



STANDARD  
VANGUARD

*Instruction  
Book*

FIVE SHILLINGS

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# INSTRUCTION BOOK

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## STANDARD “VANGUARD” SALOON 1950

Incorporating :

STANDARD ESTATE CAR  
STANDARD DELIVERY VAN  
STANDARD PICK-UP TRUCK

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THIRD EDITION  
2ND PRINTING

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THE STANDARD MOTOR CO. LIMITED  
CANLEY, COVENTRY, WARWICKSHIRE

REGISTERED OFFICE :

BANNER LANE, COVENTRY

TELEGRAMS: "STACK, COVENTRY"

TELEPHONE: TILE HILL 66611 (10 LINES)

CAR DIVISION :

CANLEY, COVENTRY

TELEGRAMS: "FLYWHEEL, COVENTRY"

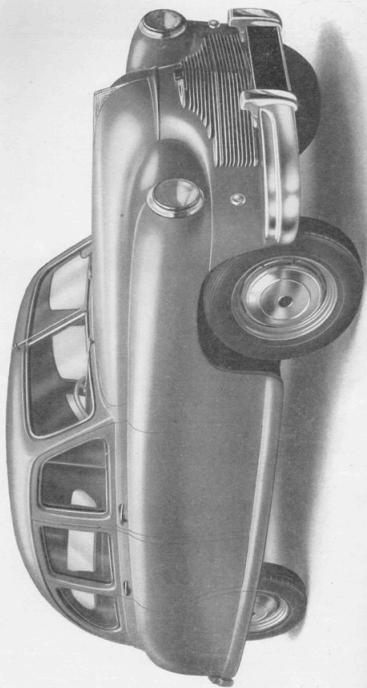
TELEPHONE: COVENTRY 3181 (15 LINES)

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THE STANDARD "VANGUARD"

## FOREWORD

The object of this book is to paint a clear picture in your mind of the car and its needs, technical terms have been avoided as far as possible.

Every effort has been made in the design to limit the attention necessary, however there will be certain points which must be attended to regularly.

By carefully reading the book, especially the lubrication section, and keeping an eye on the car's mileage, you will be able to ensure that your car receives all the service it needs and as a result increase its life appreciably.

A section on decarbonising and valve grinding has been included for the sake of the engineer owners who would prefer to do the work themselves. However, for the not so experienced owner we strongly recommend that these operations are carried out by a competent mechanic or, preferably, a Standard Agent.

It is worth noting that technical articles appear in the *Standard Car Review* which is published monthly.



## LICENCE DATA.

Car number (Commission number)	.....	.....	Plate on dash
Engine number	.....	.....	On cylinder block
			(Both numbers are to be seen by lifting the bonnet).
Cubic capacity	.....	.....	127.6 cu. in. (2088 c.c.)

## GENERAL SPECIFICATION

Number of cylinders	.....	.....	.....	4
Bore of cylinders	.....	.....	.....	3.347 in. (85 mm.)
Stroke of crank	.....	.....	.....	3.622 in. (92 mm.)
Compression ratio	.....	.....	.....	6.7
Firing order	.....	.....	.....	1, 3, 4, 2
Brake H.P. (Road Setting)	.....	.....	.....	68 at 4,200 R.P.M.

### Oil Capacity

Engine	.....	.....	12 pints	(6.8 litres)
Gearbox	.....	.....	1½ pints	(0.8 litres)
with overdrive	.....	.....	2 pints	(1.1 litres)
Rear axle	.....	.....	2 pints	(1.1 litres)

Water Capacity of cooling system	.....	.....	18 pints	(10.2 litres)
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Fuel Capacity	.....	.....	15 galls.	(68 litres)
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### Dimensions

Wheelbase	.....	.....	7' 10"	(239 cm.)
Track—Front	.....	.....	4' 3"	(130 cm.)
Rear	.....	.....	4' 6"	(137 cm.)
Ground clearance (under axle)	.....	.....	8"	(20 cm.)
Turning circle (between kerbs)	.....	.....	35' 0"	(11 metres)
Tyre size—Saloon & Estate Car	.....	.....	5.75"—16" or 6.00"—16"	
Delivery Van & Pick-up	.....	.....	(as fitted)	
Truck	.....	.....	6.00"—16"	

### Overall Dimensions

Length — Saloon, Estate Car				
and Delivery Van	.....	.....	13' 10"	(422 cm.)
Pick-up	.....	.....	13' 3"	(407 cm.)
Width	.....	.....	5' 9"	(175 cm.)
Height — Saloon	.....	.....	5' 4"	(163 cm.)
(unladen) Estate Car and Pick-up				
Truck	.....	.....	5' 6"	(168 cm.)
Delivery Van	.....	.....	5' 8"	(173 cm.)

## GENERAL SPECIFICATION

WEIGHTS. <i>Excluding extra equipment.</i>	Complete with Tools and tank full of Petrol	Shipping Weight
Saloon .....	cwts. qrs. lbs. 24 3 21 (1265 Kg.)	cwts. qrs. lbs. 23 1 21 (1190 Kg.)
Estate Car .....	25 1 21 (1290 Kg.)	23 3 21 (1215 Kg.)
Delivery Van .....	23 2 21 (1200 Kg.)	22 0 21 (1125 Kg.)
Pick-up Truck .....	24 1 0 (1230 Kg.)	22 3 0 (1155 Kg.)

**VALVE TIMING.** [With valve-rocker clearance set at 0.014" (0.35 mm.)].

Inlet valve opens 10° before top dead centre.

Inlet valve closes 50° after bottom dead centre.

Exhaust valve opens 50° before bottom dead centre.

Exhaust valve closes 10° after top dead centre.

(10 degrees before or after T.D.C. is equivalent to 0.035" piston travel).

The equivalent distances measured round the flywheel adjacent to the starter teeth :

10° ..... 1" (2.54 cm.)

50° ..... 4  $\frac{31}{32}$ " (12.6 cm.)

**VALVE-ROCKER CLEARANCES**  
(measured with engine cold).

Inlet 0.010" (0.25 mm.)

Exhaust 0.012" (0.3 mm.)

**IGNITION TIMING**

Set to fire 4° before top dead centre (distributor contact points just opening). As the advance is entirely automatic, the setting is at full retard.

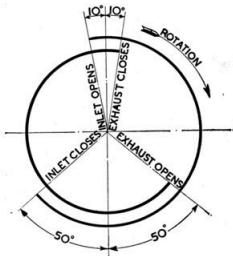


Fig. 1. Timing diagram.

Contact breaker gap should be set at 0.012" (0.3 mm.).

## GENERAL SPECIFICATION—Road Speed Data

### ROAD SPEED DATA

Gearbox ratios		Top 1	2nd 1.67	1st 3.54	Reverse 4.11
Overall ratios		4.625	7.71	16.35	18.99
Engine speeds at 10 m.p.h. (16 km/hr.)	5.50" tyres	600	1000	2120	2470
	5.75" tyres	590	990	2090	2430
	6.00" tyres	570	960	2030	2360

NOTE—Engine speeds at other car speeds are, for all practical purposes, directly proportional to those given above.

### DESIRABLE ENGINE SPEED LIMITS

(Particularly in gears lower than top)

The engine is capable of "revving" very fast, yet the driver should avoid continued "over-revving," which is most likely to occur in the lower gears. **We strongly recommend that when in first or second gear the driver shall not exceed the car speeds given below which correspond to approximately 4,000 engine r.p.m.**

### ROAD SPEED IN M.P.H. AT 4,000 R.P.M.

Top	Second	First
65 m.p.h. (105 km/hr.)	40 m.p.h. (65 km/hr.)	20 m.p.h. 30 km/hr.)

The above speeds are given in round figures so that the owner can easily remember them.

See page 16 for running-in speeds recommended.

# MANAGEMENT OF THE CAR

## CONTROLS, SWITCHES AND INSTRUMENTS

The position of the controls, switches and instruments will readily be understood by reference to Fig. 2.

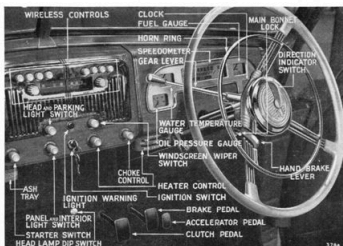


Fig. 2.

Controls, switches and instruments

## FOOT OPERATED CONTROLS

**Accelerator.** The pedal is connected by a short Bowden cable to the carburettor throttle. Do not depress pedal when starting engine from cold.

**Brake.** Operating four wheel hydraulic brakes.

**Clutch.** Press pedal to disengage drive from engine to gearbox. **Do not rest your foot on the pedal when driving, or hold clutch out to free wheel, as this will cause unnecessary wear to the carbon thrust pad.**

## MANAGEMENT OF CAR—Controls, Switches and Instruments

### HAND OPERATED CONTROLS

**Bonnet Lock.** Pull to release main bonnet lock. The safety catch is situated at the front of the bonnet and can be released by the fingers.

**Choke Control** (Carburettor easy start). Pull out when starting engine from cold (see page 12 for full instructions).

**Gear Lever.** For selecting the gears, see Figs. 3 or 3a. Always select neutral position before starting the engine.

**Handbrake.** Pull to operate rear wheel brakes. The lever will be held in any position by the ratchet. To release ratchet, first pull lever and press trigger.

**Heater Controls,** see page 71.

**Radio Controls,** see page 69.

**Overdrive Controls, etc.,** see page 73.

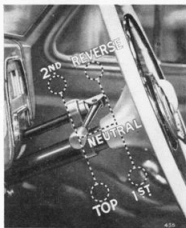


Fig. 3.

Right-hand drive



Fig. 3a.

Left-hand drive

Gear positions

## MANAGEMENT OF CAR—Controls, Switches and Instruments

### SWITCHES

**Brake Light.** The switch is connected to the brake pedal mechanism, but will operate the red rear lights only with the ignition switched on.

**Direction Indicator.** This switch will automatically be returned to “off” as the steering wheel is being brought back to the straight ahead position. The indicator will only operate with the ignition switched on.

**Head, Tail and Parking Lamps.** Pull knob to switch on parking lights. Turn slightly clockwise and pull again to switch on the head lights. Press foot operated switch to dip head light, press again for “full on” position. The switch “dips” the left-hand beam and switches off the right-hand beam. On some export models, both headlamp beams dip when the dip switch is operated.

**Horn.** Press ring on steering wheel to operate horns.

**Ignition.** Turn clockwise to switch on. Do not leave the switch “on” when engine is stationary, to avoid the battery being discharged by the current flowing through the coil windings.

**Panel and Interior Lights.** Pull knob to switch on panel light, turn slightly clockwise and pull again to switch on interior light. These lights will only operate when the parking lights are switched on.

**Reversing Light.** The switch is actuated by the gear lever mechanism, and will operate when reverse gear is engaged, with the ignition switched on.

**Starter Motor.** Press to operate engine starter (see page 12 for full instructions).

**Windscreen Wiper.** Pull to operate wipers, they will only function when the ignition is switched on. Push to stop when arms are in the desired parking position.

## MANAGEMENT OF CAR—Controls, Switches and Instruments

### INSTRUMENTS

**Clock.** The clock is electrically operated and the hand can be "set" by pressing upwards the small knurled knob (situated below the instrument panel, above brake lever) and turning in the desired direction. The action of setting the hands to the correct time will restart the clock.

**Fuel Gauge.** Registers the amount of fuel in the tank. It operates automatically when the ignition is switched on.

**Oil Pressure Gauge.** Indicates pressure of oil being pumped to the bearings. It does not show the amount of oil in the sump (excepting that if the oil level is very low the pressure usually falls due to overheating).

A habit should be made of occasionally reading the oil pressure during the course of a run, to see that the oil pump is functioning correctly. **The oil pressure gauge should read between 40 and 60 lb./sq. in. (2.8—4.2 Kg./sq. cm.) when the car is travelling at normal speeds and the oil is hot.** Of course, only a low oil pressure will be registered when the engine is idling or running at low speeds, this is quite normal.

**Speedometer.** Registers vehicle's speed and total distance covered, and is fitted with a trip which is cancelled by pushing up the serrated knob (which is situated under the dash) and turning anti-clockwise.

**Warning Light.** Glows red when ignition is switched on with the engine idling or stopped. It is an indication that current is being drawn from the battery for the ignition circuit, or other purposes that are controlled by the ignition switch.

**Water Temperature Gauge.** The gauge shows the temperature of the cooling water at the thermostat. With the engine warmed up the gauge should register a temperature of between 60° and 70° during normal running.

## MANAGEMENT OF CAR—Regular Inspection

### REGULAR INSPECTION

Maintain the oil level in the engine sump at the top mark on the dipstick. Wipe the stick before taking a reading (see Fig. 4). Dipstick on left side of engine, near distributor.

