

SILVER
Cloud

HANDBOOK

FOR

SILVER CLOUD

Number VIII

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THIS instruction book for the Rolls-Royce Silver Cloud car has been compiled to assist the owner or driver to maintain and run the car in the most efficient manner possible.

The first two chapters give all essential driving and upkeep instructions, subsequent chapters (Part II) include explanations of the working of the various units or components of the car, and include detailed directions for lubrication and maintenance.

A set of special spanners and tools is supplied with the car, and it is most desirable that these should be used when effecting any adjustment.

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THE SECRET OF SUCCESSFUL RUNNING

Before a Rolls-Royce car is sold, it is very carefully tested and adjusted by experts. It will run best if no attempt is made to interfere unnecessarily with adjustments.

An owner would do well to instruct his driver as follows:—

Lubricate effectively, in strict accordance with the advice given in this book, and do not neglect any part.

Inspect all parts regularly, but take care not to alter any adjustments unless really necessary.

SERVICE FACILITIES FOR ROLLS-ROYCE CARS

Our interest in your Rolls-Royce car does not cease when you take delivery of the car. It is our ambition that every purchaser of a Rolls-Royce car shall continue to be more than satisfied.

With this end in view, the Special Retailer, through whom the car was purchased, has established a properly equipped Service Station, staffed by men who have been specially trained in servicing Rolls-Royce cars.

In addition, on the staff of Rolls-Royce Limited there are experts whose sole duty it is to maintain contact with the Special Retailers, and they are available, at all times, to be called in for consultation on any matters affecting your car.

If, therefore, you require any assistance, we ask that you should immediately contact the Special Retailer, who will be only too pleased to place his facilities at your disposal. If necessary he will call in for consultation our expert in that area. It is earnestly hoped that this arrangement will prove of mutual benefit, as we shall thus be kept in constant touch with our customers, who may be spared the trouble of a long journey to one of our Company's Service Stations.

In the event of it being more convenient to call on us direct for assistance, our Main Service Station at Hethe Road, Willesden, London N.W.10, and the one at our factory at Crewe, will be ready at all times to help.

GENERAL INFORMATION

Chassis and Engine Numbers.

The chassis number will be found on the identification plate fixed to the front of the dashboard, and also stamped on the left-hand side frame member just forward of the dashboard under the bonnet.

The engine number is stamped on the crankcase above the front left-hand mounting.

Chassis Number.....
 Engine Number.....

Engine.

Number of cylinders	.. ..	6	
Bore	.. ..	$3\frac{3}{4}$ "	95 m/m.
Stroke	.. ..	$4\frac{1}{4}$ "	114 m/m.
Capacity	.. ..	298.2 cu. ins.	4887 c.c.
R.A.C. rating	.. ..	33.7 h.p.	
Compression ratio	.. ..	6.6 : 1	
Firing order	.. ..	1, 4, 2, 6, 3, 5	
Tappet clearance—			
Inlet	.. ..	.006" (cold)	.15 m/m.
Exhaust	.. ..	.012" (cold)	.3 m/m.
Contact breaker gap	.. ..	.019"—.021"	.45—.55 m m.
Sparking plug	.. ..	Lodge CLNP or Champion N8BR	14 m/m.
Sparking plug gap	.. ..	.025"	.65 m/m.
Oil sump capacity	.. ..	16 pints	
Coolant capacity—engine and radiator	.. ..	$3\frac{1}{2}$ gallons, imperial	

Gearbox.

Rolls-Royce automatic type, incorporating four forward speeds and reverse with over-riding hand and "kick-down" change speed control.

Overall gear ratios:

1st speed	..	13.06 : 1	4th speed (direct)	3.42 : 1
2nd speed	..	9.00 : 1	Reverse	14.72 : 1
3rd speed	..	4.96 : 1		

Rear Axle.

Semi-floating type, hypoid bevel drive.

Ratio	..	..	..	..	12/41	3.42 : 1
Oil capacity.	..	..	..	..	1½ pints	

Brakes.

Servo assisted hydrostatic brakes, hydraulic operation on front wheels, hydraulic and mechanical operation on rear wheels.

Handbrake operates on rear wheels.

Steering.

Cam-and-roller type.

Suspension.

Independent front wheel suspension incorporating coil springs, hydraulic shock dampers and torsion rod stabiliser.

Rear suspension by semi-elliptic springs in combination with controllable hydraulic shock dampers. An axle control rod is fitted which, together with the road springs, takes the torque and brake reaction.

Tyres.

8.20" x 15".

Wheels.

Pressed steel, 6L x 15" well base rims.

Dimensions.

Overall length	..	..	..	..	17' 8"	539.5 cms.
Overall width	..	..	..	..	6' 2½"	190.5 cms.
Overall height	..	..	..	..	5' 4½"	163.0 cms.
Weight (kerbside)	..	..	..	..	39 cwts.	1953 kgs.
Wheel base	..	..	..	..	10' 3"	312.4 cms.
Track—						
Front wheels	..	..	..	..	4' 10"	147.31 cms.
Rear wheels	..	..	..	..	5' 0"	152.4 cms.
Turning circle	..	..	..	..	41' 8"	12.7 m.

Fuel System.

Carburettors	..	..	..	Twin S.U. HD.6 Diaphragm Type. Special automatic control for starting.
Fuel tank capacity	..	..	..	18 gallons. 81.8 litres.

Electrical Equipment.

Battery	Dagenite 6.HZP.9.GZ or Exide 6.XCV.9.L. 12 volt. 57 ampere/hour. Negative earthed to frame.
Dynamo	Lucas C-47. 12 volt.
Starter motor	Lucas M-45.G. 12 volt.
Horns	Lucas CT.750. Wind tone.
Bulbs—	
Headlamps	12 V. 60/36 W. 12 V. 42/36 W. Canada and South America. 12 V. 45/36 W. 'Granilux', France. 12 V. 45/40 W. Europe, except France.
Sidelamps	12 V. 4 W.
Stop Tail lamps	12 V. 18/6 W.
Fog Lamps	12 V. 48/18 W.
Reverse and number plates	12 V. 18/6 W.
Boot lamp	12 V. 6 W.
Roof lamp	12 V. 4 W.
Companion lights	12 V. 6 W.
Map lamp	12 V. 4 W.
Inspection lamp	12 V. 6 W.
Fuses	30 amperes, one strand of No. 31. S.W.G. tinned copper wire.

Spare Wheel.

The spare wheel is carried in a special compartment in the boot at the back of the car. To remove the spare wheel release ratchet locking clasp and pull wheel rearward.

Jacking System.

The wheel jack is carried in the boot, and is fitted into slotted brackets on either side of the car as required.

Tools.

The tools are carried in a special compartment in the floor of the boot, and are accessible on lifting the carpet on the left-hand side, and removing the lid covering the tray.

Battery.

This is carried in a special compartment at the rear of the chassis frame and is accessible on lifting the boot carpet on the right-hand side and removing the lid (see Fig 32).

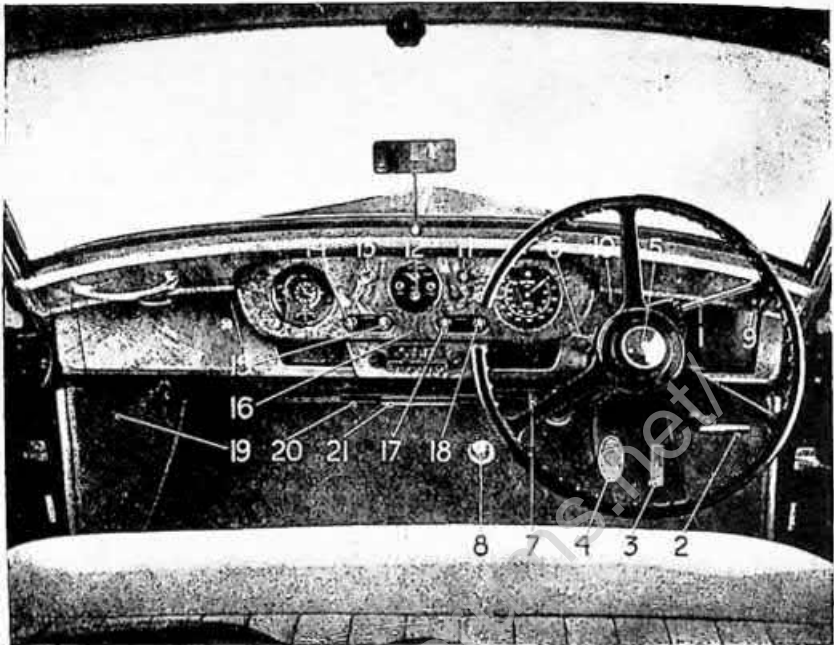


Fig. 1.—DRIVER'S CONTROLS.

1. Gear Range Lever.
2. Handbrake.
3. Accelerator Pedal.
4. Brake Pedal.
5. Horn Push.
6. "Ride" Control Switch.
7. Chassis Lubrication Pedal.
8. "Dip" Switch.
9. Direction Indicator Switch.
10. Charging Plug.
11. Petrol Filler Door Switch.
12. Ignition and Master Switch.
13. Cigar Lighter.
14. De-mister Control.
15. Windscreen Wiper and Washing Control.
16. Fuel/Oil Level Switch.
17. Instrument Lights.
18. Heating and Air Ventilation Control.
19. Bonnet Lock.
20. Picnic Tray.
21. Ash Tray.

CHAPTER I

To Drive the Car

Preliminary.

Before starting to drive the car, a careful study of the positioning and operation of the driver's controls, illustrated in Fig. 1, should be made. A knowledge of the correct functioning of the various accessories will enable the driver to obtain the maximum satisfaction and enjoyment from the use of the car.

When seated in the driving position, ensure that the controls are all within an easy and comfortable reach, by adjusting as necessary the position of the front seat.

At the centre of the front seat valance, a small lever should be moved to the right to release the catch and so enable a fore or aft adjustment of the seat to be made. The forward motion is assisted by springs, and the seat rises when pushed forward to suit the shorter person.

A control handle at the side (see Fig. 54), if raised, releases the catch and allows the angle of the seat back to be adjusted. This adjustment can alter the leg room by as much as three inches if necessary. The seat backs can either be pushed back, or allowed to come forward under the action of their springs as desired. Releasing the handle locks the back in position.

Next, ensure that the coolant, oil and petrol supplies are sufficient,

The radiator filter cap is located under the bonnet on the left-hand side, and to obtain access it is necessary to release the appropriate side bonnet lock from inside the car (19, Fig. 1). The coolant in the radiator should be on a level with the lower edge of the filling orifice when cold.

Only a recommended anti-freeze solution should be used for topping up (see page 46).

The engine oil level is normally checked by removing the dipstick on the left-hand side of the engine (see Fig. 4), and noting that the oil is at the proper level as shown by the "Max" mark on the submerged end.

For a quick check on the approximate level of the oil, such as when filling-up at a petrol station, or when the car is running on the road, use should be made of the press button switch (16, Fig. 1) when the level will be shown on the specially marked portion of the fuel gauge.

The engine must not be run with the oil level below the "Minimum" mark.

The engine oil filler cap is on the front end of the rocker cover (see Fig. 4).

To check the amount of petrol in the tank, switch "ON" the ignition and note gauge reading on the instrument panel.

A green warning light on the instrument panel is illuminated when the quantity of petrol in the tank falls below three gallons.

The petrol filter is contained within the left-hand side rear wing. To obtain access, turn the switch (11, Fig. 1), this will operate the remote controlled solenoid to unlock the filler cover door. Should the solenoid fail, the locking catch can be released by a pull wire from inside the boot.

Foot Controls.

The brake and accelerator pedals (4 and 3, Fig. 1) are fitted in the normal positions, no clutch pedal being necessary.

On the floor, to the left of the steering column, is the plunger switch (8, Fig. 1) which operates the dipping headlamp mechanism. Depression of this switch with the foot operates the mechanism to either dip the headlamps or restore them to full brilliancy as required.

A small red warning light, mounted in the speedometer, is illuminated whenever the headlamps are "full-on".

Hand Controls.

Mounted on the steering column is the gear range selector lever (1, Fig. 1), the operation of which is described later.

On the opposite side of the column is mounted the "Ride" control switch (6, Fig. 1) which varies the damper loading of the rear shock absorbers.

The control switch should be at position "N" (normal), and in this position will give a comfortable "ride" under all ordinary driving conditions. Position "H" (hard), may be used when road conditions are exceptional.

In the centre of the steering wheel (5, Fig. 1) is the horn push.

Under the dashboard, convenient to the right hand (2, Fig. 1) is the handbrake lever, which operates the mechanical linkage of the rear brakes.

It is operated by pulling the handle towards the driver; to release, the handle is given a slight twist to release the locking catch.

Mounted in a convenient position on the screen finisher (9, Fig. 1) is the control switch for the direction indicators, and is operated by movement to the left or right as required.

Small green lights mounted in the speedometer wink in conjunction with the appropriate outside flashers as an indication that these are working correctly.

Ignition and Master Keys.

Two keys are provided with the car: one, the master key, has a square-shaped "bow" head that will operate all the locks.

The ignition key, which has a round "bow"-shaped head, will operate the ignition and front doors only. Thus, the cubby box and boot can be left locked when parking in a garage if required.

Ignition Switch.

The combined ignition and master switch is a four-position switch which can be operated by the ignition or master key, either to the left or right of the "off" position.

The roof light, boot lamp, inspection lamp, charging point and clock are independent of the master switch and are thus always available.

Movement of the switch once to the LEFT switches on the red warning light and also completes the circuit to allow the radio, wind-screen wipers, cigar lighter and interior lights to be used while the car is parked.

Movement of the switch once to the RIGHT switches on the red warning light, the ignition circuit, electric fuel pumps and fuel gauge, oil pressure and water temperature indicators.

A further twist to the RIGHT operates the starter motor. The switch in this position is spring loaded and will return to the previous position on releasing.

Withdrawal of the key either locks all circuits, including lighting, in the off position, or if the lighting switch is at "S and T", the parking lights remain operative with all other circuits off.

Starting the Engine.

On cars fitted with the automatic gearbox it is most important before attempting to start the engine to ensure that the gear range lever on the steering column is in neutral, quadrant position "N", also, that the handbrake is on.

Before starting the engine, the accelerator pedal must be depressed to its full extent and then released entirely. This will allow the fast idle cam to position itself in relation to the engine temperature, and thus set the throttle to the correct opening for starting. The engine is then ready to start.

Insert the ignition key and switch on the ignition by turning the key in a clockwise direction to the first position. This will switch on the electric fuel pumps and fuel gauge, and also the red warning light.

Operate the starter motor by turning the ignition key farther in a clockwise direction; hold in this position and release as soon as the engine fires. The key will return to the first position. When the engine speed is sufficient to cause the dynamo to excite up to battery voltage, the red warning light will be extinguished.

If the car is allowed to warm up before use, the accelerator pedal should be lightly depressed after a few minutes' running, and then released, when the fast idle cam will again position itself in relation to the engine temperature and set the throttle at a slightly lower engine speed.

When the engine reaches its normal operating temperature, the engine will tick over at the normal pre-set speed.

The Automatic Gearbox.

The gearbox is fully automatic in operation through the range of the gear ratios; however, a manual control lever is mounted on the



Fig. 2.—GEAR RANGE LEVER.

1. Lock Button.

steering column, by means of which a selection may be made of the desired ranges best suited to the operating conditions, thus giving the driver greater flexibility of control and enabling him to use his judgment and skill.

Three forward speed ranges are provided, also Neutral and reverse. The quadrant is marked as follows:—

N. 4. 3. 2. R.

The gear ratios available in each of the positions are as under:—

“4”—Top, 3rd, 2nd and 1st.

“3”—3rd, 2nd and 1st.

“2”—2nd. (1st gear by kick-down only.)

The gear lever quadrant is provided with a gate between position “2” and “3”; this allows changes between the 4th and 3rd speed ranges to be made without risk of entering the 2nd speed range. Likewise, changes between the 2nd speed range and reverse when “shunting” are facilitated. A button at the end of the gear lever must be depressed to enable the lever to be moved in or out of neutral or reverse, thus preventing inadvertent engagement.

COASTING.

Owners are advised that coasting or "freewheeling" down hills *with the engine switched off* must definitely be avoided, as this is likely to cause severe damage to the Automatic Gearbox mechanism.

This damage can occur with the manual control lever in any of the five positions, including position "N".

Similarly, if, in the unfortunate event of an accident, it should be necessary to give instructions for the car to be towed, owners are requested to instruct that the following procedure should be carried out before the car is moved, to safeguard the gearbox from further damage.

- (i) The car should not be towed if there is any sign of mechanical failure or breakage in the gearbox. In this case the car must be transported.
- (ii) When satisfied that the gearbox is undamaged, remove the front interior carpet to obtain access to the inspection cover in the floor, see (3, Fig. 15), page 58. Remove the six screws and the cover.
- (iii) Release the locknut and slacken off the rear band adjusting screw (5, Fig. 15) $4\frac{1}{2}$ complete turns. Re-tighten the locknut and replace the inspection cover, screws, and front carpet.
- (iv) Keep the control lever at "N" throughout, and maintain when possible a towing speed between 15 and 25 miles per hour. Distances must at all times be kept to a minimum.

IMPORTANT.

At no time must a speed of 25 miles per hour be exceeded whilst towing.

ROLLS-ROYCE LIMITED,
LONDON.

The Drive Away.

For normal driving the gear lever is placed in position "4", when all four speeds are available under the automatic control, which will select suitable gear ratios for all driving conditions according to the degree of throttle opening and the speed of the car.

The hand lever should be used for gear changes between top and third, and the driver is encouraged to use this method in exactly the same way as he would with a normal gearbox. Completely imperceptible changes can be made if the throttle is at the same time adjusted to suit.

Should the driver in an emergency desire the maximum acceleration at his disposal, he may obtain the next lower gear at full throttle by a quick depression of the accelerator pedal, beyond the normal limit of its travel. This is known as the kick-down, and will cause the engagement of third gear if driving in top, the second gear if driving in third, or successively the first gear if driving in second.

Difficult Country.

For greater control of the car when driving in very hilly or difficult country, the gear lever should be placed in position "3". This will give the use of 1st, 2nd and 3rd by automatic change or kick-down. To bring the top gear back into use the lever has only to be moved back into the "4" position. Easing the accelerator pedal facilitates the change, but it is not essential.

When descending very steep gradients, the gear lever should be placed in position "2".

Also, position "2" should be used for prolonged crawling in heavy traffic. In this position 1st gear is by-passed and the car starts in 2nd gear and so avoids frequent 1—2 and 2—1 gear changes.

Only at prolonged halts, due to traffic jams, etc., is it necessary to engage neutral; at all ordinary traffic controls the gearbox may be left in the gear range then in use.

If the car should become embedded in deep snow, it is possible by suitable timing of the engagement of Reverse and Second speeds to rock the car out of the rut.

Parking.

When parking the car, the gear selector lever should be placed in neutral, position "N", and the handbrake applied, or, use may be made of the gearbox parking lock, which operates when the selector lever is placed in position "R" and the engine switched off with the car stationary.

Tow Starting.

If it should be necessary to start the car by towing or pushing, the gear lever should be placed in the neutral position. Once the car has reached a speed of 15-20 miles per hour, the gear lever should

be moved to the "4" position. Care should be taken not to have the throttle too wide open when the car is being towed or it may accelerate too rapidly and overtake the towing vehicle.

Lighting Switches.

The switch controlling the lamps is situated above the ignition switch, and is a large rotary switch operated by a lever. It has four positions clearly marked on the panel face:—

OFF	.. ..	All lamps off.
S. and T.	.. ..	Side and Tail lamps on.
H., S. and T.	.. ..	Head, Side and Tail lamps on.
F., S. and T.	.. ..	Fog, Side and Tail lamps on.

The instrument lights and map lamp are controlled by a single switch (17, Fig. 1): to operate, turn once to the right for a subdued light behind the instrument faces, turn twice to the right for a bright light. Pull out the knob to illuminate the map lamp.

De-misting, Heating and Ventilation.

The combined system, shown in detail in Fig. 52, may be used, either separately or conjointly to give maximum driving comfort regardless of external conditions.

