set screws from the float chamber cover. The float chamber cover and the float lever can then be removed together. Place the cover on a work bench (with the float lever attached to the cover) with the float lever side up.

2. Lift up the float lever with the tip of your finger and then slowly lower the float lever. Stop lowering the float lever at the position at which the float lever seat just contacts the valve stem.

3. The float level is correct if dimension "H" in Figure EF-46 is 14 to 15 mm (0.5512 to 0.5906 in) under the foregoing conditions. If the dimension is not correct, adjust by bending float lever.

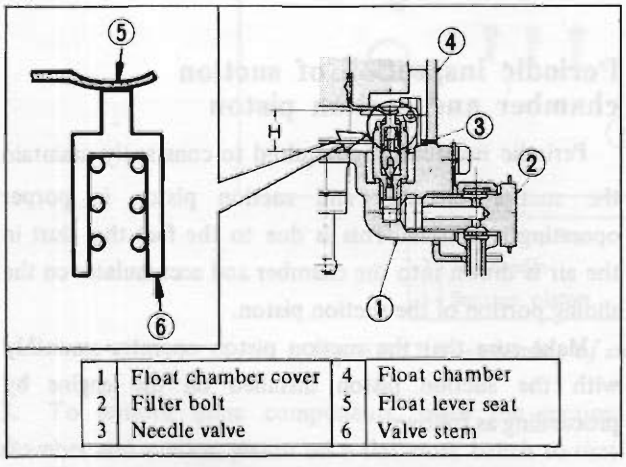


Fig. EF-47 Adjustment of float level

Adjustment of starting interlock valve opening

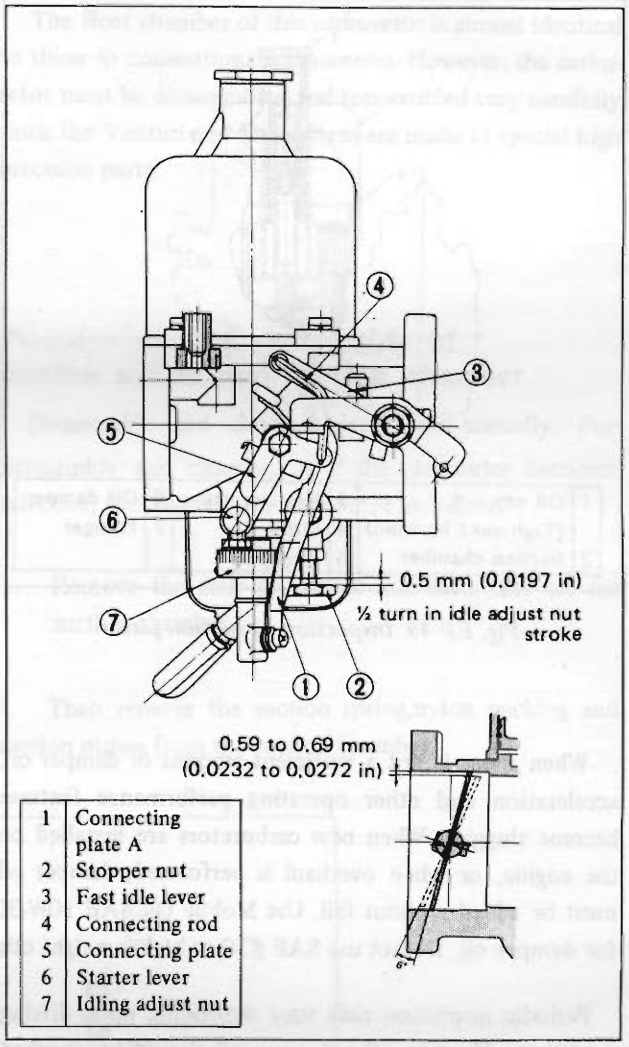
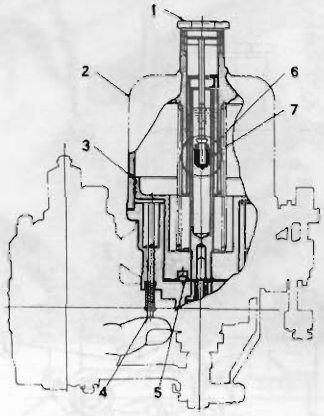


Fig. EF-48 Adjustment of starting interlock opening

For the adjustment of starting interlock opening, bend the connecting rod as shown in Figure EF-48 with an appropriate tool such as radio pinchers to change its length.

