HOW TO USE THIS HANDBOOK

Follow this simple step-by-step procedure to obtain the best results from your tires.

1. Pick the right design for the job

On page 7 of this handbook there is an explanation of the Tire and Rim Association tire type codes. The TRA tire type codes are an excellent guide for determining the type of service for which a tire is intended. Use an R-1 tire (DT710, Dyna Torque Radial, Dyna Torque or Dyna Torque II) 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 likely be 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 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 ballast 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."

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 streeses under tractor tires at various inflation pressures.* Proceedings of the 11th Annual Conference of ISTVS, Volume I, Incline Village, CA. Sept. 27-30, 1993.

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 pages 112-113 and to the footnotes of the extended load tables on pages 94-110.

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 on pages 94-110.

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 tables on pages 119-125 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 decreases also. 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

Tire measurements are shown on the pages 26-93.

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 tire width (SD) for bias tires and 2.5 inches plus 10% of the tire width for radial tires.

5. Weight your tractor properly

A tire on a tractor can meet all of the above 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 tractor are shown below:

	Weight Distribution Front/Rear Range	
	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 the above points and still have questions, read the sections titled "Things You Should Know About Farm Tires" starting on page 8 and "Optimum Tractor Tire Performance" on page 20 or consult your local Goodyear Farm Tire Dealer.

INTRODUCTION

This Farm Tire Handbook is designed as a convenient reference for tire dealers, tractor and implement dealers, tractor and implement manufacturers, salesmen and farmers.

The first several sections of the book are devoted to a presentation of the most popular tires designed for agricultural use. The concluding sections offer information on service and maintenance. You'll also find material on such related products as tubes, valves, and rims.

While we've attempted to make this handbook as complete and easy to use as possible, we do invite your inquiry if you have an unanswered question. Simply contact your local Goodyear Store or Dealer – or if you prefer, write us direct: Goodyear, Farm Tire Marketing Department, Akron, Ohio 44316. Either way, we'll be happy to be of service.

***TUBELESS DIMENSIONAL DATA & INFLATION TABLES**

Tubeless agricultural tires have the same outside appearance and the same dimensions as tube-type tires. Tubeless tires carry the same loads at the same inflation pressures as tube-type tires. Therefore, all tire dimensional data shown in this handbook along with the load/inflation tables, liquid fill values, etc., apply to either tubeless or tube-type tires.

TABLE OF CONTENTS

SELECTION OF TIRES FOR AGRICULTURAL VEHICLES AND DEFINITION OF TERMS

TIRE SELECTION

a) Selection of size and Ply Rating on each axle shall be based on the highest individual wheel load (as determined below) when vehicle is weighed statically.

Maximum load per tire shall not be greater than specified in applicable tables.

b) For sustained high torque service – Drive wheel tires on Agricultural tractors operating in the field must be selected to withstand the maximum pull of the tractor under normal operating service.

c) Maximum speed for Agricultural tires is 25 MPH.

DEFINITIONS OF TERMS

Maximum Load – Maximum loads on individual tires are determined by considering the maximum axle load on each half of the axle and dividing by the number of tires on that half. The maximum load in field service or transport is to include:

a) **Net Weight** – defined as the actual weight of the vehicle with standard equipment, including the maximum capacity of engine fuel, oil, coolant, and operator (170#).

b) **Accessory Weight, Optional Equipment Weight, and Special Order Modifications.**

Accessory Weight – means the combined weight of those installed production items not previously considered in "Net Weight" (such as air-conditioner, etc.)

Optional Equipment Weight – means the difference in Net Weight between the optional item and standard item replaced (such as engine, brakes, tires, etc.). This is to include the Net Weight of additional items offered by the manufacturer which are not replacements for standard items (such as cabs, sideboards, etc.)

c) **Tire Ballast** – if used, must be included in determination of Maximum Load.

d) **Field Modifications** – means the Net Weight change due to vehicle alterations made by those other than the original manufacturer (such as modifications for additional capacity, reinforcements, etc.)

e) **Bin and Tank Loads** – includes total weight when full.

f) **Implements** – includes that portion of the weight of any implement carried by the axle.

g) **Cyclic Loading on Agricultural Harvesting Equipment** – means gradual increase of payload to maximum allowable load (see appropriate tables and notes) with unloading before off-field transport.

Hillside Combine – Combine intended for service on slopes above 11° (20% Grade).

Operating Conditions – Refer to footnotes in appropriate tables.

Minimum Dual Spacing – Minimum dual tire centerline to centerline measurement.

For Tractor Drive Wheel Tires

Bias Tires – Design Section Width x 1.10 + 1.50 inches.
Radial Tires – Design Section Width x 1.10 + 2.50 inches.

L (In Size Designation) – Low section height agricultural tires.

SL – Service limited to agricultural usage.

FI – Tires for use only on farm implements in Agricultural Service with intermittent highway use.

