SECTION INDEX

Supplement to Group F: Fuel System

SOLEX 40 PII-4
Twin Throat Downdraft Carbureter

General Description

The 1600 S-90 engine in type 356 B cars is equipped with SOLEX 40 PII-4 twin throat downdraft carbureter; the throats measure 1 37/64 in. (40 mm) in diameter. As a result of the low mounting of the carbureters it was possible to omit chokes or similar starting aids.

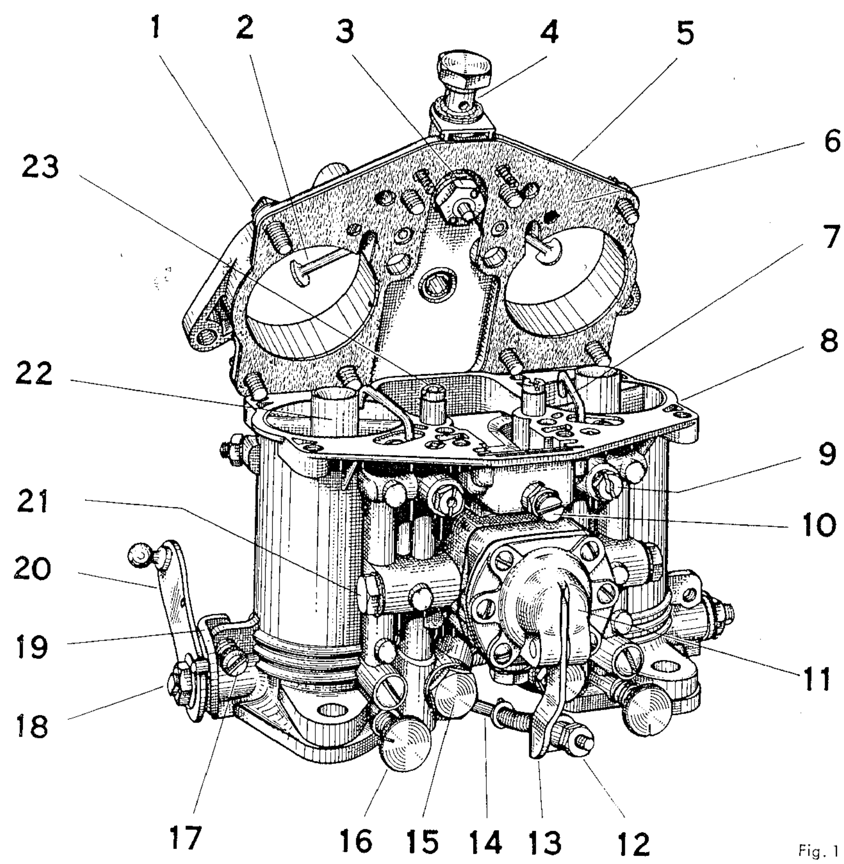


Fig. 1

① Float chamber cover retaining screw
② Power enrichment nozzle
③ Float needle valve assembly
④ Fuel inlet bolt
⑤ Float chamber cover
⑥ Float chamber gasket
⑦ Accelerating pump nozzle
⑧ Carbureter 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 Thrust block
⑳ Throttle arm
㉑ Accelerating pump jet
㉒ Primary venturi
㉓ Air correction jet

Operating Principles

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

Schematic View of Carbureter

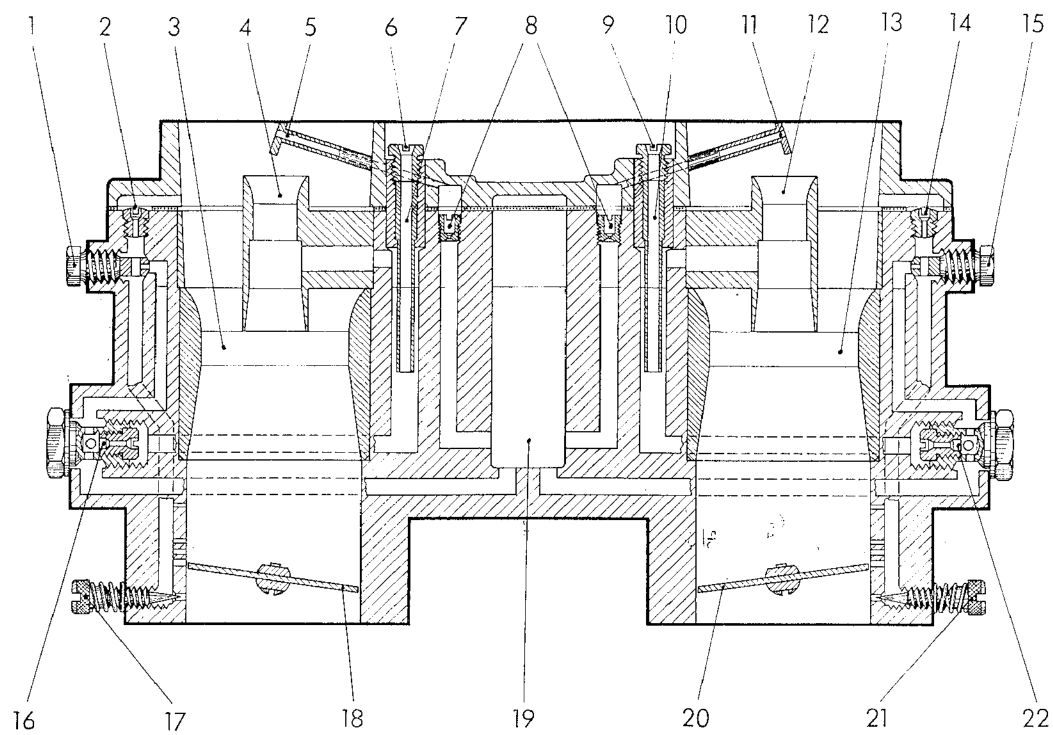


Fig. 2

For reasons of schematic clarity the throttle shaft is purposely shown in an untrue, transverse arrangement.

1. Idle metering jet
2. Idle air bleed
3. Main venturi
4. Primary venturi
5. Power enrichment nozzle
6. Air correction jet
7. Emulsion tube
8. Power enrichment jets
9. Air correction jet
10. Emulsion tube
11. Power enrichment nozzle
12. Primary venturi
13. Main 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 is located on the broad side of the carbureter; it is actuated through an adjustable rod and supplies fuel to both induction barrels.

① Primary venturi

② Accelerating pump nozzle

③ Accelerating pump jet

④ Accelerating pump diaphragm spring

⑤ Accelerating pump diaphragm

⑥ Fuel inlet from float chamber to check valve

⑦ Check valve with return flow port

⑧ Pump rod spring

⑨ Pump lever

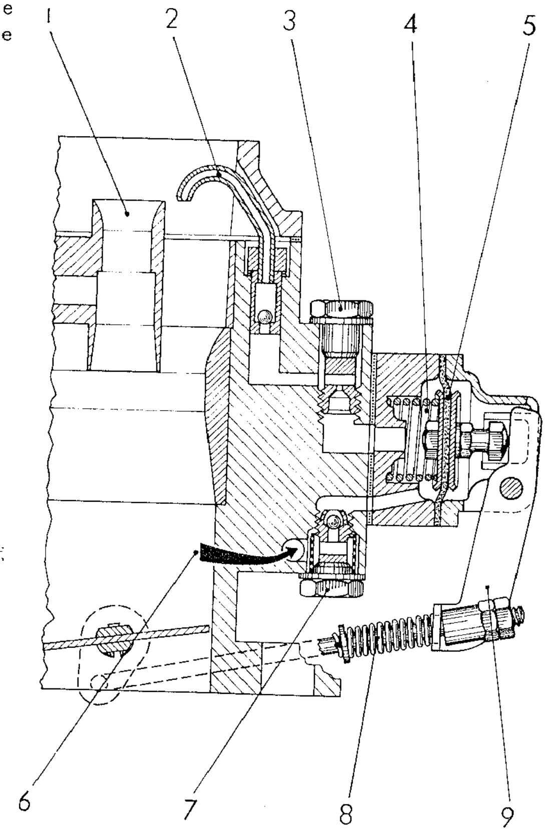


Fig. 3

The float chamber is situated between both induction barrels. The fuel level in the float chamber is controlled through the buoyancy of the float whose toggle causes the float needle valve to open or shut. The float level can be raised or lowered by a screw which controls the height of the intermediate swivel joint, which makes it possible to easily adjust the fuel level in the float chamber to suit the particular grade of fuel used. The fuel level may be checked by removing the plug in the inspection port.

