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MILITARY SPECIFICATION

REPAIR AND REBUILDING OF USED AIRCRAFT PNEUMATIC TIRES

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for the qualification, repair, and rebuilding of aircraft pneumatic tires. A rebuilt aircraft tire is one which has had the tread, or the tread and the sidewall material of a worn tire replaced with new material by means of vulcanization. Rebuilt tires are sometimes referred to as retreaded, recapped, or remanufactured tires.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. Unless otherwise specified (see 6.2), the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATIONS

Military

MIL-T-5014	-	Tires, Pneumatic, Aircraft
MIL-R-6855	-	Rubber, Synthetic, Sheets, Strips, Molded or Extruded Shapes

STANDARDS

Federal

Fed Test Method STD-NO.601	-	Rubber: Sampling and Testing

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Ogden ALC/MMEDO Hill Air Force Base Utah 84056 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 2620

Military

MIL-STD-129	-	Marking for Shipment and Storage
MIL-STD-698	-	Quality Standards for Aircraft Pneumatic Tires and Inner Tubes
MIL-STD-45662	-	Calibration Systems Requirements

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

DOD Publication	
SD-6	Provisions Governing Qualification
DOD Instruction	
4151.13	Policies Governing the Retreading and Maintenance Engineering Management of the Aircraft Tire Program
Air Force Technical Order	
4T-1-3	Inspection, Maintenance Instructions, Storage, and Disposition of Aircraft Tires and Inner Tubes
Army Technical Manual	
TM55-2620-200-24	Inspection, Maintenance Instructions, Storage, and Disposition of Aircraft Tires and Inner Tubes
Navy Technical Manual	
NAVAIR-04-10-506	Inspection, Maintenance, Repair, Storage, and Disposition Instructions-Aircraft Tires and Tubes

See supplement 1A for list of applicable standards and AF drawings.

(Copies of specifications, standards, handbooks, drawings and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer).

2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D412-80	Rubber Properties in Tension
D413-76	Rubber Property-Adhesion to Flexible Substrate
D792-66R75	Plastics, Specific Gravity & Density of, By Displacement
D2240-81	Rubber Property - Durometer Hardness

(Application for copies of ASTM publications should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103).

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies).

2.3 Order or precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Classification of requirements. The requirements for the repair and/or rebuilding of used aircraft pneumatic tires are classified herein as follows:

REQUIREMENTS	PARAGRAPH
Qualification	3.2
Design, Construction, and Materials	3.3
Repair Criteria-Reparable Tires	3.4
Rejection Criteria-Non Reparable Tires	3.5
Tire Rebuilding Procedure	3.6
Tire Repairing Procedure	3.7
Control Instruments	3.8
Markings	3.9
Age Limits and Storage Conditions for Tread Rubber and Repair Material	3.10
Other Requirements	3.11

3.2 Qualification. Tires furnished under this specification shall be products which are qualified for listing on the applicable qualified products list at the time set for opening of bids (see 4.3 and 6.3) in accordance with DOD Manual SD-6.

3.3 Design, construction and materials. Design, construction, and materials of the rebuilt tires shall conform to the requirements specified herein and on the applicable drawings. The applicable drawing takes preference over the requirements of this specification if a conflict exists between them.

3.3.1 Tread configuration. The tread pattern shall be rib tread having a minimum of four grooves for tires having a cross section width greater than 11.50 inches, and a minimum of three grooves for tires having a cross section width of 11.50 inches or less. The grooves shall be continuous, circumferential and have an uninterrupted mold skid depth as controlled by Tables I through VI.

3.3.2 Groove depth. The mold skid depth shall meet the minimum requirements of Tables I through VI unless otherwise specified by the procuring activity. The actual tire skid depth in a groove closest to center of the tread shall be reported on the Qualification Test Report.

3.3.3 Undertread thickness. The thickness of the material between the carcass and the bottom of the tread pattern shall not be less than thirty percent or more than fifty percent of the actual mold skid depth in noncut resistant tires. The undertread thickness shall not be less than thirty percent or more than seventy-five percent of the actual mold skid depth in fabric tread reinforced tires. The rubber stock adjacent to and above the carcass or breaker plies shall not be less than 1/16 inch to permit proper buffing for additional rebuilds. The basis for additional undertread requirement will be the amount of undertread used in the qualified tire sample and subject to approval by the procuring activity.

3.3.4 Tread construction. The tread construction shall be one of the following types as specified by the procuring activity (see 6.2):

a. Rubber tread

b. Reinforced tread

c. Other

3.3.4.1 Rubber tread. A rubber tread is one with no reinforcing plies in the tread material.

3.3.4.2 Reinforced tread. A reinforced tread is one constructed with fabric cord or other reinforcing materials as an integral part of the assembled tread.

3.3.4.3 Other. Tread type other than listed by this specification as approved by the cognizant engineering activity (see 6.2).

3.3.5 Materials. Materials used in rebuilding to meet this specification shall have been previously verified by successful dynamometer qualification. This includes tread stock, repair materials, cord and woven fabrics, adhesives, cements, etc. All tires shall be tested and pass dynamometer and specification requirements, whenever the design, construction or materials are changed unless otherwise authorized. Reclaimed rubber/materials shall not be used.

3.3.6 Tire characteristics. The size, weight, balance, and other characteristics of the rebuilt and repaired tires shall conform to the requirements specified in tables I thru VI. The weights as listed are maximum for all types of tread constructions.

3.3.7 Tire dimensions. Dimensions of inflated rebuilt tires shall conform to the requirements specified in Table VII through XII. All lettering, decorative ribs, and designs on the rebuilt tire shall be included in these dimensions.

3.4 Repair criteria - reparable tires. Unless otherwise noted in the applicable drawing for each tire size, tires with the following maximum injuries shall be considered acceptable for repair and rebuilding. There is a certain category of tires for which no cuts or exposed cord or damage is allowed. These will be covered by specific service directives.

3.4.1 Tread and shoulder area.

a. For tires up to and including 139 knot ratings.

(1) Cuts, cracks, holes or other injuries less than one inch in length that do not extend through more than 33 1/3 percent of the tire cord body fabric plies.

(2) Cuts, cracks, holes or other injuries less than 1 1/2 inches in length that do not extend through more than twenty-five percent of the tire cord body plies.

(3) Eight or less cuts or punctures within limits specified above and not more than one of type a. (1) in the same 45° section of a tire.

(4) Twenty or less cuts less than 1 1/2 inches in length that do not extend through more than the top reinforcing carcass ply for tires that do not have less than the eight actual plies.

(5) Breaker or carcass ply exposure that does not exceed one percent of the total buffed area in one spot or more than two percent for the entire tire. Exposed fabric shall not exceed one carcass ply in depth. If the edge of a tread ply is exposed due to the buff contour, this condition shall not be considered as the normal condition of exposed cord. Fabric or ply exposure is that condition where the rubber skim coat has been removed leaving cord exposed.

b. For tires 140 knots and up to and including 217 knots.

(1) Cuts, cracks, holes or other injuries less than 1/2 inch in length that do not extend through more than 33 1/3 percent of the tire cord body fabric plies.

(2) Cuts, cracks, holes or other injuries less than one inch in length that do not extend through more than 20 percent of the tire cord body fabric plies.

(3) Three or less cuts per rebuild within limits specified above. Cuts shall be separated by at least a 60° arc from each other.

(4) Twenty or less cuts less than 1 1/2 inches in length that do not extend through more than the top reinforcing carcass ply for tires that do not have less than eight actual plies.

(5) Breaker or carcass ply exposure that does not exceed one percent of the total buffed tread area in one spot or more than two percent for the entire tire. Exposed fabric shall not exceed one carcass ply in depth. If the edge of a tread ply is exposed due to the buff contour, this condition shall not be considered as the normal condition of exposed cord. Fabric or ply exposure is that condition where the rubber skim coat has been removed leaving cord exposed.

3.4.2 Sidewall area. Cuts, cracks, holes or weather checking which do not extend into any of the tire cord body plies.

3.4.3 Bead area.

a. Cuts, cracks, holes, chafer separations, or other injuries less than four square inches in area that do not extend into any of the tire cord body fabric plies. The maximum allowable number of such injuries is two with no more than one occurring in either bead.

b. Any leaks in the bead toes, heel or bead base.

c. Wear of bead chafer stock exposing the square woven fabric.

d. Wear of the chafer fabric up to but not beyond 25 percent of the chafer yearn diameter provided the wear does not exceed the criteria of 3.4.3(a).

3.4.4 Tubeless innerliner.

a. Cuts, cracks, holes or other injuries that do not extend into any of the tire cord body fabric plies. The maximum allowable number of such injuries is ten.

3.5 Rejection criteria - nonreparable tires. Tires with the following injuries or conditions shall be considered unacceptable for repair or rebuilding and shall be condemmed and disposed of as scrap.

a. Cuts, cracks, holes, that penetrate the innerliner wear, flat spots or other injuries that exceed the maximum allowable injury limitations set forth in 3.4.

b. Separations in any portion of the tire cord body plies, exceeding 1/2 square inch.

c. Separations around the bead wire.

d. Oil soaked or permanently mis-shaped due to faulty maintenance or storage conditions.

e. Flex, impact, or bruise breaks in the cord body plies in any portion of the tire.

f. Loose, or broken cords in the breaker ply.

g. Kinked, broken or exposed bead wires.

h. Damaged bead areas resulting from heat exposure. Damaged area will show evidence of condition which is either soft and tacky or brittle and cracked, or discolored.

i. Evidence of tread and shoulder blisters (not superficial) that indicates tread or cord body ply separations.

j. Crazed, brittle undertread rubber.

k. Manufactured in a country other than the United States, unless otherwise authorized.

l. Date of manufacture of carcass or name of manufacturer not known.

3.6 Tire rebuilding procedure.

3.6.1 Preliminary inspection. Aircraft tires covered by this specification are required to be one hundred percent inspected before rebuilding. The inspection work area shall be maintained and equipped in such a manner as to assure an accurate evaluation of the rebuildability of the carcass being inspected. The following inspection procedures shall constitute the minimum requirements.

a. Tread

(1) Cuts, cracks, holes and other injuries: Foreign materials such as nails, bolts, glass and stones shall first be removed. All cuts and other apparent injuries shall be probed thoroughly with a blunt instrument without causing further damage, to permit examination that will determine the extent of the injury. If the injury penetrates the cord ply, it may be reamed out during the buffing operation to check the total area and depth. Separation larger than those described in paragraph 3.5.b shall be a cause for rejection.

(2) Groove cracking. If a cracking condition is formed in the base of a groove, it shall be probed to determine degree of penetration. Extent of penetration shall be checked against injury limitation provisions specified in 3.4 and 3.5 to determine if carcass is suitable for rebuilding and repair.

(3) Skid burn. Checks shall be made for evidence of skid burns penetrating into the cord body after buffing. The extent of fabric exposure shall be checked against injury limitation provisions specified in 3.4 and 3.5.

(4) Excessive oil or grease exposure. This condition normally is detected by the swelling of the rubber material resulting in a tacky composition. If extent of rubber deterioration extends to the tire cord body, the casing shall be rejected as unsuitable for rebuilding and repair.

(5) Excessive wear. Tires shall be checked carefully for excessive wear by probing the area to determine the amount of undertread remaining on tire. Tires worn to a point where a questionable amount of cord body fabric is exposed shall be subject to rejection as unsuitable for rebuilding and repair inasmuch as further removal of tread rubber in the buffing operation would result in cord body fabric exposure beyond limits specified in 3.4 and 3.5.

(6) Separation. Tread separation in a worn tire will normally be disclosed by evidence of a bulge. Separation extending into the cord plies shall be cause for rejection (see 3.5.b).

b. Sidewall.

(1) Checking. Numerous small cracks in the sidewall rubber are referred to as "checking." If the cracks penetrate into the tire cord body, the tire shall be rejected.

(2) Radial or circumferential cracks. If radial or circumferential cracks are found that exceed 50% of the thickness of the sidewall material, the sidewall shall be replaced by spot repair or extended veneer as appropriate if the cracks have not extended to the cord body. If the crack extends to the cord body the tire shall be rejected.