NHS – Not for highway service

1 inch = 25.4 millimeters = 2.54 centimeters
1 foot = 30.48 centimeters = .3048 meters
1 mile = 1609.3 meters = 1.6093 kilometers
1 mile = 5280 feet = 1760 yards
1 square inch = 6.4516 square centimeters
1 square foot = 144 square inches
1 square yard = 9 square feet
1 square mile = 640 acres
1 hectare = 2.471 acres
1 gallon water = 8.3453 pounds of water
1 U.S. gallon = 3.785 liters
1 peck = 8 quarts (dry)
1 bushel = 4 pecks (U.S.)
1 lbm = .4536 kilogram
1 lbf = 4.45 Newtons
1 psi = 6.895 kilopascal (kPa) = .06895 bar

★ MARKED RADIAL AGRICULTURAL TRACTOR DRIVE TIRES

Construction and performance characteristics of radial agricultural tractor drive tires are considerably different from those of bias ply tires. Therefore, a different approach is needed to effectively recognize these differences. To maximize the benefits inherent in our radial tractor tires in a load/inflation program that will be different but readily understood, Goodyear has introduced “Symbol” marked radial drive tires.

All conventional sized radial agricultural tractor drive tires are marked with ★, ★★, or ★★★. The maximum load rating for ★ agricultural tractor tires in all sizes is at 18 psi inflation pressure. Maximum load for all ★★ agricultural tractor tires is at 24 psi and for all ★★★ agricultural tractor tires the maximum load is specified at 30 psi.

To clearly recognize the capabilities of the radial tractor tire, a panel cured in each sidewall will show: the symbol marking; the maximum tire load at the appropriate inflation pressure; and a notation on which bias ply rating tire(s) this radial tire will replace.

NOTE: The above descriptions associating 18 psi, 24 psi, and 30 psi with ★, ★★, and ★★★ marked tires applies to radial agricultural tractor tires only. Earthmover and All Terrain Vehicle (ATV) tires also use star symbol markings. However, different inflation pressures are used. For All Terrain Vehicle (ATV) tires, see pages 88-91.

Here is an example of how the panel will look for a radial agricultural tractor drive tire:

“SYMBOL” MARKED REPLACEMENT CHART

Dyna Torque Radial		USA or European Ply Rating	European Radial
13.6R28	★★★	8PR	13.6R28 123A8
14.9R26	★★★	10PR	14.9R26 127A8
14.9R28	★★★	10PR	14.9R28 128A8
14.9R30	★★★	10PR	14.9R30 129A8
14.9R34	★★★	10PR	14.9R34 131A8
14.9R46	★★★	8PR	14.9R46 137A8
15.5R38	★	6PR	
16.9R24	★★	8PR	16.9R24 134A8
16.9R26	★★	8PR	16.9R26 135A8
16.9R28	★★	8PR	16.9R28 136A8
16.9R30	★★	8PR	16.9R30 137A8
16.9R38	★	6PR	

Dyna Torque Radial		USA or European Ply Rating	European Radial
18.4R26	★★	8 & 10PR	18.4R26 140A8
18.4R34	★	6 & 8PR	
18.4R38	★	6 & 8PR	
	★★	10PR	18.4R38 146A8
18.4R42	★★	10PR	18.4R42 148A8
18.4R46	★★★		18.4R46 150A8
20.8R34	★	8PR	
20.8R38	★	8PR	
	★★	10PR	20.8R38 153A8
20.8R42	★★	10PR	20.8R42 155A8
24.5R32	★	10PR	
30.5LR32	★	10 & 12PR	

INDUSTRY STANDARDS & TIRE SELECTION CHART

The “Ply Rating” designation used throughout this book complies with the designation adopted by the Tire and Rim Association. For all agricultural tires shown here, the term “Ply Rating” is used to identify a given tire with its maximum recommended load, when used in a specific type of service. It is an index of tire strength and does not necessarily represent the actual number of cord plies in the tire.

TIRE CODE

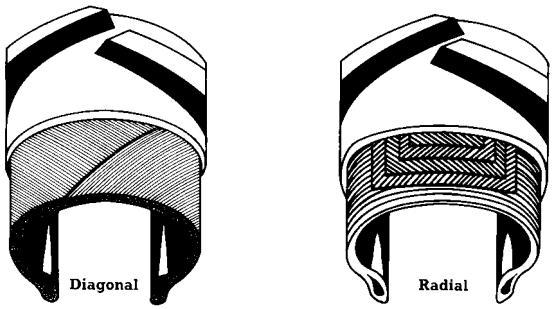
In the table below, Goodyear provides a tire selection chart and the code approved by the Tire and Rim Association for specific types of agricultural tires. (This code was created in the interest of simplifying reference to specific types of agricultural tires, regardless of the manufacturer’s design name.) Goodyear agricultural tires reflect the appropriate code number on the tire sidewall, in the vicinity of the size stamping.