① Float chamber vent

② Float needle valve

③ Float chamber cover

④ Threads for fuel inlet bolt

⑤ Inspection port plug

⑥ Float

⑦ Float level adjustment

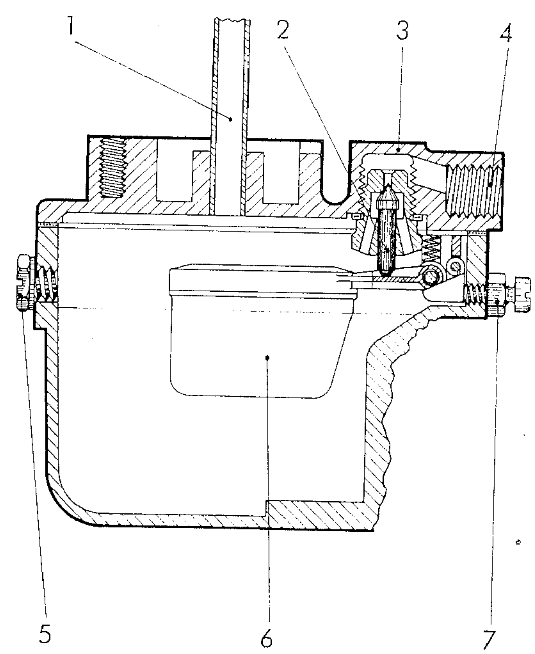


Fig. 4

Located in the float chamber cover is the fuel inlet, the float chamber vent, and the float needle valve assembly — the latter being situated inside the float chamber cover. In addition, two power enrichment nozzles are pressed into the float chamber cover.

Idle Metering

The fuel passes through the idle metering jet (g) where it mixes with air entering through the idle air bleed (u) and converts into an emulsion. The emulsion is channelled to four small orifices located near the throttle valve. The amount of emulsion which is discharged through the lowest orifice is controlled by the idle mixture screw (w). Emulsion drawn into the induction barrel through the idle mixture orifice combines with induction air entering through the partly open throttle valve whereupon it atomizes into an idle mixture.

The idle mixture can be leaned out by turning the adjustment screws in, and enriched by turning the screws out. Both screws should always be equally set.

The idle speed adjustment controls the idle rpm; that is, by turning the idle speed adjustment clockwise the rpm are increased, by turning the adjustment counter-clockwise the rpm are decreased.

The idle system incorporated in this carbureter is known as an independent system. This is because the fuel is drawn from a point short of the main jet (y). As a result, negative pressure occuring in the induction barrels brings about a continuous response from the idle metering system. Due to this arrangement certain amount of the idle mixture continues to enter the induction barrels during normal power settings as well.

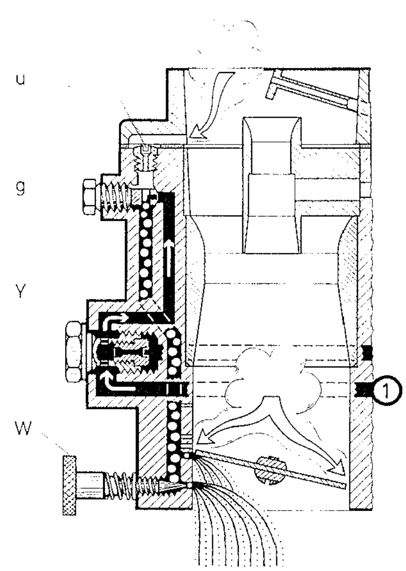


Fig. 5

Intermediate Metering

The three by-pass ports located above the idle mixture discharge orifice serve the purpose of intermediate metering but have varying functions. The lowest port, situated at the throttle crack and above the idle orifice, discharges idle mixture when the throttle is set for idling. The two upper ports begin to discharge the fuel mixture only after the throttle has been slightly opened. This system was devised to provide smooth transition from idle speeds to power settings.

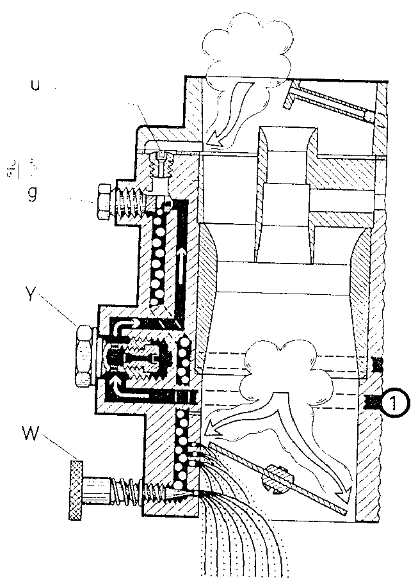


Fig. 6

Power Metering (normal operation)

The fuel flows through the main jet carrier (y) and the therein located main jet (Gg) into a well which connects with the primary venturi (x) and, thus, with the induction barrel. Placed into the well is the emulsion tube (s) together with the air correction jet (a) which is located directly above it. Vaccum in the induction barrel draws the fuel into the primary venturi where it is mixed with air; the fuel/air mixture then passes through the main venturi (k) where it is fully atomized. As the increasing vaccum effect causes the fuel level in the well to drop, air passes through the air correction jet and through calibrated orifices in the emulsion tube to mix with fuel metered by the main jet, thus emulsifying and effecting a derichment of the fuel/air mixture.

As long as the engine operates in the lower RPM range under partial or full load, only the main metering system is supplying the fuel. However, as the engine RPM increase, the vaccum effect at the power enrichment nozzle becomes so intense that it begins to draw fuel from the power enrichment system. The power enrichment system consists of a discharge nozzle and a metering jet; the fuel is drawn directly from the float chamber. This system feeds supplemental fuel into the primary venturi when the engine operates under full-power conditions at high RPM.

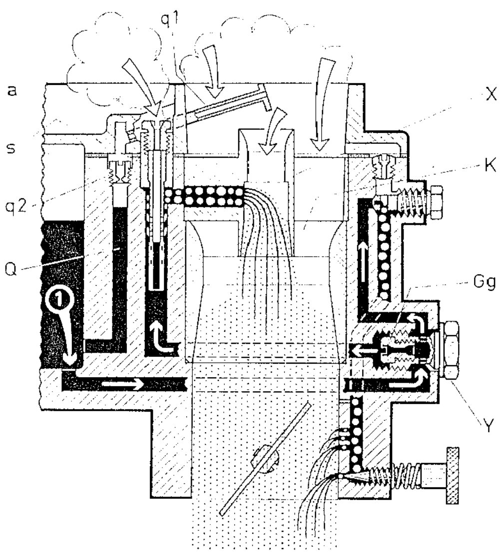


Fig. 7

Partial Load

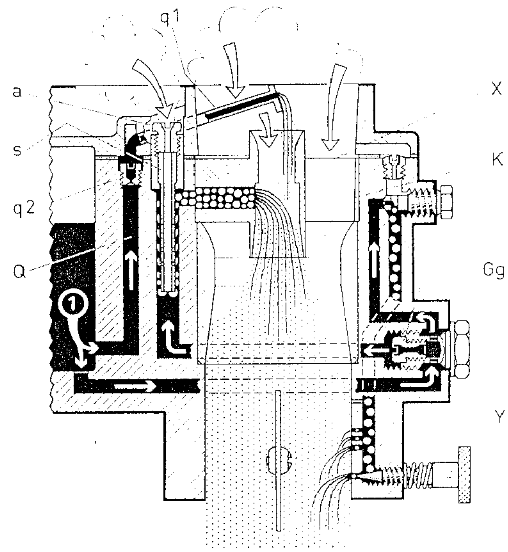


Fig. 8

Full Power with Enrichment

Incorporation of the fuel enrichment system into the main metering system makes it possible to finely balance and properly dose the fuel/air mixture with due regard to the desired fuel economy as well as to highest maximum performance upon demand.

