

# RECREATIONAL VEHICLE TIRE GUIDE



## HOW TO GET THE MOST FROM YOUR TIRES

Always weigh your fully-loaded motorhome before traveling to ensure that the total weight does not exceed the capacity of your tires.



**MICHELIN**

*Because so much is riding on your tires.®*

**Michelin - the leader in technology, the leader in the manufacturing of tires for RV applications.**

*From the introduction of the first radial truck tire over 45 years ago, to the technological breakthrough of Advanced Technology fuel efficient tires, Michelin has rightfully earned the enduring reputation as the world leader in tire technology.*

*Today, Michelin quality, service, and reputation are world renowned. And Michelin enjoys a solid reputation in the RV industry. In fact, the vast majority of the quality RV Chassis manufacturers of Class "A" (large coach with basement-style storage), Class "C" (mini-motor homes), wide body, diesel pusher, and bus conversions for motor homes and motor coaches specify Michelin as original equipment.*

*No one knows more about tires than Michelin. That's why we strongly recommend you have Michelin on your motor home. But whatever brand of tires you use, your tires are a major investment and need proper care and maintenance for long life and safe operation of your RV. With proper care and maintenance of your Michelin tires, as recommended in this brochure, you'll get the maximum performance that we've so carefully designed into them.*

## WHAT IS A TIRE'S FUNCTION?

The Michelin tire designed for your RV is a very technical and precisely engineered product. To obtain the maximum use and best service out of your Michelin tires it is helpful to understand the function of a tire. A tire is a "container" that holds air. It is the combination of air and tire that supports the vehicle and its contents. In addition, since the tire is the only contact that the vehicle has with the road surface, it must provide other functions such as traction for moving, stopping and steering as well as providing a cushion for the vehicle.

## THE IMPORTANCE OF AIR PRESSURE

The most important factor in maximizing the life of your tires is maintaining proper inflation. Driving on a tire that does not have the correct inflation pressure for the load of the vehicle is dangerous and may cause premature wear, tire damage, and/or loss of control of the vehicle.

A tire that is underinflated will build up excessive heat that may go beyond the prescribed limits of endurance of the rubber and the radial cords. This could result in sudden tire failure. A tire that is underinflated will also cause poor vehicle handling, rapid and/or irregular tire wear, and an increase in rolling resistance which results in a decrease in its fuel economy.

Overinflation will reduce the tire's footprint or contact patch with the road, thus reducing the traction, braking capacity, and handling of the vehicle. A tire that is overinflated for the load that it is carrying will also contribute to a harsh ride,



uneven tire wear, and will be more susceptible to impact damage.

Maintaining correct tire inflation pressure for each loaded wheel position on your vehicle is of the utmost importance and must be a part of regular vehicle maintenance.

## HOW MUCH AIR SHOULD I CARRY IN MY TIRES?

Federal law requires that the tire's maximum load rating be molded into the sidewall of the tire. If you look on your tire's sidewall you'll see the maximum



load allowed for the size tire and load rating, and the minimum cold air inflation pressure needed to carry that stated maximum load. Utilizing less air pressure means a lesser load can be carried by the tire. The chart at the end of this brochure shows weights that can be supported by various air pressures.

**The amount of air pressure you need to use depends on the weight of your fully-loaded vehicle. So, you cannot determine your correct air pressure unless you know your vehicle's actual weights.**

## DANGERS OF OVERLOADING

What are the risks of driving an overloaded RV? In addition to possible problems with tires, wheels, and springs, there can be problems of brake failure, drivetrain failure, wheel bearing failure, etc. Moreover, an overloaded RV uses more fuel, is harder to handle, and can lead to driver fatigue. If any component should fail, it could result in vehicle damage and/or loss of vehicle control. In addition to the above dangers, there are some states that require certain motor homes and RVs to utilize the Highway Patrol's weight scales to check for overloaded axle weights. Citations can be issued to violators.

## HOW TO DETERMINE YOUR RV'S CORRECT WEIGHT

The G.V.W.R. (Gross Vehicle Weight Rating) and G.A.W.R. (Gross Axle Weight Rating) stickers on your RV (normally located on the support pillar next to the driver's seat) will show you the chassis manufacturer's and/or the RV manufacturer's total vehicle maximum weight ratings and per axle weight ratings.

### MOTORHOME WEIGHT INFORMATION

Model \_\_\_\_\_  
 GVWR \_\_\_\_\_  
 UVW \_\_\_\_\_  
 NCC \_\_\_\_\_  
 GCWR \_\_\_\_\_

GVWR (Gross Vehicle Weight Rating) means the maximum permissible weight of this motorhome. The GVWR is equal to or greater than the sum of the Unloaded Vehicle Weight plus the Net Carrying Capacity.

