



# Rx for Light Trucks, RVs, Mini-buses & Ambulances

## Overweight Vehicles & Underinflated Tires: A GROWING PROBLEM

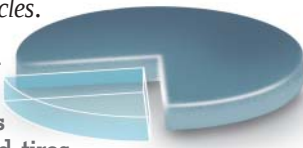
Overloading an RV, mini-bus, light truck, van or ambulance, or running on underinflated tires, is not just hard on the vehicle – it could cause your tires to fail. Tires and axles are designed to handle only so much weight. Exceeding it puts a strain on the whole system. Overloading and underinflation are both unsafe, send operating and repair costs sky-high and can cause unexpected downtime. Don't let an overweight vehicle or underinflated tire spoil your trip – or worse.

### How overweight ARE our vehicles?

Since 1993, "A'Veigh We Go," a project of the Recreational Vehicle Safety Education Foundation (RVSEF), has weighed over 9,000 motor homes and trailers in conjunction with RV events.

The results are not pretty. Of the RVs checked by RVSEF, *nearly a quarter had loads that exceeded the capacity of the tires on the vehicles.*

According to RVSEF, 23% of RV's had overloaded tires



Most of the weight was on the rear. Forty percent of all rear tires were overloaded. And weight distribution was so poor that about 28 percent of all motor homes were out of balance by 400 pounds or more from one axle end to the other.

In a separate survey conducted by Bridgestone/Firestone, 4 out of 5 RVs had at least one underinflated tire, a third of which were dangerously underinflated, and at risk of failure.

An underinflated tire cannot carry the load of a properly inflated tire. When a tire is underinflated, the extra weight causes greater heat build-up in the tire, which can lead to tire failure.



Often, these dangerously underinflated tires were the inner tires of dual pairs, tires that are difficult to see and difficult to service.

On average, RVs were overloaded by over 900 pounds, based on the RV manufacturer's specifications.

### Neglect makes matters worse

Even a tire that's in perfectly good condition, properly mounted and correctly inflated can lose between 1 and 2 lbs. of inflation pressure (psi) per month, depending on tire size. *(This is normal. See the story on page 9.)*

And yet, nearly 40% of RV users say they go six months or more between inflation pressure checks.

With this kind of inflation pressure loss, their tires could be as much as 12 psi low, a potentially very serious situation that could cause a sudden tire failure that could lead to accidents or death.

## the High Cost of overloading & underinflation

### Negative effects ON SAFETY

- Tire failures
- Reduced handling capability
- Dangerous on-road breakdowns
- Stopping distances may lengthen

### Negative effects ON YOUR POCKETBOOK

- Rapid tire wear
- Irregular tire wear
- Rapid component wear
- Excessive fuel consumption
- Costly breakdowns

**For your safety and that of your passengers, never exceed your vehicle's safe load capacity, and always make sure your vehicle's load is properly distributed.**

# How does overloading happen?

## Too Much Stuff

Many vehicles, including RVs, mini-buses, trailers and ambulances end up overloaded simply because people put too many things into them. There is no easy way to determine the weight you've loaded, so there's a temptation to keep loading until every available space is filled. People are loading by volume, but weight is far more important.

Unfortunately, you may have exceeded the load-carrying capacity of the tires or axles long before every-

thing is on board. The only way to tell if a vehicle is overloaded is to have it weighed. *(See below for more information.)*

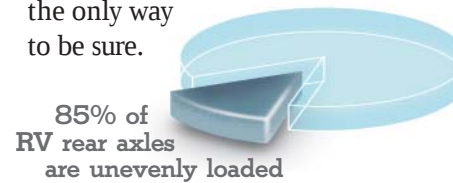
**Load Out of Balance**  
And, it's also possible to be within the vehicle's Gross Vehicle Weight Rating *(see page 4 for definitions of terms)*, yet still have overloaded axle ends or tires.

That comes about, of course, if the load is not properly distributed. Again, balance is something very difficult to determine when you're loading the vehicle. You could be

out of balance from front to rear or from side to side.

If uneven loading is serious enough, you could be within an axle or tire's carrying capacity on one end of an axle, and over capacity on the other.

Unfortunately, this is even harder to discover, because some types of load-leveling systems compensate for out-of-balance loading, making it harder to see. Again, properly weighing the vehicle is the only way to be sure.



When you weigh your RV or travel trailer (including "fifth wheel" types), you must weigh it with everything on board *including passengers*.

## Weighing your vehicle



It is essential to weigh each axle end of your vehicle to determine whether it is overloaded, and whether the load is correctly distributed, front to back and side to side.



## How? ALL ABOARD!

The most critical point about weighing a vehicle is that it must be weighed with everything on board that will be there while you're traveling.

That means you must weigh the vehicle with passengers, supplies, food,

water, fuel, oil, towed items, bicycles, clothing, propane, etc. Bear in mind that water, fuel and propane can easily exceed 750 lbs. You must know the actual load on the axles and wheels, and there's no other way to do it.

## AXLE END BY AXLE END

In addition to knowing the total weight on the ground, it is crucial to know

## Under-Spec'd AXLES or TIRES

Increasing capacity by changing axles is probably too expensive and impractical for most RV owners.

With tires, you may have some flexibility. Tires are available in a variety of load ratings and sizes, and if the tires you currently have cannot handle the load, it may be possible to replace your tires with tires of higher capacity. Consult the vehicle manufacturer before making any change to your tires.

Bear in mind, though, that the ultimate capacity of the vehicle is determined by the weakest link in the system. If axles are at or near the limit of their capacity, there's no point putting on tires that can handle higher loads.

the weight on each end of each axle. That's the only way you can find out if the load is both within the capacity of the axles, wheels and tires, as well as whether or not the load is properly distributed.