CODE	INDUSTRY TIRE TYPE	TIRE SERVICE	GOODYEAR NAME
F-1	Agricultural Single Rib Tread	Rice Farming	Single Rib
F-2-M	Agricultural Multiple-Rib Tread	General Farming	Dyna Rib Four Rib
F-2	Agricultural Multiple-Rib Tread		Super Rib Tripe Rib R/S / Triple Rib HD
F-3	Industrial Multiple-Rib Tread	Light Industrial Service	Multi Rib Laborer
	REAR TRACTOR TIRES		
R-1	Drive Wheel, Regular Tread	General Farming	Ultra Torque Radial DT710/DT720/DT730 Dyna Torque Radial Dura Torque Dyna Torque II Power Torque
R-1W	Drive Wheel, Wet Traction Tread	Wet or Moist Soil	Super Traction Radial/ DT 800/DT 810/DT 820
R-2	Cane and Rice, Drive Wheel, Deep Tread	Wet Muck Sugar Cane Rice Farming	TD-8 TD-8 Radial
R-3	Drive Wheel, Shallow Tread	Sandy or Volcanic Ash Soils Orchards Highway Mowing Golf Course Work Light Industrial Service	All Weather
R-4	Industrial Tractor, Drive Wheel, Intermediate Tread	Light Industrial Service Highway Mowing	Industrial Sure-Grip Industrial Torque IT525
HF-1	High Flotation, Rib Tread	Golf Course Work	Tundra Grip, Terra Rib, Softrac
HF-2	High Flotation, Regular Lug Tread	General Farming	Super Terra Grip
HF-3	High flotation, Deep Lug Tread	Wet or Moist Soil	Super Terra-Grip XT
HF-4	High Flotation, Extra Deep Tread	Wet Muck	Custom Flo-Grip
	GARDEN TRACTOR TIRES		
	Lug Type	Gardens	Super Sure-Grip
	Universal Type	Lawn Mowers	Lawn and Garden
	IMPLEMENT TIRES		
I-1	Rib Tread	Free Rolling Wheels	Rib Implement Farm Service Farm Utility
I-2	Moderate Traction Implement	Drive or Free Rolling Wheels	All Weather Softrac II All Traction
I-3	Traction Tread	Drive Wheels	Sure-Grip Traction Implement
I-6	Smooth Tread		

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 dismounted rim will rust quickly if not rinsed with tap water immediately. For instructions on how to liquid fill tubeless and tube type tires, see page 126.

Tire size Nomenclature

Conventional sizing - 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 page 12 for a more complete description of this sizing system.

Sidewall Info

All Goodyear farm tires have on both sidewalls the name "GOODYEAR" in large letters, a size marking, a tire name such as "DT710", 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 which are found on pages 94 through 118.

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. See page 6 for additional information.

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 page 13). 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 pages 14 - 18.

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 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 pages 132 - 137 for the list of recommended and alternate rims.

THINGS YOU SHOULD KNOW ABOUT FARM TIRES (CONT'D)

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

On page 7 of this handbook there is an explanation of the Tire and Rim Association tire type codes. The TRA tire type codes are 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 DT710, Dyna Torque Radial and Dyna Torque II.

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 percent 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, DT810 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 are used on turf or in sandy areas where the disturbance of an aggressive lug-type tire is not wanted. R-3s 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, Industrial Torque, 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 the type codes for steer, implement and garden tractor tires, see page 7.

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 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 on pages 94 through 118 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.

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 know 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.

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, 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.

THINGS YOU SHOULD KNOW ABOUT FARM TIRES (CONT'D)

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 on pages 94 through 110. 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 tables on pages 94 through 110. See also the section above on Optimum Tractor Tire Performance on page 20.

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 & 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.

Other Reasons To Adjust Pressure

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 at the top of page 11. For more complete information on how to set up your tractor for optimum performance see the section on "Optimum Tractor Tire Performance".

THINGS YOU SHOULD KNOW ABOUT FARM TIRES (CONT'D)

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 3 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 on pages 138 through 147 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 tables on pages 94 through 118.

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 over-loaded 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. On the left is a photo of a tire operated extensively on the road.

Using the correct inflation pressure from the 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 occurs which experience shows was started by the overheated condition that developed when the unit was towed at a high speed.

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.

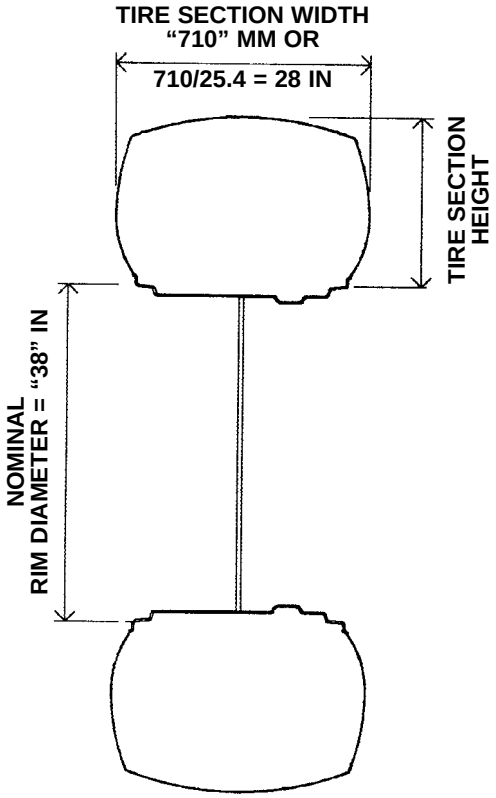
Since heat and light also degrade tires, care should be taken to make sure that they are stored in a cool, dark place. Tires should be protected from sunlight either under shelter or at least covered with an opaque tarp or black polyethylene.

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.

MILLIMETRIC TIRE SIZE MARKING

Some farm tires use “millimetric” marking similar to passenger, truck, and earthmover tires. Millimetric load and speed ratings are noted in a “service description” which combines a LOAD INDEX and a SPEED SYMBOL. See below for explanations of these terms. Millimetric marking complies with an ISO standard for agricultural tires and allows tailoring a tire to specific dimensional constraints (diameter and width), load requirements, and rolling circumference targets for mechanical front wheel assist tractors.

