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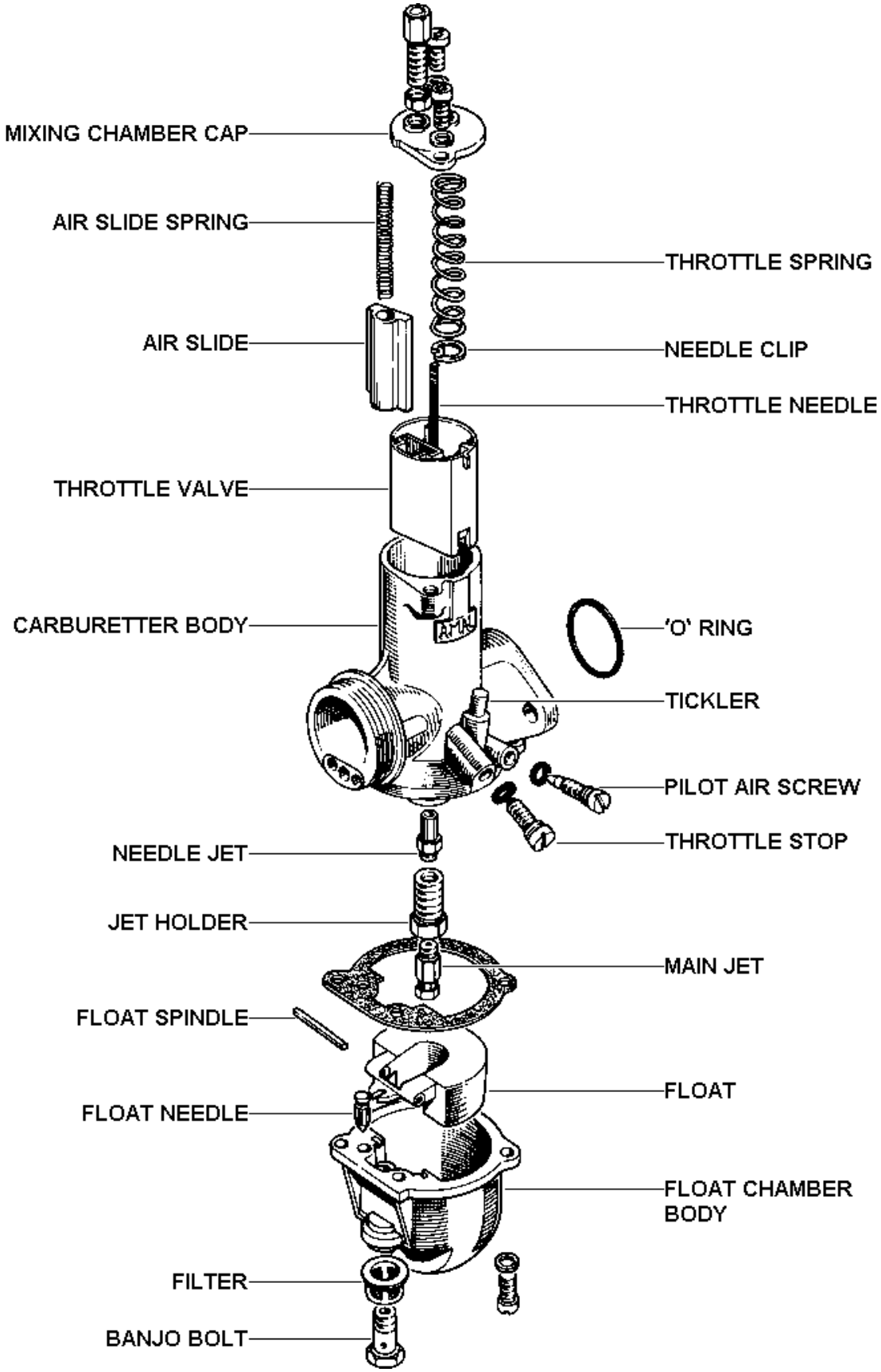


FIG. C.1. *Concentric carburetter exploded*

DESCRIPTION

All the D14 Bantam models are fitted with an Amal carburetter having a concentric float chamber and a cable operated air valve. The only variation between the models is in the lengths of the control cables.

The carburetter, because of the sizes of its jets and choke bore, proportions and atomises just the right amount of petroil and air, to provide the mixture for combustion and give adequate lubrication.

The float chamber maintains a constant level of fuel at the jets and incorporates a valve to cut off the fuel supply when the engine is stopped.

The throttle, opened from the handlebar twist grip, controls the volume of mixture and therefore the power.

