TIRE DEMOUNTING AND MOUNTING PROCEDURES FOR AGRICULTURAL TIRES

Note: These instructions are for single-piece rims

CONTENTS

The photos are provided as illustrative examples of proper tire procedures and do not constitute any endorsement of specific products.

USTMA would like to thank the Tire Industry Association (TIA) for providing photos for this publication.

Purpose

The purpose of this manual is to provide both the tire service professional and machine owners and operators with an understanding of the many factors that are essential to the proper care and service of agricultural tires. This manual is not all inclusive. U.S. Tire Manufacturers Association (USTMA) does not intend for it to eliminate the need for in-depth, hands-on training.

It is strongly recommended that anyone who services agricultural tires receives professional training. Tire manufacturers and industry organizations, such as the Tire Industry Association*, provide comprehensive service and maintenance information and hands-on training programs for tire service professionals.

The "WARNINGS" contained in USTMA publications are important and must be followed. Questions pertaining to specific products or pieces of service equipment should be addressed directly to the manufacturer of that product.

Introduction

The USTMA represents companies that manufacture tires in the United States. The USTMA and its members recognize how important tires are to safety.

Tire changing can be dangerous and should be done by trained personnel using proper tools and procedures. Always read and understand any "WARNINGS" contained in this publication and in the manufacturers' owner's manuals, on the equipment, and listed on websites and molded onto tire sidewalls.

Tires are designed and manufactured with advanced technology and great care to provide thousands of hours of excellent service. For maximum safety, performance and service life, they must be maintained properly. This Care and Service Manual will address these and other factors relative to the care and service of agricultural tires.

For the most current printed materials, visit the USTMA web site at www.USTires.org and click on "Publications" to search for other manuals, bulletins, wall charts, etc. For questions regarding USTMA publications, call 202-682-4800.

Typical Tool Requirements

- Combination bead breaker
- Portable hydraulic pump
- Bead keeper
- Rubber mallet
- Tubeless tire irons (Two)
- Spoon bar (Two)
- C-bar
- Wire brush
- Approved tire mounting lubricant
- Air/water inflation gauge
- Clip-on air chuck with an extension air hose
- Air inflation equipment should have a pressure regulator and an air filter/water separator to remove moisture
- Safety cage or restraining device
- Personal protective equipment (hearing protection, safety glasses, gloves, safety shoes)
- Boom truck (recommended for assistance in lifting/positioning heavy tires)
- Inflator ring (optional)
- Valve retrievel tool/valve fishing tool (optional)

Note: Only use tools/equipment/procedures per OSHA 1910.177 - "Servicing multi-piece and single piece rim wheels"

*The Tire Industry Association (TIA) is a trade association that represents all segments of the tire industry, including those that manufacture, repair, recycle, sell, service or use new or retreaded tires, and also those suppliers or individuals who furnish equipment, materials or services to the industry. Visit www.tireindustry.org for more information.

⚠WARNING

Tire changing can be dangerous and should be done by trained personnel using proper tools and procedures. Always read and understand any manufacturer's warning contained in owner's manuals, on the equipment, listed on websites and molded onto tire sidewalls. Failure to comply with these procedures and manufacturer's recommendations may result in faulty positioning of the tire and/or rim parts, and cause the assembly to burst with explosive force, sufficient to cause serious injury or death. Never mount or use damaged tires or rims.

⚠WARNING

Serious injury or death may result from:

- Explosion of tire/rim/wheel assembly due to improper mounting. Never exceed 35 psi (Air Pressure) or the manufacturer's stated maximum when seating beads. Always use safety cage or other restraining device & clip-on extension hose. Only specially trained persons should mount tires.
- Tire failure due to misapplication/improper inflation/overloading/exceeding maximum speed – follow tire manufacturer's instructions. Check inflation pressure frequently with gauge.
- Explosion of the tire/rim/wheel assembly due to welding the rim without first removing the tire – Never rework, weld, heat or braze the rim of a tire/rim/wheel assembly.

⚠WARNING

NEVER INFLATE BEYOND 35 PSI OR THE MANUFACTURERS STATED MAXIMUM
WHEN SEATING THE BEADS.
NEVER STAND, LEAN, OR REACH OVER THE ASSEMBLY DURING INFLATION.

Inspect both sides of the tire to be sure that the beads are evenly seated. Inflation should be done in a safety cage or other restraining device. If both beads are not properly seated when pressure reaches 35 psi, completely deflate the assembly, reposition the tire 180 degrees on the rim, relubricate, and reinflate.

Inflating beyond 35 psi inflation pressure or the manufacturer's stated maximum seating pressure when trying to seat the beads is a DANGEROUS PRACTICE that may break a tire bead (or even the rim) with explosive force, possibly resulting in equipment damage, serious injury or death. After the beads are fully seated, set the pressure to operating conditions per the tire manufacturer's data book. Never exceed the recommended maximum allowable inflation pressures.

Never rework, weld, heat or braze the rim of a tire/rim/wheel assembly.

⚠WARNING

Inflating an unsecured tire is dangerous. If it bursts, it could be hurled into the air with explosive force resulting in serious personal injury or death. Never inflate a tire unless it is secured to a vehicle, tire mounting machine or other restraining device such as a safety cage.

Completely deflate the tire by removing the valve core before removing the wheel/tire from the axle if there is known or suspected damage to the tire or wheel or if the tire has been run at 80% or less of its recommended pressure. Demount, inspect and match all the tire and rim parts before reinflating.

Stay out of the trajectory as indicated by shaded area. Under some circumstances the trajectory may deviate from its expected path. Always deflate tires before handling. Inflate only in a safety cage.

Safety Checklist

NEVER:

- Attempt to demount a tire from a rim unless it is completely deflated.
- Use any rim, wheel, or component that is damaged, bent, pitted from corrosion, cracked or worn. These are unserviceable parts and must be removed from service so they cannot be reused.
- Use silicone, petroleum, antifreeze or solvent-based lubricants.
- Substitute an inner tube for a permissible or non-permissible repair.
- Reinstall tubes that have been damaged and not properly repaired. If a tube is unrepairable, discard and replace with a new tube.
- Use a bias tube with radial tires.
- Reinflate a tire that has been operated in a run-flat, underinflated or over loaded condition (80% or less of recommended pressure). If unsure, demount and inspect all tires and rim parts before reinflating.

ALWAYS:

- Wear adequate protective eyewear, protective footwear, gloves, and ear protection while servicing tires to avoid injury.
- Use specialized tools as recommended by tire service supply professionals for servicing farm tire and rim assemblies, including mounting, demounting and inflating tires.
- Use OSHA-compliant inflation equipment including a safety cage or other restraining device when inflating a tire.
- Inspect the beads and inside of the tire for loose cords, cuts, penetrating objects or other damage. Repairable damage must be repaired before placing the tire back into service. Tires with unrepairable damage must be removed from service and scrapped in a way it cannot be recovered.
- Replace a tire with one having the same rim diameter designation and suffix letters.
- Remove dirt, liquids or other foreign material from inside the tire before mounting.
- After removing the valve core and/or valve core housing to deflate a tire, run a piece of wire through the stem to ensure it is not plugged by debris.
- Use the properly sized new tube in new tires. The proper size can be found in the tube size description, which typically is printed on the tube or the tube packaging.
- If reusing a tube in a tire currently in service, make sure it is the proper size and check the valve core and valve cap and replace when necessary.

- Check to be sure the tube is clean before installing in tire.
- Lubricate the tire bead area, bead seat surface and rim well of the rim with an approved tire mounting lubricant or a thin solution of vegetable oil soap with rust inhibitor in water. Silicone, petroleum, antifreeze or solvent-based lubricants will degrade the tire. Refer to TISB 41, "Tire Bead Lubricants, Mounting Aids, Bead Sealers, OEM Mobility Kits, Tire Sealants, Balancing Substances and Flammable Substances."
- Use a safety cage or other restraining device when inflating a tire. Use an extension hose with an in-line air gauge and clip-on air chuck, allowing the operator and all bystanders to stand clear of the tire/wheel trajectory zones.
- Inflate the tire with the valve core removed. Do not exceed 35 psi or the manufacturers specified maximum bead seating pressure when seating the beads. If the beads are not properly seated when the pressure reaches 35 psi, completely deflate the assembly, reposition the tire and/or tube on the rim, relubricate, and reinflate to the recommended operating pressure. Always consult the tire manufacturer's load and pressure tables for the correct pressure for the tire's intended use and operating conditions.
- When inflating a tube-type tire, remove the valve core housing to completely deflate and relax the tube to prevent wrinkles. Reinsert the valve core housing with the valve core removed and inflate the tube/tire to the recommended operating pressure. Always consult the tire manufacturer's load and pressure tables for the correct pressure for the tire's intended use and operating conditions.
- Inspect the valve core, valve core housing, and/or valve stem for proper air retention and replace if damaged or leaking.
- Always use a self-sealing metal valve cap to help prevent the loss of air or fluid. Ensure that the o-ring is in working condition and tighten the valve cap after any inflation or pressure check, as this alone ensures that the valve remains clean and sealed.

