The Talbot Manual

Technical Resource

Fuel System

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The Talbot Fuel System

General Description

The Talbot fuel system consists of a rear mounted tank from which fuel is pumped by a mechanical AC pump. Some owners have substituted/augmented this with an electric pump, often for carburettor priming or emergency use. They are beyond our remit, but for SU pumps the Burlen website carries copious overhaul notes.

From the pump the fuel flows to a carburettor on the offside of the engine. Early cars used a Smiths 5 jet carburettor which is not covered by these notes. The majority of cars were fitted with a Zenith fixed jet instrument. Smaller and earlier cars used an up draught version, later and larger cars downdraught. Both work in exactly the same way. Some owners have substituted SU carburettors. These are not covered but there is copious information available on these excellent instruments.

The Fuel Pump

Description

The AC mechanical pump is mounted on the nearside of the engine block. It is operated by a lever activated by a lobe on the camshaft. The lever is attached to a rubber diaphragm. The rocking of the lever creates an alternate sucking and pumping action, passing fuel through a gauze filter and bowl and onto the carburettor. Most pumps have a manual priming lever so as to minimise churning the engine when the carburettor is dry.

Maintenance

The pump requires very little maintenance and is a remarkably reliable unit. Every year it is worth removing the float bowl and filter and swilling these with clean petrol. If pump performance falters it is probable that the diaphragm is split or perished.

The AC type A and B pump as fitted to Talbots

Glass bowl and gauze filter should be removed and cleaned annually

The original diaphragm held by a nut

New diaphragm on right. Will need to be un-riveted from its rod

New diaphragm fitted

Later AC pumps can be fitted but will need a modified lever

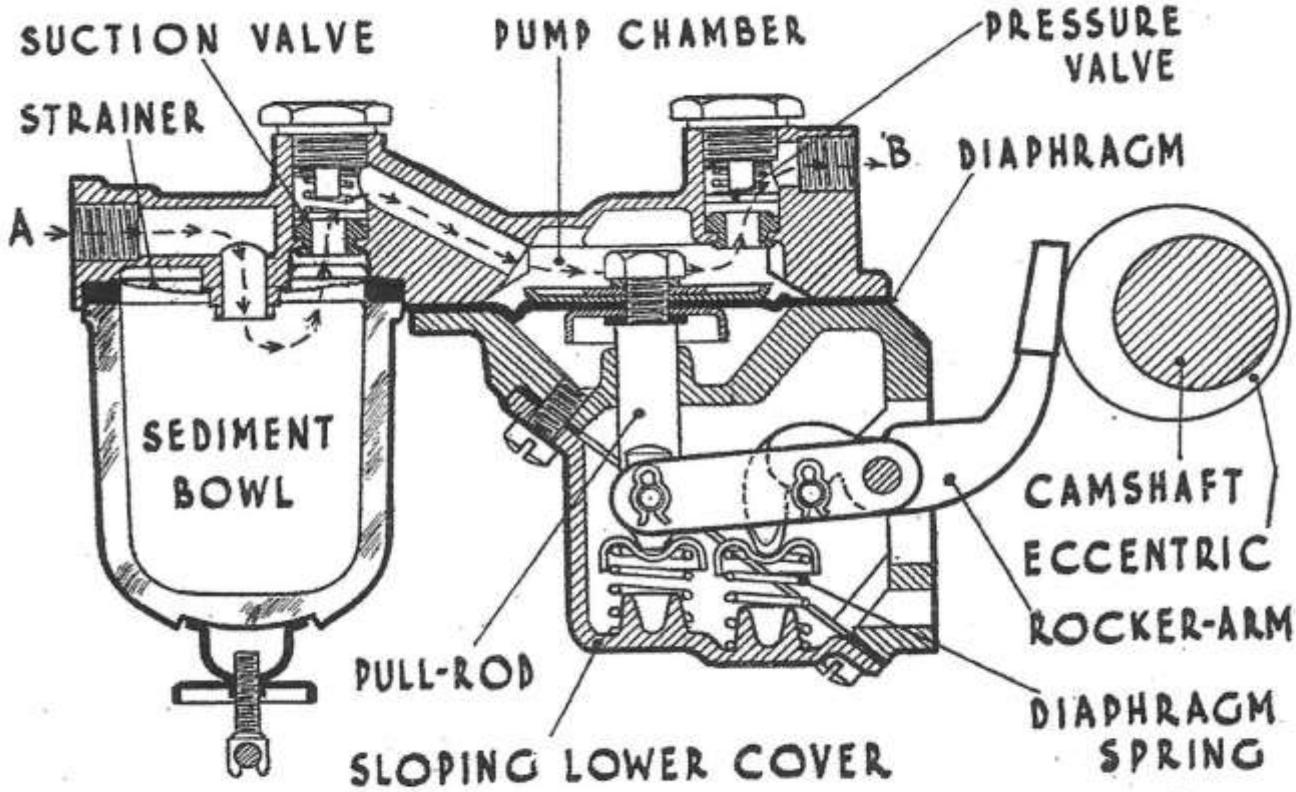


Fig. 2.—SECTIONAL DIAGRAM OF AN EARLY A.C. FUEL PUMP, SERIES B

The arrows indicate the path of the fuel through the pump on its way from the tank to the carburettor.

and one of the early models—Series B—respectively, and although at first glance they appear to differ widely, examination will quickly reveal that the contrary is the case.

On both models rotation of the eccentric on the camshaft lifts the rocker arm, the other end of which, being attached to the diaphragm by a pull-rod, pulls down the diaphragm and creates a vacuum in the pump chamber.

Formation of the vacuum causes fuel to leave the car tank and enter the pump at *A*, from whence it proceeds, via the sediment chamber, the filter, and suction valve, into the pump chamber. On the return stroke, pressure from the diaphragm spring forces the diaphragm upwards, thus ejecting the fuel from the pump chamber, through the pressure valve, and opening *B* into the carburettor.

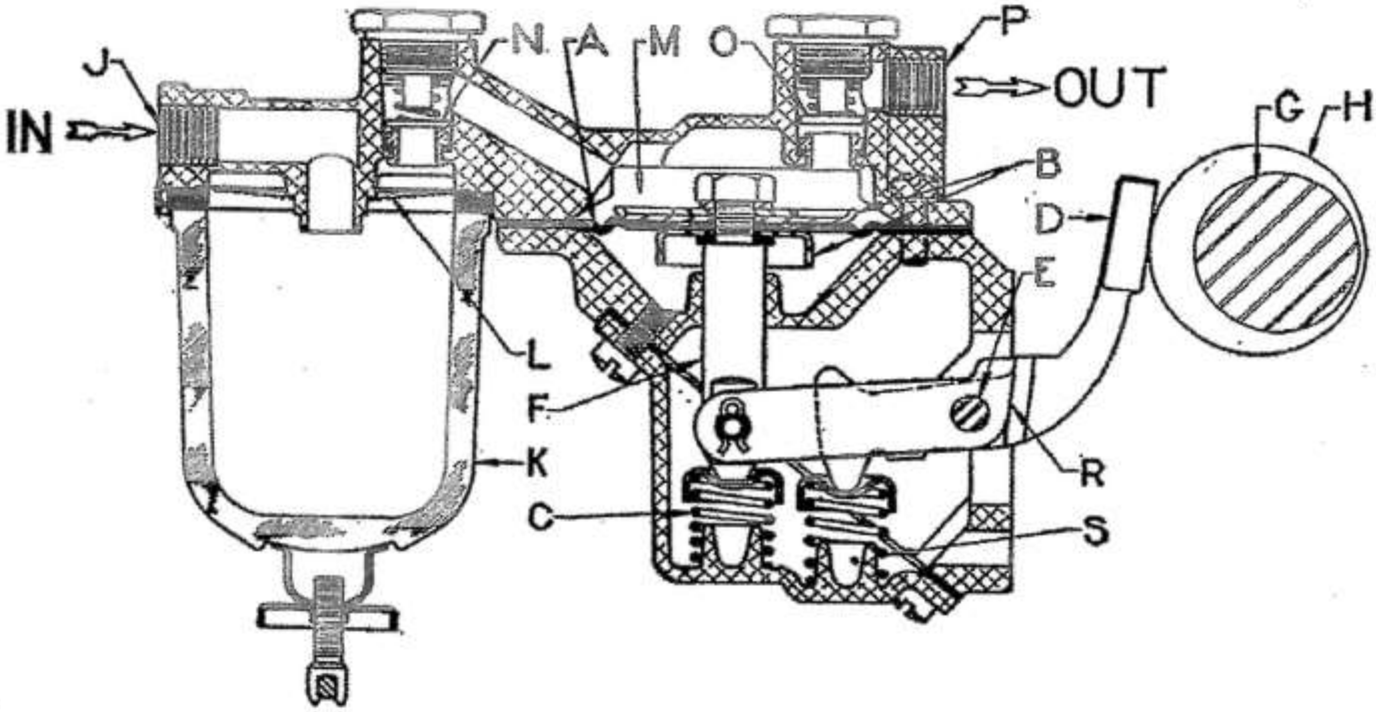
On the carburettor bowl becoming filled, the float shuts off the inlet needle valve, thereby creating a pressure in the chamber of the pump, and this pressure holds the diaphragm down against its spring until the carburettor needs more fuel and the needle valve opens.

Types of A.C. Fuel Pumps

As already stated, the operating principle just described holds good for all five models, but the models vary in design, and the way to tell one from the other is by noting the following features :

THE AC FUEL PUMP

SERIES B



How It Works

By revolving shaft (G) the eccentric (H) will lift rocker arm (D), which is pivoted at (E) and which pulls the pull rod (F), together with diaphragm (A) held between metal discs (B) downward against spring pressure (C), thus creating a vacuum in pump chamber (M).

Fuel from the rear tank will enter at (J) into sediment bowl (K) and through strainer (L) and suction valve (N) into pump chamber (M). On the return stroke, spring pressure (C) pushes diaphragm (A) upward forcing fuel from chamber (M) through pressure valve (O) and opening (P) into the carburetor.

When the carburetor bowl is filled the float in the float chamber will shut off the inlet needle valve, thus creating a pressure in pump chamber (M). This pressure will hold diaphragm (A) downward against the spring pressure (C) and it will remain in this position until the carburetor requires further fuel and the needle valve opens. The rocker arm (D) is in two pieces split at (R) and the movement of the eccentric (H) is absorbed by this "break" (R) when fuel is not required.

Spring (S) is merely for the purpose of keeping rocker arm (D) in constant contact with eccentric (H) to eliminate noise.

Service Hints

Service on the AC Fuel Pump is available through United Motors Service Branches and Authorized AC Service Stations, who are prepared with parts and fixtures for repairing all types of pumps. There are some service operations on this fuel pump that can, if necessary, be done without referring to the service station and these are tabulated on the reverse side of this sheet. In some instances trouble is attributed to the fuel pump which in reality is caused by some other condition. These should be carefully checked to avoid the needless replacement of fuel pumps.

LACK OF FUEL AT THE CARBURETOR

Check as follows:

Cause	Remedy
Gasoline tank empty.	Refill.
Leaky tubing or connections.	Replace tubing and tighten all pipe connections at the fuel pump and gasoline tank.
Bent or kinked tubing.	Replace tubing.
Glass bowl loose.	Tighten thumb nut, making certain that cork gasket lies flat in its seat and not broken.
Dirty screen.	Remove glass bowl and clean the screen. Make certain that cork gasket is properly seated when reassembling.
Loose valve plug.	Tighten valve plug securely, replacing valve plug gasket if necessary.
Dirty or warped valves.	Remove valve plugs and valves. Wash valves in gasoline. If damaged or warped, replace them. Examine valve seat to make certain there are no irregularities which prevent proper seating of valves. Place valve in valve chamber with the polished side downward. Make certain that valve lies flat on its seat and is not left standing on edge. Reassemble valve plug and spring, making certain that spring is around the lower stem of the valve plug properly. Use new gasket under valve plug if necessary.

LEAKAGE OF FUEL AT THE DIAPHRAGM

Check as follows:

Cause	Remedy
Loose cover screws.	Tighten cover screws alternately and securely. CAUTION: Do not disassemble the pump body. NOTE: Sometimes there appears to be a leak at the diaphragm, whereas the leak actually exists at one of the pipe fittings and the fuel has run down the pump to the diaphragm flange, appearing to originate there.

FLOODING OF CARBURETOR

Check as follows:

Cause	Remedy
Carburetor needle valve not seating.	Check carburetor for proper adjustment.

IMPORTANT: Do not attempt to disassemble the fuel pump further than described above, because it is absolutely necessary to use a special fixture in reassembling the pump when once taken apart. When the above remedies do not correct the condition, replace with a new fuel pump sending the old fuel pump to your nearest AC service station.

The Carburettor

Description

The Zenith carburettor is of the fixed jet type. Fuel flow is controlled by a number of brass "jets" with differing diameter holes. These are measured in hundredths of a millimetre – hence size 200 is 2.00mm. Most carburettors fitted to Talbots have three jets that concern us. The slow running jet, in conjunction with the air screw, controls idle speed. It operates independently of the other jets. The main jet, in conjunction with the compensating jet and economy jet controls mixture through the rest of the rev range. (see Zenith notes for operating principles of the fixed jet carburettor.)

The V1/2 carburettor fitted from the mid1930s to 18hp and above cars is a more sophisticated device. Whilst following the same operating principles it introduces a number of enhanced features:-

- A separate starting device in place of the air strangler.
- An economy jet controlling fuel flow up to ¾ throttle
- An accelerator pump squirting fuel into the venturi.

Maintenance

The carburettor requires no routine maintenance, other than cleaning the gauze inlet filter from time to time. These notes describe how to access the jets and check float level. "Tuning" involves experimenting with different size chokes and jets and is beyond our scope. A chart of standard jet and choke sizes is included.

Filter

The gauze filter is accessed by removing the fuel feed pipe from the float bowl. Withdraw the filter and rinse in clean petrol. Make sure you fit the retaining union with both fibre washers to eliminate potential leaks.

