5. Fuel System

Idling speed

The vacuum in the engine crankcase sucks air through the carburettor. Partly past the throttle which is adjusted by means of the large screw. Partly through the throat (B) past the adjustment screw (A); this air breaks up the fuel in the mixing section of the idling jet to facilitate carburetion.

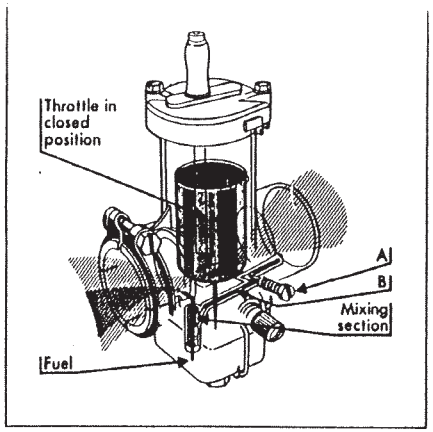


Fig. 15

High speed

Air is sucked through the passage (C). This air breaks up the fuel in the mixing tube (D). The atomized fuel is then sucked up into the venturi of the carburetor and mixed with the air flowing through the throttle opening.

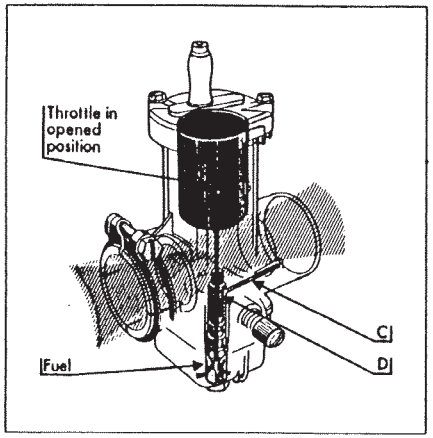


Fig. 16

Fuel supply system

Fuel flows through the needle valve (E) when the float is below the pre-set position. As the fuel level rises, so does the float and closes the needle valve. This procedure is repeated with the result that the fuel level in the float chamber of the carburetor remains constant.

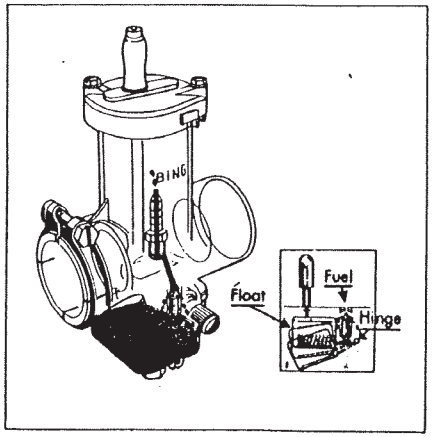


Fig. 17

BING CARB Rx

If you have a Bing on your bike, and you're too lazy to read this article, you will blow your motor up. Don't say we didn't warn you.

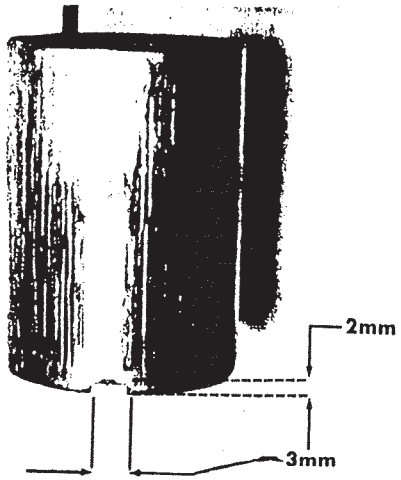
By BRIAN FABRE

Expensive European motorcycles are built to give the purchaser the basic package without the necessary detailing that makes a "works" machine. In order to get proper performance, it is usually necessary to go completely through the motorcycle before entering it in a race. If such things as motor mounts, carburetor settings, brake linings, etc., are not serviced correctly, there is an excellent chance that disaster is just around the corner. This means more out-of-pocket expense on top of the payments that must be made.

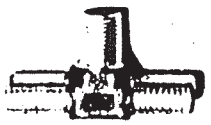
One of the most expensive parts of the motorcycle to repair is the power unit. Improper jetting or inadequate fuel supply can easily ruin the piston or the connecting rod. There have been cases where the rod broke in half after the piston seized, resulting in a new engine. (As an example: a 400 Maico Radial engine costs over $800.) Though many of the popular motocrossers from Europe use the 36mm Bing center float carburetor, almost everything that is applicable to the Bing is applicable to the other slide-type carburetors.

