

# SECTION 4

## Owner maintenance

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*The long-term safety, reliability and performance of your vehicle will depend very largely on how it is maintained.*

*Maintenance is the owner's responsibility and it is ESSENTIAL that all routine services are carried out at the specified intervals. These are shown in the Service Portfolio book included in the literature pack. The Service Portfolio book also includes a service record section, which enables a record to be kept of all the routine services carried out on the vehicle - ensure your Land Rover dealer stamps and signs the book after each service.*

*This section of the handbook includes information to assist the owner to carry out those daily, weekly and monthly checks that are necessary to ensure safe, reliable motoring.*

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# Owner maintenance

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## OWNER MAINTENANCE

In addition to the routine services, which should be carried out according to the manufacturer's recommendations at the intervals shown in the Service Portfolio book, a number of simple checks and adjustments must be carried out by the owner or driver on a regular basis.

These are listed below and fully described on the pages that follow.

### Daily checks

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

### Weekly checks

These should be carried out at least every 250 miles or 400 km.

- Engine oil level.
- Coolant level.
- Screen washer fluid level.
- Condition and pressure of tyres.

### Monthly checks

- Brake fluid level.
- Power steering fluid level.
- Active cornering enhancement fluid level

**NOTE:** Any significant or sudden drop in fluid levels, or uneven tyre wear should be reported to your dealer without delay.

All fluid specifications and capacities are shown in 'General data'.

IMPORTANT INFORMATION
<p><b>Special operation conditions</b></p> <p>When a vehicle is operated in extremely arduous conditions or a dusty, wet or muddy terrain, more frequent attention must be paid to servicing requirements.</p> <p>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.</p> <p>Contact a Land Rover dealer for advice.</p>

# Owner maintenance

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## Planned maintenance

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

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 dealer.

## 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.

## 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.*

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## Road testing on dynamometers (‘rolling roads’)

## WARNING

*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 dealers. Contact your Land Rover dealer for further information.*

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# Owner maintenance

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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:**

- Keep your hands, tools and clothing away from drive belts and pulleys.
- DO NOT TOUCH exhaust or cooling system components until the engine has cooled.
- DO NOT TOUCH electrical leads or components while the engine is running, or with the starter 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 the vehicle lifting jack as the only means of support.
- Ensure sparks and naked lights are kept away from the engine compartment.
- Remove metal wrist bands and jewellery before working in the engine compartment.
- DO NOT allow battery leads or terminals to make contact with tools or metal parts of the vehicle.

### 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 10 minutes. Keep clear of all fans while working in the engine compartment.***

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## Poisonous liquids

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, clutch, active cornering enhancement and power steering fluids, as well as petrol, diesel, engine oil and windscreen washer additives.

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

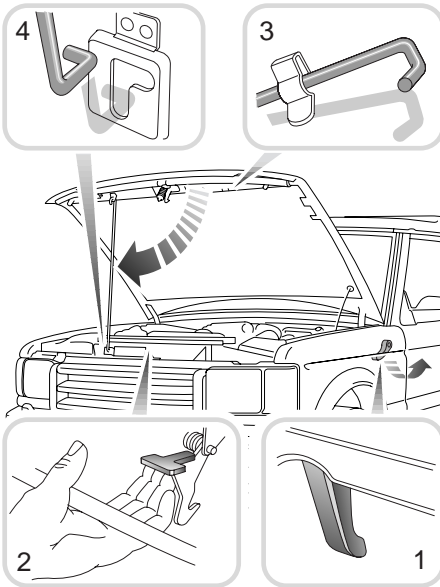
## Used engine oil

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 with toxic chemicals such as used engine oil. Use authorised waste disposal sites to dispose of discharged batteries, used oil and toxic chemicals.

## PROTECT THE ENVIRONMENT!

# Bonnet opening



H2525

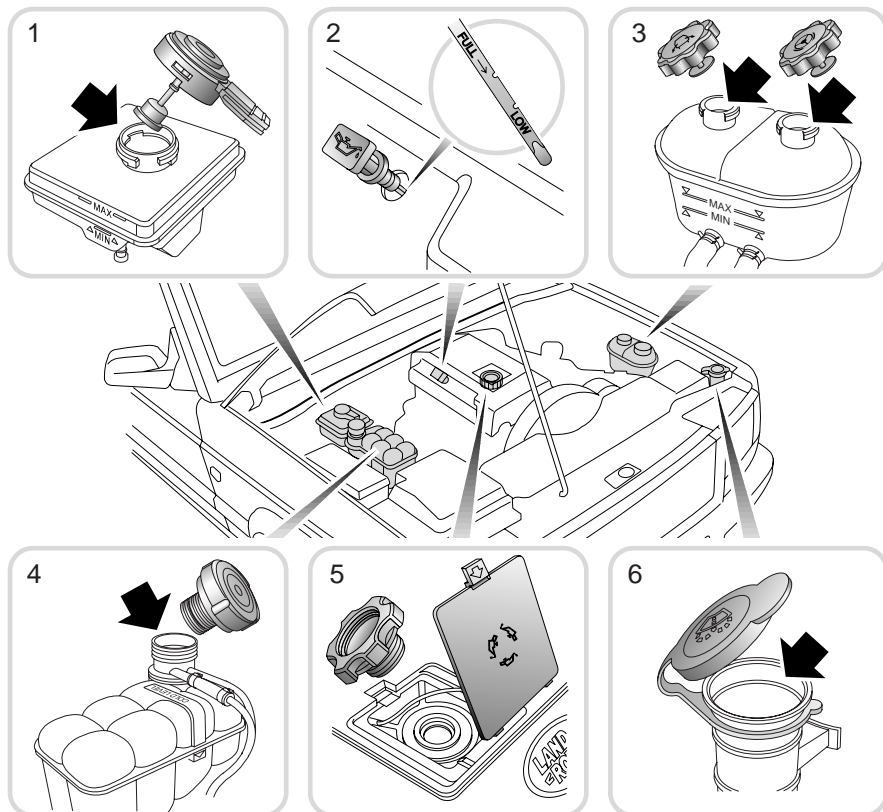
1. From inside the vehicle on the left hand side, pull the bonnet release handle (see illustration).
2. Lift the bonnet safety catch lever and raise the bonnet.
3. Release the bonnet support stay from the underside of the bonnet.
4. Fit the support stay into the slotted hole in the bonnet locking platform.

## Closing the bonnet

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

# Engine compartment



H2537

## Diesel engine

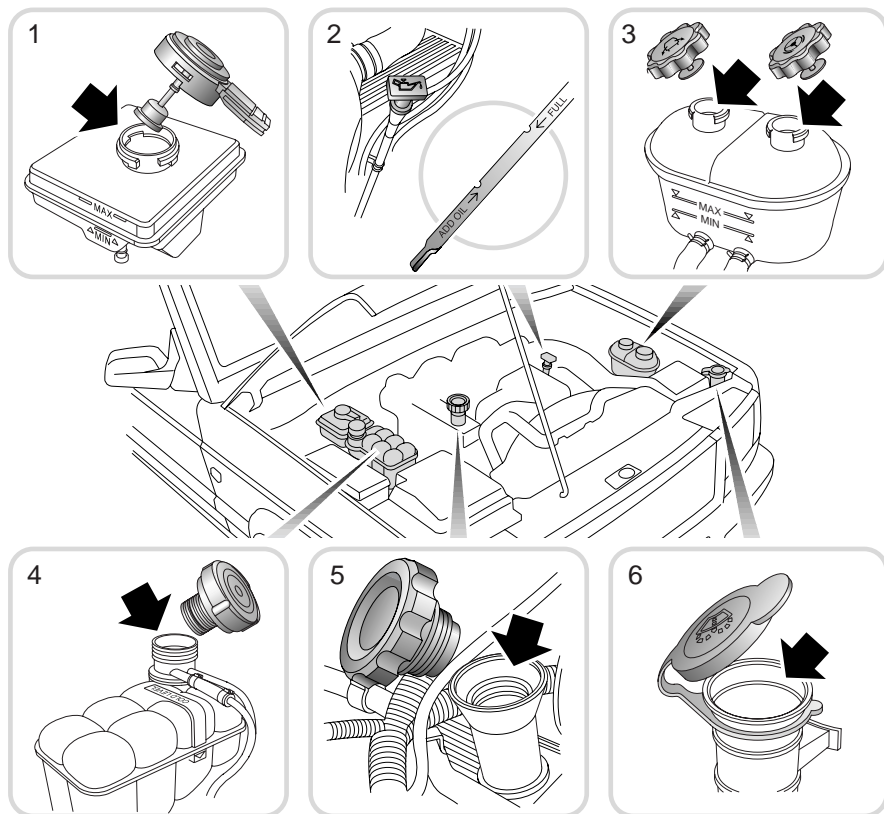
1. Brake fluid reservoir.
2. Engine oil dipstick.
3. Power steering and active cornering enhancement (if fitted).
4. Cooling system reservoir.
5. Engine oil filler cap.
6. Washer reservoir.

