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§571.119 Standard No. 119; New pneumatic tires for motor vehicles with a GVWR of more than 4,536 kilograms (10,000 pounds) and motorcycles.

S1. Scope. This standard establishes performance and marking requirements for tires for use on motor vehicles with a GVWR of more than 10,000 pounds and motorcycles.

S2. Purpose. The purpose of this standard is to provide safe operational performance levels for tires used on motor vehicles with a GVWR of more than 10,000 pounds, trailers, and motorcycles, and to place sufficient information on the tires to permit their proper selection and use.

S3. Application. This standard applies to:

- (a) New pneumatic tires for use on motor vehicles with a GVWR of more than 4,536 kilograms (10,000 pounds) manufactured after 1948;
- (b) New pneumatic light truck tires with a tread depth of 18/32 inch or greater, for use on motor vehicles with a GVWR of 4,536 kilograms (10,000 pounds) or less manufactured after 1948;
- (c) Tires for use on special-use trailers (ST, FI and 8-12 rim or lower diameter code); and
- (d) Tires for use on motorcycles manufactured after 1948.

S4. Definitions. All terms defined in the Act and the rules and standards issued under its authority are used as defined therein.

Light truck tire means a tire designated by its manufacturer as primarily intended for use on lightweight trucks or multipurpose passenger vehicles.

Model rim assembly means a test device that (a) includes a rim which conforms to the published dimensions of a commercially available rim, (b) includes an air valve assembly when used for testing tubeless tires or an innertube and flap (as required) when used for testing tubetype tires, and (c) undergoes no permanent rim deformation

and allows no loss of air through the portion that it comprises of the tire-rim pressure chamber when a tire is properly mounted on the assembly and subjected to the requirements of this standard.

S5. Tire and rim matching information.

S5.1 Each manufacturer of tires shall ensure that a listing of the rims that may be used with each tire that he produces is provided to the public. For purposes of this section each rim listing shall include dimensional specifications and a diagram of the rim. However a listing compiled in accordance with paragraph (a) of this section need not include dimensional specifications or a diagram of a rim if the rim's dimensional specifications and diagram are contained in each listing published in accordance with paragraph (b) of this standard. The listing shall be in one of the following forms:

- (a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires, to any person upon request, and in duplicate to: Docket Section, National Highway Traffic Safety Administration, 400 Seventh Street SW., Washington, DC 20590; or
- (b) Contained in publications, current at the date of manufacture of the tire or any later date, of at least one of the following organizations:

- The Tire and Rim Association
- The European Tyre and Rim Technical Organisation
- Japan Automobile Tire Manufacturers' Association, Inc.
- Deutsche Industrie Norm
- British Standards Institution
- Scandinavian Tire and Rim Organization
- The Tyre and Rim Association of Australia

S5.2 Information contained in a publication specified in *S5.1(b)* which lists general categories of tires and rims by size designation, type of construction, and/or intended use, shall be considered to be manufacturer's information pursuant to *S5.1* for the listed tires, unless the publication itself or specific information provided according to *S5.1(a)* indicates otherwise.

S6. Requirements. Each tire shall be capable of meeting any of the applicable requirements set forth below, when mounted on a model rim assembly corresponding to any rim designated by

the tire manufacturer for use with the tire in accordance with S5. However, a particular tire need not meet further requirements after having been subjected to and met the endurance test (S6.1), strength test (S6.2), or high speed performance test (S6.3).

S6.1 Endurance.

S6.1.1 Prior to testing in accordance with the procedures of S7.2, a tire shall exhibit no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices.

S6.1.2 When tested in accordance with the procedures of S7.2:

(a) There shall be no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices.

(b) The tire pressure at the end of the test shall be not less than the initial pressure specified in S7.2(a).

S6.2 Strength. When tested in accordance with the procedures of S7.3 a tire's average breaking energy value shall be not less than the value specified in Table II for that tire's size and load range.

S6.3 High speed performance. When tested in accordance with the procedures of S7.3, a tire shall meet the requirements set forth in S6.1.1 and S6.1.2(a) and (b). However, this requirement applies only to motorcycle tires and to non-speed-restricted tires of nominal rim diameter code 14.5 or less marked load range A, B, C, or D.

