

APPENDIX IX.

CARBURATION.

The ROLLS-ROYCE Duplex Carburettor is made with two jets, with their corresponding air passages. When the engine is running slowly, throttle down, only one jet (the right-hand smaller one) is open, and as the throttle is opened the second one automatically comes into action, and as the engine increases in speed the automatic supplementary air valve admits additional air. The whole arrangement is so constructed as to insure sufficiently vigorous suction at slow speeds and perfectly free passage of the gases at high speeds, and at the same time to keep the ratio between air and spirit constant.

The engine is not only more economical, but it also works more satisfactorily when the quantity of spirit is the smallest possible amount that will ignite promptly. The engine should therefore be run with the weakest possible mixture, and owing to the fact that the atmospheric conditions and motor spirits vary, we provide means of adjusting the quantity of spirit (through a certain range) from the dashboard, and in later types from the steering column. This also enables the driver to test whether the carburation is correct.

Should it be found necessary, however, to dismantle the whole carburettor, the readjustment can be made quite easily by taking care that the small levers are clamped upon the regulating nuts when the screws are exactly level with the top of the nuts, and the marks on the nuts parallel with the dashboard regulator in the central position. If, however, some part has been broken or replaced so as to render useless this indication of the manufacturer's setting, then proceed as follows: - Put the hand regulator in the central position and slack off the levers which are clamped to the milled nuts, screw the milled nuts round so that the cones controlled by these milled nuts just open the petrol spray, then make an attempt to start the engine by "flooding" or putting a small quantity of petrol in the induction pipe, or both. As soon as you are able to get the engine to fire, make a rough adjustment as quickly as possible, so as to keep the engine running.

Now throttle the engine down by putting the governor lever as low as possible, and proceed to regulate the slow-speed jet (right-hand one) until the engine runs steadily with the smallest amount of petrol, which means that the nut is screwed as far as possible in a right-hand direction (clockwise, looking at the top). In reducing this low-speed jet to the minimum, the engine may commence to "hunt" on the governor, which is an indication that the jet has been reduced too much. It should then be slowly increased by turning anticlockwise until the engine runs steadily when warm with the smallest amount of petrol and at a reasonably slow speed. The bolt on the lever can then be tightened.

Then proceed to adjust the high-speed jet as follows:- Advance the ignition half-way up the quadrant, using both battery and magneto ignition, open the throttle wide by hand, and while the engine is running very fast with the throttle wide open, screw the milled nut clockwise until the engine shows definite signs of dropping in speed through getting insufficient petrol to ignite quickly.

Now proceed to tighten the bolt which clamps the lever on to the screw, and the car should then be taken on the road and the hand lever can be tied in various positions to test if the carburation can be made too weak by putting the lever in its extreme weak position, and if it cannot be made too weak to run at its fastest speed, then the high-speed jet can be reduced (say quarter of a turn at a time) until, upon testing, it is found that the hand regulator will effectively reduce the petrol to below the minimum for best running.

It will be noticed that this puts into the hands of the driver the power to have the correct mixture at high or low speeds, and if it is found that the engine fails to run economically or misses fire at high or low speeds, the jet can be separately regulated so as to correct any such fault.

THROTTLE VALVE

With reference to the throttle valve, this should be capable of being completely closed by the governor after the engine has been raced with the foot accelerator. If this is not the case, the control of the engine is apt to be faulty at slow speeds. Also, if the throttle valve gets worn and is so slack as to allow the engine to draw any gas when it should be shut, firing in the silencer may occur after running downhill or upon closing the throttle after a fast run.

CONSUMPTION.

On dry level roads a gallon of petrol should carry a car of average weight with an average load about 14 miles; if the consumption is much inferior to this, the following points should be looked to:- The carburettor may give too rich a mixture and the jets may be reduced by the hand lever; the timing of the ignition may be incorrect, or the car may have been driven with the ignition lever too much retarded; the automatic air valve or piston in the carburettor may not be working freely; the float or needle valve may not be working freely, causing "flooding,"; there may be a leak of air in one of the inlet pipes between the carburettor and cylinders, or there may be a leakage in the petrol system.

MISSING FIRE.

If this should occur and it is not traceable to any fault in the ignition, there may be other causes:-

If the mixture is not properly adjusted the engine may refuse to run on all cylinders. missing-fire may therefore occur through faulty adjustment of the carburettor or when the piston of the automatic air-valve has stuck.

Missing-fire may also occur owing to the sticking of exhaust valves. This can be temporarily corrected by removing the valve cap and turning the engine until the faulty valve is lifted from its seat, paraffin can then be squirted on to the valve stem and guide; the valve should be removed when convenient, and the stem thoroughly cleaned and polished, and replaced without lubrication.

