Owner Maintenance



Maintenance

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ROUTINE MAINTENANCE

Regular systematic maintenance is the key to ensuring the continued reliability and efficiency of your vehicle.

Maintenance is the owner's responsibility and you must ensure that owner maintenance operations, brake fluid and coolant changes are carried out when required and according to the manufacturer's recommendations.

The routine maintenance requirements for your vehicle are shown in the Service Portfolio book. Most of this necessary workshop maintenance requires specialised knowledge and equipment, and should preferably be entrusted to a Land Rover Retailer.

Passport to Service

The Passport to Service book includes a Service Record section, which enables a record to be kept of all services that are carried out on the vehicle. This section of the book also provides a facility for the Retailer to record brake fluid and camshaft drive belt changes, as well as the fitting of replacement airbag modules.

Ensure your Retailer signs and stamps the book after each service.

Brake fluid and coolant replacement

The brake fluid and engine coolant (anti-freeze and water solution) needs to be replaced every 36,000 miles (60,000 km) or 36 months, whichever is the sooner.
Your Retailer will replace the brake fluid and coolant at the scheduled services.

OWNER MAINTENANCE

In addition to the routine services referred to previously, a number of simple checks must be carried out more frequently. You can carry out these checks yourself and advice is given on the pages that follow.

Any significant or sudden drop in fluid levels, or uneven tire wear, should be reported to a dealer without delay.

Daily checks

- Operation of lights, horn, direction indicators, wipers, washers and warning lights.
- Operation of seat belts and brakes.
- Look for fluid deposits underneath the vehicle that might indicate a leak.

Weekly checks (or every 250 miles (400 km)

- Engine oil level.

  NOTE: *The engine oil level should be checked more frequently if the vehicle is driven for prolonged periods at high speeds.*
- Coolant level.
- Screen washer fluid level.
- Tire pressures and condition.
- Operate air conditioning*.

Monthly checks

- Brake fluid level.
- Power steering fluid level.

Driving in arduous conditions

IMPORTANT INFORMATION

Special operation conditions

When a vehicle is operated in extremely arduous conditions, 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.

Arduous driving conditions include:

- Repeated short distance driving (e.g. up to 8 km), stop-start driving or idling for long periods.
- Driving in dusty and/or sandy conditions.
- Driving on rough and/or muddy roads and/or wading.
- Driving in extremely hot conditions.
- Towing a trailer or driving in mountainous conditions.

Contact a Land Rover Retailer for advice.

SAFETY IN THE GARAGE

WARNING

Cooling fans may continue to operate after the engine is switched off. When the engine is hot, the cooling fans may also COMMENCE operating after the engine is switched off and continue operating for up to 8 minutes. Keep clear of all fans while working in the engine compartment.

If you need to carry out maintenance, observe the following safety precautions at all times:

- ***Keep your hands and clothing away from drive belts and pulleys.***
- ***If the vehicle has been driven recently, DO NOT TOUCH exhaust and cooling system components until the engine has cooled.***
- ***DO NOT TOUCH electrical leads or components while the engine is running, or with the ignition switch turned on.***
- ***NEVER leave the engine running in an unventilated area - exhaust gases are poisonous and extremely dangerous.***
- ***DO NOT work beneath the vehicle with a jack as the only means of support.***
- ***Ensure sparks and naked flames are kept away from the engine compartment.***
- ***Wear protective clothing, including, where practicable, gloves made from an impervious material.***
- ***Remove metal wrist bands and jewellery before working in the engine compartment.***
- ***DO NOT allow tools or metal parts of the vehicle to make contact with the battery leads or terminals.***

WARNING

Under no circumstances should any part of the fuel system be dismantled or replaced by anyone other than a suitably qualified motor vehicle technician. Failure to comply with this instruction may result in fuel spillage with a consequent serious risk of fire.

Poisonous fluids

Fluids 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, gasoline, 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 may cause serious skin disorders, including dermatitis and cancer of the skin. ALWAYS wash thoroughly after contact.



It is illegal to pollute drains, water courses or soil. Use authorised waste disposal sites to dispose of used oil and toxic chemicals.

EMISSION CONTROL

Your vehicle is fitted with various items of emission and evaporative 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 repair shop 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.

Whilst Land Rover North America Inc. maintains that an authorised Land Rover retailer is best equipped to carry out repairs and maintenance on the emission control system, such work may be carried out by any competent automotive repair shop, or individual, using certified parts.

WARNING

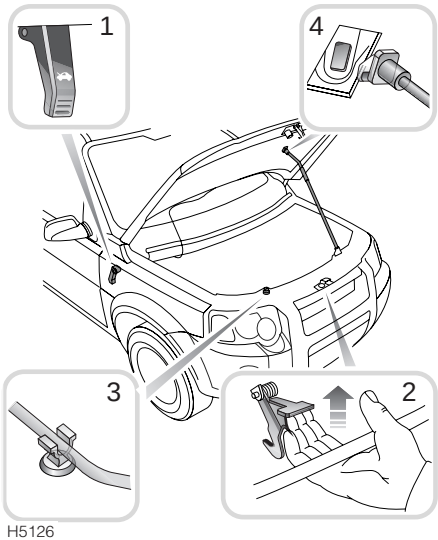
Under no circumstances should any part of the fuel system be dismantled or replaced by anyone other than a suitably qualified motor vehicle technician. Failure to comply with this instruction may result in fuel spillage with a consequent serious risk of fire.

ROAD TESTING DYNAMOMETERS ('rolling roads')

Because your vehicle is equipped with anti-lock brakes and 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 practiced by Land Rover Retailers. Contact your Land Rover Retailer for further information.

Bonnet Opening

HOOD OPENING



H5126

1. From inside the vehicle on the right hand side, pull the hood release handle (see illustration).
2. Lift the hood safety catch lever and raise the bonnet.
3. Unclip the hood support stay.
4. Fit the support stay into the cut-out in the underside of the hood.

Closing the hood

WARNING

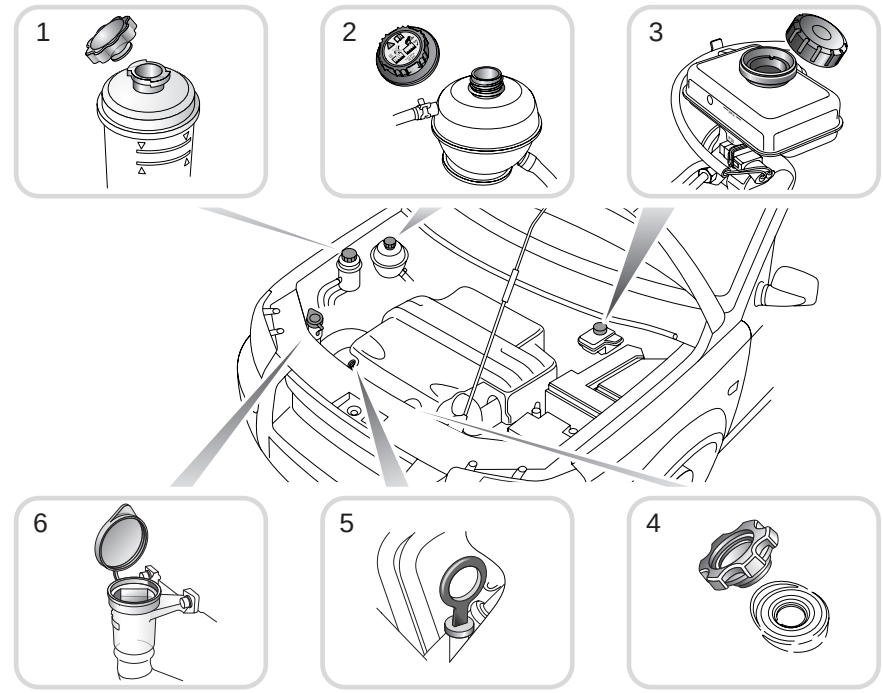
DO NOT drive with the bonnet retained by the safety catch alone.

