

APPENDIX VI.

LUBRICATION OF ENGINE.

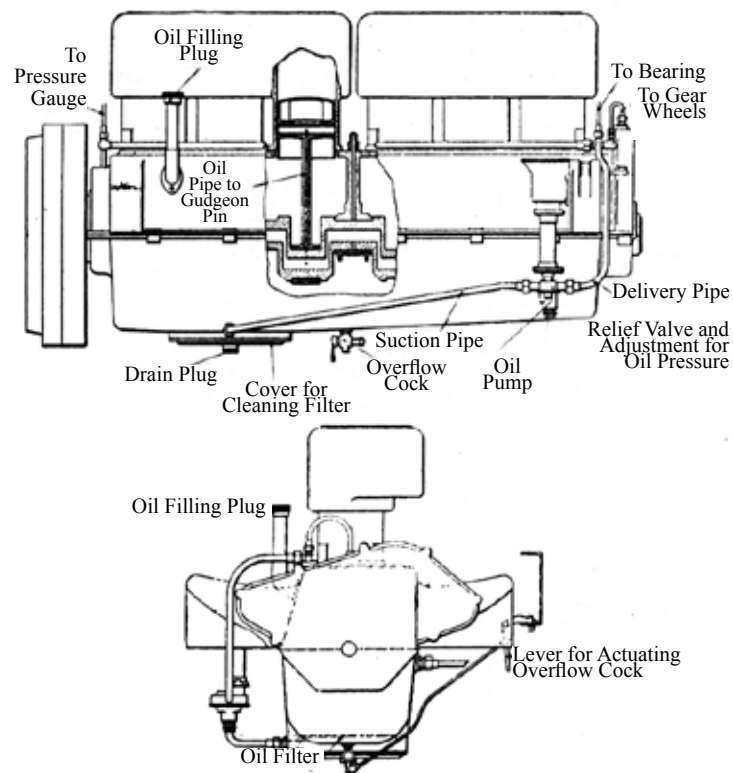


Fig. 58. LUBRICATION SYSTEM OF ROLLS-ROYCE ENGINE
(Extra Oiling System not Shown.)

LUBRICATION OF THE ENGINE.

The correct amount of oil to be contained by the oil-well of the engine is $\frac{3}{4}$ gal., and that contained in the supply tank is $1 \frac{1}{4}$ gals.

The engine should be oil-retaining *i.e.*, there should be practically no waste or leakage noticeable. Any serious leak of oil should be attended to.

Notwithstanding the correct quantity of oil having been put into the engine, the driver must always be certain that the oil is *circulating* properly, otherwise, (unlike "splash" lubrication) the oil in the well would be useless,



Fig. 59. THE ENGINE OIL PUMP.

for it would not reach the cranks. The proper circulation of the oil is denoted by the oil pressure gauge situated on the dashboard.

When the engine is running, this gauge should never indicate less than 3 lbs. or more than 20lbs per square inch.

The oil pump (Fig. 59.) is provided with an automatic "by-pass" or relief valve, which governs the maximum pressure at which the pump circulates the oil ; to alter this relief valve - and so adjust the pressure at which the oil should constantly circulate - there will be found a large

screw (A) just underneath the relief valve, checked by a lock-nut (B) ; this screw should be screwed up or down as the pressure is required to be increased or diminished ; when making this adjustment, have the engine running, and watch the gauge. A special spanner is provided for this adjustment.

Fig 60. shows the pump in pieces, relief valve C, valve seat B, valve spring K, fibre washer E, screwed collar F, square steel driving tube J, suction side S, delivery side D, body of pump A, adjusting screw G, and lock-nut H.

Fig. 61. shows how the pump should be fixed when in position ; D is the delivery side (front of engine) ; S the suction side leading to base chamber ; the arrow marks the direction of rotation.

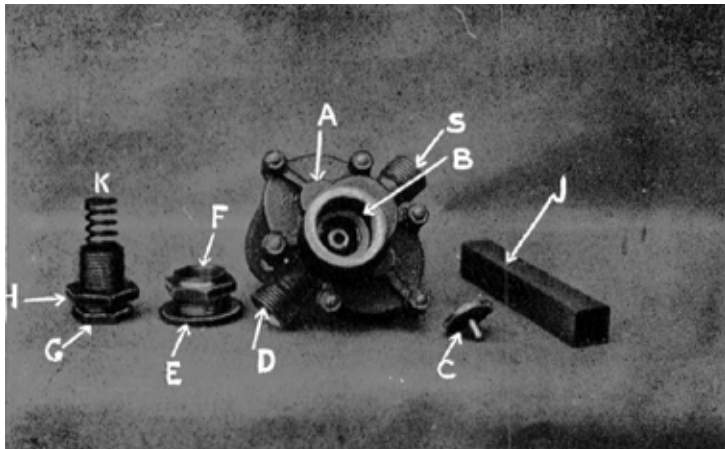


Fig. 60. ENGINE OIL PUMP DISMANTLED.

Do not cut the oil circulation pressure down low, but run with it as high as you can *without* causing smoke in the exhaust ; there *should be* a slight smoke visible in the exhaust when first starting up the engine from cold, but there is something wrong if the exhaust *continuously* emits blue smoke with the oil pressure set below 7 lbs.

