

Safe Tire & Rim Servicing Procedures

Single-Piece Rims 3-Piece Rims 5-Piece Rims

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IMPORTANT SAFETY INFORMATION



To prevent SERIOUS INJURY or DEATH:

- ONLY personnel trained in tire and rim servicing, using the proper procedures and tools, shall service tires.

- **REFER** to any available OSHA Wall Charts when performing any tire and rim Servicing.

- ALWAYS read and fully understand all procedures in this Safety Manual before performing any tire and rim servicing.

- ANY inflated tire mounted on a wheel contains explosive energy.

- THE use of damaged, mismatched or improperly assembled tire and wheel components can cause the assembly to separate with explosive force.

- IF struck by an exploding tire, wheel component, or the air blast, you, or someone else may be seriously injured or killed.

- ONLY assemble a tire and rim after you have positively identified and correctly matched the tire and rim diameter, width, and contour.

- ALWAYS use a tire cage or other approved restraining devices when inflating tires.

- ALWAYS use a clip-on chuck when inflating tires.

- ALWAYS use inflation equipment consisting of an in-line valve with a pressure gauge or regulator and a sufficient length of hose to stand outside the trajectory.

- NEVER exceed the recommended inflation pressure on the sidewall of the tire you are inflating.

- NEVER exceed 35 p.s.i. for truck tires or 40 p.s.i for agricultural tires when seating beads.

- ALWAYS STAND CLEAR of the trajectory zone.



IMPORTANT SAFETY INFORMATION



We urge those involved in the servicing of tires and wheels to read the U.S. Department of Labor and Occupation Safety and Health Administration (OSHA) document 29 CFR part 1910.177 entitled Servicing of Single-Piece and Multi-Piece Rim Wheels and the U.S. Department of Labor Mine Safety and Health Administration Tire Safety and Awareness Program 30 CFR Parts 56/57.14100. Copies of these tire servicing standards are found at the end of this section.



Your employer is responsible for providing proper procedures and training for tire technicians. See Occupational Safety and Health Administration (OSHA), 29 CFR 1910.177, Servicing of Single-Piece and Multi-Piece Rim Wheels.

For additional information go to www.moveero.com



1.0 Inspecting Single-Piece Tire & Rim/Wheel Components

A WARNING

ALWAYS conduct a visual and tactile inspection of the tire.

• LOOK and FEEL for any damage or evidence of being operated overloaded and/or in a run-flat condition (80% or less of its recommended operating inflation pressure).

Photo 3A is an example of innerliner damage created by an underinflated and overloaded condition.

NOTE: Radial tires that have undulations or irregular sidewall distortions could possibly have permanent sidewall structural damage (steel cord fatigue). Ply cords weakened by underinflation and/or overloading may break one after another, until a rupture occurs in the upper sidewall with accompanying instantaneous air loss and explosive force. This can result in serious injury or death. Follow tire industry recommended inspection procedures for tires with these characteristics. Photo 3B is an example of sidewall undulations indicative of a potential "zipper rupture".

- Remove rust, dirt, or foreign material from all tire and rim/wheel mating surfaces.
- Inspect rim/wheel. NEVER use any single-piece rims/wheels that are worn, bent, cracked, or pitted by corrosion. Clearly mark and remove all unserviceable parts from the service area. See examples 3C and 3D
- · DO NOT rework, weld, heat or braze any rim parts or components for any reason.
- Before mounting, be sure that the tire is properly matched to the rim.

NEVER assemble a tire and rim unless you have positively identified and correctly matched the tire and rim diameter. If an attempt is made to seat the tire bead by inflating on a mismatched rim/wheel, the tire bead will break with explosive force and may result in serious injury or death.

3C In the examples below, a rim flange wear gauge can be used to determine if the rim flange is acceptable for service. The gauge reads "Daylight in this area is an acceptable rim."



3D Use a carpenter square and a credit card to examine rim diameter.



By using the carpenter square and the credit card on this wheel, it is more clear that the rim diameter has been reduced so the wheel should not be used.





ANY INFLATED TIRE MOUNTED ON A WHEEL CONTAINS EXPLOSIVE ENERGY. THE USE OF DAMAGED, MISMATCHED OR IMPROPERLY ASSEMBLED TIRE AND WHEEL COMPONENTS CAN CAUSE THE ASSEMBLY TO SEPARATE WITH EXPLOSIVE FORCE. IF STRUCK BY AN EXPLODING TIRE, WHEEL COMPONENT, OR THE AIR BLAST, YOU OR SOMEONE ELSE MAY BE SERIOUSLY INJURED OR KILLED.







1.1 Inspecting Multi-Piece Tire & Rim/Wheel Components

ALWAYS conduct a visual and tactile inspection of the tire, rim/wheel and its components.
 LOOK and FEEL for any damage or evidence of being operated overloaded and/or in a run-flat condition (80% or less of its recommended operating inflation pressure).

Photo 3A is an example of innerliner damage created by an underinflated and overloaded condition.

