



RECOMMENDED
SPECIFICATION
GUIDELINES

For Preparing A Tire Retread
And Repair Government Bid

GOOD YEAR

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PURPOSE OF RECOMMENDED GUIDELINES

This guideline's inspection criteria, types of retread manufacturing processes and performance criteria for retread recommendations are intended for use by government agencies of all levels in securing a well manufactured retread and to achieve reliable services, safety and economy in bidding and procurement of retreaded tires. These guidelines are meant to be used as a whole, as deletions or modifications may prevent good retreading and quality product procurement.

Goodyear has received Cooperative Plant Quality Certification (CPQC)
by Tank-Automotive And Armaments Command (TACOM).

CLASSIFICATION OF RETREADING AND REPAIR PROCESSES

Covers following types of Bias or Radial Ply Casings:

- Light Truck
- Medium Truck
- Heavy Truck
- Industrial and Off-Road

RETREADING PROCESSES

Pre-cure method:

1. UniCircle™
2. Flat PreCure

Mold-cure method:

1. Top Tread
2. Full Tread
3. Bead to Bead
4. Off-Road re-lugging, grooving and retreading

REPAIRS (bias and radial ply casings):

1. Nail Hole
2. Spot
3. Reinforcement
4. Section
5. Bead Area

RETREAD PLANT INSPECTION GUIDELINES

All retread bidders must be retreaders operating retread plants within the area defined by the bid requirements as approved by the government agency or be supplied retreads from an approved retread plant to that agency.

Qualifying bidders must be inspected by an approved national organization and follow recognized retread manufacturing procedures. Such inspection procedures may be by the retread plant's tread rubber supplier in accordance with specific procedural guidelines set forth in retreader, dealer, purchase or franchise agreements.

The prospective retread supplier may provide evidence of certification of the production facility from a nationally recognized tire retreading association within the previous 12-month period.

The agency requesting the bid reserves the right to accept or reject the certification of the plant. Retread Plants and their suppliers approved under guidelines of Procurement Specification CTQP-441 "Administrators Approval & Requirement Manual for Tires, Pneumatic Retreaded and Repaired (formerly ZZ-T-441) are considered certified as to manufacturing procedures and competence.

STANDARDS

Written manufacturing and processing standards conforming to industry accepted procedures and as specified in Procurement Specification CTQP-441 shall be followed in the performance of each step of operation. Copies of the written retread process procedures adopted shall be available at the appropriate manufacturing location and shall be furnished to the agency for reference as requested. Retread process procedures shall establish process requirements for plant personnel performing each operation. Bid specifications may include details for:

- Conditioning of casings, which may include drying of casings.
- Inspection and casing grading procedures. (Including types of inspection equipment and methods.)
- Tire repairing.
- Buffing and cementing procedures.
- Tread rubber application.
- Curing.
- Trimming, finishing, and final inspection.

TREAD RUBBER AND MATERIALS

All tread rubber used in the process of retreading and repairing tires shall conform to the following minimum specifications:

TREAD RUBBER PHYSICAL PROPERTIES

Contain no less than 47% rubber hydrocarbons by weight. Have a minimum of 25% and a maximum of 50% polybutadine, and have the following minimum physical properties:

| | <i>Min.</i> | <i>Max.</i> | <i>Typical</i> |
|-------------------------------|-------------|-------------|----------------|
| <i>Tensile strength (psi)</i> | 2,000+ | — | 2,400 |
| <i>Elongation (%)</i> | 380+ | 700 | 500 |
| <i>Modulus at 300%</i> | 1,300 | 1,800 | 1,400 |
| <i>Hardness*</i> | 64 | 70 | 65 |
| <i>Specific Gravity</i> | 1.118 | 1.14 | 1.12 |

*Hardness will be measured using a Shore Durometer, "A" scale.

Unless otherwise specified, commercial truck tires shall be processed using materials containing antioxidants of a quality to provide standard commercial resistance to weathering.

TREAD RUBBER SAMPLES

The agency reserves the right to secure random rubber samples and submit them to recognized agencies for evaluation. Failure to meet material specifications will result in loss of the supplier's right to do business with any agency with bid jurisdiction. Suppliers may be required to supply a sample of retread tread rubber at the time of bid.

TREAD DESIGN TREAD DEPTH REQUIREMENTS

The agency reserves the right to request minimum tread depth requirements depending on intended use of the tire.

TREAD DESIGN

All government agencies will set the criteria for the selection of tread design. Some of the considerations are as follows: vehicle type, speed, load, operation, tire type, ply rating, casing condition, etc. The overall requirement is the right tread design for application. Published procurement guidelines such as Procurement Specification CTQP-441 may be used as a guideline.

MANUFACTURING PROCEDURES

Effective retread programs are those where all casings to be retreaded are provided by the government agency. Rejected casings remain the property of the agency that supplied the tire for retreading. The agency arranges for disposal of any rejected casings.

Casings may be disposed of by the Retread Plant, in an approved manner, at an agreed upon charge to the agency.