If the gauge shows signs of dropping back, the oil feed is failing and should be at once attended to (try letting more oil into the engine) ; if the gauge drops to *zero*, the car must on no account be driven on (except in emergencies for a mile or two), otherwise the white metal bearings may be destroyed.

Do not touch the oil pressure regulator screw if it can possibly be avoided ; this is very carefully adjusted by the makers, and it is most improbable that this is the part causing trouble - make sure that all the other parts are right first..

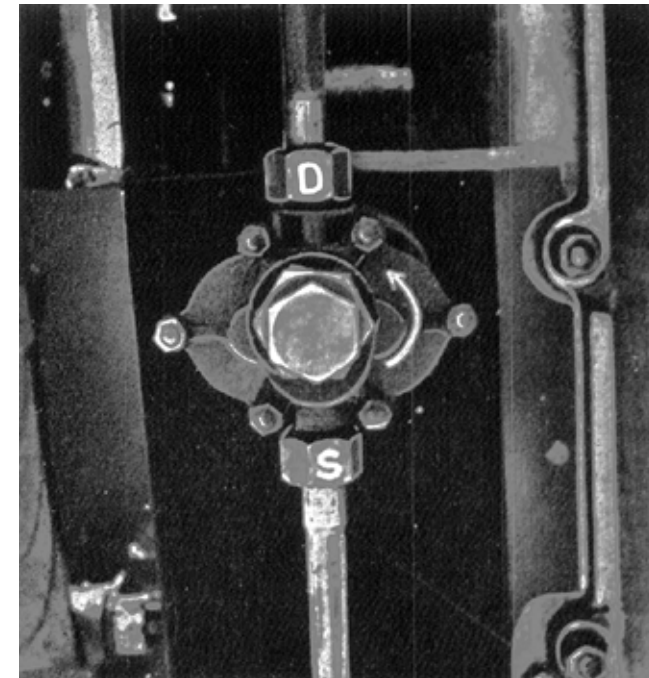


Fig. 61. INVERTED VIEW OIL PUMP IN POSITION, SHOWING DIRECTION OF OIL CIRCULATION.

In conjunction with the forced feed system just described there is fitted an extra oiling system by means of which an increased quantity of oil is delivered to the cylinders when the throttle is opened beyond a certain point. An oil valve and filter, fixed to the front face of the dashboard, is connected to the main oil supply from the pumps. When the accelerator pedal is depressed beyond a certain point, this valve is opened by a small lever interconnected with it, and the extra oil is distributed direct to the cylinder wall by small pipes.

The cleaning and adjustment of this mechanism is described in operation 19, Appendix II.

It is advisable, for much night work, to fit a small electric lamp over the pressure gauge.

The oil pressure registered on the gauge should be constant,

and should not vary more than 2 or 3 lbs. for *any* engine speed. (When the accelerator pedal is depressed sufficiently to operate the extra oil, the pressure gauge will drop a few pounds owing to the partial release of the pressure.)

Causes of Engine Lubrication Failure.

If the gauge begins to fluctuate considerably, or the oil pressure fails completely when the engine is running, the following are the probable causes :-

- (1) Insufficient oil in the well of the engine.
- (2) The filter or one of the oil pipes is choked up, (See operation 3., Appendix II.)
- (3) The relief valve on the oil pump is being held open by some foreign substance deposited on the face ; this valve can very easily be taken out and cleaned.
- (4) There is a leak somewhere in the oil system, probably in one of the pipes or unions. If the leak is on the "delivery" side of the pump,, it will reveal itself by a slight flow of oil ; but if it is on the "suction" side, the pump will be drawing in air, and the location of the leak will not be so easy ; the short suction pipe C (Fig. 35) between the oil-well and the pump might be taken off and blown through to see if it is split anywhere or if the soldering of the unions has been cracked.
- (5) The oil system wants "priming" owing to some part having been recently dismantled. (See operation 3, Appendix II)
- (6) The pressure gauge may be at fault. To test this, unscrew a union or priming plug, and estimate the pressure by laying finger gently over opening.
- (7) The pump is not working owing to some foreign substance getting into the wheels and jamming the pump ; this will cause the square driving piece to "open out" (so designed to avoid breaking the pump). but will be difficult to detect without taking off the pump or pump cover. The square driving piece is a piece of steel tube, and can be easily replaced.

Should the oil pressure vary considerably with the speed of the engine, thoil is probably too thin ; thin oil should be avoided.

If the pressure fails only when the accelerator pedal is pressed well down, then it is the extra oil system that is at fault, and this should be carefully inspected for leaks.

So long as *some* pressure is showing on the gauge occasionally, the journey may be continued (but at a slow speed) *if absolutely necessary*.

Should any pistons, piston pins, or connecting rods be taken apart at any time, care should be taken, when putting them together, to see that the oil-hole in the bronze bush of the small end of the connecting rod is on the *opposite* side to the hole in the piston pin, otherwise the oil will be forced straight through and will flood the cylinders (causing excessive smoking), even with the oil pressure set at its lowest level.