

Off-road Driving

BEFORE YOU DRIVE

Before venturing off-road, it is **absolutely essential** that inexperienced drivers become fully familiar with the vehicle's controls, in particular the transfer gear switch and Hill Descent Control (HDC), 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

- 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 and consequent damage to the catalytic converter.
- As a precaution against accidental loss, remove the towing eye cover and the front spoiler before driving off-road (see '*TOWING EYES*', page 218).
- To prevent damage, and improve departure angles, remove and stow any towing equipment fitted to the vehicle. See '*TOW BAR FITMENT*', page 156.

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, including off-road recovery techniques.

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

With the main selector lever set at 'D', the gearbox automatically provides the correct gear for the appropriate gear range selected (HIGH or LOW). For greater vehicle control through gear selection, manual CommandShift™ mode is recommended.

HIGH range gears should be used whenever possible - only change to LOW range when ground conditions become very difficult.

Braking

As far as possible, vehicle speed should be controlled through correct gear selection and the use of Hill Descent Control (HDC). Application of the brake pedal should be kept to a minimum. In fact, if the correct gear and HDC have been selected, braking will be largely unnecessary.

If the brake pedal is depressed when HDC is active, HDC is overridden and the brakes will perform as normal. If the brake pedal is then released, HDC will recommence operating, at reduced speed.

Off-road Driving

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 HDC. Use of manual CommandShift™ gear selection to limit the transmission to lower gears will also increase engine braking. Select '1' or '2' LOW range, depending on the severity of the descent.

While descending a slope (either forwards or in 'R' - reverse) it should be remembered that HDC and the engine will provide sufficient braking effort to control the rate of descent, and that the brakes should not be applied.

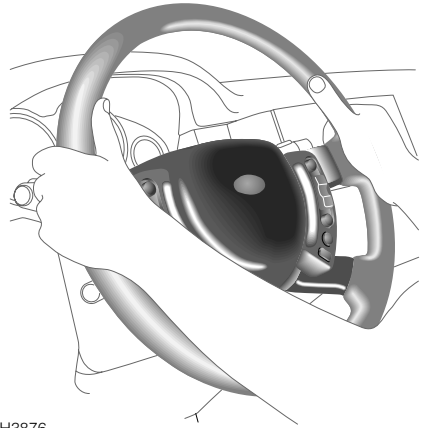
Accelerating

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.

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.

Steering



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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.

Off-road Driving

Ground clearance

Don't forget to allow for ground clearance beneath the vehicle suspension components and under the front and rear bumpers. 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.

ALWAYS attempt to avoid obstacles that may foul the vehicle.

Electronic air suspension

Select 'Off-road height', to increase approach/departure angles and ground clearance (see '*ELECTRONIC AIR SUSPENSION (EAS)*', page 150).

Loss of traction

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

- 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.

CD Autochanger

Playing CDs while negotiating arduous off-road terrain is not recommended. Severe jolting of the vehicle may disturb the operation of the autochanger, causing the disc to 'jump' or 'skip'.

AFTER DRIVING OFF-ROAD

IMPORTANT INFORMATION

Before rejoining the public highway, or driving at speeds above 25 mph, 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.
- The underside of the vehicle should be checked for damage, especially the suspension air springs and dampers.
- Any damage to paint or protective coatings, should be rectified by a Land Rover dealer as soon as possible.

If you have any doubt whether the vehicle has been damaged, have the vehicle inspected by a Land Rover dealer.

SERVICING REQUIREMENTS

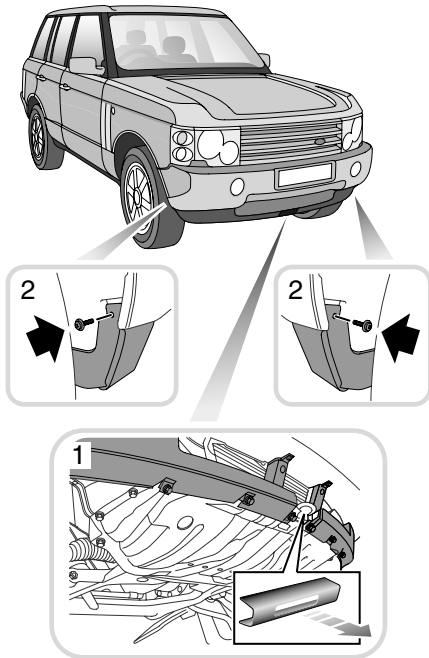
Vehicles operated in arduous conditions, particularly on dusty, muddy or wet terrain, and vehicles undergoing frequent or deep wading conditions will require more frequent servicing. See '*OWNER MAINTENANCE*', page 175 and contact a Land Rover dealer for advice.