INCOMING AND INITIAL INSPECTION

Casing inspection shall be made by a trained, certified operator. The inspection shall include placing the tire on a mechanical spreader under adequate lighting (recommended 200-300 ft/candles), and distortion of the natural contour sufficient for visual manual inspection. Casings accepted for retreading shall not contain any of the following:

- Ply separation.
- Broken, damaged, kinked, or exposed bead wire.
- Injuries to plies in the bead area.
- Flex breaks.
- Loose ply cords or evidence of overload, underinflation or run flat.
- Tread separations which cannot be removed during buffing.
- Sidewall separation.
- Weather cracking extending into the body plies.
- Non-repairable damage to the inner liner or bead seating area on a tire designated as tubeless.
- Injuries of sufficient sizes and number that cannot be repaired using acceptable commercial practice.
- Radial belt separations.

Acceptable non-destructive inspection equipment could be any of the following: electronic, ultrasonic, X-ray, electro-mechanical, holography, shearography or other types of casing inspection equipment which can aid in determining casing integrity and best use, in addition to visual inspection.

The retread supplier will provide written RAR (return as received) reports which outline all pertinent information as to why tires have not been accepted for processing.

BUFFING

Tires must be buffed on an inflated rim to match road wheel dimensions.

The buffed casing shall be to dimensions compatible to the retread system used. The worn tread surface shall be removed to a symmetrical profile in accordance with the procedural specifications. The buffed area of the casing shall be free of contamination and oxidation. All buffing should be performed on an inflated buffer.

Note: Some Off-Road tires are not buffed on inflatable rims.

Precure Retreading:

Casings utilizing precured treads shall be buffed to a width that is compatible with casing dimensions. The buffed area shall have all tread grooves removed and the buff shall be centered on the casing with equal shoulder heights over the bead bundle area. The buffed tire shall be as close as possible to the specified radius. Radial tires will be buffed to a maximum of 3/32" remaining undertread over the belt package.

Mold Cure Retreading:

The casings using uncured tread rubber shall be uniformly buffed using a template or other system of measure to ensure matching of the mold contour and size. The casing shall be buffed to properly fit the mold in accordance with bead-to-bead measurements, diameter and section width requirements as published in the specifications for the equipment used.

CEMENTING

Buffed casings to be cemented must be clean and free of foreign materials such as buffing dust, dirt, oil, etc. Cementing shall be accomplished within a maximum of eight hours after buffing.

BUILDING

Precure Retreading:

Tires must be built on an inflated rim to match road wheel dimensions.

The tread rubber shall be centered around the buffed circumference of the tire. Tread pattern interruption shall be minimized at the tread splice. The cut ends of the tread should be properly texturized over the entire surface and shall be free of contamination. The splice shall be cured together using suitable bonding material. Tread stretch requirements and building tolerances shall conform to industry accepted practices.

Mold Cure Retreading:

Tires must be built on an inflated rim to match road wheel dimensions.

The tread rubber shall be of a crown width, base width, and gauge dimension as required for the mold design and size in which the tire is to be cured. The applied tread rubber shall provide the required undertread gauge. Tread rubber bonding surfaces shall not be contaminated. Tread rubber must be centered around the buffed circumference of the tire. Stitching and splicing shall be carried out in such a way as to eliminate trapped air pockets without pulling the tread off center or distorting the rubber.

The tread width used shall be determined by the casing dimensions.

CURING

Precure Retreading:

Tires to be cured shall be stored in a manner to prevent distortion of the uncured materials, and shall be kept free of contamination.

Envelopes, tubes, or sealing ring devices used to cure the tire shall be free of leaks and defects. Curing procedures must include specifications on curing time, temperature, and pressure.

The proper curing tubes, rims, sealing bands, and other assemblies shall be used and available in the work area of the shop.

Mold Cure Retreading:

Tires to be cured shall be stored in a manner to prevent distortion of the uncured materials, and shall be kept free of contamination.

Curing procedures must include specifications on curing time, temperature, and pressure. Proper curing tubes and rims, if used, shall be available in the work area of the shop.

CASING REPAIRS

All casing repairing must be carried out using prescribed methods and tools. Operators must be trained to industry recognized repairing standards. Final determination of repairability, type of repair, and repair material must be made after skiving and inspection and in accordance with the recommended tables and criteria of the repair materials supplier and/or tire manufacturer.

RADIAL REPAIRS

Nail Hole:

Nail hole injuries may be repaired before or after a tire is buffed.

Any number of nail holes may be repaired in the repairable area of a radial truck tire. The only limiting factor is that the repair patches do not overlap.

Injuries 3/8" (9mm) and smaller through the approved repairable crown area shall be repaired using a repair patch and a suitable fill material in the injury. If the injury is larger than 3/8" (9mm) in the crown area after the damage and rust have been removed, the tire will require a section repair.

Any injury through the ply cords of a sidewall will require a section repair.

Spot Repair:

A spot repair in a radial tire is limited to cracks and cuts in the rubber with **no exposed or damaged body plies**. Any number of spot repairs can be made.

Any damage found on the body wires of a radial tire will require that the damage be removed and receive a full section repair.

