

**DEPARTMENT OF TRANSPORTATION**

**National Highway Traffic Safety Administration**

**49 CFR Parts 571 and 585**

**[Docket No. NHTSA 2005-22251]**

**RIN 2127-AJ70**

**Federal Motor Vehicle Safety Standards; Tire Pressure Monitoring Systems**

**AGENCY:** National Highway Traffic Safety Administration, DOT.

**ACTION:** Final rule; response to petitions for reconsideration.

**SUMMARY:** This document responds to petitions for reconsideration requesting changes in our April 8, 2005 final rule establishing a new Federal motor vehicle safety standard (FMVSS) requiring installation in new light vehicles of a tire pressure monitoring system (TPMS) capable of detecting when one or more of a vehicle's tires is significantly under-inflated. The petitions for reconsideration are granted in part and denied in part, and through this document, we are amending the standard and related provisions accordingly.

**DATES:** Effective Date: The amendments made in this final rule are effective

**[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Voluntary compliance is permitted immediately.

Petitions for Reconsideration: If you wish to submit a petition for reconsideration for this rule, your petition must be received by **[INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

**ADDRESSES**: Petitions for reconsideration should refer to the docket number above and be submitted to: Administrator, Room 5220, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

See the **Supplementary Information** portion of this document (Section VI; Rulemaking Analyses and Notices) for DOT's Privacy Act Statement regarding documents submitted to the agency's dockets.

**FOR FURTHER INFORMATION CONTACT**: For non-legal issues, you may call Mr. George Soodoo or Mr. Samuel Daniel, Office of Crash Avoidance Standards (Telephone: 202-366-2720) (Fax: 202-366-4329).

For legal issues, you may call Mr. Eric Stas, Office of Chief Counsel (Telephone: 202-366-2992) (Fax: 202-366-3820).

You may send mail to these officials at National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

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**I. Summary of Decision**

This document responds to 15 petitions for reconsideration related to our April 8, 2005 final rule<sup>1</sup> establishing FMVSS No. 138, Tire Pressure Monitoring Systems. The petitioners raised a variety of issues, most of which involved requests for technical changes to the standard (see section IV of this document for a complete discussion of issues raised in the petitions and their resolution). We have decided to grant the petitions in part and to deny them in part.

The following points highlight the amendments to Standard No. 138 that we are adopting in response to the petitions for reconsideration of the April 8, 2005 final rule (excluding a few minor editorial changes).

- We have decided to postpone the compliance date for the standard's required TPMS-related owner's manual statement until September 1, 2006 (Model Year 2007), thereby granting petitions' request for additional lead time to incorporate the required language into the vehicle owner's manual. We do not believe that extending the compliance date in this manner (consistent with a recommendation in one of the petitions) would result in any safety consequences. Delay of the owner's manual requirements would not impact the functioning of the TPMS or the warnings that it provides, and we expect that even before that date, TPMS-equipped vehicles would have some owner's manual statement presenting relevant information to the consumer.

We specifically note that delay in the compliance date for the standard's owner's manual requirements does not impact vehicle manufacturers' responsibility to provide

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<sup>1</sup> 70 FR 18136 (April 8, 2005) (Docket No. NHTSA-2005-20586-1).

TPMSs complying with FMVSS No. 138 on a schedule consistent with the phase-in commencing on October 5, 2005, as set forth in the April 8, 2005 final rule.

- The agency has decided to retain the final rule's requirement for the TPMS malfunction indicator lamp (MIL) to illuminate whenever there is a malfunction that affects the generation of transmission of control or response signals in the vehicle's tire pressure monitoring system. However, in response to petitions, we have decided to amend the standard's test procedures for malfunction detection to clarify that telltale lamps will not be disconnected because such malfunctions will be indicated during the bulb check(s) required under the standard. Specifically, we are amending S6(k) by adding the following statement: "When simulating a TPMS malfunction, the electrical connections for the telltale lamps shall not be disconnected."

- The lack of synchronization between the timing of compliance for compliance under FMVSS No. 138 and the TPMS telltale requirements of FMVSS No. 101, Controls and Displays, have been remedied through an earlier amendment to FMVSS No. 101. Technical revisions to FMVSS No. 138 have also been made in light of recent amendments to FMVSS No. 101 that have resulted in a change in location of the TPMS telltale provisions from Table 2 to Table 1 of that standard.

- In this rule, we are amending the regulatory text in FMVSS No. 138 to clarify that for a combined low tire pressure/TPMS malfunction indicator telltale, the same flashing/continuous-illumination sequence is required for one or more malfunctions that may affect the system simultaneously.

- The agency has decided to modify the standard's test procedures to reduce the current 2-psi pressure adjustment (below the TPMS activation threshold) to 1 psi. The 2-

psi adjustment was intended to facilitate testing, but several petitioners expressed concern that a 2-psi adjustment could allow TPMSs to achieve compliance with an under-inflation detection capability of 30 percent or more. The agency anticipates that a 1-psi adjustment would continue to facilitate testing while maintaining the under-inflation level close to the standard's 25-percent under-inflation activation threshold.

- In order to more clearly differentiate between the TPMS standard's two phase-in production periods which are of different lengths (*i.e.*, almost 11 months vs. one year), we have decided to modify 49 CFR 585.66, Reporting Requirements, to differentiate the reports to be submitted to the agency for each of the two phase-in periods. As currently drafted, section 585.66(b)(1), Basis for Statement of Compliance, and section 585.66(b)(2), Production, require manufacturers to report values for the full production year, without mention of the period corresponding to the first period of the phase-in (*i.e.*, from October 5, 2005 to September 1, 2006), which is the relevant total production value for calculation under S7.1(b) of FMVSS No. 138. Because the reporting of this information directly relates to determining compliance with the requirements of FMVSS No. 138, we have decided to revise 49 CFR 585.66(b)(1) and (2) to clearly differentiate between the two phase-in production periods.

## **II. Background**

### **A. The TREAD Act**

Congress enacted the Transportation Recall Enhancement, Accountability, and Documentation (TREAD) Act of 2000<sup>2</sup> on November 1, 2000. Section 13 of that Act<sup>3</sup> required the Secretary of Transportation, within one year of the statute's enactment, to

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<sup>2</sup> Public Law 106-414, 114 Stat. 1800 (2000).

<sup>3</sup> See 49 U.S.C. 30123 note (2003).

complete a rulemaking “to require a warning system in new motor vehicles to indicate to the operator when a tire is significantly under inflated.” Section 13 also required the regulation to take effect within two years of the completion of the rulemaking.

Responsibility for this rulemaking was delegated to NHTSA.

#### B. Rulemaking History Prior to the April 2005 Final Rule

Since passage of the TREAD Act, FMVSS No. 138 has had a protracted regulatory history. In summary, the agency published a notice of proposed rulemaking (NPRM)<sup>4</sup> on July 26, 2001, which was followed by a final rule<sup>5</sup> published on June 5, 2002.

After issuance of the June 2002 final rule, Public Citizen, Inc., New York Public Interest Research Group, and the Center for Auto Safety filed a suit challenging certain aspects of the TPMS regulation. The Court of Appeals for the Second Circuit (Second Circuit) issued its opinion in Public Citizen, Inc. v. Mineta<sup>6</sup> on August 6, 2003. The Court found that the TREAD Act unambiguously mandates TPMSs capable of monitoring each tire up to a total of four tires, effectively precluding the one-tire, 30-percent under-inflation detection option in the June 5, 2002 final rule, or any similar option for a system that cannot detect under-inflation in any combination of tires up to four tires. Ultimately, the Court vacated the standard in its entirety and directed the agency to issue a new rule consistent with its August 6, 2003 opinion. NHTSA published a final rule in the **Federal Register** on November 20, 2003, vacating FMVSS No. 138.<sup>7</sup>

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<sup>4</sup> 66 FR 38982 (July 26, 2001) (Docket No. NHTSA-2000-8572-30).

<sup>5</sup> 67 FR 38704 (June 5, 2002) (Docket No. NHTSA-2000-8572-219).

<sup>6</sup> 340 F.3d 39 (2d Cir. 2003).

<sup>7</sup> 68 FR 65404 (Nov. 20, 2003) (Docket No. NHTSA-2003-16524-1).

The agency commenced rulemaking efforts to re-establish FMVSS No. 138 in a manner consistent with the Court's opinion and responsive to issues raised in earlier petitions for reconsideration, the majority of which remained relevant. To this end, the agency published a new NPRM<sup>8</sup> on September 16, 2004.

After carefully considering public comments on the NPRM, the agency published a final rule<sup>9</sup> in the **Federal Register** on April 8, 2005, which re-established FMVSS No. 138, with a phase-in set to begin on October 5, 2005. (For a more complete discussion of this earlier period of the regulatory history of the TPMS rulemaking, readers should consult the June 5, 2002 final rule, the September 16, 2004 NPRM, and the April 8, 2005 final rule.)

#### C. The April 8, 2005 Final Rule

As noted above, the April 8, 2005 final rule for TPMS re-established FMVSS No. 138 in a manner consistent with the Second Circuit's opinion. Specifically, it requires passenger cars, multi-purpose passenger vehicles, trucks, and buses with a GVWR of 4,536 kg (10,000 pounds) or less, except those with dual wheels on an axle, to be equipped with a TPMS to alert the driver when one or more of the vehicle's tires, up to all four of its tires, is significantly under-inflated.<sup>10</sup> Subject to the phase-in schedule and the exceptions below, the final rule mandated compliance with the requirements of the

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<sup>8</sup> 69 FR 55896 (Sept. 16, 2004) (Docket No. NHTSA-2004-19054-1).

<sup>9</sup> 70 FR 18136 (April 5, 2005) (Docket No. NHTSA-2005-20586-1).

<sup>10</sup> There are two types of TPMSs currently available, direct TPMSs and indirect TPMSs. Direct TPMSs have a pressure sensor in each wheel that transmits pressure information to a receiver. In contrast, indirect TPMSs do not have tire pressure sensors, but instead rely on the wheel speed sensors, typically a component of an anti-lock braking system, to detect and compare differences in the rotational speed of a vehicle's wheels, which correlate to differences in tire pressure.

We anticipate that new types of TPMS technology may be developed in the future that will be capable of meeting the standard's requirements. For example, such systems might incorporate aspects of both direct and indirect TPMSs (*i.e.*, hybrid systems). In concert with TPMS suppliers, tire manufacturers might be able to incorporate TPMS sensors directly into the tires themselves. In issuing a performance standard, NHTSA is cognizant of and seeks to encourage technological innovation.



standard, commencing with covered vehicles manufactured on or after October 5, 2005 (*i.e.*, MY 2006). The standard is intended to be technology-neutral, so as to permit compliance with any available TPMS technology that meets the standard's performance requirements.

The following points highlight the key provisions of the April 8, 2005 final rule.

- The TPMS is required to detect and to provide a warning to the driver within 20 minutes of when the pressure of one or more of the vehicle's tires, up to a total of four tires, is 25 percent or more below the vehicle manufacturer's recommended cold inflation pressure for the tires, or a minimum level of pressure specified in the standard, whichever pressure is higher. These minimum activation pressures are included in Table 1 of FMVSS No. 138.
- Vehicle manufacturers must certify vehicle compliance under the standard with the tires installed on the vehicle at the time of initial vehicle sale.<sup>11</sup>
- The TPMS must include a low tire pressure warning telltale<sup>12</sup> (yellow) that must remain illuminated as long as any of the vehicle's tires remain significantly under-inflated and the vehicle's ignition locking system is in the "On" ("Run") position.<sup>13</sup> The TPMS's low tire pressure warning telltale must perform a bulb-check at vehicle start-up.

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<sup>11</sup> We note that some vehicle manufacturers authorize their dealers to replace the vehicle's factory-installed tires with other tires, including ones with a different size and/or recommended cold tire inflation pressure. The TPMS must perform properly with any such tires, because the vehicle could be equipped with those tires at the time of initial sale. Of course, the manufacturer would not have that responsibility if the dealer installed other tires without manufacturer authorization.

<sup>12</sup> As part of this final rule, we added two versions of the TPMS low tire pressure telltale and a TPMS malfunction telltale to Table 2 of FMVSS No. 101, Controls and Displays (since changed to Table 1).

<sup>13</sup> We note that if a vehicle manufacturer elects to install a low tire pressure telltale that indicates which tire is under-inflated, the telltale must correctly identify the under-inflated tire. (See S4.3.2, as contained in the April 8, 2005 final rule.)

- The TPMS must also include a TPMS malfunction indicator to alert the driver when the system is non-operational, and thus unable to provide the required low tire pressure warning.<sup>14</sup> The TPMS malfunction indicator must detect a malfunction within 20 minutes of occurrence of a system malfunction and provide a warning to the driver. This final rule provided two options by which vehicle manufacturers may indicate a TPMS malfunction:
  - (1) Installation of a separate, dedicated telltale (yellow) that illuminates upon detection of the malfunction and remains continuously illuminated as long as the ignition locking system is in the “On” (“Run”) position and the situation causing the malfunction remains uncorrected, or
  - (2) Designing the low tire pressure telltale so that it flashes for a period of at least 60 seconds and no longer than 90 seconds when a malfunction is detected, after which the telltale must remain continuously illuminated as long as the ignition locking system is in the “On” (“Run”) position. This flashing and illumination sequence must be repeated upon each subsequent vehicle start-up until the situation causing the malfunction has been corrected.

If the option for a separate telltale is selected, the TPMS malfunction telltale must perform a bulb-check at vehicle start-up.

- The TPMS is not required to monitor the spare tire (if provided), either when it is stowed or when it is installed on the vehicle.
- For vehicles certified under the standard, vehicle manufacturers must provide in the owner’s manual a specified statement explaining the purpose of the low tire

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<sup>14</sup> We note that the TPMS telltale(s) may be incorporated as part of a reconfigurable display, provided that all requirements of the standard are met.

pressure warning telltale, the potential consequences of significantly under-inflated tires, the meaning of the telltale when it is illuminated, and what actions drivers should take when the telltale is illuminated. Vehicle manufacturers also must provide a specified statement in the owner's manual regarding: (1) potential problems related to compatibility between the vehicle's TPMS and various replacement or alternate tires and wheels, and (2) the presence and operation of the TPMS malfunction indicator. For vehicles that do not come with an owner's manual, the required information must be provided in writing to the first purchaser at the time of initial vehicle sale.

In terms of the timing for compliance, the final rule provided as follows. Subject to the vehicle manufacturer option for carry-backward credits discussed below, NHTSA decided to adopt the following phase-in schedule: 20 percent of a vehicle manufacturer's light vehicles are required to comply with the standard during the period from October 5, 2005 to August 31, 2006; 70 percent during the period from September 1, 2006 to August 31, 2007, and all light vehicles thereafter. Vehicle manufacturers are not required to comply with the requirements related to the TPMS malfunction indicator (including associated owner's manual requirements) until September 1, 2007; however, at that point, all covered vehicles must meet all relevant requirements of the standard (*i.e.*, no additional phase-in for MIL requirements). The final rule included phase-in reporting requirements consistent with the phase-in schedule discussed above.

Small volume manufacturers (*i.e.*, those manufacturers producing fewer than 5,000 vehicles for sale in the U.S. per year during the phase-in period) are not subject to

the phase-in requirements, but their vehicles must meet the requirements of the standard beginning September 1, 2007.

Consistent with the policy set forth in NHTSA's February 14, 2005 final rule<sup>15</sup> on certification requirements for vehicles built in two or more stages and altered vehicles, final-stage manufacturers and alterers must certify compliance for all covered vehicles manufactured on or after September 1, 2008 (no phase-in). However, final-stage manufacturers and alterers may voluntarily certify compliance with the standard prior to this date.

NHTSA decided to permit vehicle manufacturers to earn carry-forward credits for compliant vehicles, produced in excess of the phase-in requirements and manufactured between the effective date of this rule and the conclusion of the phase-in. These carry-forward credits could be used during the phase-in, but they could not be used to delay compliance certification for vehicles produced after the conclusion of the phase-in. Except for vehicles produced by final-stage manufacturers and alterers (who receive an additional year for compliance), all covered vehicles must comply with FMVSS No. 138 on September 1, 2007, without use of any carry-forward credits.

To further ease implementation, we decided to also provide carry-backward credits, whereby vehicle manufacturers may defer compliance with a part or all of the certification requirements for the first period of the phase-in, provided that they certify a correspondingly larger percentage of vehicles under the standard during the second period of the phase-in.