EXAMPLE: TIRE SIZE: 710/70R38 166A8



INTERNATIONAL SPEED SYMBOLS

Speed Symbols	Speed Category (Km/h)	Speed Category *(MPH)
A1	5	2.5
A2	10	5
A3	15	10
A4	20	12.5
A5	25	15
A6	30	20
A7	35	22.5
A8	40	25
B	50	30
C	60	35
D	65	40
E	70	43
F	80	50
G	90	55

*For information only.

“710” TIRE SECTION WIDTH IN MILLIMETERS Dividing this number by 25.4 gives the width of the tire in inches.

“70” ASPECT RATIO OF TIRE
Just like in a passenger tire, the aspect ratio is the ratio of section height to section width.

$$\text{ASPECT RATIO} = \frac{\text{TIRE SECTION HEIGHT}}{\text{TIRE SECTION WIDTH}} \times 100$$

“R” RADIAL CONSTRUCTION

“38” NOMINAL RIM DIAMETER IN INCHES

“166” LOAD INDEX

Load indexes are a uniform way to describe the load carrying capacity of the tire. A 166 load index means that the tire can carry 5300 kg or 11700 lbs. See page 13. Unlike a star rated tire, a load index tire does NOT correspond to a specific inflation pressure. For example, look on page 100-103 of this book. A 320/85R34 has a LI (LOAD INDEX) of 133 at 200 kPa (29.0 psi). A 133 load index means the tire can carry 2060 kg or 4540 lbs. A 480/70R28 has the same load index (same load carrying capacity) but at a different pressure, 120 kPa (17.4 psi). Always check the handbook to determine the pressure needed to carry the specified load.

“A8” SPEED SYMBOL

The speed symbol determines the maximum speed allowed for the rated load of the tire. From the table on the left, A8 means the maximum speed allowed for the rated load of the tire is 40 km/h or 25 MPH.

SEE PAGES 14-19 FOR MORE INFORMATION ON METRIC SIZE TIRES

INTERNATIONAL LOAD INDEX NUMBERS KILOGRAM LOADS, AND T&RA EQUIVALENT POUND LOADS

(NOT applicable to Passenger Car Tires)

LOAD INDEX (LI)	kg	lbs	LOAD INDEX (LI)	kg	lbs	LOAD INDEX (LI)	kg	lbs
80	450	990	110	1060	2340	140	2500	5520
81	462	1020	111	1090	2400	141	2575	5680
82	475	1050	112	1120	2470	142	2650	5840
83	487	1070	113	1150	2540	143	2725	6000
84	500	1100	114	1180	2600	144	2800	6150
85	515	1140	115	1215	2680	145	2900	6400
86	530	1170	116	1250	2760	146	3000	6600
87	545	1200	117	1285	2830	147	3075	6800
88	560	1230	118	1320	2910	148	3150	6950
89	580	1280	119	1360	3000	149	3250	7150
90	600	1320	120	1400	3080	150	3350	7400
91	615	1360	121	1450	3200	151	3450	7600
92	630	1390	122	1500	3300	152	3550	7850
93	650	1430	123	1550	3420	153	3650	8050
94	670	1480	124	1600	3520	154	3750	8250
95	690	1520	125	1650	3640	155	3875	8550
96	710	1570	126	1700	3740	156	4000	8800
97	730	1610	127	1750	3860	157	4125	9100
98	750	1650	128	1800	3960	158	4250	9350
99	775	1710	129	1850	4080	159	4375	9650
100	800	1760	130	1900	4180	160	4500	9900
101	825	1820	131	1950	4300	161	4625	10200
102	850	1870	132	2000	4400	162	4750	10500
103	875	1930	133	2060	4540	163	4875	10700
104	900	1980	134	2120	4680	164	5000	11000
105	925	2040	135	2180	4800	165	5150	11400
106	950	2090	136	2240	4940	166	5300	11700
107	975	2150	137	2300	5080	167	5450	12000
108	1000	2200	138	2360	5200	168	5600	12300
109	1030	2270	139	2430	5360	169	5800	12800

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 as follows:

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

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: 14.9R30 Dyna Torque Radial
REAR: 18.4R42 Dyna Torque Radial
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: Look on pages 16-18 to find the rolling circumference for each size. (Sizes are sorted by rolling circumference.)

14.9R30 Dyna Torque Radial Rolling Circumference = 167.4 in
18.4R42 Dyna Torque Radial Rolling Circumference = 220.5 in
Front/Rear Gear Ratio: 1.333 (available thru tractor dealer)

CURRENTLY:

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

$$= \frac{167.4 \times 1.333}{220.5}$$

= 1.012 IF THIS NO. > 1 MEANS POSITIVE SLIPPAGE
IF THIS NO. < 1 MEANS NEGATIVE SLIPPAGE

TO FIND PERCENTAGE SLIPPAGE:

(1.012-1) = .012

x 100 = 1.2% SLIPPAGE (GOOD; WITHIN +1 to +5% RANGE)

NEW TIRE:

Now find a tire on page 16 with approximately the same rolling circumference (167.4 in) as the 14.9R30 front tire. Select 16.9R26 Super Traction Radial as a possible replacement. It has a rolling circumference of 161.8 in.