The water level in the radiator should occasionally be examined, and if necessary replenished. It is advisable to use clean rain water when replenishing the radiator as the use of hard water results in a deposit on the inner side of the cooling surfaces, thus reducing efficiency.

Tyre pressures should be checked weekly by application of a gauge directly to the valve. The correct pressures are given on page 36. It is usually a good plan to have the spare tyre inflated to a slightly higher pressure than that recommended for the rears, *i.e.* approximately 32 lb./sq. in. (2.25 kg/sq. cm.) It will be a simple matter to release the pressure, should the tyre be required for use.

The acid level in the battery should be examined fortnightly and maintained so that it is just level with the top of the separators. A mirror will be found useful when checking the acid level. Use only distilled water when replenishing (obtainable from the local chemist or garage). Do not overfill or the acid may splash out and do damage. Keep the filler plugs screwed tight to prevent leakage of acid.

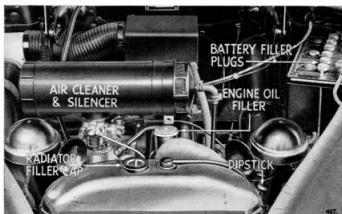


Fig. 4.

View under bonnet



# THE ENGINE

## TO START THE ENGINE

### **IMPORTANT—When Starting the Engine at any time :**

If the engine does not start when the starter is operated **Do not re-operate until starter motor and engine have come to rest.** This is to avoid damage to the starter pinion.

### **Starting when Engine is cold**

Place the gear lever in the neutral position and see that the handbrake is on. Pull the carburettor choke control out to the stop, switch on the ignition and press the starter switch button. When the engine has become sufficiently warmed up, push the choke control back to the **half-out** position. After one or two minutes driving, as the engine warms up, it will be possible to push the control right in without causing the engine to run with undue hesitation. Difficulty is sometimes experienced in starting if the atmosphere is very damp, causing moisture to collect on the exposed porcelain portions of the sparking plugs. Caps are provided on the plugs to minimise this trouble. If the battery has been allowed to get into a run-down condition it is best to use the starting handle. When the engine fails to start do not keep the choke control out too long or the sparking plugs will become wet with petrol and it will be necessary to remove and dry them. **It is important that the accelerator pedal should not be depressed when starting the engine from cold** as the effect of the carburettor choke device is upset when the throttle is open. It will usually be found possible to reverse out of the garage on the choke control alone, usually in the intermediate position, without using the accelerator. When the car has been left standing for some considerable time, the fuel level in the carburettor float chamber may have become rather low due to evaporation. The hand primer on the fuel pump can be used under such circumstances, before the starter is operated, to conserve the electrical energy in the battery (see page 51.)

### **Starting in very cold conditions**

In very cold weather the oil in the engine and gearbox

## MANAGEMENT OF CAR—The Engine

becomes thick when the car has been standing for some hours. Thick oil causes the engine to be “stiff” and an unusual effort is required to turn the crankshaft. This can be reduced to a minimum by using the recommended oils. It is advisable to free the engine, giving the crankshaft a few turns, using the starting handle. This relieves the load on the starter. Under these conditions the clutch pedal may be depressed when operating the starter, to relieve the motor of the considerable drag in the gearbox. Intelligent use of the starter, as described, will greatly prolong the life of the battery.

It is also advisable to add  $1\frac{1}{2}\%$  of engine oil to the fuel in very cold weather. This is at the rate of quarter of a pint of oil to each two gallons of fuel. However, this practice should not be continued excepting under these very cold conditions. The addition of oil to the petrol will improve the lubrication of the cylinder bores, which is desirable when the engine is working in exceptionally cold weather.

### **Starting with Engine warm or hot**

When restarting the engine while it is still hot the accelerator pedal should be depressed to about one third of its travel before pressing the starter button. If difficulty is experienced in starting, due to the use of the choke device when the engine is hot, the mixture may be momentarily too rich, in which case depress the accelerator to the full extent whilst operating the starter with the choke control pushed right in.

### **Warming up**

In order to minimise cylinder wear the engine should be warmed up quickly, when starting from cold in winter, the engine may be “idled” for a minute to let the oil circulate but it should not be allowed to idle for long periods, neither should the engine be raced up to high speeds.

To accomplish rapid warming up, the engine should not be started from cold until it is desired to drive the car away. After starting, the choke control should be pushed back to the half-way position. A speed of approx. 30 m.p.h. in top gear may be regarded as a desirable warming up speed.

## MANAGEMENT OF CAR—The Engine

Do not forget to push the control right in as soon as the engine will allow, and do not give full throttle until the engine has warmed up. An automatic thermostat is fitted in the cooling system, incorporating a by-pass, which greatly assists in quick warming up.

### COOLING SYSTEM

In frosty weather some steps must be taken to prevent the cooling water freezing, as water expands when freezing thus causing a great bursting pressure, with considerable risk of a cracked cylinder block or radiator and consequent leaks. If the garage is not heated the water may be drained, but it is desirable to use an anti-freeze mixture. As the cooling system is fitted with a thermostat there is a risk of the radiator block freezing while the engine is running during the warming up period when the thermostat is shut, even though the car has been left in a warm garage and water is not frozen at the start of the run.

#### Draining

For the purpose of draining, taps are provided in the radiator bottom tank and at the rear of the cylinder block on the right-hand side. If heater is fitted, see also page 69.

#### Filling

When filling the radiator it is advisable to re-check the water level after the engine has been warmed. All the air may not have been forced out until the valve in the thermostat has been opened.

#### Anti-Freeze Mixtures

We recommend owners to use Smith's "Bluecol" non-corrosive anti-freeze (inhibited Glycol base compound) in order to protect the cooling system during frosty weather and reduce corrosion to a minimum. Drain sufficient water away and replace by "Bluecol." If this is attended to, particularly when the car is new, corrosion will be checked and result in a clean cooling system. If the anti-freeze is added when the weather has already become cold, then it is advisable to drain all the water away and mix the anti-freeze with water in a watering can. If the anti-freeze

## MANAGEMENT OF THE CAR—The Engine

is put directly into the radiator it may take some time to mix with the cylinder jacket water, due to the thermostat preventing circulation until the jacket water is hot.

The recommended "Bluecol" proportions for your car are given below. With this anti-freeze in the cooling water it is unnecessary to drain the system, even in the coldest weather, and one filling lasts the whole winter. "Bluecol" does not evaporate; therefore it is only necessary to top up with water in the usual manner.

### **Recommended "Bluecol" proportions for protection from various degrees of frost.**

Degrees of Frost, °F .....	15	25	35
Proportion .....	10%	15%	20%
Amount of "Bluecol" .....	2 pints	3 pints	4 pints

NOTE.—We recommend that you provide for the cooling system, ample protection against sudden fall in temperature, by using in your car the 20% proportion of "Bluecol."

### **Caution**

Before adding the anti-freeze preparation make sure that the water hose clips are securely fitted and the cylinder head nuts are tight. If the solution is able to escape through a leaking gasket into the cylinders it may be burnt into a tacky substance capable of doing harm to the engine. However, this could only happen in the rare event of a faulty gasket.

If the car is taken to a garage for any repair which involves draining the radiator it is advisable to state that the radiator contains an anti-freeze, so that the cooling water can be preserved and used again.

## MANAGEMENT OF THE CAR—The Engine

### NEW ENGINES

When the car is new, the engine may seem to be somewhat lacking in power due to the working surfaces not having become fully bedded down. This will continue for the first 200 or 300 miles (320-480 km.) during which time the engine will become gradually "run-in" (with proper use). The power will then improve as the car is used for the first 1,000 miles (1,600 km.), and this will be accompanied by a corresponding improvement in petrol consumption. The engine sump should be drained and refilled with new oil at the completion of the first 1,000 miles (see page 20).

At approximately 5,000 miles much benefit is gained by having the valves ground in as described on page 52. Although this involves some slight inconvenience in giving attention to a new engine, the trouble is well repaid by the results obtained.

It is inadvisable to drive a new car fast or to run the engine at high speed in the low gears. The good and lasting bearing surfaces obtainable by careful running-in are well worth the patience required to drive the car at only moderate speeds for at least the first 500 miles (800 km.).

We do not recommend that the engine should be religiously driven at the specified speeds for the first 500 miles (800 km.), but suggest that "running-in" should be progressive and that no harm is done if the engine is allowed to "rev" fairly fast so long as it is thoroughly warm, providing it is not **pulling hard**. Also do not let the engine pull hard at low speeds, always select a lower gear.

The following table gives the permissible speeds in top gear :—

During the first 250 miles (400 km.)	40 M.P.H. (64 km/hr.)
During the following 150 miles (240 km.)	45 M.P.H. (72 km/hr.)
During the following 100 miles (160 km.)	50 M.P.H. (80 km/hr.)

During the first 500 miles (800 km.) it is inadvisable to exceed the following speeds in the gears :—

In first gear	15 M.P.H. (24 km/hr.)
In second gear	30 M.P.H. (48 km/hr.)

## MANAGEMENT OF THE CAR—The Engine

We have found the use of an upper cylinder lubricant to be of advantage, particularly in new engines, and recommend the use of such a lubricant, particularly until the engine is thoroughly "run-in." The lubricant should be mixed with the fuel in the proportions given on the container. Such lubricants may be used with advantage throughout the life of the car, particularly during wintry weather.

Running-in compounds containing Acheson's colloidal graphite are available. They are prepared in a form suitable for addition to the oil in the engine sump. These should only be used during the running-in period for new or reconditioned engines. First 500 miles (800 km.)].

## DRIVING THE CAR

To obtain a minimum of clutch wear, always start away in first gear unless facing downhill, in which case second gear may be engaged. If the driver engages a higher gear in order to save a gear change the clutch will have to be slipped unduly, resulting in unnecessary wear.

### Gear Changing

The gear lever, situated on the steering column, operates through the system of a sliding rod, connecting rods and levers to the gearbox, and a minimum of effort is required to change from one gear to another. The position of the lever for selection of the various gears is given on page 8. When in the neutral position, the gear lever is spring loaded downwards and rests between top and second gears. The synchromesh gearbox provides a synchronised easy gear change for the three forward gears.

When changing into a synchronised gear the movement should be slow and deliberate. **DO NOT HURRY.** Upon its first movement the gear lever will encounter a slight resistance from the synchronising cones. The

## MANAGEMENT OF CAR—The Engine

continuance of a steady pressure will synchronise the gears and the resistance will be overcome as the driving dogs slide into engagement.

The gear lever must always be moved right home to secure full engagement.

Do not attempt to engage reverse gear whilst the car is travelling forward.

### Using the Brakes

The four wheel hydraulic brakes are very powerful and require only a small effort to slow down the car. Do not apply the brakes harshly except in emergency as this only causes undue tyre wear and discomfort to passengers.

### Engine as a Brake

When travelling downhill using the engine as a brake, *i.e.*, with gear engaged, **do not switch off the ignition.** This would allow unburnt mixture to accumulate in the exhaust system, and when switching on again, there is a likelihood of an explosion with consequent damage to the system.

# GENERAL UPKEEP

## LUBRICATION

This is one of the most important subjects in connection with the upkeep of a car and careful attention to the following instruction will be amply repaid by the results obtained.

**For the recommended periods of lubrication see the lubrication chart folded inside the rear cover of this book. The correct lubricants to be used are given on pages 83 and 84.**

### Grease Gun

One grease gun is supplied in the tool kit and should be filled with the grease recommended for wheel hubs and engine water-pump. This grease can be used for general chassis lubrication as well as for hub bearings. We also specify an alternative grease which is recommended as being superior for general chassis lubrication but is unsuitable for wheel hub lubrication, because, due to its oily nature, it may escape from the hub bearings on to the brake linings. Thus any car owner desiring to use this type of lubricant would require an additional grease gun for general chassis lubrication, retaining the other gun for wheel hub lubrication only.

Whilst the above applies to the owner desiring to attend to the lubrication of his car personally, most owners will prefer to have these operations carried out by a Standard Agent.

### THE NECESSITY FOR HIGH QUALITY OIL

There are many reputable oils on the market and many more "cheap" oils of indifferent quality. The use of high quality lubricant is an essential safeguard. It has to be sufficiently fluid to give immediate lubrication when starting from cold and to maintain sufficient body during a fast run on a hot day. A first class oil can withstand the combustion flames playing on the cylinder walls and it will not form an undue amount of carbon in the combustion heads. It will keep down the rate of cylinder and bearing wear so that the engine will maintain its performance over many years. In this way, the money spent on high quality oil represents a valuable insurance against premature old



## GENERAL UPKEEP—Engine Lubrication

age and unnecessary breakdowns. The lubricants which we recommend are obtainable everywhere and have maintained a uniform high standard of quality over many years. They can be trusted to withstand all demands made upon them and possess a margin of safety which is completely adequate.