Replace the support stay in its retaining clip, then lower the bonnet, allowing it to drop for the last 12 inches (30 cm) approx.

After closing the hood, check that the lock is fully engaged by attempting to lift the front edge of the hood. This should be free from all movement.

Engine Compartment

2.5 GASOLINE ENGINE



H5131

1. Power steering reservoir.
2. Cooling system reservoir.
3. Brake fluid reservoir.
4. Engine oil filler cap.
5. Engine oil dipstick.
6. Washer reservoir.

WARNING

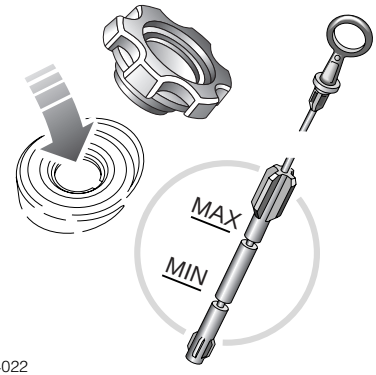
While working in the engine compartment, ALWAYS observe the safety precautions listed under 'SAFETY IN THE GARAGE', page 175.

ENGINE OIL

Oil level check & top-up

WARNING

Take care to avoid spilling engine oil onto a hot engine - a fire may result. Wipe up any spillage immediately.



H4022

1. Withdraw the dipstick and wipe the blade clean.
2. Slowly insert the dipstick and withdraw again to check the level, which should NEVER be allowed to fall below the lower mark on the dipstick.
3. To top-up, remove the oil filler cap and add oil to maintain a level between the upper and lower marks on the dipstick. As a general guide, if the level on the dipstick is:
   - nearer to the upper mark than the lower, add no oil.
   - nearer to the lower mark than the upper, add half a litre of oil.
   - at or below the lower mark, add one litre of oil.

WARNING

Driving the vehicle with the engine oil level ABOVE the upper mark, or BELOW the lower mark on the dipstick, will damage the engine.

4. Wait for five minutes and then re-check the level, adding more oil if necessary - DO NOT OVERFILL!
5. Finally, ensure the dipstick and filler cap are replaced.

NOTE: *If oil consumption seems excessive, check the system for leaks and contact your Retailer.*

Check the oil level weekly, or every 250 miles (400 km). Ideally the oil level should be checked with the engine cold and the vehicle resting on level ground. If the engine is already warm, then wait for at least two minutes after switching off before checking the level.

NOTE: *Check the engine oil more frequently if the vehicle is driven at high speeds for prolonged periods.*

Oil specification

See *'LUBRICANTS AND FLUIDS', page 239*.

DRAIN & REFILL

Ensure that the engine oil is changed at the recommended service intervals as specified in the Passport to Service book.

NOTE: *Under severe operating conditions (i.e. r5egular use in muddy terrain, or dusty conditions), the engine oil must be changed more frequently, possibly to the degree that daily changes are required. Consult your Land Rover retailer for guidance.*

Used engine oil

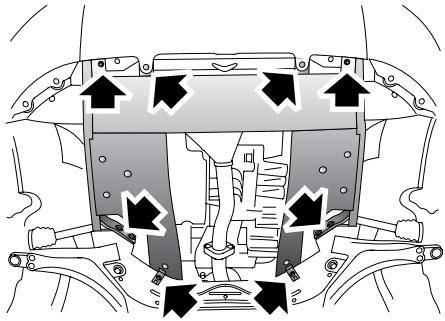
WARNING

Prolonged contact with used engine oil can cause serious skin disorders, including dermatitis and cancer of the skin. When working in a situation where you may come into contact with engine oil wear suitable protective clothing, and always wash thoroughly any areas of skin that become contaminated.

It is illegal to pollute drains, water courses or soil with toxic chemicals such as used engine oil. Use authorised waste disposal sites to dispose of used oil and toxic chemicals.

Removing the underbelly panel

Before it is possible to drain the engine oil and/or replace the oil filter, the underbelly panel must be removed from beneath the engine.



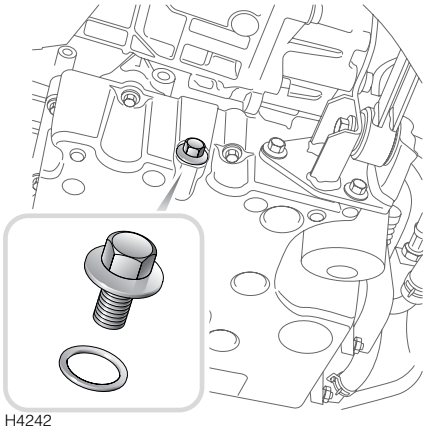
H4323

The underbelly panel is held in position by 14 screws and bolts. These are best removed in the following order:

1. Remove the 2 screws securing the bumper valance to the underbelly panel brackets.
2. Remove the 4 screws securing the wheel arch liners to the bumper valance.
3. Remove the 2 bolts securing the rear of the underbelly panel.
4. Remove the 6 bolts securing the underbelly panel frame.

Drain

With the engine warm (to assist oil drainage), and the vehicle parked on firm, level ground, remove the engine oil filler cap. Position a container of suitable size (at least 5.5 quarts (5.2 litres)) under the drain plug at the bottom of the sump.



H4242

Remove the drain plug and sealing washer. Allow the engine oil to drain into the container.

WARNING

Oil from the engine can be very hot. To avoid harmful burns take care when removing the drain plug.

Refill

Clean the oil drain plug and its mating surface on the engine sump. Fit the drain plug, complete with a new sealing washer and tighten to 18 lbf.ft (25 Nm).

Refill the engine with fresh oil suitable for the climatic conditions in which the vehicle is to be operated, and which conforms to the required specification, see *'LUBRICANTS AND FLUIDS', page 239*.

DO NOT overfill the engine. Remember that some oil will remain in the engine after it has been drained. Therefore it is recommended that slightly less oil than the full capacity is added initially see *'CAPACITIES', page 241*.

After filling allow a few minutes to elapse before checking the oil level. This will allow the oil to drain through the engine and into the sump, allowing an accurate reading. Once the correct level of oil is shown on the dipstick replace the filler cap.

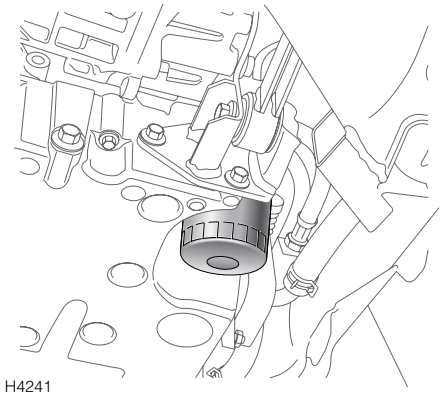
Start and run the engine without revving above idle until the oil pressure warning light has extinguished. Check for oil leaks around the drain plug.

