

Land Rover guide to off-roading

In rainforests, deserts, and other places no ordinary vehicles could reach, you will find all-terrain vehicles. The moment you venture off the tarmac is the moment you realise the incredible potential of your Land Rover. This guide is designed to make sure you get the most out of your off-road adventure.

Knowing your vehicle inside-out



- Before you venture off-road, it's worth ensuring that you have a good mental picture of the underside of your vehicle.
- Check the position of fragile parts such as the fuel tank, engine sump, differentials, and gearbox – so you're less likely to snag them on rocks, tree stumps, and other obstacles.
- Check the roof rack and consider it as you drive under low tree branches.
- Read the owner's manual and discover the purpose of all the on-board technology and features.

Expert tips for off-road driving

As long as it is safe to do so, test the surface by walking over the ground before you drive over it.

Before ascending a hill, ensure you know what's over the crest.

Always walk your water obstacle wearing wellington boots and carrying a stick for checking silt and underwater hollows. Better to get your feet wet than your vehicle stuck.

Never hook your thumbs inside the steering wheel, as any kickback from the terrain could sprain or even break them.

The Golden Rules for off-road driving

- **Drive as slowly as possible and as fast as necessary.**
- **Know your vehicle's dimensions – height, weight, width, length, approach and departure angle, ramp angle, and ground clearance.**
- **Know the international hand signals for marshalling (see image).**
- **Avoid gear changes while negotiating difficult terrain.**
- **Always read the ground as far ahead as you can. If it is safe to do so, walk the ground before you drive.**
- **Use great care when driving on loose or wet surfaces due to the reduced level of grip.**
- **Be prepared to admit defeat. Back off and try again, or try an alternative route.**
- **Avoid excessive wheelspin at all times but especially on soft ground where the vehicle can easily lose momentum and even cause environmental damage.**
- **Use a gentle right throttle foot.**
- **Always keep both hands on the wheel, even when reversing.**
- **Always tell someone where you're going, what route you plan to follow, and when you expect to return.**

Essential kit for off-roading



The essential kit for serious off-roading

For any off-road adventure, it's essential that you know your vehicle inside out (see Overview) and pack the essentials in your Land Rover before heading out.

Check list:

- Tow rope
- Shovel
- 2-way radio
- Suitable, climate-appropriate clothing
- Correct footwear
- GPS navigation and maps
- Food and water
- Extra fuel

Driving technique

The basics

- To drive effectively over rough terrain, a degree of smoothness is required.
- Make sure the throttle is applied smoothly and released slowly. This keeps the tyres from spinning on acceleration or deceleration.
- Keep steering precise and braking to a minimum.
- The driver always controls the vehicle; the vehicle should never control the driver.

How to overcome obstacles

- Try walking the ground before you actually drive on it.
- Approach ridges straight on.
- Approach a log, rocky step or ditch diagonally so that three wheels always retain contact with the ground.
- Make sure tyres are fully inflated to road pressures for rocky ground.
- Straddle deep ruts with your vehicle. This will keep the vehicle level, reducing environmental impact.

How to return to the road

- Disengage diff-lock, if applied.
- Stop and check for any minor damage.
- Check for cuts in tyres including inside the walls.
- Check for body damage that will rub against tyres.
- Check for debris lodged in the underside of the vehicle and in the tyres.
- Check that lights, windows, and mirrors are clear.
- Check that number plates can still be read.
- Check that all equipment is secure.



When a deeply rutted track takes over the steering

As you drive along a deeply rutted track, take special care if the ruts are cut into slippery ground. Indeed, you may be unaware that the wheels are not pointed straight ahead until grip becomes available and the vehicle suddenly veers to one side. (Vehicles such as The Range Rover, Range Rover Sport and Discovery 4 have a wheel direction indicator to help you in situations such as this.)

Unless you are going downhill, the best way to avoid having your wheels 'locked' by a rutted track is to relax your grip on the steering wheel occasionally, while keeping a frictional grip with your palms. This will allow the wheels to regain the straight-ahead position. The tyres may not be able to grip the slippery sides of the rut and you will be unable to turn the steering wheel to the left or right.

Selecting the best gear

RULE OF THUMB GUIDE TO SELECTING THE BEST GEAR

CONDITIONS	GEAR
Rocky ground.	Low range 1st gear.
Soft ground.	Low range 2nd or 3rd gear.
Ice and snow.	Highest gear possible for conditions.
Climbing slopes.	Climb in highest practical gear.
Descending slopes.	Low range 1st gear.
Wading.	Low range 2nd gear.
Sandy tracks.	Try 3rd, 4th or 5th in low range.