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

16.9R26 Super Traction Radial Rolling Circumference = 161.8 in
18.4R42 Dyna Torque Radial Rolling Circumference = 220.5 in
Front/Rear Gear Ratio: 1.333 (available thru tractor dealer)

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

$$= \frac{161.8 \times 1.333}{220.5}$$

= .978 IF THIS NO. > 1 MEANS POSITIVE SLIPPAGE
IF THIS NO. < 1 MEANS NEGATIVE SLIPPAGE

TO FIND PERCENTAGE SLIPPAGE:

(.978-1) = -.022

x 100 = -2.2% 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.

NEW TIRE:

Now find a tire on page 16 with approximately the same rolling circumference (167.4 in) as the 14.9R30 front tire. Select 16.9R28 DT 710 as possible replacement. It has a rolling circumference of 169.3 in.

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

16.9R28 DT 710 Rolling Circumference = 169.3 in
18.4R42 Dyna Torque Radial Rolling Circumference = 220.5 in
Front/Rear Gear Ratio: 1.333 (available thru tractor dealer)

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

$$= \frac{169.3 \times 1.333}{220.5}$$

= 1.023 IF THIS NO. > 1 MEANS POSITIVE SLIPPAGE
IF THIS NO. < 1 MEANS NEGATIVE SLIPPAGE

ROLLING CIRCUMFERENCE (CONT'D)

TO FIND PERCENTAGE SLIPPAGE:

(1.023-1) = .023

x 100 = 2.3% 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 PAGES 132-135 TO SELECT THE CORRECT RIM FOR THE NEW TIRE.

EXAMPLE #2:

Find front and rear tires for row crop planting purposes.

GIVEN: 14.9R30 Dyna Torque Radial Rolling Circumference = 167.4 in
18.4R42 Dyna Torque Radial Rolling Circumference = 220.5 in
Front/Rear Gear Ratio: 1.333 (available thru tractor dealer)

From the previous example, it is known that a 14.9R30 front and an 18.4R42 rear gives a good match. If we find similar row crop sizes, (narrow width tires to allow for clearance between rows) as the 14.9R30 and 18.4R42 respectively, these new tires should have a good front to rear match. Look on page 16 to find the 14.9R30 Dyna Torque Radial rolling circumference of 167.4 in. The next two sizes above this tire are the 290/95R34 DT730 (overall width = 11.1 in) and the 320/85R34 Dyna Torque Radial (overall width = 12.6 in). Both tires are good candidates because of the narrow width and similar rolling circumference as the existing tire (14.9R30). Now look on page 18 to find the 18.4R42 Dyna Torque Radial rolling circumference of 220.5 in. Find a narrow width tire with about the same rolling circumference as the 18.4R42. The 320/90R50 DT800 fits the criteria (overall width = 12.6 in and rolling circumference of 219.0 in). Now check to see if the front & rear combination is within the acceptable +1 to +5% positive slippage.

FRONT: 290/95R34 DT730 Rolling Circumference = 166.9 in
REAR: 320/90R50 DT800 Rolling Circumference = 219.0 in
Front/Rear Gear Ratio: 1.333 (available thru tractor dealer)

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

$$= \frac{166.9 \times 1.333}{219.0}$$

= 1.016 IF THIS NO. > 1 MEANS POSITIVE SLIPPAGE
IF THIS NO. < 1 MEANS NEGATIVE SLIPPAGE

TO FIND PERCENTAGE SLIPPAGE:

(1.016-1) = .016

x 100 = 1.6% SLIPPAGE (GOOD; WITHIN +1 to +5% RANGE)

AFTER DETERMINING IF THE NEW TIRES MATCH, LOOK AT THE OVERALL DIAMETER AND OVERALL WIDTH TO COMPARE TO CURRENT TIRE FOR CLEARANCE PURPOSES. NEXT, DETERMINE IF THE NEW TIRES CAN CARRY THE LOAD ON YOUR TRACTOR. FINALLY, SEE PAGES 132-135 TO SELECT THE CORRECT RIMS FOR THE NEW TIRES.

WORKSHEET:

FRONT TIRE SIZE: _____ Rolling Circumference = ____ in

REAR TIRE SIZE: _____ Rolling Circumference = ____ in

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

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

$$= \frac{\quad x \quad}{\quad}$$

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

TO FIND PERCENTAGE SLIPPAGE:

(____ -1) = ____

x 100= ____% SLIPPAGE (WITHIN +1 to +5% RANGE ?)

