Fuel System

CARBURETORS

The following carburetor types are fitted:

— Weber 34 DCHD 4 on engine 115 C.005;

— Weber 34 DCS 2 and 34 DCS 4 on engine 118 B.000.

WEBER 34 DCHD 4 CARBURETOR SETTING DATA

ITEM	Primary Throat	Secondary Throat
Bore	1.339″ (34 mm)	1.339″ (34 mm)
Venturi	.984″ (25 mm)	.984″ (25 mm)
Main jet	.051″ (1.30 mm)	.055″ (1.40 mm)
Idling jet	.020″ (0.50 mm)	.027″ (0.70 mm)
Air correction jet	.088″ (2.25 mm)	.090″ (2.30 mm)
Starting jet	.059″ (1.50 mm)	
Starting air jet	.197″ (5 mm)	
Accelerator pump jet	.027″ (0.70 mm)	
Accelerator pump recirculation jet	shut off	
Idling air jet	.075″ (1.90 mm)	
Needle valve housing	.069″ (1.75 mm)	
Float	.63 oz (18 gr)	
Float level: — distance of float from the face of cover (vertical, without gasket)	.197″ to .216″ (5 to 5.5 mm)	
— float travel	.335″ (8.5 mm)	

SETTING DATA OF WEBER 34 DCS 2 AND 34 DCS 4 CARBURETORS

ITEM	Primary Throat	Secondary Throat
Bore	1.339″ (34 mm)	1.339″ (34 mm)
Venturi	.866″ (22 mm)	.866″ (22 mm)
Main jet	.041″ (1.05 mm)	.041″ (1.05 mm)
Air correction jet	.079″ (2 mm)	.079″ (2 mm)
Idling jet	.016″ (0.40 mm)	.016″ (0.40 mm)
Idling air jet	.031″ (0.80 mm)	.031″ (0.80 mm)
Accelerator pump jet	.016″ (0.40 mm)	.016″ (0.40 mm)
Starting jet	.031″ (0.80 mm)	
Starting air jet	.059″ (1.50 mm)	
Needle valve housing	.069″ (1.75 mm)	
Float	.63 oz (18 gr)	
Float level: — distance of two float halves from the face of cover (vertical, without gasket)	.256″ (6.5 mm)	
— float travel	.335″ (8.5 mm)	

WEBER CARBURETOR TYPE 34 DCHD 4

Description (Figs. 88 and 89).

The Weber 34 DCHD 4 carburetor is of the dowdraft, dual-barrel, compound design.

The first carburetor stage is directly under the mechanical control of the accelerator which operates the primary throttle valve (12) via a system of links and levers.

The second throat, instead, will turn in automatically, beyond the driver's control, thanks to a device consisting of a vacuum chamber (19) which contains a diaphragm (44) being connected to the secondary throat throttle (37) via a system of links and levers.

The secondary throttle (37) begins opening as soon as vacuum in the first throat is such as to overcome, through the passage (38), the force of the spring opposing the diaphragm (44) which, in turn, causes the lever on the secondary throttle (37) spindle to rotate via a rod.

As the secondary throttle is opening, vacuum in the second throat affects also the port at the primary Venturi restriction, thus ensuring the full opening of the secondary throttle whenever the engine may so require.

Provision is made for the secondary throat throttle to close through a mechanical device in spindles of the primary and secondary throttles (fig. 87).

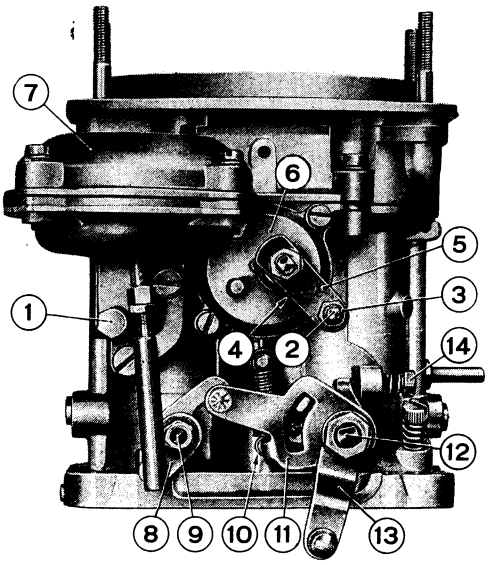


Fig. 87. - Weber 34 DCHD 4 carburetor to suit engine 115C.005.

1. Cable sheath retaining screw - 2-3. Choke control cable retaining screw and nut - 4. Lever return spring - 5. Choke control lever - 6. Vacuum device cover - 7. Vacuum device - 8. Secondary throat throttle control lever - 9. Secondary throat throttle spindle - 10. Sector return spring - 11. Sector for release and return of lever (8) - 12. Primary throat throttle spindle - 13. Primary throat throttle control lever - 14. Screw for idle adjustment of primary throat throttle.

