<table>
<thead>
<tr>
<th><strong>Docketed Date:</strong></th>
<th>2/25/2021</th>
</tr>
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<tbody>
<tr>
<td><strong>Submitter Role:</strong></td>
<td>Commission Staff</td>
</tr>
<tr>
<td><strong>Submission Date:</strong></td>
<td>2/25/2021 11:03:24 AM</td>
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<tr>
<td><strong>Filer:</strong></td>
<td>Spencer Kelley</td>
</tr>
<tr>
<td><strong>Organization:</strong></td>
<td>California Energy Commission</td>
</tr>
<tr>
<td><strong>Document Title:</strong></td>
<td>Presentation - United States Tire Manufacturers Association - Tire Workshop 2-18-2021</td>
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<tr>
<td><strong>TN #:</strong></td>
<td>236895</td>
</tr>
<tr>
<td><strong>Project Title:</strong></td>
<td>Tire Efficiency Order Instituting Information Proceeding</td>
</tr>
<tr>
<td><strong>Docket Number:</strong></td>
<td>20-TIRE-01</td>
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Presentation Overview

USTMA/Overview

What does your tire do?

How are tires regulated?

Tire design for the marketplace

Questions and Discussion
USTMA Full Corporate Members
<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>USTMA members share of U.S. tire shipments</td>
<td>79%*</td>
</tr>
<tr>
<td>Total tire manufacturing industry size in U.S.</td>
<td>$148.4 billion</td>
</tr>
<tr>
<td>Total jobs supported by U.S. tire manufacturing</td>
<td>737,000</td>
</tr>
<tr>
<td>Direct U.S. jobs through manufacturing, distribution and retailing</td>
<td>284,000</td>
</tr>
<tr>
<td>Additional U.S. indirect jobs in supplier and related activities</td>
<td>450,000</td>
</tr>
</tbody>
</table>

WHAT DOES YOUR TIRE DO?
What Does Your Tire Do?

Your tire is the only thing that connects your motor vehicle to the ground.

150 cm² = 1 HAND

500 cm² = 3 HANDS
What Does Your Tire Do?

Grip and road handling:

1. carry
2. drive & brake
3. steer
Interaction of Tire Performance Parameters

- Tire design is an exercise in balance and choice
- Improving or optimizing one performance parameter significantly impacts others
Key Tire Performances
HOW DO TIRES AFFECT FUEL ECONOMY?
Energy Requirements for Combined City/Highway Driving

Engine Losses: 68% - 72%
- thermal, such as radiator
- exhaust heat, etc. (58% - 62%)
- combustion (3%)
- pumping (4%)
- friction (3%)

Auxiliary Electrical Losses: 0% - 2%
- (e.g., climate control fans, seat and steering wheel warmers, headlights, etc.)

Parasitic Losses: 4% - 6%
- (e.g., water, fuel and oil pumps, ignition system, engine control system, etc.)

Power to Wheels: 16% - 25%
- Dissipated as
- wind resistance (6% - 12%)
- rolling resistance (4% - 7%)
- braking (4% - 7%)

Drivetrain Losses: 5% - 6%

Idle Losses: 3%
In this figure, they are accounted for as part of the engine and parasitic losses.

Some percentages may not add to 100% due to rounding.

Source: https://www.fueleconomy.gov/feg/atv.shtml
What is Tire Rolling Resistance?

“The force at the axle in the direction of travel required to make a loaded tire roll.”

Key Performance Trade-offs

Rolling Resistance

Wet Traction

Treadwear
HOW ARE TIRES REGULATED IN THE U.S.?
# Federal Motor Vehicle Safety Standards affecting tires

