

The logo features a stylized 'B' with a red triangle on its left side.

BRIDGESTONE

Your Journey, Our Passion

A red triangular graphic element in the bottom right corner of the page.

Advances in Tire Technology

Some Thoughts from Bridgestone Americas

Presented at the
Passenger Vehicle Tire Safety Symposium
National Transportation Safety Board
December 10, 2014

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Introduction

- **Bridgestone Briefly**
 - Globally
 - The Americas
- **Some Key Points About Tire Technology**
 - Performance Minimums
 - Regulations to Accelerate Innovation
- **Some Key Considerations for the Industry**
 - Pressure will Always Mean Pressure
 - Tires + Cars + Technology = Enhanced Traceability

Introduction

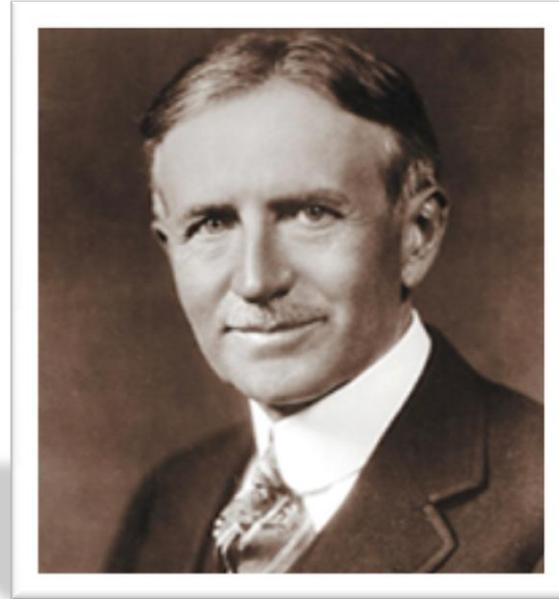
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100 Years and Counting



Shojiro Ishibashi

Founded 1931



Harvey Firestone

Founded 1900



1 in 6 tires made
in the world is
manufactured
by **Bridgestone**
Group

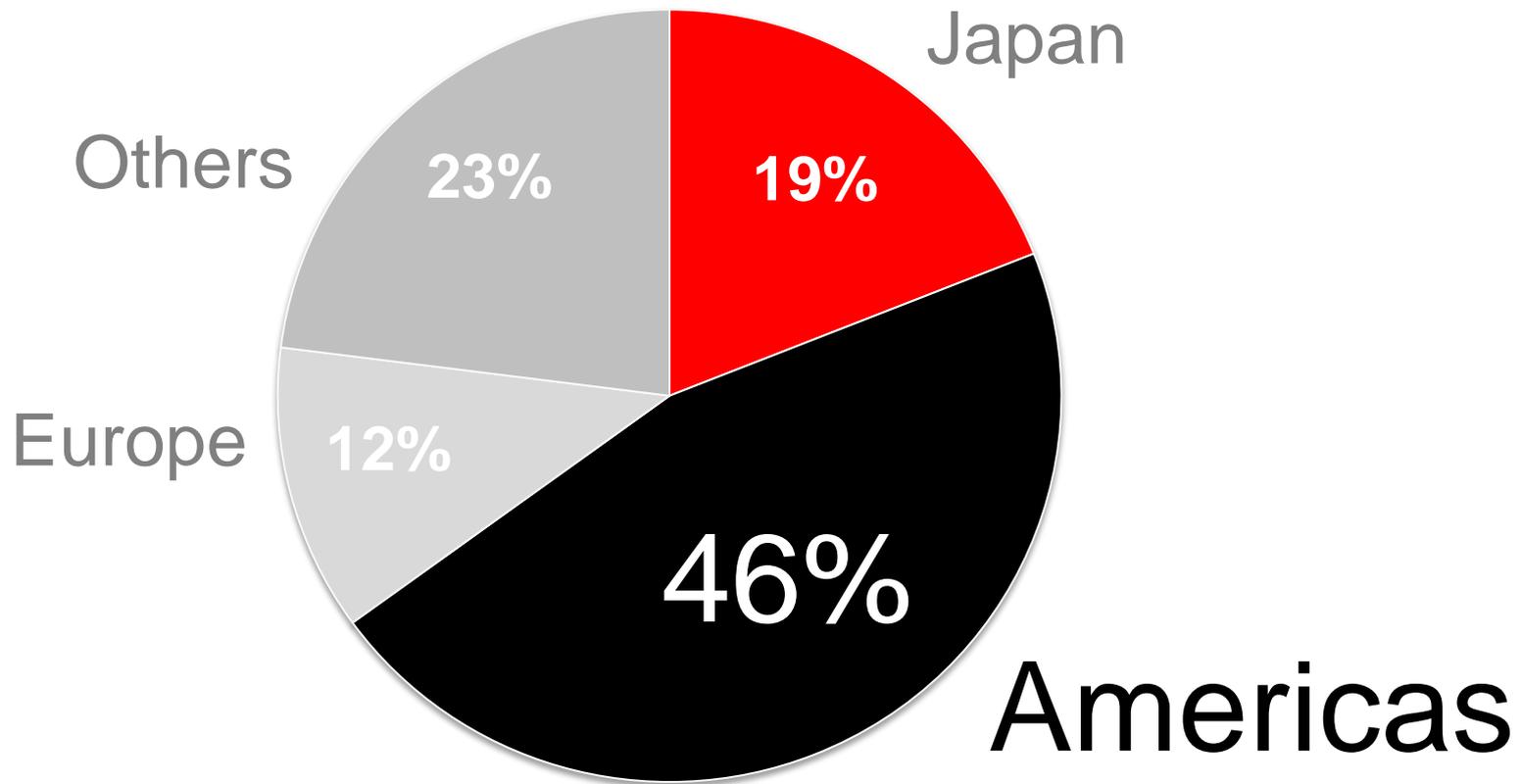
Largest Tire & Rubber Company in the World

