

## 6 / TIRES AND WHEELS

### THE IMPORTANCE OF PROPER TIRE INFLATION

Your trailer tires and wheels, and tongue or fifth-wheel hitch support the entire weight of the trailer and its contents. The tires are also the only contact the trailer has with the road surface. Determining and maintaining proper inflation is the most important factor in maximizing the life of your tires. Driving on a tire that does not have the correct inflation pressure for the trailer load is dangerous and may cause premature wear, tire damage, tread delamination and/or loss of control of the trailer and/or tow vehicle.

An under-inflated tire will build up excessive heat that may go beyond the limits of the tire materials. This could result in sudden tire failure. An under-inflated tire will also cause poor vehicle handling, rapid and/or irregular tire wear, and an increase in rolling resistance which results in decreased tow vehicle fuel economy.

The maximum cold inflation pressure for your tires is stated on the tire sidewalls (see page 8 of this chapter) and Federal certification label (see Chapter 1, page 6). Keep your tires inflated to this maximum cold pressure. This reduces the chance of a failure and improves towing stability. Maintaining correct tire inflation pressure for your trailer is of the utmost importance and must be a part of regular vehicle maintenance.

**You must weigh your trailer when it is fully loaded as you expect to use it.** You need to weigh all axles together and calculate the hitch weight. You may find that even though the total weight is within the GVWR, one side may be overloaded. For this reason, you must know the weight of each side of the trailer. When you know the weight on each side of the trailer, the combined axle assembly, and the hitch weight, you will be able to manage your loading to be able to maintain good balance and assure good and safe handling on the road. Here are some tips to help you plan your loading:

- ▶ *Do not overload. Experiment with various loads starting with light loads and working up to heavier loads. Take into consideration the load of the fresh water system. The tow vehicle and the terrain will affect the true weight you should carry.*

#### **WARNING**

**Check tire pressures before traveling. Always check tire pressure when tires are cold. Do not exceed the maximum recommended pressure.**

#### **WARNING**

**Keep tires properly inflated. A tire that is run long distances or at high speeds while seriously under-inflated will overheat to the point where the tire may lose air suddenly and/or catch fire, possibly resulting in damage to the vehicle and its contents and/or personal injury.**

- ▶ *Distribute the load evenly over the axles as much as possible. Keep heavy items low and forward, preferably in the lower storage areas. This will produce a lower center of gravity, and improve road stability.*
- ▶ *Distribute the load evenly on each side of the trailer. Place heavier objects opposite the heavier appliances, cabinets, furniture, etc. when possible. Experiment with various load positions until you find the best distribution.*
- ▶ *Avoid loading heavy items in or on the rear of the trailer. This can cause both total weight problems and hitch weight distribution problems.*
- ▶ *Secure items so they won't move around while traveling. Make sure all items and materials are properly stored. Close and latch all drawers, cabinet doors, and closet doors. Pull all loose furniture away from cabinets and walls, and lay on their side or secure to prevent rubbing during travel.*
- ▶ *Carry only as much water as you think you will need while traveling. Water weighs over eight pounds per gallon. Whenever possible, empty the holding tanks before getting on the road.*
- ▶ *If you are heading for rough terrain, use heavy packing material in the cupboards to hold plates, glasses, etc. Put a nonskid material beneath heavier items to prevent shifting. Expensive and breakable belongings should be well packed and placed on the floor in the center of the trailer, as the center rides best.*
- ▶ *Store emergency items such as fire extinguisher, first-aid kit, highway warning devices, gloves, etc. in a readily accessible place. Don't bury these items beneath other cargo.*
- ▶ *When you have properly loaded your trailer with the things you need for your trip, make a diagram that outlines where things are stored. With this diagram, your list of items and the weight of the items, you will be able to find specific items easily and have a handy reference for determining proper weights.*

- *Weigh your trailer after you have loaded it. You may have to do this several times to get it right.*

Check the trailer tires frequently. Tires can lose air over a period of time. In fact, tires can lose 1 to 3 PSI per month. This is because molecules of air, under pressure, migrate through the rubber from the inside to the outside. A drop in tire pressure could cause the tire to become overloaded, leading to excessive heat build up. If a trailer tire is under-inflated, even for a short period of time, the tire could suffer internal damage. A flat can go unnoticed on a multiple axle trailer while it is being towed. Running with a flat can cause it to catch fire and burn up your rig. With multiple axles or tandem wheels it is hard sometimes to see a flat tire as the other tires are supporting the weight of the rig and the flat tire is less noticeable. A quick check can be made by "thumping" each tire with a tire iron or rod to make sure they all sound the same. Each time you gas up, walk around the trailer and give a quick check by feeling each tire with your hand. A tire that is getting low will be hotter than the rest. There is no substitute, however, for actually measuring tire pressures to make sure they are all within safe limits. Always check the cold tire inflation pressures before each trip and at least once a week during the trip for proper inflation levels.