UVW (Unloaded Vehicle Weight) means the weight of this motorhome as built at the factory with full fuel, engine oil, and coolants. The UVW does not include cargo, fresh water, LP gas, occupants, or dealer installed accessories.

NCC (Net Carrying Capacity) means the maximum weight of all occupants including the driver, personal belongings, food, fresh water, LP gas, tools, tongue weight of towed vehicle, dealer installed accessories, etc., that can be carried by this motorhome. (NCC is equal to or less than GVWR minus UVW)

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

This motorhome is capable of carrying up to \_\_\_\_\_ gallons of fresh water (including water heater) for a total of \_\_\_\_\_ pounds.  
 Reference: Weight of fresh water is 8.33 lbs/gal; Weight of LP gas is 4.5 lbs/gal (average).

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

The G.V.W.R. is the maximum total weight for which the vehicle is rated - including passengers, fluids, and cargo. The G.A.W.R. is the maximum for which a single axle is rated. These per axle and total maximum weight ratings could be limited by the tires, wheels, axle and axle bearings, springs, the vehicle frame, or other components of the vehicle.

The G.A.W.R. sticker is only a guide in knowing your maximum loaded axle weights and subsequently your correct tire inflation pressure. Even RV's of the same make and model, will vary in actual loaded

axle weights, because of different options and personal loads.

While your actual, loaded axle weight should be below the G.A.W.R., you must weigh your RV in a loaded condition to know its actual weight. Weigh the front axle, the total unit, and then the rear axle. It is possible for a vehicle to be within the G.V.W.R. yet overloaded on an axle. It is even possible for one wheel position to be overloaded, even though the G.A.W.R. has not been exceeded. **For this reason Michelin recommends weighing each wheel position of the vehicle.** This will give you a clear indication of exactly how the weight of your RV is distributed. The Tire Industry Safety Council provides instructions on how to weigh your vehicle by wheel position. These instructions and diagrams are presented on the following pages. Once you know the total weight, and the weight on each wheel position, the tire load data chart in this brochure will show you the correct cold inflation pressure per tire for each wheel position.

## WHERE TO WEIGH YOUR VEHICLE

There are probably several certified public scales in your area. You will find public-access scales in a variety of places, such as moving and storage company lots, farm suppliers with grain elevators, gravel pits, recycling companies, and large commercial truck stops .

If you are not aware of a nearby public scale, check your area telephone book yellow pages under the "scales - public" section or "weighers." A nominal fee will be charged, but this is money wisely spent.



## How to Weigh Your RV

Your RV must be weighed fully loaded, that is, with passengers, food, clothing, fuel, water, propane, supplies, etc. Any towed vehicle (car/pickup, boat or trailer) or item loaded on brackets on the back of the RV, such as bikes or motorcycles, should also be included in the weighing. There are three types of scales:

- 1) PLATFORM - This scale is long enough to weigh the complete vehicle. The following steps are suggested and are illustrated on the following pages of this brochure:
  - a) Pull onto the scale so that only the front axle is on the platform (with the end of the scale midway between the front and rear axles), and record the scaled weight.
  - b) Pull forward until the full unit is on the scale, and record the scaled weight.
  - c) Pull forward so that only the rear axle is on the scale (again with the edge of the scale midway between the front and rear axles), and record the scaled weight.
  - d) If the RV has a rear tag axle, pull forward so that only the tag axle remains on the scale, and record the scaled weight.
  - e) To determine individual wheel position weights, it is necessary to repeat the first three steps (1a, 1b and 1c), but this time, use only one side of the scale, as shown on the following pages of this brochure.
  - f) To calculate the opposite side of the vehicle wheel position weight, subtract this side's weights from the weights recorded in steps 1a, 1b and 1c.

If there is no towed vehicle, this weight will represent the actual weight on the tag axle. To determine the actual load on the rear axle, subtract this value from the recorded weight in step 1c. If there is a towed vehicle, proceed to step 1e to obtain the "towed vehicle only" weight. Subtract that value from the value above and then subtract that from the weight recorded in step 1c.

- g) If a boat, trailer or other vehicle is being towed, it should be weighed and combined with the towing vehicle's G.V.W. (Gross Vehicle Weight) to ensure the total weight does not exceed the G.C.W.R. (Gross Combined Weight Rating).

