

§ 571.208a Optional test procedures for vehicles manufactured between January 27, 2004 and August 31, 2004.

For vehicles manufactured between January 27, 2004 and August 31, 2004, a manufacturer may, at its option, comply with certain requirements of Standard No. 208 in accordance with the test procedures set forth in this § 571.208a instead of the corresponding test procedures in § 571.208.

S1 through S15 [Reserved] See § 571.208, S1 through S15.

S16. *Test procedures for rigid barrier test requirements using 5th percentile adult female dummies.*

S16.1 *General provisions.* Crash testing to determine compliance with the requirements of S15 of this standard is conducted as specified in the following paragraphs (a) and (b).

(a) *Belted test.* Place a 49 CFR part 572 subpart O 5th percentile adult female test dummy at each front outboard seating position of a vehicle, in accordance with the procedures specified in S16.3 of this standard. Impact the vehicle traveling longitudinally forward at any speed, up to and including 48 km/h (30 mph), into a fixed rigid barrier that is perpendicular within a tolerance of ±5 degrees to the line of travel of the vehicle under the applicable conditions of S16.2 of this standard.

(b) *Unbelted test.* Place a 49 CFR part 572 subpart O 5th percentile adult female test dummy at each front outboard seating position of a vehicle, in accordance with the procedures specified in S16.3 of this standard, except S16.3.5. Impact the vehicle traveling longitudinally forward at any speed, from 32 km/h (20 mph) to 40 km/h (25 mph), inclusive, into a fixed rigid barrier that is perpendicular within a tolerance of ±5 degrees to the line of travel of the vehicle under the applicable conditions of S16.2 of this standard.

S16.2 *Test conditions.*

S16.2.1 The vehicle, including test devices and instrumentation, is loaded as in S8.1.1 of FMVSS No. 208.

S16.2.2 Movable vehicle windows and vents are placed in the fully closed position, unless the vehicle manufacturer chooses to specify a different adjustment position prior to the time the vehicle is certified.

S16.2.3 Convertibles and open-body type vehicles have the top, if any, in place in the closed passenger compartment configuration.

S16.2.4 Doors are fully closed and latched but not locked.

S16.2.5 The dummy is clothed in form fitting cotton stretch garments with short sleeves and above the knee length pants. A size 7½W shoe which meets the configuration and size specifications of MIL-S-21711E (see S4.7) or its equivalent is placed on each foot of the test dummy.

S16.2.6 Limb joints are set at one g, barely restraining the weight of the limb when extended horizontally. Leg joints are adjusted with the torso in the supine position.

S16.2.7 Instrumentation shall not affect the motion of dummies during impact.

S16.2.8 The stabilized temperature of the dummy is at any level between 20.6 °C and 22.2 °C (69 °F to 72 °F).

S16.2.9 *Steering wheel adjustment.*

S16.2.9.1 Adjust a tiltable steering wheel, if possible, so that the steering wheel hub is at the geometric center of its full range of driving positions.

S16.2.9.2 If there is no setting detent at the mid-position, lower the steering wheel to the detent just below the mid-position.

S16.2.9.3 If the steering column is telescoping, place the steering column in the mid-position. If there is no mid-position, move the steering wheel rearward one position from the mid-position.

S16.2.10 *Driver and passenger seat setup.*

S16.2.10.1 *Lumbar support adjustment.* Position adjustable lumbar supports so that the lumbar support is in its lowest, retracted or deflated adjustment position.

S16.2.10.2 *Other seat adjustments.* Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position.

S16.2.10.3 *Seat position adjustment.* If the passenger seat does not adjust independently of the driver seat, the driver seat shall control the final position of the passenger seat.

S16.2.10.3.1 If the seat is adjustable in the fore and aft and/or vertical directions, move the seat to the rearmost position at the full down height adjustment. If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. If the seat cushion contains a height adjustment, independent of the seat back, set this adjustment to the full down position. Record a seat cushion reference angle.

S16.2.10.3.2 Using only controls which move the seat fore and aft, move the seat to the full forward position. If seat adjustments other than fore-aft are present and the seat cushion reference angle changes from that measured in S16.2.10.3.1, use those adjustments to maintain as closely as possible the angle recorded in S16.2.10.3.1.

S16.2.10.3.3 If the seat height is adjustable, determine the maximum and minimum heights at this position, while maintaining, as closely as possible, the angle recorded in S16.2.10.3.1. Set the seat at the midpoint height with the seat cushion reference angle set as closely as possible to the angle recorded in S16.2.10.3.1. Mark location of the seat for future reference.

S16.3 *Dummy seating positioning procedures.* The 49 CFR part 572 subpart O 5th percentile adult female test dummy is positioned as follows:

S16.3.1 *General provisions and definitions.*

S16.3.1.1 All angles are measured with respect to the horizontal plane unless otherwise stated.

S16.3.1.2 The dummy's neck bracket is adjusted to align the zero degree index marks.

S16.3.1.3 The term "midsagittal plane" refers to the vertical plane that separates the dummy into equal left and right halves.

S16.3.1.4 The term "vertical longitudinal plane" refers to a vertical plane parallel to the vehicle's longitudinal centerline.

