

The 8 h.p. Rover Engine

The engine is 85m/m. x 100m/m. bore and stroke. 1,130 c.c., two cylinders. The rating is 8.96-h.p., and the tax £9 per annum.

The nuts 28 on holding down studs should be inspected occasionally to see that they are tight. The valve tappet is shown, and this may be adjusted in relation to the end of the valve by means of adjusting nut 23 after slackening locking nut 24. Do not forget to tighten up locking nut 24 after any adjustment, and it is extremely important, if it is desired to escape valve troubles, that the clearance between the tappets and the end of the valve stems should be set to the gauge provided in the tool kit, and this measurement to be when the engine and valves are cold. These clearances should be frequently checked over with the gauge supplied.

In order to remove the gudgeon pin it is only necessary to slack back the bolt at the top end of the connecting rod with the special spanner supplied. It should not be completely removed, and is in fact prevented by means of a split pin from falling out should it ever become slack. The gudgeon pin may be then pushed through with the fingers. Great care should be taken in replacing this to get it dead central. There are brass pieces at each end to prevent it scoring the cylinder should it become loose. This bolt locking the gudgeon pin should be tightened up as tightly as possible every time the cylinder has been taken down, care being taken not to twist the connecting rod in tightening the bolt.

LUBRICATION.

Use Rover No. 8 oil, and do not fill tank above bottom of neck 29.

The oil circulation is maintained by a gear pump, driven by worm gear from the intermediate timing wheel. It is very important that the lubricating system is kept working correctly, otherwise serious damage may be caused to engine.

Oil is drawn by pump from the oil tank 31 and delivered by pipe 32 through the crankcase at the top directly over the centre web of the crankshaft (and also by a branch pipe 33 to the side of the timing case).

The oil is thus picked up at the top of the crankcase and thrown to No. 2 (or near-side) cylinder by reason of the rotation of the crankshaft. Surplus oil collects in the sump, the level of which just allows the dipper on No. 1 connecting rod to pick up oil and lubricate No. 1 cylinder. By this means both cylinders receive an equal amount of oil.

The level of the oil in crank case is kept constant by means of the pipe shown at 3.

Any excess of oil collected in crank case overflows through strainer back into oil tank, where it is cooled for further use.

This illustration of the 8-h.p. Rover engine shows the stiff crankshaft carried on a single-row ball bearing in front and two ball bearings at back. It will be noticed that the large ends of the connecting rods

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(continued)

are fitted with roller bearings. The camshaft driving the magneto through the adjustable coupling 11, 12, 13, is clearly drawn, as also the oil level in the engine draining through the filter back into the tank, which may be drained and cleaned through nut 9 at the bottom.

The accessibility of the oil pump is clearly illustrated. It is never necessary to take off the pump unless the oil tank is being removed for cleaning by undoing nut 7 and two bolts 30 shown in front view of engine.

It will be noticed that the engine is set in the frame at an angle in order to keep the whole of the transmission to the back axle as nearly as possible in line when in use so that very little work is thrown on to the universal joints.

When grinding in a valve, use very fine emery powder and oil; turn the valve backwards and forwards with a screwdriver, and lift it occasionally to let in fresh grinding paste and to change the position of the valve on the seating. After grinding in thoroughly clean the parts with paraffin. The cylinder heads should be first removed for this operation.

The cylinder heads will require removing about every 1,500 miles for the purpose of de-carbonising. When re-lacing be careful that all faces are clean and that even pressure is given by each holding down bolt by tightening down each in turn gradually, one after another. After bolting down the cylinder head, run the engine slowly for a few minutes, and then give each nut a final turn. After doing this it is exceedingly important to see that the clearance between the valves and the valve tappets is correct.

Oil leaks from the end of the camshaft may be cured by screwing up gland nut 6.

TO CLEAN OILING SYSTEM.

Every 1,500 miles.—Take out plug 9 at bottom of oil tank (shown in diagram) and drain all oil out. Replace plug, put half-pint paraffin in tank, rock car from side to side, redrain, replace plug tightly, refill tank with Rover No. 8 Oil.

