

# MOR



## Crown Puncture Repair Training Guide

- Passenger Tires
- Light Truck Tires
- Truck Tire
- Retread Repair Only





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# MOR Tire Repair Benefits

- Reduce Customer Cost
- Reduce facility Cost
- Improving efficiencies by eliminating shipping costs and labor costs
- Standardized program
- Reduce liabilities by using an approved product



## MOR PASSENGER/LIGHT TRUCK ONE-PIECE REPAIR

Item #	Description	UOM
6MOR	MOR Passenger/Light Truck/Truck 1/4", 6mm, One-Piece Repair	Box of 14
10MOR	MOR Light Truck/Truck/Ag 3/8", 10mm, One-Piece Repair	Box of 10



## MOR PASSENGER/LIGHT TRUCK TWO-PIECE REPAIR

Item #	Description	UOM
6SMOR	MOR Passenger/Light Truck/Truck 1/4", 6mm, Thermacure Repair	Box of 20
111MOR	MOR 2.5" Round Non-Reinforced All Purpose Repair/Tube Repair	Box of 50
10SMOR	MOR Light Truck/Truck/Ag 3/8", 10mm, Thermacure Repair	Box of 20
112MOR	MOR 3.5" Square Reinforced Multi-Purpose Repair	Box of 30

\*Injury angles greater than 25° must be repaired using a two-piece repair method



## MOR TIRE REPAIR/SERVICE CHEMICALS

Item #	Description	UOM
704MOR	MOR Pre-Buff Cleaner, Quart	Each
760MOR	MOR Fast Dry Vulcanizing Fluid, 8oz	Each
738MOR	MOR Security Coat, 16oz	Each

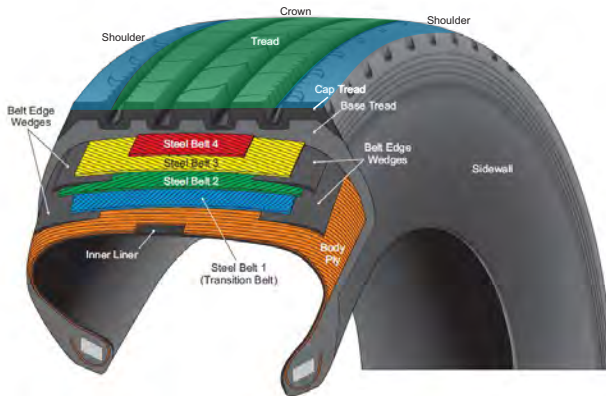
# Introduction

Proper tire repair is an essential component of tire life cycle management. Utilizing a proper tire repair program from MOR can help to prolong the life of the tire casing by installing a permanent, worry-free repair. MOR repair units have been manufactured and tested to meet or exceed all industry requirements of new tires. You can be assured that when a tire is properly repaired with a MOR repair unit, it will be as safe as a new tire.

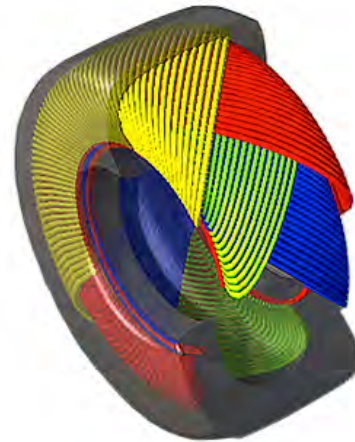
When tires are repaired properly, the tire's usable life is extended. This saves the owner of the tire money and reduces waste. If a tire is repaired improperly, it can result in an unsafe condition for both the technician installing the tire on the wheel and then the vehicle, and also for the driver of the vehicle. Improper repairs can lead to further loss of air pressure when the tire is in service, which can result in premature tire failure. Avoid potential causes of accidents by installing repairs properly. Improper repairs can also lead to frustration for the owner of the tire by having to get the repair reworked, which can be costly, or having to repeatedly add air to the tire due to a slow leak. These improperly repaired tires typically have a shorter life span, which can lead to more frequent tire replacement, higher fuel costs and more tires going into landfills.

Throughout this training program, the user will learn about the construction of the tires being worked on, the industry standards for proper tire repair, and the different methods of properly repairing crown puncture injuries in tires.

# Tire Construction Basics



**RADIAL**



**BIAS**

It is important to understand that pneumatic tires are high pressure air containers and the air inside of the tire is what supports the load of the vehicle, not the tire itself. If a tire does not have enough air pressure for the load being carried, the tire will over flex and likely fail. When dealing with light truck (LT), medium and heavy truck tires with steel body plies it is also important to understand that when these tires are operated in an under inflated or overloaded condition, the tire may be susceptible to a zipper rupture during the inflation process and additional inspection of the tire is required.

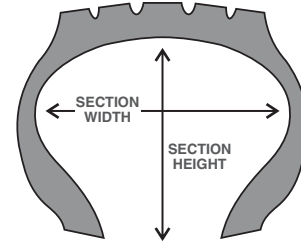
When inflating a tire, the tire must be strong enough to contain the inflation pressure. Due to this pressure, tires are reinforced with either fabric or steel body plies that wrap around the bead bundle. The bead bundle is a steel wire hoop that holds the tire firmly against the rim and prevents the tire from leaking or slipping.

The two most common types of tires used in the industry are bias and radial ply. Bias ply tires have body plies that wrap around one bead and run diagonally across the tire and wrap around the opposite bead. Bias tires will always have at least two layers of body plies that wrap around the tire in alternating directions and intersect in the crown at nearly a right angle. The nature of the flexing of bias tires allows for greater distortion in the tread area, typically leading to a faster wear rate than radial tires, as well as lower fuel economy.

