Land-Rover Owner's Maintenance Manual

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Land-Rover Owner's Maintenance Manual

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Incorporating Free Service and Maintenance Schedules

Covering Series IIA Bonneted Control and

Land-Rover 1 ton

Petrol and Diesel Models

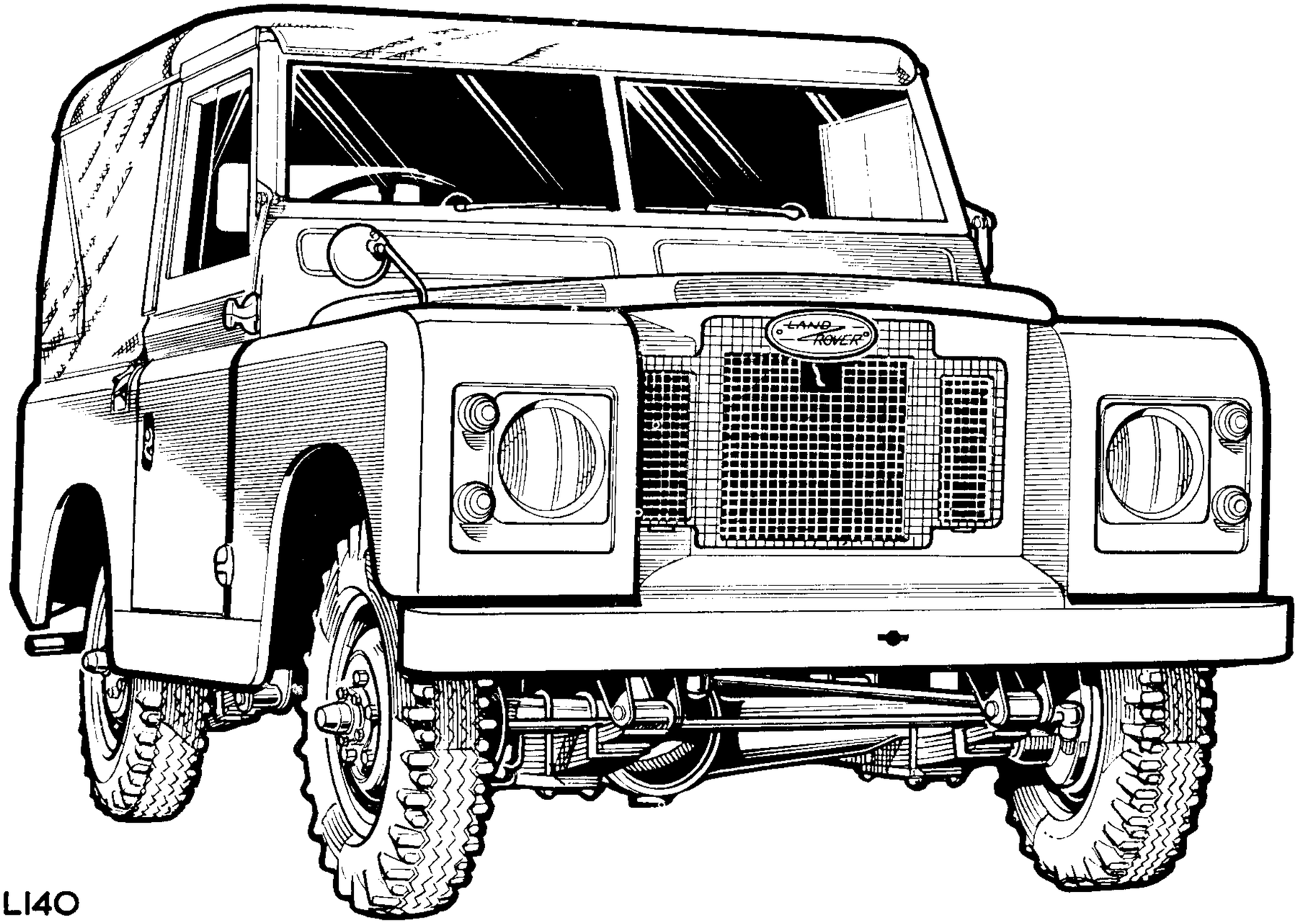
Leyland Cars — Service
Allesley, Coventry

Specification details set out in this Handbook apply to a range of vehicles and not to any particular vehicle. For the specification of any particular vehicle, owners should consult their Distributor or Dealer.

The Manufacturers reserve the right to vary their specifications with or without notice and at such times and in such manner as they think fit. Major as well as minor changes may be involved in accordance with the Manufacturers' policy of constant product improvement.

Whilst every effort is made to ensure the accuracy of the particulars contained in this Handbook, neither the Manufacturers nor the Distributor or Dealer by whom this Handbook is supplied shall in any circumstances be held liable for any inaccuracy or the consequences thereof.

Part No. 606162



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Introduction . . . .

This book has been prepared to provide supplementary information to that contained in the Owner's Instruction book. Its intention is to give clear and simple information necessary for the efficient care and maintenance of the vehicle.

It covers both the Petrol and Diesel models. The paragraphs in this book are therefore applicable to both models, unless otherwise stated in the sub-heading.

This book is divided into four sections:

Part 1. Routine maintenance and adjustments.
Part 2. Electrical equipment, optional equipment, fault finding, etc.
Part 3. General data and index to Parts 1 and 2.
Part 4. Free Service and Maintenance Schedules.

The new vehicle pre-delivery check will have been carried out by the Distributor or Dealer responsible for the sale of the vehicle, leaving a stub in the book to certify that the work has been done.

The routine maintenance of this vehicle has been kept down to a minimum and can, if desired, be carried out by operators without special tools. Any work beyond that detailed in this book should be entrusted to Rover Distributors or Dealers who are equipped and prepared also to carry out the routine maintenance.

It should be noted that the sequence of normal maintenance repeats itself every 36.000 km (24,000) miles.

The Rover Company is always prepared to give advice on maintenance or other matters to individual owners, but any correspondence with the Company *must bear the chassis number* which will be found on a plate affixed to the dash panel in the glove compartment.

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PART ONE

ROUTINE MAINTENANCE AND ADJUSTMENTS

Notes on general maintenance

Lubrication and maintenance are necessary to keep any vehicle in good mechanical condition. All the items which require regular maintenance as detailed in the Maintenance Section are shown in Part One of this book in terms of mileage which would apply in a temperate climate under clean working conditions. Climatic and operating conditions affect maintenance intervals to a large extent; in many cases, therefore, the determination of such intervals must be left to the good judgment of the operator or to advice from a Rover Distributor or Dealer, but the recommendations will serve as a firm basis for maintenance work.

If the vehicle is used almost exclusively in low transfer ratio or for stationary work, mileage is of no use whatever in deciding maintenance intervals; lubrication attention must then be based on operation hours.

Of particular importance in this connection are the undermentioned items:

IMPORTANT

1. Check engine oil level and water level in radiator daily or weekly, depending on operating conditions.
2. Drain and refill engine sump every 6.000 km (4,000 miles) or every four months, whichever comes first.
3. Every month check tyre pressures and inspect tyre treads.

4. Every month check brake fluid level and battery acid level.

5. Owners are under a legal obligation to maintain all exterior lights in good working order, this also applies to headlamp beam setting, which should be checked at regular intervals by a Rover Distributor or Dealer.

Engine. Under severe conditions of mud or dust, the first and subsequent oil changes must be more frequent, even to the extent of a daily change. Under deep wading conditions through water carrying mud and grit, a daily oil change is essential.

Air cleaner. When the vehicle is used for dusty road or field work, attention must be more frequent and may involve a daily oil change; under extremely bad conditions, cleaning twice daily may be called for.

Gearbox, transfer box, differentials and swivel pin housings. It is essential to change oil much more frequently than indicated if the vehicle is operated under bad conditions, especially if deep wading is carried out.

Propeller shafts. Under tropical or severe conditions, particularly where sand is encountered, the sliding joints must be lubricated very frequently to prevent ingress of abrasive material.

Fuel system, Diesel models. Absolute cleanliness is essential when dealing with the fuel system. The filters must receive regular attention to ensure efficient running and to prevent damage to the distributor pump and injectors. The quantity of fuel and general operating conditions will determine to a large extent how often the filters need attention.

Lubricants. The recommended lubricants have been found suitable for the Land-Rover and should be used whenever possible in the grades specified. When ordering oil, the correct grade, as well as the make, should be clearly stated.

The Rover Company attaches very great importance to the nature of the lubricants used in its products and therefore gives specific recommendations as detailed on the next page.

Should any of the recommended lubricants not be available in certain overseas territories, the Rover Distributor or Dealer for that territory will obtain specific guidance from The Rover Company, or owners may communicate with the Company where they so wish.

Multigrade oils, produced by the makers of the lubricants listed overleaf, are also approved for the range of SAE grades that they cover.

Rover parts

It is important that operators should recognise the necessity of using only genuine Rover Parts or Rover Approved Parts when repair or maintenance work is being carried out on the Land-Rover.

Rover parts are produced to the same high standard as those parts built into the vehicle in its original production and it is in your best interest that you should insist that only genuine Rover Parts or Rover Approved Parts are fitted to your Land-Rover.

Recommended lubricants and fiuids

These recommendations apply to temperate climates where operational temperatures are above —10°C (14°F)
Lubricants marked with an asterisk (*) are multigrade oils suitable for all temperature ranges.
Information on oil recommendations for use under extreme winter conditions can be obtained from your local Rover Distributor or Dealer or The Rover Co. Ltd, Technical Service Department.

COMPONENTS	SAE	BP	CASTROL	DUCKHAM'S	ESSO	MOBIL	REGENT TEXACO-CALTEX	SHELL
Petrol models **Engine, air cleaner and governor**	20W	*BP Super Visco-Static 20W-50	*Castrol GTX	Duckham's Q20-50 Motor Oil	Uniflo or Esso Motor Oil 20W	Mobiloil Super or Mobiloil Special 20W-50	Havoline 20W-50	*Shell Super Oil
Diesel models **Engine and air cleaner**	20W	BP Vanellus 20W	Castrol CRI 20	Duckham's Fleetol HDX20	Essolube HDX 20	Delvac 1120 or Delvac 1220	Ursa Oil Heavy Duty 20-20W	Shell Rotella S or T 20/20W
Gearbox and transfer box **Differentials and swivel pin housings** **Steering box** **Steering relay unit** **Rear power take-off, pulley unit and capstan winch hydraulic winch gearbox**	90EP	BP Gear Oil SAE 90EP	Castrol Hypoy	Duckham's Hypoid 90	Esso Gear Oil GP 90/140	Mobilube GX 90	Multigear Lubricant EP 90	Spirax 90 EP
Hydraulic winch supply tank	—	*BP Super Visco-Static 20W-50	*Castrol GTX	Duckham's Q20-50 Motor Oil	Esso Motor Oil 20W	MobiloilSpecial 20W/50 or Delvac 1120 or Delvac 1220	Havoline 20/20W	*Shell Super Oil or Shell Rotella S
Lubrication nipples	—	BP Energrease L2	Castrol LM Grease	Duckham's LB10 Grease	Esso Multi-purpose Grease H	Mobilgrease MP or Mobil Grease Super	Marfak All-purpose	Retinax A or Darina AX
Anti-freeze solutions		BP Anti-Frost	Castrol Anti-Freeze	'Standard' Anti-Freeze	Esso Anti-Freeze	Mobil Permazone	PT Anti-Freeze	Shell Anti-Freeze
		Bluecol and Prestone or any anti-freeze solution conforming to British Standards BS 3151 or 3152						
Brake and clutch fluid	Castrol Girling Brake and Clutch Fluid 'Crimson' Specification J. 1703							

Routine maintenance

On the following pages, in the same general order as listed in the Maintenance Section of this book, will be found full instructions on how to carry out the maintenance and ajustments required on the Land-Rover models.

Absolute cleanliness is essential when carrying out the maintenance work that follows.

The maintenance periods are given in kilometres and miles only. When using the vehicle for stationary work or under arduous conditions, refer to the chart in the maintenance section of this book for equivalent periods based on fuel consumption or hours' running time.

Full details of the maintenance required on the Land-Rover are available in chart form on application to: The Rover Company Limited, Technical Service Department, Solihull, Warwickshire, England.

Engine oil level—Daily or weekly, depending on operating conditions. All models

Proceed as follows:

Stand the vehicle on level ground and allow the oil to drain back into the sump. Withdraw the dipstick (A) wipe it clean, re-insert to its full depth and remove a second time to take the reading. Add oil as necessary; never fill above the 'H' mark.

The oil level dipstick on 4-cylinder models carries three marks: 'H', 'L' and 'MIN L'. Under normal circumstances the oil level should not be allowed to fall below the minimum level mark 'MIN L'.

However, when the Land-Rover is being used at steep angles, the oil should not be allowed to fall below the intermediate mark 'L'. This will obviate any danger of oil pump starvation when the vehicle is facing downhill at a steep angle.

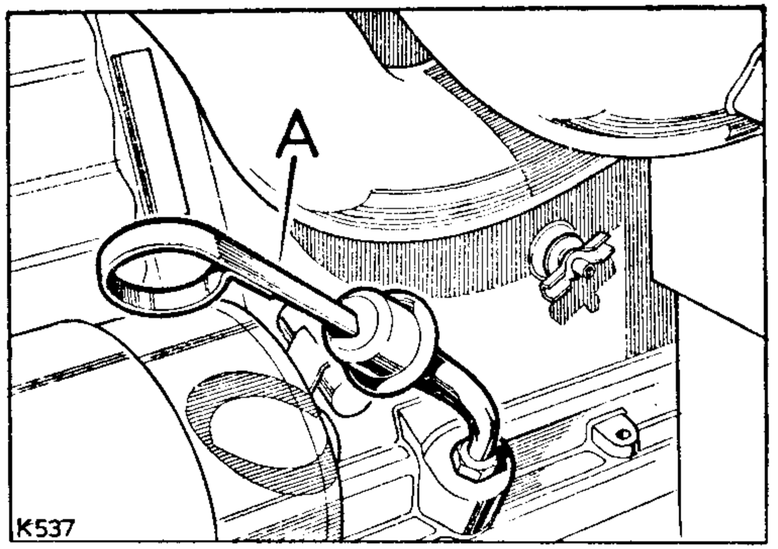


Fig. 1
Engine oil level dipstick, 4-cylinder models illustrated

Engine oil changes and filter replacement—Every 6.000 km (4,000 miles) or every four months, whichever comes first

To change the engine oil:

Run the engine to warm up the oil, then stop. Remove the drain plug (A) Fig. 2 in the right-hand side of the sump. Allow oil to drain away completely and replace the plug.

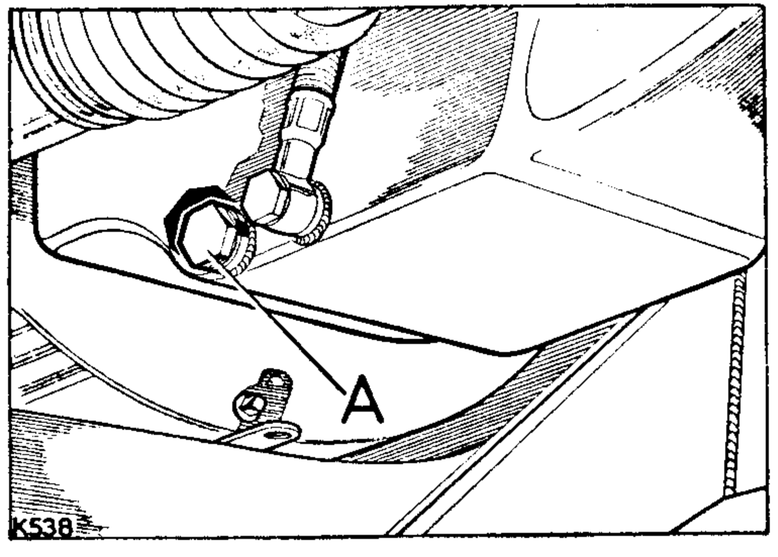


Fig. 2. Engine sump drain plug

Engine

To change filter, located at right-hand side of engine on 4-cylinder models, left-hand side on 6-cylinder models:

1. Place oil tray under engine.
2. Unscrew the bolt (D) Figs. 3 and 4 from the filter adaptor and remove the container (C) Figs. 3 and 4 and element (B) Figs. 3 and 4.
3. Discard the used filter element and large rubber washer (A) Figs. 3 and 4.
4. Wash the container in petrol.
5. Place the new filter element in the container and reassemble the unit, using the new large rubber washer supplied with the element.
6. Ensure that all the sealing washers are in position and intact, and that the container is correctly located in the adaptor.

Refill with oil of the correct grade through the filler at the front of the engine; the total capacity including filter is: 4-cylinder models: 6,0 litres (11 Imperial pints), 12 US pints; 6-cylinder models: 5,5 litres (10 Imperial pints), 11.5 US pints.

Run engine and check for oil leaks at filter and drain plug.

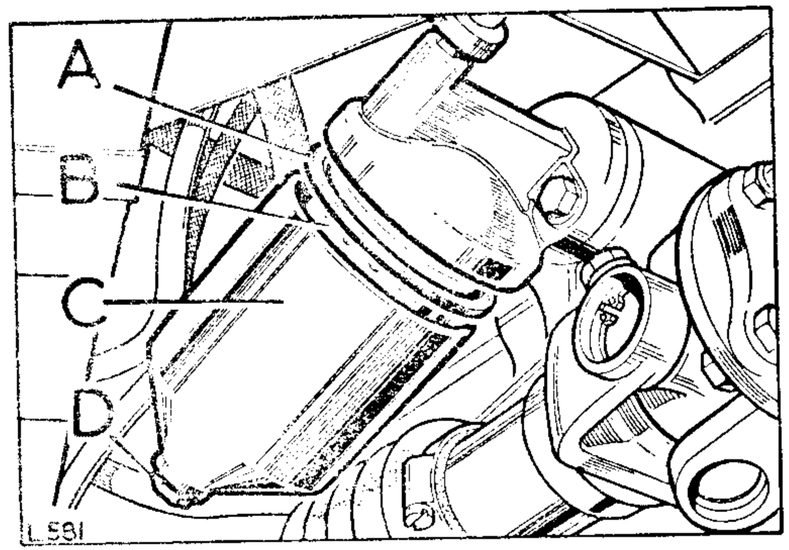


Fig. 3. Engine oil filter, 4-cylinder models

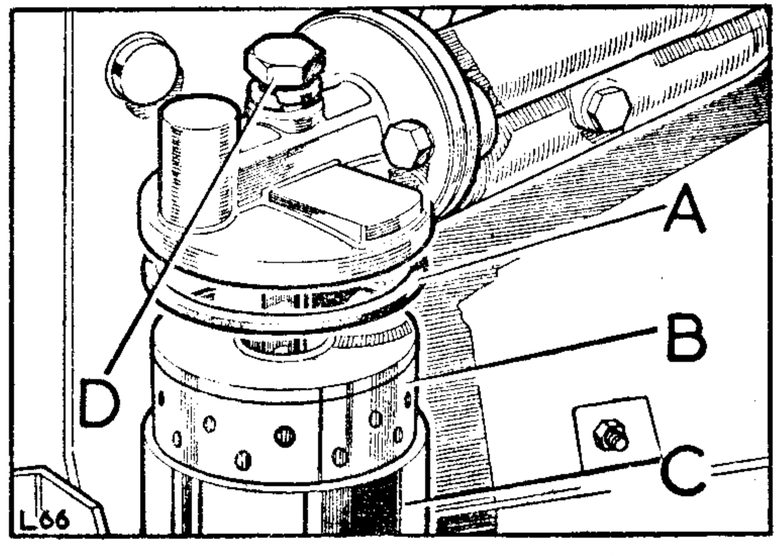


Fig. 4. Engine oil filter, 6-cylinder models

Engine breather filters—Every 12.000 km (8,000 miles). All models

Clean as follows:

Remove the filters (A) and (B) and wash the gauze thoroughly by swilling the units in petrol. Re-wet the gauzes by dipping in clean engine oil and shake off the surplus; 4-cylinder models, replace the engine breather filter (B) with the slot facing forward and the oil filler filter (A) with the slot facing the rear of the vehicle. Models with sealed engine breather system. Connect hose to top breather.

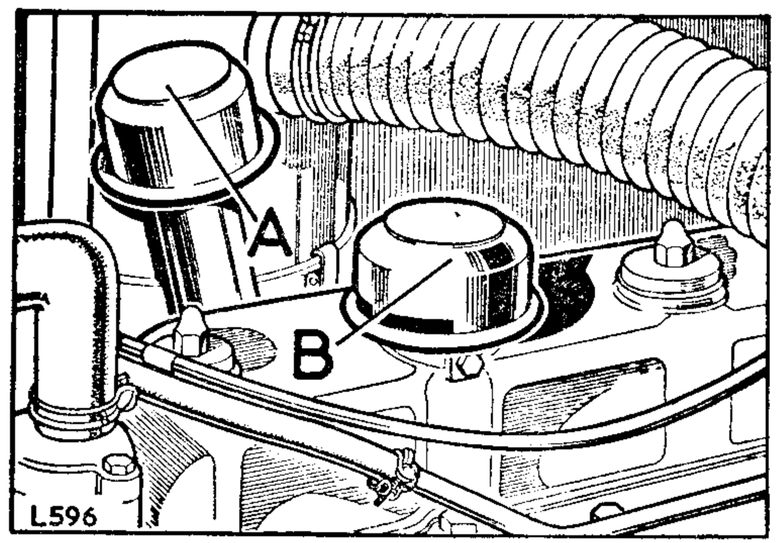


Fig. 5
Engine breather filters, 4-cylinder models illustrated

Crankcase emission control, flame-trap type (as applicable)—Every 30.000 km (20,000 miles).

Clean as follows:

1. Detach the rubber hoses (A) from each side of the flame trap (C) by compressing clips (B).
2. Withdraw flame trap.
3. Fit new flame trap and reverse removal procedure.
4. Warm up engine and re-adjust carburetter if necessary.

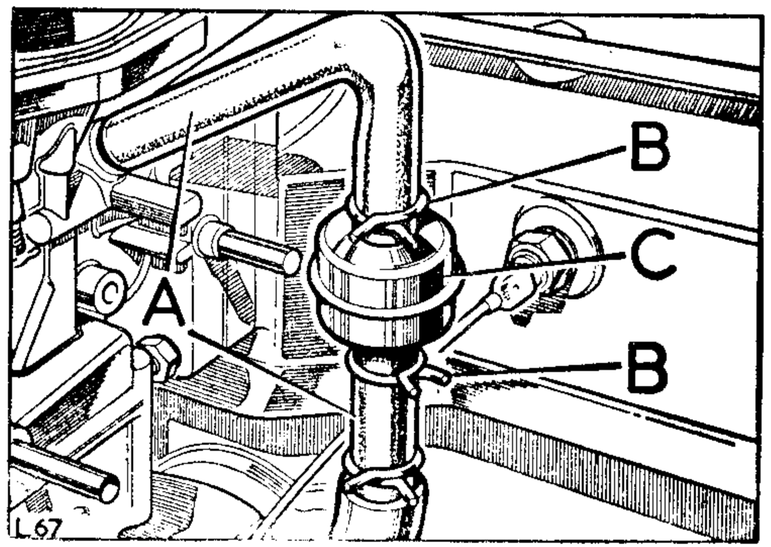


Fig. 6. Crankcase emission control, flame-trap type

Air cleaner All models—Every 6.000 km (4,000 miles).

Attention to the air cleaner is extremely important, especially under dusty conditions, as engine wear generally will be seriously affected if the vehicle is run with an excessive amount of sludge in the cleaner oil bath.

In cases where the vehicle is operated under dusty road or field conditions, attention must be more frequent, even to the extent of a daily oil change; under extremely bad conditions, cleaning twice daily may be called for.

Proceed as follows:

1. Slacken wing nut 'A' and release the clamping strap securing the complete air cleaner. Disconnect the outlet elbow from the carburetter intake pipe and remove the cleaner from the vehicle.
2. Remove the oil bowl from the bottom of the cleaner by releasing the three securing clips (B).
3. Clean all dirty oil and sludge from the bowl and refill with fresh engine oil to the level indicated by a ring formed in the pressing; the capacity is approximately 0,85 litre (1.5 Imperial pints).
4. Clean the filter in the cleaner body by swilling the complete body in petrol or paraffin and shake off the surplus.
5. Replace the bowl and refit the complete unit in the vehicle.

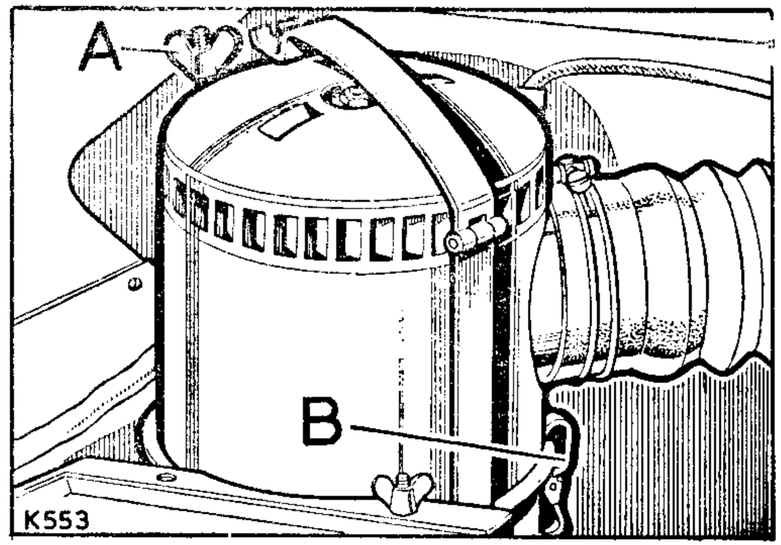


Fig. 7
Air cleaner, Regular models illustrated

Carburetter slow-running adjustment—Every 6.000 km (4,000 miles). 4-cylinder Petrol models

The only adjustments provided at the carburetter are a throttle stop screw (A) and a volume control screw (B).

Should the carburetter require adjustment for any reason, proceed as follows:

1. Run the engine until normal operating temperature is obtained. If necessary adjust the throttle stop screw (A) to give the correct idling speed.
2. Adjust the volume control screw (B) so that the engine will idle evenly with no tendency to stall on snap closure of the throttle.
3. Check that, as the throttle is opened slowly, there is a clear positive acceleration of the engine speed.
4. Finally, it may be necessary to readjust the throttle stop screw to give a satisfactory idle speed.

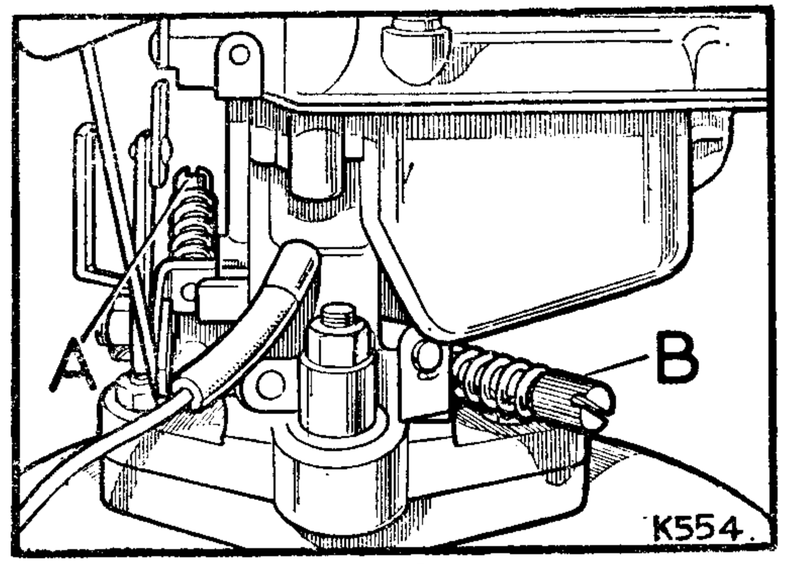


Fig. 8
Carburetter slow-running adjustment, 4-cylinder Petrol models

Carburetter slow-running adjustment—Every 6.000 km (4,000 miles). 6-cylinder models

1. Run the engine until normal operating temperature is obtained. If necessary adjust slow-run screw (A) Fig. 9 to give the correct idling speed.

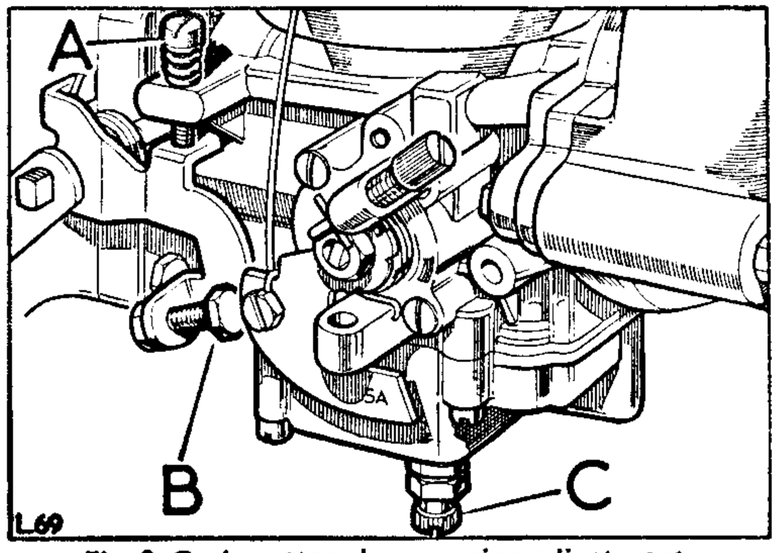


Fig. 9. Carburetter slow-running adjustment, 6-cylinder Petrol models

2. Lift the carburetter piston approximately 1 mm (0.031 in.) by means of the lift pin (A) Fig. 10 situated on the right of the carburetter body. There is approximately 5 mm (0.187 in.) free movement of the lift pin before it contacts the piston.

3. If the engine speeds up immediately the mixture is too rich and the jet adjustment screw (C) Fig. 9 must be turned anti-clockwise when viewed from above, thus weakening the mixture; if the engine stops immediately, the mixture is too weak and the jet adjustment screw should be turned clockwise, again when viewed from above, to enrich the mixture.

   If the engine just falters and continues to run unevenly the adjustment is correct.

   Finally adjust the slow-run screw (A) Fig. 9, to get a smooth idling speed.

The fast idle screw (B) Fig. 9 should not require adjustment.

For starting at temperatures down to —18°C (0°F) push and turn the spring-loaded choke adjustment screw (B) Fig. 11 so that the peg (A) Fig. 11 is at right-angles to the slot. Leave in this position.

When starting at temperatures below —18°C (0°F) turn the screw until peg is recessed in slot.

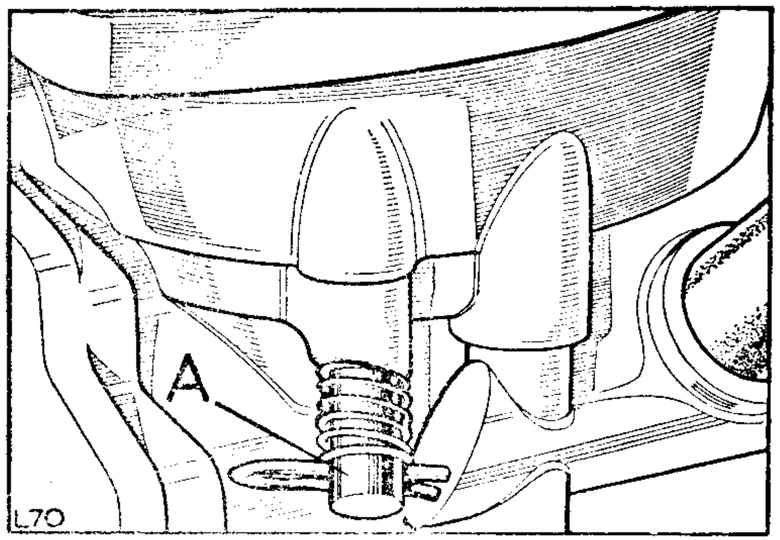


Fig. 10
Carburetter lift-pin. 6 cylinder Petrol models

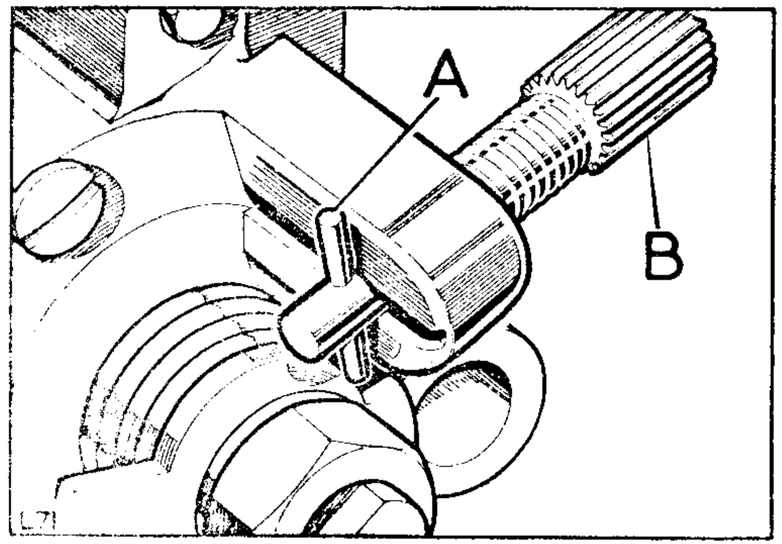


Fig. 11
Choke adjustment screw, 6-cylinder Petrol models

Carburetter hydraulic damper—Every 12.000 km (8,000 miles). 6-cylinder Petrol models

Unscrew the cap (A) on top of the suction chamber, withdraw cap and hydraulic damper, replenish the damper reservoir as necessary with SAE 20 oil to within about 12 mm (0.5 in.) from the top of the tube. Then replace cap and hydraulic damper.

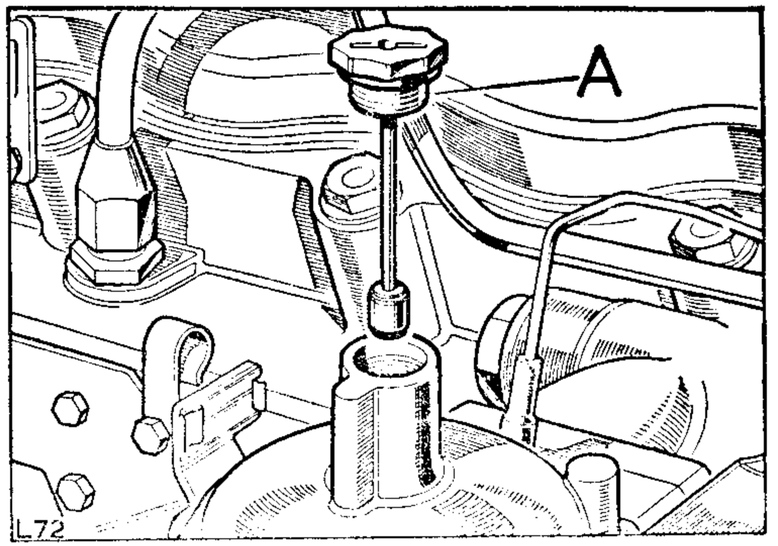


Fig. 12
Carburetter hydraulic damper, 6-cylinder Petrol models

Fuel sediment bowl and filter element— Every 18.000 km (12,000 miles). Petrol models

The fuel sediment bowl on 4-cylinder models—filter element on 6-cylinder models, provide additional means of filtration between pump and carburetter.

