

OBTAIN THE BEST RESULTS FROM YOUR TIRES

1. Pick the right design for the job

Tire and Rim Association tire type codes are an excellent guide for determining the type of service for which a tire is intended. Use an R-1 tire (UltraTorque Radial or Duratorque for example) for general dry land farming. Use an R-1W (Super Traction Radial, DT800, DT810 or DT820 Radial) for farming in wet, moist, heavy clay soils. An R-1W offers about 25% more tread depth than a conventional R-1 tire to give good traction without clogging in wet, heavy clay soils. Use an R-2 for farming in wet muck and mud such as rice or sugar cane farming. An R-2 tire has twice the tread depth as an R-1 tire to dig in the mud without clogging. Using a tire for any service not listed for it will result in poor performance and/or poor tire life. An R-2 (Special Sure Grip TD-8) tire used in general dry land farming will wear more quickly, not pull as well and provide a rougher ride than the R-1 that you should be using. An R-1 used in sand service will bury itself quickly when asked to pull, whereas an All Weather (R-3) will be better able to stay on top of loose sand.

2. Pick a tire to carry the load

A tire must be large enough and/or of high enough

USDA AGREES!

The National Soil Dynamics Laboratory of the United States Department of Agriculture has stated, "...inflation pressure should be set at the manufacturer's recommendation for the actual load on the tire, which actually is the minimum acceptable inflation pressure for that load. This will minimize soil stresses and compaction, and maximize efficiency. Don't overinflate your tires."

Source: Bailey, A.C., R.L. Raper, T.R. Way, E.C. Burt, and C.E. Johnson. 1993. *Soil stresses under tractor tires at various inflation pressures*. Proceedings of the 11th Annual Conference of ISTVS, Volume I, Incline Village, CA. Sept. 27-30, 1993.

ply rating to be able to carry the maximum load that you intend to place on it. When determining maximum load, remember to include the weight of full bins or tanks, tillage tools carried on the tractor, and all ballasts including liquid fill in the tires. The air in the tire enables it to carry the load – thus you get more load capacity by either using a bigger tire (more air volume) or by using a higher ply rating tire (more air pressure) or both. A ten ply rating tire operated at six ply rating pressure will only carry the load of a six ply rating tire. To get the best results, a tire should be inflated to a pressure appropriate for the load on it. See box below. For further information on how to properly inflate your tires and ballast your tractor, see the "Goodyear Optimum Tractor Tire Performance Handbook."

Special cases:

COMBINES – Rear tractor tires used on the drive wheels of combines are applied using special consideration for the cyclic loading encountered in this service. For proper loads and inflation pressures in this application refer to the extended load tables.

SPEEDS OTHER THAN FIELD SERVICE – Usually, transport conditions require a decrease in load. Read the notes at the bottom of the appropriate load table to find out how much.

HILLSIDE COMBINES – Increases in tire load are not permitted for tires on hillside combines. (A hillside combine is a combine designed to operate on slopes steeper than 11 degrees or 20% grade.) The inflation pressure in the downhill tire may be increased four psi for stability.

FURROW WHEELS – If you are plowing with one wheel in the furrow, you should increase the inflation pressure in that tire to four psi over the pressure shown in the tables.

3. Pick a tire to handle the horsepower

All tires must be sized for the load requirements that they encounter, but a rear tractor tire must meet an additional requirement – it must be able to get the tractor horsepower to the ground. Each rear

tractor size and ply rating has a maximum amount of pull that it can handle without shortening its life. Since the horsepower a tire transmits can be calculated from knowing its pull and travel speed, the horsepower capabilities tables show the maximum PTO horsepower that each size and ply rating will handle at different speeds – five mph and three mph. Notice that as speed decreases the amount of horsepower that a given tire will handle also decreases. Virtually all tractor manufacturers agree with Goodyear that higher plowing speeds result in less wear and tear on both tractor and tires. The best speed to pull your implement is at least 5 mph.

4. Check the size

These measurements are useful when trying to match different sizes of tires. Section Width or SD is the overall width of the tire cross-section. Overall Diameter or OD is the diameter of a new inflated tire measured at the centerline. Static Loaded Radius or SLR is extremely important for mechanically driven front wheel assist tractors. The Loaded Section Width is important for determining whether a tire will fit between crop rows. When changing to a larger size tire, please leave about two inches of clearance between the tire and any machine parts that it comes close to. The distance between sidewalls for duals should be 1.5 inches plus 10% of the section width (SD) for bias tires and 2.5 inches plus 10% of the tire width for radial tires.

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5. Weight your tractor properly

A tire on a tractor can meet all of the other criteria and still not provide optimum service because the vehicle is improperly ballasted. Generally speaking, you may choose between traction or flotation – whatever you do to increase one will decrease the other. For flotation, a large low ply rating tire operating at relatively low pressure with a light load on it is needed. Traction requires a higher ply rating tire operating at maximum pressure with a heavy load. Since the amount of pull that a tire will generate before spinning is strongly dependent on load, keeping a certain amount of flotation will require very large tires or duals. Duals can provide either flotation or traction depending on how they are weighted and inflated. Unballasted at 12 psi, duals will give good flotation. When ballasted to maximum rated load at maximum rated pressure, however, duals will produce considerably more drawbar pull than the same size single tire. Note: Be careful not to exceed the manufacturer's recommendations for total axle and/or vehicle weight. Weight distribution is also very important in farm tractors. Recommended front/rear weight distributions for various types of tractors are shown below:

| | Weight Distribution Front/Rear | |
|------------------------------|--------------------------------|-------|
| | From | To |
| 2-wheel drive..... | 35/65 | 25/75 |
| Power assist front axle..... | 40/60 | 35/65 |
| 4-wheel drive..... | 60/40 | 51/49 |

These weight distributions will be suitable for most general farming applications. Consult your tractor manufacturer for special cases.

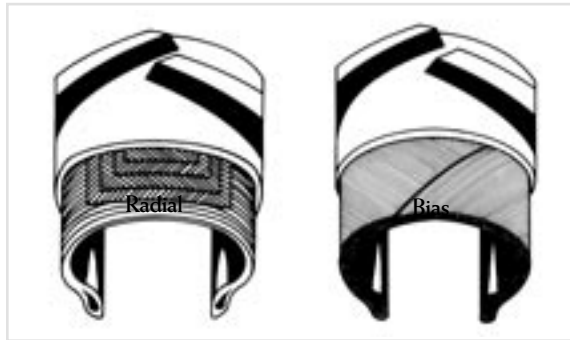
6. Consult your Goodyear dealer

If you have checked all of these points and still have questions, read the sections titled "Things You Should Know About Farm Tires" and "Optimum Tractor Tire Performance" or consult your local Goodyear Farm Tire Dealer.

THINGS YOU SHOULD KNOW ABOUT FARM TIRES

Radial vs. Bias

As the drawing below shows, radial tire construction is substantially different from bias tire construction. The crossed plies of the bias tire run diagonally from bead to bead. In a radial tire, the carcass plies run in a radial direction from one bead to another. Radial tires also have stiff belts in the tread area that restrict growth and stabilize the lugs when they contact the ground. Radial tires have more supple sidewalls than bias tires that, in combination with the stiff belts, provide traction and efficiency superior to bias tires.



Tubeless Tires

Tubeless tires have been used for many years on combines and industrial tractors and have recently been adopted at all wheel positions by leading tractor manufacturers. They operate at the same inflation and have the same load capacity as equivalent tube type tires. Not only do tubeless tires provide higher reliability and easier puncture repair, but also lower assembly costs than tube type tires. When used with calcium chloride solution, rim corrosion is not a problem as long as you maintain the proper inflation pressure to keep the tire bead firmly on the rim's bead seat. This seals outside air away from the rim and controls corrosion. A dismantled rim will rust quickly if not rinsed with tap water immediately. For

instructions on how to liquid fill tubeless and tube type tires, see "Liquid Weighting of Tractor Tires" section.

Tire Size Nomenclature

Conventional sizing – This is probably the most common size marking system in use today. Examples would be 7.50-16, 11L-15, 13.6-28 and 18.4R38. The first number is the nominal cross-section in inches, which is followed by a dash (-) to indicate bias construction or an "R" to indicate radial construction. The number after the dash or "R" is the nominal rim diameter.

Metric sizing – This new tire marking system has the approval of the International Standards Organization (ISO). Examples are 320/90R46 and 710/70R38. The number before the "/" is the nominal cross-section in millimeters. After the "/" is the aspect ratio, "R" indicates radial construction ("D" for bias or Diagonal), and then the nominal rim diameter. See "Millimetric Size Marking" for a more complete description of this sizing system.

Sidewall Info

On both sidewalls of all Goodyear farm tires is the name "Goodyear" in large letters, a size marking, a tire name such as "DT810," and a panel giving the maximum pressure for that tire, the load corresponding to that pressure, and the maximum speed for which that load is valid. If your operating conditions are different from those on the sidewall, you must consult the notes at the bottom of the extended load tables.

Ply Rating / Star Marking / Load Index

The load and/or pressure capacity of a tire is shown in the ply rating (bias tires), the star marking (conventional radial tires), or the load index (metric

radials). It can describe tire strength (ply rating), rated inflation capacity (star marking), or rated load capacity (load index).

Ply Rating – Used by bias tires and some older radials. Ply rating is an indication of carcass strength and not the actual number of fabric plies in the tire. Maximum rated loads and pressures are different for each tire size with the larger tires operating at lower pressures for a given ply rating.

Star Marking – Used by conventional-sized farm tractor radials. Star marking is an indication of rated inflation pressure: 1 STAR farm tractor tires are rated at 18 psi, 2 STAR farm tractor tires are rated at 24 psi, and 3 STAR farm tractor tires are rated at 30 psi. Loads vary with tire size.

Load Index – Used with metric radials. Load index is an indication of rated load with each load index number corresponding to a certain load (see table on "International Load Index" table). If two tires have the same load index, they will carry the same load, but not necessarily at the same inflation pressure.

MFWD Lead / Lag Calculation

On mechanical front wheel drive (MFWD) tractors, front and rear rolling circumference must be matched to the tractor front-to-rear gear ratio. For further details see "Rolling Circumference" section.

Rim Selection

It is important to always mount a tire on a rim that is approved for it. Not only must the width be correct, but also the flange contour (i.e. DW, DD, F, L, ...) must be the one recommended for the tire in question.

Use Of A Rim Wider Than Recommended – Using a wider rim results in flattening of the tread face. This effect may improve traction in some looser soil conditions. In hard soils, however, the flatter tread penetrates less effectively and tractive effort

THINGS YOU SHOULD KNOW ABOUT FARM TIRES

is reduced. Additional stresses concentrated in the shoulder area tend to increase the rate of shoulder treadwear. By spacing the tire beads farther apart, the sidewalls are forced to flex in an area lower than normal and this can result in circumferential carcass breaks and/or separation. See "Rim Types" and "Approved Rim Contours" sections for the list of recommended and alternate rims.

Use Of A Rim Narrower Than Recommended

– This condition brings potential mounting problems because the rim shield or flange cover molded into most drive tire designs tends to interfere with the seating of the tire beads on a narrow rim. Once mounted on a narrow rim, the tire rim shield applies undue pressure on the rim flange with possible tire sidewall separation or premature rim failure at the heel radius. On a narrow rim the tread of the tire is rounded, as with the over-inflated tire, treadwear will be concentrated in the center area of the tread and traction in the field will be reduced.

Drive Tire Designs

This handbook includes an "Industry Standards and Selection Chart," which is an excellent guide for determining the type of service for which a tire is intended.

R-1 is the most common type of lug tire used in the United States and Canada and is the tire to use for general dry land farming. Goodyear R-1 tires include the UltraTorque, Dyna Torque Radial and Duratorque.

R-1W tires were introduced in Europe for the wet soils found there. They fill a gap between the R-1 and R-2 tires and provide the right tire for areas with wet, sticky soils. The "W" signifies wet soil service. R-1W tires are defined as having 20% deeper tread depth than an equivalent R-1 tire, but actually range from 15 to 35 percent deeper. Goodyear R-1W designs include the Super Traction Radial, Optitrac DT824 and DT820.

R-2 tires are for cane and rice and other crops grown in wet muck or flooded fields. R-2 tires are about twice as deep as R-1 tires. Goodyear R-2 designs include the Special Sure Grip TD-8 and Special Sure Grip TD-8 Radial. Although R-2 tires are excellent in the service for which they are intended, the widely-spaced lugs can cause problems with wear and vibration when roaded. R-2 tires also do not pull as well as R-1 tires in the drier soils typical of crops such as corn and beans.

R-3 designs such as the Goodyear All Weather and All Weather Radial are used on turf or in sandy areas where the disturbance of an aggressive lug-type tire is not wanted. R-3's shallow, button-style treads are not designed for hard pulling, but may give surprisingly good traction on smooth, dry surfaces.

R-4 tires are found on tractors with backhoes and/or front-end loaders at construction and other industrial sites. These tires have shallow, durable lugs. R-4 examples include the Goodyear IT510 Radial, IT525, and Industrial Sure Grip.

HF-1, HF-2, HF-3 and HF-4 are types of a high flotation tire referred to as Terra-Tire. In comparison with conventional tires, these tires have a wider cross section, a larger air volume, and operate at lower inflation pressures. The net result is a flotation effect for go-anywhere performance – despite terrain, despite load. The HF-1 is a Rib Tread similar to an R-3 tire. The HF-2 type is a regular lug tread similar to an R-1 tire. The HF-3 type is a Deep Lug Tread similar to an R-1W tire. The HF-4 is an Extra Deep Lug Tread similar to an R-2 tire.

Tread depth is the biggest factor affecting traction in wet soils, but as the soil dries out, deep lugs turn from assets to liabilities. In soil conditions most prevalent in North America, an R-1 tire will pull better than an R-1W.

For an explanation of all codes see Industry Standards and Tire Selection chart.

Flotation / Compaction

Flotation is defined as "the ability of a tire to resist sinkage into the soil." If a tire is not able to stay on top of the soil, it will leave a rut under which the soil texture is disturbed. It is a concern in loose, wet, or easily compacted soils. Agricultural soils need to have air and water-filled pore spaces that allow root growth, the transport of plant nutrients, and rapid absorption of rain water. Compaction is defined as a decrease in the volume of these pore spaces. There are two different concerns: 1) subsoil compaction which is dependent on the total weight of the vehicle and 2) surface disturbance which is highly related to the average pressure between the tire and soil. For a given load, the tire that will carry the load at the lowest required inflation pressure will provide the greatest flotation and the least surface disturbance and compaction. This is because the average pressure under a tire is a little higher (about

A NOTE ON CONTACT AREA

The only contact area that we publish in this handbook is the "Gross Flat Plate" contact area. This is the total area contained within the ellipse of contact resulting from applying rated vertical load to a tire at rated pressure on a smooth hard surface. Previous editions of this book have also published a figure known as "penetrated area" which was all the area under a tire at the stated penetrated soil depth. It was felt that this figure was misleading because of the many assumptions made in its determination. In soft soil, the ratio between the pressure in the tire and the pressure that the soil can support determines the degree of soil deformation. This is why soil disturbance is minimized by opting for larger tires that can carry the required load at lower inflation pressures.

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1 to 2 psi for a radial and 2 to 3 psi for a bias) than the inflation pressure in the tire. Although we publish "Gross Flat Plate" contact areas for individual tires elsewhere in this book, it is important to remember that the published contact areas are correct only at that tire's rated inflation pressure and rated load. See box on contact area below. To compare the flotation characteristics of different size tires, use the load/inflation tables to determine the pressure corresponding to your load per tire. If you are looking for flotation, the tire that will carry the load at the lowest required inflation pressure is best.

