

Air Suspension Works

We've now clocked up 120,000 mainly bush kilometres on our Discovery 3 and what was a massive gamble two years ago has paid off. The suspension has lived up to Land Rover's claims for superior on and off road behaviour over conventional steel spring suspensions.

(Contrary to what you read on some blogs, where it's suggested Land Rover gave us the Disco, we did pay for the vehicle and you're welcome to check that out with our financing mate Mark McKenzie at Translease.)

When we bought the Disco 3 we didn't need any convincing about the theoretical superiority of air over steel springs, because we also test and report on trucks, up to 160-tonne road trains. Heavy trucks and buses have been using air suspensions for more than 30 years and while initial applications were strictly for on-road use, more recent uses include severe off-bitumen work.



Air suspended trucks are permitted to carry heavier loads than most steel-sprung trucks, because testing has proved that air suspensions cause less damage to road surfaces and substrates than conventional, tight-pack, steel leaf springs. In addition to that earning advantage, air suspensions provide constant ride height, regardless of load and much improved cab and trailer ride quality. Many road transport users insist that their products are delivered in air-suspended trucks and trailers.

Yet another advantage is that with electronic control, air suspension can be reactive when the vehicle is cornering. As load transfers to the suspensions on the outside of the corner the computer allows higher pressure in those springs than in the inside ones.

For a 4x4, air suspension design shares the advantages of improved ride, constant on-road ride height and cross-linked sway resistance with heavy vehicle air suspension, but there are additional features. In off-road mode, the cross-linking can be programmed so that as one wheel is pushed upwards the displaced air can pass across to the air spring on the opposite side of the vehicle, forcing it downwards to maintain surface contact. The sway resistance needed in on-road situations is bypassed and off-road wheel travel is enhanced.

Another 4x4 exclusive is different ride-height settings. In the case of the Discovery 3 the standard ride height is for on-road driving. There's a driver-selected height increase of 55mm for off-road driving and this lift is possible at speeds up to 40km/h.

Extended mode is activated automatically when the off-road height has been selected and the vehicle still grounds. The bags inflate further; raising the vehicle an additional 35mm. Should that lift prove insufficient to clear the obstacle the driver can activate another 35mm lift, for a total ground clearance increase of 125mm over standard height.

As well, there's a 'kneel' setting 50mm lower than standard that's handy when loading the vehicle or taking on vertically challenged passengers. It's also a useful setting when entering low-height car parks. The low-height setting can be locked, so there's no chance of entering a car park at the kneel height and departing, by accident, at sprinkler-smashing height.

Height control can be programmed into the key fob, so the driver can raise or lower the vehicle from the outside – great for trailer coupling.

In the interests of handling safety the 'high' setting is cancelled above 40-45km/h and that has earned the Disco 3 some criticism. There are many tracks in Australia where it's safe to travel above that speed, but extra clearance is needed to ensure the under-body – especially the vulnerable exhaust pipes – don't bang on the characteristic hump in the middle of the track.

A couple of times we've experienced the well-reported problem of computer confusion when the driver asks for increased ride height and the suspension is busy coping with rough terrain. The cure is to turn off the engine and restart the computer by firing it up again – just as you'd do on your laptop. Now we know to select ride height increase when the vehicle suspension is relatively stable.

We had a yellow icon light up on the dashboard on a remote area trip, but the suspension behaved normally. The cure – back in civilisation – was a replacement height control valve under warranty, but it's not an expensive part anyway.

Air Suspension Choices

By far the best way to get air suspension is in an integrated factory package. Land Rover, Range Rover, Audi, VW, Porsche, Mercedes-Benz and now Jeep have 4x4s with independent air suspensions as standard or optional equipment. Toyota has air at the rear of the Prado Grande, but for some reason doesn't offer air on the 200 Series.

After-market air suspension kits are available and some work very well. The best kits come with an on-board compressor, height control valves, remote air spring control and gauges that register bag pressure.

Basic kits have air lines running to fill points that employ conventional tyre valves.