The B.S.A SCOUT 10 h.p.

(Series VI)

Instruction Book

TAIL LITE.
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TAIL LITE

B.S.A. CYCLES LTD.

Important.

In order that you may obtain the utmost satisfaction from your car, we recommend you to give periodic attention to the following points:

A lubrication chart will be found on pages 32 and 33, and a study of this will enable you to give adequate attention to all the lubrication requirements.

For obvious reasons it is advisable to check the quantity of petrol in the tank; the radiator, also, should be inspected daily, and special precautions taken in frosty weather (see page 21).

Check the tyre pressures weekly; a study of the notes (page 54) will help you to understand the need for this. At the same time see that the wheel nuts are tight (page 21).

Give the battery regular attention (page 46); the little trouble will be amply repaid.

It is most important that the car receives careful treatment during the early part of its life, as its subsequent performance and condition depend on this; see the instructions in "Running in" (page 2).

A study of the following pages will enable you to gain a thorough knowledge of your car and its maintenance, and a little attention on the lines indicated will obviate most of the irregularities from which any car may suffer.

The B.S.A. SCOUT

Before taking the car on the road for the first time, make sure that the engine, gearbox, clutch chamber, and differential case are supplied with the correct amount of oil. Full instructions on this point will be found on pages 13 to 18, under the heading of "Lubrication." Also see that the battery contains the correct quantity of acid and is properly charged (see page 46), and that the tyres are pumped up to the correct pressure (see page 54). The battery is mounted on the scuttle, and access to it is gained by lifting the bonnet. The petrol tank on the two-seater holds 11 gallons, and the saloon and four-seater petrol tank capacity is 6½ gallons. A good brand No: 1 petrol, benzol mixture or Ethyl petrol should be used.

STARTING UP.

These matters having received attention the car is ready for the road. First, see that the gear lever is in the neutral position. The engine is fitted with automatic ignition advance.

Now switch on the ignition by pressing in the key placed in the centre of the lighting switch on the instrument panel and turning it clockwise. Immediately this is done a red light will appear on the dial containing the grouped instruments. This serves as an indication that the ignition is switched on. When the engine is started the light goes out and it reappears if the engine stops while the ignition is still switched on. Further notes on this appear under the heading "Electrical Equipment" (see page 43). It should be borne in mind, however, that whenever the engine is stationary the ignition should always be switched off and that the red light serves as a reminder of this fact. Otherwise the battery will be discharged.

If the car has not been used for some days, it may be advisable to prime the carburetter. This is done by rocking the priming lever on the petrol pump backwards and forwards a few times until no definite resistance to motion can be felt (see page 25).

If the engine is cold pull out the starter carburetter knob on the facia board (marked "Pull Rich") as far as it will go and press the starter switch, also on the facia board, firmly and decisively. The engine should start immediately, and the self-starter control should then be released promptly, since the starter must not be left in action while the engine is running, or damage may be done. Then push in the starter carburetter knob, but if the engine spits back, pull it out again for a few moments until the engine runs steadily. This control may also be used in the intermediate position (see page 31).

When starting the engine do not depress the accelerator pedal while this knob is out. If the engine is warm it will not be necessary to use this knob at all.

Thus the operations for starting may be summarised as follows:—

1. See that the gear lever is in neutral position.
2. Switch on.
3. Pull back starter carburetter knob (if engine is cold).
4. Operate self-starter control firmly.

If at any time the self-starter should be out of action, the engine may be started with ease by means of the starting handle which is provided in the tool kit. To start the engine, the starting handle should be engaged so that the handle is at the bottom. This handle turns clockwise in the ordinary way. If the handle is then grasped by the right hand **(with the thumb on the same side of the handle as the fingers in order to avoid possible injury in the event of a backfire)** and given a sharp pull up, the engine will start, although if the engine is cold one or two pulls may be required. **Never attempt to start by pushing the handle down, as in the unlikely event of a backfire there is danger of a damaged wrist. It is important to remember that the engine should not be left running for more than a short space of time when the car is in a closed building, as the exhaust gases are highly dangerous in a confined space.**

RUNNING IN.

The ultimate condition of the engine, in respect of both power and mechanical silence, depends very largely upon the treatment it has received during the running in stage.

It is most important that the engine should not be harshly treated and it is strongly recommended that 35 m.p.h. in top gear should not be exceeded for at least 500 miles and preferably 1,000 miles. The maximum speeds on the other gears should be proportionately lower. The use of an upper-cylinder lubricant is also advisable particularly during this period.

Recommended lubricants will be found on pages 32 and 33.

THE CAR ON THE ROAD.

The disposition of the controls is as follows:—

The gearchange lever is in the centre of the car, just below the facia board, and the hand brake is adjacent to it (pulling the lever towards the driver puts the brake on). The pedals are arranged in the conventional manner, on the left the clutch, and on the right the accelerator pedal, the brake pedal coming conveniently between them.

The gear positions are shewn on the small plate on the centre of the facia board, and the gears themselves are selected thus:—For first gear, the lever should be held over to the left-hand side and pulled out from the neutral position; to obtain second gear push the lever in until it meets a stop (neutral position), twist to the right and push in again as far as possible; for top gear, pull the lever straight out as far as possible and note that in so doing,

neutral gear has been passed through since, of course, it lies midway between second and top gears. To select reverse gear from the neutral position, hold the lever over towards the left-hand side and push in, at the same time depressing the small trigger on the gear change lever to the left with the thumb. This trigger is a safety device to prevent accidental engagement of reverse gear.

Start the car on first speed, unless the road is downhill, and the engine is speeded up by means of the accelerator pedal. Never forget to put the hand brake lever in the "off" position before endeavouring to start. Do not race the engine and let the clutch in suddenly. Rather accelerate the engine gently at the same time that the clutch pedal is gradually released, since this method will give a much more smooth and certain start, and will save the tyres from the sudden and destructive jerk produced when the clutch is let in suddenly.

When changing gear up, that is from first to second, or from second to top, always depress the clutch pedal fully, and move the gear lever from one position to the other comparatively slowly, releasing the accelerator pedal meantime. A silent gearchange cannot be made if the clutch is not sufficiently withdrawn, or if the movement of the gearchange lever is unduly hurried. When changing down, however, from top to second or from second to first, it is advisable to use the "double declutch" method. The sequence of operations for the "double declutch" method is as follows:—Declutch and move gear lever quickly into neutral position. Allow clutch to engage again momentarily, slightly depressing the accelerator pedal at the same time. Declutch quickly and move gear lever into required lower gear position, and then allow clutch to engage again. The whole operation, while rather complicated to describe, is extremely simple to perform, and after a few practice attempts the driver will find himself able to make a perfectly soundless change down at any speed.

GENERAL NOTES ON DRIVING.

While the actual control of a car is a comparatively simple matter, and the ability to drive in safety and comfort is readily developed, the new owner should not be content to leave matters at this stage. In his own interests, for the benefit of other road users, and for the sake of his car he should not be satisfied until he has completely mastered these details of driving which distinguish the accomplished motorist.

For example, when approaching a cross-roads or a side turning do not drive up at full speed and apply the brakes at the last moment. Such methods only serve to cause undue tyre and brake wear. Do not guide the car to the edge of the pavement by running the front wheel against the kerbstones; this will only wear your tyre away.

Use the brakes as little as possible in ordinary driving, allowing the car to slow down naturally as far as possible, by merely releasing the accelerator pedal. Excessive use of the brakes not only increases tyre wear, but also petrol consumption.

When slowing up for a complete stop, as when a call is to be made, take the foot off the accelerator pedal, declutch, move gear lever into neutral, and let clutch in again. Bring the car to a standstill by means of the foot brake, and then apply the hand brake, which should always be left on when the car is standing, to remove any possibility of the car running away on a gradient.

If when climbing a steep hill the car slows down and the engine begins to labour, and the speed falls below 20 miles an hour and is still falling, change to second gear, changing up to top gear again as soon as the gradient eases off sufficiently. Similarly, if second gear seems too high on a very steep hill, change into first gear. Do not wait till the car is nearly at a standstill before changing into a lower gear. **The gearbox is on the car for use and an early gear-change means a faster climb with less strain on the car.** The ignition is automatically advanced and retarded in accordance with the engine speed.

Always drive carefully on wet roads to avoid skids. The most common cause of skids is sudden application of the brakes, so always be careful to apply the brakes gently if the road is greasy, and similarly do not depress the accelerator suddenly, or let the clutch in with a jerk. If these precautions are observed and corners are taken at a reasonable speed, there is little fear of the car skidding. (See notes on brake adjustment on page 18.)

If the self-starter and lights are being used at all frequently, keep the lighting set switch in the "high" charging position during all daylight running, since it is important that the battery be kept properly charged. If the car is left standing with the lights on, switch on the side or parking lamps only, both to economise current and to prevent drivers of other vehicles being dazzled by the lights of your stationary car. Further instructions in connection with the electrical installation will be found on page 43.

ENGINE PERFORMANCE.

Provided that the engine receives its proper supply of oil and the tappets are kept in correct adjustment, it should run for many thousands of miles without attention.

The new owner soon becomes familiar with the performance of his car, and is able to detect even slight variations in power, especially if he covers the same route regularly. Any obvious falling off in power, such as the need for a change to a lower gear on a hill which is usually surmounted in top, or poor acceleration, should be investigated at once. It should be borne in mind, however, that engine power is affected by atmospheric conditions—the higher the barometer the higher the engine power—and the owner should therefore resist the temptation to tamper with his engine every time he feels that it is hardly up to average. He should rather be guided by obvious symptoms as described above, or by a tendency for the engine to knock or pink when labouring, before deciding that an overhaul has become necessary. Knocking—sometimes called detonation—and pinking are characteristic and unmistakable sounds emitted by an engine which may indicate that a very

inferior fuel is being used, but more usually that the engine requires to be decarbonized. (See paragraph on "Engine Overhaul" page 6).

The need for tappet adjustment becomes apparent chiefly by the clicking noise which develops in the case of excessive clearance. There may also be a slight reduction in power, and in extreme cases the exhaust note may alter in tone.

Insufficient tappet clearance will cause the valves to be burned, and the power will be seriously affected; overheating and even boiling of the cooling water may also be due to this defect. Another

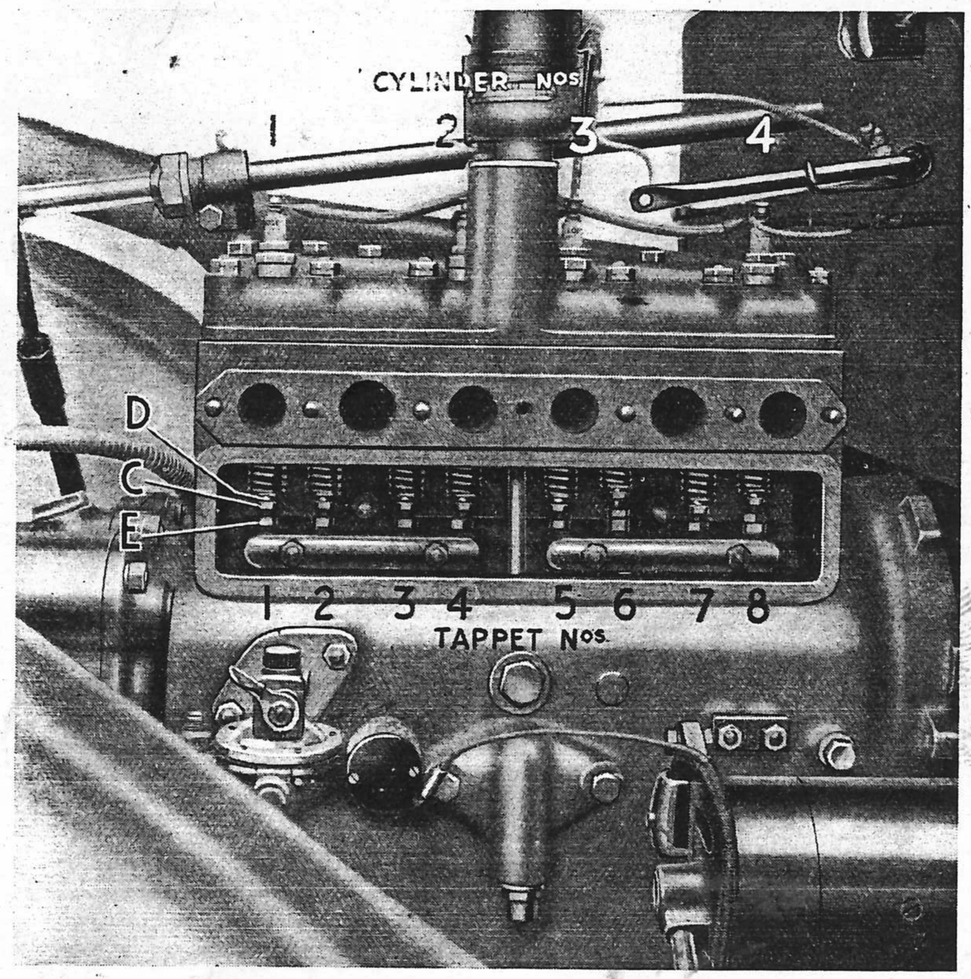


Fig. 1.

indication of insufficient tappet clearance may be lack of compression when a test is made with the starting handle, but this may also be due to defective piston rings.

If the engine has been adequately supplied with oil—i.e., if the sump oil level has been maintained—and the car has been carefully treated during the running in period, the piston rings should give no trouble whatever, but if the symptoms described in the following paragraph should develop and an examination shows that the tappet clearances and the valves are in order it will be almost certain that the pistons or rings require attention.

Such defects as difficult starting and irregular running are dealt with later in the sections relating to carburetter and ignition.

Adjusting Tappets.

These should be checked regularly—about once a month—whether the symptoms described above develop or not, and when the engine is cold.

Unscrew the two knurled nuts *A* (Fig. 2, page 7) on the near side of the engine and remove the cover plate *B*. The tappet-heads will then be exposed. To check the clearances insert the starting handle at the front of the engine and, **with the ignition switched off,** turn the engine until **No. 2** tappet (Fig. 1) has risen to its full extent. Then see whether you can insert the .008in. gauge, supplied in the kit, between tappet head *C* of **No. 1** (exhaust) tappet and the valve stem *D*. If this gauge will not pass between the clearance is insufficient. To adjust the clearance hold tappet head nut *C* with one spanner and with another spanner unlock nut *E* by turning it in an anti-clockwise direction. Screw tappet head *C* up or down until the correct clearance is obtained. Then lock nut *E* by holding the tappet head and turning the locknut in a clockwise direction. Tighten the locknut securely, but do not use a hammer on the spanner. Finally check the clearance again. No. 2 (inlet) tappet should have .004in. clearance, and this is set in the same way. The other exhaust and inlet tappets are adjusted similarly, and are Nos. 4, 5, and 8, and Nos. 3, 6, and 7 respectively as in the diagram.

To check the clearance on No. 2 tappet turn the starting handle until No. 1 tappet is on the top of its stroke. In the same way check No. 3 when No. 4 is up, No. 4 when No. 3 is up, No. 5 when No. 6 is up, and so on.

In other words, check one tappet while the other one belonging to the same cylinder is up.

If it is found that the tappet clearances have been excessive it is not likely that any harm has been done to the valves. If, on the other hand, the engine has been run for any length of time with no clearance to any of the tappets, an early opportunity should be taken of examining the valves, since the seatings will most probably be pitted or scaled. This can be checked provisionally if the starting handle is turned slowly and the compression of each cylinder felt. If all four cylinders are equally good (*i.e.*, if a definite resistance to motion is felt) the valves are sound. If any of the cylinders has poor compression, this should be investigated. When replacing the tappet cover-plate make certain that the joint in the washer is at the top.

ENGINE OVERHAUL.

When the engine has run about 5,000 miles it may be necessary to remove the cylinder head and scrape out the carbon deposit which has formed inside the cylinder head and on the top of the pistons.

This operation, however, need not be performed until the engine commences to "pink" under ordinary running conditions, which "pinking" will be accompanied by general loss of power and roughness of the engine. The whole operation is very simple and can be carried out single handed by anyone if the following instructions are carefully observed.

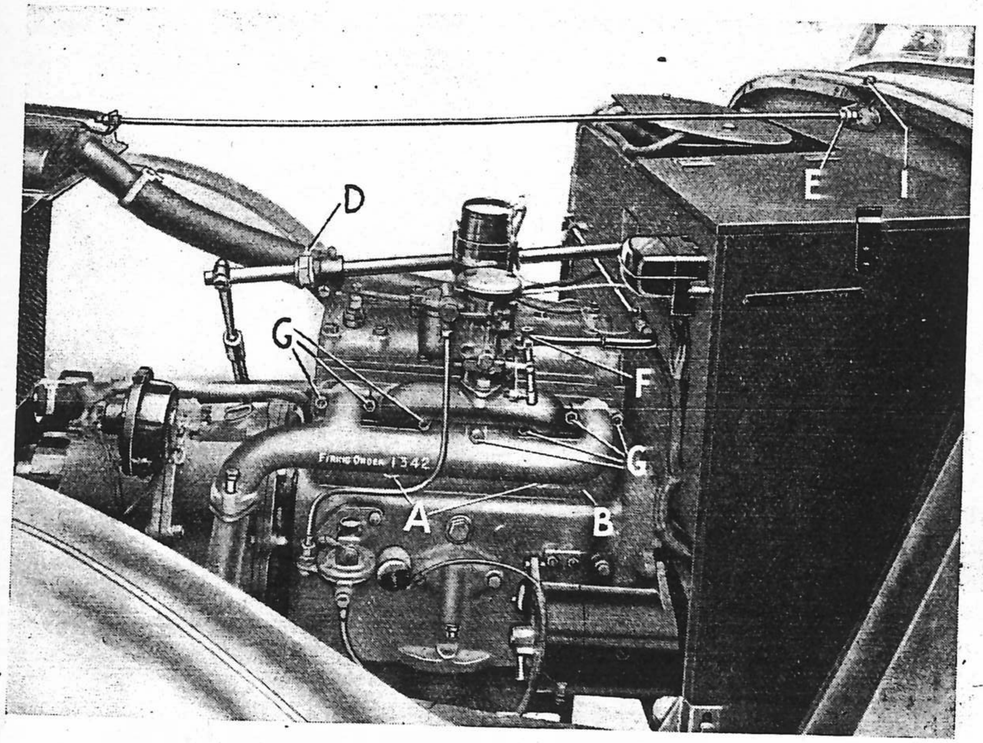


Fig. 2.

Removal of Head.

It is not necessary to remove the bonnet when decarbonizing, but it is advisable on account of the greater accessibility thus obtained.

Before starting operations it is a good idea to run the engine for a few minutes in order to warm the cylinder head up. It will retain its heat throughout the process of decarbonizing, enabling the carbon to be more easily removed and providing greater comfort in handling.

First of all run off the cooling water by removing the drain plug on the lower water pipe on the offside. Next slacken off the water hose clip *D* (Fig. 2) at the cylinder head end and withdraw that end of the hose from the cylinder end stub.

To remove the bonnet slacken the nut at the rear end of the horizontal radiator tie rod *E*. Lift the rear end of the rod out of its bracket, and swing the radiator forward about half an inch so that the central bonnet hinge pin emerges from its socket *I* on the top edge of the scuttle. Lift the bonnet off and place it carefully to one side, standing it on end. Then disconnect the

petrol pipe union, taking care not to lose the little gauze filter inside when withdrawing it. Remove the carburettor by unscrewing the two flange nuts and also the nut on the inner side of the throttle arm at *F*.

The inlet and exhaust manifolds can then be taken off together if the nuts, marked *G* (Fig. 2), and the sleeve nuts on the exhaust pipe flange, are removed.

