

BULLETIN

Tyres for Road Safety

In this publication of the Road Safety Education and Campaigning project funded by EU, we point out the failure to attend to tyre safety, which is a hidden, but a contributing factor in many road accidents. Having the best brakes on the market does not help if your tyres are worn. When braking, the idea is to have sufficient friction between the road surface and the tyres to bring the vehicle to a standstill. If the tyres are worn there will not be enough friction and the tyre will slide over the road surface, not stopping the vehicle, but causing loss of handling and steer control.

Basic rules for tyre safety:

Check your tyres considering the following:

- Tyres should always be replaced with the same size designation as recommended by the vehicle or tyre manufacturer.
- Tyre brand, size and tread pattern must be the same on each axle.
- All four tyres should be of the same size, speed rating and construction (radial or cross ply).
- Do not buy used tyres, many of which are beyond retreading but may be retreaded illicitly.
- When two radial tyres are used with two cross ply, put the radials on the rear axle. In some cases (especially commercial vehicles) the manufacturer might recommend different-sized tyres for the front and rear axles.
- Over and under-inflation reduces tyre to road contact and shortens tyre life.
- The tyre responds in the same manner to under inflation as to overloading.

Over inflation / under loading: Reduces cushioning power of tyre. Tyre is more susceptible to impact, penetrations and abrasion. Reduced road-tyre contact. Negatively affects the handling characteristics of the vehicle. (Excessive centre wear.)

Under inflation / Overloading: The biggest single cause of "burst" tyres. Under inflation causes excessive flexing of the tyre sidewall which leads to overheating and ultimately, casing break-up and tread separation. Poor tyre-road contact conditions leads to poor handling and faster wear. (Excessive shoulder wear.)

Tyre Pressure

Do not underestimate the importance of the correct pressure.

- Check tyre pressure, including the spare, once a week or before undertaking a long journey.
- Check tyre pressure early morning (low ambient temperature). Always use a reliable pressure gauge.
- Only use tyre sizes recommended by the manufacturers at the recommended inflation pressure.
- Check tyres regularly for punctures, penetrations, cuts and bulges.
- Cuts in the tyre could permit damp to reach the casing plies. This is harmful for both textile and steel casings and will affect safety and tyre life. Wheel alignment ensure uniform tyre-road contact. Misaligned wheels will lead to excessive tyre wear.
- A worn steering mechanism, ball joints and wheel bearings will also reduce tyre life.
- Some tyres are now marked with letters to indicate their speed ratings. Tyre speed ratings do not imply that vehicles can be driven safely at the maximum speed for which the tyre is rated, particularly under adverse road and weather conditions, or if the vehicle has unusual characteristics.
- One-sided wear. This takes various forms. A regular smooth band of wear all around the tyre on the inside or the outside of the tread is a sign of incorrect camber. Too much toe-in causes irregular one-sided wear.
- Tread-centre wear. Regular wear of this kind is normally a sign of high tyre pressure. Driving fast for long distances may cause this on low-profile tyres, because traveling at 120 km/h wears a tyre out twice as fast as travelling at 70 km/h.
- Inner- and outer-edge wear. If both inner and outer edges are worn, it usually implies that the tyres have been run at too low a pressure at normal speeds.
- Irregular bald spotting. This is usually caused by worn shock absorbers, worn suspension bushes, or even loose wheel bearings.
- Missing valve caps should be replaced, since they are there to prevent dirt from clogging the valves, which could cause a loss of air pressure.
- Torque wheel studs /nuts to correct setting when mounting new tyres - check for loose or missing wheel nuts.
- Check tread depth on all tyres and replace well before they reach regulatory minimum depth of 1.00 mm to reduce the risk of aquaplaning on wet roads.

Demystifying the Tyres Sidewall Code

As an example let us take P 185/60 R 14 82 V:

The first letter 'P' stands for 'Passanger Car'. The width (in millimeters) of the tyre from sidewall to sidewall is shown with '185'. 60 is the aspect ratio. The aspect ratio is the ratio of sidewall height to tyre width and expressed as per cent. In this example, 185/60 size tyre, the sidewall height is 60 % of the tyre width: $185 \times \%60 = 111$ mm.

The following letter R indicates the construction of the tyre meaning radial. It is followed by the wheel (or rim) diameter expressed in inches. In this example the tyre rim has 14 inches (=35.5 cm) diameter size.

The load index follows. Load index indicates the maximum load that the tyres can stand at maximum speed indicated by the speed index. Maximum load levels corresponding to load index indicated on the tyre, can be found from the load index table of the tyre producer.

Finally "V" indicates the speed rating, meaning the top speed under ideal conditions at an appropriate pressure level. Along with this speed rating, there is a load index, which indicates the approximate weight the tyre can carry. The most common codes are as follows :

Q (max.160 km/s)
R (max.170 km/s)
S (max.180 km/s)
T (max.190 km/s)
U (max.200 km/s)
H (max.210 km/s)
V (max.240 km/s)
Z (240 üzeri) W (max.270 km/s)
Y (max.300 km/s)

The larger the speed rating of the tyre, the more resistant it is to the heat generated due to high speed. While for a sedan type family car 'S' or 'T' type tyres are sufficient, for a Ferrari 'Z' type tyres are used.

Against written and verbal warnings from the tyre manufacturers, for economic reasons, there is a tendency of drivers towards using tyres with lower load index and speed rating than the originals. As it is mostly indicated in the user manual of vehicles, this is not technically appropriate.

General Advice on Tyre Maintenance

- Tyres, sizes speed / load ratings must conform to the specifications in the Vehicle Owner's Manual.
- Check tyres and rims for any accidental damage after impacting with potholes/curb stones or other obstacles in the road.
- Tyres, brakes, shock absorbers and rims should always be checked when servicing the vehicle.
- Vehicle wheel alignment should be tested at regular intervals to obtain even tread wear and maximum service life.
- No matter how good your car, or its tyres, this is not justification for violating speed limits. If a tyre burst, do not apply the brakes; rather use the momentum and gears to slow down the vehicle. A sudden change in direction or braking will result in loss of control over the vehicle. Rather lose one rim than your car and probably your life!
- Tyre rotation is a very contentious area, with some companies recommending it, other companies saying nothing, some are against it. Rotating the tyres regularly evens out the wear, but eventually all the tyres will have to be replaced at the same time, which is expensive.

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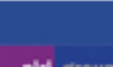
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