

produces an average increase of 30° C in tire temperatures for P-metric tires over FMVSS No. 109 and an average increase of 40° C for LT tires. RMA suggested a reduction of 10 km/h for the LT tire test speed in order to maintain the same relative severity from flat to test wheel as that which occurs with passenger tires. Ford stated that increasing the test speed from 50 mph (80 km/h) to 75 mph (120 km/h) causes reversion in the tire and is not representative of real world tire performance.

Ford suggested that the agency adopt the current endurance test protocols as defined in FMVSS No. 109 for a period of 48 hours at the end of the current protocol and that FMVSS No. 119 be modified to include an additional test step at 130% rated load. Ford stated that their data indicate that tires with marginal sidewall designs will have difficulty passing this added test step. Advocates and PC supported the 40 hours duration as being a sufficiently stringent test.

### 3. Low Inflation Pressure Performance

#### a. Generally

GRRF, ETRTO, the Alliance, and JATMA asserted that the proposed endurance and high-speed tests obviate the need for a low inflation pressure test.

GRRF, JATMA, ETRTO, and ITRA/TANA opposed to the establishment of 140 kPa as an acceptable level of inflation pressure at which to carry out a low inflation pressure test. GRRF stated that the use of inflation pressures as low as 140 kPa (20 psi) for the proposed low pressure test, taking into account the drum and the duration of the test, will result in testing at abuse levels well outside any that could be reasonably expected to be taken into account in tire design and are outside operating recommendations given by the tire industry.

RMA stated that the low-pressure test should be run at 90% of the tire's maximum load capacity rather than 100% so that 20 psi is not 42% below the required test load but at 30%, the maximum allowed under the TPMS final rule.

The Alliance and Ford stated the low-pressure testing protocols, proposed in the notice, are not representative of real world aging conditions because the 40-hour endurance test preceding the low-pressure tests causes the belt region to age anaerobically. Results from these tests showed a tremendous heat build up in the tire which leads to tread chunking, a benign failure mode rarely if ever seen outside of a racetrack. They stated that it would be better to run a

low-pressure test on a tire that had gone through an aging procedure that correlates to actual field aging of tires.

CU stated that the NPRM does not provide enough information to determine when exactly the tire would be run to the low-pressure conditions following successful completion of the endurance test. They recommended that the tire be allowed to cool down for a minimum of three hours at the ambient test condition before starting the low-pressure test.

#### b. Low Inflation Endurance

RMA, ITRA and TANA favored Option 1 stating that the Option 2 conditions are so severe that the tires experience thermal runaway (*i.e.*, the temperature did not stabilize within 30 minutes) during the required steps. RMA recommended a modified Option 1 test with adjusted test conditions which they state more accurately reflect performance on the flat surface and to more closely reflect the conditions that should exist when the TPMS warning is given: (1) Lowers LT tire speed from 120 to 110 km/h to maintain consistency with the RMA proposed endurance test conditions; (2) reduces the test load from 100 to 90% of the tire's maximum load capacity to reasonably simulate the effect of a 30% decrease in inflation pressure when the test pressure is specified at the minimum pressure listed in the NPRM at paragraph S6.4.1.1.1; and, (3) extends the time from 15 minutes to one hour for post-test measurement of inflation pressure.

CU favored an endurance type TPMS low pressure test over the high speed version proposed because they believe it is more representative of conditions consumers are likely to encounter. However, CU believed that testing the tires for 90 minutes at 75 mph represents too short a distance (just 112.5 miles) and is well below the typical fuel range of most vehicles. CU recommends that the test duration be at least four hours at 75 mph, simulating a distance of 300 miles and is more representative of the fuel range of a typical vehicle.

Advocates regarded this alternative as undemanding and insufficient for determining the underinflation tolerance of current light vehicle tires. Public Citizens believed that the stringency of the test is highly questionable considering that all of the tires tested passed the test.

#### c. Low Inflation High Speed

GRRF noted surprise that a test load of only 67% is quoted because it seems impractical for a consumer to reduce the

vehicle load following a TPMS warning indication.

JATMA stated that this test is unjustified to demand tire performance of this type because consumers would not continue driving at above 140 km/h for over one hour with a tire pressure warning.

Ford supported the low-pressure high-speed test if the tires are aged in an oven with a 50/50 blend of oxygen and nitrogen and an allowance is made for a 2-hour break-in period at 180 kPa and 120 km/h at 85% load, similar to the FMVSS No. 109 high-speed test. Ford stated that the aging process and test protocol more closely approximates a full size spare that is put into service after 3–4 years: oxidatively aged and potentially under-inflated. The break-in period would give the aged tire an opportunity to be worked before being deflated and run to the low pressure test procedure and does not cause reversion in wedge rubber of the tire.

Advocates and PC supported the parameters of this test. However, Advocates regarded a 67 percent load as completely unrealistic and recommends that the agency consider raising the loading percentage for the low pressure/high speed test from 67 percent to 100 or 110 percent.

### 4. Road Hazard Impact

RMA stated the current FMVSS No. 109 plunger test should remain only for bias ply tires because radial tires are not susceptible to the type of failure that the current plunger tests was designed to prevent.

RMA, GM, the Alliance, ETRTO, and GRRF stated that the SAE J1981 test was developed as a wheel damage test, to test a wheels ability to withstand potholes and other anomalies, and has very limited use or experience within the industry as a tire test and significant work will be required to develop it into a tire test. RMA, ITRA/TANA, JATMA, GM, Alliance, and Advocates stated that a road hazard test, if NHTSA feels it is necessary, should be deferred for further study and research and to not be included in the proposed FMVSS No. 139.

Ford, the Alliance, and CU recommended that the agency retain the current test and Ford and CU suggest that the agency augment the stringency of the test. Ford stated that it currently uses twice the value specified in FMVSS No. 109 as a corporate specification for their tire suppliers and this level provides a reasonable indication that radial tires will exhibit good resistance to rock induced tread damage.