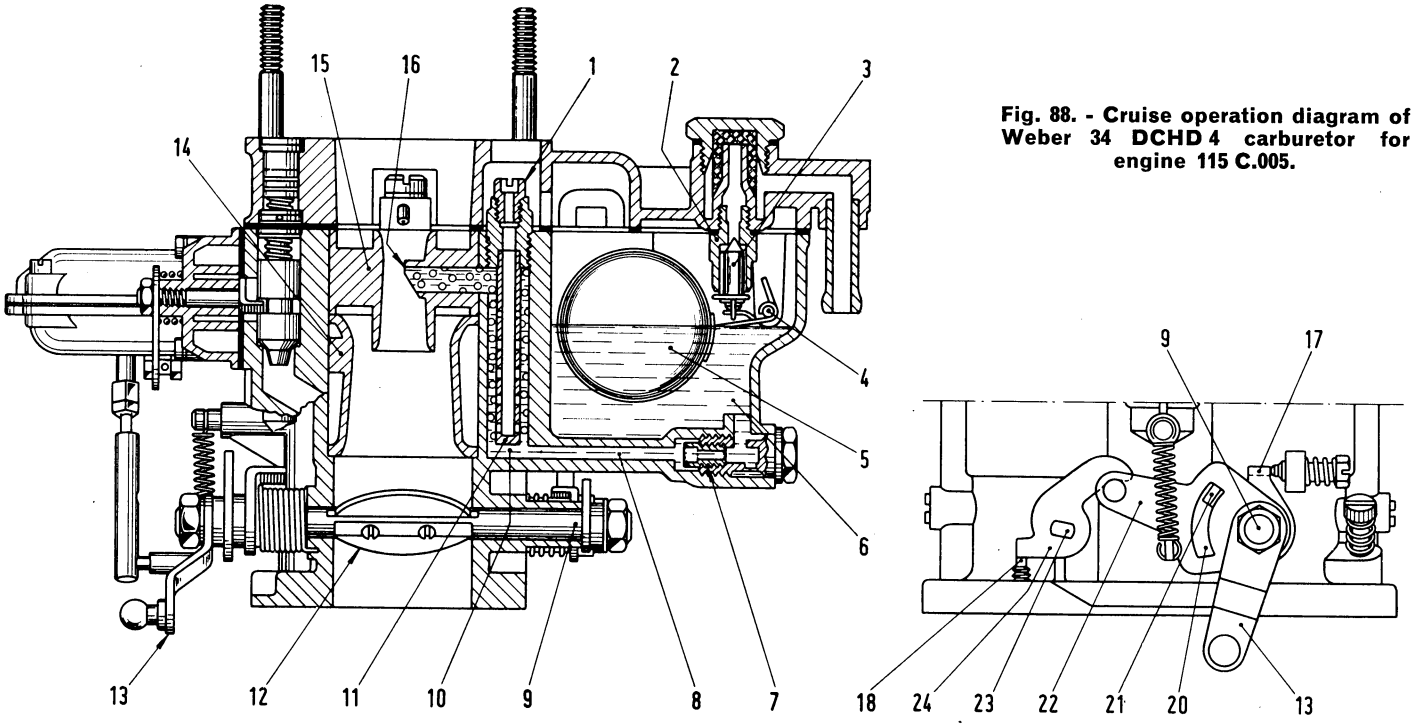


Fig. 88. - Cruise operation diagram of Weber 34 DCHD 4 carburetor for engine 115 C.005.

1. Air correction jet - 2. Needle valve - 3. Valve needle - 4. Pivot pin - 5. Float - 6. Bowl - 7. Main jet - 8. Main jet-to-emulsion well passage - 9. Primary throttle spindle - 10. Emulsion well - 11. Emulsion tube - 12. Primary throttle - 13. Primary throttle control lever - 14. Primary Venturi - 15. Auxiliary Venturi - 16. Discharge tube - 17. Lever stop sector - 18. Secondary throttle stop adjusting screw - 20. Slot for lug (21) - 21. Drag lug for sector (22) - 22. Sector for release and return of lever (24) - 23. Secondary throttle spindle - 24. Secondary throttle return lever.

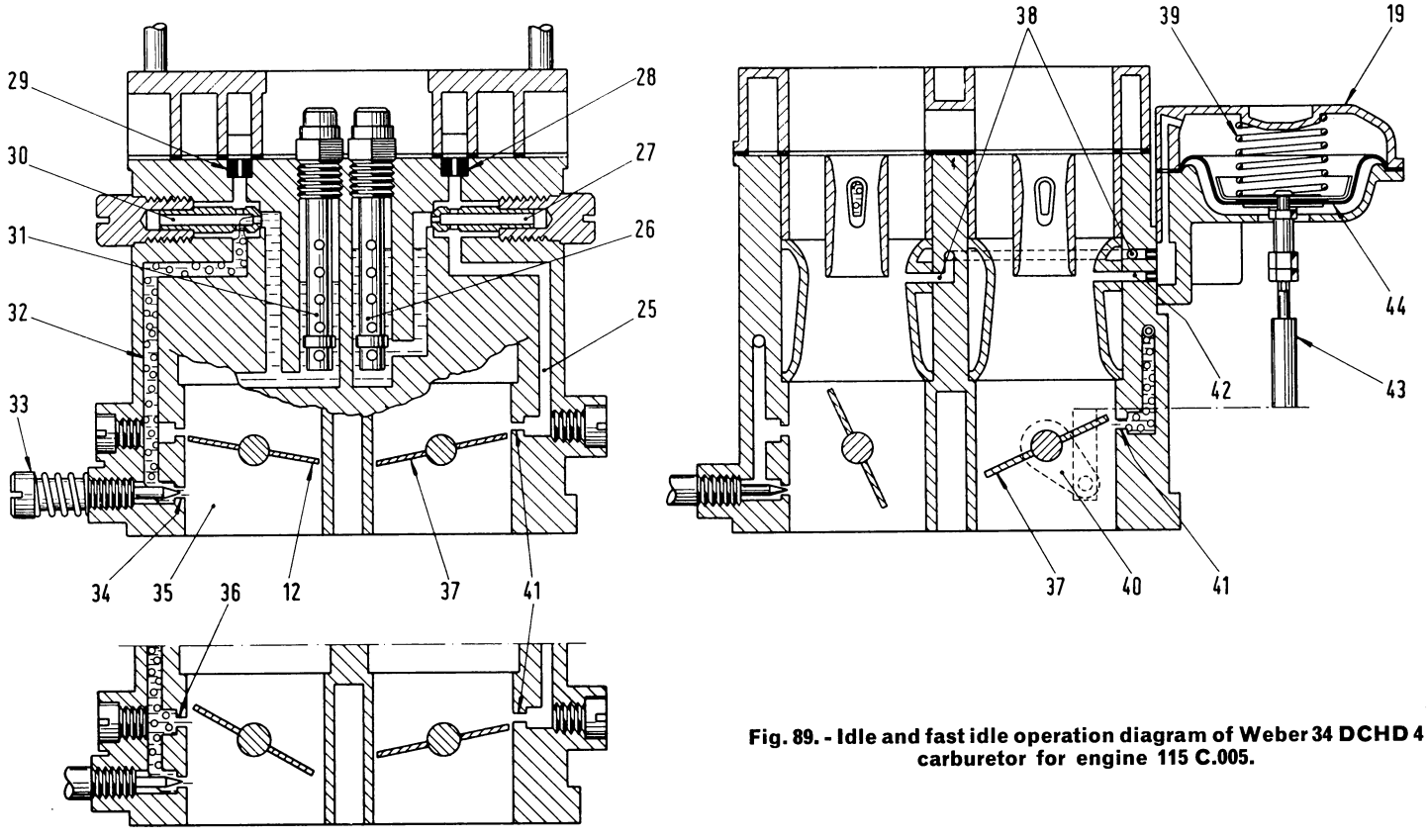


Fig. 89. - Idle and fast idle operation diagram of Weber 34 DCHD 4 carburetor for engine 115 C.005.

