SECTION L.

FUEL SYSTEM

ADDITIONAL INFORMATION

L.1. - GENERAL DESCRIPTION

The fuel system has a fuel tank located at the rear of the luggage compartment. The filler cap is located on the rear right-hand panel, the filler pipe being connected to the tank by a short length of hose retained with clips. The fuel tank gauge unit is located in the rear face of the tank. The fuel gauge on the instrument panel registers the quantity of fuel in the tank with the ignition switched on.

A fuel pipe connects the fuel tank to a diaphragm type mechanical fuel pump mounted on the right-hand side of the engine and operated by the jackshaft. The fuel pump incorporates a gauze screen and an inverted sediment bowl. From the fuel pump a branched pipe delivers fuel to the carburetters.

Either two side draught Weber, or from Chassis No. 8600, two side draught Zenith Stromberg carburetters are used (see respective sections dealing with carburetters and also 'Technical Data').

The air cleaner is of the replaceable paper element type, mounted in the nose of the car forward of the radiator. A flexible hose connects the air cleaner to an airbox mounted on the carburetters.

L.2. - FUEL SYSTEM

To Clean

1. Remove the air cleaner and clean (Section 'L.17').
2. Disconnect the fuel supply pipe at both the carburetters and fuel pump locations.

Weber Carburetters

1. Unscrew the wing nuts and lift off the two main and idling jet covers. Remove the screws securing the carburetter covers and remove the two covers.
2. Remove the jets and blow them clean with an air line (Section 'L.10').
3. Clean the floats and float chambers with petrol and blow clean with an air line.
4. Refit the carburetter covers ensuring that the floats are free to move in their bodies. Replace the two main jet covers and secure with their wing nuts. Check float level.

Zenith-Stromberg Carburetters

1. Remove the carburetters from the engine (Section 'L.13').
2. With the carburetters off the engine, remove and clean the float chambers, floats and needle valve assemblies (Section 'L.15').
3. Refit the needle valve assemblies, the floats and float chambers. Ensure that the

needle valves and floats are free to move. Refit the carburetters to the engine.

All Engines

1. Using an air line, blow through the previously disconnected fuel supply pipes between carburetters and fuel pump. Replace the pipe.
2. Disconnect the pipe between the fuel tank and the fuel pump, and blow through using an air line. Replace the pipe.
3. Remove the fuel pump sediment bowl and filter, wash in clean petrol, and refit.
4. Replace the air cleaner.

L.3. - FUEL TANK

To Remove

1. From under the R/H side of the car and above the rear suspension upper wishbone, remove the rubber grommet (not fitted on all models) from the body to expose the fuel tank drain plug. Using a funnel with rubber tube attached, release the plug and drain the petrol into a suitable container.
2. While still under the car, remove the fuel supply pipe from the tank. Remove the cables from the fuel gauge sender unit, noting their locations.
3. From inside the boot, remove the boot floor (see Section 'B'). Release the rubber hose connecting the fuel filler neck to the tank.
4. Remove the nuts from below the boot (underside of body) and pull tank from its location.

To Replace

1. Refit the drain plug into the tank ensuring that it is fully tightened.
2. Push the tank into its location and secure with its nuts and washers.
3. Refit the rubber hose connecting the tank to the filler neck. Replace the cables to the fuel tank sender unit. Replace boot floor. From below the car, refit the fuel supply pipe to the tank. Replace rubber grommet (Part No. W 0210) around tank drain plug.

L.4. - FUEL TANK SENDER UNIT

To Remove

1. Drain the fuel from the tank into a suitable container. (See Section 'L.3').
2. Remove boot backboard. (See Section 'B').
3. Make a note of the wiring positions, then remove cables from sender unit.
4. Unscrew the sender unit lock ring.

To Replace

1. Place a new sealing ring in the recess in the tank, then fit the sender unit tightening its lock ring with a suitable wrench.
2. Reconnect the cables to their correct locations on the sender unit.
3. Replace the boot backboard.

L.5. - FUEL GAUGE

To Remove

1. Remove the radio or its blanking piece (see Section 'B').
2. From behind the fuel gauge, release the nut securing the gauge strap, pull off strap and pull gauge out of facia panel from front.
3. Note position of wiring cables and remove from gauge.

To Replace

1. Reconnect cables to the fuel gauge, push gauge into location in facia panel.
2. From behind facia panel, replace securing strap with its nut.
3. Refit radio or blanking piece.

L.6. - FUEL PUMP

Description

Fuel is drawn from the fuel tank by the pump which is secured to the engine block and is driven by an eccentric on the jackshaft. The pump consists of two main bodies which clamp a diaphragm between their outer flanges.

The lower body assembly comprises a rocker arm and link, both of which pivot on a pin located in the body; attached to the link is the pull rod incorporated in the diaphragm assembly. To protect the diaphragm from crankshaft oil splash, an oil seal is located at the point in the lower body where the push rod passes through. A return spring is interposed between the undersides of the diaphragm and the lower body, the spring determining the pump output pressure, (see 'Technical Data'). A further spring is fitted between the rocker arm and the body for the purpose of ensuring that the rocker arm is in constant contact with the eccentric on the jackshaft.

Assembled in the upper body are two valve assemblies,one being opened by suction, the other by pressure. Both valves are held in position by a recess in the upper body which is then staked.

Both inlet and outlet valve assemblies are identical in construction and are renewable and interchangeable.

