

Tyre repair and replacement

This guide provides an overview of:

- Repairing a punctured tyre – tube patch repairs
- Fitting a tube protector strip
- Fitting a replacement tube and/or tyre
- Castor tyres

Repairing a punctured tyre – tube patch repairs

Patch repairs can be successful but can also be challenging and take considerable time if there are small or several holes. A new tube however, is economical and provides a more certain chance of success.

Items needed:

- ▶ Container of water
- ▶ Tools to remove wheel if required (large shifting spanner, or 17-19mm spanners, at times up to 21-22mm, or 1" or 1 & 1/8" may be needed)
- ▶ Tyre levers or spoons (screwdrivers or objects with sharper edges can pinch and puncture the tube)
- ▶ Bike tyre patch repair kit (includes patches and sandpaper)

1. Remove the wheel from the wheelchair. If quick release wheels, push button and remove. If bolt on wheels, turn wheelchair upside down, loosen the nut on the axle and remove
2. If the tyre is not fully deflated, depress the valve to let all the air out
3. Use tyre levers to take the tyre off the rim – side opposite push rim
4. Push the valve stem through the hole in the rim and remove the tube. Check the inside of the running surface of the tyre for glass or anything still protruding through that could cause a repeat puncture
5. Pump up the tube full of air then place the tube under water, moving the tube around the water basin until you see air bubbles. Use chalk or similar to mark the location of the hole
6. Use the sandpaper in the bike tyre repair kit to roughen the surface of the tyre around the area to be patched
7. Remove backing from patch and apply to the marked area on the tube, pressing the patch on firmly. Leave patch to adhere for a few minutes. Some self adhesive patches are thicker and provide a tackier bond while others are thin with a weaker bond till the tyre is inflated – if applied carefully the later can still provide an effective seal for most holes
8. Insert the tube back into the tyre, pushing the valve through the hole in the rim, working around the tyre. Give the tube just a couple of pumps of air so it is slightly inflated – this reduces the risk of pinching or twisting the tube
9. Lever tyre back onto the rim. Inflate to the pressure shown on the side wall of the tyre or at least 25-30psi (pounds per square inch). Never run tyres at less than 20psi unless they are special low pressure tyres
10. Replace the wheel and fasten axle bolts if required. The wheel should spin freely but not move from side to side on the axle
 - If wheel does not spin freely, loosen axle nut a little
 - If the wheel moves from side to side the axle fasteners are too loose, tighten further



Water test for hole(s). Make sure you move all parts of the tube through the water to check if there is more than one hole. Allow the tube to dry off before patching



Make sure the tube is not twisted. A small amount of air in the tube makes it easier to avoid twisting or pinching the tube



Take care with tyre levers not to pinch and puncture the tube



Valve not straight! The valve should be perpendicular / at right angles to rim

Fitting a replacement tube and/or tyre: If you carry a spare tube it is quicker to fit a new tube than it is to repair the puncture (as above)

- ▶ Repeat the procedure on page 1, skipping steps 5 to 7 (steps 5 to 7 apply to patching a punctured tube).

Tyres should be replaced when the tread is worn out; if any cracks are visible on the tyre (very old tyres) or if any fibres are showing through the running surface of the tyre.

To fit a **replacement tyre**, follow steps 1-3 above. After 1 side of the tyre is off the rim, then the other side can be levered over the same edge of the rim so the tyre is fully off the wheel. Follow these steps in reverse to fit the replacement tyre.

Repeated flat tyres, thorn proof tubes and tube protection

In some areas or activities people get flat tyres quite regularly due to hazards such as those found in:

- Outdoor areas with “goat head” burrs or similar hazards – these sharp objects easily pierce the tyre and tube
- Office areas where thumb tacks or staples, etc can easily cause a puncture

Thorn proof tubes (a thicker tube found in bike shops) still puncture fairly easily and “tube protectors” (or “tyre liner” by some manufacturers) can be effective in preventing punctures for shorter pointed objects, but may be punctured by upturned thumb tacks or similar. Some people have used seat belt webbing as a tyre liner and reported success, though something as sharp and long as an upturned thumb tack may still get through.

For some power wheelchair tyres or wider tyres there may be an alternative tyre available which is more resistant to punctures. Standard grey wheelchair tyres are 4 ply, with 4 layers to the tyre. Six or 8 ply tyres have more layers, are tougher and longer lasting. Specialist wheelchair tyres with Kevlar lining have been reported to resist punctures very effectively.

Fitting a tube protector strip

Tube protector strips (or tyre liners) are used by mountain bike riders where large thorns can be experienced. They are sold in some bike shops or can be ordered in. If you have standard wheelchair tyres, these are 24” diameter by 1 & 3/8” wide. Tyre liners come in sizes to suit bikes ranging from narrow to wide, so choose a width to suit your size and width of wheelchair tyre size. Bike wheels may be 24” or 26” so there is often excess length to many tyre liners when used in wheelchairs

1. Remove the wheel from the wheelchair
2. Deflate tyre and lever one side off rim
3. Remove tube
4. Place tyre liner around the tyre so it lines the inside of the running surface of the tyre. If the strip is too long, overlap or trim off any excess material
5. Lever tyre back onto rim. Inflate to the pressure shown on the side wall of the tyre or at least 25-30psi. Never run tyres at less than 20psi unless they are special low pressure tyres



Castor tyres

Air filled castor tyres are a little different to repair/replace. These are repaired or replaced by MASS on all MASS subsidised manual and powerdrive wheelchairs, or mobile shower commode chairs. Call MASS Repairs Staff on 3136 3545 to arrange. If you do find you need to repair or replace air filled castor tyres, note the following variations:

1. Remove wheel from the castor fork. Take note of any washers and/or spacers to ensure they are refitted correctly
2. Deflate the tyre
3. Many air filled castors are fitted to a split rim. Unfasten the bolts or screws that hold the 2 sides of the rim together. The tyre and tube are then easily removed
4. Repair or replace the punctured tube and place back inside tyre
5. Place the tube into the tyre and fit one side of the tyre to the castor rim. Then fit the other half of the castor rim so the holes on both sides of the rim line up and the valve passes through the hole in the castor rim. Fasten the rim together
6. Inflate to the pressure shown on the side wall of the tyre or at least 25-30psi. Never run castor tyres less than 20psi unless they are special low pressure tyres
7. Replace the castor wheel in castor fork and fasten. The wheel should spin freely but not move from side to side on the axle
 - If the wheel does not spin freely the axle fasteners are too tight, loosen until it spins freely
 - If the wheel moves from side to side the axle fasteners are too loose, tighten further

Some **solid castors** can be very difficult to remove or put onto a castor rim. A special press can be used to push these over the edge of the rim in a workshop and they are not designed to be repaired. These are usually replaced as a single unit, with new tyre, rim and bearings fitted.