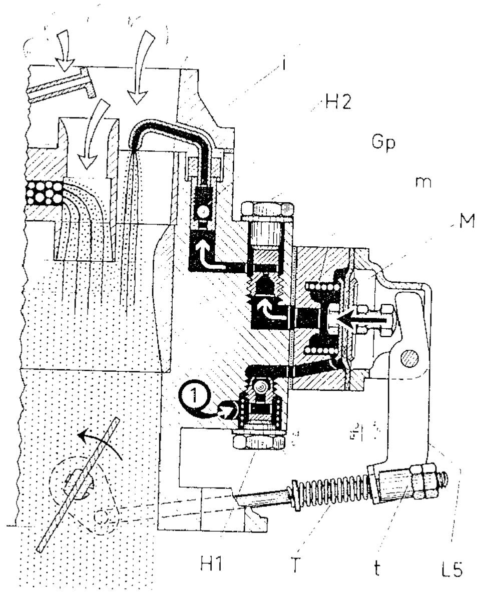
Acceleration

A mechanically actuated diaphragm-type accelerating pump (R) is utilized. The pump is flooded with fuel supplied directly from the float chamber. When the pump is at rest, the diaphragm (M) is forced outward by the diaphragm spring (m). When the throttle valve is opened, the pump is acted upon over the pump rod (T) and the pump lever (L 5) which push the diaphragm inward, thus forcing the fuel to pass through the pump jet (Gp) and the calibrated injection nozzle (i) into the main venturi; this enrichment of the fuel/air mixture provides a smooth acceleration.

The check valve (H 1) located in the pump inlet prevents the fuel from flowing back into the float chamber. A second check valve (H 2), located at the base of the injection nozzle, keeps air from entering the pump through the injection nozzle when the pump is on the inlet stroke.

Quantity of fuel injected during acceleration is adjustable and depends upon the length of the pump stroke. The pump adjustment (t) affects the pump stroke and, thus, determines the quantity of fuel to be injected during acceleration. The pump jet together with the calibrated injection nozzle controls only the duration of injection.

The check valve assembly (H 1) is provided with a return flow port measuring .0142" (0.36 mm) in diameter. The return flow port serves the purpose of preventing excessive enrichment of the fuel/air mixture during acceleration; that is, depending upon the stroke velocity of the pump plunger, larger or smaller amounts of fuel are permitted to escape through the return flow port.



Acceleration

Fig. 9

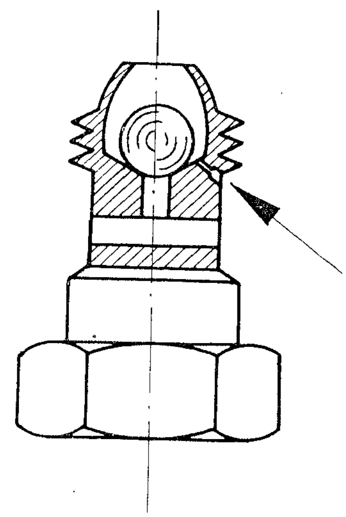


Fig. 10

Subject	Page	Remarks
Fuel Pump		
Fuel Tank		
Fuel Selector Valve		

Carbureter Specifications
For Engine Type 1600 S-90

Title	Specifications	Remarks
Carbureter	Solex 40 PII-4	2 per engine
Main venturi (K)	32	2 per carbureter
Main jet (Gg)	0115	2 per carbureter
Air correction jet (a)	180	2 per carbureter
Idle metering jet (g)	57.5	2 per carbureter
Idle air bleed (u)	1.8	2 per carbureter
Accelerating pump	No. 72	1 per carbureter
Pump jet (Gp)	50	2 per carbureter
Accelerating pump nozzle	high-type, with 0.4 restrictor	2 per carbureter
Float needle valve (spring-loaded)	175	1 per carbureter
Float	7.4 g	1 per carbureter
Emulsion tube	No. 25	2 per carbureter
Main jet carrier	6	2 per carbureter
By-pass ports	1.7; 1.4; 1.0	
Injection quantity (warm season)	0.45 cc (.122 fl. dram.) from 2 strokes, each nozzle	2 nozzles per carbureter
Injection quantity (cold season)	0.65 cc (.176 fl. dram.) from 2 strokes, each nozzle	

Main jet metering is of great importance when operating at considerably varying altitudes for which the following rule-of-thumb may be applied: Change main jet calibration by 6% for each 1,000 m (3,280′) altitude variation. For example: normal main jet calibration at an altitude of 400 m (1,312′) is 0115; proper jet size for an altitude of 1,400 m (4,592′) is 0110.

Removing and Installing Carbureters

Spezial Tool:
P-75, Carbureter Adjustment Gauge

The following procedures apply to both carbureters.

Removal

1. Close fuel valve.
2. Remove air cleaner.
3. Remove fuel inlet bolt at carbureter.
4. Detach throttle rod from throttle lever.
5. Remove carbureter flange nuts.
6. Withdraw carbureter.
7. Cover intake manifold stack.

Installation

Assemble in reversed order observing the following:

1. Install new carbureter flange gaskets.
2. Uniformly cross-tighten carbureter flange nuts.
3. Adjust throttle rod so that throttle valves can fully open.
4. Check fuel inlet bolt gaskets, replace with new if necessary.
5. If necessary, clean and oil air cleaners.
6. Adjust idle speed. Adjust carbureter by using adjustment gauge (P-75).

Cleaning Carbureters

The following procedures apply to both carbureters.

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

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

7. Install main venturis. When installing the venturis make certain that the venturi throat is facing up, that is, so that the writing on the venturi tubes can be read from above. Firmly tighten venturi securing screws but do not overtighten.

8. Check for radial play of throttle shaft. Excessive play will allow false air to enter the induction barrel, thus impairing engine starting and idling.

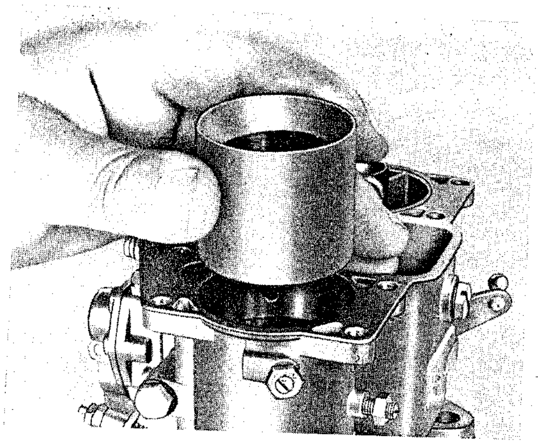


Fig. 12

9. Inspect idle mixture screws; burred, bent, or broken needle tips are unsatisfactory requiring replacement of screw.

Adjusting Idle Speed

Spezial Tool:

P-75, Carbureter Synchronizing Unit

1. Remove idle mixture adjusting screws and inspect needle tips for burrs, grooves, and misalignment. If in doubt, install new adjustment screws.

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

3. Detach throttle rods from throttle levers.

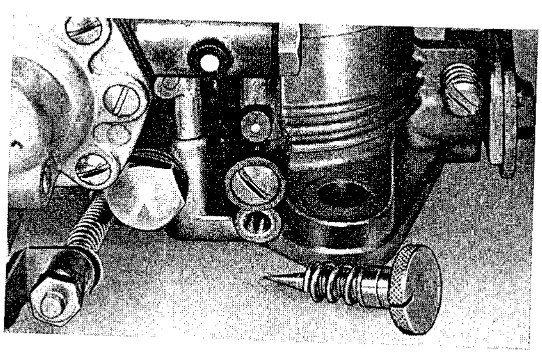


Fig. 13

4. Uniformly turn idle speed adjustment screws in until the engine idles at about 1,000 rpm.

5. Following any convenient sequence turn idle mixture screws fully in on both carbureters — do not tighten or else needle tips will be damaged — then back off $1^1/_2$ turns. From this position turn the screws in or out until fastest idle is achieved. In no case should the idle mixture screws be left fully turned in.