Jets

The jets can be reached without removing the carburettor from the inlet manifold. Remove the two retaining bolts and drop the float bowl down, taking care not to spill petrol over the exhaust pipe! The main and compensating jets are in the bottom of the bowl. In some cases these are reached from the inside and in other cases from the outside, having removed the brass blanking plugs. The jets are unscrewed using the squared end of one of the retaining bolts. Blow through the jets to ensure they are clear and remove any debris from the bottom of the float bowl.

The slow running jet is reached from the top of the float bowl. It has a screwdriver slot to aid removal. As its aperture is by far the smallest it is the most likely to be blocked. If you cannot blow through it , use a piece of fine wire to clear it. The interdental "teepee" brush is an excellent modern alternative!

On the V1/2 carburettor depress the pump by hand. A squirt of petrol should come out of the emulsion tube beak if all is well. The economy jet is behind the blanking plug on the side of the carburettor. It has a finer thread than the other jets.

Remove gauze filter from petrol pipe union and swill in clean petrol

Brass blanking plugs to access main and compensator jets on V1/2

Removing blanking plugs with squared key

Removing economy jet blanking plug

Main, compensator and economy jets. Economy jet has fine thread

Slow running jet. Remove with screwdriver

Float and accelerator pump in bowl. Slow running jet on the right

Needle valve. Fuel level is adjusted by changing the fibre washer

Emulsion tube which projects into venturi

Slow running mixture controlled by air bleed screw

The Zenith "V"-type Carburettor

This is a later model replacing the "U" and "H" types. It embodies an automatic starting device with an original atomisation and distribution principle.

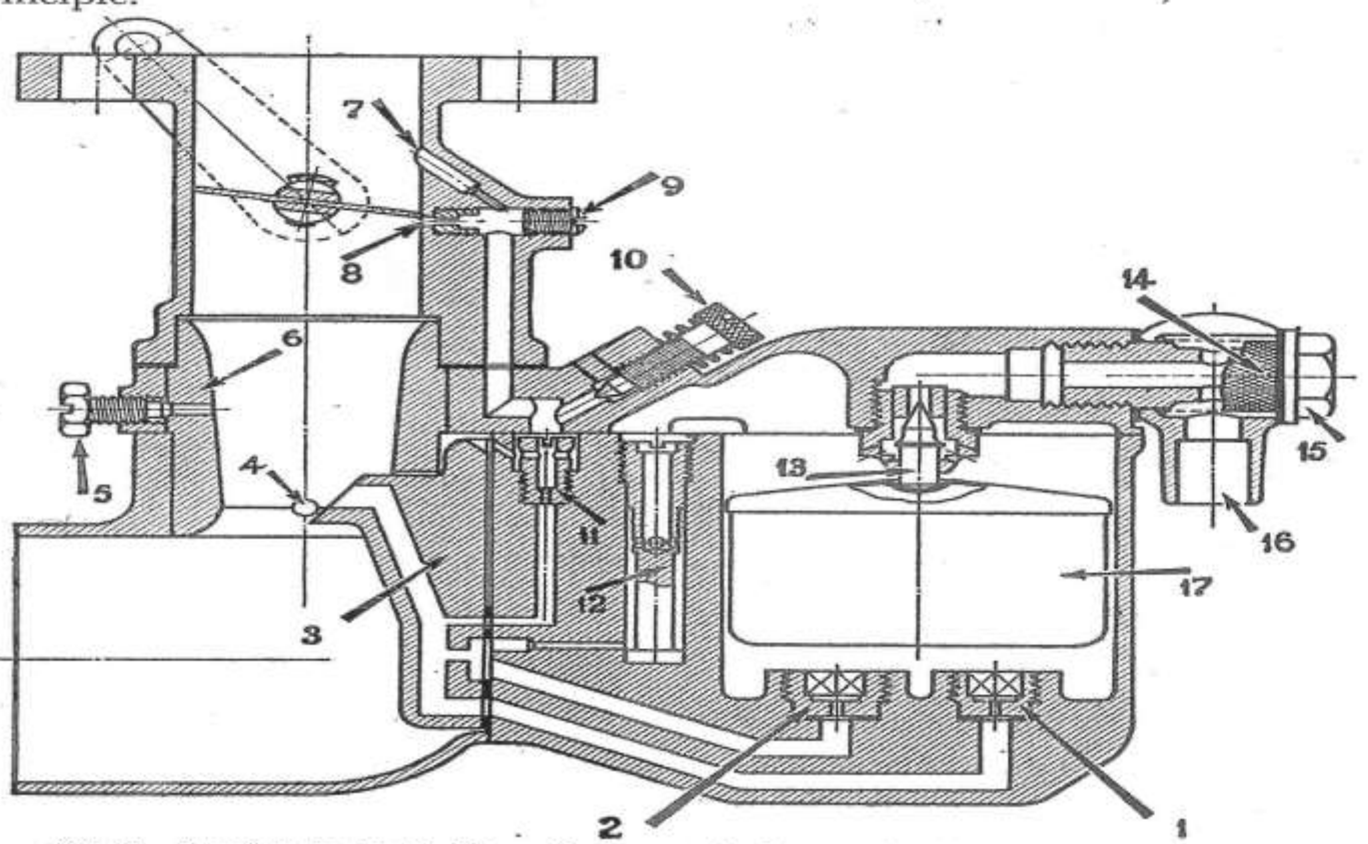


Fig. 63.—Showing the Zenith V-type Carburettor in Cross-sectional View (Diagrammatic).

1, Main Jet.
2, Compensating Jet.
3, Emulsion Block.
4, Distributor Bar.
5, Choke-retaining Screw.
6, Choke Tube.
7, Slow-running Outlet.
8, Progression Jet.
9, Progression-jet Cover or Plug.
10, Slow-running Air Screw.
11, Slow-running Jet.
12, Capacity Tube.
13, Needle.
14, Filter.
15, Filter Union.
16, Petrol Union.
17, Float.

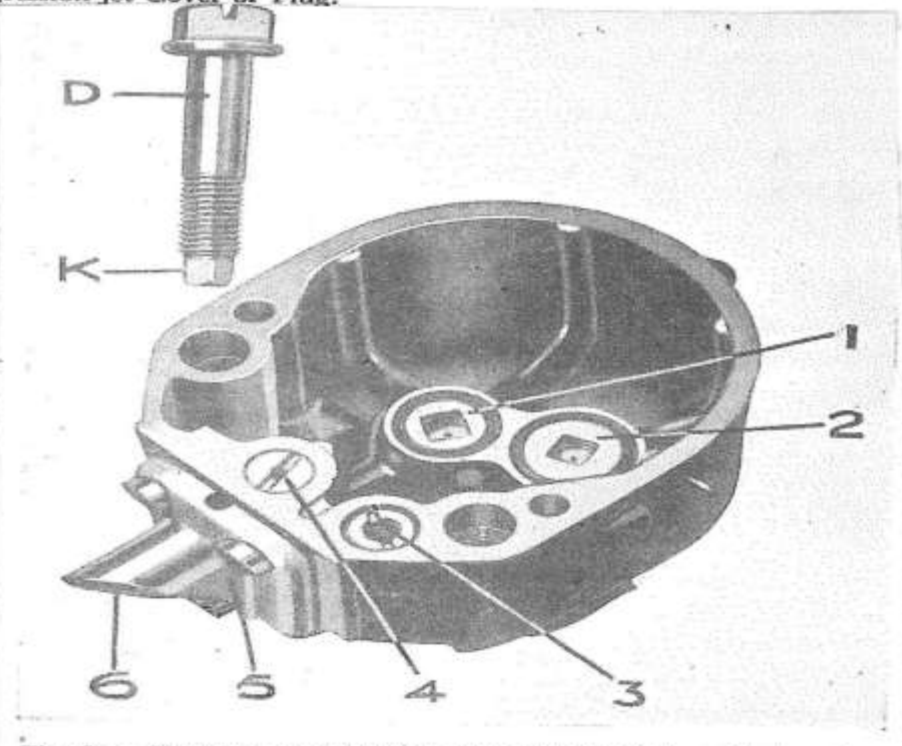


Fig. 65.—Showing Jet Chamber of Zenith "V"-type Carburettor. 1, Main Jet. 2, Compensating Jet. 3, Compensating Well. 4, Slow-running Jet. 5, Emulsion Block. 6, Choke-tube Nozzle. D, One of the Two Holding-down Screws, with Square Key at K.

INSTRUCTION No. 100

ZENITH CARBURETORS: Principle of Operation; The Compensating Jet and Compound Nozzle; Theory Applied in Zenith Practice; Installing, Adjusting and Checking a Zenith Carburetor; Carburetor Adjustments; Servicing and Maintenance of the Zenith; Zenith Model SV; Care of the Carburetor; Factors Which Assist Good Carburetion.

PRINCIPLE OF THE ZENITH CARBURETOR[1]

The Zenith Carburetor is a plain-tube type of carburetor with fixed adjustments.

In order to make clear the principle[2] of this carburetor, simplified illustrations and explanation are given below taken from the Zenith pamphlet entitled "The Balanced Ration."

The Balanced Ration

Just as the food we eat must contain the right proportions of carbo-hydrates, proteins, fats, etc., in order to keep the body working at its highest efficiency, so, the automobile **engine must be fed exactly the right proportions of gasoline and air,** in order that it may function properly.

In each case, the highest pitch of efficiency—the Zenith—is reached only by means of a perfectly balanced ration. Appetites may vary, greater exertion of either the human body or the automobile engine will call for a **larger ration; but always the ration must be balanced,** must contain the same kinds of foods in the same proportions in order to produce the best results.

Few of us devote very much real thought to the subject of diet. We prefer to leave the matter to those in charge of the kitchen, whose particular task it is to see that we are supplied with the various foods in the proper quantities to form the balanced ration necessary to sustain our energies.

The engine too is dependent upon its kitchen. Its cylinders take in and digest the food and turn it into energy just as the human stomach does, but before the food reaches the cylinders it must be measured out, the proper proportions of fuel and air must be brought together and mixed thoroughly and so prepared for the engine's consumption. The device that performs this function—the link between the raw food and the prepared meal—the kitchen, in fact, which supplies the engine with its balanced ration—is the carburetor.

The Ordinary Ration

The simple carburetor: A simple carburetor is one having a fuel chamber, a single air entrance and a single jet (see Fig. 1). Suction, created by the pumping of the pistons, causes fuel and air to flow through the carburetor into the engine. Each alternate downward stroke of a piston draws a fresh charge of mixed fuel and air from the carburetor into its own particular cylinder, where it is compressed and exploded.

The simple carburetor won't do. However, fuel is more responsive to suction than is air. Consequently as the engine gathers speed the flow of fuel into the engine increases much faster than the flow of air, the mixture becoming too rich. **It is no longer the perfectly balanced ration which the engine needs in order to do its best work.**

Attempts to overcome the defects: More speed should be a matter of a larger ration, not a richer ration. Many attempts have been made to overcome this natural tendency of the mixture supplied by the simple carburetor to become rich. However, due to mechanical difficulties or sensitiveness to changeable atmospheric and temperature conditions many of these devices have proven unsatisfactory.

How the defects were overcome: The French scientist, M. Baverey, inventor of the Zenith carburetor, solved the problem of the "balanced ration" by taking the direct and natural method of so arranging the fuel jets that they accurately proportion the fuel flow to the air flow in accordance with the suction. **He used natural methods, not mechanical methods.**

To overcome the variation of the simple jet which allows the mixture to grow richer under increasing suction, Baverey introduced another, calling it the **compensating jet,** which has exactly the opposite effect, allowing the mixture to grow "poorer" under increasing suction. He then combined the two jets into one—the **compound nozzle**—and achieved the desired result, a carburetor which delivers at all engine speeds a mixture containing exactly the right proportions of air and fuel—**the perfectly balanced ration.**

How Zenith Balances the Ration

In Zenith carburetors there are four measuring parts, supplied to meet the exact requirements of any particular engine:

1. The **choke tube** (X) (Fig. 4)—This measures the amount of air taken into the engine. The flow of air increases as the engine speed increases.

2. The **main jet** (S) (Fig. 4)—This acts exactly like the jet in the simple carburetor. It varies in flow with the suction.

3. The **compensating jet** (6) (Fig. 4)—The flow from this jet is constant regardless of the amount of suction, or the speed of the engine.

4. The **idling jet** (2) (Fig. 4)—This operates only when the throttle is barely cracked open. Further opening of the throttle automatically puts the idling device out of operation because the fuel in the well is then all drawn through the cap jet (4) (Fig. 4).

How the Main Jet Acts

Look at Fig. 1. You will see that (G), the main jet, is directly connected with the fuel chamber (F).

Compare the fuel chamber to a bottle and the main jet to a straw.

Now, if you put a straw down to the bottom of a full bottle (Fig. 1A), you will find that the harder you suck on the straw the more liquid you will get.

The suction of the engine will act on the fuel in the bowl through the main jet the same as your suction on the straw acted on the liquid in the bottle.

[1] Reprinted from Zenith instruction booklets.
[2] See also pages 130, 131 of *Dyke's Auto Encyclopedia.*

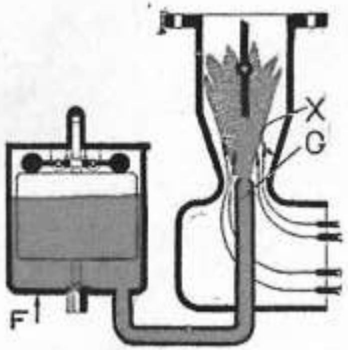


Fig. 1.

Fig. 1A.

How the Compensating Jet Acts

Look at Fig. 2. You will see that (I), representing the compensating jet, empties into the well (J), which is open to the air.

The cap jet (H) connects with this well.

Compare well (J) to a glass, compensating jet (I) to a bottle, and cap jet (H) to a straw.

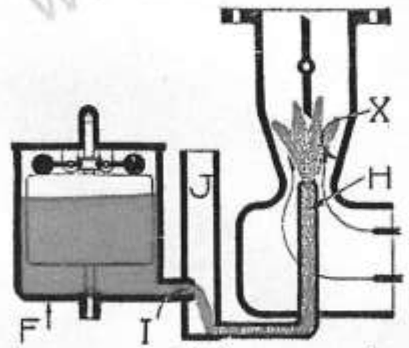


Fig. 2.

