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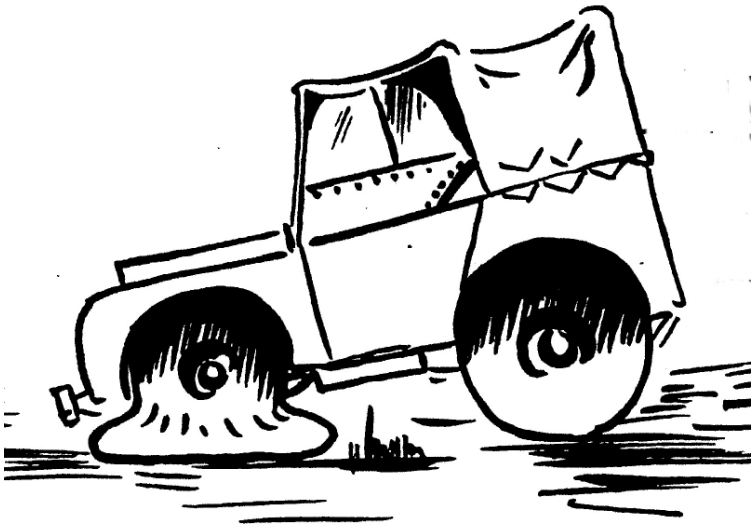
# Tubes for Tyres



This article about tubes has been put together because very little information about this subject is available to the recreational 4WD owner.

In extreme tyre conditions tubes are a very helpful tool for the modern tubeless 4WD owner.

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# Tubes for Tyres

4WD travellers these days mostly use tubeless tyres, the only exceptions being split rims and the odd Land Rover with tube type rims. It is hardly surprising that along with the apparently decreasing knowledge about tyres in general 4WDers also have a very poor level of knowledge about tubes and how to handle them. From what I have witnessed most folks simply don't give tubes any thought at all. Anyone with tubeless tyres looking to do a big remote area trip should give tubes a thought as the poor old tube can be a very good safety net for the tubeless tyre user.

Dealing with tubes can be a frustrating job if you don't have a few ideas of how to handle them. Much the same as the other information pages on this site I thought I'd jot down a few things I have been taught and many more things I have had to learn the hard way. As usual I'll go through the different subjects one at a time, and remember that this is my experience after more than 750,000kms on tubes in 4WDs and having dealt with hundreds of punctured and damaged tyres both tubeless, tubed and split rimmed.

Here are three examples of what goes on with tubes;

- Six years ago during a very tough off-track section on a private trip, two vehicles using tubeless tyres ran out of plugs. We took the worst plugged tyre off the rim and bonded several patches over the various holes in the tyre. Asking if they had some tubes I was told they had only one spare tube between two vehicles, good oh!! Anyway the bloke got the tube and we fitted it no worries. Problem then was the tyre wouldn't inflate. The tube had a hole in it. Turns out that tube had been sliding around in the bottom of a toolbox for several years. That's not so bad, but when there are tools, smaller toolboxes etc also sliding around in the same box you end up with a tube that is a little worse for wear.

- Five years ago a fellow had two punctures in two tubeless tyres one day. We stripped the tyres off and bonded on good big patches. One tyre inflated well, the other would not. Tried everything and still no go. Broke out the spare tubes, brand new still in the plastic bags. Now I had learnt from the previous effort described above to inflate every tube to check for damage before fitting. It's not a bad trick as in this very instance the first tube we inflated had a puncture. We moved on to the second tube, it was also punctured, but some kind soul had thought to put a patch on it. Now these were bought "brand new" over the counter at some expense. Anyway patched up the tube, fitted it and inflated the tyre. Pays to be careful doesn't it.

- The other classic problem we see pretty often is when the bloke pulls out his spare tube and it has the wrong valve stem. He has neglected to tell the bloke at the tyre shop what's on the vehicle and worse still the bloke behind the counter didn't bother to ask what rims were in use.

## Beware of Tyre Shops

Be very careful dealing with tyre shops in suburban areas, particularly the big franchises. The fellows working there will almost without exception have no idea about dealing with tyres, tubes and rims in very remote country where tyre damage is a fact of life. Generally speaking these blokes won't have much of an idea about many of the issues I mention in articles on this website. Remember all they do is sell and fit new tubeless tyres which they handle with a tyre changing machine. Your best bet is to find a tyre place that handles truck gear. At the very least they should know how to handle tubes and levers.