They are located:

4-cylinder models, on the right-hand side of the engine.
6-cylinder models, on the dash at the right-hand side of engine.

4-cylinder models

Clean as follows:

1. Remove the bowl by slackening the thumb screw (A) and swinging the retainer aside.
2. Remove and clean filter gauze (B) in petrol.
3. Ensure that the sealing washer (C) is in good condition.
4. Replace gauze and refit bowl (D).
5. Prime by operating hand lever (E).

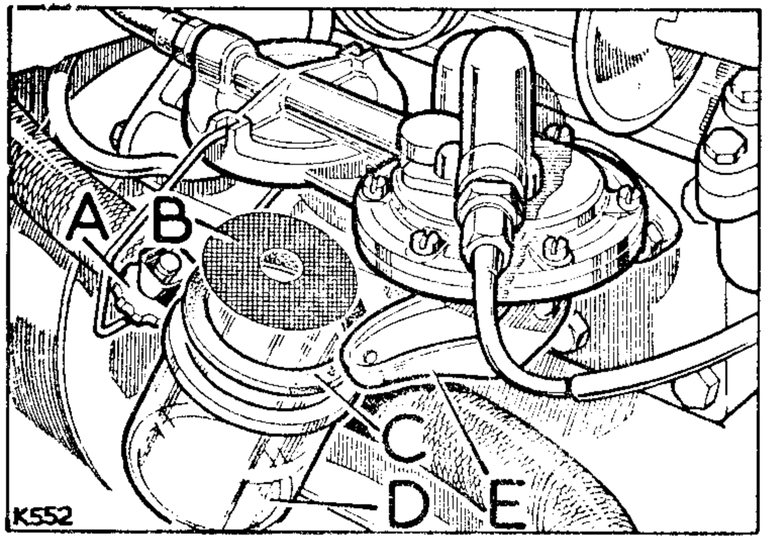


Fig. 13
Fuel pump and sediment bowl, 4-cylinder Petrol models

6-cylinder models

Replace element as follows:

1. Support element holder (B) and unscrew special bolt (C) at bottom of filter. The element holder can now be removed.
2. Remove and discard the used element (A).
3. Thoroughly clean the element holder in petrol.
4. If necessary renew the upper and lower centre seals and also the seal for the centre bolt.
5. Fit the new element, large hole uppermost, into the holder, using the seal supplied with the element.
6. Place the element holder in position and secure with the special bolt.
7. Start the engine and check for fuel leaks.

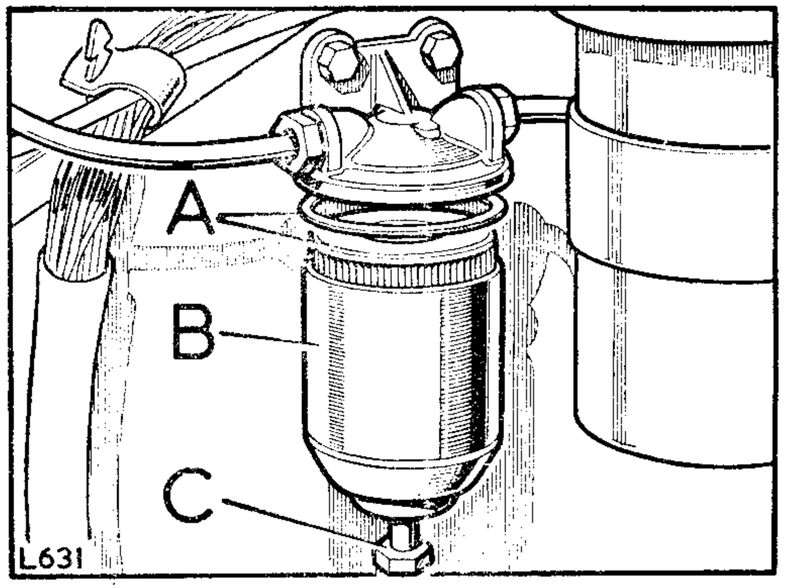


Fig. 14 Fuel filter, element type, 6-cylinder models

Fuel pump 6-cylinder Petrol models

A dual fuel pump is fitted at the right-hand chassis side member.

On vehicles with one fuel tank both pumps will operate immediately the ignition is switched on, so filling the carburetter for easy starting.

With twin tank installations the pump connections are such that the primary and secondary pumps draw on the main and additional fuel tank respectively.

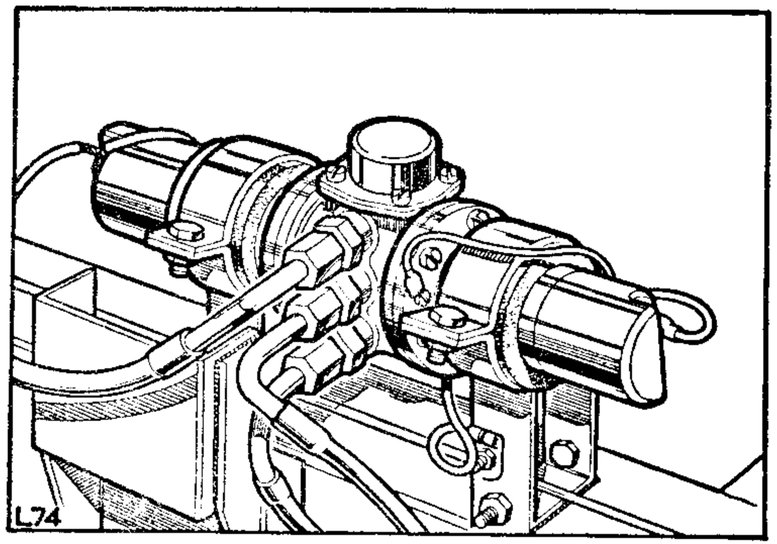


Fig. 15 Dual fuel pump, 6-cylinder Petrol models

The secondary pump should be used once a week for a few miles' driving to ensure that it is kept in good condition.

The change-over switch is situated behind the driver's seat.

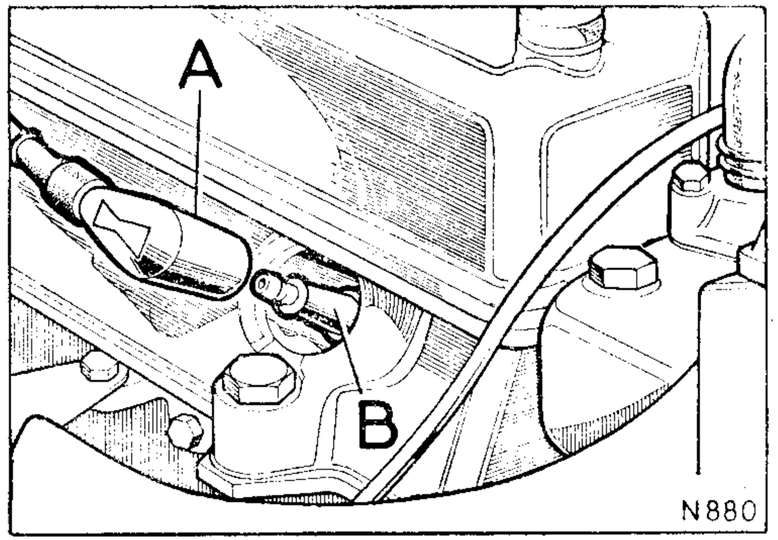


Fig. 16
Sparking plug and cover

Sparking plugs—Check every 6.000 km (4,000 miles); replace every 12.000 km (8,000 miles). Petrol models

The sparking plugs are fitted with plastic covers (A) retained in the cylinder head by rubber rings. To gain access to the plugs (B) for cleaning and gap-setting, pull up the plug covers without detaching them from the high tension leads.

Check or replace the sparking plugs as applicable; if the plugs are in good condition, clean and re-set the electrode gaps to 0,75 to 0,80 mm (0.029 to 0.032 in.).

It is important that only the recommended sparking plugs are used for replacements:

4-cylinder models 8.0:1, use Champion UN12Y
7.0:1, use Champion N8.

6-cylinder models, use Champion N5.

Before refitting sparking plugs, check and adjust the contact points, also check tappet adjustment when applicable.

Distributor contact points—Every 6.000 km (4,000 miles). Replace every 12.000 km (8,000 miles). Petrol models

Check and adjust the contact points clearance as follows. This is best done while the sparking plugs are removed, previous operation:

1. Remove the distributor cap and rotor arm; then turn the engine, using the starting handle, until the contacts are fully open.
2. The clearance should be 0,35 to 0,40 mm (0.014 to 0.016 in.) with the feeler gauge a sliding fit between the contacts.
3. If necessary, slacken the screw (B) which secures the adjustable contact and adjust by the adjuster slot (A) until the clearance is correct; re-tighten the retaining screw.
4. Replace the rotor arm and distributor cap.

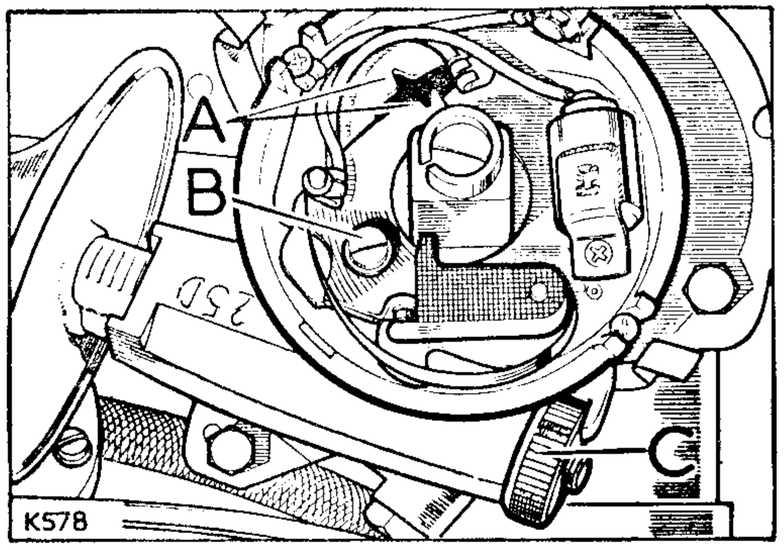


Fig. 17
Distributor contact points

Distributor maintenance—Every 6.000 km (4,000 miles). Petrol models

Lubricate as follows:

1. Remove the distributor cap and rotor arm (A).
2. Lightly smear the cam with clean engine oil.
3. Add a few drops of thin machine oil to lubricate the cam bearing and distributor shaft (B).
4. Add a few drops of thin machine oil through the side of the contact breaker base plate, to lubricate the automatic timing control (B).

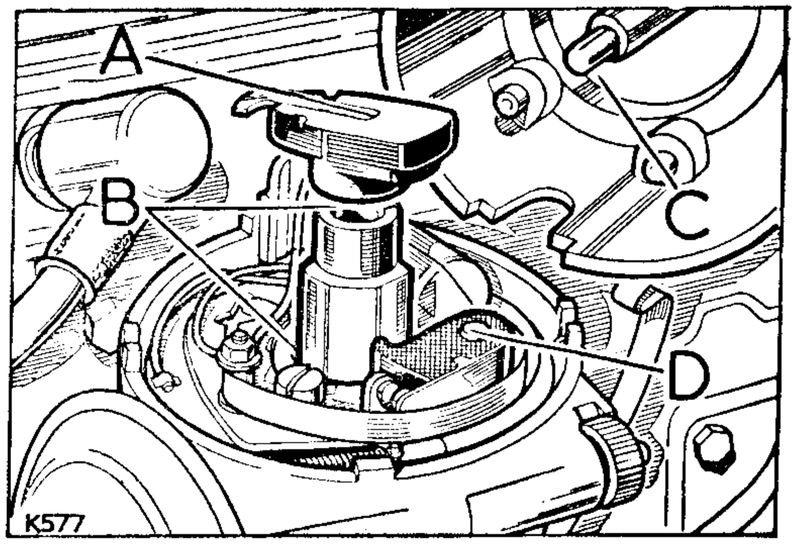


Fig. 18
Distributor

5. Remove the nut on the terminal block and lift off the spring and moving contact, also remove adjustable contact secured with a screw. Ensure that the contacts are free from grease or oil; if they are burned or blackened, clean with a fine carborundum stone and wipe with a petrol-moistened cloth. Add a smear of grease to contact pivot (D) before replacing the contacts. Then adjust as detailed in previous operation.
6. Wipe the inside and outside of the cap with a soft dry cloth; ensure that the small carbon brush (C) works freely in its holder.
7. Replace rotor arm and distributor cap.

Ignition timing—Every 6.000 km (4,000 miles). Petrol models

In addition to automatic timing advance and retard mechanism, the distributor incorporates an adjuster screw (A); known as the octane selector. This is a vernier adjustment attached to the distributor, fitted with a sliding portion controlled by an adjusting screw. The body of the distributor is marked R (Retard) and A (Advance) to indicate direction of turn.

Should pinking develop as a result of the need for decarbonising, the control can be retarded a little by turning the screw in a clockwise direction. Do not forget to return it to the original position after decarbonising.

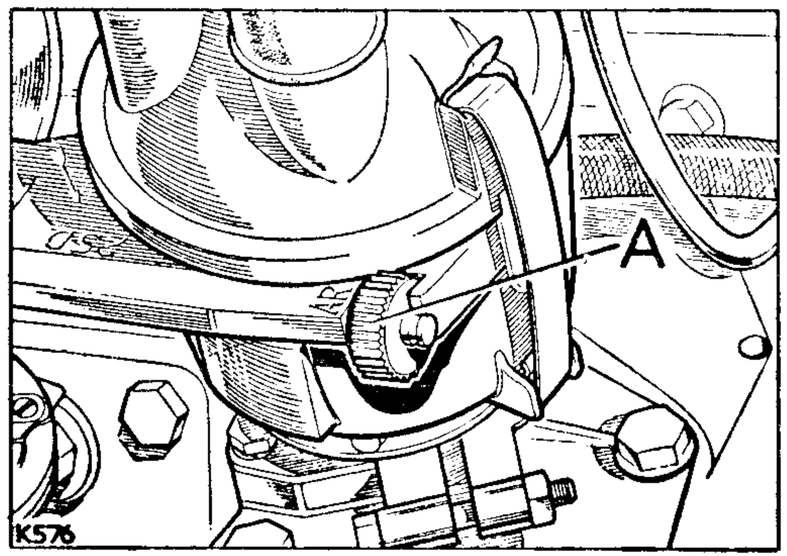


Fig. 19. Ignition timing

In certain countries very low grade fuel is supplied, in which case it may be necessary to adjust the octane selector to avoid pinking, even with a clean engine.

Should the distributor have been disturbed, the ignition timing must be reset as follows:

1. Set the contact breaker point gap to 0,35 to 0,40 mm (0.014 to 0.016 in.) with the points fully open.
2. $2\frac{1}{4}$ litre petrol models:

   The timing marks (A), (B) and (C) represent 6° BTDC, 3° BTDC and TDC respectively.

   Rotate the engine until the mark (D) on the crankshaft pulley is in line with the pointer as follows:

8.0:1 compression ratio—
TDC when using 90 octane fuel
3° ATDC* when using 85 octane fuel
7.0:1 compression ratio—
6° BTDC when using 90 octane fuel
3° BTDC when using 83 octane fuel
TDC when using 75 octane fuel
*Estimate this position on pulley

} United Kingdom use two-star grade fuel

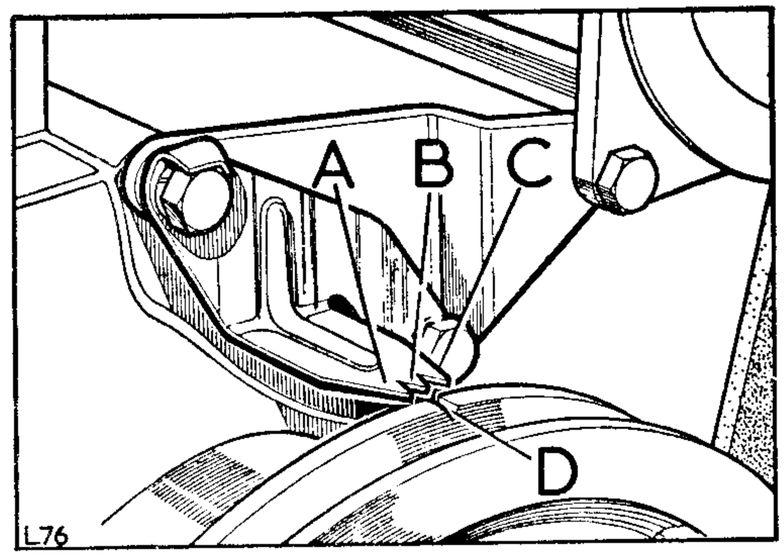


Fig. 20
Ignition timing, $2\frac{1}{4}$ litre Petrol model

3. 2.6 litre 6-cylinder models:

   Rotate the engine until the appropriate mark on the crankshaft pulley is in line with the pointer (A) as follows:

   7.8:1 compression ratio—
   2° ATDC when using 90 octane fuel
   6° ATDC when using 85 octane fuel
   7.0:1 compression ratio—
   TDC when using 83 octane fuel
   2° BTDC when using 90 octane fuel
   } United Kingdom use two-star grade fuel

4. The distributor rotor will now correspond with No. 1 cylinder high tension lead terminal.

5. Set the octane selector so that the fourth line from the left-hand side of the calibrated slide is against the face of the distributor body casing.

6. Slacken the pinch bolt at the base of the distributor head, rotate the distributor bodily in the opposite direction to the arrow on the rotor arm until the contact breaker points are just opening with the fibre cam follower on the leading side of the cam; re-tighten the pinch bolt.

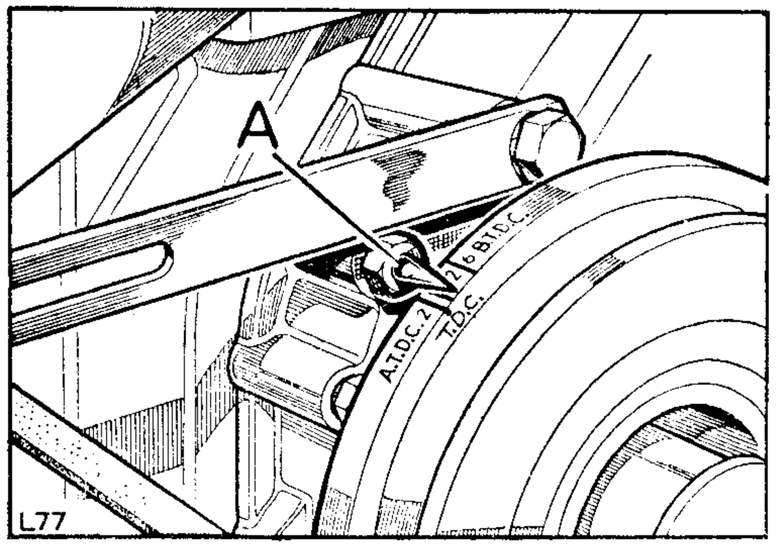


Fig. 21
Ignition timing, 2.6 litre 6-cylinder models

Fuel injectors—Check every 18.000 km (12,000 miles). Diesel models
Absolute cleanliness is essential when handling fuel injectors

Nozzle holders and nozzles should not be dismantled unless proper testing and re-setting facilities are available. If a nozzle is found to be faulty, replace the complete unit.

The injectors are located in the top of the cylinder head on the right-hand side. Injectors may be removed for checking and adjustment as follows:

(a) Disconnect the spill pipe at T-piece and slacken banjo bolts at nozzles. The feed pipes must be removed from the injectors and the pump, these pipes should be free at both ends; on no account must the pipes be bent to clear the union on the injector.

(b) Remove flange securing nuts.

(c) Lift out the injectors (A) complete with spill pipe and copper washers (B). Remove the steel washers (C) from inside the injector holes.

(d) Fit spill pipe to new injectors, ensuring that no foreign matter is present. Do not fully tighten banjo bolts at this stage. Fit assembly of injectors and spill pipe to cylinder head, taking great care not to damage nozzle (A) and also ensure that both new copper washer (B) and steel washer (C) are fitted. The steel washer must be fitted with the 'U' of the corrugation downwards.

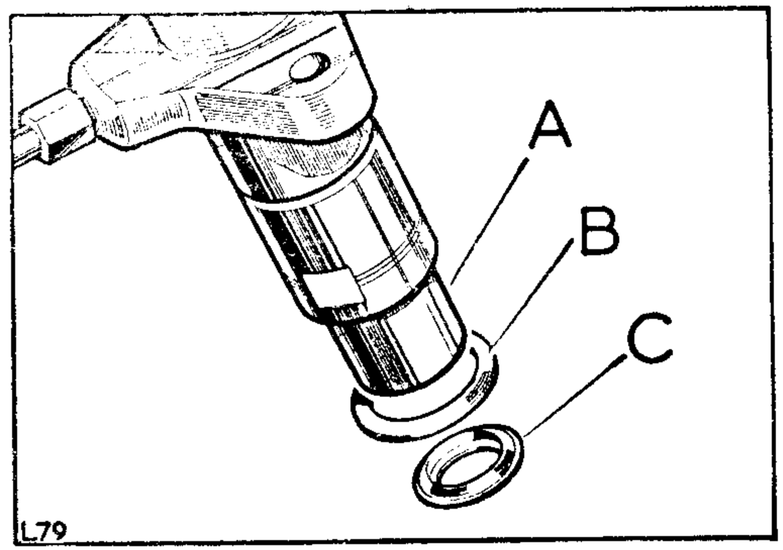


Fig. 22
Position of injector nozzle washers, Diesel models

(e) Refit flange securing nuts.

(f) Tighten each nut alternately an equal amount to ensure that the injector goes into position evenly. The nuts must be tightened only to a torque of 0,8–1,0 mkg (6–8 lb ft). Alternatively, a 0.5 in. AF open-ended spanner of not more than 100 mm (4 in.) in length can be used. Failure to carry out the above precautions when replacing injectors may result in nozzle distortion, giving rise to rough and uneven running. Finally, tighten spill pipe banjo bolts.

Checking nozzles in engine, Diesel models

The first symptoms of nozzle trouble usually come under one or more of the following headings:

1—Cylinder knock;

2—Engine overheating;

3—Loss of power;

4—Smoky exhaust (black);

5—Increased fuel consumption.

To check the nozzles, proceed as follows:

(a) With the engine running, release the fuel feed pipe union on each nozzle in turn.

(b) If the injector being checked has been operating properly, there will be a distinct reduction in engine speed accompanied by obvious roughness, but a faulty injector will make less reduction to engine speed when its fuel pipe is loosened.

Do not assume, however, that the nozzles are the only cause of the trouble, as faulty valve timing, leaking valves, incorrect pump timing, dirty filters, etc., may all cause similar touble.

Adjusting injectors, Diesel models

The use of a test pump is essential when adjusting injectors; we strongly recommend therefore, that adjustment required on injectors be carried out by your nearest Rover Distributor or Dealer or CAV Agent.

Great care should be taken to prevent the hands getting into contact with the spray, as the working pressure will cause the fuel to penetrate the skin with ease.

Heater plugs, Diesel models

The heater plugs do not require any maintenance. However, if at any time when the heater plug is used, the warning light glows very brightly, a short circuit in the system is indicated. No light will indicate an open circuit. This should receive attention at your nearest Rover Distributor or Dealer.

Great care must be taken not to twist the centre terminal when removing heater plug leads.

Fuel and injection system, Diesel models

Absolute cleanliness is essential when handling any part of the fuel injection system.

The fuel system comprises the fuel tank, pipe lines, sediment bowl filter, mechanically operated pump, paper element type filter, injectors and injection pump. It is most important that the system be kept clean and free from leaks.

Priming the fuel system, Diesel models

A—When the paper element filter is changed the system must be primed as follows:

1. Do not attempt to start the engine hoping to draw the fuel through in this way, otherwise the full priming procedure will be necessary.
2. Slacken the bleed pipe on the top of the filter.
3. Operate the hand priming lever on the mechanical pump, until fuel free from bubbles emerges.
4. Tighten the bleed pipe.
5. Operate the hand priming lever once or twice to clear the last bubbles of air into the filter bleed pipe.
6. Start engine in normal way and check for leaks.

B—When fuel system has been completely emptied proceed as follows:

7. Carry out operations above, 1 to 5 inclusive.
8. Release air vent screw (B) on distributor body.
9. Operate the fuel pump hand priming lever until fuel free of air emerges from aperture (A).
10. Retighten the air vent screw.
11. To ensure that all air is exhausted from the pump it may also be necessary to slacken air vent screw (C) in the distributor control cover and repeat items 9 and 10.
12. Start the engine in the normal way and check for leaks.

C—When distributor pump only has been drained it is only necessary to carry out operations 8 to 12 inclusive.

Always ensure that fuel pump lever is on the bottom of the operating cam when priming the fuel system, otherwise maximum movement of the priming lever will not be obtained.

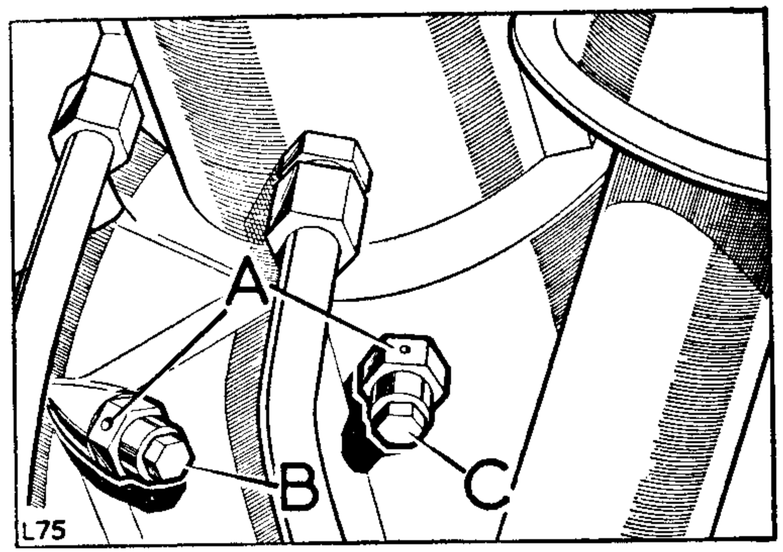


Fig. 23
Priming the distributor pump, Diesel models

Fuel filter, paper element type—Every month, drain off water; Every 18.000 km (12,000 miles) change filter element. Diesel models

Drain off water as follows:

1. Slacken off drain plug (D) to allow water to run out.
2. When pure diesel fuel is emitted, tighten drain plug.

Change filter element as follows: In some instances it may be advantageous to remove the complete unit before attempting to change the filter element.

1. Support element holder (C) and unscrew the special bolt (A) on the top of the filter, the element holder can now be removed.
2. Remove and discard the used element (B).
3. Wash the element holder in petrol or fuel oil.
4. If necessary renew both the large rubber washer and the small rubber washer in the filter top, also renew the large rubber washer in the element holder.
5. Push the new element on to the filter top spigot with the perforated holes in the element to the top.
6. Fit the element holder to the bottom of the element, and secure with the special bolt.
7. Prime the system and check for fuel leaks.

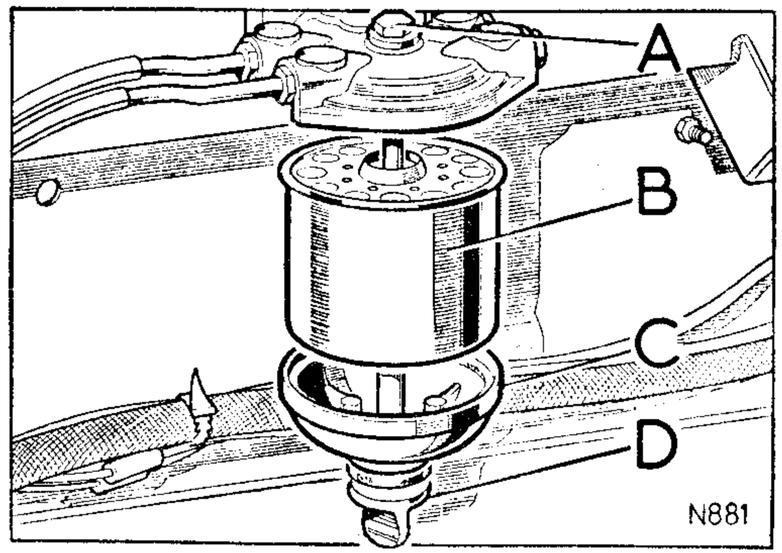


Fig. 24
Paper element filter, Diesel models

Fuel sedimenter—Every month, drain off water; every 18.000 km (12,000 miles), dismantle and clean. Diesel models

The sedimenter increases the working life of the fuel filter by removing the larger droplets of water and larger particles of foreign matter from the fuel.

Drain off water as follows:

1. Slacken off drain plug (E) to allow water to run out.
2. When pure diesel fuel is emitted, tighten drain plug.

Dismantle and clean as detailed below:

1. Disconnect fuel inlet pipe (B) at sedimenter and raise pipe above level of fuel tank to prevent draining from tank. Support in this position.
2. Support sedimenter bowl and unscrew special bolt (A) on top of unit. The lower bowl (D) and element (C) can now be removed.
3. Clean all parts in petrol.
4. Fit new oil seals and reverse removal procedure.
5. Slacken off the drain plug (E), when pure diesel fuel runs out tighten plug. Start engine and check for air leaks.

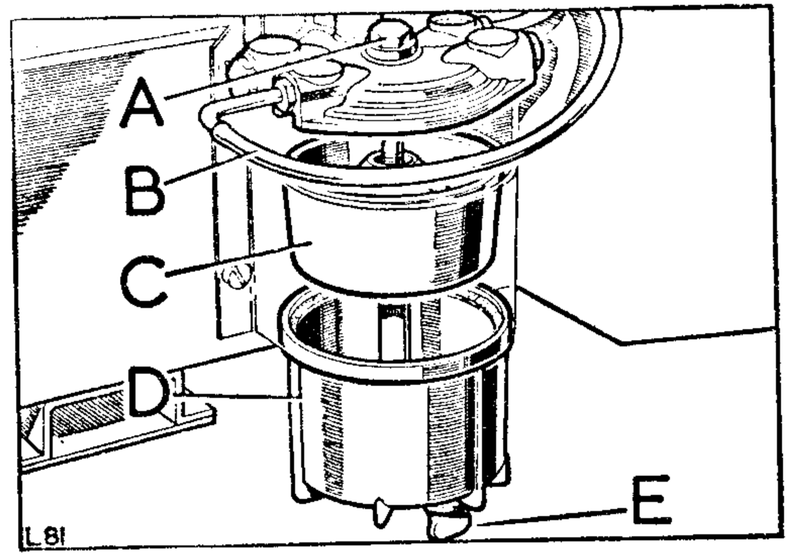


Fig. 25
Fuel sedimenter

Distributor pump, Diesel models

This unit is correctly set on leaving the factory and requires no further adjustment. It is lubricated by the diesel fuel and does not require any maintenance in this respect.

Should any trouble be experienced with the distributor pump, consult your nearest CAV Agent.

If for any reason the distributor pump has been removed, it must be refitted and timed as follows:

1. Turn the crankshaft in the direction of rotation until both valves of number one cylinder are closed and the piston is ascending the bore on the compression stroke. Continue to turn the crankshaft slowly until the pointer (A) Fig. 26 is midway between the 14° and 16° marks, that is 15° before top dead centre. This must be done carefully. If the flywheel is inadvertently turned too far and the timing mark goes past the pointer, do not turn the flywheel back, but repeat the above operation.

   Ensure that a correct line of vision is taken when lining up the timing marks. An incorrect line of vision can result in the timing being 1° to 2° out.

2. The master spline on the driving gear should now be approximately 20° from the centre line of engine measured from front end, that is, at the 4 o'clock position.

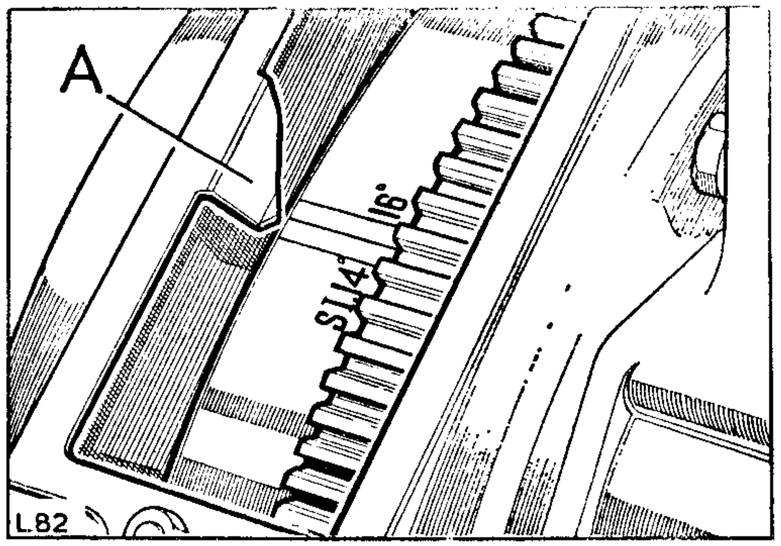


Fig. 26. Timing marks on flywheel

3. Insert the timing gauge (A) Fig. 27, Rover Part Number 605863, into the driving gear, then twist gauge in a clockwise direction to take up backlash and any wear in the gears. Hold in this position, then, if necessary, slacken off bolts (C) Fig. 27 retaining timing pointer (B) Fig. 27 on side of cylinder block. Adjust pointer so that it coincides with the line on timing gauge.
4. Remove timing gauge.
5. Rotate driving gear on distributor pump so that master spline lines up with master spline on driving gear.

   Then offer pump to engine, ensuring that the timing mark (A) Fig. 28 on the pump flange coincides with the timing pointer (B) Fig. 28.

When the distributor pump is timed as detailed above, that is, with the timing pointer on the engine altered to take up backlash and wear on the gears, it ensures that optimum distributor pump timing is achieved.

Should there be any fall-off of power during the life of the engine, retiming the distributor pump to take up gear wear could well make a significant improvement to engine performance, providing the engine is generally in good condition.

