February 18, 2020

Honorable James C. Owens
Acting Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, S.E.
West Building
Washington, DC 20590

RE: Federal Motor Vehicle Safety Standards for Tires; Docket No. NHTSA-2019-0011

Dear Acting Administrator Owens:

Michelin North America, Inc. ("Michelin") appreciates the opportunity to offer comments on the National Highway Traffic Safety Administration's ("NHTSA") Advanced Notice of Proposed Rulemaking ("ANPRM or "Notice") seeking comment on provisions of the Federal Motor Vehicle Safety Standards ("FMVSS") for tires.[1]

Michelin concurs with and joins the comments filed in response to this ANPRM by the U.S. Tire Manufacturers Association ("USTMA"). In addition, Michelin offers its own separate comments on the following issues, which are discussed in greater detail below:

- The Tire Strength (Plunger Energy) and Bead Unseating Resistance Tests under FMVSS 139 are obsolete and provide no safety benefit, therefore, they should be eliminated;
- The Tire Endurance Test Parasitic tread chunking pass/fail criteria under FMVSS 139 measures a benign condition that is not representative of real-world use, therefore, this criteria also provides no safety benefit and should be removed from the Tire Endurance Test;
- Certain tire markings that are required under the FMVSS for pneumatic tires should not be applied to non-pneumatic tire assemblies;
- Any new or modified FMVSS for tires should not be rigid technology-based standards, but rather should establish performance-based standards that pair design flexibility with robust performance and testing requirements to verify required levels of safety;
- Michelin urges NHTSA to consider the following concrete actions to remove unnecessary regulatory barriers to tire innovation:

[1] 84 Fed. Reg. 69698 (December 19, 2019).

- Prioritize prompt action on Michelin's petition for rulemaking to remove unnecessary regulatory barriers to non-pneumatic innovation by the tire industry;

- Facilitate deployment of innovative new tread compounds and tread patterns with the potential to deliver significant safety and performance improvements in tread wear, rolling resistance, wet grip and snow traction; and

- Update the Uniform Tire Quality Grading Standards ("UTQGS") by bringing the existing traction grading into conformity with modern antilock braking systems.

I. Introduction

Michelin manufactures and sells tires for automobiles, airplanes, farm equipment, heavy duty trucks, motorcycles, and bicycles. We operate 19 plants located in 8 States and Nova Scotia, Canada and employ over 22,000 people in North America.[2] The Company has earned a long-standing reputation for building innovative premium tires. Michelin also offers a full range of innovative services and solutions that help make mobility safer, more efficient, and more environmentally friendly. Michelin's Research and Development ("R&D") Company in North America employs over 1,060 engineers and other staff who have been responsible for bringing some of the finest products in the world to market, including the first 80,000-mile passenger tire for American-made vehicles.[3]

As a registered motor vehicle equipment manufacturer, Michelin commends NHTSA for seeking public comment on modifications to the existing standards and tests, including Tire Strength Test (Plunger Energy Test), Bead Unseating Resistance Test, Tire Endurance Test, Tire Marking requirements, as well as other matters related to emerging tire innovations.

II. Michelin Responses to Requests for Comment

A. Tire Strength (Plunger Energy) and Tire Bead Unseating Resistance Test

Michelin concurs with and joins the comments of the USTMA regarding the Tire Strength (Plunger Energy) Test under FMVSS 139 (S6.5) and the Bead Unseating Resistance Test under FMVSS 139 (S6.6).

As USTMA explains, the Strength (Plunger Energy) Test requirements under FMVSS 139 were intended for pneumatic bias ply tires. These test requirements neither meaningfully address pneumatic radial tires, which have a significantly different structure and mechanical behavior than pneumatic bias ply tires, nor provide any safety benefits for consumers. The Strength Test is difficult to perform on many popular low aspect pneumatic radial passenger tires because the plunger "bottoms out" on the rim prior to reaching the required force under the test

[2] Michelin operates 15 plants in the U.S., located in Greenville, SC; Spartanburg, SC; Lexington, SC; Sandy Springs, SC; Starr, SC; Duncan, SC; Covington, GA; Norwood, NC; Dothan, AL; Tuscaloosa, AL; Louisville, KY; Fort Wayne, IN; Kansas City, MO; Ardmore, OK.

