

INSTRUCTION MANUAL

FOR THE

“WOLSELEY”

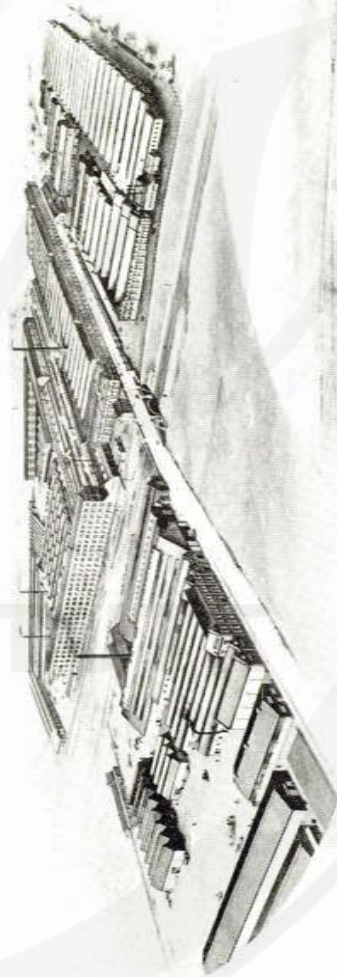
FIFTEEN

WOLSELEY MOTORS LTD

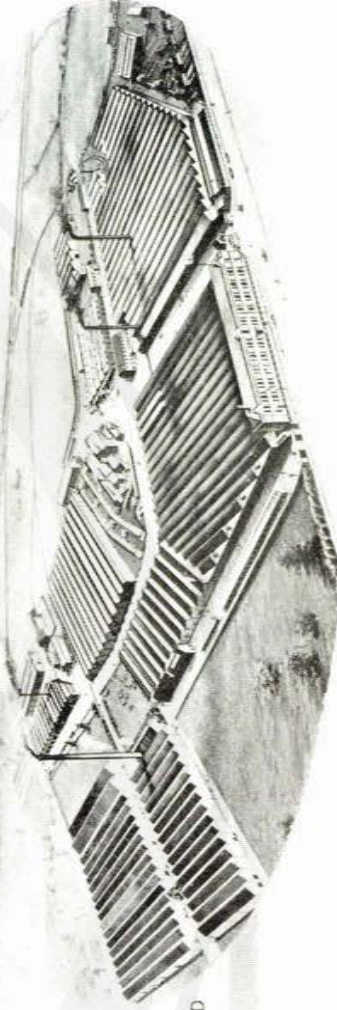
*Proprietors* — VICKERS LIMITED



ADDERLEY PARK  
WORKS



WARD END  
WORKS



*The Birmingham Works of WOLSELEY MOTORS LTD. Total Area 100 acres.*

No. 598.



By Appointment to  
H.M. Queen Alexandra

Price 7 6 net.



THE "WOLSELEY" FIFTEEN TOURING CAR

# THE "WOLSELEY" FIFTEEN INSTRUCTION MANUAL



**WOLSELEY MOTORS LIMITED**

(Proprietors: VICKERS LIMITED).

HEAD OFFICE:

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**BOMBAY: Sandhurst Bridge Road, Chaupatty.**

Makers' Car No. \_\_\_\_\_

Type of Car \_\_\_\_\_

Owner: \_\_\_\_\_

Car Registration No. \_\_\_\_\_

License No. \_\_\_\_\_

Date Renewal Due \_\_\_\_\_

*This is the No. to be quoted in all correspondence or when ordering replacements.*

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## THE "WOLSELEY" FIFTEEN.

### Introduction.

THIS book of reference has been compiled for the help and guidance of our clients in the care, adjustment, and maintenance of the "Wolseley" Fifteen Autocar. The descriptions, illustrations and photographs have been so arranged that all mechanical details may be easily followed even by those who do not possess a mechanical training.

The book is very fully illustrated, as we consider it is easier to impart information with the aid of photographs and diagrams than by a long technical description. We have given our recommendations in as clear and concise a form as possible, so that all users of "Wolseley" Autocars may benefit by our accumulated experience and extensive experiments. At the same time we do not advise a novice to undertake the charge of a car without having first received some practical training in its working and adjustment.

In compiling this book an elementary knowledge of the control and operation of autocars has been pre-supposed.

We have endeavoured as far as possible to deal with all difficulties which may arise, but at the same time realise that there will be times when it is difficult to diagnose some fault. We are always pleased to give such cases our special attention.

WOLSELEY MOTORS LIMITED

(Proprietors VICKERS LIMITED)

ADDERLEY PARK, BIRMINGHAM.





THE CHASSIS OF THE "WOLSELEY 7" FOURER.

## I.

### General Description.

The chassis frame is constructed of pressed steel, and is of tapered channel section. The engine has four cylinders, the bore and stroke of which are  $3\frac{1}{8}$  inches (80 m/m) and  $5\frac{1}{8}$  inches (130 m/m) respectively. The normal engine speed is 1,700 revolutions per minute. The Treasury rating is 15.6.

The clutch is of the multiple disc type, the pressure of the clutch spring being readily adjustable.

The gear box is of the sliding spur gear type, giving three speeds forward and one reverse, the gear change being by side lever and selector gate mechanism.

A live type rear axle, driven by worm gearing, is fitted.

All four wheels are mounted on Timken taper roller bearings.

The petrol tank is situated between the frame at the rear of the chassis, and petrol is fed to the carburetter by a vacuum feed mounted under the bonnet.

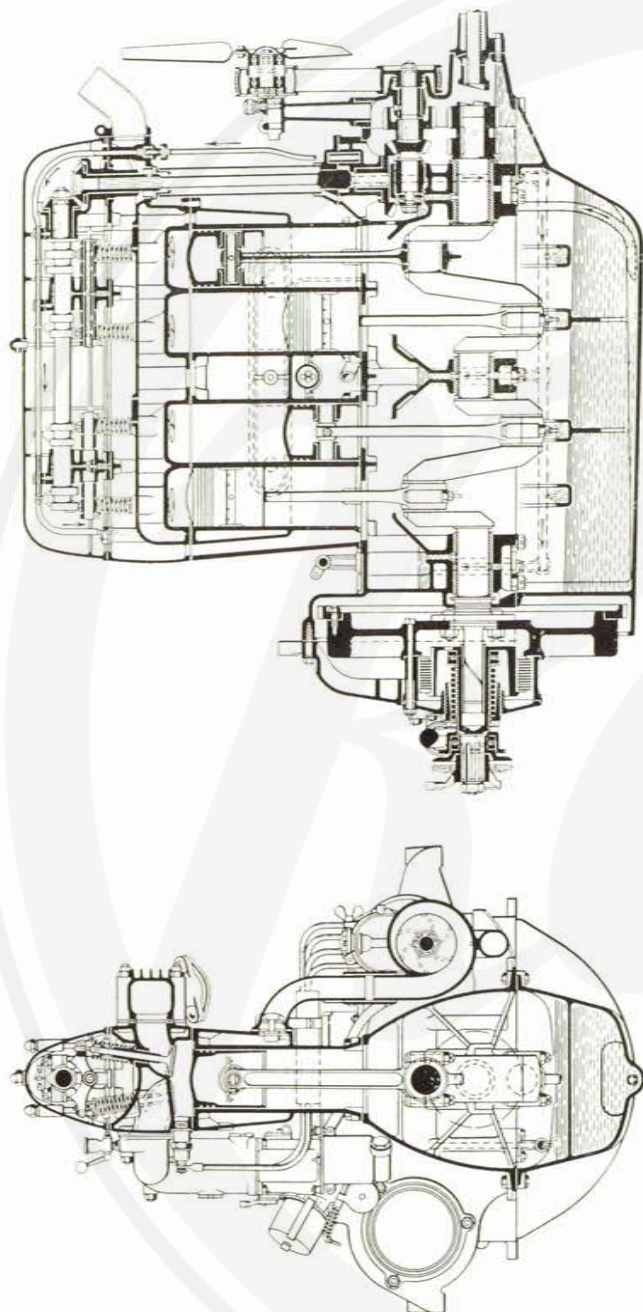
The steering is through a worm and wheel, and the throttle and ignition control levers are mounted on the steering wheel.

Two independent brakes are fitted, operating inside drums attached to the rear wheels, and actuated by a pedal and hand lever respectively.

The radiator is of the honeycomb type, additional draught being induced by a fan, and a centrifugal pump is provided for water circulation.

Electric starting and lighting equipment is included in the standard specification.





LONGITUDINAL SECTION.  
SECTION OF THE "WOLSELEY" FIFTEEN HORSE ENGINE.

TRANSVERSE SECTION.

## II.

### The Motor.

The motor is constructed with monobloc cylinders and detachable cylinder head. The valves are situated in the head, and are operated through rockers by an overhead camshaft. The Wolseley patented camshaft drive is by an inverted tooth chain from the crankshaft to a countershaft immediately above it, from which a vertical shaft carries the drive through bevel gearing to the camshaft. The outer end of the countershaft carries the fan driving pulley.

The valves, which are inclined from the vertical, are actuated by set screws in the rocker arms, these set screws constituting a ready means of adjusting the clearance. The camshaft and valve operating mechanism is enclosed by an aluminium cover, which is removable by unscrewing four nuts.

The crankshaft is of the three-bearing type, and is carried in white metal bearings. The gudgeon pins work in phosphor bronze bearings secured in the pistons, the pins being fixed in the small ends of the connecting rods. The big ends of the connecting rods are lined with white metal.

The aluminium alloy pistons, which have three rings, are lubricated by splash from dipper on the connecting rods.

Although the amount of oil splashed to the pistons and cylinder walls is reduced to the minimum compatible with efficient service, some is liable to work past the rings to the tops of the pistons and the cylinder heads; these therefore require cleaning occasionally to remove the carbon deposit. This may be readily accomplished by removing the cylinder head. The sequence of operations is as follows—

Empty the radiator and detach the top water connection from the cylinder head. Turn off the petrol at the stop cock, and dis-



connect the petrol pipe from the carburetter. Uncouple the carburetter controls. Disconnect the carburetter heating water-pipe and the Autovac suction pipe from the induction pipe. The induction pipe and carburetter may then be detached from the cylinder head. Uncouple the plug wires. Detach the exhaust manifold from the downtake pipe. Disconnect the camshaft oil pipe. Remove the camshaft cover, and unscrew the nuts holding down the cylinder head. Loosen set screw in top of vertical shaft. Great care should be taken not to damage the induction pipe joints or the cylinder joint if it is intended to use these again.

It is advisable, while the cylinder head is removed, to examine the valves and seats as to their condition. If these exhibit a dirty or pitted surface, they should be ground in in accordance with instructions given on page 22.

The faces of the cylinder and head must be thoroughly scraped and cleaned, but on no account should a file be used for this purpose.

When refitting the cylinder head a new copper and asbestos joint should preferably be used, although the old one may be used again if it is intact.

Great care must be taken that the joint does not burr up around the stud holes; also that it is clear of the cylinder bores.

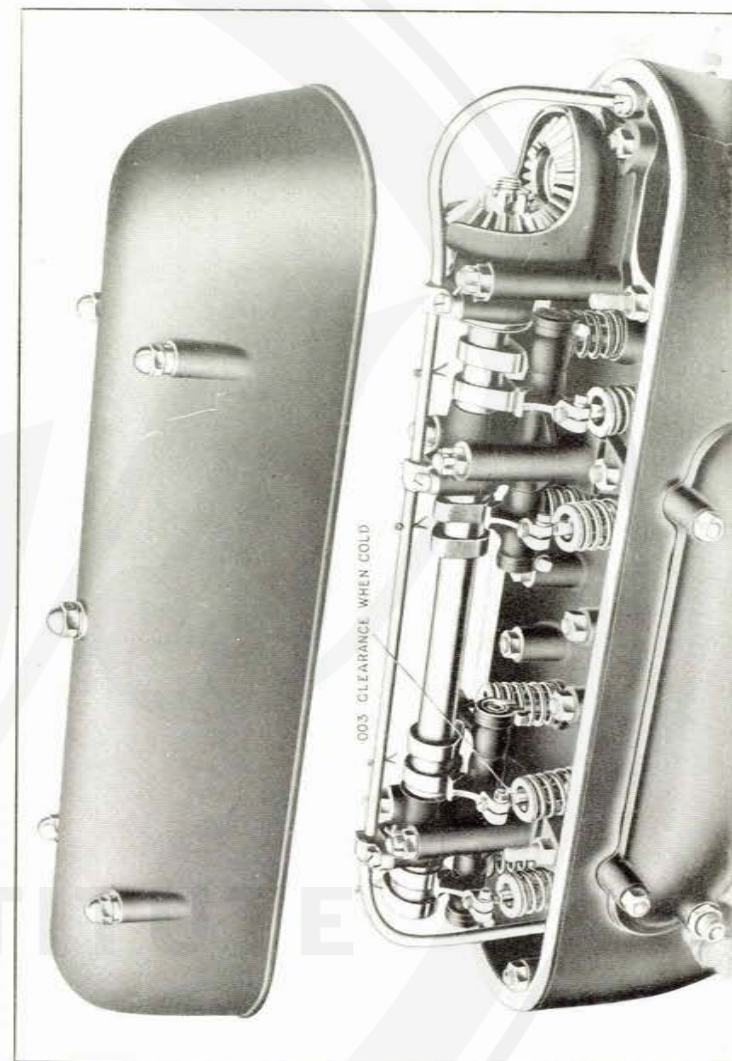
No red lead or similar material should be used when making the joint, but as a further safeguard against leakage the joint may be dressed on both sides with shellac varnish or thick boiled linseed oil.

The joint should be nipped down evenly by tightening each nut a little at a time.

Do not tighten all the nuts up at one end of the cylinder head, or difficulty will be found when an attempt is made to tighten up those at the other end.

Screw down a nut at one end a little, and then go to the other end, and thus backwards and forwards until all the nuts are tight.

To ensure a tight joint, the nuts should be further tightened after the engine is hot.



VIEW OF CYLINDER HEAD WITH COVER REMOVED.



Carbon deposit, if excessive, causes pre-ignition, which is manifested by the "pinking" noise made when the engine is labouring on a stiff hill or when picking up on one of the high gears.

### LUBRICATION.

**Selection of Lubricant.**—Efficient lubrication with a good quality oil is probably the most important feature in connection with the upkeep of a car.

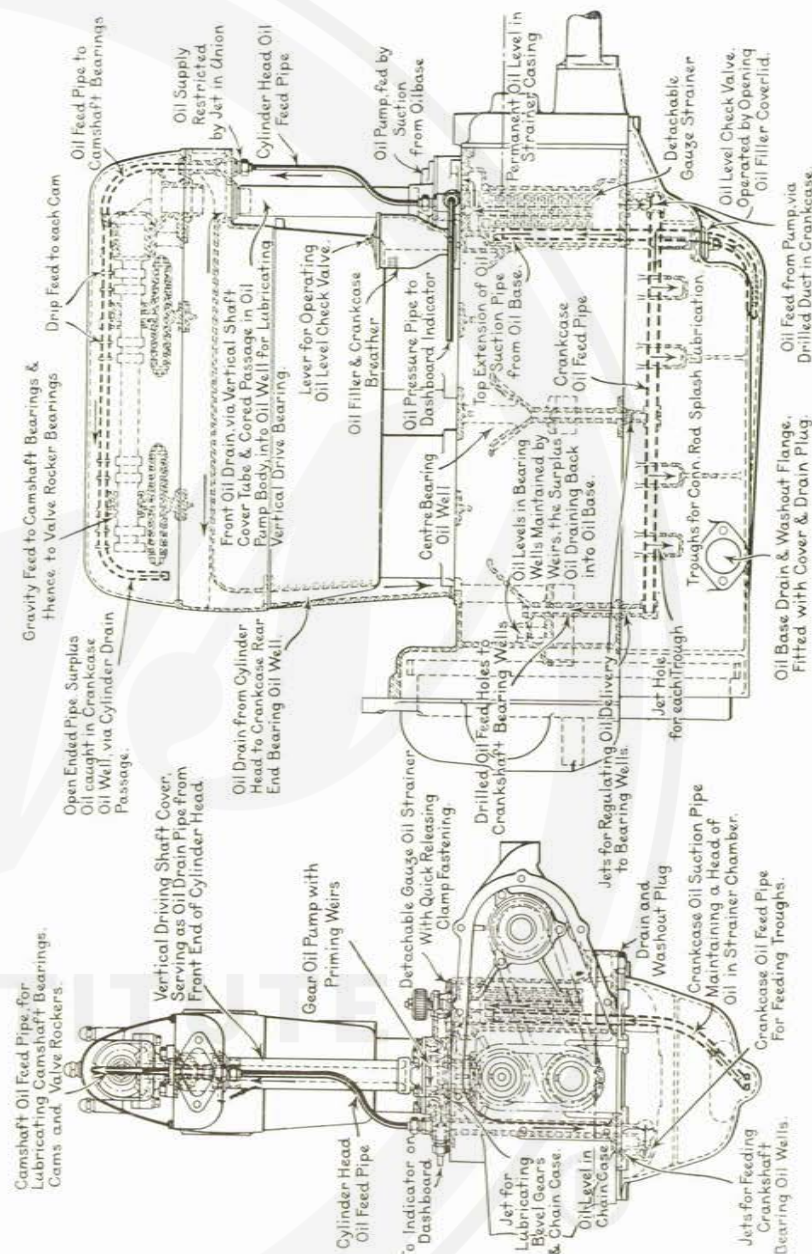
The oil we recommend is "Wolseley" Extra Heavy Filtrate, a high grade pure mineral oil, for which all our engines are adjusted, and the oil which, after many years of experience, and much money spent on careful and accurate testing, has been found to give the best all-round results. If owners of our cars do not use the oil we use and recommend they deprive themselves of the advantage of our exhaustive experiments and experience.

**Description of Lubrication System.**—The lubrication system is automatic.

The engine oil base forms a reservoir, from which the oil is drawn through a detachable strainer to the oil pump. This is driven from the vertical shaft and is situated at the point where the latter leaves the crankcase. Oil is delivered by the pump to the crankshaft bearings and the troughs which span the oil base, and also to the timing gear. In addition, a pipe is fitted by which oil is taken to the cams and the bearings of the camshaft and rockers, the surplus oil being returned to the oil base by means of a passage in the cylinder casting.

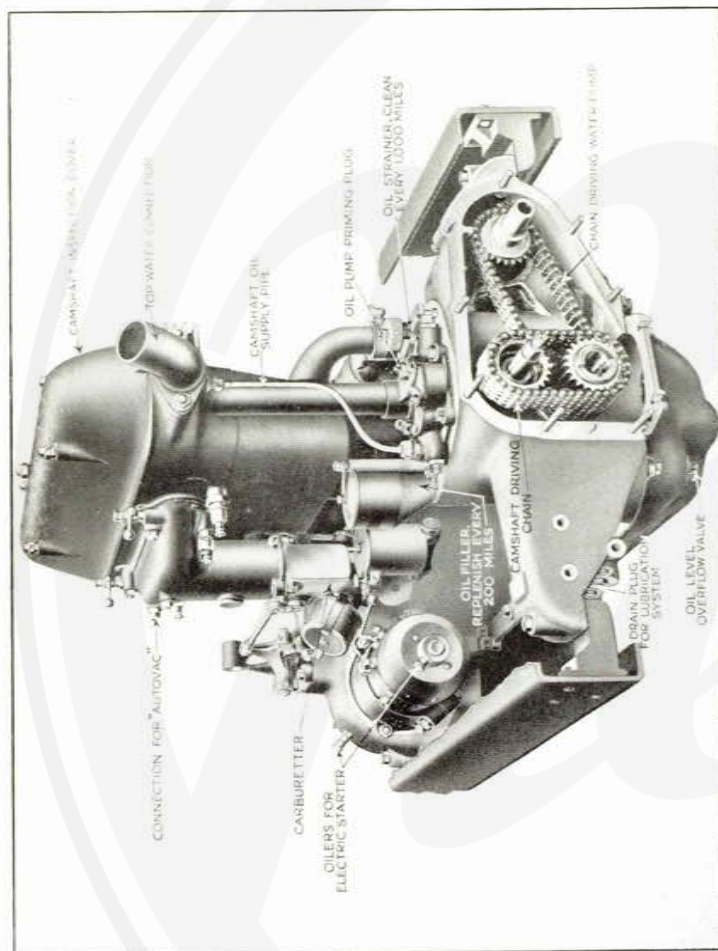
**Oil Pressure Gauge.**—A pressure gauge on the instrument board enables the driver to see that a sufficient pressure is maintained in the lubrication system. The pressure should not fall below 3 lbs. per sq. inch for efficient lubrication. The pressure will, of course, vary with the engine speed and the heat of the oil.

**Oil Strainer.**—The strainer chamber through which all the oil passes to the pump, is in the form of a cylindrical box with readily detachable gauze, removable for cleaning by slackening the clamping screw. Although the straining area of the gauze



# NON-LOCALIZATION DEGREE





FRONT VIEW OF ENGINE WITH CHAIN COVER REMOVED

is very large, it is liable to get choked up, especially on new engines, and it is advisable to clean the strainer after the first 200 miles, and afterwards every 1,000 miles.

An indication that the strainer requires cleaning is the falling pressure registered by the oil pressure gauge.

The strainer box should also be washed through occasionally, the plug at the bottom of the box being removed for this purpose.

Special care should be taken to ensure that the strainer is intact before replacing, and that the strainer makes an airtight joint with the casing. Failure to observe these precautions will render the pump inoperative, as it will always pump air in preference to oil. The oil pump is under ordinary circumstances self priming. Should the oil pump, however, have been washed out, it is necessary to add oil through the plug provided in the pump cover.

After a new car has run about 1,000 miles the oil base should be drained by removing the drain flange (see page 16), filling up again with fresh oil to the correct level. Any deposit which may have collected at the bottom of the sump should also be washed out. In cleaning out the oil base, it is preferable to use a brush; **on no account should fluffy material be used**, as particles are certain to remain in the oil base and eventually choke the strainer.

The oil in the reservoir should be changed about every 2,000 miles, as after a time the oil loses some of its lubricating properties. After draining as mentioned above, the oil base should be replenished, by means of the filler on the crank case, into which oil should be poured until it commences to drip from the overflow valve. The valve is automatically operated when the spring securing the filler cap is turned.

When replenishing it is sufficient to pour the oil into the filler, as mentioned previously, but if the oil base has been removed and the engine washed out, it is advisable to refill the troughs before replacing the base.

When the oil base is filled to the level of the overflow valve, there should be sufficient oil for about 500 miles running. It is advisable, however, to add oil every 200 to 300 miles.

It is important that no foreign matter finds its way into the engine with the oil; the strainer provided in the filler orifice should therefore always be used.

### COOLING SYSTEM.

In this model the circulation is maintained by a pump driven from the engine. Cooling is assisted by a fan mounted behind the radiator, and driven from the engine by a belt. The radiator is filled through a filler in the top, and the water should be replenished as may be found necessary. A gauze strainer is fitted in the filler, and is removable, but should always be used when filling up.

The expansion of the water on being heated is sufficient to cause an appreciable wastage during the first few miles running, or while the temperature is reaching its maximum after filling up with cold water. This wastage need not cause any apprehension, as after running a few miles the surplus water will have been ejected, and further loss by evaporation will be very slight, except under abnormal conditions. Under ordinary working conditions the cooling system should require very little attention.

**Filling the Cooling System.**—It is essential when filling the radiator that the water should be clean. If hard water is generally used, depositing lime or magnesia, a strong boiling solution of washing soda will assist in removing the deposit, but care must be taken that this solution does not come into contact with the paint. If the ordinary water of the district is very hard, it is preferable to use rain water well strained.

**To empty the Cooling System.**—Remove drain plug (No. 9 on page 46) at the lowest part of the system after unscrewing the radiator cap. In cold weather it is necessary to guard against frost, and should it not be possible to store the car in a warm building, the precaution should be taken of draining

all the water away, refilling—with hot water, if available—when the car is again wanted for use. If the water in the system is allowed to freeze, there is great risk of damaging the pump when starting up again, or of cracking the cylinders or radiator.

We do not advocate too frequent draining of the cooling system and refilling with fresh water, as this increases the amount of solid matter deposited on the radiator tubes.

**Water Pump.**—The water pump used is of very simple construction; it is of the centrifugal type, driven from the motor by enclosed chain gearing. The pump spindle is provided with two packing glands and is lubricated by a greaser fitted to the rear bearing.

It is necessary to tighten the glands to prevent leakage of water, but great care should be taken not to screw them up too hard, otherwise they are liable to run hot and cause excessive wear on the spindle.

When the glands have been tightened to the full extent, they should be re-packed.

**Fan.**—The fan spindle bearing requires ordinary attention with regard to lubrication (see No. 4, page 46). The fan is driven by a belt from a pulley on the bevel countershaft. The tension of the belt is adjustable by rotating the eccentric portion of the fan spindle. It should not be adjusted too tightly, but just enough to allow the fan to be turned easily by hand. When the fan belt also drives the dynamo it must be kept tight.

### ENGINE TIMING.

**Engine Timing Gears.**—Access is obtained by removing the radiator and the engine front cover.

The lubrication of the timing wheels and chain is automatic, as the chain at its lowest point continually runs through a bath of oil. **On no account should grease** be put into the timing gear case, as it is in direct communication with the crank-case.



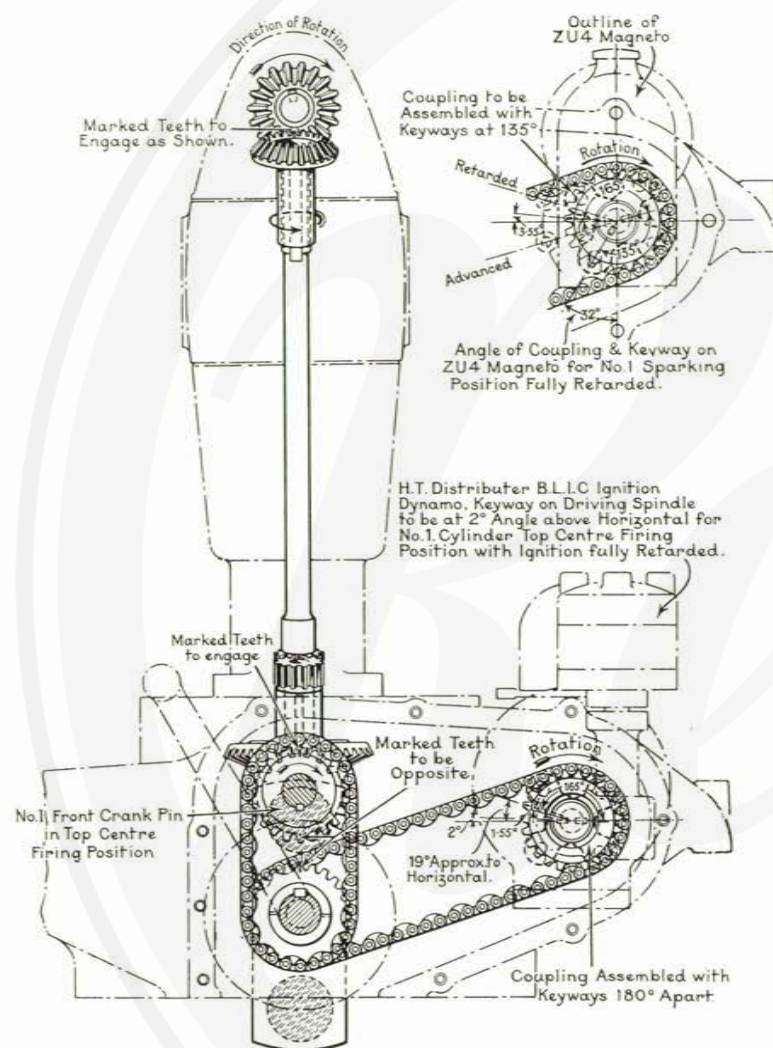
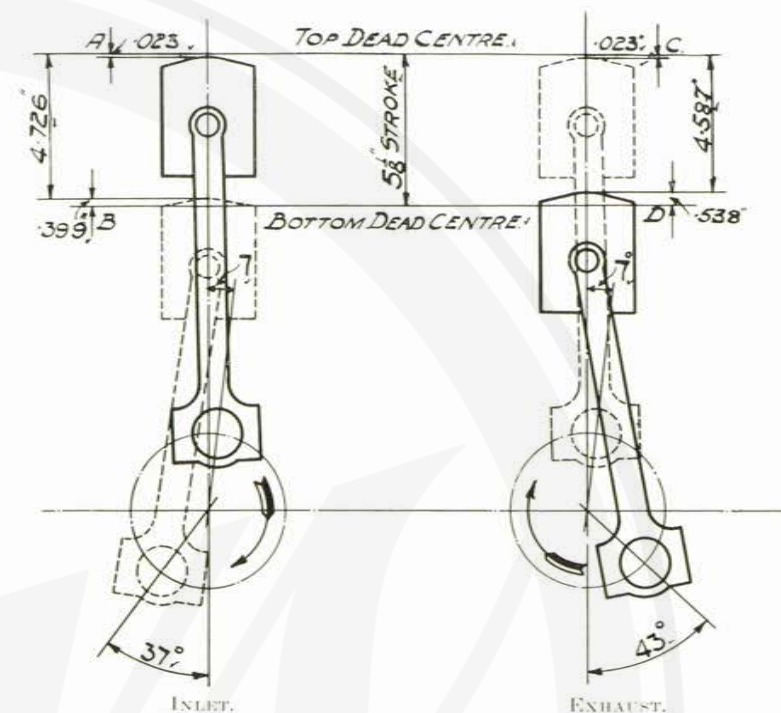
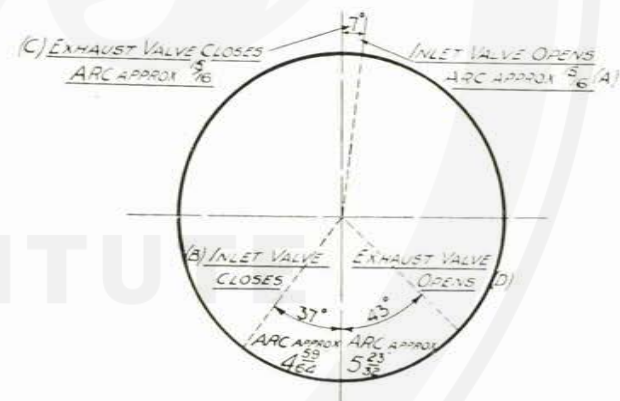


DIAGRAM SHOWING SETTING FOR VALVES AND IGNITION.