Terra-Tire is a specifically designed high flotation tire. The large ground contact area of Terra-Tire flotation tires effectively distributes load over a relatively broad area, providing a reduction in unit ground pressure in comparison to conventional tires. This reduction in ground pressure means less soil compaction and less ground disturbance—on the farm or on the golf course. It also means improved mobility, permitting the Terra-Tire to traverse mud or snow or soft sand that would often bog down a conventional tire.

Singles / Duals / Triples

Duals or triples can give you increased traction or increased flotation over single tires depending on how you set them up.

If you want TRACTION, add weight to your tractor up to the published load capacity for the tire using the appropriate row (single, dual or triple) from the tables in the "Load and Inflation" section. Inflation pressure must be increased to match the load using the same table. Be careful not to exceed the manufacturer's maximum load rating for the axle. If flotation is not a concern, higher load capacity single tires used at higher load and pressure will increase traction and be more efficient and maneuverable than dual or triple tires.

If you want FLOTATION from your duals or triples,

run your tractor at the manufacturer's minimum weight/HP ballasting recommendations and decrease inflation pressure to match the lighter load according to the "Load and Inflation" tables and the "Optimum Tractor Tire Performance" section.

Compared to single tires, duals and triples can allow you to both increase traction (more weight) and improve flotation (lower inflation pressure) if only moderate increases in ballasting are made. However, remember that duals and triples increase your tractor's rolling resistance and decrease traction efficiency.

Dual Attachment Systems

While rim-mounted duals are easier to take on and off, the spacer band between the two rims decreases ground clearance. Axle-mounted duals are more flexible because they allow you to change spacing. Axle-mounted duals are also better at transmitting high torque.

Liquid / Air Fill With Duals

A few years ago the recommendation was to put liquid only in the inner tire but new information has changed the guidelines. All tires on an axle should be filled to the same level which should not exceed 40% (4 o'clock valve stem position). Likewise, all tires on a given axle should be inflated to the same pressure. See the section on optimizing your tractor to find the current rules concerning the use of liquid ballast.

Mixing Radial and Bias Duals / Unmatched Duals

There is no reason why you cannot mix radial and bias tires on the same axle. Of course you don't get the full benefits of radial tires when you mix them with bias, but the result is still better than dual bias tires. The radial tire would typically be mounted at the inside dual position. A guideline to follow when dealing with unmatched duals is that the larger

diameter of the two unmatched duals should be at the inside position.

Tire Overload or Underinflation

Overloading and underinflating a tire both have the effect of over-deflecting it. Under these conditions the tread on the tire will wear rapidly and unevenly, particularly in the shoulder area. Radial cracking in the upper sidewall area will be a problem. With underinflated bias drive tires in high torque applications, sidewall buckles will develop leading to carcass breaks in the sidewall. While an underinflated drive tire may pull better in some soil conditions, this is not generally true and not worth the high risk of tire damage incurred.

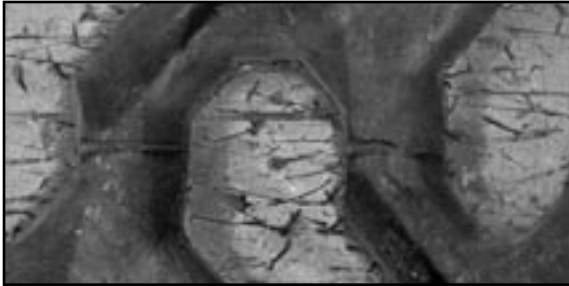
Overinflation

Overinflation results in an under-deflected tire carcass. The tread is more rounded and wear is concentrated at the center. Traction is reduced in high torque service because both width and length of the ground contact area are reduced. The harder carcass — with reduced flexing characteristics — does not work as efficiently. Moreover, the tightly stretched overinflated carcass is more subject to weather checking and impact breaks.

Pressure Adjustments For Slow Speed Operation

Higher loads are approved for intermittent service operations at reduced speed. This is shown in the footnotes under the "Load and Inflation" tables for rear and front tractor tires operated at speeds up to 5 MPH max. To carry the increased load at this speed, the pressure **MUST** be increased as shown in the footnotes to reduce tire deflection and assure full tire service life.

THINGS YOU SHOULD KNOW ABOUT FARM TIRES



Furrow Drive Wheel Tires

In mold board plowing operations, where tires on one side of the tractor are run in the furrow, inflation pressure in the furrow tire should be increased 4 psi over the rated value. The additional pressure compensates for the additional load being carried by the furrow tire and reduces sidewall buckling tendencies in bias tires under high torque.

Side Hill Work

When working back and forth on the side of a hill with a slope exceeding 11 degrees (20% grade), the tires of a tractor will alternately be on the down side. It is recommended that the inflation pressure in the rear tires be increased for additional stability. For base pressures 12 psi and above, the pressure should be increased 4 psi. For base pressures below 12 psi, the pressure should be increased by 30%. When one side is continuously operated in the down slope position, it is only necessary to increase the inflation pressures on that side.

Drawbar Pull and Tire Slip

The amount of drawbar pull available depends on the load carried by the tractor drive axle(s). For more pull, more weight should be added. The effect of added weight will be in proportion to the figures in the following table. For each 100 pounds added to the rear axle of the tractor, the average drawbar pull will be increased by:

| Surface | Pull Increase (Pounds) |
|---------------|------------------------|
| Concrete Road | 70 |
| Dry Clay | 55 |
| Sandy Loam | 50 |
| Dry Sand | 35 |
| Green Alfalfa | 35 |

When the tractor is not properly weighted for drawbar load requirements, excessive wheel slippage will waste time and fuel and result in tearing of the leading edge of the lugs and spin cuts as shown in the photo above. For more complete information on how to setup your tractor for optimum performance, see the section on "Optimum Tractor Tire Performance."

Rim Slippage

In attempting to obtain maximum tractor drawbar pull, tube valves are occasionally torn off because of slippage of the tire bead on the rim. Tubeless tires, although immune to pulled valves due to slippage, may still suffer abrasion on the base of the bead after prolonged operation with the tire slipping on the rim. Tire slippage on the rim may be caused by:

1. Low inflation pressure for load.
2. Improper seating of tire bead on rim.
3. Use of thick soap solution or improper mounting lubricant in mounting the tire beads to the rim.
4. Inadequate tire size or strength rating for the high torque requirements.
5. Undersize rim — consult Goodyear Service Department for specialized equipment needed to determine if rims are out of spec.
6. Poor rim knurling on bead seat.

When one of the first three conditions is responsible for the problem, tires should be demounted and tire

beads and rims carefully cleaned. Tire should then be remounted and inflated to 35 psi to properly seat the tire beads on the rim. **The precautions found in this handbook MUST be observed.** If tube type tire, the tube should then be completely deflated and then reinflated to recommended operating pressure.

Where inadequate tire size or load capacity is the problem, a change to a higher load capacity and/or larger tire size will be required. Determine tire adequacy by checking the "Load and Inflation" tables.

If it is determined that the rim is undersize or has poor knurling, then it must be replaced.

Roading of Farm Tires

Tractor tires operate most of the time in field conditions where the lugs can penetrate the soil, and where all portions of the tread make contact with the ground. In operating on hard roads in an underinflated or overloaded condition, the tread lugs distort and squirm excessively as they enter and leave contact. On highly abrasive or hard surfaces, this action wipes off the rubber of the tread bars or lugs and wears them down prematurely and irregularly.

Using the correct inflation pressure from the "Load and Inflation" table will even the load distribution across the face of the tread resulting in more uniform wear.

Farm tractor and implement tires are designed for low speed operations not exceeding 25 mph (some radial tires are also rated for 30 mph). If tractors or implements are towed at high speeds on the highway, high temperatures may develop under the tread bars and weaken the rubber material and cord fabric. There may be no visible evidence of damage at the time. Later, a premature failure may occur, which experience shows was often started by the overheated condition that developed when the unit was towed at a high speed.

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Tire Storage and Care

Stored tires and tires on stored implements should be protected from attack by oxygen and ozone. Although Goodyear farm tires use considerably more of the materials that protect against ozone and oxygen than car or truck tires, care should be taken in storage conditions to get full life expectancy from your tires.

Because tires readily absorb oil, grease, fuels, and other solvents, they should never be stored on oily floors or adjacent to volatile solvents. These tend to leach the protectants and will damage and weaken tires.

Mounted and unmounted tires should be stored away from motors, generators and arc welders because these are all sources of ozone. Ozone attacks rubber, causing it to crack perpendicular to any applied stress. These cracks expose more surface and ozone attack can escalate until rubber degradation can cause tire carcass failure. Even minor ozone-induced surface cracks can form an access route for foreign matter to penetrate the tire when it is put back into use.

Since heat and light also degrade tires, care should be taken to make sure that they are stored in a cool, dark place. Tires should be protected from sunlight, either under shelter or at least covered with an opaque tarp or black polyethylene.

To store tires mounted on rims but not on a machine, such as tractor duals, reduce inflation pressure to about 10 psi and store vertically, standing on their treads. Tires off rims can be stacked evenly on their sidewalls, but never so high as to distort the bottom tire. To protect tires on a machine in storage for six months or more, block up the machine to reduce stress on the tires. With the tires off the ground, pressure can be reduced to 10 psi. If it's not possible to elevate the tires, increase inflation pressure to 25 percent above that required for the actual load on the tire to decrease deflection. The machine should be moved from time to time to change the location of stress concentrations in the tire ground contact area. Make sure that you remember to reset inflation pressure to the recommended operating value when the machine is restored to service.

ROLLING CIRCUMFERENCE

Rolling circumference is the distance a tire travels in one revolution. With the growing number of mechanical front wheel drive (MFWD) tractors, the rolling circumference of the tires play an important role in determining the correct setup for your tractor. In MFWD tractors, both the front and rear tires do the work. Since the front tires are smaller than the rear tires, the front tires have to rotate faster to cover the same distance as the rear. The mechanical gearbox in the tractor accomplishes this task. Typical Front/Rear gear ratios range from 1.2 to 1.5. When selecting tires for your MFWD tractors, be sure to maintain the proper ratio of rolling circumference for your tractor. Typical tractor setups maintain a positive front tire slippage or overrun from +1 to +5%*.

*Consult vehicle manufacturer for recommended range for your particular unit.

This positive slippage maintains good steering ability for the user and reduces tire wear. (Positive slippage-front tires pulling, or leading, the rear tires. Negative slippage-front tires resisting, or lagging, the rear tires.) Too much positive slippage would cause the front tires to try to do too much work, and they become less efficient. Too much negative slippage would have a braking effect on the front and reduce steering ability.

Revs/Mile can be determined from Rolling Circumference:

$$\frac{\text{Revs}}{\text{Mile}} = \frac{63360}{\text{Rolling Circumference (In.)}}$$

Rolling circumference of tires play an important role in maintaining the correct setup of your tractor. When choosing a different size or type of tire, make sure the rolling circumference of the tire is close to the rolling circumference of the old tire being replaced. An example of this procedure is the following:

GIVEN: FRONT: 420/80R28 UltraTorque
 REAR: 520/80R38 UltraTorque
 Front/Rear Gear Ratio: 1.333 (available thru tractor dealer)

FIND WHICH OTHER FRONT TIRES WOULD FIT ON THIS TRACTOR AND STILL MAINTAIN A POSITIVE SLIPPAGE OR LEAD IN THE RANGE OF +1 TO +5%.

1. Determine the rolling circumference of both front and rear tires using the "Rolling Circumference" section of this handbook. (Sizes are sorted by rolling circumference.)

420/80R28 UltraTorque Rolling Circumference = 168.3 In.
 520/80R38 UltraTorque Rolling Circumference = 218.6 In.
 Front/Rear Gear Ratio: 1.333 (available thru tractor dealer)

CURRENTLY:

Slippage =

$$\frac{\text{Front Tire Rolling Circumference} \times \text{FRONT/REAR Gear Ratio}}{\text{Rear Tire Rolling Circumference}}$$

$$= \frac{168.3 \times 1.333}{218.6}$$

$$= 1.024 \text{ IF THIS NO. } > 1 \text{ MEANS POSITIVE SLIPPAGE}$$

$$\text{IF THIS NO. } < 1 \text{ MEANS NEGATIVE SLIPPAGE}$$

TO FIND PERCENTAGE SLIPPAGE:

$$(1.024 - 1) = .024$$

$$\times 100 = 2.4\% \text{ SLIPPAGE (GOOD; WITHIN +1 to +5\% RANGE)}$$

NEW TIRE:

Now find a tire on the engineering data pages with approximately the same rolling circumference (668.3 In.) as the 420/80R28 front tire. Select 420/70R28 as a possible replacement. It has a rolling circumference of 158.7 In.

Now check to see if this tire matches with the rear to maintain a positive slippage of +1 to +5%.

420/70R28 DT812 Rolling Circumference = 158.7 In.
 520/80R38 UltraTorque Rolling Circumference = 218.6 In.
 Front/Rear Gear Ratio: 1.333 (available thru tractor dealer)

Slippage =

$$\frac{\text{Front Tire Rolling Circumference} \times \text{FRONT/REAR Gear Ratio}}{\text{Rear Tire Rolling Circumference}}$$

$$= \frac{158.7 \times 1.333}{218.6}$$

= .966 IF THIS NO. > 1 MEANS POSITIVE SLIPPAGE
 IF THIS NO. < 1 MEANS NEGATIVE SLIPPAGE

TO FIND PERCENTAGE SLIPPAGE:

$$(.966 - 1) = -.034$$

$$\times 100 = -3.4\% \text{ SLIPPAGE (NOT ACCEPTABLE; NOT WITHIN +1 TO +5\% RANGE)}$$

TRY ANOTHER TIRE WITH A ROLLING CIRCUMFERENCE CLOSER TO THE 14.9R30 DYNA TORQUE RADIAL OF 167.4 in.

ROLLING CIRCUMFERENCE

NEW TIRE:

Now find a tire on the engineering data pages with approximately the same rolling circumference (668.3 In.) as the 420/80R28 front tire. Select 320/85R34 DT800 as possible replacement. It has a rolling circumference of 168.1 In.

Now check to see if this tire matches with the rear to maintain a positive slippage of +1 to +5%.

320/85R34 DT800 Rolling Circumference = 168.1 In.
 520/80R38 UltraTorque Rolling Circumference = 218.6 In.
 Front/Rear Gear Ratio: 1.333 (available thru tractor dealer)

$$\text{Slippage} = \frac{\text{Front Tire Rolling Circumference} \times \text{FRONT/REAR Gear Ratio}}{\text{Rear Tire Rolling Circumference}}$$

$$= \frac{168.1 \times 1.333}{218.6}$$

= 1.025 IF THIS NO. > 1 MEANS POSITIVE SLIPPAGE
 IF THIS NO. < 1 MEANS NEGATIVE SLIPPAGE

TO FIND PERCENTAGE SLIPPAGE:

$$(1.025 - 1) = .025$$

$$\times 100 = 2.5\% \text{ SLIPPAGE (GOOD; WITHIN +1 to +5\% RANGE)}$$

After determining if the front matches, look at the overall diameter and overall width to compare to current tire for clearance purposes. Next, determine if the new tire can carry the load on your tractor. Finally, see the "Approved Rim Contours" section to select the correct rim for the new tire.

WORKSHEET:

FRONT TIRE SIZE: _____ Rolling Circumference = _____ In.

REAR TIRE SIZE: _____ Rolling Circumference = _____ In.

