

SECTION 5

Workshop maintenance

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Workshop maintenance

WORKSHOP MAINTENANCE

It is recommended that the maintenance procedures covered in this section of the handbook, should only be carried out by qualified personnel in a fully equipped workshop; preferably an authorised Land Rover dealer. However, if the vehicle is being operated in a remote area, where full workshop facilities are not available, some maintenance can be carried out, provided that it is completed in safe conditions by experienced personnel.

WARNING

DO NOT carry out any maintenance in dusty, damp or dirty conditions.

NOTE: *Some of the servicing procedures require specialised knowledge and equipment, and therefore MUST be carried out by a qualified person, familiar with the maintenance and safety procedures practised by Land Rover dealers. These NECESSARY procedures are NOT covered in this handbook and should be referred to a Land Rover dealer.*

Servicing schedules

In normal operating conditions, servicing should be carried out at intervals of 6,500 miles (10,000 km) or every six months, whichever is sooner.

IMPORTANT INFORMATION

Special operating conditions

When a vehicle is operated in extremely arduous conditions, or on dusty, wet or muddy terrain, more frequent attention must be paid to servicing requirements.

For example; if your vehicle experiences deep wading conditions, even DAILY servicing could be necessary to ensure the continued safe and reliable operation of the vehicle.

Contact a Land Rover dealer for advice.

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Emission control

Your vehicle is fitted with various items of emission control equipment, designed to meet specific territorial requirements.

You should be aware that unauthorised replacement, modification or tampering with this equipment by an owner or motor vehicle repairer, may be unlawful and subject to legal penalties.

In addition, engine settings must NOT be tampered with. These have been established to ensure that your vehicle complies with stringent exhaust emission regulations. Incorrect engine settings may adversely affect exhaust emissions, engine performance and fuel consumption, as well as causing high temperatures, which will result in damage to the catalytic converter and the vehicle.

Replacement parts

It is essential that only Land Rover parts are used, safety features embodied in the vehicle may be impaired if other, non-approved parts are used. In certain territories, legislation prohibits the fitting of parts not to the manufacturer's specification.

WARNING

The fitting of parts of inferior quality, or the carrying out of non-approved alterations or conversions, may be dangerous and could affect the safety of the vehicle and occupants. It could also invalidate the terms and conditions of the vehicle warranty.

Road testing on dynamometers (‘rolling roads’)

WARNING

Because your vehicle is equipped with permanent four-wheel drive, it is essential that any dynamometer testing is carried out ONLY by a qualified person, familiar with the dynamometer testing and safety procedures practised by Land Rover dealers. Contact your Land Rover dealer for further information.

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SAFETY IN THE GARAGE

Whenever you carry out maintenance on your vehicle, the following safety precautions should be observed at all times.

- ALWAYS keep hands, tools and items of clothing clear of all drive belts and pulleys whilst they are in operation.
- DO NOT touch exhaust or cooling system components until they are cool.
- DO NOT touch electrical leads or components with the starter switch turned on.
- NEVER leave the engine running in an unventilated area; exhaust gases are poisonous and contain carbon monoxide, which can cause unconsciousness and can be fatal.
- DO NOT work beneath the vehicle with the lifting jack as the only means of support.
- Ensure sparks and open flame are kept away from the engine and battery compartments.
- DO NOT use any lubricants, solvents or sealants etc, without first reading any warnings and instructions supplied with these substances; they could be harmful if improperly used.

WARNING

Remember, cooling fans and air conditioning system condenser fans (if fitted), may continue to operate after the engine is switched off. Always wait until the fans have completely stopped moving before working in the engine compartment.

Fuel system safety

Fuel vapour is highly flammable and in confined spaces, is also very explosive and toxic. When fuel evaporates, it produces 150 times its own volume in vapour and when mixed with air, becomes an easily ignitable mixture; consequently even a small spillage is very dangerous.