NOTE: Radial tires that have undulations or irregular sidewall distortions could possibly have permanent sidewall structural damage (steel cord fatigue). Ply cords weakened by underinflation and/or overloading may break one after another, until a rupture occurs in the upper sidewall with accompanying instantaneous air loss and explosive force. This can result in serious injury or death. Follow tire industry recommended inspection procedures for tires with these characteristics. Photo 3B is an example of sidewall undulations indicative of a potential "zipper rupture".

• Remove rust, dirt, or foreign material from all tire and rim/wheel mating surfaces.

- NEVER use any multi-piece rim parts that are worn, bent, cracked, or pitted by corrosion. Clearly mark and remove all unserviceable parts from the service area.
- DO NOT rework, weld, heat or braze any rim parts or components for any reason.

• ALWAYS find the identification stamp on multi-piece rim components. NEVER use a rim part unless you can positively identify it from the markings stamped by the manufacturer. If you cannot identify a multi-rim component, DO NOT USE IT.

Examples of Unserviceable Parts

Bent, rusted, cracked, or worn parts cannot be safely assembled and must be clearly marked and removed from the service area. Replace them with properly matched, serviceable parts.









ANY INFLATED TIRE MOUNTED ON A WHEEL CONTAINS EXPLOSIVE ENERGY. THE USE OF DAMAGED, MISMATCHED OR IMPROPERLY ASSEMBLED TIRE AND WHEEL COMPONENTS CAN CAUSE THE ASSEMBLY TO SEPARATE WITH EXPLOSIVE FORCE. IF STRUCK BY AN EXPLODING TIRE, WHEEL COMPONENT, OR THE AIR BLAST, YOU OR SOMEONE ELSE MAY BE SERIOUSLY INJURED OR KILLED.



Notice:

Before starting maintenance work, it is recommended that tire pressure records are updated to ensure early detection of air leaks which may be caused by cracks in rim components.



Cleaning prior to Inspection:

Cleaning rim components using a wire brush makes examination and tire installation easier. Pay particular attention to cleaning the the O-ring grooves and lock ring grooves on the gutter.





Rim base inspections:



		Checkpoint				
Inspected Part	Check Method	Cracking	Wear	Deformation /Ellipse	Corrosion	Surface Roughness
O-ring groove	Visual Inspection	0			0	0
	Non-destructive inspection	0				
Lock ring groove	Visual Inspection	0	0		0	0
	Non-destructive inspection	0				
Contact zone with side ring	Visual Inspection	0	0		0	0
Contact zone with side mig	Non-destructive inspection	0				
Base P part	Visual Inspection	0	0		0	0
buse k purt	Non-destructive inspection	0				
Rim circumference weld zone	Visual Inspection	0				
Rim circonnerence weid zone	Non-destructive inspection	0				
Valve hole	Visual Inspection	0			0	
	Non-destructive inspection					
Disc weld zone	Visual Inspection	0				
	Non-destructive inspection	0				
Disc bolt boles	Visual Inspection	0	0	0		
	Non-destructive inspection					
Contact zone with tire bead	Visual Inspection		0		0	
Solitaet zolie with the bead	Non-destructive inspection					
Tire side outer surface	Visual Inspection				0	
	Non-destructive inspection					
Weld zone for accessories	Visual Inspection	0				
	Non-destructive inspection					



Lock ring inspections:







Contact zone with gutter section

	Checkpoint					
Inspected Part	Check Method	Cracking	Wear	Deformation /Ellipse	Corrosion	Surface Roughness
Contact zone with bead	Visual Inspection	0	0			0
seat band or side ring	Non-destructive inspection					
Contact zone with gutter of	Visual Inspection	0	0		0	0
rim base	Non-destructive inspection					
Overall form	Visual Inspection			0		
	Non-destructive inspection					



Bead seat band inspections:



	Inspected Part Check Method	Checkpoint				
Inspected Part		Cracking	Wear	Deformation /Ellipse	Corrosion	Surface Roughness
Base B part	Visual Inspection	0	0		0	0
	Non-destructive inspection	0				
Contact zone with side ring	Visual Inspection	0	0		0	0
	Non-destructive inspection	0				
Contact Zone with lock ring	Visual Inspection	0	0			0
Contact Zone with lock hing	Non-destructive inspection					
Contact zone with tire bead	Visual Inspection		0		0	0
	Non-destructive inspection					
Inner and outer surface	Visual Inspection				0	
	Non-destructive inspection					
Overall form	Visual Inspection			0		
	Non-destructive inspection					
Weld zone for accesories	Visual Inspection	0				
Weld 20ne for accesories	Non-destructive inspection					



Side ring inspections:





Inspected Part Check Metho		Checkpoint				
	Check Method	Cracking	Wear	Deformation /Ellipse	Corrosion	Surface Roughness
Contact zone with rim base	Visual Inspection	0	0			0
(for 5-piece rims)	Non-destructive inspection	0				
Contact zone with bead	Visual Inspection	0	0			0
seat band (for 5-piece rims)	Non-destructive inspection	0				
Base P part (for 3-piece rims)	Visual Inspection	0	0		0	0
Buse R purt (101 3-piece mins)	Non-destructive inspection	0				
Inner and outer surface	Visual Inspection				0	
(for 3-piece rims)	Non-destructive inspection					
Contact zone with tire	Visual Inspection		0		0	
	Non-destructive inspection					
Overall form	Visual Inspection			0		
	Non-destructive inspection					



2.0 Personal Protective Equipment

ALWAYS wear adequate protective eyewear (or face shield), protective footwear, and ear protection.



