THE S.U. CARBURETTER

The second article in the series based on official S.U. service data

IN the case of unsatisfactory behaviour of the engine, before proceeding to a detailed examination of the carburetter it is advisable to carry out a check of the general condition of the engine, in respects other than those bearing upon the carburation.

Attention should, in particular, be directed towards the following :—

The ignition system.

Incorrectly adjusted contact breaker gap.

Dirty or pitted contact breaker points, or other ignition defect.

Loss of compression of one or more cylinders.

Incorrect plug gaps.

Oily or dirty plugs.

Sticking valves.

Badly worn inlet valve guides.

Defective fuel pump, or choked fuel filter.

Leakage at joint between carburetter and engine flange, or between induction pipe flanges and cylinder head or block.

If none of the above defects is present to a degree which is thought accountable for unsatisfactory engine performance, the carburetter should be investigated for the following possible faults.

1. Sticking of piston

The symptoms here are either stalling and a refusal of the engine to run slowly or, alternatively, lack of power accompanied by excessive fuel consumption. This defect is easily detectable. Where the carburetter is not fitted with an air cleaner, or, in cases where the air cleaner, or air pipe, are readily detachable, the piston may be examined conveniently. In cases where the removal of these parts is unduly troublesome, some indication of the condition of freedom of the piston is provided by exploration with a thin rod, nail, or the like, inserted through one of the atmospheric holes situated beneath the overhanging part of the flange which supports the suction chamber. In certain cases it will be found that a projecting spring-loaded pin is provided in this situation, and for this purpose.

The piston should rest, when the engine is not running, upon the bridge (28) (Fig. 1). When raised by means of the finger, or by the blade of a penknife, to its highest position against the appreciable resistance of the damper piston, and then released, it should drop freely and strike the bridge sharply and distinctly.

If it becomes prematurely arrested in its downward movement, or if it appears unduly reluctant to break away from its position of rest on the bridge when an attempt is made to raise it from this position, the jet should be lowered by means of the enrichment mechanism, and the test repeated.

If the previous symptoms persist it can be assumed either that the enlarged diameter of the piston is making contact with the bore of the suction chamber, or that the piston rod is not sliding freely within its bush. There is, furthermore, the possibility that the damper rod (26) (Fig. 1) has become bent and is inducing friction between the damper piston and the bore of the main piston rod. This last possibility may be investigated by removal of the oil cap and damper assembly ; if the removal of the damper allows free downward movement of the piston the damper rod may then be straightened before reassembly if this appears to be the cause of the trouble. If, on the other hand, sticking has been eliminated by the act of dropping the jet, the indication is that contact and friction are taking place between the jet and the needle and that " centring of the jet " is required.

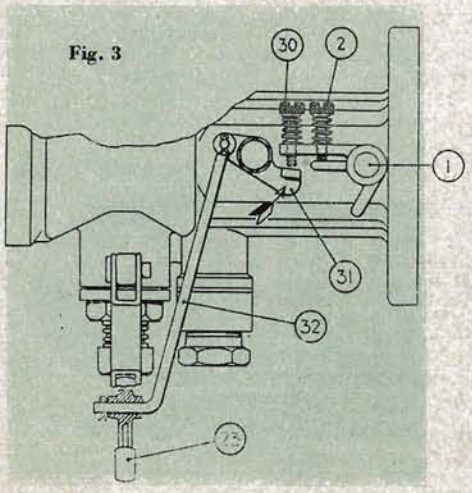

Fig. 3

Centring the Jet

Rectification should be conducted as follows, according to the diagnosis. To deal with dirt, or contact, between the piston and suction chamber, or sticking of the piston rod in its bush, remove the suction chamber, withdraw the piston and thoroughly clean both parts with petrol and a clean cloth. Apply a few drops of light oil to the piston rod, preferably diluted with paraffin if any signs of rust or corrosion are noticed on the rod. Replace the piston in the suction chamber and test for rotational and sliding freedom. Any direct local contact between these two parts, attributable to some indentation of the suction chamber, may be rectified by carefully removing, by means of a hand scraper, any high spots which may show up on the suction chamber bore. On no account should any attempt be made to enlarge generally the bore of the suction chamber, or to reduce the diameter of the enlarged part of the piston, as the maintenance of a limited clearance between these parts is absolutely essential to the proper functioning of the carburetter.