A multi-purpose switch (14, Fig. 1) controls the air flow for de-misting the windscreen.

A similar switch (18, Fig. 1) controls the air which is directed to the front and rear floors.

Neither switch works if the engine is not running. With the de-mister switch "off" and the car running, a small current of air is always being circulated on to the windscreen.

Both switches have a similar action. To operate, pull out switch knob to first notch for cold air, and to the second notch for hot air.

When the switch knob is upright the air flow is only that produced by the ram effect of the forward movement of the car.

When the switch knob is turned clockwise to the first position, the booster fan is switched on to half-speed. Turning the knob farther to the second position brings the fan on to full-speed.

As a guide the following settings are suggested:—

External conditions:—

Very cold	..	De-mister on Hot	..	} Fans off, or at half-speed or full-speed as required.
		Heater on Hot	..	
Cold	..	De-mister on Cold	..	
		Heater on Hot	..	
Warm	..	De-mister on Cold	..	
		Heater Off	..	
Hot	..	De-mister on Cold	..	
		Heater on Cold	..	

On the later series cars, the vacuum operated taps controlling the supply of hot coolant from the engine to the heater matrices are fitted with hand operated small by-pass taps.

The opening of the by-pass taps allows a trickle of hot coolant to circulate through the matrices and gently warm the incoming air from either system. This may be found advantageous when the full heat from the system is not required.

To open the by-pass taps, looking from the top, turn the lever in a clockwise direction, anti-clockwise to close, the operating movement being similar to a normal coolant tap.

With the system in operation, the car should be driven with the windows closed, thus keeping out wind noise and so adding to driving comfort.

De-frosting of the rear window is accomplished by means of an internally built-in heating element.

It is recommended that during the winter when de-frosting of the rear window will be frequently required, that this feature is left switched on. It will then come into operation whenever the engine is started.

In summer, or if not required, the switch on the parcel tray should be turned off.

Windscreen Wiping and Washing.

Again, a single switch (15, Fig. 1) is used to control both these features.

To operate the wipers, turn the switch knob clockwise to the first position; the wipers will then operate at normal speed. Further turning to the second position will greatly increase the speed of wiping.

The higher speed of wiping is intended for use during heavy rain. It should not be used in heavy snow or with a dry or drying windscreen, i.e., when the load on the motor is in excess of normal.

The windscreen wiper motor is fitted with an automatic switch which breaks the electrical circuit if the motor overheats due to overloading. When this occurs, the windscreen wipers will stop, but will restart if the switch is turned "off" and the motor is allowed to cool for about ten minutes.

For washing the windscreen, two small jets are arranged on the scuttle, to squirt fluid on to the windscreen within the traversing arc of the wipers.

To operate, depress the knob of the wiper switch, release, and then switch on the wipers to complete the cleansing.

Chassis Lubrication.

The main parts of the front suspension are lubricated through a system of piping direct from a foot-operated pump mounted on the front of the dashboard.

The operating pedal is under the scuttle and should be used according to the mileage travelled. As it is necessary to prime the system and to expel air, the first stroke of the pump may not be effective, therefore give the pedal two strokes every even 200 miles as registered on the speedometer. This will ensure adequate lubrication.

AUTOMATIC GEARBOX.

SERVICE AFTER 1,000 MILES RUNNING.

Important.

During the early life of the automatic gearbox a certain amount of initial bedding-in of the brake bands occurs. This cannot be compensated for in the original factory adjustments, and it is therefore most important that after the car has completed the first 1,000 miles running, it should be taken to the Rolls-Royce Retailer in your territory for the appropriate adjustments to be carried out.

No charge will be made for this service.

If it is inconvenient for you to send the car to the retailer from whom it was purchased, any Rolls-Royce Retailer will be pleased to carry out this adjustment.

ROLLS-ROYCE LIMITED.
LONDON.

CHAPTER II

Lubrication and Maintenance

Periodic Lubrication and Attention.

The life of the car will be prolonged and the wear of all moving parts reduced to the minimum by giving particular attention to the periodic lubrication and adjustment of all the parts outlined below.

To assist owners, special standardised maintenance schedules, at fixed prices, covering the necessary attention at 5,000, 10,000 and 20,000 miles respectively, are available at either of the Company's Service Stations or at any of the officially Appointed Retailers.

LUBRICANTS RECOMMENDED

Engine.

For normal operation of the car under temperate climatic conditions, Rolls-Royce Limited recommend a first quality oil of viscosity S.A.E.20 for the engine for all-the-year-round use, but, if conditions permit of long journeys of maintained high speeds, a heavier duty oil of S.A.E.30 grade would provide better oil mileages. Also, it would be advantageous to use an S.A.E.30 grade oil when the car is normally operated under tropical climatic conditions.

On the other hand, under extreme winter conditions of sub-zero temperatures, the use of a lighter grade oil of S.A.E.10 viscosity would provide easier starting and satisfactory lubrication.

The following oils are recommended:—

	"A"	"B"
	S.A.E.20	S.A.E.30
B.P.	Energol S.A.E.20W.	Energol S.A.E.30.
Wakefield's	Castrolite	Castrol X.L.
Shell	X-100 20/20W.	X-100 30.
Mobil	Mobiloil Arctic	Mobiloil A.

Equivalent oils to the above are also marketed by:—Sternol Limited, Alexander Duckham & Co. Ltd., Esso Petroleum Co. Ltd., Gulf Oil Group of Companies, and Dalton & Co. Limited.

In the instructions which follow, reference is made to oil "A" or "B" as above, i.e., viscosity 20 or 30.

Gearbox.

The automatic gearbox should be filled and topped up only with Automatic Transmission Fluid, Type "A", having a qualification number prefixed by AQ/ATF.

Any of the following may be used:—

Mobil	Mobilfluid 200 ..	Type AQ/ATF—101
Shell	Donax T.6	Type AQ/ATF—398
B.P.	Energol ATF Type A	Type AQ/ATF—261
Wakefield's	Castrol TQ	Type AQ/ATF—156
General Motors ..	Hydra-Matic Fluid ..	Type AQ/ATF

Rear Axle.

Wakefield's Special Castrol Hi-press S.C. (If this is unobtainable, use a first quality Hypoid oil of viscosity S.A.E.90. Do not mix these oils; drain and refill.)

Carburettor Air Valve Damper.

Viscosity S.A.E.20.

Steering Box—Chassis Oil Pump.

Viscosity S.A.E.30.

Starter Motor Gears.

Viscosity S.A.E.30.

Contact Breaker—Cam Pad, Pivots and Governor.

Viscosity S.A.E.20.

Hydraulic Shock Dampers.

Automatic Transmission Fluid—AQ/ATF.

Propeller Shaft.

Vacuum Mobilgrease No. 2.

Distributor Grease Cup.

High Melting Point Grease.

Hydraulic Brake Fluid.

Wakefield-Girling Brake Fluid—Crimson.

REGULAR MAINTENANCE**WEEKLY****1.—Engine Oil.**

Inspect oil level on dipstick or electric gauge **when engine is not running**, and top up as necessary with correct oil. Do not run engine with oil level down to "Min." mark. (See page 37.)

(Filler cap on rocker cover.)

2.—Chassis Lubrication.

Replenish reservoir as necessary, but do not overfill. Leave one inch between oil level and bottom of filler orifice.

(Reservoir on front of dashboard, under bonnet.)

3.—Radiator Coolant.

Inspect coolant level and, if necessary, top up with the correct anti-freeze mixture to maintain the level, when cold, to the bottom edge of the filling orifice.

(Filler cap on header tank, under bonnet.)

4.—Tyres.

Check the tyre pressures. (See page 74.)

These should be:—

Front, 19 lbs./sq. in. (1.33 kg./sq. cm.) } Cold.
Rear 26 lbs./sq. in. (1.83 kg./sq. cm.) }

or

Front, 22-23 lbs./sq. in. (1.55-1.62 kg./sq. cm.) } Hot.
Rear, 32-34 lbs./sq. in. (2.25-2.40 kg./sq. cm.) }

5.—Distributor Grease Cup.

Give grease cup one turn; when empty i.e., fully screwed down, refill with the correct grease. (See page 28.)

6.—Windscreen Washer.

Inspect and refill reservoir if required, using the special liquid (see page 99).

Periodically the reservoir should be removed and washed out to remove any sludge deposit.

(Reservoir under bonnet on left-hand side.)

MONTHLY**7.—Battery.**

Check level of acid in each cell and top up with distilled water if necessary. Check more frequently when big mileages are covered, or when the car is being run during hot weather.

(Access through luggage boot.)

8.—Brakes.

The rear brakes should be checked every month or every 2,500 miles, whichever is the shorter.

The adjusters (1, Fig. 20) should be turned with a spanner in a clockwise direction until solid resistance is felt, the resistance being equal for both brakes. The adjusters should then be turned back two "clicks", this will give the correct setting.

The front brakes are automatically self-adjusting, and no hand adjustment is provided.

9.—Gearbox.

Run the engine for three minutes and whilst still running inspect the fluid level in the gearbox by means of the dipstick. (See Fig. 15.) If necessary, replenish with one of the recommended Automatic Transmission Type "A" Fluids, to the level marked on the dipstick. (See page 57.)

(Access, remove rubber bung in floor in front of front passenger's seat.)

10.—Carburettors.

Inspect level of oil in reservoir of automatic air valve guide, and top up with the recommended oil. (See page 51.)

11.—Oil Bath Air Cleaner (if fitted).

Every 1,000 miles the oil container and the filter element should be removed by unscrewing the long bolt which passes through the top of the silencer.

The oil container should be emptied and carefully cleaned, the filter element being thoroughly washed in petrol and allowed to dry.

Replace the element and refill the oil container with oil "A" to the indicated level, and refix in position.

NOTE.—The cleaner should be serviced at more frequent intervals if the car is being operated under very dusty conditions. (See page 54.)

12.—Fan Belt.

The tension of the fan belt should be checked after the first 1,000 miles and adjusted if necessary (see page 44). Subsequently it should be regularly checked every 5,000 miles.

EVERY 2,500 MILES.**1.—Engine Oil Sump.**

When engine is warm, drain crankcase and refill with oil "A" to the correct level.

EVERY 5,000 MILES.**1.—Engine Oil Filter.**

Remove felt element and discard. Replace with new element. Refill bowl with oil, re-assemble and check that cover joint is oil tight. (See page 38.)

(Filter on right-hand side of engine crankcase.)

2.—Rear Axle.

Inspect oil level in rear axle when warm, by removing plug (1, Fig. 18); if necessary, top with correct oil to level of hole. (See page 59.)

If the correct oil is not obtainable, do not add a different oil but if replenishment is necessary, drain off and refill with an alternative oil as directed on page 28.

3.—Steering Box.

Remove plug and fill casing with oil "B" to mouth of plug orifice. (See page 69.)

4.—Ignition Governor.

Remove the distributor cover and lift off rotor. Apply two or three drops of oil "A" to governor spindle. (See page 84.)

5.—Contact Breakers.

Apply one drop of oil "A" to the pivot pin of each rocker arm. (See page 84.)

6.—Distributor Cam.

Apply one or two drops of oil "B" to the cam lubricator pad. (See page 84.)

7.—Control Mechanism.

Apply a few drops of oil "A" with oil-can to the gear range selector controls and accelerator linkage.

8.—Brake Connections, etc.

Apply, liberally, oil "A" to all joints and pins of brake rods and connections.

9.—Sparking Plugs.

The recommended plugs are either Lodge CLNP or Champion N8BR, 14 m/m non-detachable. Set gaps to .025" (.65 m/m.).

10.—Tyres.

Check wheel balance and change position of tyres. (See page 74).

EVERY 10,000 MILES.**1.—Starter Motor.**

Remove plug on front of reduction gear casing and fill to orifice with S.A.E.30 oil. (See Fig. 33.)

2.—Dynamo.

Insert a few drops of oil "B" into the oil-hole in the rear end bearing. (See Fig. 30.)

3.—Hydraulic Shock Dampers.

Inspect oil level and add more oil if necessary.

Use only correct oil. (See pages 70 and 71.)

4.—Universal Joints and Propeller Shaft.

Inject Mobilgrease No. 2 by means of a grease-gun into lubricator located at centre of each universal joint, and also into the lubricator on the sliding joint. (See Fig. 17.)

5.—Valve Rocker Clearances.

Check the inlet valve rocker clearances and re-set if necessary.

This operation should be performed *when the engine is cold.*

The correct clearance for the inlet rockers is .006" (.15 m/m.) and for the exhaust tappets is .012" (.3 m/m.).

6.—Air Cleaner (A.C. Wire Mesh Type) (if fitted).

Remove cleaner element from front end of silencer, after unscrewing the wing-nut and taking off end cover. Carefully wash element in petrol or paraffin and afterwards oil with oil "A". Drain off excess oil before refitting.

It should be noted that if the car is being run under particularly dusty conditions, the element may need cleaning more frequently. (See page 54.)

7.—Hydraulic Master Cylinders.

Check level of oil in reservoirs on right-hand valance plate; add more oil if necessary to maintain to indicated level.

Also, inject Mobilgrease No. 2 by means of a grease-gun, into lubricator located in pivot pin of balance lever.

EVERY 20,000 MILES.**1.—Dynamo.**

Inspect brushes for wear; to do this, release screw and slide cover to expose brushes. (See page 77.)

Should the brushes need renewal, it is advised that the car is taken to one of the Special Distributors for this work, as the dynamo must be removed and the new brushes correctly bedded to the commutator.

2.—Gearbox.

Drain out all the fluid by removing the drain plugs from the fluid coupling casing and the gearbox sump, and refill with the correct type of fluid. (See page 28.)

Detailed instructions are given on page 57.

3.—Fuel Filters.

Remove cover from rear filter, located on cross-member in front of main tank, lift out gauzes by means of centre removal sleeve, and clean. Drain and clean filter sump.

Remove and clean the gauze filters of petrol pump and also those at fuel inlets to carburetters, taking care, first, to see that the ignition switch is off, and fuel pumps are therefore inoperative. (See page 49.)

4.—Fuel Tank.

Release—but do not remove—drain plug at bottom of main tank to allow any accumulated water to escape. (See page 48.)

5.—Rear Axle.

Drain axle when warm, and refill. Approximately $1\frac{1}{2}$ pints of oil will be required.

None but the recommended oil should be used.

6.—Chassis Lubrication Pump.

Remove and discard felt strainer pad, located at base of chassis oil pump. (See page 95.) Replace with new pad.

7.—Front Brakes.

Remove brake drums and examine wear on brake shoes, fit replacement shoes if lining is worn down to within $1/32$ " of rivets. (See page 64.)

8.—Propeller Shaft.

Dismantle front ball and trunnion type universal joint, clean, and repack with $1\frac{1}{2}$ ozs. of Mobilgrease No. 2 (See page 59.) It is advised that this work should be entrusted to one of the "Special Retailers."

PART II

**CONTAINING EXPLANATIONS OF THE
WORKING OF THE VARIOUS UNITS OF
THE CAR, WITH DETAILED DIRECTIONS
FOR LUBRICATION AND MAINTENANCE**

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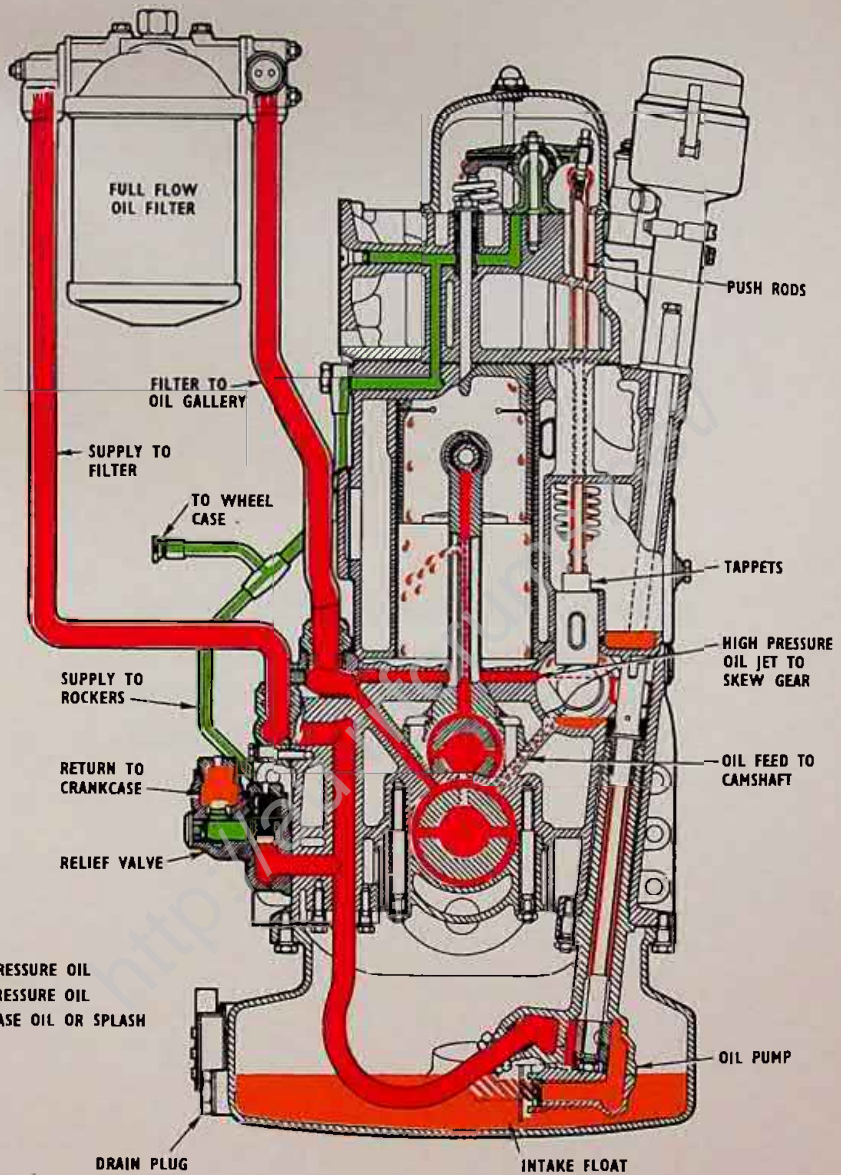


FIG. 3. ENGINE LUBRICATION SYSTEM

CHAPTER III

Engine Lubrication System

The engine lubrication system is of the forced feed, full-flow filtered type, and is diagrammatically illustrated in Fig. 3.

The system is filled or topped up by opening the oil filler cap (1, Fig. 4) on the inlet rocker cover, and pouring in the required amount of recommended oil.

It is essential that the oil is changed at 2,500 mile intervals, and also that the level is not allowed to fall below the "Min." mark on the dipstick.

It is not advisable to mix different types of oil, and the sump should be drained if changing from one brand to another. The sump must not be flushed with paraffin or petrol.



Fig. 4.—OIL FILLER CAP AND DIPSTICK.

1. Filler Cap.
2. Dipstick.
3. Engine Breather Pipe.

the plug (1, Fig. 16) should be removed, by use of the hexagon adaptor and ring spanner from tool kit, and the oil allowed to drain out, preferably when warm.

On replacing the plug, ensure that the joint washer is sound and in position.

Oil Level Indicator.

In order that a quick check may be obtained, the petrol gauge on the instrument panel has been so arranged that by depressing the switch (see Fig. 1) it will register the approximate quantity of oil in the engine sump.

The gauge is electrically connected to a float unit fitted into the right-hand side of the crankcase sump.

The amount of oil should be maintained at "Full", this corresponding with the "Max" mark on the dipstick, and showing that there is approximately 16 pints of oil present. A red line on the gauge indicates "minimum" and the engine should never be run with the oil level below this mark.

Oil Pressure.

An electrically operated oil pressure gauge is fitted on the fascia board.

Under the normal conditions of engine temperature and running, the instrument pointer should be mid-way on the instrument scale, which represents an approximate oil pressure of between 20—30 lbs./sq. in. At cruising speeds above 35 miles per hour, the pointer should be within the white band.

When the engine is idling and hot, the pressure will fall, but provided it increases as the engine speed increases, this is in order.

The car should not be run if the gauge pointer fluctuates or is continuously below the white band. The oil level in the sump should be checked and the relief valves should be examined for incorrect seating of the valves (see page 40).