If you pour a tiny stream of liquid into a glass from a bottle, Fig. 2A, you can only suck out from the glass as much liquid as the tiny stream allows you, no matter how hard you suck on the straw.

It is apparent, therefore, that regardless of the suction at the tip of cap jet (H) only as much fuel will be drawn through it as is emptied into well (J) by the compensating jet (I).

Fig. 2A.

As the flow through the compensating jet is constant, it follows then, also, that the flow through the cap jet is constant.

The Compound Nozzle

Look at Fig. 3. You will see Figs. 1 and 2 combined. In this view cap jet (H) surrounding main jet (G) forms what we call "the compound nozzle."

Combining the first straw, or jet, that gave more liquid under increasing suction, with the second straw, or jet, which gives the same amount of liquid regardless of the amount of suction, you have a compound feed or nozzle.

This will permit the total flow of liquid to increase only within definite limitations and, by varying the size of the straws, or jets, you can bring the rate of flow absolutely under your control.

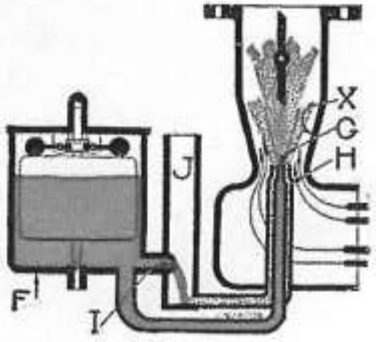


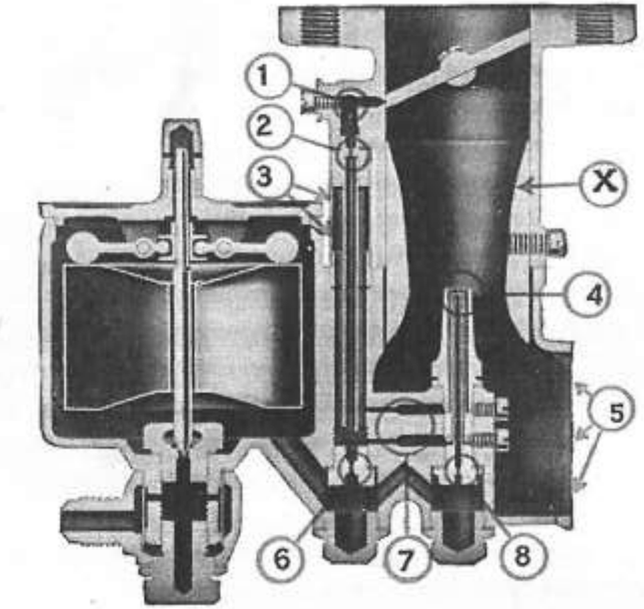
Fig. 3.

How Theory Is Applied in Zenith Practice

The illustration, Fig. 4, shows a sectional view of the model "U" Zenith carburetor.

Number 8 is the main jet. Follow it and its connections and compare with diagrammatic view shown in Fig. 1.

Number 6 is the compensating jet. Compare it with the view shown in Fig. 2. The jet here acts the same as (I) in Fig. 2, emptying into the well above it. This well is open to the air at Number 3,



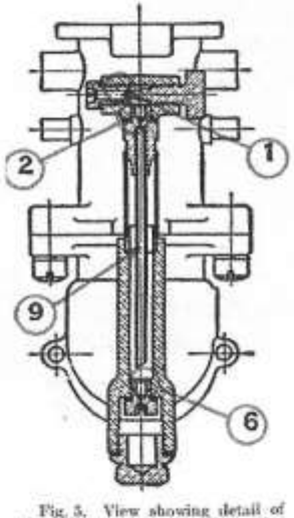


Fig. 5. View showing detail of the idling and starting jet. (See further explanation on pg. 1295 under "Idling and Starting Jet.")

Fig. 4. Sectional view of the Zenith model "U" carburetor.

Name of parts: 1, idling jet passage; **2,** idling jet; **3,** opening to compensating jet; **4,** cap jet; **5,** air intake; **6,** compensator; **7,** compensator jet passage; **8,** main jet; **9** (see Fig. 5) idling tube; **X,** venturi or choke tube (note there is only one venturi here, whereas on the model "SV" pages 1297, 1298, there are two venturi, a small and a large one).

The **single venturi carburetor** is used considerably on small engines, requiring in most instances 1" outlets. On larger engines, requiring 1¼" sizes up, the **double venturi carburetor** such as the model "SV" is used considerably.

Fig. 6

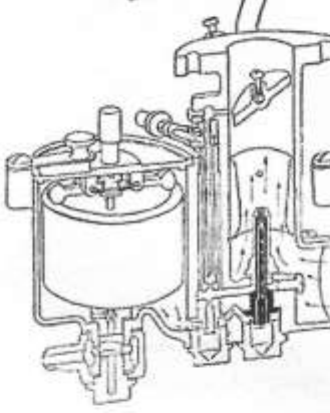


Fig. 7

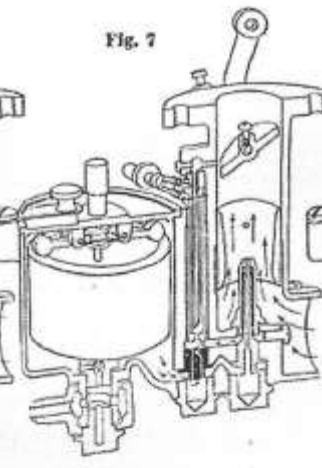


Fig. 8

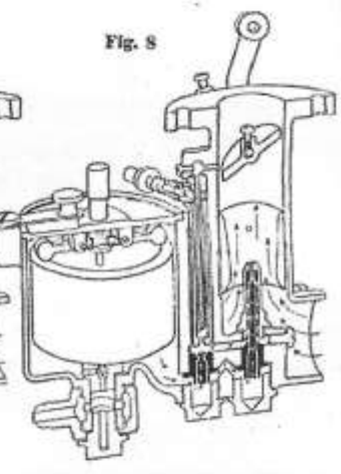


Fig. 6. **The main jet is shown in black.** This receives gasoline direct from the carburetor bowl, so gives an increasingly rich mixture as the suction increases.

Fig. 7. **The compensating jet is shown in black.** The gasoline flowing through this is limited only by the size hole through it, giving a constant flow of fuel when the suction—and consequently the air—is increased.

This means a leaner mixture as the gas suction is increased.

Fig. 8. **The compound nozzle** (the main and compensating jets) **is shown in black** and both are in actual operation, both jets supply gasoline, one growing richer, one leaner, as greater demand is made on the carburetor by the engine.

By selecting the proper sizes of main and compensating jets for any given installation, the relation of total gasoline to air drawn through the carburetor can be kept constant and exactly correct at all engine speeds.

From this well, through passages Number 7, the fuel flows to the (in this case) double cap jet. This is formed by the two outer pieces under Number 4.

Number 5 designates **the main air intake** of the carburetor. The amount of air necessary to meet the demands of the engine is measured through the choke tube (**X**) (see Fig. 4).

This is seen as the restricted tube held in place by the set screw just above the compound nozzle.

Idling and Starting Jet

This idling jet (2) (Fig. 5) is an auxiliary to the compound nozzle and operates only when the throttle is just cracked open.

The idling tube (9) projects downward to the bottom of the well which is filled with fuel when the engine is at rest.

Cranking the engine causes a strong suction over the throttle which, acting through the idling jet (2) and tube (9), draws fuel, and through idling air valve (1) draws air, forming the proper mixture for starting and idling the engine.

When the **engine is idling the well** is about half full of fuel. **This provides a reserve for acceleration as, when the throttle is open,** this fuel rushes through passages (7) Fig. 4, to balance the air passing by the compound nozzle.

Practice

The Zenith principle, illustrated and explained in preceding pages, is incorporated in every Zenith carburetor.

The illustrations (Figs. 6, 7, and 8) show how it is adapted to actual working conditions, through the use of parts governing the flow of air and gasoline which can be varied to meet individual requirement, but which become integral parts of the carburetor not subject to mis-adjustment.

INSTALLING, ADJUSTING, AND CHECKING A ZENITH CARBURETOR[1]

The type and size of carburetor to be used can be determined from the one to be replaced, or by measuring inlet manifold opening and refer to Fig. 9 and table below.

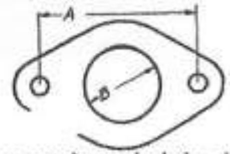


Fig. 9

Carburetors come in nominal sizes having actual diameters of barrels (**B**) and distance between bolt hole centers in flanges (**A**) as follows:

Nominal Size	Actual Size (B)	Bolt Center (A)
7/8"	1 1/16"	2 1/4"
1 "	1 3/16"	2 3/8"
1 1/4"	1 7/16"	2 11/16"
1 1/2"	1 11/16"	2 15/16"
1 3/4"	1 15/16"	3 5/16"
2 "	2 3/16"	3 9/16"

Model and size are designated by the marking on carburetor. The **model** appears in letters and the **size** in **figures. For example,** ST-4, or U4 means a model ST or U carburetor 1" size.

The **different figure markings** and corresponding **sizes** are as follows: the figure marking 3½ means ⅞" size; 4, 1" size; 5, 1¼"; 6, 1½"; 7, 1¾"; 8, 2".

There are two main types—the **vertical** which hangs from the manifold; and the **horizontal** which bolts to the side of the cylinder block.

Carburetor Adjustment

The following instructions will enable you to figure out what is necessary to **correct an adjustment.**

To correctly and quickly work out the adjustment you need to know what to change to accomplish a certain result and, at the same time, what effect that change will have on other points of operation.

Note the following carefully and you will have little difficulty in "working out" or correcting an adjustment.

Fig. 10 (left). Choke tube or venturi.

Fig. 11 (right). Main jet.

[1] From Zenith carburetor instruction book (Zenith-Detroit Corporation, Detroit, Mich.). These instructions can also be **used to check carburetors already installed** in order to see if they have the proper size choke tube, main jet, and idling jet.

Fig. 10. **Choke tube or venturi (arrow shows where size is stamped in millimeters).** Its job is to measure the air through the carburetor. In size it should be **large enough** to supply all the air needed for maximum speed, and **small enough** to keep the air moving fast enough at low speed to completely atomize the fuel.

Fig. 11. **Main jet (size stamped on base).** This is the long jet (8) Fig. 4, page 1294. It is directly connected with the float chamber and will vary in amount of fuel flowed with the speed of the engine. Its effect is most noticeable at high speed.

In the **older types** of carburetors such as Models L, O, and HP, its size is marked in 1/100ths of a millimeter.

In the **later types** the mark signifies the number of 1/100ths of a millimeter divided by 5.

Examples of Markings of Jets

Model L (old model) main jet, having a hole 1 millimeter in diameter, is $\frac{100}{100}$ millimeters and consequently marked 100.

Model U (later model) main jet, having a hole 1 millimeter in diameter, is $\frac{100}{100}$ millimeters and as 100÷5=20, therefore it is marked 20.

The main jets are made in various sizes progressing in steps of 5/100ths of a millimeter.

Model L (old model) main jets come in sizes as low as 60 up to as high as 250, and in this order—100–105–110, etc.

Equivalent sizes of Model U, ST, and SV (later model) main jets would be from 12 up to 50, and in this order—20–21–22–23.

See Tables on page 1290 for sizes to use.

Fig. 14

Fig. 12.

Fig. 13

Fig. 12. **Compensating jet** (left) (**size stamped on base**). This is the short jet (6) (Fig. 4, page 1294).

It empties into the well (**J**) (Fig. 3, page 1293) which is open to the atmosphere and accordingly is not affected by the suction.

It flows the same amount of fuel at **all speeds** but its effect is most noticeable at low speed such as climbing a hill or pulling through deep sand and mud and in acceleration. The **compensating jets are drilled** in the same manner as the main jets.

Fig. 13. Cap jet. This is not a measuring jet and bears no mark and is made in one size only. The fuel measured through the comp. jet goes through channel hole (7) (Fig. 4) and out of cap jet into carburetor barrel (the barrel is that part which holds the choke tube and throttle valve).

Fig. 14. **Idling jet (size stamped on nut at top).** This is the jet (2) (Fig. 4) and its sole function is to supply fuel for closed throttle operation. Immediately the **throttle is opened it is put out of action** as the fuel goes into carburetor through cap jet.

AN ENTIRELY NEW ZENITH CARBURETTER

The Motor
May 27, 1930.

Can be Dismantled in a Few Seconds. Easy Starting Device Instead of Strangler. More Power, Smoothness and Economy are Features

THE new Zenith carburetter, which has just been introduced, is entirely different in appearance from any previous Zenith model and it is obvious from a cursory examination that ease of dismantling and accessibility are features which have been considered very carefully. Apart from this, of course, the aim of the designer has been to provide greater economy, smoothness, more power and more positive acceleration, combined with easier starting, features which we understand are fully substantiated in practice.

Made in Two Parts.

The instrument is made in two parts—the top and the bottom, which are held together by one stirrup. The top carries only the choke tube, easy starting device, needle-valve, slow-running adjustment and throttle, the three jets and float being housed in the lower portion. Thus, simply by undoing a wing-nut, the stirrup can be released and the base removed whereby the jets can be cleaned or changed in comfort and with less risk of soiling one's clothes, away from the car—a feature which will appeal to every owner-driver. What is more, the instrument can be completely dismantled in a few seconds without any tools, as the butterfly nut can be taken from the stirrup and used as a key for all parts, whilst one wing acts as a jet key.

