4WD HANDLING GUIDE

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Terrain	About	Key Tips
Mud & Water	Mud trenches & Waterlogged troughs are a good test for water-fording capabilities.	**<u>Before Attempting</u>** • Did you know that mud is nearly as slippery as ice? • The speed you drive on mud is like ice. Even walking on mud helps you realise that running might not be ideal! • The problem with mud is that it isn't limited to grip but also depth and potentially, damage to the mechanicals. • The first step to mud is to check the depth and if the bottom is hard or soft. • If it's deeper than your clearance and soft (a stick can be pushed into the ground), leave it alone and find another way. • Otherwise, when learning about mud, drive as slow as you can into it, when the wheels start spinning slowly and you're not moving forward, stop immediately and then try to back out. Doing that again and again might be enough to gently clear a path and safely navigate the course. • Racing through mud is fun for some but not technically correct. • Do you need to go there?

		• Do have appropriate tyres and pressures? • Do you have recovery gear? • Check the depth, the ground underneath needs to be hard, and you have a good exit. • Usually, we select low range and first gear to crawl through the mud to avoid speed and wheel spin. • When you become more advanced and experienced, there are some more tricks to learn in mud. **Check Depth & Terrain** Walk the pit if possible (with a stick) to gauge depth and hidden obstacles. Avoid pits with unknown bottoms or deep ruts. **Inspect Your Vehicle** Ensure recovery points are secure and rated. Check tyre pressure (slightly lower for better traction). Engage 4WD mode before entering. **Plan Your Exit** Identify a clear path out of the pit. Make sure there's enough space to maintain momentum.

Rock Pits	Rock pits challenge drivers' finesse, patience, and strategic thinking.	**<u>Before Attempting</u>** **Inspect the Track** • Walk the section, if possible, to check for loose rocks, sharp edges, and clearance. • Plan your line to avoid underbody damage by driving on high points. **Check Your Vehicle** • Ensure your tyres are in good condition and properly inflated - a lower-than-normal pressure will allow the tyre to wrap around spark objects and less likely to be punctured. • Confirm recovery points are not tow points and underbody protection (bash plates, diff guards). **Engage the Right Gear** • Use low-range 4WD for better torque and control. • Lock differentials if available for extra traction. **<u>Driving Technique</u>** **Go Slow & Controlled** • Crawl over rocks - speed causes damage and bouncing can cause instability. In worst cases, a sudden

		shift in weight can be the cause of rolling over. • Use steady throttle; avoid all sudden inputs from braking or accelerating. **One Wheel at a Time** • Approach obstacles so only one wheel climbs at a time to maintain stability. • Avoid Straddling Large Rocks. • Keep wheels on high points, not the centre, to protect your underbody. **Steer Smoothly** • Avoid jerky movements; keep a firm grip on the wheel and don't let the wheel spin. **<u>Recovery & Safety</u>** **Never Go Alone** • Have another vehicle or a spotter for guidance. • Carry recovery gear: winch, snatch strap, shackles, traction boards. **Spotter Communication** • Use clear hand signals or radios—don't rely on shouting. **Stay Clear During Recovery**

		• Keep bystanders away from recovery lines and winch cables. **<u>Extra Tips</u>** Protect Tyres: Sharp rocks can puncture - consider all-terrain or mud-terrain tires with strong and durable sidewall construction. • Check Undercarriage After: Look for damage to suspension, diffs, and exhaust. • Pack Essentials: Gloves, first aid kit, and plenty of water.
Sand Pit	Sand often requires a lot of skill, equipment, and composure. It's not just about making it through - it's about navigating unpredictability, practicing recovery techniques, and mastering momentum in soft ground.	**Stop Before You Dig Deeper** • Most people drive too fast on sand. • Generally, it's an unstable surface and can influence the direction of your car. • Sand can be wet and flat, sand can be dry and fluffy. • Speed on damp/flat sand can be higher (but not without its risks) • Speed on fluffier sand will have a 'sweet spot' and this could be around 20 kph. • Start by reducing tyre pressures to around 25 psi. You can go lower but 15 psi and under can often introduce other problems. • We generally use low range and select the gear we want which is

		often 2nd or 3rd. This is where the car operates well, not over revving and you aren't fighting the steering. • If you find you are in very loose sand and the car starts to labour to a stop, do not spin the wheels. Gently back up on the tracks you just made, pack it down so you can use a little bit of momentum and see how far that takes you. • Making a track like this could take one go, it could also take 20 but trust the system of avoiding wheel spin (and digging a hole that you need to shovel out of!). • Other 'self-recovery' techniques can include 'paddling'. This is when you spin the steering wheel very quickly from full left to full right lock, as fast as you can. This gently rocks the car. • Recovery gear needs to be at least a shovel and traction boards - ideally also approved recovery points for a 'snatch' recovery. • If you feel the vehicle bogging down, <u>stop immediately!</u> Spinning wheels will only dig you in further. • Avoid aggressive throttle; it worsens the situation. **Assess the Situation** • Check which wheels are buried and how deep.