Next detach the high-tension cables from the sparking plugs and remove the plugs. Mark the cables to ensure correct replacement.

It is not necessary to remove the distributor in order to remove the head, but if it is desired to do so, the following method should be employed:—

Remove the screw attaching the distributor locking plate to the cylinder head boss, but do not unscrew the clip bolt, otherwise the timing may be disturbed. Withdraw the distributor unit complete, noting that the lower end of this spindle is tongued to fit in the groove machined in the vertical driving shaft, so facilitating replacement.

Slacken the clip bolt on the gear change rod bearing, and lift the latter off its mounting on the cylinder head. The gear change rod assembly may then be slid bodily rearwards leaving a clear space for working on the head.

Then follows the actual removal of the cylinder head, which can be accomplished when the 19 nuts have been removed.

These nuts are necessarily screwed up very tight, and in order to avoid distortion or straining of the head they should be unscrewed in the **reverse** order to that shown in Fig. 3. Half a turn on each nut is sufficient at first, then a complete turn of each nut in rotation,

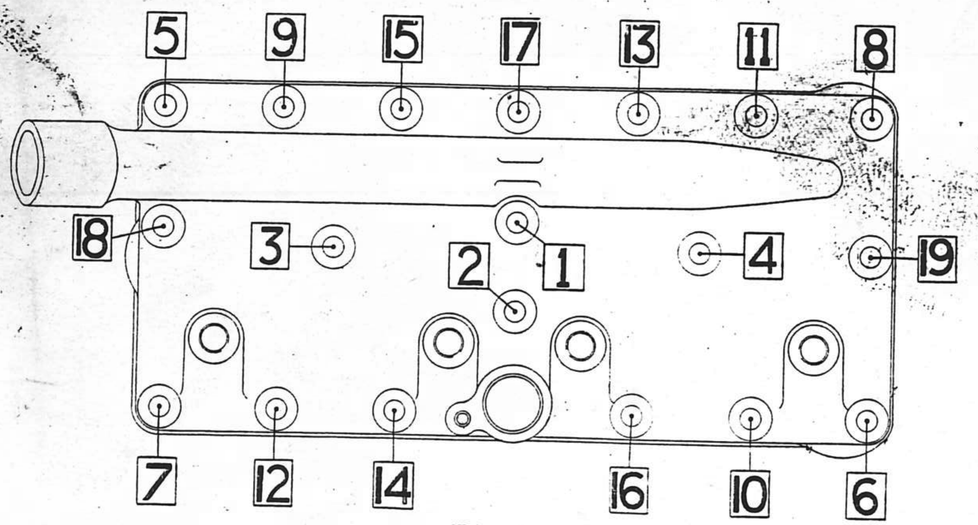


Fig 3.

and finally each nut in turn can be completely unscrewed. Now tap the head lightly all round the edge with a lead or wood mallet, and then tap the three projections along the lower edge of the head in an upwards direction in order to break the joint. If the water hose stub is then grasped and a gentle rocking effort is applied, the head should be drawn clear of the studs without difficulty.

Carbon on Pistons.

Having removed the cylinder head block place it carefully on one side while the pistons are being decarbonised. With the starting handle turn the engine until Nos. 1 and 4 pistons are at the top of their stroke. Then stuff some clean rag into Nos. 2 and 3 cylinders and proceed to scrape the carbon from Nos. 1 and 4 pistons, using a screwdriver or similar tool for this purpose. Carefully remove all the carbon deposit, but avoid damaging the piston heads by scratching the metal with your screwdriver. Remove also any carbon from the top face of the cylinder block round the valves. After removing all traces of carbon wipe the surfaces with a paraffin rag, **but do not polish with emery cloth since this would damage the carefully machined surface.** After finishing these two pistons remove the rag from Nos. 2 and 3 cylinders and turn the engine until the two centre pistons are at the top. Insert rag in the two end cylinders and then decarbonise Nos. 2 and 3 pistons as described above.

Removal of Valves.

While the cylinder head is off the valves should be removed for examination and ground-in if necessary. In order to avoid getting the valves mixed up they should be removed, ground-in if necessary, and replaced one at a time. It will be noted, however, that the valves are numbered 1 to 8 counting from the radiator.

Before extracting the valves it is necessary to remove the tappet chest cover plate, as described on page 6. The simplest method of removing a valve is shown in Fig. 4. Rest the bracket on the special lever on the side of the valve chest. Apply the forked end of the lever to the valve spring cup, making certain that it

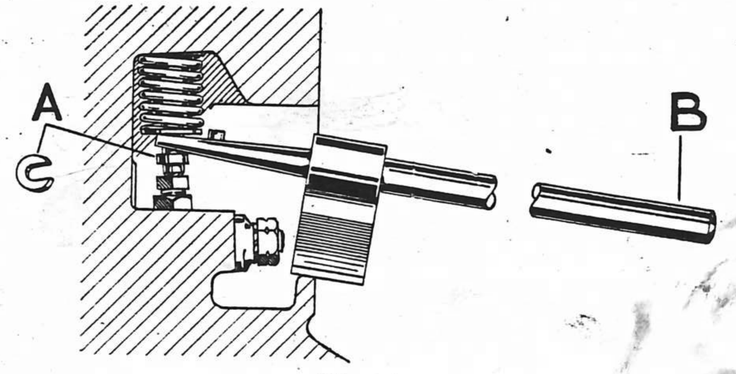


Fig. 4.

clears the cotter *A*. A downward pressure at *B* will then compress the spring, enabling the cotter *A* to be pulled out with a pair of pliers. When the spring is compressed the valve may be raised, and it should be tapped down on to its seating gently. When the cotter is withdrawn the spring should be released, and the valve can then be lifted out. An alternative method of valve extraction entails the use of a special valve-removing tool of a kind obtainable at any garage. Instructions for use are always given with these tools, but in any case the method is similar to that just described.

Grinding-in Valves.

If the valve is slightly pitted on its seat it may be ground in by the following method after first removing any carbon deposit and cleaning with petrol or paraffin.

Valve-grinding compound (obtainable at any garage or accessory shop) is smeared lightly on the face of the valve, which is then returned to its seating.

By means of a screwdriver rotate the valve backwards and forwards by a turn of the wrist.

Every few strokes the valve should be lifted slightly off its seat and moved to a different position. This operation should be continued until an inspection of the valve face shows a smooth surface all the way round.

If it is badly pitted, however, it should be sent to the B.S.A. works at Small Heath to be refaced. On its return a very slight amount of grinding-in will be sufficient to make a good face. Never attempt to grind in a badly-pitted valve, as excessive valve-grinding wears away the valve seat in the cylinder and causes the valve to become pocketed, with consequent loss of power. After grinding in be very careful to wipe away all traces of the grinding material both on the valve and in the cylinder head. Before replacing the valves smear their stems with a little oil.

After replacing the valves check the tappet clearances and adjust them if necessary in accordance with the instructions given on page 6. Then cover the cylinder block with a piece of clean rag while attention is turned to the cylinder head.

Decarbonizing Cylinder Head.

This is a perfectly straightforward job calling for the use of the screwdriver. Be careful to remove all traces of carbon from the edges of the sparking plug holes and from the lower threads. As in the case of the cylinder block, do not use emery cloth on the machined face.

Cylinder Head Gasket Washer.

Examine this carefully for defects. If it is sound and bright—black and badly-stained patches, especially between the cylinder holes, may indicate blow or leakage of gas—it should be carefully replaced over the studs. If you are in any doubt as to the soundness of the gasket you should fit a new one.

Reassembling after Decarbonization.

The process described for dismantling should be repeated in the reverse order. Before attempting to tighten the cylinder head nuts make certain that the tongue in the lower end of the distributor spindle engages with the slot in the upper end of the driving spindle. After the cylinder head nuts are screwed down into contact with the head tighten them up half a turn at a time in the order shown in Fig. 3. Screw these nuts up really tight, but do not hammer them up with unnecessary violence.

Replace the gear change operating rod, and make certain that the shaft slides correctly in its bearing, otherwise gear changing will become difficult.

It may be found after the engine has warmed up that each cylinder head nut may be tightened up another fraction of a turn, and for this reason their tightness should be checked shortly after the car has been run again.

Pistons and Rings.

In the ordinary course of events it should not be necessary to examine the pistons or rings until many thousands of miles have been covered.

Removal of Pistons.

The removal of the pistons calls for a certain amount of skill, and it is hardly a job to which the non-mechanically minded motorist would take kindly. We therefore recommend that the owner should entrust such work to the B.S.A. dealer in his neighbourhood.

For those who wish to carry out the work themselves the following brief instructions are given.

The pistons, complete with connecting-rods, must be drawn out from the underside of the engine (see Fig. 6).

Remove the sparking plugs, drain the sump, and remove it by undoing the twenty bolts and gently tapping it off. Turn the engine until a piston is at bottom dead centre. Withdraw the split cotter pins from the connecting-rod bolts and unscrew the nuts. Pull the big-end cap off and turn the engine to a position such that it will leave the connecting-rod clear of the crankshaft. Then draw the connecting-rod and piston down clear of the cylinder bore. To remove the piston from the rod undo the pinch-bolt inside the piston and tap the gudgeon-pin out.

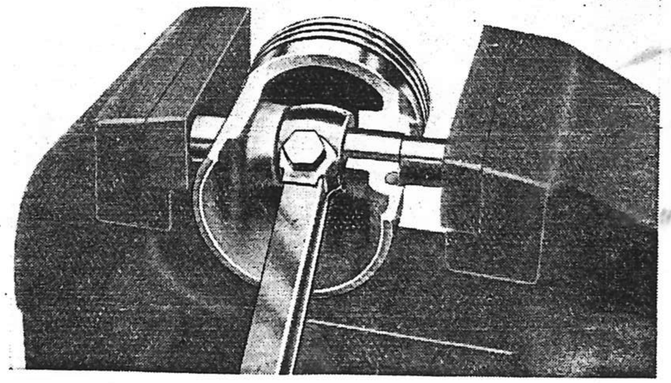


Fig. 5.

The connecting-rods are carefully matched in weight for perfect balance. If it is necessary to fit a new rod, one should be obtained bearing the same mark as the original, otherwise engine balance may

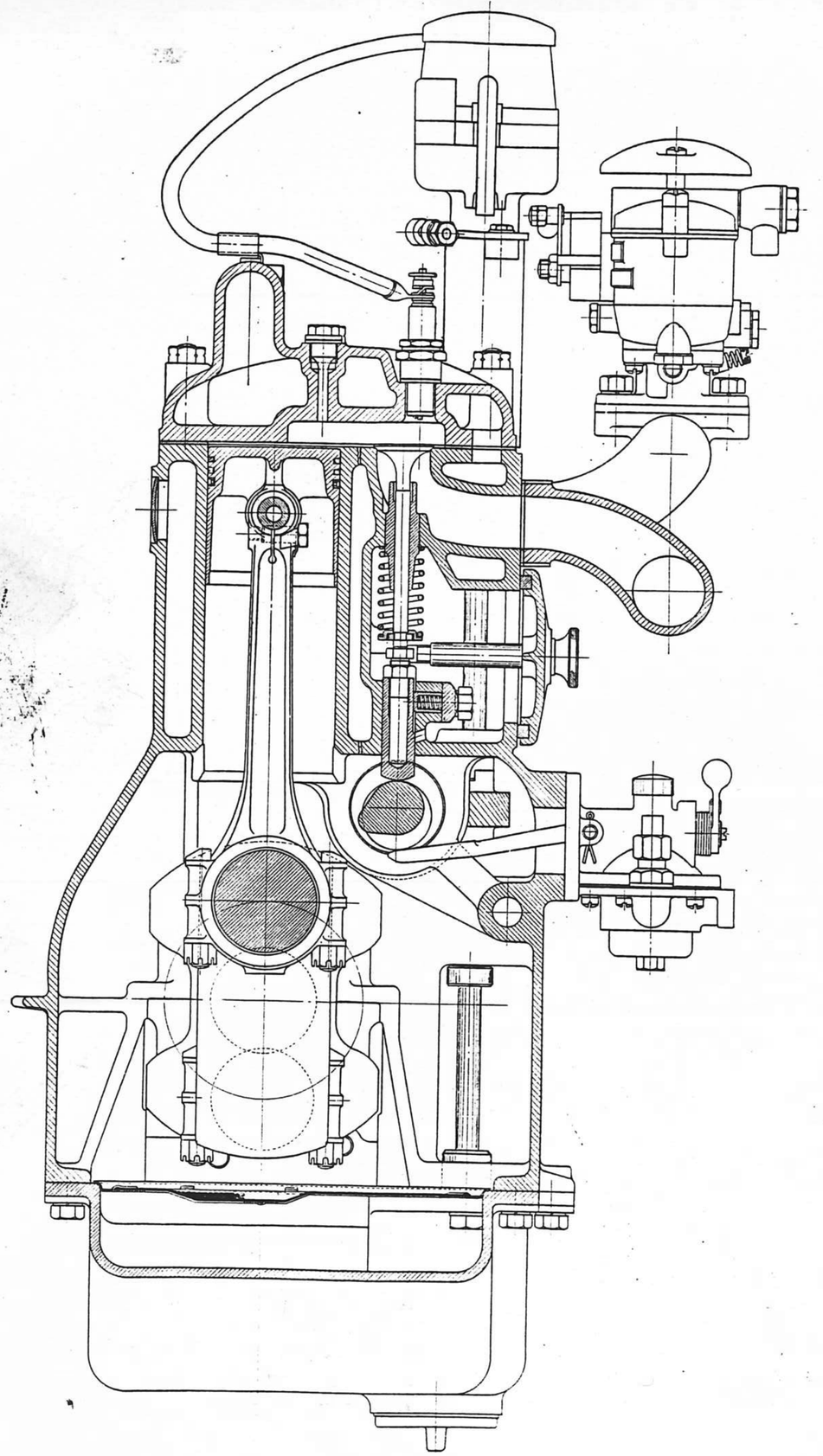


Fig. 6.

be adversely affected. This mark which is found on the bolt boss may be either "+," "0," or "−."

When removing the gudgeon-pins insert a small plug in each end of the pin so that it can be held in a vice by means of them. This will simplify the removal and replacement of the pinch-bolt (Fig. 5).

LUBRICATION.

Efficient and regular lubrication of all moving parts is essential for the proper maintenance of the car. This does not apply only to the engine, gearbox, clutch, and differential, which of course cannot function at all without proper lubrication; it also applies to such parts as the steering gear, brake mechanism, and spring bearings, etc. Correct and adequate lubrication of these parts does not merely stop rapid wear occurring, and so greatly lengthens the life of the car, but it also prevents the deveopment of annoying rattles and squeaks, and ensures sweet working of the controls at all times. Close attention should therefore be paid to the instructions which follow on the important subject of lubrication. Special attention has been paid in the design of the car to the reduction to a minimum of the number of parts which require lubrication, with a view to reducing as far as possible the time required to attend to it. As is explained below, the engine, gearbox, clutch, and differential are lubricated automatically, so that it is only necessary to replenish their supply of oil at infrequent intervals, while the remaining parts are dealt with by the grease gun system.

To keep the B.S.A. car properly lubricated therefore requires very little time and trouble, which will be amply repaid by the improved running of the car, and the longer life which will be obtained from all wearing parts, with consequent reduced maintenance costs.

Engine.

The engine is automatically lubricated by a rotary gear pump, which is driven through spiral gears from the camshaft. An extension on the pump body projects into the engine sump, the capacity of which is one gallon. In operation, the pump draws oil through the filter in the sump and delivers it under pressure to a channel drilled in the cylinder block. From here the oil is supplied direct to the main bearings and big-ends.

A metered oil feed is taken from the end main bearings to lubricate the camshaft end bearings, the oil then passing to the tappet gallery thus ensuring adequate lubrication for the tappets and camshaft centre bearings. A special oil supply is arranged for the timing chain. The piston, cylinders, and small end bearings are lubricated by splash.

A green warning light is fitted in the grouped instrument dial on the facia board, and under normal conditions when the engine is warmed up, the green light should disappear. At low engine

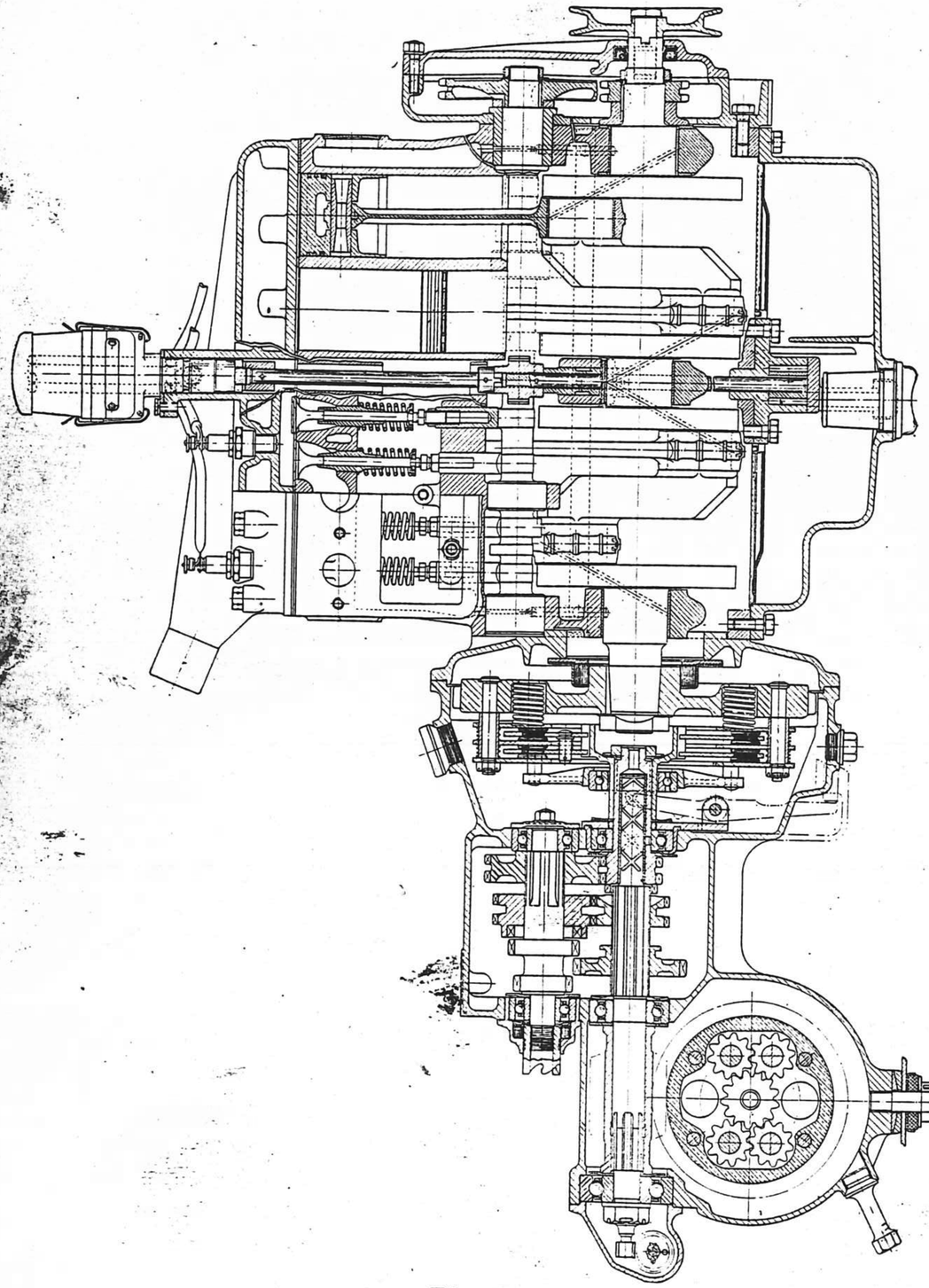


Fig. 7.

speeds, e.g., tick-over, the green light may appear, but so long as there is an adequate supply of oil in the sump the light should disappear at all normal speeds.

