

~~ZZ-T-1083E~~  
August 20, 1976  

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~~SUPERSEDED~~  
ZZ-T-1083D  
December 3, 1974

FEDERAL SPECIFICATION

TIRES, PNEUMATIC, LOW SPEED, OFF HIGHWAY

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

**1.1 Scope.** This specification covers pneumatic tires, both tube and tubeless types and flaps when applicable, for mounting on construction, earthmoving, mining and logging equipment, road graders, mobile cranes, and similar vehicles operated at low speeds and off the road.

**1.2 Classification.** Tires covered by this specification shall be furnished in the following groups, classes, sizes, and ply ratings, as specified (see 6.2).

1.2.1 Groups. Tires shall be of the following groups:

- 1 - Off-the-road tires used in intermittent highway service (tube type).
- 1A- Off-the-road tires used in intermittent highway service (tubeless).
- 2 - Earthmoving, mining, and logging tires for short hauls (tube type).
- 2A- Earthmoving, mining, and logging tires for short hauls (tubeless).
- 3 - Road grader (tube type).
- 3A- Road grader (tubeless).
- 4 - Fork-lift truck, mobile crane, shovels, mining car, front end loaders and dozers (tube type).
- 4A- Fork-lift truck, mobile crane, shovels, mining car, front end loaders and dozers (tubeless).

1.2.1.1 Group 4 and 4A tires shall not be tested for qualification nor included on the Qualified Products List. The group 4 and 4A tires are shown in the Appendix A of this specification for informational purposes. When specified, the Group 4 and 4A tires shall be inspected for acceptance (see 6.2).

**1.2.2 Sizes and ply ratings.** Tires shall be of the sizes, load ranges or ply ratings listed in appendix A.

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issues in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

Federal Specifications:

UU-T-81 - Tags, Shipping and Stock.

ZZ-I-550 - Inner Tube, Pneumatic Tire.

Federal Standards:

Fed. Std. no. 123 - Marking for Domestic Shipment (Civil Agencies).

Fed. Test Method Std. No. 601 - Rubber: Sampling and Testing.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

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(Single copies of this specification and other Federal Specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago Kansas City, MD, Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.)

(Federal Government activities may obtain copies of Federal specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

### **Military Specifications:**

MIL-T-4 - Tire, Pneumatic, and inner Tube, Pneumatic Tire: Tire with Flap; Packaging and Packing Of.

MIL-T-1 2459 - Tire, Pneumatic; for Military Ground Vehicles.

### Military Standards

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.

MIL-STD-129 - Marking for Shipment and Storage.

MIL-STD-1224 - Visual Inspection Guide for Pneumatic Tires (Non-Aircraft).

(Copies of Military Specifications and Standards required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

The Tire and Rim Association, Inc., Yearbook 1971.

(Applications for copies should be addressed to the Tire and Rim Association, Inc., Command Bldg. 34 N. Hawkins Avenue, Akron, Ohio 44373.)

## 3. REQUIREMENTS

**3.1 Qualification. Tires furnished under this specification shall be products which have been qualified (see 3.4, 3.9 and 4.2), and have been listed on or approved for listing on the applicable Qualified Products List.** Qualification retests will be required if the manufacturer has modified his product or changed his material or processing sufficiently that the validity of previous qualification is questionable or when deemed necessary to determine that the quality of the product is being maintained, Suppliers shall submit a list of time they propose to supply to the Government. This list of tires shall include brands, numerical level of each brand, size, actual tread number of breakers, load ranges and ply rating, if tube or tubeless, type of cord material(s), type of tread design, type of service, plant that produced tires, location of each plant, location(s) of laboratory test facilities, and who shall be the contact representative for the company. From this list, tires of particular brands shall be tested for qualification in order that the manufacturer may be eligible to be awarded contracts or orders for tires under this specification. Tires furnished under this specification shall be listed on the Qualified Products List and not be of quality lower than the equivalent grade the supplier furnished for sale through commercial channels. A qualified tire brand will qualify other tire brands having an equal or higher quality level rating, provided each is of the same construction and body ply material.

### 3.2 Materials.

3.2.1 Compound. The basic compound used in the tire construction shall be of natural rubber, synthetic rubber, or a combination thereof. Reclaimed rubber may be used in basic compounds.

3.2.2 Plies. Plies shall be of rubber-coated nylon, polyester, rayon, metal tire, or other, as specified (see 6.2).

3.2.3 Breaker strips. Breaker strips, when used, shall be of a suitable rubber-coated nylon, polyester, rayon, metal wire or other as specified (see 6.2).

3.3 Design and construction. Each tire constructed shall consist of component parts as described in 3.3.3 through 3.3.7, inclusive and shall properly fit Tire and Rim Association's approved rims for the respective tire sizes as listed in appendix A.

3.3.1 Tube type tires. Each tire shall be of a form to enclose an inner tube containing air under pressure and conforming to the applicable requirements of ZZ-I-550. The tire shall otherwise conform to the requirements of this specification.

3.3.2 Tubeless tires. Tubeless tires shall incorporate carcass materials and construction to provide air retention equal to that of a conventional tire and tube. It shall otherwise conform to the requirements of this specification.

3.3.3 Carcass. The carcass shall consist of plies of rubberized cord of material suitable for the intended purposes. The carcass may be reinforced with breaker strips designed to improve impact resistance.

3.3.4 Tread. The tread shall consist of a rubber compound (see 3.2.1). The tread and tread design shall be suitable for minimizing skidding, resisting abrasion, and protecting the carcass from injury. The tread design shall be the manufacturer's standard design for the application as specified (see 6.2).

3.3.5 Sidewall. The sidewall shall consist of a rubber compound (see 3.2.1), and shall be designed to protect the carcass against moisture, weathering, abrasion, or other injury.

3.3.6 Bead. The bead shall be of such construction as to anchor the tire firmly to the rim without slippage under normal operating conditions and of such design as to fit Tire and Rim Association, Inc. standard rims. Beads of tubeless tires shall be of such construction and design as to effect a satisfactory air seal between the tire and rim.

3.3.7 Flaps. When required, a flap of the current size shall be furnished in each tire. Flaps shall be the endless type of sufficient width. The flaps shall be formed to approximate the contour of the tire beads and shall fit the tire without buckling or wrinkling.

#### 3.4 Performance.

3.4.1 Breaking energy. When tested in accordance with 4.3.2.2, the minimum breaking energy shall be as specified in appendix A.

3.4.2 Ozone resistance and temperature requirements. When specified (see 6.2), tires and flaps shall be compounded to meet the ozone resistance and temperature requirements of MIL-T-12459 (see 4.3.5). All tires as part of production shall contain anti-oxidants and anti-ozonants to provide standard commercial resistance to weathering.

#### 3.4.3 Physical requirements.

3.4.3.1 Tensile strength. The tensile strength of tire treads shall be not less than 1,700 pounds per square inch (p.s.i.), and for sidewalls, not less than 900 p.s.i., when tested as specified in 4.3.4.