Instructions on how and when owner maintenance should be carried out are included on the following pages.

### WARNING

*While working in the engine compartment, ALWAYS observe the safety precautions listed under 'Safety in the garage', at the beginning of the Owner Maintenance section.*

# Engine compartment



H2535

## Petrol engine

1. Brake fluid reservoir.
2. Engine oil dipstick.
3. Power steering and active cornering enhancement (if fitted).
4. Cooling system reservoir.
5. Engine oil filler cap.
6. Washer reservoir.

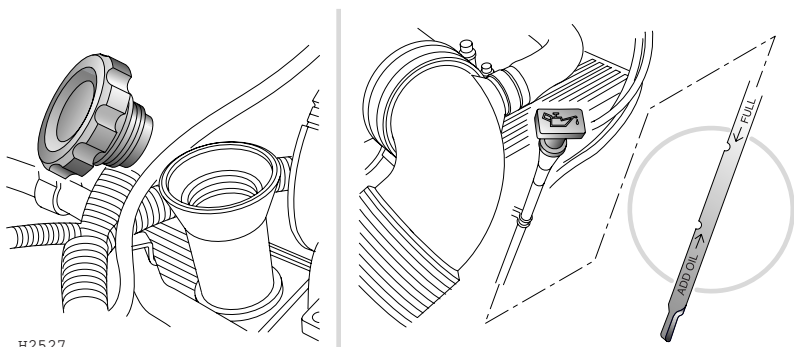
Instructions on how and when owner maintenance should be carried out are included on the following pages.

### WARNING

*While working in the engine compartment, ALWAYS observe the safety precautions listed under 'Safety in the garage', at the beginning of the Owner Maintenance section.*

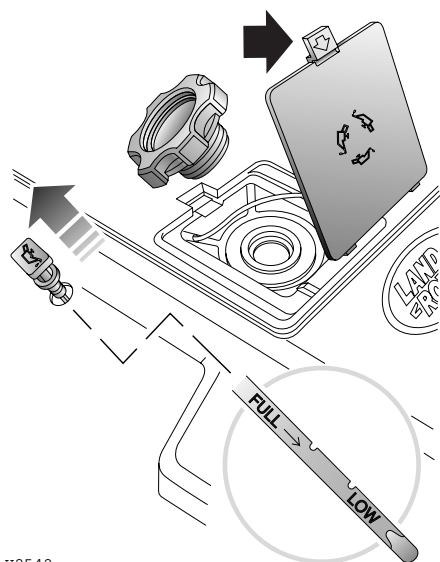


# Engine



H2527

## Petrol engine



H2542

## Diesel engine

### ENGINE OIL LEVEL-CHECK & TOP-UP

Check the oil level at least every 250 miles (400 km) when the engine is COLD and with the vehicle resting on level ground as follows:

1. Withdraw the dipstick and wipe the blade clean.
2. Fully reinsert 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, unscrew the oil filler cap and add oil to maintain the level between the UPPER and LOWER marks on the dipstick.

### DO NOT OVERFILL!

**NOTE:** On diesel engine vehicles it is necessary to remove the access flap before topping up - lift the release tab (arrowed).

# Engine

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As a general guide, if the level on the dipstick:

- is nearer to the upper mark than the lower, add no oil.
- is nearer to the lower mark than the upper, add half a litre of oil.
- is below the lower mark, add one litre of oil and re-check the level after a further five minutes.

**NOTE:** *If it is necessary to check the oil level when the engine is hot, switch off the engine and let the vehicle stand for five minutes to allow the oil to drain back into the sump. DO NOT start the engine. Follow the procedure already described.*

## Oil specification

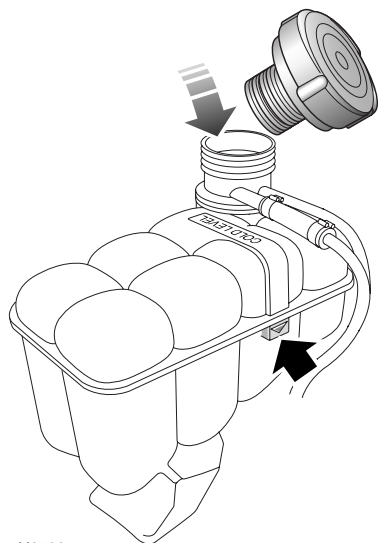
It is essential to use an oil suitable for the climatic conditions in which the vehicle is to be operated. Precise specifications are shown in 'General data'. If in doubt, contact your Land Rover dealer.

# Cooling System

## COOLING SYSTEM 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.



H2539

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.

Top-up with a 50% mixture of anti-freeze and water so that the surface of the coolant is level with the indicator on the side of the tank (arrowed in illustration). Ensure the cap is tightened fully after top-up is completed.

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

### DO NOT OVERFILL!

#### Anti-freeze

Anti-freeze contains important corrosion inhibitors. The anti-freeze content of the coolant must be maintained at 50%  $\pm$  5% all year round (not just in cold conditions). Failure to do so may cause corrosion of the radiator and engine components.

The specific gravity of a 50% anti-freeze solution at 68° F (20° C) is 1.075 and protects against frost down to -33° F (-36° C).

USE ONLY Havoline Extended Life Coolant (XLC) or any ethylene glycol based anti-freeze (containing no methanol) with only Organic Acid Technology (OAT) corrosion inhibitors.

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 frost protection. DO NOT top-up or refill with conventional anti-freeze formulations. If in doubt consult a Land Rover dealer.

# Cooling System

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## WARNING

- *Anti-freeze is poisonous and can be fatal if swallowed. 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 will damage painted surfaces.*
  - *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.*
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# Brakes

## WARNING

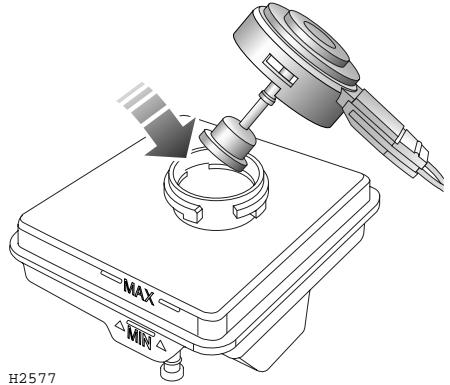
*Contact your dealer immediately if brake pedal travel is unusually long or if there is any appreciable drop in brake fluid level.*

### BRAKE FLUID 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. Any substantial drop in fluid indicates a leak in the system, in which case the vehicle must NOT be driven and you should contact your dealer.

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 container without removing the filler cap.

**NOTE:** *The brake fluid reservoir also supplies fluid to operate the hydraulic clutch.*



### Topping-up

Wipe the filler cap clean before removing to prevent dirt from entering the reservoir. Unscrew the cap (1/8 turn) and top up the reservoir to the 'MAX' mark using *FMVSS 116 DOT 4* 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!**

# Brakes

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## WARNING

***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.***

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

***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 the affected area immediately with plenty of water.***

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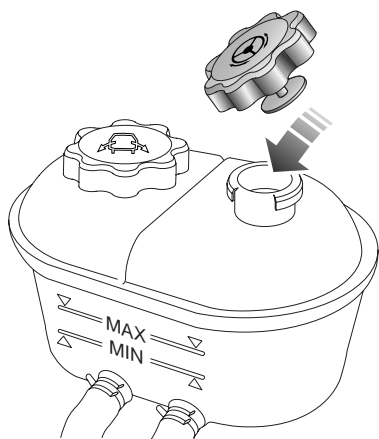
## IMPORTANT INFORMATION

Brake fluid must be completely renewed every 24,000 miles (40,000 km) or 24 months, whichever is the sooner.

At 48,000 mile (80,000 km) intervals or every 4 years, whichever is the sooner, all hydraulic brake fluid, seals and flexible hoses should be renewed. All working surfaces of the caliper cylinders should be examined and the components renewed where necessary. Under arduous operating conditions, these intervals may need to be reduced. Please consult your Land Rover dealer.

# Power Steering

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## POWER STEERING TOP-UP

Check and top-up the fluid level **ONLY** with the engine switched off and the system cold, and ensure that the steering wheel is not turned after stopping the engine.

Check the fluid level against the level 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 until the fluid reaches the upper level mark.