- 2) SEGMENTED PLATFORM - Platform scales with

segmented sections can provide individual axle weights and total vehicle weights simultaneously, when the vehicle is positioned properly.

Position the vehicle on the scales so that each axle is centered as much as possible on separate segments, and record the weight. Reposition the vehicle so that only one side is on the scale, again centered on the segment as much as possible. Subtract the weighed wheel positions from the total axle weights to determine the unweighed wheel positions' weights.

- 3) SINGLE AXLE - This scale weighs one axle at a time. Drive your front axle onto the scale and stop long enough for the weight to be recorded. Pull vehicle forward until the rear axle is on the scale. To obtain the gross vehicle weight, add the two axle loads together. To obtain the individual wheel position weights, repeat this process with only one side of the RV on the scale.

**Note: Even though the weight of the total axle may be within the axle's rating, it may be overloaded on one side. This causes one wheel position to be overloaded. Therefore, side-to-side weighing is required.**

**Your RV must remain as level as possible on the scale (even though an axle or side is not physically on the scale). Obviously, to obtain the side-to-side weights, there must be enough space on either side of the scale to accommodate the RV being partially off the scale.**

If there is a difference in the weights on one side of the vehicle as compared to weights on the other side, components (tires, wheels, brakes, springs, etc.) on the heavier side could be overloaded, even though the total axle load is within the G.A.W.R. It is important to redistribute the load to avoid component failure, as well as to improve the handling characteristics of the vehicle. With these actual weights, it is now possible to compare them against the G.A.W.R., G.V.W.R. and tire capacities. These actual weights are also what should be used to help determine the proper air pressure for the tires.

# WEIGHING YOUR SINGLE AXLE RECREATIONAL VEHICLE

**RV: To Obtain Individual Axle and Gross Vehicle Weights:**

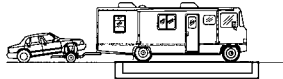
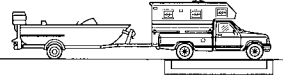
**STEP 1a**



Scale Weight \_\_\_\_\_ lbs.  
(Step 1a = GAW)

From Owner's Manual \_\_\_\_\_ lbs.  
GAWR

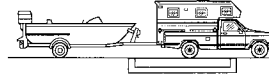
**STEP 1b**



Scale Weight \_\_\_\_\_ lbs.  
(Step 1b = GVW)

From Owner's Manual \_\_\_\_\_ lbs.  
GVWR

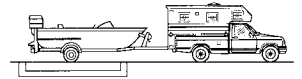
**STEP 1c**



Scale Weight \_\_\_\_\_ lbs.  
(Step 1c = GAW)

From Owner's Manual \_\_\_\_\_ lbs.  
GAWR

**STEP 1d**

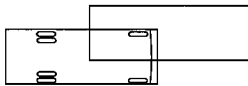


Scale Weight \_\_\_\_\_ lbs.  
(Step 1d)

From Owner's Manual \_\_\_\_\_ lbs.  
Vehicle Weight (GCWR-GVW)

## To Obtain Individual Wheel Position Weights:

**STEP 2a**



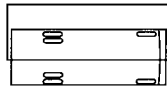
One Side Scale Weight \_\_\_\_\_ lbs.  
(Step 2a)

Calculate Other Side Weight \_\_\_\_\_ lbs.  
(Step 1a-2a)

Tire Load (lbs.) \_\_\_\_\_ lbs.  
(See Note #1)

Inflation \_\_\_\_\_ psi  
(See Note #1)

**STEP 2b**



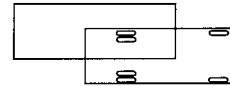
One Side Scale Weight \_\_\_\_\_ lbs.  
(Step 2b)

Calculate Other Side Weight \_\_\_\_\_ lbs.  
(Step 1b-2b)

Tire Load (lbs.) \_\_\_\_\_ lbs.  
(See Note #1)

Inflation \_\_\_\_\_ psi  
(See Note #1)

**STEP 2c**



One Side Scale Weight \_\_\_\_\_ lbs.  
(Step 2c)





Calculate Other Side Weight \_\_\_\_\_ lbs.  
(Step 1c-2c)

Tire Load (lbs.) \_\_\_\_\_ lbs.  
(See Notes #1 & 2)

Inflation \_\_\_\_\_ psi  
(See Note #1)

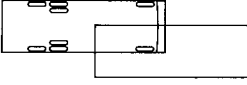
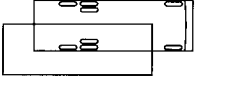
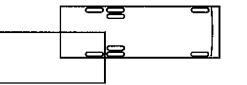
# WEIGHING YOUR TANDEM AXLE RECREATIONAL VEHICLE