The interlock opening is increased by increasing the length of the connecting rod and is reduced when the rod is shortened. The interlock opening is correct, if clearance between the throttle valve and throttle chamber (dimension B) is 0.59 to 0.69 mm (0.0232 to 0.0272 in) when the starter lever is pulled all the way out. To measure dimensions B, move the throttle lever to full-closing, and make sure that there is no play in the first idling lever and adjusting lever interlocked unit.

Checking the damper oil



1	Oil cap nut (Tightened by hand)	3	Suction piston	6	Oil damper
2	Suction chamber	4	Lifter	7	Plunger
		5	Stop pin		

Fig. EF-49 Inspection of suction piston

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

Periodic inspection may vary depending upon driving conditions. However, the damper oil should be checked approximately every 5,000 km (3,000 miles) of driving (or approximately every 3 months).

To check damper oil level, remove the oil cap nut as shown in Figure EF-50 and check the oil level marking on the two grooves on the plunger rod. No difficulty will be encountered and there is no danger until the oil level reaches the lower line. If the oil level drops below the lower line, add oil. Total oil volume is approximately 3 cc (0.18 cu in). Squirt oil into the damper little by little so that the oil level completely reaches the upper line.

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

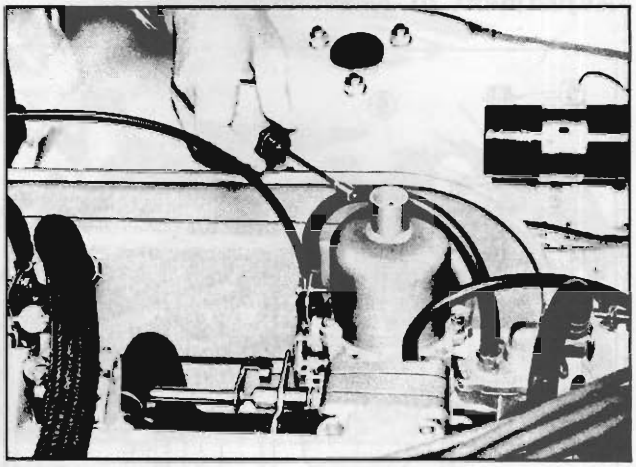


Fig. EF-50 Check damper oil

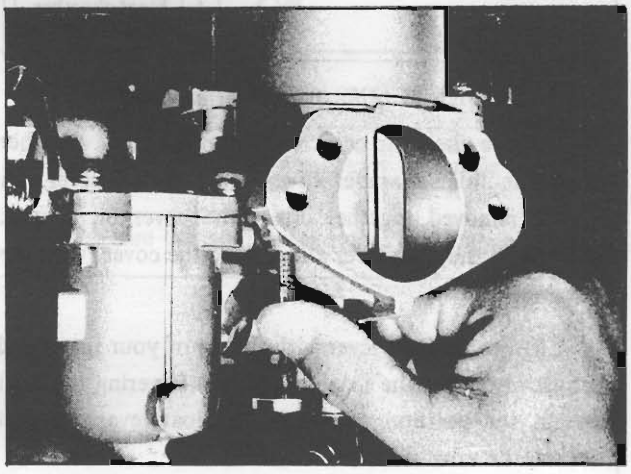


Fig. EF-51 Inspection of suction piston

Periodic inspection of suction chamber and suction piston

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

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

1. First, remove the oil cap nut.

2. Gradually raise lifter with your finger. The lifter head will contact the suction piston when the lifter has been raised approximately 1.5 mm (0.0591 in). Raise the lifter further. The suction piston will then be raised approximately 8 mm (0.3150 in).

