

Submitted for recognition as an American National Standard

Laboratory Speed Test Procedure for Light Truck Tires

1. **Scope**—This SAE Recommended Practice provides a method for testing the speed performance of light truck tires under controlled conditions in the laboratory on a test wheel.
2. **References**—There are no referenced publications specified herein.
3. **Definitions**
 - 3.1 **Ambient Temperature**—This is the temperature of the air measured during a high-speed test at a fixed location near the tire. The fixed location of ambient temperature measurement is defined as a point on the rotational axis of the tire, 0.31 m (12 in) from the plane touching the nearest tire sidewall (or a point where an equivalent temperature exists).
 - 3.2 **Capped Inflation Pressure**—The process of inflating the tire to a specified pressure and allowing the inflation pressure to build up, as the tire temperature increases during the test procedure.
 - 3.3 **Maximum Load**—The maximum load (Pound load, Kilogram load, or Load index) that is molded on the tire sidewall, or if not molded, shown in the publication of a recognized tire standardizing body.
 - 3.4 **Load Index**—A numerical code associated with the maximum load a tire can carry at the speed indicated by its Speed Symbol under specified service conditions.
 - 3.5 **Service Description**—A service designation, which is distinct from the size designation, consisting of the Load Index (Single load/Dual load, where applicable) and Speed Symbol.
 - 3.6 **Speed Category**—A category assigned to a tire which denotes the maximum speed for which the use of the tire is rated.

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3.7 Speed Symbol—A symbol indicating the speed category at which the tire can carry a load corresponding to its Load Index under specified service conditions (see Table 1).

TABLE 1—SPEED SYMBOL

Speed Symbol	Speed Category
N	140 km/h (87 mph)
P	150 km/h (93 mph)
Q	160 km/h (99 mph)
R	170 km/h (106 mph)
S	180 km/h (112 mph)
T	190 km/h (118 mph)
H	210 km/h (130 mph)

3.8 Chunking—The breaking away of pieces of the tread or sidewall.

3.9 Cord Separation—The parting of cords from adjacent rubber compounds.

3.10 Cracking—The parting within the tread, sidewall, or inner liner of the tire extending to cord material.

3.11 Innerliner Separation—The parting of the innerliner from cord material in the carcass.

3.12 Tread Separation—The pulling away of the tread from the carcass.

3.13 Sidewall Separation—The parting of the rubber compound from the cord material in the sidewall.

3.14 Ply Separation—The parting of the rubber compound between adjacent plies.

3.15 Bead Separation—A breakdown of the bond between components in the bead area.

4. Test Equipment

4.1 Test Wheel Specifications

4.1.1 **DIAMETER**—The diameter of the Standard test wheel used for the high-speed test is 1.708 m (67.23 in). An optional test wheel of 2.0 m (78.74 in) diameter may also be used.

4.1.2 **WIDTH OF THE TEST SURFACE**—This must exceed the tread width of the test tire.

4.1.3 **OUTER SURFACE**—Smooth steel.

4.2 Test Rim—It must have a contour and width as shown in the publication of a recognized standardizing body for the tire size to be tested.

4.3 Control Accuracy—Operating conditions must be maintained within the following accuracies:

- a. Test Load: $\pm 1\%$
- b. Speed: +2, -0 km/h (+1, -0 mph)

4.4 Instrumentation Accuracy

- a. Test Load: ± 20 N (5 lbf)
- b. Inflation Pressure: ± 4 kPa (0.5 psi)
- c. Temperature: ± 0.5 °C (1 °F)
- d. Speed: ± 0.5 km/h (0.3 mph)

5. Test Conditions**5.1 Load**

- a. 90% of the Maximum Single Tire Load—For 1.7 m Diameter Test Wheel
- b. 92% of the Maximum Single Tire Load—For 2.0 m Diameter Test Wheel

5.2 Inflation Pressure (Capped)—100% of the Inflation pressure corresponding to the maximum load. Tolerance for setting initial inflation pressure: ± 7 kPa (± 1 psi).

5.3 Ambient Temperature— 38 °C ± 3 °C (100 °F ± 5 °F)

5.4 Camber Angle—0 degrees ± 0.3 degrees

5.5 Slip Angle—0 degrees ± 0.3 degrees

6. Test Procedure

6.1 Thermal Conditioning—Condition the tire/wheel assembly at test room temperature for not less than 3 h. Readjust the inflation pressure to that specified in 5.2.

6.2 Operation—The tire and wheel assembly shall be mounted on the test axle and pressed normal to the outer face of the test wheel with the test load. Carry the test through, without interruption, as follows.

- a. Time taken to pass from zero speed to the initial test speed—10 min
- b. Initial test speed is the prescribed maximum speed (speed category) of the tire less 20 km/h (12 mph)
- c. Duration at Initial Test Speed—10 min
- d. Successive Speed Increments—10 km/h (6 mph)
- e. Duration at Second Speed Step—10 min
- f. Duration at the Speed Category Step—30 min
- g. Duration of Optional Successive Speed Steps—30 min

6.3 Test Records—The following information should be recorded for each tire:

6.3.1 TIRE IDENTIFICATION

- a. Manufacturer
- b. Brand or Trade Name
- c. Tire Size Designation
- d. Tire Maximum Load
- e. Service Description (If the tire has service description designation)
- f. Speed Category (If the tire has a speed category designation)
- g. Tire pressure corresponding to the maximum load
- h. Serial Number (Identification Number)
- i. Other pertinent information

6.3.2 TEST WHEEL IDENTIFICATION

- a. Test Wheel Diameter
- b. Other Pertinent Information

6.3.3 TEST CONDITIONS

- a. Date and Time
- b. Rim Diameter, Width and Contour
- c. Test Load
- d. Test Inflation
- e. Ambient Temperature
- f. Other Pertinent Information

6.3.4 TEST DATA

- a. Initial Test Speed
- b. Subsequent Completed Speed Steps—Speed and Duration
- c. Duration and Speed of Final Step
- d. Tire Removal Condition after Final Step

7. Termination of Test and Data Evaluation

7.1 The test may be considered terminated by one of the following:

- a. Completion of predetermined final step
- b. Tire structural degradation

7.2 Upon visual inspection of the dismounted tire, any visible evidence of the following constitutes tire structural degradation:

- a. Tread Separation
- b. Cord Separation
- c. Ply Separation
- d. Bead Separation
- e. Sidewall Separation
- f. Chunking
- g. Innerliner Separation
- h. Cracking