

Be Tire Smart - Play Your PART

Proper tire care and safety is important.

Carlisle recommends getting in the habit of taking five minutes every month to check your tires, including the spare.

P Pressure

It results in unnecessary tire stress, irregular wear, loss of control and accidents. A tire can lose up to half of its air pressure and not appear to be flat!

A Alignment

Is your vehicle pulling to one side, or shaking? Hitting a curb or pothole can throw your vehicle out of alignment and damage your tires. Have a tire dealer check the alignment periodically to ensure that your vehicle is properly aligned.

R Rotation

Promotes uniform tire wear. Regularly rotating your vehicle's tires will help you achieve more uniform wear.

T Tread

Measure it -- and inspect it.
Advanced and unusual wear can reduce the ability to tread to grip the road in adverse conditions. Visually check your tires for uneven wear, looking for high and low areas or unusually smooth areas. Also check for signs of damage.

IMPORTANT SAFETY INFORMATION

Any tire, no matter how well constructed, may fail in use as a result of punctures, impact damage, improper inflation, overloading, or other conditions resulting from use or misuse. Tire failure may create a risk of property damage and serious personal injury. To reduce the risk of tire failure, we strongly recommend you read and follow all safety information contained in this manual.

Carlisle recommends periodic inspection and removal of embedded objects by a qualified service person.

TIRE INFLATION

Always keep the tire manufacturer's maximum recommended air pressure in all your tires, including the spare. This is an important requirement for tire safety and mileage. Tire sidewall stamping information will tell you the recommended **cold air pressure**.

SAFETY WARNING: Driving on tires with too little air pressure is dangerous. Your tires will get overheated. This can cause a sudden tire failure that could lead to serious personal injury.

Under inflation may also: (1) Damage the tire leading to tire failure (2) Adversely affect vehicle handling (3) Reduce tire life (4) Increase fuel consumption.

SAFETY WARNING: Driving on tires with too much air can be dangerous. The tires are more likely to be cut, punctured, or broken by sudden impact. Review tire sidewall stamping information for the recommended inflation and your owner's manual for other tire information.

SAFETY WARNING: Never inflate a tire unless it is secured to the vehicle or a tire mounting machine. Inflating an unsecured tire is dangerous. If it bursts, it could be hurled into the air with explosive forces resulting in serious personal injury.

TIPS FOR SAFE TIRE INFLATION

- Check your tire air pressure, including your spare tire, at least once a week and before long trips. Be sure to use an accurate pressure gauge.
- Check your air pressure when the tires are "cold". The tires are "cold" when your vehicle has been driven less than a mile at moderate speed or after being stopped for three or more hours.
- If you must add air when your tires are hot, add four pounds per square inch (psi) (28 kPa) above the recommended cold air pressure. Recheck the inflation pressure when the tire is cold.
- Never release air from a hot tire in order to reach the recommended cold tire pressure. Normal driving causes tires to run hotter and air pressure to increase. If you release air when your tires are hot, you may dangerously under inflate your tires.
- If your tires lose more than two pounds per square inch (2 psi) (14 kPa) per month, the tire, the valve, or wheel may be damaged. Consult THE DEALER location for an inspection.
- Check your spare tire.
- Use valve caps to keep valve cores clean, clear of debris and to help guard against air leakage.

SAFETY WARNING: Driving your vehicle in an overloaded condition is dangerous. Overloading causes excessive heat to build up in your tires. This can lead to sudden tire failure and serious personal injury while the tire is overloaded or at some later date.

TIPS FOR SAFE LOADING

Review tire sidewall stamping information and the vehicle owner's manual for the vehicle load limits and proper tire inflation. Never exceed the maximum load rating stamped on tire sidewall of you tire or the maximum vehicle load rating, **whichever is less**. Make sure the load is spread evenly on all tires so that no single tire is overloaded. Tongue weight, tongue height and especially load leveling hitches must be set properly to avoid overloading your trailer tires.

TIRE DAMAGE

SAFETY WARNING: Driving on damaged tires is dangerous. A damaged tire can suddenly fail causing serious personal injury. Have your tires regularly inspected by THE DEALER location for damage.