3.4.3.2 Ultimate elongation. The ultimate elongation of treads shall be not less than 400 percent (2 to 10 inches), and for sidewalls not less than 300 percent (2 to 8 inches) when tested as specified in 4.3.4.

#### 3.5 Dimensions.

3.5.1 Tire overall diameter. When tested in accordance with 4.3.1.1.2, tire overall diameter shall meet the requirements as shown in appendix A.

3.5.2 Tire overall width. When tested in accordance with 4.3.1.1.3, tire overall width shall meet the requirements as shown in appendix A.

3.5.3 Skid depth. When tested in accordance with 4.3.1.1.4, skid depth shall meet the requirements as shown in appendix A.

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**3.6 Age of tires.** Tires furnished on orders of any size, group, or type under this specification shall be not more than 12 months old on the date of shipment by the manufacturer. On such orders, the month and year of manufacture shall be shown on the label applied to the tread of each tire (see 3.8). On tires furnished on new vehicles, the equipment manufacturer shall be responsible for assuring that the tires mounted on the vehicle are not more than 12 months old.

**3.7 Identification marking.** Each tire shall be branded, molded, or have permanently affixed in an unobstructed location on the sidewall, as a minimum the following information.

- (a) Manufacturer's name, brand name, or trademark.
- (b) Nominal size.
- (c) Ply rating and/or load range.
- (d) Serial number.
- (e) Tubeless, when applicable.
- (f) Ply material (composition of the material or materials used in the ply and breaker strip).

**3.8 Special labeling (see 6.2)** Each tire shall have a special label on the tread face, if specified. This special label shall supplement the manufacturer's commercial label, so that combined, they show tire size, actual plies and load range or ply rating, whether tube type or tubeless, tread type, ply material (i.e., nylon, rayon), the Federal Stock Number, contract number, purchase order number, the month and year of manufacture, and average item weight. The material of the label shall have a pressure sensitive adhesive backing, which will not allow accidental loss and will not cause deterioration of the tread compound. All printing shall be clear and readable and shall contrast with the label's background. The Federal Stock Number shall be in letters and numbers not less than 1/4-inch high. The special label and the manufacturer's commercial label shall be placed on the tread face not more than 1/2-inch apart.

**3.9 Workmanship.** The tires shall show no evidence of poor workmanship. All plies including breaker strips shall be smooth and evenly laid and shall be free of buckles, wavy cord, air pockets, depressions and any other defect of imperfection, which may impair serviceability.

#### 4. QUALITY ASSURANCE PROVISIONS

**4.1 Responsibility for inspection.** Unless otherwise specified on 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 that supplies and services conform to the prescribed requirements.

**4.1.1 Inspection of component and material.** In accordance with 4.1, the contractor is responsible for insuring that components and materials used are manufactured, sampled and examined, and tested in accordance with the requirements of this specification.

**4.1.2. Material furnished for tests.** Tires, flaps, valves, and inner tubes used for or in tests shall be furnished by the manufacturer) without cost to the Government.

**4.1.3 In-process inspection.** Inspection shall be performed throughout the manufacturing process to assure that no deviation is made from the indicated requirements. These shall include all processes such as preparation of cord fabric, bead wire, and chemicals for compounding, compounding of rubber, preparation of plies, sidewalls, beads and treads, tire assembly, forming, and vulcanizing. Wherever a deviation is noted correction shall be made. Failure to make intermediate correction may cause rejection of the affected lot of tires.

#### 4.2 Qualification tests, inspections, and examinations.

**4.2.1 Qualification.** Qualification shall be performed under the supervision of the Government at the prospective supplier's or other commercial laboratory acceptable to the Government, or at a Government laboratory, if specified. The costs incurred for the qualification shall be borne by the prospective supplier. The qualification shall consist of proving energy (see 4.3.2), visual examinations (see 4.4.3), burden

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defects (see 4.3.3), tire overall diameter (see 4.3.1.1.2)/ the overall width (see 4.3.1.1.3), skid depth (see 4.3.1.1.4), tire size factor (see 4.3.1.1.5), tensile strength and ultimate elongation (see 4.3.4), in accordance with table I.

Table I

Number of tires for examination	Characteristics	Number of tires to be examined	Test		Retest	
			Acc.	Rej.	Acc.	Rej.
	Visual examination, major defects (all groups)	3	0	1	0	1
	Visual examination, minor defects (all groups)	3	1	2	0	1
	Tire overall diameter (all groups)	3				
	Skid depth (all groups)	3				
	Tire overall width (all groups)	3				
	<b>Total examinations</b>	<b>9</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>1</b>
	Breaking energy (all groups)	3				
	Hidden defects (all groups)	3				
	<b>Total examinations</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>1</b>
<b>Total tires - 3</b>	Tensile strength	3				
	Ultimate elongation	3				
	<b>Total examinations</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>

4.2.2 Tires required for qualification tests. The Government shall select a tire size from each of the groups 1, 1A, 2, 2A, 3, and 3A tires. The suppliers shall arrange to produce these tire sizes in the plants that they propose to qualify for the Qualified Products List. A sample shall be selected at random from a batch of not less than 25 tires. Three tires plus three spares for each group are required to perform all the specified tests and should be performed in the order shown in table I. Prospective supplier shall specify the tire size and Ply types from each group that he intends to furnish to the Government under this Specification. A Government representative shall select the tire for qualification tests and examinations. Where more than one plant is involved, separate samples of tires shall be tested from each plant.

4.2.3 Retests. In the event of failure to pass the laboratory tests listed in table 1, the manufacturer shall be allowed a maximum of one retest for groups 1, 1A, 2, 2A, 3, and 3A tires. Each retest shall consist of all the test characteristics listed in table I for the retest of groups 1, 1A, 2, 2A, 3, and 3A tires. The acceptance and rejection criteria are listed in table I.

#### 4.3 Examinations, tests, and inspection.

##### 4.3.1 Dimensional examinations.

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**4.3.1.1 Tire overall diameter, tire overall width, and skid depth tests.**

**4.3.1.1.1 Preparation of tire for tire overall diameter, tire overall width, and skid depth tests.** The tire shall be mounted on the rim specified in appendix A and inflated to the pressure shown for the Tire and Rim Association load in appendix A. The tire shall be allowed to stand for a minimum of 24 hours at room temperature and the pressure adjusted within 1/2 p.s.i. of the pressure shown in appendix A.

**4.3.1.1.2 Tire overall diameter.** The tire overall diameter shall be determined to the nearest 0.01-inch by measuring the outside circumference of the inflated tire with a steel tape and dividing by 3.1416. The diameter may be determined by means of a tips calibrated to directly show tire diameter.

**4.3.1.1.3 Tire overall width.** The tire overall width is the average maximum width of the inflated tire including the sidewalls, side ribs, bars, decorations, letters, or numerals. The width shall be measured to the nearest 0.01-inch at six different points equally spaced around the tire and the results shall be averaged.

**4.3.1.1.4 Skid depth.** the depth of the tread groove nearest to or on the tread centerline of the tire shall be measured to the nearest 0.001-inch at six points (measurement shall not be made on tread wear indicators) equally spaced around the inflated tire and the results shall be averaged (see appendix A).