Radial tires have body plies that run straight across the tire at a 90-degree angle to the beads. Passenger and many LT tires typically utilize fabric cords such as polyester, while some larger LT tires, medium, or heavy truck tires are made with a single ply of steel cords. Underneath the tread are multiple layers of belts consisting of fabric and/or steel cords to help stabilize the tire. These belts allow the tread to maintain even contact with the road surface, which leads to longer tread life and better fuel economy.

The dimensions of a tire are identified in the tire's size. For example, the information provided in tire size **P265/60R18** gives the following information:

- P** = Passenger Tire (light truck tires begin with prefix LT)
- 265** = Section Width in millimeters (measured at the widest part of the tire sidewall to sidewall)
- /60** = Aspect Ratio or section height to width ratio in % (for this tire, 265mm X .60 = 159mm sidewall height)
- R** = Radial tire
- 18** = Rim diameter in inches



An example of a truck tire size is **11R22.5**

- 11** = Section width in inches
- R** = Radial Tire
- 22.5** = Rim diameter and type (Rims with ".5" in the rim size are tubeless or drop-center rims, while rim sizes which are whole numbers such as 20, are typically multi-piece, tube-type rims)

On passenger and LT tires, a service description is stamped next to the tire's size. This service description will identify the tires load index and speed rating. The load index will consist of a two or three digit number indicating the tire's load carrying capacity. Speed Index is a letter designation identifying the tire's maximum speed threshold. Exceeding either of these limitations may lead to premature tire failure due to over-flexing and/or heat fatigue. For example: **P265/60R 18 110H**

- 110** = maximum load of 2337 pounds
- H** = maximum speed of 130 MPH

SPEED RATINGS		
Letter	MPH	km/h
S	112	180
T	118	190
U	124	200
H	130	210
V	149	240
Z	149+	240+
W	168	270
Y	186	300
(Y)	186+	300+

Another component of the tire to be aware of is the date the tire was manufactured. Every tire used in highway applications is required to have a DOT code stamped on the sidewall. This code starts with the letters "DOT" to signify that the tire meets Department of Transportation standards for highway use. The last four digits of the DOT code identify the date the tire was manufactured by week and year. The first two digits of the date signify the week the tire was manufactured in while the last two digits indicate the year. For example, a tire manufactured 3516 was manufactured the 35th week of the year 2016. Tires manufactured prior to the year 2000 had a three-digit date code: two digits for the week but only one for the year (example: 356 = 35th week of either 1986 or 1996). There are currently no regulations stating a maximum age for tires in use, but age should be a factor in determining whether a tire should remain in service.

When inflating a passenger tire, always refer to the Tire and Loading Information placard located on the driver side door jamb. This placard will identify the proper inflation pressure and maximum load for the OE tires. When inflating LT, medium and heavy tires, it is recommended to refer to the Tire and Rim Association's Load & Inflation tables for recommended operating pressure. Failure to maintain proper inflation pressure can result in many unfavorable conditions for the tire. Under inflation will result in faster, irregular wear of the tire's tread and may also lead to higher fuel consumption for the vehicle. This condition may also lead to premature tire failure.

# Tire Inspection

A thorough inspection of the casing is critical to ensuring that the repair being performed will be worth the investment. In order to perform a proper inspection of the casing, the technician will need to be well educated on inspection procedures and have a few basic tools and proper lighting at their disposal.

Recommended Tools for Tire Inspection:

- Low RPM Buffer (Max. 5,000 RPM) such as: S1036 or CP873K
- S892 Texture Brush, 3"
- 919 Probe
- Minimum 200 lumens work light such as: #JS78606 – Rechargeable Slim LED Work Light or #ALSFL501R Straight Light (500 lumen)

Tires should not be repaired if any of the following conditions are present:

1. External

- Damage to the cords that exceeds the limitations in the MOR Radial Repair Chart
- Broken, damaged, kinked or exposed bead bundle (See Image 7 on page 7)
- Weather checking which exceeds 2/32" (1.5mm) (See Image 9 on page 7)
- Multiple injuries to the same body cord(s)
- Tires with 2/32" (1.5mm) or less remaining tread depth unless planned for retreading (See Image 5 on page 7)
- Radial and/or circumferential cracking
- Any signs of a potential zipper rupture (ripples, bulges, or softness in the upper sidewall, or crunching or popping sounds when flexed)

2. Internal

- Porous or loose inner liners
- Open liner splices which expose body cords
- Injuries to the body cords beyond repairable limits
- Evidence of run-flat or overloading damage such as wrinkled, creased or discolored inner liner (See Image 2 on page 7)
- Injuries in the non-repairable bead area to the body cords
- Impact breaks (See Image 10 on page 7)

For more information, refer to "Radial Tire Conditions Analysis Guide" produced by the Technology and Maintenance Council (TMC) of the American Trucking Association or "Passenger & Light Truck Tire Conditions Manual" Produced by the Tire Industry Association (TIA). Follow industry recommended practices from Tire Retread & Repair Information Bureau (TRIB).



When inspecting Steel body ply LT, medium or heavy truck tires returning to service, it is important to understand the risks of potential zipper ruptures. When working with these tires, it is required by the Occupational Safety and Health Administration to check the tire pressure prior to servicing the tires. If the pressure is at 80% or less of its recommended operating pressure, the tire must be dismounted and inspected for a potential zipper rupture.

Zipper ruptures are circumferential ruptures in the sidewall caused by operating the tire in an under inflated and/or overloaded condition. These conditions allow for over flexing of the sidewall which can result in overheating of the casing and potential catastrophic tire failure. It is always recommended to inflate these tires with the valve core removed, in a safety cage with a clip-on chuck and sufficient length of air hose to keep the technician away from the sidewall of the tire during the inflation process.