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.

Off-road Driving

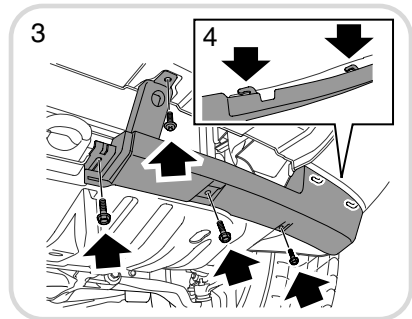
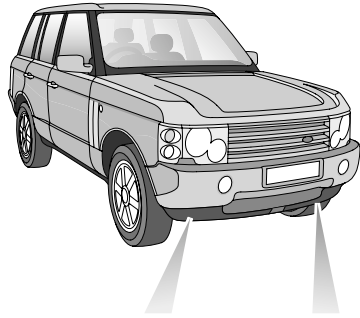
REMOVING THE FRONT BIB SPOILER

To improve off-road performance, it is possible to remove the front bib spoiler from the vehicle - this will also prevent the spoiler from being damaged.



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1. Remove the towing eye cover (see 'TOWING EYES', page 218).
2. From inside the wheel arch, remove the bolt/washer securing the spoiler to the wheel arch liner. Repeat for the other side of the vehicle. Keep the bolts and washers in a safe place.



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3. On one half of the spoiler, remove the three bolt/washers and one screw/washer securing the spoiler to the bumper. Keep the bolts, screw and washers in a safe place.
4. Slide the half-spoiler outwards towards the side of the vehicle and remove.

Repeat items 3 and 4 for the other half of the spoiler.

Refitting the spoiler is the reverse of the removal procedure.

WARNING

Ensure that the spoiler halves and the towing eye cover are securely stowed in the vehicle, so they do not become projectiles in the event of an accident or emergency manoeuvre.

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.

Deactivate DSC (see '*DYNAMIC STABILITY CONTROL (DSC)*', page 146), then select 'D' (drive) and REMAIN in that gear until a firm surface is reached. It is generally advisable to use LOW range, as this will enable you to accelerate through worsening conditions without the risk of being unable to restart.

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.
- To avoid wheel spin, select 'D' (drive) and use the MINIMUM throttle necessary to get the vehicle moving.
- If forward motion is lost, avoid excessive use of the throttle - this may dig the vehicle into the sand. Clear sand from around the tyres and ensure that the vehicle underside is 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 tyres so that the vehicle is again on level ground. If a restart is still not possible, place sand mats or ladders beneath the tyres.

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

- Select 'D' (drive) in LOW range.
- 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.

DRIVING ON ROUGH TRACKS

Although rough tracks can sometimes be negotiated in normal drive, on very rough tracks, engage LOW range to enable a steady, low speed to be maintained without constant use of the brake pedal.

Driving Techniques

CLIMBING STEEP SLOPES

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 and selecting '3' or '4' using CommandShift™ selection is recommended. It is advisable to engage HDC, in case there is a need to reverse down the slope to avoid an obstacle. If the surface is loose or slippery, use sufficient speed in the highest practical gear to take advantage of your vehicle's momentum and disable DSC. However, too high a speed over a bumpy surface may result in a wheel lifting, causing the vehicle to lose stability. 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 'N' (neutral) and engage LOW range, then select 'R' (reverse).
4. Select Hill Descent Control (HDC).
5. Release the handbrake. Then fully release the foot brake and allow the vehicle to reverse down the slope using engine braking and HDC to control the rate of descent.
6. Unless it is necessary to stop the vehicle to negotiate obstructions, DO NOT apply the brake during the descent - even a light application may cause the front wheels to lock, rendering the steering ineffective.
7. If the vehicle begins to slide, accelerate slightly to allow the tyres to regain grip.

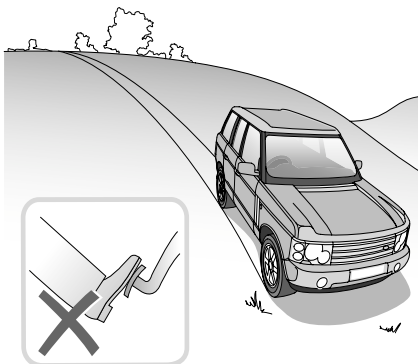
When the vehicle is back on level ground and safety permits, a faster approach will probably enable the hill to be climbed. However, DO NOT take unnecessary risks, if the hill is too difficult to climb, find an alternative route.