Front/Rear Gear Ratio: _____ (available thru tractor dealer)

$$\text{Slippage} = \frac{\text{Front Tire Rolling Circumference} \times \text{FRONT/REAR Gear Ratio}}{\text{Rear Tire Rolling Circumference}}$$

$$= \frac{\quad \times \quad}{\quad}$$

$$= \quad \text{ IF THIS NO. } > 1 \text{ MEANS POSITIVE SLIPPAGE}$$

$$\text{ IF THIS NO. } < 1 \text{ MEANS NEGATIVE SLIPPAGE}$$

TO FIND PERCENTAGE SLIPPAGE:

$$(\quad - 1) = \quad$$

$$\times 100 = \quad \% \text{ SLIPPAGE (WITHIN +1 to +5\% RANGE ?)}$$

OPTIMUM TRACTOR TIRE PERFORMANCE

Testing and field experience have shown that small adjustments in tractor weight split, ballast type, and tire inflation pressures to optimize your tractor for each job will allow you to reap significant benefits from improved tractor performance. Our primary focus is on adjusting your tractor for use in heavy tillage operations or when it is subjected to high static loads on the rear when carrying heavy 3 point hitch implements or from a towed implement that places a high down-load on the tractor drawbar. A few minutes of your time will be required to manage these adjustments for each job, but you will find them very worthwhile. They will result in:

- Significantly Improved Traction (Reduced Slip and Higher Fuel Efficiency)
- Reduced Compaction
- Improved Flotation
- Improved Ride
- Reduced Tire Wear
- Improved Side Hill Stability
- Improved Penetration Resistance
- Better Control of Power Hop

The fundamental principle that applies to all farm tires and especially radial drive tires is this: Tire inflation pressure must match tire load. A properly inflated radial drive tire will have "cheeks." That is, the sidewalls will bulge noticeably.

The major items to be considered in achieving optimum performance from your tractor are:

- Appropriate tire size and number of tires
- Total tractor weight and static weight split (% of static weight on the front and on the rear axles)
- Type of ballast used (Cast Weight and Liquid)
- Tire inflation pressures

Tire Size Selection

Select big, tall radial tires for use on 4WD tractors and on the rear of MFWD tractors — tires that are large enough to carry the static weight of the tractor with inflation pressures in the 6 to 14 psi range (lower pressure provides a better, "softer" ride). The bigger the tire, the lower the inflation pressure required to support a given axle load. This will provide the best tractive performance, the best ride, and improve control of power hop. Soil compaction will also be reduced since the average soil contact pressure under a radial tire is approximately equal to the inflation pressure plus 1 or 2 psi. Thus, the lower the inflation pressure, the less compaction.

Tractor Ballasting (Weight and Weight Split)

For best efficiency, tractor horsepower should be used to pull a moderate load at higher field speeds rather than a heavy load at low speeds. Pulling a lighter load at a higher speed means that the tractor can be ballasted to fewer LBS./HP which prolongs the life of bearings, gears and tires. General ranges are provided here — check with your tractor dealer for specific tractor brand recommendations. The tractor dealer can usually estimate weights and weight splits for your tractor from tables of data provided by the tractor manufacturer. Since the weight split of a 4WD tractor is especially important in achieving optimum performance and controlling power hop, accurate front and rear axle weights are needed. If these weights are not available from the tractor dealer, the unit must be weighed. Use platform scales to weigh the front and rear axle separately. Accurate tire pressure recommendations can only be made by using accurate weights and weight splits. It is also important that you consider the type of ballast used (cast weights and/or liquid) when setting up your tractor for optimum performance – see the next section for further details.

| | Total Tractor Weight | Percent on Front Axle |
|---------------------|--|--|
| 4WD | 85-125 pounds per engine horsepower. | For towed implements, use 51-55%. This is very important to help in control of power hop. With no hitch, PTO or ballast, the front will be 60% or more out of the factory. For hitch-mounted implements, use 55-60%. For towed implements with very high downward loads on drawbars, use 55-65%. |
| MFWD | 120-145 pounds per PTO horsepower. 130 is most common. | 35-40% for all types of implements. Power hop is easier to control as front split is reduced. |
| 2WD Row Crop | Same as MFWD. | 25-35%. Use higher percentage with heavy hitch-mounted implements. |

Ballast Type

Liquid ballast should be avoided since it has a stiffening effect that degrades ride and generally reduces ability to control power hop. If liquid ballast is used in the rear of 4WD tractors or MFWD tractors, **all tires on the axle must be filled to the same level, which should not exceed 40% fill** (4 o'clock valve stem position). Use 50% fill when desired weight split cannot be met by other means. Do not use liquid in 4WD fronts unless ballasting is needed for heavy hitch-mounted ripper or scraper applications. Up to 75% fill may be used in MFWD fronts if needed for weight and/or to provide stiffness to assist in power hop control.

Tire Inflation Pressures

When radial drive tires can be operated at lower pressures (generally below 14 psi), the tractive performance of the tractor is greater, without hop, ride is more comfortable, and soil compaction pressures are minimized.

OPTIMUM TRACTOR TIRE PERFORMANCE

A tire should be inflated to a pressure appropriate for the load on it. Correct inflation pressure for the individual tire load is provided in the tables in this book. **Never operate with pressures lower than the minimum stated in the tables.**

Individual tire loads are determined by dividing the axle load by the number of tires per axle. Axle loads can be determined from your tractor dealer, from tractor manufacturer's handbooks, or by weighing the front and rear on a platform scale. Rear pressures must be raised with heavy hitch-mounted implements. On extremely steep hillsides (steeper than 20% grade) or where lateral stability is needed, increase rear pressures 4 psi above the pressure found in the table. All tires on an axle must have the same pressure. Do not over inflate or under inflate. Use a pencil type or dial gauge that is accurate in the lower pressure ranges. Pencil type gauges for ATV tires calibrated from 0-20 psi in half psi increments can be used for most rear tires. (They are not designed for liquid ballast.)

TIRE INFLATION PRESSURE SHOULD BE CHECKED REGULARLY BEFORE WORK WHEN TIRES ARE COOL. TIRE PRESSURES CHANGE SEASONALLY AS OUTSIDE TEMPERATURE CHANGES.

Power Hop Control

Under some field conditions, when pulling towed implements, MFWD and 4WD tractors can experience a type of vibration or bounce called power hop. If power hop occurs after following all of the foregoing guidelines on tire size, weight split, ballast type and inflation pressures, make the following adjustments to inflation pressures:

MFWD

Raise **front** inflation pressure by 8 psi. Usually 8 psi above the correct inflation pressure for the load will suffice. If power hop is not eliminated, further front tire inflation pressure increases in 2 psi increments is advised until hop is eliminated. Rear tire inflation pressures should remain at the correct pressures for the load. The maximum front pressure should not exceed

6 psi above the maximum rated pressure for the tire (radial or bias.) If the tractor still hops, use 75% liquid fill in front tires and remove an equivalent amount (or more) of front cast ballast. If the tractor still hops, remove any liquid ballast in rear tires and replace with cast weight equivalents.

4WD

Raise the **rear** inflation pressure from the correct inflation by 8 psi if hop continues. If power hop is not eliminated, further rear tire inflation pressure increases in 2 psi increments is advised until hop is eliminated. The maximum pressure should not exceed 6 psi above the maximum rated pressure for the tire (radial or bias). If raising the rear pressure fails to control hop, then reset the rear tires to the correct pressure for the load and raise the fronts. It is very important that one of the two axles remain at the correct pressure for its load. On extremely steep hillside operations, keep the fronts at the correct pressure for the load and raise the rear pressures.

Monitoring Your Tractor's Performance

After adjusting your tractor to achieve optimum tractive performance following the guidelines here, it is important that you monitor tractor behavior especially under high draft load conditions such as tillage and scraper operations.

When performing field operations that load the tractor close to a traction or power limit, you should continuously monitor:

Wheel Slip (radar monitor recommended) – Should be no more than 15% in normal tillage conditions — typically 5-12%. If wheel slip is less than 5% with your highest draft implement and hardest pulling conditions, you are over ballasted if ground speeds are slow or under utilizing your tractor if ground speeds are high. If slip is greater than 15%, you should either add weight or reduce your drawbar requirements — implement is too big for tractor.

Engine Speed – The engine should operate in the speed range specified by the manufacturer. Under normal conditions at full throttle, the speed should be near rated, but may drop a few hundred rpm during

short duration, high draft conditions. You may also "shift up and throttle back" if this does not cause the engine to labor. **Check your tractor manufacturer's recommendation.**

Ground Speed (A radar monitor is recommended) – 5 mph or higher is preferred, but no less than 4 mph continuously. **Check your tractor manufacturer's recommendation.**

If the tractor can maintain engine and ground speed within these limits but the slip is high, you should do one or more of the following:

1. Reduce draft by reducing implement working depth or width.
2. Add ballast, but maintain correct weight split.
3. Consider larger diameter tires.

If the tractor is unable to maintain a minimum of 4 mph and the slip is within the acceptable range, you should reduce draft by reducing implement working depth or width.

Please Note

It is important to note that when tractors are optimized for one service category, switching operations to another category may require ballast changes and will require inflation pressure changes.

See Optimum Tractor Tire Performance Worksheets on the following pages.

2WD

For **two wheel drive row crop tractors**, the same guidelines as for MFWD tractors can be followed with these significant differences:

1. Only 25-35% of the static weight should be on the front – use higher percentages with heavy hitch-mounted implements as recommended by your tractor manufacturer.
2. Liquid ballast to 75% fill can be used in rear tires, but ride will be best if cast wheel weights or partial liquid fills are used instead.
3. The correct inflation pressures from the tables will also provide optimum tractive performance for your 2WD tractor.

OPTIMUM TRACTOR TIRE PERFORMANCE WORKSHEET — MECHANICAL FRONT WHEEL DRIVE TRACTORS

1. DETERMINE INITIAL VALUES:

DATE _____

Farmer Name _____ Address _____ PH (_____) _____

Tractor Make & Model _____ PTO-HP _____ Implement used _____

Front Tire Size _____ singles duals triples Front Ply/Star Rating _____ liquid fill none 25% 40% 75% _____

Rear Tire Size _____ singles duals triples Rear Ply/Star Rating _____ liquid fill none 25% 40% 75% _____

Front Tractor Axle Weight _____ Front Weight/Total Weight = _____ %. Rear Tractor Axle Weight _____ Rear Weight/Total Weight = _____ %.

Total Weight _____ Total Weight/PTO-HP = #/PTO-HP. Weight should be 120-145 pounds per PTO horsepower. (130 is most common.)

Weight split should be 35-40% on front axle.

2. ADJUST WEIGHT & WEIGHT SPLIT IF NECESSARY

(Comments: _____)

Front weight added: (cast/liquid) _____ Front Tractor Axle Weight _____ Front Weight/Total Wt. = _____ %

Rear weight added: (cast/liquid) _____ Rear Tractor Axle Weight _____ Rear Weight/Total Wt. = _____ %

Total Weight _____ Total Weight/PTO-HP = _____

3. DETERMINE CORRECT INFLATION PRESSURE FOR THE LOAD

For MFWD Tractors with Standard Towed High Draft Implements (Disks, Chisel Plows, Field Cultivators, Mulch Tillers, Towed Rippers, etc.)

Front Tractor Axle Weight _____ Rear Tractor Axle Weight _____ **or**

For MFWD Tractors with Rear Hitch-Mounted Implements (Rollover Plows, PTO Rototillers, Mounted Rippers, Row Crop Cultivators, etc.)

Front Tractor Axle Weight with implement **lowered** _____ Rear Tractor Axle Weight with implement **attached and raised** _____ **or**

For MFWD Tractors with Towed Implements That Impose High Downward Loads on Tractor Drawbars (Scrapers, Potato and Beet Harvesters, Grain Carts, Slurry Tanks, etc.)

Front Tractor Axle Weight with implement **detached** _____ Rear Tractor Axle Weight with **fully loaded implement attached** _____

Front Static Tire Load = Front Weight/Number of Front Tires = _____

Rear Static Tire Load = Rear Weight/Number of Rear Tires = _____

From the appropriate inflation pressure tables,

Required Front Tire Inflation Pressure _____ Required Rear Tire Inflation Pressure _____

4. DETERMINE HOP CONTROL INFLATION PRESSURE

If power hop occurs, raise **front** inflation pressure by **8 psi**. Usually **8 psi** above correct inflation pressure for the load will suffice. If power hop is not eliminated, further front tire inflation pressure increases in 2 psi increments is advised until hop is eliminated. Rear tire inflation pressures should remain at the correct pressures for the load. The maximum front pressure should not exceed 6 psi above the maximum rated pressure for the tire (radial or bias). If tractor still hops, use 75% liquid fill in front tires and remove an equivalent amount (or more) of front cast ballast.

Required Hop Control Front Tire Inflation Pressure _____

Required Hop Control Rear Tire Inflation Pressure _____

Comments _____

Please send a copy of this sheet along with comments to Farm Tire Eng., Titan Tire Corporation, 3769 Route 20 East, Freeport, IL 61032.

OPTIMUM TRACTOR TIRE PERFORMANCE WORKSHEET — 4WD TRACTORS

1. DETERMINE INITIAL VALUES:

DATE _____

Farmer Name _____ Address _____ PH (_____) _____

Tractor Make & Model _____ Engine-HP _____ Implement used _____

Front Tire Size _____ singles duals triples Front Ply/Star Rating _____ liquid fill none 25% 40% 75% _____

Rear Tire Size _____ singles duals triples Rear Ply/Star Rating _____ liquid fill none 25% 40% 75% _____

Front Tractor Axle Weight _____ Front Weight/Total Weight = _____ %. Rear Tractor Axle Weight _____ Rear Weight/Total Weight = _____ %.

Total Weight _____ Total Weight/Engine-HP = _____ #/Engine-HP

Weight should be 85-125 pounds per engine horsepower. For towed implements, use 51-55% on front axle. For hitch-mounted implements, use 55-60% on front axle. For towed implements with very high downward loads on drawbars, use 55-65%.

2. ADJUST WEIGHT & WEIGHT SPLIT IF NECESSARY

(Comments: _____)

Front weight added: (cast/liquid) _____ Front Tractor Axle Weight _____ Front Weight/Total Wt. = _____ %

Rear weight added: (cast/liquid) _____ Rear Tractor Axle Weight _____ Rear Weight/Total Wt. = _____ %

_____ Total Weight Total Weight/Engine-HP = _____

3. DETERMINE CORRECT INFLATION PRESSURE FOR THE LOAD

For 4WD Tractors with Standard Towed High Draft Implements (Disks, Chisel Plows, Field Cultivators, Mulch Tillers, Towed Rippers, etc.)

Front Tractor Axle Weight _____ Rear Tractor Axle Weight _____ or

For 4WD Tractors with Rear Hitch-Mounted Implements (Rollover Plows, PTO Rototillers, Mounted Rippers, Row Crop Cultivators, etc.)

Front Tractor Axle Weight with implement lowered _____ Rear Tractor Axle Weight with implement attached and raised _____ or

For 4WD Tractors with Towed Implements That Impose High Downward Loads on Tractor Drawbars (Scrapers, Potato and Beet Harvesters, Grain Carts, Slurry Tanks, etc.)