For more information on zipper ruptures, refer to Tire Information Service Bulletin Vol. 33, Number 5 "Inspection Procedures to Identify Potential Zipper Ruptures in Steel Cord Radial Truck, Bus and Light Truck Tires" produced by the US Tire Manufacturers Association.



Zipper Rupture in a Light Truck Tire with steel body plies.

## Non-Repairable Conditions

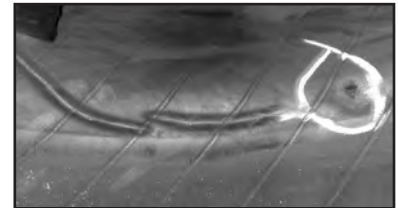
The tire inspection process is critical in determining if the tire can safely be repaired and returned to service without being sent to a retread facility for more involved repairs. The inspection should be done with the tire removed from the wheel and placed on a tire spreader using adequate lighting. The technician must be able to examine the tire beads, interior and exterior sidewalls, and the tread area.



**1.** Injury no greater than 1/4" for passenger tires. Injury no greater than 3/8" for light truck/truck tires.



**2.** Run flat or under-inflated



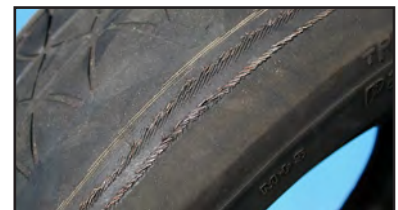
**3.** Inner liner separation



**4.** Casing separation



**5.** Excessive tread wear



**6.** Exposed plies/cables



**7.** Deformed bead, exposed fabric or steel



**8.** If injury angle exceeds 25 degrees, a 2-piece repair must be used.



**9.** Ozone cracking

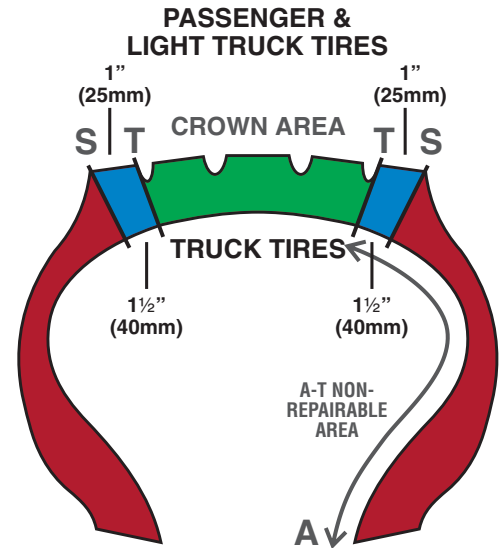


**10.** Tire damage from impacts

# PROPER PUNCTURE REPAIR

## Industry Guidelines

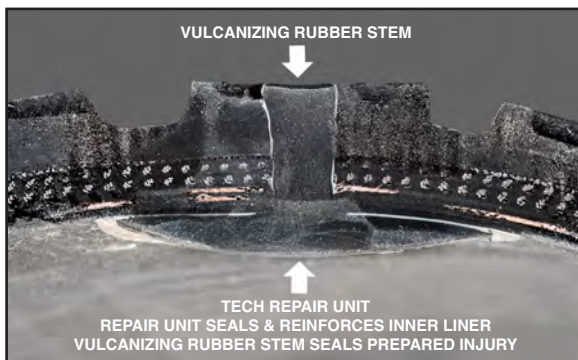
When repairing punctures in tires it is important to be aware of tire industry guidelines and recommendations. When repairing tires, puncture repairs are limited to the Crown (T-T) area of the tire. The maximum size is dependent upon the type of tire being repaired. Passenger and fabric body ply LT tires have a maximum puncture repair size of ¼" (6mm) after damage removal. Steel body ply LT (10 Ply Rated or higher) have a maximum puncture repair size of 3/8" (10mm) after damage removal.



In order to perform a proper, permanent puncture repair on a tire, the following steps must always be used:

- Removal of the tire from the rim so proper inspection may be performed
- Removal of the damaged material with a carbide cutter
- Buffing the inner liner to a #1 or #2 buffed texture
- Fill the injury with a vulcanizing rubber stem or approved rubber fill material
- Reinforce and seal the tire inner liner at the point of injury, with a proper repair unit
- NEVER use a plug only or patch only repair

### PROPER TIRE REPAIR



### IMPROPER TIRE REPAIR



There is no tire industry limit to the number of puncture repairs that may be performed in standard passenger, LT, medium or heavy truck tires. Multiple repairs may be performed so long as the injuries are far enough apart that the repair units will not overlap and they are offset so that the injuries are not damaging the same body plies in a radial tire. In a bias tire, the injuries must be limited to one per quadrant. When repairing high-performance tires with speed ratings of H or higher, or run-flat tires, check with tire manufacturer for guidelines.



## ONE-PIECE REPAIR

# MOR One-Piece Repairs



MOR One-Piece Repairs are patch/plug units designed for puncture repairs in the crown area of passenger, LT and truck tires. One-piece repairs feature chemical cushion gum both on the repair base and stem, providing maximum adhesion in the injury and to the inner liner of the tire. MOR One-Piece Repairs also feature a lead wire on the stem for easy installation of the repair unit. All MOR One-Piece Repairs can be installed in any radial or bias tire.

When using MOR One-Piece Repairs, it is important to identify the type of tire being worked on prior to installing the repair to ensure the proper repair unit is being installed. The 6MOR repair can be used on all types of passenger, LT, medium truck and heavy truck tires. The 10MOR repair may be used in steel cord LT and medium truck tires.