Every 4,000 miles.—Take plug 8 out of engine, and allow old oil to drain out. Replace plug and put in 1-pint paraffin. Rock car from side to side and turn engine round a few times: remove plug again, allow paraffin to drain out, replace plug, and be sure it is tight.

Remove oil tank complete by nuts 7 and 30.

Unscrew cap of pump and take out gear wheels. Take care not to lose any of these pieces, and replace in same order after clearing tank and strainer as described below. Make sure that oil joints at bottom of pump are tight before replacing tank.

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(continued).

Clean oil strainer thoroughly in petrol, and do not wipe with cloth. Wash inside of tank with paraffin.

After re-assembling pump into tank re-fit tank to engine case, care being taken to get driving tongue 4 into slot in top of pump spindle before tightening up nuts 7 and 30. A tight joint must be made between oil tank and engine case. If brown paper joint is torn, another should be cut and steeped in oil before fitting.

When re-oiling engine after cleaning oiling system as described, put $\frac{1}{2}$ -pint oil through timing gear case cover 10 as well as filling tank in the usual way.

Instructions for timing magneto will be found on page 18.

The 8 h.p. Rover Clutch

The illustration shows the Rover single plate disc clutch and the gear box with three speeds and reverse.

Between the flywheel and clutch plate is the single ferodo-faced driven plate, which is gripped between the two former by means of the four springs, with adjusting nuts, two of which are shown. No lubrication is needed, the clutch being designed to run dry. If it is desired at any time to make any adjustment care should be taken to adjust each nut equally.

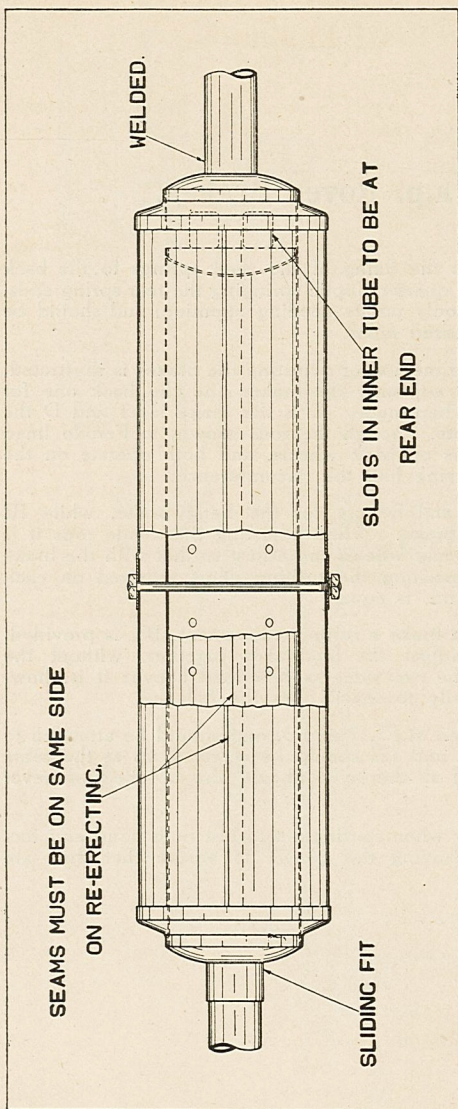
The ball race in the clutch trunnion, which takes the load when the clutch is withdrawn, is lubricated by means of a greaser which will be found on the off-side of the clutch cover. This ball race should be frequently greased.

THE GEARBOX AND PROPELLOR SHAFT.

The various gears are clearly marked in our illustration. The gear box should be filled only to bottom of lay shaft with Rover No. 10 oil about every 2,000 miles, unless any leakage is occurring, in which case more frequent attention is needed. Filling is done by means of the cover screwed on the gear box lid with small screws.