Under no circumstances must the engine be run if the green warning light appears even at so comparatively low a speed as 30 m.p.h. in top gear. If the pressure has fallen in this manner the matter must be investigated at once. Pull out the oil sump dipstick on the nearside of the engine and examine the oil level.

There is no adjustable oil control in the B.S.A. system, and the only point requiring attention is a periodical examination of the oil level in the sump.

After many thousands of miles the oil pressure may fall on account of wear developing at the connecting rod big-end bearings, consequently causing the green light to appear at low speeds, but this is a matter which should be rectified by fitting new bearings.

Oil Level.

It is necessary for the driver to make sure that there is always sufficient oil in the sump, remembering that when full it contains sufficient for a considerable mileage. Nevertheless, the driver should make a regular habit of withdrawing the oil level dipstick every morning and examining it.

The oil level is shown by the dipstick on the nearside of the crankcase. The dipstick is marked "F" for full and "1" when one quart is required, "2" when two quarts are required to replenish the sump. The oil level should never be allowed to fall as far as the "2" mark. **The oil sump should be drained and refilled in accordance with the instructions given in the lubrication chart** (see pages 32 and 33).

Oil for Engine.

To obtain the most satisfactory service from your car it is essential to use only high quality lubricants—this point cannot be over-emphasized. It is most important, also, that one of the recommended grades of oil is used. Always purchase from branded cabinets or sealed packages. For correct lubrication we strongly recommend the high quality oils tabulated on pages 32 and 33. It is not sufficient merely to specify the grade; the actual brand required should be stated.

Periodically the oil sump should be drained by removing the drain plug and filter from the bottom of the sump (see centre pages). Clean the filter gauze with petrol by using a brush. On no account must rag be used owing to the possibility of fluff getting into the lubrication system. Our recommended practice is to drain when the engine is hot, immediately after a run, in which condition as much as possible of the contamination present will be removed. We do not favour the use of paraffin as there is the possibility that some paraffin will remain and impair the quality of the fresh oil which is added.

After draining away the old oil a good quality flushing oil may be used for the purpose of cleaning the lubrication system. Pour the oil into the sump (a suitable size tin can be purchased from any B.S.A. dealer) and run the engine at a slow speed for two or three minutes, afterwards again draining the sump and refilling with a recommended oil shown on pages 32 and 33.

During the running in period we recommend the use of one of the grades of upper cylinder lubricant now on the market. The addition of the correct amount of one of these to the petrol reduces the tendency towards seizure with a new engine if it is over-driven, and in the long run its trifling extra cost is amply repaid; not only is the risk of seizure with consequent damage to pistons reduced, but the pistons and cylinders are enabled to bed down under conditions which ensure that the ultimate performance of the engine is at a maximum.

Clutch.

The clutch requires a little oil occasionally, which should be poured in through the filler hole. If a quarter-pint of engine oil is put in periodically (see centre pages) it will be sufficient. Apart from this the clutch will require no attention.

Do not let the clutch run without oil. If the filler cap is removed while the engine is running, a considerable film of oil should be visible on the flywheel. If the flywheel appears dry, stop the engine and pour oil in the clutch chamber as instructed above until a film appears on the flywheel when the engine is running. There will then be sufficient oil in the clutch chamber and the filler cap may be replaced.

Gearbox.

The gearbox should be topped up through the filling orifice on the offside at regular intervals (see centre pages).

Before adding oil to the gearbox remove the level plug provided on the offside of the box. Add only sufficient WARM oil to bring the level to this plug hole. Failure to observe this instruction may result in difficult starting, overheating, and seizures.

To fill an empty gearbox about one pint of oil is required.

Periodically drain out all the old oil by removing the drain plug in the bottom. Replace the drain plug and refill with fresh oil up to the correct level. This operation is carried out more easily when the gearbox is warm—immediately after a run.

Differential.

To lubricate the differential it is necessary to remove the plug on the nearside at the rear of the differential case, using the lifting jack handle as a key, and pour in oil until it reaches the level of the filler plug. Lubrication of the differential is quite automatic, providing the oil level is maintained.

It will be found much easier to get the oil to flow in if the refilling is done when the car has just come in from a long run, as the gears will be warm and so the oil will flow more easily. If the oil flows in very slowly, jack up one of the wheels, and turn it by hand while the oil is being poured in. The oil should be warmed before pouring in. The motion of the worm wheel will then tend to draw the oil in. If at any time there is any doubt as to the amount of oil in the differential case, drain and flush all the oil out through the drain plug, and then put in approximately one pint of oil.

Note that with a new car it will be advisable to drain the oil out and refill with the quantity mentioned, when the car has covered 200 miles. When replacing the filler cap take care to screw it up tightly. Be very careful to choose a suitable grade of oil for use in the differential, as an unsuitable oil might cause damage to the worm gear by which the front axle is driven. The same grades of oil as recommended for the gearbox (see pages 32 and 33) should be used in the differential. After prolonged running a slight "weep" of oil may be observed on the differential case and cap, but this is quite in order.

Other Parts (see pages 32 and 33).

All other parts of the chassis which require lubrication can be supplied with grease by means of the grease gun which is supplied in the tool kit.

A grease gun is supplied with the kit. To lubricate, place the nozzle of the gun on to the nipple, and by pushing the handle of the gun down several times grease will be forced into the working parts at high pressure; continue this operation until the grease exudes from the joint faces.

The diagram shows the position of all the nipples to which the grease gun should be applied. It cannot be too strongly stated that the ten minutes or so required to inject grease at all these points once a week will be time well spent. The improvement in the general smoothness of running of the car will alone amply repay the trouble taken, while the reduction in maintenance costs resulting will undoubtedly be appreciable.

The rear hubs are lubricated by filling the hub caps with grease and screwing them into position.

Lubricate the front swivels at regular intervals as shown on the chart on pages 32 and 33.

It will also be found that five minutes work with the grease gun immediately after the car has come in from a long run through heavy rain or on very wet roads will be well worth while. The action of forcing grease into the bearings automatically forces out any water or dirt which may have entered, and this prevents such parts as the steering joints or spring bearings from rusting up or becoming stiff.

Use only a good quality grease, as poor grease will go hard and block up the passages through which it has to pass, while it may contain acid matter, which will corrode the highly finished bearing surfaces.

Put a few spots of oil on the carburetter control rod joints occasionally, and also on the fork joints on the brake gear to prevent them becoming stiff.

Springs.

All the springs on B.S.A. cars are thoroughly greased before delivery. It is advisable, however, to regrease all springs every six months. The spring leaves should be separated by means of a small wedge and grease introduced between them with an old knife. This attention will ensure good springing and perfect comfort on the worst road surfaces throughout the life of the car. Be careful to use a grease which will not go hard at low temperatures or after long periods of use.

RUNNING ADJUSTMENTS.

In the following pages instructions are given for the few simple adjustments which may be found necessary, all of which can easily be carried out by the driver without skilled assistance.

A good driver will occasionally go over all the nuts on the car with a spanner to see that they are kept tight, and will carefully look round the car to see that everything is in order. A loose nut or similar small trouble is easily cured, but if neglected it might lead to more serious trouble and expense. An occasional careful inspection of the car as suggested is therefore well worth while.

Brake Adjustment.

The brakes are of the Bendix Single Anchor type, cable operated and are fitted with a central compensator, which compensates the brakes both from side to side and front to rear.

It is recommended that overhauling and servicing of the brakes should be carried out by an authorised Bendix Service Agent, but full details for carrying this out is available on application.

The following brief instructions are given for those who wish to perform the adjustments themselves.

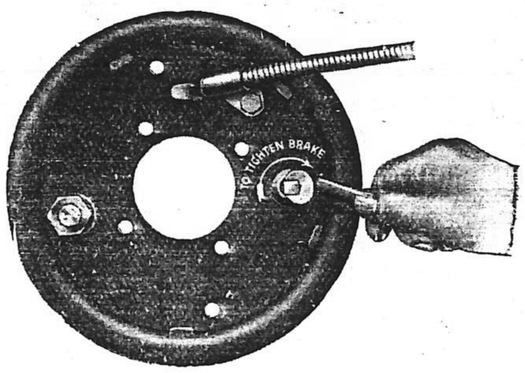


Fig. 8.

The adjustment is affected at the rear of the backing plate, and is of the crown wheel type (see Fig. 8). Normal wear can be taken up periodically by expanding the brake shoes in the drum by turning the shoe adjuster in a clockwise direction until the brake drum is filled, then slack back the brake adjuster until the wheels are just free. The brake operating cables are fitted with centrally disposed lubricators, which must be frequently

lubricated. It is also essential that the joints and pins on the central compensator should be free and these must also be lubricated at frequent intervals.

It is **imperative** to clear the holes in the conduit brackets situated on the brake backing plate before greasing the cables, otherwise there is the possibility of grease reaching the brake linings. At intervals as stated on the lubrication chart on pages 32 and 33, the cable should be charged with a **high melting point graphited grease** until it exudes from the conduit bracket holes.

Clutch Adjustment.

After a considerable mileage has been done the clutch may require adjustment. This is done by slackening off the nut at the front end of the clutch actuating rod and sliding the lever a little along the slot which is provided at this point. This adjustment, which applies to all models, should be such that when the clutch is fully engaged there is $\frac{1}{2}$in. free pedal movement.

LUVAX HYDRAULIC SHOCK ABSORBERS.

These shock absorbers are carefully adjusted before leaving the works and require the minimum of attention.

Refilling with Fluid.

Every 8,000—10,000 miles unscrew the filler plug *A* at the top of the casing, and, if necessary, refill with fluid to within three-quarters of an inch of the top. If this is not done the working of the shock absorber will be impaired.

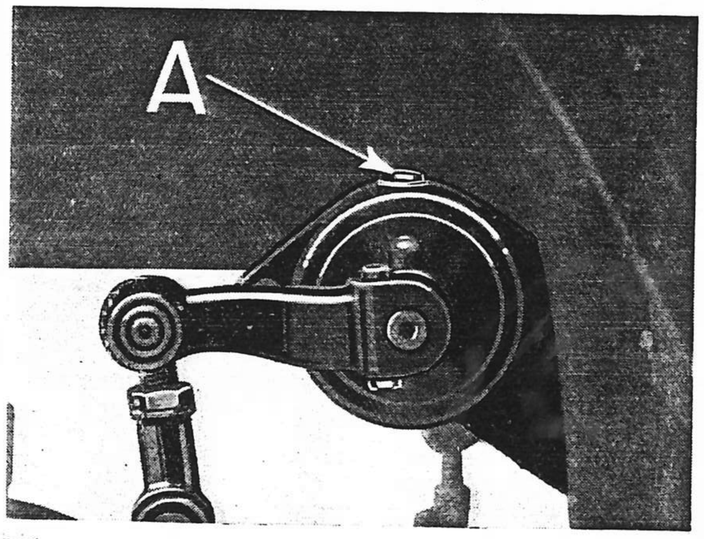
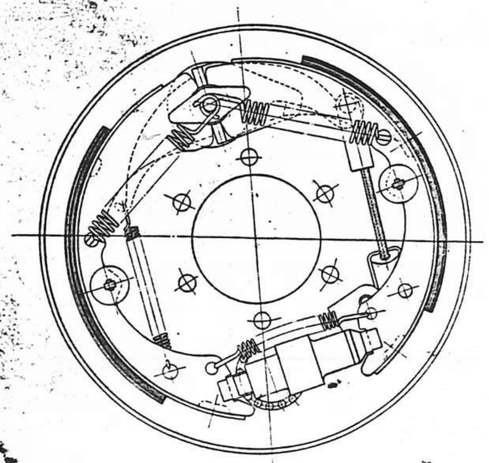


Fig. 9

Use only Luvax Official Hydraulic Shock Absorber Fluid.

This is a special grade of fluid whose properties have been carefully selected to meet the conditions essential for efficient working at all times. It can be obtained from any LUCAS–C.A.V.–ROTAX Service Depot, or your local dealers, in sealed one pint tins with a special pouring spout.



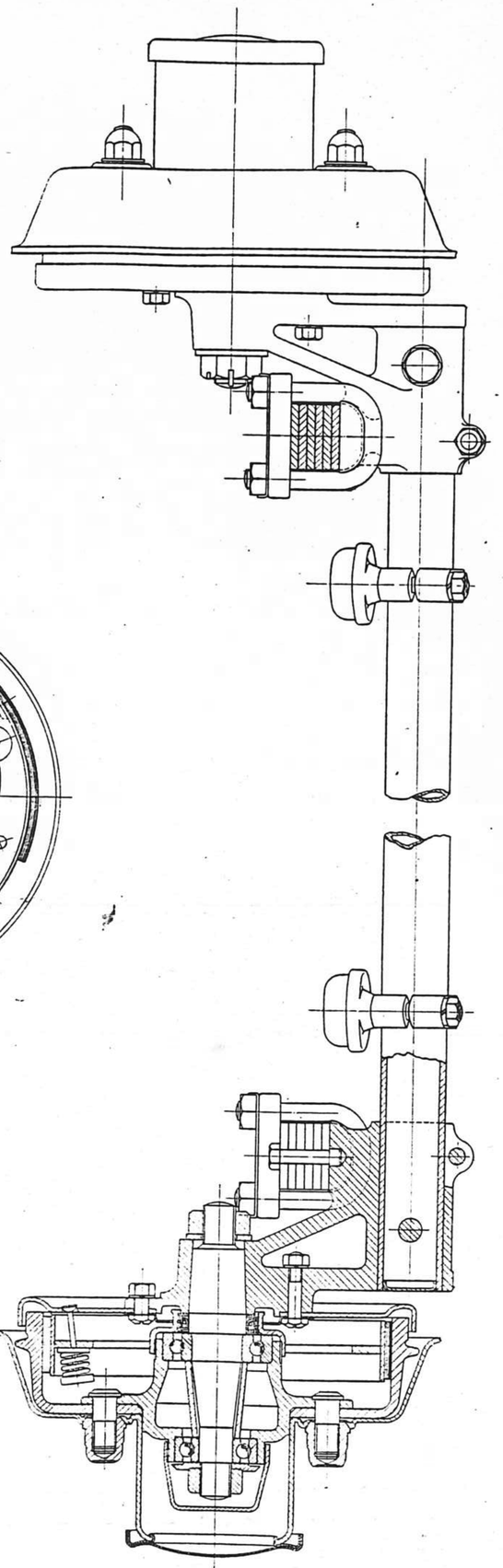


Fig. 10. Rear Axle and Brakes

Wheels.

B.S.A. cars are fitted with detachable pressed steel wheels, which are very easily removed and re-fitted if the following simple instructions are followed.

When it is desired to remove a front wheel the following is the procedure. The jack should be placed under one front wheel spring as near to the wheel as possible. Then screw the jack up and remove the wheel centre disc by applying a screwdriver behind its rim, in the small gap specially made for this purpose. Unscrew the four nuts with the special brace provided, and the wheel will come off. Note that the nearside front wheel and rear wheel have nuts marked "L," which have a left-hand thread, while those on the other wheels are marked "R" and have a right-hand thread. Therefore nuts on the former are removed by turning clockwise and on the latter by turning counter-clockwise. The wheel nuts can be undone more readily if the axle is only jacked up sufficiently to remove the weight from the wheel, without disengaging the tyre from the ground, so that the wheel will not turn. In this case it will be necessary to jack the axle up a little more before proceeding to refit the wheel so as to allow clearance for a fully inflated tyre.

To fit a wheel on the hub it is only necessary to lift it into position and carefully tighten up all four nuts with the brace and then spin the wheel to see that it runs true. Do not forget to replace the wheel centre discs and make sure they are fixed securely. It is advisable, after running a few miles, to go over the nuts again with the brace to make sure they are tight.

Steering Gear.

If the ball joints on the track rod and steering cross rod have been disturbed for any reason, it is of the utmost importance when re-assembling, that the screwed end plugs should be screwed up solid and then slackened back only sufficient to enable the split pins to be inserted. **In no case should this exceed half a turn.**

Radiator.

It should always be borne in mind that the radiator of a water-cooled car is comparatively fragile, and that it should therefore be treated with consideration. The front grill acts as a guard for the actual cooling elements which are placed immediately behind it, but there is no protection on the inside. Care should be taken, therefore, when using spanners or other tools to avoid accidentally striking the honeycomb, since a severe blow may cause leakage. The most important point, however, in connection with your radiator is its protection against freezing in cold weather. This applies equally to the cylinder water-jacket, and at the beginning of the winter a quantity of one of the well-known brands of non-freezing radiator preparation should be added to the cooling water. Failing one of these, ordinary commercial glycerine should be used. The capacity of the B.S.A. water system is approximately 24 pints, and four pints of glycerine added to the radiator should prevent freezing in the coldest of British winters. Before adding the

glycerine an equivalent amount of water should, of course, be run out through the drain plug on the lower water pipe on the offside of the engine.

In order that the engine may be run at an adequate temperature during cold weather a radiator muff may be used, but the practice, sometimes recommended, of running with only a partial water supply must not be followed in the case of a thermo-syphon system such as that employed on the B.S.A. car.

Throughout the year a careful watch should be kept on the water level. This should always be within an inch of the filling orifice. If the water in your district is hard it should preferably be boiled before it is poured in. This will help to remove some of the chemical impurities which in time might cause an obstruction in the honeycombs.

The water supply in the B.S.A. car is adequate for satisfactory cooling, and if it should boil at any time (provided the level is maintained) this may be due to the excessive use of low gear, to unusually severe road conditions, incorrect carburation or ignition (see page 39), or, if the above points are in order, to some engine or mechanical defect which should be investigated without delay. Do not remove filler cap or pour water into the circulating system until it has cooled down. In the case of a new car, after it has done a few miles on the road the water-hose connections should be inspected for leakage. If there appears to be any weeping at the ends this can be rectified by tightening up the clips a little.

Petrol Filter.

This is situated at the top of the carburetter float chamber at the petrol pipe union, and is so arranged that it traps any dirt which may be in the petrol, and so prevents the carburetter jets becoming choked. If the hexagon headed plug, which will be found in front of the petrol pipe union, be unscrewed, the filter gauze will come away with it, and any dirt which may have been collected can then be removed.

This should be done once or twice during the season. Remember to replace the fibre washers when re-assembling the filter.

NOTES ON DISMANTLING.

Removing Toe Board.

After lifting the mat the toe board may be removed by unscrewing the fixing screws.

Removing Radiator.

First empty the radiator by removing the drain plug in the lower water pipe and then disconnect the top and bottom water-hose connections by releasing the clips and forcing the hose off the radiator inlet and outlet pipes.