Front Tractor Axle Weight with implement detached _____ Rear Tractor Axle Weight with fully loaded implement attached _____

Front Static Tire Load = Front Weight/Number of Front Tires = _____

Rear Static Tire Load = Rear Weight/Number of Rear Tires = _____

From the appropriate inflation pressure tables,

Required Front Tire Inflation Pressure _____

Required Rear Tire Inflation Pressure _____

4. DETERMINE HOP CONTROL INFLATION PRESSURE

If power hop occurs, raise the rear inflation pressure by 8 psi above the correct inflation pressure for the tire load. If powerhop is not eliminated, further rear tire inflation pressure increases in 2 psi increments is advised until hop is eliminated. The maximum pressure should not exceed 6 psi above the maximum rated pressure for the tire (radial or bias). If raising the rear pressure fails to control hop, then reset the rear tires to the correct pressure for the load and raise the fronts. It is very important that one of the two axles remain at the correct pressure for its load. If liquid is used in the rear, raising rear pressures usually works best.

Required Hop Control Front Tire Inflation Pressure _____

Required Hop Control Rear Tire Inflation Pressure _____

Comments _____

Please send a copy of this sheet along with comments to Farm Tire Eng., Titan Tire Corporation, 3769 Route 20 East, Freeport, IL 61032.

GROUND BEARING PRESSURE & CONTACT AREA COMPARISONS

Farm tires are designed and built for the purpose of use in agricultural soils. Most users of such farm tires have concerns about the impact the tire leaves on the soil. This impact could be from the perspective of reduced erosion or of maintaining highest crop yield. In extreme cases, it maybe an issue about mobility from single or multiple passes over the soil. In any case, this discussion is to equip the reader with a better understanding of how to assess which tires or combinations of tires cause the least impact on the soil.

The tire companies commonly provide flat plate contact areas (also known as gross contact area) for their farm tires. Since the flat plate contact area is dependent on tire inflation, tire load and tire service application such as single, dual, or triple configurations, or reduced speed 10, 15 or 20 mph service load bonuses, a single flat plate area figure listed in a farm tire handbook can be very misleading.

Comparing tires within one manufacturer's handbook may be okay for relative comparisons, such as showing that an 800/65R32 will give more contact area than a 650/75R32, however, comparisons between manufacturer's data is an unsuitable technique. This is because the conditions used for the footprint area measurement may well be different. This creates an impossible 'apples-to-apples' comparison and gives no clear indication of what the real soil ground bearing pressure might be.

Given this scenario, what should one do?

The best approach is to compare the inflation pressure that any given tire or set of tires (as in dual, triple configurations) require to carry any given load. The tire or set of tires that can carry that load at the lowest inflation pressure has the largest footprint and will

impact the soil to the least amount. This will allow comparisons between manufacturers, design groups (R-1 vs. R-3), bias vs. radial, flotation tires versus narrow row crop tires, etc.

The basic principle is that 'Inflation Pressure Rules' and using published footprint figures is inaccurate in comparing tire options for equipment.

In summary, instead of relying on published contact area figures, assess tire sizes and mounting configurations using the inherent capability of the tire(s) to carry the load at the lowest allowed inflation pressure. This is consistent with what the tire industry and farm equipment manufacturers are telling their customers, so you are strongly encouraged to follow this approach.

To assess ground bearing pressure, the tire inflation pressure is the primary factor plus an additional amount that represents the tire casing stiffness when deflected. For bias farm tires, this casing stiffness factor is 2 to 3 psi added to the tire inflation pressure required to carry the load and for radial farm tires, the ground bearing pressure is 1 to 2 psi added to the required tire inflation pressure. This is a far simpler and more accurate technique to assessing ground bearing pressures than any approach using contact area figures as described above.

HORSEPOWER CAPABILITIES OF DRIVE TIRES USED ON TWO WHEEL DRIVE & FRONT AXLE ASSIST TRACTORS AT VARIOUS SPEEDS

Take time to carefully match the recommended tire size to your power unit and field operating speed to obtain maximum efficiency and tire life.

Tractor manufacturers recommend operation of their equipment at field speeds of 5 mph and above. Tire sizes fitted to most tractors are selected assuming field operation in this speed range. If speed is reduced below this recommended range for prolonged time periods, tire and/or equipment problems can be expected.

Excessive tire wear, slippage and excessive fuel consumption are problems that may be encountered when a tire's horsepower capacity is exceeded. These problems may be eliminated by careful evaluation of your equipment's horsepower capabilities, drive tire loads and inflation pressure, and the speed at which you operate your equipment. Increasing or decreasing your continuous operating speed by small increments in the critical field speed range will make a significant change in tire requirements, tire performance, and in overall efficiency and performance of your equipment.

The tables that follow provide you with an easy way to be sure that you have the right size tires for your operation. As these tables show, field tillage speeds less than the recommended 5 mph may require a larger tire size. It also may help you to determine whether singles, duals, or triples should be used. Since the horsepower capability of a tire depends on the inflation pressure in the tire, the table that follow show horsepower ratings for radial tires at a range of pressures from 6 psi up to rated pressure. Bias tires cannot be used below 12 psi, so only 12 psi and above are shown for them. Four-wheel drive (all tires same size) tractors are not shown because current size selection criteria result in adequate tire horsepower capability.

TO USE THESE TABLES: Find the size of interest in the left-hand column and select the operating pressure determined by load considerations*. Follow that row across to the right until you come to the type of tractor and tillage speed that you use. For front wheel assist tractors, horsepower capacity is based on rear drive tire size and inflation. The number shown in the table is the maximum PTO horsepower the tires can transmit when duals (four tires per axle) are used on the tractor. To obtain the horsepower ratings for singles (two tires per axle) and triples (six tires per axle), multiply the horsepower ratings by 0.568 and 1.397 respectively. Please note that tillage speeds below 5 mph are not recommended by tractor manufacturers. The reference horsepower in the table must be greater than your tractor PTO horsepower. If the tractor PTO horsepower exceeds the amount shown in the table then you must either use a tire with a higher horsepower capacity or else decrease the drawbar pull requirements to enable a higher tillage speed. NOTE: The higher the operating speed, the more horsepower a tire can handle.

**See section titled "Obtain Best Results From Your Tires."*

HORSEPOWER CAPACITIES AS DUALS

| Main Drive Tire Size | Load Indicator/ Ply Rating | Inflation Pressure (PSI) | RECOMMENDED 5 MPH | | 3 MPH | |
|-------------------------|----------------------------------|--------------------------------|----------------------|-----------------|-------|-----------------|
| | | | 2WD | Front Assist | 2WD | Front Assist |
| 14.9R46 | | 6 | 118 | 139 | 71 | 84 |
| 14.9R46 | | 12 | 178 | 210 | 107 | 126 |
| 14.9R46 | ★ | 18 | 224 | 264 | 135 | 158 |
| 14.9R46 | ★★ | 24 | 265 | 312 | 159 | 187 |
| 14.9R46 | ★★★ | 30 | 305 | 358 | 183 | 215 |
| 15.5-38 | | 12 | 136 | 160 | 81 | 96 |
| 15.5-38 | 6 | 20 | 184 | 216 | 110 | 130 |
| 15.5R38 | | 6 | 101 | 118 | 60 | 71 |
| 15.5R38 | | 12 | 152 | 179 | 91 | 107 |
| 15.5R38 | ★ | 18 | 190 | 223 | 114 | 134 |
| 16.9-38 | | 12 | 172 | 202 | 103 | 121 |
| 16.9-38 | 6 | 18 | 218 | 256 | 131 | 154 |
| 16.9-38 | 8 | 24 | 258 | 303 | 155 | 182 |
| 16.9R38 | | 6 | 129 | 152 | 77 | 91 |
| 16.9R38 | | 12 | 195 | 229 | 117 | 138 |
| 16.9R38 | ★ | 18 | 244 | 287 | 146 | 172 |
| 16.9R38 | ★★ | 24 | 296 | 348 | 178 | 209 |
| 16.9R38 | 141 | 24 | 296 | 348 | 178 | 209 |
| 16.9R38 | ★★★ | 30 | 334 | 393 | 200 | 236 |
| 18.4-34 | | 12 | 195 | 229 | 117 | 138 |
| 18.4-34 | 6 | 16 | 229 | 270 | 138 | 162 |
| 18.4-34 | 8 | 20 | 265 | 312 | 159 | 187 |
| 18.4-34 | 12 | 32 | 344 | 405 | 207 | 243 |
| 18.4R34 | | 6 | 148 | 174 | 89 | 104 |
| 18.4R34 | | 12 | 218 | 256 | 131 | 154 |
| 18.4R34 | ★ | 18 | 280 | 329 | 168 | 197 |
| 18.4R34 | ★★ | 24 | 321 | 377 | 192 | 226 |
| 18.4R34 | 144 | 24 | 321 | 377 | 192 | 226 |
| 18.4-38 | | 12 | 207 | 243 | 124 | 146 |
| 18.4-38 | 6 | 16 | 244 | 287 | 146 | 172 |
| 18.4-38 | 8 | 20 | 280 | 329 | 168 | 197 |
| 18.4-38 | 10 | 26 | 334 | 393 | 200 | 236 |
| 18.4-38 | 12 | 32 | 373 | 439 | 224 | 263 |

Note: For single tires, multiply the above horsepower rating by 0.568. For triples, multiply the above horsepower rating by 1.397.

HORSEPOWER CAPACITIES AS DUALS

| Main Drive Tire Size | Load Indicator/ Ply Rating | Inflation Pressure (PSI) | RECOMMENDED 5 MPH | | 3 MPH | |
|----------------------|-------------------------------|--------------------------|----------------------|--------------|-------|--------------|
| | | | 2WD | Front Assist | 2WD | Front Assist |
| 18.4R38 | | 6 | 156 | 184 | 94 | 110 |
| 18.4R38 | | 12 | 229 | 270 | 138 | 162 |
| 18.4R38 | ★ | 18 | 296 | 348 | 178 | 209 |
| 18.4R38 | ★★ | 24 | 344 | 405 | 207 | 243 |
| 18.4R38 | 146 | 24 | 344 | 405 | 207 | 243 |
| 18.4-42 | | 12 | 218 | 256 | 131 | 154 |
| 18.4-42 | 8 | 20 | 296 | 348 | 178 | 209 |
| 18.4-42 | 10 | 26 | 344 | 405 | 207 | 243 |
| 18.4R42 | | 6 | 161 | 189 | 96 | 113 |
| 18.4R42 | | 12 | 244 | 287 | 146 | 172 |
| 18.4R42 | ★ | 18 | 313 | 368 | 188 | 221 |
| 18.4R42 | ★★ | 24 | 362 | 426 | 217 | 256 |
| 18.4R42 | 148 | 24 | 362 | 426 | 217 | 256 |
| 18.4R46 | | 6 | 172 | 202 | 103 | 121 |
| 18.4R46 | | 12 | 258 | 303 | 155 | 182 |
| 18.4R46 | ★ | 18 | 321 | 377 | 192 | 226 |
| 18.4R46 | ★★ | 24 | 386 | 454 | 232 | 272 |
| 18.4R46 | ★★★ | 30 | 446 | 525 | 268 | 315 |
| 20.8-34 | | 12 | 237 | 279 | 142 | 167 |
| 20.8-34 | 8 | 18 | 305 | 358 | 183 | 215 |
| 20.8-34 | 10 | 22 | 344 | 405 | 207 | 243 |
| 20.8-34 | 14 | 32 | 420 | 494 | 252 | 296 |
| 20.8R34 | | 6 | 178 | 210 | 107 | 126 |
| 20.8R34 | | 12 | 265 | 312 | 159 | 187 |
| 20.8R34 | ★ | 18 | 334 | 393 | 200 | 236 |
| 20.8-38 | | 12 | 250 | 294 | 150 | 177 |
| 20.8-38 | 8 | 18 | 321 | 377 | 192 | 226 |
| 20.8-38 | 10 | 22 | 362 | 426 | 217 | 256 |
| 20.8-38 | 14 | 32 | 446 | 525 | 268 | 315 |
| 20.8R38 | | 6 | 190 | 223 | 114 | 134 |
| 20.8R38 | | 12 | 280 | 329 | 168 | 197 |
| 20.8R38 | ★ | 18 | 355 | 417 | 213 | 250 |
| 20.8R38 | ★★ | 24 | 420 | 494 | 252 | 296 |

HORSEPOWER CAPACITIES AS DUALS

| Main Drive Tire Size | Load Indicator/ Ply Rating | Inflation Pressure (PSI) | RECOMMENDED 5 MPH | | 3 MPH | |
|-------------------------|----------------------------------|--------------------------------|----------------------|-----------------|-------|-----------------|
| | | | 2WD | Front Assist | 2WD | Front Assist |
| 20.8R38 | 153 | 24 | 420 | 494 | 252 | 296 |
| 20.8-42 | | 12 | 265 | 312 | 159 | 187 |
| 20.8-42 | 10 | 22 | 386 | 454 | 232 | 272 |
| 20.8R42 | | 6 | 195 | 229 | 117 | 138 |
| 20.8R42 | | 12 | 296 | 348 | 178 | 209 |
| 20.8R42 | ★ | 18 | 373 | 439 | 224 | 263 |
| 20.8R42 | ★★ | 24 | 446 | 525 | 268 | 315 |
| 20.8R42 | 155 | 24 | 446 | 525 | 268 | 315 |
| 23.1-34 | | 12 | 280 | 329 | 168 | 197 |
| 23.1-34 | 8 | 16 | 334 | 393 | 200 | 236 |
| 23.1-34 | 10 | 20 | 386 | 454 | 232 | 272 |
| 24.5-32 | | 12 | 305 | 358 | 183 | 215 |
| 24.5-32 | 10 | 20 | 409 | 482 | 246 | 289 |
| 24.5-32 | 12 | 24 | 459 | 540 | 275 | 324 |
| 24.5-32 | 16 | 30 | 516 | 607 | 310 | 364 |
| 24.5R32 | | 6 | 224 | 264 | 135 | 158 |
| 24.5R32 | | 12 | 334 | 393 | 200 | 236 |
| 24.5R32 | ★ | 18 | 430 | 506 | 258 | 304 |
| 24.5R32 | ★★ | 24 | 503 | 592 | 302 | 355 |
| 30.5L-32 | | 12 | 362 | 426 | 217 | 256 |
| 30.5L-32 | 10 | 16 | 430 | 506 | 258 | 304 |
| 30.5L-32 | 12 | 20 | 488 | 574 | 293 | 344 |
| 30.5L-32 | 14 | 22 | 516 | 607 | 310 | 364 |
| 30.5L-32 | 16 | 26 | 574 | 675 | 344 | 405 |
| 30.5L-32VA | 16 | 26 | 574 | 675 | 344 | 405 |
| 30.5L-32VA | 24 | 38 | 709 | 834 | 426 | 501 |
| 30.5LR32 | | 6 | 265 | 312 | 159 | 187 |
| 30.5LR32 | | 12 | 396 | 466 | 238 | 280 |
| 30.5LR32 | ★ | 18 | 503 | 592 | 302 | 355 |
| 250/95R50 | | 6 | 86 | 101 | 52 | 61 |
| 250/95R50 | | 12 | 122 | 144 | 73 | 86 |
| 250/95R50 | | 17 | 156 | 184 | 94 | 110 |
| 250/95R50 | 125 | 23 | 190 | 223 | 114 | 134 |

Note: For single tires, multiply the above horsepower rating by 0.568. For triples, multiply the above horsepower rating by 1.397.