S16.3.1.5 The term "vertical plane" refers to a vertical plane, not necessarily parallel to the vehicle's longitudinal centerline.

S16.3.1.6 The term "transverse instrumentation platform" refers to the transverse instrumentation surface inside the dummy's skull casting to

which the neck load cell mounts. This surface is perpendicular to the skull cap's machined inferior-superior mounting surface.

S16.3.1.7 The term "thigh" refers to the femur between, but not including, the knee and the pelvis.

S16.3.1.8 The term "leg" refers to the lower part of the entire leg including the knee.

S16.3.1.9 The term "foot" refers to the foot including the ankle.

S16.3.1.10 The longitudinal centerline of a bucket seat cushion is determined at the widest part of the seat cushion. Measure perpendicular to the longitudinal centerline of the vehicle.

S16.3.1.11 For leg and thigh angles use the following references:

S16.3.1.11.1 *Thigh*—a straight line on the thigh skin between the center of the ½-13 UNC-2B tapped hole in the upper leg femur clamp (see drawings 880105-504 (left thigh) and 880105-505 (right thigh), upper leg femur clamp) and the knee pivot shoulder bolt (part 880105-527 in drawing 880105-528R & 528L, sliding knee assy. w/o pot).

S16.3.1.11.2 *Leg*—a straight line on the leg skin between the center of the ankle shell (parts 880105-609 & 633 in drawing 880105-660, ankle assembly) and the knee pivot shoulder bolt (part 880105-527 in drawing 880105-528R & 528L, sliding knee assy. w/o pot).

S16.3.2 *Driver dummy positioning.*

S16.3.2.1 *Driver torso/head/seat back angle positioning.*

S16.3.2.1.1 With the seat in the position determined in S16.2.10, use only the controls which move the seat fore and aft to place the seat in the rearmost position, without adjusting independent height controls. If the seat cushion reference angle automatically changes as the seat is moved from the full forward position, maintain, as closely as possible, the seat cushion reference angle in S16.2.10.3.1, for the final forward position when measuring the pelvic angle as specified in S16.3.2.1.11.

S16.3.2.1.2 Fully recline the seat back, if adjustable. Install the dummy into the driver's seat, such that when the legs are positioned 120 degrees to the thighs, the calves of the legs are not touching the seat cushion.

S16.3.2.1.3 *Bucket 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.

S16.3.2.1.4 *Bench seats.* Position the midsagittal plane of the dummy vertical and parallel to the vehicle's longitudinal centerline and aligned with the center of the steering wheel rim.

S16.3.2.1.5 Hold the dummy's thighs down and push rearward on the upper torso to maximize the dummy's pelvic angle.

S16.3.2.1.6 Place the legs at 120 degrees to the thighs. Set the initial transverse distance between the longitudinal centerlines at the front of the dummy's knees at 160 to 170 mm (6.3 to 6.7 in), with the thighs and legs of the dummy in vertical planes. Push rearward on the dummy's knees to force the pelvis into the seat so there is no gap between the pelvis and the seat back or until contact occurs between the back of the dummy's calves and the front of the seat cushion.

S16.3.2.1.7 Gently rock the upper torso relative to the lower torso laterally in a side to side motion three times through a ± 5 degree arc (approximately 51 mm (2 in) side to side) to reduce friction between the dummy and the seat.

S16.3.2.1.8 If needed, extend the legs slightly so that the feet are not in contact with the floor pan. Let the thighs rest on the seat cushion to the extent permitted by the foot movement. Keeping the leg and the thigh in a vertical plane, place the foot in the vertical longitudinal plane that passes through the centerline of the accelerator pedal. Rotate the left thigh outboard about the hip until the center of the knee is the same distance from the midsagittal plane of the dummy as the right knee ± 5 mm (± 0.2 in). Using only controls which move the seat fore and aft, attempt to return the seat to the full forward position. If either of the dummy's legs first contacts the steering wheel, then adjust the steering wheel, if adjustable, upward until contact with the steering wheel is avoided. If the steering wheel is not adjustable, separate the knees enough to avoid steering

wheel contact. Proceed with moving the seat forward until either the leg contacts the vehicle interior or the seat reaches the full forward position. (The right foot may contact and depress the accelerator and/or change the angle of the foot with respect to the leg during seat movement.) If necessary to avoid contact with the vehicles brake or clutch pedal, rotate the test dummy's left foot about the leg. If there is still interference, rotate the left thigh outboard about the hip the minimum distance necessary to avoid pedal interference. If a dummy leg contacts the vehicle interior before the full forward position is attained, position the seat at the next detent where there is no contact. If the seat is a power seat, move the seat fore and aft to avoid contact while assuring that there is a maximum of 5 mm (0.2 in) distance between the vehicle interior and the point on the dummy that would first contact the vehicle interior. If the steering wheel was moved, return it to the position described in S16.2.9. If the steering wheel contacts the dummy's leg(s) prior to attaining this position, adjust it to the next higher detent, or if infinitely adjustable, until there is 5 mm (0.2 in) clearance between the wheel and the dummy's leg(s).