## RV: To Obtain Individual Axle and Gross Vehicle Weights:

	STEP 1a	STEP 1b	STEP 1c	STEP 1d	STEP 1e (Calculated)
					
Scale Weight	_____ lbs. (Step 1a = GAW)	_____ lbs. (Step 1b = GVW)	_____ lbs. (Step 1c)	_____ lbs. (Step 1d = GAW)	_____ lbs. Drive Axle GAW = (1c-1d)
From Owner's Manual	_____ lbs. GAWR	_____ lbs. GVWR		_____ lbs. GAWR	_____ lbs. GAWR

Note: Should your tandem axle recreational vehicle be pulling a travel trailer, please see "Weighing Your Single Axle Recreational Vehicle," Step 1d.

## To Obtain Individual Wheel Position Weights:

	STEP 2a	STEP 2b	STEP 2c	STEP 2d (Calculated)
				
One Side Scale Weight	_____ lbs. (Step 2a)	_____ lbs. (Step 2b)	_____ lbs. (Step 2c)	_____ lbs. Step 2d: Right Duals = (2b-2c)
Calculate Other Side Weight	_____ lbs. (Step 1a-2a)	_____ lbs. (Step 1c-2b)	_____ lbs. (Step 1d-2c)	_____ lbs. Left Duals = (1e-2d)
Tire Load (lbs.)	_____ lbs. (See Note #1)		_____ lbs. (See Note #1)	_____ lbs. (See Notes #1 & 2)
Inflation	_____ psi (See Note #1)		_____ psi (See Note #1)	_____ psi (See Note #1)

### CAUTION

Individual wheel position weights must not exceed the maximum tire load capacity. Maximum tire load capacity can only be achieved utilizing the air pressure as listed on the sidewall of the tire.

<sup>1</sup> From the tire manufacturer's load and inflation tables or the sidewall of the tires mounted on the vehicle.

<sup>2</sup> If vehicle has duals, read dual capacity from tire and multiply by 2 (two) to obtain dual assembly load carrying capacity.

For more information/additional assistance, contact your tire dealer.

## How To Use The Actual RV Weight Information With The Tire Data Load Chart

Let's consider an RV running on its original equipment 8R19.5 XZA LRF tires, with actual corner weights of **2,100 lbs.** on the left front tire, **2,600 lbs.** on the right front tire, **5,680 lbs.** on the left rear duals and **5,160 lbs.** on the right rear duals. **For control of your RV, it is critical that the tire pressures be the same across an axle.** Therefore, we must "overinflate" the left front tire and the right rear duals. Checking the load/inflation table below shows that a cold tire pressure of 70 psi will support 2,800 lbs. on a single front tire. To accommodate temporary shifting of load from side to side which is common in RV's, however, 75 psi in both front tires is recommended as this will provide a reserve capacity for the tires.

To determine the air pressure for the rear duals, again take the heaviest position, in this instance, the left rear which weighs **5,680 lbs.** The load/inflation table below shows that a cold pressure of 75 psi will support 5,740 lbs on 2 dual tires. For reserve capacity, a cold inflation pressure of 80 psi is recommended in all four dual tires.

It is important to note that the cold inflation pressure for the tire must never exceed the maximum inflation rating stamped on the wheel.

**REMEMBER:** For control of your RV, it is critical that

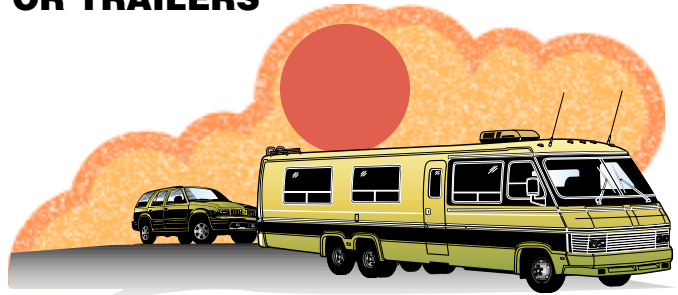
<b>S = 1 tire on 1 side</b> of single axle	<b>[-----]</b> Single Axle
<b>D = 2 tires on 1 side</b> of dual axle	<b>[[-----]]</b> Dual Axle
<b>For Tag axle, use applicable Single or Dual chart</b>	

the tire pressures be the same on both sides of an axle.