## Tubes Available These Days

The biggest complaint these days is that the tube sold to you over the counter is not the best specimen for long term remote area work, well that's true enough. Cost is the main problem, blokes don't like paying a lot of dough for something they hope they'll never use, or blokes don't understand that with tubes you get exactly what you pay for. If your welfare rests on the tubes in your tyres, or on the tubes in your repaired tyres, then you need to be a bit more aware of what is needed. Be wary of the bloke behind the counter at the tyre shop when he says the "mining industry" uses these tubes or some such thing. Cheap tubes are fine for around town and the odd weekend away, but don't expect them to be 100% if you intend doing big miles in harsh off-road conditions. Most fellows that run tubes all the time will know this already from experience.

*It is simply the best idea to buy good quality thicker tubes. Not surprisingly they will be the ones that are not on the shelf. Pretty much any of the tubes from the major tyre manufacturers will be very good.*

These are the problems with "over the counter" tubes generally;

Too Thin

Almost without fail the cheap tubes are too thin, hold them up to the light and you can just about read a newspaper through them. The slightest damage to that type of tube will result in a slow leak down the road somewhere, there is just not enough rubber thickness to guard against tiny little damages that happen all the time and are hard to notice.

Always ask for a Heavy Duty tube, these will be thicker and last much longer even if the quality is not so good. Most places will have to order in Heavy Duty tubes so be prepared to wait.

Multi Sized Tubes

Along the same line as the too thin problem is the fact that many tubes are made to fit more than one tyre size. Now that's OK if the rubber is good quality and thick enough with the right characteristics to stretch far enough but the cheap tubes are normally a bit thin already and then you want to stretch it into the largest size tyre on the label. It'll be fine around town, but just don't expect it to last the life of the tyre it is in when you're in the bush.

Patch Glue Won't Stick

This is pretty common with the cheap tubes as well, some will take glue and others it seems the patches just won't stick for any period of time. Not much you can do except ask the blokes in the tyre shop what glue they use and if they have any tricks up their sleeves. If they'll let you, get them to show you how they do a tube repair. Also get fresh glue before every trip, none of the patch glues keep on the shelf for very long at all.

[Using patch glues can be a bit of an art-form. Follow the instructions as best you can for best results.]

## What is Not in your Tyre Repair Kit

As we have pointed out elsewhere on this website the modern over the counter tyre repair kits have a few flaws if you travel in very remote country well out of reach of a tyre shop. Mostly it is the type of tyre repair patches included in the kits but for tyres running tubes or needing to use a tube there are at least three problems.


Range of tube patches, talcum powder and Innerliner Sealer not usually in commercial kits

## Talcum Powder: The forgotten tool

It is rare to come across anyone that carries talcum powder these days in a tyre repair kit. Once upon a time it was common knowledge that with tubes you needed talcum powder. But in this modern progressive age when the latest and greatest is all you need the old skills and tools get forgotten, which is funny because in very remote country nothing much has changed except for the advent of the vehicle itself, food for thought I hope.

Everyone who uses tubes, or may have to use tubes, should have Talcum Powder in their repair kit, it is that simple. There are several reasons for doing this;

- Dry lubricant - The powder allows the tube to move against the tyre during flexing and movement without chafing. This is most important at lower pressures such as for off-road and sand. [One of the many reasons why a repair patch will not stay on a tube is because of this lack of lubricant. The friction with the tyre sidewall will simply rub the patch loose.]

This tube patch rubbed due to a combination of lack of talcum powder and being at low pressure for several weeks

- Release Agent - by not allowing the repair patches and excess glue to stick. Tube patches won't stick to tyres and tyre patches won't bond to tubes. If you have to pull the tyre apart for another repair and the tube is glued to the tyre then getting it out can rip the tube so much that it can't be repaired, not good.
- If you make a meal of fitting the tube into the tyre the talcum powder will help the tube slip and unfold itself so it can inflate evenly without twists. Inflated tubes with wrinkles will eventually cause trouble.
- If you have been in the bush for a few weeks it will also make you smell a little better.

## Good Sized Patches

An identical problem as with the tyre patches, in all the kits we have seen the tube patches are too small in size & too small in number. Generally speaking if you have a puncture more than 15mm long you won't have tube patch big enough but that doesn't matter as you won't have a tyre patch either, so much for keeping your tyres in service.