(3) Cuts and snags. Cuts and other apparent injuries shall be probed thoroughly with a blunt awl, or other instrument that will open the injury without causing further damage, to determine the extent of injury. If the injury penetrates the cord body, the carcass shall be rejected as unsuitable for repair. Injuries to the sidewall rubber only can be repaired.

c. Cord body.

(1) Ply Separation. Marked ply separation in a worn tire normally is evident by the existence of a bulge; however, to assure disclosure, all tubeless type tires shall be subjected to the air injection test of 4.6.1. If a separation exists, the air pressure from the needle may cause the area to bulge. The air pressure from the needle will not produce a separation except where a weakness already exists which would make the tire unsuitable for rebuilding. Tires with cord body ply separation larger than 1/2 square inch, shall be rejected as being unsuitable for rebuilding and repair.

(2) Breaks. Cord body breaks are evidenced by fabric cords broken in a single line of criss-cross pattern. Any evidence of breaks in the inner or outer portion of the carcass shall render it unsuitable for rebuilding and repair.

(3) Damaged cords. Cord damage which is not confined to the innermost ply will show discoloration streaks and pock marks, or as broken or strained cords in the innermost ply of the cord body. Tires with strained and damaged cords shall be rejected.

d. Innerliner. The tubeless innerliner shall be thoroughly checked for evidence of open splices, cracks, blisters and holes, and the degree of penetration checked against the injury limitation provisions of 3.4 and 3.5 to determine if the casing is suitable for rebuilding and repair. Whenever possible, this inspection shall be conducted without spreading the tire beads. In addition, the innerliner shall be inspected for evidence of damage, leakage, porosity or cracks during the air needle test (see 4.6.1).

e. Bead

(1) The bead area shall be checked for evidence of kinked, broken or exposed bead wires. If any of these conditions are found, the tire shall be rejected as unsuitable for rebuilding and repair.

(2) For tubeless tires in conjunction with the air needle test, spray the sidewall bead area with suitable leak detecting solution and inspect the bead area to make certain sidewall vents are bleeding. If vents are not bleeding the tire must be properly revented.

(3) For tubeless tires in conjunction with the air needle test inspect the bead toe, base, and heel seating area using a suitable leak detecting solution spray to locate any air leakage.

3.6.2 Drying. All tires found suitable for rebuilding and repair shall be clean and dry prior to rebuild processing. All tires prior to buffing shall be placed in a hot room at 140° to 180° Fahrenheit (F) for a minimum period of 12 hours and no more than 48 hours. Tires shall be placed in the hot room such that damage and/or deformation of the tire is not caused.

3.6.3 Buffing.

a. Tires shall be rasped or abraded uniformly without furrows or gouges to insure complete cementing and to prevent the formation of air pockets. The rate of material removal shall be slow enough to prevent overheating and glazing of the buffed surface. When required, a flexible shaft rasp shall be used to remove any glazed surfaces existing in low or flat spots. The buffed surface shall be of a uniform texture and free from moisture, loose cords and foreign material which could affect adhesion properties between casing and tread rubber. The rasped surface shall be cleaned of buffing dust or foreign material by brushing with a stiff brush or the use of a vacuum. Compressed air may be used provided adequate controls are maintained to prevent moisture and oil from being sprayed on the tire buffed surface.

b. The bead toe will be inspected on all tires being used as, or converted to, a tube type application for evidence of excessive toe flash or sharp edges protruding above the base of the bead area which would result in tube cutting or chafing. If this condition is present, the toe will be trimmed and buffed per 3.6.3.c.

c. If trimming of the bead toe is necessary, the trimming shall be accomplished so that no sharp edges are exposed above the base of the bead area and the flash does not protrude further than 1/8 inch from the face contour of the bead. If trimming the bead toe results in a sharp edge, this edge will be buffed so that a minimum radius of 1/16 inch is left for a gum rubber surface. Buffing shall not be down to the tire cord material as carcass plies shall not be cut. If a step off exists at the end of the toe flash or trimmed to flash, the step off shall be buffed to conform to the same requirements.

3.6.4 Cementing. Vulcanizing cement shall be sprayed or brushed on a buffed surface that is free of dust, dirt and other foreign matter. The tire shall be cemented in an area which has good ventilation to accelerate evaporation of solvent in the cement and be equipped with mechanical handling equipment to transport tires and thus keep the cemented tire off the floor. The buff surface of the tire shall not be touched with bare hands/soiled gloves either before or after cementing except as necessary for repair of injuries and this must be minimal. The cement shall be agitated, stirred, or recirculated to maintain a uniform solids content. Avoid breathing of vapors. Avoid skin and eye contact.

3.6.5 Building. Building involves the application of new tread rubber of various constructions to the cemented buffed surface. The tread rubber in all cases shall be properly centered around the carcass. Tires up to and including thirty-three inches diameter shall have the tread centered within plus or minus one-eighth inch. Tires over thirty-three inches diameter shall have the tread centered within plus or minus one quarter inch. Stitching or rolling of the tread rubber not applied by the orbitread method, shall be accomplished by starting at the center and working toward the edges so that air pockets will be eliminated. Wrinkles at the edges of the tread shall be thoroughly stitched. For laminated or precured tread construction, a ninety degree butt splice is permissible. If more than one lamination is required, the individual splices shall be angularly spaced a distance corresponding to the total number of laminations. For a two lamination construction, the splices will be 180° apart; for three laminations, the splices will be 120° apart. Other methods of applying tread rubber are acceptable if procedure is used in qualification of the tire on the dynamometer.

3.6.6 Curing. The following practices shall apply in the curing operation.

a. Curing temperature, time and pressure shall be accurately established to achieve an optimum tread cure. Optimum cure shall be established by the cure equivalent method involving the use of thermocouples or by testing samples of tread material after step curing at the required cure temperature. Tensile strength, modulus, elongation and hardness shall be used to determine the optimum cure that will provide the best properties for tire performance. The cure equivalent method involving the use of thermocouples installed in test tires shall be used to verify the optimum state of cure.

b. Molds, matrices or curing chambers shall be so designed and installed with sufficient heat capabilities, that temperature variance does not exceed plus or minus five degrees fahrenheit of the desired mold tread surface temperature over the entire heating surface. To assure positive control over curing heat requirements a recording type instrument must be used to record temperature for each separately heated segment of the mold, matrix or chamber versus time for the entire curing cycle. Similarly, curing bag or chamber pressure must be recorded against time for the entire curing cycle. The temperature and pressure recording charts must be reviewed for proper cure control by the Quality Control Inspector once per shift. These charts referencing a control processing number referring to the tire carcass manufacturer, rebuild number, serial number, and date of manufacture shall be kept for a minimum of two years.

c. The mold or matrices shall be so designed as to cure rebuilt tires without damage or distortion.

d. Curing tubes and rims shall be of the proper design and size for a particular size, brand and ply rating tire cured in a specific mold. The mold shall have an identification number that transfers to the tire in the new rubber area an identification of the specific mold used.

3.6.7 Finishing. After curing, the tire shall be inspected, trimmed, cleaned and painted. Prior to trimming and painting the outside of the tire shall be checked to insure adequate molding and that the tire received optimum cure. The tread shall be straight and not porous. Appearance, and tread blemishes shall be within the limits of MIL-STD-698. The tire paint or dye shall be non-injurious to the rubber.

3.6.8 Balancing. Each rebuilt tire shall have all previous balance pads removed, prior to the initial inspection before the retread is applied. Rebuilt tires shall be balanced when not inflated within tolerance as given in Tables I through VI. Out of tolerance may be corrected by utilizing balance pads affixed to the inside of the tire. Pads must be removeable without injuring the carcass or inner liner material. The pad shall be such that it will not chafe the innertube. An alternate method of balancing consists of applying extra tread rubber to the tread of uncured rebuilt tires.

3.6.9 Solvents. Suitable solvents shall be used which are free of contamination.

3.6.10 Uniformity. After cure and finishing, the rebuilt tires shall be checked in accordance with 4.6.19, on a sampling basis to be sure that the cured tread is positioned on the carcass in an even manner within limits given in 3.6.5.

3.7 Tire repairing procedure.

3.7.1 Preparing the injury. Remove all damaged or unsound material. Skive should be made at the best angle to effect repair of the cut or injury. Buff the skived areas so that no knife marks or smooth surfaces remain. Skiving of a cut is not a procedural requirement.

3.7.2 Building. The plug shall be built up with any one or a combination of cushion, plug, fabric ply or innerliner materials which have been verified for the intended use. Repair materials shall be stitched or compressed into the injury so that no air entrapment occurs.

3.7.3 Finishing. After the cure, the outside of the plug shall be trimmed and finished to match the original contour and appearance.

3.7.4 Bead area. Any leaks in the seating portion of the bead toe, base, or heel area meeting reparable criteria per 3.4 shall be repaired as follows:

a. Tires salvageable by application of a self curing rubber cement to the bead area to prevent leakage shall be repaired in this manner. The rubber cement shall be fully cured within 72 hours of application and shall not peel nor roll when a tire is installed on a wheel. The rubber cement or bead sealer, after it is dry, must have a thin coating of a suitable bead lubricating material applied over it to keep the cement from rolling up when the tire is mounted. The cement shall retain its integrity for the tread life.

b. Removal and replacement of the outer rubber compound material on the outside of the chafer strip entirely around 360° of the tire bead area is allowed as an alternative method of repair.

c. After bead repair, tires shall meet the mounting requirements of MIL-T-5041 controlling the minimum and maximum force required to seat the tire on the wheel rim. The first tire of each size repaired shall be mounted on a wheel for a seating pressure check. Avoid breathing of vapors. Avoid skin and eye contact.

3.7.5 Sidewall repair/veneer. Sidewall repair or veneer as appropriate shall be accomplished when damage, radial or circumferential cracks are present in the sidewall material. Sidewall repair or veneer as appropriate shall be accomplished when weather checking extends beyond 50% of the sidewall rubber material. Sidewall repair or veneer shall not be made if damage, checking, or cracking extends into any part of the carcass cord of the last ply. The veneer shall not extend down the sidewall of the tire to a point closer than one inch to the top of the applicable wheel rim flange. The tire shall be revented if necessary.

3.7.6 Venting - tube type tire. All tires with inflation pressures greater than 100 psi shall be suitably vented to prevent blistering. There shall be at least four vents per sidewall which shall be located above the wheel-rim flange. Additional vents in the sidewall may be made as required. When sidewall rebuilding material is added during the cure and the tire is revented, all new vent holes shall be marked with an aluminum or white dot. Where air bleed ridges or grooves are molded into the bead face and inner surface if tires, ventholes and markings will not be required.

3.7.7 Venting - tubeless tires. Tubeless tires shall be suitably vented if necessary to prevent blistering. When sidewall rebuilding material is added during the cure and the tire is revented, all new vent holes shall be marked with a bright green dot.

3.8 Control instruments. The effective use of recording instruments combined with temperature and pressure gauges is required. These gauges shall be calibrated in accordance with applicable provisions of MIL-STD-45662 as follows:

a. Each operating gauge shall be checked against a master gauge and calibrated at least once in every 30 day period.

b. Each master gauge shall be sent to a certified testing laboratory annually for check and calibration and a certified test report obtained.

3.9 Markings.

3.9.1 Balance marker. A balance marker consisting of a red dot shall be painted or stamped onto the sidewall of the tire immediately above the bead to indicate the light weight point of the tire. The dot shall be permanent for any period of storage plus one tread life of the tire. In the event the old and new balance markers do not fall in the same spot, the old marker shall be removed.

3.9.2 Identification of product.

3.9.2 Original tire identification data. The identification data required of the original tire manufacturer is required to remain on the tire and shall be replaced by engraving or embossing if removed during rebuilt manufacture. The required original tire identification data are as follows:

a. Size.

b. On tubeless add TUBELESS.

c. Ply rating (PR is permissible).

d. Date of manufacture. Reidentify in the same manner as the tire carcass was originally marked.

e. Serial number.

f. Manufacturer's name or trademark, or both.

g. The carcass manufacturer's Qualified Test Report number, prefaced by the letters "QTR."

h. Tires shall be marked with appropriate type of tread construction if other than rubber tread (see 3.3.4).

i. Additional markings as specified by the applicable drawings.

j. Cut limit dimension (keep original limit on tire sidewalls only if the limit for the rebuilt tire is identical) (see 3.9.2.2.g).

k. National Stock Number with the numbers preceded by "NSN" (for example, NSN 2620007294664) on one side of the tire.