6. Adjust idle speed screws until the idle speed drops to 800—900 rpm.

7. Place carbureter adjustment gauge (P-75) on carbureter throat and adjust plunger glass to vertical position.

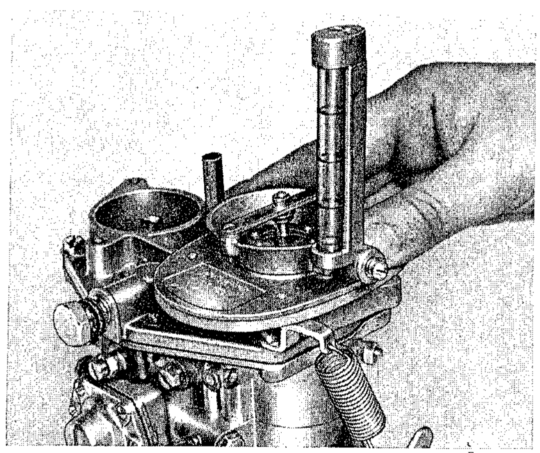


Fig. 14

8. Turn adjustment screw on gauge until plunger moves to about half-way between two scriber marks on glass tube; this accomplished, no further adjustments should be made on gauge as it is set for the particular engine.

9. Place gauge (P-75) on the second throat of same carbureter; plunger should move up to same point as obtained during procedure outlined under Point 8, above. Should a different reading be obtained it will be necessary to resynchronize both throttle valves; this is easily accomplished by slightly twisting the throttle shaft. Using the adjustment gauge check if throttle valves are properly synchronized by comparing subsequent readings obtained at the two carbureter throats.

10. Without changing gauge settings place gauge (P-75) on second carbureter and adjust throttle valve with idle speed screw so that plunger in glass tube moves to same position as obtained in previous testing outlined under Point 8, above. Also check throttle valve synchronization according to outline under Point 9, above, and correct if necessary.

11. Should it be noted during the adjustment procedure that idle rpm has changed, corrective adjustment must be made with idle speed screws, whereupon synchronization of carbureters must be rechecked with carbureter gauge (P-75) and corrected if necessary.

12. Reconnect throttle rods to throttle levers.

Note: Carbureter rods must be so adjusted as to reconnect with throttle levers without causing tension elsewhere.

13. Set hand throttle to 1,200—1,300 rpm and using gauge (P-75) check if both carbureters are still synchronized, following instructions under Point 8 and 9. If the gauge shows unequal readings on both carbureters it will be necessary to again resynchronize the carbureters by marking proper adjustments on both throttle rods.

14. Recheck idle speed.

15. Check injection quantity (warm season 0.45 cc from each nozzle on two pump strokes, cold season 0.65 cc).

16. Check accelerator pedal stop screw and adjust if necessary. When the accelerator pedal is depressed against the stop screw the carbureter lever should be clearing the carbureter stop block by about 1 mm (.039 in.).

17. Install air cleaners with gaskets and tighten securing screws.

Adjusting Accelerating Pump

Spezial Tool:
P-25 a, Liquid Graduate

1. Adjust idle speed.

2. Run engine to fill float chamber with fuel.

3. Stop engine, remove both air cleaners.

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

5. Hold liquid graduate (P-25 a) at the tip of the nozzle and rapidly move throttle lever two times from stop to stop.

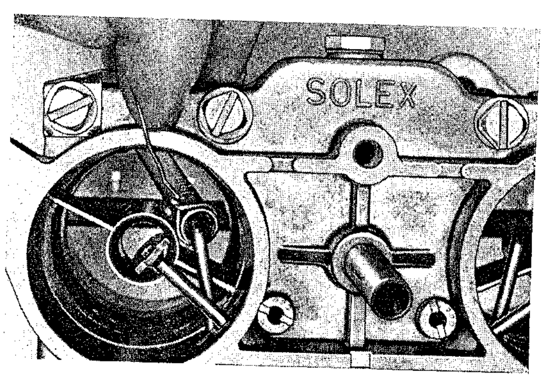


Fig. 15

6. Check injection quantity, empty the graduate glass, and repeat the procedure on the second injection nozzle.

7. Injection quantity from each nozzle on two pump strokes should be 0.45 cc (.122 fl. dram.) in warm season, 0.65 cc (.176 fl. dram.) in cold season.

8. Perform injection quantity check on the second carbureter.

9. If necessary, readjust injection quantity by resetting the adjustment nut on the pump rod. If an adjustment should not be possible due to lack of threads, place a spacer between the pump lever and the adjustment nut to gain way.

Note: The jet of squirting fuel should not strike the primary or main venturi and must pass through the slit between the carbureter throat and the opening throttle valve (see Fig. 16).

Apply the following procedure if a 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. If the float level is correct, the fuel can be seen or it will just begin to come outside.
4. If necessary, readjust float level.

Note:

Turn adjustment screw in to lower the **fuel** level.

Turn adjustment screw out to raise the **fuel** level.

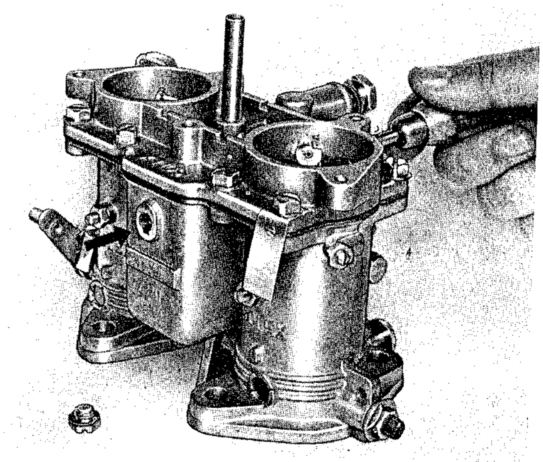


Fig. 18

Note:

Turning the adjustment screw in causes the float to drop which, in turn, causes some fuel to run out through the inspection port. Therefore, when this occures while making adjustments allow the engine to consume the excess fuel before making final adjustments.

Servicing Air Cleaners

The oil-wetted wire mesh air cleaners remove dust particles and impurities from the induction air. The air cleaners should be serviced at intervals dictated by local dust or air contamination conditions.

1. Remove retaining screws.
2. Withdraw air cleaners.
3. Wash air cleaners in clean solvent or gasoline.
4. Thoroughly clear air cleaners with compressed air.
5. Apply a thin coat of oil to wire mesh.
6. Reinstall air cleaners with gaskets and tighten retaining screws.

SPECIAL TOOLS

Applicable to the Supplements in

GROUP F

FUEL SYSTEM SECTION

Carbureter Service Diagnosis

The following service diagnosis is applicable only if the carbureter components match the specifications listed in the table on page SF 9.

Malfunction	Possible Cause	Remedy
1. Engine does not start despite properly functioning ignition and adequate fuel in tank	a. Lack of fuel in fuel system	a. Clean main jet. Check fuel supply lines. Remove fuel line connecting fuel pump with carbureter and, with ignition off, actuate starter; if pump supplies fuel, float needle valve is plugged; if pump does not supply fuel, trouble may be in stuck pump check valves, faulty pump mechanism, or dirty fuel selector valve
	b. Carbureter floods	b. Check and clean float needle valve. Check gasket at float needle valve. Check float, if damaged replace with new one
2. Uneven idling	a. Wrong idle settings	a. Readjust idle speed
	b. Idle jet or idle air bleed plugged	b. Clean idle jets or idle air bleed respectively
	c. Leak in the intake manifold	c. Check intake manifolds, flange connections, and gaskets
	d. Damaged idle mixture screw	d. Install new idle mixture screw
3. Poor transition (flat spot)	a. Idle settings too lean	a. Readjust idle system, check idle jets
	b. Improper float level	b. Readjust float level
	c. Improper injection quantity	c. Check injection quantity
	d. Leak in the intake manifold	d. Check intake manifolds, flange connections, and gaskets
4. Engine stalls when throttle is quickly shut	Wrong idle settings	Readjust idle system
5. Engine runs unevenly, misses, backfires	a. Mixture too rich	a. Check fuel pump pressure. Check float level. Check float needle valve. Check float
	b. Mixture too lean	b. Clean main jets. Check fuel lines. Check float level
	c. Leak in the intake manifold	c. Check intake manifolds, flange connections, and gaskets
6. High fuel consumption	a. High fuel pressure overriding float needle valve	a. Check fuel pressure
	b. Leak in float	b. Install new float
	c. Float needle valve not closing	c. Check float needle valve

FUEL SYSTEM

General Description

The fuel system of the Porsche motor car consists of the fuel tank with a fuel selector valve, fuel gauge sending unit, fuel lines, mechanical fuel pump, and two twin throat downdraft carbureters.

