CONTENTS

GROUP F: FUEL SYSTEM

Second Edition of this page, March 1967

DESCRIPTION

THE FUEL SYSTEM CONSISTS OF THE FOLLOWING MAJOR COMPONENTS:

1. Fuel tank
2. Fuel lines
3. Mechanical fuel pump
4. Two double - throat downdraft carburetors with air cleaner

The fuel tank is located under the front lid beneath the luggage compartment. It has a capacity of 62 liters (16.4 US gal.) of which 7 liters (1.8 US gal.) are the reserve.

The fuel supply line leads to the fuel pump through the frame tunnel.

The fuel pump is actuated by a cam, machined into the distributor pinion shaft, over an actuating plunger.

Each bank of two cylinders has one double-throat downdraft carburetor with an accelerating pump.

The air cleaners or induction silencers remove dust and dirt from the induction air.

DESCRIPTION OF THE SOLEX 40 P II - 4 CARBURETOR

General

The Type 912 Porsche is equipped with two SOLEX 40 P II - 4 double-throat downdraft carburetors. The induction throats are 40 mm (1.575") in diameter. Since the carburetors are located very close to the combustion chambers, cold starting enrichment devices are not needed.

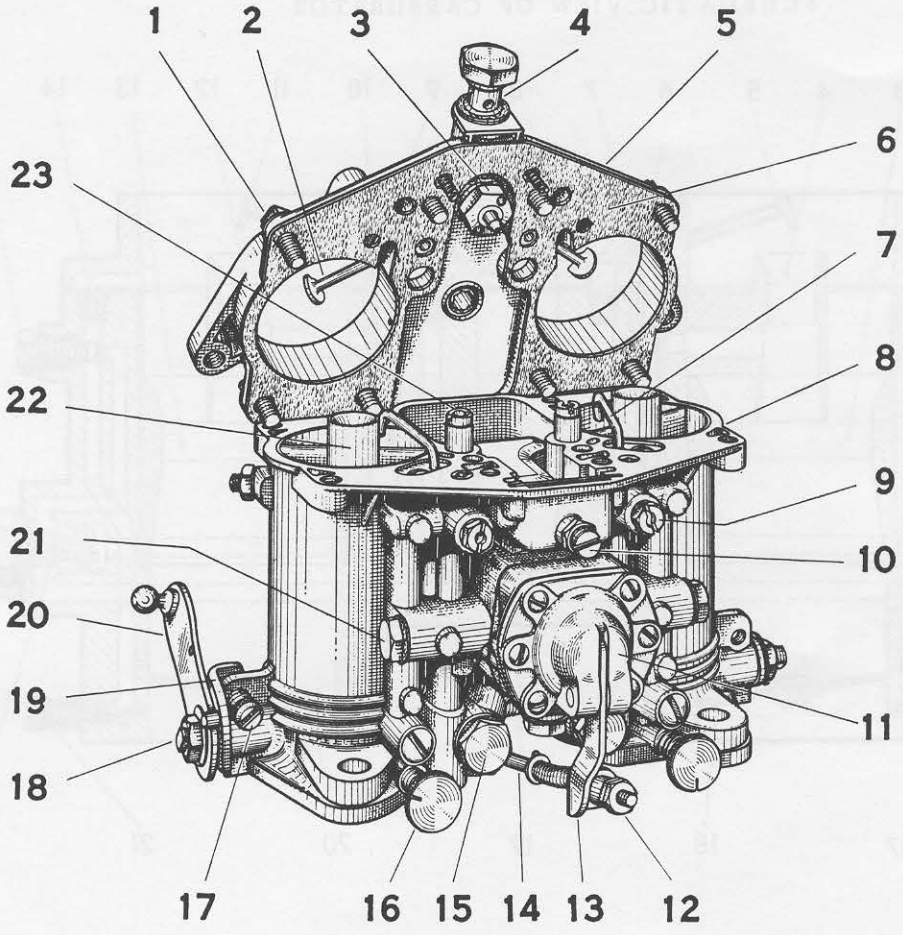


Fig. 1

1 Cover retaining screws
2 Power enrichment nozzle
3 Float needle valve
4 Fuel line connector
5 Carburetor cover
6 Cover gasket
7 Accelerating pump nozzle
8 Carburetor body
9 Idle jet
10 Float level adjustment
11 Accelerating pump
12 Accelerating pump adjustment
13 Accelerating pump lever
14 Accelerating pump rod
15 Main jet carrier with jet
16 Idle mixture adjustment
17 Idle speed adjustment
18 Throttle shaft
19 Throttle return stop
20 Throttle arm
21 Accelerating pump jet
22 Preatomizer
23 Air correction jet

Description

The carburetor basically consists of the main body and cover, with a gasket separating the two. The main body contains two induction barrels, each having an independent idle and power metering system. The throttle shaft, which passes through both barrels, controls both throttle valves and carries a throttle return stop and throttle arm.

SCHEMATIC VIEW OF CARBURETOR

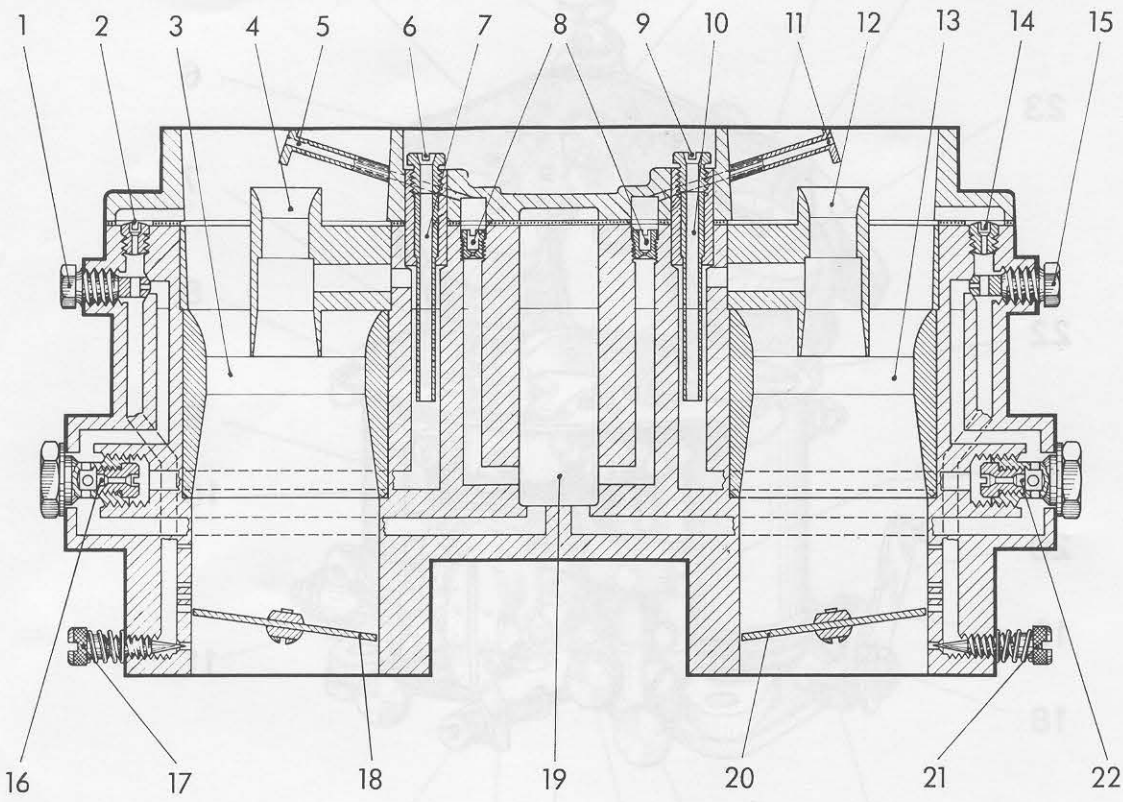


Fig. 2

1 Idle metering jet
2 Idle air bleed
3 Venturi
4 Preatomizer
5 Power enrichment nozzle
6 Air correction jet
7 Emulsioning tube
8 Power enrichment jets
9 Air correction jet
10 Emulsioning tube
11 Power enrichment nozzle
12 Preatomizer
13 Venturi
14 Idle air bleed
15 Idle metering jet
16 Main jet carrier
17 Idle mixture adjustment
18 Throttle valve
19 Float chamber
20 Throttle valve
21 Idle mixture adjustment
22 Main jet carrier

The accelerating pump located on the broad side of the carburetor is actuated through an adjustable rod and feeds fuel to both induction throats.