### 8R19.5 LRF - ALL TIRES

PSI		70	75	80	85	90
lbs. per position	<b>S</b>	2800	2975	3170	3325	3500
	<b>D</b>	5400	5740	6100	6415	6750
kg. per position	<b>S</b>	1270	1350	1440	1508	1587
	<b>D</b>	2450	2602	2767	2908	3063

## EFFECT OF TOWED VEHICLES OR TRAILERS



You've just read about your RV's G.V.W.R. (Gross Vehicle Weight Rating) and your RV's G.A.W.R. (Gross Axle Weight Rating). If you are towing a vehicle or trailer, you need to know your RV's G.C.W.R. (Gross Combined Weight Rating). This is the total actual loaded weight of your RV plus total actual loaded weight of the towed vehicle. The total actual loaded weight of the RV and towed vehicle should not exceed the G.C.W.R. While the G.C.W.R. has more to do with the drivetrain (engine, transmission, axle, brakes, and bearings) design limits, this additional weight can also affect the tires and how your RV handles. And finally, please don't forget to consider the tongue weight of the trailer and its impact on vehicle handling.

## WHEN TO CHECK YOUR RV TIRES' AIR PRESSURE

Now that you have found what the correct air pressure per axle needs to be for your RV, you need to know when to check your air pressure. You should check the air pressure every two weeks or at least once each month and before any major trip. Your RV tires' air pressure should be checked every "drive" morning on long trips. On short trips of a day or less driving each way, your tires should be checked before you leave on your trip and again before you start your trip home. If your vehicle is stored for any length of time, air pressure should be checked prior to storage but, more importantly, when it comes out of storage.

Check your tires when they are "cold" and have not been driven for more than one mile. The stated load capacity for a given cold inflation pressure is based on ambient outside temperature. If you must check your tires when they are warm or hot, do allow for a slight



increase in air pressure and make sure they are within a couple of pounds of each other on the same axle. Never let air out of a hot tire.

To maintain the inflation pressure in your tires you will need the proper equipment. It is recommended that you purchase a quality truck tire air gauge which has an angled dual head. This type of gauge allows you to check inflation on the inner dual wheel which has the valve stem pointing toward you, and on the outer wheel which has the valve stem pointing away from you. Nothing should restrict your ability to check your tire's air pressure daily when you are driving your RV. Pressure sealing valve caps should always be used to prevent air from escaping from the valve stem. If you use valve stem extension hoses, make sure they are good quality stainless steel braid reinforced and are securely anchored to the outer wheel. If your RV has wheel covers which must be removed to check the inflation, then consider removing them as the extra time and effort required may lead you to avoid checking your air pressure.

## **PREFLIGHT CHECKLIST**

What if you don't check your air pressure? If a tire picks up a nail or screw that creates a slow leak and causes some air pressure loss, you might eventually spot it visually if it is a front tire. If it is an outside rear dual, you might also spot it with a visual inspection. However, if it is an inside rear dual, the chances of spotting it without an air pressure check are very slim. If you begin driving without finding it, very quickly (in most cases a few miles) your outside rear tire next to the low air pressure tire is going to heat up from carrying double its load, which will cause both tires to fail.

As you "preflight" check your vehicle every "drive morning," include an air pressure check of your tires. The peace of mind is worth the extra few minutes!

## **ADDITIONAL TIRE CARE RECOMMENDATIONS**

### **Tire Repair**

Even the best drivers can drive over a nail and the best tires can pick up that nail or screw and go flat. If you pick

up an object that causes a flat with a Michelin RV tire, the repair must be made to the inside of the tire to be repaired properly. To do this, the tire needs to be demounted and inspected on the inside of the casing for any other damage that the object may have caused. See your Michelin truck tire dealer for the proper repair and damage inspection.



### **Tire Inspection**

Your RV tires should be inspected thoroughly at least once a year, and any time you drive in rough or rocky terrain, or when you have your RV serviced. This inspection should include both the outside and inside sidewalls, the tread area, and the valves, caps, and any valve extensions. Inspect for nails, cuts, bulges, aging, or fatigue cracks and weathering or ozone checking. Also, check between the duals for objects lodged between them. See your Michelin dealer at once if anything unusual is observed.



On a regular basis, rub the palm of your hand across the face of the tread on your front tires to feel for any feathered wear from "toe" alignment problems. (Be careful since severe wear can expose steel belt edges that are very sharp.) A "toe" misalignment problem can be caused by impact with a "chuck" hole in the road. Bad "toe" wear can be hard to find visually, but can be felt very quickly with the hand. This type of alignment problem can wear rubber off the tread of your tires in just a few hundred miles.