It appears as though the Bing carburetor problems are threefold: 1.) The carburetor runs too rich at low speeds. 2.) When the jetting is changed for good low-speed performance, it will be too lean in the mid-range speeds. 3.) At low speeds, the carburetor will suddenly become richer for no apparent reason.

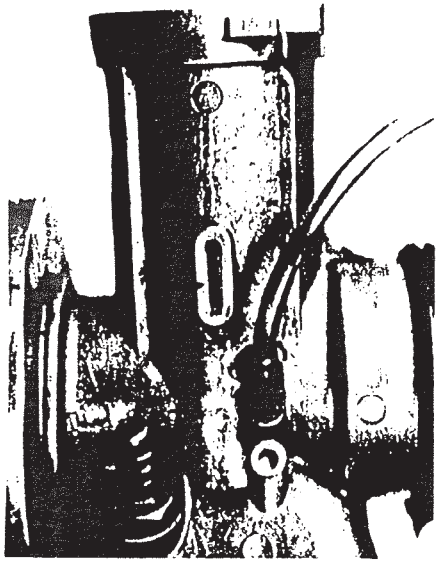
Using 400cc engine carburetor settings as an example, the average tuner will first lower the needle to the leanest position, and then if he's not satisfied, out will come the factory-supplied 185 main jet and in will go a 170-175. Low-speed problems seem to go away for a short while, usually until the engine gets a good healthy bite of the ground



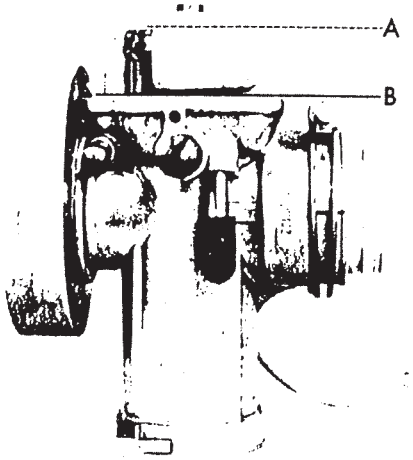
Some of the richness just off idle can be eliminated by cutting this notch. Do not exceed 2mm deep x 3mm wide.



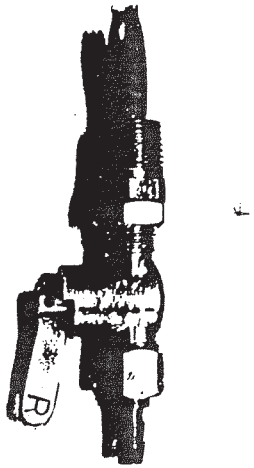
High flow fuel "T" can be made from a brass fitting if the threads are turned off in an engine lathe. Also check at the hardware store for a copper tubing "sweat" fitting, they work and do not have threads.



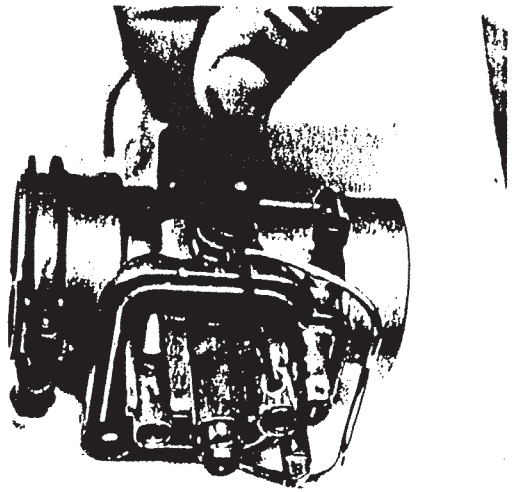
We suggest that the slide key be epoxied in. There have been many cases of it falling out. Later models have corrected this by center punching over the key. Don't try center punching your carb or you'll ruin it.



Adjust the float level (A) so that the floats are parallel to the float bowl gasket surface (B).



Triumph fuel taps have good flow. Yamaha valves on the MXers are better.