Stop the engine and wait a few minutes. Then check the oil level and top up if required.

Finally, replace the underbelly panel.

OIL FILTER RENEWAL

It is recommended that oil filter renewal takes place at the same time as draining and refilling the engine oil. Therefore, the underbelly panel will already be removed.



H4241

1. Clean the area around the oil filter head and place a suitable container beneath the engine.
2. Using a strap wrench, or similar tool, unscrew the filter anti-clockwise and discard it.

It is illegal to pollute drains, water courses or soil with toxic chemicals such as used engine oil. Use authorised waste disposal sites to dispose of used oil and toxic chemicals.

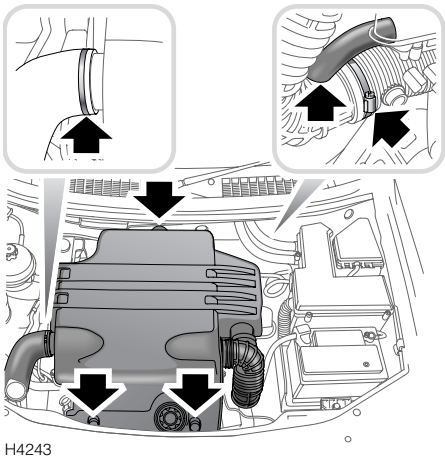
3. Smear the seal of the new filter with clean engine oil.
4. Fit the new filter and tighten clockwise until the seal makes contact with the filter head, then tighten a further half turn. Use hand force only, DO NOT overheating.
5. Start and run the engine without revving above idle until the oil pressure warning light has extinguished. Check for oil leaks around the oil filter and drain plug.
6. Stop the engine and wait a few minutes. Then check the oil level and top up if required.

Air Cleaner

AIR CLEANER ELEMENT RENEWAL

Renewing the air cleaner element at the recommended service intervals (see your 'Passport to Service book'), is extremely important. However, to maintain optimum engine performance under dusty operating conditions, more frequent renewal will be required. Consult your Land Rover retailer for guidance.

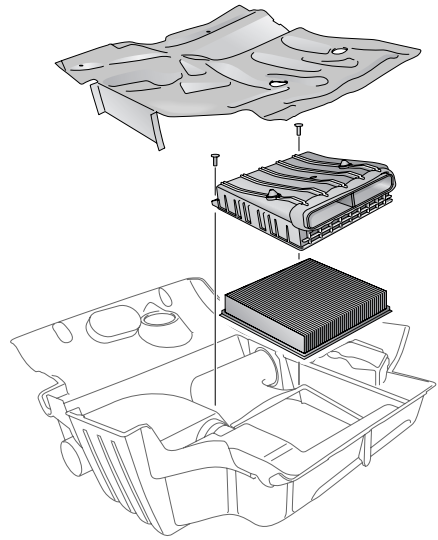
Removing the engine cover



H4243

1. Loosen the clip and disconnect the fresh air intake hose from the side of the engine cover (see left inset to illustration).
2. Loosen the clip and disconnect the air intake and bypass hose from the throttle body (see right inset to illustration).
3. Release the two turnbuckle fastenings that secure the front of the engine cover.
4. Release the retaining strap at the rear of the engine cover and remove the cover.

Renewing the air cleaner element



H4246

With the engine cover turned upside down, remove the screws securing the heatshield to the underside of the engine cover. This will provide access to the air cleaner cartridge.

Remove the two screws securing the air cleaner cartridge to the engine cover, then release the cartridge and remove the air cleaner element.

Before fitting a new element, clean the inside of the air cleaner cartridge.

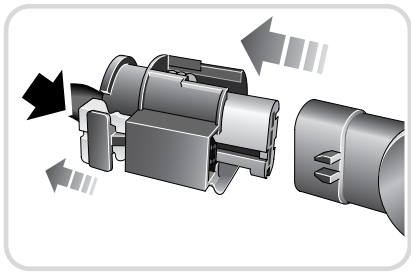
IMPORTANT INFORMATION
Always fit a new air filter element. Under no circumstances should a contaminated element be cleaned and used again.

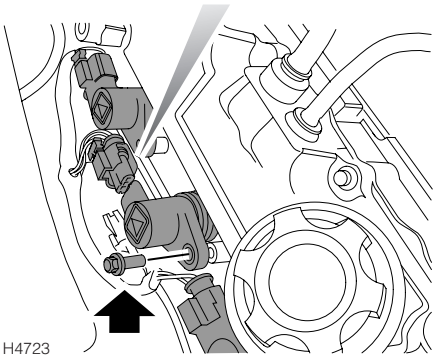
SPARK PLUG REMOVE & REFIT

WARNING

Do not attempt to touch any of the electrical cables or connections whilst the engine is running. The voltages generated by the ignition system can cause serious injuries, and in some cases, death.

Spark plug removal





H4723

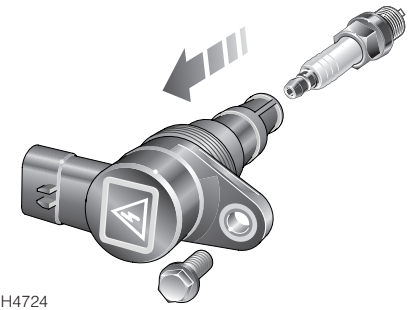
1. Disconnect the battery earth cable.
2. Remove the engine acoustic cover, see *'Removing the engine cover', page 183*.
3. Carefully noting the relative fitting positions, release the locking clips and remove the multiplugs from the plug top coils.
4. Remove the six bolts securing the plug top coils to the camshaft covers and remove the coils.
5. Using a suitable spark plug wrench, remove the spark plugs from both cylinder heads.

Refitting the plugs

When refitting take care not to cross-thread the spark plugs as costly damage to the cylinder head will occur.

Fit only plugs of the type recommended by Land Rover see *'ENGINE', page 242*, and tighten to a torque of 18 lbf ft (25 Nm). Please note that fitting incorrect grades of plug may lead to engine failure and serious damage.

Refitting the plug top coils



H4724

1. Refit the plug top coils to the spark plugs.
2. Refit the bolts securing the plug top coils to the camshaft covers and tighten to a torque of 6.5 lbf ft (9 Nm).
3. Reconnect the multiplugs to the plug top coils and secure with the locking clips.
4. Refit the engine cover.
5. Reconnect the battery earth cable.

COOLANT CHECK & TOP-UP

WARNING

NEVER remove the filler cap when the engine is hot -escaping steam or scalding water could cause serious personal injury.

Unscrew the filler cap slowly, allowing the pressure to escape before removing completely.

NEVER run the engine without coolant.