**4.3.2 Breaking energy test.** Groups 1, 1A, 2, 2A, 3, and 3A tires shall meet the requirements shown in appendix A.

**4.3.2.1 Preparation of tire for breaking energy tests.** The tire shall be mounted on the rim specified in appendix A, and inflated to the pressure shown for the Tire and Rim Association load in appendix A. The tire shall be allowed to stand for a minimum of 24 hours at room temperature and the pressure adjusted within 1/2 p.s.i. of the pressure shown in appendix A.

**4.3.2.2 Procedure.** After the tire has been mounted and measured, as specified in 4.3.1.1.2 through 4.3.1.1.5, inclusive, a 1 1/4-inch in diameter cylindrical steel plunger with a hemispherical end shall be forced into the center of the tread portion in the full depth area of the inflated tire (p.s.i. appendix A), at the rate of two inches per minute. Five measurements of force and penetration at break shall be made at points equally spaced around the circumference of the tire. In the event the tire fails to break before the plunger is stopped by reaching the rim, the force end penetration shall be taken as this occurs. Tubes shall be allowed in tubeless tires. The energy to break a tire shall be calculated from the average energy values at break by means of the following formula:

**W = energy at break in inch-pounds**

**F = force at break in pounds**

$$W = \frac{F P}{2}$$

**P = penetration at break in inches**

**4.3.3 Hidden defects inspection.** After the plunger test has been made, a visual inspection of the tested tire in the area between the plies and tread shall be made for evidence of hidden defects. The tire shall be cut into not less than eight equal cross sections, with each section being cut circumferentially in midcrown and on each side of the crown at the point of maximum shoulder thickness any additional cuts deemed necessary for complete inspection of the tire shall be made. The cut sections shall then be inspected for evidence of hidden defects such as separation of tread, ply, or bead, and the tire construction in accordance with MIL-STD-1224.

**4.3.4 Tensile strength and elongation test.** After being checked for hidden defects the tire shall be subjected to tests for tensile strength and ultimate elongation of tread and sidewall, to determine the conformance to 3.4.3.1 and 3.4.3.2, respectively.

**4.3.4.1 Preparation of test specimens.** Test specimens shall be cut (longitudinally at center of tread or sidewall) with a die No. VI of method 4111 of Fed. Test Method Std. No. 401. On tread specimens, the nonskid portion shall be sliced off

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with a knife, after which the central portion shall be buffed on each side over a length of 2 1/2 inches until free from friction compound, fabric impressions, or irregularities of surface. In case specimens cut with die No. VI cannot be obtained, specimens may be cut with a die No. IV of method 4111 of the same standard. On 1 idewall specimens rubber solvent shall be used, if necessary, to separate rubber and fabric, and one or both sides shall be buffed as necessary. This sample shall be furnished by the manufacturer.

4.3.4.2 Procedure. The specimens, prepared as specified in 4.3.4.1, shall be tested for tensile strength and ultimate elongation in accordance with methods 4111 and 4121 of Fed. Test Method Std. No. 601.

4.3.5 Ozone resistance and temperature requirements. When specified, specimens shall be tented in accordance with MIL-T-12459 (see 3.4.2).

4.3.6 Inspection of preparation for delivery. The preservation, packaging, packing, and marking of the tires shall be inspected to determine conformance to the applicable requirements of section 5.

#### 4.4 Lot purchase

4.4.1 Sampling for inspection and acceptance. Sampling for inspection and acceptance shall be performed in accordance with the provision set forth in MIL-STD-105. Testing shall be performed at the supplier's or other commercial laboratory acceptable to the Government or at a Government laboratory, if specified.

4.4.2 Inspection lot. The inspection lot shall consist of all tires of one group, size, and ply type, from an identifiable production period, from one manufacturer, one plant, and submitted for acceptance at one time.

4.4.3 Visual examination. The sample unit shall be one new completely fabricated tire. Visual examination of the external and internal surfaces of each sample tire shall be in accordance with MIL-S D-1224. The AQL for major defects shall be 4.0 percent defective and for minor defects, 6.5 percent defective. The inspection level shall be S-4.

4.4.4 Dimensional examination. The sample unit shall be one new completely fabricated tire. Each sample tire shall be inspected for:

Tire overall diameter (see 4.3.1.1.2).  
Tire overall width. (see 4.3.1.1.3).  
Skid depth (see 4.3.1.1.4).

A tire failing to pass one or more of the above characteristics shall be considered a defective tire. The acceptance shall be in accordance with table II. Use any three tires selected for visual examination.

4.4.5 Material furnished for tests. Tires, flaps, valves, and inner tubes used for or in tests shall be furnished by the manufacturer without cost to the Government.

Table II

Number of tires for examination	Characteristics	Number of tires to be examined	Test	
			Acc.	Rej.
	Tire overall diameter (all groups)	3		
	Skid depth (all groups)	3		
	Tire overall width (all groups)	3		
	Total examinations	9	1	2
<b>Total tires - 3</b>				



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## 5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A or C, as specified (see 6.2).

5.1.1 Level A. The tires shall be packaged in accordance with level A requirements of MIL-T-4.

5.1.2 Level c. The tires shall be packaged in accordance with the supplier's commercial practice.

5.2 Packing. Packing shall be level A, B, or C, as specified (see 6.2).

5.2.1 Level A. The tire shall be packed in accordance with the level A requirements of MIL-T-4.

5.2.2 Level B. The tires shall be packed in accordance with level B requirements of MIL-T-4.

5.2.3 Level C. The tires shall be packed to insure carrier acceptance and safe delivery to destination in containers complying with the rules and regulations applicable to the mode of transportation.

5.3 Marking.

5.3.1 Civil agencies. In addition to marking required by the contract or order, the tires and shipping containers shall be marked in accordance with Fed. Std. No. 123 and UU-T-81.

5.3.2 Military agencies. In addition to marking required by the contract or order, the tires and shipping containers shall be marked in accordance with MIL-STD-129.

## 6. NOTES

6.1 Intended use Tires covered by this specification are intended primarily for mounting on earthmoving mining, logging, and fork-lift trucks, road graders, mobile cranes, compactors, shovels, mining cars, and front end loaders.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

- (a) Title, number and date of this specification.
- (b) Size, ply rating, and ply material of tires (see 1.2.2, 3.2.2, and 3.2.3).
- (c) Tread design (see 3.3.4).
- (d) Ozone resistance and temperature requirements (see 3.4.2).
- (e) Special Labeling when required (see 3.8).
- (f) Inspection and testing responsibility (see 4.1, 4.3 through 4.3.6)
- (g) Selection of applicable level of packaging and packing requirements (see 5.1 and 5.2).

6.3 Qualification. In procurement of product: requiring qualification. awards will be made only for such products as have been approved in writing for inclusion in the applicable Qualified Products List prior to the set for opening for bids, whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to communicate with the Director, Automotive Technical Support Division, Federal Supply Service, General Service Administration, Washington, DC, prior to preparing to submit a bid for the purchase of tires to the effect of:

6.4 Level B packaging. When level B packaging is specified for civil agency procurement, the requirements of 5.1.1 shall apply.