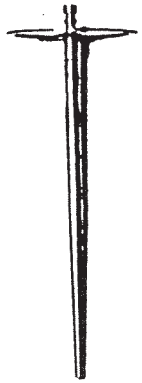
Hole has been opened up to allow fuel to escape directly into the float chamber without passing along the sides of the float needle. Upper surface of the hole passes just below the needle seat. Be extra careful not to scratch the seat.

Bing float needle is prone to fast wear. A groove, which develops quickly, will cause improper sealing at low speeds. If jetting changes for no apparent reason, the culprit is usually the float needle.

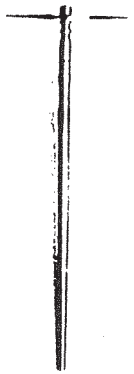
going up the straightaway. Suddenly, a big hand seems to grab the bike, causing it to slow down. The instant the clutch is disengaged the engine stops. Pushing the motorcycle back to the pits, think of at least $100 to repair it. Gruesome, isn't it?

First rule of thumb is the fact that the factory main jet setting is usually spot-on for maximum power, or one size rich. Second rule of thumb is, don't diddle with the main jet. Let's put all the foofooraw to the side and start at the root of the problem and then continue forward. If we can get gasoline into the float bowl in adequate quantities, jetting will be a snap. Looking at the restrictions in the system, two areas come under critical examination. Fuel valves from Europe are big enough to supply a mo-ped engine, no larger. Remove it from the gasoline tank and discard it. Purchase an accessory item fuel valve or adapt an industrial fuel valve available from the local hardware or farm equipment dealer. It may take a piece of rubber tubing and hose clamps to adapt the fuel valve, but don't let that discourage you.

With gasoline flowing freely from the gas tank, it won't do any good if it can't get to the main jet. Evidently Bing thought that the 36 mm'er would be used on 50cc strassa racers, so they made the passage from the gasoline line to the float bowl just large enough to pass about one gallon of fuel every 10 minutes. At full throttle a two-cycle engine will consume approximately one pound of fuel per hour per horsepower. That means that a 45-horsepower engine will consume 45 pounds of fuel per hour. To be on the safe side, assume that gasoline weighs 6.5 pounds per gallon. The engine requires about seven gallons of fuel per hour and the passage in the carburetor will deliver only six gallons per hour. It should be evident that the fuel supply system cannot maintain proper fuel level in the float bowl.



Carburetor needle in rich position.



Carburetor needle in lean position.

Fuel inlet fitting and the fuel passage below must be enlarged in order to keep the float bowl full when the engine is developing maximum horsepower.

Remove the brass fuel inlet fitting and drill the inner diameter with a 3/16 (.1875 dia.) drill. Holding the carburetor body by hand, drill the passage just under the brass fuel inlet to 3/16. Take it very slow as the drill will break through into a small chamber at the end of the passage. At the other side of the chamber is the brass seat for the float needle. If the drill cuts into the brass seat far enough, the float needle will not seat and the carburetor is scrap. Do not be alarmed if the drill opens the passage directly to the float chamber. This will require a trip to the hardware store for an epoxy kit. Mix the epoxy per directions and patch the broken-through area. After the epoxy has dried, redrill the passage again.

At this point, the carburetor will handle a weak 360cc engine, but is still inadequate for the fire-breathing 400cc and larger engines. So we must drill and massage a little bit more in order to get the flow higher. With a grinding wheel, attached to a small Dremel or a drill motor, cut through the side of the needle chamber so that when the needle drops away from the seat, the fuel has direct access to the float bowl. Again, be careful so that the grinding wheel does

Cont'd. on page 93

Carburettor adjustment

Slow running

Always warm up the engine before adjusting.

1. Gently turn the air screw right home. Then screw it back 1,5 turn.
2. Start the engine and adjust the throttle stop screw until a satisfactory slow running speed is achieved.
3. Adjust the air screw until the engine runs smoothly (turning clockwise gives a richer mixture, anti-clock wise gives a leaner mixture).
4. If necessary, re-adjust the throttle stop screw for a satisfactory slow running speed.

Main adjustments

For this carburettor the following main adjustments are recommended, with certain divergences depending on the temperature, climate and racing circumstances.

Main jet:	Nr 180
Needle jet:	2,85
Idle jet:	Nr 35
Needle:	1,5 × 28

Needle position: 3 (the needle in the upper position).
Idle screw (the small screw) is opened 1,5 turns from bottom position.