3.0 For all tires

- ALWAYS follow the blocking, jacking, or cribbing of the vehicle/equipment guidance provided by the vehicle/equipment manufacturer.

- ONLY use properly diluted tire lubricant (nonflammable vegetable or soap-based). NEVER use concentrated tire lubricant or it may not completely evaporate and residue could cause tire to slip. NEVER use petroleum based lubricants, silicone or antifreeze.

- NEVER use starter fluid, ether, gasoline, or other flammable materials and/or accelerants to lubricate the beads of a tire or there may be an explosive separation of the tire/wheel during servicing or during use.

- NEVER inflate over the maximum psi as indicated on each tire or the manufacturer's guidance.

- When seating tire beads NEVER exceed the maximum p.s.i for the tire or 35 p.s.i for a single piece rim.

- NOTE: Certain tire manufactures may recommend to overinflate the tire by 20 p.s.i to assist in seating tire beads on a multi-piece rim. After the beads have been properly seated, the tire MUST be deflated to the correct operating pressure.

- NEVER stand, lean, or reach over the tire rim/wheel assembly in thetire cage or other approved restraining devices during inflation.



4.0 Single-Piece Rims (Drop Center Rims)

4.1 Terminology

- 1. Rim Size (Nominal Bead Seat Diameter)
- 2. Rim Width
- 3. Rim Inside Dia.
- 4. Bead Seat Area
- 5. Flange
- 6. Flange Height
- 7. Valve Hole (Location and size can vary)





4.2 Demounting

Tools Required

- Cap and core removal tools
- Hydraulic bead unseating tool
- Two tire irons (36" if ON vehicle or 18" if OFF vehicle)
- Tire
- Diluted tire lubricant.

If ON Vehicle	If OFF Vehicle
 Jack, crib and block the vehicle/equipment per the manufacturer's instructions. 	1. Remove any fluid fill from tire.
2. Remove any fluid fill from tire.	2. Always remove the valve core and exhaust all air. Use exhaust muffler if applicable. Check valve stem not plugged by inserting a wire through the valve stem. For tube type tires, remove the rim nut and push valve through valve hole. NOTE: ALWAYS deflate both tires, if ON vehicle AND vehicle has a dual tire assembly.
3. Always remove the valve core and exhaust all air. Use exhaust muffler if applicable. Check valve stem not plugged by inserting a wire through the valve stem. For tube type tires, remove the rim nut and push valve through valve hole. NOTE: ALWAYS deflate both tires, if ON vehicle AND vehicle has a dual tire assembly.	3. Lay tire and rim down with the narrow ledge (or short side) of the rim closer to the ground. Use hydraulic bead unseating tool between the tire bead and rim flange and force the bead off the bead seat. Then turn tire and rim over with narrow ledge up and unseat bead.
4. Before attempting to demount tire on the vehicle, ensure the narrow ledge (or short side) of the drop center is facing out. If the narrow ledge of the drop center is facing inside, the assembly must be removed from the vehicle before the tire can be demounted.	4. Lubricate the tire bead area and rim flange with diluted tire mounting lubricant.
5. Use hydraulic bead unseating tool between the tire bead and rim flange and force the bead off the bead seat on both sides of the rim.	5. Force the part of the bead that is directly across from the valve into the well. Starting at the valve, insert both 18" tire irons under the bead and pry the bead over the rim flange.

CONTINUES ON NEXT PAGE



4.2 Demounting Cont.

If ON Vehicle	If OFF Vehicle
6. Lubricate the tire bead area and rim flange with diluted tire mounting lubricant.	 6. After the first section of the bead is over the rim flange, use one tire iron to pry the next section over the flange. Continue prying tire over rim flange until the entire tire bead is on the outside of the rim flange. NOTE: DO NOT attempt to pry too large a section of the bead over the rim flange at one time. Leave one tool in position and place the second about five (5) inches away. Repeat in successive steps until the tire bead is completely unseated. Avoid extremely hard prying, which will damage the tire bead.
7. Lock the wheel with the valve at the top. At the bottom, force the outside bead into the well of the rim. At the top, insert both 36" tire irons under the bead and pry the bead over the rim flange.	7. For tube-type tires, pull the tube out of the casing, starting at the bottom.
 8. After the first section of the bead is over the rim flange, use one tire iron to pry the next section over the flange. Continue prying tire over rim flange until the entire tire bead is on the outside of the rim flange. NOTE: DO NOT attempt to pry too large a section of the bead over the rim flange at one time. Leave one tool in position and place the second about five (5) inches away. Repeat in successive steps until the tire bead is completely unseated. Avoid extremely hard prying, which will damage the tire bead. 	8. To completely remove the tire from the rim, insert tire irons under the inside bead at the side of the tire. Pry the inside bead over the rim flange. Before starting, check the bead area on the opposite side of the tire is down in the well of the rim.
 For tube-type tires, pull the tube out of the casing, starting at the bottom. 	
10. To completely remove the tire from the rim, insert tire irons under the inside bead at the side of the tire. Pry the inside bead over the rim flange. Before starting, check the bead area on the opposite side of the tire is down in the well of the rim.	