The fuel tank has a capacity of 13.3 US gallons (50 liters) and is accessible through the front luggage compartment. The fuel selector valve, located under the tank and accessible to occupants of the front seats, has three positions, namely, ZU (closed), AUF (open), and RESERVE. The fuel reserve of appr. 1.6 US gallons (6 liters) may be tapped by setting the fuel selector valve on RESERVE, that is, by turning the lever clockwise.

A modified fuel tank has been adapted commencing with chassis serial numbers as follows:

Coupé	identification-No.	117 601
Cabriolet	identification-No.	155 601
Hardtop	identification-No.	201 601
Roadster	identification-No.	89 601

REMOVING AND INSTALLING FUEL TANK

Removal

1. Take out spare tire, jack, and tool kit.
2. Undo rubber pad and take out.
3. Close fuel valve.
4. Pull rubber fuel hose off fuel valve.
5. Remove cotter pin which secures selector, lever to fuel valve and pull selector lever somewhat to rear.
6. Remove screw which holds ground wire to fuel gauge sending unit, disconnect fuel gauge wire from snap-on connector.
7. Detach cover panels and rubber seal at filler neck; the two upper sheetmetal screws are accessible from the tank compartment, the two lower sheet-metal screws from the wheel well side.
8. Loosen hose clamp on rubber (seal (Ref. Fig. 2).

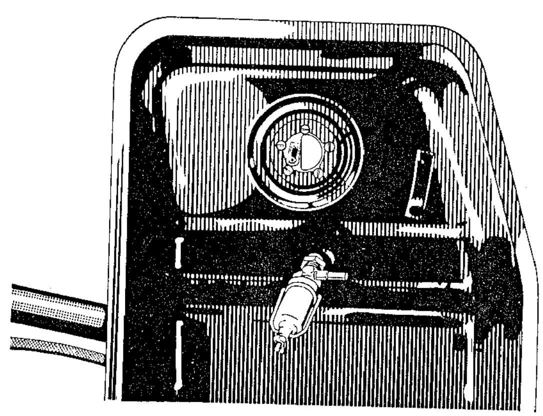


Fig. 1

Second Edition of this page, November 1961

REMOVING AND INSTALLING FUEL SELECTOR VALVE

The fuel selector valve has to be removed when cleaning the tank or the tank wire screen.

Removal

1. Remove tank and drain gasoline.
2. Remove nut which holds fuel selector valve, withdraw valve from tank.
3. Blow out wire screen with compressed air.

Installation

Install the valve by reversing the removal procedure and observing the following points:

1. Thoroughly clean fuel tank.
2. Install new gaskets which seal wire screen flange (one gasket on each side of the flange).
3. Make certain that fuel valve stub lines up with selector lever; if necessary, loosen fuel valve retaining nut and slightly turn the fuel valve to proper position.
4. Check all connections for possible leaks.

FUEL SELECTOR VALVE

1. Gasket
2. Fuel valve retaining nut
3. Fuel hose connector
4. Filter
5. Sediment bowl
6. Wire screen
7. Fuel outlet (AUF: open)
8. Gasket
9. Rubber grommet
10. Plug

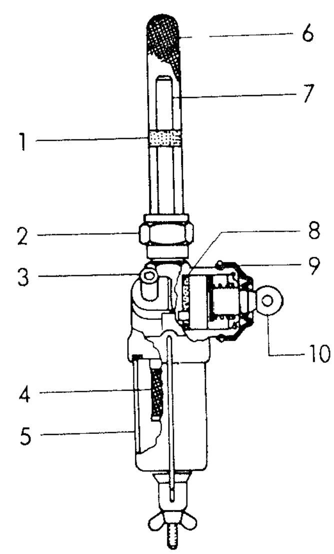


Fig. 4

REMOVING AND INSTALLING FUEL GAUGE SENDING UNIT

Removal

1. Disconnect cable at battery.
2. Drain (hose) gasoline.
3. Place a basin underneath the fuel tank to collect fuel.
4. Remove fillister-head screws holding fuel gauge sending unit and remove unit.

   In case of extremely dirty fuel, remove and thoroughly clean tank (see page SF 21).

Installation

Install fuel gauge sending unit by reversing the removal procedure and observing the following points:

1. Replace "Thiokol" gasket, if necessary.
2. Upon reassembly, check sending unit for possible leaks.

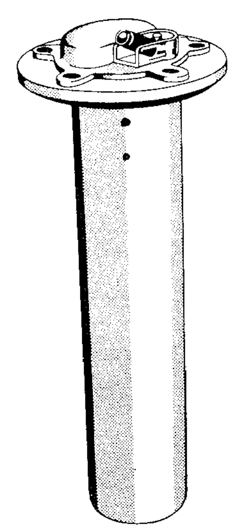


Fig. 5

CARBURETOR LINKAGE, HAND THROTTLE AND BELL CRANK

From identification-No.

Coupé	117 601	Hardtop	201 601
Cabriolet	155 601	Roadster	89 601

the carburetor linkage has been modified.

General Remarks

The metal connecting piece between the long accelerator rod and the tie rod on the bell crank is replaced by a flexible piece, see Fig. 6/3. This eliminates the vibration between engine and accelerator pedal.

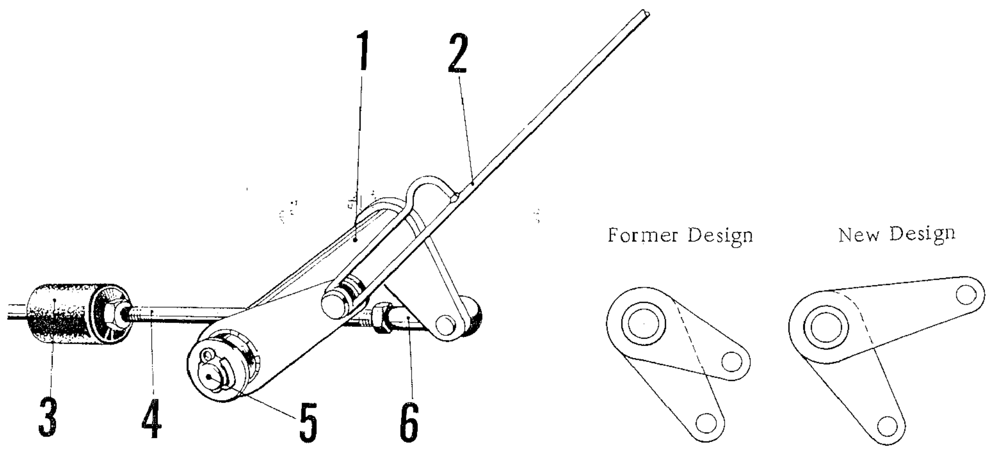


Fig. 6

1. Bell crank
2. Accelerator rod
3. Flexible piece
4. Accelerator rod to the accelerator pedal
5. Bearing bolt
6. Control-rod

By modifying the bell crank of the carburetor linkage on transmission, a progressive opening of the throttles is possible. This allows a slow opening of the throttles during the first one third of the accelerator pedal travel and results in soft driving, especially in traffic. The table below shows the relation of the throttle valve position to the accelerator pedal travel.

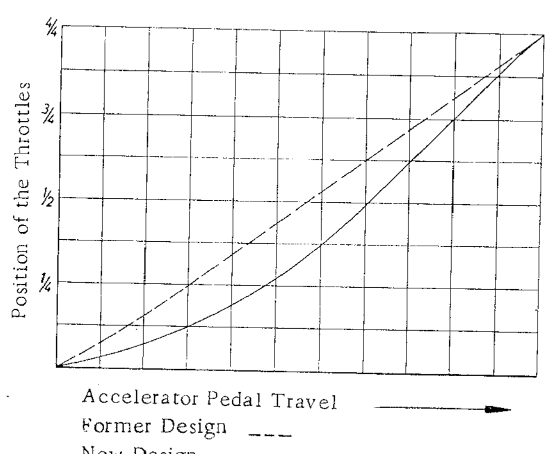


Fig. 7

General

Fuel is pumped to the carburetors by a diaphragm pump which is mounted on the engine block. The fuel pump is operated by the distributor shaft eccentric over an actuating plunger. The quantity of fuel delivered by the pump is metered automatically in direct proportion 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 an actuating plunger. Located between both assemblies is a 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.