HORSEPOWER CAPACITIES AS DUALS

| Main Drive Tire Size | Load Indicator/ Ply Rating | Inflation Pressure (PSI) | RECOMMENDED 5 MPH | | 3 MPH | |
|-------------------------|----------------------------------|--------------------------------|----------------------|-----------------|-------|-----------------|
| | | | 2WD | Front Assist | 2WD | Front Assist |
| 250/95R50 | 128 | 29 | 207 | 243 | 124 | 146 |
| 250/95R50 | 131 | 35 | 224 | 264 | 135 | 158 |
| 250/95R50 | 137 | 46 | 265 | 312 | 159 | 187 |
| 250/95R54 | | 6 | 89 | 105 | 54 | 63 |
| 250/95R54 | | 12 | 125 | 147 | 75 | 88 |
| 250/95R54 | | 17 | 161 | 189 | 96 | 113 |
| 250/95R54 | | 23 | 201 | 237 | 121 | 142 |
| 250/95R54 | | 29 | 218 | 256 | 131 | 154 |
| 250/95R54 | | 35 | 229 | 270 | 138 | 162 |
| 250/95R54 | | 46 | 271 | 319 | 163 | 191 |
| 250/95R54 | 141 | 52 | 296 | 348 | 178 | 209 |
| 320/85R34 | | 6 | 92 | 108 | 55 | 65 |
| 320/85R34 | | 12 | 129 | 152 | 77 | 91 |
| 320/85R34 | 121 | 17 | 167 | 196 | 100 | 118 |
| 320/85R34 | 127 | 23 | 201 | 237 | 121 | 142 |
| 320/85R34 | 131 | 29 | 224 | 264 | 135 | 158 |
| 320/85R34 | 133 | 35 | 237 | 279 | 142 | 167 |
| 320/85R38 | | 6 | 98 | 115 | 59 | 69 |
| 320/85R38 | | 12 | 136 | 160 | 81 | 96 |
| 320/85R38 | | 17 | 178 | 210 | 107 | 126 |
| 320/85R38 | | 23 | 213 | 250 | 128 | 150 |
| 320/85R38 | | 29 | 237 | 279 | 142 | 167 |
| 320/85R38 | 135 | 35 | 250 | 294 | 150 | 177 |
| 320/85R38 | | 46 | 296 | 348 | 178 | 209 |
| 320/85R38 | 143 | 52 | 313 | 368 | 188 | 221 |
| 320/80R42 | | 6 | 98 | 115 | 59 | 69 |
| 320/80R42 | | 12 | 136 | 160 | 81 | 96 |
| 320/80R42 | 123 | 17 | 178 | 210 | 107 | 126 |
| 320/80R42 | 130 | 23 | 218 | 256 | 131 | 154 |
| 320/80R42 | 133 | 29 | 237 | 279 | 142 | 167 |
| 320/80R42 | | 35 | 250 | 294 | 150 | 177 |
| 320/80R42 | 141 | 46 | 296 | 348 | 178 | 209 |
| 320/90R42 | | 6 | 109 | 128 | 65 | 77 |

HORSEPOWER CAPACITIES AS DUALS

| Main Drive Tire Size | Load Indicator/ Ply Rating | Inflation Pressure (PSI) | RECOMMENDED 5 MPH | | 3 MPH | |
|-------------------------|----------------------------------|--------------------------------|----------------------|-----------------|-------|-----------------|
| | | | 2WD | Front Assist | 2WD | Front Assist |
| 320/90R42 | | 12 | 152 | 179 | 91 | 107 |
| 320/90R42 | 126 | 17 | 195 | 229 | 117 | 138 |
| 320/90R42 | | 23 | 237 | 279 | 142 | 167 |
| 320/90R42 | | 29 | 258 | 303 | 155 | 182 |
| 320/90R42 | 139 | 35 | 280 | 329 | 168 | 197 |
| 320/90R46 | | 6 | 112 | 132 | 67 | 79 |
| 320/90R46 | | 12 | 156 | 184 | 94 | 110 |
| 320/90R46 | 127 | 17 | 201 | 237 | 121 | 142 |
| 320/90R46 | 135 | 23 | 250 | 294 | 150 | 177 |
| 320/90R46 | 138 | 29 | 271 | 319 | 163 | 191 |
| 320/90R46 | 140 | 35 | 288 | 339 | 173 | 203 |
| 320/90R46 | 146 | 46 | 344 | 405 | 207 | 243 |
| 320/90R46 | 148 | 52 | 362 | 426 | 217 | 256 |
| 320/90R50 | | 6 | 118 | 139 | 71 | 84 |
| 320/90R50 | | 12 | 167 | 196 | 100 | 118 |
| 320/90R50 | 129 | 17 | 213 | 250 | 128 | 150 |
| 320/90R50 | 136 | 23 | 258 | 303 | 155 | 182 |
| 320/90R50 | 140 | 29 | 288 | 339 | 173 | 203 |
| 320/90R50 | 142 | 35 | 305 | 358 | 183 | 215 |
| 320/90R50 | 148 | 46 | 362 | 426 | 217 | 256 |
| 320/90R54 | | 6 | 122 | 144 | 73 | 86 |
| 320/90R54 | | 12 | 172 | 202 | 103 | 121 |
| 320/90R54 | | 17 | 224 | 264 | 135 | 158 |
| 320/90R54 | 138 | 23 | 271 | 319 | 163 | 191 |
| 320/90R54 | | 29 | 296 | 348 | 178 | 209 |
| 320/90R54 | | 35 | 313 | 368 | 188 | 221 |
| 320/90R54 | 149 | 46 | 373 | 439 | 224 | 263 |
| 340/85R46 | | 6 | 118 | 139 | 71 | 84 |
| 340/85R46 | | 12 | 167 | 196 | 100 | 118 |
| 340/85R46 | 129 | 17 | 213 | 250 | 128 | 150 |
| 340/85R46 | | 23 | 258 | 303 | 155 | 182 |
| 340/85R46 | 140 | 29 | 288 | 339 | 173 | 203 |
| 380/80R38 | | 6 | 118 | 139 | 71 | 84 |

Note: For single tires, multiply the above horsepower rating by 0.568. For triples, multiply the above horsepower rating by 1.397.

HORSEPOWER CAPACITIES AS DUALS

| Main Drive Tire Size | Load Indicator/ Ply Rating | Inflation Pressure (PSI) | RECOMMENDED 5 MPH | | 3 MPH | |
|-------------------------|----------------------------------|--------------------------------|----------------------|-----------------|-------|-----------------|
| | | | 2WD | Front Assist | 2WD | Front Assist |
| 380/80R38 | | 12 | 167 | 196 | 100 | 118 |
| 380/80R38 | 130 | 17 | 218 | 256 | 131 | 154 |
| 380/80R38 | 137 | 23 | 265 | 312 | 159 | 187 |
| 380/80R38 | 140 | 29 | 288 | 339 | 173 | 203 |
| 380/80R38 | 142 | 35 | 305 | 358 | 183 | 215 |
| 380/85R46 | 146 | 46 | 344 | 405 | 207 | 243 |
| 380/90R46 | | 6 | 148 | 174 | 89 | 104 |
| 380/90R46 | | 12 | 201 | 237 | 121 | 142 |
| 380/90R46 | | 17 | 265 | 312 | 159 | 187 |
| 380/90R46 | | 23 | 321 | 377 | 192 | 226 |
| 380/90R46 | | 29 | 355 | 417 | 213 | 250 |
| 380/90R46 | 149 | 35 | 373 | 439 | 224 | 263 |
| 380/90R50 | | 6 | 152 | 179 | 91 | 107 |
| 380/90R50 | | 12 | 213 | 250 | 128 | 150 |
| 380/90R50 | | 17 | 271 | 319 | 163 | 191 |
| 380/90R50 | | 23 | 334 | 393 | 200 | 236 |
| 380/90R50 | | 29 | 362 | 426 | 217 | 256 |
| 380/90R50 | 151 | 35 | 396 | 466 | 238 | 280 |
| 380/90R54 | | 6 | 156 | 184 | 94 | 110 |
| 380/90R54 | | 12 | 224 | 264 | 135 | 158 |
| 380/90R54 | | 17 | 288 | 339 | 173 | 203 |
| 380/90R54 | 146 | 23 | 344 | 405 | 207 | 243 |
| 380/90R54 | | 29 | 386 | 454 | 232 | 272 |
| 420/80R46 | | 6 | 152 | 179 | 91 | 107 |
| 420/80R46 | | 12 | 213 | 250 | 128 | 150 |
| 420/80R46 | 139 | 17 | 280 | 329 | 168 | 197 |
| 420/80R46 | 145 | 23 | 334 | 393 | 200 | 236 |
| 420/80R46 | 149 | 29 | 373 | 439 | 224 | 263 |
| 420/80R46 | 151 | 35 | 396 | 466 | 238 | 280 |
| 420/80R46 | 156 | 46 | 459 | 540 | 275 | 324 |
| 420/80R46 | 159 | 52 | 503 | 592 | 302 | 355 |
| 480/70R34 | | 6 | 144 | 169 | 86 | 102 |
| 480/70R34 | | 12 | 201 | 237 | 121 | 142 |

HORSEPOWER CAPACITIES AS DUALS

| Main Drive Tire Size | Load Indicator/ Ply Rating | Inflation Pressure (PSI) | RECOMMENDED 5 MPH | | 3 MPH | |
|-------------------------|----------------------------------|--------------------------------|----------------------|-----------------|-------|-----------------|
| | | | 2WD | Front Assist | 2WD | Front Assist |
| 480/70R34 | | 17 | 258 | 303 | 155 | 182 |
| 480/70R34 | 143 | 23 | 313 | 368 | 188 | 221 |
| 480/70R34 | 146 | 29 | 344 | 405 | 207 | 243 |
| 480/70R34 | 155 | 46 | 446 | 525 | 268 | 315 |
| 480/85R34 | | 6 | 172 | 202 | 103 | 121 |
| 480/85R34 | | 12 | 237 | 279 | 142 | 167 |
| 480/85R34 | | 17 | 305 | 358 | 183 | 215 |
| 480/85R34 | 149 | 23 | 373 | 439 | 224 | 263 |
| 480/80R38 | | 6 | 172 | 202 | 103 | 121 |
| 480/80R38 | | 12 | 237 | 279 | 142 | 167 |
| 480/80R38 | | 17 | 305 | 358 | 183 | 215 |
| 480/80R38 | 149 | 23 | 373 | 439 | 224 | 263 |
| 480/80R42 | | 6 | 178 | 210 | 107 | 126 |
| 480/80R42 | | 12 | 250 | 294 | 150 | 177 |
| 480/80R42 | | 17 | 321 | 377 | 192 | 226 |
| 480/80R42 | 151 | 23 | 396 | 466 | 238 | 280 |
| 480/80R46 | | 6 | 190 | 223 | 114 | 134 |
| 480/80R46 | | 12 | 265 | 312 | 159 | 187 |
| 480/80R46 | 145 | 17 | 334 | 393 | 200 | 236 |
| 480/80R46 | 152 | 23 | 409 | 482 | 246 | 289 |
| 480/80R46 | 155 | 29 | 446 | 525 | 268 | 315 |
| 480/80R46 | 158 | 35 | 488 | 574 | 293 | 344 |
| 480/80R50 | | 6 | 195 | 229 | 117 | 138 |
| 480/80R50 | | 12 | 271 | 319 | 163 | 191 |
| 480/80R50 | 147 | 17 | 355 | 417 | 213 | 250 |
| 480/80R50 | 154 | 23 | 430 | 506 | 258 | 304 |
| 480/80R50 | 157 | 29 | 475 | 558 | 285 | 335 |
| 480/80R50 | 159 | 35 | 503 | 592 | 302 | 355 |
| 520/85R38 | | 6 | 201 | 237 | 121 | 142 |
| 520/85R38 | | 12 | 288 | 339 | 173 | 203 |
| 520/85R38 | 148 | 17 | 362 | 426 | 217 | 256 |
| 520/85R38 | 155 | 23 | 446 | 525 | 268 | 315 |
| 520/85R42 | | 6 | 213 | 250 | 128 | 150 |

Note: For single tires, multiply the above horsepower rating by 0.568. For triples, multiply the above horsepower rating by 1.397.

HORSEPOWER CAPACITIES AS DUALS

| Main Drive Tire Size | Load Indicator/ Ply Rating | Inflation Pressure (PSI) | RECOMMENDED 5 MPH | | 3 MPH | |
|-------------------------|----------------------------------|--------------------------------|----------------------|-----------------|-------|-----------------|
| | | | 2WD | Front Assist | 2WD | Front Assist |
| 520/85R42 | | 12 | 296 | 348 | 178 | 209 |
| 520/85R42 | 150 | 17 | 386 | 454 | 232 | 272 |
| 520/85R42 | 157 | 23 | 475 | 558 | 285 | 335 |
| 520/85R46 | | 6 | 224 | 264 | 135 | 158 |
| 520/85R46 | | 12 | 313 | 368 | 188 | 221 |
| 520/85R46 | | 17 | 396 | 466 | 238 | 280 |
| 520/85R46 | 158 | 23 | 488 | 574 | 293 | 344 |
| 540/65R30 | | 6 | 148 | 174 | 89 | 104 |
| 540/65R30 | | 12 | 207 | 243 | 124 | 146 |
| 540/65R30 | | 17 | 265 | 312 | 159 | 187 |
| 540/65R30 | | 23 | 313 | 368 | 188 | 221 |
| 540/65R30 | | 29 | 355 | 417 | 213 | 250 |
| 540/65R30 | 150 | 35 | 386 | 454 | 232 | 272 |
| 540/65R34 | | 6 | 156 | 184 | 94 | 110 |
| 540/65R34 | | 12 | 218 | 256 | 131 | 154 |
| 540/65R34 | 140 | 17 | 288 | 339 | 173 | 203 |
| 540/65R34 | 145 | 23 | 334 | 393 | 200 | 236 |
| 580/70R38 | 155 | 23 | 446 | 525 | 268 | 315 |
| 600/70R30 | | 6 | 190 | 223 | 114 | 134 |
| 600/70R30 | | 12 | 271 | 319 | 163 | 191 |
| 600/70R30 | | 17 | 344 | 405 | 207 | 243 |
| 600/70R30 | 152 | 23 | 409 | 482 | 246 | 289 |
| 620/75R30 | 163 | 35 | 558 | 656 | 335 | 394 |
| 620/70R42 | | 6 | 237 | 279 | 142 | 167 |
| 620/70R42 | | 12 | 334 | 393 | 200 | 236 |
| 620/70R42 | 153 | 17 | 420 | 494 | 252 | 296 |
| 620/70R42 | 160 | 23 | 516 | 607 | 310 | 364 |
| 620/70R46 | | 6 | 244 | 287 | 146 | 172 |
| 620/70R46 | | 12 | 344 | 405 | 207 | 243 |
| 620/70R46 | | 17 | 446 | 525 | 268 | 315 |
| 620/70R46 | 162 | 23 | 548 | 644 | 329 | 387 |
| 650/75R32 | | 12 | 334 | 393 | 200 | 236 |
| 650/75R32 | | 17 | 430 | 506 | 258 | 304 |

HORSEPOWER CAPACITIES AS DUALS

| Main Drive Tire Size | Load Indicator/ Ply Rating | Inflation Pressure (PSI) | RECOMMENDED 5 MPH | | 3 MPH | |
|----------------------|-------------------------------|--------------------------|----------------------|--------------|-------|--------------|
| | | | 2WD | Front Assist | 2WD | Front Assist |
| 650/75R32 | 160 | 23 | 516 | 607 | 310 | 364 |
| 650/75R32 | | 29 | 574 | 675 | 344 | 405 |
| 650/75R32 | 167 | 35 | 626 | 736 | 375 | 442 |
| 650/75R32 | 172 | 46 | 725 | 853 | 435 | 512 |
| 650/75R34 | | 6 | 244 | 287 | 146 | 172 |
| 650/75R34 | | 12 | 344 | 405 | 207 | 243 |
| 650/75R34 | 155 | 17 | 446 | 525 | 268 | 315 |
| 650/75R34 | 162 | 23 | 548 | 644 | 329 | 387 |
| 650/75R34 | 168 | 29 | 641 | 755 | 385 | 453 |
| 650/85R38 | | 6 | 288 | 339 | 173 | 203 |
| 650/85R38 | | 12 | 409 | 482 | 246 | 289 |
| 650/85R38 | 160 | 17 | 516 | 607 | 310 | 364 |
| 650/85R38 | 167 | 23 | 626 | 736 | 375 | 442 |
| 650/85R38 | 170 | 29 | 688 | 810 | 413 | 486 |
| 650/85R38 | 173 | 35 | 746 | 877 | 447 | 526 |
| 650/65R42 | | 6 | 229 | 270 | 138 | 162 |
| 650/65R42 | | 12 | 321 | 377 | 192 | 226 |
| 650/65R42 | 153 | 17 | 420 | 494 | 252 | 296 |
| 650/65R42 | 158 | 23 | 488 | 574 | 293 | 344 |
| 650/65R42 | 162 | 29 | 548 | 644 | 329 | 387 |
| 650/65R42 | 165 | 35 | 594 | 699 | 357 | 420 |
| 650/65R42 | 170 | 46 | 688 | 810 | 413 | 486 |
| 710/70R38 | | 6 | 280 | 329 | 168 | 197 |
| 710/70R38 | | 12 | 386 | 454 | 232 | 272 |
| 710/70R38 | | 17 | 503 | 592 | 302 | 355 |
| 710/70R38 | 166 | 23 | 610 | 718 | 366 | 431 |
| 710/70R42 | | 6 | 288 | 339 | 173 | 203 |
| 710/70R42 | | 12 | 409 | 482 | 246 | 289 |
| 710/70R42 | 160 | 17 | 516 | 607 | 310 | 364 |
| 710/70R42 | 168 | 23 | 641 | 755 | 385 | 453 |
| 800/65R32 | | 12 | 396 | 466 | 238 | 280 |
| 800/65R32 | | 17 | 503 | 592 | 302 | 355 |

Note: For single tires, multiply the above horsepower rating by 0.568. For triples, multiply the above horsepower rating by 1.397.