3. Release your finger from the lifter. The suction piston will drop, and the sound of the suction running against the Venturi will be heard.

The conditions of the piston and chamber are satisfactory if the suction piston rises smoothly. The condition of the center ring described in the following paragraph "DISASSEMBLY AND REASSEMBLY" can also be checked in this manner.

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

DISASSEMBLY AND REASSEMBLY

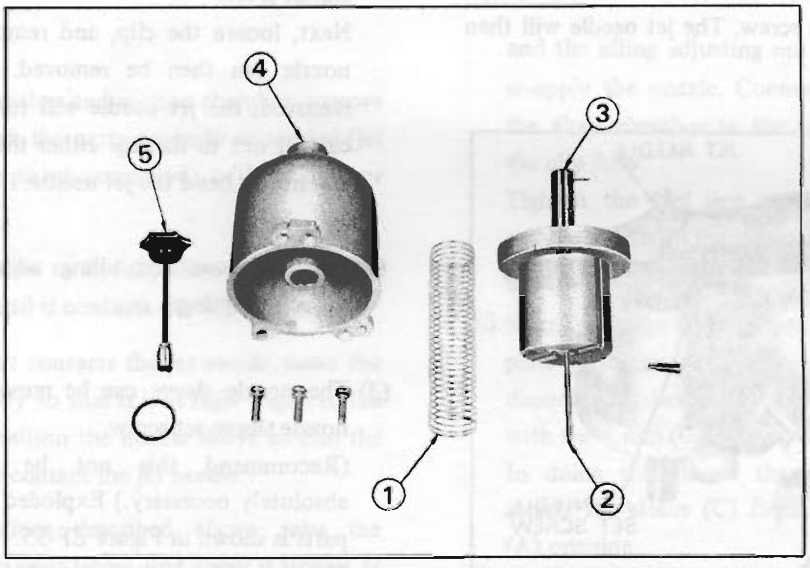
The float chamber of this carburetor is almost identical to those in conventional carburetors. However, the carburetor must be disassembled and reassembled very carefully since the Venturi and fuel system are made of special high precision parts.

Disassembly and reassembly of suction piston and suction chamber

Disassemble and clean at least semi-annually. For disassembly and cleaning, or if the carburetor becomes defective, disassemble and reassemble as follows:

1. Remove the four set screws and then take off the suction chamber.

2. Then remove the suction spring,nylon packing and suction piston from the suction chamber.



1	Suction spring	4	Suction chamber
2	Jet needle	5	Oil cap nut
3	Suction piston		

Fig. EF-52 Disassembly of suction chamber and suction piston

3. To remove these components, place the suction chamber and suction piston on a flat work bench so that the inside of the suction chamber and the sliding part of the suction piston are not damaged. Be extremely careful not to bend the jet needle on the lower part of the suction piston. (See figure EF-53.)

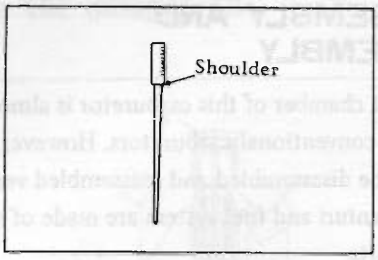


Fig. EF-53 Jet needle

4. Do not remove the jet needle from the suction piston unless absolutely necessary. When it must be removed, first loosen the jet needle set screw. To accomplish this, hold the jet needle within 2 mm (0.0787 in) from the shoulder with a pair of pliers so as not to damage the needle and remove the needle by pulling and turning slowly so as not to bend the needle.

