

the center of the seat as being determined at the widest part of the seat cushion. We stated that we rejected Toyota's petition because the difference in lateral position between the H-point and the center of the seat, as we were defining it, would not be significant.

We believe that the current Mitsubishi petition raises a valid issue, and are amending the definition of the longitudinal centerline of a bucket seat cushion, which is used in the dummy seating positioning procedures (sometimes by reference to Plane B) for the 5th percentile adult female dummy and the positioning procedures for advanced air bag tests with a CRS. The amended definition now references the seating reference point (SgRP). There are current seat designs that lack symmetry, both in terms of seat cushion and seat back. This may become even more common with the proliferation of seat-mounted side air bags and seats with fully integrated belts. The argument that the difference between the middle of the widest part of the seat and the center of the designated seating position (H-point or SgRP) is not significant may not be valid with some current and future seat designs.

It is the agency's intent to have the 5th percentile adult female test dummy and the CRS placed in a normal lateral position. Therefore, S16.3.1.10 under the dummy seating positioning procedures for the 5th percentile adult female test dummy and S20.1.10 under the test procedures for the child safety tests are amended, for bucket seats, to reference the SgRP, which the manufacturers will provide to the agency.

We recognize that the amendments made to the barrier test that uses the 5th percentile adult female test dummy may be appropriate for incorporation into the barrier tests that use the 50th percentile adult male test dummy. However, as stated above, we also recognize the time sensitive nature of the petitions for reconsideration and the need to address the issues raised in those petitions. Therefore, we are not at this time incorporating such amendments into the barrier test that uses the 50th percentile adult male dummy, but may consider such changes at a later date.

B. Plane D and Plane C

"Plane D" and "Plane C," which are used to position test dummies in the out-of-position test procedures, are redefined to reference an axis based on the volumetric center of the folded and the volumetric center of the static inflated air bag. The December 2001 final rule had defined "Plane D" and "Plane C" by referencing the "geometric

center of the opening through which the air bag deploys. "The agency stated in the preamble of the December 2001 final rule that "[t]his would not necessarily be the same as the geometric center of the air bag cover. Rather, it would be the geometric center of whatever frame or casing is used to allow the air bag to deploy in a controlled manner."

Toyota and Volkswagen petitioned the agency as a result of a lack of clarity with the regulatory text. The Ford RFI also asked for clarification on the target point as contained in S26.2 (driver out-of-position test Position 1—Chin on Module). Toyota asked if the geometric center is to be measured for the tear seam of the air bag door or for the opening through which the air bag deploys. Ford asked if the geometric center should be "determined in three-dimensional space," or "from a projection of the opening to a single plane parallel to the steering wheel rim or to the airbag reaction surface." Ford continued:

If the cover of the airbag is "adaptive" to differing conditions; e.g. varying deployment path dependent upon resistance to bag opening, which "opening" should be used: the "opening" common to a normal deployment or the anticipated "alternative opening" for low risk deployment conditions?

Both Toyota and Volkswagen recommended amended language to clarify the reference point. Toyota suggested that the phrase of interest be changed to the "point where the air bag door intersects the horizontal line traveling through the center point of the inflator." Volkswagen stated that in order to make the identification of the target point more objective in the 3-year-old and 6-year-old dummy tests, the regulatory text describing the target point should be amended to read the "point determined by the perpendicular projection onto the instrument panel of the geometric center of the opening in the inflator module through which the air bag deploys into the occupant compartment."

We agree that the regulatory text adopted in the December 2001 final rule is not sufficiently objective, and are establishing an objective method to transfer a point onto the air bag cover. The agency considered several methods for identifying this point and is adopting a method that relies on the volumetric center of the folded air bag and the volumetric center of the static inflated air bag (Static Inflated Air Bag Method).

One method considered was the use of high-speed film or video of the deploying bag in a static environment and without test dummies present to

determine an axis of air bag deployment. However, in some cases the bag may not deploy in a uniform or repeatable manner, resulting in an unacceptable level of variability in the target point. Additionally, we have observed deployments where the cover deflects the bag and causes it to initially squeeze out along an axis away from the occupant towards the vehicle floor pan. This would result in a very low target point.

In developing a reference, our initial assumption was that the target point should be located somewhere on the air bag cover surface because the test dummy would be in a position to either be struck by the deploying air bag cover or by the air bag pushing through its cover into the passenger compartment. A target line could be defined as the intersection of a vehicle's vertical longitudinal plane, which bisects the air bag laterally, and the portion of the air bag cover surface that is displaced during air bag deployment. The target point would then be the mid-point of the target line. While this may be a relatively simple determination for a rigid door-type cover, it would be difficult for a flexible flap-type configuration because the portion of the cover displaced during deployment is hard to define. Also, the mid-point of the intersection of the air-bag cover with the vehicle longitudinal plane may have no relationship to the path the air bag takes when deploying.

Another method considered for defining the target point was to determine the unobstructed deployment path of the air bag into the passenger compartment (Clear Deployment Path Method). Toyota's recommendation for revision to the target point location involved the intersection of an imaginary axis or "axis of deployment," with the outer surface of the air bag cover. Toyota recommended that the axis of deployment be defined by the centerline of the air bag inflator. This does not work well if the inflator is remotely located with respect to the air bag.

We have determined that a technique similar to the Clear Deployment Path Method is best for determining the target point. The technique adopted in this document, the Static Inflated Air Bag Method, is similar to the Clear Path Deployment Path Method in that the reference axis passes through the volumetric center of the folded air bag, but differs by also using the volumetric center of the static inflated air bag. Determination of the direction of the deployment axis is done by blocking the air bag vents and inflating the air bag. For air bags that vent through the bag