### **Obtaining the correct Grade**

In ordering your oil be careful to state the make as well as the grade. For example, never ask for XL, A, "Double" or "30," but always use the correct wording as given in the columns on page 83 or 84 according to the brand chosen and see that the oil is drawn from a container bearing the well known trade mark.

### **Draining**

To drain the engine, gearbox or rear axle, remove the plug provided beneath each unit, this process is assisted by opening the filler to allow ingress of air, and by draining when the oil is warm after a run of at least 10 miles (16 km.) Under these conditions impurities in the oil will be well mixed and will flow away with the oil during the draining process.

### **Flushing Oils (see recommended Lubricants, page 83 or 84).**

We advocate the occasional use of flushing oil during the draining and refilling operation of the engine sump. The normal procedure is as follows :

Drain the sump while the engine is hot, screw in the drain plug and pour four pints of flushing oil into the oil filler. Start the engine and adjust the throttle so that a fairly fast idling speed is obtained.

Occasional short bursts of acceleration should be given to distribute the oil throughout the engine and then after ten minutes running drain the sump and repeat the operation with a fresh charge.

With very dirty engines, it may be necessary to lengthen the period somewhat or even to use a third charge of flushing oil.

Refill the sump with new engine oil, the small quantity of flushing oil left in the filter will not be harmful.

## GENERAL UPKEEP—Engine Lubrication

### ENGINE

We recommend low viscosity oils for use in the engine sump. These oils, whilst maintaining sufficient body when hot are fluid enough to give early lubrication to cylinder walls etc. when starting the engine from "cold," a quality not possessed by the "heavier" oils in sufficient degree for use in modern engines. They are each of the correct viscosity and character to afford complete lubrication protection. Additives which dilute the oil or otherwise impair this protection must NOT be used. We therefore stress the value of using only the recommended oils. After many thousands of miles running the rate of oil consumption will increase. When the rate becomes higher than one gallon per 1,000 miles (1 litre per 400 km.), it will be desirable to use the next heavier grade of the brand of oil you normally employ.

The working parts of the engine are lubricated by oil contained in the sump, drawn through a filter by the gear type pump and delivered under pressure to the crankshaft journals, crankpins, connecting rod little ends, camshaft bearings and rocker shaft. Oil returning from the rocker gear lubricates the tappets and cams. The jets of oil from connecting rod bearings lubricate the pistons and the timing chain is fed with oil from the camshaft bearing. Suitable oil seals are embodied at the front and rear ends of the crankshaft which effectively prevent oil leaking along the shaft.

**Every 200 miles (320 km.)** the oil level should be checked and topped up if necessary. Withdraw dipstick and wipe clean, then insert and push fully home before withdrawing for reading (see Fig. 4). Should the level be at the lower mark on the dipstick 4 pints (2.2 litres) of oil will be required for topping up.

The regular addition of oil not only maintains the correct level, but also tends to keep up the quality of the lubricant. However, gradual deterioration takes place until it becomes advisable occasionally to drain the sump and refill with fresh oil. If the engine is found to require very little oil for replenishment, then it is desirable to drain the oil every 2,500 miles (4,000 km.) and refill with fresh oil.

Once every year, if flushing oils have not been used, it is advisable to remove the sump and thoroughly clean out with petrol. Dry off with a smooth rag or good quality brush, taking care not to let any fluff or hairs remain, and leave for a quarter of an hour whilst the remaining film evaporates before replacing the sump. In the meantime, brush with fuel the gauze intake filter.

Do not forget to refill with clean oil when the sump is replaced.

## Caution

Do not attempt to clean out the sump with paraffin or petrol unless it is removed from the engine, as any remaining liquid will tend to dilute the oil.

## The Oil Cleaner

The Oil Cleaner has been designed to filter the oil to a very fine degree and the only attention it requires is to see that the filtering cartridge is removed and that a new replacement cartridge of the correct type is fitted at periods not exceeding 10,000 miles (16,000 km.).

It is essential that this operation be carried out at the specified periods to ensure the full filtration of the oil.

The cleaner manufacturer's name and cartridge number, which are clearly marked on the top of the cleaner body, must be quoted when obtaining a replacement cartridge.

To renew the cartridge, unscrew the securing bolt and remove the container, the cartridge can then be withdrawn. Wipe out the container to remove foreign matter trapped by the filter, using a non-fluffy cloth and inspect afterwards to make certain that no cloth fibres remain.

It is desirable to discard the old container and cartridge washers, replacing them with new ones, every time the cartridge is renewed. When re-assembling the container ensure that the washers and spring are correctly positioned (see Fig. 5). Do not tighten the bolt more than is necessary to obtain an oil tight joint.

Approximately one pint of oil will be lost due to the removal of the container and the sump should be topped up with new oil after assembly. However, as this operation should be done when the engine oil is being drained the refilling of the sump by the specified amount will automatically allow for this loss.



Fig. 5. Oil Cleaner

## GENERAL UPKEEP—Lubrication

The container should not be disturbed until cartridge renewal is required ; to do so invites the hazard that the accumulated dirt on the outside of the container may be allowed to contaminate the inside and thus be carried into the bearings when the engine is re-started.

If at any time the cleaner body is removed from the crankcase, take great care to fit the joint washer correctly, otherwise damage will be caused when next the engine is started, through the " blanking-off " of the oil passages. It is advisable to fit the washer to the crankcase and ensure that the holes in the washer match those in the crankcase before attaching the body.

### Ignition Distributor (see Fig. 6)

Every 5,000 miles (8,000 km.), the cam should be smeared lightly with engine oil. A pronounced squeak occurs when the cam is quite dry. Withdraw the moulded rotor arm from the top of the spindle (care should be taken because this part is made of a brittle material) but do not remove the screw exposed to view. Apply, by means of oil-can, a few drops of thin machine oil around the edge of the screw and down the hole provided, to lubricate the cam bearings and distributor spindle respectively. At the same time, place a single drop of clean engine oil on the contact breaker arm pivot.

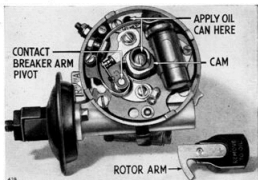


Fig. 6.

Ignition distributor

When replacing the rotor arm make sure that it is pushed on as far as possible.

The moving parts of the automatic advance mechanism should be lubricated with winter grade engine oil. This can

## GENERAL UPKEEP—Lubrication

be squirted through the gap between the cam and the base plate. Take great care not to allow any oil to get on or near the contacts.

### Water Pump and Fan

There is one nipple provided, see Fig. 6a, to which the grease gun should be applied every 5,000 miles. Give **five strokes only with gun.**

### Dynamo and Starter

Once every 10,000 miles unscrew the cap of the lubricator at the commutator end. If the lubricating wick is dry, the cap should be filled with high melting point grease or petroleum jelly. The bearing at the driving end of the dynamo is packed with grease before leaving the works and after a considerable mileage the dynamo should be removed for cleaning, adjustment and repacking of the bearings with grease. This should be done preferably by the nearest Standard or Lucas Service depot. The starter is fitted with special bearings which require no lubrication.

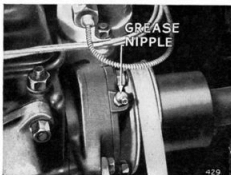


Fig. 6a.

Water pump



Fig. 7.

Oil Bath Air Cleaner

### Air Cleaner and Silencer

**Home Use.** The air cleaner gauze should be re-oiled with engine oil in order to ensure effective filtering of the air. Every 5,000 miles (8,000 km.) it is advisable to

## GENERAL UPKEEP—Lubrication

remove the air cleaner and wash in petrol, particularly the gauze, after which soak the gauze in oil and allow to drain before finally wiping over and refitting.

**Export.** This cleaner is of the oil bath type (see Fig. 7), and must be cleaned out and refilled with fresh engine oil each time the oil in the engine is changed, additionally it should be inspected every 1,000 miles (1,600 km.) (or more frequently under very dusty operating conditions) and topped up with oil.

To clean the element remove the wing nut and cover, then the element can be lifted out. Wipe out the oil chamber, which may be also be removed and refill with fresh engine oil to the level indicated, the quantity required will be approximately  $\frac{1}{2}$  pint (.27 litre). Swill the element in petrol, drain and replace in chamber.

### CLUTCH SHAFT BEARINGS

The oil can should occasionally be applied to the clutch bearings (one at each side of the clutch housing), the oil holes are accessible from underneath the car. This operation requires a pump type of oil can.

### CLUTCH AND BRAKE PEDAL BEARINGS

Grease nipples are provided (see Fig. 8), they are accessible from underneath the car.

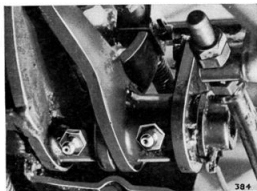


Fig. 8. Pedal Bearings

### GEARBOX

The correct oil only should be used in the gearbox as the use of very thick oil or grease will spoil the operation of gear changing. Every 2,500 miles (4,000 km.) the oil level should be checked and topped up if necessary.

To check the oil level, raise the carpet and remove the rubber plug from the gearbox domed cover plate, thus exposing the dipstick (see Fig. 9). The plug is on the left-hand side for

## GENERAL UPKEEP—Lubrication



Fig. 9.

Gearbox oil filler and dipstick

right - hand drive cars and vice versa. Withdraw dipstick and wipe clean, then insert stick and push it fully home before withdrawing for reading. The correct level is to the top mark. The dipstick orifice is also the gearbox oil filler.

If overdrive is fitted see also page 73.

Every 10,000 miles (16,000 km.) the gearbox should be drained and re-filled with new oil (see page 83 or 84).

### REAR AXLE

**It is essential to drain and replenish the axle with "Hypoid" oil every 5,000 miles (8,000 km.).**

The hypoid bevel gears fitted in the rear axle require a special lubricant to ensure efficient operation and long life.

This type of gear incorporates a sliding action between the exceptionally sturdy gear teeth, resulting in silent operation. However, the rubbing action is too severe for normal axle oils, so special "Hypoid" oils have been developed which contain additives that make the oil capable of withstanding pressures many times heavier than normal oils can cope with. A further feature of "Hypoid" oils is that they are "lighter," that is to say more fluid than normal axle oils. However, the special additives begin to lose their properties in the course of use, and the oil tends to revert to a light gear oil.

**Thus it is advisable to completely drain and replenish with new "Hypoid" oil every 5,000 miles (8,000 km.) and in any event do not exceed a period of 10,000 miles (16,000 km.).**

It is desirable to have the oil level checked during this period,

## GENERAL UPKEEP—Lubrication

and if the oil level is below the bottom mark on the dipstick do not “top up” but drain the oil and refill with new oil, this will overcome the danger of mixing the various grades of oil.

The filler is accessible from underneath the car or by removing the cover below the rear seat cushion. Clean away mud before unscrewing the filler plug to avoid grit falling into the axle.

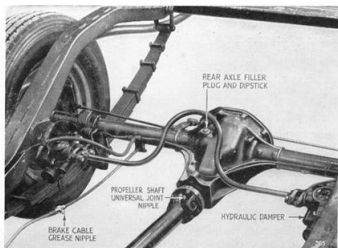


Fig. 10.

Rear of chassis

A dipstick is provided to indicate the oil level (see Fig. 10) and should not be screwed in when testing the oil level, but rested on top of the threads. The correct level is to the top mark on the dipstick.

## BRAKES

It is important that the filler cap on the brake fluid reservoir, integral with the master cylinder (see Fig. 11) should be removed every 5,000 miles (8,000 km.), the fluid level checked and



Fig. 11.

Brake master cylinder filler



## GENERAL UPKEEP—**Lubrication**

topped up if necessary. Remove front wheel to gain access to the filler plug and always clean the area around the plug before removing it, this will lessen the risk of grit falling into the chamber after removal of the plug. The reservoir should be filled to within half-an-inch of the top, and never less than half full (see page 83 or 84 for the correct fluid). As the cups in the master and all wheel cylinders are pure rubber it is imperative to use only the recommended fluid. Mineral oils would, in a very short time, distort and ruin them.

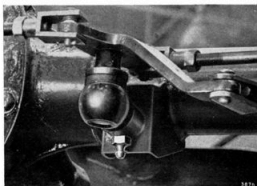
### **Handbrake Cables and Conduits**

To ensure free, efficient action, it is essential that the handbrake cables be kept well lubricated, particularly where they are enclosed by the conduits.

Grease nipples are fitted in the conduits, one located under the bonnet and the other on the right-hand side of chassis to the front of the rear axle, to which the grease gun should be applied every 5,000 miles (8,000 km.). This operation should be carried out with the handbrake applied.

During the winter months it is very important to keep the bottom cable regularly lubricated as this prevents the entry of water which on cold nights will freeze, thus locking the brake cable.

When lubricating the cables, grease is forced both ways and the gun should be pumped until grease exudes at the end of the conduit.