Mud and sand



Range Rover, Discovery 4, and Range Rover Sport have a unique Terrain Response® system that can be set for different driving conditions: rock crawl, mud and ruts, sand, grass/gravel/snow or road.

Terrain Response® is a groundbreaking feature that should be used in conjunction with proactive driving techniques. Here are some additional tips for off-road driving in mud and sand.

The basics:

- Use steady momentum to carry you through deep sand or mud.
- Do not select a gear that is too low in mud because it will spin tyres more easily.
- However, in sand a low gear is usually better.
- If muddy conditions force you to drive in ruts, make sure you know where your front wheels are pointing at all times.
- Tyres can cut through mud to find traction on firmer ground below.
- Sand is firmest at dawn.
- If you have to sit out a sandstorm, turn the rear of the vehicle to face the wind, and then turn the engine off.
- Follow the tyre and Land Rover's advice on tyre pressure.
- However, where the sand is soft and contains stones, a low pressure works better.
- When the wheels start to spin, ease off the throttle and allow the tyres to slow down and regain traction.

Remember: Before setting out on your adventure, always make sure you and your passengers are wearing climate-suitable clothing.

Sand: The fine detail

- **The geology of desert.** Sand covers only about 20 per cent of the Earth's deserts. Most of the sand is in sand sheets and sand seas – vast regions of undulating dunes like ocean waves 'frozen' in an instant of time.
- **Beaches.** Usually firm enough to take a vehicle between high tide mark and four metres from the sea. Beware of incoming tide.
- **Damp sand.** Damp desert sand after rain can be easier to drive on. Often, flowers blooming overnight will help bind sand together.
- **Firm sand.** Stretches of desert where you can travel in relatively high range.
- **Dry sand.** A surface crust that's stronger in the cool of the morning.
- **Wet sand.** Keep off. It can contain areas of 'floating' sand or quicksand.
- **Sand dunes.** Avoid climbing over dunes, go round them.

Snow



As with mud / sand, Terrain Response® can also be set for driving in the snow. Terrain Response® is a groundbreaking feature that should be used in conjunction with proactive driving techniques. Here are some additional tips for off-road driving in snow.

Before you drive in snow:

- Check which snow chains we recommend for your Land Rover and whether they can be safely fitted to the tyres on your vehicle.
- Inspect regularly to ensure the chains are taut.
- Practice fitting snow chains before you actually need them, preferably on a sunny day.

Remember: Before setting out on your adventure, always make sure you and your passengers are wearing climate-suitable clothing.

The basics for driving in snow:

- Use steady momentum to carry you through deep snow.
- Do not select a gear that is too low in snow as it will spin tyres more easily.
- Follow the tyre and vehicle manufacturer's advice on tyre pressure.
- When the wheels start to spin, ease off the throttle and allow the tyres to slow down and regain traction.
- Select the highest gear possible for the conditions.

Hills

How to climb hills

- Wherever possible, investigate the area on foot. Always know what's on the other side of the hill.
- Engage Hill Descent Control (HDC) if available.
- Ascend a hill in the highest gear in which the vehicle will 'pull' comfortably. If the gear selected is too low, the wheels will spin. If too high, you will not have enough power to climb the hill.
- Always approach the hill from a straight-ahead position, rather than diagonally, to avoid a roll-over.
- Never attempt to turn the vehicle on a steep slope.
- Be prepared for a failed climb. It happens to the best drivers. Work out an escape route and know where all the obstacles are.

How to descend hills

- Stop a vehicle length before the descent so that you have time to make any corrections.
- You can also get out of the vehicle and assess the land ahead.
- Engage HDC, if available.
- As a rule of thumb, use 1st gear low range or '1' on the automatic gearbox and use brakes sparingly.
- Follow the natural fall line; the route water would take down the slope.
- Never roll or reverse downhill with the transmission in neutral or the clutch depressed.
- Never turn the vehicle on a steep slope. This could lead to sideways sliding.
- If you do need to stop on the way down ask yourself one question: is it safe?

Crossing water



Tips for crossing water

- Whenever possible, cross water at a ford.
- As long as it is safe to do so, walk the stream before you try it in a vehicle. Use a stick to gauge depth and pinpoint underwater hollows.
- Do not cross deep fast-flowing streams.
- In deep waves create a small bow wave about one metre in front of the bumper.
- Do not slip the clutch as this reduces control.
- Ease off the as you approach the other side of the water.
- If there's a steep slope, take a look at our guide on driving up and down slopes (see Hills).

How to create the perfect bow wave

- Accelerate as you enter the water until a bow wave has formed.
- Try to keep it about one metre in front of the bumper to keep water away from the fan electronics.
- Maintain a speed that keeps the bow wave flowing in front of the bumper.
- Remember, the aim is to create a gentle wave, not a surfing wave!