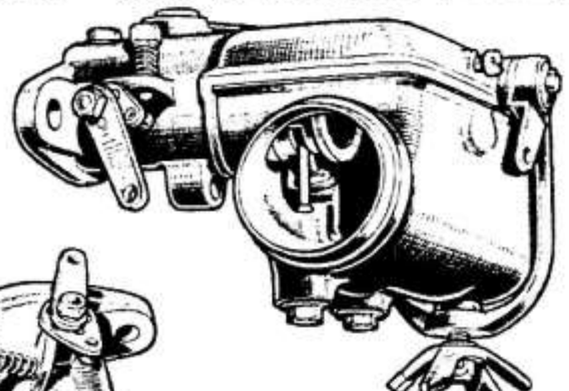
One of the outstanding claims made is that the mixture is automatically and rapidly adjusted to every condition and requirement of the engine, moreover, that the fuel is atomized to the greatest possible degree. Indeed, it is claimed that no liquid petrol can ever reach the cylinders, every drop being vaporized and turned into a mixture even when starting up from cold. This is due principally to the new design and arrangement of jets whereby most of the petrol is actually mixed with air even before passing out of the jets. A special rich starting jet ensures economy when starting from cold, for it provides just that richness of mixture necesary for starting, instead of flooding the engine with liquid petrol, as often happens when an air strangler is used. Incidentally, the design of this instrument obviates the use of a strangler, the easy-starting control being manipulated from the dash. The interior of the instrument is streamlined to assist in the free flow of gas, and this, combined with improved atomization and diffusion, ensures an increase of power. Flat spots are overcome so that snappy acceleration is an outstanding feature under all conditions, even when the engine is cold.

How it Works.

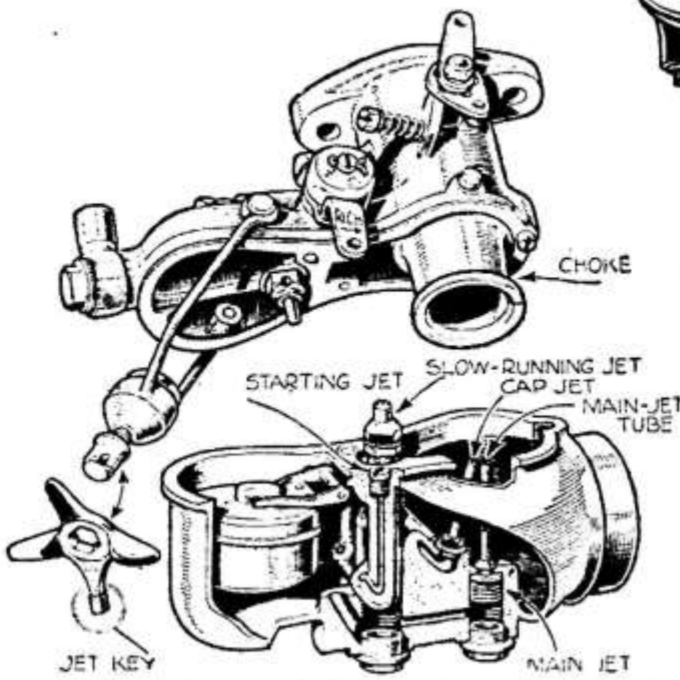
The functioning of the new U-type Zenith carburetter is very interesting, and with the assistance of the accompanying illustrations it will be possible to understand clearly the working thereof from the time the engine is started until the maximum speed is obtained. Petrol passes through the filter tube at the inlet into the float chamber, causing the float to rise and operate the control needle on reaching a pre-determined height. It will be noticed, incidentally, that the float is of the pivoted type.

The petrol then flows through a passage to the jets and up through the main jet into a jet tube which feeds the fuel into the choke. It will also pass through the compensator (H) filling the sloping passage and cap jet to the same height, whilst it will rise also in the well (K) to an equal level.

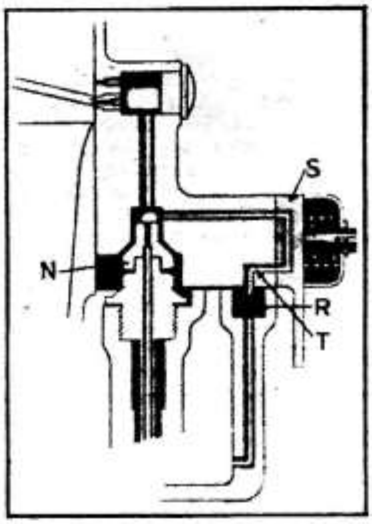
In order to start, the throttle valve is opened slightly, uncovering an outlet, another small outlet being already above the throttle; when the engine is turned over a very strong suction is set up which is communicated through these two orifices to the slow running jet, which is in direct communication by means of a tube with the petrol standing in the well. Thus petrol is drawn up, and on its way comes into contact with a certain amount of air drawn from the seating (Q), the supply being easily regulated by means of an



The horizontal model showing the location of the jets and choke in relation to the air intake.



(Left) The new Zenith carburetter (vertical model) broken apart into its two component parts which are normally held together by a stirrup. The base is cut open to show the jets and float arrangement.



The slow-running jet (N) and the easy-starting enrichening device (on the right) which give double or treble the mixture strength for starting only.

adjusting screw, which can be set to give just the right mixture for easy starting and slow running. Immediate response and instant starting should be obtained.

As the throttle is opened it fully uncovers the lower of the two slow-running jets, allowing a greater quantity of mixture to be drawn through so that the engine commences to accelerate smoothly and definitely. This creates a suction in the choke tube and petrol at once begins to issue from the main jet tube and the cap jet, both of which, incidentally, are very large, comparatively speaking, which allows the petrol already standing therein to pass out freely. This prevents any possibility of a pause in the change over from the slow-running to the main jets, and hence absence of flat spots.

The petrol in these two jet tubes will become rapidly exhausted, but there will be no break in the acceleration because there is already a quantity standing in the well which will continue to pass out through the cap jet. By the time this petrol is exhausted the engine will have accelerated sufficiently to create adequate suction in the choke tube to continue to draw petrol through the main jet, this being fed direct from the float chamber and through the atomizing compensator jet (H).

In passing, it should be mentioned that a capacity tube (T) regulates the exact quantity of petrol that is standing in reserve in the well, so that only just sufficient is allowed to pass to give smooth and progressive acceleration at low speeds. As the speed increases the whole of the petrol supply is derived from the combined main and atomizing compensator jets.

It is essential to appreciate the difference between the main jet and the atomizing compensator. The former is comparatively small and is fed direct from the float chamber; really, it comes only into serious operation at very high speeds, although petrol which is standing above the main jet in the tube when the engine is running slowly is always ready to assist in sharp acceleration. Most of that used comes through the atomizing compensator jet, but passes through the cap jet in the form of an emulsion of air and petrol, in view of the fact that it mixes with air entering through a series of ventilation holes (V) located just above the well. Not only does this give correct compensation necessary to maintain an accurate proportion of petrol and air throughout the whole range of speed, but it has also an atomizing effect. This is, in fact, an improved arrangement of the well-known Baveray system of correct proportioning of air and petrol which has been a feature of Zenith carburetters for the past 20 years.

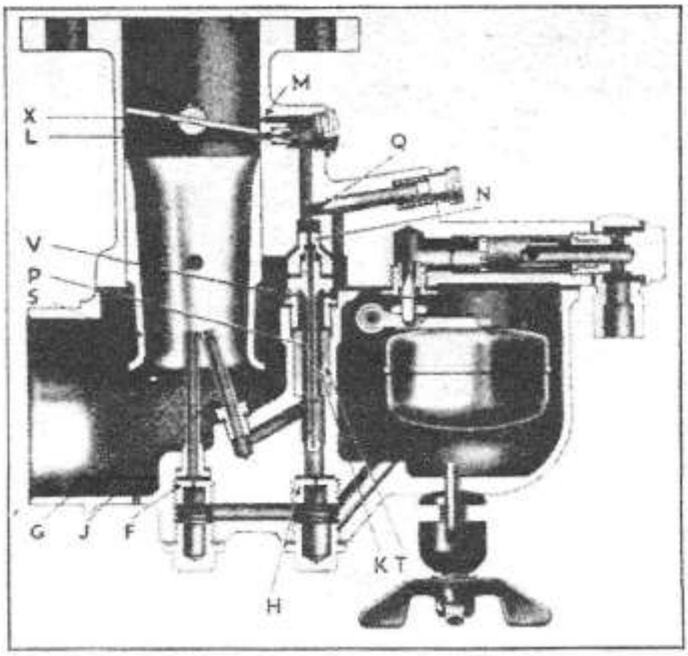
Petrol coming from the main jet is also atomized, because the spray issuing from the main jet tube encounters the petrol-laden air stream from the atomizing compensator; it is for this reason that the latter jet is placed at an angle with the main. Another feature which assists atomization is the area of the main jet tube. The choke tube is long, whilst the throttle valve is thin in order to offer the very smallest possible resistance to the air stream; consequently, when the throttle is fully open the maximum quantity of gas is supplied to the cylinders.

The next point to consider is what happens when slowing down and then accelerating again on top gear. The fact of shutting the throttle diverts the suction from the main jet tube and cap jet to the slow-running holes, and consequently the cap jet sloping passage readily fills with fuel. Thus when the throttle is opened again there is a plentiful supply available momentarily to balance the sudden rush of air that occurs in such circumstances. The amount of petrol, however, is carefully proportioned so that choking does not occur.

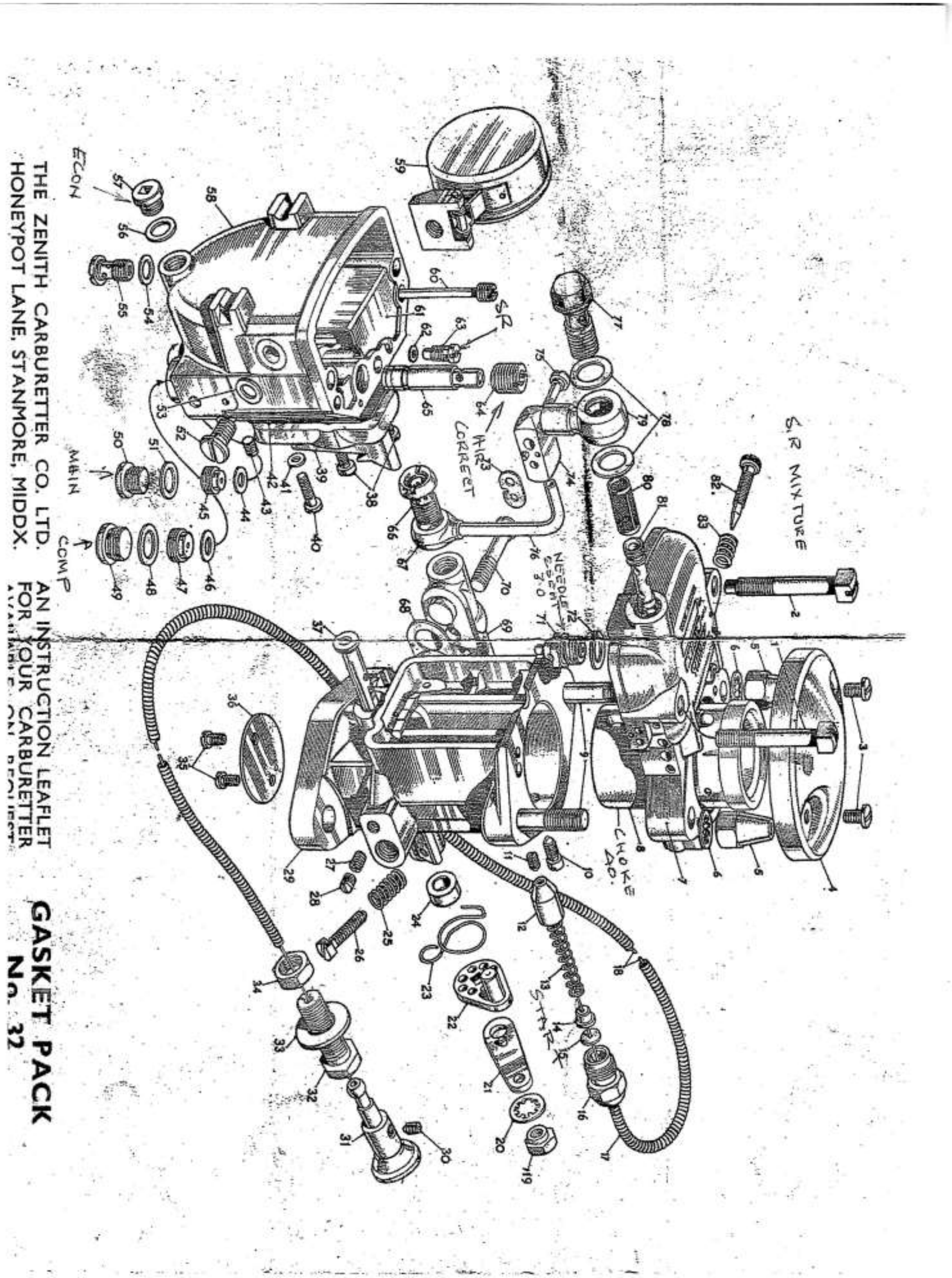
There is one other feature which has yet to be described, this being the special starting device illustrated on the previous page. This consists of an additional jet to the slow running, and is provided to increase greatly the strength of the mixture available for starting. This jet is fed direct from the float chamber and communicates via a passage and starting valve to the top of the slow-running jet. Consequently, if the enrichening lever be pulled the valve is opened and the starting jet linked up with the slow-running jet, thereby giving double or treble its effective size and providing the richness which is essential for starting away from cold. There is not an excess of liquid fuel, however, because of the air passing through the seating (Q) which atomizes this supply.

The new U-type carburetter is available in horizontal and vertical types, there being models suitable for every car. Carburetters are already available complete with the necessary fittings and attachments, so that the change over can be made in the minimum of time. It can quickly be tuned, as there are no meddlesome adjustments necessary, because the instrument can be sent out properly set for the particular engine to which it is to be fitted. Should any alterations be necessary, then the accessibility of the carburetter will at once make itself apparent to the owner.

The prices range from £4 10s. for a carburetter for cars up to 8 h.p. to £11 for models of over 30 h.p. R.A.C. rating. This very interesting instrument is marketed by Zenith Carburetter Co., Ltd., of Newman Street, London, W.1.



A detailed sectional view of the Zenith U-type instrument. The reference letters are included to assist readers in following the functioning of this carburetter.


