

# Selecting Replacement Tyres

Buying replacement tyres for your 4x4 is a tricky business in which you need to consider much more than the price.

Most new 4x4s are purchased by people who never go off-road and that's the determinant for the tyres that are fitted. High-speed tyres are lightly made, to reduce the heat build-up that occurs as the various components of the tyre flex.

So, nearly all new 4x4 wagons roll out of the showroom on rubber that is ideal for sealed-road, small-stone dirt road and sand driving. ('Small-stone' dirt roads are surfaces with pebbles no larger than marble-sized.)

Take standard-issue rubber on a loaded vehicle into stony or 'staky' country and you'll have plenty of tyre trouble. We know it from years of experience and from comparative testing.

We witnessed a Cooper Tyres test, done in Queensland, where original equipment tyres were compared with Cooper S/T-C tyres. Part of that testing involved running all the test tyres at low speed over a steel stud. At all pressure settings the Coopers showed much more puncture resistance than the OEM-fitted tyres:

Pressure -	Cooper S/T-C	OEM tyre #1	OEM tyre #2
kPa (psi)	(Number of passes before puncture)		
260 (38)	2	1	1
190 (28)	3	1	1
165 (24)	5	1	1
140 (20)	16	2	2
110 (16)	No puncture after 25 passes	4	4

Other results we've derived from experience and testing are that lower tyre pressures improve low-speed puncture resistance; tyre sidewalls aren't as puncture prone as the tread area; nylon tread belts improve puncture resistance; pressure is more important than tread pattern in soft sand; and lowered pressures improve the trail tackling ability of tyres.

If you want to go seriously bush you'll need purpose-built, light-truck-rated (LT) tyres, but what size and what pattern is best?

## Fat Rubber Issues

Fitting the same-sized tyres as the original ones doesn't involve any great difficulty, even if the speed rating on the replacement rubber is less than the standard tyres.

Under ADR 24, a vehicle may be equipped with tyres other than those listed on the tyre placard provided that: the load rating of the tyres is not less than the lowest load rating listed on the tyre placard of the vehicle or equivalent variant of that model vehicle; the speed rating of the tyres fitted to a softroader is at least 180 km/h ('S'), even when the tyre placard requires a higher speed rating than 'S'; the speed rating of the tyres fitted to vehicles with special features for off-road use of at least 140 km/h ('N'), even when the tyre placard requires a higher speed rating than 'N'.

In special circumstances, the speed rating may be less than the ratings specified above if the speed rating of the tyre is more than the vehicle's maximum speed.

If you want to upsize your tyres, the situation becomes a little more complex, because different States and Territories have different tyre size restrictions.

The most conservative is NSW, which currently limits diameter changes to 15mm over the maker's largest optional tyre diameter for that vehicle model and a 25mm increase in wheel track (the distance across the footprint of the vehicle, measured at the tyre tread centres).

A Draft National Code of Practice for Light Vehicle Construction and Modification is being evaluated by the various State and Territory authorities. In this document the permissible tyre diameter change is 50mm and the track change is 50mm for 4x4s with live axles front and rear.

Another ramification of any tyre size increase is the effect that change can have on vehicle height. The Draft Code proposes that no 4x4 can be raised more than 50mm without an engineering certificate. If you've already lifted your vehicle 50mm by means of a suspension change – a very common height increase – any tyre height increase would be technically breaching the Code. Some authorities already police a maximum 50mm height increase, regardless of how it's achieved.

Tyre width is also considered under the Code, which proposes a width limit of no more than 50 percent greater than the original tyre. The only cases where we can envisage this being a limiter on width are where the wider tyres won't fit within the bodywork, or where the wider rubber could have an adverse effect on steering behaviour.

A consideration many 4x4 owners overlook when fitting larger tyres to their vehicles is the change in rolling radius. This is effectively a change in final drive ratio that can reduce off-road ability and adversely affect top-gear gradeability – particularly when towing.

Another nasty effect of big tyres with large rolling radius is a reduction in braking ability. Any increase in tyre radius moves the tyre-road contact patch further away from the braking action, reducing brake power at the road surface for the same amount of pedal pressure.

All these side-effects suggest that a modest tyre size increase is best. Most recreational 4x4 wagons produced in the last 10 years left the factory on appropriately-sized rubber. Utes and some working wagons came with skinny tyres, but most of those can be upgraded by fitting the wheel and tyre sizes specified for up-market models.

## **Patterns and Compounds**

Tyre patterns for 4x4s span the range from pure-highway to pure-off-road. It's best to buy what you need, not what you think looks cool. Street-pattern LT tyres run quieter than lug types, use less fuel and work fine on nearly all on and off road surfaces.

Pure-off-road tyres are obvious, because of large, widely-spaced block patterns that often extend down the sidewalls. They're noisy, thirsty (because of much higher rolling resistance) and they wear in a characteristic 'heel and toe' chamfer that can cause vibration when the tyres are partly worn.

In between these extremes are patterns that have separate tread blocks, but they're closer spaced and are less aggressive in appearance.

Highway-pattern LT tyres will do well in most off-road situations, but if you're on dirt and rocky trails most of the time, go for the block pattern types.

Tyre makers compromise between grip and wear with rubber compounds. The longer-lasting compounds are hard, so they wear well when used mainly on smooth bitumen and dirt surfaces.

However, they tend to 'chip' when used extensively on stony roads.

Softer compounds don't wear so well on smooth surfaces, but the treads flex more readily than hard-compound rubber, making them more chip-resistant.

Once again, it's a case of buying what you really need.