The Pump.

A gear type pump is mounted internally off the lower face of the crankcase and driven by means of a shaft and skew gears from the centre of the camshaft. A coupled extension of this shaft drives the ignition distributor.

The oil intake from the sump is by means of a float fitted with a gauze strainer, which ensures the collection of clean oil, free from sludge. Oil drawn by the pump through the floating intake is delivered via the relief valves direct to the full flow-filter.

The Filter.

The full-flow filter is fitted on the right-hand side of the crankcase and is shown in Fig. 5.

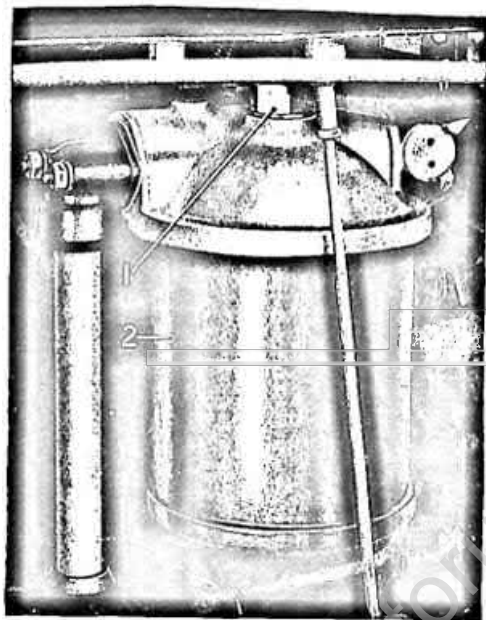


Fig. 5.—OIL FILTER.

1. Retaining Nut. 2. Filter Bowl.

intake manifold and the valance plate.

NOTE.—When the engine is hot, the filter is full of oil; when the engine is cold, the filter is only half full of oil. It is, therefore, advisable to remove the filter when the engine is cold.

Drain the oil from the filter bowl and discard the old element. Fit replacement element. Ensure that the rim of the filter bowl is clean, refill bowl with clean engine oil and replace in position.

On next running the engine, it should be inspected for oil leaks around the filter joint.

Oil Pressure Relief Valves.

The relief valve unit is fitted on the crankcase below the oil filter as shown in Fig. 6.

The two valves are in series, and their combined effect is to regulate the pressure of the high-pressure oil supply to the crankshaft and connecting rod bearings to approximately 25 lbs. per sq. in. at normal cruising speeds.

After passing through the filter, the oil is conveyed to the crankcase main oil gallery, as shown in the diagrammatic illustration (Fig. 3).

Every 5,000 miles the oil filter element should be renewed. It is not practicable to clean the felt element, and no attempt should be made to do so.

To remove the element, slacken off nut (1, Fig. 5) two or three turns and then give nut two or three taps with spanner to break rubber seal between cap and filter bowl.

Support filter bowl in left hand and remove nut and washer. The filter bowl can now be lifted out through the gap between the air

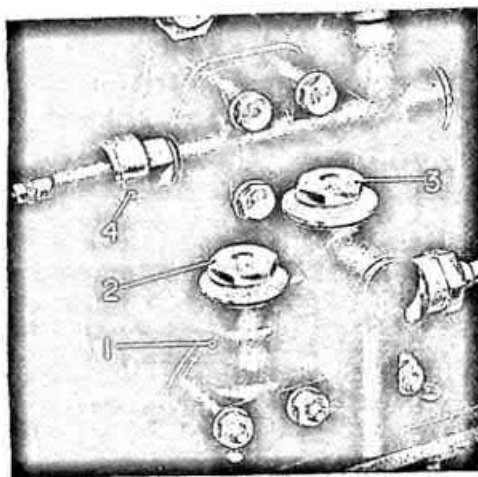


Fig. 6.—OIL PRESSURE RELIEF VALVES.

1. Relief Valve Unit.
2. H.P. Valve.
3. L.P. Valve.
4. Oil Pressure Switch (Carburettor Solenoid Circuit).

Oil which passes the high pressure valve (2, Fig. 6) enters the low pressure chamber, and from there is piped to the inlet rocker shaft and wheelcase.

In order to ensure a supply of oil to the low pressure system under all conditions of running, small slots are cut in the seating of the high-pressure valve.

Normally the relief valves do not require any attention, but should the oil pressure fluctuate or drop considerably, the valves should be removed for inspection and cleaning.

Unscrew the plugs (2 and 3, Fig. 6) and remove; the valves may then be lifted out for inspection and cleaning of valves and seats. No attempt must be made to alter the spring settings by interfering with the springs themselves, or by varying the number of washers under the plugs.

Care must be taken to replace all parts in a perfectly clean state.

Crankshaft and Connecting Rods.

The oil from the main oil gallery is fed through oilways drilled in the crankcase webs, to each of the seven crankshaft main bearings, which are of the copper-lead-indium lined steel shell type.

Each connecting rod is drilled to convey oil to the gudgeon pin bearing, the drilling passing through the big-end bearing shell. A small hole is cross-drilled into this oilway to allow a fine squirt of oil to lubricate the cylinder wall.

Camshaft.

The camshaft, driven by single helical gears, is carried in four plain bearings, which are lubricated with high pressure oil through drillings in the crankcase webs, as shown in Fig. 3. The centre gear driving the oil pump and distributor is also under high pressure lubrication.

The camshaft driving gears in the wheelcase are lubricated from the low-pressure system.

Valve Rockers, Push Rods and Tappets.

The low pressure oil supply to the valve rockers is by way of a drilled passage through the cylinder block and head to the centre pedestal of the inlet valve rocker shaft.

The rocker shaft is drilled longitudinally, and also radially in the plane of each rocker, to lubricate the rocker arm bearings, and the rocker arms are also drilled through to lubricate the push-rod ball ends and the ends of the valve stems as shown in Fig. 3.

Each valve stem is provided with a packing gland, held in position by the inner valve spring, which prevents excess oil from percolating down the valve guides. Oil from the rocker casing is returned to the crankcase through the push rod tunnels.

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CHAPTER IV

Engine Cooling System

The cooling system is filled with a 25 per cent. mixture of anti-freeze and water before the car leaves the factory, and it is strongly recommended that a similar mixture is used all the year round, both summer and winter.

As anti-freeze deteriorates and the inhibitors are consumed during use, it is most important that the coolant is changed and the system thoroughly flushed out every twelve months. Rolls-Royce recommend that the car is taken regularly every Autumn to one of their "Special Retailers" for this service.

The service consists of draining the cooling system, thoroughly flushing out the radiator and cylinder block, and refilling the system with a fresh anti-freeze solution of the correct strength.

The flushing may be carried out by removing the radiator connections and applying a hose to the lower pipe, the upper one being allowed to run to waste. Mains water pressure will remove all loose sediment in about half-an-hour's flushing. The engine drain cock and thermostat should then be removed and the procedure repeated, applying the hose to the drain cock aperture.

On no account must any strong alkaline compound be used to clean out the cooling system. Several such compounds are available, but their use must be carefully avoided, owing to the fact that they have a detrimental chemical action on aluminium.

If the recommended anti-freeze solutions (see page 46) are not available, plain, preferably soft, water may be used when there is no danger of frost.

The radiator filler is located under the left-hand side of the bonnet. A warning notice is embossed on the cap to the effect that it must not be removed when the engine is running. Hot coolant is likely to be forced out in such circumstances. The level, when cold, should be to the bottom edge of the filling orifice.

Coolant Pump and Fan.

The coolant circulation is maintained by a centrifugal pump mounted in tandem with the fan, on the front part of the cylinder block, and is driven by the "V" belt, which also drives the dynamo, from the front end of the crankshaft.

It is improbable that any leakage or any other trouble will be experienced over long periods of running, and no attention should be necessary between general overhauls of the chassis.

If, for any cause, the engine has to be run with the fan removed, it is essential that the fan retaining set-screws, with suitable distance-pieces to allow for the thickness of the fan, are refitted in position.

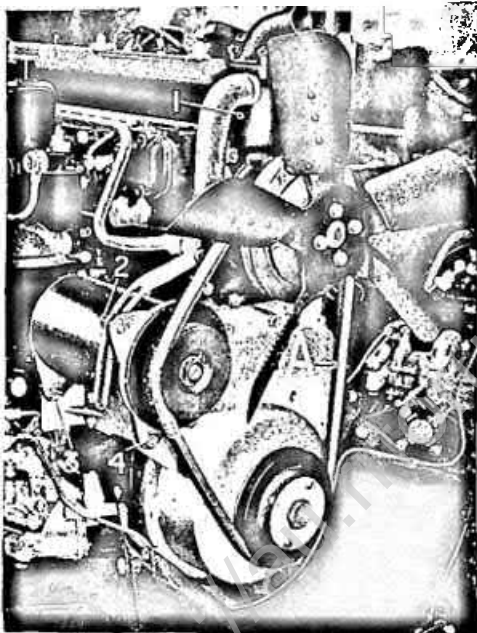


Fig. 7.—FAN BELT ADJUSTMENT.

1. Thermostat Casing 2, 3 and 4. Dynamo Bolts.
"A"—Check Tension Here.

dynamo should be moved upwards to the full extent of the slot, when it will be found that the belt can be easily replaced without straining.

The fan must not be forcibly turned by hand, as this will cause bending of the blades and may result in a damaged radiator.

Overheating.

Overheating may be due to one or more of the following causes:—

- (a) The thermostat may have failed.
- (b) The fan belt may need adjustment.
- (c) There may be a shortage of coolant in the system.
- (d) Detonation and poor grade of fuel.
- (e) Radiator matrix blocked with flies or dirt, etc.

Fan Belt Adjustment.

This is effected by releasing the three nuts (2, 3 and 4, Fig. 7), and removing the dynamo outwards on the special slotted link.

If the belt is too loose, it will slip and wear excessively—if too tight it will cause premature wear to the pump spindle and dynamo bearings.

The tension should be such that the fan belt can be moved transversely, with the fingers, at a point equidistant from the crankshaft pulley and the fan pulley through a total distance of one inch.

If it is necessary to remove the belt, it should not be strained over the pulleys. The

Engine Thermostat.

Thermostat fitted in the coolant outlet from the cylinder head, and contained within the casing (1, Fig. 7), retards the circulation of the coolant through the radiator until the engine has attained a satisfactory working temperature.

The coolant by-passes the radiator when the thermostat valve is closed or only partly open, and thus ensures a quick supply of heat to the induction pipes after starting from cold, as well as a rapid warming up of the engine coolant jacket and the car heating system.

The thermostat fitted as standard and marked "Summer", is arranged to open the valve when the temperature of the coolant rises to 75 to 77° C.

For Winter use, in countries where conditions are severe, it is recommended that the thermostat is changed for one of a higher rating, marked "Winter", opening at a coolant temperature of 84 to 86° C. The use of this thermostat will provide a greater "well" of residual heat to assist rapid warming up of the car heating system.

Reference to the instrument board temperature indicator will show if the valve is opening correctly, and that there is no shortage of coolant.

Frost and Anti-Freeze Mixtures.

As long as the original coolant is maintained in the system, no precautions need be taken against frost.

If, for any reason, the original coolant has been replaced with water, then the system must be drained if the car is to be left exposed to temperatures below 32° F.

Draining is accomplished by opening two drain taps, one situated at the bottom of the radiator and one on the right-hand side of the cylinder block (Figs. 8 and 9).



Fig. 8.—RADIATOR DRAIN TAP.

1. Radiator Bottom Tank.
2. Drain Tap—"Off" Position.

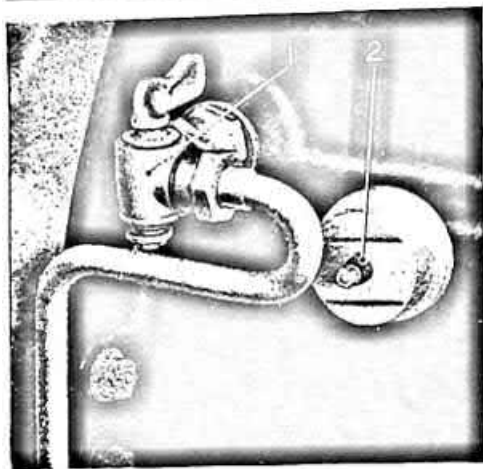


Fig. 9. - CYLINDER DRAIN TAP.

1. Drain Tap. 2. Connection—Oil Pressure Gauge.

Also before attempting to start the engine after exposure to frost, hot water should be poured over the coolant pump to thaw any particles of ice which may be present in the casing, and which would probably damage the impeller.

A suitable and recommended anti-freeze mixture for use is made by mixing soft water with either Smith's "Bluecol" or Shell "Snowflake", the proportions of anti-freeze being varied to suit the degree of frost likely to be encountered.

An approximate indication of the frost protection ensured by the differing amounts of anti-freeze is given below:—

Freezing point	22°F.	12°F.	2°F.	-3°F.
Degrees of frost	10°F.	20°F.	30°F.	35°F.
Anti-freeze ..	4½ pints.	6¾ pints.	10 pints.	11 pints.

When changing from water to anti-freeze, the radiator system must be drained. New anti-freeze of the required amount should be mixed with an equal quantity of soft water. This mixture should then be slowly poured into the radiator to avoid air locks, the radiator being finally topped up with soft water.

The engine should then be run until normal operating temperature is reached, to ensure uniform distribution of the anti-freeze throughout the system.

The rubber connections must be carefully examined and replaced if unsound, as any leakage will necessitate replenishment with anti-freeze mixture.

When an anti-freeze mixture is in use, a similar mixture should be used for replenishment purposes.

CHAPTER V

The Fuel System

The fuel supply to the carburetters from the 18-gallon tank at the rear of the chassis is by means of a double electric pump unit (Fig. 10), mounted externally on the right-hand side chassis frame member.

Incorporated in the feed pipe from the tank to the pumps is the main filter, as shown in Fig. 11. Filters are also provided in the pump unit itself, and at the carburetter inlet.

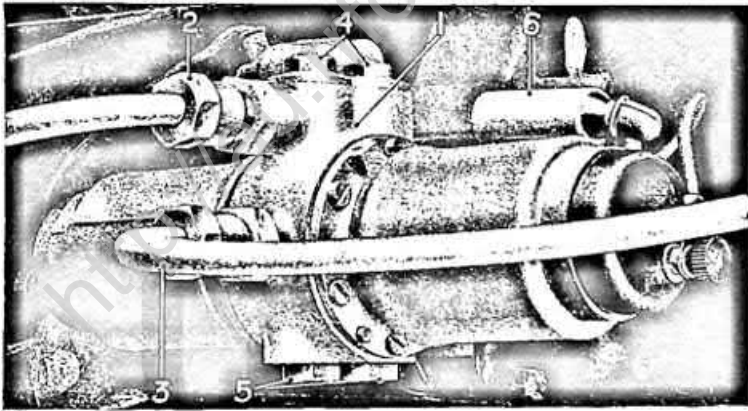


Fig. 10—FUEL PUMPS.

- | | |
|--------------------|---------------------------------|
| 1. Fuel Pump Unit. | 4. Suction and Delivery Valves. |
| 2. Inlet Pipe. | 5. Filters. |
| 3. Outlet Pipe. | 6. Suppressor Condenser. |

Fuel Pumps.

The fuel pumps (Fig. 10) are of the electric, solenoid operated, diaphragm type, and the unit comprises two independent pumps

complete with diaphragms, solenoids, contact trip mechanisms and suction and delivery valves.

Both the pumps deliver into a common chamber and are simultaneously rendered operative when the ignition switch is turned to the first position "Right".

Duplicate pumps are provided primarily to ensure reliability, and that there should be no starvation of fuel at maximum engine demands.

Should it be necessary to disconnect the fuel pipes at the pumps, first release the cover of the main filter (see Fig. 11) to prevent loss of fuel by syphoning, due to the location of the pumps being below the level of the main tank.

Faulty Operation of Pumps.

The failure, or shortage, of fuel supply to the carburetters may be due to one or more of the following causes:—

1. *Shortage of fuel in the tank.*—This should have caused the green warning lamp to light, but if the tank has been allowed to run dry, the pumps will tick continuously and noisily.
2. *Air leak on the suction side.*—Either at the filter or on the pipe line. A slight air leak will cause the pumps to work rather faster than normal, but if sufficiently bad to cause a complete air lock, the pumps will tick continuously and noisily as if short of petrol.
3. *Pump valves not seating.*—The delivery valves do not give any easily detectable signs of their functioning. If a suction valve is not seating, the pump will tick continuously when the engine is switched on but not running. It is probable that foreign matter is lodged under one of the valves.

If the above is suspected, remove the caps (4, Fig. 10); the valves and valve cap assemblies may then be lifted out and cleaned.

4. *Sluggish operation of the pumps.*—Check that the electrical connection and contact points are clean and in proper order. Verify, by alternately disconnecting the pipes at the unions, that it is the pump, and not due to a blockage in the pipe line. If with the pipes disconnected the pumps still work sluggishly, the unit should be removed and returned to Messrs. Rolls-Royce Limited, or one of their "Special Retailers" for overhaul.

Fuel Tank.

Periodically, every 20,000 miles, it is advisable to release the drain plug one or two turns to drain off any accumulation of sediment of water in the tank. See that the plug is afterwards securely retightened.

Fuel Filters.

All filters should be regularly cleaned every 20,000 miles.

The rear filter, shown in Fig. 11, is provided with two circular gauzes located above a large settling sump. Fuel passes upwards through these gauzes, and dirt settles on their lower faces and in the sump.

To remove the gauzes, unscrew the yoke retaining nut and remove cover. Lift out gauzes by means of the centre removal sleeve.

When refitting the cover, care must be taken that the sealing washer is sound, and properly in position, and the nut (1) tightly screwed up. Any leaks on this, the suction side of the pumps, although they may not be apparent by leakage of fuel, will impair the proper functioning of the pumps by admitting air.



Fig. 11.—REAR FILTER.

- | | |
|--------------|----------------|
| 1. Yoke Nut. | 4. Outlet. |
| 2. Cover. | 5. Drain Plug. |
| 3. Inlet. | |

In addition, the two gauze filters in the fuel pump and also those at the carburetter inlets should be removed and cleaned.

To remove the filters from the fuel pump unscrew the cap nuts (5, Fig. 10) extract filters, clean in petrol and replace, ensuring that the cap nuts are retightened.

To remove the filters from the carburetter inlets, unscrew the two union nuts (1, Fig. 12). The filter gauzes can then be removed and cleaned in petrol.

When refitting, care must be taken to replace each gauze with its open end upwards, also that the aluminium joint washers are in position on the unions.

Fuel Gauge.

The fuel gauge registers the total amount of fuel in the tank and is operative when the ignition switch is "ON".

The green warning light is illuminated when the level falls below three gallons.

As mentioned on page 28, this gauge also registers the amount of oil in the engine crank, when the appropriate switch is operated.

The Carburetters:

Two carburettors of the S.A. MacIntyre type are fitted as shown in Fig. 12. One is shown in section (Fig. 13) to illustrate the principal parts:

This type of carburettor automatically adjusts both its choke and jet area in accordance with the demand of the engine as determined by the degree of throttle opening, the engine speed, and the load against which the engine is operating.

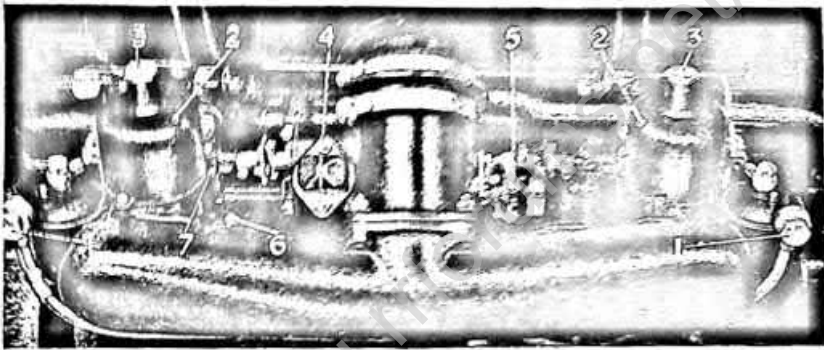


Fig. 12.—CARBURETTORS ON ENGINE.