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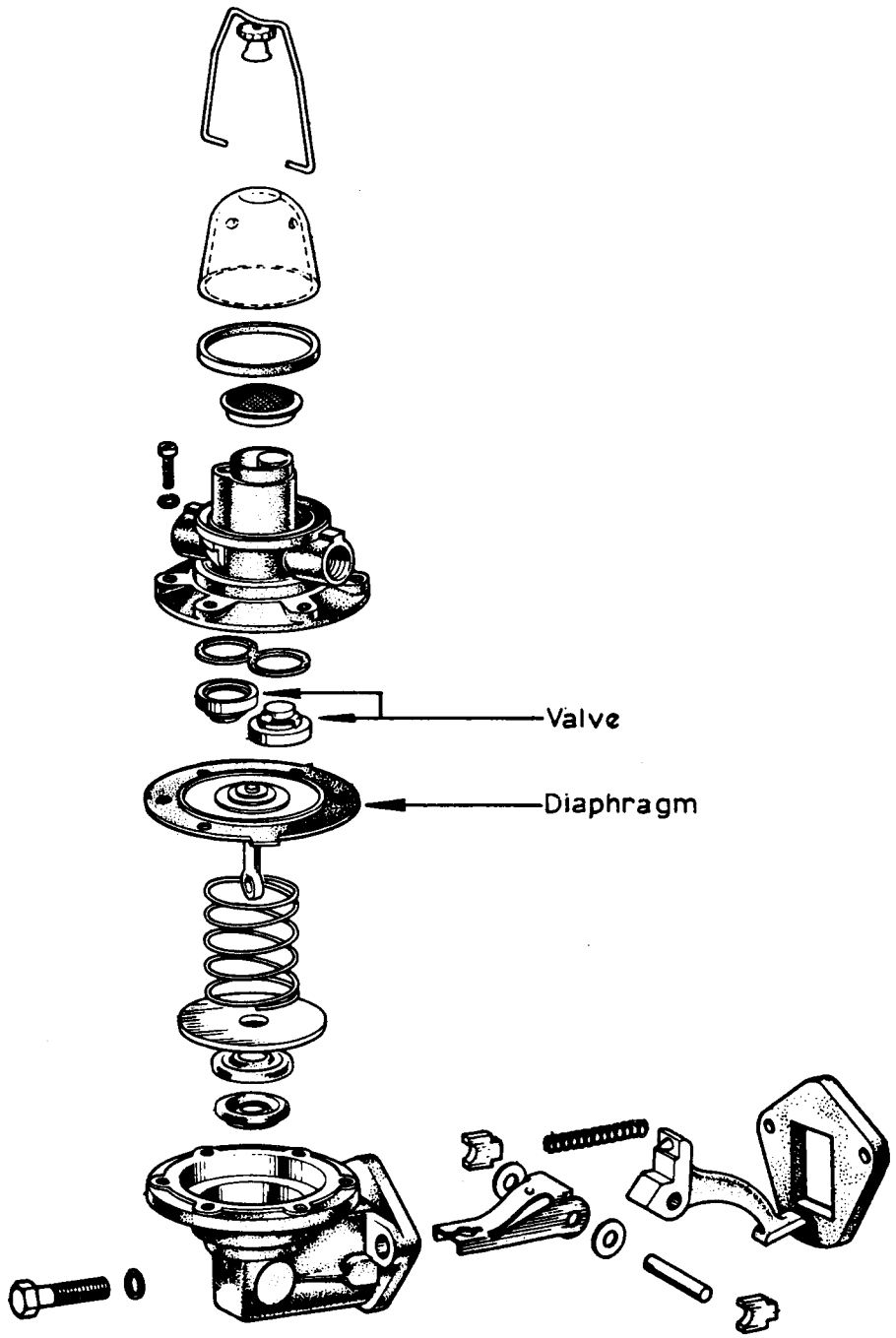

Fig. 1. FUEL PUMP COMPONENTS

Also incorporated in the upper body is a filter gauze which is held in position with a domed glass top cover and gasket, this in turn being held by a centre screw clamping the cover to the upper body.

To Remove Fuel Pump

1. Disconnect the pipes from the inlet and outlet bosses of the fuel pump. Seal off the ends of the pipes to prevent the ingress of foreign matter.
2. Remove two fuel pump retaining bolts and lockwashers, and withdraw fuel pump and gasket from cylinder block.

To Dismantle

1. Before commencing to dismantle, clean exterior of pump and scribe a line across the lower and upper body flanges of the pump for location purposes during re-assembly.
2. Remove domed glass top cover of pump also gasket and filter gauze.
3. Remove the screws and spring washers securing the lower and upper bodies together and separate the two bodies.
4. The valve assemblies are 'staked' in position and it is necessary to relieve this 'staking' in order to remove valves.
5. From the lower body remove the diaphragm and pull rod assembly, first turning the assembly through an angle of 90° in order to free the rod from the link in the rocker arm assembly.

   NOTE: The diaphragm and pull rod are a permanent assembly and no attempt should be made to separate the two parts.
6. Lift out the diaphragm return spring and, where fitted, remove oil seal retaining washer and oil seal.
7. Providing that the rocker arm pin is held firmly in the lower body it should not be necessary to remove the rocker arm pin or associated parts unless undue wear is in evidence.

   Should it be necessary to remove the rocker arm from body, the following procedure should be adopted:-

   The rocker arm and associate parts are located by two retainers, which are fitted into slots at engine face of castings, the retainers in turn being held by punch indentations at each end of retaining pins.

