SECTION C FUEL SYSTEM

SECTION C

FUEL SYSTEM

List of Illustrations:

FUEL SYSTEM.

Tank Capacity	- 18 or 23 gallons.
Fuel Delivery	- S.U. Twin Electric Pumps.
Air Cleaner type	- Mesh or Oil Bath.
Carburetter	
Silver Wraith)	
Silver Dawn)	- Stromberg, dual down-draught,
Bentley L.H.D.)	type AAV. 26M, or
Phantom IV)	Zenith, single down-draught type DBVC.42.
Bentley R.H.D.	Two S.U. carburetters.
Fuel Pumps	- Delivery pressure, carburetter, 1 lb./sq.in. (Min. at tick-over.)

STROMBERG JET DATA.

SILVER WRAITH - R.H. and L.H. drive.

A.C. Air Cleaner / Oil Bath Air Cleaner

	Sea Level to 4,000 ft.	Over 4,000 ft.	Sea Level to 3,000 ft.	3,000 ft. to 6,000 ft.	Over 6,000 ft.
Main Jets	.044*	130 cc*	.041*	.040*	.039*
Power Jet	No. 54	No. 54	No. 57	No. 57	No. 57
Idle Jet	No. 70	No. 70	No. 70	No. 70	No. 70
Idle air bleed	No. 60	No. 60	No. 60	No. 60	No. 60
Float needle seat	.101"	.101"	.101"	.101"	.101"
Accelerator pump capacity	16-20 cc's	16-20 cc's	16-20 cc's	16-20 cc's	16-20 cc's
Vacuum kick-gap	.125"	.125"	.125"	.125"	.125"

SILVER DAWN - R.H. and L.H. drive.
BENTLEY - L.H. drive.

A.C. Air Cleaner / Oil Bath Air Cleaner

	Sea Level to 4 000 ft.	Over 4,000 ft.	Sea Level to 3,000 ft.	3,000 ft. to 6,000 ft.	Over 6,000 ft.
Main Jets	.045*	.041*	.042*	.041*	.040*
Power Jet	No. 54	No. 54	No. 57	No. 57	No. 57
Idle Jet	No. 70	No. 70	No. 70	No. 70	No. 70
Idle air bleed	No. 60	No. 60	No. 60	No. 60	No. 60
Float needle seat	.101"	.101"	.101"	.101"	.101"
Accelerator pump capacity	16-20 cc's	16-20 cc's	16-20 cc's	16-20 cc's	16-20 cc's
Vacuum kick-gap	.125"	.125"	.125"	.125"	.125"

PHANTOM IV -

	A.C. Air Cleaner		Oil Bath Air Cleaner		
	Sea Level to 4,000 ft.	Over 4,000 ft.	Sea Level to 3,000 ft.	3,000 ft. to 6,000 ft.	Over 6,000 ft.
Main Jets	.046*				
Power Jet	No. 54				
Idle Jet	No. 66				
Idle air bleed	No. 52				
Float needle seat	.101"				
Accelerator pump capacity	16-20 cc's				
Vacuum kick-gap	.125"				

* denotes Broad Ring type.

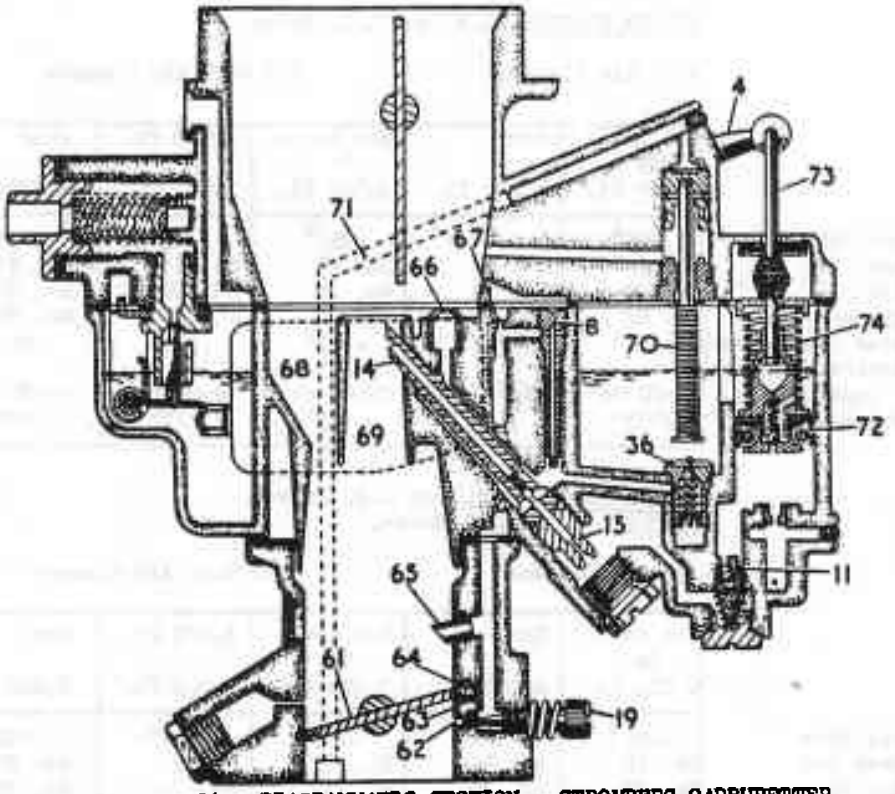


FIG. C1. DIAGRAMMATIC SECTION - STROMBERG CARBURETTER.

4. Lever accelerator pump.
8. Idle tube.
11. Pump check valve.
14. Main discharge tube.
15. Metering jet.
19. Idle valve screw.
36. Power by-pass jet.
61. Throttle valve.
62. Idle discharge hole.
63. First progression hole.
64. Second progression hole.
65. Secondary air bleed.

66. High speed air bleed.
67. Primary air bleed.
68. Outer choke.
69. Inner choke.
70. Vacuum piston spring.
71. Vacuum channel.
72. Accelerator pump piston.
73. Accelerator pump rod.
74. Duration spring, accelerator pump.

STROMBERG CARBURETTER ADJUSTMENT:

The carburetter is carefully adjusted to the engine before leaving the factory and the settings should not be altered unnecessarily.

There are two adjustments on the carburetter, one for the idling speed and one for the idling mixture. Both of these adjustments should be made together, and only when the engine is well warmed up.

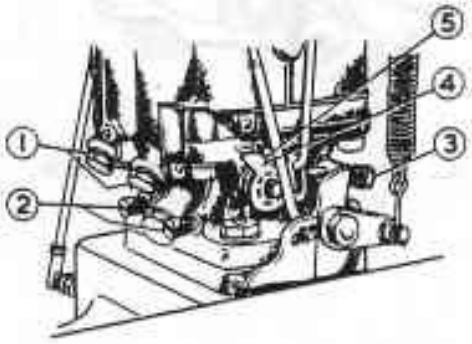


FIG. C2. CARBURETTER ADJUSTMENT.

1. Main jets.
2. Idling jets.
3. Throttle stop screw.
4. Choke control cam.
5. Fast idle cam.

(i) The throttle stop screw should be set so that the engine runs at approximately 350 r.p.m. The stop screw adjusts both throttle valves in unison, these being mounted on a common spindle.

(ii) Adjust each slow running mixture screw separately, to give the most even running. Each of these screws adjusts the mixture strength to the three, or four, cylinders supplied by each choke tube, turning the screw in weakens the mixture, and turning the screw out enrichening it. The approximate setting is 1½ turns back from the closed position. Operate these screws only with the fingers.

DIAGNOSIS OF FAULTS - (Stromberg Carburetter)

(1) Faulty running or misfiring - check ignition system, cleanliness and setting of plugs, ignition distributor condenser. Sufficiency of fuel in tank, cleanliness of strainers.

(2) Loss of maximum speed - check that throttle valves can be fully opened, see that power jets are free from obstruction.

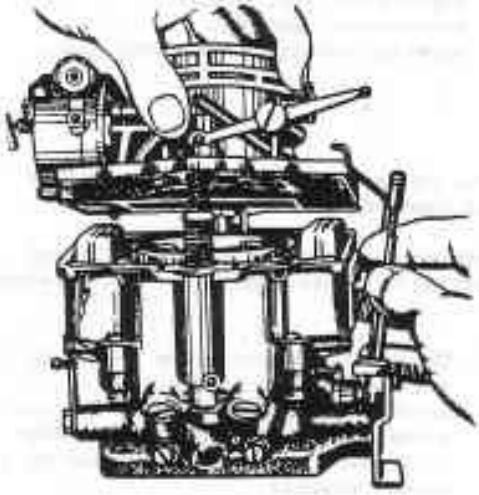
(3) Flat spot at small throttle opening - Adjust idling. If flat spot is still evident, examine idle discharge holes and pilot jets for stoppage.

(4) Flat spot at half throttle opening - check main jets and accelerator pump for stoppage.

(5) High fuel consumption - check fuel level in float chamber, see page C8.

NOTE: - During re-assembly, any damage to main body joint, permitting an air leak to vacuum passage (71, Fig.C1), will cause by-pass valve to be open and so allow excess fuel to pass at cruising speeds.

DIS-ASSEMBLY.



TG. C3. REMOVING AIR HORN.