Look for scales at moving and storage companies, farm suppliers, gravel pits, recycling companies or truckstops.



You can get this free brochure  
“How to Weigh Your Travel Trailer or RV,” providing  
detailed instructions on weighing your RV or travel trailer,  
online, from many tire dealers, and by calling 1-800-847-3272.

## Once you're there

Because weighing your vehicle is a complicated job, we've published a separate booklet, “How to Weigh your Travel Trailer or RV,” that you can use as a workbook for weighing and recording your results.

You can download a copy of the booklet from our web site, [www.trucktires.com](http://www.trucktires.com). Copies are

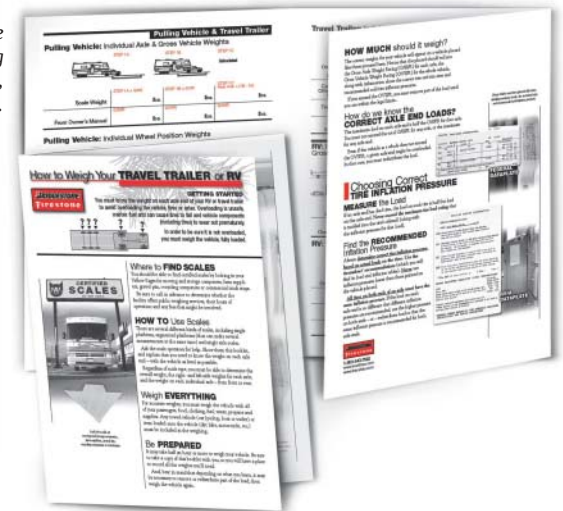
also available free of charge at Firestone MasterCare Tire Centers, and from many other authorized tire dealers nationwide. You can also obtain a copy by calling us, at 1-800-847-3272 or by e-mail to [contact@trucktires.com](mailto:contact@trucktires.com), and asking for the free publication: **How to Weigh Your Vehicle.**

## Where?

### FINDING SCALES

You should be able to find certified scales by looking in your Yellow Pages for moving and storage companies, farm suppliers, gravel pits, recycling companies or commercial truck stops.

Be sure to call in advance to determine whether the facility offers public weighing services, their hours of operation and any fees that might be involved.



## What to do if your weights aren't right

You must not exceed the total Gross Vehicle Weight Rating (GVWR) for your vehicle, RV or travel trailer, AND you must not exceed the Gross Axle Weight Rating (GAWR) of each of your axles, nor the maximum load for your tires.

If your weight is higher than the GVWR, you'll have to reduce the load by removing some things.

If you have not exceeded the GVWR, but have exceeded the maximum permissible load on the axles or tires, you may be able to redistribute weight to bring all loads back to permissible levels.

Remember, running overloaded is both dangerous and illegal, besides putting excessive – and expensive – wear and tear on most vehicle components.

# What is your vehicle's capacity?

|                                                                                                   |                        |                    |            |
|---------------------------------------------------------------------------------------------------|------------------------|--------------------|------------|
| MANUFACTURED BY: FOUR WINDS INTERNATIONAL                                                         |                        | DATE: 07/02        |            |
| INC. VEH. MFG. BY: GENERAL MOTORS CORP                                                            |                        | DATE: 03/02        |            |
| GVWR                                                                                              | 5579 KG (12300 LB)     | 26Q                | FCC027933  |
| FRONT                                                                                             | GAWR 1951 KG (4300 LB) | TIRES LT225/75R16D | RIMS 16X6K |
| COLD INFLATION PRESSURE                                                                           |                        |                    |            |
| 420 KPA SINGLE <input checked="" type="checkbox"/> DUAL <input type="checkbox"/>                  |                        |                    |            |
| 60 PSI <input checked="" type="checkbox"/> DUAL <input type="checkbox"/>                          |                        |                    |            |
| INTERM                                                                                            | KG (LB)                |                    |            |
| REAR                                                                                              | 3901 KG (8600 LB)      | TIRES LT225/75R16D | RIMS 16X6K |
| COLD INFLATION PRESSURE                                                                           |                        |                    |            |
| 450 KPA SINGLE <input type="checkbox"/> DUAL <input checked="" type="checkbox"/>                  |                        |                    |            |
| 65 PSI <input type="checkbox"/> DUAL <input checked="" type="checkbox"/>                          |                        |                    |            |
| THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT IN: |                        |                    |            |
| V.I.N.                                                                                            | 1GBJG31GX21194020      | TYPE               | MPV        |
|                                                                                                   |                        | FD-222             |            |

## FEDERAL DATAPLATE

A Federal Dataplate is required by law on all vehicles. It lists the *Gross Vehicle Weight Rating (GVWR)*, the maximum weight at which the vehicle may be operated. Note that this weight rating may be legally exceeded only when the vehicle is parked.

The Federal Dataplate also provides a *Gross Axle Weight Rating (GAWR)*, the maximum weight that should ever be on a given axle. Because this rating is based on the actual characteristics of the vehicle components, you should never exceed this rating, even when the vehicle is parked.

The GAWR, divided by two, is the maximum axle rating for each end of the axle. You must not exceed this weight on either end of the axle, even if the total does not exceed the GAWR.

All members of the Recreational Vehicle Industry Association (RVIA) are required to place an additional label on the vehicles they manufacture. It lists information not found on the Federal Dataplate and supersedes the Federal Dataplate, which usually covers only the basic vehicle chassis.

There are two versions of the RVIA label, depending on whether the vehicle was manufactured from September 1996 through August 2000, or after September 1, 2000.

There are also separate versions of the label for motor homes and for trailers, including "fifth wheel" trailers.