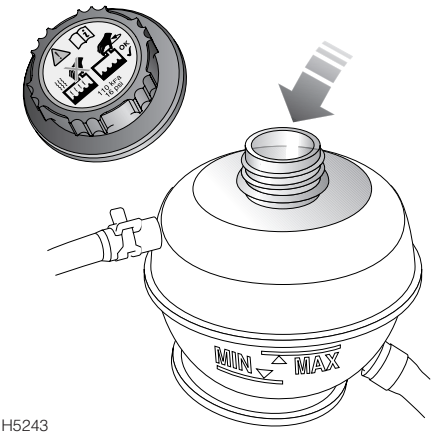
Anti-freeze will damage painted surfaces; soak up any spillage with an absorbent cloth immediately and wash the area with a mixture of car shampoo and water.

NEVER top-up with salt water. When travelling in territories where the water supply contains salt, always ensure you carry a supply of fresh (rain or distilled) water.

Avoid spilling anti-freeze onto a hot engine - a fire may result.

The coolant level in the expansion tank should be checked at least weekly (more frequently in high mileage or arduous operating conditions). Always check the level WHEN THE SYSTEM IS COLD and with the vehicle resting on level ground.

If it is necessary to remove the filler cap before the system has fully cooled, loosen the cap slowly, allowing the air pressure to escape gradually.



H5243

Top-up with a 50% mixture of anti-freeze and water so that the surface of the coolant is level with the 'MAX' indicator on the side of the tank. See *'LUBRICANTS AND FLUIDS', page 239*.

Ensure the cap is tightened fully after top-up is completed. The cap has a distinctive 'ratchet click', tighten until three clicks are heard.

If the coolant level has fallen appreciably, suspect leakage or overheating and arrange for your Retailer to examine the vehicle.

NOTE: *DO NOT add rust inhibitors or other additives to the coolant - these may not be compatible with the coolant or engine components.*

If the cooling system is to be topped-up before the vehicle is left unused over the winter, mix the anti-freeze and water together thoroughly BEFORE adding it to the cooling system.

ANTI-FREEZE

WARNING

Anti-freeze is poisonous and can be fatal if swallowed - keep containers sealed and out of the reach of children. If accidental consumption is suspected, seek medical attention immediately.

Prevent anti-freeze coming in contact with the skin or eyes. If this occurs, rinse immediately with plenty of water.

Anti-freeze contains important corrosion inhibitors. The anti-freeze content of the coolant must be maintained at 50% ± 5% all year round (not just in cold conditions). To ensure that the anti-corrosion properties of the coolant are retained, the anti-freeze content should be checked once a year (regardless of mileage) and completely renewed every 3 years or 36,000 miles (60,000 km), whichever is the sooner. Failure to do so may cause corrosion of the radiator and engine components.

The specific gravity of a 50% anti-freeze solution at 68ºF (20ºC) is 1.075 and protects against freezing down to -33ºF (-36ºC).

Coolant specification

See *'LUBRICANTS AND FLUIDS', page 239*.

In an emergency - and only if this type of anti-freeze is unavailable - top-up the cooling system with clean water, but be aware of the resultant reduction in freezing protection. DO NOT top-up or refill with conventional anti-freeze formulations. If in doubt consult a Land Rover Retailer.

BRAKE FLUID

WARNING

Brake fluid is highly toxic - keep containers sealed and out of the reach of children. If accidental consumption of fluid is suspected, seek medical attention immediately.

If brake fluid should come into contact with the skin or eyes, rinse immediately with plenty of water.

Take care not to spill fluid onto a hot engine - a fire may result.

DO NOT drive the vehicle with the fluid level below the 'MIN' mark.

Brake fluid will damage painted surfaces; soak up any spillage with an absorbent cloth immediately and wash the area with a mixture of car shampoo and water.

NOTE: *Brake fluid must be completely renewed every 36,000 miles (60,000 km) or 36 months, whichever is the sooner.*

Check

The fluid level may fall slightly during normal use as a result of brake pad wear but should not be allowed to fall below the 'MIN' mark. If there is any appreciable drop in level over a short period, consult your Retailer. **DO NOT drive if the fluid level is below the minimum mark on the reservoir.**

WARNING

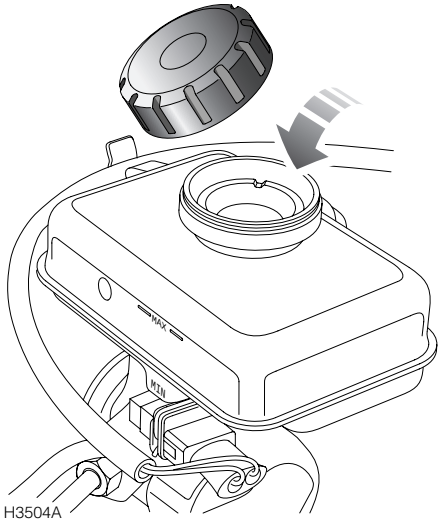
Contact your Retailer immediately if brake pedal travel is unusually long or if there is any appreciable drop in brake fluid level.

With the vehicle on level ground, check the fluid level at least every week (more frequently in high mileage or arduous operating conditions). Check the level visually through the side of the transparent reservoir without removing the filler cap.

Brake fluid specification

See *'LUBRICANTS AND FLUIDS', page 239.*

Top-up



Wipe the filler cap clean before removing, to prevent dirt from entering the reservoir. Unscrew the cap and top-up the reservoir to the 'MAX' mark using a recommended fluid.

Use only new fluid from an airtight container (old fluid from opened containers or fluid previously bled from the system will have absorbed moisture, which will adversely affect performance, and must NOT be used). **DO NOT OVERFILL.**

POWER STEERING FLUID

WARNING

Power steering fluid is highly toxic - keep containers sealed and out of reach of children. If accidental consumption of fluid is suspected, seek medical attention immediately.

If power steering fluid should come into contact with the skin or eyes, rinse immediately with plenty of water.

Power steering fluid will damage painted surfaces. Soak up any spillage with an absorbent cloth immediately and wash the area with a mixture of car shampoo and water.

Take care not to spill power steering fluid onto a hot engine - a fire may result. Wipe up any spillage immediately.

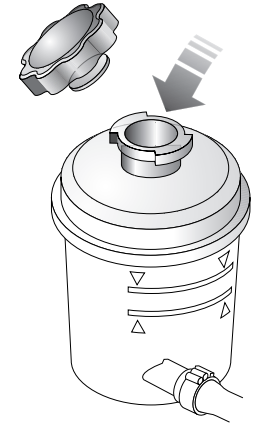
Check and Top-up

Check and top-up the fluid level ONLY when the engine is cold. You should also ensure that the front wheels are in the straight ahead position before stopping the engine and checking the fluid level.

Check the fluid level against the marks on the side of the reservoir.

If more fluid is needed, first wipe the filler cap clean to prevent dirt from entering the reservoir, then twist the cap a quarter turn anti-clockwise and pull to remove.

Top up the reservoir to the upper level mark using a recommended fluid. **DO NOT OVERFILL.**



H5244

Emergency operation

Any large or sudden drop in the fluid level must be investigated by a Land Rover Retailer.

If it can be established that fluid loss is slow, then the reservoir may be topped-up to the upper level mark to enable the vehicle to be driven to the nearest Land Rover Retailer for examination.

If the fluid level has dropped below the lower level mark, top-up the reservoir before starting the engine, or damage to the steering pump could result.