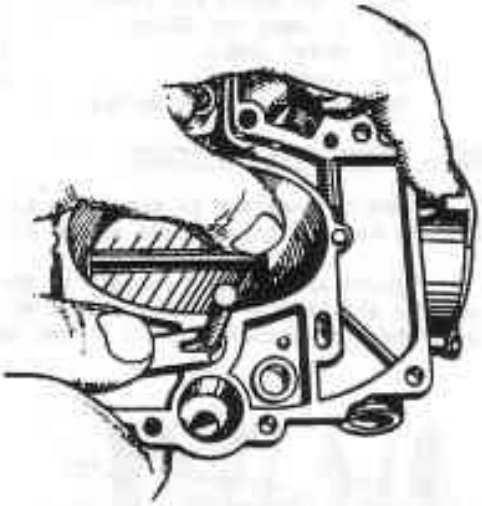
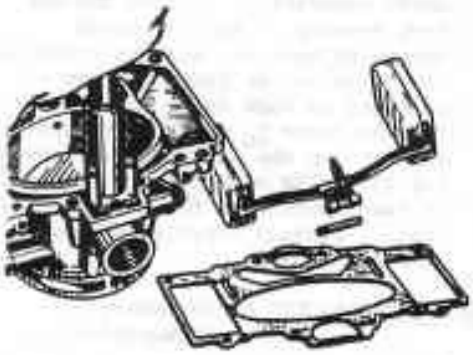


FIG. C4. REMOVING VACUUM POWER PISTON. (Tool No. T 24773.)



G. C5. REMOVING FLOAT NEEDLE
\LVE SEAT. (Tool No. T 20140.)

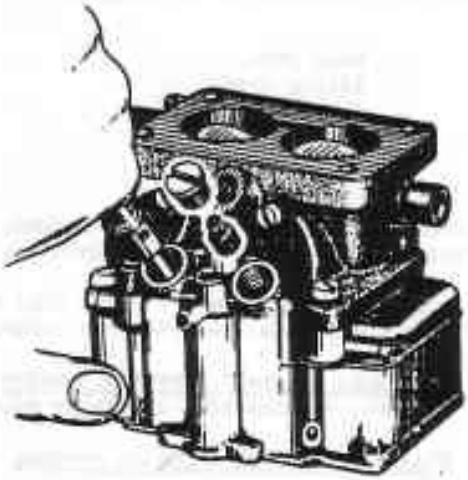
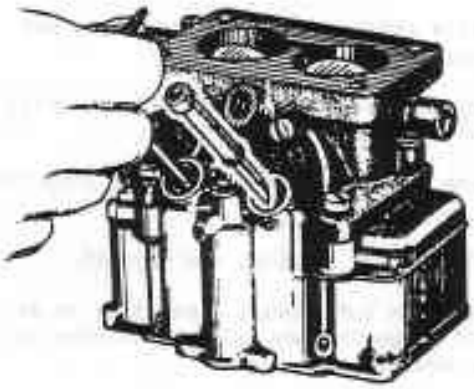


FIG. C6. REMOVING METERING JETS. (Tool No. T 24924.)



IG. C7. REMOVING MAIN DISCHARGE TUBE (Tool No. T 24967.)

DIS-ASSEMBLY. (Continued)

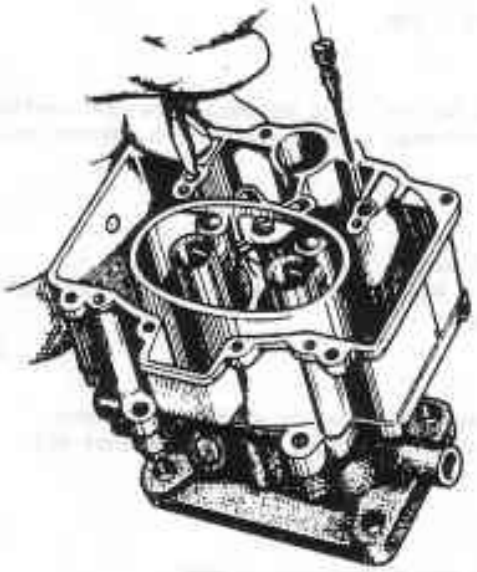


FIG. C8. REMOVING IDLE TUBES.

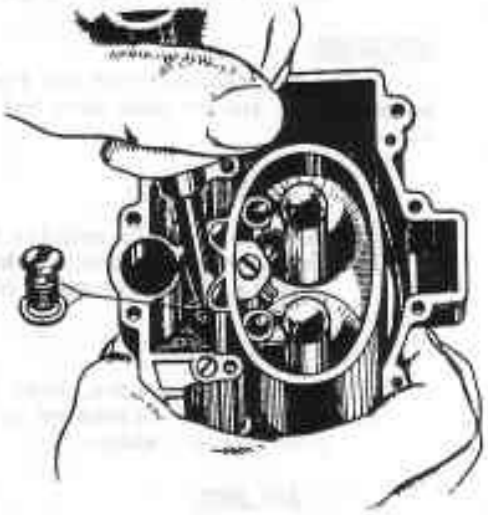


FIG. C9. REMOVING POWER JETS.

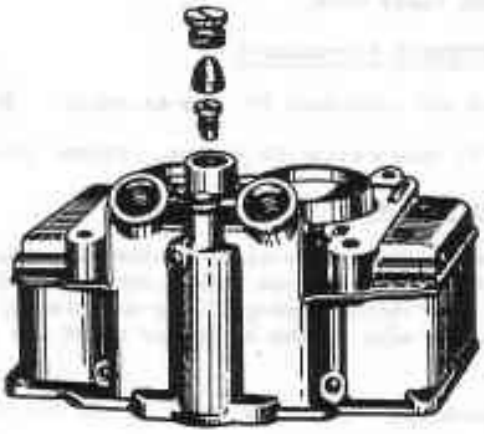


FIG. C10. CHECK VALVE, PLUG & STRAINER.

CARBURETTER DIS-ASSEMBLY (Stromberg).

Remove carburetter from engine.

(1) Remove air silencer.
(2) Disconnect fuel feed pipe.

(3) Disconnect throttle control from lever.
Disconnect lever from strangler valve spindle.
(4) Remove holding nuts and lift carburetter from manifold.

Dis-assembly:- See Figs. C3 - C10.

SERVICING.

Gum residue from the fuels may be found deposited on the needle valve assembly and the various jets and orifices. The recommended solvent is denatured alcohol.

Throttle body.

(1) Examine throttle spindle for wear.
(2) Examine casting for cracks. Remove any carbon or rust from throttle barrels with fine emery cloth.

Main body.

(1) Examine for cracks, bent flange surfaces or stripped threads.
(2) Inspect main discharge jets for bent tips, and ensure that all channels are clean.

Air horn.

(1) Inspect strangler valve stem for distortion or wear.
(2) Check floats are not punctured.
(3) Check vacuum power piston bore is not too badly worn for re-use.
(4) Check that kick piston moves freely in housing and that link pin is not too badly worn.

CARBURETTER RE-ASSEMBLY (Stromberg).

Reverse the procedure for dis-assembly. See Figs. C11 - C15.

To refit carburetter to engine, reverse the dismantling procedure.

Automatic Starting System.

The two calibrated settings of the automatic starting system are the setting of the thermostat and the actual strangler valve opening by the vacuum piston. This, the "vacuum kick-gap", is measured by inserting gauge of specified diameter between the edge of the strangler valve and the side of the carburetter body.

The "kick-gap" is set to .125" by the manufacturers.

To check thermostat, remove from engine, and allow to obtain room temperature, which should be 70°F. If this temperature is unobtainable, set thermostat one notch rich for every 5° above 70° and, conversely, one notch lean for every 5° below 70°F.

Refer to Fig. C16, unhook thermostat spring from prong (F), loosen locking screw (B) and rotate the indicator point (D) to the "O" (Zero mark E) on the plate (G). In this position, the hook on the thermostat spring should come flush with the prong (F) of the indicator, the lever (A) being held up against the stop. The pointer (D) should then be revolved until it is opposite

RE-ASSEMBLY.

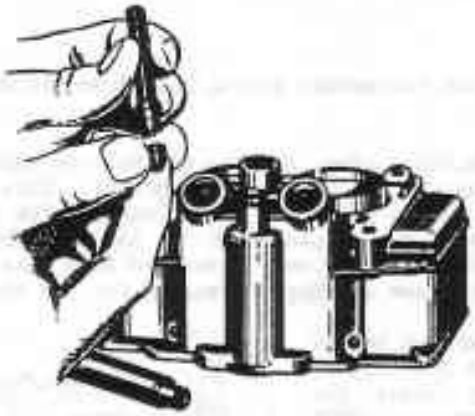


FIG. C11. INSTALLING CHECK VALVE STRAINER (1). (Tool No. T 25097).

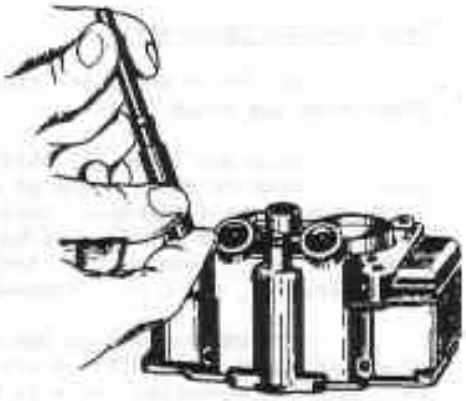


FIG. C12. INSTALLING CHECK VALVE STRAINER (2).