S16.3.2.1.9 For vehicles without adjustable seat backs, adjust the lower neck bracket to level the head as much as possible. For vehicles with adjustable seat backs, while holding the thighs in place, rotate the seat back forward until the transverse instrumentation platform of the head is level to within ± 0.5 degree, making sure that the pelvis does not interfere with the seat bight. Inspect the abdomen to ensure that it is properly installed. If the torso contacts the steering wheel, adjust the steering wheel in the following order until there is no contact: Telescoping adjustment, lowering adjustment, raising adjustment. If the vehicle has no adjustments or contact with the steering wheel cannot be eliminated by adjustment, position the seat at the next detent where there is no contact with the steering wheel as adjusted in S16.2.9. If the seat is a power seat, position the seat to avoid contact while assuring that there is a maximum of 5 mm (0.2 in) distance between

the steering wheel as adjusted in S16.2.9 and the point of contact on the dummy.

S16.3.2.1.10 If it is not possible to achieve the head level within ± 0.5 degrees, minimize the angle.

S16.3.2.1.11 Measure and set the dummy's pelvic angle using the pelvic angle gage (drawing TE-2504, incorporated by reference in 49 CFR part 572, subpart O, of this chapter). The angle shall be set to 20.0 degrees ± 2.5 degrees. If this is not possible, adjust the pelvic angle as close to 20.0 degrees as possible while keeping the transverse instrumentation platform of the head as level as possible by adjustments specified in S16.3.2.1.9 and S16.3.2.1.10.

S16.3.2.1.12 If the dummy is contacting the vehicle interior after these adjustments, move the seat rearward until there is a maximum of 5 mm (0.2 in) between the contact point of the dummy and the interior of the vehicle or if it has a manual seat adjustment, to the next rearward detent position. If after these adjustments, the dummy contact point is more than 5 mm (0.2 in) from the vehicle interior and the seat is still not in its forwardmost position, move the seat forward until the contact point is 5 mm (0.2 in) or less from the vehicle interior, or if it has a manual seat adjustment, move the seat to the closest detent position without making contact, or until the seat reaches its forwardmost position, whichever occurs first.

S16.3.2.2 Driver foot positioning.

S16.3.2.2.1 If the vehicle has an adjustable accelerator pedal, adjust it to the full forward position. Rest the right foot of the test dummy on the undepressed accelerator pedal with the rearmost point of the heel on the floor pan in the plane of the pedal. If the foot cannot be placed on the accelerator pedal, set it initially perpendicular to the leg and then place it as far forward as possible in the direction of the pedal centerline with the rearmost point of the heel resting on the floor pan. If the vehicle has an adjustable accelerator pedal and the right foot is not touching the accelerator pedal when positioned as above, move the pedal rearward until it touches the right foot. If the accelerator pedal in the full rearward position still does not

touch the foot, leave the pedal in that position.

S16.3.2.2.2 If the ball of the foot does not contact the pedal, change the angle of the foot relative to the leg such that the toe of the foot contacts the undepressed accelerator pedal.

S16.3.2.2.3 Place the left foot on the toe-board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe-board and floor pan, and not on the wheel-well projection or foot rest.

S16.3.2.2.4 If the left foot cannot be positioned on the toe board, place the foot perpendicular to the lower leg centerline as far forward as possible with the heel resting on the floor pan.

S16.3.2.2.5 If necessary to avoid contact with the vehicle's brake or clutch pedal, rotate the test dummy's left foot about the lower leg. If there is still pedal interference, rotate the left leg outboard about the hip the minimum distance necessary to avoid the pedal interference. If the left foot does not contact the floor pan, place the foot parallel to the floor and place the leg as perpendicular to the thigh as possible.

S16.3.2.3 Driver arm/hand positioning.

S16.3.2.3.1 Place the dummy's upper arms adjacent to the torso with the arm centerlines as close to a vertical longitudinal plane as possible.

S16.3.2.3.2 Place the palms of the dummy in contact with the outer part of the steering wheel rim at its horizontal centerline with the thumbs over the steering wheel rim.

S16.3.2.3.3 If it is not possible to position the thumbs inside the steering wheel rim at its horizontal centerline, then position them above and as close to the horizontal centerline of the steering wheel rim as possible.

S16.3.2.3.4 Lightly tape the hands to the steering wheel rim so that if the hand of the test dummy is pushed upward by a force of not less than 9 N (2 lb) and not more than 22 N (5 lb), the tape releases the hand from the steering wheel rim.

S16.3.3 Passenger dummy positioning.

S16.3.3.1 Passenger torso/head/seat back angle positioning.

S16.3.3.1.1 With the seat in the position determined in S16.2.10, use only

the controls which move the seat fore and aft to place the seat in the rear-most position, without adjusting independent height controls. If the seat cushion reference angle automatically changes as the seat is moved from the full forward position, maintain as closely as possible the seat cushion reference angle in S16.2.10.3.1, for the final forward position when measuring the pelvic angle as specified in S16.3.3.1.11.

S16.3.3.1.2 Fully recline the seat back, if adjustable. Install the dummy into the passenger's seat, such that when the legs are 120 degrees to the thighs, the calves of the legs are not touching the seat cushion.

S16.3.3.1.3 *Bucket 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.