5. Idling and other operating performance features will be adversely affected if the jet needle is not installed correctly in the suction piston. Set the jet needle in the suction piston so that the shoulder portion is flush with the bottom of the suction piston. Apply an appropriate tool having a horizontal (flat) surface such as slide calipers to the lower end, as shown in Figure EF-54, so that the shoulder of the jet needle contacts this surface, and tighten the jet needle set screw. The jet needle will then be installed correctly.

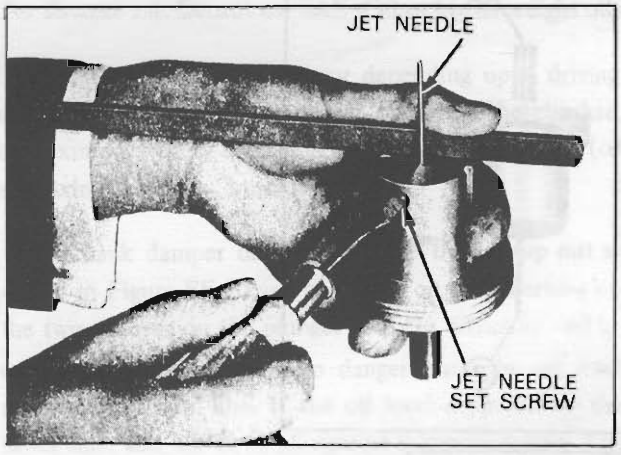


Fig. EF-54 Installing the jet needle

6. Wash the suction chamber and suction piston with clean gasoline, and dry with compressed air, so as to remove all dust, oil, etc. from the piston and chamber.

7. Then apply a few drops of light oil to the suction piston rod, and reassemble. Under no circumstances should oil be applied to the inside the suction chamber or to in Figure EF-48 with an appropriate tool such as radio pinchers to change its length. improper or defective operation.

Disassembly and reassembly of the nozzle

1. Disassembly

The nozzle can be easily removed. However, unless absolutely necessary do not disassemble the nozzle since reassembly of the nozzle sleeve, washer, and nozzle sleeve set screw is extremely difficult.

(1) First, remove the 4 mm (0.1575 in) diameter screw, and then remove the connecting plate from the nozzle head. This can be done easily by pulling lightly on the starter lever.
Next, loosen the clip, and remove the fuel line. The nozzle can then be removed. When the nozzle is removed, the jet needle will remain inside. Thus, be careful not to damage either the jet needle or nozzle and not to bend the jet needle.

(2) Next, remove the idling adjusting nut and idling adjusting spring.

(3) The nozzle sleeve can be removed by removing the nozzle sleeve set screw.
(Recommend this not be disassembled unless absolutely necessary.) Exploded view of disassembled parts is shown in Figure EF-55.
The nozzle jet is the heart of the carburetor, and is a high precision component. To clean the nozzle, use gasoline and dry with compressed air.