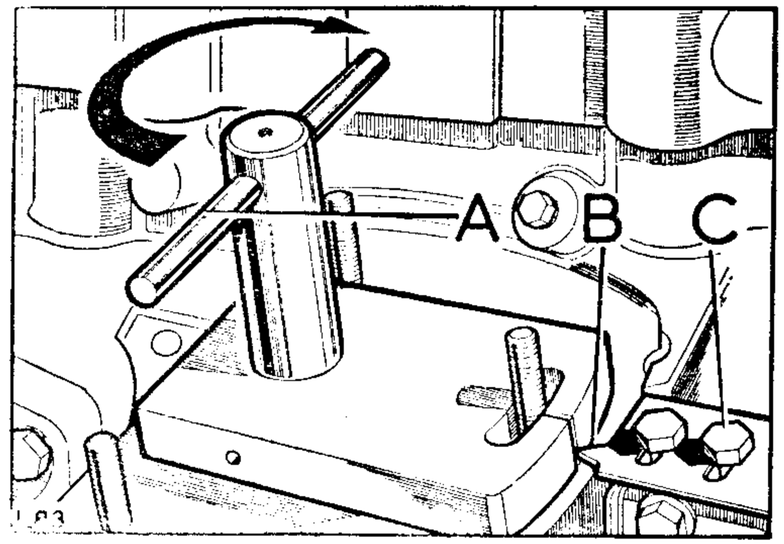


Fig. 27
Timing gauge, Rover Part No. 605863, located in driving gear

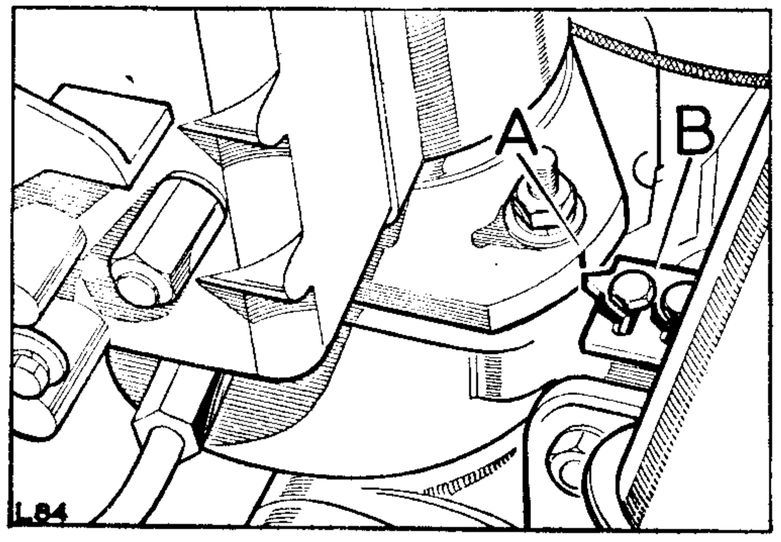


Fig. 28. Distributor pump correctly timed

Tappet adjustment—Every 12.000 km (8,000 miles)

The correct clearance is: 4-cylinder models, inlet and exhaust, 0,25 mm (0.010 in.), engine hot. 6-cylinder models, inlet 0,15 mm (0.006 in.), engine hot, and exhaust 0,25 mm (0.010 in.) with the engine hot or cold.

To carry out tappet adjustment, proceed as follows:

1. Rotate the engine in the running direction until the valve receiving attention is fully open and then move the engine one complete turn, to bring the tappet on to the back of the cam.
2. Check the tappet clearance with a feeler gauge (C). If adjustment is required, slacken the locknut (B) and rotate the tappet adjusting screw (A) until the clearance is correct; re-tighten the locknut, taking care to ensure that this operation does not upset the clearance.
3. Repeat for the other valves in turn.

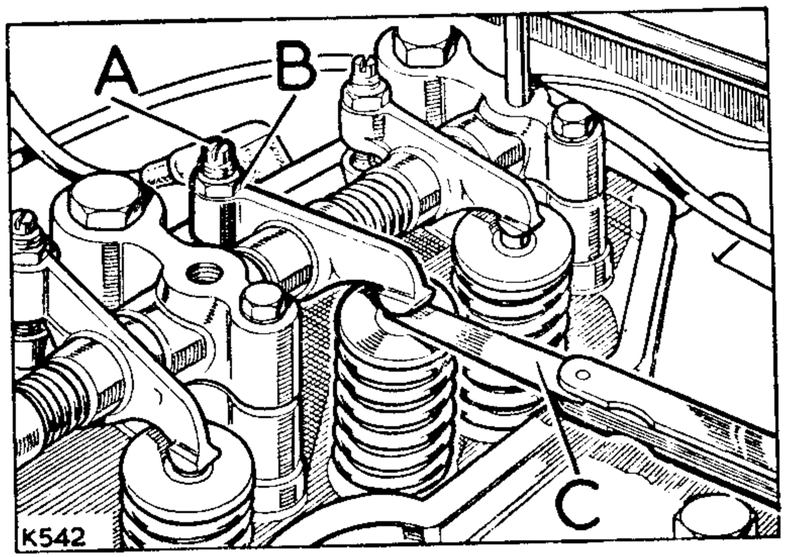


Fig. 29
Tappet adjustment, 4-cylinder models

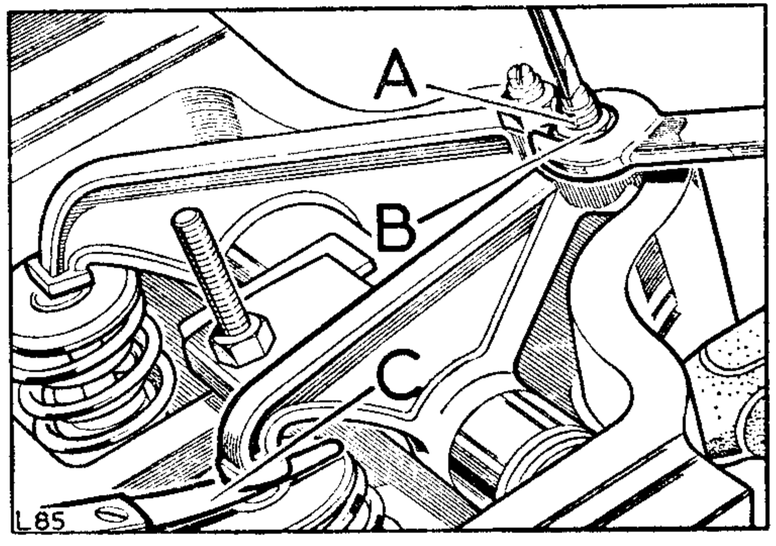


Fig 30.
Tappet adjustment, 6-cylinder models

Fan belt adjustment—Every 6.000 km (4,000 miles)

Check by thumb pressure between the fan and crankshaft pulleys at point marked 'B'. Movement should be 8 to 11 mm (0.312 to 0.437 in.).

If necessary adjust as follows:

1. Slacken the pivot bolt (A) securing the dynamo to the mounting bracket, slacken the adjusting bolt (C).
2. Pivot the dynamo inwards or outwards as necessary and adjust until the correct belt tension at (B) is obtained.
3. Tighten adjusting and pivot bolts.

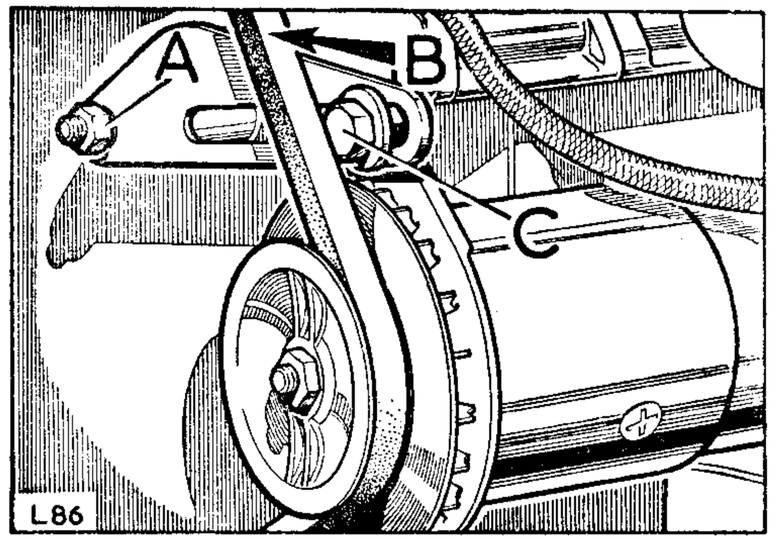


Fig. 31
Fan belt adjustment, 4-cylinder model illustrated

Dynamo lubrication—Every 18.000 km (12,000 miles)

Lubricate at the commutator end bearing by inserting the nozzle of a pump type oil can (B) in the small central hole (A) and injecting just sufficient engine oil to moisten the lubricating pad.

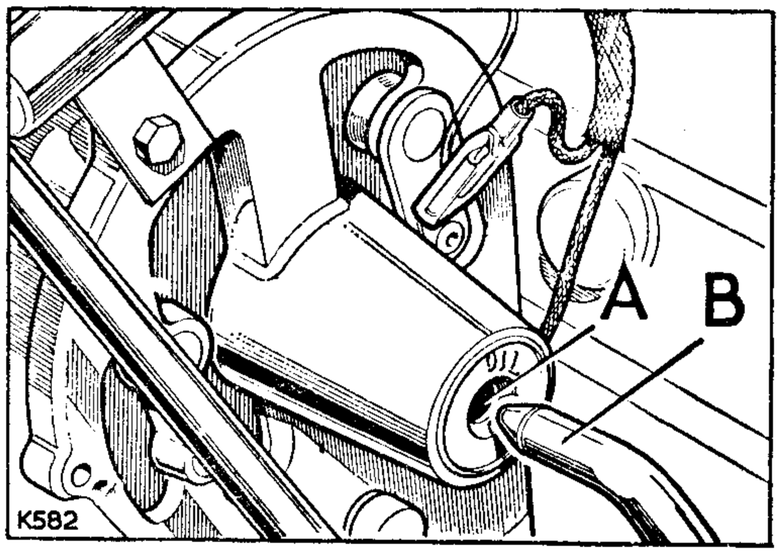


Fig. 32. Dynamo lubrication

Radiator water level—Daily or weekly, depending on operating conditions, and at every maintenance inspection.

The radiator filler cap is under the bonnet panel.

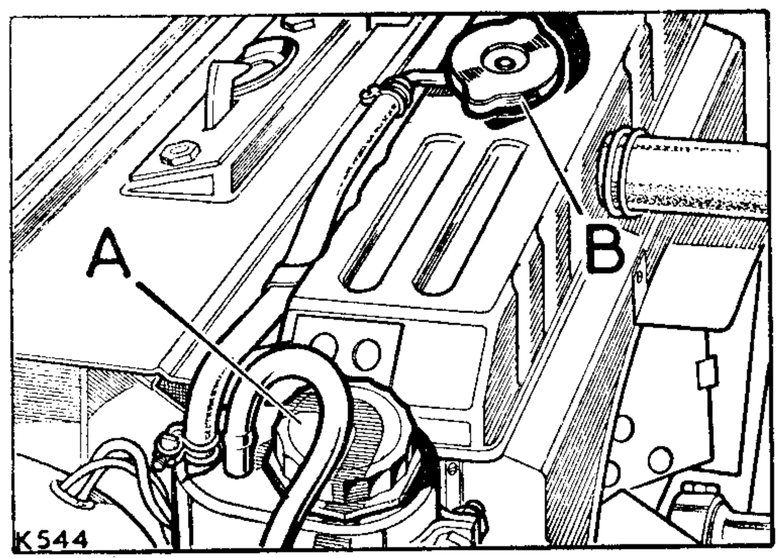


Fig. 33. Radiator filler cap

Diesel models

Never run the engine without water, not even for a very brief period, otherwise the injectors may be seriously damaged. This is due to the very high rate of heat transfer in the region of the injector nozzles.

All models

The cooling system is pressurised and care must be taken when removing the radiator filler cap, especially when the engine is hot.

When removing the filler cap (B), first turn it anti-clockwise to the stop and allow all pressure to escape, before pressing it down and turning further in the same direction to lift it off.

When replacing the filler cap, it is important that it is tightened down fully, not just to the first stop. Failure to tighten the filler cap properly may result in water loss, with possible damage to the engine through overheating.

All models have a semi-sealed cooling system, that is, an overflow bottle (A) attached to the left-hand side of the radiator.

The water level in the cooling system is checked at the radiator only and topping-up is also carried out in the normal manner through the radiator filler. The pipe in the overflow bottle should always be submerged in water.

With a cold engine the correct water level is 12 to 19 mm (0.5 to 0.75 in.) below the bottom of the filler neck. For capacities see Data Section.

Use soft water wherever possible; if the local water supply is hard, rainwater should be used.

Frost precautions

In cold weather, when the temperature may drop to or below freezing point, precautions must be taken to prevent freezing of the water in the cooling system.

As a thermostat is fitted in the system, it is possible for the radiator block to freeze in cold weather even though the engine running temperature is quite high; for this reason, the use of an anti-freezing mixture is essential.

Only anti-freeze solutions conforming to British Standard No. BS 3151 or 3152 must be used. Prestone, although it does not conform to either Standard, is also suitable.

When the temperature is between 0°C and minus 18°C (32°F and 0°F), use one part of anti-freeze to three parts of water.

Proceed as follows:

1. Ensure that the cooling system is leak-proof; anti-freeze solutions are far more 'searching' at joints than water.
2. Drain and flush the system. Drain plug (A) Fig. 34 under radiator at left-hand side and drain tap (A) Fig. 35 for cylinder block 4-cylinder at left-hand side of engine adjacent to dipstick. 6-cylinder at right-hand side of engine adjacent to engine breather.
3. Pour in approximately 4,5 litres (one gallon) of water, add solution, then top-up with water to within 12 to 19 mm (0.5 to 0.75 in.) below bottom of filler neck.
4. Run the engine to ensure a good circulation of the mixture.

During the winter months in Britain Land-Rovers leaving the Rover factory have the cooling system filled with 33⅓% of anti-freeze mixture. This gives protection against frost down to minus 32°C (minus 25°F). Cars so filled can be identified by the blue and white sticker affixed to the right-hand side of the windscreen and a blue and white disc tied to the engine.

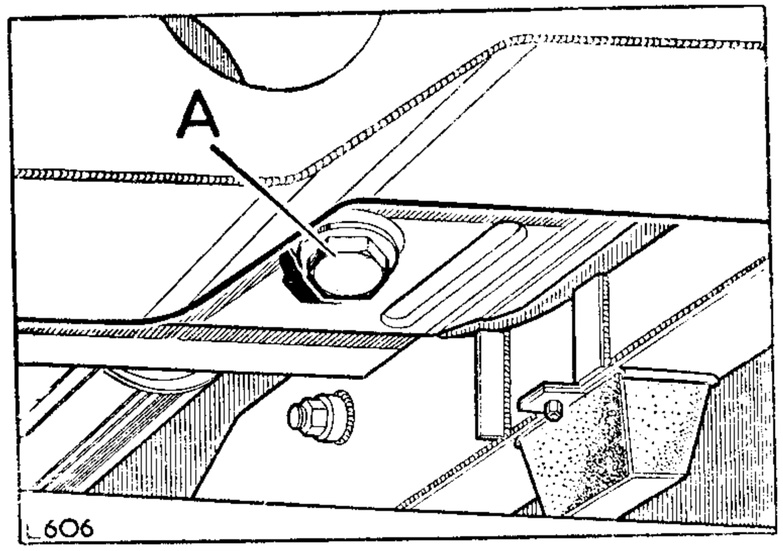


Fig. 34. Radiator drain plug

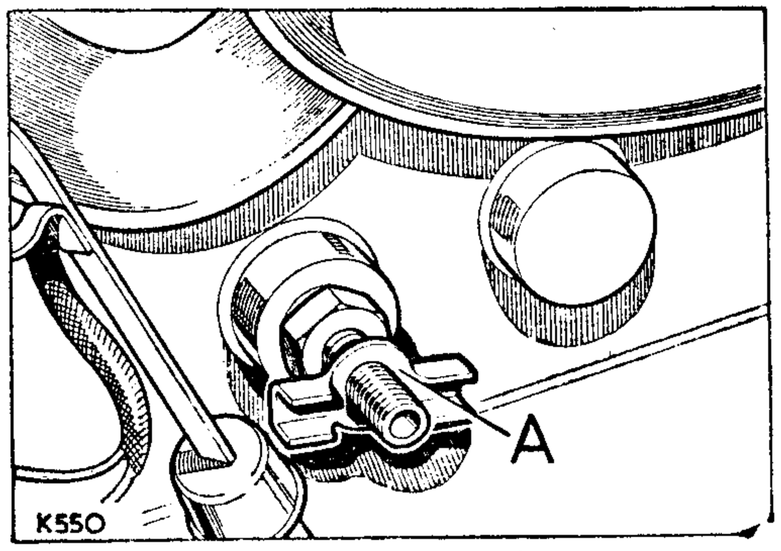


Fig. 35. Cylinder block drain tap

Main gearbox oil level—Every 6.000 km (4,000 miles)

Check oil level daily or weekly when operating under severe stationary working conditions.

The main gearbox and clutch withdrawal mechanism are lubricated as one unit. Check oil level and top up if necessary to the bottom of the filler-level plug hole (A).

This plug is accessible from under the vehicle and can be seen from above when the rubber grommet is removed from the left-hand side of the gearbox cover.

If significant topping up is required check for oil leaks at drain and filler plugs, all joint faces and through drain hole in bell housing.

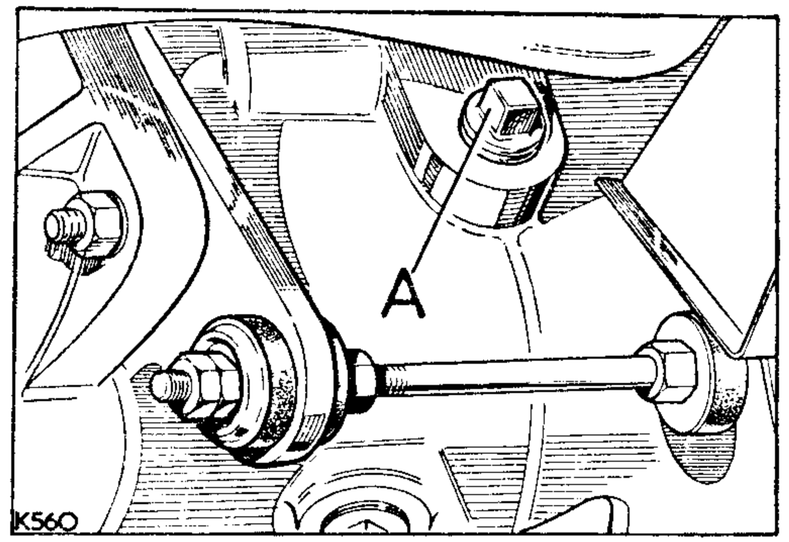


Fig. 36. Gearbox oil filler-level plug

Transfer box oil level—Every 6.000 km (4,000 miles)

Check oil level daily or weekly when operating under severe wading conditions.

The transfer box and front wheel drive housing are lubricated as one unit. Check oil level and top up if necessary to the bottom of the filler-level plug hole (A). The filler-level plug is in the rear face of the transfer box, it is accessible when the seat box centre panel is removed.

If significant topping up is required check for oil leaks at drain and filler plugs, all joint faces and through drain hole in bell housing.

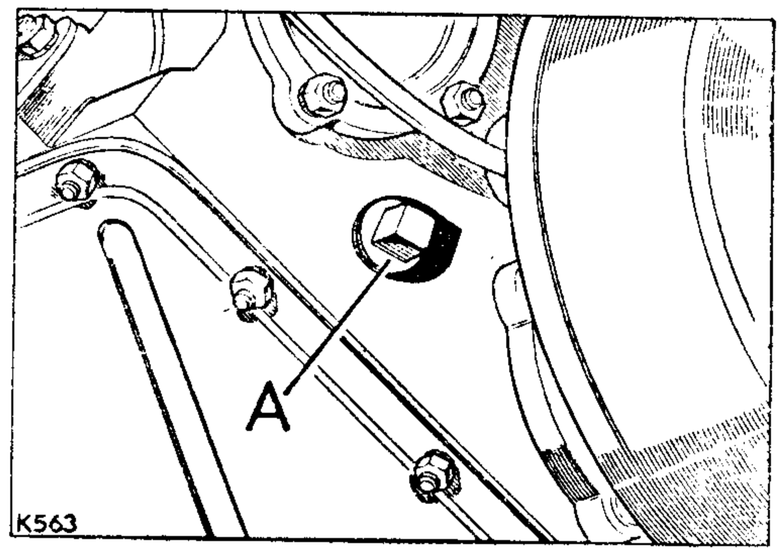


Fig. 37. Transfer box oil level

Main gearbox oil changes—Every 18.000 km (12,000 miles)

Drain and refill monthly when operating under severe wading conditions.

To change the gearbox oil, proceed as follows:

1. Immediately after a run, when the oil is warm, drain off the oil by removing the drain plug (A) in the bottom of the gearbox casing.
2. Replace the drain plug and refill gearbox with the correct grade of oil.

   The capacity is: 1,5 litres (2.5 Imperial pints), 3 US pints.

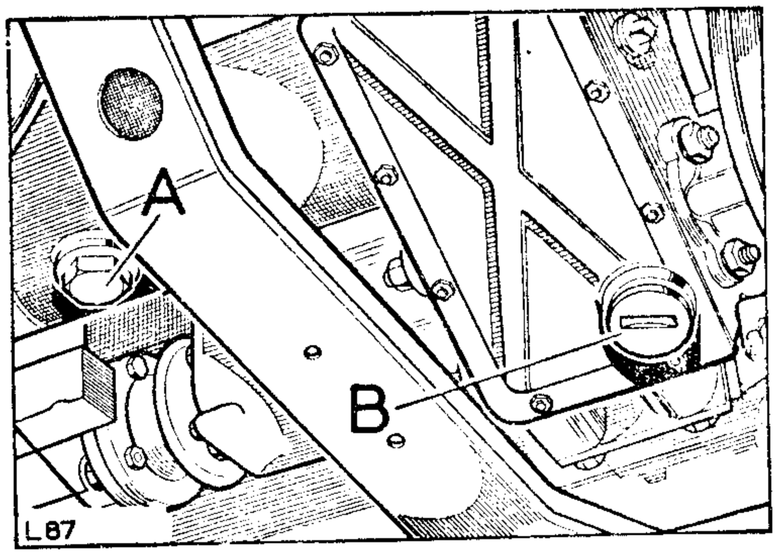


Fig. 38. Gearbox and transfer box drain plug

Transfer box oil changes—Every 18.000 km (12,000 miles)

Drain and refill monthly when operating under severe wading conditions.

To change the transfer box oil proceed as follows:

1. Immediately after a run, when the oil is warm, drain off the oil by removing the drain plug (B) in the bottom of the transfer box.
2. Replace the drain plug and refill transfer box with the correct grade of oil.

   The capacity is 2,5 litres (4.5 Imperial pints), 5.5 US pints.

Flywheel housing drain plug—Every 6.000 km (4,000 miles). When in use for wading

The flywheel housing can be completely sealed to exclude mud and water under severe wading conditions, by means of a plug fitted in the bottom of the housing.

The plug (C) is screwed into a bracket (A) adjacent to the drain hole (B) and should only be fitted when the vehicle is expected to do wading or very muddy work.

When the plug is in use it must be removed periodically and all oil allowed to drain off before the plug is replaced.

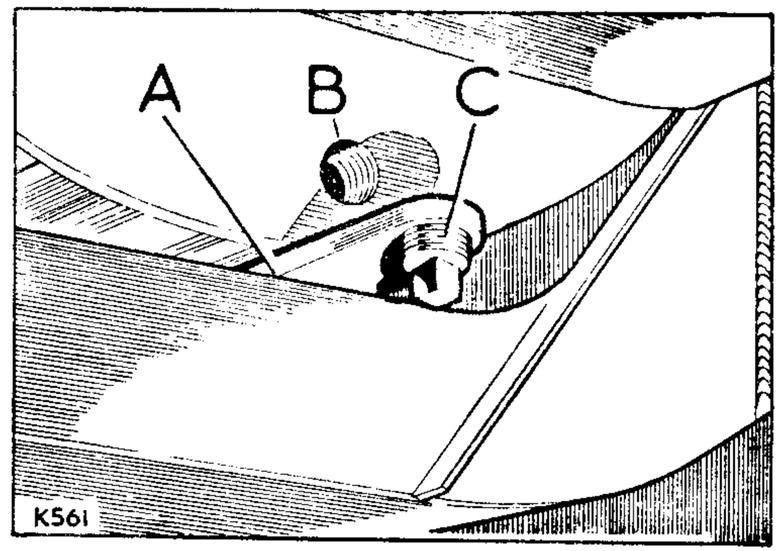


Fig. 39. Flywheel housing drain plug

Clutch mechanism

Land-Rover models are fitted with a hydrostatic clutch, that is a clutch mechanism which is correctly set on initial assembly to give approximately 8 mm (0.312 in.) free movement at the pedal pad, and which requires no adjustment throughout the life of the clutch plate.

Clutch fluid reservoir—Every 6.000 km (4,000 miles)

4-cylinder models have a combined brake and clutch fluid reservoir mounted on the dash, above the steering box.

On 6-cylinder models there is a separate clutch fluid reservoir integral with the clutch master cylinder.

4-cylinder models.

Check fluid level in reservoir by removing cap (A); top-up if necessary so that fluid just shows in bottom of filter (B).

The brake reservoir is shown at (C) and the clutch reservoir at (D).

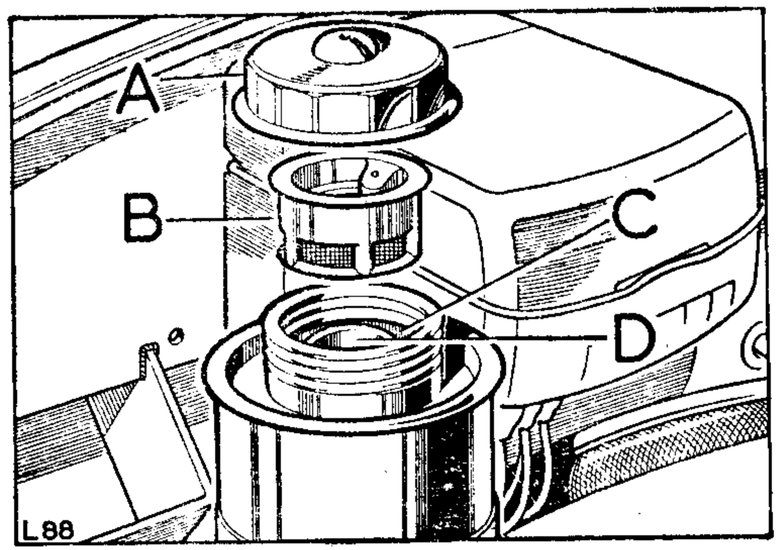


Fig. 40
Clutch and brake fluid reservoir, 4-cylinder models

6-cylinder models.

Check fluid level in reservoir by removing cap (A), top up if necessary to bottom of filler neck (B).

Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J. 1703).

If significant topping-up is required, check for leaks at master cylinder, slave cylinder and connecting pipe.

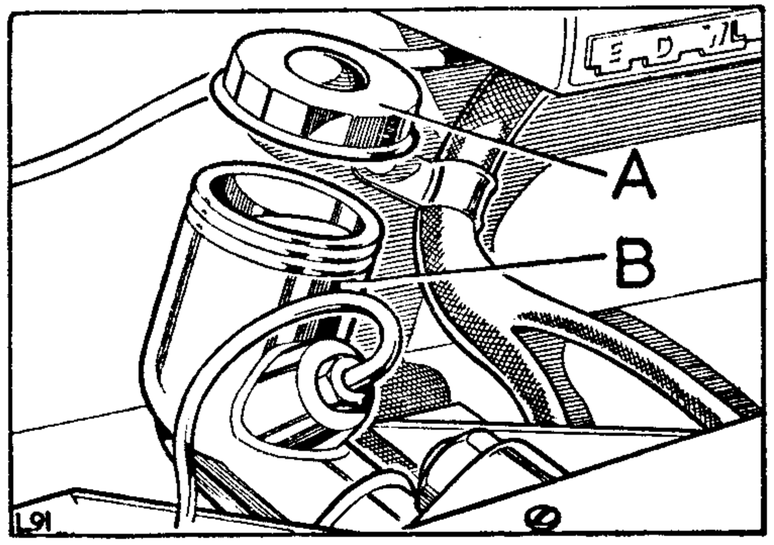


Fig. 41. Clutch reservoir, 6-cylinder models

Bleeding the clutch system

If the level of the fluid in the clutch reservoir is allowed to fall too low or if the pipe has been disconnected, the clutch will not operate correctly due to air having been absorbed in the system. This air lock must be removed by bleeding the hydraulic system at the slave cylinder.

1. Attach a length of rubber tubing to the bleed nipple (A) and place the lower end of the tube in a glass jar.
2. Slacken the nipple and pump the clutch pedal, pausing at each end of the return stroke, until the fluid issuing from the tube shows no sign of air bubbles when the outlet is held below the surface of the fluid in the jar.
3. Hold the tube under the fluid surface and tighten the bleed screw.
4. The fluid in the reservoir should be replenished throughout the operation to prevent another air-lock being formed, using only new fluid—Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J. 1703). Note particularly that on 4-cylinder models, the fluid reservoir for the clutch is the small central tube in the combined reservoir.

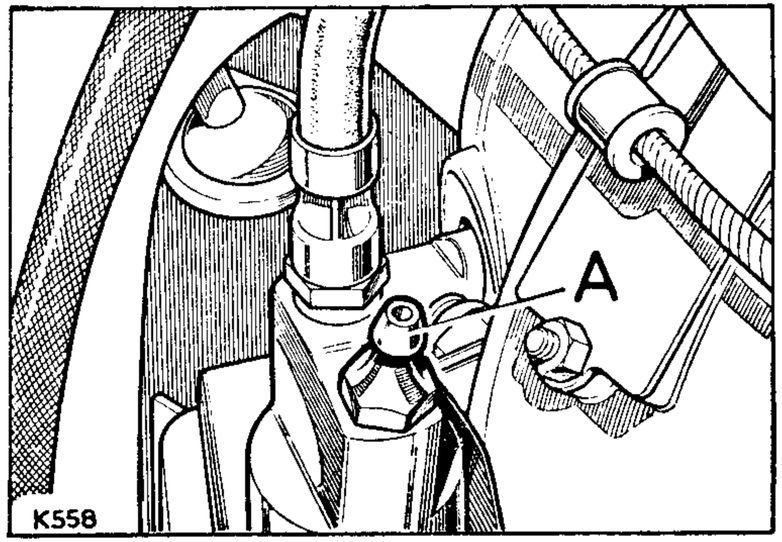


Fig. 42. Bleed nipple for clutch slave cylinder

Battery acid level—Every month and at every maintenance attention

Check weekly when operating under severe conditions.

The battery is located:

'Regular' and 'Long' 4-cylinder Petrol models—under bonnet at right-hand side.

6-cylinder 'Long' models—under left-hand front seat.

'Regular' and 'Long' Diesel models—one under bonnet at right-hand side, the other under the left-hand seat.

The specific gravity of the electrolyte should be checked at every maintenance attention. Readings should be:

Temperate climate below 26.5°C (80°F) as commissioned for service, fully charged 1.270 to 1.290 specific gravity.

As expected during normal service, three-quarter charged 1.230 to 1.250 specific gravity.

If the specific gravity should read between 1.190 to 1.210, half-charged, the battery must be bench charged and the electrical equipment in the car should be checked.

Tropical climate above 26.5°C (80°F) as commissioned for service, fully charged 1.210 to 1.230 specific gravity.

As expected during normal service, three-quarter charged 1.170 to 1.190 specific gravity.

If the specific gravity should read between 1.130 to 1.150, half-charged, the battery must be bench charged and the electrical equipment on the car should be checked.

Check acid level as follows:

1. Wipe all dirt and moisture from the battery top.
2. Remove the filler plugs or manifold lid (A). If necessary add sufficient distilled water to raise the level to the top of separators. Replace the filler plugs or manifold lid.

   Avoid the use of a naked light when examining the cells.

In hot climates it will be necessary to top up the battery at more frequent intervals.

In very cold weather it is essential that the vehicle is used immediately after topping up, to ensure that the distilled water is thoroughly mixed with the electrolyte. Neglect of this precaution may result in the distilled water freezing and causing damage to the battery.

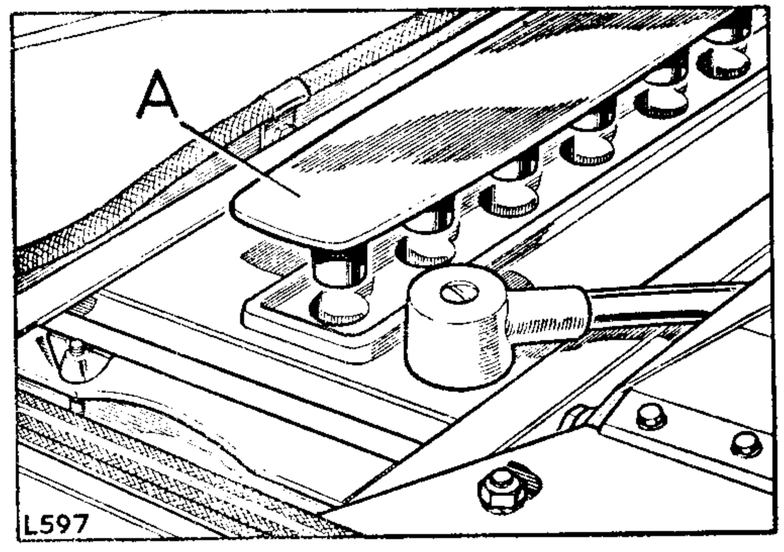


Fig. 43. Battery acid level

Battery terminals—Every 12.000 km (8,000 miles)

Remove battery terminals, clean, grease and refit. Replace terminal screw, do not overtighten. Do not use the screw for pulling down the terminal.

Front and rear differential oil level—Every 6.000 km (4,000 miles)

Check oil level and top up if necessary to the bottom of the filler plug hole. The rear axle filler-level plug (A) Fig. 45 is on the right-hand side of the differential casing and the front axle plug (A) Fig. 44 is at the front of the axle casing.

A second plug fitted at the rear of the front axle casing can be disregarded.

If significant topping up is required check for oil leaks at plugs, joint faces and oil seals adjacent to axle shaft flanges and propeller shaft driving flange.

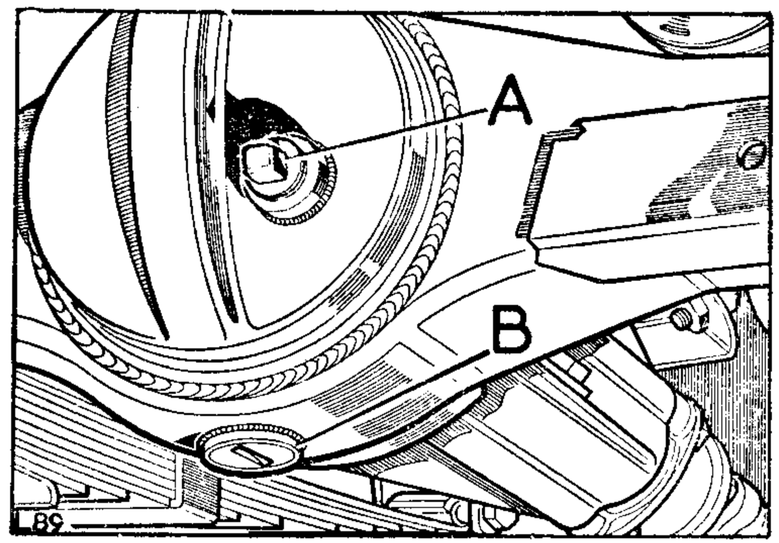


Fig. 44. Front differential oil filler-level plug

Front and rear differential oil changes—Every 18.000 km (12,000 miles)

To change the differential oil, proceed as follows:

1. Immediately after a run, when the oil is warm, drain off the oil by removing the drain plugs (B) Figs. 44 and 45 in the bottom of the axle casings.
2. Replace the drain plugs, remove filler-level plugs (A) Figs 44 and 45 and refill with oil of the correct grade; the capacity is approximately:

   Rover type axles—1,75 litres (3 Imperial pints), 3.5 US pints.