At tick-over the mixture is controlled by the pilot jet. As the throttle is opened this is added to by a supply from the main jet, controlled by the needle in the needle jet until, at three-quarter throttle, the main jet takes over.

The pilot supply is controlled by a small jet, situated in the base of the mixing chamber within the float chamber.

The main jet does not spray directly into the mixing chamber, but discharges through the needle jet into the primary air chamber, and goes from there as a rich petroil/air mixture through the primary air choke, into the main air choke. This primary air choke has a compressing action in conjunction with bleed holes in the needle jet, which serves the double purpose of compensating the mixture from the needle jet and allowing the fuel to provide a well outside and around the needle jet, available for snap acceleration.

The carburetter also has an independently operated mixture control known as an air slide, for use when starting from cold. This slide partially blocks the passage of air through the main choke, enrichening the mixture.

DISMANTLING AND REBUILDING (Concentric Float Chamber)

Unscrew the two fixing nuts and withdraw the carburetter from its mounting studs; it will not be necessary to detach the cables from the handlebar controls.

Take out the two Phillips-head fixing screws and remove the carburetter top cover complete with throttle valve and air slide assembly. Compress the throttle spring and remove the needle clip to release the needle. Whilst still compressing the spring, push the cable downwards to release the nipple from its location in the valve. Take care not to lose the needle clip when taking off the spring.

To release the air slide, compress the spring and slip the nipple out of the base of the slide.

Unscrew the "banjo" bolt which secures the fuel pipe "banjo" connector to the float needle seating block and withdraw the nylon filter.

The float chamber is secured to the base of the mixing chamber by two screws with spring washers. On removal, it will be noted that the float spindle is a press-fit into the chamber body and that the needle is retained in position by the rear forked end of the float.

The pilot jet, needle jet and main jet (with holder) can now be unscrewed from the mixing chamber base.

Take out the throttle stop adjusting and pilot air adjusting screws and ensure that the small rubber "O"-ring on each screw is in good condition before replacing. These "O"-rings are necessary to retain any adjustments made with the screws.

The float chamber tickler (or primer) consists of a spring and plunger, splayed at one end to retain it in the mixing chamber. This item should not be subjected to a great deal of wear and is therefore unlikely to require replacement.

Having dismantled the carburetter, carefully clean all parts in petrol (gasoline). Hard deposits on the carburetter body are best removed with a light-grade wire brush. After washing the parts in clean petrol, allow to dry and ensure that all holes or small drillings are free from dirt. A hand pump is ideal for "blowing through" and blockages in the drillings. Inspect the component parts for wear and check that the jets are in accordance with the recommended sizes in General Data.

Reassembly is simply a reversal of the above instructions but remember to replace any gaskets or "O"-rings that appear unserviceable. Refer to fig. C1 for guidance.

INSPECTING THE CARBURETTER COMPONENTS

The parts most liable to show wear after considerable mileage are the throttle valve slide and the mixing chamber.

(1) Inspect the throttle valve for excessive scoring of the front area and check the extent of wear on the rear slide face. If wear is apparent, the slide should be renewed; be sure to fit valve with correct degree of cut-away (see General Data).

(2) See that the air slide has not been subjected to excessive wear and that it is a good fit in the jet block. Ensure also that the valve return spring is serviceable.

(3) Check the throttle return spring for efficiency. Check also that it has not lost its compressive strength by measuring the free length and comparing it with the figure given on page GD3.

(4) Examine the needle jet for wear or possible scoring and check the tapered end of the needle for similar signs.

(5) Check the float needle for efficiency by inserting it into the float needle seating block, pouring a small amount of petrol (gasoline) into the aperture surrounding the needle and checking it for leakage.

(6) Ensure that the float is not punctured by shaking it to see if it contains any fuel. Do not attempt to repair a damaged float. A new one can be purchased at a small cost.

(7) Check the fuel filter that fits over the needle seating block, for any possible damage to the mesh. If the filter has parted from its supporting structure it will allow the petroil mixture to pass through unfiltered.

HINTS AND TIPS

Throttle Cable
See that there is a minimum of backlash when the twist grip is turned back and that any movement of the handlebar does not cause the throttle to open.

Use the adjuster on the cable to obtain the correct setting and ensure that the throttle valve shuts down freely.

Fuel Feed
Unscrew the float chamber "banjo" bolt, remove the "banjo" and take off the filter gauze from the needle seating.

Ensure that the filter gauze is undamaged and free from all foreign matter. To check fuel flow before replacing the "banjo", turn on fuel tap momentarily and see that the fuel gushes out.

