

# TOYO TIRE TALK

## Subject: Inflation Pressure (Plus Sizing)

### 1. Introduction

Most tires are 75,70,65 or 60 aspect ratio but lower profile tires of 55,50,45 even less than 40 aspect ratio are becoming popular and 'plus sizing' is one of hottest trend in the market.

This is why Lower Profile Tires are popular:

- 1.They provide very good vehicle handling qualities, however, ride comfort may not be as good as higher profile tires.
- 2.They allow for a larger rim diameter that allows the vehicle to be equipped with larger diameter disk brakes for improved breaking performance.
- 3.They enhance the appearance of the vehicle and are in fashion.
- 4.More and more new cars are coming equipped with lower aspect ratio tires at the O.E. level.

However the flexible region (shoulder - side area) of those tires is narrower than compared with standard tires. Thus, it is very difficult to determine whether tires are correctly inflated just by a visual inspection. See photos below:



**SIZE:225/40ZR18 92W reinforced**

proper inflation pressure

220kPa (31 psi)

underinflation pressure 1

150kPa (21 psi)

underinflation pressure 2

100kPa (14 psi)

So we would like you to be reminded that the most important factor is inflation pressure. Now we will discuss the recommended way for plus sizing and providing the correct inflation pressure.

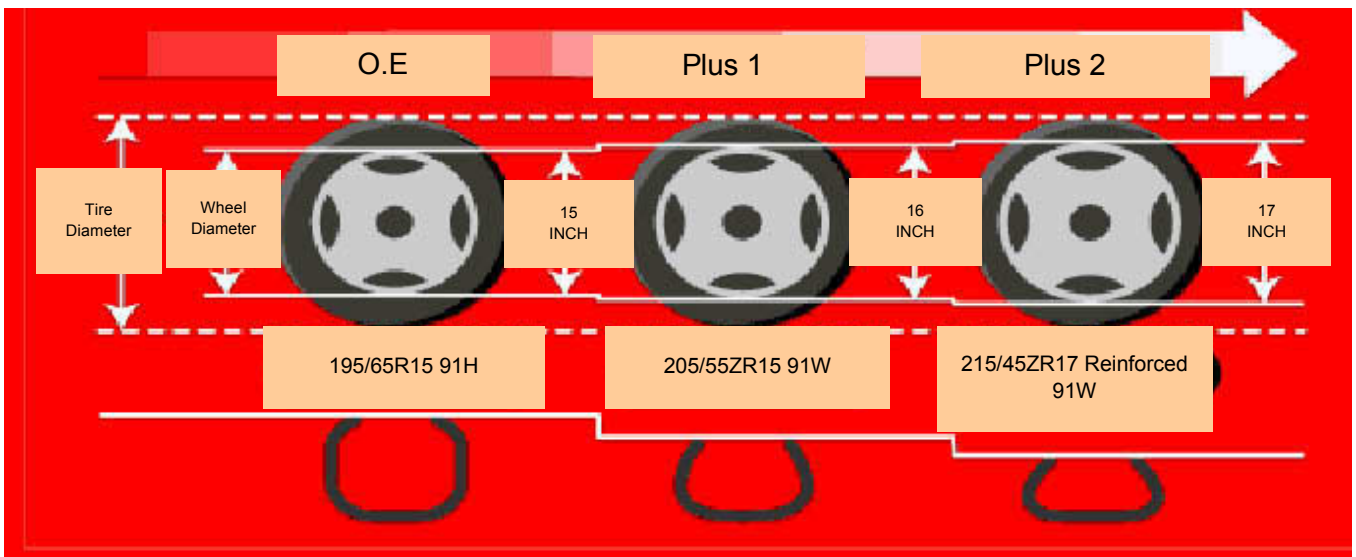
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## 2.The rule of thumb for Plus sizing

Plus Zero fitment, is to increase section width by 10mm and drop aspect ratio by 5 points. The rim diameter stays the same.