1 Preatomizer

2 Accelerating pump nozzle

3 Accelerating pump jet

4 Pump diaphragm spring

5 Pump diaphragm

6 Fuel passage, float chamber to check valve

7 Check valve with return flow port

8 Pump rod spring

9 Pump arm

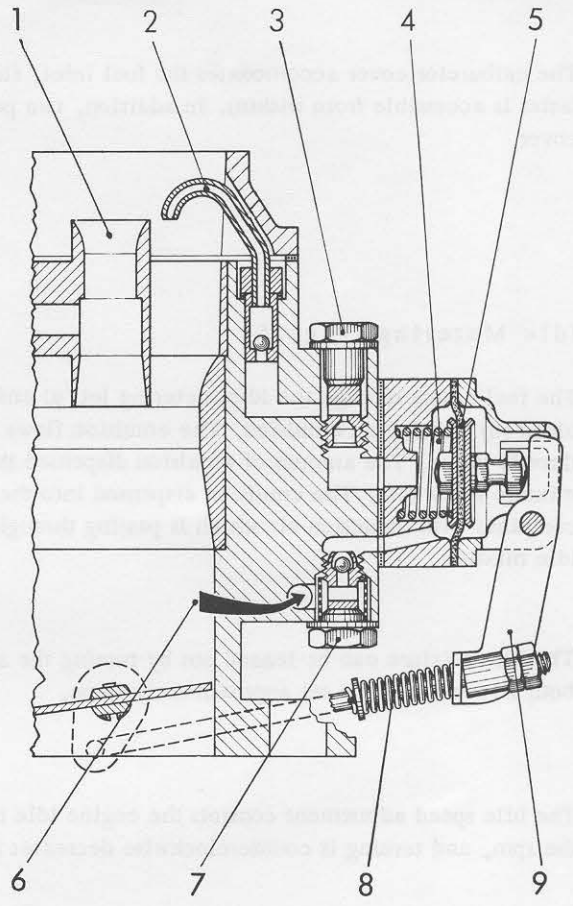
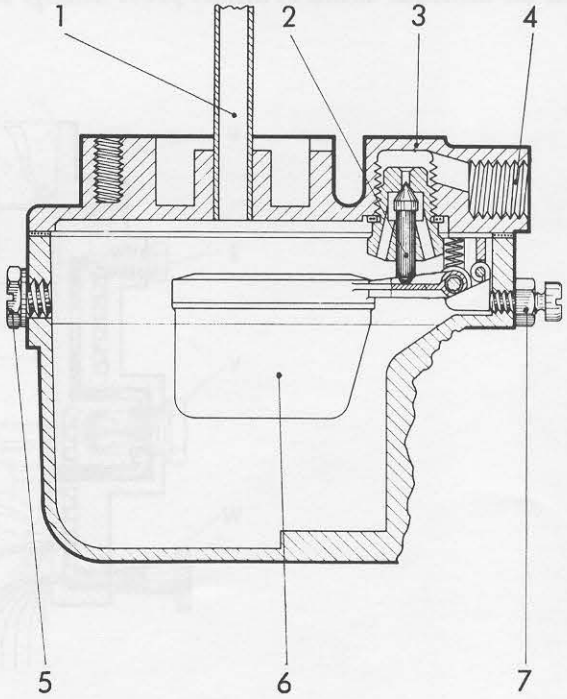


Fig. 3

The float chamber is located between both induction throats. The fuel level in the float chamber is regulated through the buoyancy of the float, that is, the float tang opens or closes the float needle valve. The float level may be adjusted by means of an externally located screw which adjusts the height of the intermediate swivel joint. This provision makes it possible to easily adjust the float level for the particular grade of fuel used. The fuel level may be checked by removing the plug from the inspection port.



1 Float chamber vent

2 Float needle valve

3 Carburetor cover

4 Threads for fuel line connector

5 Inspection port plug

6 Float

7 Float level adjusting screw

Fig. 4

The carburetor cover accomodates the fuel inlet, float chamber vent, and float needle valve (the latter is accessible from within). In addition, two power enrichment nozzles are press-fit into the cover.

Idle Metering (Fig. 5)

The fuel enters through the idle metering jet (g) and mixes with air entering through the idle air bleed (u) forming an emulsion. The emulsion flows to four small discharge ports located near the throttle valve. The amount of emulsion dispensed through the lowest port is controlled by the idle mixture screw (W). The emulsion dispensed into the induction throat through the idle mixture port combines with induction air which is passing through the partly open throttle valve and atomizes into idle mixture.

The idle mixture can be leaned out by turning the adjustment screw in, and enriched by turning it out; both screws should be set approximately same.

The idle speed adjustment controls the engine idle rpm, i.e., turning the screw clockwise increases the rpm, and turning it counterclockwise decreases rpm.

The idle system employed in this carburetor is an independent system since it draws the fuel from a point before the main jet carrier (Y). As a result, negative pressures prevailing in the induction throat have a continuous effect on the idle metering system and a certain amount of the idle mixture is fed into the induction throats at normal power settings as well.

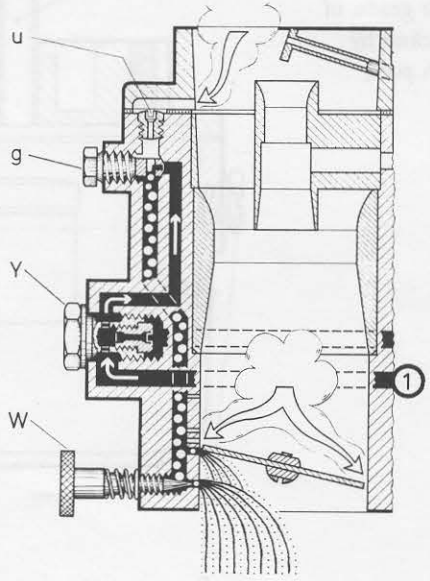


Fig. 5

Intermediate Metering

The three discharge ports located above the idle mixture discharge port provide progressive metering at intermediate throttle openings between idling and power. The lowest port, located at the throttle valve level, feeds idle mixture when the throttle is set for idling, while the two upper ports begin to feed the mixture as the throttle begins to open. This metering provision ensures smooth transition from idle speeds to power settings

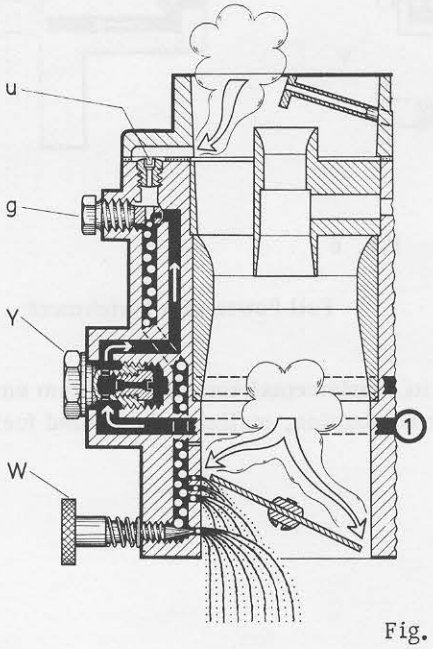


Fig. 5a

Power Metering

The fuel flows through the main jet carrier (Y) and the main jet (Gg) into a well which contains the emulsion tube (s) and, directly above it, the air correction jet (a). Vacuum in the induction throat draws the fuel into the preatomizer (X) where it mixes with air and continues to the venturi (K) where it is fully atomized into the combustion mixture. As the vacuum in the induction throat increases, the fuel level in the emulsion tube well decreases and air enters through the air correction jet, mixing with the fuel through orifices in the emulsion tube and effecting a derichment of the fuel/air mixture.

As long as the engine is operating in the mid-rpm range under partial or full throttle load, only the main metering system supplies the fuel. However, as the air velocity in the induction throat increases with increasing rpm, the vaccum effect in the throat becomes so intense that it begins to draw supplemental fuel from the power enrichment nozzle (q1); the power enrichment system consists of the discharge nozzle (q1) and the metering jet (q2) and draws fuel directly from the float chamber. The enrichment system comes into action when the engine is running under full throttle at high rpm.