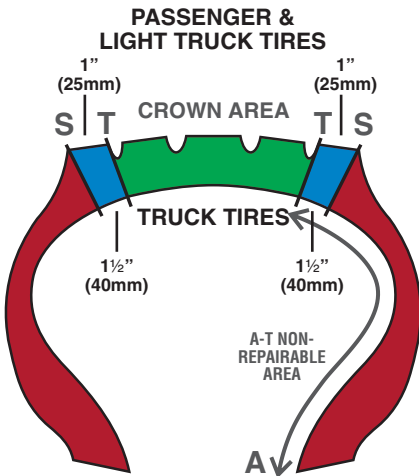
Another factor to consider when using MOR One-Piece Repairs is the angle of injury. MOR One-Piece Repairs have a maximum angle of 25°. If these maximum angles are exceeded, it could cause adverse effects on the repair leading to premature repair failure. For this reason, it is recommended to utilize the two-piece repair method for injuries with extreme angles.



## WARNING

Failure to properly repair tire could cause **SUDDEN TIRE FAILURE, RESULTING IN SERIOUS INJURY OR DEATH.** Carefully read and follow these instructions.

# ONE-PIECE TIRE REPAIR LIMITATIONS



All injuries larger than those defined in the chart or outside the specified T-T area must be treated as a section repair.

Type of Tire	Repair Unit	Carbide Cutter	Prepared Crown Injury Size Ø	Number of Repairs Per Tire	
RUN FLAT TIRE	6MOR	CC6 (270)	6mm (1/4")	1	Repairs must not overlap or be on the same radial ply.
PERFORMANCE TIRE RATED H, V, W, Y OR Z	6MOR	CC6 (270)	6mm (1/4")	1	
STANDARD PASSENGER & FABRIC CORD LIGHT TRUCK TIRES	6MOR	CC6 (270)	6mm (1/4")	NO LIMIT	
STEEL CORD LIGHT, MEDIUM & HEAVY TRUCK TIRE	6MOR	CC6 (270)	6mm (1/4")	NO LIMIT	
	10MOR	CC10 (271/38)	10mm (3/8")	4	

NOTE: THIS CHART SERVES ONLY AS A SUGGESTED GUIDELINE. INDUSTRY RECOMMENDED PRACTICES AND TIRE MANUFACTURER'S RECOMMENDATIONS SHOULD ALSO BE FOLLOWED.

## PLEASE READ BEFORE PERFORMING ANY TIRE REPAIR:

- Protective eyewear must be worn while repairing tires.
- Tire industry recommendations state all injuries must be filled with a rubber stem or suitable vulcanizing material and a repair unit applied to the inner liner.
- Failure to follow industry recommendations may result in premature tire failure.
- Tire manufacturers' warranties and policies regarding repair of radial passenger, performance, or run flat tires may differ.
- Chemicals used during the repair process are extremely flammable. Do not use near sources of ignition.
- Failure to follow the procedures shown in this manual may result in premature tire failure. This could result in serious injury or death.

## TECH Service Truck Nail Hole Tool Kit



- Comes fully assembled and ready to use
- Sturdy lockable case for security and convenience
- Transportable for ease of use while doing field repairs

### ITEM NO. 896NHTK CONTAINS:

#### TOOLS AND ACCESSORIES

- 1 – 896BOX – Plastic Tool Box for 896 Kit
- 1 – 911 Allen Wrench 2mm, QC Adaptor
- 1 – 912 Allen Wrench 3mm, S1041/38 Adaptor
- 1 – 913 8" (200mm) Slip Joint Pliers
- 1 – TRT105 Color Coded Injury Measuring Tool
- 1 – 915 Spiral Cement Tool
- 1 – 919 Pointed Awl
- 1 – 933 Rubber Scraper
- 1 – 939 Stitcher, 2", 50mm x 1/4", 6mm
- 1 – 973 Chrome 6" Diagonal Pliers
- 1 – TK – Tech Knife
- 1 – CP873K – Low Speed Tire Buffer w/Exhaust Kit
- 1 – S1035 – 500 RPM Reversible Drill
- 1 – S892 Texture Brushes & Washers 75mm
- 1 – RH107 – 2-1/2" – 3/8" Bore, 170 Fine Grit
- 1 – S923 Safety Glasses
- 1 – 111TM Repair Template
- 1 – ODEC5 – Oval Decal 5-1/2"

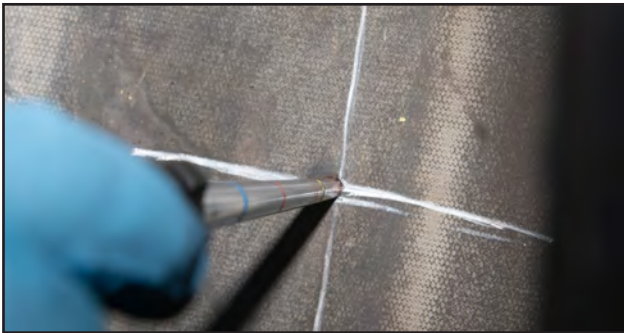
#### CUTTERS & ADAPTORS

- 1 – CC6 (270) 6mm (1/4") Carbide Cutter
- 1 – CC8 (271) 8mm (5/16") Carbide Cutter
- 1 – CC10 (271/38) 10mm (3/8") Carbide Cutter
- 1 – S1040 Quick Change Adaptor  
For No. 270 Carbide Cutter
- 1 – S1041 Quick Change Adaptor  
For No. 271 Carbide Cutter
- 1 – S1047 Quick Change Long Adaptor  
3/8", 24 thread

# Tire Inspection & Pre-Cleaning



**1.** Locate and mark all damage on the inside and outside of the tire while checking for separation.



**2.** Determine the size and angle of the injury using the TRT105 injury measuring tool. If the angle exceeds 25°, a two-piece repair must be used.