   ENV type axles—1,4 litres (2.5 Imperial pints), 3.5 US pints.

   The drain plugs have slotted heads and can be removed with the aid of the single-ended spanner in the tool kit.

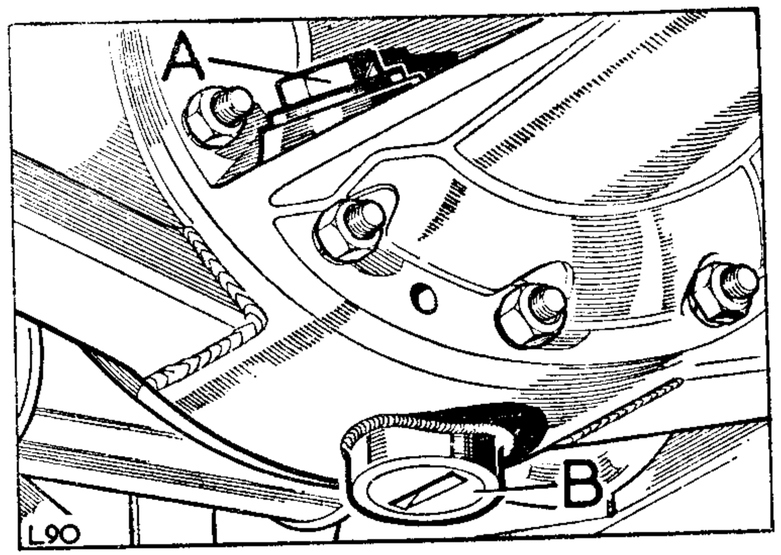


Fig. 45. Rear differential oil filler-level plug

Swivel pin housing oil level—Every 6.000 km (4,000 miles)

The front wheel drive universal joints, swivel pins and front hubs receive their lubrication from the swivel pin housings. Check oil level and top up if necessary to the bottom of the filler-level plug holes (A) at the rear of the housings.

If significant topping up is required check for oil leaks at plugs, joint faces and oil seals.

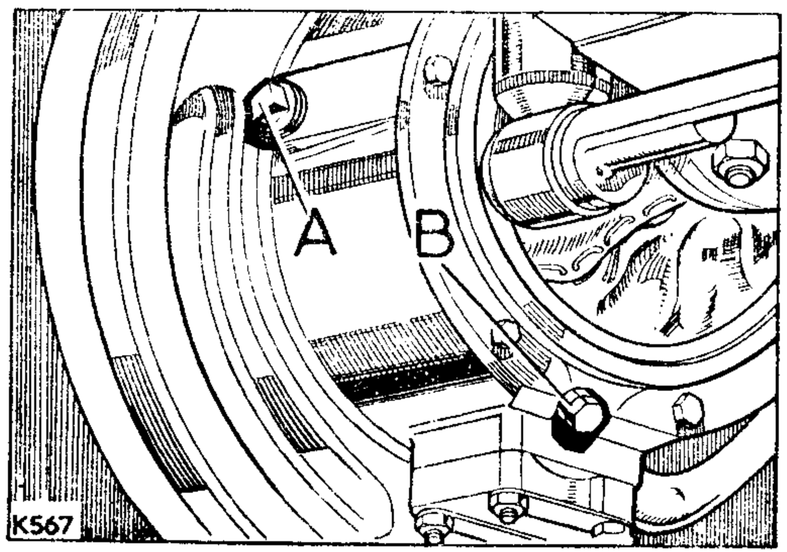


Fig. 46. Swivel pin housing oil filler-level plug

Swivel pin housing oil changes—Every 18.000 km (12,000 miles)

To change the swivel pin housing oil, proceed as follows:

Immediately after a run, when the oil is warm, remove the drain plug (B) from the bottom of each housing: allow the oil to drain away completely and replace the plugs. Refill with oil of the correct grade through the filler-level plug holes (A); the capacity of each housing is approximately 0,5 litre (1 Imperial pint), 1.2 US pints.

Steering box oil level—Every 6.000 km (4,000 miles)

Check oil level and top up if necessary to the bottom of the filler-plug hole (A) on the top of the cover plate. If significant topping up is required check for oil leaks at joint faces and rocker shaft oil seal. Access to the plug is gained by lifting the bonnet panel.

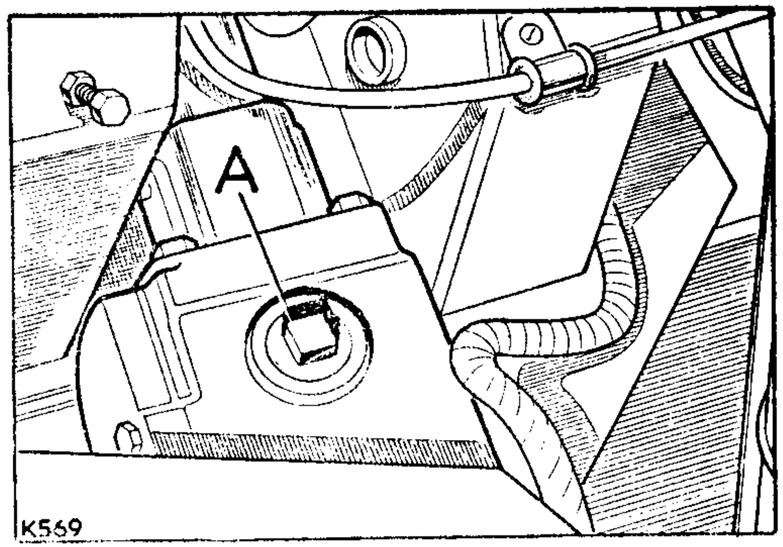


Fig 47. Steering box oil filler plug

Steering ball joints—Every 6.000 km (4,000 miles)

Check rubber boots daily when operating under arduous conditions.

The steering joints (A) have been designed to retain the initial filling of grease for the normal life of the ball joints; however, this applies only if the rubber boot remains in the correct position. Check to ensure that the rubber boots have not become dislodged or damaged, and check for wear in the joint.

This can be done by moving the ball joint vigorously up and down. Should there be any appreciable free movement the complete joint must be replaced.

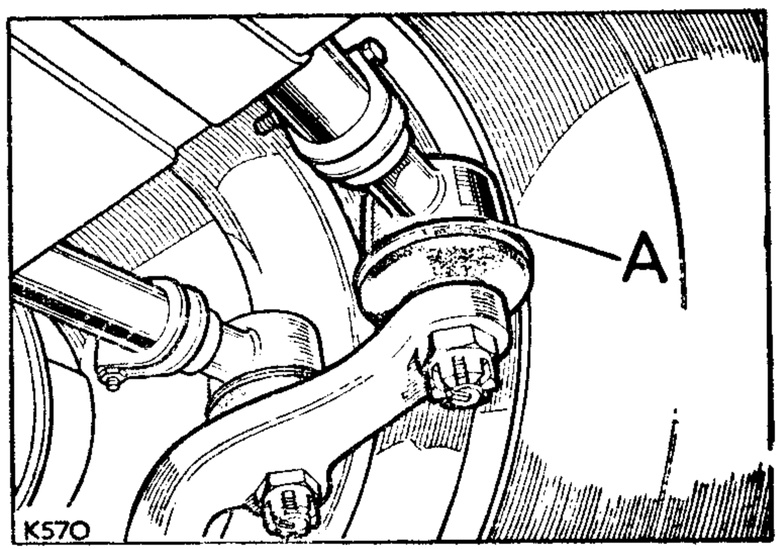


Fig. 48. Ball joints

Steering relay unit—Every 6.000 km (4,000 miles)
Bonneted control models only.

Check oil level and top-up if necessary until the oil is visible at the base of the filler and breather holes. If significant topping-up is required, check joints for leakage and fit new joint washers as necessary. To check oil level and top up, proceed as follows:

1. Remove the name plate (A) and withdraw radiator grille (B), Fig. 49.
2. Remove two of the bolts (C) securing the relay top cover (D), Fig. 50.
3. Using one of the holes as an oil filler (the other acting as a breather hole) fill the relay unit with the correct grade of lubricating oil to the bottom of the filler hole. See Data section for recommended lubricants.
4. Whilst filling, it is probable that oil will eject through the breather hole. If this occurs *do not* assume that the relay unit is full. Time must be given to allow the oil to find its way to the main chamber. Wait a few moments until the breather hole is clear of oil, then continue filling.
5. As the unit fills up, air is forced out usually in the form of an oil bubble, escaping through the breather hole, again giving the impression that the unit is full. Wait for the bubble to subside, then continue filling in this manner until the oil is clearly visible at the base of the filler and breather holes.
6. Replace the two top cover bolts.

Refit the radiator grille and name plate.

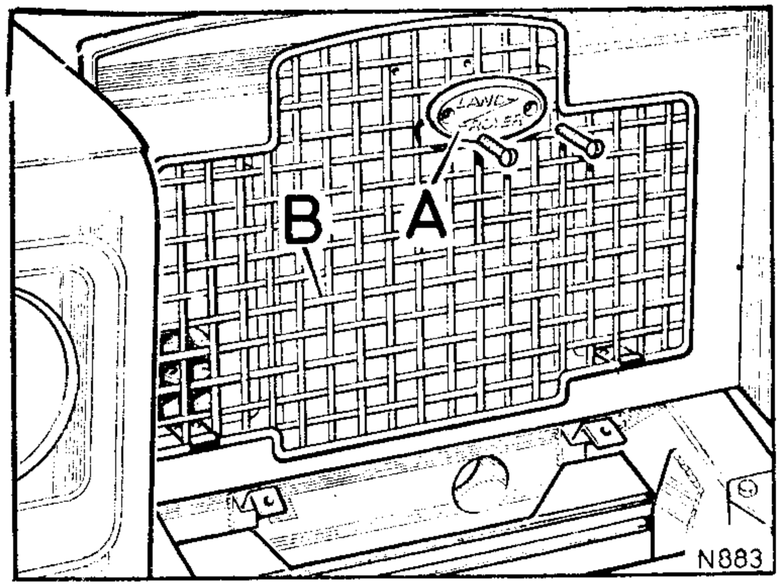


Fig. 49. Radiator grille

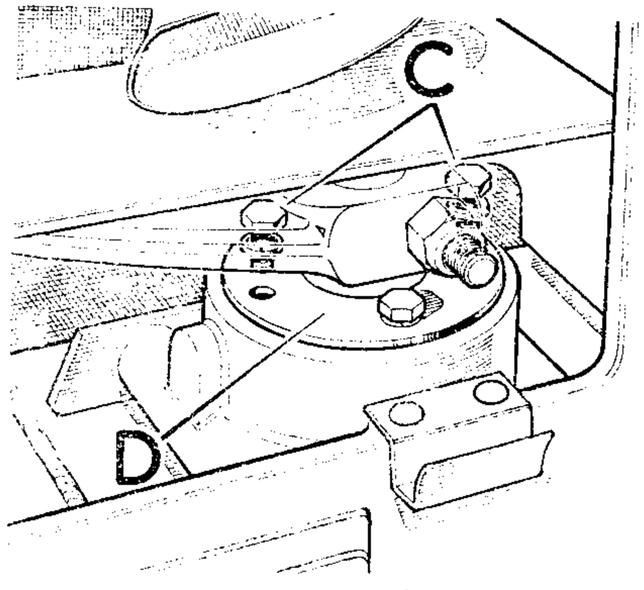


Fig. 50. Steering relay unit

Wheel alignment—Every 6.000 km (4,000 miles)—Fig. 51

Special equipment is required to check wheel alignment and this work should be carried out by a Rover Distributor or Dealer.

For those owners who have suitable equipment, the alignment should be 1,2 to 2,4 mm (0.046 to 0.093 in.) toe-in.

To adjust

1. Set the vehicle on level ground with the road wheels in the straight ahead position and push it forward a short distance.
2. Slacken the clamps (B) securing the ball joints (A) at each end of the track rod.
3. Turn the track rod (C) to decrease or increase its effective length as necessary until the toe-in is correct.
4. Push the vehicle rearwards turning the steering wheel from side to side to settle the ball joints, then with the road wheels in the straight ahead position, push the vehicle forward a short distance.
5. Recheck the toe-in, if necessary carry out further adjustment.
6. When the toe-in is correct, lightly tap the track rod ball joints towards the rear of the vehicle to the maximum of their travel. This ensures full unrestricted movement of the track rod. Then secure the ball joint clamps.

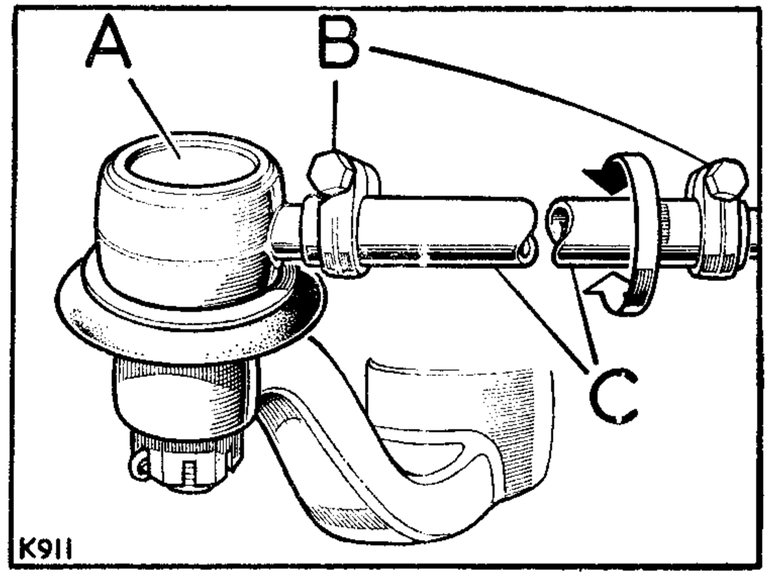


Fig. 51. Track rod adjustment

Brake system

The wheel brakes, operated by a pendant foot pedal, are of the hydraulic type with servo assistance on 6-cylinder 'Long' models. The handbrake operates a mechanical brake unit mounted on the output shaft from the transfer box.

When the vehicle is used in deep muddy conditions the brake drums must be periodically removed and cleaned, at the same time the brake shoes and anchor plate should be thoroughly cleaned.

When used continuously under exceptionally wet and muddy conditions this operation may be advisable once, or even twice a week, to prevent the abrasive action of packed mud rapidly wearing out brake linings and drums.

Brake fluid reservoir—Every month and at every maintenance inspection

4-cylinder models. The combined fluid reservoir for the brakes and clutch is mounted above the foot pedals in front of the dash. 6-cylinder models. The brake reservoir is mounted above the master cylinder.

4-cylinder models, Fig. 52

Check fluid level in brake reservoir by removing cap (A), top up if necessary so that fluid just shows in bottom of filter (B). Make sure that the brake reservoir (C) and on 4-cylinder the clutch reservoir (D) are topped up.

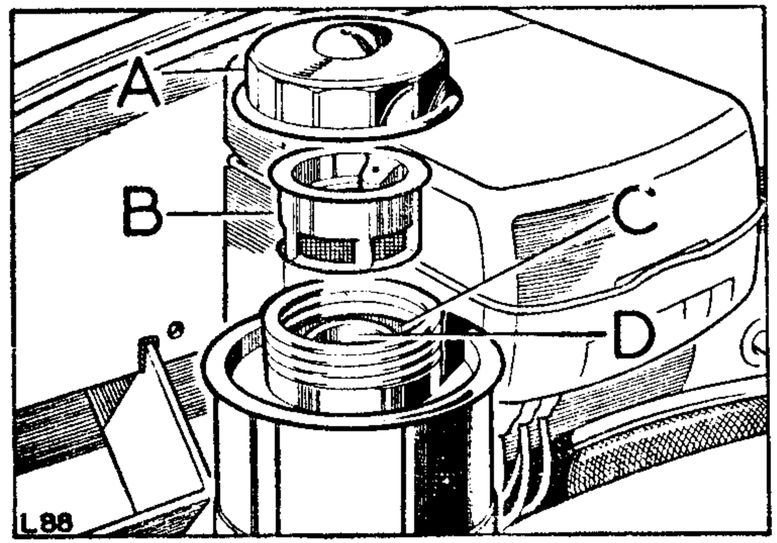


Fig. 52
Brake and clutch fluid reservoir, 4-cylinder models

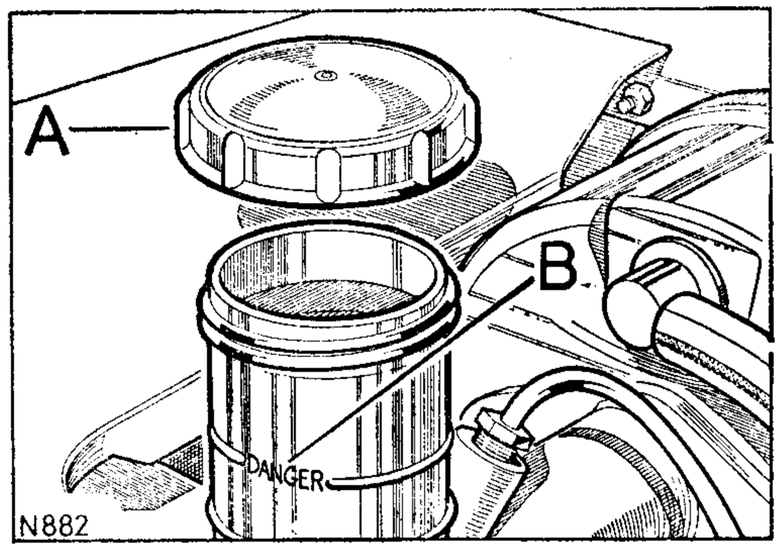


Fig. 53
Brake fluid reservoir, 6-cylinder models

6-cylinder models, Fig. 53

Check fluid level in brake reservoir by removing cap (A), top up if necessary. Do not let fluid level fall below 'DANGER' mark (B).

Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J. 1703).

If significant topping-up is required, check master cylinder, wheel cylinders and brake pipes for leakage; any leakage must be rectified immediately.

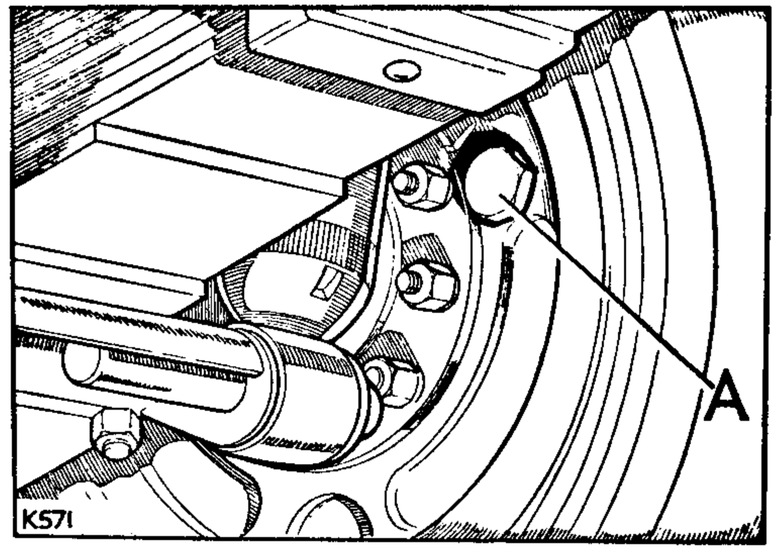


Fig. 54. Wheel brake adjustment

Wheel brake adjustment—Every (6.000 km) 4,000 miles

When lining wear has reached the point where the pedal travel becomes excessive, it is necessary to adjust the brake shoes in closer relation to the drum.

Proceed as follows:

'Regular' Models

1. Jack up each wheel in turn.
2. On the back face of the brake anchor plate will be found a hexagon adjustment bolt (A), which operates a snail cam bearing on the leading shoe. Only one of these is fitted to each wheel brake unit, thereby providing single-point adjustment.
3. Spin the wheel and rotate the adjuster bolt until the brake shoe contacts the drum, then ease the adjuster until the wheel again rotates freely.
4. Repeat for the other three wheels.

'Long' Models

5. Each shoe is independently set by means of a hexagon adjustment bolt (A) operating through a serrated snail cam.
6. Apply the brakes and set the snail cam adjusters so that the brake shoes are in firm contact with the drums.
7. Slacken off each adjuster just sufficiently for the drum to rotate freely.
8. Repeat for the other wheels in turn.

Note: The rear brake shoes should be adjusted individually to obtain the best results.

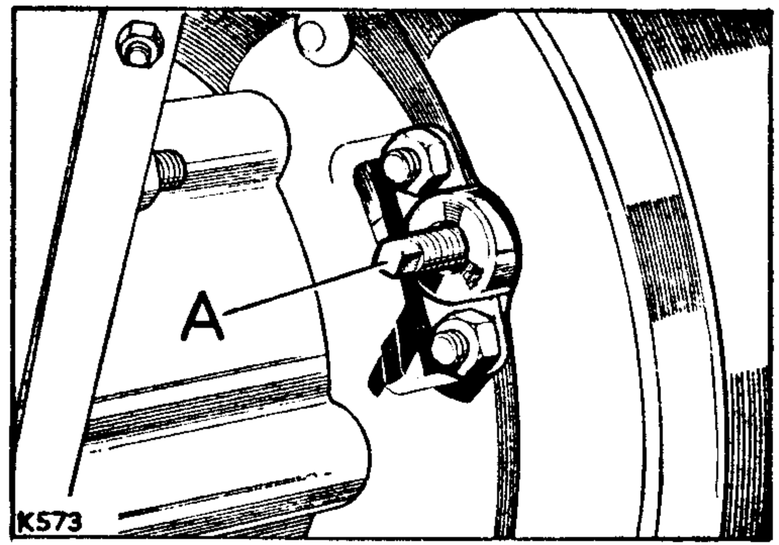


Fig. 55. Transmission brake adjustment

Transmission brake adjustment—Every 6.000 km (4,000 miles)

If hand brake movement is excessive, adjust as follows:

Release the hand brake. The adjuster (A) protrudes from the front of the brake backplate and is accessible after removing the centre seat box panel. Access may also be gained from beneath the vehicle. During rotation of the adjuster a click will be felt and heard at each quarter revolution. Rotate adjuster in a clockwise direction until the brake shoes contact the drum. Then unscrew the adjuster two clicks and give the hand brake a firm application to centralise the shoes.

Bleeding the brake system

If the brakes feel spongy, this may be caused by air in the hydraulic system. This air must be removed by bleeding the hydraulic system at each wheel cylinder. Bleeding must always be carried out at all wheels.

1. Slacken the adjusters off on all brake shoes.
2. Attach a length of rubber tubing to the bleed nipple (A) on the wheel cylinder farthest from the brake pedal and place the lower end of the tube in a glass jar containing brake fluid.
3. Slacken the bleed screw and depress the brake pedal smartly, and release slowly, until the fluid issuing from the tube shows no signs of air bubbles when the tube is held below the surface of the fluid in the jar.
4. Hold the tube under the fluid surface and, with the foot brake fully depressed, tighten the bleed screw.
5. Repeat for the other three wheels in turn, finishing at the one nearest the brake pedal.
6. Pump brake pedal until rear shoes are in firm contact with the brake drums.
7. While holding pedal depressed, adjust rear adjusters up to the shoes.
8. Release pedal and slacken rear adjusters until shoes are just clear of the drums.

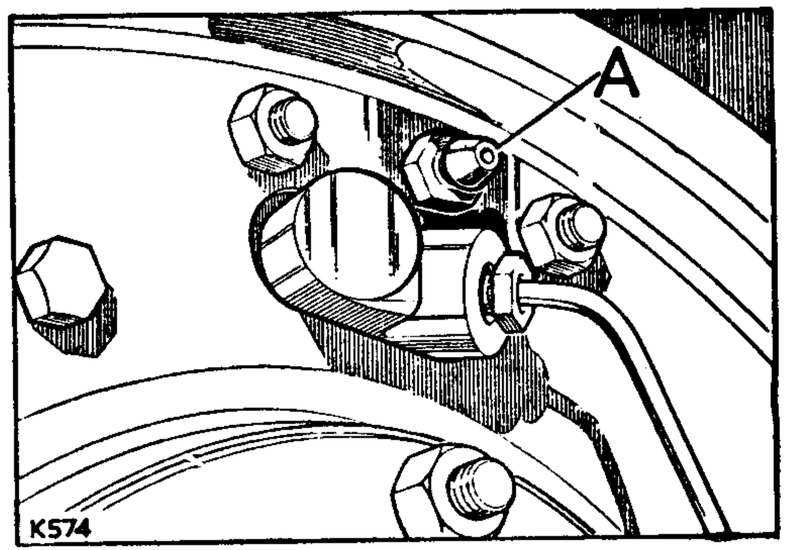


Fig. 56. Brake bleed nipple

9. Adjust front shoes in the normal manner.

The fluid in the reservoir should be replenished throughout the operation, to prevent another air lock being formed, using only new fluid. Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J. 1703).

Note particularly that the fluid reservoir for the brakes on 4-cylinder models is the outer portion of the combined reservoir.

It will be obvious that the above operation requires two people.

Fluid changing, brake system—Every eighteen months.

All the fluid in the brake system should be changed every eighteen months. It should also be changed before touring in mountainous areas if not done in the previous nine months.

Use only Castrol Girling Brake and Clutch Fluid 'Crimson' Specification J.1703 from sealed tins.

The above work should be carried out by your local Rover Distributor or Dealer.

Rubber seals in brake system—Every 64.000 km (40,000 miles)

Renew all rubber seals in master cylinder, wheel cylinders and servo unit where applicable. This should be done every three years if mileage travelled is less than 64.000 km (40,000 miles). Refill with correct fluid, that is, Castrol Girling Brake and Clutch Fluid 'Crimson' Specification J.1703 from sealed tins.

The above work must be carried out by your local Rover Distributor or Dealer.

Changing wheel positions—Every 6.000 km (4,000 miles)

The road wheels should be changed round as illustrated to equalise tyre wear.

When cross-country tyres are used, the 'V' tread should be directed to the front at the top.

At the same time inspect the tyre tread. Minimum tread depth must be at least 1 mm throughout at least three-quarters of the breadth of the tread and round the entire outer circumference of the tyre.

Check also for cuts, lumps and bulges and exposed ply or cord structure.

Warning: Do not touch the outer ring of nuts on divided type wheels, unless the wheel is removed and the tyre fully deflated, or severe personal injury may result.

IMPORTANT. As the Land-Rover is fitted with a transmission brake, it is necessary before removing a road wheel to apply the hand brake and engage four-wheel drive.

This will ensure that the hand brake is operative on all four wheels.

Remember to engage two-wheel drive when the road wheel has been replaced.

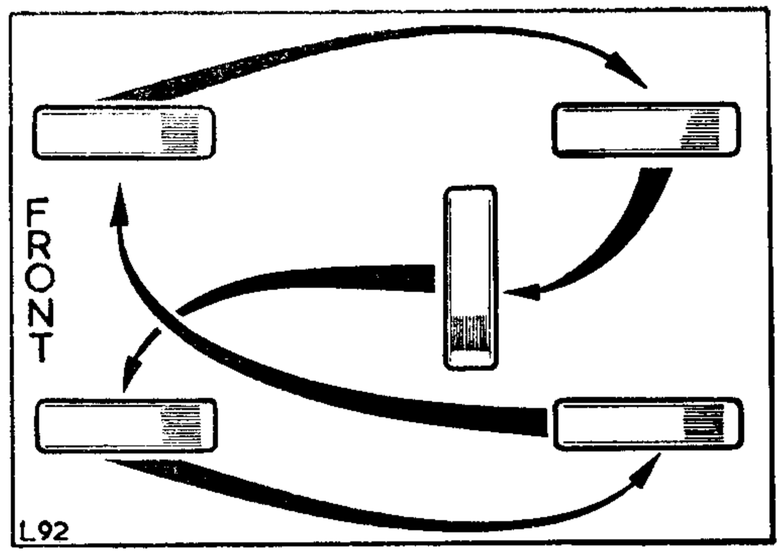


Fig. 57 Changing wheel positions

Tyre pressures—Every month and at every maintenance attention

Maximum tyre life and performance will only be obtained if the tyres are maintained at the correct pressures.

Model		Normal				Emergency soft			
		Load under 250 kg (550 lb.)		Load over 250 kg (550 lb.)		Load under 250 kg (550 lb.)		Load over 250 kg (550 lb.)	
88 Bonneted Control models		Front	Rear	Front	Rear	Front	Rear	Front	Rear
6.00, 6.50 and 7.00 x 16.00	kg/cm²	1,8	1,8	1,8	2,1	1,1	1,1	1,1	1,4
	lb/sq in.	25	25	25	30	15	15	15	20
	bars	1.72	1.72	1.72	2.07	1.03	1.03	1.03	1.38
7.50 x 16.00	kg/cm²	1,8	1,8	1,8	2,1	0,8	0,8	0,8	1,4
	lb/sq in.	25	25	25	30	12	12	12	20
	bars	1.72	1.72	1.72	2.07	0.83	0.83	0.83	1.38
109 Bonneted Control and 1 Ton models									
7.50 x 16.00	kg/cm²	1,8	1,8	1,8	2,5	1,1	1,1	1,1	1,8
	lb/sq in.	25	25	25	36	15	15	15	26
	bars	1.72	1.72	1.72	2.48	1.03	1.03	1.03	1.79
Michelin 7.50 x 16.00 XY	kg/cm²	1,8	1,8	1,8	3,0	1,1	1,1	1,1	2,5
	lb/sq in.	25	25	25	42	15	15	15	35
	bars	1.72	1.72	1.72	2.89	1.03	1.03	1.03	2.41
9.00 x 16.00	kg/cm²	1,4	1,4	1,4	2,1	0,7	0,7	0,7	1,4
	lb/sq in.	20	20	20	30	10	10	10	20
	bars	1.38	1.38	1.38	2.07	0.7	0.7	0.7	1,38

1. Whenever possible, check with the tyres cold, as the pressure is about 0,1 kg (2 lb) 0.14 bars higher at running temperature.
2. Always replace the valve caps, as they form a positive seal on the valves.
3. Any unusual pressure loss in excess of 0,05 to 0,20 kg (1 to 3 lb) 0.07 to 0.21 bars per month should be investigated and corrected.
4. Always check the spare wheel, so that it is ready for use at any time.
5. At the same time, remove embedded flints, etc., from the tyre treads with the aid of a penknife or similar tool. Clean off any oil or grease on the tyres, using petrol sparingly.
6. 'Butyl' synthetic inner tubes are fitted and all repairs must be vulcanised.
7. It is advisable to run-in new tyres by driving at reasonable speeds for the first 402 kilometres (250 miles) or so, before driving at high speeds.

Body, propeller shaft and road springs—Every 18.000 km (12,000 miles)

Check tightness of body securing bolts, propeller shaft bolts, road spring leaf clips (B) and 'U' bolt nuts (A).

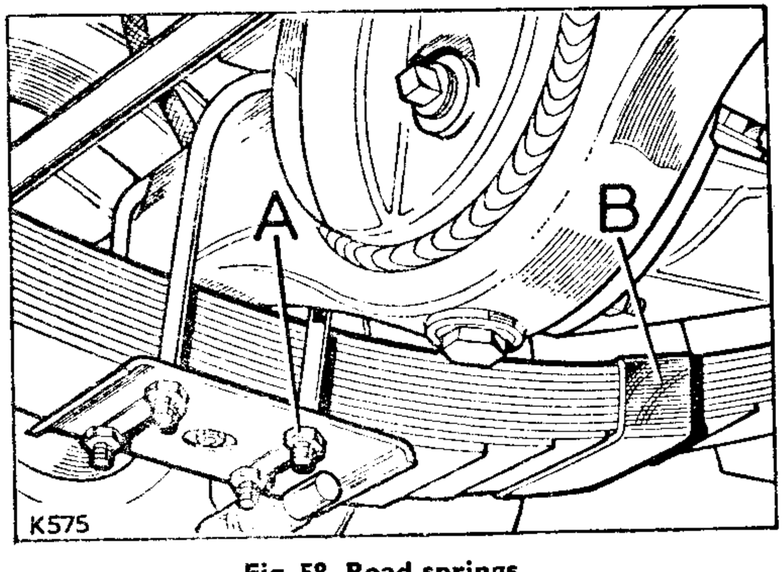


Fig. 58. Road springs

Propeller shaft lubrication—Every 6.000 km (4,000 miles)

Apply one of the recommended greases at the lubrication nipple (B) on the sliding portion of the rear propeller shaft and to the lubrication nipples (A) fitted to the universal joints of both front and rear shafts.

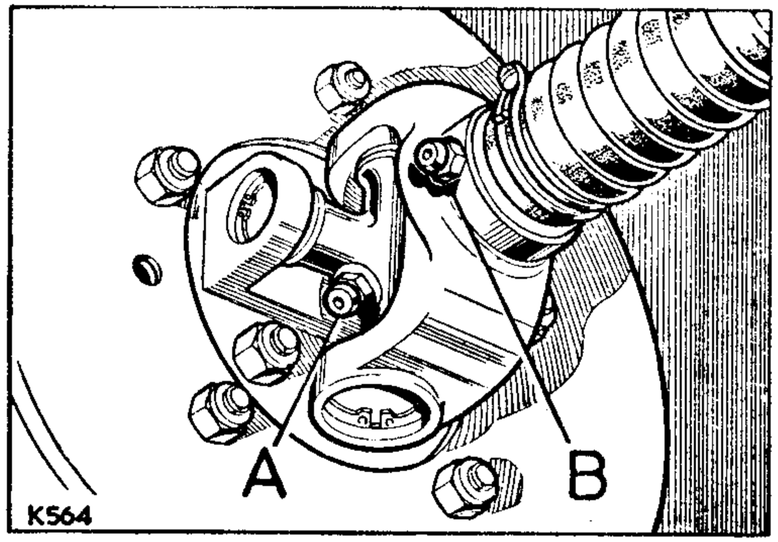


Fig. 59. Propeller shaft lubrication

Front propeller shaft sliding portion—Every 36.000 km (24,000 miles)

Lubricate the sliding spline on the front propeller shaft, with one of the recommended greases, as follows:

1. Disconnect one end of the propeller shaft.
2. Remove plug in sliding spline and fit a suitable grease nipple.
3. *Important.* Compress propeller shaft at sliding joint to avoid overfilling, then apply grease.
4. Replace grease nipple with plug and reconnect propeller shaft.

Headlamp beam setting—Every 12.000 km (8,000 miles)

This operation is best done with special equipment and should be carried out by your local Rover Distributor or Dealer.