TIPS FOR SPOTTING DAMAGED TIRES

- After striking anything unusual in the roadway, ask THE DEALER location to demount the tire and inspect it for damage. A tire may not have visible signs of damage on the tire surface. Yet, the tire may suddenly fail without warning, a day, a week, or even months later.

- Inspect your tires for cuts, cracks, splits or bruises in the tread and sidewall areas. Bumps or bulges may indicate a separation within the tire body. Have your tire inspected by a qualified tire service person. It may be necessary to have it removed from the wheel for a complete inspection.
- Inspect your tires for adequate tread depth. When the tire is worn to the built-in indicators at 2/32nd inch (1.6 millimeters) or less tread groove depth, or the tire cord or fabric is exposed, the tire is dangerously worn and must be replaced immediately.
- Inspect your tires for uneven wear. Wear on one side of the tread or flat spots in the tread may indicate a problem with the tire or vehicle. Consult THE DEALER location.
- Inspect your rims also. If you have a bent or cracked rim, it must be replaced.

TIRE REPAIRS

SAFETY WARNING: Driving on an improperly repaired tire is dangerous. An improper repair can cause further damage to the tire. It may suddenly fail, causing serious personal injury. To be safe, go to THE DEALER location for proper tire repairs.

SAFETY WARNING: Before having a tire repaired, tell THE DEALER location if you have used an aerosol fixer to inflate/seal the tire. Aerosol fixers could contain a highly volatile gas. Always remove the valve core outdoors, away from sources of excessive heat, flame, or sparks and completely deflate the tire before removing it from the rim for repair.

- Never repair a tire with less than 2/32nd inch (1.6 millimeters) tread remaining. At this tread depth, the tire is worn out and must be replaced.
- Never repair a tire with a puncture larger than 1/4 inch (6.4 millimeters) in diameter. Such tires cannot be properly repaired and must be replaced.
- Repairs of all tires (radial and non-radial) must be of the plug and inside patch type unless the hole is too small to insert a plug. Using plugs alone on any type of tire is not a safe repair.
- Never repair a tire with a puncture or other damage outside the tread area. Such tires cannot be properly repaired and must be replaced.
- Any tire repair done without removing the tire from the rim is improper.
- Tubes, like tires, should be repaired only by a qualified service person.
- Never use a tube as a substitute for a proper repair.

SAFETY WARNING: A tire's speed rating is void if the tire is repaired, re-treaded, damaged or abused, or otherwise altered from its original condition. Thereafter, it should be treated as a non-speed-rated tire. Exceeding speed limit ratings reduces your tires load carrying ability, and may lead to sudden tire failure.

REMOVING AND REPLACING TIRES ON RIMS

SAFETY WARNING: Always stand well clear of any tire mounting operation. This is especially important when the service operator inflates the tire. If the tire has been improperly mounted, it may burst with explosive force causing serious personnel injury.

A new valve must be installed on the rim each time a worn out tire is replaced.

SAFETY WARNING: Removing and replacing tires on rims can be dangerous. Attempting to mount tires with improper tools or procedures may result in a tire explosion causing serious personal injury. This is a job for THE DEALER location or other qualified tire service personnel only.

Serious Personal Injury Can Result From:

1. Failure to select the proper tire and rim. The tire must match the width and diameter requirements of the rim. For example, when mounting 16-inch diameter tires, use only 16-inch diameter rims.
2. Failure to inspect both the tire and rim. The rim must be free of cracks, dents, chips, and rust. The tire must be free of bead damage, cuts, and punctures.
3. Failure to follow proper procedures. For proper mounting procedures, consult the **Care and Service of Automobile and Light Truck Tires** published by the Rubber Manufacturer's Association.
4. Exceeding the maximum bead seating pressure. The tire service person must never inflate a tire beyond 40 pounds per square inch (psi) (2 76kPa) to seat the beads. Be absolutely certain beads are fully seated before adjusting inflation pressure to the level recommended for vehicle operation.

SAFETY WARNING: Never put flammable substances in tire/rim assemblies at any time. Never put any flammable substance into a tire/rim assembly and attempt to ignite to seat the beads.