Operation

The eccentric on the distributor shaft presses against the diaphragm plunger. The plunger transmits the pressure to the diaphragm coupling against the plunger spring but with the support of the diaphragm spring. As a result, the sucked-in fuel is forced to the carburetors through the outlet valve and the fuel line. When the actuating plunger moves back, a vacuum is created above the diaphragm, thus sucking the fuel into the pump, through the inlet valve. This process repeats itself with every revolution of the eccentric (once every two revolutions of the crankshaft).

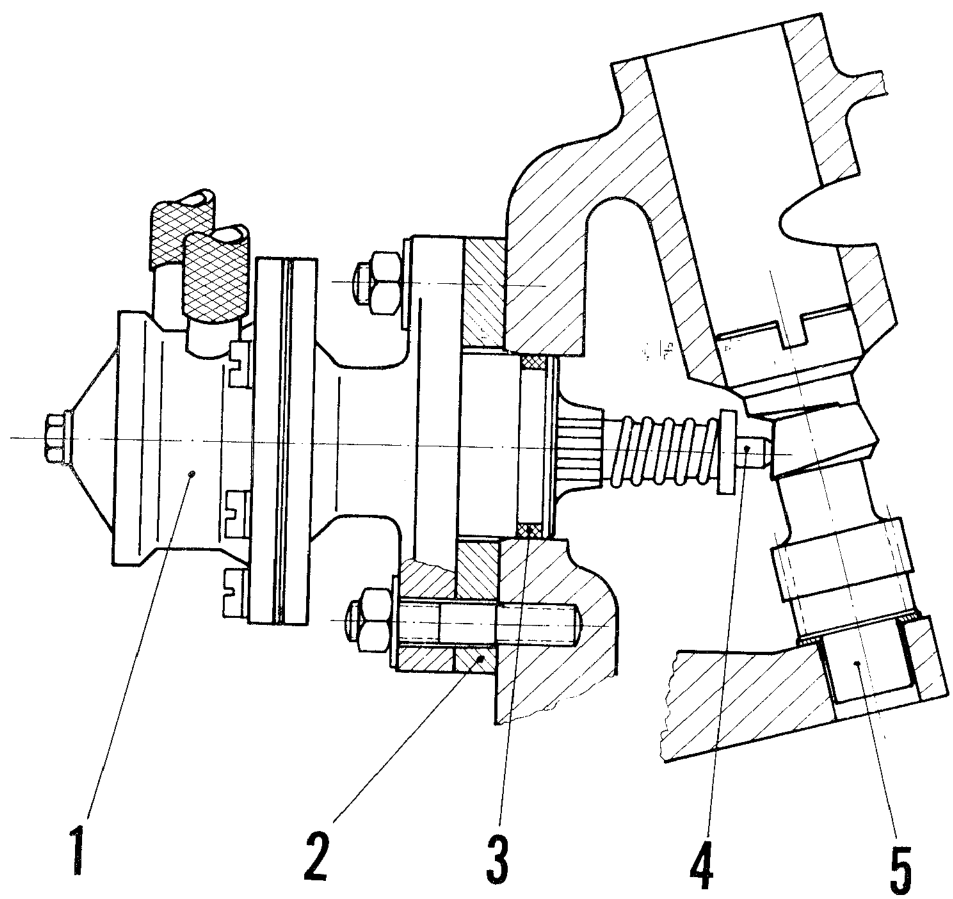


Fig. 2

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

Fuel pump components

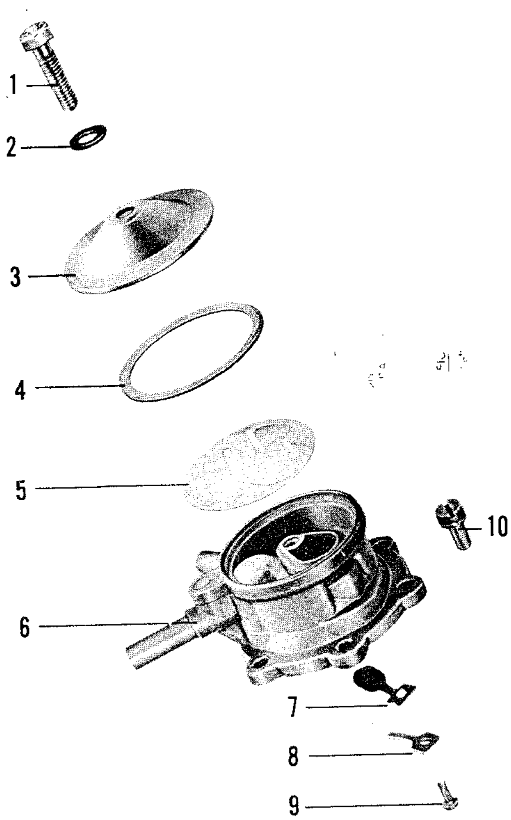


Fig. 3

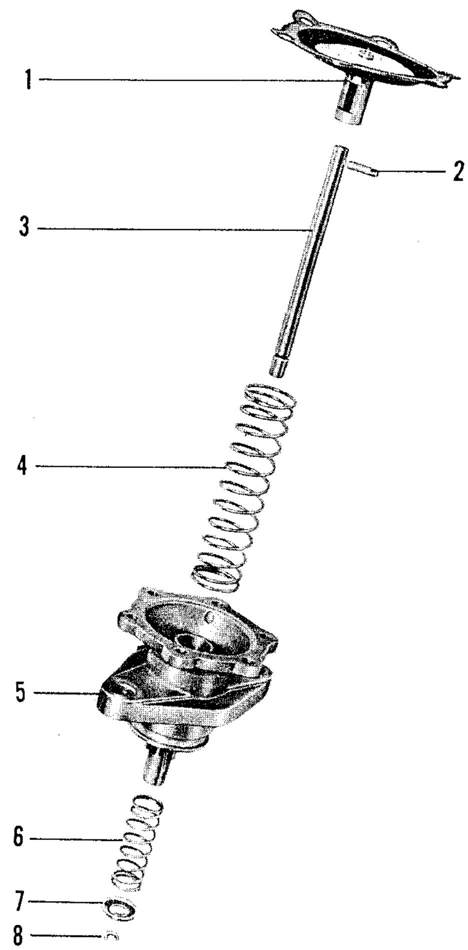


Fig. 4

1 Hex-head bolt
2 Gasket
3 Cover
4 Gasket
5 Fuel screen
6 Pump, upper assembly
7 Leaf spring
8 Valve stop
9 Self-threading screw M 3x8
10 Cheese-head screw w/washer

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

Testing pump pressure

General

The pump pressure is governed by the degree of spring compression on intake stroke. 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 shut, pressure builds up in the fuel line and pump housing causing a decrease in pump stroke. In normal operation, the diaphragm stroke amounts to only a few tenths of a milimeter.

The lower assembly is vented through two orifices in the casting. Also, should fuel leak into this part of the pump, it can drain out through the venting holes.

Testing

The pump pressure should be 0.20 to 0.24 atmospheres (ATÜ) when the float needle valve is closed and the engine running at 1,000 to 3,000 rpm. Minimum fuel delivery should be 30 liters per hour, which equals 500 cc per minute, at 4,500 rpm.

The simplest way to check the fuel pump pressure is with the aid of a pressure gauge, by inserting a T-joint into the fuel line between the pump and the carburetor. A fuel valve is built into the fuel line behind the pressure gauge.

Essential to proper pump pressure is correct spring tension and serviceable condition of diaphragm and valves.

Excessive pump pressure results in carburetor flooding and, in almost all cases, leads to oil dilution. A too low pressure results in lean mixture and, thus, a rough running engine, misfiring at high rpm, and loss of power.