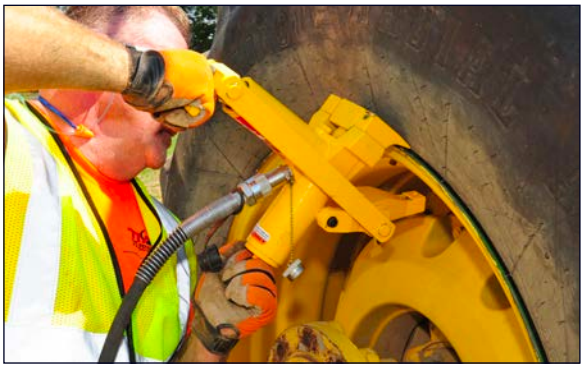
Servicing on the Vehicle:
Steps for Demounting Tubeless or Tube-Type Tires on the Vehicle

⚠WARNING

Tire changing can be dangerous and should be done by trained personnel using proper tools and procedures. Always read and understand any manufacturer's warning contained in owner's manuals, on the equipment, listed on websites and molded onto tire sidewalls. Failure to comply with these procedures and manufacturer's recommendations may result in faulty positioning of the tire and/or rim parts, and cause the assembly to burst with explosive force, sufficient to cause serious injury or death. Never mount or use damaged tires or rims.

1 Jack up and support the vehicle per equipment manufacturer's recommendations. Check for any liquid ballast and remove from the tire. Deflate the tire by removing the valve core and/or valve core housing. After the airflow stops, run a piece of wire through the stem to ensure it is not plugged by debris. For tube-type tires, remove the rim nut and push the valve through the valve hole.

2 Before attempting to demount the tire on the tractor or machine, make sure the short side of the drop center is facing out. If the short side of the drop is on the inside, the assembly must be removed from the equipment before the tire can be demounted. See page 22 for "Servicing Off the Vehicle." After the tire is completely deflated, place a "bead unseating" tool between the tire bead and rim flange and force the bead off the bead seat. Be careful not to damage the tire's bead area. The beads should be unseated on both sides of the rim. Do not use a sledge hammer or duck bill hammer to break the bead.



3 Thoroughly lubricate the tire bead area and rim flange with approved, commercially available tire mounting lubricants made for bead seating. Vegetable oil based soap solutions may also be used as a mounting lubricant. Never use silicone, petroleum, antifreeze or solvent-based lubricants.

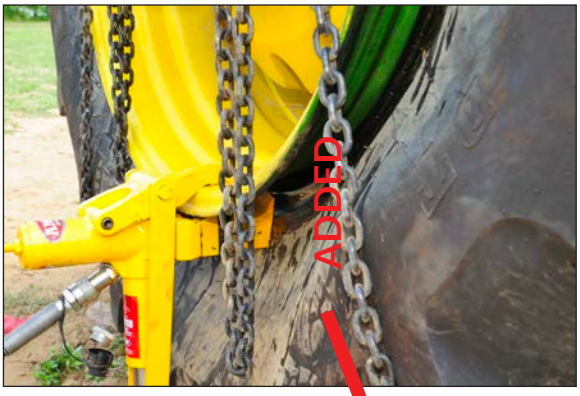
Servicing on the Vehicle: Steps for Demounting Tubeless or Tube-Type Tires on the Vehicle

⚠WARNING

Silicone, petroleum, antifreeze or solvent-based lubricants must not be used. These substances may:

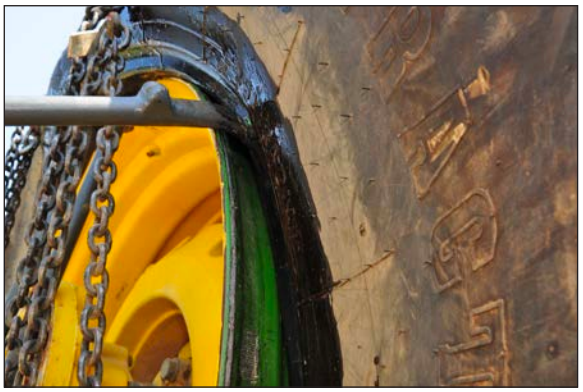
- cause the tire to slip on the rim
- have a harmful effect on the tire, tube, flap and/or rim
- create explosive mixtures of air and vapors in the tire which may result in serious injury or death

4 Lock the wheel with the valve at the top. Force the outside bead at the bottom into the well. A lockable chain sling may be used to gently lift large tires to create some space between the top bead and the rim.



5 Insert the curved end of the tubeless tire iron under the bead at the top and pry the bead over the rim flange. Take small bites to avoid extremely hard prying, which will damage the tire beads.

6 After the first section of the bead is over the rim flange, use one tire iron to hold that section over the flange and use another tire iron to pry the next section over the flange. Do not attempt to pry too large a section of the bead over the rim flange at one time. Never release your grip on either iron, as they may spring back.



Servicing on the Vehicle: Steps for Demounting Tubeless or Tube-Type Tires on the Vehicle

7 Repeat the process around the tire making sure that the tire iron or lever is always placed in the correct spot before attempting to remove the bead. After the entire front bead is removed, position the tire so that the back bead is in the drop center. If servicing a tube-type tire, remove the tube at this point.

8 To remove the tire completely from the wheel, apply appropriate lubricant to the surface of the back bead. See Warning on page 7. Insert tire irons under the inside bead at the side of the tire. Pry the rest of the inside bead over the rim flange. When starting this operation, be sure that the bead area on the opposite side of the tire is down in the well of the rim.

Servicing on the Vehicle:
Steps for Mounting on the Vehicle for Tubeless Tires

⚠WARNING

Tire changing can be dangerous and should be done by trained personnel using proper tools and procedures. Always read and understand any manufacturer's warning contained in owner's manuals, on the equipment, listed on websites and molded onto tire sidewalls. Failure to comply with these procedures and manufacturer's recommendations may result in faulty positioning of the tire and/or rim parts, and cause the assembly to burst with explosive force, sufficient to cause serious injury or death. Never mount or use damaged tires or rims.

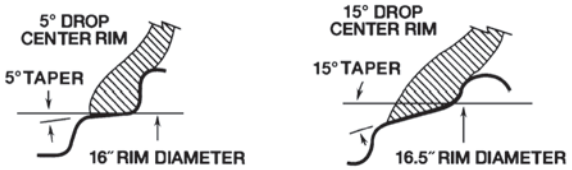
⚠WARNING

There is a danger of serious injury or death if a tire of one bead diameter is installed on a rim or wheel of a different rim diameter.

Always replace a tire with another tire of exactly the same bead diameter designation and suffix letters. The tire should match the rim diameter. There is a danger of serious injury or death if a tire of one bead diameter is installed on a rim or wheel of a different rim diameter. Always replace a tire with another tire of exactly the same bead diameter and appropriate suffix to be mounted on an approved rim contour.

For example: A 16" tire goes on a 16" rim. Never mount a 16" tire on a 16.1" or 16.5" rim. A 16.1" tire goes on a 16.1" rim.

While it is possible to pass a 16" diameter tire over the lip or flange of a 16.1" or 16.5" size diameter rim, it cannot be inflated enough to position itself against the rim flange. If an attempt is made to seat the tire bead by inflating, the tire bead will break with explosive force and could cause serious injury or death. Rims of different diameters and tapers cannot be interchanged. The following diagram illustrates the difference between rims of two different tapers and diameters:



The following diagram shows how beads of a 16" tire will not seat on a 16.5" rim. The beads cannot be forced out against the rim flanges by using more air pressure because this will break the beads and the tire will explode with force sufficient to cause serious injury or death.

Servicing on the Vehicle: Steps for Mounting on the Vehicle for Tubeless Tires

⚠WARNING

Certain non-domestic farm implement equipment has been imported into North America equipped with unique diameter rims for which no North American produced replacement tire sizes are available.