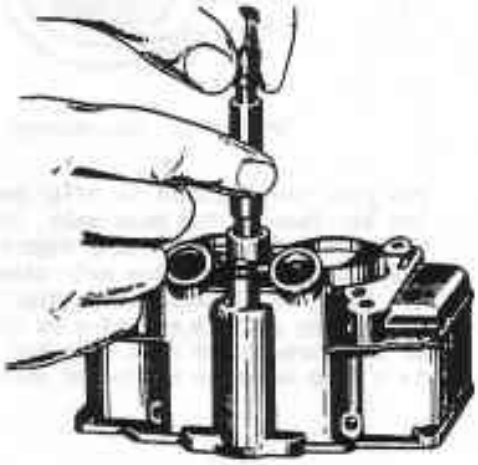


FIG. C13. INSTALLING CHECK VALVE STRAINER (3).

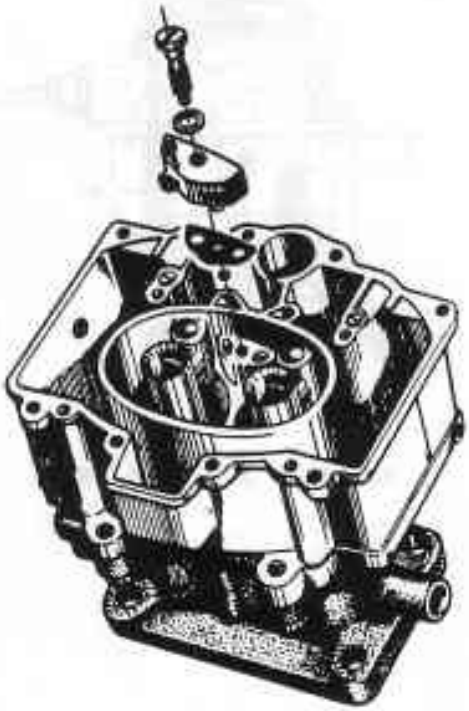


FIG. C14. ASSEMBLY OF ACCELERATOR PUMP NOZZLE.

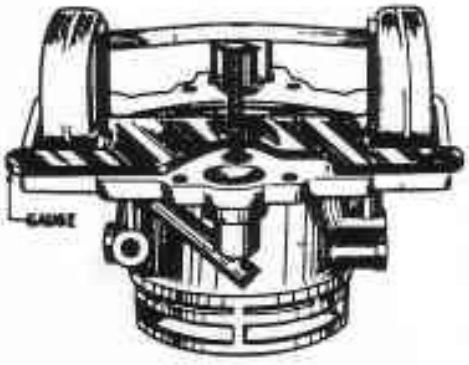


FIG. C15. CHECKING FLOATS. (Tool No. T 24971).

the centre dot (C), stamped on the plate, indicating the correct tension or setting, rich of the zero point. (This dot is 10 notches rich of the zero point.)

Recalibrating Thermostat.

If, after the above check, the thermostat spring hook does not come flush with the prong (F):-

With the lever (A) held up against stop, revolve the pointer cage (D) until the hook on the thermostat spring comes flush with the prong. This will bring pointer to a different position and so provide a fresh location for the zero point. This should then be stamped on the plate and the old mark obliterated. Number off 10 notches on the rich side of the new zero point and mark this with a new centre dot, which will represent the new setting of tension for the thermostat.

The rod connecting the thermostat to the strangler valve, should be so adjusted for length, that when the strangler valve is fully closed, the lever (A) on the thermostat is approximately .050" off the stop pin (B).

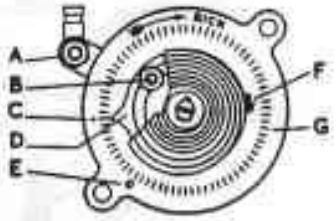


FIG. C16. THERMOSTAT.

Checking Fuel Level in Float Chamber.

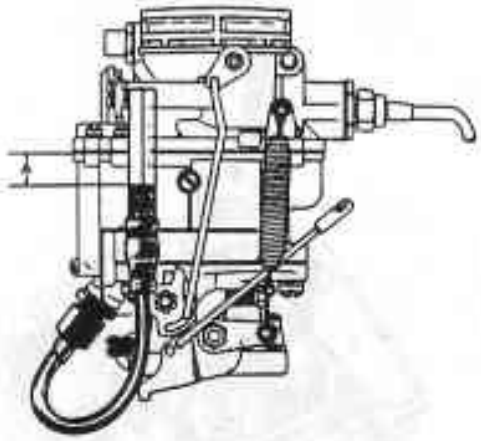


FIG. C17. FUEL LEVEL CHECK.

The fuel level should be 9/16" below the top face of the main body, and is best checked by connecting sighting tube after removing the main discharge jet plug, as illustrated in Fig. C17. A sighting plug is provided on the side of the carburetter main body but this is a less accurate method of checking.

ZENITH, TYPE D.B.V.C.42 CARBURETTER.

JET DATA.

	A.C. Air Cleaner.			Oil Bath Cleaner.		
	Sea Level to 3,000 ft.	3,000 ft. to 5,000 ft.	5,000 ft. to 8,000 ft.	Sea Level to 3,000 ft.	3,000 ft. to 5,000 ft.	5,000 ft. to 8,000 ft.
Venturi	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"
Main Jet	.060"	.058"	.056"	.058"	.056"	.054"
By-pass Jet	.054"	.054"	.054"	.050"	.050"	.050"
Pump Jet	No.70	No.70	No.70	No.70	No.70	No.70
Vacuum Piston Setting	.207"/.202" .781"/.718"			.207"/.202" .781"/.718"		
Petrol Level 9' Head	Below hole face.			Below hole face.		
Thermostat	12 notches rich.			12 notches rich.		

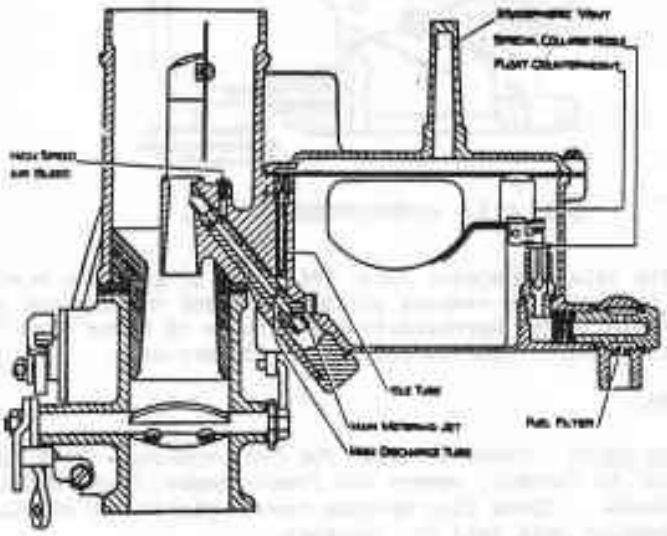


FIG. C18. CARBURETTER SECTION.

ZENITH CARBURETTER ADJUSTMENT.

The carburetter is carefully adjusted to the engine before leaving the factory and the settings should not be altered unnecessarily.

There are two adjustments on the carburetter, one for idling speed and one for the idling mixture. Both of these should be made together, and only when the engine is well warmed up.

(1) The throttle stop screw should be set so that the engine runs at approximately 350 r.p.m.

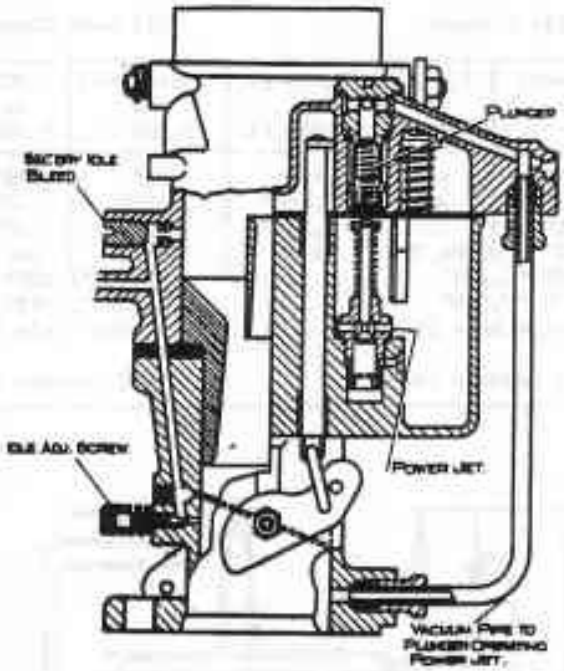


FIG. C19. CARBURETTER SECTION.

(2) Adjust the idle adjustment screw (Fig.C19) to give the most even running. Turning the screw IN weakens the mixture, and turning the screw OUT enrichens it. The approximate position is 1½ turns back from the closed position. Operate screw with fingers only.

DIAGNOSIS OF FAULTS.

For loss of maximum speed - Check throttle for full opening, check by-pass jet for stoppage. In order to examine, remove the float chamber cover and screw out the by-pass valve complete. Check also by-pass vacuum piston for sticking in the "UP" position. Examine main jets for stoppage.

Flat spot at small throttle opening - Adjust idling to give more regular engine rhythm. If flat spot is still evident, examine idle discharge holes and idle tube for stoppage.