Removing and installing fuel pump

Removal

1. Pull fuel hoses off at pump.

2. Remove pump shield.

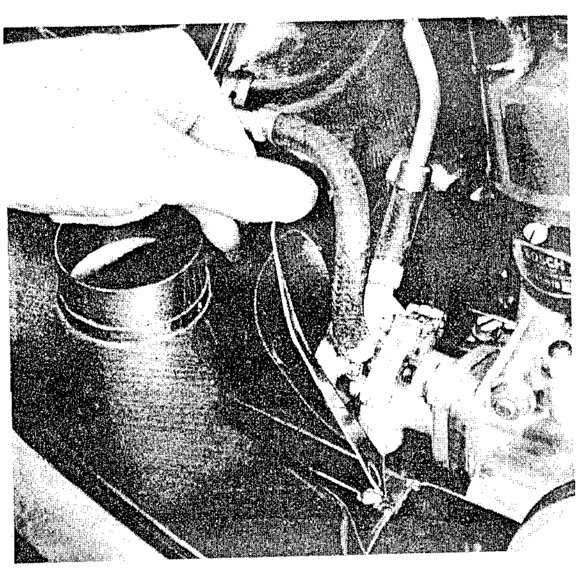


Fig. 5

3. Remove pump attaching nuts at flange.

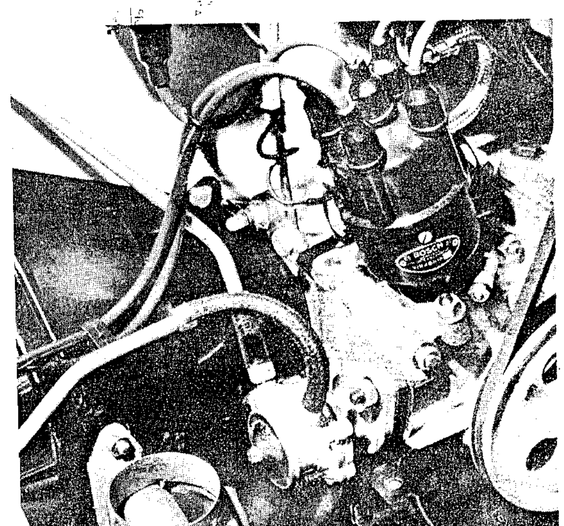


Fig. 6

4. Remove pump and insulating spacer.

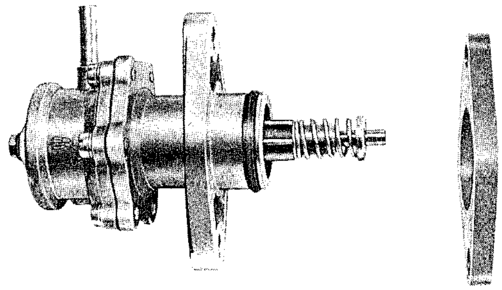


Fig. 7

Installation

Installation is accomplished in reversed order. It should be ascertained that the O-ring is in good condition, otherwise it should be replaced.

Reconditioning fuel pump

Disassembly

1. Remove hex bolt which secures cover.
2. Remove cover and fuel screen.
3. Remove six cheese-head screws securing the upper assembly, withdraw assembly.

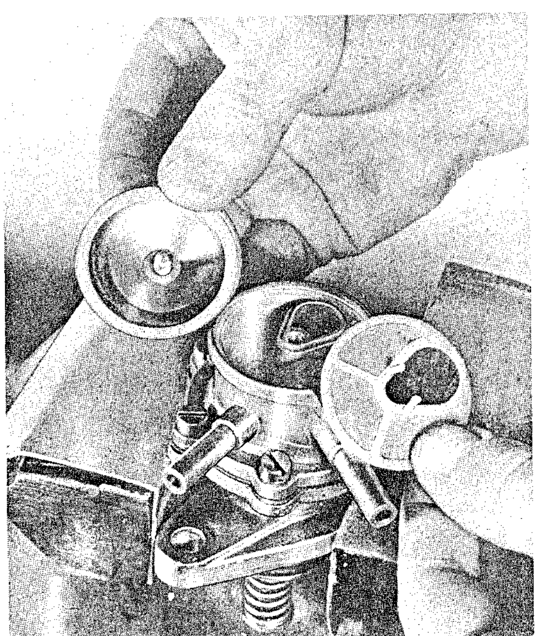


Fig. 8

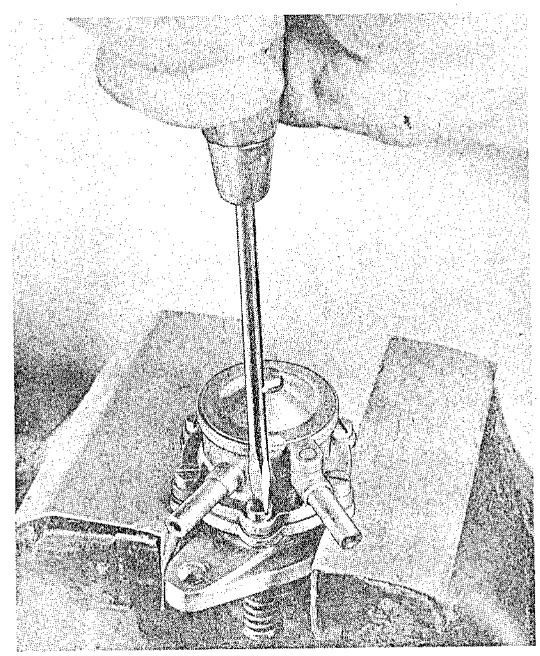


Fig. 9

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.

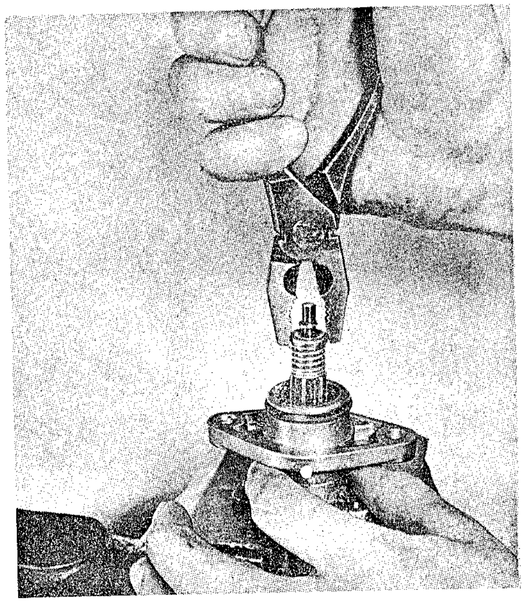


Fig. 10

5. Withdraw the diaphragm-plunger-spring assembly from lower pump casting; ascertain 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.

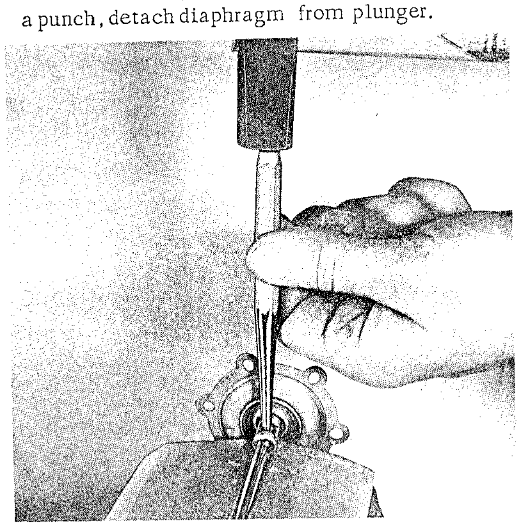


Fig. 11

7. Remove self-threading cheese-head screw at inlet valve and remove leaf spring and spring stop (outlet valve cannot be dismounted).