Oilcan lubrication—Every 12.000 km (8,000 miles)

Apply a few spots of oil to throttle linkage joints, hand brake linkage, door locks and hinges, bonnet prop rod, etc.

PDF by roby65to

PART TWO

GENERAL INFORMATION

This section of the book gives details of headlamp light unit and bulb changing and circuit diagrams.

Headlamps

To replace light unit or bulb:

1. Remove headlamp bezel (E) retained by four screws (F).
2. Slacken the three recessed-head screws (A) turn and remove rim (D) lift out light unit (C) and remove from connector (B).
3. Bulb or light unit (C) as applicable can now be replaced.
4. Refit rim and headlamp bezel.

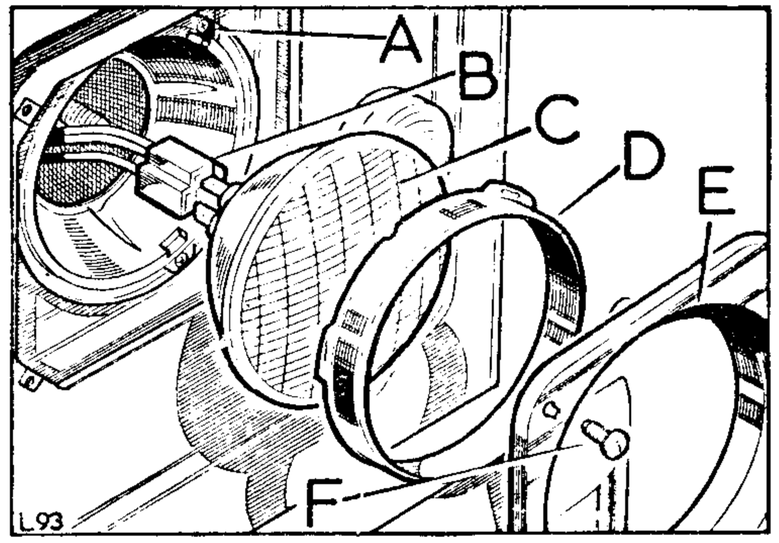


Fig. 60. Headlamp light unit replacement

Side, tail, stop and flasher lamps

To replace a bulb:

1. Remove rim retaining screws (C), lever the rubber bead away from the lamp and remove the lens (B) from the bottom first.
2. Renew the bulb (A) move the rubber bead aside, locate the lens at the top of the lamp and press it into position.
3. Finally position the bead so that it fits snugly round the lens
4. Replace rim retaining screws.

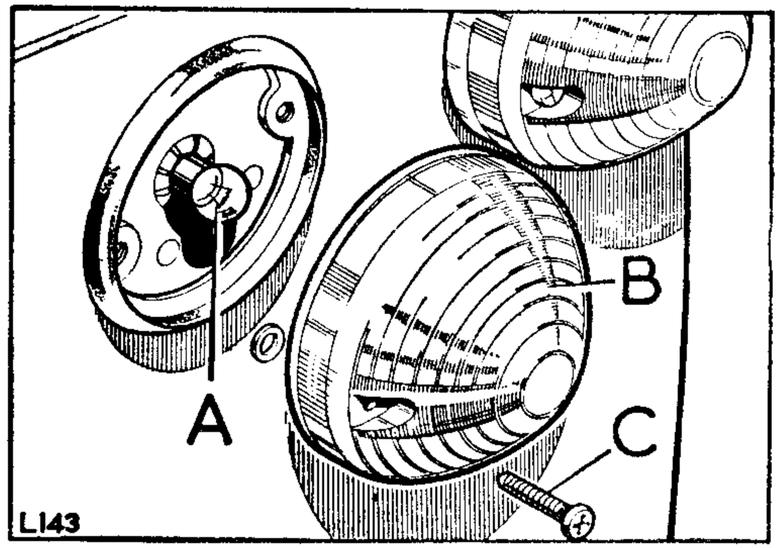


Fig. 61
Side, tail and stop lamp bulb replacement

Rear number plate illumination lamp (where applicable)

To replace the bulb:

1. Slacken the securing screw (C) and remove cover (B); the bulb (A) is then accessible in the lamp body.

On most models the rear number plate illumination lamp is incorporated in the stop tail lamp.

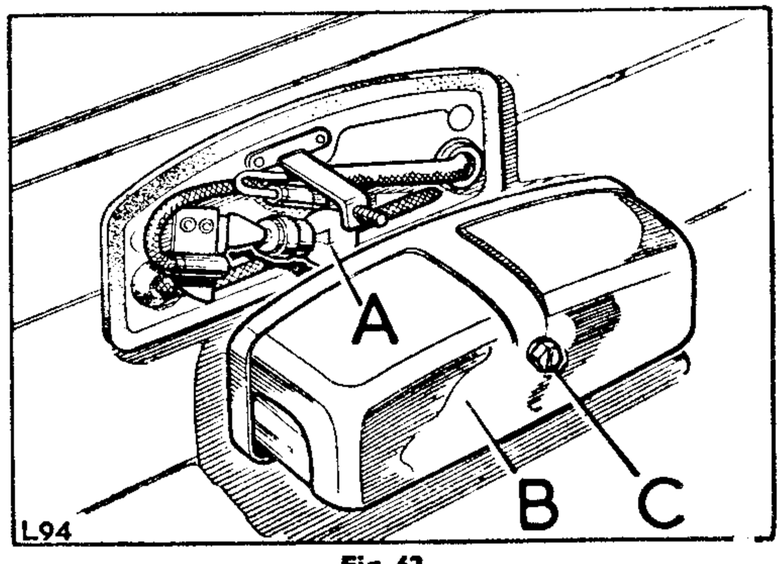


Fig. 62
Rear number plate illumination lamp

Interior light (where applicable)

To replace the bulb:

1. Remove screw (A) retaining cover (C) and rim (D).
2. Replace bulb (B) and refit cover and rim.

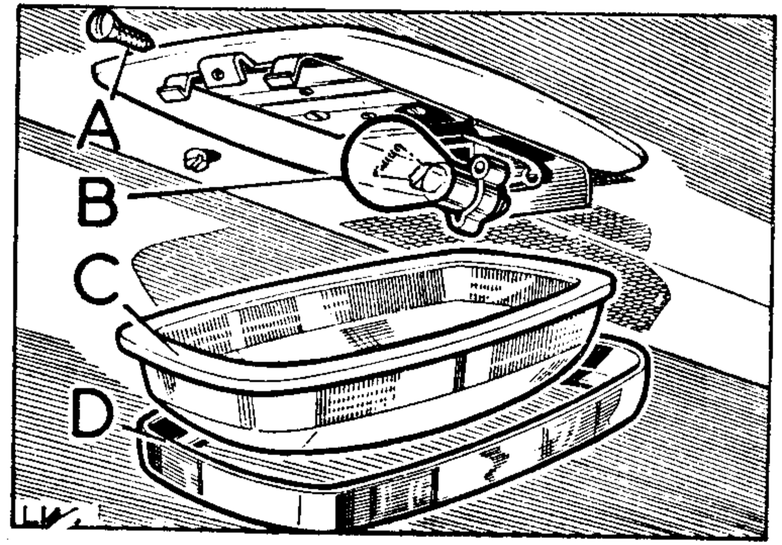


Fig. 63. Interior light

Warning lights

To replace warning lights:

1. Remove five screws (B) retaining instrument panel.
2. Bulbs (A) can then be replaced as necessary.

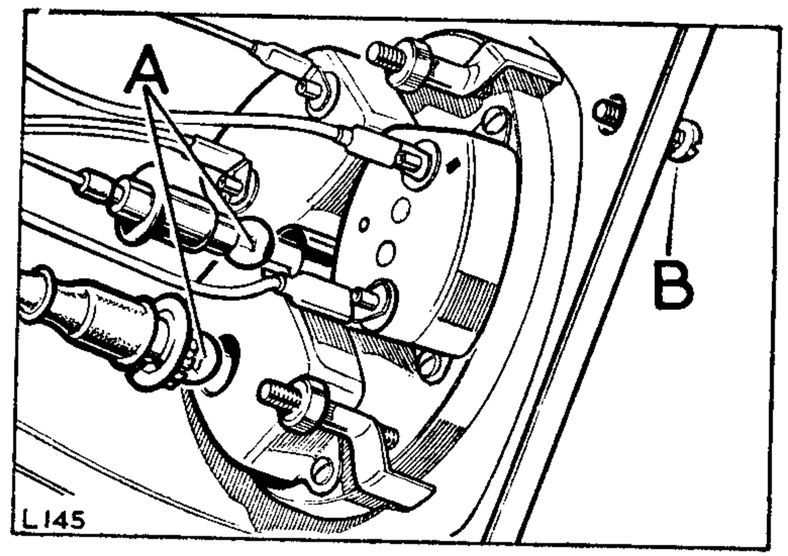


Fig. 64. Warning lights

Fuses

The fuses are located on the bulkhead under the bonnet. To replace a fuse:

1. The cover (C) should be pulled off.

2. Replace fuse (A) as required:

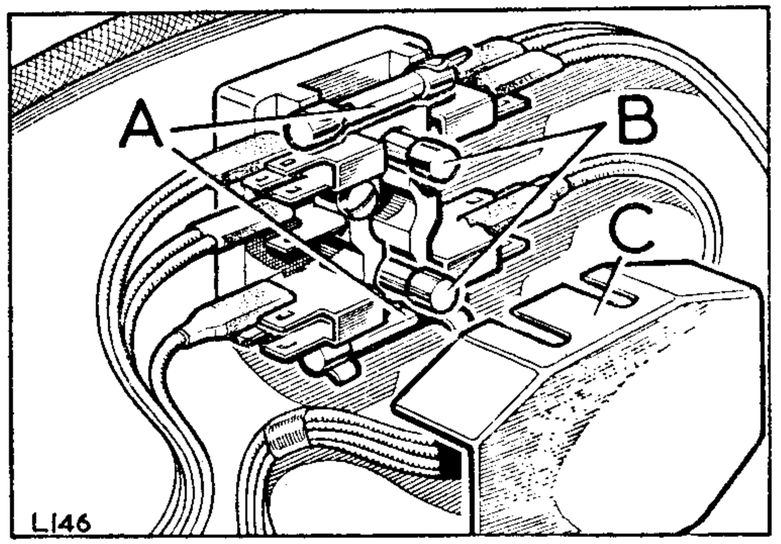


Fig. 65. Fuse box

Fuse number	Fuse protects	Fuse Amps
A3–A4	Windscreen wiper, fuel tank level unit and stop lights	35
A1–A2	Interior lamps, fog lamps, etc., as applicable	35

Two spare fuses (B) are carried in the fuse box; only 35 amp cartridge type fuses should be used as replacements.

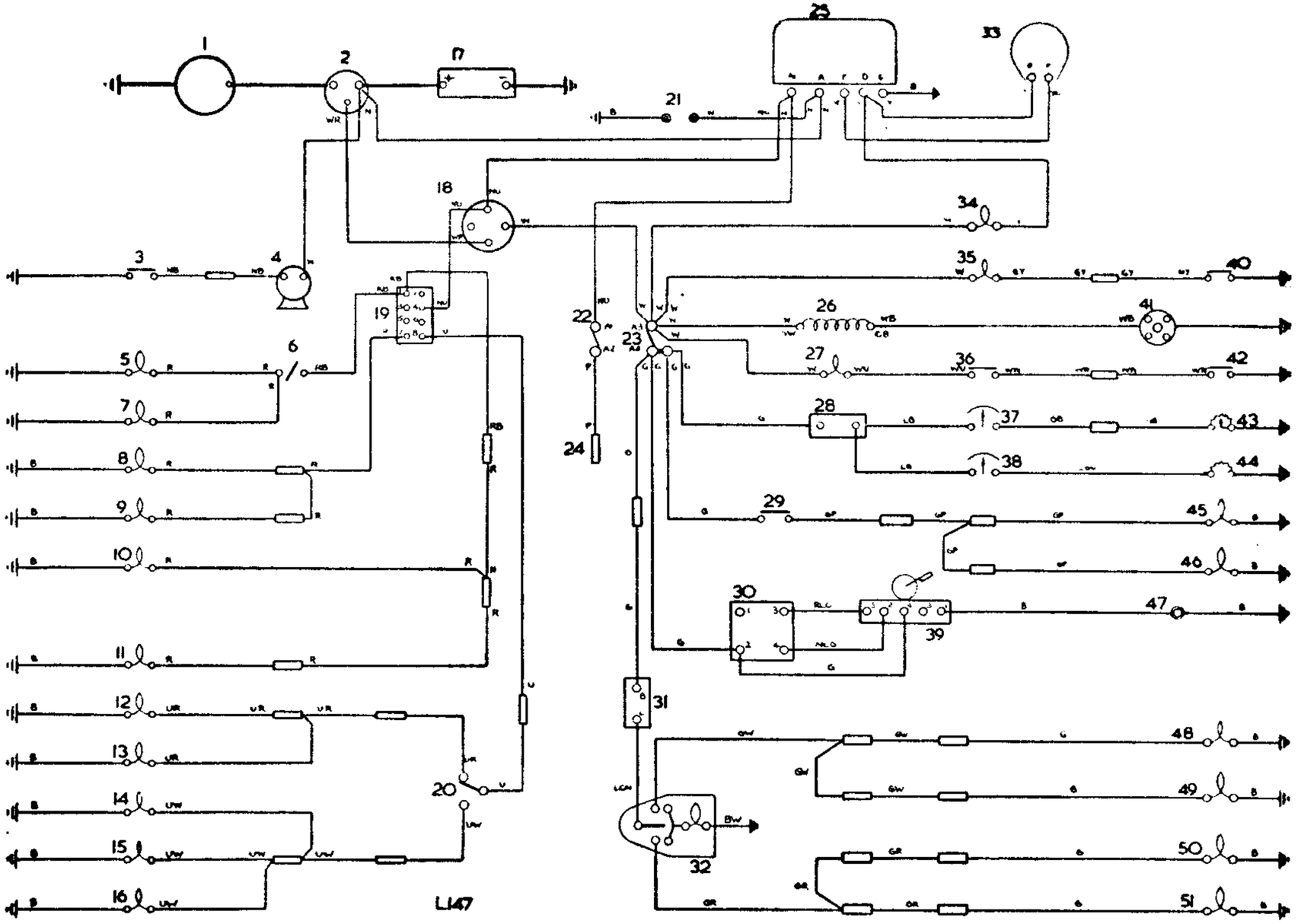


Fig. 66. Circuit diagram, 4-cylinder 'Regular', 'Long' and Station Wagon Petrol models, negative earth

Key to circuit diagram, 4-cylinder 'Regular', 'Long' and Station Wagon Petrol models, negative earth

1 Starter motor
2 Solenoid, starter motor
3 Horn push button
4 Horn
5 Panel light, speedometer
6 Switch, panel light
7 Panel light, instruments
8 Side lamp, RH
9 Side lamp, LH
10 Tail lamp, RH
11 Tail lamp, LH
12 Headlamp, RH, dipped beam
13 Headlamp, LH, dipped beam
14 Headlamp, LH, main beam
15 Headlamp, RH, main beam
16 Warning light, headlamp main beam
17 Battery, 12 volt
18 Switch, ignition and starter
19 Switch, lights
20 Switch, headlamp dip
21 Inspection sockets
22 Fuse, A1–A2 (35 amp)
23 Fuse, A3–A4 (35 amp)
24 Feed, interior light
25 Regulator box
26 Ignition coil
27 Warning light, choke
28 Voltage stabiliser, fuel gauge and temperature gauge
29 Switch, stop lamp
30 Switch, wiper
31 Indicator unit, flashers
32 Switch and warning light for flashers
33 Dynamo
34 Warning light, ignition
35 Warning light, oil pressure
36 Switch, cold start on control
37 Fuel gauge
38 Temperature gauge
39 Wiper motor
40 Switch, oil pressure
41 Distributor
42 Switch, cold start in cylinder head
43 Fuel tank unit
44 Temperature transmitter unit
45 Stop lamp, RH
46 Stop lamp, LH
47 Socket, wiper lead
48 Front flasher, RH
49 Rear flasher, RH
50 Rear flasher, LH
51 Front flasher, LH

Snap and Lucar connections —□—

Earth connections —|||||||▸

Cable colour code

B—Black P—Purple W—White R—Red N—Brown Y—Yellow U—Blue G—Green L—Light

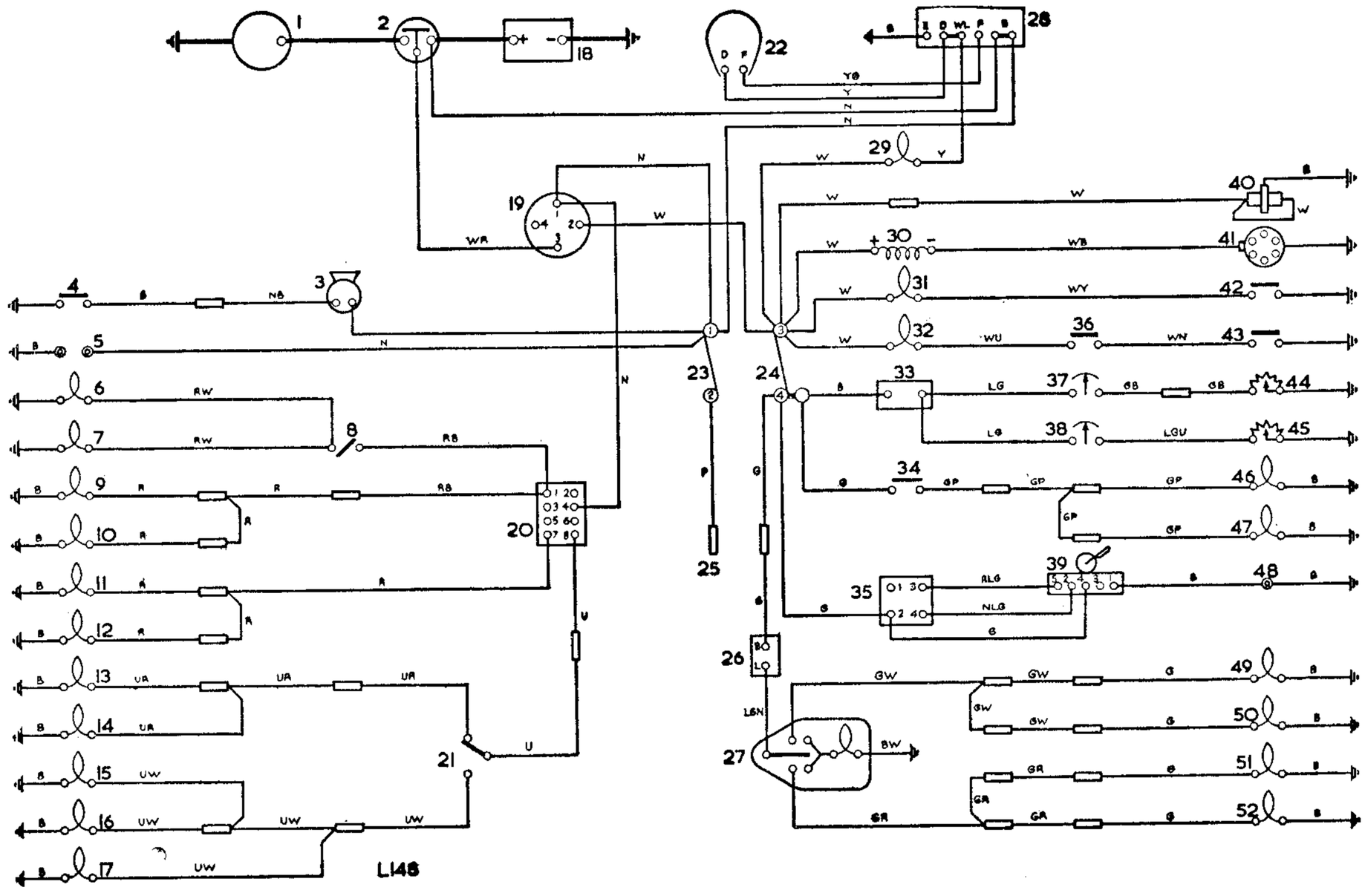


Fig. 67. Circuit diagram, 6-cylinder 'Long' and Station Wagon Petrol models, negative earth

Key to circuit diagram, 6-cylinder 'Long' and Station Wagon Petrol models, negative earth

1 Starter motor
2 Solenoid, starter motor
3 Horn
4 Horn push-button
5 Inspection lamp sockets
6 Panel illumination
7 Panel illumination
8 Switch, panel lights
9 Tail lamp, RH
10 Tail lamp, LH
11 Side lamp, RH
12 Side lamp, LH
13 Headlamp, RH dipped beam
14 Headlamp, LH dipped beam
15 Headlamp, LH main beam
16 Headlamp, RH main beam
17 Warning light, main beam
18 Battery
19 Switch, ignition and starter
20 Switch, lights
21 Switch, headlamp dip
22 Dynamo
23 Fuse, A1–A2
24 Fuse, A3–A4
25 Feed, interior light, where fitted
26 Indicator unit, flashers
27 Switch and warning light for flashers
28 Regulator box
29 Warning light, ignition
30 Ignition coil
31 Warning light, oil pressure
32 Warning light, cold-start
33 Voltage stabiliser, 10 volt fuel gauge and temperature gauge
34 Switch, stop lamp
35 Switch, wiper
36 Switch, cold-start, on control
37 Fuel gauge
38 Water temperature indicator
39 Wiper motor
40 Dual fuel pump
41 Distributor
42 Switch, oil pressure
43 Switch, cold-start, in cylinder head
44 Fuel tank unit
45 Water temperature transmitter
46 Stop lamp, LH
47 Stop lamp, RH
48 Socket, wiper lead
49 Front flasher, RH
50 Rear flasher, RH
51 Rear flasher, LH
52 Front flasher, LH

Snap and Lucar connections —□—

Earth connections via terminals or fixing bolts ———|||||||||

Earth connections via cables —B—|||||||||

Cable colour code

B—Black **P—Purple** **W—White** R—Red N—Brown Y—Yellow U—Blue G—Green O—Orange S—Slate L—Light

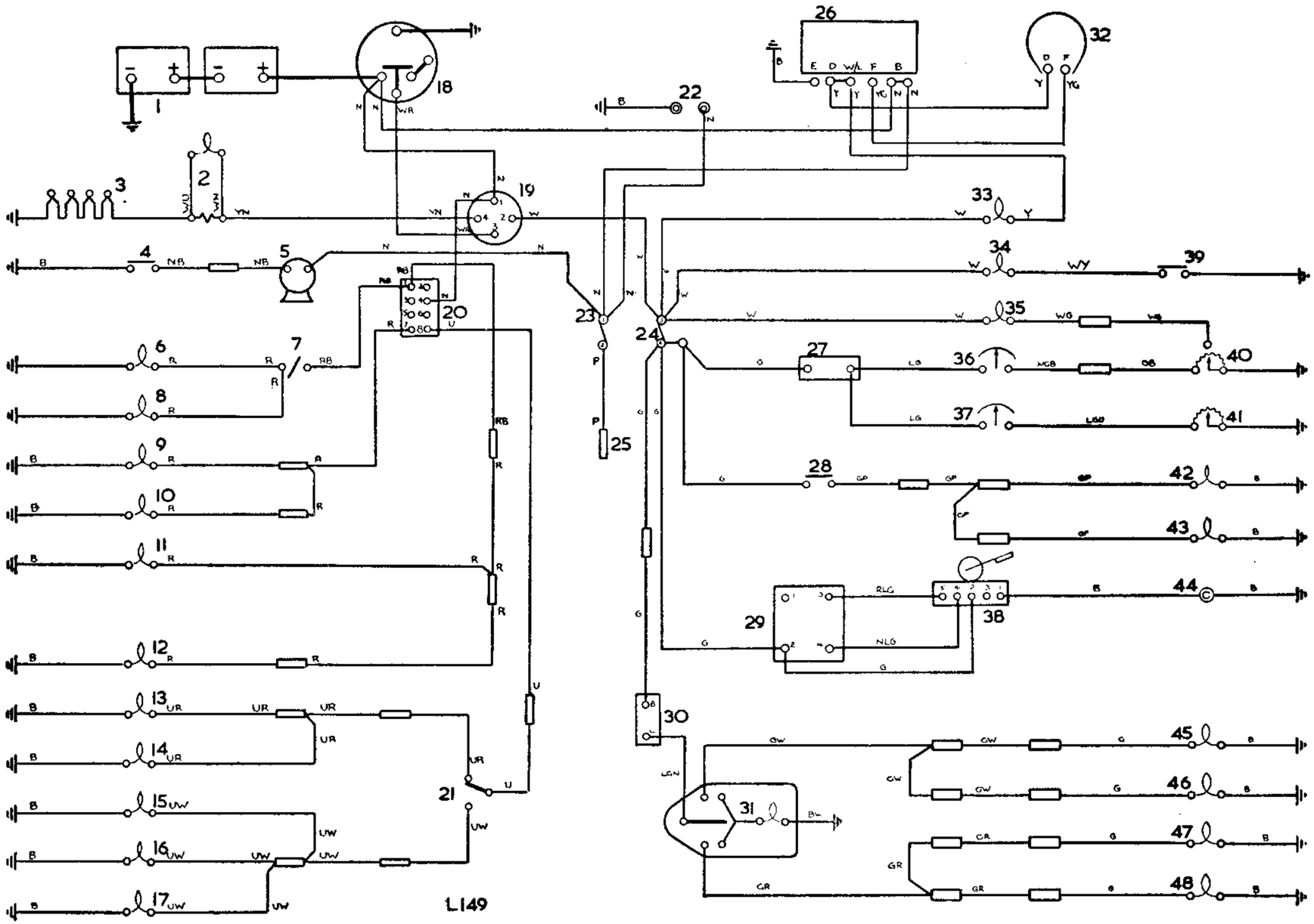


Fig. 68. Circuit diagram, 4-cylinder 'Regular', 'Long' and Station Wagon Diesel models, negative earth

Key to circuit diagram, 4-cylinder 'Regular', 'Long' and Station Wagon Diesel models, negative earth

1 Batteries, two 6 volt
2 Warning light and resistor, heater plugs
3 Heater plugs
4 Horn push button
5 Horn
6 Panel light, speedometer
7 Switch, panel light
8 Panel light, instrument
9 Side lamp, RH
10 Side lamp, LH
11 Tail lamp, RH
12 Tail lamp, LH
13 Headlamp, RH, dipped beam
14 Headlamp, LH, dipped beam
15 Headlamp, LH, main beam
16 Headlamp, RH, main beam
17 Warning light, headlamp main beam
18 Starter motor
19 Switch, starter-heater plugs
20 Switch, lights
21 Switch, headlamp dip
22 Inspection sockets
23 Fuse, A1–A2 (35 amp)
24 Fuse, A3–A4 (35 amp)
25 Feed, interior light
26 Regulator box
27 Voltage stabiliser fuel gauge and water temperature gauge
28 Switch, stop lamp
29 Switch, wiper motor
30 Indicator unit, flasher
31 Switch and warning light for flashers
32 Dynamo
33 Warning light, dynamo
34 Warning light, oil pressure
35 Warning light, fuel level
36 Fuel gauge
37 Temperature gauge
38 Wiper motor
39 Switch, oil pressure
40 Fuel tank unit
41 Temperature transmitter unit
42 Stop lamp, RH
43 Stop lamp, LH
44 Socket, wiper lead
45 Front flasher, RH
46 Rear flasher, RH
47 Rear flasher, LH
48 Front flasher, LH

Snap and Lucar connections —□—

Earth connections —|||||—

Cable colour code

B—Black P—Purple W—White R—Red N—Brown Y—Yellow U—Blue G—Green L—Light

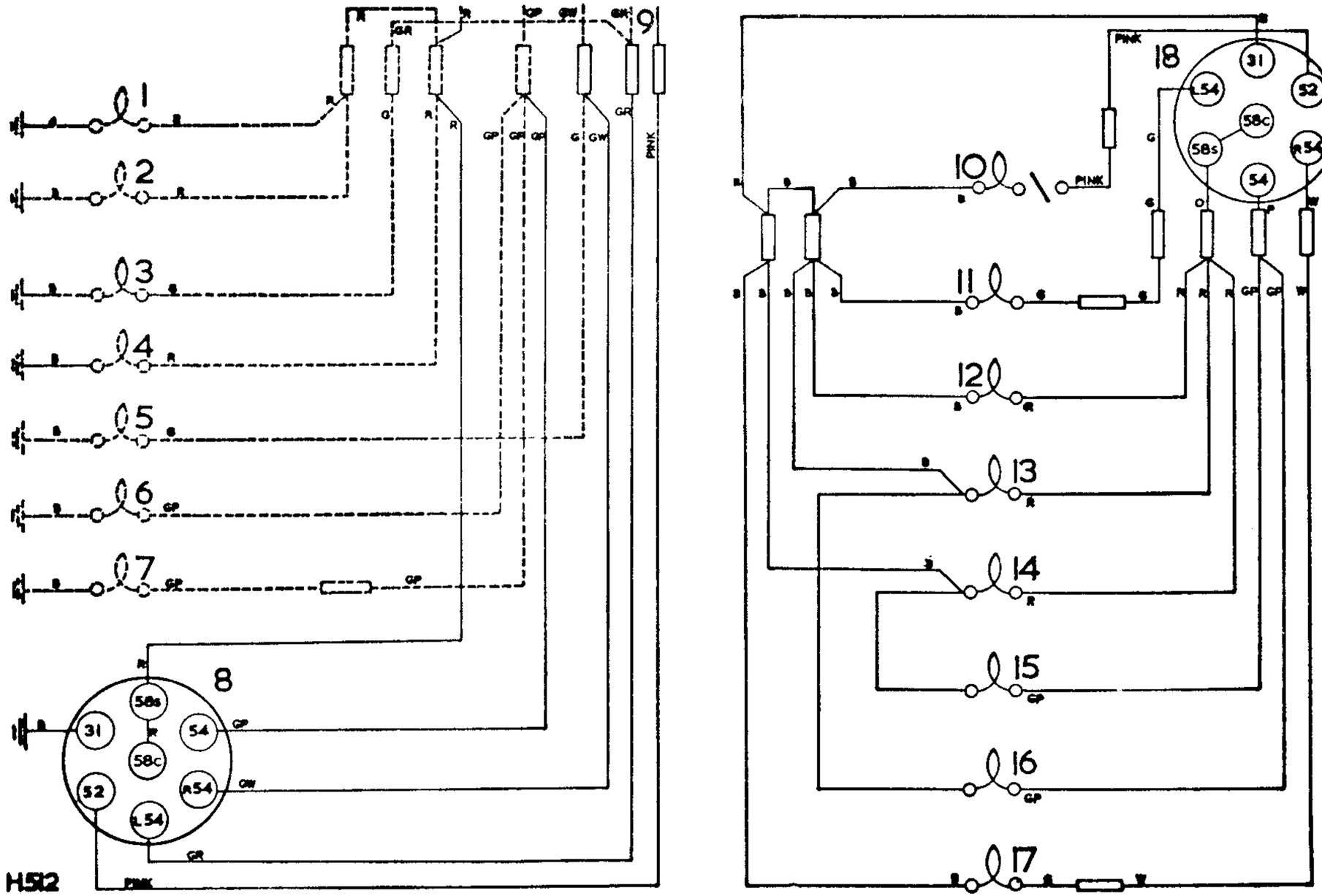


Fig. 69. Circuit diagram, flashers on trailer, negative earth

Key to circuit diagram, flashers on trailer, negative earth

Flasher socket on vehicle

1 Tail lamp, LH
2 Number plate illumination, Forward Control only
3 Flasher lamp, LH
4 Tail lamp, RH
5 Flasher lamp, RH
6 Stop lamp, RH
7 Stop lamp, LH
8 Socket on vehicle
9 To fuse box A2
10 Interior lamp and switch

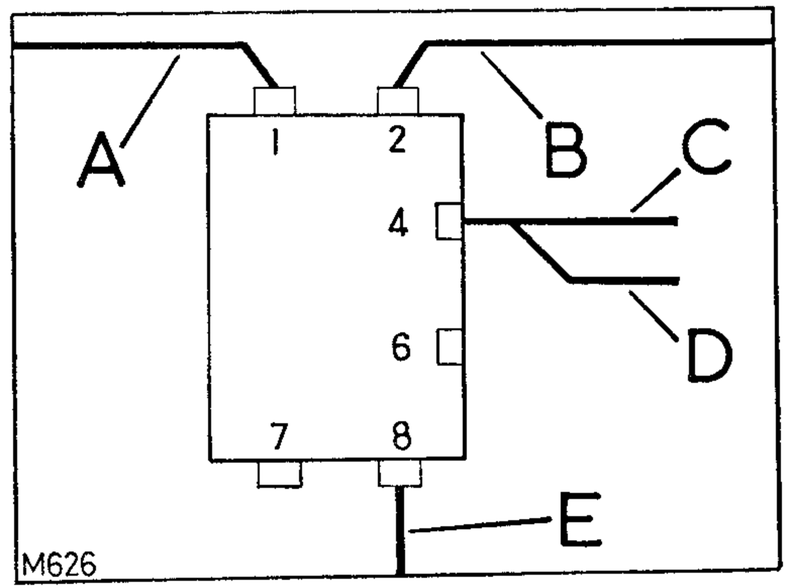
Flasher plug on trailer

11 Flasher lamp, LH
12 Number plate illumination
13 Tail lamp, LH
14 Tail lamp, RH
15 Stop lamp, RH
16 Stop lamp, LH
17 Flasher lamp, RH
18 Plug for trailer

Dotted lines indicate wiring on vehicle

Snap and Lucar connections —□—

Earth connections —|||||||—



Electrical connections at wiper/washer switch. Replaces items 30, 35 and 29 on Figs. 66, 67 and 68 respectively

A—Lead—Red and light green
B—Lead—Brown and light green
C—Lead—Green
D—Lead—Green
E—Lead from washer reservoir—Light green and black

Cable colour code

B—Black
N—Brown
P—Purple
U—Blue
W—White
G—Green
R—Red
L—Light

Optional equipment

Some of the optional equipment which may be fitted to the Land-Rover requires maintenance attention at regular intervals, or may need some explanation concerning its use.

These details are given on the pages which follow, under the appropriate headings.

Full details of all the optional equipment available for the Land-Rover are contained in a separate book, from which the following is an extract, and is obtainable free of charge from The Rover Co. Ltd., Technical Service Department, Solihull, Warwickshire England.

Dust-proofed engine breather, Petrol models

Suitable for 4-cylinder petrol engines only. This breather replaces the normal oil filler cap. It must not be fitted to vehicules operating under cold and misty conditions.

The oil in the engine breather must be renewed weekly. If, however, the vehicle is operating under extremely dusty conditions, this change of oil should be carried out daily.

When removing the oil bath breather on the oil filler, care must be taken to hold it upright to avoid spilling the oil.

On vehicles fitted with a raised air intake and a dust-proofed engine breather, the normal air cleaner should be cleaned more frequently.