6.5 Supersession data. This specification supersedes ZZ-T-0010838 dated March 15, 1972, ZZ-T-001083A September 13, 1971, ZZ-T-001083 December 30, 1966, and the type II, low speed highway and Off the road tires listed in ZZ-T-00381j, dated July 13, 1959 (in part revision of Federal Specification ZZ-T-3811, dated August 6, 1957). Federal Specification ZZ-T-3811, is superseded by Federal Specification ZZ-T-381M, dated September 8, 1971.



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APPENDIX A  
Off-the-Road Tires Used in Intermittent Highway Service

Continued on L4

Maximum speed = 50 miles per hour

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Tire Width	(2) Maximum Overall Tire Diameters		T&R Load	Inflation Pressure	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth	
				Traction	Extra Tread				Traction	Extra Tread
7.00-20 1/2 L	E-(10)	5.5	8.48	37.15	-	2,760	80	12,500	.60	-
	F-(12)					3,050	95	15,800		
7.50-20 1/2 L	E-(10)	6.0	9.13	38.52	-	3,100	80	12,500	.63	-
	F-(12)					3,430	95	15,800		
8.25-20 1/2 L	E-(10)	6.5	10.04	40.19	41.20	3,550	75	12,500	.67	1.00
	F-(12)					3,950	90	15,800		
9.00-20 1/2 L	E-(10)	7.0	11.00	42.10	43.20	4,040	70	12,500	.71	1.05
	F-(12)					4,520	85	15,800		
10.00-20 1/2 L	E-(10)	7.5	11.83	43.60	44.65	4,760	75	15,800	.70	1.10
	F-(12)					5,300	90	20,200		
10.00-22 1/2 L	F-(12)	7.5	11.83	45.60	46.65	5,070	75	15,800	.73	1.10
	G-(14)					5,640	90	20,200		
10.50-24 1/2 L	F-(12)	7.5	11.83	47.60	48.65	5,380	75	15,800	.73	1.10
	G-(14)					5,990	90	20,200		
11.00-20 1/2 L	F-(12)	8.0	12.47	44.92	46.00	5,190	75	15,800	.76	1.13
	G-(14)					5,780	90	20,200		
11.00-22 1/2 L	F-(12)	8.0	12.47	46.92	48.00	5,520	75	15,800	.76	1.13
	G-(14)					6,140	90	20,800		
11.00-24 1/2 L	F-(12)	8.0	12.47	48.92	50.00	5,860	75	15,800	.76	1.13
	G-(14)					6,520	90	20,200		
11.00-25 1/2 L	F-(12)	8.5*	12.70	48.92	50.00	5,860	75	15,800	.76	1.13
	G-(14)					6,520	90	20,200		
12.00-20 1/2 L	G-(14)	8.5	13.39	46.60	47.80	6,140	60	20,200	.79	1.19
	H-(16)					6,700	95	23,000		
12.00-21 1/2 L	G-(14)	8.5*	13.39	46.60	47.80	6,140	60	20,200	.79	1.19
	H-(16)					6,790	95	23,000		
12.00-24 1/2 L	G-(14)	8.5	13.39	50.60	51.80	6,910	60	20,200	.79	1.19
	H-(16)					7,640	95	23,000		
12.00-25 1/2 L	G-(14)	8.5*	13.39	50.60	51.80	7,870	100	28,500	.79	1.19
	H-(16)					8,740	100	33,000		
13.00-24 1/2 L	I-(16)	9.0*	14.43	52.87	-	8,290	85	23,000	.84	-
	J-(18)					9,290	85	23,000	.84	-
13.00-25 1/2 L	I-(16)	10.0*	14.68	52.87	-	8,290	85	23,000	.84	-
	J-(18)					9,290	85	23,000	.84	-
14.00-20 1/2 L	J-(18)	10.0	15.93	51.60	-	8,740	85	25,000	.90	-

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Groups 1 and 1A

APPENDIX A  
Off-The Road Tires Used in Intermittent Highway Service

Maximum speed - 50 Miles per hour (Cont'd)

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Tire Width	(2) Maximum Overall Tire Diameters		T&RA Load	Inflation Pressure	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth At Center of Sailing	
				Extra Tread	Tread				Extra Tread	Tread
14.00-21H1	J-(18)	10.0*	15.93	51.63	-	8,740	85	25,000	.90	-
14.00-24L	J-(18)	10.0	15.93	55.63	-	9,750	85	25,000	.90	-
14.00-25H1	J-(18)	10.0*	15.93	55.63	-	9,750	85	25,000	.90	-

\* Full tapered load seat rims.

- 1 Includes 6 percent above T&RA new tire section width to provide for tire (24 Hour) growth and protective side ribs and bars.
- 2 Includes 6 percent above T&RA new tire section height.

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APPENDIX A  
Wide Base Off-the-Road Tires Used in Intermittent Highway Service

Groups 1 and 1A

Maximum speed - 50 miles per hour

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Tire Width	(2) Maximum Overall Tire Diameters		T&RA Load	Inflation Pressure	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth	
				Traction	Iread				At Center of Casing	
									Traction	Iread
14-17.5HL	C-(6)	10.50	14.85	37.38	37.38	2,820	30	5000	.69	.69
	D-(8)	10.50	14.85	37.38	37.38	3,570	45	7500	.69	.69
	E-(10)	10.50	14.85	37.38	37.38	4,220	60	10000	.69	.69
15-19.5HL	F-(12)	11.75	16.47	41.20	41.20	5,360	60	12500	.73	.73
	G-(14)	11.75	16.47	41.28	41.28	6,100	75	15000	.73	.73
15-22.5HL	G-(14)	11.75	16.47	44.28	44.28	6,690	75	15000	.73	.73
	H-(16)	11.75	16.47	44.28	44.28	7,440	90	18500	.73	.73
16.5-19.5HL	H-(16)	13.00	18.09	46.39	46.39	7,430	80	18500	.78	.78
16.5-22.5HL	F-(16)	13.00	18.09	46.39	46.39	8,120	80	18500	.78	.78
18-19.5HL	H-(16)	14.00	19.44	44.57	44.57	7,960	75	18500	.81	.81
18-22.5HL	I-(16)	14.00	19.44	47.57	47.57	8,680	75	18500	.81	.81
	J-(18)	14.00	19.44	47.57	47.57	9,650	90	19500	.81	.81
19.5-19.5HL	I-(16)	15.00	21.06	47.66	47.66	9,370	75	19500	.85	.85
19.5-22.5HL	J-(18)	17.00	24.84	53.71	53.71	13,400	75	19500	.82	.82
18-21HL	H-(16)	14.00	19.44	47.66	47.66	8,680	75	19500	.81	.81
19.5-21HL	J-(18)	15.00	21.06	50.15	50.15	10,190	75	19500	.85	.85
23-21HL	J-(18)	17.00	24.84	53.90	53.90	13,400	75	19500	.85	.85

(1) Includes 8 percent above T&amp;RA new tire section width to provide for 24 hour tire growth and protective side ribs and bars.