Flat spot at half throttle - Examine main jet for stoppage. Check accelerator pump for stoppage.

High fuel consumption - Check jets and float level for setting, which should be ¾" from float cover facing. Level should be checked with the engine idling and vehicle on level ground. If setting correct, check for sticking or leaking by-pass valve, which will allow flow of fuel at part throttle. Check economiser valve for sticking, also, clean and check ball valve at base of pump cylinder, as if not seating, petrol will issue from pump jet at all times. Check tightness of vacuum piston plug on float chamber cover.

Note: Important:- The external vacuum connection unions must be tight, as leakage at this point, with the consequent partial loss of vacuum, will cause the by-pass valve to open too early.

DIS-ASSEMBLY.

Removal from Engine.

(i) Remove the air silencer.
(ii) Disconnect the fuel feed pipe from the union.
(iii) Disconnect the throttle control lever from the cam assembly.
(iv) Disconnect the strangler control rod.
(v) Remove the two retaining nuts and lift off the carburetter.
(vi) Remove retaining nuts and withdraw thermostat from housing in manifold.

Dismantling Carburetter Body.

(i) Disconnect the vacuum pipe union from the float chamber cover.
(ii) Using a 7/16" spanner, loosen the economy vacuum piston plug.
(iii) Remove the three setscrews and take off the float chamber cover. If in good condition, the gasket should be preserved; if not, it must be replaced.
(iv) Remove the economy vacuum piston assembly from the float chamber cover (Fig.C20).
(v) Unscrew the float retaining pin, remove float and withdraw the needle valve.
(vi) Using a ¼" box spanner, remove the needle valve seating.
(vii) Having previously disconnected the link, lift out the accelerator pump (Fig.C21).
(viii) Using a suitable box spanner, remove the by-pass valve (Fig.C22).
(ix) Using a box spanner, remove the pump feed valve.
(x) Using a box spanner, remove the pump discharge ball valve (Fig.C23).

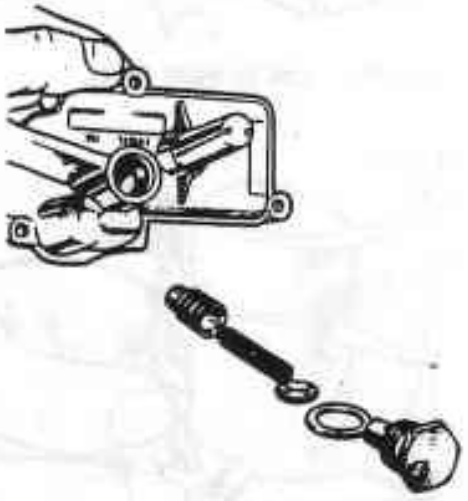


FIG.C20. ECONOMY PISTON ASSEMBLY.

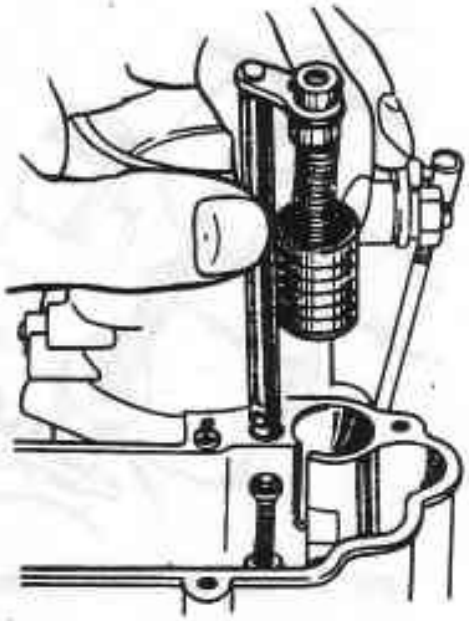


FIG.C21. ACCELERATOR PUMP.

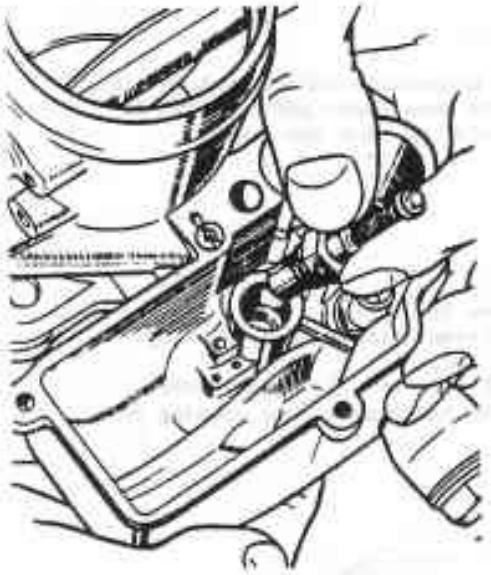


FIG.C22. THE BY-PASS VALVE.

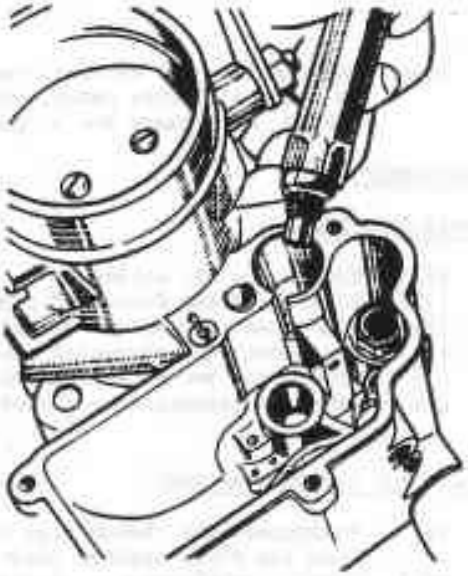


FIG.C.23. PUMP DISCHARGE BALL VALVE

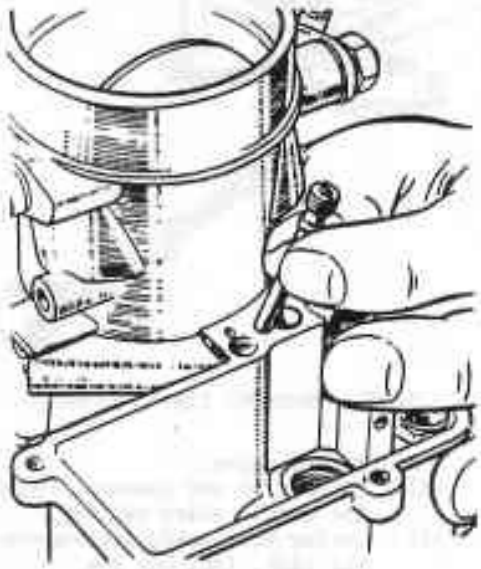


FIG. C.24. THE IDLE TUBE.

(xi) Unscrew the pump jet plug and remove the jet.

(xii) Unscrew and remove the idle tube (Fig.C24).

(xiii) Remove the main jet plug and washer with a 5/16" spanner.

(xiv) Using the special key, withdraw the metering jet.

(xv) Using the special tool, withdraw the main discharge jet. Unless the special tool is available, no attempt must be made to remove the jet, never attempt to drive it out. It is, however, rarely necessary to remove the jet, and should be undertaken only in cases of blockage or damage (Fig.C25.)

FIG.C25. THE MAIN DISCHARGE JET.

(xvi) The high speed bleed may be removed and replaced, after unscrewing, with a small greased screwdriver.
(xvii) Unscrew and withdraw the idle discharge plugs.
(xviii) Separate the throttle and main bodies, then remove the large venturi. Care must be taken that the thick washer is undamaged. The cam rod should be disconnected and it should be specially noted that the correct way to hold, is to support the strangler lever with the fore-finger, thus preventing damage to the pick-up pin in the cam assembly.

Dismantling Strangler.

(i) Holding the strangler lever in the manner already indicated, remove the cam lever rod from the valve lever.
(ii) Remove the two securing screws in the strangler butterfly valve and remove it from the spindle.
(iii) Remove pinch bolt screw, spring, distance piece and plastic washer, taking care not to damage the plastic washer.
(iv) Remove the spindle. It should be noted that the cast iron bushes inserted in the die casting are not renewable.

Inspection and Cleaning.

Inspect and clean all parts thoroughly. Gum deposits from the petrol may be removed by soaking in de-natured alcohol and then scrubbing with a stiff bristled brush.

When cleaning, on no account pass a wire or hard material through the jet orifices. These orifices have been carefully calibrated, and the slightest alteration of shape or size may interfere with the efficiency of the carburetter; use a stiff bristled brush and compressed air.

RE-ASSEMBLING.

Re-assembling the carburetter is the reverse of the dismantling instructions, except for the following points:-

(i) Ensure that all washers are in good and undamaged condition.
(ii) The main discharge jet must be replaced with the groove as indicated in Fig.C25.
(iii) The vacuum pipe must be re-attached to the float chamber cover before the cover is secured with the three screws.

The Strangler.

(i) Replace the spindle, screw the butterfly into position, but do not tighten the screws.
(ii) Slacken the pinch bolt on the strangler lever and ease it a little towards the end of the spindle.
(iii) Replace the plastic washer, distance piece and spring at the other end of the spindle.
(iv) Adjust the position of the strangler lever on the spindle by tapping gently to obtain the correct end play (i.e. .003" - .006"), then tighten the clamping bolt.
(v) Hold the strangler valve in the closed position to centralise it, and tighten the two securing screws.
(vi) Re-attach the cam lever rod, supporting it firmly (as already described) when tightening, to avoid damage to the cam assembly.
(vii) Finally, test that the movement is free.

