

Product Service Bulletin

Important Information To Better Serve Your Customers

This PBS Is Applicable To: U.S. and Canada

October 11, 2022

PSB #2022-11

TO: Goodyear Company Owned Stores, Independent Goodyear Dealers and Associate Dealers in the U.S. and Canada

**SUBJECT: Proper Puncture Repair Procedures for Passenger & Light Truck Tires
(Replaces PSB 2017-11)**

Follow the U.S. Tire Manufacturers Association's (USTMA), step-by-step directions found in the attached **PUNCTURE REPAIR PROCEDURES FOR PASSENGER AND LIGHT TRUCK TIRES** wall chart to properly perform a puncture repair on a Goodyear manufactured or marketed passenger or light truck tire. This illustrated wall chart shows the industry recommended puncture repair procedures for passenger and light truck tires (including European commercial metric, C-Type tires). The wall chart also contains important information regarding puncture repairs, acceptable location of repairs, and damage limits, along with other essential safety warnings and cautions.

A full-sized English copy of the wall chart can be ordered from U.S. Tire Manufacturers Association. To order, visit their website at <https://www.ustires.org/publications>, call 202-682-4800 or email: info@ustires.org.

When ordering the PUNCTURE REPAIR PROCEDURES FOR PASSENGER AND LIGHT TRUCK TIRES wall chart, please refer to the information listed below:

USTMA Item #:	USTMA Non-Member Pricing:
PRP-PLT-0517	\$3.00

Run-Flat tires may also be repaired in the same manner specified in the wall chart. Be aware that for H and above speed rated tires, Goodyear allows only one properly performed puncture repair for the speed rating of the tire to be maintained. For information on Sound Comfort, Noise Shield & Silent Core Technologies (foam in tire) see Product Service Bulletin listed in the Product Service area on Tire HQ.

THE GOODYEAR TIRE & RUBBER COMPANY & GOODYEAR CANADA INC.

PRODUCT SERVICE DEPARTMENT

PUNCTURE REPAIR PROCEDURES FOR PASSENGER AND LIGHT TRUCK TIRES

RECOMMENDED PROCEDURES

BEFORE PERFORMING A PUNCTURE REPAIR, READ THIS SECTION

This publication covers puncture repair procedures for passenger and light truck tires (including European commercial metric, C-Type tires) in the tread area as described by the graphic below. The tire must always be properly repaired as described in this chart. Improperly repaired tires can fail while in service, such as by tread-belt separation and/or detachment, which may result in an accident causing serious personal injury or death.

For speed rated tires, the tire manufacturer must be contacted for its individual repair policy and whether the speed rating is retained after repair. Speed rated tires may be identified by the use of a speed symbol (for example: Q, S, T, U, H, V, W, Y, (Y), or ZR) that may appear in the tire service description, which can be found near or in the tire size designation on the tire sidewall. Although a tire may be speed rated, we do not endorse the operation of any vehicle in an unsafe or unlawful manner. A properly repaired speed rated tire (per the tire manufacturer's recommendations) can be used for legal highway service, just as a properly repaired non-speed rated tire.

PUNCTURE INJURY SIZE LIMIT 1/4"(6mm)

For Passenger and Light Truck Tires (Including C-Type Tires)



This graphic indicates that puncture repairs are limited to the tread area as generally depicted in the graphic. DO NOT make repairs where the injury damage extends into the shoulder/belt edge area OR where the injury extends at an angle into the shoulder area. If there is any question that the injury extends into the shoulder/belt edge area, then the tire must be scrapped.

OTHER REPAIR LIMITATIONS

- **Not all tires can be repaired.** Specific repair limits should be based on recommendations or repair policy of the tire manufacturer and/or type of tire service (e.g. service description, runflat technology, commercial service applications, etc.).
- **For all tires, repair units cannot overlap.** The number of repairs should be limited first by the tire manufacturer's recommendations and repair policy and then by application and the individual tire's condition as determined by the inspection process detailed in Steps 1 and 2.
- **Some run-flat technology tires cannot be repaired.** Consult tire manufacturer for their repair policy and, if applicable, for their recommended repair procedures.
- **Industry recommended repair methods include:** (1) Two-piece stem and patch repair components, and (2) one-piece patch/stem combination repair units. For punctures angled greater than 25°, two-piece stem and patch repair components are recommended (see Step 2). NEVER use only a plug (stem) and NEVER use only a patch to repair a puncture.

ONLY SPECIALLY TRAINED PERSONNEL USING THE PROPER TOOLS AND PROCEDURES SHOULD REPAIR TIRES

NEVER repair tires with a tread puncture larger than 1/4" (6mm).

NEVER repair tires worn to the tire's treadwear indicators or to 2/32" remaining tread depth in any area of the tread.