## COMMON TERMS

### GCWR Gross Combined Weight Rating

The maximum allowable total loaded weight rating of the RV and any vehicle it is towing. GCWR minus GVWR (see next definition) represents the allowable weight for the towed vehicle.

### GVWR Gross Vehicle Weight Rating

The weight rating established by the chassis manufacturer as the maximum weight (including vehicle, cargo, liquids, passengers, etc.) the components of the chassis can support.

### Tongue Weight

The downward weight exerted at the hitch or 5<sup>th</sup> wheel connection by a fully loaded towed vehicle.

### GVW Gross Vehicle Weight

The actual weight of a fully loaded vehicle (including vehicle, cargo, liquids/fuels, passengers, towed vehicle's tongue weight, etc.). The GVW must not exceed the GVWR.

### GAWR Gross Axle Weight Rating

(for each axle) The maximum weight rating that the components (tires, rims/wheels, brakes, springs, axle) of each axle are designed to support.

### GAW Gross Axle Weight

The actual weight of a fully loaded vehicle that is carried by a single axle.

### TRAILER WEIGHT INFORMATION

SERIAL# 1UJB0279316L0061

MODEL 190L QWEST SERIES 03 II

**GVWR** (Gross Vehicle Weight Rating) means the maximum permissible weight of this trailer when separated from the tow vehicle.

**UVW** (Unloaded Vehicle Weight) is the total weight of this trailer as manufactured at the factory when separated from the tow vehicle. If applicable, it includes full generator fuel, engine oil, and coolants.

**CCC** (Cargo Carrying Capacity) is equal to GVWR minus each of the following: UVW, full fresh (potable) water (including the water heater), full LP gas weight.

**GCWR** (Gross Combination Weight Rating) means the value specified by the trailer manufacturer as the maximum allowable weight of this trailer with its towed trailer or towed vehicle.

\*\*The GCWR of this trailer is 0 Lbs. ( 0 kg.)

### CARGO CARRYING CAPACITY (CCC) COMPUTATION

|                                                     | Pounds/kg. |
|-----------------------------------------------------|------------|
| GVWR                                                | 5500/ 2497 |
| Minus UVW                                           | 3939/ 1768 |
| Minus fresh water weight of 43 gal. @ 8.33lbs./gal. | 358/ 163   |
| Minus LP gas weight of 14 gallons @ 4.24lbs./gal.   | 60/ 27     |
| CCC for this trailer*                               | 1143/ 519  |

\*Dealer installed equipment will reduce the CCC.

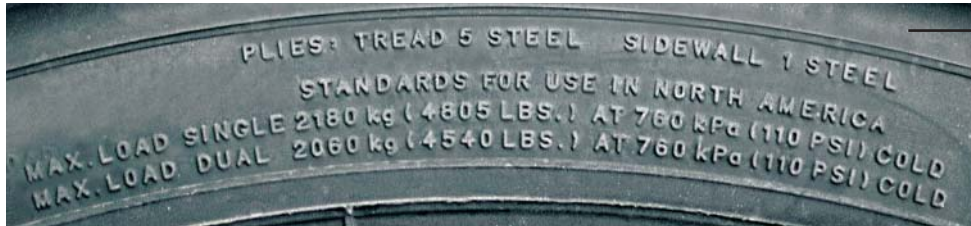
\*\*This trailer is not recommended nor intended to be used to tow any other vehicle or trailer

CONSULT OWNER MANUAL(S) FOR SPECIFIC WEIGHING INSTRUCTIONS AND TOWING GUIDELINES.

Vehicles manufactured by members of the Recreational Vehicle Industry Association use labels like these to provide additional information not found on the Federal Dataplate.

## RVIA DATAPLATE

# What is the capacity of your tires & wheels?



*The maximum inflation pressure (displayed on the tire's sidewall) is also the minimum required to carry the maximum load.*

## Tire Load Rating

Just like axles, tires and wheels have load ratings. The maximum ratings are molded into the side of the tires, and sometimes stamped on the insides of wheels.

Bear in mind that these are maximum ratings. The sidewall of the tire shows maximum load and minimum inflation pressure for that load.

If you use passenger tires (no "LT" in their size designation) on multipurpose passenger vehicles, trucks, buses or trailers, you must reduce the load rating of these tires by 10 percent.

*Wheels are often (but not always) stamped with the maximum loads and inflation pressures that may be used with them. See your dealer for ratings if your wheels are not marked.*

## Wheel Load & Inflation Ratings

Be sure you also know the load and inflation pressure ratings for your wheels as well. Often, these are stamped on the inside of the wheels, but if not, your dealer can help you find out what they are. Never exceed the maximum load or inflation pressure rating of your wheels.



## What inflation pressure to use

Never set tire inflation pressures **BELOW** the recommendations you find on the vehicle manufacturer's placard.

Also, you must not exceed the maximum inflation pressure ratings shown on tire sidewalls. Overinflated tires are more likely to be cut, punctured or broken by sudden impact if they hit an obstacle, like a pothole, at high speed. Correct inflation pressure can help minimize that kind of damage.

*Inflation pressures that are too high for the load can make tires more susceptible to impact breaks if they encounter obstacles at high speeds.*

## UVW

### Unloaded Vehicle Weight

The weight of the vehicle as built at the factory with full fuel, engine oil and coolants, but without cargo, fresh water, LP gas, occupants or dealer-installed accessories.

## NCC

### Net Carrying Capacity

The maximum weight of all occupants including the driver, plus personal belongings, food, fresh water, LP gas, tools, tongue weight of any towed vehicle, dealer-installed accessories, etc. that can be carried. (*NCC is equal to or less than GVWR minus UVW.*)

## SCWR

### Sleeping Capacity Weight Rating

The manufacturer's designated number of sleeping positions multiplied by 154 pounds (70 kilograms) for each. Note: If your passengers weigh more than 154 pounds each, the number of passengers may have to be reduced to avoid exceeding SCWR.