***The most common causes of tire failure are overloading and underinflation.*** Both result in excess flexing of the sidewall which causes heat buildup and eventual tire failure. ***Continuing to run with a flat can cause it to catch fire.***

The most important things you can do to avoid tire failures are:

- maintain proper tire pressure
- stay within tire and vehicle load limits
- avoid road hazards if possible
- inspect tires for cuts, slashes, and other irregularities.

Properly maintained tires improve the steering, stopping, traction, and load-carrying capability of your vehicle. Make tire safety a regular part of your vehicle maintenance routine. Recognize that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.



**Tire load ratings are dependent on tire inflation pressures. Under-inflated tires can be damaged and result in a loss of inflation pressure.**

**NOTE:** The air pressure recommended on the tire information placard is for the original standard equipment tires only. Your trailer may be equipped with optional-sized tires. Always follow the pressure recommendations stamped in the tire sidewall for any replacement tire.

## UNDERSTANDING TIRE PRESSURE AND LOAD LIMITS

Tire inflation pressure is the level of air in the tire that provides it with load-carrying capacity and affects the overall performance of the vehicle. The tire inflation pressure is a number that indicates the amount of air pressure that a tire requires to be properly inflated. It is difficult to obtain the recommended tire pressure if your tires are not cold. Because tires are designed to be used on more than one type of vehicle, tire manufacturers list the “maximum permissible inflation pressure” on the tire sidewall. This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

## CHECKING & ADJUSTING TIRE PRESSURE

It is important to check your vehicle's tire pressure at least once a month, always before every trip, and at least once a week while on the road. Not only do tires naturally lose air over time, but they can lose air suddenly if you drive over a pothole or other object, or if you strike the curb. It is difficult to determine tire inflation pressure by looking at the tire. Purchase a tire pressure gauge to keep in your vehicle. Gauges can be purchased at tire dealerships, auto supply stores, and other retail outlets.

The recommended tire inflation pressure is the proper pressure when a tire is cold. A “cold” tire is one that has not been driven on for at least three hours. When you drive, your tires get warmer, causing the air pressure within them to increase. Therefore, to get an accurate tire pressure reading, **you must measure tire pressure when the tires are cold.**

- ▶ *Refer to the tire sidewalls for the recommended tire pressure. Your trailer may be equipped with optional tires. Always refer to the tire sidewalls for recommended tire pressure.*
- ▶ *Check and write down the pressure in all tires.*
- ▶ *If the tire pressure is too high in any of the tires, slowly release air by gently pressing on the tire valve stem with the edge of your tire gauge until you get to the correct pressure.*
- ▶ *If the tire pressure is too low, note the difference between the measured tire pressure and the correct tire pressure. You will need to add air to get to the correct pressure.*

- ▶ *Add air to each tire that is under-inflated.*
- ▶ *Check all the tires again to make sure they have the same air pressure.*

If you have been towing your trailer and think that a tire is under-inflated, fill it to the recommended cold inflation pressure. Remember to recheck and adjust the pressure in all tires when you can obtain a cold reading.

## TIRE TREAD

The tire tread provides the gripping action and traction that helps to prevent your trailer from slipping or sliding, especially when the road is wet or icy. In general, tires are not safe and should be replaced when the tread is worn down to 1/16 of an inch. Tires have built-in treadwear indicators that let you know when it is time to replace your tires. These indicators are raised sections spaced intermittently in the bottom of the tread grooves. When they appear “even” with the outside of the tread, it is time to replace your tires.

## TIRE LIFE

Trailer tires may be worn out even though they still have plenty of tread left. This is because trailer tires have to carry a lot of weight all the time, even when not in use. It is actually better for the tire to be rolling down the road than to be idle. During use, the tire releases lubricants that are beneficial to tire life. Using the trailer tires often also helps prevent flat spots from developing. The average life of a trailer tire is about five years under normal use and maintenance conditions. After five years, trailer tires may be degraded to the point that they should be replaced, even if they have had minimal or no use. Exposure to sunlight (ultra-violet damage) and high speed towing in hot conditions also reduces tire life. As heat builds up during driving, the tire's internal structure starts to break down, compromising the strength of the tire. Have your tires inspected by a tire supplier to determine if your tires need to be replaced.

