

COMPETITION TIRES

Understanding Shaving and Air Pressure

I have had many people ask me, "What good does shaving tires really do, and why don't my tires get better as they wear down to where shaving would make them better performers?"

I was thinking about that the other day while shaving, not the tires but the kind were you use shaving cream. I said that is a great question and one that needs explaining.

One of the reasons radial racing slicks are so effective is because they feature shallow tread depths and their contact patch acts as a single unit. However, any tread design breaks up the contact patch into smaller elements and additional deep tread depth (required to enhance wet traction) allows tread block squirm which will reduce dry performance. This means that tires typically provide their worst wet traction...and their best dry performance just before they wear out. However, its also important to remember that the heat generated every time a tire is driven activates bonding agents in the rubber. As this process is repeated continually throughout the tire's life, its rubber compounds gradually harden and lose flexibility reducing the tire's grip. Therefore, a shaved "new" tire will provide more traction than a tire worn to the exact same tread depth after being driven for thousands of miles on the road.

Tire shaving is an effective means of permitting more of a tire's performance capability to be realized early in its life. Tire shaving removes tread rubber and reduces tire weight by several pounds. A shaved tire's tread profile will usually result in a slight increase in the width of the tire's contact patch putting a little more rubber on the road. The resulting shallower tread depths reduce the tire's slip angle, increases its responsiveness and help stabilize its cornering power by minimizing tread block squirm. Minimizing tread block squirm also reduces heat buildup and the risk of making the tire go "off" by overheating its tread compound. And in many cases, shaved tires used in competition actually have a longer useful life than tires that begin being run at full tread depth.

The table below suggests tire inflation pressures to be used during competition. Tires should be reset to normal inflation pressures when returned to the street. These recommendations should be used as a starting point. Pressure can be adjusted to match the driver's preferences. Adjust pressure in 2 lb. increments.

Type of Vehicle	Position	Pressure
Front Engine/	Front	35-45 psi
Rear Drive	Rear	30-40 psi

When racing on D.O.T. approved tires air pressure is a major consideration in tuning the handling of your car, especially in cases where suspension adjustments are limited. The chart below shows some of the changes you can make to change the balance of the car.

Adjustments	Decrease Understeer	Decrease Oversteer
Front Tire Pressure	Higher	Lower
Rear Tire Pressure	Lower	
Higher		
Front Tire Section	Larger	Smaller
Rear Tire Section	Smaller	Larger
Front Wheel Camber	More Negative	More Positive
Rear Wheel Camber	More Positive	More Negative
Front Wheel Toe	Toward Toe-Out	Toward Toe-In
Rear Wheel Toe	Toward Toe-In	Toward Toe-Out
Front Wheel Caster	More Positive	More Negative
Front Springs	Soften	Stiffen
Rear Springs	Stiffen	Soften
Front Anti-sway Bar	Soften (Thinner)	Stiffen (Thicken)
Rear Anti-sway Bar	Stiffen (Thicker)	Soften (Thinner)
Weight Distribution	More Rearward	More Forward

To get even tire wear when using D.O.T. tires you must be very careful not to use too low of a tire pressure. Tires can wear unevenly if underflated and seem to work best at much higher pressures, such as the mid 30s to as high as 50 psi. Underinflation will cause a thin ring of wear at the very edge of the tread. The best results seem to come when they are properly inflated, on fairly wide wheels, and with a good amount of negative camber. If properly inflated, these problems can be avoided. Probably the biggest adjustment you can make to improve tire wear is the driver. Avoided sliding the tires, locking up the wheels under braking and drive as smooth as possible.

TIRE PRESSURES IN THE RAIN

For both autocross and road racing, increase tire pressures 6-10 psi from what you would normally run in dry conditions. Hydroplaning occurs when a wedge of water develops between the tire and road surface. This wedge can actually lift the tire off the road and eliminate traction. Increasing the pressure rounds the profile of the tire by decreasing the deflection of the tire. This results in a smaller contact patch narrower and shorter. It also helps keep the grooves in the tread open so they can channel the water out from under the tire.

Thank you to the Tire Rack for its great library of available information.



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