## CCC

### Cargo Carrying Capacity

The GVWR minus all of the following: UVW, full fresh (drinking) water weight (including heater), full LP gas weight, SCWR, tongue weight of any towed vehicle and weight of any dealer-installed accessories.

# Speed Rating

Many tires have speed ratings. You'll find this information on the tire sidewall. The speed rating indicates the maximum speed at which the tire can be operated at the correct load and inflation pressure. Never operate your vehicle at speeds that exceed the maximum speed for the lowest-rated tire on the vehicle.

1. Do not exceed maximum speeds allowed by law.
2. Always reduce your speed appropriately for traffic, weather, vehicle or road conditions.
3. Never exceed the maximum speed of "speed-rated" tires.
4. With "LT" (Light Truck) tires do not exceed legal speed limits. *(If you use LT tires at speeds between 66 and 75 mph, increase cold inflation pressures by 10 psi above the recommended pressure for the load but do not exceed the maximum inflation pressure for wheel or tire.)*
5. If you use medium commercial truck tires, do not exceed the "maximum sustained speed" rating for these tires as found in the manufacturer's databook.

**Remember, in all cases, the lowest speed-rated tire determines the maximum speed for the entire vehicle combination, including any towing vehicle.**

## Care ON THE ROAD

When you're traveling, do as professional commercial drivers do: inspect your tires regularly and check and adjust cold inflation pressure every day that you actually travel. *(See page 12 for details on how to measure and adjust inflation pressure properly.)*

If you need to "block" tires to level the vehicle, be sure that the block is larger than the "footprint" of the tire. No part of the tire should ever "hang over" the edge of the block. This can cause internal damage to the tire.



## tire USAGE & CARE

### Care AT HOME

For best tire performance and life, the best thing you can do when you get home is to take the load off your tires by putting the vehicle up on blocks.

Cover the tires with opaque material to keep sunlight away. Ozone in the air can deteriorate tires, especially sidewalls, and UV radiation from the sun can accelerate this effect.

If you remove the tires from the vehicle, store them in a cool, dry, dark place, away from grease, oil and fuel, and well away from electrical equipment *(like motors or generators)* that produce ozone.

Keep your stored tires inflated to a minimum pressure of 10-15 psi, and arranged side-by-side, like a row of donuts. Avoid letting tires sit on asphalt for long periods of time because they can absorb damaging oils from it.

### CLEANING tires

Generally, you do no damage to your tires by leaving them dirty.

Sidewall rubber contains antioxidants and antiozonants that are designed to gradually work their way to the surface of the rubber to protect it.

Washing tires excessively removes these protective compounds, and can cause tires to age prematurely.

The same thing is true of most tire "dressings," designed to make tires look shiny. Most of these preparations remove protective compounds, again causing tires to age abnormally.

Occasional washing with soap and water is OK, but anything beyond that can actually shorten the life of your tires.

*Washing tires too often can remove protective compounds and result in premature aging. Avoid harsh cleaning agents, steam cleaning and tire dressings.*

## How old are my tires?

Every tire sold in the U.S. is required to have a DOT (Department of Transportation) identifying number. This is a 10- or 11-digit number that contains lots of information about the tire manufacturer, size, plant where it was made, etc.

The last 3 or 4 digits are of most interest to you, because they can tell you how old your tires are.

DOT numbers appear only on one sidewall of your tire. Older tires have 3-digit numbers, with the first two digits signifying the week of the year and the third

digit the year when the tire was made. Tires made in the 1990s may also have a triangle alongside the numbers, signifying that they were made between 1990 and 1999.

Newer tires have 4-digit numbers, where the first two digits signify the week of the year and the latter two digits indicate the year.



## How old is TOO OLD?

This is a difficult question. It depends on use, care and conditions. For a variety of reasons, tires that get a lot of use may actually last longer than those that don't. And, tires that have been properly inflated, stored, rotated and inspected often will last longer than those that have not.

There's no easy answer. RV users, for example, often put no more than a few thousand miles on their tires a year. Their tires may need to be replaced because of age long before their treads

are "worn out." Is a 10-year-old tire too old? Probably. Is a 6-year-old tire too old? Maybe. Have your tires inspected.

The age of your tires, along with their overall wear, condition of sidewalls, etc. are all factors your tire dealer will take into consideration when inspecting your tires and advising you on tire replacement.

For safety's sake ask your dealer to destroy your old tires or render them unserviceable so no one else can use them.

*The last 3 or 4 digits of the DOT number on your tires tell you the week and year that the tire was manufactured.*

## DO NOT REPAIR TIRES YOURSELF

Practically no RV owner we know is properly equipped or trained to repair tires. The equipment and supplies, not to mention the skills required, go way beyond everyday tire care knowledge.

**Know the right answers**  
It is both incorrect and dangerous to attempt to repair a tire without removing it from the wheel on which it is mounted.