(2) Includes 6 percent above T&amp;RA new tire section height.

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APPENDIX A  
Tires for Earthmoving, Hauling, and Logging Service for Short Hauls

Groups 2 and 2a

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Tire Width	(2) Maximum Overall Tire Diameters		Max Speed 40 MPH TRA Load	Infl. Press.	Max Speed 30 MPH TRA Load	Infl. Press.	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth At Center of Casing	Tread Extra
				Extra Tread	Load							
12.00-20RHS	G-(14)	8.5	13.39	46.61	47.77	5,190	60	6,130	60	20,200	.79	1.1"
	H-(16)					5,680	70	6,710	70	23,000		
12.00-21RHS	G-(14)	8.5*	13.39	46.61	47.77	5,190	60	6,130	60	20,200	.79	1.1"
	H-(16)					5,590	70	6,710	70	23,000		
12.00-22RHS	G-(14)	8.5	13.39	50.61	51.77	5,840	60	6,900	60	20,200	.79	1.15"
	H-(16)					6,390	70	7,550	70	23,000		
12.00-23RHS	G-(14)	8.5*	13.39	50.61	51.77	5,840	60	6,900	60	20,200	.79	1.15"
	H-(16)					6,390	70	7,550	70	23,000		
13.00-22RHS	J-(18)	10.0	14.90	52.87	54.89	7,400	70	8,750	70	25,000	.85	1.53"
13.00-25RHS	J-(18)	10.0*	14.90	52.87	54.89	7,400	70	8,750	70	25,000	.85	1.53"
14.00-20RHS	F-(12)	10.0	15.93	51.63	53.75	6,020	45	7,110	45	15,800	.90	1.65"
	H-(16)					7,120	60	8,400	60	23,000		
14.00-21RHS	L-(20)	10.0*	15.93	51.53	53.75	6,020	45	7,110	45	15,800	.90	1.6"
	H-(16)					7,120	60	8,400	60	23,000		
14.00-24RHS	L-(20)	10.0	15.93	55.63	57.75	7,950	60	9,410	60	27,000	.90	1.65"
	H-(16)					9,070	75	10,720	75	30,000		
14.00-25RHS	H-(16)	10.0*	15.93	55.63	57.75	7,950	60	9,410	60	27,000	.90	1.65"
	L-(20)					9,070	75	10,720	75	30,000		
16.00-22RHS	H-(16)	11.25*	18.36	64.11	68.40	9,410**	80	11,120(**)	80	30,000	.90	1.65"
	L-(20)					9,410**	80	11,120(**)	80	30,000		
16.00-25RHS	H-(16)	11.25*	18.36	60.11	62.40	8,020	45	9,480	45	23,000	1.01	1.6"
	L-(20)					8,790	60	11,210	60	27,000		
16.00-25RHS	H-(16)	11.25*	18.36	60.11	62.40	8,790	45	10,390	45	23,000	1.01	1.65"
	L-(20)					9,490	60	12,290	60	27,000		
13.00-25RHS	F-(12)	13.00*	21.17	65.23	67.52	10,400	40	12,530	40	23,000	1.12	1.91"
	H-(16)					10,600	50	14,280	50	27,000		
	L-(20)					12,080	60	15,890	60	30,000		
	L-(24)					13,440	60	17,390	70	33,000		
	(28)					14,710	70	18,800	80	36,000		
	(32)					15,900	80					

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APPENDIX A  
Tires for Earthmoving, Mining, and Logging Service for Short Hauls (Cont'd.)

Groups 2 and 2A

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Tire Width	Maximum Overall Tire Diameters		Max Speed 40 MPH T&R Load	Infl. Press.	Max Speed 30 MPH T&R Load	Infl. Press.	Minimum Breaking Energy Inchl.-lbs.	Minimum Skid Depth At Center of Casing Traction	Extra Tread
				Traction	Extra Tread							
18.00-33	N-(24) (32)	13.00*	21.17	73.23	75.52	15,590	60	18,420	60	30,000	1.12	1.9.
18.00-49	N-(24) (26)	13.00*	21.17	89.23	91.52	19,710	60	23,290	60	30,000	1.12	1.9.
21.00-25	H-(15) L-(24) N-(24) (28)	15.00*	24.30	70.66	72.61	23,320	80	27,560	80	36,000	1.23	1.91
21.00-35	H-(16) L-(23) N-(24) (32) (36)	15.00*	24.30	80.66	82.61	17,220	60	20,430	60	33,000	1.23	1.91
21.00-49	L-(20) N-(24) (28) (32) (36)	15.00*	24.30	94.66	96.61	20,520	60	24,250	60	33,000	1.23	1.91
24.00-25	J-(18) H-(24) (30) (33)	17.00*	27.76	75.71	77.67	29,410	80	34,770	80	39,000	1.35	2.03
24.00-29	H-(24) (30) (33)	17.00*	27.76	79.71	81.67	21,240	55	25,100	55	34,500	1.35	2.03
24.00-35	H-(24) (30) (36) (42)	17.00*	27.76	85.71	87.67	24,950	55	29,490	55	34,500	1.35	2.03

Tires for Earthmoving, Mining, and Logging Service for Short Hauls (Cont'd.)

GROUPS 2 and 24

Tire Size	Load Range and Ply Rating	Design Rtn	Maximum Overall Tire Width	Maximum Overall Tire Diameter		Max Speed 40 MPH TRM Load	Infl. Press.	Max Speed 30 MPH TRM Load		Minimum Breaking Energy Inch-lb.	Minimum Skid Depth At Center of Casing Traction	Extra Tread
				Extra Tread	TRM Load			Infl. Press.	TRM Load			
24.00-49	(36)	17.00*	27.76	99.71	101.67	33,000	65	39,010	65	39,000	1.35	2.05
	(42)					35,880	75	42,410	75			
	(46)					37,260***	80	44,050(***)	80			
27.00-43	(24)	22.00*	32.40	90.49	92.65	24,740	40	29,240	40	30,000	1.50	2.25
	(30)					28,190	50	33,320	50	34,500		
	(36)					31,360	60	37,070	60	39,500		
	(42)					38,500	60	45,585	60	39,500		
	(46)					43,210	70	49,890	70			
30.00-33	(46)	22.00*	34.99	96.50	98.87	45,630	80	53,940	80	33,000	1.65	2.47
	(38)					39,390	40	35,930	40	37,500		
	(34)					34,630	50	40,730	50	37,500		
	(40)					33,530	60	45,540	60			
	(40)					47,700	60	56,390	60			
	(46)					52,210	70	61,700	70			
	(52)					56,440	80	66,720	80			
33.00-41	(43)	26.00*	42.01	117.54	120.33	60,750	60	71,600	60		1.94	2.90
	(42)					63,960	55	75,600	55			
36.00-31	(50)	26.00*	42.01	127.54	130.33	70,530	65	83,360	65		1.94	2.90
	(58)					76,630	75	90,640	75			

\*Full tapered bead seat rims.

\*\*Maximum 10,000 at 90 p.s.i. inflation.