Fluid specification

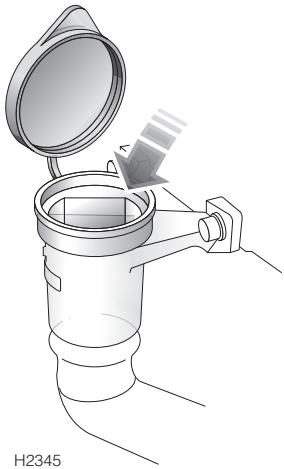
See *'LUBRICANTS AND FLUIDS', page 239.*

Oils manufactured to the specifications shown on page 245, are suitable for use in temperatures between -4ºF to + 86ºF (-20°C to +30°C) (if climatic temperature falls outside these limits, seek advice from your Retailer).

NOTE: *The colour of commercially available fluids may differ from that of the power steering fluid used to fill the system during manufacture. This is not cause for concern.*

WINDSHIELD WASHERS

Fluid top-up


H2345

The windshield washer reservoir supplies both front and rear screen washer jets.

Check the reservoir level at least every week and to prevent freezing in cold weather, top-up with a mixture of water and a recommended Windshield-wash.

Preferably mix the recommended quantities of water and windshield-wash in a separate container before topping-up the system, and always follow the instructions on the windshield-wash container.

WARNING

Some windshield-wash products are inflammable, particularly if high or undiluted concentrations are exposed to sparking. DO NOT allow windshield-wash to come into contact with naked flames or sources of ignition.

Body panels may suffer discoloration as a result of windshield-wash spillage. Take care to avoid spillage, particularly if an undiluted or high concentration of windshield-wash is being used. If spillage occurs, wash the affected area immediately with water.

DO NOT use an anti-freeze or vinegar/water solution in the washer reservoir - anti-freeze will damage painted surfaces, while vinegar can damage the windshield washer pump.

Washer jets

Operate the washer switches periodically to check that the nozzles are clear and properly directed.

The windshield washer jets are set during manufacture and should not need adjusting. However, if adjustment is ever necessary, insert a needle into the jet orifice and lever gently to position each jet so that the spray is directed towards the centre of the windshield.

Should a windshield washer jet become obstructed, insert a needle or thin strand of wire into the orifice to clear the blockage.

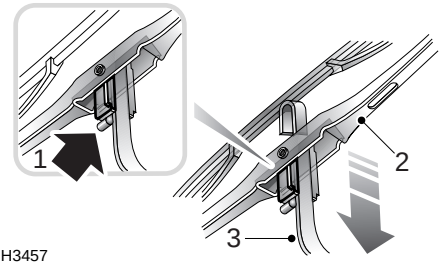
NOTE: *The rear window washer jet is integral with the wiper arm and requires no adjustment.*

Wiper Blades

WIPER BLADE REPLACEMENT

IMPORTANT
• Grease, silicone and petrol based products impair the blade's wiping capability. Wash the wiper blades in warm soapy water and periodically check their condition. • If signs of hardness or cracking in the rubber are found, or if the wipers leave streaks or unwiped areas on the windshield during use, then the wiper blades should be replaced. • Clean the windshield regularly with an approved glass cleaner and ensure the screen is thoroughly cleaned before fitting replacement wiper blades.

Front wiper blades



H3457

Lift the wiper arm away from the windshield. With the blade at 90^0 to the arm as shown, disconnect the blade by pushing in the locking tab (1) and sliding the blade (2) down the arm (3).

Fitting a replacement blade is a reversal of this process; position the new blade assembly on the wiper arm and slide the blade fully towards the hooked end of the arm until it locks in place. Check that the blade is securely locked before returning the wiper assembly to the windshield.

Only fit replacement wiper blades that are identical to the original specification.

Rear wiper blades



H3458

Lift the wiper arm away from the rear window, as far as the spare wheel carrier will allow. Pivot the blade assembly away from the arm (as arrowed), levering against resistance, until the two retaining lugs detach from their slots at the end of the arm. Carefully replace the arm to its stowed position.

To replace, position the wiper arm into the aperture in the middle of the blade assembly, line up the retaining lugs with the corresponding slots in the wiper arm and push firmly into position until the blade clips into place.

Battery

BATTERY SAFETY

WARNING

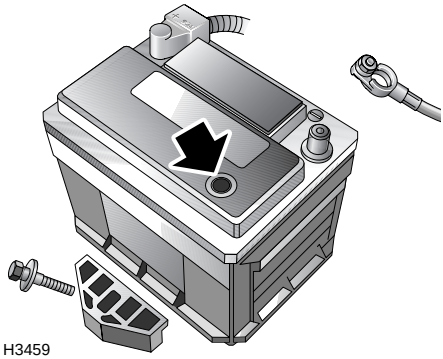
Batteries contain sulphuric acid, which is both corrosive and poisonous. If spillage occurs:

- ***On clothing or the skin - remove any contaminated clothing immediately, flush the skin with large amounts of water, and seek medical attention urgently.***
- ***In the eyes - flush with clean water immediately for at least 15 minutes. Seek medical attention urgently.***
- ***Swallowing battery acid can be fatal unless IMMEDIATE action is taken - seek medical attention urgently.***

During normal operation batteries emit explosive hydrogen gas - ensure sparks and naked lights are kept away from the engine compartment.

For your safety, remove all metal wrist bands and jewellery before working in the engine compartment and NEVER allow the battery terminals or vehicle leads to make contact with tools or metal parts of the vehicle.

BATTERY MAINTENANCE


H3459

The battery is designed to be maintenance free, so topping-up is unnecessary. On the top of the battery there is a battery condition indicator (arrowed in illustration). Examine the indicator periodically to check the battery's condition. When the indicator shows:

- GREEN - the battery is in a good state of charge.
- DARK (turning to black) - the battery needs charging.
- CLEAR (or light yellow) - the battery must be replaced. Do not charge the battery or push start the vehicle in this condition.

NOTE: *If necessary, clean the battery top to ensure a clear view. Use a flashlight if natural light is poor.*

If the indicator shows clear or yellow, tap the indicator with the handle of a screwdriver to disperse any air bubbles. If the colour is unchanged, the battery must be replaced.

Battery

Battery removal and replacement

WARNING

- ***ALWAYS remove the starter key before disconnecting the battery. Failure to do this may cause a failure of the airbag SRS.***
- ***Do not reverse the polarity of the battery - the electrical system may be damaged if the battery leads are connected to the wrong terminals.***
- ***Keep the battery upright at all times - damage will be caused if the battery is tilted more than 45 degrees.***
- ***DO NOT run the engine with the battery disconnected, or disconnect the battery while the engine is running.***

Before disconnecting the battery, disarm the alarm, and ensure that the ignition switch and all electrical equipment is turned off.

To remove: disconnect the negative ('-') cable first and then the positive ('+') cable. When reconnecting, connect the positive cable first and then the negative cable. Do not allow the battery terminals to make contact with metal parts of the vehicle.

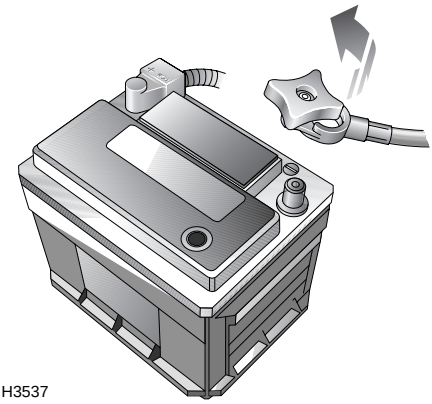
To release the battery from the vehicle, undo the bolt and remove the battery clamping plate (see previous illustration).