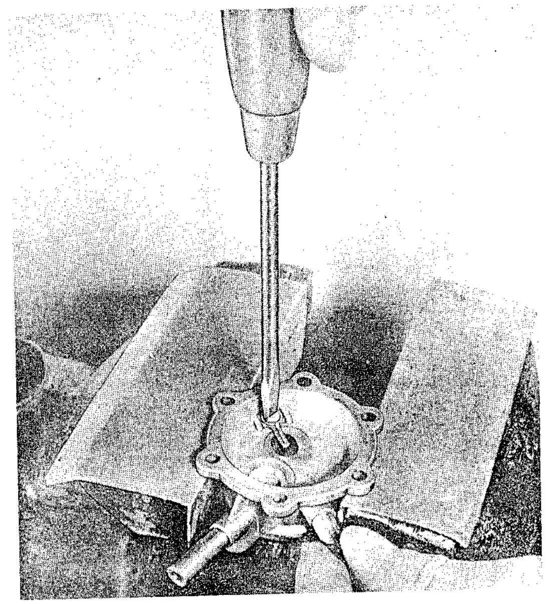


Fig. 12

8. Clean pump components with gasoline.

Reassembly

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

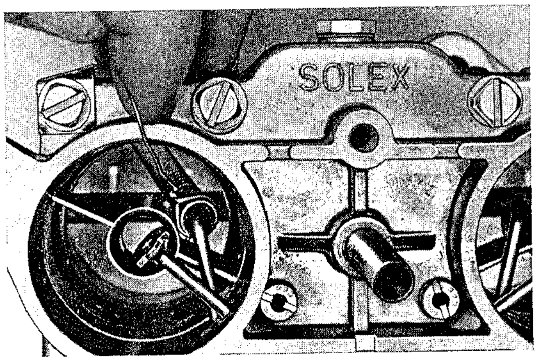
1. Check proper functioning of outlet valve in upper assembly.
2. Check sealing surfaces of inlet valve.
3. Install leaf spring and spring stop, check for proper operation.
4. Reconnect diaphragm and plunger with pin, check free movement of plunger in diaphragm coupling. Center coupling pin in plunger.
5. When mounting pump upper assembly, make certain that diaphragm is not creased. Evenly tighten screws in cross-sequence.
6. Check gasket at pump cover, replace if necessary.

Engine type	1600 C	Notes
Carburetor Zenith	32 NDIX	2 per engine
Characteristics	dependent idling	
Venturi K	28	2 per carburetor
Main jet Gg	0130	2 per carburetor
Air correction jet a	210	2 per carburetor
Idling jet g	55	2 per carburetor
Idling air jet u	140	2 per carburetor
Pump jet Gp	40	2 per carburetor
Accelerating pump nozzle	No. 8 short	2 per carburetor
Float needle valve (spring loaded)	125	1 per carburetor
Float weight	per float 5, 2 g	2 per carburetor
Emulsion tube	No. 1 S	2 per carburetor
By-pass ports	1, 4/1, 4	
Injection quantity (warm season)	0, 25 cc from 2 strokes, each nozzle	2 nozzles per carburetor
Injection quantity (cold season)	0, 35 cc from 2 strokes, each nozzle	2 nozzles per carburetor
Float level	18, 5 ± 1, 0 mm .728" ± .04"	mesured with cover closed and a test pressure of 1, 8 m WC

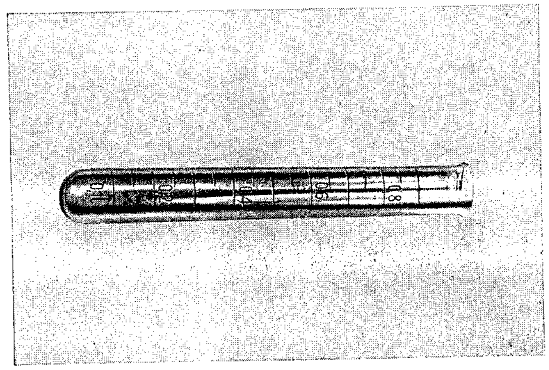
Main jet metering is of great importance when operating at considerably varying altitudes for which the following rule-of-thumb may be applied: Change main jet calibration by 6% for each 1, 000 m (3, 280') altitude variation. For example: normal main jet calibration at an altitude of 400 m (1, 312') is 0115; proper jet size for an altitude of 1, 400 m (4, 592') is 0110.

Liquid Graduate

P 25a



Example of use



Tool

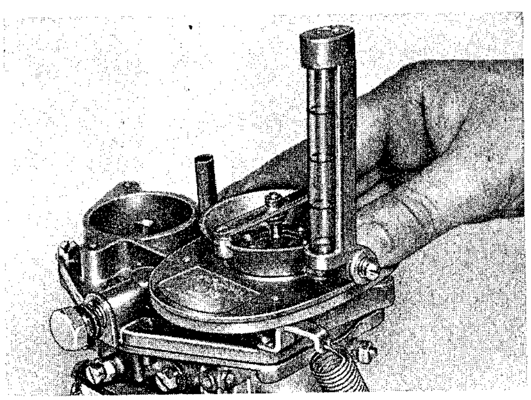
Use: To check injection quantity

See operation page SF 15

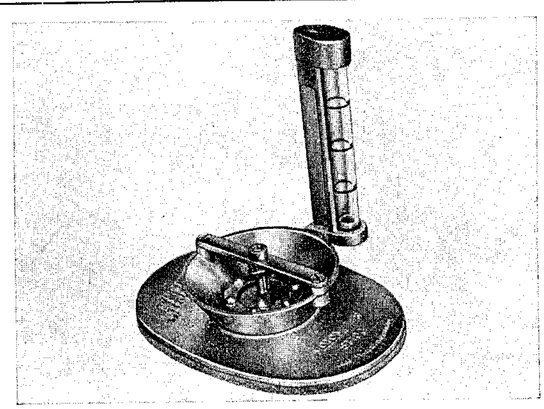
Subject to change

Carbureter Synchronizing Unit

P 75



Example of use



Tool

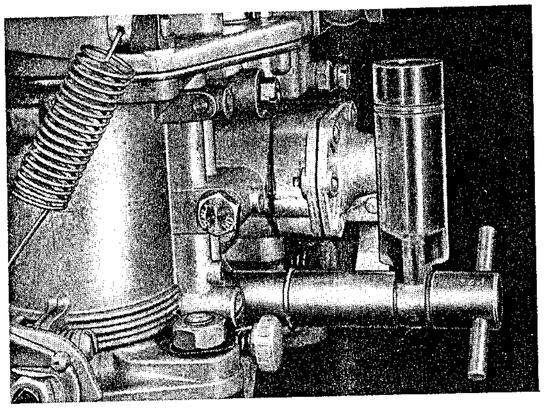
Use: To synchronize both carbureters

See operation page SF 13

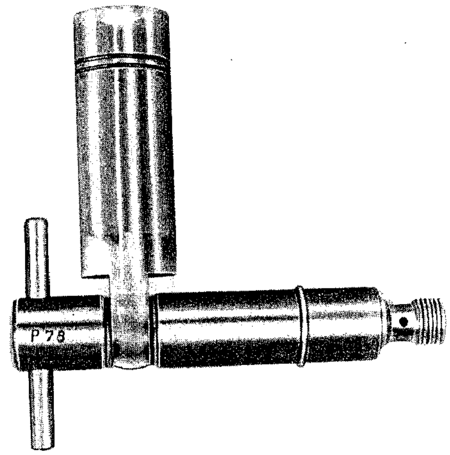
Subject to change

Float Level Gauge

P 78



Example of use



Tool

Use: To check float level Carbureter Solex 40 PII-4

See operation page SF 16

Subject to change

Engine type	1600 SC	Notes
Carburetor type	Solex 40 PII-4	2 per engine
Venturi K	32	2 per carburetor
Main jet Gg	0115	2 per carburetor
Air correction jet a	180	2 per carburetor
Idling jet g	57, 5	2 per carburetor
Idling air jet u	1, 8	2 per carburetor
Injection tube No.	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, 4g	1 per carburetor
Emulsion tube	No. 25	2 per carburetor
Main jet carrier	6, 0	2 per carburetor
By-pass ports	1, 7/1, 4/1, 0	
Injection quantity (warm season)	0, 45 cc (.122 fl. dram) from 2 strokes, each nozzle	2 nozzles per carburetor
Injection quantity (cold season)	0, 65 cc (.176 fl. dram) from 2 strokes, each nozzle	2 nozzles per carburetor

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