**Fig. 12.**

Handbrake compensator

## GENERAL UPKEEP—Lubrication

**Brake Pedal Bearing** (page 25).

### Handbrake Compensator

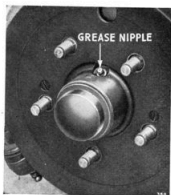
A grease nipple is provided on the compensator which is situated on the rear axle casing (see Fig. 12).

## WHEEL HUBS

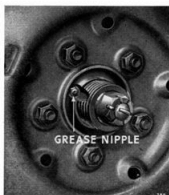
The front and rear hubs require a small but regular supply of grease as specified on page 83 or 84, every 5,000 miles (8,000 km.). It is essential that the correct type of grease be used, this has a high melting point. Five strokes of the "hand" grease gun will normally be sufficient as it is inadvisable to overload the hubs with grease. **The grease should not be used from a machine unless it is certain that the machine reservoir contains the correct grade of grease.**

### Front Hubs

To grease the hub bearings, jack up and remove the front wheel, when the grease nipple will be exposed (see Fig. 13a).



**Fig. 13a.** Front hub lubricator

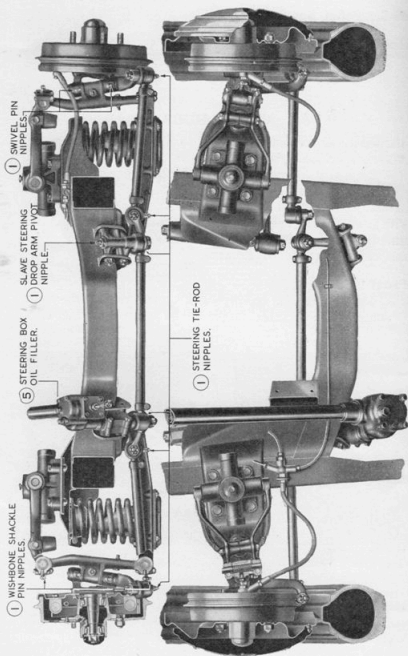


**Fig. 13b.** Rear hub lubricator

### Rear Hubs

These bearings are lubricated via nipples (see Fig. 13b) accessible on removal of the nave plate.

## GENERAL UPKEEP—Lubrication



**Fig. 14.**

Front suspension lubrication (The numerals indicate the attention periods in thousands of miles).

## GENERAL UPKEEP—Lubrication



Fig. 15.

Removal of wheel cover

### Wheel Cover

**Removal** (See Fig. 15). They may be released by depressing the lever on the inside of the cover, hinging it outwards and then lifting out of the hinges. Replacement is the reverse of this process.

### Nave Plate Removal and Refitting

Engage the special lever provided in kit, in one of the wheel depressions (see Fig. 15a), and lever off the Nave Plate.

To refit plate, place its edge over the securing studs or clips as far as possible and give a sharp tap with the hand on the plate, to spring it into the correct position.



Fig. 15a.

Nave plate removal

## FRONT SUSPENSION

Nipples are provided for the lubrication of the swivel pin bearings, suspension pivots, ball joints and outer bush of each wish-bone shackle (see Fig. 14). Do not lubricate the inner bushes of the shackles as they contain rubber.

It is an advantage when greasing the king pin bushes to jack up the front of the car so that the suspension hangs free. This will allow grease to cover the thrust washer faces as it exudes from the lower bush as the grease gun is applied.

To maintain the best riding qualities of the independent

## GENERAL UPKEEP—Lubrication

suspension it is essential that it is properly and regularly lubricated. The distance of 1,000 miles (1,600 km.) between lubrication of the suspension pivots should be regarded as a maximum.

### PROPELLER SHAFT

The universal joints are of the needle roller bearing type and each is fitted with a nipple for lubrication. A nipple is also fitted to the front end of the shaft for lubrication of the sliding splines (see Fig. 16). The three nipples should receive attention with an oil gun every 5,000 miles (8,000 km.), using oil recommended on page 83 or 84.

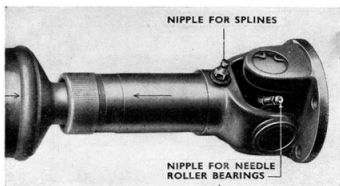


Fig. 16.

Propeller shaft lubrication

### REAR ROAD SPRINGS

The spring blades should not be allowed to get rusty as this will prevent the correct working of the springs and provide a hard suspension.

Service stations are often equipped to spray the springs with penetrating oil, but this is not lasting in effect, and it is advisable afterwards to paint over with rear axle or engine oil.

It is the area around the tips of the blades which most requires the lubricant, as it is at these points that one blade presses upon the next. The blade clips should also be oiled.

Rubber bushes are fitted in all the rear spring eyes and must not be lubricated.

## GENERAL UPKEEP—Lubrication

### STEERING

To lubricate the steering unit, remove the screwed plug and top-up with oil to the level of the orifice (see Fig. 17), this should be carried out every 5,000 miles (8,000 km.).

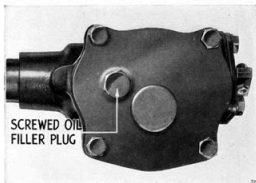


Fig. 17.

Steering box oil filler

Grease nipples are provided on all steering ball joints and the "slave" steering drop arm pivot (see Fig. 14). These nipples should receive attention with the grease gun every 1,000 miles (1,600 km.) as their duty is high.

### HYDRAULIC DAMPERS

The piston type dampers fitted should not require any attention such as "topping up." If they become inoperative they should be serviced by the makers. Your car may be fitted with either Armstrong or Girling Hydraulic dampers.

### GEAR CHANGE MECHANISM

The only attention necessary is to ensure that the steering column mechanism and the two selector rod bushes on the frame side member (see lubrication chart) receive attention every 5,000 miles (8,000 km.).

**Left Hand Drive.** The grease gun should be applied to the nipple provided.

## GENERAL UPKEEP—Lubrication

**Right Hand Drive.** The gears and the adjacent control bushes (see Fig. 18), should be lubricated with oil (see lubrication chart).



Fig. 18.

Gear change mechanism  
(Right-hand drive model)

## HINGES, CONTROLS, DOOR LOCKS, ETC.

The bonnet catches, hinges and several small control joints should be given occasional attention with the oil can. Door locks should receive a drop of oil every month to ensure easy operation with the key and to prevent corrosion.

The connections on the handbrake and ratchet mechanism, the clutch operating links, etc., all require attention to allow the controls to work freely and prevent unnecessary wear.

## ACCELERATOR CONTROLS

Apply oil to the cable at each end of the casing and work the pedal to spread the oil inside casing.

## GENERAL UPKEEP—Lubrication

### DIRECTION INDICATORS

A little thin oil should be applied by means of a small brush to the catch pin between the arm and the operating mechanism. This can be done when the indicator is switched up.

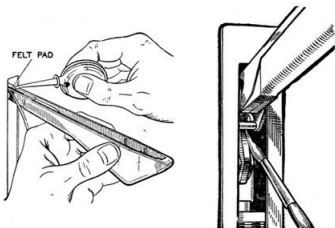


Fig. 19. Lubrication of direction indicator mechanism

Also withdraw the screw on the underside of the arm end and slide off the arm cover. Place the connecting wire to the bulb on one side and apply a drop of thin machine oil to the lubricating pad at the top of the arm. To replace the arm cover, slide it in an upward direction so that the side plates engage with the slots on the underside of the spindle bearing and secure with the screw.

### WINDSCREEN WIPER

The windscreen wiper motor is adjusted and packed with grease before leaving the works and therefore requires no additional attention.



## CARE OF TYRES

**Maintain the correct inflation pressure by weekly tests with a gauge applied directly to the valve.** The maintenance of correct tyre pressure is a large factor in tyre life and the steering of the car.

Tyres lose their pressure due to diffusion, even though there is no porosity or leakage due to a puncture or faulty valve. The loss varies from 1 to 3 lb. per sq. in. per week and must be made up if the tyre is to give proper service.

**Examine the tyres occasionally for flints or other road matter** which may have become embedded in the tread. If the car is driven where tacks or short nails may be picked up, these also may be found buried in the tread. If these are left in they may eventually work through the cover and puncture the tube. Fill up any large holes with a suitable compound, obtainable for the purpose.

**Oil** should not be allowed to get on the tyres. If any should accidentally do so, clean off by using petrol sparingly.

**Do not drive over sharp edged kerbs** or "bump" them with the side of the tyre, as this is liable to fracture the cotton tyre casing, and in the latter case upset the front wheel alignment or even bend the wheel "out of truth."



Fig. 20. Tyre tread examination

Tyre Size		CORRECT TYRE PRESSURES (Fully-laden condition)			
		Front		Lb./Sq. in	Kg./Sq. cm.
				Rear	
Saloon (as fitted)	.....	} 24	} 1.7	26	1.85
Estate Car	.....			28	1.95
Pick-up Truck	.....			} 30	2.1
Delivery Van	.....				

## GENERAL UPKEEP—Care of Tyres

It is assumed that the above pressures are maintained by weekly attention. If the owner is able to check the pressure only every two or three weeks, then it is advisable to inflate the tyres by an additional 2 lb./sq. in. On the other hand, it is permissible for a more comfortable ride, when carrying only two persons, to run with pressures 2 lb./sq. in. below those recommended, provided they are checked weekly or some convenient time when purchasing fuel.

### WHY TYRE RESULTS VARY

**Speed.** Car owners vary greatly in the speed at which they habitually drive. The rate of tread wear at 50 m.p.h. is double that at 30 m.p.h.

**Rapid Acceleration and Cornering.** During wheel slippage caused by rapid acceleration or severe cornering, excessive tread wear takes place due to the abrasion of the tyre against the road surface.

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

### FRONT WHEEL ALIGNMENT

The alignment of the front wheels is most important in its effect on tyre wear and good steering. Excessive toe-in will lead to severe tyre wear particularly on the "kerb side" front tyre.

"**Toe-in**" or "**toe-out**" is the amount by which the front wheels are inclined from parallel.

The outer tie-rod tubes are threaded at both ends, and revolving these tubes will, therefore, either shorten or increase the ball joint centres, thus altering the wheel alignment.

Each tie-rod tube is prevented from rotation by a bolted clamp at each end.

#### Correct Wheel Alignment

The wheels should **Toe-in**  $\frac{1}{8}$ ".

#### To Check and Adjust Wheel Alignment

Jack up each front wheel in turn until just clear of "ground." Spin wheel to test for run-out. Set wheel so that maximum run-out is at the top. Lower and remove the jack.

This operation will tend to correct for errors which might otherwise occur due to wheel run-out.

Set the steering in the "straight ahead" position and measure

## GENERAL UPKEEP—Care of Tyres

the distance between the two front wheel rims at a height above the ground approximately equal to that of the wheel hubs. Take this measurement both in front of and behind the hub centres. The amount by which the front measurement is less than the rear is termed "toe-in."

If adjustment is found necessary and the correction is only small, adjust the left-hand tie rod, but if the correction is greater than  $\frac{1}{16}$  in. the adjustment should be carried out on both outer tie rods. To adjust a tie rod proceed as follows: Slacken the clamp bolts at each end of the tie rod. Revolve the left-hand tie rod tube anti-clockwise to toe-out, or clockwise to toe-in the wheels, the right-hand tie rod should be rotated clockwise to toe-out and anti-clockwise to toe-in, the direction of rotation being viewed from the left-hand road wheel. One complete turn of the tie rod tube will alter alignment by approximately  $\frac{1}{2}$  in. measured at the wheel rims. When adjustment is complete ensure that the ball joints are in the centre of "swing" before securely tightening tie-rod tube clamps. The clamps must, of course, be positioned as shown in Fig. 14 (page 30).

### THE JACK

A triangulated screw jack is provided which is adapted to lift any wheel of the car as required.

Fit the jack in position as shown, making sure that it is right home in its socket. Apply the handbrake or chock the wheels which will remain on the ground, before operating the handle.

If a jack is used under the rear axle case, **take care** to ensure that the jack pad does not touch the rear cover plate when lifting, otherwise there is a risk of damage and consequent oil leak.

To remove nave plate and wheel cover, see page 31.



Fig. 21.

Jacking the car

## BODYWORK

### CARE OF BODYWORK

The "finish" used for coachwork is remarkably durable but in order to retain the lustre of the finish, it is necessary to take a little trouble in cleaning and polishing it occasionally. Although dust may be removed with a duster, yet if it has been wet, it is advisable to clean off with a sponge and water. Always use water when removing mud, and when the car is clean finally wipe over with an almost dry chamois leather. All chromium parts should be cleaned frequently with a little soap and water, finished off with a damp chamois leather, and then be polished with a soft dry rag. If, due to neglect, the plate becomes spotted it is necessary to use a chromium plate cleaner. The radiator grilles should be kept smart in appearance in the same manner.