   To remove the rocker arm assembly, hold rocker arm firmly in suitable vice

and with two flat bars approximately 12 in. long (30.5 cm.), insert one each side in the gap between the casting and vice, lever the body away from the rocker arm and pin.

NOTE: Care should be taken that the type of removing bars used are flat to ensure that the body machined face is not damaged.

Inspection and Overhaul

1. Thoroughly wash all parts in clean paraffin, ensuring that valves are cleaned separately if being used again.
2. Check the diaphragm for hardening or cracking and examine the lower extremity of the pull rod, where it connects with the rocker arm link, for wear. Renew the diaphragm assembly if any of these signs are in evidence.
3. Check diaphragm return spring, if corroded or damaged, it should be replaced.
4. Visually check valve assemblies, if any doubt exists, replacement valves should be fitted. The two valves are identical and can be used for either application by inverting their positions.
5. Examine the rocker arm face pad for wear. Slight wear is permissible but should not exceed a depth of .010 in. (.254 mm.). Check rocker arm pin and link holes for wear, also the underside of link where diaphragm pull rod engages for wear. Badly worn or damaged parts should be renewed. Check rocker arm return spring.
6. Discard old oil seal and gaskets.
7. Examine upper and lower bodies for cracks or damage. If either the diaphragm or engine mounting flanges are distorted, these should be lapped to restore their flatness. Renew if either distortion is excessive.

To Re-assemble

The re-assembly of the rocker arm into the body is as follows:-

Assemble rocker arm, link and spacing washers onto rocker arm pin, place rocker arm return spring into body and insert rocker arm assembly into body of pump. Ensure that the rocker arm return spring is properly engaged between locating 'pips' on casting and rocker arm. Tap two new pin retainers into slots in the body and, while holding the retainers hard against the rocker arm, pin punch over the end of the slots with a 1/8 in.(3.17 mm.) pin punch to prevent retainers working loose.

NOTE: When refitting rocker arm pins, always use new service replacement

retainers (coloured copper for identification). These are slightly shorter than the original type to allow for new staking.

Fit new oil seal washer and steel retaining washer into the lower body.

Place the diaphragm return spring in position over oil seal retaining washer.

Place the diaphragm assembly over the spring, with the pull rod downwards and with the locating tab on the diaphragm at the twelve o'clock position.

Press down on the diaphragm at the same time turning the assembly to the left in such a manner that the slot on the pull rod will engage the fork in the link, ultimately turning the assembly a complete quarter of a turn to the left, which will place the pull rod in its correct working position in the link.

This will also permit the matching up of the holes in the diaphragm with those on the pump body flange and the tab will now be at the nine o'clock position.

Place the new valve gasket in the upper body around the valve ports.

Place valve assembly in inlet port with spring facing outwards. Fit other valve in the outlet port position with spring inside the port.

When refitting re-stake valve in four positions by using a suitable punch.

Refit filter gauze in top of upper body, also glass domed cover with new cover gasket. Fit central clamping screw.

The upper and lower bodies can now be fitted together as follows:

Push the rocker arm towards the pump body until the diaphragm is level with the body flange.

Place the upper half of the pump body into its correct position by aligning the scribed lines made on the two flanges prior to dismantling.

Replace the securing screws and spring washers and tighten only until the heads of the screws engage the washers.

Push the rocker arm away from the pump so as to hold the diaphragm at the top of the stroke and while so held, tighten the body screws diagonally and securely.

IMPORTANT: After assembling in the manner described above, the edges of the diaphragm should be flush with its two clamping flanges.

Any appreciable protrusion of the diaphragm indicates incorrect fitting in which case, special care should be taken in maintaining downward pressure on the rocker arm while the diaphragm screws are finally tightened.

To Replace

1. Clean the mounting face on the cylinder block, removing any trace of gasket which may be adhering to the face. Fit a new gasket to the cylinder block flange, holding it in place with a smear of grease.
2. Insert the rocker arm through the hole in the cylinder block so that the arm lies on the camshaft eccentric.
3. Secure the fuel pump to the cylinder block with two spring washers and bolts, tightening the bolts evenly to the torque loading given in 'Technical Data'.
4. Ensure that the pipe joints are clean and refit the fuel pipes.
5. Run the engine and check for leaks at the joints.

L.7. - WEBER CARBURETTERS

General Description

These carburetters are of the dual barrel side-draught type, each consisting of two single barrel carburetters with two venturis in each barrel. A small auxiliary venturi is located in each barrel and they discharge fuel, except under certain conditions, into the narrowest portions of the large venturis. By using two venturis in each barrel a greater depression is created than when a single venturi is employed. Also, the velocity of an airstream is higher at the centre, and the velocity of this central core is used by the auxiliary venturis, which discharge into the centre of the main venturis at the narrowest section.

The throttle plates in each carburetter are on a common spindle and the synchronising linkage between the carburetters ensures that the throttle plates in each carburetter open an identical amount. It should be remembered that one barrel supplies one cylinder only, since the inlet tracts are not interconnected. Apart from the throttle linkage, the carburetters are identical and each carburetter is, in effect, two carburetters with duplicated main jets, idling jets, etc.

However, whilst each barrel has an accelerator pump jet, there is only one piston type accelerator pump per carburetter and this feeds both jets. To facilitate cold starting a progressive starting device is fitted, discharging the mixture into both barrels on the engine side of the throttle plates. The idling jets, main and air correction jets, together with their emulsion tubes, are accessible after removing the small circular cover retained by a wing nut on top of the carburetter cover.