4.3 Mounting



To prevent SERIOUS INJURY or DEATH:

- ONLY personnel trained in tire and rim servicing, using the proper procedures and tools, shall service tires.

- **REFER** to any available OSHA Wall Charts when performing any tire and rim Servicing.

- ALWAYS read and fully understand all procedures in this Safety Manual before performing any tire and rim servicing.

- ANY inflated tire mounted on a wheel contains explosive energy.

- THE use of damaged, mismatched or improperly assembled tire and wheel components can cause the assembly to separate with explosive force.

- IF struck by an exploding tire, wheel component, or the air blast, you, or someone else may be seriously injured or killed.

- ONLY assemble a tire and rim after you have positively identified and correctly matched the tire and rim diameter, width, and contour.

- ALWAYS use a tire cage or other approved restraining devices when inflating tires.

- ALWAYS use a clip-on chuck when inflating tires.

- ALWAYS use inflation equipment consisting of an in-line valve with a pressure gauge or regulator and a sufficient length of hose to stand outside the trajectory.

- NEVER exceed the recommended inflation pressure on the sidewall of the tire you are inflating.

- NEVER exceed 35 p.s.i. for truck tires or 40 p.s.i for agricultural tires when seating beads.

- ALWAYS STAND CLEAR of the trajectory zone.



Tools Required

- Two tire irons (36" if ON vehicle or 18" if OFF vehicle)
- Diluted tire lubricant
- Wire brush
- Locking pliers
- Rubber mallet
- Valve retrieval tool (tube-type tires)
- Extension hose with in-line gauge and clip-on air chuck
- Air/water inflation gauge
- Tire cage or other approved restraining device

1. Use a wire brush to clean and inspect rim for fatigue cracks.



If damage is found, DO NOT use. Mark or tag as unserviceable and remove from service area. Replace any cracked, badly worn, damaged and severely rusted rims or wheels. Do not attempt to rework, weld, heat, or braze any rim or wheel component under any circumstances.

Coat the rim with paint or a rust inhibitor if necessary. Follow procedures and safety precautions of the paint manufacturer.

2. Inspect tire for wear, cracks, tears, punctures and

other damage. Tires with excessive or uneven wear, cracks, tears, punctures, blisters or other damage may explode during inflation or service.



If damage is found, DO NOT use. Mark or tag as unserviceable and remove from service area. Tire should be destroyed and replaced with good tire of correct size, type and manufacturer for assembly, machine, and application.

If concerned about the condition of the rim base, wheel components, or tire - STOP - contact the manufacturer or distributor for assistance.

3. Thoroughly lubricate both tire beads and rim flanges with diluted tire mounting lubricant.

CONTINUES ON NEXT PAGE



If ON Vehicle	If OFF Vehicle
4. Before placing tire on rim, check valve hole is at the bottom of the wheel. Check directional tread tires are mounted for correct rotation direction. Place a pair of bead locks on the outer rim flange at the 11 o'clock and 1 o'clock positions. Place the inner bead of tire over bead locks and into the well of the rim. Use tire irons to work the inner tire bead completely over the rim flange, taking small bites and being careful not to damage the bead. Remove bead locks from outer rim flange.	4. Lay the rim on the floor with the narrow ledge on the top. Check directional tread tires are mounted for correct rotation direction. Push the bottom bead over the rim flange as far as possible. Use 18" tire irons to work the first tire bead completely over the rim flange, taking small bites and being careful not to damage the bead.
5. For tubeless tir For tube	es, skip to step 6. type tires:
With the inner bead on the rim, pull the tire toward the outside of the rim as far as possible to make room for the tube. Be sure valve is at the bottom of the wheel. Align the stem with the valve hole and starting at the bottom, insert tube into tire. Place the valve in valve hole and screw the rim nut in place. The tube should be partially inflated and areas contacting the rim should be re-lubricated to prevent localized stretching. Check tube is inside rim before proceeding.	Partially inflate the tube and insert it into the tire casing with the valve located near the valve hole in the rim. Attach a valve retrieval tool to the valve and thread the tool through the valve hole. NOTE: You may want to use a block to raise the tire to make it easier to insert the tube.
 6. Starting opposite the valve, use the tire irons to lift the outer bead up and over the rim flange, then down into the rim well. Install bead locks on top the rim as far apart as possible. Use tire irons to advance the bead locks and work the outer tire bead completely over the rim flange. Be sure the bead is always in the well of the rim while taking small bites and being careful not to damage the bead. Remove bead locks after the tire is mounted. Be careful not to pinch the tube. 	 6. Starting opposite the valve, 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. NOTE: Locking pliers may be used to prevent tire slipping off the back of the rim.
7. Centering of the tire and rim assembly is extremely important to prevent broken beads. With the valve stem at the bottom, lower the jack until the tire is centered on the rim.	7. Centering of the tire and rim assembly is extremely important to prevent broken beads.