### **COMMON TIRE DAMAGES**

No tire, regardless of its quality, is indestructible. Certain conditions of use and abuse can stress a tire beyond reasonable operating limits, causing it to come out of service even when considerable tread remains. Such conditions are clearly indicated by the damage they leave on the tire itself.

Below we have listed some common damages and the signs they leave behind. Please understand that this list is by no means exhaustive and is intended only as a general guide.

## **Fatigue Rupture**

This type of damage is sometimes called a “zipper rip” because of the zipper-like effect it creates in the steel casing cords of the damaged tire. Overload and/or underinflation for a given load, and improper blocking of the tires can cause the steel casing to fatigue and result in this type of damage. As one cord breaks, each cord around it is subjected to even more stress. Eventually, the weakened cords may break, one after the other, until a rupture occurs in the upper sidewall.

## **Dual Kissing**

While somewhat romantic in name only, this type of damage refers to what happens when two tires in dual configuration make contact with each other while in operation. The heat generated by the friction between the two tires severely weakens the casing material of the dual tires. This is easily seen on the sidewalls of the tires where the duals came in contact. The condition may be caused by several factors:

- improper mounting;
- incorrect dual spacing;
- underinflation
- “casing growth”

In this last case, the fabric casing cords of the tire actually stretch and expand, causing the tire to touch or kiss, under load at the contact patch.

## **Underinflation**

This condition is often referred to as a “run flat” tire. It is caused by operating a tire at very low or zero air pressure. When a tire is run at normal highway speeds, underinflated, it flexes too much and builds up heat. This heat damages the inner liner, casing and outer sidewall of the tire. If not remedied quickly, the tire will be irreparably damaged.

In extreme cases, the sidewall of the tire is destroyed, both from the excessive heat it endured and due to the

weight of the vehicle pressing on the tire casing without the cushioning effect of the correct air pressure, and the crushing/cutting action of the wheel as it rolls on the uninflated sidewall. According to guidelines put out by the Rubber Manufacturers Association (RMA), any tire that has been run at less than 80% of recommended air pressure for the load it is carrying should be inspected for possible damage.

When one tire in a dual configuration comes out of service due to underinflation/run flat damage, the other tire in the dual configuration should be inspected immediately. If the unserviceable tire was underinflated, that means the serviceable tire was carrying more and more of the load for that wheel position. Consequently, it too may have suffered some casing damage.

## **TIRE WEAR, BALANCE AND WHEEL ALIGNMENT**

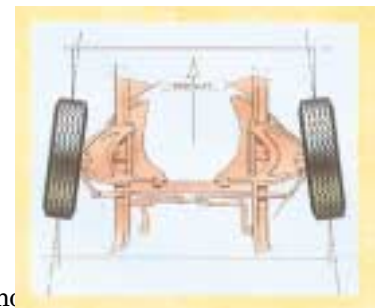
All tires mounted on RV's should wear in a smooth, even wear pattern when the tires are maintained with the correct air pressure for the load on the tire. If tires begin to show an irregular wear pattern, and the vehicle alignment is correct, sometimes just rotating the tires by changing direction of rotation and wheel position will allow the tires to wear evenly.

An unbalanced tire/wheel assembly may cause steering difficulties, a bumpy ride and worn spots on your tires. It is recommended that tire/wheel assemblies be dynamically balanced if one of these conditions exist.

Check with your motor home chassis manufacturer for the correct alignment specifications.

Michelin recommends, for optimum radial tire life and performance, that the “toe in” setting should be as close as is practical to zero, within the motor ho

specifications. The caster should be set to the maximum positive or minimum negative setting within the tolerances specified by the manufacturer.



## Toe Wear

A feathered wear pattern on the front tires typically indicates misalignment (toe in or out). Sometimes a radial tire will not have this wear pattern unless the toe condition is severe. Instead of the feathered edge wear, the tire will be worn on the inside or outside shoulder which could be confused with camber wear. A skewed rear axle and tag could cause feathered edge wear on one shoulder of one front tire and feathered edge on the opposite shoulder of the other front tire. In order to correctly diagnose a tire wear condition, the motor home should have the alignment checked on all wheel positions before any corrections to alignment are made.

## Camber Wear

Also known as edge wear, camber wear shows up on the inside or outside shoulders of the tread. Wear on the inside edge of both tires may be due to negative camber or toe-out, a misalignment. If only one tire shows edge wear, check for worn kingpin bushings, bent or worn steering components, or excessive positive camber setting.

