TOYO TIRE TALK

No.06-002 (TTT-182)

Technical Service Department Japan.

Technical tips and information that may allow you to better serve your customers.

We would appreciate your input, please contact us.
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6th April, 2006

Subject : Indentation or Bulge in the Sidewall

Has a complaint been received from a customer about a tire with an indentation (depression or concavity) or bulge (protrusion) in the sidewall?

Whenever such a complaint is received, very careful consideration is required as these are completely different conditions caused by different factors.

An indentation in the sidewall is usually cosmetic, and the tire can remain in service. On the other hand, however, a bulge in a sidewall means (in most cases) broken ply cords or thin sidewall thickness, and such a tire must be removed from service immediately and scrapped.

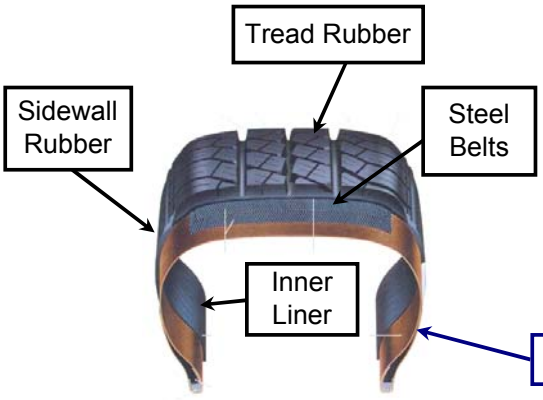
The following photos are examples of these conditions.

Sidewall Indentation

Sidewall Bulge

The following has more detailed explanations of these conditions.

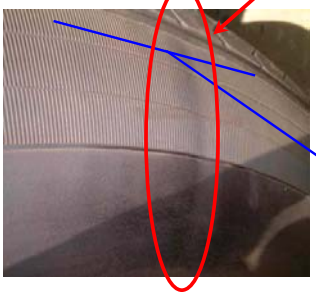
1. Indentation (Depression or Concavity) in the Sidewall.



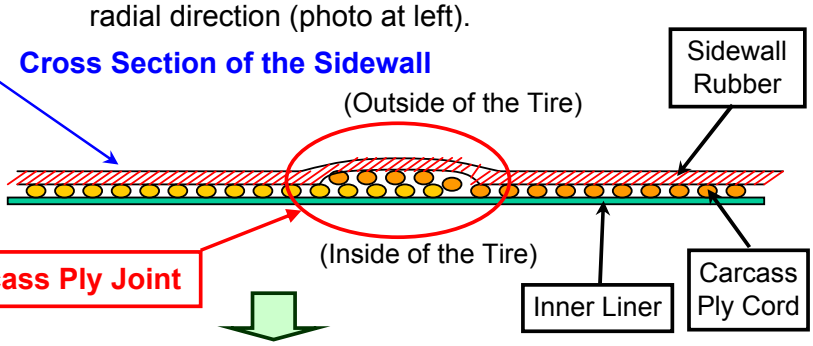
A tire is composed of many parts, such as tread rubber, steel belts, carcass ply, sidewall rubber, beads and so on.

Indentation is usually seen at or around the carcass ply joint, and is more common with a tire of high section height.

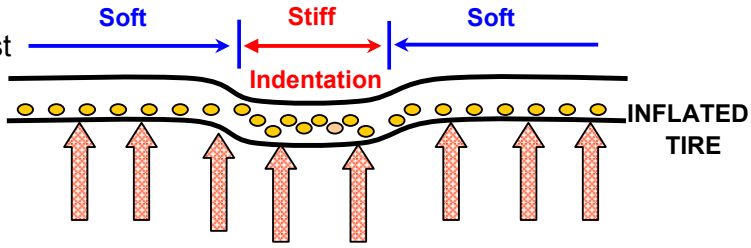
How indentation occurs.



The carcass ply joint is overlapped at the building stage as shown below. When the tire is inflated, the sidewall stretches less at the joint area than the remainder of the tire because it is stiffer there, thus creating a depression in the radial direction (photo at left).



Although this appearance may not be favourable, it is just cosmetic and the tire can be used. This is more noticeable in high inflation pressure LTR tires.



2. Bulge or Protrusion in the Sidewall.

A sidewall bulge or protrusion is usually due to broken ply cords resulting from impact damage by kerbs or potholes. As the sidewall strength is considerably reduced at this area, keeping such a tire in service is dangerous. Such a tire must demounted immediately and scrapped.

Other possible causes for this condition include mounting damage, punctured tread, improper repair, pinch shock etc. On a brand new tire, a bulge may be associated with a manufacturing condition.

Regardless of the actual cause, any tire with a bulge or protrusion must be permanently removed from service.

Carcass plies are broken by a shock due to hitting a pothole or a kerb.