3.9.2.2 Rebuilt tire identification data. The rebuilt tire is required to be legibly marked and identified as follows by molding, embossing, cured labeling, or other authorized method, so that the identification data is not in the wear area of the tire.

a. The letter "R" or "TR" followed by an arabic numeral "1", "2", or "3" etc, to signify the first, second or third time the tire has been rebuilt.

b. Julian date of rebuild manufacture. This marking shall be placed near but not adjacent to the rebuilt level marking. At least 1/2 inch should separate the rebuilt Julian date from the rebuild level marking. 23 May 1972 is written as 2144.

c. The name of the rebuild manufacturer and plant location.

d. Tires shall be marked with appropriate type of tread construction if other than rubber tread as indicated in 3.3.4. "Other" shall not be specified unless details for construction name are given in exhibit data as attachment to bid package.

e. Tires to be downgraded for operational requirements shall be marked to indicate the reduced ply rating and the appropriate National Stock Number.

f. If not present, the National Stock Number shall be placed on one side of the tire as prescribed by 3.9.2.1.

g. The cut limit dimensions shall be equal to the distance from the bottom of the tread groove which is closest to the outermost carcass ply (center tread groove in most cases) to a depth as determined from the tabulation below: The cut limit dimension will be expressed in thirty-seconds of an inch, and will be rounded to the next smaller thirty-second of an inch increment when a fraction of a thirty-second inch is involved. The cut limit identification shall be molded in a neat legible manner in two places on each sidewall of the tire 180° apart. It will be molded such that the identification is not in the wear area of the tire as shown in Figure 1. The lettering shall be one fourth inch in height and the diameter of the circle shall be one inch.

h. Mold identification number.

i. The rebuild manufacturer's Qualification Test Report number prefixed by the letters "QTR."

3.9.2.3 Positioning of rebuilt tire identification data. Unless otherwise specified, all identification molded in the rebuilt tire shall be placed in the shoulder area so that the identification becomes a portion of rebuilding compound. Letters and numbers of a minimum of 5/16 inches in height shall be placed in the shoulder area at least 1/2 inch below the junction of the shoulder area and the edge of the tread surface. The placement of the identification shall be such that normal wear of the tread surface shall not deface or remove any part of the identification. Identification shall be molded in a neat, legible and clear manner. Previous rebuilding identification in the shoulder area and on the sidewalls shall be thoroughly and completely removed during rebuilding operations. Only pertinent and current identification per requirements of 3.9.2.1 and 3.9.2.2 shall be retained. Branding shall be used only to correct illegible or incorrect molded identification data.

3.9.2.4 The edges of the rebuilt stock in the sidewall shoulder area and in the bead area for the sidewall veneer must be molded or buffed during finishing to provide a smooth transition between the original material and the rebuilding material.

3.10 Age limits and storage conditions for tread rubber and repair material. Uncured tread rubber and repair material for rebuilding pneumatic tires furnished under this specification shall show no bloom.

TIRES RATED 139 KNOTS & BELOW

No. of Carcass Plies in Tire	No. of Carcass Plies Than Can be Cut
2	0
4	1
6	1
8	2
10	3
12	3
14	4
16	5
18	5
20	6
22	7
24	7
26	8
28	9
30	9

TIRES RATED 140 KNOTS & ABOVE

No. of Carcass Plies in Tire	No. of Carcass Plies That Can be Cut
2	0
4	0
6	1
8	1
10	2
12	2
14	2
16	3
18	3
20	4
22	4
24	4
26	5
28	5
30	6

FIGURE 1. Cut Limit Identification

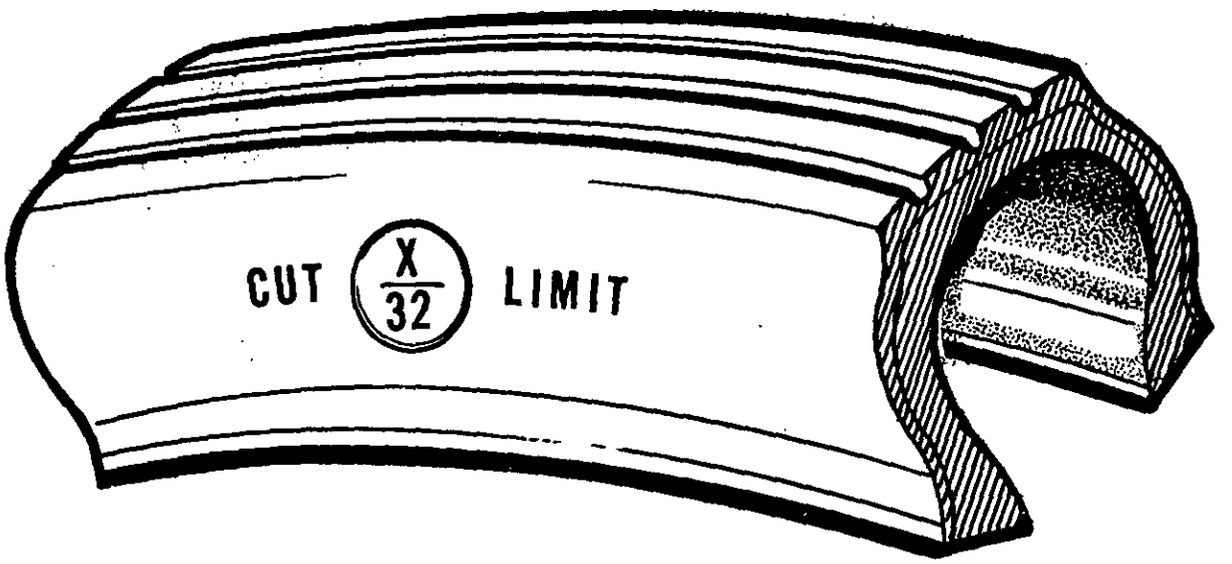


FIGURE 1. Cut Limit Identification - Continued

a. During the storage period, the materials must be kept in a dry place, protected from the elements including direct exposure to sunlight and physical damage and shall be reintained within a temperature and time related environment that will preclude any compound changes that would be detrimental to satisfactory operation of the rebuilt tire. Materials shall be no older than six months from date of manufacture or date recommended by supplier of the materials if less than six months.

3.11 Other requirements.

3.11.1 Low temperature-Cold Flex. Tread rubber and repair materials for rebuilt aircraft tires furnished under this specification shall withstand a temperature of -65°F when subjected to Cold Flex tests as specified in 4.64 and procedures in 4.6.4.3.2 of MIL-R-6855,

3.11.2 Hardness. Production rebuilt tires shall not vary in tread hardness more than plus or minus five Shore 'A' durometer points from the average hardness so indicated on the Qualification Test Report (QTR).

3.11.3 Specific gravity. Treads of production rebuilt tires shall not vary in specific gravity more than plus or minus 0.02 from the original value reported on the QTR,

3.11.4 Rebuild component adhesion,

3.11.4.1 Qualification tire. The qualification test tire shall be required to have a minimum of fifty pounds per inch tread to buffed surface adhesion when a one inch by six inch strip of the tire is tested according to 4.6.8. The actual value shall be recorded in the QTR. If the rebuilt tire has fabric tread reinforcement the rebuilder shall determine the tread to reinforcing ply adhesion value in terms of pounds per inch and record this data on the QTR. A minimum acceptable adhesion level shall also be indicated which will be used for quality control purposes (see 4.6.8). If the rebuilt tire has fabric tread reinforcement the rebuilder shall determine the reinforcing ply to reinforcing ply adhesion value in terms of pounds per inch and record this data on the QTR, A minimum acceptable adhesion level shall also be indicated which will be used for quality control purposes (see 4.6.8). A cord body adhesion value shall be obtained between the top 3rd and 4th plies, (Note: Refer to MS3377 for additional information/requirements regarding qualification of rebuilt aircraft tires),

3.11.4.2 Production tires. On a sample basis the production rebuilt tires shall be cut up, examined and tested to determine conformance to: (1) Tread to buffed rubber surface adhesion, (2) Tread to reinforcing ply adhesion, and (3) Reinforcing ply to reinforcing ply adhesion (if applicable) (see 4.6.8),

3.11.5 Cement adhesiveness. Cement used to coat the buffed tire surface shall meet a minimum adhesion value of fifty pounds per inch when tested per 4.6.9.

3.11.6 Construction inspection. The first tire that is selected for a destructive test shall be inspected after sectioning to determine that the rebuilding construction is identical to that of the original qualified tire.

3.11.7 Rebuilt material porosity. The rebuilt tire, when cut up and examined per 4.6.15, shall show no porosity in the rebuilding materials. (See 4.5.2.4)

3.11.8 Balance pad adhesion. The adhesion of the balance pad to the innerliner or first carcass ply shall not be less than 8 pounds per inch for a tubeless tire or less than 1 1/2 pounds per inch to the first carcass ply for a tube type tire.

3.11.9 Tensile strength and elongation (requirement). Tensile strength and elongation of the rebuild material taken directly from the cured tire shall be obtained according to MS3377 requirements.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Classification of tests. Inspection and tests shall consist of the following:

TEST	PARAGRAPH
Qualification Test	4.3
Acceptance Test	4.4
Individual and Sampling Tests	4.5
Test Methods	4.6

4.3 Qualification tests. The supplier shall comply with the qualification requirements as specified in Table XIII.

4.3.1 Qualification of tires for contractors with single plant facilities-reference Table XIV.

a. Up to and including 139 knots. Contractor may qualify by either of the two methods listed below.

(1) Contractor shall complete satisfactory dynamometer testing of each tire size for which qualification is desired.

(2) Within this speed category dynamometer qualification of three different tire sizes (two selected by the contractor and one by the responsible engineering agency) will qualify the contractor for all sizes between the maximum and minimum diameter of those tire sizes tested. Sizes will be categorized by the maximum inflated outside diameter (O.D.) as listed in Tables VII through XII of this specification. Subsequent extension of the range of tires within this speed category will require additional dynamometer testing to the new maximum and/or minimum size desired unless otherwise authorized by the responsible engineering agency. Complete dynamometer tests as specified in MIL-T-5041 are required. Casings for rebuilding will be furnished by the cognizant engineering activity from used or worn inventories.

b. For speed ranges 140 knots through 239 knots - contractors must complete satisfactory dynamometer testing on a minimum of one tire of each size and ply rating for which he desires to become qualified unless otherwise authorized. Complete dynamometer test requirements and the number of tires, if more than one, to be qualified will be stated on the applicable rebuild tire drawing.

4.3.2 Qualification of tires for contractors with multiple plant facilities - reference Table XIV.

a. Individual plants must have identifical product design, construction, and material compounding, processing specifications and quality control requirements and procedures and identical or equivalent equipment. In addition, the rebuilder shall certify that the above features are equal for each of the plants and that these are centrally controlled by the rebuilder.

b. For contractors with two or more plants complying to the requirements of 4,3,2a there shall be five separate speed ranges for which contractors can become qualified at each of their plants. Qualification for individual tires in each range shall be accomplished as follows:

(1) Up to and including 139 knots - Qualification of tires as specified in 4.3.1a shall be accomplished by one or more of the contractor plants. Also at least one tire shall be qualified per individual plant and this will qualify the plant involved for bidding on rebuilding of any or all of the tires in the speed range for which the contractor has qualified.

(2) Speed range - 140 knots up to and including 239 knots. For a contractor to become qualified at one or more plants to rebuild any tire size and ply rating in this speed range all of the individual tire sizes and ply ratings for which the contractor wishes to bid must be qualified by at least one or more of the contractor's plants. Also, at least one size tire shall be qualified per individual plant. The additional qualification of a new tire size and ply rating in this speed range by either one of the existing or by a new plant shall qualify all previously qualified plants for the new tire size.

Qualification to the individual tire drawing requirement will be necessary. For single wheel applications the individual tire drawing may specify that more than one tire be qualified by one plant for complete approval of the specific tire size by that plant.

(3) If a tire size and ply rating is rated for a speed less than the maximum for a particular speed range, then qualification of this tire by one plant will not qualify that plant for the particular range as listed in 4.3.2.b(2) or 4.3.2.b(3). In order to qualify for the entire speed range a plant must qualify a tire size that is rated at the maximum speed rating for that range.