CONTINUES ON NEXT PAGE



If ON Vehicle	If OFF Vehicle		
8. Place a tire cage or other approved restraining device in-line air gauge and clip-on chuck (with valve core rer	over the rim and tire. Using an extension hose with an noved), inflate the tire to seat the beads.		
NEVER inflate over the maximum psi as indicated on ec tire beads, NEVER exceed the maximum psi for the tire	ach tire or the manufacturer's guidance. When seating or 35 psi for single-piece rim.		
Check for concentric centering of tire on rim. For tubeless tires, successful mounting 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, through the valve. Where the beads have been squeezed together, the use of an inflator ring (either horizontally or vertically) will be required to provide a seal between the tire bead and rim. NEVER use a come-along, ratchet strap or flammable material to seat the beads. If assembly is incorrect, STOP - DEFLATE - CORRECT THE ASSEMBLY Repeat procedure.			
 9. Raise vehicle and rotate wheel assembly so valve is at the top (12 o'clock position). If the Tire is tube-type, completely deflate by removing the valve core housing to remove buckles and uneven stresses from the tube and flap before re-inflation. 9. If the tire is tube-type, completely deflate by removing the valve core housing to remove buckles and uneven stresses from the tube and flap before re-inflation. 			
10. Remove tire cage or other approved restraining devices.			



5.0 Drivers for Three-Piece & Five-Piece Rims

Loose Style Driver 1. Gutter Portion of Rim Base 2. 28° Mounting Bevel 3. Rim Stop Plates (location, style and size can vary



Notched Gutter Lug Style Driver

(Five-Piece Rims Only)

- 1. Lock Ring
- 2. Crimped on driver
- 3. Notch in gutter portion of rim
- 4. Notch in bead seat band



Demountable Type Rims

1. Driver Pocket (welded on gutter portion of rim base)

- 2. Driver Pocket (welded on bead seat band)
- 3. Driver Key





5.1 Alignment for Three-Piece & Five-Piece Rims





6.0 Three-Piece Rims

6.1 Terminology

- 1. Rim Size (Nominal Bead Seat Diameter)
- 2. Rim Width
- 3. Rim Inside Dia.
- 4. Bead Seat Area
- 5. Flange-Fixed
- 6. Flange Height
- 7. Valve Hole (Location and size can vary)
- 8. Flange-Removable (Side Ring)
- 9. Lock Ring
- 10. O-Ring (For tubeless application only)
- 11. 28" Mounting Bevel (utilized for demountable application only)
- 12. Rim Stop Plate (Used for demountable application only; size, shape and location can vary)
- 13. O-Ring Groove
- 14. Lock Ring Groove
- 15. Gutter Portion of Rim





6.2 Demounting

Tools Required

- One (1) straight tire iron
- Two (2) gooseneck tire irons
- Hydraulic bead unseating tool
- Diluted tire lubricant
- Wire
- Valve core removal tool.

If ON Vehicle	If OFF Vehicle		
1. Jack, crib and block the vehicle/equipment per the manufacturer's instructions	1. Place the assembly on block on the floor with loose side flange side up.		
2. Always completely deflate tire (and both tires of a dual the valve stem by running a piece of wire through the st	assembly) by removing valve core(s) from valve(s). Check tem to make sure it is not plugged.		
3. Depress the side flange using a boom truck or push-ba	r until the O-ring is completely exposed.		
4. Remove driver key, if present, and set aside to be installed later.			
5. Remove the lock ring with a tire iron or pry bar, starting near the split and working around the ring. NOTE: Avoid extremely hard prying, which will deform and damage the lock ring.			
6. Use the hooked end of gooseneck tire iron to remove the O-ring from ring groove. Cut and discard the O-ring and replace with a new O-ring. NOTE: Never use your fingers to remove the O-ring.			
7. Use hydraulic bead unseating tool between the tire bead and inner rim flange and force the bead off the bead seat of the rim.			
8. Remove the tire and side flange from rim base using a boom truck and sling or a tire handler.			
9. Lay tire down on the floor with the side flange facing upward. Use hydraulic bead unseating tool between the tire bead and side flange and force the bead off the bead seat until the side flange is completely free from the tire.			



6.3 Mounting



To prevent SERIOUS INJURY or DEATH:

- ONLY personnel trained in tire and rim servicing, using the proper procedures and tools, shall service tires.

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- ALWAYS read and fully understand all procedures in this Safety Manual before performing any tire and rim servicing.

- ANY inflated tire mounted on a wheel contains explosive energy.

- THE use of damaged, mismatched or improperly assembled tire and wheel components can cause the assembly to separate with explosive force.

- IF struck by an exploding tire, wheel component, or the air blast, you, or someone else may be seriously injured or killed.

- ONLY assemble a tire and rim after you have positively identified and correctly matched the tire and rim diameter, width, and contour.

- ALWAYS use a tire cage or other approved restraining devices when inflating tires.