## REPLACEMENT TIRES

To maintain tire safety, purchase new tires that are the same type, size, construction and load rating as the original tires. Look at the tire information placard or the sidewall of the tire you are replacing to find this information. If you have any doubt about the correct size to choose, consult with the tire dealer.



### **WARNING**

**All tires on your trailer should be the same type, size, construction and load rating — do not mix bias-belted and radial tires.**



### **WARNING**

**There is a danger of serious injury or death if a tire of one bead diameter is installed on a rim or wheel of a different rim diameter. ALWAYS replace a tire with another tire of exactly the same bead diameter designation and suffix letters.**

## TIRE SAFETY INFORMATION

This portion of the Owner's Manual contains tire safety information as required by 49 CFR 575.6.

The National Highway Traffic Safety Administration (NHTSA) has published a brochure (DOT HS 809 36 ) that discusses all aspects of Tire Safety, as required by CFR 575.6. It can be obtained and downloaded from NHTSA, free of charge, from the following web site:

[http://www.NHTSA.dot.gov/cars/rules/TireSafety/ridesonit/tires\\_index.html](http://www.NHTSA.dot.gov/cars/rules/TireSafety/ridesonit/tires_index.html)

Studies of tire safety show that maintaining proper tire pressure, observing tire and vehicle load limits (not carrying more weight in your vehicle than your tires or vehicle can safely handle), avoiding road hazards, and inspecting tires for cuts, slashes, and other irregularities are the most important things you can do to avoid tire failure, such as tread separation or blowout and flat tires.

These actions, along with other care and maintenance activities, can also:

- Improve vehicle handling
- Help protect you and others from avoidable breakdowns and accidents
- Improve fuel economy
- Increase the life of your tires.

Use this information to make tire safety a regular part of your vehicle maintenance routine. Recognize that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.

## SAFETY FIRST – BASIC TIRE MAINTENANCE

Properly maintained tires improve the steering, stopping, traction, and load-carrying capability of your vehicle. Under-inflated tires and overloaded vehicles are a major cause of tire failure. Therefore, as mentioned above, to avoid flat tires and other types of tire failure, you should maintain proper tire pressure, observe tire and vehicle load limits, avoid road hazards, and regularly inspect your tires.

## FINDING YOUR VEHICLE'S RECOMMENDED TIRE PRESSURE AND LOAD LIMITS

Tire information placards and vehicle certification labels contain information on tires and load limits. These labels indicate the vehicle manufacturer's information including:

*Recommended tire size*

*Recommended tire inflation pressure*

*Vehicle capacity weight (VCW—the maximum occupant and cargo weight a vehicle is designed to carry)*

*Front and rear gross axle weight ratings (GAWR—the maximum weight the axle systems are designed to carry).*

Both placards and certification labels are permanently attached to the trailer on the forward half of the left side, and are easily readable from outside the vehicle without moving any part of the vehicle.

## TIRE REPAIR

The proper repair of a punctured tire requires a plug for the hole and a patch for the area inside the tire that surrounds the puncture hole. Punctures through the tread can be repaired if they are not too large, but punctures to the sidewall should not be repaired. Tires must be removed from the rim to be properly inspected before being plugged and patched.

## TIRE FUNDAMENTALS

Federal law requires tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire and also provides a tire identification number for safety standard certification and in case of a recall.

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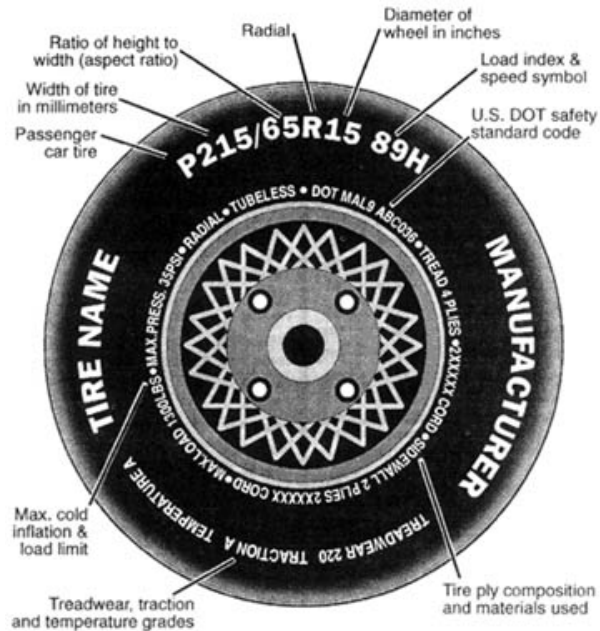
## TIRE LABEL INFORMATION

