

# Repairing Flat Tyres

The majority of bush travellers use tubeless tyres these days, so repairing them on the run is the main focus of this article; however, we've included a section at the end on tubed rubber.



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Sooner or later you'll have a flat tyre in the scrub. Hopefully, it won't be a disastrous blowout that destroys the tyre and poses a risk of a vehicle accident.

Tubeless tyres normally don't go flat all at once: a puncture causes a slow leak and the tyre gradually goes flat – if you're lucky.

If you're unlucky, this slow leak causes the tyre to flex excessively and it gets hot enough to blow out – usually in a characteristic 'unzipping' of the sidewall.

Assuming you've stopped the vehicle before blow-out point, you'll see a partially deflated tyre. If you're on the bitumen, heading for a town, simply replace the wheel and tyre with your spare and have the flat fixed professionally.

Professional repairers demount the tyre and check it, before fitting an internal 'mushroom' patch. The 'stem' of the 'mushroom' goes into the hole and the 'head' is glued to the inside of the casing. When a professional says a tyre is 'buggered' and can't be repaired, don't drive on it looking for a second opinion!

If you're on a gravel road it makes more sense to plug the leak and continue to drive on the bush-repaired tyre, at greatly reduced speed, rather than risk a puncture in your spare tyre and finish up with two damaged tyres. Have the plugged tyre repaired professionally as soon as possible.

If you're on a slow, bush track the best procedure is to plug the leaking tyre and continue doing so if you have additional punctures. At very low speeds there's no safety risk in driving on plugged tyres. Why would you replace the damaged tyre with a spare and risk damaging that tyre as well? We've done trips where we've had more than 10 plugs in a tyre!

We've sometimes had a large root piece snap off inside a tyre and we've been able to plug the tyre with a ring of plugs around the obstacle: no good for road driving, but fine on the Madigan Line. Plugged tyres must not be driven at road speeds and pressures, but should be considered 'limp-home' options.

## How to Fix a Flat Tyre

Don't rely on pressure-pack, spray-in tyre 'repair' liquids that are supposed to pump up the tyre while they repair the leak.

They don't hold enough pressure to inflate a flat 4x4-sized tyre, even if the sealant does work and what do you do then?



All 4x4 accessory shops sell tyre plug kits that come complete with auger, applicator, plugs and lubricant. A proper tyre repair kit contains sticky, fibrous plugs that get pushed into a puncture hole and 'mushroom' out on the inside of the tyre. Then, you re-inflate the tyre using a portable air compressor.



The first repair step is to locate the leak. As soon as you detect the flat tyre, pull up immediately, if it's safe to do so and inspect the tyre. Normally, you'll hear air escaping, so finding the puncture site isn't difficult.

Where it's an obvious tread puncture you can sometimes plug the hole in situ, without having to remove the wheel. Small puncturing obstacles can be pulled out with pliers.

**Remember that plugged tyres need professional assessment ASAP and thereafter may be suitable only as low-speed, bush travel spares.**

If you can't see the hole, a plastic drink bottle, filled with soapy water, is the key, because the water will bubble when it's sprayed over the leak. If you think the leak can be plugged, ready your tyre repair kit.

Tyre plug kits come with an auger that's capable of drilling out a jagged hole, but don't be too quick to grab it. Try inserting a plug first, using the lubricant provided.

Fit a plug into the split end of the insertion tool, dip the plug into the lube and then push it into the hole, until the two plug ends are projecting a centimetre or so. Slide the insertion tool collar against the tyre and withdraw the tool.

If the plug insertion tool can't be pushed in, it's time to ream the hole a little with the auger and try plugging once more. However, don't make the hole any bigger than you need to and never use the auger in a sidewall puncture, or you risk slitting the sidewall irreparably.

The golden rule is that tread shoulders and sidewalls must never be plugged, but for tiny punctures and very low speed bush work, sidewall plugs can get you out of trouble.



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## **Removing and Fitting Tubeless Tyres in the Bush**

Unless you have split-rim wheels you should avoid having to remove tyres from wheels and refit them in the bush: it's bloody hard work getting heavy 4x4 tyres on and off wheels and there's a risk of damaging rims and tyre beads.

Then there's the problem of seating the beads before you can inflate a tubeless tyre.



But, let's envisage the situation where you've run out of spares on wheels, so you need to remove a buggered tyre from a wheel and replace it with a good one.

What you learn as you remove the useless tyre will help when it comes to fitting the fresh one!

Loosen the beads on the damaged tyre with your tyre pliers or bead breaker and then use a pair of tyre levers to tease the outer bead over the outside rim.

Use a couple of small pieces of old carpet to protect the rim from tyre lever scarring. Then use the levers and a rubber mallet to force the inner bead over the outer rim.

Have a beer!