\*\*\*Maximum 11,920 at 90 p.s.i. inflation.

\*\*\*\*Maximum 35,640 at 35 p.s.i. inflation.

\*\*\*\*\*Maximum 45,630 at 65 p.s.i. inflation.

- (1) Includes 8 percent above TRM new tire section width to provide for 24 hour tire growth and protective side ribs and bars.
- (2) Includes 4 percent above TRM new tire section height for 16.00 and larger tires; Includes 6 percent above new tire section height for less than 16.00 tires.

APPENDIX A  
Wide Base Tires for Earthmoving Service for Short Hauls

Tables 2 and 2A

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Tire Width	Maximum Overall Tire Diameters		Max Speed 40 MPH TRAX Load	Infl. Press.	Max Speed 30 MPH TRAX Load	Infl. Press.	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth At Center of Casing	
				Traction	Extra Tread						Traction	Extra Tread
22.5-25	F-(22) H-(16)	17.00	22.14	60.11	62.40	7,990	30	9,640	30	15,800	1.01	1.83
23.5-25	F-(22) H-(16)	19.50	25.38	65.23	67.52	10,760	30	12,990	30	23,000	1.12	1.91
26.5-25	F-(22) H-(16)	22.00	26.62	70.00	72.61	11,260	30	13,600	30	27,000	1.23	1.91
27.5-25	F-(22) H-(16)	22.00	28.62	74.66	76.61	13,070	30	15,840	30	30,000	1.35	2.02
28.5-25	F-(22) H-(16)	25.00	31.66	75.71	77.67	14,350	30	17,330	30	31,500	1.35	2.02
29.5-25	F-(22) H-(16)	25.00	31.66	79.71	81.67	16,620	30	20,080	30	33,000	1.35	2.02
29.5-33	F-(22) H-(16)	25.00	31.86	83.71	85.67	18,020	30	21,770	30	33,000	1.35	2.02
29.5-35	F-(22) H-(16)	25.00	31.86	85.71	87.67	20,870	30	25,210	30	33,000	1.35	2.02
33.25-35	L-(20) H-(16)	27.00	35.91	90.41	92.57	22,230	30	26,850	30	37,500	1.35	2.02
33.5-33	L-(20) H-(16)	25.00	36.15	90.49	92.65	25,000	30	30,190	30	37,500	1.50	2.25
						27,210	30	34,860	30	37,500	1.50	2.25
						28,630	30	34,730	30	36,000	1.50	2.25
						32,200	30	39,070	30	36,000	1.50	2.25
						25,450	30	30,740	30	31,500	1.50	2.25
						29,480	30	35,610	30	34,000	1.50	2.25
						33,160	30	40,050	30	34,000	1.50	2.25



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APPENDIX 1  
Wide Base Tires for Earthmoving Service for Spout Hauls (Cont'd.)

Groups 2 and 21

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Tire Width	(2) Maximum Overall Tire		Max Speed 40 MPH TRRA Load	Infl. Press.	Max Speed 30 MPH TRRA Load	Infl. Press.	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth At Center of Casing Tread
				Diameters	Extra Tread						
33.5-33	(26) (32) (36)	28.00	36.18	98.00	100.00	27,420 31,760 35,710	35 45 55	33,110 38,360 43,130	35 45 55	31,500 36,000	1.67
37.5-33	(24) (30) (36) (42)	32.00	40.50	98.00	100.00	28,370 33,570 35,960 40,440	30 40 45 55	34,260 40,540 43,430 48,840	30 40 45 55	30,000 34,500 39,000	1.83
37.5-35	(28) (35) (44)	32.00	40.50	104.00	106.50	33,320 38,590 43,400	35 45 55	40,240 46,610 52,420	35 45 55	33,000 39,000	1.83
37.5-51	(36) (44)	32.00	40.50	116.50	119.00	43,630 49,060	45 55	52,700 59,260	45 55	39,000	1.83

- (1) Includes E percent above TRRA new tire section width to provide for 24 hour tire growth and protective side ribs and bars.
- (2) Includes 4 percent above TRRA new tire section height.
- (3) Design rims may also include all preferred rims (underscored) listed in the TRRA Yearbook.

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APPENDIX A  
Tires for Road Graders  
Tube Type

Maximum speed - 25 miles per hour

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Tire Width	(2) Maximum Overall Tire Diameters		T&RA Load	Inflation Pressure	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth	
				Fracture	Extra Iread				At Center of Casing	Extra Iread
7.00-20TG	D-(9) E-(10)	5.50	8.48	37.15	(Front Wheel)	2,290	8,600	.60		
7.00-24TG	E-(10)	5.50	8.48	41.15		2,550	12,500	.60		
7.50-24TG	E-(10)	6.00	11.02	42.10		3,270	12,500	.73		
9.00-24TG	E-(10)	7.00	11.83	46.10		4,100	12,500	.71		
9.50-24TG	E-(10)	7.50	11.83	47.56		4,360	12,500	.73		
7.50-20TG	C-(6)	6.00	9.13	38.52	(Rear Wheel)	2,090	6,800	.60		
9.00-24TG	E-(10)	7.00	11.02	46.10		4,100	12,500	.71		
12.00-20TG	D-(8)	8.00*	12.04	42.60		3,320	8,600	.73		
12.00-24TG	D-(8)	8.00*	12.04	46.60		3,760	8,600	.73		
12.00-24TG	C-(6)	8.00*	13.28	49.72		3,420	6,800	.79		
13.00-24TG	D-(8)	8.00*	14.15	51.88		4,340	8,600	.85		
13.00-24TG	C-(6)	8.00*	14.15	51.88		3,950	6,800	.85		
14.00-20TG	F-(12)	8.00*	15.39	50.82		4,500	8,600	.90		
14.00-20TG	F-(12)	8.00*	15.39	50.82		5,010	12,500	.90		
14.00-20TG	G-(14)	8.00*	15.39	50.82		5,480	15,800	.90		
14.00-20TG	G-(14)	8.00*	15.39	50.82		5,950	15,800	.90		
14.00-20TG	G-(14)	8.00*	15.39	50.82		6,430	20,200	.90		

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APPENDIX A  
Tires for Road Graders (Cont'd).  
Group C  
Tube Type

Maximum Speed - 25 miles per hour

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Tire Width	(2) Maximum Overall Tire Diameters		TRRA Load	Inflation Pressure	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth At Center of Casing	
				Traction	Extra Tread				Extra Tread	Extra Tread
16.00-20	E-(10)	9.00	13.29	54.00	6,066	30	12,500	.90		
16.00-20	F-(12)	10.00*	18.14	54.30	6,630	35	15,800	1.01		
16.00-24	F-(12)	10.00*	18.14	55.55	7,810	35	20,200	1.01		
18.00-26	E-(10)	DW-16**	22.79	65.46	7,910	30	15,500	1.01		
				(Wide Base)	8,270	20	12,500	1.12		
18.5-25	E-(12)	12.00	16.74	51.82	5,760	35		.88		
17.5-25	F-(12)	14.00	18.90	54.77	6,230	40		.90		
20.5-25	F-(12)	17.00	22.14	60.11	6,360	30				
					6,960	35				
					7,170	25				
					8,730	35				

\*See Appendix B for TRRA.  
\*\*Drop center rim.

