

**GIANT
CATALOG
GUIDE**

**EXCLUSIVE!—2 NEW KILLER TRAILS
KONG & RATTLER REVEALED**



FOUR WHEELER

FOUR WHEELER

NOV. / WWW.FOURWHEELER.COM / DECEMBER 1997

TIRE TECH

TREADS, TRACTION & TESTS

ANNUAL SOURCE INDEX:

**HOW TO FIND
PRACTICALLY
EVERYTHING**

**ENGINE
SCIENCE**

**ROCKER
ARMS**

SUSPENSION

- **LONG-TRAVEL
GRAND CHEROKEE**
- **ISUZU IFS KIT**

Need more traction from
your tires?

SIPPEEM

NEW GROOVES FOR OLD TREADS

Tire siping for winter traction

By Brad DeLong

Do you get that icy-hand-in-the-stomach feeling every time you brake on hard-packed snow or ice? Does your rig slip and slide in the rain? Maybe your tires need some help. Siping may be the answer. Where I live, in the inland Northwest, it's almost a religion.

Siping is the process of cutting slits across the tread of your tires. On hard surfaces, these little cuts "open up" and provide a lot more gripping surface. The sipes are made using a machine with a rotating blade to make rows of cuts, about five per inch, at 90 degrees to the tread. The depth of the cuts ranges from 11/32 to 5/32 inch—deeper on new light-truck tires, shallower on passenger-car or used-truck tires. The number of rows around the tire depends on the

width of
the

tire. There's debate on whether the sipes should be extended to overlap the edge of the tread. Sipes open to the edges of the tread probably provide better traction when cornering, but may wear faster in dry off-pavement conditions. Tires with aggressive, open treads may be harder to sipe because the guiding head of the siping machine can fall off the edge of the tire between the lugs, and the blade may damage the sidewall. It may not be possible to extend the sipes all the way to the edge in tires like these.

WHERE IT COMES FROM, AND WHAT IT DOES

The idea of siping got started in the 1920s, when a meat plant worker named John Sipe got tired of slipping on wet floors. He discovered he could stay on his feet if he cut tiny slits in his rubber-soled shoes.

Realizing this might also work on auto tires, he patented the

process. The idea didn't take off until the 1950s, when tougher, more flexible tire compounds were able to take better advantage of the siping process.

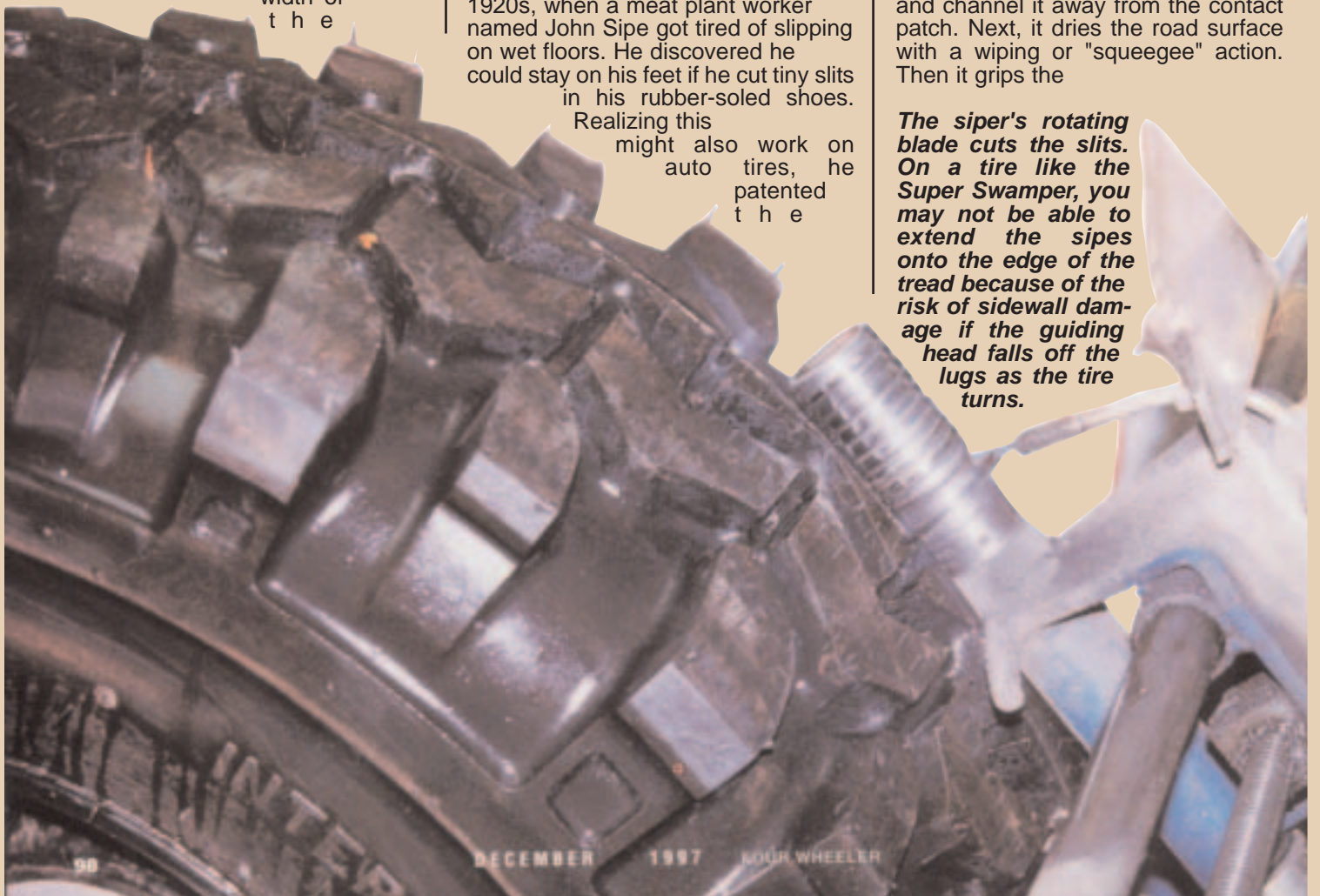
For a long time, the main sipers were truckers, who appreciated the additional traction. Now, more and more light-truck owners are asking tire stores to sipe the tires they buy, using machines built by the Saf-Tee Siping and Grooving Company of Phoenix, Arizona. Proponents of siping are enthusiastic,