If at any time it should be found that, when the car has run a short distance with the throttle wide open, "firing" takes place in the carburettor, and there are other signs of petrol "starvation," it would be as well to carefully clean out all the petrol pipes and connections, as these are liable to become coated as time goes on.

If the engine will not run well at slow speeds, look to the induction pipe. This should be sound, and there

Missing at Low Speeds. should be no external leak between the throttle and the cylinders. This is best tested by closing the throttle and blowing through the small cock on the induction pipe. It is disastrous to the slow running of the engine if any air is drawn into the cylinders otherwise than through the carburettor. The small cock should always be closed when running.

"Miss-fires," may be caused by faulty compression (see under "Compression").

PRESSURE FEED SYSTEM.

The Rolls-Royce pressure feed system is shown in Fig. 71. It includes :-

- (1) The usual hand pump (A).
- (2) A small pump (B) on the gear-box and silent relief valve (H).
- (3) A pressure gauge (H).

Cocks D and E are arranged so that in case of failure of (1) or (2) either of these means of obtaining pressure can be cut off, and these two taps provide an easy means of testing whether the failure is in either of these two systems.

In later types these cocks are combined in one fitting.

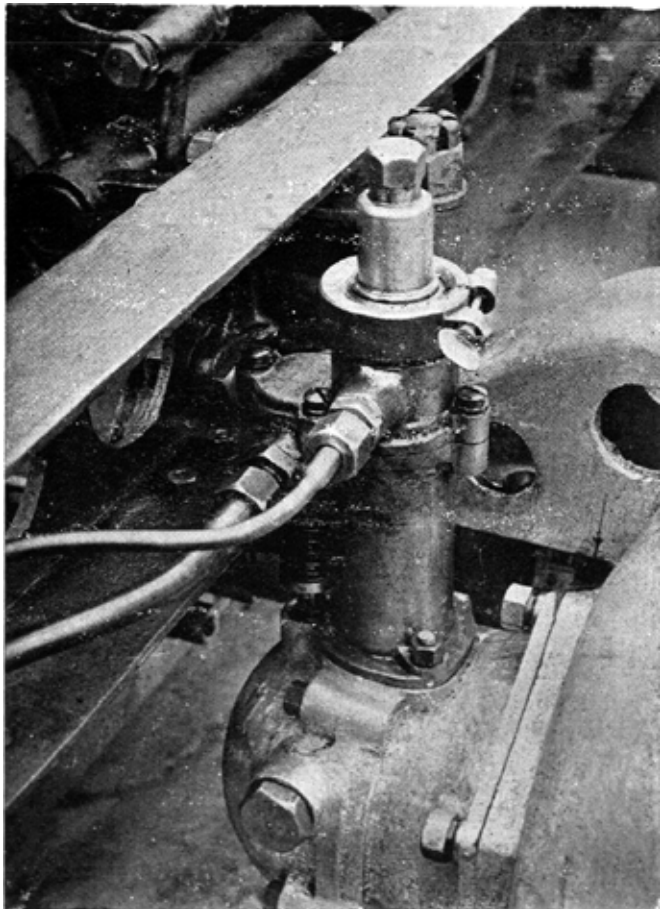


Fig. 71 AIR PUMP.

These cocks are on the nearside of the chassis, and under ordinary circumstances should be left in the "on" position.

The relief valve (H), which is set to blow off at 2lbs. per square inch has a small tap (L0 attached, by which the pressure in the tank can be released, so that no petrol flows to the carburettor.

The small power pump (B) on the gear-box has a mechanically fitted inlet with a stiff spring closing it, so that it may be certain in action and silent.

The delivery of this pump will be found exactly over the cylinder, and by unscrewing the split nut and removing the cap, it can be easily taken apart. After turning the engine or the clutch round until the small piston is in its lowest position, the bore of the cylinder and the valve and seating should be carefully cleaned with a piece of thin washed-out rag. The parts can be oiled with clean engine oil and replaced. The spring should press down with about a ¼ lb. pressure when the cap is in place, and the valve should be allowed about .004 in. lift. Any more than this will cause the valve to make a noise.

To adjust the lift of this valve, Remove the brass cap and slack back the lock-nut. The small stud (with milled end) should then be screwed lightly down on to the valve, and then screwed back about 1/10 of a turn, this will provide the requisite .0004 in. lift for the valve. If, in working, the valve makes a slight noise (like the trembler), the lift is too great; if the pressure does not rise, then the lift is insufficient. This adjustment requires to be made with great care.