When replacing, ensure the battery is fitted the right way round (terminal posts towards the rear of the vehicle) and that the clamping plate is secure. Tighten the clamping plate bolt until the clamping plate is free from movement (maximum torque 12 Nm), but do not overtighten.

Battery disposal

Used batteries should be recycled. However, batteries are hazardous - you should seek advice about disposal from a Land Rover Retailer or your local authority.

'Quick release' batteries*



H3537

In some markets, the negative ('-') lead is fitted with a 'quick release' terminal connection. Turn the handwheel anti-clockwise to disconnect the negative lead (as illustrated).

Replacement batteries

Only fit a replacement battery of the same type and specification as the original - other batteries may vary in size or have different terminal positions which could cause a fire hazard when connected to the vehicle's electrical system.

Battery charging

WARNING

DO NOT charge the battery if it is connected to the vehicle - this may seriously damage the electrical system.

DO NOT attempt to charge the battery if the battery condition indicator is clear or light yellow.

DO NOT charge the battery if it is suspected of being frozen.

As the battery ages, it may not retain its charge as effectively as when it was new. Vehicles that are used infrequently, or are used excessively for short journey motoring, or operation in cold climates, may need the battery to be charged regularly.

Always check the battery condition indicator before charging.

Batteries generate explosive gases, contain corrosive acid and produce levels of electric current sufficient to cause serious injury. While charging, always heed the following precautions:

- Before charging, disconnect and remove the battery from the vehicle.
- Make sure the battery charger leads are securely clamped to the battery terminals BEFORE switching on the battery charger. Do not move the leads once the charger is switched on.
- While charging, shield your eyes, or avoid leaning over the battery.
- Keep the area around the top of the battery well ventilated.
- Do not allow naked lights near the battery (batteries generate inflammable hydrogen during and after charging).
- The battery will be charged sufficiently once the battery condition indicator shows GREEN. When charging is finished, switch off the battery charger BEFORE disconnecting the leads from the battery terminals.

  NOTE: *The battery will take longer to charge in a cold environment.*

After charging, leave the battery for one hour before reconnection to the vehicle - this will allow time for explosive gases to disperse, thereby minimising the risk of fire or explosion.

THE EFFECTS OF BATTERY DISCONNECTION

Some of the vehicle's electrical systems will be affected if the battery is disconnected. These are listed below, together with the symptoms you might experience once the battery is reconnected and the actions required to restore operation.

Audio System

After battery disconnection, the radio code may be lost and the set fail to operate; this will be apparent from the message appearing in the display. To restore operation, enter the security code using the procedure described in the *'Audio System' book*.

Taildoor glass

If the battery has been disconnected, the taildoor glass will need to be recalibrated. If the alarm was armed when the battery was disconnected (or discharged), disarm the alarm after battery reconnection - the taildoor glass will fully lower. This will happen automatically if the alarm was in a disarmed state when the battery was disconnected.

After battery reconnection, fully raise the taildoor glass (if the glass is not fully raised, an error 'beep' will sound) - the taildoor glass is now recalibrated.

Alarm system

The alarm system will automatically reset to the status in operation prior to battery disconnection, but the handset will need to be re-synchronised (see *'Handset re-synchronisation', page 40*).

Clock

The clock will need to be reset to the correct time, see *'CLOCK', page 93*.

CARING FOR YOUR TIRES

WARNING

DEFECTIVE TIRES ARE DANGEROUS. Do not drive if any tire is damaged, is excessively worn, or is inflated to an incorrect pressure.

Always drive with consideration for the condition of the tires, and regularly inspect the tread and side walls for any sign of distortion (bulges), cuts or wear.

The most common causes of tire failure are:

- Bumping against curbs
- Driving over deep potholes in the road
- Driving with under or over-inflated tires

NOTE: *If possible, protect tires from contamination by oil, grease, fuel and other automotive fluids.*

Tire pressures

Correctly inflated tires will ensure that you enjoy the best combination of tire life, ride comfort, fuel economy and road handling.

Under-inflated tires wear more rapidly, can seriously affect the vehicle's road handling characteristics and fuel consumption, as well as increasing the risk of tire failure.
Over-inflated tires give a harsher ride, wear unevenly and are more prone to damage.

Tire pressures should be checked at least once a week with normal road use, but should be checked DAILY if the vehicle is used off-road.

Check the pressures (including the spare wheel) when the tires are cold - be aware that it only takes 1 mile (1.5 km) of driving to warm up the tires sufficiently to affect the tire pressures.

NOTE: *The spare tire pressure on vehicles fitted with steel wheels can be checked through the aperture in the wheel cover (provided the wheel is correctly positioned on the carrier).*

Air pressure naturally increases in warm tires; if it is necessary to check the tires when they are warm (after the car has been driven for a while), you should expect the pressures to have increased between 4 - 6 lbf/in^2 (30 - 40 kPa). In this circumstance, DO NOT let air out of the tires in order to match the recommended pressures.

WARNING

If the vehicle has been parked in strong sunlight or used in high ambient temperatures, DO NOT reduce tire pressures; instead, move the vehicle into the shade and allow the tires to cool before checking.

The recommended pressures for cold tires are shown in *'TIRE PRESSURES', page 246*.

Tires

Tire wear



H5086

The tires fitted as original equipment to your vehicle have wear indicators moulded into the tread pattern. When the tread has worn down to 1/16 inch (1.6 mm) the indicators start appearing at the surface of the tread pattern, producing the effect of a continuous band of rubber across the width of the tire.

A tire MUST be replaced as soon as an indicator band becomes visible or the tread depth reaches the minimum permitted by legislation.

NOTE: *If tire wear is uneven (on one side of the tire only) or becomes abnormally excessive, the wheel alignment should be checked by your dealer.*

Tread depth must be checked regularly (at every maintenance service, or more frequently). Always replace a tire before the tread reaches a remaining depth of 1/16 inch (1.6 mm). DO NOT drive with tires worn to this limit, the safety of the vehicle and occupants will be adversely affected.

NOTE: *After off-road use, check to make sure there are no lumps or bulges in the tires or exposure of the ply or cord structure.*

Valves

Keep the valve caps screwed down firmly - they prevent dirt from entering the valve. Check the valve for leaks (listen for a tell-tale hissing) when you check the tire pressure.

Punctured tires

Your vehicle is fitted with tubeless tires, which may not leak if penetrated by a sharp object, provided the object remains in the tire. If you are aware of this occurring, reduce speed immediately and drive with caution until the spare wheel can be fitted.

A puncture of this kind will eventually cause the tire to lose pressure, which is why regular (and frequent) checking of tire pressures is important. Punctured or damaged tires must be permanently repaired or replaced as soon as possible - if in doubt, seek expert advice.

DO NOT DRIVE WITH A PUNCTURED TIRE.

Replacement tires
Wheel rims and tires are matched to suit the handling characteristics of the vehicle. For safety, ALWAYS check that replacement tires comply with the original specification shown in *'WHEELS & TIRES', page 245*, and that the load and speed ratings shown on the side wall are the same as that of the original equipment. Contact your Land Rover Retailer for further information or assistance.