Flooding
This may be due to a worn needle or a punctured float, but is more likely due to impurities (grit, fluff etc.) in the tank. This trouble can sometimes be cleared by periodically cleaning out the float chamber. If, however the trouble persists, the fuel tank must be drained and swilled out.

Carburetter Air Leaks
Erratic slow-running is often caused by air leaks between the joints at the carburetter flange and the cylinder and can be detected by applying oil around the joints.

Eliminate by fitting new joint washers and tightening the flange nuts evenly to a torque wrench setting of 10—12 lb./ft.

Also check that the rubber sealing ring in the carburetter flange is undamaged and located correctly.

On much used or old machines look for air leaks caused by a worn throttle.

Banging in Exhaust
This may be caused by too weak a pilot mixture when the throttle is closed or nearly closed. It may also be caused by too rich a pilot mixture and an air leak in the exhaust system. The reason in either case is that the mixture has not fired in the cylinder but has fired in the hot silencer.

If the banging occurs when the throttle is fairly wide open, the trouble will be traced to ignition, not carburation.

Excessive Fuel Consumption
If this cannot be corrected by normal adjustments, it may due to flooding caused by impurities from the fuel tank lodging on the float needle seat, so preventing its value from closing. The float needle should also be checked for wear or damage.

High consumption can also be caused by a worn needle jet and may be remedied or improved by lowering the needle in the throttle. If this method is unsatisfactory, then a new needle and needle jet will have to be fitted.

There are many other causes of high fuel consumption and it should not be assumed that the fault lies in the carburetter alone.

Air Filters
If a carburetter is first set with an air filter and then the engine is run without, the jet setting may be affected and care must be taken to avoid overheating the engine due to a weak mixture. Testing with the air control will indicate if a larger main jet and higher needle position are required.

Air Control
The air control should at all times be kept open except when starting from cold. When the engine fires, the control must be opened.

Repeated operation of the kickstart pedal with the air valve closed results in an accumulation of liquid petrol in the crankcase and until this has been drained away, it will be quite impossible to start. The crankcase drain plug is the smaller of the two plugs under the crankcase. If poor starting re-occurs, then the fault will most likely be found in the ignition system.

Effect of Altitude on a Carburetter
Increased altitude tends to produce a rich mixture; the greater the altitude, the smaller the main jet required. Carburetters ex-works are suitably set for use in altitudes up of to approximately 3,000 feet. Carburetters used constantly in altitudes of between 3,000 to 6,000 feet should have a reduction in main jet size of 5 per cent. A further reduction of 4 per cent should be made for every 3,000 feet in excess of 6,000 feet altitude.

No adjustment can be made to compensate for lost power due to rarified air.

TRACING FAULTS

Faults likely to occur in carburation can be placed in one of two categories; either richness of weakness of petroil/air mixture.

Indications of Richness
Black smoke in exhaust.
Fuel spraying out of carburetter.
Two-strokes, four-stroking.
Heavy lumpy running.
Sparking plug sooty.

Indications of Weakness
Spitting back in carburetter.
Erratic slow-running.
Over heating.
Engine goes better if throttle is almost closed.

Having established whether the mixture is too rich or too weak, check if caused by:—

(1) Fuel feed — check that the jets and passages are clear, that filter gauze in float chamber "banjo" connection is not choked with foreign matter, and that there is ample flow of fuel. Also ensure there is no flooding.

(2) Air leaks — usually at the flange joint.

(3) Defective or worn parts — such as loose fitting throttle valve, worn needle jet, loose jets.

(4) Air cleaner choked up.

(5) An air cleaner having been removed.

(6) Removal of the silencer — this requires a richer setting.

Having ensured that the fuel feed is correct and that there is no air leaks etc., check the ignition. Now test to see if the mixture is rich or weak by partially closing the air valve and noting how the engine runs. If the engine runs better, weakness is indicated, but if the engine runs worse then the mixture is too rich.

To remedy, proceed as follows:—

To Cure Richness

Position 1. Fit smaller main jet.
Position 2. Screw out pilot air adjusting screw.
Position 3. Fit a throttle with a larger cut-away (see paragraph E, page C7).
Position 4. Lower needle one or two grooves (see paragraph D, page C7).

To Cure Weakness

Position 1. Fit larger main jet.
Position 2. Screw pilot air adjusting screw in.
Position 3. Fit a throttle with a smaller cut-away (see paragraph E, page C9).
Position 4. Raise needle one or two grooves (see paragraph D, page C7).

(Positions 1, 2, 3 and 4 refer to positions of throttle openings as shown in figure C3, page C8.)