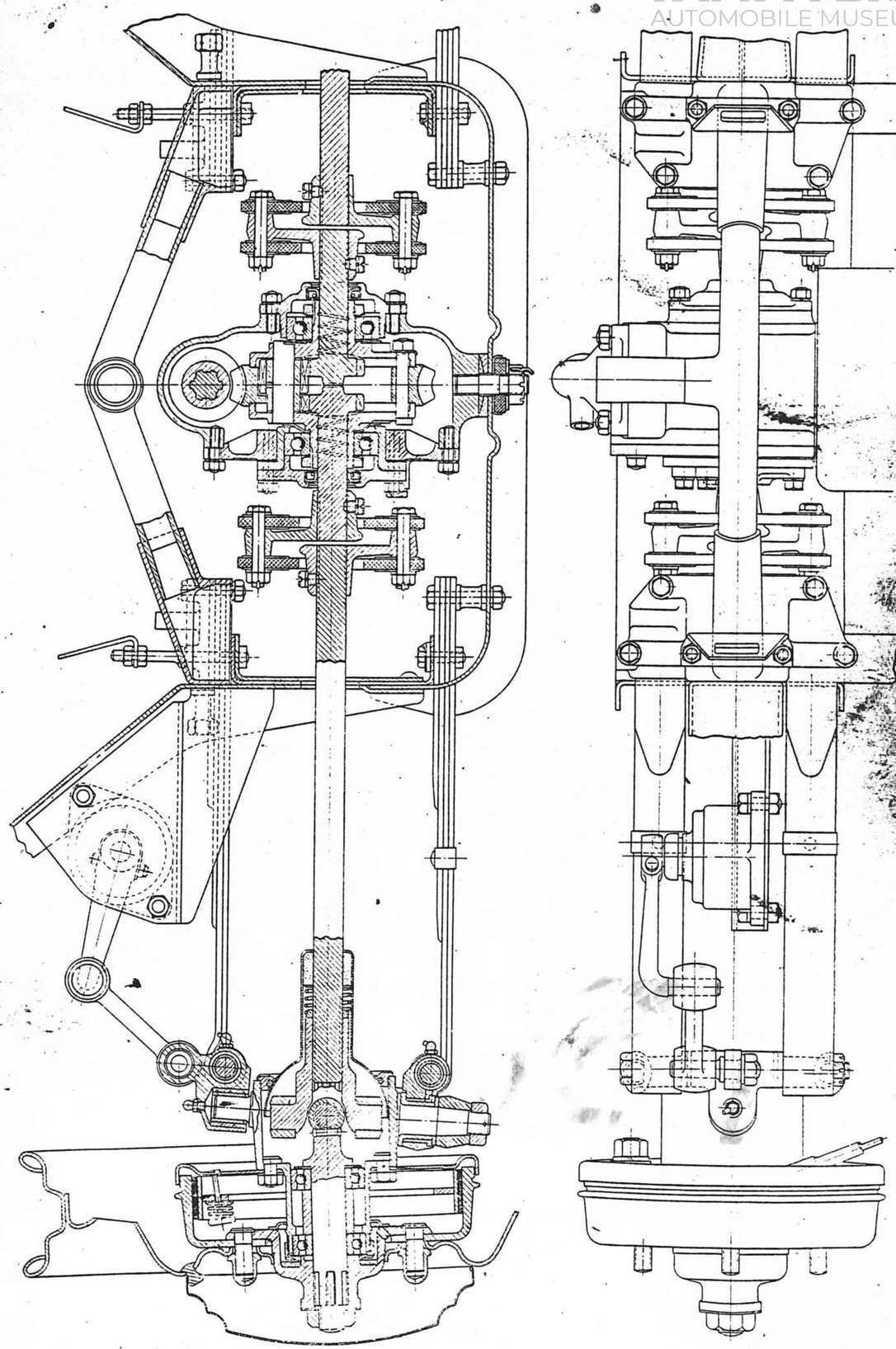


Fig. 11.

Section through Front Drive.

Slacken the nut on the rear end of the horizontal radiator tie rod. The tie rod can then be raised out of the rear bracket and the radiator can be pulled forwards at the top. This will release the bonnet which can then be taken off. Remove the two bolts which hold the radiator brackets to the spring bracket, and the radiator can then be lifted clear.

Removing the Swivels.

Scotch the rear wheels with the aid of a brick or similar article and jack up the front end of the chassis. Remove the front wheels (for which purpose the brakes should be applied temporarily) and disconnect the track rod which connects the two wheels, and the steering cross rod on the nearside swivel. This may be done by removing the end plugs from the sockets on the ends of the rods (see "Steering Gear", page 21). Release the brakes, remove the brake drums and uncouple the brake cable from the brake shoe side of the backing plate, thus allowing the brake cable to be removed. Withdraw the bolts at the outer ends of the springs, and remove the bolt from the shock absorber connecting link at the top of the swivel carrier. The swivels may now be drawn clear of the driving shafts.

Removing Gearbox.

Remove the swivels as described above, and then detach the radiator. Slacken the grub screw on each of the flexible couplings and slide the latter outwards until they are clear of the differential shafts. Remove the spring bracket bridge member (above the differential casing) and note that two of the attachment bolts pass through the mudwing stay on each side. Next remove the nut from the stud on the underside of the differential case and remove the starter. Undo the bolts by means of which the clutch housing is attached to the engine, slacken the rear engine support bolts and place a box or similar support beneath the engine sump. The gearbox can then be slid forward bodily and lifted clear of the chassis.

Removing Engine.

The engine and gearbox must be taken out together. Follow the instructions given above for the removal of the gearbox and in addition it will be necessary to perform the following operations. Disconnect the petrol pipe from the curburetter, taking care not to lose the fibre washers on each side of the union; take off the distributor cap and sparking plug leads, and disconnect the small diameter wire on the distributor. Detach the throttle, and starter carburetter controls, and withdraw the pin at the front end of the clutch actuating rod. Disconnect the wires from the dynamo. Then remove the two bolts, one on either side of the timing case base, which hold it in position on the frame cross member, and lift the engine out.

Badges on Radiator Grill.

It is important that the radiator honeycomb is not obstructed by any badges or similar attachments since they will impede the air flow and tend to cause overheating.

Removing Carburetter.

This is a perfectly straightforward job, calling for no special comments.

AMAL FUEL PUMP (Type 150/806).

Operation. (See Fig. 12.)

The shaft *A*, which is usually the camshaft of the engine, carries an eccentric *B*; this operates a rocker arm *C* pivoted 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 *KI* 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 this 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 filter sump *L* is removed for cleaning purposes by unscrewing the hexagon 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 cork washer *W*.

The priming lever *S* is then operated by hand. This brings the part of the priming lever *SI* 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

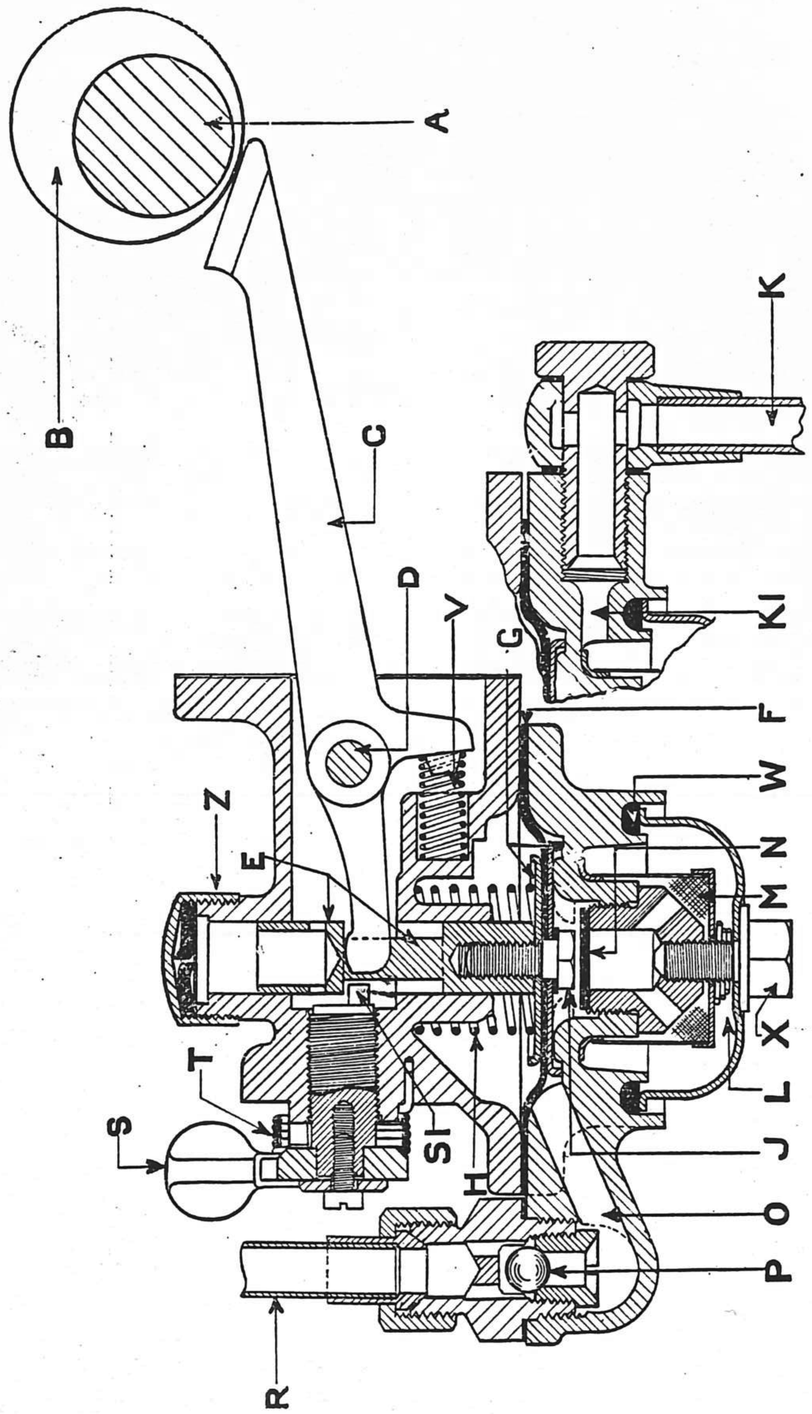


Fig. 12. Amal Fuel Pump.

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 engine can then be started up, and the pump will continue to function in the normal manner.

The priming lever *S* is held back, when not in use, by the return spring *T*.

The inspection cover *Z* can be removed for examination of the working of the pump spindle.

The pump can only fail to function for two major 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 sump bowl 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 *K* 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 *R* between the fuel pump and the carburetter.

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

Instructions for Dismantling Fuel Pump.

1. Disconnect fuel pipe connections *K* and *R* from the pump. Then remove the pump in its entirety from the engine.
2. Next remove the split cotter pin holding the lever and pivot pin *D* in position. Tap out the pivot pin *D* and remove the lever and also remove the spring *V*.
3. Take out the securing screws from the circumference of the pump and remove bottom half containing the petrol pipe connections and the filter itself.
4. The diaphragm *F*, together with the spindle *E* and spring *H*, can then be withdrawn from the pump. If fitting new diaphragms *F*, the old ones can be removed from the spindle by unscrewing the hexagon-headed pin at the bottom end, care being taken in doing so not to bend or bruise the spindle *E*; when this hexagon-headed pin is removed the smaller of the two discs protecting the diaphragm can be lifted off and the diaphragms come away freely. To hold the spindle for removing the screw *J*, place a rod in the cross hole of the spindle.

If it is desired to inspect or remove the suction valve *N* this can be done by removing first the filter bowl *L* and after that the strainer *M* with spring support and then unscrew the inlet valve seating, when the disc type suction valve drops away. The only thing to be looked for in this connection is dirt, there being no springs of any description in this valve.

After replacing the parts see that the filter bowl seats properly on the washer *W* in the recess and that the bowl is tightened up firmly.

To inspect the delivery valve *P* the delivery connection should be unscrewed from the lower half of the pump, and the bush screw-driver slot unscrewed from the underside, when the ball valve will fall away. Again nothing need be looked for in this valve, but an accumulation of impurities.

Re-assembling the Fuel Pump.

Replace parts in the reverse order, taking care that all joints are securely made.

1. Examine the two large diameter faces of the bottom and top half of the pump castings and see that they are clean. If they require scraping only remove the grit and do not damage the metal face, which is easily disfigured by a scraper.

2. If new diaphragms of three thicknesses are to be substituted or the old ones replaced—they are of saucer shape and must be fitted in the correct way. Hold the spindle screw vertically in one hand and thread on to it the red fibre washer—the larger disc *G* with rim down—the diaphragms, with rim higher (as to hold petrol), and finally the smaller disc *G* with rim up, then screw on to it the spindle *E* but do not yet tighten up finally. To ensure that the screw holes in the diaphragm leaves all register together, slip two screws through two sets of holes and then tighten up the hexagon-headed screw securely into the spindle, taking care not to scratch or bend the spindle in the process.

3. When the complete diaphragm is firmly tightened up between the two plates *G* by means of the hexagon-headed screw, slip over the spring *H* and insert the spindle into the top half of the pump and proceed to assemble the priming lever cam. To do this press the diaphragm up tight against its spring and screw in the cam *SI* as far as it will go, and then come back half-a-turn till the flat is parallel with the diaphragm, but is away from it. Now fit the return spring *T* over the boss with its point right down into the small hole in the face under the boss, then replace the lever *S* on to the cam, and refit the washer and small screw and tighten up; now pull the hook of the spring round under the lever and lift it up on to the arm. Now let go the diaphragm—it will drop but should easily pull up if the priming lever is worked to the right and drop again when the priming lever snaps back to the left side.

4. Now place the screws through the bottom half of the pump and through the holes in the diaphragm, and start screwing them into the top half of the pump, with the two halves of the pump in correct relation to each other; partially screw up the pins and then by means of the hand-operating lever *S* draw the spindle with its diaphragm to the highest position possible. This is effected by pulling the lever *S* over as far as possible, and in this position tighten up the five screws securely. This ensures that the diaphragm is fitted correctly in its position.

5. To re-assemble the operating lever *C*, replace the spring *V* and the lever together, push through the pivot pin *D* and secure it by means of the split pin through the boss formed externally on the pump. It is easier to locate the lever first by inserting a loose fitting pin through the pin hole and then drive in the fulcrum pin from the cotter pin end. See that all parts are replaced and that the diaphragm works up and down freely when lever *S* and also *C* are manipulated, noting this through inspection cover .

6. Re-fit the pump to the engine, taking care that all joints are properly made, no air leaks being possible.

7. If by any chance when the pump is re-fitted, petrol should leak from the diaphragm jointing, dismount the pump again and separate the two halves of the casting. Examine the casting faces and in between the leaves of the diaphragms to see if there is any grit which will prevent the two true faces making the diaphragm joint petrol tight.

If by accident the diaphragm facings on the castings have been damaged or distorted, a petrol tight joint might be obtained by smearing a little clear liquid cement such as gold size on the joint facings before tightening up.

The facings of the pump when produced from the works are true and capable of making a petrol tight joint without the use of cement.

SOLEX CARBURETTER (Type FAI).

Diagrammatic Section.

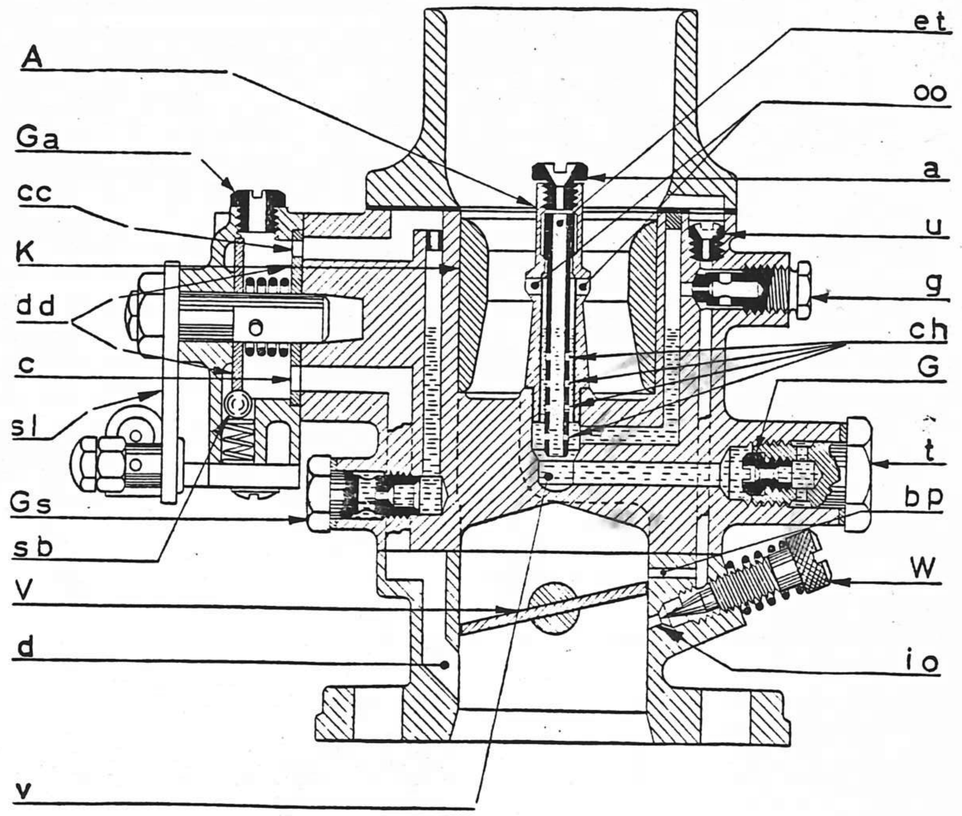


Fig. 13.

It is, unfortunately, impossible to show in one diagram all the parts of the carburetter simultaneously, so the float chamber, which is of standard design and embodies no functional finesse, is suppressed, together with the fuel ducts leading therefrom to the main and starter jets.

Model FAI. Solex carburetter incorporates the bi-starter principle, in which the hand-operated mixture enrichment device for starting from cold has two positions—a very rich one for cold starting purposes, and an intermediate one in which the petrol proportion is considerably reduced, and on which the car can be immediately driven away without any possibility of "over-dosing."

Describing the main carburetter first of all, reference to the diagram will reveal the following:—

"*t*" is the main jet carrier, screwed in the rear of which is the main jet itself (*G*). This meters petrol from the float chamber into the horizontally-disposed channel leading from the jet, to the well (*A*) of the spraying assembly.

Down the middle of this well will be observed an emulsion tube (*et*) which is located on a conical seating near its upper part, and held thereon by the correction jet (*a*) which surmounts the whole and locks the emulsion tube immovably.

Main Jet Operation.

The metered petrol from the main jet (*G*) passes into the well (*A*), where it meets air drawn downwards via the calibrated air correction jet (*a*). This passes out through the small holes into the annulus, where an emulsion is formed with the petrol, and the resulting mixture rises to the four large spraying orifices, of which two are shown (*oo*) in the waist of the choke tube. Here the emulsion is caught up in the main air current and passes down to the manifold via the throttle (*V*).

Pilot Jet Operation.

The idling is effected by petrol drawn from the main jet well via a small channel which will be seen emerging therefrom immediately above the larger horizontal lead from the main jet. This, it will be noted, turns upwards and eventually passes through the pilot jet (*g*) into the downwardly-disposed channel communicating with the idling orifice (*io*) controlled by the spring-loaded and knurled-headed taper screw (*W*).

It will be noted that this orifice is on the engine, and therefore suctional, side of the throttle. A branch lead communicates with another orifice (*bp*) which enters the airway slightly on the atmospheric side of the almost-closed throttle.

When the throttle is in the idling position, the duct in question, which we term the "bye-pass," acts as an air bleed upon the idling petrol supply, and therefore prevents over-richness when actually idling. Directly the throttle opens, however, the vane passes to the atmospheric side of the orifice in question, so that both "*bp*" and "*io*" function as delivery orifices, thereby proportionately enrichening the output at the transfer position between the pilot and main supplies and preventing lean flat spot which might otherwise take place.

Adjustment.

The adjustment of the carburetter follows the general lines of all the other Solex models, and consists in the selection of a choke tube (*K*) of suitable diameter, a main jet (*G*) of suitable size to correspond with the choke tube characteristic, and a pilot jet (*g*) to handle the idling end of the mixture curve, which is in turn assisted in effecting a perfect transfer by the air bleed (*u*) and eventually by the volume screw (*W*) which determines the idling mixture strength at all points below the actual output value of the jet itself (*g*).

The Bi-starter.

