



DEFENDER

Owner's Handbook

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Owner's Handbook

This handbook covers current Land Rover Defender models and, together with the Service Portfolio book, provides all the information you need to derive maximum pleasure from owning and driving your new vehicle.

For your convenience, the handbook is divided into sections, each dealing with a different aspect of the vehicle. These are listed on the title page and you will find it worthwhile to take a little time to read each one, and get to know your Defender as soon as you possibly can. The more you understand before you drive, the greater the satisfaction once you are seated behind the steering wheel.

IMPORTANT

The specification of each vehicle will vary according to territorial requirements and also from model to model within the vehicle range. Some of the information published in this handbook, therefore, may not apply to your particular vehicle.

Land Rover operates a policy of constant product improvement and therefore reserves the right to change specifications without notice at any time. Whilst every effort is made to ensure complete accuracy of the information in this handbook, no liabilities for inaccuracies or the consequences thereof can be accepted by the manufacturer or the dealer, except in respect of personal injury caused by the negligence of the manufacturer or the dealer.

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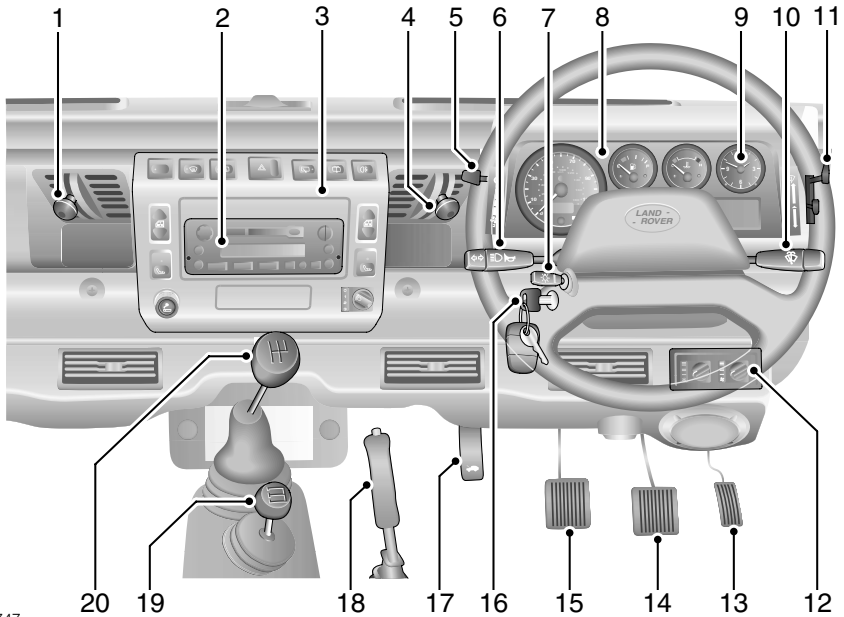
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Controls

CONTROLS



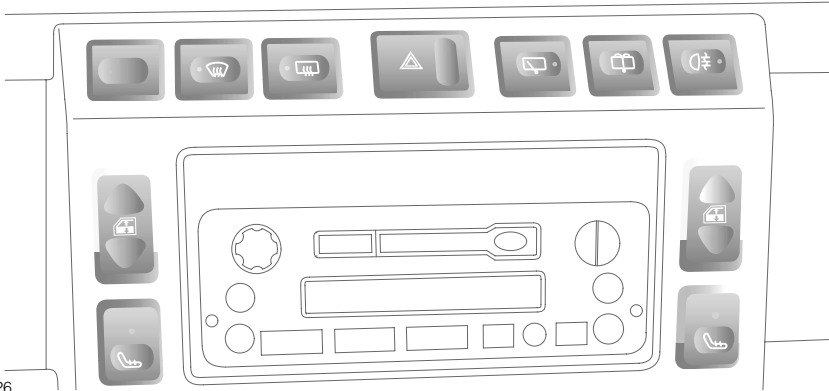
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|--|---|
| 1. Fresh air vent control | 11. Air temperature & distribution controls |
| 2. Audio system | 12. Air conditioning controls* |
| 3. Fascia switches (see overleaf) | 13. Accelerator pedal |
| 4. Fresh air vent control | 14. Brake pedal |
| 5. Air blower control | 15. Clutch pedal |
| 6. Direction indicators and horn control | 16. Starter switch |
| 7. Lighting switch | 17. Bonnet release lever |
| 8. Instrument panel | 18. Handbrake |
| 9. Clock | 19. Transfer gear lever |
| 10. Windscreen wiper/washer control | 20. Main gear lever |

NOTE: The precise specification and location of the controls may vary according to territorial requirements and from model to model within the vehicle range.

Controls

FASCIA SWITCHES



Heated front screen*



Press to operate (see 'Heated front screen*', page 50).

Heated rear screen*



Press to operate (see 'Heated rear window*', page 50).

Hazard warning lights



Press to operate (see 'HAZARD WARNING LIGHTS', page 38).

Rear window wiper*



Press to operate (see 'Rear window wiper', page 40).

Rear window washer*



Press to operate (see 'Rear window washer', page 40).

Rear fog guard lights*



Press to operate (see 'Rear fog guard lights', page 38).

Electric windows*



Press the appropriate switch to operate the front left or right window (see 'Operating the windows', page 43)

Seat heaters*



Press the appropriate switch to operate the front left or right seat heater (see 'HEATED FRONT SEATS*', page 22).

Locks & Alarm

KEYS AND HANDSETS

You have been supplied with two remote handsets and two sets of keys, comprising:

- A black key for operating the starter switch and door locks.
- A smaller metal key to operate the fuel filler cap lock.

The starter key number is stamped on a tag attached to the key ring. Check that the key number has been entered in the space provided on your Security card.

If the remote handset is lost, contact a Land Rover dealer, who can supply a replacement unit.

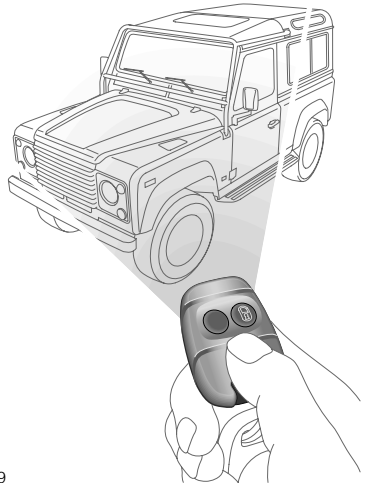
WARNING

Keep the Security card and spare handset and keys in a safe place - NOT IN THE VEHICLE!

ALARM SYSTEM*

Your vehicle is fitted with a sophisticated electronic anti-theft alarm and engine immobilisation system. In order to ensure maximum security and operating convenience, you are strongly advised to gain a full understanding of the alarm system, by thoroughly reading this section of the handbook.

Using the remote handset



H3619

While it is not necessary to point the handset at the vehicle, the handset must be within range of the vehicle when a button is pressed. Note that the operating range may vary depending upon handset battery condition and may sometimes be limited by physical and geographical factors beyond your control. From a security point of view, it may not be wise to unlock unless you are within a few feet of the vehicle.

Vehicles with central door locking

Locking with the remote handset:

Press the lock (padlock symbol) button once:

- all doors are locked (including the tail door)
- engine immobilised
- perimeter alarm activated (protects the doors and bonnet)
- interior space protection activated

The direction indicator lights flash three times to confirm that the vehicle is secure and the anti-theft alarm indicator light (in the instrument panel) starts to flash.

Locks & Alarm

Locking with the key:

Insert the key and turn the driver's door lock towards the rear of the vehicle:

- all doors locked (including the tail door)
- engine immobilised
- NO PERIMETRIC ALARM OR INTERIOR SPACE PROTECTION

The anti-theft alarm indicator light (in the instrument panel) starts to flash after 30 seconds to show that the engine is immobilised.

Unlocking with the remote handset:

Press the unlock (PLAIN) button once to disarm the alarm and unlock the doors.

The direction indicator lights flash once and the interior lights illuminate.

Unlocking with the key:

While all the doors can be unlocked using the key in the driver's door lock, this method is NOT RECOMMENDED - depending on the specification of the vehicle the alarm may not be disarmed.

Vehicles without central door locking

Locking & unlocking:

Each door lock must be operated individually, using the key. The handset will NOT operate the door locks. Turn the key towards the rear of the vehicle to lock and towards the front to unlock.

Arming & disarming the alarm:

Press the lock button on the handset to arm the alarm.

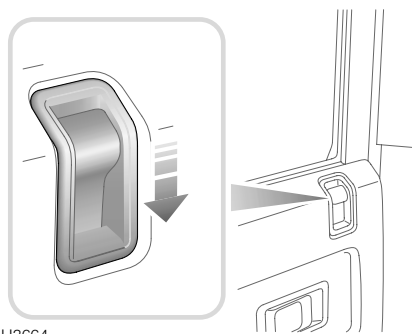
- Perimetric protection protects the doors and bonnet.
- Interior space protection is activated.
- Engine is immobilised.

Provided the doors and bonnet are securely closed, the direction indicators will flash three times and the anti-theft alarm indicator in the instrument panel will start to flash.

To disarm the alarm, press the unlock (PLAIN) button on the handset; the direction indicators will flash once and the interior lights illuminate.

Door sill locking buttons

From inside the vehicle, each door can be individually locked by depressing the appropriate sill locking button.



H3664

WARNING

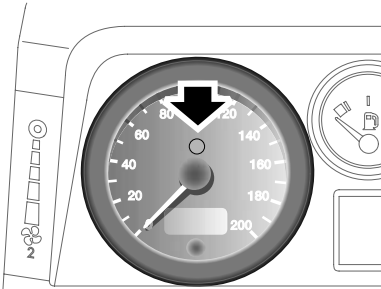
DO NOT depress the sill buttons as a means of locking the doors from outside the vehicle (this practice - known as 'slam locking' - is NOT recommended, because keys can be locked inside accidentally).

On vehicles with central door locking, operation of the driver's door sill locking button locks all the other doors too. However, engine immobilisation and interior space protection are suspended unless the handset lock button is pressed as well.

Locks & Alarm

NOTE: Slam locking, as described above, is prohibited on vehicles with central door locking.

Anti-theft alarm indicator light



H3662

The indicator light in the speedometer (arrowed in illustration) provides information about the status of the alarm system, as follows:

When the alarm is armed:

The light flashes rapidly while the alarm is arming itself. After ten seconds, the light adjusts to a slower frequency and continues to flash as an anti-theft deterrent until the alarm is disarmed.

If the engine is immobilised (even though the alarm has been disarmed):

The light flashes slowly until the engine is remobilised.

If the alarm has been triggered:

The light will flash rapidly when the alarm is disarmed until the starter switch is turned to position II.

If the remote handset battery power is low:

The light will flash rapidly during the initial ten seconds after the handset has been used, while the alarm system is arming.

If the driver's door is open:

The light illuminates for ten seconds, before adjusting to slow frequency flashing.

Mislock

If a door is not fully closed when the handset lock button is pressed, the hazard warning lights will fail to flash, indicating a mislock. In this case, the alarm system will not be fully armed and on vehicles with central door locking, none of the doors will lock.

As soon as the open aperture is closed, the hazard warning lights will flash and the anti-theft alarm indicator light will resume flashing to confirm that the system has returned to a fully armed state.

NOTE: If a mislock occurs as a result of an open door, interior space protection will not be activated.

NOTE: If a mislock occurs as a result of an open bonnet, the door apertures will still be protected by the alarm system and interior space protection will be active.

If the alarm sounds

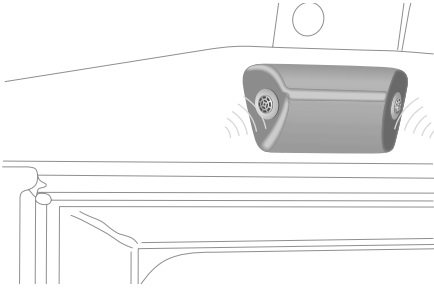
If the alarm is triggered, the alarm sounder or vehicle horn will sound for 30 seconds before switching off and resetting itself to the same protection status that existed prior to the alarm being triggered. The alarm can be triggered up to three times before needing to be reset.

To silence the alarm, press either button on the remote handset.

NOTE: While the alarm is sounding, the hazard warning lights will flash to provide a visual alarm.

Locks & Alarm

INTERIOR SPACE PROTECTION



Interior space protection is designed to protect the interior of the vehicle from intrusion (entry by a thief through a smashed window, for example). Twin sensors monitor the interior space and activate the alarm if air movement is detected in the passenger compartment.

Using the handset:

Interior space protection is activated automatically whenever the remote handset is used to set the alarm and can **ONLY** be deactivated with the handset.

Key operation:

On vehicles fitted with central door locking, using the key to arm the alarm will **NOT** activate (or deactivate) interior space protection.

NOTE: Interior space protection cannot be activated if a door is open, or if the starter switch is turned on.

NOTE: Interior protection will not operate for the first 15 seconds after the alarm is set.

WARNING

Never activate interior space protection if windows or sunroof are to be left open, or if passengers or animals are to be left inside the vehicle - any movement will activate the alarm.

Vehicles without central door locking

IMPORTANT INFORMATION

To disable interior space protection when setting the alarm, use the following procedure:

1. Open the driver's door.
2. With the driver's door open, use the handset to arm the alarm in the normal way.
3. Close the driver's door (the hazard warning lights flash three times and the anti-theft indicator light commences flashing rapidly).

The alarm system is now armed with interior protection disabled.

Locks & Alarm

ENGINE IMMOBILISATION

Engine immobilisation is an important aspect of the security system, and includes a feature known as 'passive immobilisation'. This is designed to safeguard the vehicle from theft, should the driver forget to lock the doors or arm the alarm. Engine immobilisation is automatic whenever any of the following conditions occur:

- The vehicle is locked using handset or key.
- Thirty seconds after the starter switch has been turned off AND the driver's door opened.
- Five minutes after the starter switch is turned off, or the alarm system is disarmed.

IMPORTANT INFORMATION

The engine immobilisation system relies on the handset to re-mobilise the engine. Look after the handsets at all times, protecting them from loss, damage and battery discharge.

If the engine has immobilised passively, re-mobilisation will occur when the starter switch is turned to position 'II', provided the handset is on the same ring as the key and in close proximity to the switch.

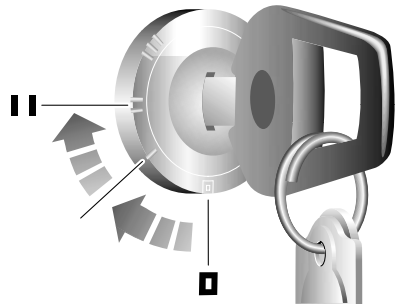
- ALWAYS keep the handset on the same ring as the key.
- NEVER attach both handsets to the SAME key ring.

Any attempt to start the engine while it is immobilised, will cause the engine immobilisation warning light (in the speedometer) to flash.

Emergency key access

If the handset is damaged, or fails to operate, the engine can be re-mobilised by using the starter key to enter a unique four number emergency key access code. The code is recorded on the Security card and is entered as follows:

If your handset is lost or inoperative, it is impossible to disarm the alarm. As soon as the door is opened, the alarm will sound (continuously for up to three 30 second periods), and continue while the code is being entered.



H3615

1. Remove the handset from the key ring and keep the handset well away from the starter switch when entering the code.
2. From inside the vehicle, with the driver's door closed, immediately insert the key into the starter switch and turn to position 'II'. Hold this position until the alarm sounds, then switch off and open and close the driver's door.
3. Turn the starter switch to position 'II' the required number of times to enter the first digit of the code (if the first digit is 4, turn the key to position 'II' and then back to '0' four times).
4. Open and close the driver's door (this will enter the first digit of the code).

Locks & Alarm

5. Turn the starter switch to position 'II' and back to '0' the required number of times to enter the SECOND digit of the code.
6. Open and close the driver's door again.
7. Turn the starter switch to position 'II' and back to '0' the required number of times to enter the THIRD digit of the code.
8. Open and close the driver's door again.
9. Turn the starter switch to position 'II' and back to '0' the required number of times to enter the FOURTH digit of the code.
10. Finally, open and close the driver's door one more time.

If the code has been entered correctly, the anti-theft indicator light will extinguish, the alarm will stop sounding and the engine can be started.

If an incorrect code has been entered:

If the code is entered incorrectly, the alarm sounder will sound twice, the anti-theft indicator light will continue to illuminate, and the engine will fail to start. Before entering the code again, turn the starter switch to position 'II' and hold in this position for 5 seconds.

After three failed entry attempts, the security system invokes a delay period of thirty minutes during which the system will not accept any further attempts to enter a code.

IMPORTANT INFORMATION

Memorise the emergency key access code or keep the Security card on your person in case of emergencies. NEVER leave the card in the vehicle.

REMOTE HANDSET BATTERY

The battery should last for approximately three years dependent upon use. When the battery needs replacing it will be apparent from the following symptoms:

- The handset will only work every other operation while disarming.
- The hazard warning lights will not flash when the alarm is disarmed.

Always fit a Land Rover STC 4080 or a Panasonic CR2032 replacement battery (available from a Land Rover dealer).

IMPORTANT INFORMATION

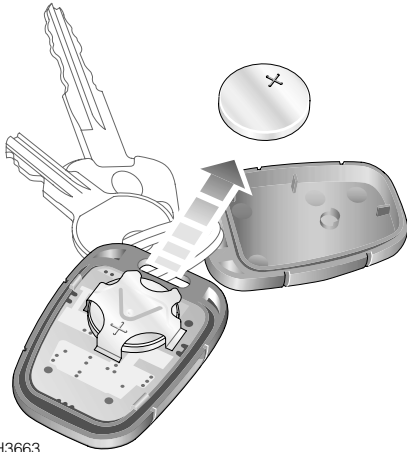
- DO NOT remove a battery until you are ready to install the replacement.
- The engine will immobilise five minutes after the key is removed from the starter switch (or 30 seconds after the starter has been switched off and the driver's door opened). If handset battery replacement is NOT completed within this period, the emergency key access code will have to be entered before the handset can be synchronised.

WARNING

The handset contains delicate electronic circuits and must be protected from impact and water damage, high temperatures and humidity, direct sunlight and the effects of solvents, waxes and abrasive cleaners.

Locks & Alarm

Battery replacement



H3663

1. Unlock the vehicle and disarm the alarm system.
2. Turn the starter switch to position 'II', then turn to position '0' and remove the key.
3. Carefully prise the handset apart; start from the key ring end using a coin or small screwdriver. Avoid damaging the seal between the two halves of the case and **DO NOT** allow dirt or moisture to get inside the handset.
4. Slide the battery out of its clip, taking care to avoid touching the circuit board or the contact surfaces of the clip.
5. Press and hold one of the buttons for at least five seconds (this will drain any residual power from the handset).
6. Fit the new battery, ensuring that correct polarity is maintained ('+' side facing up). Finger marks will adversely affect battery life; if possible, avoid touching the flat surfaces of the battery and wipe them clean before fitting.
7. Press the two halves of the handset firmly together and ensure that both halves are fully joined, to prevent dirt or moisture from entering the handset.
8. Operate the PADLOCK symbol button at least four times within range of the vehicle to resynchronise the handset.
9. Press the unlock button once to unlock the vehicle.

The handset is now ready for use.

Locks & Alarm

ALARM OR HANDSET DIFFICULTIES

If the alarm goes off unexpectedly:

Ensure all the windows and sunroof are closed, or if they need to be left open, disable interior space protection.

If the alarm goes off when a door is opened:

Disarm the alarm with the handset before unlocking. If the handset has failed, enter the emergency key access code (refer to '*Emergency key access*', page 15).

If the starter will not operate:

Ensure the handset is on the same key ring as the starter key. If it still will not operate, consult a Land Rover dealer.

If the hazard warning lights fail to flash when the alarm is armed:

A door or bonnet is partially opened - close the open aperture and try again.

IMPORTANT INFORMATION

Battery disconnection

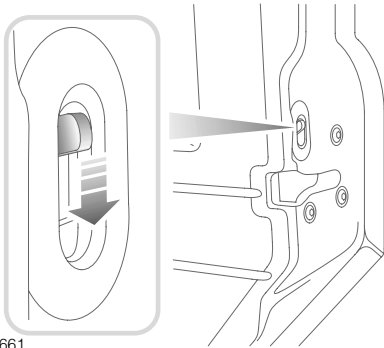
Your vehicle is equipped with a battery backed-up sounder, which operates as an anti-theft siren if the vehicle battery is disconnected.

Before disconnecting the vehicle battery, it is ESSENTIAL to refer to '*Battery removal and replacement*', page 115, in order to prevent the alarm from sounding.

If the vehicle battery is disconnected for any reason, the status of the security system prior to disconnection will be memorised and automatically reset when the battery is reconnected.

Locks & Alarm

CHILD-PROOF LOCKS*



H3661

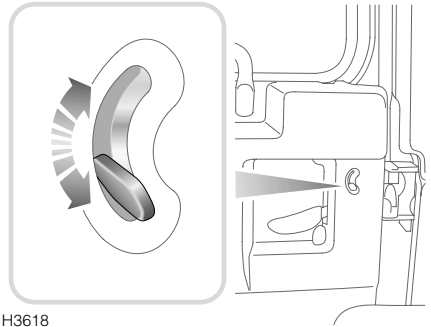
Move the locking levers on the rear doors down to engage the child locks.

With the child-proof locks engaged, the rear doors cannot be opened from inside the vehicle, thereby avoiding the risk of a door being opened accidentally while the vehicle is moving.

WARNING

NEVER leave children unsupervised in the vehicle.

TAIL DOORS*



H3618

From outside, use the key to lock and unlock the taildoor. From inside and with the door closed, push the locking button up to lock and down to unlock (see illustration).

Seats

FRONT SEATS

WARNING

To avoid the risk of loss of control and personal injury, DO NOT adjust the driver's seat or head restraint while the vehicle is in motion.

Forward/backward adjustment



H3739

Lift the bar at the front of the seat to slide the seat forward or back. Ensure the seat is locked in position before driving.

Seat back adjustment



H3738

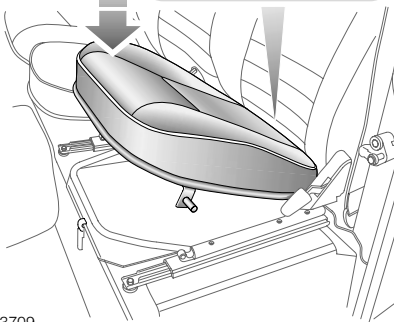
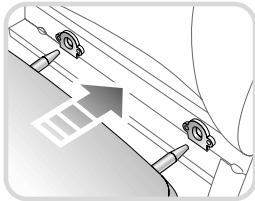
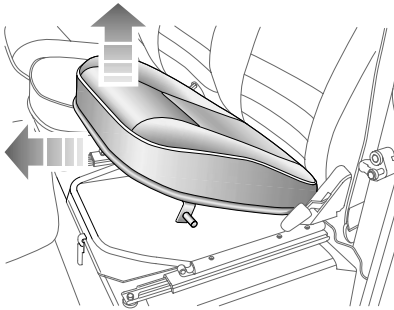
Lift the lever on the side of the seat and lean backwards or forwards to achieve the desired angle, then lower the lever to lock.

WARNING

DO NOT travel with the seat backs reclined steeply rearwards. Optimum benefit is obtained from the seat belt with the seat back angle set to approximately 25 degrees from the upright (vertical).

Seats

Seat cushion removal



H3709

WARNING

ENSURE that the seat cushion is securely in place before driving.

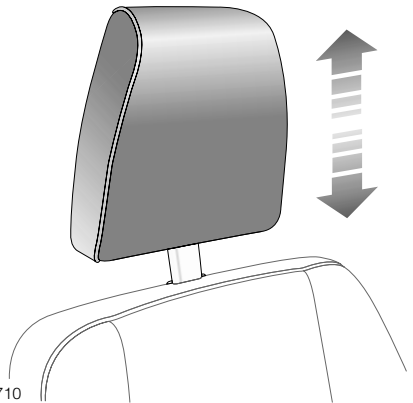
The front seat cushions can be removed to access the battery and secondary fuse box as follows:

Pull up the front of the seat base to release it from its retaining clips, then pull the cushion forward to remove.

When replacing, insert the lugs at the back of the seat cushion into the corresponding holes where the seat base meets the seat back, then push firmly down on the front of the seat cushion to secure in place.

NOTE: On cars equipped with seat heaters, an electrical lead connects the heater unit in the seat cushion with the vehicle wiring harness. When removing the seat cushion care must be taken to avoid straining or damaging the lead.

HEAD RESTRAINTS



H3710

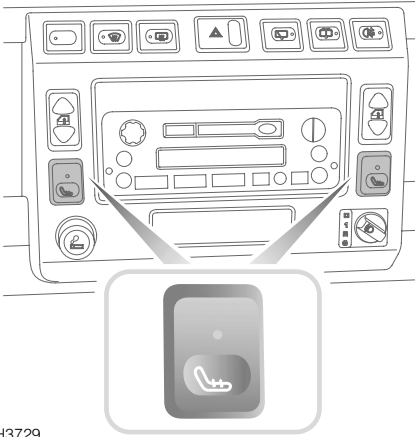
Pull the head restraint up or down until the cushion is level with the back of the head.

WARNING

Head restraints are designed to support the back of the head (NOT THE NECK), and to restrain rearward movement of the head in the event of a collision. The restraint must be positioned level with the head to be effective.

Seats

HEATED FRONT SEATS*



H3729

With the starter switch turned on, press the switches to operate the heating elements in either the driver's or front passenger seat (the indicator light in the switch illuminates). Press a second time to switch off.

The seat heaters are thermostatically controlled and operate intermittently to achieve and then maintain a predetermined temperature between 79°F and 97°F (26° - 36°C).

IMPORTANT INFORMATION

The seat heaters consume considerable power from the battery. For this reason, they should **ONLY** be operated while the engine is running.

NOTE: *The centre front seat* is not equipped with heating elements.*

Seats

FOLDING THE REAR SEATS

WARNING

DO NOT adjust the seats while the vehicle is in motion.

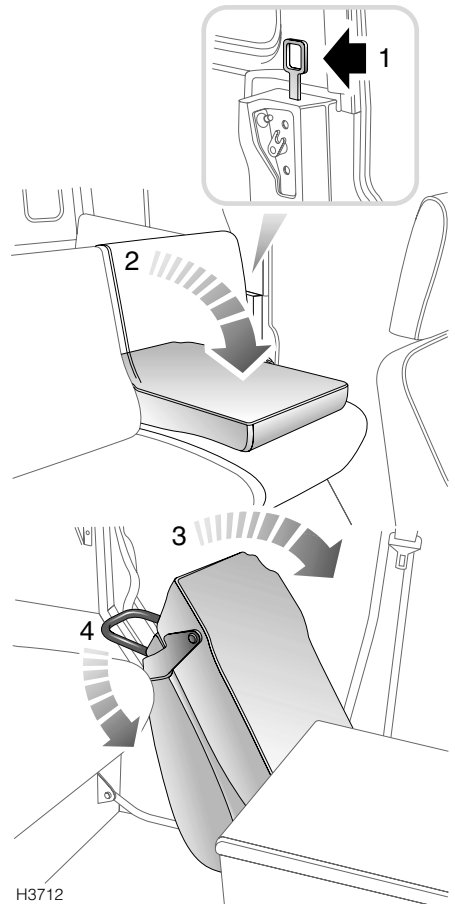
When re-erecting the 60/40 split rear seats*, ensure that the seat stands are properly positioned.