17 and 19 are the two arms of the front universal joint on the propellor shaft, and are connected together by the flexible Hardy joint 18. This construction obviates any necessity for lubrication at this point. 20 is the propellor shaft running to the back axle. There is a sliding universal joint at its bottom end, where it joins the back axle, and this is fitted with a plug, which should be removed every 1,000 miles and filled with good grease (see oiling diagram). This joint is protected by a leather cover. If the leather cover comes loose it must be immediately attended to, or undue wear of the universal joint will ensue.

It is advisable to oil occasionally the pins on which the clutch springs are mounted in order to ensure a smooth-acting clutch.



The 8 h.p. Rover Silencer.

This is now being made in two halves, and may be dissembled quite easily if necessary. It will now be seen that there is a bolt running through the centre of the silencer, and after removing this the two halves can be drawn apart. In re-assembling it is important to note that the longitudinal seams in the outside body and the internal tube must be on the same side, in order that the bolt will pass through easily.

It should not be necessary to examine the interior under a distance of 10,000 miles, unless the engine is being continually over-oiled.

To Start Engine

Before attempting to start engine be sure that change speed lever is in neutral position by moving the lever freely crossways through the gate.

Fill the dash-tank with petrol. This holds five gallons. A mixture of half petrol and half benzol may be used if desired.

In removing bonnet sides take hold of the top of the air scoop at the point where it joins the bonnet side proper.

To start the engine, retard the ignition lever (right hand) about half-way along the quadrant, open the throttle about four notches by pushing forward the left hand lever. The ignition is advanced by drawing it backwards, towards the driver, and the throttle is opened by pushing it forwards, away from the driver.

At the front of the car a small knob will be seen protruding through the radiator; pull this out to its limit, and then pull the engine over compression very slowly a few times before switching on. The number of times necessary to pull over before switching on varies according to temperature of the atmosphere and the engine, also with the fuel used, and the condition of the engine; probably twice is enough in summer weather. *This should never be done if the engine is hot from having been only recently stopped.*

Allowing the knob to return, switch on, and the starting handle should now be pulled upwards smartly with a movement which disengages the handle when at the top of the stroke. The engine should then start, and in cold weather may be run a moment or two with the knob held in its outward position until the inlet pipe is warm enough to prevent "popping back" in the carburettor.

