National Transportation Safety Board
Tire Safety Symposium
Washington D.C.

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Today’s Topics

Tire Construction – The Laminate Pieces
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Tire Construction – The laminate pieces

Overview of Common Failure Modes
Today’s Topics

Tire Construction – The laminate pieces

Overview of Common Failure Modes

What can Vehicle Owners do?
Today’s Topics

Tire Construction – The laminate pieces

Overview of Common Failure Modes

What can everyone do?

Appearances are Not Deceiving
Step-down Passenger Tire
• Belt Structure – Passenger
• Belt Structure – Light Truck
Lower Sidewall Construction

- Innerliner
- Sidewall
- Outside Rubber Reinforcement
- Bead Filler
- Bead – Tape / Weftless
- Rubber Chafer / Abrasion Strip
- Ply Turn-up Ending
Lower Sidewall Construction

- Innerliner
- Sidewall
- Outside Rubber Reinforcement
- Flipper
- Bead Filler
- Turn-down ply
- Rubbers Chafer / Abrasion Strip
- Bead – Tape / Weftless
- Ply Turn-up Ending
Nylon Overlay Strips
Step-down Passenger Tire
Overlay Strips and Belts
Most Common Failure Modes

- Overdeflection
  - Underinflation / Overload

- Impact Related
  - Immediate or after Time/Miles

- ICP (Intra-Carcass Pressurization)
  - Breach of the Innerliner

- Puncture / Poor Repair
  - Plugs with no Patches, Patches with no Plugs or Incorrect Location

- Environmental
  - Don’t abuse the tire

- Physiological Damage
  - Loss of Elasticity in the Tire
Belt to Belt Separation

Double Parabola followed by tread/belt detachment
Overdeflection noted at the Compression Groove
Severe case of Overdeflection – Run Flat

Photos courtesy of B. Hagerty
What can vehicle owners do?

What can vehicle owners do?

Vehicle Placard – Owner’s Manual - NOT THE SIDEWALL
What can vehicle owners do?

Walk around the vehicle when you fill up with gas

......AND LOOK AT THE TIRES!
What can vehicle owners do?

Whenever you approach your vehicle

..... LOOK AT THE DRIVER’S SIDE TIRES!
What can vehicle owners do?

Listen and feel what the vehicle is telling you

Take the car to a professional tire shop when you see something that doesn’t appear right

Follow general good maintenance practices (inflation/rotation/alignments)
What can vehicle owners do?

Replace the tires at 4/32”
What can Vehicle Owners Look for?

- Uneven, treadwear inboard (side facing the axle) & outboard (side facing you)
- Uneven treadwear within the tread
- Fast shoulder wear
- Localized fast wear
- Bulges or bumps
Localized Fast Wear
Localized Fast Wear
One shoulder does not appear like the other

Camber

One shoulder worn much more than the other
Cuts, Snags, Gouges – Physical Damage
Ozone Deterioration (Weather Checking)
Tread Cracking, Tearing, Cutting / Chipping
Bulges
In Summary

• There is a lot that the tire owner can do to maintain their tires and reduce the risk of tire failure

• Maintenance requires some vigilance on the owner’s part – The tire is the only part of the car/truck in contact with the earth

• The tire is a highly engineered laminate structure

• **Keep Air in the Tire** – **Keep Air in the Tire** – **Keep Air in the Tire** – **Keep Air in the Tire** – **Keep Air in the Tire**
Thank you NTSB for the invitation and privilege to present today