- | | |
|--------------------------------------|--------------------------------------|
| 1. Fuel Inlet and Filter. | 4. Choke Operating Solenoid. |
| 2. Air Valve Chamber. | 5. Throttle Stop Screw. |
| 3. Hydraulic Damper Piston. | 6. Idle Mixture Strength Adjustment. |
| 7. Idle Mixture Quantity Adjustment. | |

This is effected by using the manifold depression to levitate a piston or air valve carrying a tapered needle which regulates the fuel passage. The upper side of the piston is connected by passage ways to the base of the piston facing the throttle valves, and is thus subject to the depression in the throttle body.

As the air flows through the carburettor increases, so the depression between the piston and the throttle valve increases, thereby causing the piston to rise and admit more air, and consequently the needle to be withdrawn from the jet, thus allowing more fuel to flow. Similarly as the air flows fall, due to reduced engine requirements, so the piston falls, maintaining a state of balance whereby the piston keeps at a certain height, dependent on engine speed and throttle opening. An approximately constant air velocity, and hence an approximately constant degree of depression, is maintained in the region of the fuel jet, even under idling conditions, and so obviates the necessity for a separate idling jet. A single jet only is employed in the carburettor.

Automatic Air Valve.

The top portion of the guide spindle carrying the air valve piston is hollow, forming a well surrounding a small stationary damper piston, suspended from the suction chamber cap by means of a rod. The hollow interior of the spindle contains a quantity of S.A.E.20 engine oil, and the slight retarding effect upon the movement of the air valve assembly, occasioned by the resistance of this small piston, provides the momentary enrichment desirable when the throttle is abruptly opened. The damper piston is of a composite construction and offers little resistance to the passage of the oil during the downward movement of the main piston.

Every month, the oil reservoir cap nut (3, Fig. 12) should be unscrewed and the plunger withdrawn, great care being taken to avoid damage to the plunger rod by bending; the reservoir should be topped up, if required, with the recommended oil, so as to maintain the level of the oil to the top of the guide rod only. The plunger should then be replaced, taking care that no dirt or grit is present. A slight steady pressure may be required to displace the oil sufficiently to allow the engagement of the thread of the oil reservoir cap nut.

If it is suspected that the automatic air valve is not working correctly, the air intake should be removed, and a check made by lifting the piston with the fingers, when it should be noted that the piston falls quite freely on to its seat when released.

If any sticking or sluggishness is apparent, it will be necessary to dismantle the air valve assembly. First disconnect and remove the air silencer complete, then remove the three securing screws, and lift off the air valve chamber. The piston valve can be then lifted out, the utmost care being taken not to bend or damage its depending needle valve, or to bruise the valve in any way. The valve, chamber and guide should be carefully wiped with a piece of clean cloth dipped in petrol, and the piston rod **ONLY** lubricated with a few drops of thin oil.

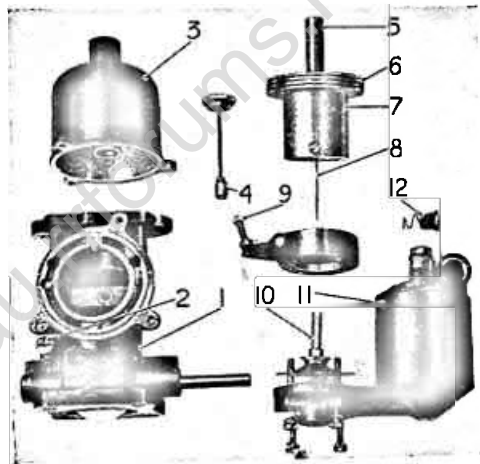


Fig. 13.—CARBURETTER DISMANTLED.

- | | |
|--------------------------------------|--------------------------------------|
| 1. Carburettor Body. | 7. Piston. |
| 2. Idle Mixture Quantity Adjustment. | 8. Needle. |
| 3. Air Valve Chamber. | 9. Idle Mixture Strength Adjustment. |
| 4. Hydraulic Damper Piston. | 10. Jet Tube. |
| 5. Guide Stem and Oil Well. | 11. Float Chamber. |
| 6. Suction Disc. | 12. Inlet Filter. |

No polishing paste or abrasives should be used to clean the valve or valve chamber.

The suction disc (6, Fig. 13) does not touch the walls of the valve chamber, there being a small clearance, and it is centralised solely by the piston rod working in the guide. Therefore any sluggishness in movement is probably due to dirt in the guide, or on the valve chamber walls.

When replacing the valve, it will be noticed that there is a slot which must engage a tongue provided on the carburetter body. The air valve chamber can only be replaced in one position, the three screw holes being unevenly spaced to ensure this.

If the above treatment does not effect a cure, the fault may be due to a bent jet needle, or, alternatively, to the needle fouling the jet. If this is suspected it is recommended that communication is made with Messrs. Rolls-Royce Limited or one of their "Special Retailers".

The needle valve is secured in position by means of a grub screw, and if it should be necessary to remove this, as, for instance, when replacing an accidentally damaged needle, it must be particularly noticed that the location of the valve is determined by a shoulder or a ring round the shank of the needle, depending on the carburetter type. The valve should be pushed into the piston until this locating shoulder or ring is just flush with the lower face and the grub screw tightened.

If a needle should be accidentally damaged, a new one must be obtained from either Messrs. Rolls-Royce Limited, or one of their "Special Retailers". Code letters are stamped on the end of the needle, denoting the needle characteristics, and it is essential that only one of the same coding is fitted.

Automatic Choke Control.

The automatic system consists of:—

- (i) An out-of-balance butterfly valve in the common air intake pipe, indirectly coupled to a diaphragm which is subject to induction pipe depression.
- (ii) A small electro-magnet wired in parallel in the ignition circuit, to hold the butterfly closed when starting with a cold engine. An oil pressure sensitive switch releases the electro-magnet at a determined engine oil pressure.

A temperature sensitive switch, mounted on the dashboard and wired in series with the electro-magnet disconnects this circuit when the under-bonnet temperature is above 15° C., as a closed choke is not necessary when restarting with a "hot" engine.

- (iii) A cam for "Fast Idle", loose-coupled to a pick-up lever connected to the butterfly valve spindle.

- (iv) A thermostatic spring unit housed in a suitable recess in the water jacketing of the induction manifold.

As the engine cools, the thermostatic spring also cools, and gradually gains tension. The thermostatic spring is, however, unable to close the choke valve until the throttle stop screw has been lifted from the fast idle cam.

It is therefore necessary to depress the accelerator pedal and then allow it to return to its normal position before attempting to make a start.

As soon as the engine is running, the depression created in the induction pipe is exerted on the diaphragm, which transmits its energy to the loose lever on the butterfly spindle. This, in turn, catches up on a peg and turns the spindle to open the butterfly valve a pre-determined amount, against the loading of the thermostatic spring.

Assuming that the accelerator pedal has not been moved, the engine will continue to run at a speed determined by the starting position of the "fast idle" cam. The engine coolant jacketed pocket holding the thermostatic coil units will gradually warm up and transmit heat to the coil. This, in turn, will unwind and gently release the load on the butterfly, which will slowly open.

With the depression of the accelerator pedal for the drive away, the "fast idle" stop on the throttle shaft will move away from the cam and the cam will fall on to the pick-up lever coupled to the butterfly spindle. The loading of the thermostatic spring and the off-set of the butterfly have been so arranged that any air flow greater than that required for a "fast idle" automatically opens the butterfly sufficient for engine requirements.

Float Feed Mechanisms.

These are of the usual "top feed" pattern, whereby, as the level of the petrol rises in the float chamber, a lever bearing on the top of the float moves the conical seat "needle" upwards on to its seating, so shutting off the supply.

If it is required to dismantle and clean a float chamber, the carburettor must first be removed from the engine. The float chamber is retained by four long screws which also locate and hold the diaphragm jet assembly. Before removing screws, mark the relative parts to ensure that on re-assembly, these parts are replaced in original positions, otherwise, jet needle centralisation will be disturbed. The float chamber should be wiped out with a piece of clean wash-leather before being refitted.

Adjustment of Controls.

There should be no necessity for any variation of the adjustments as fixed by the makers. Great care is taken during the testing of the car to secure the best settings, and these should not under normal circumstances be altered.

Setting of Idling Adjustments.

1. The strength or quality of the mixture for slow running is set by means of an adjustable screw, one on each carburetter (9, Fig. 13) on the side of the main body.

The screw operates a rocking lever to raise or lower the jet tube, which is attached to a rubberised diaphragm covering the jet main well.

Turning the screw clockwise and so lowering the jet enriches the mixture and vice versa.

2. The quantity of mixture for slow running is determined by means of an adjustable screw, one on each carburetter (2, Fig. 13), which varies the restriction in a separate by-pass passage across the throttle.
3. With the engine warm and running, manipulate the screws to give an even running, approximately 400 r.p.m. As a mechanical guide, the screws should be approximately one and a half turns back from the closed position.

Any sign of hunting is due to too rich a mixture. Irregular firing, indicated by irregular pulsations from the exhaust pipe, shows the mixture to be too weak, and both the adjusting screws should be screwed down a little, i.e., clockwise.

Air Cleaner and Silencer.

The air cleaner which may be either of the "steel wool element" type or the "oil bath" type is fitted at the front end of the silencer to prevent the passage of dust and grit to the engine through the carburetter.

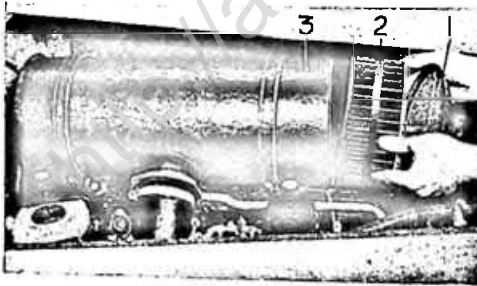


Fig. 14.—AIR CLEANER AND SILENCER.

- | | |
|---------------------|--------------|
| 1. End Cover. | 3. Silencer. |
| 2. Cleaner Element. | |

Where the "steel wool element" type is fitted (Fig. 14) the element should be withdrawn, by removing the end cover (1), every 10,000 miles, unless the car is being operated under particularly dusty conditions, when the cleaning must be carried out at 5,000 mile inter-

vals or less, depending on dust concentration.

The cleaner element should be carefully washed in petrol or paraffin, and afterwards oiled with engine oil. It should then be thoroughly drained and refitted.

Where the "oil bath" type is fitted, this should be regularly cleaned every 1,000 miles or less, depending on local conditions. The filter element should be removed by unscrewing the long bolt which passes through the top of the silencer whilst supporting the filter bowl.

The filter bowl should be carefully lifted out, emptied, and cleaned. The element should be thoroughly washed in petrol and allowed to dry.

Replace the element, refill the filter bowl with engine oil to the indicated level, and refix in position.

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CHAPTER VI

Transmission

The Gearbox.

The Rolls-Royce Automatic Gearbox combines epicyclic gear trains with a fluid coupling and automatic control of gear changes.

The approximate speeds at which the automatic changes occur are as below:—

					Up Changes (m.p.h.)		
					1—2	2—3	3—4
Light Throttle	..	..	..	..	6	11	20
Full Throttle	..	..	..	..	18	31	65
					Down Changes (m.p.h.)		
					4—3	3—2	2—1
Light Throttle	..	..	..	..	14	8	4

No adjustments should be attempted; any inconsistency of operation should be reported to Messrs. Rolls-Royce Limited or one of their "Special Retailers".

To ensure the efficient operation of the gearbox it is essential that only one of the recommended fluids should be used. Also that the fluid level should be inspected every month.

The recommended procedure is:—

1. Ensure that the selector lever is at "N", and that the hand brake is "ON"; start the engine and run at idling speed for three minutes to warm up the transmission.
2. Remove the dipstick access cover (1, Fig. 15) and thoroughly clean around the dipstick. With the engine still running, check the level with the dipstick.
3. If topping up is necessary, pour in the correct oil in small quantities, checking frequently. Ensure that the level is at, but does not exceed, the "F" mark.

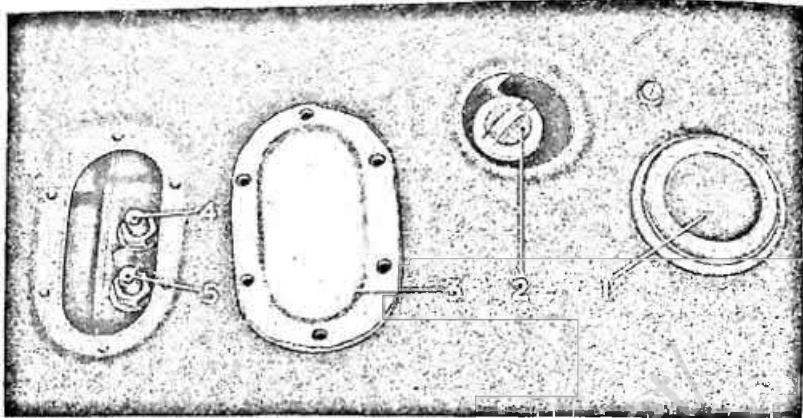


Fig. 15—ACCESS TO GEARBOX.

- | | |
|---------------------------------|-------------------------|
| 1. Cover, Dipstick. | 4. Front Band Adjuster. |
| 2. Dipstick. | 5. Rear Band Adjuster. |
| 3. Cover, Brake Band Adjusters. | |

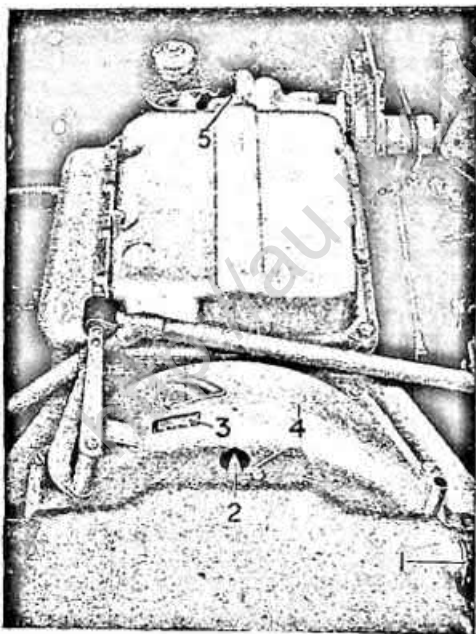


Fig. 16. GEARBOX UNDERNEATH VIEW.

- | | |
|-----------------------|------------------------|
| 1. Engine Sump Drain. | 4. Lower Bell-Housing. |
| 2. Timing Pointer. | 5. Gearbox Drain. |
| 3. Flywheel. | |

Every 20,000 miles, the gearbox and the fluid coupling should be completely drained and refilled with fresh oil.

The gearbox is drained by removing the plug (5, Fig. 16). To obtain access to the fluid coupling drain plug, remove the lower bell-housing cover (4, Fig. 16) and turn the engine by means of the starter motor to bring the drain plug in the torus cover to the lowest position. Remove plugs and thoroughly drain.

To refill gearbox, replace drain plugs and:—

1. Pour in 14 pints of the recommended fluid.
2. With the handbrake on, start the engine and allow it to run at

a fast idle for several minutes to fill the fluid coupling.

3. Stop the engine and add a further 5 or 6 pints of fluid.
4. Start the engine and whilst running at a slow idle, check the level with the dipstick and add sufficient fluid to bring the level up to the "F" mark.

Propeller Shaft.

The propeller shaft is of the open divided type, coupled together and also to the rear axle and gearbox by universal joints.

At the centre connection is incorporated the splined sliding joint (Fig. 17).

The centre and rear universal joints are fitted with needle roller bearings, and each joint is provided with a grease gun lubricator (3), located at the centre of the cross-piece.

The sliding joint is also provided with a grease gun lubricator (4), and every 10,000 miles the correct grease should be injected by means of the grease gun into all three lubricators.

The front universal joint should be dismantled every 20,000 miles and repacked with 1½ ozs. of Mobilgrease No. 2. The centre support ball bearing is packed with grease on assembly and needs no attention.

Rear Axle.

The rear axle is of the semi-floating type.

The final drive is by offset hypoid bevel gears, which possess the advantages of being silent in running, and, owing to the offset disposition of the pinion, of enabling a lower body position to be obtained without decreasing the ground clearance.

It is important that no other oil than that recommended should be used in the rear axle. (See page 28.)

Every 5,000 miles the level of the oil should be inspected, and topped-up if necessary.

Every 20,000 miles the casing should be drained and refilled with fresh oil to the correct level.

The drain plug (2, Fig. 18) should be removed, with the special spanner provided in the tool kit, preferably when the casing is warm, and all the oil allowed to drain out. Afterwards, replace drain plug.

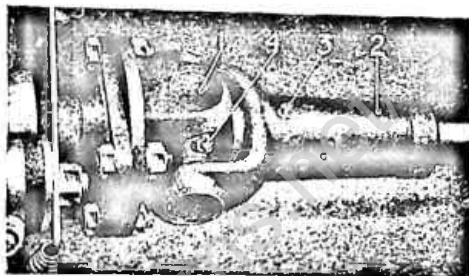


Fig. 17.—PROPELLER SHAFT JOINTS.

- | | |
|---------------------|--------------------------|
| 1. Universal joint. | 3 and 4. Grease Nipples. |
| 2. Sliding joint. | |

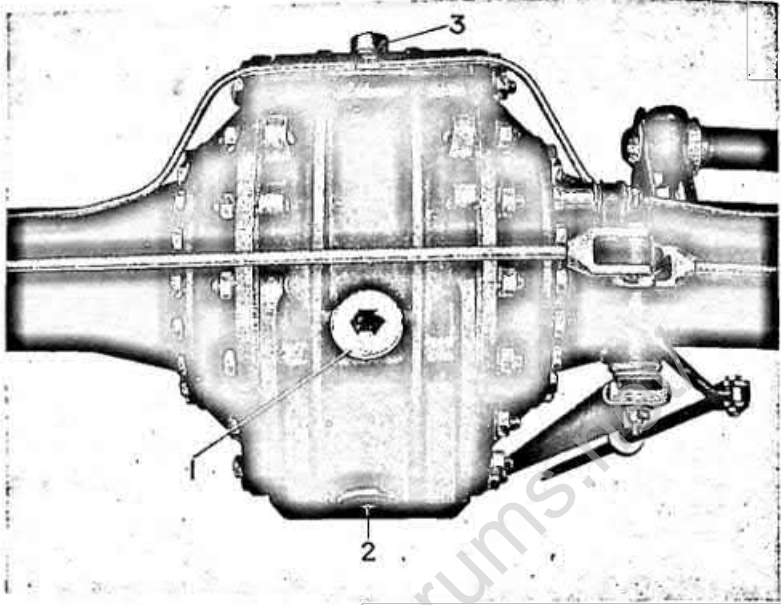


Fig. 18.—REAR AXLE.

1. Filler and Level Plug.
2. Drain Plug.
3. Breather.

Plug (1) should then be removed for filling purposes. One-and-a-half ($1\frac{1}{2}$) pints of fresh oil should be inserted, using a syringe. This quantity should just cause oil to overflow from the filling orifice.

Replace the plug and ensure that the joint washer is in position and that there is no leakage from either plug.

