SECTION C

CARBURETTERS AND FUEL SYSTEM

MARK 2 MODELS

2·4, 3·4 and 3·8 litre

INDEX

CARBURETTERS
(2·4 litre)

INDEX *(continued)*

CARBURETTERS
(3·4 litre)

THE FUEL SYSTEM

CARBURETTERS AND FUEL SYSTEM

The 2.4 litre model is equipped with twin Solex B.32 PBI-5 type carburetters ; the 3.4 and 3·8 litre model are equipped with twin S.U. H.D.6 type carburetters. Each type of carburetter is dealt with separately in the following section.

CARBURETTERS
(2·4 litre)

DESCRIPTION

The 2.4 litre model is fitted with twin Solex B.32 PBI-5 type carburetters. This type of carburetter is fully dust-proofed and has a progressive starting device with fast idle ; it also incorporates an anti-percolation device and accelerator pump.

Dust-proofing

The carburetters are fully dust-proof, all air to the engine (ventilating the float chambers, starting, slow-running and main spraying circuits) is drawn through the air cleaner. This ensures maintenance of a balanced mixture and complete filtration of all inducted air, even if the air cleaner gradually becomes clogged in service.

The Starting Device

The starting device, operated by the facia control, ensures immediate starting from cold and quick drive-away.

The control in the full rich position supplies a very rich mixture, to enable starting at low temperatures.

After starting, the mixture control should be placed in the intermediate position (half-way). This supplies a weaker mixture of greater volume, and enables the car to be driven away immediately. This position can also be used when the engine is not stone cold.

During the warming up period of the engine the control should be moved gradually towards the off position, thus progressively reducing richness until the starting device is out of action.

Idling

For idling, the mixture is supplied to the engine past the butterfly and from the pilot jet and the pilot jet air bleed. Engine speed can be varied by the slow-running adjustment screw which opens or closes the throttle as required, whilst adjustment of the volume control screw varies the mixture strength and volume from the pilot jet and the pilot air bleed.

Main Circuit

For normal running, petrol is supplied from the float chamber through the main jet ; it is mixed in the main well with air metered through the air correction jet, and carried into the well via the emulsion tube. The mixture is then discharged from the main spraying well into the air stream passing through the choke tube.

Accelerating Pump

The accelerating pump is mechanical in operation and consists mainly of a pump membrane, membrane return spring, lever and an actuating rod, the latter item being the connecting link between the throttle spindle and lever. An inlet valve permits petrol to pass from the float chamber into the pump chamber.

On depressing the accelerator pedal, the movement of the actuating rod and lever displaces the pump membrane and forces the petrol from the chamber through the pump jet and pump injector pipe into the main air stream, thereby ensuring a condition of rapid, smooth acceleration. During this operation a small ball in the inlet valve prevents the petrol from returning to the float chamber.

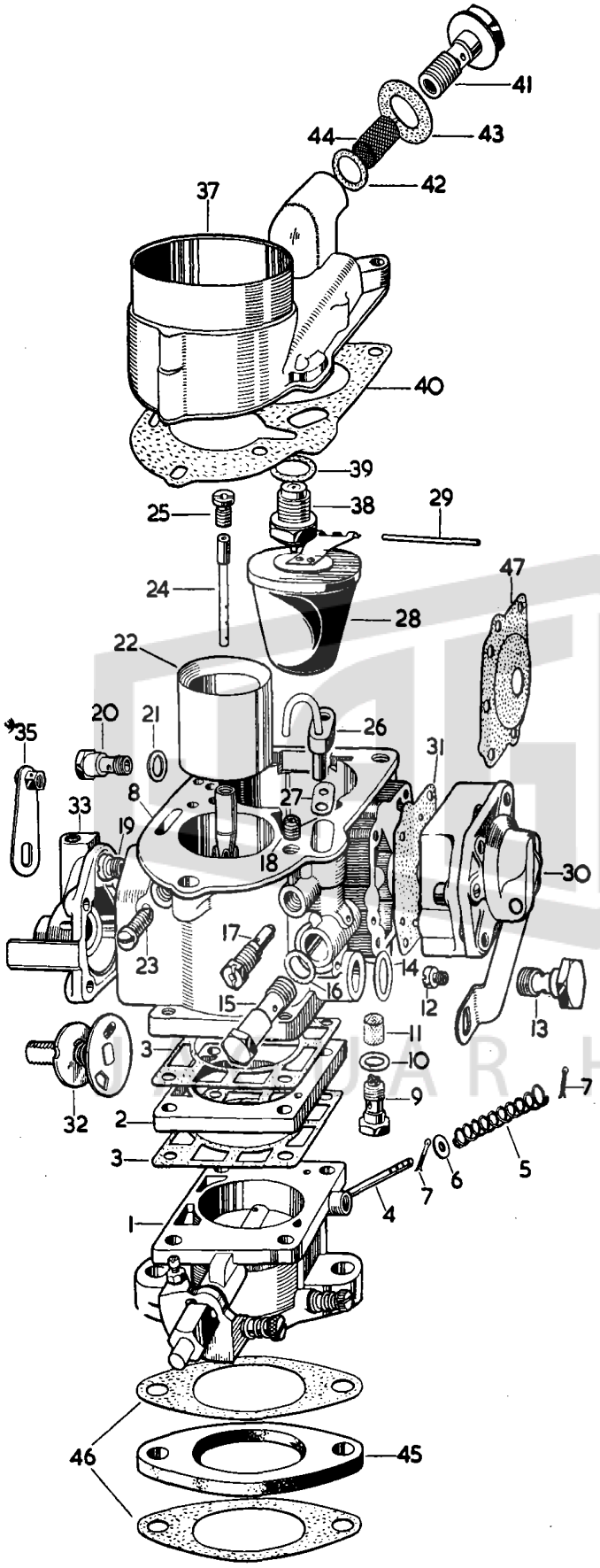
Since the injector pipe is positioned in the waist of the choke tube and there is no outlet valve within the pump circuit, petrol passes from the pump to the injector at both part and full throttle running conditions.

DATA

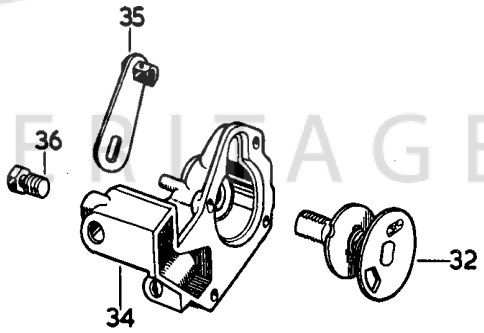
Type	Solex B.32 PBI-5 (twin)	
Choke and Jet Sizes	7 to 1 comp. ratio	8 to 1 comp. ratio.
Choke	23 mm.	24 mm.
Main jet	110	110
Air correction jet	200	180
Emulsion tube	14	14
Pump jet	55	55
Pilot jet	50	50
Pilot air bleed	1.2 mm.	1.2 mm.
Needle valve	1.5 mm.	1.5 mm.
Needle valve washer	1 mm.	1 mm.
Starter petrol jet	GS.105	GS.105
Starter air jet	GA.4.5	GA.4.5

Adjustments Required for Altitude

If the car is operated between 5,000 and 10,000 ft., it is recommended that the main jets are reduced by one size, that is, from 110 to 105. Above 10,000 ft. reduce the main jets to 100.



1. Throttle chamber.
2. Nylon insulating washer.
3. Gasket.
4. Control rod.
5. Spring.
6. Washer.
7. Split pin.
8. Float chamber.
9. Non-return valve.
10. Washer.
11. Filter.
12. Bolt.
13. Main jet.
14. Washer.
15. Pump jet.
16. Washer.
17. Pilot jet.
18. Air bleed.
19. Starter air jet.
20. Starter petrol jet.
21. Washer.
22. Choke tube.
23. Screw.
24. Emulsion tube.
25. Air correction jet.
26. Accelerator pump injector.
27. Gasket.
28. Float.
29. Float spindle.
30. Accelerator pump.
31. Gasket.
32. Starter valve.
33. Starter valve body (front carburetter).
34. Starter valve body (rear carburetter).
35. Starter valve lever.
36. Bolt.
37. Float chamber cover.



38. Needle valve.
39. Washer.
40. Gasket.
41. Banjo bolt.
42. Washer—small.
43. Washer—large.
44. Filter.
45. Insulating washer.
46. Gasket.
47. Diaphragm.