S16.3.3.1.4 *Bench seats.* Position the midsagittal plane of the dummy vertical and parallel to the vehicle's longitudinal centerline and the same distance from the vehicle's longitudinal centerline as the midsagittal plane of the driver dummy.

S16.3.3.1.5 Hold the dummy's thighs down and push rearward on the upper torso to maximize the dummy's pelvic angle.

S16.3.3.1.6 Place the legs at 120 degrees to the thighs. Set the initial transverse distance between the longitudinal centerlines at the front of the dummy's knees at 160 to 170 mm (6.3 to 6.7 in), with the thighs and legs of the dummy in vertical planes. Push rearward on the dummy's knees to force the pelvis into the seat so there is no gap between the pelvis and the seat back or until contact occurs between the back of the dummy's calves and the front of the seat cushion.

S16.3.3.1.7 Gently rock the upper torso relative to the lower torso laterally side to side three times through a ± 5 degree arc (approximately 51 mm (2 in) side to side).

S16.3.3.1.8 If needed, extend the legs slightly so that the feet are not in contact with the floor pan. Let the thighs rest on the seat cushion to the extent permitted by the foot movement. With the feet perpendicular to the legs, place the heels on the floor pan. If a

heel will not contact the floor pan, place it as close to the floor pan as possible. Using only controls which move the seat fore and aft, attempt to return the seat to the full forward position. If a dummy leg contacts the vehicle interior before the full forward position is attained, position the seat at the next detent where there is no contact. If the seats are power seats, position the seat to avoid contact while assuring that there is a maximum of 5 mm (0.2 in) distance between the vehicle interior and the point on the dummy that would first contact the vehicle interior.

S16.3.3.1.9 For vehicles without adjustable seat backs, adjust the lower neck bracket to level the head as much as possible. For vehicles with adjustable seat backs, while holding the thighs in place, rotate the seat back forward until the transverse instrumentation platform of the head is level to within ± 0.5 degrees, making sure that the pelvis does not interfere with the seat bight. Inspect the abdomen to insure that it is properly installed.

S16.3.3.1.10 If it is not possible to orient the head level within ± 0.5 degrees, minimize the angle.

S16.3.3.1.11 Measure and set the dummy's pelvic angle using the pelvic angle gage (drawing TE-2504, incorporated by reference in 49 CFR part 572, subpart O, of this chapter). The angle shall be set to 20.0 degrees ± 2.5 degrees. If this is not possible, adjust the pelvic angle as close to 20.0 degrees as possible while keeping the transverse instrumentation platform of the head as level as possible as specified in S16.3.3.1.9 and S16.3.3.1.10.

S16.3.3.1.12 If the dummy is contacting the vehicle interior after these adjustments, move the seat rearward until there is a maximum of 5 mm (0.2 in) between the contact point of the dummy and the interior of the vehicle or if it has a manual seat adjustment, to the next rearward detent position. If after these adjustments the dummy contact point is more than 5 mm (0.2 in) from the vehicle interior and the seat is still not in its forward most position, move the seat forward until the contact point is 5 mm (0.2 in) or less from the vehicle interior, or if it has a manual seat adjustment, move the seat

to the closest detent position without making contact, or until the seat reaches its forward most position, whichever occurs first.

S16.3.3.2 *Passenger foot positioning.*

S16.3.3.2.1 Place the passenger's feet flat on the toe board.

S16.3.3.2.2 If the feet cannot be placed flat on the toe board, set them perpendicular to the leg center lines and place them as far forward as possible with the heels resting on the floor pan.

S16.3.3.3 *Passenger arm/hand positioning.*

S16.3.3.3.1 Place the dummy's upper arms in contact with the seat back and the torso.

S16.3.3.3.2 Place the palms of the dummy in contact with the outside of the thighs.

S16.3.3.3.3 Place the little fingers in contact with the seat cushion.

S16.3.4 *Driver and passenger adjustable head restraints.*

S16.3.4.1 If the head restraint has an automatic adjustment, leave it where the system positions the restraint after the dummy is placed in the seat.

S16.3.4.2 Adjust each head restraint to its lowest position.

S16.3.4.3 Measure the vertical distance from the top most point of the head restraint to the bottom most point. Locate a horizontal plane through the midpoint of this distance. Adjust each head restraint vertically so that this horizontal plane is aligned with the center of gravity (CG) of the dummy head.

S16.3.4.4 If the above position is not attainable, move the vertical center of the head restraint to the closest detent below the center of the head CG.

S16.3.4.5 If the head restraint has a fore and aft adjustment, place the restraint in the forwardmost position or until contact with the head is made, whichever occurs first.

S16.3.5 *Driver and passenger manual belt adjustment (for tests conducted with a belted dummy)*

S16.3.5.1 If an adjustable seat belt D-ring anchorage exists, place it in the manufacturer's design position for a 5th percentile adult female with the seat in the position specified in S16.2.10.3.

S16.3.5.2 Place the Type 2 manual belt around the test dummy and fasten the latch.

S16.3.5.3 Ensure that the dummy's head remains as level as possible, as specified in S16.3.2.1.9 and S16.3.2.1.10 and S16.3.3.1.9 and S16.3.3.1.10.