Global Group Sales: US \$36 billion



Net Global Sales (2013)

Largest Subsidiary of Bridgestone Group



(Sales by Geographical Segment)

Source: 2013 Annual Report

Bridgestone Americas – A Diverse Footprint

Firestone Natural Rubber



Firestone Fibers and Textiles



Bridgestone Americas Tire Ops



Bridgestone Retail Operations



Firestone Building Products



Firestone Industrial Products



It's All About The BOSS

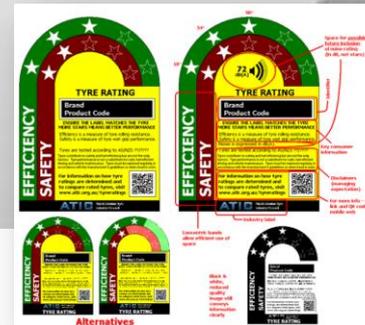
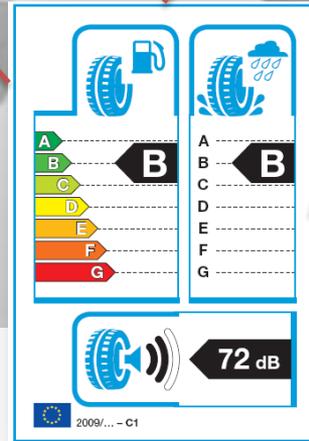


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Performance Minimums Needed

Emphasis on Rolling Resistance



Performance Minimums Needed



 29542

 Federal Register / Vol. 74, No. 118 / Monday, June 22, 2009 / Proposed Rules

DEPARTMENT OF TRANSPORTATION
 National Highway Traffic Safety Administration
 49 CFR Part 575
 [Docket No. NHTSA-2008-0121]
 RIN 2127-AK45
Tire Fuel Efficiency Consumer Information Program
 AGENCY: National Highway Traffic Safety Administration, Department of Transportation (NHTSA).
 ACTION: Notice of proposed rulemaking (NPRM).

By putting information on all three parameters on a label, a consumer would factor any possible tradeoffs between rolling resistance, traction, and treadwear, and/or cost differences between tires. That is, with all three ratings on one label, a consumer could see whether they were opting for a decrease in traction and treadwear to gain improved rolling resistance.

Labeling Acknowledges Trade-offs

Minimums will also help consumers make best decisions

Addendum 116 – Regulation No. 117

Revision 2 - Amendment 2

Supplement 2 to the 02 series of amendments – Date of entry into force: 15 July 2013

Uniform provisions concerning the approval of tyres with regard to rolling sound emissions and/or to adhesion on wet surfaces and/or to rolling resistance

Category of use	Wet grip index (G)
Normal tyre	≥ 1.1
Snow tyre	≥ 1.1
"Snow tyre for use in severe snow conditions" and with a speed symbol ("R" and above, including "H") indicating a maximum permissible speed greater than 160 km/h	≥ 1.0
"Snow tyre for use in severe snow conditions" and with a speed symbol ("Q" or below excluding "H") indicating a maximum permissible speed not greater than 160 km/h	≥ 0.9
Special use tyre	Not defined

Wet Grip

Stage 1		Limit dB(A)
Category of use		
Normal tyre		76
Snow tyre		78
Special use tyre		79

Tyre class	Max value (N/kN)
C1	12.0
C2	10.5
C3	8.0

For "snow tyre for use in severe snow conditions", the limits shall be increased by 1 N/kN.