S6.4 Treadwear indicators. Except as specified in this paragraph, each tire shall have at least six treadwear indicators spaced approximately equally around the circumference of the tire that enable a person inspecting the tire to determine visually whether the tire has worn to a tread depth of 1.6 mm (one-sixteenth of an inch). Tires with a rim diameter code of 12 or smaller shall have at least three such treadwear indicators. Motorcycle tires shall have at least three such indicators which permit visual determination that the tire has worn to a tread depth of 0.8 mm (one-thirty-second of an inch).

S6.5 Tire markings. Except as specified in this paragraph, each tire shall be marked on each sidewall with the information specified in paragraphs (a)

through (j) of this section. The markings shall be placed between the maximum section width (exclusive of sidewall decorations or curb ribs) and the bead on at least one sidewall, unless the maximum section width of the tire is located in an area which is not more than one-fourth of the distance from the bead to the shoulder of the tire. If the maximum section width falls within that area, the markings shall appear between the bead and a point one-half the distance from the bead to the shoulder of the tire, on at least one sidewall. The markings shall be in letters and numerals not less than 2 mm (0.078 inch) high and raised above or sunk below the tire surface not less than 0.4 mm (0.015 inch), except that the marking depth shall be not less than 0.25mm (0.010 inch) in the case of motorcycle tires. The tire identification and the DOT symbol labeling shall comply with part 574 of this chapter. Markings may appear on only one sidewall and the entire sidewall area may be used in the case of motorcycle tires and recreational, boat, baggage, and special trailer tires.

(a) The symbol DOT, which shall constitute a certification that the tire conforms to applicable Federal motor vehicle safety standards. This symbol may be marked on only one sidewall.

(b) The tire identification number required by part 574 of this chapter. This number may be marked on only one sidewall.

(c) The tire size designation as listed in the documents and publications designated in S5.1.

(d) The maximum load rating and corresponding inflation pressure of the tire, shown as follows:

(Mark on tires rated for single and dual load): Max load single ___ kg (___lb) at ___ kPa (___psi) cold. Max load dual ___ kg (___lb) at ___ kPa (___psi) cold.

(Mark on tires rated only for single load): Max load ___ kg (___lb) at ___ kPa (___psi) cold.

(e) The speed restriction of the tire, if 90 km/h (55 mph) or less, shown as follows:

Max speed ___ km/h (___mph).

(f) The actual number of plies and the composition of the ply cord material in the sidewall and, if different, in the tread area;

(g) The words "tubeless" or "tube type" as applicable.

(h) The word "regroovable" if the tire is designed for regrooving.

(i) The word "radial" if a radial tire.

(j) The letter designating the tire load range.

S6.6 Maximum load rating. If the maximum load rating for a particular tire size is shown in one or more of the publications described in S5.1(b), each tire of that size designation shall have a maximum load rating that is not less than the published maximum load rating, or if there are differing published ratings for the same tire size designation, not less than the lowest published maximum load rating for the size designation.

S7. Test procedures.

S7.1 General conditions.

S7.1.1 The tests are performed using an appropriate new tube, tube valve and flap assembly (as required) that allows no loss of air for testing of tube-type tires under S7.2, S7.3, and S7.4, and tubeless tires under S7.3.

S7.1.2 The tire must be capable of meeting the requirements of S7.2 and S7.4 when conditioned to a temperature of 35 °C (95 °F) for 3 hours before the test is conducted, and with an ambient temperature maintained at 35 °C (95 °F) during all phases of testing. The tire must be capable of meeting the requirements of S7.3 when conditioned at a temperature of 21 °C (70 °F) for 3 hours before the test is conducted.

S7.2 Endurance. (a) Mount the tire on a model rim assembly and inflate it to the inflation pressure corresponding to the maximum load rating marked on the tire. Use a single maximum load value when the tire is marked with both single and dual maximum load.

(b) After conditioning the tire-rim assembly in accordance with S7.1.2, adjust the tire pressure to that specified in (a) immediately before mounting the tire rim assembly.