Fig. 1. Exploded view of the Solex carburetter.

ROUTINE MAINTENANCE

EVERY 2,500 MILES (4,000 KM.)

Check the slow running and adjust if necessary, as described under "Slow Running—Adjustment".

EVERY 5,000 MILES (8,000 KM.)

Tune Carburetters

See instructions on page C.10.

Carburetter Filters

Remove the bolts securing the petrol pipe banjo unions to the float chambers; withdraw the gauze filters from the banjo bolts. Clean the filters in petrol; do not use a cloth as particles will stick to the gauze.

Fuel Feed Line Filter (Early Cars)

The filter is attached to the inlet manifold, and is of the glass bowl type with a flat filter gauze.

At the recommended intervals, or more frequently if the glass bowl shows signs of becoming full of sediment, slacken the locking nut, swing the retaining clip to one side and remove the bowl (4) (Fig. 2), sealing washer (3), and filter gauze (2).

Clean the filter gauze and bowl by washing in petrol. Examine the sealing washer and if necessary fit a new one.

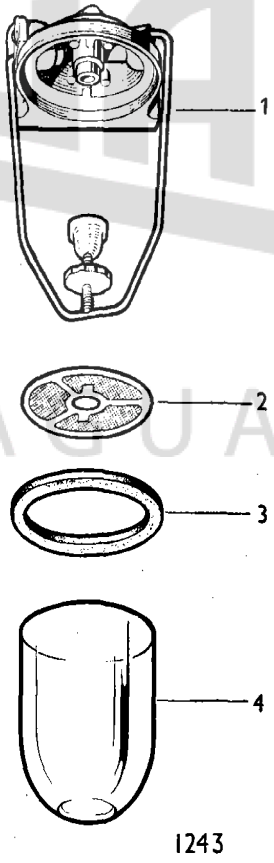


Fig. 2. Fuel feed line filter.

EVERY 10,000 MILES (16,000 KM.)

Petrol Pump Filter (Early Cars)

The petrol pump is situated behind the trim panel on the left-hand side of the luggage compartment.

To gain access to the filter remove the base plate by unscrewing the six cheese-headed screws. Thoroughly clean the filter in petrol; do not use cloth as particles will stick to the gauze.

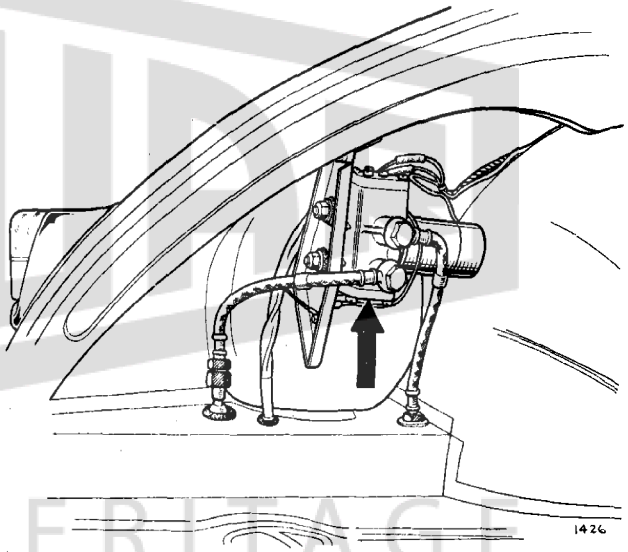


Fig. 3. Location of the petrol pump.

PERIODICALLY

Inlet Manifold Drain Tubes

Two drain tubes are fitted at the bottom of the inlet manifold and it is important that they are kept clear. Obstructions in the tubes will cause excess petrol to collect in the manifold which may result in difficult starting.

Periodically, the tubes and adaptors should, therefore, be removed and checked for being clear.

—oo—

STARTING

Starting from Cold

For starting from cold the mixture control (marked Start) should be moved up to the fully rich (Cold) position.

Switch on the ignition and press the starter switch button but do not touch the accelerator. Release the starter button as soon as the engine fires—this is important. If for any reason the engine does not start, do not operate the starter switch again until both the engine and the starter motor have come to rest.

As soon as the engine speed increases slide the mixture control to the intermediate (Hot) position ; this position will be felt as a marked resistance in the slide.

Drive off at a moderate speed, progressively moving the mixture control to the off (Run) position until the knob is at the bottom of the slide and the red warning light is extinguished.

Starting in Moderate Temperature

In warm weather or if the engine is not absolutely cold, it is usually possible to start the engine with the mixture control in the intermediate (Hot) position by adopting the procedure given above.

Starting when Hot

Do not use the mixture control. If the engine does not start immediately, slightly depress the accelerator pedal when making the next attempt.

Do NOT pump the accelerator pedal as owing to the action of an accelerating pump in the carburetter an excessively rich mixture will be admitted into the engine.

Difficult Starting (engine hot)

On extremely hot days or when the engine is stopped after a fast climb, occasional difficulty may be experienced in starting immediately.

This may be due to a temporary richness of mixture. On no account pump the accelerator, but slowly depress it to about one-third of its travel, maintaining this position until the engine fires.

Use of the Mixture Control—Important

Use of the mixture control (marked " Start ") brings into operation a starting device which provides the richer mixture necessary for starting. Do NOT permit the starting device to remain in operation longer than is necessary but return the control to the (Run) position as soon as the engine will allow. Unnecessary use of the mixture control will result in increased cylinder bore wear.

A reminder that the starting device is in operation is provided by a red warning light adjacent to the mixture control slide. When the control is returned to the (Run) position the starting device is taken out of action and the warning light is extinguished.

CARBURETTERS

Removal

Bend the rubber seal, joining the air intake pipe to the air cleaner, back on to the air cleaner flange. Disconnect the air intake pipe steady bracket. The air intake pipe can now be removed by applying a steady pressure under the centre, care being taken not to lose the two connecting sleeves from the top of the carburetters.

Disconnect the distributor vacuum feed pipe from front carburetter by unscrewing the union. Disconnect the petrol feed pipe by removing the banjo bolts. Disconnect the accelerator linkage from the throttle spindle. By removing the two retaining setscrews from the mixture control levers and also the outer cable retaining setscrew, the control cable can be withdrawn from the carburetters. Remove the four carburetter flange securing nuts and washers and lift off the carburetters.

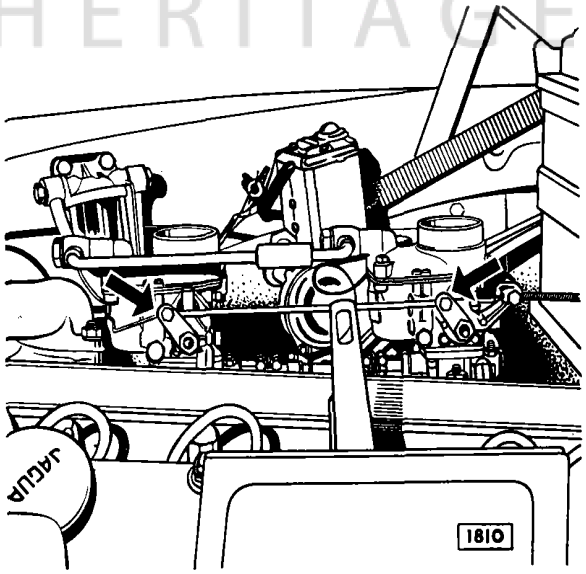


Fig. 4. The mixture control wire should be connected with the carburetter levers pushed fully forward and with the manual lever on the facia placed in the " Run " position.

Refitting

Refitting is the reverse of the removal procedure. Always fit two new joints to each flange on assembly, one on each side of the carburetter insulating distance piece. When refitting the mixture control ensure that the mixture lever inside the car is in the "Run" position and that the levers on the carburetters are as far forward as possible. Thread the control wire into position, remembering to replace the distance tube between the two choke levers (see Fig. 4).

DISMANTLING TO CLEAN

Remove the air cleaner. Unscrew banjo bolts (Bb) (Fig. 5) and remove filter gauzes.

Unscrew float chamber cover fixing screws and gently remove each cover (Fc). Needle valves (Nv) are now exposed for removal.

Lift and remove float toggles (Ft), spindles (Fs) and floats (F). Remove pilot (g), pump (Gp) and starter jets, the latter being situated at bottom left-hand side of starter box, then pump non-return valve and gauze, situated at base of pump chamber, plug (Gu) and main jets located in holders (T). The emulsion tubes may be lifted out with a matchstick after removing air correction jets (a) (before doing so, make sure that throttles are closed in case parts are accidently dropped).