12. Primary throttle valve - 19. Vacuum chamber - 25. Secondary throat idle transfer port passage - 26. Secondary emulsion tube - 27. Secondary idle jet - 28. Secondary idling air calibrated bushing - 29. Primary idling air calibrated bushing - 30. Primary idle jet - 31. Primary emulsion tube - 32. Idle passage - 33. Idle adjusting screw - 34. Idling feed orifice - 35. Primary throat - 36. Primary throat idle transfer port - 37. Secondary throttle valve - 38. Vacuum device port and passage at primary throat - 39. Spring - 40. Secondary throttle control lever - 41. Secondary throat idle transfer port - 42. Vacuum device port at secondary throat - 43. Secondary throttle control rod - 44. Vacuum device diaphragm.

Accelerator Pump (fig. 90).

This pump is of the plunger type.

When the primary throttle is closed, the lever (52) raises the rod (51) and thus the plunger (49) causing fuel to be drawn from the bowl (6) through the ball valve (47) into the pump cylinder.

When the primary throttle (12) is opened, the lever (53) depresses the lever (52) working idle on the secondary spindle (23). As a result, the rod is released

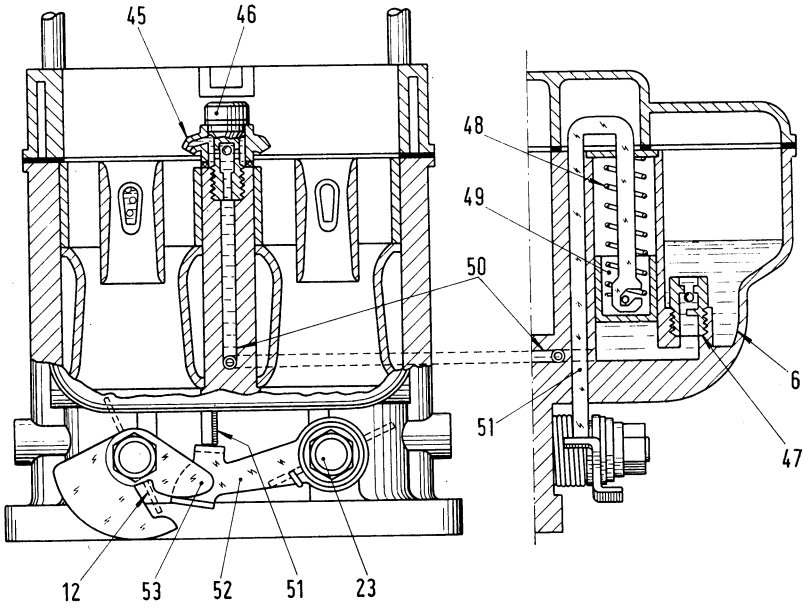


Fig. 90. - Power operation diagram of Weber 34 DCHD 4 carburetor for engine 115 C.005.

6. Bowl - 12. Primary throttle valve - 23. Secondary throttle spindle - 45. Accelerator pump jet - 46. Delivery valve - 47. Suction valve - 48. Spring - 49. Accelerator pump plunger - 50. Delivery passage - 51. Plunger rod - 52. Rod control lever, idler - 53. Pump control lever, primary.

and the plunger (49) moves downward under pressure from the spring (48), forcing fuel into the passage (50), and via the valve (46) to the pump jet (45) where it is injected into the primary throat.

Easy Starting Device (fig. 91).

The fuel control starting device is intended to ensure easy starting from cold, regular engine operation at idle and car set-out in a cold condition.

The starting device (choke) is used until the engine has reached its normal running temperature.

The mixture rate (rich or weak) changes after the position of the choke control on the dashboard.

With the choke control knob all the way out the fuel mixture is very rich ensuring easy starting even of a coldest engine.

The choke is of the gradual acting type.

INSTRUCTIONS FOR USING THE EASY STARTING DEVICE

Starting Engine.

— From cold: pull the control knob out to its fullest extent and return it slightly once the engine has started.

— Engine slightly warm: pull the control knob only half way out.

Warming up Engine.

During this period, whether the engine is stationary or moving, the knob should be returned gradually and with short pauses to the midway position, thus ensuring that the starting mixture supplied to the cylinders is never in excess of the engine's actual requirements.

Engine Running Normally.

As soon as the normal engine temperature is reached, the control knob should be fully returned to the closed position (diagram C).

OPERATION NOTES

Once the engine has started, with the choke fully on, the engine will rev up suddenly causing substantial vacuum increase downstream throttle valve. Vacuum in the passage (63) opens the valve (62) so that air is drawn past the bushing (61) orifice to weaken the mixture in the passage (54) from the starting jet (59).

So the mixture rate and amount supplied by the easy starting device will be always such as to ensure the regular running of a cold engine (diagram B).

Idling Adjustment (fig. 93).

For idle adjustment, work on the primary throat only by means of the throttle stop screw (5) and the volume control screw (4).

Screw (5) controls the degree of opening of the primary throttle, whilst the tapered screw (4) regulates the volume of mixture delivered by the idling mixture passage and further mixed with the air drawn in by the engine suction, thus enabling the appropriate degree of idling richness to be obtained.