HORSEPOWER CAPACITIES AS DUALS

| Main Drive Tire Size | Load Indicator/ Ply Rating | Inflation Pressure (PSI) | RECOMMENDED 5 MPH | | 3 MPH | |
|-------------------------|----------------------------------|--------------------------------|----------------------|-----------------|-------|-----------------|
| | | | 2WD | Front Assist | 2WD | Front Assist |
| 800/65R32 | 167 | 23 | 626 | 736 | 375 | 442 |
| 800/65R32 | 169 | 29 | 667 | 785 | 400 | 471 |
| 800/65R32 | 172 | 35 | 725 | 853 | 435 | 512 |
| 800/70R38 | | 6 | 334 | 393 | 200 | 236 |
| 800/70R38 | | 12 | 475 | 558 | 285 | 335 |
| 800/70R38 | 166 | 17 | 610 | 718 | 366 | 431 |
| 800/70R38 | 173 | 23 | 746 | 877 | 447 | 526 |
| 900/65R32 | | 6 | 344 | 405 | 207 | 243 |
| 900/65R32 | | 12 | 475 | 558 | 285 | 335 |
| 900/65R32 | 166 | 17 | 610 | 718 | 366 | 431 |
| 900/65R32 | 172 | 23 | 725 | 853 | 435 | 512 |
| 900/50R42 | | 6 | 296 | 348 | 178 | 209 |
| 900/50R42 | | 12 | 409 | 482 | 246 | 289 |
| 900/50R42 | | 17 | 532 | 626 | 319 | 375 |
| 900/50R42 | 168 | 23 | 641 | 755 | 385 | 453 |

PROCEDURES FOR FILLING & REMOVING SOLUTION

Tube-Type or Tubeless Tires Mixing Solution

Prepare the calcium chloride mixture by pouring the calcium chloride into the water (never the water into calcium chloride, as considerable heat is generated in this mixing process). The solution should be allowed to cool to atmospheric temperature before pumping in the tire. The pump can be used to mix and cool this solution by circulating it through the pump and back into the barrel with the pump running and the handle moved right to the fill position.

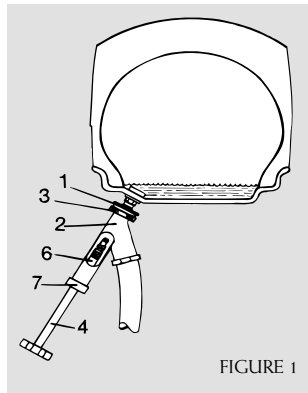


FIGURE 1

Connecting To Valve Stem

The following connections should be made when the pump is not running and with the control handle in the vertical or check position: To connect liquid fill core ejector to two-piece style rear tractor valves TR-218A, TR-618A, (figure 1), unscrew union (1) from core ejector body (2) screw on valve stem finger tight. Screw core ejector body on union (1) making sure rubber gasket (3) is in place, with handle (4) of core ejector pulled out. Push handle (4) of core ejector in until it makes contact with the core housing of the valve, then hold the core ejector in left hand, strike the handle (4) with the right hand to force the core housing in ejector chuck (6). Turn handle (4) to the left to unscrew the core housing, pushing inward lightly so you can feel the threads disengage when completely unscrewed. Then pull handle (4) out as far as it will go to retract core housing into ejector

body. The handle will pull out easier if rotated while pulling, as packing nut (7) should be tight enough to prevent air or liquid leaks.

To connect liquid fill core ejector to one-piece style front tractor valves TR415, TR413 (figure 2), screw adapter (A) and gasket to union (1). Insert large end of core remover (B) securely into chuck of core housing ejector (6). Screw adapter and union assembly on valve stem finger tight. Screw ejector union and adapter assembly to core ejector body making sure gasket is in place. The rest of the operation is the same as with the above two-piece valve as described above.

Removing Solution From Tube-Type Or Tubeless Tire

Jack up tractor until tire is slightly deflected and valve is at the bottom. Connect core housing ejector and union to valve stem as previously described. Unscrew and retract core housing into ejector body with control handle at check position.

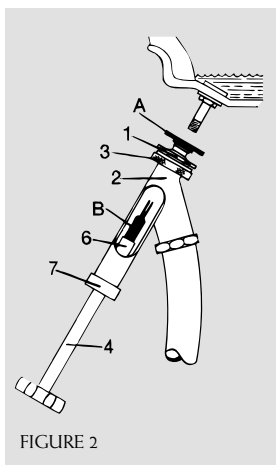


FIGURE 2

WARNING:
NEVER EXCEED
RECOMMENDED
OPERATING
PRESSURE WHEN
FILLING TIRE
WITH SOLUTION
OR REMOVING
SOLUTION FROM
TIRE.

Start pump and turn control handle to evacuate position and run until tire is completely evacuated. Turn control handle to check position, stop pump and disconnect core ejector after replacing core housing in the valve stem.

In cases with a tubeless tire unseat beads and demount front bead from rim and pump remaining solution from the tire.

Filling Tube-Type Or Tubeless Tires With Solution

To fill a tire 75% with water or solution: First inflate tire to 35 psi after beads have been fully seated in mounting procedure. Jack up the wheel, if done on a tractor, and turn to bring valve to top position. Then lower jack until tire is slightly deflected. With pump not running and control handle at the check position, connect ejector and remove core housing as described above.

After connection is made, bleed pressure down to about 5 psi. (to keep the beads seated on the rim) by moving control handle to left or evacuate position.

When this point is reached, start pump and move the control handle to the right or fill position. Start hydroinflating tire. Check pressure in tire every few minutes with pump gauge by placing pump in neutral or check position. If pressure exceeds 20 psi, move handle to evacuate until pressure is bled back to not less than 5 psi. After pressure is lowered, continue pumping. Repeat above steps as often as may be necessary to fill until water or solution weight added to assembly is equal to that shown in the tables on previous pages.

Replace core housing in valve stem by pushing handle in until contact is made and turn to right until the core housing is screwed tight in valve stem. Then withdraw handle, turn handle to evacuate, and pump all liquid from hose. Finally, shut off pump, then unscrew ejector body (2) and union (1) from

PROCEDURES FOR FILLING & REMOVING SOLUTION

valve. (Fig. 2)

To assure fully-seated beads, inflate tire to 35 psi inflation pressure using a standard air line, and then with valve stem at the top, bleed pressure — and excess water or solution — down to 1-2 psi above recommended inflation.

Set final working pressure after tire has been mounted on tractor with weight on tire and valve at bottom, using an air-water gauge.

Pump Care And Maintenance

Drain Pump: If water or a weak solution of calcium chloride has been used, the pump should be removed from the barrel to prevent it from freezing.

Siphon Valve: To avoid solution or vacuum leakage, keep the nut opposite of the handle tight to a point where handle will turn just a little hard.

Core Ejector: Packing nut (7) on plunger should be kept fairly tight to avoid leaks. However, do not set it so tight that plunger cannot be easily pushed into position. When not in use over long periods of time, keep items (2), (1), (A), and (B) in a bucket of clear water.

Solution in Pump: Do not pump all solution out of barrel. A small amount of solution is required to keep air out of pump and thus prevent corrosion and sticking. If water is used, be sure to place barrel where water will not freeze.

LIQUID WEIGHTING OF TRACTOR TIRES

Tube-Type or Tubeless Tractor Tires

The traction or pulling power which a tire can exert is in proportion to the weight it carries. The greater the load on the tire, the more tractive effort it can exert. The way to secure more traction and reduce tire slippage and treadwear is add weight to the rear axle.

Filling tires with liquid is one of the most widely used methods of adding weight to the drive axle of a tractor because of its economy and simplicity. Plain water may be used where freezing never occurs. In colder climates where freezing temperatures occur, calcium chloride flake can be added at the strengths of 3.5 lbs. per gallon of water. For extremely cold climates, 5 lbs. of calcium chloride per gallon of water is used. Note that the calcium chloride not only provides freezing protection but also increases the weight added by 20% and 28% for 3.5 lbs./gal. and 5 lbs./gal. respectively. The following tables are for front and rear tractor tires filled to 75% or

“valve-level” (valve at 12 o'clock position). Use of fill levels greater than this are not recommended because the tire becomes more susceptible to impact breaks. For a softer ride and better control of power hop, it is recommended that 40% fill (4 o'clock valve position) not be exceeded. Weights and amounts of fill for the 40% level are approximately half of those shown in the tables below. Liquid fill has a stiffening effect on tire deflection, especially at lower inflation pressures. Because of this, use of liquid fill may make controlling power hop more difficult. For information on optimizing your tractor and eliminating power hop, see the section on Optimum Tractor Tire Performance.

Either tube-type or tubeless tires may be filled with calcium chloride solution. Rim corrosion is not a problem with tubeless tires as long as the tire is always kept inflated. This keeps outside air sealed away from the rim and restrains corrosion. A rim

used tubeless with calcium chloride solution must be rinsed with tap water immediately after dismounting to prevent extremely rapid corrosion.

These tables are based on the use of Type 1-77% commercial calcium chloride flake. If type 2-94% calcium chloride flake is used, reduce the weight of calcium chloride added by 25%. Where anti-freeze protection is needed, the 3.5 lbs./gal (420 g/l) solution is slush free to $-12^{\circ}\text{F}/-24^{\circ}\text{C}$ and will freeze solid at $-52^{\circ}\text{F}/-47^{\circ}\text{C}$. The 5 lbs./gal. (600 g/l) solution is slush free to $-52^{\circ}\text{F}/-47^{\circ}\text{C}$ and will freeze solid at $-62^{\circ}\text{F}/-52^{\circ}\text{C}$.

LIQUID WEIGHTING OF TRACTOR TIRES

Front Tractor Tires – 75% Fill

| Tire Size | Water | | 3½ lbs./420 g CaCl ₂ | | | 5 lbs./600 g CaCl ₂ | | |
|------------|-------------|----------|---------------------------------|-------------------|-----------|--------------------------------|-------------------|-----------|
| | Gal./Liters | Weight | Water | CaCl ₂ | Total Wt. | Water | CaCl ₂ | Total Wt. |
| | | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. |
| 4.00-12 | 2/8 | 17/7.7 | 1.7/7 | 6/2.7 | 20/9.1 | 1.6/6 | 8/3.6 | 21/9.5 |
| 4.00-15 | 2.5/10 | 21/9.5 | 2/8 | 7/3.2 | 24/11 | 2/8 | 10/4.5 | 27/12 |
| 5.00-15 | 4/15 | 33/15 | 3/12 | 10/4.5 | 35/16 | 3/12 | 15/6.8 | 40/18 |
| 5.50-16 | 5/19 | 42/19 | 4/15 | 14/6.4 | 47/21 | 4/15 | 20/9.1 | 53/24 |
| 6.00-14 | 6/23 | 50/23 | 5/19 | 18/8.2 | 60/27 | 5/19 | 25/11 | 67/30 |
| 6.00-16 | 6/23 | 50/23 | 5/19 | 18/8.2 | 60/27 | 5/19 | 25/11 | 67/30 |
| 6.50-16 | 7/27 | 58/26 | 6/23 | 21/9.5 | 71/32 | 5.5/21 | 28/13 | 74/34 |
| 7.50-10 | 6/23 | 50/23 | 5/19 | 18/8.2 | 60/27 | 4.8/18 | 24/11 | 64/29 |
| 7.5L-15 | 8.5/33 | 71/32 | 7/27 | 24/11 | 82/37 | 7/27 | 35/16 | 93/42 |
| 7.50-16 | 10/38 | 83/38 | 8.5/33 | 30/14 | 101/46 | 8/28 | 40/18 | 107/49 |
| 7.50-18 | 11/42 | 92/42 | 9.5/37 | 33/15 | 112/51 | 9/35 | 45/20 | 120/54 |
| 7.50-20 | 12/46 | 100/45 | 10/38 | 35/16 | 118/54 | 9.5/37 | 48/22 | 127/58 |
| 9.00-10 | 9/35 | 75/34 | 7.5/29 | 26/12 | 89/40 | 7.2/28 | 36/16 | 96/44 |
| 9.5L-15 | 11/42 | 92/42 | 9.5/37 | 33/15 | 112/51 | 9/35 | 45/20 | 120/54 |
| 9.50-15 | 18/69 | 150/68 | 16/62 | 56/25 | 189/86 | 15/58 | 75/34 | 200/91 |
| 9.50-20 | 18/69 | 150/68 | 16/62 | 56/25 | 189/86 | 15/58 | 72/33 | 200/91 |
| 9.50-24 | 20/77 | 167/77 | 17/65 | 60/27 | 202/92 | 16/62 | 80/36 | 213/97 |
| 10.00-16 | 18/69 | 150/68 | 16/62 | 56/25 | 189/86 | 15/58 | 69/31 | 184/84 |
| 11L-15 | 14/54 | 117/53 | 12/46 | 42/19 | 142/64 | 11/42 | 53/24 | 147/67 |
| 11L-16 | 15/58 | 123/56 | 13/50 | 46/21 | 155/70 | 12/46 | 60/27 | 160/73 |
| 11.00-15 | 24/92 | 200/91 | 20/77 | 70/32 | 237/108 | 19/73 | 95/43 | 253/115 |
| 11.00-16 | 25/96 | 208/94 | 22/85 | 77/35 | 260/118 | 20/77 | 93/42 | 267/121 |
| 14L-16.1 | 28/108 | 233/106 | 24/92 | 84/38 | 284/129 | 23/88 | 110/50 | 307/139 |
| 16.5L-16.1 | 41/158 | 342/155 | 35/135 | 122/55 | 414/188 | 33/127 | 167/76 | 440/200 |

Rear Tractor Tires – 75% Fill

| Tire Size | Water | | 3½ lbs./420 g CaCl ₂ | | | 5 lbs./600 g CaCl ₂ | | |
|-----------|-------------|----------|---------------------------------|-------------------|-----------|--------------------------------|-------------------|-----------|
| | Gal./Liters | Weight | Water | CaCl ₂ | Total Wt. | Water | CaCl ₂ | Total Wt. |
| | | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. |
| 7.2-16 | 7/26 | 58/26 | 6/23 | 21/9.5 | 71/32 | 5/19 | 25/11 | 67/30 |
| 8.3-16 | 9/34 | 75/34 | 8/30 | 28/13 | 95/43 | 8/30 | 40/18 | 107/48 |
| 9.5-16 | 12/45 | 100/45 | 10/38 | 35/16 | 118/54 | 10/38 | 50/23 | 133/61 |
| 11.2-16 | 18/68 | 150/68 | 15/57 | 53/24 | 178/81 | 14/53 | 70/32 | 187/85 |
| 12.4-16 | 21/79 | 175/79 | 18/68 | 63/29 | 213/97 | 17/64 | 85/39 | 227/103 |
| 13.6-16.1 | 31/117 | 258/117 | 26/98 | 91/41 | 308/139 | 25/95 | 125/57 | 333/152 |
| 18.4-16.1 | 49/185 | 409/186 | 42/159 | 147/67 | 497/226 | 39/148 | 195/88 | 520/236 |

Note: For 40% fill, multiply above values by 0.5.

