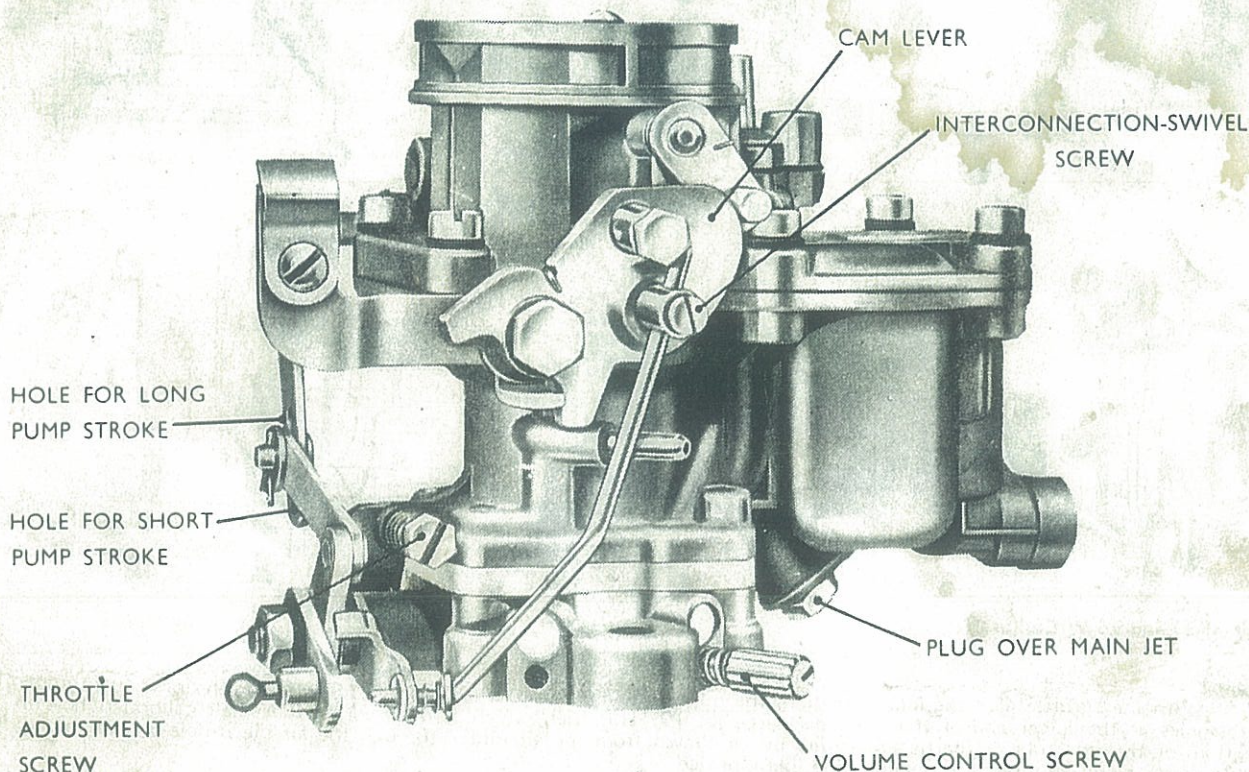


# ZENITH<sup>®</sup> CARBURETTORS

## SERVICE BULLETIN

SERIES WIA & WIP



The W series of carburetors are downdraught models, and embody a mechanically operated accelerating pump, an automatic strangler interconnected with the throttle, and a depression-operated power jet. A lever type float is fitted, and the throttle body is insulated from the main body to reduce the conduction of heat from the manifold to the floatchamber and jets.

The sizes available are 34, 36 and 42 m.m. bore and a number or variation in the type letters denotes some form of modification. Model numbers and details are listed below.

### Carburetor Type

WIA	Initial model, three screws are used to secure the throttle body to main body
WIA—2	Four screws are used to secure the throttle body to main body
36 WIA—3	Air regulating screw is fitted instead of volume control screw
42 WIA	Initial model
42 WIA—2	Special short throttle body
42 WIAT	As 42 WIA but fitted with thermostatically operated air strangler.
42 WIATD	Similar to 42 WIAT but fitted with throttle damper for automatic gearbox.
36 WIP	Initial model, three screws are used to secure the throttle body to main body
36 WIP—2	Four screws are used to secure the throttle body to main body
36 WIP—3	Air regulating screw is fitted instead of volume control screw.

"P" signifies the power jet circuit is not incorporated, not being necessary on certain applications.

### Operation

Petrol enters the carburetor through the inlet, this is at the base of the floatchamber in the sizes 34 and 36, and in the floatchamber cover on the size 42, and then passes through the needle seating 15. At this point the flow is controlled by the needle 14. As petrol is admitted, the float rises and pushes the needle on to its seat, thus cutting off the flow when the correct level is reached in the floatchamber. This action is entirely automatic, and continues all the time the carburetor is being fed with fuel.

