INSTRUCTION BOOK

FOR THE

1½ litre Model

(Series RME)

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SECOND EDITION

FRONT SUSPENSION

To achieve maximum benefit from Riley "Torsionic" Independent Front Suspension and to ensure the longest possible tyre life, frequent checks, as set out in the Instruction Book, on the "Torsionic" Independent Suspension should be made during the first 5,000 miles or 8000 km. of your car's life.

RILEY MOTORS LIMITED

Proprietors: Morris Motors Limited

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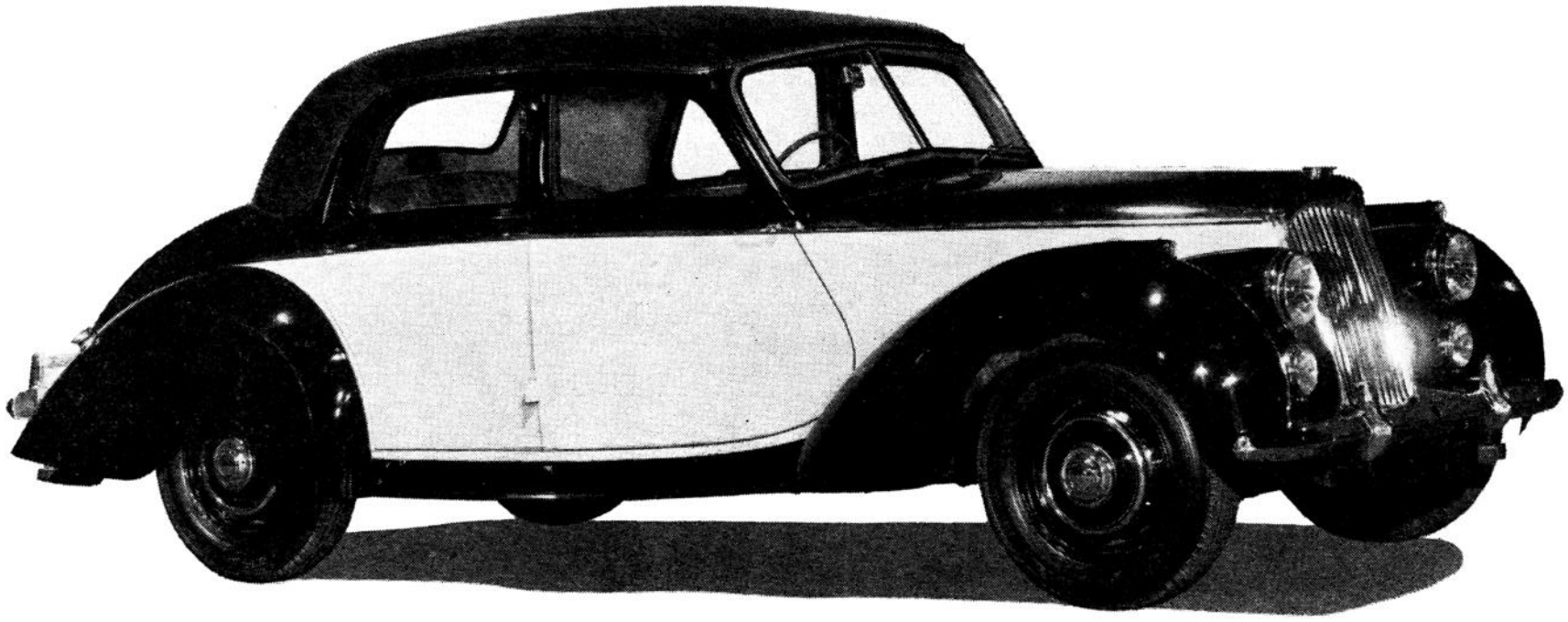


The Riley 1½ litre Saloon

TO RILEY OWNERS

THE object in compiling this Instruction Book has been to provide a good working knowledge of the car and instruction for routine maintenance, but not to provide the owner with a complete guide for a major overhaul. Such an overhaul would require a set of special tools and equipment only to be found in garages and service depots, and without these the average private owner would be unable to continue.

For those who are in a position to undertake their own minor repairs, and who desire to do so, a comprehensive Workshop Manual is available at a nominal price on application to your Distributor or to the Service Department, Riley Motors Limited, Abingdon, Berks.

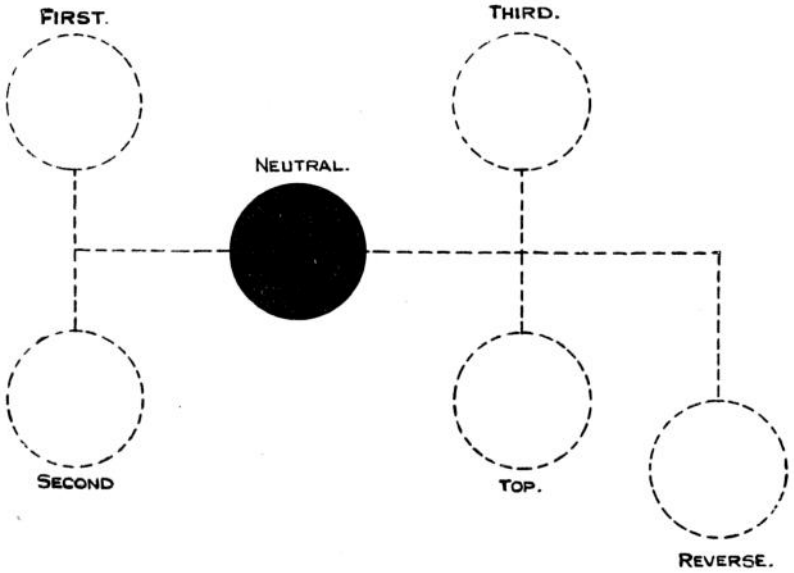
If, after reading this book, you find yourself in difficulty, our Service Department is always at your disposal and will readily answer any questions on points which may be causing you trouble.

General Data

Engine	4-cylinder, O.H.V.
Bore	69 mm. (2·7165 in.)
Stroke	100 mm. (3·937 in.)
Capacity	1496 c.c. (91·28 cu. in.)
B.H.P.	54 at 4,500 r.p.m.
Sparking plugs	Champion L.10.S
Carburetter	S.U. horizontal H2, fitted 90 jet and No. 3 needle standard, or V2 needle weak, or BY needle rich

Gear Ratios :

Top	5·125 to 1
Third	7·585 to 1
Second	11·736 to 1
First	20·372 to 1
Reverse	20·372 to 1
Rear axle ratio	8/41



The gear positions.

R.P.M.	ROAD SPEED							
	1st Gear		*2nd Gear*		*3rd Gear*		*Top Gear*	
	m.p.h.	*k.p.h.*	*m.p.h.*	*k.p.h.*	*m.p.h.*	*k.p.h.*	*m.p.h.*	*k.p.h.*
1,000	3·8	5·8	7·65	12·3	10·0	16·1	15·2	24·5
1,500	5·7	9·2	11·2	18·0	15·2	24·7	23·0	37·0
2,000	7·6	12·25	14·8	24·0	20·3	32·7	30·2	48·8
2,500	9·5	15·3	18·8	30·0	25·4	40·6	37·5	60·7
3,000	11·2	18·0	22·5	36·0	30·5	49·1	45·5	73·0
3,500	13·1	21·0	26·3	42·5	35·6	58·0	53·0	85·5
4,000	15·0	24·0	30·0	48·3	41·0	65·5	60·5	97·4
4,500	17·2	27·5	34·0	54·7	46·0	74·0	68·5	110·2
5,000	19·0	30·6	38·3	61·5	51·5	82·9	76·0	122·3

Chart showing the relation between r.p.m. and road speed in m.p.h. and k.p.h.

Tyres	5·75—16	
Tyre pressures (normal) ...	Front ...	22 lb. per sq. in. (1·5 kg./cm.^{2})
	Rear ...	24 lb. per sq. in. (1·7 kg./cm.^{2})

NOTE.—It is essential that these pressures be maintained. When a full load of four persons and luggage is carried the tyres should be inflated to an extra pressure of 2 lb. per sq. in. (·14 kg./cm.^{2}).

Tyre pressures should be checked each week. Unequal tyre pressures, or tyres inflated to the incorrect pressures, will affect steering and suspension.

Dimensions

Height	5 ft. 0½ in.	(1·54 m.)
Width	5 ft. 3½ in.	(1·61 m.)
Length	14 ft. 11 in.	(4·547 m.)
Ground clearance	7½ in.	(19 cm.)
Wheelbase	9 ft. 4½ in.	(2·857 m.)
Track	Front ... 4 ft. 4¼ in.	(1·327 m.)
	Rear ... 4 ft. 4¼ in.	(1·327 m.)
Turning circle	30 ft. 0 in.	(9·2 m.)
Weight (unladen)	26 cwt.	(1323 kg.)

The front wheels are set parallel to each other. There is no " toe in."

Capacities

Fuel tank	12½ gallons	(56 litres)
Cooling system	13 pints	(7·5 litres)
Engine sump	10 pints	(5·6 litres)
Gearbox	2 pints	(1·13 litres)
Rear axle	2½ pints	(1·42 litres)

Electrical System

Battery	12-volt, 51-amp./hour
Fuses	35 amperes and 50 amperes
Headlamp bulbs	Special design, pre-focus double-filament construction. Both are 42/36 watts with special fitting. Lucas No. 354. Overseas models have lighting to suit local regulations
Sidelamps	6 watts. Lucas No. 207

Tail-lamp	6 watts.	Lucas No. 207
Stop-lamp	6 watts.	Lucas No. 207
Roof-lamp	6 watts.	Lucas No. 207
Reversing lamp	36 watts.	Lucas No. 57
Fog-lamps	48 watts.	Lucas No. 162

The ignition light, panel light and fuel gauge light are screw-in type and 2·2 watts. Lucas No. 987.

Special 3-watt 12-volt festoon-type bulbs are fitted in the Trafficators. Lucas No. 256.

Tappet Clearance

This is measured between the rocker and the top of the valve stem.

Inlet	·015 in. (·38 mm.)
Exhaust	·015 in. (·38 mm.)

These clearances should be set when the engine is hot. An additional ·001 in. (·025 mm.) must be allowed if the clearance is set with the engine cold.

Valve Timing (with tappet clearance set at ·019 in. (·48 mm.)).

Inlet opens	7° before T.D.C.
Inlet closes	48° after B.D.C.
Exhaust opens	48° before B.D.C.
Exhaust closes	20° after T.D.C.

The timing wheels are marked and set and should not be altered

Ignition Timing	8° before T.D.C., full advance
Firing order	1, 2, 4, 3
Contact breaker gap	·014 in. to ·016 in. (·36 mm. to ·40 mm.)
Sparking plug gap	·025 in. (·63 mm.)

Engine Temperature

The normal running temperature should be 70° C.—80° C. (158° F.—176° F.)

Starting Handle

This is stowed in the luggage boot on the left-hand side.

Engine and Chassis Number

This is stamped on a plate to be found on the bulkhead under the bonnet. This number should be quoted in all correspondence complete with prefixes and suffixes.

The chassis number is also stamped on the left-hand frame member just in front of the bulkhead.

Filler Caps

Fuel Tank. It is essential to remove both filler caps when taking in fuel, to avoid air lock and blow back.

Radiator. A pressurised cooling system is employed and care must be exercised when unscrewing the cap while the system is hot. To assist this, the filler cap is retained by a bayonet catch with a graduated cam which permits release of internal pressure before release. A lobe on the end of the cam guards against accidental release before the internal pressure is relieved. **Protect your hand against escaping steam.** Final removal of the cap is effected by pressing it downwards against the spring pressure to release it from the safety lobes.

Anti-dazzle Driving Mirror

The angle of reflection is controlled by the metal tongue protruding below the casing of the mirror. Press the tongue forward to obtain a dazzle-free reflection. Normal rear vision is restored when the tongue is pulled to the rear.

Tools

All the tools are stored in the tool compartment under the bonnet except the starting handle, which is stored in the boot.

The following is a list of the standard tools supplied :—

Special jack.

Tyre pump.

Grease gun.

Tool roll with the following tools :—

3 set spanners ($\frac{3}{16}$ in.$\times\frac{1}{4}$ in., $\frac{5}{16}$ in.$\times\frac{3}{8}$ in., $\frac{7}{16}$ in.$\times\frac{1}{2}$ in.).

3 box spanners ($\frac{3}{16}$ in.$\times\frac{1}{4}$ in., $\frac{5}{16}$ in.$\times\frac{3}{8}$ in., $\frac{7}{16}$ in.$\times\frac{1}{2}$ in.).

Tommy bar.

Brake bleeding tube.

Adjustable spanner.

Hammer.

Screwdriver.

Two tyre levers.

Pair of pliers.

Tyre valve spanner.

Distributor screwdriver and gauge.

The First 1,000 Miles
or 1600 km.

During the early life of your car it is essential that the mechanism be run in carefully. We suggest that three or four long runs during its early life will be more beneficial than a series of very short runs, during which the engine will hardly have time to attain its normal working temperature.

Whilst it is not our policy to suggest to owners that they should maintain a set speed and never exceed this, until a certain number of miles have been covered, we do suggest that the car be run as lightly and effortlessly as possible during its early life and that the actual running in should be of a progressive nature.

Careful study of the chapter on General Lubrication, with particular reference to the change of oils at 500 miles or 800 km., will amply repay the time you spend on this operation.

If you think it necessary to use one of the many upper cylinder lubricants during the running-in period, be sure to use one of an approved brand.

Nuts and bolts have a habit of settling down slightly after the car has travelled the first few hundred miles of its life, and such things as bumper bar attachments, body attachment bolts and similar points should be carefully checked and adjusted where necessary.

Details of the "Free Service" to which you are entitled after the car has covered 500 miles or 800 km. are given on the opposite page.

500 Miles (800 km.) Service

Riley Motors Limited retain interest in their cars after they are sold, and want to know that you are obtaining the utmost satisfaction and pleasure from their products.

During the early life of the car, soon after it has completed 500 miles or 800 km., you are entitled to have it inspected free of charge by the Distributor or Dealer from whom the car was purchased or, if not convenient, by any other authorised Riley Distributor or Dealer by arrangement.

The following are details of the attention included in this service :—

Drain oil from engine, gearbox and rear axle, and refill.

Oil and grease all points of the car.

Tighten cylinder head and manifold nuts to recommended pressures.

Check tightness of valve rocker-shaft brackets to recommended pressures.

Check tappet clearances and reset if necessary.

Tighten fan belt if necessary.

Check all water connections and tighten clips if necessary.

Examine and clean carburetter and reset slow-running adjustment if necessary.

Examine and adjust, if necessary, sparking plug and distributor points.

Check working of automatic ignition control and, if necessary, reset ignition timing.

Check front wheel alignment and steering connections. Adjust if necessary.

Check tightness of universal joint nuts, wheel nuts, spring clips and wing (fender) bolts.

Check clutch pedal for free movement and adjust if necessary.

Check fluid level in master cylinder and top up if necessary.

Check braking system functionally and bleed lines if necessary.

Check electrical system functionally.

Examine battery and top up to proper level with distilled water or diluted acid as may be required. Clean and tighten terminals.

Inspect shock absorbers for leaks. Examine oil levels and top up if necessary (piston type only).

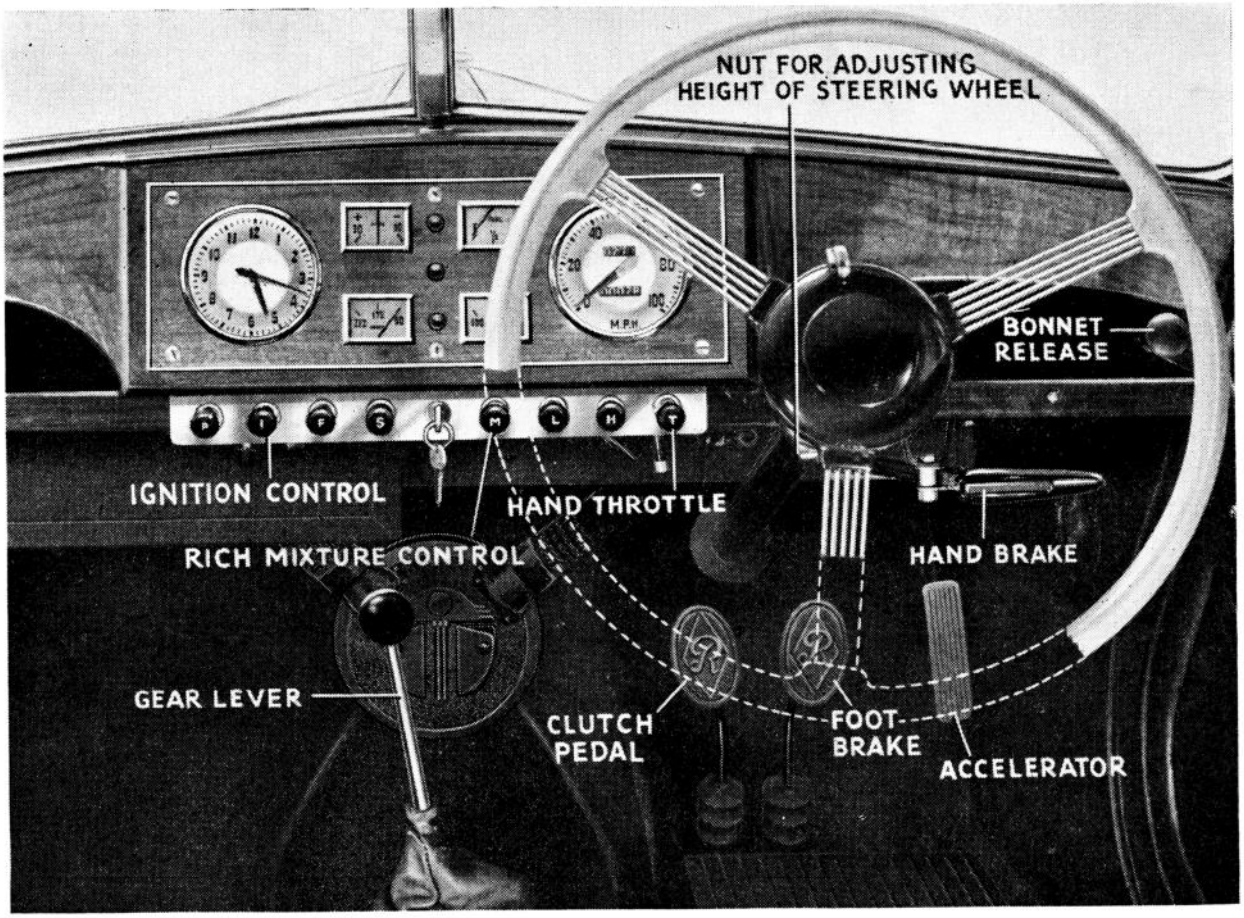
Test tyres for correct pressure.

Check doors for ease in opening and closing. If necessary lightly smear with a suitable lubricating agent all dovetails and striking plates.

Where the Jackall jacking system is in use, check union nuts to recommended pressures and, if necessary, top up the fluid reservoir.

(All materials chargeable to the customer.)

Controls



The engine and driving controls.

The following is a description of the various controls, gauges, and switches which are to be found in the driving compartment of your car. The description is sub-divided into two parts, the Engine and Driving Controls, and the Instruments and Switches.

ENGINE AND DRIVING CONTROLS

The steering wheel is of the sprung type and is fitted with a telescopic adjustment. To adjust the position of the wheel, slacken the hand grip nut on the bottom of the steering wheel hub. When the correct setting has been obtained, the nut must be re-tightened.

The gear lever is situated in a central position, being so arranged that the minimum movement by the driver is necessary when changing gear. Reference to the illustration under General Data (page 4) will show the gear positions.

Clutch, foot brake and accelerator pedals are fitted in that order, from left to right. In the case of left-hand-drive models, this order is reversed.

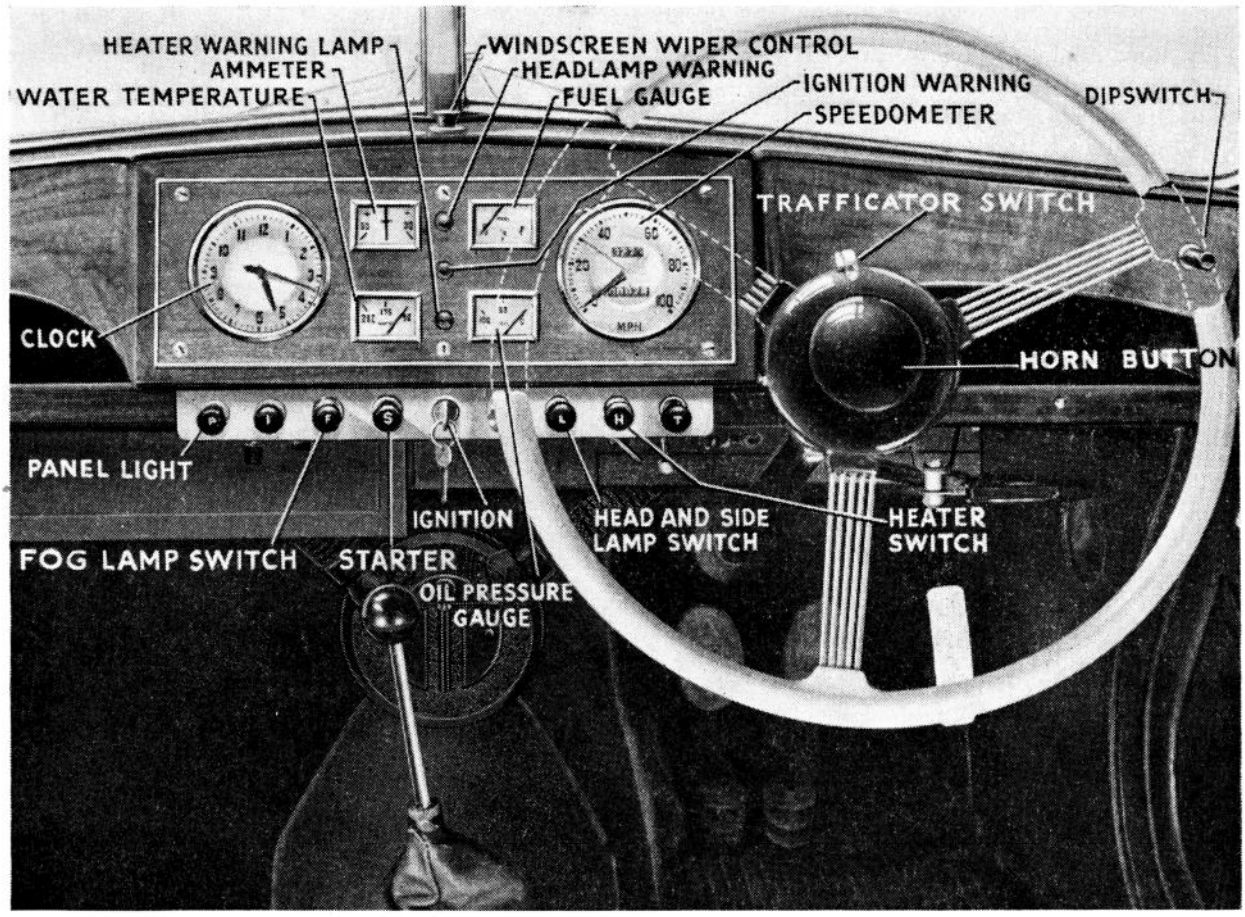
The hand brake will be seen just below the glove tray, and to the right of the steering wheel, the ratchet release being incorporated in the pistol-grip handle.

The rich mixture control is on the right-hand side of the ignition switch and marked " C." Its sole function is to provide a rich mixture for starting and it should be closed as soon as the warming engine will allow. Pull out to operate.

The hand throttle is marked " T " and is on the extreme right of the panel. It is used to control the slow running whilst the engine is warming up. Turn the knob counter-clockwise to increase the engine speed.

The ignition control is the second knob from the left on the panel and is marked " I." It provides means for controlling the automatic advance under conditions of heavy load. It should be pulled out to retard the ignition slightly when the engine shows signs of " pinking."

The bonnet release controls are fitted at either end of the glove tray. Pull to release whichever side of the bonnet is required to be opened. The catches are spring-loaded, and a downward pressure on the panels is all that is required to re-lock the bonnet top.



The instruments and switches.

INSTRUMENTS AND SWITCHES

The speedometer is situated on the right of the panel and is provided with a total mileage indicator and a trip recorder. The setting control for the latter is below the panel and just behind the hand throttle control.

The electric clock is on the left-hand side of the panel and is set by means of the knob below the panel and behind the ignition control.

The oil pressure gauge is the bottom right of the four square-shaped instruments on the panel.

The fuel contents gauge is the instrument on the top right.

The ammeter is the instrument on the top left.

The water temperature gauge is on the bottom left.

The ignition warning light is the centre of three small lights in the middle of the panel and its purpose is to show when the ignition is switched on. This light will be extinguished when the engine is running above a certain speed, thereby indicating that the dynamo is charging the battery.

The headlamp warning light is the upper of the three warning lights, and it glows red when the headlamps are in the full beam position.

The heater warning light is the lower of the three warning lights, and it glows amber when the heater motor is in operation.

Switches on the panel, reading from left to right, are :—

The panel light, marked with a " P." Turn on by moving in a clockwise direction. Continue to turn in order to decrease the brightness.

The fog-lamps, marked with an " F." Pull out to bring one lamp into operation. Turn clockwise and pull out again for both lamps.

The starter button, marked " S " is on the left of the ignition switch. Press to operate.

The ignition switch is controlled by a removable key, which also locks the car door master lock and the boot lid lock.

The headlamp and sidelamp switch is marked " L " and should be pulled out to bring the sidelamps into operation. Turn clockwise and pull out again to switch on the headlamps.

The dip switch is close to the steering wheel at the end of the facia near the door. Press inwards to operate. It is of the repeating type, dipping the headlamps on one operation and raising them on the next.

The horn button is situated in the centre of the steering wheel and is actuated by a downward pressure.

The Trafficator switch is located above the horn button and operates by movement of the lever in the required direction. The switch is self-cancelling except when only a slight turn is made.

The windscreen wipers are brought into use by means of the " push-pull " switch on the top of the facia, above the centre of the panel.

The interior lights are operated by means of individual switches attached to each unit.

Note.—The sidelamps, roof-lights and panel lights are wired in the same circuit, and the effect of this is that the panel lights and roof-lights function only when the sidelamps are switched on.

The reversing lamp operates only when the ignition is switched on and when the gear lever is in the reverse gear position.

Access to Spare Wheel

The spare wheel is carried in a separate compartment below the luggage boot floor and is reached by raising the boot lid. Make sure that the support catch is properly engaged.

This will reveal a lever parallel to the edge of the boot floor which actuates the transverse bolt rods of the number-plate panel. Raise the lever to release the number-plate panel and hinge the panel slightly rearwards and then upwards, taking care that the number-plate lamps clear the bumper bar.

Pull the number-plate upwards on its radius arms until the spring catch in its centre engages the rim on the boot floor. This holds the number-plate panel in position on the radius arms and gives access to the spare wheel.

The spare wheel is retained in position by a special plate and wing nut and is easily withdrawn when these have been removed.

Replacing the Spare Wheel

Slide the wheel into position in the spare wheel compartment and fasten it in position with the retaining plate and wing nut.

Release the central spring from the rear edge of the boot floor and lower the number-plate panel carefully, again watching that the lamps do not foul the bumper bar.

Engage the lower edge of the number-plate panel and push the upper edge forward into position.

Move the bolt lever into the engagement position and lower the boot lid.

Jacking System

There are four jacking points on the car. They are located under the over-riders at the front and rear. Square-sectioned tubes welded directly to the chassis are used to accommodate the special Riley jack, rubber plugs being inserted in the ends of the tubes when the jack is not in use.

General Lubrication

It can be assumed that the initial lubrication has been undertaken before the car left the factory, but the wise motorist will commence his routine check from the day he takes over.

Engine

The lubrication of the engine is provided by a gear-driven, self-priming pump of high capacity, the oil being passed through a full-flow external filter of the " throw-away " type.

All engine bearings are pressure fed.

The oil filler orifice will be found on the left-hand rocker cover; from here the oil reaches the sump via passages in the cylinder head and block.

Check the oil level in the sump with the dipstick every 250 miles or 400 km.

The oil level dipstick is situated on the left-hand side of the engine and just forward of the exhaust pipe. The dipstick has a mark on it which indicates the oil level when the sump is full, and on no account should the level be allowed to drop so that there is no indication on the dipstick.

Location of the engine oil filler.

Before checking the oil level, the dipstick should be withdrawn, wiped on a piece of clean cloth and reinserted, otherwise an incorrect reading may be obtained. When replenishing the oil, wait a short time before checking the level so that the new oil has time to reach the sump.

It is essential that after the first 500 miles or 800 km. the oil be drained from the engine, and for this purpose an oil drain plug is provided which will be found on the right-hand side of the sump. When this has been done, the engine should be refilled with the correct amount of the recommended lubricant. (See page 17.)

Provided the change recommendations are carried out, there should be no need for flushing with any other fluid or oil, but if this latter process is necessary, then one of the oils recommended for extreme conditions should be used.

NOTE.—Paraffin (kerosene) should never be used for flushing purposes.

The sump should be drained and refilled, as described above, at subsequent intervals of 3,000 miles or 5000 km.

Every 6,000 miles or 10000 km. remove the external oil filter, which is of the throw-away type, and fit a new one.

Each 12,000 miles or 20000 km. remove the sump and clean its interior.

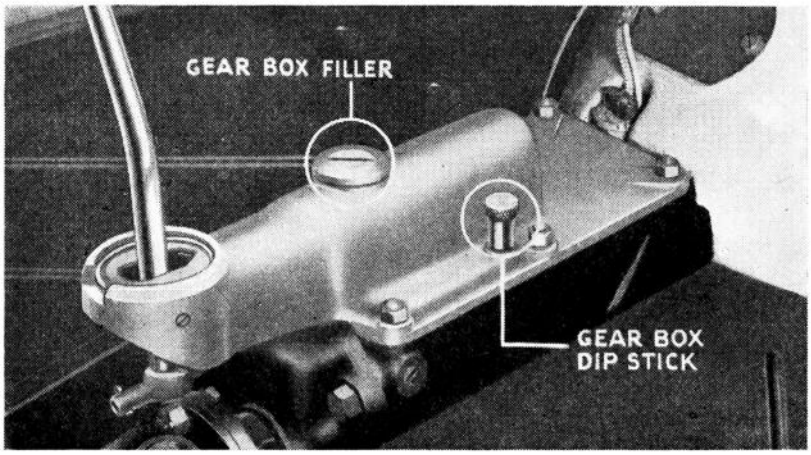
The oil pressure gauge may indicate 100 lb. per sq. in. (7 kg./cm.^{2}) when the engine and oil are cold. As the oil and engine warm up this pressure will drop, and the following are the **minimum** pressures permissible when running in top gear:—

Pressure		*Speed*
19 lb. per sq. in. (1·3 kg./cm.^{2})	at	15 m.p.h. (24 k.p.h.)
35 lb. per sq. in. (2·5 kg./cm.^{2})	at	50 m.p.h. (80 k.p.h.)