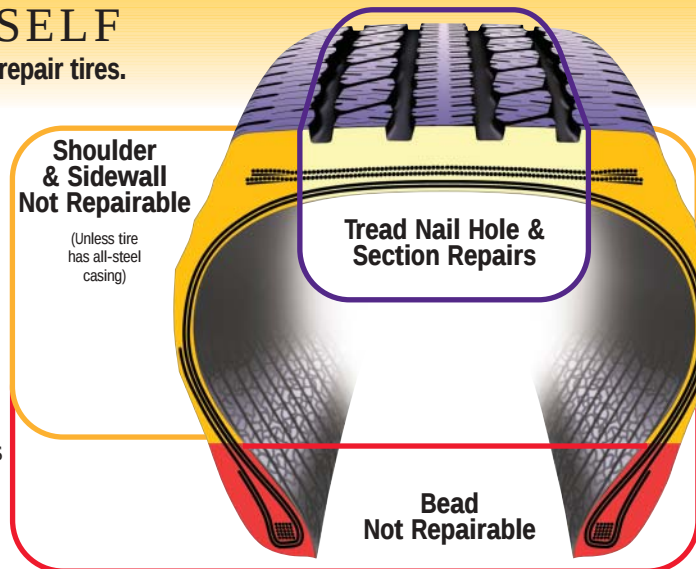
You will sometimes see cheap "string" repair kits in auto parts stores and even in some convenience stores. You may also be told that a "plug" repair can be done from the outside of the tire, without removing it from the wheel.

Using these types of repairs is dangerous and can do permanent damage to your tires, rendering them unusable. Improper repairs will also invalidate any warranty on your tires.

### Recognize a Proper Repair

A correctly repaired tire will have both a plug or "stem" through any hole, and a reinforced patch on the inside. There are some combination units that are acceptable. A plug alone is not enough. A patch alone is not enough.

Repairs can only be made in the tread area, and only inside the area between the shoulder grooves as shown here.



*Repairs can only be made in the tread and only in the area of the belts.*

## REPAIRS

### What makes it a proper repair?

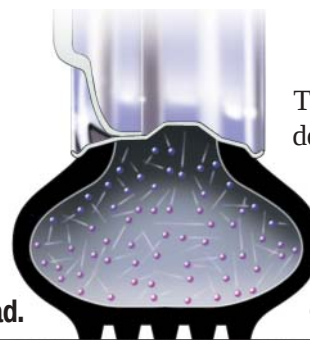
1. Punctures are filled and sealed with a "stem."
2. Inside of tire has a reinforced patch covering the puncture.
3. Tire is fully inspected inside and out for hidden damage.
4. Repair is made according to tire manufacturer's specifications.
5. Repair size does not exceed limits set by tire manufacturer.
6. Repair is in a permitted location.

## AIR: your most important asset

### What air does

Surprising as it might seem, it's not the tires that support your vehicle. It's the air inside them. And that's why it's so critical that you keep the right inflation pressure in every tire all the time.

**It's not the tire, but the air inside it that supports the load.**



That's also why the right inflation pressure depends on the load on each axle end. So, as we said in the section on weighing, you first need to know the axle end loads for each axle. Then you can determine whether you have the right tires and the correct inflation pressure for them.

## What to Do After You Weigh Your Vehicle

**READING THE TABLES** – Each tire manufacturer publishes load and inflation tables for its tires, and these are what you'll use to find the correct inflation pressure.

| TIRE SIZE DESIGNATION | USAGE  | kPa<br>psi | TIRE LOAD LIMITS (kg/lbs) AT VARIOUS COLD INFLATION PRESSURES (kPa/psi) |              |              |                                                 |              |              |                                                 |              |              |                                                 |
|-----------------------|--------|------------|-------------------------------------------------------------------------|--------------|--------------|-------------------------------------------------|--------------|--------------|-------------------------------------------------|--------------|--------------|-------------------------------------------------|
|                       |        |            | 450<br>65                                                               | 480<br>70    | 520<br>75    | 550<br>80                                       | 590<br>85    | 620<br>90    | 660<br>95                                       | 690<br>100   | 720<br>105   | 760<br>110                                      |
| 225/70R19.5           | DUAL   | kg<br>lbs. | <b>1180(D)</b> <sup>114</sup><br><b>2600(D)</b>                         | 1230<br>2720 | 1300<br>2860 | <b>1360(E)</b> <sup>119</sup><br><b>3000(E)</b> | 1410<br>3115 | 1470<br>3245 | <b>1550(F)</b> <sup>123</sup><br><b>3415(F)</b> | 1580<br>3490 | 1640<br>3615 | <b>1700(G)</b> <sup>126</sup><br><b>3750(G)</b> |
|                       | SINGLE | kg<br>lbs. | <b>1250(D)</b> <sup>116</sup><br><b>2755(D)</b>                         | 1310<br>2895 | 1380<br>3040 | <b>1450(E)</b> <sup>121</sup><br><b>3195(E)</b> | 1500<br>3315 | 1570<br>3450 | <b>1650(F)</b> <sup>125</sup><br><b>3640(F)</b> | 1690<br>3715 | 1740<br>3845 | <b>1800(G)</b> <sup>128</sup><br><b>3970(G)</b> |

### Check the ratings

First, compare the actual axle end weight, which you determined by weighing the fully loaded vehicle, with the maximum load allowed on the tires you have on the vehicle.

The actual permissible load depends on both the tire size and load range. The maximum load amount is molded into the sidewall of the tire. It's also shown in the load and inflation tables, alongside the letter indicating the load range of your tires.

On a Bridgestone or Firestone load and inflation table (which can be found in data books available at your tire supplier) maximum loads are shown in boldface. For the tire size

225/70R19.5, as you can see from the chart, the maximum load for a single tire is 2,755 lbs. for a "D" load range tire, 3,195 lbs. for an "E" load range tire, 3,640 lbs. for an "F" load range tire and 3,970 lbs. for a "G" load range tire.

### Using higher load range tires

From what we've just seen, it's clear that you could increase your load capacity by changing to a higher load-rated tire of the same size at a higher pressure. Bear in mind that you still must not exceed the gross axle weight rating shown on the vehicle placard, and you may not exceed the maximum tire inflation requirement for the wheels you are using.

### Increasing pressures

And also notice that sometimes, you can increase load capacity by increasing the inflation pressure in your tires. In our example, a single "F"-rated tire can be used with a load of 3,315 lbs. at 85 psi, 3,450 lbs. at 90 psi and 3,640 lbs. at 95 psi.

