

## WORST-CASE SCENARIO.

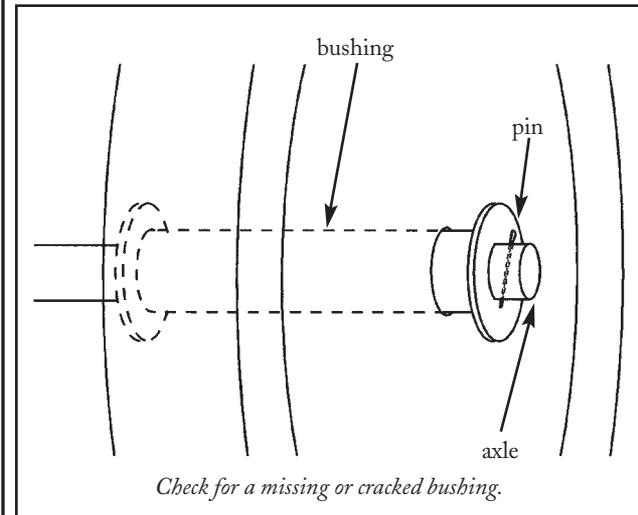
# HOW TO FIX A WAGON WHEEL

## 1 Examine the wheel.

The wheel is generally held in place by two pins, one on either side of the hub, which is the center of the wheel. If the outer pin breaks, the wheel may fall off or become damaged. Most wagon wheel failures occur at the hub, which carries the weight of the wagon's load.

## 2 Locate the wheel's bushing.

The center of the hub has a thin plastic or metal bushing—a  $\frac{1}{2}$ - to 1-inch section of tubing—that spins around the axle. Check for a missing or cracked bushing.



**3 Remove the bushing.**

If the bushing is still present, use pliers to remove it. If the bushing has broken into several pieces, remove all pieces.

**4 Construct a new bushing.**

Cut a small section of plastic tubing—a section of garden hose or plastic pipe—to fit inside the wheel hub. (If the bushing is metal, use a hacksaw to cut a small section of metal pipe.) The new bushing should fit snugly inside the hub, but should be a few millimeters in diameter bigger than the axle so the wheel can spin freely. Use pliers or a rubber mallet to fit the bushing into the hub, if necessary.

**5 Replace the wheel.**

**6 Spin the wheel.**

The wheel should spin around the axle with no wobbling: If the wheel wobbles, the bushing is not tight against the hub and should be reset.

**7 Insert a bolt or pin through the axle.**

Repair or replace the pins as necessary. If the pins are damaged and cannot be reused, insert small tacking nails through the pinholes. Bend the sharp end of the nail with a set of pliers to hold it in place. Be certain that the nails are secure and that there is no slippage.

## HOW TO FIX A FLAT BIKE TIRE WITHOUT A PATCH

**1 Release the brake.**

Squeeze the brake, then pull out the brake cable from where it connects to the brake shoes next to the rim of the wheel.

**2 Remove the wheel.**

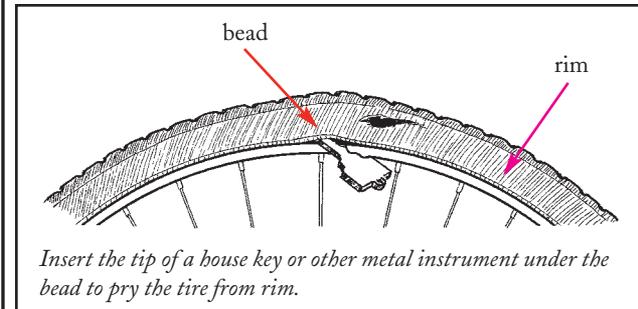
Open the quick-release lever or use a wrench to loosen the bolts from the wheel hub. Take the wheel off the bike.

**3 Remove one side of the tire from the rim.**

Insert the tip of a screwdriver, house key, or other metal instrument under the bead (the edge where the tire attaches to the rim) and press down on the tool. Repeat in several places until that side of the tire comes free.

**4 Remove the tube.**

Pull the tube out of the tire.



**5 Construct an emergency patch.**

Fold several small-denomination bills into squares or rectangles, depending on the size of the gash. Stack the folded bills and place the patch inside the tire. Cover the gash completely. If no cash is available, use a foil wrapper from an energy bar or candy bar.

**6 Stuff the entire tire with leaves or grass.**

Make sure your patch does not slip.

**7 Replace the tire bead over the rim edge.**

Use your hands to work the tire bead back over the rim edge. It may be necessary to use a key or screwdriver to fit the whole tire back on the rim. As you are working, you may need to add more grass or leaves to make the tire sturdy enough to ride. Once the tire is back on the rim, work both sides of the tire bead from side-to-side until it is fully secured.

**8 Remount the wheel.**

Replace the wheel by either snapping the quick-release lever back into position or by tightening the nuts that hold the wheel in place.

**9 Ride home slowly.**

**Be Aware**

A large gash in the tire's sidewall may result in the still-inflated tube sticking out of the tire. Serious injury may occur if the bike is ridden in this condition.

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