MOST COMMON PROBLEMS



Under Inflate

WEAR ON BOTH EDGES: UNDER INFLATION

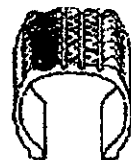
The worst enemy a tire can have is too little inflation pressure. If a tire looks like this, it may be under inflated. Under inflation reduces tread life through increased tread wear on the outside edges (or shoulders) of the tire. When a tire is under inflated, the shoulder of the tread bears most of the load and wears the outside edges out faster than the center of the tire. It can reduce fuel economy through increased rolling resistance (soft tires makes your vehicle work harder). Check your tires regularly for proper inflation. Abnormal tire wear may also be due to misalignment or mechanical problems.



Over Inflate

WEAR IN CENTER: OVER INFLATION

Generates excessive heat, which reduces the tire durability. Uneven wear reduces the useful life of a tire. Check your tires regularly for proper inflation. Abnormal tire wear may also be due to misalignment or mechanical problems. A trailer tire with this wear pattern may cause a sudden failure.

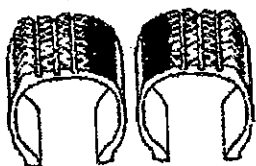


Cupping

CUPS OR DIPS IN THE TREAD: WORN PARTS

It may be a sign that wheels are out of balance or that suspension parts are worn out, axle damage or misalignment may be present.

WEAR ON ONE SIDE: MISALIGNMENT

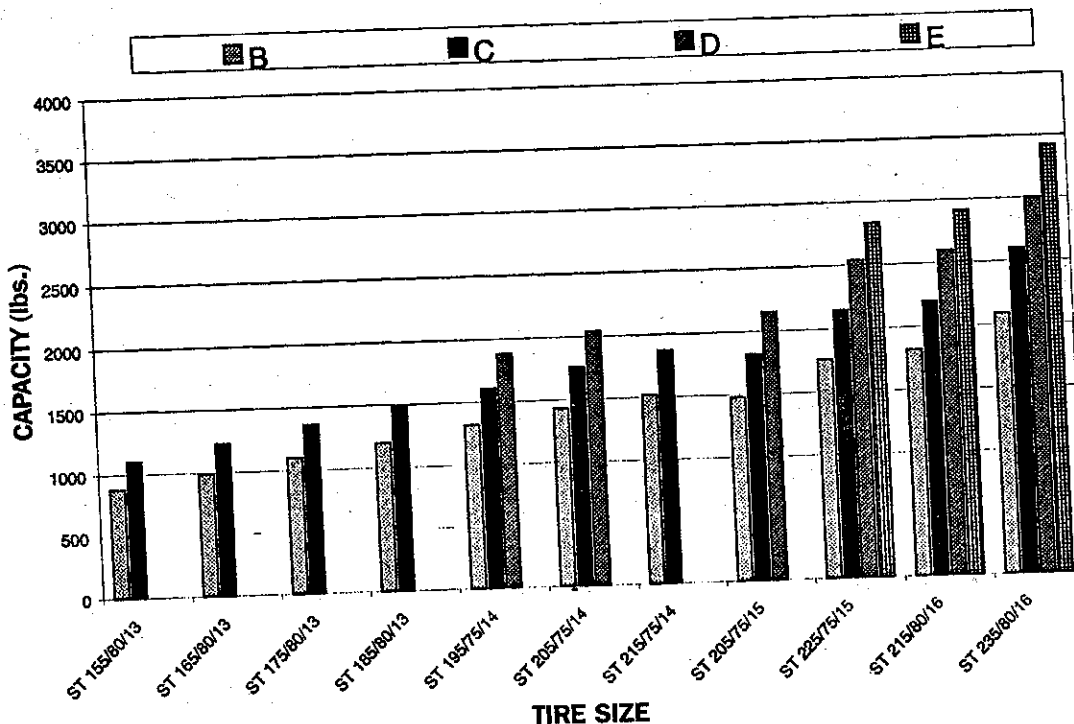


Inside Wear Outside Wear

SAW-TOOTH EDGES: MISALIGNMENT

Do the edges of the tread take on a sawtooth or feathered appearance? This is caused by erratic scrubbing against the road. The solution is toe-in or toe-out alignment correction.

TRAILER TIRE LOAD RANGES (IN lbs.)



This chart (above) shows that the same size tire can meet different load ranges. Even though the sizes are the same, tires can be made differently to meet various load requirements. As the load range increases, so does the required air pressure. Most C-range tires require a maximum pressure of 50 psi, while D-range tires must be at 65 psi to handle the increased load capacity. Load-range E tires must be set at 80 psi. Match the size and load rating of the tire to your trailer.