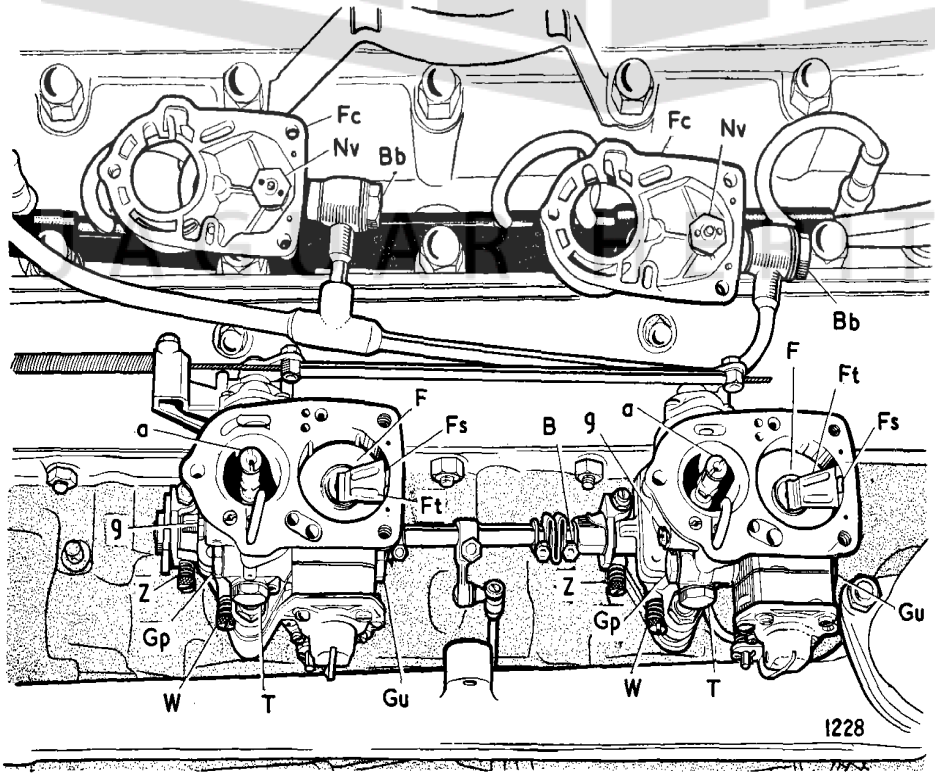
Cleaning and Inspection

Cleanliness during servicing is of the utmost importance, and rag should on no account be used for cleaning or drying the interior of the carburetters. A clean tray filled with petrol, a small stiff paint brush (no loose hairs) and compressed air for the dismantled instruments and parts, is desirable.

Sediment can be quickly removed by gentle brushing followed by swilling out with petrol.

The interior of the carburetters and exposed passages should be blown out, to ensure that all loose particles of foreign matter are cleared.

For cleaning jets use compressed air only; never use wire as a probe, as this can easily result in increased petrol consumption, and a possible reduction in engine performance.



Bb	Banjo bolt.
Fc	Float chamber cover.
Nv	Needle valve.
F	Float.
Fs	Float spindle.
Ft	Float toggle.
g	Pilot jet.
Gp	Pump jet.
Gu	Plug.
T	Main jet holder.
a	Air correction jet.
B	Clamping bolt.
Z	Slow running adjustment screw.
W	Volume control screw.

Fig. 5. View of the carburetters with float chamber covers removed.

Floats

Inspect floats for leakage and dents. Leaking or dented floats should be renewed ; never repair except in cases of dire emergency, as the volume and weight of the floats are important.

Needle Valves

Thoroughly clean with petrol, blow out and check needles for quick drop and seal. Any tendency for a needle to stick can usually be cured by a short immersion in a degreasing tank, otherwise the unit should be renewed.

Should the occasion arise where the pump and starter units have to be dismantled, careful note should be made of the position of the various parts, as incorrect assembly will result in complete failure of either component.

It is stressed that the accelerating pump is specially set at the factory, therefore the unit should not needlessly be dismantled. However, should the membrane require replacing, they are not normally supplied separately but form part of an assembly.

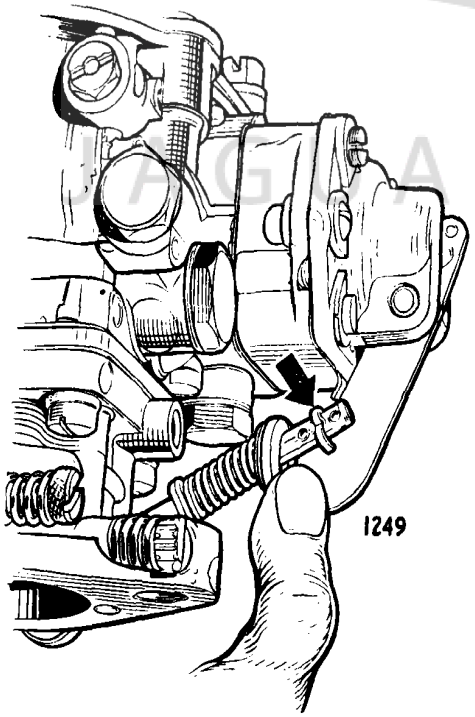


Fig. 6. Showing the position for the split pin in the accelerator pump control rod.

REASSEMBLING

Before reassembling, check all carburetter assembly screws and flange nuts for tightness ; do not use undue force.

When replacing petrol jets and needle valves, fit new fibre washers, using genuine parts only ; failure to do so may upset the calibration of the carburetter.

The nose of the pilot jet makes seating contact in the casting, therefore they should be screwed in tightly, but not with undue force or the seating will be damaged.

Refit toggles and spindles, taking care that toggles are fitted with the letters "TOP" uppermost and move freely on their spindles. Refit needle valves to float chamber covers, using the correct washers, as their thickness partly determine petrol level ; make a final check on needle stems for free movement.

Fit new gaskets to float chambers before replacing covers—the carburetters, being dustproof, require a seal at this joint. Refit petrol pipe and air cleaner.

Note :—If the carburetters have been lifted off the manifold, new flange joints must be used on reassembly. At the same time it is advisable to check the flatness of the face of the carburetter flanges before refitting them to the manifold, to eliminate any possibility of air leaks at this point.

SLOW RUNNING ADJUSTMENT

Adjustment and synchronisation of the carburetters is quite simple, but is dependent on cylinder compressions, valve clearances, the ignition setting, sparking plug gaps and contact breaker gap being set as laid down.

The idling must be set with a fully warmed up engine.

Each carburetter has two external adjustments, the slow-running adjustment screw (Z) (Fig. 5) and mixture volume control screw (W).

(1) Switch off the engine and loosen the clamping bolt (B) on the flexible link between the carburetters. Each instrument should now be separately adjusted. Starting with the front carburetter :—

(2) Unscrew the screw (Z), and ensure the throttle is closed by manual pressure on the slow running screw. Insert a .002" feeler (or strip of paper) between screw (Z) and the casting stop, screw in (Z) until feeler or paper is lightly nipped. Remove feeler and screw in (Z) one further complete turn from this point.

(3) Gently screw the volume control screw (W) clockwise until light contact is made with the casting seat, then unscrew three-quarters of a turn.

Repeat the above adjustments to the rear carburetter.

(4) Start the engine and, watching the Rev. counter, adjust each slow running screw (Z) equally, until the engine is turning at 650 r.p.m. Then screw out each volume control screw (W) a quarter of a turn at a time, until a drop in r.p.m. is registered indicating richness.

(5) Carefully screw in each volume control screw (W) by quarter turns until the engine reaches the highest and steadiest idling speed, taking care not to go beyond this point where erratic running will be evident due to weakness.

(6) Should the engine speed now be other than 650 r.p.m., adjust the slow running adjustment screws (Z) as required, repeating the adjustments in order to obtain the required idling speed and synchronisation.

(7) Throttle connecting linkage between the carburetters should now be securely tightened, care being taken that both throttles are against their stops during the process.

FAULT FINDING

Sudden break in performance

This may be due to tiny particles of foreign matter or water escaping the filters in the carburetters and fuel pump, and blocking one or more of the petrol metering jets.

Poor slow running

Sudden failure to idle smoothly may be due to one or both pilot jets becoming obstructed and failing to meter the quantity of petrol required by the engine.