The following instructions apply to eccentricity of jet and needle. Re-centring of the jet in relation to the needle will be necessary should the jet have become laterally displaced in service due to inadequate tightening of the locking screw (15) (Fig. 1) or any other cause. This operation will, of course, also be necessary if the jet and its associated parts have been removed for any reason. It may also be necessary after the removal and replacement of a needle. The procedure for the re-centring of the jet is as follows, referring to Fig. 1. The jet stop nut (18) should first be screwed upwards to its fullest extent, and the jet head then raised to contact it so that the jet assumes its highest possible position. The locking screw (15) should now be loosened just sufficiently to release the jet and jet bush assembly (5), (13), (14), etc., and permit this to be moved laterally.

A moderate side loading applied to the lower protruding part of the lower jet bush (14) will indicate whether or not the assembly has been sufficiently freed. The piston should now be raised, and, maintaining the jet in its highest position, the piston should be allowed to drop. This will cause the needle to be driven fully into the jet mouth, and thus bring about the required centralisation. The locking screw should now be tightened and the jet returned to its former position. Should any indication of contact between the needle and the jet persist, which may sometimes occur due to further displacement of the assembly on finally tightening the locking screw, this must again be slacked off and the operation repeated until correct centralisation has been achieved.

2. Flooding from float-chamber or mouth of jet.

Flooding may occur due to a punctured and petrol-laden float, or to dirt between the float-chamber needle valve and its seating. To remedy either defect the float-chamber lid should be removed and the necessary cleaning, float replacement, or repair effected.

3. Leakage from bottom of jet

If persistent slow leakage is observed in the neighbourhood of the jet head, it is probable that the jet gland washer (17) and its lower counterpart, together with the locking screw washer (19) require replacement. Careful perusal of Section 1, in conjunction with Fig. 1, should enable this to be done without difficulty. The jet lever (23) should first be detached from the jet head, the locking screw (15) removed, and the entire jet and jet bush assembly withdrawn. On reassembly, great care should be taken to replace all parts in their correct positions, as shown in the diagram. Re-centring of the jet, as previously described, will, of course, be necessary after this operation.

4. Water or dirt in carburetter

If trouble due to this cause is suspected the float-chamber should be examined and cleaned out. If excessive water or foreign matter has been present it is possible that the jet has become choked. Before removing the jet and its associated parts for cleaning, the following expedient may be attempted.

The jet should be dropped to its fullest extent, the suction chamber and piston removed, and the suction chamber alone replaced. The main air inlet should then be obstructed and the engine rapidly but briefly turned over by hand, or by the starter. This operation subjects the jet to a high degree of suction which will probably result in any foreign matter being drawn out, both from the jet and from the adjacent fuel passages. If it fails to do so, however, the jet and associated parts must be removed for cleaning.

5. Failure of fuel supply to float-chamber

If the engine is found to stop under idling or light running conditions, notwithstanding the fact that a good supply of fuel is present at the float-chamber inlet union (observable by momentarily disconnecting this), it is