Regular running

1. Turn out the throttle stop screw so that the throttle closes completely.
2. Gently turn the air screw right home. Then screw it back one half-turn.
3. Run the motorcycle down a long hill with the throttle closed and in 2nd gear. The hill must be steep enough for the machine to run on no power. After about 50 yards give a quick burst of full throttle. If the engine tends to »four-stroke» momentarily the air screw is too far in. Back it off half a turn and repeat the test. Continue the procedure until the engine answers instantly. Beware of opening the air screw too far, as acceleration will suffer.

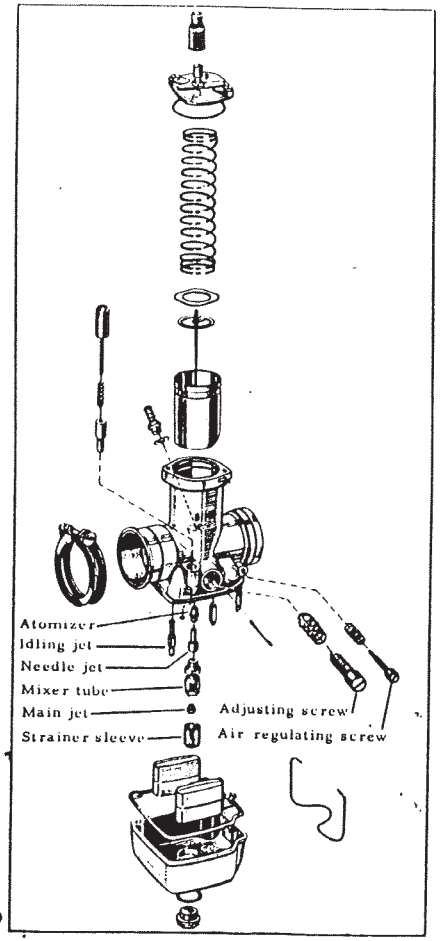


Fig. 20

Needle

The needle determines the mixture ratio between slow running and three-quarters throttle. From 3/4 throttle up to full throttle the main jet is decisive. The needle has three settings, the uppermost (no 1) giving the leanest and the lowest (no 3) the richest mixture.

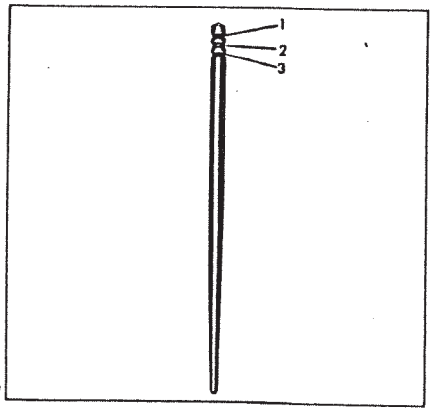


Fig. 21

Needle adjustment

Drive up a hill that is within machine capability in 3rd gear and at 1/4 throttle. Slowly increase the throttle to 3/4 open. If acceleration is poor it may be due to lean needle setting. Raise the needle one mark and repeat the test.
If the engine runs unevenly or »four-strokes» during this test then the needle setting is too rich. Lower the needle one mark and repeat the test.

