Dummy Seating Procedure for Rear Outboard Positions (Version I)

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Document Revision History

In August 2005 the protocol was revised in the following ways:

Steps 8 and 9 were updated to address vehicles with adjustable seatbacks in rear outboard positions.

The following rear occupant seating procedure is intended for use with small female dummies. It also may be used as a guideline for seating midsize and large male dummies.

1. Adjust the rear seat, if applicable. Set the rear seat to the rearmost position in the fore-aft adjustment range, unless otherwise specified by the test vehicle manufacturer. If a seat is vertically adjustable, it should be placed in its full-down position. The seatback angle should be set to 23 degrees, as measured by an H-point manikin torso angle, or to the angle specified by the manufacturer.

2. Place the dummy in the seat.

2.1. On bucket or contoured seats, center the dummy on the seat cushion so that its midsagittal plane is vertical and coincides with the vertical longitudinal plane through the center of the seat cushion.

2.2. On bench seats, position the midsagittal plane of the dummy vertical and parallel to the vehicle's longitudinal centerline and positioned so that some portion of the dummy just touches, at or above the seat level, the side interior surface of the vehicle.

3. Place the lower legs at 90 degrees to the thighs. Push rearward on the dummy's knees to force the pelvis into the seat so there is no gap between the pelvis and the seatback or until contact occurs between the back of the dummy's calves and the front of the seat cushion, without allowing the angle between the thighs and lower legs to change. In vehicles with long seat pans, the dummy's pelvis may not be in contact with the seatback even when the back of the calves are touching the front of the seat cushion. In cases where the gap between the pelvis and seatback exceeds 50 mm, the lower legs can be straightened to a maximum tibia-thigh angle of 135 degrees to allow the pelvis to slide rearward.

4. Hold the dummy's thighs down and push rearward on the upper torso to maximize the dummy's pelvic angle.

5. Gently rock the upper torso relative to the lower torso laterally in a side-to-side motion 3 times through a ±5 degree arc (approximately 50 mm side to side) to reduce friction between the dummy and the seat.

6. Position the feet.

6.1. If the feet can reach the floorpan, they should be placed flat on the floorpan and beneath the front seat as far as possible without interference. After initial positioning, it should be possible to lift the legs behind the ankles and, when slowly released, the legs should return to the original position with the heel contacting the floor. Upper and lower legs should have centerlines that are close to longitudinal and vertical planes, respectively.

6.2. If the feet are suspended above the floorpan, they should be left alone.

7. Rest the dummy's thighs against the seat cushion and set the initial transverse distance between the longitudinal centerline of the dummy's knees at 160-170 mm, with the thighs and legs of the dummy in vertical planes.

8. Measure the dummy's pelvic angle. The angle should be set to 20 ± 2.5 degrees for small female dummies and 22.5 ± 2.5 degrees for midsize and large male dummies.

8.1. If the dummy's pelvic angle is within the specified range, continue to step 9.

8.2. If the measured pelvic angle is below the specified range, hold the dummy's thighs down and push rearward on the upper torso to maximize the dummy's pelvic angle. If the pelvic angle is within the specified range, proceed to step 9. If the pelvic angle is still below the specified range and the seatback is adjustable, adjust the seatback rearward one notch (or 2 degrees for infinitely adjustable seatbacks) and again hold the dummy's thighs down and push rearward on the upper torso; check the pelvic angle.

Repeat the previous step until the pelvic angle is within the specified range or until the seatback is in the full-rearward position. If the pelvic angle is within the specified range, proceed to step 10. If the pelvic angle is still below the specified range or the seatback is not adjustable, proceed with the following: Lift the thighs and pelvis and move them forward (away from the seatback) the minimum amount necessary (not exceeding a distance of 50 mm between the seatback and dummy) to achieve the correct pelvic angle. Hold the dummy's thighs down and push rearward on the upper torso to maximize the dummy's pelvic angle. Repeat this step until the pelvic angle is within the specified range. Proceed to step 9.

8.3. If the measured pelvic angle is above the specified range, rotate the torso forward. This will push the pelvis rearward and decrease the pelvic angle. Holding the dummy's thighs down, slowly rotate the torso rearward until it is supported by the seatback. If the pelvic angle is within the specified range, proceed to step 9. If the pelvic angle remains above the specified range and the seatback is fixed, record the pelvic angle and proceed to step 9. If the seatback is adjustable, adjust the seatback forward one notch (or 2 degrees for infinitely adjustable seatbacks) and again rotate the torso forward and then hold the dummy's thighs down and slowly rotate the torso rearward until it is supported by the seatback; check the pelvic angle. Repeat the previous step until the pelvic angle is within the specified range or until the seatback is in the full-forward position. Proceed to step 9.

9. Measure the head transverse instrumentation platform angle. The anterior-posterior and medial-lateral angle should be level to within ±0.5 degrees. Adjust the lower neck bracket to level the head in the anterior-posterior direction. If it is not possible to achieve the head level within ±0.5 degrees, minimize the angle by moving the seatback one notch (or 2 degrees for infinitely adjustable seatbacks) in the appropriate direction to achieve the head level.

   After moving the seatback, if the pelvic angle is above the specified range, decrease the pelvic angle by rotating the torso forward and then holding the dummy's thighs down and slowly rotating the torso rearward until it is supported by the seatback; record the pelvic angle and head angle, making sure the head is level within ±0.5 degrees; proceed to step 10. If the pelvic angle is below the specified range, hold the dummy's thighs down and push rearward on the upper torso to maximize the dummy's pelvic angle; record the pelvic angle and head angle, making sure the head is level within ±0.5 degrees; proceed to step 10. If it is not possible to achieve both the head level and the specified pelvic angle, priority goes to leveling the head.

10. Place safety belt around the dummy and fasten the latch.

10.1. Apply an 8-18 Newton (2-4 pound) load to the lap belt by pulling the upper torso belt adjacent to the latchplate. The lap belt should lie across the top of the thighs close to the pelvis, but not pushing into the abdomen.

10.2. If the belt has an automatic retractor, remove all slack from the lap belt and pull all webbing out of the retractor and allow it to retract against tension by holding pressure on the webbing with fingers. Repeat this operation four times.

10.3. The upper portion of the belt should lie flat on the dummy's chest. Pull the belt 50-100 mm from the chest and allow it to retract on its own.

11. Position the dummy's arms and hands. For dummies with half arms (BioSID, EuroSID-1, EuroSID-2, and SID-IIs), adjust the upper arm to the stop position 45 degrees forward of the neutral (down) position.