## DO NOT OVERFILL!

## Emergency operation

Any large or sudden drop in the fluid level must be investigated by a qualified dealer.

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 qualified dealer 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.

## 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.***

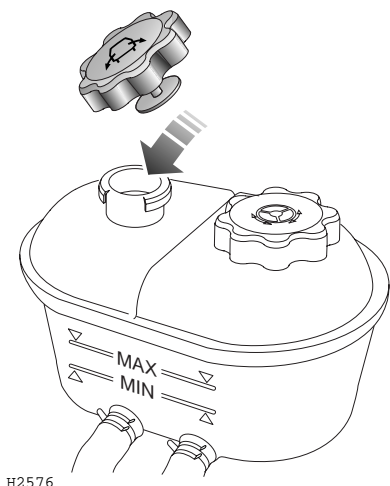
***If power steering fluid should come into contact with the skin or eyes, rinse immediately with plenty of water.***

***Do not spill power steering fluid onto a hot engine - a fire may result.***

***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.***

# Active cornering enhancement

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## WARNING

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

*Do not spill fluid onto a hot engine - a fire may result.*

*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.*

## ACTIVE CORNERING ENHANCEMENT FLUID TOP-UP

Check the fluid level against the level 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 until the fluid reaches the upper level mark.

### DO NOT OVERFILL!

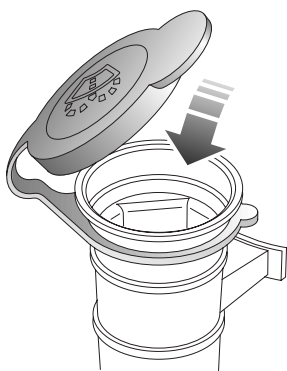
Any large or sudden drop in the fluid level must be investigated by a qualified dealer.

**NOTE:** While the power steering and active cornering enhancement systems share the same fluid specification and reservoir, both systems are entirely independent of each other. The reservoir is divided into two compartments and each system has its own filler cap.



# Washers

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H2541

## WINDSCREEN WASHER TOP-UP

The windscreen washer reservoir supplies both front and rear screen washer jets and headlight washer jets (where fitted).

Check the reservoir level at least every week and top-up with a mixture of water and Land Rover Parts STC 8249 Screenwash. Preferably mix the recommended quantities of water and screenwash in a separate container before topping-up, and always follow the instructions on the container. Note that an approved screenwash is necessary to prevent freezing in very cold weather.

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

## WARNING

**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 windscreen washer pump.

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

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

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## WASHER JETS

The windscreen 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 windscreen.

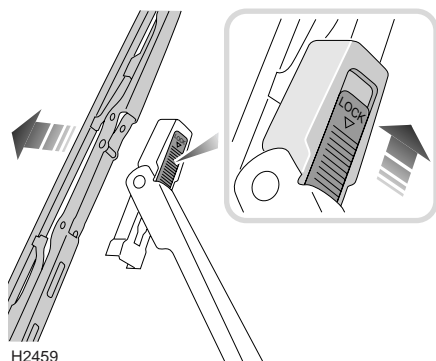
The rear screen jets located in the wiper arm are not adjustable.

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

## HEADLIGHT WASHERS (if fitted)

The spray jets are set during manufacture and should not need to be adjusted.

# Wiper blades



## WIPER BLADE REPLACEMENT

### Front wiper blades

Lift the wiper arm away from the windscreen. Disconnect the blade by pushing the locking tab (see inset in illustration) to the unlock position.

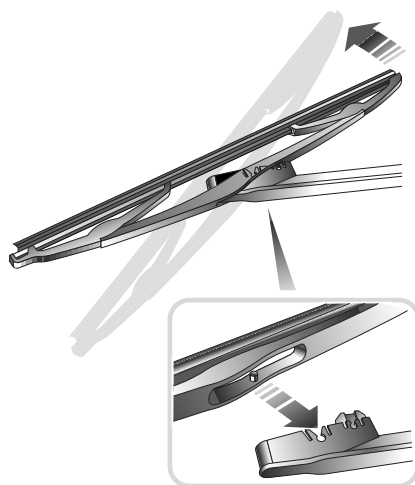
Fitting a replacement blade is a reversal of this process. Check that the blade is securely locked before returning the wiper assembly to the windscreen.

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

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 windscreen during use, then the wiper blades should be replaced.

Clean the windscreen regularly with an approved glass cleaner and ensure the screen is thoroughly cleaned before fitting replacement wiper blades.



### Rear wiper blade

With the spare wheel removed from the taildoor, lift the wiper arm away from the rear screen. 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.

# Tyres

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## WARNING

- *Never drive your vehicle if the tyres are badly worn, cut or damaged, or if the pressures are incorrect.*
  - *Incorrectly inflated tyres wear rapidly and seriously affect the vehicle's safety and road handling characteristics.*
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### Caring for your tyres

Always drive with consideration for the condition of the tyres and frequently inspect the tread and side walls for signs of distortion or damage (in particular, look for lumps, cuts and bulges).

### Tyre pressures

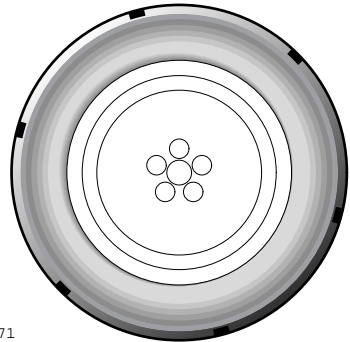
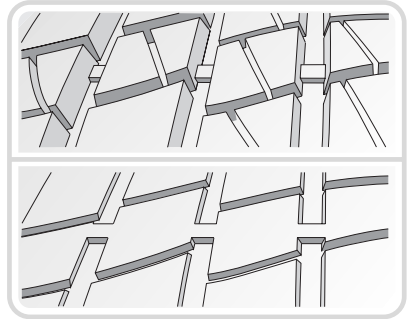
Tyre pressures should be checked at least once a week with normal road use, but should be checked DAILY if the vehicle is used off-road.

Check the pressures, including the spare, when the tyres are cold (air pressure naturally increases in warm tyres). The recommended pressures are shown in the 'General data' section.

## WARNING

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

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### Tyre wear

Some tyres fitted as original equipment have wear indicators moulded into the tread pattern. When the tread has worn down to 1.6 mm (1/16 inch) 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 tyre.

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

# Tyres

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Tread depth must be checked regularly (at every maintenance service, or more frequently). Always replace a tyre before the tread reaches a remaining depth of 1.6 mm. DO NOT drive with tyres 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 tyres or exposure of the ply or cord structure.

## Valve caps

Keep the valve caps screwed down firmly to prevent dirt from entering the valve.

## Replacement tyres

Wheel rims and tyres are matched to suit the handling characteristics of the vehicle. For safety, ALWAYS check that replacement tyres comply with the original specification shown in 'General Data' later in this handbook 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 dealer for further information or assistance.

## WARNING

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

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

***DO NOT replace wheels with any type other than genuine Land Rover parts. Wheels and tyres 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.***

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## Snow chains

Snow chains are designed for use on metalled roads in extreme snow 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:

- **Front wheels:** Snow chains must not be fitted to the front wheels unless the vehicle is equipped with 215/75 R16 Pirelli Scorpion S/T 107T tyres.
- **Rear wheels:** Snow chains can be fitted to the rear wheels of any vehicle, provided the wheels and tyres conform to one of the original equipment specifications listed in the handbook (see 'General Data').
- Whether chains are to be fitted to the rear wheels only, or to all four wheels, ONLY Land Rover approved chains should be used - these are designed for your vehicle and will eliminate any risk of damage to other components.
- 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).
- Avoid tyre 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 dealer.

## WARNING

***Fitting unapproved snow chains could damage brake components.***

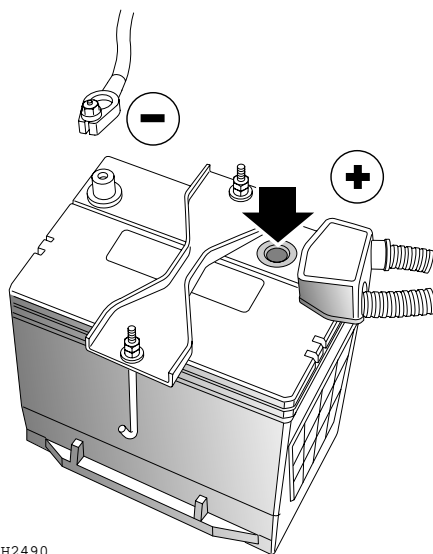
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# Battery

## WARNING

*Batteries contain 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.*



H2490

## Battery maintenance

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 jump start the car in this condition.
- If the green dot is missing, the battery needs charging.