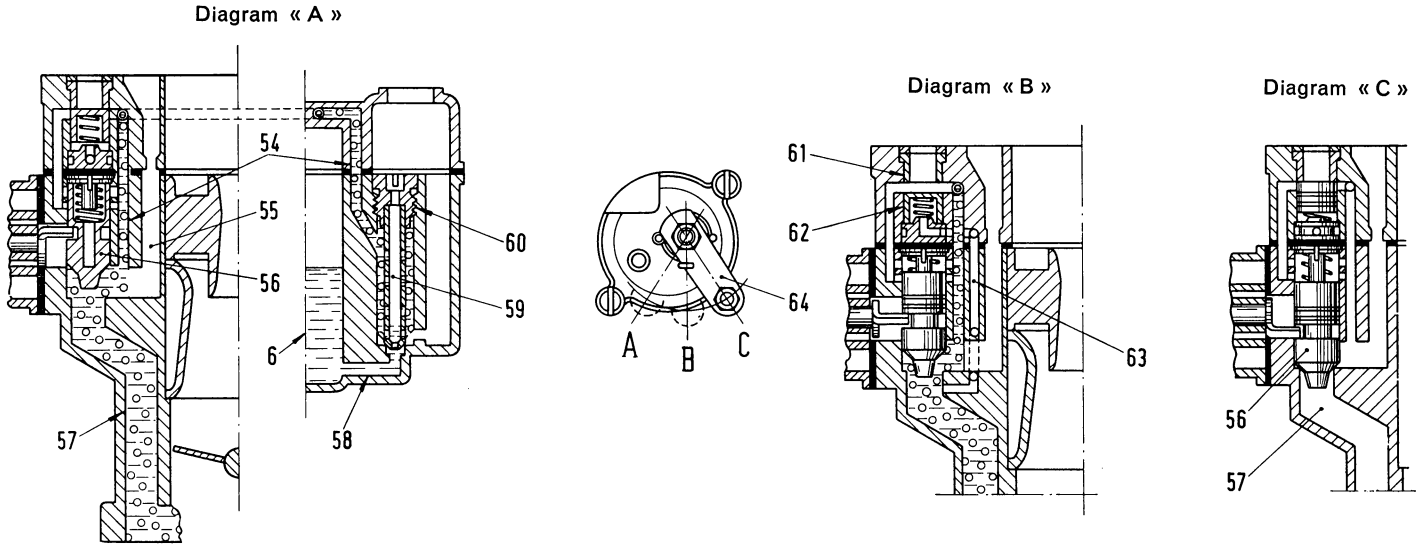


Fig. 91. - Operation diagram of Weber 34 DCHD 4 carburetor easy starting device (choke) (engine 115 C.005).

Diagram « A »: easy starting device all the way in.
Diagram « B »: easy starting device part way in.
Diagram « C »: easy starting device out.

6. Bowl - 54. Starting mixture passage to choke - 55. Air passage - 56. Plunger - 57. Starting mixture passage to primary throat - 58. Fuel passage from bowl to starting jet - 59. Starting jet - 60. Starting air jet - 61. Leaning air bushing - 62. Leaning air metering valve - 63. Vacuum passage controlling valve (62) - 64. Choke control lever.

A. Position of lever 64 with easy starting device all the way in - B. Lever position with easy starting device part way in - C. Lever position with easy starting device all the way out.

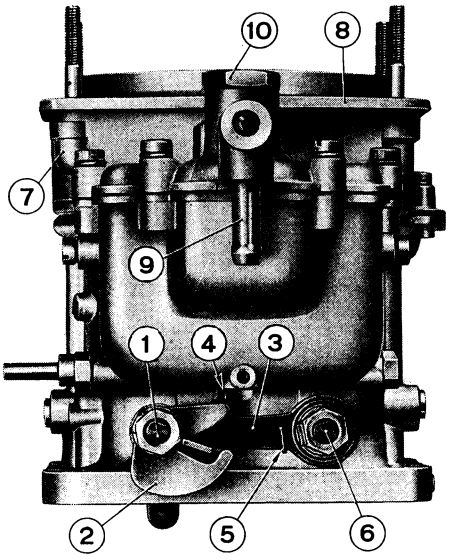


Fig. 92. - Weber 34 DCHD 4 carburetor for engine 115 C.005.
1. Primary throat throttle spindle - 2. Accelerator pump control lever, primary - 3. Rod control lever, idler - 4. Plunger rod - 5. Return spring for lever (3) - 6. Secondary throat throttle spindle - 7. Body side cover - 8. Air cleaner mounting flange - 9. Fuel delivery line connector - 10. Filter inspection cover.

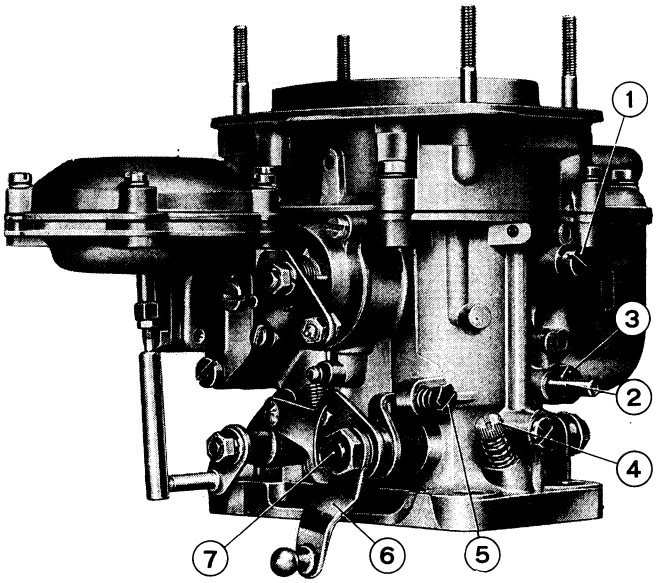


Fig. 93. - Weber 34 DCHD 4 carburetor for engine 115 C.005.
1. Idling jet - 2. Vacuum advance line connector - 3. Main jet - 4. Volume control screw - 5. Throttle stop screw - 6. Primary throat throttle control lever - 7. Primary throat throttle spindle.

Idling adjustment should be carried out with the engine warm and running by first of all adjusting the throttle stop screw (5) to a point where the engine does not falter.

Then adjust the volume control screw (4) to obtain the mixture which gives the highest regular engine speed at the selected degree of throttle restriction. Finally, unscrew very slowly the stop screw (5) to reduce engine speed to the minimum without irregular running.