NEVER perform a tire repair without removing the tire from the rim/wheel assembly for internal inspection. (Do not perform an outside-in tire repair or on-the-wheel repair.) It is essential that only a specially trained person remove any tire from the wheel when it has been damaged or is losing air. A thorough inspection for any internal damage can then be made.

NEVER use only a plug (stem) and never use only a patch to repair a puncture. The injury must be completely filled with a suitable vulcanizing material or rubber stem and a patch must be applied to the inner liner to prevent air loss.

NEVER repair a tire that has an existing, improper repair (non-USTMA repair); the tire must be scrapped.

NEVER substitute an inner tube for a proper repair or to remedy an improper repair.

NEVER invert radial tires. (Avoid excessive spreading of the tire or tire beads.)

NEVER buff the tire innerliner too deep, exposing the tire casing body ply cords. If this type of damage occurs during buffing, the tire must be scrapped.

WARNING

Never perform a tire repair without removing the tire from the rim/wheel assembly for internal inspection.

(Do not perform an outside-in tire repair or on-the-wheel repair.)



Driving on the tire a short distance while it was severely under inflated caused this dangerous, non-repairable condition shown above. The damage was not visible from the outside. Every tire must be removed from the wheel for inspection and to assess reparability.^{1,2}

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 warnings contained in owner's manuals, on the equipment, listed on websites and molded onto tire sidewalls.

Failure to comply with these procedures 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 physical injury or death. Never mount or use damaged tires or rims.

For more on tire mounting safety and procedures refer to the USTMA Demounting and Mounting Procedures for Passenger and Light Truck Tires wall chart.¹

WARNING

Tires must always be properly repaired as described in this chart. Improperly repaired tires can fail while in service, such as by tread-belt separation and/or detachment, which may result in an accident causing serious personal injury or death.

As explicitly illustrated in the following ten steps, the basic principles for puncture repairing are: to remove the tire from the wheel for inspection and repair; to prepare the injured area; to fill the injury with a suitable, vulcanizing material or rubber stem that must fill the injury and keep moisture out; to seal the inner liner with a patch repair unit to prevent air loss; and, to re-inspect the finished repair.

WARNING

Serious eye or injuries may result from not wearing adequate eye goggles (or face shields) and ear protection while repairing tires.

4 PREPARE INJURY CHANNEL

All damage must be removed. Use an electric/air powered drill (1,200 rpm max.) with an appropriate size carbide cutter or other suitable tool. Beginning from the inside, ream the puncture channel a minimum of three times—repeat from the outside. Use a probe to check for any splits in the radial plies surrounding the injury. Remove any additional damage found.



8 CEMENTING

Do not mix products from different repair material manufacturers.³

Apply chemical cement and allow it to dry according to repair material manufacturer's procedures. Do not use forced air or an auxiliary heat source to reduce drying time. In cold and/or humid climate conditions, additional drying time may be required.

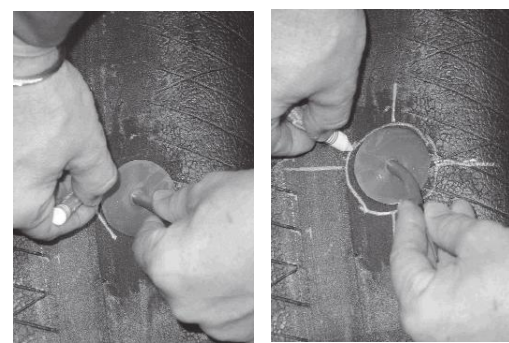


WARNING Do not use flammable cements near fire, flame or any other source of ignition. Explosive force and/or fire from ignition of cement could cause serious injury or death.

5 REPAIR UNIT SELECTION

Select the appropriate size repair unit, based on repair material manufacturer's recommendations.

Center the unit over the injury and outline an area 1/2" (13mm) larger than the repair unit, so buffing will not remove the crayon marks.