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<sup>15</sup> 70 FR 7414 (Feb. 14, 2005) (Docket No. NHTSA-1999-5673-54).

### III. Petitions for Reconsideration

NHTSA received a total of 17 petitions for reconsideration of the April 8, 2005 final rule from: (1) the Alliance of Automobile Manufacturers (Alliance); (2) the Association of International Automobile Manufacturers, Inc. (AIAM); (3) BMW Group (BMW); (4) Continental Teves, Inc.; (5) EnTire Solutions, LLC (EnTire); (6) ETV Corporation Pty Limited (ETV); (7) European Tyre and Rim Technical Organisation (ETRTO); (8) Michelin North America, Inc. (Michelin); (9) M-Vision, Inc.; (10) NIRA Dynamics AB; (11) Public Citizen; (12) Rubber Manufacturers Association (RMA); (13) SmarTire Systems, Inc. (SmarTire); (14) Specialty Equipment Market Association (SEMA); (15) Sumitomo Rubber Industries (SRI); (16) Tire Industry Association (TIA); and (17) Volkswagen/Audi (VW/Audi). All of these petitions may be found in Docket No. NHTSA-2005-20586. (We note that Public Citizen withdrew its petition for reconsideration in a letter dated June 16, 2005,<sup>16</sup> and TIA withdrew its petition for reconsideration in a letter dated July 28, 2005.<sup>17</sup> Consequently, we are not discussing these two petitions further in this document.)

The petitioners raised a variety of issues related to the TPMS standard, most of which were technical. These issues included ones involving the final rule's requirements for the under-inflation detection level, the under-inflation and malfunction detection times, functioning of the TPMS with spare tires, tire reserve load, compliance testing conditions and procedures, system disablement and reprogrammability, telltale issues, breadth of the malfunction detection requirement, minimum activation pressure, owner's manual requirements, sharing of TPMS servicing information, and phase-in calculations.

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<sup>16</sup> Docket No. NHTSA-2005-20586-31.

<sup>17</sup> Docket No. NHTSA-2005-20586-35.

All of the issues raised in the petitions for reconsideration presently before us are addressed in the Discussion and Analysis section immediately below.

#### Effective Date

In light of the rapidly approaching October 5, 2005 start of the phase-in for FMVSS No. 138, we find that there is good cause to make these amendments effective 30 days after publication. The changes resulting from this final rule responding to petitions for reconsideration generally involve requested technical modifications and clarifications to the standard. We believe that vehicle manufacturers and other interested stakeholders would benefit from rapid implementation of these amendments. We note, however, that vehicle manufacturers may voluntarily comply with the requirements of this final rule immediately.

### **IV. Discussion and Analysis**

#### **A. Low Tire Pressure Warning Lamp Activation Requirements**

The April 8, 2005 final rule required that each TPMS-equipped vehicle must illuminate a low tire pressure warning telltale not more than 20 minutes after the inflation pressure in one or more of the vehicle's tires, up to a total of four tires, is equal to or less than either the pressure 25 percent below the vehicle manufacturer's recommended cold inflation pressure, or the pressure specified in the third column of Table 1 of the standard for the corresponding type of tire, whichever is higher. The low pressure telltale must continue to illuminate as long as the inflation pressure of the tire(s) remains below the activation threshold above and the ignition locking system is in the "On" ("Run") position, or until the system is manually reset in accordance with the vehicle manufacturer's instructions. (See S4.2, as contained in the April 8, 2005 final rule.)

Several petitioners requested that the agency modify the time period for the TPMS to detect and to provide a warning regarding significant under-inflation in one or more of a vehicle's tires. Some petitioners recommended a reduction in detection time (ETRTO, SmarTire Systems, ETV); others sought an increase in such time period (NIRA Dynamics, VW/Audi), and still another argued for some combination of the two (BMW).

ETRTO argued that the decision in the final rule to set a 20-minute detection time requirement for the TPMS low tire pressure warning (an increase from the 10-minute detection time proposed in the NPRM) may compromise safety, because driving for an additional 10 minutes on a significantly under-inflated tire could cause that tire to further deflate, overheat, and fail. ETRTO cautioned that "technical neutrality" should not be permitted to surpass safety concerns. Accordingly, the ETRTO petition urged NHTSA to adopt an under-inflation detection time of 10 minutes, as proposed in the NPRM. ETRTO did not provide supporting data to demonstrate the extent of tire degradation that would result from the under-inflation detection time adopted in the final rule.

In its petition, SmarTire Systems argued that repeated exposure of a tire to excessive heat build-up could cause cumulative deterioration of the tire's structural components, which could ultimately lead to tire failure. SmarTire Systems provided data intended to show that within 12 minutes of city driving (at approximately 30 mph) at a low ambient temperature, pressure build-up within a properly inflated tire is about 3 psi, resulting from temperature build-up within the tire. According to the petitioner, the longer detection time interval may exacerbate this phenomenon and could actually mask an under-inflation condition. SmarTire Systems argued that this situation potentially could have unintended consequences for testing, as well as negative safety implications.

As a result, SmartTire Systems also recommended that the standard be modified to return to a 10-minute under-inflation time requirement, as originally proposed.

ETV argued that in order to maximize safety, the standard should be amended to require a TPMS to detect low tire pressure and to provide a warning immediately upon vehicle start-up. In making this argument, ETV analogized to other vehicle safety systems (*e.g.*, air bags, ABS/brakes, seat belts) that provide a warning while the vehicle is stationary or parked (*i.e.*, before the driver moves the vehicle into traffic).

An opposing viewpoint was presented in the petition submitted by NIRA Dynamics, which argued that the 20-minute under-inflation detection time for more than one tire is unnecessarily stringent in light of the circumstances that normally cause multiple-tire under-inflation. According to the petitioner, under-inflation in multiple tires usually results from slow diffusion over many months (loss of 1-2 psi per month), so 20-minute time requirements for TPMS calibration and under-inflation detection are not necessary. NIRA Dynamics also stated that indirect TPMSs update actual parameter values whenever a vehicle is driven (storing the latest values in memory when the engine is turned off). Therefore, the TPMS telltale would be expected to illuminate, regardless of the length of the last driving cycle, as soon as the accumulated driving time with an under-inflated tire is sufficiently long. Accordingly, NIRA Dynamics recommended that NHTSA increase the time period permitted for TPMS calibration and low pressure detection for multiple tires to one hour. The petitioner stated that such a change would permit the use of advanced indirect TPMS technologies, while maintaining the safety benefits of the standard. The petition of VW/Audi made an argument very similar to that of NIRA Dynamics on this point.



BMW also expressed its expectation that a TPMS-equipped vehicle would not need to be driven continuously during a single trip in order to detect low tire pressure, but instead, cumulative driving time gathered over a number of shorter trips should be adequate to detect and warn about significant tire under-inflation. Therefore, BMW reasoned that the TPMS would be unlikely to need the fully allotted detection time in most cases.

However, BMW recommended a slightly different solution from that proposed by NIRA Dynamics and VW/Audi. Specifically, BMW stated that NHTSA should revise the standard to require a 10-minute cumulative driving detection time for pressure loss in a single tire and a 60-minute cumulative driving detection time for pressure loss in multiple tires, an approach that it believes would offer an equivalent or higher level of safety than the approach adopted in the final rule. Alternatively, BMW suggested that its approach be adopted as an optional means of compliance. BMW argued that its requested change also would make the standard more technology-neutral, because it stated that there are not any “production-ready” indirect TPMSs that can meet the standard’s 20-minute detection requirement under all circumstances.

NHTSA has carefully considered the arguments of petitioners seeking modifications to the standard’s low tire pressure warning lamp activation requirements. In general, the petitioners reiterated arguments raised at previous stages of this rulemaking and did not provide any new information to support their positions. Thus, we have decided to retain the low tire pressure activation requirements (including those related to system calibration) set forth in the April 8, 2005 final rule. Our reasoning is largely the same as expressed in that notice, which we summarize below.

We continue to believe that a 20-minute time period for under-inflation detection in one to four tires is appropriate, as is a 20-minute time period for TPMS calibration. The low tire pressure lamp activation requirements reflect the agency's careful balancing of safety and practicability concerns viewed through the prism of available data.

As we noted in the final rule, TPMSs were not developed to warn the driver of extremely rapid pressure losses that could accompany a vehicle encounter with a road hazard or a tire blowout. According to the tire industry, those types of events account for approximately 15 percent of pressure loss cases.<sup>18</sup> Presumably, a driver would be well aware of the tire problem in those situations, and the TPMS would provide little added benefit.

Instead, TPMSs' benefits lie in warning drivers when the pressure in the vehicle's tires is approaching a level at which permanent tire damage could be sustained as a result of heat buildup and tire failure is possible; this low level of inflation pressure generally results from a more measured pressure loss cause by a slow leak, defective valve, or diffusion. According to the tire industry, approximately 85 percent of all tire pressure losses are slow air losses that occur over hours, weeks, or months of vehicle use.<sup>19</sup> In those cases, a detection time of 20 minutes is not likely to pose a safety risk to the driving public.

The agency's tire research suggests that even in a 25-percent under-inflated condition, the vehicle can be operated safely for this detection period without an appreciable risk of permanent damage or tire failure. NHTSA conducted testing on a variety of Standard Load P-metric tires at 20 psi with 100-percent load at 75 mph for 90

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<sup>18</sup> 67 FR 38704, 38728 (June 5, 2002) (Docket No. NHTSA-2000-8572-219).

<sup>19</sup> *Id.*

minutes on a dynamometer, and none of these tires failed.<sup>20</sup> This testing led the agency to conclude that warnings at less severe conditions will give drivers sufficient time to check and re-inflate their vehicles' tires before the tires experience appreciable damage. Furthermore, analysis of public comments at the NPRM stage demonstrated that a detection time period shorter than 20 minutes could raise issues of detection accuracy for many systems, which could lead to false telltale illuminations ("nuisance warnings"), which in turn could negatively impact consumer acceptance of TPMSs.

Petitioners advocating a shorter time period did not provide any countervailing data to substantiate their assertions that a 20-minute detection time for a significantly under-inflated tire would lead to tire damage or tire failure. Although manufacturers are encouraged to provide the low tire pressure warning as quickly as possible, we believe that a 20-minute detection time is unlikely to result in any adverse safety consequences.

We also believe that a 20-minute detection time is consistent with our intention to articulate a standard that is practicable and technology-neutral. As noted in the final rule, we are aware of at least one indirect TPMS that is currently capable of meeting the standard's four-tire, 25-percent under-inflation detection requirement within 20 minutes,<sup>21</sup> and we expect that with additional time and development, other indirect and hybrid systems also would be able to meet the requirements of the standard.

We are not adopting ETRTO's and SmarTire's recommendations to reduce the time period for under-inflation detection time to 10 minutes because our tire data suggest that such change is not required for safety and because it would likely decrease the number of technologies available for complying with the standard. The same reasoning

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<sup>20</sup> *Id.* at 38726.

<sup>21</sup> Docket No. NHTSA-2004-19054-96.

applies to our decision to deny ETV's suggestion that the TPMS be required to provide a low tire pressure warning upon vehicle start-up (*i.e.*, before the vehicle is in motion).

Furthermore, we have decided not to extend the low tire pressure detection time beyond 20 minutes for multiple-tire under-inflation, as requested by NIRA Dynamics, VW/Audi, and BMW. As explained in the final rule, we believe that adverse safety consequences could result if the low tire under-inflation detection time were to extend beyond 20 minutes. As discussed in the final rule, available research suggests that average commuting times are less than 30 minutes in most cases.<sup>22</sup> Many other trips, such as routine errands, may also involve drive times of less than 30 minutes. We expressed concerns that by increasing the low tire pressure detection time, it would be conceivable that consumers could be driving on significantly under-inflated tires for a potentially extended period of time without receiving a warning from the TPMS.

We also expressed concern that extending the low tire pressure detection time beyond 20 minutes could be problematic in other situations. For example, where a tire is punctured by a nail or is otherwise damaged, it may experience a moderately rapid pressure loss. As to damaged tires experiencing a relatively less rapid pressure loss, research into the rate of temperature buildup shows that for constant load, pressure, and speed conditions, tires generally warmed up and stabilized their temperatures within 15 minutes;<sup>23</sup> thus, the tire will rapidly reach a temperature that places stress on an under-inflated tire. In such cases, we are concerned about delaying the warning to the driver for too long. Therefore, in the April 8, 2005 final rule, we selected 20 minutes for the low

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<sup>22</sup> 70 FR 18136, 18148 (April 8, 2005) (Docket No. NHTSA-2005-20586-1).

<sup>23</sup> See June 5, 2002 comments of the RMA (Docket No. NHTSA-2000-8011-64).

tire pressure detection time, because we believed that it would maintain the utility of the TPMS and the safety benefits associated with that system.

We do not believe that the arguments presented by BMW and NIRA Dynamics regarding the cumulative nature of data gathering by the TPMS justifies changing the standard's low tire pressure detection time to one hour for multiple tires. We believe that a one-hour delay in warning the driver of significant tire under-inflation either when the system is new, reset, or reprogrammed is too long, particularly given that other systems can provide a warning more rapidly. BMW and NIRA Dynamics did not provide any data indicating that tires could be operated safely for one hour after reaching a level of inflation that is 25 percent below placard pressure. Thus, we are concerned that an increase in the detection time for multiple-tire under-inflation could decrease the safety benefits of the rule. The same logic applies to BMW's suggestion that the time for malfunction detection be increased to one hour, a request that we are also denying, because a malfunctioning TPMS may not be available to warn about a concurrent tire under-inflation problem.

B. TPMS Malfunction Indicator Lamp (MIL) Activation Requirements

1. What Constitutes a TPMS Malfunction?

As part of the final rule establishing FMVSS No. 138, the TPMS-equipped vehicle's MIL telltale must provide a warning to the driver not more than 20 minutes after the occurrence of a malfunction that affects the generation or transmission of control or response signals in the vehicle's TPMS. (See S4.4, as contained in the April 8, 2005 final rule.) Paragraph S6(k) of the final rule's test procedures provides for the simulation of one or more TPMS malfunction(s) by disconnecting any electrical connection between

TPMS components, or by installing a tire or wheel on the vehicle that is incompatible with the TPMS.

The details as to exactly what constitutes a TPMS malfunction were among the most extensively discussed issues in the petitions for reconsideration. Many petitioners who discussed this issue generally sought clarification regarding whether a malfunction warning would be required under specific situations. The malfunction-related issues raised in these petitions are addressed below.

The AIAM recommended amending S4.4(a) to narrow the definition of “TPMS malfunction” to limit that term to conditions where proper power supply is maintained to the TPMS. According to the AIAM petition, the standard, as currently written, would require installation of another electronic control module (ECM) in addition to the TPMS ECM in order to solely monitor MIL telltale operations, a largely redundant feature that would use up limited space behind the dashboard.

As its recommended solution, the AIAM recommended that the scope of S4.4(a) be limited to situations where the TPMS has power, which would allow the system to identify malfunctions in the TPMS ECM and components such as the wheel sensors, signal antennae, or the presence of incompatible tires. In its petition, the AIAM argued that an interruption of power to the ECM or to the telltale (or to the connection between the ECM and the telltale) would be identifiable by failure to illuminate the TPMS MIL during bulb check. The AIAM also recommended modifying S6(l) to incorporate these conditions or by having S6(k) exclude these conditions from the procedures for creating a simulated TPMS malfunction.

The Alliance similarly argued in its petition that NHTSA should clarify that S6(k) of the test procedures, which permits “disconnecting the power source to any TPMS component,” should not include disconnecting the power source to the telltale itself. The Alliance stated its belief that the telltale is an FMVSS No. 101 component (not a “TPMS component”), and that the situation where there is a loss of power to the telltale is already covered by the bulb check requirements in S4.3.3(a) or S4.4(b)(4)(i), thereby obviating the need for it to be covered under S4.4(a).

The Alliance also recommended a minor editorial change in S4.4(b)(3) that would modify that provision to read as follows: “Continues to illuminate the TPMS malfunction telltale under the conditions specified in S4.4(a)....” The standard currently references “S4.4.”