Checking and Adjusting the Automatic Choke.

The adjustment of the "Automatic Choke" portion of the carburetter consists of six mechanical settings. No other adjustment on the engine is necessary.

These adjustments consist of the following:-

1. Thermostat setting.
2. Thermostat lever and setting pin.
3. "Vacuum kick" gap.
4,5. The position of the fast idle stop screw on the cam with the strangler (a) closed for cold starting, and (b) in the "vacuum kick" position.
6. The fast idle throttle gap.

1. The Thermostat Setting.

The thermostat spring is sensitive to variation of temperature, therefore the setting check must be made in a room with a temperature of 70°F. The thermostat should be left for an hour before setting, in the room, to adjust itself to this temperature.

(i) Loosen nut R (Fig.C.26).
(ii) Unhook the end of the spring from the retaining prong S.
(iii) With the spring free, hold the lever T against the check pin U in the closed position. Note that the figure shows a "Right-hand" thermostat.
(iv) Rotate the prong S, until it just touches the outside of the spring loop.
(v) Check that the pointer V is now opposite "0" mark.
(vi) As a result of mishandling, it may be necessary to remove the old "0" mark and to make a new one opposite the pointer.
(vii) Check and reposition, if necessary, the position of the centre dot marking the tension setting.
If the zero point has been altered, so also must the setting point be altered. The setting must be made to the specification which is given as a number of notches rich (see page 9).
(viii) Slip the loop of the spring over the prong S.
(ix) Turn the cage until the pointer V is opposite the centre dot.
(x) Tighten the nut R.

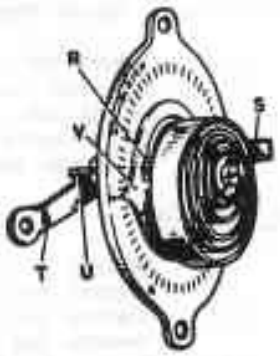


FIG.C26. THE THERMOSTAT.

2. The Thermostat Lever and Setting Pin.

(i) Check that the thermostat rod ball joint is engaged in the correct hole in the strangler spindle lever, i.e. the centre hole.
(ii) Hold the strangler valve in the fully closed position.
(iii) Check the gap between the thermostat lever and the setting pin with a drill shank of the specified size, i.e. .09" - .12", 42/43 drill size (Fig.C27).
(iv) If the gap is incorrect, adjust the ball joint thread to the correct gap size. The ball joint must be disconnected from the strangler, before making this adjustment.

3. Checking the "Vacuum Kick" Gap.

(i) Remove the grub screw.
(ii) Insert a piece of stiff wire into the grub screw hole, lightly holding the strangler towards the closed position, press the vacuum piston to its stop screw.
(iii) Check that the fast idle now rests on the lowest step of the cam.
(iv) Check the vacuum kick gap between the top of the strangler valve and the body with a drill of the specified diameter (see Fig.C28.).

4,5. Adjust the Fast Idle Stop Screw on the Cam and the "Vacuum Kick" Gap.

(See also "The Fast Idle Throttle Gap", page C18.)

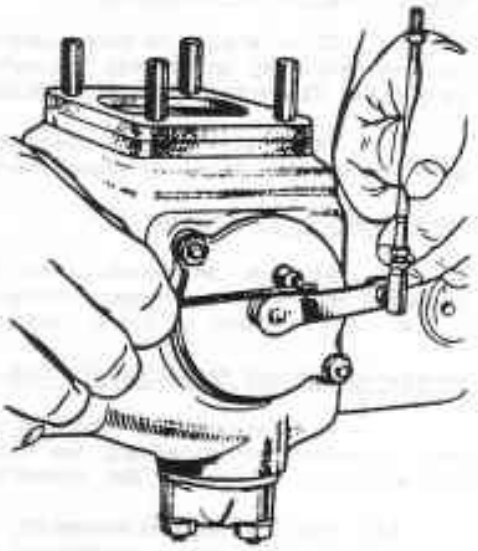


FIG. C.27. CHECKING GAP - THERMOSTAT LEVER AND CHECKING PIN.

It should be noted that, with the strangler fully closed, the fast idle stop should rest on the middle step of the cam.

With the strangler opened to the "Vacuum Kick" position, the stop screw should rest on the lowest step of the cam.

(i) If the "Vacuum Kick" gap is correct - The position of the fast idle stop screw on the cam may be adjusted by bending the stop tag on the cam lever, as required, with a pair of pliers or a screwdriver (Fig.C.30).
Remember that when the strangler valve is opened to the "Vacuum Kick" position, the stop screw must rest on the lower step.
(ii) If the "Vacuum Kick" gap is incorrect - Try to adjust it without disturbing the vacuum kick piston stop pin. If possible, adjust the gap by twisting the left and right-hand threaded cam rod with a pair of pliers.

Then check the position of the fast idle stop screw and, if necessary, adjust as described previously. If adjustment, as described in 3 No.(ii), is found to be impossible, then the vacuum piston assembly must be removed.

Dismantling Vacuum Piston Assembly.

(a) Remove the two screws securing the cam plate.
(b) Swing the cam assembly clear without unlinking the cam rod. This must be done before the vacuum piston assembly is unscrewed, or the pick-up lever will foul the piston and prevent it being turned.
(c) Using a large broad ended screwdriver, unscrew the vacuum cylinder and piston of the carburetter.
(d) Separate the piston from the cylinder (Fig.C29.).
(e) Unscrew the piston stop pin with a pair of long-nosed pliers.
(f) Clear the lead sealing plug from the end of the pin and interior screw threads.

Dismantling the Cam Assembly.

If it should be found necessary to dismantle the cam assembly, this can be done easily by unscrewing the nut and withdrawing the stem. Check the pick-up pin for distortion due to maladjustment.

It is essential to observe the sequence of dismantling and the relative position of each part, to ensure correct re-assembly.

Re-assembling the Piston.

Replace the vacuum piston assembly, ensuring that the thin copper washer is in place under the head of the cylinder.

Re-Assembling and Replacing the Cam.

In re-assembling the cam, care must be taken when attaching the cam spring. The method of attachment and assembly are:

(a) Replace the cam assembly, ensuring that the pick-up pin is correctly positioned. Care must also be taken to ensure that the pick-up lever is engaged in the slot of the piston.
(b) Replace the two securing set-screws in the cam plate.
(c) Adjust the vacuum kick piston stop pin until the correct vacuum kick gap is obtained (Fig.C28).

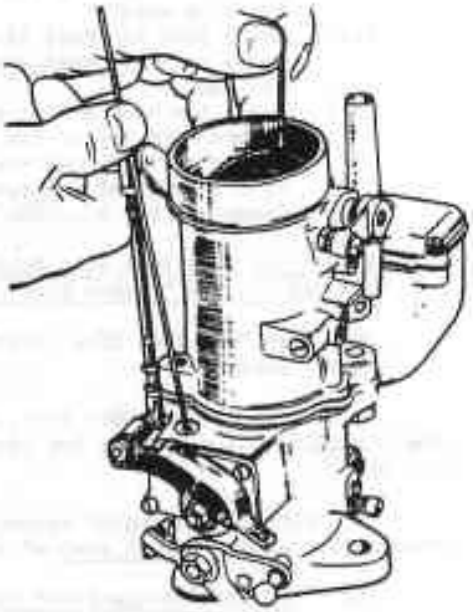


FIG. C28. CHECKING VACUUM KICK GAP.

FIG.C29. VACUUM PISTON & CYLINDER.

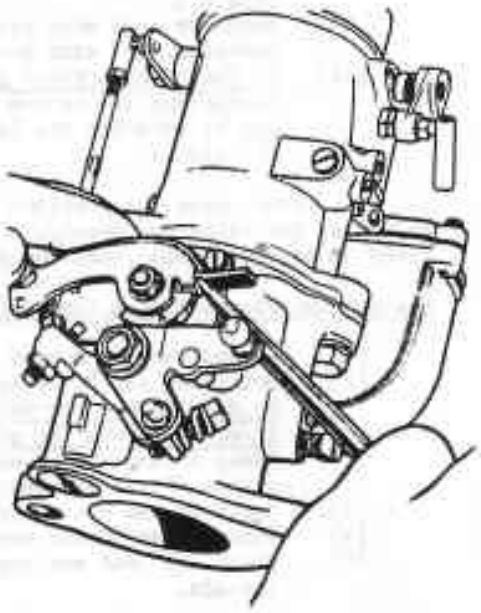


FIG.C30. ADJUSTING CAM LEVER STOP TAG.

(d) Invert the carburetter, and drop a lead shot into the stop pin hole. Seal with a sharp blow on a thin punch, this locks the stop pin in position and seals it.

6. The Fast Idle Throttle Gap.

(i) With the strangler valve held in its fully closed position, check that the fast idle screw rests on the centre step of the cam.

(ii) Check that the throttle valve is open sufficiently to pass a drill .031" - .033" dia., between the butterfly and the throttle body. It should be noted that the gap must be gauged at its widest point, i.e. at the idle discharge holes.

(iii) If necessary, adjust the gap by the fast idle stop screw.