When the seat is erected, the latching mechanism should be visually checked and physically tested to ensure that the latch is secure before driving.

Before folding the rear seats:

- Slide the front seats forward.
- Ensure that the outer rear seat belts are correctly stowed.
- Pass the seat belt locks through the junction of the backrest and the cushion and into the loadspace.

60/40 split rear seats*



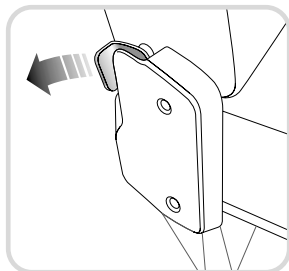
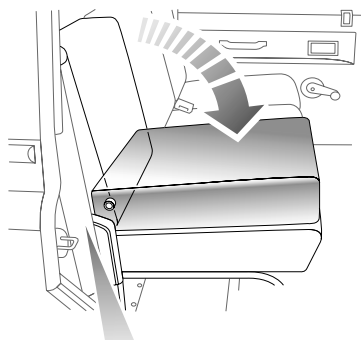
H3712

1. Pull up the release catch (see inset).
2. Fold the backrest forward.
3. Lift and fold the seat base forward.
4. Fold away the seat stand.

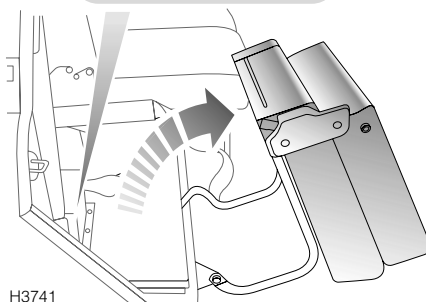
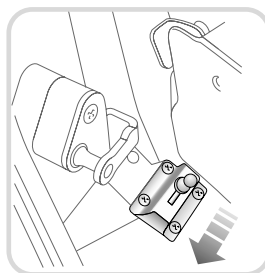
Seats

Individually split rear seats*

NOTE: The centre seat cannot fold until both outer seats have been folded.



H3740



H3741

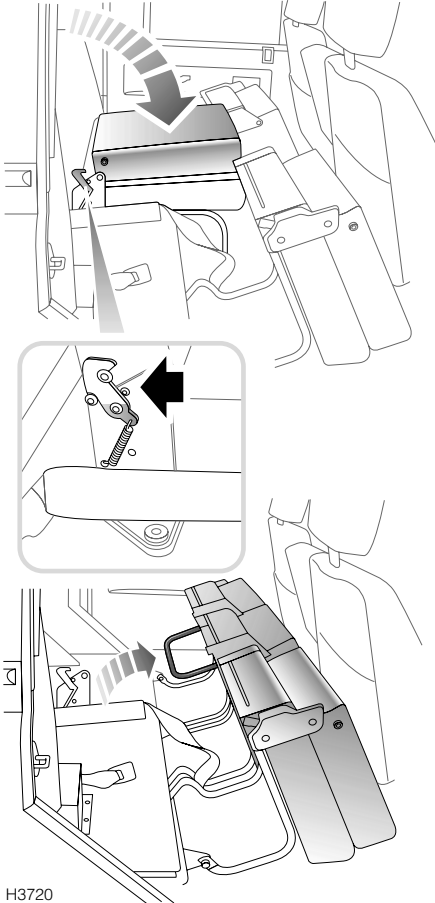
Outer seats:

1. Release the catch (see first inset).
2. Fold the backrest forward.
3. Slide back the bolt (see second inset).
4. Lift and fold the seat base forwards.

Seats

Centre seat:

1. Release the catch - as stage '1' for the outer seats.
2. Fold the backrest forward.
3. Lift and fold the seat base forwards.



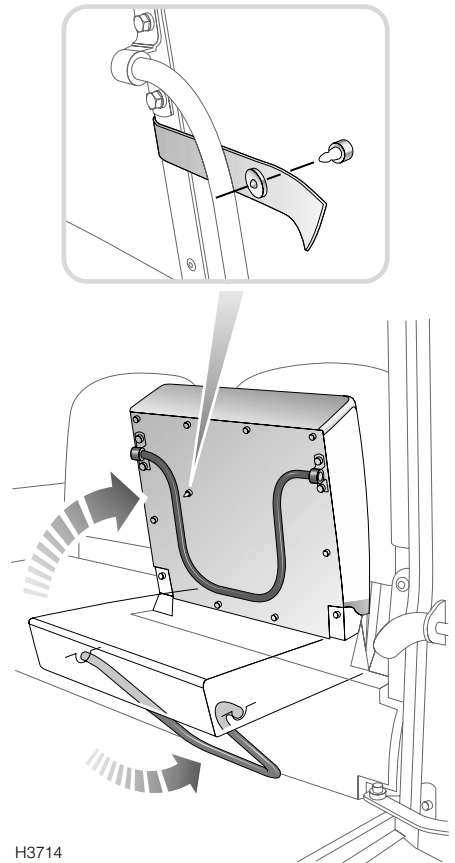
H3720

When returning the backrest to the upright position, ensure that both the seat base and the backrest of all three seats are securely latched in place before driving.

Rear compartment folding seats*

WARNING

When the seat is in use, the steel support must be angled as shown in the illustration (i.e. pointing away from the front of the seat, with its foot angled into the floor where the floor meets the side of the vehicle).



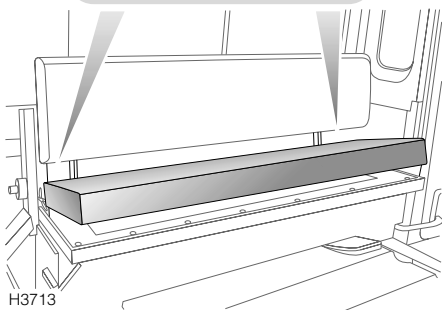
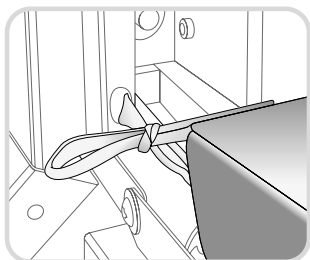
H3714

Seats

1. Unclip the restraining strap (see inset) and fold down the seat base.
2. Position the steel seat support as shown in illustration.

The steel supports can be folded flat against the underside of the seat base when not in use. The strap (see inset) should be used to secure the seat base in the folded position when not in use.

Rear compartment bench seats*



H3713

These are fixed seats and cannot be folded. The seat cushions are removable (see illustration).

Seat Belts

SEAT BELT SAFETY

The seat belts fitted to the front and second row seats are intended for use by adult sized occupants. Each belt should be used by one occupant only.

Observe the following precautions:

- DO make sure ALL passengers are securely strapped in at all times - even for the shortest journeys.
- ALWAYS adjust seat belts to eliminate any slack in the webbing. DO NOT slacken the webbing by holding the belt away from the body - to be fully effective, the seat belt must remain in full contact with the body at all times.
- ALWAYS fit the lap strap as low on the hips as possible (never across the abdomen), and ensure that the diagonal belt passes across the shoulder without slipping off or pressing on the neck.
- DO NOT wear seat belts over hard, sharp or fragile items in clothing, such as pens, keys, spectacles etc.
- Always replace a seat belt assembly that has withstood the strain of a severe vehicle impact, or if the webbing shows signs of fraying.
- Where possible use the seat belts to secure large items of luggage that are to be carried on the seats - in the event of an accident, insecure items become flying missiles capable of causing serious injury.
- DO NOT use a seat belt that is twisted or obstructed in any way that could impede its smooth operation.

- DO NOT allow front seat occupants to travel with the seat backs reclined steeply rearwards. Optimum benefit is obtained from the seat belt with the seat back angle set to approximately 25 degrees from the upright (vertical) position.
- DO NOT allow foreign matter (particularly sugary food and drink particles) to enter the seat belt locks - such substances can render the locks inoperative.
- In most countries, all occupants are required by law to wear a seat belt, unless they have been issued with a medical exemption certificate.
- During pregnancy, women should wear the lap belt across the hips below the baby, with the diagonal belt passing across the shoulder, between the breasts and to one side of the baby - if in doubt, consult a doctor.

WARNING

Ensure that all seat belts are worn correctly - an improperly worn seat belt increases the risk of death or serious injury in the event of a collision.

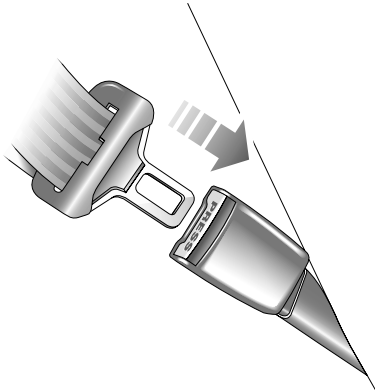
Seat Belts

SEAT BELTS

To minimise injury in the event of an accident, it is important that seat belts are worn correctly.

Read the instructions below and the advice contained under the heading 'SEAT BELT SAFETY'.

Fastening the inertia reel seat belts



H3715

Pull the belt over the shoulder and across the chest and, ensuring that the webbing is not twisted, insert the metal tongue plate into the buckle nearest the wearer - a 'CLICK' indicates that the belt is securely locked.

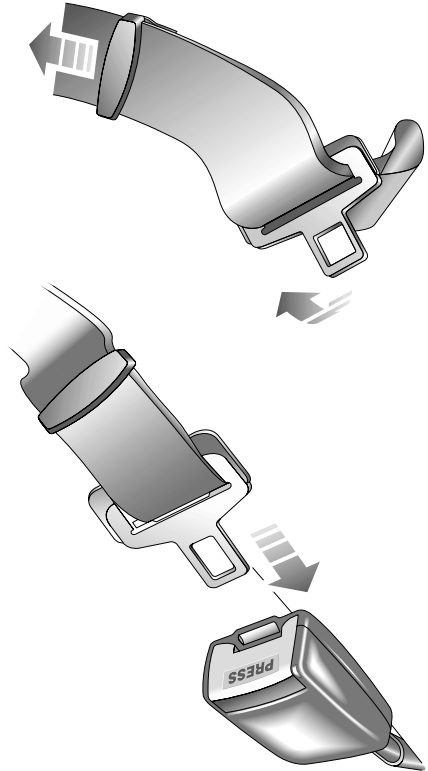
Seat belts are designed to bear upon the bony structure of the body (pelvis, chest and shoulders) and can only be worn safely with the seats in a normal upright position - DO NOT allow front seat occupants to travel with the seat steeply reclined.

NOTE: In some circumstances, perhaps due to the vehicle being on a slope, the automatic locking mechanism may engage, preventing the initial extension of the belt. This is not a fault - ease the belt free and use it.

Releasing the belt

Press the RED button on the seat belt buckle.

Lap belts



H3716

To adjust, pull the slider along the belt and feed the webbing through the buckle until the belt is comfortably tight. Then, insert the metal tongue plate into the buckle nearest the wearer - a 'CLICK' indicates that the belt is securely locked. When not in use, the lap belts should be fastened.

Seat Belts

CARING FOR SEAT BELTS

Regularly inspect the belt webbing for signs of fraying, cuts and wear; also pay particular attention to the condition of the fixing points and adjusters.

DO NOT bleach or dye the webbing and avoid contaminating the webbing with polish, oil or chemicals (see '*CLEANING THE INTERIOR*', page 122).

Testing inertia reel belts

- With the seat belt fastened, give the webbing near the buckle a quick upward pull. The buckle must remain securely locked.
- With the seat belt unfastened, unreel the webbing to the limit of its travel. Check that unreeling is free from snatches and snags and then allow the belt to FULLY retract.
- Partially unreel the webbing, then hold the tongue plate and give it a quick forward pull. The mechanism must lock automatically and prevent any further unreeling.

If a seat belt should fail any of these tests, contact your dealer immediately.

WARNING

Always replace a seat belt that shows signs of webbing damage or has withstood the strain of a severe vehicle impact.

Child Restraints

CHILD SAFETY SEATS

Seat belts fitted to your vehicle are designed for adults and larger children. For their safety, it is very important that all infants and young children are restrained in a suitable child safety seat appropriate to their age and size (see table below). Child safety seats approved for use in your vehicle are available from Land Rover dealers.

Only fit a child safety seat of a type approved for the specific seating positions in your vehicle (see table), and ensure the seat manufacturer's fitting instructions are followed exactly.

NOTE: Accident statistics show that children are safer when properly secured in the rear seating positions than in the front. However, if a child seat suitable for the size of the child is available and it is necessary for the child to travel in the front, set the seat fully rearwards and only use an approved child seat.

Defender 90 & 110 Station Wagons only

Mass Group As indicated on child safety seat packaging.	Seating Positions			
	Front Passenger	Front Centre*†	Rear Outboard	Rear Centre*†
0 = Up to 10 kg (0-9 months)	U	X	U	X
0+ = Up to 13 kg (0-2 years)	U	X	U	X
I = 9 to 18 kg (9 months - 4 years)	U	X	U	X
II & III = 15 to 36 kg (4-12 years)	U	X	U	X

U = Suitable for 'universal' category restraints approved for this mass group.
 X = Seat position not suitable for children in this mass group.
 * = If fitted
 † = Not suitable for the majority of child restraints which require a 3-point seatbelt for attachment, however, a child restraint may be used in these positions provided that it is specifically designed and sold for use with a 2-point seatbelt.

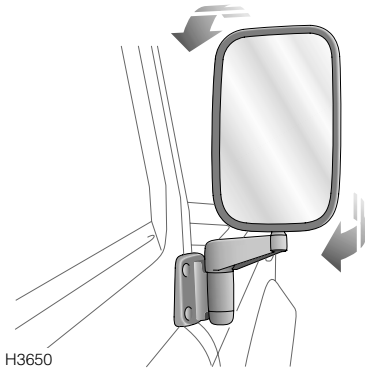
NOTE: The side facing folding or fixed bench seats fitted in the load carrying area of some vehicles, are not suitable for fitting child safety seats.

Door Mirrors

EXTERIOR MIRRORS

NOTE: Objects viewed in exterior mirrors may appear further away than they actually are.

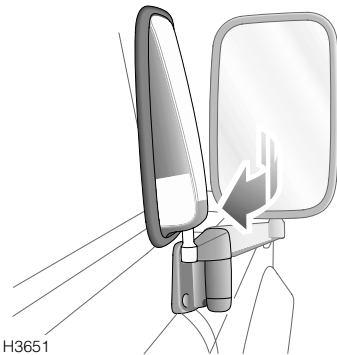
Manually adjustable mirrors



H3650

Move the mirror glass to the required position.

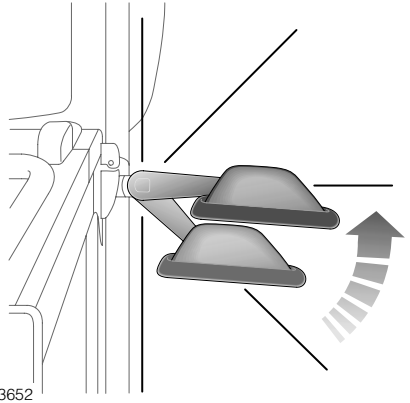
Folding the mirror body



H3651

The door mirrors are designed to fold forwards or rearwards on impact. They can also be folded back towards the side windows into a 'park' position to enable the vehicle to negotiate narrower openings.

Positioning the mirror for towing

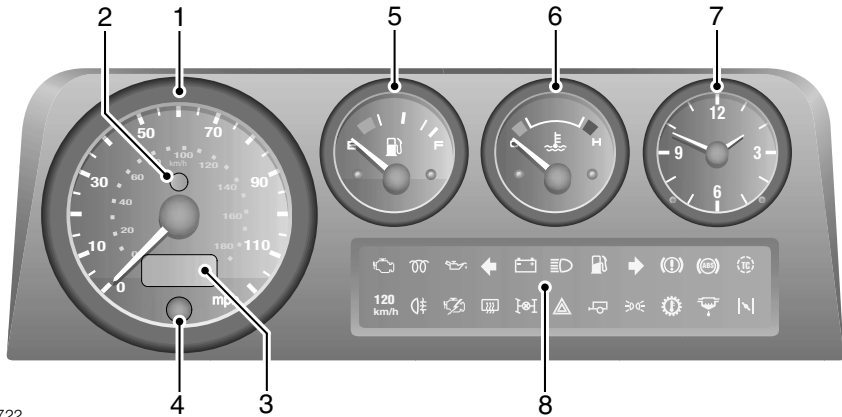


H3652

To improve rear visibility when towing, the mirrors can be folded outwards (see illustration), so that the mirror stem is at 90° to the side of the vehicle, increasing the field of vision.

Instruments

INSTRUMENT PANEL



H3722

1. Speedometer

Indicates road speed in miles per hour and/or kilometres per hour.

2. Anti-theft alarm indicator light

Indicates the status of the alarm system (see 'Anti-theft alarm indicator light', page 13).

3. Total distance (odometer) and trip recorder

Indicates the total distance or the individual journey distance travelled by the vehicle.

4. Trip recorder reset button

Briefly press and release the button to change the digital display between either the total distance travelled, or the individual journey distance. Press and hold the button to reset the trip recorder to zero.

5. Fuel gauge

The pointer indicates the fuel level when the starter switch is turned to position 'II'.

NOTE: When the fuel remaining drops to a minimum of 2 gallons (9 litres), the low fuel warning light will illuminate (see 'WARNING LIGHTS', page 33).

6. Temperature gauge

Once the engine coolant has reached its normal operating temperature, the pointer should remain between the BLUE and RED segments.

If the pointer moves towards the RED segment, this indicates that the engine coolant is becoming too hot. Should the pointer move INTO the RED segment, severe engine damage could occur. In this case, stop the vehicle as soon as safety permits and allow the engine to idle for five minutes in order to cool down - DO NOT SWITCH OFF. Seek qualified assistance before continuing.

7. Clock

For further information on setting the time on the clock, see 'CLOCK', page 51.

8. Warning lights

For further information on the functionality of the warning lights, see 'WARNING LIGHTS', page 33.

Warning Lights

WARNING LIGHTS



H3723

The location and specification of the warning lights may vary according to model and market requirements.

WARNING

DO NOT drive if a RED warning light remains on once the engine is running or illuminates whilst driving.

Check engine - AMBER*



The light illuminates as a bulb and system check when the starter switch is turned on, and extinguishes as soon as the engine is started. Illumination at any other time indicates an engine fault - if the light illuminates while driving, avoid high speeds and seek qualified assistance urgently.

Glow plug - AMBER



Illuminates when the starter switch is turned to position 'II'. Wait for the light to extinguish before starting the engine.

Low oil pressure - RED



The light illuminates as a bulb check when the starter switch is turned to position 'II' and extinguishes when the engine is started. If the light remains on, flashes on and off, or illuminates whilst driving, stop the vehicle as soon as safety permits and SWITCH OFF THE ENGINE IMMEDIATELY. Seek qualified assistance before driving. Always check the oil level when this light illuminates.

Direction indicators - GREEN



The left or right warning light flashes in time with the corresponding left or right direction indicator lights whenever they are operated. If the warning light fails to flash, or flashes very rapidly, this may indicate a bulb failure in one of the direction indicator lights.

If the hazard switch is pressed, both warning lights will flash in conjunction with the direction indicator lights.

Battery charging - RED



The light illuminates as a bulb check when the starter switch is turned to position 'II' and extinguishes once the engine is running. If it remains on, or illuminates whilst driving, a fault is indicated. Seek qualified assistance urgently.

Warning Lights

Headlight main beam - BLUE



Illuminates when the headlights are switched to main beam.

Low fuel - AMBER



Illuminates when the fuel remaining in the tank drops to a minimum of 2 gallons (9 litres). If the light illuminates, refuel at the first opportunity.

Handbrake, brake fluid - RED



The light illuminates for about 3 seconds as a bulb check when the starter switch is turned on. It also illuminates when the handbrake is applied with the starter switch in position 'II'. The light should extinguish when the handbrake is fully released or shortly after the electrical circuits are switched on. If the light illuminates whilst driving, a fault with the braking system is indicated. Stop the vehicle as soon as safety permits and seek qualified assistance before continuing.

Anti-lock braking system - AMBER*



Illuminates for approximately 1 second as a bulb and system check when the starter switch is turned to position 'II', and briefly extinguishes before coming on again. If the light does not extinguish and then come on again, then a fault occurred with the ABS system and you should consult a qualified dealer at the earliest opportunity. The warning light will remain on until the vehicle is driven above approximately 5 mph (7 km/h).

If the light remains on or subsequently illuminates while driving, a fault has been detected by the self monitoring system. This means that full ABS control may not be available and you should consult your dealer at the earliest opportunity.

Traction Control - AMBER*



Illuminates as a bulb check when the starter switch is turned to position 'II' and extinguishes after approximately 3 seconds. The light illuminates for a minimum of 2 seconds, whenever traction control is operating.

If the warning light flashes (for at least 10 seconds) traction control has been operating for too long and has temporarily shut down to allow the system to cool - this will only occur in extreme conditions.

If the light illuminates continuously, a fault with the system is indicated; seek qualified assistance.

Rear fog guard lights - AMBER



Illuminates whenever the rear fog guard lights are on.

NOTE: In clear conditions, rear fog guard lights can dazzle other road users. Use **ONLY** when visibility is severely restricted.

Engine immobilisation - RED



Flashes during any attempt to start the engine when the engine is immobilised.

Heated rear screen - AMBER



Illuminates when the rear screen heater is operating.

Differential lock - RED



Illuminates whenever the differential is locked. If the light remains on after the differential lock is disengaged, transmission 'wind-up' may be present. Reversing for a short distance and then going forward will usually 'unwind' the transmission. If the light remains on, contact your dealer as soon as possible.

Warning Lights

Hazard warning lights - RED



Illuminates in conjunction with the direction indicator warning lights, when the hazard warning lights are operated.

Trailer direction indicators - GREEN



The light illuminates briefly as a bulb check when the starter switch is turned to position 'II'. If a trailer is attached, the light illuminates in conjunction with the vehicle direction indicator lights to show that all trailer indicator lights are functioning correctly. In the event of a bulb failure on the trailer, the warning light flashes once and then remains off.

Sidelights - GREEN



Illuminates whenever the sidelights are on.

Transmission oil temperature - RED*



Illuminates as a bulb check when the starter switch is turned to position 'II' and extinguishes after 3 seconds approx. If the light illuminates while driving, the gearbox oil temperature is too high (most likely to occur in very hot weather during continuous high speed driving, or whilst towing heavy loads on steep inclines or if the handbrake has been applied while driving).

If the light illuminates, reduce speed. If the light remains on, stop the vehicle and allow the gearbox to cool. Do not drive until the light has extinguished. (Depending on the ambient temperature and the carrying loads imposed on the vehicle, it may take several minutes before the light extinguishes and it is safe to drive).

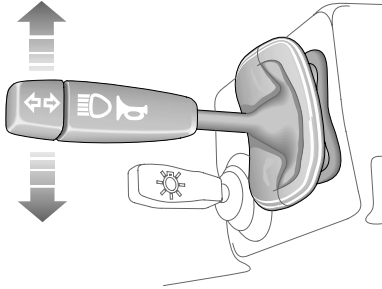
Fuel filter - AMBER*



Illuminates as a bulb check when the starter switch is turned to position 'II' and extinguishes after 3 seconds approximately. If the light illuminates while driving, this indicates the presence of excessive amounts of water in the fuel. You may continue driving but should seek qualified assistance at the earliest convenient time.

Lights & Indicators

DIRECTION INDICATORS

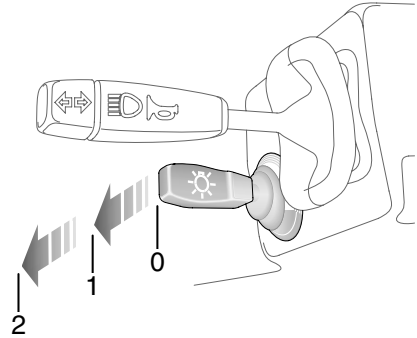


H3629

Move the lever **DOWN** to indicate a **LEFT** turn, and **UP** to indicate a **RIGHT** turn (the appropriate **GREEN** warning light on the instrument panel will flash in time with the direction indicators).

Hold the lever part-way up or down against spring pressure to indicate a lane change.

LIGHTS



H3632

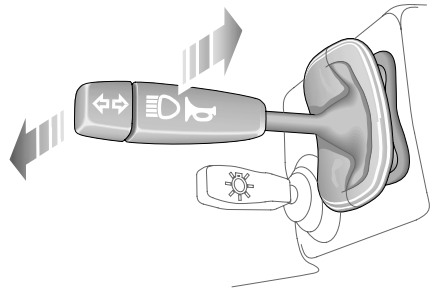
Side, tail and instrument panel lights

Push the lighting switch to position 1.

Headlights

Push the lighting switch to position 2.

Headlight main and dipped beams



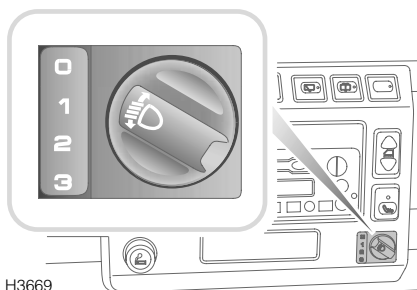
I3630

With the headlights switched on, push the lever away from the steering wheel to change headlight beams (**BLUE** warning light glows when the headlights are on main beam).

To flash the headlights, pull the lever part way towards the steering wheel and release.

Lights & Indicators

Headlight levelling *



The angle of the headlight beams is affected by the distribution of weight inside the vehicle. The headlights should be adjusted so that the point at which the beams meet the road surface ahead of the vehicle provides adequate illumination without dazzling other road users.

The four-position switch should be used to adjust the headlight beams in relation to the vehicle loadings identified opposite.

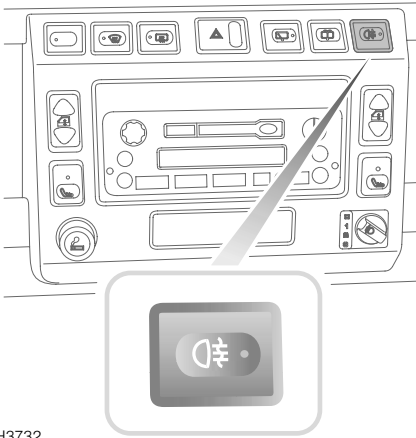
Position	Loading Condition
0	Driver, or driver and front passenger only (loadspace empty).
1	All seats occupied (loadspace empty)
2	All seats occupied with loadspace loaded to max. permissible rear axle weight.
3	Driver only with loadspace loaded to max. permissible rear axle weight.

Vehicles fitted with front seats only

Positions '1' and '2' should only be used when required, according to the distribution and weight of the load being carried.