S16.3.5.4 Remove all slack from the lap belt. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this operation four times. Apply a 9 N (2 lbf) to 18 N (4 lbf) tension load to the lap belt. If the belt system is equipped with a tension-relieving device, introduce the maximum amount of slack into the upper torso belt that is recommended by the manufacturer. If the belt system is not equipped with a tension-relieving device, allow the excess webbing in the shoulder belt to be retracted by the retractive force of the retractor.

S17 through S19 [Reserved]. See § 571.208, S17 through S19.

S20 *Test procedure for S19 of FMVSS No. 208.*

S20.1 *General provisions.*

S20.1.1 Tests specifying the use of a car bed, a rear facing child restraint, or a convertible child restraint may be conducted using any such restraint listed in sections A, B, and C of appendix A of FMVSS No. 208 respectively. The car bed, rear facing child restraint, or convertible child restraint may be unused or have been previously used only for automatic suppression tests. If it has been used, there shall not be any visible damage prior to the test.

S20.1.2 Each vehicle certified to this option shall comply in tests conducted with the right front outboard seating position, if adjustable fore and aft, at full rearward, middle, and full forward positions. If the child restraint or dummy contacts the vehicle interior, move the seat rearward to the next detent that provides clearance. If the seat is a power seat, move the seat rearward while assuring that there is a maximum of 5 mm (0.2 in) clearance.

S20.1.3 If the car bed, rear facing child restraint, or convertible child restraint is equipped with a handle, the vehicle shall comply in tests conducted with the handle at both the child restraint manufacturer's recommended position for use in vehicles and in the upright position.

S20.1.4 If the car bed, rear facing child restraint, or convertible child restraint is equipped with a sunshield, the vehicle shall comply in tests conducted with the sunshield both fully open and fully closed.

S20.1.5 The vehicle shall comply in tests with the car bed, rear facing child restraint, or convertible child restraint uncovered and in tests with a towel or blanket weighing up to 1.0 kg (2.2 lb) placed on or over the restraint in any of the following positions:

(a) with the blanket covering the top and sides of the restraint, and

(b) with the blanket placed from the top of the vehicle's seat back to the forwardmost edge of the restraint.

S20.1.6 Except as otherwise specified, if the car bed, rear facing child restraint, or convertible child restraint has an anchorage system as specified in S5.9 of FMVSS No. 213 and is tested in a vehicle with a right front outboard vehicle seat that has an anchorage system as specified in FMVSS No. 225, the vehicle shall comply with the belted test conditions with the restraint anchorage system attached to the vehicle seat anchorage system and the vehicle seat belt unattached. It shall also comply with the belted test conditions with the restraint anchorage system unattached to the vehicle seat anchorage system and the vehicle seat belt attached. The vehicle shall comply with the unbelted test conditions with the restraint anchorage system unattached to the vehicle seat anchorage system.

S20.1.7 If the car bed, rear facing child restraint, or convertible child restraint comes equipped with a detachable base, the vehicle shall comply in tests conducted with the detachable base attached to the child restraint and with the detachable base unattached to the child restraint.

S20.1.8 Do not attach any tethers.

S20.1.9 *Seat set-up.* Unless otherwise stated,

S20.1.9.1 *Lumbar support adjustment.* Position adjustable lumbar supports so that the lumbar support is in its lowest, retracted or deflated adjustment position.

S20.1.9.2 *Other seat adjustments.* Position any adjustable parts of the seat that provide additional support so that

they are in the lowest or most open adjustment position.

S20.1.9.3 If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position.

S20.1.9.4 If the seat height is adjustable, determine the maximum and minimum heights at the full rearward, middle, and full forward positions. Set the seat at the mid-point height for each of the three fore-aft test positions.

S20.1.9.5 The seat back angle, if adjustable, is set at the manufacturer's nominal design seat back angle for a 50th percentile adult male as specified in S8.1.3 of FMVSS No. 208.

S20.1.9.6 If adjustable, set the head restraint at the full down and full forward position.

S20.1.10 The longitudinal centerline of a bucket seat cushion is determined at the widest part of the seat cushion. Measure perpendicular to the longitudinal centerline of the vehicle.

S20.2 *Static tests of automatic suppression feature which shall result in deactivation of the passenger air bag.* Each vehicle that is certified as complying with S19.2 of FMVSS No. 208 shall meet the following test requirements.

S20.2.1 *Belted rear facing and convertible child restraints.*

S20.2.1.1 The vehicle shall comply in tests using any child restraint specified in section B and section C of appendix A of FMVSS No. 208.

S20.2.1.2 Locate a vertical plane through the longitudinal centerline of the child restraint. This will be referred to as "Plane."

S20.2.1.3 For bucket seats, "Plane B" refers to a vertical plane parallel to the vehicle longitudinal centerline through the longitudinal centerline of the right front outboard vehicle seat cushion. For bench seats, "Plane B" refers to a vertical plane through the right front outboard vehicle seat parallel to the vehicle longitudinal centerline the same distance from the longitudinal centerline of the vehicle as the center of the steering wheel.