Washing alone will not keep up the brilliance of the paintwork and polishing with a suitable polish, specially prepared for this purpose, such as Duckham's DA Liquid Wax Polish No. 13, is advisable. Occasional removal of the "traffic film" which accumulates over the finish is well worth while, and special cleaners for the purpose are available. The finish will improve in appearance if properly looked after.

Tar is best removed before it has had time to set. This may be done by the aid of a little paraffin or petrol. However, it often happens that tar becomes firmly attached, and attempts to remove it are made when the car is being cleaned. Special tar removers are available for this purpose which are designed to dissolve tar without damage to the parts.

For parts requiring lubrication see page 34.

If, for example, the door hinges are left unlubricated they will eventually wear and cause the door to fall out of proper location with the door catch and dovetail. This leads to door rattles which can be avoided by careful attention to proper lubrication.

The interior of the body should be dusted occasionally, and the carpets taken out, shaken and brushed. Grime may be removed from the leather upholstery by the application of a little soap and a damp cloth, followed by a final wipe down with an almost dry sponge or wash-leather. When a vacuum cleaner is available it can be used with advantage to help clean the interior of the car.

## GENERAL UPKEEP—Bodywork

### DOOR ADJUSTMENT

The doors are provided with spring loaded dovetails for the purpose of preventing rattle and governing the pressure on the lock bolt when the door is closed.

The lock plates and dovetails are adjustable so that when wear eventually takes place they can be repositioned. This adjustment should preferably be carried out by a coach fitter.

### FRONT SEAT ADJUSTMENT

The front seat is adjustable for "leg length" by turning the handle which is situated under the front of the seat.

### SPARE WHEEL AND TOOL COMPARTMENT

#### Saloon and Estate Car

The spare wheel and tools are housed below the luggage compartment. The spare wheel is secured by a single strap and the tools secured as shown in Fig. 22.

The tool roll and grease gun may also be kept in this compartment.

#### Pick-up Truck and Delivery Van

Tools are secured by two straps under the driver's seat. The spare wheel is housed under the passengers' seat or platform, if no seat is provided on the van.

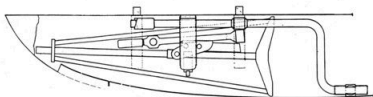
### TOOL KIT

The tool kit is comprised of the following, the detail numbers being given for anyone requiring spares :

	Detail No.
Adjustable Spanner	9472
Combination Tool. Used as screwdriver, tommy bar and nave plate remover	59427
Contact Breaker (Gauge and Screwdriver)	52125
Feeler Gauges (1 set)	60126
Grease Gun	60056
	or 59429
Jack	200144
Open Ended Spanner, .43" and .69" A/flats	59425
Open Ended Spanner, .50" and .56" A/flats	59426
Pliers	9465

## GENERAL UPKEEP—Bodywork

							Detail No.
Starting Handle	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	57899
Tool Roll	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	24731
Tube Spanner, .69" and .83" A/flats				XXXXXX	XXXXXX	XXXXXX	59423
Tube Spanner, .50" and .56" A/flats				XXXXXX	XXXXXX	XXXXXX	59424
Tyre Levers (2)	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	52322
Tyre Valve Tool	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	52203
Wheel Nut Spanner		XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	59428



**Fig. 22.**

Tool kit layout

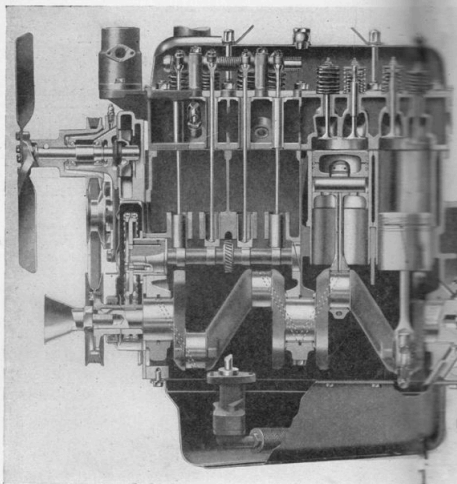
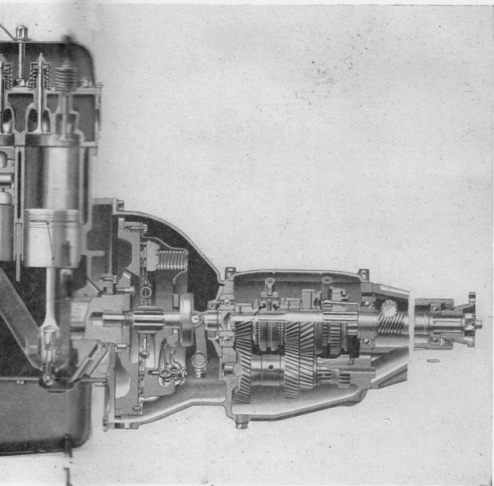


Fig. 23.



Engine longitudinal section



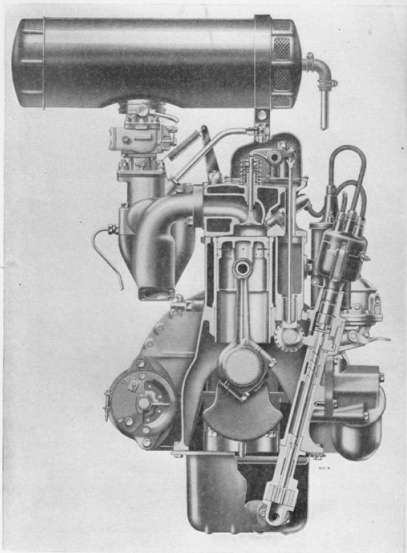
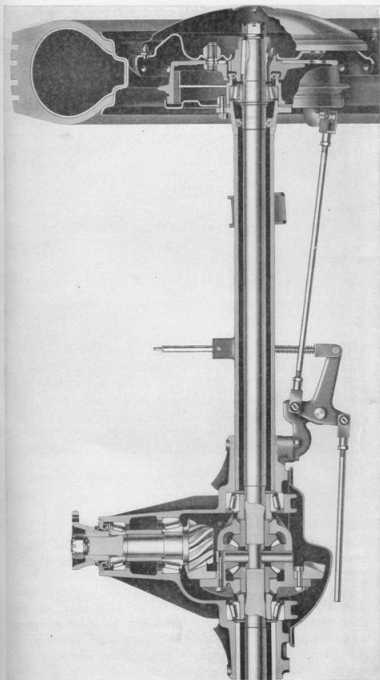


Fig. 24.

Engine cross section



Rear axle section

Fig. 25.

## RUNNING ADJUSTMENTS

Various adjustments are necessary from time to time in order to keep the mechanism in efficient running order. The periods between depend largely upon the manner in which the car is used and no definite time can be given here for carrying out these corrections. The car should be examined, however, every 5,000 miles (8,000 km.) and any adjustments which appear necessary can then be made (see page 59).

### ENGINE

#### Cylinder Head Nuts

After the first 1,000 miles (1,600 km.) the cylinder head nuts should be checked, with engine warm, for tightness in the order shown in Fig. 26.

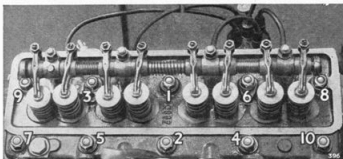


Fig.26.

Order of tightening cylinder head nuts

#### Valve-Rocker Clearances

A clearance between the valve stem and the valve cap is necessary to ensure correct closing of the valves and efficient running of the engine.

The correct running clearance is 0.010" (0.25 mm.) for the inlet valves and 0.012" (0.3 mm.) for the exhaust valves measured with engine cold. Two gauges are provided in the tool kit for the purpose of setting these clearances.

## RUNNING ADJUSTMENTS—Engine

If a rocker becomes noisy, it may be silenced by adjusting the clearance to the correct amount. Do not set the valve clearances too small or the engine will not maintain good tune.

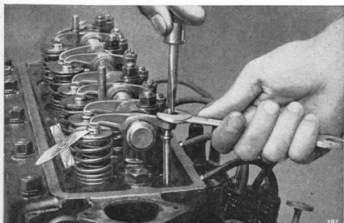


Fig. 27.

Valve-rocker clearance

### Adjustment of Valve-Rocker Clearance

Remove the air silencer and the rocker cover and turn the crankshaft with the starting handle for half a revolution after the valve to be adjusted has closed.

Rotate valve cap until the clearance measuring slot is in a convenient position and insert the correct feeler (see Fig. 27). Slacken the lock nut and adjust the rocker screw with a screwdriver until the gauge is a sliding fit between the top of the valve stem and the inside of the valve cap.

Now tighten the lock nut and check that the clearance has not altered.

## RUNNING ADJUSTMENTS—Engine

### Ignition Timing

The ignition is automatically advanced to suit the ever changing needs of the engine. **When fully retarded, i.e., engine at rest, the ignition should be set to fire  $4^{\circ}$  before top dead centre (measured at the crankshaft).** The ignition is correctly set at the works and should not normally be adjusted, excepting that after the car has covered a considerable mileage it may be necessary, due to the increased carbon deposit, to set back slightly the ignition, to prevent a metallic sounding noise termed "pinking." It is evident when pulling hard up-hill or when accelerating from low speed in top gear.

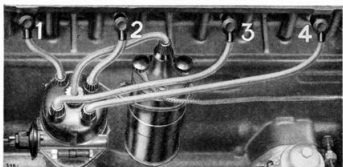


Fig. 28.

Ignition leads

The setting recommended above should be regarded as a starting point, as individual engines may require more or less advance than this. Maximum power is obtained by giving the greatest possible advance without causing pinking. Minor adjustments can readily be made on the road.

To advance ignition, slacken the two small setscrews and turn the distributor body clockwise, and vice versa. Do not alter the ignition more than  $1^{\circ}$  at a time ( $2^{\circ}$  on crankshaft). To obtain **top dead centre** position turn the crankshaft until the small drilled hole in the belt pulley is in line with the pointer attached to the timing cover.

The firing order is given in Fig. 28. The distributor is shown marked corresponding to the cylinder numbers to

## RUNNING ADJUSTMENTS—Engine

which the high tension cables should go. The cylinder numbers are counted in sequence, No. 1 being the cylinder nearest to the radiator.

### Valve Timing

See page 5 for correct valve timing. To obtain top dead centre see Ignition Timing, page 48.

### Sparking Plugs

The sparking plugs were adopted for original equipment after lengthy tests as sparking plug types vary in suitability for different engines, it is important that the correct type of plug be fitted when making replacements, this is :

Champion No. L10— $\frac{1}{2}$ " reach.

The gaps (*i.e.*, the width between the firing point of the centre electrode and the earth point) are originally set and should be maintained at thirty-two thousandths of an inch (0.8 mm.) to ensure even running of the engine.

Incorrect gap settings may cause misfiring or erratic slow running. Faulty plug leads or cracked porcelain insulation in the sparking plug will also cause faulty ignition, see also page 12.

Sparking plugs should be thoroughly cleaned by a sand blasting process and checked and adjusted, if necessary, for gap setting after 5,000 miles (8,000 km.) use and at 10,000 miles or 15,000 km. should be replaced by new plugs.



*Oily, dirty, worn out plugs—  
a sluggish, wasteful, hard  
starting engine.*



*New, clean efficient plugs—  
a quick starting, responsive  
engine.*

**Fig. 29.**

Plug before and after cleaning

## RUNNING ADJUSTMENTS—Engine

### Carburettor

The correct sizes of choke and jets are fitted to the carburettor and it is inadvisable to alter them as they are the result of exhaustive bench and road tests.

Slow running adjustments are provided and these are the only points that may require attention after the engine has become run-in. Two adjusting screws are shown in Fig. 30, one for limiting the closing of the throttle and thus the idling speed. The other screw regulates the strength of the idling mixture. There is also a screw which sets the full open position. Don't interfere with this.

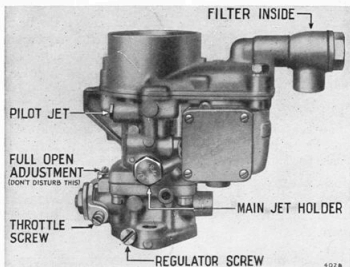


Fig. 30.

Carburettor

### CHOKE AND JET SIZES

Component	Size of Jet
Choke tube	25
Main jet	135
Air correction jet	190
Pilot jet (slow running)	55
Starter jet	130

## RUNNING ADJUSTMENTS—Engine

**SLOW RUNNING ADJUSTMENT.** We recommend that the carburettor be adjusted to run at a fairly fast idling speed, because an engine which is regulated to a minimum speed when hot, is apt to stall when cold.

**CLEANING THE JETS AND FILTER.** It may happen that foreign matter enters the float chamber and is sucked into the jets, so preventing the flow of fuel and causing the engine to falter. Fig. 30 shows the jets which may be removed for cleaning purposes. Care should be taken not to enlarge the jet orifice. The filter incorporated in the fuel pipe union can be removed for cleaning after the union bolt has been removed.