From the floatchamber, petrol passes through the main jet 16 at the base of the inclined channel which houses the main discharge jet 19. The tip of the latter protrudes into the throat of the small venturi, as shown in the diagram.

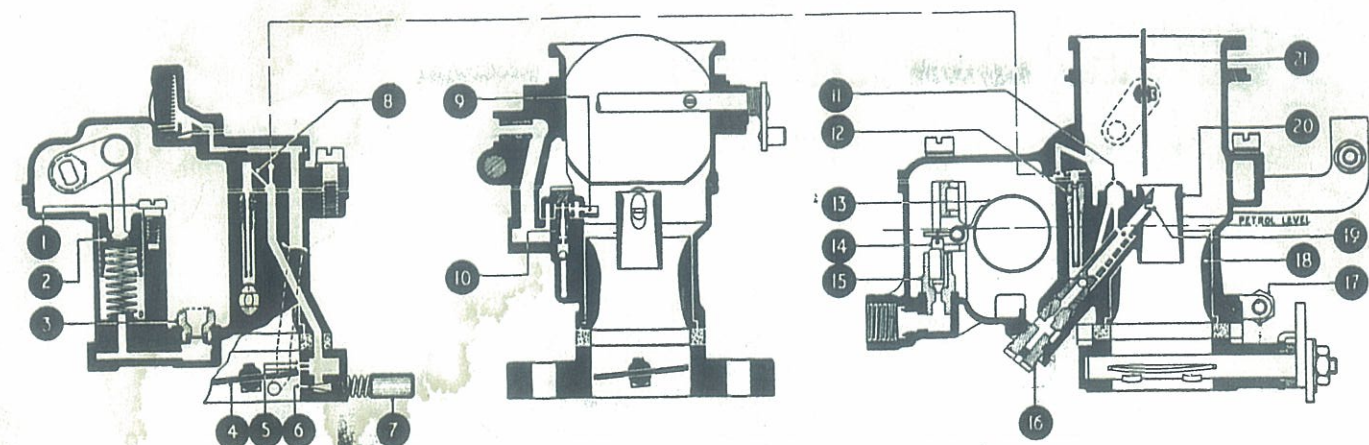
### Starting from Cold

When the dashboard control is pulled, it operates the cam lever. This permits the spring-loaded strangler flap 21 to close, at the same time opening the throttle a pre-set amount by means of the interconnection rod.

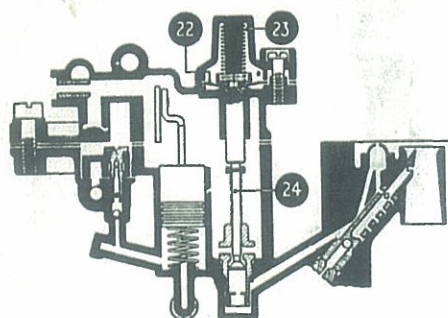
With the ignition switched on, but without the accelerator pedal being touched, the engine is turned over by the starter or by hand. Immediately it fires the speed will tend to build up, and the increased depression thus created will open the strangler flap, thereby admitting air and weakening the mixture.

With the strangler still closed the vehicle may, if desired, be driven away, but it should be gradually released as the engine attains its normal working temperature.

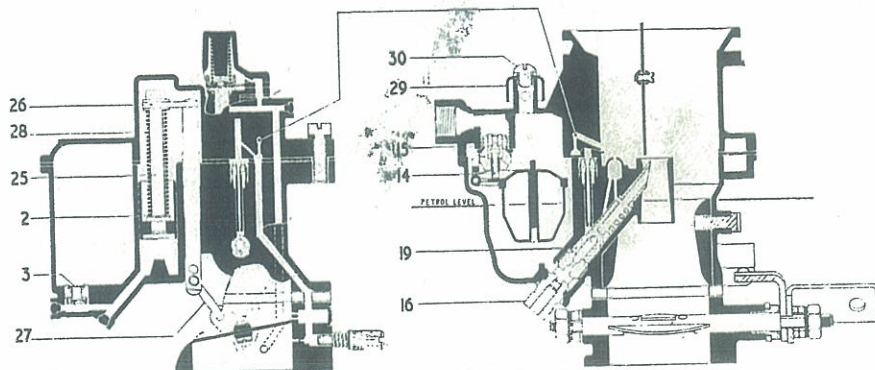




Section of 34 and 36 W Carburetter



Section of 34 and 36 W Carburetter



Section of 42 W Carburetter

#### Idling

With the throttle 4 in the idling position, the mixture will be supplied by the idle tube 12, which draws fuel through the crossholes at the lower end of the main discharge jet 19. This fuel, which is metered by the small calibrated hole in the bottom of the idle tube, is partly emulsified by air drawn from the air intake through the air bleed hole 8, and the mixture then passes along an internal channel to the idling orifice 6.

