

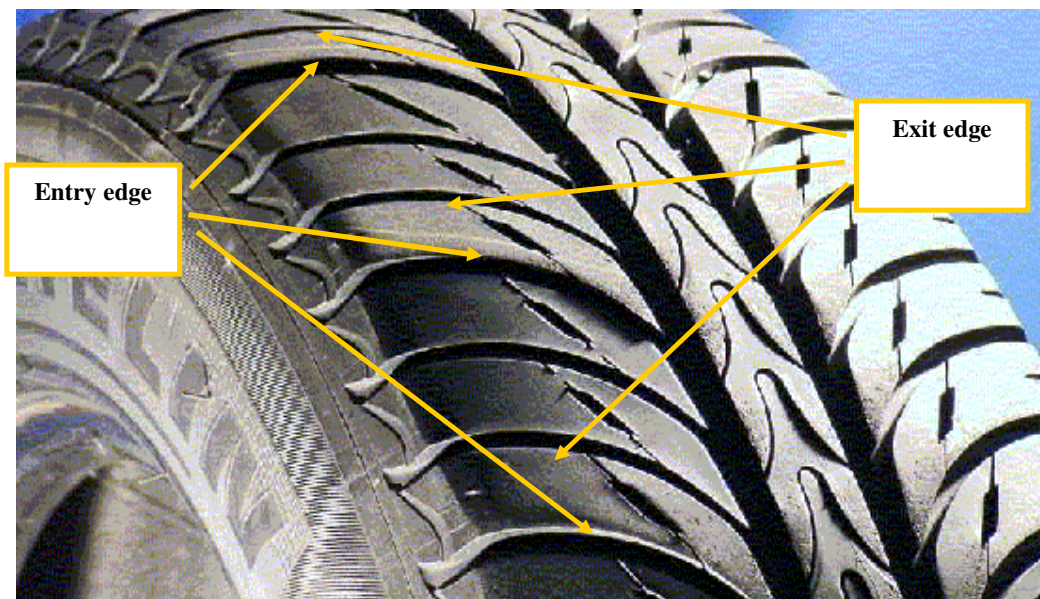
Causes of Uneven Tread Lug Wear: “Sow Teeth Usage”

There is only one reason for uneven wear of the tread lugs of tires in the form of what is known as “sow teeth usage” or wear in the form of “saw teeth.” It lies on the side of the mutual interaction between the tire tread and road surface. There are also several factors that influence this phenomenon to strengthen or weaken it.

Essentially, of greatest importance is to understand the mechanism of usage in “sow teeth” usage on tread lugs.

“Sow teeth” usage is most commonly experienced in the case of tires mounted on a rear free axle. Why is this the case? Let us try to imagine the work performed by a tire on the rear axle. The car’s drive is transmitted through the front axle while the rear axle is drawn along, which means that the rear wheels are rotated as a result of the effect of the asphalt acting on the tread of rear tyres. This means they continuously rotate in the same direction and always act more strongly on the exit edge of the tread lug. This results in its greater wear. During breaking, the rear tires act on the asphalt resulting in greater mutual interaction, but still in the same direction on the exit edge. Thus, the wear is even greater on the same edge of the tread lugs.

The situation is different in the case of the front drive axle. When providing drive, the tread lugs always act on the asphalt on the entry edge, resulting in its wear. When breaking, the tread lugs on the front tires experience wear on the opposite side, the exit side, just like the rear tires. Such a situation means that on the drive axle the tread lugs experience wear in two directions, thus resulting in even wear, albeit accelerated.



A factor with an impact on the phenomenon of “sow teeth” usage is the tread pattern. The more “open” the pattern (the farther apart the lugs of the tread from each other) the greater the risk of sow teeth usage in the tread. In terms of resistance to “sow teeth” usage, the ideal tire would be one in which the tread pattern is uniform with no voids or lugs. However, it must be remembered



that a tire must perform several other requirements such as providing drive traction, breaking, road handling, channeling away any rainwater, comfort, etc. It is for this reason that the tread pattern is designed to perform all these requirements to as great a degree as possible.