IDENTIFY THE LOAD RANGE

The most critical factor in choosing a trailer tire is load range. You can find the load range moulded into the sidewall of every tire. For towing, look for C, D and E load ranges.

Load ranges are based on specific inflation pressures. With a higher inflation pressure, the tire can carry more weight. Therefore, a load range C tire is at its peak load capacity when inflated to its maximum pressure of 50 psi. In range D, you need to be at 65 psi to handle the increased load capacity. Load range E tires must be set at 80 psi.

In order to select the proper load range, you must first weigh your trailer fully loaded with any load leveling devices normally used. This means full of water, LPG and gear. Go to a truck stop or public scale and weigh the entire rig. While you are there, weigh each axle separately. This will let you know if you have exceeded the tow rating of the trailer axles. Weigh your tow vehicle or are overloading one of the trailer axles. Weigh each side of the vehicle. This further verifies that the load is balanced.

There are other considerations in picking ST tires. For the trailer tire to manage the weight, all must be identical. Do not mix bias and radial tires. What's more, the load range and size of each tire should be the same. And each should have the same amount of tread wear. This becomes critical when replacing a tire.

When replacing a single tire, always run the same outside diameter tire on the same axle. A smaller tire will carry more weight, and may become overloaded.

After a blowout on a tandem-axle trailer, you should replace both tires on that side. The remaining tire was likely subjected to excessive loading and, as a consequence may fail in the near future.

TRAILER TIRE LOAD LIMITS (IN LBS) AT VARIOUS INFLATION PRESSURES

	20	25	30	35	40	45	50	55	60	65	70	75	80
ST 155/80/13	640	740	815	880 (B)	970	1040	1100 (C)						
ST 175/80/13	795	905	1000	1100 (B)	1190	1270	1360 (C)						
ST 195/75/14	935	1070	1190	1320 (B)	1410	1510	1610 (C)						
ST 215/75/14	1110	1270	1410	1520 (B)	1660	1790	1870 (C)						
ST 225/75/15	1260	1430	1600	1760 (B)	1880	2020	2150 (C)	2270	2380	2540 (D)			
ST 235/80/16	1510	1720	1920	2090 (B)	2270	2430	2600 (C)	2730	2870	3000 (D)	3130	3260	3420 (E)

The above table DOES NOT endorse the reduction of air pressure. It is to be used as an example of the relationship between air pressure vs load or lack of there of. Carlisle Tire & Wheel only recommends and only warrants tires maintained at the max air pressure while in service. This table (above) shows the relationship between air pressure and load capacity for popular sizes of trailer tires. The capacities apply equally to radial and bias versions. The letters following some capacities indicate the load range.

MAXIMUM PSI?

Maximum load range is attained only when the tire is at its maximum air pressure. There is no advantage to taking air out of the tire. With maximum pressure, the tire will perform and wear better, and you will get better gas mileage. Reduce the psi, and you compromise the functionality of the tire. This is the position that we take on this.

There are ultimately three keys to avoiding tire trouble while towing: (1) Make sure your rig is equipped with the proper tires; (2) Maintain the tire meticulously; and (3) Replace trailer tires every three to five years of service, whether they look like they are worn out or not.

MAINTENANCE TIPS

When a trailer is in long-term storage, there are steps you can take to add life to the tires.

- Put the trailer on blocks to take the weight off the tires.
- Lower the air pressure.
- Keep the tires covered to protect them from the sun's ultra-violet light.

When taking the trailer out of storage, make sure there are no cracks in the grooves and no wire showing. Cracks in the sidewall could indicate interior damage or separations in the tire.

WHEEL MAINTENANCE

Important! Your new wheels do require care to maintain their factory appearance. We strongly insist you take a few reasonable steps to protect your investment.

- **Regular Cleaning** - Typical road soils trap moisture, which can cause corrosion over a period of time. Brake dust, caused by friction of your trailers braking system, is itself corrosive and cause pitting of the wheel finish. These soils must be removed regularly, possibly weekly, depending on your trailering habits.
- **Use of Proper Cleaning Agents** - Your wheels finish should be treated as you would treat the finish of your car. Most household cleaning agents are too harsh for the finish on your wheel and must be avoided. There are a vast number of commercially available wheel cleaners on the market today, but we urge extreme caution regarding their use, since they tend to be acid or lye based. Always follow the manufacturer's recommendations on the bottle for safe and effective cleaning.
- **Chrome Steel Wheels** - After cleaning, always apply a coat of soft non-abrasive cream wax to help prevent surface corrosion. Surface corrosion or rust can be prevented with proper care.

