



# Flat Tires and Tire Savers

STORY BY **JAN HEINE**

**Some cyclists take their tires for granted and others fret over them. Most of us carry at least one spare inner tube with us on every ride, but there are ways to avoid the dreaded flat**

→ **FLAT TIRES** are the bane of a cyclist's existence. When pneumatic tires were first introduced in the 1890s, *Vélocio*, the grandfather of cyclotourists, wrote of the incredible speed and comfort that the new tires allowed, but also of the fear of the nail, "the terrible nail," that inevitably would deflate a cyclist's bliss. Back then, removing a tire required disassembling the rim with many tiny screws, something few cyclists attempted on the road. Instead, they walked their bike to the next train station and took a train home. For touring, most cyclists stuck to solid rubber tires that were slow and bumpy but puncture-proof.

Today, flat tires are much easier to

fix, but they continue to be a significant nuisance. Most cyclists will do almost anything to avoid them. Let's look at what causes flat tires.

## PUNCTURES

The most common cause is a puncture from a foreign object. On paved roads, debris rests on the hard road surface, and when you ride over it, the only place it can go is into the rubber of your tire. If the debris is sharp, it will get stuck, and with each wheel revolution, it will get hammered farther in, until it punctures the tube.

The horseshoe nails of the 1890s have been replaced by tiny steel wires that are used in modern radial tires.

When semi-trailer trucks get a flat, the driver often doesn't notice until the tire has been shredded, spewing tiny wires for miles over the road. Other common causes of punctures are glass as well as tiny crushed rocks that are spread on wintry roads to provide traction on snow and ice.

When riding on gravel or dirt, punctures are rare. The rubber of your tire is harder than the ground, and debris gets pushed into the ground instead of into your tire. That is how cyclocross racers can ride on relatively fragile hand-made tubular tires. Off-road sidewall cuts from sharp rocks are your biggest concern.

Another cause for flats is the "pinch flat." When hitting an obstacle, your tire can compress so much that the inner tube gets crushed between the rim and the road surface. In most cases, pinch flats occur as two punctures side by side caused by the two horns of the rim create what is known as a snakebite.

## AVOIDING FLATS

The best way to avoid flats is to avoid the debris that punctures the tire. Traffic driving down the road sweeps the pavement clean. The debris comes to rest where cars rarely tread: on highway shoulders and in the gutter. In the city, you should ride about three feet from the edge of the road, both to be more visible and to avoid most debris.

Bicycle tourists usually ride on scenic backroads, where debris gets swept into the ditch and flat tires don't often occur. If you find yourself on the shoulder of a busy highway, check your map. Hopefully, an old road parallels the highway, offering much more pleasant riding all around.

Beyond that, experienced cyclists scan the road ahead, and when they see piles of debris or pieces of glass, they go around them rather than over them. Scanning ahead also is the best way to avoid accidents, so it is a good habit.

What else can you do to decrease your chance of flatting? Use wide tires. They run at lower pressures and roll over debris that would get hammered into narrower, harder tires. Many tests

have shown that wider tires don't roll more slowly than narrow ones, so you gain comfort and flat resistance without giving up speed. And if a tire starts getting a series of flats for no apparent reason, it's a clear sign that it is worn out. Replace it with a new one to restore your peace of mind.

Pinch flats are becoming a thing of the past as road riders move to wider tires, which can take bigger hits without bottoming out. A pinch flat indicates that your air pressure is too low. An immediate remedy is pumping your tires to a higher pressure, but long term, it makes sense to use wider tires if your bike can fit them.

## PUNCTURE-RESISTANT TIRES

Sometimes, you cannot avoid riding on highway shoulders. In some regions, goatheads — the seeds of the appropriately named puncturevine plant — litter even the most scenic backroads. In those cases, puncture-resistant tires are your last resort.

Puncture-resistant tires are reinforced with ultra-strong materials between tread and casing. Because sharp rock slivers and steel wires will penetrate even the most bulletproof layer over time, some tire makers add foam underneath the tread, moving the inner tube farther away from the outside of the tire. Because most debris is small, it never reaches the tube but remains stuck in the foam layer.

Unfortunately, there is a big downside to puncture-resistant tires: they make the tire a lot stiffer. When you make a tire stiffer, you lose performance and comfort because more energy is required to flex the tire as it rotates. How much speed do you give up? *Bicycle Quarterly's* testing has shown that puncture-resistant tires roll about 15 percent slower than supple high-performance tires. Over the course of a day, you will be over an hour ahead on the faster tire. Even if



Figure 1: Puncture-resistant tires have tough belts and foam layers that decrease comfort and performance.

you have to fix a flat every day — and few people experience that many flats — you will arrive sooner on the faster tires. More important, your bike will feel much more alive and comfortable on supple, fast tires.

## TIRE SAVERS

One way to increase a tire's flat protection without affecting its performance is to remove debris that gets picked up by the tire before it has a chance to get embedded in the tread. Racers used to wipe their tires with their gloves. A better solution are "tire savers," wires that lightly rub the tire surface and wipe off any debris. Tire savers are hard to find these days, but they are worth seeking out if you are

concerned about flat tires yet don't want to suffer the harsh ride and low performance of puncture-resistant tires.

## AVOID RE-FLATTING

When riders have multiple flats on a single ride, the debris that caused the initial puncture often remains stuck in the tire's tread. Then it's only a matter of time until the new tube punctures as well. That debris can be very difficult to find. During one 600-kilometer randonneur brevet, I flatted every 80 kilometers. After the third flat, I finally found a tiny piece of wire embedded in the tread. The wire was so short that it protruded only when the tread flexed under load. With each wheel revolution, it nibbled away at the new tube until that punctured, too.

If I have a flat, I always look for the debris that caused the puncture — or at least the cut it left in the tire, because some debris punctures the tube without getting stuck. If I cannot find the cause of the flat, I replace both the tube and the tire. (I carry a folding spare tire when touring.) At the end of the day's ride, with good light and more time, I should be able to find the object that caused the puncture.

Most of all, I'm glad that flat tires are no longer the problem they were in the early days of cycling. Touring on back roads, most riders have very few flats. Avoid places where debris accumulates and you will avoid most flats. Ride on wider tires because their lower pressure makes them less prone to punctures. Puncture-resistant tires are a trade-off because they roll more slowly and are less comfortable. **AG**

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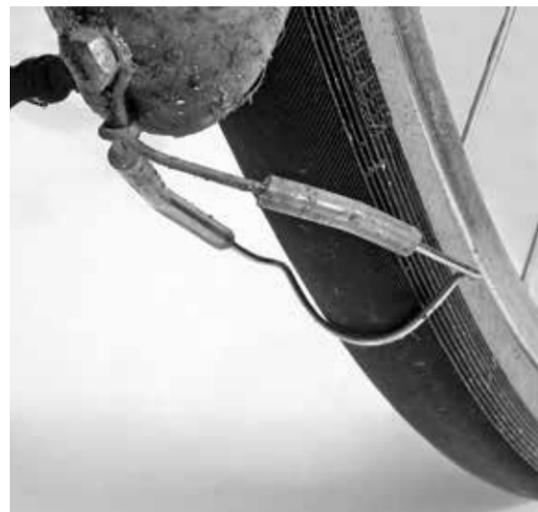


Figure 2: Tire savers wipe debris off your tires before it can get embedded in the tread.

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