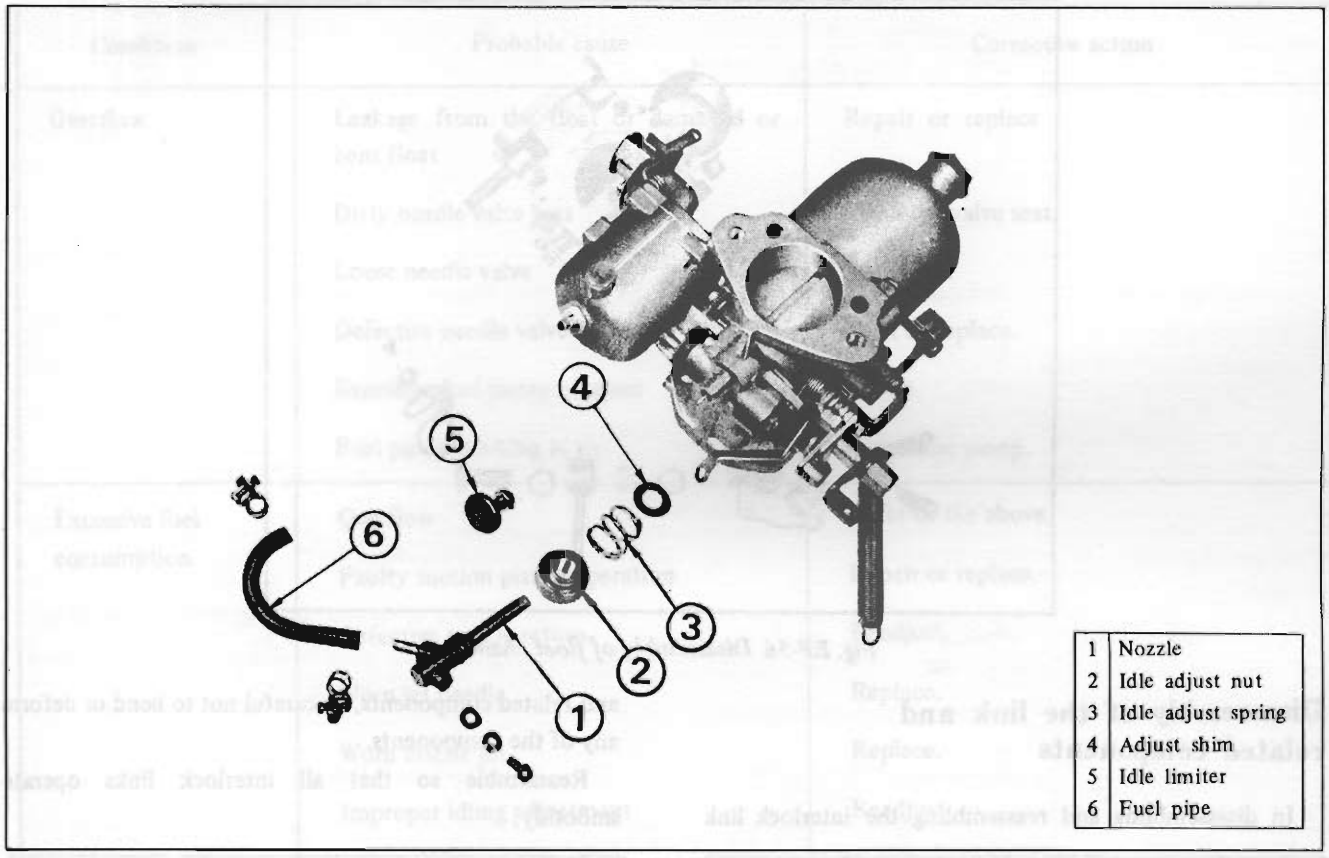


Fig. EF-55 Disassembly of nozzle

2. Assembly

(1) For centering the piston and suction chamber, remove the oil cap nut with the parts properly assembled (jet needle and suction piston assembled), without damper oil applied.

(2) Set the suction piston to its fully closed position, and insert the nozzle until it contacts the nozzle sleeve.

(3) When the nozzle jet contacts the jet needle, move the nozzle sleeve slightly so that it is at right angles to the center axis, and position the nozzle sleeve so that the nozzle jet does not contact the jet needle.

(4) Under the conditions described above, raise the suction piston with your finger, and lower it slowly. If the suction piston drops smoothly until the suction piston stop pin drops on the Venturi making a light striking sound, the condition of the piston is satisfactory. Securely tighten the nozzle sleeve at this position with the nozzle sleeve set screw.

(5) Remove the nozzle, install the idling adjusting spring and the idling adjusting nut on the nozzle sleeve, and re-apply the nozzle. Connect the fuel line leading to the float chamber to the nozzle nipple, and tighten the clip fully.
Tighten the fuel line at the position at which the enlarged part of the nipple holds and the fuel line is not twisted.