A common float chamber is incorporated in each carburetter with twin floats, to

reduce the effects of fuel surge, actuating a single needle valve which incorporates a damping device to prevent the needle from chattering on its seat. The floats straddle the centrally located jets, their position reducing the effects of fuel surge which occurs when cornering, braking and accelerating. A gauze filter is fitted between the fuel entry point in the carburetter cover and the float chamber.

The following operating details apply, for simplification purposes, to one barrel of a carburetter. The supply to the other barrel is the same.

Cold Starting

The progressive starting device on one side of the carburetter is actuated by the choke control on the instrument panel. It consists of two spring-loaded pistons, operated by a single lever connected to the choke control, which opens or closes a duct to each throttle barrel, and two petrol starting and air corrector jets, supplied with petrol from the float chamber and air from the float chamber respectively.

With the engine being cranked by the starter motor and the pistons raised from their seats by the action of pulling out the choke control on the facia panel, petrol passes from the float chamber through the starting jet and is emulsified by air from the calibrated bush in the carburetter body. This mixture is then ducted to the piston chamber at a point below the piston where it meets further air passing through two holes, uncovered by the piston, which are open to atmosphere. The mixture is then ducted to an orifice on the engine side of the throttle plate.

When the engine starts and the choke control is pushed progressively home as the engine warms up, the piston will move closer to its seat and the orifice at the top of the piston chamber will be uncovered thus allowing a greater quantity of air to enter through the starting device piston spring guide/retainer. At the same time, the orifice below the piston which supplies the mixture from the starting jet is partially blanked and so are the holes open to atmosphere, thus reducing and weakening the quantity of mixture delivered.

With the choke control pushed fully home the piston will be returned to its seat and close the duct to the barrel.

Idling and Progression Supply

Petrol passes from the float chamber to the idling jet and is emulsified with air from the float chamber. The orifice in the tapered end meters the petrol and the hole in the side of the idling jet calibrates the air. The mixture passes through the holes in the idling jet holder and via passages is ducted to the idling discharge orifice on the engine side of

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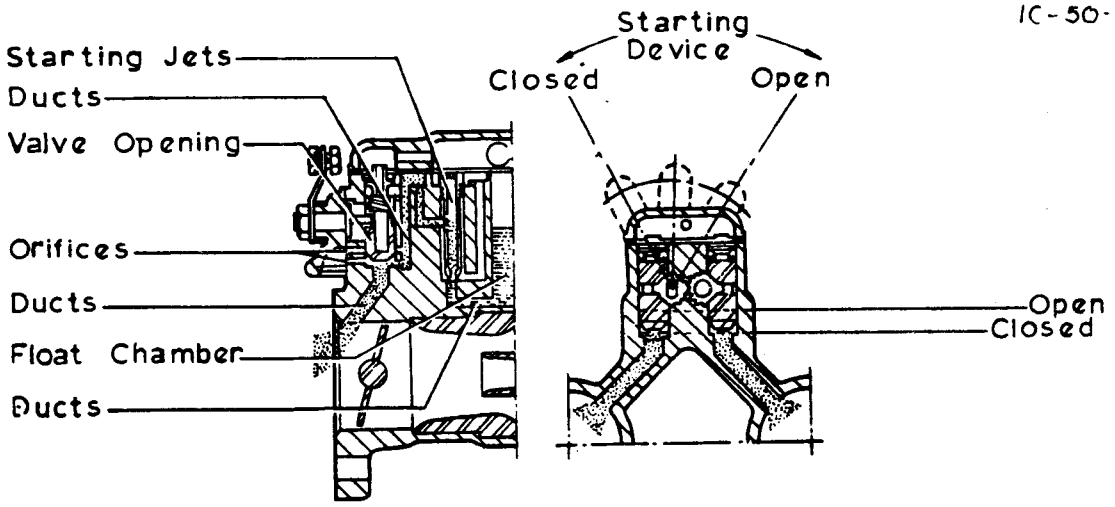

Fig. 2. STARTING DEVICE (WEBER)

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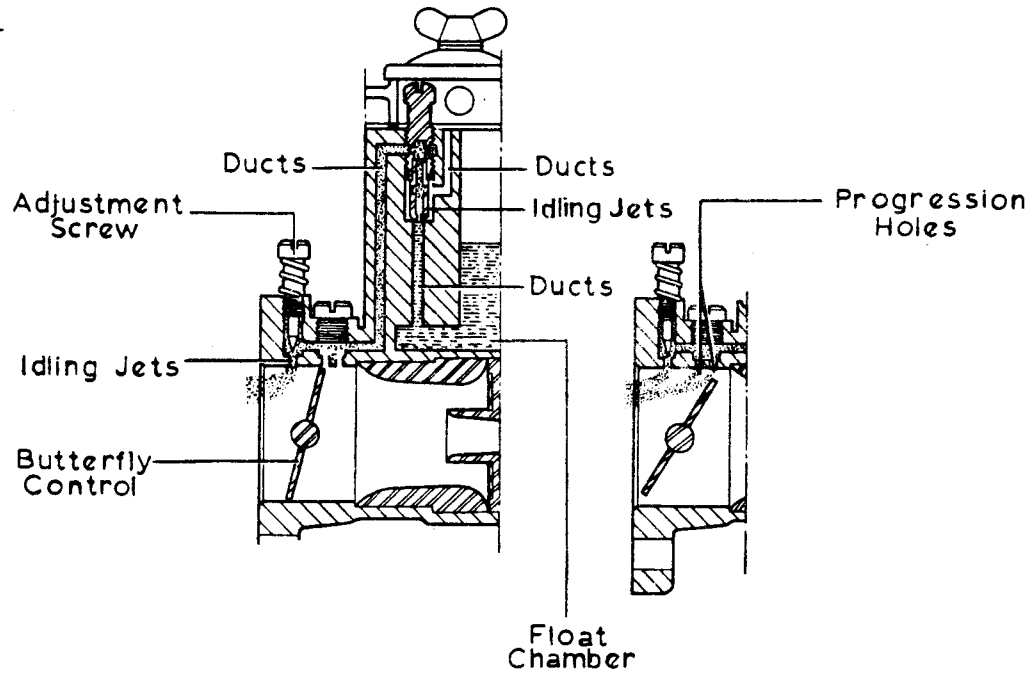