Any attempt to mount and inflate 15” nominal bead diameter tires on these rims may cause one of the tire beads to break, possibly resulting in serious physical injury or even death.

The rims in question are 15.3” in diameter and 9” wide. However, rims manufactured in 1981 and earlier are marked as 15” diameter; only those manufactured in 1982 and later are marked as 15.3” diameter. The key to avoiding this potentially dangerous situation is the 9” width. The North American wheel industry does not manufacture a 9” rim width for farm implement use.

The European tire sizes that may be mounted on these rims are:

10.0/75 - 15.3 (or 15)	11.5/80 - 15.3 (or 15)
10.5/85 - 15.3	12.5/80 - 15.3

North American produced 15” farm implement tires are not to be mounted on any 9” wide farm implement rim or any rim marked 15.3” diameter.

NOTE

For the following procedure it is recommended to use a boom truck for assistance in lifting/positioning heavy tires.

1 Prior to installing the tire, thoroughly clean then inspect the rim for hairline cracks, burrs or damage. Remove all foreign material, corrosion, or debris and make sure all rim surfaces are clean and bead seating surfaces are not damaged. If the rim is damaged, cracked, broken or bent, it cannot be reworked, welded or otherwise heated and it must be replaced.

Thoroughly inspect the inside, outside and bead area of the tire for any damage or cuts that expose ply material. Make sure the inside of the tire is clean and free of any foreign material.

⚠WARNING

Fitting a tire to a rim with cracks, significant distortion, signs of fracture, evidence of welded repairs, etc. may cause physical injury or death.

Servicing on the Vehicle: Steps for Mounting on the Vehicle for Tubeless Tires

2 Thoroughly lubricate both the inside and outside bead areas, and the interior surface of the rim as depicted in Figure 1. Use only commercially available lubricants specially designed for tire mounting that will not degrade the tire. Do not for example use silicone, petroleum, antifreeze or solvent-based lubricants.

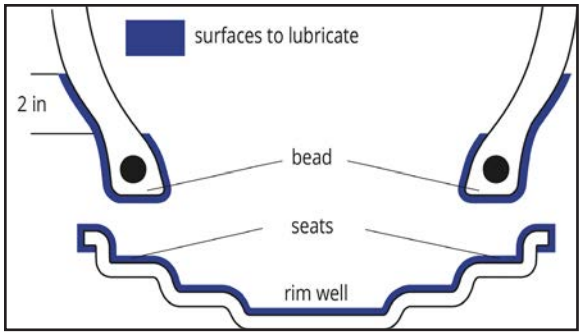


FIGURE 1: Proper lubrication

⚠WARNING

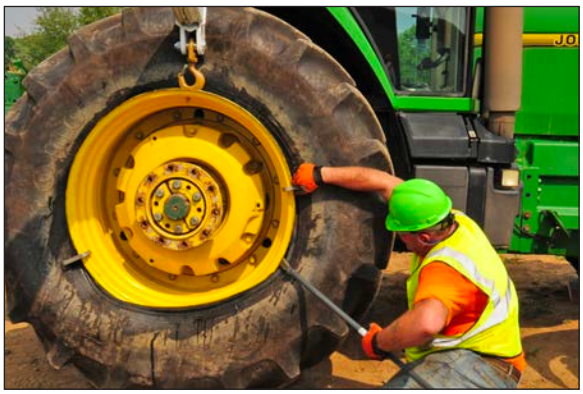
Silicone, petroleum, antifreeze or solvent-based lubricants must not be used. These substances may:

- cause the tire to slip on the rim
- have a harmful effect on the tire, tube, flap and/or rim
- create explosive mixtures of air and vapors in the tire which may result in serious injury or death

3 To put the tire on the wheel, place the inner bead over the flange at the top. Be sure the bead is not "hung up" on the bead seat, but that the bead is guided into the rim well, while the tubeless tire iron or C-bar are used to work the first bead over the rim.

Servicing on the Vehicle: Steps for Mounting on the Vehicle for Tubeless Tires

4 Starting at the top, use the tubeless tire irons to lift the outer bead up and over the rim flange, then down into the rim well. Use the bead keeper to hold the bead in position. After getting the first section of the outer bead into the rim well, use a boom or clamp to hold the bead in the rim well and then work the bead over the rim flange in a circular direction. Never use a hammer to force the bead over the rim flange.



5 Inflating depends on how well the shape of the tire has been maintained. If the beads are in or near their molded position, they can be seated by inflating the tire (with the valve core removed) using an OSHA-compliant inflation device with a clip-on air chuck. When it's difficult to seat the beads, do not use flammable materials or other means of physically forcing the bead to seat. An air tank with a quick release may be used to assist.

⚠WARNING

Never, under any circumstance, introduce a flammable substance into a tire. Igniting this substance in an effort to facilitate seating the beads is extremely unsafe. This may result in an explosion of the tire with force sufficient to cause serious personal injury or death. This practice may also result in undetected damage to the tire or rim that could result in failure of the tire in service.

6 Lower the jack until the tire is centered on the rim. Centering of the tire and rim assembly is extremely important to prevent broken beads. Using an extension hose with an in-line air gauge and clip-on chuck (with valve core removed), inflate the tire to seat the beads. Do not exceed 35 psi to seat the beads, check to see that both beads are seated all the way around the tire. It is essential for the operator to stand clear of the tire sidewall during inflation. See Warning box on p. 13. As a reminder, continued use of proper PPE is required during tire service.

Servicing on the Vehicle: Steps for Mounting on the Vehicle for Tubeless Tires

⚠WARNING

NEVER INFLATE BEYOND 35 PSI OR THE MANUFACTURERS STATED MAXIMUM
WHEN SEATING THE BEADS.
NEVER STAND, LEAN, OR REACH OVER THE ASSEMBLY DURING INFLATION.

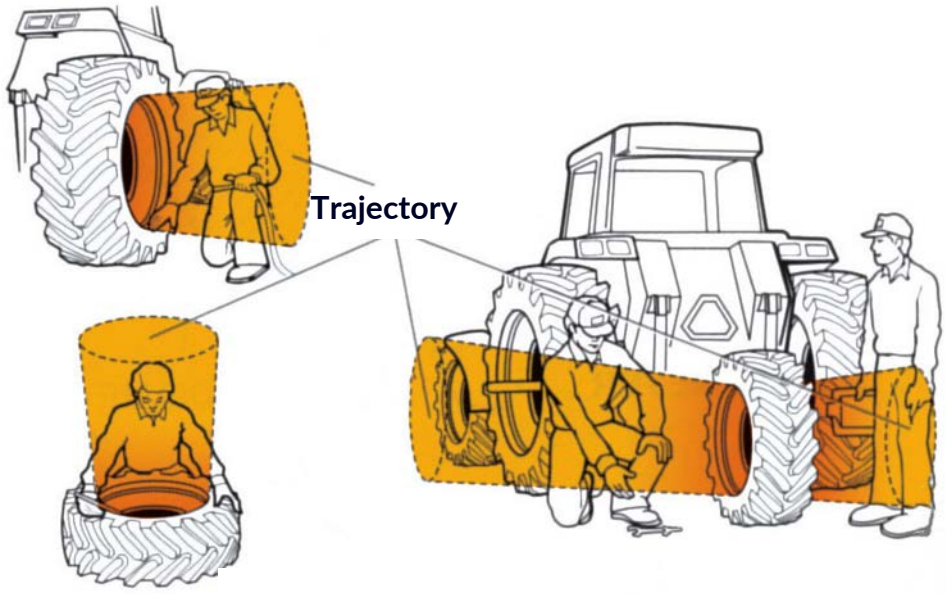
Inspect both sides of the tire to be sure that the beads are evenly seated. Inflation should be done in a safety cage or other restraining device. If both beads are not properly seated when pressure reaches 35 psi, completely deflate the assembly, reposition the tire 180 degrees on the rim, relubricate, and reinflate.

Inflating beyond 35 psi inflation pressure or the manufacturer's stated maximum seating pressure when trying to seat the beads is a DANGEROUS PRACTICE that may break a tire bead (or even the rim) with explosive force, possibly resulting in equipment damage, serious injury or death. After the beads are fully seated, set the pressure to operating conditions per the tire manufacturer's data book. Never exceed the recommended maximum allowable inflation pressures.

Never rework, weld, heat or braze the rim of a tire/rim/wheel assembly.