RADIAL TIRE SIZES
SORTED BY ROLLING CIRCUMFERENCE

SIZE	DESIGN	ROLLING CIRC. (IN)	OVERALL DIAMETER (IN)	OVERALL WIDTH (IN)
240/70R16	DT810 Radial	87.4	29.2	9.6
260/70R16	DT810 Radial	91.1	30.5	10.2
250/80R16	Super Traction Radial	97.5	32.6	10.3
250/80R18	Super Traction Radial	103.7	34.6	10.1
260/80R20	Super Traction Radial	112.0	37.4	10.3
11.2R20	Super Traction Radial	117.6	39.4	11.5
380/70R20	DT810 Radial	126.3	42.4	15.0
320/70R24	DT810 Radial	129.7	43.2	12.1
320/75R24	DT710 Radial	130.3	43.4	12.3
380/70R24	DT810 Radial	139.8	46.8	14.8
13.6R24	Super Traction Radial	141.4	47.0	13.8
420/70R24	DT810 Radial	146.2	49.0	16.6
14.9R24	Super Traction Radial	146.4	48.7	15.4
14.9R24	DT710 Radial	149.1	49.8	15.7
380/70R28	DT810 Radial	152.0	50.7	15.1
13.6R28	Super Traction Radial	153.2	51.0	13.8
16.9R24	Super Traction Radial	154.4	51.9	17.7
13.6R28	DT710 Radial	155.0	51.6	14.3
13.6R28	Dyna Torque Radial	155.4	51.8	14.0
14.9R26	Dyna Torque Radial	155.6	52.0	14.8
16.9R24	Dyna Torque Radial	157.1	52.7	17.5
420/70R28	DT810 Radial	158.7	52.9	16.9
14.9R28	Super Traction Radial	158.8	52.9	15.2
250/95R34	DT800 Radial	159.7	53.1	9.9
380/85R28	UltraTorque Radial	160.1	53.4	15.0
14.9R28	Dyna Torque Radial	161.2	53.8	15.2
14.9R28	DT710 Radial	161.5	53.8	15.7
16.9R26	Super Traction Radial	161.8	53.9	17.6
16.9R26	Dyna Torque Radial	163.1	54.6	17.0
14.9R30	Super Traction Radial	164.7	54.9	15.2
290/95R34	DT730 Radial	166.9	55.4	11.1
320/85R34	Dyna Torque Radial	166.9	55.4	12.6
14.9R30	Dyna Torque Radial	167.4	55.8	15.2
14.9R30	DT710 Radial	167.6	55.8	15.7
480/70R28	DT810 Radial	167.9	56.1	19.1
380/85R30	UltraTorque Radial	168.0	56.0	15.0
16.9R28	Super Traction Radial	168.1	56.1	17.6
420/85R28	UltraTorque Radial	168.3	56.2	17.0
16.9R28	Dyna Torque Radial	168.7	56.4	17.2
16.9R28	DT710 Radial	169.3	56.5	18.1
18.4R26	Super Traction Radial	170.2	56.8	19.2
18.4R26	DT710 Radial	170.9	57.2	19.4
18.4R26	Dyna Torque Radial	171.5	57.5	19.0
540/65R30	DT820 Radial	172.7	57.6	20.9

(Continued On Next Page)

RADIAL TIRE SIZES
SORTED BY ROLLING CIRCUMFERENCE *(Continued)*

SIZE	DESIGN	ROLLING CIRC. (IN)	OVERALL DIAMETER (IN)	OVERALL WIDTH (IN)
16.9R28	Special Sure Grip TD8 Radial	173.0	58.2	16.9
16.9R30	Super Traction Radial	173.4	57.9	17.6
480/70R30	DT810 Radial	174.8	58.4	18.9
16.9R30	Dyna Torque Radial	175.2	58.5	17.2
600/65R28	DT820 Radial	175.2	58.7	23.3
16.9R30	DT710 Radial	175.4	58.5	18.1
380/85R34	DT800 Radial	176.8	58.9	15.0
13.6R36	Super Traction Radial	176.9	59.1	13.8
420/90R30	UltraTorque Radial	177.3	59.2	17.0
380/85R34	UltraTorque Radial	177.4	59.0	15.0
16.9R30	Special Sure Grip TD8 Radial	179.0	60.2	16.9
14.9R34	Dyna Torque Radial	179.7	59.8	15.2
385/85R34MPT	Dyna Torque Radial	179.7	59.8	15.2
18.4R30	Super Traction Radial	182.0	60.8	19.2
13.6R38	Super Traction Radial	183.4	61.3	13.8
18.4R30	DT710 Radial	183.4	61.2	19.4
15.5R38	DT710 Radial	185.1	61.4	16.0
16.9R34	Super Traction Radial	185.7	62.0	17.6
480/70R34	DT810 Radial	186.8	62.2	19.2
380/80R38	DT800 Radial	187.1	62.2	15.0
620/75R26	DT820 Radial	187.8	62.8	23.9
28LR26	Super Traction Radial	189.3	63.3	28.3
750/65R26	DT820 Radial	190.4	64.4	30.1
18.4R34	Super Traction Radial	193.8	64.8	19.2
18.4R34	DT710 Radial	195.8	65.2	19.4
480/85R34	UltraTorque Radial	196.8	65.6	18.9
320/90R42	DT800 Radial	196.9	65.4	12.6
16.9R38	Super Traction Radial	197.3	66.0	17.6
16.9R38	DT710 Radial	200.1	66.5	18.1
18.4R38	Super Traction Radial	205.2	68.7	19.2
320/90R46	DT800 Radial	206.8	68.6	12.6
250/95R50	DT800 Radial	207.0	68.5	9.9
480/80R38	UltraTorque Radial	207.0	68.9	18.9
18.4R38	Dyna Torque Radial	207.6	69.1	19.0
18.4R38	DT710 Radial	208.1	69.2	19.4
24.5R32	Dyna Torque Radial	211.9	70.9	24.9
18.4R38	Special Sure Grip TD8 Radial	212.4	71.2	18.4
320/90R46	Special Sure Grip TD8 Radial	213.0	70.8	12.6
340/85R46	Special Sure Grip TD8 Radial	213.0	70.8	13.6
650/75R32	DT820 Radial	213.4	71.4	24.2
800/65R32	Super Traction Radial	213.5	71.5	30.1
30.5LR32	Dyna Torque Radial	213.6	71.5	29.8
20.8R38	Super Traction Radial	215.7	72.2	21.6
580/70R38	DT810 Radial	216.4	72.2	23.1