		• Identify the firmest direction for recovery (forward or backward). **Lower Tyre Pressure** • Drop tyre pressure further (as low as 12–16 psi if safe for your rims). This increases the tire footprint and improves traction • Clear around Tyres. • Use a shovel to remove sand from in front of and behind the tires. • Create gentle ramps for the tires to climb out. • Use Traction Aids. • Place traction boards, mats, or even branches under the tires. • Ensure they are aligned with your intended direction of travel. **Gentle Throttle** • Engage low-range 4WD. • Apply steady, gentle throttle - avoid wheel spin. **Recovery Gear** If traction boards fail, use a snatch strap or winch with another vehicle. • Always use rated recovery points - never tow balls.

		• Keep bystanders clear of recovery lines. **Safety Precautions** • Wear gloves when handling recovery gear. • Use a winch damper if winching. • Communicate clearly with anyone assisting. After Recovery • Check tyre pressure and reinflate before driving at speed. • Inspect underbody and brakes for sand buildup.
Reverse Traverse	The Reverse Traverse is a precision-driving activity crafted to test both vehicle handling and driver nerve. It flips the script on conventional off-roading by shifting the focus to reverse control. This is a rarely practiced but essential skill in real-world recoveries and trail navigation.	**<u>Before Attempting</u>** **Assess the Terrain** • Walk the section to check slope angle, surface stability, and obstacles. • Identify a safe path for reversing- avoid steep drop-offs or loose soil. **Know Your Vehicle's Limits** • Understand your vehicles' limits around being on a side slope. • Nearer to the limit, the harder it is to ensure stability. • Remove roof loads if possible - they increase rollover risk.

		Engage Correct Settings • Use low range 4WD, for controlled torque. • Lock differentials if traction is uneven. **<u>Driving Technique</u>** • Go Slow • Reverse at a crawl - speed increases risk of loss of control. • Use steady throttle and avoid sudden acceleration or braking. **Use Mirrors & Spotter** • Constantly check mirrors and rear camera if available. • Have a spotter guide you with clear hand signals or radio. • Avoid sharp steering inputs that can destabilize the vehicle. **Avoid Over-Correction** • Small, smooth adjustments prevent fishtailing or sliding. **<u>Recovery & Safety</u>** • If sliding, stop. • Do not fight gravity aggressively - apply brakes gently and re-plan.

		<u>Extra Tips</u> • Check Load Balance: Heavy gear at the rear can worsen control. • Wet or Loose Surfaces: They reduce traction and increase sliding risk. • Practice on Mild Terrain First: Build confidence before tackling steep reverse traverses.
Logs	Logs can often challenge a vehicle's traction, suspension articulation, and the driver's finesse - as it's not just a craw it's a test of control, as tyres grip, slip, and surge across uneven cylindrical surfaces.	**<u>Before Attempting</u>** **Inspect the Log** • Check size for clearance, stability, and whether it's rotten or slippery. • Ensure there's no hidden debris or sharp branches that could damage tires or underbody. **Check Vehicle Clearance** • Know your approach and departure angles so the log won't strike the car and if the log is too high for your clearance, use ramps or traction boards to reduce the step. **<u>Driving Technique</u>** **Use Low Range** • Engage low-range 4WD for controlled torque. **Slow & Steady**

		• Crawl over the log—avoid speed that could cause bouncing or loss of control. **One Wheel at a Time** • Approach so one wheel climbs first, then the other, to maintain stability. **Avoid Straddling** • Keep wheels on the log rather than letting the log pass under the center of the vehicle (risk of damage to diffs and exhaust). **<u>Recovery & Safety</u>** **Have a Spotter** • Use clear hand signals or radios for guidance. • Spotter should stand in a safe position, away from the vehicle's path. **Carry Recovery Gear** • Snatch strap, traction boards, shovel, and gloves. • If stuck, clear around tyres and use boards for traction. • Stay Clear During Recovery • Keep bystanders away from recovery lines and winch cables. **<u>Extra Tips</u>**

		• Protect Tyres: Logs can have sharp edges—use all-terrain or mud-terrain tires. • Check Undercarriage After: Look for damage to suspension, diffs, and exhaust. • Avoid Wet Logs: They can be extremely slippery—reduce throttle and maintain control.
Articulation	It's all about twist, tilt, and balance as vehicles tackle staggered terrain that forces wheels to operate independently across exaggerated contours. Offset ramps and dips that simulate natural erosion channels and gullies.	**<u>Before Attempting</u>** **Know Your Vehicle's Limits** • Understand your suspension travel and clearance. • Check for vulnerable components (diffs, fuel tank, exhaust and sidesteps). **Inspect the Track** • Walk the section to identify deep ruts, holes, and obstacles. • Plan your line to keep traction on as many wheels as possible. **Engage Correct Settings** • Use low range 4WD for controlled torque. • Lock differentials if available (especially rear or center). **<u>Driving Technique</u>** **Slow & Controlled** • Crawl through obstacles—speed increases risk of damage or rollover.