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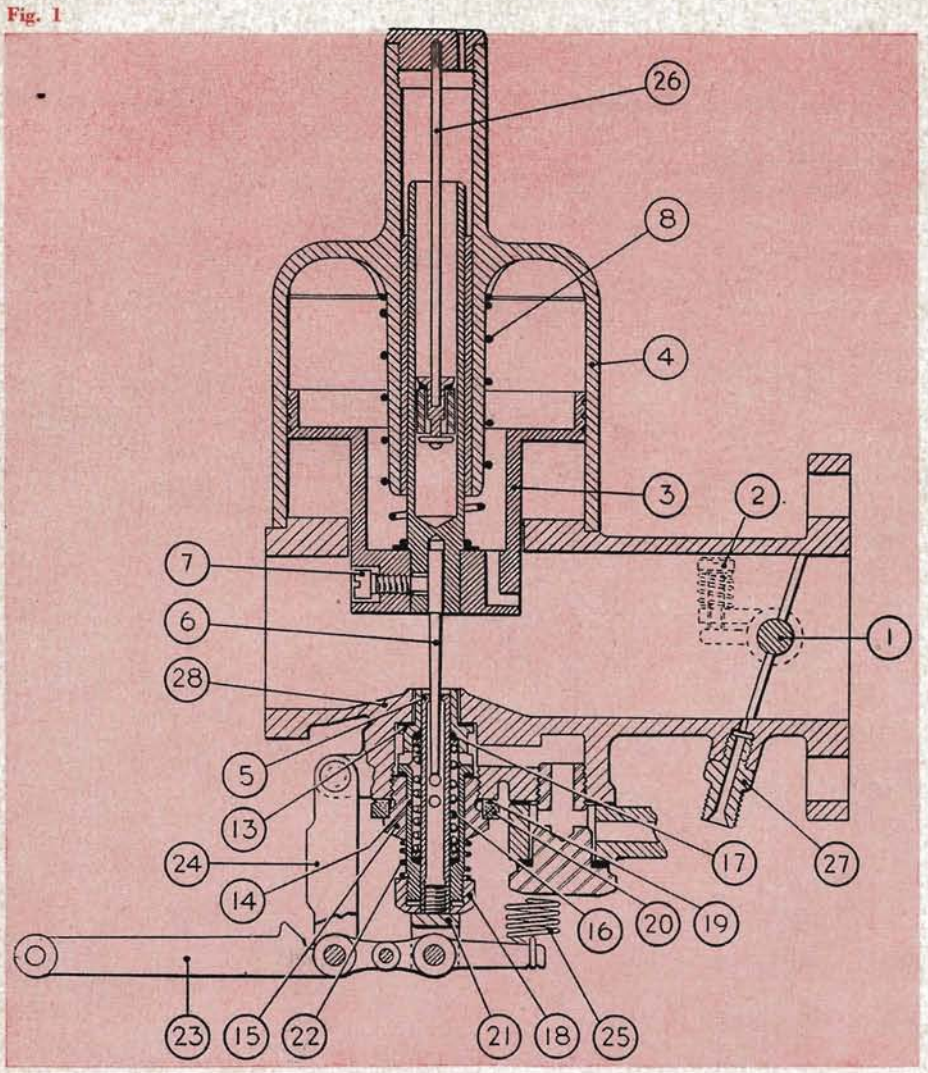
Fig. 1



possible that the needle has become stuck to its seating. This possibility arises in the rare cases where some gummy substance is present in the fuel system. The most probable substance of this nature is the polymerised gum which sometimes results from protracted storage of fuel in the tank.

After removal of the float-chamber lid and float lever, the needle may be withdrawn and its point thoroughly wiped with a rag dipped in alcohol. Similar treatment should also be applied to the needle seating, which can conveniently be cleaned by means of a matchstick and cloth dipped in alcohol. Persistent trouble of this nature can only be cured properly by complete mechanical cleansing of the tank and fuel system, on which further advice is available from the carburetter manufacturers on application. If the engine is found to suffer from a serious lack of power, which becomes evident at higher speeds and loads, this is probably due to an inadequately sustained fuel supply, and the fuel pump should be investigated for inadequate delivery, and any filters in the system inspected and cleaned.

6. Sticking of jet

Should the jet and its operating mechanism become unduly resistant to the action of lowering and raising by means of the enrichment mechanism, the jet should be lowered to its fullest extent, and the lower part thus exposed should be smeared with petroleum jelly or similar lubricant. Oil should also be applied to the various linkage pins in the mechanism, and the jet raised and lowered several times in order to promote the passage of the lubricant upwards between the jet and its surrounding parts.

In the case of many carburetters of recent manufacture a direct connection is provided between the jet movement and the throttle opening. Such an interconnection ensures that the engine will continue to run when the mixture is enriched by lowering the jet, without the additional necessity of maintaining a greater throttle opening than is normally provided by the setting of the slow-running screw (2) (Fig. 1).

The mechanism involved in this interconnection is shown in Fig. 3. It will be seen that a connecting rod (32) conveys movement from the jet lever (23) to a lever (31) pivoted on the side of the main body.

Movement of the jet lever in the direction of enrichment is thus accompanied by an upward movement of the extremity of the lever (31) which, in turn, abuts against the adjustable screw (30), and this opens the throttle to a greater degree than the normal slow-running setting controlled by the slow-running stop-screw (2). The screw (30) should be so adjusted that it is just out of contact with the lever (31) when the jet has been raised to its normal running position, and the throttle is shut back to its normal idling condition, as determined by the screw (2).

(To be continued)