Should it be found necessary to alter the oil pressure, an oil pressure release valve will be found on the left side of the crankcase, just behind, and lower than, the external oil filter. In order to increase the oil pressure, the adjusting screw should be turned clockwise. Make certain that the locknut is re-tightened after any adjustments have taken place.

Clutch

This is of the dry-plate type, and as a carbon ring is employed in the withdrawal mechanism, no lubrication is necessary other than the application of a grease gun filled with grease to Ref. D to the grease nipple on the clutch cross-shaft every 1,000 miles (1600 km.).



Positions of gearbox filler and dipstick.

Gearbox

This should be drained after the first 500 miles or 800 km. The gearbox should then be filled with the correct amount of recommended oil to Ref. B (page 17). The filler cap and dipstick are located just forward of the gear change lever and are reached by removing the tunnel over the top of the gearbox. The draining and refilling should be carried out at subsequent intervals of 6,000 miles or 10000 km.

Replenishments or topping up should take place at intervals of 1,000 miles or 1600 km., great care being taken to ensure that the gearbox is not filled above the mark on the dipstick.

Rear Axle

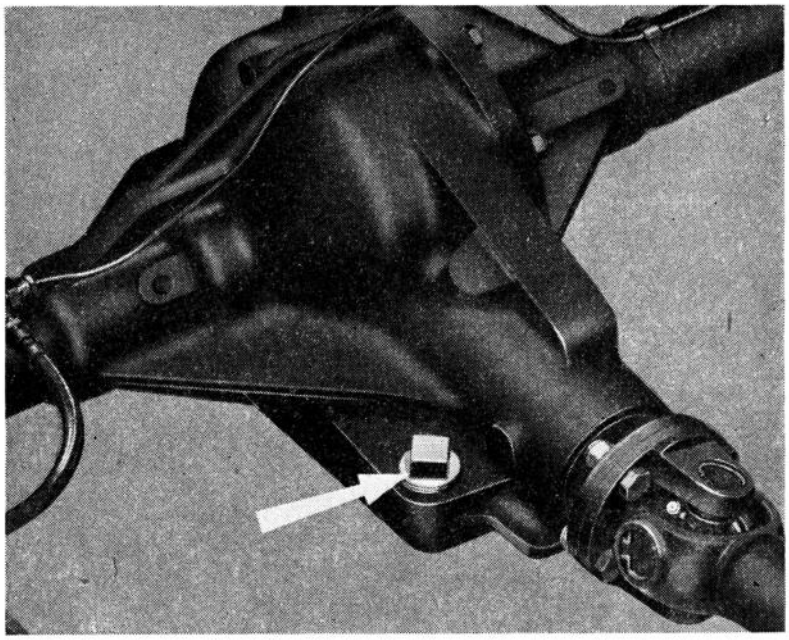
As with the gearbox, this component should be drained and refilled after the first 500 miles or 800 km. with hypoid oil to Ref. B (page 17). Replenishment should be made at subsequent intervals of 1,000 miles or 1600 km.

Every 6,000 miles or 10000 km. the rear axle should be drained and refilled with fresh oil.

The filler cap will be found on the right-hand side of the differential casing; this also acts as a level plug, and is reached by jacking up the rear wheel on the right-hand side and removing the wheel. The filler plug is then reached through the gap between the spring and the frame.

The use of hypoid oil to Ref. B (page 17) is essential.

Note.—Do not rotate the road wheels during this operation, otherwise overfilling may result.



Combined filler and level plug for the rear axle.

Shock Absorbers

The shock absorbers, being of the telescopic sealed type, do not require replenishing.

Every 12,000 miles or 20000 km. they should be disconnected, checked for correct action, and renewed if found defective in any way.

Hubs

The rear hubs are automatically lubricated from the rear axle and require no separate attention. The front hubs are packed with grease on assembly and only require attention at intervals of 6,000 miles or 10000 km., when the hub cap should be unscrewed, repacked with grease to Ref. C (page 17) and replaced.

Propeller Shaft and Intermediate Shaft

Every 1,000 miles or 1600 km., the grease gun should be applied to the grease nipples on the intermediate and propeller shaft universal joints and on the sliding joint. There are four nipples in all, one on the intermediate shaft and three on the propeller shaft (including the sliding joint). Use grease to Ref. D (page 17) in the grease gun for this purpose and give two or three strokes.

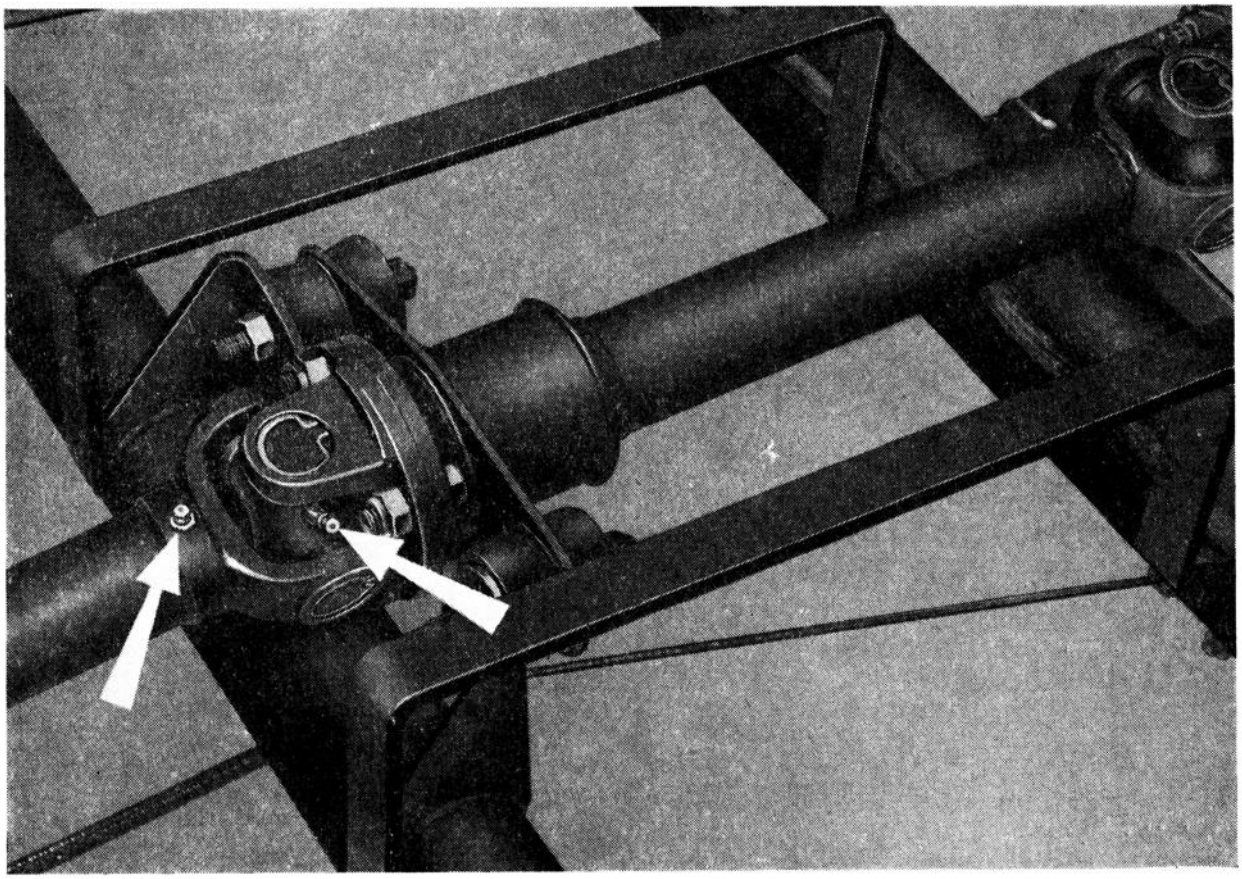
Water Pump

Every 1,000 miles or 1600 km., the grease gun filled with grease to Ref. C (page 17) should be applied to the grease nipple on the engine water pump casting and given two or three strokes.

Independent Front Suspension and Steering Gear

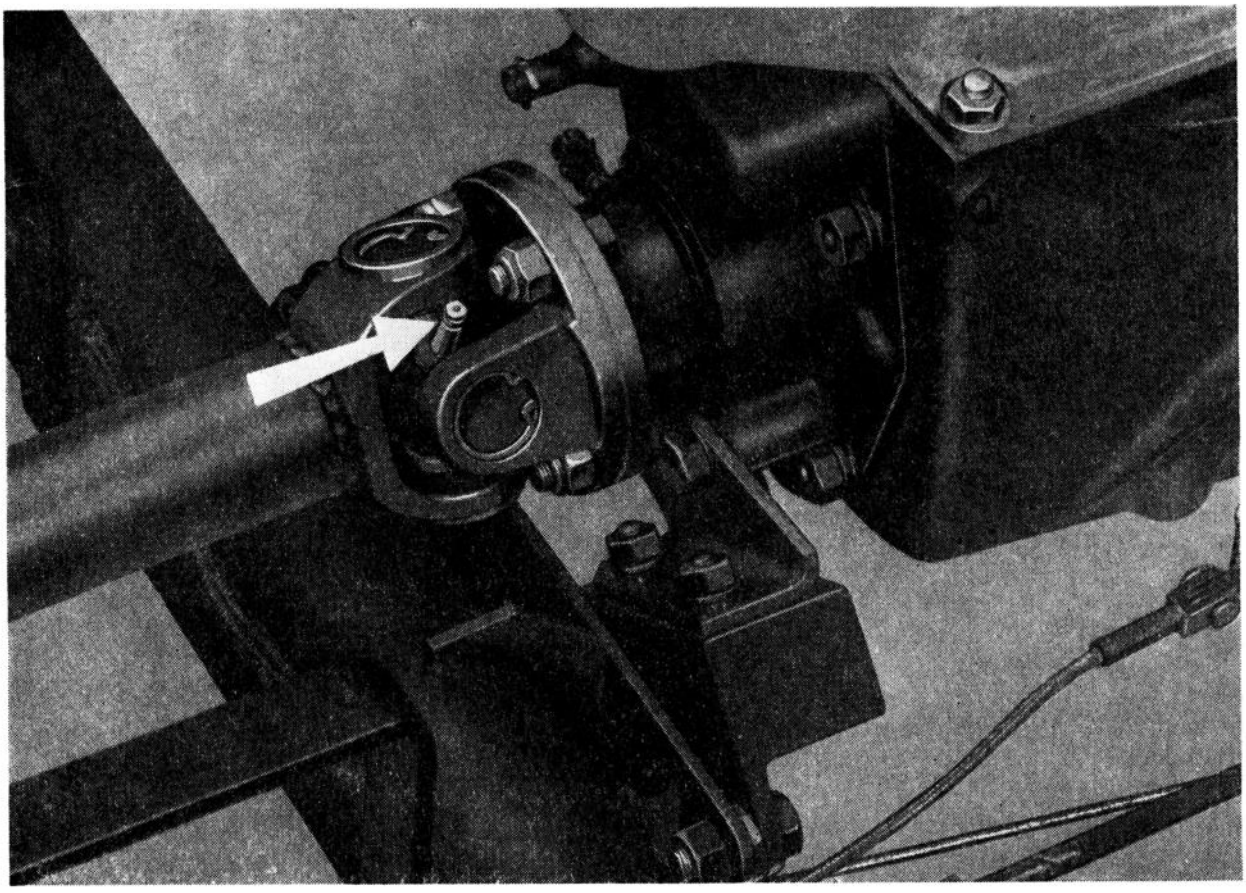
On the " Torsionic " front suspension there are eight grease nipples which require two or three strokes from a grease gun filled with grease to Ref. D (page 17) every 1,000 miles or 1600 km. These are located as follows :—

1. One at the top and one at the bottom of each steering swivel.
2. One at each end of both track-rods.



Above.—This is a view of the universal joint between the intermediate shaft and main driving shaft. Note the two grease nipples.

Below.—Rear flexible mounting for the power unit. Note the grease nipple on the intermediate shaft universal joint.



Recommended Lubricants

Component	A			B		C	D	E	F
	Engine and Air Cleaner			Gearbox, Steering Gearbox and Rear Axle (Hypoid Gears)		Wheel Hubs and Fan Bearings	Chassis Greasing Nipples, etc.	Cables and Control Joints	Oilcan and Carburetter
Climatic Conditions	**Tropical and temperate down to 32° F. (0° C.)**	**Cold and extreme cold down to 0° F. (−18° C.)**	**Arctic below 0° F. (−18° C.)**	**Tropical and temperate down to 10° F. (−12° C.)**	**Extreme cold below 10° F. (−12° C.)**	**All conditions**	**All conditions**	**All conditions**	**All conditions**
"MOBILOIL"	Mobiloil "A"	Mobiloil "Arctic"	Mobiloil 10 W	Mobilube "G.X." 90	Mobilube "G.X." 80	*Home*— Mobil Hub Grease *Export*— Mobilgrease No. 5	Mobilgrease No. 2 or 4	Mobilgrease No. 2 or 4	Mobiloil "Arctic"
B.P. "ENERGOL"	"Energol" S.A.E. 30	"Energol" S.A.E. 20	"Energol" S.A.E. 10	"Energol" E.P. S.A.E. 90	"Energol" E.P. S.A.E. 80	"Energrease" C.3	"Energrease" C.1	"Energrease" C.1	"Energol" S.A.E. 20
"SHELL"	"Shell" X—100 30	"Shell" X—100 20/20 W	"Shell" X—100 10 W	"Shell" Spirax 90 E.P.	"Shell" Spirax 80 E.P.	"Shell" Retinax A	"Shell" Retinax A	"Shell" Retinax A	"Shell" X—100 20/20 W
"FILTRATE"	Medium "Filtrate" 30	Zero "Filtrate" 20	Sub-Zero "Filtrate" 10	Hypoid "Filtrate" Gear 90	Hypoid "Filtrate" Gear 80	Super Lithium "Filtrate" Grease	Super Lithium "Filtrate" Grease	Super Lithium "Filtrate" Grease	Zero "Filtrate" 20
"STERNOL"	"Sternol" W.W. 30	"Sternol" W.W. 20	"Sternol" W.W. 10	"Sternol" Ambroleum E.P. 90	"Sternol" Ambroleum E.P. 80	"Ambroline" R.B. Grease	"Ambroline" M.M. Grease	"Ambroline" A.F. Grease	"Sternol" W.W. 20
"DUCKHAM'S"	Duckham's N.O.L. "Thirty"	Duckham's N.O.L. "Twenty"	Duckham's N.O.L. "Ten"	Duckham's Hypoid 90	Duckham's Hypoid 80	Duckham's L.B.10 Grease or H.B.B. Grease	Duckham's L.B.10 Grease or H.P.G. Grease	Duckham's L.B. 10 Grease or "Keenol" K.G.16 Grease	Duckham's N.O.L. "Twenty"
"CASTROL"	"Castrol" X.L.	"Castrolite"	"Castrol" Z	"Castrol" Hypoy	"Castrol" Hypoy 80	"Castrolease" Heavy	"Castrolease" Medium	"Castrolease" Brake Cable Grease	"Castrolite"
"ESSO"	"Essolube" 30	"Essolube" 20	"Essolube" 10	"Esso" Expee Compound 90	"Esso" Expee Compound 80	*Home*— "Esso" Grease *Export*— "Esso" Bearing Grease	*Home*— "Esso" Pressure Gun Grease *Export*— "Esso" Chassis Lubricant	*Home*— "Esso" Pressure Gun Grease *Export*— "Esso" Chassis Lubricant	"Essolube" 20

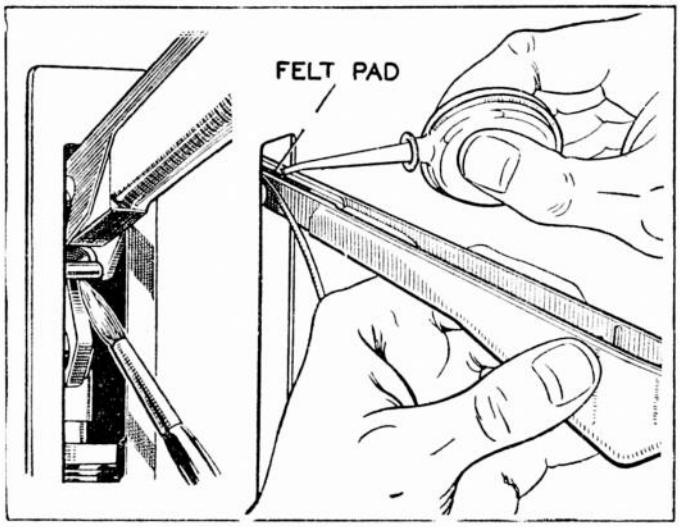
The steering box itself is packed with grease before leaving the factory and does not need any further attention until the car has travelled 30,000 miles or 50000 km. (See pages 30 and 31.)

The inner mountings of the tubular struts are carried on rubber bushes and require no lubrication.

Dynamo Lubrication

At the pulley end of the armature spindle the dynamo is provided with a ball race which is packed with grease on assembly and which requires no further attention between periods of general overhaul (12,000 miles or 20000 km.).

A lubricator is provided for the plain bearing at the commutator end which should be unscrewed every 3,000 miles or 5000 km., half-filled with grease to Ref. C (page 17), and replaced.



The lubrication points on the Trafficators are here clearly shown.

Trafficator Lubrication

Every 6,000 miles or 10000 km. apply a trace of sewing-machine oil, with a brush, to the Trafficator catch pin. Withdraw the screw on the end of the arm, slide off the cover, move the connecting wire to one side and apply a drop of oil to the felt pad in the groove at the top of the arm.

Distributor Lubrication

Every 3,000 miles or 5000 km. slightly smear the cam with a very slight trace of grease to Ref. D (page 17), or if this is not available, clean engine oil can be used. At the same time lift off the rotor from the top of the spindle by pulling it off vertically and add a few drops of oil (Ref. F, page 17) to the cam centre. Do not remove the screw exposed to view. There is a clearance between the screw and the inner face of the spindle for the oil to pass.

Replace the rotor with its drive lug correctly engaging the spindle slot and push it on the shaft as far as it will go.

The automatic timing control should also be given lubrication attention at intervals of 3,000 miles or 5000 km. by carefully adding a few drops of oil (Ref. F, page 17) through the hole in the contact breaker through which the cam passes.

A trace of oil should also be given to the pivot pin on which the contact breaker lever works.

Do not allow any oil to get on or near the contacts. Do not over-oil.

Carburetter

Every 1,000 miles or 1600 km. the oil cap nut should be unscrewed from the top of the suction chamber and a small quantity of thin engine oil inserted into the opening. Use one of the oils indicated under Ref. F on page 17.

General Notes on Lubrication

The correct lubrication of your car is of exceptional importance and the most vital part of the complete car is the engine. Due to the fact that different motor-car engines vary considerably in their characteristics, such as working temperature, clearances between moving parts, and other technical points, it is necessary that the lubrication should not be haphazard, but attended to with care and regularity, and that only the recommended lubricants be used.

Note.—It is most unwise to mix different brands of lubricant, and this practice is not recommended.

1. Oil should be drained from the engine, gearbox and rear axle when these components are warm after the car has returned from a journey; the oil is then in a more fluid state and is readily drained off.

2. When filling with oil or grease, make sure that there is no dirt around the grease nipples or filling points. If this is not done, dirt and grit may enter the mechanism, thereby causing rapid and unnecessary wear.

3. Make sure that all drain plugs and filler caps are replaced correctly and securely tightened.

4. Regular attention with an oilcan to such points as throttle rod fork ends, cloth rod pins and toggles will be amply repaid by the absence of harsh operation and unnecessary wear.

5. The door hinges are fitted with small grease nipples and should receive occasional attention from the grease gun. The lock catches should also be lightly coated with grease at the same time.

Extreme Cold Conditions

Where a car is operated in temperatures which are consistently below zero Fahrenheit (—18° C.) the use of an oil of lower viscosity than that recommended for normal use is desirable, and under such conditions the appropriate grade of engine oil shown on page 17 should be used.

Similar considerations apply in the case of the gearbox, rear axle and steering gearbox, where the recommended grades should be used when temperatures consistently below 10° Fahrenheit (—12° C.) are encountered.

Cold Weather Precautions

If the car is not stored in a warmed building, steps must be taken to prevent the cooling water from freezing during frosty weather. Water, upon freezing, expands, with the result that there is a considerable risk of bursting either the radiator, the cylinder block or the heater unit by the pressure generated.

As there is no provision for draining the heater radiator it is essential to use anti-freeze in the cooling system in severe weather and when frost is expected.

We recommend owners to use Smiths " Bluecol," Shell " Snowflake " or Filtrate " Nevafreze " non-erosive anti-freeze in order to protect the cooling system and reduce corrosion to a minimum.

The correct quantities of anti-freeze for different degrees of frost resistance are :—

Down to 7° *F.* (−14° *C.*)	*Down to* 0° *F.* (−18° *C.*)
15% solution	20% solution

When estimating the quantity of anti-freeze required remember that the water capacity of the cooling system is increased by the heater, and an additional $\frac{1}{2}$ pint (·28 litre) of anti-freeze should be used.

First decide what degree of frost protection is required before adding the anti-freeze to the radiator. If temperatures below 0° F. (−18° C.) are likely to be encountered, a mixture of at least 25% of anti-freeze must be used. Consult your local Dealer.

Before introducing anti-freeze mixture to the radiator it is advisable to clean out the cooling system thoroughly by swilling out the passages with a hose inserted in the filler cap, keeping the two drain taps open.

The drain taps are situated at the base of the radiator on the right-hand side and at the front end of the cylinder block on the right-hand side.

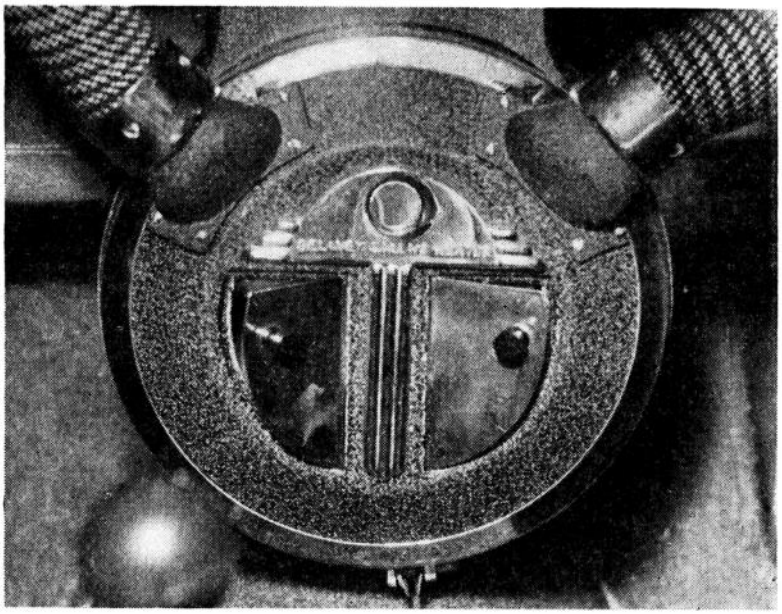
Only top up when the cooling system is at its normal running temperature, in order to avoid losing anti-freeze due to expansion.

Make sure that the cooling system is water-tight and examine all joints, replacing any defective rubber hose with new.

The Heater

The car heater fitted as standard equipment to the 1½-litre Riley comprises a radiator and electrically driven fan. Hot water is supplied to the radiator from the engine cooling system and the fan forces air through the radiator to the interior of the car and the demister ducts. An amber light on the instrument panel below the ignition warning light shows the driver that the fan is switched on.

The fan is controlled by the second knob from the right-hand end below the instrument panel. To switch on the fan, turn the knob in a clockwise direction until one " click " is felt; the fan is then running at full speed. To reduce the speed of the fan, continue to turn the knob in the same direction until the required speed is obtained.

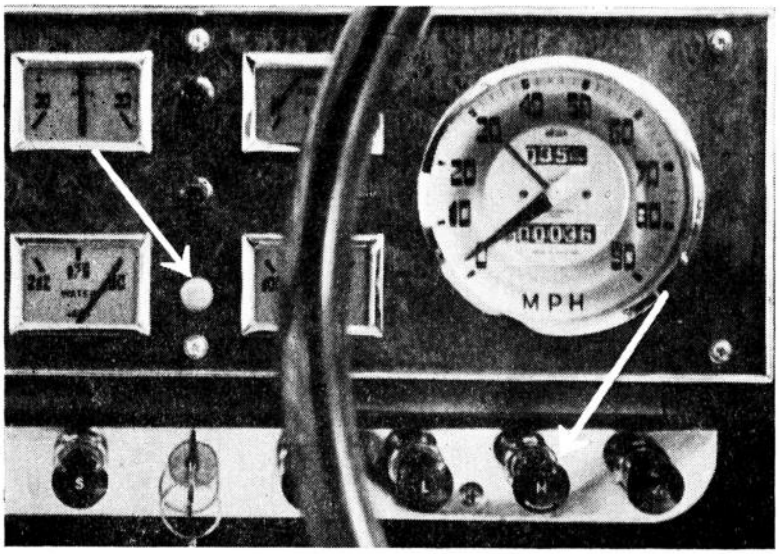


The heater unit showing the controlling doors and the ducts to the windscreen.

Two doors cover the front of the heater unit. These doors may be fully or partially opened to suit the requirements of the driver and passengers. When the doors are fully closed the supply of warm air to the windscreen is at its maximum.

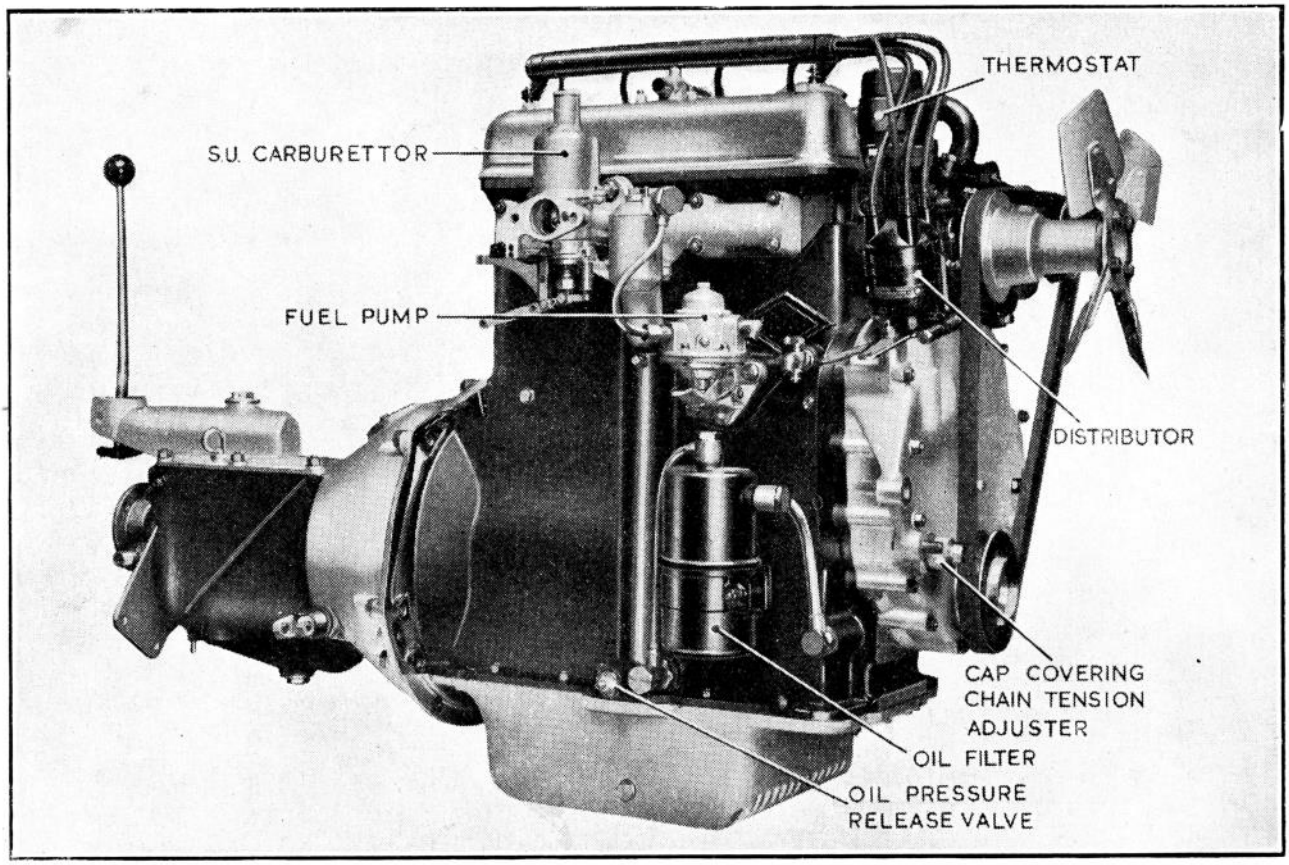
Hot water enters the radiator through a hose connected to the thermostat by-pass pipe, and returns to the engine through a second hose to the bottom of the car radiator. The heater may be isolated from the cooling system in hot weather by closing the tap fitted at the engine end of the heater intake hose.

No water drain tap is fitted to the heater and it is therefore important to use anti-freeze in the cooling system in climates where freezing may take place.

