AMAL

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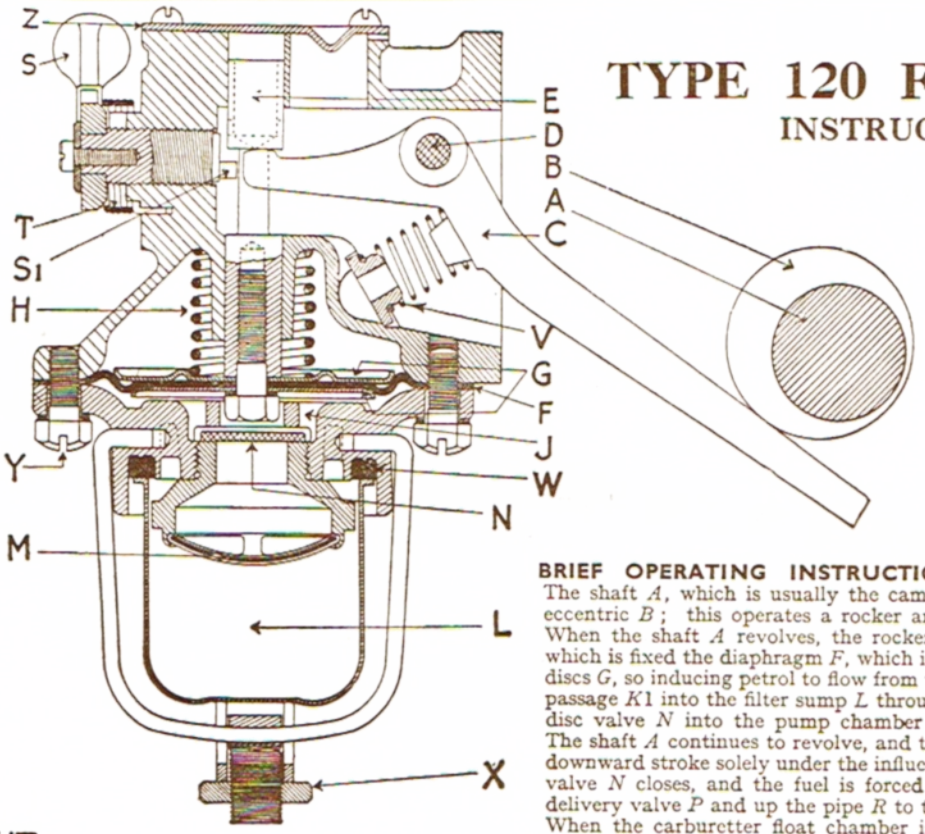
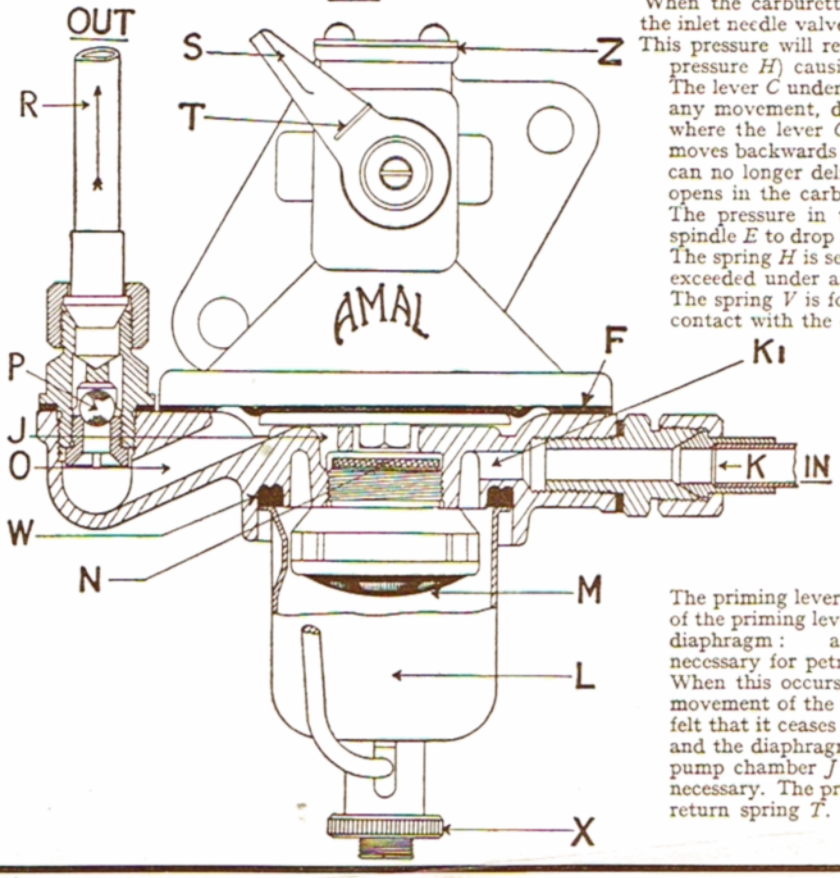
TYPE 120 FUEL PUMP
INSTRUCTIONS.