(1) Includes a percent above TRRA new tire section width to provide for 24 hour tire growth and protective side ribs and bars.  
(2) Includes a percent above TRRA new tire section height for less than 16.00 and 4 percent for 16.00 and larger.

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APPENDIX A  
Tires for Road Graders  
Tubeless

TABLE 1A

Maximum speed - 25 miles per hour

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Fire Width	(2) Maximum Overall Tire Diameters		T&RA Load	Inflation Pressure	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth	
				Fracture	Extra Tread				At Center of Casing	Extra Tread
7.50-20TG	C-(6)	6.00	9.13	36.52		2,090	6,800	.63		
7.50-24TG	E-(10)	6.00	9.13	42.52		3,270	12,500	.63		
9.00-24TG	E-(10)	7.00	11.02	46.10		4,100	12,500	.71		
10.00-20TG	D-(8)	8.00	12.04	42.50		3,320	8,600	.73		
10.00-24TG	D-(8)	8.00	12.04	46.50		3,760	8,600	.73		
12.00-24TG	C-(6)	8.00	13.28	49.72		3,420	6,800	.79		
	D-(8)					4,360	5,500			
13.00-24TG	C-(6)	8.00	14.15	51.86		3,950	6,800	.85		
	D-(8)					4,500	2,500			
	E-(10)					5,010	12,500			
	F-(12)					5,480	15,800			
14.00-20TG	F-(12)	8.00	15.39	50.62		5,950	15,800	.90		
	G-(14)					6,430	20,200			
14.00-24TG	D-(8)	8.00	15.39	54.82		5,450	8,600	.90		
	E-(10)					6,060	12,500			
	F-(12)					6,630	15,800			
16.00-20TG	G-(14)	10.00	18.14	54.80		7,910	20,200	1.01		
16.00-24TG	F-(12)	10.00	18.14	58.90		7,910	15,800	1.01		
18.00-26TG	E-(10)	Dn 16*	22.79	65.46		8,270	12,500	1.12		

\*Drop center rim.

(1) Includes 8 percent above T&amp;RA new tire section width to provide for 24 hour tire growth and protective side ribs and bars.

(2) Includes 6 percent above T&amp;RA new tire section height for less than 16.00 and 4 percent for 16.00 and larger.

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Groups 4 and 5

APPENDIX A  
Tires for Fork-Lift Truck, Mobile Cranes, Shovels, Mining Cars, Front End Loaders, Compactor and Dozer

Maximum speed - 5 miles per hour

Tire Size	Load Range and Ply Rating	Design Rim	Maximum Overall Tire Width	Maximum Overall Tire Diameter		TRA Load	Inflation Pressure	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth At Center of Casing	
				Traction	Extra Tread				Traction	Extra Tread
7.00-15RHS	F-(12)	5.50	8.48	32.15	-	4,450	100	15,800	.60	-
7.00-20RHS	E-(10)	5.50	8.48	37.15	-	5,280	95	12,500	.60	-
	F-(12)					5,440	100	15,800		
7.50-13RHS	E-(10)	5.50**	8.64	26.39	-	3,510	95	12,500	.63	-
	F-(12)					3,620	100	15,800		
7.50-15RHS	E-(10)	6.00	9.13	33.52	-	4,720	90	12,500	.63	-
	F-(12)					5,020	100	15,800		
7.50-18RHS	D-(8)	6.00	9.13	36.52	-	4,590	70		.63	-
	E-(10)					5,320	90	12,500		
	F-(12)					5,660	100	15,800		
7.50-20RHS	D-(8)	6.00	9.13	38.52	-	4,960	70		.63	-
	E-(10)					5,740	90	12,500		
	F-(12)					6,110	100	15,800		
8.25-15RHS	F-(12)	6.50	10.04	35.18	-	5,990	100	15,800	.67	-
8.25-16RHS	E-(10)	6.50	10.04	38.18	-	5,920	80	12,500	.67	-
8.25-20RHS	E-(10)	6.50	10.04	40.16	-	6,370	80	12,500	.67	-
	F-(12)					7,260	100	15,800		
9.00-10RHS	E-(10)	6.00**	9.94	29.14	-	4,270	80	12,500	.71	-
	F-(12)					4,860	100	15,800		
9.00-15RHS	F-(12)	7.00	11.02	37.10	-	6,710	90	15,800	.71	-
9.00-20RHS	F-(12)	7.00	11.02	42.10	-	8,070	90	15,800	.71	-
10.00-15RHS	G-(14)	7.50	11.83	32.56	32.56	8,320	95	20,200	.73	1.10
10.00-20RHS	F-(12)	7.50	11.83	43.56	44.66	8,840	85	15,800	.73	1.10
	G-(14)					9,430	95	20,200		
11.00-20RHS	F-(12)	8.00	12.47	44.89	46.03	9,310	80	15,800	.76	1.13
	G-(14)					9,980	90	20,200		
12.00-20RHS	G-(14)	8.50	13.39	46.61	47.77	10,990	85	20,200	.79	1.19
	F-(16)					12,080	100	23,000		
12.00-24TS*	G-(6)	8.00	13.28	49.72	-	7,500	35	6,800	.79	-
	D-(8)					9,250	50	8,600		
	G-(6)					8,510	35	6,900		
13.00-24TS*	H-(4)	8.00	14.15	51.88	-	9,860	45	8,600	.85	-
	F-(12)					12,730	70	15,800		
	H-(16)					14,800	90	23,000		

APPENDIX A  
 22-TL-1083E  
 Tires for Fork-Lift Truck, Mobile Cranes, Shovels, Mining Cars, Front End Loaders, Compactor and Dozer (Cont'd.)