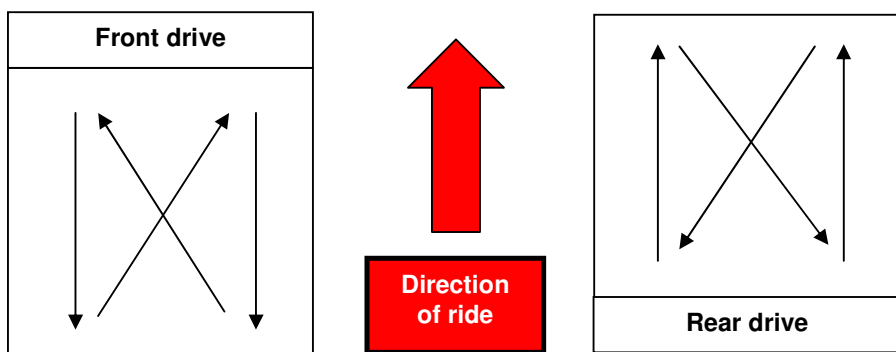
A successive factor is the tire pressure. It should be appropriate to loading. Higher pressure results in an increase in the “sow teeth” usage phenomenon. Automobile and tire manufacturer recommendations should be adhered to. New cars provide information in the form of stickers stating pressure recommendations for each axle with respect to vehicle load.

The state of the car’s suspension and shock absorbers are not without meaning. Damaged suspension and worn shock absorbers work to increase the “sow teeth” usage phenomenon on tread lugs. Contrary to the commonly held view, multi-wishbone wheel suspension systems are not a cause of sow teeth usage in tire treads. However, the phenomenon is more visible in the case of such a suspension because the tire is not subject to wear in the direction perpendicular to the direction of travel, which is the case in older suspension systems. Tires on the rear axles of station wagons not subjected to any significant loading are very sensitive to “sow teeth” usage. In this case, the stiffer shock absorbers of the rear unloaded axle increase the sow teeth usage phenomenon. In this case it is recommended that the pressure in the rear tires be appropriate to loading—i.e. use of the lowest allowable pressure for the given automobile.

A successive factor influencing “sow teeth” usage is driving style. Rapid acceleration and sudden breaking will work to increase the phenomenon of “sow teeth” usage on free axles. On the other hand, high-speed driving over winding roads will tend to wear away signs of “sow teeth” usage.

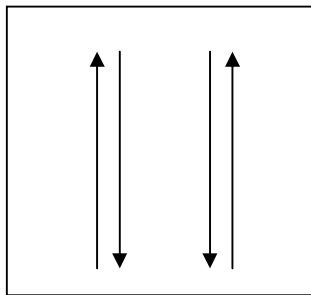
“Sow teeth” usage also applies to tires used on high-performance vehicles with four-wheel drive. In this case we are dealing with high automobile mass, high power and high torque in rotating the wheels as well as breaking. For this reason the tire tread is subject to significant friction forces that can result in major wear on the tread lugs.

In order to minimize the “sow teeth” usage phenomenon acting on the tread it is necessary to systematically rotate the position of the wheels/tires on the vehicles—at least once each season or once every 7,000–10,000 kilometers. The diagram below presents the recommended direction of changes in location of wheels/tires on a vehicle with single-axle drive equipped with symmetrical and asymmetrical tires.

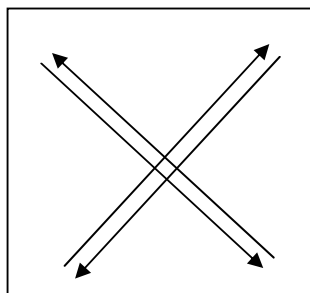


Directional tires can be rotated in line with the above scheme, but it is necessary to remove them from their wheel rims in order to maintain the proper direction of tire rotation.

The following rotational scheme is recommended for the tires/wheels of vehicles with directional tires without the need for tire removal:



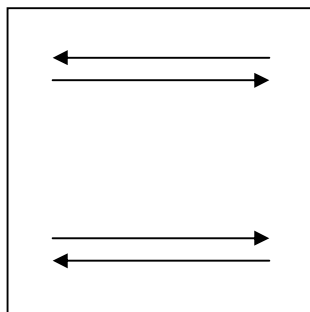
As for four-wheel drive vehicles, the following rotation scheme for tires/wheels should be used:



NAPĘD 4X4

In this case directional tires require removal from the wheel rim in order to guarantee the proper direction of tire rotation.

For vehicles 4x4 equipped with different sizes of tires on front and rear axle is recommended following schema of rotation wheels/tires:



4X4 Drive

Above schema concern vehicles equipped with symmetric and asymmetric tires. **Rotation should assure change of direction of tires rolling.**

In the event of a strong saw teeth usage phenomenon, it is possible to wear away the tire on special equipment found at select tire service stations. Unfortunately, this decreases the life of the tire.

It should be stressed that such uneven wear has no direct bearing on driving safety. It only decreases driving comfort due to noise.

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