⚠WARNING

It is essential for the operator to stand clear of the tire. DO NOT place hands or head in or near the restraining device while inspecting and inflating the tire. Even in a restraining device, close proximity to the force of air and/or exploded remnants from a tire rupture could cause serious personal injury or death. ALWAYS remain outside of the wheel assembly's trajectory zone as in the illustrated examples below. NOTE: Under some circumstances, the trajectory may deviate from its expected path. This is particularly important if the tire is being mounted on a multi-piece rim.



Servicing on the Vehicle: Steps for Mounting on the Vehicle for Tubeless Tires

7 Bead seating is important. If the bead is not properly seated, remove all air from the tire. Relubricate the tire's bead area and the rim. Standing outside the trajectory, re-inflate to reseat the beads and adjust the inflation to the tire's operating pressure. Replace the valve core or install the valve core housing. Verify the inflation pressure and adjust if necessary. Install a self-sealing metal valve cap.

⚠WARNING

Never, under any circumstance, introduce a flammable substance into a tire. Igniting this substance in an effort to facilitate seating the beads is extremely unsafe. This may result in an explosion of the tire with force sufficient to cause serious personal injury or death. This practice may also result in undetected damage to the tire or rim that could result in failure of the tire in service.

NOTE

Do not refer to the sidewall for all load and pressure recommendations.
Always consult with the tire manufacturer's and the rim manufacturer's Technical Data Books for specific recommendations and conditions of use.

Servicing on the Vehicle:
Steps for Mounting on the Vehicle for Tube-Type Tires*

⚠WARNING

Tire changing can be dangerous and should be done by trained personnel using proper tools and procedures. Always read and understand any manufacturer's warning contained in owner's manuals, on the equipment, listed on websites and molded onto tire sidewalls. Failure to comply with these procedures and manufacturer's recommendations may result in faulty positioning of the tire and/or rim parts, and cause the assembly to burst with explosive force, sufficient to cause serious injury or death. Never mount or use damaged tires or rims.

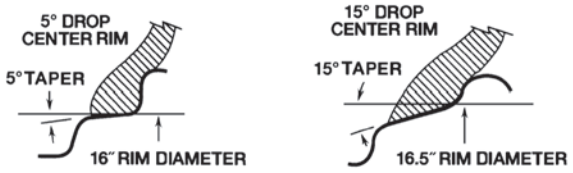
⚠WARNING

There is a danger of serious injury or death if a tire of one bead diameter is installed on a rim or wheel of a different rim diameter.

Always replace a tire with another tire of exactly the same bead diameter designation and suffix letters. The tire should match the rim diameter. There is a danger of serious injury or death if a tire of one bead diameter is installed on a rim or wheel of a different rim diameter. Always replace a tire with another tire of exactly the same bead diameter and appropriate suffix to be mounted on an approved rim contour.

For example: A 16" tire goes on a 16" rim. Never mount a 16" tire on a 16.1" or 16.5" rim. A 16.1" tire goes on a 16.1" rim.

While it is possible to pass a 16" diameter tire over the lip or flange of a 16.1" or 16.5" size diameter rim, it cannot be inflated enough to position itself against the rim flange. If an attempt is made to seat the tire bead by inflating, the tire bead will break with explosive force and could cause serious injury or death. Rims of different diameters and tapers cannot be interchanged. The following diagram illustrates the difference between rims of two different tapers and diameters:



The following diagram shows how beads of a 16" tire will not seat on a 16.5" rim. The beads cannot be forced out against the rim flanges by using more air pressure because this will break the beads and the tire will explode with force sufficient to cause serious injury or death.

* This section applies to using tubes in both tubeless and tube-type tires.

Servicing on the Vehicle: Steps for Mounting on the Vehicle for Tube-Type Tires*

⚠WARNING

Certain non-domestic farm implement equipment has been imported into North America equipped with unique diameter rims for which no North American produced replacement tire sizes are available.

Any attempt to mount and inflate 15" nominal bead diameter tires on these rims may cause one of the tire beads to break, possibly resulting in serious physical injury or even death.

The rims in question are 15.3" in diameter and 9" wide. However, rims manufactured in 1981 and earlier are marked as 15" diameter; only those manufactured in 1982 and later are marked as 15.3" diameter. The key to avoiding this potentially dangerous situation is the 9" width. The North American wheel industry does not manufacture a 9" rim width for farm implement use.

The European tire sizes that may be mounted on these rims are:

10.0/75 - 15.3 (or 15)	11.5/80 - 15.3 (or 15)
10.5/85 - 15.3	12.5/80 - 15.3

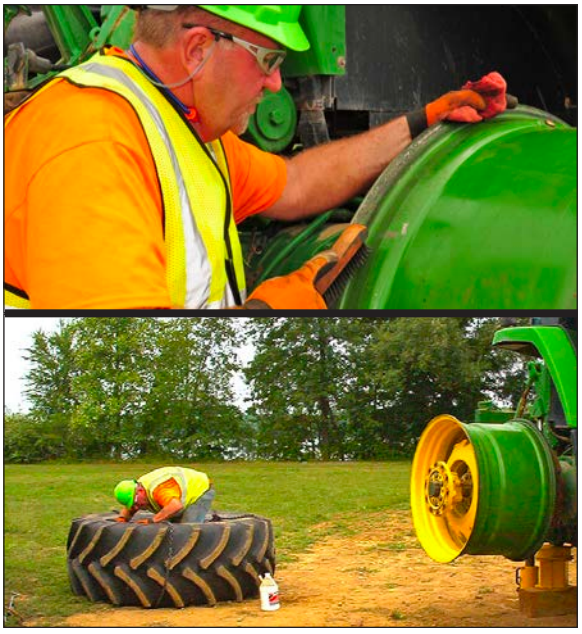
North American produced 15" farm implement tires are not to be mounted on any 9" wide farm implement rim or any rim marked 15.3" diameter.

NOTE

For the following procedure it is recommended to use a boom truck for assistance in lifting/positioning heavy tires.

1 Prior to installing the tire, thoroughly clean then inspect the rim for hairline cracks, burrs or damage. Remove all foreign material, corrosion, or debris and make sure all rim surfaces are clean and bead seating surfaces are not damaged. If the rim is damaged, cracked, broken or bent, it cannot be reworked, welded or otherwise heated and it must be replaced.

Thoroughly inspect the inside, outside and bead area of the tire for any damage or cuts that expose ply material. Make sure the inside of the tire is clean and free of any foreign material.



⚠WARNING

Fitting a tire to a rim with cracks, significant distortion, signs of fracture, evidence of welded repairs, etc. may cause physical injury or death.

Servicing on the Vehicle: Steps for Mounting on the Vehicle for Tube-Type Tires*

2 Thoroughly lubricate both the inside and outside bead areas, and the interior surface of the rim as depicted in Figure 1. Use only commercially available lubricants specially designed for tire mounting that will not degrade the tire. Do not for example use silicone, petroleum, antifreeze or solvent-based lubricants.

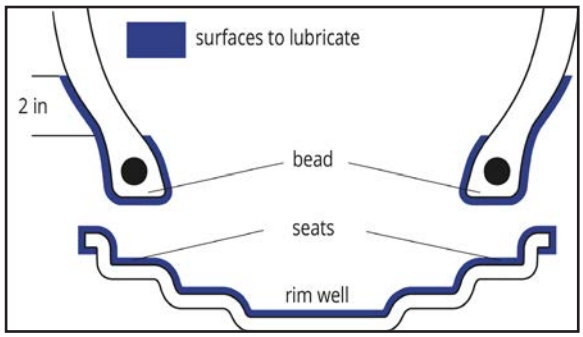
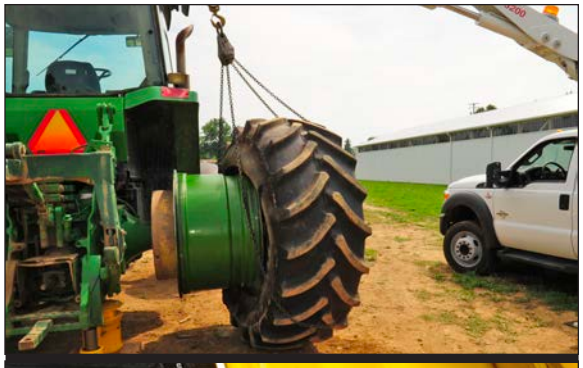


FIGURE 1: Proper lubrication

3 Before placing the tire on the rim, be sure the valve hole of the rim is at the bottom of the wheel. Chains or other lifting aids may be used to properly position the tire during the following steps. To put the tire on the wheel, place the inner bead over the flange at the top. Be sure the bead is not “hung up” on the bead seat, but that the bead is guided into the rim well, while the tubeless tire iron or C-bar is used to work the first bead over the rim flange.