Plus 1 fitment requires an increase in section width of 10mm, a reduction in aspect ratio of 10points and an increase in rim diameter of one inch. (+10/-10/+1)

Plus 2 calls for a 20mm jump in section width, a 20-point drop in aspect ratio and a two-inch an increase in rim diameter. (+20 -20/+2)



**Plus sizing requires close attention.**

- Do not change overall tire diameter by more than plus 2 percent or minus 3 percent except for tires that are installed on full size pick-ups. In case of Full size Pick ups, do not change more than plus 6 percent or minus 3 percent. This is to prevent problem with the ABS breaking system, as well as to prevent an error to the speedometer or odometer.
- Never fit tires with load-carrying capacity lower than the vehicle manufacture specifies. Example: factory installed size = 205/55ZR15 91W. Would size 215/45ZR17 87W be suitable 'plus 1' fitment? No. Although the tire diameter is OK, the load capacity is too low. However size 215/45ZR17 reinforced 91W is suitable.
- Never use an inflation pressure lower than the recommendation of the vehicle manufacturer. The 'Tire Information Placard' can be located in various places; such as the door jam or glove box.
- Take into consideration other factors such as; wheel offset, clearance of the vehicle body and suspension components.

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## 3. Inflation pressure at plus sizing

When you carry out any plus sizing, you must consider the inflation pressure recommended by the vehicle manufacture, because the load capability of the replacement tire must be equal or greater than the original factory tire.

However, Reinforced tire will be required 30-40kPa(5-6psi) higher inflation pressure.

For example; the O.E standard size, 195/65R15 91H, has load-carrying capacity of 515 kg at 200kPa(28psi) that recommended by the vehicle manufacture.

(Table 1)

Load Index	Tyre Load Carrying Capacity (kg) at Various Inflation Pressures (bar) (1) Capacité de charge (kg) en fonction de la pression de gonflage (bar) (1) Tragfähigkeit (kg) bei Luftdruck (bar) (1)										
	1,5	1,6	1,7	1,8	1,9	2,0	2,1	2,2	2,3	2,4	2,5
62	175	185	195	205	215	225	230	240	250	255	265
63	180	190	200	210	220	230	235	245	255	265	272
64	185	195	205	215	225	235	245	255	265	275	280
84		205	210	225	235	245	435	450	470	485	500
85	340	360	370	390	415	435	450	465	480	500	515
86	350	370	390	410	425	445	460	480	495	515	530
87	360	380	400	420	440	455	475	490	510	525	545
88	370	390	410	430	450	470	485	505	525	540	560
89	385	405	425	445	465	485	505	525	545	560	580
90	400	420	440	460	480	500	520	540	560	580	600
91	410	430	450	475	495	515	535	555	575	595	615
92	420	440	465	485	505	525	550	570	590	610	630

The plus 2 fitment size, 215/45ZR17 reinforced 91W, must be capable of carrying more than 515 kg. This reinforced 91 has load-carrying of 530 kg at 240kPa(34psi).

(Table 2)

Load Index	Load Capacity (kg) Inflation Pressure chart for Extra Load or Reinforced Tyres (bar) (1) Capacité de charge (kg) en fonction de la pression de gonflage (bar) (1) Tragfähigkeit (kg) bei Luftdruck (bar) (1)														
	1,5	1,6	1,7	1,8	1,9	2,0	2,1	2,2	2,3	2,4	2,5	2,6	2,7	2,8	2,9
66	175	185	195	205	215	225	230	240	250	260	265	275	285	290	300
67	180	190	200	210	220	230	235	245	255	265	275	280	290	300	307
68	185	195	205	215	225	235	245	255	260	270	280	290	295	305	315
88	190	200	210	220	230	240	250	260	270	280	290	300	310	315	325
91	365	380	395	415	435	455	485	505	525	540	555	565	585	600	615
92	370	390	410	430	450	470	485	505	525	540	560	575	595	615	630
93	385	405	425	445	465	485	500	520	540	560	575	595	615	630	650
94	395	415	435	455	480	500	520	535	555	575	595	615	635	650	670
95	405	430	450	470	490	515	535	555	575	595	615	630	650	670	690
96	420	440	485	485	505	525	550	570	590	610	630	650	670	690	710
97	430	455	475	500	520	540	565	585	605	625	650	670	690	710	730
98	445	465	490	510	535	555	580	600	625	645	665	685	710	730	750
99	455	480	505	530	555	575	600	620	645	665	690	710	730	755	775

<The table above is provided in the 2001 ETRTO Year Book.>

## 4. CONCLUSION

When you are deciding upon replacement tires, it is important to check load-carrying capacity. Therefore, we recommend a tire that has load-carrying-capacity that is equal to or greater than the factory tire, and be capable of maintaining the recommended air pressure.

You have to pay attention to the air pressure when you fit reinforced tires because that tire will be required higher inflation pressure.

Toyo as a Tire Manufacturer, cannot recommend any down grade of the recommended load index.

We also recommend that the tire pressure be checked at least once per month and the air pressure must be checked BEFORE the start of a long journey. It is also important to check the tire pressure while they are COLD.