**P** - The “P” indicates the tire is for passenger vehicles.

**NOTE: Passenger car tires are not recommended for use on trailers.**

**LT** - “LT” indicates the tire is for light trucks. **NOTE: Light truck tires are not recommended for use on trailers.**

**ST** - “ST” is an indication the tire is for trailer use only.



**Next number** - This three-digit number gives the width in millimeters of the tire from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.

**Next number** - This two-digit number, known as the aspect ratio, gives the tire’s ratio of height to width.

**R** - The “R” stands for radial. Other tire designs may be “bias ply” or “bias belted” and are designated by other letters.

**Next number** - This two-digit number is the wheel or rim diameter in inches. If you change your wheel size, you will have to purchase new tires to match the new wheel diameter.

**Next number** - This two- or three-digit number is the tire’s load index. It is a measurement of how much weight each tire can support. You may find this information in your owner’s manual. If not, contact a local tire dealer.  
**Note:** You may not find this information on all tires because it is not required by law.

**Speed Rating** - The speed rating denotes the top speed at which a *passenger car* tire is rated. A speed rating will not be found on “ST” tires used on trailers. All “ST” tires are speed restricted to 65 mph. Never operate a vehicle in an unsafe or unlawful manner. Tire speed ratings (if indicated) should never be associated with the ability of the vehicle to handle the speed for which the tire is rated.

**U.S. DOT Tire Identification Number** - This begins with the letters “DOT” and indicates that the tire meets all federal standards. The next two numbers or letters are the plant code where it was manufactured, and the last four numbers represent the week and year the tire was built. For example, the numbers 3 97 means the 3rd week of 1997. The other numbers are marketing codes used at the manufacturer’s discretion. This information is used to contact consumers if a tire defect requires a recall.

**Tire Ply Composition and Materials Used** - The number of plies indicates the number of layers of rubber-coated fabric in the tire. In general, the greater the number of plies, the more weight a tire can support. Tire manufacturers also must indicate the materials in the tire, which include steel, nylon, polyester, and others.

**Maximum Load Rating** - This number indicates the maximum load in kilograms and pounds that can be carried by the tire.

**Maximum Permissible Inflation Pressure** - This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

## IMPORTANT SPECIAL NOTICE

Your trailer is equipped with tires designated as “ST”. This designation means that the tires are built specifically for trailer applications. They are correct for your trailer and the maximum loads the trailer was designed and rated to carry.

Tire industry standards require that tires with the ST designation are speed restricted to 65 MPH under *normal* inflation and load conditions. Unless a different speed restriction is indicated on the sidewall of the tire, it is best that you not operate your trailer at speeds above 65 mph.

### **NOTICE**

Although tires designated “LT” are sometimes used on trailers, they are not recommended for use on your trailer and should not be considered as replacements for the original equipment “ST” designated tires.

## VEHICLE LOAD LIMITS

Determining the load limits of a vehicle includes more than understanding the load limits of the tires alone. A Federal Certification Label is located on the forward half of the left (road) side of the unit. The certification label indicates the vehicle's gross vehicle weight rating (GVWR). This is the most the fully loaded vehicle can weigh. It also provides the gross axle weight rating (GAWR). This is the maximum weight a particular axle can carry. If there are multiple axles, the GAWR of each axle is provided. In the same location as the certification label described above, there is a vehicle placard. This placard provides tire and loading information. In addition, this placard will show a statement regarding maximum cargo capacity.

## CARGO CAPACITIES

Cargo can be added to the vehicle, up to the maximum weight specified on the placard. The combined weight of the trailer and the cargo is provided as a single number. In any case, remember: ***the total weight of a fully loaded vehicle can not exceed the stated GVWR.***

Water and propane also need to be considered. The weight of fully filled propane containers is considered part of the weight of the RV before it is loaded with cargo and is not considered part of the disposable cargo load. Water however, is a cargo weight and is treated as such. If there is a fresh water storage tank of 100 gallons, this tank when filled would weigh over 800 pounds. If more cargo is being transported, water can be off-loaded to keep the total amount of cargo added to the vehicle within the limits of the GVWR so as not to overload the vehicle.