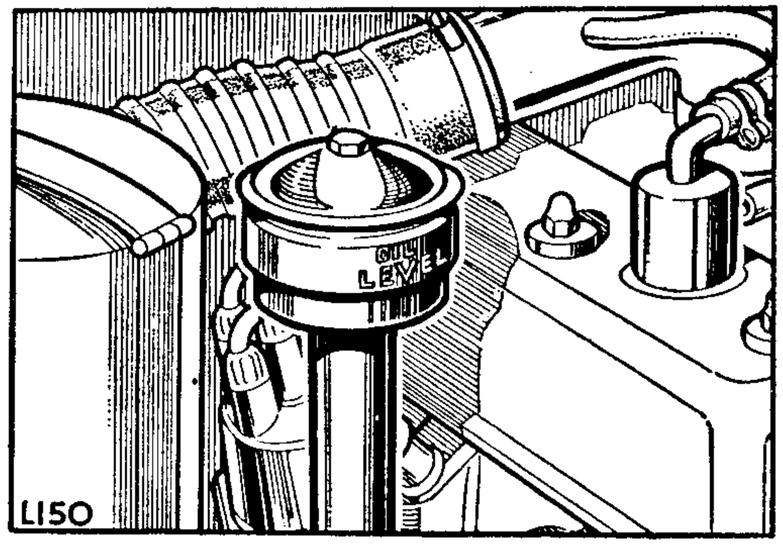


Fig. 70
Dust-proofed engine breather 'Regular" and 'Long' models illustrated

Raised air intake, Petrol models only

Suitable for 4-cylinder petrol models only, it comprises an air intake for the air cleaner attached to the front RH side of the windscreen. The engine breather on the top rocker cover is connected to an elbow between carburetter and air cleaner.

This optional equipment must only be used in conjunction with the dust-proofed engine breather described previously.

It must receive occasional attention by removing the centrifugal air intake and blowing out any foreign matter which may be adhering to it.

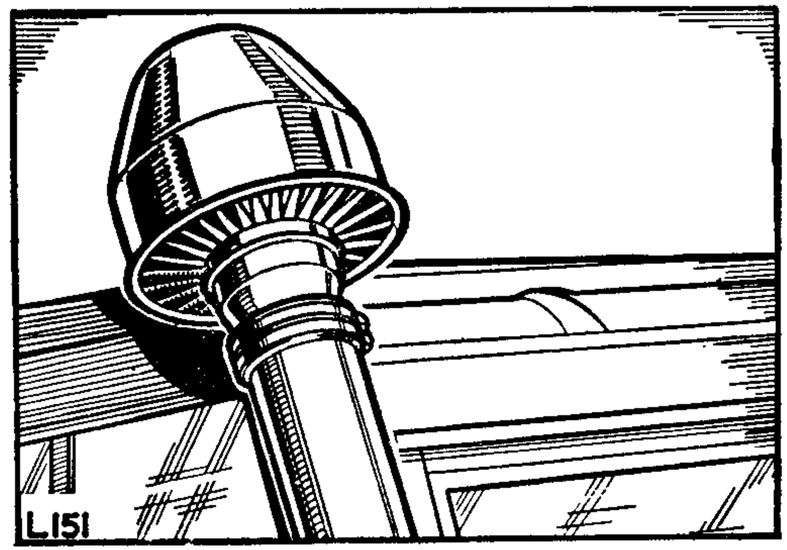


Fig. 71
Raised air intake,'Regular' and Long' models, illustrated

Power take-off units

Operating instructions for the power take-off units together with pulley, engine and road speeds are contained in a separate book; copies obtainable on request to:

The Rover Company Ltd., Technical Service Dept., Solihull, Warwickshire, England.

Centre power take-off

The driving pulley, usually of the multi-belt pattern, bolts directly on to the flanged output shaft. Operation and maintenance instructions for the driven equipment will be provided with the equipment and is available from the manufacturer. When the drive is by vee belt, not more than 20–25 BHP (15–18.6 kW) can be transmitted through the centre power take-off, or damage to the rear engine mountings will result.

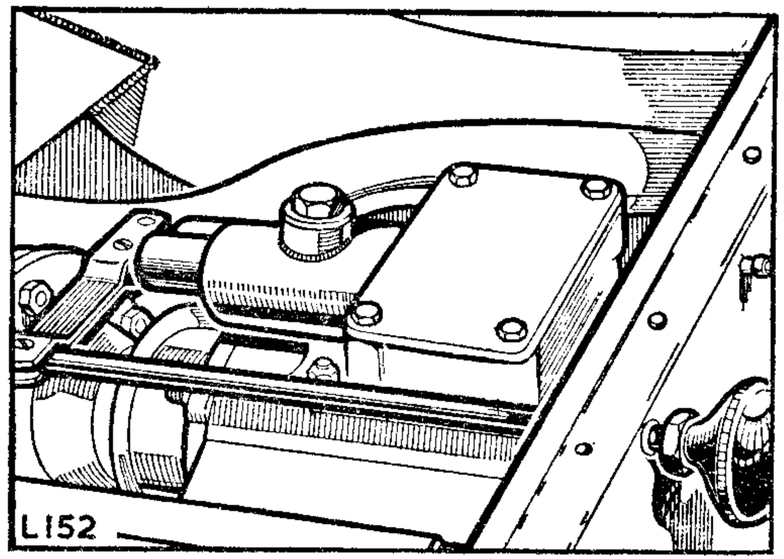


Fig. 72
Centre power take-off,'Regular'and 'Long'models illustrated

Centre power take-off maintenance

The belt drive to the driven equipment must be adjusted periodically, to ensure that the tension is correct. It should be possible to depress the belts by thumb pressure 12 to 25 mm (0.5 to 1 in.) at a point midway between the pulleys.

In the case of multi-belt drives, all must be renewed if one belt breaks or is damaged. Whenever the belts are removed they should be marked to ensure replacement in the original grooves.

Rear power take-off, 'Regular' and 'Long' models

The rear power take-off unit, mounted on the rear chassis cross-member, is driven by a propeller shaft from the flanged output shaft at the rear of the gearbox; the standard SAE six-splined output shaft is on the centre-line of the vehicle and provides power for towed equipment.

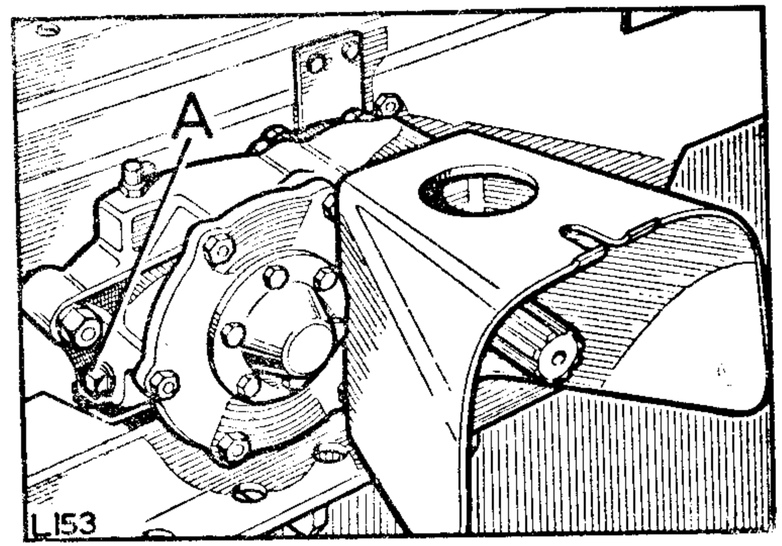


Fig. 73
Rear power take-off, 'Regular' and 'Long' models

Rear power take-off maintenance

1. Oil level. The oil level must be checked at every 40 operation hours and replenished as necessary to the bottom of the filler-level plug hole (A) on the side of the casing.
2. Oil changes. The oil should be completely drained from the unit after the first 30 hours and thereafter at intervals of six months by removing the drain plug from the bottom of the casing; refill to the bottom of the filler-level plug hole with oil of the recommended grade. The oil capacity is approximately 0,5 litre (1 Imperial pint).
3. Propeller shaft. Lubricate the propeller shaft as applicable with grease of the correct grade at intervals of six months.

Rear drive pulley, 'Regular' and 'Long' models

The 200 mm (8 in.) rear drive pulley unit may be attached to the rear power take-off unit in place of the guard by means of four spring washers and nuts. Difficulty would be experienced in holding the vehicle steady if more than 20 BHP (15.0 kW) is transmitted through the pulley.

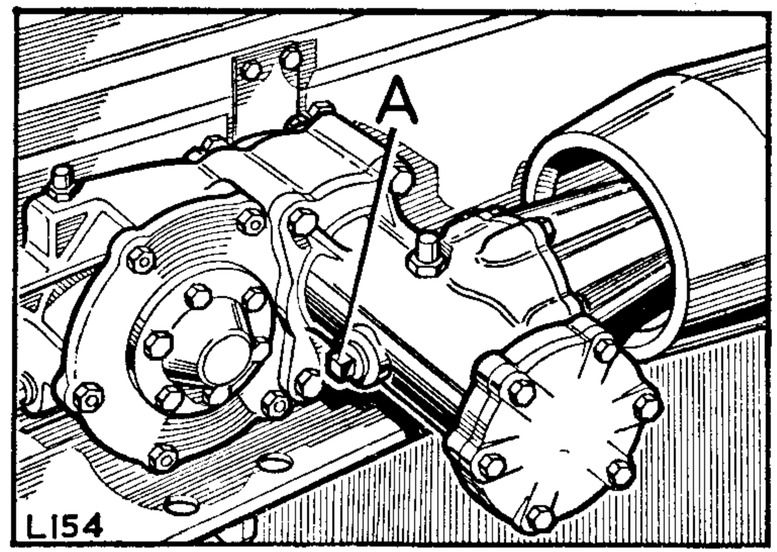


Fig. 74
Rear drive pulley, 'Regular' and 'Long' models

Rear drive pulley maintenance

1. Oil level. The oil level must be checked at every 40 operation hours and replenished as necessary to the bottom of the filler-level plug hole (A) in the side of the casing.

2. Oil changes. The oil should be completely drained from the unit after the first 30 hours and thereafter at intervals of six months by removing the unit from the vehicle and pouring out the oil through the filler-level plug hole. Refill to the bottom of the filler-level plug hole with oil of the recommended grade; the capacity is approximately 0,5 litre (0.75 Imperial pint).

Oil cooler

An engine oil cooler must be fitted when the vehicle is used to drive stationary equipment under conditions in excess of:

Power required: 24 BHP (18.0 kW) at 2,000 RPM—Petrol models
20 BHP (15.0 kW) at 1,500 RPM
24 BHP (18.0 kW) at 2,000 RPM
20 BHP (15.0 kW) at 2,500 RPM } Diesel models
10 BHP (7.5 kW) at 3,000 RPM

Ambient air temperatures: 20°C (68°F).

Running time: 30 minutes.

It incorporates a cooling radiator (B) inserted in the engine oil system and mounted just in front of the radiator; a gauge on the dash panel gives continuous indication of the oil temperature.

The oil temperature should never exceed 90°C (194°F) and the engine must be switched off and the oil allowed to cool down if this temperature is reached under working conditions.

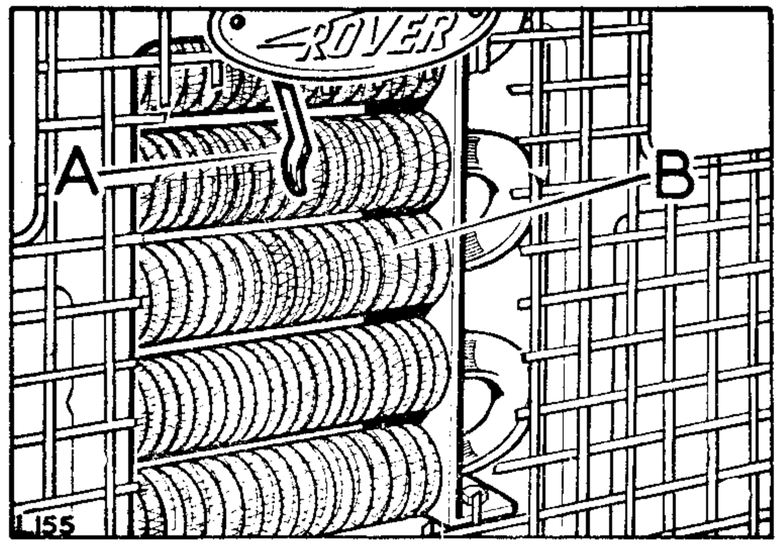


Fig. 75
Oil cooler, 'Regular' and 'Long' models illustrated

Engine governor, Petrol models only

An engine governor may be fitted when a centre power take-off or rear drive pulley is used; it would also simplify many jobs necessitating use of the rear splined output shaft.

Engine governor maintenance

Every 40 operation hours, check the oil level in the governor body by removing the filler plug (A) at the top front and the level plug at the left-hand side; replenish as necessary with engine oil through the filler hole, until the level is to the bottom of the level plug hole (B). Replace both plugs.

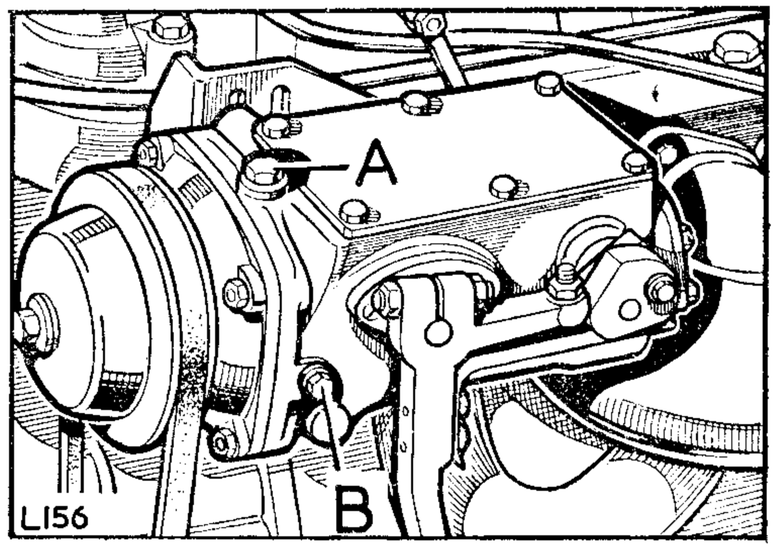


Fig. 76. Engine governor, Petrol models

Hydraulic winch

This comprises a hydraulic drum winch, with cable, which is mounted at the front of the vehicle on 'Regular' and 'Long' models, or in a central chassis position, beneath the body, on Forward Control models.

It is driven by a hydraulic pump fitted to the rear of the transfer gearbox.

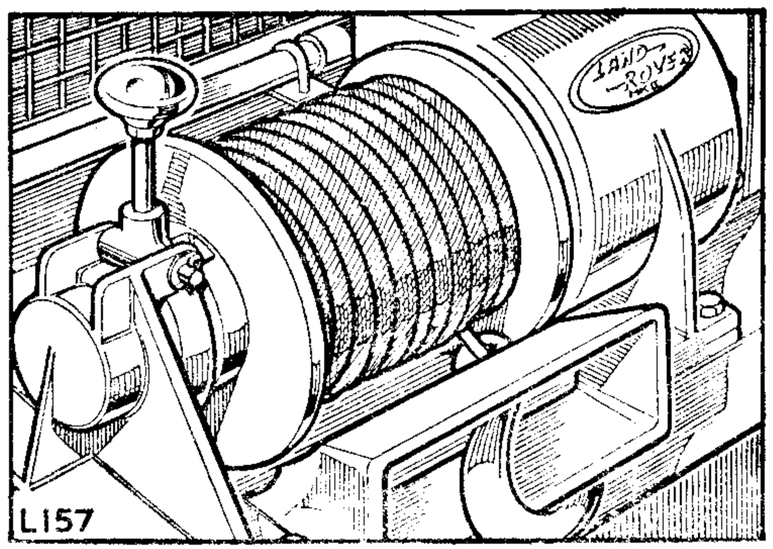


Fig. 77
Hydraulic winch 'Regular' and 'Long' installation

Operating controls are fitted to the heel board, inside the cab, and a hydraulic oil supply tank is fitted in the rear LH side wheelarch.

Instructions for using hydraulic winch.

1. Vehicle should be positioned in line with the object to be recovered, or in the case of self-recovery the end of the cable should be anchored in line with the vehicle.
2. The transfer box lever should be placed in the neutral position.
3. Engage 3rd gear in the main gearbox and pull out the power take-off lever protruding through the heel board. The hydraulic pump will then be driving when the clutch is released.

   The engine should be run at approximately 2,000 rpm, which will result in the pump being driven around 1,500 rpm. In practice the engine can be controlled during self-recovery by the accelerator pedal, but for some applications the hand throttle can be used.
4. The hydraulic control lever protruding from the heel board, can now be moved to the desired 'Pay-out' or 'Pay-in' position. Upon releasing this control it will automatically return to the central (neutral) position.

To 'Pay-out' the cable, push the control lever downwards, or on the Forward Control installation push the control inwards. Reverse the movements to 'Pay-in' the cable.

The following points should be noted:

1. The control for the engagement of the cable drum to the driving shaft, on the front installation is on the RH side of the winch unit. Pull this control outwards to engage.

   When disengaged for a rapid run-out of the cable, two inbuilt brake pads prevent over-run of the drum, which would otherwise cause the cable to spring into loose coils.

2. When rewinding the slack cable after a winching operation, it is necessary to apply some resistance to the cable to obtain a neat and even lay on the drum.

   With the front-mounted installation, an assistant holding the end of the cable against the pull of the drum will be found sufficient.

   This may be obtained by such means as winching in another vehicle on which the brakes are lightly applied, or alternatively by anchoring the cable to a tree or ground anchor and allowing the winch to pull the vehicle along, while the brakes are held lightly applied.

3. If the overload safety valve operates during a winching operation (indicating that the maximum pull has been exceeded) the control valve can be moved to the 'Pay-out' position and then re-engaged to 'Pay-in' position.

4. When recovery or self-recovery operations take place on a very steep slope, the maximum pull sometimes is exceeded due to the angle of the cable when the vehicle has reached the apex of the hill. If the safety valve operates it will sometimes be found that a restart is not possible. In these circumstances the vehicle should be lowered a certain amount in the 'Pay-out' position, and a further attempt made after the tension in the cable has been reduced.

5. Ground anchors, sprags under the wheels, other vehicles, trees, etc., can be used for securing the vehicle when it is used for general winching or for securing the end of the cable when self-recovery is necessary. The safety valve in the pressure line of the hydraulic system will prevent damage to both the winch and the vehicle.

6. The power take-off lever should be returned to the disengaged position after winching operations are completed, to prevent the pump being driven unnecessarily when travelling along the road.

Hydraulic winch maintenance

1. Every 40 operation hours check the oil level in the hydraulic oil supply tanks by removing cover plate (A) Fig. 78 and filler cap (B) Fig. 78. Oil should be just visible in the bottom of the oil filter.

2. Oil level in winch gearbox. Every 40 operation hours check the oil level by removing the level plug (A) Fig. 79 in the side of the end casing. Replenish as necessary, to the bottom of the level plug hole.

3. Oil changes. Every six months, drain off the oil from the supply tank by removing the slotted head drain plug (D) Fig. 78. At the same time remove and clean the tank oil filter (C) Fig. 78.

   Also drain off the oil from the winch gearbox by removing the side cover plate.

   Refill both supply tank and winch gear with oil of the correct grade.

   Capacity:

   Supply tank: 20,0 litres (4.5 gallons), 7.5 US gallons.

   Winch gearbox: 1,0 litre (2 pints), 2.5 US pints.

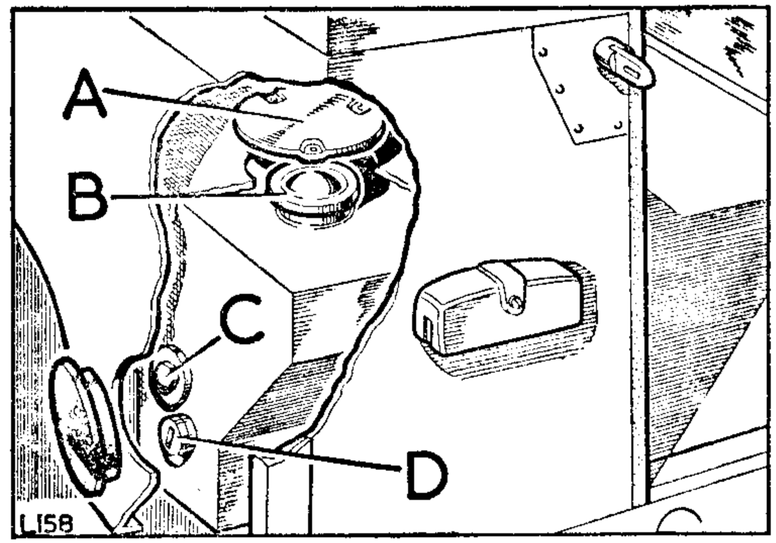


Fig. 78
Supply tank for hydraulic winch, 'Regular' and 'Long' models illustrated

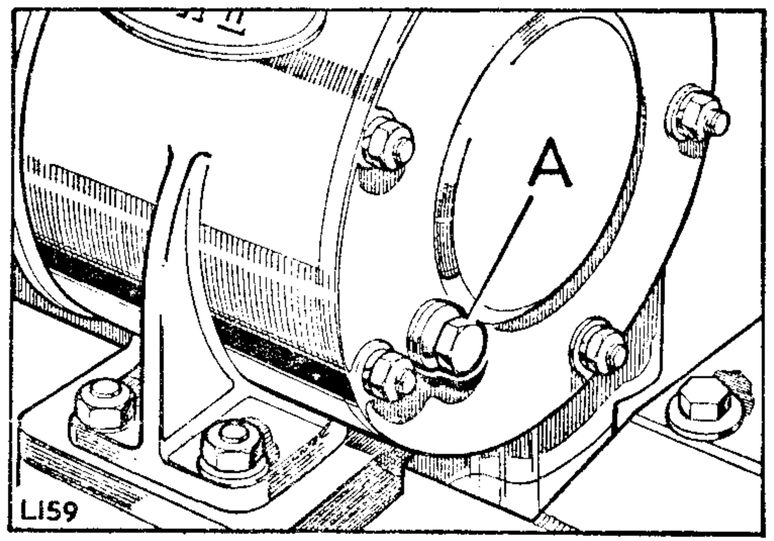


Fig. 79
Hydraulic winch gearbox, 'Regular' and 'Long' models

4. Lubrication nipples. Every 40 operation hours apply one of the recommended grades of grease to the lubrication nipples.

   At the same time, lubricate with oil, the drum shaft and control lever.

   The drum lubrication nipples are accessible after paying out the winch cable.

FAULT FINDING

Location and remedy of faults

The following pages set out the recommended procedure for a systematic examination to locate and remedy the causes of some of the faults which may occur during the life of the vehicle.

All the checks listed can be readily carried out without special equipment; if the fault is not located in this way, consult the local Rover distributor or dealer, who will be able to investigate the defect more closely.

Engine fails to start, Petrol models

1. Check that the ignition is switched on.
2. Check that there is sufficient petrol in the tank.
3. Check that the cold start control is set correctly.
4. Check that the engine is being turned at an adequate speed by the starter motor; this speed will be recognised after some experience with the vehicle.

   If the cranking speed is too low:

   (i) Check the battery connections for tightness and cleanliness.

   (ii) Check the state of charge of the battery by switching on the headlamps and pressing the starter button; if the headlamps go out or very dim when the starter is operated, the battery requires recharging from an independent electrical supply.

   It should be possible to start the engine by cranking with the starting handle.

A warning is given against the possibility of electric shock when handling the HT equipment. This danger will be eliminated by giving careful thought to the action anticipated, before carrying it out.

5. Remove and clean the sparking plugs and reset the electrode gaps to 0,75 to 0,80 mm (0.029 to 0.032 in.). Refit to engine; as plug covers are fitted an audible check should now be made.

   (i) Lift the cover from each plug terminal in turn, about 7 mm (0.25 in.) and listen for the sharp snap of the spark, as the engine is turned over. Sparking should be strong and regular.

   (ii) If the sparks are not regular:

      (a) Check that the distributor rotor is in position.

      (b) Check that the LT connections on the coil and distributor are clean and tight.

      (c) Check that the distributor points are:

         1. Clean and opening and closing correctly.
         2. Correctly set when open, gap 0,35 to 0,40 mm (0.014 to 0.016 in.).

      (d) Check that current is present at the SW terminal on the coil, by disconnecting the wire at the coil end and touching it against the SW terminal, with the ignition switch on and the distributor contact-breaker points closed. If sparks occur, low tension current is flowing through the coil correctly; if there is no spark, either the coil or the low tension wiring is defective and your dealer should be consulted.

   (iii) If the sparks are weak and in addition there is a flashing at the distributor contact-breaker points, a faulty distributor condenser is indicated.

   (iv) If the sparks are present on some leads, but not on others, check the distributor cap for cracks and the plug leads for faulty insulation.

6. Disconnect the petrol pipe from the carburetter and check that petrol is delivered to the carburetter when the hand lever on the petrol pump is operated. If petrol is not delivered from the pipe:
   (i) Check that the petrol pipes and filters are clear.
   (ii) Check that there are no air leaks in the suction line to the petrol pump.

Engine starts but soon stops, Petrol models

1. Check that the controls are set correctly.
2. Check the petrol feed to the carburetter.

   If there is little or no flow:
   (i) Check the petrol level in the tank.
   (ii) Check that the air vent in the filler neck is clear.
   (iii) Check the petrol pump for correct operation.
   (iv) Check that the petrol filters are clear.
   (v) Check that the petrol pipes are clear.

Engine misfires, Petrol models

Engine not running on all cylinders, either intermittently or continually.

1. Stop the engine and endeavour to re-start with the starter motor to check the state of the battery and connections. If the battery is in a low state of charge, it will need recharging from an independent electrical supply, and the charging circuit should be checked as directed under charging circuit below.

Before making the tests on the HT equipment you are advised to read the warning on page 85.

2. Remove the cover from each sparking plug in turn and check:

(i) By raising the cover from the plug terminal about 7 mm (0.25 in.) whilst engine is running. Sparks should be heard jumping the gap regularly.

If no spark is present on one or more cylinders:

(a) Remove and check the sparking plug concerned.

(b) Check for moisture on the HT leads or distributor.

(c) Check, clean and reset the distributor contact-breaker points to 0,35 to 0,40 mm (0.014 to 0.016 in.) as necessary.

(d) Check the distributor cap for cracks and the plug leads for faulty insulation.

If the spark is irregular on all cylinders:

(a) Check for moisture on HT leads or distributor.

(b) Check the distributor points, clean and re-set as necessary.

(c) Check the distributor cap for cracks and plug leads for faulty insulation.

(d) Check the LT connections for tightness and cleanliness.

(e) Check for flashing or 'blueing' of the contact-breaker points. If present, the distributor condenser should be renewed.

(f) Check for a fault in the ignition circuit by connecting a wire between the 'A' connection on the voltage regulator box and the 'SW' connection on the coil, thus by-passing the ignition switch. At the same time, the wire from the ignition switch must be disconnected from the coil. Leave the ignition switch off.

Note: When making the above test remember that the 'A' terminal is at battery potential. Connections to it must not be allowed to make contact with the metalwork of the vehicle otherwise a short circuit of the battery will result.

(ii) Listen for any audible alteration in the running of the engine, as each cover is lifted. No alteration will indicate that the sparking plug in question is at fault:

(a) Remove and replace or clean the plug; reset the gap to 0,75 to 0,80 mm (0.029 to 0.032 in.) as necessary.

3. If the 'missing' is accompanied by 'spitting back' through the carburetter, a valve may be sticking. This can often be cured by slowly dropping thin oil or upper cylinder lubricant into the carburetter intake, while the engine is running. Persistence of this complaint points to the need for an engine overhaul.

Lack of engine power, Petrol models

1. Check that the carburetter throttle is opening fully.
2. Check that the brakes are not binding and that the tyre pressures are correct.
3. Check the ignition timing.
4. Check the tappet adjustment.
5. If items 1-4 are satisfactory, it is probable that the engine needs decarbonising, and your Rover distributor or dealer should be consulted.

Starter motor, Petrol models

1. Starter motor lacks power or fails to turn engine.

(a) Gearbox or power take-off auxiliary engaged.

(b) See if the engine can be turned over by hand. If not, the cause of the stiffness of the engine must be located and remedied.

(c) If the engine can be turned by hand, check that the trouble is not due to a discharged battery.

(d) Examine the connections to battery, starter and starter switch, making sure that they are tight and that the cables connecting these units are not damaged.

(e) It is also possible that the starter pinion may have jammed in mesh with the flywheel, although this is by no means a common occurrence. To disengage the pinion, pull off the dust cap and rotate the squared end of the starter shaft by means of a spanner.

2. Starter operates, but does not crank engine.
This fault will occur if the pinion of the starter drive is not allowed to move along the screwed sleeve into engagement with the flywheel, due to dirt having collected on the screwed sleeve. Clean the sleeve carefully with paraffin.

3. Starter pinion will not disengage from flywheel when engine is running.
Stop the engine and ascertain if the starter pinion is jammed in mesh with the flywheel. Release it, if necessary, by withdrawing the dust cap and rotating the squared end of the starter shaft in the opposite direction to normal rotation. If the pinion persists in sticking in mesh, have the equipment examined at a service depot. Serious damage may result to the starter if it is driven by the flywheel.

Engine will not crank by starter, Diesel models

1. Gearbox or power take-off auxiliary engaged.
2. Battery terminals loose or broken or batteries discharged.
3. Switch wires and connections loose or broken or switch fault.
4. Starter or solenoid faulty.
5. Short circuit on heater plugs.

Engine will not crank, starter motor rotates, Diesel models

1. Faulty starter clutch assembly.

Engine will not crank on handle, Diesel models

1. Gearbox or power take-off auxiliary engaged.
2. Starter bendix jammed.
3. Hydraulic lock. Water in combustion chamber. Check for internal water leaks.
4. Hydraulic lock. Oil in combustion chamber.
5. Pump faulty. Must be repaired by a CAV Agent.

Engine cranking speed low, Diesel models

1. Battery terminals loose or broken or batteries discharged.
2. Earth connection, chassis to engine, broken or loose.
3. Wrong grade engine oil.
4. Starter faulty or short circuit on heater plugs.

Sufficient engine cranking speed, engine will not start, Diesel models

1. Little or no fuel in tank. Replenish and prime system.
2. Stop control out or shut-off lever jammed. Linkage incorrectly adjusted.
3. Incorrect starting procedure.

4. Heater plugs faulty.
5. Throttle sticking or incorrectly adjusted.
6. Air in system due to fuel leaks on fuel pump, filter, injection pump or connection pipes. Rectify as necessary and prime system.
7. Insufficient flow of fuel at injection pump inlet.
8. Ample fuel at pump inlet but little or no fuel at injector pipes. Check that nylon or gauze filter at distributor pump inlet connection is not blocked or choked. If in doubt about pressure of fuel to injectors, remove injector and allow to spray in air. Keep well away from spray as fuel will penetrate the skin easily under these conditions. Ensure stop lever is in 'run' position. If no injection, remove pump for checking, rectification or replacement.
9. Water in fuel system. Drain fuel system completely. Fit new paper filter element. It is advisable to remove injector pump for checking by a CAV Agent. After refitting pump, refill tank with clean fuel, prime fuel system.
10. Air vent at fuel tank restricted, causing vacuum.
11. Tank pick-up pipe blocked or fractured.
12. Incorrect pump timing or valve timing.
13. Very low compression pressure due to faulty cylinder head gasket, piston rings or valves, etc.
14. Injectors or pump faulty. Pump must be repaired by a CAV Agent.
15. Aid to diagnosis of trouble, observe whether white smoke is emitted from exhaust. If no white smoke, fault is with injection equipment. If white smoke, fault is unlikely to be in injection equipment.

Engine difficult to start, cranking speed sufficient, Diesel models

1. Stop control out or shut-off lever jammed. Linkage incorrectly adjusted.
2. Incorrect starting procedure.
3. Heater plugs faulty.
4. Throttle sticking or incorrectly adjusted.
5. Faulty injectors.
6. Incorrect pump timing.
7. Leaking injector pipes.
8. Low compression pressures.
9. Pump faulty. Must be repaired by a CAV Agent.

Engine starts but stops after a little running, requires priming to restart, Diesel models

1. Little or no fuel in tank. Replenish and prime system.
2. Air in system due to fuel leaks on fuel pump, filter, injection pump or connection pipes. Rectify as necessary and prime system.
3. Insufficient flow of fuel at injection pump inlet.
4. Ample fuel at pump inlet but little or no fuel at injector pipes. Check that nylon or gauze filter at distributor pump inlet connection is not blocked or choked. If in doubt about pressure of fuel to injectors, remove injector and allow to spray in air. Keep well away from spray as fuel will penetrate the skin easily under these conditions. Ensure stop lever is in 'run' position. If no injection, remove pump for checking, rectification or replacement.

5. Air vent at fuel tank restricted, causing vacuum.
6. Tank pick-up pipe blocked or fractured.
7. Water in fuel. Drain and clean complete fuel system. Renew paper filter element. Drain and clean fuel storage tank. It is advisable to remove distributor pump for checking by a CAV Agent. After refitting pump, refill tank with clean fuel and prime fuel system. Ensure that dust and water is excluded to avoid recurrence of trouble.

Engine stalls, Diesel models

1. Engine operating temperature too low.
2. Idling stop incorrectly set. Reset to 590 $\pm$ 20 rpm with hand brake on, while engine is hot. Must be carried out by Rover Distributor or Dealer.
3. Faulty injectors, incorrect pump timing, leaking injector pipes, faulty pump.
4. Excessive load, e.g., power take-off.
5. Internal collapse of air cleaner connection.

Engine will not idle, Diesel models

1. Hand or foot throttle linkage incorrectly set or jamming. Check with hand brake on and off and adjust as necessary.
2. Idling stop incorrectly set.
3. Injectors or pump faulty. Pump must be repaired by a CAV Agent.

Engine misfires, Diesel models

1. Engine running on less than four cylinders, either intermittently or continually. Check injectors, rectify or replace. Check for leaks on high pressure pipes.
2. Check for blockage in spill pipe and connections.

Lack of power, Diesel models

1. Throttle linkage incorrectly set or jamming.
2. Excessive load on vehicle or power take-off; e.g., brakes binding.
3. Faulty injectors or low compression pressures.
4. Maximum speed stop incorrectly set. Reset to 4,000 ± 20 rpm with engine hot. Must be carried out by a Rover Distributor or Dealer.
5. Pump faulty. Must be repaired by a CAV Agent.
6. Tappets incorrectly set. Reset inlet and exhaust tappets to 0,25 mm (0.010 in.) with engine hot or cold.
7. Petrol in fuel.

Smoke, Diesel models

1. Faulty injectors or incorrect pump timing.
2. Overfilled oil bath in air cleaner. Fill to correct level.
3. Choked air cleaner. Clean as maker's instructions.
4. Worn or faulty engine condition.
5. Pump faulty. Must be repaired by a CAV Agent.