Fig. 3. IDLING & PROGRESSION SUPPLY (WEBER)

the throttle plate. The quantity of mixture passing through the discharge hole is regulated by a needle type volume control screw.

Three progression holes by the throttle plate edge are connected to the passage supplying the idling mixture. These progression holes ensure a smooth and progressive supply of mixture as the throttle plate is gradually opened.

Main System

The emulsion tube is a push fit in its holder. In one end of the emulsion tube is the air corrector jet and in the other end the petrol jet.

When the throttles are opened further, depression is imposed on the auxiliary venturis. Petrol passes from the float chamber through the main jet into the emulsion tube where it mixes with air which has passed through the air corrector jet.

The mixture is then channelled to the 'beak' in the auxiliary venturi which in turn discharges into the main venturi.

Accelerator Pump System

The accelerator pump ensures smooth acceleration and reduces any hesitation when the throttle is suddenly opened.

The single accelerator pump in each carburetter supplies two pump jets, one per barrel. Only one inlet valve is fitted but there are two delivery valves.

With the throttle plates closed the accelerator pump control rod is raised by the arm pinned to the throttle plate spindle. The control rod, which is 'U' shaped, and the piston are spring-loaded so that if the throttle spindle arm is lowered the pump piston will descend under the action of its own spring.

When the piston ascends petrol is drawn from the float chamber past a ball in the inlet valve located in the bottom of the float chamber. This inlet valve has a lateral calibrated orifice which passes any excess fuel into the float chamber when the piston descends.

When the throttles are opened, the spindle rotates the arm which allows the pump control rod and piston to descend under the action of their spring. The inlet ball valve closes, preventing fuel from returning to the float chamber, except by calibrated orifice. Petrol is then forced to a pump delivery valve, lifts the weighted ball from its seat in the carburetter body and then passes to the appropriate pump jet, mounted between the edge of the main venturi and throttle plate.

When the accelerator pedal is released, the vacuum caused when the pump piston

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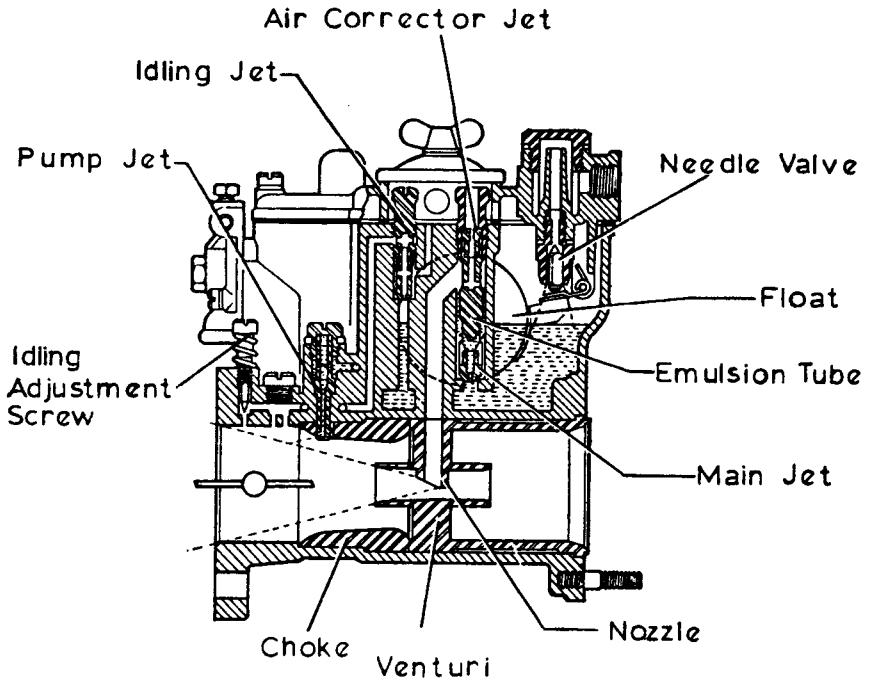

Fig. 4. MAIN SYSTEM (WEBER)

