This comprehensive list is all you need to make sure your 4WD gets the right suspension parts

**TIE-RODS, DRAG LINKS** – These are two key components that should always be upgraded to guarantee safe travel when tackling obstacles off-road. The tie-rods on most common live axle 4WDs are very easily damaged due to their position on the diff. Upgrading to a stronger link is recommended but also be aware, sometimes size is limited and interference with suspension arms and links can occur and actually lock the steering under full flex. In LandCruisers and Patrols approximately 35-36mm diameter tie-rods allow sufficient clearance for full, safe articulation. The material of the tie-rods and draglinks should also be considered, upgrading to a solid high-grade chromoly steel will ensure a long safe service life. The grades of chromoly available also vary greatly – anything from cheaply milled Chinese 4140 that barely make the spec, through to custom heat treated / through hardened European milled 4340.

The type of bar used greatly determines the impact strength and resistance to bending or failing as well as corrosion resistance. Another important aspect to consider is the strength of the bar once machined and threaded. Finally check what brand and type of ball joint is used! Some joints actually have far less travel then the OE joints and pivot pin and ball can be as little as ~11mm in diameter in critical areas as compared to a specifically designed joint of ~17mm.

**PANHARDS** – As these are subjected to high tensile forces in both compression and extension it is recommended that the material used be of sufficient sectional modulus (cross section or diameter) to resist failure should any offset loading occur. The types of material considered as best for upgrades should be at least medium to high tensile steels such as K1045 (solid bar) or Mecaplus E470, and for more extreme protection or competition use 4140 solid bar or even up to 4340. The thickness of the eyes at each end is also very critical as well as the welding practice used to attach them. The machining and corrosion resistance often reflect the quality and effort that has gone into the manufacture. Precision CNC machining and bending generally ensure a quality product to the customer.

**REAR TRAILING ARMS** – The factory rear arms in both LandCruisers and Patrols are quite thin and are fine for only moderate off-road work. Superior Engineering offer a range of rear trailing arms for all levels of off-roading, from the high tensile Mecaplus tubing and solid 4140 chromoly bar through to a custom milled through hardened 4340M solid bar for the ultimate in strength/weight. The lower rear arms often make contact with even small rock ledges and are very prone to damage. These arms are also put under compression in this situation when trying to climb and the result is the arm bending which often leads to the diff rotating and snapping off the shocks and the pinion flange.

**RADIUS ARMS** – This is a double edge sword, for road duties where unsprung weight is preferred to be as light as possible, a thinner arm has benefits, BUT as soon as you go off-road or do any high speed outback touring where impacts from obstacles or even unseen ruts may be encountered, a strong solid radius arm is vital for safety. The preferred material to allow enough sectional area and impact resistance should come from a medium tensile 32mm GR350 steel plate. Arms that are made from medium tensile 32mm GR350 steel plate.

**TIE-ROD ADJUSTERS** – Once lifted, Nissan Navara tie-rod adjusters are prone to failure when off-road, the solution for this is an aftermarket heavy duty item. To provide maximum strength and toughness the material used by Superior Engineering is a specialised tool-steel which after CNC machining undergoes a customised heat treatment and corrosive resistance process to provide added durability and hardness. As with any suspension compoenents you may need, contact your local 4WD suspension specialist for information on the best parts for your 4WD.