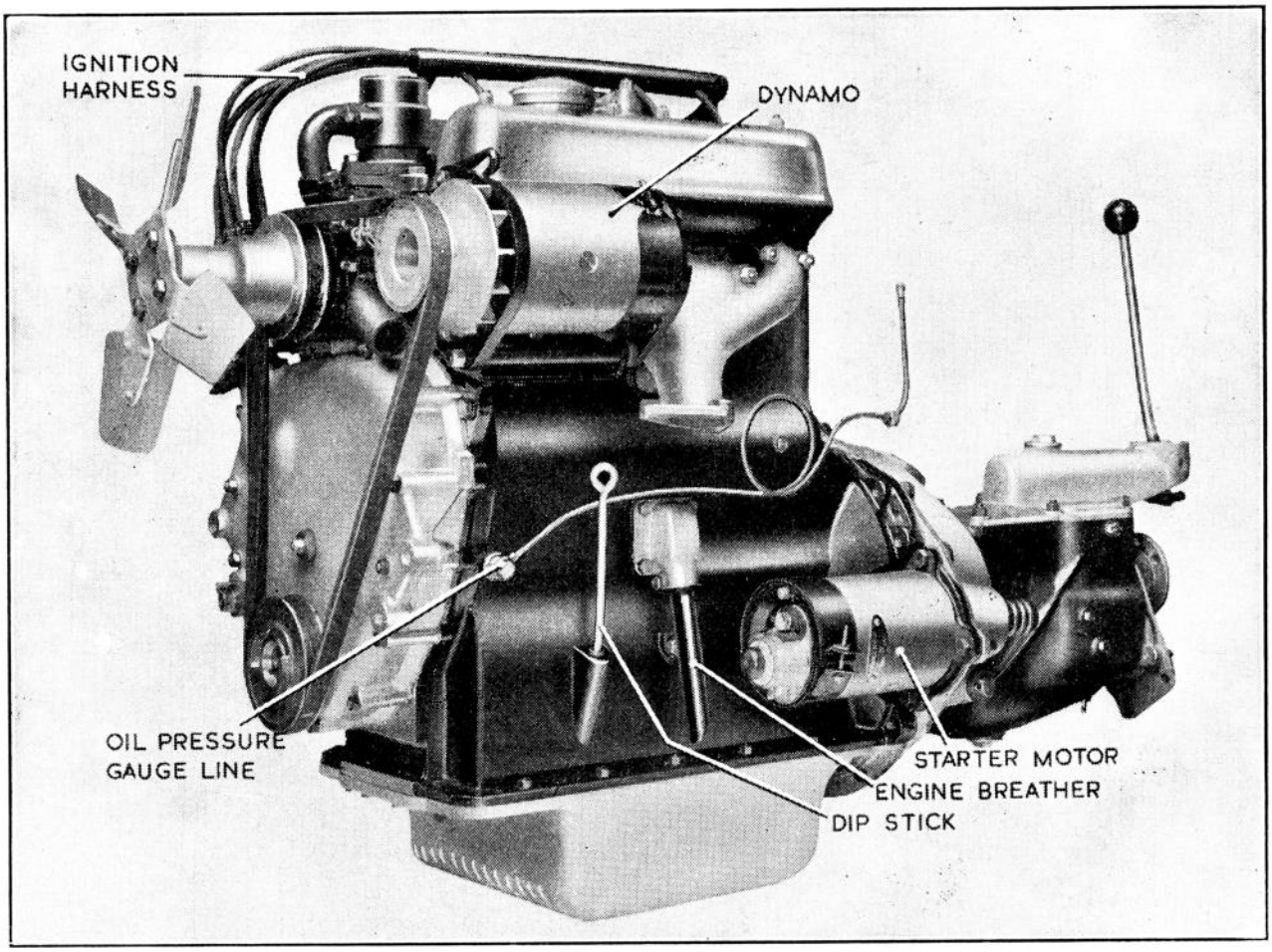


The left-hand arrow indicates the amber panel light which gives warning that the heater motor is switched on, and the right-hand arrow indicates the motor switch.

The Engine



Above.—Right-hand side of engine.



Below.—Left-hand side of engine.

Description of Engine

Crankcase

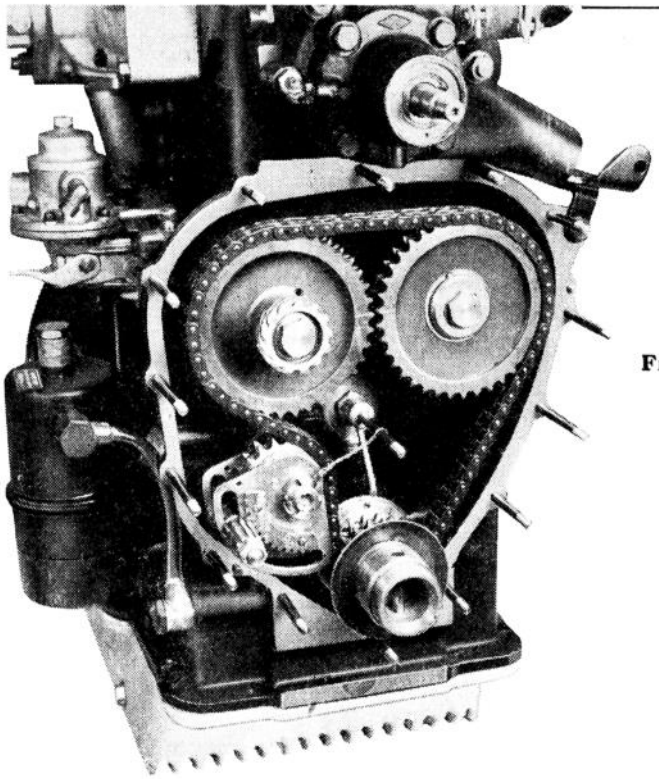
This is cast in one piece with the cylinder block and is made of very high quality cast iron with the various bearing surfaces machined to close limits to ensure a high degree of interchangeability.

Tappets

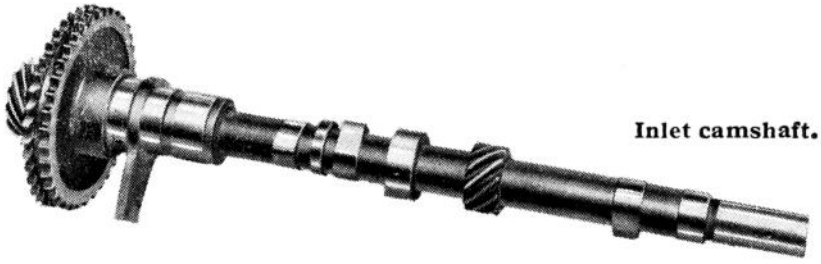
These are of generous diameter with large bearing areas. They are made hollow, the object being to provide maximum strength with a minimum of weight.

Camshafts and Timing Gear

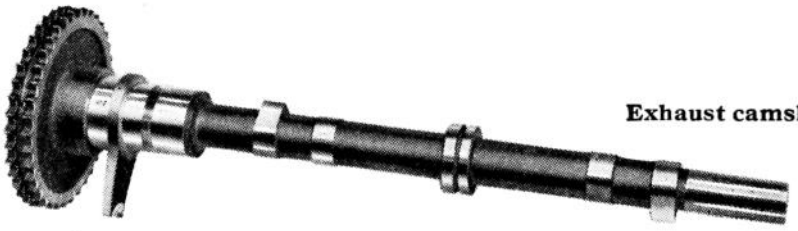
The camshafts run the complete length of the engine and are carried in phosphor-bronze bearings at each end. These bearings are pinned in position in the block by



Front of engine with timing cover removed.



Inlet camshaft.

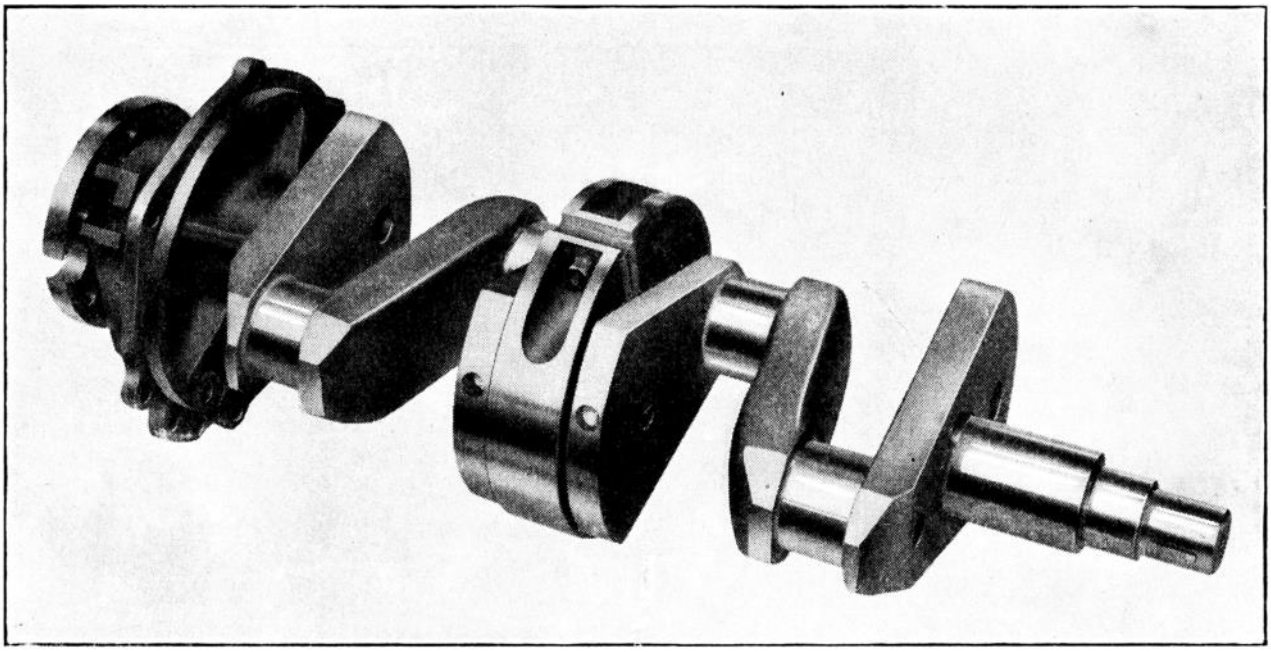


Exhaust camshaft.

means of set screws. The centre bearing is machined in the cylinder block. All bearings are line reamered in order to ensure perfect alignment and accurate rotation of the camshafts. Brass plugs are screwed into the cylinder block casting at the rear end of the camshafts in order to prevent oil leakage and the entry of dirt.

The inlet camshaft has a spiral gear machined in situ at its centre for the oil pump drive. At the front end is a gear drive for the distributor.

The cams themselves, besides being designed to give the requisite valve opening, are also designed for quietness in operation, great care and precision being taken during manufacture. The camshafts are driven from the crankshaft by means of an endless chain running over an intermediate wheel which is readily adjustable for chain tension.



The sturdy crankshaft. Note how the rear and centre bearing housings are attached to the crankshaft for assembly purposes.

Crankshaft

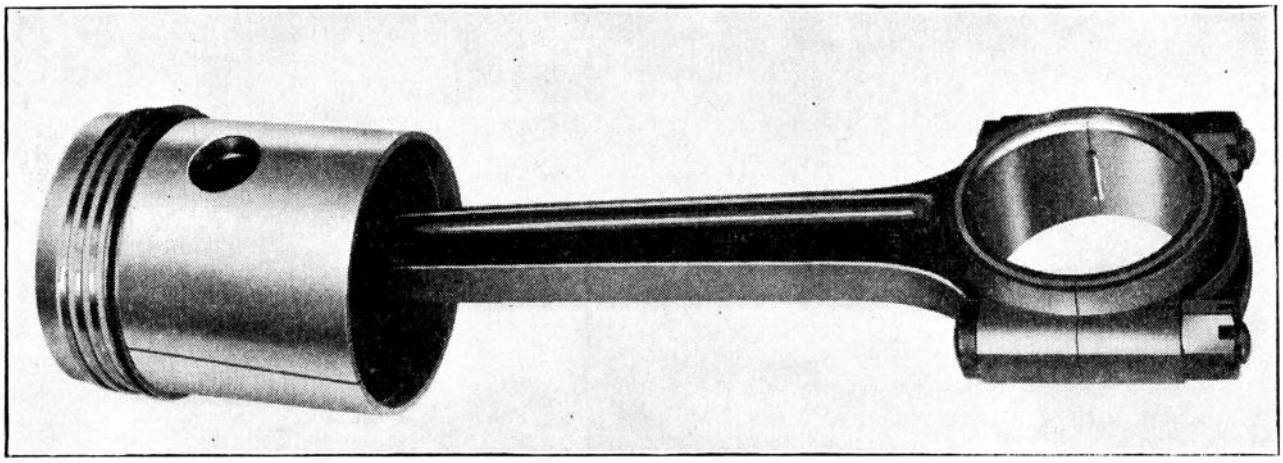
The crankshaft is so designed that the exact balance between lightness and strength has been achieved. The bearing areas are of generous size and are fed with oil at high pressure by means of oilways.

At the forward end of the crankshaft is the main timing wheel, keyed in position and clamped by the hand starter dog, which is keyed and locked in position by a taper pin. An oil thrower is positioned between the timing wheel and starter dog.

The complete crankshaft is rigidly supported in three bearings, the forward one being held directly in the crankcase casting. The centre and rear bearings are carried in large-diameter bearing housings which are in turn bolted to the crankcase.

Both these bearings and housings are of the split type, and should they at any time be removed, it is essential that they be replaced correctly. Marks are stamped on the parts concerned to facilitate this operation.

Prior to the fitting of the crankshaft, all bearings are secured and line reamered in position; after this they are carefully hand fitted to the crankshaft. At its rear end there is a flange to which the flywheel is bolted.



Assembly of piston and connecting rod.

Connecting Rods

Made of H-section high-tensile steel and designed to provide great rigidity. At the upper end is the gudgeon pin bush which is made of phosphor-bronze and pressed into position. This bush is provided with an oilway.

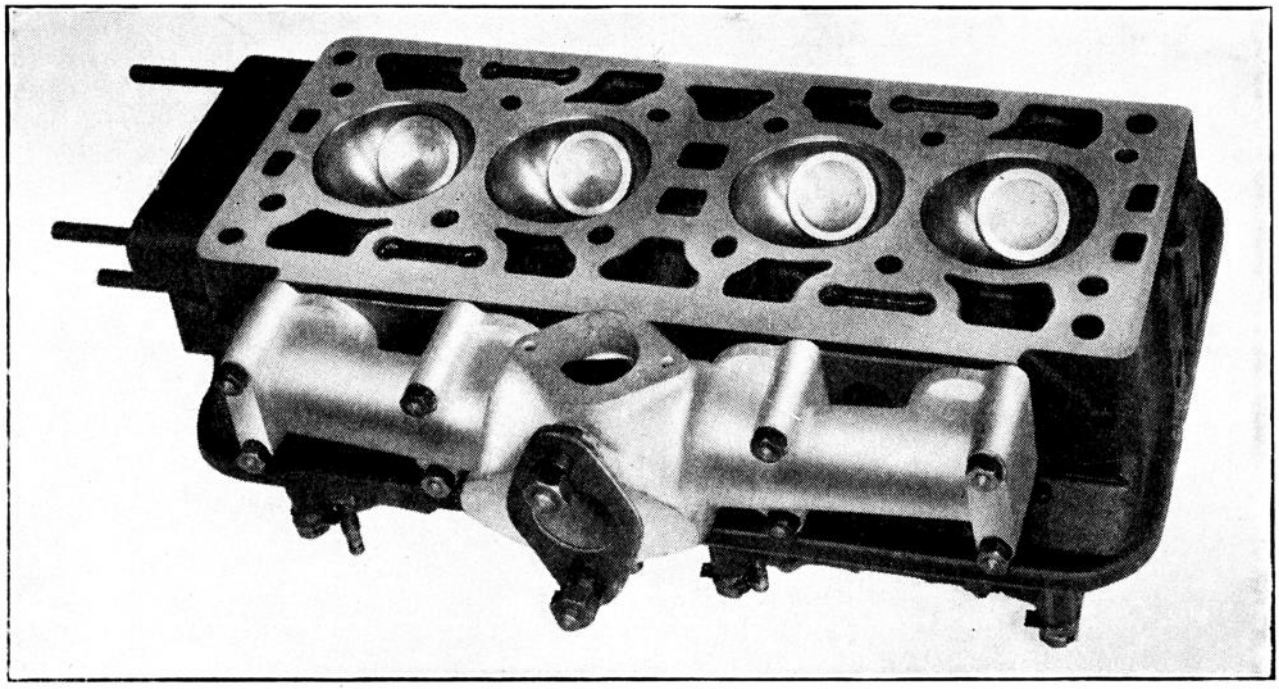
The big-end bearings, which are of white metal and run directly onto the connecting rods and caps, are very carefully hand-fitted to the crankshaft in order to ensure long life and the minimum of frictional losses.

If at any time the connecting rods are removed, it should be noted that they are marked 1, 2, 3, and 4, starting at the front end. The bearing caps are marked in a like manner, and care should be exercised to see that they are replaced in the position from which they were removed.

Pistons

High-compression aluminium-alloy pistons are used, the skirt being split on one side only. Four piston rings are fitted, three compression and one oil control.

The gudgeon pin is positioned in the piston by means of spring steel circlips. The pistons are marked with numbers, so that they may be replaced in their correct bores,



The cylinder head and inlet manifold.

No. 1 being at the front. It should also be noted that the splits in the skirts of the pistons must always be placed on the exhaust side.

Sump

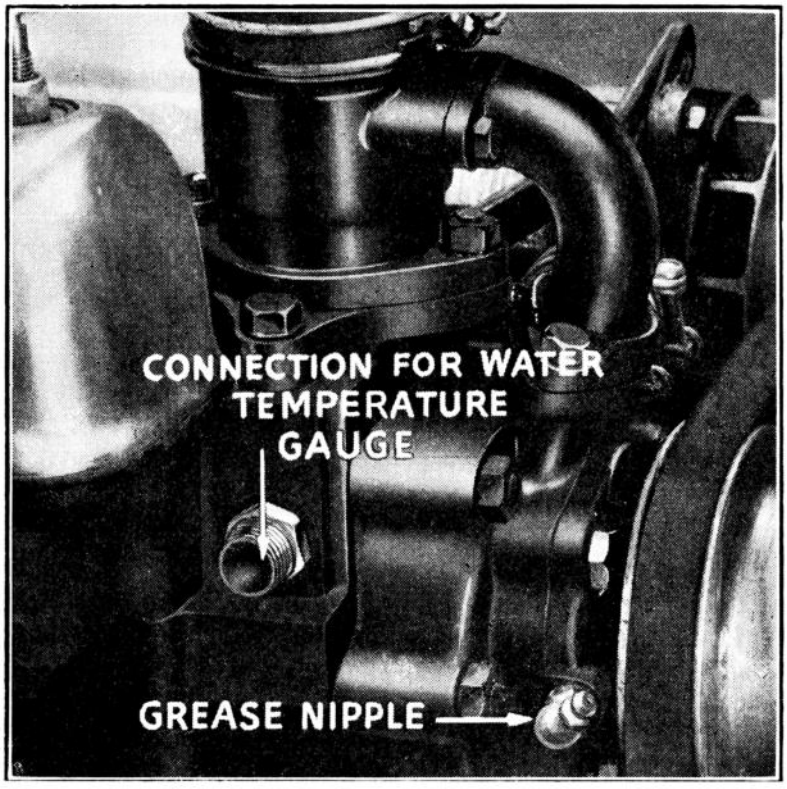
The sump, which is bolted directly to the crankcase, is made of aluminium and ribbed to assist oil cooling. Incorporated in the sump, and covering its entire area, is a large oil strainer of fine mesh.

Cylinder Head and Valve Gear

The design of the engine is such that the cylinder head and valve gear are incorporated as one complete unit.

The valves are inclined at an angle of 45° to the vertical, with the inlet and exhaust ports so designed that a very free and unimpeded gas flow is obtained. These facts, when coupled with the machined hemispherical combustion chamber, provide efficiency of the highest order. The rockers are short and sturdy and are operated by means of short stiff push-rods which are interposed between the tappets and the rocker ball end. It should be noted that the push-rods are concave at one end and convex at the other. The convex end should always be in contact with the tappet base, the concave end locating itself on the adjustable ball end of the rocker. The adjustable ball end of the rocker is held in position by means of a locknut.

A special cooling system is employed whereby a constant flow of cool water is directed around the hottest part of the engine, i.e. the exhaust valve seats. The rocker gear is protected from dirt and rendered oil-tight by means of laminated cork gaskets and aluminium covers, the latter being held in position by suitably placed studs and nuts.



This is a close-up view of the water pump and thermostat.

Water Pump and Thermostat

The water pump is situated at the front of the cylinder head, with the thermostat mounted just above it. The cooling fan is carried on an extension of the water pump shaft, the whole being driven by a V-belt from the crankshaft.

The function of the thermostat is to ensure that the flow of cooling water is restricted until the engine has reached its normal working temperature. Whilst the engine is undergoing its initial warming up, the water is by-passed from the top of the thermostat direct to the suction side of the water pump. As soon as the cooling water has reached a temperature of 72° C. (162° F.), the main valve opens and the by-pass valve shuts. The cooling water then circulates throughout the cooling system in the normal manner.

This ensures a rapid warming up of engine and oil.

Ignition

This is supplied from a 12-volt battery and heavy duty coil, the distributor being fitted at the front of the engine on the right-hand side. The drive is taken from the adjacent camshaft.

An automatic advance and retard mechanism is incorporated in the distributor, which is also provided with a manual control.

Starter

This is situated on the left-hand side of the engine and is securely mounted to the flywheel housing, the gear on the starter automatically engaging with teeth on the rim of the flywheel as soon as the starter motor is operated.

Generator

The location of the generator is on the left-hand side of the engine, and it is mounted so that the tension of its driving belt may be set readily. (Further information on the generator, ignition, etc., will be found in the chapter on Electrical Equipment.)

Carburetter

An S.U. H2 instrument is fitted. This is extremely efficient and remarkably simple in operation; a detailed description will be found on pages 41–44. An air silencer and cleaner is fitted to the intake of the carburetter.

Air Silencer and Cleaner

Bolted directly to the carburetter, this should be cleaned out with petrol (gasoline) every 3,000 miles (5000 km.). After cleaning, the filter element should be re-oiled with engine oil.

Oil Filter

Is situated on the inlet side of the engine and receives the full flow of oil direct from the pump before the oil reaches the engine. It is of the " throw-away " type.

The filtering medium in the sealed body consists of a felt strainer supported on a wire cage. The normal life of the filter is 6,000 miles or 10000 km., after which distance a replacement should be obtained from your Riley Dealer. Should the filter at any time become choked, either through lack of care or using a type of oil that is not on our recommendation chart, the oil is permitted to by-pass the filter. Naturally the oil is then in a poor condition and matters should be rectified as soon as possible.

Fuel Pump

The fuel pump is driven from an eccentric on the inlet camshaft and consists of a mechanically operated diaphragm pump between the fuel tank and carburetter.

Description of Oiling System

The heart of the oiling system is naturally the pump, and in the Riley engine this is of the gear type and driven from the inlet camshaft. The pump, which is self-priming, works fully submerged in the oil sump and is encased in a strainer. The design of the pump is such that a more than adequate supply of oil is delivered at high pressure to all moving parts at all times.

From the pump, oil is delivered by an external pipe, via a pressure release valve, to the external full-flow oil filter. From the filter another external pipe leads to the crank-case side and thence through oilways and an internal pipe to the three main bearings.

The connecting rod big-end bearings are supplied with oil by means of oilways drilled in the crankshaft. The camshafts, timing chain and rocker-shafts are supplied by means of external oilways.

Description of Chassis

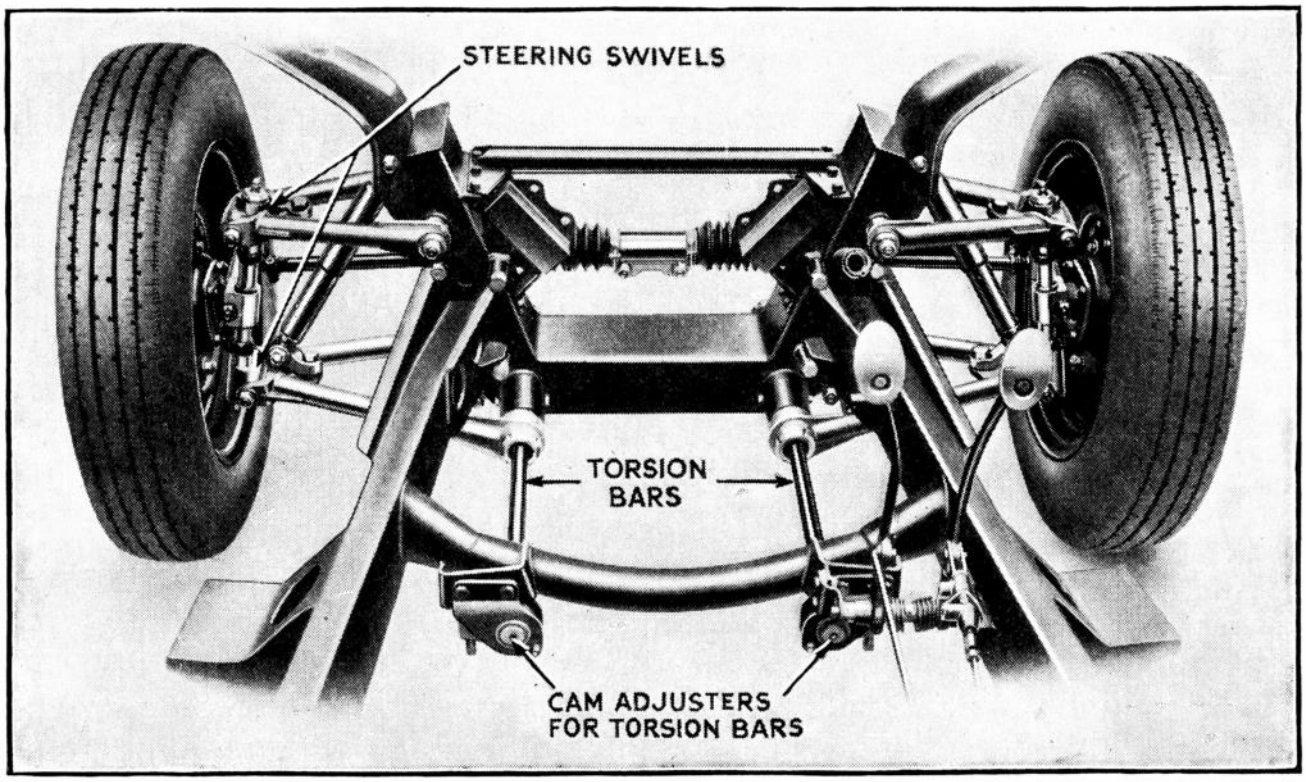
The front of the chassis is specially designed to take the front suspension and steering mechanism. The side-members, which are of deep box section and internally strengthened, are of welded construction and are braced by cross-members of tubular section.

Such items as floorboard supports, body supports, clutch shaft bearing brackets, etc., are attached to the main structure by welding, thus ensuring that these parts will not work loose and set up unwanted rattles.

It will be appreciated that the chassis is of maximum strength and minimum weight, both factors being the result of long racing experience.

FRONT SUSPENSION

Riley " Torsionic " independent front suspension is designed and produced as a complete unit, incorporating the steering mechanism, and resulting in an extremely rigid front end, providing accurate steering under all conditions.



Rear view of the " Torsionic " independent front suspension.

The suspension consists of a system of tubular struts carried on a very robust box-section cross-member or cradle.

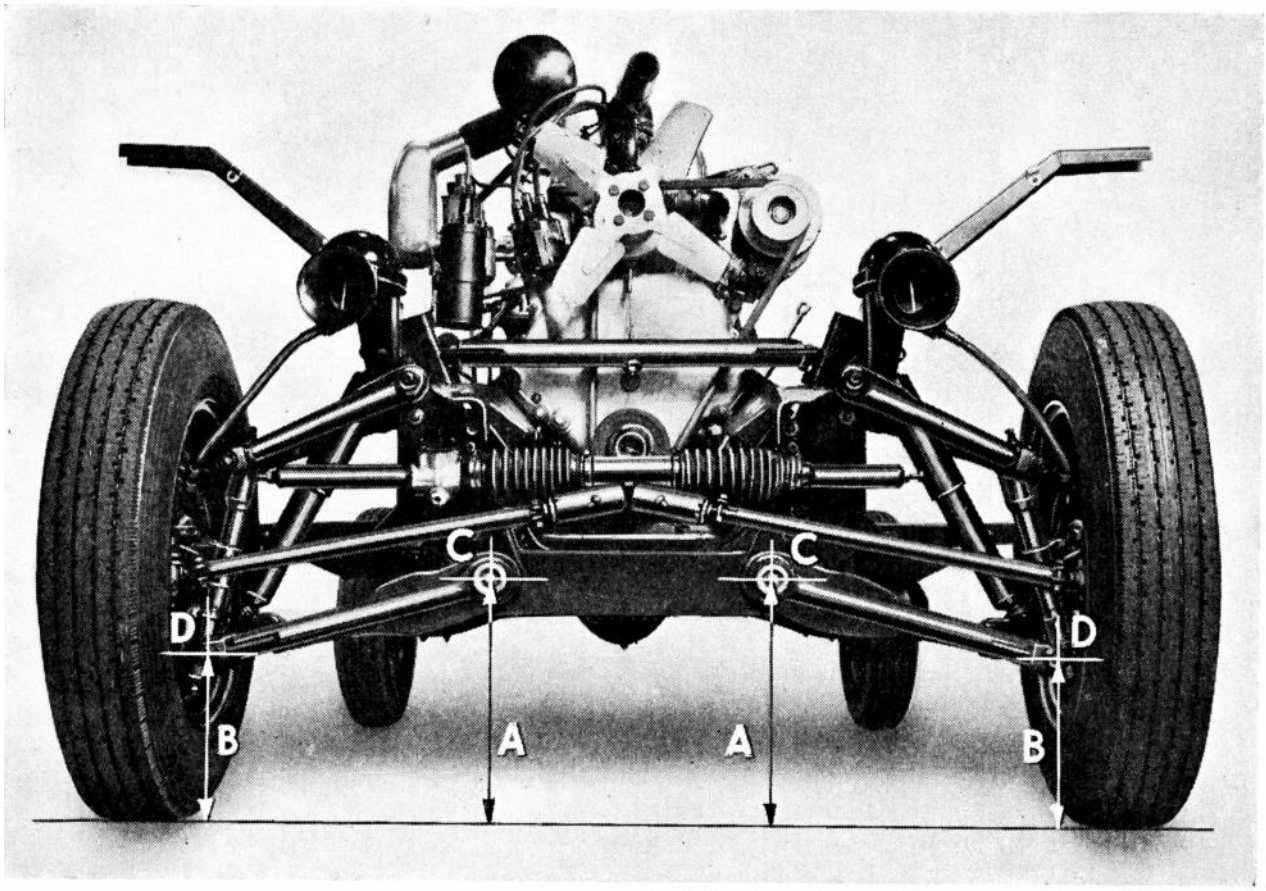
The lower struts are attached to parallel torsion bars, which replace the orthodox road springs. These torsion bars have a cam adjustment at the rear end. The inner mountings of the struts are special flexing rubber bushes, which do not require any lubrication or maintenance.