S.U. CARBURETTERS - MANUAL CONTROLLED TYPE.

JET DATA.

S.U. Carburetter - H.4, 1½" dia. choke, 3.500" bore engine. Carburetter has 2 bolt fixing.

Jet size - .100".
Jet needle - L.B.1 Bentley air cleaner.
- S.C. A.C. air cleaner, commencing chassis B.2.BH.
- S.F. Oil bath air cleaner.

S.U. Carburetter - H.6, 1¾" dia. choke, 3.500" bore engine. Carburetter has 4 bolt fixing. Commencing Chassis B.83.H°.

Jet size - .100".
Jet needle - S.J. A.C. air cleaner.
- S.F. Oil bath air cleaner.

S.U. Carburetter - H.6, 1¾" dia. choke, 3.625" bore engine. Carburette has 4 bolt fixing.

Jet size - .100".
Jet needle - S.P. A.C. air cleaner.

ADJUSTMENT - S.U. CARBURETTERS.

There are only two adjustments on the carburetter, the jet adjusting nut for the mixture, and the idle adjusting screw for the idling speed. Both these should be carried out together and with the engine well warmed up.

(1) Mixture - the jet adjusting nut acts as a "stop" against which the jet head should bear, except when jet is lowered for cold starting. The adjustment consists of varying the position of this "stop" and so varying the amount by which the jet is raised for normal running.

If the engine has a constant uneven beat (hunting), this is due to a rich mixture. If the exhaust note is irregular and splashy, the mixture is too weak.

(2) Throttle - the correct idling speed is obtained by adjusting the throttle stop screw.

As two carburetters are fitted, correct synchronisation is required.

Synchronising throttles - This is mostly an aural check and largely a matter of trial and error. The air intake must be removed to "listen in" to the sound of the air flow through the carburetters.

(1) Free the connecting shaft and fit a temporary throttle stop to the rear carburetter, and with the engine well warmed up and running at a fast tick-over (500 - 600 r.p.m.), adjust each carburetter by means of the throttle stop screws, "aurally" and for "equal depression" of the pistons.

(2) Slightly advance the opening of the rear carburetter and nip up the pinch bolt on the connecting shaft. Re-check and re-adjust if necessary to correct. Afterwards, remove rear throttle stop screw and adjust as necessary on front carburetter for correct idling.

SERVICING. - S.U. Carburetters.

Gum residue from the fuels may cause sticking of needle or piston, this should be removed by cleaning with a solvent, such as denatured alcohol.

Hydraulic Suction Piston Damper.

This device, located in the hollow piston rod, is attached to the oil cap nut; it consists of a plunger with a one-way valve and its function is to give a slightly enrichened mixture by preventing the piston from rising unduly quickly on acceleration. The only attention necessary is to keep it supplied with thin oil.

Centring of Jet - S.U. Carburetter.

Should it be essential to remove the jet, this can be done by unscrewing the jet holding screw. It must be understood that the needle is very nearly as large as the jet, and yet must not touch it. Therefore, careful assembly is needed when centring jet to needle.

First disconnect jet head from jet operating lever. Withdraw jet completely and remove adjusting nut and spring. Replace nut without spring and screw up to highest position. Next, feel that piston is perfectly free by lifting with finger. If not, slacken jet screw and manipulate lower part of assembly, including the projecting part of the bottom half jet bearing, adjusting nut and jet head. This assembly should now be slightly loose. The piston should now rise and fall quite freely as the needle is now able to move the jet into the required central position. Tighten the jet screw and check that piston is now quite free, if not, slacken off and repeat operation. When complete freedom of piston is achieved, remove jet adjusting nut and jet, replace spring and screw back to its original position.

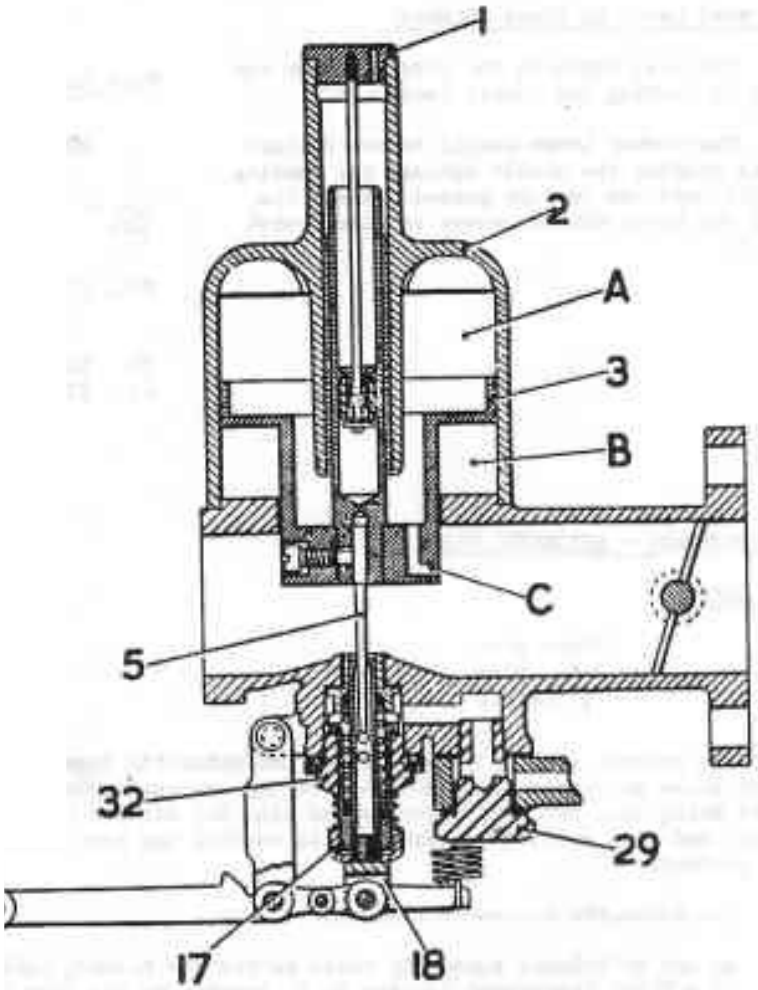


FIG. C31. DIAGRAMMATIC SECTION - S.U. CARBURETTER.

1. Hydraulic damper rod and cap.
2. Automatic air valve cylinder.
3. Suction disc.
5. Jet needle.
17. Jet adjusting nut.
18. Jet head.
29. Float chamber retaining bolt.
32. Jet holding screw.
A. Upper side of piston (Under depression).
B. Lower side of piston (To atmosphere).
C. Connecting channel to A.

Checking Fuel Level in Float Chamber.

The fuel level in the float chamber can be varied by bending the forked lever (43).

The forked lever should be set so that when it is holding the needle against its seating, a 7/16" dia. rod can just be passed between the lever and the float chamber cover as illustrated in Fig.C.32.

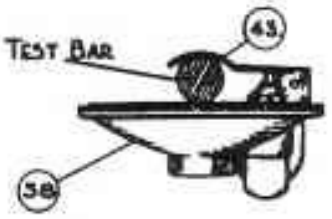


FIG. C32. CHECKING FLOAT LEVEL.

38. Float chamber cover.
43. Float lever.

S.U. CARBURETTERS - AUTOMATIC TYPE.

JET DATA.

Choke size - 1¾".
Jet size - .100".
Jet needle - S.H.

The general working principles of the automatic type carburetter are similar to those as previously described for the non-automatic type. The main difference being that the hand throttle and also the mixture control has been eliminated, and that an electro-thermostatic control has been incorporated for starting purposes.

The automatic system consists of:-

(1) An out of balance butterfly valve in the air intake, indirectly coupled to a "kick diaphragm" located in a housing on the side of the air intake. This diaphragm is subject to induction depression by means of a connecting pipe from the diaphragm housing to the induction manifold.

(2) An electro magnet wired in parallel in the starter relay circuit, which holds the butterfly in the closed position for cold starting.

(3) A fast idle cam connected by a rod to the butterfly spindle.

(4) A thermostatic coil coupled to the butterfly valve and subject to engine coolant temperature.

OPERATION.

Before attempting to start, the accelerator pedal must be depressed in order to release the fast idle cam and allow the thermostatic spring to close the butterfly. On releasing the pedal, the throttle opening becomes greater than for normal idling, as the extra stop is resting on the fast idling cam. In cases of starting under low ambient temperature conditions, the accelerator should be held depressed, about half of normal travel, whilst the starter button is operated.

Pressing the starter button causes the electro-magnet to hold the butterfly in the closed position. When the engine fires, the button is released, the magnet ceases to hold the butterfly closed and the induction pipe depression operates on the kick diaphragm to move the loose lever on the butterfly spindle, the lever opening the butterfly to a predetermined amount.

As the engine warms up, the thermostatic spring loses tension and the butterfly opens; but prior to this, the depression, acting on the kick diaphragm, is such that the diaphragm can hold the butterfly open against the thermostatic spring for the drive away. Further depressing the accelerator pedal in driving away, causes the fast idle stop to move away from the cam; the air flow passing the off-set butterfly, assisting in opening for any engine requirements more than a fast idle.

Certain chassis in RT, RS and SR series may suffer from flooding of carburetter when starting from cold, an over-ride has been incorporated on later productions whereby, when the accelerator pedal is fully depressed, the choke valve is mechanically opened by trip levers. Requisite parts for this modification are available from the London Service Station.