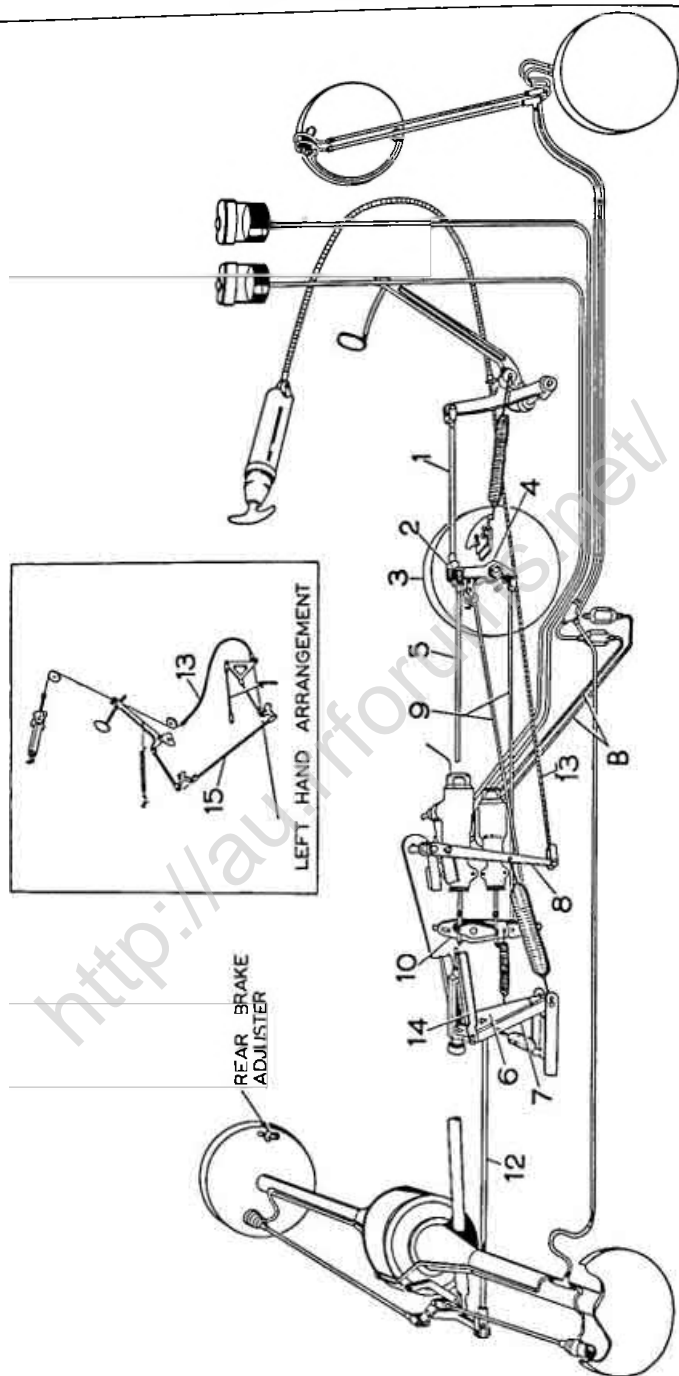


Fig. 19.—ROLLS-ROYCE BRAKING SYSTEM.

CHAPTER VII

The Braking System

The Rolls-Royce braking system is of the Servo operated hydro-mechanical type. A servo motor of the dry disc-brake type is fitted to the gearbox and driven at approximately one-fifth of the propeller shaft speed.

Pressure on the brake pedal actuates the servo, which in turn operates through the dual master cylinders to supply hydraulic pressure to the front and rear brakes. The front brakes are entirely operated by hydraulic pressure, whereas the rear brakes are simultaneously operated both hydraulically by the servo and mechanically by direct pedal effort, as shown in Fig. 19, in the proportions of 60 per cent. hydraulic and 40 per cent. mechanical.

The two master cylinders differ in size, the smaller supplying pressure to one of the two brake expanders in each front brake, and the larger supplying pressure to the two rear brake expanders and the remaining expander in each front brake.

This dual hydraulic and mechanical system effectively provides three braking systems capable of independent operation in the unlikely event of servo hydraulic or mechanical failure.

The hand brake lever operates the rear brakes only and uses part of the foot pedal linkage.

Operation.

On right-hand drive cars, the brake pedal directly operates the pull rod (1, Fig. 19); on left-hand drive models the pedal operates the pull rod through the medium of the cross shaft (15) as shown in the inset. The pull rod is coupled to the lever (2) of the servo motor (3), and this lever has inclined cams formed on the face of its boss which engages, through the medium of steel balls, with similar cams on the face of the lever (4).

From lever (4) a rod (5) directly actuates the rear brakes through the intermediate lever (6), the rod (12), and the rear brake equaliser.

Simultaneously, by reason of the small relative movement between the cams of levers (2) and (4) the servo is operated and applies the

master cylinders through one of the two rods (9) and the lever assembly (10), depending on whether the car is moving forwards or backwards.

The master cylinders then actuate the front and rear brakes hydraulically through the pipes (B).

The handbrake is mounted under the fascia board and is connected by an enclosed cable (13) to the lever (8), which is carried on the master cylinder support bracket. This lever (8) operates, through a pair of links (14) and a special lever (7), to actuate lever (6) by means of the pin. The linkage is then the same as for the foot brakes. The pin connecting lever (6) with rod (5) slides along the slotted link so that rod (5) remains stationary and the brake pedal is not disturbed when using the handbrake.

Adjustments.

There is no adjustment for the front brakes; the wear is taken up automatically. The rear brakes should be checked and adjusted if necessary every month or 2,500 miles as recommended on page 30.



Fig. 20.—ADJUSTMENT OF REAR BRAKES.
1. Rear Brake Adjusting Screw.

The rear brakes are adjusted by tightening the adjusters (1, Fig. 20) in a clockwise direction until solid resistance is felt, the resistance being equal for both brakes, and then turning back the adjuster two "clicks". This will give the correct setting.

When adjusting the brakes it is not necessary to jack up the car, but it is important to see

that the handbrake is in the "off" position.

If, after long service, the rear brake linings require renewal, this will be apparent by the adjusters coming to the end of their travel, and will have a solid feel quite distinct from the resistance felt when the brake shoes are correctly adjusted.

An inspection of the front brakes should be made every 20,000 miles to check if they need re-lining. The adjustment is automatic for normal wear, but an indication that the brakes require re-lining would be the lack of front braking at the end of a long stop.

If the linings are not worn to $1/32$ " of the rivets, they are suitable for further use and the drums may be replaced. When replacing the

drums push the shoes in towards each other and then fit the drum with which the shoes will be in light contact.

A slight rub is normal for both front and rear brakes, and is quite correct.

Adjustment of Handbrake.

Adjustment of the rear brakes takes up both the pedal and hand-brake clearance in the same operation. No other adjustment is required.

Adjustment of Servo.

An adjustment is provided for the initial setting and wear of the friction surfaces, but once correctly set, should require no further attention for a considerable period, as very little wear occurs. Any adjustment should be effected by Messrs. Rolls - Royce Ltd., or one of their "Special Retailers".

Lubrication.

The necessity for hand lubrication of various parts of the mechanism has been reduced to a minimum by the use of self-lubricating bearing bushes at the fulcrum of practically all levers.

The only points requiring attention are the greasing point for the master cylinder balance lever needle roller bearing, which should be greased every 10,000 miles and the jaws and pins of the pull rods and intermediate levers which should be oiled every 5,000 miles. The ball bearing cams which actuate the servo are filled with lubricant on initial assembly and require no attention between overhauls of the chassis.

Bleeding the Hydraulic System.

Bleeding, that is, expelling air from the system should only be necessary when completely recharging the system with fluid following the removal of a component or the disconnection of a pipe joint. Under normal conditions air does not enter the system as a result of brake application.

To bleed the system, proceed as follows:—



Fig. 21. BLEEDING FRONT BRAKES.
(Showing position of Bleed Screw.)



Fig. 22. --BLEEDING REAR BRAKES.
(Showing position of Bleed Screw.)

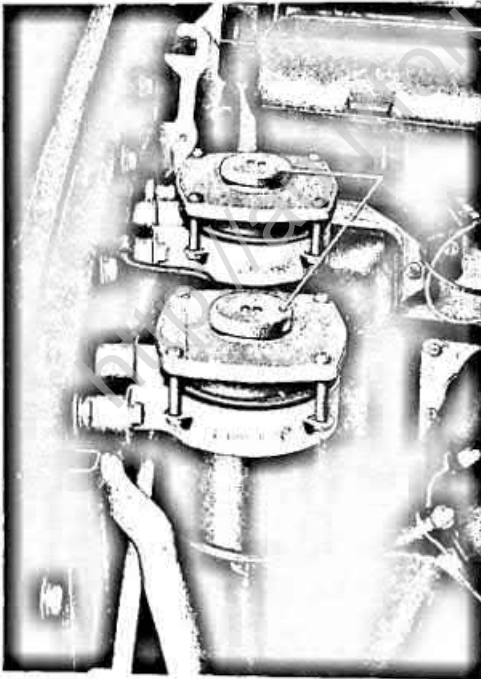


Fig. 23. MASTER CYLINDERS SUPPLY TANKS.
1. Filler Caps.

1. Remove rubber cap and attach a clean rubber drain tube to one front brake bleed-screw (Fig. 21) and immerse the other end in a clean glass jar in which there is sufficient hydraulic brake fluid to submerge the end of the tube.
2. Fill both master cylinder brake fluid supply tanks (Fig. 23) with the recommended fluid, and ensure that they do not become completely empty during the following operations.
3. Pump the master cylinders by movement of lever (10, Fig. 19). Operate the master cylinder with a deliberate forward movement; at the same time open the bleed screw. At the end of the forward stroke, close the bleed screw and then allow the master cylinder pistons to return to the rest position with the bleed screw still closed.

The lever must be pulled right back at the end of each

stroke, but it should be remembered that the pistons are not mechanically attached to the operating lever in any way, and a pause of five seconds should be made at the end of each cycle before making a further forward movement of the lever and opening the bleed screw.

Continue bleeding for approximately 10 cycles or until no more air bubbles appear in the bottle.

4. Repeat the above operations for the other three front brake bleed screws and the two rear brake bleed screws. Finally refill the two brake fluid supply tanks to the level indicated.

Hydraulic Master Cylinders.

Both brake fluid supply tanks for the two master cylinders, fitted to the right hand valance plate (Fig. 23) should be examined every 10,000 miles and topped up if necessary, with the recommended fluid.

As there should be no loss of fluid due to brake use, any large fall in the fluid level indicates a leak at some point in the system which must be traced and rectified.

CHAPTER VIII

Steering, Suspension, Wheels and Tyres

Steering.

The steering mechanism is of the cam-and-roller type, and requires no attention beyond the periodic lubrication.

The steering box is provided with a filling plug (1, Fig. 24). Every 5,000 miles, the casing around the plug should be cleaned and the plug removed, preferably when the box is warm, and the level of the oil inspected. If necessary it should be topped up to the level of the orifice.

For correct oils, see page 28.

Steering Arms and Joints.

The ball joints of the steering tubes are lubricated from the centralised chassis system, as illustrated in Fig. 47.

The bearing pads of all joints are spring-loaded, being self-adjusting for wear. They should not normally require attention except when the car is undergoing a general overhaul.

Front Suspension.

Independent front wheel suspension is used, as this type of suspension permits large wheel movements without causing steering errors, and without transferring the road shocks to the other wheel or to the steering system.

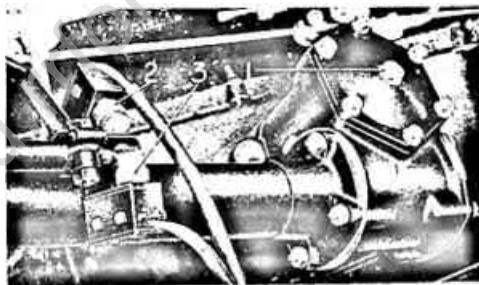


Fig. 24.—STEERING BOX.

1. Steering Box Filler Plug.
2. Micro-switch—Starter Circuit.
3. Micro-switch—Reverse Lights.

Large open coil springs are used in the front suspension and damping is provided by the double acting hydraulic shock absorbers which are an integral part of the system.

No attempt must be made to remove the coil springs of the front suspension.

Special appliances are required as the springs are compressed even when in the rebound position.

Any necessary dismantling or adjustment of the suspension must be effected by Messrs. Rolls-Royce Limited or one of their "Special Retailers".

Front Stabiliser.

In order to check the tendency of the car to "roll" on corners, a steel torsion-rod stabiliser is provided at the front end of the chassis.

The stabiliser is carried in rubber bearings, and is coupled to the lower triangle levers by links with rubber pads.

No attention is necessary.

Front Shock Dampers.

Each shock damper consists of a piston assembly operating in a cylinder which is maintained full of oil, the oil being displaced from one end of the cylinder to the other past a spring loaded valve.

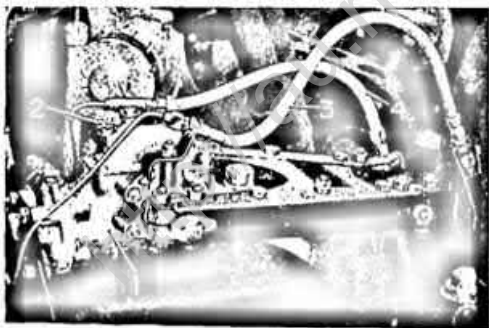


Fig. 25.—FRONT SHOCK DAMPERS.

- | | |
|-----------------------|--------------------------|
| 1. Shock Damper Unit. | 3. Hydraulic Brake Pipe. |
| 2. Filler Plug. | 4. Lubrication Pipe. |

Unless it is obvious that the effectiveness of the shock damper has been reduced, no attention is necessary except the periodical inspection of the oil level.

Every 10,000 miles, the filler plug (2, Fig. 25) should be removed, after carefully cleaning the surrounding casing, and the oil level inspected and topped up if necessary.

It is of vital importance that only perfectly clean oil of the correct grade should be used, and this should be strained through a fine gauze before using.

The importance of the above cannot be over-emphasised, as a very small particle of foreign matter lodged under one of the valves will impair the effectiveness of the damper.

Road Springs.

The rear suspension is by leaf springs of grooved section material. They are lubricated for life with a special grease.

The spring eye and shackle bushes are of rubber, and no attention either to these or the springs is required.

Rear Torsion Bar.

A "Z" type stabiliser bar is fitted between the rear axle and the chassis on the rear right-hand side. Its duty is to reduce car roll and axle rock.

The stabiliser is carried in rubber bearings and no attention is necessary.

Rear Shock Damper.

Hydraulic double acting shock dampers of special design are fitted to the rear axle (Fig. 26).

The shock damper consists of a piston assembly operating in a cylinder which is maintained full of oil, the oil being displaced from one end of the cylinder to the other past a spring loaded valve.

The degree of damping is controllable through the **Ride Control Switch** on the steering column. The switch controls the movement of a solenoid which alters the size of a slow leak passage so enabling a "Normal" or "Hard" ride to be obtained to suit the car loading or road conditions.



Fig. 26. --REAR SHOCK DAMPERS.

- | | |
|-----------------------------|-----------------|
| 1. Shock Damper Unit. | 3. Filler Plug. |
| 2. "Ride" Control Solenoid. | |

Unless it is obvious that the effectiveness of the shock damper has been reduced, no attention is necessary except the periodical inspection, and the topping up, if necessary, of the oil level.

Every 10,000 miles, the filler plug (3, Fig. 26) should be removed after carefully cleaning the surrounding casing, and the oil level inspected and topped up if necessary.

As with the front shock dampers, it is vitally important that only perfectly clean oil of the correct grade is used, and also that no foreign matter is allowed to enter the filling aperture.

Wheels.

All wheels are of heavy gauge pressed steel, with 15" by 6" well-base rims, and are secured with five nuts.

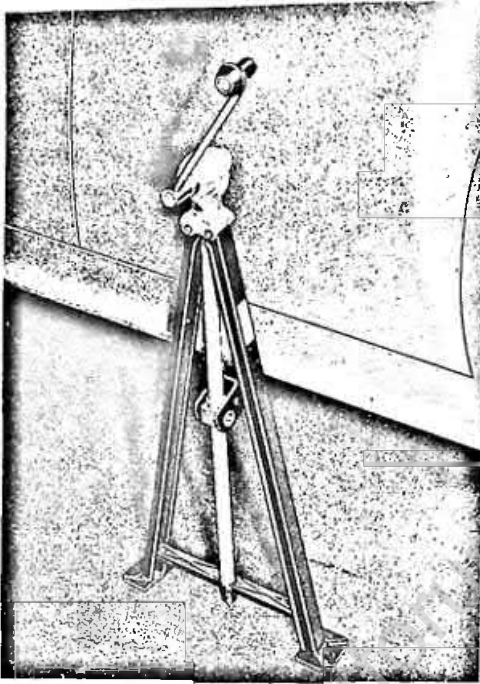


Fig. 27.—WHEEL JACK IN POSITION.

The jack is fitted into slotted brackets conveniently arranged on the side frame member, adjacent to the centre body pillar, and is used on either side of the car as required.

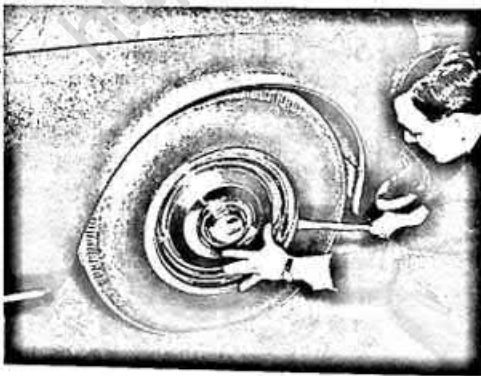


Fig. 28.—REMOVING HUB CAP.

The securing nuts for the right-hand wheels have right-hand threads and those for the left-hand have left-hand threads.

The nuts must be tightened evenly and securely, and the studs kept clean and lightly greased.

Wheel Discs.

The discs are of the snap-on-type, and may be removed by prising off with the special tool provided in the tool kit.

The Jacking System.

A portable wheel-jack is provided in the tool kit and is operated as shown in Fig. 27.

Wheel Changing.

No difficulty should be experienced in wheel changing; the spare wheel can be put on the rear or front hub with very little effort, as follows:—

1. Apply the handbrake (this should be done before jacking up the car. Placing the gear lever in reverse is not sufficient).
2. Jack up the appropriate side of the car by pushing the pigot

on the jack into the hole provided under the sill, adjacent to the centre door pillar.

The spigot must be pushed right home before attempting to jack up the car. If mud is present in the hole it can be removed by the jack spigot.

The jack should be held as upright as possible and the legs separated as far as the link allows, and the jack handle turned clockwise until the wheel to be changed is just clear of the ground.

NOTE.—If the spigot is on the same side of the jack as the handle when removed from the storage place in the boot, it can be moved to its correct side by separating the jack legs as far as the link allows and turning the handle to raise the spigot on the thread. After changing the spigot over, the jack should be lowered to a convenient height to be applied to the car as above.

3. Remove the spare wheel from the locker in the boot and position convenient to the wheel to be changed.
4. Remove hub cap with the tool provided.
5. Remove all the wheel nuts. On a front wheel this is best done before the wheel is jacked clear of the ground.
6. Remove the wheel and fit the spare. In the case of a front wheel, lift the wheel on to the hub and rotate the wheel, which will also rotate the hub, until a stud enters at the half-way line. Rotate the wheel to bring the entered stud to the top, when the other four will be correctly positioned.

In the case of a rear wheel, lift the wheel on to the hub; one of the wheel studs will be found to be nearly on the horizontal half-way line, either to the front or rear. Rotate and tilt the wheel until this stud protrudes through the nearest stud hole. Using the entered stud as a fulcrum, raise the wheel until the other studs enter their respective holes.

Replace all the wheel nuts. For a front wheel, nip up the nuts and then lower the jack until the wheel contacts the ground. Then fully tighten the nuts.

7. Replace the wheel discs, taking care to get the valve hole in the correct position.

Lubrication of Wheel Bearings.

The wheel bearings are correctly packed with ball-bearing grease in the first instance, and should need no attention between general overhauls of the chassis.

Tyres.

The tyres fitted are 8.20" by 15" of approved types. When purchasing new tyres, if approved types are not available, a four-ply tyre of six-ply rating is recommended in preference to a six-ply.

The recommended pressures are:—

front, 19 lbs./sq. inch (1.33 kg./sq. cm.)	} Cold.
Rear, 26 lbs./sq. inch (1.83 kg./sq. cm.)	
Front, 22-23 lbs./sq. inch (1.55-1.62 kg./sq. cm.)	} Hot.
Rear, 32-34 lbs./sq. inch (2.25-2.40 kg./sq. cm.)	

Tyre pressures should always be checked when the tyres are cold, preferably in the morning or after standing in a cool place, and never after a fast run. Heat developed on fast runs or from hot roads increases the pressures, but they decrease again when the tyre cools. Under no circumstances should the tyre pressures be reduced to compensate for increased pressures due to heat.

If it should be necessary to adjust the tyre pressures immediately after the car has been in use, inflate as marked for "Hot".