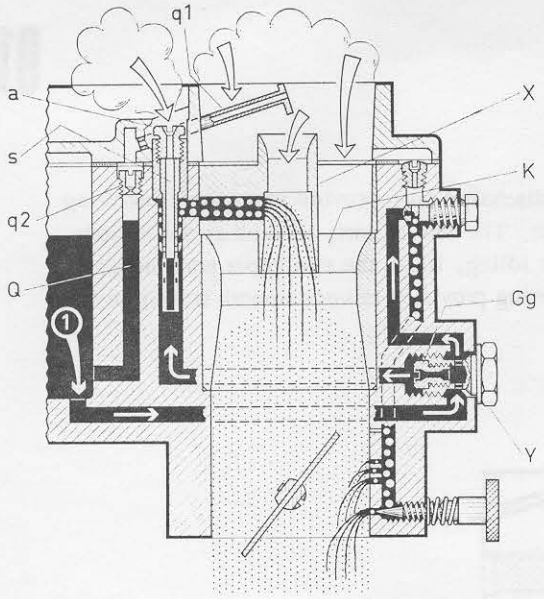


Fig. 6

Partial Load

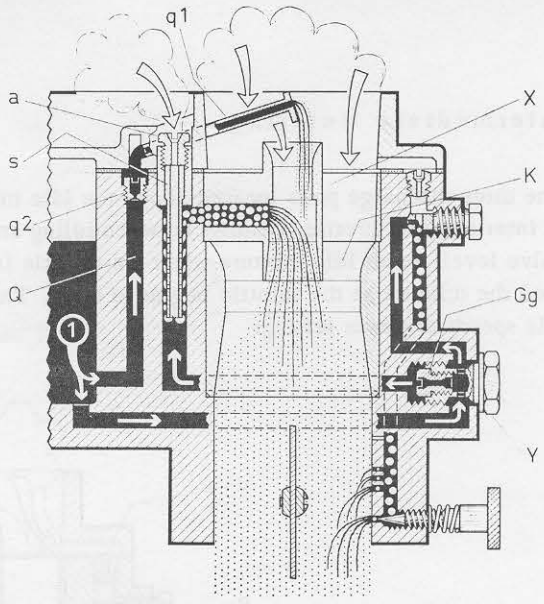


Fig. 7

Full Power with Enrichment

The main metering system together with its supplemental enrichment system ensures a well balanced and metered fuel/air mixture required for combustion, realizing the desired fuel economy and, yet, maximum power output on demand.

Acceleration

A mechanically actuated diaphragm-type accelerating pump is employed. The pump receives fuel directly from the float chamber. When the pump is at rest, the diaphragm (M) is kept outwards by the diaphragm spring (m). As the throttle valve opens, actuating motion is transmitted to the pump by the pump rod (T) and pump lever (L5), pushing the diaphragm inward against the fuel and forcing it to pass through the pump jet (Gp) and the calibrated injection nozzle (i) into the venturi, enriching the fuel/air mixture and resulting in smooth engine response at acceleration.

The check valve (H1), in the pump inlet, prevents the fuel from backing up into the float chamber; a second check valve (H2), at the base of the injection nozzle, prevents air from entering the pump through the injection nozzle when the pump is on the inlet stroke.

The amount of fuel dispensed by the pump on its pressure stroke at time of acceleration is predetermined by the length of the pump stroke; the stroke can be adjusted through the pump adjustment (t). The pump jet and the calibrated injection nozzle control only the duration of injection.

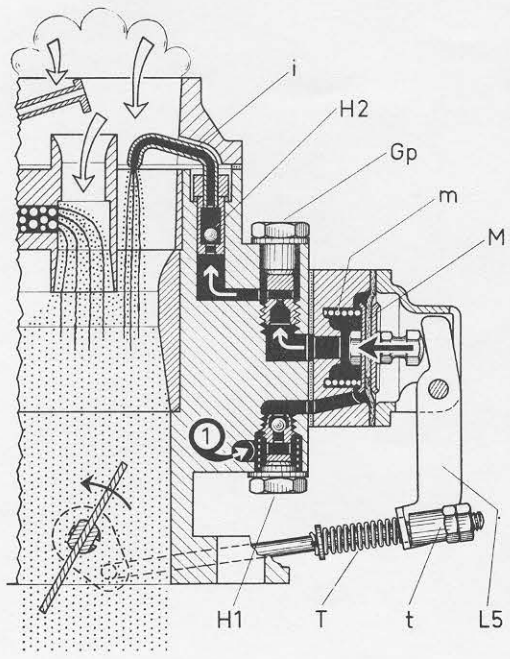


Fig. 8

Acceleration

The check valve assembly (H1) has a return flow passage measuring 0.36 mm (.0142") in diameter. This port prevents excessive enrichment of the fuel/air mixture by fuel dispensed by the fuel pump during acceleration, that is, depending upon the speed with which the throttle pedal is depressed, larger or smaller amounts of fuel are permitted to flow back to the pump.

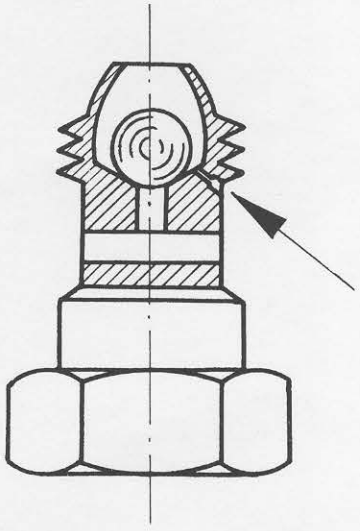


Fig. 9

CARBURETOR SPECIFICATIONS

Carburetor type	Solex 40 P II-4	2 per engine
Venturi (K)	32	2 per carburetor
Main jet (Gg)	0120	2 per carburetor
Air correction jet (a)	180	2 per carburetor
Idle metering jet (g)	57.5	2 per carburetor
Idle air bleed (u)	1.8	2 per carburetor
Accelerating pump	72	1 per carburetor
Pump jet (Gp)	50	2 per carburetor
Accelerating pump nozzle	high-type with 0.4 restrictor	2 per carburetor
Float needle valve (spring-loaded)	175	1 per carburetor
Float	7.4 g	1 per carburetor
Emulsion tube	Nr. 25	2 per carburetor
Main jet carrier	6	2 per carburetor
Intermediate metering ports	1.7; 1.4; 1.0	
Injection quantity (warm season)	0.45 cc (7.3 minims) from 2 strokes, each nozzle	2 nozzles per carburetor
Injection quantity (cold season)	0.65 cc (10.6 minims) from 2 strokes, each nozzle	

The main jet size is of great importance when operating at considerably varying altitudes for which the following rule-of-thumb may be applied: Change main jet size by 6% for each, 1,000m (3.280') altitude variation. For example, normal jet size at an altitude of 400 m (1.312') is 0120; proper jet size for an altitude of 1,400 m (4.592') is 0115.

REMOVING AND INSTALLING FUEL LINE

1 Fu

1. Remove both air cleaners.
2. Detach fuel line from both carburetors by removing connectors.
3. Remove attaching clip from air blower housing.
4. Withdraw fuel hose from fuel pump.

Reassemble in reversed order of the above using new gasket and attaching the fuel line so it does not touch the housing to cause rattles.

REMOVING AND INSTALLING CARBURETOR

2 Fu

Removal

1. Unsnap air cleaner fasteners.
2. Remove air cleaner.
3. Remove air cleaner base plate.
4. Detach carburetor linkage from throttle arm.
5. Detach fuel line.
6. Remove four carburetor retaining nuts from carburetor flange.
7. Withdraw carburetor.
8. Cover intake duct.

Installation

Install in reversed order of the above, making sure that the gaskets seat well and the linkage does not bind.

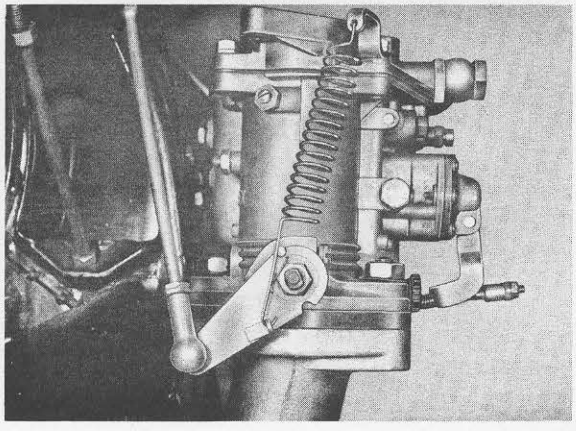


Fig. 10

Changing Air Cleaner Cartridge (KNECHT-Filter)

1. Remove center screw from filter housing top and pull out.
2. Withdraw filter housing top by pulling up.
3. Replace cartridge.

Reassembly

Inspect square plastic foam gasket, replace if necessary.

3 Fu

CLEANING CARBURETOR

1. Remove carburetor (2Fu).
2. Wash carburetor with clean solvent.
3. Remove retaining screws from carburetor cover.
4. Withdraw carburetor cover, watch float pin retainers.
5. Remove float pin and float.
6. Remove main, idle, and pump jets.
7. Remove air correction jets and shake out emulsion tubes.
8. Remove power enrichment and idle air bleed jets.
9. Remove float needle valve assembly.
10. Clean all jets and ports
11. Reassemble carburetor.

The carburetor should be cleaned in a utensil containing clean solvent. All jets and ports should be cleared with compressed air. In no case should wire or other mechanical devices be used for cleaning the jets because the calibrated orifices can be damaged or enlarged.