Understanding this flexibility will allow you, the owner, to make choices that fit your travel and camping needs.

When loading your cargo, be sure it is distributed evenly to prevent overloading front to back and side to side. Heavy items should be placed low and as close to the axle positions as reasonable. Too many items on one side may overload a tire. The best way to know the actual weight of the vehicle is to weigh it at a public scale. Talk to your RV dealer to discuss the weighing methods needed to capture the various weights related to the RV. This would include weights for the following: axles, wheels, hitch or pin and total weight.

## How Overloading Affects Your RV and Tires

The results of overloading can have serious consequences for vehicle safety. Too much weight on your vehicle's suspension system can cause spring, shock absorber, or brake failure, handling or steering problems, irregular tire wear, tire failure or other damage. An overloaded vehicle is hard to drive and hard to stop. In cases of serious overloading, brakes can fail completely, particularly on steep hills. The load a tire will carry safely is a combination of the size of tire, its load range, and corresponding inflation pressure. Excessive loads and/or under-inflation cause tire overloading and, as a result, abnormal tire flexing occurs. This situation can generate an excessive amount of heat within the tire. Excessive heat may lead to tire failure. It is the air pressure that enables a tire to support the load, so proper inflation is critical. Since RVs can be configured and loaded in many ways, air pressures must be determined from actual loads (determined by weighing) and taken from the load and inflation tables provided by the tire manufacturer. These air pressures may differ from those found on the certification label. However, they should never exceed the tire limitation for load or air pressure. If you discover that your tires cannot support the actual weights, the load will need to be lightened.

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## TIRE SAFETY TIPS

### PREVENTING TIRE DAMAGE

- ▶ *Slow down if you have to go over a pothole or other object in the road.*
- ▶ *Do not run over curbs or other foreign objects in the roadway, and try not to strike the curb when parking.*

### TIRE SAFETY CHECKLIST

- ▶ *Check tire pressure (including the spare) at least once a month and before going on any trip*
- ▶ *Inspect tires for uneven wear patterns on the tread, cracks, foreign objects, or other signs of wear or trauma.*
- ▶ *Remove bits of glass and foreign objects wedged in the tread.*
- ▶ *Make sure your tire valves have valve caps.*
- ▶ *Do not overload your vehicle. Check the Tire Information and Loading Placard or User's Manual for the maximum recommended load for the vehicle.*

## STEPS FOR DETERMINING CORRECT LOAD LIMIT

- ▶ *Locate the statement "The weight of cargo should never exceed XXX lbs" on your vehicle's placard.*
- ▶ *The figure stated on the placard is the available amount of cargo load capacity. The weight of all cargo loaded in the vehicle may not safely exceed this figure.*
- ▶ *Determine the weight of cargo being loaded in the vehicle. That weight may not safely exceed the available cargo capacity.*

For further information about wheel and tire safety:

1-888-327-4236 (TTY: 1-800-424-9 53)  
<http://www.safercar.gov>

and

NHTSA  
400 Seventh St. S.W.  
Washington, DC 20590

## GLOSSARY OF TIRE AND WEIGHT TERMINOLOGY

**Cold inflation pressure** - The pressure in the tire before you drive.

**Load rating** - The maximum load that a tire is rated to carry for a given inflation pressure.

**Maximum load rating** - The load rating for a tire at the maximum permissible inflation pressure for that tire.

**Maximum permissible inflation pressure** - The maximum cold inflation pressure to which a tire may be inflated.

**Recommended inflation pressure** - This is the inflation pressure provided by the vehicle manufacturer on the Tire Information label and on the Federal Certification/VIN tag.

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**WARNING**
**WHEEL SEPARATION  
CAN OCCUR**

On first trip, torque wheel nuts at 10, 25 and 50 miles and every 50 miles during the first 200 miles thereafter, and before each trip. After winter storage, check wheel nut torque before beginning a trip. After excessive braking, check wheel nut torque.


**WARNING**

Installation of wheels which are not compatible with the manufacturer-installed axle assembly could result in wheel separation, which can lead to property damage, serious injuries or loss of life.


**WARNING**

Do not tow the trailer with missing wheel nuts or faulty lug bolts.