Charging circuit, all models

1. Battery in low state of charge.
   (a) This state will be shown by lack of power when starting, poor light from the lamps and hydrometer readings below 1.200, and may be due to the dynamo either not charging or giving low or intermittent output. Check the ammeter reading when the vehicle is running steadily in top gear with no lights in use; a definite steady charge should be indicated. The charging warning light will not go out if the dynamo fails to charge, or will flicker on and off in the event of intermittent output.
   (b) Examine the charging and field circuit wiring, tightening any loose connections, or replacing broken cables. Pay particular attention to the battery connections.
   (c) Examine the fan and dynamo driving belt; adjust tension as necessary.
   (d) If the cause of the trouble is not apparent, have the equipment examined at a service depot.
2. Battery overcharged.
   This will be indicated by burnt-out bulbs, very frequent need for topping-up of battery and high hydrometer readings. Check the ammeter reading when the car is running steadily—with a fully charged battery and no lights or accessories in use, the charge reading should be of the order of only 3-4 amperes. If the ammeter reading is in excess of this value, it is advisable to have the regulator setting tested and adjusted if necessary at a service depot.

Lighting circuits

1. Lamps give insufficient illumination.
   (a) Test the state of charge of the battery, recharging it if necessary either by a long period of day-time running or from an independent electrical supply.
   (b) Check the setting of the headlamps.
   (c) If the bulbs are discoloured as a result of long service, they should be renewed.

2. Lamps light when switched on, but gradually fade out.
   Test the state of charge of the battery, recharging it if necessary either by a long period of day-time running or from an independent electrical supply.

3. Brilliance varies with speed of vehicle.

   (a) Test the state of charge of the battery, recharging it if necessary either by a long period of day-time running or from an independent electrical supply.

   (b) Examine the battery connections, making sure that they are tight; replace faulty cables.

4. Lights flicker.
   Examine the circuits of the lamps for loose connections.

5. Failure of lights.

   (a) Test the state of charge of the battery, recharging it if necessary either by a long period of day-time running or from an independent electrical supply.

   (b) Examine the wiring for a loose or broken connection and remedy.

PART THREE
GENERAL DATA

Engine, 4-cylinder Petrol models

Bore		90,49 mm (3.562 in.)
Stroke		88,9 mm (3.500 in.)
Number of cylinders		4
Cylinder capacity		2,286 cc (139.5 cu. in.)
Compression ratio		8.0:1 7.0:1 Optional
BHP	BHP and maximum torque figures are derived from bench tests and do not allow for installation losses in the vehicle	81 (160.5 kW) at 4,250 rpm
Maximum torque		17.5 mkg (127 lb/ft) at 2,500 rpm
Firing order		1, 3, 4, 2
Sparking plug type		
8.0:1 compression ratio		Champion UN12Y
7.0:1 compression ratio		Champion N8
Sparking plug point gap		0,75 to 0,80 mm (0.029 to 0.032 in.)
Distributor contact breaker gap		0,35 to 0,40 mm (0.014 to 0.016 in.)
Ignition timing (static—full retard)		
8.0:1 compression ratio		TDC when using 90 octane fuel
7.0:1 compression ratio		3° BTDC 83 octane fuel
Ignition timing to be set to		
8.0:1 compression ratio		3° ATDC 85 octane fuel
7.0:1 compression ratio		TDC when using 75 octane fuel

United Kingdom use two-star grade fuel

Tappet clearance, inlet	Engine at running temperature	0,25 mm (0.010 in.)
Tappet clearance, exhaust	Engine at running temperature	0,25 mm (0.010 in.)
Valve timing (No. 1 exhaust valve peak)		95° BTDC
Oil pressure		3,2 to 4,6 kg/cm² (45 to 65 lb/sq in) at 50 kph (30 mph) in top gear with engine warm
Lubrication		Full pressure
Oil filter, internal		Gauze pump intake filter in sump
Oil filter, external		Full-flow filter

Engine, 6-cylinder Petrol models

Bore		77,8 mm (3.063 in.)
Stroke		92,075 mm (3.625 in.)
Number of cylinders		6
Cylinder capacity		2,625 cc (160.3 cu. in.)
Compression ratio		7.8:1
		7.0:1 Optional
BHP	BHP and maximum torque figures are derived from bench tests and do not allow for installation losses in the vehicle.	95 (71.0 kW) at 4,500 rpm
Maximum torque		18,5 mkg (134 lb/ft) at 1,750 rpm
Firing order		1, 5, 3, 6, 2, 4
Sparking plugs		
7.8:1 and 7.0:1 compression ratio		Champion N5
Sparking plug point gap		0,75 to 0,80 mm (0.029 to 0.032 in.)

Distributor contact breaker gap	0,35 to 0,40 mm (0.014 to 0.016 in.)	
Ignition timing (static—full retard)		
7.8:1 compression ratio	2° ATDC 90 octane fuel 6° ATDC, 85 octane fuel	United Kingdom use 2 Star grade fuel
7.0:1 compression ratio	TDC, 83 octane fuel	
Ignition timing to be set to		
7.0:1 compression ratio	2° BTDC when using 90 octane fuel	
Tappet clearance, inlet	0,15 mm (0.006 in.). Engine hot	
Tappet clearance, exhaust	0,25 mm (0.010 in.). Engine hot or cold	
Valve timing (No. 1 exhaust valve peak)		
7.8:1 compression ratio	106° BTDC	
7.0:1 compression ratio	106° BTDC	
Oil pressure	2,8 to 3,5 kg/cm² (40 to 50 lb/sq in.) at 50 kph (30 mph) in top gear with engine warm	
Lubrication	Full pressure	
Oil filter, internal	Gauze pump intake filter in sump	
Oil filter, external	Full-flow filter	

Engine, Diesel models

Bore	90,49 mm (3.562 in.)
Stroke	88,9 mm (3.500 in.)
Number of cylinders	4
Compression ratio	23:1
Cylinder capacity	2,286 cc (139.5 cu. in.)

BHP	BHP and maximum torque figures are derived from bench tests and do not allow for installation losses in the vehicle.	67 (50.0 kW) at 4,000 rpm
Torque		14,5 mkg (105 lb/ft) at 1,800 rpm
Firing order		1, 3, 4, 2
Tappet clearance, inlet	Engine cold or at running temperature	0,25 mm (0.010 in.)
Tappet clearance, exhaust		0,25 mm (0.010 in.)
Valve timing (No. 1 exhaust valve peak)		109° BTDC
Oil pressure		2,5 to 4,5 kg/cm² (35 to 65 lb/sq in.) at 50 kph (30 mph) in top gear with engine warm
Lubrication		Full pressure
Oil filter, internal		Gauze pump intake filter in sump
Oil filter, external		Full-flow filter

Clutch, 4-cylinder models

Type	Single dry plate 230 mm (9 in.) diameter. Hydraulic operation
Adjustment	Hydrostatic clutch. No adjustment necessary

Clutch, 6-cylinder models

Type	241 mm (9.5 in.) diameter diaphragm type clutch. Hydraulic operation
Adjustment	Hydrostatic clutch. No adjustment necessary

Main gearbox

Type	Single helical constant mesh with synchro-mesh on top and third speeds

Transfer box

Type	Two speed reduction on main gearbox output
Front wheel drive	Two/four wheel drive control on transfer box output

Propeller shafts

Type	Open type to both axles

Rear axle

Type	Spiral bevel; fully floating shafts
Ratio	4.7:1

Front axle

Differential	Spiral bevel
Front wheel drive	Enclosed universal joints
Ratio	4.7:1

Gear ratios, 'Regular', 'Long' and Station Wagon

Main gearbox:	Top	Direct
	Third	1.50:1
	Second	2.22:1
	First	3.6:1
	Reverse	3.02:1
Transfer gearbox	High transfer	1.148:1
	Low transfer	2.35:1

Overall ratio (final drive):	In high transfer	In low transfer
Top	5.4:1	11.1:1
Third	8.05:1	16.5:1
Second	12.0:1	24.6:1
First	19.4:1	39.7:1
Reverse	16.3:1	33.2:1

Gear ratios, long 1 ton models

Main gearbox: Top	Direct	
Third	1.50:1	
Second	2.22:1	
First	3.6:1	
Reverse	3.02:1	
Transfer gearbox: High transfer	1.53:1	
Low transfer	3.27:1	

Overall ratio (final drive)	In high transfer	In low transfer
Top	7.19:1	15.4:1
Third	10.80:1	23.1:1
Second	15.96:1	34.1:1
First	25.9:1	55.3:1
Reverse	21.7:1	46.4:1

Fuel system, 4-cylinder Petrol models

Petrol pump	Mechanical, with sediment bowl
Carburetter	Zenith 36 I.V.
Air cleaner	Oil bath type with integral centrifugal pre-cleaner

Fuel system, 6-cylinder Petrol models

Petrol pump	Dual electric, located at chassis side-member
Carburetter	Zenith Type 175 CD 2S single horizontal, dust-proof
Air cleaner, all models	Oil bath type with integral centrifugal pre-cleaner

Fuel system, Diesel models

Fuel pump	Mechanical with hand primer (high pressure type)
Air cleaner	Oil bath type with integral centrifugal pre-cleaner
Fuel filters	Paper type element and sedimenter

Injection system, Diesel models

Injector pump	Distributor type, self-governing
Injectors: Type	CAV Pintaux, nozzle size BDNO/SPC 6209
Start of injection	16° BTDC

Cooling system

Type	Pump, fan and thermostat; pressurised to 0,6 kg/cm² (9 lb/sq in.)

Electrical system, Petrol models

Type	Negative earth
Voltage	12
Battery capacity	58 AH
Ignition system	Coil
Charging circuit	4 cylinder models. Compensated voltage control 6 cylinder models. Current voltage control

Electrical system. Diesel models

Type	Negative earth
Voltage	12. Two 6 volt batteries in series
Battery capacity	120 AH
Charging circuit	Current-voltage control

Replacement bulbs and units

Headlamps with bulbs:

LHStg Italy	Lucas 410, 12 v, 45/40 w, Duplo clear
LHStg France	Lucas 411, 12 v, 45/40 w, Duplo yellow

Headlamps with sealed beam units:

RHStg	Lucas 54521872 60/45 w
LHStg Europe except France and Italy	Lucas 54523079 60/50 w
LHStg Except Europe	Lucas 54522231 50/40 w

Sidelamps	Lucas 207, 12 v, 6 w
Stop, tail lamps	Lucas 380, 12 v, 21/6 w
Flasher lamps	Lucas 382, 12 v, 21 w
Rear number plate lamp	Lucas 989, 12 v, 6 w
Instrument panel lights	Lucas 987, 12 v, 2.2 w MES
Warning lights	Lucas 987, 12 v, 2.2 w MES
Warning light, brakes	Lucas 281, 12 v, 2 w
Warning light, heater plugs, Diesel models	Lucas 982, 6 v, 1.8 w MES
Warning light, fuel level, Diesel models	Rover Part No. 560756 Mini-lamp 12/14 v .04 A
Warning light, flashers	Magnatex GBP 12 v 2.2 w
Interior light	Lucas 382, 12 v, 21 w

Suspension

Road springs	Semi-elliptic leaf
Hydraulic dampers	Telescopic; non-adjustable

Brakes

Foot brake 88	Hydraulic, 254 mm (10 in.) brake drums
Foot brake 109	Hydraulic, 279 mm (11 in.) brake drums. Servo assisted on 6-cylinder 'Long' and 1 ton models
Hand brake	Mechanical on transfer box output shaft

Steering

Type	Recirculating ball	
	'Regular', 'Long' and Station Wagon models	1 ton models
Ratio: Straight ahead	15.6:1	19.6:1
Full lock	23.8:1	29.9:1
Front wheel toe-in	1,2 to 2,3 mm (0,046 to 0.093 in.)	
Camber angle	1.5°	
Castor angle	3°	
Swivel pin inclination	7°	

Capacities

Component	Litres	Imperial unit	US unit
Engine sump oil, 4-cylinder	6,0	11 pints	13 pints
Engine sump oil, 6-cylinder	6,8	12 pints	14 pints
Extra when refilling after fitting new filter, 4-cylinder	0,85	1.5 pints	1.8 pints
Extra when refilling after fitting new filter, 6-cylinder	0,5	1 pint	1.2 pints
Air cleaner oil, 4-cylinder	0,85	1.5 pints	1.8 pints
Air cleaner oil, 6-cylinder	0,5	1 pint	1.2 pints
Main gearbox oil	1,5	2.5 pints	3 pints
Transfer box oil	2,5	4.5 pints	5.5 pints
Rear differential (Standard)	1,75	3 pints	3.5 pints
Front differential (Standard)	1,75	3 pints	3.5 pints
Rear differential (ENV type)	1,4	2.5 pints	3.5 pints
Front differential (ENV type)	1,4	2.5 pints	3.5 pints
Swivel pin housing oil (each)	0,5	1 pint	1.2 pints
Fuel tank, 4-cylinder models	45	10 gallons	12 gallons
Fuel tank, 6-cylinder models except Station Wagon	50	11 gallons	13 gallons
Fuel tank, 6-cylinder Station Wagon models	73	16 gallons	19 gallons
Cooling system, 4-cylinder Petrol models	8,1	14.25 pints	17.1 pints
Cooling system, 6-cylinder Petrol models	11,2	20 pints	24 pints
Cooling system, Diesel models	7,8	13.75 pints	16.5 pints
Hydraulic front winch, supply tank	20,0	4.5 gallons	7.5 gallons
Hydraulic front winch, gearbox	1,0	2 pints	2.4 pints

Recommended lubricants and fluids

These recommendations apply to temperate climates where operational temperatures are above —10°C (14°F)

Lubricants marked with an asterisk (*) are multigrade oils suitable for all temperature ranges.

Information on oil recommendations for use under extreme winter conditions can be obtained from your local Rover Distributor or Dealer or The Rover Co. Ltd, Technical Service Department.

COMPONENTS	SAE	BP	CASTROL	DUCKHAM'S	ESSO	MOBIL	REGENT TEXACO-CALTEX	SHELL
Petrol models **Engine, air cleaner and governor**	20W	*BP Super Visco-Static 20W-50	*Castrol GTX	Duckham's Q20-50 Motor Oil	Uniflo or Esso Motor Oil 20W	Mobiloil Super or Mobiloil Special 20W-50	Havoline 20W-50	*Shell Super Oil
Diesel models **Engine and air cleaner**	20W	BP Vanellus 20W	Castrol CRI 20	Duckham's Fleetol HDX20	Essolube HDX 20	Delvac 1120 or Delvac 1220	Ursa Heavy Duty Oil 20/20W	Shell Rotella S or T 20/20W
Gearbox and transfer box **Differentials and swivel pin housings** **Steering box** **Steering relay unit** **Rear power take-off, pulley unit and capstan winch hydraulic winch gearbox**	90EP	BP Energol SAE 90EP	Castrol Hypoy	Duckham's Hypoid 90	Esso Gear Oil GP 90/140	Mobilube GX 90	Multigear Lubricant 90	Spirax 90 EP
Hydraulic winch supply tank	—	*BP Super Visco-Static 20W-50	*Castrol GTX	Duckham's Q20-50 Motor Oil	Esso Motor Oil 20W	Mobiloil Special 20W/50 or Delvac 1120 or Delvac 1220	Havoline 20/20W	*Shell Super Oil or Shell Rotella
Lubrication nipples	—	BP Energrease L2	Castrol LM Grease	Duckham's LB10 Grease	Esso Multi-purpose Grease H	Mobilgrease MP or Mobil-grease Super	Marfak All-purpose	Retinax A or Darina AX
Anti-freeze solutions		BP Anti-Frost	Castrol Anti-Freeze	'Standard' Anti-Freeze	Esso Anti-Freeze	Mobil Permazone	PT Anti-Freeze	Shell Anti-Freeze
		Bluecol and Prestone or any anti-freeze solution conforming to British Standards BS 3151 or 3152						
Brake and clutch fluid	Castrol Girling Brake and Clutch Fluid 'Crimson' Specification J. 1703							

General data

Dimensions and Weights	'Regular'		'Regular' Station Wagon		'Long'		'Long' Station Wagon		1 Ton	
	Metric	British	Metric	British	Metric	British	Metric	British	Metric	British
Overall length	3,62 m	142.562 in.	3,62 m	142.375 in.	4,44 m	175 in.	4,44 m	175 in.	4,44 mm	175 in.
Overall width	1,68 m	66 in.	1,68 m	66 in.	1,68 m	66 in.	1,68 m	66 in.	1,68 mm	66 in.
Overall unladen height, hood up	1,97 m	77.5 in.	—	—	—	—	—	—	—	—
Overall unladen height, hood down, screen up	1,73 m	68 in.	—	—	—	—	—	—	—	—
Overall unladen height, hood down, screen down	1,46 m	57.5 in.	—	—	—	—	—	—	—	—
Overall unladen height, with cab or hard top	1,95 m	76.875 in.	1,98 m	77.875 in.	2,06 m	81 in.	2,07 m	81.375 in.	2,10 m	83 in.
Wheelbase	2,23 m	88 in.	2,23 m	88 in.	2,77 m	109 in.	2,77 m	109 in.	2,77 m	109 in.
Track	1,31 m	51.5 in.	1,31 m	51.5 in.	1,31 m	51.5 in.	1,31 m	51.5 in.	1,31 m	51.5 in.
Turning circle	11,6 m	38 ft.	11,6 m	38 ft.	14,3 m	47 ft.	14,3 m	47 ft.	14,3 m	47 ft.
Unladen ground clearance under differentials, 6.00 x 16 tyres	203 mm	8 in.	203 mm	8 in.	—	—	—	—	—	—
Unladen ground clearance under differentials, 7.00 x 16 tyres	222 mm	8.75 in.	222 mm	8.75 in.	—	—	—	—	—	—
Unladen ground clearance under differentials, 7.50 x 16 tyres	—	—	—	—	248 mm	9.75 in.	248 mm	9.75 in.	—	—
Unladen ground clearance under differentials, 9.00 x 16 tyres	—	—	—	—	—	—	—	—	298 mm	11.75 in.
Weight running, with water, oil, 5 gallons fuel: Petrol models	1.339 kg	2,953 lb.	1.488 kg	3,281 lb.	1.497 kg	3,301 lb.	1.702 kg	3,752 lb.	2.060 kg*	3,886 lb.
Diesel models	1.405 kg	3,097 lb.	1.557 kg	3,435 lb.	1.574 kg	3,471 lb.	1.778 kg	3,922 lb.	1.691 kg**	3,728 lb.

† With two exterior mirrors

* 6-cylinder Petrol models

** 4-cylinder Petrol models

Dimensions and Weights	'Regular'		'Regular' Station Wagon		'Long'		'Long', Station Wagon		1 Ton	
	Metric	British	Metric	British	Metric	British	Metric	British	Metric	British
Maximum approved payload, normal roads	*Driver, two passengers and: 454 kg	1,000 lb.	*7 persons and: 45 kg	100 lb.	Driver, two passengers and: 908 kg	2,000 lb.	10 persons and: 181 kg	400 lb.	Driver, two passengers and: 1.015 kg	2,240 lb.
Maximum approved payload, cross-country	Driver, two passengers and: 363 kg	800 lb.	6 persons and: 23 kg	50 lb.	Driver, two passengers and: 816 kg	1,800 lb.	10 persons and: 91 kg	200 lb.	Driver, two passengers and: 1.015 kg 1.270 kg	2,240 lb. 2,800 lb.
Maximum drawbar pull, dependent upon surface conditions:										
Petrol models	1.800 kg	4,000 lb.	1.800 kg	4,000 lb.	1.600 kg	3,500 lb.	1.600 kg	3,500 lb.	1.600 kg	3,500 lb.
Diesel models	1.497 kg	3,300 lb.	1.497 kg	3,300 lb.	1.315 kg	2,900 lb.	1.315 kg	2,900 lb.	—	—
Maximum roof rack load	50 kg	112 lb.	50 kg	112 lb.	50 kg	112 lb.	50 kg	112 lb.	50 kg	112 lb.
Internal body dimensions:										
Length (between cappings)	1,09 m	43 in.	—	—	1,85 m	72.75 in.	—	—	1,85 m	72.75 in.
Width (between cappings)	1,44 m	56.875 in.	—	—	1,44 m	56.875 in.	—	—	1,44 m	56.875 in.
Depth	495 mm	19.5 in.	—	—	483 mm	19 in.	—	—	483 mm	19 in.
Height of wheel arch	216 mm	8.5 in.	—	—	229 mm	9 in.	—	—	229 mm	9 in.
Width of wheel arch (to body side)	349 mm	13.75 in.	—	—	349 mm	13.75 in.	—	—	349 mm	13.75 in.
Width of floor (between wheel arches)	921 mm	36.25 in.	—	—	921 mm	36.25 in.	—	—	921 mm	36.25 in.
Height, floor to roof (maximum)	1,23 m	48.5 in.	—	—	1,22 m	48 in.	—	—	1,22 m	48 in.

* Maximum loads for cross-country when heavy duty springs are fitted.

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PART FOUR

LAND-ROVER FREE SERVICE AND MAINTENANCE SCHEDULES

The regular carrying out of the following scheduled services is an extremely important factor in maintaining the value of the vehicle and contributing to its reliability.

Your attention is particularly drawn to the need for more frequent maintenance attention to certain units, as shown on the sheets that follow, when the Land-Rover is used under arduous conditions or when wading.

Maintenance attention information for items of optional equipment, that is, power take-off, hydraulic winch, etc, will be found in Part One of this book and also in the Optional Equipment Book, copies of which can be obtained free of charge from: The Rover Company Limited, Technical Service Department, Solihull, Warwickshire, England.

In addition to the regular maintenance schedules, details are also provided of the work to be done at the Free Service Inspection after the vehicle has covered approximately its first 1.500 km (1,000 miles).

Provision has been made in the book for a certifying signature that the various services have been carried out so that there is a permanent record of these having been completed.

Whilst it is intended that this part of the book should be used in conjunction with the Maintenance Section, particulars are none the less included as to recommended lubricants and other important maintenance data.

It will be noted that certain maintenance work which is required from time to time has been omitted from these schedules. This will include such work as decarbonising, brake relining, etc, the need for which will vary very much according to circumstances, and Rover Distributors or Dealers should be consulted about such points at the time other service work is being carried out.

Details of these Maintenance Schedules in chart form can be obtained free of charge from: The Rover Company Limited, Technical Service Department, Solihull, Warwickshire, England.

SUMMARY OF MAINTENANCE ATTENTION

IMPORTANT

1. Check engine oil level and water level in radiator daily or weekly depending on operating conditions.
2. Drain and refill engine sump every 6,000 km (4,000 miles) or every four months, whichever comes first.
3. Every month check tyre pressures and inspect tyre reads.
4. Every month check brake fluid level and battery acid level.
5. Diesel models. Every month drain water from fuel filter and fuel sedimenter.
6. Owners are under a legal obligation to maintain all exterior lights in order, this also applies to headlamp beam setting, which should be checked at regular intervals by a Rover Distributor or Dealer.
7. For capacities, recommended lubricants, tyre pressures and conversion chart for maintenance based on fuel consumption or hours' running time, see end of book.

AT 1,500 KM (1,000 MILES)
Free service.

AT 6.000 KM (4,000 MILES)
Drain and refill engine.
Renew external oil filter.
Air cleaner, oil bath type: Empty, clean and refill.
Petrol models: Check carburetter slow running.
Petrol models: Check sparking plugs.
Petrol models: Check distributor contact points.
Petrol models: Lubricate and clean distributor.
Check fan belt adjustment.
Check water level in radiator.
Check gearbox and transfer box oil level.
Drain flywheel housing, when drain plug is fitted.
Check fluid level in clutch reservoir.
Check battery acid level and specific gravity of electrolyte.
Check oil level in differentials.
Check oil level in front swivel pin housings.
Check hubs for leakage.
Check oil level in steering box.
Check oil level in steering damper unit.
Check rubber boots on steering joints.
Check wheel alignment
Check fluid level in brake reservoir.
Check and, if necessary, adjust brake shoes.
Check and, if necessary, adjust handbrake shoes.
Change round all road wheels.
Check tyre pressures and inspect tyre treads.
Lubricate propeller shafts.
Road test.

AT 12.000 KM (8,000 MILES)
As 6.000 km (4,000 miles) plus
Clean breather filters.
Petrol models, 6-cylinder: Oil carburetter hydraulic damper.
Petrol models: Replace sparking plugs.
For service replacements use only:
4-cylinder models,
8.0:1 compression ratio. Champion UN 12Y.
7.0:1 compression ratio. Champion N8.
6-cylinder models,
Champion N5.
Check tappet clearance.
Clean, grease and tighten battery terminals.
Check headlamps beam setting.
Check lights and instruments for correct operation.
Oil throttle linkage joints, door locks and hinges, handbrake linkage, bonnet prop-rod, etc.

SUMMARY OF MAINTENANCE ATTENTION—*continued*

AT 18.000 KM (12,000 MILES)

As 6.000 km (4,000 miles) plus
Petrol models: Clean fuel sediment bowl.
Diesel models: Remove injectors, check and, if necessary, adjust.
Diesel models: Renew fuel filter element.
Diesel models: Clean sedimenter.
Lubricate dynamo.
Drain and refill gearbox and transfer box. } Replaces oil level check.
Drain and refill differentials. } Replaces oil level check.
Drain and refill front swivel pin housings. } Replaces oil level check.
Check all body bolts.
Check 'U' bolts and spring clips.
Check propeller shaft bolts.

AT 24.000 KM (16,000 MILES)

As 6.000 km (4,000 miles) and 12.000 km (8,000 miles).

AT 30.000 KM (20,000 MILES)

As 6.000 km (4,000 miles), plus
Clean crankcase emission control, flame-trap type, where fitted.

AT 36.000 KM (24,000 MILES)

As 6.000 km (4,000 miles), 12.000 km (8,000 miles) and 18.000 km (12,000 miles) plus:
Lubricate front propeller shaft sliding joint.

IMPORTANT NOTE:

All fluid in the brake system should be changed every eighteen months. It should also be changed before touring in mountainous areas if not done in the previous nine months. Use only Castrol Girling Brake and Clutch Fluid 'Crimson' Specification J.1703.

Renew all rubber seals in brake system every three years if mileage covered is less than 64.000 km (40,000 miles).

LAND-ROVER
NEW VEHICLE
PRE-DELIVERY
INSPECTION

Carried out by
Rover Distributor or
Dealer

NAME .....

ADDRESS .....

.....

.....

We certify that the New Vehicle Pre-delivery Inspection has been completed

Signature .....

Date .....

LAND-ROVER
NEW VEHICLE PRE-DELIVERY INSPECTION

The Pre-delivery Inspection *must* be carried out in a thorough manner before the vehicle is delivered

The following sequence of operations under the headings of Engine Compartment, Passenger/Load Compartment, Underbody, Road Test and Final Preparation will enable this work to be carried out in the most efficient manner

ENGINE COMPARTMENT—vehicle on a level floor

1. Check engine sump and steering box oil levels.
2. Check radiator fluid level (anti-freeze specific gravity in winter).
3. Check windscreen washer reservoir (isopropyl alcohol in winter).
4. Check battery electrolyte level and battery post terminals for security.
5. Check the clutch and the brake reservoir fluid level.
6. Check fan belt adjustment. 8 to 11 mm (0.312 to 0.437 in.) free movement between fan and crankshaft pulleys.
7. Check for security all electrical connections on dynamo, starter, voltage regulator, fuse box, oil pressure switch, thermostat switch and brake stop lamp switch.
   Petrol models. Check for security electrical connections on coil, distributor, high and low tension cables.
8. **Diesel models.** Check all pipes on distributor pump and injectors, fuel filters and mechanical fuel lift pump.
9. **Diesel models.** Check heater plug connection, also all other engine compartment electrical connections.
10. Check water hoses, drain taps and heater pipe connections (where fitted) for leakage; check tightness of hose clips.
11. Check bonnet lock and safety catch.

PASSENGER/LOAD COMPARTMENT—vehicle on the floor

12. Check the door locks, safety catches, seals, sliding windows and door check stops (private locks where fitted) for correct operation.
13. Check adjustable driver's seat for adjustment and security.
14. Check windscreen ventilators for fit and easy operation.
15. Check handbrake for operation.
16. Check side and head positions on lighting switch and the dipper switch, making sure that the main beam warning light operates correctly. Check interior light where fitted.
17. Check the horn button and horn.
18. Check the flasher switch, flasher lamps and warning light.
19. Switch on the ignition and check the following—ignition and oil pressure warning lights, fuel gauge, ammeter, windscreen wipers and the brake stop light (on Diesel models the services control key is inserted in the centre of the starter switch).
20 Check the battery acid level and specific gravity of electrolyte, also that the battery post terminals and the battery fixings are secure.

CONTINUED OVERLEAF

NEW VEHICLE PRE-DELIVERY INSPECTION

LAND-ROVER

NEW VEHICLE PRE-DELIVERY INSPECTION—*continued*

UNDERBODY—vehicle on ramp

21. Check all wheel securing nuts for tightness, and spare wheel stowage. Carry out a general underbody examination, checking all hydraulic connections.

22. Check the front and rear differential oil levels.

23. Check the gearbox and transfer box oil levels.

24. Check the flywheel housing drain plug, which should be in its stowage bracket.

25. Check the swivel pin housing oil levels.

26. Check the security of the exhaust pipes and silencer.

27. Check all tyre pressures, including spare, and replace all dust caps. (For correct tyre pressures see 'Data' Section).

ROAD TEST

28. Switch on the ignition (service key on the Diesel model inserted in the centre of the starter switch) and start the engine.

29. Check the ignition and oil pressure warning lights for correct operation.

30. **Diesel models.** Check the operation of the governor quadrant control.

31 Take the vehicle on a short road test and check the complete range of gears in both high and low range, checking the operation of the high range four-wheel drive control.

32. Check the clutch, brakes and steering.

33. Check the speedometer for speed and mileage recording.

34. Check for any abnormal noises.

35. Check the heater and rheostat control and the demisters (where fitted).

36. Check the choke warning light by operating the choke control momentarily.

37. **Petrol models.** Switch off the ignition.
Diesel models. Check the engine stop control, also switch off electrical services.

38. Check the tool kit.

FINAL PREPARATION

39. Wash the vehicle and ensure interior and exterior cleanliness.

40. Check for damage to bodywork and paintwork.

41. Check windscreen and side screens for scratches or blemishes.

42. Make sure the owner is thoroughly conversant with all the controls, particularly the transfer box and the four-wheel drive control in high range. If necessary, go out for a short run with the owner.

43. Check that all literature is complete.

LAND-ROVER
FREE SERVICE AT
1,500 KM (1,000 MILES)
Carried out by
Rover Distributor or Dealer

NAME .....

ADDRESS .....

.....

.....

We certify that the Free Service has been completed

Signature .....

Mileage .....

Km .....

Fuel Petrol/Diesel

Gallons .....

Litres .....

Hours .....

Date .....

LAND-ROVER

FREE SERVICE UNDER NORMAL ROAD CONDITIONS AT 1.500 KM (1,000 MILES)

For capacities, recommended lubricants, tyre pressures and conversion chart for maintenance based on fuel consumption or hours' running time, see end of book

Owner's signature.....**authorising work detailed below to be carried out**

Special attention should be given to any complaints made by the owner

Engine

Check oil level daily or weekly, depending on operating conditions.

Clean air cleaner daily or twice daily under really severe conditions of dust or when wading.

Check water level daily or weekly, depending on operating conditions.

Drain water from sedimenter on Diesel models, monthly.

Check for oil leakage, note and report for rectification and action.
Drain and refill engine sump.
Empty, clean and refill oil bath air cleaner.
Petrol models: Check sparking plugs. Gap 0,75 to 0,80 mm (0.029 to 0.032 in.).
Diesel models: Tighten cylinder head bolts; also remove, check and, if necessary, adjust injectors.
Check tappet clearance. 4-cylinder: Inlet and exhaust 0,25 mm (0.010 in.). 6-cylinder: Inlet 0,15 mm (0.006 in.). Exhaust 0,25 mm (0.010 in.). Engine hot.
Petrol models: Check carburetter slow running at normal running temperature; also check for signs of leaks or flooding.
Petrol models: Lubricate and clean distributor.
Petrol models: Check distributor contact points. Gap 0,30 to 0,40 mm (0.010 to .016 in.).
Check water level in radiator, 12 to 19 mm (0.5 to 0.75 in.) below bottom of filler neck. Check anti-freeze specific gravity in winter.
Check fluid level in windscreen washer reservoir (add isopropyl alcohol in winter).
Check fan belt adjustment. 8 to 11 mm (0.312 to 0.437 in.) free movement between fan and crankshaft pulleys.
Lubricate accelerator linkage and check for correct operation.
Check dynamo and exhaust manifold fixings.
Check engine mounting brackets and rubbers.
Note and report any excessive oil leaks for rectification and action.
Drain and refill gearbox and transfer box.
Drain flywheel housing when drain plug is fitted for wading.
Check gearbox mounting brackets and rubbers.
Lubricate main gear lever spherical ball and transfer gear lever linkage.

Gearbox and transfer box

Check oil level daily or weekly when operating under severe stationary working conditions.

Drain and refill gearbox and transfer box monthly when operating under severe wading conditions.

Clutch

Check fluid in reservoir, top up if necessary.
Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).

Fuel system

Absolute cleanliness is essential when dealing with the Diesel fuel system.

Filters will need more frequent attention if poor quality fuel is used.

Petrol models: Clean sediment bowl and filter.

Diesel models: Clean sedimenter.

Check all fuel pipes and connections for leakage.

Electrical

Check battery acid level weekly when operating under severe conditions.

Check battery acid level and specific gravity of electrolyte, also all electrical connections.
Clean, grease and tighten battery terminals.

General

Apply a few spots of oil to throttle linkage joints, door locks and hinges, bonnet prop rod, etc.

CONTINUED OVERLEAF

FREE SERVICE AT 1.500 KM (1,000 MILES)

LAND-ROVER

FREE SERVICE UNDER NORMAL ROAD CONDITIONS AT 1.500 KM (1,000 MILES)

—continued

Axles, front and rear

Drain and refill axles and swivel housings monthly when operating under severe wading conditions.

Note and report any excessive oil leaks for rectification and action.

Drain and refill differentials.

Drain and refill front swivel pin housings.

Steering box and ball joints

Check rubber boots daily when operating under arduous conditions.

Check oil level, top-up if necessary to bottom of filler plug hole.
Check that rubber boots on steering ball joints are not dislodged or damaged.
Check wheel alignment toe-in: 1,2 and 2,4 mm (0.046 and 0.093 in.).

Brakes

Clean out brake drums weekly when wading in deep muddy conditions.

Check fluid level in reservoir, top up if necessary. Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).
Check brake pipes and hoses for chafing and looseness. Report any defects.

Wheels and tyres

Check tyre pressures monthly.

Check tyre pressures and inspect tyre treads. Minimum tread depth 1 mm.
Check also for cuts, bulges and exposed ply or cord structure.
Check all road wheel securing nuts.

Body and road springs

Check all body bolts for tightness
Check security of 'U' bolts and spring clips.
Check straps on rear axle.
Check all body bolts for tightness.
Check all door locks, safety catches and door travel limit stops.

Propeller shafts, front and rear

Lubricate sliding joints daily under really severe conditions or when wading.

Lubricate sliding joints and journals as applicable.

Check securing bolts for tightness.

General

Apply a few spots of oil to throttle linkage joints, door locks and hinges, bonnet prop rod, handbrake linkage, etc.