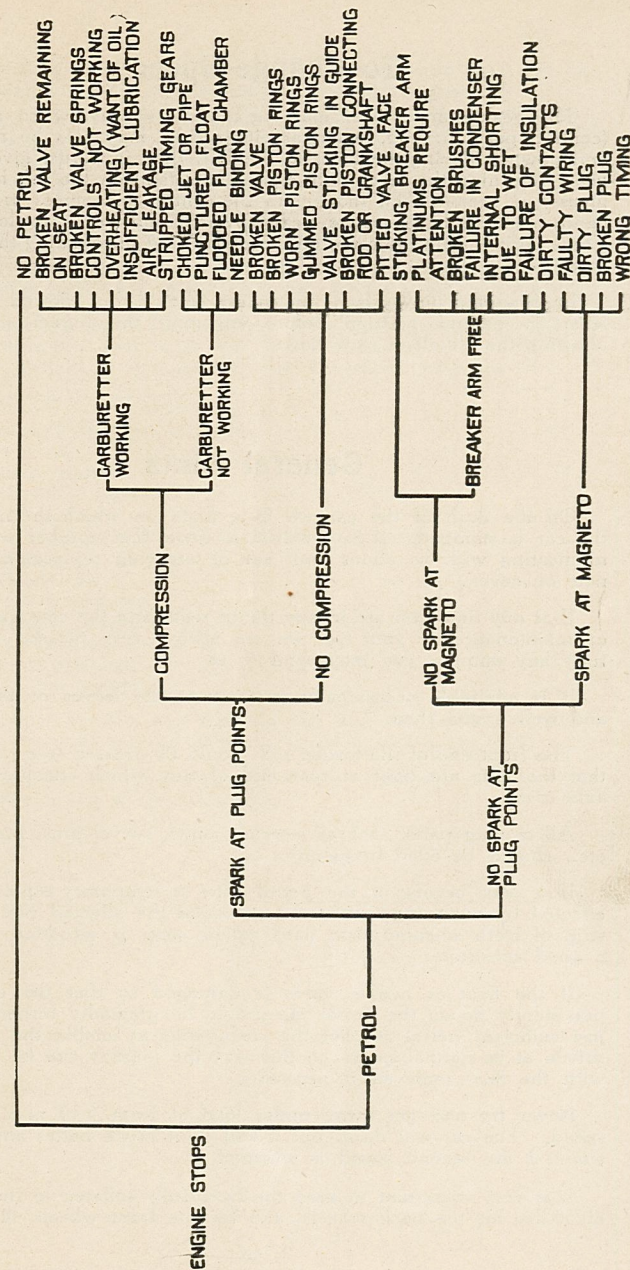
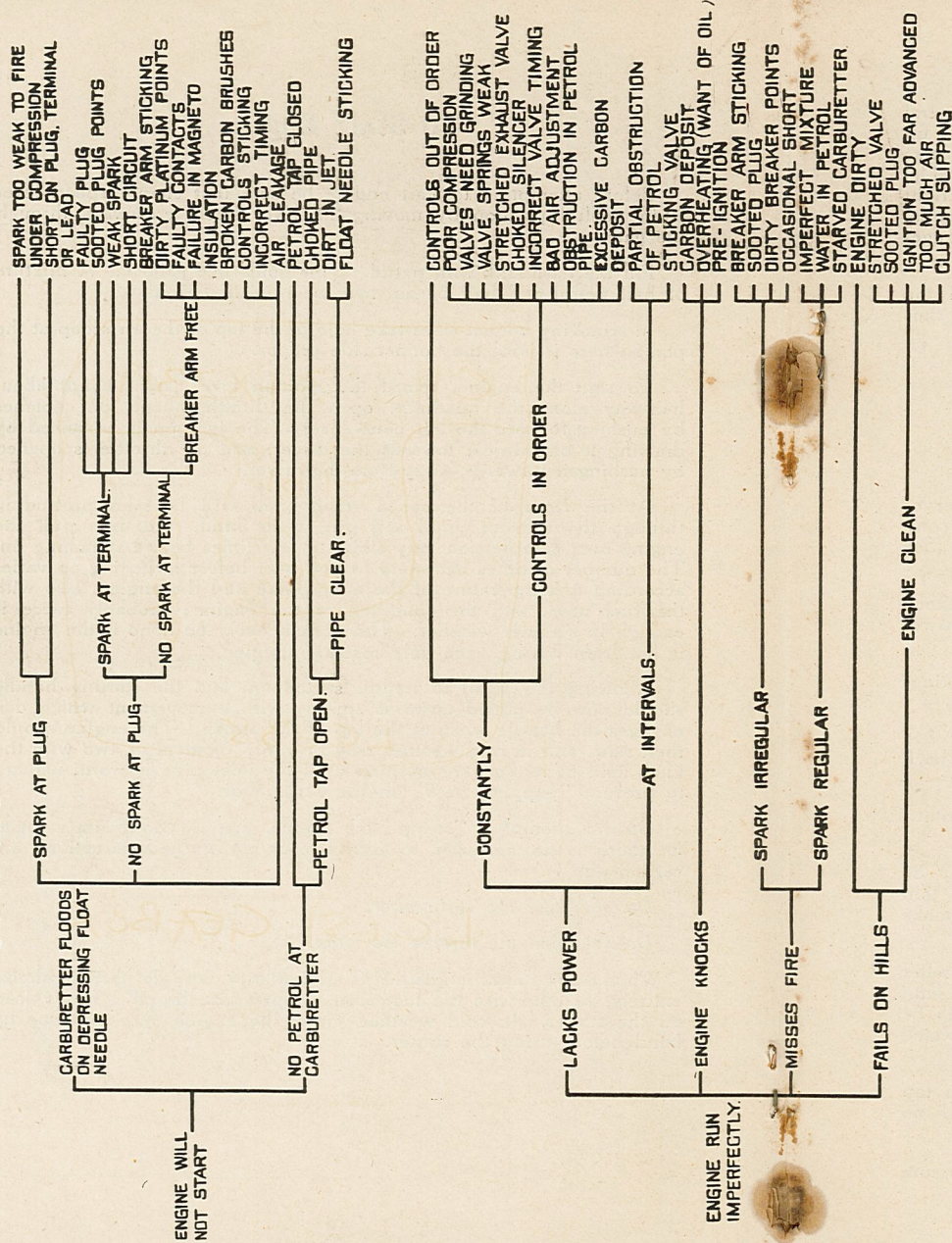
Do not attempt to "swing" the engine, that is, continuously rotate it; there is no necessity to risk a back-fire if the instructions are carried out.