- A—Valve opens after completion of exhaust stroke (approx.  $-.023^\circ$  for  $5\frac{1}{4}''$  stroke).  
 B—Valve closes after completion of suction stroke (approx.  $+.399^\circ$  for  $5\frac{1}{4}''$  stroke).  
 C—Valve closes after completion of exhaust stroke (approx.  $+.023^\circ$  for  $5\frac{1}{4}''$  stroke).  
 D—Valve opens before completion of working stroke (approx.  $+.538^\circ$  for  $5\frac{1}{4}''$  stroke).



ARC LENGTHS ARE MEASURED ON OUTSIDE DIAMETER OF FLYWHEEL

The above are mean settings; considerable variation is permissible without affecting results.

VALVE TIMING DIAGRAM.

**Valve Grinding and Adjustment.**—Should the valves require grinding in, this operation should be carried out as follows—

Remove the cylinder head (see page 11). Release the valve springs by removing the cotters from above the spring cups, and lift out the valves. The valves should then be smeared with a suitable grinding paste, and ground to their seats by means of a screwdriver or brace and bit. When "grinding-in" only slight pressure is necessary. A suitable paste is put up in convenient tins, and can be supplied on application.

While "grinding-in," the valve should be frequently lifted and moved round at the same time, so that the seating may be ground quite true all over. A light spring under the valve head will be found to be of some assistance.

After this operation the valves and seats must be thoroughly cleaned with a material which does not leave fluff. Do not swill with petrol or paraffin, as it is liable to wash the grinding material into the working parts.

In the event of a new valve being fitted, it will, of course, be necessary to grind it to its seat.

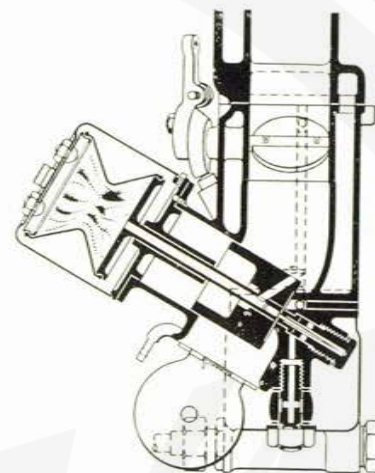
A minimum amount of wear takes place on the valve operating mechanism, as all dirt and foreign matter is excluded by the cover, and the parts are constantly subjected to a copious supply of lubricant.

The rockers which actuate the valves are provided with set-screws, by which the clearance between the rockers and valves may be adjusted (see page 13). The correct clearance is .003 of an inch.

The engine should be quite cold when the adjustment is made.

Do not overstrain the locking screw, although it should be pulled quite tight.

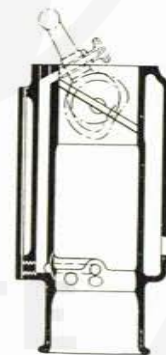
While the cover is off, the engine should be run a little, so that the oil supply can be observed.



Section through Main Jet.



Section through Auxiliary Jet.



Section showing Starting and Slow Running Passage.

SECTIONAL VIEWS OF FLOATING WEIGHT CARBURETTOR.



## CARBURETTER.

The carburetter is of the floating weight taper needle type, provided with an easy starting device, and an auxiliary jet for high speeds, and is fully protected by letters patent.

To facilitate easy starting, a groove is cut right across the main jet orifice, so that even with the weight on its seating, and the throttle nearly closed, there is still a current of air at high velocity passing along the groove and across the jet. This grooved passage communicates, by means of a passage in the carburetter body, with an opening in the throttle chamber at a point adjacent to the butterfly throttle valve when the throttle is closed.

For the purpose of automatically regulating the mixture according to the throttle opening, an auxiliary jet is provided, its effective aperture being controlled by a taper needle. For approximately the first half of the throttle opening this jet is closed, all the fuel being from the main jet. From this point, however, the cam which is fixed to the throttle spindle allows the needle in the auxiliary jet to be withdrawn, so that as the throttle is opened the aperture is increased.

To start the engine the only carburetter setting necessary is to close the air shutter and almost close the throttle. In cold weather easy starting will be facilitated by flooding the float chamber. When warm, if correctly set, the engine accelerates freely and quickly from the minimum to high speeds. When cold the engine may accelerate better if the throttle is opened gradually. During cold weather it is very important to warm the engine thoroughly by running it for several minutes before attempting to drive the car.

If there is any difficulty in accelerating when the engine is hot, it may be due to the engine not getting the correct proportion of petrol. This can easily be checked by setting the hand throttle for the engine to run at a moderate speed. By passing the finger up the air inlet, the floating weight can be moved. If the speed of the engine increases when the floating weight is lowered, i.e., when the mixture is strengthened by decreasing the air supply, the taper needle should be adjusted so as to project less beyond

the weight, thus increasing the petrol supply. In adjusting the needle it is advisable that no single adjustment should be more than  $\frac{1}{32}$  inch.

**Under no circumstances should the taper needle be filed,** as this is designed to give, in conjunction with the auxiliary jet, the correct mixture at all speeds.

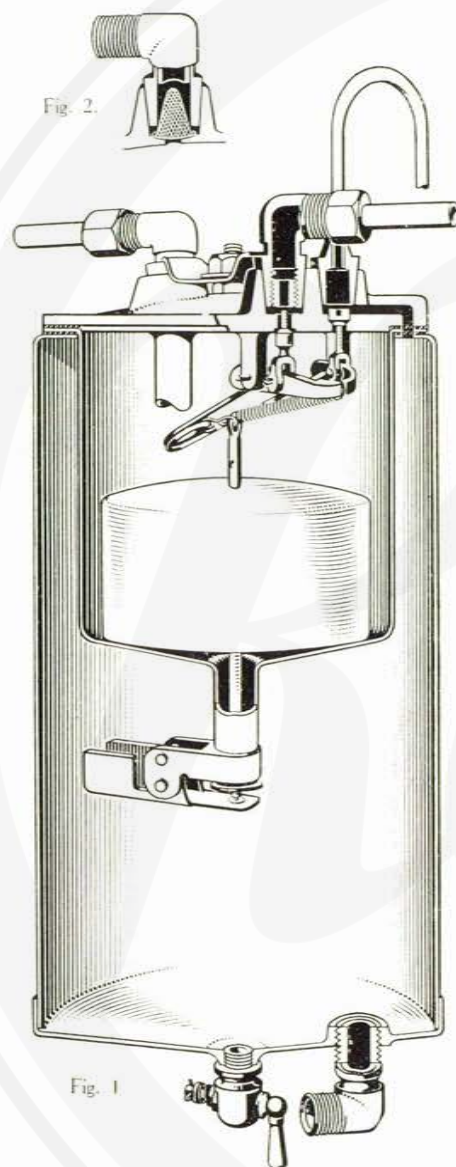
Should the floating weight stick, due to dust or grit, the bellows, weight, and needle should be removed together, cleaned and replaced, care being taken to avoid damaging the needle or jet. A little oil should be applied periodically to the floating weight spindle guide.

When the car is used in tropical countries and during hot weather, it may be advisable to turn off the cock controlling the hot water circulation to the carburetter.

If, after a period of satisfactory running, the engine runs badly, first ascertain if petrol is properly supplied, and that the pipe to the carburetter is not blocked up. If fuel comes out of the jet freely on flooding the carburetter, there is no doubt of this. Also see that the induction pipe joints are quite tight.

Should the float chamber flood, the following are the most likely causes—

- (1) The float may have developed a leak, and become wholly or partly filled with petrol, therefore being unable to hold the needle valve tight.
- (2) There may be a little grit under the needle valve, which will probably be removed by allowing the petrol to flood through for an instant. The needle valve should be held up for a short time, and not pulled up and down, as this is liable to damage the valve seat.
- (3) The needle valve seat may require re-grinding, which should be carefully done, great care being taken that there is no grit on the seat when being ground, or it will be ruined. The best grinding medium is jewellers' rouge.



SECTIONAL VIEW OF "AUTOVAC" PETROL FEED TANK.

**"Pinking"**—"Pinking" is due to the spontaneous ignition of the residue of the charge after primary ignition has occurred round the sparking plug points, caused by the pressure rising to such an extent that the spontaneous ignition temperature of the mixture is attained.

As this pressure depends upon the initial compression, it follows that a high efficiency engine is more liable to "pinking" than one having a relatively low compression.

The liquid fuels at present available vary considerably in their spontaneous ignition temperatures, and some of them have a comparatively low spontaneous ignition temperature, and consequently the tendency to "pinking" is greater when using these fuels in a modern high efficiency engine.

A ready means of preventing "pinking" is, however, available. Benzol has a spontaneous ignition temperature several hundred degrees above that of any petroleum spirit, and if mixed with any type of petrol in equal proportions, practically eliminates the tendency to "pinking."

**THE "AUTOVAC" FEED.**—The "Autovac" petrol feed system employs a small tank carried on the front of the dash, beneath the bonnet. This tank is divided into two chambers, an upper or inner and a lower or outer (see Fig. 1, p. 26).

The upper chamber is connected to the induction pipe, and another pipe connects it to the main supply tank at the rear of the car.

The lower chamber is connected to the carburetter.

The induction strokes of the engine create a vacuum in the upper chamber, and this vacuum draws petrol from the main supply tank. As the petrol flows into the upper chamber it raises a float, which upon reaching a certain height automatically shuts the vacuum valve and opens an atmospheric valve, releasing the vacuum and allowing the petrol to flow into the lower chamber.

The float descends with the petrol flowing out, and when a certain level is reached it reopens the vacuum valve and closes the



atmospheric valve. The process of refilling the upper chamber then commences, and this process is repeated continuously and entirely automatically.

The lower chamber is always open to the atmosphere, so that the petrol therein flows uninterruptedly to the carburetter, as required, and with an even pressure.

The "Autovac" should require no attention other than flushing with clean petrol every two or three months, and keeping all the connections tight.

To flush out, first open the drain cock at the base of the tank (this opens in an upward direction); if no petrol runs out the cock may be stopped up by sediment, but can be cleared by the introduction of a piece of wire. Unscrew the nut on the top of the "Autovac" which holds the retaining bridge piece in position, remove the bridge piece, and take out the main petrol supply connection, after first disconnecting petrol pipe. This connection, being a push fit, and only retained by the bridge piece, can be readily removed by tapping gently and twisting round in any direction.

On removing the elbow (see Fig. 2, page 26) the strainer will be exposed. Remove this and clean. Then thoroughly wash out the tank with clean petrol through the hole covered by the filter. Replace the filter and the elbow, pushing the latter well down so as to ensure a tight joint, and then replace the bridge piece. It is advisable to see that the bridge piece bears evenly on all three joints, and also to avoid over-tightening the retaining nut.

**HINTS WITH REGARD TO THE FAILURE OF THE "AUTOVAC."**—Should any trouble be experienced it will invariably be of such a simple nature that it can be rectified very easily if the following hints are studied—

**"Autovac" fails to operate after the car has been standing idle for some length of time (say two or three weeks).—**Disconnect the petrol pipe from the main tank, remove the elbow joint, and pour in sufficient petrol to wet the drop valve. Replace

the elbow and reconnect the petrol pipe. Put the throttle in the **closed** position and turn the engine a few revolutions with the self starter. This should have the desired effect.

**"Autovac" fails to deliver petrol or the delivery is irregular.**—Remove the carburetter float chamber cover and, if no flow of petrol is visible—

- (1) Ascertain if the main tank contains any petrol.
- (2) See that the petrol tap between the "Autovac" and the carburetter is turned on.
- (3) Make sure that the vent in the filler cap of the main tank at the rear is free, also the vent on the "Autovac." (This is important.)
- (4) See that all connections are airtight, especially those on the pipe running from the top of the "Autovac" to the induction pipe.
- (5) Give the "Autovac" a few light blows with the clenched fist in order to dislodge any grit which may be holding the drop valve off its seating. Do not use any violence, however.
- (6) Inspect the filter on the main petrol supply elbow.
- (7) Disconnect the pipe from the base of the "Autovac" to the carburetter and see that it is not stopped up.

Put the throttle in the closed position, and turn the engine a few revolutions with the starter.

If the desired effect is not now obtained, either the main petrol pipe is stopped up or there is some failure of the internal mechanism. The second of these occurrences will necessitate opening the "Autovac" (see paragraph "Dismantling the 'Autovac'").

It is easy to ascertain if the main petrol pipe is stopped up by disconnecting from the "Autovac" and blowing through it.

**Petrol is drawn into the Induction Pipe.**—The symptoms are that black smoke issues from the exhaust pipe, engine chokes and stops, and petrol pours from the carburetter air inlet.



This is very unlikely to occur, and can only be caused by one of the three following reasons—

- (1) Vent on top of the "Autovac" is completely stopped up. Clear the vent, and completely drain the "Autovac" before restarting the engine.
- (2) Interior mechanism is sticking or defective, and is not allowing the vacuum valve to close. This will necessitate opening the tank.
- (3) Float petrol logged.

If the car is stranded, however, a temporary expedient is as follows—

Disconnect the petrol pipe to the main tank, and proceed until the "Autovac" runs dry; recouple the pipe until the "Autovac" fills; disconnect again, and continue thus until garage is reached.

Do not put pressure in the main tank. If the main tank air vent becomes restricted or choked the suction of the engine will cave in the walls of the tank.

#### **Dismantling the "Autovac."**

- (1) Disconnect both of the pipes running to the top of the "Autovac."
- (2) Unscrew the small holding down screws and remove the top, gently prising it off with a blunt knife or screwdriver, and taking care not to break the cork gasket or jointing ring.

The float and valve mechanism is attached to the top, and will come away with it.

See that both the vacuum valve—located under the elbow connection to the induction pipe—and the atmospheric valve—situated under the vent—are clean and free from grit. See that the atmospheric valve is central on its seating when the float is in the "down" position, and does not bind anywhere.

When float is raised or in the "up" position, the vacuum valve should be shut and the atmospheric valve opened; when the float falls the reverse should be the case. See that the operating mechanism works freely and does not bind anywhere.

Both valves are screwed and soldered to their yokes; see that the solder is unbroken and that both valves are securely attached.

The drop valve should have a free movement on its pivot, and otherwise requires no attention.

When replacing the "Autovac" top it is very important that the vent hole in the outer tank should register with its corresponding hole in the cork gasket and in the "Autovac" top. It is not necessary when replacing the top to use any shellac or similar substance to re-make the joint. See that the top is clean, also the surface of the joint on the outer tank and gasket is unbroken. Screw down evenly all round, and a good airtight joint will result.

### **ELECTRICAL EQUIPMENT.**

**Ignition.**—High tension ignition either by B.L.I.C. magneto or dynamo igniter is used for the "Fifteen" engine.

**Magneto.**—The magneto is chain driven from the motor. It requires only occasional lubrication, about two drops of oil in each lubricator every 1,000 miles. The machine must be kept clean and free from damp. The metal segments in the distributor require cleaning about every 1,500 miles with ordinary metal polish.

**Contact Breaker.**—The contact breaker is fitted on the rear end of the armature spindle, and is held in position by a screw, the removal of which will allow the contact breaker to come away.

The distance between the platinum points when the lever is depressed by the steel segments must not exceed .015 inches. The distance may be adjusted by means of the screw. A gauge, which is combined with the special spanner, is supplied for this purpose.

Special care should be taken that the platinum points of the contact breaker are always free from oil, as otherwise it is impossible to make a good contact, and the production of the current from the magneto is considerably reduced.

The spark at the plug occurs at the moment of separation of the platinum points, each plug firing in succession according to the position of the brush in the distributor.





**Timing of the Ignition.**—The variation in the time of ignition is effected by causing the platinum points to separate earlier or later. For this purpose the timing lever is arranged so that it can be rotated; the position of the cams being thereby advanced or retarded.

**Setting of the Ignition.**—In order to check the setting of the ignition, if occasion arises, the engine should be cranked until the piston in No. 1 cylinder reaches top dead centre on compression stroke, when the platinum points of the contact breaker with the ignition fully retarded should be just on the point of breaking, and figure No. 1 opposite the window in the distributor cover. The order of firing is—1, 3, 4, 2. No. 1 cylinder is the front one. The wiring from the distributor to the sparking plugs is as shown on page 36.

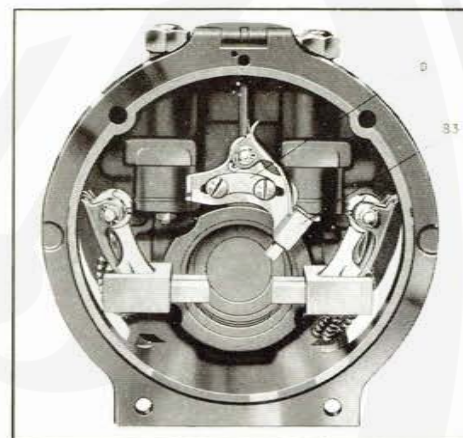
**Fault Location.**—In the event of the ignition proving defective, the cause may generally be most quickly located by proceeding in the following manner—

- (1) If missing occurs in one cylinder only, examine the plug; the points may be short-circuited, the gap too wide, or the insulation weak through excessive sooting. The gap should be about 0.5 m/m (0.020 inch); bad insulation may sometimes be remedied by washing the plug out with petrol. As a rough test, the plug may be removed and allowed to spark when lying on the cylinder cover; a spark under these conditions is not an absolute proof of the correct setting of the points, however, as it can happen that the same plug might fail to spark under compression.
- (2) Defective insulation or a loose or broken wire in one of the high tension cables leading from distributor to plugs may occasionally be responsible.
- (3) Complete failure of the ignition may mean that the wire leading from the magneto to the cut-off switch has been accidentally earthed. This may be tested immediately by disconnecting the wire at the magneto, when it should again operate normally if this has been the cause.

- (4) Another possible cause of complete failure of the ignition is the sticking of the contact breaker. If this is the case, the hole in the fibre bush should be very slightly enlarged.

**Dynamo Ignition.**—The B.L.I.C. dynamo igniter performs two duties, as follows—

- (1) The dynamo generates current and supplies it to the battery for starting, lighting, and ignition purposes.
- (2) Low tension current from the battery is converted by the coil mounted on the top of the dynamo into high tension current, which passes through the distributor to the sparking plugs.

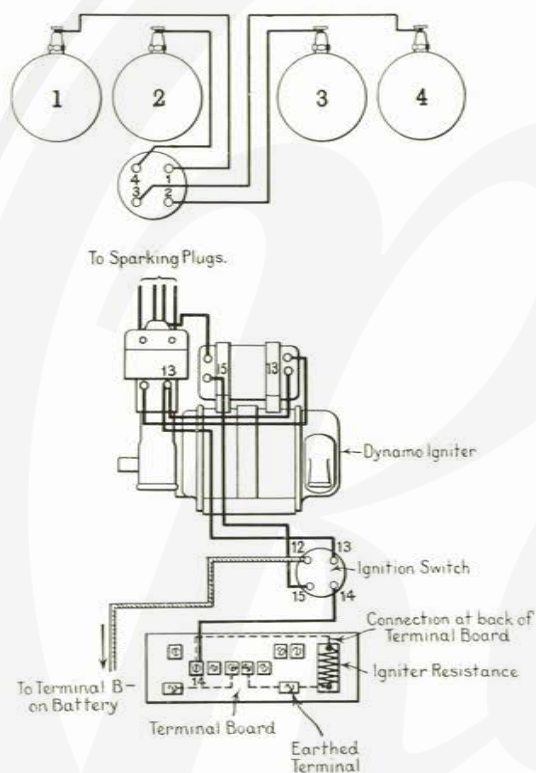


COMMUTATOR END BRACKET OF THE B.L.I.C. DYNAMO.

The dynamo requires very little attention to keep it in good order. A few drops of engine oil should be added to each lubricator every 500 miles, and the overflow hole at the bottom of each bearing kept clear, so that any excess oil can drain away.

The commutator should be wiped free of dust occasionally and should at all times present a perfectly smooth surface. If the surface is rough or glazed with carbon it may be carefully smoothed with very fine glass-paper. The carbon brushes in the cover should slide freely in their holders; if (through accumulation of dust or

oil) the brushes are inclined to stick, they should be taken out and cleaned, and, if necessary, the springs readjusted so that the brushes make good contact. The angular position of the third brush (B.3) must not be altered, as its exact position controls the output of the dynamo.



IGNITION WIRING DIAGRAM (B.L.L.C. DYNAMO IGNITER).

The igniter portion of the machine consists of a contact breaker and distributor driven through spiral gearing from the dynamo spindle, and a coil mounted on the top of the dynamo. The distributor and contact breaker housing should be taken off occasionally for examination of the working parts. Any deposit of carbon on the distributor brush track should be removed with a duster moistened with petrol. Both high tension brushes should move

freely in their boxes. It is very important that the platinum points of the contact breaker are always kept free from oil. The maximum opening between the platinum points with the lever fully depressed by the cam should be between .012 and .020 inches. The distance may be adjusted by means of the screw.

It should be noted that the contact breaker housing and distributor are so keyed that there is only one way of replacing them: if the housing is held so that the inspection window is on its lower edge and opposite the contact points the key will be found opposite its slot. After replacing the housing, put the distributor in place, making sure that the brush lies inside the distributor track before fastening it in position with the clips.

The igniter bearings and driving gear are packed with grease when assembled, and should require no further lubrication for several years.

The coil requires no attention, and no attempt should be made to dismantle it.

**Fault Location.**—Should the dynamo ignition fail to operate correctly, the cause may be located by proceeding as follows—

First look into the points mentioned under (1) and (2) on page 34.

- (3) Complete failure of the ignition may mean that the low tension circuit from battery to coil is broken. This may be tested immediately by disconnecting the short lead at No. 13 terminal on the ignition housing and opening the contacts, the ignition switch being in the "on" position when a spark should occur at the contacts. If the engine is turned over by hand until the contacts are closed, the circuit may be broken by operating the contact breaker lever with the fingers. The spark appears bright at night, but it must be looked for with care in the daylight. When this has been done do not forget to replace the wire on its terminal. If no spark takes place it is possible that one of the wires has become loose or broken, and the following connections should be examined—Nos. 13 and 15 on coil and igniter housing; Nos. 12 to 15 on ignition switch; No. 14 on terminal board and screws securing the ignition



resistance. Also examine the ignition resistance for breakage in the resistance wire by connecting the top and bottom screws together through a piece of wire. Should the fault lie here the opening of the contacts while the resistance is thus short circuited should cause a spark. If a spare resistance is carried it should replace the broken one, but if not, the engine may be run as an emergency measure with the resistance cut out as described above, but this should not be done unless it cannot be helped, as the coil is liable to overheat if it is continued for very long.

- (4) Another possible cause of complete failure of the ignition is the sticking of the contact breaker lever. The contacts in this case are opened by means of the cam striking the lever heel, but they remain in this position, the spring tension being insufficient to close them. If on inspection this proves to be the case, the depressing spring should be lifted off, the screw holding the spring should be removed, and the contact breaker lever pulled off. The bush, which is of fibre, and has probably swollen slightly, due to dampness, should then be reamed out to a slightly larger diameter.
- (5) Defective insulation on the H.T. cable from coil to distributor would also cause failure, the spark taking place between this and the frame instead of at the plug points. The cable can be quickly renewed.
- (6) Intermittent firing, which appears to be due to none of the above causes, may be brought about by the contact breaker lever or contact blocks being in electrical connection with the base. The opening of the contacts should also be examined: this should lie between 0.3 mm. and 0.5 mm., or 0.012 inch and 0.02 inch. To adjust this all that is necessary is to slacken the nut on top of the block holding the long contact screw, and rotate this screw until the correct gap is obtained, care being taken to relock it before running. The contacts should be free from oil or dirt, otherwise sparking will occur and the life of the platinum be reduced.

- (7) If the battery is nearly exhausted do not operate the starter, as the voltage may drop to a very low value and may not be able to supply enough current to the coil, whereas this would not be the case if the engine were cranked over by hand.
- (8) If the igniter has recently been replaced or reconnected the timing should be checked.

If all the foregoing remedies have proved unavailing, it is of little use spending time in any further investigation: the trouble is in all probability not possible to remedy without special appliances, and the machine should be returned to us for examination.

It is necessary with battery ignition for the charging switch to be on while the engine is running, so that the current used may be replaced by the dynamo. When the battery is fully charged, the charging rate of the dynamo is considerably reduced.

**Ignition Switch.**—Turn the switch to the "off" position when leaving the car, or the battery will be discharged.

**Switch Gear.**—The switch gear of the lighting set is mounted partly on the instrument panel and partly on the engine side of the dashboard.

Three pull-out switches are provided on the switchboard, namely, H, head lamp; S. & T., side and tail lamps; and C, charging. An ammeter is also included on the instrument panel, the functions of which will become clear later. The automatic cut-out is mounted on the dashboard.

**Charging System.**—As a general rule the charging switch should be in the "on" position, i.e., pulled out so that the current used for ignition will be continually replaced. If, however, the lamps are not regularly in use, the battery will become fully charged and the electrolyte will evaporate excessively. When the battery is fully charged, charging should be discontinued for a while, as excessive overcharging will reduce the life of the battery.

If any doubt is felt as to whether the battery is fully charged or not, the electrolyte should be tested with a hydrometer. The

ammeter indicates battery charge or discharge, although the discharge to the starter is not registered. To prevent the battery becoming unduly discharged when the lights are in use, the "S & T" switch is arranged so that the dynamo will be charging whether the "C" switch is out or in.