EnTire Solutions argued that for TPMSs using Hardwired Vehicle Speed Input to the TPMS receiver, such input does not directly affect “the generation or transmission of control or response signals” in the vehicle’s TPMS, and disconnecting vehicle speed input would not involve an electrical connection between “TPMS components” as called out specifically in S6(k) of the FMVSS No. 138 test procedures. According to EnTire Solutions, disconnecting vehicle speed input is “impractical” to diagnose since such a disconnect would not prevent the TPMS from providing under-inflation warnings while driving unless there are multiple problems with the system. Accordingly, EnTire Solutions requested clarification as to whether systems using Hardwired Vehicle Speed Inputs need to illuminate the TPMS MIL telltale upon disconnection of those inputs.

EnTire Solutions also requested a clarification regarding paragraph S6(k) of the TPMS test procedures, which provides an instruction regarding “disconnecting any

electrical connection between TPMS components....” Specifically, the petitioner questioned whether the above language refers to connector-level interconnects or individual wires.

In its petition, EnTire Solutions stated that for systems using multiple ground paths for the receiver, it is “impractical” to diagnose a single ground path disconnection. EnTire Solutions recommended that the standard be amended to clarify that TPMS MIL activation will not be required in such cases. EnTire Solutions also asked if the system could be constructed such that the low pressure detection lamp could be illuminated by an auxiliary power source when the primary source is disconnected without illuminating the MIL. This question applies to low tire pressure telltales that indicate which tire is under-inflated and telltales that do not indicate which tire is under-inflated (*i.e.*, the ISO lamp).

NIRA Dynamics’ petition argued that it is not possible for vehicle manufacturers to meet the final rule’s certification requirement for the TPMS to be able to detect all replacement tires that are not compatible with the system, because it is not possible to know what tires will be offered in the future or how such tires will interact with current TPMSs. According to NIRA Dynamics, to make such a certification, vehicle manufacturers installing indirect TPMSs would be required to test their systems with all types of tires available on the market, both now and in the future, something which would not be possible for economic and practical reasons. Therefore, the petitioner recommended amending the final rule to state that the TPMS MIL requirements are limited to electrical and system transmission interruptions or failures that result in no sensor signal being sent to the TPMS control module.



In its petition, SRI argued that there are other conditions, albeit rare, that could affect the performance of TPMSs even if the control or response signals are properly transmitted. For example, SRI stated that a direct TPMS may not recognize that it is transmitting incorrect pressure data due to a sensor failure, or an indirect TPMS may not recognize that the sensitivity of the TPMS is lower due to certain tire characteristics. SRI essentially agreed with the argument of NIRA Dynamics, arguing that analyzing the influence of all replacement tires on the TPMS would be just as difficult as requiring that the TPMS be compliant with all replacement tires.

M-Vision's petition questioned whether the standard's requirements for malfunction detection would include instances where there is a mechanical failure of the TPMS, including ones resulting from a separation of the joint/mount between the sensor assembly and the wheel, or separation of parts from the sensor assembly. According to M-Vision, a typical TPMS sensor weighs about 40 grams (1.41 ounces), and if such components come loose as a result of fatigue, they may generate high g-forces, cause internal damage to the tire, and ultimately lead to tire failure. The M-Vision petition also argued that a loose TPMS device rattling within the front wheel could lead to sudden wheel imbalance while the vehicle is in motion, potentially causing the driver to steer improperly. In order to prevent what it deems to be a significant safety risk, M-Vision recommended that the definition of a "TPMS malfunction" be modified to include mechanical failures, as described in its petition.

Continental Teves' petition requested clarification of that portion of S4.4(a), which requires the TPMS MIL to illuminate "not more than 20 minutes after occurrence of a malfunction that affects the generation of transmission of control or response signals

in the vehicle's tire pressure monitoring system.” (Emphasis added.) We understand Continental Teves to be arguing that there are other circumstances or factors that could “affect” the system (*e.g.*, replacement tire construction) without preventing it from detecting and providing the requisite low tire pressure warning. Therefore, Continental Teves recommended changing the word “affects” to “inhibits” in S4.4(a), which it argued is consistent with the purpose of the TPMS MIL to alert the driver when the system is not functional.

Given that the TPMS MIL requirements were a relatively recent conceptual addition to FMVSS No. 138, it is not surprising that several petitioners requested clarification of those provisions. As noted above, such clarification requests included questions of coverage of specific potential malfunction, some of which the petitioners asserted could be difficult to detect. Our response, addressing these concerns about the standard's malfunction requirements, is provided below.

In overview, we have decided to retain the final rule's requirement for the TPMS MIL to illuminate whenever there is a malfunction that affects the generation of transmission of control or response signals in the vehicle's tire pressure monitoring system. The agency continues to favor a broad detection requirement for the TPMS MIL and not one limited to specific malfunctions, because such restrictions would unnecessarily reduce the safety benefits of the TPMS. However, in response to petitions (AIAM, Alliance) and in light of our own prior statements, we have decided to amend the standard's test procedures for malfunction detection to explicitly state that telltale lamps will not be disconnected, because such malfunctions would be indicated during the bulb checks required under S4.3.3(a) and/or S4.4(b)(4). Consequently, the driver would be

provided with information regarding the operability of the TPMS warning telltale(s) through alternative means.

We believe that this clarifying change is consistent with the final rule. In that notice, we stated that “the MIL should not be required to signal a burned out bulb as a TPMS malfunction, because that problem would already be identified during the check-of-lamp function at vehicle start-up.” (70 FR 18136, 18151 (April 8, 2005)) It was not our intention to require a redundant system solely to monitor the TPMS telltale(s). Similarly, the check-of-lamp function would alert the driver of malfunctions pertaining to processes directly tied to operation of the TPMS telltale(s) that necessitate servicing. When the driver takes the vehicle to the repair facility, the problem should be diagnosed and corrected, even though it may not be the one anticipated (*e.g.*, a problem with a wire rather than a burned out bulb). Thus, this subset of TPMS-related malfunctions would still be expected to be identified, but through a mechanism other than the MIL. Accordingly, we are amending S6(k) to delimit the types of system malfunctions that will be simulated during testing, consistent with the above. Specifically, we are adding the following statement to that paragraph: “When simulating a TPMS malfunction, the electrical connections for the telltale lamps shall not be disconnected.”

Furthermore, in response to EnTire’s requests for clarification regarding specific potential disconnections, we have decided that all electrically-powered components and devices that interface with the TPMS, including hardwired vehicle speed inputs, are potential candidates for disconnection under S6(k). Similarly, a single ground path in a multiple ground path system may be a candidate for disconnection during TPMS malfunction testing.

We are denying NIRA Dynamics request that the standard be amended to exclude incompatible aftermarket and replacement tires from the malfunctions that the TPMS malfunction indicator must be able to detect. As noted in the April 8, 2005 final rule, we believe that the ability of the TPMS malfunction indicator to detect incompatible tires is key to the long-term functionality of the TPMS, and unless such a warning is provided, some drivers may lose the benefits of the system entirely. It is plainly foreseeable that most vehicles will outlast their original set of tires, so this requirement is necessary to ensure that consumers continue to receive the TPMS's important information related to low tire pressure.

The petition of NIRA Dynamics did not provide data to demonstrate the nature or extent of indirect TPMSs' alleged problems related to detection of incompatible tires. We do not believe that manufacturers would have to test all tires in order to determine which tires are incompatible with a given system, as NIRA Dynamics has suggested. Our understanding is that indirect TPMSs detect low tire pressure by comparing the differences in the rolling radius of the tires (*i.e.*, speed of the tires) and activating the low tire pressure telltale when the difference between wheel speeds reaches a certain, pre-determined value. We further understand that for indirect TPMSs, incompatible tires are primarily tires with a relationship between rolling radius and tire pressure that is outside the range of the system or where the geometry of one tire is outside the tolerances of the system. In such cases, the TPMS must be able to distinguish between a tire with low pressure and one that is incompatible with the TPMS, and to then illuminate the MIL.

In direct TPMSs, tire incompatibility is primarily associated with tire construction materials and their potential attenuation of radio frequency signals generated by the

TPMS unit (sensor) inside the tire. Based upon all available information, we have decided that TPMSs should continue to be required to alert the driver of a variety of system malfunctions, including installation of incompatible aftermarket or replacement tires. We believe that this approach will ensure continued, long-term TPMS functionality, which is consistent with Congress' intention to improve tire and vehicle safety, as expressed in the TREAD Act.

We have decided not to adopt M-Vision's recommendation that we amend the standard's malfunction detection requirement to specifically address mechanical failures of the system, such as a separation of wheel-mounted TPMS components. We believe that severe mechanical failures of TPMS wheel components would trigger the TPMS malfunction indicator in most cases, because a severe mechanical problem with a sensor would retard communications between the sensor and the receiver. In addition, it would be difficult to simulate a mechanical malfunction of a wheel component without dismounting the tire from the wheel, and potentially damaging the TPMS. Furthermore, we have not been presented with any data to demonstrate that mechanical failures, such as those described in the M-Vision petition, are likely to arise in actual vehicles or the consequences thereof. If situations involving mechanical failures of TPMS wheel components were to develop frequently, those types of potential TPMS failures may be determined to be defects, which would be properly addressed by NHTSA's Office of Defects Investigation.

Regarding Continental Teves' recommendation for a wording change under the standard's malfunction detection requirement (S4.4), specifically to state that a malfunction "inhibits" rather than "affects" the generation or transmission of control or

response signals in the vehicle's TPMS, we have decided to deny that request. Overall, the rationale offered by Continental Teves in support of its recommended change to the definition of a TPMS malfunction was not cogent and seemed incomplete. For example, the petition mentioned a hybrid system, but it did not explain how it operates. We do not believe that the Continental Teves petition provides a sufficient basis to support its recommended change to the standard.

We have decided to grant the Alliance's request for a technical change in S4.4(b)(3) that would modify that provision to read as follows: "Continues to illuminate the TPMS malfunction telltale under the conditions specified in S4.4(a)...." Although we do not believe that the standard's current reference to S4.4 in that provision is likely to cause any confusion or additional burden, we agree that the Alliance's recommended specification is more precise.

## 2. MIL Disablement

The final rule did not contain any provision for MIL disablement, and the preamble discussed the agency's rationale for not permitting system disablement (see section IV.C.2(c), as contained in the April 8, 2005 final rule).

In its petition, SEMA expressed support for the agency's decision in the final rule not to permit disablement of the TPMS malfunction indicator lamp. However, SEMA requested clarification as to whether the MIL may be disabled (made inoperative) for the purpose of replacing the TPMS with an equivalent aftermarket TPMS that also meets the requirements of the FMVSS No. 138. For example, SEMA suggested that a consumer may wish to "upgrade" the vehicle's TPMS in situations where that person encounters incompatible replacement tires. If disablement of the MIL were permitted for such

replacement purpose, SEMA argues that it would alleviate SEMA's concerns that consumers will choose not to install aftermarket or replacement rims and tires because they would lose the benefits of the MIL or have to accept driving with the MIL illuminated. Thus, SEMA recommended that NHTSA clarify that it is permissible to make the TPMS inoperative in order to replace the system with another TPMS that is also compliant with FMVSS No. 138.

We do not believe that it is necessary to amend the TPMS standard in order to permit suppliers and service technicians to install aftermarket components and systems that comply with FMVSS No. 138. This principle holds for our safety standards generally. We believe this approach is appropriate for the following reasons.

By way of background, the disablement for repair/replacement concept is addressed in 49 U.S.C. 30122(b), which provides:

A manufacturer, distributor, dealer, or motor vehicle repair business may not knowingly make inoperative any part of a device or element of design installed on or in a motor vehicle or motor vehicle equipment in compliance with an applicable motor vehicle safety standard prescribed under this chapter [49 USC 30101 *et seq.*] unless the manufacturer, distributor, dealer, or repair business reasonably believes the vehicle or equipment will not be used (except for testing or a similar purpose during maintenance or repair) when the device or element is inoperative.

When an automotive service business brings a vehicle into its facility for repair, replacement, or servicing of vehicle systems or components, it stands to reason that certain operating components or systems may need to be disabled in order to effectuate those changes. Furthermore, while such changes are pending, we expect that the vehicle would not be engaged in on-road use. By the time the vehicle is again returned to on-

road use, the business must ensure that aspects of the vehicle covered by applicable FMVSSs have been made inoperative. With that proviso, upgrades to the vehicle of the type mentioned by SEMA would be permissible, even if the standard does not explicitly state it.

### C. Telltale Requirements

The final rule requires each TPMS to include a low tire pressure warning telltale that is mounted inside the occupant compartment in front of and in clear view of the driver and which is identified by one of the symbols for the “Low Tire Pressure Telltale” in Table 2 of FMVSS No. 101, Controls and Displays. The low tire pressure warning telltale is required to illuminate under the conditions specified in S4.2 of FMVSS No. 138, and it must also perform a check of lamp function when the ignition locking system is activated to the “On” (“Run”) position or a position between “On” (“Run”) and “Start” that is designated by the manufacturer as a check position. (See S4.3, as contained in the April 8, 2005 final rule.)

Under the final rule, the TPMS-equipped vehicle is also required to be equipped with a TPMS malfunction indicator (beginning September 1, 2007). This malfunction indicator may be provided either through a separate, dedicated telltale or through a combined low tire pressure/TPMS malfunction telltale. For the separate TPMS MIL, the telltale must be mounted inside the occupant compartment in front of and in clear view of the driver and be identified by the word “TPMS,” as described under “TPMS Malfunction Telltale” in Table 2 of FMVSS No. 101. The dedicated TPMS malfunction telltale is required to illuminate under the conditions specified in S4.4 of FMVSS No. 138 for as long as the malfunction exists, and it must also perform a check of lamp function



when the ignition locking system is activated to the “On” (“Run”) position or a position between “On” (“Run”) and “Start” that is designated by the manufacturer as a check position. (See S4.4(b), as contained in the April 8, 2005 final rule.)

If the vehicle manufacturer elects to provide a combination telltale, it must meet the requirements of S4.2 and S4.3, as discussed above, and also indicate a TPMS malfunction as follows. While the ignition locking system is activated to the “On” (“Run”) position, upon detection of a TPMS malfunction, the combination telltale must flash for a period of at least 60 seconds but no longer than 90 seconds. After this period of prescribed flashing, the telltale must remain continuously illuminated as long as the malfunction exists and the ignition locking system is activated to the “On” (“Run”) position. This flashing and illumination sequence must be repeated each time the ignition locking system is activated to the “On” (“Run”) position until the situation causing the malfunction has been corrected. (See S4.4(c), as contained in the April 8, 2005 final rule.)

As discussed below, the Alliance petition raised issues related to the operation of the TPMS related telltale(s), as well as the timing for implementing the telltale requirements. More specifically, the Alliance’s petition sought clarification regarding how a combined TPMS telltale should operate when sequential malfunctions occur. The Alliance identified the following potential approaches: (1) Have one flashing sequence cover all TPMS malfunctions; (2) Have each malfunction trigger a separate warning, or (3) Extend the length of the flashing sequence to indicate more than one malfunction. The recommendation of the Alliance was to leave the choice among these approaches to vehicle manufacturer discretion.

The Alliance also petitioned to correct what it perceives to be a lack of synchronization between the TPMS telltale requirements in FMVSS No. 138 and in FMVSS No. 101. Specifically, the Alliance stated that vehicle manufacturers have no compliance requirements vis-à-vis FMVSS No. 138 until October 5, 2005, but there is not any corresponding compliance date specified in FMVSS No. 101 regarding the TPMS-related symbols (which arguably results in a compliance date of April 8, 2005 for those telltale symbols). According to the Alliance, failure to remedy this apparent oversight would negatively impact the voluntary introduction of TPMSs that are not certified to FMVSS No. 138, and the Alliance stated that substantial lead time is needed to incorporate such display changes. Therefore, the Alliance recommended adding two footnotes to Table 2 of FMVSS No. 101 that would exempt vehicles from compliance with the TPMS symbol requirements for vehicles whose TPMSs are not certified as compliant with FMVSS No. 138 during the phase-in period for that standard.<sup>24</sup>

Regarding the issue of sequential (multiple) malfunctions, we have decided that for vehicles with a combined low tire pressure/malfunction warning indicator, the telltale must flash for a single period of at least 60 seconds but no longer than 90 seconds and then remain continuously illuminated. This sequence will serve to alert the driver to any and all TPMS malfunctions detected by the system. We believe that once a consumer is warned that a TPMS malfunction exists, that person would be expected to take the vehicle to a service professional to diagnose and correct the problem. This reaction is not

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<sup>24</sup> The Alliance recommended that the following statement be added to Footnote 9 of FMVSS No. 101 Table 2: “*Display requirements for Tire Pressure Monitoring System Malfunction Telltale are effective for vehicles manufactured on or after September 1, 2007.*”

The Alliance also recommended adding a new Footnote 10 to that table as follows: “*Display requirements of the low tire pressure telltale are mandatory only for vehicles compliant with the requirements of FMVSS No. 138 at the date of vehicle manufacture.*”

likely to change depending upon the number of malfunctions, and at such time, we anticipate that all conditions impairing operation of the TPMS would be resolved. Furthermore, we have decided to specify how sequential malfunctions would be indicated in order to prevent confusion on the part of the consumer and to ensure that TPMSs provide a consistent message across the fleet. Accordingly, we have made minor technical changes to S4.4(c)(2) of the standard to clarify this matter.