You can always put a large patch over a small hole but it is difficult to put a small patch over a large hole……

## Innerliner Sealer

This is a black liquid rubber used to paint around the edge of repair patches in tubeless tyres. Innerliner Sealer is needed to stop slow leaks through the innerliner of tubeless tyres caused by the buffing required to glue the patch on. If you don't have any Innerliner Sealer you may have to fit a tube to maintain air pressure in the tyre.

## Protecting Tubes in Split Rims

A 4WD split rim by design has two gaps in the rim that dirt, dust and sand can enter the tyre over a period of time. This does play havoc with tubes and is often the reason for those annoying little slow leaks if you spend *a lot of time off-road at lower pressures*. Obviously if you are dealing with sand all the time it can be a real concern and it only needs one grain of sand to produce a bad result eventually.

The easiest way to solve this problem is to dob some silicone into the gap in the locking ring and also fill in the slot where the valve comes through the rim. That should stop sand & grit getting into the tyre and onto the tube.

## Fitting Tubes into Tyres – things to check on

The following are just some of the issues with handling and dealing with tubes anywhere. Some of the problems relate to all tyre & rim combinations, others are specific.

### Correct size tube

Tubeless

- The traditional tubeless sizes such as 15" & 16" are OK, but the late model tyres and rims in 17" & 18" are a big problem. Now this is a curly one, sometimes an incorrect sized tube may need to be fitted. It is a last resort but it will be better than nothing. Have a very good yarn to a good tyre fitter about this issue before going bush. If the fitter is a good one he will want to have a look at the internals of your rims for sharp edges, particularly if they are alloys.

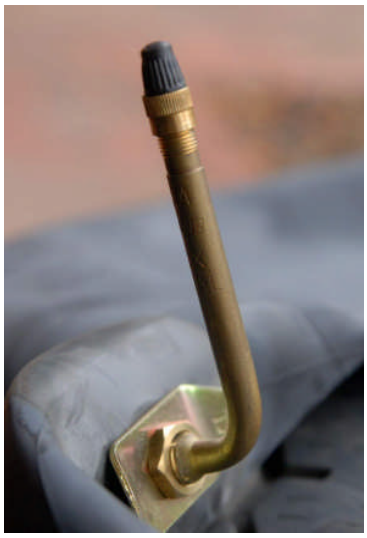
Tube rims & split rims

- For tube type rims and split rims this is not such a problem. However as mentioned before use the thicker tubes of good quality from the well known or very large tyre manufacturers.

## Correct valve stem

### TR75A – Split Rim

Split Rims have a long bent brass valve stem. It cannot be mistaken for any of the other 4WD type valve stems. Simply mention split rims and you will get the right gear.



TR75A common split rim valve stem

### TR13 - Tubeless

Tubeless tubes have a short black rubber-looking valve stem about 10mm in diameter. When fitted it looks different to normal fitted tubeless valves because the tube valve stem has virtually no taper at all, just a 10mm thick straight black valve stem about 35mm long.

TR13 tubeless valve stem

TR15 - Tubed

Tube type rims have a larger valve hole than tubeless so there is a difference in tube valve stems. Still about 35mm long but it is tapered. At the base it's about 16mm thick and goes to about 10mm at the end.

TR15 tube rim valve stem

You won't see many TR15 tubes around these days as there are not that many tube type rims still in service for 4wds. In most cases you will only find TR13 valved tubes (for tubeless). That is fine; all you need to do is ask for enough of the little plastic adapters that are made to slip over the tubeless valve to make the base larger from about 10mm to 16mm. If you can't get any of them, fit the tube anyway and just use some silicone to fill in the gap between the TR13 valve stem and the 16mm hole in the rim. You don't want sand and grit getting into your tyre & tube when you are at lower pressures.

## Check Tube is 100%

Before fitting a tube inflate it, really put some air into it. Get away from the noise of the camp and carefully inspect the entire surface looking for cuts and nicks. Tiny holes letting air out can be heard usually but if your hearing is not 100% then feel slowly with your fingers, you should be able to feel the jet of air from the hole. If you're still not sure about a bit of a cut drip or spray some soapy water on it, if it leaks the air will make the water bubble and it will be pretty easy to see. If the tube has been stored for some years check for perishing particularly at the corners where it was folded, modern butyl rubber does perish given enough time.