Idling is adjusted by means of the throttle stop screw 17 and the volume control screw 7. If screwed in, the screw 17 will open the throttle wider and increase the engine revolutions; when unscrewed slightly, the speed will be reduced.

The quality of the idling mixture is established by the size of the idle jet 12, and that of the air bleed 8. The jet is a variable, but the air bleed is drilled in the carburettor casting and is not intended to be altered. The screw 7, which has a tapered tip, and is on the engine side of the throttle, controls the amount of idle mixture passed to the engine. To weaken the mixture, the screw should be turned clockwise; conversely, it must be unscrewed to make the mixture richer.

In those carburettors having the figure -3 in the type designation, i.e. 36 WIP-3, the mixture control for idling is an air regulating screw, mounted higher up the body of the carburettor, in fact in the floatchamber cover. The screw is cone ended with a spring to ensure it stays set in the position in which it is adjusted. Turning the screw varies the amount of air admitted and controls the depression acting on the slow-running jet. The action is the reverse of the volume control screw, and turning clockwise the air regulating screw enriches the mixture by increasing depression on the jet. Turning anti-clockwise weakens the mixture by admitting more air and reducing depression on the jet.

The two small holes 5 at the throttle edge break into the idle channel. These assist in the transfer of the fuel supply as the throttle is opened, and provides a smooth and progressive action during that period; they are known as "progression holes", and are not adjustable. It is important that they are not tampered with.

As the throttle continues to open, the depression at the throat of the small venturi 20 will draw a mixture of petrol and air from the tip of the main discharge jet 19 through the large venturi 18, past the throttle and into the engine.

As the fuel level in the main discharge jet falls, a number of holes in the side of the jet will gradually be uncovered, and these will admit air supplied by the high-speed bleed 11. The petrol being drawn into the lower of these holes and up through the centre of the jet will consequently be emulsified by the incoming air, and on arrival at the tip it will be still further atomised as it meets the stream of air passing through the small venturi.

#### Accelerating Pump

To obtain economical running at normal driving speeds yet at the same time ensure faultless acceleration, a controlled and metered supply of fuel is required when the throttle is suddenly opened. This is provided by the accelerating pump, the object of which is to overcome any tendency for a lag in acceleration when the carburettor is adjusted to give a low consumption at normal road speeds. It is directly connected to the throttle spindle by suitable linkage, so that every time the throttle is snapped open a small quantity of metered fuel is injected into the air stream, thus providing an immediate response.

When the pump piston 2 is at the top of its stroke, the cylinder is charged with petrol admitted from the floatchamber through the non-return valve 3. The piston is spring-loaded, and is retained in its cylinder by the screw 1, in the sizes 34 and 36. The pump assembly in the size 42 m.m. is different and is shown in the drawing of this larger size. It will be seen the piston is on a rod 25 which passes through a hole in the cross head that is part of the actuating rod 26. This rod operating through a drilling parallel with the bore is coupled to the lever on the throttle spindle by a link 27. The spring 28, surrounding the rod 25, will be compressed on fast downward movement of the actuating rod 26, and force down the piston with its rod to provide a follow-up action of the pump. When the throttle is opened, the piston is forced down by the pump linkage, discharging a stream of petrol via an internal passage through the non-return discharge valve 10 and pump discharge nozzle 9, into the air stream.