WEBER CARBURETORS TYPE 34 DCS 2 AND 34 DCS 4

These carburetors (34 DCS 2, front and 34 DCS 4, rear), to suit Model 1600 S, are of the dual barrel type with synchronous opening of throttle valves, choke and accelerator pump.

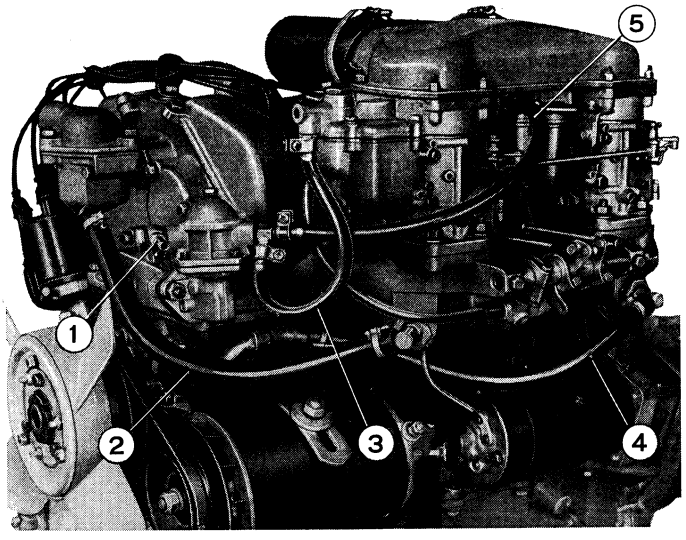


Fig. 94. - Weber 34 DCS 2 and 34 DCS 4 carburetors in place on engine 118 B.000.
1. Fuel inlet connector - 2. Water hose, head funnel to intake manifold - 3. Front carburetor feed line - 4. Water hose, intake manifold to heater return pipe - 5. Rear carburetor feed line.

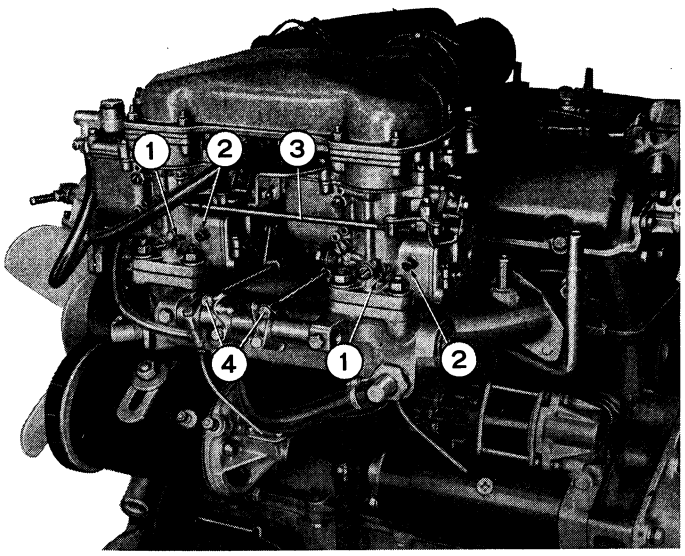


Fig. 95. - Weber 34 DCS 2 and 34 DCS 4 carburetors in place on engine 118 B.000.
1. Idle mixture adjusting screw - 2. Throttle adjusting screw - 3. Choke control lever link - 4. Throttles control lever rod.

Normal Operation (fig. 98).

The fuel, through needle valve (2) flows to bowl (6) where float (5), articulated on pivot pin (4), regulates the opening of needle (3) in order to keep the level of the liquid constant.

From bowl (6), through main jets (7) and passages (8), the fuel reaches wells (10).

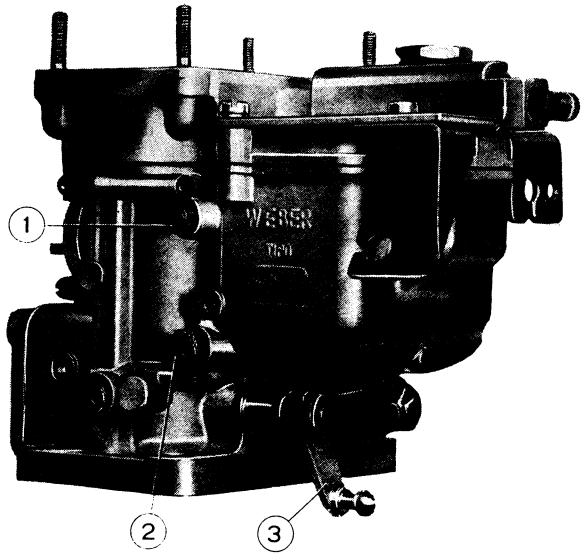


Fig. 96. - Rear Weber 34 DCS 4 carburetor to suit engine 118 B.000.

1. Idle jet - 2. Main jet - 3. Throttles control lever.

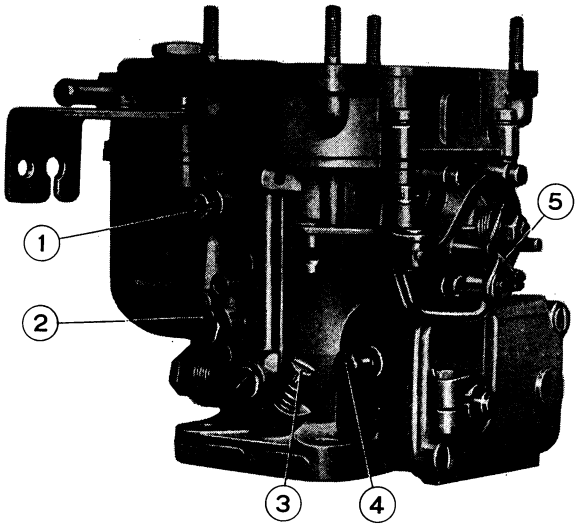


Fig. 97. - Rear Weber 34 DCS 4 carburetor to suit engine 118 B.000.

1. Idle jet - 2. Main jet - 3. Idle mixture adjusting screw - 4. Throttle adjusting screw. - 5. Choke control lever.

Mixed with the air from the orifices of emulsion tubes (11) and from air corrector jets (1), through nozzles (16), fuel reaches the carburetion area, consisting of auxiliary Venturis (15) and primary Venturis (14).