4.3.3 High performance tires. In certain cases tire sizes may be placed in a higher speed range for qualification than for which the actual rated speed would indicate. Special requirements will be placed on individual tire specification sheets or drawings.

4.3.4 Examination and testing for qualification. Qualification examination and testing of the product shall not be authorized until a prequalification inspection has been satisfactorily completed and the provisions of "Defense Standardization Program, SD-6, Provisions Governing Qualification" have been satisified and approved1.

4.3.4.1 Dynamic tests. The dynamic tests shall be performed as specified in MIL-T-5041, and individual tire drawings and standards.

4.3.5 Quality control system. A current written description of the contractor quality control system shall be submitted to and must be received by the responsible engineering activity prior to bid opening. The rebuild contractor shall notify the responsible engineering activity regarding any change to the written procedure that might affect the degree of control required by the applicable specification or document (see 6.2.2). The responsible activity retains the right to disapprove the contractor's quality control system.

4.3.6 Qualification test reports.

4.3.6.1 Data required. Three copies of qualification test reports per Figures 2, 3, and 4 accompanied by a bead to bead section of one-half of the dynamometer tested tire, including the original carcass manufacturer's serial number, shall be forwarded to the responsible cognizant engineering activity (see 6.2.2). For tires rated 174 knots and above, a bead to bead sample of one-half of an identical untested rebuilt tire, including the serial number of the original manufacturer's tire, shall also be included. In addition, a one inch cross section of the tire and three each eight inch by ten inch photographs of the cross section of the tire per MIL-T-5041 shall be included. Each photograph shall be identified by QTR number. The remains of the carcass and all dynamometer test data are to be retained by the tire rebuilder for possible examination until approval

has been granted or the QTR rejected by the cognizant engineering activity. Nonavailability of the total carcass remains or the dynamometer test data to the cognizant engineering activity, upon request, will automatically constitute rejection of the QTR. (Note: Refer also to MS3377).

4.3.6.2 Additional data requirement. All rebuilders who qualify three size tires in the 0 to 139 knot speed range per 4.3.1a(2) or 4.3.2b(1) shall submit to the cognizant engineering activity a list of Pre-Qualification Test Report numbers specifically identifying each tire size, ply rating, and separate construction in this speed range for which they desire to be listed as qualified (see 6.2.2). Rebuilders with multiplant facilities need only assign one QTR number to a particular tire size, ply rating, and construction regardless of the number of plants involved. However, if actual dynamometer tests have been performed by two or more plants on the same tire, the same number shall be used with the plants identified in the QTR. If a QTR for a particular size tire is to supersede a previous QTR from another plant, it should so be indicated on the latest report. Only those tire sizes in the speed range 0 - 139 knots which are currently being considered for listing in the QPL will be so listed.

4.3.6.3 Design and construction identification. The design and construction of qualified rebuilt tires shall be identified by the rebuilder's QTR number. The rebuilt stock number identifying the specific compound used for the tread material shall be listed on the QTR. Changes in tread design, tread construction, material and manufacturing processes that affect performance or appearance of the rebuilt tire shall require prior approval and may be cause for retest if so requested by the responsible engineering agency. A full description of such changes shall be submitted to the responsible engineering agency to determine status of affected QTR's (see 6.2.2). Rebuilt tires receiving qualification approval shall be listed in a QPL maintained by the appropriate agency.

4.3.6.4 Post qualification requirement. Rebuilders who bid and are awarded a contract for rebuilt tires in the 0 to 139 knot inclusive speed range shall provide copies of the QTR to the responsible engineering agency for each rebuilt tire that was not previously dynamometer tested and reported. The information required shall be that of Figures 2, 3, and 4, excluding dynamic requirements and deflection data. In addition a one inch bead to bead cross section of the rebuilt tire, a bead to bead section of one-half of the rebuilt tire which includes the carcass manufacturer's serial number, and footprints shall also be provided for each tire. Additionally, 8x10 photographs (three each for Army, Air Force and Navy) of the cross section of the tire identified by a QTR number shall be provided. Likewise, three footprints at both 100 percent rated load and inflation pressure and 60 percent rated load and 100 percent rated inflation pressure shall also be provided for each tire. This information is only a one time requirement and need not be repeated on further contracts unless a construction, design, or compound change is effected that would change the information on

the QTR. The tire selected for examination shall be one of the first five from the production contract. This information shall be supplied to the cognizant engineering activity not more than 30 days from the production of the first tire on the contract.

4.3.7 Footprints. Three prints, indicating the actual shape, net and total gross contact area in square inches of the rebuilt tire footprints at 60 percent and 100 percent static load and 100% rated inflation pressure shall be submitted with each QTR. Bottom footprint shall be required for all Navy Type VII and Type VIII rebuilt tires. Each print shall be identified by a QTR number.

4.3.8 Qualification test tires. The qualification test tires shall consist of the required rebuilt sizes, construction and types as specified in 3.3. Worn tires for qualification tests may be obtained by contacting the approving agency for the appropriate service. Qualification tires, except those for which the specific MS sheet or drawing prohibits cut through damage shall have three cuts of a cut length of one-half inch and extending through thirty-three and one-third percent of the carcass plies and spaced at least 60° apart, inflicted and repaired in accordance with 3.7. The length of cuts is to be measured at the bottom of the cut. Maximum area of allowable exposed cord on the top carcass ply shall be included in the repair of the subject tire (see 3.4). Repairs inflicted in accordance with this paragraph should be identified to the cognizant engineering activity as to location with respect to the serial number. Damage inflicted to the worn tire in accordance with this paragraph shall be witnessed and verified by a Government representative.

4.3.9 Carcass soundness. The choice (from typically worn tires of the procuring department inventory) with respect to the ability of the rebuilt tire to complete the prescribed dynamometer test, follow-on service tests if specified, and performance, is the sole responsibility of the contractor unless otherwise authorized.

4.3.10 Dynamic tests. The dynamic tests shall conform to the requirements of MIL-T-5041 and individual rebuilt tire drawings and requirements. For availability of dynamic test facilities (see 6.4).

4.3.11 Dynamic test inspection.

4.3.11.1 Tread chunking. The maximum allowable amount of tread chunking shall be less than the width of the rib or one square inch in area. A rib width shall be determined by measuring from the center of one groove to the center of the next groove across the rib of a tread that contains the fault. The depth of the void shall be not greater than seventy-five percent of the skid depth. There shall be no more than three chunks each up to one square inch in area or ten chunks totaling more than four square inches in area out of the tread.

4.3.11.2 Groove cracking-rubber and fabric tread tires. There shall be no groove cracking in tires having all rubber tread. In tires of fabric tread, any void in the bottom of the groove

shall be no deeper than a void caused by the outer layer of cord pulled through the rubber stock in the bottom of the groove. Hi-Speed/Hi-Performance tires shall exhibit no groove cracking. There shall be no rib under cutting. The tire shall be inspected when inflated to rated pressure.

4.3.11.3 Slippage. Mounted rebuilt tires when tested in accordance with 4.3 shall show no evidence of slippage on the wheel rim that would damage the tubes or valve in tubetype tires or the air seal on tubeless tires.

4.3.11.4 Bead separation. If bead wire or bundle separation is found in the cut section of a tire that has completed the required test, the fabric around the bead bundles shall be stripped back at least one inch to determine if separation was caused by sectioning the tire or was due to testing. If no separation is found in the stripped area, the bead shall be considered satisfactory. Separation will be considered cause for disqualification.

4.3.11.5 Cord fraying fabric "reinforced" tread construction. Cord fraying, if present in the groove of the tire, shall be only on the outer layer of cord. Unless otherwise specified, the maximum allowable broken and frayed cords shall be as follows:

Broken Cords	One groove	30 percent of one tire circumference
Broken Cords	All grooves (accumulative)	40 percent of one tire circumference
Frayed Cords	One groove	65 percent of one tire circumference
Frayed Cords	All grooves (accumulative)	95 percent of one tire circumference
Broken & Frayed Cords	One groove	65 percent of one tire circumference
Broken & Frayed Cords	All grooves (accumulative)	95 percent of one tire circumference

4.3.11.6 Tests for qualification of tube type and tubeless tires. Completed dynamometer qualification tests of a tubeless rebuilt tire will qualify a tubetype tire of identical construction, size and ply rating and vice versa unless otherwise specified.

4.4 Acceptance tests. The acceptance tests shall consist of the individual tests per 4.6.1, 4.6.2, and 4.6.3, and the sampling tests per 4.5.2 which involve 4.6.2 through 4.6.20. See Table XIII for tabulation of examination and tests.

4.5 Individual and sampling tests.

4.5.1 Examination. Each rebuilt tire shall be subjected to examination as described in 4.6.1, 4.6.2, and 4.6.3.

4.5.2 Sampling tests.

4.5.2.1 Sampling procedures. The following procedure shall be applied to the inspection of the rebuilt tire characteristics listed as items 4, 6(b) and 17 of Table XIII. Each tire size and ply rating, identified by a separate National Stock Number, shall be considered as a separate group for inspection per 4.5.2.1a through 4.5.2.1g.

a. Inspect all tires in the order produced until twenty-four consecutive tires, for each tire size and ply rating, meet all inspection criteria.

b. Randomly, select one tire out of every five, for each tire size and ply rating, produced for inspection. If twenty-four consecutive tires inspected at this level meet all inspection criteria (covering a total of one hundred twenty tires), the procedure required by 4.5.2.1c will apply.

c. Select at random one tire out of every twenty-five, for each tire size and ply rating, produced for inspection. If twenty-four consecutive tires inspected at this level meet all inspection criteria (six hundred tires), the procedure required by 4.5.2.1d will apply.

d. One tire shall be selected at random out of one hundred twenty-five for each tire size and ply rating, produced for inspection. Continue inspection at this level until a defective sample is found.

e. If a defective sample is found, production shall be stopped, the cause determined, the deficiency corrected and an explanation provided to the U.S. Government inspector for review and approval to continue production.

f. When production is again started, inspection shall be initiated at the previous inspection level as indicated in the flow-chart for a multi-level continuous sample plan (Table XV).

g. For continuing production where no more than ninety days have elapsed between production intervals, inspection shall continue at the same level achieved prior to discontinuing production.

4.5.2.2 Mold dimensions. At the beginning of each contract, the rebuilder will notify the Government representative which individual molds or curing chamber have been previously used for Government contracts. Each mold shall be identified as to a specific National Stock Number (for tire size and ply rating). A new mold shall require that each of the items 6a, 7a, b, c and d, requirements of Table XIII are demonstrated to be corrected for the various manufacturer's carcasses to be used in the respective mold. Any deviation from the above requirements of Table XIII must be corrected before starting production.

4.5.2.3 Tensile strength and elongation (sample). The tensile strength and elongation of the tread material shall be obtained initially by the cognizant engineering activity. Additional testing will be handled by the activity per MS 3377.

4.5.2.4 Destructive test requirement. Randomly select one out of the first five tires cured from each tire size and ply rating as identified by a National Stock Number for each manufacturer's carcass. This is to be performed at least once in each rebuilt manufacturer's history for the highest rebuild level being processed for the individual manufacturer's carcass, to determine conformance with requirements of Table XIII items 10, 11, 12, 13, 17, 18, 19 and 20. Items 11, 12, 17, 18 and 19 shall be evaluated at three points equidistant around the tire. The first tire of each size and ply rating selected for a destructive test should be inspected after sectioning to determine that the construction is identical to that of the originally qualified rebuilt tire. These tests are to be performed for each tire size at least once every six months, and whenever a rebuild die size is changed, source is changed, or process is changed. If the test data fail to demonstrate conformance with specification requirements, the rebuilder shall determine the cause of failure and implement corrective action to remove the condition causing the substandard product. A second test shall then be accomplished on the same manufacturer's carcass to verify that the corrective action has removed the product deficiency. The deficiency and corrective action shall be explained to the Government inspector prior to approval to proceed with production of rebuilt tires that initially failed the tests. The reduced sampling plan outlined in Table XVI will be used in conjunction with these requirements.

4.5.2.5 Tread and repair materials. Each shipment of tread and repair materials shall be tested and certified by the manufacturer to meet rebuilder's original material requirements.