The steering swivels—or, as they are commonly known, king-pins—are of special design, and the top and bottom bearings are 12 in. (30·5 cm.) apart—an exceptional distance—while the bearing area is 80 per cent. greater than in the orthodox type of king-pin. This ensures inherent stability and long life. There is a grease nipple at the top and bottom of these swivels which requires attention with the ordinary grease gun, filled with the recommended grease, every 1,000 miles or 1600 km. (See page 15.)

The steering is provided with two track-rods, these having the normal steering ball mounting with a greaser at each end. The grease nipples are of the hydraulic self-sealing type, and are placed exactly where the lubrication is required.

The total number of greasers at the " front end " is eight, and attention every 1,000 miles or 1600 km. is the only maintenance necessary on the front end suspension and steering.

The steering rack housing itself is packed with grease when it leaves the factory, and does not require any further attention until 30,000 miles or 50000 km. have been covered, when it should be repacked with grease to Ref. D (page 17).



Where the measurements must be taken when checking the setting of the front suspension.

Adjusting the "Torsionic" Front Suspension

The following should receive attention at regular intervals of 6,000 miles (10000 km.), particularly during the early life of the car.

With the car resting on its wheels, the tyre pressures should be verified and, if necessary, set to the pressure 22 lb. sq. in. (1·5 kg./cm.²). The torsion bars should then be adjusted as indicated below, and the track checked. Checking of the track should be carried out at hub level at the same points on the wheel rims by turning the wheels through 180°. This will allow for manufacturing limits on the wheels.

Setting the Torsion Bars

Dimensions at "A," in the illustration on page 29, should be 1½ in. (38 mm.) more than the dimensions at "B," the measurements being taken from the centres of attachments "C" and "D" to level ground.

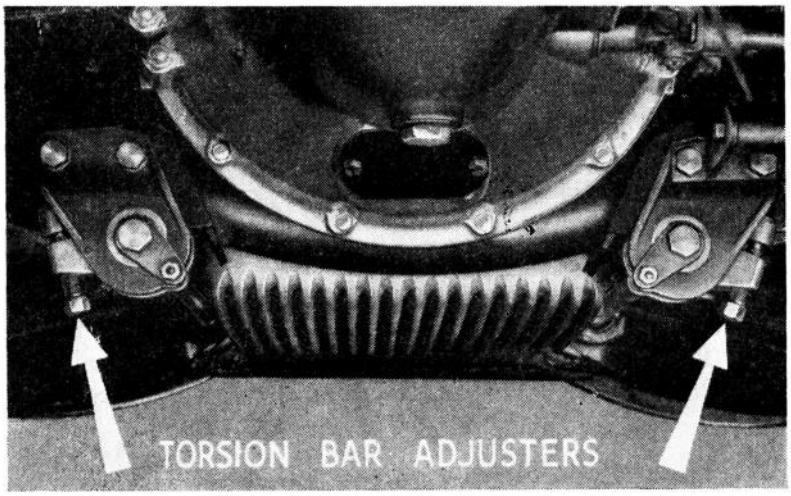
If this difference in height is less than 1½ in. (38 mm.) the dimensions must be increased, the procedure being as follows:—

The front of the car must be jacked up until the wheels are completely clear of the ground; the weight of the car will then be removed from the suspension gear. This point is very important, and on no account must any attempt be made to increase the dimensions at "A" with the weight of the car on its front wheels.

The adjusters at the rear ends of the torsion bars should now be screwed IN to effect the necessary alteration in height between "A" and "B."

The car must now be lowered onto its road wheels again and the springing allowed to settle by rocking the front end up and down a few times. Dimensions "A" and "B" should now be re-checked.

If the difference between "A" and "B" is now greater than 1½ in. (38 mm.) there is no need to jack the car up again in order to decrease this dimension. It is only necessary to screw the adjusters OUT until the correct measurement is obtained.



Location of the adjusters.

Important Note

The track should be set parallel (i.e. no "toe in") with the struts set with a difference of 1¼ in. (32 mm.) between dimensions "A" and "B." Then each adjuster should be screwed in until the 1½ in. (38 mm.) setting is obtained. This will mean approximately 1⅓ turns on each adjusting screw. No further adjustment to *track* should be made after setting at the 1¼ in. (32 mm.) setting.

Steering Gear

The steering mechanism fitted to the "Torsionic" front suspension is of the horizontal rack and pinion type.

The inner steering column is positioned by means of splines, circlip, and a screwed collar.

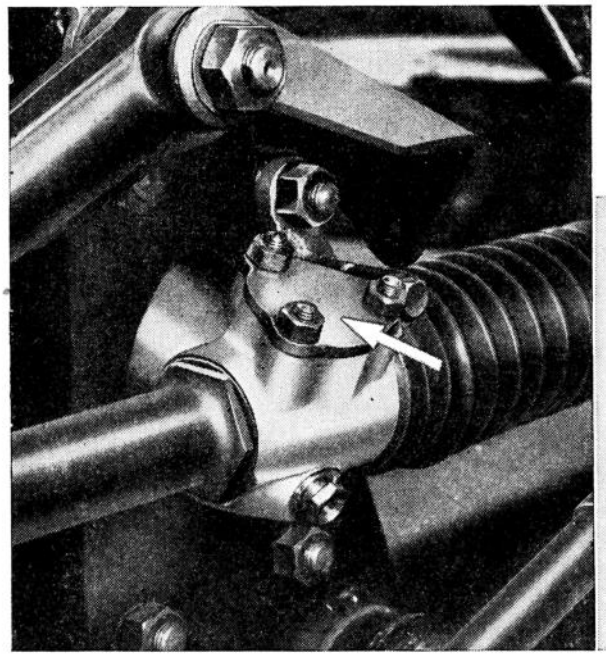
The steering gearbox is made of aluminium and houses a small pinion and integral shaft carried in taper bearings. This pinion is adjusted for position by means of shims of different thickness under the top bearing cap.

Running at right angles to this shaft and pinion is the housing for the horizontal rack gear, the gear itself being held in suitable bearings.

Pressure on the rack gear is applied by a spring-loaded plunger in order to eliminate backlash between the two gears.

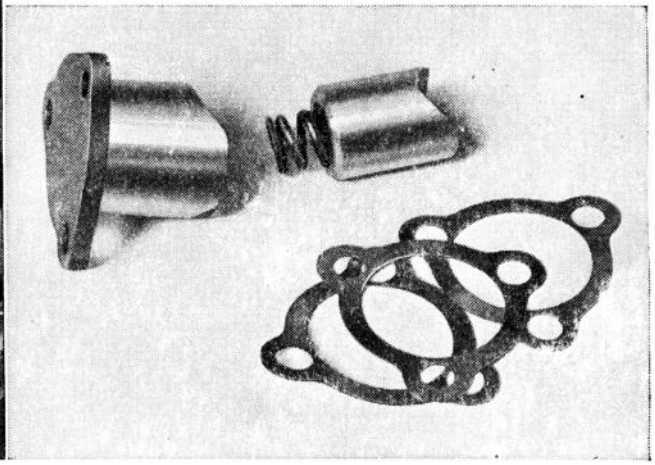
At either end of the steering unit are set screws and locknuts which control the turning circle of the car.

Lubrication of the steering gearbox is effected by removing the plunger housing and plunger, shown in the illustration below, and inserting grease to Ref. D (page 17) as the steering is turned from lock to lock. This greasing should occur each 30,000 miles or 50000 km. Care must be taken not to lose the shims under the cover and to see they are correctly in position when the cover is replaced.



Left.—The arrow indicates the plunger housing, which must be removed prior to greasing the steering gear.

Below.—This photograph shows the plunger housing, spring-loaded plunger and packing shims used on the steering gear.



Jacking System

There are four jacking points on the car. They are located under the over-riders at front and rear. Square-section tubes welded directly to the chassis are used to accommodate the special Riley jack, rubber plugs being inserted in the ends of the tubes when the jack is not in use.

Shock Absorbers

The front absorbers are of the telescopic hydraulic type and are situated between the outer end of the lower tubular struts of the front suspension and the side of the box-section front members. They are of the sealed type and require no maintenance.

Every 12,000 miles (20000 km.) they should be removed from the car, tested for correct action and renewed if in any way defective.

Those at the rear are also of the telescopic hydraulic type, being securely attached to the chassis and connected by means of rubber-bushed attachment pins to the rear axle casing. They are diagonally mounted to control sway.

Rear Axle

Removing or adjusting the rear axle is an undertaking for your Riley agent, and it is not proposed to give a detailed description in this book.

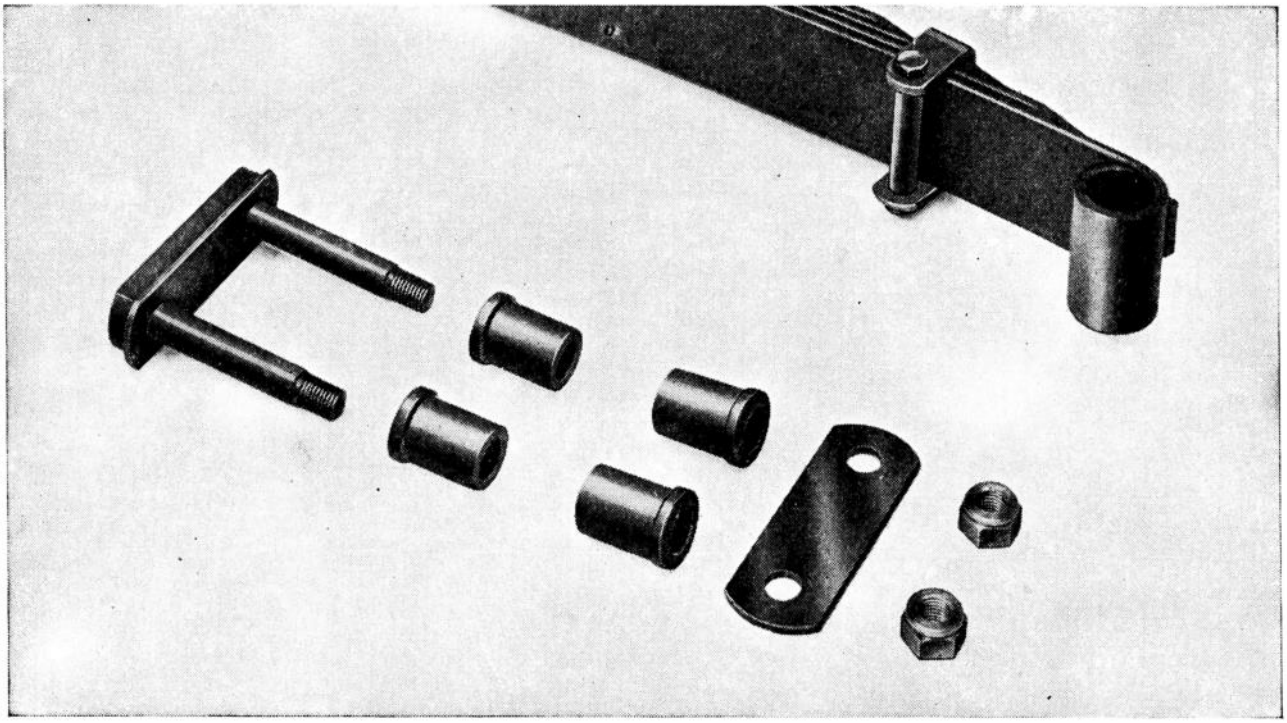
No trouble should be experienced as long as the recommended lubrication is carried out. **Remember only hypoid oil of the recommended grade may be used.**

Exhaust System

Between the engine manifold and the main silencer a short length of flexible pipe is interposed; this is done to eliminate unnecessary stresses in the manifold and exhaust pipe due to movement of the flexibly mounted engine.

From the engine the pipe leads to the main silencer, which is of large diameter and over 40 in. (102 cm.) long, the second silencer is connected by means of a short length of pipe to the first, and finally the exhaust gases escape to the atmosphere at the rear of the car.

Great care is taken to prevent the leakage of exhaust gases, and the complete system is flexibly mounted to eliminate vibration and its attendant rattles and wear.



Details of a rear shackle. Note the rubber bushes, which require no lubrication.

Rear Springs

The rear springs are of sturdy construction and are attached to the chassis by flexing rubber bushes. The shackle attachment bolts are provided with a special type of self-locking nut, and this consequently eliminates the use of split pins.

The special rubber bushes require no lubrication.

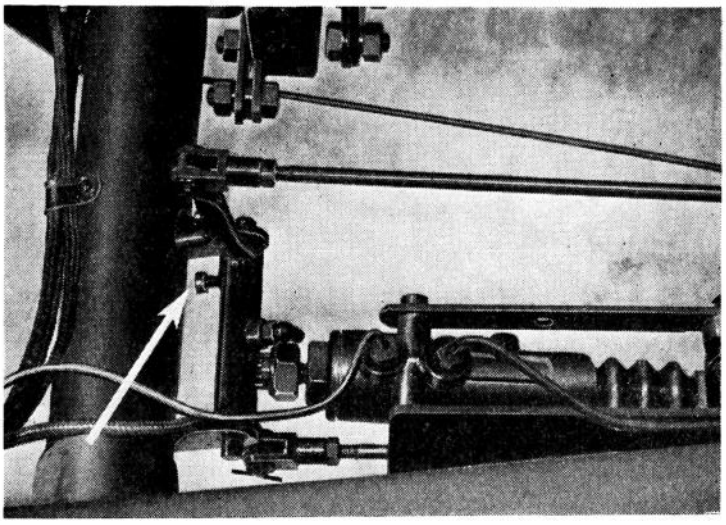
Mounting of Power Unit

The engine and gearbox are mounted as a complete unit on three points. At the front there are two mountings, one either side of the timing case and securely attached to engine and chassis. At the rear there is a single mounting, attachments being provided on the gearbox and a chassis cross-member. Short lengths of steel cable are used at the front and rear to prevent excessive movement of the unit.

Clutch Adjustment

If trouble is experienced due to the clutch spinning after the linings have settled down during the running-in period, it is probable that the trouble is due to lack of the correct working clearance between the clutch release lever plate and the graphite release bearing (parts 10 and 7 on page 37). This clearance should be $\frac{1}{16}$ in. (1·6 mm.) or $\frac{3}{4}$ in. (19·05 mm.) of free movement at the pedal.

Adjustment is effected by slackening the locknut on the end of the clutch operating rod where it passes through the lower end of the clutch pedal lever, and turning the adjusting nut in the appropriate direction. Do not forget to tighten up the locknut when the adjustment is completed.



The clutch stop.

The clutch stop, shown above, should then be set so that when the clutch is completely withdrawn, there is a further movement of $\frac{1}{2}$ in. (13 mm.) at the pedal.

Tyre and Wheel Balance

In the interests of smooth riding, precise steering and the avoidance of unpleasant reactions, Dunlop tyres are balanced to predetermined limits. By fitting the tyre so that the white spots near the cover bead coincide with the black spots on the tube a high degree of tyre balance is achieved. When using tubes which do not have the black spots, it is usually advantageous to fit the covers so that the white spots are at the valve position. The tyre and wheel assemblies must not be more than 28 in./oz. (2016 cm./gm.) out of balance. Assemblies exceeding this figure must be balanced with Dunlop rim weights to Part Nos. WBW/1 to 7 ($\frac{1}{2}$ oz. to $3\frac{1}{2}$ oz. or 15 gm. to 100 gm.) to within this limit.

It is imperative that any balance weights fitted are placed on the outside of the wheel. If fitted on the inside there is the possibility of damage to the brake flexible pipes.

Braking System

The braking system is of the Girling hydraulic type with the hand brake operating on the rear shoes by independent cable and pull-rod mechanism.

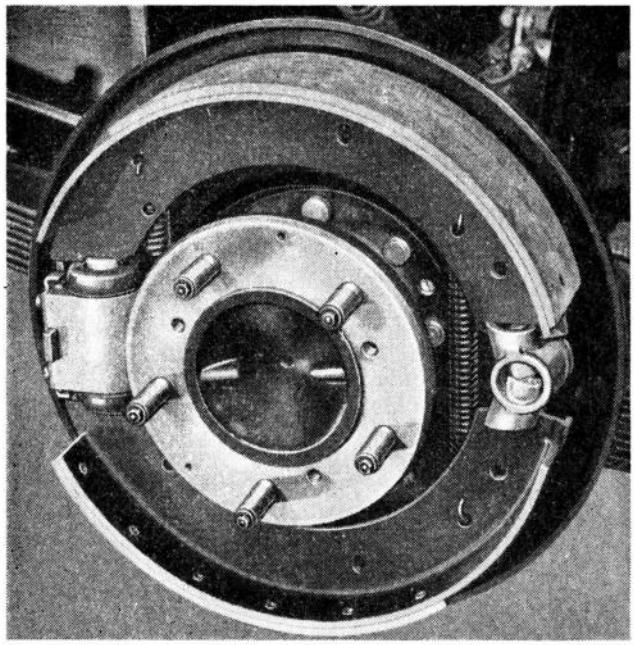
The master cylinder and the system is maintained full of fluid from a supply tank mounted on the engine bulkhead on the right-hand side. The fluid level in this should be maintained at the level indicated on the supply tank.

Use only genuine Girling Fluid. On no account must oil be introduced into the system or it will render the brakes inoperative.

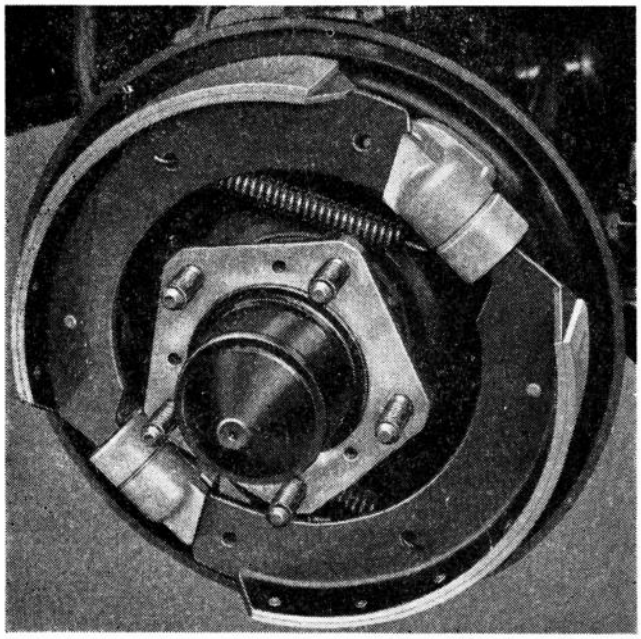
The front brakes are of the two-leading-shoe type with each shoe independently operated by separate wheel cylinders.

The rear brake-shoes are operated by a single wheel cylinder in each drum to which is also connected the hand brake operating mechanism.

Since all the eight brake-shoes are operated through the same hydraulic system perfect compensation and the maximum braking effort is achieved.



Above :—The location of the brake fluid supply tank.



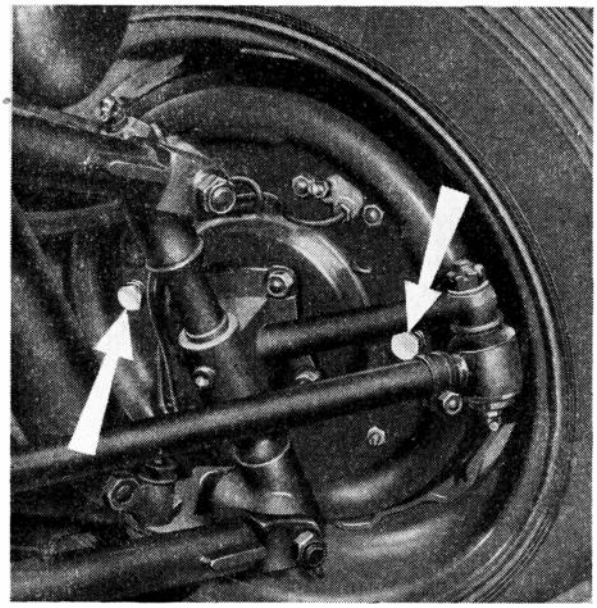
Top left :—The rear brake-shoe assembly, showing the wheel cylinder which is common to both brake-shoes.

Left :—The front brake-shoe assembly, indicating the two leading shoes with their separate wheel cylinders.

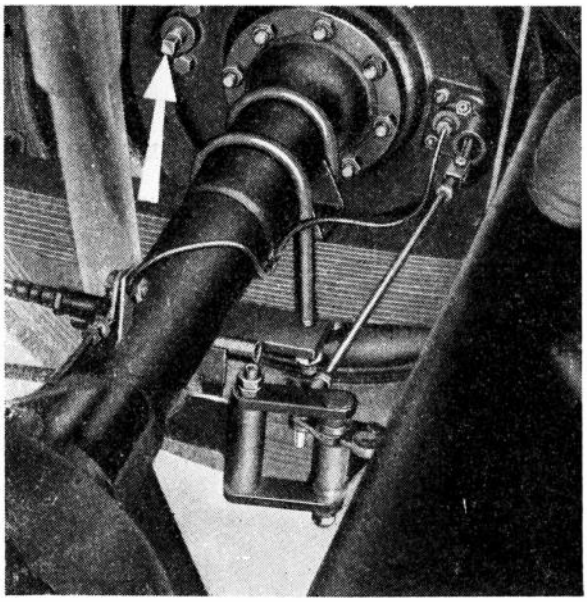
Maintenance of the Brakes

Maintenance has been reduced to the minimum, but the following points should be noted carefully :—

1. Check and, if necessary, top up the contents of the fluid supply tank which is situated on the engine bulkhead. Only Girling Brake Fluid or Wakefield W.D. 3 should be used.
2. Occasionally check the unions for leakage and the hoses for wear in the hydraulic part of the system.
3. Oil the link pins and other joints in the mechanical part of the hand-operating system.
4. Make sure that the connection between the master cylinder and the brake pedal is free, because it is essential that no binding should take place at this point, since the master cylinder piston, after each application of the brake, must be allowed to return unassisted by the brake pedal return spring. There should be $\frac{1}{2}$ in. (12 mm.) of free movement at the pedal before it makes contact with the piston.



The two shoe adjusters on the front wheels which adjust each shoe independently.



The shoe adjuster on the rear wheel which adjusts both shoes simultaneously.

Brake Adjustments

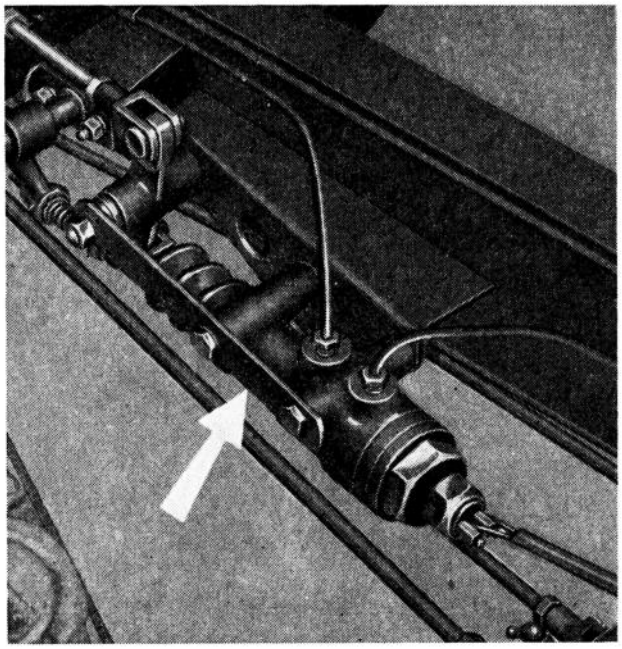
Rear : Starting at the rear wheels, it will be noted that on the inner face of the brake back plate on the forward side there is a square-headed adjuster which must be screwed in until an appreciable resistance is felt, as distinct from the resistance produced by the locating flats of the adjuster. This means that the brake-shoes have been expanded against the brake-drums. The adjuster must now be screwed out to the next nearest flat and the drum checked for freedom. The adjuster must be unscrewed to the extent of another flat if there is any sign of binding or rubbing. This is the only adjustment that is necessary on the rear brakes, and on no account must any adjustment be made to any of the tie-rods or links in the hand brake system.

Front : On the front wheels the adjustment is somewhat different, due to the fact that **each brake-shoe has to be adjusted separately.**

The Girling two-leading-shoe system is used on the front brakes and the following instructions should be noted when adjustments are being carried out :—

The actual adjustments are effected by means of the two hexagon-headed bolts projecting from the back plate on each side of the axle. In order to move the shoes nearer the drums so that compensation for wear may be obtained, the adjusting bolts must be turned **in the direction of rotation of the wheel** in the case of the left-hand wheel, and **against the direction of rotation** in the case of the right-hand wheel. The adjusters in each case must be turned clockwise when viewed from the centre of the car. Turn the bolts until a definite resistance is felt, and then slacken them back to the point where no binding is experienced.

Make sure all nipples are tight, otherwise loss of fluid will result and, subsequently, braking effort.

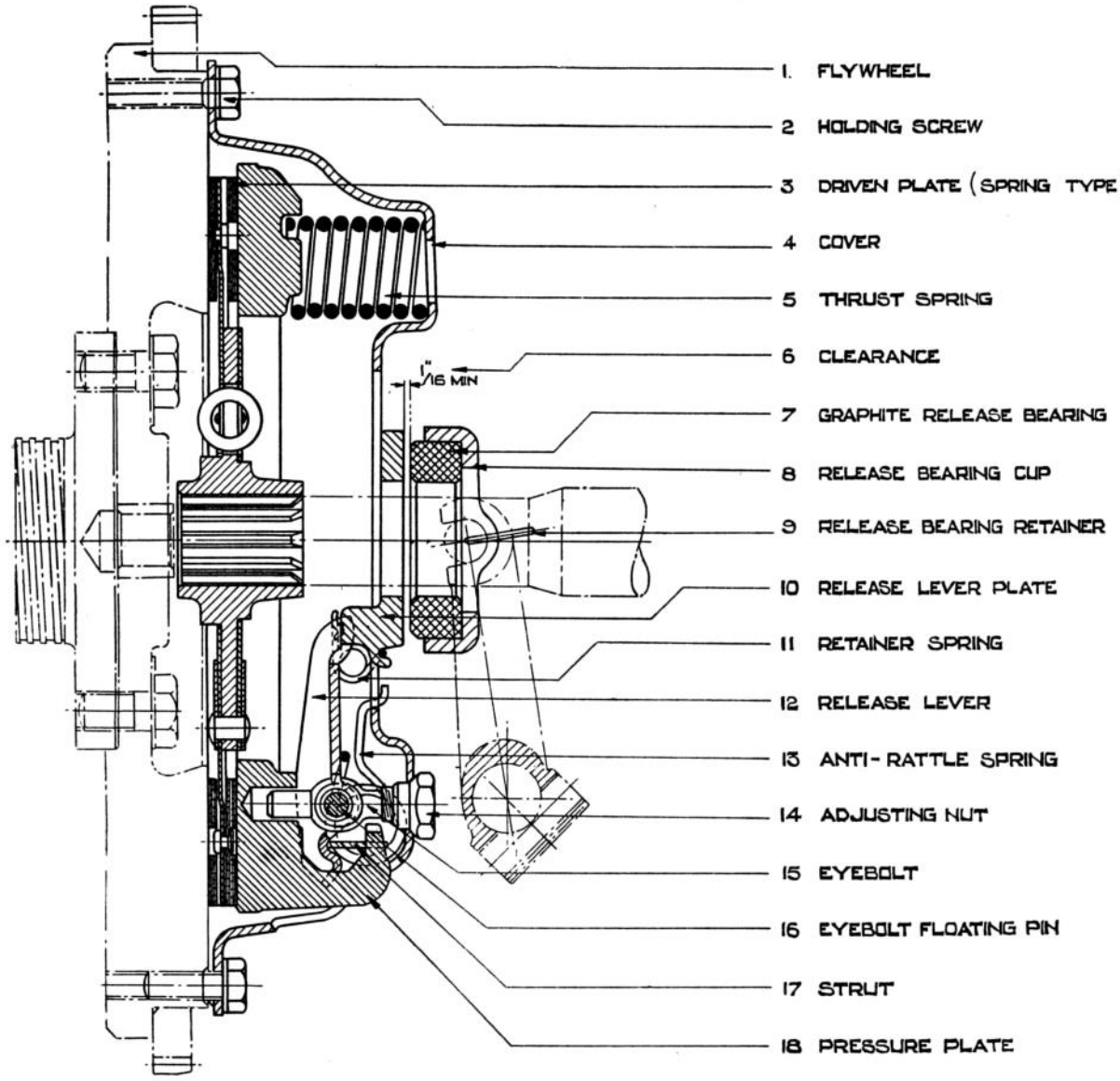


The master cylinder of the Girling hydraulic braking system.

The Clutch

The drive from the engine is transmitted to the transmission system by a single-plate dry clutch. No adjustment for wear is provided in the clutch itself.

An individual adjustment is provided for locating each release lever, but the adjusting nut is locked in place by means of a split pin and should never be disturbed, unless the clutch is dismantled for replacement of parts.



Section of the clutch.

A graphite release bearing (7) is used to actuate the clutch and it is mounted in a cup attached to the throw-out fork. A release plate (10) is attached to the inner ends of the release levers (12) by spring retainers and is pivoted on a floating pin (16), which remains stationary in the lever and rolls across a short flat portion of the enlarged hole in the eyebolts (15). The outer ends of the eyebolts extend through holes in the clutch cover and are fitted with adjusting nuts (14) by which each lever is located in the correct position. The outer or shorter ends of the release levers engage the pressure plate lugs through struts (17) which provide knife-edge contact between the outer ends of the levers and the pressure plate lugs, so eliminating friction at this point.

Thus, when pressure is applied to the release bearing the pressure plate (18) is pulled away from the driven plate (3), compressing the series of thrust springs (5) which are assembled between the pressure plate and the clutch cover (4).

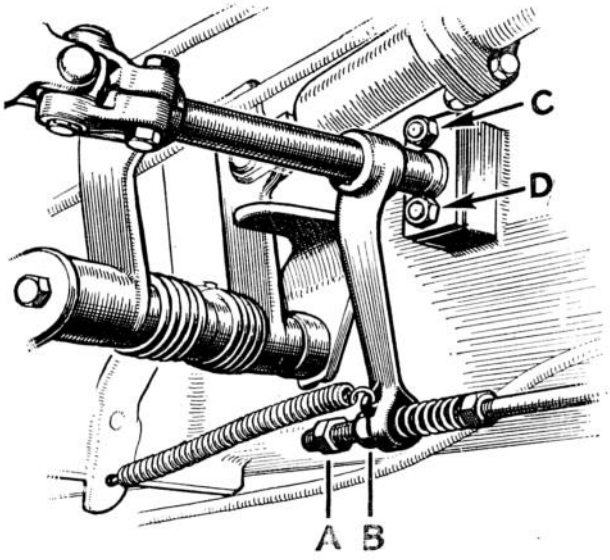
When any of the gears are engaged and the foot pressure is removed from the clutch pedal, the thrust springs force the pressure plate forward against the driven plate, gradually and smoothly applying the power of the engine to the rear wheels.