# Battery

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**NOTE:** When checking the battery condition indicator, if necessary, clean the battery top to ensure a clear view.

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.

## WARNING

**ALWAYS** remove the starter key before disconnecting the battery. Failure to do this could cause a failure of the airbag SRS.

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### Battery removal and replacement

Before disconnecting the battery, disarm the alarm, and ensure that the starter 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 car, undo the nuts securing the battery clamping plate and remove the clamping plate.

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 nuts until the clamping plate is free from movement, but do not overtighten.

### 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 car's electrical system.

### Battery disposal

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

## WARNING

- **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.**
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# Battery

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## Battery 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 - charging the battery with the cables connected may damage the vehicle's electrical system.
- 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 and 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.
- After charging, leave the battery for an hour BEFORE reconnection to the vehicle - this will allow time for explosive gases to disperse, thereby minimising the risk of fire or explosion.

**NOTE:** Be aware that a battery will take longer to charge in a cold environment.

## WARNING

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

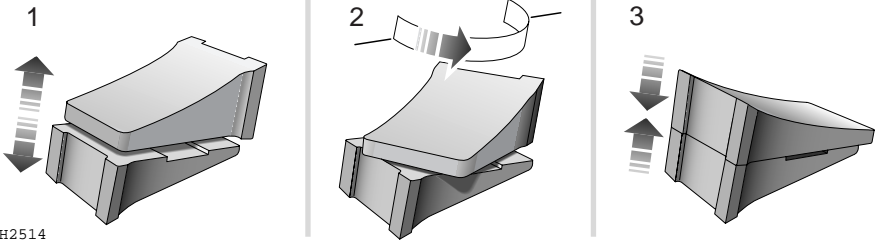
**DO NOT attempt to charge the battery if the battery condition indicator is clear or light yellow.**

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

---



# Wheel changing



## IMPORTANT INFORMATION

Before changing a wheel, always observe the following precautions!

- Park your vehicle away from the thoroughfare, and make your passengers wait in a safe area AWAY from the vehicle.
- Switch on the hazard warning lights to alert other road users.
- Ensure the jack is positioned on firm, level ground.
- Apply the handbrake and engage 1st gear in the main gear box ('P' for automatic transmission) and select 'L' in the transfer box. Position the vehicle's front wheels in the straight ahead position, turn off the starter switch and remove the key.

### In addition:

NEVER raise the vehicle with passengers inside, or with a caravan or trailer connected!

NEVER work beneath the vehicle with the jack as the only means of support. The jack is designed for wheel changing only!

## Using the wheel chock

### WARNING

***Before raising the vehicle, it is ESSENTIAL to chock the road wheels in two places; the handbrake acts on the transmission, not on the rear wheels, and therefore may not hold the vehicle when raised.***

If possible, position the vehicle on level ground, chocking both sides of the wheel diagonally opposite the one to be removed.

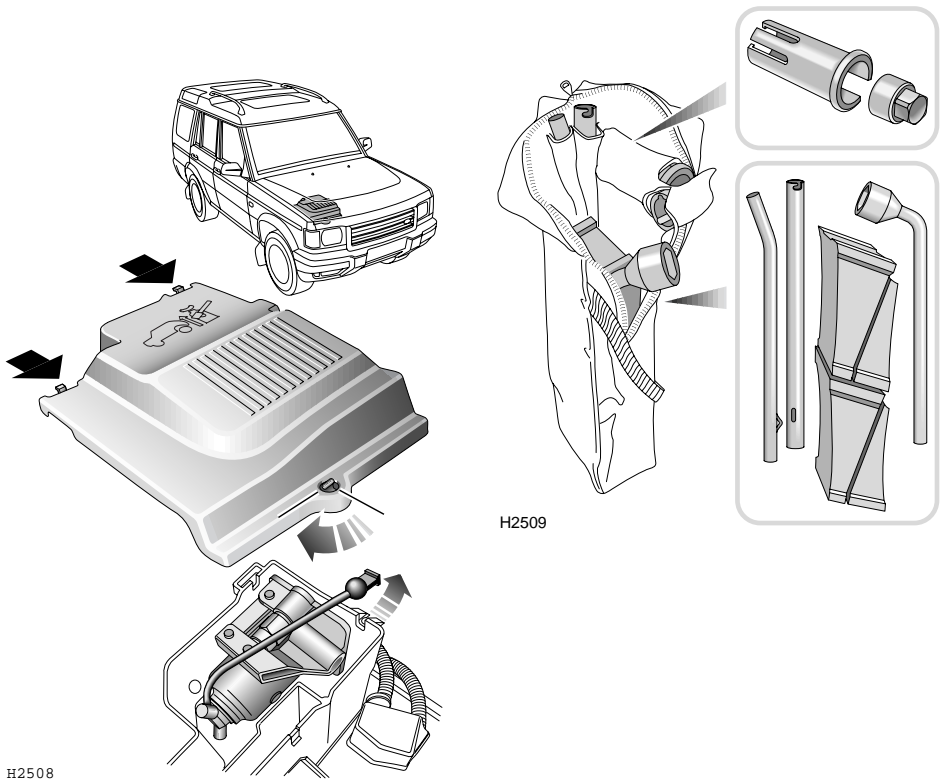
If jacking the vehicle on a slope is unavoidable, place the chocks on the downhill side of the two opposite wheels.

The wheel chocks are stowed with the jack handle and wheel nut spanner in the tool bag.

Assemble the wheel chocks as follows:

- 1) Pull the two halves of the chock apart.
- 2) Twist one half of the chock 180°.
- 3) Push the two halves back together.

# Wheel changing



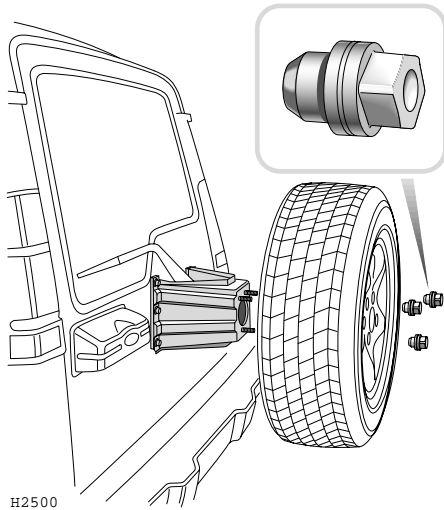
The jack is stowed in the front of the engine compartment next to the battery. To access the jack, remove the battery cover. The jack handle and other tools are stowed in a tool bag in the taildoor storage pocket.

## WARNING

*Due to its stowage position in the engine compartment the jack may be hot if the engine has been running.*

# Wheel changing

---



## WARNING

- **DO NOT** use the spare wheel securing nuts in place of the road wheel nuts, or use the road wheel nuts to secure the spare wheel - the nuts are not inter-changeable.
- The wheels are extremely heavy. Take care when lifting and particularly when removing the spare wheel from its mounting position on the tail door.

## Removing the spare wheel

Vehicles fitted with a steel spare wheel are supplied with a cover, which fits over the wheel. Use the wheel nut wrench supplied in the tool kit to remove the nuts securing the cover.

Similarly, use the wheel nut wrench to remove the nuts securing the spare wheel to the carrier and then lift off the wheel.

**NOTE:** In some markets, vehicles fitted with alloy wheels have a locking wheel nut fitted to each wheel, including the spare (see 'Locking wheel nuts' later in this section). In other markets, vehicles fitted with alloy wheels have a single locking wheel nut fitted to the spare wheel only.

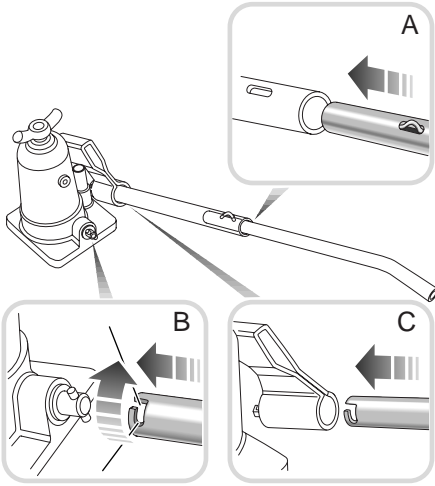
Locking wheel nuts are not specified for steel wheels.