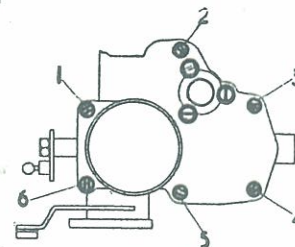
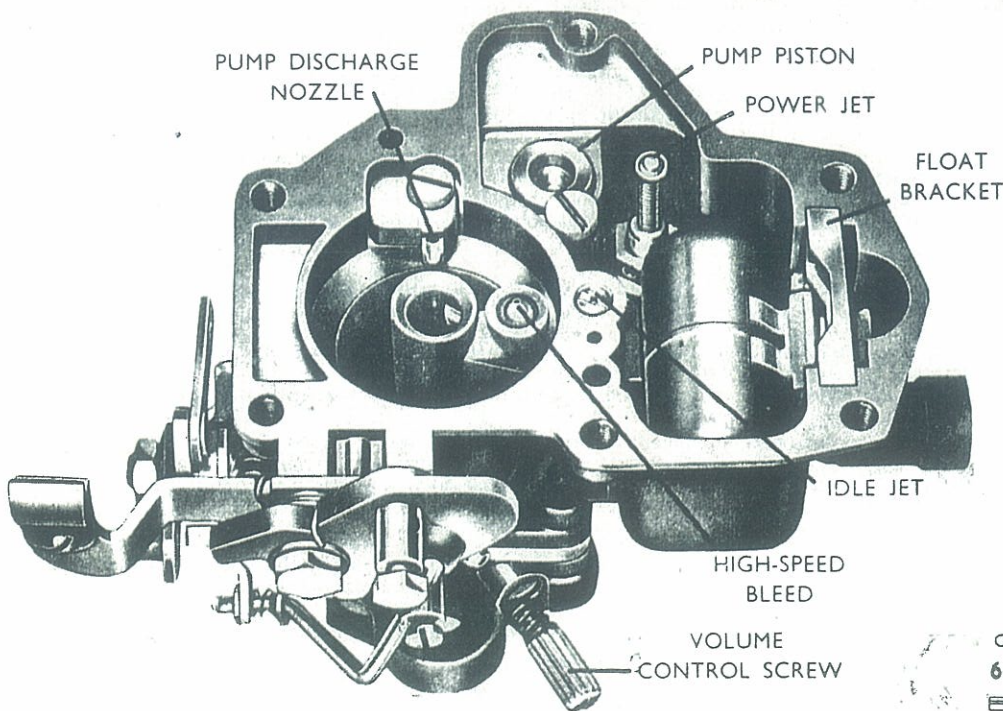


Fig. 3

In the smaller sizes 34 and 36 provision is made for varying the pump travel, and long, medium or short strokes may be arranged. With the link attached to the hole in the end of the pump lever, a short stroke is obtained. The inner hole gives a long stroke, and of course the intermediate position provides a medium stroke. On some 36W carburetors the pump is actuated by a cam, in place of the direct linkage, as in the illustration on the front page. The purpose of the cam is to ensure the greater proportion of the discharge from the pump nozzle is during the early part of the throttle movement, as is required on particular applications to ensure the best possible acceleration.

On the size 42 there are two holes in the pump actuating rod 26, and the hole nearest the end of the rod provides the long stroke, the other hole the short stroke. The short stroke is normally used in summer, and the long stroke in winter.

#### Power Jet

In the WIA type, the power jet is automatically operated by the engine depression. A small casting, attached by three screws, is mounted on the floatchamber cover. Inside is a diaphragm 22, normally retained in a flexed position by a compression spring 23. This diaphragm is connected to a long metal stem, which in turn operates the power jet 24. On the opposite side of the diaphragm, the compartment housing the spring is in direct communication with the engine side of the throttle by means of suitable channels.

When the manifold depression is high (as at low throttle openings) it is imposed on the diaphragm, overcoming the compression of the spring and raising the stem, thus keeping the power jet closed. Upon opening the throttle, however, the depression is reduced, which allows the extended stem to push the valve off its seating. This action admits a further quantity of petrol (over and above that supplied by the main jet) to the main discharge jet.

#### Floatchamber Ventilation

In some models the floatchamber is vented direct to the atmosphere through a horizontal channel in the floatchamber cover just below the air-cleaner spigot, or in the case of the 42 mm. illustrated, via a hole in the floatchamber cover protected by the cover 29 held in place by the screw 30. In others, the ventilation is arranged internally by means of an angular impact tube projecting into the air intake, by the side of the strangler flap.

#### Automatic ignition advance control

A connection for the automatic ignition advance control is provided. The small hole, where it breaks into the throttle bore, is very carefully drilled both for size and position, and should on no account be tampered with.

#### General

To dismantle the carburetter, remove the six screws and spring washers (items 5, 6, 73 and 74 in the exploded illustration) when the floatchamber cover can be laid aside and the interior of the floatchamber will be exposed. This will give access to the idle tube, high speed bleed, accelerating pump, power jet, float, needle and seating. When replacing the cover, the screws should be put back and tightened in the following order (fig. 3):—2,5,1,4,6,3. Take care that the gasket is in position and undamaged; in the case of the 34 and 36 mm. sizes ensure that the pump lever, under the floatchamber cover, engages correctly in the top of the piston, and that the needle has entered its seating.

If for any reason the economy diaphragm cover has been removed, be careful that the economy spring seats squarely in the brass cup of the diaphragm, otherwise the power jet will not function correctly.

The main jet is accessible from beneath the floatchamber, and may be removed with a spanner. It is fitted with a flexible sealing ring, and care must be taken not to damage this when handling the jet. When extracting it be careful that the main discharge jet 19 does not drop out and sustain damage. Upon replacement it is essential that the main discharge jet is carefully refitted as shown in the diagram, i.e., with the sharpened tip at the extreme top and the row of holes on the underside.