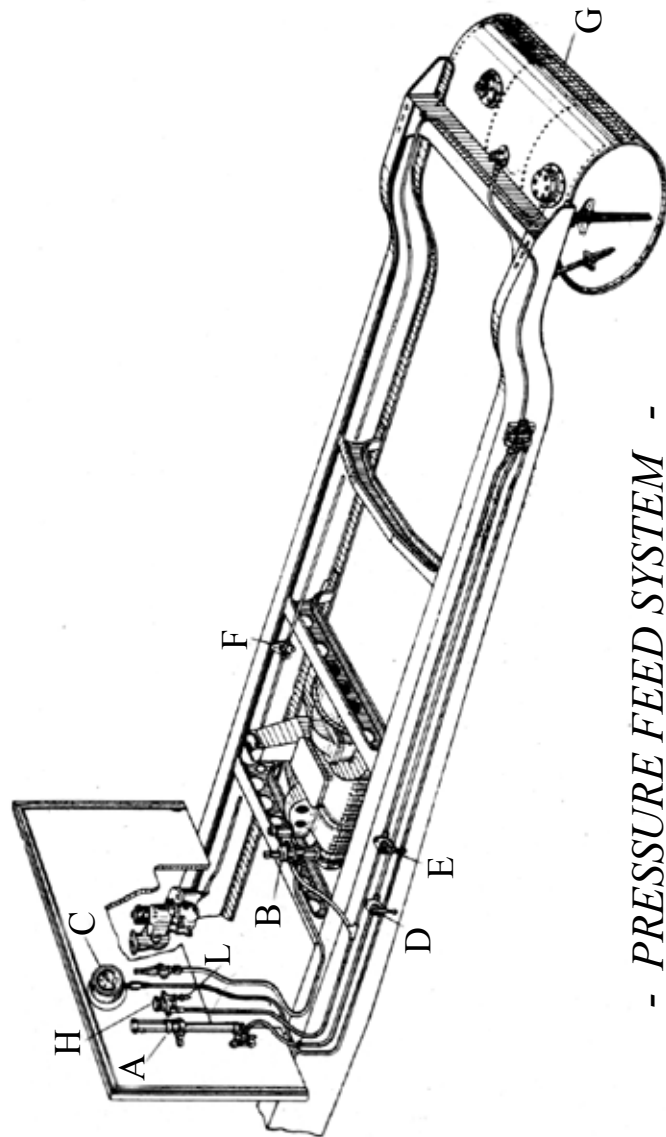
All valves and valve seats connected with this pressure system must be kept scrupulously clean, otherwise the pressure will not be maintained for any length of time after the pump stops.

The filling plug and filter is situated in the centre of the tank, and to re-fill the tank with petrol it is only necessary to remove the small plug

To get at the filter, which should be taken out and cleaned periodically, the six screws should be slackened one turn, when the whole cap can be unscrewed bodily by hand and the filter can be removed and cleaned.

When replacing this fitting, the six screws should be tightened a little at a time, each in turn to provide an even pressure all round the cap.

The supply pipe and filter is fitted into the tank in a similar manner, and to take it out of the tank for cleaning purposes the same operations should be followed, previously having disconnected the unions of the pipe at the top.



- PRESSURE FEED SYSTEM -

Fig. 71

PLAN OF PETROL SYSTEM ON R.R. CHASSIS

This fitting, as will be seen, consists of a long copper tube fixed into the cap, and having an extension which carries a gauze washer fitted at the lower end.

The gauze washer fitted in this extension should very seldom (if ever) require to be cleaned on the inside surface, but to do so in any case is quite an easy matter. A locking spring will be found in the recess of the extension, and by slipping this out of its place, the end can be screwed off by hand and the gauze cleaned.

NOTES.

Remove the tail lamp at night (unless electric) when filling petrol tank.

Should the pressure fail, proceed as follows :-

Raise pressure in petrol tank by a few strokes of hand pump, then turn off hand pump tap.

If pressure still falls, turn off power pump tap ; this cuts off the power pump relief valve and air filter.

If the trouble is not in any of these parts, try all the fittings of the petrol tank ; a few drops of oil round the screw heads will enable the leakage to be detected.

The only remaining joints are the union on the pressure gauge and those in the junction box fitted in the "near" side member close to the upward bend.

If the trouble is located in the power pump fittings, find out whether the mechanically operated valve drops on its seat or whether the stem is too long to allow this. There should be .010" to .015" clearance at the end of the stem when the pump piston is on its "up" stroke. If too long, the valve should be taken out and the necessary amount ground off the end.