THE ZENITH CARBURETTER CO. LTD.
HONEYPOT LANE, STANMORE, MIDDX.
AN INSTRUCTION LEAFLET
FOR YOUR CARBURETTER
AVAILABLE ON REQUEST
GASKET PACK
No. 32
S.R MIXTURE
SR
AIR CORRECT
CHOKE 40.
START
ECON
MAIN
COMP

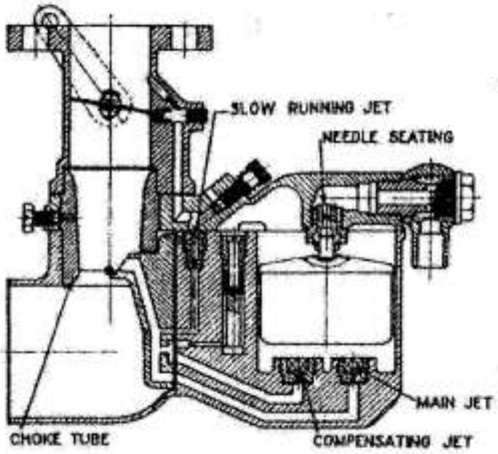
ZENITH

CARBURETTER DATA

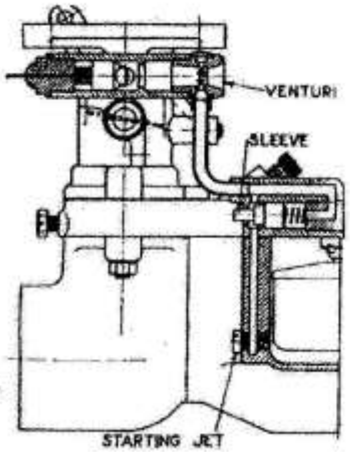
ENGINE MAKE & MODEL	YEAR	CARB. TYPE	C.S.	CHOKE	MAIN	COMP.	ECON.	S.R.	PUMP	PROG.	VENT.	C. TUBE	N. & S.	STARTING			
														Venturi	Start.	Control	
SUNBEAM																	
Dawn 12 h.p. ...	1934-5	30VM	539	25	110	70	-	45	-	90	STD.	2	2·0	STRANGLER			
25 h.p. ...	1934-5	48VI	-	33	150	140	190	70	-	190	STD.	STD.	3·5	STRANGLER			
20 h.p. ...	1933																
20 h.p. Sports ...	1933-5	48VI	-	38	185	165	250	70	-	No jet	STD.	STD.	3·5	STRANGLER			
20 h.p. ...	1932-3	36UP-2	497	26	107	150	Nil	55	-	No jet	Spec.	6	3·0	STRANGLER			
SUNBEAM TALBOT																	
10 h.p. ...	1940	30VIG-4	898	25	75	100	-	50	50	No jet	F/T.1·8	2*	1·5	THERMO STRANGLER†			*C †T
10 h.p. ...	1939	30VIG-4	866	25*	72	95	-	50	50	No jet	F/T.1·5	2†	1·5	THERMO STRANGLER††			*C †C ††
						Service carburetters have setting as C/S 898.											
Earlier models, see TALBOT.																	
TALBOT																	
10 h.p. ...	1938-9	30VIG-2	829	25	75	90	-	50	50	No jet	F/T.1·5	2*	1·5	STRANGLER			*C
						Service carburetters have setting as C/S 898.											
10 h.p. ...	Late 1937	30VIG	736	25	80	80	-	50	50	No jet	F/T.1·5	2*	1·5	STRANGLER			
						Service carburetters have setting as C/S 898.											
10 h.p. ...	Early 1937	34VIM	714	24	105	55	-	45	-	160	2·0	1	2·0	STRANGLER			
10 h.p. ...	1936	34VIM	650	26	120	60	-	45	-	160	3·0	1	2·0	STRANGLER			
"75," 17.9 h.p.	Late 1936-7	36VI-2	643	32	180	85	170	65	60	180	4·0	1	2·0	5·0	150	150	
"75," 17.9 h.p.	Early 1936	36VI-2	-	32	175	85	170	65	60	180	4·0	1	2·0	5·5	110	150	
"75," 17.9 h.p.	1935	36VI-2	-	32	175	85	170	65	50	180	4·0	1	2·0	5·5	105	4·5*	*A
B.G. "110" ...	1937	48VI-2	710	37	175	90	195	70	80	No jet	1·5	2	3·5	6·0	140	5·0*	*A
"95" BD "105" ...	1937	48VI-2	671	37	175	90	200	80	80	No jet	1·5	2	3·5	6·5	170	150	
"95" BD "105" ...	1936	48VI-2	-	40	200	110	210	70	80	200	4·0	2	3·0	6·0	140	5·0*	*A
"105" AV & AZ ...	1937	48VI-2	585	40	200	110	210	70	80	No jet	4·0	2	3·0	6·5	170	150	
"105" AV & AZ ...	1935-6	48VI-2	-	40	200	110	210	70	80	No jet	4·0	2	3·0	6·0	140	5·0*	*A
"100" and "110" ...	1936	48VI-2	649	42	200	110	210	70	80	No jet	1·5	2	3·0	6·0	140	5·0*	*A
BA110, BB100, AZ100	1937	48VI-2	610	42	200	115	220	70	80	No jet	1·5	2	3·0	6·0	140	5·0*	*A
BA110, BB100, AZ100	1936	48VI-2	-	42	200	110	210	70	80	No jet	1·5	2	3·0	6·0	140	5·0*	*A
BA110, BB100, AZ100	1934-5	48VI-2	-	42	200	115	220	80	80	No jet	1·5	2	3·5	6·0	140	5·0*	*A
AV95, AV105 ...	1933-4	48VI	-	39	190	175	230	65	-	No jet	STD.	-	4·0	STRANGLER			
"75" 18 h.p. ...	1934-5	36VEG	613	29	135	85	-	70	-	No jet	STD.	2	2·0	4·0	110	5·0*	*A
"90" ...	1933-4	42VG	-	31	195	115	170	90	50	No jet	-	2	3·0	4·0	110	5·0*	*A
AX65, 14 h.p. ...	1933-5	30VEH	501	23	90	90	-	50	-	60	STD.	2	2·0	4·0	95	5·0*	*A

5 Talbot Fuel System

THE ZENITH TYPE "V" AND TYPE "U" CARBURETTORS



SHOWING THE POSITIONS OF THE VARIOUS JETS IN "V" TYPE



THE AUTOMATIC STARTING DEVICE

Car.	Carburettor Size and Type	Choke Tube	Main Jet.	Compensating Jet.	Slow Running Jet.	Needle Seating.	Starting Device Details: Jet.	Starting Device Details: Venturi.	Starting Device Details: Sleeve.
Sunbeam 20 h.p. (Speed Model)	48 VI	38	185	165	70	4.0	Automatic Strangler		
Talbot "65"	30 VEH	24	90	90	50	2.0	105	5.0	5.0
Talbot "95"	48 VI	39	190	175	65	4.0	Automatic Strangler.		
Talbot "105"	48 VI	39	190	175	65	4.0	Automatic Strangler.		

GENERAL NOTES:

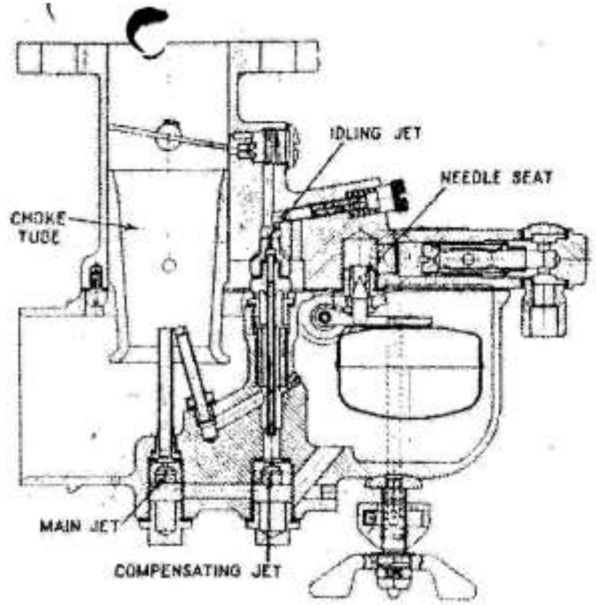
Choked Air Cleaner

A choked air cleaner will result in poor m.p.g., and these fittings should be cleaned from time to time; the petrol consumption might also be checked with the cleaner removed.

Is Pressure from Mechanical Pump Too Great?

Where fuel is fed to the carburettor by a mechanical pump, it is possible that the pressure from same is excessive, causing internal flooding of the carburettor all the time the engine is running. To remedy this, a smaller needle seating could be tried in the carburettor, or the pump may be packed out from the engine by means of an extra gasket, thereby reducing the travel of the pump arm.

16



SHOWING POSITIONS OF JETS IN "U" TYPE CARBURETTOR

Make and Model.	Carburettor Size and Type.	Choke Tube.	Main Jet.	Comp. Jet.	Idling Jet.	Needle Seat.
Austin 10 h.p.	24 UH	17	57	95	45	1.5
Austin 12 h.p.	30 UH	19	70	100	55	2.5
Austin 12-6	30 UX05	17.5	70	105	55	2.5
Austin 16-6	30 UX03	18	70	107	55	2.5
Lagonda 14 h.p.	36 UH	24	85	130	60	3.0
Riley 9 h.p.	26 UH	17	55	100	50	2.5
Riley Sports	Two 24 UH	16	55	95	45	2.5
Sunbeam 20 h.p.	36 UP	26	90	150	55	3.0
Talbot 14/45	30 UH	22	90	115	60	2.5
Talbot "75"	36 UP	26	100	155	60	3.0
Talbot "90"	42 UP	29	130	165	70	3.0
Vauxhall Cadet	30 UJ2	19	75	100	55	2.0
Vauxhall 23.6 h.p. Sports	42 UP	33	150	145	60	3.5

Causes of Flooding

Flooding or leakage when standing is usually due to dirt or foreign matter, and the carburettor should be thoroughly cleaned by removing the bowl or float chamber. While this part is dismantled, examine the float, which may have become punctured. This can be detected by shaking it to hear if it contains petrol. A defective float would at once cause leakage from the carburettor by failure to close off the needle valve.

Other Causes of High Petrol Consumption

Remember that a number of factors can account for a heavy petrol bill, such as retarded ignition, poor compression, brakes binding, engine running too cool, or leaks between tank and carburettor.

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Details of Car	Carburettor	Choke Tube	Main Jet	Comp. Jet	S.R. Jet	Economy Jet	Capacity Tube	Progression Jet	Starter: Venturi	Starter: Starting Jet	Starter: Control Jet	Needle Seating	Dilution Plugs
RILEY—*contd.*													
1½-litre (2 carbs.)	36 VH	25	100	75	55	140	2	160	4·5	110	110	1·5	Out
1½-litre, 1938	36 VI-2	28	110	80	70	135	2	Nil	5·0	130	110	2·5	—
15/6, 1937–8	36 VH	27	110	95	65	150	2	160	5·5	135	120	2·0	Out
16/4, 1938	42 VI-2	32	130	110	75	150	2	Nil	5·0	140	120	2·5	—
or	36 VI-2	32	130	100	75	150	2	Nil	5·0	140	120	2·5	—
V 8, 1937–8 (2 carbs.)	36 VI-2	25	100	75	55	130	2	150	4·5	110	110	2·5	Out
STANDARD													
Flying 9	30 VM-3	24	90	65	55	—	2	150	4·5	110	90	1·5	Out
Flying 10	30 VM-3	25	95	65	55	—	2	150	4·5	110	90	1·5	Out
TALBOT													
10 h.p., 1937	34 VIM	26	120	60	45	—	1	160	Strangler			2·0	—
later	34 VIM	24	105	55	45	—	1	160	Strangler			2·0	—
10 h.p., late 1937–9	30 VIG	25	80	80	55	—	—	130	Strangler			2·0	—
10 h.p.	30 VIG-2	25	75	90	50	—	—	Two 130 holes	—	—	—	1·5	—
Model "75"	36 VI-2	32	180	85	65	170	1	180	5·0	110	150	2·0	—
" 105 AV, AZ	48 VI-2	40	200	110	70	210	2	200	6·0	140	5·0	3·0	—
or	48 VI-2	40	200	110	70	210	2	200	6·5	170	150	3·0	—
3½ litre	48 VI-2	42	200	110	70	210	2	200	6·0	140	5·0	3·0	—
or	48 VI-2	37	175	90	80	200	2	Nil	6·0	140	5·0	3·5	—
or	48 VI-2	37	175	90	80	200	2	Nil	6·5	170	150	3·5	—
Model 100, 110	48 VI-2	42	200	110	70	210	2	200	6·0	140	5·0	3·0	—
VAUXHALL													
10 h.p., early 1938 *or*	30 VIG / 30 VIG-2	25	85V	70	50	—	2	Nil	Strangler			1·5	—
10 h.p., late 1938–9	30 VIG-2	25	75	90	50	†	*	Nil	Strangler			1·5	—
12/6, 1937	30 VM	21	85	90	50	—	*	75	Strangler			1·5	Out
12/6 and 14/6, late 1937	30 VIG	22	80	75	55	—	*	75	Strangler			1·5	—
12/6 and 14/6, 1938–9	30 VIG-2	22	80	90	50	—	*	—	Strangler			1·5	—
12/4, 1938–9	30 VIG-2	25	75	90	50	†	2	—	Strangler			1·5	—
14 h.p., 1937	30 VM	22	95	70	55	—	*	75	Strangler			1·5	Out
25 h.p., 1937–8	42 VIM-3	31	130	80	55	—	2	120	Strangler			2·5	—
25 h.p., 1939	42 VIM-3	29	95	120	55	—	*	120	Strangler			2·5	—

* Cast integral permanent size. † Pump jet 50.

M.R.O. I.—4*

LIST OF SETTINGS FOR SUNBEAM AND TALBOT CARS.

