

How to Read Speed Rating, Load Index & Service Descriptions

Using a P195/60R15 87S tire size as an example, the 87S at the end of the size represents the tire's service description. A service description identifies the tire's load index and speed rating. Service Descriptions are required on all speed rated (except for Z-speed rated) tires manufactured since 1991.

The first two digits (**87S**) represent the tire's load index and are followed by a single letter (**87S**) identifying the tire's speed rating.

Load Index

P195/60R15 **87S** - The load index (87) is the tire size's assigned numerical value used to compare relative load carrying capabilities. In the case of our example the 87 identifies the tires ability to carry approximately 1,201 pounds.

The higher the tire's load index number, the greater its load carrying capacity.

89 = 1,279 pounds
 88 = 1,235 pounds
 87 = 1,201 pounds
 86 = 1,168 pounds
 85 = 1,135 pounds

A tire with a higher load index than that of the Original Equipment tire indicates an increase in load capacity. A tire with a load index equal to that of the Original Equipment tire indicates an equivalent load capacity. A tire with a lower load index than the Original Equipment tire indicates the tire does not equal the load capacity of the original.

Typically, the load indexes of the tires used on passenger cars and light trucks range from 70 to 110.

Load Index	Pounds	Kilograms	Load Index	Pounds	Kilograms
71	761	345	91	1356	615
72	783	355	92	1389	630
73	805	365	93	1433	650
74	827	375	94	1477	670
75	853	387	95	1521	690
76	882	400	96	1565	710
77	908	412	97	1609	730
78	937	425	98	1653	750
79	963	437	99	1709	775
80	992	450	100	1764	800
81	1019	462	101	1819	825
82	1047	475	102	1874	850
83	1074	487	103	1929	875
84	1102	500	104	1984	900
85	1135	515	105	2039	925
86	1168	530	106	2094	950
87	1201	545	107	2149	975
88	1235	560	108	2205	1000
89	1279	580	109	2271	1030
90	1323	600	110	2337	1060

Speed Rating

In Germany some highways do not have speed limits and high speed driving is permitted. Speed ratings were established to match the speed capability of tires with the top speed capability of the vehicles to which they are applied. Speed ratings are established in kilometers per hour and subsequently converted to miles per hour (which explains why speed ratings appear established at "unusual" mile per hour increments). Despite the tire manufacturer's ability to manufacture tires capable of high speeds, none of them recommend the use of their products in excess of legal speed limits. The maximum operating speed of a vehicle must be limited to the lowest speed rated tire on the vehicle.

Speed ratings are based on laboratory tests where the tire is pressed against a large diameter metal drum to reflect its appropriate load, and run at ever increasing speeds (in 6.2 mph steps in 10 minute increments) until the tire's required speed has been met.

It is important to note that speed ratings only apply to tires that have not been damaged, altered, under-inflated or overloaded. Additionally, most tire manufacturers maintain that a tire that has been cut or punctured no longer retains the tire manufacturer's original speed rating, even after being repaired because the tire manufacturer can't control the quality of the repair.

Over the years, tire speed rating symbols have been marked on tires in any of three ways shown in the following examples:

225/50SR16 225/50SR16 89S or 225/50R16 89S

Each of these was an acceptable method of identifying speed ratings.

Early tires had their speed rating symbol shown "within" the tire size, such as 225/50SR16. Tires using this type of branding were not to have been produced after 1991.

225/50SR16 112 mph, 180 km/h

225/50HR16 130, 210 km/h

225/50VR16 in excess of 130 mph, 210 km/h

Beginning in 1991, the speed symbol denoting a fixed maximum speed capability of new tires must be shown only in the speed rating portion of the tire's service description, such as 225/50R16 89S. The most common tire speed rating symbols, maximum speeds and typical applications are shown below:

L	75 mph	120 km/h	Off-Road & Light Truck Tires
M	81 mph	130 km/h	Temporary Spare Tires
N	87 mph	140km/h	
P	93 mph	150 km/h	
Q	99 mph	160 km/h	Studless & Studdable Winter Tires
R	106 mph	170 km/h	H.D. Light Truck Tires
S	112 mph	180 km/h	Family Sedans & Vans
T	118 mph	190 km/h	Family Sedans & Vans
U	124 mph	200 km/h	
H	130 mph	210 km/h	Sport Sedans & Coupes
V	149 mph	240 km/h	Sport Sedans, Coupes & Sports Cars

When Z-speed rated tires were first introduced, they were thought to reflect the highest tire speed rating that would ever be required, in excess of 240 km/h or 149 mph. While Z-speed rated tires are capable of speeds in excess of 149 mph, how far above 149 mph was not identified. That ultimately caused the automotive industry to add W- and Y-

speed ratings to identify the tires that meet the needs of new vehicles that have extremely high top-speed capabilities.

W 168 mph 270 km/h Exotic Sports Cars

Y 186 mph 300 km/h Exotic Sports Cars

While a Z-speed rating still often appears in the tire size designation of these tires, such as 225/50ZR16 91W, the Z in the size signifies a maximum speed capability in excess of 149 mph, 240 km/h; the W in the service description indicates the tire's 168 mph, 270 km/h maximum speed.

225/50ZR16 in excess of 149 mph, 240 km/h

205/45ZR17 88W 168 mph, 270 km/h

285/35ZR19 99Y 186 mph, 300 km/h

Most recently, when the Y-speed rating indicated in a service description is enclosed in parentheses, such as 285/35ZR19 (99Y), the top speed of the tire has been tested in excess of 186 mph, 300 km/h indicated by the service description as shown below:

285/35ZR19 99Y 186 mph, 300 km/h

285/35ZR19 (99Y) in excess of 186 mph, 300 km/h

As vehicles have increased their top speeds into Autobahn-only ranges, the tire speed ratings have evolved to better identify the tires capability, allowing drivers to match the speed of their tires with the top speed of their vehicle.