Section Repairs:

The number of section repairs should not exceed the tire manufacturer's recommended limit. The section repairs must not overlap and separate repairs cannot affect the same ply cord(s).

The cost of installing section repairs should not exceed the value of the casing.

Bead Repair:

The following conditions will be considered repairable in the rubber covering the bead area of a radial truck tire:

- Cuts or tears in the rubber covering the bead area that **do not damage or expose the body ply or bead wires**.
- Repairs made to the bead must ensure that the original bead contour can be restored.

BIAS TIRE REPAIRS

Nail Hole Repair:

A nail hole injury can be repaired either before or after the tire is buffed.

Any number of nail holes in a bias tire can be repaired. The only limiting factor is that repair patches do not overlap and that injuries are a minimum of 3" apart.

Nail hole repair limitations: An injury up to 3/8" (9mm) in diameter through the repairable area of a tube type or tubeless bias tire will require a repair patch and suitable fill material in the injury. If the injury is larger than 3/8" (9mm) and through 75% or more of the ply cords after all damage has been removed, the injury will require a section repair.

Spot Repair:

A spot repair is the removal and replacement of rubber in an injury. An injury can be treated as a spot repair in the repairable area of a bias tire if less than 25% of the actual body plies are damaged. Any number of spot repairs can be made in a tire.

Reinforcement Repair:

A reinforcement repair is the repair of an injury through 25% but less than 75% of the body plies of a bias tire. The repair will require both hole filling material and a reinforcing repair unit. (Note: In California, a reinforcement is defined as over 25% but less than 50% of the body plies.)

Section Repairs:

A section repair is made when an injury extends beyond 75% or more of the body plies of a bias tire, in either the tread or sidewall, in the repairable area. (In California, a section repair is defined as extending beyond 50% or more of the body plies.)

Bead Repair:

The following conditions will be considered repairable in the rubber covering the bead area of a bias tire:

- Cuts or tears in the rubber covering the bead area that **do not damage or expose the body ply or bead wires**.
- Repairs made to the bead must ensure that the original bead contour can be restored.

FINAL INSPECTION

The retreader shall make a final inspection of the retreaded tire. The inside of the tire shall be checked on a tire spreader with adequate lighting (200-300 ft/candles recommended) to ensure that nail holes, reinforcement repairs, skives, section and bead repairs are properly bonded and cured. The outside of the tire in all areas shall be inspected to ensure that it has been properly bonded and cured. The cosmetic appearance of the tire shall be such which is considered good commercial practice. If the retreaded tire shows any defects which will result in less than optimum performance, the retread shall be rejected or reworked.

A partial list of defects are:

- Bead kink and buckled casings.
- Sidewall cracks or radial splits: any cord showing.
- Cut, loose, or damaged plies or cords: any visible evidence.
- Ply, tread, or sidewall separation: any visible evidence.
- Tread folds or tread element rounding: with radius over one-half of skid depth or over 1" long.
- Mold folds or mold tearing: any visible evidence.
- Light spots exceeding 1/16" deep.
- Open tread splice.
- Defective tubeless tire liner or open liner splice: any areas showing cord.
- Foreign items cured into inside or outside of the tire: any visible damage not repaired.
- Off-register mold-cured treads: treads radially off-register more than 1/8"; mold halves in misalignment by more than 1/16" on the periphery on size 8.25 and smaller sizes, or more than 1/8" on larger size tires.
- Tread flash: thickness at mold register greater than the following range of the tire sizes indicated:
 - Sizes 9.00-c/s-and smaller-1/32"
 - Sizes over 9.00-c/s-1/16"
- Exposed bead wires or damaged bead cover on tubeless tire sufficient to affect the quality of the bead sealing.
- Off-center precured treads: over 1/8 inch for truck tires.
- Nail hole not repaired.
- Sidewall or shoulder injuries not repaired.
- Soft, porous or incomplete cure (tread hardness).
- Cupping, dimpling, bulging, buckling, or separation of fabric, patch or tread.
- Splitting, shrinking or separation of the plug from the basic tire: any visible evidence.
- A sidewall bulge associated with an authorized repair exceeding 1/16" uninflated and/or 3/8" inflated.
- Tread area repairs not regrooved.
- Any other defects.

The defective tire shall remain the property of the government, which shall be responsible for its disposal.

TIRE PAINTING

A light coat of approved tire paint may be applied to all finished tires.

WARRANTY

Retread manufacturers and retread suppliers shall provide a warranty for workmanship and material failure of the retread. Warranties for retreads which fail because of casing failure should be documented and submitted to the original tire manufacturer.

ADDITIONAL SUPPORT SERVICES

The following is a list of additional services that may be provided by a retreader:

- Fleet surveys
- Failed tire analysis
- Tire and evaluation comparisons
- Nail hole repair clinic
- Fleet performance studies

MANUFACTURER'S PRODUCT LIABILITY INSURANCE

The bidder shall furnish evidence of general product liability insurance in the amount required by the agency. A certificate of insurance must be supplied upon request.

NOTE:

\$3,000,000 general liability coverage is considered to be adequate.

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