It is recommended that you always have a FOAM, CO₂ GAS, or POWDER type fire extinguisher close at hand when working with fuel or the fuel system.

ALWAYS disconnect the battery negative lead BEFORE carrying out work on the fuel system.

WARNING

It is imperative that the battery is disconnected BEFORE and not during any work on the fuel system, as arcing at the battery terminal could ignite fuel vapour in the atmosphere.

Whenever fuel is being handled, transferred or stored, or when carrying out work on the fuel system, all forms of ignition MUST be extinguished or removed, any lighting being used MUST be flameproof and kept clear of the fuel.

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Poisonous liquids

Most liquids and lubricants used in motor vehicles are poisonous and should not be consumed or brought into contact with open wounds. These include; battery acid, anti-freeze, brake and power steering fluid, as well as petrol, engine oil and windscreen washer additives.

For your own safety, ALWAYS read and obey all instructions printed on labels and containers.

Used engine oil

Prolonged contact with engine oil can cause serious skin disorders, including dermatitis and skin cancer. ALWAYS wash thoroughly after contact.

It is illegal to pollute drains, water courses or soil with toxic chemicals such as used engine oil. ALWAYS dispose of vehicle liquids and lubricants at authorised waste disposal sites, or at garages which provide facilities for the receipt of discharged batteries, used engine oil and toxic chemicals. If in doubt, contact your Local Authority for advice.

PROTECT THE ENVIRONMENT!

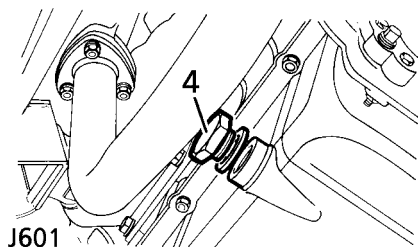
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ENGINE OIL RENEWAL

NOTE: For engine oil check & top-up see 'Owner maintenance'.

WARNING

DO NOT attempt to drain the engine sump if the engine has been running for some time, the engine oil will be hot and may cause severe scalding.



With the vehicle resting on firm, level ground, run the engine for a few minutes so that the oil will drain more easily. Turn the starter switch to position '0' and disconnect the battery negative lead.

Remove the oil filler cap and position a suitable container under the oil drain plug (4) to collect the used oil.

Remove the drain plug and its washer and allow the oil to drain completely.

NOTE: If, by necessity, this procedure is being carried out in dusty or sandy conditions, refit the drain plug as soon as the main bulk of the oil has drained.

When the sump has fully drained, clean the draining plug and the surrounding area of the sump and refit with a new copper washer.

Refill the sump with fresh oil of the correct specification (see 'General data'). Refit the filler cap and let the vehicle stand for five minutes to allow the oil to drain back into the sump. Check the oil level using the dipstick (as described in 'Owner maintenance') and top up until the correct level is obtained.

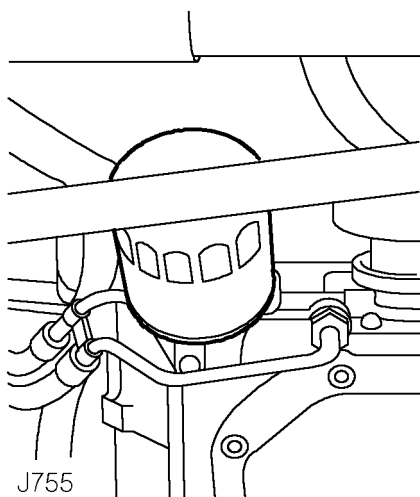
- **DO NOT use oil previously drained from the engine.**
- **DO NOT OVERFILL!**

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ENGINE OIL FILTER RENEWAL

To prevent any possibility of air locks in the oil pump, it is recommended that filter renewal is carried out AFTER the engine oil has been changed.

To minimise the risk of draining the oil pump, ensure that the oil is at the correct operating level before removing the filter.