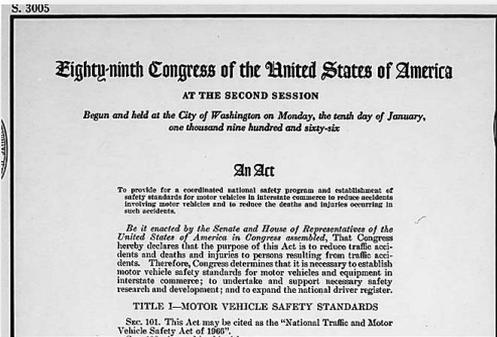
Rolling Resistance

Regulations Can Accelerate Innovation

Technical Innovation Needs “Regulatory Innovation”

Senate Report 1301 (1966): ...at least once every 2 years, as Federal safety research and development matures, the Secretary is directed to issue new and revised standards ... the new and revised **standards are expected to be performance standards, specifying the required minimum safe performance of vehicles but not the manner in which the manufacturer is to achieve the specified performance ...** **Manufacturers and parts suppliers will thus be free to compete in developing and selecting devices and structures that can meet or surpass the performance standard.**

The Secretary would thus be concerned with the measurable performance of a braking system, but not its design details. Such standards will be analogous to a building code which specifies the minimum load-carrying characteristics of the structural members of a building wall, but leaves the builder free to choose his own materials and design. **Such safe performance standards are thus not intended or likely to stifle innovation in automotive design.**



1966

Title 49: Transportation

PART 555—TEMPORARY EXEMPTION FROM MOTOR VEHICLE SAFETY AND BUMPER STANDARDS

Subpart A—General

§555.2 Purpose.

(a) The purpose of this part is to provide a means by which manufacturers of motor vehicles may obtain temporary exemptions from Federal motor vehicle safety standards on the basis of substantial economic hardship, facilitation of the development of new motor vehicle safety or low-emission engine features, or existence of an equivalent overall level of motor vehicle safety.

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Pressure is Pressure – And Needs to be Maintained

*Tire Pressure
Maintenance is
Critical*



c) Press the tire gauge straight and firmly until the scale extends.



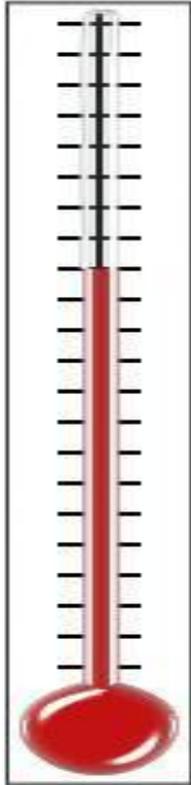
Pressure is Pressure – And Needs to be Respected

Tire Pressure Maintenance is Critical – Consumer Behavior is KEY



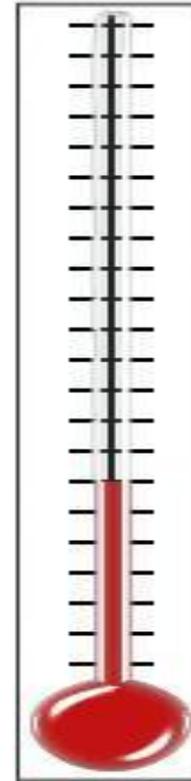
Tires + Cars + Technology = Enhanced Traceability

