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DaimlerChrysler Corporation
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Director
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December 15, 2000

Rebecca MacPherson
Office of the Chief Counsel, NCC-20
National Highway Traffic Safety Administration
400 Seventh St., S.W.
Washington, D.C. 20590

Dear Ms. MacPherson:

This letter responds to your request of vehicle manufacturers to provide information regarding the positioning of child test dummies for low risk deployment out-of-position (OOP) tests. You made this request during the December 6, 2000 Technical Workshop, held at VRTC in East Liberty, OH. The following comments apply to both the 3-year-old and 6-year-old test procedures for positions 1 and 2, and respond to General Motors' Proposed Test positions.

Position 1 - Chest on Instrument Panel (S22.4.2 and S4.4.2)

DaimlerChrysler prefers that the current positioning procedures remain as currently written. While the current procedure may not always result in contact between the thorax of the dummy and the instrument panel, it maximizes on-axis loading of the thorax instrumentation of the dummy for a given vehicle design. This procedure also provides the greatest distinction between the chest interaction and the head interaction positions for the test dummies. In contrast, the agency's proposals for modifying the procedure by either:

- moving the test dummy downward and below Plane C in the vehicle,
- or increasing the thorax instrument cavity angle,

both tend to "blur" the distinction between the two test positions.

If, however, the agency determines that a change in the procedure must be made, DaimlerChrysler prefers that the revised procedure:

- maintain the original thorax instrument cavity angle,
- maintain the minimum 5 mm offset between the head of the dummy and the windshield of the vehicle,
- and widen the area of desired contact between the test dummy and instrument panel to include the entire thorax and abdominal surfaces of the test dummy (instead of "Point 1").

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This procedure essentially moves the test dummy "forward and downward," in a plane, along the angle of the windshield in vehicles where early head contact with the windshield prevents contact between the dummy and the instrument panel of the vehicle. It decreases the offset from the instrument panel due to early head-windshield contact, but lowers Point 1 below Plane C, thus decreasing on-axis interaction with the thorax instrumentation of the dummy.

In vehicles where the test dummy contacts the instrument panel with its abdomen or chest, no change in position would occur due to the proposed change, since Point 1 would remain in Plane C (though possibly not in contact with the instrument panel) for maximum on-axis loading of the instrumentation.

Of the options described by the agency, DaimlerChrysler believes that this revision of the test procedure will be repeatable and produce a test position that is distinct from test position 2. Furthermore, this procedure minimizes the reduction of on-axis loading of the chest instrumentation (by "lowering" the dummy), while reducing the "offset" between the dummy and instrument panel due to windshield interference (by moving the dummy "forward").

Finally, we urge the agency to clearly define the contact zone on the test dummy and that the zone include the thorax and abdominal surfaces so that lowering of the test dummy (and movement of Point 1 below Plane C) is minimized.

Position 2 - Head on Instrument Panel (S22.4.3 and S24.4.3)

First, DaimlerChrysler agrees with the suggestion made during the workshop that both sections S22.4.3.5 and S24.4.3.4 should be revised by changing the phrase "If contact has not been made" to specify that the intended contact is between the head (or chest) of the test dummy and the instrument panel. As currently written, if the lower legs or abdomen contact the instrument panel, the back angle is not increased and the head of the test dummy is not put in contact with the instrument panel.

Second, at the workshop, the agency requested that manufacturers consider what modifications (if any) should be made to sections S22.4.3.4 and S24.4.3.4 to make a repeatable first contact between the test dummy and the instrument panel. DaimlerChrysler believes that, as the test dummy is moved forward off the front edge of the seat, the initial angles of the legs and the thorax instrument cavity of the dummy should be maintained as originally set in the first step of the procedure. In vehicles with high H-points, where the feet of the test dummy are unsupported, a block should be used to support the feet and maintain the leg angles. This procedure will result in a more repeatable test procedure that will place the head of the test dummy in a similar position test-to-test.

If the legs of the dummy are allowed to relax due to the weight of the lower legs, the angles at the hip and knee may change. Consequently, the point of first contact between the dummy and instrument panel will vary as will the position of the head of the dummy will also vary and decrease test repeatability.

Test Procedure Recommendations from General Motors

DaimlerChrysler does not support the substitution of the test procedures presented by General Motors for those already in the regulation. These proposals were not sufficiently objective to be considered practicable and repeatable test procedures.

300 Milliseconds Test Duration

Finally, although this issue was discussed only peripherally at the workshop, DaimlerChrysler wishes to reiterate that the low risk deployment OOP test procedures are not practicable if a 300 millisecond test duration is required. The purpose of the OOP tests is to assess the injury potential of interaction with a deploying air bag. Such events are typically completed in less than 150 milliseconds. Once the initial interaction is over, the purpose of the test is also completed. Including the results of non-biofidelic interaction with the vehicle interior does not accurately represent the potential for injury due to the air bag, especially since vehicle "test bucks" typically do not contain complete vehicle content (interior trim, carpet, etc.) rearward of the instrument panel. Thus, DaimlerChrysler again asks that the agency reconsider this requirement of the regulation in its final rule answering petitions for reconsideration.

In conclusion, DaimlerChrysler thanks the agency for its participation in the VRTC workshop and for considering these comments. If there are any questions regarding these comments, please contact Randy Edwards of my staff at (248) 576 -7303.

Sincerely,

Matthew C. Reynolds

cc: Stephen Kratzke
Aloke K. Prasad (via: Electronic Mail)
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