Reference to the diagram will show the bi-starter as a disc valve controlled chamber fed via the petrol jet (*Gs*) and the air jet (*Ga*), and put into operation by the lever (*sl*) which rotates the spring-loaded discs (*dd*) until the drillings in the right-hand disc register with the ducts (*cc*) by which the petrol enters and (*c*) by which the eventual mixture passes into the airway below the throttle at (*d*).

It differs, however, from the original Solex starter in that, instead of having two positions, "shut" and "open," there is now an intermediate one, so that it is possible, when the lever is operated along the full length of its travel, to have a very rich mixture which will ensure easy starting under the coldest conditions, and then, by pushing it back a short distance, another very much smaller drilling in the inner disc comes into operation, its effective position being located by the spring-ball (*sb*) which makes contact with a corresponding notch in the outermost disc. This cuts down considerably the mixture strength and permits either of prolonged idling for warming-up purposes or of the engine being driven straight away under load without any fear of fuel over-dosing.

When the temperature has reached the point where the assistance of the intermediate starting mixture is no longer necessary, the actuating knob is pushed fully home and the holes in the right-hand disc fail any longer to correspond with the channels (*c*) and (*cc*).

As in the case of the main setting, the bi-starter is adjusted to suit the needs of the engine by a suitable selection of the air jet (*Ga*) and the petrol jet (*Gs*).

DISMANTLING THE CARBURETTER.

It will be seen that the pilot jet (*g*), the main jet (*G*), the starter air jet (*Ga*), and the starter petrol jet (*Gs*) are all accessible from the exterior without dismantling the carburetter.

Access to the interior is quite easy and obvious. In both cases the air cleaner, if fitted, should be removed.

In the case of the FAI. carburetter, two slotted square-headed bolts will be found securing the top casting to the remainder of the carburetter.

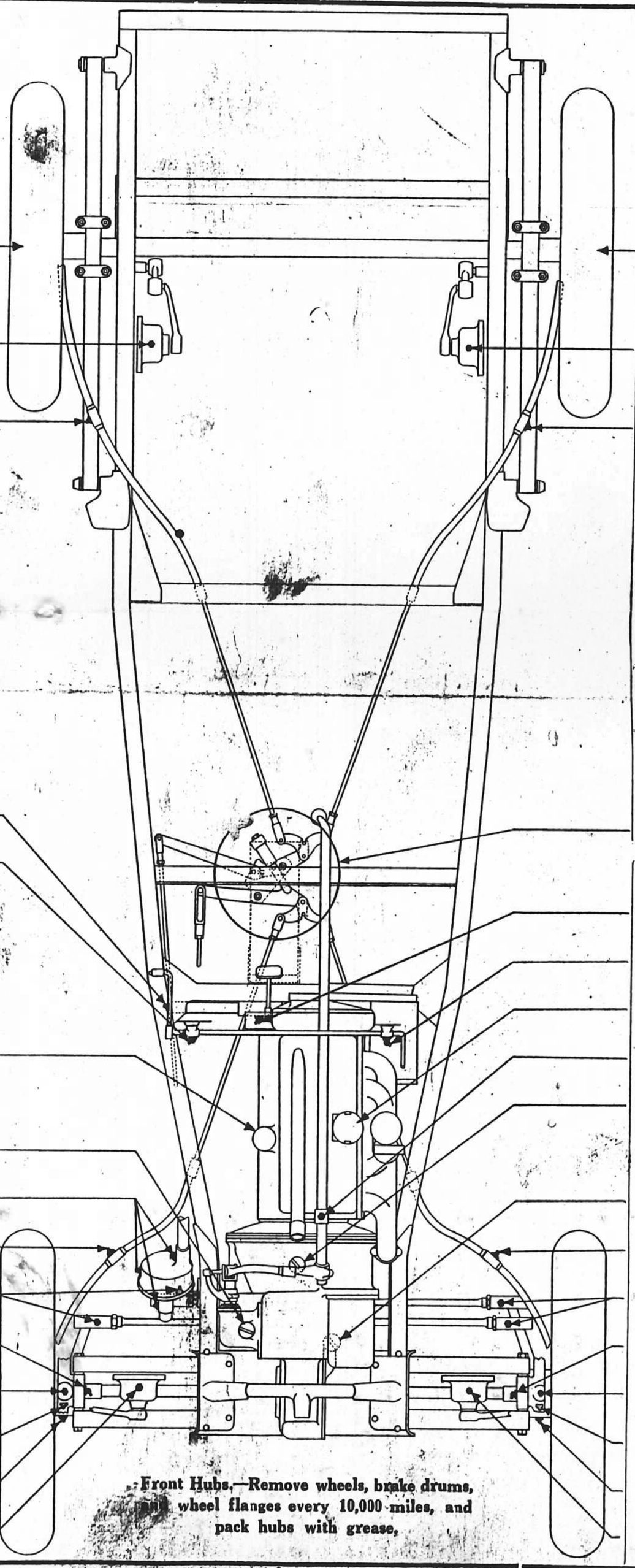
Removal of these will allow the top to be removed, exposing the float chamber, air correction jet (*a*) and pilot jet air bleed (*u*).

It will be seen that the float can be lifted out quite easily, and only a small well-fitting screwdriver is required to withdraw (*a*) and (*u*) should it be necessary to remove them for cleaning.

The B.S.A. 10 h.p. SCOUT LUBRICATION CHART

Key L'ter	Recommended Grade	VACUUM	WAKEFIELD	SHELL	ESSO	PRICE'S
E	Engine and Clutch { Summer	Mobiloil BB	Patent Castrol XL	Triple Shell	Essolube 50	Motorine C
	{ Winter	Mobiloil A	Patent Castrol XL	Double Shell	Essolube 40	Motorine M
O	Gearbox and Differential	Mobiloil C	Castrol D	Shell Spirax Gear Oil	Esso Gear Oil Heavy	Motorine
G	Chassis. Grease Gun	Mobilgrease No 4	Castrolease Heavy	Shell RB Grease	Esso Grease	Battersea A Belmoline C

ATTENTION REQUIRED	Miles 2000	Miles 500
Remove Wheel and Cap Pack latter with grease and replace	G	
Top up with Luvax Hydraulic Shock Absorber Fluid every 8,000 to 10,000 miles		
Grease Brake Cable	G	
Grease Pedal Shaft	G	
Grease Accel. Pedal Shaft	G	
ENGINE		
Inspect daily. Drain and refill after first 500 and after every 2,000. Dip-stick marked in quarts to replenish	E	E
Inspect Gearbox every 500. Drain and refill every 2,000	O	O
Grease Steering Box	G	
Grease Brake Cable	G	
Grease Steering Ball Pins	G	
Grease Spring—top & bot.	G	
Grease Swivel—top	G	
Grease Swivel—bottom	G	
Grease Universal Joint	G	
See Rear Shock Absorbers	——	



Front Hubs.—Remove wheels, brake drums, and wheel flanges every 10,000 miles, and pack hubs with grease.

Miles 500	Miles 2000	ATTENTION REQUIRED
G		Remove Wheel and Cap Pack latter with grease and replace
		Top up with Luvax Hydraulic Shock Absorber Fluid every 8,000 to 10,000 miles
G		Grease Brake Cable
E		Lubricate Brake Compensating Mechanism as required
G		Grease Clutch Pedal
G		Grease Accel. Pedal Shaft
——	——	Distributor—see below
G		Grease Gear Lever Shaft
E		Add quarter pint to Clutch
O	O	Inspect Differential every 500 miles. Drain and refill at 2,000 miles
G		Grease Brake Cable
G		Grease Steering Ball Pins
G		Grease Springs—top & bot
G		Grease Swivel—top
G		Grease Swivel—bottom
G		Grease Universal Joint
——		See Rear Shock Absorbers

Distributor and Control Joints

A few drops of Light Oil every 1,000 miles.

Battery

Inspect every fortnight. Top up with distilled water. Grease terminals occasionally.

Tyres

24lbs.□" front and rear
Check weekly.

ADJUSTMENT OF THE CARBURETTER.

The Starting Device. The air jet (*Ga*) and the petrol jet (*Gs*) are determined by experiment to suit the engine for which the carburetter is issued, and it is very seldom that an alteration is required.

Should adjustment be needed, however, due perhaps to change of climate or altitude, never alter the air jet without consulting Messrs. Solex Ltd., or one of their Service Stations, for this is determined once and for all on a cylinder capacity basis.

Use a larger or smaller Gs as indicated by the symptoms.

1. If starting from cold is not practically instantaneous, or the engine stalls immediately after starting, a size larger Gs is required.
2. If black exhaust fumes occur, or there are other signs of over-richness such as "hunting" immediately after the engine is started, particularly when the dashboard knob is pushed half-way in, a smaller Gs is required.

MAIN CARBURETTER.

Slow Running Adjustment. The idling or pilot jet (*g*) provides the necessary output for idling.

The slow-running screw mounted on the abutment plate of the throttle lever, limits the closing of the throttle, and thus fixes the idling speed of the engine. By screwing in this part the engine speed will rise, and vice versa.

The mixture adjustment screw (*W*) permits the richness of the idling mixture to be varied. By turning it in an **anti-clockwise** direction, enrichment takes place, up to the limit of the pilot jet output and conversely, by clockwise rotation the mixture is weakened.

Poverty of mixture is recognized by the irregular behaviour of the engine and the tendency to stall. Over-richness will cause the engine to "hunt" and tend to stall when the "hunt" becomes excessive.

In order to perfect the slow-running, adjust first the screw on the abutment plate, so as to fix approximately the speed of the engine.

Then experiment with the screw (*W*) until even running is obtained.

As this operation will generally alter the speed, it will be seen that finally a nice adjustment of both the screw on the abutment plate and the mixture regulating screw (*W*) will determine the results.

N.B.—Do not make the mistake of trying to adjust the idling to too slow a speed.

ADJUSTMENT FOR GENERAL RUNNING.

Generally speaking, the choke tube fitted to the carburetter is correct, and should not require altering unless a special performance is required.

The main jet is determined by "tuning in" to the choke tube size and corrected by selection of a suitable "air correction" jet as described in previous paragraphs.

The engine may be taken to be adequately catered for in carburation, for careful tests are made on bench and road before the setting is finalized.

All adjustments to the idling and main mixtures must be carried out when the engine is at normal working temperature.

We particularly warn users against ever attempting to ream jets.

GENERAL NOTES.

During cold weather, when the engine has remained at rest for a lengthy period, it is advisable to give it a few turns by hand to break the oil film **before switching on the ignition and before pulling out the dashboard knob of the Solex starting device.**

The majority of motors are fitted with a petrol pump. In that case, after a long period of disuse the following may occur:—

For the first few revolutions of the engine there may be no sign of starting. Then a few late explosions, and prolonged action of the starter motor will be required before normal firing takes place.

This is occasioned by the inability of the pump to supply the required amount of petrol to the carburetter.

It is well, therefore, under such conditions, to make use of the priming device fitted to the pump to fill the carburetter float chamber before attempting to start the engine.

Similarly, if the car has been standing for some time, say two or three days, the petrol in the float chamber may have become stale. Difficult starting may result during cold weather, and it is well, therefore, to pump in a fresh supply before attempting to start the engine.

DIAGNOSIS OF FAULTS.

It is well always to approach the diagnosis systematically and avoid doing more than one thing at a time, for in that case it is impossible to ascertain from the eventual results, which was the successful factor.

FLOODING.

Loose Joints.

It is easy to see whether any of the exterior joints are loose.

The first thing to do, therefore, when a carburetter floods is to verify these various joints.

Grit on the Needle Seating.

This does not as a rule occur in the case of carburetters provided with a filter and generally only within the first few miles after fitting, in which case it is usually due either to stray particles of packing material or to particles of oxide or solder which are apt

to get loose inside the petrol pipe. Remove the needle valve and clean same by carefully blowing it out and noting by suction test that it is hermetic, after which replace it and be sure that the washer is perfect and the tightening adequate.

N.B.—Never attempt to "grind in" a needle valve. In cases where damage to seating is only small, a new seating can be made by removing the complete needle valve assembly from the carburetter, placing it on a hard surface, and lightly tapping the needle "home," rotating it between every two or three taps.

Punctured Float.

If any petrol gets into the float, its weight is of course increased, with the consequence that the level is raised and flooding occurs via the jets. In such a case one must either change the float, or locate, if possible, the point of leakage and solder same. To do this, immerse the float under boiling water, when the emergence of bubbles will disclose the puncture, and cause the petrol to evaporate. This is an emergency measure only, for the solder will unbalance and overweight the float. A new float should be obtained as soon as possible.

Too much Fuel Pressure.

The carburetter is normally fitted with needle valves of which the diameter of the seating is 1.5 mm.

With the advent of mechanical and electrical fuel pumps, it sometimes happens that the pressure developed in them is in excess of normal, and flooding or excessive petrol consumption results.

In such cases, the correct procedure of course is to have the fuel pump tested, and adjusted if delivering at above the prescribed pressure, but the difficulty can sometimes more easily be overcome by fitting a needle valve one size smaller than standard.

It will be realized, however, that this is merely a compromise, and that to be certain of freedom from trouble, the fuel pump should be checked.

Pressure should not exceed approximately 2 lbs. per sq. inch.

Stoppage in Petrol Supply.

It is advisable at the commencement to assure oneself that the petrol tap is turned on, that there is petrol in the tank, and by unscrewing the petrol pipe at its union, that the pipework is clear of obstruction.

It often happens, especially after first fitting, that an air lock occurs in the pipe. This is cured in the ordinary way either by removing and priming same or by the temporary application of air pressure to the filler cap.

Vapour locks can also be produced by a petrol pipe too near the exhaust manifold.

A frequent cause of difficult starting is leakage at the pipe unions connecting the fuel pump with the petrol tank. Do not overlook this possibility when endeavouring to diagnose the cause of difficult starting.

Bad Slow Running.

Ascertain that the adjustment is correct. If, even then, good slow running is not obtained, air leakage is indicated at some point of the induction system, probably via worn inlet valve stems in their guides. In this case try a slightly larger auxiliary jet, but not too large, for then the engine will "hunt" when idling. Where there is any choice between two jets which give approximately the same results, always use the smaller one.

Before making any jet alterations it is well to assure oneself in every case that the jet is clear of obstruction.

If, in spite of trying various auxiliary jets, regular slow running is not possible, excessive induction leakage is certainly indicated, assuming the ignition to be in order and valve timing normal. The engine in this case will not idle regularly and when one attempts to reduce the idling speed, it will generally stall. Air leakage in such a case is confirmed by a depression of the tickler (if one is fitted) at this moment which will cause a temporary pick-up.

One must realise that slow running is in such a case impossible, for the engine is actually inspiring via various sources of leakage, a greater quantity of air than that entering via legitimate means, so that the correct slow running mixture becomes unobtainable.

LACK OF MAXIMUM SPEED.

Butterfly Not Opening Fully.

Note that when the accelerator is depressed fully, the butterfly opens to its greatest extent. This can be checked by observing the position of the limit screw which should be in contact with the boss cast on the outside of the throttle chamber.

Insufficient Ignition Advance.

This is a prevalent cause both of heavy petrol consumption and insufficient top speed and can usually be recognised by inability to make the engine knock on a hill when slowing up with fully advanced spark. In such a case, if advancement at the coupling is easy, it is well to try the effect of setting the ignition forward 10 or 15 degrees; otherwise refer to the Service Department, B.S.A. Cycles Ltd.

Defective Petrol Supply.

This can always be recognised by standard acceleration up to a certain speed at which periodic hesitations and back-firing occur, curable always by a slight throttle reduction. In such a case remove the float chamber and note the rate of petrol flow from the needle valve which will frequently be sufficient indication. For confirmation, make a special test with an independent test tank placed as high as possible on the car so as to ensure a good head.

Silencer Choked.

In certain designs of silencers this trouble can easily occur after the car has covered a fair distance. It is generally easy to recognise it by the absence of a clearly marked exhaust note at the tail pipe and instead a steady rush of hot gas. To confirm, make a test with the exhaust pipe disconnected from the silencer.

OVERHEATING.

It is seldom that the carburetter is the cause of this.

Too much petrol, or on the other hand, an excessively weak mixture, can certainly raise the temperature a little, but in no case should it nearly approach the margin of cooling provided by the water-cooling under normal conditions.

Apart from a major examination, the most likely directions in which to work are reducing the mixture, but not to an unduly weak condition, and advancing the ignition as far as possible consistent with the avoidance of knocking.

A retarded spark will always raise appreciably the engine temperature.

A most frequent and unsuspected cause of overheating is furred radiators and water jackets.

KNOCKING.

Knocking is similarly the result of various causes which as a rule have nothing to do with carburation, such as pre-ignition due to defective plugs, excessive carbonisation, excessive ignition advance or to mechanical noises which can easily be confused therewith, such as loose bearings, worn pistons, etc.

When knocking is actually caused by carburation it can only be due to weak mixture and if not curable by one size bigger main jet, other causes must be sought out.

EXCESSIVE CONSUMPTION.

Note first that there is no leakage either at the carburetter, the pipe line or the petrol tank. Be sure then that the estimation of fuel consumption is correct.

To confirm this, it is always advisable, if possible, to make a definite test over a known mileage in average country with a measured quantity of petrol, either in the main tank if it is of the type from which all the petrol can be drained or by the use of an externally placed auxiliary test tank. The longer the test, of course, the more accurate will the reading be, assuming a non-stop run.

Insufficient Ignition Advance.

This is a most frequent cause of heavy consumption as mentioned above and it is always well to run with the spark as far forward as is consistent with the avoidance of knocking.

It is well, of course, to note that there is no sign of misfiring and that the carburetter is not flooding, or petrol being lost through other sources of leakage.

Bad Condition of the Engine.

The state of the motor has, of course, a very considerable effect upon economy.

It is easy to realise that if compression is lost via worn piston rings or pitted valves, quite an abnormal amount of fuel can in some cases be used to obtain a normal performance. An increase of as much as 100 per cent. in consumption can easily result from this cause.

It is, however, as a rule, readily detectable owing to the general lack of power exhibited and in such a case it is useless to attempt to remedy matters at the carburetter.

MECHANICAL PUMPS.

Fuel waste can result if for any reason too much pressure is being developed. This trouble can generally be presumed when flooding occurs while descending a hill against the engine and causes fresh petrol to be smelt from the front seats.

If ordinary tests fail to disclose any leakage, a short run with a pint or quart test tank and the pump out of action will confirm if the latter is the cause.

There is also a possibility of air leaks between the rear tank and the pump, which will delay the delivery of petrol to the carburetter.

AIR FILTERS.

An air filter with too small a section of filtering medium will frequently raise the consumption owing to the increased vacuum imposed upon the jet thereby. If this is suspected, make a comparative test with the air filter removed. Should the cause be located here, first clean carefully the filtering medium and try again, but if the consumption is still bad it is probably the result of the filter itself being too small.

PETROL CONSUMPTION.

There are so many factors governing petrol consumption that the importance of giving attention to all the following points must be emphasized if the best all-round results are to be obtained:—

Engine.

Weak compression on one or more cylinders. This may be due either to the need for valve grinding, incorrect tappet adjustment, or, in the case of an engine which has covered a considerable mileage, piston ring wear and consequent leakage. If the engine has been stripped down for an overhaul, the setting of the timing pinions should be checked.

Valve Timing.

The valve timing can be correctly set if the camshaft wheel is turned so that the arrow on it lines up with the mark on the engine shaft sprocket, when the piston on No. 1 cylinder is at top dead centre. This is clearly seen on the illustration (Fig. 14). The chain must be replaced while the teeth are in this position.

Ignition.

Assuming that the battery is in good order and giving its full voltage, periodical attention should be given to the contact breaker; the contacts must separate by the specified amount and

must be kept clean and free from serious sticking. The actual timing of the ignition should be verified, and it may be possible in certain cases, dependent upon local conditions—including the type of fuel used—to make an advance on the standard setting.