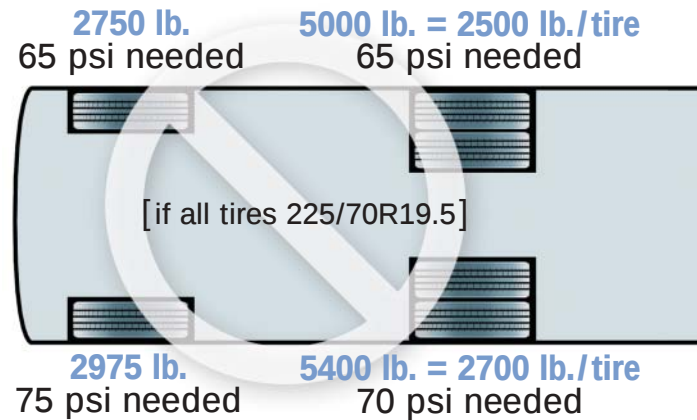
Remember, these are minimum pressures for each of these loads. In other words, you can increase your inflation pressure above what the chart shows, so long as you don't exceed the maximum pressure specified for that tire.

**Never operate your vehicle with tires inflated to less pressure than required for the load. Never operate your vehicle with tires inflated to less pressure than specified on the vehicle placard, NO MATTER WHAT THE LOAD. Never inflate your tires above the maximum pressure shown on their sidewalls.**

## Same on both ends

It's also important that you use the same inflation pressure on both ends of each axle. If axle end loads differ enough that the tables specify different inflation pressures for each end, the axle is out of balance enough that you should redistribute the load.

If you can't do that, you must inflate the tires on both ends to the pressure required for the end with the heavier load.



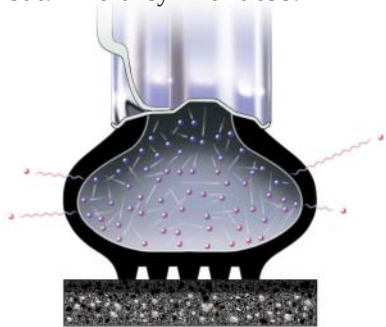
*The tires on both ends of an axle must be inflated to the same pressure. If loads dictate different pressures, the load is probably improperly distributed.*

# Protecting Your Most Important Assets

## Keeping air inside – where it belongs

It would be nice if you could just put the right inflation pressure in your tires and forget it. Unfortunately, that's what too many people try to do.

The trouble is, air doesn't stay inside your tires. Those molecules are active little guys, always looking for a way out. And they find it too.



*Depending on the size of the tire, you can lose 1 to 2 psi per month as a result of diffusion of air molecules through tire sidewalls.*

Air can actually work its way through the sidewalls of your tires and escape. If you can imagine ping-pong balls bouncing their way through miles of a tangled briar patch, you've got the idea.

## How much can you lose?

Depending on size, a tire can lose 1 to 2 pounds of inflation pressure (psi) per month by diffusion through sidewalls. If you have a bad valve stem or faulty seal between the tire and wheel – or a nail in one of your tires – losses can occur even faster.

That means up to 12 psi loss in just 6 months if you never check and adjust inflation pressure. That's enough loss for many tires to be seriously – and dangerously – underinflated.

## How often should you check?

The absolute best practice you could use would be to check (and adjust, if necessary) every single tire, every single travel day.

Many tires used on RVs are commercial grade tires and commercial drivers are required to check their tires as part of their pre-trip checks. Of course if you go somewhere and park your vehicle for a week, you wouldn't need to check every day during that time – just the day you arrive and the day you leave.

That's probably too much for most RV owners, so we suggest this: Make sure you check (and adjust, if necessary) the cold inflation pressure in every tire on your vehicle at least once during every travel week.

Altitude and outdoor temperatures also affect inflation pressures, another good reason to check them frequently.

## What happens if you don't?

Running a tire underinflated is like running your engine without enough oil or coolant. It may seem to work OK for a while, but you are doing serious, permanent damage.

Adding oil or coolant won't fix engine damage, and adding air won't fix tire damage. The tire is still seriously damaged and can still fail, even after inflation is corrected.

If you find any tire 20 percent or more underinflated, you should have it inspected (both inside and out) by your tire dealer.

## Is there an easier way?

Checking inflation shouldn't take that long to do, and it shouldn't be that hard. On the gatefold pages at the back of this booklet, you'll find some tips to make inflation checks easier and more effective.

CHECK EVERY TIRE AT LEAST ONCE DURING EVERY TRAVEL WEEK!  
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CHECK EVERY TIRE AT LEAST ONCE DURING EVERY TRAVEL WEEK!

Dual tires add lots of load capacity to an axle, but they require the same maintenance as single tires.

The valve stem for the inner tire of a dual may be difficult or even impossible to reach. Fortunately, there are things you can do.



## dealing with duals



Sometimes, the inner dual is difficult or impossible to check.

You may need to add extension hoses to solve this problem.

## CLOCK 'EM!

When dual tires are mounted on the vehicle, they should always be put on with the valve stems 180 degrees apart. If one valve is at 12 o'clock, the other should be at 6 o'clock.

That's one way to make checking inflation pressures easier.



Dual tires should always be mounted on the vehicle so that their valve stems are 180 degrees apart.

## REPLACE 'EM!

If you have rubber valve stems, they should be replaced with properly rated valve stems every time you replace a tire. It's cheap to do, and could save a costly repair bill later.



What's even better is to replace your rubber valve stems with all-steel stems. On these, you only have to replace the rubber grommets each time. And,



steel stems are necessary if you need to use valve extensions.