- ALWAYS use a clip-on chuck when inflating tires.

- ALWAYS use inflation equipment consisting of an in-line valve with a pressure gauge or regulator and a sufficient length of hose to stand outside the trajectory.

- NEVER exceed the recommended inflation pressure on the sidewall of the tire you are inflating.

- NEVER exceed 35 p.s.i. for truck tires or 40 p.s.i for agricultural tires when seating beads.

- ALWAYS STAND CLEAR of the trajectory zone.



Tools Required

- Two tire irons (36" if ON vehicle or 18" if OFF vehicle)
- Diluted tire lubricant
- Wire brush
- Locking pliers
- Rubber mallet
- Valve retrieval tool (tube-type tires)
- Extension hose with in-line gauge and clip-on air chuck
- Air/water inflation gauge
- Tire cage or other approved restraining devices.

1. Use a wire brush to clean the rim base and all components throroughly. Clean all dirt and rust from inter-locking faces of multi-piece rim components, particularly the gutter sections that hold the lock ring and O-ring in place.

2. Inspect rim base and wheel components for cracks, wear, corrosion and damage.



If damage is found, DO NOT use. Mark or tag as unserviceable and remove from service area. Replace any cracked, badly worn, damaged and severely rusted rims or wheel components. Do not attempt to rework, weld, heat, or braze any rim or wheel component under any circumstances.

Verify the replacement parts are the correct size, type and manufacturer for the wheel to be assembled.

3. Coat the rim with paint or a rust inhibitor if necessary. Follow procedures and safety precautions of the paint manufacturer.

4. Inspect tire for wear, cracks, tears, punctures and other damage. Tires with excessive or uneven wear, cracks, tears, punctures, blisters or other damage may explode during inflation or service.



If damage is found, DO NOT use. Mark or tag as unserviceable and remove from service area. Tire should be destroyed and replaced with good tire of correct size, type and manufacturer for assembly, machine, and application.

If concerned about the condition of the rim base, wheel components, or tire - STOP - contact the manufacturer or distributor for assistance.

5. Install valve on rim. Follow valve manufacturer's recommendations and installation instructions.

6. Lubricate both tire beads, rim base, side flange, O-ring groove and areas where O-ring meets the side flange with diluted tire mounting lubricant.

CONTINUES ON NEXT PAGE



If ON Vehicle	If OFF Vehicle		
7. Place the tire on the rim base using a boom truck and sling or a tire handler.	 Place the rim base on block on the floor with gutter side facing upward. Place tire over rim base. 		
8. Position the side flange on the rim base with the help of the boom. If present, be sure the driver pocket on side flange is aligned with pocket on rim	8. Position the side flange on the rim base. DO NOT use boom or hammer to force side flange on the rim. If present, be sure the driver pocket on side flange is aligned with pocket on rim base.		
9. Use the boom to push the slide flange and tire back to expose the O-ring groove. Place a new, lubricated O-ring into the O-ring groove. Snap the O-ring it into place by placing it in groove on one side, stretching like a rubber band and seating on the opposite side. DO NOT roll O-ring into place. Lubricate the entire O-ring area with diluted tire mounting lubricant.	9. Use tire iron to push the slide flange against the tire and expose the O-ring groove. Place a new, lubricated O-ring into the O-ring groove. Snap the O-ring it into place by placing it in groove on one side, stretching like a rubber band and seating on the opposite side. DO NOT roll O-ring into place. Lubricate the entire O-ring area with diluted tire mounting lubricant.		
10. Start the lock ring in the lock ring groove and push or walk it into place. Check lock ring is installed with the correct side facing you. When a driver key is used, make sure the gap in the lock ring is at least 6" away from the driver key.			
11. Check components to make sure parts are correctly assembled. NOTE: Lock ring should be fully seated in gutter around the circumference. If present, insert driver key.			
12. Place rim and tire in a tire cage or other approved restraining devices during tire inflation. Use a clip-on chuck with an in-line pressure gauge and enough hose so you can stay away from the potential trajectory danger zone.			
WITH VALVE CORE REMOVED: Inflate to approximately 12 psi and check for proper engagement of all components.			
If assembly is correct, install valve core and inflate to recommended pressure.			
If assembly is incorrect, STOP - DEFLATE - CORRECT THE ASSEMBLY - AND REPEAT PROCEDURE.			
Never attempt to align or seat side flange, lock ring or other components by inflation, hammering, welding, heating or brazing.			
Never inflate beyond manufacturer's recommended tire pressure.			
Then remove tire cage or other approved restraining dovices			

Then remove tire cage or other approved restraining devices.