4.5.2.6 Uniformity properties. Lateral uniformity (Table XIII item 20) shall be checked for tires selected at random starting with sampling plan 4.5.2.1d. Reduce or increase the level of sampling depending on results, in accordance with instructions of 4.5.2.1d, e, and f.

4.5.3 Acceptance and rejection criteria.

4.5.3.1 Corrective action. When a rebuilt tire fails to meet the requirements of the individual test, no rebuilt tires still on hand or later produced shall be accepted until the extent and cause of failure have been determined and appropriately corrected. The rebuild manufacture shall forward a report to the Government representative and cognizant engineering activity describing the cause of failure and the action taken to preclude recurrence (see 6.2.2). After correction, the individual test shall be repeated as provided 4.5.2.1, 4.5.2.2, 4.5.2.3, or 4.5.2.4.

4.6 Test methods.

4.6.1 Air injection test. The air injection procedure and test for checking all tubeless tires for separations and leaks is as follows:

a. Equipment required:

(1) Air injection needle assembly. (This consists of a size number 16 hypodermic needle attached to an air chuck fitted to a water and oil trapped supply lines).

(2) A suitable leak detecting solution.

b. Test method:

(1) Set air line demand pressure from 100 to 125 psig. Higher air pressure may be used but rebuilder must have prior written approval by the cognizant engineering activity.

(2) Insert needled into the sidewall just above vent ribs or rim flange penetrating through at least the outermost carcass ply and connect the air to the chuck. (Caution: Always be sure that the needle is inserted into the tire before air line is connected; it is recommended that the chuck be equipped with a valve that prevents air flow when the needle is removed). Air pressure must be injected into the sidewall for a minimum of ten minutes. The air needle must not be inserted into the tire in the flex area of the sidewall or the shoulder area of the tire.

(3) Spray the sidewall bead area with leak detecting solution and inspect sidewall bead area to make certain vents are bleeding.

(4) Remove needle and spray the entire inside of tire with leak detecting solution and inspect for any bulging in the chafer or bead area.

(5) Inspect innerliner and total bead area for any leaks or separations and inspect exterior portion of tire for separations.

(6) If vents are not bleeding, tire must be properly revented.

(7) Inspector must circle all inner-liner defects and also mark bead area with crayon so tires will be repaired.

(8) Re-venting should not be accomplished unless required.

4.6.2 Examination of product. Each rebuilt tire shall be visually examined to determine compliance with the requirements specified per MIL-STD-698 and herein with respect to workmanship and marking.

4.6.3 Balance. Each rebuilt tire shall be balance checked by determining the exact load on the tire required to produce static balance and reducing this load to within the applicable ounce-inch static unbalance values specified in Tables I through VI. Any time that a balance pad is installed, the balance of the tire should be rechecked after maximum of three pads of six ounces maximum for each or a total of eighteen ounces of pads are allowed. For main wheel tires a maximum of three pads of eight ounces maximum each or a total of twenty-four ounces of pads are allowed. The 20.00 - 20/22 P.R. and 20.00 - 20/26 P.R. tires are allowed three balance pads of fourteen (14) ounces maximum each pad. Prebalancing the uncured rebuilt tire with tread rubber is allowed.

4.6.4 Tensile strength and elongation (test procedures). Tensile strength and elongation of the retread stock after cure of the tire shall be obtained per ASTM D412.

4.6.5 Tire measurements. The rebuilt tire shall be mounted on the rim, inflated to the specified rated inflation pressure and allowed to stand for four hours minimum at room temperature after which time the pressure loss due to stretch is to be replaced before measurements are made. The rebuilt tire dimensions are required to be within the allowable limits specified in Tables VII through XII.

4.6.6 Other measurements. The weight, mold skid depth and tread pattern shall be determined and shall be in accordance with Tables I through VI and the applicable specification drawing per tire size. The maximum weights listed in Tables I through VI are for all tire constructions.

4.6.7 Shoulder measurement. The point at which the maximum shoulder width and diameter are measured for inflated rebuilt tires must lie on or within one of two arcs that meet at the shoulder dimension point as designated in MIL-T-5041.

4.6.8 Rebuild component adhesion. When tested in accordance with ASTM D413 a minimum of 50 lbs/in shall be required to separate the two strips of material listed in "a" below unless otherwise authorized by the applicable drawing. The same method shall be used to determine the values of b, c, & d below. These values shall meet the minimum adhesion requirement established by the rebuilder when he qualified his product and which were approved by the cognizant engineering activity.

a. Tread to buffed rubber surface adhesion.

b. Tread to reinforcing ply adhesion.

c. Reinforcing ply to reinforcing ply adhesion (if applicable).

d. Cord body adhesion between top 3rd and 4th ply.

4.6.9 Vulcanizing cement adhesiveness. Each time that a new lot or shipment of cement is used the rebuilder shall perform an adhesiveness test as outlined below. A minimum of 50 pounds per inch width of test material shall be required to separate the two materials.

4.6.9.1 Specimen preparation. Two control specimens prepared from rebuild tread stock material six inches square shall be used for this test. One specimen with a thickness of 0.080 inch shall be cured at the optimum time and temperature. Cured specimens shall have mold sheen removed by stone buffing to a velvet finish prior to application of cement. Buffed specimens shall be wiped before and after buffing with a cloth dampened with approved rubber solvent to insure clean surface. The other specimen of 0.0625 in thickness shall be uncured. The vulcanizing cement shall be applied to matching three inch portions of the two specimens, A separating heat-resisting film material shall be placed between the two uncoated portions of the specimens and then the specimens placed in a mold and cured at the optimum time and temperature. Each vulcanized specimen will be cut into strips one inch wide and six inches long and each with a three inch portion which has been bonded and a three inch portion which has remained unbonded. To prevent excessive stretching during testing, a layer of square woven fabric may be cured on the outside of each six-inch square tread material section.

4.6.9.2 Apparatus. The apparatus shall consist of a testing machine strain gage type tester such as Instron or of the inclination-balance or pendulum type which shall fulfill the following requirements.

a. The applied tension as measured and recorded shall be accurate within plus or minus one percent.

b. Specimens shall be held in the testing machine by grips which clamp firmly and prevent slipping at all times.

c. The machine shall be autographic, producing a chart showing the inches of separation as one axis and applied tension as the other axis coordinated.

d. The machine shall be of such capacity that the maximum applied tension during test shall not exceed eighty-five percent nor be less than fifteen percent of the rated capacity.

e. Rate of jaw separation shall be two inches per minute.

4.6.9.3 Procedure. Testing shall be conducted as soon as possible after the test specimens have been conditioned to a temperature of seventy-three degrees plus or minus two degrees fahrenheit. Each free end of the unbonded portion of the test specimen will be clamped into the testing machine. When the one portion is attached to the recording head, care shall be taken to adjust it symmetrically in order that the tension shall be distributed uniformly. The autographic mechanism and chart shall be adjusted to zero and the machine started. The separation shall be continued for a sufficient distance to indicate the adhesion value.

4.6.9.4 Calculation. The adhesion strength shall be determined by drawing on the autographic chart the best average load line which will accommodate the peak of all of the points on the curve. The load expressed in pounds per inch width shall be reported as the adhesion strength of the vulcanizing cement under test. For each series of tests, the arithmetic average of all peak values obtained shall be calculated and reported as the "average value".

4.6.10 Balance pad adhesive. Bonding agents must provide a minimum adhesion of eight pounds per inch width to the inner liner for a tubeless tire or one and one half pound per inch width to the bond ply for a tube type tire when tested in accordance with ASTM D413.

4.6.11 Vulcanization cure equivalent method. To determine conformance with 3.6.6a, the tire tread compound test slabs shall be tested in accordance with ASTM D412 and by the cure equivalent method.

4.6.12 Undertread thickness. When the tire is sectioned in accordance with 4.5.2.4 the undertread thickness shall be measured from the bottom of the center or nearest to the center groove to the top of the carcass, breaker, or red indicator cord (if this is present and is placed on top and adjacent to the carcass or breaker cord). The undertread thickness is divided by the original mold skid depth and this value is multiplied by 100 to obtain the percent thickness. Those values shall be per 3.3.3. These data shall not be obtained until 24 hours after vulcanization.

4.6.13 Tread hardness. The durometer hardness shall be determined at three points equidistant on the rebuilt tire tread surface on the rib nearest to the center of the tread. These values shall be within plus or minus five durometer points from the tread hardness reported on the QTR. FED-STD-601, test method 3021 or ASTM D2240 shall be used for determining the durometer values.

4.6.14 Specific gravity. Each time a tire is cut up for adhesion tests, the specific gravity of the tread stock shall be determined at three points equidistant around the tire at the surface of the tread rib closest to the center of the tread. These values shall be within plus or minus 0.02 from the specific gravity reported on the QTR. Federal Test Method Std No. 601, Method 14011 or ASTM Std D792-66 shall be used.

4.6.15 Porosity. No porosity in the rebuild stock shall be visible when the tire is cut in accordance with 4.5.2.4.

4.6.16 Low temperature test. The rebuild and repair material components shall meet the minus sixty-five degrees fahrenheit requirement when tested according to the procedure specified in MIL-R-6855.

4.6.17 Construction check. Each time that a tire is cut up per 4.5.2.4 the rebuilt tire shall be compared to the qualification test report data and rebuilders specification requirement to assure that the proper construction and design are being built into the rebuilt portion of the tire.

4.6.18 Storage. Storage procedures for aircraft tires are specified in the following publications:

a. Army: TM-55-2620-200-24

b. Navy: NAVAIR 04-10-506

c. Air Force: T.O. 4T-1-3

4.6.19 Uniformity. The lateral uniformity of the cured tread shall be measured by laterally applying a dial indicator to the edge of the rebuild above the shoulder area as defined by MIL-T-5041 and below the contact area of the tread as indicated by the footprint obtained at 100% static rated load and rated inflation pressure. The tire shall have been mounted on a fixture inflated to a minimum of 30 psi. The tire shall then be rotated 360°. The dial indicator reading shall not vary more than allowed by requirements of 3.6.5.

4.6.20 Tread skid depth. Determine tire skid depth at room temperature using a tire skid depth gage, obtain tire skid depth in thousandths of an inch at three equidistant points around the tire circumference in a groove closest to center of tread.

5. PACKAGING

5.1 Packaging requirements. Unless otherwise specified, rebuilt tires shall not require packing. Tires shall be prepared for and shipped in such a manner as to preclude distortion or other damage which could prevent normal bead seating.

5.2 Marking. Each rebuilt tire shall be identified with color coded tape in accordance with MS14113.

The tires shall be labeled per MIL-STD-129 as follows:

NSN _____
Tire, Pneumatic, Aircraft
Specification _____

6. NOTES

6.1 Intended use. Rebuilt tires covered by this specification are intended for use on main and auxiliary wheels installed on aircraft.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Type, size, and ply rating of rebuilt tire.

c. National stock number.

d. Type rebuilt.

e. Reports as required by applicable procuring agency.

f. Sampling plans if other than specified in 4.5.2.

g. Rebuilder shall obtain wheels for bead fit checks and tire measurements from procuring agency for duration of contract.

6.2.2 Data requirements. When this specification is used in an acquisition which incorporate a DD Form 1423, Contract Data Requirements List (CDRL) the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL incorporated into the contract. When the provisions of DAR 7-104.9 (n) (2) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification is cited in the following paragraphs.

	Paragraph no.	Data requirements	Applicable DID no.
(a)	4.3.5	Specification maintenance document (Equipment/ Munitions)	DI-E-3106
(b)	4.3.6.1	Parts qualification test plan	DI-T-5477A
(c)	4.3.6.2	Parts qualification test plan	DI-T-5477A
(d)	4.3.6.3	Parts qualification test plan	DI-T-5477A
(e)	4.5.3.1	Parts qualification test plan	DI-T-5477A

(Copies of DID's required by contractors in connection with specific acquisition functions should be obtained from the Naval Publication and Forms Center or as directed by the contracting officer).