		• Use steady throttle; avoid sudden acceleration. **Keep Wheels on High Points** • Position wheels on ridges rather than dropping into deep ruts. • Avoid straddling obstacles that could hit underbody. **Maintain Balance** • Articulation can lift wheels—avoid aggressive steering that worsens tilt. • If a wheel lifts, keep calm and maintain momentum without spinning. **<u>Recovery & Safety</u>** • **Have a Spotter** • Spotter should guide wheel placement and watch for tipping. • Use clear hand signals or radios. **Carry Recovery Gear** • Snatch strap, traction boards, shovel, gloves. • Winch if tackling extreme articulation tracks. **Stay Clear During Recovery** Keep bystanders away from recovery lines and winch cables. **<u>Extra Tips</u>**

		• Check Suspension After: Articulation stresses components—inspect for leaks or damage. • Avoid Overloading: Heavy loads reduce suspension flex and increase rollover risk. • Practice on Mild Terrain First: Build confidence before tackling extreme articulation tracks.
Rampover	Rampover Ridges are designed to test a vehicle's clearance, approach, and departure angles with thrilling precision. Drivers approach a sharp crest that rises rapidly, forcing them to gauge their rig's breakover capacity as they teeter over the summit.	**<u>Before Attempting</u>** **Assess the Obstacle** • Walk the ramp-over first to check height, width, and stability. • Ensure it's not too steep for your approach/departure angles. **Know Your Vehicle's Clearance** • Understand your break-over angle (to avoid belly contact). • If unsure, use ramps or traction boards to reduce the angle. • Engage Correct Settings • Use low-range 4WD for controlled torque. • Lock differentials if available for traction. **<u>Driving Technique</u>** • Approach Straight-On • Keep the vehicle aligned with the obstacle—avoid diagonal approaches.

		Slow & Controlled • Crawl up and over - speed can cause bouncing or loss of control. • Use steady throttle; avoid sudden acceleration. **Maintain Momentum** • Enough to crest the obstacle without spinning wheels. • Do not stop at the peak unless necessary. **Avoid Straddling Sharp Edges** • If the obstacle is narrow, keep wheels on the highest points rather than letting the centre scrape. **<u>Recovery & Safety</u>** **Have a Spotter** • Spotter should guide wheel placement and watch for underbody contact. • Use clear hand signals or radios. **Carry Recovery Gear** • Snatch strap, traction boards, shovel, gloves. • If stuck, clear underbody and use boards for traction.

		Stay Clear During Recovery • Keep bystanders away from recovery lines and winch cables. **<u>Extra Tips</u>** • Protect Undercarriage: Install bash plates and sliders. • Check After Crossing: Inspect for damage to diffs, exhaust, and suspension. • Avoid Wet or Loose Soil: It can collapse under weight.
Alternating Side Slope	Alternating Side Slopes are a dynamic lateral challenge that puts drivers and rigs to the ultimate stability test. These can simulate the nerve-testing side angles found in mountainous and cliff-edge trails.	**<u>Before Attempting</u>** **Assess the Terrain** • Walk the section to check slope angles, surface stability, and hidden obstacles. • Avoid slopes that exceed your vehicle's safe tilt angle (usually 20–30° for most 4WDs). **Know Your Vehicle's Limits** • Understand your centre of gravity and load distribution. • Remove roof loads if possible - they increase rollover risk. **Engage Correct Settings** • Use low-range 4WD for controlled torque.

		• Lock differentials if traction is uneven. **<u>Driving Technique</u>** **Smooth Transition** • Approach the change in slope slowly and at a shallow angle. • Avoid sudden steering or throttle changes—these can destabilise the vehicle. **Keep Momentum Controlled** • Maintain steady speed - too fast increases rollover risk, too slow can cause loss of traction. **Steer Uphill if Sliding** • If the back of the vehicle begins to slide downhill, gently steer uphill to regain control. • If the front slides downhill, steer downhill. • The aim in both cases is to get the car 'square' to the hill. **Avoid Braking Hard** • Sudden braking can cause the vehicle to pivot downhill. **<u>Recovery & Safety</u>** **Have a Spotter**

		• Spotter should guide wheel placement and monitor tilt. • Use clear hand signals or radios. **Stay Clear During Recovery** • If recovery is needed, keep bystanders away from recovery lines and winch cables. **Carry Recovery Gear** • Snatch strap, traction boards, shovel, gloves, and winch if slopes are extreme. **<u>Extra Tips</u>** • Check Load Balance: Heavy gear on one side increases rollover risk. • Avoid Wet or Loose Surfaces: They reduce traction and increase sliding. • Practice on Mild Slopes First: Build confidence before tackling alternating slopes.