Lights & Indicators

FOG LIGHTS



H3732

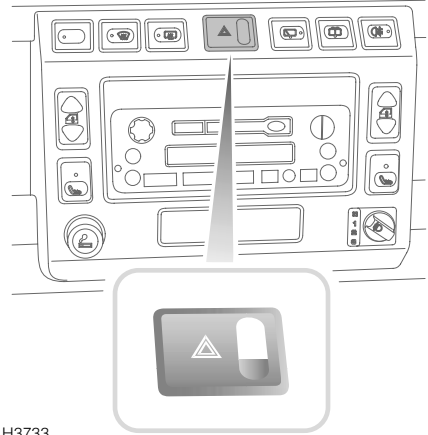
Rear fog guard lights



Press to operate, press a second time to switch off (the indicator light in the switch illuminates when the fog guard lights are switched on). The rear fog guard lights illuminate **ONLY** when the headlights are also switched on, and the starter switch is turned to position 'II'. Switching off the headlights, or turning the starter switch to position '0', will automatically extinguish the rear fog guard lights too (the fog guard lights will not illuminate again unless selected manually).

ALWAYS remember to switch the fog guard lights off as soon as visibility permits; in clear conditions fog guard lights can dazzle other road users!

HAZARD WARNING LIGHTS



H3733



Press to operate; all the direction indicator lights (including those fitted to a trailer) will flash together. Use **ONLY** in an emergency to warn other road users when your stationary vehicle is causing an obstruction, or is in a hazardous situation. Remember to switch off before moving away.

Wipers & Washers

OPERATING

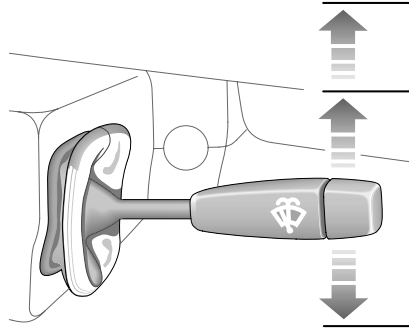
The wipers and washers will only operate when the starter switch is turned to position 'I' or 'II'.

IMPORTANT INFORMATION

- DO NOT operate the wipers on a dry screen.
- In freezing or very hot conditions, ensure that the blades are not frozen or stuck to the glass.
- In winter, remove any snow or ice from around the arms and blades, including the wiped area of the windscreen and the heater air intakes.

NOTE: If the wiper blades have stuck to the glass, a thermal cut-out may temporarily prevent the wiper motor from operating. If this is the case, switch the wipers off, free them from the obstruction and then switch on again.

WINDSCREEN WIPERS



H3627

Intermittent wipe

Pull lever down.

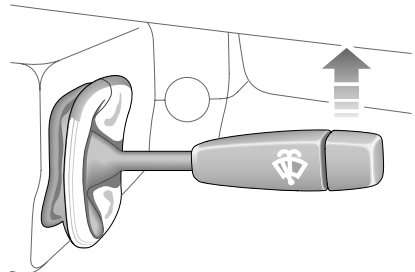
Normal speed wipe

Push lever up to first position.

Fast speed wipe

Push lever up to second position.

Single wipe



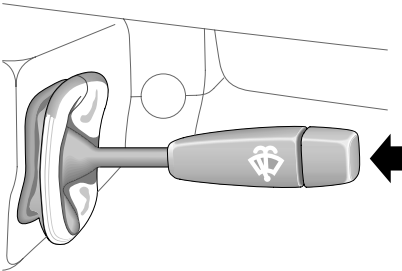
H3626

Push the lever up against spring pressure and release immediately.

NOTE: With the lever held up, the wipers will continue operating at slow speed until it is released.

Wipers & Washers

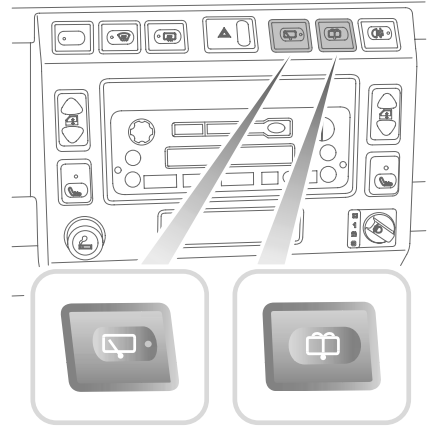
WINDSCREEN WASHER



H3628

Press to operate. The windscreen wipers will operate in conjunction with the washers for as long as the lever pressed, the wipers continuing for a further 4 seconds after the lever is released.

REAR WINDOW WIPER AND WASHER



H3731

Rear window wiper



Press to operate: the wiper operates continuously until the switch is pressed again.

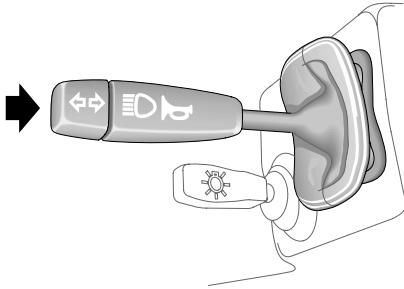
Rear window washer



Press and hold switch for the required duration of window washing. Washing stops as soon as the switch is released.

Horn

HORN



H3631

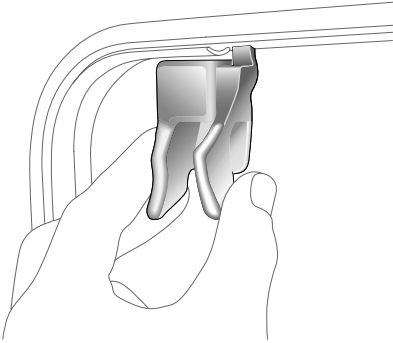
Press the end of the lever to operate the horn.

Manual Windows

FRONT AND REAR WINDOWS

Raise or lower the window by rotating the handle mounted on the door trim pad.

SLIDING REAR WINDOWS*

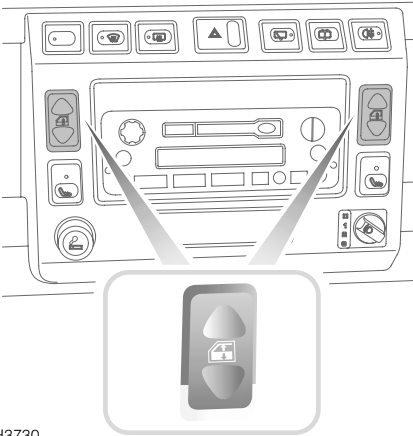


H3609

To open, press the catch tongues together, slide the window to the desired position and release the catch, ensuring that it locates securely in the sockets, locking the window in position.

Electric Windows

ELECTRIC WINDOWS



H3730

Operating the windows

The electric windows can be operated when the starter switch is at position 'II' by pressing the switches on the centre console as follows:

Press and HOLD the bottom of a switch to lower and the top of a switch to raise. The window will stop moving as soon as the switch is released.

WARNING

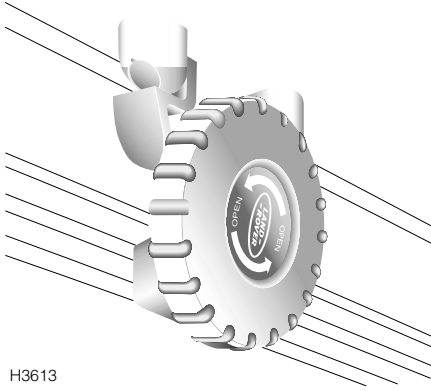
Accidental closing of an electrically operated window on fingers, hands or any vulnerable part of the body, can result in serious injury. Always observe the following precautions:

ENSURE children are kept clear whilst raising or lowering windows.

ENSURE that all adult passengers are familiar with the controls and the potential dangers of electrically operated windows.

Sunroof

SUNROOF*



H3613

The sunroof can be opened to varying degrees or, if required, can be removed completely.

- **To OPEN the roof:** Turn the hand wheel anti-clockwise to give the desired opening.
- **To CLOSE the roof:** Turn the hand wheel clockwise until resistance is felt.

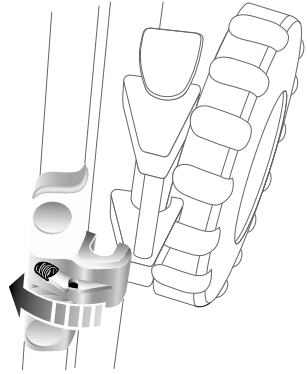
WARNING

ENSURE the sunroof is not obstructed when opening or closing.

DO NOT allow passengers to extend any part of their bodies through the sunroof aperture while the vehicle is moving - injury from flying debris, branches of trees or other obstructions could occur.

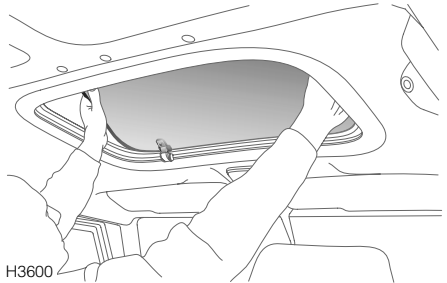
ALWAYS close the roof when the vehicle is unattended.

To remove the sunroof



H3612

Open the sunroof fully and push the catch rearwards (as arrowed in illustration) to disengage the handwheel mechanism.



H3600

Remove the sunroof by tilting upwards and lifting rearwards to disengage the two locating lugs.

WARNING

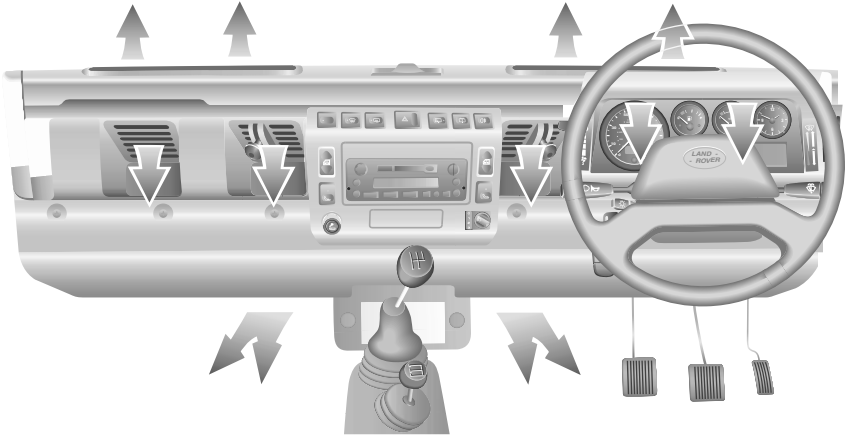
DO NOT store the sunroof loose in the vehicle.

DO NOT remove the sunroof whilst the vehicle is moving.

Refit the sunroof by following the same procedure in reverse.

Heating & Ventilation

VENTILATION



H3758

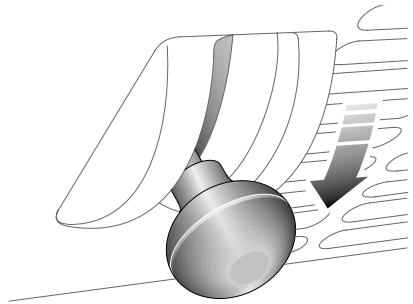
The ventilation system provides fresh or heated air to the interior of the vehicle.

NOTE: Always keep the exterior air intake grilles clear of obstructions such as leaves, snow or ice.

The temperature of the air supplied to the windscreen and foot level vents is controlled by the heater, while the fresh air vents in the upper fascia provide fresh air only. The location of the vents is shown in the illustration above.

Information concerning the operation of the heating and ventilation system, appears on the following pages.

Fresh air vents



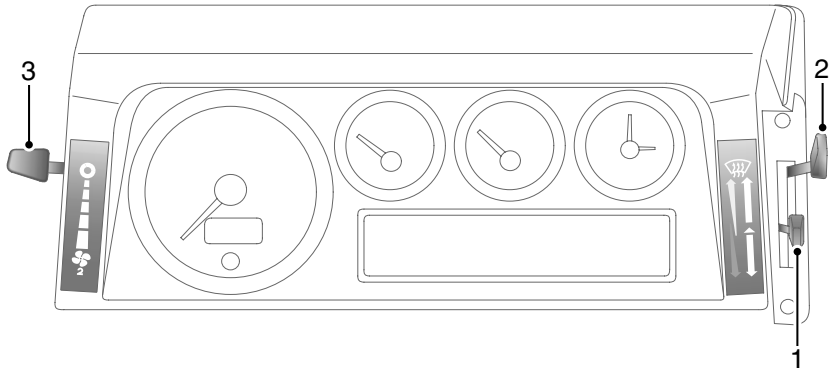
H3719

To open the vents in the upper fascia, pull one of both knobs out and push the levers downwards. To close the vents, pull the knobs out and raise the levers.

These vents provide unheated fresh air only.

Heating & Ventilation

HEATER CONTROLS



H3676

NOTE: For vehicles fitted with an air conditioning system, the controls and air conditioning vents are described on a later page (see 'AIR CONDITIONING CONTROLS*', page 48).

1. Temperature control

Move the lever downwards (towards the RED arrow) to increase air temperature, or upwards (towards the BLUE arrow) to reduce air temperature.

2. Air distribution control

- Lever fully up - windscreen vents only.
- Lever midway - foot level and windscreen vents.
- Lever fully down - foot level vents (also provides some air to the windscreen).

3. Air blower control

- Lever at position '0' - no air will enter the vehicle through the windscreen and foot level vents.
- Lever between positions '0' and '1' - progressively more air will enter the vehicle, depending solely on the ram effect of the vehicle moving through the air.
- Lever between positions '1' and '2' - the fan will operate and progressively increase in speed.

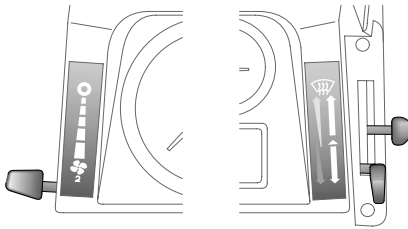
Heating & Ventilation

USING YOUR HEATER

The following examples of basic heater settings are intended as a general guide; the air distribution, temperature and blower controls can then be further adjusted to suit your comfort requirements.

Always remember that full heating is not available until the engine has reached its normal operating temperature.

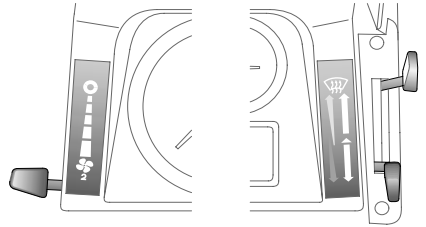
Maximum heating



H3677

- Temperature control - fully down.
- Distribution control - midway.
- Air blower control - fully down.
- Fresh air vents - fully closed.

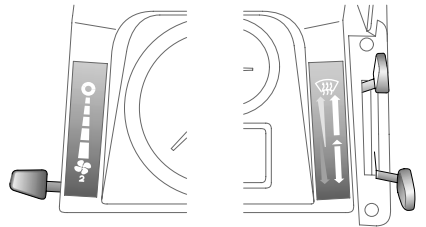
Demisting and defrosting



H3678

- Temperature control - fully down.
- Distribution control - fully up.
- Air blower control - fully down.
- Fresh air vents - fully open for demisting (fully closed for defrosting).
- Opening a window may improve demisting.

Maximum ventilation

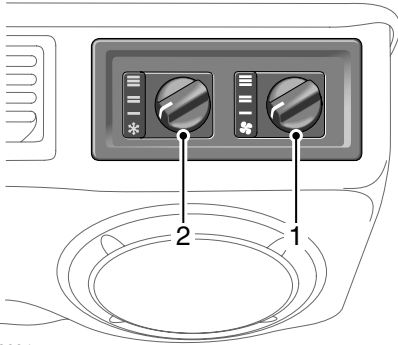


H3679

- Temperature control - fully up.
- Distribution control - fully down.
- Air blower control - fully down.
- Fresh air vents - fully open.

Air Conditioning

AIR CONDITIONING CONTROLS*



H3684

1. On/off blower control

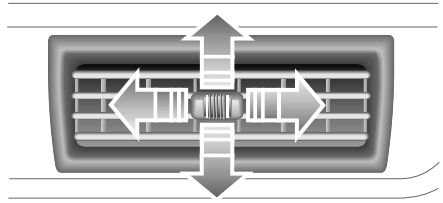
Rotate clockwise to the first position to turn on the air conditioning. Rotate further (positions II and III) to increase the flow of conditioned air from the four vents in the lower fascia.

NOTE: The air conditioning will only operate with the engine running.

2. Temperature control

Rotate clockwise (positions I to III) to obtain progressively cooler air.

Air conditioning vents



H3756

The four air conditioning vents located in the lower fascia can be adjusted to suit your requirements. The adjuster in the centre of each vent can be used to adjust volume and direction of air. To cut off the supply of air from any particular vent, slide the adjuster fully to the left.

General operating notes

- For optimum operating efficiency, ensure all the air conditioning vents are open.
- In very humid conditions, slight screen misting may be experienced when the air conditioning system is turned on. This is a natural occurrence on most automotive air conditioning systems. It is not a fault and misting will clear after a few seconds once the air conditioning system is operating.
- If the temperature inside the vehicle is higher than that outside when you start the engine, it will take time for the air conditioning to become fully effective. It is best to ventilate the vehicle by opening the windows and setting the controls to 'Maximum cooling'. When the vehicle has been ventilated, close the windows and set the blower controls for personal comfort.
- Operating the air conditioning takes power from the engine and consequently increases fuel consumption.

Air Conditioning

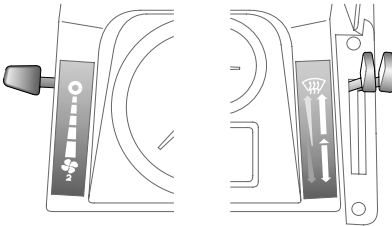
- All air conditioning systems need to be operated for a short while every week (even in winter) to maintain them in peak condition.
- Surplus water produced by the dehumidifying process is expelled from the system via drain tubes beneath the vehicle. This may result in a small pool of water forming on the road when the vehicle is stationary and is not a cause for concern.

USING THE AIR CONDITIONING

Air conditioning provides additional cooling to the vehicle interior and also reduces the moisture content of the air.

It is important to keep windows, sunroof* and fresh air vents closed during operation.

Air conditioning settings



H3687

When air conditioning is to be used, ensure that the fresh air vents are closed, and the heater unit controls are set as shown, i.e.

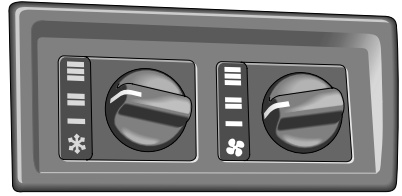
Air blower control - position '0'.

Temperature control - fully up.

Distribution control - fully up.

The following examples of air conditioning settings are included for your guidance.

Normal cooling

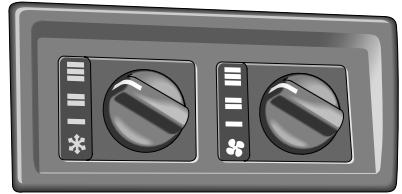


H3688

Temperature control - set to positions I or II.

Blower control - set to desired speed.

Maximum cooling



H3690

Temperature control - set to position III.

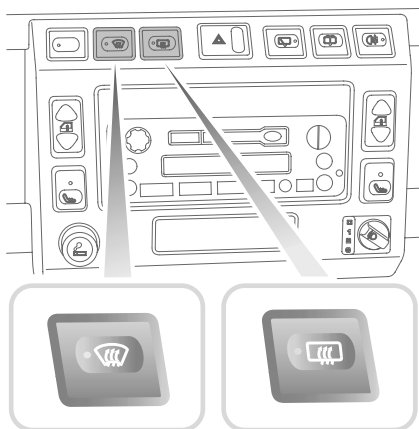
Blower control - set to position III.

Heated Screens

HEATED FRONT SCREEN AND REAR WINDOW


WARNING

DO NOT stick labels over the heating elements, and **DO NOT** scrape or use abrasive materials to clean the inside of the window.




H3743

Heated front screen*

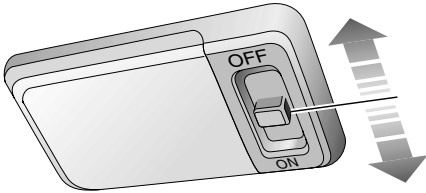
 Press to operate (the indicator light in the switch illuminates); press a second time to switch off (the indicator light extinguishes). After 8 minutes continuous operation, the heater switches off automatically. Note that the heated front screen operates only with the engine running.

Heated rear window*

 Press to operate; press a second time to switch off. The indicator light in the switch illuminates while the heating elements are switched on and extinguishes when they are turned off.

Interior Equipment

INTERIOR LIGHTS



H2592

Switch positions:

- 'OFF' - Light permanently off.
- 'ON' - Light illuminates continuously.

With the switch in the centre position, the interior light illuminates automatically whenever a door is opened or the alarm system is disarmed. The light remains illuminated for 15 seconds after the doors are closed, or until the starter switch is turned on.

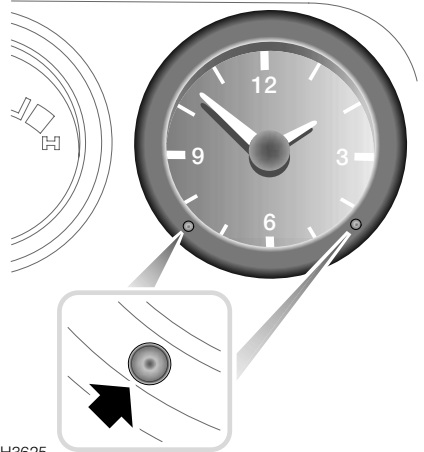
NOTE: Any subsequent opening and shutting of doors prior to the starter switch being turned on again, will cause the 15 second delay feature to operate.

On Station Wagon models, illumination of the interior lights is also activated by opening and closing the tail door.

After driving, the interior lights will fade and then extinguish as soon as the vehicle is locked or when the last door is closed.

NOTE: When the light is switched for automatic operation (switch in centre position), a 'time-out' function extinguishes the lights after 8 minutes approx. if a door is left open, to prevent the battery from discharging.

CLOCK

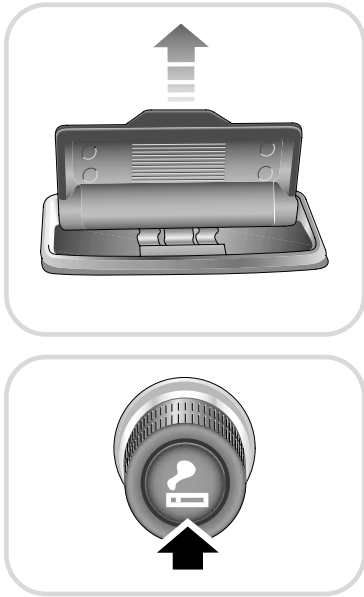


H3625

To adjust the time, use a ballpoint pen or similar probe to advance or put back the time, by pressing in the left or right hand buttons at the bottom of the clock bezel.

NOTE: The clock will need to be reset if the battery is disconnected.

Interior Equipment

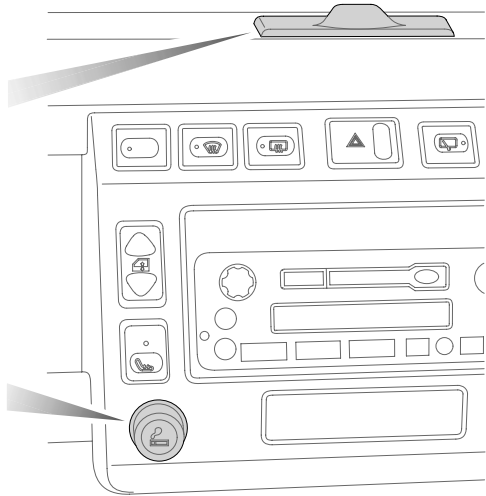


H3727

CIGAR LIGHTER*

With the starter switch turned on, press the lighter in to heat up. When it has reached the correct temperature it will partially eject and can then be withdrawn for use.

- ONLY hold the cigar lighter by the handle.
- DO NOT plug accessories into the cigar lighter socket unless they are approved by Land Rover.



ASHTRAY

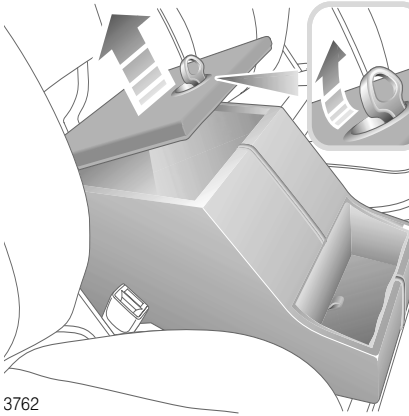
WARNING

DO NOT use the ashtray for disposing of waste paper or other combustible items.

Lift the lid of the ashtray to open. To remove, carefully prise the body of the ashtray out of the fascia panel.

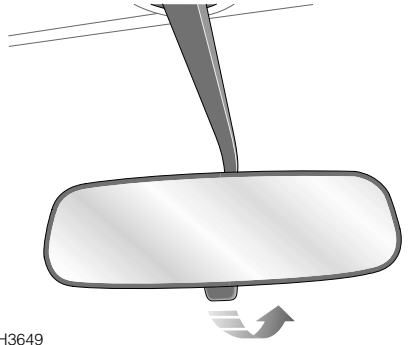
Interior Equipment

CUBBY BOX



Lift up the catch (see inset) to release the lid.

INTERIOR REAR-VIEW MIRROR



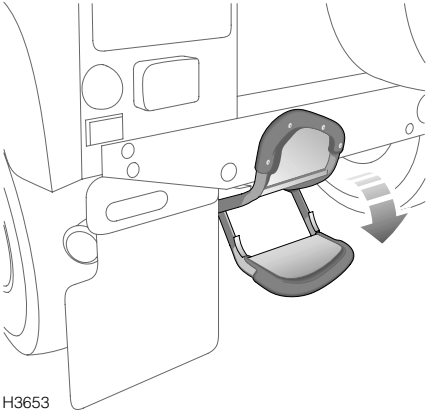
The manual rear view mirror can be dipped to reduce glare from the headlights of following vehicles. At night, move the lever at the base of the mirror forward to 'dip' the mirror. Normal visibility is restored by pulling the lever back again.

WARNING

In some circumstances the view reflected in a 'dipped' manual mirror can confuse the driver as to the precise location of following vehicles. Remember to take additional care!

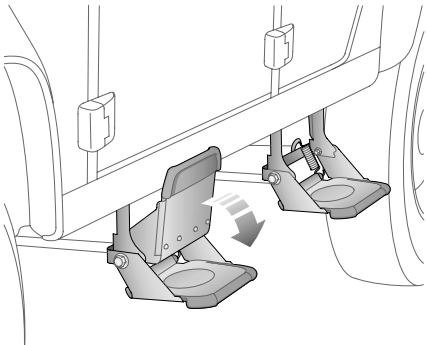
Side & Rear Step

STEPS



H3653

Rear step



H3660

Side steps

The side and tail door steps are hinged to enable them to be folded down when in use, or up when not required.

In-Car Telephones

IN-CAR TELEPHONES

WARNING

Refrain from operating a telephone fitted with its own aerial inside the vehicle (see main text).

Your vehicle utilises a number of electronic systems. These systems may be affected by the use of mobile communication equipment inside the vehicle. However, the use of an external aerial will greatly reduce the likelihood of this occurrence.

For your safety, always note the following precautions before fitting or using an in-car telephone, or any mobile communication equipment.

- Only use an installation kit incorporating an aerial external to the vehicle.
- Ensure that the installation is carried out by a competent installer.
- Refrain from operating a mobile phone fitted with its own aerial inside the vehicle - the electromagnetic field radiated by the phone may interfere with the vehicle's electrical systems.