	Carb.	Choke Tube.	Main Jet.	Comp. Jet.	S.R. Jet.	Cap Tube.	Prog. Jet.	Start Vent.	Start Jet.	Sleeve or Con. Jet.	N.S.
Sunbeam "Dawn" 1933-5	30.VM	25	110	70	45	2	90	Strangler			2.0
" 20 HP.1933. 1934-5	48.VI	33	150	140	70	-	190	"			3.5
			190	Economy Jet.							
" Light 20 Sports 1933-5	48.VI	38	185	165	70	-	-	"			3.5
			250	Economy Jet.							
Talbot Mod.65 14 HP.1933-5	30.VEH	23	90	90	50	2	60	4.0	95	5.0	2.0
" " 75 18 HP.1934-5	36.VEG	29	135	85	70	2	-	4.0	110	5.0	2.0
" " 75 18 HP.Early 1936.	36.VI-2	32	175	85	65	1	180	5.5	105	4.5	2.0
			170	Economy Jet.							
" " 75 18 HP.Early 1936	36.VI-2	32	175	85	65	1	180	5.5	110	150	2.0
			170	Economy Jet.							
" " 75 18 HP.Late 1936	36.VI-2	32	175	85	65	1	180	5.0	110	150	2.0
			170	Economy Jet.							
" " 90 1933-4	42.VI	31	195	115	90	2	-	4.0	110	5.0	3.0
			170	Economy Jet.							
" AV.95-105 1933-4	48.VI	39	190	175	65	2	-	Strangler			4.0
			230	Economy Jet.							
" 105 1935	48.VI-2	40	200	110	70	2	-	6.0	140	5.0	3.5
			210	Economy Jet.							
" 105 1936	48.VI-2	40	200	110	70	2	200	6.0	140	5.0	3.0
			210	Economy Jet.							
" 110 1935	48.VI-2	42	200	115	80	2	-	6.0	140	5.0	3.5
			220	Economy Jet.							
" 3½ Litre 1936	48.VI-2	42	200	110	70	2	200	6.0	140	5.0	3.5
			210	Economy Jet.							
" or	48.VI-2	37	175	90	80	2	-	6.0	140	5.0	3.5
			200	Economy Jet.							
" or	48.VI-2	37	175	90	80	2	-	6.5	170	150	3.5
			200	Economy Jet.							
" 100,110	48.VI-2	42	200	110	70	2	-	6.0	140	5.0	3.0
			210	Economy Jet.							

The table below shows the Zenith carburettor settings as applied to Talbot motors - Not sure where this cam efrom, so it is difficult to say how true it is, although the 90 jet settings work for me!

More information on the chart headings appears at the bottom of this page..

Make & Model	Year	Carb	C.S.	Choke size	Main jet size	Compensator jet size	Economy jet size	Slow running jet size	Pump	Prog	Vent.	C.Tube	N&S	Starting ++
Talbot														
10hp	1938-39	30VIG-2	829	29	75	90	–	50	50	None	F/T1.5	2[4]	1.5	Strangler
Service carburettors have settings as CS 898 above														
10hp	**Late 1937**	**30VIG**	**736**	**25**	**80**	**80**	**–**	**50**	**50**	**None**	**F/T1.5**	**2[4]**	**1.5**	**Strangler**
Service carburettors have settings as CS 898 above														
10hp	Early 1937	34VIM	714	24	105	55	–	45	–	160	2.0	1	2.0	Strangler
10hp	1936	34VIM	650	26	120	60	–	45	–	160	2.0	1	2.0	Strangler
'75' 17.9hp	Late 36-37	36VI-2	643	32	180	85	170	65	60	180	4.0	1	2.0	5.0/150/150
'75' 17.9hp	Early 1936	36VI-2	–	32	175	85	170	65	60	180	4.0	1	2.0	5.5/110/150
'75' 17.9hp	**1935**	**36VI-2**	**–**	**32**	**175**	**85**	**170**	**65**	**50**	**180**	**4.0**	**1**	**2.0**	**5.5/105/4.5[8]**
B.G. '110'	1937	48VI-2	710	37	175	90	195	70	80	None	1.5	2	3.5	6.0/140/5.0[8]
'95' BD '105'	**1937**	**48VI-2**	**671**	**37**	**175**	**90**	**200**	**80**	**80**	**None**	**1.5**	**2**	**3.5**	**6.5/170/150**
'95' BD '105'	1936	48VI-2	–	40	200	110	210	70	80	200	4.0	2	3.0	6.0/140/5.0[8]
'105' AV & AZ	**1937**	**48VI-2**	**585**	**40**	**200**	**110**	**210**	**70**	**80**	**None**	**4.0**	**2**	**3.0**	**6.5/170/150**
'105' AV & AZ	1935-36	48VI-2	–	40	200	110	210	70	80	None	4.0	2	3.0	6.0/140/5.0[8]
'100' & '110'	1936	48VI-2	649	42	200	110	210	70	80	None	1.5	2	3.0	6.0/140/5.0[8]
BA110 BB100 AZ100	**1937**	**48VI-2**	**610**	**42**	**200**	**115**	**220**	**70**	**80**	**None**	**1.5**	**2**	**3.0**	**6.0/140/5.0[8]**
BA110 BB100 AZ100	1936	48VI-2	–	42	200	110	210	70	80	None	1.5	2	3.0	6.0/140/5.0[8]
BA110 BB100 AZ100	1934-35	48VI-2	–	42	200	115	220	80	80	None	1.5	2	3.5	6.0/140/5.0[8]
AV96 AV105	1933-34	48VI	–	39	190	175	230	65	–	None	STD	–	4.0	Strangler
'75' 18hp	**1934-35**	**36VEG**	**613**	**29**	**135**	**85**	**–**	**70**	**–**	**None**	**STD**	**2**	**2.0**	**4.0/110/5.0[8]**
'90'	1933-34	42VG	–	31	195	115	170	90	50	None	–	2	3.0	4.0/110/5.0[8]
AX65 14hp	1933-35	30VEH	501	23	90	90	–	50	–	60	STD	2	2.0	4.0/95/5.0[8]

Abbreviation	Explanation
Econ	**Abbreviation for "Economy Jet"**
S.R.	Abbreviation for "Slow Running Jet"
C.S.	**Abbreviation for "Contract Sheet", Zenith internal use only, always to be quoted in correspondence with Zenith**
Comp	Abbreviation for "Compensation jet". **This jet cannot be confused with the "main jet" as the external diameter of the two jets vary, the main jet being** smaller than the compensating jet in diameter. The jets have the same "flow" calculations and are stamped with the **size numbers. The sizes normally follow in stages of "5" , although "half-size" jets are sometimes used. The greater** the number stamped on the jet, the larger is the drilling of the orifice.
Vent	**Abbreviation for "Ventilation to the capacity well".** **In V type carburettors the ventilation is in the screw over the capacity well. Numbers are stamped on the head of** this screw when the size of the hole differs from the standard diameter. In certain carburettors where the capacity well is cored to the required size and has no loose tube fitted, the top of the well is open and no screw is incorporated. In 'U' type carburettors the ventilation to the compensating jet is by means of holes drilled in the head of the slow running jet carrier, the size being stamped on a flat of the hexagon head. **The letters 'P.T. and F.T. indicate Part Throttle and Full Throttle ventilation respectively, where the carburettor has an** economy device of the diaphragm type as in the VIG carburettor or the spring blade type as on the VEM carburettor.
"C" Tube	**Abbreviation for "Capacity Tube"** **This is a separate loose fitting in certain types, but in others the capacity well is cored the correct diameter to give the** necessary reserve of fuel for acceleration purposes.
N & S	**Abbreviation for "Needle & Seating"** The size being stamped on the hexagon of the seating.
Choke	**Abbreviation for "Choke Tube"** This may be cast the correct size in the barrel of the carburattor or may be a loose detachable fitting. The size shown on the choke tube indicates the smallest bore of the restricted part in millimetres. Therefore, if the number is difficult to decipher, a pair of internal callipers will enable the size of the tube or cast restriction in the barrel to be checked. Normally, the screw retaining the choke tube does not protrude beyond the inner bore of the tube. In some cases,

	however, a long or extended screw is used to assist distribution of the fuel. **In 'U' type carburettors no bar was fitted across the choke tube as standard, but it has been used on a few occasions** to help distribution.
Start Device	On cerrtain 'V' type carburettors a type of starting device was used that employed a spring loaded air valve. The spigotted end of this valve was fitted with a loose sleeve, the diameter of which is specified on the setting list. The sleeve was not marked, but the size is the outside diameter of the sleeve in millimetres. Certain 'U' type carburettors has a starting valve employing a starting jet only, which screwed into the top face of the lower half. Ensure that this jet is screwed into the side to coincide with the position of the starting valve on the upper half of the carburettor. In certain instruments the face of the lower part was tapped to accomodate the starting jet on either side, a blank starting jet being fitted in the side not used, although such blank jet is not strictly necessary.
Prog	Abbreviation for "Progression Jet"

Useful Hints

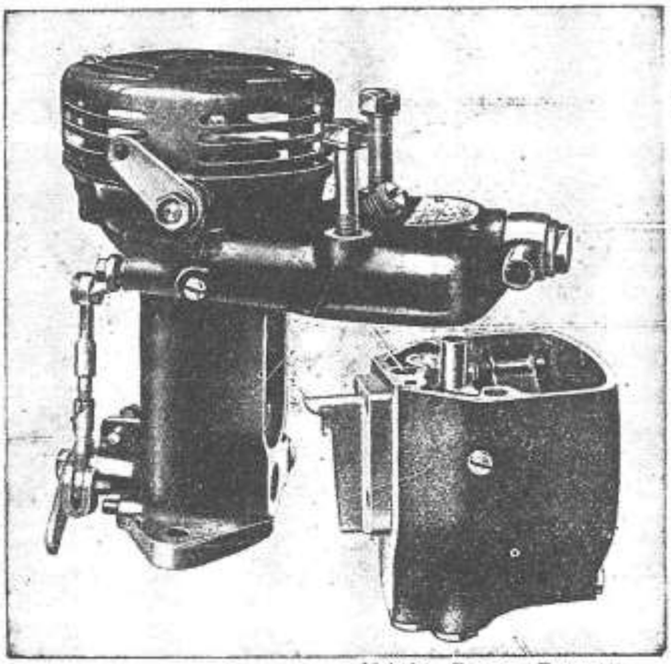
ADJUSTING THE ZENITH DOWN DRAUGHT CARBURETTER

The VI type Zenith carburetter as fitted to Sunbeam "Twenty," "Twenty-Five" and "Light Twenty" Sports, also Talbot "95" and "105" models.

A FEATURE of the carburetter is the ease in which any adjustments can be executed. It will be found only necessary to adjust very few parts, and the user will get the utmost from the carburetter if all other parts are left untouched.

Dismantling the Carburetter

To take apart the barrel and the bowl it is only necessary to take out the two screws on the float chamber cover, as will be seen in the illustration.



The only parts in the barrel that may need attention are the air regulating screw and the adjustable stop screw.

Slow Running

The adjustment for slow running consists in setting the throttle opening by means of the stop screw, which determines the speed at which the engine will tick-over, and the air regulating screw, which ensures an even tick-over. The positions of both of these screws are indicated in the illustration.

To adjust the slow running speed of the engine, it is merely necessary to screw the adjustable stop in a clockwise direction, to make the engine run faster, and in the opposite direction for a slower running engine. If the engine is inclined to "hunt" when running slowly, it indicates that the mixture is rather rich. This will be corrected by unscrewing the air regulating screw and so weaken the mixture.

Should the engine refuse to tick-over for any length of time, or stall on deceleration, it is a sign that the slow-running mixture is weak. To overcome this, turn the regulating screw in a clockwise direction to enrich the mixture.

If it is found necessary to have the adjusting screws right home, it is advisable to fit the next larger slow running jet. These running in 5's, and the larger the number the bigger the jet.

It is always advisable from the point of view of strong tick-over and clean acceleration, to have a size of slow running jet permitting even tick-over with a close setting of the adjusting screw, *i.e.*, between one-quarter and one-and-a-half turns from the full home position.

To Clean the Filter

The filter should be cleaned from time to time. To do this, unscrew the petrol connection and pull the filter out of its chamber. It will be found that the filter is supported by a long extension which has a screwdriver slot at the end opposite to the petrol connection. When the extension is unscrewed, the filter gauze will slide off, and can be washed clean in petrol.

Choke Tube

It will not be found necessary to alter the size of the choke tube in this carburetter. They are always of a minimum size, consistent with maximum power. The accelerating pump will give the required flexibility.

Main, Compensating and Economy Jets

By removing the plugs at the base of the bowl, all the jets will be found readily accessible. The screws removed when taking apart the barrel and the bowl are squared at the end to form the key for removing both the plugs and the jets.

The plug at the side of the bowl covers the compensating jet, the plug nearest this jet at the bottom of the bowl covers the economy jet, and the remaining plug covers the main jet (see illustration).

The slow running jet is easily removed with a screwdriver.

We would especially point out that it is inadvisable to tamper with any other of the screws or plugs to be found in the bowl. The screw which holds the whole of the accelerating pump system in position, and the plug found between the economy and main jet plugs, which holds the delicate by-pass valve and spring of the economy jet, are particularly mentioned in this direction.

It is important that the joint between the emulsion block and the bowl should be kept tight. Consequently, to prevent the washer forming the joint between the block and the bowl being damaged, it is recommended that the screws holding the emulsion block in position should not be touched. The connecting link from the throttle spindle to the lever operating the pump should not be interfered with. If lengthened, it would delay the coming into action of the pump. If shortened, it would prevent the throttle from fully opening.

The Strangler

The strangler flap in the intake is lightly spring loaded, ensuring that immediately the engine fires the flap opens to a degree determined by the speed of the engine and throttle opening, rendering its action entirely automatic. Consequently it is impossible for the cylinders to be swamped with neat petrol when starting from cold, and the economy both in saving of petrol, and prevention of damage to the cylinders will be realised.

Starting

It is advisable when starting from cold first to extend fully the control on the dash operating the automatic air strangler, then open the throttle about one-third on the hand control and switch on. On turning the engine over a few times, either on the starter or by hand, it should start readily and continue to run. It is quite in order to leave the strangler control on the dash fully extended for a few minutes owing to the action of the automatic air strangler described above.

General Hints

The carburetter should be cleaned periodically, and it should be carefully noted that when cleaning the jets it is advisable **not** to pass anything through them that is liable to enlarge the jets.