6.3 Procurement action on qualified products. With respect to products requiring qualification, awards will be made only for such products as have, prior to the time set for opening of bids, been tested and approved for inclusion in the applicable Qualification Products List in accordance with the provisions of this specification, whether or not such products have actually been so listed by that date. The attention of suppliers is called to this requirement and manufacturers are urged to arrange to have the products that they propose to offer to the Government tested for qualification in order that they may be covered by this specification. The activity responsible for the Qualified Products List is the Operations and Support Branch Engineering Division Attn: MMEDO, Hill AFB, Utah and information pertaining to qualification of products may be obtained from that activity.

6.4 Qualification testing. All manufacturers desiring to qualify a rebuilt tire should send a letter of request to the responsible engineering agency per DOD publication SD-6 Provisions Governing Qualification. This includes manufacturers who desire to contract for dynamic testing at the Air Force Flight Dynamics Laboratory at Wright Patterson Air Force Base. Responsible agencies are as follows:

Army - U.S. Army Aviation Systems Command
St. Louis MO 63166

Navy - Naval Air Rework Facility, North Island
Attn: Code 34420
San Diego, CA 92135

Air Force - ASD/ENFL
Wright Patterson AFB, OH 45433

Operations & Support Branch Engineering Division
Attn: MMEDO
Hill AFB, UT 84056

6.4.1 Dynamometer testing at the AFFDL Landing Gear Test Facility, designated a DOD facility by Department of Defense Instruction 4151.13, is available to responsible activities within the Army, Navy, Air Force, and other Government Agencies. Testing services may also be made available to industry when the testing is in direct support of Military/ Government programs, and when the responsible department, agency, or other activity specifically authorizes, requests, or sponsors the test support. Test requests should include a detailed description of the test plan and the time period during which the requesting organization desires the test to be conducted. Correspondence relating to requests for test support or information on specific test capabilities should be addressed to:

Attn: Manager, Landing Gear Test Facility
Wright Patterson AFB, OH 45433

6.5 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodian:
Navy - AS
Air Force - 99

Reviewer:
Navy - AS
Air Force - 11

Preparing Activity:
Air Force - 70

(Project 2620-0233)

TABLE I

SIZE, CONSTRUCTION, AND PERFORMANCE OF TYPE I (SMOOTH CONTOUR) REBUILT TIRE

TIRE TYPE (1)	SIZE	PLY RATING (PR)	STATIC LOAD RATING (MAX)	INFLATION PRESSURE	TIRE WEIGHT (MAX)	MOLD SKID DEPTH R&N TREAD PATTERN (MIN)	MOLD SKID DEPTH TOTAL TREAD THICKNESS (MIN) (2)	MOMENT OF STATIC UNBAL (MAX)	REBUILT DRAWING NUMBER	REBUILT RATING KNOTS
			lbs	psi	lbs	in	in	oz-in		
TT	10.00	8	650	45	4.0	0.08	0.12			139
TT	14.50	8	2,000	80	8.0	0.09	0.15			139
TT	33	10	8,000	70	48.5	0.30	--	22		139
TT	36	12	10,500	70	69.0	0.32	--	32		139
TT	44	12	15,000	70	113.5	0.38	--	50		139
TT	56	20	35,000	100	249.0	0.37	--	80		139
TT	56	20	35,000	100	265.0	0.37	--	80		139

(1) TL tubeless tire; TT tube type.

(2) Total tread thickness. (Minimum for non-skid or ribbed tires includes mold skid depth plus under-skid thickness)

TABLE II

SIZE, CONSTRUCTION, AND PERFORMANCE OF TYPE II (HIGH PRESSURE) REBUILT TIRES

TIRE TYPE (1)	SIZE	PLY RATING (PR)	STATIC LOAD RATING (MAX)	INFLATION PRESSURE	TIRE WEIGHT (MAX)	MOLD SKID DEPTH (MIN)	MOMENT OF STATIC UNBAL (MAX)	REBUILT DRAWING NUMBER	SPEED RATING KNOTS
TT	26X6	10	5,150	130	28.0	0.21	17		139

TABLE III

SIZE, CONSTRUCTION, AND PERFORMANCE OF TYPE III (LOW PRESSURE) REBUILT TIRES

TIRE TYPE (1)	SIZE	PLY RATING (PR)	STATIC LOAD RATING (MAX)	INFLATION PRESSURE	TIRE WEIGHT (MAX)	MOLD SKID DEPTH (MIN)	MOMENT OF STATIC UNBAL (MAX)	REBUILT DRAWING NUMBER	SPEED RATING KNOTS
			lbs	psi	lbs	in	oz-in		
TT	5.00-5	4	800	31	5.5	0.11	15		139
TT	5.00-5	6	1,260	49	5.5	0.11	15		139
TL	5.00-5	10	2,150	88	8.0	0.16	15		139
TT	6.00-6	6	1,750	42	9.5	0.18	8		139
TT	6.00-6	8	2,350	55	9.5	0.18	17		139
TL	6.00-6	8	2,350	55	11.0	0.18	17		139
TT/TL	6.50-8	6	2,300	51	12.5	0.20	17		139
TL	6.50-8	8	3,150	75	13.5	0.20	17		139
TT	6.50-8	8	3,150	75	12.5	0.20	17		139
TT/TL	6.50-10	6	2,770	62	13.5	0.20	17		139
TL	6.50-10	10	4,750	100	17.0	0.20	17		139
TT	7.00-6	6	1,900	38	11.0	0.19	17		139
TL	7.00-8	16	6,650	125	26.0	0.15	17		139
TT	7.50-10	6	3,000	46	17.5	0.21	17		139
TT	7.50-10	12	1,800	80	32.5	0.90(channel)	17		139
TT	7.50-14	8	5,700	87	32.5	0.37	17		139
TT/TL	8.50-10	6	3,250	41	21.5	0.33	17		139
TT	8.50-10	8	4,400	55		0.12	17		139
TT/TL	8.50-10	10	5,500	70	25.2	0.12	17		139
TT/TL	8.50-10	12	8,000	100	30.5	0.22	17		139

TABLE III (CONTINUED)

TIRE TYPE (1)	SIZE	PLY RATING (PR)	STATIC LOAD RATING (MAX)	INFLATION PRESSURE	TIRE WEIGHT (MAX)	MOLD SKID DEPTH (MIN)	MOMENT OF STATIC UNBAL (MAX)	REBUILT DRAWING NUMBER	SPEED RATING KNOTS
			lbs	psi	lbs	in	oz-in		
TT	9.00-6	10	4,500	58	25.0	0.28	17		139
TT	9.50-16	10	9.250	90	59.5	0.41	20		139
TT	10.00-7	12	7,100	80	36.0	0.35	17		139
TT	11.00-12	8	6,300	45	48.5	0.30	24		139
TL	11.00-12	8	6,300	45	50.0	0.30	24		139
TT	12.50-16	12	12,800	75	93.0	0.45	35	MS 22080	130
TL	12.50-16	12	12,800	75	102.0	0.45	35	MS 22080	130
TT	15.50-20	14	20,500	90	147.0	0.46	52		139
TT	15.50-20	20	29,900	135	184.0	0.46	52		139
TT	17.00-16	12	16,000	60	137.0	0.48	52		139
TT/TL	17.00-20	22	34,500	130	250.0	0.51	80		139
TT/TL	20.00-20	22	38,500	95	245.0	0.40	90	65D30338	174
TL	20.00-20	26	46,500	125	284.0	0.40	90	MS 27823	174

(1) TT-Tube Type; TL-Tubeless Type.

TABLE IV

SIZE, CONSTRUCTION, AND PERFORMANCE OF TYPE VI (LOW PROFILE) REBUILT TIRES

TIRE TYPE	SIZE	PLY RATING (PR)	STATIC LOAD RATING (MAX)	INFLATION PRESSURE	TIRE WEIGHT (MAX)	MOLD SKID DEPTH R&N TREAD PATTERN (MIN)	TOTAL TREAD THICKNESS (1) (MIN)	MOMENT OF STATIC UNBAL (MAX)	REBUILT DRAWING NUMBER	SPEED RATING KNOTS
			lbs	psi	lbs	in	in	oz-in		
TT	15x6.0-6	4	1,250	45	7.5	0.22		8		139
TT	22x7.25	8	4,600	80	17.5	0.15	.19	12		139
TT	29x11-10	8	5,000	45	31.5	0.15		20		139
TT	29x11-10	10	7,070	60		0.35		20		139

(1) Total tread thickness for nonskid or ribbed tires includes mold skid depth plus undertread.

TABLE V

SIZE, CONSTRUCTION, AND PERFORMANCE OF TYPE VII (EXTRA HIGH PRESSURE) REBUILT TIRES

TIRE TYPE (1)	SIZE	PLY RATING	STATIC LOAD RATING (MAX)	INFLATION PRESSURE	TIRE WEIGHT (MAX)	MOLD SKID DEPTH (MIN)	STATIC UNBAL (MAX)	REBUILT DRAWING NUMBER	SPEED RATING KNOTS
			lb	psi	lb	in	oz-in		
TT	12.50x4.50	14	3,000	165	8.5	0.25*	11		139
TT	16x4.4	6	1,700	85	10.0	0.20	9		139
TL	18x5.5	8	3,050	105	13.5	0.17	10		139
TT	18x5.5	12	5,050	170	19.0	0.17	10		217
TL	18x5.7	14	6,200	215	16.3	0.17+0.03 -0.00	2.5	MS3379(AS)	217
TL	20x5.5	14	7,200	230	22.0	0.18	10	MS3380(AS)	174
TT	22x5.5	8	4,350	135	17.5	0.19	13		139
TL	22x5.5	12	7,100	235	26.0	0.19	6	MS14142(AS)	174
TL	24x5.5	12	8,070	250	27.0	0.20	8		139
TL	22x6.75-10	18	10,600	245	28.0	0.30	10	MS14185(AS)	
TL	22x6.6-10	20	12,000	270	30.0	0.30	10	MS14187(AS)	190
TL	22x6.6-10	18	10,700	260	26.0	0.22	10		200
TL	25.5x8.0-14	18	15,300	275	34.0	0.25	17		217

* Channel Tread

TABLE V (CONTINUED)

SIZE, CONSTRUCTION, AND PERFORMANCE OF TYPE VII (EXTRA HIGH PRESSURE) REBUILT TIRES

TIRE TYPE (1)	SIZE	PLY RATING	STATIC LOAD RATING (MAX)	INFLATION PRESSURE	TIRE WEIGHT (MAX)	MOLD SKID DEPTH (MIN)	STATIC UNBAL (MAX)	DRAWING NUMBER	SPEED RATING KNOTS
			lb	psi	lb	in	oz-in		
TT	24x5.5	16	11,500	355	30.0	0.28	12	MS3381(AS)	174
TT	24x7.7	10	5,100	85	24.5	0.21	17		139
TL	24x7.7	10	5,100	85	27.0	0.21	17		139
TL	24x7.7	14	8,200	135	32.5	0.12	8		217
TT	25x6.0	16	12,000	330	34.5	0.21	15		139
TT	26x6.6	14	10,000	225	34.5	0.30	17	MS22078(AS)	174
TL	26x6.6	14	10,000	225	39.0	0.30	17	MS22078(AS)	174
TL	26x6.6	14	10,000	225	38.0	0.30	13	MS3383(AS)	139
TT	26x6.6	14	10,000	225	33.6	0.30	13	MS3383(AS)	139
TT	26x6.6	16	12,000	270	35.7	0.30	13	MS3383(AS)	174
TL	26x6.6	16	12,000	270	39.9	0.30	13	MS3383(AS)	174
TL	28x7.7	14	11,000	195	42.0	0.30	14	MS3384(AS)	174
TL	28x9.0	22	16,650	235	52.5	0.25	14	MS3385(AS)	150
TL	30x8.0-16	26	24,100	360	71.0	0.30	10	MS14176(AS)	215

TABLE V (CONTINUED)