NOTE:—It is incorrect to attempt to cure a rich mixture at half-throttle by fitting a smaller jet because the main jet may be correct for power at full throttle. The correct method is to lower the throttle needle.

VARIABLE SETTINGS AND PARTS

Figure C2 is a sectioned diagram of the concentric carburetter body, showing the throttle adjusting screw (*A*), and the pilot air adjusting screw (*B*).

PARAGRAPH "A" — **Throttle Adjusting Screw** Set this screw to hold the throttle open sufficiently to keep the engine running when the twist grip is shut off.

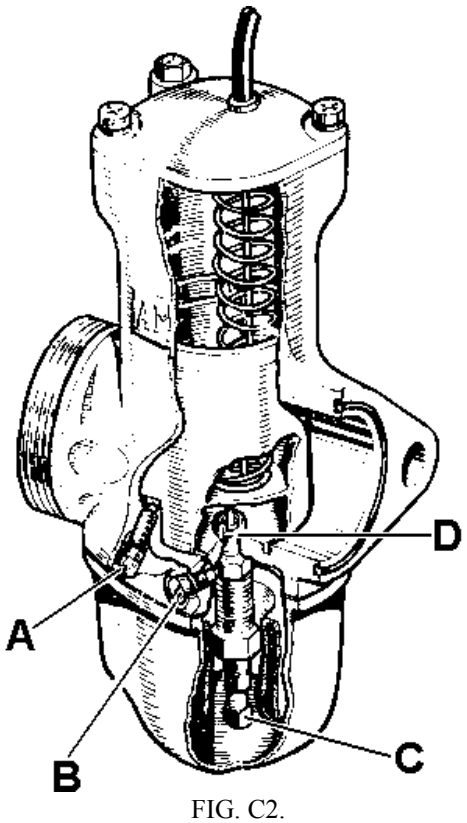


FIG. C2.

PARAGRAPH "B" — **Pilot Air Adjusting Screw** This screw regulates the strength of the pilot mixture for "idling" and for the initial opening of the throttle. The screw controls the depression on the pilot jet by metering the amount of air that mixes with the fuel.

PARAGRAPH "C" — **Main Jet**
The main jet controls the fuel supply when the throttle is more than three-quarters open, but at smaller throttle openings although the supply of fuel goes through the main jet, the amount is diminished by the metering effect of the needle in the needle jet.

Each jet is calibrated and numbered so that its exact discharge is known and two jets of the same number are alike. Never ream out a jet, get another the right size. The bigger the number the bigger the jet.

To gain access to the main jet, the concentric float chamber must first be removed (two screws).

PARAGRAPH "D" — **Needle and Needle Jet**
The needle is attached to the throttle valve and being taper — either allows more or less fuel to pass through the needle jet as the throttle is opened or closed throughout the range, except when idling or nearly full throttle. The taper needle position in relation to the throttle opening can be set according to the mixture required by fixing it to the throttle valve with the jet needle clip in a certain groove, thus either raising or lowering it. Raising the needle richens the mixture and lowering it weakens the mixture at throttle openings from one-quarter to three-quarters open.

PARAGRAPH "E" — **Throttle Valve Cut-away**
The atmospheric side of the throttle is cut-away to influence the depression on the main fuel supply and thus gives a means of tuning between the pilot and needle jet range of throttle opening. The amount of cut-away is recorded by a number marked on the throttle valve, *viz.,* 389/3½ means throttle valve type 389 with number 3½ cut-away; larger cut-aways, say 4 and 5, give weaker mixtures and 2 a richer mixture.

PARAGRAPH "F" — **Air Valve**
This is only used for starting the engine, and for experimenting with air supply. It must be fully open when the engine is running.

PARAGRAPH "G" — **Tickler or Primer**
This is a small spring-loaded plunger, in the float chamber wall. When pressed down on the float, the needle valve is allowed to open and so "flooding" is achieved. Flooding temporarily enrichens the mixture until the level of the fuel subsides to normal.