The most satisfactory and effective method is to blow through the jets, or wash them in petrol. Any obstruction will then be removed, and leave the jets undamaged.

THE WORKING & ADJUSTMENT

OF

ZENITH

CARBURETTER

TYPE 36 VI-2

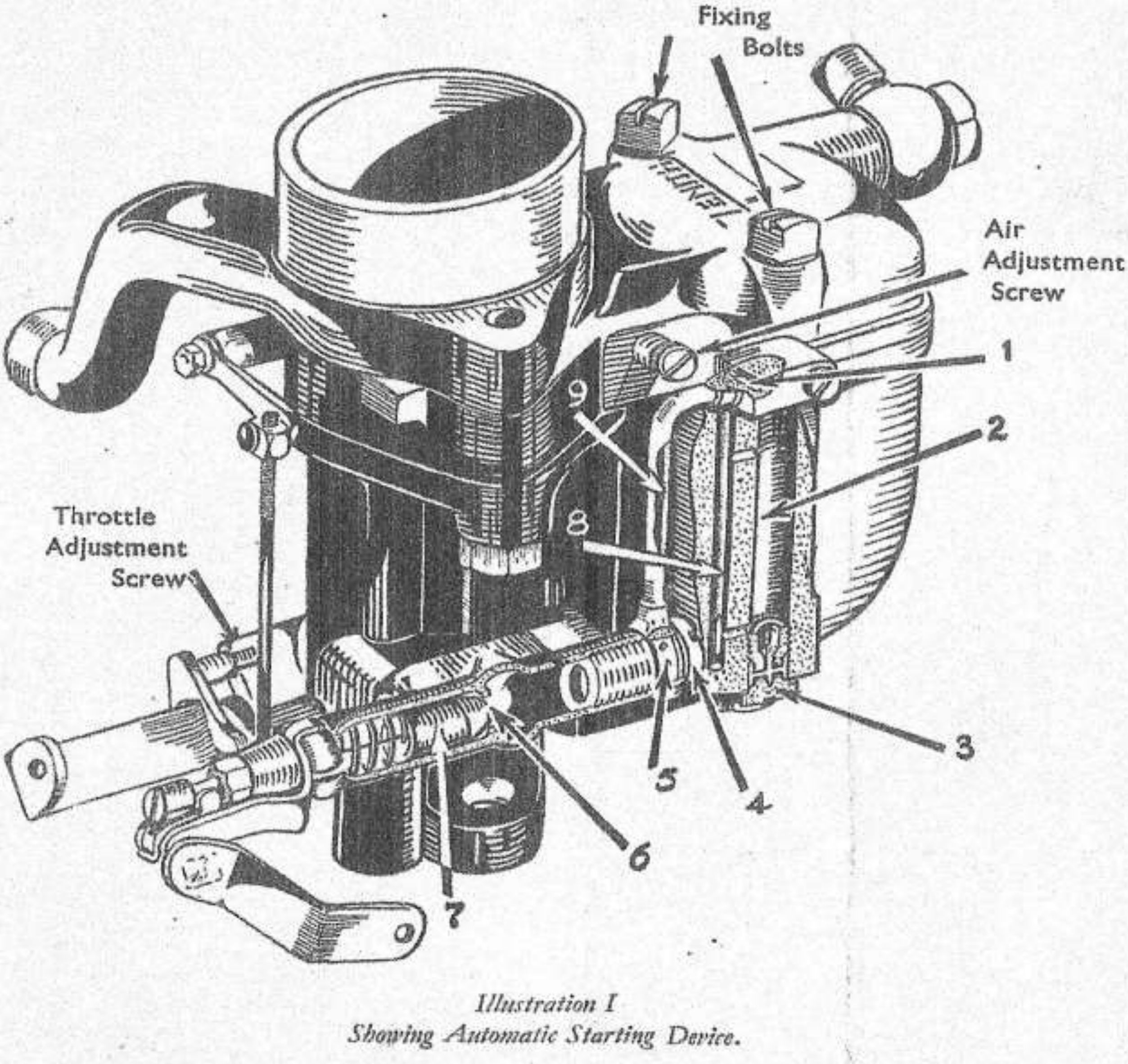


Illustration I
Showing Automatic Starting Device.

Ref. V.14.

Price 3d.

ZENITH CARBURETTER

TYPE 36 VI-2

The 36 VI-2 instrument is a Downdraught model of the latest "V" type carburetter and embodies a pump and economy device together with the latest instant starting device.

WORKING DESCRIPTION.

Petrol enters the carburetter at the union 1 (see illustration II) and passing through a gauze filter 14 reaches the needle and seating 13. Unless the float 2 is already lifted against the needle by petrol in the float chamber 3 the petrol will continue its course past the needle into the float chamber. It will continue to flow until the various passages are filled and the petrol reaches a pre-determined level which causes the float to lift against the needle, pushing it on to its seating. This prevents more petrol entering and causing the carburetter to flood.

Petrol will have entered the passage 18 in the base of the bowl by passing through the outlet 19 and economy jet 5. It will then have passed through the main jet 9 into the main channel 11 in the emulsion block 12. Here it will remain at the pre-determined height, which is just below the emulsion block outlet.

The petrol will have also passed through 17 to the compensating jet 6. From the compensating jet the fuel passes along the passage 16 above it and joins the petrol from the main jet in the common channel 11.

From the main channel in the emulsion block petrol will pass into the slow running jet drilling via the passage 10.

Similarly the well of the capacity tube 20 will be filled to the petrol level by the fuel flowing from the emulsion block through passage 15.

It has now been observed how the petrol reaches the jets and channels. The fuel will occupy the positions described all the time the engine is stationary and there is a supply of petrol from the tank or pump.

STARTING.

Let it now be supposed that the engine is to be started from cold. The automatic starting device control on the dashboard is operated, resulting in the main valve 7 (illustration I) being drawn off its seating. With ignition switched on, the engine should now be turned over by means of the starter, ensuring at the same time the throttle pedal is not depressed, as it is essential that the throttle should not be opened beyond the normal idling position for starting purposes. When the engine is rotated with the throttle in this position all the suction or depression created will be concentrated upon the outlet 6 on the engine side of the throttle. This depression will be apparent at the venturi 4 and in the communication tube 9, which will result in air being drawn through the venturi and petrol from the dip tube 8.

Petrol is drawn up the dip tube, across the connection 1 and into the venturi by means of the holes 5. Here the petrol will be met by air entering the venturi and will be broken up to form a rich starting mixture. This mixture will then pass into the induction pipe through the drilling 6. The sizes of the dip tube and venturi are such that this mixture of petrol and air is correct to ensure the engine will now fire and continue to run. This rich mixture is only necessary for a short

2

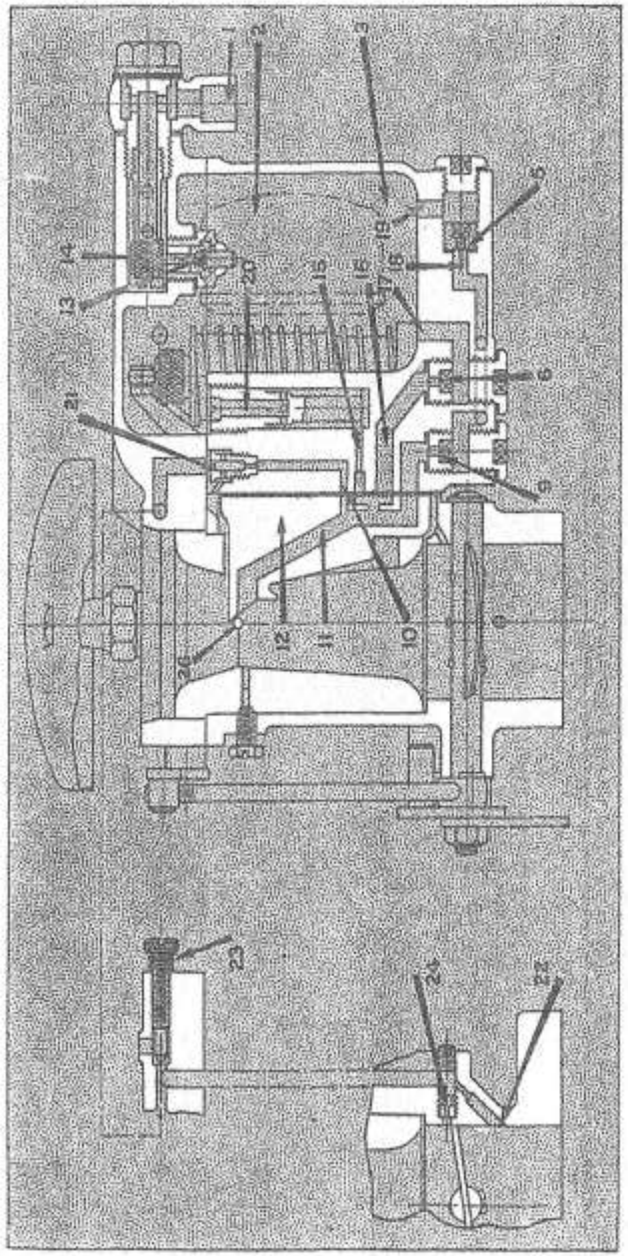


Illustration II

Section of Carburetter 36 VI-2

3

Now upon the throttle being closed the outer spring 44 will force the piston back to its top or inoperative position. This will cause petrol to be drawn into the top of the fixing stud 31, where a small dome filter is placed, and out through the holes 66 at the stud base. Here the petrol passes through another filter and along the passage 56. The ball-valve 55 will be lifted and the petrol will continue its course past the valve and along the channel 54, through 57 into the pump chamber 52.

It will be realised that the ball-valve 55 will fall back to its seating by reason of its own weight and thus prevent petrol returning to the bowl through the inlet passages. Similarly ball-valve 59 prevents the pump leak becoming an inlet channel. A further ball-valve is situated at 46 near the pump jet. When petrol is pumped up the channel 51 it will push the ball-valve against the air-inlet 45 and prevent petrol escaping through this.

It was pointed out in the main carburetter section that a restriction in the form of an economy jet is placed on the main jet. The full effect of the main is only required during the last part of the throttle movement, consequently the main is restricted until the economy device is brought into action. An extension on the top plate 43 of the pump strikes the shoulder 64 on the last part of the downward stroke. This causes the valve 60 to be moved off its seating and petrol will immediately enter from the float chamber at 61, flow past the valve 60, through the opening 29 and so into the main jet channel 58 ; thus the economy jet is by-passed and the full effect of the main jet is obtained.

As soon as the throttle commences to close the top plate 43 will rise and the valve 60 will return to its seat against the action of the spring 63, consequently the supply of petrol to the main jet is once more regulated by passing first through the economy jet.

ADJUSTMENT.

The carburetter is delivered with a jet setting that has been found by extensive experimental work to be most suitable for the engine to which it is fitted, consequently very little adjustment to the carburetter should be needed, indeed the user will find that greater service will be obtained from the carburetter if adjustments are made only when absolutely necessary. Adjustment to the slow running mixture is the only likely alteration, apart from an occasional cleaning of the jets, float chamber bowl, filter gauze, etc. When trouble is experienced with the engine do not assume that it is always due to the carburetter. If satisfied that the instrument is completely free from dirt do not be tempted to alter the carburetter until all other possible causes of trouble, such as sparking plugs, timing of ignition, valves, etc., have been investigated.

THE BOWL OF THE CARBURETTER IS REMOVED BY RELEASING THE FIXING BOLTS.

The hand should be placed beneath the bowl during this operation so that when the bolts are removed the bowl will drop into the hand. (Economy note : Petrol in the bowl can then be emptied back into the tank.)

The jets should be removed occasionally and thoroughly cleaned. One of the fixing bolts is squared at the end to fit into the jet covers and jets. When the bottom end of the bolt is placed in the squared recesses a spanner applied to the head of the bolt will enable the jets to be removed.

When cleaning the jets do not pass anything through them that is likely to damage the carefully calibrated orifices. The most satisfactory and efficient method is to blow through them and wash them in petrol—this should remove

any obstruction and will leave the jets undamaged. The sizes of all jets in Zenith carburetters are clearly numbered and the larger the jet the greater the number. The **slow running jet** is provided with a screw-driver slot to enable it to be removed. This applies also to the screw holding the **capacity tube.** Upon removing the screw and inverting the bowl the capacity tube will fall out. To remove the **float** remove the large headed screw 65. The complete **pump and economy device** mechanism can be taken out by unscrewing the plug 66. This will enable the two filters to be cleaned and the pump and economy attachment can be removed by pulling out the unit from the inside of the bowl. The **emulsion block** is held to the side of the bowl by three screws, and the removal of these will enable the block to be taken off and the pump jet 47 inspected. Particular care should be taken not to damage the gasket beneath the block. Upon replacing locate the bottom screw first and then tighten all screws evenly.

The **starting jet 3** is taken from the carburetter by means of a screw-driver. This also applies to the **progression jet 24** but in this case the cover must be removed first and care taken that it is replaced after inspection.

SLOW RUNNING IS ADJUSTED BY MEANS OF THE THROTTLE STOP SCREW AND THE AIR REGULATING SCREW.

The stop screw determines the speed of slow running, i.e., it adjusts the throttle position for idling. To increase the slow running speed the stop screw must be turned in a clockwise direction. If turned with opposite rotation a slower tick-over will be given.

The richness of the slow running mixture is adjusted by the air-regulating screw. Should the engine refuse to tick over for any length of time or stall on deceleration the slow running jet may be choked and should be cleaned. After examination reset the slow running by means of the throttle and air adjustment screws. If the engine is inclined to hunt when running slowly the mixture is too rich and must be weakened by turning the air-regulating screw in an anti-clockwise direction. The best position for the slow running air screw from the point of view of pick-up is **within three turns** of the full home position. A size of slow running jet must be decided upon that will permit even tick-over with this setting of the screw.

There are factors quite apart from the carburetter that have a considerable influence on the slow running, i.e., slow running when the engine is out of gear and the car is stationary. These factors include non airtight joints, worn valve guides, valves not seating, ignition too far advanced, incorrect setting of sparking plug points. Such details must always be given consideration when slow running is irregular. The carburetter only should not be suspected.