Regarding the issue of the coordination of the compliance dates for the requirement of FMVSS No. 138 and Table 2 of FMVSS No. 101, we agree that it was not the agency's intention to require vehicle manufacturers to comply with the requirements for the TPMS telltale(s) in advance of the requirements for the installation of FMVSS No. 138-compliant TPMSs themselves. Vehicle manufacturers are not required to install TPMSs until October 5, 2005, and compliance could potentially be postponed if they elect to use carry-backward credits. During the phase-in, manufacturers could install other TPMSs that are not necessarily compliant with FMVSS No. 138, so we would not expect those vehicles to comply with the TPMS-related requirements of FMVSS No. 101, although we would expect vehicles voluntarily certified to FMVSS No. 138 to also meet the requirements of FMVSS No. 101. Furthermore, the TPMS malfunction telltale is not required until September 1, 2007, a fact reflected in FMVSS No. 138 but not in FMVSS No. 101.

During our consideration of these petitions for reconsideration, the agency published a final rule updating FMVSS No. 101 (70 FR 48295 (August 17, 2005)).<sup>25</sup> At that time, we were already aware of this synchronization issue. Therefore, in order to clarify the relationship between the TPMS-related requirements of FMVSS Nos. 138 and

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<sup>25</sup> Docket No. NHTSA-2005-22113-1.

101, we included an amendment in that final rule to modify the relevant table in FMVSS No. 101.

We note here that the above final rule for FMVSS No. 101 reorganized that standard to some extent, and consequently, the TPMS telltale provisions are now contained in Table 1, rather than Table 2. Accordingly, we are revising S4.3.1(b) and S4.4(b)(2) of FMVSS No. 138, in order to properly reference the TPMS-related provision of FMVSS No. 101.

Returning to our discussion of the three footnotes for the TPMS-related telltales incorporated into FMVSS No. 101, these footnotes read as follows.

Footnote 13, which is applied to the symbols and words for all three TPMS telltales (*i.e.*, the combined telltale which does not indicate which tire is under-inflated, the combined telltale which does indicate which tire is under-inflated, and the dedicated TPMS MIL), provides, “Required only for FMVSS compliant vehicles.” Thus, if the vehicle is certified to FMVSS No. 138, the TPMS telltale in question must comply with the requirements in Table 2.

Footnote 14, which applies only to the dedicated TPMS MIL telltale, makes clear that a separate telltale is not required; it states, “Alternatively, either low tire pressure telltale may be used to indicate a TPMS malfunction. See FMVSS 138.”

Footnote 15 also applies only to the dedicated TPMS MIL, stating, “Required only for vehicles manufactured on or after September 1, 2007.” For vehicle manufacturers that elect to provide a separate telltale for the MIL, the telltale would need to display “TPMS” after that date. Again, vehicle manufacturers with vehicles certified to FMVSS No.138 could voluntarily certify that they comply with the MIL requirements

before that date, in which case they would be subject to this TPMS telltale requirement, if they chose to install a dedicated MIL telltale. Because the necessary changes have already been incorporated into FMVSS No. 101, no additional amendments to the regulatory text are required by this final rule on this issue.

D. Tire-Related Issues

1. Spare Tires

The April 8, 2005 final rule does not require the TPMS to monitor the pressure in a spare tire (either compact or full-sized), either while stowed or when installed on the vehicle.

In its petition, ETV expressed its opinion that the TREAD Act requires the TPMS to continuously monitor all four active tires at all times while the vehicle is being driven. ETV then argued that because the April 8, 2005 final rule does not require the spare tire (whether compact or full-size) to be equipped with a TPMS sensor (for direct systems), this would render the TPMS either entirely or partially inoperable, in contravention of the TREAD Act. Furthermore, ETV expressed concern that in such situations, the TPMS MIL may illuminate, thereby masking other tire or system faults. Accordingly, ETV recommended that the standard be amended to require the spare tire to be fitted with a TPMS sensor so that the TPMS may continue to function in compliance with the standard when a spare tire is in use.

We have decided not to adopt ETV's recommendation that we modify the standard to require the TPMS to operate when a spare tire is installed on the vehicle. We came to this decision for a number of reasons, including the knowledge on the part of drivers that temporary tires are not intended for extended use, the fact that compact spare

tires pose operational problems for both direct and indirect TPMSs, the disincentive for manufacturers to supply a full-size spare (or any spare tire) if TPMS compliance were required, and the increased cost of the rule, with little if any safety benefit, if a spare tire must be monitored. In fact, as the standard is currently written, illumination of the TPMS MIL when a spare tire is installed may have the beneficial effect of encouraging the driver to rapidly repair or replace the regular tire, thereby permitting the spare tire to be returned to emergency reserve status. As noted in the final rule, NHTSA will not conduct compliance testing under Standard No. 138 with spare tires installed on the vehicle.

## 2. Tire Reserve Load

The April 8, 2005 final rule establishing FMVSS No. 138 does not include any separate requirements for tire reserve load beyond those already specified under our FMVSSs for tires.

Consistent with the position in its earlier petition for rulemaking and its comments on the NPRM, the RMA argued that the April 8, 2005 final rule for TPMS does not adequately protect motor vehicle operators from the risk of driving on significantly under-inflated tires, because it does not provide a warning when one or more of the vehicle's tires has insufficient pressure to carry the actual load on the tires. According to the RMA, the final rule's TPMS activation threshold fails to ensure that consumers will receive adequate warning before the tire's inflation pressure falls below the minimum level required to support the actual load (or if unknown, the maximum load) on the tire. The RMA did not provide any new data on this topic, and for the sake of brevity, it did not repeat in its petition all of its earlier arguments and reasoning as to the need for a tire reserve load.

Instead, it incorporated its earlier submissions by reference.<sup>26</sup> The RMA's petition repeated its earlier recommendation that NHTSA should establish a reserve load requirement to ensure that the tires can safely carry the vehicle maximum load (*i.e.*, not drop below the minimum values presented in the load/pressure tables of the Tire and Rim Association (TRA) Year Book), when the vehicle's tires are under-inflated by 25 percent.

ETRTO made essentially the same arguments as the RMA regarding the need for a tire reserve load requirement, in order to maximize consumer safety as required under the TREAD Act. We note that the RMA and ETRTO petitions for reconsideration provided no new data on the tire reserve load issue.

We have decided to deny RMA's and ETRTO's request that we establish a tire reserve load requirement, based upon the reasoning cited in earlier agency pronouncements on this issue, as summarized below. In a notice published in the **Federal Register** on May 19, 2005, the agency denied the RMA's petition for rulemaking seeking to establish its recommended tire reserve load because neither the RMA's nor the agency's data demonstrated a safety need for such a requirement.<sup>27</sup> Specifically, the available evidence did not demonstrate a reliable or conclusive relationship between tires with little or no pressure reserve and a higher rate of tire failures in the field. For a more complete discussion of the tire reserve load issue, please consult the above-referenced notice responding to the RMA petition.

We further believe that the tire reserve load requirement requested by the RMA and ETRTO is unnecessary in light of certain other requirements in our tire standards. By way

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<sup>26</sup> Specifically, the RMA referenced its submissions to Docket No. NHTSA-2000-8572 (entry numbers 116, 172, 228, 238, 241, 260, 261, 262, 263, and 271) and to Docket No. NHTSA-2004-19054 (entry number 34).

<sup>27</sup> 70 FR 28888 (May 19, 2005) (Docket No. NHTSA-2005-20967-8).

of explanation, FMVSS No. 110, Tire Selection and Rims, mandates, among other things, that all passenger cars sold in the United States be equipped with tires that are capable of carrying the vehicle's maximum loaded vehicle weight at the manufacturer's recommended cold inflation pressure (vehicle placard pressure). Multipurpose passenger vehicles, trucks, buses and trailers must be fitted with tires that are capable of supporting the vehicle's gross axle weight rating (GAWR).<sup>28</sup> In most cases, vehicle manufacturers meet these requirements by consulting standardized tables for tire size, loading, and inflation pressure published by the Tire and Rim Association or other international tire industry organizations.<sup>29</sup>

Vehicle manufacturers may, at their discretion, specify a higher placard pressure for the tires fitted to their products than that provided by the TRA tables to support the vehicle's maximum load. This additional tire pressure is known as "tire pressure reserve." Within bounds, an increase in tire pressure results in an increase in load carrying capacity. The extra load carrying capacity realized, because of the additional tire pressure, is called the "tire load reserve."

As noted in our denial of the RMA's petition, we believe that the existing requirements in our tires standards provide an adequate pressure reserve. FMVSS No. 110 also includes a requirement for a tire pressure reserve based on vehicle normal load.

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<sup>28</sup> This requirement was adopted from FMVSS No. 120, Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars. Before TREAD Act-related upgrades were made (which also consolidated NHTSA's tire standards), passenger cars, and non-passenger cars regardless of their gross vehicle weight rating (GVWR), were covered by FMVSS Nos. 110 and 120 respectively.

<sup>29</sup> Paragraph S4.3.1(c) of FMVSS No. 110 permits the use of standard tire pressure/load tables contained in publications listed in paragraph S4.4.1(b) of FMVSS No. 109 that are current at the date of manufacture of the tire or any later date. Specifically, publications by any of the following international industrial organizations may be used: (1) The Tire and Rim Association, (2) The European Tyre and Rim Technical Organization, (3) Japan Automobile Tire Manufacturers' Association, Inc., (4) Tyre & Rim Association of Australia, (5) Associacao Latino Americana de Pneus e Aros Brazil), or (6) The South African Bureau of Standards.



“Vehicle normal load” is that load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and occupant weight and dividing the result by two. The number of occupants used to determine the “normal load” is defined in FMVSS No. 110 as two persons for a vehicle with four seating positions, and three persons for a vehicle with five seating positions. The current standard requires that the vehicle normal load on a tire shall not be greater than 88 percent of the tire’s maximum load rating as marked on the tire sidewall.

NHTSA published a final rule upgrading the standards applicable to tires on June 26, 2003.<sup>30</sup> The upgraded version of FMVSS No. 110 specifies that the vehicle normal load on each tire must not exceed 94 percent of the tire’s load rating at the placard pressure for that tire. This change in calculation of vehicle normal load is intended to more accurately reflect the load based on the vehicle’s placard pressure, which may vary from vehicle to vehicle, even when the same tires are used. We anticipate that this change may result in a placard pressure increase of 1-2 psi.<sup>31</sup>

### 3. Minimum Activation Pressure

Under S4.2 of the standard, the TPMS must illuminate a low tire pressure warning telltale not more than 20 minutes after the inflation pressure in one or more of the vehicle’s tires, up to a total of four tires, is equal to or less than either the pressure 25

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<sup>30</sup> The June 23, 2003 final rule pertained to FMVSS No. 109, New Pneumatic Bias Ply and Certain Specialty Tires, FMVSS No. 110, Tire Selection and Rims for Motor Vehicles with a GVWR of 4,536 Kilograms (10,000 Pounds) or Less, FMVSS No. 119, New Pneumatic Tires for Motor Vehicles with a GVWR of More Than 4,536 Kilograms (10,000 Pounds) and Motorcycles, FMVSS No. 120, Tire Selection and Rims for Motor Vehicles with a GVWR of More Than 4,536 Kilograms (10,000 Pounds), and FMVSS No. 139, New Pneumatic Radial Tires for Light Vehicles. See 68 FR 38116 (June 23, 2003) (Docket No. NHTSA-2003-15400-1).

<sup>31</sup> The agency has conducted a FMVSS No. 110 vehicle normal load evaluation and has concluded that almost all light vehicles could meet a revised criteria for load reserve based on 94 percent of placard pressure with only a minor increase (e.g., 1 or 2 psi) in inflation pressure to accommodate the new requirement. *Id.* at 38141.

percent below the vehicle manufacturer's recommended cold inflation pressure, or the pressure specified in the 3<sup>rd</sup> column of Table 1 of the standard for the corresponding type of tire, whichever is higher. Table 1 is titled "Low Tire Pressure Warning Telltale – Minimum Activation Pressure" (MAP). The third column of Table 1 specifies the following MAP values: (1) P-metric, Standard Load (140 kPa/20 psi); (2) P-metric, Extra Load (160 kPa/23 psi); (3) Load Range C (200 kPa/29 psi); (4) Load Range D (240 kPa/35 psi); and (5) Load Range E (240 kPa/35 psi).

The Alliance acknowledged the modifications to the MAP values in the final rule as an improvement over the values proposed in the NPRM. However, the Alliance nevertheless recommended that the standard should be modified further to permit light truck Load Range D and E tires to be used across the safe operating range of inflation pressures for those tires that are specified in the load/pressure tables of the TRA Year Book. According to the Alliance, TPMSs require a 7 to 10 psi differential between recommended cold inflation pressure and the TPMS low tire pressure warning threshold in order to allow for environmental effects, manufacturing variation, and other system variables, while avoiding nuisance warnings. Therefore, in order to specify a placard pressure of 35 psi, the TPMS activation threshold would need to be lowered to 25 to 28 psi.

As discussed in its earlier petition for rulemaking on MAPs,<sup>32</sup> the Alliance argued that the MAP values in Table 1 are likely to prove problematic for certain vehicle applications. The Alliance stated that it had previously submitted certain component and vehicle test data in support of its petition, including LT tire test data supplied by General Motors (data from endurance tests, low inflation pressure tests, laboratory and on-vehicle

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<sup>32</sup> Docket No. NHTSA-2000-8572-265 and 266.

bead unseating tests).<sup>33</sup> Based upon such data, the Alliance has concluded that there is not a demonstrated safety need for the specific MAP values for LT tires set forth in Table 1. According to the Alliance, more stringent requirements, testing at higher tire deflection levels, are already set by paragraph S6.4, “Low Inflation Pressure Performance,” of FMVSS No. 139, New Pneumatic Radial Tires for Light Vehicles, so there is arguably not any need for such a requirement under FMVSS No. 138.

Therefore, in its petition, the Alliance identified three recommended options for addressing the MAP issue: (1) eliminate the MAP requirement for LT tires; (2) adopt the MAP values proposed by the Alliance, or (3) adopt 29 psi as the MAP for all LT tires (Load Range C, D, and E).

In its petition, the RMA expressed an opposing viewpoint on the MAP issue, objecting to the decision in the final rule to lower the MAP for Load Range D and E tires to 35 psi. The RMA argued that a MAP of 35 psi for these tires will not ensure that consumers receive an adequate warning before the tires become significantly under-inflated or over-inflated. The RMA recommended that the agency conduct further rulemaking related to MAPs, including issuance of an NPRM, so that the interested public has an opportunity to provide additional information and to fully participate in the resolution of this issue. (Michelin’s petition made the same arguments on this issue as the RMA petition, and it incorporated the RMA’s document by reference.)

After careful consideration of the petitions addressing the MAP issue, we have decided to confirm and retain the MAP values for LT tires as presented in Table 1. As noted in the final rule, the TRA Year Book includes load/pressure relationships for Load

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<sup>33</sup> The petition also stated that additional data related to the MAP issue were supplied by the Alliance and GM at Docket No. NHTSA-2000-8572-268 and Docket No. NHTSA-2004-19054-95.

Range D and E tires from 80 psi (maximum inflation pressure) down to 35 psi. This value provides a benchmark, indicating that a Load Range D or E tire could be safely operated at an inflation pressure as low as 35 psi. This approach is analogous to the approach we used in selecting the MAP values for P-metric tires, although the various tire industry publications exhibited more consistent values for P-metric tires.