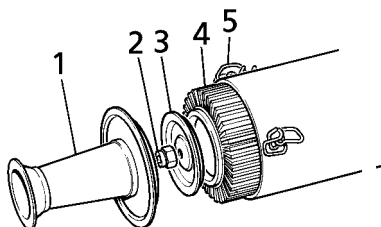
- Turn the starter switch to position '0' and follow the battery disconnection procedure (see *'Owner maintenance'*).
- Clean the area around the head of the filter.
- Place a suitable container beneath the filter.
- Using a strap wrench, unscrew the filter and discard it safely.
- Half fill the filter and smear the rubber washer of the new filter, with clean engine oil of the correct specification (see *'General data'*).
- Screw the filter on clockwise until the rubber washer touches up against the machined face, then tighten a further half turn using hand pressure only. DO NOT OVERTIGHTEN.
- Connect the battery negative lead and run the engine at a fast idle for five minutes.
- Check the filter for leaks.

Stop the engine and let the vehicle stand for five minutes to let the oil drain back into the sump. Check the oil level (see *'Owner maintenance'*) and top up if necessary.

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AIR CLEANER ELEMENT RENEWAL

Engine performance will be seriously affected if the air cleaner element becomes choked with dust and other airborne particles.

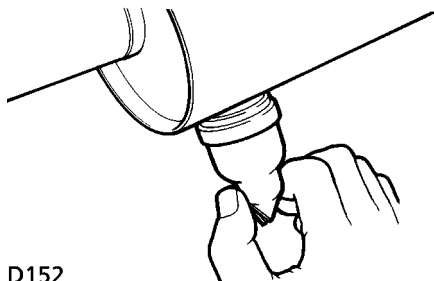


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- Release the three clips (5) and remove the inlet tube (1).
- Remove the nut (2) and end plate (3).
- Withdraw the element (4) and discard. DO NOT attempt to clean and re-fit the old element.
- Insert the new element and re-assemble in the reverse of the removal procedure.

Air cleaner dump valve check

The dump valve is situated on the base of the air cleaner support bracket.

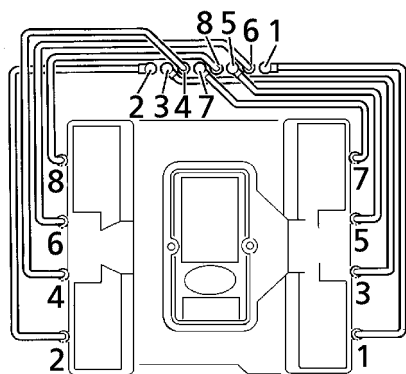


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- Squeeze open the dump valve (as illustration) and check that the interior is clean. Renew the valve if perished.

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SPARK PLUG CHECK/RENEWAL



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- Remove the H.T. leads from the spark plugs.
- Remove the plugs using a spark plug socket and ratchet.
- If they are in poor condition, replace with new plugs of the correct specification (see 'General data').
- Set the spark plug gaps to the correct setting (see 'General data').
- Fit the spark plugs and washers - DO NOT OVERTIGHTEN.

NOTE: Fitting incorrect grades of spark plug, may lead to piston overheating and engine failure.

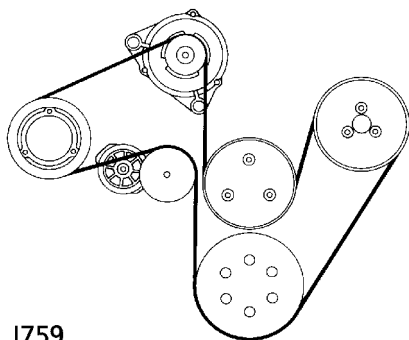
- Refit the H.T. leads in the correct order (as illustration), ensuring that the leads are firmly seated onto the plugs.

IGNITION WIRING & H.T. LEAD CHECK

Check the H.T. leads for insulation cracking, or corrosion at end contacts. If the H.T. leads are damaged, replace with new leads of the same specification.