Rear Tractor Tires – 75% Fill

| Tire Size | Water | | 3½ lbs./420 g CaCl ₂ | | | 5 lbs./600 g CaCl ₂ | | |
|-----------|-------------|-----------|---------------------------------|-------------------|-----------|--------------------------------|-------------------|-----------|
| | | Weight | Water | CaCl ₂ | Total Wt. | Water | CaCl ₂ | Total Wt. |
| | Gal./Liters | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. |
| 8.3-24 | 13/49 | 108/49 | 11/42 | 39/18 | 131/60 | 10/38 | 50/23 | 133/61 |
| 9.5-24 | 17/64 | 142/64 | 15/57 | 53/24 | 178/81 | 14/53 | 70/32 | 187/85 |
| 11.2-24 | 24/91 | 200/91 | 20/76 | 70/32 | 237/108 | 19/72 | 95/43 | 253/115 |
| 12.4-24 | 30/114 | 250/113 | 26/98 | 91/41 | 308/139 | 25/95 | 125/57 | 333/152 |
| 13.6-24 | 38/144 | 317/144 | 32/121 | 112/51 | 379/172 | 30/114 | 150/68 | 400/182 |
| 14.9-24 | 47/178 | 392/178 | 40/151 | 140/64 | 474/215 | 38/144 | 190/86 | 507/230 |
| 16.9-24 | 61/231 | 509/231 | 52/197 | 182/83 | 616/280 | 49/185 | 245/111 | 654/296 |
| 17.5L-24 | 55/208 | 459/208 | 47/178 | 165/75 | 557/253 | 45/170 | 225/102 | 600/272 |
| 19.5L-24 | 69/261 | 575/265 | 60/227 | 210/95 | 710/322 | 56/212 | 280/127 | 747/339 |
| 21L-24 | 87/329 | 725/329 | 74/280 | 259/117 | 876/397 | 70/265 | 350/159 | 934/424 |
| 14.9-26 | 48/182 | 400/181 | 41/155 | 144/65 | 486/220 | 39/148 | 195/88 | 520/236 |
| 16.9-26 | 65/246 | 542/246 | 56/212 | 196/89 | 663/301 | 52/197 | 260/118 | 694/315 |
| 18.4-26 | 79/299 | 659/299 | 68/257 | 238/108 | 805/365 | 64/242 | 320/145 | 854/387 |
| 23.1-26 | 128/485 | 1068/485 | 109/413 | 328/173 | 1291/586 | 103/390 | 515/234 | 1374/624 |
| 28L-26 | 157/594 | 1309/594 | 134/507 | 469/213 | 1587/720 | 127/481 | 635/288 | 1694/769 |
| 11.2-28 | 27/102 | 225/102 | 24/91 | 84/38 | 284/129 | 22/83 | 110/50 | 293/133 |
| 12.4-28 | 35/132 | 292/132 | 30/114 | 105/48 | 355/162 | 28/106 | 140/64 | 374/170 |
| 13.6-28 | 43/163 | 359/163 | 37/140 | 130/59 | 439/199 | 35/132 | 175/79 | 467/211 |
| 14.9-28 | 53/201 | 442/201 | 46/174 | 161/73 | 545/247 | 43/163 | 215/98 | 574/261 |
| 16.9-28 | 69/261 | 575/261 | 59/223 | 207/94 | 699/317 | 56/212 | 280/127 | 747/339 |
| 18.4-28 | 84/318 | 701/318 | 72/273 | 252/114 | 852/387 | 68/257 | 340/154 | 907/412 |
| 21L-28 | 97/367 | 809/367 | 83/314 | 291/132 | 982/446 | 79/299 | 395/179 | 1054/478 |
| 14.9-30 | 57/216 | 475/216 | 48/182 | 168/76 | 568/258 | 46/174 | 230/104 | 614/278 |
| 16.9-30 | 73/276 | 609/276 | 63/238 | 221/100 | 746/338 | 59/223 | 292/132 | 787/355 |
| 18.4-30 | 89/337 | 742/337 | 77/291 | 270/123 | 912/414 | 72/273 | 360/163 | 960/436 |
| 23.1-30 | 143/541 | 1193/541 | 123/466 | 431/196 | 1457/662 | 116/439 | 580/263 | 1547/702 |
| 24.5-32 | 170/643 | 1418/643 | 146/553 | 511/232 | 1729/785 | 138/522 | 690/313 | 1841/835 |
| 30.5L-32 | 217/821 | 1809/821 | 186/704 | 651/295 | 2202/999 | 176/666 | 880/399 | 2347/1065 |
| 35.5L-32 | 313/1287 | 2609/1287 | 291/1101 | 1019/462 | 3446/1563 | 275/1041 | 1375/624 | 3669/1665 |
| 14.9-34 | 63/238 | 525/238 | 54/204 | 189/86 | 639/290 | 51/193 | 255/116 | 680/309 |
| 16.9-34 | 82/310 | 684/310 | 70/265 | 245/111 | 829/376 | 66/250 | 330/150 | 880/400 |
| 18.4-34 | 100/379 | 834/378 | 85/322 | 298/135 | 1007/457 | 81/307 | 405/184 | 1081/491 |
| 20.8-34 | 128/485 | 1068/485 | 109/413 | 328/173 | 1291/586 | 103/390 | 515/234 | 1374/624 |
| 23.1-34 | 159/602 | 1326/602 | 136/515 | 476/216 | 1610/731 | 128/485 | 640/290 | 1708/775 |
| 13.9-36 | 51/193 | 425/193 | 44/167 | 154/70 | 521/237 | 42/159 | 210/95 | 560/254 |
| 13.6-38 | 57/216 | 475/216 | 49/185 | 172/78 | 581/263 | 46/174 | 230/104 | 614/278 |
| 15.5-38 | 66/250 | 550/250 | 56/212 | 196/89 | 663/301 | 53/201 | 265/120 | 707/321 |
| 16.9-38 | 90/341 | 751/341 | 77/291 | 270/123 | 912/414 | 73/276 | 365/166 | 974/442 |
| 18.4-38 | 110/416 | 917/416 | 94/356 | 329/149 | 1113/505 | 89/337 | 445/202 | 1187/539 |
| 20.8-38 | 140/530 | 1168/530 | 120/454 | 420/191 | 1421/645 | 114/431 | 570/259 | 1521/690 |
| 18.4-42 | 115/435 | 959/435 | 98/371 | 343/156 | 1160/527 | 93/352 | 465/211 | 1240/563 |
| 20.8-42 | 148/560 | 1234/560 | 127/481 | 444/202 | 1503/682 | 120/454 | 600/272 | 1600/726 |

Note: For 40% fill, multiply above values by 0.5.

Rear Tractor Tires – 75% Fill

| Tire Size | Water | | 3½ lbs./420 g CaCl ₂ | | | 5 lbs./600 g CaCl ₂ | | |
|---------------------|-------------|----------|---------------------------------|-------------------|-----------|--------------------------------|-------------------|-----------|
| | | Weight | Water | CaCl ₂ | Total Wt. | Water | CaCl ₂ | Total Wt. |
| | Gal./Liters | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. |
| 14.9-46 | 80/303 | 667/303 | 68/257 | 238/108 | 805/365 | 65/246 | 325/147 | 867/393 |
| 18.4-46 | 129/488 | 1075/488 | 111/420 | 389/176 | 1314/596 | 105/397 | 525/238 | 1400/635 |
| 20.8-46 | 150/568 | 1251/568 | 128/384 | 448/203 | 1515/687 | 121/458 | 605/274 | 1614/732 |
| Sure Grip Loader SS | | | | | | | | |
| 10-16.5 | 12/46 | 97/44 | 10/38 | 35/16 | 119/54 | 10/38 | 50/23 | 134/61 |
| 12-16.5 | 15/58 | 126/57 | 13/50 | 46/21 | 154/70 | 13/50 | 65/30 | 173/78 |
| 14-17.5 | 22/85 | 185/84 | 19/73 | 67/30 | 227/103 | 18/68 | 90/41 | 240/109 |
| 15-19.5 | 29/112 | 240/109 | 25/96 | 87/39 | 294/133 | 24/91 | 120/54 | 320/145 |

Metric Size Tires – 75% Fill

| Tire Size | Water | | 3½ lbs./420 g CaCl ₂ | | | 5 lbs./600 g CaCl ₂ | | |
|-----------|-------------|----------|---------------------------------|-------------------|-----------|--------------------------------|-------------------|-----------|
| | | Weight | Water | CaCl ₂ | Total Wt. | Water | CaCl ₂ | Total Wt. |
| | Gal./Liters | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. |
| 240/70R16 | 8/29 | 65/29 | 7/26 | 25/11 | 83/38 | 6/23 | 30/14 | 80/36 |
| 250/80R16 | 12/46 | 101/46 | 10/38 | 35/16 | 118/54 | 10/38 | 50/23 | 133/60 |
| 250/80R18 | 13/49 | 108/49 | 11/42 | 39/17 | 130/59 | 11/42 | 55/25 | 147/67 |
| 250/95R34 | 24/90 | 197/90 | 20/76 | 70/32 | 237/107 | 19/72 | 95/43 | 253/115 |
| 250/95R50 | 32/119 | 263/119 | 27/102 | 95/43 | 320/145 | 26/98 | 130/59 | 347/157 |
| 260/70R16 | 10/37 | 81/37 | 8/30 | 28/13 | 95/43 | 8/30 | 40/18 | 107/48 |
| 260/80R20 | 15/57 | 126/57 | 13/49 | 46/21 | 154/70 | 12/45 | 60/27 | 160/73 |
| 290/95R34 | 34/130 | 287/130 | 29/110 | 102/46 | 343/156 | 28/106 | 140/64 | 373/169 |
| 290/90R38 | 34/129 | 283/129 | 29/110 | 102/46 | 343/156 | 28/106 | 140/64 | 373/169 |
| 320/70R24 | 23/87 | 192/87 | 20/76 | 70/32 | 237/107 | 19/72 | 95/43 | 253/115 |
| 320/75R24 | 25/95 | 210/95 | 22/83 | 77/35 | 260/118 | 20/76 | 100/45 | 267/121 |
| 320/85R34 | 38/144 | 316/144 | 33/125 | 116/52 | 391/177 | 31/117 | 155/70 | 413/188 |
| 320/85R38 | 37/142 | 312/142 | 32/121 | 112/51 | 379/172 | 30/114 | 150/68 | 400/181 |
| 320/80R42 | 40/153 | 336/153 | 35/132 | 123/56 | 414/188 | 33/125 | 165/75 | 440/200 |
| 320/90R42 | 49/186 | 409/186 | 42/159 | 147/67 | 497/226 | 40/151 | 200/91 | 533/242 |
| 320/90R46 | 52/195 | 430/195 | 44/167 | 154/70 | 521/236 | 42/159 | 210/95 | 560/254 |
| 320/90R50 | 55/210 | 462/210 | 47/178 | 165/75 | 556/252 | 45/170 | 225/102 | 600/272 |
| 320/90R54 | 56/210 | 463/210 | 48/182 | 168/76 | 568/258 | 45/170 | 225/102 | 600/272 |
| 340/80R18 | 27/101 | 223/101 | 23/87 | 81/37 | 272/123 | 22/83 | 110/50 | 293/133 |
| 340/85R46 | 57/214 | 472/214 | 49/185 | 172/78 | 580/263 | 46/174 | 230/104 | 614/278 |
| 380/70R20 | 31/117 | 258/117 | 27/102 | 95/43 | 320/145 | 25/95 | 125/57 | 333/151 |

Note: For 40% fill, multiply above values by 0.5.

