



**The Solution to Pinch Flats™**

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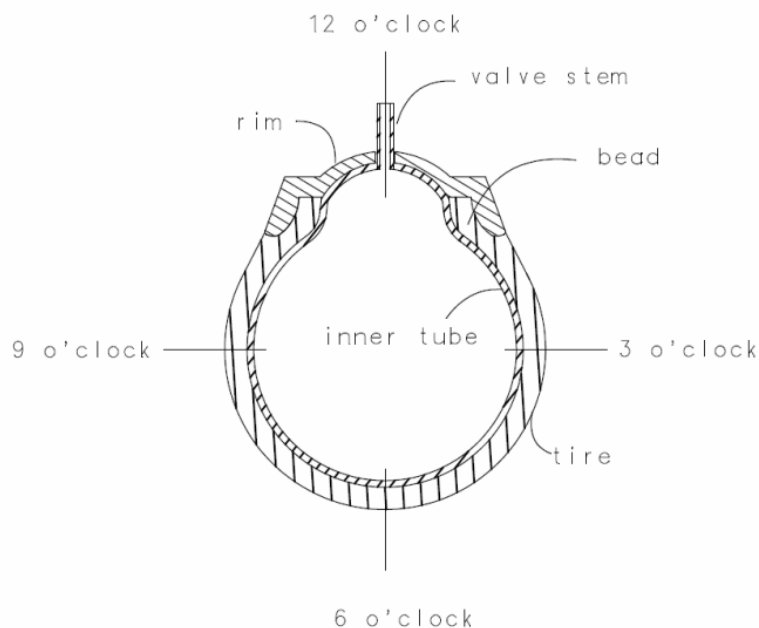


**JEC Products, Inc.**

## TUBE SADDLE® Tech Tips

### Flat Tire Forensics 101: Part 1

*Tech Tips* is a free publication intended to provide useful information to all riders and racers. We encourage you to pass it along to all your riding buddies. In this first *Tech Tips* edition we deal with all aspects of the dreaded flat tire, how to diagnose them and how to avoid them. In Part 1 we cover the “Pinch Flat” and “Puncture Flat”. In Part 2 we will cover the “Rim Lock Failure Flat – Valve Stem Tear” and in Part 3 we will cover the “Friction and Heat Flat” and “Installation Failure Flat.”



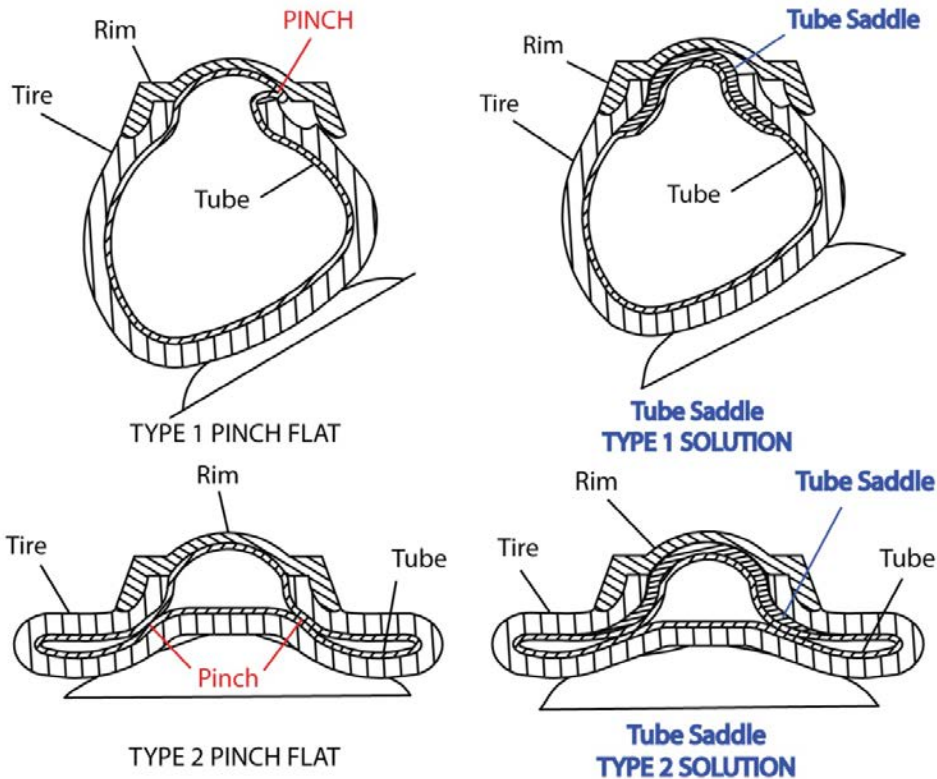
#### How to identify the “Pinch Flat” and the “Puncture Flat”, and what you can do to prevent them

We have never met a rider who has not had a flat tire. But we have met many riders who either don't know the cause of their flat, or erroneously misdiagnose the cause of their flat. Lets first start with a tire-inner tube-rim assembly in cross section.