**3.** Pre-clean the inner liner with MOR Pre-Buff Cleaner (704MOR) and a scraper 2 to 3 times to remove contaminants.

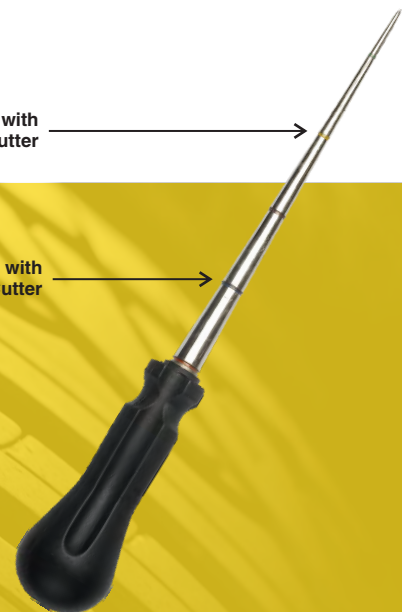
Use 6MOR with  
CC6 (270) Cutter

Use 10MOR with  
CC10 (271/38) Cutter



## TECH TIP:

Insert the **TRT105** measuring tool into the injury from the inside of the tire. Apply firm pressure to the handle while rotating the tool in a circular motion. When the tool meets resistance, find the closest visible line to the inner liner. Refer to the illustration (right) to determine the injury size.



## Injury Preparation



**4.** Outline the area to be buffed 1/2" larger than the repair or use the appropriate repair template.



**5.** Using a low speed buffer (maximum 5,000 rpm) and an appropriate inner liner buffing wheel, buff the entire outlined area to a #1 or #2 buffed texture.



**6.** Damaged rubber and steel should be removed from the injury using a carbide cutter on a low speed air/electric drill, maximum 1,200 rpm. Drill the injury from the inside of the tire 3 to 5 times, followed by 3 to 5 times from the outside. In passenger tires, drilling the injury can be done with a 2,500 rpm air buffer as long as care is taken not to scorch the injury channel.



**7.** The injury should be inspected after drilling is complete by flexing the tire and probing the injury with a pointed awl to make sure all splits and loose material have been removed.



### TECH TIP:

- Tire industry puncture repair guidelines state that the inner liner should be buffed to a #1 or #2 buffed texture using a low speed air tool, maximum 5,000 rpm.
- An even velvet texture minimizes the chance of trapped air while maximizing adhesion.





# Cleaning & Cement Application



**8.** Use a soft wire brush on a low rpm buffer to remove buffing debris. Do not apply excess pressure as this could alter the buffed texture and reduce repair adhesion. Remove all debris from the tire using a vacuum, being careful not to contact and contaminate the buffed surface.



**9.** Use a spiral cement tool (913) to apply MOR Chemical Vulcanizing Fluid (760MOR) into the injury 3 to 5 times turning the tool in a clockwise motion. Reinsert the spiral cement tool into the injury from the outside of the tire to complete the cementing process.



**10.** Apply a thin, even coat of MOR Chemical Vulcanizing Fluid (760MOR) to the buffed surface.



**11.** Allow 3-5 minutes drying time for 760MOR. Additional drying time may be necessary in adverse weather conditions. Vulcanizing Fluid must be completely dry.

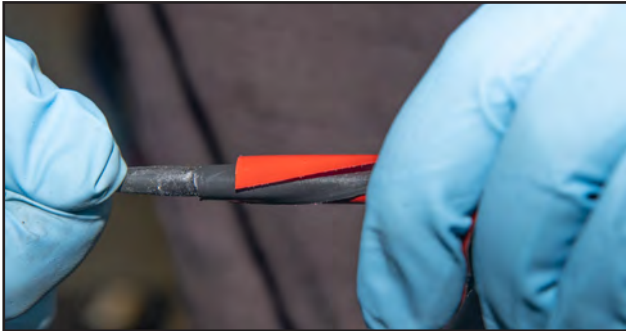


## TECH TIP:

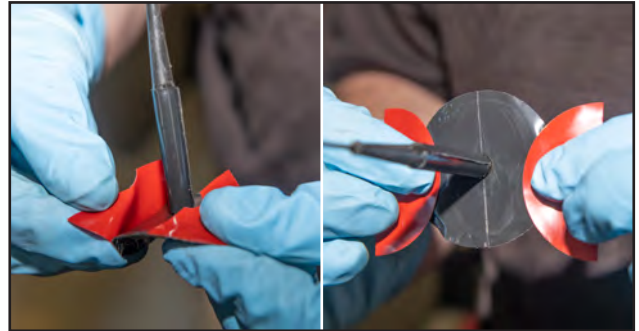
- Do not use a compressed air line to clean the buffed area, as contamination from moisture and oil will occur.
- When cleaning the tire, care should be taken to not let anything touch the buffed surface.
- Do not use any outside heat sources or open flame to shorten the drying time of vulcanizing fluid. This will adversely affect the vulcanizing fluid and potentially lead to premature repair failure.