Ideally, tires should be replaced as sets of four, but if this is not possible, replace the tires as axle sets. When replacing tires in axle sets, always fit the new tires to the rear axle.

Always have the wheels and tires re-balanced after replacing.

WARNING

ALWAYS use the same make and type of radial-ply tires front and rear. DO NOT use cross-ply tires, or interchange tires from front to rear.

Your vehicle is fitted with road wheels that will NOT accept inner tubes. DO NOT fit a tubed tire.

DO NOT replace wheels with any type other than genuine Land Rover parts. Wheels and tires are designed for both off-road and on-road use and have a very important influence on vehicle handling. Alternative wheels which do not meet original equipment specifications should not be fitted.

UNIFORM TIRE QUALITY GRADING

Quality grades, where applicable, can be found on the tire sidewall between the tread shoulder and maximum section width.
For example:

Treadwear 200	*Traction AA*	*Temperature A*

NOTE: *Tires that have deep tread, and winter tires, are exempt from these marking requirements.*

In addition to the marking requirements, passenger car tires must conform to Federal Safety Requirements.

Treadwear
The treadwear grade is a comparative rating based on the wear rate of the tire when tested under controlled conditions on a specified government test course.
For example; a tire graded 150 would wear one and a half times as well on a government test course as a tire graded 100. However, the relative performance of tires depends on the actual conditions of their use, and may depart significantly from the norm due to variations in; driving habits, service practices, and differences in road characteristics and climate.

Traction
The traction grades, from highest to lowest, are; AA, A, B, and C. These grades represent a tire's ability to stop on a wet pavement as measured under controlled conditions on specified government test surfaces of asphalt and concrete.

WARNING

The traction grade assigned to a tire is based on straight-ahead braking tests, and does not include; acceleration, cornering, hydroplaning. or peak traction characteristics.

Temperature
The temperature grades, from highest to lowest, are, A, B, and C. These grades represent a tires resistance to the generation of heat, and its ability to dissipate heat, when tested under controlled conditions on an indoor laboratory test wheel.
Sustained high temperatures can cause the material of a tire to degenerate, and reduce the tire life, and excessive temperature can lead to sudden tire failure.

'C' grade is the minimum performance level which all passenger car tires must meet under the Federal Motor Safety Standard (FMVSS) 109.

Grades 'B' and 'A' represent higher levels of performance on the laboratory test than the minimum required by law.

WARNING

The temperature grade for a tire is established with the correct loading and inflation pressure. Excessive speed, under inflation, or overloading, either separately, or in combination, can cause heat build up and possible tire failure.

SNOW CHAINS

Snow chains are designed for use on hard surface roads in extreme conditions only, and are not recommended for off-road use. If it is necessary to fit snow chains to your vehicle, ALWAYS observe the following:

- Snow chains can ONLY be fitted to vehicles equipped with 195/80 x 15 tires.
- It is recommended that ONLY Land Rover approved chains are used - these are designed for your vehicle and will eliminate any risk of damage to other components. Approved snow chains are only available from a Land Rover Retailer.
- Always adhere to the snow chain fitting and retensioning instructions, and the speed limitations recommended for varying road conditions. NEVER exceed 30 mph (50 km/h).
- ONLY fit snow chains in pairs.
- Avoid tire damage by removing the chains as soon as the road is free from snow.

For further information about approved snow chains, consult your Land Rover Retailer.

WARNING

DO NOT fit unapproved snow chains - this could damage tires, wheels, suspension and brake components and could result in damage to the bodywork of the vehicle.

WASHING YOUR VEHICLE


H5215

WARNING

Some high pressure cleaning systems are sufficiently powerful to penetrate door and window seals and damage rubbing strips and locking mechanisms. Never aim the water jet directly at heater air intakes, body and sunroof seals, the softback canopy, or at any components that might easily be damaged.

Read individual product warnings before using any car cleaning or washing products.

If the vehicle is particularly dirty, use a hose to flush grime and grit from the painted surfaces, prior to washing. Then, wash the vehicle using cold or lukewarm water containing a good quality wash and wax shampoo. Always use plenty of water to ensure that grit is flushed from the surface and not ground into the paintwork. After washing, rinse the vehicle with clean water and dry off with a chamois leather.

- Do not use hot water.
- Do not use detergent soap products or washing-up liquid.
- In hot weather, do not wash the vehicle in direct sunlight.

When using a hose, do not direct the jet into the heater air intake ducts, or through the wheel trim apertures onto the brake components, or at the door, window or sunroof seals, or at the soft-back canopy* where water pressure could penetrate the seals.

Automatic car wash

If using an automatic car wash (5-door models), remove the radio aerial before entering the car wash.

NOTE: *DO NOT wash a 3-door model in an automatic car wash.*

Removing tar spots

Use white spirit to remove tar spots and stubborn grease stains from paintwork. Then wash immediately with soapy water to remove all traces of spirit.

Underbody maintenance

Corrosive materials used for snow and ice removal and dust control can collect on underbody parts. If these materials are not removed, accelerated rusting can occur. Use a hose to regularly flush the underbody with plain water, taking particular care to thoroughly clean those areas where mud and other debris can easily collect.

Similarly, after off-road driving or wading in muddy or salt water conditions, use a hose to wash underbody components and other exposed parts of the vehicle.

Steam cleaning
Before steam cleaning the engine, cover the power steering reservoir to prevent contamination of fluid and ensure the covers and seals of electrical components are in place. After steam cleaning carefully re-wax the metallic components, especially the steering column, engine coolant pipes, hose clips and the ignition coil clamp, to prevent corrosion.

WARNING

Do not direct high temperature or high pressure steam or water onto electrical wiring or components.

Softback canopy and hardback

- Use a soft brush to remove dust and flaking dirt from the canopy or hardback (not the windows), then soak with a mild soap and water solution to soften encrusted dirt and remove stains, prior to washing.
- Wash using a mild soap and water solution, before rinsing the canopy or hardback with clean lukewarm or cold water. Rinse until all traces of soap are removed.
- Never use spirit, petrol or chlorine based cleaning agents, or wash/wax compounds to clean the canopy, hardback and windows - wax polishes will become ingrained in the textured finish.
- Never use an automatic car wash, or a high pressure hose.
- Do not aim jets of water at zips or seals.
- Ensure the canopy is dry before folding or removing.
- Improper cleaning and lack of care may cause damage to the canopy and window panels, resulting in water penetration.

Softback or hardback windows

WARNING

DO NOT use abrasive or solvent cleaners on the canopy or hardback and especially NOT on the window panels. Use only mild detergents.

- Wipe off any dust or dirt using a damp soft cloth.
- DO NOT wipe the window panels when they are dry.
- Wash the windows with a clean, grit-free sponge or cloth and a mixture of a mild detergent and cold or lukewarm water. Rinse the window panels thoroughly and wipe with a soft moist cloth.

  NOTE: *The removable window panels fitted to the softback, are susceptible to scratching from the effects of dirt and grit. For this reason, it is important to wash them frequently.*
- Remove frost, ice and snow using lukewarm water - do not use a scraper. Take care when clearing ice or snow from the window panels, as they are easily scratched and could crack at low temperatures.
- Do not put adhesive backed material (badges, stickers etc) onto the window panels - this may result in damage and discolouration.