[3] On October 7, 2019, Michelin was awarded the 2019 SmartWay Excellence Award, the Environmental Protection Agency's highest recognition for leadership in freight, supply chain, energy and environmental performance. More information is available at https://www.michelinmedia.com/pages/blog/detail/article/c0/a908/.

procedure. As a result, the industry has been forced to develop deep well rims solely for testing purposes. Specially-fabricated deep well rims add cost and complexity to compliance testing and, more importantly, are not representative of real-world conditions (the rim wells on the market are as shallow as possible to provide as much as room as possible for the brake caliper, and also for weight and cost optimization). FMVSS testing conditions and procedures that are not representative of real-world conditions, provide no real safety benefit, and may incentivize designs intended to meet testing parameters, rather than improve real-world performance and safety. Accordingly, the Strength Test should be eliminated.

Likewise, the regulatory requirements for the Bead Unseating Test under FMVSS 139 for passenger and light truck pneumatic radial tires are obsolete and unjustified and should also be eliminated. The bead unseating regulations, which were designed for pneumatic bias ply tires over a half a century ago, are obsolete and also not a functionally relevant test for this performance on the pneumatic radial tires that dominate today's tire market. Further, application of the regulations to pneumatic radial tires provides no safety benefit to consumers while simultaneously increasing the costs of tire development and production.

B. Tire Endurance Test: Failure Due to Chunking

Michelin concurs with and joins the comments of the USTMA regarding the Tire Endurance Test (chunking of tread blocks as a damage condition) under FMVSS 139 (S6.3.2(a)). Parasitic tread chunk failure should be eliminated as a failure condition because it is not indicative of a tire structural problem and does not pose a safety threat. The test, which requires running a tire on a curved road wheel, creates significantly higher temperatures than tires encounter in real world highway application. The result is increased adhesion to the road wheel, which causes increased strain on the tread block elements. This leads to further elevation in tread block temperatures, tread rubber strength reduction, and tearing of the rubber which results in chunking within the tread block. These conditions are not representative of real-world use. More importantly, unlike failure conditions that indicate structural problems and safety risks (such as tread separation or sidewall separation), parasitic tread chunking is benign and does not interfere with safe tire operation.

Tire manufacturers are forced to spend significant time and resources to overcome this artificial failure mode, which leads to unnecessarily higher costs and research and development delays. It costs Michelin millions of dollars to overcome the parasitic failure mode in the development and launch of our products. Further, a significant cost of the current test is forgone benefits of new technologies that are impeded by the tread chunking failure mode. We believe that if the parasitic tread block chunking did not result in test failure, Michelin could bring to market tread compounds and tread patterns that would deliver significant performance improvements in tread wear, rolling resistance, wet grip and snow traction (by as much as 20 percent).

In sum, because the Endurance/Low Pressure test conditions do not occur in real world highway driving, and because chunking which does not expose reinforcing material does not pose a significant safety hazard even when it occurs, the existing test imposes significant costs without commensurate safety benefits. The irrelevant failure condition also impedes innovations

that would improve wet traction, tread wear, snow traction, and rolling resistance, thereby denying consumers both increased safety and cost savings. Accordingly, parasitic tread block chunking should be eliminated as a failure condition in the Endurance Test.

C. Tire Markings for Ply Description, Ply Rating, Tubeless, and Radial

Michelin concurs with and joins the comments of USTMA concerning tire markings for pneumatic radial tires. Michelin also comments separately here on the potential application of tire marking requirements to non-pneumatic tires. The following table lists the pneumatic radial tire markings required by FMVSS No. 139 (S5.5) and identifies whether there would be corresponding non-pneumatic marking.

49 CFR 571.139 S5.5	Non-Pneumatic
a.) DOT Symbol	Not required until an applicable FMVSS is promulgated
b.) Size Designation	Not applicable until industry standard or other recognized sizing convention is developed
c.) Inflation Pressure	Not applicable
d.) Maximum load	Not applicable until industry standard or other recognized sizing convention is developed
e.) Cord Material *	Not applicable
f.) Number of Plies *	Not applicable
g.) Word "Tubeless" *	Not applicable
h.) Word "Radial" *	Not applicable
i.) Alpine Symbol	If applicable based on industry defined snow test

** Indicates markings currently being considered for suppression under the Regulatory Reduction Act*

Where particular tire markings are by definition not applicable to non-pneumatic tire assemblies, no new FMVSS should be considered. Other markings should be considered only if necessary.

FMVSS No. 139 (S5.5) also addresses location and size of markings. Because of the very narrow sidewall on a non-pneumatic tire assembly, it would be difficult to affix all of the foregoing tire markings. Recognizing the lack of a sidewall surface on non-pneumatic tire assemblies, the FMVSS already provide for Tire Identification Number marking in alternate locations on the tire assembly.[4] Similar accommodation should be made for the other markings, including any of those noted in the foregoing table that are determined to be necessary for non-pneumatic tire assemblies. While it may be feasible to mold the markings on the edge of the tread surface, this location is not well protected from curb scrubbing or other usage conditions which may obliterate the markings. In addition, any future FMVSS for labeling non-pneumatic

[4] *See* 49 CFR § 574.5(a)(3).

tire assemblies should consider the alternative use of electronic tire identification RFID as a better and more reliable solution for non-pneumatic tire assembly markings.