# Wheel changing

---

## WARNING

- *Ensure the jack is positioned on firm, level ground.*
- *DO NOT use the jack to raise the vehicle until you have carefully read and understood 'Positioning the jack' later in this section. If in doubt, consult your dealer.*
- *Ensure that the space under and around the vehicle is free from obstruction as it is lowered.*



H2510

### Operating the jack

Slot the two parts of the jack lever together, ensuring that the spring clip protrudes from the engagement slot where the two parts join (see inset 'A'). Close the jack release valve by using the notched end of the jack lever to turn the valve fully clockwise (see inset 'B'). Insert the lever into the socket as shown (inset 'C') and twist the lever to lock it into the socket. Pump the lever up and down to raise the jack.

To lower the jack, detach the lever (twist and pull) and then slot the notched end over the pegs on the release valve. Slowly turn the release valve anti-clockwise allowing the weight of the vehicle to lower the jack.

DO NOT fully unscrew the release valve.

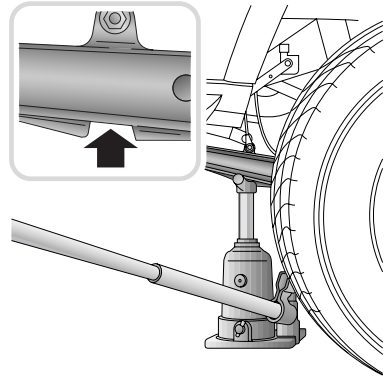
# Wheel changing

## Positioning the jack

Always position the jack from the side of the vehicle, approximately in line with the appropriate jacking point.

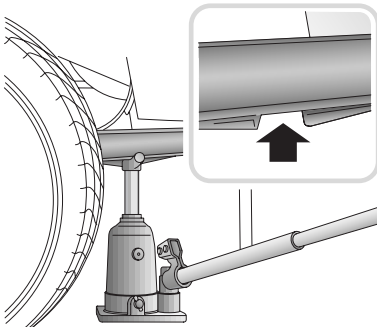
### WARNING

- **ALWAYS** use the complete, two-piece, jack lever throughout to minimise any chance of accidental damage or injury.
- **ONLY** jack the vehicle using the jack location points described, or damage to the vehicle could occur.



H2515

*Rear jacking point*



H2516

*Front jacking point*

Position the jack so that, when raised the cradle head of the jack engages with the shaped notch on the underside of the front or rear suspension links - either just forward of the rear wheels or just to the rear of the front wheels (see illustrations).

## Changing a wheel

Before raising the vehicle, ensure that all the precautions listed at the beginning of this section have been observed. Also, ensure that the wheel chocks are correctly positioned (as described previously).

In some markets, vehicles fitted with alloy wheels have one locking wheel nut fitted to each wheel. Refer to 'Locking wheel nuts' later in this section before changing an alloy wheel.

- Use the wheel nut wrench to slacken the wheel nuts half a turn anti-clockwise.
- Raise the vehicle until the tyre is clear of the ground, and remove the wheel nuts and wheel (DO NOT damage the surface of the wheel by placing it face down on the road).

# Wheel changing

---

- On alloy wheels, lightly oil or grease the wheel-mounting spigot (using an approved anti-seize compound) to minimise the tendency for adhesion between the wheel and the spigot. Ensure that no oil or compound comes into contact with the brake components or the flat mounting surfaces of the wheel. If, due to an emergency situation, this treatment is not practicable; refit the spare wheel for the time being, but remove and treat the wheel at the earliest opportunity.
- Fit the spare wheel and lightly tighten the wheel nuts, ensuring they are firmly seated. DO NOT fully tighten whilst the tyre is clear of the ground.
- Lower the vehicle and remove the jack and wheel chocks.
- Fully tighten the wheel nuts in an alternating pattern until all are tightened. DO NOT OVERTIGHTEN by using foot pressure or extension bars on the wheel nut wrench, as this could overstress the wheel studs. Check the wheel nut torque at the earliest opportunity (see 'General data').
- REMEMBER to change to 'H' (high range) before driving.
- Finally, check the tyre pressure.

## WARNING

*When fitting a wheel, ensure that the mating faces of the hub and wheel are clean and free from rust - an accumulation of dirt or rust could cause the wheel nuts to become loose and result in an accident.*

---

## Care of the jack

Examine the jack occasionally, clean and grease the moving parts, particularly the ram.

To avoid contamination, the jack should always be returned to its fully closed position.

## WARNING

*After wheel changing, always secure tools, chocks, jack and spare wheel in their correct storage positions.*

---

# Wheel changing

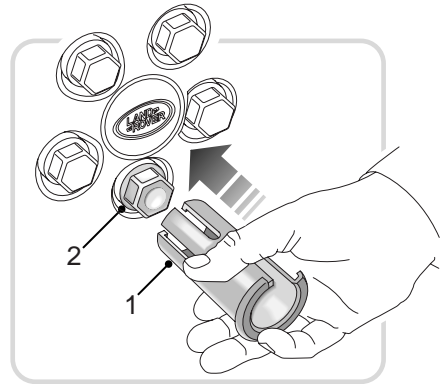
## LOCKING WHEEL NUTS

Vehicles fitted with alloy wheels may be equipped with a locking wheel nut on each wheel (including the spare). The locking wheel nut covers are visually very similar to standard wheel nuts but can be identified by a concave indent on the surface. The locking wheel nut and cover can only be removed using the special tools provided, as follows:

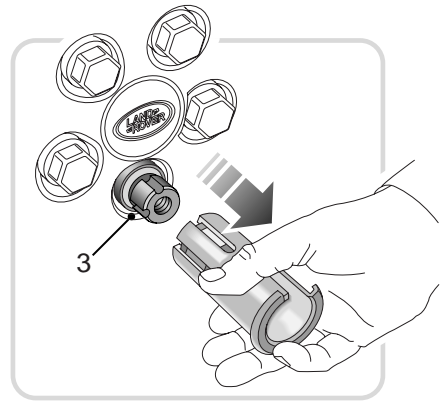
- Push the extractor tool (1) firmly over the stainless steel nut cover (2).
- Pull the extractor tool **squarely** away from the wheel to remove the nut cover and reveal the locking wheel nut (3).
- Fit the metal key socket (4) securely over the locking wheel nut.
- Fit the wheel nut wrench onto the key socket and unscrew the nut in the normal way.

A code letter is stamped on the face of the key socket. Ensure the code letter is entered in the space provided on your Security Information card - you will need to quote this number if replacement components are required. Keep the card in a safe place away from the vehicle.

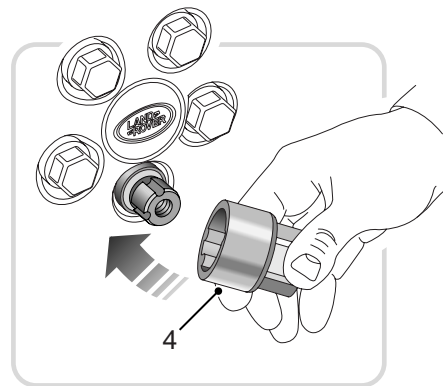
**NOTE:** If the extractor tool has been inadvertently pushed onto a standard wheel nut, it can be removed **ONLY** by first undoing and removing the nut; slide the wheel nut wrench down the centre of the extractor and onto the wheel nut.



H2511



H2512



H2513

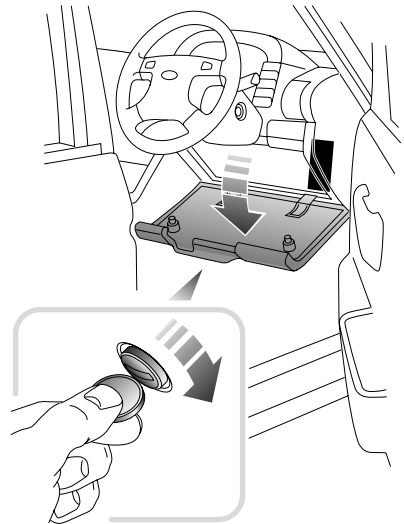
# *Fuse box*

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## **FUSE BOX**

Fuses are simple circuit devices which protect electrical equipment against the effects of excess current. A 'blown' fuse is indicated when the electrical equipment it protects becomes inoperative.

The main fusebox is fitted below and to one side of the steering column; to access the fuses, remove the cover by releasing the fixing screws using a coin or small screwdriver to twist the turnbuckle screw through 90 degrees.



H2496



# Fuse box

## Renewing a fuse

Always turn the starter switch to position 'O' and switch off the affected electrical circuit before removing a fuse.