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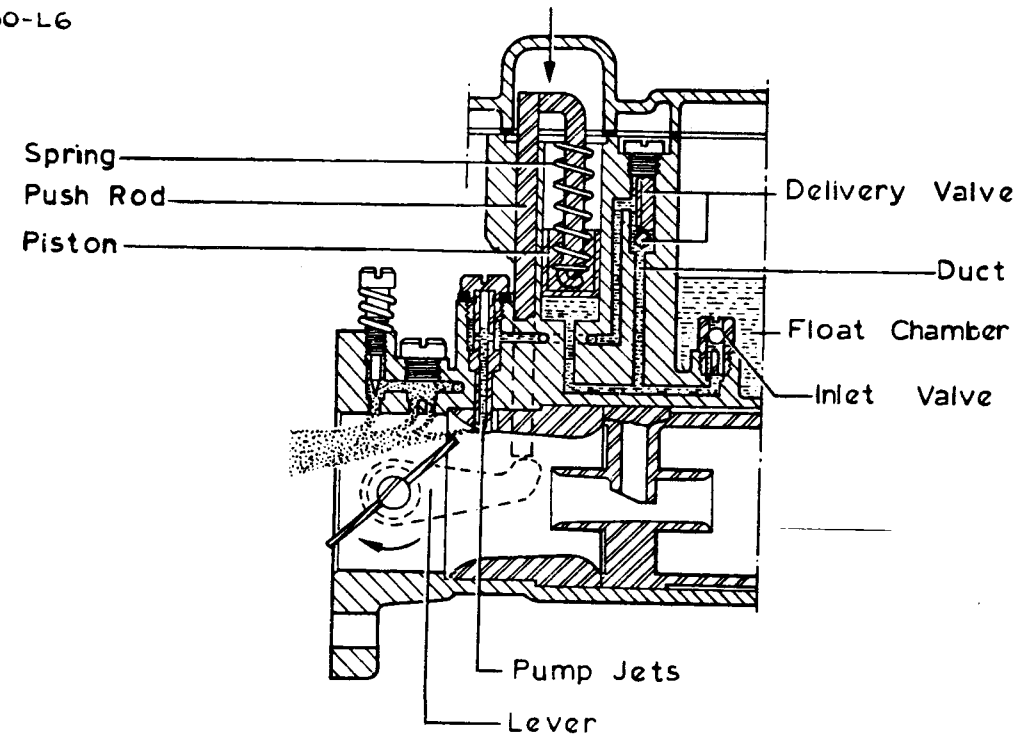

Fig. 5. ACCELERATOR PUMP SYSTEM (WEBER)

rises closes the delivery valve ball to prevent the entry of air through the pump jet. The pump cylinder is, therefore, refilled by fuel flowing past the inlet ball valve and lateral calibrated orifice.

High Speed Device.

To slightly enrich the mixture at high engine speeds, the accelerator pump delivery valve performs as a power jet. When the vacuum at the pump jet reaches a certain value, according to the delivery valve ball weight, the ball is drawn from its seat and, via the accelerator pump housing and inlet valve, fuel is drawn from the float chamber.

It will be appreciated that the pump jet controls the amount of additional fuel and the delivery valves weight the point of opening.

Carburetter Flexible Mountings

Studs are screwed into the flanges of the inlet tracts, and these studs pass through the spacer, the carburetter mounting flanges, double coil spring washers and the nuts. 'O' rings are sandwiched between the carburetters, spacers, and the inlet tracts. The 'O' rings act as a seal to prevent the ingress of air, and together with the double coil spring washers, also act as an insulator to absorb vibration and prevent frothing in the float chambers.

At every 'A' Service (see Section 'O') check the clearance, with feeler blades, between the coils of the eight spring washers. The clearance should be .04 in. (1.01 mm.) and it must be remembered to check also the four washers which are below the carburetters. If only the top four washers are set and those underneath are loose, the carburetters will tilt with the possibility of air leaks and the 'O' ring being pulled from its mounting plate and barrel.

To obtain the correct clearance, slacken or tighten the carburetter retaining nuts. Be careful not to overtighten the nuts, otherwise the mounting plate may permanently be distorted and the 'O' ring can then become detached. Also, the coil spring washer may fracture if over-tightened.

L.8. - WEBER CARBURETTERS

To Remove

1. Release the clip and disconnect the air cleaner trunking from the air box. Remove the central bolt visible in the air box, and pull off the outer half of the box.
2. Unhook the throttle return spring and remove throttle cable from carburetters. Disconnect the fuel supply pipes at the carburetters. Remove the choke cable.

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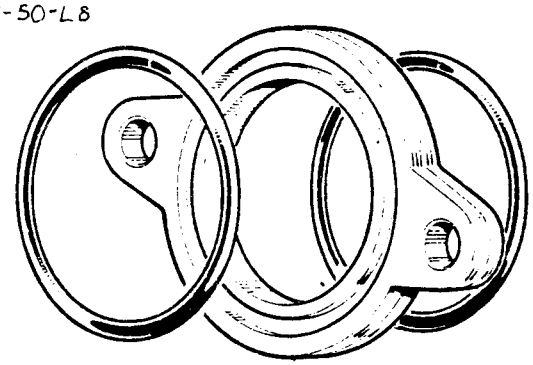

Fig. 7. CARBURETTER FLEXIBLE MOUNTING (WEBER)