The MAP values in Table 1 provide a floor value for activation of the TPMS for given classes of tires, and we do not believe that it is consistent with safety to eliminate the MAP for Load Range D and E tires. The MAPs play an important role in the TPMS's ability to provide a timely warning to the driver regarding low tire pressure. We believe that the minimum operating pressure recommended for Load Range D and E tires in the TRA Year Book is an adequate and safe value for the MAP. We are aware that a MAP of 35 psi effectively requires that the minimum vehicle placard pressure be 40 to 45 psi to ensure proper TPMS function. However, we expect that the MAP issue raised by the Alliance and GM is only likely to impact a small percentage of vehicles using LT tires (*i.e.*, typically vehicles with a GVWR of over 8,500 pounds).<sup>34</sup> Furthermore, our analysis of the available data has led us to conclude that the MAP values currently presented in Table 1 should not have a significant negative impact upon vehicle handling or the propensity for rollover, so we believe that the current MAP values provide a long-term resolution of this issue without the need for further rulemaking.<sup>35</sup>

With regard to the RMA and Michelin petitions, neither of them provided any data or rationale explaining why the agency should initiate new, separate rulemaking to address the MAP issue for Load Range D and E tires. These petitions merely provided a

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<sup>34</sup> Docket No. NHTSA-2000-8572-265.

<sup>35</sup> DOT HS 809 701.

conclusory statement that MAP values of 35 psi will not ensure that consumers will be warned before the tires are dangerously overloaded or under-inflated.

E. Owner's Manual Requirements

Under S4.5, the owner's manual of each vehicle certified as complying with FMVSS No. 138 must provide an image of the Low Tire Pressure Telltale symbol (and an image of the TPMS Malfunction Telltale warning ("TPMS"), if a dedicated telltale is utilized for this function) with the following statement in English:

Each tire, including the spare (if provided), should be checked monthly when cold and inflated to the inflation pressure recommended by the vehicle manufacturer on the vehicle placard or tire inflation pressure label. (If your vehicle has tires of a different size than the size indicated on the vehicle placard or tire inflation pressure label, you should determine the proper inflation pressure for those tires.)

As an added safety feature, your vehicle has been equipped with a tire pressure monitoring system (TPMS) that illuminates a low tire pressure telltale when one or more of your tires is significantly under-inflated. Accordingly, when the low tire pressure telltale illuminates, you should stop and check your tires as soon as possible, and inflate them to the proper pressure. Driving on a significantly under-inflated tire causes the tire to overheat and can lead to tire failure. Under-inflation also reduces fuel efficiency and tire tread life, and may affect the vehicle's handling and stopping ability.

Please note that the TPMS is not a substitute for proper tire maintenance, and it is the driver's responsibility to maintain correct tire pressure, even if under-inflation has not reached the level to trigger illumination of the TPMS low tire pressure telltale.

*[The following paragraph is required for all vehicles certified to the standard starting on September 1, 2007 and for vehicles voluntarily equipped with a compliant TPMS MIL before that time.]* Your vehicle has also been equipped with a TPMS malfunction indicator to indicate when the system is not operating properly. *[For vehicles with a dedicated MIL telltale, add the following statement:* The TPMS malfunction indicator is

provided by a separate telltale, which displays the symbol “TPMS” when illuminated.] *[For vehicles with a combined low tire pressure/MIL telltale, add the following statement: The TPMS malfunction indicator is combined with the low tire pressure telltale. When the system detects a malfunction, the telltale will flash for approximately one minute and then remain continuously illuminated. This sequence will continue upon subsequent vehicle start-ups as long as the malfunction exists.]* When the malfunction indicator is illuminated, the system may not be able to detect or signal low tire pressure as intended. TPMS malfunctions may occur for a variety of reasons, including the installation of replacement or alternate tires or wheels on the vehicle that prevent the TPMS from functioning properly. Always check the TPMS malfunction indicator after replacing one or more tires or wheels on your vehicle to ensure that the replacement or alternate tires and wheels allow the TPMS to continue to function properly.

For vehicles that do not come with an owner’s manual, the required information must be provided in writing to the first purchaser of the vehicle (S4.5(c)).

As provided under S4.5(b), vehicle manufacturers may include information in the owner’s manual about the time for the TPMS telltale(s) to extinguish once the low tire pressure condition or the malfunction is corrected. Vehicle manufacturers may also include information in the owner’s manual about the significance of the low tire pressure warning telltale illumination, a description of corrective action to be undertaken, whether the TPMS functions with the vehicle’s spare tire (if provided), and how to use a reset button (if one is provided).

Petitioners recommended changes to the content of the owner’s manual language, and they also requested additional lead time for implementing the standard’s owner’s manual provisions. These arguments are presented immediately below.

1. Lead Time

The Alliance argued that because the owner's manual requirements of FMVSS No. 138 do not provide any additional lead time for those provisions, they significantly impact the ability of manufacturers to earn and apply carry-forward and carry-backward credits. The Alliance stated that the text for the required owner's manual language differs substantially from that incorporated in the June 2002 final rule (since vacated) or September 2004 NPRM, and its petition also stated that current owner's manuals of TPMS-equipped vehicles contain a statement consistent with the language provided in one or the other of those two notices.

The Alliance stated that preparation of owner's manuals normally involves a one-to-two year process, something that the Alliance claims that NHTSA has recognized in other proceedings.<sup>36</sup> Although at first blush these owner's manual changes may seem like a simple matter, the Alliance argued that the multiplicity of brands and models significantly increases the complexity of this task. Furthermore, the Alliance's petition stated that, overall, since the time of the June 5, 2002 final rule, "the different versions of the [required owner's manual] text differ only in detail, and not in substance or intent." As a result, the Alliance argued that such differences do not justify hindering manufacturers' ability to introduce TPMSs in an expedited fashion. For the above reasons, the Alliance recommended delaying the effective date for all TPMS-related owner's manual requirements until September 1, 2006.

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<sup>36</sup> The Alliance referenced NHTSA's final rule responding to petitions for reconsideration of the Tire Safety Information rulemaking (see 68 FR 33655 (June 5, 2003) (Docket No. NHTSA-2003-15278-1)). In that rule, the agency decided to extend the final rule's lead time (of less than one year) for an additional year, in part because of the need for vehicle manufacturers to effect changes to owner's manuals. The notice stated, "Additionally, for all car lines, manufacturers will be required to make extensive changes to their owner's manuals and these changes typically require a longer lead time than that provided by the final rule." 68 FR 33655, 33656 (June 5, 2003).

The AIAM's petition raised many of the same arguments regarding the need for lead time for the owner's manual requirements, both for vehicles that manufacturers intend to earn carry-forward credits, as well as for other vehicles. However, the AIAM's petition differed in that it asked NHTSA to delay the standard's compliance date for TPMS-related owner's manual requirements until September 1, 2007. Because that is the date for mandatory compliance with the standard's malfunction detection requirements, the AIAM reasoned that such date would allow all required owner's manual language related to the TPMS to be incorporated at the same time.

After careful consideration of these petitions, we have decided to delay the compliance date for the TPMS owner's manual requirement, thereby granting petitions' request for additional lead time to incorporate the required language into the vehicle owner's manual. We have decided to postpone compliance with the owner's manual requirement until September 1, 2006, and we are modifying S4.5(a) of the standard accordingly. (We note that the compliance date for incorporation of the required language related to the TPMS MIL is has not changed (*i.e.*, September 1, 2007).) We believe that this request can be granted without negatively impacting vehicle safety. First, delay of the owner's manual requirements would not impact the functioning of the TPMS or the warnings that it provides. Furthermore, we expect that even before that date, TPMS-equipped vehicles would have some owner's manual statement presenting relevant information to the consumer. This change should facilitate vehicle manufacturers' ability to earn carry-forward and carry-backward credits for TPMSs that otherwise comply with FMVSS No. 138 since publication of the April 8, 2005 final rule.



We specifically note that delay in the compliance date for the standard's owner's manual requirements does not impact vehicle manufacturers' responsibility to provide TPMSs complying with FMVSS No. 138 on a schedule consistent with the phase-in commencing on October 5, 2005, as set forth in the April 8, 2005 final rule.

We are denying the AIAM's request to extend the vehicle owner's manual requirements until September 1, 2007. Based upon our analysis, we believe that a September 1, 2006 compliance date is practicable, so we do not see any reason to further delay presentation of a standardized message to consumers regarding the presence and function of TPMSs.

2. Content of Required Statement

In its petition, ETRTO argued that the provisions in the April 8, 2005 final rule dealing with the owner's manual language may be inadequate to warn consumers regarding potential TPMS shortcomings. Accordingly, ETRTO recommended that S4.5 of the standard be amended to: (1) clearly explain the precautions that the consumer must take to ensure proper functioning of the TPMS for systems equipped with a manual reset feature (*e.g.*, to prevent recalibration at an incorrect inflation level); (2) explicitly state that the TPMS may not alert the driver for a 20-minute period immediately after a malfunction occurs, until such time as the TPMS can detect the malfunction, and (3) require, rather than permit, vehicle manufacturers to provide the information specified under S4.5(b).

SRI recommended amending S4.5(a) by supplementing the required statement in the vehicle owner's manual with the following additional language to make consumers aware that other anomalous situations may exist:

When illuminated, the malfunction warning light indicates that the TPMS is not receiving a signal from the inflation pressure or wheel sensors. However, even if the malfunction warning light is not illuminated there can be conditions that can cause the system to be less sensitive to the tire pressure loss. It is the driver's responsibility to maintain correct tire pressure even if both TPMS and malfunction indicator lamps are not illuminated.

SRI argued that its recommended owner's manual language is necessary because it is not possible to anticipate all problems that would cause inaccuracies in a TPMS's functioning, some of which may not be capable of being detected by the TPMS malfunction indicator.

After careful review, we have decided that no further modifications to the vehicle owner's manual requirements are required as a result of the ETRTO and SRI petitions. We believe that the language set forth in the April 8, 2005 final rule provides a clear message to the consumer regarding the presence and function of the TPMS installed in the vehicle, as well as its supporting role to the vehicle operator's ongoing responsibility for regular tire maintenance. We believe that the required owner's manual statement accomplishes its purpose, so it is not necessary to require the additional language recommended by ETRTO and SRI.

Furthermore, we have decided to deny ETRTO's request to make mandatory the other TPMS-related topics addressed in S4.5(b). Again, because we believe that the required statement under S4.5(a) provides a clear and simple explanation about the TPMS to the consumer, we believe the optional topics listed in S4.5(b) may be beneficial, but are not necessarily critical. In addition, some of those topics may not apply to all vehicles, depending upon the type of TPMS technology installed.

### 3. Other Owner's Manual Issues

The Alliance recommended moving the requirements currently contained in S4.5, Written Instructions, from 49 CFR Part 571 (*i.e.*, FMVSS No. 138) to 49 CFR Part 575, Consumer Information, the locus of other owner's manual requirements involving specific language. According to the Alliance, other safety standards under Part 571 with requirements for the owner's manual generally provide manufacturers discretion to include their own descriptions of certain required information or elements (*e.g.*, FMVSS Nos. 108, 202, 205, 208, 210).

The Alliance expressed concern that retention of the owner's manual requirement in Part 571 could unnecessarily trigger the recall and remedy provisions under 49 U.S.C. 30118 and 30120. The Alliance argued that even a typographical error, no matter how minor or insignificant, would at the very least require the manufacturer to notify NHTSA that a noncompliance exists by filing a report under 49 CFR Part 573, Defect and Noncompliance Reports, and to petition for a determination of inconsequentiality.

Furthermore, the Alliance argued that movement of the TPMS-related owner's manual requirements to Part 575 would not have any impact upon vehicle manufacturers' compliance, because even with such a change, manufacturers would still be subject to the penalty provisions of Part 578, Civil and Criminal Penalties, for violations of the Part 575 regulations. In addition, Alliance stated that there is already sufficient incentive for manufacturers to communicate effectively regarding safety issues, because vehicle manufacturers have a strong incentive to satisfy customers, to protect corporate reputation, and to avoid litigation.

The Alliance argued that reassigning the TPMS-related owner's manual requirements to Part 575 would alleviate any carry-forward credit concerns associated

with text that does not precisely conform to that adopted in FMVSS No. 138. That is because under S7.4(a) of FMVSS No. 138 and Subpart G of Part 585 (TPMS Phase-in Reporting Requirements), a manufacturer must report compliance with all TPMS requirements, except for S4.4 which deals with the TPMS MIL, in order to earn carry-forward credits.

The Alliance's petition also stated that the required owner's manual language presented in the agency's TPMS Laboratory Test Procedure (TP-138-00) does not match that set forth in S4.5(a). The Alliance asked the agency to reconcile this conflicting language.

Upon consideration, we have decided to deny the Alliance request to move the requirement under S4.5(a) for the specific owner's manual statement to 49 CFR Part 575. We believe that the required statement describing the TPMS and its role is a fundamental aspect of the standard, and accordingly, we believe that it should remain an integral part of FMVSS No. 138. Although it is true that errors in printing the owner's manual statement could trigger manufacturer responsibilities under the recall and remedy provisions of 49 U.S.C. 30118 and 30120, we believe that such instances would be rare and easily avoidable. Careful proofreading of pre-publication owner's manual statements should ensure that the standard's required language is faithfully executed, and in rare instances where typographical errors arise, those situations can be readily corrected through a petition for determination of inconsequential noncompliance.

As to the Alliance's point regarding the discrepancy between the required owner's manual language in S4.5(a) of the standard and the TPMS Laboratory Test Procedure

(TP-138-00), we have since corrected the latter document to remedy this inadvertent error (see <http://nhtsa.gov/portal/site/nhtsa/menuitem.b166d5602714f9a73baf3210dba046a0/>).

#### F. Test Procedures

The test conditions for the TPMS may be found under S5 of the standard, and the corresponding test procedures may be found at S6 of the standard. Specific aspects of these test conditions and procedures are outlined below, along with focused issues raised in petitions for reconsideration.

However, the petition submitted by ETRTO raised the issue of the adequacy of the test procedures generally, so that topic will be discussed and responded to as an initial matter. Specifically, ETRTO argued that the final rule's test procedures represent a step backward from the NPRM in terms of ensuring that drivers are warned promptly when a vehicle's tires are 25-percent under-inflated or reach the minimum activation pressure. ETRTO expressed concern that "comparison of an under-inflation level checked while tyres are warm with a placard inflation level relative to cold tyres may be seriously misleading." The petitioner provided data intended to demonstrate the inconsistent results that may be presented, depending upon the tire and when it is tested under the test procedures of FMVSS No. 138. ETRTO stated that the final rule's arguments related to the vehicle cool-down period (discussed at section IV.C.4.d of the final rule) are not pertinent because they are not supported by experimental evidence. Furthermore, ETRTO argued that the final rule does not take into account measurement uncertainties and capabilities of TPMSs, and that measurement quality assurance principles have not been met. ETRTO also asserted that modifications are necessary because manometers at gas station air pumps are seriously inaccurate, something which could contribute to the

above problems. For these reasons, ETRTO recommended reverting to the test procedures set forth in S6 of the NPRM, because it believes that those procedures are more likely to result in closer compliance with the standard's 25-percent under-inflation detection requirement.

In response, we note that the test procedure for low tire pressure detection was modified in the final rule to eliminate the one-hour cool-down period after system calibration, because that provision required that the tires be cycled from cool to warm during the test. That would have introduced temperature and pressure uncertainties during the test procedure, and there would have been the possibility that tire pressure would rise to a level above the activation threshold for the low tire detection telltale. Elimination of the one-hour cool-down period allows the low pressure test to be conducted with minimal temperature and pressure change.

We believe that the arguments in the April 8, 2005 final rule related to the vehicle cool-down period (see section IV.C.6.d) are supported by the data in the ETRTO petition. That is, the tire pressure in the deflated tire remains below the TPMS telltale activation level while the vehicle is driven. With regard to the argument that the test procedure in the final rule allows the test pressure in the under-inflated tire to be 30 percent or more below placard pressure, the compliance tests must be conducted at an under-inflation level of 25 percent or more below placard or at the MAP. We believe that the test procedures, as amended in this final rule, will result in TPMS testing with an under-inflation level of 25 – 30 percent below placard for the test tire(s), which we also believe is sufficiently accurate when variations in ambient temperature, tire temperature, tire geometry, and test instrumentation are considered. The example offered by ETRTO in

which tire pressure errors at service stations are calculated based on a pressure gauge with 90 percent accuracy, is not representative of the level of accuracy experienced in compliance or certification testing. For these reasons, we believe that the test procedures, as amended in response to the petitions, are appropriate.