Pilot jets should then be removed and the metering orifices cleared by blowing through.

When replacing jets, screw in securely but do not use undue force.

Heavy fuel consumption

In cases of heavy fuel consumption on 2.4 litre cars, the usual checks on choke levers, throttle synchronisation, timing, tuning, etc., should be carried out but in addition the accelerator pump discharge injector tube should be checked for correct positioning.

The position should be checked by placing a straight edge across the lower face of the mounting block and measuring the gap between the end of the tube and the straight edge as shown in Fig. 7. The correct gap should be .020"—.040" (.50—1.00 mm.). If this dimension is not correct, remove the assembly and fit a replacement (Part No. 5032) taking care to refit the gasket under the base of the assembly and tighten the locating screw. The injector tube must not be bent as there is a danger of loosening the tube in the mounting block.

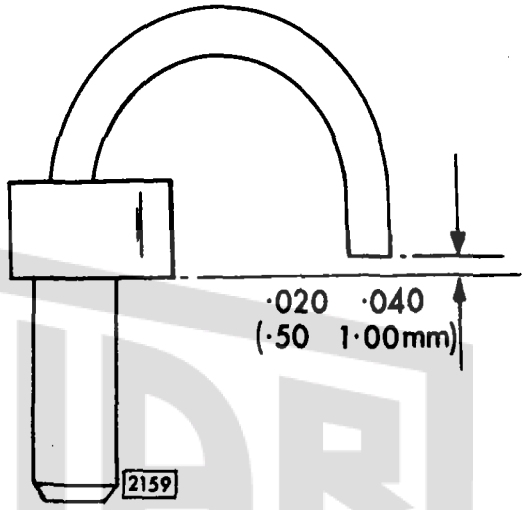


Fig. 7. Check the gap as illustrated.

Failure to respond to throttle opening (engine hot)

If the engine will idle but suddenly fails to respond to throttle opening, the main jets should be removed for cleaning. Main jets are assembled in holders, the heads of which are clearly marked "Main Jet Holder". The latter are easily removed with an adjustable spanner, the jets then being exposed. Gripping the holder between the jaws of the spanner, the jets can be removed with a screwdriver and blown out. During this operation the float chamber will have drained, thereby carrying away impurities.

Important :—Do not probe the jet metering orifices with wire—disregard of this precaution may lead to increased petrol consumption and sub-standard performance.

Flat spot (engine hot)

Should the engine become reluctant to accelerate from slow to normal speeds the pump jets may be partly or completely obstructed and should be removed for cleaning. After replacing jets and priming the carburetters, pump action may be checked in the following manner. Remove air cleaner and open throttles.

A discharge should then occur from each pump injector, visible in the choke tubes of the carburetters.

Difficult starting (engine cold)

Provided the carburetters contain petrol and the ignition spark is good, the engine should start immediately.

If it does not and there is no smell of petrol after considerable cranking, the starter petrol jets may need blowing out to clear obstructions.

Note :—When refitting main, petrol and starter jets make certain that each fibre sealing washer is undamaged and that the jets are securely tightened.

Deterioration of performance

This is usually due to wear after long use, therefore, when the time arrives for a major overhaul, due consideration must also be given to the condition of the carburetters as they will also have suffered the effects of general wear and tear. It is therefore recommended that full advantage be taken of the manufacturer's reconditioned carburetter service by fitting replacement units.

CARBURETTERS

(3.4/3.8 litre)

DESCRIPTION

The 3.4 and 3.8 litre models are fitted with twin S.U. H.D.6 type carburetters. The enrichment device for starting is in the form of an auxiliary carburetter attached to the front carburetter.

The H.D. type carburetter differs from the earlier type in that the jet glands are replaced by a flexible diaphragm, and idling mixture is conducted along a passage way, in which is located a metering screw, instead of being controlled by a throttle disc.

The jet (18) (Fig. 11), which is fed through its lower end, is attached to a synthetic rubber diaphragm (10) by means of the jet cup (9) and jet return spring cup (13), the centre of the diaphragm being compressed between these two parts ; at its outer edge it is held between the diaphragm casing (14) and the float chamber arm. The jet is controlled by the jet return spring (12) and the jet actuating lever (15), the latter having an external adjusting screw which limits the upward travel of the jet and thus controls the mixture adjustment ; screwing it in (clockwise) enriches the mixture, and unscrewing it weakens the mixture.

Throttle spindle glands.

Provision is made for the use of throttle spindle glands consisting of the cork gland itself (25) (Fig. 11), a dished retaining washer (28), a spring (27) and a shroud (26). This assembly should not require servicing and can only be removed by dismantling the throttle spindle and disc.

Idling

The carburetter idles on the main jet and the mixture is conducted along the passage way (8) (Fig. 11) connecting the choke space to the other side of the throttle disc.

The quantity of mixture passing through the passage way and, therefore, the idling speed of the engine is controlled by the " slow-run " valve (5), the quality or relative richness of the mixture being determined by the jet adjusting screw. It follows that when idling, the throttle remains completely closed against the bore of the carburetter.

DATA

Type			S.U. H.D.6 (twin)
Size			1" (4.45 cm.)
Jet needle type—			
		Oil Bath Air Cleaner	Paper Element Air Cleaner
3.4 litre	7 to 1 comp. ratio	SC	TM
	8 to 1 comp. ratio	SC	CI*
	9 to 1 comp. ratio	SC	CI*
3.8 litre	7 to 1 comp. ratio	TX	TM
	8 to 1 comp. ratio	SC	CI*
	9 to 1 comp. ratio	SC	CI*
Jet size			.10" (2.54 mm.)
Auxiliary starting carburetter—needle type			425/8.

* Early cars fitted with TU needles.

Note : The jet needle type is stamped on the side or top face of the parallel portion of the needle.
The auxiliary starting carburetter needle is stamped with the large number (e.g. 425) on the shoulder at the top of the needle and with the small number on the parallel portion of the needle.