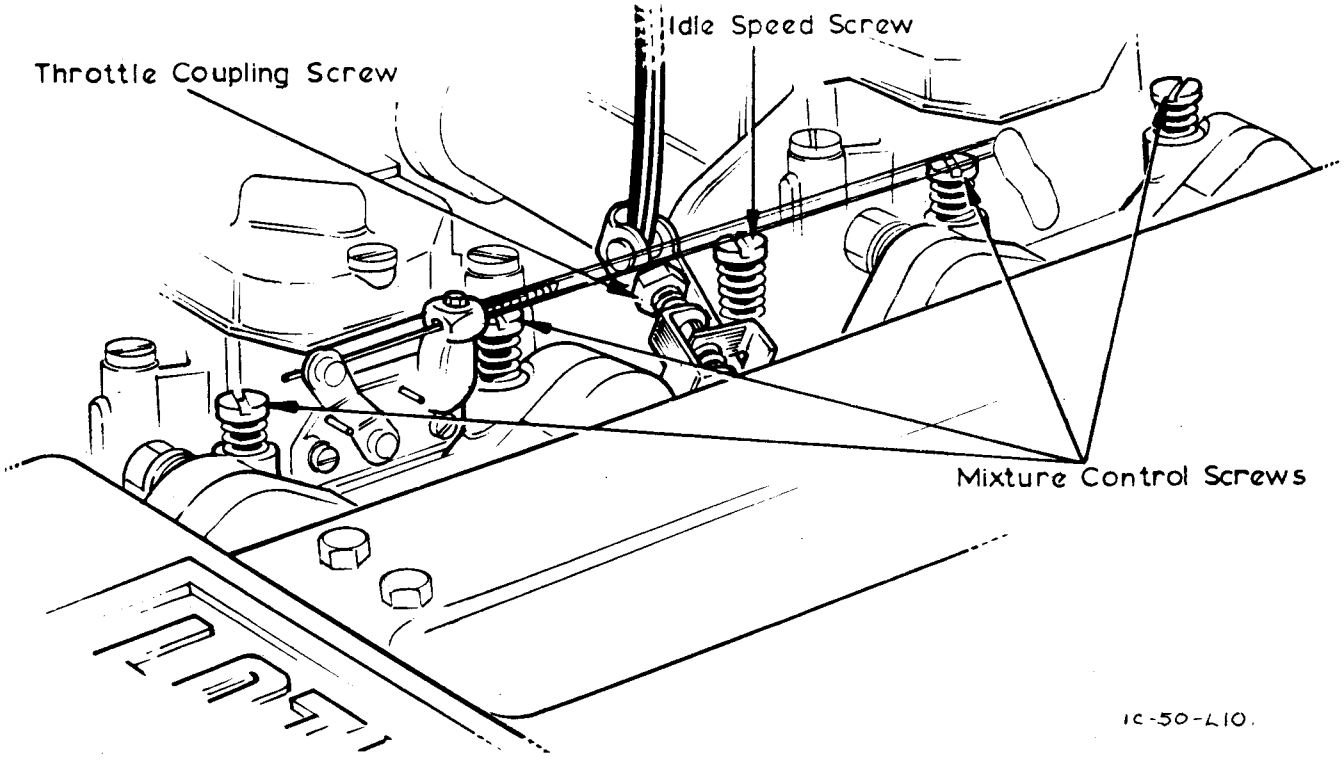

Fig. 8. CARBURETTER ADJUSTING SCREWS (WEBER)

3. Progressively release the carburetters securing nuts, (four are visible from above, the other four being below). Remove nuts and washers.
4. Carefully remove the two carburetters as an assembly, ensuring that the synchronising linkage between the two is not distorted. Remove the spacers with their 'O' rings from the mounting studs.

To Replace

1. Carefully examine to check that each carburetter metal spacer is not damaged, and that the 'O' rings in the faces of the plate are in position. Fit the spacer assemblies.
2. Fit the carburetters, ensuring that the synchronising linkage is correctly positioned so that the lug on the rear carburetter throttle linkage is between the spring-loaded plunger and adjusting screw on the front carburetter. To each stud fit a double coil spring washer, a flat washer and nut. Tighten the eight nuts progressively until a .04 in. (1.0 mm.) clearance exists between the carburetter flange and spacer. This clearance should be checked with feeler blades. Do not overtighten the nuts otherwise the 'O' rings will be flattened into the recesses of the plate.
3. Refit the fuel supply pipes to the carburetters. Reconnect the choke control by securing the cables casing in the case arm of each starting device cover with the clamp screw. Ensure that the choke control on the facia panel is pushed fully home and that the starting device operating levers are in the 'off' position.
4. Reconnect the throttle cable and throttle return spring. If not already fitted, a new spring (Part No. B26 S 028) having a double coil, should be used.
5. Ensure the gasket is in good condition between the two halves of the air box, then refit outer half. Reconnect the air trunking to the air box.

L.9. - WEBER CARBURETTERS

To adjust

The only adjustments required are synchronisation, mixture strength, and idling speed. These adjustments being effected by the idle speed adjustment screw (or throttle screw) the interconnecting throttle arm screw (or coupling screw) and the four idling mixture volume adjustment screws (or mixture screws).