SIZE CONSTRUCTION, AND PERFORMANCE OF TYPE VII (EXTRA HIGH PRESSURE) REBUILT TIRES

TIRE TYPE (1)	SIZE	PLY RATING	STATIC LOAD RATING (MAX)	INFLATION PRESSURE	TIRE WEIGHT (MAX)	MOLD SKID DEPTH (MIN)	STATIC UNBAL (MAX)	REBUILT DRAWING NUMBER	SPEED RATING KNOTS
			lb	psi	lb	in	oz-in		
TT	32x8.8	18	15,800	200	65.0	0.24	21		139
TT	34x9.9	14	14,000	150	65.0	0.31	27	7430512	139
TL	34x9.9	14	14,000	150	71.5	0.31	27	7430512	139
TL	36x11	22	23,300	200	100.0	0.28	16	MS27817(USAF)	174
TL	36x11	24	26,500	235	97.0	0.26	15		160
TL	38x11	14	15,400	130	94.5	0.25	18	MS27818(USAF)	195
TL	39x13	16	17,200	115	102.0	0.26	10		195
TT	40.12	14	14,500	95	103.0	0.37	40		139
TL	40x12	14	14,500	95	114.0	0.37	40		139
TL	40x14	26	30,500	175	140.0	0.30	20	MS3387(AS)	174
TL	40x14	28	33,500	200	140.0	0.30	20	MS3387(AS)	174
TL	44x13	26	33,000	200	174.0	0.31	50	62D31339	174
TL	44x13	26	35,000	200	163.0	0.31	22	MS3388(AS)	174
TL	44x16	28	38,400	185	186.0	0.38	50	MS27815(USAF)	174
TL	49x17	26	39,600	170	169.0	0.30	50	AF Dwg 71204	174
TL	49x17	26	39,600	170	226.0	0.40	50	MS27811(USAF)	195
TT	56x16	24	45,000	178	320.0	0.35	45	MS27812(USAF)	174
TL	56x16	38	76,000	315	379.0	0.35	90	MS27813(USAF)	217
TL	56x16	34	65,000	270	355.0	0.35	45	MS27816(USAF)	

(1) TT Tube Type
TL Tubeless Type

TABLE VI

SIZE, CONSTRUCTION, AND PERFORMANCE OF TYPE VII (E.H.P.) LOW PROFILE REBUILT TIRES

TIRE TYPE (1)	SIZE	PLY RATING	STATIC LOAD RATING (MAX)	INFLATION PRESSURE	TIRE WEIGHT (MAX)	MOLD SKID DEPTH (MIN)	STATIC UNBAL (MAX)	REBUILT DRAWING NUMBER	SPEED RATING KNOTS
TL	22x7.7-12	16	10,500	280	27.0	0.17	17		239
TL	22x8.5-11	16	10,000	210	30.0	0.20	13		217
TL	24x8.0-13	18	12,500	285	29.0	0.21	15		217
TL	26x8.0-14	16	12,700	235	46.0	0.20	17		239
TL	28x9.0-14	22	18,100	280	64.0	0.30	17	74205	186
TL	30x11.50-14.5	26	25,000	245	90.0	0.26	19	MS14172(AS)	214
TL	30x11.50-14.5	24	25,000	243	75.0	0.26	19	MS21780(USAF)	210
TL	31x11.50-16	22	23,300	275	84.0	0.25	21	MS27820(USAF)	239
TL	34.5x9.75-18	26	30,100	340	80.7	0.35	20		225
TL	37x11.5-16	28	31,200	245	100.0	0.30	30	MS14170(AS)	190
TL	47x18-18	30	43,700	175	197.0	0.30	60		196
TL	47x18-18	36	54,000	205	205.0	0.30	60		217

(1) TT-Tube Type
TL-Tubeless

TABLE VII

DIMENSION OF TYPE I (SMOOTH CONTOUR) REBUILT TIRES

SIZE	(A) INFLATED OUTSIDE DIAMETER Inches (Min)	(A) (Max)	(B) INFLATED SECTION WIDTH Inches (Min)	(B) (Max)	(C) INFLATED SHOULDER DIAMETER Inches (Max)	(D) INFLATED SHOULDER WIDTH Inches (Min)	(D) (Max)	(E) INTER-MEDIATE DIA Inches (Max)	(F) INTER-MEDIATE DIA Inches (Min)	(F) (Max)	(G) SECTION DIA Inches (Max)
10.00	9.76	10.27	4.00	4.31	9.17	2.10	2.60	7.42	3.46	3.85	5.67
14.50	14.26	15.00	5.98	6.43	13.39	3.06	3.81	10.76	5.08	5.73	8.14
33	32.06	33.56	10.84	11.60	31.74	4.50	6.80	27.75	8.92	10.01	22.29
36	35.40	37.43	12.56	13.47	35.35	4.80	7.23	30.76	10.42	11.64	24.43
44	43.64	45.63	15.12	16.23	43.12	6.00	8.78	37.59	12.48	13.94	30.01
56	55.44	57.51	19.12	20.52	54.23	9.02	11.78	47.09	16.40	18.21	37.34

TABLE VIII

DIMENSIONS OF TYPE II (HIGH PRESSURE) REBUILT TIRES

SIZE	(A) INFLATED OUTSIDE DIA Inches (Min)	(A) (Max)	(B) INFLATED SECTION WIDTH Inches (Min)	(B) (Max)
26x6	25.10	26.10	6.25	6.85

TABLE IX

DIMENSIONS OF TYPE III (LOW PRESSURE) REBUILT TIRES

SIZE	INFLATED OUTSIDE DIAMETER INCHES (Min)	(Max)	INFLATED SECTION WIDTH INCHES (Min)	(Max)	INFLATED SHOULDER DIAMETER INCHES (Max)	INFLATED SHOULDER WIDTH INCHES (Max)
5.00-5	13.65	14.48	4.65	5.10	12.78	4.33
6.00-6	16.80	17.85	5.90	6.49	15.73	5.51
6.50-8	19.15	20.21	6.55	7.16	17.99	6.08
6.50-10	21.35	22.46	6.25	6.85	20.20	5.82
7.00-6	18.00	19.13	5.90	7.21	16.76	6.13
7.00-8	20.10	20.50	6.85	7.05	18.90	6.38
7.50-10	23.30	24.57	7.20	7.88	21.95	6.70
7.50-14	27.00	28.16	7.20	7.88	25.64	6.70
8.50-10	24.70	26.12	8.20	8.96	23.18	7.62
9.50-16	32.50	33.87	9.10	9.99	30.68	8.50
10.00-7	24.30	26.00	9.65	10.56	22.60	8.96
11.00-12	31.00	32.81	10.50	11.54	29.05	9.79
12.50-16	37.35	39.12	12.00	13.13	34.95	11.18
15.50-20	44.30	46.01	15.05	16.48	42.32	14.01
17.00-16	43.70	45.92	16.35	17.92	40.51	15.24
17.00-20	47.70	49.61	16.40	17.77	44.51	15.09
19.00-23	53.15	56.06	18.25	19.96	50.09	17.00
20.00-20	54.30	57.10	18.80	20.60	50.39	17.61
25.00-28	69.30	72.44	24.70	26.47	64.46	22.51

TABLE X

DIMENSIONS OF TYPE VI (LOW PROFILE) TIRES

SIZE	A INFLATED OUTSIDE DIAMETER Inches (Min)	(Min)	B INFLATED SECTION WIDTH Inches (Min)	(Max)
15x6.0-6	14.55	15.50	5.90	6.50
22x7.25-11.50	21.75	22.67	7.00	7.65
29x11-10	28.10	29.50	10.40	11.33

DIMENSIONS OF TYPE VII (EXTRA HIGH PRESSURE) REBUILT TIRES

SIZE	(A) INFLATED OUTSIDE DIAMETER INCHES (MIN)	(MAX)	(B) INFLATED SECTION WIDTH INCHES (MIN)	(MAX)	(C) INFLATED SHOULDER DIAMETER INCHES (MIN)	(MAX)	(D) INFLATED SHOULDER WIDTH INCHES (MIN)	(MAX)
12.5x4.5	12.34	13.10	4.59	5.00	12.12	12.64	4.07	4.33
16x4.4	15.50	16.24	4.15	4.58	-	14.75	-	2.99
18x4.4	17.40	18.24	4.15	4.58	-	16.70	-	3.90
18x5.5	17.30	18.20	5.35	5.87	-	16.45	-	5.15
18x5.7	17.30	18.20*	5.35	5.87	-	Unspecified	-	Unspecified
20x4.4	19.50	20.24	4.15	4.58	-	19.67	-	4.07
20x5.5	19.55	20.45	5.35	5.87	-	19.58	-	5.10
22x5.5	21.55	22.45	5.35	5.87	-	21.58	-	5.10
24x5.5	23.55	24.45	5.35	5.87	-	23.58	-	5.10
24x7.7	23.00	24.16	7.20	7.88	-	21.62	-	6.95
25x6.0	24.35	25.33	5.80	6.33	-	23.99	-	5.15
25x6.75	24.80	25.85	6.45	7.06	-	23.72	-	6.21
26x6.6	25.05	26.10	6.25	6.85	-	23.84	-	6.03
28x7.7	26.60	27.80	7.40	8.08	-	25.23	-	7.16
28x9.0	26.80	28.07	8.35	9.12	-	25.18	-	8.03
29x7.7	27.60	28.80	7.40	8.09	-	26.23	-	7.16
30x6.6	29.68	30.42	6.13	6.70	-	28.45	-	5.66
30x8.8	29.50	30.86	8.35	9.17	-	27.77	-	8.14
32x8.8	30.05	31.45	8.35	9.17	-	28.42	-	8.14
34x9.9	32.45	33.92	9.55	10.51	-	30.52	-	9.06
36x11	34.00	35.67	10.80	11.85	-	32.12	-	10.40
38x11	36.00	37.67	10.80	11.85	-	34.12	-	10.40
39x13	37.50	39.12	12.00	13.13	-	34.95	-	11.54
40x12	38.55	40.35	11.70	12.72	-	36.03	-	11.23
40x14	38.85	40.51	13.25	14.42	-	35.67	-	12.36
44x13	42.30	44.26	12.80	13.91	-	40.03	-	12.15
44x16	42.30	44.00	15.05	16.68	-	38.81	-	14.11
46x16	45.05	46.00	15.50	16.50	-	41.35	-	14.50
49x17	47.70	49.61	16.40	17.76	-	43.69	-	14.93
56x16	54.95	57.25	15.40	16.69	-	52.10	-	14.73
56x16	54.80	56.74	15.50	16.69	-	51.54	-	14.69

*The maximum thrown and grown outside diameter shall not exceed 18.70 inches.

TABLE XII

DIMENSIONS OF TYPE VIII (EXTRA HIGH PRESSURE) LOW PROFILE REBUILT TIRES

SIZE	INFLATED OUTSIDE DIAMETER INCHES (MIN)	(MAX)	INFLATED SECTION WIDTH INCHES (MIN)	(MAX)	INFLATED SHOULDER DIAMETER INCHES (MAX)	INFLATED SHOULDER WIDTH INCHES (MAX)
22x8.5-11	21.40	22.33	8.10	8.76	19.81	7.73
26x8.0-14	25.64	26.36	7.73	8.24	24.15	7.26
28.9.0-14	27.30	28.13	8.60	9.10	25.25	8.00
30x11.50-14.50		*31.00		11.85	*27.54	*10.40
31x11.50-16	30.63	31.45	11.12	11.85	28.67	10.40
37x11.5-16	36.10	38.05	10.90	11.96	34.06	10.50
47x18-18	46.00	47.77	17.75	18.44	42.31	16.22

*Maximum Grown and Thrown Dimensions

EXAMINATION AND TESTS

ITEM	QUALIFICATION Applicable	QLTY ASSURANCE (X)	REQUIREMENTS	SAMPLING PLAN	TEST METHOD
(1) SD-6 Procedure	X	X	3.2	4.3.4	
(2) Air Injection (Tubeless Tires)	X	X	3.6.1.c.1	4.6.1	4.6.1
(3) Balance Check	X	X	3.6.8	4.5.1	4.6.3
(4) Weight	X	X	3.3.6	4.5.2.1	4.6.6
(5) MIL-STD-698	X	X	3.6.7	4.5.1	4.6.2
(6) Skid Depth					
(a) Mold Skid Depth	X	X	3.3.6	4.5.2.2	4.6.6
(b) Tread Skid Depth	X	X	3.3.2	4.5.2.1	4.6.21
(7) Rebuilt Tire Dimension	X	X	3.3.7	4.5.2.2	4.6.5
(a) Inflated outside diameter	X	X	3.3.7	4.5.2.2	4.6.5
(b) Inflated section width	X	X	3.3.7	4.5.2.2	4.6.5
(c) Inflated shoulder diameter	X	X	3.3.7	4.5.2.2	4.6.7
(d) Inflated shoulder width	X	X	3.3.7	4.5.2.2	4.6.7
(8) Tensil Strength and elongation	X	X	3.11.9	4.5.2.3	4.6.4
(9) Vulcanizing Cement Adhesives	X	X	3.11.5	4.6.9	4.6.9
(10) Rebuilt Component Adhesion	X	X	3.11.4	4.5.2.4	4.6.8
(a) Tread to buffed rubber surface adhesion	X	X	3.11.4.1	4.5.2.4	4.6.8
(b) Tread to reinforcing ply adhesion	X	X	3.11.4.1	4.5.2.4	4.6.8
(c) Reinforcing ply to reinforcing ply adhesion	X	X	3.11.4.1	4.5.2.4	4.6.8
(d) Cord Body adhesion between top 3rd and 4th plies	X	X	3.11.4.1	4.5.2.4	4.6.8