1. Test Conditions

The final rule included provisions under S5, Test Conditions, to specify the conditions under which the agency would conduct compliance testing under S6, Test Procedures. Specifically, S5 provided that during testing, the ambient temperature would be between 0° C (32° F) and 40° C (104° F) (see S5.1, as contained in the April 8, 2005 final rule). The road test surface will be any portion of the Southern Loop of the Treadwear Test Course defined in Appendix A and Figure 2 of 49 CFR 575.104, and the road surface will be dry during testing (see S5.2, as contained in the April 8, 2005 final rule).

The vehicle will be tested at any weight between its lightly loaded vehicle weight and its gross vehicle weight rating (GVWR) without exceeding any of its gross axle weight ratings (see S5.3.1, as contained in the April 8, 2005 final rule). The vehicle's TPMS will be calibrated and tested at speeds between 50 km/h (31.1 mph) and 100 km/h (62.2 mph) (see S5.3.2, as contained in the April 8, 2005 final rule). The vehicle's rims may be positioned at any wheel position, consistent with any related instructions or limitations in the vehicle owner's manual (see S5.3.3, as contained in the April 8, 2005 final rule). The final rule also specifies that the vehicle's tires will be shaded from direct sun when the vehicle is parked (see S5.3.4, as contained in the April 8, 2005 final rule)

and that driving time shall not accumulate during application of the service brake (see S5.3.5, as contained in the April 8, 2005 final rule).

The RMA petitioned the agency to amend the test conditions in the TPMS standard to ensure that the system operates under all conditions that would represent the real-world driving environment. Although the RMA's petition did not set forth these recommended changes in detail, it did reference the same recommendations from the organization's earlier petition for rulemaking and its comments on the September 2004 NPRM for TPMS. In those earlier submissions, the RMA argued that the temperature range for testing should be expanded to include ambient temperatures below freezing (32° F) and above 104° F. The RMA also advocated testing under slippery road conditions, increasing the range for the driving speed to include speeds over 100 kmh for low tire pressure detection, and testing during braking maneuvers.

ETRTO made a similar argument in its petition, seeking changes to the standard's test condition to comport with the organization's suggestions presented at an earlier stage of the rulemaking. In its earlier submissions, ETRTO made comments similar to those provided by the RMA (discussed immediately above) on this issue, except that ETRTO also recommended testing at speeds below 31 mph. According to ETRTO, unless such modifications are made to better reflect actual driving environments, the standard will not maximize consumer safety, as required by the TREAD Act.

The petition of VW/Audi argued that the Southern Loop of the Tread Wear Test Course may not represent a reasonable or practicable means of evaluating real-world TPMS usage, as would meet the objective of establishing a standard that would both enhance motor vehicle safety and also be practicable for compliance purposes. For this



reason, VW/Audi recommended that S6(d) and (f) of the standard's test procedures should be revised to permit up to 60 minutes of driving time for certification purposes. Specifically, VW/Audi recommended that S6(d), the system calibration/learning phase, should permit a cumulative total of 60 minutes of driving with a minimum of 10 minutes in at least three vehicle speed ranges (*e.g.*, 50-70 kmh, 70-85 kmh, and 85-100 kmh (or some other sets of speed ranges with limits of  $\pm 10$  kmh)). VW/Audi also stated that the detection time in S6(f)(2) should be increased to a total cumulative time of 60 minutes, and that the drive time in S6(f)(3) should be the lesser of 60 minutes or the time at which the low tire pressure telltale illuminates.

After considering the petitioners' comments regarding test conditions, we have decided that no further modifications to the test conditions in S5 are necessary. The agency's intention in developing the test procedure for TPMS-equipped vehicles was not to test the TPMS at every conceivable vehicle operating condition, but to instead evaluate the system at operating conditions that are typically encountered during normal driving. The RMA and ETRTO did not present any new data or arguments regarding the adequacy of the final rule's test conditions, nor did they specify any recommendations for test parameters that they believe would be more reflective of real world driving conditions.

Consistent with the approach discussed above, the agency decided to specify the Southern Loop of the Tread Wear Test Course, a public roadway, for the compliance test, rather than using a test facility. We do not agree with the argument in the VW/Audi petition that the Southern Loop of the Tread Wear Test Course is not a reasonable or practicable means of evaluating real-world TPMS usage. We believe that a public

roadway is highly representative of the real world conditions that may be encountered by drivers, and we further believe that, in light of the fact that this particular course has been used for several years for testing under our Uniform Tire Quality Grading Standards (UTQGS), there is not any reason to believe that the course would not similarly be suitable for TPMS testing.

We are not adopting the suggestion of VW/Audi to specify that portions of the test be conducted in three  $\pm 10$  kmh subsets of the overall speed range specified in S5.3.2. The VW/Audi petition did not provide any data to demonstrate why these narrower speed range categories are necessary, and because vehicle operators are unlikely to observe such strictures during normal driving, we have decided to retain the final rule's speed range of 50-100 kmh (31.1-62.2 mph) without additional refinement. Furthermore, we do not believe that VW/Audi's argument related to extending the time periods for TPMS calibration and low tire pressure detection is directly related to the standard's test conditions; accordingly, this issue is being addressed elsewhere in this notice.

For these reasons, we continue to believe that the test conditions specified in the final rule will result in robust TPMSs that will function normally over a wide range of operating conditions. Accordingly, we do not believe that additional specifications related to temperature, weather, or speed would appreciably change the TPMS's performance. Furthermore, it is unlikely that design changes yielding greater safety benefits would result because vehicle manufacturers are aware of the temperature, weather, vehicle speed, and other conditions that their vehicles are exposed to and typically design to meet or exceed those conditions.

## 2. Vehicle Cool-Down Period

Under S6, Test Procedures, the final rule states that the vehicle will be driven within five minutes after reducing the inflation pressure in the tire(s) as part of the low tire pressure detection phase (see S6(f)(1), as contained in the April 8, 2005 final rule), and, for vehicles in which the TPMS successfully detected low tire pressure, it also requires the vehicle's ignition to be turned off for five minutes, after which time the ignition locking system is reactivated to determine whether the system continues to detect the under-inflation condition (see S6(g), as contained in the April 8, 2005 final rule). Under S6(h), the next sequential step in the test procedure, the vehicle is to be kept stationary for a period of up to one hour with the engine off, after which time the vehicle's tires are re-inflated and the TPMS should recognize that the low tire pressure situation has been resolved. The vehicle may be driven in order to allow the TPMS to check the tire pressure and to extinguish the low tire pressure telltale.

In their petitions, ETRTO and SmarTire objected to the agency's decision in the April 8, 2005 final rule to eliminate the vehicle "cool down" period in S6(e) and S6(f)(1), for the following reasons. With reference to the calibration/learning phase in S6(d), SmarTire argued that a 20-minute driving interval (especially at high speeds and high ambient temperatures) may increase tire pressure by 5-6 psi over placard pressure. SmarTire expressed concern that this pressure build-up of 5-6 psi would still be present when the pressure in the tire(s) is reduced to the test pressure.

SmarTire provided data indicating that as presently worded, the FMVSS No. 138 test procedure would permit a TPMS with only a 50-percent under-inflation detection capability, rather than the required 25-percent under-inflation detection capability. SmarTire asserted that this situation could lead to irreparable structural damage to the

tire, which could possibly lead to tire failure, so the petitioner recommended amending the final rule to restore the one-hour cool down period to the test procedure.

ETRTO also provided tire pressure data obtained by driving a vehicle, deflating the warm tires, and measuring tire pressure at various time intervals after tire deflation. The ETRTO data indicated that, under most deflation conditions, the warm tires that were deflated to 25 percent below placard pressure minus 2 psi maintained a tire pressure of 30 percent or more below placard pressure.

For the reasons that follow, we have decided against reinstating the one-hour cool-down period proposed in the NPRM. However, we are also sensitive to petitioners' arguments that the pressure during testing should be kept as close as possible to the standard's 25-percent under-inflation activation threshold.

Our understanding of the relevant positions on the cool-down period is as follows. Vehicle manufacturers expressed concern that if a vehicle is permitted to cool down for one hour after the calibration phase of testing, once the vehicle is driven, the tires will warm up, and tire pressure would be expected to rise by several psi. Thus, vehicle manufacturers are concerned that the tires may warm up to a point above the TPMS low tire activation threshold (*i.e.*, less than 25 percent below placard pressure), thereby causing the low tire pressure telltale to extinguish after illumination or not illuminate at all. Accordingly, the vehicle manufacturers favor both a short cool-down period (*e.g.*, five minutes or less) and a larger temperature compensation adjustment (*e.g.*, 2 psi).

In contrast, tire manufacturers are concerned that there would be a 30-percent or greater difference in pressure between: (a) a cold tire inflated to placard pressure and then heated up by driving and (b) a warm tire that has been deflated to 25 percent below

placard pressure. Under real world driving conditions, this would increase the potential for tire damage and failure. Accordingly, tire manufacturers favor a longer cool-down period (*e.g.*, one hour) and a smaller temperature compensation adjustment.

In response to public comment from vehicle manufacturers at the NPRM stage, the agency reduced the cool-down period in S6(f)(1) from the NPRM's proposed one hour to the final rule's five minutes, in order to conduct the low pressure test without significant temperature variation. We agree with the vehicle manufacturers that elimination of the one-hour cool-down period will help maintain the under-inflated tire's pressure and allow it to remain below the TPMS activation threshold during testing. Although the pressure difference between the fully-inflated tires and the under-inflated tire(s) may be somewhat larger without the one-hour cool-down, the actual pressure of the under-inflated tire(s) would not be expected to be significantly above the standard's low tire pressure activation threshold. The SmarTire and ETRTO petitions did not provide any data to document the tire damage expected to occur as a result of the final rule's reduction in the time of the cool-down period, and they did not provide any alternative solution to the problem of tire pressure and temperature rising during vehicle operation. Accordingly, we have decided to retain the provisions in S6 related to vehicle cool-down as presented in the final rule without change.

### 3. 2-psi Adjustment (Temperature Correction)

Under S6(e) of the final rule, any combination of one to four tires is deflated to 14 kPa (2 psi) below the inflation pressure at which the TPMS is required to illuminate the low tire pressure warning. This provision sets the stage for the test procedures' low pressure test (*i.e.*, the system detection phase). This adjustment provides some margin in

compliance testing to ensure that a warm tire does not cause a tire deflated by 25 percent below placard pressure to again rise slightly above the 25-percent TPMS warning threshold.

The issue of the 2 psi adjustment in S6(e) of the test procedures was among the most frequently raised issues in the petitions for reconsideration (*i.e.*, topic addressed by the Alliance, Michelin, the RMA, and SmarTire). The RMA stated that the final rule modified the test procedure to include a –14 kPa (–2 psi) adjustment in tire pressure during testing, rather than the –7 kPa (–1 psi) adjustment proposed in the NPRM, but it did not provide any independent testing data or other verification to support this change.

To address this point, a number of RMA member companies conducted testing, and these data, provided with the RMA petition, suggested that this change to the test procedures could permit testing of the TPMS with tires under-inflated by 32 percent or more below placard pressure, rather than the required 25 percent. Furthermore, the RMA stated that its testing showed that by controlling the deflation rate, it would be possible to eliminate any increase in tire pressure that occurs after rapid tire deflation.

The RMA offered the following recommended solution to this perceived problem, which it characterized as a minor modification of S6(e) of the standard's test procedures, but which it believes would produce consistent and objective results. Specifically, the RMA's petition called for a pressure re-check and reset after deflation through the following modified language:

Stop the vehicle and deflate any combination of one to four tires until the deflated tire(s) is (are) at ~~14 kPa (2 psi) below~~ the inflation pressure at which the tire pressure monitoring system is required to illuminate the low tire pressure warning telltale. After two minutes, re-check the tire pressure and adjust the pressure as necessary.

Michelin reiterated the RMA's point that a -14 kPa (-2 psi) adjustment to the TPMS activation threshold could result in a TPMS being tested at 32 percent under-inflation, rather than the required level of 25 percent, and it incorporated the reasoning set forth in the RMA submission by reference. Michelin also provided an attachment to its petition intended to demonstrate the variability of the pressure increase for warm tires after deflation depending upon tire size and deflation technique.

SmarTire also objected to the provision in the test procedures that sets the tire pressure at 14 kPa (2 psi) below the 25-percent-below-placard level, because it argued that this approach could result in a TPMS being tested at 30-percent under-inflation. SmarTire stated that if a 14 kPa (2 psi) tolerance on test pressure setting is necessary for test consistency, then the agency should modify the standard to require the TPMS to illuminate the low tire pressure warning telltale at some point above the 25-percent under-inflation threshold, such that 25-percent under-inflation remains the minimum requirement.

The Alliance did not object to the level of the pressure adjustment provided in S6(e), but it did request further changes to S6 to account for the fact that environmental factors (*e.g.*, ambient temperature, wind), road test surface temperature (*i.e.*, heat transfer from road to tire), and sun load on the tires (during driving and when stationary) can impact tire temperature and tire pressure. According to the Alliance, unless the standard carefully controls for these factors, there is a significant risk that a vehicle will be mistakenly determined to be out of compliance.

Therefore, the Alliance also recommended additional verification in order to provide an objective determination of noncompliance, which it believes may be accomplished by modifying S6(f) and (g) of the standard as follows:

(f) If the low tire pressure telltale did not illuminate, stop the vehicle. Check the inflation pressure of the tire(s) deflated in S6(e).

(i) If the pressure in the deflated tire(s) is below the inflation pressure at which the TPMS is required to illuminate the low tire pressure telltale, discontinue the test.

(ii) If the pressure in the deflated tire(s) is above the inflation pressure at which the TPMS is required to illuminate the low tire pressure telltale, repeat procedure from S6(e).

(g) If the low tire pressure telltale illuminated during the procedure in paragraph S6(f), turn the ignition locking system to the “Off” or “Lock” position. After a 5-minute period, turn the vehicle’s ignition locking system to the “On” (“Run”) position. The telltale must illuminate and remain illuminated as long as the ignition locking system is in the “On” (“Run”) position. If the telltale does not illuminate or turns off during this procedure, check the inflation pressure of the tire(s) deflated in S6(e). If the pressure in the deflated tire(s) is below the inflation pressure at which the TPMS is required to illuminate the low tire pressure telltale, discontinue the test.

After careful consideration of the petitioners’ arguments related to the 2-psi pressure adjustment, we have decided to reduce that adjustment to 1 psi. However, we have decided that it is not necessary to incorporate the additional pressure checks recommended by the Alliance and the RMA. The following explains our rationale.

In response to public comments submitted by NIRA Dynamics and VW/Audi on the NPRM, we added the 2-psi pressure adjustment to the low tire pressure detection test in S6(f). However, given that the vehicle cool-down period has been significantly reduced and that the low tire pressure test is to be conducted without significant tire



temperature variation, we are concerned that a 2-psi pressure adjustment may actually represent an under-inflation level closer to 30 percent, rather than the standard's stated activation threshold of 25-percent under-inflation. Assuming that a tire's inflation pressure typically rises 2-3 psi during normal vehicle operations, we believe that this is a valid concern. We believe that amending the standard to provide a 1-psi adjustment under S6(f) would significantly reduce the amount of under-inflation deviation from the threshold level articulated in the standard.

The Alliance recommended revising the test procedure in a manner that would eliminate the standard's current five-minute cool-down period because it believes that even a small delay could allow the tires to cool slightly, thereby resulting in a pressure decrease that could once again allow the pressure to increase above the detection threshold level, once the vehicle is driven again during the low pressure detection phase. According to the Alliance, the 2-psi adjustment helps ensure that any pressure increase as the vehicle is driven will not result in the pressure rising above the activation level. We have considered the Alliance's concerns, but we have decided that it is not necessary to eliminate the five-minute cool-down period and that it is possible to limit the pressure adjustment to 1 psi without triggering testing problems.

Test data submitted by the RMA in August 2003 demonstrated that a tire's temperature and inflation pressure do not begin to decrease immediately following the end of the road wheel test (conducted under FMVSS No. 139), but instead, the tire maintains its operational temperature and pressure for a few minutes before beginning to slowly decrease to its initial test pressure.<sup>37</sup>

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<sup>37</sup> Docket No. NHTSA-2003-15400-9.