7.0 Five-Piece Rims

7.1 Terminology

- 1. Rim Size (Bead Seat Diameter)
- 2. Rim Width
- 3. Rim Inside Dia.
- 4. Back Flange Portion of Rim Base
- 5. Center Band Portion of Rim Base
- 6. Gutter Band Portion of Rim Base
- 7. Rim Base (Entire Shaded Area)
- 8. Bead Seat Band (Removeable, Gutter Side Only)
- 9. Lock Ring
- 10. O-Ring
- 11. Flange, Inner (Removable)
- 12. Flange, Outer (Removable) *Note: Inner and Outer Flanges are identical
- 13. 28° Mounting Bevel (Utilized for demountable application only)
- 14. Valve Hole (Location, size and configuration can vary)
- 15. O-Ring Groove
- 16. Knurl (Located on Back Flange Portion of Rim Base and Bead Seat Band tire mating surfaces)
- 17. Lock Ring Groove (size and shape can vary depending on style of lock ring)
- Pry Bar Pocket [not shown] (continuous gap entire circumference on some items)





7.2 Demounting

Tools Required

If ON vehicle:

- Lifting device or boom truck
- Hydraulic bead unseating tool
- Gooseneck tire iron
- Straight tire iron
- Wire
- Valve core removal tool

If OFF vehicle:

- Hydraulic bead unseating tool,
- Two (2) straight tire irons,
- Valve core removal tool
- Wire
- Screwdriver

If ON Vehicle	If OFF Vehicle			
1. Jack, crib and block the vehicle/equipment per the manufacturer's instructions	1. Place the assembly on the floor with back flange side facing upward.			
2. Always completely deflate tire (and both tires of a dual assembly) by removing valve core(s) from valve(s). Check the valve stem by running a piece of wire through the stem to make sure it is not plugged.				
3. Depress the flange and bead seat band using a boom t	truck or push-bar until the O-ring is completely exposed.			
4. Remove driver key, if present, and set aside to be installed later.				
5. Remove the lock ring with a tire iron or pry bar, starting near the split and working around the ring. NOTE: Avoid extremely hard prying, which will deform and damage the lock ring.				
6. Use the hooked end of gooseneck tire iron to remove the O-ring from ring groove. Cut and discard the O-ring and replace with a new O-ring. NOTE: Never use your fingers to remove the O-ring.				
7. Place the hook of the hydraulic demounting tool into one of the pry bar pockets on the back flange side of the rim base. A continuous lip is provided on some rim bases. Hand tighten the set screw until the tool is at a right angle to the rim when under pressure. NOTE: For rims without a pry bar notch or continious lip, a hydraulic bead unseating tool between the tire bead and inner rim flange can be used to force the bead off the bead seat of the rim.				

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7.2 Demounting Cont.

If ON Vehicle	If OFF Vehicle	
8. Apply pressure and depress the flange about 3/4". If necessary, release the pressure to readjust the tool. Place the end of the gooseneck tire iron between the flange and the lip of the bead seat band and release the pressure. Then place the hook of the hydraulic demounting tool under the lip of the bead seat band and continue the procedure around the rim; then slowly apply pressure until the tire bead is COMPLETELY unseated.		
 Remove the tire, flange and bead seat band from rim base using a boom truck and sling or a tire handler. Remove the back side flange from the rim base and set aside to be installed later. 		
10. Lay tire down on the floor with the flange and bead seat band facing upward. Using the same procedure in steps 7 & 8, use the hydraulic bead unseating tool to separate the bead seat band from the flange.		



7.3 Mounting



To prevent SERIOUS INJURY or DEATH:

- ONLY personnel trained in tire and rim servicing, using the proper procedures and tools, shall service tires.

- **REFER** to any available OSHA Wall Charts when performing any tire and rim Servicing.

- ALWAYS read and fully understand all procedures in this Safety Manual before performing any tire and rim servicing.

- ANY inflated tire mounted on a wheel contains explosive energy.

- THE use of damaged, mismatched or improperly assembled tire and wheel components can cause the assembly to separate with explosive force.

- IF struck by an exploding tire, wheel component, or the air blast, you, or someone else may be seriously injured or killed.

- ONLY assemble a tire and rim after you have positively identified and correctly matched the tire and rim diameter, width, and contour.

- ALWAYS use a tire cage or other approved restraining devices when inflating tires.

- ALWAYS use a clip-on chuck when inflating tires.

- ALWAYS use inflation equipment consisting of an in-line valve with a pressure gauge or regulator and a sufficient length of hose to stand outside the trajectory.

- NEVER exceed the recommended inflation pressure on the sidewall of the tire you are inflating.

- NEVER exceed 35 p.s.i. for truck tires or 40 p.s.i for agricultural tires when seating beads.

- ALWAYS STAND CLEAR of the trajectory zone.



Tools Required

- Lifting device or boom truck
- One (1) straight tire iron
- Two (2) gooseneck tire irons
- Approved lubricant
- Rubber mallet
- Extension hose with in-line gauge and clip-on air chuck
- Air/water inflation gauge
- Tire cage or other approved restraining device.