D. Other Tire-Related Issues – Emerging Tire Innovations and Removal of Regulatory Barriers to Enhanced Motor Vehicle Safety

NHTSA has solicited comments regarding emerging tire innovations and trends that may enhance motor vehicle safety, whether the existing FMVSS impede tire innovations, and what regulatory actions from NHTSA are needed to remove regulatory barriers to innovation.

Michelin has a long history of driving innovation to bring new solutions for better mobility to the market. In 1946, Michelin invented the pneumatic radial tire structure. Pneumatic radial tires were a transformative advancement in tire technology as they were more resistant to most types of failure modes, more pleasant to drive, and more economical than pneumatic bias ply tires. Michelin's tradition of innovation has continued through numerous innovative tire solutions since the introduction of pneumatic radial tires.[5] Michelin's teams are constantly working to develop the products and services of the future — for safer, more accessible, cleaner and more connected mobility that consumes less energy and fewer resources.

Accordingly, Michelin appreciates the opportunity to provide these comments on emerging tire innovations and removal of regulatory barriers to enhanced motor vehicle safety.

1. New or Modified FMVSS Should Facilitate Innovation by Pairing Technological Flexibility with Robust Performance and Testing Requirements

Under the Motor Vehicle Safety Act ("Safety Act"), NHTSA has been charged by Congress to protect the driving public against unreasonable risks of harm caused by the design, construction, or performance of motor vehicles or motor vehicle equipment. To accomplish this, NHTSA has established two primary regulatory mechanisms to maintain motor vehicle safety: (1) the FMVSS and the manufacturers' obligation to certify motor vehicles and/or motor vehicle equipment to these standards;[6] and (2) the manufacturers' obligation to identify and remedy defects that present an unreasonable risk to motor vehicle safety.[7]

The FMVSS are principally ***technology-based standards*** that are designed to test and certify the motor vehicles and motor vehicle equipment on the road today. If a manufacturer develops an innovative motor vehicle or motor vehicle equipment design, compliance with the FMVSS governing existing technologies may be very difficult, complicated, or impossible. Consequently, the FMVSS may act as a barrier to innovative products that significantly improve safety. As a result, new safety innovations may require a notice and comment FMVSS rulemaking to revise standards or tests under 49 CFR Parts 552 and 553.

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[5] *See* Attachment, Michelin's History of Innovation.
[6] 49 U.S.C. §§ 30111, 30115.
[7] 49 U.S.C. §§ 30116, 30118, 30120.

Tire manufacturers continue to develop cutting-edge and visionary new tire and wheel products that have the potential to significantly enhance safety and mobility. Michelin believes that to meet NHTSA's strategic priorities to support deployment of innovative vehicle equipment designs, any new or modified FMVSS must facilitate continued innovation. To advance the statutory objective of the FMVSS to reduce traffic accidents and deaths and injuries resulting from traffic accidents,[8] the standards should be designed to verify a product's performance capabilities, not solely to replicate the technology on the road today. Therefore, in accordance with U.S. Department of Transportation standards governing the development and issuance of regulations, new or modified FMVSS should establish ***performance-based standards that pair design flexibility with robust performance and testing requirements to verify required levels of safety.***[9] Because of the rapid pace of technological exchange and development, it is imperative that new or modified FMVSS should ***not*** be rigid technology-based standards.

If a manufacturer develops an innovative new tire design that necessitates a new or modified FMVSS, NHTSA should not assume that all testing standards for legacy technology will be relevant for new product designs. As discussed above and in the comments submitted by the USTMA, the Bead Unseating Resistance and Tire Strength Tests were intended to assess the performance of pneumatic bias ply tires decades ago. Today, they are outdated and ineffective to measure the performance of pneumatic radial tires. The Tire Endurance Test parasitic tread chunking pass/fail criteria measures a benign condition that is not representative of real-world use and provides no safety benefit. Existing standards, tests, and procedures in the current FMVSS may have little-to-no utility to test the safety and effectiveness of innovative new products, particularly non-pneumatic tires. Accordingly, future FMVSS tire rulemakings should evaluate new or modified testing procedures based on credible research, industry standards or recommendations, and recommendations by industry standards organizations (such as ASTM, ISO, SAE, T&RA).