Data from studies of the relationship between tire pressure and time were submitted by the RMA<sup>38</sup> and Michelin<sup>39</sup> along with their petitions. These studies, which involved deflating tires at different rates and monitoring the pressure after deflation, indicated that tire pressure rose several psi above the pressure at which the deflation was ended when the deflation rate was rapid. However, for slower deflation rates, the pressure tended to remain very close to the value attained immediately after the deflation procedure was completed. Therefore, based upon the available information, we do not believe that it is necessary to eliminate the five-minute cool-down period or that it is critical to maintain a 2-psi pressure adjustment in the test procedure. We also do not believe that additional modifications are necessary to compensate for the “environmental effects” mentioned by the Alliance; the Alliance did not provide data demonstrating the extent of these alleged effects, and we believe that the standard accounts for such effects as promulgated.

Instead, we believe that the Alliance’s concerns can be accommodated by careful, deliberate administration of the test, as reflected in our more detailed Laboratory Test Procedure for TPMS (TP-138-00). For example, in the Laboratory Test Procedure, we specify use of a pressure gauge with an accuracy of  $\pm 0.5$  percent, which we believe would ensure that the tire pressure is close to the intended value when measured. Use of an accurate gauge is important so as to reduce the number of measurements needed to obtain an accurate reading. That is because each time a pressure measurement is taken from an inflated tire, there is a slight loss of inflation pressure, so fewer checks should result in fewer adjustments and less pressure loss. We do not believe that S6 requires

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<sup>38</sup> Docket No. NHTSA-2005-20586-21.

<sup>39</sup> Docket No. NHTSA-2005-20586-29.

amendment to incorporate additional pressure checks during testing to ensure that the pressure is at the correct value, because we believe that the existing procedures are adequate. We are also denying the RMA's recommendation to eliminate the pressure adjustment entirely, because we believe that such action would unnecessarily complicate our testing.

Furthermore, we believe that deflating the tire to 1 psi below the 25-percent under-inflation threshold, as opposed to 2 psi, would not change the stringency of the performance requirements specified in S4.2, but it would ensure that the pressure in the under-inflated tire(s) remains closely tied to the low tire pressure activation threshold. This adjustment was included to facilitate the vehicle test, not to relieve manufacturers' responsibility to provide a TPMS that can detect when a tire is 25-percent below placard pressure. Given the difficulty involved with allowing an extended tire cool-down period during the low pressure detection phase, we believe that amending the standard to provide a 1-psi pressure adjustment is a reasonable approach that should prevent actual under-inflation values that are significantly below the standard's 25-percent activation value.

#### 4. Calibration Time

Under the April 8, 2005 final rule, the standard's test procedures provide a cumulative time period of up to 20 minutes for TPMS calibration. During this system "learning phase," the vehicle is driven for up to 15 minutes of cumulative time (not necessarily continuously) along any portion of the test course. Direction of travel on the test course is then reversed, and the vehicle is driven for an additional period of time, for

a total cumulative time of 20 minutes. (See S6(d), as contained in the April 8, 2005 final rule.)

As noted above, the petitions of NIRA Dynamics and VW/Audi asked that the standard be amended to provide a one-hour time period for TPMS calibration. The petitioners argued that effective calibration of their TPMSs requires up to one hour of time over a range of speeds. In addition, the petitioners asserted that in light of the mechanism through which multiple-tire under-inflation occurs (*i.e.*, through slow diffusion), calibration within 20 minutes is unnecessary.

After careful consideration, we have decided to deny the petitioners' requests to increase calibration time from the current 20 minutes to one hour. Even though the agency is committed to developing a standard that is as technology-neutral as possible, we believe that a 60-minute time period for TPMS calibration is too long. Were we to adopt a calibration time period consistent with the petitioners' recommendations, the average consumer might require several trips for the TPMS to be properly calibrated. While calibrating, the TPMS is unavailable to provide its important warning about low tire pressure. Furthermore, we note that TPMS calibration and under-inflation detection are sequential events, so those time periods must be added to properly reflect the amount of time that may elapse before the TPMS may provide a warning to the driver. This fact argues against extending calibration time in the manner the petitioners have suggested, particularly because situations exist where the low pressure condition may arise for reasons other than slow diffusion.

Since there is no indication as to when the TPMS calibration process is complete, most consumers are likely to assume that calibration is complete shortly after the system

reset button is activated, for systems that use a reset feature. We believe that such expectation brings about a false sense of security to consumers who may believe that once the reset button is activated, the system is again ready to detect low inflation pressure in any of the vehicle's tires. (Because the issue of calibration time is closely linked to the issue of low tire pressure warning activation, please see section IV.A of this notice for additional explanation regarding the need for the TPMS to provide its warnings promptly.)

Depending upon how often there is a need to reset the system, there is the potential for the TPMS to be unavailable to provide a low tire pressure warning with some degree of frequency, which would add to our concern about extending the calibration time in S6(d). Furthermore, we note that Sumitomo Rubber Industries, a manufacturer of indirect TPMSs, currently produces a system that can calibrate within 20 minutes, thereby demonstrating the practicability of a 20-minute calibration requirement.<sup>40</sup> We expect that with additional time and development, other systems could satisfy this requirement as well. For these reasons, we continue to believe that requiring TPMS calibration within 20 minutes is appropriate.

#### G. TPMS Reprogrammability

Under the final rule, vehicle manufacturers are permitted, but not required, to provide a TPMS reprogrammability feature. However, the final rule made clear that the agency will conduct compliance testing with the tires installed on the vehicle at the time of initial sale and will follow any manufacturer instructions in the owner's manual related to resetting the TPMS. (See 70 FR 18136, 18146 (April 8, 2005))

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<sup>40</sup> In a June 28, 2005 letter submitted to the docket, SRI suggested that additional calibration time would be beneficial in terms of system accuracy, although it is not absolutely necessary. (See Docket No. NHTSA-2005-20586-37).

According to SEMA, replacement tires for a vehicle may require higher inflation pressure than the vehicle's original equipment tires, and unless the TPMS is reprogrammed to reflect this new placard pressure, those replacement tires may become more than 25 percent under-inflated by the time the TPMS low tire pressure warning telltale illuminates. SEMA argued that this situation would both defeat the purpose of the rule and also give drivers a false sense of security, although SEMA acknowledged that it does not have specific information to demonstrate how significant this problem currently is or will be in the future. SEMA recommended that the standard be amended to require TPMS reprogrammability.

We have decided to deny SEMA's request that we amend FMVSS No. 138 to require TPMS reprogrammability, because there is no evidence to demonstrate an actual problem in this area. We believe that vehicle manufacturers installing TPMSs that may require reprogramming in certain situations are well aware of this issue and will provide this feature, as necessary. Thus, in the final rule, we expressly stated that TPMSs are permitted to be reprogrammable. Once again, although we are uncertain as to the exact details of system reprogrammability, we assume that it will be fairly easy for the service industry to reprogram TPMSs to accommodate different tires and rims.

#### H. Sharing of TPMS Servicing Information

The April 8, 2005 final rule stated that the agency does not believe it necessary to mandate vehicle manufacturers to report repair and servicing information to the aftermarket sales industry and the service industry. As stated in the preamble to the final rule, NHTSA has not received any consumer complaints regarding the serviceability of existing TPMSs, and the agency expects that the marketplace will make sufficient

information available to permit convenient sales, maintenance, and repair of such systems. (See 70 FR 18136, 18175 (April 8, 2005))

In its petition, SEMA reiterated the argument made in its comments on the NPRM that the agency should require vehicle manufacturers to share sufficient information to allow third-party servicing of TPMSs. SEMA stated that it has heard complaints that the service and repair industry and the aftermarket sales industry have been denied access to TPMS service information from both sensor manufacturers as well as vehicle manufacturers. However, SEMA did not provide any information to substantiate these anecdotal complaints, nor did it provide any facts to ascertain how large a problem there may be regarding access to service information. To resolve these concerns, SEMA recommended that the standard be amended to include a requirement that any TPMS servicing information must be made available to the vehicle owner, to the extent that such information is available to other parties.

SEMA further argued that unless this recommendation and the other recommendations contained in its petition are followed, the rule may have a significant negative impact upon its small business members, because they may be unable to install their products if the TPMS MIL cannot be extinguished.

We have decided to deny SEMA's request that we compel vehicle manufacturers to share TPMS servicing information with the service and repair industry. SEMA has not provided any evidence to demonstrate that vehicle manufacturers would not make necessary repair and servicing information available to the aftermarket sales industry and to the service industry, and its claims of a significant negative impact on its members are also speculative.

As noted in the final rule, we have not received any consumer complaints regarding the serviceability of existing TPMSs. Vehicles currently include many complex systems, and although dealer involvement may be necessitated in some cases, the marketplace has generally made available sufficient information to permit convenient maintenance and repair of such systems. We do not believe that TPMS technologies will prove any different in this regard.

Furthermore, we are not requiring vehicle manufacturers to share TPMS servicing information with the vehicle owner. We believe that such a requirement would be unnecessary for the reasons discussed above and also because consumers are likely to find such highly technical information to be confusing and of little direct usefulness.

#### I. Phase-In Calculations

Under S7, Phase-in Schedule, the final rule sets forth the requirements for vehicle manufacturer implementation of the TPMS standard. Specifically, under S7.1, for vehicles manufactured on or after October 5, 2005 and before September 1, 2006, the number of vehicles complying with the standard (other than the TPMS malfunction provisions of S4.4) must not be less than 20 percent of either: (a) the manufacturer's average annual production of vehicles manufactured on or after September 1, 2002 and before October 5, 2005, or (b) the manufacturer's production on or after October 5, 2005 and before September 1, 2006.

Under S7.2, vehicles manufactured on or after September 1, 2006 and before September 1, 2007 are subject to a 70 percent phase-in of either: (a) the manufacturer's average annual production of vehicles manufactured on or after September 1, 2003 and



before September 1, 2006, or (b) the manufacturer's production on or after September 1, 2006 and before September 1, 2007.

As required by S7.3, all vehicles manufactured on or after September 1, 2007 must comply with all requirements of the standard, including the TPMS malfunction requirements of S4.4. However, S7.7 provides an exception for vehicles manufactured by final-stage manufacturers and alterers, entities that are not subject to the phase-in and for which the final rule provides an additional year for compliance (*i.e.*, until September 1, 2008).

The final rule provides carry-forward credits for vehicles that comply with the requirements of the standard and which are in excess of the compliance requirement for the phase-in reporting period in question (see S7.4(a), as contained in the April 8, 2005 final rule). In addition, the final rule provides carry-backward credits, through which a vehicle manufacturer is permitted to reduce its compliance responsibility during the first period of the phase-in, provided that it increases compliance by a corresponding number of vehicles during the second period of the phase-in (see S7.4(c), as contained in the April 8, 2005 final rule).

The AIAM argued that the final rule is inconsistent regarding its articulation of the compliance requirement for the initial period of the phase-in (*i.e.*, from October 5, 2005 to September 1, 2006). Its petition stated that the final rule's preamble calls for a 20 percent of a vehicle manufacturer's production to be equipped with TPMSs that are compliant with FMVSS No. 138 during that roughly eleven-month period. However, in the regulatory text, one of the options for calculating the number of vehicles that must comply during that period is based upon a full year of production (*i.e.*, S7.1(a)).

According to the AIAM, that provision of the final rule effectively requires a compliance rate of approximately 22 percent during the initial phase-in period (rather than 20 percent).

To remedy this situation, the AIAM recommended revising S7.1(a) to read, “The manufacturer’s total production of vehicles manufactured on or after September 1, 2002, and before October 5, 2005, divided by 3.414.” Furthermore, the AIAM urged the agency to adopt a separate reporting requirement under 49 CFR 585.66(b) for the first phase-in period, which would require vehicle manufacturers to submit the following information: (1) the number of complying vehicles for the period from October 5, 2005, to August 31, 2006, and (2) total light vehicle production for that period, or total light vehicle production for the period from September 1, 2002, to October 5, 2005, depending upon the compliance option that is selected.

After carefully considering AIAM’s argument, we have decided to retain the phase-in requirement in S7 for the initial period of the phase-in without change. Under S7.1, a vehicle manufacturer has two options for calculating the number of FMVSS No. 138-compliant vehicles that must be produced during the initial period of the phase-in from October 5, 2005 to September 1, 2006. Consistent with the discussion in the preamble of the final rule, one of those options is 20 percent of the manufacturer’s actual production during that period. Alternatively, the manufacturer may choose 20 percent of a three-year average as the basis for calculating the required number of complying vehicles. The manufacturer is free to choose whichever of these two options it considers to be the most advantageous.

We do not believe that the difference between the shortened initial production period and the slightly lengthened three-year average will have a significant effect on the number of vehicles that will be required to comply with the standard in MY 2006. Given our understanding of vehicle manufacturers' production plans as reflected in their responses to the agency's September 9, 2003 Special Orders, we tentatively decided in the NPRM that 50 percent compliance during the first year of the phase-in would be reasonable; thus, the final rule's phase-in requirement of 20 percent for the initial period should be achievable under either method of calculation. Furthermore, carry-backward credits are available under S7.4(c) of the standard to further ease implementation in the event the difference between the two methods of calculation under S7.1 somehow proves problematic.

However, we are granting the AIAM's request that we modify 49 CFR 585.66, Reporting Requirements, to differentiate the reports to be submitted to the agency for each of the two phase-in periods. As currently drafted, section 585.66(b)(1), Basis for Statement of Compliance, and section 585.66(b)(2), Production, require manufacturers to report values for the full production year,<sup>41</sup> without mention of the period corresponding to the first period of the phase-in (*i.e.*, from October 5, 2005 to September 1, 2006), which is the relevant total production value for calculation under S7.1(b) of FMVSS No. 138. Because the reporting of this information directly relates to determining compliance with the requirements of FMVSS No. 138, we have decided to revise 49 CFR 585.66(b)(1) and (2) to clearly differentiate between the two phase-in periods.

## **V. Benefits and Costs**

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<sup>41</sup> Under 49 CFR 585.64, the term "production year" is defined as "the 12-month period between September 1 of one year and August 31 of the following year, inclusive."

Section VI of the April 8, 2005 final rule summarized the costs associated with the TPMS standard, as more fully described in the Final Regulatory Impact Analysis (FRIA)<sup>42</sup> accompanying the final rule. The FRIA addresses the full range of anticipated costs related to TPMSs, including the cost of different TPMS technologies, overall vehicle costs, maintenance costs, testing costs, and opportunity costs.

In summary, the FRIA estimated that the average incremental cost for all vehicles to meet the standard's requirements would range from \$48.44-\$69.89 per vehicle, depending upon the specific technology chosen for compliance. Since approximately 17 million vehicles are produced for sale in the U.S. each year, the total annual vehicle cost is expected to range from approximately \$823-\$1,188 million per year. The agency estimated that the net cost per vehicle would be \$26.63-\$100.25 (assuming a one-percent TPMS malfunction rate for replacement tires) and that the total annual net cost would be approximately \$453-\$1,704 million.

The agency has determined that the technical amendments resulting from this final rule responding to petitions for reconsideration will not appreciably change the costs and benefits reported in the FRIA. Accordingly, the agency has decided that the estimates in that document remain valid and that additional analysis is not required.

## **VI. Rulemaking Analyses and Notices**

### **A. Vehicle Safety Act**

Under 49 U.S.C. Chapter 301, Motor Vehicle Safety (49 U.S.C. 30101 *et seq.*), the Secretary of Transportation is responsible for prescribing motor vehicle safety standards that are practicable, meet the need for motor vehicle safety, and are stated in

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<sup>42</sup> Docket No. NHTSA-2005-20586-2.

objective terms.<sup>43</sup> These motor vehicle safety standards set a minimum standard for motor vehicle or motor vehicle equipment performance.<sup>44</sup> When prescribing such standards, the Secretary must consider all relevant, available motor vehicle safety information.<sup>45</sup> The Secretary also must consider whether a proposed standard is reasonable, practicable, and appropriate for the type of motor vehicle or motor vehicle equipment for which it is prescribed and the extent to which the standard will further the statutory purpose of reducing traffic accidents and associated deaths.<sup>46</sup> The responsibility for promulgation of Federal motor vehicle safety standards has been delegated to NHTSA.<sup>47</sup>

As noted previously, section 13 of the TREAD Act mandated a regulation to require a tire pressure monitoring system in new vehicles. In satisfaction of this congressional directive, NHTSA established FMVSS No. 138, Tire Pressure Monitoring Systems, in a final rule published in the **Federal Register** on April 8, 2005. The agency received 17 petitions for reconsideration of the final rule, two of which were subsequently withdrawn. Most of these petitions raised issues involving technical modifications and correction. In this final rule responding to petitions for reconsideration, the agency carefully considered the statutory requirements of both the TREAD Act and 49 U.S.C. Chapter 301.