## ONE-PIECE REPAIR

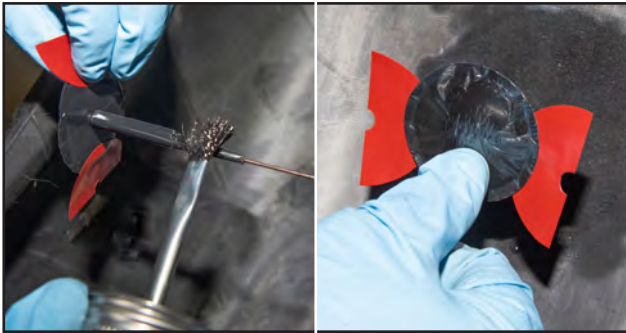
# Repair Installation & Finishing



**12.** Remove the red poly from the stem by pulling and twisting the repair as shown.



**13.** Reposition the poly on the cap to prevent contamination of the black gum and allow easier removal of trapped air during installation.



**14.** Apply a small amount of vulcanizing fluid to the black tapered portion of the stem. Relax the beads of the tire. Insert the lead wire through the injury.



**15.** Grasp the wire with pliers and pull the stem through the tire until the cap forms a slight indentation.



**16.** Press down the repair with your thumb from the center out.



**17.** With the red poly still positioned under the cap, stitch the repair unit from the center out using firm pressure.



### TECH TIP:

**MOR Ultra Stems** are slightly larger than the prepared injury, resulting in a compression fit with excellent adhesion. Placing a small amount of vulcanizing fluid on the stem just before inserting it into the tire injury provides lubrication for easier installation.



**18.** Remove the poly from the cap, press down the sides and continue stitching toward the edges of the repair. Stitch with firm pressure in the opposite direction to ensure air is removed.



**19.** Remove the clear protective poly from the top of the repair. When applicable, clearly mark the date of installation, initials and repair center location in the provided area.



**20.** Seal the edge of the repair and the over buffed area of the inner liner with MOR Security Coat (738MOR).



**21.** With the stem relaxed, cut off the excess 1/8" (3mm) above the tread surface.



**22.** The tire is ready to return to service.



## TECH TIP:

**MOR Security Coat (738MOR)** is designed to replace the inner liner that was removed during the buffing process and promote better air retention.

## TWO-PIECE REPAIR

# MOR Two-Piece Repair System



The MOR Two-Piece Repair System is designed to produce a safe, permanent repair for LT, medium, and heavy duty truck tires. A proper two-piece repair consists of a vulcanizing rubber stem or rope rubber to fill and permanently seal the injury channel, in conjunction with a separate repair unit which reinforces the tire and seals the inner liner. This repair system meets all tire industry guidelines for proper puncture repairs.

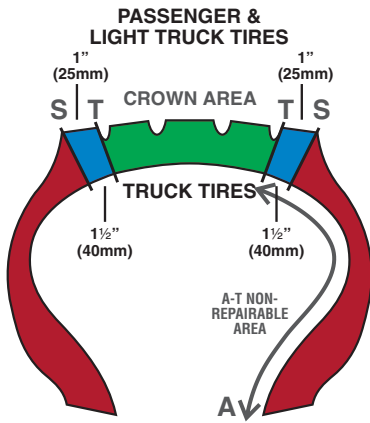
The MOR Two-Piece Repair System is widely used throughout the tire industry due to its reliability and versatility. One-piece repairs such as the 6MOR and 10MOR are limited to a maximum angle of 25°, but a two-piece repair does not have this same restriction. The angle of the injury alone will not preclude a technician from using a two-piece repair. Another aspect of the two-piece method is the variety of types of repair units and filler materials that are available to fit your shop's needs. When filling the injury, the technician may utilize MOR Ultra Stems 6SMOR or 10SMOR based on the injury size. When reinforcing the tire on the inside, the technician may use MOR All Purpose Repairs such as the 111MOR or 112MOR for both radial or bias tires. The two-piece method can also be adapted to fit any heat cure system, such as retreading with the use of MOR All Purpose Repairs. With all of these options, there will be a solution for any needs your shop has for two-piece puncture repairs.









## WARNING

Failure to properly repair tire could cause **SUDDEN TIRE FAILURE, RESULTING IN SERIOUS INJURY OR DEATH.** Carefully read and follow these instructions.

## TWO-PIECE TIRE REPAIR LIMITATIONS



All injuries larger than those defined in the chart or outside the specified T-T area must be treated as a section repair.

Type of Tire	Prepared Injury Size	MOR Ultra Stem	Carbide Cutter	Crown Area Repair Unit	
 <b>Passenger Tires T Rated or Below &amp; LT Tires Through Load Range D</b> <b>H, V, W, Y, or Z Rated Performance Tires</b> <b>Run Flat Tires</b>	6mm (1/4")	6SMOR	270	111MOR	<b>REPAIRS MUST NOT OVERLAP!</b> 
	6mm (1/4")	6SMOR	270	111MOR	
	6mm (1/4")	6SMOR	270	111MOR	
 <b>Light Truck Tires Load Range E &amp; Above</b>	6mm (1/4")	6SMOR	270	111MOR	<b>REPAIRS MUST NOT BE IN THE SAME BODY PLY!</b> 
	10mm (3/8")	10SMOR	271/38	112MOR	
 <b>Truck Tires</b>	6mm (1/4")	6SMOR	270	111MOR	
	10mm (3/8")	10SMOR	271/38	112MOR	

## PLEASE READ BEFORE PERFORMING ANY TIRE REPAIR:

- Protective eyewear must be worn while repairing tires.
- Tire industry recommendations state all injuries must be filled with a rubber stem or suitable vulcanizing material and a repair unit applied to the inner liner.
- Failure to follow industry recommendations may result in premature tire failure.
- Tire manufacturers' warranties and policies regarding repair of radial passenger, performance, or run flat tires may differ.
- Chemicals used during the repair process are extremely flammable. Do not use near sources of ignition.
- Failure to follow the procedures shown in this manual may result in premature tire failure. This could result in serious injury or death.