All-steel, clamp-in valve stems are recommended on duals, especially when extension hoses are in use.

## EXTEND 'EM!

If the holes in the wheels are too small or in the wrong places, it may be impossible to check inflation on inside tires. That's no excuse for not doing it, however.

The answer may be adding extension hoses that connect to the valve stem on the inside tire and are fastened to the outer wheel. That way you can check inflation on both tires quickly and easily.

If you use extension hoses, you must use all-steel valve stems, because

the extra weight of the hoses can distort rubber stems and cause leaks, especially at highway speeds.

The best extension hoses will have stainless steel reinforcement and external braiding for long, trouble-free life.

Make sure the ends of the hoses are securely attached to the wheels so that they cannot come loose over time. We've illustrated a couple of good methods for attaching the hose ends here.



Adding extension hoses to the inside wheels of dual assemblies can make inflation pressure maintenance easier.



If you use extension hoses, the hoses must be securely fastened to the wheels, as shown here.

## Measuring & Maintaining PSI

# Gauges

There is only one way to correctly measure the inflation pressure in your tires, and that is with a quality inflation pressure gauge.

Tire “billies,” boot toes, hammers, tire irons and baseball bats are NOT inflation pressure gauges. No matter how much experience you have, if you use these techniques, you are NOT measuring inflation pressure, and you risk serious underinflation of your tires – and that can be both dangerous



and expensive. Never measure inflation pressures with anything other than a good gauge.

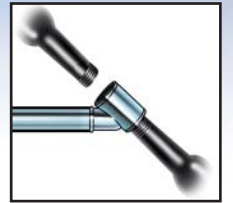
When you buy a gauge, get one with a double, angled foot. This will make checking the outer tire of a dual set much easier. And, treat your tire gauge like any other precision instrument: don't drop



it or use it for any purpose other than that for which it was made.

If you drop your gauge, take it to your tire dealer and ask them to check it for accuracy. Shock can knock any gauge out of calibration, sometimes by a lot.

A professional tire gauge with a double, angled foot end will make checking inflation pressures faster and easier.



## The eyes DON'T have it

Another way you CAN'T tell correct inflation is by looking at your tires. With today's radial tires, a visual inspection cannot be used to verify correct inflation. Different tires, from different manufacturers will have different degrees of bulge at a given pressure.

The difference between the shape of a correctly inflated tire and one that is dangerously underinflated is too subtle to determine by eye.

Please, always use a good air pressure gauge – and ONLY a good air pressure gauge – to measure the inflation pressure in your tires.

*No one can tell by looking at a tire whether it has the correct inflation pressure.*

70 PSI

60 PSI

50 PSI

40 PSI

# Checking Tire Air Pressures

## Keep it “COLD”!

Always check inflation when the tires are cold. “Cold” means when they’re at the same temperature as the outdoor air.

The way to make sure your tires are cold is to either park the vehicle and wait at least 3 hours before checking pressures, or to let the vehicle sit parked overnight, then check the pressures before you’ve driven it a mile.

A short, low-speed drive to the gas station is OK, but not a long, 65-mph freeway jaunt. Never let air out of a hot tire, no matter how high the pressure seems to be. You’ll just end up with an underinflated tire when it cools down.

**ALLOW TIRES  
TO COOL FOR  
3 TO 4 HOURS  
BEFORE CHECKING  
INFLATION AND  
BEFORE YOU DRIVE  
MORE THAN 1 MILE.**

## Keep it CLEAN!

Get your gauge and a clean rag or paper towel, and wipe each valve stem before you remove the cap. (And be sure every valve stem has a high-quality, metal valve cap with an inner rubber gasket.)

Believe it or not, the metal cap



**Valve stem caps should always be metal, with an internal rubber seal, never plastic.**

is the actual seal that keeps the air inside. A good cap will work even when the valve doesn’t. Plastic caps may not provide adequate seal at the higher inflation pressures used on these vehicles, especially when fitted with commercial grade tires.

Take the air hose with you, and check and adjust each tire to the correct inflation pressure. “Close enough” isn’t. Don’t take a chance. As long as you’re going to the trouble of checking, make sure they’re all correct.

## Check it out!

Considering the hard work RV tires have to do, if you find any tire 20 percent or more below the correct pressure, treat that tire as a commercial vehicle tire (which most RV tires are): Have the tire removed, demounted and inspected – inside and out – by a qualified tire technician.

Driving on a tire that is 20 percent or more underinflated can cause serious, permanent damage to the tire that may not be visible. Only a qualified technician can tell if the tire is safe for continued use.

Tires with internal damage from underinflation can fail catastrophically and without warning, a serious safety hazard.

## Check ’em all!

**Many vehicles have dual tires. You must check both tires because both tires are essential to properly handling the load. The second tire is not a “spare” or a “backup” for the other one.**

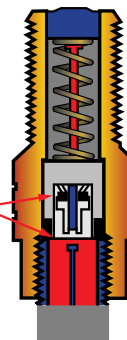
**Both tires should have absolutely identical inflation pressures, and both should have about the same amount of wear. Neither should show any evidence of serious damage to the tread or sidewalls.**

**And speaking of spares, be sure to check your spare tires too! If you get a flat along the way, you’ll be glad you did.**

## Check through the CAPS

If you’ve ever dropped a valve stem cap into a puddle or lost it in gravel, you’ll really appreciate the new, double-seal, flow-through valve caps that are available.

These caps allow you to check and adjust air pressures without ever removing the caps themselves. They have a good rubber seal, together



with an internal valve that is designed to keep out dirt and water while allowing you to check and adjust pressures.

The most common flow-through cap is the “Alligator V2B.” Ask your tire dealer for a set. And don’t forget one for each of your spare tires!