WARNING

DO NOT attempt to reverse down a slope without the engine running and ensure that 'R' (reverse) is selected. Otherwise, HDC and the braking effect of the gearbox will be lost.

Driving Techniques

DESCENDING STEEP SLOPES



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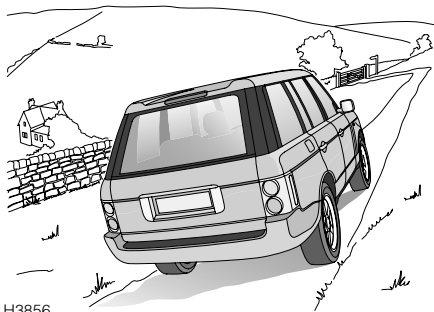
WARNING

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

- Slow the vehicle and select LOW range.
- With the transmission in manual CommandShift™ mode, change down the gears to select either '1' or '2', depending on the severity of the slope, before bringing the vehicle to a stop at least vehicle length before the start of the slope.
- Select Hill Descent Control (HDC).
- Unless it is necessary to stop the vehicle in order to negotiate obstructions, **DO NOT** touch the brake pedal during the descent - the engine and HDC will limit the speed, keeping the vehicle under perfect control provided the front wheels are rotating.
- If the vehicle begins to slide, the limits of adhesion have been reached, and it may be impossible to maintain the minimum speed relative to the gear selected. In this case, HDC may automatically accelerate the vehicle sufficiently to maintain directional stability. **DO NOT** use the accelerator or the brakes or attempt to change gear. HDC will automatically slow the vehicle down again as soon as possible.
- Once the descent has been started, 'D' can be selected in the main gearbox. HDC will continue to operate and the previously selected manual 'gear' will be retained until the descent is complete.
- Once level ground is reached, the transmission will automatically select 'D' for the next stage of your journey.

Driving Techniques

TRAVERSING A SLOPE



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.

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.

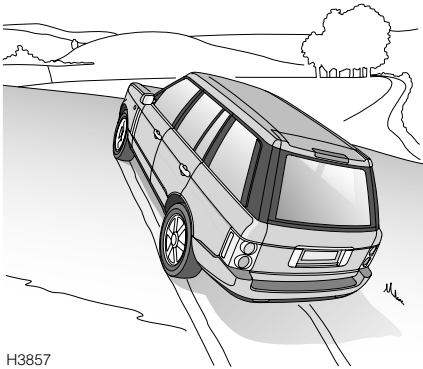
DRIVING IN EXISTING WHEEL TRACKS

As far as possible allow the vehicle to steer itself along the bottom of the ruts and always keep a light hold of the steering wheel to prevent it from spinning free. Deactivation of DSC may help in deep ruts.

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.

Driving Techniques

CROSSING A RIDGE



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

CROSSING A DITCH

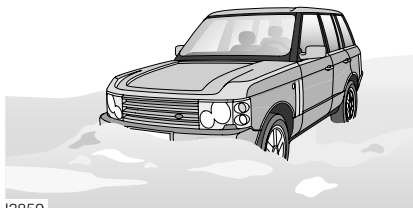


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Cross ditches at an angle so that three wheels always maintain contact with the ground. If a ditch is approached head on, both front wheels will drop into the ditch together, possibly resulting in the chassis and front bumper being trapped on opposite sides of the ditch. If the severity of terrain makes this inevitable, selecting 'Off-road' height with the EAS to increase clearance between the ground and the bottom of the vehicle may help.

Driving Techniques

WADING



H3859

WARNING

The maximum advisable wading depth is 0,5 m. Wading at a depth greater than the maximum advisable wading depth regularly, is not recommended.

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

Before wading, ensure the electronic air suspension is set to off-road height.

If the water is likely to exceed 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.
- 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 (located on the front wings) is clear of the water level.

- 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.

NOTE: If deep wading is to be carried out regularly, contact your Land Rover dealer for advice.

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 brakes have thoroughly dried out; in the meantime, leave the vehicle parked in 'P'.
- Remove any protective covering from in front of the radiator grille.
- If the water was particularly muddy, remove any blockages (mud and leaves) from the condenser and 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.

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