2. Emerging Tire Innovations Will Enhance Motor Vehicle Safety

As noted above, Michelin and other tire manufacturers continually develop cutting-edge and visionary new tire and wheel products that have the potential to significantly enhance safety and mobility. Today, the opportunities for innovation extend beyond the pneumatic radial tire. For that reason, it may be beneficial for NHTSA to consider tire-related innovations in four categories:

(1.) Innovations related to products within the scope of current tire safety standards (FMVSS);
(2.) Innovation related to products outside of the scope of current tire safety standards (Non-FMVSS);
(3.) Non-tire products integrated into the tire to enhance safety (Integrated); and
(4.) Non-tire products impacted by tire innovation (Non-Tire).

[8] 49 U.S.C. § 30101.
[9] 49 CFR § 5.5 (e) – "Regulations should be technologically neutral, and, to the extent feasible, they should specify performance objectives, rather than prescribing specific conduct that regulated entities must adopt."

Examples of tire-related innovations in each of these categories include:

FMVSS	Non-FMVSS	Integrated	Non-Tire
▪ High load capacity tires; ▪ Extended mobility tires; ▪ Tire marking-alternative technologies; ▪ Innovative and sustainable tire materials.	▪ Non-pneumatic (or airless) tires; ▪ Active tire / wheel; and ▪ Smart / connected tires.	▪ RFID and telematics; ▪ Self-inflating tires; ▪ Flexible wheels.	▪ Tire pressure monitoring system; ▪ Tire pressure management.

To the extent that tire-related innovations – including those listed above – are outside the scope of the current FMVSS, NHTSA should not impose new unnecessary barriers to advancements that will enhance motor vehicle safety. Historically, NHTSA has waited to develop new FMVSS for innovative motor vehicles or motor vehicle equipment technology until after the technology has matured. NHTSA recently explained:

> *Traditionally, only after a new technology is developed and proven does the Agency establish new safety standards. This approach has yielded enormous safety benefits*, but one limitation of this approach is that it takes time. Strong safety regulations and standards are a vital piece of NHTSA's safety mission … [However] [t]his Guidance serves in part as a reminder that *even before such rulemaking occurs, NHTSA currently has enforcement authority to address safety risks as they arise*."[10]

Michelin supports the continued implementation this successful regulatory policy which promotes safety innovation. For example, Michelin is a leading innovator in connected tires, including the use of RFID chips to collect information regarding ambient temperature, inflation pressure, tread wear, location, and more. Connected tires have the potential to help drivers adapt their behavior to improve tire performance and durability, and anticipate when tire changes are needed. As these features evolve, tire manufacturers will be able to provide safer and more reliable products, as well as services to enhance performance and driver experience. Accordingly, we urge NHTSA to facilitate research, development, and testing of tire innovations by avoiding new regulatory barriers to safety innovations.

3. Recommendations for Concrete Actions to Remove Regulatory Barriers to Tire Innovation

[10] "NHTSA Enforcement Guidance Bulletin 2016-02: Safety-Related Defects and Automated Safety Technology," 81 Fed. Reg. 65705 (Sept. 23, 2016) (emphasis added).

(1) Removal of Regulatory Barriers to Non-Pneumatic (Airless) Tires for Highway Service

As NHTSA is aware, Michelin has filed a petition for rulemaking seeking clarifications of the scope of the existing FMVSS for tires to remove unnecessary regulatory barriers to non-pneumatic (airless) tires for highway service, including Michelin's Unique Puncture-Proof Tire System ("Uptis").[11] Because the FMVSS for pneumatic tires include testing standards, markings, and other requirements related to inflation pressure, non-pneumatic tires cannot be certified under the existing FMVSS. As a result, they are effectively prohibited from highway service.

Non-pneumatic tire assemblies like Uptis have strong potential to be the next transformative advancement in tire technology. Because the Uptis non-pneumatic tire assemblies do not rely on inflation pressure, risks associated with underinflation or over inflation are eliminated. Further, non-pneumatic tire assembly technology offers other important benefits, including reduced maintenance and improved load carrying capacity (variation due to inflation pressure is removed), more consistent rolling resistance and improved fuel economy, and reduced scrap tire waste due to longer tire life and elimination of early removal due to pressure loss.

Michelin's Uptis is a state-of-the-art non-pneumatic tire assembly solution designed to provide performance on par with conventional pneumatic radial tires, but with the added safety, maintenance and environmental benefits associated with non-pneumatic technology. Accordingly, for the reasons expressed in Michelin's petition, Michelin respectfully requests that NHTSA prioritize prompt action on the petition and remove unnecessary regulatory barriers to non-pneumatic innovation by the tire industry. This will further enable Michelin to achieve its publicly stated goal of 2024 market introduction of Uptis.