S20.2.1.4 *Facing rear.*

(a) The vehicle shall comply in both of the following positions, if applicable:

(1) Without attaching the child restraint anchorage system as specified

in S5.9 of FMVSS No. 213 to a vehicle seat anchorage system specified in FMVSS No. 225, align the child restraint system facing rearward such that Plane A is aligned with Plane B.

(2) If the child restraint is certified to S5.9 of FMVSS No. 213, and the vehicle seat has an anchorage system as specified in FMVSS No. 225, attach the child restraint to the vehicle seat anchorage instead of aligning the planes. Do not attach the vehicle safety belt.

(b) While maintaining the child restraint positions achieved in S20.2.1.4(a), secure the child restraint by following, to the extent possible, the child restraint manufacturer's directions regarding proper installation of the restraint in the rear facing mode.

(c) Place any adjustable seat belt anchorages at the vehicle manufacturer's nominal design position for a 50th percentile adult male occupant. Cinch the vehicle belts to any tension from zero up to 134 N (30 lb) to secure the child restraint. Measure belt tension in a flat, straight section of the lap belt between the child restraint belt path and the contact point with the belt anchor or vehicle seat, on the side away from the buckle (to avoid interference from the shoulder portion of the belt).

(d) Position the 49 CFR part 572 subpart R 12-month-old CRABI dummy in the child restraint by following, to the extent possible, the manufacturer's instructions provided with the child restraint for seating infants.

(e) Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and close all vehicle doors. Wait 10 seconds, then check whether the air bag is deactivated.

S20.2.1.5 *Facing forward (convertible restraints only)*.

(a) The vehicle shall comply in both of the following positions, if applicable:

(1) Without attaching the child restraint anchorage system as specified in S5.9 of FMVSS No. 213 to a vehicle seat anchorage system specified in FMVSS No. 225, align the child restraint system facing forward such that Plane A is aligned with Plane B.

(2) If the child restraint is certified to S5.9 of FMVSS No. 213, and the vehicle seat has an anchorage system as

specified in FMVSS No. 225, attach the child restraint to the vehicle seat anchorage instead of aligning the planes. Do not attach the vehicle safety belt.

(b) While maintaining the child restraint positions achieved in S20.2.1.5(a), secure the child restraint by following, to the extent possible, the child restraint manufacturer's directions regarding proper installation of the restraint in the forward facing mode.

(c) Place any adjustable seat belt anchorages at the vehicle manufacturer's nominal design position for a 50th percentile adult male occupant. Cinch the vehicle belts to any tension from zero up to 134 N (30 lb) to secure the child restraint. Measure belt tension in a flat, straight section of the lap belt between the child restraint belt path and the contact point with the belt anchor or vehicle seat, on the side away from the buckle (to avoid interference from the shoulder portion of the belt).

(d) Position the 49 CFR part 572 subpart R 12-month-old CRABI dummy in the child restraint by following, to the extent possible, the manufacturer's instructions provided with the child restraint for seating infants.

(e) Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and close all vehicle doors. Wait 10 seconds, then check whether the air bag is deactivated.

S20.2.2 *Unbelted rear facing and convertible child restraints*.

S20.2.2.1 The vehicle shall comply in tests using any child restraint specified in section B and section C of appendix A of FMVSS No. 208.

S20.2.2.2 Locate a vertical plane through the longitudinal centerline of the child restraint. This will be referred to as "Plane A".

S20.2.2.3 For bucket seats, "Plane B" refers to a vertical plane parallel to the vehicle longitudinal centerline through the longitudinal centerline of the right front outboard vehicle seat cushion. For bench seats, "Plane B" refers to a vertical plane through the right front outboard seat parallel to the vehicle longitudinal centerline the same distance from the longitudinal centerline of the vehicle as the center of the steering wheel.

S20.2.2.4 *Facing rear.*

(a) Align the child restraint system facing rearward such that Plane A is aligned with Plane B and the child restraint is in contact with the seat back.

(b) Position the 49 CFR part 572 subpart R 12-month-old CRABI dummy in the child restraint by following, to the extent possible, the manufacturer's instructions provided with the child restraint for seating infants.

(c) Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and close all vehicle doors. Wait 10 seconds, then check whether the air bag is deactivated.

S20.2.2.5 *Facing forward.*

(a) Align the child restraint system facing forward such that Plane A is aligned with Plane B and the child restraint is in contact with the seat back.

(b) Position the 49 CFR part 572 subpart R 12-month-old CRABI dummy in the child restraint by following, to the extent possible, the manufacturer's instructions provided with the child restraint for seating infants.

(c) Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and close all vehicle doors. Wait 10 seconds, then check whether the air bag is deactivated.

S20.2.3 *Tests with a belted car bed.*

S20.2.3.1 The vehicle shall comply in tests using any car bed specified in section A of appendix A of FMVSS No. 208.

S20.2.3.2(a) Install the car bed by following, to the extent possible, the car bed manufacturer's directions regarding proper installation of the car bed.

(b) Place any adjustable seat belt anchorages at the vehicle manufacturer's nominal design position for a 50th percentile adult male occupant. Cinch the vehicle belts to secure the car bed.

(c) Position the 49 CFR part 572 subpart K Newborn Infant dummy in the car bed by following, to the extent possible, the car bed manufacturer's instructions provided with the car bed for positioning infants.