**Starter.**—To start the engine, push down the switch plunger smartly as far as it will go, and release immediately the engine fires. The starter drives the engine by means of a sliding pinion which works upon a screw thread on the starter shaft, the pinion engaging with a gear ring on the flywheel. When the starter shaft commences to turn, the inertia of the pinion causes it to slide along the shaft and engage with the flywheel gear. In a similar way, when the engine fires the pinion over-runs the starter shaft, and slides out of engagement. **Before starting**, switch on the ignition, turn on the petrol, close the carburettor air shutter, nearly close the throttle, and retard the ignition, the same as when starting by hand. If magneto is fitted the ignition may be slightly advanced.

A few spots of oil should be added to each lubricator, and the driving pinion thread every month. If the pinion becomes sluggish on the thread, remove the plug on the crankcase arm and clean the threads with a small brush dipped in paraffin; a little fresh gear oil should then be added.

**Battery.**—It is absolutely essential for the efficient working of the electrical equipment that the battery is kept in good condition.

The best indication of the state of the battery is the strength of the acid. The specific gravity of the acid in the "Exide" battery supplied with the B.L.I.C. equipment should be 1.280 when fully charged, and should never be discharged below 1.180. The corresponding figures for the C.A.V. battery are 1.225 and 1.170 respectively. Should the battery be slightly overcharged, no harm will be done, but much harm can be done by excessive discharging. Hydrometers for testing the specific gravity of the electrolyte can be supplied to order.

The electrolyte in the cells should be maintained at a level of about  $\frac{1}{4}$  inch above the tops of the plates by the addition of pure

distilled water as often as required, care being taken, however, not to reduce the density below the figures given above.

**Never add acid** except to compensate for spillage. The battery must be kept clean, and if any water or acid has been spilt it must be wiped off at once. The connections must be kept tight. Any corrosion of the metal should be removed and the parts smeared with vaseline.

Never bring a naked light near the battery.

Keep the vent holes clear.

Care should be taken that the battery is held firmly in position to prevent jolting, or the connections will be broken.

**Location of Faults in Lighting Set.**—For convenience of reference we have tabulated the most probable faults according to the symptoms which are likely to be displayed.

**Dynamo fails to Charge.**—Either (1) the field fuse has blown, or (2) the ammeter is reading incorrectly, or (3) there is a disconnection somewhere between the dynamo and battery.

(1) **Field Fuse Blown.**—The field fuse may have blown owing to disconnection in the battery circuit. Look for and tighten up loose connections at the battery box, or failing there at any of the main terminals on dynamo, terminal board, or switchboard. A slack terminal connection can be detected by attempting to move the cable up and down in its socket; there should of course be no play. A cracked cell out of which the acid has run, may be the cause, or the battery fuse may have blown. In the last case the cause is probably due to a short circuit somewhere in the wiring, or either No. 3 cable from the battery to terminal board and ammeter, or in one of the lamp circuits: this should be found and remedied before fitting a new fuse. The charging switch may not be making good contact: examine the switch blades. The same trouble may also be caused by internal conditions in the dynamo, such as a commutator dirty or burned through over lubrication, broken brushes, No. 1 brush lead earthing owing



to leads being broken or displaced, displaced springs, &c., but as these are unlikely the other troubles should be looked for first.

- (2) **Ammeter reads incorrectly.**—If the ammeter is reading incorrectly (owing perhaps to a heavy short circuit) it can be checked with the engine at rest by measuring the discharge current taken by the lamps when switched on. The current taken by two 12-volt 25-candle-power head lamps is a little over 4 amperes.
- (3) **Disconnection between Dynamo and Battery.**—In this case there is a break somewhere between dynamo and battery, but the speed has not yet risen sufficiently to blow the field fuse. Reduce the engine speed at once and investigate as in (1) above. Alternatively the cut-out may not be operating correctly. The cut-out is correctly adjusted on leaving the Works and should need no further adjustment. To protect the owner from irresponsible persons tampering with the adjustments one of the screws holding the cover in place is sealed. If it is evidently out of adjustment, however, the seal may be broken, the cover removed, and the nut clamping the spring underneath the cut-out readjusted, until the lower contact is thrust upwards and the ammeter commences from zero to read a steadily increasing charging current with rising engine speed. The two contacts should be about 1 mm. apart when the dynamo is at rest. If either contact is roughened it should be faced up as flat as possible with a smooth file, the battery fuse being removed the while. The upper contact should then be adjusted so that, after closing, the contacts reopen with falling engine speed at a discharge current of 2 to 3 amperes. Finally both lower and upper screws should be securely fixed by means of their respective locking nuts and the cover replaced.

**Lamps do not light.**—If with the engine at rest none of the lamps light, look for blown battery fuse (see above) or for bad connections between battery, ammeter, terminal board, or switch-

board. If one particular lamp does not light look for a broken filament, a badly fitting lamp cap, a loose adaptor or broken wire, probably either at junction of wire to adaptor or to terminal board.

**Lamps Glow too Brightly and Burn Out.**—Battery fuse has blown owing to short circuit; alternatively there is a broken connection in the battery circuit. The charging switch should at once be pushed in if the battery fuse has blown or if a disconnection is suspected between dynamo and battery; this is important, in order to avoid burning out the lamps or damaging the dynamo. See under "dynamo fails to charge" (1), above.

**Distribution Box Fuse Blows.**—Look for short circuits on auxiliary circuits—horn, dashboard lamp, interior lights, &c.

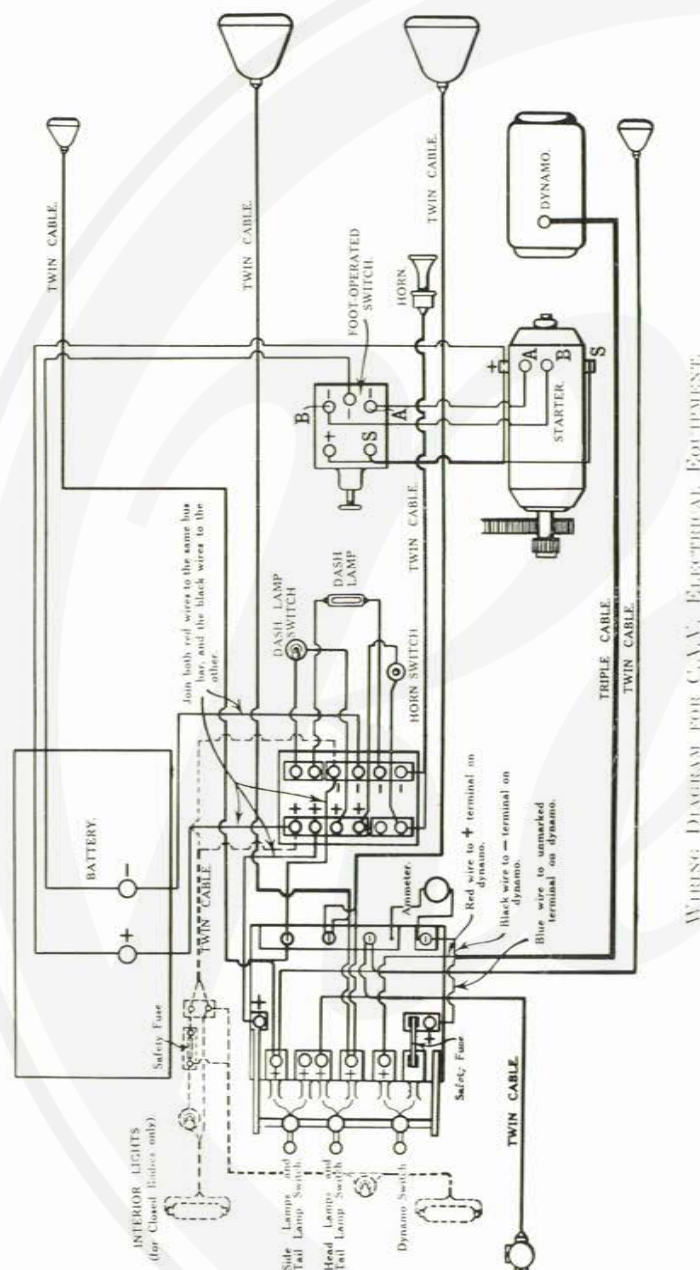
## C.A.V. EQUIPMENT.

**Dynamo.**—A few drops of oil should be put in each lubricator and the free wheel every 1,000 miles or so.

The commutator should be examined occasionally, and, if necessary, cleaned with a piece of rag. Should the surface be rough or glazed with carbon, it may be carefully smoothed with very fine glass-paper. See that the brushes slide freely in the boxes.

**Starter.**—When starting the engine electrically do not forget to set the carburettor and ignition controls the same as when starting by hand. Press down the starter switch to a little more than half its traverse and dwell momentarily there before urging the plunger right home. The plunger should be released immediately the engine fires.

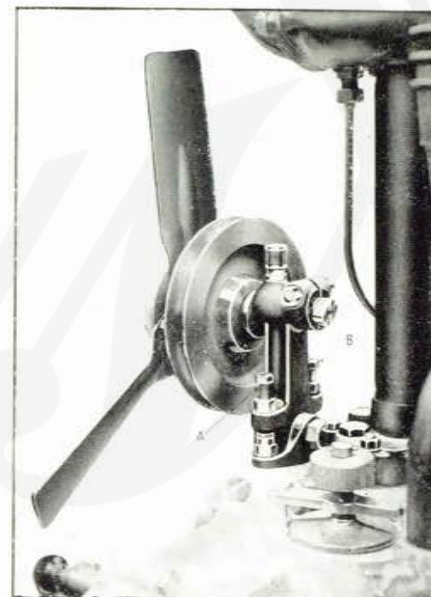
As the starter is only used at intervals, it does not require lubricating as often as the dynamo, and a few spots of oil in the lubricator and the driving pinion thread every month will be sufficient. If the pinion should become sluggish on the thread, remove the plug on the crankcase arm and clean the threads with a small brush dipped in paraffin; a little fresh gear oil should then be added.



WIRING DIAGRAM FOR C.A.V. ELECTRICAL EQUIPMENT.

**Dynamo Switch.**—Until it is known that the battery is fully charged, the dynamo switch should always be on while the engine is running. The reading of the volt-meter shows charging voltage but not the condition of the battery. When a reading of 15 volts is reached there is no object in further charging until the lights are required, when the dynamo should always be switched on.

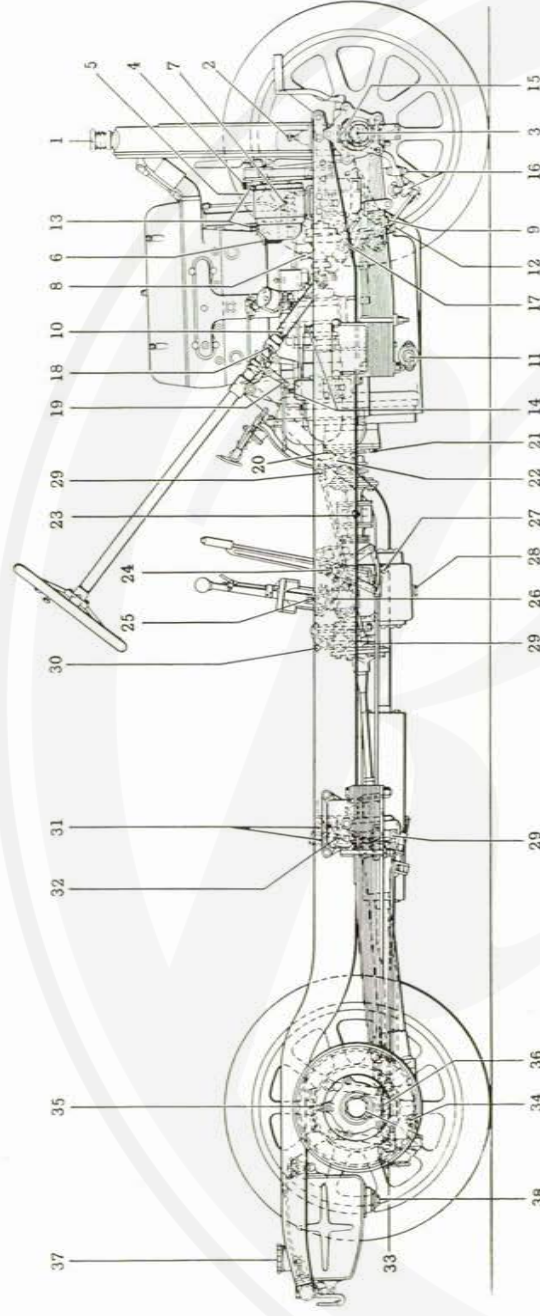
All battery connections must be kept tight, as bad contact will cause the field fuse in the switch-box to "blow."



**Belt Adjustment.**—To tighten up the dynamo belt, unscrew the set screw "A" a little, and screw up the set screw "B" and then lock with the locking nuts. The belt should not be adjusted too tightly, or excessive load will be put on the dynamo bearings.

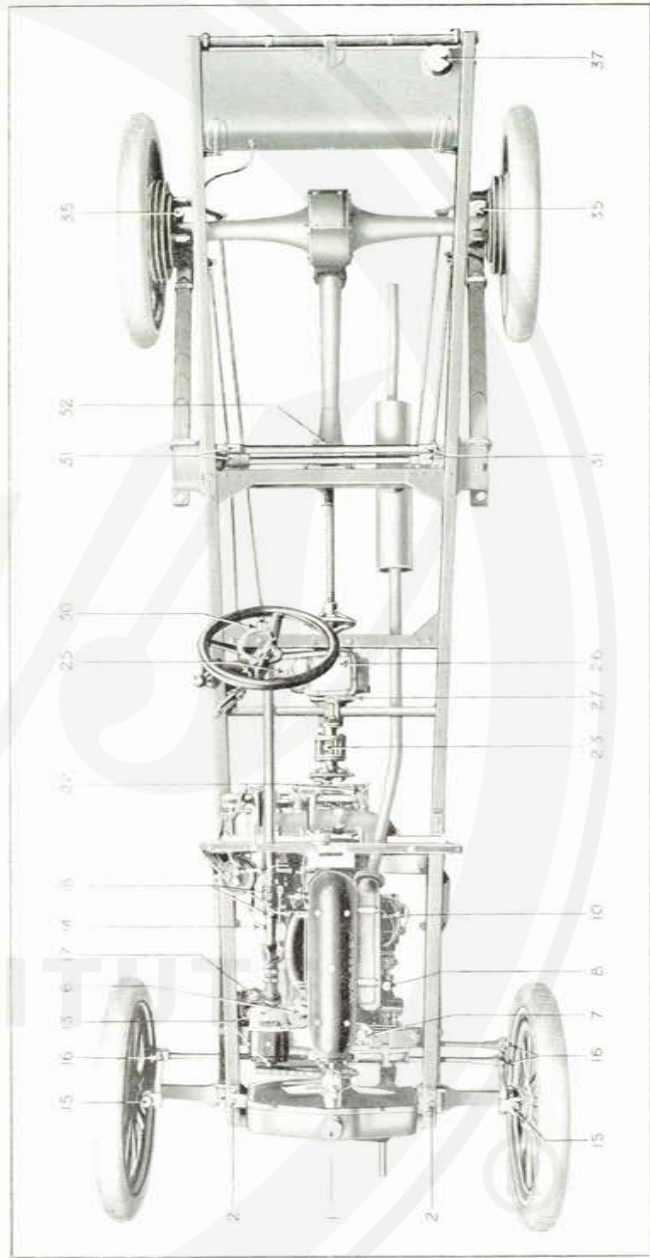






1. Radiator filling cap (fill through strainer).
2. Oil the radiator.
3. Grease the hub bearings (remove hub caps).
4. Oil the fan bearings, left.
5. Adjust nut for fan (fill crank chamber oil filler).
6. Grease the pump spindle.
7. Grease the water circulation.
8. Drain the water circulation.
9. Oil the magneto.
10. Oil the magneto and the reserve.
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31. Oil the brake cross tube bearings.
32. Grease the torque tube ball socket.
33. Grease the oil filler.
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CHASSIS LUBRICATING DIAGRAMS.

The letterpress refers to both diagrams elevation and plan.

### III.

## Chassis Details.

### CLUTCH.

The clutch is of the multiple steel disc type, fully enclosed and running in oil.

It is necessary to add oil occasionally to make up for wastage, one of the plugs provided (see page 46) being removed for this purpose.

We recommend "**Wolseley**" disc clutch oil as being the most suitable, and we attach great importance to this recommendation, as we have found in several instances that clutches have been ruined, and sometimes damage to the change speed gears has been caused, solely on account of the use of an unsuitable lubricant.

When the car has run 500 miles the oil in the clutch should be drained off, and some paraffin added. The engine should then be run with the clutch pedal depressed and the car stationary, so that the metal particles which get into the clutch plates will be washed out. After draining off the paraffin, put in three fluid ounces of "**Wolseley**" disc clutch oil. This operation should be repeated every 500 miles on a new car until the clutch plates have thoroughly bedded themselves, which will be evidenced by the cleanliness of the oil when it is drained out. The clutch then need only be washed out about every 1,000 miles.

**Never run the clutch with paraffin or graphite.**

The clutch should take up the drive quite smoothly. The car should not be driven with a slipping or fierce clutch. Slipping will cause heating and wear; fierceness may cause serious damage to the mechanism and tyres.

If the clutch slips the following points should be looked into—

The clutch pedal may be fouling the floor board, thus preventing the full engagement of the clutch. A set screw is provided for adjusting the position of the pedal.

The spring may require adjustment owing to wear on the plates having caused a reduction in the spring pressure. Adjustment can be made by means of the nut, which will be seen in the illustration on page 10. If the clutch plates become much worn, additional ones should be put in to make up the thickness. If the plates (which total 38), when taken out, are found to be scored, it is advisable to return them to the works for treatment.

The oil (if not "**Wolseley**" disc clutch oil) may be too thick, or too much may have been added.

Tightness of the universal joint or stiffness in the pedal actuation may also prevent the full pressure of the spring taking effect on the plates. These details should be kept well lubricated.

If the clutch is too fierce more oil should be used.

The ball bearing in the clutch withdrawal collar and also the face of the collar which bears against the withdrawal fork should be lubricated occasionally.

**Clutch Stop.**—The clutch stop is correctly adjusted before the car leaves the works, and should not require any further attention in the way of adjustment. It should occasionally be cleaned with a little petrol, as it is apt to absorb oil and thus become ineffective. The stop should permit sufficient clearance to allow the plates in the clutch to clear themselves before it comes into action, as otherwise wear of the plates will be caused, and difficulty experienced in changing gear. If the clutch does not stop readily it is probable the stop requires adjusting away rather than closer (see paragraph on changing speed, page 65).

To check this adjustment, put the stop entirely out of action, and adjust the pedal so that the clutch is fully withdrawn when the pedal has been pushed forward to its limit. Then adjust the stop so that it comes into full operation only when the above limit has been reached. This adjustment should be made when the clutch contains the correct quantity of oil.



## GEAR BOX.

The gear box is constructed so that direct drive is obtained on top speed. Selector gate change speed mechanism is fitted, and a device is provided to prevent accidental engagement of the reverse.

Timken taper roller bearings are used throughout. These bearings are adjustable to take up end play, but adjustment should not be required except after long service.

Should any of the bearings require adjustment, this is made by removing the locking piece and tightening the adjusting nut until there is the least perceptible amount of end play. **Do not overtighten these bearings.**

It should be noted that the adjustment of the first motion shaft is made by means of the nut "A" (see page 51), which should be *unscrewed* to tighten up the bearings, the nut "B" being the retaining nut for the front bearing.

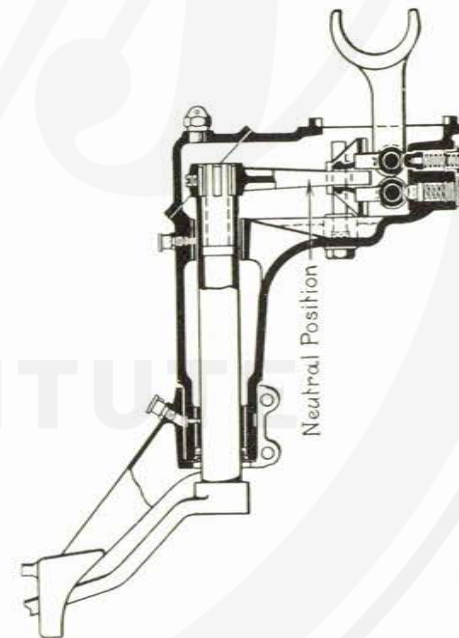
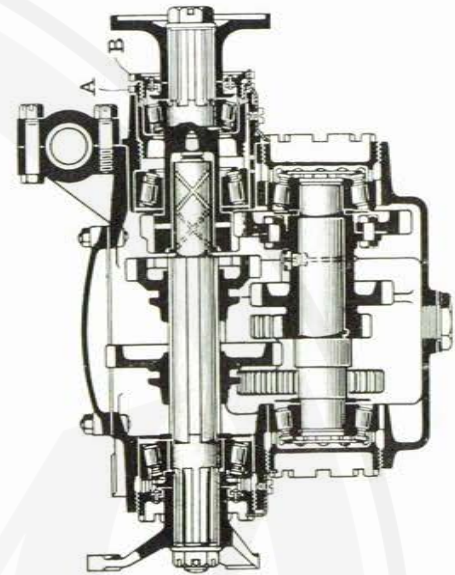
We recommend that adjustment of the Timken bearings, when necessary, should be made by an accredited repairer.

For lubrication of the gear box we strongly advise clients to use only "Wolseley" Filtrate Gear Oil.

Oil retainers are provided to prevent the lubricant from leaking where the various shafts leave the gear box. An inspection cover is provided on the top of the gear box. The gears should be inspected occasionally, and the gear oil replenished as required to the correct level.

The plug for checking this is the one on the flat side of the gear box, nearest to the forward end.

At the conclusion of the first 1,000 miles with a new car, the gear box should be emptied by removing the drain plug, and then thoroughly washed out with paraffin, using a brush to make sure that all foreign matter has been washed away. The box should then be replenished with new oil to the level of the plug. Afterwards it is sufficient to do this every 2,000 miles.



SECTIONAL ARRANGEMENT OF GEAR BOX.

## UNIVERSAL JOINTS.

The universal joint immediately in front of the gear box should be replenished with "Wolseley" filtrate gear oil every 500 miles. A plug is provided for this purpose in the coupling box. The blocks and the steel faces in the coupling box are easily renewable when worn, as also are the steel slippers.

The joint enclosed in the torque tube ball should also be lubricated every 500 miles. The plugs will be found in the clip which secures the leather cover to the shaft. **Do not use grease for lubricating either of these universal joints.**

The fabric universal joints should not require any attention beyond keeping the fabric free from oil or water.

## TORQUE TUBE.

This is rigidly bolted to the axle casing at the rear end, and is carried by a swinging ball socket at the front end. Two greasers are provided for the lubrication of the ball and socket. Use "Wolseley" Filtrate Cup Grease.

## WORM DRIVING SHAFT.

The worm driving shaft—as will be seen in the illustration on page 53—extends the full length of the torque tube, and runs in a ball bearing at the upper end. The upper end of the shaft carries the speedometer drive bevel wheel, and also a universal coupling. Oil for the upper bearing and speedometer drive is introduced by removing a plug in the side of the casing.

The hexagon-headed screw on the top of the casing is the locking screw for the bearing retaining nut.

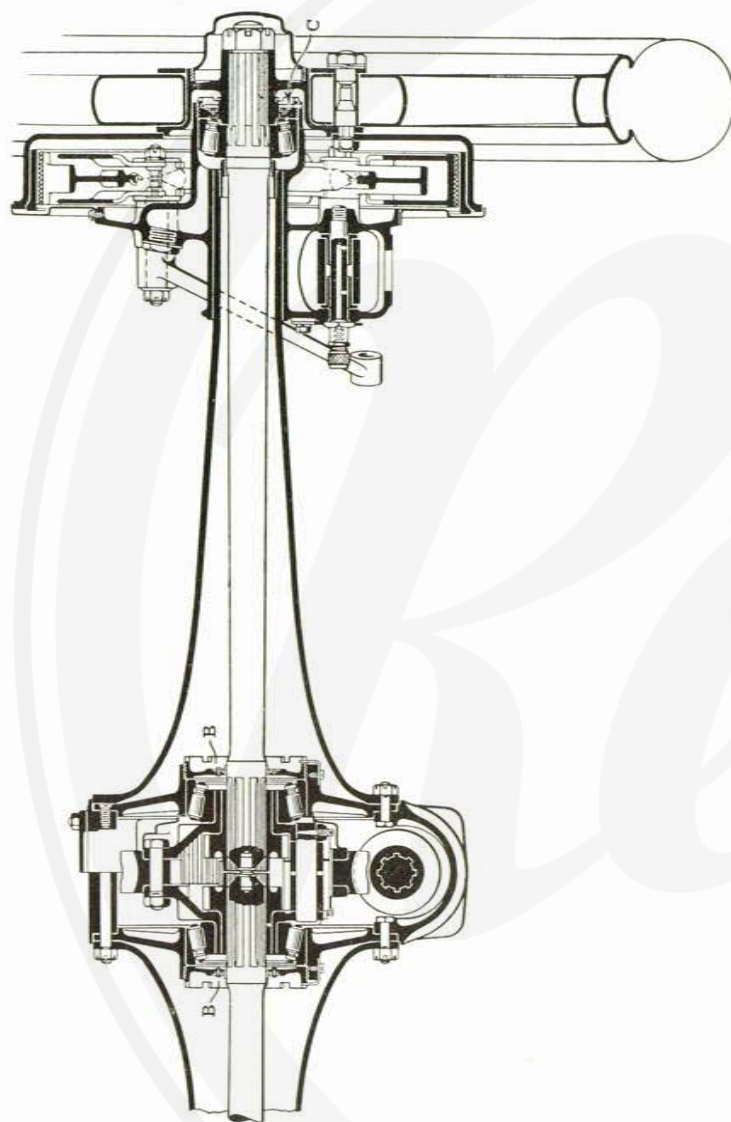
## REAR AXLE.

The rear axle is of the live type, and is fitted with worm gearing. Both the worm and worm wheel are carried on Timken taper roller bearings, which bearings are also used on the outer end of the axle shafts. End play in the worm bearings is taken up by means



SECTIONAL VIEW OF TORQUE TUBE AND WORM DRIVING SHAFT.





SECTIONAL VIEW OF REAR AXLE.

of the adjusting screw "A" (page 53) at the rear of the worm-casing. Adjustment of the worm wheel bearing, and differential shaft outer bearing, is made by means of the adjusting nuts "B" and "C" respectively (page 54). **Care should be taken not to overtighten the Timken bearings;** screw up the adjusting screw or nut until there is the least perceptible end play, and then lock in this position.

It is important to see that the tang of the circlip used for locking the nut "C" is pressed right into the holes both in the nut and brake bracket. Adjustment will necessitate the drilling of another hole.