(2) Facilitate Implementation of Innovative and Sustainable Tire Materials

As noted above, the Endurance Test (parasitic chunking of tread blocks as a damage condition) under FMVSS 139 (S6.3.2(a)) creates higher friction and higher temperatures than tires encounter in real world highway application. Tire manufacturers spend significant time and resources to overcome this artificial failure mode, and a significant consequence of the current test is the preclusion of new technologies that are impeded by a test failure mode that is irrelevant to highway safety. If NHTSA eliminated parasitic tread block chunking as a failure mode under the Endurance Test, Michelin could deploy new tread compounds and tread patterns that would deliver significant performance improvements in tread wear, rolling resistance, wet grip and snow traction (by as much as 20 percent). Accordingly, Michelin recommends that NHTSA adopt the USTMA's recommendation to eliminate parasitic chunking of tread blocks as a failure mode under the Endurance Test.

(3) Update Uniform Tire Quality Grading for Traction Performance

[11] NHTSA Docket No. NHTSA-2019-0114.

The Uniform Tire Quality Grading Standards ("UTQGS") were established in 1978, and some grading standards have not been substantially revised since that time. As a consequence, certain grading standards have not kept up with innovations in motor vehicle safety. In particular, the UTQGS traction grading procedure is based on a locked wheel traction coefficient. However, FMVSS 135 initiated phase-in of antilock brake systems ("ABS") in 2008 and mandated ABS on all light duty vehicles beginning in 2011. Accordingly, the consumer information provided by the UTQGS traction grading is inconsistent with modern vehicle braking control systems. As a consequence, the UTQGS traction grading acts as an impediment to reasoned consumer decision making. More importantly, the UTQGS impedes introduction of tire innovations that maximize peak braking coefficient. Therefore, Michelin recommends that NHTSA revise the UTQGS traction grading procedure to ensure that it is consistent with modern ABS technology.

III. Conclusion

Michelin supports the comments filed by the USTMA regarding the removal of the Tire Strength Test, Bead Unseating Resistance Test, and suppression of the Tire Endurance Test Parasitic Tread Block Chunking pass/fail criteria, which are outdated and unnecessary to verify the performance of pneumatic radial tires available on the market today. Further, Michelin strongly supports NHTSA's efforts to remove unnecessary regulatory barriers (and to avoid imposing new regulatory barriers) to emerging tire innovations that will enhance motor vehicle safety.

Michelin appreciates the opportunity to submit these comments.

Sincerely,

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Attachment

Michelin's History of Innovation

Michelin has earned a long-standing reputation for building innovative premium tires. Innovation is part of Michelin's DNA, and we embrace the changes that come along with introducing new solutions for better mobility to the market. Michelin has a long history as the leader in our industry in this area. The following are examples of significant technological innovations that have been developed and deployed by Michelin throughout our history –

1891 - First detachable tire with an inner tube for bicycles

1908 - "Twinned" tire for heavy-goods vehicles

1913 - Steel wheel to replace the earlier wooden wheels

1929 -**" Micheline**" tire for rail trains

1930 - **"**Michelin N" first snow tire

1933 - Michelin filed a patent for a tire with a built-in inner tube

1934 - Michelin "STOP" tires introduced siping

1937 - Michelin "METALIC" **first steel casing tire** for trucks

1946 - Michelin filed the patent for radial casing tire. **First radial tire** was released in 1949 under the name of MICHELIN X. Followed by: Truck tires (1952), Earthmovers (1959), Winter XM+S (1964), Agricultural Bib X (1978), Aircraft Air X (1981) and Motorcycle (1987)

1992 - Michelin developed the **first "Green Tire"** utilizing silica technology

1994 - Michelin "ALPIN" with Y-siped technology

2000 - **Michelin X-One** single truck tire

2003 - Michelin Ultraflex technology for agricultural tires

2012 - **TWEEL airless assembly** introduced for non-automotive applications

2014 - Michelin Premier A/S utilizing EverGrip technology **self-regenerating tread**

2015 - Michelin Cross Climate the **first summer tire with winter certification**

2015 - Michelin ACOUSTIC foam filled tire for sound absorption

2015 - Michelin Selfseal puncture protection

2017 - Michelin ACORUS: cushion to protect tire and wheel from road impacts

2017 - **Vision concept** connected airless tire with a 3D rechargeable tread

2017 - Michelin introduces RFID for commercial truck and retread tires

2018 -Track Connect: tire with real-time monitoring of pressure and temperature