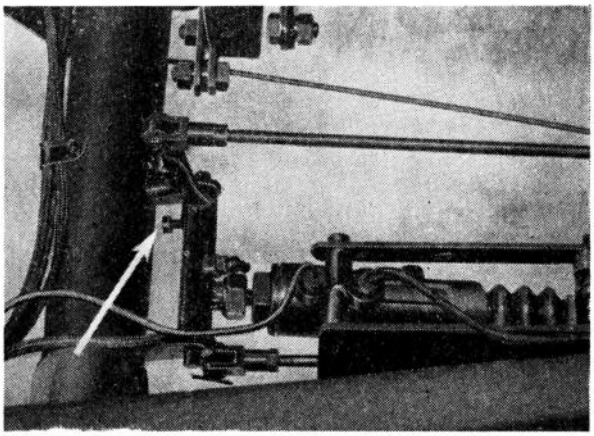
As the clutch facings wear, the pressure plate moves closer to the flywheel face and the outer or shorter ends of the release levers follow. This causes the inner or longer ends of the levers to travel farther towards the gearbox, and decreases the clearance between the release lever plate and the release bearing. The effect on the clutch pedal is to decrease the initial clearance or free travel. Some free movement **must** always be maintained to prevent clutch slip. This free movement is restored by adjusting the clutch pedal, and there should be $\frac{3}{4}$ in. (19 mm.) of free or " lost " movement at the pedal before pressure on the release mechanism is felt, this resulting in $\frac{1}{16}$ in. (1·6 mm.) clearance between the release lever plate and the clutch withdrawal thrust bearing.

Provision for adjustment is made at the junction of the clutch operating rod with the clutch operating lever on the clutch operating shaft extension, shown in the accompanying illustration.

The locknut " A " should be slackened off and the position of the clutch pedal adjusted by means of the adjusting nut " B " to obtain the required free movement. **Do not forget to re-tighten the locknut.**

A check should now be made of the effective pedal travel when the clutch is fully withdrawn; this should be $\frac{1}{2}$ in. (12·7 mm.) between the position of the pedal when the free movement is just taken up, and the position of the pedal when fully depressed. Any adjustment necessary to obtain this effective travel should be made by adjusting the position of the stop screw on the clutch countershaft.





Above.—The clutch stop on the countershaft of the clutch operating mechanism.

Left.—" A " is the locknut, and " B " is the adjusting nut for adjusting the position of the clutch pedal and its free movement. DO NOT TIGHTEN THE NUTS " C " AND " D."

The Gearbox

From the clutch already described the drive is transmitted to the rear wheels through the gearbox. It is doubtless already known that the box contains four forward gears and a reverse gear.

Neutral position is in the centre, in which position the engine turns the gearbox primary shaft, but no gears are engaged and the car consequently remains stationary.

To move off from stationary after starting the engine, the driver should depress the clutch pedal fully, holding it in this position with the foot whilst moving the gear lever into the first gear position. The gear should engage without force; if any difficulty is experienced, move the lever back into neutral and momentarily lift the foot from the clutch. Then again depress the pedal and select first gear as described previously. The hand brake should then be released and the clutch pedal gradually let up, the engine simultaneously being gently accelerated with the right foot on the accelerator pedal. The car should then move smoothly away from rest.

As soon as the car is properly in motion it is advisable to change up into second gear. The second, third and top gears are all fitted with synchromesh, as a result of which gear changing is rendered perfectly simple.

To change up into any of these gears from the next lower gear, just depress the clutch pedal, momentarily ease the accelerator pedal and at the same time move the gear lever into neutral, pausing slightly to enable the synchromesh to balance the speed of the engaging gears before pushing it into the desired gear position, allowing the clutch pedal to rise and again accelerating.

(Actually a slight resistance is felt between neutral and the engaged position in second, third and top gears. This indicates the position at which the synchromesh clutch engages, and the pause should be made against this resistance to ensure that the synchromesh engages properly.)

Reverse gear is to the rear and the extreme right of the box, and care should be taken when changing from third to top to avoid forcing the gear lever into the reverse position. This is guarded against by a special spring-loaded safety fence, the tension of which has to be overcome before the reverse gear can be selected.

Always ensure that the car comes to complete rest before engaging a gear which will reverse its direction.

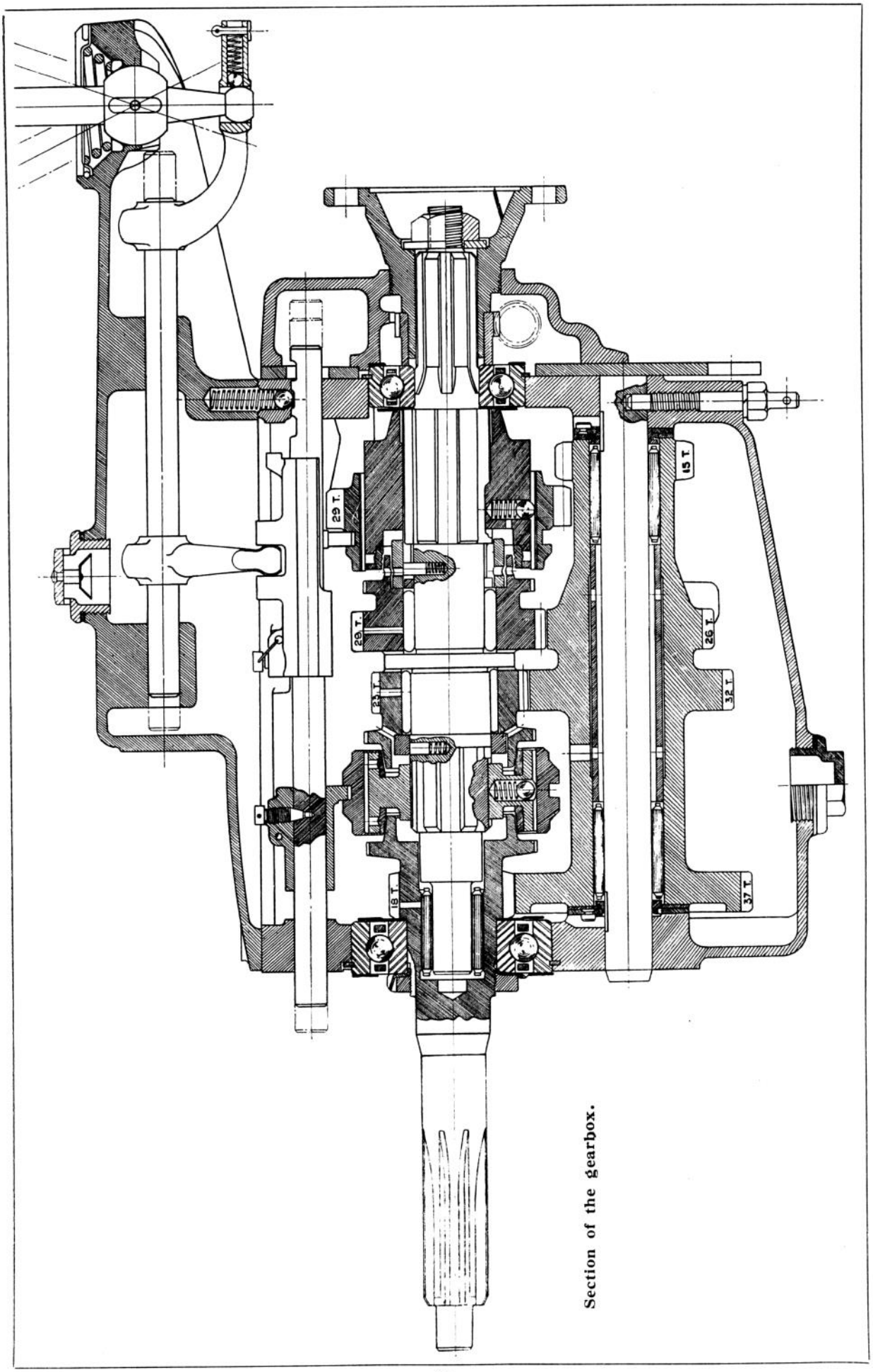
When changing down, the order is to some little extent reversed, in that it should be borne in mind that after depressing the clutch pedal the engine should be speeded up (approximately doubled) before the next lower gear is engaged.

On the few occasions when it is desired to change down from second to first, the clutch pedal should be depressed, the engine speed being slightly increased before moving the lever into first gear position and releasing the clutch.

For this change " double declutching " is beneficial. The novice should take an opportunity to have this demonstrated by the Riley Dealer, as it requires a little practice.

When descending a hill that is known to be steep it is advisable to slow down and change into third or even second gear before the descent is commenced. This will result in the engine acting as an additional brake.

On no account should hills be descended in neutral or with the clutch pedal depressed. Such practice will cause unnecessary wear on the brakes and clutch withdrawal mechanism.



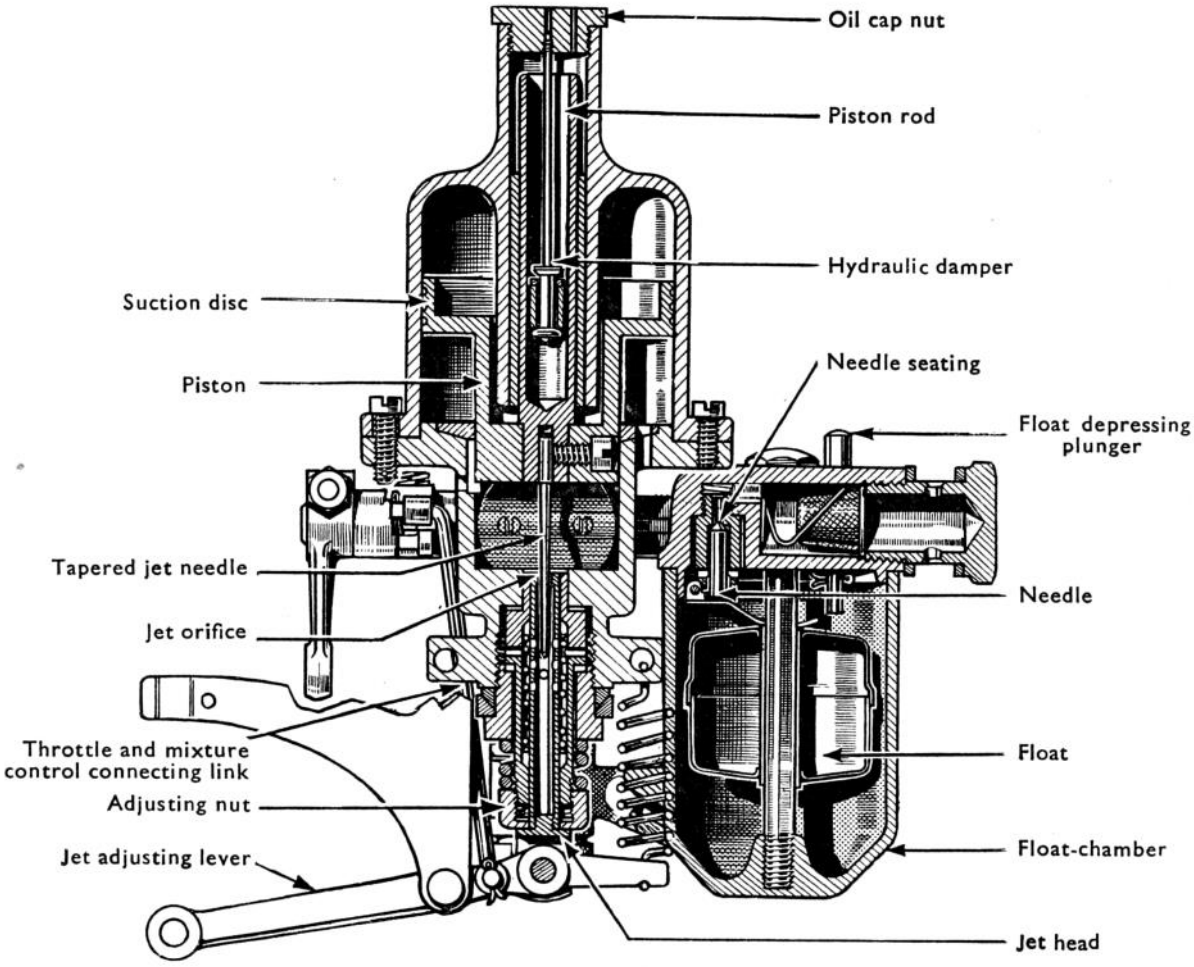
Section of the gearbox.

The S.U. Carburetter

Type H2

The tuning of the S.U. carburetter is very simple if it is understood that the jet is of a standard size. The **only** adjustment possible is fitting the right size needle and the setting for the correct idling speed. **No** other adjustments are provided.

Should you suspect the carburetter of causing trouble, after previously giving good results, do not change the needle, for this cannot be the cause of the trouble.



Section of the carburetter.

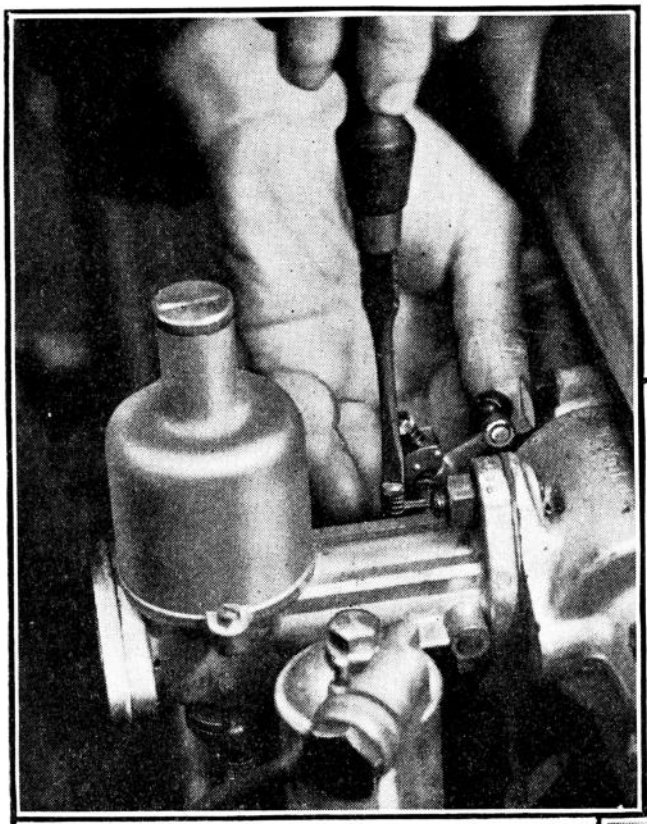
The correct way to adjust the carburetter is to set it correctly at its idling speed. The carburetter is then set throughout its range. This adjustment is made by means of the jet and the jet adjusting nut; in other words, the position of the jet is altered relative to the tapered needle.

The engine should run as evenly as possible, and the exhaust note is a very good indication of this. If the exhaust has a periodically uneven note (called " hunting ") a rich mixture is indicated. If the exhaust note is irregular, a weak mixture is indicated.

If this idling adjustment is not made, consumption and performance will not be up to standard.

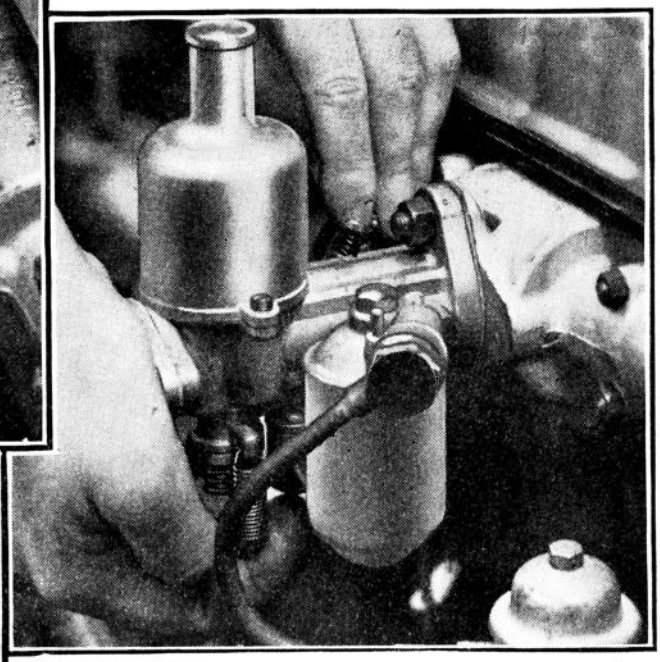
Adjustment

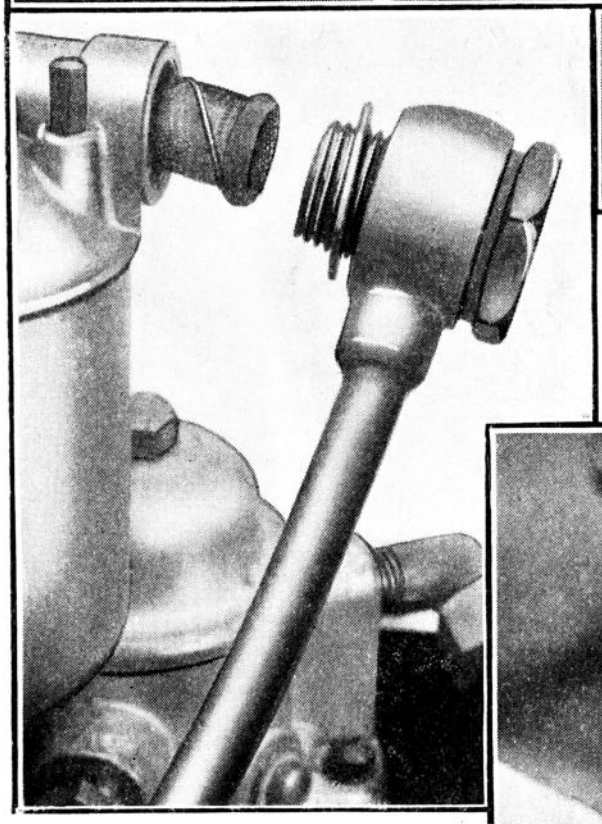
The carburetter should be set when the engine has attained its normal working temperature, and the way to do this is to adjust the jet **up** to a weak mixture position and then screw the jet adjusting nut down until the engine is running evenly and at the best speed for this throttle stop setting.



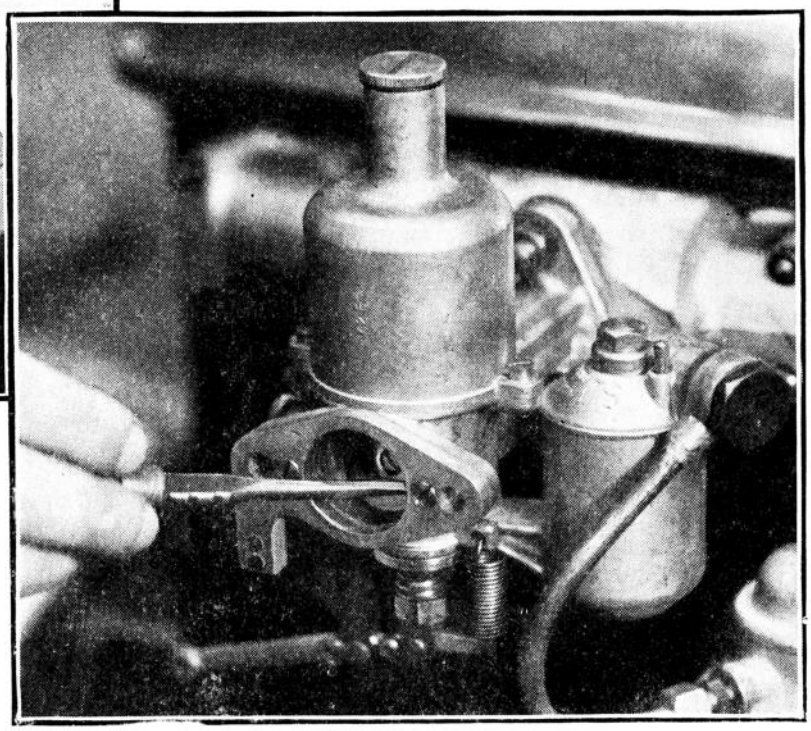
Left.—Setting the final slow running by means of the adjusting screw on the throttle control at the carburetter.

Below.—Clearing the main jet by closing the air intake and opening the throttle.





Left.—Shows the carburetter filter assembly. Note the correct positioning of the filter and spring. Make sure that the washers are perfectly clean when reassembling.



Right.—Checking the piston for freedom of movement. If the piston fails to fall by its own weight, adjust the carburetter as explained in the text.

A simple way to check for a rich mixture is to raise the piston $\frac{1}{32}$ in. or 1 mm. when the engine is idling. If the engine speed increases, the mixture is too rich, and the jet must be screwed **up**. If the engine stops, it is too weak. The correct setting is indicated when there is a momentary speeding up of the engine when the piston is raised, followed by inferior running.

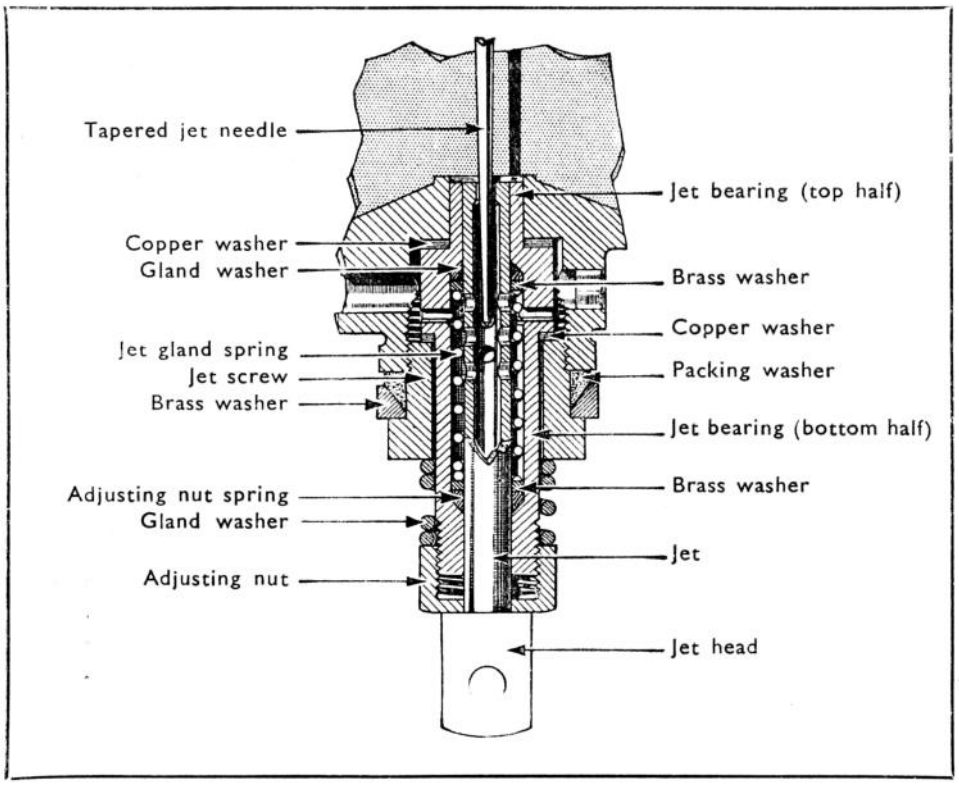
If the engine should be running at too high an idling speed when the best running condition is attained, the throttle stop screw should be unscrewed a fraction of a turn to obtain the desired idling speed.

CARBURETTER TROUBLES

1. Sticking Piston

This should be checked by removing the cap from the top of the suction chamber with its attached damper piston, lifting the suction piston with a pencil or similar article and allowing the suction piston to fall to its original position; if the action is sluggish or erratic, the assembly should be removed and carefully cleaned. A small amount of thin engine oil to Ref. F (page 17) should then be applied to the **piston rod only** and the carburetter reassembled.

A small quantity of thin engine oil (Ref. F) must then be introduced into the top of the suction chamber to fill the piston dashpot.



Section of the S.U. jet assembly.

2. Water or Dirt in Carburetter

When this condition is suspected, the following is the routine to be employed:—

(*a*) Lift the piston.

(*b*) Depress the tickler to flood the carburetter.

(*c*) Watch the jet.

(*d*) Observe the flow of fuel through the jet. If the flow of fuel is poor, the jet is blocked, in which case :

(1) Start the engine.
(2) Open the throttle.
(3) Close the air intake with your hand.
(4) Keep the throttle open until the engine speeds up.

If the above procedure does not rectify the trouble, the jet should be removed and cleaned ; but it is unlikely that this will be necessary since the jet orifice is large and easily cleared by the above procedure.

Careful consideration of the following notes on the refitting and centring of the jet will ensure that this is carried out correctly. If this is not done, the carburetter will give a poor performance.

The jet and jet bearing assembly can be released by slackening the large jet holding screw, with hexagon head, screwed into the base of the carburetter, and as the jet is only slightly larger than the needle it will be obvious that great care must be taken in locating the jet, particularly as the jet and needle must be concentric.

The following is the correct procedure for centring the jet :—

(*a*) Slacken the large hexagon nut at the base of the jet housing.
(*b*) Screw the jet adjusting nut to its top position.
(*c*) Move jet up until the jet head is against the adjusting nut.
(*d*) Raise the piston and allow it to fall smartly onto its seating, and tighten the large hexagon nut. Check the piston for freedom of movement.
(*e*) If the piston is not free, the large hexagon nut must be slackened and the procedure repeated. This may have to be done several times.
(*f*) Bring the jet adjusting nut back to its original position.

3. Flooding of Float-chamber

This is generally due to dirt on the guide of the needle valve and can usually be rectified by depressing the tickler—this allows a flood of fuel to flow through the valve.

4. Float Needle Sticking

This will cause lack of fuel at the carburetter, and the needle should be removed and cleaned, together with the seating.

5. Maintenance

Every 1,000 miles or 1600 km. the oil cap nut should be unscrewed from the top of the carburetter and carefully withdrawn with its attached damper piston.

A teaspoonful of engine oil to Ref. F (page 17) should then be poured into the opening and the damper and cap replaced. Some resistance to the insertion of the damper should be felt if all is well, but this is easily overcome by steady pressure on the damper while it is being inserted.

If the damper is full of oil and working correctly the suction piston should offer considerable resistance when an attempt is made to raise it with a finger, but it should fall back onto its seating readily when it is raised against this resistance and released.

Tyres

HINTS ON CARE AND MAINTENANCE

Tyre Pressures

The importance of maintaining the correct tyre pressures cannot be too highly stressed, and the tyre pressures of your car should be checked and adjusted at least weekly. This adjustment of air pressure not only influences the wearing qualities of the tyres, but also vitally affects the running of the car and its behaviour when on the road. For example, an under-inflated tyre induces more friction between tyre and road and increases the rolling resistance. In other words, the car will not move so readily along the road. Thus it will be seen that under these circumstances the engine of your car will have more work to do for a given road speed, and fuel consumption will obviously increase. In addition it will increase tyre wear, make steering more difficult, and, in extreme cases, will quickly ruin the tyres.

Tyre pressures bear a direct relation to braking efficiency, steering and comfort. For instance, if tyres are over-inflated, the springs, wheel bearings and the car generally will be subjected to unnecessary vibrational stresses, which will make themselves apparent as rattles, and eventually cause breakages.

The correct tyre pressures are indicated on page 5.

Repairing Tubes

Have punctures or injuries vulcanised. Ordinary patches should be used only for emergencies.

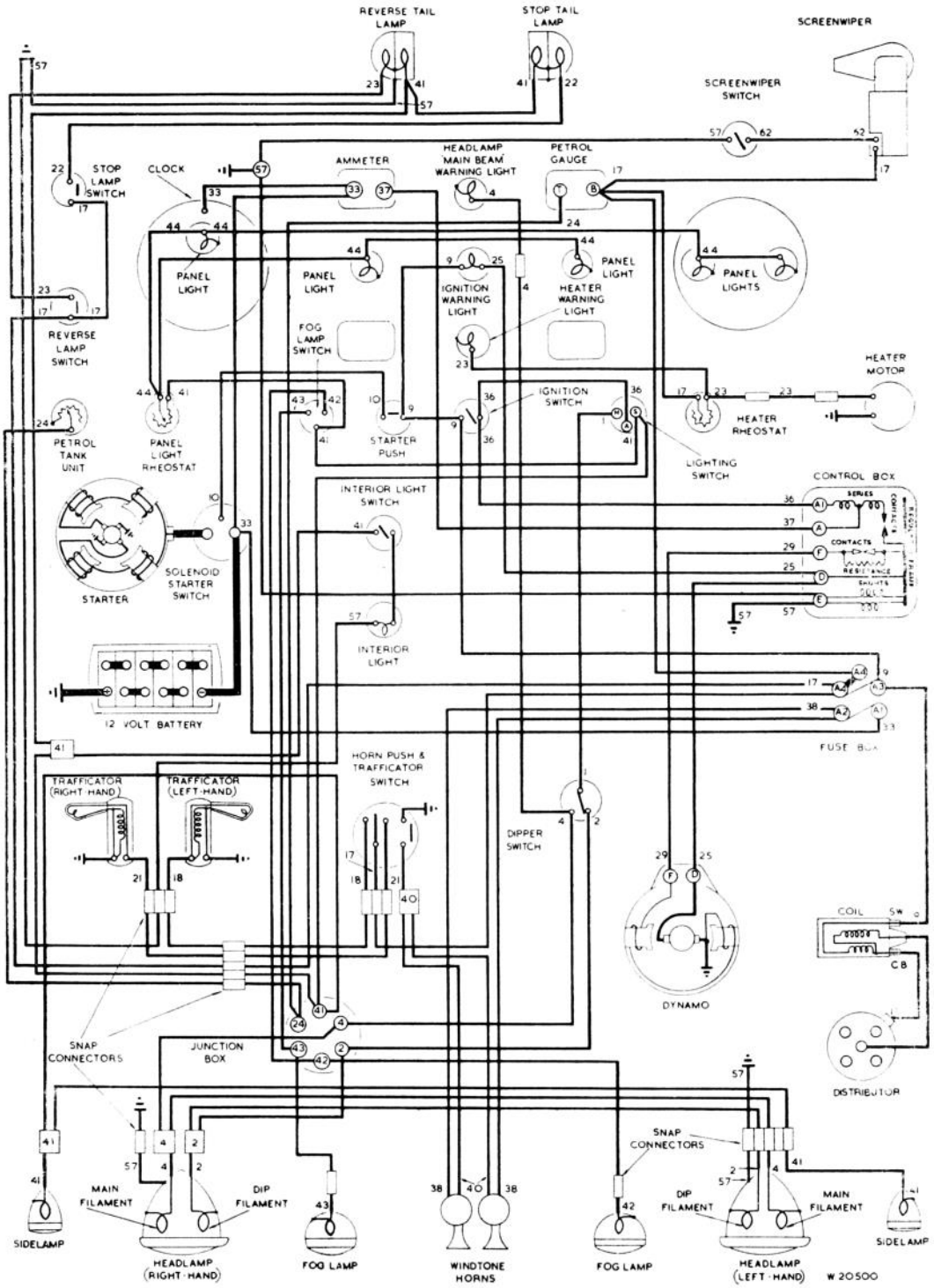
Oil and Grease

Tyres should never be allowed to stand in a pool of oil, grease or fuel. Oil or grease may be removed from a tyre by the use of a rag moistened with petrol (gasoline).