In fig. 98 is also shown the device for synchronous opening of throttle valves. From lever (13), throttles (12) are controlled synchronously through toothed sectors (17) and (18) fixed to spindles (19) and (9). So throttles are opening in opposite direction each other, which ensures an equal degree of feeding to intake manifolds.

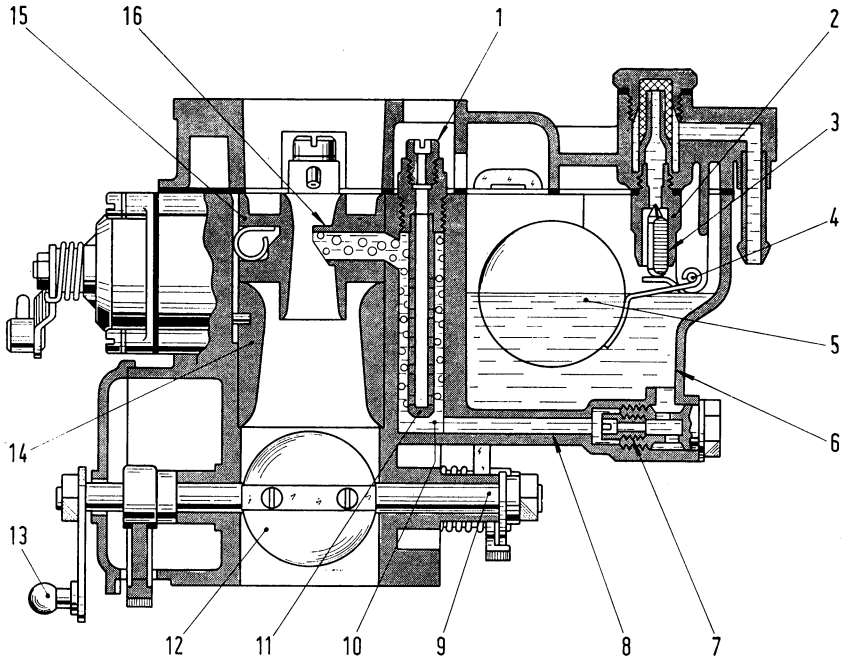
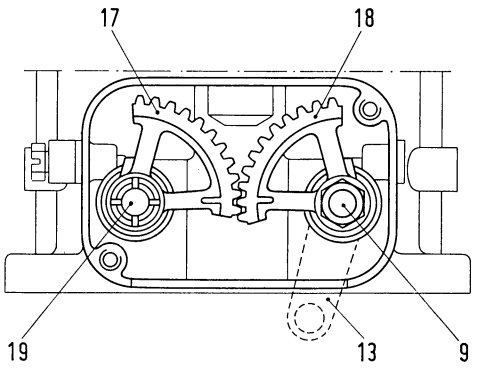


Fig. 98. - Cruise operation diagram of Weber 34 DCS carburetor to suit engine 118 B.000.



1. Air correction jet - 2. Needle valve - 3. Valve needle - 4. Pivot pin - 5. Float - 6. Bowl - 7. Main jet - 8. Passage, main jet to well - 9. Throttle spindle - 10. Well - 11. Emulsion tube - 12. Throttle valve - 13. Throttle control lever - 14. Primary Venturi - 15. Auxiliary Venturis - 16. Nozzle - 17-18. Toothed sectors controlling synchronous opening of throttle valves - 19. Throttle spindle.

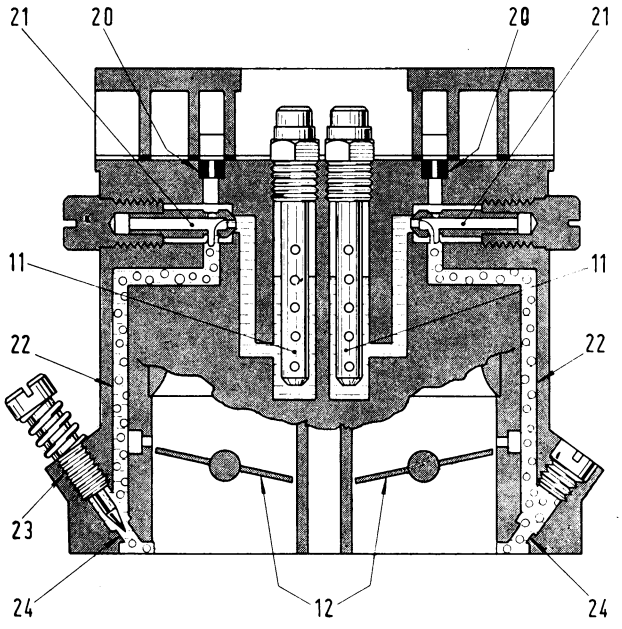
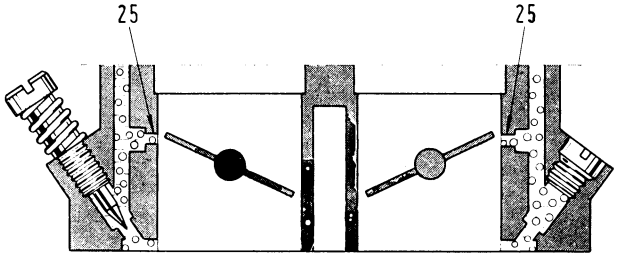


Fig. 99. - Idle and fast idle operation diagram of Weber 34 DCS carburetor to suit engine 118 B.000.

11. Emulsion tubes - 12. Throttle valves - 20. Idle air calibrated bushings - 21. Idle jets - 22-24. Idle feed passages and orifices - 23. Cone tipped screw for fuel feed orifice adjustment at one carburetor throat. - 25. Idle transfer orifices.



Idle Speed and Transfer (fig. 99).

Fuel streams from emulsion wells (11) to idle jets (21), where it blends with air from calibrated hushings (20), and then is ported through passages (22) and idle feed orifices (24) to carburetor throats dowstream of throttles (12).

The fuel feed orifice can be adjusted through a cone tipped screw at one throat, whereas at the other there is a fixed adjustment. For the setting of the idle speed on both carburetors, adhere to the directions covering the 34 DCHD 4 carburetor on page 65.