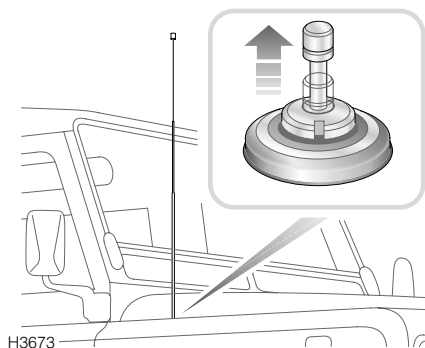
For your safety

WARNING

Using any hand-held appliance while driving can be dangerous. Always stop the vehicle before making a call and ensure the telephone is switched off while you are driving.

In-Car Entertainment

RADIO AERIAL



Set into the front wing, the telescopic aerial can be raised or lowered manually.

IN-CAR ENTERTAINMENT

Radio cassette player

Full operating instructions for any audio equipment fitted as standard to your vehicle, are contained in the '*In-Car Entertainment*' book in the vehicle literature pack.

Driving & Operating

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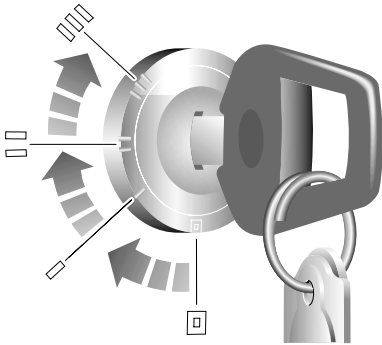
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Starting & Driving

STEERING COLUMN LOCK



H3584

To unlock the steering column

Insert the key FULLY and turn the starter switch to position 'I'. A small movement of the steering wheel may be necessary to disengage the steering lock while turning the switch.

To lock the steering column

Turn the key to position '0' and withdraw it from the starter switch. Turn the steering wheel slightly until the lock engages.

WARNING

Once the steering lock is engaged, it is impossible to steer the vehicle. DO NOT remove the key or turn the starter switch to position '0' while the vehicle is in motion.

STARTER SWITCH

The starter switch is located to the left of the steering column, and uses the following sequence of key positions to operate the steering lock, electrical circuits and starter motor:

Position '0'

- Steering locked (if key is removed).
- Most lighting circuits are operational, including: sidelights, headlights, hazard warning and rear fog guard lights.

Position 'I'

- Steering unlocked.
- Radio/cassette player can be operated.

Position 'II'

- All instruments, warning lights and electrical circuits are operational.

Position 'III'

- Starter motor operates.

Release the key immediately the engine starts (the key will automatically return to position 'II'). Note that operation of position 'I' electrical functions will be interrupted during engine cranking.

Starting & Driving

STARTING - Diesel engines

WARNING

Never start or leave the engine running in an unventilated building - exhaust gases are poisonous and contain carbon monoxide, which can cause unconsciousness and may even be fatal.

1. Check that the handbrake is applied and that the gear lever is in neutral.
2. Switch off all unnecessary electrical equipment.
3. Insert the starter key and turn the switch to position 'I'. Wait until the glow plug warning light extinguishes.

NOTE: *The waiting time will vary according to the engine coolant temperature (when the engine is hot, the glow plug warning light will extinguish almost immediately).*

4. Turn the key to position 'III' to operate the starter motor. DO NOT press the accelerator pedal while starting. RELEASE THE KEY as soon as the engine is running.

If the engine stalls or fails to start, you MUST return the starter switch to position 'I' before attempting to restart; the engine will not start by turning the starter switch from position 'II'.

In temperate climates DO NOT operate the starter for longer than 10 seconds. If the engine fails to start, switch off and wait 10 seconds before re-using the starter.

NOTE: *Continued use of the starter will not only discharge the battery, but may cause damage to the starter motor.*

NOTE: *In temperate climates, the battery charging and oil pressure warning lights should extinguish as soon as the engine is running.*

In cold weather, or when the battery is in a low state of charge, depress the clutch pedal while starting and hold it down until the engine is running. This will reduce the load on the battery.

Precautions

- **The diesel engine must not be run above idle speed until the oil pressure warning light extinguishes. This will ensure that the engine and turbo-charger bearings are properly lubricated before being run at speed.**
- **Similarly, ALWAYS allow the engine to idle for 10 seconds before switching off.**

Cold climates

In very cold climates the oil pressure warning light may take several seconds to extinguish. Similarly, engine cranking times will also increase; at -22°F (-30°C) the starter motor may need to be operated continuously for as long as 30 seconds before the engine will start. For this reason, ensure that all non-essential electrical equipment is switched off.

Starting & Driving

DRIVING

IMPORTANT INFORMATION

Vehicle stability

Your vehicle has a higher ground clearance and, hence, a higher centre of gravity than ordinary passenger cars to enable the vehicle to perform in a wide variety of different off-road applications. An advantage of the higher ground clearance is a better view of the road, allowing the driver to more easily anticipate problems. Inexperienced drivers should take additional care, remembering that the vehicle is not designed for cornering at the same speeds as conventional passenger cars, any more than a low slung sports car is designed to perform satisfactorily in off-road conditions. As with other vehicles of this type, failure to operate the vehicle correctly may result in loss of control or even rollover.

Vehicle height

The overall height of your vehicle exceeds that of ordinary passenger cars. Always be aware of the height of your vehicle and check the available headroom before driving through low entrances. This is particularly important if the vehicle is fitted with a roof rack or if a sunroof is open.

Instruments and warning lights

Before driving it is important to fully understand the function of the instruments and warning lights (see 'INSTRUMENT PANEL', page 32).

NOTE: Red warning lights are of particular importance, illumination indicating that a fault exists. If a red light illuminates, always stop the vehicle and seek qualified assistance before continuing.

Warming-up

DO NOT warm-up the engine by allowing it to idle at a slow speed.

In the interests of fuel economy, it is advisable to drive the vehicle straight away, remembering that harsh acceleration and labouring the engine before the normal operating temperature has been reached can damage the engine.

Running-in

Proper running-in will have a direct bearing on the reliability and smooth running of your vehicle throughout its life.

In particular, the engine, gearbox, brakes and tyres need time to 'bed-in' and adjust to the demands of everyday motoring. During the first 500 miles (800 km), it is essential to drive with consideration for the running-in process and heed the following advice:

- LIMIT maximum road speed to 50 mph (80 km/h). Initially, drive the vehicle on a light throttle and only increase engine speeds gradually once the running-in distance has been completed.
- DO NOT operate at full throttle or allow the engine to labour in any gear.
- AVOID fast acceleration and heavy braking except in emergencies.

Starting & Driving

Power assisted steering

Power assistance is progressively applied the more the steering wheel is turned. For example; where manual steering effort would normally be greatest (at slow speeds on maximum lock), power assistance is greatest. Similarly, where only minimal steering effort would normally be required (at high speed with the wheels straight ahead), then power assistance is also minimal, thus enabling the driver to benefit from apparently consistent steering effort at all times.

WARNING

Under no circumstances must the steering wheel be held on full lock for more than thirty seconds in one minute, otherwise the steering assembly may be damaged.

NOTE: Power assistance is dependent on the engine running. If the engine is not running, greater effort will be required to steer the vehicle.

FUEL ECONOMY

Fuel consumption is influenced by two major factors:

- How your vehicle is maintained.
- How you drive your vehicle.

To obtain optimum fuel economy, it is essential that your vehicle is maintained in accordance with the manufacturer's service schedule.

Items such as the condition of the air cleaner element, tyre pressures and wheel alignment will have a significant effect on fuel consumption. But, above all, the way in which you drive is most important. The following hints may help you to obtain better value from your motoring:

- Avoid unnecessary, short, start-stop journeys.
- Avoid fast starts by accelerating gently and smoothly from rest.
- Do not drive in the lower gears for longer than necessary.
- Decelerate gently and avoid sudden and heavy braking.
- Anticipate obstructions and adjust your speed accordingly well in advance.
- When stationary in traffic, select neutral to improve fuel economy and air conditioning performance.

Starting & Driving

AUXILIARY EQUIPMENT

WARNING

DO NOT use auxiliary equipment, such as roller generators, that are driven by one wheel of the vehicle, as they could cause failure of the gearbox differential. If the differential lock is engaged in an attempt to avoid damage, the vehicle will drive itself forward.

EMISSION CONTROL SYSTEM

WARNING

Exhaust fumes contain poisonous substances which can cause unconsciousness and may even be fatal.

- ***DO NOT inhale exhaust gases.***
 - ***DO NOT start or leave the engine running in an enclosed unventilated area, or drive with the taildoor open.***
 - ***DO NOT modify the exhaust system from the original design.***
 - ***ALWAYS repair exhaust system leaks immediately.***
 - ***If you think exhaust fumes are entering the vehicle have the cause determined and corrected immediately.***
-

Land Rover vehicles are fitted with emission and evaporative control equipment necessary to meet a number of territorial requirements.

In many countries it is against the law for vehicle owners to modify or tamper with emission control equipment, or to sanction the unauthorised replacement or modification of this equipment. In such cases the vehicle owner and the repairer may both be liable for legal penalties.

It is important to remember that all Land Rover dealers are properly equipped to perform repairs and to maintain the emission control system on your vehicle.

Catalytic Converter

CATALYTIC CONVERTER*

The exhaust system on some vehicles incorporates a catalytic converter, which converts poisonous exhaust emissions from the engine into environmentally less harmful gases.

WARNING

Catalytic converters can be easily damaged through improper use, particularly if the wrong fuel is used, or if an engine misfire occurs. For this reason it is VERY IMPORTANT that you heed the precautions which follow.

Fuel

ONLY use fuel recommended for your vehicle (see 'TYPE OF FUEL', page 66).

Starting the engine

- DO NOT continue to operate the starter after a few failed attempts (unburnt fuel may be drawn into the exhaust system, thereby poisoning the catalyst), and do not attempt to clear a misfire by pressing the accelerator pedal - seek qualified assistance.
- When starting a COLD engine, DO NOT drive if a misfire is suspected and do not attempt to clear a misfire by pressing the accelerator - seek qualified assistance.
- Do not attempt to push or tow-start the vehicle.

Driving

- If a misfire is suspected, or the vehicle lacks power while driving, provided the engine has reached its normal operating temperature, it may be driven SLOWLY (at risk of catalyst damage) to a Land Rover dealer for assistance.

- NEVER allow the vehicle to run out of fuel (the resultant misfire could damage the catalyst).
- Consult your dealer if your vehicle is burning excessive oil (blue smoke from the exhaust), as this will progressively reduce catalyst efficiency.
- On rough terrain do not allow the underside of the vehicle to be subjected to heavy impacts which could damage the catalytic converter.
- DO NOT overload or excessively 'rev' the engine.
- DO NOT switch off the engine when the vehicle is in motion with a drive gear selected.

WARNING

Exhaust system temperatures can be extremely high - DO NOT park on ground where combustible materials such as dry grass or leaves could come into contact with the exhaust system - in dry weather a fire could result.

Vehicle maintenance

Any engine misfire, loss of engine performance or engine run-on, could seriously damage the catalytic converter. For this reason, it is vital that unqualified persons do not tamper with the engine, and that regular systematic maintenance is carried out by a Land Rover dealer.

Fuel Filling

SAFETY ON THE FORECOURT

WARNING

Petroleum gases are highly inflammable and, in confined spaces, are also extremely explosive.

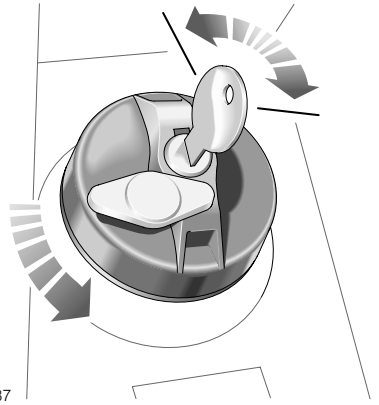
Always take sensible precautions when refuelling:

- Switch off the engine.
- Do not smoke or use a naked flame or light, or operate a mobile phone.
- Take care not to spill fuel.
- Do not overfill the tank.

FUEL FILLER

WARNING

DO NOT fully remove the filler cap until any captive tank pressure has been released (wait until the hissing stops).



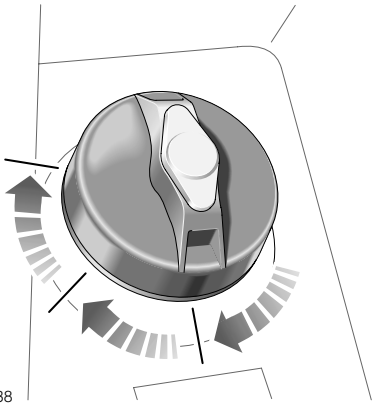
H3637

The fuel filler is located in the rear right-hand body side. To unlock the fuel cap:

1. Insert the smaller metal key and turn it 90 degrees clockwise.
2. Turn the key 90 degrees anti-clockwise and then remove.

The cap should then be unscrewed gradually, as it is designed to allow the fuel tank to vent during the first half turn. Carefully loosen the cap one half turn until resistance is felt, and allow fuel tank pressure to be released. Once the pressure is released (hissing has stopped), it is safe to fully remove the filler cap.

Fuel Filling



When replacing, ensure that the key is removed from the lock, then tighten the cap clockwise until you hear the fuel cap ratchet click at least three times. This locks the cap (the key is not needed). Finally, reposition the key cover over the lock.

TYPE OF FUEL

Use diesel or automotive gas oil (AGO) to EN 590.

The quality of diesel fuel (Derv) can vary in different countries and only clean, good quality fuel should be used. It is important that the sulphur content of diesel fuel does not exceed 0.3%; in Europe all supplies should be within this limit, but in other parts of the world, you should check with your supplier.

Ensure the fuel filter element is changed and the fuel sedimenter drained, at the recommended service intervals.

If good quality diesel fuel is unavailable and it is necessary to use poor quality fuel, it may be necessary to have the fuel filter/sedimenter drained regularly.

NOTE: *The use of paraffin (kerosene) as a diesel fuel additive is illegal in the UK.*

WARNING

If the fuel tank is accidentally filled with petrol it is ESSENTIAL that you contact your dealer BEFORE attempting to start the engine!

Fuel Filling

FUEL FILLING

WARNING

DO NOT attempt to fill the tank to its maximum capacity. If the vehicle is to be parked on a slope, in direct sunlight, or high ambient temperature, expansion of the fuel could cause spillage.

Filling station pumps are equipped with automatic cut-off sensing to avoid fuel spillage. Fill the tank SLOWLY until the filler nozzle automatically cuts-off the supply. DO NOT attempt to fill the tank beyond this point or spillage could result due to expansion of the fuel.

The diesel pumps on garage forecourts fill at a maximum of 45 litres (10 gallons) per minute. Use of commercial vehicle diesel pumps with a higher fill rate, may result in premature pump cut-off and fuel spillage.

EMPTY FUEL TANK

Td5 diesel engine vehicles

After running the fuel tank dry, refuel the tank with at least 1 gallon (4.5 litres) of diesel fuel, then carry out the following procedure:

1. Turn off the starter switch and wait for 15 seconds.
2. Turn the starter key to position 'II' and wait for 30 seconds.
3. Repeat steps 1 and 2 six times.
4. After the final 30 second period, fully depress the accelerator pedal.
5. Keeping the pedal depressed, start cranking the engine.
6. Continue cranking the engine and as soon as the engine is firing smoothly, ease the accelerator pedal back to approximately halfway through its travel, and release the starter key. The engine should now be running.
7. If the engine fails to start, repeat the process.

During the above procedure, the fuel pump will be heard to operate (priming the engine). This noise is not cause for concern.

IMPORTANT INFORMATION

The engine must NOT be cranked for more than 20 seconds in any one period.

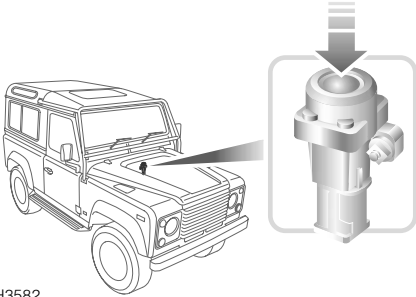
If the above procedure is carried out on a vehicle that has NOT run out of fuel, it will result in the engine flooding with fuel and failing to start.

Tdi diesel engine vehicles*

If the vehicle runs out of fuel, then qualified assistance may be required to prime the fuel system before the engine can be restarted.

Fuel Filling

FUEL CUT-OFF SWITCH (Td5 models)



H3582

The fuel cut-off switch is a safety device which, in the event of a collision or sudden impact, automatically cuts off the fuel supply to the engine.

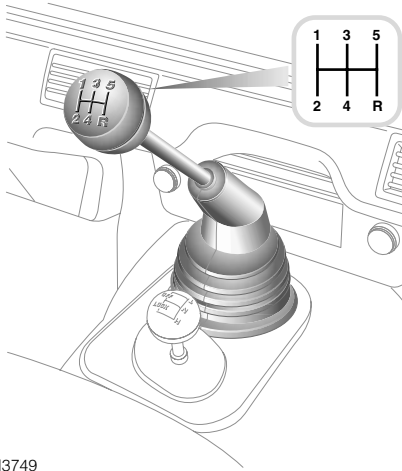
The switch is located on the engine compartment bulkhead. After an impact, the switch must be reset by pressing the rubber top (arrowed in illustration) before the engine can be restarted.

WARNING

ALWAYS check for fuel leaks before resetting the switch!

Manual Gearbox

GEAR LEVER



H3749

Manual transmission vehicles feature a five speed main gearbox and a two-speed (LOW & HIGH) transfer box. In addition, a centre differential in the transfer box distributes the drive to the front and rear axles, providing permanent four wheel drive. By using the main gearbox in conjunction with the transfer gears, ten forward and two reverse speeds are available.

The gear positions for the main gearbox are shown on the gear lever knob. Note that when the gearbox is in neutral, the gear lever is spring-loaded to lie naturally between third and fourth gear positions.

WARNING

Do not select reverse gear unless the vehicle is stationary.

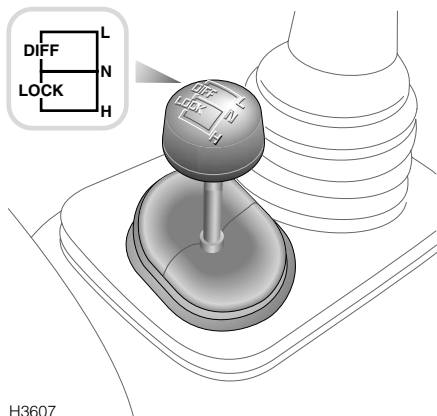
Do not attempt to start the engine with the vehicle in gear. The engine must ONLT be started with the main gear lever in neutral and the handbrake applied.

Precautions while driving

- DO NOT rest your hand on the gear lever while driving - pressure from your hand may cause premature wear to the gear selector mechanism.
- DO NOT use the clutch pedal as a foot rest. To prevent unnecessary wear, always keep the left foot well clear of the clutch pedal except when changing gear.
- DO NOT hold the vehicle stationary on a hill by slipping the clutch. This will wear out the clutch. Always use the handbrake.

Transfer Gearbox

TRANSFER GEARBOX



H3607

The second gear lever is used to select either the high or low range of gears in the transfer gearbox and, in addition, also controls the centre differential (known as the 'Diff lock').

High range ('H')

The high range of gears should be used for all normal road driving and also for off-road driving across dry, level terrain.

Low range ('L')

Use low range gears when moving off from rest when towing a heavy load, or in any situation where low speed manoeuvring is necessary, such as reversing a trailer or negotiating a boulder strewn river bed; also use low range for more extreme off-road conditions where progress in high range cannot be maintained. DO NOT attempt to use LOW range gears for normal road driving.

Neutral ('N')

With the transfer lever in neutral, drive cannot be transmitted to the road wheels, regardless of the position of the main gear lever. Use transfer neutral when being towed or when using winching or power take off facilities.

'Diff lock' centre differential

Use the 'unlocked' position for all normal driving, and use the 'diff lock' position to improve traction in extreme conditions where wheel grip could be lost, such as; driving over wet grass, mud, sand, ice or snow. Return to the 'unlocked' position as soon as dry, firm ground is reached.

DO NOT use the 'diff lock' unnecessarily!

USING THE TRANSFER GEARBOX

With the vehicle stationary and the engine running, depress the clutch and then move the lever fully forward (or backwards) in TWO distinct but positive moves - 'high to neutral'.... 'neutral to low' (or vice versa).

If there is resistance to the gear engaging, do not force the lever. Instead, with the main lever in gear, release the clutch momentarily and then try again.

Transfer Gearbox

Changing from high to low on the move

With the vehicle slowing to a stop and travelling **NO FASTER THAN 5 mph (8 km/h)**, depress the clutch and push the transfer lever into neutral. Just before the road wheels stop turning (and with the clutch still depressed) push the lever fully forward into 'L' (low).

NOTE: Use positive and confident moves, but do not rush the gear change.

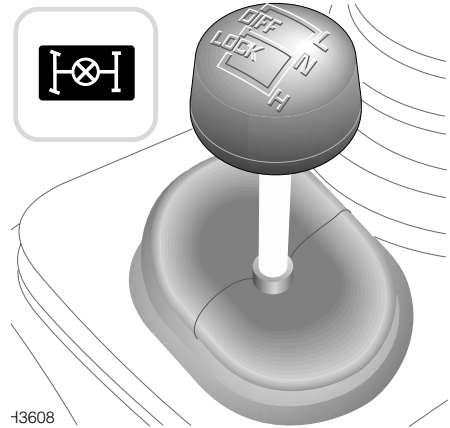
Changing from low to high on the move

Changing from 'L' (low) to 'H' (high) can be achieved without stopping the vehicle, as follows:

1. Apply slight backward pressure to the transfer gear lever in preparation for changing.
2. Then, in three simultaneous moves, depress the clutch, release the accelerator and pull the transfer lever into neutral.
3. Release the clutch pedal for approximately 3 seconds before depressing it again and moving the transfer lever firmly into the high position.
4. Finally, select a suitable main gear, release the clutch and continue driving in the normal way.

NOTE: After a little practice, this operation can be carried out smoothly and quickly by using firm, positive moves.

THE DIFFERENTIAL LOCK



Unlike many four wheel drive vehicles, all Land Rover vehicles have permanent four wheel drive. This is achieved by the inclusion of a lockable differential between the front and rear drive shafts. With the differential locked, the drive shafts to front and rear axles are (in effect) joined together, causing both to rotate at the same speed. This is a normal feature with all four-wheel drive vehicles and enhances traction on difficult off-road surfaces. However, with the differential unlocked, the different running requirements of the two axles can be accommodated, thereby enabling Land Rover vehicles to operate permanently in four wheel drive for both road AND off-road use.

Selecting diff lock

The diff lock can be engaged or disengaged either with the vehicle stationary, or when driving at any road speed. However, with the vehicle in motion, it is **ESSENTIAL** to be travelling on firm ground, in a straight line, and without wheel slip.

Transfer Gearbox

WARNING

DO NOT engage the diff lock if one or more wheels are slipping - this could damage the transmission. If wheels are slipping, ease off the accelerator before engaging the diff lock.

DO NOT engage the diff lock from the transfer neutral position.

To lock the differential:

Briefly ease the throttle and move the transfer gear lever to the left - from either 'H' (high) or 'L' (low) position (the warning light on the instrument panel will illuminate).

To unlock the differential:

Move the transfer gear lever to the right - to either 'H' (high) or 'L' (low) position as required; when the diff lock disengages, the warning light will extinguish.

When to use the diff lock

As a general rule, the differential should only be locked in order to drive off-road on loose and slippery surfaces. ALWAYS unlock the differential for normal road driving or as soon as a hard grippy surface is reached, whether high or low gears are selected.

NOTE: A valuable introduction to off-road driving, which includes many useful references to the transfer gearbox and the diff lock, is included in the 'Off-road driving' section of this handbook.

WARNING

If the vehicle is driven on normal road surfaces with the differential locked, the steering will feel stiff, excessive tyre wear will occur and the transmission will be 'wound up'. This places excessive strain on the transmission.

Diff lock warning light



The amber warning light in the instrument panel illuminates when the diff lock is actually engaged - rather than when it has been selected. Similarly, it will only extinguish when the diff lock is actually disengaged. This accounts for a slight delay between diff lock deselection and the warning light extinguishing, which is quite normal.

IMPORTANT INFORMATION

Transmission 'wind up'

If the warning light is obviously reluctant to extinguish after the diff lock has been deselected, some transmission 'wind up' may be present.

Reversing the vehicle a short distance and then going forward will usually 'unwind' the transmission and extinguish the light and the vehicle can be driven as normal. However, if after two or three attempts to 'unwind' the transmission the light remains on, consult your dealer AS SOON AS POSSIBLE.

Brakes

FOOT BRAKE

For your safety, the hydraulic braking system operates through dual circuits. If one circuit should fail, the other will continue to function. However, in the event of brake failure where only one circuit is operational, the vehicle should only be driven at slow speed to the nearest qualified dealer. In these circumstances, exercise extreme caution and be aware that increased brake pedal travel, greater pedal pressure, and longer stopping distances will be experienced.

Servo assistance

The braking system is servo assisted, but ONLY when the engine is running. Without this assistance greater braking effort is necessary to safely control the vehicle, resulting in longer stopping distances. Always observe the following precautions:

- NEVER allow the vehicle to freewheel with the engine turned off.
- ALWAYS take particular care when being towed with the engine turned off.
- If the engine should stop for any reason while the vehicle is in motion, bring the vehicle to a halt as quickly as traffic conditions safely allow, and DO NOT pump the brake pedal as the braking system may lose any remaining assistance available.

Brake warning light



If the warning light in the instrument panel illuminates while driving, and the handbrake is fully released, a fault with the braking system is indicated. Check the brake fluid level; if the light continues to illuminate, seek qualified assistance before continuing.

Brake pads

Brake pads require a period of bedding in. For the first 500 miles (800 km), you should avoid situations where heavy braking is required.

Remember! regular servicing is vital to ensure that the brake pads are examined for wear and changed periodically to ensure long-term safety and optimum performance.

WARNING

DO NOT rest your foot on the brake pedal while travelling as this may overheat the brakes, reduce their efficiency and cause excessive wear.

NEVER move a vehicle without the engine running because braking assistance will not be available. The pedal brakes will still function, but more pressure will be required to operate them.

If the brake warning light should illuminate while the vehicle is in motion, bring the vehicle to a halt as quickly as traffic conditions and safety permit and seek qualified assistance before continuing. DO NOT pump the brake pedal - the braking system may lose any remaining servo assistance available.

Wet conditions

Driving through water or even very heavy rain may adversely affect braking efficiency. Always dry the braking surfaces by intermittent light application of the brakes, first ensuring that you are at a safe distance from other road users.

Brakes

HANDBRAKE

Unlike most other vehicles, the handbrake operates on the rear propeller shaft, and NOT on the road wheels. This may result in slight movement of the vehicle after the handbrake is applied.

To engage the handbrake, pull the lever up fully.

To release, pull the lever up slightly, depress the button and lower the lever.

Always apply the handbrake fully whenever you park.

When parking on a slope, do not rely on the handbrake alone to hold the vehicle, park in a low forward gear when facing uphill and in reverse gear when facing downhill. For extra security on steep slopes, move the transfer lever into low range or engage the diff lock.

WARNING

DO NOT apply the handbrake while the vehicle is in motion as this could result in loss of vehicle control and damage to the transmission.