It is essential that the case in the centre of the axle is always provided with sufficient lubricant. We recommend "Wolseley" Filtrate Gear Oil, which should be added until it is level with the top of the filler. **Graphite or thick grease should on no account be used.**

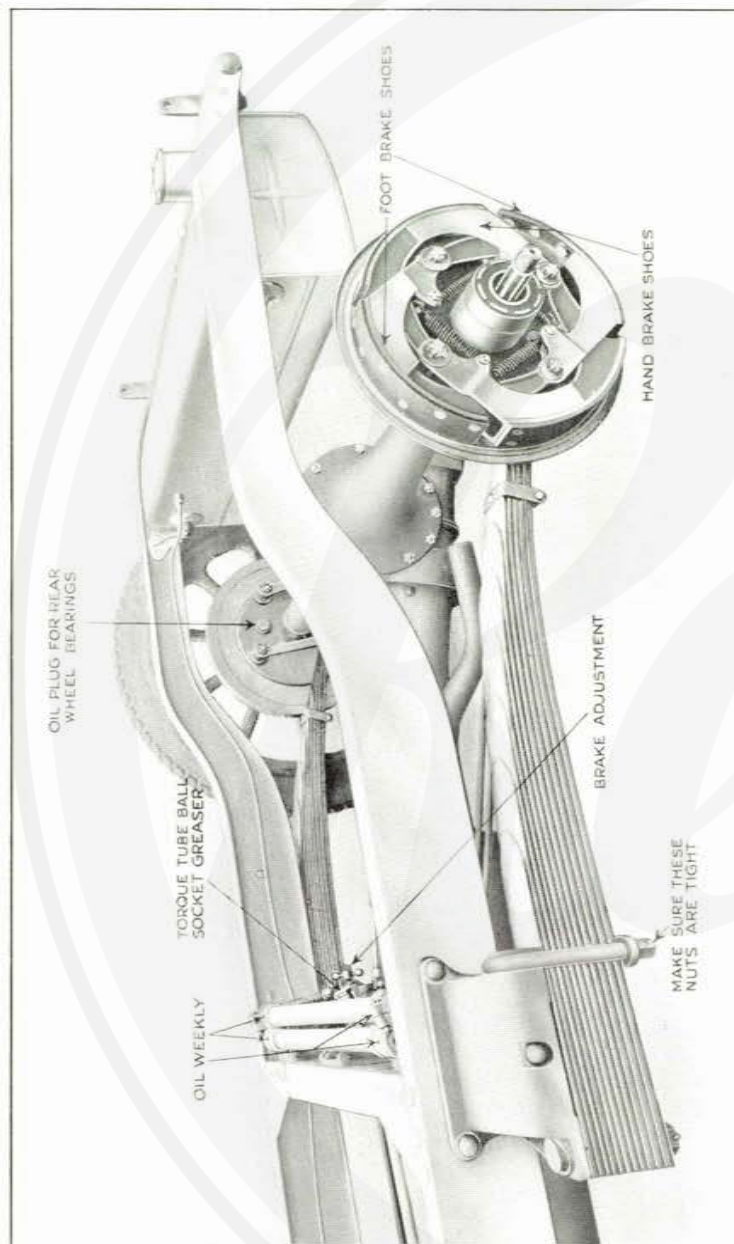
The axle shaft outer bearings are enclosed in the ends of the axle tubes and run in an oil bath, which must be occasionally replenished with gear oil through the plug hole (see page 56).

### BRAKES.

The brakes are of the internal expanding double-acting shoe type, there being two pairs of shoes operating inside each brake drum. One pair of brake shoes is actuated quite independently of the other pair in the same drum, each pair being operated by the hand lever and pedal respectively. They are specially designed for the car and are fully protected by letters patent.

The brakes are fitted with renewable fabric linings.

The operation is entirely by rods, and is equalised by a lever mechanism to both sides of the car. The brakes are hand adjusted by means of nuts with automatic locking device, and an independent adjustment is provided to vary the position of the pedal to suit individual requirements. The foot brake pull rod is also provided with a three-step link adjustment.

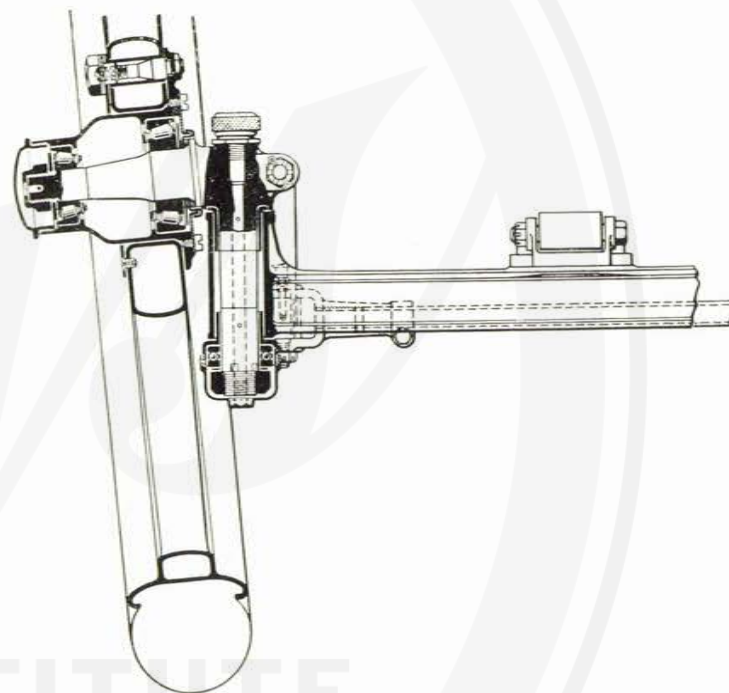


REAR END OF CHASSIS SHOWING BRAKES

To prevent rusting and undue wear, the brake rod joints should be occasionally oiled.

The brake cam spindles are carried by special self-lubricating bushes.

To adjust the brakes, jack up the rear axle and turn the adjusting nut in an anti-clockwise direction until the shoes are just clear of the drum. Rotate the wheel by hand, and listen to make sure that no contact is made when the brake is off, also see that the full pressure on the pedal or hand lever is transmitted.



SECTIONAL VIEW OF FRONT HUB AND SWIVEL AXLE

### FRONT AXLE.

The front axle is a Vickers' steel drop forging, carrying the swivel axles in plain bearings, the weight being taken by ball thrust bearings. These bearings are lubricated by means of the oiler fitted to the top of the swivel (No. 15, page 46).



The front wheels run on Timken taper roller bearings, which are adjustable, but require little attention beyond ensuring adequate lubrication.

It is important, however, that the car should not be run when the wheels have excessive end play. In this case the bearings should be adjusted until the end play becomes only just perceptible. The bearings must not be over-tightened.

The internal cones are a good sliding fit on the axle, so that they can be adjusted easily.

The external cups are a tight fit in the housing.

If the hub bearings have been removed for any purpose, the cups must not be hammered into position, but replaced by applying a steady even pressure.

The front hub bearings are lubricated by removing the hub cap and filling the hub with grease. The great advantage of keeping the hubs full of grease is that thereby water is excluded from the bearings. Care should be taken that the grease is free from grit. A film of lubricant should always appear outside the inner hub bearing and also outside the upper swivel pin bearing.

#### DETACHABLE STEEL WHEELS.

These should be removed periodically, and the parts well greased, otherwise they may be difficult to detach. The illustrations on pages 67 and 69 show the method of jacking up the car for this purpose.

After the car has been jacked up, unscrew the hub nuts, and the wheel can then be easily removed.

#### STEERING.

The steering is of the worm and wheel type, the worm being carried on Timken bearings, which are adjusted for end play by means of a nut in the bottom of the casing (see page 59). The top castellated nut is provided for tightening the oil retaining gland when necessary.



SECTIONAL VIEW OF STEERING COLUMN.

An oil-filling plug is fitted to the worm casing, by means of which it should be kept fairly full of gear oil.

The steering lever is rigidly fixed to the worm wheel, and is connected to the axle by means of a ball-jointed steering tube which passes across the chassis to the steering arm on the near side swivel axle. The joints of the steering tube, and also those of the steering cross rod behind the axle, must be frequently oiled (say every 200 miles).

The nuts securing the steering arms to the swivel axles should be periodically examined and tightened if necessary, as any slackness of these will cause excessive strain, due to the consequent hammering, and is liable to result in fracture by fatigue, and possibly a serious accident.

The ignition and throttle controls are situated on the steering hand wheel. A small quantity of oil should occasionally be applied under the control lever bosses. The control worms inside the steering column, also the sliding sleeves and steering column bearings, are lubricated through the oil-hole at the centre of the steering wheel, normally closed by a snap-headed screw.

When the car is stationary, the wheels should never be forced round by the steering wheel. This causes unnecessary strain to be placed on the steering gear, unless assistance is rendered by the road wheels being pulled in the direction required. When manoeuvring the slightest movement of the car is sufficient to prevent this strain.

In order to prevent undue strain on the steering gear and wear of the front tyres, it is important that the front road wheels should be correctly set. The correct setting is that the measurement from centre to centre of the tyre should be  $\frac{1}{4}$  inch less at the front than at the back.

#### PETROL TANK.

When filling the petrol tank, to avoid injury to the paintwork the petrol tin should be tipped with the spout at the top, always using the strainer that is fitted into the tank filler. The strainer

should be examined periodically to make sure that the gauze is unbroken, and that no leakage is taking place.

The filler cap should not be excessively tightened. The vent holes in the cap must be kept clear, as if these become stopped up the "Autovac" petrol feed will cease to function (see also p. 29).

Occasionally the drain plug (No. 38, page 46) should be removed, and the strainer which is attached thoroughly cleaned.

#### SILENCER.

After the car has run a considerable distance, the holes in the silencer centre tube may require cleaning, as they gradually become choked with soot. This tube can be drawn out of the silencer after removing the exhaust pipe from the engine. A choked silencer results in loss of power.

#### BONNET.

The bonnet hinges should be lubricated fairly frequently. As a rule they are never dried after washing, consequently if the lubrication is neglected they soon get rusty, and the hinges are often badly strained as a result. The bonnet catches should be oiled occasionally.

#### CARRIAGE SPRINGS.

In all cars the springs are standardised, and are made to various specifications to suit different types of bodies, and it is essential that the load on the chassis should be approximately what is provided for in the spring specification.

If modifications or additions are made to the body after leaving our works, the suspension of the car may require modification to give the best results.

If the spring plates are allowed to get rusty, free play of the springs is prevented, and cars in this condition are sometimes thought to be too stiffly sprung.



It is therefore necessary to lubricate with grease between the leaves occasionally. The easiest way to do this is to jack up the car so that the springs are entirely relieved of weight, and then separate the leaves by inserting a screwdriver or chisel. A thin strip of metal dipped in a mixture of graphite and grease can then be passed between the parted leaves.

The bolts securing the springs to the spring brackets should be examined weekly during the first few weeks' driving of the car to ensure that they are kept tight, as the spring plates may "settle" slightly, and thus cause the bolts to become slack, with the result that the bracket might fracture if the slackness is not taken up. The bolts holding the spring brackets to the frame should also be examined periodically, and tightened if necessary, as a slack bolt allows hammering and consequent fracture of the bracket.

It is most necessary that the rear spring pins should be kept lubricated (No. 36, page 46), as even if they do not squeak they rapidly wear if allowed to become dry. Lubricators are provided for this purpose.

#### TYRES.

The tyres are such an important item in the upkeep of a car that they should receive very careful attention, in order to secure from them the best service. It is very important that the tyres be inflated to their correct pressure. This varies according to the weight of the car and the size of the tyres, and therefore it is advisable to obtain from the tyre manufacturers their special books of instruction for guidance.

The pressure recommended is 70 lbs. per square inch for both 815×105 and 815×120 tyres, cars fitted with 815×120 tyres having a heavier body.

We recommend clients always to carry, in addition to the spare wheel, one or two spare inner tubes for replacement in case of more than one puncture, as it is not always possible to effect a satisfactory repair to a punctured tube by the roadside.

#### IV.

### Driving.

**Driving**—Skilled driving of a car is only acquired by practice, and when a driver is able to manipulate without conscious effort of will the clutch, brakes, ignition, and throttle levers, a car may be said to be safe in his charge.

When driving in traffic or passing other vehicles on the road, the driver should never take any risks, but should be ready to declutch or apply the brakes on the instant if necessary. The brakes should never (unless in case of emergency) be strongly applied, as this can inflict injury to the tyres or cause a side-slip; at the same time causing unnecessary wear on the mechanism.

When descending long or dangerously steep gradients it is advisable to use the hand brake alternately with the foot brake. In such circumstances a throttled engine has a very steadying influence, especially if one of the lower gears is engaged before the descent is begun.

**Changing Speed.**—The art of changing gears can only be acquired by practice, and, as mentioned in the Introduction to this Manual, we do not advise a novice to undertake the charge of a car without having first received a course of instruction.

To change up, release the accelerator pedal, depress the clutch pedal, and move the gear lever smartly into its desired position.

It is seldom drivers have any difficulty in changing up, for the reason that the above-mentioned operations follow what may be called a natural sequence. Successful changes down, however, cannot be carried out in the same way, for the reason that the speed of the clutch shaft and sliding gears in relation to the speed of the car must be increased instead of decreased.

In order to acquire the correct judgment for making silent downward changes at high speed, we suggest practice on level ground.

For example, we will assume that the car is on the top gear and is being driven on the level at 20 miles per hour: the engine speed will then be 1,000 revolutions per minute. If it is desired to engage the second speed at 20 miles per hour, it follows that the engine speed, and with it the speed of the first motion shaft, will have to be increased to 1,700 revolutions per minute.

Having grasped these essentials, it will be at once realised that in making the change from top to second on the level at 20 miles per hour, a fraction of time must elapse whilst the engine speed is being increased from 1,000 to 1,700 revolutions per minute. During that time the gear lever must be in its neutral position, the clutch must be engaged, and the throttle must be open. Place the hand on the change speed lever and exert a fair amount of pressure. Whilst this pressure is being applied, momentarily depress the clutch pedal: the top speed immediately comes out of action, and the lever must remain in the neutral position whilst the engine speed is increasing. (Several tests have shown us that it normally takes one second for this speed to be reached.) Immediately the time has elapsed the lever can be pressed forward and the second speed gears will engage noiselessly. During this operation it must be understood that with the exception of the momentary depression already referred to no pressure must be exerted on the clutch pedal.

When changing on a hill, the only variation is in respect of the time during which the gears remain in neutral. The steeper the hill the greater the retarding effect on the car, consequently the less time the lever must remain in neutral. On a hill of, say, 1 in 10, the change can be made with practically no hesitation at all.

Drivers have various ways of gear changing, such as double clutching &c., but by following the foregoing instructions the number of operations is reduced to a minimum, and it will be found when once the necessary judgment has been acquired, downward changes can be made at any speed within the capacity of the engine to drive the car on the lower gear. By this means changes may be made at high speed with absolute certainty, and

a car can very often be driven fast up hill on one of the indirect gears instead of being allowed to struggle up on top.

On this model, which has a  $5/24$  worm gear ratio as standard and 815 by 105 tyres, probably the best results in hill climbing will be obtained by dropping into the second gear when the speed of the car has dropped to 25 miles per hour, and the first gear 13 miles per hour. When the  $5/26$  ratio worm gear is fitted the changes down should be at speeds proportionately reduced.

Difficulty in changing speed may arise from the adjustment of the clutch stop. It will be noticed that the clutch stop limits the travel of the clutch pedal, and should the clutch stop be adjusted too closely, not allowing sufficient movement of the pedal, the plates will not be properly separated and will probably be pressed together sufficiently to overcome any friction that can be put upon the clutch stop. If, however, the clutch stop is adjusted in accordance with our instructions on page 49, allowing much more travel to the pedal before it comes into operation, it allows sufficient distance for the plates to separate, when the stop coming into operation will have ample power to stop the clutch spinning. Even with the clutch stop properly adjusted, changing speed downwards, if the clutch pedal is too far depressed, that is to say, far enough to bring the stop into action, becomes a very difficult matter, because the momentum of the revolving parts is so small that even a slight application of the clutch stop considerably retards their motion.

Roughening of the plates, and consequent fierce clutch, will certainly result if the engine is accelerated before the clutch is home after changing up, or in other words, the clutch must not be allowed to slip when the engine is running fast and picking up its load.

Great care should be taken that the reverse gear is never brought into engagement until the car has come to a dead stop, otherwise there is risk of damaging the gear wheels.

If the engine races when the steering wheel is turned one way, and stops when turned the other way, it is due to end play of steering column, which should be adjusted (see page 58).



**Change Speed Gear.**—If it is necessary for any purpose to take down the change speed control mechanism, we would point out when it is re-assembled there should be a minimum of  $\frac{1}{32}$  in. clearance between the hand lever and the end of the quadrant slot when the respective gears are engaged.

**Care of Varnish and Paintwork.**—To ensure the varnish and paintwork keeping its appearance for the longest possible period, it is most important that the car is never put away in a dirty condition. When the car is washed down a plentiful drenching with the hose should be given before attempting to sponge down. This removes the greater proportion of mud and grit, leaving very little for the sponge to gather. If the sponge and water is used without this preliminary, the sponge picks up a lot of grit, which, after a few washings, will cause the varnish to become scratched and rendered dull, almost as if it had been sandpapered.

After the car has been washed down, it should be wiped over with a piece of chamois leather to remove the beads of water, which, if left on (especially in sunlight) may cause spottings, and in extreme heat the risk of blistering.

When a car is at rest it is an advantage for it to be kept in the shade, as the heat of the sun has an injurious effect on the paintwork and tyres.

If the varnish becomes spotted, the application of a little linseed oil by means of a soft rag or lint may have a beneficial effect.

Spots of tar should be removed by rubbing with a little pure vaseline, which can be removed with a soft leather as soon as it has softened the tar.

The use of so-called cleaning compounds is not recommended, plenty of cold water being all that is required.

To sum up—

Clean down as soon as possible.

Use plenty of water.

Use cold water.

Keep hoods up and covered bodies completely closed.

Keep out of the sun when at rest.

Remove tar spots with vaseline.

Avoid the use of—

Petrol or petroleum spirit in the water for cleaning; it will crack the varnish.

Warm water; it will cause the paint to soften.

Cleaning compounds; they dull the surface.

**Hoods.**—To lower the hood, proceed as follows—Pull back locking hooks. Stand in driver's seat and raise front of hood seeing that the canvas is clear of the joints. Push back smartly as far as possible, when the hood will automatically fall into its folded position. Arrange the canvas folds, see that separators are correct, and strap down.

To raise the hood, first unstrap it, stand on the off side, place the left hand under the cross-bar which projects at the rear and the right hand under the next stick. If pressure is then applied by both hands, the back part of the hood can be completely raised in one motion, and will remain upright while the operator changes his position to pull the front part forward, which can be done when standing either in the front or rear part of the car.



ILLUSTRATION SHOWING CORRECT POSITION UNDER FRONT AXLE FOR JACKING UP FRONT OF CAR.

When cleaning hoods always use soap and water. It is to be particularly remembered that on no account should petrol be used if the hood material is rubber-proofed.

The hood should never be lowered when it is wet, and neither canvas nor leather hoods should be left folded when the car is not in use.

**Care of Leather Upholstery.**—When cleaning the car, water should not be allowed to splash on to the upholstery. A soft dry cloth should always be sufficient to remove superficial dust, and a brush can be used in awkward places. On no account must oil or oily rags be allowed to come in contact with the leather. A small spot of oil will develop and spread to a surprising extent. If by chance the leather becomes spotted with oil or grease, this can be usually removed by means of rectified benzine, applied with a rubber of clean cotton wool, care being taken not to disturb the colour. Should the spot prove obstinate, however, rubber solution is usually efficacious. The best rubber solution only should be employed, and must be spread over the spot with the finger. If allowed to dry thoroughly, it can then be rubbed off without leaving any traces behind. Linseed oil is the worst offender, and we know of nothing that will successfully deal with this. After the leather has been in use for some time, and the surface begins to look a little dull, it can be improved by sponging with a weak solution of egg albumen, and when thoroughly dry rubbing vigorously with a stiff brush.

**Storage.**—The motor-house must be a dry, well-ventilated building, and preferably arranged so that it can be heated during cold, frosty weather. It should be kept clean and free from dust and should be sufficiently large to allow a gangway around the car for convenience of inspection, and also because the car is liable to suffer from dampness if it is placed too close to the walls of the house. As a safeguard against fire, a chemical extinguisher should be kept handy. Petrol should be stored in a separate building. It is advisable to fill the petrol tank when the car is outside the motor-house.

When filling with petrol, water, or oil, a gauze strainer should be used in order that no dirt may pass through.

Lubricating oil and grease may be stored in the motor-house, preferably in steel drums, so that supplies may be drawn off as required.

To keep the floor of the motor-house clean from any oil which may drop from the motor while standing, a sheet-iron tray should be kept under the motor and gear-box while the car is in "garage." Convenient dimensions for this tray are 5 feet long by 3 feet wide with sides about 1 inch high.

A dark garage is the best for the tyres. When the car is not in regular use it should be jacked up or put on blocks to take the weight off the tyres.

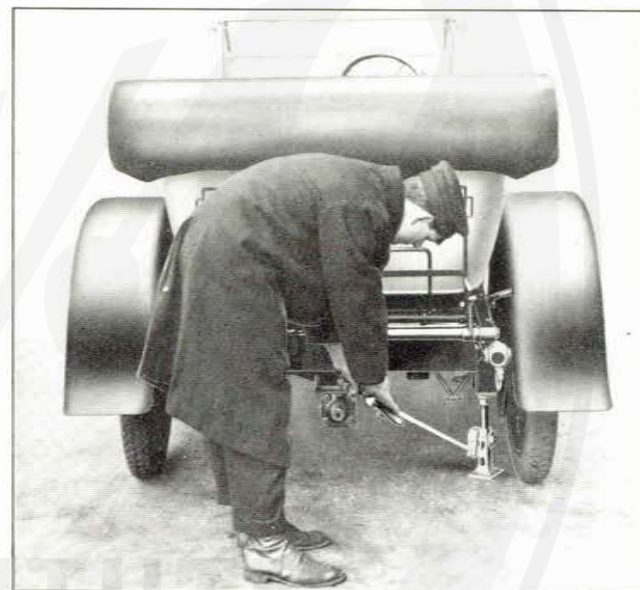


ILLUSTRATION SHOWING CORRECT POSITION UNDER REAR AXLE FOR JACKING UP REAR OF CAR.

**Overhauling.**—It is convenient to have in the motor-house an engineer's bench fitted with a parallel vice, and provided with a few tools, so that adjustments and small repairs may be done at once, instead of being neglected and only taken in hand when absolutely necessary.



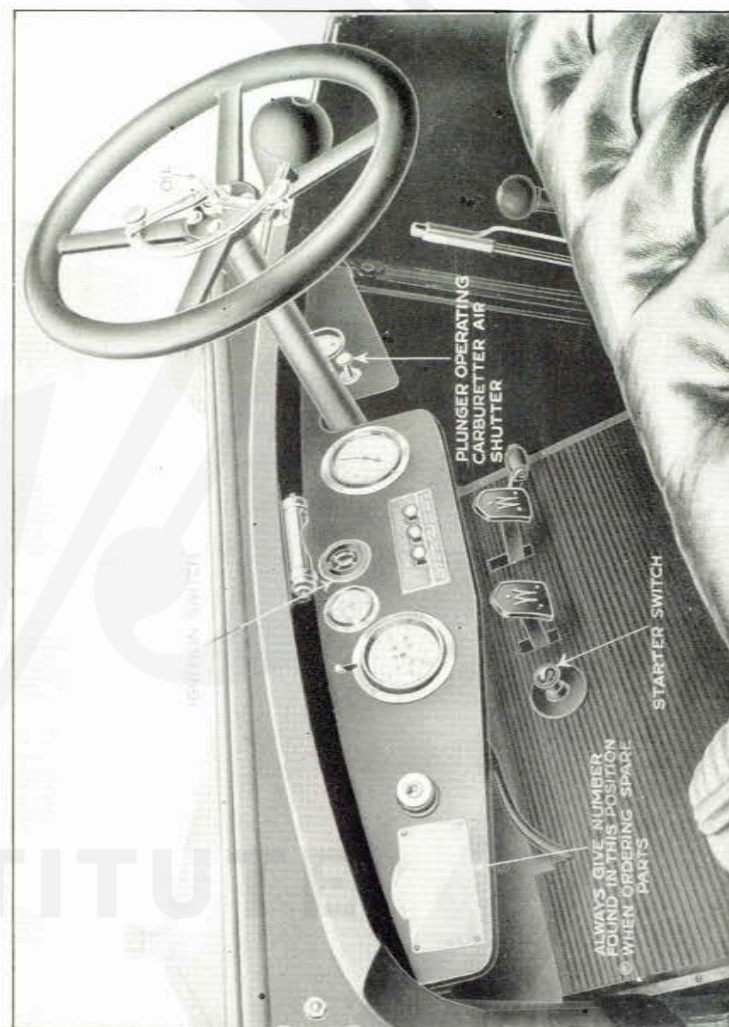
By immediately attending to any adjustments or replacements that may be required, a car is not only kept in better order, but the cost of upkeep is also reduced to a minimum, as if one portion of the mechanism fails to do its work properly undue strain is thrown on other parts, with consequent risk of sudden breakdown.

**Spare Parts.**—When ordering spare parts, to avoid any possibility of error, it is essential that the **number of the car** (see page 71) and the **horse-power** should be given, and, if possible, the number of the parts in our spare parts catalogue. If there is any doubt on these points, it is advisable to send the old part or a sketch of the part required.

We would remind clients when sending telegrams for parts to make them clear, as it is far better to put a few extra words in a telegram than risk having an incorrect part forwarded.

When chassis only are delivered by ourselves, it is of course impossible for us to give the car the finished test it would have if the complete car were delivered by our works or our depot. In such cases we are prepared to place at the disposal of the client the services of one of our testers, charging for his services, plus out of pocket expenses. It is sometimes found that coachbuilders are not fully alive to the peculiarities of the chassis, and consequently trouble arises which might have been avoided. These troubles perhaps are quite trivial, but at the same time they may be none the less disconcerting, and are calculated to give the owner a bad impression of the car. Moreover, if one of our men proves the car before it is taken into service, we have his finished test report, which not only completes the chassis record but is very useful for us to refer to should any attention be necessary afterwards. Attention of this kind, too, is frequently found beneficial to drivers who may be quite competent men, but at the same time not fully acquainted with the peculiarities of the car for which they are about to be responsible.

**Guarantee.**—The Company undertake, subject to the terms specified in their catalogues and sales specifications, to repair or renew within a period of twelve months from date of delivery of



VIEW OF INSTRUMENT BOARD ON "WOLSELEY" FIFTEEN.

any chassis or autocar from its works, any part or parts which may be discovered within such a period to be defective in material or workmanship.

When a claim is contemplated it is of the utmost importance that we should be immediately notified as to the reason for the claim, and also the car number, so that we may have the opportunity of advising how the matter should be dealt with.

**Insurance.**—For the convenience of their customers the WOLSELEY MOTORS LIMITED have made arrangements for the issue of LLOYDS POLICIES in accordance with the terms given in the catalogue. Policies can be obtained through our offices and depôts, or through any of our agents.

In the event of accident, repairs up to any amount may be put in hand immediately, either with ourselves or with one of our authorised agents, without waiting for permission of the insurers, provided the repair permit is produced, which, together with a list of authorised repairers, is supplied with each policy. *Necessary temporary repairs, or permanent repairs up to £10, may be executed immediately by any competent repairer, without consent of the insurers.*

**Garage.**—Our London garage, which is the official garage of the Royal Automobile Club, is in a most convenient position, opposite St. James' Park Station. It has available space for the storage of several hundred cars, and is open day and night for the reception of cars of all makes. Special inclusive tariffs quoted on application.

**Repairs.**—We have established extensive repair shops at our Adderley Park Works, Birmingham, and have also large repair works in Gatliff Road, Commercial Road, Pimlico. These works are entirely devoted to repairs, and are fitted with the latest machinery and appliances for the purpose.

## V.

### HINTS ON THE CARE OF "WOLSELEY" AUTOCARS.

**Before starting a journey** make sure there is sufficient petrol in the tank to feed the engine at least as far as the next pre-arranged stopping place. Great inconvenience is often caused to driver and passengers if the petrol tank has to be replenished on the road side. Always carry a spare can. See that the "Autovac" is working properly.

Replenish the oil in the engine sump and see that the lubrication system is working properly, also see that the universal joints in the transmission are thoroughly lubricated. Make sure the clutch has sufficient oil, but does not slip.

Fill up the radiator.

The brakes should be examined to see that they are working freely and are properly adjusted.

The tyres should be pumped up if necessary, not forgetting the spare. See that the detachable wheels are properly fixed, and are readily removable if found necessary.

Make sure the spares are sufficient and are reasonably accessible.

#### Hints on Driving

Don't try to start the engine with the throttle too far open (see page 24).

Don't unduly flood the carburetter.

Don't open the throttle too far or too quickly until engine is sufficiently warm, otherwise you may have a "pop back" and, if the carburetter has been flooded, a more or less serious fire.