TUNING THE CARBURETTER

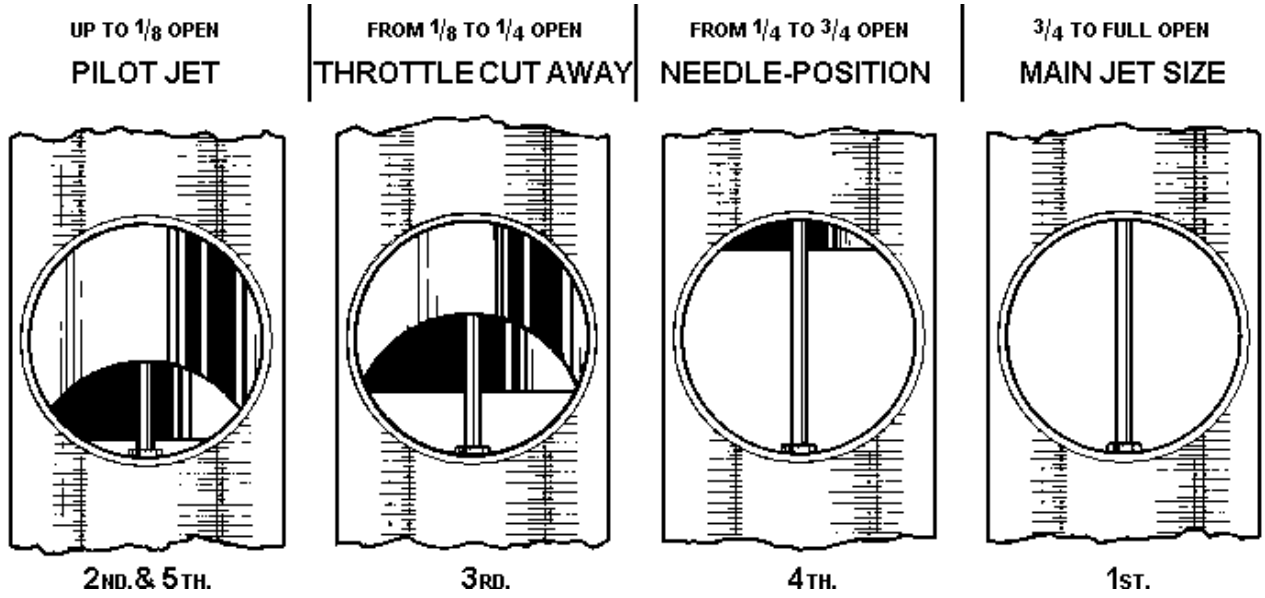
Tune-up in the following order
Read remarks in sections above for each tuning device and get the motor going perfectly on a quiet road with a slight up-gradient so that on test the engine is pulling under load.

FIRST — **Main jet** with throttle in position 1, Fig. C3. If at full throttle the engine runs "heavily", the main jet is too large. If at full throttle, the engine seems to have better power when the throttle is eased off or the air valve is slightly closed, then the main jet is too small.

With the correct sized main jet, the engine at full throttle should run evenly and regularly with maximum power.

If testing for speed work, ensure that the main jet size is sufficient for the mixture to be rich enough to maintain a cool engine. To verify this, examine the sparking plug after taking a fast run, declutching and stopping the engine quickly. If the sparking plug has a cool appearance the mixture is correct; if sooty, the mixture is rich; if however, there are signs of intense heat, the plug being very white in appearance, the mixture is too weak and a larger main jet is necessary.

SECOND — **Pilot jet** (Fig. C3) with throttle in positions 2 and 5. With engine idling too fast with the twist grip shut off and the throttle shut down on to the throttle adjusting screw, and ignition set for best slow-running; (1) screw out throttle adjusting screw until the engine runs slower and begins to falter, then screw pilot air adjusting screw in or out, to make engine run regularly and faster.



SEQUENCE OF TUNING
FIG. C3.

(2) now gently lower the throttle adjusting screw until the engine runs slower and just begins to falter, adjust the pilot air adjusting screw to get best slow-running, if this second adjustment leaves the engine running too fast, go over the job a third time.

THIRD — **Throttle cut-away** with throttle in position 3 (Fig. C3). If, as you take off from the idling position, there is an objectionable spitting from the carburetter, slightly richen the pilot mixture by screwing in the air screw. If this is not effective, screw it back again, and fit a throttle with a smaller cut-away. If the engine jerks under load at this throttle position and there is no spitting, either the jet needle is much too high or a lower throttle cut-away is required to cure richness.

FOURTH — **Needle** with throttle in position 4 (Fig. C3). The needle controls a wide range of throttle openings and also the acceleration. Try the needle in as low a position as possible, *viz.,* with the clip in a groove as near the top as possible; if acceleration is poor and with the air control partially closed, the results are better, raise the needle by two grooves; if very much better then try lowering the needle by one groove and leave it where it is best. If mixture is still to rich with clip in groove number one nearest the top, the needle jet probably wants replacement because of wear. If the needle itself has had several years of use, replace it also.

FIFTH — **Finally,** go over the idling again for final touches.