Metric Size Tires – 75% Fill

| Tire Size | Water | | 3½ lbs./420 g CaCl ₂ | | | 5 lbs./600 g CaCl ₂ | | |
|--------------|-------------|----------|---------------------------------|-------------------|-----------|--------------------------------|-------------------|-----------|
| | Gal./Liters | Weight | Water | CaCl ₂ | Total Wt. | Water | CaCl ₂ | Total Wt. |
| | | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. |
| 380/70R24 | 36/136 | 299/136 | 31/117 | 109/49 | 367/166 | 29/110 | 145/66 | 387/175 |
| 380/70R28 | 41/155 | 342/155 | 35/132 | 123/56 | 414/188 | 33/125 | 165/75 | 440/200 |
| 380/85R28 | 50/188 | 414/188 | 43/163 | 151/68 | 509/231 | 40/151 | 200/91 | 533/242 |
| 380/85R30 | 54/205 | 452/205 | 46/174 | 161/73 | 545/247 | 44/167 | 220/100 | 587/266 |
| 380/85R34 | 56/213 | 470/213 | 48/182 | 168/76 | 568/258 | 46/174 | 230/104 | 614/278 |
| 380/80R38 | 56/212 | 468/212 | 48/182 | 168/76 | 568/258 | 46/174 | 230/104 | 614/278 |
| 380/90R46 | 76/287 | 631/287 | 65/246 | 228/103 | 769/349 | 61/231 | 305/138 | 814/369 |
| 380/90R50 | 79/300 | 660/300 | 68/257 | 238/108 | 805/365 | 64/242 | 320/145 | 854/387 |
| 380/90R54 | 84/319 | 702/319 | 72/273 | 252/114 | 852/387 | 68/257 | 340/154 | 907/411 |
| 385/85R34MPT | 60/226 | 497/226 | 51/193 | 179/81 | 604/274 | 48/182 | 240/109 | 640/290 |
| 420/70R24 | 47/176 | 388/176 | 40/151 | 140/64 | 473/215 | 38/144 | 190/86 | 507/230 |
| 420/70R28 | 53/200 | 441/200 | 45/170 | 158/71 | 533/242 | 43/163 | 215/98 | 573/260 |
| 420/80R46 | 86/325 | 715/325 | 74/280 | 259/117 | 876/397 | 70/265 | 350/159 | 934/423 |
| 420/85R28 | 66/249 | 549/249 | 56/212 | 196/89 | 663/301 | 53/201 | 265/120 | 707/321 |
| 420/90R30 | 72/274 | 604/274 | 62/235 | 217/98 | 734/333 | 59/223 | 295/134 | 787/357 |
| 480/70R28 | 71/268 | 590/268 | 61/231 | 214/97 | 722/328 | 57/216 | 285/129 | 760/345 |
| 480/70R30 | 75/284 | 625/284 | 64/242 | 224/102 | 758/344 | 61/231 | 305/138 | 814/369 |
| 480/70R34 | 83/314 | 691/314 | 71/269 | 249/113 | 840/381 | 67/254 | 335/152 | 894/405 |
| 480/80R38 | 105/397 | 875/397 | 90/341 | 315/143 | 1065/483 | 85/322 | 425/193 | 1134/514 |
| 480/80R42 | 113/427 | 941/427 | 97/367 | 340/154 | 1148/521 | 92/348 | 460/209 | 1227/557 |
| 480/80R46 | 119/451 | 993/451 | 102/386 | 357/162 | 1207/548 | 97/367 | 485/220 | 1294/587 |
| 480/80R50 | 125/474 | 1044/474 | 107/405 | 375/170 | 1267/575 | 102/386 | 510/231 | 1360/617 |
| 480/85R34 | 99/376 | 829/376 | 85/322 | 298/135 | 1006/456 | 81/307 | 405/184 | 1080/490 |
| VA500/95D32 | 138/521 | 1147/521 | 118/447 | 413/187 | 1397/634 | 112/424 | 560/254 | 1494/678 |
| 520/85R38 | 133/504 | 1111/504 | 114/431 | 399/181 | 1349/612 | 108/409 | 540/245 | 1440/653 |
| 520/85R42 | 142/537 | 1183/537 | 122/462 | 427/194 | 1444/655 | 115/435 | 575/261 | 1534/696 |
| 520/85R46 | 153/580 | 1278/580 | 131/496 | 459/208 | 1551/703 | 124/469 | 620/281 | 1654/750 |
| 540/65R30 | 80/304 | 671/304 | 69/261 | 242/110 | 817/370 | 65/246 | 325/147 | 867/393 |
| 580/70R38 | 142/536 | 1181/536 | 121/458 | 424/192 | 1432/650 | 115/435 | 575/261 | 1534/696 |
| 600/65R28 | 99/374 | 824/374 | 85/322 | 298/135 | 1006/456 | 80/303 | 400/181 | 1067/484 |
| 620/75R26 | 125/475 | 1046/475 | 108/409 | 378/171 | 1278/580 | 102/386 | 510/231 | 1360/617 |
| 620/70R42 | 169/641 | 1412/641 | 145/549 | 508/230 | 1716/779 | 137/519 | 685/311 | 1827/829 |
| 620/70R46 | 183/692 | 1523/692 | 157/594 | 550/249 | 1858/843 | 148/560 | 740/336 | 1974/895 |
| 650/75R32 | 162/613 | 1350/613 | 139/526 | 487/221 | 1645/746 | 131/496 | 655/297 | 1747/793 |

Metric Size Tires – 75% Fill

| Tire Size | Water | | 3½ lbs./420 g CaCl ₂ | | | 5 lbs./600 g CaCl ₂ | | |
|-----------|-------------|-----------|---------------------------------|-------------------|-----------|--------------------------------|-------------------|-----------|
| | Weight | | Water | CaCl ₂ | Total Wt. | Water | CaCl ₂ | Total Wt. |
| | Gal./Liters | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. |
| 650/75R34 | 185/699 | 1539/699 | 158/598 | 553/251 | 1870/848 | 150/568 | 750/340 | 2001/907 |
| 650/85R38 | 229/865 | 1905/865 | 196/742 | 686/311 | 2320/1052 | 185/700 | 925/420 | 2467/1119 |
| 650/65R42 | 164/619 | 1364/619 | 140/530 | 490/222 | 1657/752 | 133/503 | 665/302 | 1774/805 |
| 710/70R38 | 201/763 | 1680/763 | 173/655 | 606/275 | 2048/929 | 163/617 | 815/370 | 2174/986 |
| 710/70R42 | 228/863 | 1901/863 | 195/738 | 683/310 | 2308/1047 | 185/700 | 925/420 | 2467/1119 |
| 750/65R26 | 168/635 | 1398/635 | 144/545 | 504/229 | 1705/773 | 136/515 | 680/308 | 1814/823 |
| 800/65R32 | 202/766 | 1687/766 | 173/655 | 606/275 | 2048/929 | 164/621 | 820/372 | 2187/992 |
| 800/70R38 | 265/1002 | 2208/1002 | 227/859 | 795/360 | 2687/1219 | 215/814 | 1075/488 | 2867/1301 |
| 900/50R42 | 235/888 | 1956/888 | 201/761 | 704/319 | 2379/1079 | 190/719 | 950/431 | 2534/1149 |
| 900/60R32 | 270/1022 | 2252/1022 | 231/874 | 809/367 | 2734/1240 | 219/829 | 1095/497 | 2921/1325 |
| 900/65R32 | 289/1096 | 2413/1096 | 248/939 | 868/394 | 2936/1332 | 235/889 | 1175/533 | 3134/1422 |

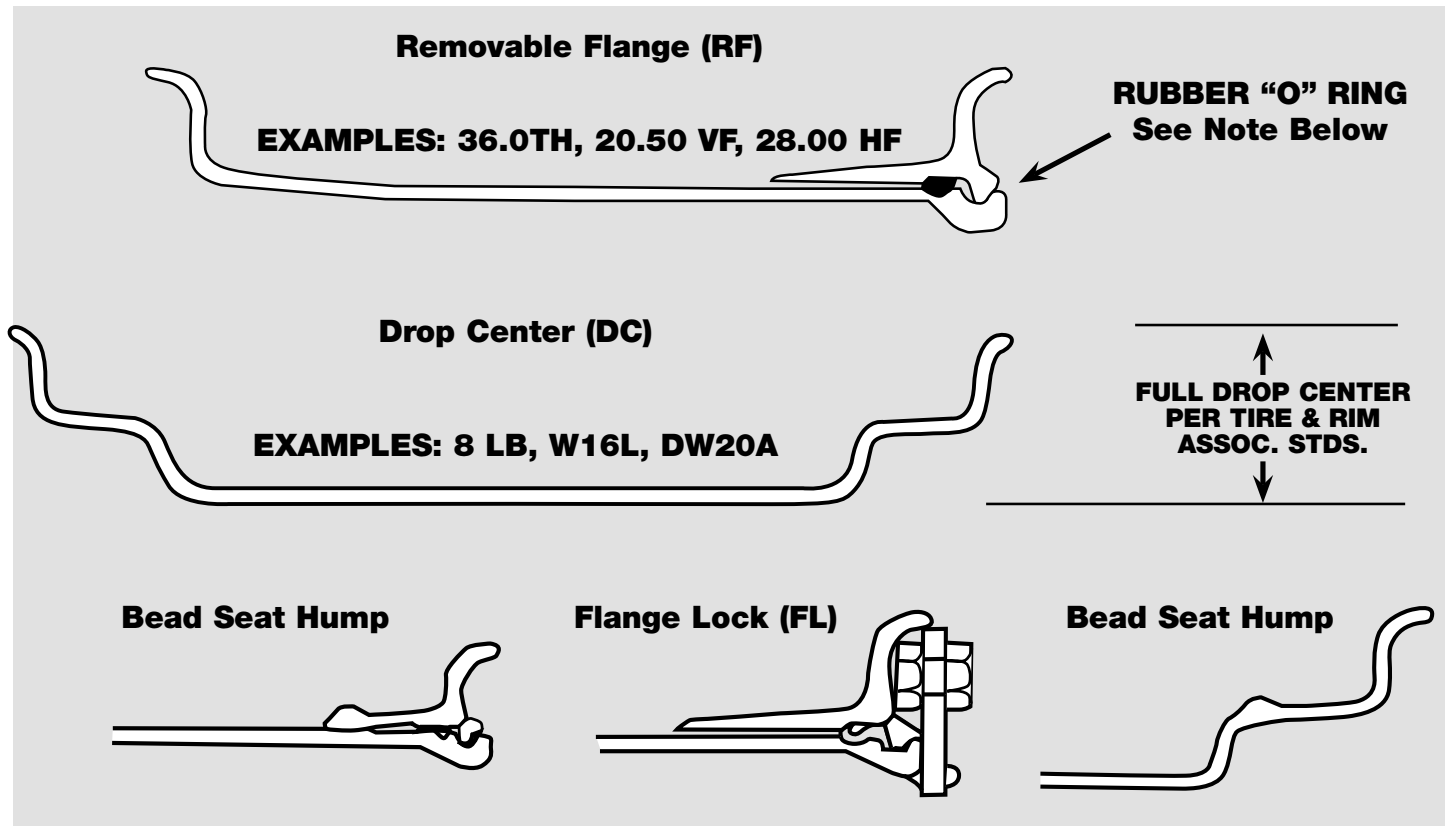
Note: For 40% fill, multiply above values by 0.5.

Terra-Tires – 75% Fill

| Tire Size | Water | | 3½ lbs./420 g CaCl ₂ | | | 5 lbs./600 g CaCl ₂ | | |
|-------------------|-------------|-----------|---------------------------------|-------------------|-----------|--------------------------------|-------------------|-----------|
| | | Weight | Water | CaCl ₂ | Total Wt. | Water | CaCl ₂ | Total Wt. |
| | Gal./Liters | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. | Gal./Liters | Lbs./Kg. | Lbs./Kg. |
| 23x8.50-12 NHS | 6/23 | 50/23 | 5/19 | 18/8 | 60/27 | 5/19 | 25/11 | 67/30 |
| 23x10.50-12 NHS | 7/26 | 58/26 | 5/19 | 21/10 | 71/32 | 6/23 | 30/14 | 80/36 |
| 26x12.00-12 NHS | 10/38 | 83/38 | 9/34 | 31/14 | 106/48 | 8/30 | 40/18 | 107/49 |
| 25x8.50-14 NHS | 7/26 | 58/26 | 6/23 | 21/10 | 71/32 | 6/23 | 30/14 | 80/36 |
| 25x7.50-15 NHS | 6/23 | 50/23 | 5/19 | 18/8 | 60/27 | 5/19 | 25/11 | 67/30 |
| 25x10.50-15 NHS | 7/26 | 58/26 | 6/23 | 21/10 | 71/32 | 6/23 | 30/14 | 80/36 |
| 25x12.50-15 NHS | 8/30 | 67/30 | 7/26 | 25/11 | 83/38 | 7/26 | 35/16 | 93/42 |
| 27x8.50-15 NHS | 7/26 | 58/26 | 6/23 | 21/10 | 71/32 | 6/23 | 30/14 | 80/36 |
| 27x9.50-15 NHS | 9/34 | 75/34 | 8/30 | 28/13 | 94/43 | 7/26 | 35/16 | 93/42 |
| 27x10.50-15 NHS | 10/38 | 83/38 | 9/34 | 32/15 | 106/48 | 8/30 | 40/18 | 107/49 |
| 29x12.50-15 NHS | 14/53 | 116/53 | 12/45 | 42/19 | 142/64 | 11/42 | 55/25 | 146/66 |
| 31x12.50-15 NHS | 18/68 | 149/68 | 15/57 | 52/24 | 177/80 | 14/53 | 70/32 | 186/84 |
| 31x13.50-15 NHS | 19/72 | 158/72 | 16/61 | 56/25 | 189/86 | 18/68 | 75/34 | 200/91 |
| 31x15.50-15 NHS | 20/76 | 166/75 | 17/64 | 60/27 | 201/91 | 16/61 | 80/36 | 213/97 |
| 33x12.50-15 NHS | 22/83 | 183/83 | 19/72 | 66/30 | 224/102 | 18/68 | 90/41 | 239/108 |
| 36x13.50-15 NHS | 30/114 | 250/113 | 26/98 | 91/41 | 308/140 | 24/91 | 120/54 | 320/145 |
| 38x20.00-16.1 NHS | 42/159 | 349/158 | 36/136 | 126/57 | 425/193 | 34/129 | 170/77 | 452/205 |
| 38x14.00-20 NHS | 30/114 | 249/113 | 26/98 | 91/41 | 307/139 | 24/91 | 120/54 | 320/145 |
| 41x14.00-20 NHS | 32/121 | 267/121 | 27/102 | 95/43 | 320/145 | 26/98 | 130/59 | 347/157 |
| 42x25.00-20 NHS | 66/250 | 548/249 | 57/216 | 200/91 | 673/305 | 53/201 | 265/120 | 705/320 |
| 44x18.00-20 NHS | 56/212 | 476/216 | 48/182 | 168/76 | 566/257 | 45/170 | 225/102 | 548/249 |
| 44x41.00-20 NHS | 110/416 | 913/414 | 94/356 | 329/149 | 1109/503 | 88/333 | 440/200 | 1170/531 |
| 48x25.00-20 NHS | 92/348 | 764/347 | 79/299 | 277/126 | 933/423 | 74/280 | 370/168 | 984/446 |
| 48x31.00-20 NHS | 125/473 | 1038/471 | 107/405 | 375/170 | 1263/573 | 100/378 | 500/227 | 1330/603 |
| 48x20.00-24 NHS | 54/204 | 450/204 | 46/174 | 161/73 | 545/247 | 43/163 | 215/98 | 573/260 |
| 54x31.00-26 NHS | 117/443 | 975/442 | 100/378 | 350/159 | 1184/537 | 95/360 | 475/215 | 1267/575 |
| 66x43.00-25 NHS | 327/1238 | 2714/1231 | 280/1060 | 980/445 | 3304/1499 | 263/995 | 1315/596 | 3498/1587 |
| 66x44.00-25 NHS | 347/1313 | 2880/1306 | 298/1128 | 1043/473 | 3516/1595 | 279/1056 | 1395/633 | 3711/1683 |
| 67x34.00-25 NHS | 224/848 | 1859/843 | 192/727 | 672/305 | 2266/1028 | 180/681 | 900/408 | 2394/1086 |
| 67x34.00-26 NHS | 220/833 | 1826/828 | 188/712 | 659/299 | 2220/1007 | 176/666 | 882/400 | 2343/1063 |
| 67x34.00-30 NHS | 202/765 | 1677/761 | 173/655 | 606/275 | 2041/926 | 162/613 | 810/367 | 2155/978 |
| 73x44.00-32 NHS | 372/1408 | 3088/1401 | 318/1204 | 1113/505 | 3895/1767 | 299/1132 | 1495/678 | 3977/1804 |

RIM TYPES

Goodyear tires are designed to be used with rims having the dimensions of those shown as "approved rims" for the tire size in the Tire and Rim Association yearbook, current at the time of tire manufacture. Usage of other rims must be specifically approved by Goodyear Farm Tires.



Rim Types:

1. Removable Flange (RF) Drop Center (DC) – These are conventional type rims used with tire sizes as specified in the "Approved Rim Contours" charts that follow. When available in both types, the RF rim is recommended for heavier loads and more severe service.
2. Flange Lock (FL) – Driving mechanism and flange locking device on (RF) rims, for use with a high torque application and/or low pressure (below 10 psi) to maintain air seal.
3. Bead Seat Hump – Available when specified on drop center and removable flange rims. For Terra-Tire sizes which operate on side-slopes or rough terrain at inflation pressures of 10 psi or less.

NOTE: Rubber "O" Ring - 20" Dia. Rim Part #OR20JM★, 25" Dia. Rim Part #OR25T★, 32" Dia. Rim Part #OR32T★
 (★-Goodyear Part Number)