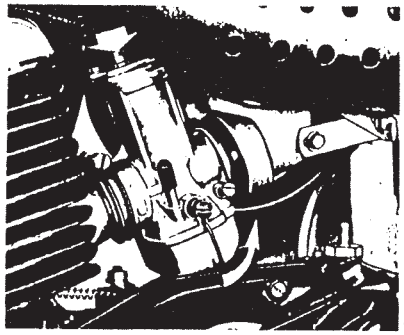


Fig. 22

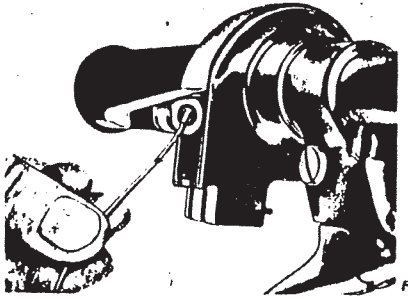


Fig. 23

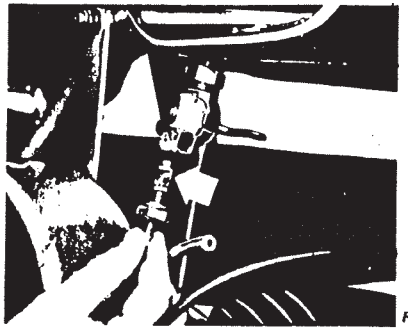


Fig. 24

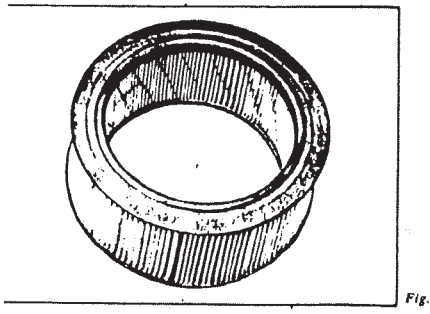


Fig. 25

Main jet

The surest way to determine the right size of main jet is to try and abviously large number. Run at full throttle in 4th gear and allow the engine to run down. It will »four-stroke». Reduce jet size by one number at a time, until 4-stroking is eliminated. If the main jet is too small, acceleration may suffer. Use the largest possible size without 4-stroking at high revs.

Finally

High temperature, high elevation above sea level and lower barometric pressure generally require leaner settings. However, remember to restore the richer setting when conditions are normal again. If settings are too lean, acceleration and top speed will be less and there will be risk of engine damage.

Changing throttle wire

1. Remove carburettor cover.
2. Compress throttle spring and unhook wire.
3. Open cover of throttle handgrip and remove wire.
4. Fix new wire in handgrip and throttle flap.
5. Refit throttle flap and screw carb. cover in place. *Important:* Check that throttle wire and adjusting screw are correctly located. See Fig. 20 and 22.
6. Check that wire runs freely and will not be pinched by steering.

Dismantling and cleaning

Remove the air filter and retainer from the carburettor and frame.
Lift out the throttle from the carburettor.
Loosen the carburettor attaching clamp and remove the carburettor from the intake manifold.
Remove the float chamber from the carburettor by loosening the spring strap (see Fig. 22).
Remove the peg and take out the float.
Remove or change the main jet and idling jet if necessary. Thoroughly clean all parts in petrol and blow dry with compressed air.
Assemble the carburettor in the reverse order. Make sure that the float chamber is fitted correctly on the carburettor housing and that the rubber seal between the carburettor and air filter holder is intact.
Clean the fuel cock filter (see Fig. 24) and carburettor float chamber free from water and dirt. Fit a new air filter if necessary.

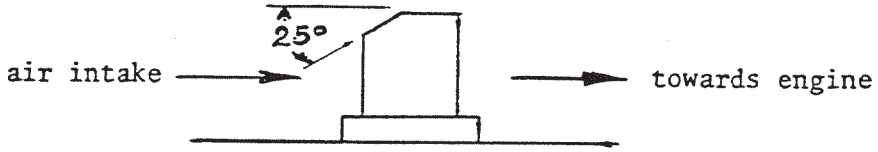
Air filter

This is a papertype filter with a large effective area. It is accessible for cleaning or replacement by removing the three nuts which hold the filter casing.
The filter element must not be washed in petrol or any other type of solvent. Instead use compressed air or a soft brush. If heavily blocked with dirt, the filter should be changed.
When refitting the filter the contact surfaces with the air inlet connection and casing should be greased in order to ensure good sealing.
Tighten up the three nuts fully when fitting.

RE: 450 WR FUEL ECONOMY
and HELPING THE ENERGY CRISIS

Many 450 WR owners have difficulty getting good fuel mileage out of their bikes. The problem is easily recognized by the sweat which builds up on the foreheads and under the arms of 450 WR owners as they push their bikes out of the woods after embarking on a ride.

Fuel economy can be improved on 450s by making this modification to the atomizers in the Bing carbs.



The atomizer, after being modified as shown below with a 25 degree cut, should be installed backwards from the normal position with the cut section facing towards the air intake (shown above). The 36mm Bing carb should be set up with the following jets for most conditions:

MAIN JET: #190 NEEDLE JET: 2.85 PILOT JET: #35

This jetting will crispen up the mid-range. Caution should be taken as to jetting for your particular area. The above specs are a guide only. Check the rider's manual for information on how to determine the proper jetting.