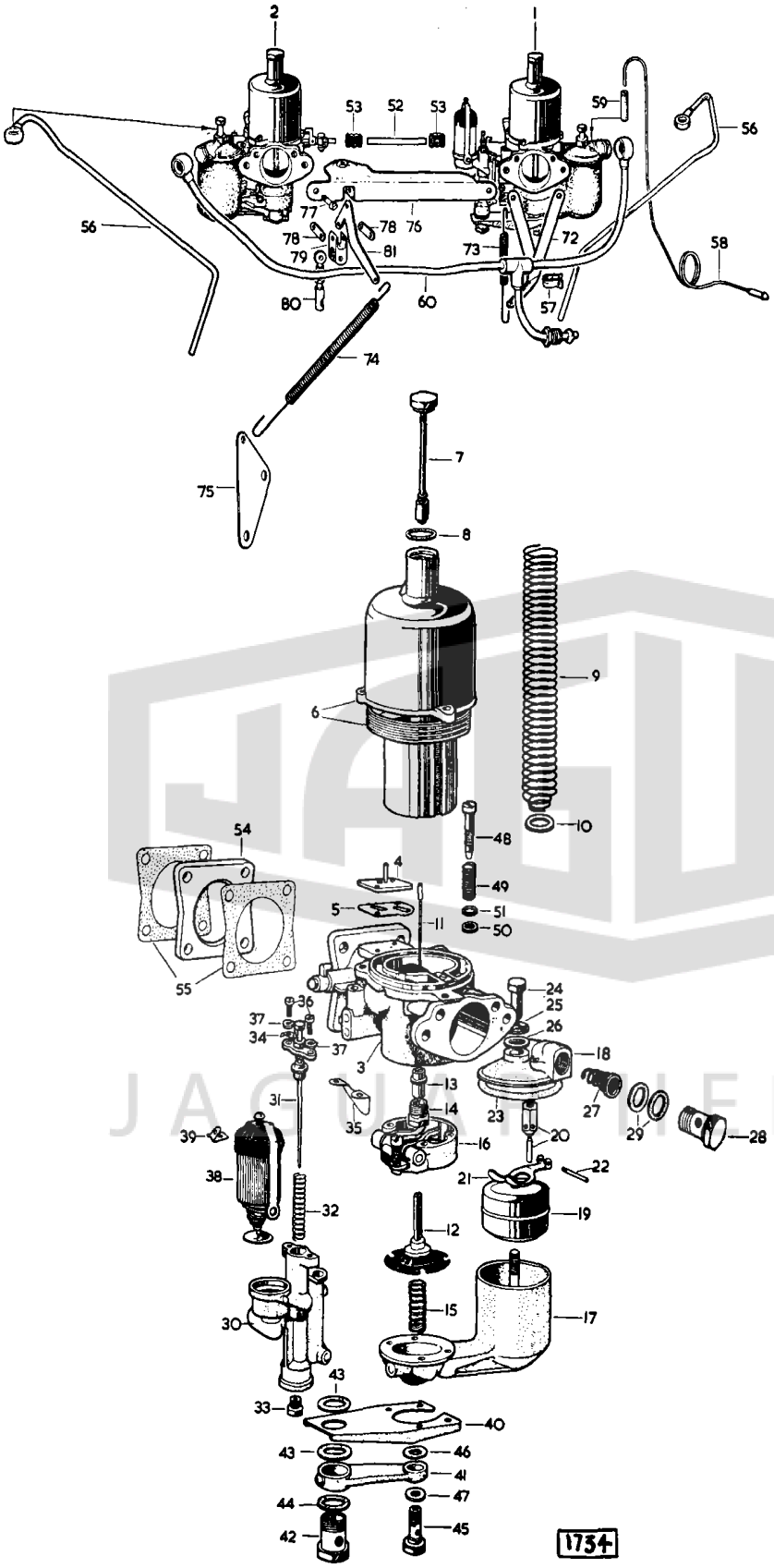


Fig. 8. Exploded view of the S.U. carburetter.

1. Front carburetter
2. Rear carburetter
3. Carburetter body
4. Ignition union adaptor
5. Gasket
6. Suction chamber and piston
7. Damper
8. Washer
9. Spring
10. Skid washer
11. Jet needle
12. Jet
13. Jet bearing
14. Nut—jet bearing
15. Spring
16. Jet unit housing
17. Float chamber
18. Float chamber cover
19. Float
20. Float needle and seat
21. Float needle lever
22. Knurled pin
23. Gasket
24. Cap nut
25. Fibre serrated washer
26. Aluminium washer
27. Filter
28. Banjo bolt
29. Fibre washer
30. Auxiliary starting carburetter body
31. Auxiliary starting carburetter needle
32. Spring
33. Jet
34. Spring clip
35. Dust shield
36. Screw
37. Double coil spring washer
38. Solenoid
39. Spring clip
40. Bracket
41. Connecting arm
42. Banjo bolt
43. Fibre washer
44. Fibre washer
45. Banjo bolt
46. Fibre washer
47. Aluminium washer
48. Slow running control valve
49. Spring
50. Neoprene washer
51. Brass washer
52. Connecting rod
53. Connecting rod coupling
54. Manifold insulator
55. Gasket
56. Overflow pipe
57. Overflow pipe clip
58. Distributor vacuum suction pipe
59. Neoprene coupling tube
60. Petrol feed pipe
72. Front carburetter spring bracket
73. Front carburetter throttle spring
74. Throttle return spring
75. Return spring bracket
76. Throttle stop bracket
77. Dowel bolt
78. Link
79. Trunnion
80. Link rod
81. Throttle lever

ROUTINE MAINTENANCE

Warning: If it is desired to clean out the float chamber, do not use compressed air as this may cause rupture of the rubber jet diaphragm.

EVERY 2,500 MILES (4,000 KM.)

Lubricate Carburetter Piston Damper

Each carburetter is fitted with an hydraulic piston damper which unless periodically replenished with oil, will cause poor acceleration and spitting back through the carburetter on rapid opening of the throttle.

To replenish with oil, unscrew the cap on top of suction chambers and lift out the damper valve which is attached to the cap. Fill the hollow piston spindle, which can be seen down inside the bore of the suction chamber, with S.A.E. 20 engine oil.

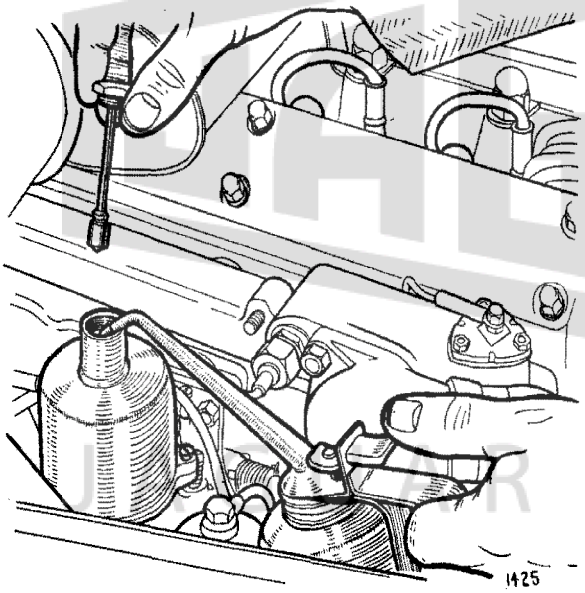


Fig. 9. Topping up a carburetter hydraulic piston damper.

Checking Carburetter Slow Running

The idling speed of the engine should be 500 r.p.m. on cars fitted with 3-speed synchromesh gearbox or automatic transmission, 700 r.p.m. for cars fitted with all-synchromesh gearbox when the engine is at normal working temperature.

If adjustment is required turn the two slow running volume screws (see Fig. 12) by exactly equal amounts until the idling speed, observed on the revolution counter instrument, is correct.

EVERY 5,000 MILES (8,000 KM.)

Cleaning Carburetter Filters

Removal of the bolt securing the petrol pipe banjo union to each float chamber will expose the filters. Remove the filters and clean in petrol; do not use a cloth as particles will stick to the gauze.

When refitting, insert the filter with the spring first and ensure that the fibre washers are replaced one to each side of the banjo union.

Fuel Feed Line Filter

The filter is attached to the right-hand wing valance and is of the glass bowl type with a flat filter gauze.

At the recommended intervals, or more frequently if the glass bowl shows signs of becoming full of sediment, slacken the locking nut, swing the retaining clip to one side and remove bowl (4) (Fig. 2) sealing washer (3), and filter gauze (2).

Clean the filter gauze and bowl by washing in petrol. Examine the sealing washer and if necessary fit a new one.

Tune Carburetters.

See instructions given on page C.17.

EVERY 10,000 MILES (16,000 KM.)

Petrol Pump Filter (Early Cars Only)

The petrol pump is situated behind the trim panel on the left-hand side of the luggage compartment.

To gain access to the filter remove the base plate by unscrewing the six cheese-headed screws. Thoroughly clean the filter in petrol; do not use cloth as particles will stick to the gauze.

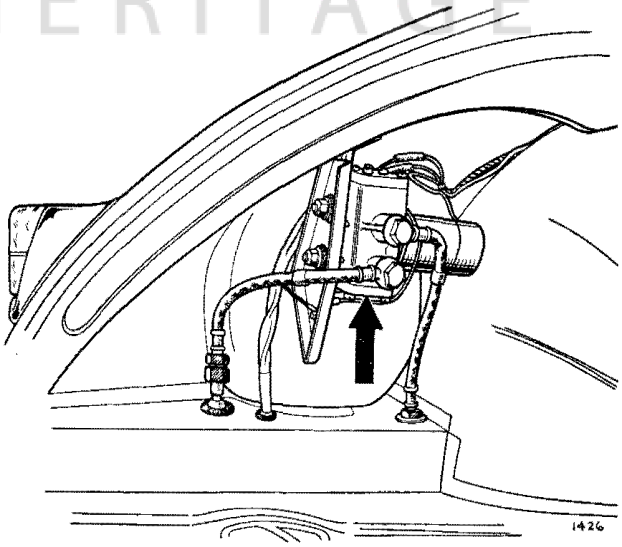


Fig. 10. Location of the petrol pump.

CARBURETTERS

Removal

Remove the air silencer or cleaner positioned across the cylinder head. Remove the air intake pipe by unscrewing the setscrews attaching the pipe to the carburetters. Remove both banjo bolts and the four fibre washers from the float chambers. Disconnect the two return springs and the distributor vacuum pipes from the front carburetter. Remove the cover on the auxiliary starting carburetter solenoid on the side of the front carburetter and disconnect the electrical cables. Remove the clip attaching the overflow pipes from the float chambers to the oil filter mounting screw and disconnect union connecting starter pipe to auxiliary starter carburetter.

Remove split pin, plain and spring washers from the connecting link pivot pin located on the manifold between front and rear carburetters and disconnect throttle link rod joint from ball pin on bell crank lever.