THE FILTER.

Petrol is filtered on entering the carburetter and the gauze 14 should be cleaned from time to time. To remove this item unscrew the petrol connection and take the filter out of its seating. The gauze can then be cleaned thoroughly with petrol.

When reassembling the filter care should be taken to see that the washers on both sides of the petrol pipe connection are correctly replaced.

GENERAL.

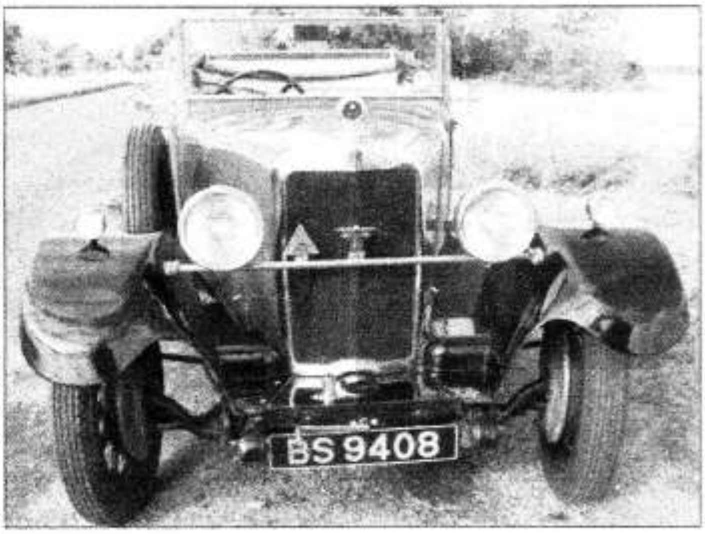
To keep the bowl clean swill it out occasionally with petrol.

No other adjustments are likely to be necessary under normal conditions,

SU CARBURETTOR PROBLEMS SOLVED ON AN AD 14/45

By John Essam

I purchased BS9408 (formerly VF2000) in April 2008 in the knowledge that the carburettor fitted to the car (an RAG), was badly worn; the car would only run at 38 mph - any other setting was a series of flat spots. I had no knowledge of Talbots at this stage, which has now changed somewhat following a complete restoration, another story and I am very grateful for the help advice and information freely given by friendly and enthusiastic TOC and STD register members. The consensus was the SU carburettor was probably the better bet as a replacement.



Above: John is searching for history for his 14/45 if you have any?

On recommendation I had Andrew Turner restore an 1¼ HS2 unit but on commissioning the engine following a rebuild I could not get the car to run at all well continually spitting back through the carburettor . This is, as we all know a sign of weak mixture and following a double check on the usual things – ignition, valve clearances, air leaks, a rebuild of the Autovac and replacement of all the unions and olives in the fuel supply I turned my attention to the needles.

Using Michael Marshall's excellent tables I started to experiment with richer and richer needles but was still getting the symptoms of weakness on acceleration accompanied by plenty of soot out of the exhaust and black plugs not to mention the amount of fuel the engine was consuming!

I had by now reached the point of despair and having by now satisfied myself beyond any doubt that the problem lay with the carburettor I turned my attention to the vacuum chamber spring. The carburettor had been supplied with a 2.5oz (light blue) spring and this had been recommended right through this ordeal. I established that strengthening the spring richens the mixture on acceleration as the needle moves up more slowly. I immediately saw this was the answer, fitted a 4.5 oz (red) spring which almost eliminated the problem followed by an 8 oz (yellow) spring and the weakest needle I had (an EF) and now have the car running beautifully .

Above: The SU installation on a 14/45.

Members who run the 14hp on an SU find the mixture rich on tick over and have various solutions to bleed air into the manifold. I attach a photo of my installation where I have used a model steam engine valve, modifying the taper slightly which gives me good adjustment. I now look forward to next year.

If any member has information on my 14/45 I would be grateful as very little is known at this stage particularly up to the late 1960's and between the mid 1970's to 1999 at which stage she was mustard yellow and registered VF2000 this was from new. (I think one of the dealers through whose hands the car passed 1999 to 2007 sold the number on).

Loss of Power on a Talbot 14/45

The car would not accelerate past about 2500 rpm. It felt like fuel starvation. But lifting off the throttle resulted in normal tick over. The carburettor is a SU HV3 with bronze body.
Returning home I remained convinced that the problem was a temporary shortage of fuel so the first thing was to check that the tank vent was not blocked. All clear and no improvement found.

Thought it would be a good idea to check the fuel filter at the tank end and decided to replace as it was many years old even though it looked OK. Checked fuel bowl for sediment but this was clean. Still no improvement.

So next decided to check fuel flow rate from the Facet fuel pump at the SU. I spoke to Burlen and established that fuel flow rate for my car would be more than met by a rate of 1 pint per minute. The measured amount was 1.125 pints per minute. So my assumption of petrol supply problem effectively evaporated. Checked the float in the SU was set at the correct height. It was.
The next task was to check the timing. This was exactly the same as when the advance curve was set up. Checking in the distributor cap all looked OK with no trace of any tracking. However noted some deposit on the rotor arm centre electrode and a funny regular pattern on the centre fixed carbon electrode.

Clearly some arcing had been occurring between the two. Detailed measurements proved that there was a 0.035" gap between rotor arm centre contact and carbon central contact. Pat Durnford confirmed that this was something he often saw and varied from each combination of rotor arm and cap. This was reset to ensure proper physical contact. There were no deposits on the end of the rotor arm but there was some minor oxidation of the brass studs for the plug leads and that was gently removed. At last I thought I had found the problem - a loss of sparks under load due to these faults in the distributor cap. Road test showed some improvement in that whilst there was some reduction in the loss of power from 2500 rpm the car would go on to 3250 rpm and then the power would come back in full measure.

A plug reading showed good plugs on two pistons the rest showed very sooty plugs.

1 2 3 4 5 6

It was at this stage that I began to suspect the problem lay in the movement of the SU piston in the dashpot. Lifting the piston by finger and then releasing resulted in it falling with a thunk when it met the jet bridge so that appeared OK.

I then made a manometer to fit to a spare dashpot sealing cap so that as the piston rose the coloured water in the manometer would rise. The manometer was calibrated to show maximum theoretical piston rise. The whole was then installed in the car next to a passenger and the car road tested. This showed that the piston did in fact rise to the correct amount under load so piston weight was satisfactory. These early carburettors have no spring in the dashpot and are often referred to having “heavyweight“ pistons. If the piston proves too light you can either add lead weights to the top of the piston or a dashpot spring of suitable strength may be added to ensure that the piston very nearly reaches the top at maximum power.
Talking to a local Rover 2000 specialist garage they confirmed that they had often seen my symptoms on the Rovers they maintained and invariably they found the cause to be associated with sticking pistons and that thorough cleansing and removal of any high spots cured the problem.

Stripping down the piston and dashpot and cleaning I then carried out a piston drop test by inverting the dashpot, removing the dashpot closing plug, blanking the hole from the underside of the piston to the inside of the piston shaft with gaffer tape and timing the fall of the piston. The time should be between 5 to 7 seconds. It was observed that the spec was met sometimes whilst at other times the maximum was exceeded. Carefully moving the piston in and out by hand revealed that sometimes a slight scratchiness could occasionally be felt. The outer diameter of the piston was then coated in engineers blue and the piston reinserted and gently spun and eased in and out. On removal there was evidence of a few blue spots on the inside of the dashpot. These were gently removed using 1200 worn wet and dry lubricated with thin oil. This was repeated until there was no evidence of contact between piston and dashpot. Repeated drop tests then showed consistent results. Road testing showed a marked improvement with clean acceleration almost every time with the very occasional momentary power loss around 2500 rpm.
Carrying out a plug reading showed a much better set of plugs with just the right coloration.

1 2 3 4 5 6

I now felt that I was on the correct path.

The occasional momentary loss of power could be due to the action of pulling down the dashpot onto the main body of the carburettor causing some slight distortion. The bottom face of the dashpot was coated with engineers blue and the dashpot without piston mounted on the body and rotated. This showed that first contact was made between the fixing dashpot lugs and the fixing area on the bronze body. Use of a straight edge showed that the dashpot lugs were slightly proud of the circumference of bottom of the dashpot. This suggested that it might be possible for the dashpot not to pull down square as the two fixing screws were tightened, causing distortion of the dashpot leading to interference.

The next step was to place the dashpot on a flat surface with worn 600 wet & dry oil lubricated and the dashpot gently rotated whilst held down to the abrasive and ensure that the whole of the bottom face was flat. The dashpot, without piston, was then assembled and rotated to carefully check for a good fit over the whole perimeter. I then cleaned and reassembled with the piston face blued and repeatedly raised the piston to the top. Inspection of the inner dashpot surface showed no blue had been transferred locally. Repeating the drop test showed that the times were repeatable and within spec.

Final road testing shows that the problem had been eliminated. I suspect that the problem was caused by some dirt getting embedded onto the piston surface and causing some pickup between piston and dashpot. This results in a mismatch between airflow rate and fuelling level due to "incorrect" piston height hence intermittent power loss. So whilst my first thought was wrong much of the problem was down to incorrect mixture strength for an entirely different reason! !

So now I am a little wiser and will try to keep a more open mind when trying to understand the causes of problems. Certainly regular cleaning and inspection of carburettor and distributor must be added to my routine maintenance.

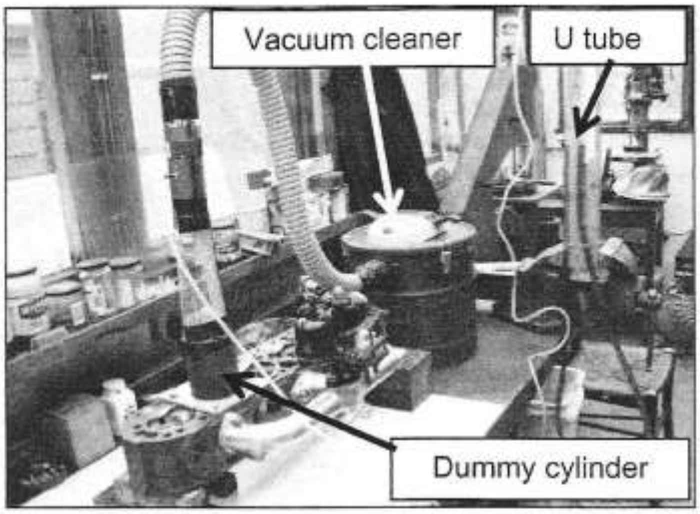
Gordon Higginbotham
1/4/2016

AIR FILTERS

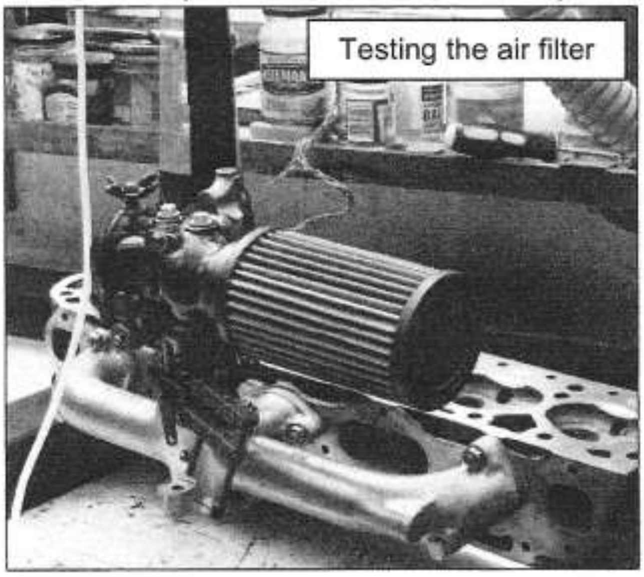
By Ian Potts

As part of my education, the Club Secretary recommended that I read a book by Vizard called 'Tuning the A-series Engine'. The Secretary must have mentioned it to Father Christmas as well as there was a copy in my Christmas stocking, and I found it fascinating reading. Topics covered included 'What it takes to make power', 'Workshop practice', 'Manifolds', 'Camshafts', 'Cylinder heads' and so on, much of it being quite general and applicable to any engine. What I found interesting and informative was that all his statements were backed up by facts; every modification done was bench tested and the before and after results shown on a graph and he destroyed many myths in the process.

One chapter was entitled 'Performance Filtration'. Vizard's arguments for installing an air filter were very persuasive; when he went on to show that certain air filters do not impede flow but may actually improve it I was hooked. He used flow bench and desert testing, showing that wire mesh filters were not worth using, paper filters work well but clog up quickly and foam filters were generally not as good as paper filters. However the wire and cotton combination produced by K&N was outstanding. The filter topped the list in flow efficiency when new, and when packed with 3/16 inch of dust sucked up from a dusty off-road race it still out-flowed most brands of new, paper element filters. There were also graphs showing power developed with an open intake and with a K&N filter installed; the differences were very small (of the order of 1%) and at some points on the graph the filter actually improved the power output.



As part of my engine re-building process I had made myself a flow bench powered by a vacuum cleaner and measuring air pressure using a U tube (more on this in a future article), so it was easy to test Vizard's claims. The K&N website has a useful search tool enabling you to find a filter by shape and dimension and I bought the RD-0520 which is 6" long, 3.5" in diameter and with an intake diameter of 54mm (yes, their website really did mix imperial and metric units!) as being suitable for a 75 engine with an up-draught carburettor.



Installed on the flow bench I was amazed to see that it actually improved flow! Admittedly not by much, but the vacuum reading went down by about 1%. It certainly didn't impede the flow. Examining the intake to the filter showed a very smooth and curved intake path which together with a large filter area probably explains the results.

Installing the filter on the engine threw up a slight problem in that the accelerator linkage fouled the filter. A short intake tube had to be machined to move the filter back about 20mm, however, as the picture shows the final result is very neat.

Now I'm convinced that an air filter is a worthwhile and necessary addition, I've got to think about how to install one on the 105. This isn't quite as easy as the intake on the 48V1 carb is elliptical in shape and will probably require a special adaptor.

Ref: Tuning the A-series engine by David Vizard, ISBN 978-1-85960-620-9 3rd edition.