ROCK HOPPING

Rock-hopping is potentially dangerous, because if you make a serious error of judgment on a steep, rocky trail it's easy to end up on your roof or wrapped around a tree.

Hard-driving challenges like the Telegraph Line at Cape York or the run from the Kimberleys' Mitchell Plateau down to the sea are characterised by deep washaways and shelves a half-metre high. Judgment of where to aim your 4x4 in such conditions and at what speed is largely a matter of experience, and training is the best way to gain that experience quickly.

Experienced drivers 'feel' what the vehicle is doing and can look at a rocky climb and pick the best contours to tackle. Speed is out of place on rocky trails, where the best progress is the smoothest.

Rock work is usually done in the lowest gear you have and at a crawl. If you need to slip the clutch to keep going, or to rev the engine hard in the case of an automatic 4x4 you're probably asking too much of your vehicle.

Don't try to run standard road pressures when you're climbing over large stones and shelves, but you'll need enough pressure to ensure the tyres can't spin on the rims and to keep the sidewalls from flattening out as they encounter rock edges.

We usually run narrow-section 235/85R16-type light truck tyres at 25-30psi unless there's a very heavy load on board. Lower-profile light truck tyres can be dropped into the low-20psi range.

It's important to remember that a 4x4 can usually descend terrain it can't necessarily climb up, so make sure that there's an 'escape route' from your valley-floor rock-climbing venue, just in case you can't get to where you'd planned.

No matter how good the forward vision is from your driving seat there are steep uphill and downhill situations that can leave you unsighted. Many experienced drivers can remember what the trail looked like just before it disappeared under the bonnet, but others cannot.

Don't be too proud to get out and have a look at difficult sections and, if necessary, have someone guide your progress with voice and hand signals, to ensure that the tyres get the best purchase spots and avoid deep holes.

The centre diff should be locked as soon as you're on loose, steep ground, but don't wait until you're wedged on a rock or jammed in a crevice before engaging your across-axle diff locks, if you have them.

An across-rear-axle lock should be engaged before attempting demanding terrain, unless you have to make some very tight turns. A locked rear diff will tend to steer you straighter than you might like.
As soon as you're over the obstacle the diff should be unlocked, to prevent unwanted steering effects and transmission damage.

A front diff lock has an even more pronounced effect on steering and is best used when you need to clamber over a stone shelf, but can keep the wheels straight.

Rock gear

We can't think of any standard 4x4 that's ideally set up for hard rock work. All but air suspended vehicles can benefit from a suspension change that improves approach and departure angles and ground clearance.

There's no need to go mad with suspension height increases: around 50mm is enough to make a significant improvement in rock-hopping clearance.

The ideal rock-hopping tyre has a mud-service tread, with separate blocks and shoulder lugs that run down the sidewall at least 50mm. Also ideal is a recessed bead section that protects the edge of the wheel rim from rock damage and stops grit getting between the tyre bead and the rim.

The best wheels for rocky trails are steel ones.
For severe rock-hopping work you can't rely just on the standard limited slip rear differential in your 4x4. More traction aids are needed.

A good electronic traction control system is ideal for steep, rocky work, because traction control is at its best in situations where it works for a short time, then has a recovery period, to build up hydraulic pressure.

The ultimate traction aid is an across-axle differential lock, either of the automatic type or driver-controlled. For the best possible tractive ability an additional diff lock can be installed in the front-axle.

You're more likely to need your winch in steep rocky country than anywhere else. Vehicles get hung up on rock ledges and stuck in crevices or holes, and it's often more difficult to manoeuvre a tow vehicle into place than it is to winch.

Winch kits include shackles, but you should add some extra ones, as well as a winch extension strap and some cable clamps for repairing a broken cable.

Steep, stony trail driving almost always involves road-building - sometimes under one or more wheels of a stuck vehicle - and for that you may need an additional means of lifting your 4x4. The standard jack is fine, but what if it jams or breaks? A second hydraulic jack is easy to stow.

The advantage of a high-lift jack is that you don't have to crawl under the vehicle to set it up. The disadvantage is that it needs appropriate jacking points on your vehicle, such as key holes in front and rear bars, and sturdy side rails.

Under body damage is common when driving over belly-scraping rocks, so the standard belly protection plate may need to be replaced by one that can take more hits.
Take off your fancy aluminium side steps before serious trail driving: it's only a half-hour job in most cases.

The most common hang-up is a tow bar tongue, so slide it out or unbolt it.