The figure above shows a cross section of a tire-inner tube-rim assembly showing the valve stem, rim, inner tube, tire, and tire bead. Now imagine interposing a dial clock over the assembly. The 12 o'clock position is the valve stem, the 6 o'clock position is the bottom of the tire (knobbies not shown), and the 3 o'clock and 9 o'clock positions are the sidewall positions of the tire. In the articles below, we will refer to a particular position within the assembly by its “o'clock” position.

## The “Pinch Flat”

The pinch flat is the most common flat of all. There are two types of pinch flats, which we call Type 1 and Type 2.



In the upper left above, the Type 1 pinch flat, or “roll-over pinch flat,” is shown. The roll-over pinch flat occurs when hitting an object hard at a side angle that causes the bead of the tire to jump out of its seat in the rim. When this happens, the bead of the tire rolls over the inner tube at the 11 o’clock or 1 o’clock position. The result is a tear in the inner tube at either of these two positions. The roll-over pinch flat is rather immediate, you hit something really hard at a side angle, and the tire is flat within a few yards after impact.

In the lower left above, the Type 2 pinch flat, or “straight impact pinch flat,” is shown. The straight impact pinch flat occurs when hitting an object really hard straight on, with the tire collapsing on itself at the bead area. When the hit is hard enough, the inner tube is typically cut in two places, either the 2 o’clock and 4 o’clock position, or the 10 o’clock and 8 o’clock position. Like the roll-over pinch flat, the straight impact pinch flat is immediate; you hit something really hard straight on and feel the tire slam into the rim. On the next page are examples of an inner tube failure from a roll-over and straight impact pinch flat.



**Type 1 “roll-over” pinch flat**



**Type 2 “straight impact” pinch flat**

When you get a flat, inspect the inner tube for the source of the leak. As you can see in the Type 1 roll-over pinch flat above, the inner tube has a cut in the 1 o'clock position. In the Type 2 straight impact pinch flat above, the inner tube has two cuts, one in the 2 o'clock position and one in the 4 o'clock position, and why it is often called the “Snake Bite pinch”. If your inner tube from a flat looks like either of these, you know you had a pinch flat and you can replace the inner tube and not worry about a nail or thorn in the tire.

The common solution to the pinch flat is to run thicker inner tubes and increase tire pressure. This has been so common for so many years that riders don't realize what they are sacrificing to avoid the pinch flat. When running tire pressures higher than necessary, not only is traction and braking power reduced, but the action of your suspension is diminished. Your tire pressure is the first level of your suspension, which is mostly ignored by most riders. Being able to run 2 to 3 psi lower tire pressure than usual provides substantial benefits in how your suspension performs.



Tube Saddle<sup>®</sup> foam tire flap, shown in the cross-section picture on the left, was developed to substantially eliminate the common pinch flat and take advantage of running lower tire pressure.

The flap is a barrier between the inner tube, tire bead, and rim. In the Tube Saddle<sup>®</sup> Type 1 solution (pg. 2 upper right), the Tube Saddle<sup>®</sup> isolates the inner tube from the bead of the tire when the bead is knocked toward the center of the rim. In the Tube Saddle<sup>®</sup> Type 2 solution (pg. 2 lower right), the Tube Saddle<sup>®</sup> takes the brunt of the impact instead of the inner tube, and being softer than the inner tube, if anything is to tear it is Tube Saddle<sup>®</sup>.

## The “Puncture Flat”

A puncture flat, where some object penetrates the tire and inner tube, is generally not that common as a pinch flat. However there are some areas where it is a concern, like Wickenburg, Arizona where there are forests of Cholla cactus, or in Baja where there is metal debris everywhere.

The main feature of a puncture flat is that it typically occurs when you haven't hit anything, the tire just goes flat. Sometimes it is immediate such as with a nail, and sometimes slow, as with cactus. If you even suspect you got a puncture flat, it is critical to inspect both the inner tube and the tire, before making the repair.

Remove the inner tube carefully and lay in same position on the tire. Inflate the inner tube to find the leak. The leak will typically reside between the 3 o'clock and 9 o'clock position. The key is to locate the leak in the inner tube and inspect the tire in that location. A metal puncture is not always easy to catch, but inserting a new inner tube without removing the metal just results in another flat. Cactus is more difficult, all you can do is make sure there are no needles protruding inside the tire.

Regarding cactus punctures, it only takes one needle to create the flat, but you can count on the fact that there are probably numerous needles still in the tire. With cactus, inspect the tire as carefully as you can and remove or break as many needles as possible, otherwise you might be fixing flats all day long. Finally, if you get multiple flats from cactus, get rid of the tire when you have the chance.



The only real solution to the puncture flat is to run a tire sealant in the inner tube. This only needs to be done if you are going riding or racing in an area prone to puncture flats. There are a number of products you can use, such as the two pictured above.

**For additional *Tech Tips* and information about Tube Saddle® visit our website**

**[www.tubesaddle.com](http://www.tubesaddle.com)**



**Foam Tire flap**

Eliminate pinch flats  
Lower your tire pressure  
Maximize your traction  
Reduce arm pump

Available in the following sizes:  
21" front 18" rear 19" rear  
19" front 16" rear  
17" front 14" rear  
18" - 4.25 adventure

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