**NOTE.**—A fully comprehensive booklet on each type of Solex carburettor can be obtained post paid on remittance of 1/- to Solex Ltd., 223/231, Marylebone Road, London, N.W.1.

### Fuel Pump

The mechanically operated fuel pump mounted on the left-hand side of the crankcase, provides a constant pressure of fuel to the carburettor. A hand primer is fitted which can be used to pump fuel to the carburettor if the float chamber is not already full, under which condition a slight pumping resistance is felt before the lever reaches its stop. This resistance ceases when the chamber is full.

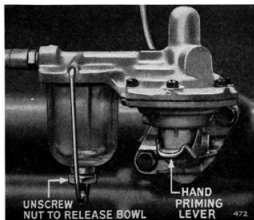


Fig. 31.

Fuel pump



## **RUNNING ADJUSTMENTS—Engine**

The glass bowl acts as a sediment chamber for the petrol passing to the pump. The foreign matter collects on the underside of the gauze and, being washed off by the petrol, sinks to the bottom of the bowl. To remove the sediment, detach the bowl by unscrewing the nut at its base and wash the bowl out with the fuel that will be in it. When refitting the bowl tighten the nut just sufficient to ensure a fuel-tight joint as overtightening may result in damage.

If the pump fails to supply fuel to the carburettor it is advisable to attend to the following points : (a) inspect the fuel pipe unions which, if any are loose, should be tightened up, (b) a blockage may have been caused in the fuel pipe which may be removed by blowing through the pipe with the aid of a tyre pump.

If, after attending to the above points, the pump still fails to operate, it should be renewed and the old pump sent to the nearest A.C. Service Station or Standard Service Depot.

### **Decarbonising and Valve Grinding**

It is recommended that the cylinder head be removed for decarbonising and valve grinding after the first 5,000 miles (8,000 km.). This is chiefly to give attention to the valve seats, the metal of which becomes stabilised during this period. Thereafter it will be found that decarbonisation will be required only after a period of about 20,000 miles (32,000 km.). Providing that the engine is running satisfactorily after this period and that each cylinder gives a normal compression, showing that the valves are seating reasonably well, it is much better to leave it alone and delay decarbonising for as long as the engine continues to run satisfactorily.

The grinding of the valves becomes necessary in order not only to increase the efficiency of the engine, but to prevent a badly seating valve becoming worse and getting burnt.

We recommend that the work should be carried out by the skilled mechanics at your nearest Standard Agent. For those who desire to do this work themselves, the main points to watch are outlined below :

## RUNNING ADJUSTMENTS—Engine

- 1 The procedure of turning the crankshaft in order that the compression will “break” the seal of the cylinder head should not be practised with this design of engine.

Once the cylinder head has been removed it is important that the crankshaft is not rotated unless the cylinder sleeves are firmly clamped down against their seatings. This can be accomplished by using two tubes and washers. If this precaution is not observed the sleeves may rise, tearing the joint washer, with consequent risk of water leaking into the crankcase after assembly.

- 2 **There are two types of gasket and it is essential that they are fitted correctly, one has ONE oil feed hole, the other has TWO.**

The gasket shown in Fig. 32 **MUST** be fitted with the plain side uppermost. The gasket shown in Fig. 32a should be fitted with the plain side downwards against the cylinder block.

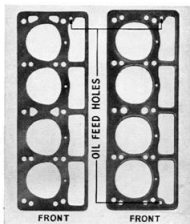


Fig. 32 and 32a. Cylinder head gasket

- 3 It has been found advantageous to remove the tappets and clean the insides just prior to refitting the cylinder head to ensure that any chips of carbon which may have fallen into the chamber are removed from the push-rod seatings.
- 4 When replacing the cylinder head nuts tighten them gradually in the sequence shown on page 46 in order to produce an even pressure on the gasket and prevent undue strain in the cylinder head casting. If a new gasket has been fitted it will be necessary later to go over the nuts again and give them a further tightening. This should be done when the engine has been thoroughly warmed through.

## RUNNING ADJUSTMENTS—Engine

- 5 The outer valve springs are close-coiled at one end and when fitting, the close-coiled end should be against the cylinder head. When tightening down the rocker pedestals **ensure that the valve caps are locating properly on the valve stems.** Failure to attend to these items may result in damage to the push-rods.
- 6 Smother the rocker gear with oil, particularly where the rockers bear on to the valve caps, fill the cooling system, then start and run the engine for approximately two minutes before adjusting the valve-rocker clearances.
- 7 When replacing the rocker cover ensure that the cork washer is undamaged and shellaced to the cover, otherwise oil may leak through the joint.

### CLUTCH

A Borg & Beck single dry plate clutch is fitted and as it is correctly set before leaving the works it will be some considerable time before it requires re-adjustment.

#### Adjustment

Indication that adjustment is required is given when :

1. The free pedal movement is reduced to about  $\frac{1}{4}$ " (6 mm.) or
2. The free pedal movement increases until the clutch will not be fully released when the pedal is fully depressed.

It is then necessary to adjust the clearance until there is backlash or free movement of about  $\frac{1}{32}$ " (13 mm.) measured at the pedal pad. This will provide the  $\frac{1}{16}$ " (1.5 mm.) clearance required at the toggle ring.



Fig. 33.

Clutch adjustment

## RUNNING ADJUSTMENTS

### BRAKES

Lockheed hydraulic brakes are fitted to all four wheels. Two leading shoe type being used on front wheels, leading and trailing shoe type on rear wheels.

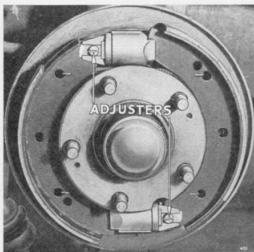


Fig. 34.

Brake shoe assembly, front

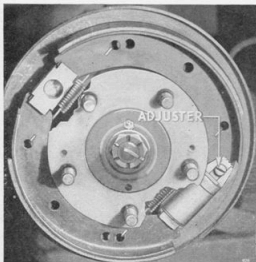


Fig. 35.

Brake shoe assembly, rear

## RUNNING ADJUSTMENTS—**Brakes**

The pedal operates the brakes on all four wheels hydraulically, whilst the handbrake control operates the brakes on the rear wheels, by means of cable and rods.

It must be remembered that the presence of oil, grease or similar foreign matter on a brake shoe will seriously affect the coefficient of friction and in consequence the retarding effect of that particular brake, in spite of the fact that it is being applied with the same force as the others. In such cases, the brake drum should be thoroughly cleaned with fuel and the brake shoes replaced by new replacement shoes. Cleaning the brake shoe is not satisfactory.

See page 27 for checking level of fluid in reservoir. If it is found to be particularly low it is an indication that a leak has developed somewhere in the system and it should be traced and rectified without delay.

Do not reline the shoes, but fit genuine Lockheed replacement shoes. These shoes have the right type of lining machined to the correct radii.

Should the shoes be removed, care must be exercised to ensure that the pull-off springs are located behind the shoes and hooked through the correct holes as shown in Figs. 34 and 35.

### **Adjustment of Brake Shoes**

After a considerable mileage it may be found necessary to adjust the brakes. This is evident when the brake pedal has to be depressed to within 1" of the floor before the brakes operate. There are TWO adjusters to each front wheel and ONE to each rear wheel (see Figs. 34 and 35).

The following procedure should be followed to correctly adjust the brakes.

1. Apply the brakes hard with the car stationary, to position the shoes in the drum, then release brake.
2. Jack up the car and remove the nave plates and road wheel.
3. Rotate brake drum until hole provided coincides with screwdriver slot in micram adjuster (see Fig. 34 and 35).
4. Insert a screwdriver and turn the adjuster clockwise until the shoe contacts the brake drum, then turn

## RUNNING ADJUSTMENTS—Brakes

adjuster back one notch. There is a constant drag on the rear wheels due to the action of the differential and the axle oil, don't confuse this with the brake drag.

5. Replace wheel and nave plates, then remove jack.

### Handbrake Adjustment

Adjustment of the brake shoes as previously described automatically readjusts the handbrake mechanism. The rods are correctly set before leaving the works and only maladjustment will result from tampering with the mechanism.

### Bleeding the System

Except for periodical inspection of the fluid level in the reservoir chamber and lubrication of the handbrake cables and connections (see page 28) no attention should be necessary. If, however, a pipe joint is uncoupled at any time, or the wheel cylinder cups are inspected or replaced, the system must be bled in order to expel any air which may have been admitted.



Fig. 36.

Bleeding the brakes

## RUNNING ADJUSTMENTS—Brakes

Air is compressible, and its presence in the system will affect the working of the brakes.

Whilst the majority of owners will prefer to have these operations carried out by a Standard Agent, for the benefit of those desiring to carry out their own running adjustments, the procedure is as follows :

1. Remove the front road wheel to allow access to master cylinder reservoir.
2. Wipe clean the bleeder nipple of the brake concerned and fit a piece of rubber tube over it, allowing the tube to hang in a clean container partially filled with fluid, so that the end of the pipe is below the level of the fluid (see Fig. 36).
3. Unscrew the bleeder nipple one complete turn with a suitable spanner. There is only one bleeder nipple to each wheel.
4. The fluid reservoir of the master cylinder must be topped up before commencing the bleeding operation, and must be kept at least half-filled during the whole operation, otherwise more air will be drawn into the system via the master cylinder. Always clean the area around the plug before removing it, this will lessen the risk of grit falling into the chamber after removal of the plug. Seven to eight strokes of the pedal will reduce the fluid level from full to half-full.
5. Depress the brake pedal quickly and allow it to return without assistance.

Repeat this pumping operation with a slight pause between each depression of the pedal. Observe the flow of fluid being discharged into the glass jar and when all air bubbles cease to appear, hold the pedal firmly down and securely tighten the bleeder nipple.

NOTE. Depending upon the position at which a pipe joint has been uncoupled it will be necessary to bleed the system at either both the front or both the back wheels. If the pipe was uncoupled at the master cylinder then the system must be bled at all four wheels.

## **RUNNING ADJUSTMENTS—Brakes**

### **PROPELLER SHAFT**

If the propeller shaft has been removed it is essential when re-assembling the front end splines to see that the arrows on the universal joint and propeller shaft end are in line (see Fig. 16, page 32) so that the propeller shaft will transmit uniform motion. A single universal joint does not transmit uniform motion when the driving and driven shafts are inclined to one another, but when two joints are used, one at each end of the propeller shaft, and set in correct relation one to the other, the errors of one are corrected by the errors of the other and uniform motion ensues. Hence the importance of re-engaging the splines correctly when they have been taken apart.

### **HYDRAULIC DAMPERS**

If these are removed, or for some reason new ones are fitted, it is advisable to hold the hydraulic damper right way up in a vice, check level of fluid and replenish if necessary. Pump the pistons to each end of the stroke by moving the lever to its full extent. This will dispel any air which may have entered the chamber. After this operation, re-check the fluid level and keep the hydraulic damper the right way up until it is fitted in place.

### **LOOSE BOLTS AND NUTS**

All the vital nuts are locked in position by split pins, locking wire, or by an additional lock nut or lock washer. It is, however, desirable that the car should be examined every 5,000 miles (8,000 km.) so that if any nut is found to be loose it may be tightened. The wheel nuts can periodically be checked by the owner himself and occasionally removed, oiled and refitted.

The general examination of the chassis is a mechanic's job.



## ELECTRICAL SYSTEM

A 12 volt earth return (or one wire) lighting and starting set is fitted.

**As the frame parts are not insulated, one cable should be disconnected from the battery terminal before removing any electrical unit, otherwise there is risk of a serious "short."**

### IGNITION

See page 10 for the function of the red warning lamp bulb. Although the failure of this bulb will not affect the ignition, the bulb should be replaced at the earliest opportunity by one of the same size and type, *i.e.*, Lucas No. 987, 12 volt, 2.2 watt (see page 67).

#### Misfiring, etc.

If misfiring occurs, check that the fault is not due to a defect in the carburettor, fuel supply, sparking plugs, etc.

The engine will run erratically in the rare occurrence of a wire having broken inside its insulated casing. The trouble is then difficult to trace.

Examine the high tension leads. If they are cracked and perished, replace with 7 mm. rubber covered ignition cable.

#### Cleaning and Adjustment of Distributor Contacts.

Every 5,000 miles (8,000 km.) wipe the inside and outside of the moulded distributor cover with a soft dry cloth, paying particular attention to the space between the terminals. See that the small carbon brush on the inside of the moulding works freely on its holder.

Examine the contact breaker. The contacts must be free from grease or oil. If they are burned or blackened clean them with a fine carborundum stone or with very fine emery cloth. Afterwards wipe away any trace of dirt or metal dust with a cloth moistened in petrol.

After cleaning check the contact breaker gap. To do this turn the crankshaft with the starting handle until the contacts are fully opened and insert the gauge 0.012" (0.3 mm.) provided on the ignition screwdriver, between the contacts.