**Safety Act, 49 U.S.C. §§ 30103-30105 et seq.**

<table>
<thead>
<tr>
<th>FMVSS Number</th>
<th>CFR Citation</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard No. 109</td>
<td>49 CFR 571.109</td>
<td>New pneumatic and certain specialty tires. (FMVSS 109)</td>
</tr>
<tr>
<td>Standard No. 110</td>
<td>49 CFR 571.110</td>
<td>Tire selection and rims and motor home/recreation vehicle trailer load carrying capacity information for motor vehicles with a GVWR of 4,536 kilograms (10,000 pounds) or less.</td>
</tr>
<tr>
<td>Standard No. 119</td>
<td>49 CFR 571.119</td>
<td>New pneumatic tires for motor vehicles with a GVWR of more than 4,536 kilograms (10,000 pounds) and motorcycles.</td>
</tr>
<tr>
<td>Standard No. 120</td>
<td>49 CFR 571.120</td>
<td>Tire selection and rims and motor home/recreation vehicle trailer load carrying capacity information for motor vehicles with a GVWR of more than 4,536 kilograms (10,000 pounds).</td>
</tr>
<tr>
<td>Standard No. 138</td>
<td>49 CFR 571.138</td>
<td>Tire pressure monitoring systems.</td>
</tr>
<tr>
<td>Standard No. 139</td>
<td>CFR 571.139</td>
<td>New pneumatic radial tires for light vehicles.</td>
</tr>
</tbody>
</table>
Highlight on FMVSS No. 139

Scope: new pneumatic radial tires for vehicles weighing 10,000 GVWR or less made after 1975, with some exceptions

Key performance tests:
- Endurance/low pressure test – most stringent performance test in the world
- High speed test

Other Requirements
- Physical dimensions
- Marking requirements
- Plunger energy test
- Bead unseating test

Compliance by self-certification: tire manufacturer self-certifies tire that is in compliance with FMVSS by including “DOT” on sidewall of tire; tires subject to NHTSA compliance audits, investigation and potential recall
# Consumer Information and Standards

## Uniform Tire Quality Grading (UTQG)
- Requires sidewall grading of passenger tires for wet traction, tread wear and temperature

## Consumer Tire Information Rule
- Mandated by Congress in 2007
- Requires consumer ratings at point of sale for wet traction, rolling resistance (tire efficiency), and tread wear
- When complete, will assist consumers with comparing tire performances across models, brands and manufacturers

## Performance Standards
- 2015 Congressional mandate that NHTSA develop minimum performance standards for tire efficiency and wet grip
- Must evaluate higher speed rated tires to ensure no disparate effect
- Must use ISO 28580 (rolling resistance test method) and UN Regulation No. 117 wet grip test method
TIRE DESIGN FOR THE MARKETPLACE
What is the perfect tire? It depends!

• What kind of vehicle do you drive?
  o The consumer has already made vehicle choice by the tire they are buying replacement tires!
  o Gas engine? Electric vehicle? Hybrid?
• Is the tire original equipment or a replacement tire?
• How are the roads you use?
  o Well-maintained? Rough? Curvy? Mountainous?
  o Do you need to drive off-road?
• What is your weather like?
  o Do you have different seasons? Rain? Snow? Hot? Cold?
• What kind of driving do you do?
  o Long distances, long commute or trips? Short trips mostly? Some of both? Traffic?
  o Do you use your vehicle for work? Do you haul heavy items?
Original Equipment vs. Replacement Tires

- Original equipment tires
  - Tires designed for specific year/make/model/trim level of vehicle
  - Focus on fuel economy, ride, noise, “new car feel”
  - Adequate (not optimized) wet traction, treadwear
  - No treadwear warranties – enough to get through a lease period
- Replacement tires (all-season)
  - Tire designed to perform well on wide range of vehicles (as many as 30 fitments for a single tire size/speed rating)
  - Consumers demand optimized treadwear and wet traction performance
  - Expected treadwear warranties between 40,000 – 80,000 miles
- USTMA considers all tires to be replacement tires for purposes of regulation

Global Passenger Tire Markets are Very Different

United States

- All-season, 83.7%
- Summer, 4.4%
- All-terrain, 5.5%
- 3PMS, 6.3%


Canada

- All-season, 43.5%
- Summer, 0.1%
- All-terrain, 2.2%
- 3PMS, 54.2%


Europe

- Summer, 64.5%
- All-terrain, 0.4%
- 3PMS, 35.0%


Notes: 3PMS Category includes dedicated winter and 4-season with 3PMS marking. European summer category may include small percentage of tires with M+S marking.
## Major Passenger Tire Market Segments

