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As one front wheel loses traction all the traction load of moving the vehicle is rapidly transferred to the two rear wheels, as both front wheels are no longer providing any traction. This doubling of load on the rear wheels encourages them to break traction and spin. If the load was transferred smoothly or evenly then they wouldn't spin but this doesn't happen in 4WD situations. If the front differential can be made to always contribute some tractive effort then the rear wheels won't spin.

The alternatives to improve traction are a Limited Slip Differential (LSD) or better yet an automatic front locking differential from 4WD Systems



An LSD has the same action as an 'open' differential but has the advantage of providing some balance of the drive in certain circumstances but not if there is a significant difference in the tractive resistance on the two wheels for example and one wheel on slimy mud, the other on hard rock or b) one wheel in the air, the other on ground. A Locking Differential mechanically locks the two axles together so that drive is always shared evenly between the two wheels. If the tyres do lift off the ground, the wheel in the air can only turn at the same speed as the one on the ground. This means no spinning wheels unless they both spin. There are two basic styles of locking differential, manual and automatic. When locked, all differential Automatic lockers provide the same traction.

The manual styles rely on the driver making a judgement about the possible loss of traction in each situation. The automatic style should really be termed automatic un-lockers as they are always engaged and automatically unlock. Automatic lockers have little effect on the steering so they are ideal to fit to front differentials where the greatest improvement is to be gained.

The majority of 4WD vehicles come with an LSD standard in the rear. Almost no models come with any traction device in the front differential where it is most needed.

THE CONCLUSION

As if it were that simple.

**WITH AN
AUTOMATIC DIFF LOCK
IN THE FRONT, IMPROVED
SUSPENSION ALL ROUND,
GOOD TYRES AND A
COMPRESSOR YOU CAN GO
ANYWHERE!**



TYRE PRESSURES

We see or recognise tyre deflation by the amount of "bag" or side wall deformation on both sides of the rim (it may not be symmetrical).

However this extra width serves largely to create more resistance for the tyre as it passes over or through the ground. The second but more important aspect of deflation is the increase in the length of the tyre footprint as tyre pressures are reduced. The width of the tyre is less important than its height. Hence a tall skinny tyre (say 7.50 x 16) may gain more footprint than a shorter wider tyre (say 10.5R x 15). Wide tyres may provide better control on road but don't necessarily have an advantage off road. Even so I have 33 x 12.5R x 15 tyres and I find they don't perform well in sand until I reduce the pressures to around 12 or 13 psi. If I get stuck or I know it is a particularly soft area then I reduce the pressure to 10psi. If I get bogged down at 10psi then I know I really shouldn't be there for a start (aw' hell it happens all the time) and down go the pressures to as low as need be to stop the tyre slipping on the ground. On a couple of beach occasions I have been bogged right at the waters edge. Nothing like an incoming tide to increase the heart rate! With the pressures at 4psi the tyres look flat but will float over almost anything. I simply drove up the beach with very little power and no turning. When at the top of the beach I pumped the tyres back to 10psi and on my way (back to camp for clean clothes and respirator).



Tyre off bead in sand

The lower limit of tyre pressures is governed by the speed and load of the vehicle. When pressures are low it is easy to push the bead of the tyre away from the rim so you have to be careful not to turn too sharply or at too greater speed. It is also easy to bounce the bead off the rim when going over undulations too fast at low pressure

In both cases you get instant deflation of the tyre (assuming they are tubeless). If this happens, with the use of a quality under bonnet compressor of sufficient capacity you can easily hold the bead against the rim by hand (after jacking up with a bull-bag or similar) and the compressor will re-seat the bead.

If you have tubed tyres you will find the tube will slip inside the tyre and eventually tear the valve stalk off the rest of the tube.

A new tube will be required, a bead breaker kit and tyre levers to fit it.

As the load increases so does the required tyre pressure. The pressures do not need to be as low to get the same bag shape or contact area increase and more pressure is required to keep the bead against the rim or stop the tube slipping inside the

tyre, depending on the style. With the heavy loads of outback touring, tyre pressures from 18 to 28 psi are to be expected.

COMPRESSORS

If your tyres are slipping or spinning on the ground, be it sand, mud, grass or rocks then they have lost traction. Deflating the tyres will result in greater surface contact with the ground and hence improved traction. Everyone knows about deflating tyres in sand but many 4WD drivers are reluctant to reduce tyre pressures on other surfaces.

Get yourself a good compressor and try it next time you're 4WD driving. The difference is amazing.



Designed for very fast inflation, the 4WD Systems Series 1 and Series 2 compressors are both suited to heavy duty applications and are built to commercial standards.

Air capacity comparison between leading models ★						
Model	Systems II	Systems I	Big Red	Blue T2	Bullet	ARB
Litres/min	61.7	37.1	31.7	30.3	29.5	24.1
Cubic ft/min	2.18	1.31	1.12	1.07	1.04	0.85

★ Obtained from manufacturer's rated specifications & Overlander magazine

SPARE WHEEL CARRIER

The chassis mounted 4WD Systems Spare Wheel Carrier range is designed for rugged off-roading and easy every day use. Available for 60, 80 & 100 Series Landcruisers, Nissan Patrol & Pathfinder, and Mitsubishi Challenger. Optional hi-lift jack carriers are also available.