NOTE: Ensure leads are reconnected in the correct order or the engine will misfire.

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DRIVE BELTS

Driving belt tension

The drive belt and all pulleys should be examined regularly for any damage, deterioration or fouling (grit, mud, oil etc). Replace or clean where necessary.

After every off-road session, the drive belt should be inspected for cuts and possible damage caused by stones. If the belt has jumped, reposition it correctly and, if necessary, replace it at the earliest opportunity.

WARNING

Before checking any drive belt; to prevent the possibility of serious injury, follow the battery disconnection procedure (see 'Owner maintenance') to prevent the engine from being started.

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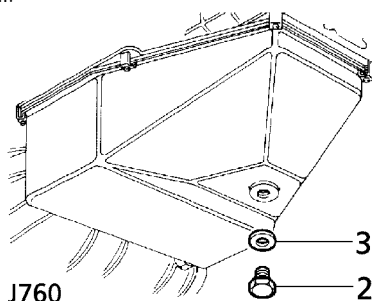
MAIN GEARBOX OIL RENEWAL

WARNING

For safety, DO NOT work underneath the vehicle unless it is safely parked with the wheels chocked, or is supported by heavy duty stands.

Extreme care should be taken when draining gearbox oil, it may be hot and cause severe scalding.

Ensure the vehicle is parked on firm, level ground and chock the wheels. Place a suitable container under the gearbox to catch the used oil.



WARNING

Use only NEW oil - DO NOT use oil previously drained from the system.

- Withdraw the gearbox dipstick, located to the rear of the right hand rocker cover, to assist with oil drainage.
- Remove the drain plug (2) and allow the oil to drain completely.
- Clean and refit the drain plug, using a new sealing washer (3). Tighten the plug to a torque of 10 Nm (7.5 lbf/ft).
- Refill the gearbox through the dipstick tube with new oil of the correct specification (see 'General data').
- Let the vehicle stand for five minutes, then check the oil level using the dipstick (as described in 'Owner maintenance') and top up until the correct level is obtained.
- Refit the dipstick.

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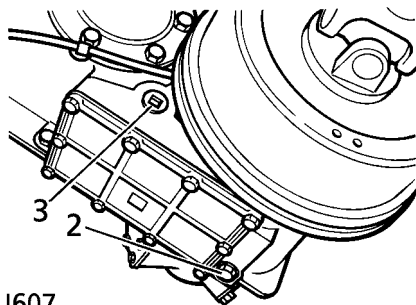
TRANSFER GEARBOX OIL RENEWAL

WARNING

For safety, DO NOT work underneath the vehicle unless it is safely parked with the wheels chocked, or is supported by heavy duty stands.

Extreme care should be taken when draining gearbox oil, it may be hot and cause severe scalding.

Ensure the vehicle is parked on firm, level ground and chock the wheels. Place a suitable container under the gearbox to catch the used oil.



- Clean the area surrounding the drain plug (2) and filler level (3) plug, to prevent contamination of the gearbox.
- Remove the drain plug (2) and allow the oil to drain completely.

- Clean and refit the plug with a new washer. Tighten to a torque of 30 Nm (23 lbf/ft).
- Remove the filler level plug (3) and inject the correct grade of oil (see 'General data') until it begins to run from the hole.

WARNING

Use only NEW oil - DO NOT use oil previously drained from the system.

- Clean and refit the filler level plug. Tighten to a torque of 30 Nm (23 lbf/ft).
- Wipe any surplus oil from the area and remove the wheel chocks.

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FRONT/REAR AXLE OIL RENEWAL

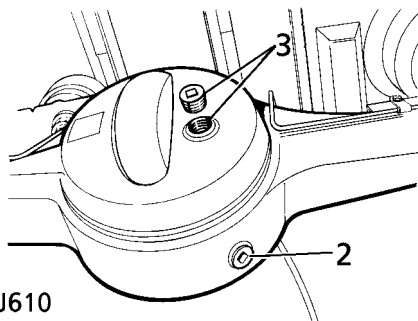
WARNING

For safety, DO NOT work underneath the vehicle unless it is safely parked with the wheels chocked, or is supported by heavy duty stands.