**WARNING**

Torque wheel nuts to the wheel manufacturer's specifications. Incorrectly torqued wheel nuts can cause the wheel to separate from the wheel mounting surface during operation, causing property damage, personal injury or death.

## WHEELS AND WHEEL NUT TORQUE

The axle and wheel assemblies of your RV are designed differently than those on your car. The overall size, weight and center of gravity of a recreational vehicle subject the wheels to pressures unique to trailering. During normal cornering, the tires and wheels experience a considerable amount of stress called "side-load". Trailer wheels must carry higher loads per wheel than passenger car or light truck wheels. The axles on multiple-axle trailers do not steer, and are subjected to very high side load stress whenever the trailer makes a tight turn. When you go around corners — especially tight ones — the wheels on your trailer are subjected to these strong side loads. This action tends to flex the wheel and gradually loosen the wheel nuts. Even though the materials and manufacturing processes are maximized for this type of service, the extra load stresses and flexing can cause loosening.

Proper wheel nut torque is very important to safe and dependable trailering. Although the wheel and axle systems used in your trailer are similar to those on your car or truck, they differ in several important ways. These differences require special attention to wheel nut torque both when the trailer is new and throughout the trailer's life.

***It is critical that the wheels be properly torqued during the first 10 to 50 miles of operation.*** The wheels have been correctly torqued before leaving the factory. But settling and wearing in of components during the first few miles of operation may cause some loosening of the wheel nuts.

**The wheel nut torque specification is shown on the *Wheel Nut Torque Table* at the end of this chapter. The values are different depending on the type of wheel installed. Always use an accurate torque wrench to tighten the wheel nuts.** Before each trip and any time a wheel is replaced, be sure to tighten the wheel nuts as outlined in the following section. If a wheel is replaced, check the torque again after 10, 25 and 50 miles. If you ever notice wheel wobbling or hear a rattling sound coming from a wheel, especially at low speeds, a wheel nut may have come loose. If you have reason to believe a wheel nut has come loose, ***safely stop at the side of the road as soon as possible.*** Check all wheel nuts, and tighten to the specified torque. If wheel stud bolt threads are damaged or faulty, get professional service help. ***Do not tow the trailer with missing wheel nuts or faulty wheel stud bolts.***

If you ever have to replace lost or damaged wheel nuts, be sure the replacements match the cone angle of the originals.

## WHEEL NUT TORQUE REQUIREMENTS & MAINTENANCE

### Tools Required

Dial indicator or adjustable dial torque wrench  
7/8" or 13/16" socket

**DO NOT USE a 4-way socket or any other type of wrench**, which does not measure the actual pressure applied to the wheel nut.

Please refer to the torque wrench manufacturer's instructions for information on correct use, storage and maintenance of your torque wrench.

### **Remember:**

#### **Check wheel nut torque before every trip.**

MVP RV recommends this maintenance procedure to ensure proper torque has been applied to wheel nuts before heading out on the road.

**Always follow the appropriate tightening sequence ("star pattern")** as indicated in these instructions or in your axle manufacturer's owner's manual to assure proper torque.

Torque wheel nuts in the correct stages and follow-up intervals after any wheel reinstallation. For further information on these steps, you may want to refer to the axle manufacturer's owner's manual in your Owner's Information Packet. Proper torque of wheel nuts can only be achieved by using a torque wrench and a socket.

### **Setting Torque Value on a Dial Indicator Wrench**

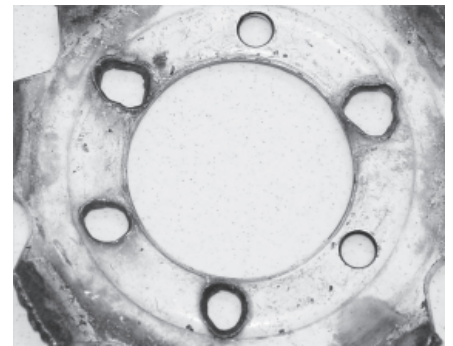
1. Make sure your indicator needle is set to "0".
2. As you apply clockwise pressure to the wheel nut, both needles will show the current amount of torque being applied.
3. When you reach your desired torque value, stop applying pressure and your indicator needle will stay at the highest torque value reached.

### **Setting Torque Value on Adjustable Dial Wrench:**

1. Unlock the handle and set the dial to your desired torque value.
2. Lock the handle back in place.
3. As you apply clockwise pressure to the wheel nut, you will hear an audible "click" when the desired torque wrench value is reached. Do not apply further pressure once you hear the "click".