## Check for Stickers inside the Tyres - Tubeless

One little trap with tubeless tyres and the fitting of tubes are those inspection stickers from the factory on the inside of the tyres. Some of these stickers will be paper, some will be aluminium. Have a good look inside the tyres and without fail get rid of them. Take them off otherwise there is a very good chance that the tube will have a hole rubbed in it from those stickers.


Innerliner sticker in tubeless tyre

## Talcum Powder

Rub talcum powder all over the tube, a nice light dusting of powder is great. Also dust powder into the tyre as well, concentrate a light coating of powder onto both sidewall areas. This is where the most movement of the tube occurs so the dry lubricant is most needed there. Don't use handfuls of the stuff, too much in a clump can also rub a hole in tubes. Make sure you dust any repairs both on the tube and on the tyre. You don't want them sticking together.

## Inside the Tyre – spotlessly clean

Blokes I have watched usually have no idea about how to be spotlessly clean when doing tyre repairs in the bush, dirt, dust and sand go everywhere. You can't afford to leave any sand and grit inside the tyre when a tube is fitted. Any sand or grit inside a tyre with a tube means trouble. It is just like coarse sandpaper to a tube – learn to be spotlessly clean and tidy.

## Tubeless Rims – no sharp bits

Some of the tubeless rims have sharp edges and machining marks left in them from manufacture, alloy rims are the worst in this regard. I always check the "inside surface" of the rim for defects like these as they will cut or rub a tube pretty quickly particularly at lower pressure for sand etc. Be very aware that hand tools will also damage tubeless rims, particularly alloys. Get your file out and smooth it off if you do find anything sharp.

Damage on alloy tubeless rim from bead breaking tools, not good for tubes

## Alloy Tubeless Rims – valve hole problems

Alloy rims have a few problems in the context of tubes. The valve holes are normally quite thick which doesn't allow the tube valve to poke through far enough sometimes to get an airline on and alloy rims usually have sharp edges at these valve holes which can rub and cut a tube at the valve over time.

Steel tubeless rims are a far better option for remote area work where multiple tyre punctures are normal and the fitting of a tube to reinforce repairs is likely.

Tube valve barely poking through alloy rim

Sharp edges at the valve hole on alloy

## Inflate tube – fill it out

Once the tube is installed inflate it a little to fill the shape out and get rid of any twists or wrinkles. Don't put too much air in otherwise you may have trouble getting the last of the tyre on the rim.

## Wheel-weights

Keep a close eye on the wheel-weights during the whole job. Make sure you don't knock any of them off with the levers or the bead. You do not want a loose wheel-weight inside the tyre with your tube when you get the job completed. If you drop one in the tyre in a short time the wheel-weight will rub a hole in the tube and you will be getting a bit more tyre changing practise……

## "Pinching" a tube

Whenever you fit a tube to any tyre be very careful not to "pinch" the tube between a lever and the tyre or rim. You can also "pinch" a tube between the bead and the rim when you push the bead down into the well when refitting the last tyre bead. It is a little hard to explain with words but just go steady and by looking and thinking before doing the jobs you should avoid most problems.

This is why it pays to practise and learn how to do things at home where there is no pressure and you feel comfortable.

## Final Inflation - letting the trapped "air" out

Tubeless

During inflation of a tubeless tyre with a tube air can become trapped between the tube and the tyre, this can give you a false pressure reading which can lead to a tyre failure down the road if you are not careful. For this problem I will usually inflate the tube so there are no wrinkles in it before work on the last tyre bead, and during final inflation push the valve in and out so the trapped air can get out through the valve hole. Remember the rim and beads are airtight and the only place the trapped air can escape is through the valve hole.

If air doesn't stop coming out the valve hole there is a problem, you'll need to take the tube out and look for damage.

Tube Type Rims

Not so critical with a tube type rim, some of the air will escape from around the bead but most of it will rush out through the valve hole. Air should only come out for a short while, it will depend on how quick your compressor is, but if it doesn't want to stop coming out of the valve hole then you probably have a hole in the tube for some reason and you will have to take the bead off again and get the tube out to find what is wrong.

If air doesn't stop coming out the valve hole there is a problem, you'll need to take the tube out and look for damage.

I've left a few things out of this article but see how you go.