NOTE.—the filter "M" may be a unit construction as illustrated, or alternatively, the gauze "M" may be detachable and held in position by a loose ring screwed on to the adaptor, which is the non-return valve seating: this ring having projections which would contact an indentation in the filter bowl should it or the valve seating attempt to screw loose.



BRIEF OPERATING INSTRUCTIONS.

The shaft *A*, which is usually the camshaft of the engine, carries an eccentric *B*; this operates a rocker arm *C* pivotted at the point *D*. When the shaft *A* revolves, the rocker arm *C* lifts the spindle *E* to which is fixed the diaphragm *F*, which is interposed between two metal discs *G*, so inducing petrol to flow from the tank up the pipe *K* through passage *K1* into the filter sump *L* through the filter *M* and the suction disc valve *N* into the pump chamber *J*.

The shaft *A* continues to revolve, and the diaphragm *F* commences its downward stroke solely under the influence of the spring *H*, the suction valve *N* closes, and the fuel is forced along the passage *O* past the delivery valve *P* and up the pipe *R* to the carburetter.

When the carburetter float chamber is filled, the float will shut off the inlet needle valve, thus creating a pressure in the pump chamber *J*. This pressure will react against the diaphragm *F* (against the spring pressure *H*) causing it to remain in the "raised" position.

The lever *C* under these conditions, can no longer give the spindle *E* any movement, due to the fact that it is raised beyond the point where the lever *C* engages the spindle. The lever *C* then simply moves backwards and forwards idly, and when this occurs the pump can no longer deliver any fuel until such time as the needle valve opens in the carburetter float chamber to admit a further supply. The pressure in the pump chamber *J* then falls and allows the spindle *E* to drop and once more come in contact with the lever *C*.

The spring *H* is set at a pre-determined pressure, and this cannot be exceeded under any circumstances of the pump's operation.

The spring *V* is for the purpose of maintaining the rocker arm *C* in contact with the eccentric *B* to prevent noise, and it has no action on the fuel pump itself.

The inspection cover *Z* can be removed for examination of the correct setting of the pump, which is: the top of the spindle should be $\frac{1}{8}$" to $\frac{1}{16}$" below the top of the face of the pump in its highest position.

The filter sump *L* is removed for cleaning purposes by unscrewing the knurled nut *X*; the filter *M* can then be unscrewed, cleaned and replaced. The sump *L* is afterwards fitted and screwed up tightly so as to make an air-tight joint by means of the washer *W*.

The priming lever *S* is then operated by hand. This brings the part of the priming lever *S1* in contact with the spindle *E*, so working the diaphragm: about a dozen slow strokes is all that should be necessary for petrol to reach the float chamber of the carburetter. When this occurs, and the float chamber is full, the resistance to movement of the priming lever *S* will gradually diminish, until it is felt that it ceases to act. This means that the float chamber is full, and the diaphragm is raised under the pressure so produced in the pump chamber *J* and no further actuation of the priming lever is necessary. The priming lever *S* is held back, when not in use, by the return spring *T*.

P.T.O.

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SERVICE HINTS—AMAL FUEL PUMP, TYPE 120

Do not entirely dismantle the pump unless it is necessary to examine the diaphragm and the spindle. Normal cleaning can be done under the headings Paragraphs A and B.

A.

For normal cleaning it is only necessary to remove the filter cup *L* by loosening the stirrup nut *X* and swinging the stirrup to one side, when the cup will fall away exposing the filter gauze *M*. The gauze *M* can be removed for cleaning, and if the adaptor on to which it fits also screws out, care must be taken not to damage or lose the suction valve *N*.

When replacing these parts see that the washer *W* is in good order, as any bad fit here would cause a leakage of fuel or even an air leak, which would upset the function of the pump. The nut *X*, when centred in the cup, should be screwed up firmly.

B.

If it is desired to clean out all the fuel passages, this can be done without disturbing the diaphragm and without taking the two halves of the pump apart, as all the passages are underneath the diaphragm.

1. Disconnect the fuel pump connections *K* and *R* from the pump and remove the pump in its entirety from the engine by undoing the flange bolts.
2. Remove the filter bowl as in paragraph *A* above and also the suction valve *N* and its seating.
3. To inspect the delivery valve *P* in the outlet pipe, unscrew the hexagon cage from the lower half of the pump : The ball valve seating with the screwdriver slot may be unscrewed from the underside when the ball valve will fall away.
4. All parts may now be flushed out with petrol and reassembled. It is to be noted that neither in the suction valve nor the ball delivery valve are there any springs. and nothing need be looked for in these types of valves but an accumulation of imputities.