Servicing on the Vehicle: Steps for Mounting on the Vehicle for Tube-Type Tires*

4 With the first bead on the rim, pull the tire toward the outside of the rim as far as possible to make room for the tube.

5 Before inserting a tube in a tire, be sure the valve is at the bottom of the wheel. Align the stem with the valve hole and start placing the first segment of the tube in the bottom portion of the tire. Use a valve fishing chain to assist in the adjustment of the tube position within the tire. Partially inflate the tube. With the help of the valve fishing chain, ensure the valve stem remains in place while pushing the remainder of the tube inside the tire. Make sure to evenly distribute the tube around the rim.

Servicing on the Vehicle: Steps for Mounting on the Vehicle for Tube-Type Tires*

6 Thoroughly lube the outer bead both on the inside and the outside bead area. Starting at the top, use the tire irons to lift the outer bead up and over the rim flange, then down into the rim well. Be careful not to pinch the tube in this operation. Use the bead keeper to hold the bead in position. After getting the first section of the outer bead into the rim well, use a boom or clamp to hold the bead in the rim well and then work the bead over the rim flange in a circular direction. Never use a hammer to force the bead over the rim flange. After the bead is completely secured over the flange, ensure the valve is perpendicular to the rim and screw the valve-retaining rim nut in place.

NOTE

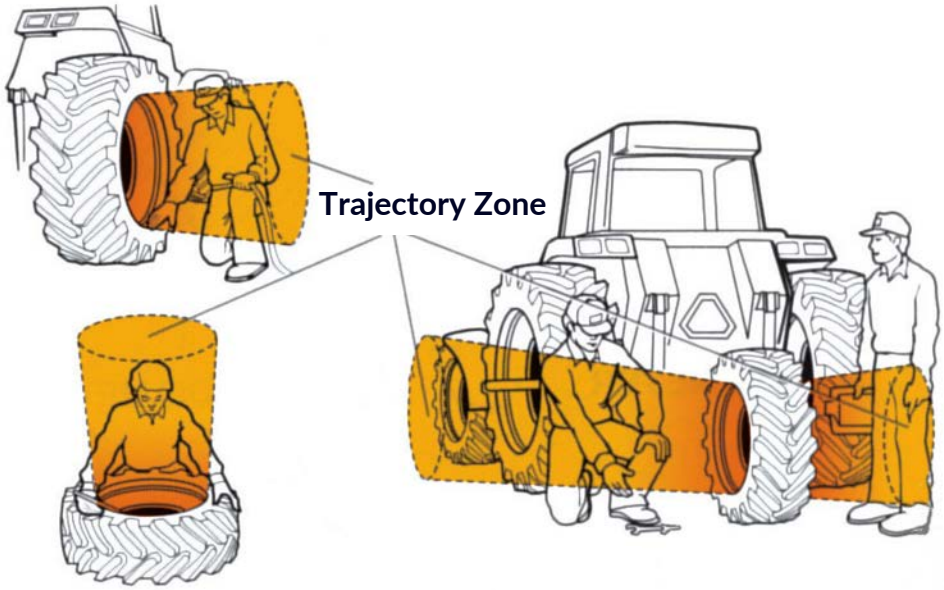
Never use a hammer to force the bead over the rim flange.
This may cause permanent damage to the bead, rendering the tire unserviceable.

Servicing on the Vehicle: Steps for Mounting on the Vehicle for Tube-Type Tires*

7 With the valve stem at the bottom, lower the jack until the tire is centered on the rim. Centering of the tire and rim assembly is extremely important to prevent broken beads. Using an extension hose with an in-line air gauge and clip-on chuck (with valve core removed), inflate the tire to seat the beads. Do not exceed 35 psi to seat the beads, check to see that both beads are seated all the way around the tire. As a reminder, continued use of proper PPE is required during tire service.

⚠WARNING

It is essential for the operator to stand clear of the tire. DO NOT place hands or head in or near the restraining device while inspecting and inflating the tire. Even in a restraining device, close proximity to the force of air and/or exploded remnants from a tire rupture could cause serious personal injury or death. ALWAYS remain outside of the wheel assembly's trajectory zone as in the illustrated examples below. NOTE: Under some circumstances, the trajectory may deviate from its expected path. This is particularly important if the tire is being mounted on a multi-piece rim.



Servicing on the Vehicle: Steps for Mounting on the Vehicle for Tube-Type Tires*

⚠WARNING

NEVER INFLATE BEYOND 35 PSI OR THE MANUFACTURERS STATED MAXIMUM
WHEN SEATING THE BEADS.
NEVER STAND, LEAN, OR REACH OVER THE ASSEMBLY DURING INFLATION.

Inspect both sides of the tire to be sure that the beads are evenly seated. Inflation should be done in a safety cage or other restraining device. If both beads are not properly seated when pressure reaches 35 psi, completely deflate the assembly, reposition the tire 180 degrees on the rim, relubricate, and reinflate.

Inflating beyond 35 psi inflation pressure or the manufacturer's stated maximum seating pressure when trying to seat the beads is a DANGEROUS PRACTICE that may break a tire bead (or even the rim) with explosive force, possibly resulting in equipment damage, serious injury or death. After the beads are fully seated, set the pressure to operating conditions per the tire manufacturer's data book. Never exceed the recommended maximum allowable inflation pressures.

Never rework, weld, heat or braze the rim of a tire/rim/wheel assembly.

8 To prevent wrinkles in the tube, completely deflate and then reinflate the tire to operating pressure before installing the valve core or valve core housing. Recheck the inflation pressure and adjust if necessary. Install a self-sealing metal valve cap.

Servicing Off the Vehicle:
Steps for Demounting Tubeless or Tube-Type Tires Off the Vehicle

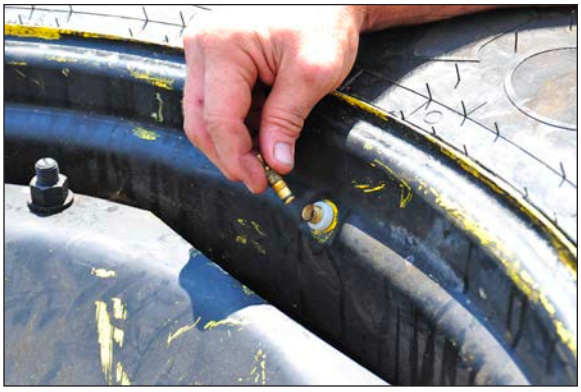
⚠WARNING

Tire changing can be dangerous and should be done by trained personnel using proper tools and procedures. Always read and understand any manufacturer's warning contained in owner's manuals, on the equipment, listed on websites and molded onto tire sidewalls. Failure to comply with these procedures and manufacturer's recommendations may result in faulty positioning of the tire and/or rim parts, and cause the assembly to burst with explosive force, sufficient to cause serious injury or death. Never mount or use damaged tires or rims.

NOTE

For the following procedure it is recommended to use a boom truck for assistance in lifting/positioning heavy tires.

1 Check for any liquid ballast and remove from the tire by removing the valve core or valve core housing to ~~and completely~~ deflate the tire. After the airflow stops, run a piece of wire through the stem to ensure it is not plugged by debris. See ballast manufacturer recommendations for removing liquid ballast. On tube-type tires, remove the plastic collar nut on the valve stem.



2 Lay the assembly on the ground with the narrow ledge on the bottom. Position the bead breaking tool between the tire bead and rim flange at the pry notch of the tire (if pry notch is present on tire). Use caution not to damage the tire bead area.

Servicing Off the Vehicle: Demounting Tubeless or Tube-Type Tires Off the Vehicle

3 After the bead has been released completely around the tire, lubricate the bead and the flange prior to turning the tire and rim over and repeat the bead unseating procedure (see step 2) with the narrow ledge up.

4 With the narrow ledge on top, thoroughly lubricate the tire bead area and rim flange with approved, commercially available tire mounting lubricants made for bead seating. Vegetable oil based soap solutions may also be used as a mounting lubricant. (Never use silicone, petroleum, antifreeze or solvent-based lubricants.)