Extreme care should be taken when draining axle oil, it may be hot and cause severe scalding.

NOTE: A rear axle is illustrated, but the procedure is the same for both axles.

Ensure the vehicle is parked on firm, level ground and chock the wheels. Place a suitable container under the axle to be drained to catch the used oil.



J610

- Clean and refit the drain plug.
- Remove the filler level plug (3) and inject the correct grade of oil (see 'General data') until it begins to run from the hole.

WARNING

Use only NEW oil - DO NOT use oil previously drained from the system.

- Clean and refit the filler level plug.
- Wipe any surplus oil from the area and remove the wheel chocks.

- Clean the area surrounding the drain plug (2) and filler level plug (3), to prevent contamination of the axles.
- Remove the drain plug (2) and allow the oil to drain completely.

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BRAKE PAD, DISC AND CALIPER CHECK

If the vehicle is being operated in arduous conditions, especially when deep mud and/or wading situations are regularly encountered, the condition of the brake pads, discs and calipers should be checked at least weekly, if not even more frequently.

Hydraulic disc brakes are fitted to the front and rear wheels, they are self adjusting and therefore, no provision for manual adjustment is made.

- Check the thickness of the brake pads, which should not be less than 0.125 in (3 mm).
- Check for uneven brake pad wear.
- Check for oil contamination on the brake discs and pads.
- Check condition of the brake discs for wear and/or corrosion.
- Check the brake calipers for any leaking brake fluid.

If necessary, any replacement or rectification of discs, brakes or calipers, should be carried out by a Land Rover dealer.

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HANDBRAKE CHECK/ADJUSTMENT

WARNING

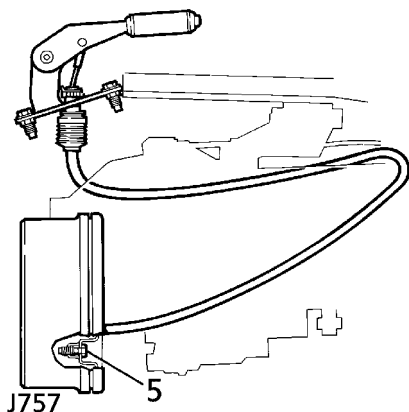
For safety, DO NOT work underneath the vehicle unless it is safely parked with the wheels chocked, or is supported by heavy duty stands.

Ensure the vehicle is parked on firm, level ground and chock the wheels.

Select 'P' and release the handbrake.

If the handbrake movement is excessive, adjust as follows:

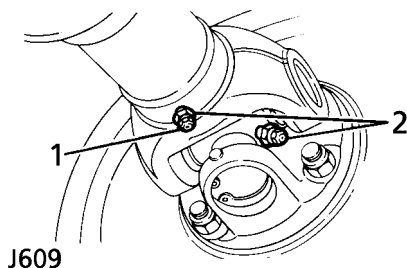
- Raise one rear wheel clear of the ground and ensure it is supported securely with an axle stand.



- Tighten the adjusting bolt (5) to a torque of 25 Nm (18 lbf/ft) and ensure that the brake drum is locked - if this is not the case, consult a Land Rover dealer.
- Now loosen the adjusting bolt by turning it 1.5 turns counter-clockwise.

The brake drum should now be free to rotate, and the brake shoes correctly adjusted.

PROPELLER SHAFT LUBRICATION



- Clean all the grease nipples on the front and rear propshaft universal joints (1). Charge a low pressure hand grease gun with the recommended grade of grease (see 'General data') and apply to the grease nipples (2).

WARNING

Any additional greasing of the propshaft MUST be carried out by an authorised Land Rover dealer.