THE PUMP CAN ONLY FAIL TO FUNCTION FOR TWO REASONS :

Firstly—actual mechanical breakage, which will be obvious, and hardly likely to occur, and :

Secondly—due to external air leaks, which should be examined for in the following order :—

1. The connection between the filter sump *L* and the pump. See that the knurled nut marked *X* is screwed up tight, and that the jointing washer *W* is in good condition.
2. Check over for air leaks in the inlet tubing between the tank and the fuel pump, making certain that all the joints and unions are tight, and that there are no cracks or leaks in the pipe itself.

The same remarks apply to the tubing between the fuel pump and the carburetter.

3. Examine the six bolts which hold the halves of the pump together, and make the joint for the diaphragm. These must be perfectly tight.

C. INSTRUCTIONS FOR COMPLETE DISMANTLING AND REASSEMBLING OF THE FUEL PUMP.

1. Disconnect the fuel pump as indicated in paragraph B.

2. To remove the diaphragm spindle *E* it is necessary to withdraw the priming cam S1. Therefore, to do this remove the small screw and washer from the priming lever *S*, unhook the spring *T* from where it grips the lever, and then prise off the lever itself and detach the spring. Lift the spindle *E* by depressing the rocking lever *C* and unscrew the priming cam S1 three or four turns.

3. **Removal of Operating Lever.**

If the pump is actuated by a plunger (not as illustrated overleaf), that is with the plunger operating on a short rocking lever inside the pump, remove the top plate *Z* and extract the spring, but if the pump is operated by a long lever protruding from the pump (as illustrated overleaf), there is no need to remove the cover plate *Z*. Next remove the split cotter pin holding the rocker pivot *D* in position, tap out the pivot pin *D* and remove the lever, and also the spring *V* if the lever is as illustrated.

4. To take apart the two halves of the pump, screw out the six securing screws *Y* from the circumference of the pump and gently separate the two halves which clamp the diaphragm together.

5. The diaphragm *F* together with the spindle *E* and the spring *H* can then be withdrawn from the pump. If it is desired to inspect the diaphragm leaves *F*, these can be removed from the spindle by unscrewing the hexagon headed pin, on earlier models this pin cannot be removed until the rivet through the spindle positioned about ½" from the diaphragm has been knocked out, take care not to bend or bruise the spindle *E*. When the hexagon headed pin is removed the diaphragm leaves and the two supporting discs can be separated.

5A. After examination of the diaphragms or the fitting of new ones they can be reassembled, the diaphragms are shaped and must be fitted correctly, the larger recess is fitted uppermost (*see illustration*) to encircle the larger disc *G*, ensure when fitting the smaller disc underneath it fits properly into the recess on the underside of the diaphragm. Fit the washer under the hexagon headed pin and smear the thread with " loctite " prior to refitting.

Care must be taken before tightening up the hexagon headed pin that the bolt holes in the diaphragm leaves are aligned, to ensure correct registration a couple of screws *Y* may be put through the holes in the edge of the diaphragm.

6. When all parts are cleaned and ready for reassembling, see that the spindle is clean, slip over the spring *H*, and insert into position, and then place the screws *Y* through the bottom half of the pump, through the holes in the diaphragm, and then start them screwing into the top half of the pump. It is now necessary to reassemble the rocking lever *C* (see paragraph 9) and its return spring *V* on to the pin *D* when placed through its holes in the body and replace the split pin through the external boss of the bearing and through the pin itself, and having done this, proceed to re-fix the priming lever *S*. Now lift the spindle *E* by depressing the rocker arm *C*, and screw in the priming lever cam *S*1 as far as it will go—then come back one or two turns and finally adjust in such a position that the spindle *E* moves freely up and down, with the cam pin *S*1 sufficiently far forward to engage with the spindle and also with the flat on the end of the cam spindle in a vertical position so that the lever *S* with its return spring *T* can be re-assembled, and that the engagement stop drops over the stop on the body. The spiked end of this spring fits into a small hole in the casing and the hooked end is sprung over the lever.

Now continue to screw up the pins *Y* finger tight and then, by means of the priming lever *S*, draw up the spindle with the diaphragm to the highest position possible by moving the lever *S* over as far as possible in a clockwise direction, and in this position tighten up the screws *Y* securely. This ensures that the diaphragm is correctly fitted in its position. It should be verified that the rocker arm *C* will lift the diaphragm and that the diaphragm will fall easily under the action of spring *H* when the rocker arm *C* is released, also verify that the priming lever *S*, when operated, will also lift the diaphragm.

7. All parts should now be reassembled as noted in paragraph B.

8. If the inspection plate *Z* has been removed, it is possible to see the movement of the spindle under the influence of the priming lever or the rocking lever *C*. Unless the movement is free, the pump must be dismantled again and reassembled. All parts should be tight to avoid either fuel or air leaks, and the pump may be re-fitted to the engine.

9. If the pump is of the plunger type (not as illustrated), replace the rocking lever and its pivot pin *D* and then replace the spring for the lever in the hole under the plate *Z* which is then fastened down by the small screws.

10. The diaphragm spindle is lubricated from the engine.

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