4 Fu

DISASSEMBLING AND REASSEMBLING CARBURETOR

1. Remove carburetor (2 Fu).
2. Remove retaining screws from carburetor cover, withdraw cover with gasket.
3. Remove float with pin and intermediate swivel joint.
4. Remove four accelerating pump retaining screws and remove pump.
5. Remove main jet carrier with jets.
6. Remove idle air bleed and idle jets.
7. Remove air correction jets and shake out emulsion tubes.
8. Remove injection nozzle retaining screws and carefully withdraw the nozzles making certain that nozzles are not bent in the process.
9. Remove both pump jets and accelerating pump check valve.
10. Remove power enrichment jets.
11. Remove idle mixture adjusting screws.
12. Loosen preatomizer set screws.
13. Pull out preatomizers by first freeing with a gentle twist.

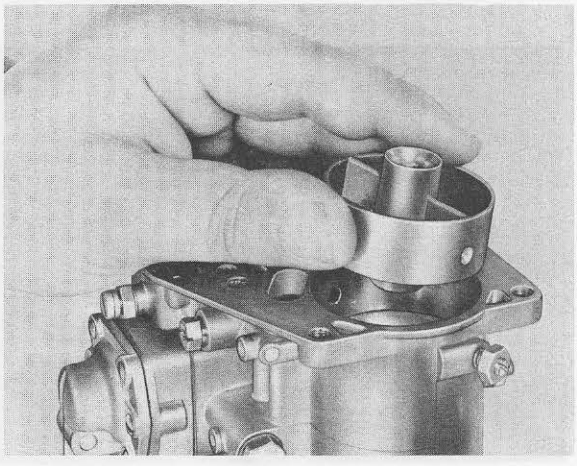


Fig. 11

14. Loosen and remove venturi set screws.

15. Pull out venturis by first freeing with a gentle twist and then carefully lifting these out, making sure they do not bind.

16. Remove burrs in venturi which were caused by set screw pressure.

Inspection and Reassembly

Reassemble in reversed order of the above by noting the following points:

1. Check float needle valve and seat for wear (leak test).

2. Fuel line connector threads in cover must not be damaged.

3. Check condition of gaskets, replace if necessary.

4. Ensure that accelerating pump diaphragm is in good condition.

5. Check float for leaks, replace of defective.

6. Ensure that all jets are of proper size by comparing specifications on page F 11.

When replacing jets or check valves, ensure that only genuine SOLEX-stamped parts are used. The parts are carefully calibrated to permit precise settings and low fuel consumption.

7. Install venturis. When installing the venturis make certain that the venturi throats face up, that is, the writing on the venturi tubes should be seen from above. Firmly tighten venturi set screws but do not overtighten.

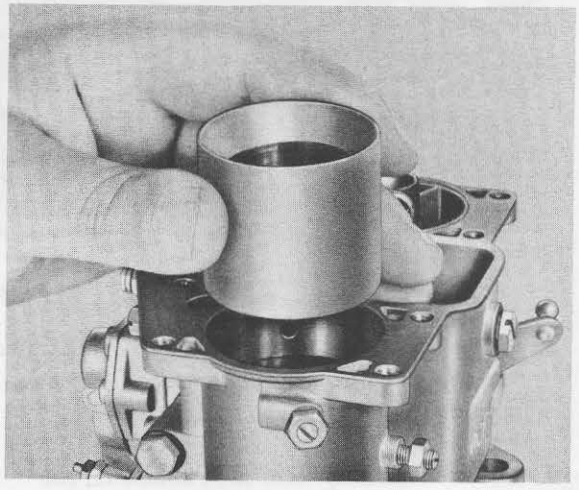


Fig. 12

8. Check radial clearance of throttle shaft. Excessive clearance allows false air to pass through and impairs engine starting and idling.

9. Inspect idle mixture adjusting screws; bent, burred, or broken needle tips call for replacement of the screw.

5 Fu

ADJUSTING INJECTION QUANTITY

Special Tools: P 25a Calibrated Vial

1. Adjusting idle speed.

2. Run engine to fill float chamber with fuel.

3. Stop engine, remove both air cleaners.

4. Work throttle arm until air bubbles cease to show at the pump injection nozzle.

5. Hold calibrated vial (P 25a) at the tip of the nozzle and quickly move throttle arm two times from stop to stop.

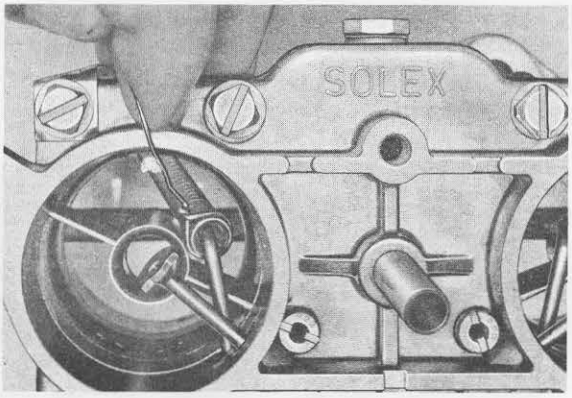


Fig. 13

6. Check injection quantity, empty the calibrated vial, repeat procedure on the second injection nozzle.

7. Injection quantity from each nozzle on two pump strokes should be 0.45 cc (7.3 minims) during the warm season, and 0.65 cc (10.6 minims) during the cold season.

8. Check injection quantity in second throat.

9. If required, readjust injection quantity by resetting the adjusting nut on the pump rod. If adjustment should not be possible due to lack of threads, insert a spacer between the pump arm and the nut.

Note

Fuel squirting from the pump nozzle should not strike the preatomizer nor the venturi and must pass through the slit between carburetor wall and throttle valve.

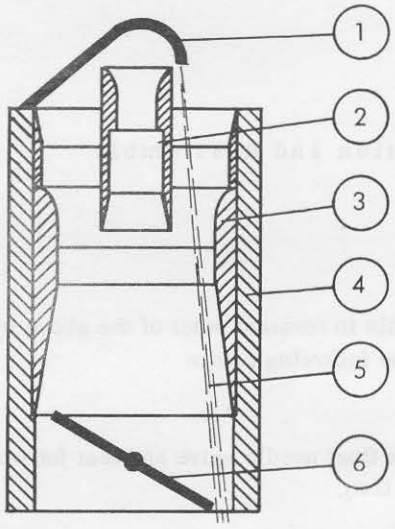


Fig. 14

1 Injection nozzle	4 Carburetor body
2 Preatomizer	5 Squirting fuel
3 Venturi	6 Throttle valve

Should it become necessary to bend the injection nozzle, ansure that its tip remains at same height. The pump jet does not affect the injection quantity. Changes in size of the pump jet affect only the duration of injection since the jet size controls the flow only in respect to flow duration.

Injection quantity as well as the moment of injection must be identical in all carburetor throats.

ADJUSTING IDLE SPEED

Special Tools: P 227 Carburetor Synchronizer

1. Remove idle mixture adjusting screws and inspect needle tips for burrs, grooves, and bends. Install new screws if in doubt.

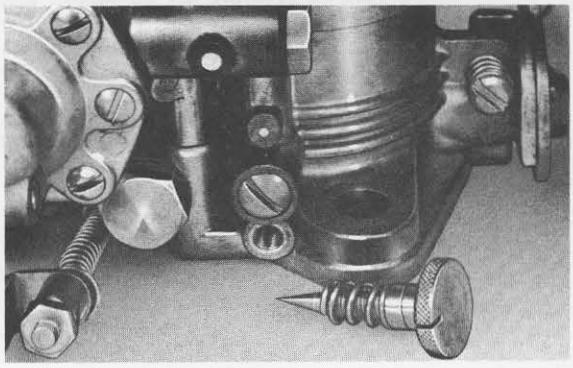


Fig 15

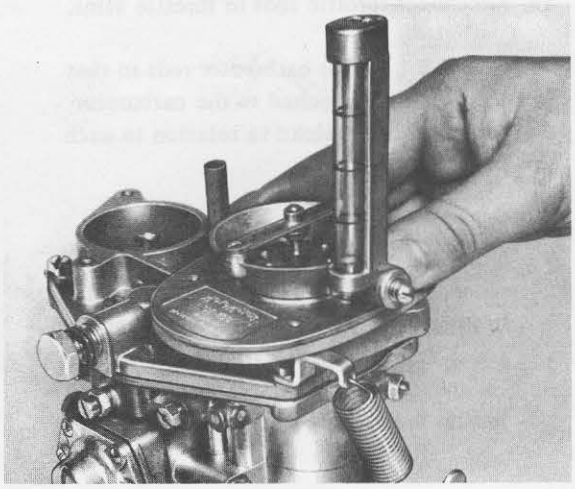


Fig. 16

2. Bring engine to normal operating temperature and remove air cleaners.

3. Detach throttle rods from throttle arms.

4. Uniformly turn idle adjusting screws in until engine idles at about 1 000 rpm.

5. Following any convenient sequence turn idle mixture screws fully in on both carburetors -do not tighten since this can damage the needle points- then back off 1 1/2 turns. Form this position turn the screws in or out until fastest idling speed is achieved. In no case should the screws be left in fully turned-in position.