ADJUSTMENT:

(Before installing carburetter in position.)

(1) With the butterfly closed, a radial clearance of .010" is required between the pin (1, Fig.C33) and the pick-up lever (2), adjust by means of washers placed on kick diaphragm spindle.

(2) Fit the diaphragm assembly and adjust the kick-gap to .090", see Fig.C34.

(3) With the butterfly closed, adjust the air gap between the lever (1) and the solenoid yoke, to .002"/.006" by means of shims (Fig.C35). It is essential that the faces are parallel, to ensure magnetic flux density.

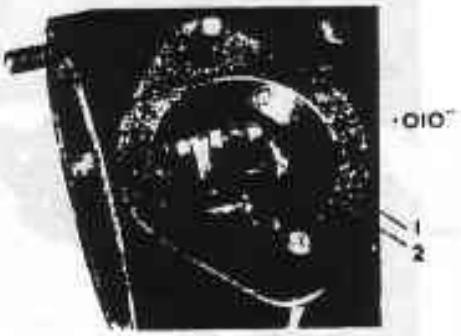


FIG.C33. PICK-UP LEVER CLEARANCE.

1. Lever.
2. Pin.

FIG.C34. KICK DIAPHRAGM ADJUSTMENT.

(With the carburetters installed on engine.)

1) Fit butterfly body complete to air intake and connect depression pipe between kick diaphragm and induction pipe.

2) With front carburetter throttle fully closed, tighten the coupling pinch bolt to give .098" clearance between the fast idle cam and the cam lever (Fig.C36); the cam adjusting screw hole should be central with cam face. Hold the rear carburetter throttle closed and tighten the rear coupling pinch bolt.

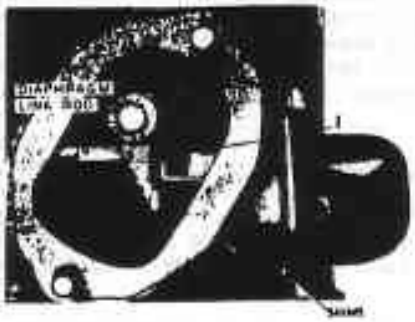


FIG.C35. SOLONOID YOKE ADJUSTMENT.

IG.C36. FAST IDLE CAM AND LEVER ADJUSTMENT.

(3) Fit thermostat unit.

(4) Screw in throttle stop ½ turn. Fit screw (1) and locknut to lever (1A, Fig. C.37). With screw resting on fast idle cam (3), adjust screw to give .030" clearance between throttle stop screw and stop lug.

(5) With butterfly closed, adjust rod (1, Fig.C38) to give 1/32" clearance between thermostat lever and stop (2 and 3). Adjust fast idle pick-up rods to butterfly.

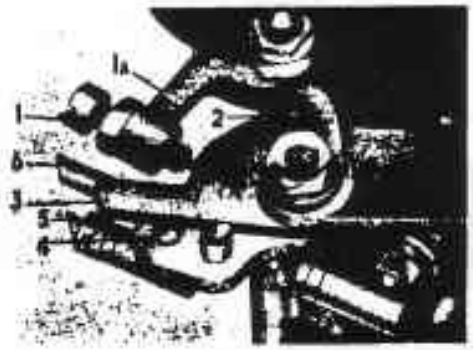


FIG.C37. THROTTLE STOP ADJUSTMENT.

1. Fast Idle Adjusting Screw.
2. Fast Idle Cam Stop.
3. Fast Idle Cam.
4. Fast Idle Cam Link.
5. Rod, Butterfly to Fast Idle Cam.
6. Rod, Thermostat to Butterfly.

FINAL TEST ADJUSTMENT.

To alter jet adjustment, remove cap nut from carburetter jet, and rotate jet holding screw, upwards to weaken mixture and downwards to strengthen. With the engine warm, finally set the mixture for idling.

FIG.C38. THERMOSTAT LEVER ADJUSTMENT.

Allow the engine to cool, and readjust the fast idle cam screw (1, Fig.C37) to obtain .030" clearance between throttle stop and lug. Ensure consistent setting as a difference of .002"/.003" makes a difference to starting speed of engine. Adjustment of the fast idle cam pick-up rod (5) assists during the warming up period, the length of the rod alters the relative positions of the fast idle screw to the fast idle cam.

THERMOSTAT.

Any checking and resetting of the thermostat spring must be done at a room temperature of 68°F, and the unit should be left for two hours in this temperature to stabilise.

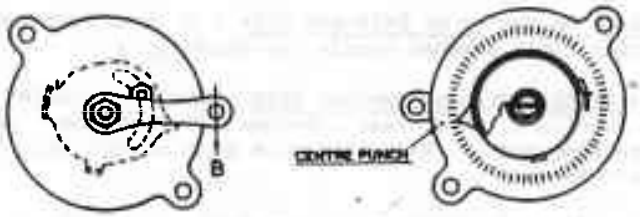


FIG.C39. BI-METAL COIL ADJUSTMENT.

The coils are pre-set to a loading of 200 - 205 grammes. This weight should just move the lever clear of the stop in the direction of arrow 'B', Fig.C39.

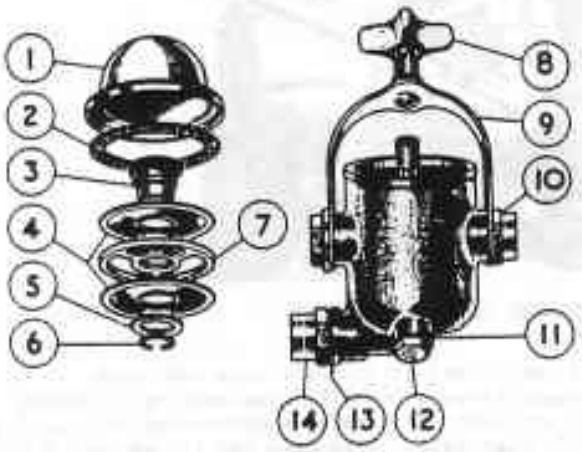
Since the coils are temperature sensitive, they must not be handled whilst adjusting.

FUEL FILTERS.

The main fuel filter mounted at the rear of the frame and close to the outlet from the fuel tank, is provided with two circular gauzes located above a settling sump, Fig.C40. Fuel passes upwards through these gauzes and dirt settles on their lower faces and in the sump.

Service by dis-assembling and cleaning gauzes in petrol, and clean out sump.

A small gauze filter is also fitted in the inlet union to each carburetter. These should be periodically removed and serviced.



1. Cover.
2. Cork washer.
3. Knurled nut.
4. Gauzes.
5. Washer.
6. Spring clip.
7. Distance piece.
8. Wing nut.
9. Stirrup.
10. Inlet union.
11. Aluminium washer.
12. Drain plug.
13. Aluminium washer.
14. Outlet union.

FIG.C40. MAIN FUEL FILTER.

FUEL PUMPS.

Twin fuel pump units are fitted, each pump works independently of the other, but both deliver fuel to a common chamber.

Servicing.

(1) Restriction in System on Delivery Side - if pump functions, check carburetter float chamber needle for sticking.

(2) Restriction in System on Suction Side - disconnect inlet pipe line, if pump functions, check rear strainer and pipe line. Also, check filter in pump body. Restriction on suction side will cause pump to become overheated.

(3) Failure of Electric Supply - if pump does not function, check electric supply by connecting 12 volt bulb between supply lead and pump body.

(4) Pump Valves Stuck to Seating - Unlikely unless car has been laid up for considerable time, remove valves, clean and replace, smooth sides downwards.

(5) Faulty Pumping Unit - disconnect and check points and flexible connections. Clean points if necessary.

(a) To remove diaphragm assembly, remove magnet housing complete with diaphragm assembly. Unstick diaphragm from flange of housing and unscrew anti-clockwise. Remove brass rollers and check for "flats" on spherical edges, renew if worn.

(b) To re-assemble and adjust diaphragm, slacken off spring blade retaining screw so that no pressure is exerted on tungsten points on outer rockers. (If this is not done, diaphragm cannot be correctly set.)

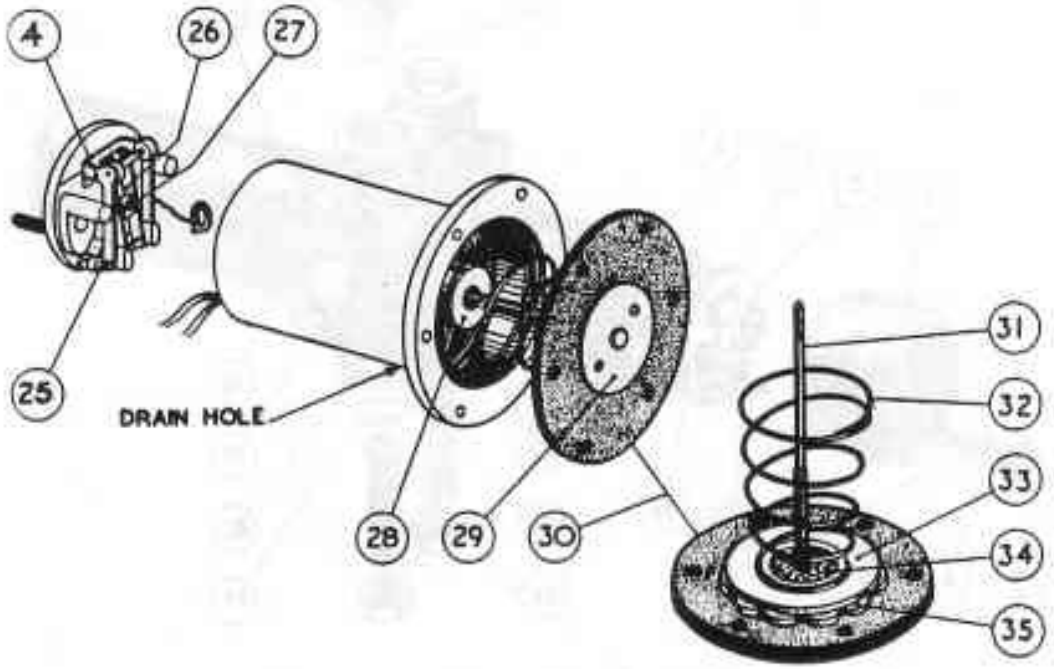


FIG.C42. CONTACT MECHANISM.