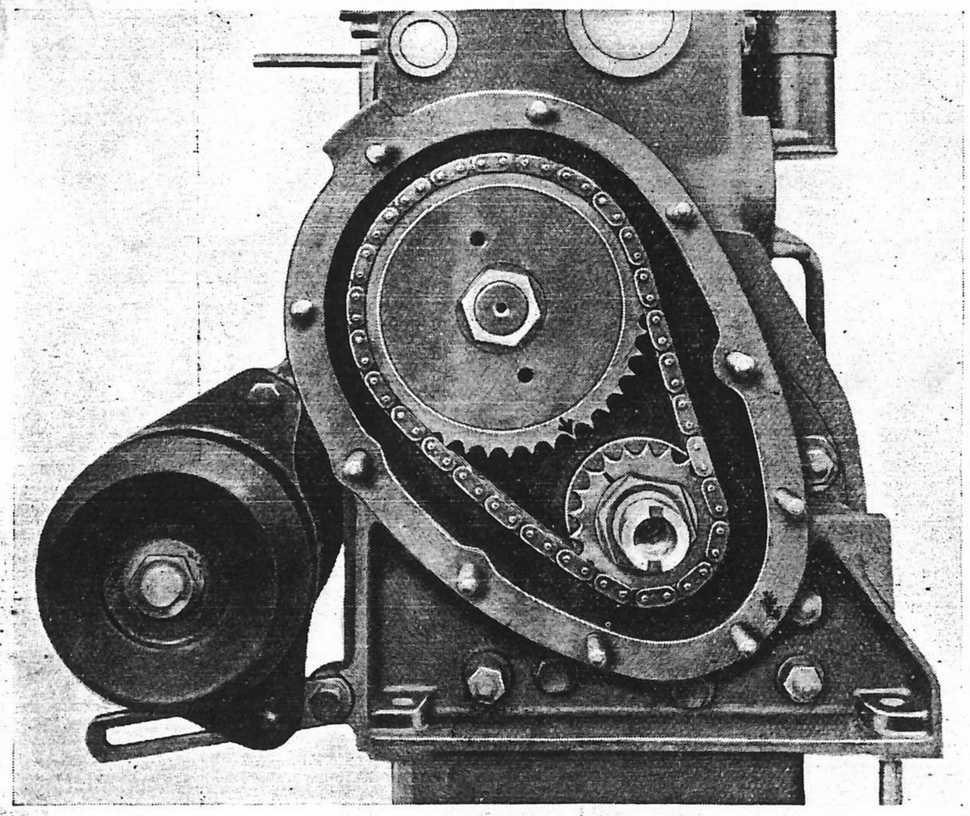


Fig. 14.

The sparking plugs must be kept clean and free from oil or soot, and the points set to .018in. (see page 53). Spasmodic firing is not necessarily noticeable to any extent, but will result in loss of power and an increase in petrol consumption. The sparking plug must be taken apart to clean it properly (see page 52), and care should be taken not to damage the internal insulator when removing caked carbonised oil.

Ignition Timing.

If the distributor has been removed for any reason, the following instructions will facilitate the resetting of the timing:—

Remove the sparking plug from No. 1 cylinder, and the filling plug over the clutch pit. Turn the engine over slowly by means of the starting handle and note when the exhaust valve closes. The valve can be felt with the aid of a pencil through the sparking plug hole, and is the left-hand valve, viewed from the

distributor side of the engine. It will be noted that a mark on the flywheel appears under the clutch filler-plug hole when the valve has just closed. Now turn the engine one more revolution until this mark appears again. The piston on No. 1 cylinder will then be at top dead centre. Carefully set the distributor arm *C* in the position shown in Fig. 15, and then gently replace the distributor so that the flat side (*A* in Fig. 15) is parallel to the engine and away from the carburetter. As the distributor gear meshes with the driving gear, the arm will be seen to turn slightly. Before tightening the clip screw (*B* in Fig. 15) see that the contacts are just breaking. The gap should be not more than .002in., and if this is not quite correct, gently move the distributor body left or right until the .002in. gauge just goes between the contacts. If this cannot be done with only slight movement of the distributor body, it will be necessary to withdraw the distributor and reset on another gear tooth. The actual operation is much more simple than might appear. After the first 1,000 miles when the contact breaker has bedded down, and subsequently if the car is not running well, this

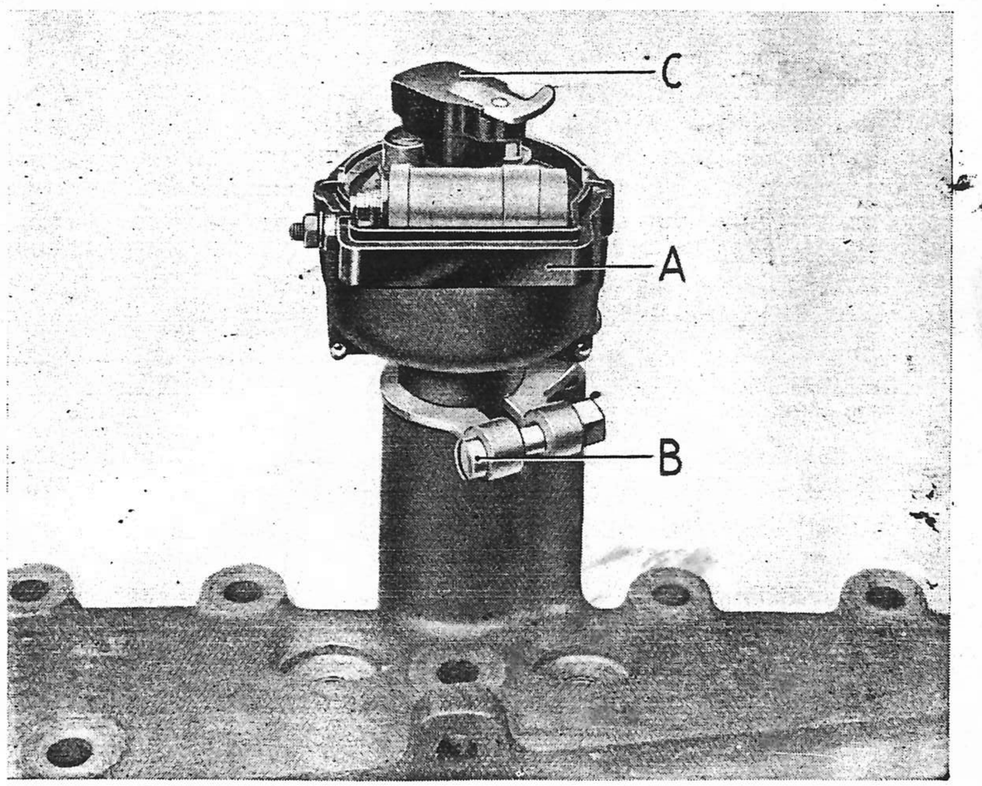


Fig. 15.

point should be carefully checked. The owner cannot expect to obtain satisfactory running unless the timing is correctly set. This applies more particularly in the case of automatic ignition advance, such as fitted to the B.S.A. car, since there is no manual control for the rectification of any slight discrepancy. The driver is entirely

dependent upon the functioning of the automatic advance, and the power developed can be seriously affected. A further point having a direct bearing on correct ignition timing is the adjustment of the contact breaker points. The gauge fixed to the ignition spanner supplied in the kit should just pass between the points when they are fully open. If the gap has become reduced due to wear on the fibre heel of the contact breaker arm, the timing will be retarded and the two screws (Fig. 17) should be slackened and the contact plate moved round until the correct gap is obtained at the points. After making the adjustment care must be taken to tighten the screws. It is equally important that the gap should not become excessive, but this condition is not so likely to occur. An error of one thousandth of an inch in the gap means a difference in the ignition timing of about 2° on the crankshaft.

Expressed briefly the above detailed instructions amount to the following:—

Set contacts to ignition spanner gauge when they are fully open.
Set contacts to open .002in. at T.D.C.

Carburetter.

Under certain conditions the main and pilot jet sizes may be reduced by one size, but, generally speaking, this is not desirable, and endeavour should be made to obtain the required petrol consumption without this alteration by following out the suggestions above and below. The adjustable screw controlling the slow running setting should be kept out (i.e., unscrewed) as far as may be without prejudicing starting up. Although it is claimed that this setting has little effect upon the petrol consumption, this is not necessarily the case under conditions where there may be a fair amount of engine idling or running, say, downhill against the engine with the throttle closed. The weaker the mixture under these conditions the less will be the wastage of petrol.

All joints in the carburation system and the petrol pipe line should be kept tight. Excessive flooding is productive of petrol waste, and should be avoided at all times, since it prejudices easy starting and tends to wash away the oil from the cylinder walls of a cold engine.

The air hole in the filler cap of the petrol tank should be cleaned out from time to time. Occasionally this gets choked, and float chamber starvation at high speeds will result.

What are called "floating" obstructions in the carburetter jet are sometimes difficult to locate, and indicate their presence by causing partial choking at irregular intervals. Any restriction of the petrol supply due to any of the foregoing may cause spitting back when running fast.

Driving.

Violent acceleration, either on the top or lower gears, should be avoided, as should an undue amount of running on the latter.

The petrol consumption on the lower gears is very much heavier, for obvious reasons, than on top gear, and experience will show that it is possible to use top gear to a greater extent than would perhaps be realised during the early period of running.

LUCAS ELECTRICAL LIGHTING, STARTING, AND IGNITION EQUIPMENT AS FITTED TO B.S.A. "SCOUT" CARS.

The equipment requires very little attention, but the owner is urged to inspect it occasionally and, if necessary, to clean and adjust those parts referred to in the following instructions. The attention usually required need take no more than a few minutes, and it is an important factor in maintaining the electrical equipment in first-class condition.

DYNAMO.

Very occasionally—about twice every season—remove the end cover and examine the brushes and commutator. See that the brushes, which are attached to spring arms press firmly on the commutator and that the arms move freely on their pivots.

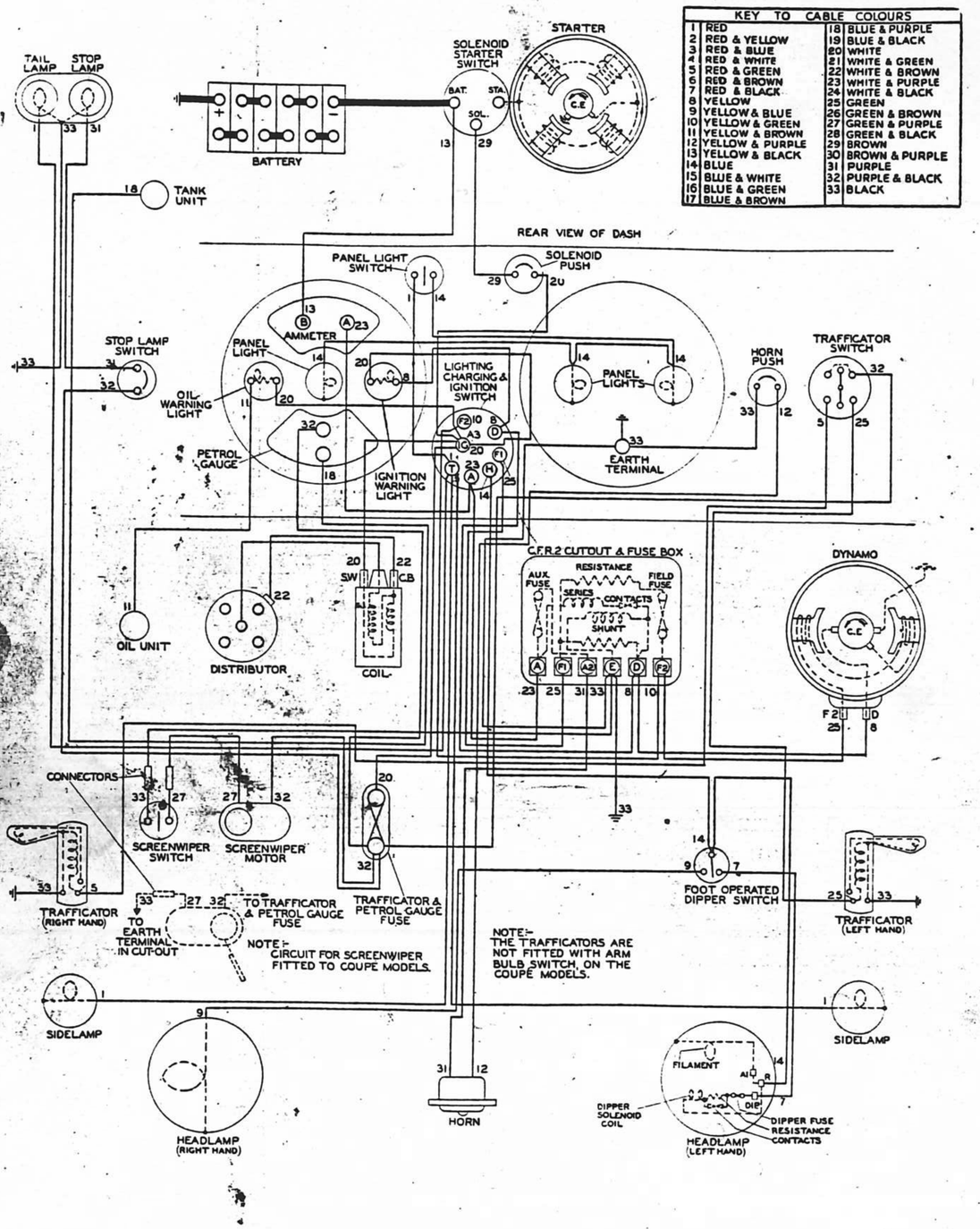
The surface of the commutator should be kept clean and free from oil and brush dust, etc. The best way to clean the commutator is to insert a fine duster held by means of a suitably-shaped piece of wood, against the commutator surface, slowly rotating the armature at the same time.

The bearings are packed with grease before leaving the works, and consequently no attention is needed.

After the car has run several thousand miles the dynamo should be dismantled for cleaning, adjustment and repacking the bearings with grease. This is preferably done by the nearest Lucas Service Depot.

Cut-out and Fuse.

This unit houses the cut-out and two fuses protecting the dynamo and the auxiliary accessories, e.g., the electric horn, etc. Underneath the terminal base are located the resistances which enable the dynamo output to be varied in different positions of the charging switch. The cut-out is connected between the dynamo and the battery. This unit is an automatic switch which prevents the battery discharging through the dynamo whenever the dynamo voltage is below that of the battery. This happens when the engine is stationary and also when starting before the engine speed is sufficient to cause the dynamo to generate at a higher voltage than the battery. The cut-out does not prevent the overcharging of the battery, as is sometimes supposed. This is prevented by the proper use of the charging switch, as described on page 46.



Lighting and Ignition Wiring Diagram

Fig. 16.

The cut-out is accurately set before leaving the Works and must not be tampered with. Take care not to close the cut-out contacts when removing or replacing the cover, as this may cause damage to the equipment. Should they become inadvertently closed when the engine is stationary, carefully pull them apart.

Dynamo Fuse.

The fuse on the right-hand side is connected in the dynamo field circuit and will blow in the event of the battery becoming disconnected from the dynamo due to broken wiring or to a loose or broken connection at the dynamo or battery terminals.

Auxiliary Accessories Fuse.

This fuse will blow in the event of a short circuit occurring in the wiring or any of the accessories connected through it, or in one of the accessories themselves.

STARTER MOTOR.

If, for any reason, the pinion wheel on the motor does not engage with the flywheel teeth examine the screwed sleeve on the armature spindle to see that it is free from dirt, and if necessary wash over with paraffin. Occasionally give it a few drops of thin machine oil. If by any chance the starter pinion should jam in the flywheel apply a spanner to the square end of the starter spindle and give a sharp tap with a hammer in an anti-clockwise direction. Access is obtained to the squared end of the shaft by withdrawing a small metal end cap.

As in the case of the dynamo, the surface of the commutator must be kept clean and free from oil, brush dust, etc.

SWITCH POSITIONS.

The combined lighting, charging, and ignition switch has four positions as follows:—

"LOW" CHARGE: Dynamo gives about half its daytime output.

"HIGH" CHARGE: Dynamo giving its full daytime output.

SIDE: Side lamps and tail lamps on.

HEAD: Head lamps, side, and tail lamps on.

The dynamo automatically gives its maximum output when the head lamps are switched on.

For further particulars on the use of the battery charging switch see page 46.

The ignition switch is combined with the lighting and charging switch and takes the form of a key which can be withdrawn when the ignition is off, thus ensuring the safety of the car in the absence of the owner.

To switch on the ignition depress the key and turn it clockwise. To switch off, depress and turn it anti-clockwise.

Coil Ignition Warning Light.

A warning lamp is provided in the instrument panel, which gives a red light when the ignition is on and the car is stationary. The warning light will also light when the engine is running very slowly.

After long service the warning lamp bulb may burn out. This will not affect the ignition but it should be replaced as soon as possible so as to act as a safeguard against leaving the ignition switched on when parking the car and consequently discharging the battery.

BATTERY.

It is of the utmost importance that the battery receives regular attention, as upon its good condition depends the satisfactory running of the starter motor, the illumination of the lamps, and the functioning of the coil ignition system.

Regular Inspection.

At least once a month the vent plugs in the top of the battery should be removed and the level of the acid solution examined. If necessary distilled water (which can be obtained from all chemists and most garages) should be added to bring the level to the top of the separators. If, however, acid solution has been spilled, it must be replaced by a dilute sulphuric acid solution of the same specific gravity as the electrolyte in the cell to which it is to be added. It is advisable to complete the inspection by measuring the specific gravity of the acid, as this gives a very good indication of the state of charge of the battery. An instrument known as a hydrometer is employed for this purpose, and these can be bought at any Lucas Service Depot. Finally see that the tops of the cells are clean and dry and that the terminals are tight and smeared with vaseline.

Charging of the Battery and Use of the Charging Switch.

The charging switch should be kept in the "low" position during summer and "high" in winter. For cars running under average conditions this will ensure that the battery is kept in a fully charged state.

In exceptional cases it may be advisable to use the switches out of season. For instance, if, in winter, the car is run regularly during the day with practically no night running, and the hydrometer readings are always found to be about 1.285, and if the acid level gets unusually low, then it is probable that the battery is being overcharged. In these circumstances move the charging switch to the "low" charge position. On the other hand, if exceptional use is made of the lamps and starter in the summer, causing the battery to be in a low state of charge (hydrometer readings of 1.200 or under), then run with the charging switch in the "high" charge position.

LAMPS.

Head Lamps.

These lamps are provided with an electrically operated anti-dazzle device arranged for operation by means of a switch mounted on the toeboard, the switch being foot operated. When the switch is moved to the dip position, the nearside head lamp beam is dipped and turned to the left side of the road, while at the same time the offside head lamp is switched off, thus causing no discomfort to approaching traffic. The movement of the reflector is effected by means of a solenoid and plunger.

A fuse is provided with the electrical dipper unit to protect the equipment in the event of the reflector failing to function properly. It is of the cartridge type and is carried in spring clips alongside the dipping mechanism. If the reflector fails to function, remove the fuse from its holders and see if there is a break in the fuse wire. A spare fuse is clipped to the reflector bracket.

If the fuse should blow repeatedly, and the cause of the trouble cannot be found, have the reflector examined at the nearest Lucas Service Depot.

The head lamps are provided with an adjustable mounting which is locked by a single nut.

In order to comply with the lighting regulations, the lamps are adjusted at the works.

The head lamp bulb can be focussed by moving the bulb holder backwards and forwards when the clamping clip at the back of the reflector is slackened. Care must be taken to tighten the clip after the adjustment.

Removing Lamp Front and Reflector.