6. Adjust idle speed screws until the engine idling rpm drops to 800 - 900.

7. Place carburetor synchronizer (P 277) on carburetor throat and adjust plunger glass to vertical position.

8. Turn adjusting disc in synchronizer until plunger moves to about half-way between two marking rings about midway of the glass tube length; this accomplished, the synchronizer is set for the particular engine and no further adjustments should be made with the disc in the synchronizer.

9. Place synchronizer (P 277) onto second throat of the carburetor assembly; the plunger should move up to same point as during procedure described above. If the reading is different, the throttle valves are not in alignment and must be synchronized, which is easily accomplished by twisting the throttle shaft. Using the syncronizer, recheck synchronization of both throttle valves by comparing readings of the synchronizer when placed first on one, then on the other throat.

10. Without changing synchronizer adjustment, place synchronizer onto throats of second carburetor assembly and adjust throttle valve with idle speed screw so that the plunger in synchronizer moves to same height as observed during test described in Pt. 9, above readjust throttle valve if necessary.

11. Should it be noted during the adjusting procedure that the idle speed has changed, readjust idle speed screw settings and recheck carburetor synchronization with the synchronizer, correct of necessary.

12. Reconnect throttle rods to throttle arms.

    N O T E ! Adjust carburetor rods so that these can be attached to the carburetor arms without preload in relation to each other.

13. Set idling speed to 1,200 - 1.300 rpm. Using the synchronizer (P 277) recheck synchronization of all throats as described in Pts. 8 and 9. If the gauge does not show equal values in both carburetors, synchronize these with each other by properly adjusting the carburetor throttle rods.

14. Recheck idle speed.

15. Check injection quantity (warm season 0,45 cc from each nozzle on two pump strokes, 0,65 cc in cold season).

16. Check accelerator pedal stop bolt and adjust if necessary. When the accelerator pedal is depressed against the stop bolt, the carburetor arm should be clearing the carburetor stop block by about 1 mm (.039").

17. Install air cleaners with gaskets, tighten retaining screws.

7 Fu

CHECKING CARBURETOR FLOAT LEVEL

Special Tools: P 78 Float Level Gauge

1. Place car on level base.

2. Remove main jet carrier from one carburetor.

3. Install float level gauge (P 78) in place of main jet carrier.

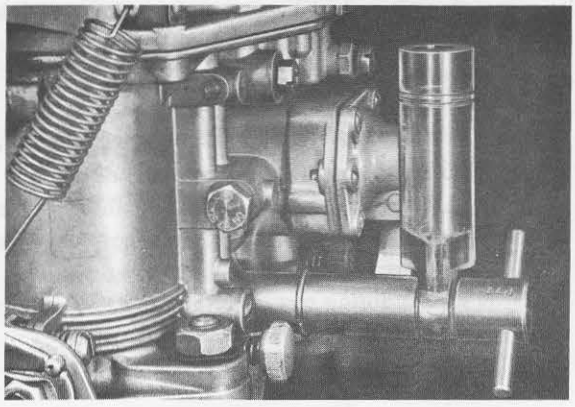


Fig. 17

4. Start engine and allow to idle. When float level is correctly set, the fuel will rise to a point between the marking rings on the gauge tube. If the fuel level check is accomplished according to the above instructions, the need for a float level readjustmnet will seldom occur. Whenever the float level deviates from specifications, first check the float, float adjustment swivel, and the float needle valve; thereupon proceed with steps required for readjusting the float level by resetting the externally located float level adjusting screw.

    N o t e :

    Turn adjusting screw in to lower the fuel level, turn the screw out to raise the level.

Apply the following procedure if the float level gauge (P 78) is not at hand:

1. Place car on level base.

2. Start engine.

3. Remove plug from the float level inspection port. When the float level is correct, the fuel will be seen in the machined groove within the threaded part of the port, or it will just begin to flow out.

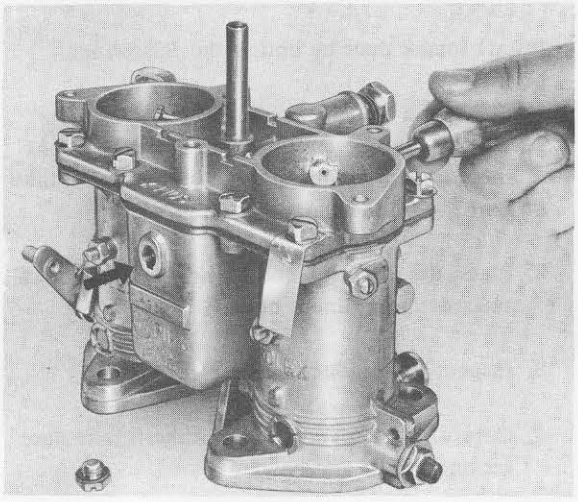


Fig. 18

4. Readjust float level if necessary.

Note:

Turn adjusting screw to lower the float level, turn the screw out to raise the level.

Note

Turning the adjustment screw in causes the float to move downward which, in turn, causes some of the fuel to run out through the inspection port.
Therefore, allow the engine to use up the fuel excess before making the final adjustment.

REMOVING AND INSTALLING AIR CLEANERS

8 Fu

1. Detach carburetor heating hose.

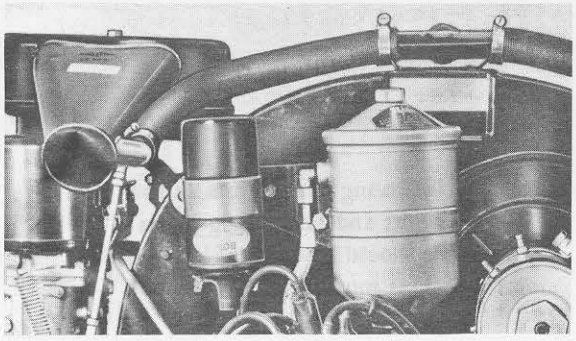


Fig. 19

2. Unsnap all four fasteners at the lower part of the air cleaner housing (KNECHT-Filter).

3. Detach crankcase breather hose from the air cleaner housing.

4. Withdraw the air cleaner housing upward (KNECHT-Filter).
   Remove five retaining bolts at forward air duct box and remove box (MANN and HUMMEL Filter).

5. Remove retaining bolts from air cleaner base plate and remove plate (KNECHT-Filter).

Installation

Install air cleaner in reversed order of the above, ensuring that the gasket sealing surfaces are clean; use new gaskets if necessary.

REMOVING AND INSTALLING INTAKE DUCT

9 Fu

Removel

1. Remove carburetor (2 Fu).

2. Remove spark plug connectors from spark plugs.

3. Remove side cover plate.

4. Remove retaining nuts and bolt from intake duct and withdraw duct.

5. Cover intake port in cylinder head.

Installation

Install intake duct by noting the following points:

1. Use new intake duct gasket. Make sure that the gasket matches the contours of the intake port in cylinder head.

2. Place the graphite-coated side of the gasket towards the cylinder head.

3. Inspect intake duct for cracks.

4. Carefully and evenly tighten the intake duct retaining nuts and bolt.

5. Install new gasket between duct and carburetor.

10 Fu

REMOVING AND INSTALLING THROTTLE LINKAGE

1. Remove floor mat to gain access to opening in floorboard.

2. Detach throttle rod at ball joint of cross-shaft at air blower housing.

3. Remove gearshift lever base retaining screw (hex head).

4. Withdraw gearshift lever with base.

5. Remove handbrake lever with base.

6. Remove attaching clip of throttle rod through freed openings.

7. Detach throttle rod from rear cross-shaft ball joint
   joint (beneath transmission).

8. Pulling rearward, withdraw throttle rod.

Installation

Note the following during installation:
The ball joints and all moving joints of the cross-shafts should be well lubricated. Ball joint lock nuts must be well tightened.

ADJUSTING THROTTLE LINKAGE

The throttle linkage must be so adjusted that all throttle valves work in unison. In addition it should be noted that the throttles do not bind throughout the entire extent of travel from idle to full power settings.

Note

Smooth and even clowing action of the throttles can be achieved only when all throttle linkage ball joints move freely. Lubricate the ball joints if necessary.