4.	Outer rocker.	30.	Diaphragm assembly.
25.	Hinge pin.	31.	Armature rod.
26.	Inner rocker.	32.	Armature spring.
27.	Trunnion.	33.	Armature.
28.	Magnet core.	34.	Impact washer.
29.	Brass plate.	35.	Rollers.

Re-assemble parts into magnet housing, and holding housing as shown in Fig.C43, unscrew the armature one sixth of a turn (one flange hole) at a time and simultaneously press in and out, until a point is reached, at which the outer rocker will "toggle over" (when the diaphragm is pressed in), then unscrew it a further two thirds of a turn. The setting is now correct. Re-tighten spring blade screw.

NOTE:- Keep the spring blade out of contact and press firmly and steadily on the diaphragm assembly while setting it.

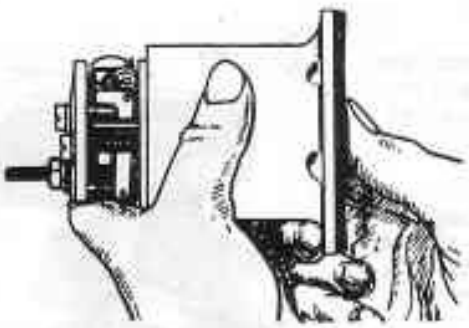


FIG.C43. ADJUSTING DIAPHRAGM.

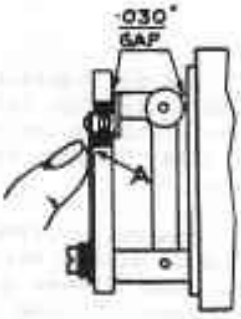


FIG.C.44. CHECKING ROCKER CLEARANCE.

Stretch the diaphragm to the end of its stroke while tightening retaining screw.

Do not attempt to move core of magnet under any conditions.

Do not stretch the armature spring.

(7) To Cure a Noisy Pump - if the pump ticks excessively, check for air leak on suction side, from tank to pump. If pump continues to tick without delivering petrol, check for foreign matter under valves.

AIR CLEANERS.

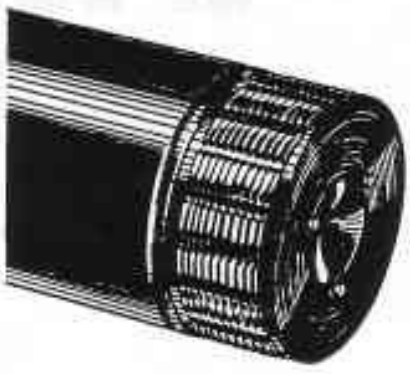


FIG.C45. "BENTLEY" TYPE AIR CLEANER.

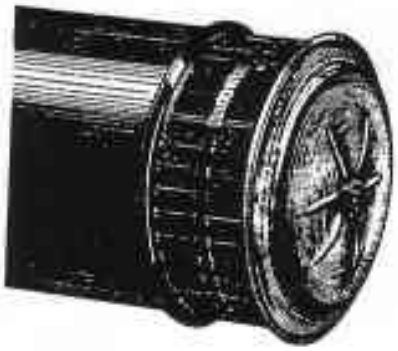


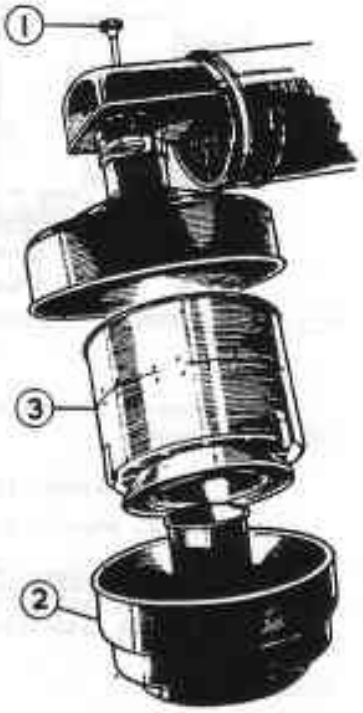
FIG.C46. A.C. AIR CLEANER.

The standard air cleaner is the A.C. copper mesh type as illustrated in Fig.C.46. Early type Bentley Mk.VI chassis were fitted with a Bentley manufactured similar type as in Fig.C.45.

The gauze mesh should be periodically removed and washed in petrol paraffin, dipped in engine oil, drained, and then replaced.

For use overseas, an Oil Bath type is available, see Fig. C47. As this type of cleaner gathers a considerable amount of dust and dirt, frequent servicing is necessary.

Unscrew nut from top, and lower filter bowl; discard oil and remove filter element. Wash element and bowl in petrol, replace element, fill in oil to correct level and refix.



1. Retaining screw.
2. Oil bowl.
3. Element.

FIG.C47. OIL BATH AIR CLEANER.

THE MODIFIED AUTOMATIC S.U. CARBURETTER

OIL PRESSURE SOLENOID SWITCH.

This switch has been introduced to ensure more positive starting from cold by delaying the opening of the choke valve. With the earlier system the choke was held fully closed by a solenoid wired in parallel with the starter button. When the engine fired and the starter button was released, the solenoid at the same time released the choke valve, which opened, due to engine depression and sometimes oscilated before achieving the position determined by the kick diaphragm travel, thereby causing stalling.

The break in the solenoid circuit is now delayed by 5 to 7 seconds after the engine has started by wiring the solenoid in parallel with the ignition circuit and the introduction of an oil pressure switch to break the circuit at a predetermined oil pressure.

To prevent choking the solenoid lever is spring loaded to the choke spindle, allowing the manifold depression to open the choke valve against the spring loading while the solenoid is in operation. The spring is adjusted to give a maximum choke opening of 5° thereby ensuring starting and running.

On reaching an oil pressure of 15 lbs/sq.in. the switch breaks the solenoid circuit and the choke is opened another 5° by the kick diaphragm operated by manifold depression. The oil pressure switch is fitted between the pump and the filter, and the solenoid now fitted is a two pole unit, but although energised whenever the oil pressure falls below 15 lbs/sq.in. it is only magnetically strong enough to close the choke when the valve is within 5° of the closed position.

In the event of flooding, the choke valve spindle pin is allowed 30° of free travel in the solenoid lever, therefore the choke can be opened 30° by fully depressing the accelerator pedal even though the solenoid is in operation.

Settings.

(1) Kick Diaphragm Travel.

This should be set .075" by means of a No.46 drill between the choke valve and the body.

(2) Solenoid Air Gap.

The solenoid air gap is set to between .0005" and .004" and adjusted by shims under the solenoid flange.

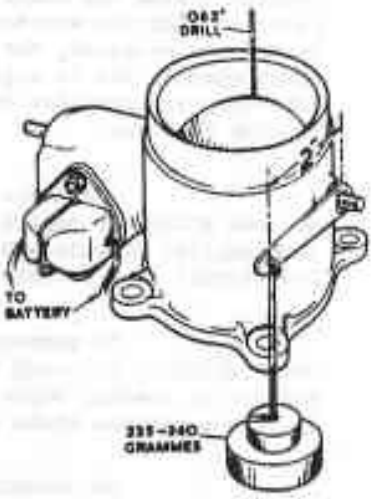
(3) Spring Tension Setting.

The spring tension should be set so that a weight of 235 to 240 grammes acting on a 2" arm just open the valve sufficiently to allow a .062" drill to be inserted between valve and body as shown in the illustration.

Having set the kick diaphragm and the air gap, fix the housing in a vice by means of two ¼" bolts and nuts fitted to the flange holes, connect a 12 volt battery to the solenoid and adjust. Adjust the spring tension so that the weight opens the choke to the amount required.
A special tool is designed for this purpose.

(4) Fast Idle Setting.

With the engine warm set the mixture and slow running in the usual way. Adjust the fast idle screw on the highest step of the cam to give .035 clearance between the throttle stop screw and the stop.



SETTING THE SPRING TENSION.

The Bi-Metallic Solenoid Switch.

A further modification has been incorporated by the introduction of a Bi-Metal switch situated on the conduit elbow on the R.H. side of the dashboard just below the fuse box and wired in the solenoid circuit.

As the positive closing of the choke is unnecessary when the under bonnet temperature is more than 15° C (approx) this switch "breaks" at this temperature and recloses at 10° C. The system therefore ensures full closing for cold starting and avoids over-richness when the engine is hot or warm.