First, this final rule reflects the agency's careful consideration and analysis of all issues raised in the petitions for reconsideration. In responding to the issues raised in these petitions, the agency considered all relevant motor vehicle safety information. In

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<sup>43</sup> 49 U.S.C. 30111(a).

<sup>44</sup> 49 U.S.C. 30102(a)(9).

<sup>45</sup> 49 U.S.C. 30111(b).

<sup>46</sup> *Id.*

<sup>47</sup> 49 U.S.C. 105 and 322; delegation of authority at 49 CFR 1.50.

preparing this document, the agency carefully evaluated available research, testing results, and other information related to various TPMS technologies. In sum, this document reflects our consideration of all relevant, available motor vehicle safety information.

Second, to ensure that the TPMS requirements remain practicable, the agency evaluated the potential impacts of the petitions' requested actions in light of the cost, availability, and suitability of various TPMSs, consistent with our safety objectives and the requirements of the TREAD Act. As noted above, most of the changes resulting from this final rule involve relatively minor modifications to the April 8, 2005 final rule for TPMS. In sum, we believe that this final rule responding to petitions for reconsideration is practicable and will maintain the benefits of the April 8, 2005 final rule, including prevention of deaths and injuries associated with significantly under-inflated tires, increased tread life, fuel economy savings, and savings associated with avoidance of property damage and travel delays (*i.e.*, from crashes prevented by the TPMS).

Third, the regulatory text following this preamble is stated in objective terms in order to specify precisely what performance is required and how performance will be tested to ensure compliance with the standard. Specifically, this final rule makes minor modifications to the performance requirements for operation of the TPMS, both in terms of detecting and providing warnings related to low tire pressure and system malfunction.

The final rule also discusses test requirements for TPMS calibration, low tire pressure detection, and TPMS malfunction. This test involves driving the vehicle under a defined set of test conditions (*e.g.*, ambient temperature, road test surface, test weight, vehicle speed, rim position, brake pedal application) on a designated road course in San

Angelo, Texas. The test course has been used for several years by NHTSA and the tire industry for uniform tire quality grading testing. The standard's test procedures carefully delineate how testing will be conducted. The agency continues to believe that this test procedure is sufficiently objective and would not result in any uncertainty as to whether a given vehicle satisfies the requirements of the TPMS standard.

Fourth, we believe that this final rule responding to petitions for reconsideration will meet the need for motor vehicle safety by making certain modifications that will enhance the ability of the TPMS standard to provide a warning to the driver when one or more tires become significantly under-inflated, thereby permitting the driver to take corrective action in a timely fashion and potentially averting crash-related injuries.

Finally, we believe that this final rule responding to petitions for reconsideration is reasonable and appropriate for motor vehicles subject to the applicable requirements. As discussed elsewhere in this notice, the modifications to the standard resulting from this final rule will further the agency's efforts to address Congress' concern that significantly under-inflated tires could lead to tire failures resulting in fatalities and serious injuries. Under the TREAD Act, Congress mandated installation of a system in new vehicles to alert the driver when a tire is significantly under-inflated, and NHTSA has determined that TPMSs meeting the requirements of this final rule offer an effective countermeasure in these situations. Accordingly, we believe that this final rule is appropriate for covered vehicles that are or would become subject to these provisions of FMVSS No. 138 because it furthers the agency's objective of preventing deaths and serious injuries associated with significantly under-inflated tires.

B. Executive Order 12866 and DOT Regulatory Policies and Procedures

Executive Order 12866, "Regulatory Planning and Review" (58 FR 51735, October 4, 1993), provides for making determinations whether a regulatory action is "significant" and therefore subject to OMB review and to the requirements of the Executive Order. The Order defines a "significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or Tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Although the April 8, 2005 final rule was determined to be economically significant, this final rule responding to petitions for reconsideration involves only relatively minor technical amendments to the FMVSS No. 138. Accordingly, it was determined that this final rule is not significant under either Executive Order 12866 or the Department of Transportation's Regulatory Policies and Procedures. The agency has estimated that the incremental costs associated with the minor modifications to the standard resulting from this final rule will not appreciably change the costs of compliance with FMVSS No. 138. Accordingly, the figures presented in the Final Regulatory Impact



Analysis, docketed along with the April 8, 2005 final rule, remain apposite without modification.

C. Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 et seq., as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (*i.e.*, small businesses, small organizations, and small governmental jurisdictions). The Small Business Administration's regulations at 13 CFR Part 121 define a small business, in part, as a business entity "which operates primarily within the United States." (13 CFR 121.105(a)). No regulatory flexibility analysis is required if the head of an agency certifies the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.

NHTSA has considered the effects of this final rule under the Regulatory Flexibility Act. I certify that this final rule would not have a significant economic impact on a substantial number of small entities. The rationale for this certification is that the present final rule responding to petitions for reconsideration only makes technical modifications and corrections to the safety standard for TPMS. As discussed in detail in the April 8, 2005 final rule establishing FMVSS No. 138, we do not anticipate that the TPMS standard will have a significant economic impact on a substantial number of small

entities, and nothing in this final rule would change either that assessment or its underlying reasoning.

D. Executive Order 13132 (Federalism)

Executive Order 13132, “Federalism” (64 FR 43255, August 10, 1999), requires NHTSA to develop an accountable process to ensure “meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.” “Policies that have federalism implications” are defined in the Executive Order to include regulations that have “substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.” Under Executive Order 13132, the agency may not issue a regulation with Federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, the agency consults with State and local governments, or the agency consults with State and local officials early in the process of developing the proposed regulation. NHTSA also may not issue a regulation with Federalism implications and that preempts a State law unless the agency consults with State and local officials early in the process of developing the regulation.

Although statutorily mandated, this final rule responding to petitions for reconsideration of the TPMS standard was analyzed in accordance with the principles and criteria set forth in Executive Order 13132, and the agency determined that the rule would not have sufficient Federalism implications to warrant consultations with State and local officials or the preparation of a Federalism summary impact statement. This final

rule is not expected to have any substantial effects on the States, or on the current distribution of power and responsibilities among the various local officials.

E. Executive Order 12988 (Civil Justice Reform)

Pursuant to Executive Order 12988, “Civil Justice Reform” (61 FR 4729, February 7, 1996), the agency has considered whether this rulemaking would have any retroactive effect. This final rule does not have any retroactive effect. Under 49 U.S.C. 30103, whenever a Federal motor vehicle safety standard is in effect, a State may not adopt or maintain a safety standard applicable to the same aspect of performance which is not identical to the Federal standard, except to the extent that the State requirement imposes a higher level of performance and applies only to vehicles procured for the State’s use. 49 U.S.C. 30161 sets forth a procedure for judicial review of final rules establishing, amending, or revoking Federal motor vehicle safety standards. That section does not require submission of a petition for reconsideration or other administrative proceedings before parties may file a suit in court.

F. Executive Order 13045 (Protection of Children from Environmental Health and Safety Risks)

Executive Order 13045, “Protection of Children from Environmental Health and Safety Risks” (62 FR 19855, April 23, 1997), applies to any rule that: (1) is determined to be “economically significant” as defined under Executive Order 12866, and (2) concerns an environmental, health, or safety risk that the agency has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the agency must evaluate the environmental health or safety effects of the planned rule on

children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the agency.

This final rule responding to petitions for reconsideration is not an economically significant regulatory action under Executive Order 12866, and furthermore, the problems associated with under-inflated tires equally impact all persons riding in a vehicle, regardless of age. Consequently, this final rule does not involve decisions based upon health and safety risks that disproportionately affect children, as would necessitate further analysis under Executive Order 13045.

G. Paperwork Reduction Act

Under the Paperwork Reduction Act of 1995 (PRA), a person is not required to respond to a collection of information by a Federal agency unless the collection displays a valid OMB control number. As part of the April 8, 2005 final rule, each of the estimated 21 affected vehicle manufacturers is required to provide one phase-in report for each of two years, beginning in the fall of 2006.

Pursuant to the June 5, 2002 TPMS final rule, the OMB has approved the collection of information “Phase-In Production Reporting Requirements for Tire Pressure Monitoring Systems,” assigning it Control No. 2127-0631 (expires 6/30/06). NHTSA has been given OMB clearance to collect a total of 42 hours a year (2 hours per respondent) for the TPMS phase-in reporting. At an appropriate point, NHTSA may ask OMB for an extension of this clearance for an additional period of time.

However, the present final rule responding to petitions for reconsideration does not contain any additional information collection requirements beyond those contained in the April 8, 2005 final rule.

#### H. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104-113, (15 U.S.C. 272) directs the agency to evaluate and use voluntary consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law or is otherwise impractical. Voluntary consensus standards are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies, such as the Society of Automotive Engineers. The NTTAA directs us to provide Congress (through OMB) with explanations when we decide not to use available and applicable voluntary consensus standards. The NTTAA does not apply to symbols.

There are no voluntary consensus standards related to TPMS available at this time. However, NHTSA will consider any such standards as they become available.

#### I. Unfunded Mandates Reform Act

Section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA) requires federal agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of more than \$100 million annually (adjusted for inflation with base year of 1995 (so currently about \$112 million in 2001 dollars)). Before promulgating a NHTSA rule for which a written statement is needed, section 205 of the UMRA generally requires the agency to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of

the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows the agency to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the agency publishes with the final rule an explanation of why that alternative was not adopted.

As discussed in that notice, the April 8, 2005 final rule establishing FMVSS No. 138 is not expected to result in the expenditure by State, local, or tribal governments, in the aggregate, of more than \$112 million annually, but it is expected to result in an expenditure of that magnitude by vehicle manufacturers and/or their suppliers. In that final rule, NHTSA adopted a performance requirement for a system with a four-tire, 25-percent under-inflation detection capability; we believe that this approach is consistent with safety and the mandate in the TREAD Act, and it should provide a number of technological choices, thereby offering broad flexibility to minimize costs of compliance with the standard.

In contrast, the present final rule responding to petitions for reconsideration only makes technical modifications and corrections to the standard. Therefore, we do not believe that this final rule will appreciably change the costs of compliance with FMVSS No. 138. Therefore, the agency has not prepared an economic assessment pursuant to the Unfunded Mandates Reform Act.

J. National Environmental Policy Act

NHTSA has analyzed this rulemaking action for the purposes of the National Environmental Policy Act. The agency has determined that implementation of this action will not have any significant impact on the quality of the human environment.

K. Regulatory Identifier Number (RIN)

The Department of Transportation assigns a regulation identifier number (RIN) to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

L. Privacy Act

Please note that anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477-78), or you may visit <http://dms.dot.gov>.

**List of Subjects in 49 CFR Parts 571 and 585**

Imports, Motor vehicle safety, Reporting and recordkeeping requirements, Tires.

In consideration of the foregoing, NHTSA is amending 49 CFR Parts 571 and 585 as follows:

**PART 571 – FEDERAL MOTOR VEHICLE SAFETY STANDARDS**

1. The authority citation for Part 571 of Title 49 continues to read as follows:

**Authority:** 49 U.S.C. 322, 30111, 30115, 30117, and 30166; delegation of authority at 49 CFR 1.50.

2. Section 571.138 is amended by revising paragraphs S4.3.1(b), S4.4(b)(2) and (3), S4.4(c)(2), S4.5(a), S6(e), and S6(k) to read as follows:

**§571.138 Standard No. 138; Tire pressure monitoring systems.**

\* \* \* \* \*

S4.3 Low tire pressure warning telltale.

S4.3.1 \* \* \*

\* \* \* \* \*

(b) Is identified by one of the symbols shown for the “Low Tire Pressure”

Telltale in Table 1 of Standard No. 101 (49 CFR 571.101); and

\* \* \* \* \*

S4.4 TPMS malfunction.

\* \* \* \* \*

(b) Dedicated TPMS malfunction telltale.

\* \* \* \* \*

(2) Is identified by the word “TPMS” as described under the “Tire Pressure Monitoring System Malfunction” Telltale in Table 1 of Standard No. 101 (49 CFR 571.101);

(3) Continues to illuminate the TPMS malfunction telltale under the conditions specified in S4.4(a) for as long as the malfunction exists, whenever the ignition locking system is in the "On" ("Run") position; and

\* \* \* \* \*

(c) Combination low tire pressure/TPMS malfunction telltale

\* \* \* \* \*

(2) When the ignition locking system is activated to the “On” (“Run”) position, flashes for a period of at least 60 seconds but no longer than 90 seconds upon detection of



any condition(s) specified in S4.4(a). After this period of prescribed flashing, the telltale must remain continuously illuminated as long as a malfunction exists and the ignition locking system is in the "On" ("Run") position. This flashing and illumination sequence must be repeated each time the ignition locking system is placed in the "On" ("Run") position until the situation(s) causing the malfunction(s) has (have) been corrected.

#### S4.5 Written instructions.

(a) Beginning on September 1, 2006, the owner's manual in each vehicle certified as complying with S4 must provide an image of the Low Tire Pressure Telltale symbol (and an image of the TPMS Malfunction Telltale warning ("TPMS"), if a dedicated telltale is utilized for this function) with the following statement in English: \* \* \*

\* \* \* \* \*

#### S6 Test procedures.

\* \* \* \* \*

(e) Stop the vehicle and deflate any combination of one to four tires until the deflated tire(s) is (are) at 7 kPa (1 psi) below the inflation pressure at which the tire pressure monitoring system is required to illuminate the low tire pressure warning telltale.

\* \* \* \* \*

(k) Simulate one or more TPMS malfunction(s) by disconnecting the power source to any TPMS component, disconnecting any electrical connection between TPMS components, or installing a tire or wheel on the vehicle that is incompatible with the TPMS. When simulating a TPMS malfunction, the electrical connections for the telltale lamps are not to be disconnected.

\* \* \* \* \*

## **PART 585 -- PHASE-IN REPORTING REQUIREMENTS**

3. The authority citation for Part 585 of Title 49 continues to read as follows:

**Authority:** 49 U.S.C. 322, 30111, 30115, 30117, and 30166; delegation of authority at 49 CFR 1.50.

4. Part 585 is amended by revising 585.66(b)(1) and (2) of Subpart G as follows:

### **Subpart G – Tire Pressure Monitoring System Phase-in Reporting Requirements**

\* \* \* \* \*

#### **§ 585.66 Reporting requirements.**

\* \* \* \* \*

(b) *Report content.*

(1) *Basis for statement of compliance.* Each manufacturer must provide the number of passenger cars, multipurpose passenger vehicles, trucks, and buses with a gross vehicle weight rating of 4,536 kilograms (10,000 pounds) or less, except those vehicles with dual wheels on an axle, manufactured for sale in the United States for each reporting period as follows:

(i) *Period from October 5, 2005 to August 31, 2006.* The number shall be either the manufacturer's average annual production of vehicles manufactured on or after September 1, 2002, and before October 5, 2005, or, at the manufacturer's option, it shall be the manufacturer's production on or after October 5, 2005 and before September 1, 2006. A new manufacturer that has not previously manufactured these vehicles for sale in the United States must report the number of such vehicles manufactured during the production period on or after October 5, 2005 and before September 1, 2006.

(ii) *Period from September 1, 2006 to August 31, 2007.* The number shall be either the manufacturer's average annual production of vehicles manufactured on or after September 1, 2003, and before September 1, 2006, or, at the manufacturer's option, it shall be the manufacturer's production on or after September 1, 2006 and before September 1, 2007. A new manufacturer that has not previously manufactured these vehicles for sale in the United States must report the number of such vehicles manufactured during the production period on or after September 1, 2006 and before September 1, 2007.

(2) *Production.* Each manufacturer must report for the production period for which the report is filed: the total number of passenger cars, multipurpose passenger vehicles, trucks, and buses with a gross vehicle weight rating of 4,536 kilograms (10,000 pounds) or less that meet Standard No. 138 (49 CFR 571.138).

\* \* \* \* \*

Issued:

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Jeffrey W. Runge  
Administrator

Billing Code 4910-59-P

[Signature page for RIN 2127-AJ70]  
Final Rule; Response to Petitions for Reconsideration]