

Advocates, PC, and CU stated that NHTSA needs to explore other methods using more sophisticated means of evaluation, e.g., shearography, for damage. GM noted that any anomaly from the pendulum impacts in its testing was undetectable by visual inspection.

#### 5. Bead Unseating

RMA and GRRF believed that a bead-unseating test is unnecessary for radial tires. RMA, and ITRA/TANA suggested that if a bead unseating test must be maintained, then the current test be retained rather than adopting a completely new test. However, they believed that it does need to be modified to take into account the aspect ratio of tires. ITRA and TANA asked that retread tires be exempt from the proposed tests because the bead of the tire is part of the original casing and is not altered in the retreading process, and, as such, there would be redundancy in testing the original casings.

GRRF, Toyota, the Alliance, CU, and Ford stated that the introduction of this revised test without further validation would seem to be premature at this stage. They asserted concerns regarding the lack of a fully defined procedure, the specification of the test equipment, the costs of equipment, and the availability of suitable equipment on the open market. Several commenters, including Toyota, Ford, and the Alliance, asserted that there are significant differences between the agency's proposal and Toyota's test and/or certain specifications that need refinement, such as the load values, specifications for the test wheel/rim, inflation pressures, test device methods, and lateral force.

PC and Advocates supported the agency's proposal for the air loss bench test method because the test is independent of vehicle type but do not support the 200 millimeters per second as being satisfactory because they say it reveals nothing about how a tire would perform in a skid when the vehicle encounters either a pothole or a raised fixed object on the roadside applying an extremely rapid lateral, peak load to the tire. Advocates, however, questioned whether the test advances tire safety if all current production tires would pass the test.

#### 6. Aging Effects

##### a. Generally

RMA and ITRA/TANA stated that none of the options in the NPRM are accepted industry tests with a proven relationship to actual tire performance.

RMA and GRRF added that any aging test would be redundant in light of the revised high-speed and endurance tests plus a new low-pressure test.

The Alliance and ETRTO stated that the three test options proposed artificially decay of the materials in the tire structure, but those decays do not reflect what occurs in "real life" over a long period of service.

Ford stated that the predominant factor for tire aging in normal service is aerobic/oxidative aging, which may be accelerated by heat and cites to the NHTSA Office of Defects Investigation (ODI) Engineering Analysis Report on Firestone tires in support of this statement. Ford and the Alliance stated that the proposed tests do not appear to age the tire aerobically/oxidatively. Ford recommended aging mounted tires with a 50/50 blend of oxygen/nitrogen in an oven 70° C for 2 weeks. After this oven aging, they recommend a peel test be performed on the tire and suggest that it may be more appropriate to test the endurance, high speed, or low-pressure performance of a tire aged in this manner.

ITRA/TANA argued that retreads should be exempt from this test.

PC and Advocates asserted that shearographic analysis is critical in accurately determining aging test compliance.

Consumers Union believed further investigation of a more suitable procedure is needed.

##### b. Adhesion (Peel) Test

RMA stated that the proposed adhesion peel force test is the least appropriate option due to the following reasons: (1) ASTM-D413 is a peel adhesion test used in the industry to monitor trends and detect large shifts in historic levels and, under the best scenario for minimizing variability, has a 16.8% inherent variability, (2) the test is evaluating only a component of the tire, not the tire's overall performance, (3) peel force does not correlate with field performance, or, at a minimum, a recognized industry test wheel test—the peel adhesion test is not a separation-initiating test, it relates only to propagation (4) there is a lack of mechanical and chemical interaction as would occur in actual field.

GRRF and JATMA opposed this test stating that the proposals do not specify which of the several interfaces of the belt construction are to be tested.

ETRTO stated that the ASTM method is known by the industry to evaluate the vulcanized cord ply, not cut specimens from the tire.

CU believed that the peel test is not sufficiently repeatable or precise and

urged NHTSA to conduct more research to develop a practical and efficient method of testing the effects of tire aging.

##### c. Michelin's Long Term Durability

RMA, JATMA, GRRF, and CU did not support this test because of its length and inherent cost.

ETRTO and JATMA stated that the use of pure oxygen for inflating tires, presents a danger of explosion and requires special safety procedures to be implemented in the laboratories.

JATMA stated that the test ambient temperature should be  $38 \pm 3^\circ\text{C}$  so existing equipments can be used without any change. JATMA also states that the NHTSA test criterion that no reduction of inflation pressure from initial test pressure is not possible because  $\text{O}_2$  is consumed during the test.

PC supported this test as a starting point for the proposed aging test.

##### d. Oven Aging

ETRTO asserted that this test will cause an extended vulcanization of all rubber components inside a tire and does not represent "real world" service conditions where the area subjected to heating and to repeated stresses is that inside the edges of the tread area.

RMA, ITRA/TANA, and GRRF believed this test is a more valid measure of tire performance than Option 1 and significantly less onerous than Option 2. RMA recommended the following modifications if the agency chooses to pursue this test: (1) lower the aging temperature from 75 to 70° C. 70° C is an industry standard for aging of rubber compounds and used by some companies for aging of tires prior to test, and (2) adopt the ambient temperature, inflation pressures, and speed from the RMA recommended endurance tests with steps of: (a) 4 hours at 85% load, (b) 6 hours at 90% load, (c) 14 hours at 100% load.

JATMA stated that a 15-day test is not suitable for mass production management. JATMA further states that the test ambient temperature should be  $38 \pm 3^\circ\text{C}$  so the existing equipments can be used without any change.

CU stated that this procedure does not resemble what consumers experience in the real world with tire aging. In real world conditions, tires do not heat up evenly, and it is often the hot spots and dynamic flexing that define the weak link in tire design.

#### B. Application of New Standard/ Deletion of FMVSS No. 109

RMA and TRA recommended that the proposed FMVSS No. 139 apply to new pneumatic radial tires on powered