### **WARNING**

**Loose wheel nuts can damage the stud and/or wheel. If driven in this condition for any extended period, severe wheel damage could occur affecting the handling of your trailer.**



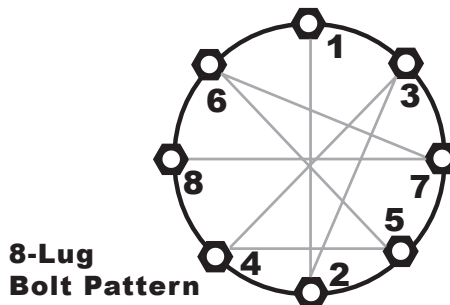
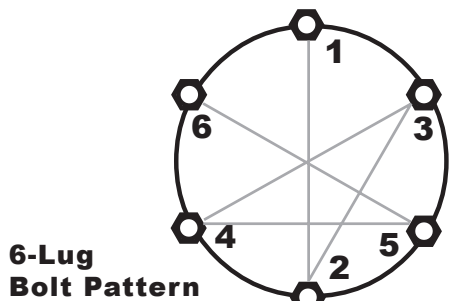
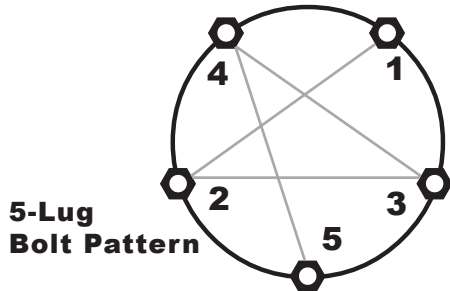
This wheel was operated with four loose wheel nuts. Note the damaged holes, and that only two nuts were holding the wheel on the axle hub.

### **WARNING**

**Do not attempt to repair or modify a damaged wheel. Even minor modifications can cause a dangerous failure of the wheel and result in personal injury or death.**

## ! WARNING

Under- or over-tightening of wheel nuts can cause the wheel to separate from the axle and could lead to property damage, serious injury or death.



**NOTE:** Use a torque wrench to tighten wheel nuts. Do not tighten with an impact wrench unless using a torque stick.

**NOTE:** The *maximum* torque value for the wheel mounting studs is 120 ft.-lbs. Studs are **Grade 8, 1/2"-20 UNF, Class 2A**.

### Wheel Nut Torquing Sequence

#### Pre-Trip Torquing Procedure:

1. Set your torque wrench to the final value listed in the **Wheel Nut Torque Table** at the end of this chapter.
2. Begin with the appropriate bolt for your wheel (12 o'clock position for 8 and 6 hole wheels and 2 o'clock position for 5 hole wheels, as illustrated) and apply torque to all wheel nuts following the star pattern indicated.
3. Complete the procedure on each wheel. Before moving to each new wheel, be sure to verify your preset torque wrench value.

#### Torquing After Wheel Reinstallation

After removing a wheel from your RV for any reason, you must carefully follow a 2-step process:

- 1) Wheel Reinstallation
- 2) Follow-up

#### Wheel Reinstallation

When you reinstall a wheel, the wheel nut torque must be applied in 3 stages. This will ensure the wheel studs are centered in the wheel holes, and will help the wheel nuts maintain proper torque.

1. Start all wheel nuts by hand.
2. Stage 1

Set your torque wrench to the 1st Stage value<sup>3</sup> on the **Wheel Nut Torque Table**.

Begin with the appropriate bolt for your wheel (12 o'clock position for 8 and 6 hole wheels and 2 o'clock position for 5 hole wheels) and apply torque to all wheel nuts following the star pattern as shown in the **Wheel Nut Torquing Sequence** illustration.

3. Stage 2

Increase your torque wrench setting to the 2nd Stage value on the **Wheel Nut Torque Table**.

Begin with the appropriate bolt for your wheel and apply torque to all wheel nuts following the star pattern.

Following stage 2, the wheel can support the weight of the trailer and can be lowered off of the jack stands.

4. Stage 3

Increase your torque wrench setting to Final Torque value on the **Wheel Nut Torque Table**.

Begin with the appropriate bolt for your wheel and apply torque to all wheel nuts following the star pattern.