(c) Mount the tire-rim assembly on an axle and press it against a flat-faced steel test wheel that is 1708 mm (67.23 inches) in diameter and at least as wide as the tread of the tire.

(d) Apply the test load and rotate the test wheel as indicated in Table III for the type of tire tested conducting each

successive phase of the test without interruption.

(e) Immediately after running the tire the required time, measure the tire inflation pressure. Remove the tire from the model rim assembly, and inspect the tire.

S7.3 Strength. (a) Mount the tire on a model rim assembly and inflate it to the pressure corresponding to the maximum load, or maximum dual load where there is both a single and dual load marked on the tire. If the tire is tubeless, a tube may be inserted to prevent loss of air during the test in the event of puncture.

(b) After conditioning the tire-rim assembly in accordance with S7.1.2, adjust the tire pressure to that specified in (a).

(c) Force a cylindrical steel plunger, with a hemispherical end and of the diameter specified in Table I for the tire size, perpendicularly into a raised tread element as near as possible to the centerline of the tread, at a rate of 50 mm (2 inches) per minute, until the tire breaks or the plunger is stopped by the rim.

(d) Record the force and the distance of penetration just before the tire breaks, or if it fails to break, just before the plunger is stopped by the rim.

(e) Repeat the plunger application at 72° intervals around the circumference of the tire, until five measurements are made. However, in the case of tires of 12 inch rim diameter code or smaller, repeat the plunger application at 120° intervals around the circumference of the tire, until three measurements are made.

(f) Compute the breaking energy for each test point by one of the two following formulas:

$$(1) W = [(F \times P)/2] \times 10^{-3} \text{ (joules)}$$

Where:

W = Breaking energy (in joules) (kJ)
 F = Force in newtons (N) and
 P = Penetration in millimeters (mm), or;

$$(2) W = (FP/2)$$

Where:

W = Breaking energy in inch-pounds,
 F = Force in pounds,
 P = Penetration in inches.

(g) Determine the average breaking energy value for the tire by computing

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the average of the values obtained in accordance with paragraph (f).

S7.4 *High speed performance.* (a) Perform steps (a) through (c) of S7.2.

(b) Apply a force of 88 percent of the maximum load rating marked on the tire (use single maximum load value when the tire is marked with both single and dual maximum loads), and rotate the test wheel at 250 rpm for 2 hours.

(c) Remove the load, allow the tire to cool to 35 °C (95 °F), and then adjust

the pressure to that marked on the tire for single tire use.

(d) Reapply the same load, and without interruption or readjustment of inflation pressure, rotate the test wheel at 375 rpm for 30 minutes, then at 400 rpm for 30 minutes, and then at 425 rpm for 30 minutes.

(e) Immediately after running the tire the required time, measure the tire inflation pressure. Remove the tire from the model rim assembly, and inspect the tire.

TABLE I—STRENGTH TEST PLUNGER DIAMETER

Tire type	Plunger diameter	
	(mm)	(inches)
Light truck	19.05	¾
Motorcycle	7.94	5/16
≤ 12 rim diameter code (except motorcycle)	19.05	¾
Tubeless:		
≤ 17.5 rim diameter code	19.05	¾
>17.5 rim diameter code, load range F or less	31.75	1¼
> 17.5 rim diameter code, load range over F	38.10	1½
Tube-type:		
Load range F or less	31.75	1¼
Load range over F	38.10	1½

TABLE II—MINIMUM STATIC BREAKING ENERGY
(Joules (J) and Inch-Pounds (inch-lbs))