To remove the front slacken the screw at the bottom of the rim and swing it aside from the bolt. The front can then be removed. When replacing the front, locate the top first, then press on. To remove the reflectors turn back the two ends of the cork washer at the top of the rim and withdraw the screw which can then be seen. The reflector can then be removed by turning it to the left.

Side Lamps.

In order to carry out a bulb replacement it is necessary to remove the front by withdrawing the fixing screw at the top of the lamp. When refitting, locate the bottom first and then secure with the screw.

Stop Tail Lamp.

The front of this lamp is secured by means of a screw and can be withdrawn when the screw is slackened.

Panel Illumination.

The panel lamps are incorporated in the instrument panel and are accessible from the back of the panel. The bulb holders can be released for bulb replacement by pulling them out.

The reflectors are protected by a transparent and colourless covering which enables any accidental finger marks to be removed with a soft cloth without affecting the surface of the reflector. Do not use metal polishes on Lucas reflectors.

Replacement of Bulbs.

The correct Lucas replacement bulbs for the lamps are: "Head lamps," Lucas No. 2; "Side, stop and tail lamps," Lucas No. 207.

Electric Windscreen Wiper.

The windscreen wiper requires practically no attention; all moving parts are packed with grease during assembly, and no adjustment is required.

If the rubber squeegee becomes worn or perished, it can easily be replaced at very small cost.

To start the wiper, pull out the handle and turn to disengage it from the switch. Then move switch to "ON" position. To stop the wiper, move switch to "OFF" position, pull out handle to disengage wiper blade from the gears, and turn the end of the handle into the top of the switch control.

Type fitted to Saloon.

To start the wiper, push in the knob and turn clockwise. To stop, move the switch to the "park" position and pull out.

"TRAFFICATORS."

Every two to three months or if the arms become stiff at any time raise each arm and apply a drop of thin machine oil to the catch pin between the arm and the operating mechanism. The "Trafficators" are kept in the closed position by means of a spring. The arms can be pulled out by hand. If any difficulty is experienced switch the "Trafficator" on and then supporting the arm in a horizontal position, move the switch to the off position.

Replacing a Bulb.

If at any time the arm fails to light up when in operation raise the arm as described above and examine the bulb, replacing it if necessary with a Lucas No. 256 3-watt festoon type bulb.

To remove the bulb, withdraw the screw on the underside of the arm and slide off the metal plate. To replace the plate, slide it on in an upwards direction, so that the side plates engage with the slots on the underside of the spindle bearing. Finally secure the plate by means of its fixing screw.

ELECTRIC HORN.

These horns, before being passed out of the Works, are adjusted to give their best performance and will give a long period of service without any attention; no subsequent adjustment is required.

If the horn becomes uncertain in its action giving only a choking sound, or does not vibrate, it does not follow that the horn has broken down. First ascertain that the trouble is not due to some outside source, e.g., a discharged battery, a loose connection or short circuit in the wiring of the horn or a blown fuse.

It is also possible that the performance of a horn may be impaired by the horn becoming loose on its mounting.

If the note is still unsatisfactory, do not attempt to dismantle the horn but return it to a Lucas Service Depot for examination.

COIL IGNITION EQUIPMENT.

The coil ignition equipment is provided with an automatic advance mechanism which relieves the driver of the need for constant adjustment of the hand ignition control. The device is situated in the distributor body and it consists of a centrifugally operated mechanism regulating the ignition advance in proportion to the engine speed. The mechanism is packed with grease during assembly and requires no attention.

Distributor Unit.

Occasionally remove the distributor moulding by pushing aside its two securing springs. See that the electrodes are clean and free from deposit. If necessary wipe out the distributor with a dry duster and clean the electrodes with a cloth moistened with petrol. Next examine the contact breaker. It is important that the contacts are kept free from any grease or oil. If they are burned or blackened they may be cleaned with very fine carborundum stone or fine emery cloth and afterwards with a cloth moistened with petrol. Care must be taken that all particles of dirt and metal dust are wiped away. It is possible that misfiring may be caused if the contacts are not kept clean.

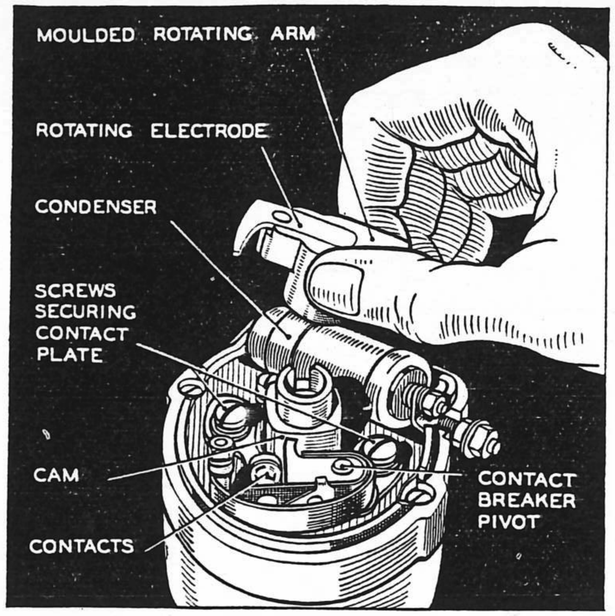


Fig. 17.

The contact breaker gap is set to 10—12 thousandths of an inch before leaving the works, and it will probably need adjusting only at long intervals. It is not advisable to alter the setting unless the gap varies considerably from that given above. If adjustment is necessary proceed as follows: Turn the engine round slowly by hand until the points are seen to be fully opened, then, using the ignit on screwdriver slacken the two screws securing the contact plate and move the plate until the gap is set to the thickness of the gauge. After making the adjustment care must be taken to tighten the locking screws.

Lubrication of Distributor Unit.

The distributor main bearing is lubricated from an oiler. This should be given a few drops of good quality thin machine oil about every 1,000 miles.

The cam should be given a smear of grease about every 5,000 miles or whenever it appears to be dry. Every 3,000 miles place a single drop of oil on the pivot on which the contact breaker works.

About every 3,000 miles lift off the rotating distributor arm and add a few drops of thin machine oil.

About every 3,000 miles the moving parts of the automatic timing control must be lubricated with a good grade of thin engine oil. To render the control accessible, remove the distributor moulding, and lift off the rotating distributor arm; then remove the contact

breaker moulding by removing its two securing screws. Take care to refit the contact breaker base moulding in its original position.

Coil.

The coil unit is not adjustable in any way, and requires no attention beyond seeing that the terminal connections are tight and the moulded coil top is kept clean.

HOW TO LOCATE AND REMEDY TROUBLE IN THE IGNITION EQUIPMENT.

Condition.	Method of detection of possible causes.	Remedy.
Engine will not fire.	Starter will not turn engine and lamps do not give good light. Battery discharged.	Start engine by hand. Battery should be recharged by running car for a long period during day time with charging switch in high charge position. Alternatively recharge from an independent electrical supply.
	Controls not set correctly for starting.	See that ignition is switched on, petrol turned on and everything is in order for starting.
	Remove lead from centre distributor terminal and hold it about ¼in. away from some metal part of the chassis, while engine is turned over. If sparks jump gap regularly, the coil and distributor are functioning correctly. If the coil does not spark, the trouble may be due to any of the following causes:—	Examine the sparking plugs, and if these are clean and the gaps correct, the trouble is due to carburetter, petrol supply, etc
	Fault in low tension wiring. Indicated by (1) No ammeter reading when engine is slowly turned and ignition switch is on, or (2) No spark occurs between the contacts when quickly separated by the fingers when the ignition switch is on.	Examine all cables in ignition circuit, and see that all connections are tight. See that battery terminals are secure.
	Dirty or pitted contacts.	Clean with fine carborundum stone or fine emery cloth and afterwards with a cloth moistened with petrol.
	Contact breaker out of adjustment. Turn engine until contacts are fully opened and test gap with gauge on screwdriver.	Adjust gap to gauge.

Condition.	Method of detection of possible causes.	Remedy.
Engine misfires.	Dirty or pitted contacts.	Clean with fine carborundum stone or fine emery cloth and afterwards with a cloth moistened with petrol.
	Contact breaker out of adjustment. Turn engine until contacts are fully opened and test gap with gauge on screwdriver.	Adjust gap to gauge.
Engine misfires.	Remove each sparking plug in turn, rest it on the cylinder head and observe whether a spark occurs at the points when the engine is turned. Irregular sparking may be due to dirty plugs, or defective high tension cables. If sparking is regular at all the plugs the trouble is probably due to engine defects.	Clean plugs and adjust the gaps to instructions on this page. Replace any lead if the insulation shows signs of deterioration or cracking. Examine carburetter, petrol supply, etc.

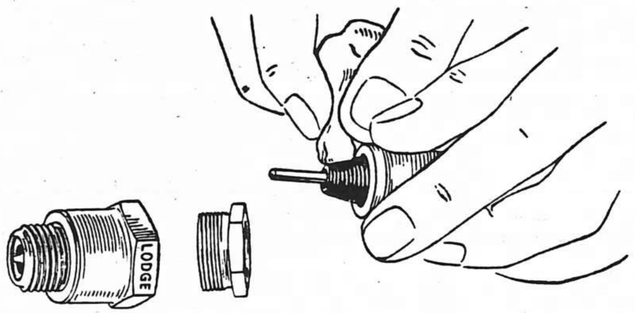


Fig. 18.

SPARKING PLUGS.

A little regular attention to the sparking plugs will help to ensure that the maximum efficiency is obtained from the engine. During the early part of its life, due to the newness of the moving parts, a fair amount of oil is likely to reach the combustion chambers and the interiors of the plugs. This will result in the plugs becoming fouled up, and they must be taken to pieces and thoroughly cleaned. The insulation should be wiped with a rag soaked in petrol (Fig. 18), but should not be scraped unless the carbon is caked hard, and then only with great care to avoid damaging the insulator. Metal parts can either be wiped with a rag or soaked in petrol, washed in paraffin or scraped (Fig. 19).

When taking the plug to pieces it is important that the metal case should not be distorted. For this reason it is advisable to use a box spanner on the gland nut. If the hexagon of the metal body of the plug is held in a vice, the vice must not be screwed up so as to clamp it, but just sufficiently tight to prevent it from turning (Fig. 20). After cleaning, and before screwing the plug together again, the surface of the points should be rubbed over with a piece of smooth emery paper, and it is also advisable to see that there is no grit in the joint between the insulator and the metal body, as otherwise it will be difficult to make the plug gas-tight. After assembling the plug the spark gap should be adjusted to .018in., or roughly the thickness of an ordinary visiting card. (A gauge may be obtained free of charge on application to the makers of the plugs fitted to our cars, Messrs. Lodge Plugs Ltd., Rugby, enclosing 1½d. to cover postage.)

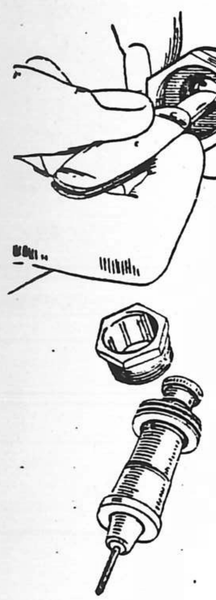


Fig. 19.

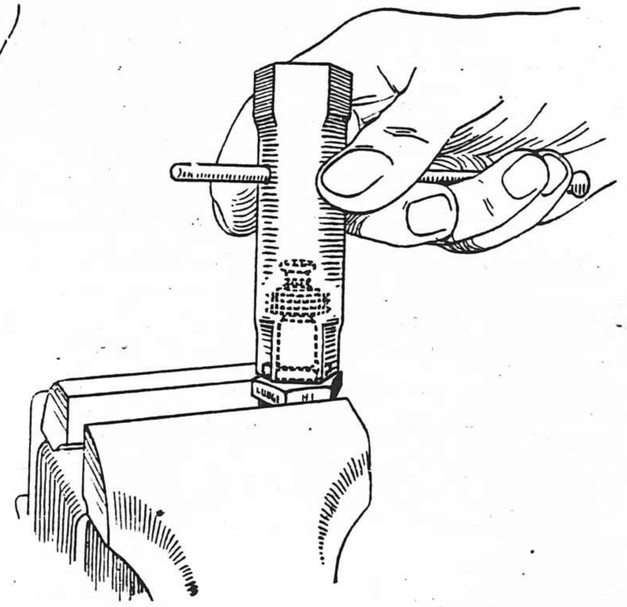


Fig. 20

When the engine is thoroughly "run in" it is unlikely that the plug will require frequent cleaning, unless a "leaded" fuel is being used, in which case it is advisable to dismantle the plugs and clean them at least every 1,000 miles. In normal use the spark gaps will get gradually wider, and this throws an unnecessary strain on the coil. It is therefore advisable occasionally to adjust the spark gaps by bending the earth or side electrodes towards the centre pin.

The most suitable type of plug is fitted to your engine as a result of careful tests, and it is advisable when renewing your plugs to see that the same model is obtained.

Inflation.

The whole principle of the pneumatic tyre is the employment of compressed air to form a cushion between the vehicle and the road. The inner tube is merely the "container," and the outer cover its protective covering. The air carries the load.

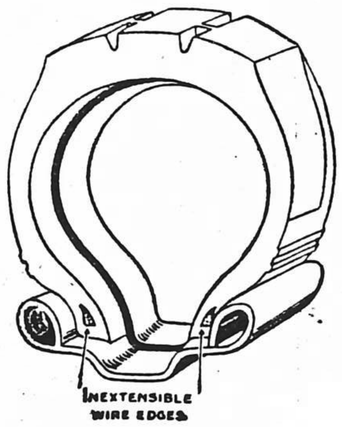


Fig. 21.

A pneumatic tyre is simply an arrangement to utilize a quantity of compressed air around a vehicle wheel for the purpose of supporting the load, absorbing shock, and, when occasion demands, transmitting the power for driving and retarding the vehicle. The tyre manufacturer supplies the tube, and the cover. The quantity of compressed air necessary to make the tyre pneumatic **is not supplied by the tyre maker.** It is the duty of the tyre user to supply and maintain the correct air pressure, without which the pneumatic tyre cannot function efficiently. If pressure is less than specified by the tyre maker, the life of the cover and tube will be diminished, mainly because of the excessive bending and flexing to which they will be subjected. (Pressure is conveniently measured in lbs. per square inch.)

Thus the key to economical and efficient tyre service is "Maintain the correct pressure—test your tyres at least weekly." Any loss of air can be made up then with very little effort. A gauge applied to the valve must be used; it is seldom possible to detect an under-inflated tyre from its appearance.

The correct pressures for the B.S.A. car normally loaded are:—
All models (front and rear), 24lbs. per square inch.

Fitting and Removal Instructions for Tyres.

Special Note.

Inextensible wires are incorporated in the edges of wired type tyres. Therefore do not attempt to stretch the wire edges of the tyre cover over the rim edge.

Force is entirely unnecessary and may be dangerous, as it merely tends to damage the cover edges and serves no useful purpose.

Fitting or removing will be quite easy if the wire edges are carefully adjusted into the rim base; if it is not found to be easy, the operation is not being correctly performed.

To Remove Tyre.

Remove all valve parts, and push both cover edges into the base of the rim at the part diametrically opposite the valve, then lever the cover edges near the valve over the rim edge.

To Fit Tyre.

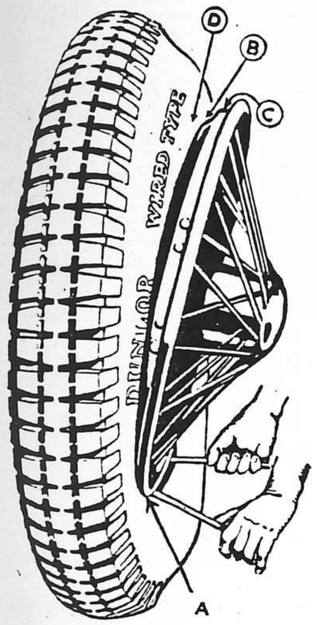


*Fig.*22.

Push one edge of the cover over the edge of the rim. It will go quite easily if the part first put on is pushed right down into the base rim.

Very slightly inflate the inner tube—do not distend it—place it in the cover, with the valve through the hole in the rim. (Take care that the valve, which is fitted in the side of the tube, is on the correct side of the rim.)

Fit the second edge of the cover, commencing at a point diametrically opposite the valve, and pushing the edge down into the base of the rim.

Small levers may be gently used to ease the last few inches over the rim edge

Whilst inflating, see that the edges of the cover are seated evenly round the rim; check by the line on the cover.

Alignment of Road Wheels.

In the normal course of wear and tear, or due to minor impacts, the wheels of a car often develop irregularities or cease to point directly towards the direction of motion.

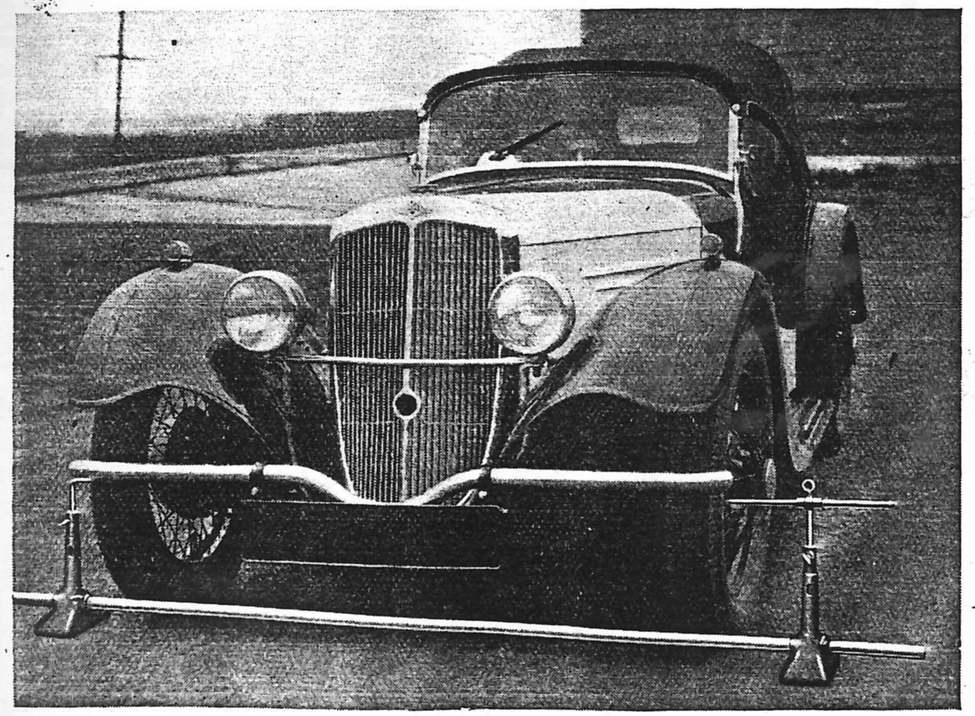


Fig. 23

Any Dunlop service depot or competent garage possesses an alignment gauge, and can test the wheels of any car. If a number of cars are kept, it would pay to purchase a gauge, such as the cheap and efficient Dunlop gauge, illustrated in Fig. 23.

The majority of cases of misalignment can be corrected by adjustment of the track-rod—a few minutes' work for any competent mechanic. The "toe-in" for front wheels should not exceed one-eighth inch; "toe-out," even in the smallest degree, is to be avoided. Rear wheels should be parallel.

Oil and Grease.

These substances are very detrimental in their effect on rubber and should never be allowed to remain in contact with tyres for any length of time.

Oil can be removed from tyres by the use of rag and a very little petrol; use petrol sparingly, as this also is a solvent of rubber.

Why Tyre Results vary.

Scientific investigations of the actual effect of some of the major factors have recently been made, and the results are surprising.

Speed.