Remove the four nuts and washers securing each carburetter to the inlet manifold. The carburetters can now be removed from the inlet manifold.

Refitting

Refitting is the reverse of the removal procedure.

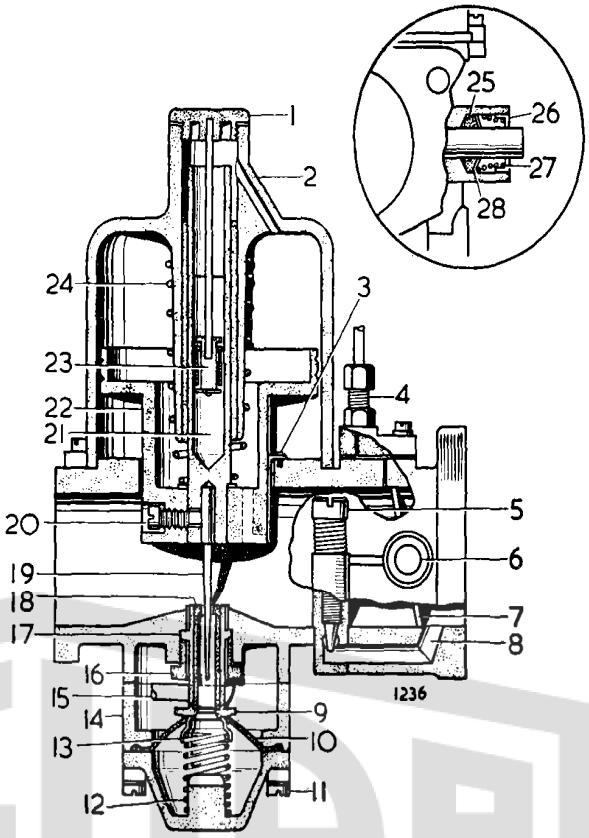


Fig. 11. Sectioned view of the S.U. carburetter.

1. Damper cap.
2. Suction chamber.
3. Piston guide.
4. Union for vacuum advance/retard.
5. Slow running volume screw.
6. Throttle spindle.
7. Throttle butterfly.
8. Slow run passage.
9. Jet cup.
10. Diaphragm.
11. Float chamber securing screw.
12. Jet return spring.
13. Return spring cup.
14. Jet unit housing.
15. Actuating lever.
16. Nut—jet bearing.
17. Jet bearing.
18. Jet.
19. Jet needle.
20. Needle retaining screw.
21. Oil reservoir.
22. Piston.
23. Damper.
24. Piston return spring.
25. Throttle spindle gland.
26. Shroud for spring.
27. Spring.
28. Washer.

CLEANING THE SUCTION CHAMBER AND PISTON

This should be done at approximate intervals of every twelve months or if the carburetter is dismantled for any reason. After detaching, clean the main inside bore of the suction chamber and the two outside diameters of the piston with a rag moistened in petrol or thinners and then reassemble in a dry and clean condition with a few spots of thin oil on the piston rod only. Do NOT use metal polish to clean the suction chamber and piston.

CARBURETTER TUNING

It is useless to attempt carburetter tuning until the cylinder compressions, valve clearances, sparking plug gaps and contact breaker point gaps have been tested, checked and adjusted, if necessary. The distributor centrifugal advance mechanism and vacuum advance operation should be checked and ignition timing set to the correct figure. For final road test, adjustment of not more than six clicks of the micrometer adjustment at the distributor to either advance or retard is permitted. The ignition setting is important since if retarded or advanced too far the setting of the carburetters will be affected.

Only two adjustments are provided at the carburetters (i) The slow running volume screw (A) (Fig. 12) governing idling speed and (ii) the mixture adjusting screws (B) governing mixture strength. Correct setting of the mixture strength at idling speed ensures that the carburetters are correctly adjusted throughout their entire range.

Ensure that needles are correctly located in the pistons, that is, with the shoulder of the needles flush with the base of the pistons. Check over the carburetters and ensure that pistons are free in the suction chambers, petrol filters clean and hydraulic piston dampers topped up with the recommended grade of engine oil. Lubricate the throttle controls and check for free operation and full travel.

Before carrying out the instructions which follow it is desirable to ensure that the mixture strength of both carburetters is correct. To do this, screw out both mixture screws until the tops of the jets are flush with the jet bridge in each carburetter body; this can be observed through the piston chamber after removal of the suction chamber and piston. Screw in the mixture screws until the jets start to move and then rotate screws a further $3\frac{1}{2}$ turns.

Slacken one clamp bolt on the coupling between the throttle spindles, check that both butterfly valves are fully closed by rotating both throttle spindles clockwise when viewed from the front. Tighten the coupling clamp bolt. Screw in (rotate clockwise) the slow running volume screws until they are down fully on their seatings. Unscrew each screw $2\frac{1}{2}$ turns.

Run the engine until the normal operating temperature is reached and check that both carburetters are sucking equally by placing one end of a length of rubber tube to the ear and the other end in the inside of each carburetter intake in turn. Rotate the slow running volume screws until the carburetters are synchronised, that is, are sucking equally and the engine is idling at approximately 500 r.p.m. on cars fitted with the 3-speed synchromesh gearbox or automatic transmission, 700 r.p.m. on cars fitted with the all synchromesh gearbox.

Recheck that both butterfly valves are fully closed by rotating the throttle spindles (in a clockwise direction looking from the front) and noting if any

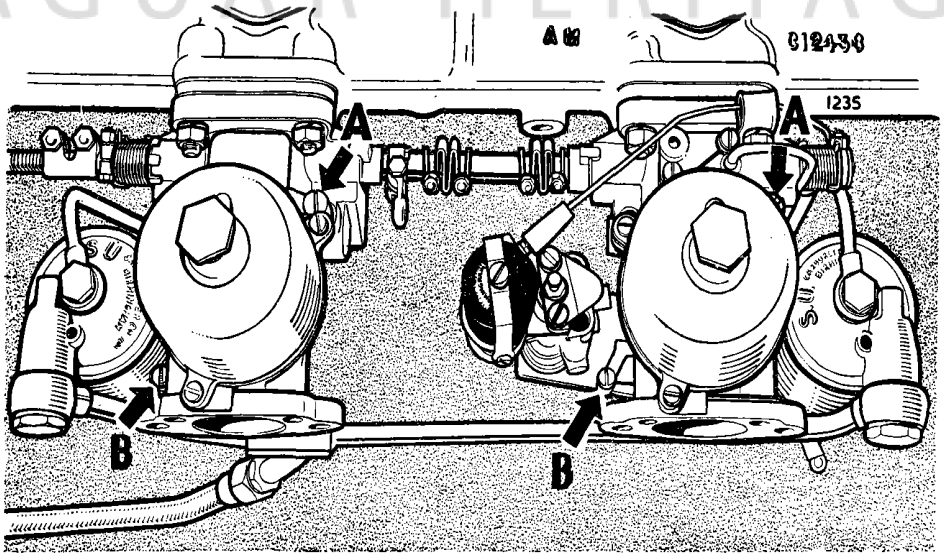


Fig. 12. "A"—Slow running volume screw. "B"—Mixture adjusting screw.

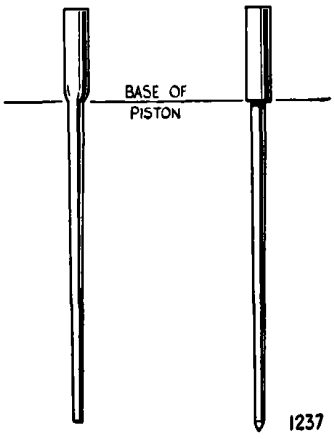


Fig. 13. The jet needle must be positioned with the shoulder flush with the bottom face of the piston.

change in engine speed results ; no change in engine speed or note should result if the butterfly valves are fully closed.

Next check the mixture strength by lifting the piston (by means of the lifting pin—see Fig. 14) of the front carburetter by approximately $\frac{1}{32}$" (.8 mm.) when, if

(a) the engine speed increases, this indicates that the mixture strength of the front carburetter is too rich.

(b) the engine speed immediately decreases, this indicates that the mixture strength of the front carburetter is too weak.

(c) the engine continues to run without change of speed, then the mixture strength of the front carburetter is correct.