Mixture also reaches carburetor throats through idle transfer orifices (25) at throttle valves, thus ensuring a regular increase in angular velocity of engine off idle speed.

Power Operation (fig. 100).

When throttles are closed, lever (33) raises rod (31) and plunger (29). Fuel is drawn from bowl (6) into pump cylinder past inlet ball valve (32).

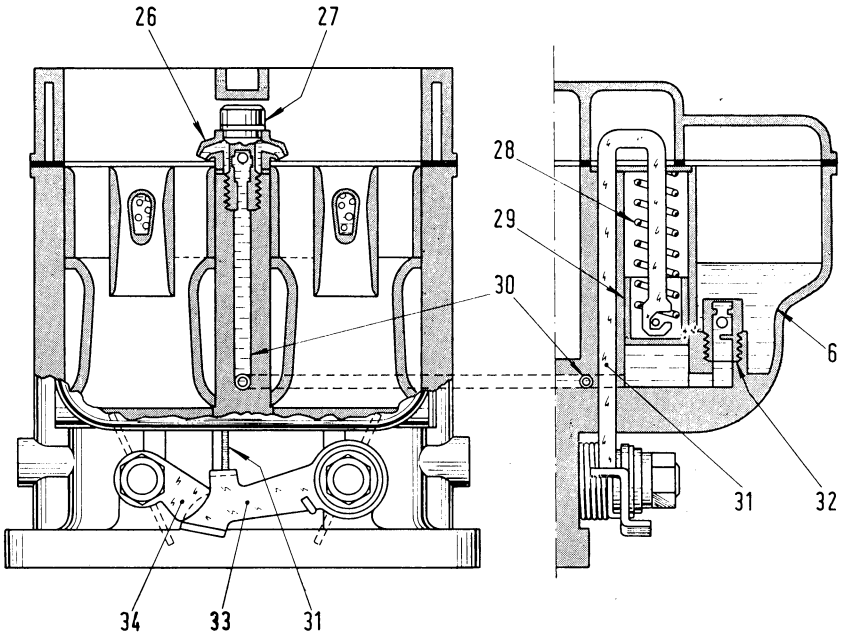


Fig. 100. - Power operation diagram of Weber 34 DCS carburetor to suit engine 118 B.000.

6. Bowl - 26. Accelerator pump jet - 27. Accelerator pump jet valve - 28. Spring - 29. Pump plunger - 30. Pump jet passage - 31. Rod - 32. Inlet valve - 33-34. Plunger rod levers.

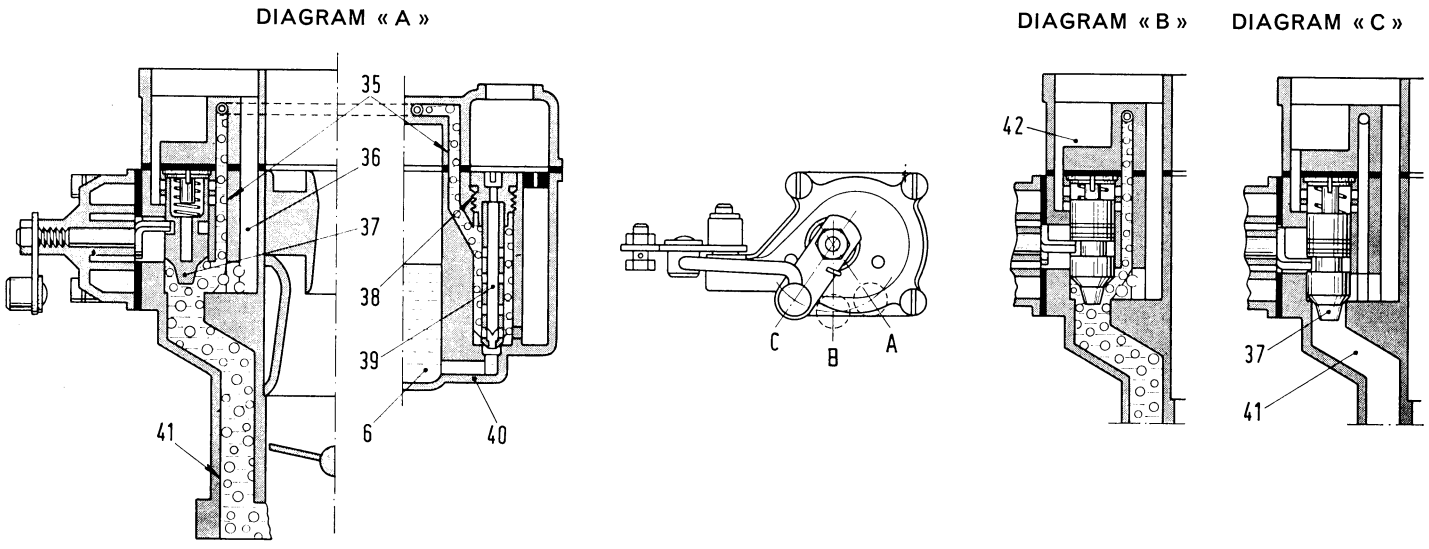


Fig. 101. - Operation diagram of Weber 34 DCS carburetor easy starting device (choke) (engine 118 B.000).

Diagram « A »: easy starting device all the way in - Diagram « B »: easy starting device part way in - Diagram « C »: easy starting device out.

6. Bowl - 35. Starting mixture passage to choke - 36. Air passage - 37. Plunger - 38. Starting air jet - 39. Starting jet - 40. Fuel passage from bowl to starting jet - 41. Starting mixture passage to primary throat - 42. Leaning air inlet.

A. - Lever position corresponding to choke all the way in - B. Lever position with choke part way in - C. Lever position with choke all the way out.

When throttles are opened, lever (34) lowers lever (33), releasing the rod (31). Plunger (29) moves downward under pressure from the spring (28) and fuel is forced past passage (30) and into throttle chambers through the delivery valve (27) and calibrated pump jets.

Suction valve (32) may come with a calibrated orifice on side face for excess fuel recirculation to bowl.

Easy Starting Device (fig. 101).