<table>
<thead>
<tr>
<th>Performance Category</th>
<th>U.S. Major Tire Segments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All-season</td>
</tr>
<tr>
<td>Ride and Comfort</td>
<td>Best</td>
</tr>
<tr>
<td>Handling</td>
<td>Good</td>
</tr>
<tr>
<td>Wet traction</td>
<td>Good</td>
</tr>
<tr>
<td>Dry traction</td>
<td>Good</td>
</tr>
<tr>
<td>Treadwear</td>
<td>Best</td>
</tr>
<tr>
<td>Winter traction</td>
<td>Good</td>
</tr>
<tr>
<td>Off-road</td>
<td>Fair</td>
</tr>
</tbody>
</table>
Relative Size of Major U.S. Tire Segments

- Several sub-segments exist within each major market segment
- All-season is largest market segment in the U.S.
- All-season can be used to illustrate examples of subsegments in next slide

## All-season Tire Segment

<table>
<thead>
<tr>
<th>Performance Category</th>
<th>All-season sub-segment breakout (illustration)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Touring</td>
</tr>
<tr>
<td>Ride and Comfort</td>
<td>Good</td>
</tr>
<tr>
<td>Handling</td>
<td>Good</td>
</tr>
<tr>
<td>Wet traction</td>
<td>Good</td>
</tr>
<tr>
<td>Dry traction</td>
<td>Good</td>
</tr>
<tr>
<td>Treadwear</td>
<td>Better</td>
</tr>
<tr>
<td>Winter traction</td>
<td>Better</td>
</tr>
</tbody>
</table>
Tire Speed Ratings Also can Segment Tire Performance

- All speed rating groups are present in both touring and performance sub-segments

### USTMA Passenger Tire Speed Rating Popularity (2019-2020 OE + Replacement)

- **H&V**: 59.3%
- **T&Below**: 31.2%
- **Above V**: 9.5%


<table>
<thead>
<tr>
<th>Speed Symbol Group</th>
<th>Maximum Speed in group</th>
</tr>
</thead>
<tbody>
<tr>
<td>T &amp; Below</td>
<td>190 kph/118 mph</td>
</tr>
<tr>
<td>H&amp;V</td>
<td>240 kph/149 mph</td>
</tr>
<tr>
<td>Above V</td>
<td>&gt;240 kph/149 mph</td>
</tr>
</tbody>
</table>
2020 USTMA Passenger Tire Replacement Shipments by Brand Type and Channel Type

2020 USTMA Replacement Tire Shipments by Brand Type

- Manufacturers: 76.0%
- Associate: 11.1%
- Private: 12.9%


2020 USTMA Replacement Tire Shipments by Channel Type

- National Dealer: 45.9%
- Regional Dealer: 16.7%
- Local Dealer: 14.9%
- Other: 7.1%
- General Merchandise: 9.8%
- Company Outlet: 5.5%

USTMA Passenger Tire Replacement Shipments by U.S. Region

U.S. Regions

New England
(Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)

Middle Atlantic
(Pennsylvania, New Jersey, New York)

South Atlantic
(Florida, Georgia, North Carolina, South Carolina, West Virginia)

East North Central
(Illinois, Indiana, Michigan, Ohio, Wisconsin)

East South Central
(Alabama, Kentucky, Mississippi, Tennessee)

West North Central
(Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota)

West South Central
(Arkansas, Louisiana, Oklahoma, Texas)

Mountain
(Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming)

Pacific
(Alaska, California, Hawaii, Oregon, Washington)

Summary

**Tires are complex, highly engineered products designed to deliver performance meeting needs of a range of customers**

- Safety is the primary consideration in tire design
- When a tire is optimized for one performance, other attributes are affected

**U.S. tire market is unique**

- Dominated by all-season tires, unlike the EU tire market where summer and winter tires are most popular
- OE and replacement market tire markets are distinct, with different tire attributes
- Replacement tire customers value long tread life, all-season traction and price

**USTMA looks forward to working with CEC on this proceeding and welcomes the opportunity to provide further education, information and data throughout the process**
Thank you!

Contact information:

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U.S. Tire Manufacturers Association  
Email: tnorberg@ustires.org