New Tyres.

New tyres require a short period of running-in. The heat generated by a new tyre until it has been correctly flexed makes it unsafe for really high speed driving.

It is recommended that after the fitting of a new tyre, or tyres, the speed of the car should not exceed 90 miles per hour for the first 100 miles.

During the running-in period, the ride of the car may appear rather hard, but will ease to normal as the tyre gains flexibility.

Tyre Service.

Normal tyre wear is irregular between the front and rear wheels and to minimise this wear it is recommended that the tyres are interchanged in position every 5,000 miles, i.e., the car should be jacked up alternately on each side, and the front wheel interchanged with the rear wheel on the same side of the car.

At the same time the wheel balancing should be checked and corrected if necessary.

It should be realised that if the tyre wear is uneven the toe-in may need adjustment, i.e., if the wear on the near side front tyre is more than that on the off-side front tyre then the toe-in is too great, likewise if the wear on the off-side front tyre is greater than that on the near side, then there is not enough toe-in.

All cars, unless specially requested, are now equipped with tubeless tyres, these having many advantages over the conventional type of tyre and tube.

Should a puncture occur on a tubeless tyre as the result of penetration by a nail or other normal puncturing object, providing the object

is left in the tyre, it is usually possible to complete one's journey without having to effect a repair.

When a repair is necessary it is recommended that a Dunlop "Reddiplug" repair kit is used.

The "Reddiplug" method of repair is extremely simple, and can be made without removing the tyre from the rim. Briefly, it consists of forcing a rubber plug through the hole with the threading needle, an operation which can be completed in a matter of minutes. Full directions are given with each kit.

On cars fitted with the conventional tyre and tube, the inner tubes are manufactured from "Butyl" (synthetic rubber), identified by having the valve stems coloured blue.

In the event of a puncture, these tubes should be repaired in the same manner as tubes of natural rubber.

When installing a tube into the tyre cover, care must be taken to see that the tube is free from kinks. These tubes retain their extended size when deflated and do not contract to normal shape as do the natural rubber inner tubes.

Balancing Wheels and Tyres.

It is most important, in view of the high speeds attainable, that the road wheels are properly balanced both statically and dynamically.

As a wheel and tyre assembly may lose its original balance due to irregular tyre wear, or tube or tyre repair, it is recommended that the wheel balance is checked every 5,000 miles.

Special equipment is necessary for the checking and correcting the balance of the wheels, and the car must be taken to one of the Special Retailers for this service.

Snow Tyres.

India "Winter" or Dunlop "Wintergrip" tyres may be fitted to the rear wheels of the car for winter running. These allow for faster driving and give a more comfortable ride than chains. Owing to the heavier tread, car speed on these tyres should be limited to 75 miles per hour.

CHAPTER IX

The Electrical System

The electrical system is earthed by connecting the negative side of the battery to the chassis frame, and all switching is done in the positive leads.

Before commencing work on a chassis which is likely to involve the electrical system, it is advisable to disconnect the chassis frame connection from the negative battery terminal, but do not disconnect whilst any charge or discharge current is passing.

The wiring diagram (Fig. 29) shows the various units with their electrical connections, the wires being indicated in colours to correspond with those of the actual coverings.

Dynamo.

The dynamo, shown in Fig. 30, is driven by the same belt that drives the water pump and fan. It is of the shunt wound type, the excitation of the field being automatically regulated to suit the state of charge of the battery and is operated on the current voltage control system.

There are two external connections, the smaller terminal is the field connection, and this is connected to the terminal marked "F" on the regulator. The larger terminal is similarly connected to the terminal "D" on the regulator.



Fig. 30. —THE DYNAMO.

1. Brush Gear Cover.
2. Rear Bearing Oiling Point.

Every 10,000 miles a few drops of oil "B" should be inserted into the oil-hole in the rear end bearing.

Every 20,000 miles the commutator and brushes should be inspected by slackening the screw and sliding aside the cover (1). Deposits of carbon dust, moisture and oil should be removed, and note taken of any appreciable wear of the brushes.

Cleanliness of the commutator and freedom of the dynamo brushes in their holders are the most important points in the maintenance of the dynamo.

The commutator may be cleaned, if it is very dirty, with a fine duster moistened with petrol; the engine should be turned slowly whilst the duster is held against the commutator by a suitable piece of wood.

Premature failure or excessive wear of the brushes indicates some definite fault in the machine which should be returned for correction. In normal circumstances the brushes should only need replacing after considerable running, and when this is necessary, it is recommended that this work should be done by Messrs. Rolls-Royce Limited or one of their "Special Retailers".

Current Voltage Regulator and Cut-out.

The regulator consists of three units, a cut-out relay, a current regulator and a voltage regulator, mounted on a single base and enclosed in a dust proof cover, the whole being mounted on the dashboard as shown in Fig. 31.

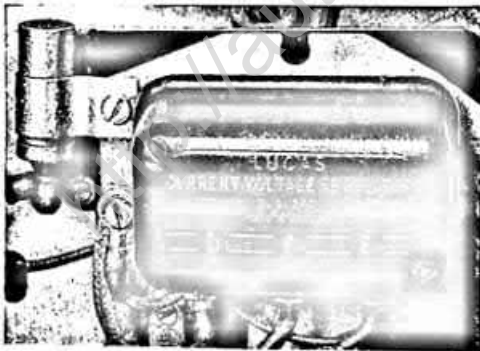


Fig. 31.—CURRENT VOLTAGE REGULATOR AND CUT-OUT.

The operation of the cut-out is to break the circuit between the battery and the dynamo when the dynamo voltage is less than the battery voltage in order to prevent the battery discharging through the dynamo.

The current regulator limits the dynamo output to a safe value when the battery is in a low state of charge and/or when the electrical load on the system is high.

The constant voltage regulator allows the charging current to drop as the fully charged state of the battery is reached, and continues at a normal trickle charge value.

The regulator and cut-out requires no attention, and no adjustment should be attempted. If any defects in operation should develop, Messrs. Rolls-Royce Limited or one of their "Special Retailers" should be consulted.

Battery.

The battery recommended and specified for this car is as follows:—

Battery Maker's Designation.		Voltage.	Normal Charging Current.
P. & R. Dagenite.	Exide.		
6 HZP.9/GZ	6 XCV.9 L	12	5 amperes.

It is mounted at the rear of the chassis frame and is easily accessible for service or removal through the boot.

First Charge.

If the battery is received in a dry condition it will be necessary to fill the cells with acid solution of the correct specific gravity and charge the battery, before it is put into use.

It is strongly recommended that the necessary charging should be undertaken by a properly equipped service station, as unless the initial charge is correct the battery will never give satisfactory service.



Fig. 32. ACCESS TO BATTERY.

Topping-up.

Under normal operating conditions the level of the solution will gradually fall in each cell, mainly owing to evaporation losses. A regular inspection should be made to see that the level of the acid solution has not fallen to expose the tops of the separators and plates.

In this case, the battery should be "topped-up" by removing the vent plug in the centre of each cell lid and adding distilled water to each cell, until the level of the solution is approximately $\frac{3}{8}$ " above the tops of the separators.

It is difficult to lay down a hard and fast rule as to how frequently "topping-up" will be required, because this varies so much, according to the use to which the car is put, and also the temperature in which it operates. It must be remembered that "topping-up" will be necessary more frequently in hot weather than in cold.

It should never be necessary to add sulphuric acid to the cells, unless it is definitely known that some of the acid has been spilt. The addition of acid to the battery should only be done by an experienced battery man, who at the same time will carry out any adjustments to the acid gravity.

Specific Gravity of Electrolyte.

Various acid specific gravity figures are given for reference in the following table, and they apply to both makes of batteries.

Acid gravity figures are taken by means of an hydrometer.

Climate.	Specific Gravity of Sulphuric Acid Solution. (Corrected to 70° F.)	
	Filling in for First Charge.	Fully Charged.
	6 HZP.9/GZ 6 XCV.9/L	
Temperate	1.260	1.280 (1.270-1.285)
Tropical (i.e. where the temperature is frequently 90° F. or over)	1.190	1.210 (1.200-1.215)

Charging.

The dynamo will, under ordinary running conditions, provide enough current to ensure re-charging of the battery, but it is possible if necessary to charge the battery from a trickle charger whilst in position on the car, making use of a flexible lead and the special two-pin plug supplied, which fits the charging plug socket on the fascia board arranged just above the steering column.

Be certain that the direction of current is correct, the socket holes are marked + and - respectively, and, in addition, are made of different sizes in order to clearly distinguish them.

Maintenance.

The battery must be well secured in its box so that it cannot move.

The cable terminals should be well coated with lanolin or pure vaseline (not grease), before putting the battery into service.

The top of the battery should always be kept clean, and as far as possible, dry; attention should be given immediately to the least sign of corrosion occurring on the terminals.

Keep the terminals and connectors well covered with lanolin or pure vaseline, all contact surfaces clean and firmly screwed up, but do not use abrasives for cleaning. To remove corrosion, use a solution of ammonium carbonate, applying with a rag.

Do not inspect the battery with the aid of a naked light, and on no account disconnect any of the battery terminals or connections when a charge or discharge current is passing.

The battery must never be allowed to remain in a discharged condition. A battery not in service should be kept in condition by fully charging it and then giving it a freshening charge at least once a month. It should be given a thorough charge before being put back into service.

Starter Motor.

The starter motor is shown in Fig. 33. A small train of gears is arranged in a casing behind the motor, the effect of which is to provide a total reduction gear ratio between motor and crankshaft of 18.15 : 1.

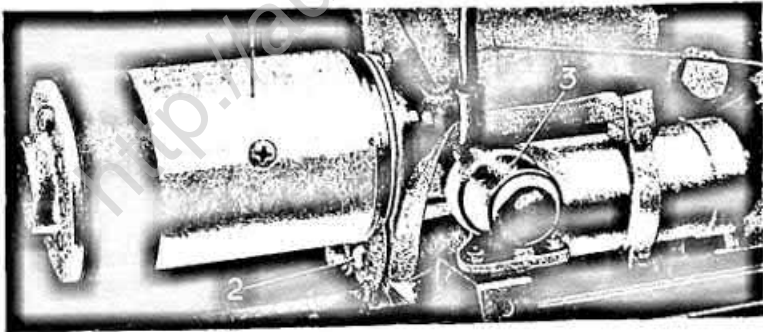


Fig. 33.- STARTER MOTOR.

1. Starter Motor.

2. Starter Motor Switch

3. Gear Casing Oil Plug.

A plug (2) in the front cover of the gear casing should be removed every 10,000 miles and oil "B" injected until it is level with the orifice. This oil also lubricates the driving end bearing of the armature shaft.

Ordinarily, the brushes will last a long time. In the event of replacements being necessary, application should be made to Messrs. Rolls-Royce Limited or one of their "Special Retailers".

The fitting of new brushes requires expert knowledge and care, and emphasis is laid on this point, as cases have arisen of faulty operation of the motor due to the inexpert fitting of brushes.

When replacing the starter motor in the chassis, it is important to be sure that a clean and sound electrical connection of cable to motor is re-obtained, owing to the heavy current which this has to carry.

If the starter appears to be sluggish in its action, and such sluggishness is traceable to the battery, no further attempt should be made to use the starter until the battery has been duly inspected and fully charged from an external source.

Starter Motor Switch.

The main starter switch is mounted on the frame adjacent to the starter and is relay-operated. Closing of the switch on the instrument panel energises an electric magnet, which closes the main contacts.

No attention should be necessary to the switch between general overhauls of the chassis.

Micro-Switches.

Situated at the base of the steering column, the unit incorporates two switches actuated by the gear change column control lever (see Fig. 24).

One switch is connected in the starter motor circuit and is closed only when the hand control lever is in neutral. This ensures that the engine can only be started up in neutral.

The second switch (3) is the reversing light switch, and is closed when the hand control lever is in reverse.

Fuse Boxes.

The large fuse box (Fig. 34) carries the eight circuit fuses. Each circuit fuse is one strand of No. 31 S.W.G. tinned copper wire.

The small fuse box carries the horn fuse. This is a cartridge type fuse of 25 amp. rating.

Spare fuse wire is provided on a special holder within the large fuse box.

Special care must be taken that all fuses are gripped firmly in their holders, and that the contacts are clean and bright.

Ignition Distributor.

The ignition contact breaker and distributor are shown in Fig. 35, an internal view of the contact breaker being shown in Fig. 36.



Fig. 35. IGNITION DISTRIBUTOR.

- | | |
|---------------------------|---------------------|
| 1. Rotor. | 4. Spare Condenser. |
| 2. Television Suppressor. | 5. Greaser. |
| 3. Condenser. | |

checked for the correct gap opening which should be .019" (.45 m/m.) to .021" (.55 m/m.). If adjustment is necessary, turn the engine slowly so that the cam fully opens the contact breaker points, loosen the locking screws (3 and 4, Fig. 36) and turn the respective adjusting screws (5 and 6) to



Fig. 36. IGNITION DISTRIBUTOR (INTERIOR).

- | | |
|------------------------------------|-----------------------|
| 1 and 2. Rocker Arms. | 9 and 10. Pivot Pins. |
| 3 and 4. Locking Screws. | 11. Cam Pad. |
| 5 and 6. Adjusting Screws. | 12. Felt Wick. |
| 7 and 8. Synchronising Adjustment. | |

The lubricator (5, Fig. 35) should be given a turn every 1,000 miles, and, when empty, re-filled with the correct grease, as specified on page 28.

The distributor should be periodically removed and inspected every 5,000 miles; the moulding and the electrodes should be wiped with a dry cloth.

The rotor should be removed and the contact points inspected, and if burnt or pitted, carefully cleaned with fine emery cloth.

Periodically, and always after cleaning, the contact points should be checked for the correct gap opening which should be .019" (.45 m/m.) to .021" (.55 m/m.). If adjustment is necessary, turn the engine slowly so that the cam fully opens the contact breaker points, loosen the locking screws (3 and 4, Fig. 36) and turn the respective adjusting screws (5 and 6) to obtain the correct gaps as measured with a feeler gauge. Ensure that the locking screws are correctly tightened after adjustment.

The screws (7 and 8) *must not be disturbed* as this would upset the synchronism of the two contact breaker arms.

The rocker arm pivot pins (9 and 10) should be lubricated with one or two drops of oil "A", and at the same time, one or two drops of oil "B" should be applied to the cam lubricator pad. Also, remove the rotor and

apply a few drops of oil "A" to the felt wick (12) to lubricate the automatic timing control.

Carefully replace the rotor arm with the keyway in the correct position and pushed right home.

Two condensers (3 and 4, Fig. 35) are mounted on the side of the distributor, one is connected across the control points, the other being carried as a spare.

In cases where the engine misfires or fails to start, and that this condition is obviously not due to petrol starvation, it is possible that the condenser is at fault. The wire should be disconnected from the suspected condenser and reconnected to the spare. The faulty condenser should be renewed at the earliest opportunity.

Ignition Timing.

If the ignition timing has been deranged, it can be reset by reference to the markings on the engine flywheel.

The crankshaft should be rotated until the small pointer on the lower bell-housing cover registers 2° early of the T.D.C. mark on the flywheel, when No. 1 piston is at the top of its firing stroke.

The car should be run up on a ramp or over a pit. Examination of the lower bell-housing cover (4, Fig. 16) will show the small inspection hole on the side.

Operate the starter motor to approximately line up the flywheel marking with the pointer, then prise the flywheel round into correct position.

The contact breaker should now be adjusted by rotating in an anti-clockwise direction, so that the cam is just on the point of causing the contact break when revolving in the normal direction, while at the same time the high tension rotor is opposite No. 1 distributor contact, the rotor being in the fully retarded position.

A convenient method of determining precisely when the break takes place is by reference to the ammeter. With the ignition switched on, and someone watching the ammeter, the engine should be rotated until the required cam just breaks the contacts, as indicated by the reading of the ammeter. Do not confuse this with the "flick" from the petrol pump operation.

The distributor head securing screw should then be securely tightened.

Ignition timing variation during running is entirely controlled by the centrifugal governor incorporated in the distributor.

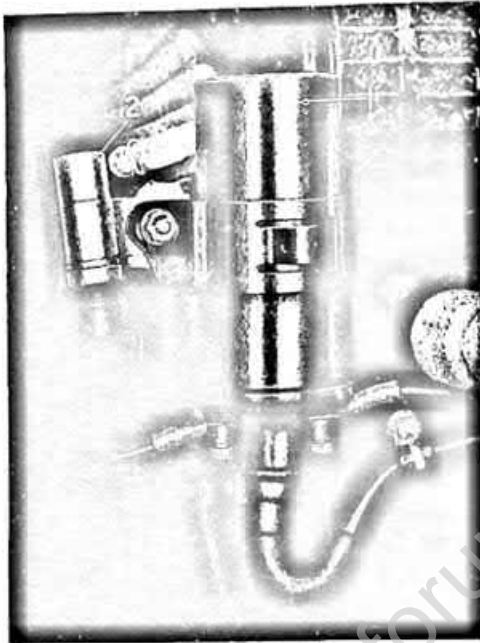


Fig. 37.—IGNITION COIL.

1. Ignition Coil. 2. Suppressor Condenser.

Ignition Coil.

The high-tension ignition coil is mounted on the front end of the engine, as illustrated in Fig. 37.

The coil may be either of Lucas or Delco-Remy manufacture, a difference being in the marking of the terminals. The Lucas coil terminals are marked "S.W." (switch wire) and "C.B." (contact breaker), the Delco-Remy coil being marked "+" (switch wire), "-" (contact breaker).

It is most important that should it be necessary to fit a new coil that the replacement coil is of the correct polarity, i.e., suitable for negative earth return. Also, that when

re-connecting the 1 mfd. condenser, fitted to reduce electrical interference to the radio from the ignition system, that this is connected to the correct terminal. This is the terminal marked either "S.W." or "+" depending on the make of coil.

The outside of the coil casing should be kept clean; misfiring is occasionally caused by an accumulation of dirt around the terminals.

Firing Order of Cylinders.

The firing order of the engine is 1, 4, 2, 6, 3, 5. No. 1 is the front cylinder.

Sparking Plugs.

The sparking plugs are either Lodge CLNP or Champion N8BR, 14 m/m. non-detachable, and the correct gap is .025" (.6 m/m.).

Efficient running at all speeds can only be obtained if the condition of the plugs is satisfactory. Every 5,000 miles they should be removed, cleaned and reset. Most Service Stations are equipped with sparking plug cleaning and testing machines.

Electric Fuel Pumps and Gauge.

The electric fuel pumps should not need any attention over long periods of running, except periodic maintenance (see page 33) or,

perhaps, the cleaning of the suction or delivery valves (see page 48). If an electrical fault is suspected, it is recommended that the necessary inspection and any work in connection with repairs should be carried out by Messrs. Rolls-Royce Limited, or one of their "Special Retailers".

Reference to the wiring diagram (Fig. 29) will show that they are supplied with current through the ignition switch and, consequently, are only operative when the ignition switch is closed.

The fuel gauge is divided into two parts:—

- (a) An indicating instrument, mounted on the instrument panel, and marked "0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and F".
- (b) A petrol tank unit, with a float for measuring the amount of petrol in the tank.

The indicating instrument has two actuating coils:—

1. A control coil, which is connected across the battery and so provides a constant torque on the pointer, tending to swing it over to the "Full" side of the scale.
2. A deflecting coil, which is connected in series with the battery and the tank unit rheostat, and so arranged to act in opposition to the control coil.

The tank unit consists of a variable rheostat, the sliding arms of which are operated by the up-and-down movement of the float, thus varying the circuit resistance from a minimum in the empty position to a maximum in the full position. With the float in the "empty" position the current in the deflecting coil is at a maximum, and its turning effort is of sufficient strength to move the pointer, against the opposing force of the control coil, back to the "0" position on the indicating instrument. Thus, as the resistance is varied by the position of the float, the pointer indicates the petrol level in the tank.

A warning light is provided on the instrument panel, which is automatically illuminated when there is approximately three gallons or less of petrol in the tank.

Electric Horns.

Twin wind-tone horns are provided, operated through a sealed relay on the front of the dashboard.