Tire characteristic Plunger diameter (mm and inches)	Motorcycle		All 12 rim diameter code or smaller except motorcycle		Light truck and 17.5 rim diameter code or smaller Tubeless		Tires other than Light Truck, Motorcycle, 12 rim diameter code or smaller					
	7.94 mm	5/16"	19.05 mm		19.05 mm	31.75 mm		31.75 mm		38.10 mm		
			J	In-lbs		J	In-lbs	J	In-lbs	J	In-lbs	
Breaking Energy	J	In-lbs	J	In-lbs	J	In-lbs	J	In-lbs	J	In-lbs	J	In-lbs
	16	150	67	600	225	2,000	600	5,100	2,000	17,500	2,000	17,500
	33	300	135	1,200	293	2,600	1,200	10,500	2,600	22,500	2,600	22,500
	45	400	203	1,800	361	3,200	1,800	15,750	3,200	27,500	3,200	27,500
			271	2,400	514	4,550	2,400	21,000	4,550	39,500	4,550	39,500
			338	3,000	576	5,100	3,000	26,250	5,100	45,000	5,100	45,000
			406	3,600	644	5,700	3,600	31,500	5,700	50,000	5,700	50,000
					711	6,300	4,200	37,500	6,300	52,500	6,300	52,500
					768	6,800	4,500	39,500	6,800	55,500	6,800	55,500

Load Range:

- A
- B
- C
- D
- E
- F
- G
- H
- J
- L
- M
- N

TABLE III—ENDURANCE TEST SCHEDULE

Description	Load range	Test wheel speed		Test load: Percent of maximum load rating			Total test revolutions (thousands)
		km/h	r/m	I–7 hours	II–16 hours	III–24 hours	
Speed restricted service: 90 km/h (55 mph)	F, G, H, J, L, M, N.	40	125	66	84	101	352.0
80 km/h (50 mph)	F, G, H, J, L ..	32	100	66	84	101	282.5
56 km/h (35 mph)	All	24	75	66	84	101	211.0
Motorcycle	All	80	250	¹ 100	² 108	117	510.0
All other	F	64	200	66	84	101	564.0
	G	56	175	66	84	101	493.5
	H, J, L, N	48	150	66	84	101	423.5

(Secs. 113, 201, 80 Stat. 718 (15 U.S.C. 1402, 1421); secs. 103, 112, 119, 201, 203, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1421, 1423); delegation of authority at 49 CFR 1.50)

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EDITORIAL NOTE: For FEDERAL REGISTER citations affecting § 571.119 see the List of CFR Sections Affected which appears in the Finding Aids section of the printed volume and on GPO Access.

§ 571.120 Tire selection and rims and motor home/recreation vehicle trailer load carrying capacity information for motor vehicles with a GVWR of more than 4,536 kilograms (10,000 pounds).

S1. *Scope.* This standard specifies tire and rim selection requirements, rim marking requirements and motor home/recreation vehicle trailer load carrying capacity information.

S2. *Purpose.* The purpose of this standard is to provide safe operational performance by ensuring that vehicles to which it applies are equipped with tires of adequate size and load rating and with rims of appropriate size and type designation, and by ensuring that consumers are informed of motor home/recreation vehicle trailer load carrying capacity.

S3. *Application.* This standard applies to motor vehicles with a gross vehicle weight rating (GVWR) of more than 4,536 kilograms (10,000 pounds) and motorcycles, to rims for use on those vehicles, and to non-pneumatic spare tire assemblies for use on those vehicles.

S4. *Definitions.* All terms defined in the Act and the rules and standards issued under its authority are used as defined therein.

Rim base means the portion of a rim remaining after removal of all split or continuous rim flanges, side rings, and locking rings that can be detached from the rim.

Rim size designation means rim diameter and width.

Rim diameter means nominal diameter of the bead seat.

Rim width means nominal distance between rim flanges.

Rim type designation means the industry or manufacturer's designation for a rim by style or code.

Weather side means the surface area of the rim not covered by the inflated tire.

S5. *Requirements.*

S5.1 *Tire and rim selection.*

S5.1.1 Except as specified in S5.1.3, each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the requirements of § 571.109, § 571.119 or § 571.139, and rims that are listed by the manufacturer of the tires as suitable for use with those tires, in accordance with S4.4 of § 571.109 or S5.1 of § 571.119, as applicable, except that vehicles may be equipped with a non-pneumatic spare tire assembly that meets the requirements of § 571.129, New non-pneumatic tires for passenger cars, and S8 of this standard. Vehicles equipped with such an assembly shall meet the requirements of S5.3.3, S7, and S9 of this standard.

S5.1.2 Except in the case of a vehicle which has a speed attainable in 3.2 kilometers of 80 kilometers per hour or less, the sum of the maximum load ratings of the tires fitted to an axle shall