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- Transportable for ease of use while doing field repairs

### ITEM NO. 896NHTK CONTAINS:

#### TOOLS AND ACCESSORIES

- 1 – 896BOX – Plastic Tool Box for 896 Kit
- 1 – 911 Allen Wrench 2mm, QC Adaptor
- 1 – 912 Allen Wrench 3mm, S1041/38 Adaptor
- 1 – 913 8" (200mm) Slip Joint Pliers
- 1 – TRT105 Color Coded Injury Measuring Tool
- 1 – 915 Spiral Cement Tool
- 1 – 919 Pointed Awl
- 1 – 933 Rubber Scraper
- 1 – 939 Stitcher, 2", 50mm x 1/4", 6mm
- 1 – 973 Chrome 6" Diagonal Pliers
- 1 – TK – Tech Knife
- 1 – CP873K – Low Speed Tire Buffer w/Exhaust Kit
- 1 – S1035 – 500 RPM Reversible Drill
- 1 – S892 Texture Brushes & Washers 75mm
- 1 – RH107 – 2-1/2" – 3/8" Bore, 170 Fine Grit
- 1 – S923 Safety Glasses
- 1 – 111TM Repair Template
- 1 – ODEC5 – Oval Decal 5-1/2"

#### CUTTERS & ADAPTORS

- 1 – CC6 (270) 6mm (1/4") Carbide Cutter
- 1 – CC8 (271) 8mm (5/16") Carbide Cutter
- 1 – CC10 (271/38) 10mm (3/8") Carbide Cutter
- 1 – S1040 Quick Change Adaptor For No. 270 Carbide Cutter
- 1 – S1041 Quick Change Adaptor For No. 271 Carbide Cutter
- 1 – S1047 Quick Change Long Adaptor 3/8", 24 thread

# Tire Inspection & Pre-Cleaning

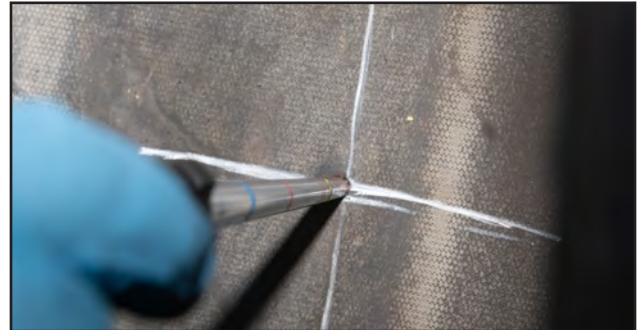


## WARNING

All Passenger, Light Truck, Medium Truck and Heavy Truck Tires must be removed from the rim and inspected before any repair is made!



**1.** Locate and mark all damage on the inside and outside of the tire while checking for separation.



**2.** Determine the size and angle of the injury using the TRT105 injury measuring tool.



**3.** Pre-clean the inner liner with MOR Pre-Buff Cleaner (704MOR) and a scraper 2 to 3 times to remove contaminants. This will promote better repair unit adhesion and prolong the life of buffing wheels by preventing buildup of contaminants.

Use 6SMOR with  
CC6 (270) Cutter

Use 10SMOR with  
CC10 (271/38) Cutter



## TECH TIP:

Insert the **TRT105** measuring tool into the injury from the inside of the tire. Apply firm pressure to the handle while rotating the tool in a circular motion. When the tool meets resistance, find the closest visible line to the inner liner. Refer to the illustration (right) to determine the injury size and angle.

## Injury Preparation & Filling

Ensure the Carbide Cutter being used is in good condition. Using a worn out Carbide Cutter could lead to incomplete damage removal, which could lead to injury growth or difficulty installing MOR All Purpose Repairs and Ultra Stems.



**4.** Damaged rubber and steel should be removed from the injury using a carbide cutter on a low speed air/electric drill, maximum 1,200 rpm. Drill the injury from the inside of the tire, following the angle of the injury. Repeat this procedure 3 to 5 times, completely removing the cutter from the injury after each pass. Repeat this process from the outside of the tire.



**5.** The injury should be inspected after drilling is complete by flexing the tire and probing the injury with a pointed awl to make sure all splits and loose material have been removed. If additional damage is detected, use a larger carbide cutter to remove the remaining damage. If the damage is beyond puncture repair limitations at this point, refer the tire to a full service repair facility for a section repair or scrap the tire.

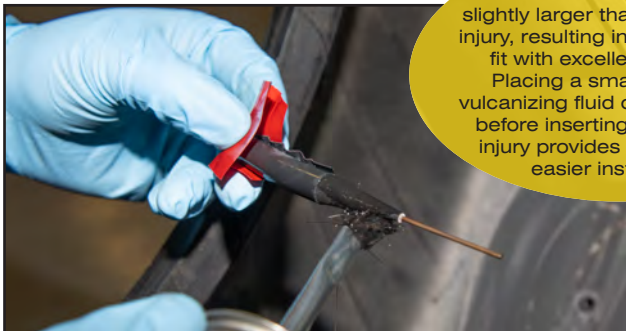


**6.** Using the spiral cement tool in a clockwise direction, apply MOR Chemical Vulcanizing Fluid (760MOR) into the injury, from the inside of the tire casing, 3 to 5 times.



**7.** Remove the protective poly from the stem. Avoid touching the black cushion gum wrapping the stem.

**MOR Ultra Stems** are slightly larger than the prepared injury, resulting in a compression fit with excellent adhesion. Placing a small amount of vulcanizing fluid on the stem just before inserting it into the tire injury provides lubrication for easier installation.