*Special, double-seal, flow-through valve caps allow you to inflate and check tires without having to remove valve caps.*

## Rotate to equalize wear

If you have a tire that is wearing unevenly, or one tire that is wearing faster than another in an equivalent position, it may be a sign of some kind of misalignment, and you should check it.

Once the uneven wear has begun, however, you may be able to extend the life of the tire by moving it to a position where the wear will be counteracted, or to a position where the wear will be slower. If you move a tire to a new position, be sure the inflation pressure is correct for the new position.

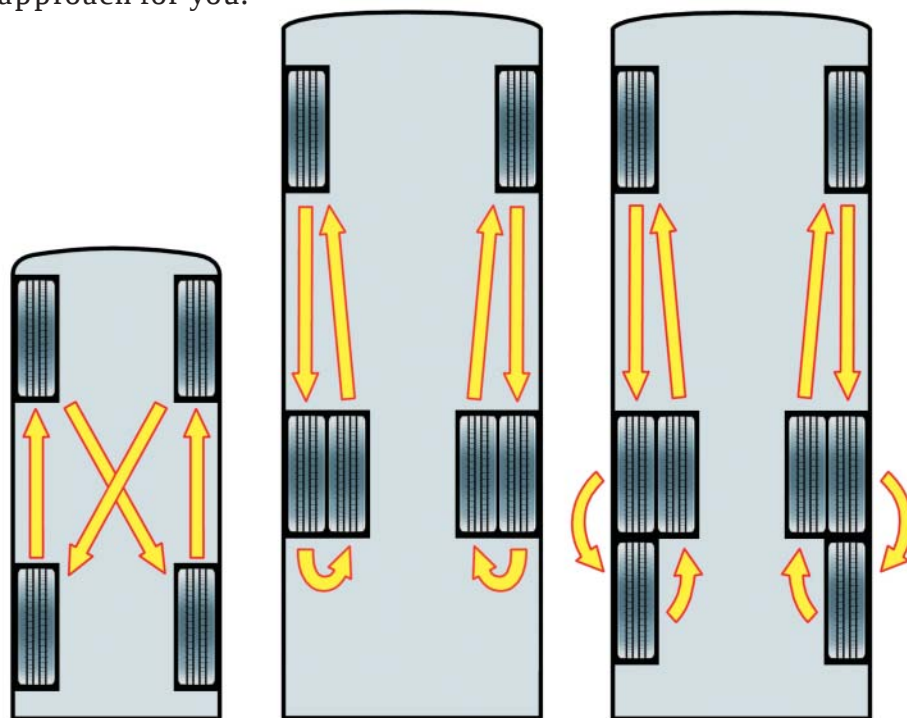
Steer tires that are wearing on one side or the other of the tread can often be swapped from one axle end to the other. Sometimes this can shift wear away from the part of the tire that's excessively worn, evening out overall wear.

Likewise, if you have a tire position that consistently wears tires faster than another, you may be able to shift tires from the slower-wearing positions there, again evening out the wear and extending tire life.

## Rotation & Alignment

Assuming all tires on the vehicle are exactly the same size, exactly the same tread pattern and exactly the same load range, there are a variety of rotation patterns you can use to equalize tread wear.

Consult your owner's manual or tire dealer to select the best approach for you.



## KEEP EVERYTHING STRAIGHT

Just as you align the wheels on your car, it's a good idea to check the alignment of the wheels on your vehicle. If tires don't track together properly, they can wear too fast or wear unevenly. Your RV dealer can help you with alignment issues.



1-800-543-7522

[www.trucktires.com](http://www.trucktires.com)  
[www.tiresafety.com](http://www.tiresafety.com)

## How to get **HELP**

There are numerous organizations that can help you operate your vehicle safely and answer questions you may have about tire and component life. A few are listed here. Remember also to contact the dealer who sold you your vehicle and your tire dealer for additional information.

### FMCA

#### [Family Motor Coach Association]

FMCA is an international organization for families who own and enjoy the recreational use of motorhomes. A portion of the membership is from the commercial recreational vehicle industry: dealers, manufacturers and RV component suppliers.

**FMCA**  
**8291 Clough Pike**  
**Cincinnati, OH 45244**

**(800) 543-3622**  
**(513) 474-3622**

**www.fmca.com**

### RMA

#### [Rubber Manufacturers Association]

RMA is the primary national trade association for the finished rubber products industry in the U.S. including tires of all types.

**RMA**  
**1400 K Street NW, Suite 900**  
**Washington, DC 20005**

**(202) 682-4800**

**www.rma.org**

### RVDA

#### [Recreational Vehicle Dealers Association]

RVDA is a national association representing RV dealers, providing educational programs, products and services to its members.

**RVDA**  
**3930 University Drive**  
**Fairfax, VA 22030-2515**

**(703) 591-7130**  
**(703) 591-0734 fax**  
**www.rvda.org**

### RVIA

#### [Recreational Vehicle Industry Association]

RVIA is a national trade association representing RV manufacturers, conversion vehicle manufacturers and suppliers.

**RVIA**  
**1896 Preston White Drive**  
**P.O. Box 2999**  
**Reston, VA 20195-0999**

**(703) 620-6003**

**www.rvia.org**

### RVSEF

#### [Recreational Vehicle Safety Education Foundation]

RVSEF is a nonprofit foundation dedicated to the safety education needs of the RV industry. RVSEF created the "A'Veigh We Go" RV weighing program in 1993, and has weighed thousands of RVs at rallies and seminars throughout the U.S.

**RVSEF**  
**4575 Annette Court**  
**Merritt Island, FL 32953**

**(321) 453-7673**  
**(321) 453-3853 fax**

**www.rvsafety.org**

**e-mail: staff@rvsafety.org**

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