DO NOT rely on the handbrake to operate effectively if the vehicle has been subjected to immersion in mud and water (see 'Off-road driving' section).

ANTI-LOCK BRAKES*

WARNING

ABS cannot overcome the physical limitations of stopping the vehicle in too short a distance, cornering at too high a speed, or the danger of aquaplaning, i.e. where a layer of water prevents adequate contact between the tyres and the road surface.

The fact that a vehicle is fitted with ABS must never tempt the driver into taking risks that could affect his/her safety or that of other road users. In all cases, it remains the driver's responsibility to drive within normal safety margins, having due consideration for prevailing weather and traffic conditions.

The driver should always take account of the surface to be travelled over and the fact that brake pedal reactions will be different to those experienced on a non-ABS vehicle.

The purpose of the anti-lock braking system (ABS) is to allow efficient braking without wheel locking - thereby allowing the driver to retain steering control of the vehicle.

Under normal braking conditions, (where sufficient road surface friction exists to reliably bring the vehicle to a halt without the wheels locking), ABS will not be activated. However, should the braking force exceed the available adhesion between the tyres and the road surface, then ABS will automatically come into operation. This will be recognisable by a rapid pulsation felt through the brake pedal.

Brakes

In normal road use, in an emergency situation full braking effort should always be applied even when the road surface is slippery. The anti-lock braking system constantly monitors the speed of each wheel and varies braking pressure to each, according to the amount of traction available, thereby ensuring that the wheels do not lock.

No matter how hard you brake, you should be able to continue steering the vehicle as NORMAL.

- DO NOT pump the brake pedal at any time; this will interrupt operation of the system and may increase braking distance.
- NEVER place additional floor matting or any other obstruction under the brake pedal. This restricts pedal travel and therefore braking efficiency is impaired.

Warning light



The anti-lock braking system incorporates a monitoring system, which checks that all the electrical components are in working order, as soon as the starter switch is turned on and also at frequent intervals during your journey.

The warning light on the instrument panel is an important part of this system. The light should illuminate for approximately 1 second as a bulb and system check when the starter switch is turned to position 'II' and briefly extinguish before coming on again. If the light does not extinguish and then illuminate again, a fault has occurred with the ABS system and you should consult with a Land Rover dealer at the earliest opportunity.

The warning light will remain illuminated until the vehicle is driven above approximately 5 mph (7 km/h).

If the light remains on, or illuminates while driving, a fault has been detected by the self monitoring system and full ABS control may not be available - consult your dealer at the earliest opportunity.

The normal braking system remains fully operational and is not affected by partial or full loss of the ABS. However, braking distances may increase.

Off-road driving

While anti-lock braking is designed to operate equally effectively in 'off-road' driving conditions, on certain surfaces total reliance on the system may be unwise - remember, in normal circumstances, anti-lock braking operates only AFTER the driver has already lost control. It cannot reliably compensate for driver error or inexperience on difficult off-road surfaces.

Note the following:

- On soft or deep surfaces such as powdery snow, sand or gravel, and on extremely rough ground, the braking distance required by the anti-lock braking system may be greater than for normal braking, even though improved steering would be experienced. This is because the natural action of locked wheels on soft surfaces is to build up a wedge of surface material in front which assists the wheels to stop.
- If the vehicle is stopped on a very steep slope where little traction is available, it may slide with the wheels locked because there is no wheel rotation to signal movement to the ABS. To counteract this, briefly release the brakes to permit some wheel movement, then re-apply the brakes to allow ABS to gain control.
- Before driving off-road read and thoroughly understand the 'Off-road driving' section of this handbook.

Traction Control

ELECTRONIC TRACTION CONTROL *

The purpose of electronic traction control is to aid traction when one or more wheels are spinning while others have good grip, e.g. if one wheel is on ice and others are on tarmac. The system works by applying the brake to a spinning wheel in order to transfer torque to the remaining wheels.

NOTE: *Traction control can operate up to speeds of 30 mph (50 km/h).*

Warning light

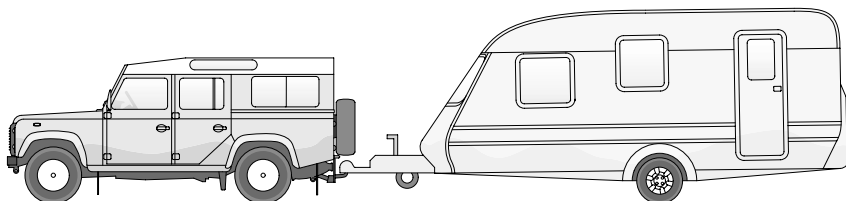


The instrument panel has a traction control warning (TC) which illuminates for a minimum of 2 seconds whenever the system is active and also illuminates as a bulb check (for approximately 4 seconds) when the starter switch is turned to position 'II'.

If there is a fault with the system, the warning light will illuminate continuously and remain illuminated when the vehicle is stopped, in which case you should contact your dealer at the earliest opportunity.

In the unlikely event that traction control operates continuously for too long (in excess of approximately 1 minute), then the control unit shuts down to allow cooling and the warning light flashes for at least 10 seconds.

Towing



H3633

TOWING

The torque ranges of Land Rover engines allow maximum-weight loads to be pulled smoothly from standstill, and reduce gear changing on hills or rough terrain. A smooth start will be achieved with trailers over 4400 lb (2000 kg) by moving off in low range then changing to high range while on the move (see 'TRANSFER GEARBOX', page 70).

The suspension is designed to cope with a heavy trailer load without upsetting the balance or feel of the vehicle.

WARNING

It is recommended that you fit only towing accessories approved by Land Rover.

In the interest of safety, the gross vehicle weight, maximum rear axle weight, maximum trailer weight and tow hitch load (nose weight) must not be exceeded.

If a NATO Hook or a Jaw and Pintle type towing accessory is to be fitted to your vehicle, DO NOT attach them directly to the chassis rear cross-member - it is essential that an adaptor plate kit (available from a Land Rover dealer) is also fitted.

DO NOT use lashing eyes or vehicle recovery towing eyes to tow a trailer or caravan.

It is the driver's responsibility to ensure that the towing vehicle and trailer/caravan are loaded and balanced so that the combination is stable when in motion. When preparing your vehicle for towing, pay attention to any instructions provided by the trailer/caravan manufacturer as well as to the information that follows.

Balancing the combination

To ensure optimum stability, it is essential that the trailer adopts a level aspect. In other words, the trailer must be level with the ground, with the towing hitch and trailer drawbar set at the same height (note the illustration at the top of the page). This is particularly important when towing twin axle trailers!

- The trailer should be level with the ground when loaded.
- The height of the drawbar hitch point should be set so that the trailer is level when connected to the loaded vehicle.

Towing

Points to remember:

- When calculating the laden weight of the trailer, remember to include the weight of the trailer PLUS the load.
- The recommended trailer nose weight plus the combined weight of the vehicle's load carrying area and rear seat passengers must never exceed the specified maximum rear axle load (see 'TOWING WEIGHTS', page 162).
- Where the load can be divided between trailer and tow vehicle, loading more weight into the vehicle will generally improve the stability of the combination. However, ensure that the gross vehicle and maximum rear axle weights are not exceeded and that the combination remains level.
- Towing regulations vary from country to country. Always ensure national regulations governing towing weights and speed limits are observed (refer to the relevant national motoring organisation for information). The vehicle's maximum permissible towed weight refers to its design limitations and NOT to any specific territorial restriction (see 'TOWING WEIGHTS', page 162).

NOTE: The maximum speed when towing is 100 kph (62 mph).

NOTE: Above 1,000 ft (300 metres) the effects of altitude can adversely affect engine performance and also cause overheating.

Vehicle weights

When loading a vehicle to its maximum (gross vehicle weight), take account of the unladen vehicle weight and load distribution to ensure that axle loadings do not exceed the permitted maximum values. It is your responsibility to limit the vehicle load in such a way that neither the maximum axle loads nor the gross vehicle weight are exceeded.

Coupled braking systems

In order to tow a trailer with a weight in excess of 3,500 kg, the vehicle must be adapted to operate a coupled braking system. If this adaptation is carried out, the vehicle identification number plate (VIN) must be changed to show the increased train weight.

Revised VIN plates may be obtained from Land Rover; these will be issued subject to satisfactory proof that the vehicle has been fitted with an approved conversion.

Trailer socket

When the engine is running, power output from the trailer socket must NOT exceed 5 amps.

ESSENTIAL TOWING CHECKS

Tyre pressures:	Ensure trailer/caravan tyres are at the pressures recommended by the trailer manufacturer.
Loading:	Keep trailer loads securely anchored, evenly distributed and as low as possible with heavy loads over the axle. Towing vehicle maximum axle weights and gross vehicle weight must not be exceeded.
Nose weight:	The recommended trailer nose weight limit is 330 lb (150 kg).
Hitch height:	Must be set so that caravan/trailer is level when connected to the tow vehicle.
Brakes:	Check the operation of trailer brakes and lights.

Load Carrying

LUGGAGE SPACE

WARNING

DO NOT carry unsecured equipment, tools or luggage which could move and cause personal injury in the event of an accident or emergency manoeuvre, either on or off road.

ROOF RACKS

ALWAYS use an approved roof rack and follow the manufacturer's fitting instructions carefully. A full list of all approved accessories is available from your Land Rover dealer.

IMPORTANT INFORMATION

Always observe the following precautions:

- The **MAXIMUM** load for approved roof rack systems is 330 lb (150 kg) for normal road use and 66 lb (30 kg) off-road. Calculation of the maximum load must include the weight of the roof rack.
- A loaded roof rack can reduce the stability of the vehicle, particularly when cornering and encountering cross winds.
- All loads should be evenly distributed, and secured within the periphery of the roof rack.
- Always secure the load to the side rails, not just to the cross rails.
- Only fit roof racks that have been designed for your vehicle. If in doubt, consult your dealer.
- Driving off-road with a loaded roof rack is not recommended. If it is necessary to stow luggage on the roof rack while driving off-road, all loads must be removed before traversing side slopes.

Ancillary Equipment

WINCHES

A number of different winches, suited to jobs ranging from vehicle recovery to haulage, can be fitted to your Defender. For further information on the types of winch available and their various uses, contact your Land Rover dealer.

As winch operation will vary considerably on different winch units, it is essential that the manufacturer's operating instructions are understood and followed carefully.

Winch safety

WARNING

If used incorrectly, winches can be extremely dangerous.

ALWAYS follow the manufacturer's operating instructions carefully.

NEVER stand near, or astride a winching cable whilst it is under tension.

ALWAYS wear protective gloves when handling winch cables.

In addition:

- DO NOT attempt to continue winching if the winch has stalled due to overloading.
- Inspect the winch and cable regularly - ALWAYS have worn or damaged parts replaced immediately.
- Only use recommended replacement parts of the same specification as the original equipment - failure to do so may not only damage the winch, but may cause serious personal injury.

After winching

Whilst wearing thick, protective gloves, clean and lubricate the cable with a recommended cable lubricant. For further information, consult your Land Rover dealer.

WARNING

NEVER allow a cable to kink, coil or overlap on the winch spool.

NOTE: If a capstan winch is used, ensure the rope is cleaned and dried before stowing.

Ancillary Equipment

POWER TAKE-OFF DRIVES

Your Defender is capable of providing a static or mobile power source, which can be used to power generators, compressors, pumps and other ancillary equipment, mounted on or under the vehicle, by means of shaft, belt or hydraulic drive. This is possible by having a power take-off drive unit fitted to the transfer gearbox. This provides the basic drive for several variations of power take-off layouts.

The power take-off capability is an integral part of the vehicle design and has been tried and tested under the most rigorous and demanding conditions across the world. Land Rover dealers provide a full range of power take-off drive units and accessories, designed and built for the Defender.

For static operation, select neutral in the transfer gearbox to disconnect the drive to the road wheels - it is then possible to operate the power take-off independently. The forward gears and hand throttle* can now be used to control the operating speed. To prevent the transmission from being overloaded, it is recommended that the highest gear possible should be used.

The lower gears can be used when lower operating speeds are required, but they should only be used for light workloads and for short periods of time.

If power take-off is being used while the vehicle is moving, it will operate at a speed in direct proportion to the road speed of the vehicle and to the selected transfer gear ratio.

For more information on the use of power take-off drives and equipment, consult your Land Rover dealer.

HAND THROTTLE*

The hand throttle is for use in conjunction with power take-off equipment (winches, pumps for example), when a relatively constant engine speed is required.

WARNING

DO NOT attempt to use the hand throttle when the vehicle is being driven.

Operating the hand throttle:

1. Select 'N' (neutral) in the transfer gearbox.
2. Pull the hand throttle control out until the desired engine speed is achieved.
3. Twist the control clockwise to lock the throttle in position.

The accelerator pedal can be used to temporarily override the hand throttle (to increase engine speed). Once the accelerator is released, the engine speed will return to the level set by the hand throttle.

To turn the hand throttle off, twist the control fully in (to the closed position).

Ensure the hand throttle is fully closed before driving.

Off-road Driving

Off-road Driving

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Off-road Driving

BEFORE YOU DRIVE

Before venturing off-road, it is **absolutely essential** that inexperienced driver's become fully familiar with the vehicle's controls, in particular the transfer gearbox, and also study the off-road driving techniques described on this and the following pages.

WARNING

Off-road driving can be hazardous!

- ***DO NOT take unnecessary risks and be prepared for emergencies at all times.***
 - ***Familiarise yourself with the recommended driving techniques in order to minimise risks to yourself, your vehicle AND your passengers.***
-

IMPORTANT INFORMATION
<ul style="list-style-type: none">• Always wear a seat belt for personal protection in all off-road driving situations.• DO NOT drive if the fuel level is low - undulating ground and steep inclines could cause fuel starvation to the engine.

BASIC OFF-ROAD TECHNIQUES

These basic driving techniques are an introduction to the art of off-road driving and do not necessarily provide the information needed to successfully cope with every single off-road situation.

We strongly recommend that owners who intend to drive off-road frequently, should seek as much additional information and practical experience as possible.

Before driving off-road it is important that you check the condition of the wheels and tyres and that the tyre pressures are correct. Worn or incorrectly inflated tyres will adversely affect the performance, stability and safety of the vehicle.

Gear selection

Correct gear selection is possibly the single most important factor for safe and successful off-road driving. While only experience will tell you which is the correct gear for any section of ground, the following basic rules apply:

- NEVER change gear or operate the clutch while negotiating difficult terrain - the drag on the wheels may cause the vehicle to stop when the clutch is depressed and restarting may be difficult.
- Generally, and especially where slippery or soft ground conditions prevail, the higher the gear you select the better.
- When descending very steep slopes always select first gear in LOW range.

Inexperienced drivers are advised to stop the vehicle (on firm ground) and carefully consider which gear will be most appropriate for each manoeuvre before continuing.

Off-road Driving

Slipping the clutch

Use of excessive clutch slip to prevent the engine stalling will result in premature clutch wear. Always select a gear low enough to enable the vehicle to proceed without needing to slip the clutch.

DO NOT drive with your foot resting on the clutch pedal; driving across uneven terrain could cause you to inadvertently depress the clutch, resulting in loss of control of the vehicle.

Transfer gears

High range gears should be used whenever possible - only change to low range when ground conditions become very difficult. The diff lock should be engaged whenever there is a risk of losing wheel grip, and disengaged as soon as firm, level, non-slippery ground is reached.

Braking

As far as possible, vehicle speed should be controlled through correct gear selection. Application of the brake pedal should be kept to a minimum. Unless ABS is fitted, any braking on wet, muddy or loose surfaces is likely to cause one or more wheels to lock - the resultant slide could prove dangerous.

NOTE: *If the correct gear has been selected, braking will be largely unnecessary.*

Use of engine for braking

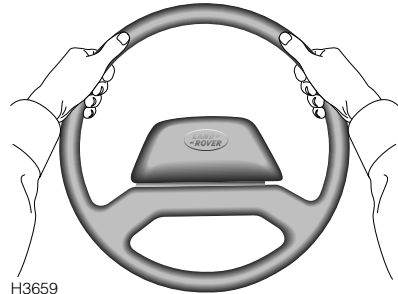
Before descending steep slopes, stop the vehicle at least its length before the descent, engage LOW range and then select first or second gear, depending on the severity of the incline.

While descending the slope it should be remembered that the engine will provide sufficient braking effort to control the rate of descent, and that the brakes should not be applied.

Accelerating

Use the accelerator with care - any sudden surge of power may induce wheel spin and, therefore, invoke unnecessary operation of traction control*, or in extreme conditions could lead to loss of control of the vehicle.

Steering



WARNING

DO NOT hold the steering wheel with your thumbs inside the rim - a sudden 'Kick' of the wheel as the vehicle negotiates a rut or boulder could seriously injure them. ALWAYS grip the wheel on the outside of the rim (as shown) when traversing uneven ground.

Survey the ground before driving

Before negotiating difficult terrain, it is wise to carry out a preliminary survey on foot. This will minimise the risk of your vehicle getting into difficulty through a previously unnoticed hazard.

Off-road Driving

Ground clearance

Don't forget to allow for ground clearance beneath the chassis, axles and under the front and rear bumpers. Note that the axle differentials are situated **BELOW** the chassis and are positioned slightly to the right of the centre of the vehicle. Note also that there are other parts of the vehicle which may come into contact with the ground - take care not to ground the vehicle.

Ground clearance is particularly important at the bottom of steep slopes, or where wheel ruts are unusually deep and where sudden changes in the slope of the ground are experienced.

On soft ground the axle differentials will clear their own path in all but the most difficult conditions. However, on frozen, rocky or hard ground, hard contact between the differentials and the ground will generally result in the vehicle coming to a sudden stop.

ALWAYS attempt to avoid obstacles that may foul the chassis or axle differentials.

Loss of traction

If the vehicle is immobilised due to loss of wheel grip, the following hints could be of value:

- Avoid prolonged wheel spin; this will only make matters worse.
- Remove obstacles rather than forcing the vehicle to cross them.
- Clear clogged tyre treads.
- Reverse as far as possible, then attempt an increased speed approach - additional momentum may overcome the obstacle.
- Brushwood, sacking or any similar material placed in front of the tyres may improve tyre grip.

Off-road Driving

AFTER DRIVING OFF-ROAD

IMPORTANT INFORMATION

Before rejoining the public highway, or driving at speeds above 25 mph (40 km/h), consideration should be given to the following:

- Wheels and tyres must be cleaned of mud and inspected for damage.
- If wheels and tyres are not cleaned properly, damage to the wheels, tyres, braking system and suspension components could occur.
- Brake discs and callipers should be examined and any stones or grit that may affect braking efficiency removed.

SERVICING REQUIREMENTS

Vehicles operated in arduous conditions, particularly on dusty, muddy or wet terrain, and vehicles undergoing frequent or deep wading conditions will require more frequent servicing. See *'OWNER MAINTENANCE'*, page 98 and contact a Land Rover dealer for advice.

After wading in salt water or driving on sandy beaches, use a hose to wash the underbody components and any exposed body panels with fresh water. This will help to protect the vehicle's cosmetic appearance.

Driving Techniques

DRIVING ON SOFT SURFACES & DRY SAND

The ideal technique for driving on soft surfaces (dry sand for example), requires the vehicle to be kept moving at all times - soft sand causes excessive drag on the wheels resulting in a rapid loss of motion once driving momentum is lost. For this reason, gear changing should be avoided.

Engage the diff lock, select the highest suitable gear and REMAIN in that gear until a firm surface is reached. It is generally advisable to use LOW range gears, as they will enable you to accelerate through worsening conditions without the risk of being unable to restart.

Disengage the diff lock as soon as firm ground is reached.

Stopping the vehicle on soft ground, in sand or on an incline

If you do stop the vehicle, remember:

Starting on an incline or in soft ground or sand may be difficult. Always park on a firm level area, or with the vehicle facing downhill.

On vehicles not fitted with traction control, to avoid wheel spin, select second or third gear and use the MINIMUM throttle necessary to get the vehicle moving.

If forward motion is lost, avoid excessive use of the throttle - this will cause wheel spin and tend to dig the vehicle into the sand. Clear sand from around the tyres and ensure that the chassis and axles are not bearing on the sand before again attempting to move.

If the wheels have sunk, use an air bag lifting device or high lift jack to raise the vehicle, and then build up sand under the wheels so that the vehicle is again on level ground. If a restart is still not possible, place sand mats or ladders beneath the wheels.

DRIVING ON SLIPPERY SURFACES (ice, snow, mud, wet grass)

- With the diff lock engaged, select the highest gear possible.
- Drive away using the MINIMUM throttle possible.
- Drive slowly at all times, keeping braking to a minimum and avoiding violent movements of the steering wheel.
- Disengage the diff lock as soon as a non-slippery surface is reached.

DRIVING ON ROUGH TRACKS

Although rough tracks can sometimes be negotiated in normal drive, it is advisable to lock the differential if excessive suspension movement is likely to induce wheel spin.

On very rough tracks, engage LOW range to enable a steady, low speed to be maintained without the constant use of the brake and clutch pedals.

Always disengage the diff lock when smooth, firm ground is reached.

Driving Techniques

CLIMBING STEEP SLOPES

Engage the diff lock and ALWAYS follow the fall line of the slope - travelling diagonally could encourage the vehicle to slide broadside down the slope.

Steep climbs will usually require the LOW gear range. If the surface is loose or slippery, use sufficient speed in the highest practical gear to take advantage of your vehicle's momentum. However, too high a speed over a bumpy surface may result in a wheel lifting, causing the vehicle to lose traction. In this case try a slower approach. Traction can also be improved by easing off the accelerator just before loss of forward motion.

If the vehicle is unable to complete a climb, do not attempt to turn it around while on the slope. Instead, adopt the following procedure to reverse downhill to the foot of the slope.

1. Hold the vehicle stationary using both foot and hand brakes.
2. Restart the engine if necessary.
3. Engage reverse gear LOW range.
4. Release the handbrake. Then release the foot brake and clutch simultaneously, and allow the vehicle to reverse down the slope using engine braking to control the rate of descent.
5. Unless it is necessary to stop the vehicle to negotiate obstructions, DO NOT apply the brake or clutch pedal during the descent - even a light application may cause the front wheels to lock, rendering the steering ineffective.
6. If the vehicle begins to slide, accelerate slightly to allow the tyres to regain grip.

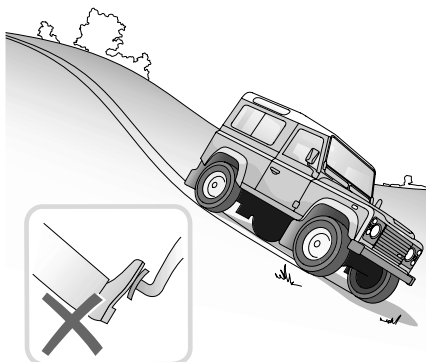
When the vehicle is back on level ground or where traction can be regained, a faster approach will probably enable the hill to be climbed. However, DO NOT take unnecessary risks, if the hill is too difficult to climb, find an alternative route.

WARNING

DO NOT attempt to reverse down a slope without the engine running, or the braking effect of the gearbox will be lost.

Driving Techniques

DESCENDING STEEP SLOPES



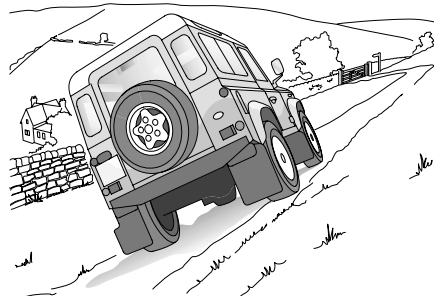
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WARNING

Failure to follow these instructions may cause the vehicle to roll over.

- Stop the vehicle at least a vehicle length before the start of the slope and engage first gear LOW range with the differential locked.
- Unless it is necessary to stop the vehicle in order to negotiate obstructions, **DO NOT** touch the brake or clutch pedals during the descent - the engine will limit the speed, keeping the vehicle under control provided the front wheels are rotating. If the vehicle begins to slide, accelerate gently to maintain directional stability. **DO NOT** use the brakes or attempt to change gear.
- Once level ground is reached, unlock the differential and select a suitable gear for the next stage of your journey.

TRAVERSING A SLOPE



H3634

WARNING

Failure to follow these instructions may cause the vehicle to roll over.

Before crossing a slope ALWAYS observe the following precautions:

- Check that the ground is firm and not slippery.
- Check that the wheels on the downhill side of the vehicle are not likely to drop into depressions in the ground and that the 'uphill' wheels will not run over rocks, tree roots, or similar obstacles that could suddenly increase the angle of tilt.
- Ensure that passenger weight is evenly distributed, that all roof rack luggage is removed and that all other luggage is properly secured and stowed as low as possible. Always remember; any sudden movement of the load could cause the vehicle to overturn.
- Rear seat passengers should sit on the uphill side of the vehicle or, in extreme conditions, should vacate the vehicle until the sloping ground has been safely negotiated.

Driving Techniques

NEGOTIATING A 'V' SHAPED GULLY

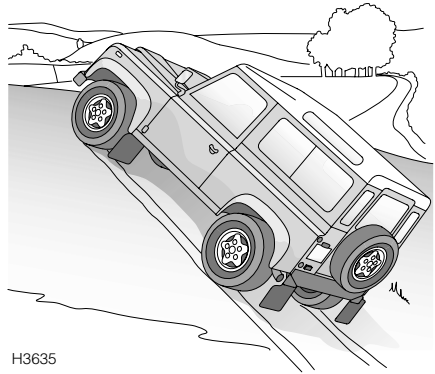
Observe extreme caution! Steering up either of the gully walls could cause the side of the vehicle to be trapped against the opposite gully wall.

DRIVING IN EXISTING WHEEL TRACKS

As far as possible allow the vehicle to steer itself along the bottom of the ruts. However, always keep a light hold of the steering wheel to prevent it from spinning free.

Particularly in wet conditions, if the steering wheel is allowed to spin free, the vehicle may appear to be driving straight ahead in the ruts, but in actual fact (due to the lack of traction caused by the wet ground) is unknowingly on full right or left lock. Then, when level ground is reached, or if a dry patch of ground is encountered, the wheels will find traction and cause the vehicle to suddenly veer to left or right.

CROSSING A RIDGE



H3635

Approach at right angles so that both front wheels cross the ridge together - an angled approach could cause traction to be lost through diagonally opposite wheels lifting from the ground at the same time.

Driving Techniques

CROSSING A DITCH



H3636

With the diff lock engaged, cross ditches at an angle so that three wheels always maintain contact with the ground. If a ditch is approached head on, both front wheels will drop into the ditch together, possibly resulting in the chassis and front bumper being trapped on opposite sides of the ditch.

WADING



H3644

WARNING

The maximum advisable wading depth is 20 inches (0,5 m).

Severe electrical damage may occur if the vehicle remains stationary for any length of time when the water level is above the door sills.

If the water is likely to exceed 20 inches (0,5 m), the following precautions should be observed:

- Fix a plastic sheet in front of the radiator grille to prevent water from soaking the engine and mud from blocking the radiator.
- Fit a drain plug to the flywheel housing and engine timing cover (Tdi engines only).
- Ensure that the silt bed beneath the water is free of obstacles and firm enough to support the vehicle's weight and provide sufficient traction.
- Ensure that the engine air intake is clear of the water level.
- To prevent saturation of the electrical system and air intake, avoid excessive engine speed.