Target is 100%



Vehicle

Target is 100%



Tire

*Effectiveness
Can Be
Increased*

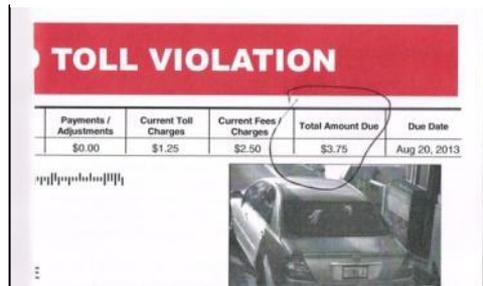
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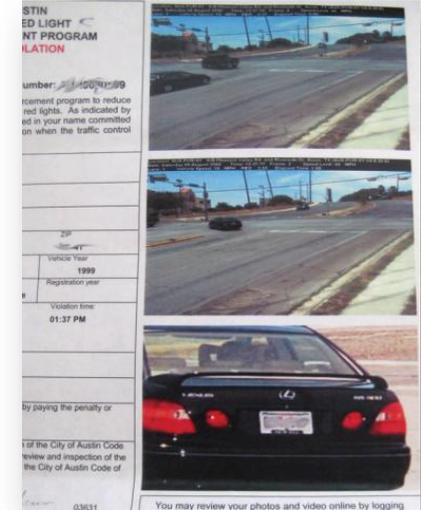
Police Equipped With License Plate Cameras



Oil Changes, Tires Rotated or Car Repairs



Tollbooth Cameras



**"Photo-Enforcement"
Intersections**



DMV

What if We Had RFID Tags in All Consumer Tires...?

Tires + Cars + Technology = Enhanced Traceability

Goal is Tracking Down Recalled Tires

WARNING: This vehicle is equipped with a **RECALLED** tire on the LR position.

**TireCo TreadTrac LT275/70R18 125/122S
Load Range E Black Sidewall DOT P5 15
46YB 4307**

**Call TireCo Customer Relations at
888.788.2168 for replacement
instructions.**

Dear Mr. Smith:

A TireCo TreadTrac tire that is currently subject to a manufacturer's recall was detected on a vehicle registered in your name at the Ohio Turnpike / Interstate 71 tollbooth on September 10, 2013.

The manufacturer has determined that this tire has a defect which relates to motor vehicle safety. It is vital that you have this tire replaced.

Please call TireCo customer relations at 888.788.2168 for the location of the service center nearest you and to set up an appointment. You are entitled to a **FREE** replacement of this tire, plus **FREE** installation and balancing.

Tires + Cars + Technology = Enhanced Traceability

Government & Industry Collaboration Driving Improvement:

- Modernize FMVSSs related to tires so as not to inhibit introduction of new technology.
- Combined consumer EDUCATION with consumer PROTECTION (thresholds for minimum rolling resistance and wet grip).
- Incentives / requirements for improved TPMS.
- Create / maintain nationwide database of recalled tires and standardize the data infrastructure to enhance consumer compliance with tire recall campaigns.

<http://www.tiresafety.com/>



CONSTRUCTION SIZES & CLASSIFICATIONS REPLACEMENT MAINTENANCE TIRE TERMS SAFETY SUMMARY DRIVING TIPS HOME

Bridgestone is pleased to present TireSafety.com in the interest of public safety.

Proper tire maintenance is an important safety function often neglected. The importance of properly maintaining your tires cannot be overemphasized. Remember, tires are the only contact between your vehicle and the road.

Under inflation is the leading cause of tire failure. Using the interactive tire pressure demo you can easily see how a tire can be as much as 50% under inflated before it is visibly noticeable. Not only are under inflated tires more prone to damage and failure, but they can lead to higher fuel costs by as much as 3 to 5¢ per gallon.

Be sure to sign up for free monthly email reminders to check your air pressure, if you haven't already. As you make your way through the site you'll find a wealth of information on tire construction, sizes, classifications, replacement, driving tips and most importantly, proper tire maintenance.

100% of recommended inflation pressure PSI?



Interactive Tire Pressure Demo
100% ◀ ██████████ ▶ 10%

To receive free monthly email reminders to check your air pressure.

my **tiresafety.com**

Member login  Tiresafety.com

Sponsored by:
BRIDGESTONE Firestone

Did you know
each month three out of four drivers wash their cars while only one out of seven correctly checks tire pressure?

That's only 15% of all car drivers.
Check your owner's manual for the recommended tire pressure from the manufacturer.

the **TIRE INDUSTRY ASSOCIATION** presents



NHTSA Safety PSA - 2007

Being safe on the road means combining driving know-how with good habits. **TEENS DRIVE SMART** is an initiative from Bridgestone Americas focused on promoting driver safety knowledge and smarts where young drivers are: at the intersection of responsibility and driving excitement.

TEENS DRIVE SMART Presented by BRIDGESTONE

<http://www.teensdrivesmart.com/>