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 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 de-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 level but slippery or soft ground conditions prevail, the higher the gear you select the better.
- When descending steep slopes, always select 1st (or reverse if descending backwards) and engage Hill Descent Control (HDC) - if fitted.

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.

Care Points .....

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.

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.

For Your Safety .....

- Off-road driving can be hazardous - DO NOT take unnecessary risks.
- Be prepared for emergencies at all times.
- Familiarise yourself with the recommended driving techniques in order to minimise risk to yourself, your vehicle and your passengers.

WARNING!

Always wear a seat belt for personal protection in all off-road driving situations.

Braking
As far as possible, vehicle speed should be controlled through correct gear selection. Application of the brake pedal should be kept to an absolute minimum. Unless hill descent control (HDC) and ABS have been 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.

Hill descent control (HDC) - if fitted
During a descent, if engine braking is insufficient to control the vehicle speed, HDC (if selected) automatically operates the brakes to slow the vehicle and maintain a speed relative to the accelerator pedal position.

When driving off-road, HDC can be permanently engaged, to ensure that control is maintained whenever 1st or reverse gears are selected. ABS and traction control are still fully operational and will assist if the need arises.

NOTE: *With HDC selected, gear changes can be carried out in the normal way.*

Use of engine for braking
For vehicles NOT fitted with HDC; before descending steep slopes, stop the vehicle at least its length before the descent, select 1st gear.

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 result in loss of control of the vehicle.


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For Your Safety .....
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 alongside) when traversing uneven ground.

IMPORTANT

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 'Maintenance' and contact a Land Rover dealer for advice).***

Ground clearance
Don't forget to allow for ground clearance beneath the body and under the front and rear bumpers (see *'Dimensions'* in *'Technical Data')*. Note that the suspension arms are situated below the body. 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 sudden changes in the slope of the ground are experienced.

ALWAYS attempt to avoid obstacles that may foul the underside of the vehicle.

Loss of traction
On vehicles not fitted with Traction control, if the vehicle is immobile due to loss of wheel grip, the following hints could be of value:

- On vehicles not fitted with traction control, 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 will improve tyre grip.

DRIVING ON SOFT SURFACES & DRY SAND

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

Stopping on soft ground, in sand or on an incline

If you do stop the vehicle, remember: Starting on an incline or on soft ground or sand may be difficult. Always park on a firm level area, or with the vehicle facing downhill.

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 body 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 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)

- 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.

IMPORTANT

After driving off-road:

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 calipers should be examined and any stones or grit that may affect braking efficiency, removed.***

CLIMBING STEEP SLOPES

Select 1st gear and engage hill descent control (HDC) - if fitted.

ALWAYS follow the fall line of the slope - travelling diagonally could cause the vehicle to slide broadside down the slope.

If the surface is loose or slippery, use sufficient speed in the highest practical gear to take advantage of your vehicle's momentum - hill descent control only operates in 1st and reverse gears, but ABS and traction control (where fitted) will still be operational when required. However, too high a speed over a bumpy surface may result in a wheel lifting, causing the vehicle to lose traction if traction control is not fitted. In this case try a slower approach.

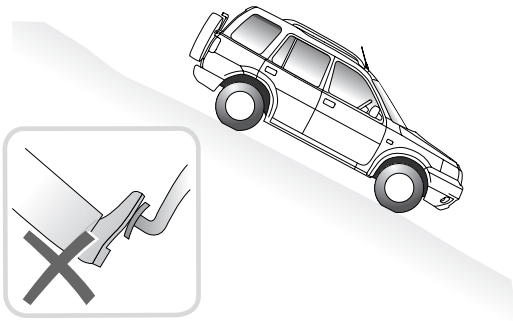
If the vehicle is unable to complete a climb, do not attempt to turn it around while on the slope. Instead, adopt the following procedure to reverse downhill to the foot of the slope.