Fuel from bowl (6) is advanced to the choke through passage (40) and starting jet (39). After blending with air from carburetor air intake metered at the starting air jet (38), fuel flows past passage (35) to the plunger (37) recess, where it mixes with air from passage (36). This mixture will be drawn up through passage (41) to ensure prompt starting of engine (diagram A).

Once the engine has started, turn the choke part way out (diagram B).

In this step, a further amount of air from passage (42) leans out the choke mixture for regular operation of the cold engine.

However, when the engine has been heated, such mixture will still be too rich and in excessive supply, so the starting device must be gradually cut out as the temperature of engine rises.

With the choke in off position, the plunger (37) shuts the passage (41) preventing any flow of mixture (diagram C).

INSTRUCTIONS FOR USING THE EASY STARTING DEVICE

The following instructions should be observed in order to obtain maximum benefit from the device:

Starting Engine.

— From cold: pull the control knob out to its fullest extent and return it slightly once the engine has started.

— Engine slightly warm: pull the control knob only half way out.

Warming up Engine.

During this period, whether the vehicle is stationary or moving, the knob should be returned gradually and with short pauses to the midway position, thus ensuring that the starting mixture supplied to the cylinders is never in excess of the engine's actual requirements.

Engine Running Normally.

As soon as the normal engine temperature is reached the control knob should be fully returned to the closed position.

ELECTRIC FUEL PUMP

(ENGINE 118B.000)

Description.

The electric fuel pump is mounted underneath car floor (fig. 103) outside the battery housing. This pump is serially connected with the mechanical pump and needing no linkage with engine it can be installed far away from engine heat.

Pump capacity is independent of engine R.P.M. rate, and the pump is automatically started as ignition is turned on, so as to fill the carburetor before engine is started, with a saving in battery current.

Operation (fig. 102).

The plunger (6) is magnetically and electrically driven up and down the tube (1) at a very high speed. When the plunger (6) is pushed up by the spring (7) load its upper end enters the field of the permanent magnet (2) (movable contact). The pulling force between magnet (2) and plunger (6) causes the magnet (with pole bent at 90°) to come in contact with the brass tube (1) in which the plunger slides. Because of the movement of breaker arm (10) whose articulation is pivoted on its fulcrum, the ground contact is pressed against the stationary contact (18), thus closing the electric circuit.

At this instant the current from battery (or from generator) flows through the coil (3) winding inducing a strong magnetic field around it, which attracts and pulls down the plunger (6).

When, following the downward movement the plunger leaves the permanent magnet (2) field, the attraction force decreases and the permanent magnet returns to rest position under the magnetic pull of the opposite pole. As a consequence, breaker contacts (5) part and cut off the current to the coil whose magnetic field collapses.

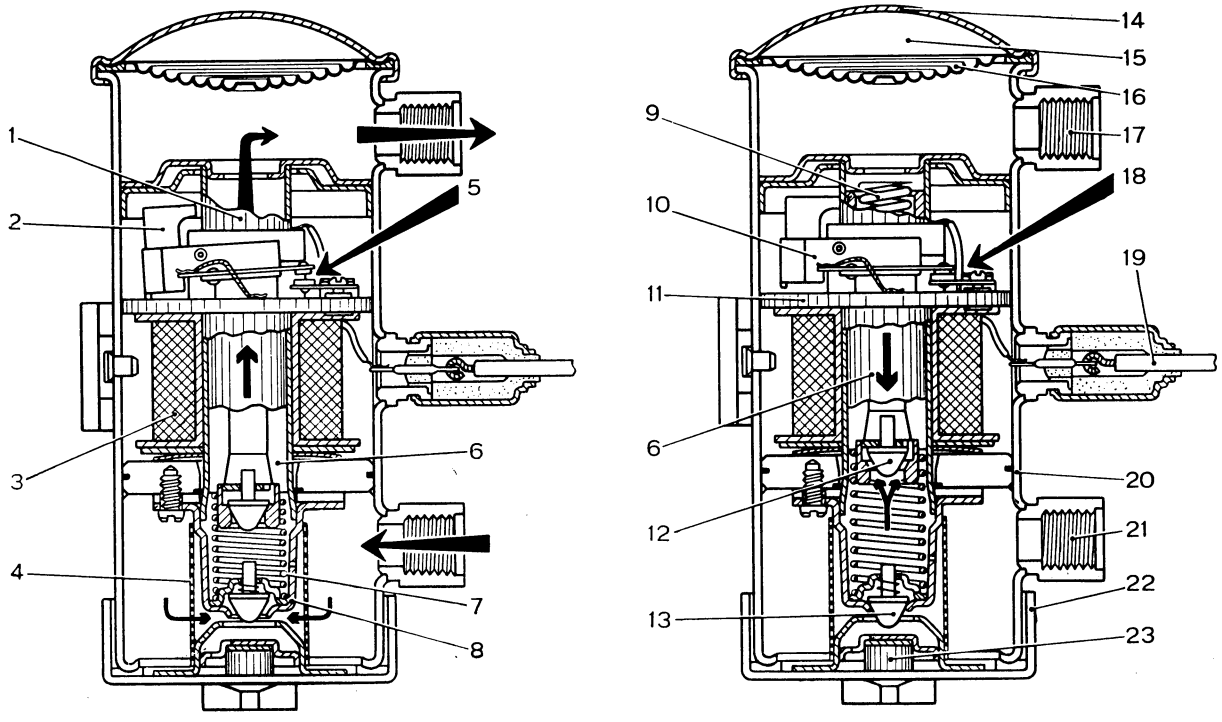


Fig. 102. - Electric fuel pump diagram.

1. Tube - 2. Magnet - 3. Coil - 4. Strainer - 5. Contacts (open) - 6. Plunger - 7. Plunger spring - 8. Valve carrier casing - 9. Damper spring - 10. Breaker arm - 11. Breaker base - 12. Fuel lift valve - 13. Fuel inlet valve - 14. Cover - 15. Air chamber - 16. Diaphragm - 17. Delivery connection - 18. Contacts (closed) - 19. Current lead - 20. Pump body - 21. Inlet connection - 22. Cover - 23. Magnet.