CARBURETOR SERVICE DIAGNOSIS

The chart applies only to carburetors which meet specifications shown on page F 11

Malfunction	Possible Cause	Remedy
1. Engine does not start despite properly functioning ignition and adequate fuel in tank.	a) No fuel in fuel system.	a) Clean main jets. Check fuel supply lines. Detach fuel line connecting pump with carburetor, actuate starter (ignition off). If fuel flows from pump, float needle valve is plugged; if no fuel flows from pump, possibly pump check valves are stuck or pump mechanism defective.
	b) Carburetor floods.	b) Check and clean float needle valve, check gasket at float needle valve assembly. Check float, replace if defective.
2. Uneven idling.	a) Improperly adjusted idling.	a) Readjust idling.
	b) Idle jets or idle air bleed plugged.	b) Clean idle jets or idle air bleed, as required.
	c) Leak in the intake ducts.	c) Check intake ducts, flange connections, and gaskets.
	d) Defective idle mixture screws.	d) Install new idle mixture adjusting screws.

Malfunction	Possible Cause	Remedy
3. Poor power transition (flat spot).	a) Idle adjustment too lean.	a) Readjust idling (check jets).
	b) Improperly set float level.	b) Readjust float level.
	c) Improper injection quantity.	c) Readjust injection quantity.
	d) Intake ducts leaking.	d) Check intake ducts, flange connections, and gaskets.
4. Engine stalls when throttle is quickly closed.	Improper idle adjustment.	Readjust idling.
5. Engine runs unevenly, misses, backfires.	a) Mixture too rich.	a) Check fuel pump pressure. Check float level. Check float needle valve.
	b) Mixture too lean.	b) Clean main jets. Check fuel lines. Check float level.
	c) Intake duct leaking.	c) Check intake ducts, flange connections, and gaskets.
6. High fuel consumption.	a) High fuel pump pressure overriding float needle valve.	a) Check fuel pressure.
	b) Defective float (leaking).	b) install new float.
	c) Float needle valve not closing.	c) Check float needle valve.

Fuel Pump Schematic

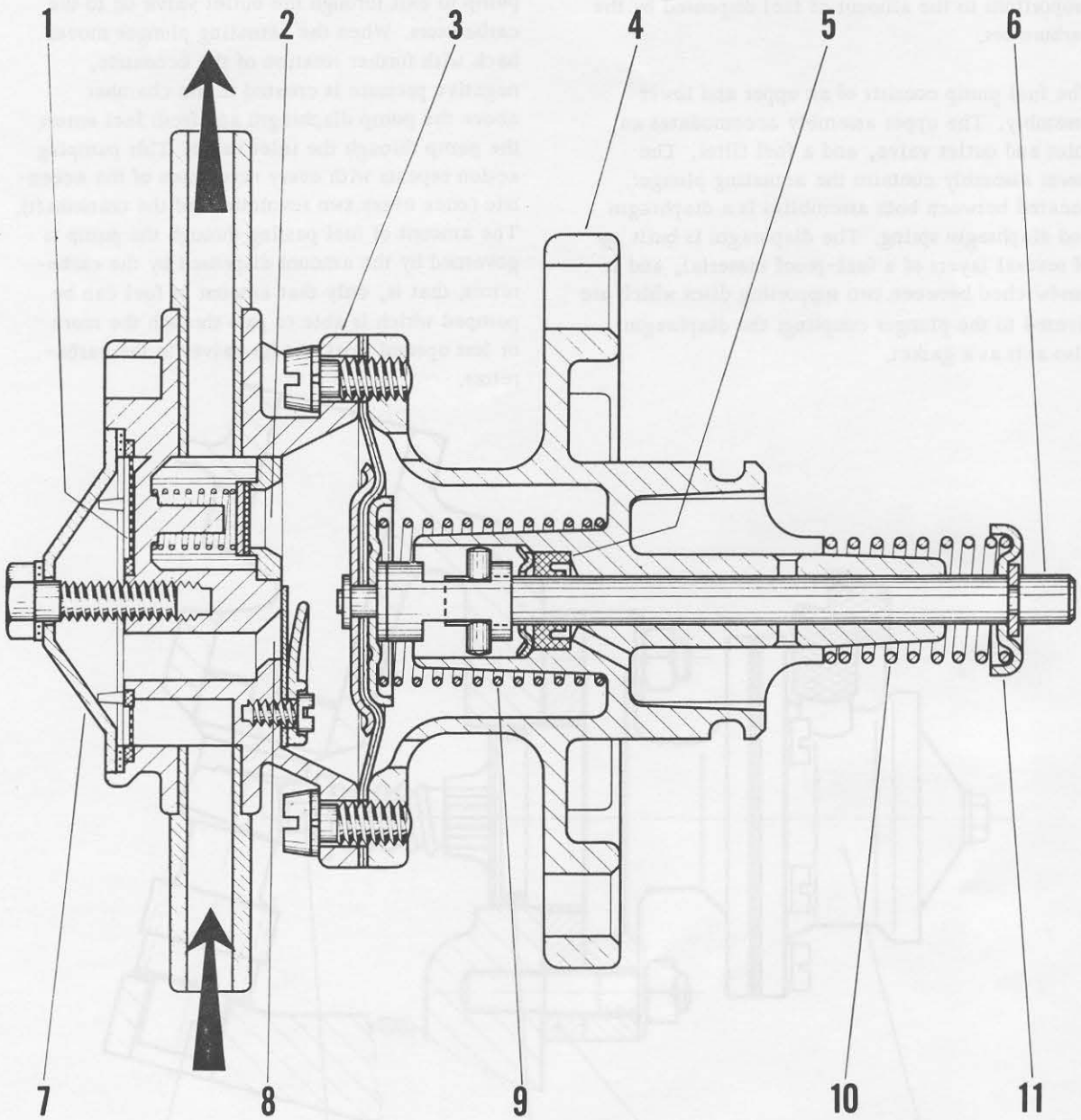


Fig. 1

1 Fuel screen
2 Outlet valve
3 Upper assembly
4 Lower assembly
5 Oil scraper
6 Actuating plunger
7 Pump cover
8 Inlet valve
9 Diaphragm spring
10 Plunger return spring
11 Spring retainer

Second Edition of this page, March 1967

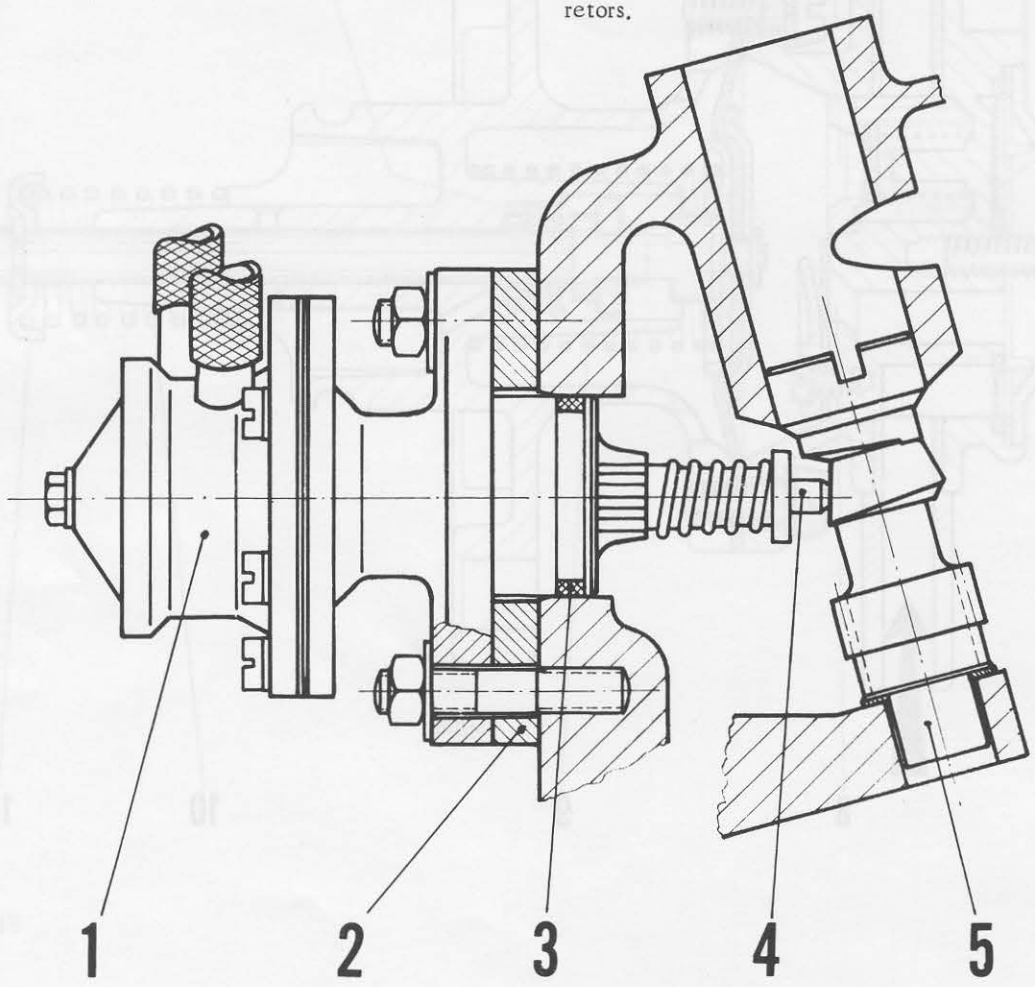
General

The fuel is pumped to the carburetors by a mechanical diaphragm pump which is mounted on the engine crankcase. The fuel pump is actuated by an eccentric machined into the distributor pinion shaft. The quantity of fuel delivered by the pump is metered automatically in direct proportions to the amount of fuel dispensed by the carburetors.