### WARNING

*Fit only replacement fuses of the same rating and type. Always rectify the cause of the failure before replacing a fuse. Seek qualified assistance if necessary.*

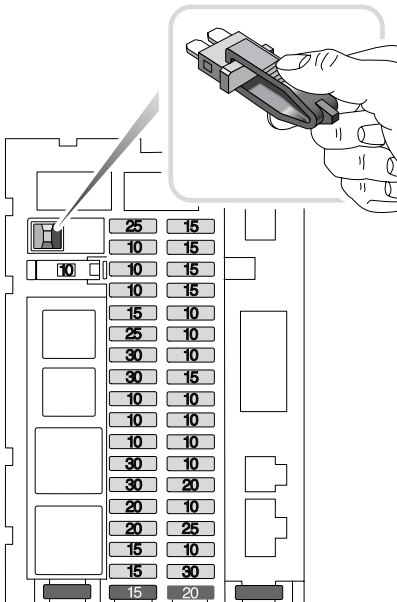
Press the fuse removal tweezers onto the head of the suspect fuse (as shown) and pull to remove. A break in the wire inside the fuse indicates that the fuse has 'blown' and must be replaced. Always replace a fuse with another of the same value, however, if the replacement fuse blows immediately the circuit MUST be checked by a qualified dealer.

Fuses are colour coded to help identify their amperage, as follows:

VIOLET	3
TAN	5
BROWN	7.5
RED	10
BLUE	15
YELLOW	20
WHITE	25
GREEN	30
ORANGE	40

A label in the fuse box cover shows the circuits protected, the fuse values and their locations. They are also listed on the following page.

## MAIN FUSE BOX



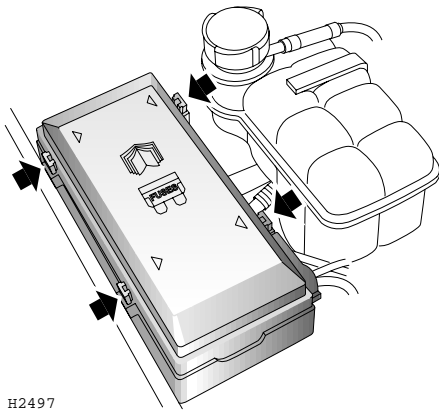
H2495

# *Fuse box*

Fuse No.	Rating (amps)	Circuits protected
1	25	Central door locking
2	10	Fuel flap release
3	10	LH headlight main beam
4	10	Rear fog guard lights
5	15	Daylight running lights (if fitted)
6	25	Rear air conditioning blower
7	30	Heater blower front
8	30	Heated rear window, heated mirrors
9	10	LH headlight dipped beam
10	10	RH headlight dipped beam
11	10	LH side & tail lights, number plate light, headlight levelling, interior illumination
12	30	Sunroof
13	30	Rear windows
14	20	Petrol engine ignition coils
15	20	Cigar lighter, interior lights, seat heaters, vanity mirror illumination
16	15	Clock, radio
17	15	Radio amplifier, speakers
18	15	Rear wiper motor
19	15	Front wipers/washers
20	15	Interior lights, clock/radio memory, engine remobilisation
21	15	Transfer box
22	10	RH headlight main beam
23	10	Starter motor
24	10	Alternator, auto transmission
25	15	Brake, reverse lights
26	10	Auxiliary circuits
27	10	Instruments, hill descent control
28	10	Self levelling suspension, anti-lock braking
29	10	Active cornering enhancement (ACE)
30	20	Cruise control, electric mirrors, rear washer
31	10	Air conditioning blower
32	25	Accessory socket
33	10	RH side & tail lights, headlight levelling, radio, trailer socket, interior illumination
34	30	Front windows
35	10	Airbag SRS - DO NOT REMOVE

**NOTE:** Spare fuses are included in the fuse box (see fuse box label).

# Fuse box



## ENGINE COMPARTMENT FUSE BOX

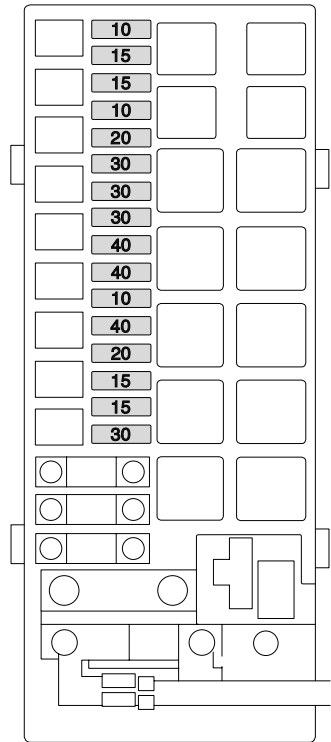
A second fuse box is located on the right side of the engine compartment adjacent to the coolant reservoir.

Press all four latches in the direction of the arrows shown on the illustration to release the fuse box cover.

Information on the underside of the cover identifies the fuses and their ratings. This information is also listed on the following page.

When replacing, the cover, locate the four latches, then push firmly downwards until the latches can be heard to 'snap' closed.

Owners are advised against removing or replacing the relays (identified as R1-R14) and fusible links (FL1-FL13). Failure of any of these items should be investigated by a qualified dealer.



## WARNING

**Batteries emit explosive hydrogen gas; ensure that sparks, flames and other ignition sources are kept away from the engine compartment.**

## ***Fuse box***

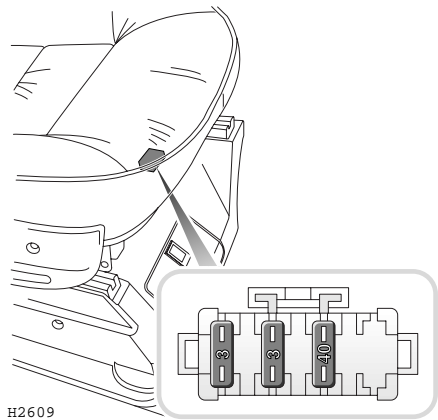
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<b>Fuse No.</b>	<b>Rating (amps)</b>	<b>Circuits protected</b>
1	30	Injectors - petrol, ECM - diesel
2	15	Engine management system
3	15	Front fog lights
4	20	Headlight washers
5	40	Cooling fans
6	10	Air conditioning
7	40	Heated front screen (LH)
8	40	Heated front screen (RH)
9	25	Trailer lights
10	30	Fuel pump
11	30	ABS valve
12	20	Automatic gearbox
13	10	Body Control Unit (BCU)
14	15	Direction indicators, hazard lights
15	15	Active cornering enhancement (ACE)
16	10	Horn

# Fuse box

## UNDERSEAT FUSES

Two identical small fuse blocks are situated one beneath each front seat.



Fuse No.	Rating (amps)	Circuits protected
1	40	Seat electrics
2	3	Lumbar support - pump
3	3	Lumbar support - solenoid

# Bulb replacement

REPLACEMENT BULBS	Watts
Headlight unit:	
Dip/main headlights	60/55
Front side lights	5
Front direction indicators	21
Side marker lights	5
Front fog lights	55
Rear light unit:	
direction indicators	21
tail lights	5
stop lights	21
rear fog guard lights	21
reversing lights	21
High mounted stop light	21
Side repeater lights	5
Number plate lights	5
Interior light	5
Interior courtesy lights	10
Vanity mirror lights	1.2
Glovebox light	5

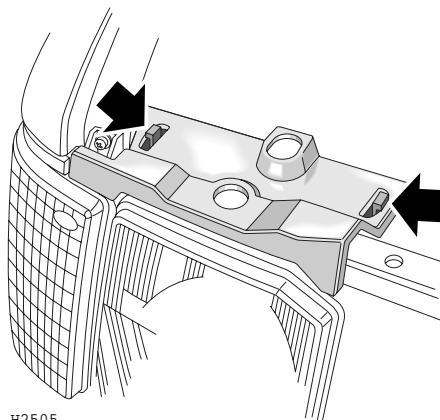
**NOTE:** All bulbs must be rated at 12 volts.

## IMPORTANT INFORMATION

Before replacing a bulb, always switch off the starter switch and appropriate lighting switch to prevent any possibility of a short circuit. Only replace bulbs with the same type and specification.