Tyre Wear

For various reasons, the wear of tyres on the four wheels seldom, if ever, takes place evenly and at the same rate ; the spare, in any case, is likely to deteriorate with age rather than wear. It is therefore a good practice periodically to change the wheels round, including the spare, thus ensuring even distribution of tyre wear and preventing the spare from being out of service too long. Additionally, it must be remembered that if the track of the front wheels is not set correctly, excessive and uneven wear may take place on the front tyres. Particular care is therefore necessary when adjusting the track as indicated on page 30.

Wiring Diagram



KEY TO CABLE COLOURS

1 Blue	17 Green	33 Brown	49 Purple
2 Blue *with* Red	18 Green *with* Red	34 Brown *with* Red	50 Purple *with* Red
3 Blue *with* Yellow	19 Green *with* Yellow	35 Brown *with* Yellow	51 Purple *with* Yellow
4 Blue *with* White	20 Green *with* Blue	36 Brown *with* Blue	52 Purple *with* Blue
5 Blue *with* Green	21 Green *with* White	37 Brown *with* White	53 Purple *with* White
6 Blue *with* Purple	22 Green *with* Purple	38 Brown *with* Green	54 Purple *with* Green
7 Blue *with* Brown	23 Green *with* Brown	39 Brown *with* Purple	55 Purple *with* Brown
8 Blue *with* Black	24 Green *with* Black	40 Brown *with* Black	56 Purple *with* Black
9 White	25 Yellow	41 Red	57 Black
10 White *with* Red	26 Yellow *with* Red	42 Red *with* Yellow	58 Black *with* Red
11 White *with* Yellow	27 Yellow *with* Blue	43 Red *with* Blue	59 Black *with* Yellow
12 White *with* Blue	28 Yellow *with* White	44 Red *with* White	60 Black *with* Blue
13 White *with* Green	29 Yellow *with* Green	45 Red *with* Green	61 Black *with* White
14 White *with* Purple	30 Yellow *with* Purple	46 Red *with* Purple	62 Black *with* Green
15 White *with* Brown	31 Yellow *with* Brown	47 Red *with* Brown	63 Black *with* Purple
16 White *with* Black	32 Yellow *with* Black	48 Red *with* Black	64 Black *with* Brown

Electrical Equipment

MAINTENANCE OF THE ELECTRICAL EQUIPMENT

Battery

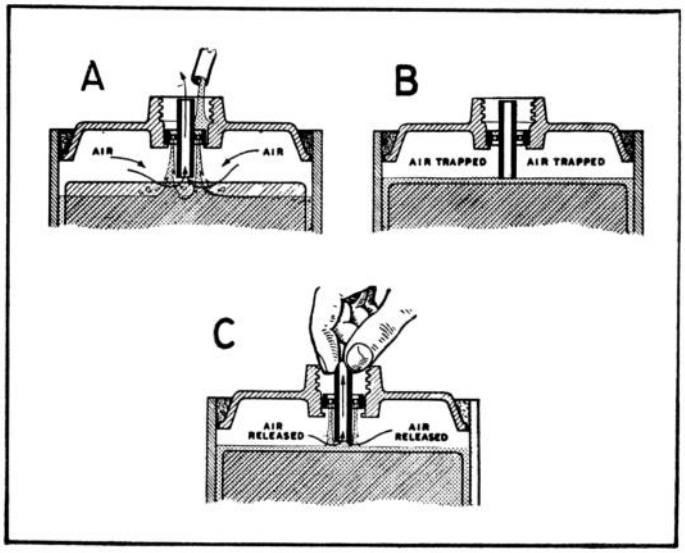
A 12-volt, 51-amp./hour battery is fitted, and about once every month the cells should be topped up with distilled water to bring the level of the electrolyte to the top of the separators. Never use tap-water, and never inspect with the aid of a naked light. The battery is fitted with a " correct acid level " device which prevents overfilling and consists of a plastic fitting below each filler plug. When topping up the battery pour distilled water round the tube which will be found in each filling orifice until no more water will enter. Raise the fitting to release the small amount of water held above it. The battery cell is then filled to the correct level. Repeat this operation on each cell.

Terminals should be kept clean, tight and lightly smeared with petroleum jelly. Occasionally the specific gravity should be checked with a hydrometer; this normally is a job for the Lucas Service Agent, but should the owner desire to take the readings, the following are the indications to be expected, assuming the temperature of the solution to be 60° F. (15·6° C.):—

Specific Gravity	*State of Battery*
1·280 to 1·300 ...	Fully charged.
About 1·210 ...	Half-charged.
Below 1·150 ...	Fully discharged.

The readings of each cell should be approximately the same, and should they be different this indicates (1) that acid has been spilled, or (2) there is an internal short in the cell in question. In both cases the battery should be examined by the Lucas Service Agent.

The battery should never be allowed to remain in the fully discharged condition, as this leads to rapid deterioration.

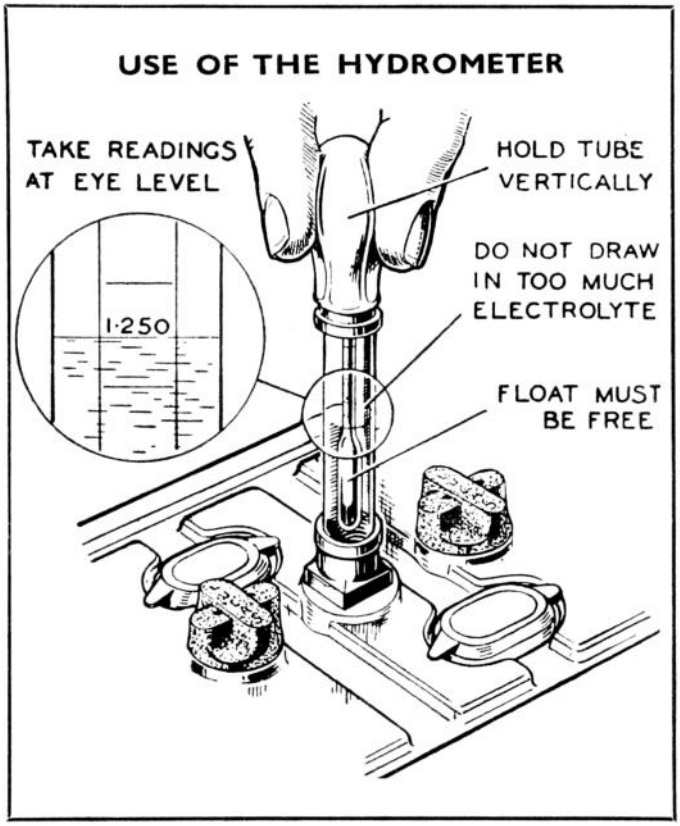


Using the "correct acid level" device.

A. Here the electrolyte is below normal. Distilled water is being poured onto the flange round the central tube.

B. Cease pouring when the water starts to rise in the filler hole. The level in the cells is controlled by an air lock.

C. Release the visible water by lifting the tube slightly. The electrolyte level is now correct.

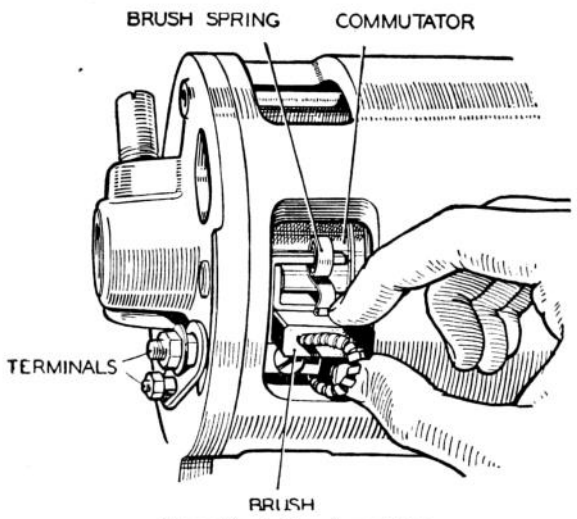


Check the electrolyte with a hydrometer.

Dynamo

This is designed to cope adequately with the charging of the battery under all conditions of load. During manufacture the dynamo bearings are packed with grease, and this is sufficient to last until the engine undergoes its major overhaul.

When this occurs, the dynamo should be inspected and overhauled by a Lucas Service Agent.



Checking the brushes.

About once each 12,000 miles or 20000 km. remove the dirt-excluding band around the brush gear and the commutator, and check the brushes for freedom in their holders by raising the brush spring and moving the brush up and down. Should the brush be sluggish, its sides should be cleaned and, if necessary, polished on a very smooth file until freedom of movement is obtained. Clean the commutator by pressing a petrol-damped rag against the segments whilst the engine is slowly rotated. The sides of the brush holders should also be cleaned.

Great care should be taken to see that any brushes that have been removed are replaced in their original positions. If a brush has become so badly worn that poor contact with the commutator is being made, the instrument should be taken to a Lucas Service Depot for rectification.

At this time the dynamo belt should be checked for wear and slackness. Belt tension is increased by moving the dynamo outwards; this is done by slackening off the lower pivot bolt and the top attachment link screw. The correct amount of free movement in the belt in the centre of its longest run is $\frac{1}{2}$ in. or 13 mm.

If the driving belt is subject to excessive tightening, a considerable strain will be placed upon the dynamo bearings, with consequent rapid wear and trouble.

The Starter Motor

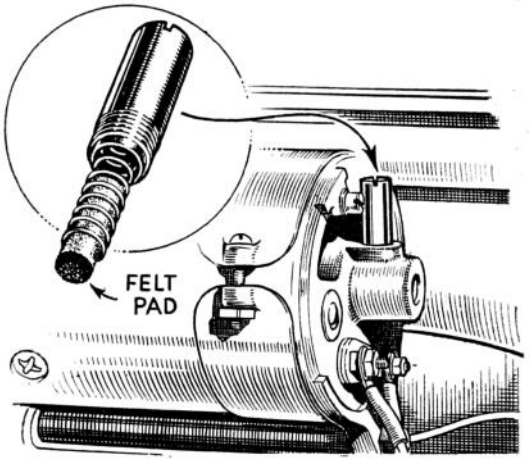
To obtain the best results from the starter motor, it is essential that the following points be observed :—

(*a*) See that controls are correctly set for starting.

(*b*) Operate the starter button firmly and, of course, release it as soon as the engine fires.

(*c*) Never operate the starter whilst the engine is in motion. If the engine does not fire at once, allow it to cease rotating before operating the starter switch again.

(*d*) Do not strain the battery by keeping the starter button depressed if the engine does not start. Remember that the starter motor takes a very heavy current.



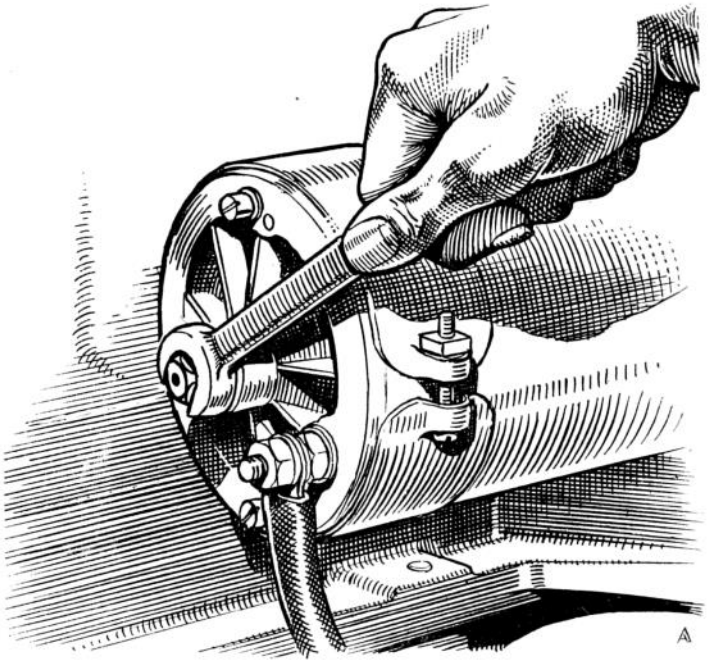
The dynamo shaft lubricator.

(*e*) In cold weather, depress the clutch whilst operating the starter—this relieves the starter motor of the very considerable drag induced by the gears in the gearbox.

Instructions regarding the brush gear, etc., are the same as for the dynamo, and the owner's attention is drawn to the notes on the dynamo.

A square shaft extension is provided for hand rotation of the starter motor for releasing a jammed starter pinion or for cleaning purposes.

If the action of the starter motor appears sluggish or erratic, the motor should be removed from its mounting and the screwed sleeve and pinion examined for dirt. If it is dirty the parts should be cleaned and a very light oil applied.



Shaft extension on the starter motor.

Regulator and Control Box

This is situated on the engine bulkhead, and houses the compensated voltage control unit and cut-out. It is reached by lifting the left-hand side of the bonnet.

The object of the voltage control unit is to ensure that the dynamo supplies an adequate charge to the battery under all conditions. For example, when the lights are on a considerable strain is imposed on the battery and the dynamo charges automatically at a high rate. When the lights are off it will be obvious that the strain on the battery is considerably less, and consequently the charging rate will also have to be less. This state is automatically controlled by the regulator, which provides a high charge when the battery is being heavily loaded or is discharged, and a low charge when the battery is lightly loaded or fully charged.

Note.—The regulator is very carefully and scientifically set by the manufacturers, and on no account should any adjustment be made to this device.

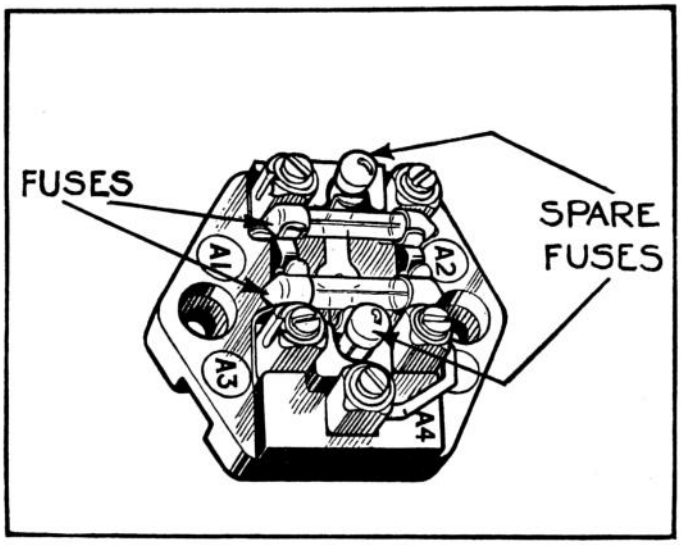
Fuses

Two fuses are housed in the fuse box, one being across the A3 and A4 terminals and controlling the stop-lamp, Trafficators, petrol gauge and wiper motor. This is a 35-amp. fuse.

The fuse across terminals A1 and A2 controls the horns and is of 50-amp. value.

Two spare fuses are provided.

A blown fuse will be indicated by a failure of the circuits which it controls, and by a visual examination of the fuse itself, the broken ends of the wire being clearly visible. If after immediately renewing a fuse it blows again, it is obvious



The fuse box.

that there is a serious short circuit or other fault in the wiring system, and careful examination must be made for anything untoward. If nothing wrong can be seen, the Lucas Service Agent should be permitted to examine the car and rectify the trouble.

Always use the correct replacement fuse. The amperage is marked on the paper slip inside the fuse.

LAMPS

Headlamps

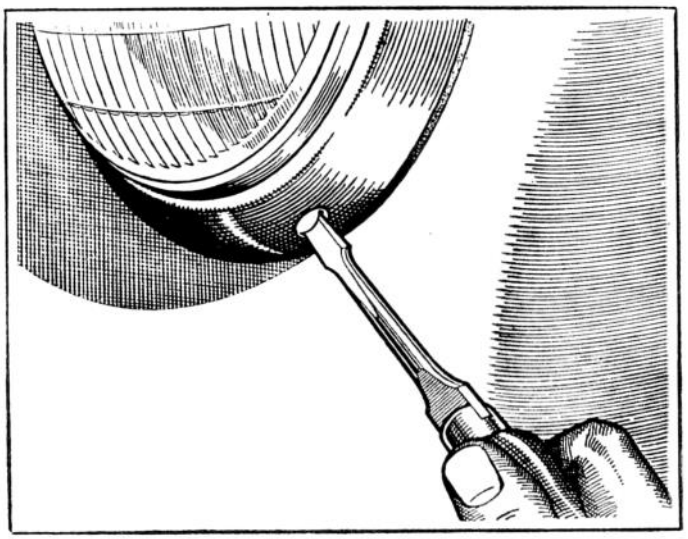
These are of special design, and the procedure for removing a reflector to change a bulb is as follows :—

(1) Remove the lamp rim by extracting the screw on the lower side of the lamps—the rim can then be lifted off. Remove the rubber sealing ring.

(2) Remove the reflector unit complete by pushing it inwards against the tension of the attachment springs and turning anti-clockwise so that the heads of the attachment screws pass through the enlarged ends of the slots in the rim.

(3) Remove the socket carrying the leads ; this is a bayonet fitting.

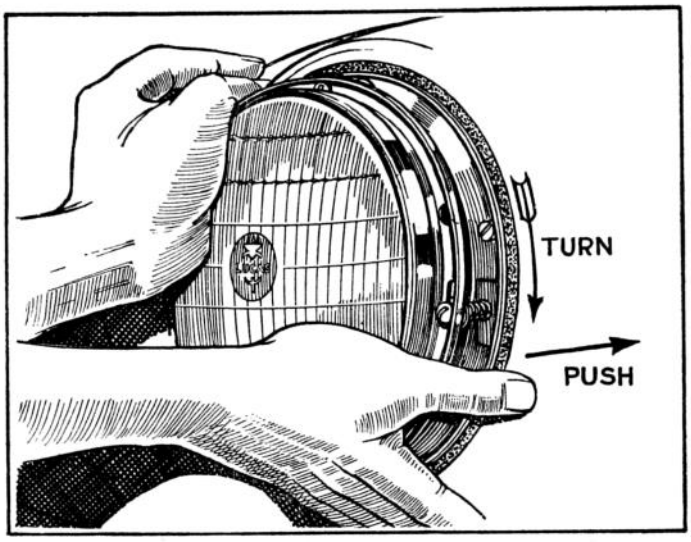
(4) Pull out the bulb from the bulb holder.



The lamp front is released by slackening the rim clamp screw as shown.

The procedure is reversed for assembly, but care must be taken to see that the slot in the bulb flange engages the tongue in the bulb holder.

An adjusting screw is provided to enable the headlamps to be set in a vertical plane to give a horizontal beam, and two adjusting screws at the side of the lamp unit enable the beam to be controlled in the horizontal plane.



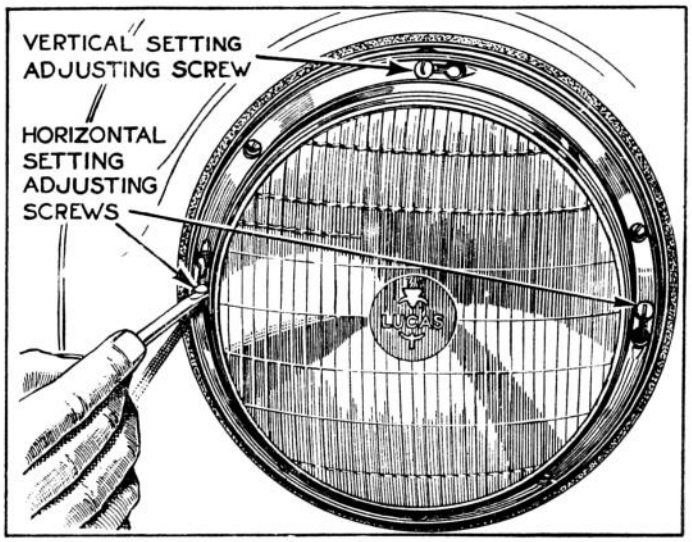
When removing or replacing the light unit it must be pushed towards the wing to compress the springs of the attachment screws. The action of replacing the light unit is here shown. Removal is effected by rotation in the opposite direction.

Sidelamps

Removal of the screw on the top of the lamp will permit the removal of the glass. The bulb has a bayonet fitting.

Tail-lamps

The cover is held in place by a screw, removal of which allows the cover to be opened. The bulbs have a bayonet fitting.



The headlamp beams are set by means of the spring-loaded attachment screws locating the light unit.

Fog-lamps

The procedure for replacing a bulb and for adjusting the beam is the same as that detailed for the headlamps.

Replacement of Bulbs

When replacing a bulb, it is important that bulbs of the same size and type are fitted, and that the bulb will focus properly in the reflector. Cheap and inferior bulbs often have a filament of such a shape that it is impossible to obtain the correct focus, and this will, of course, result in a loss of efficiency. A list of the bulbs will be found on pages 5 and 6.

Windscreen Wipers

The windscreen wiper motor is packed with grease during assembly, and no adjustment is required. The motor should require no attention, the only parts to require renewal after some considerable time being the wiper blades, which can be replaced at small cost when they become inefficient.

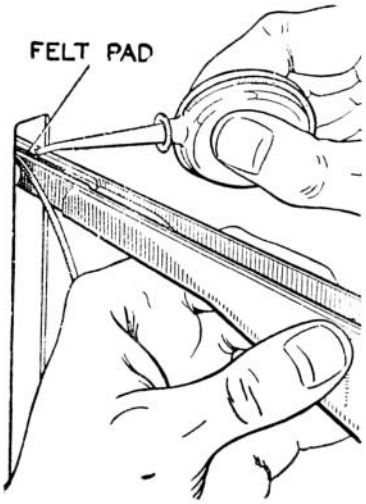
The Ammeter

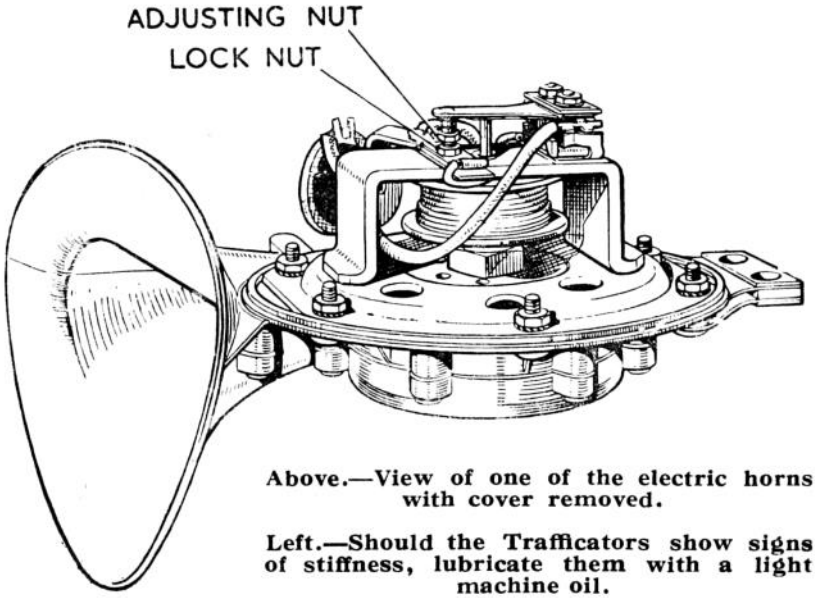
This is mounted on the dash, and its purpose is to indicate the rate of charge delivered to the battery. However, as explained in a previous paragraph, the dynamo is of the compensated voltage control type and the ammeter readings may vary considerably even at the same road and engine speeds. Since the dynamo charges at a high rate until the battery regains its fully charged condition, this is shown on the ammeter by a gradual decrease in the charging rate.

Trafficators

These are operated by a small lever at the centre of the steering wheel and are of the self-cancelling type.

To change a bulb the arm should be raised and the small screw at the end removed; the cover-plate can then be removed by lifting the cover upwards and outwards. The festoon bulb holder will then be exposed.





Above.—View of one of the electric horns with cover removed.

Left.—Should the Trafficators show signs of stiffness, lubricate them with a light machine oil.

Coil Ignition

This will give satisfactory service for very long periods without need for adjustment. Lubrication should be carried out at the intervals stated, but while the equipment is functioning satisfactorily it is not necessary for any additional maintenance to take place beyond an occasional clean.

The following points should be lubricated each 3,000 miles or 5000 km. :—

(1) A few drops of thin oil should be inserted in the opening round the rotor spindle.

(2) If the rotor arm is lifted off the spindle the hollow centre will be exposed and a few drops of thin oil should be inserted. It is not necessary to remove the central fixing screw, as provision is made for the oil to pass between the screw and the inner face of the spindle.

(3) A smear of engine oil or light grease should be applied to the contact breaker pivot, and to the cam faces.

Note.—During this lubrication process care should be taken to see that no oil or grease reaches the contact points.

Cleaning Distributor

All parts of the distributor should be cleaned at intervals of 3,000 miles or 5000 km. ; if necessary, a petrol-moistened rag should be used.

Special attention should be directed to the following points when cleaning :—

1. The space between the terminals.
2. The electrodes.
3. The rotor arm.
4. Freedom of the carbon brush in its holder.

The contact breaker should be closely examined and the contacts must be kept perfectly free of grease and dirt.

If the points appear dirty or discoloured they should be polished with a piece of fine carborundum stone or fine emery cloth. The moving contact can readily be removed for cleaning by releasing the spring attachment nut and lifting the fibre heel block off the pivot pin.

Checking and Setting the Contact Points

Turn the engine until the contact points are fully open and check the gap, which should be between ·014 in. (·36 mm.) and ·016 in. (·40 mm.).

To set the gap, the two securing screws, shown in the illustrations below, should be slackened off and the points set to the correct gap. Care should be taken to see that the screws are securely tightened after the gap has been set.

The Coil

The only attention this unit should receive is an occasional check to ensure that the terminals are tight and that the whole unit is clean, particularly between the terminals.

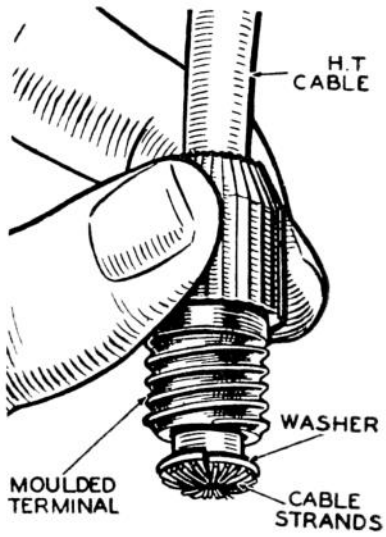
Location and Remedy of Faults

Although every precaution is taken to eliminate all possible causes of trouble, failure may occasionally develop through lack of attention to the equipment or damage to the wiring. The most probable faults are tabulated, according to the symptoms displayed, in the fault-finding tables on pages 54–57.

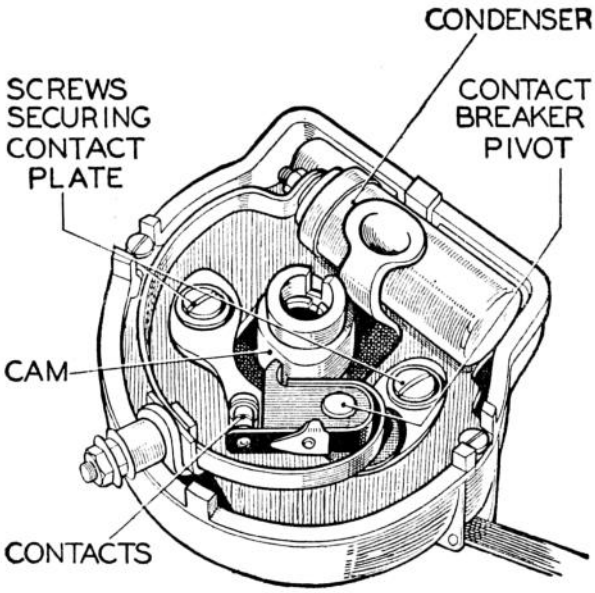
It is recommended that a systematic examination is made by following the suggestions in the fault-finding tables, as the sources of many troubles are by no means obvious. In some cases a considerable amount of deduction from the symptoms is needed before the cause of the trouble is disclosed.

For instance, the engine might not respond to the starter switch ; a hasty inference would be that the starter motor is at fault. However, as the motor is dependent on the battery, it may be that the battery is exhausted. This, in turn, may be due to the dynamo failing to charge, and the final cause of the trouble may be, perhaps, a loose terminal nut either at the battery or elsewhere in the charging circuit.

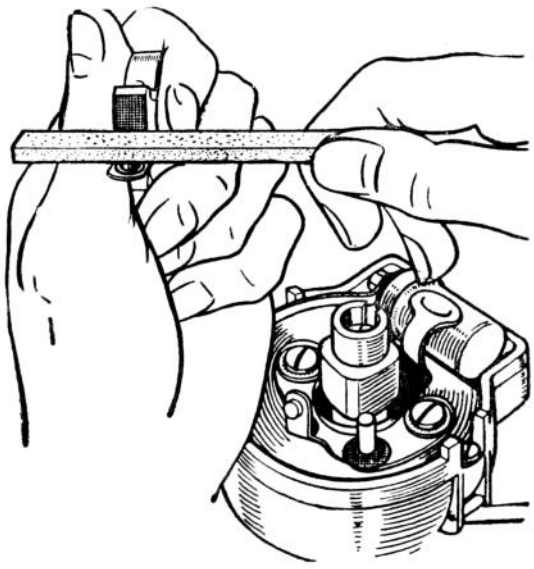
If, after carrying out the examination, the cause of the trouble is not found, get into touch with the nearest Lucas Service Depot.



Method of fixing the high-tension cable to the terminal.