The fuel pump consists of an upper and lower assembly. The upper assembly accomodates an inlet and outlet valve, and a fuel filter. The lower assembly contains the actuating plunger. Located between both assemblies is a diaphragm and diaphragm spring. The diaphragm is built up of several layers of a fuel-proof material, and is sandwiched between two supporting discs which are riveted to the plunger coupling; the diaphragm also acts as a gasket.

Function Description

The eccentric on the pinion shaft raises the diaphragm actuating plunger. The plunger transmits the pressure to the diaphragm coupling, overcoming the pressure of the plunger return spring but with the support of the diaphragm spring. This forces the fuel contained in the pump to exit through the outlet valve on to the carburetors. When the actuating plunger moves back with further rotation of the eccentric, negative pressure is created in the chamber above the pump diaphragm and fresh fuel enters the pump through the inlet valve. This pumping action repeats with every revolution of the eccentric (once every two revolutions of the crankshaft). The amount of fuel passing through the pump is governed by the amount dispensed by the carburetors; that is, only that amount of fuel can be pumped which is able to pass through the more or less opened float needle valves in the carburetors.



1 Fuel pump
2 Pump insulating flange
3 O-ring
4 Actuating plunger
5 Distributor pinion shaft

Fig. 2

FUEL PUMP COMPONENTS

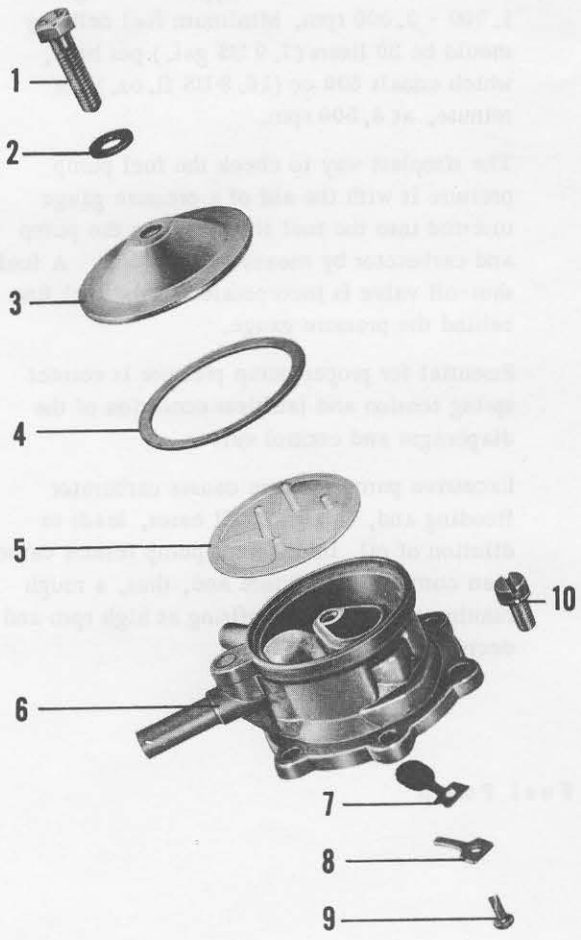


Fig. 3

1 Hex bolt
2 Gasket
3 Cover
4 Gasket
5 Fuel screen
6 Pump, upper assembly
7 Leaf spring valve
8 Valve limiter
9 Self-threading screw M 3x8
10 Fillister screw with washer

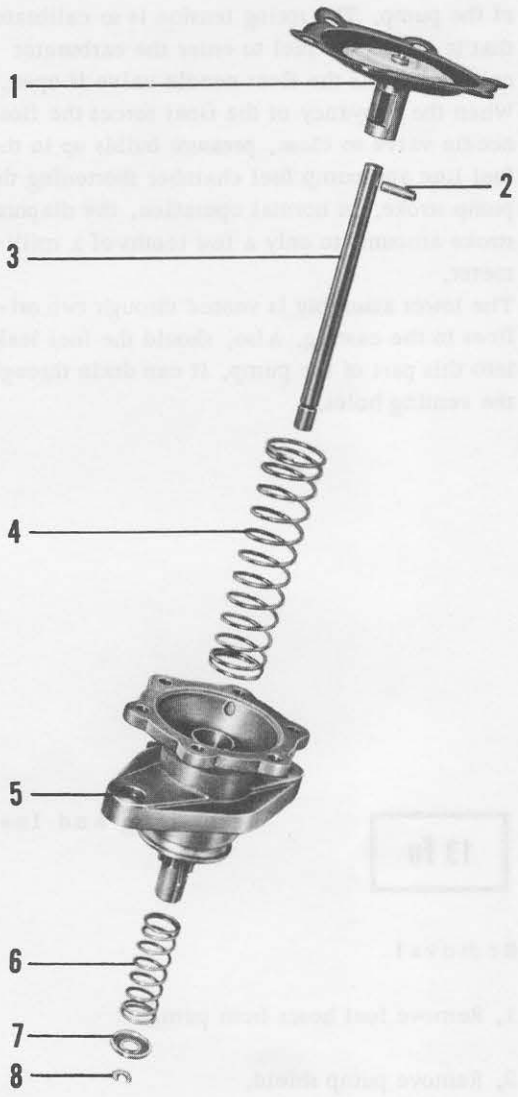


Fig. 4

1 Diaphragm assembly
2 Coupling pin
3 Plunger
4 Diaphragm spring
5 Pump, lower assembly
6 Plunger return spring
7 Spring retainer
8 Lock ring

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Testing Pump Pressure

General

The pump pressure is determined by the degree of spring compression during the intake stroke of the pump. The spring tension is so calibrated that it allows the fuel to enter the carburetor only as long as the float needle valve is open. When the buoyancy of the float forces the float needle valve to close, pressure builds up in the fuel line and pump fuel chamber shortening the pump stroke. In normal operation, the diaphragm stroke amounts to only a few tenths of a millimeter.
The lower assembly is vented through two orifices in the casting. Also, should the fuel leak into this part of the pump, it can drain through the venting holes.

Testing

The pump pressure should be 0.20 to 0.24 atmospheres (2.9 - 3.5 psi) with the float needle valve closed and engine running at 1.000 - 3.000 rpm. Minimum fuel delivery should be 30 liters (7.9 US gal.) per hour, which equals 500 cc (16.9 US fl. oz.) per minute, at 4,500 rpm.

The simplest way to check the fuel pump pressure is with the aid of a pressure gauge inserted into the fuel line between the pump and carburetor by means of a T-joint. A fuel shut-off valve is incorporated in the fuel line behind the pressure gauge.

Essential for proper pump pressure is correct spring tension and faultless condition of the diaphragm and control valves.

Excessive pump pressure causes carburetor flooding and, in almost all cases, leads to dilution of oil. Insufficient pump ressure causes lean combustion mixture and, thus, a rough running engine with misfiring at high rpm and decreased power output.

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Removing and Installing Fuel Pump