⚠WARNING

Silicone, petroleum, antifreeze or solvent-based lubricants must not be used. These substances may:

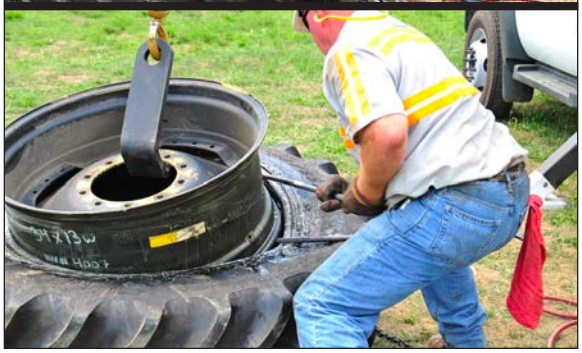
- cause the tire to slip on the rim
- have a harmful effect on the tire, tube, flap and/or rim
- create explosive mixtures of air and vapors in the tire which may result in serious injury or death

5 Make sure the part of the bead is directly across from the valve in the well. Starting at the valve, pry the bead over the rim flange using tubeless tire irons. Continue by taking small bites to avoid damage to the bead until the top bead is completely over the rim flange.

Servicing Off the Vehicle: Demounting Tubeless or Tube-Type Tires Off the Vehicle

6 If the tire has a tube, position the boom and attach the adjustable chain sling to the tire in order to lift it sufficiently to remove the tube in the tire. Note: if only the tube requires repair or replacement this can be removed, repaired, and replaced in the tire without removing the tire completely from the rim. In this case, thoroughly inspect the inside of the casing for damage or other foreign material before installing the tube. Remove any remaining fluid from inside the tire.

7 To completely remove the tire from the rim, turn assembly over so the narrow ledge is down. Lift the rim with the hook. If needed, lubricate the second tire bead and rim flange. Lift up on the rim, be sure the one side of the bead still on the rim is in the rim well and use tire irons or a hydraulic tool to assist in the removal of the rim from the tire.



8 Thoroughly reinspect the inside of the casing for damage or other foreign material. Remove any remaining fluid from inside the tire.

Servicing Off the Vehicle:
Mounting Off the Vehicle for Tubeless Tires

⚠WARNING

Tire changing can be dangerous and should be done by trained personnel using proper tools and procedures. Always read and understand any manufacturer's warning contained in owner's manuals, on the equipment, listed on websites and molded onto tire sidewalls. Failure to comply with these procedures and manufacturer's recommendations may result in faulty positioning of the tire and/or rim parts, and cause the assembly to burst with explosive force, sufficient to cause serious injury or death. Never mount or use damaged tires or rims.

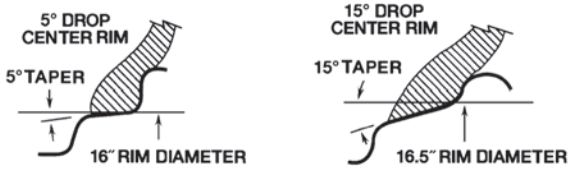
⚠WARNING

There is a danger of serious injury or death if a tire of one bead diameter is installed on a rim or wheel of a different rim diameter.

Always replace a tire with another tire of exactly the same bead diameter designation and suffix letters. The tire should match the rim diameter. There is a danger of serious injury or death if a tire of one bead diameter is installed on a rim or wheel of a different rim diameter. Always replace a tire with another tire of exactly the same bead diameter and appropriate suffix to be mounted on an approved rim contour.

For example: A 16" tire goes on a 16" rim. Never mount a 16" tire on a 16.1" or 16.5" rim. A 16.1" tire goes on a 16.1" rim.

While it is possible to pass a 16" diameter tire over the lip or flange of a 16.1" or 16.5" size diameter rim, it cannot be inflated enough to position itself against the rim flange. If an attempt is made to seat the tire bead by inflating, the tire bead will break with explosive force and could cause serious injury or death. Rims of different diameters and tapers cannot be interchanged. The following diagram illustrates the difference between rims of two different tapers and diameters:



The following diagram shows how beads of a 16" tire will not seat on a 16.5" rim. The beads cannot be forced out against the rim flanges by using more air pressure because this will break the beads and the tire will explode with force sufficient to cause serious injury or death.

Mounting Off the Vehicle for Tubeless Tires

⚠WARNING

Certain non-domestic farm implement equipment has been imported into North America equipped with unique diameter rims for which no North American produced replacement tire sizes are available.

Any attempt to mount and inflate 15” nominal bead diameter tires on these rims may cause one of the tire beads to break, possibly resulting in serious physical injury or even death.

The rims in question are 15.3” in diameter and 9” wide. However, rims manufactured in 1981 and earlier are marked as 15” diameter; only those manufactured in 1982 and later are marked as 15.3” diameter. The key to avoiding this potentially dangerous situation is the 9” width. The North American wheel industry does not manufacture a 9” rim width for farm implement use.

The European tire sizes that may be mounted on these rims are:

10.0/75 - 15.3 (or 15)	11.5/80 - 15.3 (or 15)
10.5/85 - 15.3	12.5/80 - 15.3

North American produced 15” farm implement tires are not to be mounted on any 9” wide farm implement rim or any rim marked 15.3” diameter.

NOTE

For the following procedure it is recommended to use a boom truck for assistance in lifting/positioning heavy tires.

1 Prior to installing the tire, thoroughly clean then inspect the rim for hairline cracks, burrs or damage. Remove all foreign material, corrosion, or debris and make sure all rim surfaces are clean and bead seating surfaces are not damaged. If the rim is damaged, cracked, broken or bent, it cannot be reworked, welded or otherwise heated and it must be replaced. Lay the rim on the ground with the narrow ledge on the top.

Thoroughly inspect the inside, outside and bead area of the tire for any damage or cuts that expose ply material. Make sure the inside of the tire is clean and free of any foreign material.

⚠WARNING

Fitting a tire to a rim with cracks, significant distortion, signs of fracture, evidence of welded repairs, etc. may cause physical injury or death.

Mounting Off the Vehicle for Tubeless Tires

2 Thoroughly lubricate the tire bead area and bead seat surface and rim well of the rim with an approved tire mounting lubricant or a thin solution of vegetable oil soap in water. Never use silicone, petroleum, antifreeze or solvent-based lubricants. Only use products designed for this purpose that will not degrade the tire.

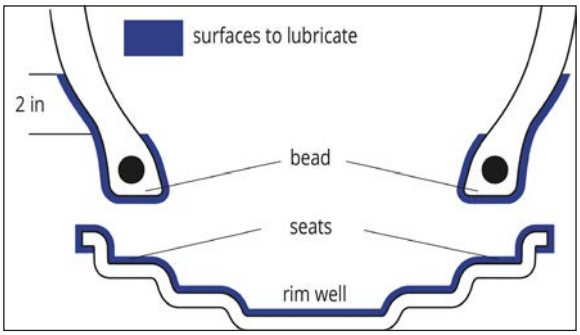


FIGURE 1: Proper lubrication

⚠WARNING

Silicone, petroleum, antifreeze or solvent-based lubricants must not be used. These substances may:

- cause the tire to slip on the rim
- have a harmful effect on the tire, tube, flap and/or rim
- create explosive mixtures of air and vapors in the tire which may result in serious injury or death

3 Push the bottom bead over the rim flange as far as possible. Use tubeless tire irons or a C-bar to work the first tire bead completely over the rim flange, taking small bites and being careful not to damage the bead. Do not use any type of hammer to force the bottom bead over the rim flange.

Mounting Off the Vehicle for Tubeless Tires

4 Stand on the tire to force the part of the bead that is directly across from the valve into the well. When the bead is well started, relubricate the remaining unmounted portion of the tire bead and rim flange. Taking small bites, lever the tire bead over the rim flange until the final section drops over at the valve. A bead lock/clamp may be used to "keep your place."

5 Centering the tire on the rim is extremely important to prevent broken beads. Use an extension hose with an in-line air gauge and clip-on chuck and place tire/rim/wheel in a safety cage or other restraining device. If using a boom, position it over the middle of the assembly to act as a restraining device.

Inflating depends on how well the shape of the tire has been maintained. If the beads are in or near their molded position, they can be seated by inflating the tire (with the valve core removed) using an OSHA-compliant inflation device with a clip-on air chuck.