Don't slip the clutch unduly.

Don't change up too soon. Let the engine speed-up before engaging the next higher gear.

Don't accelerate the engine after changing-up until the clutch is home.

Don't hang on to the high gears too long when ascending hills.

### Hints on Care of Car

Don't grind in valves unless it is really necessary.

Don't swill out valve pockets with paraffin or any other liquid after grinding: clean them with a piece of good, clean rag.

Don't neglect the tyres: see recommendations by tyre makers.

Don't let detachable rims and wheels get rusty.

Don't allow a chipped place on the wheels or axle to get rusty, as the rust will eat under the surface of the surrounding enamel and blister it off. Use black japan to touch up any parts, should the enamel chip. This should be laid on as thinly and evenly as possible.

Don't let the door hinges, dovetails, screen, hood, and grille joints get rusty for want of a little oil.

Don't let screen joints remain loose: they soon wear and perhaps cannot then be tightened up.

Don't force windows unduly: if they are tight at any time, apply a little soap or vaseline to the grooves. When lowering windows don't let them fall with a bang.

Don't lean upon the doors of a car when open. Shut the doors with sufficient smartness to ensure that the slam lock engages fully.

Don't let accumulators rattle in their boxes or run down, and don't let the acid be spilt.

A very slight smearing of the bonnet with linseed oil will prevent spotting of the paint on the bonnet, if applied before the car goes out into the rain.

When cushions get wet, remove and dry them as soon as possible, and don't put them back until the leather is thoroughly dry.

The hood curtains should not be taken off until they are dry, otherwise they will shrink, and perhaps then cannot be replaced without altering buttons. Neither should the hood be folded when it is wet.

The car should not be left dirty longer than absolutely necessary. If mud is allowed to dry on, it quickly destroys the lustre of the varnish.

Neither canvas nor leather hoods should be left folded when the car is not in use.

If the car is kept standing for any length of time it should be covered by a large dry sheet, of sufficiently fine texture to keep the dust off without excluding the light.

To destroy or prevent moths in woollen upholstery, use paraffin and camphor. This mixture should be placed in a saucer, and if a closed body is fitted, the carriage should be completely shut up.

### Hints on Cleaning Car

Don't have the car cleaned with a dry cloth, even if only dusty. Use plenty of water, and soap if necessary, to remove grease. A vacuum cleaner is very useful for removing dust from the upholstery of a car. When washing the car with a hose, don't let the water get in any joints of doors &c. This applies specially to covered bodies. If water is driven into the joints it may get behind the panels and cause the grain of the wood to rise and distort the panels, and spoil the appearance of the car.

Don't use petrol or paraffin to assist in removing grease. Use a soapy lather and thoroughly rinse with clean water. Use turpentine for cleaning the aluminium surfaces.

For cleaning silver plating, the finest jewellers' rouge should be used, the ordinary polish being too abrasive.

When cleaning the plated parts of the car, do not smear the upholstery or the paint with polish.

Use soap and water for cleaning canvas hoods; on no account use petrol if the hood material is rubber proofed.

### Hints for Cars in Regular Service

The following hints may be found useful where a car is in regular service, assuming a daily run of about 100 miles—

**Daily.** Give a turn to all screw-down greasers, those on the rear spring pins being especially important (see pages 46 and 47).

Fill oil in engine base to the correct level (see pages 14 and 17).

Examine tyres for pressure (see page 62).

See that security bolts and valve lock nuts are tight.

Fill up petrol tank and radiator (see pages 60 and 18).

See that spring clip nuts are tight (see page 62).

**Weekly.** Replenish all lubricators (see pages 46 and 47).

Oil brake pins and knuckle joints (see page 57).

Inject a little gear oil into the universal joints.

Do not add too much as the surplus will merely overflow (see page 52).

Oil bonnet hinges, bonnet clips, door locks, and hood joints.

Make up the level in the battery (see page 40).

**Monthly.** Remove and clean oil and petrol strainers (see pages 14 and 61). When replacing oil strainer see that the cover makes an airtight joint, otherwise the pump becomes inoperative.

Drain radiator and flush with hose (see page 18).

Examine tappets for clearance, and adjust if necessary. This clearance should be .003 when the engine is cold (see page 13).

Wash out clutch and replenish with oil (see page 48).

Remove front hub caps and fill with "Wolseley" Filtrate Cup Grease.

Replenish the oil bath for the rear wheel bearings (see page 55).

Lubricate magneto, starter, and dynamo bearings, two drops of oil in each oil hole (see pages 31, 35 and 40).

Examine and clean ignition distributor (see page 31).

Replenish gear-box (see page 50) and axle to correct oil levels (see page 55).

Test the strength of the electrolyte in the battery (see page 40).



# WOLSELEY MOTORS LTD.

Proprietors—VICKERS LIMITED

TABLE SHOWING QUANTITIES OIL, PETROL  
AND WATER REQUIRED

Capacity of Petrol Tank	12 gall.
Amount of water required when refilling system	4 gall.
Amount of EXTRA HEAVY "Wolseley" Filtrate required when refilling lubricating system	10½ pints
Amount of "Wolseley" Disc Clutch Oil required when renewing	3 oz.
Amount of "Wolseley" Filtrate Gear Oil to be put into Gear-box after washing out	2 pints
Amount of "Wolseley" Filtrate Gear Oil to be put into Rear Axle after washing out	2½ pints
Amount of "Wolseley" Filtrate Gear Oil to be put into Universal Joint on Propeller Shaft when renewing	2 oz.
Amount of "Wolseley" Filtrate Gear Oil to be put into Coupling for Sliding Block on Clutch Shaft	1 oz.

*List of*  
Spare Parts  
*for the*  
"WOLSELEY"  
FIFTEEN

Head Office and Works—Adderley Park, Birmingham.

Telegrams  
"EXACTITUDE, BIRMINGHAM."

Telephone  
Central 4361, Birmingham (12 lines).

London Repair Works—Gatloff Road, Commercial Road, Pimlico S.W.

Telephone—6220 (6 lines).

Telegrams—"Autovent, Vic., London."

## INSTRUCTIONS FOR ORDERING SPARE PARTS

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THIS Catalogue of Spares for the Wolseley "Fifteen" H.P. Car has been compiled in order to facilitate the ordering of parts which require replacement. The parts are grouped into components, and all the principal pieces are illustrated. When ordering, clients should quote the reference number, together with the description of the part, in order to minimise the possibility of error.

We would particularly impress upon clients the importance of always quoting the Maker's Car Number (not registered Car Number), which will be found on the metal nameplate on the dashboard. Unless this is done, we cannot be responsible if incorrect parts are supplied.

We reserve to ourselves the right to alter any part as may be considered advantageous, and therefore it is possible that illustrations shown in this book may not in all cases exactly resemble the actual part required. If, however, the Maker's Car Number is quoted, the correct part will be despatched.

All parts sent to be repaired must be forwarded carriage paid. These may be forwarded to either of the addresses on the title page, and must bear the Sender's Name, Address, and Maker's Car Number.

All parts sent for repairs are acknowledged as soon as received.

Cars sent to be repaired are driven by members of our staff entirely at customer's own risk.

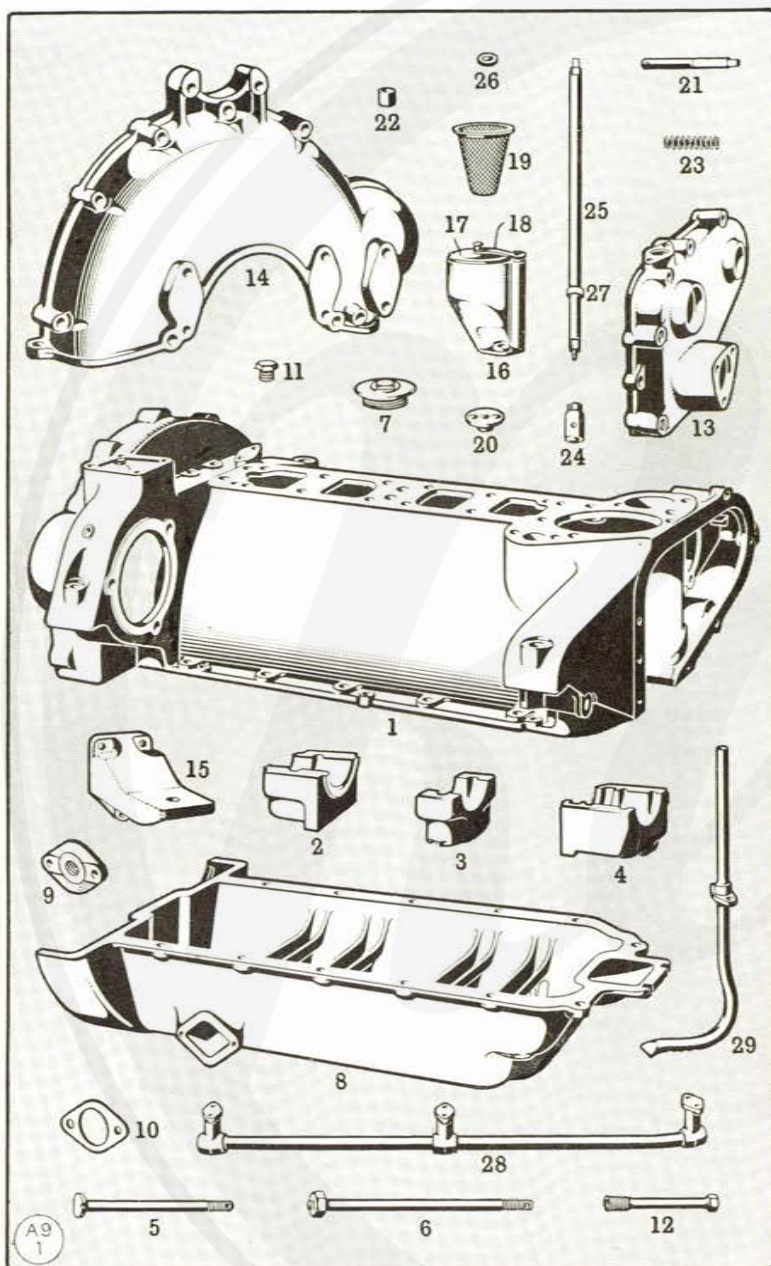
Cases will be credited at two-thirds of the price charged, if returned in good condition, carriage paid, within ten days.

To avoid delay, customers with whom we have no ledger account should send cash with order.

All prices are subject to alteration without notice.

**WOLSELEY MOTORS LTD.**

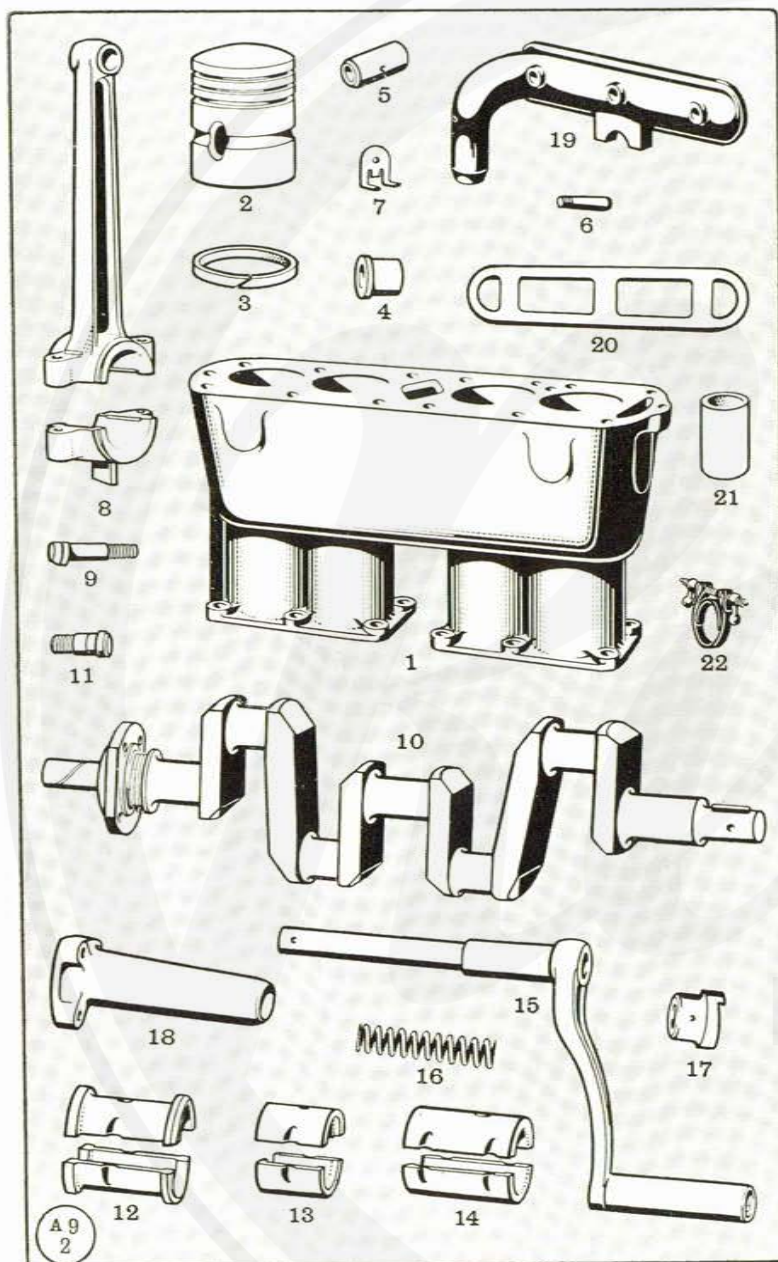




## Engine Crankcase, Oil-Base, Engine Gear Cover &c.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each.
—	A 9000	Crankcase complete, with Main Bearings, Blocks, Oil-base, Engine Chain Cover and Flywheel Cover (less Chain Wheels and Shafts) ... ..	£ 8. 0.
—	A 9001	Crankcase complete, with Bearing Blocks ... ..	
1	A 9002	Crankcase (machined only) ... ..	
2	128424	Bearing Block (front) ... ..	
3	128425	Bearing Block (centre) ... ..	
4	128426	Bearing Block (rear) ... ..	
5	142333	Bearing Bolt (front) ... ..	
6	A 9003	Bearing Bolt complete, with Head and Nuts (centre and rear) ... ..	
7	08573	Plug for Crankcase ... ..	
8	A 9004	Oil-base (machined only) ... ..	
9	67848	Flange for Oil-base ... ..	
10	141961	Joint for Flange ... ..	
11	433	Plug for Flange ... ..	
12	128962	Bolt for Oil-base ... ..	
13	A 9005	Engine Chain Cover (machined and studded) ... ..	
11	443	Plug for Cover ... ..	
14	A 9006	Flywheel Cover ... ..	
15	128448	Engine Foot Bracket (front and rear) ... ..	
—	A 9007	Oil Filler, assembled complete with Oil Level Valve ... ..	
16	128922	Oil Filler Body ... ..	
17	126624	Cover for Oil Filler ... ..	
18	A 9008	Spring Lever ... ..	
19	A 9009	Strainer for Oil Filler ... ..	
20	128923	Oil Level Valve ... ..	
21	128925	Spindle for Oil Level Valve ... ..	
22	128973	Liner for Oil Level Valve ... ..	
23	51742	Spring for Oil Level Valve ... ..	
24	128924	Jaw for Oil Level Valve ... ..	
25	141049	Spindle for Oil Level Valve ... ..	
26	141050	Collar for Spindle ... ..	
27	15052	Collar for Spindle ... ..	
28	A 9010	Crankcase Oil Pipe with Brackets ... ..	
29	A 9010a	Oil Suction Pipe with Flange ... ..	

Please state maker's car number when ordering.

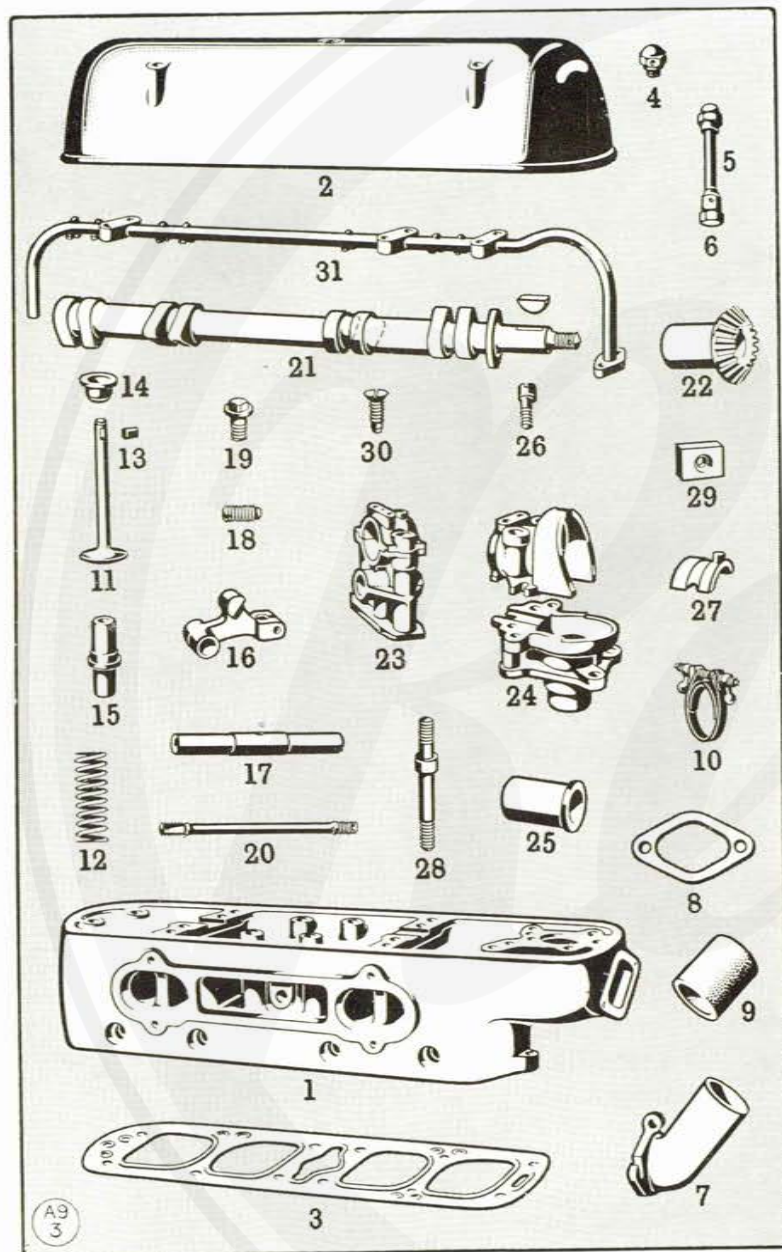


## Engine—Cylinders and Crankshaft &c.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each. £ s. d.
1	A 9011	Cylinder (machined only) ... ..	...
—	A 9012	Piston and Connecting Rod, assembled complete ... ..	...
—	A 9013	Piston, complete with Rings ... ..	...
2	A 9014	Piston (machined only) ... ..	...
3	A 9015	Piston Ring ... ..	...
4	127579	Bush for Piston ... ..	...
5	128675	Gudgeon Pin ... ..	...
6	127492	Locking Pin for Gudgeon Pin ... ..	...
7	143837	Locking Plate for Pin ... ..	...
8	A 9016	Connecting Rod assembled... ..	...
9	127580	Bolt for Connecting Rod ... ..	...
10	A 9017	Crankshaft (machined only) ... ..	...
11	128810	Bolt for Crankshaft to Flywheel ... ..	...
12	A 9018	Front Main Bearing (top) ... ..	...
—	—	Front Main Bearing (bottom) ... ..	...
13	A 9019	Centre Main Bearing (top) ... ..	...
—	—	Centre Main Bearing (bottom) ... ..	...
14	A 9020	Rear Main Bearing (top) ... ..	...
—	—	Rear Main Bearing (bottom) ... ..	...
—	A 9021	Starting Handle, assembled complete ... ..	...
15	A 9022	Starting Handle and Shaft, with Tube and Spindle fitted ... ..	...
16	142994	Spring for Starting Handle ... ..	...
17	145012	Ratchet for Handle ... ..	...
18	127488	Bracket for Handle ... ..	...
19	A 9023	Water Inlet Pipe from Pump to Cylinders ... ..	...
20	127569	Joint for Inlet Pipe... ..	...
21	A 9024	Rubber Connection for Inlet Pipe ... ..	...
22	50136	Clips ... ..	...

Please state maker's car number when ordering.

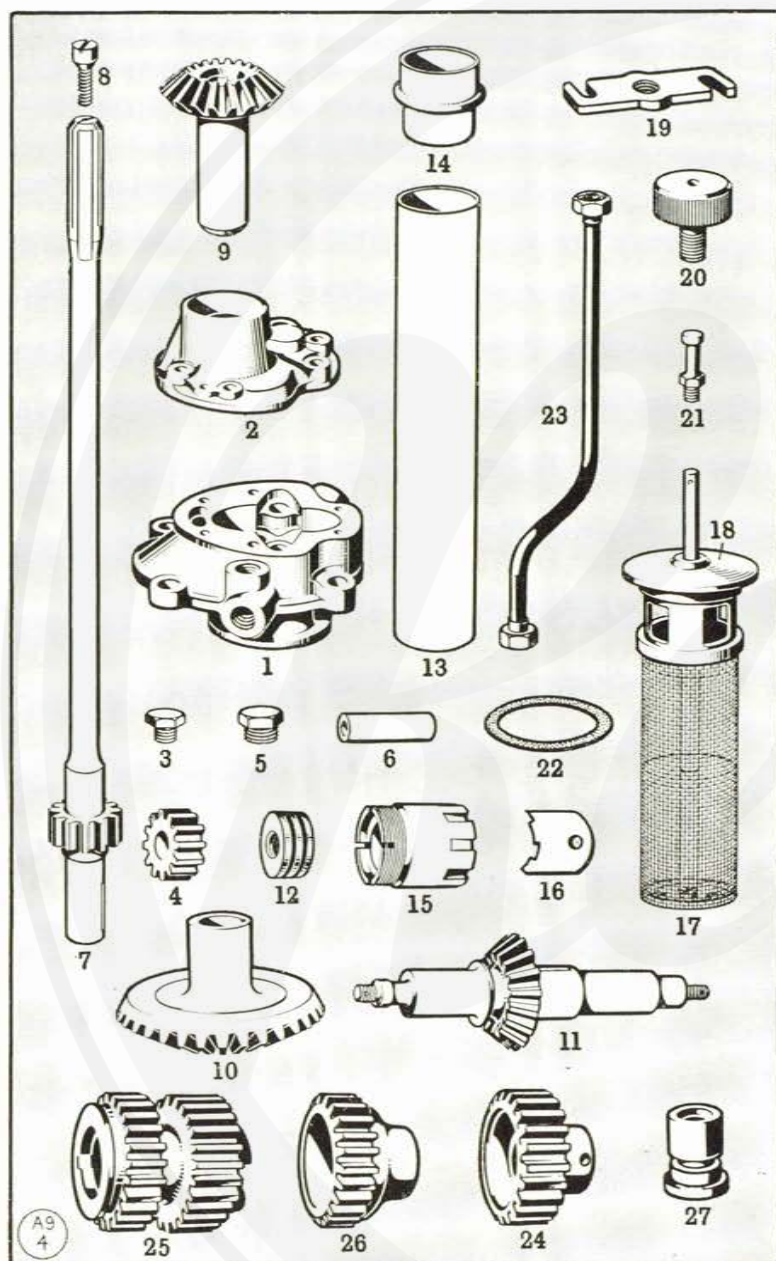




## Engine Cylinder Head, Camshaft, Valves &c.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each £. s. d.
—	A 9025	Cylinder Head assembled complete, with Camshaft Valves, &c. ...	...
—	A 9026	Cylinder Head, assembled with Valves ...	...
1	A 9027	Cylinder Head (machined only) ...	...
2	128269	Cover for Cylinder Head ...	...
3	128528	Joint for Cylinder Head ...	...
—	A 9027a	Joint for Cover (not shown) ...	...
4	128432	Breather for Cover ...	...
5	128575	Bolt for Cover ...	...
6	128576	Nut for Bolt ...	...
7	A 9028	Water Outlet Pipe (machined only) ...	...
8	142494	Joint for Water Outlet Pipe ...	...
9	A 9029	Rubber Connection for Outlet Pipe to Radiator ...	...
10	50138	Clips ...	...
—	A 9030	Valve assembled complete in Carrying Block, with Spring, Cotter, and Cup ...	...
11	128520	Valve (inlet and exhaust) ...	...
12	143439	Spring for Valve ...	...
13	128522	Cotter for Valve ...	...
14	128559	Cup for Valve ...	...
15	128560	Guide for Valve ...	...
16	142172	Valve Rocker ...	...
17	A 9031	Valve Rocker Shaft ...	...
18	128561	Adjusting Screw ...	...
19	144203	Pinching Screw ...	...
20	144186	Stud for Rocker Shaft ...	...
—	A 9032	Camshaft and Bevel Wheel assembled ...	...
21	A 9033	Camshaft ...	...
22	128467	Bevel Wheel ...	...
23	A 9034	Camshaft Bearing Bracket and Cap (rear and centre) ...	...
24	A 9035	Camshaft and Vertical Shaft Bearing ...	...
25	144187	Bush for Camshaft Bearing (front) ...	...
26	144190	Dowel for Front Camshaft Bearing ...	...
27	144188	Camshaft Bearing (rear and centre) ...	...
28	144255	Stud for Camshaft Bearing ...	...
29	A 9036	Key for Camshaft Bearing ...	...
30	127760	Set Screw for Camshaft Bearing ...	...

Please state maker's car number when ordering.