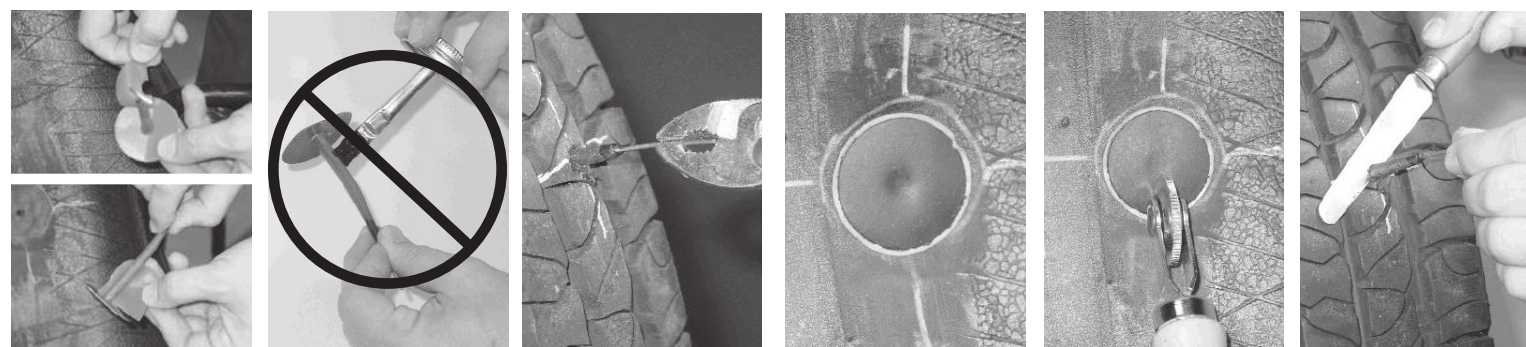
9 REPAIR UNIT APPLICATION

Do not mix products from different repair material manufacturers. Follow repair material manufacturer's installation instructions.

The tire must be in a relaxed position when the repair unit is installed. (Do not spread the beads excessively.) Remove and discard protective covering on the underside of the patch being careful not to touch the bonding material on the repair unit.

If using a two-piece, directionally marked unit, install the unit so that the alignment is correct and centered over the injury. Next, stitch down thoroughly with a stitching tool, working from the center out. If using a one-piece, combination patch/stem repair unit, do not cement the stem, instead cement the injury channel. Next, pull the stem through the injury until the unit slightly dimples, then stitch down thoroughly with a stitching tool, working from the center out.

Remove and discard the top protective covering. Cut the fill material flush with the outer tread surface while being careful not to stretch the stem.



EXTERNAL INSPECTION



Prior to demounting,¹ check the tire, wheel and valve for the source of the leak(s) by using water or a soap solution. Mark the injured area and totally deflate the tire. Then remove the tire from the wheel being careful to avoid further damage to the tire, particularly to the bead area. Place on a well-lighted spreader. (Avoid excessive spreading of the tire or tire beads.)

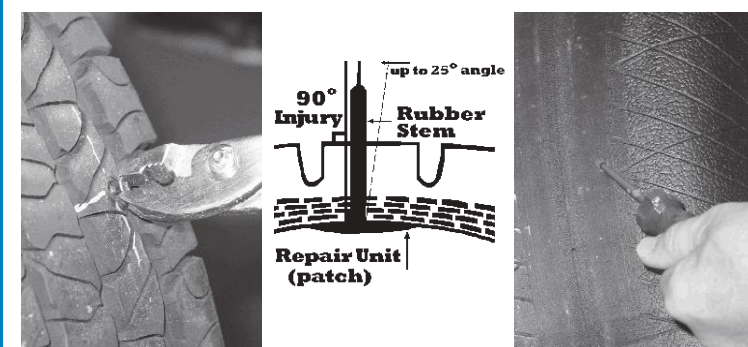
Always inspect tires internally and externally prior to installation of any repair. Bright ambient lighting and a hand-held inspection light are necessary to perform this inspection. Consult your equipment supplier for appropriate lighting.

WARNING Permanent tire damage due to under inflation and/or over loading cannot always be detected. Any tire known, or suspected to have been run at less than the placard recommended operating inflation pressure and/or over loaded, could possibly have permanent structural damage (cord fatigue, particularly steel cords or belt material). Ply cords weakened by under inflation and/or over loading may break one after another until a rupture, commonly referred to as a "zipper", occurs in the upper sidewall with accompanying instantaneous air loss and explosive force. This can result in serious injury or death. These tires should be inflated by using a restraining device (or safety cage) that complies with OSHA regulations and an air line with a clip-on air chuck.²

INTERNAL INSPECTION

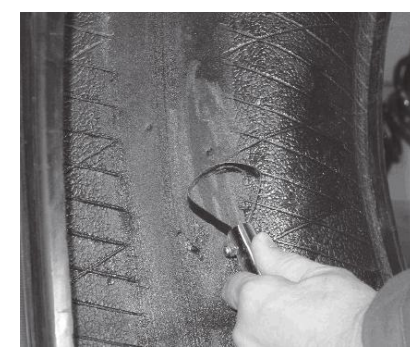
Spread the beads and mark the injury with a tire crayon. Remove the puncturing object noting the angle of penetration. Probe the injury with a blunt awl to determine the extent and direction of the injury and remove any loose foreign material. If the angle of the injury exceeds 25°, use a two-piece repair system (see graphic at center). Do not repair if injury extends into the shoulder/belt edge area and never repair in the sidewall area.