The component parts of the contact breaker assembly.



Cleaning the contact breaker points by means of a piece of fine carborundum stone after releasing the moving contact.

HOW TO LOCATE AND REMEDY COIL IGNITION TROUBLE

Symptoms	*Possible Causes*	*Remedy*
Engine will not fire.	Battery discharged. Starter will not turn engine and lamps do not give good light.	Start engine by hand. Battery should be recharged by running car for a long period during daytime. Alternatively, recharge from an independent electrical supply.
	Controls not set correctly for starting.	See that ignition is switched on, and everything is in order for starting.
	Test if coil sparks by removing lead from centre distributor terminal and holding it about $\frac{1}{8}$ in. (3 mm.) away from some metal part of the chassis while engine is turned over. If sparks jump gap regularly, the coil and distributor are functioning correctly.	Examine the sparking plugs, and if these are clean and the gap correct, the trouble is due to carburetter, fuel supply, etc.
	If the coil does not spark, the trouble may be due to any of the following causes. *Fault in low-tension wiring.* Indicated by (1) No ammeter reading when engine is slowly turned and ignition switch is on; or (2) No spark occurs between the contacts when quickly separated by the fingers when the ignition switch is on.	Examine all cables in ignition circuit and see that all connections are tight. See that battery terminals are secure.
	Dirty or pitted contacts.	Clean contacts with fine carborundum stone or fine emery cloth and afterwards with a cloth moistened with petrol (gasoline).
	Contact breaker out of adjustment. Turn engine until contacts are fully opened and test gap with gauge.	Adjust gap to gauge.
Engine misfires.	Dirty or pitted contacts.	Clean contacts with fine carborundum stone or fine emery cloth and afterwards with a cloth moistened with petrol (gasoline).
	Contact breaker out of adjustment. Turn engine until contacts are fully open and test gap with gauge.	Adjust gap to gauge.
	Remove each sparking plug in turn, rest it on the cylinder head, and observe whether a spark occurs at the points when the engine is turned. Irregular sparking may be due to dirty plugs or defective high-tension cables. If sparking is regular at all plugs, the trouble is probably due to engine defects.	Clean plugs and adjust the gaps to correct setting (·025 in. or ·63 mm.). Renew any lead if the insulation shows signs of deterioration or cracking. Examine carburetter, fuel supply, etc.

HOW TO LOCATE AND REMEDY LIGHTING TROUBLE

Symptoms	*Probable Fault*	*Remedy*
Lamps give insufficient illumination.	Battery discharged.	Charge battery either by a long period of daytime running or from independent electrical supply.
	Lamps out of alignment or bulbs incorrectly fitted.	Align lamps and fit bulbs correctly.
	Bulbs discoloured through use.	Fit new bulbs.
Lamps light when switched on but gradually fade out.	Battery discharged.	As above.
Brilliance varies with speed of car.	Battery discharged.	As above.
	Battery connection loose or broken.	Tighten connection or renew faulty cables.
Lights flicker.	Loose connection.	Locate loose connection and tighten.
Failure of lights.	Faulty cable or connection.	Examine wiring for faulty cable or connection and remedy.
	Battery discharged.	As above.
	Loose or broken connection.	Locate and tighten loose connection, or remake broken connection.

HOW TO LOCATE AND REMEDY TROUBLE WITH VOLTAGE CONTROL DYNAMO EQUIPMENT

Symptoms	*Possible Causes*	*Remedy*
Battery in low state of charge, shown by lack of power when starting. (Hydrometer readings less than 1·200.)	Dynamo not charging, indicated by ammeter not showing charge reading when running at about 20 m.p.h. (32 k.p.h.) with no lights in use. Due to :—	
	Broken or loose connection in dynamo circuit, or regulator not functioning correctly.	Examine charging and field circuits wiring. Tighten loose connection or renew broken lead. Particularly examine battery connections.
	Commutator greasy or dirty.	Clean with soft rag moistened in petrol (gasoline).
	Dynamo giving low or intermittent output, indicated by ammeter giving low or intermittent reading when car is running steadily in top gear. Due to :—	
	Loose or broken connections in dynamo circuit.	Examine charging and field circuits wiring. Tighten loose connections or renew broken lead. Particularly examine battery connections.
	Brushes greasy or dirty.	Clean with soft rag moistened with petrol (gasoline).
	Brushes worn or not fitted correctly.	Renew worn brushes. See that brushes "bed" correctly.
	Regulator not functioning correctly.	Have equipment examined by a Lucas Service Depot.
Battery over-charged, shown by burnt-out bulbs and very frequent need for topping up.	Dynamo giving high output, indicated by ammeter giving high charge reading. Due to :—	
	Regulator not functioning correctly.	Return regulator to Lucas Service Depot for attention.

HOW TO LOCATE AND REMEDY STARTER MOTOR TROUBLE

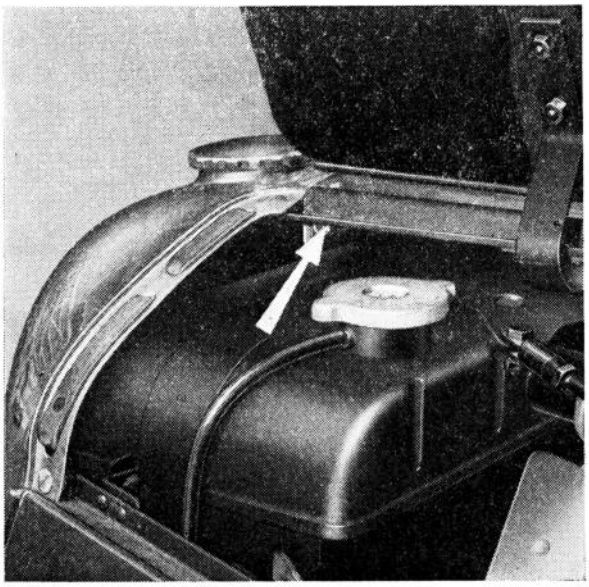
Symptoms	*Possible Causes*	*Remedy*
Starter motor lacks power or fails to turn engine.	Stiff engine, indicated by inability to turn by hand.	Locate and remedy cause of stiffness.
	If engine can be turned by hand, then trouble may be due to :—	
	Battery discharged.	Start by hand. Charge battery either by a long period of daytime running or from independent electrical supply.
	Broken or loose connection in starter circuit.	See that connections to battery, starter and starter switch are tight, and that cables connecting these units are not damaged.
	Starter commutator or brushes dirty.	Clean.
	Brushes worn or not fitting correctly.	Renew worn brushes. See that brushes " bed " correctly.
	Starter pinion jammed in mesh with flywheel.	Rotate squared end of starter shaft with spanner to free.
Starter operates, but does not crank engine.	Pinion of starter drive does not engage with flywheel, due to dirt on screwed sleeve.	Clean sleeve with paraffin and add a few drops of machine oil.
Starter pinion will not disengage from flywheel when engine is running.	Starter pinion jammed in mesh with flywheel.	Rotate squared end of starter shaft with spanner to free.

Decarbonisation

The longest and most complicated operation likely to be undertaken by the average owner is that of decarbonisation. It must be stressed that the initial decarbonisation should take place after 3,000 miles or 5000 km. have been covered. Naturally the frequency of subsequent decarbonisations will be dependent upon the type of country in which the car is being used and the type of running upon which the car is employed. For example, if a car is being used for fast, long, main road runs, the intervals will be greater than if it is being used in hilly country or exclusively for town work. In general, decarbonisation should take place between 6,000 miles and 8,000 miles or 10000 and 13000 km. One sure indication that the engine needs decarbonising is when a marked falling off in power and a marked tendency to pinking is noted.

Before starting to decarbonise it is suggested that a large box or boxes be obtained in which to place the parts that are to be removed. It is a good plan to have two or three small boxes, such as tobacco tins, in which to place nuts, washers and other small parts which otherwise have a habit of getting lost. It is advisable to have a metal tray, such as a baking dish, in which to wash the various parts. It is also advisable to make sure that all tools are to hand, and that you have a good supply of clean cloth, some paraffin, all necessary gaskets and joints and a clean stiff brush. Having obtained these necessary accessories, the sequence of operations is as follows :—

1. Remove the bonnet by slackening the two nuts attaching the bonnet centre to the radiator and removing the two attaching it to the scuttle.
2. Remove the radiator steady rods.
3. Drain the water from the radiator and the cylinder block.
4. With your brush, paraffin and rags, clean the cylinder head and its surrounding parts so that the unit is clean before work is started on the dismantling process.
5. Remove the throttle control rod from the carburetter.

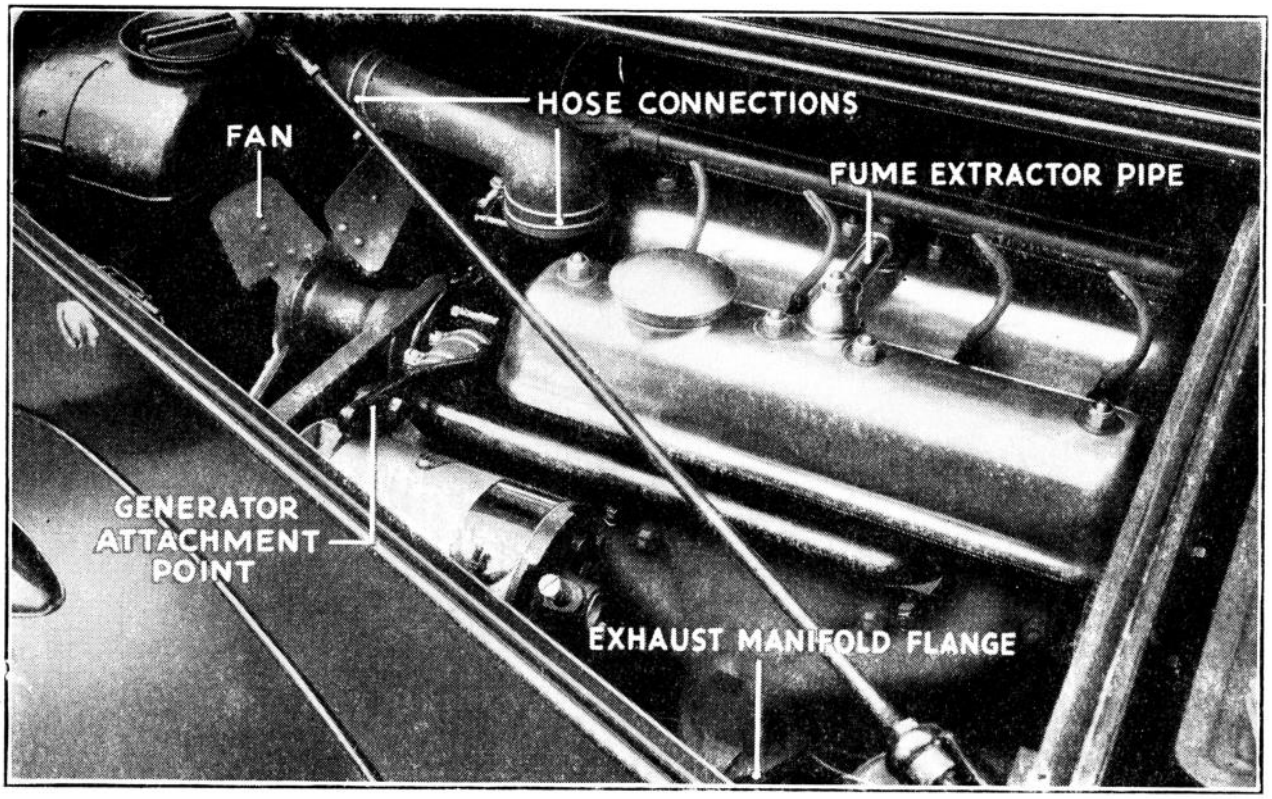


METHOD OF REMOVING THE BONNET

Above.—At the forward end of, and underneath, the centre panel are two nuts which require slackening off only. The panel is slotted at this point.

Above.—At the rear end of, and underneath, the centre panel are two nuts which must be removed prior to detaching the complete bonnet.

6. Disconnect the mixture control rod.
7. Remove the fuel line from carburetter to fuel pump.
8. Remove the carburetter and air filter.
9. Remove the induction manifold and hot-spot tubes.
   Difficulty may be experienced at this point in removing the hot-spot tubes, due to carbon formation in the exhaust manifold. If a screwdriver is inserted behind the aluminium casting, the casting and hot-spot tube should come free with a moderate pressure on the screwdriver. If this fails to move the pipes you should contact your local Distributor for the loan of a special extractor.



Left-hand side of the engine.

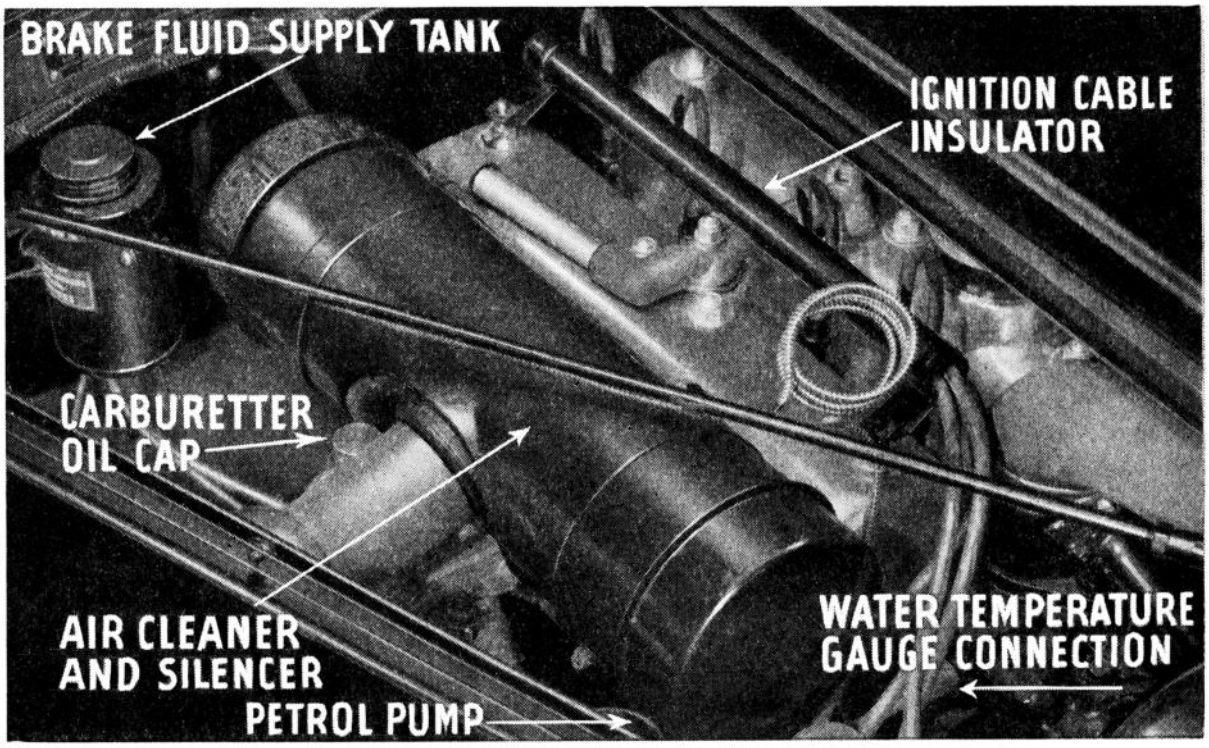
10. Remove the distributor head and ignition harness.
11. Disconnect the two water hose connections :
    (*a*) At the thermostat.
    (*b*) On the under side of the pump.
12. Remove the fan blades ; this is to prevent unnecessary damage when the head is removed.
13. Disconnect the water temperature capillary tube.
14. Remove the fan belt from the pump pulley.
15. Remove the bolt from the dynamo slotted adjuster, slacken off the dynamo mounting bolt and swing the dynamo clear of the exhaust manifold.
16. Disconnect the exhaust pipe at the manifold.
17. Remove the cross-flow water pipe.
18. Remove the exhaust manifold.
19. Remove the rocker covers.
20. Remove the cylinder head holding-down nuts, care being taken to see that each nut is very slightly slackened off before complete removal of any individual nut.

21. Remove the cylinder head.

Note.—The cylinder head should be removed with the push-rods in place. The push-rods are so designed that the concave end, where contact is made with the rocker, is larger than the tube through which the push-rod operates; thus it will be seen that the push-rods will not fall beyond the opening. Care should be taken to place the cylinder head on its side when it is removed to the bench, otherwise there is danger of bending the push-rods. Push-rods may be removed from the cylinder head by moving each rocker aside, in turn, and withdrawing the rods from the top of the head.

Each rod should be marked so that it may be replaced on the tappet from which it was removed.

When reassembling the head, the push-rods should be fitted in the following manner:—The rocker should be moved to one side against the spring pressure and the push-rod inserted. If a downward pressure is then applied to the valve, the rocker can then be moved into its correct position. During both of these operations great care must be taken to ensure that the push-rods are not bent.



Right-hand side of the engine.

22. Remove the cylinder head gasket.

Note.—If, during this dismantling process, any of the packing washers or gaskets become damaged, it is essential that they be renewed, otherwise a poor performance will result.

Operations on the Cylinder Head

Having removed the cylinder head and placed it on the bench, it is necessary to remove the valves. These can be removed by various methods of improvisation, but the whole procedure will be simplified and be more satisfactory if a valve spring compressor be used.

When dealing with valves and springs it is essential that they be segregated so that they may be replaced in the positions from which they were removed.

Having extracted the valves, the stems should, if necessary, be cleaned with very fine emery cloth, an up-and-down motion being employed, with the emery cloth held between the finger and thumb.

Carbon should then be removed from the valve head with a knife or similar instrument, and then the head polished with emery cloth. Having cleaned the valves, the cylinder head should be cleaned in a similar manner; naturally, the plugs should be taken out prior to this operation.

When cleaning the head make sure that you do not forget to clean out the exhaust and inlet passages.

With the head perfectly clean, the next thing to do is to grind in the valves, and for this a special tool may be obtained from most Dealers.

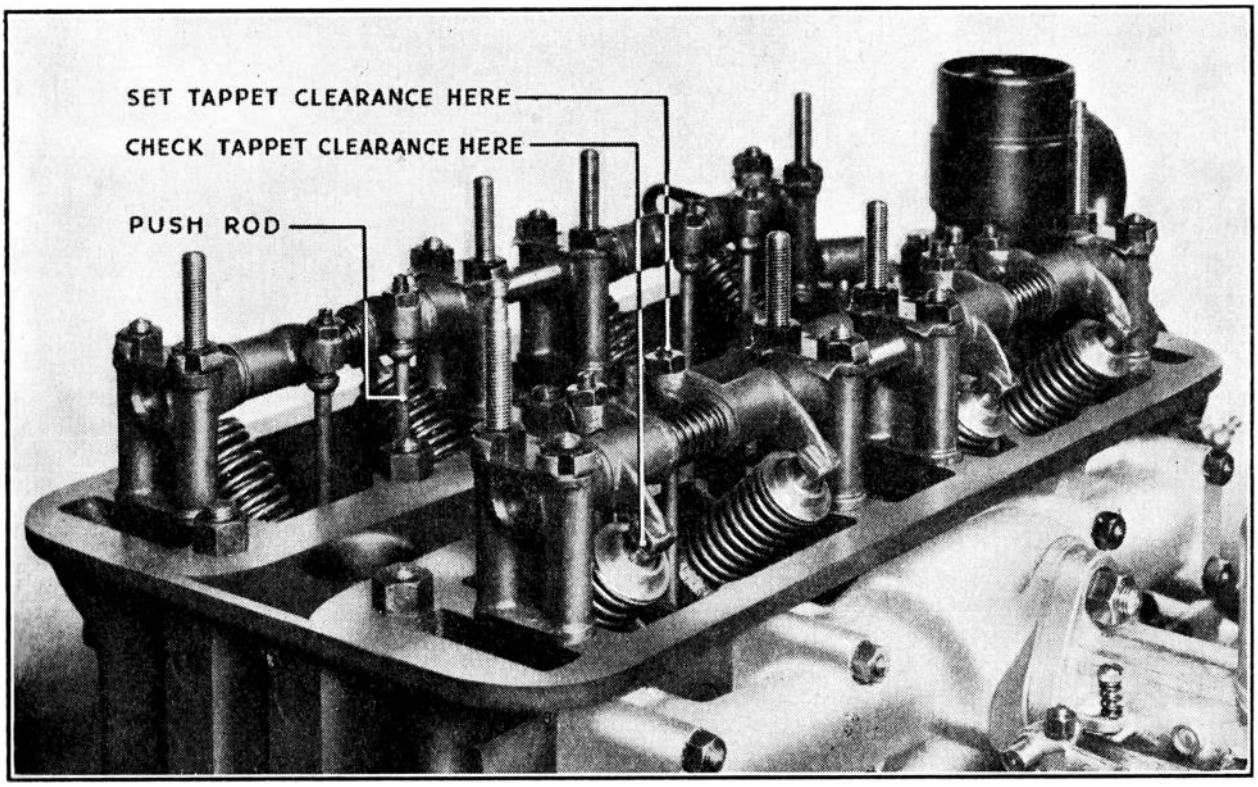
The object of grinding in the valves is to remove all surface imperfections in order to ensure a perfect gas-tight joint between the valve and its seating. To achieve this it is necessary that a grinding paste be used; this paste is obtainable in two grades, coarse and fine, but in general it should only be necessary to use the fine paste.

If the valves and seatings are badly pitted or distorted, they should be refaced with a special refacing cutter to avoid unnecessary grinding away of the seating in the head.

The bevelled edge of the valve should be lightly smeared with paste, care being taken to see that none gets on the valve stem, and then the valve replaced in its guide.

Next, the special tool should be fitted to the valve and the valve rotated back and forth—that is, with a reciprocating motion—meanwhile keeping a light pressure on the valve head.

The valve should be raised occasionally and moved into a different relative position, and the motion repeated. This procedure is to ensure perfect distribution of the grinding paste and so prevent the formation of grooves in the valve and its seating.



General view of the cylinder head, showing the valve gear.

The valve should be ground until a continuous narrow ring is visible; it is not necessary to obtain a broad seating.

After removing all traces of grinding compound, the valve should be assembled in the head, after engine oil has been applied to the stem.

Should difficulty be experienced in keeping the valve collets in place whilst refitting, they may be smeared with grease to act as a retaining medium.

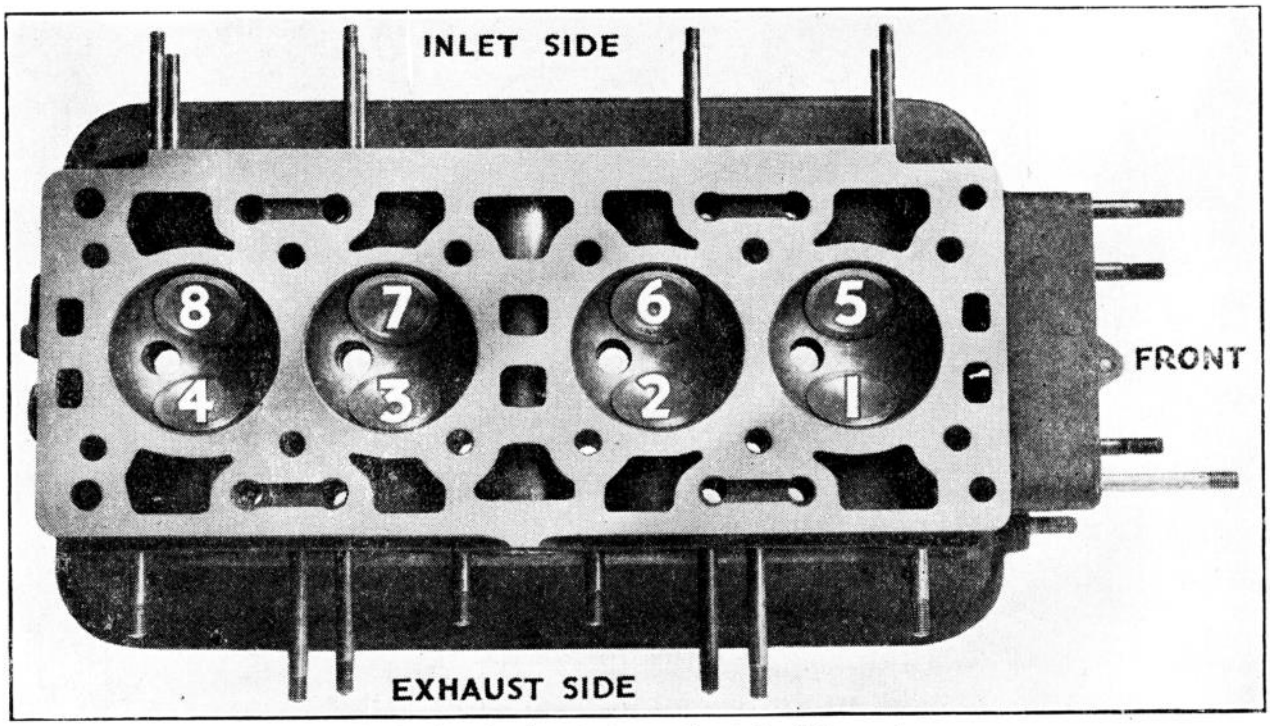
Note.—The valve heads are numbered so that there should be no confusion as to their correct position in the head.

After having finished with the cylinder head, attention should be directed to the piston crowns.

Turn the engine until any two of the pistons are at the top of their strokes, and then block up the remaining cylinders with clean rag so that dirt and carbon do not find their way into the bores.

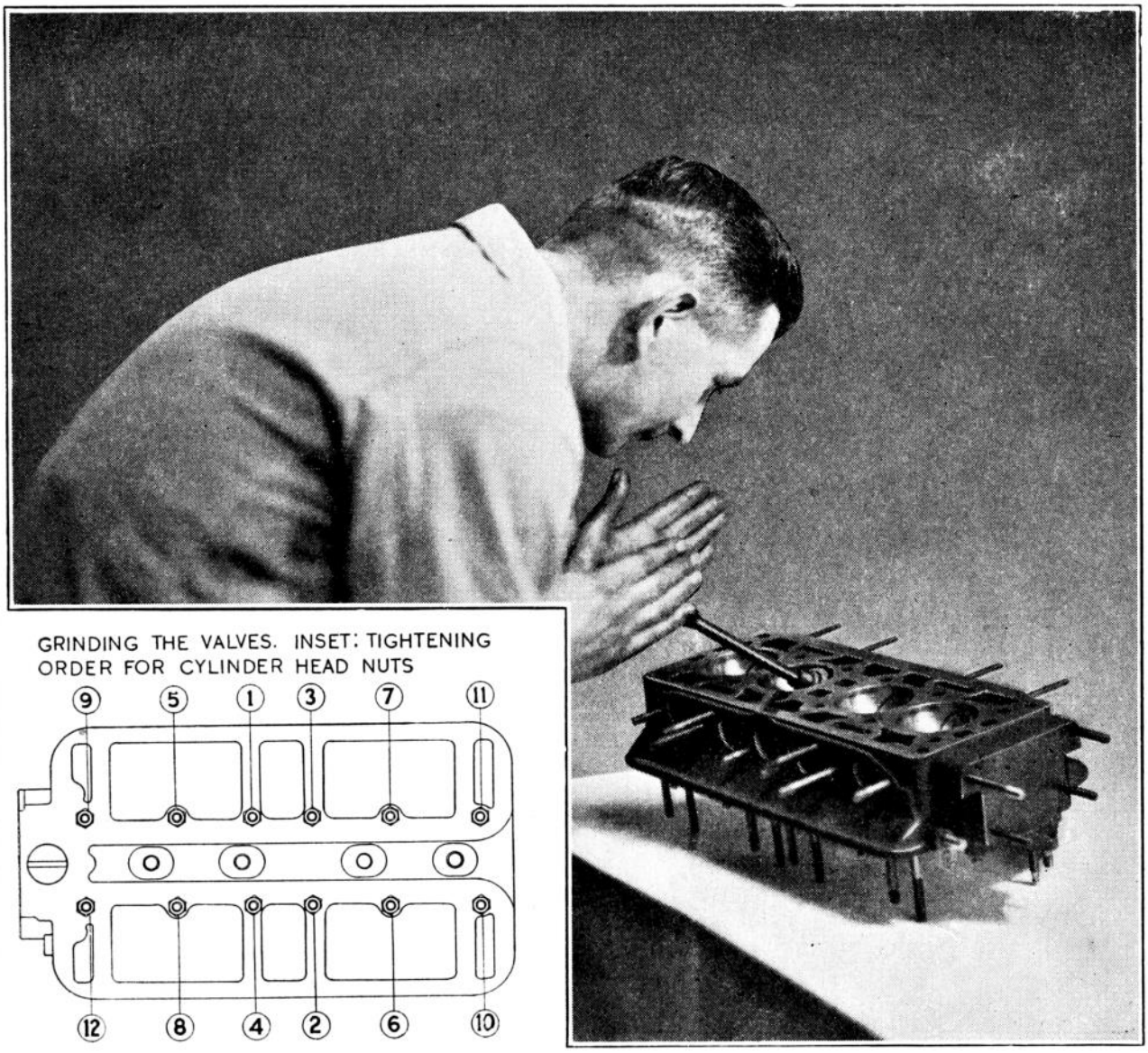
Do not on any account use a sharp tool to remove the carbon from the pistons, because this will cause scratches unless great care is taken. These scratches will cause carbon to adhere more readily and will render subsequent carbonising more rapid.

The tops of the pistons should never be polished with emery cloth because of the danger of fine particles of emery finding their way between the piston and cylinder wall, and causing unnecessary wear between piston and cylinder. When all pistons have been cleaned and all traces of loose carbon removed, a small amount of engine oil should be placed in each cylinder bore.



Cylinder head, showing numbering of the valves.

Having ascertained that the faces of the cylinder head and block are perfectly clean, also that the gasket is undamaged, the next operation is the fitting of the cylinder head. This should be replaced and securely tightened down, great care being taken to ensure that the nuts are tightened in the order shown in the diagram on page 63. As soon as the head has been tightened down, the sparking plugs should be replaced, otherwise foreign matter may find its way into the cylinder bores. Assembly is largely a reversal of the dismantling process, and the points noted on page 63 are worthy of attention.