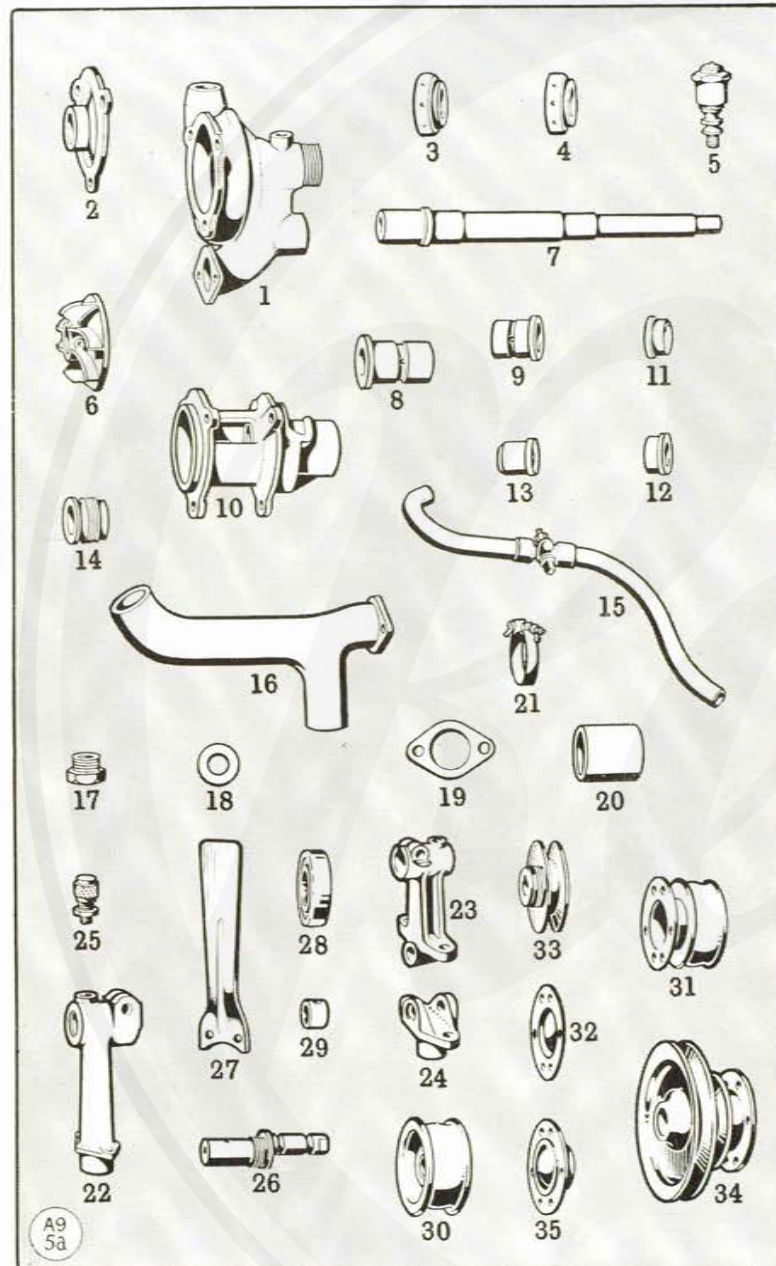
## Oil Pump, Vertical Driving Details, and Engine Gears.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each. C S. d.
—	A 9037	Oil Pump complete, with Vertical Shaft and Oil Pump Bevel Wheel	...
1	A 9037a	Oil Pump Body	...
2	A 9037b	Cover for Oil Pump Body	...
3	443	Plug	...
4	128299	Oil Pump Gear (driven)	...
5	141333	Plug	...
6	141240	Spindle	...
7	A 9037c	Vertical Driving Shaft (Oil Pump Driving Gear solid with this shaft)	...
8	143049	Screw for Vertical Driving Shaft	...
9	144176	Top Bevel Pinion	...
10	144177	Oil Pump Bevel Wheel	...
11	128465	Camshaft Driving Shaft	...
12	126088	Thrust Race	...
13	142318	Vertical Driving Shaft Cover Tube	...
14	141144	Liner for Cover Tube	...
15	141239	Bevel Shaft Bearing	...
16	141368	Locking Plate for Bearing	...
—	A 9038	Oil Strainer complete	...
17	A 9039	Strainer Body and Strainer assembled	...
—	A 9040	Strainer and Centre Rod complete	...
18	126026	Strainer Body	...
19	68637	Clamp	...
20	68258	Nut for Clamp	...
21	126023	Pillar for Clamp	...
22	A 9040a	Leather Washer for Strainer	...
23	A 9041	Vertical Oil Pipe	...
24	A 9042	Camshaft Chain Wheel	...
25	A 9043	Crankshaft Chain Wheel	...
26	A 9044	Pump and Magneto Chain Wheel	...
—	A 9045	Chain from Crankshaft to Camshaft Driving Shaft	...
—	A 9046	Chain from Crankshaft to Pump and Magneto Shaft	...
27	142464	Bush for Camshaft Driving Shaft	...

Please state maker's car number when ordering.



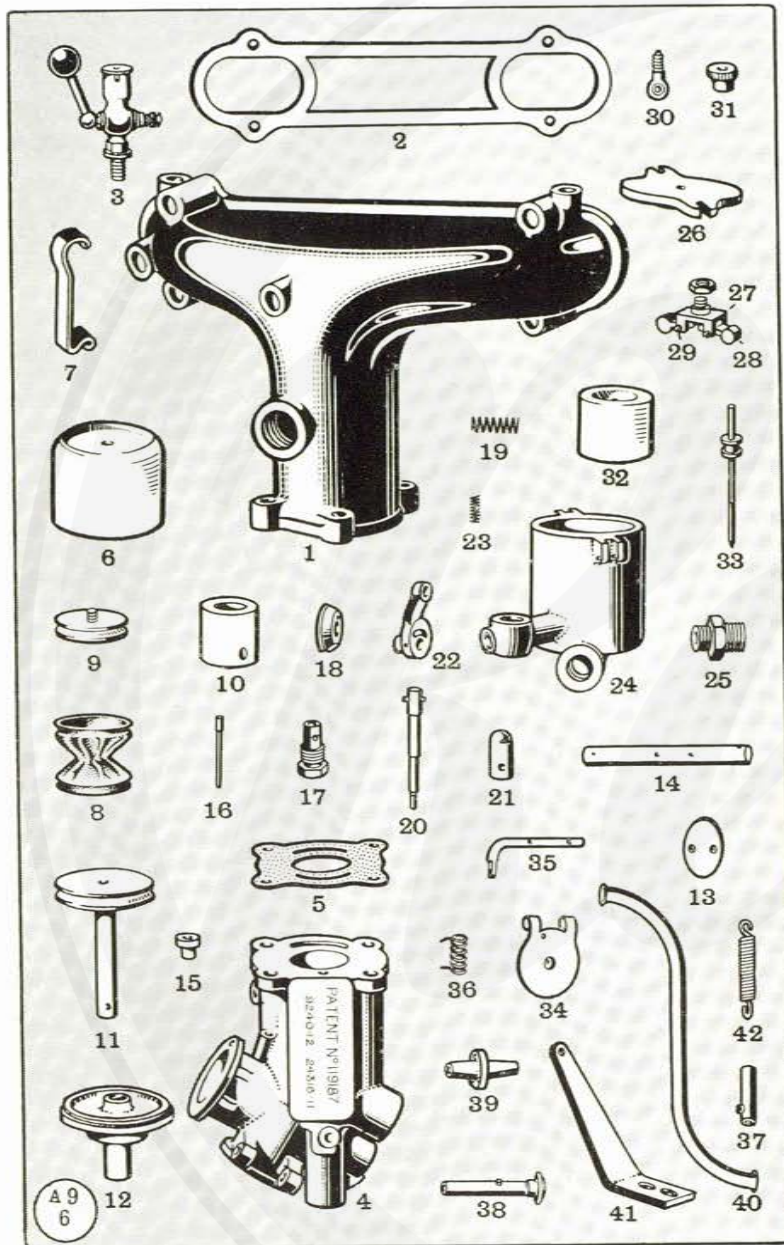
# Water Pump and Fan.



No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each. £/s./d.
	A 9047	Water Pump complete	...
1	128694	Water Pump Body	...
2	141068	Cover for Water Pump	...
3	141137	Gland Nut (inside)	...
4	141138	Gland Nut (outside)	...
5	41091	Lubricator for Pump Body	...
6	141067	Pump Vane	...
7	128690	Pump Spindle	...
8	142391	Bush for Spindle	...
9	A 9048	Bush for Spindle (in Chain Cover)	...
10	142138	Bearing and Bracket for Pump Spindle	...
11	128960	Gland for Pump (front)	...
12	128961	Gland for Pump (rear)	...
13	141241	Bush for Gland	...
14	141958	Oil Thrower for Spindle	...
15	A 9049	Water Pipe from Pump to Carburettor, Assembled with Cock	...
16	A 9050	Water Drain Pipe from Pump to Radiator	...
17	425	Drain Plug for Water Pipe	...
18	A 9051	Washer for Plug	...
19	126205	Joint for Water Pipe	...
20	A 9052	Rubber Connection from Water Pipe to Radiator	...
21	50136	Clip for Connection	...
	A 9053	Fan Assembled Complete (C.A.V.)	...
	A 9054	Fan Assembled Complete (B.L.I.C.)	...
22	127494	Fan Bracket	...
23	145299	Fan Bracket	...
24	145300	Fan Swivelling Bracket	...
25	51009	Greaser for Fan Bracket	...
26	141926	Fan Spindle	...
27	128892	Fan Blades	...
28	19180	Fan Bearings	...
29	127496	Distance Piece for Bearings	...
30	142140	Fan Driving Pulley	...
	A 9055	Fan Spindle Pulley Assembled with Blades	...
31	A 9056	Fan Spindle Pulley	...
	A 9057	Fan Belt	...
32	128891	Fan Bearing Cover	...
33	142628	Fan Driving Pulley	...
34	142612	Fan Spindle Pulley	...
	A 9058	Fan Belt (Dynamo to Fan)	...
	A 9059	Fan Belt (Engine to Fan)	...
35	143078	Fan Bearing Cover	...

Please state maker's car number when ordering

## Carburetter.

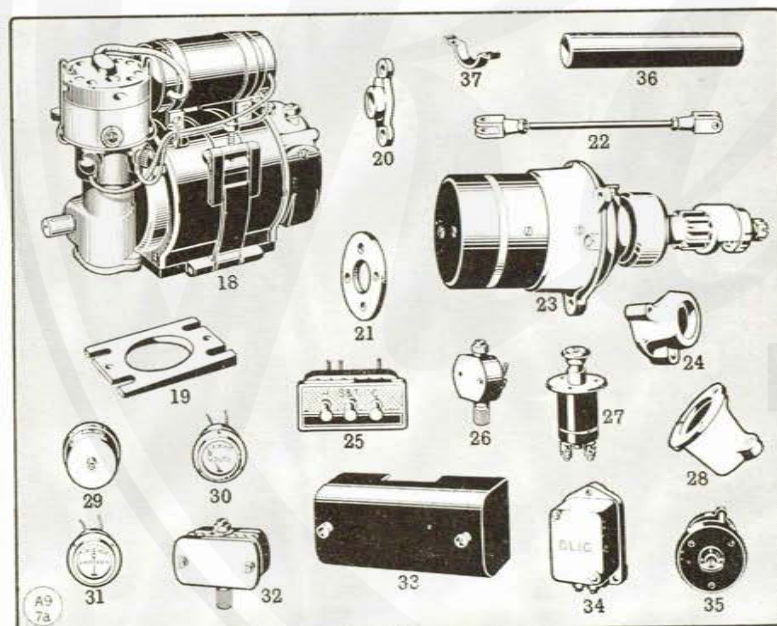
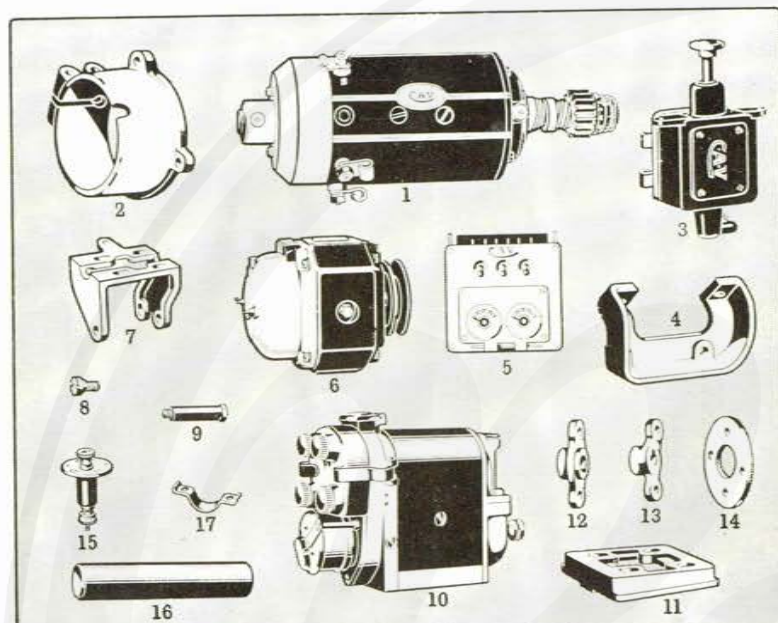


No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each.
—	A 9060	Carburetter complete with Induction Pipe and Float Chamber	...
—	A 9061	Carburetter complete with Induction Pipe (less Float Chamber)	...
1	127559	Induction Pipe	...
2	145904	Joint for Induction Pipe	...
3	60786	Priming Cock for Pipe	...
4	A 9062	Carburetter Body (machined only)	...
5	144824	Joint for Carburetter Body	...
6	61238	Cover for Dashpot Chamber	...
7	61239	Spring for Cover	...
8	52995	Bellows	...
9	54937	Bellows Carrier	...
10	126252	Floater	...
11	61263	Floater Spindle	...
12	61265	Guide for Spindle	...
13	126285	Throttle Valve	...
14	126249	Spindle for Throttle Valve	...
15	61256	Main and Auxiliary Jet	...
16	A 9063	Main Jet Needle	...
17	126251	Plug for Jets	...
18	143160	Cam for Auxiliary Jet	...
19	127231	Spring for Auxiliary Jet	...
20	A 9064	Auxiliary Jet Needle	...
21	142468	Cap for Auxiliary Jet	...
22	142455	Lever for Auxiliary Jet	...
23	127128	Spring for Cap	...
—	A 9065	Float Chamber complete	...
—	A 9066	Float Chamber Cover, assembled with Balance Weights and Needle Valve	...
24	126246	Float Chamber Body	...
25	436	Union	...
26	143085	Cover for Float Chamber	...
27	128086	Bridge Piece for Cover	...
28	128085	Balance Weight	...
29	143853	Pin for Balance Weights	...
30	65516	Bolt for Float Chamber	...
31	39579	Nut for Bolt	...
32	65514	Float	...
33	A 9067	Needle Valve and Collar	...
34	126745	Air Shutter	...
35	126744	Spindle for Air Shutter	...
36	143804	Spring	...
37	144744	Jaw for Pull Wire	...
38	A 9068	Pull Rod for Air Shutter	...
39	144742	Bracket for Pull Rod	...
40	144745	Guide Tube for Pull Wire	...
41	145204	Anchor for Air Shutter Spring	...
42	128771	Pull-off Spring for Air Shutter	...

For Carburetter Control see page 105

Please state maker's car number when ordering.





## Electrical Equipment and Ignition.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each.
			£ s. d.

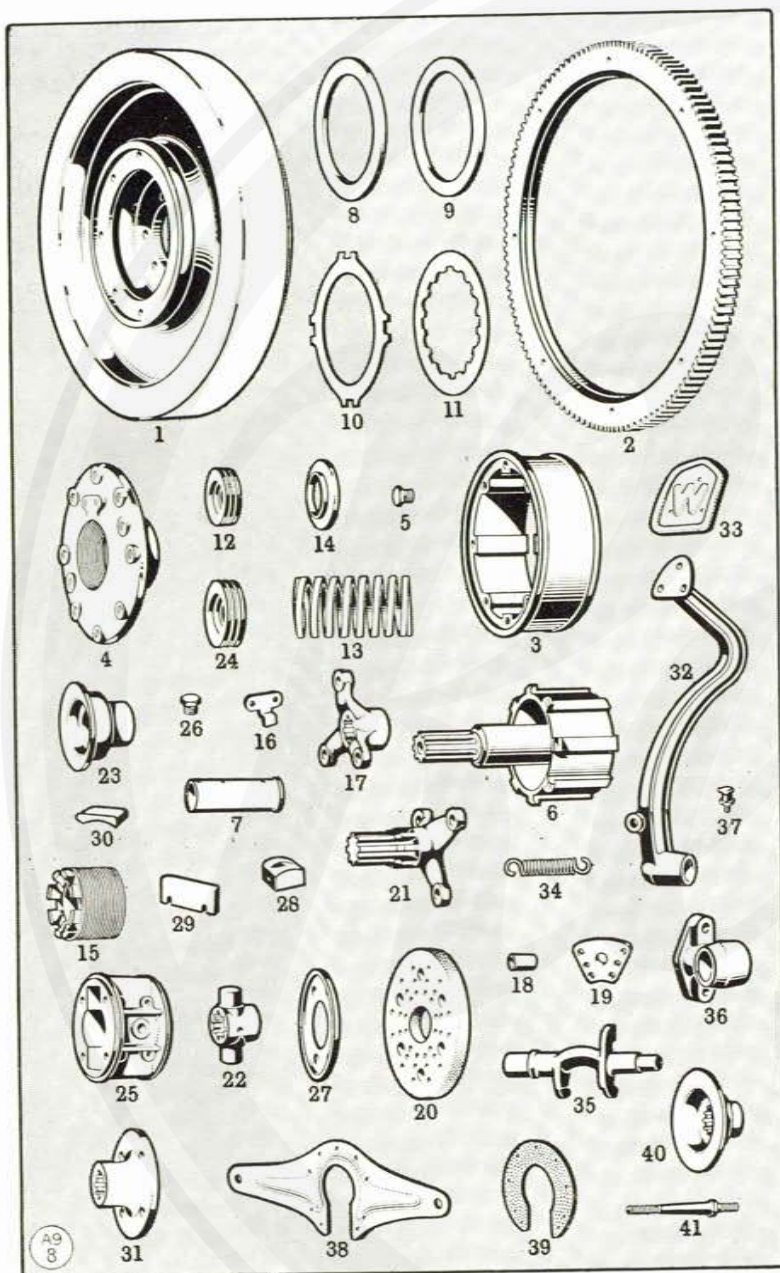
### C.A.V.

1	A 9069	Starter Motor (Z.C. Type)....	...
2	143157	Bracket for Starter Motor....	...
3	127555	Starter Switch (Z. Type)....	...
4	143043	Bracket for Switch....	...
5	A 9070	Switchboard....	...
6	142520	Dynamo (N.D. Type)....	...
7	142841	Bracket for Dynamo....	...
8	142639	Locating Screw....	...
9	142640	Lubricator Adaptor....	...
		Lubricator (not shown)....	...
10	A 9071	Magneto (Z.U.4 Type)....	...
11	142365	Magneto Base....	...
	A 9072	Coupling for Magneto complete....	...
12	141231	Magneto Coupling (Driver)....	...
13	74651	Magneto Coupling (Driven)....	...
14	74650	Leather Coupling....	...
15	143042	Magneto Switch....	...
16	142392	Ignition Wire Tube....	...
17	141238	Bracket for Tube....	...
	A 9073	Set of H.T. Wires (not shown)....	...
	A 9074	Set of L.T. Wires (not shown)....	...

### B.L.I.C.

18	A 9075	Dynamo and Igniter....	...
19	141957	Generator Base Plate....	...
20	141231	Generator Coupling....	...
21	74650	Coupling Disc....	...
22	A 9076	Distributor Control Rod....	...
23	A 9077	Starter Motor....	...
24	144258	Starter Bearing Housing....	...
25	A 9078	Switchboard....	...
26	142060	Battery Fuse Box....	...
27	A 9079	Starter Switch....	...
28	143022	Bracket for Switch....	...
29	146020	Field Fuse Box....	...
30	A 9080	Volt-Meter....	...
31	A 9081	Ampere Meter....	...
32	A 9082	Dynamo Cut-out Box....	...
33	A 9083	Terminal Board with Charging Resistance (A.2 Type)....	...
34	A 9084	Junction Box....	...
35	A 9085	Reverse Switch....	...
36	142392	Ignition Wire Tube....	...
37	141238	Bracket for Tube....	...
	A 9086	Set of H.T. Wires (not shown)....	...
	A 9087	Set of L.T. Wires (not shown)....	...

Please state maker's car number when ordering.



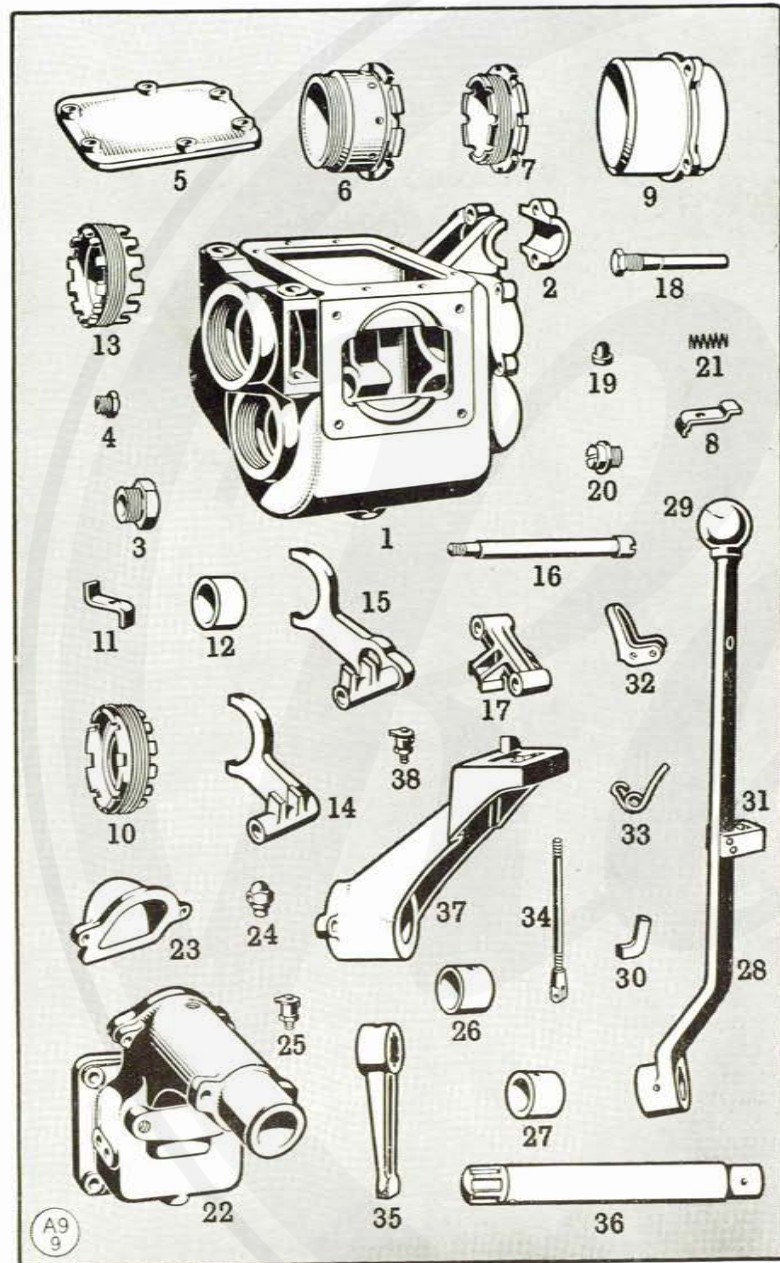
## Clutch and Control.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each (£ s. d.)
—	A/9088	Clutch assembled complete, with Flywheel, Clutch Centre, Couplings, and Universal Joint Ring	...
—	A/9089	Clutch assembled complete (less Flywheel and Driving Flange)	...
1	141115	Flywheel	...
—	—	Flywheel Cover (see page 83)	...
2	A/9090	Gear Ring for Flywheel	...
3	141116	Clutch Case	...
4	141117	Clutch Cover	...
5	443	Plug for Cover	...
6	A/9091	Clutch Centre with Bush fitted	...
7	141124	Bush for Clutch Centre	...
8	141120	Clutch Centre Ring	...
9	146261	Clutch Centre Ring	...
10	141122	Clutch Plate (Driver)	...
11	141123	Clutch Plate (Driven)	...
12	67573	Clutch Centre Bearing	...
13	122586	Clutch Spring	...
14	127215	Locking Ring for Clutch Spring	...
15	122481	Adjusting Nut	...
16	142861	Locking Plate for Nut	...
17	141149	Universal Joint Coupling (on Clutch Centre)	...
—	A/9092	Clutch Universal Coupling complete with Clutch Shaft and Clutch Centre Coupling	...
—	A/9093	Disc Universal Joint, assembled complete with Bushes, Washers, &c.	...
18	126453	Bush for Universal Joint	...
19	143925	Washer for Universal Joint	...
20	143024	Fibre Disc	...
21	126367	Clutch Universal Shaft	...
22	126368	Coupling on Clutch Shaft	...
23	122482	Clutch Thrust Box	...
24	64582	Bearing for Thrust Box	...
—	A/9094	Clutch Universal Joint Socket, assembled with Cover Plate, Bearing Plates, Blocks, Plug, Bolts, and Nuts	...
—	A/9095	Universal Joint Socket, assembled with Plates	...
25	143021	Universal Joint Socket	...
26	443	Plug for Socket	...
27	126365	Cover Plate	...
28	126371	Bearing Blocks	...
29	142899	Bearing Plates	...
30	143001	Sliding Piece for Bearing Block	...
31	126364	Driving Flange for Universal Joint on First Motion Shaft	...
32	A/9096	Clutch Pedal	...
33	142999	Clutch Pedal Pad	...
34	61299	Spring for Clutch Pedal	...
35	143068	Clutch Operating Shaft	...
36	144004	Bracket for Clutch Operating Shaft	...
37	16340	Oiler	...
—	—	(Clutch Pedal Spring Anchor, see Rocking Shaft Bracket, page 105)	...
38	141150	Clutch Brake Bracket	...
39	141151	Fibre for Bracket	...
40	141119	Stop Flanges	...
41	141126	Bolt for Clutch Stop	...

Please state maker's car number when ordering.

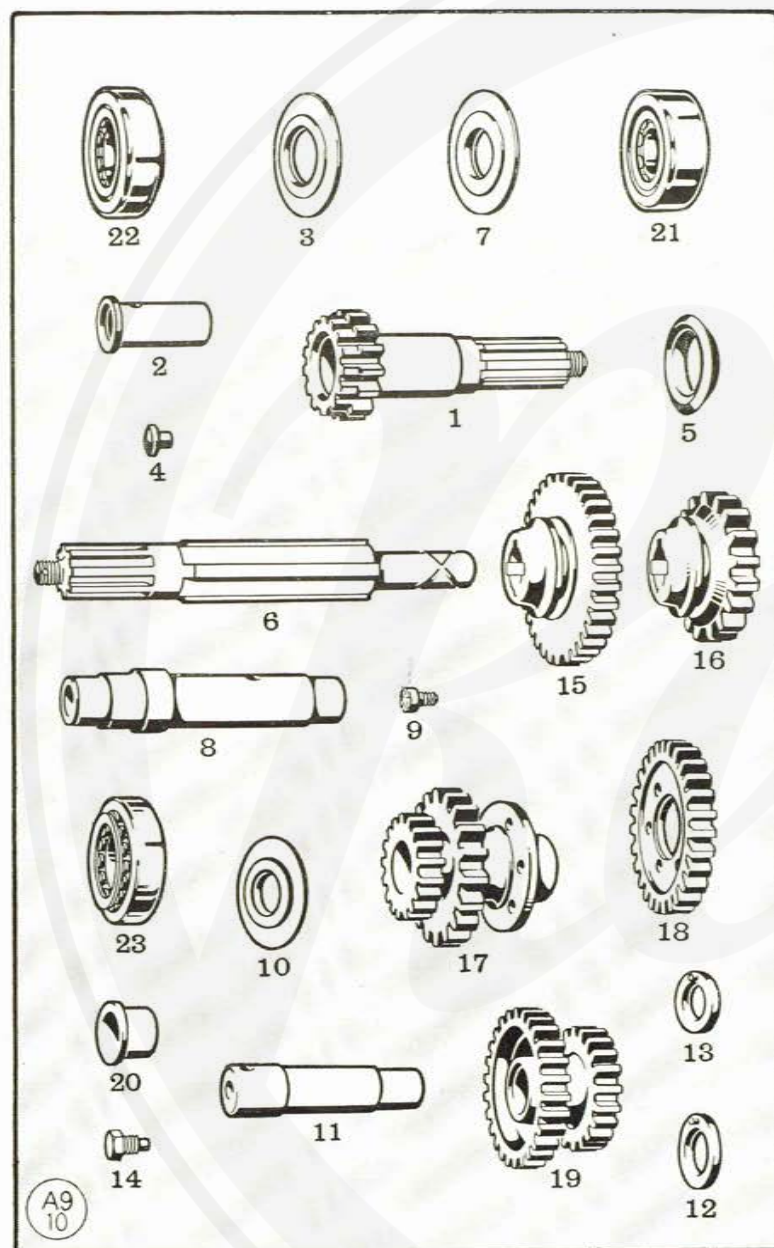


## Gearbox and Change Speed Control.



No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each. £ s. d.
—	A 9097	Gearbox assembled complete, with Change Speed Bracket	...
—	A 9098	Gearbox complete, with Change Speed Bracket, Covers, Bearings, and Gear Shifting Forks (less Gears and Shafts)	...
—	A 9099	Gearbox and Change Speed Bracket (machined and studded, with Covers fitted)	...
1	A 9100	Gearbox (machined only)	...
2	126039	Support Cap for Gearbox	...
3	413	Drain Plug (bottom of Gearbox)	...
—	A 9100a	Washer for Plug (not shown)	...
4	433	Drain Plug	...
—	A 9100b	Washer for Plug (not shown)	...
5	127738	Top Cover for Gearbox	...
6	126236	Bearing Sleeve (Front End)	...
7	A 9101	Adjusting Nut complete for Sleeve	...
8	126231	Locking Piece	...
9	126040	Front Bearing Housing	...
10	A 9102	Bearing Nut complete for Sliding Shaft	...
11	126237	Locking Plate for Rear Adjusting Nut	...
12	126334	Collar for Sliding Shaft	...
13	126169	Countershaft Bearing Nut	...
14	126170	Change Speed Fork (Short)	...
15	126171	Change Speed Fork (Long)	...
16	128340	Support for Change Speed Fork	...
17	127899	Locking Piece for Fork Rods	...
18	126225	Support for Locking Piece	...
19	145536	Plunger	...
20	126223	Plug for Plunger	...
21	126240	Spring for Plunger	...
—	—	(For Gearbox Supporting Tube and Brackets, see page 113)	...
22	A 9103	Change Speed Bracket (machined only)	...
23	145754	Cover for Change Speed Bracket	...
24	128432	Breather for Cover	...
25	16340	Oiler	...
26	126172	Bush (large)	...
27	126173	Bush (small)	...
—	A 9104	Change Speed Lever assembled with Reverse Catch and Rod	...
28	A 9105	Change Speed Lever	...
29	65812	Knob for Change Speed Lever	...
30	142931	Reverse Catch	...
31	142945	Guide for Reverse Catch	...
32	143401	Reverse Catch Handle	...
33	144788	Spring for Reverse Stop	...
34	A 9106	Reverse Rod	...
35	126220	Actuating Lever for Change Speed	...
36	A 9107	Change Speed Tube assembled with End Piece	...
37	144189	Change Speed Gate	...
38	16340	Oiler	...