## AGING/WEATHER CHECKING/OZONE CRACKING

During the yearly or pre-trip inspection, the tires should be inspected for signs of aging, weather checking and/or ozone cracking. Look for tiny cracks in the rubber surface on the sidewall of the tires. Most often the cracks are 360° around the tire.

If the cracks are less than 1/32" deep, the tire is O.K. to run. Between 1/32" and 2/32", the tire is suspect and should be examined by your Michelin tire dealer. If the cracks are over 2/32", the tire should be replaced immediately.

To protect your tires from these common damage conditions:

- 1) Keep tires properly inflated
- 2) Keep tires clean
- 3) Avoid prolonged exposure to heat, cold or moisture
- 4) Avoid prolonged exposure to ultraviolet rays
- 5) Cover your tires when vehicle is not in use
- 6) Do not park near electric generators or transformers

- 7) Do not store vehicles in an area where welding is being done or in a garage which has mercury vapor lamps

## TIRE ROTATION

If correct air pressure and proper alignment are both continually maintained, tire rotation may never be needed. However, in other cases, tire rotation may be needed to help even out alignment, underinflation, or free rolling wear problems. Follow your motor home manufacturer's rotation service recommendations. There are no restrictions as to the method of rotation with your Michelin RV tires, however, Michelin recommends including the spare tire in the rotation pattern and changing the direction of rotation. Tires can be rotated front to rear and side to side.

## PROPER CLEANING

Like the rest of your RV, it pays to keep your Michelin tires clean. Road oil will cause deterioration of the rubber and dirt buildup will help hold the chemicals in the air next to the tire and will also deteriorate the tire.

As with the cleaning of any rubber product, proper cleaning methods must be used to obtain the maximum years of service from your tires. A soft brush and the normal mild soap that you would use

to clean your RV may be used. If you use a dressing product to "protect" your tires from aging, use extra care and caution. Tire dressings that contain petroleum products, alcohol or silicones may cause deterioration or cracking and accelerate the aging process.

In many cases, it is not the dressing itself that can be a problem, but rather the chemical reaction that the product can have with the antioxidant in the tire. Heat can add to the negative reaction. When these same dressing products are used on a passenger car tire that is replaced every

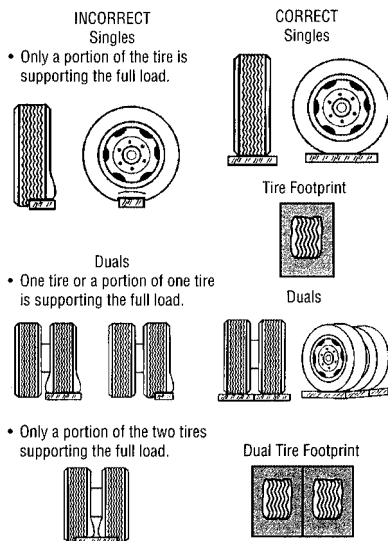


three to four years, it is rare to see a major problem. However, in most cases, RV tires may last much longer due to limited annual mileage, and the chemical reactions have much longer to take place.

## THE USE OF BLOCKS TO LEVEL MOTOR HOMES/RV'S EQUIPPED WITH RADIAL TIRES

Extreme caution must be taken to ensure that the tires are fully supported when using blocks to level motorhomes and/or RV's. The load on the tire should be evenly distributed on the block and in the case of duals, evenly distributed on blocks for both tires. If not properly done, the steel cables in the sidewall of the tires may be damaged and could lead to premature fatigue of the sidewall.

### Tire "Blocking" Methods



The correct and incorrect methods are shown here. Please note that blocks should be wider than the tread and longer than the tire's footprint. This provides maximum support to the tires and assures that the load is evenly distributed throughout the tire's footprint area.

## RV TIRE LONG TERM STORAGE

Your RV is designed for recreation, not long-term storage. However, unless you are a "full timer," you have no other choice. Rubber tires age faster when not being used. A cool, dry, sealed garage is your best bet for storage. However, many RVs are stored outside in the elements. Some storage surfaces may cause tires to age prematurely. For this reason, Michelin recommends placing a barrier (i.e. cardboard, plastic or plywood) between the tire and the storage floor/ground surface.

There are a few steps that you can take to reduce the

aging effects from long-term RV storage. Before putting your RV into storage or a non-use period, thoroughly clean your tires. Then cover the tires to block direct sunlight and ultraviolet rays. Store your RV out of a high ozone area. Failure to take these steps can cause early deterioration and shorten the life of your tires. NOTE: When a vehicle is stored, tires should be inflated to the inflation pressure as indicated on the sidewall of the tire.