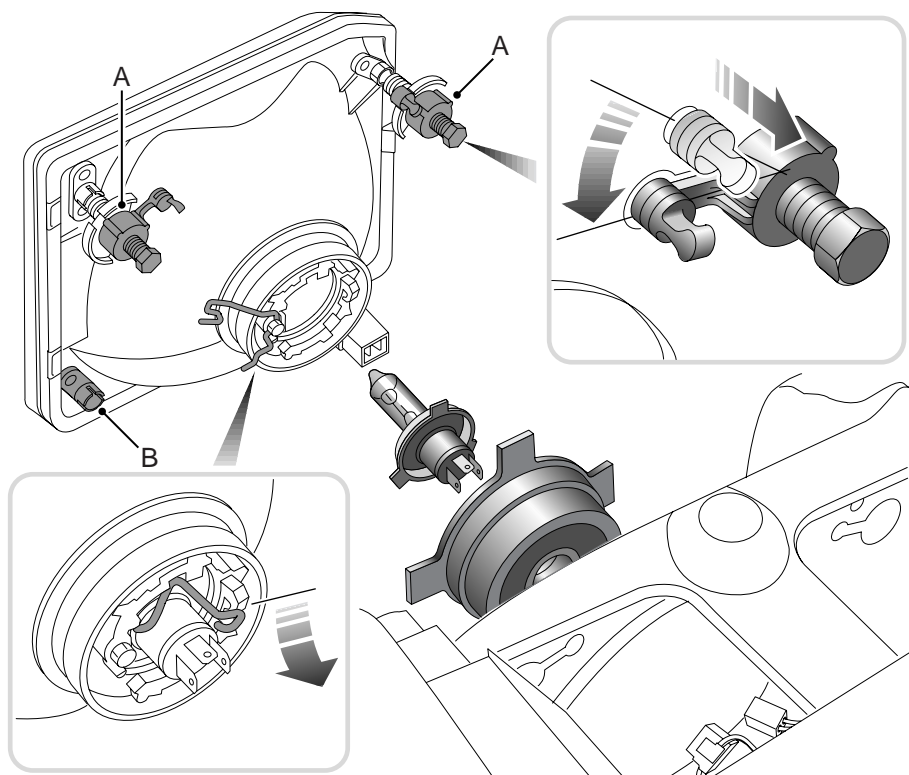
### Halogen bulbs

Halogen bulbs are used for dipped/main, supplementary main beam and front fog lights. Take care NOT to touch this type of bulb with your fingers; always use a cloth to handle them. If necessary, clean the bulb with methylated spirits to remove fingerprints.



H2505

# Bulb replacement



H2460

## HEADLIGHT AND SIDELIGHT

### Light unit removal

First remove the access panel set into the bonnet locking platform above each headlight (see previous page). To replace either the headlight or sidelight bulb, remove the light unit as follows:

Disengage the retaining clips 'A' and rotate them approximately 10 degrees (see inset) until they align with the slots in the headlight mounting panel. The light unit can now be released forward.

**NOTE:** Vehicles fitted with headlight levelling (as illustration) have two retaining clips at the top only (the bottom of the light unit is mounted on the headlight height adjustment operating rod 'B'). Remove the lamp by gently pulling it off the ball socket of the operating rod.

### WARNING

**DO NOT** screw or unscrew the retaining clips more than described - their position affects the alignment of the headlights.

# Bulb replacement

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## Headlight bulb replacement

Disconnect the electrical multi-plug and remove the rubber cover. Release the spring clip which holds the bulb and withdraw the bulb from the light unit. When replacing the bulb, ensure that the larger tab is pointing towards the top of the headlight.

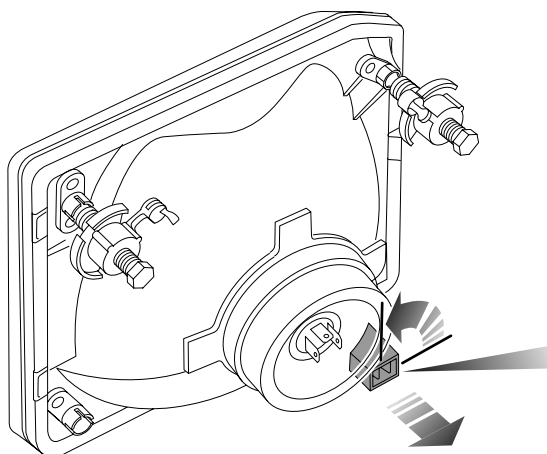
Replace the spring clip and rubber cover, ensuring the slit in the cover is at the top of the headlight, and pressing the centre firmly to seal around the electrical contacts of the bulb.

**NOTE:** Do not touch the bulb glass with your fingers. If necessary, clean the bulb with methylated spirits.

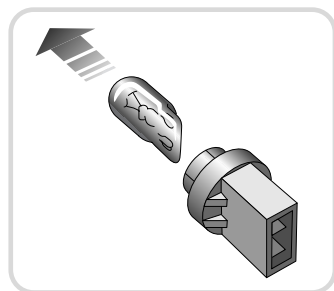
## Replacing the headlight unit

Replacement is a reversal of the removal procedure. However if headlight levelling is fitted, it is necessary to carefully align the lower fixing position 'B' to the height adjustment operating lever before fitting the retaining clips 'A'.

Once the retaining clips are secure, firmly push the bottom of the headlight unit towards the rear of the vehicle to fully engage the height adjustment operating lever.



H2461

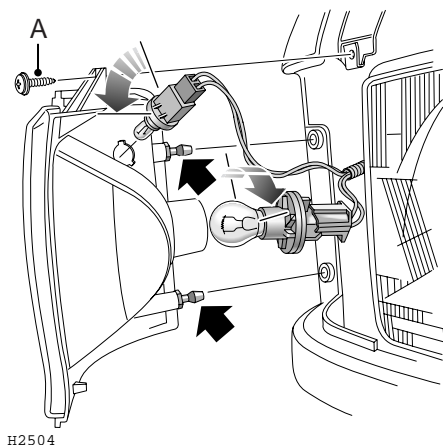


## Sidelight bulb replacement

With the light unit removed (see previous instructions), disconnect the electrical multi plug and disengage the bulb holder by twisting a quarter turn anti-clockwise. Pull the bulb from the holder to remove.



# Bulb replacement



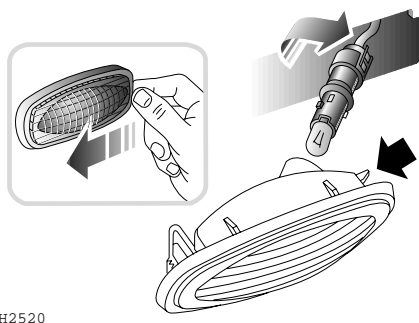
## FRONT DIRECTION INDICATOR AND SIDE MARKER LIGHT

Remove the retaining screw 'A', then ease the light unit forward to release it from the vehicle.

Both the small side marker light and larger direction indicator bulb holders are released from the light unit by twisting anti-clockwise.

Pull the side marker bulb to remove. Push and twist the direction indicator bulb to remove.

To replace the light unit, insert the two location pins (arrowed) on the outer side of the light unit into the vehicle body, push firmly into position and, finally, replace the retaining screw.

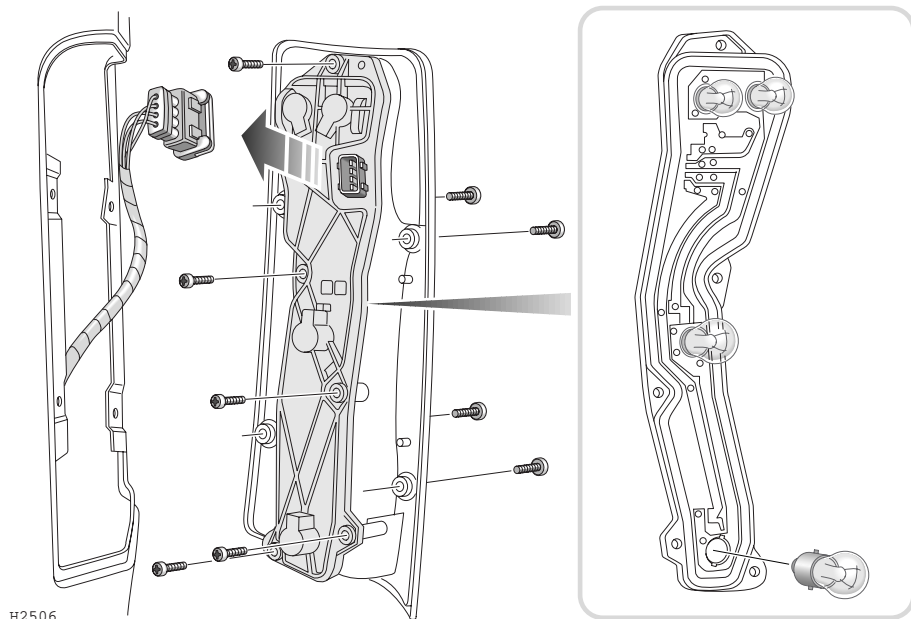


## SIDE REPEATER LIGHT

Push the lens firmly to the left and withdraw the light unit from the wing. Twist to release the bulb holder from the lens unit, then pull the bulb from its socket.