(Continued On Next Page)

RADIAL TIRE SIZES
SORTED BY ROLLING CIRCUMFERENCE *(Continued)*

SIZE	DESIGN	ROLLING CIRC. (IN)	OVERALL DIAMETER (IN)	OVERALL WIDTH (IN)
14.9R46	Dyna Torque Radial	216.5	71.8	15.2
18.4R42	Super Traction Radial	216.8	72.1	18.4
20.8R38	Dyna Torque Radial	216.8	72.2	21.2
18.4R42	DT710 Radial	216.9	72.1	19.2
650/75R34	DT820 Radial	217.0	72.6	26.8
20.8R38	DT710 Radial	217.4	72.4	21.4
420/80R46	Dyna Torque Radial	218.4	72.5	16.5
520/85R38	UltraTorque Radial	218.6	72.8	20.3
320/90R50	DT800 Radial	219.0	72.6	12.6
380/90R46	DT800 Radial	219.0	72.7	15.0
480/80R42	UltraTorque Radial	219.0	72.8	18.9
18.4R42	Dyna Torque Radial	220.5	73.3	18.7
20.8R38	Special Sure Grip TD8 Radial	221.7	74.5	21.7
18.4R42	Special Sure Grip TD8 Radial	224.6	75.0	18.4
650/65R42	DT820 Radial	226.3	75.3	25.4
20.8R42	Super Traction Radial	227.6	76.2	21.6
710/70R38	DT820 Radial	227.6	76.0	28.0
20.8R42	Dyna Torque Radial	229.1	76.2	21.2
900/50R42	DT830 Radial	229.7	76.6	34.9
20.8R42	DT710 Radial	229.8	76.4	21.4
380/90R50	DT800 Radial	230.0	76.3	15.0
480/80R46	UltraTorque Radial	230.0	76.4	18.9
520/85R42	UltraTorque Radial	230.0	76.5	20.3
710/70R38	DT720 Radial	230.0	76.6	28.6
620/70R42	DT820 Radial	230.3	76.7	24.6
18.4R46	Dyna Torque Radial	232.2	77.1	19.0
20.8R42	Special Sure Grip TD8 Radial	233.5	78.2	20.8
18.4R46	Special Sure Grip TD8 Radial	233.7	77.9	18.4
520/85R46	Super Traction Radial	242.1	80.6	21.3
710/70R42	DT820 Radial	243.1	81.1	28.2

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 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

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 on pages 94 through 107 in this book. **Never operate with pressures lower than these.**

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 in 2 psi increments until it stops. Usually 6 to 8 psi above the correct inflation pressure for the load will suffice. 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 either radial or bias tires. 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 **either** the **front** or the **rear** inflation pressures from the correct inflation by 6 psi, then 8 psi if hop continues. Whether raising the front works best or the rear works best depends on soil conditions, type of implement, operating speed and use of liquid ballast. If raising the front pressure fails to control hop, then reset the front tires to the correct pressure for the load and raise the rears. 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. 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 pages 22 and 23.

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 Harversters, 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 in **2** psi increments until it stops. Usually **6 to 8 psi** above correct inflation pressure for the load will suffice. Rear tire inflation pressures should remain at the correct pressures for the load. The maximum front pressure should not exceed 30 psi for a 2* or 36 psi for a 3* radial; for a bias tire, the maximum front inflation pressure should not exceed 6 psi above the maximum rated pressure. 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., D/460H, Goodyear Tire & Rubber Company, P.O. Box 3531, Akron, OH 44309 or fax 330-796-9135

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 **either** the **front** or the **rear** inflation pressure by **6** to **8** psi above the correct inflation pressure for the tire load. Whether raising the front works best or the rear works best depends on soil conditions, type of implement, operating speed and use of liquid ballast. If raising the front pressure fails to control hop, then reset the front tires to the correct pressure for the load and raise the rears. 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., D/460H, Goodyear Tire & Rubber Company, P.O. Box 3531, Akron, OH 44309 or fax 330-796-9135

TERRA-TIRE® FLOTATION TIRE INFORMATION

Description

TERRA-TIRE® is a high flotation tire. In comparison with conventional tires, they have a wider cross section, a larger air volume, a more flexible carcass, and operate at lower inflation pressures. This unique design gives them a large “footprint” in contact with the ground and distributes load over a large area at low unit pressure. The net result is a flotation effect for go-anywhere performance – despite terrain, despite load.

Different styles of TERRA-TIRE® high flotation tires are available in a variety of sizes for use on all-terrain vehicles. A separate line of estate TERRA-TIRE® low pressure tires is available for golf carts and similar small-sized utility vehicles in a variety of sizes for virtually unlimited application versatility.

All TERRA-TIRE® FLOTATION TIRES are of tubeless construction, and all are made with 3-T –(triple-tempered) cord to set the cord at peak strength and resilience. Tread designs include smooth, rib, and traction-lug types, permitting considerable latitude in matching tire to application.

Advantages

(1) Lower Unit Ground Pressure: 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 with conventional tires. On a typical golf cart, for example, unit pressure is only about 5 pounds per square inch. In contrast, the walking pressure of a golfer is on the order of 24 pounds per square inch.