TABLE XIII (Continued)

ITEM	QUALIFICATION Applicable	QTLY ASSURANCE (X)	REQUIREMENTS	SAMPLING PLAN	TEST METHOD
(11) Undertread thickness	X	X	3.3.3	4.5.2.4	4.6 12
(12) Porosity	X	X	3.11.7	4.5.2.4	4.6.15
(13) Balance Pad Adhesion	X	X	3.11.8	4.5.2.4	4.6.10
(14) Low Temp (-65°F) Test	X	X	3.11.1		4.6.16
(15) Vulcanizing Cure equivalent	X		3.6.6a		4.6.11
(16) Dynamometer Test	X		3.3.5		4.3
(17) Durometer Hardness of tread of rebuilt tire	X	X	3.11.2	4.5.2.1 & 4.5.2.4	4.6.13
(18) Specific Gravity of tread-of rebuilt tire	X	X	3.11.3	4.5.2.4	4.6.14
(19) Check, Construction vs that of originally qualified tire		X	3.11.6	4.5.2.4	4.6.17
(20) Uniformity - lateral runout	X	X	3.6.10	4.5.2.6	4.6.19

TABLE XIV

CONTRACTOR SINGLE/MULTIPLE PLANT QUALIFICATION REQUIREMENTS

SPEED RANGE	PLANT A	PLANT B	PLANT C	PLANT D	PLANT E	TOTAL TIRES TO BE TESTED
0-139 KNOT Qualification for Total Range By Dynamometer Testing. 3 Tire Sizes Minimum O.D, Maximum O.D. Plus One (1) Other.	No of tires to be Qualified. 3 (If Single Plant). 1 or 2 (If 2 Plants)	2 or 1 (If 2 Plants)				3 3
	1 (If 3 or more Plants).					3 or more
140-174 Knot For Example: If 6 tires were in this range - 5 at 174 knots plus one at 140 knots.	Test 6 tires if Single Plant.					6
	Test From 1 to 5 tires if 2 Plants Test 1 or 2 tires if 5 or more Plants.	Test 5 to 1 tires if 2 Plants				6
175-196 Knot For Example: If 5 tires are in this range at 194 knot rating.	Test 5 tires if Single Plant					6
	Test from 1 to 4 if 2 Plants.	Test from 4 to 1 tires if 2 Plants				5 5
	Testing at least 1 tire per Plant.					
197-217 Knot For example: If 2 tires are in this range	Test 2 tires if Single Plant.					5
	Test 1 tire if 2 Plants. Test at least 1 tire per Plant.	Test 1 tire if 2 Plants				2 2 5

TABLE XV

F L O W C H A R T

CONTINUOUS MULTI-LEVEL SAMPLING (MLP) PLAN

100% LEVEL

INSPECT 100% OF THE TIRES IN THE ORDER PRODUCED

IF 24 CONSECUTIVE TIRES ARE FOUND FREE OR DEFECTS THEN SHIFT TO LEVEL 1.

LEVEL 1

INSPECT ONE TIRE* OUT OF EVERY FIVE TIRES PRODUCED.

IF AN INSPECTED TIRE IS DEFECTIVE THEN SHIFT TO THE 100% LEVEL.

IF 24 CONSECUTIVELY INSPECTED TIRES ARE FOUND FREE OF DEFECTS THEN SHIFT TO LEVEL 2.

LEVEL 2

INSPECT ONE TIRE* OUT OF EVERY TWENTY-FIVE TIRES PRODUCED.

IF AN INSPECTED TIRE IS DEFECTIVE THEN SHIFT TO LEVEL 1.

If 24 CONSECUTIVELY INSPECTED TIRES ARE FOUND FREE OF DEFECTS THEN SHIFT TO LEVEL 3.

LEVEL 3

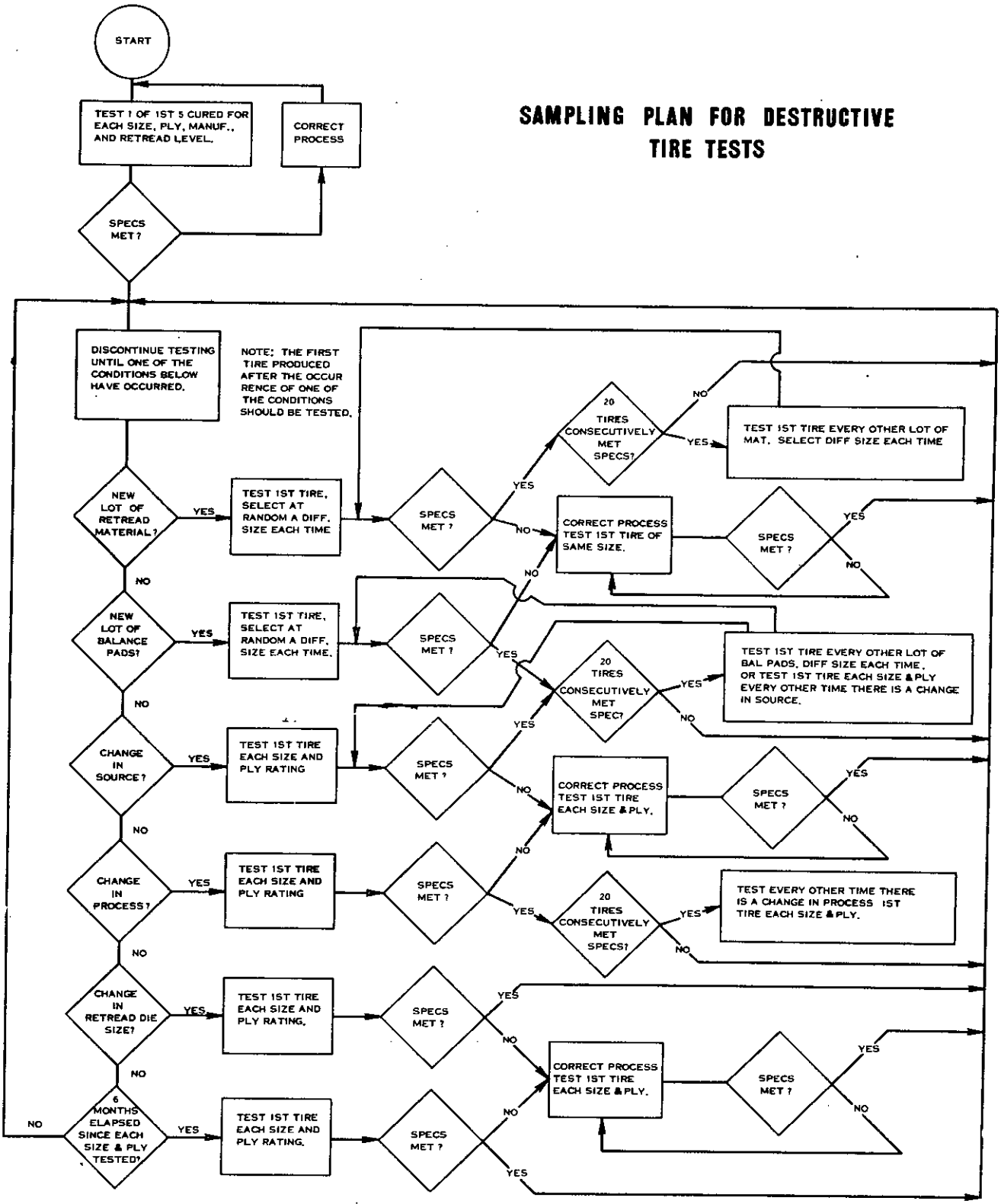
INSPECT ONE TIRE* OUT OF EVERY ONE HUNDRED TWENTY-FIVE TIRES PRODUCED.

IF AN INSPECTED TIRE IS DEFECTIVE THEN SHIFT TO LEVEL 2.

4% ACCEPTABLE QUALITY LEVEL (AQL) 5% AVERAGE OUTGOING QUALITY LIMIT (AOQL)

*TIRE MUST BE SELECTED AT RANDOM

TABLE XVI



INSPECTION AND DYNAMOMETER TEST

TEST REPORT NO._____ REPORT DATE _____

APPLICABLE SPECIFICATIONS: _____

_____

IDENTIFICATION

Size/Ply Rating_____ Mold No. _____

Code No. _____ Carcass Mfg _____

Mfg Serial No. _____ Mfg Date _____

Type Tread _____ Rebuild Mfg _____

Rebuild Date _____

PHYSICAL DATA

Finish _____ Markings _____

PARAMETER	SPECIFIED	TEST DATA
Weight	Max._____lbs	_____lbs
Bead Seat Pressure (Tires w/ bead repairs)	Max. _____;Min.__psig	_____psig
Tire Measurements After ____Hrs. Stretch @ Rated Pressure _____psig		
Unbalance	Max._____in.oz	_____in.oz.
Pressure Loss	Max._____psig	_____psig
Outside diameter	Min._____;Max____in.	_____in
Cross Section	Min._____;Max____in.	_____in
Shoulder Diameter	Max____in.	_____in
Shoulder Width	Min._____;Max____in.	_____in
Radial Runout	Unspecified	
Lateral Tread Runout	Unspecified	_____in

FIGURE 2

TEST REPORT NO _____

Flat Surface Deflection Data

Rated Load _____lbs Rated Pressure _____psig

Specified Deflection Min._____; Max. _____%

Measure Deflection _____%

Curved Surface Deflection Data

Test condition	_____	_____	_____
Flywheel O.D.	_____in.	_____in.	_____in.
Load	_____lbs.	_____lbs.	_____lbs
Pressure	_____psig	_____psig	_____psig
Deflection	_____%	_____%	_____%

DYNAMOMETER RESULTS

Certified by _____
Date _____
Title _____
Organization _____

FIGURE 2 (CONT)

PHOTOGRAPH

Cross Section of Tire
(as required)

LABORATORY DATA, TIRE PHYSICAL PROPERTIES

Test Report No _____ Date _____

Size/PR _____ Serial No _____

Parameter	Specified	Test Data
Rebuild Comp Adhesion		
a. Tread to buffed surface	Min._____lbs/in	_____lbs/in
b. Tread to tread reinforcing ply	Min._____lbs/in	_____lbs/in
c. Tread reinforcing ply to tread reinforcing ply	Min._____lbs/in	_____lbs/in
Tread ply cord tensile		_____lbs
Tread ply cord count in crown		_____ends/in
No. of tread plies		_____
Total crown thickness		_____in
Durometer Hardness (Shore A, of Tread or Rebuild)		_____
Specific Gravity (of Tread or Rebuild)		_____
Balance pad adhesion	Min._____lbs/in	_____lbs/in
Tread Thickness	Min._____in	_____in

Certified by _____

Date _____

_____
(name of facility)

FIGURE 3

REBUILD MANUFACTURER DATA

Test Report No. _____ Date _____

Size/Pr _____ Serial No. _____

Approved low temperature compound number _____

Mold Skid Depth _____ in.

Tread Skid Depth 1 _____ 2 _____ 3 _____

Tread Construction:

Low Temperature Cold Flex:

Vulcanizing cement
Adhesiveness from sample ____lbs. required to separate materials.

Porosity:

Vulcanizing cement
Adhesiveness Minimum _____lbs required to separate materials for Quality Control

Certified by _____

Date _____

Title _____

Organization _____

FIGURE 4

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