When refitting, ensure that the little tabs (arrowed in illustration) are pointed to the right and are inserted into the aperture before pushing the light unit into position in the wing.

# Bulb replacement



H2506

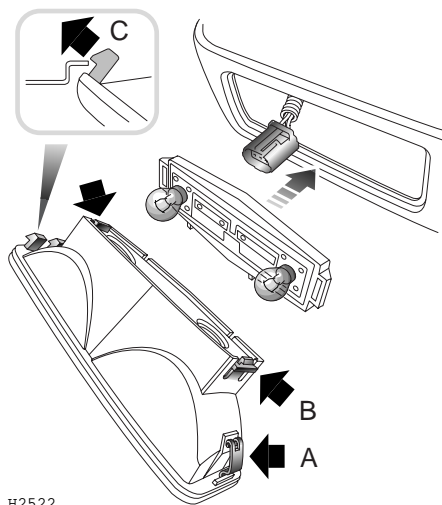
## REAR LIGHT CLUSTER

(Tail, stop & reverse lights)

From outside the vehicle remove the four retaining screws to release the light unit from the vehicle, then detach the electrical multi-plug connector, by pressing the metal retaining spring.

To gain access to the bulbs, remove the five screws from the rear of the light unit and detach the bulb holder. Push and twist to release each bulb.

# Bulb replacement



## BUMPER MOUNTED LIGHTS

(Fog guard lights & direction indicators)

### WARNING

*If the engine is warm, the exhaust system may be hot - to prevent personal injury, avoid contact with a hot exhaust system when reaching behind the bumper.*

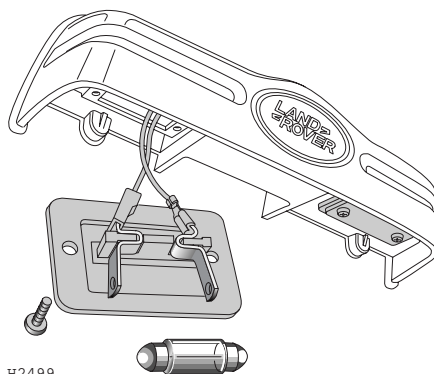
Reach behind the bumper and press the spring clip 'A' to release the light unit.

Squeeze both levers 'B' to release the bulb holder from the lens. Push and twist to release the bulbs.

**NOTE:** If necessary, the light unit can first be detached from the electrical harness by releasing the multi-plug from the rear of the bulb holder.

Before reassembling the light unit, make sure the seal (between holder and lens) is in place.

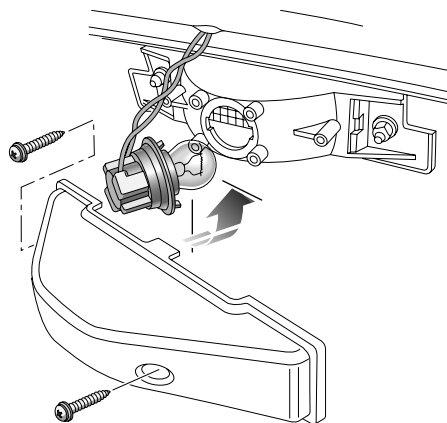
To replace the light unit, first locate the hooks 'C' in the bumper aperture and firmly push the other side of the light against spring pressure until it clicks into place.



## NUMBER PLATE LIGHTS

Remove both screws to release the light unit. Ease the light unit from its recess and pull the bulb to remove.

# Bulb replacement



## HIGH MOUNTED STOP LIGHT

Remove both retaining screws and the cover from the rear of the light unit. Twist the bulb holder anti-clockwise to remove. Push and twist anti-clockwise to release the bulb.

## FRONT FOG LIGHTS

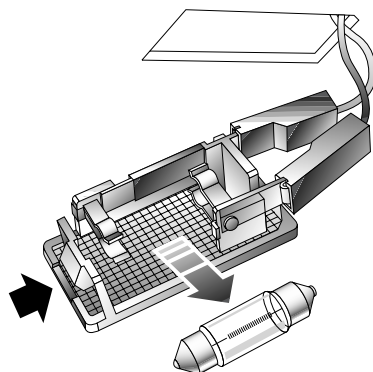
The front fog lights are mounted on the rear of the bumpers and are shielded from the rear by the lower wheelarch liner.

Access to the bulb is possible, but will entail lying beneath the centre of the vehicle at the front and reaching between the wheelarch liner and the back of the fog light.

Twist the cover on the rear of the fog light anti-clockwise .

Unhook the spring retaining clips to release the bulb. Pull the bulb from the connector. To ensure correct refitting of the light unit, owners are advised to entrust bulb changing to a Land Rover dealer.

**NOTE:** Do not touch the bulb glass with your fingers. If necessary, clean the bulb with methylated spirits.



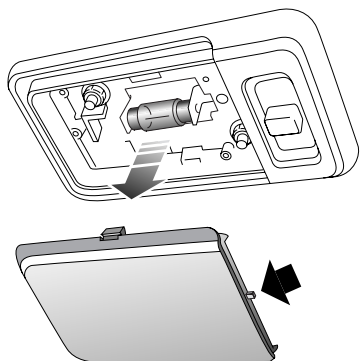
H2611

## GLOVEBOX LIGHT

Insert a small flat-bladed screwdriver (preferably with a short handle, due to limited access) into the indent (arrowed in illustration) on the left hand side of the light unit, and carefully prise the unit from the glovebox panel. Remove the bulb from its clips.

# *Bulb replacement*

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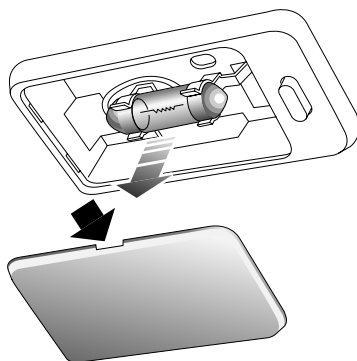


H2462

## **Interior courtesy lights**

Insert a small flat-bladed screwdriver into the indent on the side of the lens and carefully prise the lens from the light unit, then pull the bulb to remove.

When replacing the lens, first locate the lug (arrowed in illustration), then push the lens into position.



H2463

## **Interior light**

Insert a small flat-bladed screwdriver into the indent on the side of the lens (where arrowed) and prise the lens from the light unit, then pull the bulb out from the clips.



H2575

## WASHING YOUR VEHICLE

### 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, or at any components that might easily be damaged.*

Wash your vehicle frequently using a sponge and generous quantities of cold or lukewarm water containing a car shampoo. Rinse 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.

### 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.

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, where water pressure could penetrate the seals.

# *Cleaning & vehicle care*

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## **Steam cleaning**

Before steam cleaning the engine compartment, cover the power steering reservoir to prevent contamination of fluid.

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.

## **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.

## **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. Some exterior panels of your vehicle are made of aluminum which will not corrode in the same manner as steel. However, any damage should still receive prompt attention. 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 car polish to the bumper mouldings - polish will become ingrained in the textured finished.*

## **Glass and mirrors**

Clean the rear window with a soft cloth to avoid damaging the heating elements. DO NOT scrape the glass or use an abrasive cleaning fluid.

Mirror glass is particularly susceptible to damage. Wash with soapy water. DO NOT use abrasive cleaning compounds or metal scrapers to remove ice.

# *Cleaning & vehicle care*

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## **CLEANING THE INTERIOR**

### **Plastic materials**

Clean plastic-faced or cloth covered surfaces with diluted upholstery cleaner and wipe with a clean cloth.

### **Leather**

Leather seats, steering wheel and trim features should be cleaned with a damp cloth moistened with undiluted upholstery cleaner. Leave for five minutes, and then repeat the operation using a clean cloth and water - but avoid flooding the area! Dry and polish the leather with a dry, lint-free cloth.

DO NOT use petrol, detergents, furniture creams or polishes!

### **Carpet and fabrics**

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

### **Instrument pack, clock and radio**

Clean with a dry cloth only! DO NOT use cleaning fluids or sprays.

### **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 polish fascia components - for safety, these should remain non-reflective.***

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### **Airbag module covers**

To prevent airbag SRS damage, the steering wheel centre pad and area of the fascia panel containing the passenger airbag should **ONLY** be cleaned sparingly with a damp cloth and upholstery cleaner.

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

## **RECOMMENDED CARE PRODUCTS**

*(Available in the UK)*

De icer	STC 717
Alloy wheel cleaner	STC 718
Glass cleaner	STC 719
Black bumper cleaner	STC 721
Shampoo	STC 722
Wax polish	STC 723
Screen wash	STC 8249