This reduction in ground pressure means less soil compaction, 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. And since these tires operate at relatively low inflation pressures they literally envelop rocks, stumps and other obstacles. This go-anywhere capability is as adaptable to farming, logging, and exploration as it is to the golf course.

(2) Improved Shock Absorption: The carcass of a TERRA-TIRE® is very flexible. This design characteristic, coupled with low inflation pressures, provides for high level energy absorption. The resulting air-cushion effect means less wear on equipment, reduced fatigue for the operator. In fact, for many applications the TERRA-TIRE® low pressure tire, is actually mounted without the use of springs. This offers a significant reduction in initial installation cost.

(3) Increased Pay Load To Vehicle Weight: The enveloping and cushioning effect of the TERRA-TIRE® permits both a strength and a weight reduction in vehicle design. The net result in designing a vehicle for a given load capacity is an effective increase in the ratio of pay load to vehicle weight. It is axiomatic that this design capability introduced by TERRA-TIRE® also results in a net savings in construction costs.

(4) Reduced Rolling Resistance: Large ground contact area, flexibility of carcass, and low inflation pressure work together to reduce rolling resistance. On sand, for example, a typical coefficient of rolling resistance for a TERRA-TIRE®, high flotation tire, is .078, compared with .275 for a truck tire. Golf courses report that carts equipped with TERRA-TIRE® tires often provide an extra 9 holes of operation on a single battery charge.

(5) Cost-Saving Replacement of Duals: *One* TERRA-TIRE® does the work of *two* conventional tires. The weight of a TERRA-TIRE® and rim is less than the weight of the dual wheels and tires it replaces. In addition to this net weight saving, these tires provide improved flotation, yet service and maintenance costs are generally lower.

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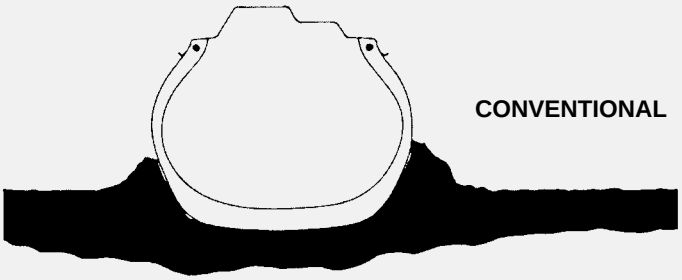
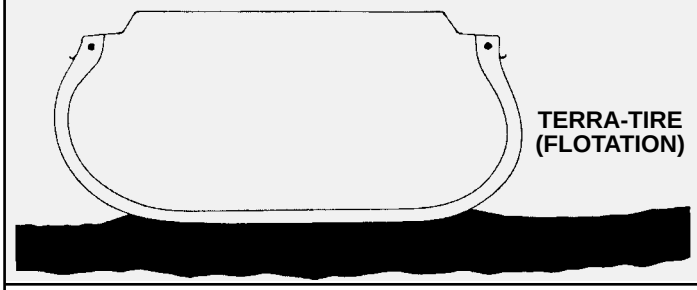
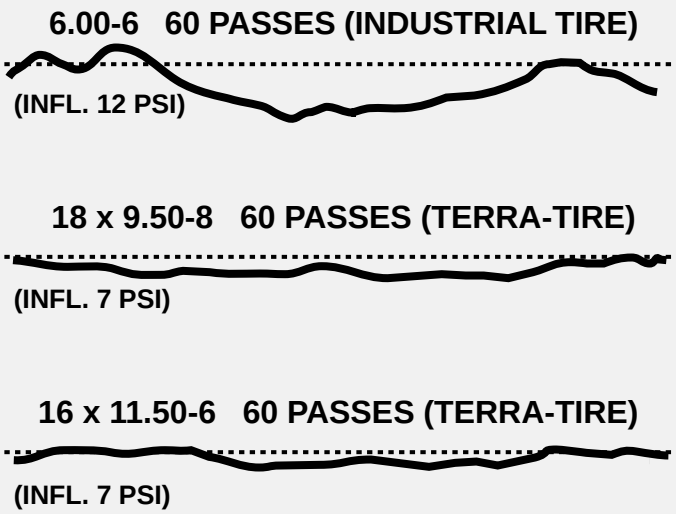
PHYSICAL CHARACTERISTICS

TIRE PENETRATION COMPARISON







ROLLING RESISTANCE

	TERRA-TIRE	Truck Tire	Track
Hard Surface	16	10	85
Sod	24	85	170
Mud	40	130	—
Soft Sand	78	275	—

Rolling resistance is the force required to roll a loaded tire and wheel assembly over a level surface at a constant speed. The rolling resistance listed in the table represents the resistance force for each 1000 pounds of load on the tire.

This force varies in a direct proportion with the resistance to flexing of the tire carcass and inversely with an increase in tire width.

The TERRA-TIRE® high flotation tire has lower rolling resistance than the conventional tire.

The rolling resistance values listed in this table are intended only for making a relative comparison between types of tires over various terrain conditions.

SIZE DESCRIPTION

TERRA-TIRE® size describes the tire dimensions in order of (1) overall diameter (2) overall width (3) bead diameter.

For example, as illustrated at the right, the 67 x 34.00-25 Custom Flo-Grip TERRA-TIRE® has a nominal overall diameter of 67(, nominal overall width of 34.00(and nominal bead diameter of 25(. Actual inflated tire dimensions are listed in the tire dimension data tables.