**If for any reason the pump discharge valve is removed, care must be taken not to lose the ball valve underneath it. Never depress the pump piston suddenly if the discharge valve is not in position, otherwise the ball may be blown out and lost.**

When cleaning jets, swirl them thoroughly in clean petrol or blow out with air pressure. On no account use anything that is likely to damage the calibration, such as needles, etc. Periodically check all the various screws, nuts, etc., for tightness.

To check the fuel level in the 34 and 36 mm. sizes with bottom feed to the floatchamber, remove the floatchamber cover, when the surface of the petrol below the face of the chamber can be measured with a depth gauge. The standard fuel level in the 34 and 36 mm. carburetters is 16 mm. ( $\frac{5}{8}$  in.) below the top face of the floatchamber, with the gasket removed, but there are applications where the level does vary from this standard setting, and one should refer to the parts sheet covering the particular application which will specify any variation of level from the normal 16 mm.

If the level is high, the float arm should be bent downwards slightly, after removing the float pin; if low, bent up. As the float may easily be damaged, great care must be taken in either of these operations.



In the 42 WIA-2 carburetters which have the fuel inlet in the cover, the standard petrol level is 19 mm. below the top of the floatchamber. The float is of nylon and the arm incorporated. The level is pre-set in the design to give the correct level under the pressure of fuel from the standard fuel pump which is in the order of  $2\frac{1}{2}$  lb. sq. in. Variations to the level can be effected by altering the thickness or number of washers used on the needle valve assembly that screws in the underside of the cover on the 42 mm. units.

Should the strangle/throttle interconnection be disturbed at any time it may be restored by opening the throttle a definite amount by means of the throttle stop screw. This measurement is given in the setting table for the car concerned under the heading of "interconnection setting," and is reckoned in the number of half-turns of the stop screw from the fully-closed position of the throttle when the strangler is shut.

Before setting the interconnection, it is advisable to note the number of half-turns to which the stop screw was adjusted for idling, so that it may be reset correctly after clamping the interconnection rod.

#### ADJUSTMENTS.

A number of variables are incorporated in the W carburetters to enable the instrument to be adjusted to ensure correct fuel/air ratio at all points in the range of throttle movement, and for all speeds and loads.

Three adjustments are provided. These are :—

- The volume-control screw, or air regulating screw, to regulate the idling mixture.
- The throttle stop screw, to vary the idling speed.
- The strangler/throttle interconnection, to adjust the amount by which the throttle opens when the strangler is closed for cold starting.

Where the carburetter is fitted as standard equipment on an engine, it will be appreciated that the sizes of these variables have been decided only after lengthy tests on the bench and on the road by our own engineers, working in collaboration with the Experimental Departments at the vehicle manufacturers. In such cases it is not indicated that changes should be made to such standard setting without careful investigation of factors in ignition and engine which could account for the trouble.

#### Altitude

The exception to the above comment on altering the standard setting does arise in those cases where the car is being operated abroad at altitudes in excess of 5,000 ft. Under these conditions some reduction in jet sizes is necessary to maintain the correct fuel/air ratio at the rarified atmosphere.

Below we detail recommended changes to main and power jets for different altitudes.

5 to 7,000 ft.	Main jet	$\frac{1}{2}$ size smaller
	Power jet	No change
7 to 10,000 ft.	Main jet	1 size smaller
	Power jet	$\frac{1}{2}$ size smaller
10 to 15,000 ft.	Main jet	2 sizes smaller
	Power jet	1 size smaller

While no change is specified for altitudes up to 5,000 ft. where an owner is more concerned with economy rather than performance, it would be worth trying the next smaller main jet in those cases where the altitude is in excess of 3,500 ft.

It must be made clear that the foregoing suggested changes will apply only in those cases where the vehicle is operated consistently at altitude; no change need be made in a run where the car climbs to an altitude, then drops down again to something under 2,000 ft. or thereabouts.

Below is a list of the variables incorporated in the carburetter.

**Choke tube.** The size will determine the weight of mixture inspired by the engine; the size usually decided upon is the smallest that will ensure the maximum power required from the engine.

**Main discharge jet or tube.** There is a range of different jets with varying diameter bores and air bleed holes, while the outlet at the end of the discharge jet which projects into the inner venturi can be open or masked. Both size and shape vary according to the characteristics of the engine, and once having been decided it is not a component that would normally be altered in service.

**Main Jet.** The size of this jet will determine the part-throttle cruise mixture, but as it is supplying fuel over the whole range of throttle movement beyond the idle position, variation to the jet will also influence mixture strength at wide throttle openings when the power jet is also feeding petrol to the main discharge tube. The main jets normally run in units of 5, the higher the number the larger the jet, 70 being the next larger to 65. Half-size jets are available, number 67 being midway between 65 and 70. In the interests of economy one should use the smallest size of main jet that will ensure even firing of the motor at light throttle openings when this jet provides all the petrol to the main discharge jet.