6 Inflate the tire (with the valve core removed) to seat the beads. Do not exceed 35 psi to seat the beads. See Warning box on page 29. It is essential for the operator to stand clear of the tire during inflation. See Warning box on page 29. When it's difficult to seat the beads, do not use flammable materials or other means of physically forcing the bead to seat. An air tank with a quick release may be used to assist. Check to see that both beads are seated all the way around the tire. Check to see that the distance between the edge of the rim and the molded rib on the lower sidewall does not vary by more than 2/32 of an inch. As a reminder, continued use of proper PPE is required during tire service.

⚠WARNING

Never, under any circumstance, introduce a flammable substance into a tire. Igniting this substance in an effort to facilitate seating the beads is extremely unsafe. This may result in an explosion of the tire with force sufficient to cause serious personal injury or death. This practice may also result in undetected damage to the tire or rim that could result in failure of the tire in service.

Mounting Off the Vehicle for Tubeless Tires

⚠WARNING

NEVER INFLATE BEYOND 35 PSI OR THE MANUFACTURERS STATED MAXIMUM WHEN SEATING THE BEADS.
NEVER STAND, LEAN, OR REACH OVER THE ASSEMBLY DURING INFLATION.

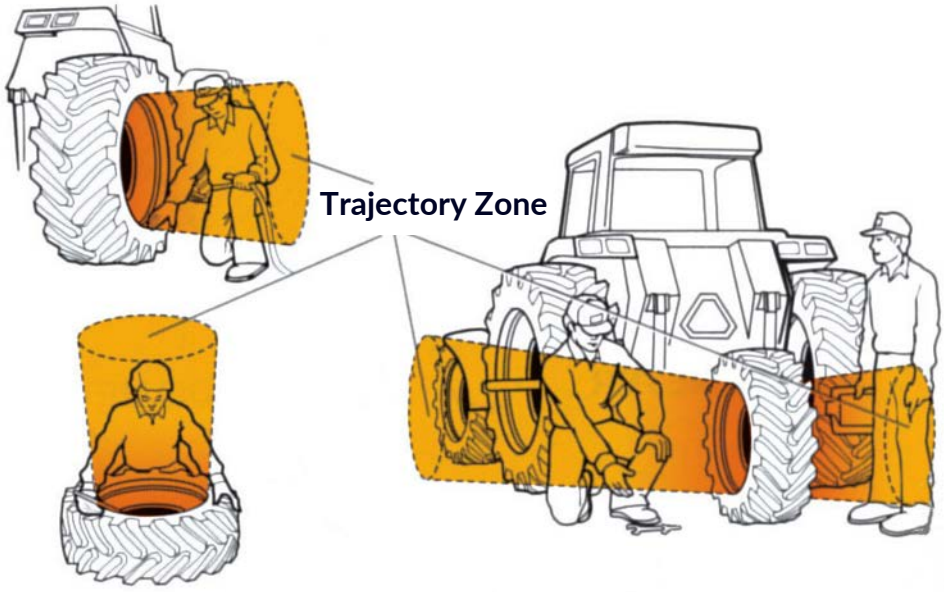
Inspect both sides of the tire to be sure that the beads are evenly seated. Inflation should be done in a safety cage or other restraining device. If both beads are not properly seated when pressure reaches 35 psi, completely deflate the assembly, reposition the tire 180 degrees on the rim, relubricate, and reinflate.

Inflating beyond 35 psi inflation pressure or the manufacturer's stated maximum seating pressure when trying to seat the beads is a DANGEROUS PRACTICE that may break a tire bead (or even the rim) with explosive force, possibly resulting in equipment damage, serious injury or death. After the beads are fully seated, set the pressure to operating conditions per the tire manufacturer's data book. Never exceed the recommended maximum allowable inflation pressures.

Never rework, weld, heat or braze the rim of a tire/rim/wheel assembly.

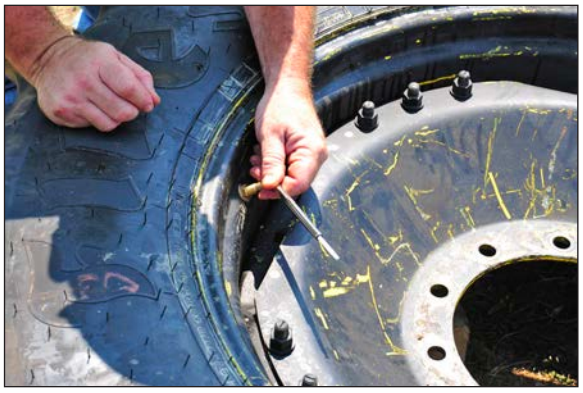
⚠WARNING

It is essential for the operator to stand clear of the tire. DO NOT place hands or head in or near the restraining device while inspecting and inflating the tire. Even in a restraining device, close proximity to the force of air and/or exploded remnants from a tire rupture could cause serious personal injury or death. ALWAYS remain outside of the wheel assembly's trajectory zone as in the illustrated examples below. NOTE: Under some circumstances, the trajectory may deviate from its expected path. This is particularly important if the tire is being mounted on a multi-piece rim.



Mounting Off the Vehicle for Tubeless Tires

7 After inflating to operating pressure, install the valve core or valve core housing and recheck the inflation pressure.



Servicing Off the Vehicle:
Mounting Off the Vehicle for Tube-Type Tires

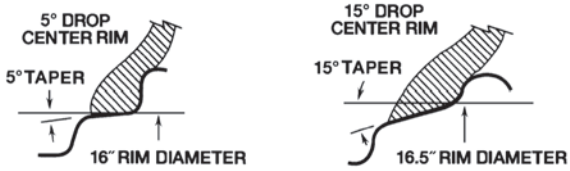
⚠WARNING

There is a danger of serious injury or death if a tire of one bead diameter is installed on a rim or wheel of a different rim diameter.

Always replace a tire with another tire of exactly the same bead diameter designation and suffix letters. The tire should match the rim diameter. There is a danger of serious injury or death if a tire of one bead diameter is installed on a rim or wheel of a different rim diameter. Always replace a tire with another tire of exactly the same bead diameter and appropriate suffix to be mounted on an approved rim contour.

For example: A 16” tire goes on a 16” rim. Never mount a 16” tire on a 16.1” or 16.5” rim. A 16.1” tire goes on a 16.1” rim.

While it is possible to pass a 16” diameter tire over the lip or flange of a 16.1” or 16.5” size diameter rim, it cannot be inflated enough to position itself against the rim flange. If an attempt is made to seat the tire bead by inflating, the tire bead will break with explosive force and could cause serious injury or death. Rims of different diameters and tapers cannot be interchanged. The following diagram illustrates the difference between rims of two different tapers and diameters:



The following diagram shows how beads of a 16” tire will not seat on a 16.5” rim. The beads cannot be forced out against the rim flanges by using more air pressure because this will break the beads and the tire will explode with force sufficient to cause serious injury or death.

Mounting Off the Vehicle for Tube-Type Tires

⚠WARNING

Certain non-domestic farm implement equipment has been imported into North America equipped with unique diameter rims for which no North American produced replacement tire sizes are available.

Any attempt to mount and inflate 15” nominal bead diameter tires on these rims may cause one of the tire beads to break, possibly resulting in serious physical injury or even death.

The rims in question are 15.3” in diameter and 9” wide. However, rims manufactured in 1981 and earlier are marked as 15” diameter; only those manufactured in 1982 and later are marked as 15.3” diameter. The key to avoiding this potentially dangerous situation is the 9” width. The North American wheel industry does not manufacture a 9” rim width for farm implement use.

The European tire sizes that may be mounted on these rims are:

10.0/75 - 15.3 (or 15)	11.5/80 - 15.3 (or 15)
10.5/85 - 15.3	12.5/80 - 15.3

North American produced 15” farm implement tires are not to be mounted on any 9” wide farm implement rim or any rim marked 15.3” diameter.

⚠WARNING

Tire changing can be dangerous and should be done by trained personnel using proper tools and procedures. Always read and understand any manufacturer’s warning contained in owner’s manuals, on the equipment, listed on websites and molded onto tire sidewalls. Failure to comply with these procedures and manufacturer’s recommendations may result in faulty positioning of the tire and/or rim parts, and cause the assembly to burst with explosive force, sufficient to cause serious injury or death. Never mount or use damaged tires or rims.

1 Prior to installing the tire, thoroughly clean then inspect the rim for hairline cracks, burrs or damage. Remove all foreign material, corrosion, or debris and make sure all rim surfaces are clean and bead seating surfaces are not damaged. If the rim is damaged, cracked, broken or bent, it cannot be reworked, welded or otherwise heated and it must be replaced. Lay the rim on the ground with the narrow ledge on the top.