Driving Techniques

- With the diff lock engaged, select a low gear and maintain sufficient throttle to prevent the engine from stalling. This is particularly important if the exhaust pipe is under water.
- Drive slowly into the water and accelerate to a speed which causes a bow wave to form; then maintain that speed.

At all times, keep all the doors fully closed.

After wading

- Drive the vehicle a short distance and apply the foot brake to check that the brakes are fully effective.
- DO NOT rely on the handbrake to hold the vehicle stationary until the transmission has thoroughly dried out; in the meantime, leave the vehicle parked in gear.
- Remove the timing cover drain plug (where fitted) and also any protective covering from the front of the radiator grille.
- If the water was particularly muddy, remove any blockages (mud and leaves) from the radiator to reduce the risk of overheating.
- If deep water is regularly negotiated, check all oils for signs of water contamination - contaminated oil can be identified through its 'milky' appearance. In addition, check the air filter element for water ingress and replace if wet - consult a Land Rover dealer if necessary.
- If salt water is frequently negotiated, thoroughly wash the underbody components and exposed body panels with fresh water.

NOTE: Vehicles required to undergo frequent or deep wading conditions will require more frequent servicing. Contact a Land Rover dealer for advice.

Wading plugs*

WARNING

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

Under severe wading conditions, the timing cover and flywheel housing must be sealed to prevent the ingress of mud and water. Fit the plugs, supplied in the tool kit. Remove the plugs immediately after wading, or periodically if the vehicle is required to do prolonged wading or very muddy work.

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Maintenance

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, routine servicing and 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 dealer.

Service Portfolio

The Service Portfolio book includes a Service Record section, which enables a record to be kept of all the services that are carried out on the vehicle. This section of the book also provides a facility for the dealer to record brake fluid and camshaft drive belt changes.

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

Brake fluid/component replacement

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 calliper 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.

Coolant replacement

The 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 dealer will replace the coolant at the scheduled service.

Maintenance

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 tyre 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 - at least 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.
- Brake fluid level.
- Clutch fluid level.
- Power steering fluid level.
- Screen washer fluid level.
- Tyre pressures and condition.
- Operate air conditioning*.

The gearbox fluid level should only be checked by a qualified dealer, at the time of a routine service.

All fluid specifications and capacities are shown in '*LUBRICANTS AND FLUIDS*', page 151.

IMPORTANT INFORMATION

Special operation conditions

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

Contact a Land Rover dealer for advice.

Maintenance

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 10 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 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 wheel changing jack as the only means of support.
- Ensure sparks and naked lights are kept away from the engine and battery.
- 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, 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. Use authorised waste disposal sites to dispose of used oil and toxic chemicals.

Maintenance

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.

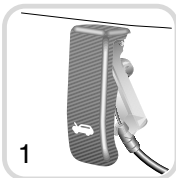
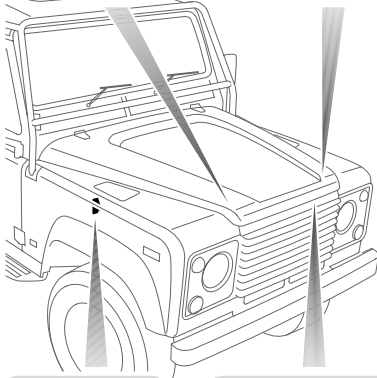
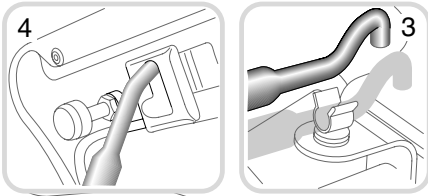
In addition, engine settings must not be tampered with. These have been established to ensure that your vehicle complies with stringent exhaust emission regulations. Incorrect engine settings may adversely affect exhaust emissions, engine performance and fuel consumption, as well as causing high temperatures,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

ROAD TESTING DYNAMOMETERS (‘rolling roads’)

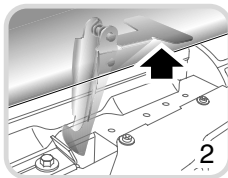
Because your vehicle is equipped with permanent four-wheel drive, it is essential that any dynamometer testing is carried out **ONLY** by a qualified person familiar with the dynamometer testing and safety procedures practiced by Land Rover dealers. Contact your Land Rover dealer for further information.

Bonnet Opening

BONNET OPENING (Td5 models)



H3598



1. From inside the vehicle on the right 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 bonnet locking platform.
4. Fit the support stay into the slotted hole in the underside of the bonnet (see illustration).

NOTE: On Tdi models the bonnet support stay is stowed on the underside of the bonnet, and slots into the corresponding circular hole in the bonnet locking platform.

Closing the bonnet

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.

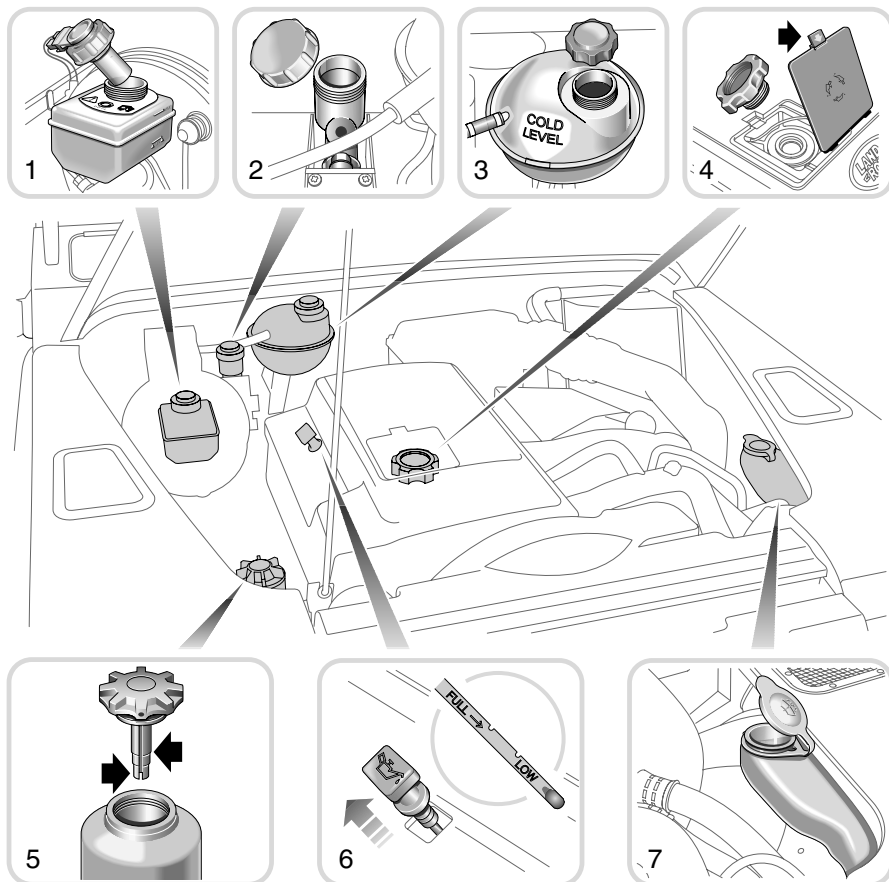
After closing the bonnet, check that the lock is fully engaged by attempting to lift the front edge of the bonnet. This should be free from all movement.

WARNING

Ensure the wipers are switched off and have returned to the parked position before opening the bonnet.

Engine Compartment

Td5 DIESEL ENGINE



H3706

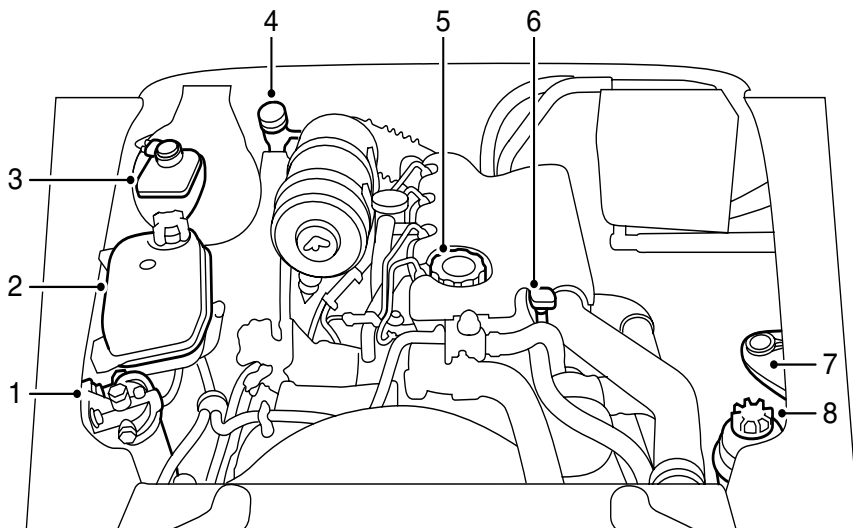
1. Brake fluid reservoir.
2. Clutch fluid reservoir.
3. Cooling system reservoir.
4. Engine oil filler cap.
5. Power steering reservoir.
6. Engine oil dipstick.
7. Washer reservoir.

WARNING

While working in the engine compartment, ALWAYS observe the safety precautions listed under 'Safety in the garage' on a previous page.

Engine Compartment

Tdi DIESEL ENGINE



H3766

1. Diesel fuel filter.
2. Cooling system reservoir.
3. Brake fluid reservoir.
4. Clutch fluid reservoir.
5. Engine oil filler cap.
6. Engine oil dipstick.
7. Washer reservoir.
8. Power steering reservoir.

WARNING

While working in the engine compartment, ALWAYS observe the safety precautions listed under 'Safety in the garage' on a previous page.

Engine Oil

CHECK & TOP-UP

WARNING

Take care to avoid spilling engine oil onto a hot engine - a fire may result!

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

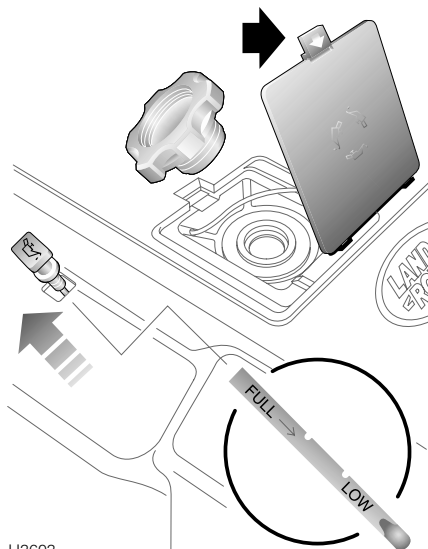
NOTE: If it is necessary to check the oil level when the engine is hot, switch off the engine and let the vehicle stand for five minutes to allow the oil to drain back into the sump. **DO NOT** start the engine.

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.

WARNING

Driving the vehicle with the engine oil level above the upper mark, or below the lower mark on the dipstick, can damage the engine.



H3603

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. Lift the release tab (arrowed) and remove the access flap.
4. 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!

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 'LUBRICANTS AND FLUIDS', page 151. If in doubt, contact your Land Rover dealer.

Cooling System

COOLANT CHECK AND 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.

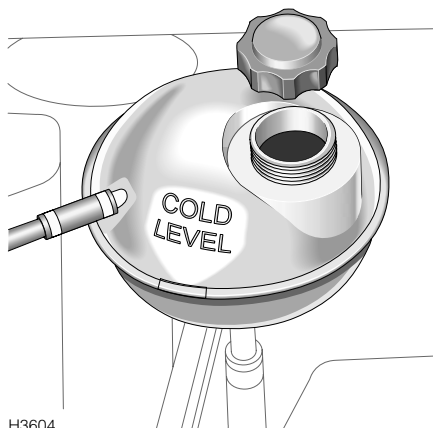
Anti-freeze will damage painted surfaces; soak up any spillage with an absorbent cloth immediately and wash the area with a mixture of car shampoo and water.

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**.

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.



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 (see 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!**

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% \pm 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 and completely renewed every 36,000 miles (60,000 km) or 36 months, 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 20°C (68°F) is 1.075 and protects against frost down to -36°C (-33°F).

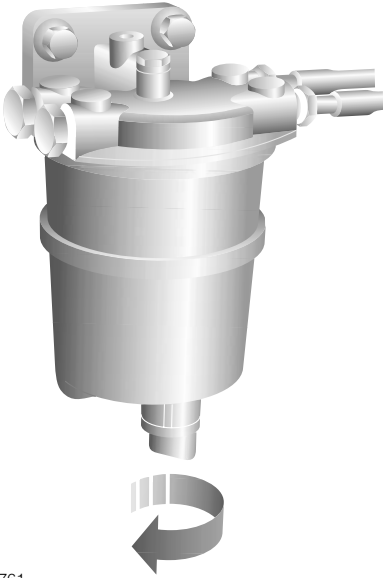
Coolant specification

Use ONLY a 50% mix of water and 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.

Fuel System

FUEL SEDIMENTER (Tdi engines)*



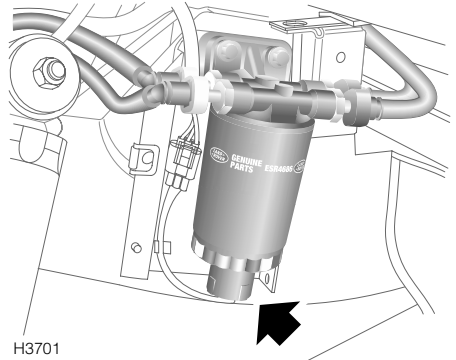
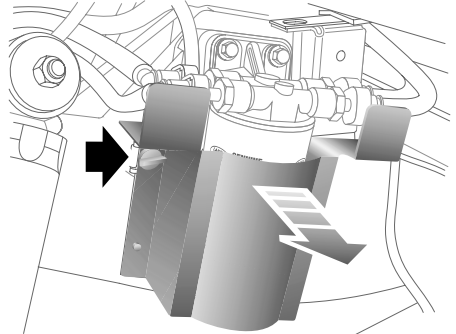
H3761

The fuel sedimenter is located at the front of the engine compartment.

To drain:

Slacken off the drain plug (arrowed in illustration), to allow any water to drain off. Retighten the plug as soon as pure diesel is emitted.

FUEL FILTER (Td5 engines)*



H3701

The fuel filter is located on the chassis side member, near the rear wheel. Twist the turnbuckle (arrowed in the upper illustration) through 90° to release the protective cover. Pull the cover forward to reveal the filter.

To drain:

Slacken off the drain plug (arrowed in the lower illustration) to allow any water to drain off. Retighten the plug as soon as pure diesel is emitted.

Brakes

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.

Check

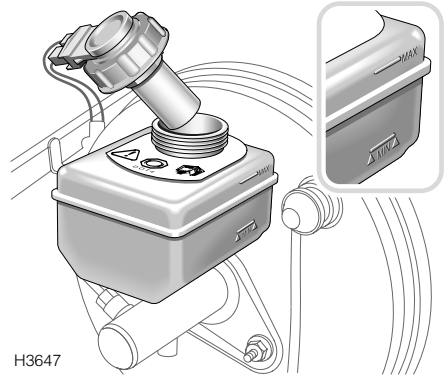
The fluid level may fall slightly during normal use as a result of brake pad wear but should not be allowed to fall below the 'MIN' mark. Any substantial drop in fluid indicates a leak in the system, in which case the vehicle must NOT be driven and you should contact your dealer.

WARNING

Contact your dealer 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.

Top-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 Shell Donax YB brake fluid conforming to DOT 4 specification.

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!**

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

Clutch

CLUTCH FLUID

WARNING

Clutch 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 clutch 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.

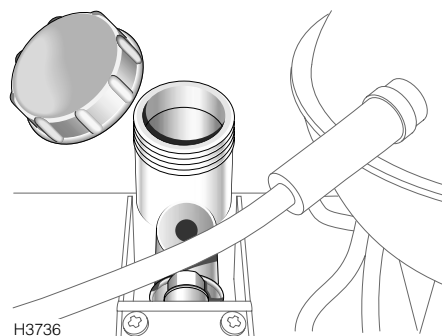
Clutch fluid will damage painted surfaces; soak up any spillage with an absorbent cloth immediately and wash the area with a mixture of car shampoo and water.

Check

With the vehicle on level ground, check the fluid level at least every week (more frequently in high mileage or arduous operating conditions).

Wipe the filler cap before removing, to prevent dirt from entering the reservoir. Check the fluid level and top-up if necessary.

Top-up



Maintain the level approximately 10 mm below the top of the reservoir, using fluid meeting *FMVSS 116 DOT 4* specification. Ensure dirt does not enter the reservoir while filling.

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!**

If significant topping-up is required, a leak is indicated - consult your dealer immediately.

Power Steering

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.

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.

Emergency operation

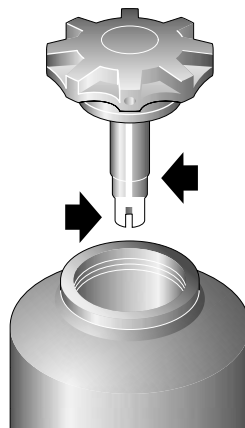
Any large or sudden drop in the fluid level must be investigated by a qualified dealer.

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.

Check and 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.



H3583

Wipe the filler cap to prevent dirt from entering the reservoir.

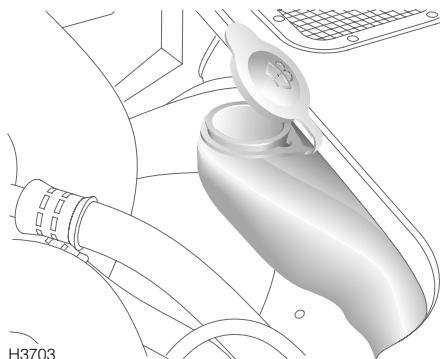
Remove the filler cap, and using a lint-free cloth, wipe the dipstick clean. Refit the cap fully and remove it again to check the fluid level. Ensure the fluid level is between the UPPER mark and the bottom end of the dipstick (arrowed in illustration). If necessary, top up with a fluid meeting *Dexron II D* or *Dexron II E/III* specification, ensuring no dirt enters the reservoir.

DO NOT fill above the UPPER mark on the dipstick.

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

Washers

WINDSCREEN WASHER TOP-UP



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

Check the reservoir level at least every week and top-up with a mixture of water and Land Rover Parts STC 8249 Screenwash to approximately 1 inch (25 mm) below the bottom of the filler neck. 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

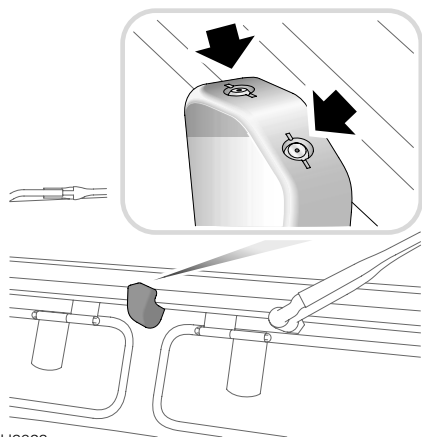
DO NOT use an anti-freeze or vinegar/water solution in the washer reservoir - anti-freeze will damage painted surfaces, while vinegar can damage the windscreen washer pump.

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.

Washers

WASHER JETS

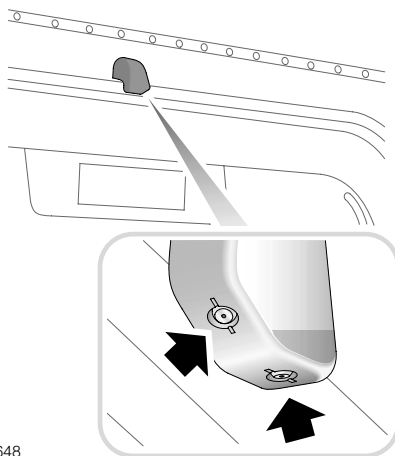


H3623

Front 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 screen.

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

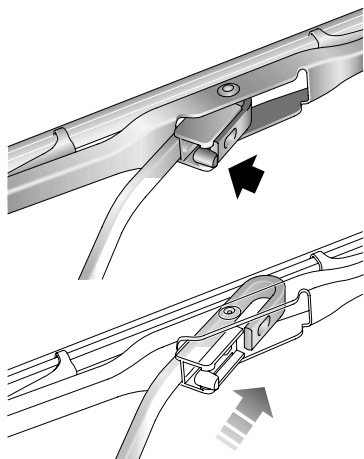


H3648

Rear washer jet

Wiper Blades

WIPER BLADE REPLACEMENT



H3718

To renew a windscreen or rear wiper blade, lift the wiper arm away from the screen, press the retaining clip (arrowed in illustration), pull the blade down the arm away from the hooked end and then unhook the wiper blade.

Locate the new blade assembly on the arm, hook it to the swivel bracket and push into engagement until the blade is retained by the clip.

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.

NOTE: On vehicles where the spare wheel is mounted on the tail door, the wheel must be removed before renewing the rear wiper blade.

Battery

BATTERY SAFETY

WARNING

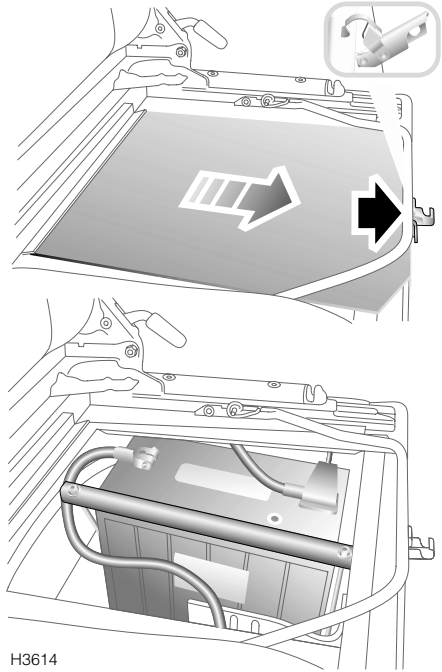
Batteries contain acid, which is both corrosive and poisonous. If spillage occurs:

- **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.

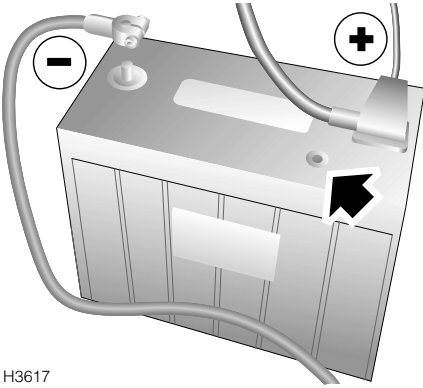


The battery is located underneath the left-hand front seat. Pull up the front of the seat base to release it from its retaining clips and pull it forward (see 'Seat cushion removal', page 21). Release the buckle on the front of the battery compartment (solid arrow in illustration) and slide off the lid in the direction shown.

When refitting the seat base, insert the rear of the base first and then push down firmly to re-engage the retaining clips - ENSURE the seat base is secure before driving.

Battery

BATTERY MAINTENANCE



H3617

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.

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.

Battery removal and replacement

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.**

Your vehicle may be fitted with a battery backed-up siren, which operates as an anti-theft siren if the main battery is disconnected.

If it is necessary to remove the main vehicle battery, it is ESSENTIAL to adopt the following procedure before disconnecting the terminals, in order to prevent the siren from sounding:

1. Turn the starter switch 'on' and then 'off'. Then remove the starter key.
2. Disconnect the vehicle battery WITHIN 15 SECONDS (if it is not disconnected within 15 seconds, the back-up siren will sound immediately the battery terminals are disconnected).

ALWAYS disconnect the negative ('-') terminal first. When replacing, connect the positive ('+') terminal first. Do not allow the battery terminals to make contact with metal parts of the vehicle.

If the siren sounds when the battery is reconnected, it CANNOT be turned off in the normal way (i.e. by operating the handset button). To deactivate the siren, disarm the alarm system with the handset and turn the starter switch to position 'II'.

Battery

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.

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.

NOTE: *On Tdi models, ensure that the battery is topped up to the correct level.*

- 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).

- On Td5 models, 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: *Be aware that a battery will take longer to charge in a cold environment.*

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.

WARNING

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

On Td5 models, 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.

Tyres

CARING FOR YOUR TYRES

WARNING

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

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

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

Tyre pressures

Correctly inflated tyres will ensure that you enjoy the best combination of tyre life, fuel economy and road handling.

Under-inflated tyres wear more rapidly, can seriously affect the vehicle's road handling characteristics and fuel consumption, as well as increasing the risk of tyre failure.

Over-inflated tyres give a harsher ride, wear unevenly and are more prone to damage.

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 wheel) when the tyres are cold - be aware that it only takes a mile (1.6 km) of driving to warm up the tyres sufficiently to affect the tyre pressures.

Air pressure naturally increases in warm tyres; if it is necessary to check the tyres when they are warm (after the vehicle has been driven for a while), you should expect the pressures to have increased between 4 and 6 lbf/in². In this circumstance, NEVER let air out of the tyres in order to match the recommended pressures.

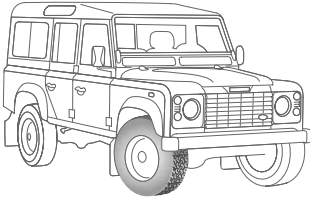
WARNING

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

The recommended pressures for cold tyres are shown in 'WHEELS & TYRES', page 156.

Tyres

Tyre wear



H3606

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.

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.

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 tyre pressure.

Punctured tyres

Your vehicle is fitted with tubeless tyres, which may not leak if penetrated by a sharp object, provided the object remains in the tyre. 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 tyre to lose pressure, which is why regular (and frequent) checking of tyre pressures is important. Punctured or damaged tyres must be permanently repaired or replaced as soon as possible. **DO NOT DRIVE WITH A PUNCTURED TYRE!**

Tyres

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 (see 'WHEELS & TYRES', page 156) 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.

If the wheel is marked 'TUBED', an inner tube MUST be fitted, even with a tubeless tyre.

If the wheel is marked 'TUBELESS', an inner tube must NOT be fitted.

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.

Always have replacement wheels and tyres balanced before use.

SNOW CHAINS

Snow chains are designed for use on metalled 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:

- **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 'WHEELS & TYRES', page 156).
- If chains are to be fitted to the front wheels only, or to all four wheels, then ONLY Land Rover approved chains should be used - these are designed for your vehicle and will eliminate any risk of damage to other components.
- Non-approved chains can be fitted to the rear wheels ONLY.
- Ensure the gearbox differential is locked.
- 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

DO NOT fit unapproved snow chains to the front wheels - this could damage brake components.

Cleaning & vehicle care

WASHING YOUR VEHICLE



H3645

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 turbo air intake*, 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.

Steam cleaning

Before steam cleaning the engine compartment, cover the brake, clutch and power steering reservoirs 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.

Cleaning & vehicle care

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 aluminium 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.

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

CLEANING THE INTERIOR

WARNING

DO NOT use water to clean the dashboard, damage to the fuses and switches could occur. Instead, clean sparingly with a damp cloth and approved upholstery cleaner.

RECOMMENDED CARE PRODUCTS (Available in the UK)	
De icer	STC 717
Alloy wheel cleaner	STC 718
Glass cleaner	STC 719
Shampoo	STC 722
Wax polish	STC 723
Screen wash	STC 8249

Plastic materials

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

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

Steering wheel and trim features should be cleaned with a damp cloth moistened with undiluted upholstery cleaner. Leave for 5 minutes, and then repeat the operation using a clean cloth and water - but avoid flooding the area! Dry and polish the trim 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 on a concealed area first.