**High-Speed Bleed.** The size of the orifice in this will determine the extent of air bleeding to the cross holes in the main discharge jet. Whilst it is a variable during the tests we conduct at the manufacturers' works, it cannot easily be altered in the field and it should not be necessary to change this part. It is, of course, necessary to ensure that the air bleed hole is quite clean.

#### Power Jet

This is virtually a spring-loaded valve with a calibrated orifice or jet. When the valve is opened, this jet will provide additional petrol to the annulus between the cored hole in which the main discharge jet is fitted and the outside of the main discharge jet, the petrol entering the centre bore of the main discharge tube through a cross hole near the base of the tube, as shown in the diagrammatic illustration.

As its name implies, the power jet provides additional petrol at wider throttle openings, or under conditions of low manifold depression, to give a mixture adequate to ensure development of maximum power as required under conditions of high speed or heavy load. Naturally, the smallest jet that will provide the power should be used. The power jets also run in fives, the lower the number the smaller the jet. Half-size jets are available, stamped in a similar manner to the main jets, i.e., 92 is midway between 90 and 95.

As indicated on page 1 there are "W" series carburetters, with "P" in the type letters, which do not have the power jet circuit, and a screw plug is fitted to blank any outlet from the floatchamber where the power jet would normally be fitted. Moreover, in these types, no diaphragm is fitted in the cover.

#### Pump Discharge Nozzle

The calibrated orifice in this small diecast block determines the amount of petrol injected into the bore of the carburetter on the downward movement of the accelerating pump which is, of course, interconnected with the throttle. This nozzle is also supplied in units of five, the lower the number the smaller the jet.

Apart from the variations to the size of the pump discharge nozzle, the stroke of the pump piston can be varied by the linkage between the throttle and the piston as referred to in the description of the operation of the carburetter. On the 34 and 36 sizes, the hole nearest the outer end of the lever gives the minimum or short stroke, whilst the hole farthest from the end of the lever will give maximum pump stroke and output. The link is generally fitted in the centre hole, which gives a medium stroke. The 42 mm. carburetter has two alternative lengths of pump stroke by positioning of the link 27 in either of the holes in the pump rod.



During hot weather, or in a country where the average day temperature is higher than in the United Kingdom, it will usually be found possible to use the short pump stroke without an adverse effect on acceleration. Conversely, during severe weather or in colder climates, it might be found advantageous to fit the link in the hole to provide the maximum stroke.

There are certain applications of the "W" series where the pump discharge nozzle is modified to provide for a degree of enrichment of the full throttle high speed mixture strength by drawing fuel from the pump circuit other than when accelerating.

The point is mentioned to ensure that if the size of the pump discharge nozzle is to be changed, it is necessary to quote part number of the nozzle required as detailed on the parts list covering a particular application, or to quote the reference number of the carburettor in ordering these nozzles.

#### **Slow-running jet**

As its name implies, this tube or jet with a calibrated orifice at the base provides the petrol for slow-running with the throttle practically closed. As with other jets in the carburettor, sizes run in fives, the higher the number the larger the jet.

The strength or mixture-ratio at idling can be varied within limits, without changing the slow-running jet, by regulation of the volume control screw in the throttle barrel. Turning this screw clockwise reduces the annulus between the conical end of the screw and the hole in the barrel from which the idle mixture is discharged, and will weaken the slow-running mixture; unscrewing the volume control screw will enrichen the mixture by increasing the annulus, and also therefore the depression over the slow-running jet.

When the air regulating type of idle adjustment is used, the screw, which is mounted on the floatchamber cover, controls the air supply to the slow-running jet. The tapered end of the screw forms a valve which, by varying the amount of air admitted, governs the depression acting on the jet. As the air is reduced, the depression increases and a greater volume of fuel will issue from the jet.

#### **Interconnection for Cold starting**

The degree of throttle opening when the strangler is closed for cold starting can be adjusted within reasonable limits. A rod secured by a setscrew in a swivel in the strangler lever enables this adjustment to be altered. The method of setting has already been explained.

#### **Petrol Level**

Whilst this can be varied within certain limits, the usual setting is 16 mm. ( $\frac{5}{8}$  in.) down from the top edge of the floatchamber, measured by a depth gauge resting on this face with the gasket removed. In checking the level ensure that the float bracket is right down in the slot by placing a piece of metal to hold it there, as the buoyancy of the float will tend to lift the bracket after the cover is removed. Make sure the carburettor is level by using a suitable spirit level across the top face of the floatchamber, with the cover removed.

Before attempting any adjustment to the float arm to alter the level, make sure the float is not punctured and is working freely on its pivot. Also see that the needle seating is clean, and is the correct size as specified for the particular application.