Do not flood the carburettor.

Do not open the throttle too wide.

When a self-starter is fitted, it is advisable to close the throttle almost entirely, as otherwise the increased compression throws a heavy load on the starter. In cold weather, crank the engine once or twice by hand before using the starter.

FAULT FINDING TABLE



If the Clutch either sticks or slips it is generally due to excess of oil. Flush out with Petrol.

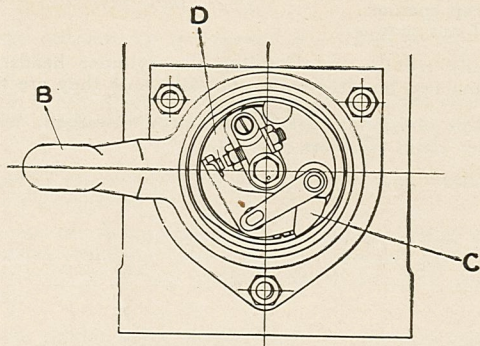
Instructions for Timing Magneto

The car when sent out is correctly timed to suit average conditions, but in case an alteration is required, small variations can be obtained by adjusting the relative positions of the steel flanges on the magneto and camshaft, between which is interposed a fibre disc 13 (see engine drawing). By slacking the nut 11 it will be found that the pin may be slid sideways in a slot in the flange 12. This can be adjusted to suit any special requirements.

If the magneto is removed for any reason, it is important to keep the fibre coupling piece in position on either of the steel flanges. This is important, as if the fibre coupling for any reason is turned the opposite way round, then, when re-assembling, the cylinders will be firing in the wrong order and at the wrong time.

Should it be necessary to re-time the engine, it will be found that a mark "SFA" is placed on the flywheel which, when set to the top centre line of the crankcase, will automatically give the correct firing position for whichever cylinder has both valves closed. The piston of this cylinder is reaching the firing point, and by removing the carbon brush holder on that side of the magneto the brass segment of the slip ring should be visible. If it is not so, it can be corrected by turning round the fibre disc 13 and rotating the armature of the magneto through half a turn.

With the flywheel in this position the contact-breaker points should just be breaking with the lever B in the fully advanced position, i.e., as shown in the diagram. If this setting cannot be obtained by adjusting



the flanges, as already explained, it will be necessary to remove the flange 12 from the magneto and turn it upon the taper shaft until the correct position is found. The easiest way to do this is to remove the magneto, loosen the flange on shaft (this is generally most easily done, after loosening the nut, by driving two screwdrivers, one each side of the boss, between it and the body of the magneto), replacing the magneto in position, setting the flywheel to the mark as stated above, and then turning the contact breaker of the magneto in the normal direction of rotation (i.e., clockwise) until the points are just breaking. Carefully remove the magneto with its flange, seeing that the position

of the contact breaker does not slip while doing so, and tighten up the nut on the end of the shaft. Then re-assemble and check the position of firing by turning the engine over slowly until the points are just breaking. The mark on flywheel should be at top centre line of the crankcase. It is at this point that it is generally found necessary to make adjustments by means of the nut 11, in order to correct any slight error.

In fixing the magneto to the base, it is very necessary to see that the two flanges and the fibre disc are all running concentrically. Unless this is done the magneto shaft will not be in a straight line with the camshaft, and the result will be uneven firing on the two cylinders. This hint should be specially noticed in carrying out the timing operation described above. Do not forget that the timing lever on the magneto must be moved, and held, as far downwards as possible during the whole of this operation, otherwise the final result will give a spark which is too far advanced.