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.

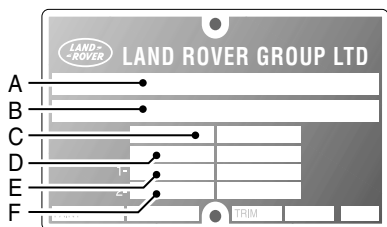
Identification Numbers

VEHICLE IDENTIFICATION NUMBER (VIN)

If you need to communicate with a Land Rover dealer, you may be asked to quote the Vehicle Identification Number (VIN).

The VIN (and recommended maximum vehicle weights) is stamped on a plate riveted to the top of the brake pedal box in the engine compartment (this should match the VIN recorded in the Service Portfolio book). The VIN is also stamped on the right-hand side of the chassis, forward of the spring mounting turret.

In addition, as a deterrent to car thieves and to assist the police, the VIN is stamped on a plate which is visible through the lowest part of the left side of the windscreen and also on the vehicle's chassis.



H3551

- 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)

NOTE: In the interests of safety, it is essential that the gross vehicle weight, gross train weight and axle loads are **NOT** exceeded. For further information see 'VEHICLE WEIGHTS', page 160.

Parts & Accessories

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.

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 dealer.

Electrical equipment

WARNING

It is extremely hazardous to fit or replace parts or accessories whose installation requires the dismantling of, or addition to, either the electrical or fuel systems.

Fitting inferior quality parts or accessories, may be dangerous and could invalidate the vehicle warranty.

It is recommended that you always consult a Land Rover dealer for advice regarding the approval, suitability, installation and use of any parts or accessories before fitting.

Parts & Accessories

AFTER SALES SERVICE

The After Sales Parts service is of paramount importance, both in the UK and across the world. In the UK there are over 100 authorised Land Rover dealers, all computer linked for rapid ordering of parts and accessories.

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

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

Travelling abroad

In certain countries, it is illegal to fit parts which have not been made to the vehicle manufacturers' specification.

Owners should ensure that any parts or accessories fitted to the vehicle while travelling abroad will also conform to the legal requirements of their own country when they return home.

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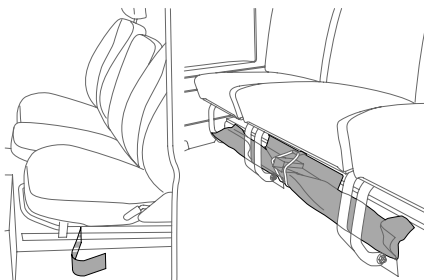
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Wheel Changing

WHEEL CHANGE TOOL KIT

Jack and tools



H3699

One of two types of jack will have been supplied with your vehicle - either a bottle jack or a pillar jack. The operation of each type differs greatly and it is important to read the appropriate operating instructions that follow.

The bottle jack* is stowed in a compartment under the left-hand front seat (see '*Seat cushion removal*', page 21 for details of access). The jack handle and tools (or pillar jack*) are stowed in bags behind the front seat in 'Pick-up' and 'Hard-top' models, and under the bench seat in 'Soft-top' and 'Station Wagon' models.

Care of the jack

Examine the jack occasionally, clean and grease the moving parts, particularly the ram (or pillar).

The bottle jack oil level should be checked at normal servicing intervals and, if necessary, topped up with an hydraulic oil with a viscosity to BS 4231 grade 32 and ISO proof 32.

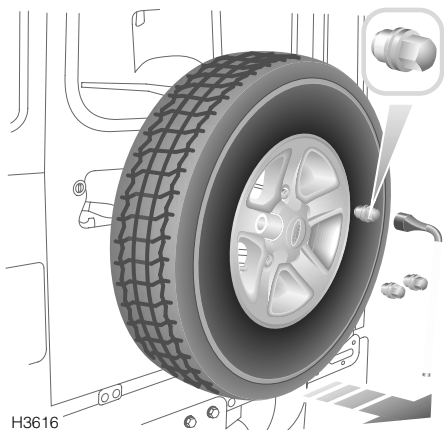
To avoid contamination, the bottle jack should always be returned to its fully closed position and must always be stowed upright.

WARNING

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

Wheel Changing

SPARE WHEEL



Use the wheel nut wrench supplied in the tool kit to remove the nuts securing the wheel 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', page 131). In other markets, vehicles fitted with alloy wheels have a single locking wheel nut fitted to the spare wheel only.

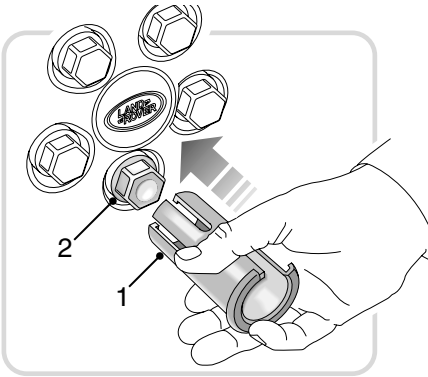
WARNING

- **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 interchangeable.
- The wheels are extremely heavy. Take care when lifting and particularly when removing the spare wheel from its mounting position.

Wheel Changing

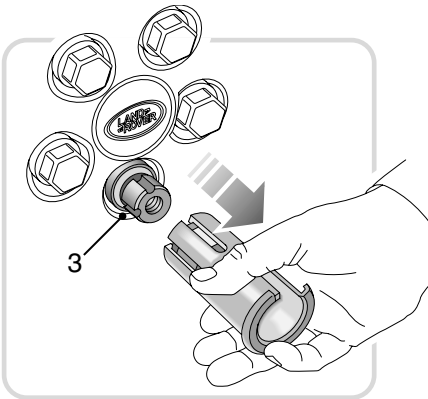
LOCKING WHEEL NUTS

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:



H2511

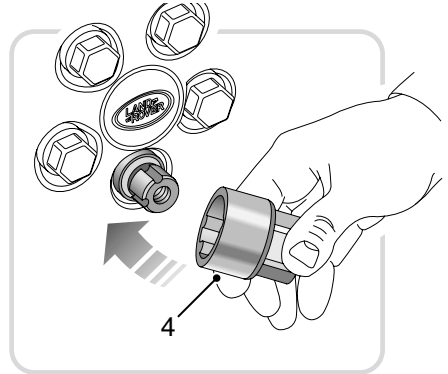
Push the extractor tool (1) firmly over the stainless steel nut cover (2).



H2512

Pull the extractor tool **squarely** away from the wheel to remove the nut cover and reveal the locking wheel nut (3).

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.



H2513

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.

NOTE: 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.

For security reasons, store the key socket and extractor tool out of sight, in a secure place in the vehicle.

Wheel Changing

CHANGING THE WHEEL

If possible, choose a safe place to stop away from the main thoroughfare. Always ask your passengers to get out of the vehicle and wait in a safe area away from other traffic.

NOTE: Switch on the hazard warning lights to alert other road users.

Before changing a wheel, ensure the front wheels are in the straight ahead position, engage the differential lock (warning light illuminates), apply the handbrake and engage 1st gear in the main gearbox and select 'L' in the transfer box.

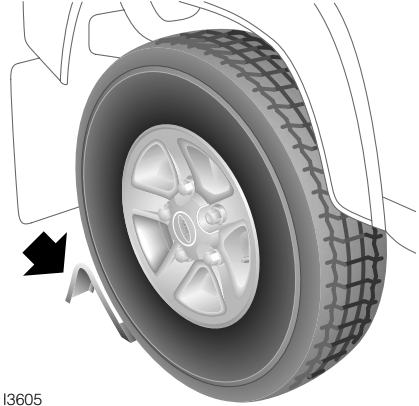
Turn off the starter switch and remove the key. Observe the following precautions:

- Ensure the jack is positioned on firm, level ground; NEVER on soft ground, or over metal gratings or manhole covers. DO NOT place additional material between the jack and the ground, this may jeopardise the safety of the jacking operation.
- Always use the wheel chock as directed.
- NEVER raise the vehicle with passengers inside, or with a caravan or trailer connected!

WARNING

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

Using the wheel chock



I3605

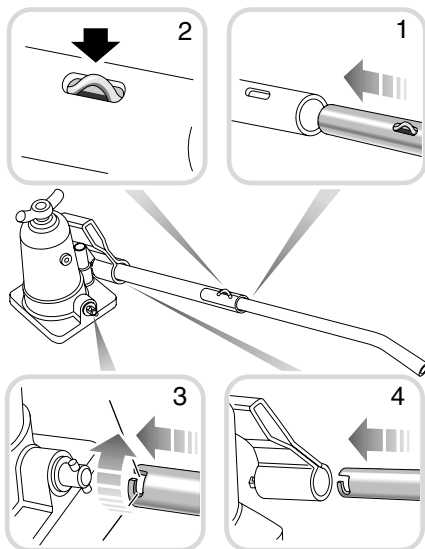
If possible, position the vehicle on level ground, chocking the wheel diagonally opposite the one to be removed - chock the front of a front wheel or the back of a rear wheel using the chock provided.

If jacking the vehicle on a slope is unavoidable, place the chock on the downhill side of the opposite wheel furthest from the wheel to be raised.

NOTE: The wheel chock is stowed in a compartment under the left-hand front seat (see 'Seat cushion removal', page 21 for details of access).

Wheel Changing

Operating the bottle jack



H3763

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.

Positioning the bottle jack

WARNING

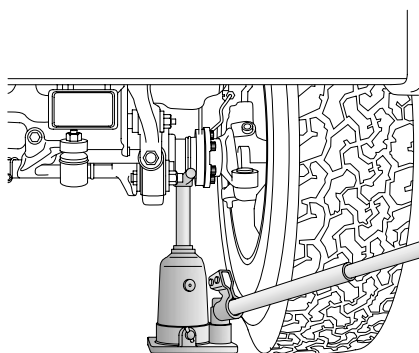
NEVER work beneath the vehicle with the jack as the only means of support. The jack is designed for wheel changing only!

NEVER use the jack from the side of the vehicle.

ALWAYS use the complete, two piece jack lever throughout, to minimise any accidental damage, injury from underbody parts or contact with a hot exhaust system.

ONLY jack the vehicle using the jack location points described, or damage to the vehicle could occur.

Always position the jack from the front or rear of the vehicle, directly in line with the jacking points and ensure that it is positioned on firm, level ground.

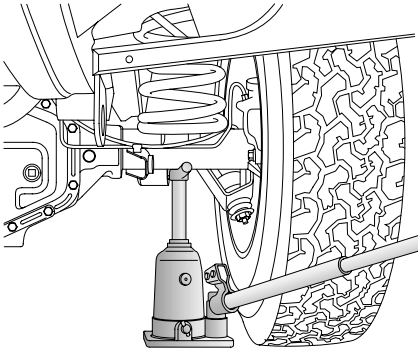


H3764

Front jacking point

Position the jack so that, when raised, it engages with the front axle casing immediately below the coil spring. The jack cradle must locate between the flange at the end of the axle casing and the large bracket to which the front suspension members are mounted.

Wheel Changing



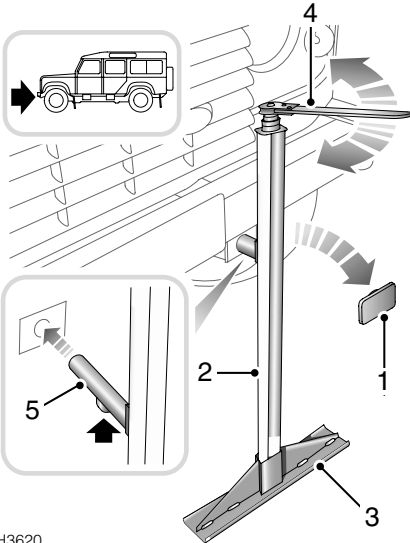
H3765

Rear jacking point

Push the mud flap up over the tyre to allow clear access (return it to its correct position when the wheel change is complete). Position the jack so that, when raised, it engages with the rear axle casing immediately below the coil spring and as close as possible to the shock absorber mounting bracket.

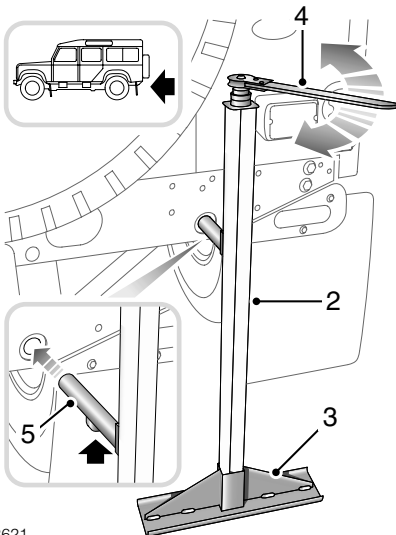
Wheel Changing

Operating the pillar jack*



H3620

Front jacking point



H3621

Rear jacking point

1. If changing a front wheel, remove the rubber plug (1) from the jacking tube nearest the wheel to be changed.
2. Fully insert the jack pillar (2) into the base (3).
3. Fit the ratchet handle (4) to the top of the pillar and adjust the height of the jacking peg (5) so that it can be inserted fully into the jacking tube.

NOTE: The jack handle operates as a ratchet - one side raises the jack, then turn the handle over to lower the jack.

WARNING

ENSURE that you are familiar with operating the jack **BEFORE** using it to raise a vehicle.

ONLY jack the vehicle using the jacking points described, or personal injury or damage to the vehicle could occur.

DO NOT use the jack without the base fitted - the vehicle would not be properly supported and could cause personal injury.

ENSURE that the jacking peg is engaged in the jacking tube fully, as far as the shoulder (arrowed in illustration).

Wheel Changing

Changing a wheel

Before raising the vehicle, ensure that all precautions listed at the beginning of this section have been observed.

1. Use the wheel nut wrench to slacken the wheel nuts half a turn anti-clockwise.
2. Raise the vehicle until the tyre is clear of the ground.
3. Remove the wheel nuts and place to one side to prevent them from being lost.
4. Remove the road wheel.

NOTE: *DO NOT damage the surface of the wheel by placing it face down on the road.*

5. On alloy wheels, use an approved anti-seize compound to treat the wheel mounting spigot. This will minimise any tendency for adhesion between the wheel and the spigot.

Ensure that no 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.

6. 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.

WARNING

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

7. Ensure that the space under and around the vehicle is free from obstructions then lower the vehicle and remove the jack and wheel chock.
8. 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.
9. Return tools, chock, jack and spare wheel in their correct storage positions.
10. REMEMBER to disengage the differential lock and change to 'H' (high range) before driving.
11. Finally, check the tyre pressure at the earliest opportunity (see '*WHEELS & TYRES*', page 156).

Emergency Starting

STARTING AN ENGINE WITH A DISCHARGED BATTERY

Using booster cables (jump leads) from a donor battery, or a battery fitted to a donor vehicle, is the only approved method of starting a vehicle with a discharged battery. Push or tow starting is NOT recommended!

WARNING

During normal use, batteries emit explosive hydrogen gas sufficient to cause severe explosions capable of causing serious injury - keep sparks and naked lights away from the engine compartment.

DO NOT attempt to start the vehicle if the electrolyte in the battery is suspected of being frozen.

Make sure BOTH batteries are of the same voltage (12 volts), and that the booster cables have insulated clamps and are approved for use with 12 volt batteries.

DO NOT disconnect the discharged battery.

DO NOT connect positive (+) terminals to negative (-) terminals, and ensure booster cables are kept away from any moving parts in the engine compartment.

Take care when working near rotating parts of the engine.

USING BOOSTER CABLES

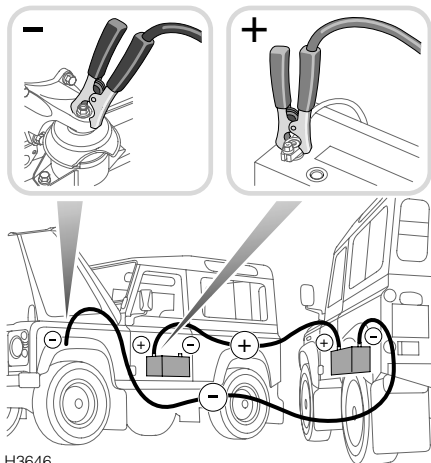
If a donor vehicle is to be used, both vehicles should be parked with their battery locations adjacent to each other. Ensure that the two vehicles do not touch.

Apply the handbrakes and ensure that the transmission of both vehicles is set in neutral ('P' or Park for donor vehicles with automatic transmission).

Turn off the starter switch and ALL electrical equipment of BOTH vehicles, then follow the connection instructions on the following page.

Emergency Starting

CONNECTING THE BOOSTER CABLES



H3646

Always adopt the following procedure, ensuring the cables are connected in the order shown below:

1. Connect one end of the RED booster cable to the positive (+) terminal of the donor battery.
2. Connect the other end of the RED booster cable to the positive (+) terminal of the discharged battery.
3. Connect one end of the BLACK booster cable to the negative (-) terminal of the donor battery.
4. Connect the other end of the BLACK booster cable to a good earth point (e.g. an engine mounting or other unpainted surface) away from fuel and brake lines on the disabled vehicle and at least 0.5 m away from the discharged battery.

WARNING

For safety reasons:

- **DO NOT connect the BLACK cable to the negative terminal of the discharged battery - if in doubt, seek qualified assistance.**
- **ENSURE that each connection is securely made and that there is no risk of the clips accidentally slipping or being pulled from the battery terminals - this could cause sparking, which could lead to fire or explosion.**

Check that the cables are clear of any moving parts of both engines, then start the engine of the donor vehicle and allow it to idle for a few minutes.

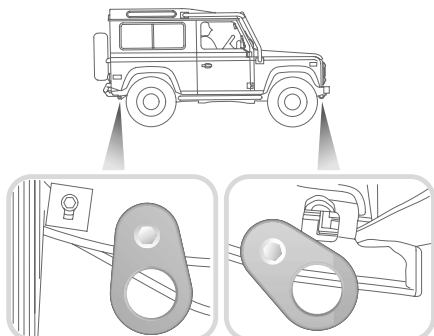
Now start the vehicle with the discharged battery. Once both engines are running normally, allow them to idle for two minutes before switching off the engine of the donor vehicle.

DO NOT switch on any electrical circuits on the previously disabled vehicle until AFTER the booster cables have been removed.

Disconnecting the booster cables must be an EXACT reversal of the procedure used to connect them, i.e: disconnect the BLACK cable from the earth point on the disabled vehicle FIRST.

Vehicle Recovery

TOWING EYES



H3702

WARNING

The towing eyes at the front and rear of the vehicle are designed for on-road vehicle recovery purposes only and must NOT be used to tow a trailer or caravan.

TOWING FOR RECOVERY

Most vehicle recovery specialists will load your vehicle onto a trailer. However, if it is necessary to recover the vehicle by towing with all four wheels on the ground, observe the following procedure:

Towing the vehicle (on four wheels)

1. With the handbrake applied, set both the main gearbox and transfer box in neutral.
2. Ensure the differential lock is in the unlocked position.
3. Turn the starter switch to the first position to unlock the steering, and then to position 'I' if it will be necessary to operate the brake lights and direction indicators.
4. Secure the towing attachment to the front towing eyes of the distressed vehicle.
5. Release the handbrake.

NOTE: *If, due to an accident or electrical fault, it is not considered safe to turn the starter switch, the battery should first be disconnected.*

WARNING

DO NOT attempt to tow the vehicle unless the starter switch is turned to position 'I'.

DO NOT remove the key or turn the starter switch to position '0' while the vehicle is in motion; the starter switch must be at position 'I' to unlock the steering.

Without the engine running, the brake servo and power steering pump cannot provide assistance; greater effort will therefore be required to operate the brake pedal and turn the steering wheel. Longer stopping distances will also be experienced.

Vehicle Recovery

Suspended tow

WARNING

Your vehicle has permanent four wheel drive - the propeller shaft MUST be detached from the axle to be trailed before towing.

If the front axle is to be trailed, ALWAYS adhere to the following precautions:

- Ensure the four bolts securing the front propeller shaft to the gearbox are tightly secured with the appropriate nuts after disconnecting the propeller shaft - otherwise serious damage to the gearbox may occur.
- Unlock the steering.
- Secure the steering wheel and/or linkage in the straight ahead position - the steering lock MUST NOT be used for this purpose.

WARNING

The propeller shaft MUST only be reconnected by a qualified Land Rover engineer. Contact your Land Rover dealer for further information.

TRANSPORTER OR TRAILER LASHING

Use the towing rings on the front and rear cross members as lashing points (see illustration). DO NOT secure lashing hooks or trailer fixings to any other part of the vehicle.

Fuses

FUSES

Fuses are simple circuit devices which protect electrical equipment against the effects of excess current.

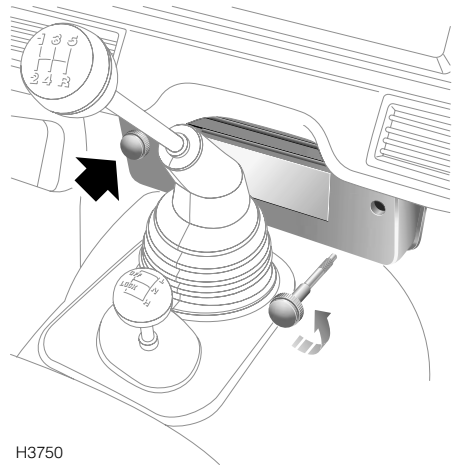
A 'blown' fuse is indicated when the electrical equipment it protects becomes inoperative.

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

Fuse colours

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

MAIN FUSE BOX



H3750

The main fuse box is fitted below and to one side of the steering column; to access the fuses, remove the cover by turning the fixing screws fully anti-clockwise.

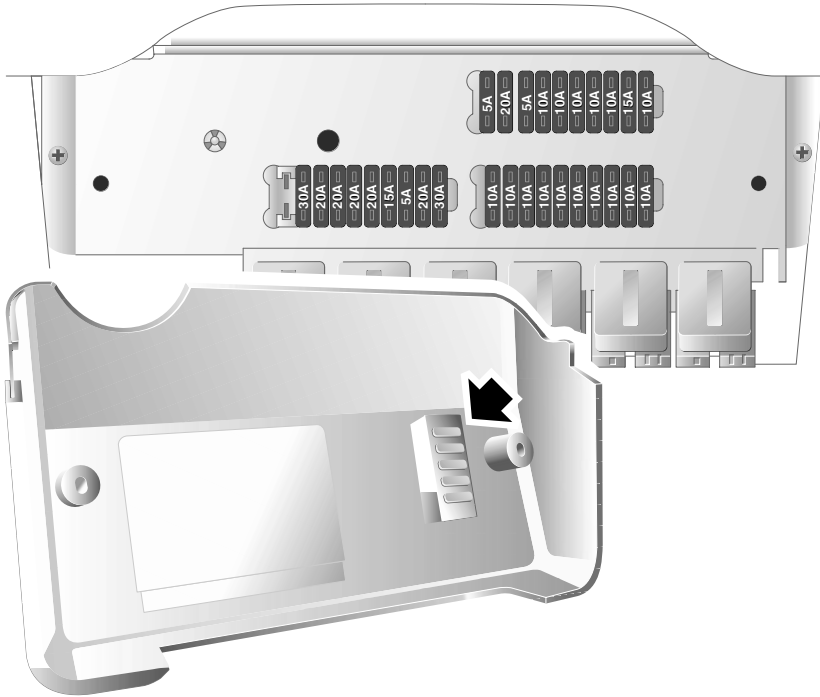
Checking or renewing a fuse

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.

Fuses



H3751

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.

NOTE: There are a number of spare fuses housed on the underside of the fuse box cover (arrowed in illustration).

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.

Fuses

Fuse specification

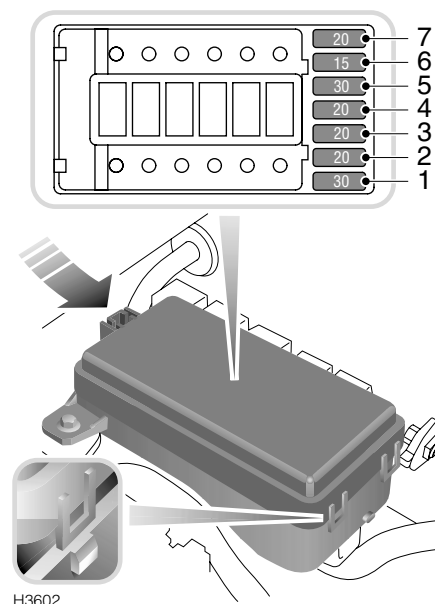
Fuse number	Rating (amps)	Circuit protected
8	10	Alarm system, ignition
9	15	Wipers & washers - front
10	10	Wipers & washers - rear
11	10	Anti-lock brakes*
12	10	Engine ECU (Td5 engine)
13	10	Brake lights
14	10	Reversing lights, glow plugs
15	5	Headlights (dim dip), ignition, air conditioning, cooling fan, instruments, heated rear window, warning lights
16	20	Cigar lighter, heater blower
17	5	Radio
18	10	Side lights - LH, instrument illumination
19	10	Side lights - RH
20	10	Switch illumination, headlight levelling
21	10	Indicators
22	10	Headlight dipped beam - RH
23	10	Headlight dipped beam - LH
24	10	Headlight main beam - RH
25	10	Headlight main beam - LH
26	10	Rear fog guard light
27	10	Alarm sounder
28	30	Air conditioning blower
29	20	Air conditioning compressor, cooling fan
30	10	Interior lights, instruments, radio, diagnostic connector
31	15	Hazard warning lights
32	20	Heated rear window
33	20	Heated seats*
34	20	Electric window - RH
35	20	Electric window - LH
36	30	Heated front screen*
37	-	-

Fuses

SECONDARY FUSE BOX

WARNING

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



Fuse No.	Value (amps)	Circuit protected
1	30	ABS
2	20	Accessory socket, trailer
3	20	Horn
4	20	Fuel pump
5	30	Main relay
6	15	Alarm, hazards
7	20	Alarm sounder, CDL

Owners are advised against removing or replacing the relays identified on the underside of the fuse box lid as:

GLOW PLUG (100A), AIR CON (60A), SPARE (60A), ABS PUMP RELAY (30A), IGNITION (60A) and LIGHTS (30A).

Failure of any of these items should be investigated by a qualified technician.

NOTE: On TD5 models, an additional fuse is taped to the wiring harness alongside the secondary fuse box. This fuse protects the engine management sensors

The secondary fuse box is located under the right hand front seat (see 'Seat cushion removal', page 21 for access procedure).

Press the catch (arrowed in illustration) to release the cover.

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

Bulb Replacement

REPLACING BULBS

Check the operation of all exterior lights before you drive the vehicle.