1. Hold the vehicle stationary using both foot and hand brakes.
2. Restart the engine if necessary.
3. Engage reverse gear and HDC (if fitted).
4. Release the handbrake. Then release the foot brake and clutch simultaneously and allow the vehicle to reverse down the slope.
5. Unless it is necessary to stop the vehicle to negotiate obstructions, DO NOT apply the brake or clutch pedal during the descent.
6. If HDC is not fitted or has not been selected and the vehicle begins to slide, accelerate slightly to allow the tyres to regain grip (on vehicles with HDC operating, acceleration is automatically controlled to ensure traction).

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 the slope without the engine running.



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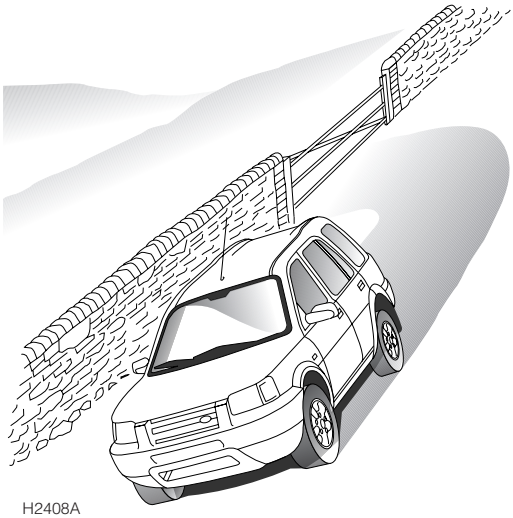
WARNING!

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

DESCENDING STEEP SLOPES

1. Stop the vehicle at least a vehicle length before the slope and engage 1st gear and hill descent control (HDC) - if fitted.
2. 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 (or HDC -if fitted) will limit the speed, keeping the vehicle under control. If HDC is not fitted and the vehicle begins to slide, accelerate gently to maintain directional stability (this occurs automatically with HDC) - DO NOT use the brakes or attempt to change gear.
3. Once level ground is reached, select a suitable gear for the next stage of your journey.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WARNING!

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

TRAVERSING A SLOPE

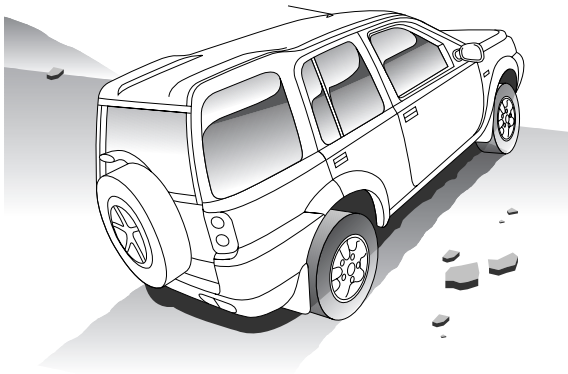
Before crossing a slope, ALWAYS observe the following precautions:

- 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.

CROSSING A RIDGE



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Operating Tip .....
Cross ridges by approaching at a right angle so that both front wheels cross the ridge together - on vehicles NOT fitted with traction control, an angled approach could cause traction to be lost through diagonally opposite wheels lifting from the ground at the same time.

CROSSING A DITCH

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Operating Tip .....
Cross ditches at an angle so that three wheels always remain in contact with the ground (if approached head on, both front wheels will drop into the ditch together, possibly resulting in the body and front bumper being trapped on opposite sides of the ditch).

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 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 wet ground, is unknowingly on full left or right 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 the left or right.

WADING

If the water is likely to exceed 0,4 metre, 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 is firm enough to support the vehicle's weight and provide sufficient traction.
- Ensure that the engine air intake is clear of the water level.
- Select 1st 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.

Keep the doors fully closed at all times.

WARNING!

The maximum advisable wading depth is 0.4 metre (16 in).

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

Care Points .....
Vehicles required to undergo frequent or deep wading conditions will require more frequent servicing. See *'Maintenance'* and contact a 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 are thoroughly dried out; in the meantime, leave the vehicle parked in gear.
- 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 radiator to reduce the risk of overheating.
- If deep water is regularly negotiated, check the transmission oils for signs of water contamination - contaminated oil can be identified by its 'milky' appearance. In addition, check the air filter element for water ingress and replace if wet, consult your dealer if necessary.