LUBRICATION.

The ball bearings require only the least possible amount of oil. A few drops at each of the provided places, once or twice a month when in regular use, is all that is required.

ADJUSTMENTS.

The only adjustments necessary are at the platinum points of the contact breaker. The proper distance of the gap is 0.5 millimetres, or roughly $\frac{1}{32}$ -in. full. Too great a gap will advance the timing. 15THOU

The whole contact breaker can easily be removed, if necessary, but, owing to the arrangement of the contact breaker, the adjustment can usually be effected in position. A special small spanner is provided with each machine, and the gauge on this is the correct distance for the break of the points.

These points only need adjustment at very long intervals, and we warn users against unnecessarily interfering with the setting. *Points must only be dressed with a dead-smooth file, and the least possible taken off.*

Before interfering with the magneto, verify that the sparking plug, the cable and the connections are correct.

If these are in order, turn the engine slowly by hand and watch if the contact breaker lever works properly. This is bedded in a fibre bush, and in moist weather there is an occasional danger of the material swelling. If this happens ease it out very slightly. This is the most common fault with all magnetos, and should be watched.

Do not take the magneto to pieces needlessly. It is easily possible to damage it. It is always advisable to return it to the works if for any reason it is to be overhauled.

MOST IMPORTANT.

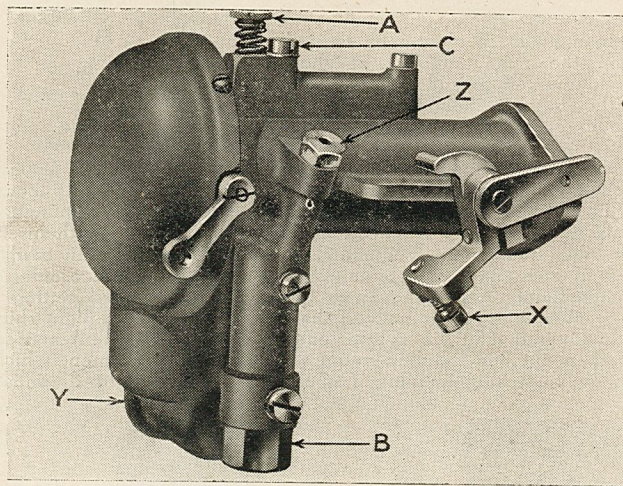
If it is necessary to take out the armature, first see that the carbon collectors and safety gap screw are removed, or the collector ring will be broken during the removal.

Keep all parts clean and free from oil, particularly the contact breaker. Oil or dirt between the points will give instant trouble.

The 8 h.p. Rover Carburetter (Smith's)

The carburetter is a Smith's single-jet; a type of carburetter known as the "straight-through" or fixed choke pattern. There is nothing to get out of order, and we would strongly advise owners not to interfere with the carburetter in any way; the only thing necessary is to keep it clean internally.

As sent out from our works, the jet fitted is size 135 and the choke tube size 19. This combination we have found to give best all-round results on petrol. In addition, the slow running jet supplied as standard is size 35, and the air plug "Z" .062.



Great care should always be taken when replenishing the fuel tank, either with petrol or benzole, to see that a funnel with a fine gauze is used to prevent water and dirt entering the tank and so on to the carburetter. It is a fact that however careful one may be some water or fine particles of dirt are bound to get through, and it is advisable to remove the small plug "Y" at entry to float chamber, say once a month, and clean filter.

It may be found advisable to fit a smaller jet, say 125, if a big percentage of benzole is used, or if the car is used at high altitudes.

To obtain the best slow running or "Ticking Over" when the engine is running idle, the adjusting screw on the throttle control lever "X" should be set so that the engine will run as slowly as possible without fear of stopping, and after locking this screw securely by

means of the small lock nut, the best mixture to enable the engine to run evenly can be obtained by turning the slow running adjusting screw "A" either up or down according to whether a weaker or richer mixture is desired. It will be noted that a very small movement of this screw makes a big difference, usually one quarter turn either way is all that is necessary.