Removal

1. Remove fuel hoses from pump.

2. Remove pump shield.

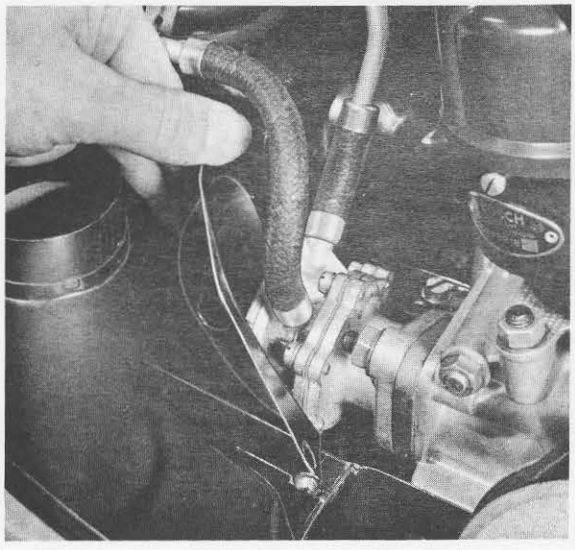

Fig. 5

3. Remove pump attaching nuts from flange.

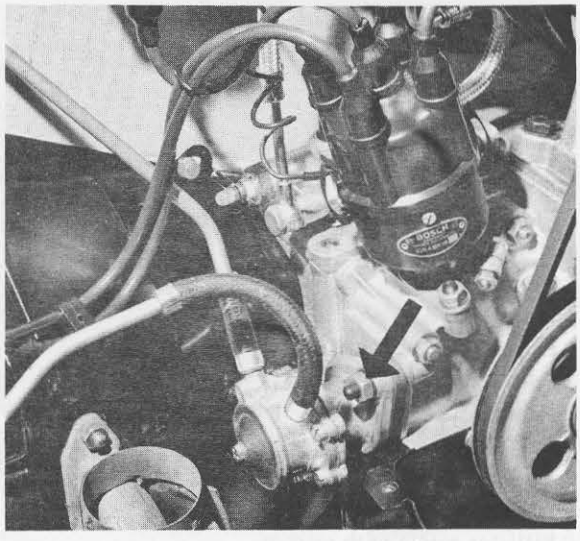

Fig. 6

4. Remove pump and insulating spacer.

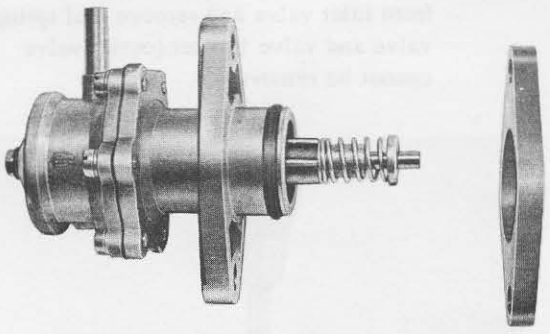

Fig. 7

Installation

Installation is accomplished in reversed order of the above. Ensure that the O-ring is in good condition, replace if necessary.

Reconditioning Fuel Pump

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Disassembly

1. Remove cover retaining hex bolt.
2. Remove cover and fuel screen.
3. Remove six fillister screws which secure the upper assembly, withdraw assembly.

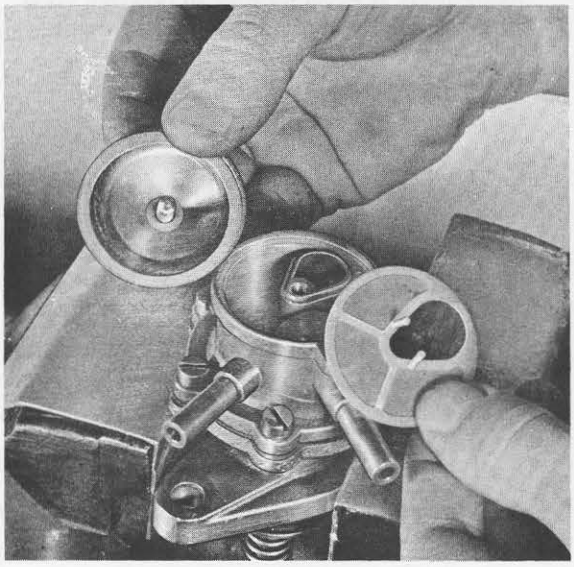

Fig. 8

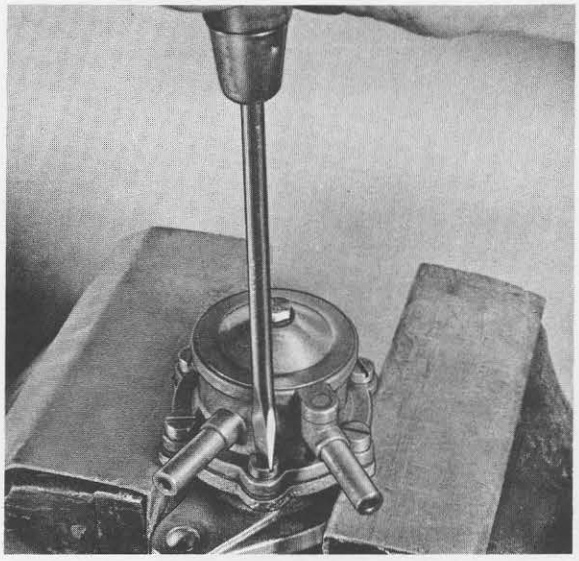

Fig. 9

4. Rest the lower assembly of pump on the diaphragm supporting disc, push spring retainer down with pliers, remove lock ring, spring retainer, and spring.

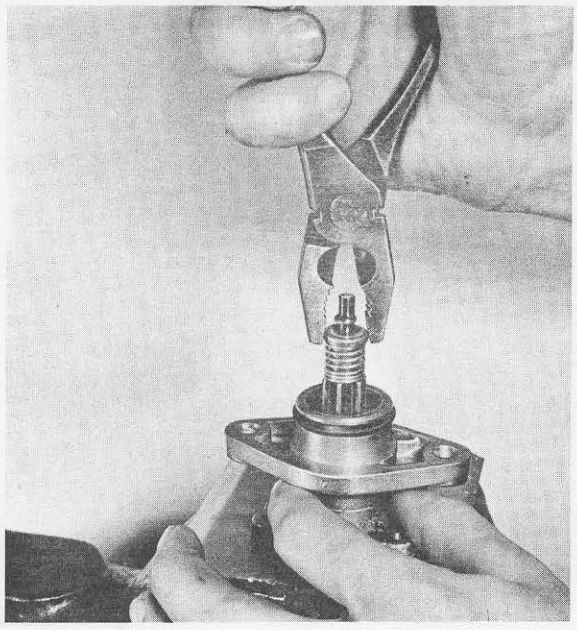

Fig. 10

5. Withdraw the diaphragm-plunger-spring assembly from lower pump casting. Ensure that there is no grit around the lock ring groove in plunger to prevent damaging the oil scraper.

6. Remove coupling pin from actuating plunger with a punch, detach diaphragm from plunger.

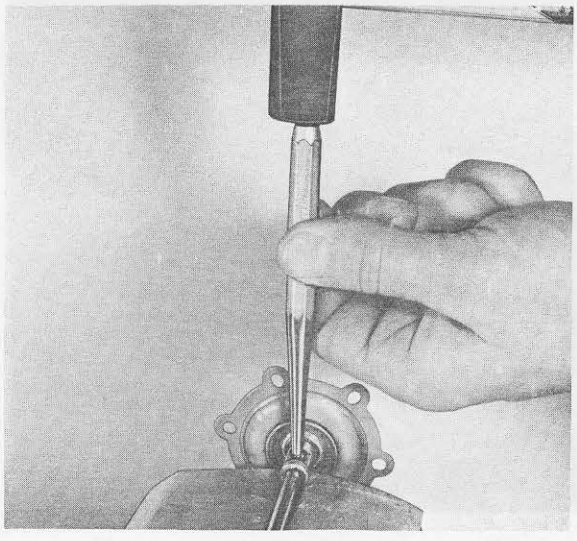

Fig. 11

7. Remove self- threading fillister screw from inlet valve and remove leaf spring valve and valve limiter (outlet valve cannot be removed).

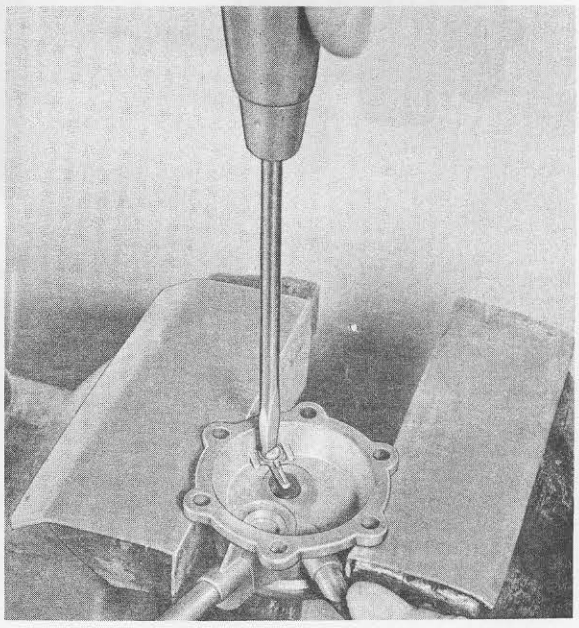

Fig. 12

8. Clean pump components with gasoline.

Reassembly

Reassembly is accomplished in reversed order of the above by noting the following points:

1. Check outlet valve in upper assembly for proper functioning.

2. Check sealing surfaces of inlet valve.

3. Install leaf spring valve and valve limiter, check for proper operation.

4. Reconnect diaphragm with plunger with the pin, check free movement of plunger in diaphragm coupling. Center coupling pin in plunger.

5. When mounting pump upper assembly, ensure that the diaphragm is not creased. Evenly tighten screws in cross- sequence.

6. Check gasket at pump cover, replace if necessary.