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

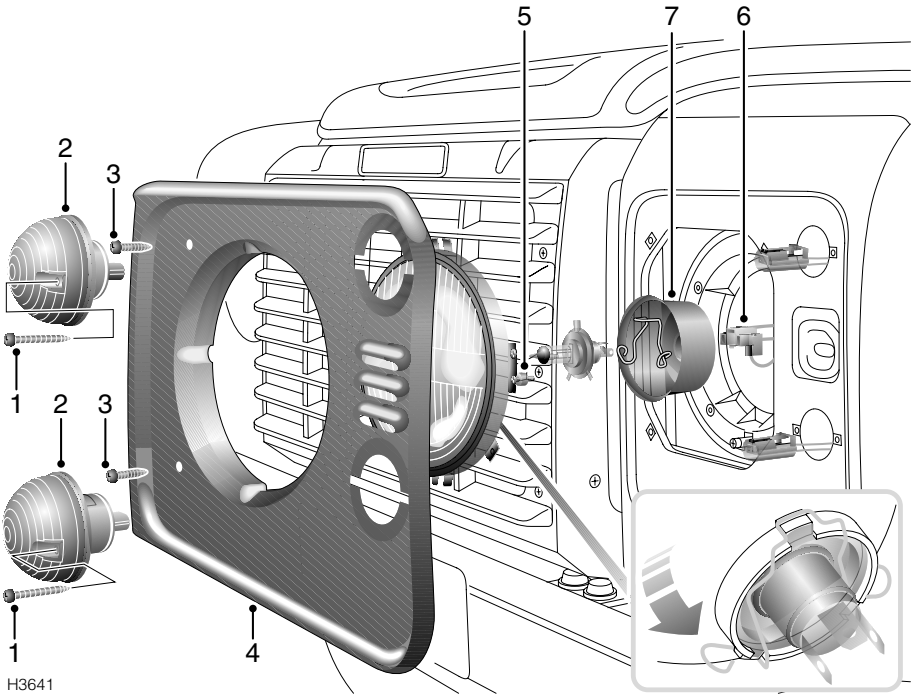
Halogen bulbs are used for headlights. Take care NOT to touch this type of bulb with your fingers; always use a cloth to handle them. If necessary, clean the bulb with methylated spirits to remove fingerprints.

Replacement bulbs

Bulb	Watts
Headlights dipped/main beam	60/55
Front side lights	5
Direction indicators	21
Side repeater lights	5
Reverse lights	21
Rear fog guard lights	21
Tail lights	5
Stop lights	21
High mounted stop light	21
Number plate lights	4
Interior courtesy lights	10

NOTE: All bulbs must be rated at 12 volts

Bulb Replacement



HEADLIGHT UNIT

Light unit removal

To replace the headlight bulb, remove the light unit as follows:

- Remove the four screws (1) retaining the side and direction indicator lights (2), release them forward and disconnect the electrical connectors.
- Remove the two screws (3) and withdraw the plastic finisher (4).
- Remove the headlight retaining screw (5), rotate the headlight clockwise to disengage and lift out the headlight.

Headlight bulb replacement

Disconnect the electrical multi-plug (6) and remove the rubber cover. Release the spring clip (7) which holds the bulb and withdraw the bulb from the light unit.

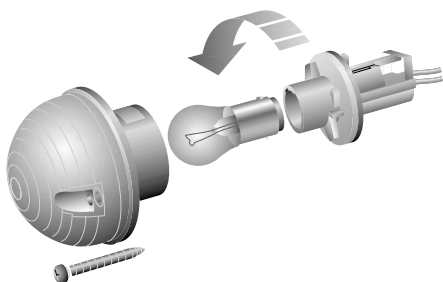
When replacing the bulb, ensure that the larger tab is pointing towards the top of the headlight, then secure the spring clip.

Replace the rubber cover, pressing the centre firmly to seal around the electrical contacts of the bulb, then refit the multi-plug.

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

Bulb Replacement

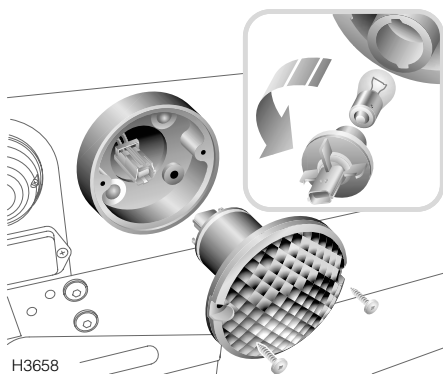
SIDE, TAIL, STOP & DIRECTION INDICATOR LIGHTS



H3654

Remove the two retaining screws and withdraw the unit. Twist the lens anti-clockwise to release the bulb unit and push and twist the bulb to remove.

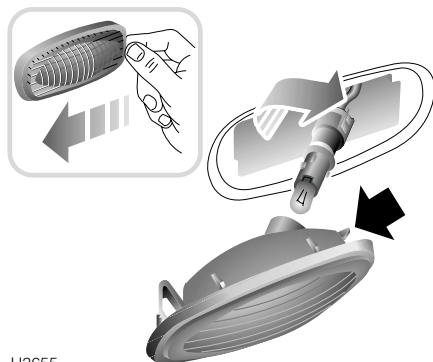
REVERSE & REAR FOG GUARD LIGHTS



H3658

Remove the retaining screws and withdraw the lens, then push and twist to release the bulb.

SIDE REPEATER LIGHT



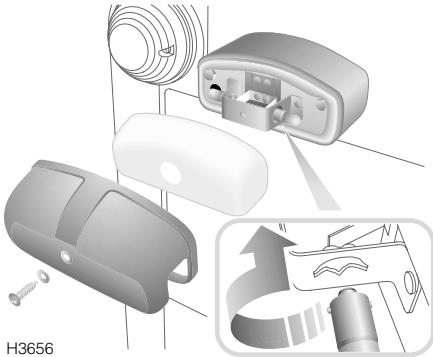
H3655

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

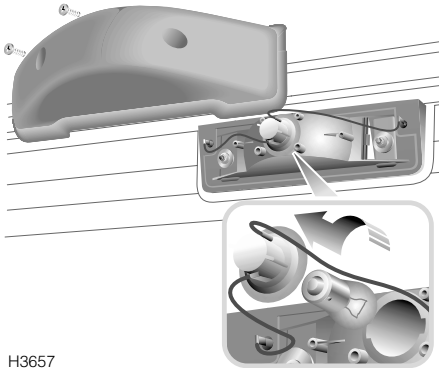
NUMBER PLATE LIGHTS



H3656

There are two bulbs in the number plate light unit. To access, remove the securing screw, remove the cover and twist to remove the appropriate bulb.

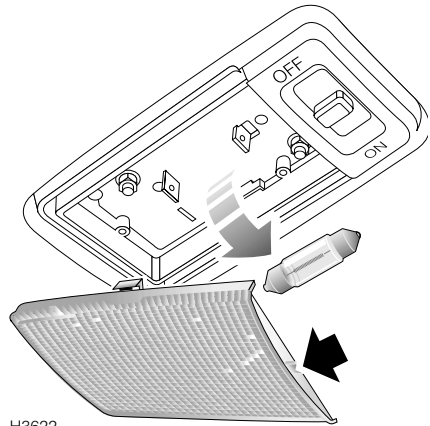
HIGH MOUNTED STOP LIGHT



H3657

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.

INTERIOR COURTESY LIGHTS



H3622

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 ease the bulb from the bulb holders to remove.

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

Technical Data

Technical Data

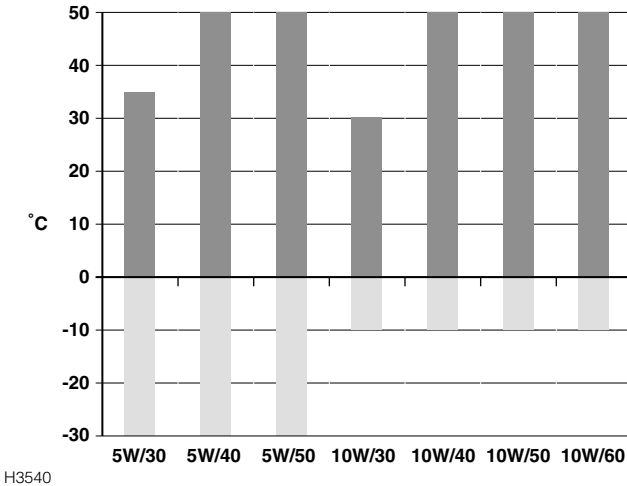
LUBRICANTS AND FLUIDS	151
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Technical Data

LUBRICANTS AND FLUIDS

Recommendations for all climates and conditions.



Engine oil - Td5 engines

Use a 5W/30, 5W/40, 5W/50 oil meeting specification ACEA: A1 and B1, and having a viscosity band recommended for the temperature range of your locality.

NOTE: ACEA B2 oils are also suitable.

Engine oil - Tdi engines

Use a 5W/30, 5W/40, 5W/50, 10W/30, 10W/40 or 10W/50 oil meeting specification ACEA: B2 and having a viscosity band recommended for the temperature range of your locality.

NOTE: ACEA B2 oils are also suitable.

Main gearbox

Use Texaco MTF 94 oil.

Transfer gearbox

Multigear Texaco 75W/90R or oil to meet API GL5.

Final drive units

Molytex 90W EP.

Power steering

ATF M2C 33 (F or G) or L ATF Dexron IID, IIE or III.

Technical Data

Lubrication nipples

(hubs, ball joints, prop. shafts, etc.)

NLGI-2 Multipurpose Lithium based grease.

Brake & clutch reservoirs

Universal brake fluids or any brake fluid having a minimum boiling point of 260°C (500°F) and complying with FMVSS 116 DOT4.

Windscreen washers

Screen washer fluid.

Engine cooling system

Use Havoline Extended Life Coolant (XLC), or any ethylene glycol based anti-freeze (containing no methanol) with only Organic Acid Technology (OAT) corrosion inhibitors. Use one part anti-freeze to one part water for protection down to -36° C (-33° F).

Air conditioning compressor

Nippondenso ND-8 or Unipart ND-8.

Door locks (anti-burst) and inertia reel seat belts

DO NOT LUBRICATE. These components are lubricated for life during manufacture.

Technical Data

CAPACITIES

The following capacities are approximate and provided as a guide only. All oil levels must be checked using the dipstick or level plugs as applicable.

Fuel tank: - 110 & 130 models - 90 models	75 litre (16.50 gall) 60 litre (13.20 gall)
Engine oil (from dry): - Td5 engines - Tdi engines	7,2 litre (12.67 pt) 5,8 litre (10.15 pt)
Additional capacity after fitting new oil filter: - Td5 engines - Tdi engines	1,00 litre (1.76 pt) 0,85 litre (1.50 pt)
Main gearbox	2,38 litre (4.19 pt)
Transfer box	2,30 litre (4.0 pt)
Front differential	1,70 litre (2.9 pt)
Rear differential: - 110 & 130 models - 90 models	1,70 litre (2.9 pt) 2,26 litre (4.0 pt) 1,70 litre (3.0 pt)
Cooling system: - Td5 engines - Tdi engines	13,0 litre (22.88 pt) 11,10 litre (20.0 pt)

Technical Data

ENGINES

Td5 Diesel

Fuel	Diesel or Automotive Gas Oil (AGO) to EN 590 specification
Capacity	2498 cm ³ (154 in ³)
Firing order	1-2-4-5-3
Bore	84,45 mm (3.3248 in)
Stroke	88,95 mm (3.5020 in)
Number of cylinders	5
Compression ratio	19.5:1

Tdi Diesel

Fuel	Diesel or Automotive Gas Oil (AGO) to EN 590 specification
Capacity	2495 cm ³ (152 in ³)
Firing order	1-3-4-2
Bore	90,47 mm (3.562 in)
Stroke	97,00 mm (3.819 in)
Number of cylinders	4
Compression ratio	19.5:1

Technical Data

ELECTRICAL SYSTEM

Battery type: - Td5 engines - Tdi engines	Delphi YGD 100860, sealed for life Delphi YGD 100850, sealed for life
Battery rating: - Td5 engines - Tdi engines	100 amp/hr 72 amp/hr
Voltage and polarity	12 V, negative (-) earth
Charging circuit	Alternator

STEERING

Steering wheel turns lock to lock: - Manual steering - Power assisted steering	4.3 3.38
Turning circle between kerbs: - 90 models - 110 models - 130 models	11,7 m (38.4 ft) minimum 13,41 m (44 ft) minimum 15,24 m (50 ft) minimum
Camber angle	0°
Castor angle	3°
Swivel pin inclination	7°
Front wheel toe-out included angle	0 to 2 mm

Technical Data

WHEELS & TYRES

Tyre pressures (normal - all load conditions)

90 models:

Loading condition		Pressure - bar (lbf/in ²)
205/80 R16 radial & 750 R16 radial	Front	1.9 (28)
	Rear	2.6 (38)

110 models:

Loading condition		Pressure - bar (lbf/in ²)
235/85 R16 radial & 750 R16 radial	Front	1.9 (28)
	Rear	3.3 (48)

130 models:

Loading condition		Pressure - bar (lbf/in ²)
750 R16 radial	Front	3.0 (44)
	Rear	4.5 (65)

NOTE: Tyre pressures must be checked with the tyres cold, as the pressure is about 0.21 bar (3 lbf/in²) higher at running temperature. If the vehicle has been parked in the sun or high ambient temperatures, DO NOT reduce the tyre pressures, move the vehicle into the shade and wait for the tyres to cool before checking the pressures.

WARNING

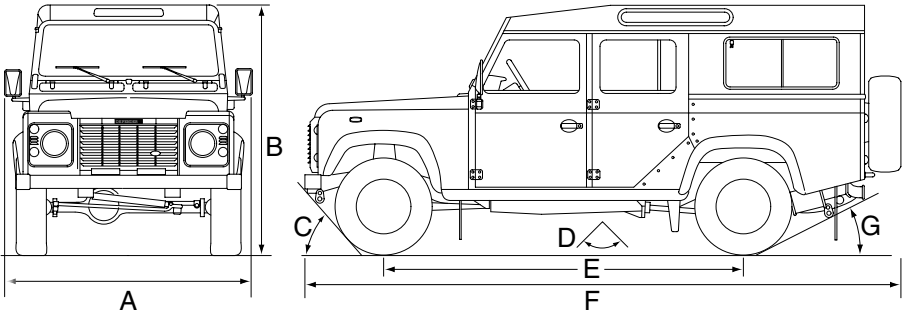
ALWAYS use the same make and type of radial-ply tyres, front and rear. **DO NOT** use cross-ply tyres or interchange tyres from front to rear.

If the wheel is marked 'TUBED', an inner tube MUST be fitted, even with a tubeless tyre.

If the wheel is marked 'TUBELESS', an inner tube must NOT be fitted.

Technical Data

DIMENSIONS



H3752

110 Station Wagon illustrated

90 models

A	Overall width	1790 mm (70.5 in)
B	Overall height:	1940 mm (76.4 in)
	- Soft top	1965 mm (77.4 in)
	- Pick-up & Station Wagon	1963 mm (77.3 in)
	- Hard top	1972 mm (77.6 in)
C	See 'OFF-ROAD PERFORMANCE', page 159	
D	See 'OFF-ROAD PERFORMANCE', page 159	
E	Wheelbase	2360 mm (92.9 in)
F	Overall length:	
	- Soft top & Pick-up	3722 mm (146.5 in)
	- Hard top & Station Wagon	3883 mm (152.9 in)
G	See 'OFF-ROAD PERFORMANCE', page 159	
	Track - front/rear	1486 mm (58.5 in)
	Width between wheel boxes	925 mm (36.4 in)

Technical Data

110 models

A	Overall width	1790 mm (70.5 in)
B	Overall height	2035 mm (80.1 in)
C	See 'OFF-ROAD PERFORMANCE', page 159	
D	See 'OFF-ROAD PERFORMANCE', page 159	
E	Wheelbase	2794 mm (110 in)
F	Overall length: Soft top & Pick-up High capacity pick-up Hard top, Station Wagon & County	4438 mm (175 in) 4631 mm (182 in) 4599 mm (181 in)
G	See 'OFF-ROAD PERFORMANCE', page 159	
	Track - front/rear	1486 mm (58.5 in)
	Width between wheel boxes: - High capacity pick-up - All other models	1090 mm (43 in) 925 mm (36.4 in)

130 models

A	Overall width	1790 mm (70.5 in)
B	Overall height	2035 mm (80.1 in)
C	See 'OFF-ROAD PERFORMANCE', page 159	
D	See 'OFF-ROAD PERFORMANCE', page 159	
E	Wheelbase	3226 mm (127 in)
F	Overall length	5132 mm (202 in)
G	See 'OFF-ROAD PERFORMANCE', page 159	
	Track - front/rear	1486 mm (58.5 in)
	Width between wheel boxes	1090 mm (43 in)

Technical Data

OFF-ROAD PERFORMANCE

90 models

	Maximum gradient (at EEC kerb weight)	45°
C	Approach angle (at EEC kerb weight): - Soft top & Pick-up - Hard top & Station Wagon	48° 51.5°
D	Ramp breakover angle (at EEC kerb weight): - Soft top & Pick-up - Hard top & Station Wagon	145° 141°
G	Departure angle (at EEC kerb weight) - Soft top & Pick-up - Hard top & Station Wagon	49° 53°
	Wading depth	500 mm (21.0 in)
	Minimum ground clearance (unladen): - Soft top & Pick-up - Hard top & Station Wagon	253.5 mm (10.0 in) 191 mm (7.5 in) 229 mm (9.0 in)

NOTE: Departure angles do not account for the addition of a tow hitch.

110 & 130 models

	Maximum gradient (at EEC kerb weight)	45°
C	Approach angle (at EEC kerb weight)	50°
D	Ramp breakover angle (at EEC kerb weight): - 110 models - 130 models	152° 155°
G	Departure angle (at EEC kerb weight): - 110 models - 130 models	35° 34°
	Wading depth	500 mm (21.0 in)
	Minimum ground clearance (unladen)	215 mm (8.5 in)

NOTE: Departure angles do not account for the addition of a tow hitch.

Technical Data

VEHICLE WEIGHTS

Axle weights and Gross vehicle weight

90 models	
Maximum front axle weight	1200 kg (2645 lb)
Maximum rear axle weight	1500 kg (3307 lb)
Gross vehicle weight:	
- Station Wagon	2550 kg (5622 lb)
- Utility vehicles	2400 kg (5291 lb)

110 models	
Maximum front axle weight	1200 kg (2645 lb)
Maximum rear axle weight:	
- Station Wagon	1750 kg (3858 lb)
- Utility vehicles	1850 kg (4078 lb)
Gross vehicle weight:	
- Station Wagon	2950 kg (6503 lb)
- Utility vehicles	3050 kg (6724 lb)

Heavy duty 110 & 130 models	
Maximum front axle weight	1580 kg (3483 lb)
Maximum rear axle weight	2200 kg (4850 lb)
Gross vehicle weight	3500 kg (7716 lb)

NOTE: Axle weights are non additive. The individual maximum axle weights and gross vehicle weights must not be exceeded.

Technical Data

EEC Kerb weights (unladen weight + full fuel tank + 75 kg driver, excluding options)

90 models	Standard	High load
Soft top & Pick-up:		
- Td5 engines	1770 kg (3402 lb)	1993 kg (4393 lb)
- Tdi engines	1694 kg (3734 lb)	1698 kg (3743 lb)
Hard top:		
- Td5 engines	1815 kg (4001 lb)	1987 kg (4380 lb)
- Tdi models	1746 kg (3849 lb)	1750 kg (3858 lb)
Station Wagon:		
- Td5 engines	1870 kg - 1885 kg (4122 lb - 4155 lb)	1989 kg - 1998 kg 4385 lb - 4404 lb)
- Tdi engines	1793 kg (3952 lb)	1797 kg (3961 lb)

110 models		
Soft top & Pick-up:		
- Td5 engines	1885 kg - 2080 kg	(4155 lb - 4585 lb)
- Tdi engines	1890 kg	(4166 lb)
High capacity pick-up:		
- Td5 engines	1920 kg - 2122 kg	(4232 lb - 4678 lb)
- Tdi engines	1927 kg	(4248 lb)
Hard top:		
- Td5 engines	1920 kg - 2110 kg	(4232 lb - 4651 lb)
- Tdi engines	1923 kg	(4239 lb)
Station Wagon		
- Td5 engines	2055 kg - 2229 kg	(4530 lb - 4914 lb)
- Tdi engines	2028 kg - 2064 kg	(4470 lb - 4550 lb)

130 models		
Td5 models	2117 kg - 2286 kg	(4667 lb - 5039 lb)
Tdi models	2086 kg	(4598 lb)

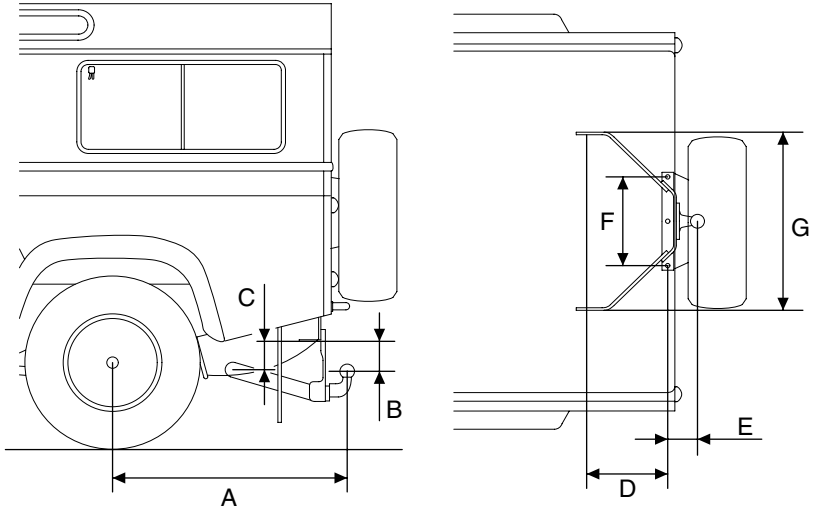
Technical Data

TOWING WEIGHTS

Maximum permissible towed weights	On-road	Off-road
Unbraked trailers	750 kg (1653 lb)	500 kg (1102 lb)
Trailers with overrun brakes	3500 kg (7716 lb)	1000 kg (2204 lb)
4 wheel trailers with coupled brakes†	3500 kg (7716 lb)	1000 kg (2204 lb)
Nose weight	150 kg (330 lb)	150 kg (330 lb)
Maximum roof rack load	150 kg (330 lb)	30 kg (66 lb)

Technical Data

TOW BAR DIMENSIONS



H3875

		90	110/130	HCPU
A	Wheel centre to centre of towball	796 mm	1005mm	1200 mm
B	Centre of inner attachment points to centre of towball	86 mm	86 mm	86 mm
C	Centre inner attachments to centre outer attachments	86 mm	82 mm	82 mm
D	Centre inner attachments to centre outer attachments	208 mm	301 mm	301 mm
E	Centre inner attachments to centre of towball	107 mm	107 mm	303 mm
F	Distance between centres of inner attachments	313 mm	313 mm	313 mm
G	Distance between centres of outer attachments	744 mm	635 mm	635 mm

Dimensions refer to towing equipment officially released by Land Rover

Technical Data

FUEL CONSUMPTION

The fuel consumption figures shown below have been calculated using a standard testing procedure (the new EC test procedure from Directive 93/116/EC), and produced in accordance with The Passenger Car Fuel Consumption (Amendment) Order 1996. Under normal use, a vehicle's actual fuel consumption figures may differ from those achieved through the test procedure, depending on driving technique, road and traffic conditions, environmental factors, vehicle load and condition.

Fuel consumption figures

	URBAN		EXTRA-URBAN		COMBINED	
	mpg	l/100km	mpg	l/100km	mpg	l/100km
Td5 90	23.5	12.0	31.5	9.0	28.0	10.1
Td5 110 & 130	22.3	12.7	29.2	9.7	26.2	10.8

Urban cycle

The urban test cycle is carried out from a cold start and consists of a series of accelerations, decelerations and periods of steady speed driving and engine idling. The maximum speed attained during the test is 31 mph (50 km/h) with an average speed of 12 mph (19 km/h).

Extra-urban cycle

The extra urban test cycle is carried out immediately after the urban test. Approximately half of the test comprises steady-speed driving, while the remainder consists of a series of accelerations, decelerations and engine idling. The maximum test speed is 75 mph (120 km/h) and the average speed 39 mph (63 km/h). The test is carried out over a distance of 4.3 miles (7 km).

Combined

The combined figure is an average of the urban and extra-urban test cycle results, which has been weighted to take account of the different distances covered during the two tests.

NOTE: These figures should not be compared with the figures produced using the ECE/EEC procedure previously required by The Passenger Car Fuel Consumption Order 1983. Because of the changes in test procedure, even the urban figures would differ if the same car were subjected to both tests.

Appendices

DECLARATIONS OF CONFORMITY

IMPORTANT INFORMATION

The Declarations of Conformity detailed on the following pages are from manufacturers of RF (Radio Frequency) equipment, whose components are used in the manufacture of your Land Rover Defender.

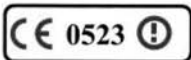
These manufacturers state that their components comply with relevant rules of the R & TTE (Radio and Telecommunication Terminal Equipment) directive.

The directive requires the manufacturer of short range radio devices to self certify that RF parts fitted to Land Rover vehicles are fit for use and that the declarations are supplied with the vehicle documentation. If at a future date a technical inspection is required, the declarations will provide all necessary information.

NOTE: *The Declarations of Conformity are published in the native language of the RF equipment manufacturer, in compliance with the R & TTE Directive.*

Appendices

DECLARATION OF CONFORMITY



This declaration is the responsibility of the manufacturer / authorised representative within the Community:

TRW Automotive Electronics
45, College Road Perry Bar Birmingham, B44 8DU UNITED KINGDOM
(Name / Address)

This certifies that

The 433,92MHz Transmitter designated: 17TN
and The 125KHz Immobilizer designated: 10AS
(Product identification)

complies with the essential protection requirements of R&TTE Directive 1999/5/EC on the approximation of the laws of the Member States relating to **Radio Spectrum Matters, EMC and Electrical Safety.**

This declaration applies to all specimens manufactured in accordance with the technical documentation described in the annex II. TRW Automotive Electronics keep this documentation at the proposal of the relevant national authorities of any Member State for inspection purpose.

Assessment of compliance of the product with the requirements relating to the essential requirements acc. to Article 3 R&TTE was based on Annex II and Annex IV of the Directive 1999/5/EC and the following standards:

Radio Spectrum:


EN 300220-1 & EN 300 330
(Identification of regulations / standards)

EMC:

EN 300 683 & EN 300 489 Part 1 & 3
(Identification of regulations / standards)

Safety:

EN 60950, ISO 3795 (based on FMVSS 302)
(Identification of regulations / standards)

 The designated products 17TN and 10AS are not submitted to harmonised standards. These devices are licence exempt and distributed in the European countries which will apply the R&TTE directive: Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and UK.

(Place, date)

Birmingham, England

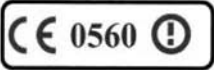



























20/02/2001

(Signature)

JOHN BURGESS

Appendices

17TN/8RCv3 TYPE APPROVALS

COUNTRY		APPROVAL
Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Tahiti and UK		
Canada (Tx)		19841021576
Canada (Rx)		35821032194A
Cyprus		MCW 129/954/1998
Gibraltar		Yes
Malta,		WT/962/9211
New Zealand		Yes
South Africa		RX-387/98
USA		KHH17TN
Brazil	 	108200-ASP1194
Croatia (Tx)		SRD-144/00
Croatia (Rx)		SRD-145/00
Czech Republic		
Korea		
Latvia		313R
Lithuania		0261
Poland	 	ML S.H.Nr1155/2000
Saudi Arabia		TRW 17TN/8RCv3 made in UK 433.92 MHz, 3V lithium battery SASO 1322/1997
Slovakia		
Slovenia		C231—1603/00
Taiwan		
Tunisia		0292/MAT/2000
Uruguay		059/DFR/2000

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