Thoroughly inspect the inside, outside and bead area of the tire for any damage or cuts that expose ply material. Make sure the inside of the tire is clean and free of any foreign material.

Mounting Off the Vehicle for Tube-Type Tires

⚠WARNING

Fitting a tire to a rim with cracks, significant distortion, signs of fracture, evidence of welded repairs, etc. may cause physical injury or death.

2 Thoroughly lubricate the tire bead area and bead seat surface and rim well of the rim with an approved tire mounting lubricant or a thin solution of vegetable oil soap in water. Never use silicone, petroleum, antifreeze or solvent-based lubricants. Only use products designed for this purpose that will not degrade the tire.

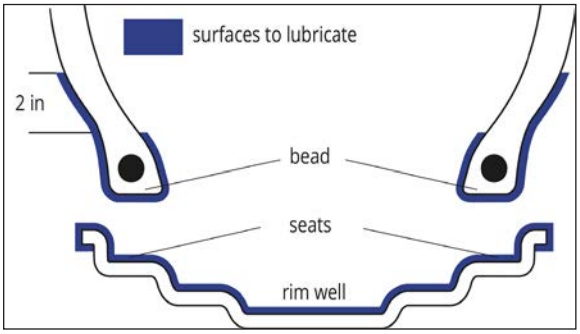


FIGURE 1: Proper lubrication

⚠WARNING

Silicone, petroleum, antifreeze or solvent-based lubricants must not be used. These substances may:

- cause the tire to slip on the rim
- have a harmful effect on the tire, tube, flap and/or rim
- create explosive mixtures of air and vapors in the tire which may result in serious injury or death

Mounting Off the Vehicle for Tube-Type Tires

3 Push the bottom bead over the rim flange as far as possible. Use tubeless tire irons or a C-bar to work the first tire bead completely over the rim flange, taking small bites and being careful not to damage the bead. Do not use any type of hammer to force the bottom bead over the rim flange.

4 Insert the tube into the tire casing with the valve located near the valve hole in the rim. Attaching the valve retrieval tool may be eased by placing a block under the tire. This allows the rim to drop and create a gap at the top bead of the tire. Attach the tool to the valve and thread it through the valve hole. Pull the valve through the rim hole and leave the valve retrieval tool attached until after the tire is fully mounted.

5 Stand on the tire to force the part of the bead that is directly across from the valve into the well. When the bead is well started, relubricate the remaining unmounted portion of the tire bead and rim flange. Taking small bites, lever the tire bead over the rim flange until the final section drops over at the valve. A bead lock/clamp may be used to “keep your place.” Be careful to avoid pinching the tube with tire irons.

Mounting Off the Vehicle for Tube-Type Tires

6 Centering the tire on the rim is extremely important to prevent broken beads. Remove the valve retrieval tool and install the collar nut. Use an extension hose with an in-line air gauge and clip-on chuck; and place tire/rim/wheel in a safety cage or other restraining device. If using a boom, position it over the middle of the assembly to act as a restraining device. Inflate the tire (with the valve core removed) to seat the beads. Do not exceed 35 psi to seat the beads. See Warning box below. It is essential for the operator to stand clear of the trajectory of the tire sidewalls. Check to see that both beads are seated all the way around the tire. Check to see that the distance between the edge of the rim and the molded rib on the lower sidewall does not vary by more than 2/32 of an inch. As a reminder, continued use of proper PPE is required during tire service.

⚠WARNING

Inflating an unsecured tire is dangerous. If it bursts, it could be hurled into the air with explosive force resulting in serious personal injury or death. Never inflate a tire unless it is secured to a vehicle, tire mounting machine or other restraining device such as a safety cage.

Completely deflate the tire by removing the valve core before removing the wheel/tire from the axle if there is known or suspected damage to the tire or wheel or if the tire has been run at 80% or less of its recommended pressure. Demount, inspect and match all the tire and rim parts before reinflating.

Stay out of the trajectory as indicated by shaded area. Under some circumstances the trajectory may deviate from its expected path. Always deflate tires before handling. Inflate only in a safety cage.

⚠WARNING

NEVER INFLATE BEYOND 35 PSI OR THE MANUFACTURERS STATED MAXIMUM
WHEN SEATING THE BEADS.
NEVER STAND, LEAN, OR REACH OVER THE ASSEMBLY DURING INFLATION.

Inspect both sides of the tire to be sure that the beads are evenly seated. Inflation should be done in a safety cage or other restraining device. If both beads are not properly seated when pressure reaches 35 psi, completely deflate the assembly, reposition the tire 180 degrees on the rim, relubricate, and reinflate.

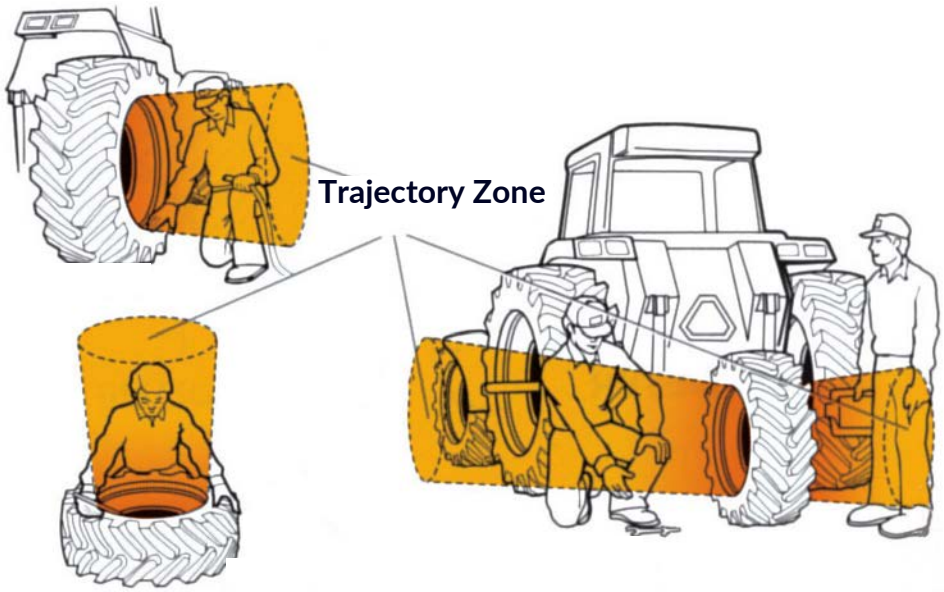
Inflating beyond 35 psi inflation pressure or the manufacturer's stated maximum seating pressure when trying to seat the beads is a DANGEROUS PRACTICE that may break a tire bead (or even the rim) with explosive force, possibly resulting in equipment damage, serious injury or death. After the beads are fully seated, set the pressure to operating conditions per the tire manufacturer's data book. Never exceed the recommended maximum allowable inflation pressures.

Never rework, weld, heat or braze the rim of a tire/rim/wheel assembly.

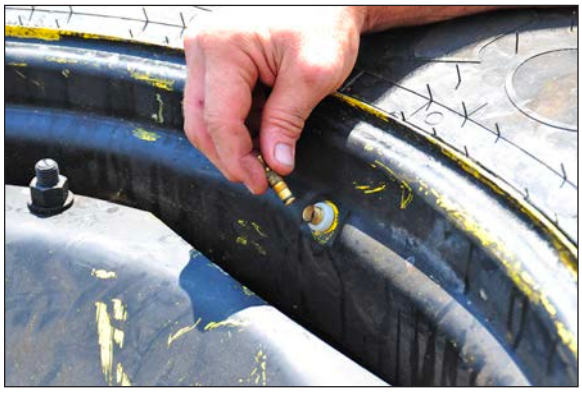
Mounting Off the Vehicle for Tube-Type Tires

⚠WARNING

It is essential for the operator to stand clear of the tire. DO NOT place hands or head in or near the restraining device while inspecting and inflating the tire. Even in a restraining device, close proximity to the force of air and/or exploded remnants from a tire rupture could cause serious personal injury or death. ALWAYS remain outside of the wheel assembly's trajectory zone as in the illustrated examples below. NOTE: Under some circumstances, the trajectory may deviate from its expected path. This is particularly important if the tire is being mounted on a multi-piece rim.



7 Completely deflate the tire to allow repositioning of the tube.



Mounting Off the Vehicle for Tube-Type Tires

8 Re-insert the valve core or valve core housing and re-inflate the tire to the recommended operating pressure.