**8.** Apply a small amount of Chemical Vulcanizing Fluid to the black tapered portion of the stem, just below the wire lead.

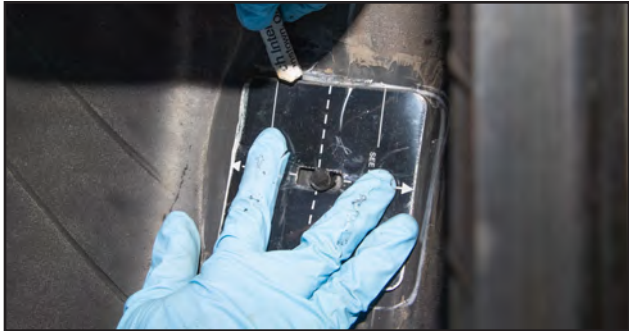


**9.** Insert the lead wire through the injury. Grasp the wire on the outside of the tire with pliers. Pull the stem through the tire until approximately 1/8" (3mm) of the stem remains above the inner liner.



# Repair Installation & Finishing

Tire industry guidelines state that the inner liner should be buffed to a #1 or #2 buffed texture using a low speed air tool, maximum 5,000 rpm. An even velvet texture minimizes the chance of trapped air while maximizing adhesion.



**10.** Outline the area to be buffed 1/2" (13mm) larger than the repair being used, or use the appropriate repair template.



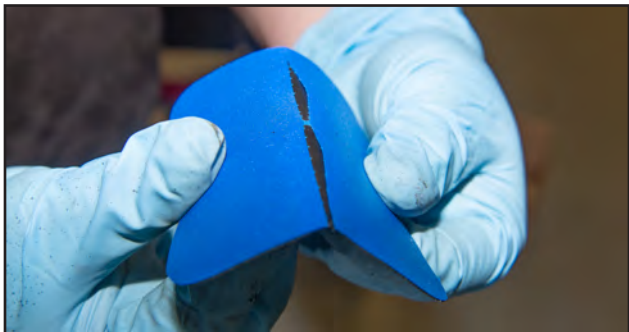
**11.** Using a low speed buffer (maximum 5,000 rpm) and an appropriate inner liner buffing wheel, buff the stem flush to the inner liner. Buff the entire outlined area on the inner liner to a #1 or #2 texture.



**12.** Use a soft wire brush on a low speed buffer to remove buffing dust and debris from the buffed area. Avoid applying excessive pressure, as this could remove texture and reduce adhesion of the repair unit to the tire. Remove the debris from the tire using a vacuum.



**13.** Apply a thin, even coat of MOR Chemical Vulcanizing Fluid (760MOR) to the buffed surface. Allow 3-5 minutes drying time. Additional drying time may be required in adverse weather conditions.



**14.** Bend the repair back and push up on the edges of the repair with your fingers to break the perforation of the protective poly on the back of the repair. Partially remove the poly, exposing the middle portion of the repair.



**15.** Relax the beads of the tire. Center the repair unit over the filled injury. Press down the center of the repair unit with your thumb.



## TECH TIP:

- Do not use a compressed air line to clean the buffed area, as contamination from moisture and oil will occur.
- When cleaning the tire, care should be taken to not let anything touch the buffed surface.
- Do not use any outside heat source or open flame to speed up the drying time of Chemical Vulcanizing Fluids, as this will adversely effect the cement and potentially lead to premature repair failure.

## TWO-PIECE REPAIR

# Repair Installation & Finishing



**16.** With the red poly still positioned under the repair unit, stitch the repair unit from the center out, using firm pressure.



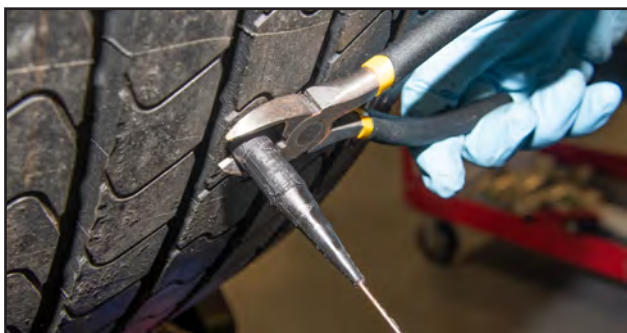
**17.** Remove the poly from under the repair unit, press down the edges of the repair and continue stitching toward the edges of the repair.



**18.** Remove the clear protective poly from the top of the repair. Clearly mark the date of installation, initials and repair center location in the provided area.



**19.** Seal the edge of the repair and the over buffed area of the inner liner with MOR Security Coat (738MOR).



**20.** With the stem relaxed, cut off the excess, leaving 1/8" (3mm) remaining above the tread surface.



**21.** The tire is now ready to return to service.



### TECH TIP:

**MOR Security Coat #738MOR** is designed to replace the inner liner that was removed during the buffing process and promote better air retention.



# Contact TECH

## Corporate Headquarters

200 E. Coshocton Street  
Johnstown, OH 43031  
Phone: 1-800-433-8324 or 1-740-967-9015

## Online Ordering Portal (J.O.E.) Support

Phone: 1-740-967-9015, ext. 1227  
triggs@trc4r.com

## Product and Training Support

Phone: 1-740-966-8055  
training@techtirerepairs.com

## Customer Service Department

Phone: 1-800-705-2206  
Fax: 1-740-967-1039  
techorders@techtirerepairs.com

## Sales Support

740-967-9015 ext. 1451  
clawless@trc4r.com

740-967-9015 ext. 1275  
tbevier@trc4r.com

**[www.techtirerepairs.com](http://www.techtirerepairs.com)**