## **ELECTRICAL SYSTEM—Battery**

If the setting is correct the gauge will be a sliding fit, but if the gap varies appreciably from the gauge the setting should be adjusted. Slacken the two screws securing the plate carrying the fixed contact and move the plate until the gap is set to the thickness of the gauge, tighten the two screws and re-check the setting.

### **THE BATTERY**

Lucas GTW9A. 12v. 51 amp. hr.

About once every fortnight (more frequently in hot climates), top up each cell with distilled water to bring the acid solution (electrolyte) level with the top of the separators. Do not use a naked light when examining the conditions of the cells and on no account use tap water when topping up. Keep the terminals clean and well covered with petroleum jelly. If they are corroded, scrape them clean, assemble and cover with petroleum jelly. Wipe away all dirt and moisture from the top of the battery, and make sure that the connections are clean.

### **THE DYNAMO**

The dynamo is of the compensated voltage control and operates in conjunction with the regulator unit which is housed alongside the cut-out in the control box.

The regulator unit ensures that the dynamo charges the battery at the rate best suited to its condition. It automatically provides a large charging current for a discharged battery and a low trickle charge for a battery in a fully charged state.

When the engine is at rest, or running slowly, the dynamo does not develop sufficient current to charge the battery, and under these circumstances, the battery would discharge itself through the dynamo if the cut-out were not fitted. The cut-out is operated by the dynamo voltage, and when, due to increasing speed, the dynamo develops sufficient voltage to actuate the cut-out, the points make contact and so allow current to flow from the dynamo to the battery. In this system, current cannot flow in the reverse direction. The cut-out requires no attention, it is correctly adjusted by the manufacturers and the sealed unit must not be tampered with.

## **ELECTRICAL SYSTEM—Starter Motor**

The brush gear and commutator on the dynamo will not normally require any attention. After 50,000 miles (80,000 km.) however, it is advisable to have the unit serviced at a Lucas depot.

### **Belt Tightness**

See that the belt is sufficiently tight to drive the dynamo. It can be adjusted by slackening the securing nuts and swinging the dynamo in the desired direction. Retighten the nuts whilst holding the dynamo in the adjusted position. Don't over-tighten the belt as this would put an undue load on the dynamo and the water pump bearings.

## **THE STARTER MOTOR**

### **Cleaning and Lubrication**

The starter brush gear and commutator will not normally require attention. After 50,000 miles (80,000 km.) however, it is advisable to have the unit serviced at a Standard or Lucas Service depot.

Should the starter pinion become jammed in mesh with the flywheel, then it can be released by turning the crankshaft with the starting handle in the normal manner, or select top gear and rock the car backwards and forwards until the pinion releases itself.

### **Starter Motor only turns Crankshaft slowly**

The battery may be run down due to leaving the ignition switched on, or leaving the car standing with the head lamps on. The grade of oil in the engine sump may be too heavy.

### **Starter Motor will not turn Crankshaft**

This may be due to a broken connection between the starter and battery or a bad contact.

If the red warning light goes out when the starter button is pressed, then the battery is in a run down condition and the engine should be started by hand.

If the motor hums but does not engage with the flywheel when the starter button is pressed, then :—

(a) The battery may be in a run down condition.

## ELECTRICAL SYSTEM—Control Box and Fuses

- (b) The brushes are sticking or the commutator requires cleaning.
- (c) Battery terminals are not clean or secure.

### CONTROL BOX

The control box, mounted on the wing valance in front of the battery, houses the voltage regulator and cut-out. These units are carefully and accurately set before leaving the works and must not be tampered with.

### FUSES

The fuse box is located forward of the control box and contains the two fuses. The top fuse (50 amp.) protects the horn while the other fuse (35 amp.) protects those items which can only operate when the ignition is switched on, *i.e.*, direction indicators, windscreen wipers, brake light, reverse light, petrol gauge, and heater (if fitted). When replacing a fuse, it is important to use the correct replacement, the fusing value is marked on a coloured paper slip inside the tube. Spare fuses are also carried in the box.

A blown fuse will be indicated by the failure of all the units protected by it, and is confirmed by examination of the fuse. If it has blown, the broken ends of the wire will be visible inside the glass tube. Before replacing a blown fuse, inspect the wiring of the units that have failed, for evidence of a short circuit or other fault which may have caused the fuse to blow and remedy the cause of the trouble. If it is not possible to locate the cause of the trouble and the new fuse blows immediately, the equipment should be examined by a Standard or Lucas Agent or Service Depot.

### LAMPS

Head Bulbs	Lamps Fitted	Lucas No.	Voltage	Wattage
<b>Home :</b>	Left-hand Lamp	..... 300	12	36/36
	Right-hand Lamp	..... 162	12	36
<b>Export :</b>	Left-hand drive			
	Both Lamps	..... 301	12	36/36
	Right-hand drive			
	Both Lamps	..... 300	12	36/36

## ELECTRICAL SYSTEM—Lamps

The lamps fitted to the Vanguard have the reflector and glass sealed as a unit. The bulb has a "pre-focus" cap accurately located and correctly positioned relative to the reflector, thus no adjustment to focusing is required when a replacement bulb is fitted.

Should it be desired to travel in countries where the "rule of the road" is changed, it may be an advantage to fit alternative headlamp bulbs in order to alter the direction of the "dipped" beam. The bulbs, Lucas No. 300, should be replaced by Lucas No. 301 and vice versa.

### Alignment

The lamp must be set to ensure that the beam is projected below the horizontal, taking into account that the lamp must be dipped slightly more to compensate for road inequalities and heavy loads which may be carried in the rear of the vehicle.

### To Check and Adjust Alignment

Park the car in front of a garage door or wall and square to it. The car must stand on level ground and the front of the lamps should be approximately 25 ft. from the "screen." The car must be unladen and the tyres at the correct pressures.

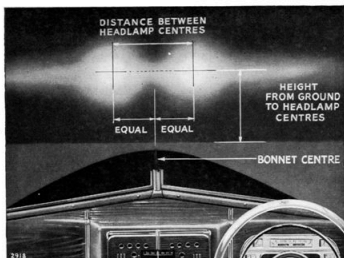


Fig. 37.

Head lamps correctly aligned.

## ELECTRICAL SYSTEM—Lamps

A point should be marked on the screen in line with the centre of the bonnet. Two crosses should be drawn on the "screen" 30" above the ground level and  $48\frac{1}{2}$ " apart, measured equally about the centre point (see Fig. 37). Switch on the head lamps and adjust the lamps if necessary, until the centre of each circle of light coincides with the centre of its respective cross.

### NOTE—Headlamps Fitted to Home Models

It will be noticed when aligning lamps that the beam images from the two lamps differ somewhat in shape. This is because the design of the double filament bulb varies slightly from that of the single filament type.

If adjustment is necessary proceed as follows :

Withdraw the front rim after removing the securing screw. Remove the dust excluding rubber. This will reveal three screws which can be adjusted to align the reflector correctly. When the correct alignment has been obtained replace the rubber and rim.

It is advisable to start adjustment with each screw screwed out half-way, this will ensure correct fitting of the rim when assembled.



Fig. 38.

Adjusting head lamp alignment.

## ELECTRICAL SYSTEM—Lamps

### Bulb Replacement

Withdraw the front rim after removing the securing screw. Press in the lamp unit against the tension of the three adjusting screw springs and turn in an anti-clockwise direction until the key-slot holes in the rim line up with the screw heads. The lamp unit can then be drawn off. Do not rotate any of the screws as this will affect the alignment of the reflector when assembled.

Rotate the back shell anti-clockwise and pull off, then the head lamp bulb can be removed. Care should be taken to see that the bulb does not drop out.

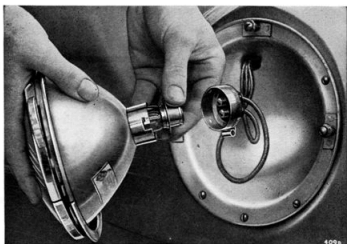


Fig. 39. Head lamp light unit with backshell removed.

### Parking Lamps (Front)

(Lucas No. 989, 12 volt 6 watt single contact bulbs fitted.) To remove bulb, peel back the rubber ring and remove rim, then the bulb can be withdrawn. When replacing rim, first slip the edge over the two small lugs, then peel back rubber as rim is fitted. Ensure that the rubber is located correctly over the rim edge, otherwise vibration may cause the rim to become detached.

## ELECTRICAL SYSTEM—Lamps

### Tail and Brake Lamps

(Lucas No. 353, 12 volt 24/6 watt, double filament bulb fitted in each lamp). To gain access to the bulb remove the cover which is secured by two screws.

### Number Plate Illuminator and Reversing Lamps

To gain access to any of the rear bulbs, remove the two securing screws and withdraw the cover (see Fig. 40).

**Number Plate Illuminator.** Two Lucas No 989, 12 volt 6 watt, or Lucas No. 994, 12 volt 4 watt bulbs fitted.

**Reversing Lamp.** Lucas No. 199, 12 volt 24 watt bulb fitted.

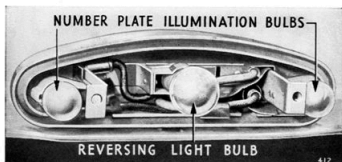


Fig. 40. Number plate illuminator and reversing lamp.

### Interior Lamp

(Lucas No. 254, 12 volt 6 watt festoon type bulb fitted.)  
To gain access to the bulb, pull off the cover.

### Ignition Warning Light

(Lucas No. 987, 12 volt 2.2 watt screw cap type bulb fitted.)  
The bulb holder can easily be withdrawn from the rear of the panel for bulb renewal.

### Instrument Panel Lights

(Lucas No. 987, 12 volt 2.2 watt screw cap type bulb fitted.)  
Replacing these bulbs is best left to the safe hands of a service station.

## WINDSCREEN WIPER

For operation see page 9, for lubrication see page 35.



## ELECTRICAL SYSTEM—Instrument Panel Lights

### Direction Indicators

(Lucas No. 256, 12 volt 3 watt festoon type bulbs fitted.)  
To replace bulb withdraw the cover as explained on page 34,  
fit new bulb and replace cover.

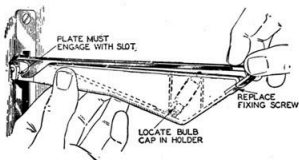


Fig. 41. Removal of bulb from indicator arm.

### WINDTONE HORNS

Each electric horn, before being passed out of the works, is adjusted to give its best performance, and will give long periods of service without any attention. No adjustment is required in service.

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

### ELECTRICAL COMPONENT SPECIFICATION

SPECIFICATION OF EQUIPMENT			BULBS			
	Model	Service No.		Lucas No.	Voltage	Watt.
Battery	GTW9A	—	<b>Head Lamps.</b>			
Control Box	RF 95/2	37065	Main.			
Coil	B12	45012	Home : Left-hand lamp	300	12	36/36
Dynamo	C39PV	22250	Right-hand lamp	162	12	36
Distributor	DVX4A	40144	Export : Left-hand drive			
Starter	M418G	25526	Both lamps	301	12	36/36
			Right-hand drive			
			Both lamps	300	12	36/36
			Parking lamps	989	12	6
			Tail and brake lamps	353	12	24/6
			Number plate illumination			
			lamps	989	12	6
			or	994	12	4
			Reverse lamp	199	12	24
Fuses	50 amp.	188219	Trafficators	256	12	3
	35 amp.	188216	Ignition warning and			
			panel lights	987	12	2.2
			Interior lamp	254	12	6

## OPTIONAL EXTRAS

### RADIO

The six-valve superheterodyne set, "His Master's Voice Automobile Radio," operates on medium and long waves and is controlled either manually or by push buttons, the whole unit being housed in the centre panel and the controls arranged as illustrated in Fig. 42.

The set is protected against possible damage due to a short by a 10 amp. fuse, housed in the main lead union.

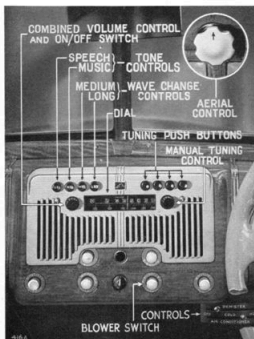


Fig. 42.

Radio and heater controls.

#### Controls

**Aerial.** This control is directly connected to the aerial mast which is of the telescopic type.

The mast should always be parked either horizontally or vertically downwards when the set is not operating. It is desirable to park the mast before entering the garage if the headroom is lower than 7ft., however, being of the safety type, provision is made for the aerial to pivot down and thus prevent damage, should it have been inadvertently left erect.

## RADIO AND HEATER—Instructions

**Tone.** These are marked SP and MU. Push in the SP button to provide an accentuated high frequency response for good speech intelligibility, while pushing in the MU will provide conditions favourable to musical production.