Car owners vary greatly in the speed at which they habitually drive. The rate of tread wear at 45 m.p.h. is double that at 35 m.p.h.

Acceleration.

During wheel slippage caused by rapid acceleration, excessive tread wear takes place due to the abrasion of the tyre against the road surface

Braking.

Some owners "drive on the brakes." It is established that where this practice is adopted, and especially if stops are frequent, the rate of tyre wear increases considerably.

Dunlop Service.

A fully equipped Service department is maintained at all Dunlop depots, staffed by tyre experts, who have at the same time an intimate knowledge of the users' requirements. Through this organization, the wide experience of the Dunlop Company on tyre and wheel problems of all kinds is always at the disposal of motorists entirely without cost or obligation. Application can be made personally or by letter to the Service department at any Dunlop Depot, or to the General Service Manager, Fort Dunlop, Birmingham; all motorists can rely on receiving courteous attention and practical help.

DIAGNOSING TROUBLES.

If the instructions given in the previous pages are followed, it is most unlikely that any actual trouble will ever be experienced. Nevertheless, a very small derangement, due, for instance, to dirt in the petrol supply, might at some time cause annoyance to an owner. In the following brief notes the causes of such possible troubles are therefore briefly diagnosed and instructions given for correcting them. In conjunction with the previous instructions as to the best method of effecting any adjustments which become necessary from time to time, these notes should make the owner independent of skilled advice

Engine will not start.

A. Engine does not revolve when starter button is pressed. Self-starter system is out of order. See instructions on "Electrical Equipment," page 43. Until fault is rectified engine can be started by means of starting handle (see page 2).

B. Engine revolves but will not start. Trouble may be due to either petrol supply or ignition.

1. Remove float chamber and see if petrol flows from the needle valve when priming lever on petrol pump is operated. If so, petrol supply is correct. If engine still refuses to start, examine for following troubles.

   H.T. wires loose.

   Sparking plugs dirty, or defective, or gap not correct (see page 52). Distributor contact breaker arm stuck or points wrongly adjusted.

2. Petrol does not flow when float chamber is removed. Trouble due to choked petrol supply. Clean filter, see petrol pipe is not choked. Remove obstruction (see instructions on carburetter, page 29).

   Examine petrol pump (see page 25).

Engine starts but stops again immediately.

A. As soon as the engine starts, depress accelerator pedal gently, and race engine for a moment to warm it up, pulling out starter carburetter control if engine spits back.

B. If engine will not respond to accelerator, but stops immediately accelerator is depressed, trouble is probably due to dirt or water in jets. Remove jets and clean, draining all petrol from float chamber.

Engine misfires or spits back in carburetter.

A. If engine cold, trouble will disappear when engine is warmed up

B. If trouble occurs when engine is warmed up, probably due to water or dirt in jets. Remove jets and clean.

Engine misses on one or more cylinders.

A. Wire disconnected from sparking plug or distributor.

B. Due to defective or oiled-up plug. Run engine for a minute and then feel plugs. Cooler plug is one giving trouble. Remove plug and clean or replace as required.

C. If not either of the above, probably tappet s'acked back or valve spring broken. Remove valve cover and examine (see pages 6 or 9).

Engine stops suddenly.

A. If no warning of stoppage, trouble due to ignition. Examine distributor.

B. If engine spits back before stopping, probably due to petrol supply. See if there is petrol in the tank. Examine for stoppage in pipe filter or jets.

Engine loses power.

A. See handbrake is off, and brakes not rubbing.

B. Check valve tappet adjustment and examine valve springs.

C. Make certain that ignition automatic advance mechanism in distributor is working correctly.

D. If the trouble comes on gradually, and the car has covered considerable mileage, decarbonise engine at first opportunity (see page 6).

Engine noisy or causing vibration.

A. Check and adjust all tappet clearances.

B. See that all bolts holding engine to frame are properly tightened.

Clutch slips.

A. See that there is sufficient oil in clutch chamber (see page 16).

B. Make sure that pedal lever is not fouling floor boards or timing cover. If it is, adjust (see page 19).

Address all Enquiries to:—

Service Dept., B.S.A. Cycles Ltd.

Birmingham, 11

and ALWAYS quote the

Engine and Chassis Nos., Series and Model Nos., Date of Purchase, Dealer from whom the Car was obtained.

SEE PAGE 64.

LUCAS GUARANTEE.

We stand by all goods of our manufacture. All usual and reasonable precautions have been taken by us to ensure excellence of materials and workmanship, and in the event of any defect in any LUCAS product which is not caused by wear and tear, misuse, accident, or negligence, being disclosed within six months of its being put into use, we will either supply new parts or components in exchange for those defective, or repair such defective parts or components, free of charge. We do not undertake to dismantle or re-assemble, or bear the cost of dismantling or re-assembling any such part or component on the vehicle or chassis. This undertaking shall be deemed to exclude any and every obligation whatsoever, and all liability for any loss or damage howsoever or whensoever caused or arising, except the cost of replacement or repair, in accordance with this undertaking.

All owners of Lucas equipment are urged to take advantage of the facilities offered by Lucas Service.

For the benefit of the users of our equipment we have established Service Depots in all large towns, which are not only at your disposal for repairs, overhauls and adjustments, but to give free advice. If you experience any difficulty with any part of the equipment, do not hesitate to consult us, we shall be only too pleased to be of assistance. The best course to adopt is to call at our nearest Service Depot, the addresses of which are given below, when the equipment can be examined as a whole.

If it is necessary to replace any part, order Genuine Lucas Spares. It is obvious that only the designers and manufacturers of the equipment are in a position to make replacement parts which will give satisfactory and lasting service.

When corresponding with Depots, or when ordering spare parts, give the name, model and year of the engine: the unit of equipment: and particular part in question. Units of equipment are identified by letters and numbers stamped or moulded on some part of the article. It is essential to quote this marking to ensure that correct replacements are sent.

Illustrated spare parts lists are available on application. State year, make, and model of engine.

BELFAST	**51/55, Upper Library Street**
Telephone: BELFAST 25617	Telegrams: "SERVDEP, BELFAST"
BIRMINGHAM, 18	**Great Hampton Street**
Telephone: CENTRAL 8401 (10 lines)	Telegrams: "LUCAS, BIRMINGHAM"
BRIGHTON	**85, Old Shoreham Road, Hove**
Telephone: HOVE 1146 (4 lines)	Telegrams: "LUSERV, BRIGHTON"
BRISTOL	**345, Bath Road**
Telephone: BRISTOL 76001 (4 lines)	Telegrams: "KINGLY, BRISTOL"
CARDIFF	**54a, Penarth Road**
Telephone: CARDIFF 4603 (4 lines)	Telegrams: "LUCAS, CARDIFF"
COVENTRY	**Priory Street**
Telephone: COVENTRY 3068	Telegrams: "LUCAS, COVENTRY"
DUBLIN	**Portland Street North, North Circular Road**
Telephone: DUBLIN 72601 (4 lines)	Telegrams: "LUSERV, DUBLIN"
EDINBURGH, 11	**60, Stevenson Road, Gorgie**
Telephone: EDINBURGH 62921 (4 lines)	Telegrams: "LUSERV, EDINBURGH"
GLASGOW	**...Grant Street (St. George's Road)**
Telephone: DOUGLAS 3075 (5 lines)	Telegrams: "LUCAS, GLASGOW"
LEEDS	**64, Roseville Road**
Telephone: LEEDS 28591 (5 lines)	Telegrams: "LUSERDEP, LEEDS"
LIVERPOOL, 13	**450/456, Edge Lane**
Telephone: OLD SWAN 1408 (6 lines)	Telegrams: "LUSERV, LIVERPOOL"
LONDON	**Dordrecht Road, Acton Vale, W.3**
Telephone: SHEPHERDS BUSH 3160 (10 lines)	Telegrams: "DYNOMAGNA, EALUX, LONDON"
LONDON	**757/759, High Road, Leyton, E.10**
Telephone: LEYTONSTONE 3361 (5 lines)	Telegrams: "LUSERDEP, LEYSTONE, LONDON"
LONDON	**155, Merton Road, Wandsworth, S.W.18**
Telephone: PUTNEY 5131 (5 lines)	Telegrams: "LUSERV, PUT, LONDON"
MANCHESTER	**Talbot Road, Stretford**
Telephone: LONGFORD 1101 (5 lines)	Telegrams: "LUCAS, STRETFORD"
NEWCASTLE-ON-TYNE, 2	**64/66, St. Mary's Place**
Telephone: CENTRAL 25571 (3 lines)	Telegrams: "MOTOLITE, NEWCASTLE-ON-TYNE"

IN ADDITION THERE ARE LUCAS-C.A.V.-ROTAX OFFICIAL BATTERY SERVICE AGENTS, OFFICIAL SPARES STOCKISTS AND DEALERS IN IMPORTANT CENTRES THROUGHOUT THE COUNTRY. LISTS ON APPLICATION.

PROPRIETARY INSTRUMENTS, FITTINGS, AND ACCESSORIES.

No expense is spared to secure as standard equipment the most suitable and highest quality instruments and accessories. Nevertheless, the Company's guarantee does not cover such parts, and in the event of trouble being experienced the parts in question should be returned to and claims made direct on the actual manufacturers, who will deal with them on the terms of their respective guarantees, as follows:

Tyres: Messrs. Dunlop Rubber Co. Ltd., Fort Dunlop, Birmingham.

Electrical Equipment: Messrs. Joseph Lucas Ltd., Birmingham, or Service Depots.

Speedometers and Clocks: Messrs. British Jaeger Instruments, Chronos Works, North Circular Road, London, N.W.2.

Carburetters: Messrs. Solex Ltd., 223-231, Marylebone Road, London.

Fuel Pump: Messrs. Amal Ltd., Holford Works, Perry Bar, Birmingham 20.

Grease Guns: Messrs. Tecalemit Ltd., Great West Road, Brentford, Middlesex.

SPECIAL NOTE.

Prompt attention to all claims under guarantee will be ensured if your covering letter gives—

(1) Make, year, and model of car.

(2) Date of purchase and name of Dealer from whom obtained.

See page 64.

B.S.A. CYCLES LTD.

BIRMINGHAM, 11.

Phone No. Vic. 2381 (10 lines)

Directors

GEOFFREY D. BURTON (*Chairman*). J. W. BRYAN. W. F. JANES. J. LEEK.

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B.S.A. SCOUT CAR

SPARE PARTS STOCKISTS.

Town.	*Name of Stockist.*	*Address.*	*Telephone No.*	*Telegraphic Address.*
Aberdeen	William Cheyne	174-183, Holburn Street	4767/8	Westgar.
Aldershot	Phillips Bros.	Birchett Road	300	Phillips, Cycles Aldershot.
Belfast	W. J. Chambers	106, Donegall Pass	2263	Fastmote, B'fast
Bellshill	J. Potts & Co.	Station Garage	6	Potts, Bellshill.
Bexhill-on-Sea	Western Road Garage	Western Road	1515	Wesgarage, Bexhill-on-Sea.
Birmingham	County Cycle & Motor Co.	300/1, Broad Street	Midland 2671/2	Comocyco, Birmingham.
Brighton	Redhill Motor & Cycle Works Ltd.	20, Gloucester Place	—	—
Bristol	Bawn's Motors	170/5, Coronation Road	63516/7	Bawns, Bristol.
Brynmawr	Nick Carter	Hilltop Garage	262	Brynmawr 262.
Cardiff	R. Bevan & Co.	Castle Street	1808	—
Chatham	H. G. Russell	Medway Garage, Medway Street	—	—
Cheltenham	North St. Motors Ltd.	North Street	4933	—
Chester	Davies Bros.	34, Bridge Street	510	—
Clacton-on-Sea	Westwood's Motors	183, Old Road	—	—
Cliftonville	H. S. Young (Cliftonville Motors)	57, Sweyn Road	—	—
Coventry	Coventry Motor Mart	86, London Road	3200	Coventry Motor Mart.
Croydon	Godfreys Ltd.	228-234, London Road.	—	—
Denham	Denham Service Station	Oxford Road	90	—
Derby	Ingles Provincial Garages Ltd.	Walbrook Road	289	—
Douglas, I.O.M.	W. H. Shimmin & Co.	Crescent Garage, Queens Promenade	610	—
Dunstable	B. G. England	Half Moon Garage, London Road	207	—
Edinburgh	Alexander & Co.	113/7, Lothian Road	21176	Motorcycles, Edinburgh.
EnfieldHighway	D. J. Shepherd & Co. (Enfield) Ltd.	Hertford Road	—	—
Exeter	Wessex Garage Co.	Longbrook Street	2342	Wessex Garage, Exeter.
Glasgow	Malcolm & Allen Ltd.	499, Eglington Street	South 2430	Rheostat, Glasgow.
Guildford	E. Pascall	Central Buildings, North Street	255	—
Henley-on-Thames	Talbot Garage	Station Road	222	Talbot Garage, Henley-on-T's.
Hull	Jordon & Co. (Hull) Ltd.	5, 6, 8, 20, 20a, Story St.	36809) (2 lines)	Gumption, Hull.
Ipswich	Revetts Ltd.	St. Margaret's Green	2822	Revetts Motors, Ipswich.
Jersey	St. Helier Garages	87, Bath Street	293	—
Kendal	Tom O'Loughlin	26a, Strickland Gate	315	—

Town.	*Name of Stockist.*	*Address.*	*Telephone No.*	*Telegraphic Address.*
Kingston-by-pass	T. G. Meeten	Shannon Corner, New Maldon.	—	—
Kingston	Bennettsof KingstonLtd.	57, Eden Street	—	—
Kirkcudbright..	J. J. Aitken & Co. ..	Tongland Garage ..	115	—
Lancaster.. ..	Loxham's Garages Ltd..	Penny Street	868	—
Leeds..	Reg. Horsley	24, King Edward Street	21515/6	Sunbeam, Leeds.
Leicester	E. W. Campion & Sons..	45, Braunstone Gate ..	58054	—
Lincoln	Wests (Lincoln) Ltd. ..	115, High Street.. ..	164	West's Garage, Lincoln.
Liverpool.. ..	Colmore Depot	Russell Buildings, School Lane	Royal 1271/2	—
Llanrwst	T. Jones Garage	Paris House, Station Rd.	136	—
London	Basil Roy Ltd.	161, Great Portland St.	Welbeck 1138/9	—
„ **S.W.2**. .	Hackford Motors Ltd...	180-182, Acre Lane, Brixton.	—	—
„ **N.W.9** .	Blackbird Hill Garage Ltd.	Blackbird Hill, Kingsbury Lane.	—	—
„ **N.W.1** .	Godfreys Ltd.	366, Euston Road ..	—	—
„ **E.7** ..	Lovetts	418, Romford Road, Forest Gate.	—	—
„ **N.W.7** .	Mebes & Mebes Ltd...	The Broadway, Mill Hill	—	—
Macclesfield ..	Gleave Motors	Davenport Street ..	2117	—
Maidstone ..	Redhill Motor & Cycle Works Ltd.	The Broadway	—	—
Malmesbury ..	Stan. Hudson	16, High Street	121	—
Manchester ..	Tom Davies	229/231, Deansgate ..	Blackfriars 0536	—
„ ..	Colmore Depot	200, Deansgate	Blackfriars 3322	—
„ ..	Colmore Depot	543, Chester Road, Old Trafford	Traff Park 2233 (4 lines)	Coldep, Manchester.
Middlesbrough.	Pallister, Yare & Cobb..	134, Marton Road ..	2873	Payacob, Middlesbrough
Newcastle-on-Tyne	Dene Motor Co. Ltd...	Haymarket	21837	Ened, Newcastle-on-Tyne
Newcastle, Staffs	Pepper's Garages	Grosvenor Garage, London Road	6696	—
Newport, Mon..	Vernon's Garage	Chapel Street	3834	Vernons, Newport, Mon.
Newton-le-Willows	Lancashire Car Distributors Ltd.	—	925	Cardis, Newton-le-Willows.
Northampton..	Kingsthorpe Motors Ltd.	50, Harborough Road..	985	Northampton 985.
Nottingham ..	Exors. of W. Henstock..	Hollowstone Garage ..	—	—
Oxford	Laytons of Oxford Ltd.	New Road	381	Integrity, Oxford.
Plymouth ..	Mrs. A. E. Snell	Frankfort Street	3706	—
Port Talbot ..	Oscar Chess Ltd... ..	The Motor House ..	349	—
Preston	Loxham's Garages ..	Fishergate	4242 (6 lines) Service 4247	—
Redhill	Redhill Motor & Cycle Works	50, Brighton Road ..	327	—
St. Annes, Lancs.	Edgar Sumner Ltd. ..	18, St. Andrews Road South	434	—

Town.	*Name of Stockist.*	*Address.*	*Telephone No.*	*Telegraphic Address.*
Sheffield	W. Wragg Ltd.	Wellington Street ..	26098	Wragg, Sheffield 26098
Southampton..	Modern Light Cars Ltd.	110/112, Lodge Road..	6361 (2 lines)	—
Southport ..	H. F. Brockbank	62, King Street	5054	—
Southsea	P. Kiln Ltd.	Elm Grove	P'mouth 4973	Percy Kiln, Southsea.
Stirling	A. Morrison	Milton Garage	Bannockburn 9	—
Sunderland ..	Dunn's Garages Ltd. ..	53/4, Northbridge Street	4994	—
Sutton-in-Ashfield	The Exors. of W. Henstock	29, Forest Street ..	90	Henstock, 90 Sutton-in-A'ld.
Swansea	J. Brayley	15, Picton Place	4733	—
Tavistock.. ..	R. Carr	Plymouth Road	102	Carr's, Tavis'k.
Truro	Taylor's Transport Co...	Lemon Quay	174	—
TunbridgeWells	G. E. Tunbridge	2, Vale Road	—	—
Wakefield ..	W. Parkinson	38, Ings Road	2087	—
Wallasey	Ward's Motor Stores ..	3/13, Leasowe Road ..	4151	—
Walsall	Kennings Ltd.	Kenning House, Hatherton Road	2283/4/5	Kenning 2283, Walsall.

USEFUL DATA.

ENGINE (Four-cylinder).—63$\frac{7}{8}$ mm. bore × 95 mm. stroke, 1.203 c.c.; 9.9 h.p. Treasury rating; £7.10s. tax; compression ratio, 6.6.

GEAR RATIOS.—5.2 top, 7.9 second, 17.2 first, 20.8 reverse.

WHEELS.—4.50in. × 17in. on 2.50 WB rim.

RADIATOR CAPACITY.—24 pints.

EXTERNAL DIMENSIONS:

	2-Seater	4-Seater	Saloon
Wheelbase	7ft. 11½in.	7ft. 11½in.	7ft. 11½in.
Track	4ft. ⅝in.	4ft. ⅝in.	4ft. ⅝in.
Overall Height	4ft. 7½in.	4ft. 10½in.	4ft. 10½in.
Overall Length ...	12ft.	12ft. 8½in.	12ft. 4in.
Overall Width	4ft. 9⅝in.	4ft. 9⅝in.	4ft. 9⅝in.
Ground Clearance ...	6in.	6in.	6in.
Unladen Weight (approx.)	14¾cwt.	15¾cwt.	17cwt.
Turning Circle	40ft.	40ft.	40ft.

1¾ turns of steering wheel, lock to lock.

WHEN IN COMMUNICATION WITH THE MANUFACTURERS ALWAYS QUOTE:

Name .....

Address .....

.....

Dealer .....

.....

Model ..... *Year* .....

Date of Purchase .....

Engine No .....

Frame No .....

NOTES.

George E. Grey Co.,
Jolifant House
Ilford

12V → 126
C45 NV 3/L-1
⊕ 22-8137

INDEX.

Oil Change 3/5-20 12/1.
Flex Coupling 3/5-30 2/11/59