No adjustments should be attempted. If service is necessary, Messrs. Rolls-Royce Limited or one of their "Special Retailers" should be consulted.

The horns are on a separate fuse carried in the small fuse box, see Fig. 34.

Direction Indicator Signals.

The direction indicator control switch is mounted on the windscreen finisher (see Fig. 1), the flasher unit being mounted on the right-hand side of the de-mister duct.

When a right turn is to be signalled, the control switch lever is moved to the right, and the signal bulbs in the right-hand fog lamp and the rear stop/tail lamp begin flashing, also a pilot lamp in the

speedometer. When a left-hand turn is to be made, the control switch lever is moved to the left.

When the signal system is operating properly, the lights flash about 90 times per minute.

In addition to the pilot light, a clicking noise in the flasher unit makes an audible signal when the circuit is on. This is purposely created as an additional warning that the signal unit is operating. The signal flasher is a sealed unit and is non-adjustable, and if service is necessary, it must be by replacement.

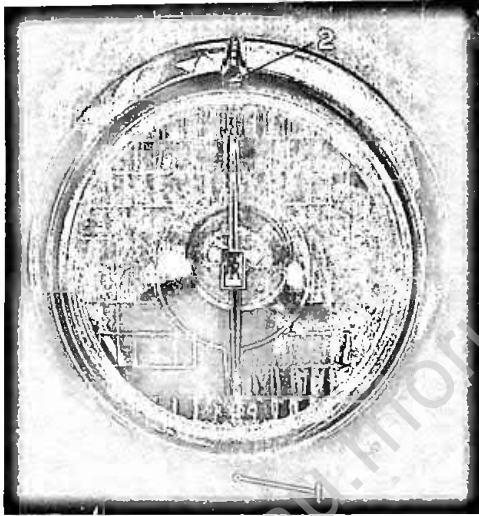


Fig. 38.—HEADLAMP—EXTERNAL VIEW.

1. Rim Retaining Screw. 2. Vertical Adjustment Screw.

oiling system. The transmitter is a sealed unit and non-adjustable; if any service is necessary it must be by replacement.

As previously stated, the pointer should be approximately midway on the instrument scale under normal conditions of engine temperature and running.

Headlamps.

The headlamps are controlled by two switches, the master switch on the switchbox and a foot-switch for "beam" selection.

A small red warning light, mounted in the speedometer, is illuminated whenever the headlamps are on the "Driving Beam" (full on).

The operation of the foot-switch, changing the "driving beam" to the "passing beam", i.e., switching over from the main filaments to the off-set filaments, extinguishes the warning light. Thus, when driving on a lighted road, this warning light serves as a ready indication of the selected headlamp "beam".

Water Temperature Gauge.

The water temperature gauge on the instrument panel is electrically connected to and operated by a bi-metal transmitter unit fitted into the engine cooling system. The transmitter is a sealed unit and non-adjustable; if any service is necessary, it must be by replacement.

Oil Pressure Gauge.

The oil pressure gauge on the instrument panel is electrically connected to and operated by a bi-metal transmitter unit fitted into the engine high-pressure

Each headlamp incorporates a light unit, which consists essentially of a reflector and front glass assembly provided with a mounting flange, by means of which it is secured in the rear shell which is secured to the body housing.

The bulb is correctly positioned in relation to the focal point of the reflector, and no focusing is required when a replacement bulb is fitted.

Replacing a Headlamp Bulb.

Remove the rim securing screw, lift off the rim and the dust-excluding rubber.

Press the light unit in against the tension of the adjusting screw springs and turn it in an anti-clockwise direction until the heads of the screws can be disconnected through the slotted hole in the flange.

The light unit can now be lifted out of the lamp body.

First twist the bakelite contact-holder and withdraw, then remove bulb holder complete with bulb. Next remove circlip securing bulb to holder and withdraw bulb. It will be necessary to tip the bulb so that the flange on the bulb cap can pass through the two slots in the holder. Re-assemble with new bulb in the reverse order.

Position the light unit in the lamp body so that the heads of the



Fig. 39.—HEADLAMP—RIM REMOVED.
1 and 2. Horizontal Adjusting Screws.
3. Vertical Adjusting Screw.

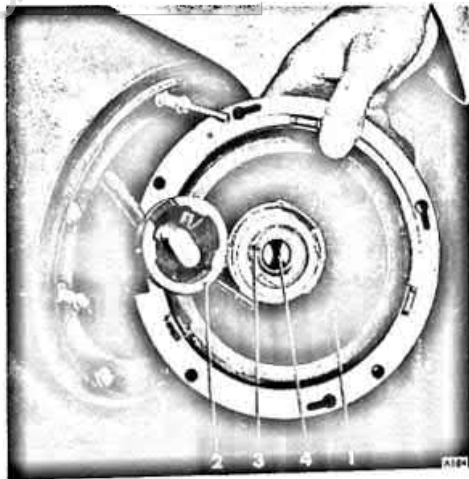


Fig. 40.—HEADLAMP—CHANGING BULB.
1. Lens Unit. 3. Circlip.
2. Contact Holder. 4. Bulb.

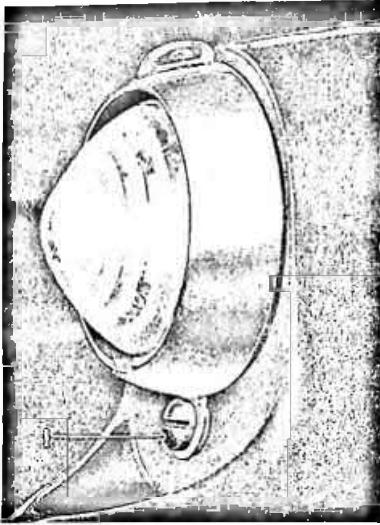


Fig. 41.—SIDE LAMP—EXTERNAL VIEW.
1. Retaining Screw.

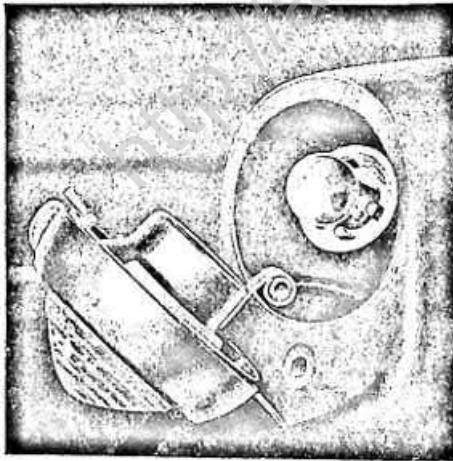


Fig. 42.—SIDE LAMP—CHANGING BULB.
(Front Part Detached.)

vertical and horizontal adjusting screws protrude through the holes in the flange; press in and twist in a clockwise direction.

Replace the rubber dust excluder so that its thicker edge lays round the light unit rim. Re-fit the front rim and secure.

Alignment and Setting.

The headlamps are correctly aligned and set with the driving beams parallel to the road surface, before the car leaves the works.

But, should the carriage of extra weight at the rear raise the level of the beams, a slight adjustment of the vertical adjustment screw will correct the setting.

The vertical adjustment screw is positioned below the motif (2, Fig. 38); screwing in raises the beam and screwing out lowers the beam.

Should horizontal adjustment at any time be necessary, remove the rim securing screw at the bottom of the lamp (1, Fig. 38) and lift off the rim and dust-excluding rubber. Operate either of the screws (1 and 2, Fig. 39) to adjust as required.

Side Lamps.

The method of changing a lamp bulb is illustrated in Figs. 41 and 42.

The rim retaining screw (1) should be removed, and the lamp unit drawn bodily forward. The bulb holder is of the "clip in" type and can be easily detached from the front portion.

The bulb is of the standard bayonet fitting type.

Fog Lamps.

Twin fog lamps are fitted, and these lamps incorporate the front "flasher" lamps by means of a double filament bulb, of the pre-focus type.

To change the bulb, remove the lens retaining screw and lift out the complete light unit. Release the bakelite contact holder by twisting in direction of arrow and then lift out the bulb. Assemble new bulb in reverse order.

Stop/Tail Lamps.

The unit, illustrated in Fig. 45, contains the rear "flasher" bulb, the stop/tail light, and the rear reflector.

To replace a bulb, which are accessible from inside the boot, twist holder anti-clockwise and pull out holder complete with bulb. The respective bulbs cannot be fitted in the wrong holders, neither can the holders be fitted in the wrong sockets; both holders are marked "TOP" to show correct positioning.

The bulbs are of the standard bayonet fitting type, the "flasher"



Fig. 43.—FOG LAMP—EXTERNAL VIEW.

1. Retaining Screw.



Fig. 44.—FOG LAMP—CHANGING BULB.

1. Lamp Body., 2. Contact Holder. 3. Lens Unit. 4. Double Filament Bulb.

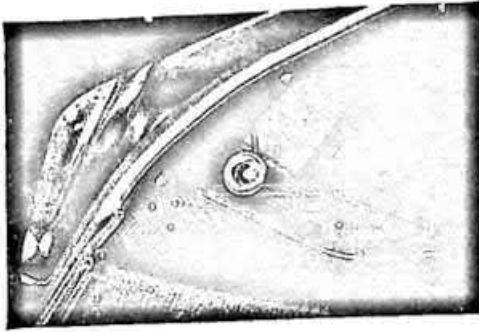


Fig. 45.—STOP/TAIL LAMPS.—CHANGING BULB.

(1 and 2), and withdraw fitting. The lamps are of the normal bayonet type.

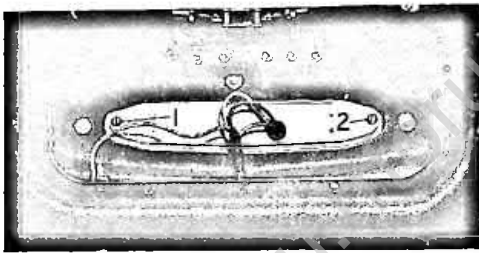


Fig. 46.—REVERSING AND REAR NUMBER PLATE LAMPS.
1 & 2. Retaining Screws.

bulb is a single filament bulb and the stop/tail light is a twin filament bulb.

Reversing Lights and Number Plate Lamp.

To change a bulb, remove cover from inner skin of boot lid, held by spring clips, to expose base of light fixture as shown in Fig. 46. Remove the two screws

Electrical Fault Location.

In case of faulty operation of the electrical system, investigate as follows:—

- (i) Failure of any part of the system separately may be due to a blown fuse in the fuse box.

IGNITION.

If, with the fuses intact, and the lights in order, the ignition:—

(a) Misses.

- (i) Check condition of sparking plugs, clean and set gaps. (See page 86.)
- (ii) Check condition of contact breaker points, clean and set gaps. (See page 84.)
- (iii) Check condition of ignition coil casing. (See page 86.)

(b) Fails.

- (i) Switch on ignition, and while turning engine with starter motor check by ammeter that coil is taking current intermittently. (Do not confuse with "flick" from petrol pump operation.) If no movement of the ammeter, check for battery voltage at coil terminals.

STARTER MOTOR.

If, with the battery in order, the starter motor:—

- (a) Is sluggish or does not turn the engine, check condition of brushes and holders. Clean oily brushes and holders with rag moistened with petrol.
- (b) If starter motor turns without turning the engine, the trouble lies in the starter drive, and Messrs. Rolls-Royce Limited or one of their "Special Retailers" should be consulted.

BATTERY.

If the battery will not retain its charge:—

- (i) Investigate that no circuit is left switched on, or accessories are in excessive use with engine not running.
- (ii) Check condition of battery.
- (iii) Check correctness of dynamo and regulator working.

DYNAMO.

- (i) Check correctness of ammeter by switching on headlamps, this should show a "discharge" reading.
- (ii) Check condition of driving belt. (See page 44.)
- (iii) To test dynamo, disconnect wiring from both terminals, clip leads of moving coil voltmeter, having suitable range, to the dynamo terminals. Run engine at fast idle; if voltmeter remains at zero, check brush gear. If this does not effect a cure, consult Messrs. Rolls-Royce Limited or one of their "Special Retailers".

REGULATOR.

If the dynamo is in order and the regulator is therefore suspect, no attempt should be made to make any adjustment; any dismantling or rectification must be made by Messrs. Rolls-Royce Limited, or one of their "Special Retailers."

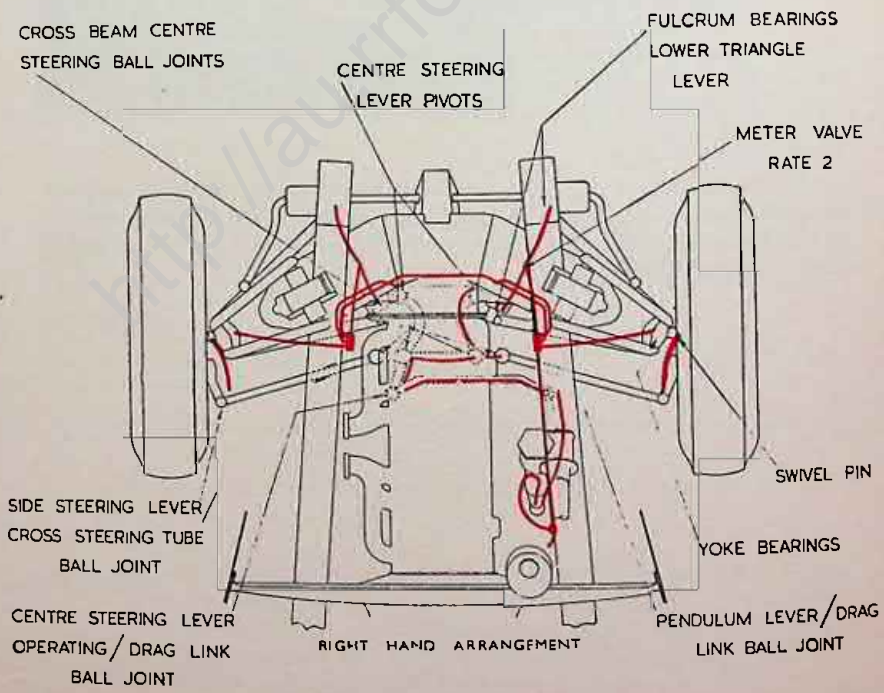
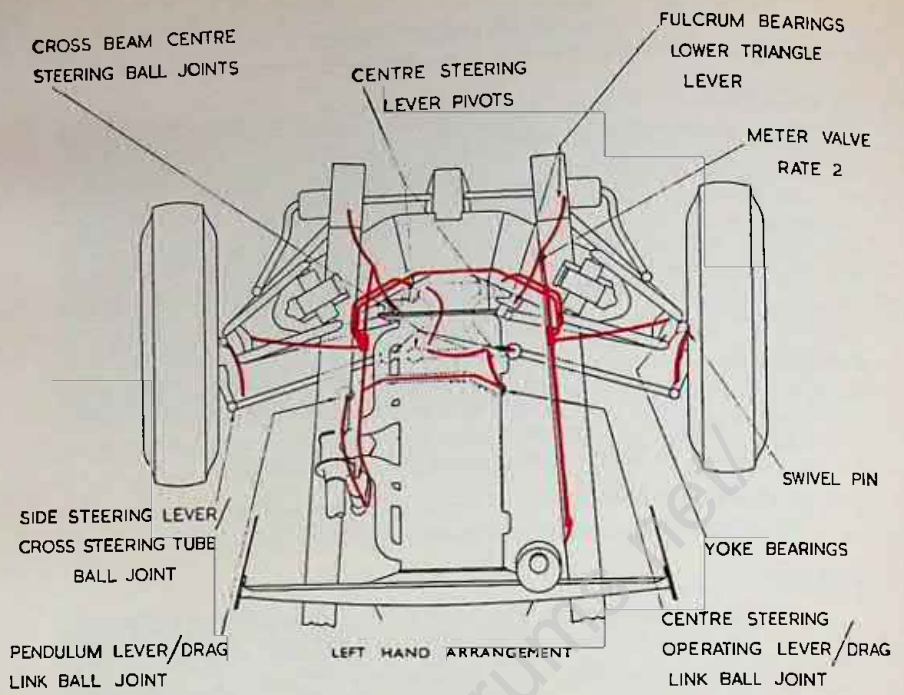


FIG. 47.—DIAGRAM OF CHASSIS LUBRICATION

CHAPTER X

Centralised Chassis Lubrication

Oil Pump and Reservoir.

A combined foot-operated pump and oil reservoir is located on the front of the dashboard, and supplies oil under pressure for chassis lubrication.

A diagram of the complete system is given in Fig. 47, the piping being shown in red.

Normally no attention to the system is necessary beyond filling the reservoir with the correct oil, see page 28, and this should be filled to about one inch from the top of the filler cover, see Fig. 48.

If the oil in the unit has been exhausted, the pedal will return instantly after depression, due to the presence of air in the system.

On the other hand, if the pedal takes an abnormal length of time to return to its raised position, the felt strainer may be choked and a new one must be fitted.

This is arranged at the bottom of the reservoir, see Fig. 48, and is removed by disconnecting the union and unscrewing the



Fig. 48.—CHASSIS LUBRICATION PUMP.

1. Reservoir.
2. Filler Cap.
3. Cover Felt Strainer

cap (3). An aluminium distance washer, the felt strainer pad, and a wire gauge support can then be taken out.

The Drip Plugs.

In each drip plug is an accurate restriction orifice which controls the flow of oil to the bearing, and also a valve which prevents oil draining away from the system when the car is at rest. The plugs are stamped with a letter and number indicating the shapes and relative rates of oil emission respectively, a higher number indicating a greater rate.

The drip plugs do not require cleaning and are not adjustable, and no attempt should be made to take them apart. If one is suspected of being defective, it must be replaced with a new one of the same rating.

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CHAPTER XI

Accessories

Radio.

"His Master's Voice" automobile radio equipment is fitted in the Silver Cloud car. The receiver, known as the "Radiomobile" Model 200X, has a seven-valve superheterodyne circuit with a metal rectifier, and is designed for medium and long wave reception.

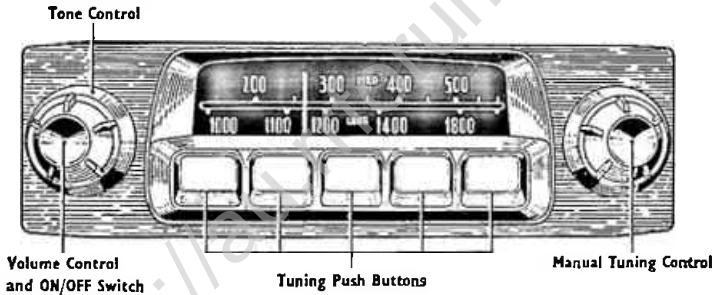


Fig. 49.—RADIO CONTROLS.

Fig. 49 illustrates the controls.

The combined volume control and "On/Off" switch is on the left of the five push-buttons. This control switches the receiver on when turned clockwise, and progressive rotation of the control increases the volume. Turning the control fully anti-clockwise will switch off the receiver. Allow about 40 seconds for the receiver to "warm-up" after switching on.

The tone control is concentric with the volume control and "On/Off" switch and provides selective tone correction for reproduction of either speech or music, by three separate tone settings.

- i. Turned fully-anti-clockwise, the amount of bass reproduction is reduced.

2. In the centre position, the bass is restored.
3. Turned fully clockwise, the amount of treble reproduction is reduced.

Position 1 is normally used for speech, and position 2 and 3 for music.

The manual tuning control is on the right of the push-buttons and provides completely variable station selection.

To switch to the long waveband when tuning manually, press the extreme right-hand push-button. To switch to the medium waveband, press any of the four remaining push-buttons.

This control is permanently engaged.

The five tuning push-buttons provide automatic tuning of five stations pre-selected from the medium and long wavebands. The right-hand button provides for one station on the long waveband, the four remaining buttons being employed for medium wave pre-selection. Wave-change switching is automatically effected when a button is pressed for any pre-selected station.

The tuning scale is divided into two sections—"medium wave" and "long wave", and is calibrated in wave-lengths (metres). The tuning pointer has a horizontal traverse and illumination of the tuning scale is by means of "edge-lighting".

To Set Up the Tuning Push-Buttons.