**Step 2) Follow-Up: Retorque after 10, 25, and 50 miles**

1. After the first 10 miles of your trip, pull your recreation vehicle off the road into a safe work area.
2. Set your torque wrench to the Final Torque value on the Wheel Nut Torque Table for your wheels.
3. Begin with the appropriate bolt for your wheels and apply torque to all lug nuts following the star pattern.
4. Reapply torque (at the Final Torque value for your wheels) and repeat steps 1, 2, & 3 again at 25 miles and at 50 miles of your first trip.
5. The follow up process is complete and you should refer to the general lug nut torque maintenance process described in "Pre-Trip Torquing Procedure".

**REPLACEMENT WHEEL REQUIREMENTS**

MVP RV installs axle systems with hubs and drums that are compatible with many wheels used in the recreational travel trailer industry that have similar or matching bolt patterns. If the original manufacturer-installed equipment must be replaced, contact the replacement wheel manufacturer to ensure compatibility prior to replacement and use.

Customers replacing original equipment must ensure the replacements are compatible with the hub and drum assembly installed. This compatibility includes, but is not limited to:

- ▶ Diameter of the hub-mounting surface
- ▶ Stud length and diameter
- ▶ Location and number of studs – Many bolt circle dimensions are available. Some vary by so little that it might be possible to attach an improper wheel that does not match the axle hub. Be sure to match your wheel to the axle hub.
- ▶ Center hole diameter for the wheel
- ▶ Wheel mounting offset from the rim center
- ▶ Rated capacity of the wheel – Make sure that the wheels have enough load carrying capacity and pressure rating to match the rated load of the tire(s).
- ▶ Offset – This is the relationship of the center line of the tire to the hub face of the axle. Take care to match any replacement wheel with the same offset wheel as originally equipped. Failure to match offset can result in reducing the load carrying capacity of your axle.

**NOTE:** The studs conform to SAE standards for **Grade 8**.

Keep the date and mileage when you check the wheel nut torque. Note any wheel nut that has lost torque. Investigate the reason(s) if the wheel nut torque is not maintained after more than one re-torquing. This indicates there is something wrong with the wheel nuts, nut studs, wheels and/or hubs and should be corrected.

If you ever experience a wheel separation incident, notify MVP RV and your dealer. Seek prompt professional assistance in assessing the trailer and its gear. Keep, but don't re-use the wheels, wheel nuts and studs involved. Don't repair or service the trailer yourself.

**WARNING**

**Do not mismatch wheels and tires.**

**WARNING**

**Do not paint or apply anti-seize or anti-rust materials to the hub mating surface of wheels. These materials prevent a secure metal-to-metal contact with the hub surface. Use of these materials may cause loosening of the wheel or wheel nuts, causing the wheel to separate from the axle, and may lead to property damage, serious injury or death.**

**NOTE: The maximum air pressure rating stated on the tire information placard is for the original equipment, factory-installed tires only. Always follow the pressure recommendations stamped in the tire sidewall for any replacement tire.**

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- ▶ Wheel fastener torque
- ▶ Wheel nut size and shape (including cone angle)
- ▶ The effects of any added wheel accessories that could affect proper seating of the wheel to hub surface.

Certain tests are recommended by the manufacturers of factory-installed equipment for all wheels and rims to be installed in place of original factory equipment. Contact the wheel manufacturer to verify compatibility with the factory installed equipment prior to replacement.

Any replacement wheel must be plain metal on the surface mating to the trailer hub. There should be no paint, clear coat material, anti-seize or anti-rust coating. These materials prevent a secure metal-to-metal contact with the hub. A secure metal-to-metal contact is required for safe and complete attachment of the wheel to the hub.

The same torquing considerations apply to replacement wheels as to original equipment. If you replace wheels, try to find out the torquing specifications for the replacement wheel. In all cases, do not torque wheel nuts greater than the value listed in the **Wheel Nut Torque Table**. This is the maximum specified torque for the wheel mounting studs. The studs conform to SAE standards for Grade 8.

<b>Wheel Nut Torque Table</b>			
	<b>Steel Wheel</b>	<b>Chrome-plated Steel Wheel</b>	<b>Aluminum Wheel</b>
<b>1st Stage</b>	20-30 ft./lb.	20-30 ft./lb.	35-40 ft./lb.
<b>2nd Stage</b>	55-60 ft./lb.	55-60 ft./lb.	75-80 ft./lb.
<b>Final Torque</b>	90-95 ft./lb.	90-95 ft./lb.	120 ft./lb.