

artificially high and mask test induced pressure losses due to the heat generated in the tire during testing. Additionally, the agency's confirmation testing at STL indicated that a tire's inflation pressure requires substantially more than 15 minutes to stabilize after testing is completed. This testing revealed that the inflation pressure decreased an average of 6–8 psi (the pressure decrease ranged from 5–12 psi) between 15 minutes and 1 hour after completion of testing in both P-metric and LT tires.

In response to RMA's suggestion and based upon our own analysis of available data, the agency has decided to require that all post-test pressure measurements be taken at least one hour after the test is completed. The agency has determined that a 1-hour period provides a sufficient time period for tire cooling and would prevent superficially high tire temperatures from masking test-induced pressure losses that would not be detectable at an earlier measurement marker.

#### *D. Tire Selection Criteria/De-Rating of P-metric Tires*

Commenters expressed a range of sentiments on these issues. Tire industry commenters strongly supported retaining the de-rating percentage of 1.10 for P-metric tires used on non-passenger car vehicles, and the proposal to revise FMVSS No. 110 to require determination of normal load based on 85% of the load at the vehicle placard pressure.

The vehicle industry commenters supported the extension of FMVSS No. 110 applicability to light trucks, MPVs and vans under 10,000 GVWR, but urged the agency to retain the vehicle normal load at 88% of the maximum load rating. The Alliance also suggested that the agency de-link the tire selection criteria from the load parameter used in the high-speed test, saying that no rationale exists for the linkage. While the Alliance stated that revising the load reserve requirement would affect areas of vehicle performance, such as braking and CAFE, and would require some redesign of vehicle systems and components, they did not provide specific data to support these assertions. GM stated that 22% of its car and 6% of its light truck volumes would not comply with the proposed tire selection criteria. Subaru also indicated that a significant percentage of its fleet would need to be altered to meet the proposals.

Consumer group commenters suggested that the agency require a higher reserve load, between 18 and 20 percent because they believe that 15% does not adequately address typical

loading conditions for trucks and heavier vehicles.

Tire reserve load currently refers to a tire's remaining load-carrying capabilities when the tire is inflated to the tire manufacturer's maximum cold inflation pressure shown on the tire sidewall and the vehicle is loaded to its gross vehicle weight rating (GVWR). A reserve load is provided by vehicle manufacturers, as per the requirements of FMVSS No. 110, to account for overloading of the vehicle, underinflation of tires, or both. The load reserve margin required by FMVSS No. 110 is linked with the load parameter in the FMVSS No. 109 high-speed test. The load parameter for the proposed high speed test was 85% percent of the maximum load as labeled on the tire.

The primary purpose of FMVSS No. 110 is to specify requirements for tire selection to prevent tire overloading. Since the standard is a vehicle-based standard, the tire selected for each vehicle to which the standard applies is based on the load limits for the tire and the maximum vehicle weight. The maximum load rating (in lbs or kg) for a tire is currently determined at the maximum inflation pressure of 240 kPa (35 psi) for standard load P-metric tires. If the vehicle manufacturer, however, chooses to recommend an inflation pressure (labeled on the placard) lower than the maximum inflation pressure, the actual rated load is lower than that maximum rated load (based on maximum inflation pressure) because the tire load rating decreases with a lower inflation pressure.<sup>34</sup>

The agency believes that the actual rated load is a more appropriate measure of load reserve than the maximum rated load. The purpose of FMVSS No. 110 is to prevent the overloading of a tire as installed on a vehicle, not on the tire in the abstract. The agency has concluded, therefore, that the most appropriate way for the vehicle manufacturer to determine the reserve load for the tire on the vehicle is to determine the load at recommended inflation pressure (as labeled on the placard), not at the maximum inflation pressure on the tire sidewall, since few, if any, vehicle manufacturers list the maximum

inflation pressure as their recommended inflation pressure.

However, if FMVSS No 110 were revised as proposed in the NPRM, vehicle manufacturers would be required to increase the reserve load from 12 percent to 15 percent on their vehicles. Additionally, the margin would, in fact, need to be made larger because the vehicle normal load would be based on the load rating at the vehicle's placard pressure rather than the load rating at the maximum inflation pressure of the tire.

The agency proposed an 85% figure, stating that increasing the tire reserve needed by a vehicle under normal loading conditions from 12 to 15 percent would result in a larger margin of safety when a vehicle is loaded to its GVWR or its tires are underinflated. Based on comments and further analysis, the agency believes that 85% figure combined with the load reserve being based on the load rating at placard pressure rather than at maximum inflation pressure is insufficiently justified at this time. Currently, the agency does not have any data that links reserve load to tire failure. The most recent data we have on this issue was analyzed in a 1981 study. That study found no correlation between reserve load and tire failure. Further, the proposed reserve load increase would have necessitated the vehicle manufacturers' making major changes in the design of some of their vehicles to comply with the requirement.<sup>35</sup> For instance, some vehicle manufacturers for some vehicles would have had to "plus" size the tires on their vehicles, which could, in turn, have necessitated a redesigning of other vehicle systems such as the suspension and braking systems.

In response to the vehicle manufacturers' concerns, we have decided to de-link the tire selection criteria from the load used in the high-speed test. The agency believes that if it were to require that the vehicle normal load at placard pressure be no greater than the figure specified for the load parameter in the high speed test, 85%, too many vehicles would need a costly<sup>36</sup> tire upsize to comply with requirements that do not, based on all currently available data, appear to provide safety benefits. Further, the agency is not aware of any safety rationale to continue to link the load

<sup>34</sup> For example, if 2 similar vehicles (similar GVWR and weight distribution) are equipped with the same tires size but the first has a placard pressure of 32 psi and the other a placard pressure of 26, psi, based on our current requirement, the reserve load will be identical for both vehicles. However, if the reserve load is based on placard pressure, then the vehicle with the higher placard pressure will have a higher load rating and load reserve than the vehicle with the lower placard pressure since the load rating increases with increased inflation pressure.

<sup>35</sup> In the FRE, the agency estimates that, based on available compliance data, 6 of 14 light vehicles would have failed the 85% lead reserve requirement. These data are discussed in more detail in the FRE.

<sup>36</sup> The cost of tire upsizing is discussed in greater detail in the FRE.