Groups 4 and 5

Maximum Speed - 5 m.p.h.s per hour

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Tire Width	(2) Maximum Overall Tire Diameters		InRA Load	Inflation Pressure	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth At Center of Casing Traction	Extra Tread
				Traction	Tread					
14.00-20.75	J-(15) L-(20)	10.00	15.93	52.63	55.00	16,110	95	25,000	.90	1.62
14.00-20.75	D-(6)	6.00	15.07	56.20	-	16,600	100	27,000	.90	-
14.00-20.75	E-(12)	10.00	15.93	57.00	58.00	15,070	65	15,800	.90	1.62
16.00-24.12	F-(12)	10.00	18.14	59.60	-	18,520	100	27,000	1.01	-
16.00-24.12	F-(12)	11.25	18.36	61.10	63.30	16,850	95	15,800	1.01	1.80
16.00-25	F-(12)	13.00	18.36	63.00	68.50	23,510	95	30,000	1.01	-
16.00-25	F-(15)	13.00	18.36	63.00	68.50	15,220	95	15,800	1.01	-
16.00-25	F-(15)	13.00	18.36	63.00	68.50	22,070	55	23,000	1.01	-
16.00-25	F-(15)	13.00	18.36	63.00	68.50	25,420	70	27,000	1.01	-
16.00-25	F-(15)	13.00	18.36	63.00	68.50	27,480	80	30,000	1.01	-
21.00-25	F-(15)	15.00	24.30	71.50	74.50	26,650	50	23,000	1.23	1.91
21.00-25	F-(15)	15.00	24.30	71.50	74.50	29,680	60	27,000	1.23	1.91
21.00-25	F-(15)	15.00	24.30	71.50	74.50	32,700	70	30,000	1.23	1.91
21.00-25	F-(15)	15.00	24.30	71.50	74.50	36,630	85	33,000	1.23	1.91
24.00-25	J-(15) N-(24)	17.00	27.75	76.90	78.90	32,640	45	25,000	1.35	2.03
24.00-25	J-(15) N-(24)	17.00	27.75	76.90	78.90	40,470	65	30,000	1.35	2.03
24.00-25	J-(15) N-(24)	17.00	27.75	76.90	78.90	45,700	80	34,000	1.35	2.03
24.00-25	J-(15) N-(24)	17.00	27.75	76.90	78.90	34,940	45	25,000	1.35	2.03
24.00-25	J-(15) N-(24)	17.00	27.75	76.90	78.90	43,330	65	30,000	1.35	2.03
24.00-25	J-(15) N-(24)	17.00	27.75	76.90	78.90	48,930	80	34,500	1.35	2.03
36.00-41	(40)	26.00	42.01	119.00	122.00	128,710	85	30,000	1.94	2.90
36.00-51	(42)	26.00	42.01	129.50	132.50	132,510	75	30,000	1.94	2.90
36.00-51	(50)	26.00	42.01	129.50	132.50	142,560	85	30,000	1.94	2.90
36.00-51	(58)	26.00	42.01	129.50	132.50	156,600	100	34,500	1.94	2.90

\*3.125-100 center rims.

\*\*Consult tire manufacturer for rim contours used with 7.5K-10 and 9.00-10 tires for mining cars.

- (1) Includes 6 percent above InRA new tire section width to provide for 24 hour tire growth and protective side ribs and bars.
- (2) Includes 6 percent above InRA new tire section height, except 4 percent for 16.00 and up and all wide base.

NOTES:

- (a) For 10 m.p.h. service, the above loads must be reduced 13 percent at same inflation pressures.
- (b) For stationary service conditions, the above loads may be increased up to 56 percent with no increase of inflation.
- (c) For fork-lift truck tires in off-the-road service, this table applies only to 8.25-18 and larger sizes.

22-1-1083E

Groups 4 and 5

APPE DIX A  
 Made Base Tires for Fork-Lift Trucks, Mobile Cranes, Shovelers, Mining Cars, Front End Loaders and Dozer

Maximum speed - 5 Miles per hour.

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Tire Width	(2) Maximum Overall Tire Diameter		TRRA Load	Inflation Pressure	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth	
				Traction	Extra Tread				At Center of Casing	Extra Tread
23.5-25	2-16	12.00SDC	16.74	52.55	53.30	9,630	40	15,800	1.12	1.91
23.5-25	2-16	14.00SDC	17.09	55.25	57.00	11,850	50	15,800	1.01	1.80
23.5-25	2-16	17.00	22.14	61.10	63.20	14,940	40	15,800		
23.5-25	2-16					17,020	50	23,000		
23.5-25	2-16					19,940	65	27,000		
23.5-25	2-16					22,410	80	30,000		
23.5-25	2-16					17,810	35	15,800	1.12	1.91
23.5-25	2-16					20,640	45	23,000		
23.5-25	2-16					23,210	55	27,000		
23.5-25	2-16					26,730	70	30,000		
23.5-25	2-16					20,750	30	15,800	1.23	1.91
23.5-25	2-16					24,560	40	23,000		
23.5-25	2-16					27,980	50	27,000		
23.5-25	2-16					31,130	60	30,000		
23.5-25	2-16					34,070	70	33,000		
23.5-25	2-16					28,120	45	25,000	1.23	1.91
23.5-25	2-16					31,620	55	28,500		
23.5-25	2-16					34,860	65	31,500		
23.5-25	2-16					28,510	35	23,000	1.35	2.03
23.5-25	2-16					35,130	50	28,500		
23.5-25	2-16					40,040	65	33,000		
23.5-25	2-16					46,250	80	37,500		
23.5-25	2-16					30,360	35	23,000	1.35	2.03
23.5-25	2-16					37,410	50	28,500		
23.5-25	2-16					43,620	65	33,000		
23.5-25	2-16					49,250	80	37,500		
23.5-25	2-16					33,050	35	23,000	1.35	2.03
23.5-25	2-16					40,720	50	28,500		
23.5-25	2-16					47,470	65	33,000		
23.5-25	2-16					53,610	80	37,500		
23.5-25	2-16					62,750	40	27,000	1.50	2.25
23.5-25	2-16					51,510	55	31,500		
23.5-25	2-16					56,790	65	36,000		
23.5-25	2-16					64,130	80	39,000		



APPENDIX A  
 Base Tires for Fork-lift Trucks, Mobile Cranes, Shovels, Mining Cars, Front End Loaders and Dozer (Cont'd.)

Groups 4 and 4A

Maximum speed - 5 m.p.h. per hour

Tire Size	Load Range and Ply Rating	Design Rim	(1) Maximum Overall Tire Width	(2) Maximum Overall Tire Diameter		I&RA Load	Inflation Pressure	Minimum Breaking Energy Inch-Lbs.	Minimum Skid Depth	
				Traction	Extra Tread				At Center of Casing	Extra Tread
33.5-33	L-(20) (26)	28.00	36.18	91.60	94.00	43,550	40	27,000	1.67	2.50
	(32)					52,470	55			
	(38)					57,850	65			
	L-(22) (26)	28.00	36.18	98.00	100.00	62,900	75	27,000	1.67	2.50
	(32)					46,910	40			
	(37)					56,510	55			
	(38)					62,310	65			
37.5-35	(32) (36)	31.00	40.23	98.00	100.00	67,750	75		1.83	2.74
	(42)					62,770	55			
	(30)					69,200	65			
	(36)					75,240	75			
37.5-33	(36) (42)	32.00	40.50	98.00	100.00	53,120	40	30,000	1.83	2.74
	(36)					63,990	55			
	(42)					70,560	65			
	(36)					76,720	75			
37.5-39	(44)	32.00	40.50	104.00	106.50	75,720	65		1.83	2.74
	(36)					85,500	80			
37.5-51	(28) (36) (44)	32.00	40.50	116.50	119.00	73,430	50		1.83	2.74
	(36)					85,610	65			
	(44)					96,670	80			

(1) Includes 8 percent above I&RA new tire section width to provide for 24 hour tire growth and protective side ribs and bars.  
 (2) Includes 4 percent above I&RA new tire section height.

NOTES

(a) For 10 m.p.h. service, the above loads must be reduced 13 percent at same inflation pressures.  
 (b) For stationary service conditions, the above loads may be increased up to 56 percent with no increase of inflation.

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