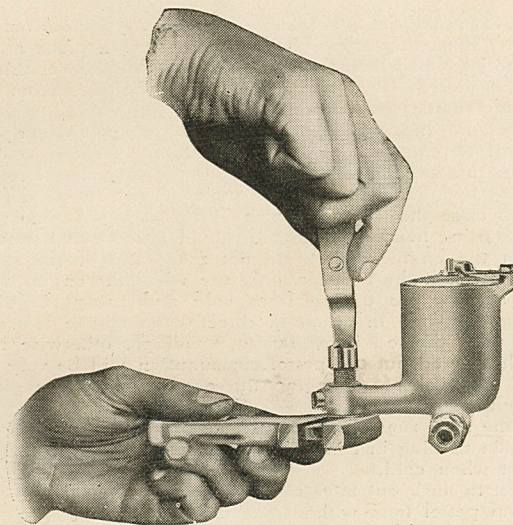


Fig. 2.—Removing the Jet.

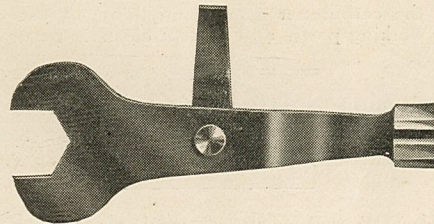


Fig. 3.

To remove the main jet, should dirt have caused a stoppage, unscrew plug "B." The jet will come away with this plug, and can be detached therefrom in the manner shown in Fig. 2, using the special screwdriver supplied (Fig. 3). This screwdriver is also made to fit the slot in the diffuser, which lies immediately above the jet when the latter is in its normal position, being reached by thrusting the blade of the screwdriver upwards through the orifice from which the plug "B" has been removed. It is very important that no other small screwdriver is used to detach the diffuser, as it is almost certain to be damaged by a pointed tool.

When the diffuser is withdrawn, it will be seen that the slow-running tube has come away with it; it is unnecessary to remove this tube from the diffuser for cleaning purposes, as an inspection will quickly reveal the presence of dirt. Should any be present, wash the slow-running tube with petrol and blow through the small holes in the centre of the diffuser; on no account must any instrument be used which might enlarge the holes, as they are of a certain fixed size and must not be altered.

The slow-running jet is accessible for cleaning without removing the main jet by detaching screw "C" and inserting a piece of fine wire through the jet, which is immediately below. The size of this jet, also, must not be altered. It is advisable to verify the cleanliness of this jet if the engine should refuse to "tick over."

After a long run, when the engine has got particularly hot and then a short stop made, it is sometimes found difficult to restart the engine. In this event the engine should be switched OFF and the throttle fully opened, then turn the engine round slowly a few times, after which close the throttle, switch "ON," and with one smart pull up of the starting handle the engine should immediately start. In this case, when the engine is hot, do not make use of the small knob protruding through the radiator, only use when the engine is cold.

When starting the engine from cold and using the air shutter (by pulling out knob in radiator), directly the engine is warm make certain to push the rod in as far as it will go, otherwise if the car is run with the rod out the petrol consumption will be very excessive and there is a risk of damaging the engine by getting pure petrol into the cylinders.

Don't set the slow running mixture too *weak* when the engine is hot.

You gain nothing in consumption, and the engine will be difficult to start when cold.

Don't forget to flush out filter once a week.

Don't fill up petrol tank without an efficient funnel.

Don't reamer out or hammer up the jets.

Don't forget to write us for any information you may require.

Don't suspect the carburetter directly anything appears to be wrong; it has no working parts, and if kept clean is never likely to give any trouble.

In purchasing Spare inner tubes, note that they should be obtained with *short* valves, specially intended for disc wheels.

If you have the slightest trouble with any detail of your car please communicate with us at once; we are only too pleased to help.

VERY IMPORTANT.

Please quote Car No. when ordering Parts or asking for any information. This will save time and ensure accuracy.