NOTE: This does not apply to clear coated steel wheels.

- **Additional Tips** - To prevent scratching of the wheel finish, never clean your wheels with scouring pads or mag polish. If you use automatic car washes, tell them not to use steam cleaners or strong chemicals to clean your wheels. They can cause permanent staining or corrosion. Use caution when cleaning tires with steel wool or a bristle brush. These types of abrasive materials must not come in contact with the wheels. Never allow any harsh chemicals or tire cleaner to come in contact with the wheels, as they will damage the appearance of the wheel permanently. Never spray cold water on extremely hot wheels. Always allow time to cool before cleaning with soap and water or the recommended wheel cleaner.

WHEEL INSTALLATION

- Clean and inspect all stud threads and mounting surfaces before installation. Threads must be free of corrosion, rust, burrs and fractures. Replace studs if they are corroded beyond reasonable repair, if threads are stripped, or a fracture is found. Check and make sure the approved lug nuts are correct for the application. When placing the wheel on the studs, there will be an apparent looseness of fit, until the lug nuts are applied.
- Check the lug nut thread engagement. Every stud must be long enough to thread into the lug nut a length at least equal to the stud diameter. For example: a 1/2" thread diameter must thread into the lug nut at least a 1/2". Check for this problem on every stud, some may be different lengths. Less than one stud thread diameter engagement is unsafe and will cause loss of nut torque. If you do not have proper thread engagement, do not install wheels.
- Lug nuts must be applied in a star or crisscross pattern to insure uniform pressure and alignment. Apply torque evenly by repeating star or crisscross pattern until desired torque is reached. Shown below is the numerical sequence.

WARNING! Never use fewer lug nuts than the wheel and the vehicle was designed for. If the wheel has 5 lug holes, than use **5 lug nuts**.

Tires

4-LUG

5-LUG

6-LUG

8-LUG

DO NOT USE AIR OR IMPACT WRENCHES TO TIGHTEN LUG NUTS! They can cause thread stripping and under or over tightening. These problems will cause wheel failure that can result in severe injury. Additionally, using them can mar the finish of some wheels. **A CALIBRATED TORQUE WRENCH MUST BE USED TO INSURE PROPER AND SAFE INSTALLATION.** Tighten all lug nuts to the proper torque specifications listed in the vehicle's owner's manual.

- _____ Wheel and tire has sufficient clearance from any brake, fender or suspension component.
- _____ All lug nuts are tightened to proper torque specification with a calibrated torque wrench.
- _____ Customer is instructed to re-torque immediately after 25 miles or return to shop so installer can re-torque.

Proper torque for this application is _____ ft.-lbs.

LUG NUT/BOLT DIAMETER	TORQUE IN FT./LBS.
7/16"	55-65
1/2"	75-85
9/16"	95-115
12 MM	70-80
14 MM	85-95

If this information is not available, use the chart shown above for your particular stud size.

AFTER INSTALLATION - RETORQUING

All lug nuts must be checked and retorqued to the proper specification immediately after 25-50 miles. Failure to retorque is unsafe and could cause a serious accident. Retorquing must be done any time the wheel lug nuts are removed for any reason.

SAFETY CHECKLIST

This safety checklist must be completed after installation. This checklist is to verify that major safety points were checked. If any item was not performed on the checklist, installer must correct before releasing vehicle to owner. Please initial appropriate boxes and sign on the appropriate line. In addition, the customer must sign and verify.

- _____ Load rating of wheel is sufficient for vehicle.
- _____ Maximum tire diameter rating of wheel is not exceeded.
- _____ Wheel and tire sizes are the same: i.e.: 16" tire on a 16" rim or 16.5" tire on a 16.5" rim.
- _____ No obstruction (spring clips retainers, rivets or weights) that prevent the wheel from seating flush on mounting surface.
- _____ All threaded studs are free of rust, corrosion, fractures, etc.