The carburetters should be 'set-up' after initial installation or subsequent overhaul as follows:-

1. Ensure the engine has reached its normal running temperature and check that the

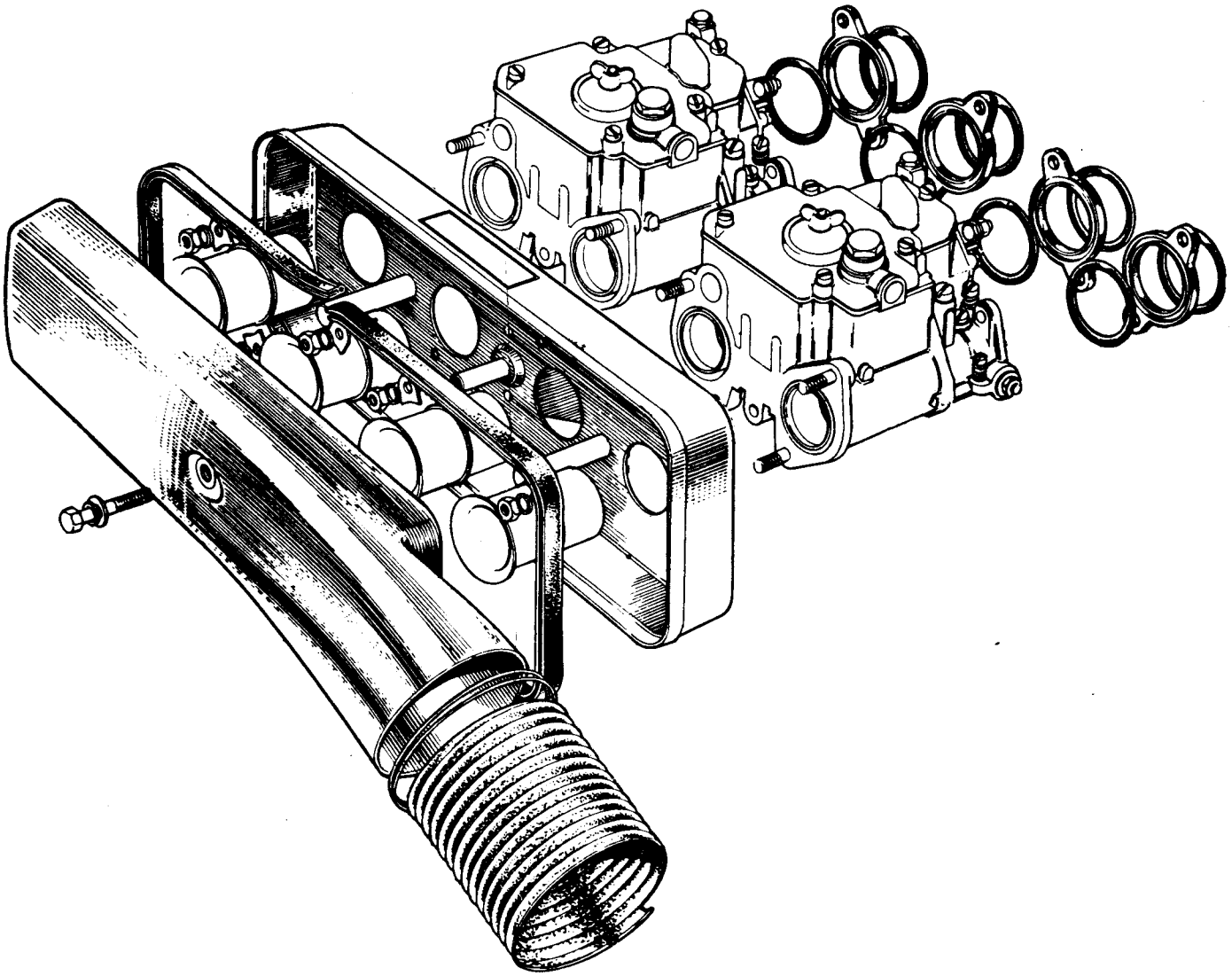

Fig. 9. AIR BOX & CARBURETTER ASSEMBLY

starting control (choke) levers, are fully forward. The warmer the engine the easier the adjustment will be.

2. Check that there are no air leaks at the 'O' ring gaskets.

3. Set all four mixture screws approximately three-quarters turn open.

4. Adjust the rear carburetter throttle screw to give approximately 1,000 r.p.m.

5. Synchronise the carburetters. This is done as follows:-

   a. Using a proprietary carburetter balancing tool (such as the Crypton Synchro-Test) adjust the coupling screw until the air flow through each carburetter is the same. Alternatively, a piece of rubber or plastic tube can be used; one end being held to the ear and the other at the mount of the carburetter trumpet. The coupling screw is then adjusted to produce the same loudness of 'hiss' at each carburetter.

   b. Short out or remove each plug lead in turn and adjust the coupling screw until the shorting out of each pair of plugs produces approximately the same drop in engine revs.

   NOTE: For method 'a' it is necessary to remove the airbox cover, but this will have negligible effect on the carburation at idling speeds.

6. Adjust each mixture screw in turn. One at a time, screw each one right in and unscrew a small amount at a time (not more than 1/8 turn, waiting approximately 5 seconds at each setting). A point will be found which will cause a rise in engine revolutions and continued unscrewing beyond that point will cause the revolutions to drop back again. Each screw must be adjusted to give the maximum rise in revolutions. The rise in revolutions may be so small (possibly 50 r.p.m. or so) as to be undetectable by ear, and it is recommended that a mirror should be hung on the steering wheel so that the tachometer may be seen.

   NOTE: During the course of items 5 and 6 it will be necessary to re-adjust the throttle screw from time to time to maintain the engine revolutions at around 1,000 r.p.m.

7. Repeat 4, 5 and 6 (possibly several times) until no further improvements can be obtained.

8. Adjust the throttle screw to give an idle of 800 to 900 r.p.m.

   NOTE: In all cases where there may be unbalance of air flows through throttles in the SAME carburetter, this can be corrected by placing a spanner on each end