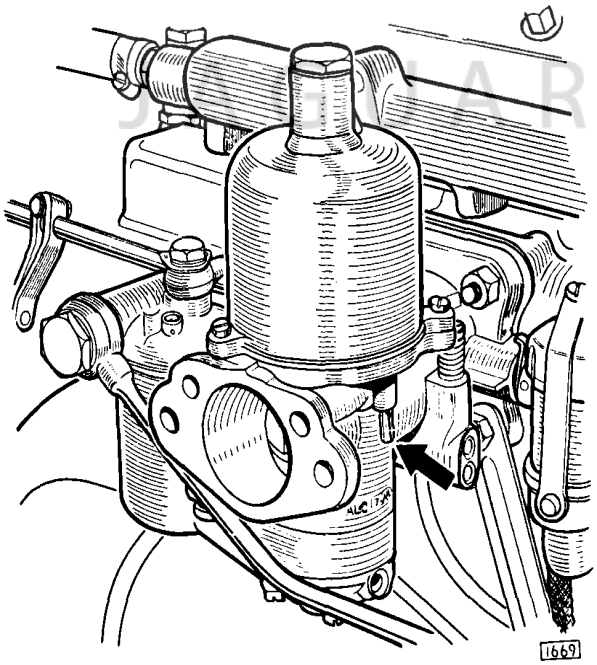


Fig. 14. The carburetter piston lifting pin ; the first part of the movement is spring loaded free travel.

Repeat the operation at the rear carburetter to test its mixture strength and after adjustment recheck the front carburetter since the two carburetters are interdependent.

To enrich the mixture, screw in the adjustment screw, that is, rotate clockwise ; to weaken the mixture unscrew the adjustment screw, that is, rotate anti-clockwise.

Some slight adjustment of the slow running to maintain this at 500 r.p.m. (or 700 r.p.m.) may now be necessary following alteration to the mixture strength, in which case ensure that the two slow running screws are rotated by an exactly equal amount or the adjustment previously made will be upset.

Float Chamber Fuel Level

When the fuel level setting is correct a $\frac{7}{16}$" (11.1 mm.) test bar will just slide between the lid face and the inside curve of the float lever fork when the needle valve is in the " shut-off " position (see Fig. 15).

If the float lever fails to conform with this check figure, it must be carefully bent at the start of the fork section, in the necessary direction for correction. Take care to keep both prongs of the fork level with each other and maintain the straight portion of the lever dead flat.

It is not advisable to alter the fuel level unless there is trouble with flooding ; although too high a level can cause slow flooding, particularly when a car is left ticking over on a steep drive, it should be remembered that flooding can also be caused by grit in the fuel jamming open the needle valve, undue friction in the float gear, excessive engine vibration, or a porous float.

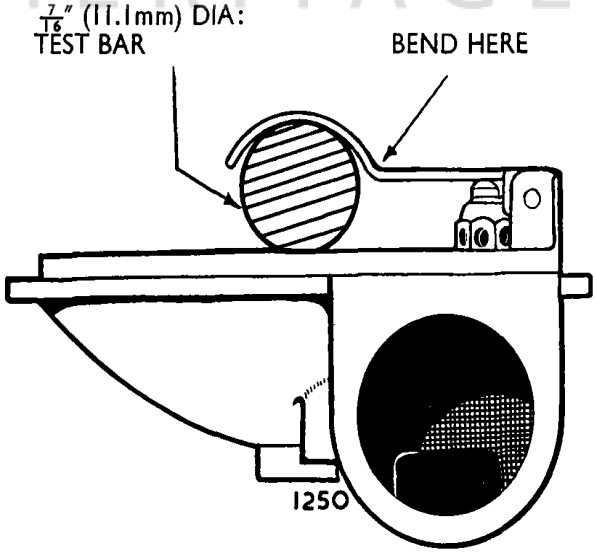


Fig. 15. Checking the float lever setting, which controls the fuel level in the float chamber.

CENTRING THE JET

Warning: Take care not to bend the carburetter needle when carrying out this operation

Remove the carburetter from the engine as described in this section.

Remove the four setscrews securing the float chamber to the carburetter body. Remove the float chamber, jet housing and jet. Remove the hydraulic damper.

With a ring spanner slacken the jet locking nut approximately half a turn. Replace the jet and diaphragm assembly.

The jet is correctly centred when the piston falls freely and hits the jet " bridge " with a metallic click. To centre the jet, push the jet and diaphragm assembly as high as possible with the hand and with a pencil or rod gently press the piston down on to the jet bridge ; centralisation will be facilitated if the side of the carburetter body is tapped lightly. Tighten the jet locking nut.

The actual centring must be carried out with the setscrews holes in the jet diaphragm and carburetter in alignment. After tightening the jet locking nut the jet diaphragm must be kept in the same position relative to the carburetter body ; the simplest way to do this is to mark one of the corresponding jet diaphragm and carburetter body setscrew holes with a soft pencil. Failure to do this may cause the centralisation to be upset.

Check that the centralisation is correct by noting if there is any difference in the sound of the piston hitting the jet bridge with the jet in its highest and lowest positions. If there is any difference in the sound, the procedure for centralising the jet will have to be repeated.

If difficulty in centring the jet is encountered after carrying out the above procedure, the jet needle can be lowered slightly in the piston to make the centralising effect more positive. The needle must, however, be restored to the normal position when checking the centralisation.

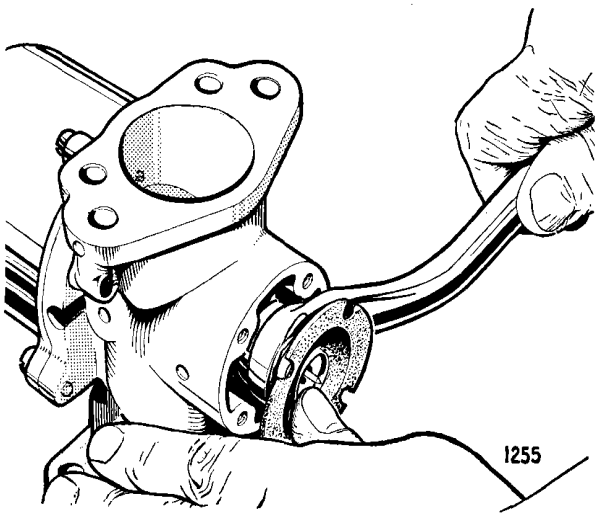


Fig. 16. *Centring the jet.*

THE AUXILIARY STARTING CARBURETTER

Description

The enrichment apparatus for starting is, in effect, an auxiliary carburetting system. The main body casting (1) containing a solenoid-operated valve and fuel metering system is illustrated as a separate unit attached by means of a ducted mounting arm to the base of the main carburetter fuel inlet.

The auxiliary carburetter forms, therefore, a separate unit additional to the normal float chamber retained by the hollow cross-drilled bolt.

Fuel is supplied to the base of the jet (9), which is obstructed to a greater or lesser degree by the tapered slidable needle (10).

When the device is in action air is drawn from atmosphere through the air intake (7) and thence through the passage (8), being carburetted with fuel as it passes the jet (9). The mixture is thence carried upwards past the shank of the needle (10) through the passage (14) and so past the aperture provided between the valve (3) and its seating (2). From here it passes directly to the inlet manifold through an external feed pipe.

The device is brought into action by energizing the winding of the solenoid (5) from the terminals (6). The centrally located iron core (4) is thus raised magnetically, carrying with it the ball-jointed disc valve (3) against the load of the small conical spring and thus uncovering the aperture provided by the seating (2).