Road test

Give vehicle a through road test and carry out any further adjustment required, including brakes, clutch, throttle linkage, etc.

Check steering and all gears in high and low range, including the high range four-wheel drive control. See Owner's Instruction Manual for operating information.

Check operation of all lights and instruments.

After test, check for oil, fuel and fluid leaks at all plugs flanges, joints and unions.

Wipe clean all controls, handles, etc. Clean windscreen and lights, interior and exterior of vehicle.

MAINTENANCE ATTENTION AT 6.000 KM (4,000 MILES)

Carried out by Rover Distributor or Dealer

NAME .....

ADDRESS .....

.....

We certify that the 6.000 km (4,000 miles) maintenance attention has been completed

Signature .....

Mileage .....

Km .....

Fuel Petrol/Diesel

Gallons .....

Litres .....

Hours .....

Date .....

MAINTENANCE ATTENTION UNDER NORMAL ROAD CONDITIONS AT 6.000 KM (4,000 MILES)

For capacities, recommended lubricants, tyre pressures and conversion chart for maintenance based on fuel consumption or hours' running time, see end of book

Owner's signature.....**authorising work detailed below to be carried out**

Engine

Check oil level daily or weekly, depending on operating conditions.

Drain and refill engine sump.
Renew external oil filter.

Clean air cleaner daily or twice daily under really severe conditions of dust or when wading.

Empty, clean and refill oil bath air cleaner.

Check water level daily or weekly, depending on operating conditions.

Petrol models: Check carburetter slow running.

Petrol models: Check sparking plugs. Gap 0,75 to 0,80 mm (0.029 to 0.032 in.).

For service replacements use only:

4-cylinder models—
8.0:1 compression ratio. Champion UN 12Y.
7.0:1 compression ratio. Champion N8.

6-cylinder models—
Champion N5.

Drain water from sedimenter on Diesel models monthly.

Petrol models: Check distributor contact points. Gap 0,35 to 0,40 mm (0.014 to 0.016 in.).

Petrol models: Lubricate and clean distributor.

Check fan belt adjustment. 8 to 11 mm (0.312 to 0.437 in.) free movement between fan and crankshaft pulleys.

Check water level in radiator (anti-freeze in winter), 12 to 19 mm (0.5 to 0.75 in.) below bottom of filler neck.

Check fluid level in windscreen washer reservoir (add isopropyl alcohol in winter).

Gearbox and transfer box

Check oil level daily or weekly when operating under severe stationary working conditions.

Check oil level, top-up if necessary to bottom of filler plug holes.

Drain flywheel housing when drain plug is fitted for wading.

Drain and refill gearbox and transfer box monthly when operating under severe wading conditions.

Clutch

Check fluid in reservoir, top-up if necessary. Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).

Electrical

Check battery acid level weekly when operating under severe conditions.

Check battery acid level and specific gravity of electrolyte.

CONTINUED OVERLEAF

MAINTENANCE ATTENTION AT 6.000 KM (4,000 MILES)

MAINTENANCE ATTENTION AT 6.000 KM (4,000 MILES)—*continued*

Axles, front and rear †

Check oil level in differentials, top-up if necessary to bottom of filler plug holes.

Check oil level in front swivel pin housings, top-up if necessary to bottom of filler plug holes.

Check hubs for leakage.

Steering box damper unit, and ball joints †

Check rubber boots daily when operating under arduous conditions.

Check oil level, top-up if necessary to bottom of filler plug hole.

Check oil level in damper unit and top up as necessary. (bonneted control).

Check that rubber boots on steering ball joints are not dislodged or damaged.

Check wheel alignment: toe-in 1,2 to 2,4 mm (0.046 to 0.093 in.).

Brakes †

Clean out brake drums weekly when wading in deep muddy conditions.

Check fluid level in reservoir, top up if necessary. Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).

Check and, if necessary, adjust brake shoes.

Check and, if necessary, adjust handbrake shoes.

See also Road Test.

Wheels and tyres

Check tyre pressures monthly.

Change round all road wheels. Finally tighten all road wheel nuts.

Check tyre pressures and inspect tyre treads. Minimum tread depth 1 mm.

Check also for cuts, bulges and exposed ply or cord structure.

Propeller shafts

Lubricate sliding joints daily under really severe conditions or when wading.

Lubricate propeller shafts.

Road test

Give vehicle a thorough road test and carry out any further adjustments required, including brakes, throttle linkage, etc.

After test, check for oil, fuel and fluid leaks at all plugs, flanges, joints and unions.

Check brake pipes and hoses for chafing and looseness. Report any defects.

Wipe clean all controls, handles, etc. Clean windscreen and lights.

†Items marked with a dagger (†) do not require such frequent maintenance attention when the vehicle is used under stationary working conditions

MAINTENANCE ATTENTION AT 12.000 KM (8,000 MILES)

Carried out by Rover Distributor or Dealer

NAME .....

ADDRESS .....

.....

We certify that the 12.000 km (8,000 miles) maintenance attention has been completed

Signature .....

Mileage .....

Km .....

Fuel Petrol/Diesel

Gallons .....

Litres .....

Hours .....

Date .....

MAINTENANCE ATTENTION UNDER NORMAL ROAD CONDITIONS AT 12.000 KM (8,000 MILES)

For capacities, recommended lubricants, tyre pressures and conversion chart for maintenance based on fuel consumption or hours' running time, see end of book

Owner's signature.....**authorising work detailed below to be carried out**

Engine

Check oil level daily or weekly, depending on operating conditions.

Clean air cleaner daily or twice daily under really severe conditions of dust or when wading.

Check water level daily or weekly, depending on operating conditions.

Drain water from sedimenter on Diesel models monthly.

Drain and refill engine sump.

Renew external oil filter.

Clean breather filters.

Empty, clean and refill oil bath air cleaner.

Petrol models: Check carburetter slow running.

Petrol models, 6-cylinder: Oil carburetter hydraulic damper.

Petrol models: Replace sparking plugs. Gap: 0,75 to 0,80 mm (0.029 to 0.032 in.).

For service replacements use only:

4-cylinder models—
8.0:1 compression ratio. Champion UN 12Y.
7.0:1 compression ratio. Champion N8.

6-cylinder models—
Champion N5.

Petrol models: Check distributor contact points. Gap: 0,35 to 0,40 mm (0.014 to 0.016 in.).

Petrol models: Lubricate and clean distributor.

Check tappet clearance. 4-cylinder—Inlet and exhaust: 0,25 mm (0.010 in.). 6-cylinder—Inlet: 0,15 mm (0.006 in.). Exhaust: 0,25 mm (0.010 in.). Engine hot.

Check fan belt adjustment. 8 to 11 mm (0.312 to 0.437 in.) free movement between fan and crankshaft pulleys.

Engine—*cont.*

Check water level in radiator (anti-freeze in winter), 12 to 19 mm (0.5 to 0.75 in.) below bottom of filler neck.

Check fluid level in windscreen washer reservoir (add isopropyl alcohol in winter).

Gearbox and transfer box

Check oil level daily or weekly when operating under severe stationary working conditions.

Drain and refill gearbox and transfer box monthly when operating under severe wading conditions.

Check oil level, top-up if necessary to bottom of filler plug holes.

Drain flywheel housing when drain plug is fitted for wading.

Clutch

Check fluid in reservoir, top up if necessary. Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).

Electrical

Check battery acid level weekly when operating under severe conditions.

Check battery acid level and specific gravity of electrolyte.

Clean, grease and tighten battery terminals.

CONTINUED OVERLEAF

MAINTENANCE ATTENTION AT 12.000 KM (8,000 MILES)

MAINTENANCE ATTENTION AT 12.000 KM (8,000 MILES)—*continued*

Axles, front and rear †

Check oil level in differentials, top-up if necessary to bottom of filler plug hole.

Check oil level in front swivel pin housings, top-up if necessary to bottom of filler plug holes.

Check hubs for leakage.

Steering box damper unit, and ball joints †

Check rubber boots daily when operating under arduous conditions.

Check oil level, top-up if necessary to bottom of filler plug hole.

Check oil level in damper unit and top up as necessary (bonneted control).

Check that rubber boots on steering ball joints are not dislodged or damaged.

Check wheel alignment: toe-in 1,2 to 2,4 mm (0.046 to 0.093 in.).

Brakes †

Clean out brake drums weekly when wading in deep muddy conditions.

Check fluid level in reservoir, top up if necessary. Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).

Check and, if necessary, adjust brake shoes.

Check and, if necessary, adjust handbrake shoes.

See also Road Test.

Wheels and tyres

Check tyre pressures monthly.

Change round all road wheels. Finally tighten all road wheel nuts.

Check tyre pressures and inspect tyre treads. Minimum tread depth 1 mm.

Check also for cuts, bulges and exposed ply or cord structure.

Propeller shafts

Lubricate sliding joints daily under really severe conditions or when wading.

Lubricate propeller shafts.

Electrical †

Check headlamp beam setting.

Check lights and instruments for correct operation.

General

Oil throttle linkage, joints, door locks and hinges, bonnet prop-rod, handbrake linkage, etc.

Road test

Give vehicle a thorough road test and carry out any further adjustments required, including brakes, throttle linkage, etc.

After test, check for oil, fuel and fluid leaks at all plugs, flanges, joints and unions.

Check brake pipes and hoses for chafing and looseness. Report any defects.

Wipe clean all controls, handles, etc. Clean windscreen and lights.

†Items marked with a dagger (†) do not require such frequent maintenance attention when the vehicle is used under stationary working conditions

MAINTENANCE ATTENTION AT 18.000 KM (12,000 MILES)

Carried out by Rover Distributor or Dealer

NAME .....

ADDRESS .....

.....

We certify that the 18.000 km (12,000 miles) maintenance attention has been completed

Signature .....

Mileage .....

Km .....

Fuel Petrol/Diesel

Gallons .....

Litres .....

Hours .....

Date .....

MAINTENANCE ATTENTION UNDER NORMAL ROAD CONDITIONS AT 18.000 KM (12,000 MILES)

For capacities, recommended lubricants, tyre pressures and conversion chart for maintenance based on fuel consumption or hours' running time, see end of book

Owner's signature ..... **authorising work detailed below to be carried out**

Engine

Check oil level daily or weekly, depending on operating conditions.

Clean air cleaner daily or twice daily under really severe conditions of dust or when wading.

Check water level daily or weekly, depending on operating conditions.

Drain water from sedimenter on Diesel models monthly.

Absolute cleanliness is essential when dealing with the Diesel fuel system. Filters will need more frequent attention if poor quality fuel is used.

Drain and refill engine sump.

Renew external oil filter.

Empty, clean and refill oil bath air cleaner.

Petrol models: Check carburetter slow running.

Petrol models: Clean fuel sediment bowl.

Renew fuel filter element.

Petrol models: Check sparking plugs. Gap: 0,75 to 0,80 mm (0.029 to 0.032 in.).

For service replacements use only:

4-cylinder models—
8.0:1 compression ratio. Champion UN 12Y.
7.0:1 compression ratio. Champion N8.

6-cylinder models—
Champion N5.

Petrol models. Check distributor contact points. Gap: 0,35 to 0,40 mm (0.014 to 0.016 in.).

Petrol models: Lubricate and clean distributor.

Diesel models: Remove injectors and, if necessary, adjust.

Diesel models: Renew fuel filter element.

Diesel models: Clean sedimenter.

Check fan belt adjustment. 8 to 11 mm (0.312 to 0.437 in.) free movement between fan and crankshaft pulleys.

Lubricate dynamo.

Check water level in radiator (anti-freeze in winter), 12 to 19 mm (0.5 to 0.75 in.) below bottom of filler neck.

Engine—*cont.*

Check fluid level in windscreen washer reservoir (add isopropyl alcohol in winter).

Gearbox and transfer box

Check oil level daily or weekly when operating undere severe stationary working conditions.

Drain and refill gearbox and transfer box monthly when operating under severe wading conditions.

Drain and refill gearbox and transfer box.

Drain flywheel housing when drain plug is fitted for wading.

Clutch

Check fluid in reservoir, top up if necessary. Use Castrol Girling Erake and Clutch Fluid 'Crimson' (Specification J.1703).

Electrical

Check battery acid level weekly when operating under severe conditions.

Check battery acid level and specific gravity of electrolyte.

CONTINUED OVERLEAF

MAINTENANCE ATTENTION AT 18.000 KM (12.000 MILES)—*continued*

Axles, front and rear †

Drain and refill differential.

Drain and refill front swivel pin housings.

Check hubs for leakage.

Steering box damper unit, and ball joints †

Check rubber boots daily when operating under arduous conditions.

Check oil level, top-up if necessary to bottom of filler plug hole.

Check oil level in damper unit and top up as necessary. (bonneted control).

Check that rubber boots on steering ball joints are not dislodged or damaged.

Check wheel alignment, toe-in 1,2 to 2,4mm (0.046 to 0.093 in.).

Brakes †

Clean out brake drums weekly when wading in deep muddy conditions.

Check fluid level in reservoir, top up if necessary. Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).

Check and, if necessary, adjust brake shoes.

Check and, if necessary, adjust handbrake shoes.

See also Road Test.

Wheels and tyres

Check tyre pressures monthly.

Change round all road wheels. Finally tighten all road wheel nuts.

Check tyre pressures and inspect tyre treads. Minimum tread depth 1 mm.

Check also for cuts, bulges and exposed ply or cord structure.

Body and road springs †

Check all body bolts for tightness.

Check security of 'U' bolts and spring clips.

Check propeller shaft bolts for tightness.

Propeller shafts, front and rear †

Lubricate sliding joints daily under really severe conditions or when wading.

Lubricate propeller shafts.

Road test

Give vehicle a thorough road test and carry out any further adjustments required, including brakes, throttle linkage, etc.

After test, check for oil, fuel and fluid leaks at all plugs, flanges, joints and unions.

Check brake pipes and hoses for chafing and looseness. Report any defects.

Wipe clean all controls, handles, etc. Clean windscreen and lights.

†Items marked with a dagger (†) do not require such frequent maintenance attention when the vehicle is used under stationary working conditions

MAINTENANCE ATTENTION AT 24.000 KM (16,000 MILES)

Carried out by Rover Distributor or Dealer

NAME .....

ADDRESS .....

.....

We certify that the 24.000 km (16,000 miles) maintenance attention has been completed

Signature .....

Mileage..... .....

Km .....

Fuel Petrol/Diesel

Gallons .....

Litres.....

Hours .....

Date .....

MAINTENANCE ATTENTION UNDER NORMAL ROAD CONDITIONS AT 24.000 KM (16,000 MILES)

For capacities, recommended lubricants, tyre pressures and conversion chart for maintenance based on fuel consumption or hours' running time, see end of book

Owner's signature.....**authorising work detailed below to be carried out**

Engine *Check oil level daily or weekly, depending on operating conditions.* *Clean air cleaner daily or twice daily under really severe conditions of dust or when wading* *Check water level daily or weekly, depending on operating conditions.* *Drain water from sedimenter on Diesel models monthly.*	Drain and refill engine sump. Renew external oil filter. Clean breather filters. Empty, clean and refill oil bath air cleaner. Petrol models: Check carburetter slow running. Petrol models, 6-cylinder: Oil carburetter hydraulic damper. Petrol models: Replace sparking plugs. Gap: 0,75 to 0,80 mm (0.029 to 0.032 in.). For service replacements use only: 4-cylinder models— 8.0:1 compression ratio. Champion UN 12Y. 7.0:1 compression ratio. Champion N8. 6-cylinder models— Champion N5. Petrol models. Check distributor contact points. Gap: 0,35 to 0,40 mm (0.014 to 0.016 in.). Petrol models: Lubricate and clean distributor. Check tappet clearance. 4-cylinder—Inlet and exhaust: 0,25 mm (0.010 in.). 6-cylinder—Inlet: 0,15 mm (0.006 in.). Exhaust: 0,25 mm (0.010 in.). Engine hot. Check fan belt adjustment. 8 to 11 mm (0.312 to 0.437 in.) free movement between fan and crankshaft pulleys. Check water level in radiator (anti-freeze in winter), 12 to 19 mm (0.5 to 0.75 in.) below bottom of filler neck.
Engine—*cont.*	Check fluid level in windscreen washer reservoir (add isopropyl alcohol in winter).
Gearbox and transfer box *Check oil level daily or weekly when operating under severe stationary working conditions.* *Drain and refill gearbox and transfer box monthly when operating under severe wading conditions.*	Check oil level, top-up if necessary to bottom of filler plug holes. Drain flywheel housing when drain plug is fitted for wading.
Clutch	Check fluid in reservoir, top up if necessary. Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).
Electrical *Check battery acid level weekly when operating under severe conditions.*	Check battery acid level and specific gravity of electrolyte. Clean, grease and tighten battery terminals.

CONTINUED OVERLEAF

MAINTENANCE ATTENTION AT 24.000 KM (16,000 MILES)

MAINTENANCE ATTENTION AT 24.000 KM (16,000 MILES)—*continued*

Axles, front and rear †

Check oil level in differentials, top-up if necessary to bottom of filler plug hole.

Check oil level in front swivel pin housings, top-up if necessary to bottom of filler plug holes.

Check hubs for leakage.

Steering box damper unit, and ball joints †

Check rubber boots daily when operating under arduous conditions.

Check oil level, top-up if necessary to bottom of filler plug hole.

Check oil level in damper unit and top up as necessary. (bonneted control).

Check that rubber boots on steering ball joints are not dislodged or damaged.

Check wheel alignment: toe-in 1,2 to 2,4 mm (0.046 to 0.093 in.).

Brakes †

Clean out brake drums weekly when wading in deep muddy conditions

Check fluid level in reservoir, top up if necessary. Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).

Check and, if necessary, adjust brake shoes.

Check and, if necessary, adjust handbrake shoes.

See also Road Test.

Wheels and tyres

Check tyre pressures monthly.

Change round all road wheels. Finally tighten all road wheel nuts.

Check tyre pressures and inspect tyre treads. Minimum tread depth 1 mm.

Check also for cuts, bulges and exposed ply or cord structure.

Propeller shafts

Lubricate sliding joints daily under really severe conditions or when wading.

Lubricate propeller shafts.

Electrical

Check headlamp beam setting.

Check lights and instruments for correct operation.

General

Oil throttle linkage, joints, door locks and hinges, bonnet prop-rod, handbrake linkage, etc

Road test

Give vehicle a thorough road test and carry out any further adjustments required, including brakes, throttle linkage, etc

After test, check for oil, fuel and fluid leaks at all plugs, flanges, joints and unions.

Check brake pipes and hoses for chafing and looseness. Report any defects.

Wipe clean all controls, handles, etc. Clean windscreen and lights.

†Items marked with a dagger (†) do not require such frequent maintenance attention when the vehicle is used under stationary working conditions

MAINTENANCE ATTENTION AT 30.000 KM (20,000 MILES)

Carried out by Rover Distributor or Dealer

NAME .....

ADDRESS .....

.....

We certify that the 30.000 km (20,000 miles) maintenance attention has been completed

Signature .....

Mileage .....

Km .....

Fuel Petrol/Diesel

Gallons .....

Litres .....

Hours .....

Date .....

MAINTENANCE ATTENTION UNDER NORMAL ROAD CONDITIONS AT 30.000 KM (20,000 MILES)

For capacities, recommended lubricants, tyre pressures and conversion chart for maintenance based on fuel consumption or hours' running time, see end of book

Owner's signature.....**authorising work detailed below to be carried out**

Engine

Check oil level daily or weekly, depending on operating conditions.

Clean air cleaner daily or twice daily under really severe conditions of dust or when wading.

Check water level daily or weekly, depending on operating conditions.

Drain water from sedimenter on Diesel models monthly.

Drain and refill engine sump.

Renew external oil filter.

Empty, clean and refill oil bath air cleaner.

Clean crankcase emission control, flame-trap type, as applicable.

Petrol models: Check carburetter slow running.

Petrol models: Check sparking plugs. Gap: 0,75 to 0,80 mm (0.029 to 0.032 in.).

For service replacements use only:

4-cylinder models—
8.0:1 compression ratio. Champion UN 12Y.
7.0:1 compression ratio. Champion N8.

6-cylinder models—
Champion N5.

Petrol models: Check distributor contact points. Gap: 0,35 to 0,40 mm (0.014 to 0.016 in.).

Petrol models: Lubricate and clean distributor.

Check fan belt adjustment. 8 to 11 mm (0.312 to 0.437 in.) free movement between fan and crankshaft pulleys.

Check water level in radiator (anti-freeze in winter), 12 to 19 mm (0.5 to 0.75 in.) below bottom of filler neck.

Check fluid level in windscreen washer reservoir (add Isopropyl alcohol in winter).

Gearbox and transfer box

Check oil level daily or weekly when operating under severe stationary working conditions.

Drain and refill gearbox and transfer box monthly when operating under severe wading conditions.

Check oil level, top-up if necessary to bottom of filler plug holes.

Drain flywheel housing when drain plug is fitted for wading.

Clutch

Check fluid in reservoir, top up if necessary. Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).

Electrical

Check battery acid level weekly when operating under severe conditions.

Check battery acid level and specific gravity of electrolyte.

CONTINUED OVERLEAF

MAINTENANCE ATTENTION AT 30.000 KM (20,000 MILES)—*continued*

Axles, front and rear †

Check oil level in differentials, top-up if necessary to bottom of filler plug holes.

Check oil level in front swivel pin housing, top-up if necessary to bottom of filler plug holes.

Check hubs for leakage.

Steering box damper unit, and ball joints †

Check rubber boots daily when operating under arduous conditions.

Check oil level, top-up if necessary to bottom of filler plug hole.

Check oil level in damper unit and top up as necessary. (bonneted control).

Check that rubber boots on steering ball joints are not dislodged or damaged.

Check wheel alignment, toe-in 1,2 to 2,4 mm (0.046 to 0.093 in.).

Brakes †

Clean out brake drums weekly when wading in deep muddy conditions.

Check fluid level in reservoir, top up if necessary. Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).

Check and, if necessary, adjust brake shoes.

Check and, if necessary, adjust handbrake shoes.

See also Road Test.

Wheels and tyres

Check tyre pressures monthly.

Change round all road wheels. Finally tighten all road wheel nuts.

Check tyre pressures and inspect tyre treads. Minimum tread depth 1 mm.

Check also for cuts, bulges and exposed ply or cord structure.

Propeller shafts

Lubricate sliding joints daily under really severe conditions or when wading.

Lubricate propeller shafts.

Road test

Give vehicle a thorough road test and carry out any further adjustments required, including brakes, throttle linkage, etc.

After test, check for oil, fuel and fluid leaks at all plugs flanges, joints and unions.

Check brake pipes and hoses for chafing and looseness. Report any defects.

Wipe clean all controls, handles, etc. Clean windscreen and lights.

†Items marked with a dagger (†) do not require such frequent maintenance attention when the vehicle is used under stationary working conditions

MAINTENANCE ATTENTION AT 36.000 KM (24,000 MILES)

Carried out by Rover Distributor or Dealer

NAME .....

ADDRESS .....

.....

We certify that the 36.000 km 24,000 miles) maintenance attention has been completed

Signature .....

Mileage .....

Km .....

Fuel **Petrol/Diesel**

Gallons .....

Litres .....

Hours .....

Date .....

MAINTENANCE ATTENTION UNDER NORMAL ROAD CONDITIONS AT 36.000 KM (24,000 MILES)

For capacities, recommended lubricants, tyre pressures and conversion chart for maintenance based on fuel consumption or hours' running time, see end of book

Owner's signature ..... **authorising work detailed below to be carried out**

Engine

Check oil level daily or weekly, depending on operating conditions.

Clean air cleaner daily or twice daily under really severe conditions of dust or when wading.

Check water level daily or weekly, depending on operating conditions.

Drain water from sedimenter on Diesel models monthly.

Absolute cleanliness is essential when dealing with the Diesel fuel system. Filters will need more frequent attention if poor quality fuel is used.

Drain and refill engine sump.

Renew external oil filter.

Clean breather filters.

Empty, clean and refill oil bath air cleaner.

Petrol models: Check carburetter slow running.

Petrol models: Replace sparking plugs. Gap: 0,75 to 0,80 mm (0.029 to 0.032 in.).

For service replacements use only:

4-cylinder models—
8.0:1 compression ratio. Champion UN 12Y.
7.0:1 compression ratio. Champion N8.

6-cylinder models—
Champion N5.

Petrol models, 6-cylinder: Oil carburetter hydraulic damper.

Petrol models: Clean fuel sediment bowl.
Renew fuel filter.

Petrol models: Check distributor contact points. Gap: 0,30 to 0,40 mm (0.014 to 0.016 in.).

Petrol models: Lubricate and clean distributor.

Check tappet clearance. 4-cylinder—Inlet and exhaust: 0,25 mm (0.010 in.). 6-cylinder—Inlet: 0,15 mm (0.006 in.). Exhaust: 0,25 mm (0.010 in.). Engine hot.

Diesel models: Remove injectors, check and, if necessary, adjust.

Diesel models: Renew fuel filter element.

Diesel models: Clean sedimenter.

Engine—*cont.*

Check fan belt adjustment. 8 to 11 mm (0.312 to 0.437 in.) free movement between fan and crankshaft pulleys.

Lubricate dynamo.

Check water level in radiator (anti-freeze in winter), 12 to 19 mm (0.5 to 0.75 in.) below bottom of filler neck.

Check fluid level in windscreen washer reservoir (add isopropyl alcohol in winter).

Gearbox and transfer box

Check oil level daily or weekly when operating under severe stationary working conditions

Drain and refill gearbox and transfer box monthly when operating under severe wading conditions.

Drain and refill gearbox and transfer box.

Drain flywheel housing when drain plug is fitted for wading.

Clutch

Check fluid in reservoir, top up if necessary. Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).

Electrical

Check battery acid level weekly when operating under severe conditions.

Check battery acid level and specific gravity of electrolyte.

Clean, grease and tighten battery terminals.

CONTINUED OVERLEAF

MAINTENANCE ATTENTION AT 36.000 KM (24,000 MILES)

MAINTENANCE ATTENTION AT 36.000 KM (24,000 MILES)—*continued*

Axles, front and rear †

Drain and refill differentials.

Drain and refill front swivel pin housings.

Check hubs for leakage.

Steering box damper unit, and ball joints †

Check rubber boots daily when operating under arduous conditions.

Check oil level, top-up if necessary to bottom of filler plug hole.

Check oil level in damper unit and top up as necessary. (bonneted control).

Check that rubber boots on steering ball joints are not dislodged or damaged.

Check wheel alignment: toe-in 1,2 to 2,4 mm (0.046 to 0.093 in.).

Brakes †

Clean out brake drums weekly when wading in deep muddy conditions.

Check fluid level in reservoir, top up if necessary. Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J.1703).

Check and, if necessary, adjust brake shoes.

Check and, if necessary, adjust handbrake shoes.

See also Road Test.

Wheels and tyres

Check tyre pressures monthly

Change round all road wheels. Finally tighten all road wheel nuts.

Check tyre pressures and inspect tyre treads. Minimum tread depth 1 mm.

Check also for cuts, bulges and exposed ply or cord structure.

Body and road springs †

Check all body bolts for tightness.

Check security of 'U' bolts and spring clips.

Propeller shafts, front and rear †

Lubricate sliding joints daily under really severe conditions or when wading.

Lubricate propeller shafts including front sliding joint.

Check propeller shaft bolts for tightness.

Electrical †

Check headlamp beam setting.

Check lights and instruments for correct operation.

General

Oil throttle linkage joints, door locks and hinges, bonnet prop rod, handbrake linkage, etc.

Road test

Give vehicle a thorough road test and carry out any further adjustments required, including brakes, throttle linkage, etc.

After test, check for oil, fuel and fluid leaks at all plugs, flanges, joints and unions.

Check brake pipes and hoses for chafing and looseness. Report any defects.

Wipe clean all controls, handles, etc. Clean windscreen and lights.

†Items marked with a dagger (†) do not require such frequent maintenance attention when the vehicle is used under stationary working conditions

Now that all the vouchers in this book have been completed you are strongly advised to apply to your Rover Distributor or Dealer for a copy of the Continuation Maintenance Schedule book, Part No. 606311 to enable the good work of preventative maintenance to be continued for another 36.000 km (24,000 miles).

CONVERSION CHART

Kilometres and miles, fuel consumption and hours' running time

Kilometres	Miles	Fuel consumption				Hours' running time
		Petrol		Diesel		
		Litres	Gallons	Litres	Gallons	
6.000	4,000	900	200	610	135	160
12.000	8,000	1.800	400	1.220	270	320
18.000	12,000	2.700	600	1.830	405	480
24.000	16,000	3.600	800	2.440	530	640
30,000	20,000	4.500	1,000	3.050	665	800
36.000	24,000	5.400	1,200	3.660	800	960

Capacities

Component	Litres	Imperial unit	US unit
Engine sump oil, 4-cylinder	6,0	11 pints	13 pints
Engine sump oil, 6-cylinder	6,8	12 pints	14 pints
Extra when refilling after fitting new filter, 4-cylinder	0,85	1.5 pints	1.8 pints
Extra when refilling after fitting new filter, 6-cylinder	0,5	1 pint	1.2 pints
Air cleaner oil, 4-cylinder	0,85	1.5 pints	1.8 pints
Air cleaner oil, 6-cylinder	0,5	1 pint	1.2 pints
Main gearbox oil	1,5	2.5 pints	3 pints
Transfer box oil	2,5	4.5 pints	5.5 pints
Rear differential (Standard)	1,75	3 pints	3.5 pints
Front differential (Standard)	1,75	3 pints	3.5 pints
Rear differential (ENV type)	1,4	2.5 pints	3.5 pints
Front differential (ENV type)	1,4	2.5 pints	3.5 pints
Swivel pin housing oil (each)	0,5	1 pint	1.2 pints
Fuel tank, 4-cylinder models	45	10 gallons	12 gallons
Fuel tank, 6-cylinder models except Station Wagon	50	11 gallons	13 gallons
Fuel tank, 6-cylinder Station Wagon	73	16 gallons	19 gallons
Cooling system, 4-cylinder Petrol models	8,1	14.25 pints	17.1 pints
Cooling system, 6-cylinder Petrol models	11,2	20 pints	24 pints
Cooling system, Diesel models	7,8	13.75 pints	16.5 pints
Hydraulic front winch, supply tank	20,0	4.5 gallons	7.5 gallons
Hydraulic front winch, gearbox	1,0	2 pints	2.4 pints

Recommended lubricants and fluids

These recommendations apply to temperate climates where operational temperatures are above —10°C (14°F).
Lubricants marked with an asterisk (*) are multigrade oils suitable for all temperature ranges.
Information on oil recommendations for use under extreme winter conditions can be obtained from your local Rover Distributor or Dealer or The Rover Co. Ltd, Technical Service Department.

COMPONENTS	SAE	BP	CASTROL	DUCKHAM'S	ESSO	MOBIL	REGENT TEXACO-CALTEX	SHELL
Petrol models **Engine, air cleaner and governor**	20W	*BP Super Visco-Static 20W-50	*Castrol GTX	Duckham's Q20-50 Motor Oil	Uniflo or Esso Motor Oil 20W	Mobiloil Super or Mobiloil Special 20W-50	Havoline 20W-50	*Shell Super Oil
Diesel models **Engine and air cleaner**	20W	BP Vanellus 20W	Castrol CRI 20	Duckham's Fleetol HDX20	Essolube HDX 20	Delvac 1120 or Delvac 1220	Ursa Heavy Duty Oil 20-20W	Shell Rotella S or T 20/20W
Gearbox and transfer box **Differentials and swivel pin housings** **Steering box** **Steering relay unit** **Rear power take-off, pulley unit and capstan winch hydraulic winch gearbox**	90EP	BP Gear Oil SAE 90EP	Castrol Hypoy	Duckham's Hypoid 90	Esso Gear Oil GP 90/140	Mobilube GX 90	Multigear Lubricant EP 90	Spirax 90 EP
Hydraulic winch supply tank	—	*BP Super Visco-Static 20W-50	*Castrol GTX	Duckham's Q20-50 Motor Oil	Esso Motor Oil 20	Mobiloil Special 20W/50 **or** Delvac 1120	Havoline 20/20W	*Shell Super Oil or Shell Rotellus
Lubrication nipples	—	BP Energrease L2	Castrol LM Grease	Duckham's LB10 Grease	Esso Multi-purpose Grease H	Mobilgrease MP or Mobil-grease **Super**	Marfak All-purpose	Retinax A or Darina AX
Anti-freeze solutions		BP Anti-Frost	Castrol Anti-Freeze	'Standard' Anti-Freeze	Esso Anti-Freeze	Mobil Permazone	PT Anti-Freeze	Shell Anti-Freeze
		Bluecol and Prestone or any anti-freeze solution conforming to British Standards BS 3151 or 3152						
Brake and clutch fluid	Castrol Girling Brake and Clutch Fluid 'Crimson' Specification J. 1703							

Tyre pressures

Model		Normal				Emergency soft			
		Load under 250 kg (550 lb.)		Load over 250 kg (550 lb.)		Load under 250 kg (550 lb.)		Load over 250 kg (550 lb.)	
88 Bonneted Control models		Front	Rear	Front	Rear	Front	Rear	Front	Rear
6.00, 6.50 and 7.00 x 16.00	kg/cm²	1,8	1,8	1,8	2,1	1,1	1,1	1,1	1,4
	lb/sq in.	25	25	25	30	15	15	15	20
	bars	1.72	1.72	1.72	2.07	1.03	1.03	1.03	1.38
7.50 x 16.00	kg/cm²	1,8	1,8	1,8	2,1	0,8	0,8	0,8	1,4
	lb/sq in.	25	25	25	30	12	12	12	20
	bars	1.72	1.72	1.72	2.07	0.83	0.83	0.83	1.38
109 Bonneted Control and 1 Ton models									
7.50 x 16.00	kg/cm²	1,8	1,8	1,8	2,5	1,1	1,1	1,1	1,8
	lb/sq in.	25	25	25	36	15	15	15	26
	bars	1.72	1.72	1.72	2.48	1.03	1.03	1.03	1.79
Michelin 7.50 x 16.00 XY	kg/cm²	1,8	1,8	1,8	3,0	1,1	1,1	1,1	2,5
	lb/sq in.	25	25	25	42	15	15	15	35
	bars	1.72	1.72	1.72	2.89	1.03	1.03	1.03	2.4
9.00 x 16.00	kg/cm²	1,4	1,4	1,4	2,1	0,7	0,7	0,7	1,4
	lb/sq in.	20	20	20	30	10	10	10	20
	bars	1.38	1.38	1.38	2.07	0.7	0.7	0.7	1,38

Pressures should be checked and adjusted monthly, paying attention to the following points:

1. Whenever possible, check with the tyres cold, as the pressure is about 0,1 kg/cm² (2 lb/sq in.), 0.17 bars higher at running temperature.
2. Always replace the valve caps, as they form a positive seal on the valves.
3. Any unusual pressure loss in excess of 0,05 to 0,20 kg/cm² (1 to 3 lb/sq in.), 0.07 to 0.21 bars per month should be investigated and corrected.
4. Always check the spare wheel, so that it is ready for use at any time.

Sandwell Printing Limited 96730

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