claiming improved traction, shorter stopping distances, and improved self-cleaning. When the rubber meets the road, the tread is designed first to mop up water from the road surface and channel it away from the contact patch. Next, it dries the road surface with a wiping or "squeegee" action. Then it grips the

The siper's rotating blade cuts the slits. On a tire like the Super Swamper, you may not be able to extend the sipes onto the edge of the tread because of the risk of sidewall damage if the guiding head falls off the lugs as the tire turns.



The larger head on the left places shallower cuts than the narrower head on the right.



surface and moves the vehicle forward. The siped slits provide a better "squeegee effect" than solid lugs of rubber, and they grip better by increasing the flexibility of the tread.

Proponents say siping increases tire life by allowing tires to run cooler. The slits in the tread allow heat to dissipate better, and some sipers claim 10 to 20 percent better mileage from a set of siped treads. Unfortunately, there hasn't been much actual testing done to tell us if all this is more than just theory and folklore. In 1978, the National Safety Council did some tests on siped and non-siped tires. On glare ice, breakaway traction with siped tires was 65 percent better, traction of a spinning tire was 28 percent improved, and stopping distance was 22 percent shorter. No tests have been done on tire wear.

Tire manufacturers, however, don't generally approve of after-market siping, but acknowledge the advantages of the process for certain designs, especially snow tires. If you look at the tread of a good snow tire, you'll see little slits running across the tread. The Bridgestone Blizzak is a good example.

The Michelin Alpin snow tire has inverted Y-shaped sipes, so that a single slit becomes two as the tire wears. The

NEW GROOVES FOR OLD TREADS

the tread. When this soft compound wears away, the sipes double in number, giving greater flexibility to the harder inner tire compound. Factory siping such as this is accomplished during the molding process, not by slicing. In turn, siping proponents hold that the OEM molding process removes some amount of rubber to create the slits. The after-market sliced siping doesn't remove rubber, so after-market sipes slits have sharper edges than the molded slits. This, in theory, would mean the after-market sipes grip better and are less likely to "chunk." In response, the manufacturers claim that molded sipes grip better when cornering because they tend to stay open better than the after-market slices. So the discussion goes.

Tire manufacturers agree that "chunking" is a problem with siped tires, because the edges of the sipes tend to hang up on dry surfaces, and small pieces of rubber can be torn away. They see off-pavement use of siped tires as particularly harmful because (1) rough rocks tend to chunk away bits of the tread, and (2) small bits of gravel can get wedged into the sipes in off-highway use, increasing wear and noise when back on the pavement.

Four wheelers who regularly sipe their tires usually maintain that chunking is not a significant problem, even when rock crawling. In fact, some of them feel

outer single "limb" is contained in the softer snow-gripping compound of

that siped tires increase traction in all situations, wet and dry. Siping certainly increases traction on wet slickrock.

TO SIPE OR ... ?

it's a personal decision, since there are very few test results to guide us. However, I feel strongly that siping my tires has given me a lot more traction and much better stopping distance on hard-packed snow and ice. This winter, I'm driving a '94 K-Blazer on siped BFGoodrich LT285/75R16 Mud-Terrain T/As. This tire has an aggressive tread, IS excellent on rocks and in mud, but the spacing is too wide to be an optimal snow tire. A snow tire needs wide-enough spaces to trap the snow, because the snow retained in the tire tread creates traction against the snow on the road. However, if the spacing is too wide, the snow gets thrown out of the tire, and traction is lost. Siping the BFGs seems to help their snow handling characteristics a great deal.