When replacing the float, bracket, arm and needle in the 34 and 36 mm. sizes, make certain the needle enters the seating, as it is possible to refit this assembly with needle outside the seating, which will give rise to violent flooding. In the 42 mm. carburettor the needle and seating are in an assembly screwed in the underside of the cover.

#### **Needle valve seatings**

These can vary between 1.5 mm. and 2.5 mm. in diameter, the size depending on the fuel pump pressure and the capacity and power of the engine.

Apart from the foregoing jets, etc., which could, where necessary, be altered after the carburettor is in service, the diameters of various drillings in the carburettor, strengths of springs actuating diaphragms and power jets are variables in tuning the carburettor to an engine; they illustrate the features that are available in the design to enable the carburettor to be tailored to the requirements of the particular motor on which it is fitted. On the other hand, once the sizes of the many variables in the carburettor have been decided upon, the mixture strength at different speeds and loads will remain constant, provided the jets and passages in the carburettor are clean and the mechanical condition of the carburettor is sound.

In any investigation of suspected faulty carburation, first check through to ensure the choke tube and jet sizes are those specified for the particular application; we stress the fact that all jets have the number stamped thereon, as does the needle seating. It is appreciated that the fact that a jet has the correct size stamped on it is no indication that it is flowing true to this size, but it is not an easy matter to check the flow of a jet with any degree of accuracy without expensive equipment. If there is any indication of the jet having been interfered with, it should be replaced with a new one of the correct size.

Whilst a general check-over of the carburettor is indicated in any complaint on carburation, we detail below under specific headings points that have a bearing on the particular trouble.

#### **Difficult starting from Cold**

Ensure there is petrol in the floatchamber, and that it is replenished by fresh petrol from the fuel pump within a few seconds of rotating the engine by the starter, or by the operation of the primer on the pump. A clip fixing the needle to the float arm ensures that the needle is lifted from the seating, eliminating any question of the needle spinning, or sticking in the closed position as can and does sometimes occur in certain models, due to the formation of a gummy deposit from petrol or additives.

See that the strangler flap in the air intake closes completely when the choke or strangler control is operated. From examination of the strangler control on the carburettor it will be seen that there is no mechanical connection between the cable and the spindle on which the strangler flap is fitted. Movement of a cam lever on the side of the air intake permits the spring operating the strangler spindle and arm to close the flap in the air intake. Therefore undue friction by reason of a bent strangler spindle, carboned-up bearings, or a broken spring could explain non-closure of the flap in the intake. Removal of the air cleaner will enable this to be checked.

The interconnection between the strangler lever and the throttle should ensure the latter opens beyond the normal slow-running position when the strangler is fully closed. The setting for a particular application gives the extent the throttle should open when the strangler is closed. The measurement given is the width of the gap between the edge of the throttle and the side wall of the throttle bore (by the idle-discharge holes) and is shown as a drill size; it is alternatively shown as half-turns of the throttle stop screw, as mentioned previously.

If the foregoing points have been checked, and one is assured that the ignition and engine generally are in order, slightly increase the amount the throttle opens when the strangler is closed.

#### **Difficult starting when hot**

Fit a new needle and seating of the size specified for the engine and check the petrol level, ensuring that this does not build up after applying the starter, and actuate the fuel pump while the floatchamber cover is off and the level is being checked. If the level rises to such an extent that petrol drip from the tip of the main discharge tube into the throttle bore check the fuel pump pressure and if necessary have it lowered.

Usually one can start the motor by gently opening the throttle to its fully or near-fully open position, and rotating the engine on the starter with the ignition switched off to clear the over-rich condition.

#### **Erratic slow-running, or stalling on deceleration**

Ensure that the slow-running jet is quite clean, and is screwed home flush with, or a little below, the top surface of the floatchamber. Check to see the gasket between cover and floatchamber is in good condition, and that the securing



screws holding the cover are tightened evenly (see fig. 3) to ensure a good joint across that part of the cover in which the slow-running tube is situated.

Make certain that the screws securing the throttle barrel to the main body of the carburettor are tight, and that the hole in the gasket to carry the mixture from the slow-running passage in the main body to the hole in the top face of the flange of the barrel portion is unobstructed. Check to ensure the slow-running outlet hole and the progression hole or holes in the throttle barrel are clear, and not carboned-up to restrict the orifice.

Inspect the volume control screw to make sure the tapered end is in good condition. If it has been screwed hard down into the slow-running hole several times, there will be a parallel portion on the taper; this will render abortive any attempt to regulate the screw. Ensure that the spring under the head of the screw is sufficiently long to prevent the screw vibrating out of adjustment.