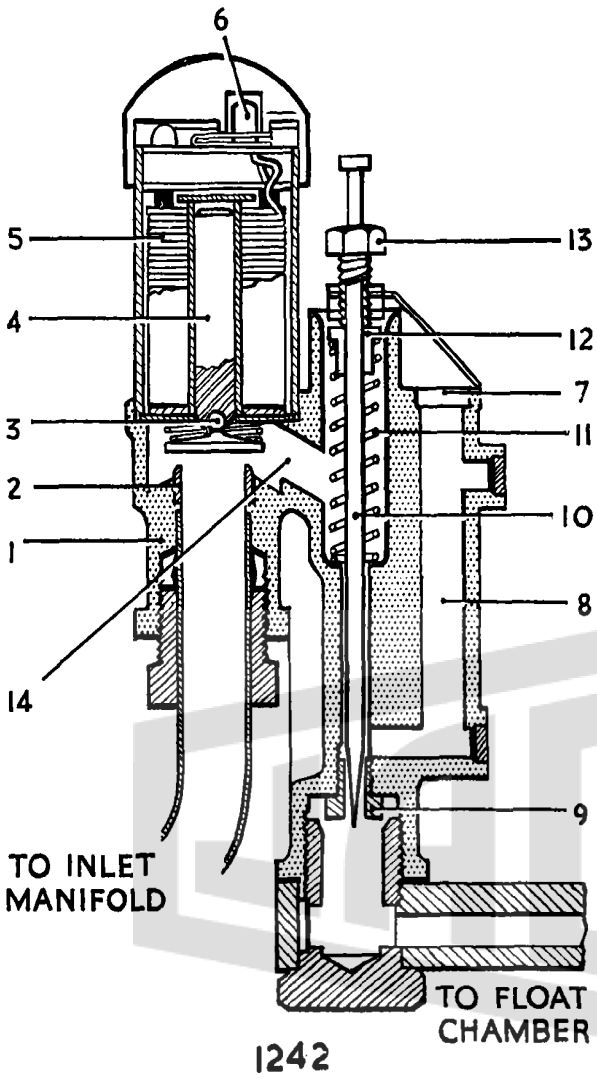


Fig. 17. Sectioned view of the auxiliary starting carburetter.

Considering the function of the slidable needle (10), it will be seen that this is loaded upwards in its open position by means of the light compression spring (11) which abuts against a disc (12) attached to the shank of the needle. The needle continues upwards through the vertically adjustable stop (13) in which it is slidable mounted and it finally terminates in an enlarged head.

Depression within the space surrounding the spring (11) is directly derived from that prevailing in the induction tract, and this exerts a downward force upon the disc (12), which is provided with an adequate clearance with its surrounding bore. This tends to overcome the load of the spring (11) and to move the needle downwards, thus increasing the obstruction afforded by the tapered section which enters the jet (9).

The purpose of this device is to provide two widely different degrees of enrichment, the one corresponding to idling or light cruising conditions and the other to conditions of open throttle or full-power operation. In effect, under the former conditions the high induction depression prevailing will cause the disc (12) to be drawn downwards, drawing the tapered needle into the jet (9), while under the latter, the lower depression existing in the induction tract will permit the collar to maintain its upward position with the needle withdrawn from the jet.

The tuning elements concerned in this device are the size and degree of taper of the lower end of the needle (10), the diameter of the disc (12), the load provided by the spring (11) and the degree of movement permitted to the needle assembly, as determined by the adjustment of the stop (13).

The solenoid (5) is energized by means of a thermostatically operated switch housed in the inlet manifold water jacket. This is arranged to bring the apparatus into action at temperatures below about 30—35°C. (86—95°F).

Adjustment

The engine must be at its normal running temperature before any attempt is made to tune the auxiliary enrichment device.

As it can generally be assumed that the tapered form of the needle (10), the strength of the spring (11), and the diameter of the disc (12) have already been appropriately chosen, tuning is generally confined to the adjustment of the stop screw (13). It will be appreciated that the main purpose of this adjustment is to limit the downward movement of the needle, the head of which abuts against the upper surface of the stop screw at the lower extremity of its travel. The final downward movement of this needle determines, as has been described, the degree of enrichment provided under idling conditions with the auxiliary carburetter in operation. An appropriate guide to its correct adjustment in this respect is provided by energizing the solenoid when the engine has already attained its normal temperature. The stop screw (13) should then be so adjusted that the mixture is distinctly although not excessively rich, that is to say, until the exhaust gases are seen to be discernibly black in colour, but just short of the point where the engine commences to run with noticeable irregularity.

Anti-clockwise rotation of the stop screw will, of course, raise the needle under these conditions and increase the mixture strength, while rotation in the opposite direction will have the opposite effect. In order to energize the solenoid under conditions when the thermostatic switch will normally have broken the circuit, it is merely necessary to short-circuit the terminal of the thermostatic switch directly to earth with a screwdriver and flick open the throttles when the starting device will be heard to come into operation with a pronounced hissing noise.

Thermostatic switch—Removal

The thermostatic switch which controls the operation of the auxiliary starting carburetter is situated at the front end of the inlet manifold water jacket.

Remove the electrical cable from the switch by removing the chrome plated domed nut.

If the radiator filler cap is securely tightened no appreciable amount of water will escape when the auxiliary starting carburetter switch is removed. Alternatively, a small amount of water can be drained from the radiator.

Remove the three securing setscrews and washers and withdraw the switch and the cork gasket.

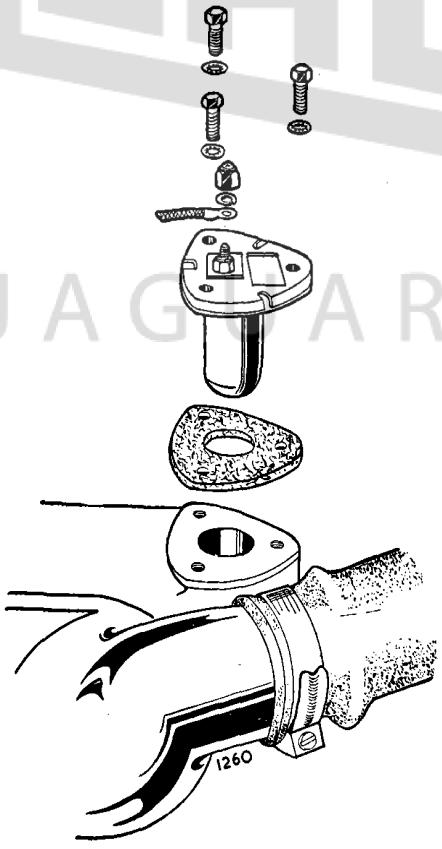


Fig. 18. Removal of the auxiliary starting carburetter thermostatic switch.

Refitting

Refitting is the reverse of the removal procedure. A new cork gasket must be fitted when the switch is replaced. If any water has been drained from the radiator or has escaped during the removal of the switch, the radiator should be topped up to the correct level.

THROTTLE CONTROL LINKAGE SETTING

If carburetters have been removed or throttle linkage has been disturbed particular attention must be paid to the setting adjustment of the control linkage.

To adjust proceed as follows :—

(i) Disconnect front carburetter coupling and rear carburetter throttle lever by releasing clamp bolts. Check that both butterflies are fully closed and that the rear carburetter coupling bolt is clearing manifold nut. With both carburetters fully closed retighten front coupling.

(ii) Unscrew intermediate throttle stop and push down on bell crank lever until centre " A " is $\frac{1}{16}$" (1.6 mm.) below a line from centre " B " to pivot centre (Fig. 19). When in this position screw down stop on to intermediate throttle lever and lock in position. Lock lever to carburetter spindle.

(iii) Ensure that when throttle is closed the intermediate lever does not foul petrol connection pipe. Open throttle fully and check that both carburetters are in the fully open position.

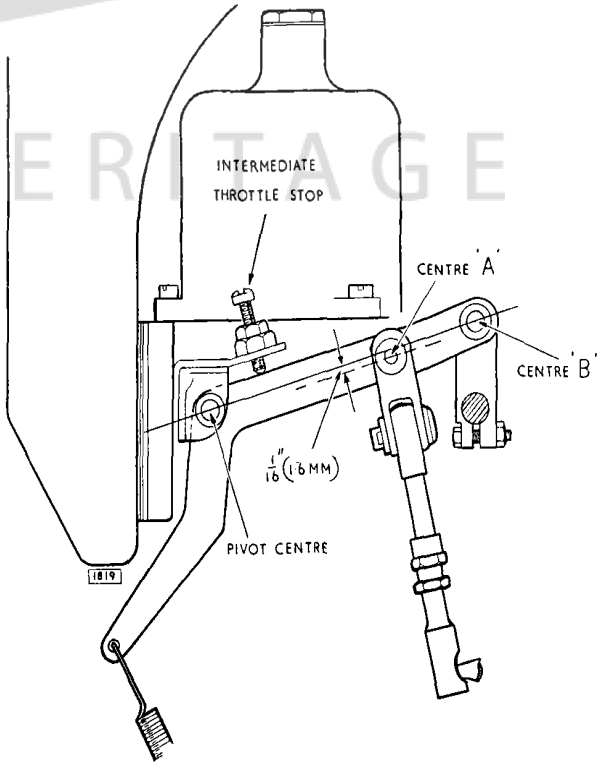


Fig. 19. Throttle control linkage setting.