1. Allow 10 minutes for receiver to warm up thoroughly.
2. Select the waveband required by pressing the appropriate push-button.
3. Tune-in desired station by means of the manual tuning control as described previously.
4. With the station accurately tuned-in, pull the push-button outward to full extent ($\frac{1}{4}$ " movement) to release the locking mechanism, then push the button firmly home, thus locking the mechanism in the required position. The push button is now set to tune the station required, and when pressed will "bring-in" the station irrespective of the position to which the scale pointer may have been adjusted previously. Proceed in the same manner for the remaining push-buttons.

The aerial is normally mounted above the windscreen on the outside of the car, and is operated from the inside by a bakelite knob. An engraved arrow indicates the position of the aerial, vertical being for normal use and horizontal for when parked and not in use.

In some cases an under car aerial may be fitted, and with these there is no inside aerial control knob.

It is unlikely that either of these types of aerial will need attention, but to ensure the best reception they should be kept clean.

If any further advice or assistance in connection with the radio equipment is required, Messrs. Rolls-Royce Limited or one of their "Special Retailers" should be communicated with, or, if more convenient, any of the Radiomobile Service Depots.

Windscreen Washing.

A vacuum operated device enables the driver to wash the windscreen whilst driving the car.

The equipment consists of two jets mounted on the scuttle just forward of the windscreen wiper blades. On pressing the windscreen wiper control knob, the induction depression is communicated to the diaphragm of a pump on the reservoir, which is a glass container



Fig. 50.—WINDSCREEN WASHING.

underneath the bonnet, and when the button is released, the diaphragm is returned under spring pressure and causes two jets of fluid to be directed on to the windscreen. The screen wipers should then be switched on, when the screen will immediately be cleaned.

The liquid in the reservoir has low surface tension and anti-freeze properties.

As the pump is actuated by the induction pipe depression, it is necessary to ease the foot off the accelerator pedal whilst the button is being depressed, otherwise there may be insufficient depression to actuate the pump.



Fig. 51.—WINDSCREEN WASHING RESERVOIR.
1. Pump Unit. 2. Filler Cover.

The jets may readily be cleared if they ever become obstructed with foreign matter, by slackening off the knurled screw and operating the pump in the normal way, as the jet consists of a small slot which becomes exposed when the screw is slackened off, and any obstruction is therefore easily washed away.

Adjustment of the angle of the jet is effected by turning the hexagon portion of the jet with a suitable spanner. The jet should impinge on the windscreen towards the top of the arc traversed by the screen wiper blades.

Tins of this special liquid, which is mixed with water for refilling the reservoir, are obtainable from the Main Service Station, Hythe Road, Willesden, N.W.10, and should be used in the proportions as directed.

Interior Heating and Ventilation.

The ventilation and warmth of the interior of the car may be varied at will and is controllable by operation of the control switch (18, Fig. 1).

The control when pulled out to the first position operates a vacuum device to open a valve to admit air from a grille in the front of the car through ducting to outlets under the scuttle in the driving compartment, and also an outlet in the floor of the rear compartment at the back of the front seat.

Incorporated in the ducting under the right-hand front wing is a heat exchanger and fan, and by further manipulation of the control, i.e., by twisting to the first or second position, the volume of the air can be increased by the fan, the fan being run at half or full speed as required.

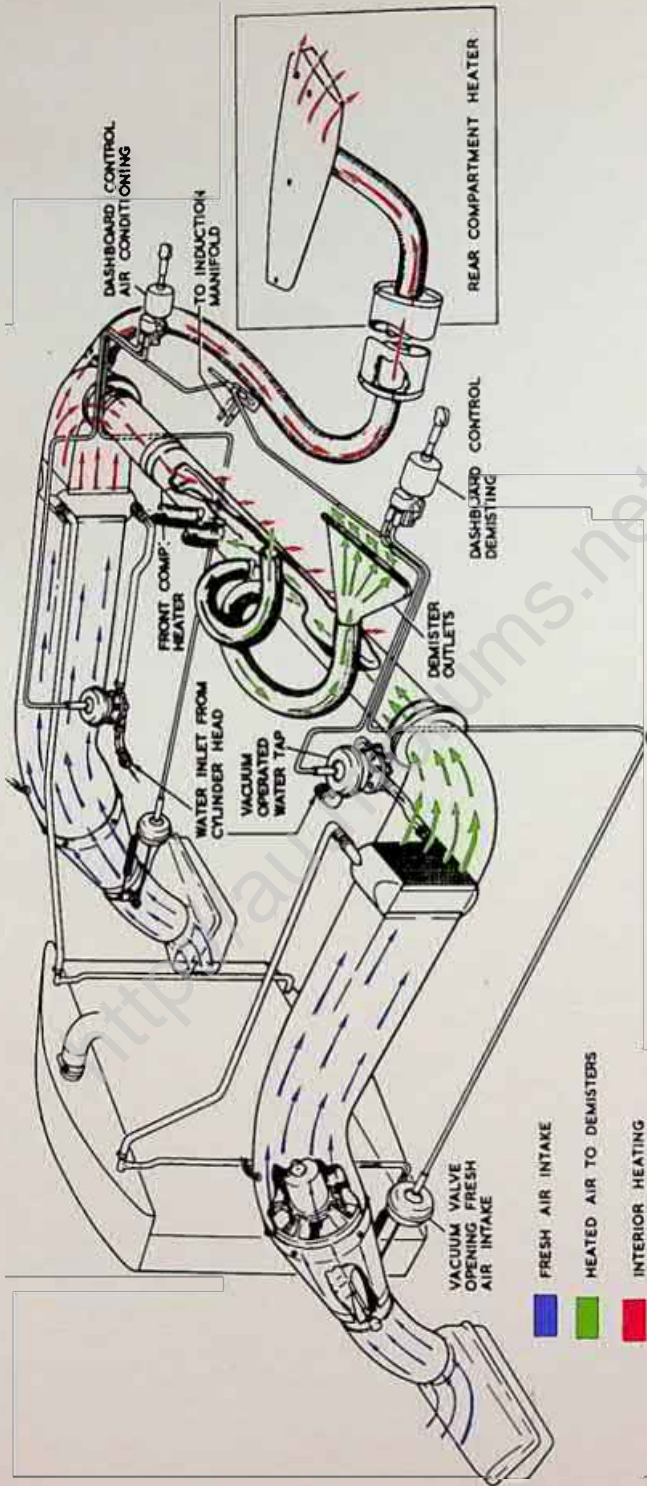


FIG. 52. DEMISTING AND AIR CONDITIONING SYSTEMS

When warmed air is required, the control is pulled out to the second position, which will open, by means of a further vacuum operated tap, the hot water supply from the cylinder head to the heat exchanger, the volume of air being controlled by the fan at either half-speed or full-speed as required. The water from the heat exchanger is returned to the bottom tank of the radiator.

De-misting and De-frosting.

The control switch for the de-misting and/or de-frosting the windscreen is shown in Fig. 1; operating instructions are given on page 23.

Air at ambient temperature is ducted from a grille in the front of the car through a heat exchanger and fan fitted under the left-hand front wing, and then to outlet vents along the capping rail. This unit is a duplicate fitting to that under the right-hand wing, and operates in a similar manner.

With the control set for cold air at "ram" speed, i.e., with only the flap valve open, forward motion of the car is usually sufficient to de-mist the windscreen; if conditions are severe switch on fan to either half-speed or full-speed as required.

For de-frosting, pull out the control knob to the second position. This will allow hot coolant from the cylinder head to circulate through the matrix of the heat exchanger and heat the incoming air.

The rear window is of the electrically heated type, and contains a series of wires moulded into the glass. A switch on the parcel tray controls this feature, and it is recommended that during the Winter months this switch is left On. The element will then be switched on when the ignition switch is turned on; the switch on the parcel tray being turned off during the Summer or if not required.

CHAPTER XII

The Body and Coachwork

The following instructions apply only to the body as manufactured and fitted by Messrs. Rolls-Royce Limited, owners of cars fitted with special bodies should be guided by the coachbuilder's instructions.

The Silver Cloud standardised saloon body is constructed of pressed steel with light alloy bonnet, doors, and boot lid.

Large doors permit quick and easy access to the driver's and passengers' compartments, the interior upholstery being of fine quality hide.

For the car to look well and retain its beauty and smart appearance, the coachwork must receive its share of attention, and should never be neglected.

Washing and Polishing.

The greatest care is taken during manufacture to ensure that the paintwork is as durable and well finished as it can be.

It is, however, obvious that the paintwork in service is subject to conditions which may cause deterioration. Therefore the following procedure with regard to cleaning and polishing the car is recommended in order to obtain the best results.

- (i) Always remove dust and mud by washing with plenty of clean water. Never attempt to dry clean the car, as this is bound to produce scratches which subsequently cannot be removed without levelling down the surface of the paint by the use of a further abrasive.

Tar may be removed by the use of the special proprietary solutions available, or by rubbing with a soft cloth moistened with a mixture of equal parts of naphtha and white spirit (turpentine substitute).

- (ii) Dry off with chamois leather after the water wash.
- (iii) Smear windows with window cleaner—this dries white.

Cleaning of movable windows by means of hosing should be avoided, as this invites the collection of water inside the doors which may take some time to dry out.

- (iv) Use a good wax polish and apply this to a section of the car, and polish before proceeding to a similar treatment of the remaining sections.

Spray polishes are available which considerably minimise the labour as compared with ordinary wax polishes. If a spray polish is used, spray half of the car and polish immediately with stockinette material, then spray and polish the remainder, including windows and plated parts.

Under no circumstances should any polishing compound containing ammonia be used.

- (v) The above procedure is recommended at least once a month, or more often as may be desired. Water washing will, of course, be carried out frequently.
- (vi) Every third month, after water washing, remove traffic film and other atmospheric deposits and the residual wax with a cleaning agent, such as Belco No. 7; afterwards re-wax with a good wax polish as instructed.

The Front Doors.

Both front doors are provided with external private locks, and both can also be locked from the inside by means of the internal handle, so that the owner can lock up and leave the car from either side.

In order to eliminate the risk of locking the keys inside the car, the door catches are "self-cancelling", that is, the act of slamming the door will always unlock it. In order to leave the car by the right-hand side door, the left-hand door should first be locked by pushing the inside handle forward and releasing it. This will return to the neutral position (an essential feature on self-cancelling locks), but the outside push button will be found to be locked. The right-hand door can then be locked by inserting the key in the boss below the outside handle and turning it forward approximately 45 degrees. The key must be returned to the vertical position before it can be withdrawn.

Similar instructions apply to egress from the left-hand side door, in both cases the exit door is locked from the outside by turning the key forward and unlocked by turning the key rearward.

These private locks should not be lubricated, the application of oil or grease is liable to cause the plungers to stick and render the lock inoperative.

The Rear Doors.

The rear door locks are not self-cancelling and are locked in the normal manner by pushing the inside handle forwards, in which position it will remain. They can therefore be locked either while the door is shut or just before slamming.

Door Hinges and Catches.

The door hinges incorporate Oilite bushes and stainless steel hinge pins, and should not therefore be lubricated. In fact the application of extra lubrication is likely to result in damage by causing dust to adhere to the working surfaces.

The door catches and striker plates should be wiped clean of dust occasionally, and a small quantity of grease applied to the faces of the groove in the striker plate.



Fig. 53.—INTERIOR APPOINTMENTS.

- | | |
|---|-------------------|
| 1. Fresh Air Inlet to Rear Compartment. | 3. Ash Tray. |
| 2. Fall Table. | 4. Cigar Lighter. |

Boot and Cubby Locks.

The boot and cubby locks are operated in a similar manner to the private locks of the front doors, in that they require a turn of the master key either way, the key being returned to the vertical position before it can be withdrawn.

- | | | | |
|-----------------------------|---------|----|----------------------------|
| Boot | .. .. . | .. | To lock, closewise. |
| | | .. | To unlock, anti-clockwise. |
| Cubby box (R.H. drive cars) | .. | .. | To lock, clockwise. |
| | | .. | To unlock, anti-clockwise. |
| Cubby box (L.H. drive cars) | .. | .. | To lock, anti-clockwise. |
| | | .. | To unlock, clockwise. |

It is not necessary to lubricate the locks, but a small quantity of grease should be applied occasionally to the pins of the striker plates at the bottom of the boot opening.

Bonnet Fasteners.

After prolonged running these fasteners may become slightly stiff to operate due to dust collecting on the mechanism. They should be cleaned occasionally and the working parts lightly lubricated with engine oil.

Picnic Tray Slides.

The occasional application of a little grease will keep the slides operating easily.

Seats.

The front seat is a bench type seat with individual backs, these being adjustable for rake. Control handles, Fig. 54, are fitted on either side of the seat, and if raised, the backs can be pushed backwards or allowed to come forwards under the action of their springs to the desired position. Releasing the handle will lock the back in position.



The whole seat is movable on ball bearing slides, and a catch for adjustment is located in the middle of the seat valance. When the catch is moved to the right, the seat is free to be pushed backwards or allowed to come forward under the action of its assistor springs.

Occasionally, check the securing screws in the slides for tightness and add, sparingly, a little grease in the runners to ensure smooth operation.

Fig. 54.—FRONT SEAT ADJUSTMENT.

1. Lever to Adjust "Rake".

Arm Rests.

Arms rests are provided on the front doors, which may be used for closing the doors from the inside. They are adjustable for height, by lifting the metal tab at the bottom to release the catch from the slots in the slide, and then raising or lowering as required. Press the tab down to lock the arm rest in position. By the same method, the arm rest is completely removable if necessary.

It is also possible to slide the arm rests to a limited extent forwards or backwards to give further adjustment for comfort.

Upholstery and Carpets.

In general the leather upholstery has an impermeable surface, and to keep it clean and fresh looking we recommend that the leather should occasionally be treated with a preparation known as "Connolly's Hide Food".

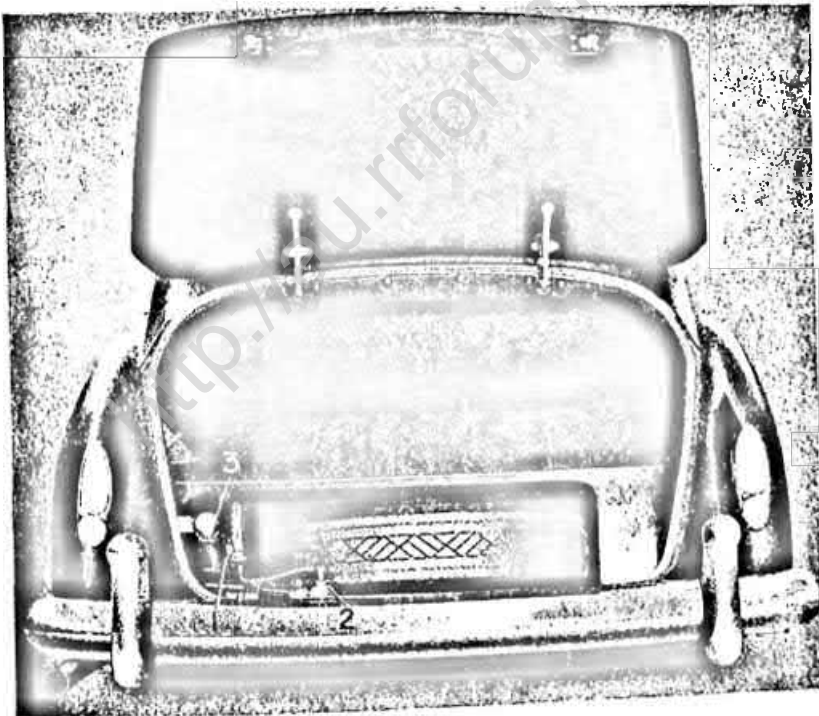


Fig. 55. LUGGAGE AND SPARE WHEEL COMPARTMENT.

1. Release Catch for Spare Wheel.

3. Inspection Lamps.

2. Wheel Jack.

Floor carpets should be removed and cleaned with a vacuum cleaner, and any stains or grease marks removed with a clean cloth moistened with a trichlorethylene solvent. This solvent can be used on the head cloth, which should receive periodical attention similar to the carpets and the other upholstery.

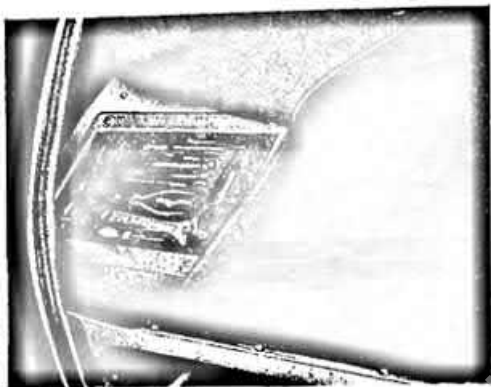


Fig. 56.—SMALL TOOLS IN BOOT TRAY.

The larger tools are carried in the spare wheel compartment, as illustrated in Fig. 55.

Luggage and Spare Wheel Compartments.

Ample luggage space is provided, and the spare wheel is carried in a separate compartment below, as illustrated in Fig. 55.

Tools.

An adequate set of tools is supplied with each car, the "small" tools being carried in a fitted tray, as illustrated in Fig. 56.

CHAPTER XIII

Storage and Recommissioning of Cars

The storage place should be dry, well ventilated and preferably heated.

The general instructions are intended to cover short periods of storage; if the storage period is likely to exceed three months, the engine and rear axle should be drained and refilled to the correct levels with a pure mineral oil, e.g. Mobil Infilrex 100 S.A.E.30 or Wakefield's Storage Oil. Also, one of these oils should be used for injecting into the cylinders.

1.—Jack up rear wheels to take all weight off tyres, and place suitable wooden supports under the axle.

Run engine gently for a few minutes with a gear engaged. When cold, inject about two tablespoonfuls of engine oil through the spark plug holes in each cylinder. Turn the engine with the starter motor a few times to distribute the oil over the cylinder walls.

Jack up front of car; a jacking pad is provided on the centre of the front suspension; support on suitable wooden blocks.

Do not deflate tyres, but cover up to exclude light.

2.—If the cooling system contains anti-freeze, do not drain. If the original coolant has been replaced by plain water, and there is any danger of freezing, drain off and refill with a suitable solution of anti-freeze and water in accordance with the frost protection recommendations given in Chapter IV, Cooling System.

3.—Drain all fuel from the main tank, rear filter and carburettors.

The fact that motor spirits undergo deterioration with time and thus cause them to adversely affect the inlet valves and the moving parts of the carburetter, it is undesirable to keep fuel tanks half filled in a warm atmosphere.

4.—Remove battery and properly charge from an external source; give a subsequent freshening charge every four to five weeks.

5.—Wash down and polish coachwork and clean all bright parts. Lightly smear with vaseline any bright parts not having an untarnishable finish.

6.—Cover the car with a light dust sheet.

Before putting the car into service again after storage, the following operations should be performed:—

- 1.—Drain engine crankcase and refill to correct level with fresh engine oil.
- 2.—Prime cylinders with engine oil.
- 3.—If previously drained, refill cooling system to the correct level.
- 4.—If the rear axle has been filled with a pure mineral oil, as directed for long period storage, drain and refill with the correct oils.
- 5.—Run engine gently for a time after starting up.
- 6.—Remove and clean spark plugs.

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CHAPTER XIV

School of Instruction

To enable the maximum satisfaction to be obtained from the ownership of a Rolls-Royce car, Instructional Courses of two weeks' duration are held on the maintenance of the Rolls-Royce chassis. During the Course, the mechanical features of the chassis are fully explained, particular emphasis being stressed on the points requiring lubrication or adjustment, at the same time instruction is given in the handling of the car on the road, where a high standard of driving is demanded. Suitable cars are maintained by the School for instructional purposes.

The Course is intended for chauffeurs who are undertaking the care of Rolls-Royce products for the first time, and also for drivers who have had previous Rolls-Royce experience on other models. In this latter case shorter periods can be arranged, although in most cases the full Course is desirable.

In the past, owner-drivers and/or members of their families have frequently attended the Courses with beneficial results, and suitable arrangements may be made by application.

The School is located in part of the Service Department building at Willesden. Further particulars may be obtained from the Principal, School of Instruction, Rolls-Royce Limited, Hythe Road, Willesden Junction, London N.W.10. (Telephone No. : LADbroke 2444.)