1. Use a wire brush to clean the rim base and all components throroughly. Clean all dirt and rust from inter-locking faces of multi-piece rim components, particularly the gutter sections that hold the lock ring and O-ring in place. 2. Inspect rim base and wheel components for cracks, wear, corrosion and damage. If damage is found, DO NOT use. Mark or tag as unserviceable and remove from service area. Replace any cracked, badly worn, damaged and severely rusted rims or wheel components. Do not attempt to rework, weld, heat, or braze any rim or wheel component under any circumstances. Verify the replacement parts are the correct size, type and manufacturer for the wheel to be assembled. 3. Coat the rim with paint or a rust inhibitor if necessary. Follow procedures and safety precautions of the paint manufacturer. 4. Inspect tire for wear, cracks, tears, punctures and other damage. Tires with excessive or uneven wear, cracks, tears, punctures, blisters or other damage may explode during inflation or service. If damage is found, DO NOT use. Mark or tag as unserviceable and remove from service area. Tire should be destroyed and replaced with good tire of correct size, type and manufacturer for assembly, machine, and application. If concerned about the condition of the rim base, wheel components, or tire - STOP - contact the manufacturer or distributor for assistance. Install valve on rim. Follow valve manufacturer's recommendations and installation instructions. 6. Position the back side flange on the rim base with the help of the boom. Make sure the concave side is facing away from operator. 7. Lubricate both tire beads, rim base, bead seat band, O-ring groove and areas where O-ring meets the side flange with diluted tire mounting lubricant. Place the tire on the rim base using a boom truck and sling or a tire handler.

CONTINUES ON NEXT PAGE



If ON Vehicle	If OFF Vehicle	
8. Position the flange and bead seat band on the rim base with the help of the boom. If present, be sure the driver pocket on bead seat band is aligned with pocket on rim base.	8. Position the flange and bead seat band on the rim base. DO NOT use boom or hammer to force flange or bead seat band on the rim. If present, be sure the driver pocket on side flange is aligned with pocket on rim base.	
9. Use the boom to push the flange, bead seat band and tire back to expose the O-ring groove. Place a new, lubricated O-ring into the O-ring groove. Snap the O-ring it into place by placing it in groove on one side, stretching like a rubber band and seating on the opposite side. DO NOT roll O-ring into place. Lubricate the entire O-ring area with diluted tire mounting lubricant.	9. Use tire iron to push the slide flange against the tire and expose the O-ring groove. Place a new, lubricated O-ring into the O-ring groove. Snap the O-ring it into place by placing it in groove on one side, stretching like a rubber band and seating on the opposite side. DO NOT roll O-ring into place. Lubricate the entire O-ring area with diluted tire mounting lubricant.	
10. Start the lock ring in the lock ring groove and push or walk it into place. Check lock ring is installed with the correct side facing you. When a driver key is used, make sure the gap in the lock ring is at least 6" away from the driver key.		
11. Check components to make sure parts are correctly assembled. NOTE: Lock ring should be fully seated in gutter around the circumference. If present, insert driver key.		
12. Place rim and tire in a tire cage or other approved restraining devices during tire inflation. Use a clip-on chuck with an in-line pressure gauge and enough hose so you can stay away from the potential trajectory danger zone.		
WITH VALVE CORE REMOVED: Inflate to approximately 12 psi and check for proper engagement of all components. If assembly is correct, install valve core and inflate to recommended pressure.		
If assembly is incorrect, STOP - DEFLATE - CORRECT THE ASSEMBLY - AND REPEAT PROCEDURE.		
Never attempt to align or seat side flange, lock ring or other components by inflation, hammering, welding, heating or brazing.		
Never inflate beyond manufacturer's recommended tire pressure.		
Then remove tire cage or other approved restraining devices.		



8.0 Additional Resources

Occupational Safety and Health Administration (OSHA), https://www.osha.gov/

- 29 CFR 1910.177, Servicing of Single-Piece and Multi-Piece Rim Wheels
- Demounting and Mounting Procedures for Tube-type Truck and Bus Tires Chart Tire Chart (OSHA 3402)
- Demounting and Mounting Procedures for Tubeless Truck and Bus Tires Chart Tire Chart (OSHA 3401)
- Multi-Piece Rim Matching Chart Tire Chart (OSHA 3403 2011)
- Servicing Multi-Piece and Single-Piece Rim Wheels 29 CFR 1910.177 Manual Tire Chart (OSHA 3421 - 2014)

U.S. Department of Labor, Mine Safety and Health Administration, https://www.msha.gov/

- Tire Repairs 30 CFR 56.14104

Association of European Wheel Manufacturers (EUWA), https://www.euwa.org/

- Safety and service recommendations for wheels (EUWA ES-1.09)

U.S. Tire Manufacturers Association, https://www.ustires.org/publications

- Care and Service of Commercial Truck and Bus Tires
- Demounting and Mounting Procedures for Passenger and Light Truck Tires Wall Chart

Tire Industry Association, https://www.tireindustry.org

- Basic Earthmover Tire Service (ETS) Training Kit
- Basic Farm Tire Service Training Kit
- OTR Tire Mount/Demount Training Program







moveero Headquarters

moveero Inc. PO Box 48, 5453 6th Avenue Armstrong, Iowa 50514 Email: sales@moveero.com

www.moveero.com

Registered Address

moveero Ltd. Hadley Castle Works Telford, Shropshire TF1 6AF United Kingdom

moveero A/S

Nagbølvej 31 DK - 6640, Lunderskov Denmark

moveero S.r.l.

European Research, Test & Development Centre Via Molino Emili 18, 25030 Maclodio (BS) Italy