

**VOLKSWAGEN**

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NHTSA-00-7013-54

Subject: *Docket 00-7013; FMVSS 208 "Occupant Crash Protection" (Advanced Air Bag Rulemaking) Supplementary Comments*

Dear Mr. Kratzke:

This letter is to submit supplementary comments for Volkswagen AG, Audi AG and Volkswagen of America, Inc. (Volkswagen) to the advanced air bag rulemaking. The comments in this letter are a follow-up to the Workshop held December 6, 2000 at VRTC, but also transmit recommendations, which were not specifically on the agenda for that Workshop.

**Testing Position 1 (Chest on Instrument Panel) and Position 2 (Head on Instrument Panel) for 3-year old and 6-year old child**

For the Position 1 tests in S22.4.2 (3-year old) and S24.4.2 (6-year old), the Volkswagen recommendation is to keep the vertical and 6 degree back angles, respectively, as the dummy is moved forward and down until instrument panel contact of the dummy without head contact to the windshield occurs. The back angles would be maintained and there would be no additional forward lean after the first contact of the dummy with the instrument panel.

For the Position 2 test in S22.4.3 (3-year old) and S24.4.3 (6-year old), the Volkswagen recommendation is to maintain the vertical and 6 degree back angles, respectively, and to move the dummy forward per S22.4.3.4 and S24.4.3.4 until head, knee, or chest contact with the instrument panel occurs and then to maintain the back angle.

**Testing Position 1 (Chest on Instrument Panel) with Six-Year Old Hybrid III Dummy (testing should be done with dummy legs attached)**

Volkswagen urges NHTSA to modify the rule to provide for a testing of the dummy with legs attached in this position also. Volkswagen's experience is that the proper test

position can be obtained with the dummy legs attached. Testing without the dummy legs creates unrealistic kinematics and injury criteria measures because the center of gravity is higher in the torso for the dummy when the legs are not attached.

If NHTSA retains the testing with the six-year old dummy without the legs attached, then the injury criteria measurements must definitely exclude any of the rebound time period because of the invalidity of the dummy kinematics.

### **Time Period for Injury Criteria Measurements (300 ms should be reduced to 150 ms)**

Volkswagen submits that the 300 ms test duration is too long and provides unrealistic results. The air bag related injury potential occurs within the period of 150 ms. After this rebound kinematics occur, which are not objectively measurable and for which the dummy kinematics and measurements are not biofidelic. The air bag interaction with the dummy is typically completed in less than 150 ms, and events after that time period are not predictable and provide no objective measure for injury criteria.

### **Determination of Geometric Center of Air Bag Tear Seam**

At the Workshop, there was some discussion of the variety of air bag tear seams and the introduction of newer designs in which the tear seam is not visible from the outside. Volkswagen proposes that for compliance testing purposes, the vehicle manufacturer provide to NHTSA the location of the geometric mid-point of the air bag deployment opening. This will avoid difficulties for certification testing by the Agency where the air bag cover or tear seam is not visible or for designs in which the visible outline of the cover or tear seam is not centered on the air bag deployment opening.

### **Dummy Used for Determining Stages of Air Bag System subject to Low Risk Deployment Test (S22.5)**

Currently, S22.5 specifies that the 16 mph rigid barrier test for determining the air bag inflation stage or combination of stages for the low risk deployment test is to be conducted with a 50<sup>th</sup> percentile male Hybrid III dummy. Volkswagen recommends that this test should be conducted with the 5<sup>th</sup> percentile female Hybrid III dummy because the low risk deployment tests to which the 16 mph barrier impact is applicable relate to the small adult and child occupants represented by the 5<sup>th</sup> percentile female and 3-year and 6-year old child dummies.

In the preamble to the Final Rule, NHTSA stated that it was not adopting the suggestion in the AAM comments that the 16 mph test be conducted with a belted dummy matching the size for which the low risk option is being certified. NHTSA decided to adopt the 50<sup>th</sup> percentile adult male dummy for the test on the basis that a lower stage air bag deployment in that test could have real-world safety benefits also to the larger adult occupant. However, Volkswagen believes that it may be realistic to calibrate a sensor system to provide full stage air bag deployment for a larger adult occupant under the 16 mph equivalent test condition, but to calibrate for a lower or first stage air bag

deployment for the small adult and child occupant. The low risk deployment test condition in the Standard is applicable to the small adult and child occupant and therefore the dummy used in the barrier crash test should be allowed to be compatible in size, for the purpose of low risk deployment sensor calibration, with the dummy for which the low risk deployment certification option is utilized.

### Conclusion

Volkswagen recognizes that the points in this letter are being submitted after the closing period for petitions for reconsideration and more than 1 month after the date of the Workshop. However, Agency consideration of these points in the development of the amendments and clarification to the Final Rule is appreciated.

Sincerely,

VOLKSWAGEN OF AMERICA, INC.



Dietmar K. Haenchen  
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/sgj

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