(6) Next, pull the starter lever lightly, hold connecting plate (A) with sleeve (C) and the 4 mm (0.1575 in) diameter washer, and tighten it on the nozzle head with the 4 mm (0.1575 in) diameter screw.
In doing this, move the starter lever slightly, and attach the sleeve (C) firmly to the connecting plate (A) opening.

(7) Upon completion of the reassembly, reconfirm that the suction piston drops smoothly.

Disassembly of the float chamber

Disassemble the float chamber in the sequence previously described under "Adjustment of the float level".

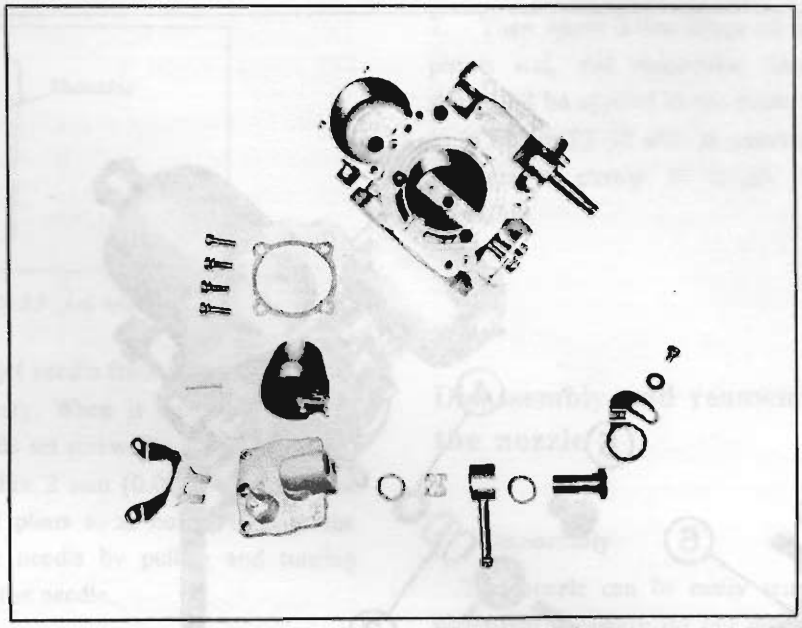


Fig. EF-56 Disassembly of float chamber

Disassembly of the link and related components

In disassembling and reassembling the interlock link and related components, be careful not to bend or deform any of the components.

Reassemble so that all interlock links operate smoothly.