The amount of throttle opening will determine the slow-running speed, while the adjustment of the volume control screw will vary the mixture strength. Set the former to give a reasonable idle speed—usually in the order of 500 r.p.m., then adjust the volume control screw so that at this speed the engine idles evenly, with no tendency to stall on snap closure of the throttle; also to ensure progressive acceleration, as the throttle is opened gently off the idle position onto the progression hole or holes which are also fed by the slow-running mixture.

Having set the volume control screw, it may be necessary to re-adjust the throttle stop screw to give satisfactory idle speed.

#### **Excessive Fuel Consumption**

Check through the carburettor to ensure that all the jets are standard sizes, the high speed bleed is clear and the air bleed holes in the main discharge tube are clean. See that the strangler flap in the air intake opens fully when the dash control is released.

Check the fuel level.

Make certain the ball beneath the screw securing the pump discharge nozzle is in position. It can easily be lost in the dismantling of the carburettor if the body is inverted after removal of the screw, or the pump piston is forced down suddenly. If the carburettor is re-assembled without this ball, the engine depression in the intake will, at certain speeds, lift petrol from the pump nozzle and adversely affect the consumption.

Dismantle the economy valve to make sure the diaphragm material is intact and the gaskets (one each side of the diaphragm) are in position and are sound.

In re-assembling the economy device, see that the spring beneath the economy device cover is in position, and is located squarely in the recess in the brass insert in the centre of the diaphragm. Take care to tighten evenly and fully the screws which secure the cover. Any leakage at the joint will affect the degree of depression necessary to overcome the spring tension which normally holds the diaphragm down to open the valve in the power jet.

Examine this valve to ensure it is clean, to permit the inverted cone to seat and shut off the jet.

Ensure there is no leakage of petrol at the fuel inlet, or where the main jet is screwed in the underside of the float-chamber. The latter has a synthetic rubber ring to provide a seal, and in good condition this ring is quite effective. In fitting a new ring to the main jet and plug, roll the ring from the threaded end of the jet to ensure it is not damaged in the process, and see that it is seating in the recess machined in the body of the plug portion of the jet.

#### **Poor Acceleration**

Check the petrol level. If this is low, there will be a delay in petrol issuing from the tip of the main discharge jet.

Too small a needle seating will cause the low level; the correct size should be fitted according to the specification.

The extension of the float arm which contacts the needle seating can be set to vary the level, as explained earlier in the text.

Make certain the calibrated orifice in the pump discharge nozzle and also the drillings in the screw securing the nozzle are clear. Check that the pump piston works freely, and is not stuck down. Provided the pump cylinder is clean, the spring beneath the piston will ensure the return of the piston. See that the non-return valve to the pump cylinder is clean and will close effectively, and that the assembly is screwed tightly into the base of the float-chamber.

If the pump link is in the short or mid-way position, try the linkage in the hole to give maximum length of piston travel.

Dismantle the economy device to make certain the stem in the centre of the diaphragm will move freely, as on snap opening the lowered depression in the manifold will permit the spring above the diaphragm to force the latter down and open the power jet valve, to provide additional fuel apart from that passing through the main jet and from the pump nozzle. Therefore any obstruction in the calibrated orifice in the power jet will affect acceleration.

Larger pump nozzles are available to meet special conditions.

Naturally, in time, wear of the carburettor will have a bearing on the output of the pump, and will affect acceleration adversely.

Flat spots or hesitation on progressive opening can be explained by maladjustment of the slow-running mixture, or by the progression hole or holes in the throttle barrel being partially obstructed.

#### **Loss of Power**

Ensure that all jets and passages in the carburettor are clear, and that the throttle opens fully.

A larger power jet may be tried, to see if increased mixture strength will improve maximum speed or power.

In cases where an engine has been modified with a view to increasing the power output, a larger choke tube with corresponding larger jets should be tried; on knowing particulars of the modifications effected we can suggest alternative parts as a basis for commencing tests to tune the carburettor to suit the altered condition of the engine. These remarks apply equally to conversions to twin or multiple carburettors, and we shall be pleased to pass on to owners the benefit of our experience on similar installations.

#### **Twin Carburettors**

On certain applications, twin carburettors are fitted. It is important that petrol levels and settings in both carburettors are the same. Care must be taken to ensure that the throttles are correctly synchronised. It is essential to adjust the throttle opening in both carburettors the same amount, from the dead shut position, to give the desired idle speed. This will ensure that as the accelerator pedal is depressed to move away, the progression holes in both carburettors come under depression at the same time, to give clean opening-up with no hesitation or flat spot.

If idling speed or mixture varies and needs frequent attention, the probable explanation is leakage at manifold joints, and these should be checked to make certain all are air-tight.

Parts lists for this carburettor can be supplied on application; please give name and type of car concerned. In any query, always quote the reference letter and figures stamped on the carburettor.

Issued by THE ZENITH CARBURETTOR CO. LTD.  
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