(d) Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and close all vehicle doors.

Wait 10 seconds, then check whether the air bag is deactivated.

S20.3 *Static tests of automatic suppression feature which shall result in activation of the passenger air bag system.*

S20.3.1 Each vehicle certified to this option shall comply in tests conducted with the right front outboard seating position, if adjustable fore and aft, at the full rearward, middle, and, subject to S16.3.3.1.8, full forward positions. All tests are conducted with the seat height, if adjustable, in the mid-height position.

S20.3.2 Place a 49 CFR part 572 subpart O 5th percentile adult female test dummy at the right front outboard seating position of the vehicle, in accordance with procedures specified in S16.3.3 of this standard, except as specified in S20.3.1, subject to the fore-aft seat positions in S20.3.1. Do not fasten the seat belt.

S20.3.3 Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and then close all vehicle doors.

S20.3.4 Wait 10 seconds, then check whether the air bag system is activated.

S20.4 *Low risk deployment test.* Each vehicle that is certified as complying with S19.3 of FMVSS No. 208 shall meet the following test requirements.

S20.4.1 Position the right front outboard vehicle seat in the full forward seat track position, adjust the seat height (if adjustable) to the mid-height position, and adjust the seat back (if adjustable) to the nominal design position for a 50th percentile adult male as specified in S8.1.3 of FMVSS No. 208. Position adjustable lumbar supports so that the lumbar support is in its lowest, retracted or deflated adjustment position. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position. If adjustable, set the head restraint at the full down position. If the child restraint or dummy contacts the vehicle interior, move the seat rearward to the next detent that provides clearance. If the seat is a power seat, move the seat

rearward while assuring that there is a maximum of 5 mm (0.2 in) clearance.

S20.4.2 The vehicle shall comply in tests using any child restraint specified in section B and section C of appendix A to FMVSS No. 208.

S20.4.3 Locate a vertical plane through the longitudinal centerline of the child restraint. This will be referred to as "Plane A".

S20.4.4 For bucket seats, "Plane B" refers to a vertical plane parallel to the vehicle longitudinal centerline through the geometric center of the right front outboard seat cushion. For bench seats, "Plane B" refers to a vertical plane through the right front outboard seat parallel to the vehicle longitudinal centerline that is the same distance from the longitudinal centerline of the vehicle as the center of the steering wheel.

S20.4.5 Align the child restraint system facing rearward such that Plane A is aligned with Plane B.

S20.4.6 If the child restraint is certified to S5.9 of FMVSS No. 213, and the vehicle seat has an anchorage system as specified in FMVSS No. 225, attach the child restraint to the vehicle seat anchorage instead of aligning the planes. Do not attach the vehicle safety belt.

S20.4.7 While maintaining the child restraint position achieved in S20.4.5, secure the child restraint by following, to the extent possible, the child restraint manufacturer's directions regarding proper installation of the restraint in the rear facing mode. Place any adjustable seat belt anchorages at the manufacturer's nominal design position for a 50th percentile adult male occupant. Cinch the vehicle belts to any tension from zero up to 134 N (30 lb) to secure the child restraint. Measure belt tension in a flat, straight section of the lap belt between the child restraint belt path and the contact point with the belt anchor or vehicle seat, on the side away from the buckle (to avoid interference from the shoulder portion of the belt).

S20.4.8 Position the 49 CFR part 572 subpart R 12-month-old CRABI dummy in the child restraint by following, to the extent possible, the manufacturer's instructions provided with the child restraint for seating infants.

S20.4.9 Deploy the right front outboard frontal air bag system. If the air bag system contains a multistage inflator, the vehicle shall be able to comply at any stage or combination of stages or time delay between successive stages that could occur in the presence of an infant in a rear facing child restraint and a 49 CFR part 572, subpart R 12-month-old CRABI dummy positioned according to S20.4 in a rigid barrier crash test at speeds up to 64 km/h (40 mph).

S21 [Reserved] See § 571.208, S21.

S22 *Test procedure for S21 of FMVSS No. 208.*

S22.1 *General provisions and definitions.*

S22.1.1 Tests specifying the use of a forward facing child restraint, including a booster seat where applicable, may be conducted using any such restraint listed in section C and section D of appendix A of FMVSS No. 208, respectively. The child restraint may be unused or have been previously used only for automatic suppression tests. If it has been used, there shall not be any visible damage prior to the test. Booster seats are to be used in the manner appropriate for a 3-year-old child of the same height and weight as the 3-year-old child dummy.

S22.1.2 Unless otherwise specified, each vehicle certified to this option shall comply in tests conducted with the right front outboard seating position at the full rearward, middle, and the full forward positions. If the dummy contacts the vehicle interior, move the seat rearward to the next detent that provides clearance. If the seat is a power seat, move the seat rearward while assuring that there is a maximum of 5 mm (0.2 in) clearance.

S22.1.3 Except as otherwise specified, if the child restraint has an anchorage system as specified in S5.9 of FMVSS No. 213 and is tested in a vehicle with a right front outboard vehicle seat that has an anchorage system as specified in FMVSS No. 225, the vehicle shall comply with the belted test conditions with the restraint anchorage system attached to the vehicle seat anchorage system and the vehicle seat belt unattached. It shall also comply with the belted test conditions with the restraint anchorage system unattached

to the vehicle seat anchorage system and the vehicle seat belt attached.