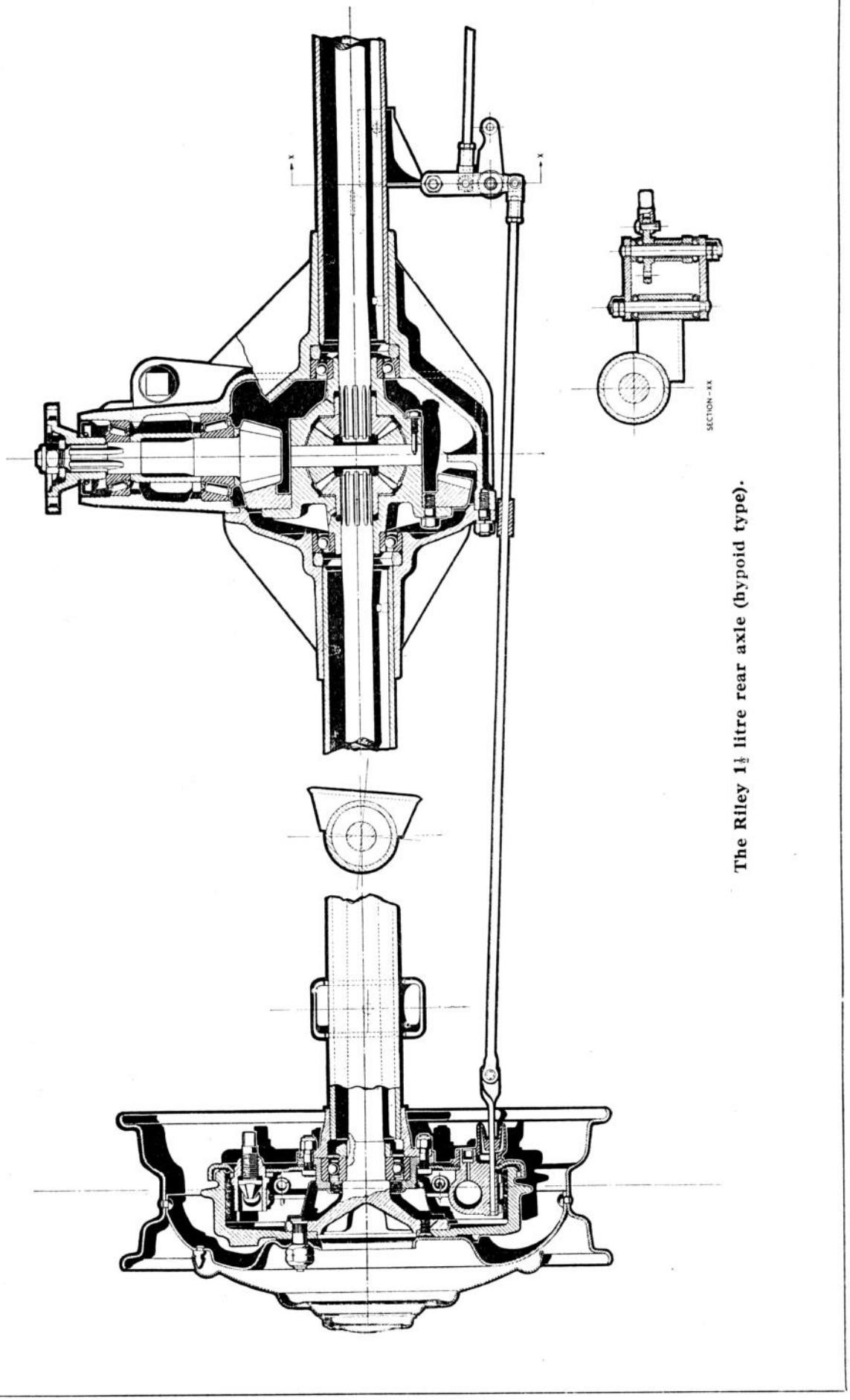
GRINDING THE VALVES. INSET: TIGHTENING ORDER FOR CYLINDER HEAD NUTS

1. Make quite sure that you fit the cylinder head gasket correctly, otherwise vital water passages will be obstructed.
2. If any of the gaskets are damaged, renew them at once.
3. Make sure that the induction manifold gasket is perfectly clean, and lightly coat each face with jointing compound.
4. When refitting the hot-spot pipes, leave the exhaust manifold loose—this will facilitate assembly.

Note.—Do not forget to fill the cooling system with the correct amount of water.

Naturally, as a result of grinding in the valves, the tappets will need setting. The procedure is to set them roughly with the engine cold and then start up the engine and run it until it has attained its normal working temperature. The tappets should then be set to their correct clearance, which is ·015 in. (·38 mm.) on both the inlet and exhaust valves.

After the car has run approximately 100 miles (160 km.), the rocker covers should be removed and a check made on the tightness of the cylinder head holding-down nuts; the tappets should then be re-checked and, if necessary, reset. It is also worth while at this point to check the tightness of both the inlet and exhaust manifolds.

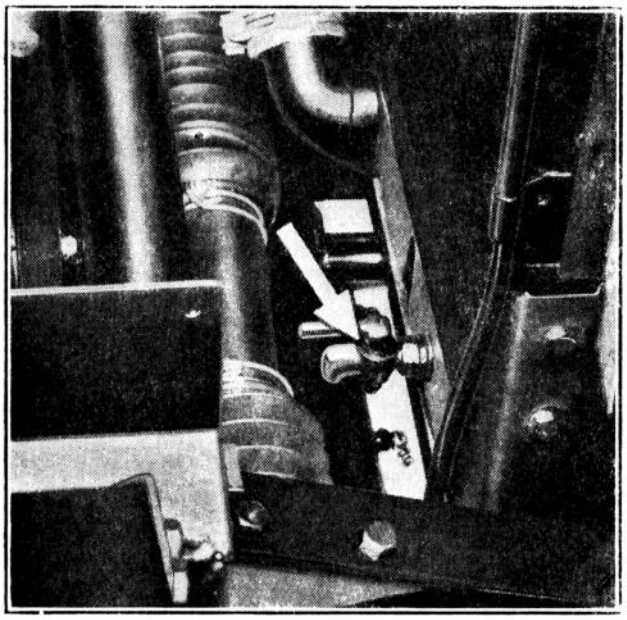


The Riley 1½ litre rear axle (hypoid type).

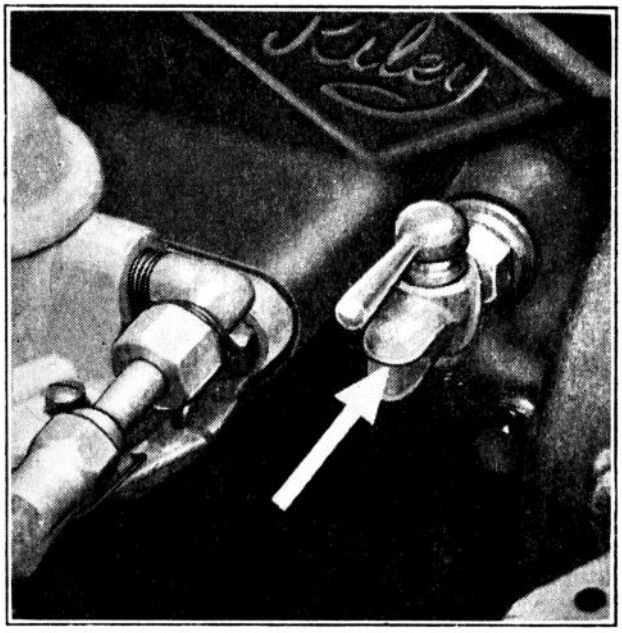
Cooling System

Care of the cooling system is as important as care of all the other systems that go to make up your car.

The more common causes of trouble that are experienced are due to rust, corrosion and the formation of scale. This happens very slowly, and in time small particles of foreign matter will adhere to the inside of the cylinder jackets, thereby preventing the proper transfer of heat from the engine to the cooling water. Occasionally small particles will break away and be carried along in the cooling water; this would not be dangerous but for the fact that they will clog the radiator tubes, the gaps in which are very small.



Left.—The location of the radiator drain tap on the right-hand side of the radiator block.



Right.—The location of the cylinder block drain tap just forward of the fuel pump.

There are two methods of preventing this trouble. The first is to use rain-water. If this is not possible, tap-water, to which has been added a suitable rust inhibitor, should be used.

It should be noted that the filler cap for the radiator is under the bonnet, on the left-hand side of the car; the cap on the chromium-plated radiator shell is for appearance only. The system has two draining points :—

1. *Radiator Drain.* This is located at the back of the radiator and on the right-hand side.

2. *Cylinder Block Drain.* This is located on the right-hand side of the engine, at the front of the cylinder block.

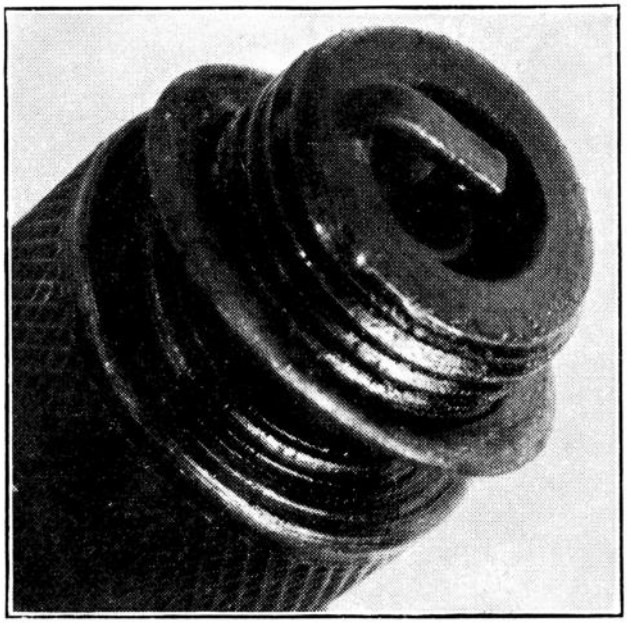
Note.—The drain tap on the radiator does not allow the system to drain completely, due to the position of the water pump, and it is therefore essential that both taps should be used. It is also essential to remove the radiator filler cap to allow air to enter the system and thus allow the water to flow freely.

Sparking Plugs

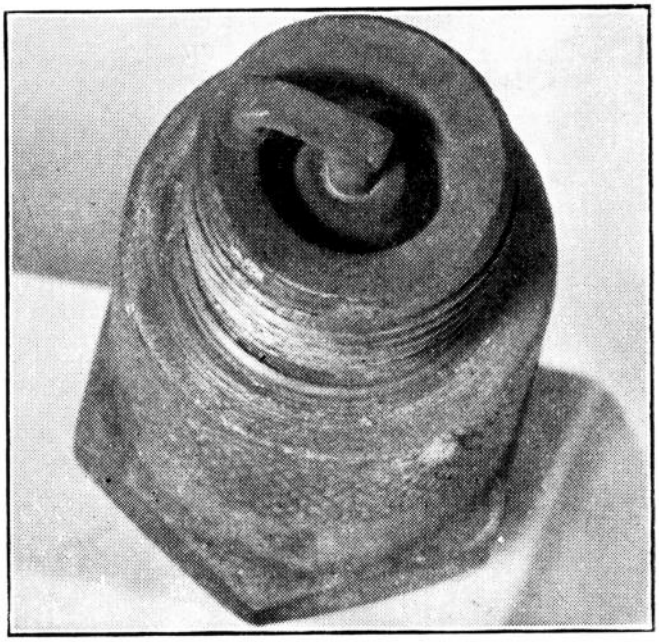
The full importance of periodic sparking plug inspection and cleaning cannot be too strongly stressed, as your sparking plugs play a vital part in the performance of your engine. We suggest that plugs be inspected and cleaned each time you have the engine oil changed, and, in order to maintain your Riley engine at the peak of its performance, that you fit a new set of Champion L.10.S sparking plugs as soon as the efficiency of the plugs has become lowered, as shown on an electrical tester.

Shows a clean and efficient sparking plug.

A fouled and inefficient plug which will waste power and fuel.



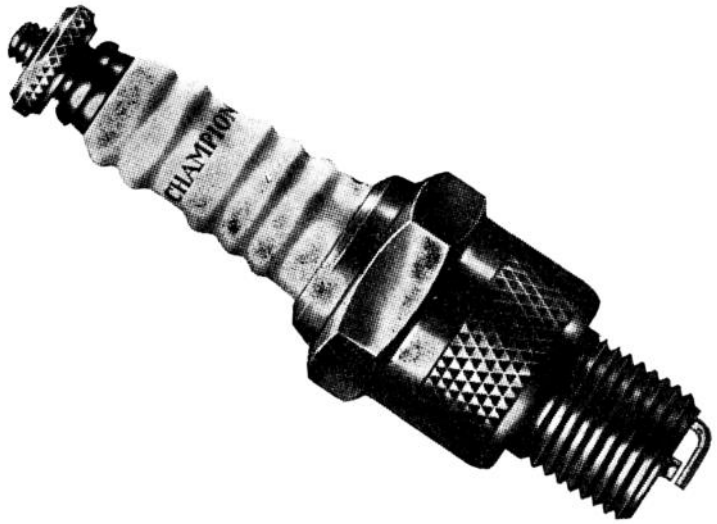
This plug shows signs of oil-fouling, indicated by a wet, shiny black deposit on the insulator. This type of fouling may be caused by worn pistons, cylinders or gummed-up piston rings.



Above is shown a plug which has become fouled by a dry, fluffy black deposit and indicates faulty carburation or a defect in the ignition system.

There is little to be gained by experimenting with different plugs as those fitted as standard are best suited to the requirements of the engine and are the result of lengthy experience by the makers.

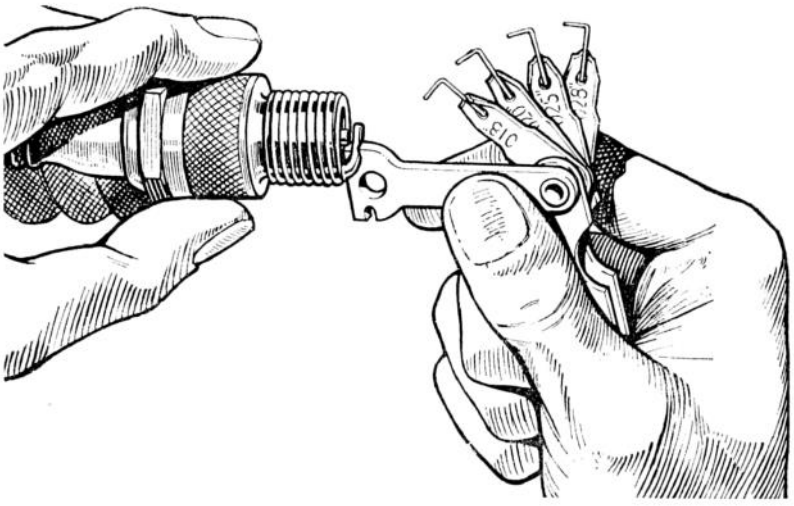
The gap between the points should be ·025 in. (·63 mm.). When adjusting the gap always move the side wire—never bend the centre wire.



The Champion sparking plug.

The Champion Sparking Plug Co. supply a special combination gauge and setting tool, the use of which is recommended.

To save fuel and ensure easy starting the plugs should be cleaned and tested at regular intervals of 3,000 miles (5000 km.), preferably by a garage with air blast equipment.



The special setting tool with gap gauges obtainable from Champion sparking plug stockists.

Every 12,000 miles (20000 km.) the plugs should be replaced by new ones to maintain engine efficiency. When refitting plugs make sure the copper washers are in good condition and screw the plug down by hand as far as possible before finally tightening down with a box spanner.

Take care not to damage the insulator.

Tracing Troubles

Engine Will Not Start

1. No fuel at the carburetter. This may be due to one or several of the following causes :—
   (*a*) No fuel in the tank.
   (*b*) Fuel pump damaged, leaking or not working.
   (*c*) An air lock in the fuel system.
   (*d*) Choked fuel line.
   (*e*) Choked filter.
2. Carburetter piston sticking.
3. Sparking plugs fouled with carbon or oiled up.
4. Sticking valves.
5. Damaged ignition leads. Look for :—
   (*a*) Cracks in the rubber casing.
   (*b*) Loose connection between the coil and distributor.
   (*c*) Oil on the leads.
6. Contact breaker points dirty or loose, the remedy being :—
   (*a*) Clean with fine emery cloth.
   (*b*) Wash with petrol (gasoline).
   (*c*) Reset to correct gap.
7. Defective coil, indicated by lack of sparking at the plugs.
8. Water or condensation on the plug leads.
9. Too rich a mixture, caused by too large a throttle opening for starting.
10. Discharged battery.
11. Condensation on plugs.

Engine Misfires

1. High speeds only.
   (*a*) Sparking plugs fouled with carbon or oiled up.
   (*b*) Fuel shortage.
   (*c*) Sticking valves. If inlet, a spitting back through the carburetter will be noted ; if exhaust, detonation in the exhaust pipe and silencer will occur.
   (*d*) Contact breaker points loose or dirty.
   (*e*) Loose ignition leads.
   (*f*) Incorrect tappet clearances.
2. Low speeds only.
   (*a*) Tappet clearances incorrect.
   (*b*) Air leaks in the induction system.
   (*c*) Carburetter slow-running setting is incorrect.
   (*d*) Battery run down.
3. All speeds.
   (*a*) Plugs fouled with carbon or oiled up.
   (*b*) Tappet clearances incorrect.
   (*c*) Sticking valves.
   (*d*) Warped valve or valves.
   (*e*) Fuel shortage.
   (*f*) Loose ignition leads.
   (*g*) Contact breaker points loose or dirty.
   (*h*) Too rich a mixture (indicated by " hunting ").

Engine Runs Hot

1. Insufficient water in the cooling system.
2. Thermostat not operating.
3. Broken fan belt.
4. Radiator blocked.
5. Mixture control maintained in rich position.
6. Incorrect lubrication.
7. Weak mixture setting.
8. Ignition incorrectly set.
9. Weak valve springs.
10. Pitted, worn or distorted valve seats.
11. Worn piston and/or piston rings.
12. Choked exhaust system.

Engine Lacks Power

1. Fouled sparking plugs.
2. Lack of oil.
3. Carburetter incorrectly set.
4. Tappet clearances either too great or too small.
5. Weak valve springs.
6. Sticking valves.
7. Brakes binding.
8. Worn piston and/or piston rings.
9. Excessive carbon deposit.
10. Pitted valve seats.
11. Punctured carburetter float.
12. Choked exhaust system.

Engine Stops Suddenly

1. Lack of fuel.
2. Ignition failure.
   (*a*) Broken lead at switch.
   (*b*) Broken lead from the distributor to coil.
   (*c*) Failure of coil.
3. Choked jet.

Spitting Back in Carburetter

1. Weak mixture.
2. Sticking inlet valve or valves.
3. Air leaks in the induction system.
4. Inlet tappets set incorrectly.
5. Plug gaps set too wide.

Banging in Silencer

1. Sticking exhaust valve or valves.
2. Leak in the exhaust system.
3. Rich mixture.
4. Throttle not fully shutting.

Lights Fail

1. Bulb or bulbs blown.
2. Fuse or fuses blown.
3. Loose battery lead.
4. Battery discharged.

Excessive Oil Consumption

1. High crankcase pressure, due to :—
   (*a*) Blocked breather.
   (*b*) Broken and/or worn piston rings.
   (*c*) Worn pistons.
2. Oil leaking.

Excessive Fuel Consumption

1. Fuel leaks at the various unions and at carburetter.
2. Damaged fuel pump.
3. Ignition set with insufficient advance.

Excessive Tyre Wear

1. Incorrect pressures.
2. Harsh driving methods.
3. Setting of the front wheels and the steering alignment incorrect.

Unusual Noises

Should you hear a noise of an unusual character it is foolish to run the car in the hope that this noise will cure itself. A noise or rattle generally indicates that something is broken or has become worn, and the car should be inspected at once by your Riley Dealer.

Maintenance Summary

Every 250 miles or 400 km. : Check oil level in engine sump, and top up if necessary (page 13) with oil to Ref. A (page 17).

After the first 500 miles or 800 km. : Drain oil from engine, gearbox and rear axle and refill with fresh oil (pages 13, 14 and 15).

Every 500 miles or 800 km. : See that the wheel nuts are tight. Check level of water in radiator—this should be $\frac{1}{2}$ in. (12 mm.) below the filler neck. Test tyre pressures.

Every 1,000 miles or 1600 km. : Apply grease gun filled with grease to Ref. D to grease nipples at (*a*) sliding joint at front end of propeller shaft and the two propeller shaft universal joints, (*b*) the universal joint on the intermediate shaft, (*c*) four points on steering swivels, (*d*) four points on steering track-rods (page 15), (*e*) one point on the brake cross-shaft

Apply the grease gun filled with grease to Ref. C to the nipple on the water pump body and give two strokes.

Inspect oil levels in gearbox and rear axle, and replenish if necessary (pages 14 and 15).

Remove oil cap from top of carburetter and add engine oil to Ref. F to dashpot.

In addition to the above, oil and grease regularly the points indicated on page 19 under "General Notes on Lubrication."

Inspect fluid level in brake master cylinder and replenish with Girling brake fluid or Wakefield W.D. 3.

Top up battery with distilled water.

Every 3,000 miles or 5000 km. : Drain oil from engine and refill with fresh oil (page 13).

Apply oil to Ref. F to distributor rotor arm spindle and advance mechanism ; apply a smear of engine oil or thin grease to Ref. D to contact breaker pivot (page 52) and cam face.

Clean and re-oil the air cleaner (page 27) (Overseas).

Clean and test sparking plugs (page 66).

Carry out initial decarbonisation (page 58) after first 3,000 miles.

Unscrew dynamo lubricator, half-fill cap with grease to Ref. C and replace (page 18).

Check dynamo belt tension (page 48). Check contact breaker gap (page 52).

Every 6,000 miles or 10000 km. : Check the "Torsionic" independent front suspension (page 30).

Give one stroke of grease gun filled with grease to Ref. C to grease nipple on hand brake cable.

Drain oil from gearbox and rear axle and refill with fresh oil.
Remove filter from carburetter. Clean and replace (page 42).
Fit new engine oil filter (page 27).
Check valve clearance (page 6).
Remove front hub caps and repack with grease to Ref. C (page 15).
Tighten spring seat bolts and door hinge fixing screws.
Apply grease gun to door hinges.
Lubricate Trafficators (page 18).
Clean and re-oil the air cleaner (Home).

Every 6,000–8,000 miles or 10000–13000 km.: Decarbonise the engine (page 58).

Every 12,000 miles or 20000 km.: Remove and clean out the engine sump (page 14); examine dynamo and starter brushes (page 48).
Check action of shock absorbers and fit new ones if defective.
Renew sparking plugs (page 66).
Adjust clutch pedal clearances (page 33).

Every 30,000 miles or 50000 km.: Pack steering gearbox with grease to Ref. D (pages 29 and 31).

Correct Postal Address

For Home enquiries:

RILEY MOTORS LIMITED
ABINGDON-ON-THAMES
BERKSHIRE

Telephone ... ... ABINGDON 251–2–3–4
Telegrams ... ... RILEY, ABINGDON

For Overseas enquiries:

NUFFIELD EXPORTS LIMITED
COWLEY, OXFORD
ENGLAND

Cables ... ... MOREX, OXFORD, ENGLAND
Telephone ... ... 77733 OXFORD, ENGLAND
Telex ... ... OXFORD TELEX 77168

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NOTES

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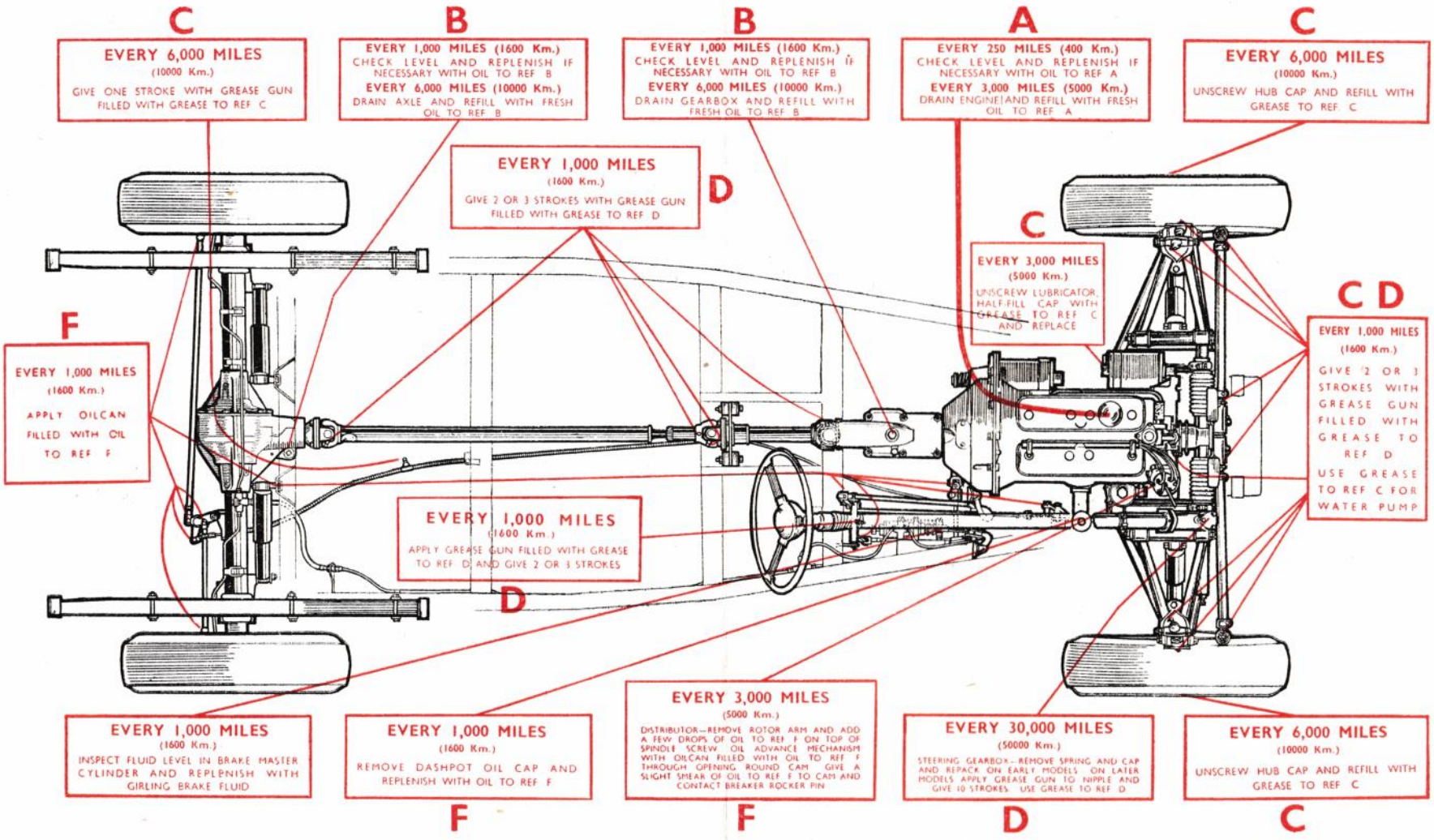
Key to Recommended Lubricants

	A			B		C	D	E	F
Component	Engine and Air Cleaner			Gearbox, Steering Gearbox and Rear Axle (Hypoid Gears)		Wheel Hubs and Fan Bearings	Chassis Greasing Nipples, etc.	Cables and Control Joints	Oilcan and Carburetter
Climatic Conditions	**Tropical and temperate down to 32° F. (0° C.)**	**Cold and extreme cold down to 0° F. (−18° C.)**	**Arctic below 0° F. (−18° C.)**	**Tropical and temperate down to 10° F. (−12° C.)**	**Extreme cold below 10° F. (−12° C.)**	**All conditions**	**All conditions**	**All conditions**	**All conditions**
"MOBILOIL"	Mobiloil "A"	Mobiloil "Arctic"	Mobiloil 10 W	Mobilube "G.X." 90	Mobilube "G.X." 80	*Home*— Mobil Hub Grease *Export*— Mobilgrease No. 5	Mobilgrease No. 2 or 4	Mobilgrease No. 2 or 4	Mobiloil "Arctic"
B.P. "ENERGOL"	"Energol" S.A.E. 30	"Energol" S.A.E. 20	"Energol" S.A.E. 10	"Energol" E.P. S.A.E. 90	"Energol" E.P. S.A.E. 80	"Energrease" C.3	"Energrease" C.1	"Energrease" C.1	"Energol" S.A.E. 20
"SHELL"	"Shell" X—100 30	"Shell" X—100 20/20 W	"Shell" X—100 10 W	"Shell" Spirax 90 E.P.	"Shell" Spirax 80 E.P.	"Shell" Retinax A	"Shell" Retinax A	"Shell" Retinax A	"Shell" X—100 20/20 W
"FILTRATE"	Medium "Filtrate" 30	Zero "Filtrate" 20	Sub-Zero "Filtrate" 10	Hypoid "Filtrate" Gear 90	Hypoid "Filtrate" Gear 80	Super Lithium "Filtrate" Grease	Super Lithium "Filtrate" Grease	Super Lithium "Filtrate" Grease	Zero "Filtrate" 20
"STERNOL"	"Sternol" W.W. 30	"Sternol" W.W. 20	"Sternol" W.W. 10	"Sternol" Ambroleum E.P. 90	"Sternol" Ambroleum E.P. 80	"Ambroline" R.B. Grease	"Ambroline" M.M. Grease	"Ambroline" A.F. Grease	"Sternol" W.W. 20
"DUCKHAM'S"	Duckham's N.O.L. "Thirty"	Duckham's N.O.L. "Twenty"	Duckham's N.O.L. "Ten"	Duckham's Hypoid 90	Duckham's Hypoid 80	Duckham's L.B.10 Grease or H.B.B. Grease	Duckham's L.B.10 Grease or H.P.G. Grease	Duckham's L.B. 10 Grease or "Keenol" K.G. 16 Grease	Duckham's N.O.L. "Twenty"
"CASTROL"	"Castrol" X.L.	"Castrolite"	"Castrol" Z	"Castrol" Hypoy	"Castrol" Hypoy 80	"Castrolease" Heavy	"Castrolease" Medium	"Castrolease" Brake Cable Grease	"Castrolite"
"ESSO"	"Essolube" 30	"Essolube" 20	"Essolube" 10	"Esso" Expee Compound 90	"Esso" Expee Compound 80	*Home*— "Esso" Grease *Export*— "Esso" Bearing Grease	*Home*— "Esso" Pressure Gun Grease *Export*— "Esso" Chassis Lubricant	*Home*— "Esso" Pressure Gun Grease *Export*— "Esso" Chassis Lubricant	"Essolube" 20

THE RILEY 1½ LITRE LUBRICATION CHART



Every 3,000 miles (5000 km.)—Overseas. Clean and re-oil engine air cleaner.

Every 6,000 miles (10000 km.)—Home. Clean and re-oil engine air cleaner.

Every 6,000 miles (10000 km.). Fit new engine oil filter.