**Wave change.** These buttons are marked MW and LW, referring to the medium or long wavebands. To select either waveband push in the appropriate button.

**Tuning push buttons.** These buttons provide automatic tuning of four stations on the medium or long wavebands. The required station may be selected simply by pushing the appropriate tuning and wave change buttons.

**Adjustment.** To reset or adjust the tuning buttons to a particular station, proceed as follows.

- (1) Switch on receiver, leaving volume control set at approximately two-thirds of full rotation, and allow about forty seconds for set to warm up.
- (2) If the station desired is on the medium waveband, push in the button marked MW. If on the long waveband, push the LW button.
- (3) Tune in the station using the manual tuning control, in the same way as when tuning a domestic receiver. Press in the tuning control and rotate it until the scale pointer indicates approximately the wavelength of the station it is desired to receive. The station should then be heard and a final adjustment should be made to tune it in accurately. Then release tuning knob.
- (4) Grip the knurled portion of one of the tuning push-buttons and unscrew it about half-a-turn (*i.e.*, turn it anti-clockwise). Then push in the button firmly. Allow it to spring back to normal position, and tighten (*i.e.*, turn it clockwise). The push-button is now set to tune the station required, and when pressed will "bring in" the station irrespective of the position to which the scale pointer may have been adjusted previously.

## RADIO AND HEATER—Instructions

Proceed in the same manner for the other push-buttons. **It must be remembered that if the desired station is on the long waveband, the LW button must be pressed first, then the tuning button, to "bring in" the station;** similarly the MW button must be pressed for medium wave stations.

**Volume and "on/off" switch.** Turning the knob clockwise switches the set "on" (this will be indicated by the illumination of the tuning scale) and controls the volume. A period of about forty seconds after switching on is required for the receiver to warm up.

**Manual Tuning.** This control operates through a friction clutch, and in order to tune in a station it is necessary to press the tuning knob while turning it.

## HEATING AND VENTILATING SYSTEM

The system can be used for heating and ventilating, *i.e.*, it is a fresh air system.

Fresh air from a forward facing intake alongside the radiator is fed to a Heating/Ventilating Set, comprising a booster and a separate heater unit, and then via a distributing duct or baffle into the car near the driver's or front passenger's feet, and also via flexible pipes to the windscreen demister nozzles. The blower and heater unit are controlled by a quadrant type of control which has two knobs marked "AIR CONDITIONING" and "DEMISTER" respectively, together with a pull-push "ON/OFF" switch for the electrically driven centrifugal blower, these controls are located as shown in Fig. 42. The blower switch will only operate when the ignition is switched on.

### Notes on Operation of System

If it is **not desired to use the system** either as a heater or a ventilator, then blower switch should be put to "OFF" position and both control knobs moved as far as possible to "OFF" position—no appreciable quantity of air will then enter the car via this system.

## HEATER—Instructions

If it is desired to use ventilating air only then the control knobs should both be moved to "COLD" position—the blower should only be switched on if it is desired to boost the ventilating air supply.

Above speeds of about 25-30 m.p.h. the air supply due to vehicle movement and the forward facing fresh air intake will probably produce all the air required—at lower speeds or if it is desired to boost the supply, the blower should be switched on.

If heating is required, either on the screen or in the vehicle generally, the appropriate control knob should be moved from the "COLD" to the "HOT" position—the degree of heating required can be controlled to suit individual preference according to the position selected for the control knob between "COLD" and "HOT," *i.e.*, there is not just a single position for cold and another for hot but the control knobs can be adjusted between the two.

For completely **unheated** air, however, control knob must be in central "COLD" position.

If it is desired to use all the air supply for the screen with none to the passenger's feet, or vice versa, this can be done by moving the appropriate knob to "COLD" or "HOT" as required and moving the other knob to the "OFF" position.

### Periodic Attention

Occasionally, especially in the Summer months, it will be necessary to pull back the rear end of the concertina rubber tube connecting the fan with the forward air intake and withdraw the gauze filter for cleaning purposes.

### Drainage of System in Cold Weather

In cold weather it is desirable to use anti-freeze in the cooling system to prevent damage—if this is not done however, and the system is drained instead, the heater will drain satisfactorily provided the main heater control is put in the "HOT" position during draining, so that the manually-operated water valve is fully open.

## OVERDRIVE—Instructions

### OVERDRIVE

#### Operation

The Laycock de Normanville overdrive unit effects the reduction in overall gear ratio to 3.82 : 1 by means of a train of epicyclic gears which are brought into action by a hydraulically operated braking band. The overdrive may only be engaged when the vehicle is moving and the gear lever is in position of top gear. It is also necessary to return the lever to the top gear position before changing down into any other gear.

To operate the unit from top gear pull the gear lever towards the steering wheel. There is no need to operate the clutch pedal at all. To release the unit, press the lever back to the position of top gear.

#### Lubrication

The oil used for both lubrication and for the hydraulic pump is the same as and connected with that of the gearbox. The capacity of the combined unit is 2 pints (1.1 litres).

#### Draining

There is a drain plug fitted to the overdrive unit and when draining the gearbox it is necessary to remove both the drain plug on the gearbox and the drain plug on the overdrive unit.

#### Operating Mechanism

There is a grease nipple situated on the cable part of the overdrive operation below the mechanism on the steering column in addition to the grease nipple fitted to the gear change mechanism on the steering column. In addition there are various points which require lubrication with oil as shown in Fig. 43.



Fig. 43. Lubrication of gear change mechanism with overdrive fitted

## SERVICE

Any Standard owner who experiences any doubt or difficulty with the performance of his car is invited to communicate with his agent, and **it is particularly desirable to seek the advice of one of our agents in the locality, preferably the supplier of the vehicle, who, being thoroughly conversant with all our models, will rapidly diagnose the symptoms of any peculiarity and be able to advise a remedy.**

Considerable care is exercised in the choice of all Standard Agents, particularly to ensure that they are suitably equipped to give after-sales service.

## MAINTENANCE

All our principal Agents hold comprehensive stocks of spares for current models.

**Every STANDARD chassis has a distinguishing number. This is known as the car commission number, and should always be quoted, together with the engine number when spares or renewals are ordered.**

When ordering spare parts it is always advisable to give, in addition to the car commission number, a brief description of the part required.

**NOTES.**



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# RECOMMENDED LUBRICANTS — OVERSEAS COUNTRIES

COMPONENT	DUCKHAM'S	VACUUM	WAKEFIELD	ENERGOL	SHELL	ESSO
ENGINE						
Air Temp. °F. Over 70°	Duckham's N.P. "Forty"	Mobiloil "AP"	Castrol XXL	Energol Auto 200	Shell X-100, S.A.E. 40 or Double Extra	Essolube 40
43° to 70°	Duckham's N.P. "Thirty"	Mobiloil "A"	Castrol XL	Energol Auto 150	Shell X-100, S.A.E. 30 or Double Shell	Essolube 30
10° to 40°	Duckham's N.P. "Twenty"	Mobiloil Arctic	Castrolite	Energol Auto 125	Shell X-100, S.A.E. 20 or Single Shell	Essolube 20
—10° to 10°	Duckham's N.P. "Ten"	Mobiloil Arctic Special	Castrol Z	Energol Auto 80	Shell X-100, S.A.E. 10 or Silver Shell	Essolube 10
Upper Cylinder Lubricant	Duckham's Adcoils	Mobil Upperlube	Castrollo	Energol Upper Cylinder Lubricant	Shell Punax U	Esso Upper Motor Lubricant
Flushing Oils	Duckham's N.P. "Ten"	Mobiloil Arctic Special	Wakefield Flushing Oil	Energol Flushing Oil	Shell Donax F	Esso Flushing Oil
Over 10°	Duckham's N.P. "Thirty"	Mobiloil "A"	Castrol XL	Energol Auto 150	Shell X-100, S.A.E. 30 or Double Shell	Essolube 30
GEARBOX						
Below 10°	Duckham's N.P. "Twenty"	Mobiloil Arctic	Castrolite	Energol Auto 125	Shell X-100, S.A.E. 20 or Single Shell	Essolube 20
Over 10°	Duckham's Hypoid 90	Mobilube GX 90	Castrol Hypoid	Energol Trans- mission 300/EP	Shell Spirax 90EP	Esso XP Compound 90
Below 10°	Duckham's Hypoid 80	Mobilube GX 80	Castrol Hypoid 80	Energol Trans- mission 200/EP	Shell Spirax 80EP	Esso XP Compound 80
STEERING BOX PROPELLER SHAFT	Duckham's XS Press 140	Mobilube GX 140	Castrol Hi-Press	Energol Trans- mission 700/EP	Shell Spirax 140EP	Esso XP Compound 140
WHEEL HUBS	Duckham's H.B.B.	Mobilgrease No. 5	Castrolase Heavy	Energol Wheel Hub	Shell Retinax RB	Esso Bearing Grease
ENGINE WATER (Hand Gun)	Duckham's Laminoid Soft	Mobilgrease No. 4	Castrolase CL	Energol Chassis Pressure No. 2	Shell Retinax C	Esso Chassis Grease
CHASSIS, Grease Nipples (Hand or Pressure Gun)	Duckham's N.P. "Twenty"	Mobiloil Arctic	Oilit	Energol Auto 125	Shell X-100, S.A.E. 20 or Single Shell	Esso Handy Oil
Oil Points (Oil Gun) Body and Chassis	Duckham's Laminoid Liquid	Mobilgrease No. 2	Castrol Penetrating Oil	Energol Penetrating Oil	Shell Donax P	Esso Penetrating Oil
REAR ROAD SPRINGS			ALTERNATIVELY USE REAR AXLE OR ENGINE OIL			
BRAKE CABLES	Duckham's Keenol K.G.16	Mobilgrease No. 4	Castrolase Brake Cable Grease	Energol Graphited No. 1	Shell Retinax C	Esso Graphite Grease
BRAKE/RESERVOIR			LOCKHEED ORANGE BRAKE FLUID OR LOCKHEED No. 5 BRAKE FLUID			
Over 0°			LOCKHEED AMERICAN BRAKE FLUID No. 21			
Below 0°						

# RECOMMENDED LUBRICANTS — BRITISH ISLES

COMPONENT	DUCKHAM'S	VACUUM	WAKEFIELD	PRICE'S	SHELL	ESSO
<b>ENGINE</b>						
Summer	Duckham's N.P. "Thirty"	Mobiloil A	Castrol XL	Energol S.A.E. 30	Double Shell	Essolube 30
Winter	Duckham's N.P. "Twenty"	Mobiloil Arctic	Castrolite	Energol S.A.E. 20	Single Shell	Essolube 20
<b>Upper Cylinder Lubricant</b>	Duckham's Adcoils	Mobil Upperlube	Castrollo	Energol U.C.L.	Shell Donax U	Essomix
<b>Flushing Oils</b>	Duckham's N.P. "Ten"	Mobil Engine Flushing Oil	Wakefield Flushing Oil	Price's Flushing Oil	Shell Flushing Oil	Esso Flushing Oil
<b>GEARBOX</b>	Duckham's N.P. "Thirty"	Mobiloil A	Castrol XL	Energol S.A.E. 30	Double Shell	Essolube 30
<b>REAR AXLE</b>	Duckham's Hypoid 90	Mobilube G.X. 90	Castrol Hypoy	Energol E.P. S.A.E. 90	Shell Spirax 90 E.P.	Esso Expec Compound 90
<b>STEERING BOX PROPELLER SHAFT</b>	Duckham's X.S. Press 140	Mobilube G.X. 140	Castrol HiPress	Energol E.P. S.A.E. 140	Shell Spirax 140 E.P.	Esso Expec Compound 140
<b>WHEEL HUBS ENGINE WATER (Hand Gun) PUMP</b>	Duckham's H.B.B.	Mobil Hub Grease	Castrolase Heavy	Belmoline C	Shell Retinax RB	Esso Grease
<b>CHASSIS, Grease Nipples (Hand or Pressure Gun)</b>	Duckham's Laminoid Soft	Mobilgrease No. 4	Castrolase CL	Belmoline C	Shell Retinax C	Esso Grease
<b>Oil Points (Oil can) Body and Chassis</b>	Duckham's N.P. "Twenty"	Mobil Handy Oil	Oilit	Energol S.A.E. 20	Single Shell	Essolube 20
<b>REAR ROAD SPRINGS</b>	Duckham's Laminoid Liquid	Mobil Spring Oil	Castrol Penetrating Oil	Price's Penetrating Oil	Shell Donax P	Esso Penetrating Oil
ALTERNATIVELY USE REAR AXLE OR ENGINE OIL						
<b>BRAKE &amp; CABLES</b>	Duckham's Keenol KG 16	Mobil Graphited Grease	Castrolase Brake Cable Grease	Belmoline C.G.	Shell Retinax C	Esso Graphite Grease
<b>BRAKE RESERVOIR</b>	LOCKHEED ORANGE BRAKE FLUID					