Please state maker's car number when ordering.



## Gearbox—Gears, Shafts and Bearings.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each. £ s. d.
1	A 9108	First Motion Shaft, with Bush, Nut, and Thrust Button ... ..	
2	126232	Bush for First Motion Shaft ... ..	
3	126175	Bearing Plate for First Motion Shaft ... ..	
4	0043726	Thrust Button for First Motion Shaft and Sliding Shaft ... ..	
5	126177	Oil Thrower for First Motion Shaft and Sliding Shaft ... ..	
6	126036	Sliding Gear Shaft ... ..	
7	126174	Bearing Plate for Sliding Shaft ... ..	
8	126037	Countershaft ... ..	
9	126230	Locking Screw for Countershaft ... ..	
10	126176	Bearing Plates for Countershaft ... ..	
11	128140	Reverse Shaft ... ..	
12	127460	Washer for Reverse Shaft ... ..	
13	127461	Washer for Reverse Shaft ... ..	
14	126229	Locking Screw for Reverse Shaft... ..	
15	126163	First and Reverse Sliding Gear (32 teeth)... ..	
16	126162	Second and Direct Sliding Gear (15 and 17 teeth) ... ..	
—	A 9109	Countershaft Gear, assembled with Constant Mesh Gear ... ..	
17	128143	Countershaft Gear (17 and 18 teeth) ... ..	
18	126590	Constant Mesh Gear (27 teeth) ... ..	
19	A/9110	Reverse Gear with Bushes fitted (21 and 26 teeth) ... ..	
20	126228	Bush for Reverse Gear (two of these are required for one gear) ... ..	

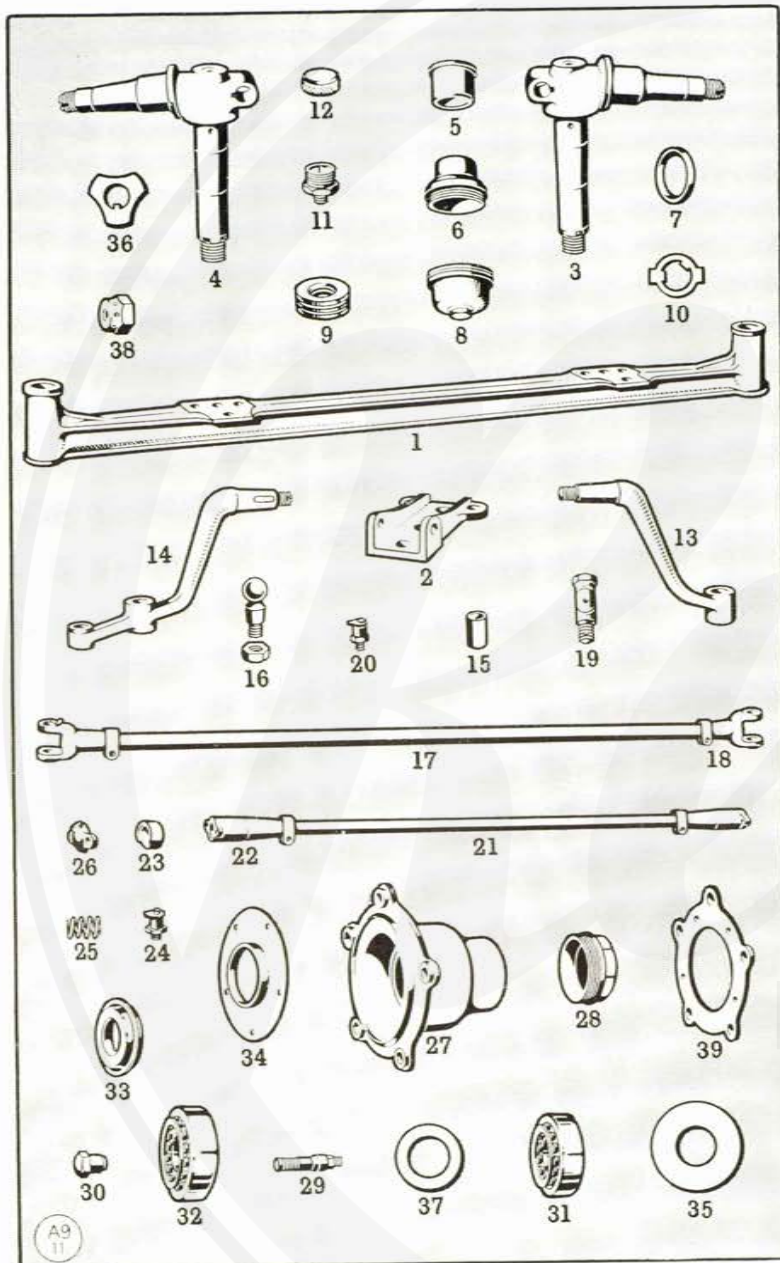
### Gearbox Bearings.

21	126254	Bearing for First Motion Shaft (front end)
22	126238	Bearing for First Motion Shaft (rear end)
—	126238	Bearing for Sliding Shaft (rear end) ...
23	63610	Bearing for Countershaft (same both ends)

Please state maker's car number when ordering.



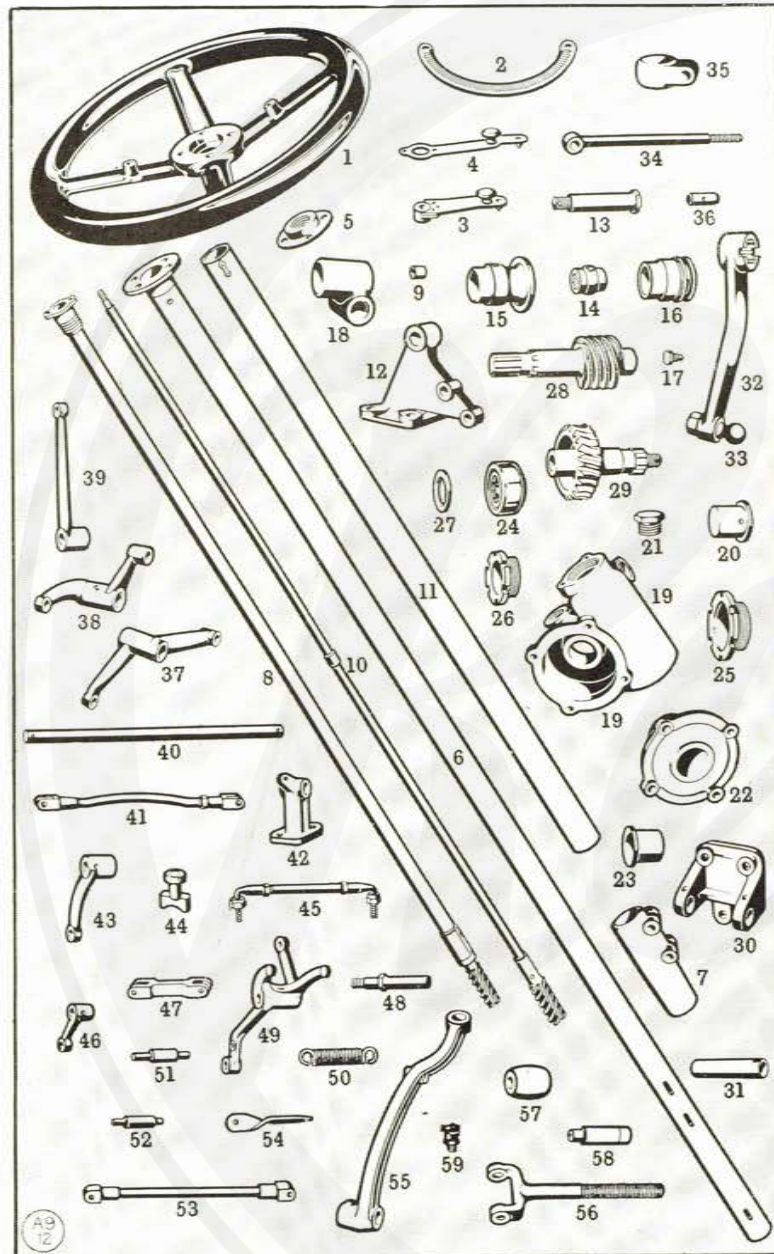
# Front Axle, Swivels and Hubs.



No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each.
		£ s. d.	
—	A 9111	Front Axle, complete with Hubs and Bearings ...	...
—	A 9112	Front Axle assembled complete, with Swivels, Steering Levers, and Steering Cross Tube ...	...
1	126387	Front Axle (machined only) ...	...
2	126427	Spring Seat for Axle ...	...
—	A 9113	Swivel Axle with Nut and Lubricator (O.S.) ...	...
3	143285	Swivel Axle (O.S.) ...	...
—	A 9114	Swivel Axle with Nut and Lubricator (N.S.) ...	...
4	143286	Swivel Axle (N.S.) ...	...
5	144348	Bush for Swivel (top) ...	...
6	A 9115	Bush for Swivel (bottom) ...	...
7	143893	Distance Piece for Swivel ...	...
8	143886	Cover for Swivel Nut ...	...
—	143895	Locking Wire for Cover (not shown) ...	...
9	60696	Thrust Bearing ...	...
10	128104	Locking Washer ...	...
11	A 9116	Swivel Lubricator complete ...	...
12	67896	Cap for Lubricator ...	...
—	A 9117	Steering Lever with Nut and Bush (O.S.) ...	...
13	143288	Steering Lever (O.S.) ...	...
—	A 9118	Steering Lever with Nut Bush and Ball Pin (N.S.) ...	...
14	143287	Steering Lever (N.S.) ...	...
15	127680	Bush for Steering Levers ...	...
16	A 9119	Ball Pin and Nut for Near-side Steering Lever ...	...
17	A 9120	Steering Cross Tube Assembled with Jaws and Pins ...	...
18	144481	Jaw End for Cross Tube ...	...
19	127679	Pin for Jaw End ...	...
20	16340	Oiler ...	...
21	A 9121	Steering Connecting Tube, assembled ...	...
22	144482	End for Steering Connecting Tube ...	...
23	128111	Bearing Block for Tube End ...	...
24	16340	Oiler ...	...
25	128041	Spring for Ball Pin ...	...
26	128110	Cap for Steering Tube End ...	...
—	A 9122	Front Hub assembled with Bearings ...	...
27	141346	Front Hub ...	...
28	126413	Cap for Front Hub ...	...
29	128909	Stud for Hub ...	...
30	128470	Nut for Stud ...	...
31	60690	Timken Bearing (247) ...	...
32	47991	Timken Bearing (357) ...	...
33	144344	Dust Cover ...	...
34	144355	Plate for Cover ...	...
35	126419	Oil Retaining Ring ...	...
36	126420	Retaining Ring ...	...
37	126584	Retaining Plate ...	...
38	126421	Adjusting Nut for Bearing ...	...
—	A 9123	Front Wheel (not shown) ...	...
39	126412	Flange for Wheel ...	...

Please state maker's car number when ordering.

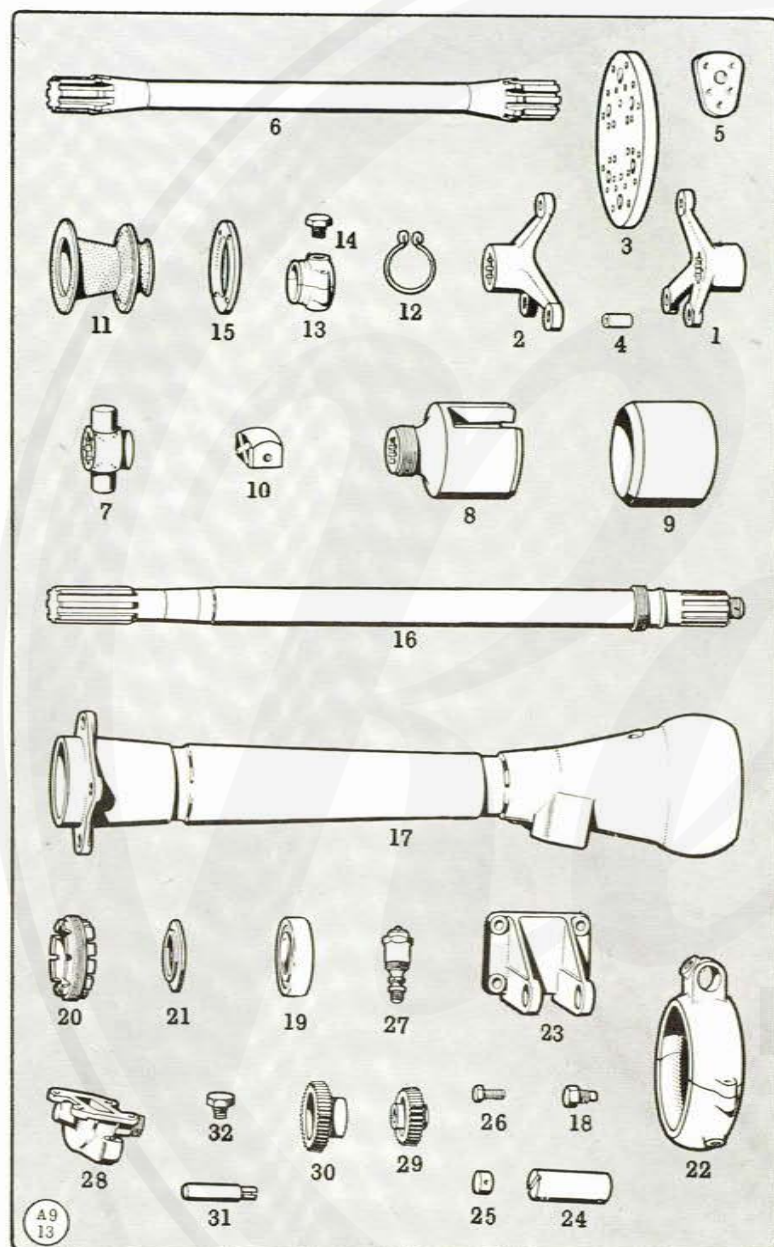
# Steering and Engine Control.



No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each.
---	A/9124	Steering, assembled complete (including Steering Wheel, Control Levers, Worm and Worm Wheel, Worm Box, and Worm Segment Lever)	...
---	A/9125	Steering Column complete (with Steering Wheel and Control Levers)	...
1	A/9126	Steering Wheel	...
2	36567	Sector for Control Levers	...
3	A/9127	Ignition Lever assembled complete	...
4	A/9128	Throttle Lever assembled complete	...
5	72177	Screwed Flange	...
6	A/9129	Steering Column (assembled with Top Flange)	...
7	128926	Steering Column Sleeve	...
8	A/9130	Throttle Control Tube, assembled with Throttle Lever End, and Throttle Worm	...
9	36569	Bush	...
10	A/9131	Ignition Control Tube, assembled with Ignition Lever End and Ignition Worm	...
11	A/9132	Steering Column Tube	...
12	141210	Steering Column Bracket	...
13	141211	Pin for Bracket	...
14	127922	Worm Nut for Throttle Tube	...
15	127922	Worm Nut for Ignition Tube	...
16	126263	Sliding Sleeve for Throttle	...
17	39186	Sliding Sleeve for Ignition	...
18	36544	Pin for Sliding Sleeves	...
19	126264	Swivelling Bracket for Steering Column	...
---	A/9133	Steering Box, assembled complete with Bushes, Covers, Studs, and Nuts	...
19	126031	Steering Box (machined only)	...
20	126954	Bush for Steering Box	...
21	425	Pin	...
22	126032	Steering Box Cover	...
23	126053	Bush for Cover	...
24	63628	Timken Bearing for Steering Box	...
25	126021	Adjusting Nut	...
26	126056	Gland Nut	...
27	126020	Bearing Distance Piece	...
28	A/9134	Worm	...
29	A/9135	Worm Wheel	...
30	126057	Steering Box Bracket	...
31	126958	Steering Box Support	...
32	A/9136	Steering Lever, complete with Ball Pin and Nut	...
33	128549	Ball Pin	...
34	143753	Steering Column Stay	...
35	143752	Lug for Stay	...
36	142665	Pin for Steering Column Stay	...
37	142431	Ignition Operating Lever	...
38	142817	Ignition Control Lever	...
39	142820	Ignition Lever	...
40	141246	Rocking Shaft	...
41	A/9137	Throttle Control Rod	...
42	141221	Rocking Shaft Bracket (this Bracket forms Clutch Pedal Spring Anchor)	...
43	142819	Lever for Rocking Shaft (Ignition Control)	...
44	A/9138	Monkey Block and Collar	...
45	A/9139	Ignition Connecting Rod with Ball Joints	...
46	141218	Lever for Rocking Shaft (Carburettor Control)	...
47	141222	Connecting Link	...
48	141212	Shaft for Throttle Control Lever	...
49	145182	Throttle Control Lever	...
50	61299	Spring	...
51	143073	Pin for Lever	...
52	144882	Pin for Accelerator Push Rod	...
53	A/9140	Accelerator Push Rod	...
54	141288	Throttle Spring Anchor	...
---	A/9141	Accelerator Pedal complete	...
55	143136	Accelerator Pedal	...
56	141262	Bracket for Pedal	...
57	141260	Roller for Pedal	...
58	141261	Pin for Roller	...
59	16340	Oil	...

Please state maker's car number when ordering.

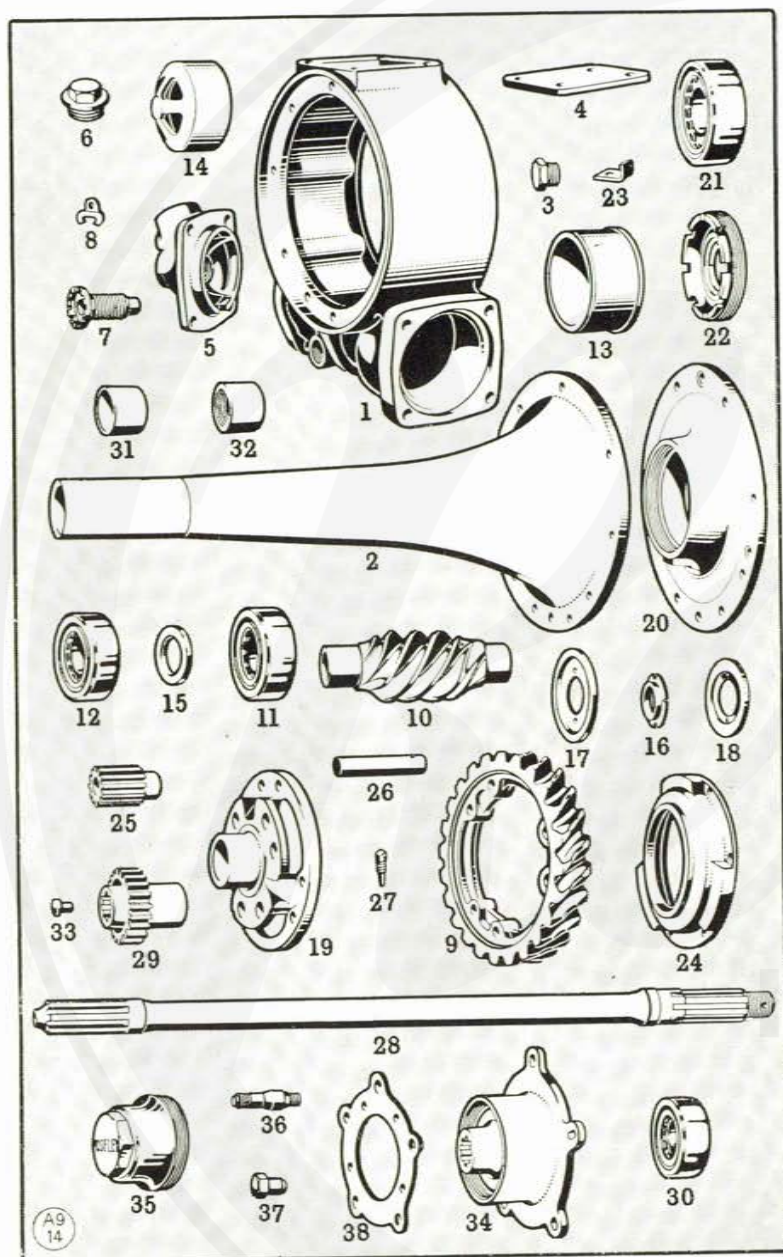




## Propeller Shafts and Torque Bar.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each. £. s. d.
	A 9142	Universal Joint Coupling complete	...
1	126444	Gearbox Universal Joint Centre	...
2	126444	Propeller Shaft Universal Joint Centre (front)	...
3	144194	Fibre Disc for Universal Joint	...
4	126453	Bush for Disc	...
5	143764	Washer for Disc	...
	A 9143	Front Propeller Shaft (assembled with Front and Rear Couplings)	...
6	126455	Propeller Shaft (front)	...
7	126368	Universal Block (rear)	...
	A 9144	Universal Joint assembled with Cover	...
8	127357	Universal Joint Socket	...
9	127916	Cover for Socket	...
10	127359	Bearing Blocks for Socket	...
11	143799	Leather Cover for Universal Joint	...
12	145334	Clip for Leather Cover	...
13	143798	End Piece for Leather Cover (in halves)	...
14	443	Plug	...
15	141786	Cover Plate for Leather Cover	...
16	A 9145	Rear Propeller Shaft assembled with Worm Shaft and Front End Piece	...
17	A 9146	Torque Tube assembled with Front Bracket and Rear Socket	...
18	126229	Screw Plug for Front Bracket	...
19	42549	Ball Bearing	...
20	127366	Adjusting Nut	...
21	126468	Oil Thrower	...
22	A 9147	Torque Tube Support complete	...
23	141391	Support Bracket	...
24	141507	Bearing Tube for Bracket	...
25	127364	Plug for Tube	...
26	141511	Bolt for Support Bracket	...
27	41091	Greaser for Torque Support	...
28	127369	Speedometer Drive Cover	...
29	A 9148	Bevel Wheel (driver)	...
30	A 9149	Bevel Wheel (driven)	...
31	126692	Bevel Spindle	...
32	443	Plug for Speedometer Cover	...

Please state maker's car number when ordering.

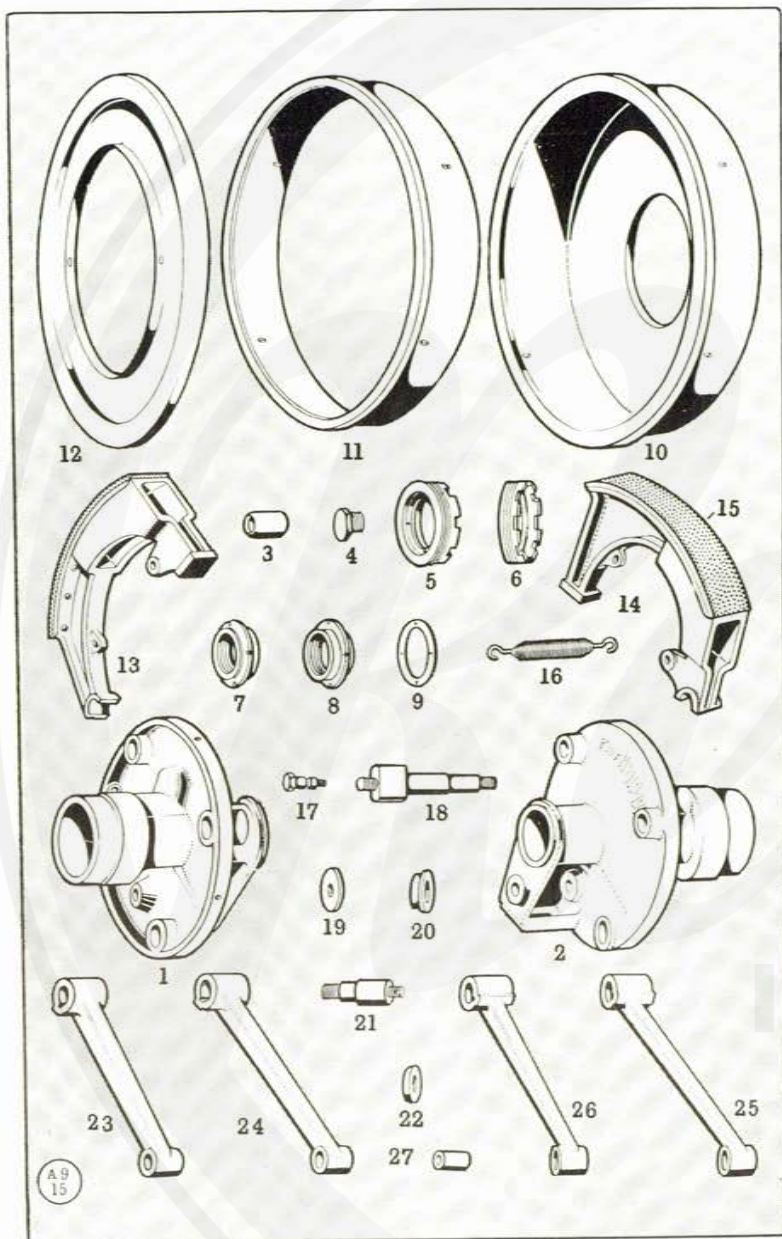


## Rear Axle and Hubs (Worm Drive).

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each
—	A 9150	Rear Axle complete, assembled with Brakes, Hubs, and Bearings	...
—	A 9151	Rear Axle complete, assembled with Brakes (less Hubs and Bearings)	...
—	A 9152	Rear Axle Case, machined and fitted with Axle Tubes and Covers	...
1	A 9153	Axle Case (machined and studded)	...
2	A 9154	Axle Tube	...
3	2474	Plug for Axle Case	...
4	126436	Cover for Axle Case (top)	...
5	141920	Worm Shaft Rear Cover	...
6	2848	Plug for Rear Cover	...
—	A 9155	Washer for Plug (not shown)	...
7	A 9156	Adjusting Nut	...
8	141924	Locking Piece	...
9	A 9157	Worm Wheel	...
10	A 9158	Worm	...
—	—	Worm Shaft (this is assembled with Propeller Shaft, Ref. No. A 9145)	...
11	126255	Worm Shaft Tinker Bearing (front)	...
12	68015	Worm Shaft Tinker Bearing (rear)	...
13	141915	Front Bearing Housing	...
14	141917	Rear Bearing Housing	...
15	141916	Distance Piece for Worm	...
16	126439	Oil Ring for Worm Shaft	...
17	141925	Plate for Oil Ring	...
18	141921	Plate for Oil Ring	...
—	A 9159	Diff. Cages, assembled with Pinions, Pins, and Worm Wheel	...
—	A 9160	Diff. Cages, assembled with Pinions and Pins only	...
19	126446	Diff. Cage (O.S. and N.S.)	...
20	126431	Bearing Plate for Diff. Cage	...
21	142422	Tinker Bearing for Diff. Cage	...
22	A 9161	Adjusting Nut for Bearings	...
23	126434	Stop for Adjusting Nut	...
24	128422	Diff. Cage Cover (O.S. only)	...
25	126509	Diff. Pinions	...
26	126487	Pins for Pinions	...
27	126488	Taper Pin for Pinion	...
28	126398	Diff. Shaft (O.S. and N.S.)	...
29	126508	Pinion for Diff. Shaft	...
30	60825	Bearing for Diff. Shaft and Rear Hub	...
31	128435	Axle Tube Oil Baffle (O.S.)	...
32	128436	Axle Tube Oil Baffle (N.S.)	...
33	0043726	Thrust Button	...
34	141347	Rear Hub	...
35	126581	Rear Hub Cap	...
36	126582	Stud for Hub	...
37	128470	Nut for Stud	...
38	126412	Flange for Wheel	...
—	A 9162	Rear Wheel (not shown)	...