Before removing your vehicle from long-term storage, thoroughly inspect each of its tires. This means a close examination of each tire's sidewalls, tread area, and air pressure. If your pressure check indicates the tires have lost air during storage, be sure to inflate them to the correct pressure for the current load before putting the unit into service.

## THE LIFE OF AN RV TIRE

The life of a tire used on an RV cannot be measured by miles alone. Among other factors, your RV tire life depends on driving habits, driving and storage conditions, geography,



atmospheric conditions, loads carried, weight distribution, as well as the age of your tires. You can determine the age of the tire by looking at the DOT number (see illustration). The last digit on the right is the last digit of the year in which it was manufactured. DOT markings related to the year of production may have an additional symbol for the decade of the 1990's. It would be shown as a triangle (<) following the last number. For example, in the illustration above, the tire was manufactured in 1998. In the near future, you can expect to see four digits in this last grouping of numbers. The first two will indicate the week of the year that the tire was produced and the last two will indicate the last two digits of the year of production. For example, "4400" in

the last grouping would indicate that the tire was made in the 44th week of the year 2000. If the Michelin tires you have on your RV were being driven on a small commercial truck, they might last 80,000 to 120,000 miles and be replaced every two years. With the average (non-full timer) RV driving 5,000 miles per year, that could take close to 20 years to obtain! Therefore, with tires on an RV, the most important consideration in the life of tires is age. The tires should be examined periodically for signs of aging, and removed from service if required. It is very likely that tires on an RV will need to be removed from service before the tread is worn out.

The rubber in your tires ages just like the rubber in your fan belt and radiator hoses. Tires contain waxes and emollients to help protect their outer surfaces from ozone and weather checking. As the tire rolls and flexes, the waxes and emollients continually migrate to the surface, replenishing this protection throughout the normal use of the tire. In cooler, clean air locations, the expected tire life will be longer than in high temperature, high ozone areas. Of course, as a tire ages, you should inspect it more frequently.

## SELECTING REPLACEMENT TIRES FOR YOUR RV

One of the most important RV equipment purchases that you will make will be the replacement tires. If you obtained good service with your first set of tires, chances are that they were matched well for your RV's weight needs and your type and area of driving.

If there is reason to replace your tires with another size, be very careful with this selection. There are some basic areas of concern, such as the load rating of the new tire and the overall diameter of the new tire for vehicle clearance and speedometer reading.

There is also the matching of the tires to the dual wheel offset for the dual spacing clearance and the load rating of the wheel. For example: buying a tire with a higher load

rating that might require 105 P.S.I. would be inappropriate if your wheel is limited to 80 P.S.I. (Be sure that the wheel width is compatible with the new tire size). Consult your vehicle manufacturer for wheel specifications.

Take for example a 25-foot Class "A" motor home. If the owner had replaced the O.E. 7.50 R 16 tires with LT235/85 R 16 LRE, these tires would have fit on the same wheels and would have carried the extra load needed, but there would have been one major problem. The LT235/85 R 16 tire requires a minimum of 10.6" dual spacing (from center of inside dual to center of outside dual), while the GM 16" x 6K wheels that were in use only had a 5" offset (5" + 5" = 10" dual spacing). Therefore, the sidewalls of the duals would rub. This rubbing action and resulting extra heat buildup could cause one or both of the dual tires to fail.

As you can see, there are some critical areas to look at in picking out replacement tires. For the best information on doing this, you should see your Michelin dealer. There are Michelin dealer locations across the country to help with this type of information and there is a location close by that is ready to help.

If you have already been driving on Michelin RV tires, you are aware of some of their extra benefits, such as the great wet and dry traction and outstanding handling. Most RV owners who drive on Michelin tires for the first time comment on the smooth, quiet ride.

For great traction, outstanding mileage, a smooth, quiet ride and for miles and miles of service, there is a premium quality Michelin RV radial for your special RV needs.

Over 100 years ago when the brothers Edouard and Andre Michelin started their small tire company, they committed themselves to these three fundamental principles: "We will make nothing but tires...thereby becoming experts in the field of manufacturing. Our prime task is to serve the customer...for it is the customer on whom we depend for our living. We must constantly aim to produce the best tire...at the most economical price possible." It is on these principles, together with stressing quality rather than quantity that Michelin has grown to become the largest producer of tires in the world, and is the clear leader in consumer tire satisfaction. Can you afford to be riding on anything less?

***For more information on the Michelin dealer nearest you, check your local telephone directory or call 1-800-847-3435.***