The new tyre goes on the wheel over the outside rim, in the reverse order to the way the old tyre came off. Lubricate the beads with soapy water to ease their passage.

Have another beer!

The fun isn't over yet: you need to seat the tyre beads, so the tyre will inflate. A fresh tyre normally sits well against an undamaged rim, so with plenty of soapy water on the beads and rim, air compressor running and several pairs of hands pushing and pulling you'll often get the beads to seal. Remove the tyre valve for this operation, to allow maximum air flow: once the beads are fully seated you can replace the valve and inflate the tyre to the desired pressure.

If manhandling the tyre doesn't work, bead seating can be aided by running a length of rope around the circumference of the tyre, in the middle of the tread and twisting a stick between the two falls of the rope – a Spanish windlass - to tighten it. An alternative is a ratchet strap, but it's dangerous should the metal bits fail while you're inflating the tyre.

If your fire insurance is paid up, you can squirt a dose of aerosol can propellant into the gap between tyre and rim and ignite the hydrocarbon gas. The flame front that follows pops the tyre beads into place. Note that we don't recommend this method!

Should you enjoy doing tyre swaps so much you want to do it again, you can buy purpose-designed bead sealing rings from Gempler's in the USA. These neoprene rings are made for light truck tubeless 16.5-inch and 17.5-inch rims, but can be used at a pinch on 16s and 17s. We've also heard of people using push-bike tubes as bead rings, to aid air sealing: the lubricated tubes pop out of the gap between tyre bead and rim as the tyre inflates.

We've never been pushed far enough to stuff a recalcitrant tyre carcass with grass as a last resort, but we've heard of it being done!

## **Tyre Repair Essentials**

Don't go bush without the following:

- **Tyre pressure monitoring system**
- **Tyre pressure gauge**
- **Air compressor**
- **Spare valves**
- **Tubeless tyre plug kit or tube patching kit and spare tubes**
- **Tyre changing tools**
- **Second jack**
- **Jacking plate**

## Preventing Punctures

Speed, weight and pressure are influences on punctures, and our experience shows that if you can reduce speed, weight and pressure you'll normally have fewer punctures.

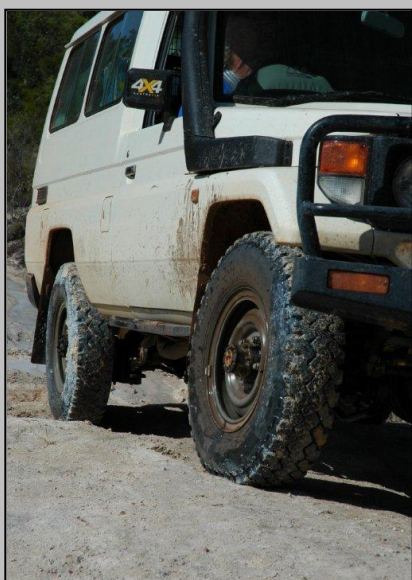
A [tyre pressure monitoring system](#) gives early warning of a slight leak, allowing you to plug the tyre before more damage is done. We've saved several tyres by using monitoring systems and wouldn't go bush without one.



The jury is still out on internal tyre sealing treatments that claim to seal punctures as they occur. Tyre makers don't like them because they block a hole without necessarily warning the driver that there was a puncture.

## Fixing Flats in Tubed Tyres

We'll assume for this topic that your tubed tyres are mounted on split rims, which is standard procedure on Japanese tubed-tyre 4x4s.



Land Rover used to fit tubed tyres to one-piece rims and that's a most undesirable combination: don't even think about going bush with that arrangement.

Demount the wheel and lay it on a flat surface, with the split rim uppermost. Tyre pliers or a similar bead breaker are necessary to separate tyre from wheel. You'll then need large, long-shaft screwdriver or thin-tipped tyre lever to tease the end of the locking ring out of the split rim.

The ring and the outer rim can then be lifted off and it's time to pull out and inspect the inner tube.

You also need to run your hand all around the inside of the tyre, checking for any protrusions or carcass wire. Any sharp protrusions need to be removed and/or patched before putting a repaired or new tube in the tyre.

Replacement tubes of exactly the right size are necessary, because you can't always patch a punctured tube: wrong-sized tubes will fail quickly through chafing.

Pack plenty of different-sized tube patches and some that are suitable for patching the inside of the tyre. You need a fine rasp to rough up rubber around a hole.

Pack a large number of small-sized rubber-solution tubes, rather than a few large ones. This glue 'goes off' in its package very quickly once opened.

Putting it all back together again is the reverse procedure, but make sure the locking ring groove is cleaned thoroughly and the locking ring is lightly lubed and seated *perfectly* before you inflate the tyre.

Always inflate the tyre with the wheel standing upright and the ring pointed away from people, just in case it flies loose.