Please state maker's car number when ordering.



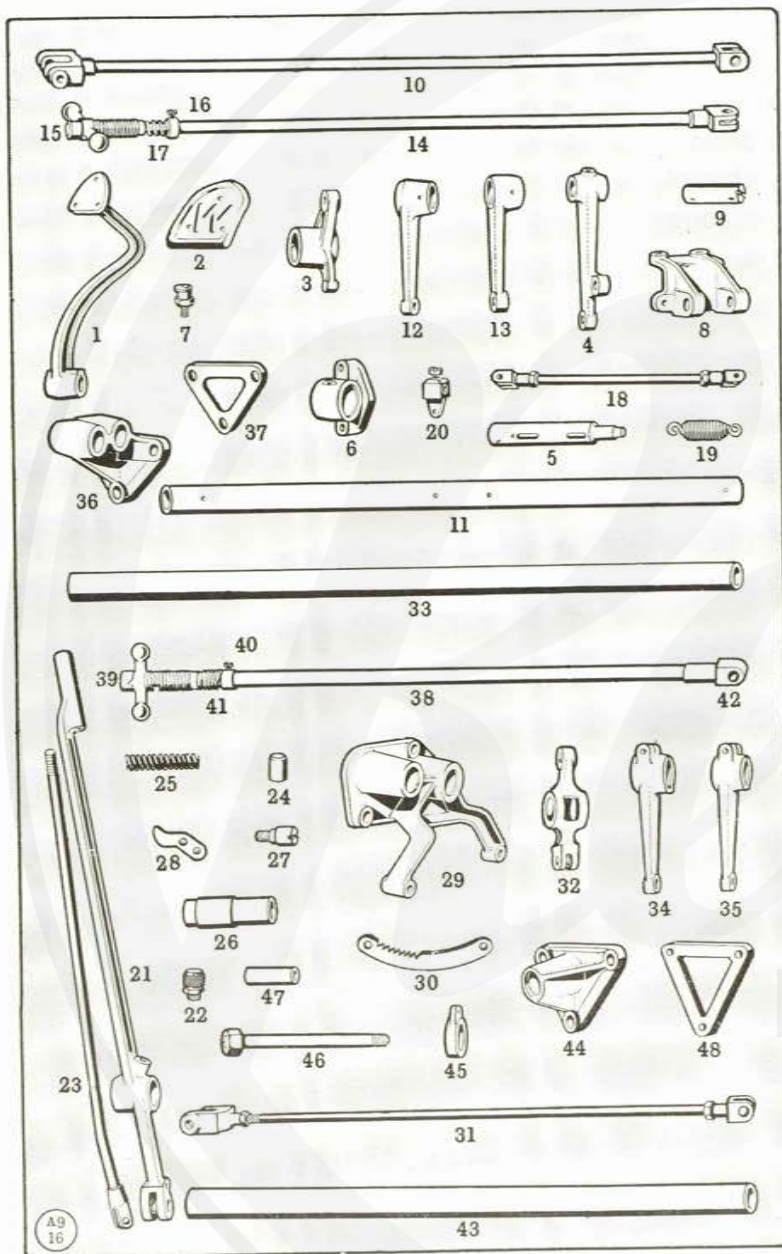


## Brakes.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each. £ s. d.
1	141736	Brake Bracket (O.S.)	...
2	141737	Brake Bracket (N.S.)	...
3	A/9163	Bush for Bracket	...
4	145978	Plug for Bracket	...
5	A/9164	Bearing Adjusting Nut (O.S.)	...
6	A/9164A	Bearing Adjusting Nut (N.S.)	...
7	128433	Oil Ring (O.S.)	...
8	128434	Oil Ring (N.S.)	...
9	126924	Plate for Oil Ring	...
10	126921	Locking Wire for Nut (not shown)	...
11	A/9165	Brake Drum and Liner complete	...
12	141741	Brake Liner	...
13	141735	Dust Cover for Brake Drum	...
14	A/9166	Foot-brake Shoes with Linings fitted	...
15	A/9167	Hand-brake Shoes with Linings fitted	...
NOTE: Brake Shoes are only supplied in pairs.			
16	A/9168	Liner for Brake Shoe	...
17	141475	Spring for Brake Shoe	...
18	142009	Anchor Pin for Spring	...
19	142028	Brake Cam and Spindle	...
20	142029	Washer for Spindle	...
21	141742	Distance Piece	...
22	141744	Fulcrum Pin for Brake Shoe	...
23	141745	Washer for Pin	...
24	127427	Foot-brake Lever (O.S.)	...
25	127428	Foot-brake Lever (N.S.)	...
26	142731	Hand-brake Lever (O.S.)	...
27	127430	Hand-brake Lever (N.S.)	...
28	38846	Bush for Lever	...

Please state maker's car number when ordering.

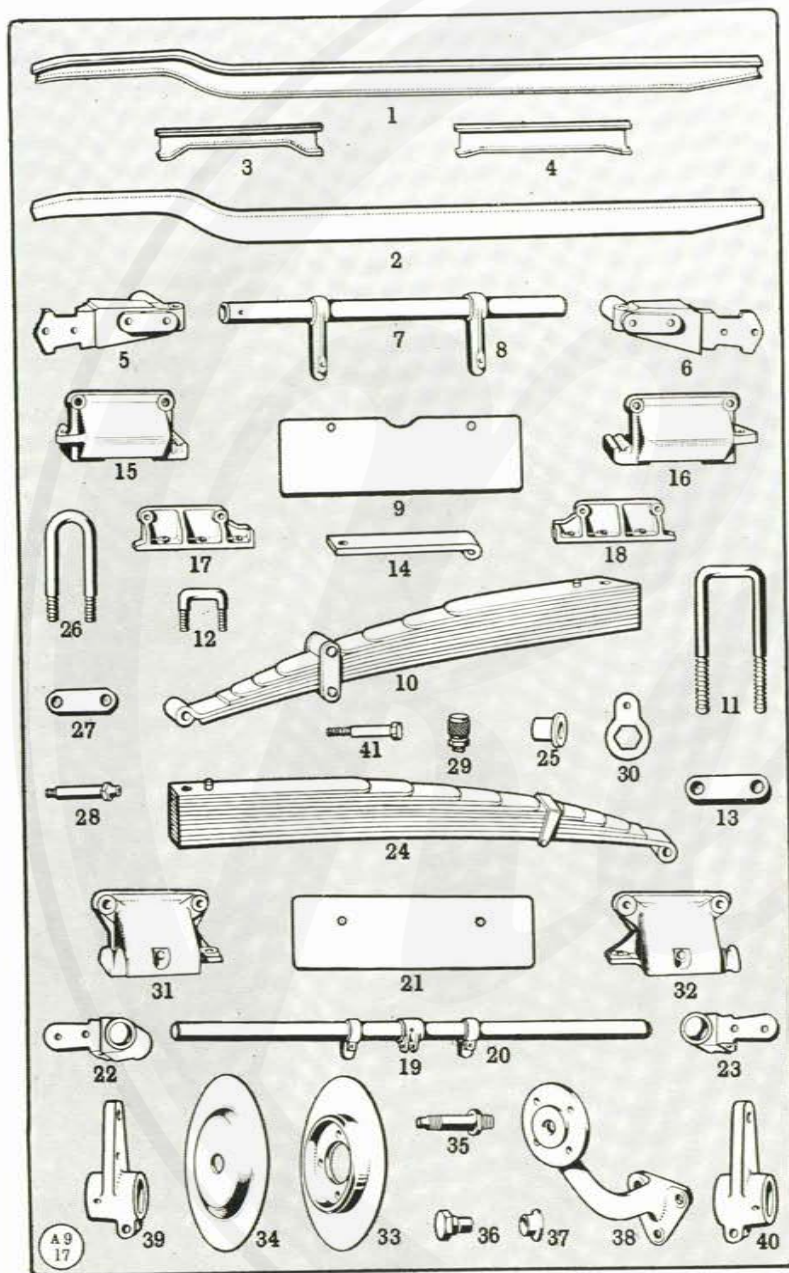
## Brake Control.



No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each.
1	A/9169	Brake Pedal	...
2	142999	Pedal Pad	...
3	143138	Brake Pedal Lever	...
4	142582	Foot-brake Lever	...
5	143069	Pedal Shaft	...
6	144604	Bracket for Pedal Shaft	...
7	16340	Oiler for Lever	...
8	142580	Support Bracket for Brake Lever	...
9	142581	Spindle for Brake Lever	...
10	A/9170	Foot Brake Pull Rod	...
11	A/9170A	Pull Rod Adjusting Plates (not shown)	...
12	126344	Compensating Tube	...
13	128387	Compensating Lever (N.S.)	...
14	143023	Compensating Lever (O.S.)	...
15	—	For Compensating Tube Brackets (see Illustration No. 36)	...
16	—	For Compensating Link (see Illustration No. 32)	...
17	A/9171	Compensating Link Rod complete	...
18	120912	Adjusting Nut for Rod	...
19	69333	Collar	...
20	38599	Spring	...
21	A/9172	Foot-brake Rod complete	...
22	35851	Spring	...
23	77410	Spring Anchor	...
24	A/9173	Hand-brake Lever, assembled complete	...
25	126312	Hand-brake Lever (machined only)	...
26	51009	Lubricator	...
27	A/9174	Brake Pawl Rod	...
28	15079	Press Knob	...
29	141831	Spring for Pawl Rod	...
30	126315	Brake Lever Pivot	...
31	126346	Pin for Brake Lever	...
32	145133	Brake Pawl	...
33	127909	Hand-brake Lever Bracket (this also forms the Gearbox Supporting Tube Bracket, O.S.)	...
34	126314	Brake Quadrant	...
35	A/9175	Hand-brake Pull Rod	...
36	143014	Compensating Link for Pull Rod	...
37	126343	Compensating Tube	...
38	128386	Compensating Lever (O.S.)	...
39	142732	Compensating Lever (N.S.)	...
40	128557	Bracket for Hand-brake Compensating Tube, O.S. and N.S. (this Bracket also carries Foot-brake Compensating Tube)	...
41	142289	Packing Piece for Bracket	...
42	A/9176	Hand-brake Compensating Link Rod, complete	...
43	120912	Adjusting Nut	...
44	69333	Collar	...
45	38599	Spring	...
46	122780	Jaw	...
47	A/9177	Gearbox Supporting Tube assembled with Brackets	...
48	126354	Gearbox Supporting Tube	...
	126322	Bracket for Tube (N.S.)	...
	141410	Collar	...
	128698	Holding-down Bolt for Gearbox	...
	126477	Tube for Bolt	...
	126355	Packing Piece for Bracket	...

Please state maker's car number when ordering.

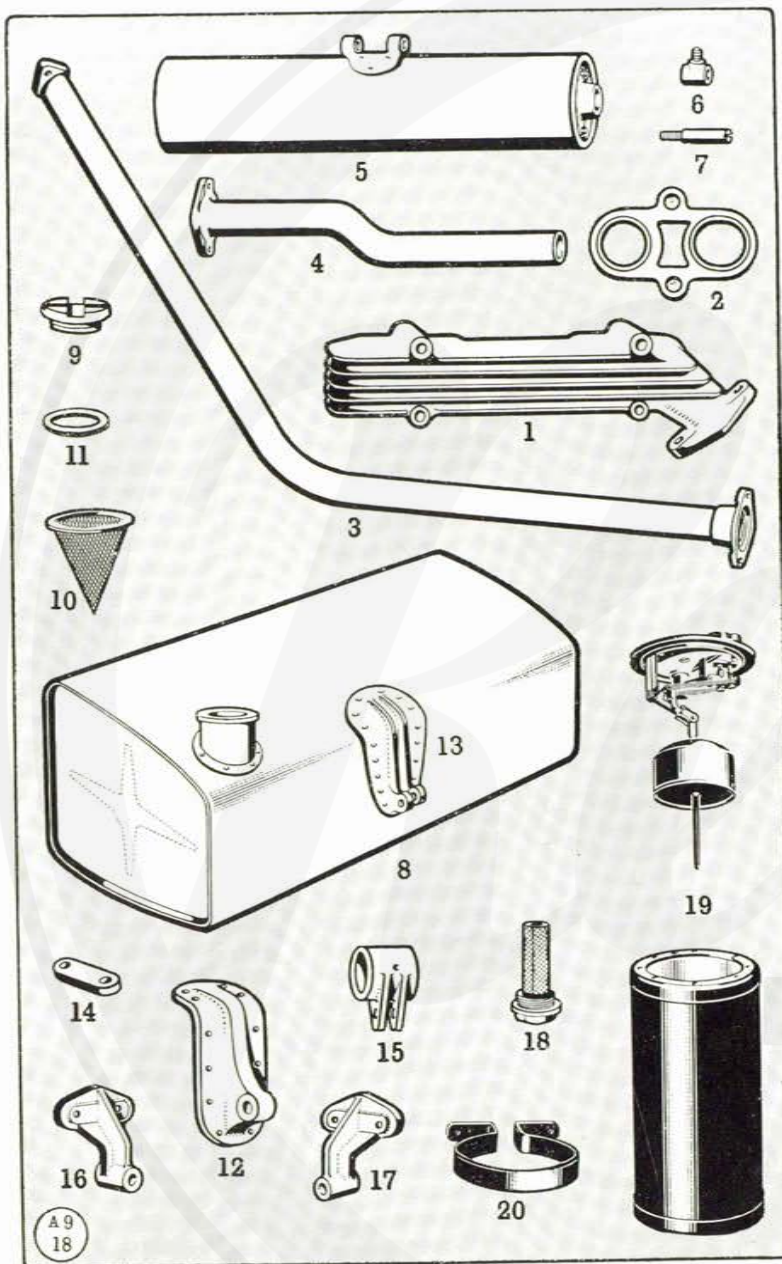




## Frame Fittings and Spring Suspension.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each. £ s. d.
	A 9178	Frame complete	...
1	128379	Frame Side Member (N.S.)	...
2	128380	Frame Side Member (O.S.)	...
3	126336	Frame Cross Member (front)	...
4	128428	Frame Cross Member (rear)	...
5	142803	Front Frame Bracket (O.S.)	...
6	142804	Front Frame Bracket (N.S.)	...
	A 9179	Front Cross Tube, assembled with Frame Brackets	...
7	A 9180	Front Cross Tube, assembled	...
8	141994	Bracket for Front Number Plate	...
9	141995	Number Plate	...
10	A 9181	Front Spring	...
11	144385	Spring Clip (large)	...
12	144441	Spring Clip (small)	...
13	126984	Spring Clip Plate	...
14	A 9182	False Plate	...
15	143278	Front Spring Bracket (O.S.)	...
16	143275	Front Spring Bracket (N.S.)	...
17	146102	Frame Reinforcing Bracket (O.S.)	...
18	146101	Frame Reinforcing Bracket (N.S.)	...
	A 9183	Rear Cross Tube, assembled with Frame Brackets	...
19	A 9184	Rear Cross Tube, assembled	...
20	142347	Bracket for Rear Number Plate	...
21	142429	Rear Number Plate	...
22	128411	Rear Frame Bracket (O.S.)	...
23	128412	Rear Frame Bracket (N.S.)	...
24	A 9185	Rear Spring (bushed)	...
25	50531	Bush for Spring	...
26	A 9186	Spring Clip (rear)	...
27	126985	Spring Clip Plate	...
28	126699	Spring Pin	...
29	62608	Greaser	...
30	127134	Locking Piece	...
31	143276	Rear Spring Bracket (O.S.)	...
32	143277	Rear Spring Bracket (N.S.)	...
33	A 9187	Dummy Hub	...
34	126976	Cap for Dummy Hub	...
35	141880	Stud	...
36	126980	Nut for Stud	...
37	126981	Stop for Nut	...
38	142030	Dummy Hub Bracket	...
39	143032	Luggage Grid Bracket (O.S.)	...
40	143033	Luggage Grid Bracket (N.S.)	...
41	A 9188	Spring Bolt	...

Please state maker's car number when ordering.

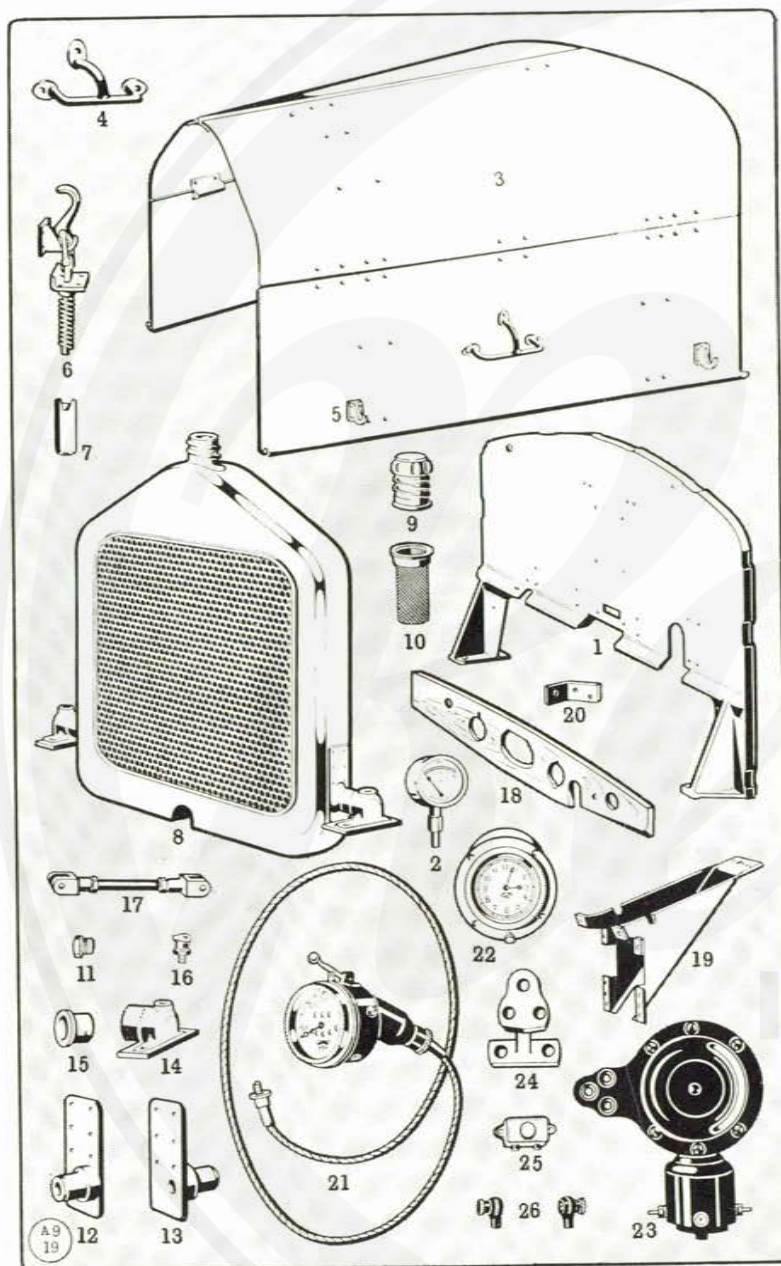


## Petrol Tank, Exhaust Pipes &c.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each. £ s. d.
1	A/9189	Exhaust Branch	...
2	126050	Joint for Exhaust Branch	...
3	A/9190	Exhaust Pipe from Engine to Silencer, assembled with Flanges	...
4	A/9191	Exhaust Outlet Pipe, complete with Flange	...
5	A/9192	Silencer, assembled complete	...
6	127510	Supporting Bracket	...
7	143003	Support Pin	...
	127547	Washer for Silencer (front end, not shown)	...
	127548	Washer for Silencer (rear end, not shown)	...
8	A/9193	Petrol Tank, assembled complete with Filler	...
9	A/9194	Filler Cap, with Baffle Plate fitted	...
10	A/9195	Strainer for Filler	...
11	A/9196	Washer for Filler Cap	...
12	126568	Front Support Bracket for Petrol Tank	...
13	126566	Rear Support Bracket for Petrol Tank	...
14	142512	Link for Bracket	...
15	141504	Rear Centre Bracket for Tank	...
16	141254	Front Support Carrying Bracket (O.S.)	...
17	141255	Front Support Carrying Bracket (N.S.)	...
18	A/9197	Sump Cap with Strainer fitted	...
19	A/9198	Autovac Feed Apparatus complete	...
20	A/9199	Bracket for Autovac	...
	A/9200	Set of Petrol Pipes	...
		Tube for Supporting Rear Centre Bracket, see Ref. No. A/9184	...

Please state maker's car number when ordering.

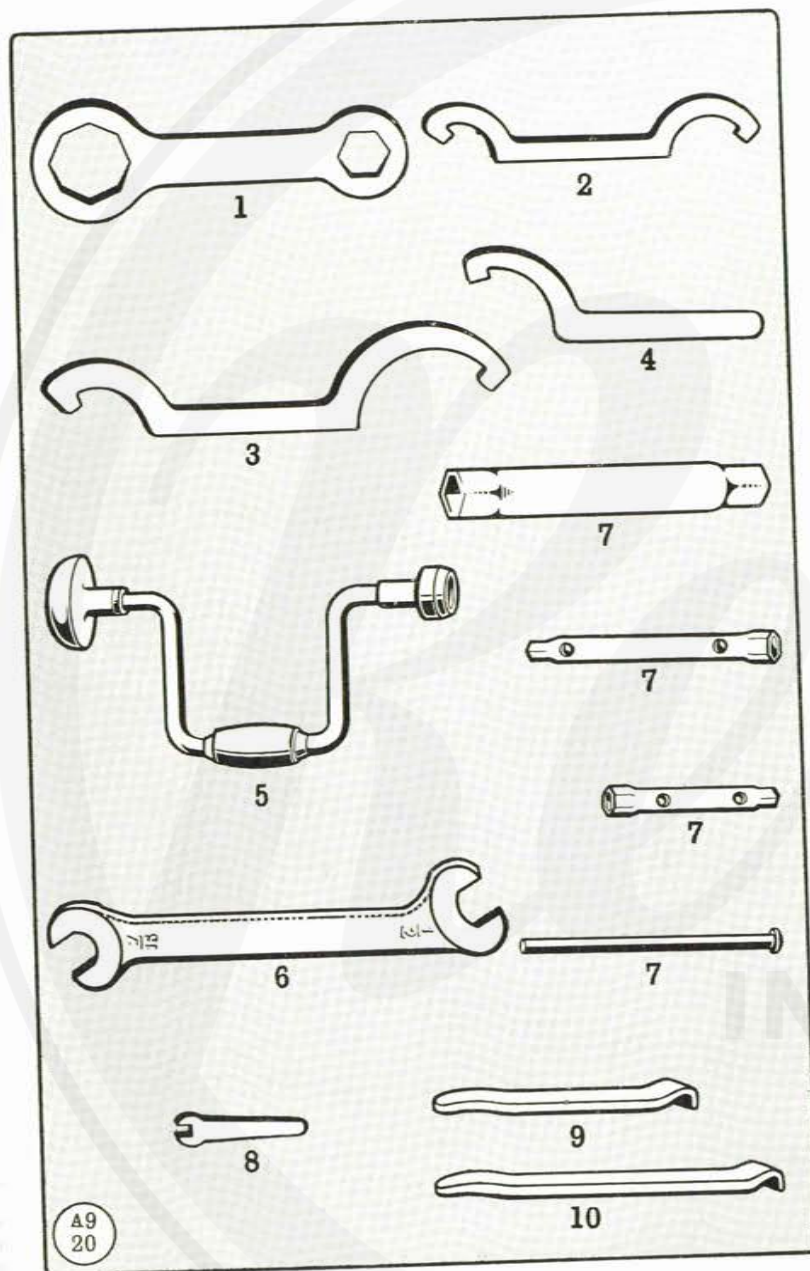




## Bonnet, Radiator and Dashboard.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each.		
			£	s.	d.
1	A/9201	Spectacle Plate ... ..	...	...	...
2	142759	Oil Pressure Gauge (including Nut and Nipple) ... ..	...	...	...
3	A/9202	Bonnet complete (unpainted) ... ..	...	...	...
4	17860	Bonnet Handle ... ..	...	...	...
5	144288	Hook for Bonnet Catch ... ..	...	...	...
6	A/9203	Bonnet Catch complete ... ..	...	...	...
7	141990	Cover for Rear Bonnet Catch ... ..	...	...	...
8	A/9204	Radiator complete ... ..	...	...	...
9	36820	Cap for Radiator ... ..	...	...	...
10	37013	Strainer ... ..	...	...	...
		Rubber Connection (Water Outlet to Radiator, see Ref. No. A/9029) ... ..	...	...	...
		Rubber Connection (Water Pump to Radiator, see Ref. No. A/9052) ... ..	...	...	...
11	443	Radiator Drain Plug ... ..	...	...	...
12	141319	Radiator Bracket (O.S.) ... ..	...	...	...
13	141320	Radiator Bracket (N.S.) ... ..	...	...	...
14	128617	Radiator Trunnion Brackets ... ..	...	...	...
15	67978	Bush for Bracket ... ..	...	...	...
16	16340	Oiler for Bracket ... ..	...	...	...
17	A/9205	Radiator Tie Rod, complete with Jaws ... ..	...	...	...
18	A/9206	Instrument Board ... ..	...	...	...
19	A/9207	Bracket for Instrument Board (centre) ... ..	...	...	...
20	A/9208	Bracket for Instrument Board (ends) ... ..	...	...	...
		For Electrical Instruments, see page 95 ... ..	...	...	...
		For Magneto Switch, see page 95 ... ..	...	...	...
21	A/9209	Speedometer complete with Cable and Clips ... ..	...	...	...
	144911	Clips for Speedometer Cable (not shown) ... ..	...	...	...
22	A/9210	Clock with Flush Ring ... ..	...	...	...
23	A/9211	Klaxon Horn ... ..	...	...	...
24	146160	Bracket for Horn ... ..	...	...	...
25	127797	Press Switch for Horn ... ..	...	...	...
26	A/9212	Terminals for Switch ... ..	...	...	...

Please state maker's car number when ordering.



## Special Tools.

No. of Illustration.	Ref. No. for Ordering.	Description of Part.	Price Each. £ s. d.
1	141976	Hub Cap Spanner ... ..	...
2	045824	Gland Spanner (small) ... ..	...
3	045825	Gland Spanner (large) ... ..	...
4	42186	Gland Spanner ... ..	...
5	142854	Brace for Road Wheels ... ..	...
6	A/9213	Double ended Spanners ( $\frac{5}{16}$ " to $\frac{3}{4}$ " ), per set	...
7	A/9214	Box Spanners (including Tommy Bars), per set ... ..	...
8	141977	Spanner for Valve Rocker Screw ...	...
9	144855	Plain Tyre Lever (small) ... ..	...
10	144856	Plain Tyre Lever (large) ... ..	...

Please state maker's car number when ordering