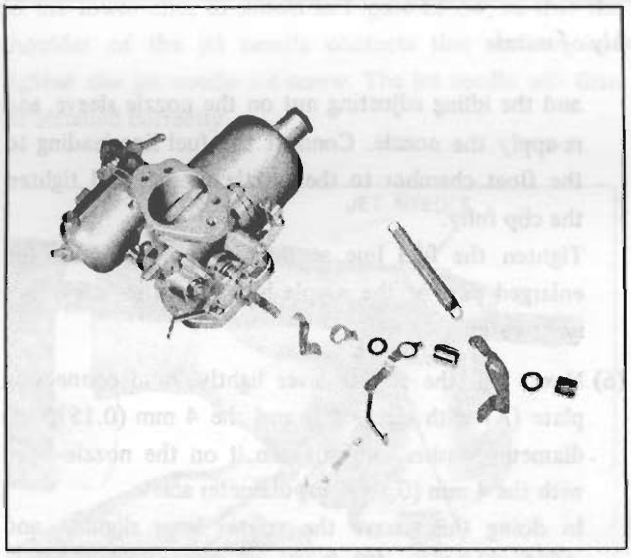


Fig. EF-57 Disassembly of throttle lever

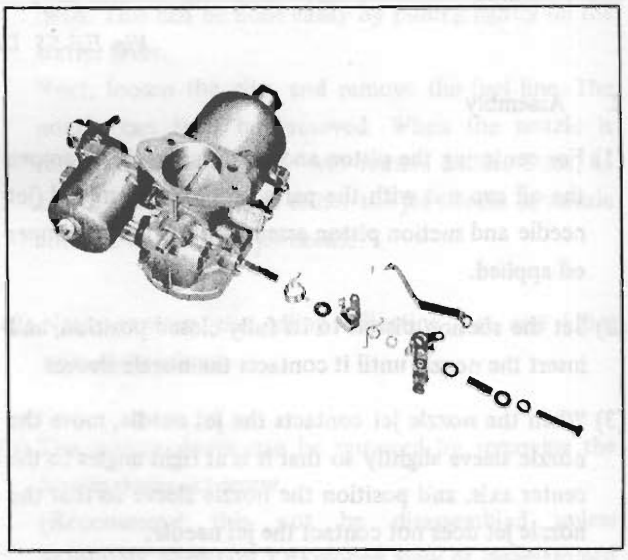


Fig. EF-58 Disassembly of starter lever

TROUBLE DIAGNOSES AND CORRECTIONS

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

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

Condition	Probable cause	Corrective action
Overflow	Leakage from the float or damaged or bent float	Repair or replace
	Dirty needle valve seat	Clean the valve seat.
	Loose needle valve	Retighten.
	Defective needle valve seat	Refit or replace.
	Excessive fuel pump pressure	Adjust.
	Fuel pump drawing in air	Repair the pump.
Excessive fuel consumption	Overflow	Refer to the above.
	Faulty suction piston operation	Repair or replace.
	Defective nozzle return.	Readjust.
	Worn jet needle	Replace.
	Worn nozzle jet	Replace.
	Improper idling adjustment	Readjust.
	Jet needle not properly installed	Readjust.
	Improper throttle valve interlock adjustment	Readjust.
Insufficient output	Throttle valve does not open fully	Readjust.
	Faulty suction piston operation	Repair or replace.
	Faulty nozzle return	Readjust.
	Clogged nozzle or fuel line	Clean.
	Jet needle not properly installed	Readjust.
	Clogged needle valve	Clean
	Defective fuel pump	Readjust.
Improper idling	Faulty suction piston operation	Repair or replace.
	Faulty nozzle return	Readjust.
	Worn jet needle	Replace.
	Improper idling adjusting nut adjustment	Readjust.
	Worn throttle valve shaft	Replace.

	Air leakage due to defective packing between manifold and carburetor	Replace the gasket.
	Improper throttle valve interlock adjustment	Readjust.
	Loose throttle lever interlock link	Readjust or repair.
Engine operation is irregular or erratic	Defective suction piston	Repair or replace.
	Insuffieient damper oil, or improper oil used	Replenish or replace.
	Improper idling adjustment	Readjust.
	Jet needle not properly installed	Readjust.
Engine does not start.	Overflow	Refer to the above.
	No fuel fed to the engine	Check the pump, the fuel line, and needle valve.
	Improper idling adjustment	Readjust.
	Defective suction piston	Repair or replace.
Faulty suction piston operation	Sticking due to dirt and other foreign matter	Clean.
	Sticking due to deformation (bulging or caving) of suction chamber or suction piston	Repair or replace.
	Nozzle not properly centered	Correct.
	Bent jet needle	Replace.
	Bent plunger rod.	Correct.

SPECIFICATIONS AND SERVICE DATA

Specifications

Applied engine (car model)	L24 (S30)
Make and type	HITACHI HJG46W–8 –9 A/T*
Construction	Side-draft, SU type
Bore	46 mm (1.811 in)
Weight	3.1 kg (6.834 lb)

* A/T: Automatic transmission

Service data

Venturi	34 mm (1.339 in)
Float level	23 .0 mm (0.906 in)
Fuel pressure	0.24 kg-cm^2 (3.414 lb/sq in)
Needle valve dia.	1.7 mm (0.067 in)
Nozzle	A
Jet needle	N-54
Suction spring	#23

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

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