Body protection
After washing, inspect the paintwork for damage. Any stone chips, fractures or deep scratches in the bodywork should be repaired promptly. Bare metal will corrode quickly and can develop into major repair expense.

Minor chips and scratches can be repaired with touch-up materials available from your dealer. Larger areas of damage need to be corrected to professional standards immediately.

Polishing
Occasionally treat the paint surface with an approved polish containing the following properties:

- Very mild abrasives to remove surface contamination without removing or damaging the paint.
- Filling compounds that will fill scratches and reduce their visibility.
- Wax to provide a protective coating between the paint and the elements.

NOTE: *DO NOT apply wax polish to the roof panels**, *or to the bumper mouldings - polish will become ingrained in the textured finished.*

Windows and mirrors
Regularly clean all windows and mirrors, inside and out, using an approved glass cleaner.

Windshield: In particular, clean the outside of the screen with glass cleaner after washing the vehicle with wash and wax products, and before fitting new wiper blades.

Rear window: Clean the inside with a soft cloth, using a side to side motion to avoid damaging the heating elements. DO NOT scrape the glass or use abrasive cleaners - this will damage the heating elements.

Mirrors: Wash with soapy water. Use a plastic scraper to remove ice. DO NOT use abrasive cleaners or metal scrapers.

Wiper blades
Wash in warm soapy water. DO NOT use spirit or gasoline based cleaners.

CLEANING THE INTERIOR

WARNING

Read individual product warnings before using any car cleaning or washing products.

Plastic materials
Clean plastic-faced or cloth covered surfaces with warm water and a non-detergent soap and wipe with a clean cloth.

NOTE: *DO NOT polish fascia components - for safety, these should remain non-reflective.*

Leather
Leather seats, steering wheel and trim features should be cleaned with warm water and a non-detergent soap. Dry and polish the leather with a dry, lint-free cloth.

NOTE: *DO NOT use gasoline, detergents, furniture creams or polishes.*

Carpet and fabrics
Clean with diluted nylon upholstery cleaner - test a concealed area first.

Instrument pack, clock and radio
Use a clean cloth which has been moistened slightly with water.

WARNING

Do not use chemicals or household cleaners. Keep fluids and liquids of all kinds away from the radio.

Fascia mounted rubber mats
The mats are removable for cleaning - replace with care.

Seat belts
Extend the belts, then use warm water and a non-detergent soap to clean. Allow the belts to dry naturally, and do not retract them or use the vehicle until they are completely dry.

WARNING

DO NOT use bleaches, dyes or cleaning solvents on seat belts.

Airbag module covers
To prevent airbag SRS damage, the steering wheel centre pad and other areas containing airbags should ONLY be cleaned sparingly with a damp cloth, warm water and a non-detergent soap.

DO NOT allow these areas to be flooded with liquid, and DO NOT use gasoline, detergent, furniture cream or polishes.

Identification Numbers

CONTACTING YOUR DEALER

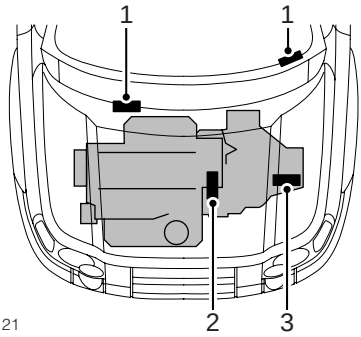
When communicating with your Retailer, always quote the Vehicle Identification Number (VIN). If your communication concerns the engine or gearbox, it may be necessary to quote these numbers as well.

IDENTIFICATION NUMBER LOCATIONS

1. Vehicle identification number (VIN)
2. Engine Number

   Stamped vertically into the right side of the cylinder block (when viewed from the front).
3. Gearbox number

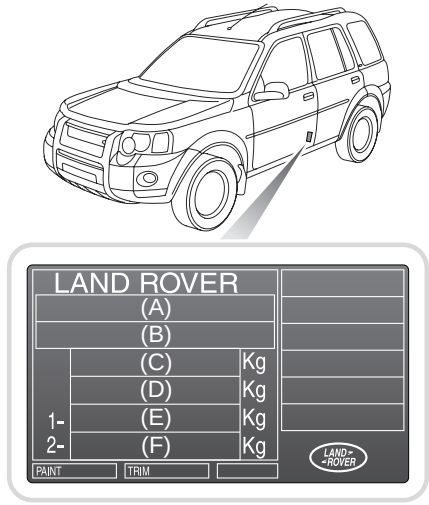
   On a label attached to the upper face of the gearbox housing.



H5121

VEHICLE IDENTIFICATION NUMBER

The VIN (and recommended maximum vehicle weights) is stamped on a plate at the foot of the left hand door pillar and also stamped into the bulkhead, at the top, inside the engine compartment. In addition, as a deterrent to car thieves and to help the police, the VIN is stamped into a plate, visible at the bottom left hand corner of the windscreen.



H5122

A. Type approval (where required)
B. Vehicle Identification Number (VIN)
C. Gross vehicle weight (where required)
D. Gross train weight (where required)
E. Maximum front axle load (where required)
F. Maximum rear axle load (where required)

PARTS AND ACCESSORIES

WARNING

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

Land Rover will not accept any liability for death, personal injury, or damage to property which may occur as a direct result of fitment of a non-approved accessories, or the carrying out of non-approved conversions to Land Rover vehicles.

Land Rover North America Inc. strongly advises against making any modifications to the suspension or steering system. This could seriously affect the handling and stability of the vehicle leading to loss of control or rollover.

Your vehicle has been designed, built and tested to cope with a variety of off-road driving conditions, some of which can place the severest possible demands on control systems and components. As such, fitting replacement parts and accessories that have been developed and tested to the same stringent standards as the original components will safeguard the continued reliability, safety and performance of your vehicle.

To augment the vehicle's already impressive performance, a comprehensive range of Land Rover-approved spare parts and accessories is available, enabling the vehicle to fulfil a wide variety of roles, and enhancing and protecting the vehicle in the many tasks to which it can be applied.

Land Rover parts are the only parts built to original equipment specifications AND approved by Land Rover designers; this means that every single part and accessory has been rigorously tested by the same engineering team that designed and built the vehicle and can therefore be guaranteed for twelve months with unlimited mileage.

A full list and description of all accessories is available from your Land Rover Retailer.

Electrical equipment

WARNING

It is extremely hazardous to fit parts or accessories where installation requires the dismantling of, or addition to, either the electrical or fuel systems.If an airbag SRS is fitted to your vehicle, it is recommended that you consult a Land Rover dealer before fitting any accessory.

After sales service

The After Sales Parts service is of paramount importance across the world.

With worldwide franchised representation in over 100 countries, Land Rover are able to support your vehicle wherever you go.

Land Rover Retailers are able to provide the full range of recommended parts and accessories that meet the rigorous, Land Rover standards of safety, durability and performance.

Travelling abroad

In some countries it is illegal to fit parts that do not conform to the vehicle manufacturer's specification. Owners should ensure that any parts or accessories fitted while travelling abroad, also conform to the legal requirements of their home country.