I also own an '87 Wrangler riding on siped Super Swamper 33x12.50s. This very aggressive mud and rock tread is not the greatest on hard-packed snow and ice. The spacing is very wide and snow retention in the tread is poor, so traction is lost on hard-packed snow; the tires are wide and offer less directional stability on hard snow and ice than do narrower tires; the tire compound is stiff and does not offer the flexibility required by a dedicated snow tire. Flexibility is also impaired by the large lug pattern. With my TSLs, siping has helped traction and braking considerably. The siping machine could not carry the sipes all the way to the edge of the tread, which might have improved cornering stability.

The authoritative Super Swampers perform well in firm deep snow, which of course is similar to mud in terms of the techniques required to negotiate it.

If you use studded snow tires, the process of center-siping can give you traction from the studs on the inside and outside of each tire, and traction from the siping in the center of the tread. (The question of using studded tires is a whole other issue. They stop you better on ice, but they may increase stopping distance on dry pavement by keeping the tread lifted, preventing it from gripping the pavement.)

If you have a set of high-end dedicated snow tires that you keep for winter use only, and they are new, it's less important to have them siped. As you use them, the softer snow-gripping surface compound will wear down.

If you're doing winter driving on regular tires, siping is highly advised. It may make the difference between stopping



NEW GROOVES FOR OLD TREADS

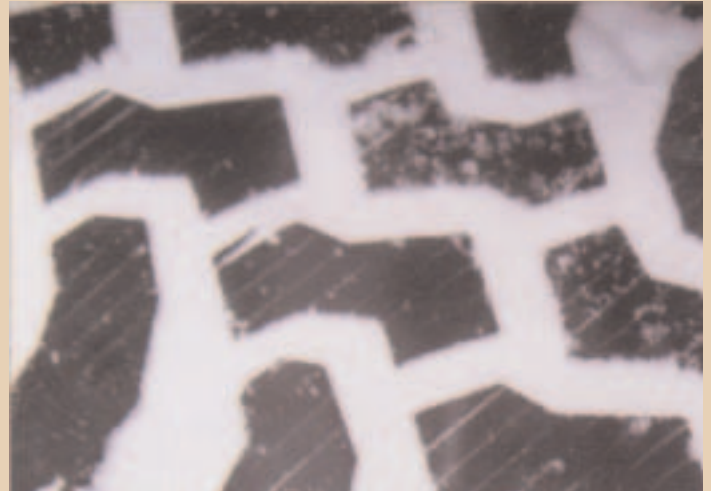
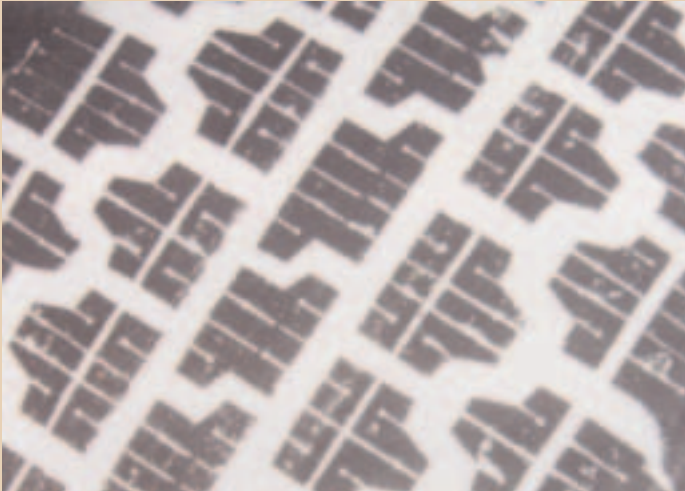
A state-of-the-art dedicated snow tire, the Bridgestone Blizzak. The tread spacing is wide enough to retain traction on snowy pavement, but it's not

so wide that the snow gets thrown out as the wheel turns.

The softer tire compound provides good flexibility and adherence to snow. Molded sipes are present to increase traction and flexibility.

and not stopping on a slick road, and it may save you from having to use chains in some situations. If the road is really slick, don't count on siping alone, even with good snow tires. Grit your teeth and put on the chains. Of course, you'll use two sets, front and back, to take full advantage of your 4x4.

The siped BFG Mud-Terrain T/A. Cost: \$11 per tire. The sipes extend to the outside of the tread to provide improved cornering and directional stability.



If you run snow tires, with or without siping, remember to install them well before the first snowfall and run them on dry pavement for 600 miles. A recent study by Michelin showed that the tread compound hardens during summer storage and needs to be reconditioned before it can provide maximum traction on snow and ice.

A potential problem with siping: slight chunking (arrow) at the edge of one of the sipes.



RESOURCES

Saf-Tee Siping & Grooving, Inc. • Dept. FW • 3451 S. 40th St. • Phoenix, AZ • 800/223-4540 •
Aftermarket siping equipment
Les Schwab Tire Stores • Dept. FW • 646 N. Madras Hwy. • P.O. Box 667 • Prineville, OR
97754 • 541/416-4136 • *Technical assistance*

A small stone (arrow) has been removed from deep within one of the sipes. If allowed to remain, retained gravel will increase wear by creating a greater tendency for rubber to chunk off the widened slit.



800.223.4540

3451 S. 40th St. Phoenix, AZ 85040-1905

www.tsissg.com • info@tsissg.com