For all tires, repair units cannot overlap. Inspect for any other internal damage. Tires with damage due to under inflation, over loading, and/or tires with an existing improper (non-USTMA) repair must be scrapped. If sealant is found inside the tire, see NOTE at bottom right corner.



3 PREPARE INNERLINER SURFACE

Clean the area around the puncture thoroughly with an appropriate (pre-buff) innerliner cleaner. Use a clean cloth and/or scraper, according to repair material manufacturer's recommendations. Consult your local repair materials supplier for an appropriate cleaner.³ This step serves to remove dirt and mold lubricants that can reduce repair unit adhesion and contaminate buffing tools.

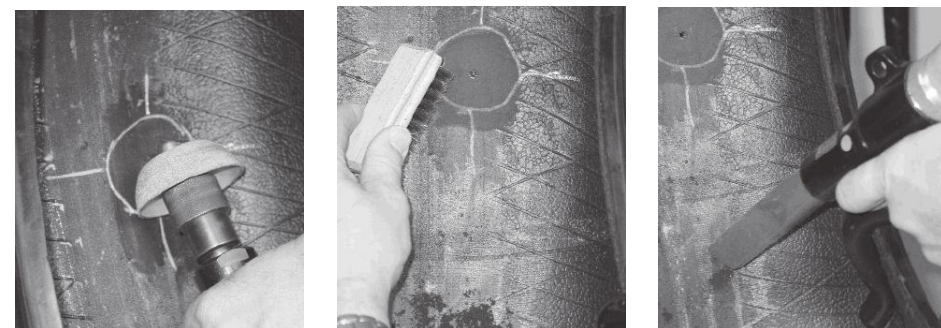


BUFFING

To prevent contamination and preserve the outline, buff within the marked area thoroughly and evenly with a low speed buffer (5,000 rpm max.) with a fine wire brush or gritted rasp. Take care not to expose or damage tire casing body ply cords. Buff to a surface texture per repair material manufacturer's recommendations.

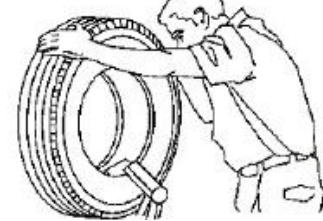
Never buff the tire innerliner too deep exposing the tire casing body ply cords. If this type of damage occurs during buffing, the tire must be scrapped.

Remove all rubber dust from the buffed area by using a fine wire brush and vacuum, being careful to avoid touching and contaminating the area. Do not use compressed air to clean bonding surfaces; air lines contain contaminants such as oil and moisture, which reduce adhesion. Follow repair material manufacturer's recommendations for cleaning the buffed area.



FINAL INSPECTION

Inspect the repair inside and out.



Mount and inflate the tire.¹ Inspect the tire/wheel assembly for damage and leakage. Pay particular attention to the repair area, the beads and the valve. If the tire continues to lose air at the repair location, it must be removed from the wheel for complete re-inspection and reworking of the repair, if possible.



WARNING A patch only or a plug (stem) only is an improper repair. Improperly repaired tires can fail while in service, such as by tread-belt separation and/or detachment, which may result in an accident causing serious personal injury or death.

NOTE for STEP 2: Tire Sealants and OEM Mobility Kits⁴

1. Vehicle Original Equipment Temporary Tire Mobility Kits and aftermarket sealants such as aerosols, liquids, or gels injected into a tire through the valve provide only temporary mobility allowing the driver to promptly reach a service location for professional inspection and possible repair. Such sealants are not considered proper repairs. Consult tire manufacturers' recommendations regarding reparability or continued use of such tires.
2. Tires with damage initially treated with any type of puncture sealant(s) may have been damaged as a result of being run under inflated and/or over loaded and should be inspected accordingly before repairing tire.
3. Tires that are manufactured with puncture sealant require specialized repairing techniques. The tire and/or sealant manufacturer(s) should be contacted for recommendations.

REFERENCES

- 1 Refer to USTMA "Demounting and Mounting Procedures for Passenger and Light Truck Tires" wall chart.
- 2 Refer to USTMA TISB Vol. 33, "Inspection Procedures to Identify Potential Sidewall "Zipper" Ruptures" in Steel Cord Radial Truck, Bus and Light Truck Tires" with accompanying wall chart.
- 3 Refer to information on the product or manufacturer Material Safety Data Sheet and follow guidelines for handling and disposal.
- 4 Refer to USTMA TISB Vol. 41, "Tire Bead Lubricants, Mounting Aids, Bead Sealers, OEM Mobility Kits, Tire Sealants, Balancing Substances and Flammable Substances."

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All USTMA tire publications may be ordered online at www.USTires.org or call +1 202.682.4800