S22.1.4 Do not attach any tethers.

S22.1.5 The definitions provided in S16.3.1 through S16.3.10 apply to the tests specified in S22.

S22.1.6 For leg and thigh angles use the following references:

(a) *Thigh*—a straight line on the thigh skin between the center of the $\frac{5}{16} \times \frac{1}{2}$ in. screw (part 9001024, item 10 in drawing 210-0000 sheet 2 of 7, complete assembly (HYB III 3 YR OLD)) and the knee bolt (part 210-5301 in drawing 210-5000-1 & -1, leg assembly).

(b) *Leg*—a straight line on the leg skin between the center of the ankle bolt (part 210-5701 in drawing 210-5000-1 & -2, leg assembly) and the knee bolt (part 210-5301 in drawing 210-5000-1 & -2, leg assembly).

S22.1.7 *Seat set-up*. Unless otherwise stated,

S22.1.7.1 *Lumbar support adjustment*. Position adjustable lumbar supports so that the lumbar support is in its lowest, retracted or deflated adjustment position.

S22.1.7.2 *Other seat adjustments*. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position.

S22.1.7.3 If the seat cushion adjusts fore and aft, independent of the seat back, set this adjustment to the full rearward position.

S22.1.7.4 If the seat height is adjustable, determine the maximum and minimum heights at the full rearward seat track position, the middle seat track position, and the full forward seat track position. Set the seat at the midpoint height for each of the three fore-aft test positions.

S22.1.7.5 The seat back angle, if adjustable, is set at the manufacturer's nominal design seat back angle for a 50th percentile adult male as specified in S8.1.3 of FMVSS No. 208.

S22.1.7.6 If adjustable, set the head restraint at the full down and full forward position.

S22.2 *Static tests of automatic suppression feature which shall result in deactivation of the passenger air bag*. Each vehicle that is certified as complying with S21.2 of FMVSS No. 208 shall meet the following test requirements:

S22.2.1 *Belted test with forward facing child restraints or booster seats*.

S22.2.1.1 Install the restraint in the right front outboard seat in accordance, to the extent possible, with the child restraint manufacturer's instructions provided with the seat for use by children with the same height and weight as the 3-year-old child dummy.

S22.2.1.2 Locate a vertical plane through the longitudinal centerline of the child restraint. This will be referred to as "Plane A".

S22.2.1.3 For bucket seats, "Plane B" refers to a vertical longitudinal plane through the longitudinal centerline of the seat cushion of the right front outboard vehicle seat. For bench seats, "Plane B" refers to a vertical plane through the right front outboard vehicle seat parallel to the vehicle longitudinal centerline the same distance from the longitudinal centerline of the vehicle as the center of the steering wheel.

S22.2.1.4 The vehicle shall comply in both of the following positions, if applicable:

(a) Without attaching the child restraint anchorage system as specified in S5.9 of FMVSS No. 213 to a vehicle seat anchorage system specified in FMVSS No. 225 and without attaching any tethers, align the child restraint system facing forward such that Plane A is aligned with Plane B.

(b) If the child restraint is certified to S5.9 of FMVSS No. 213, and the vehicle seat has an anchorage system as specified in FMVSS No. 225, attach the child restraint to the vehicle seat anchorage instead of aligning the planes. Do not attach the vehicle safety belt.

S22.2.1.5 *Forward facing child restraint*.

S22.2.1.5.1 Place any adjustable seat belt anchorages at the vehicle manufacturer's nominal design position for a 50th percentile adult male occupant. Cinch the vehicle belts to any tension from zero up to 134 N (30 lb) to secure the child restraint. Measure belt tension in a flat, straight section of the lap belt between the child restraint belt path and the contact point with the belt anchor or vehicle seat, on the side away from the buckle (to avoid interference from the shoulder portion of the belt).

S22.2.1.5.2 Position the 49 CFR part 572 subpart P 3-year-old child dummy in the child restraint such that the dummy's lower torso is centered on the child restraint and the dummy's spine is against the seat back of the child restraint. Place the arms at the dummy's sides.

S22.2.1.5.3 Attach all belts that come with the child restraint that are appropriate for a child of the same height and weight as the 3-year-old child dummy, if any, by following, to the extent possible, the manufacturer's instructions provided with the child restraint for seating children.

S22.2.1.6 *Booster seat.*

S22.2.1.6.1 Place any adjustable seat belt anchorages at the vehicle manufacturer's nominal design position for a 50th percentile adult male occupant. For booster seats designed to be secured to the vehicle seat even when empty, cinch the vehicle belts to any tension from zero up to 134 N (30 lb) to secure the booster seat. Measure belt tension in a flat, straight section of the lap belt between the child restraint belt path and the contact point with the belt anchor or vehicle seat, on the side away from the buckle (to avoid interference from the shoulder portion of the belt).

S22.2.1.6.2 Position the 49 CFR part 572 subpart P 3-year-old child dummy in the booster seat such that the dummy's lower torso is centered on the booster seat cushion and the dummy's back is parallel to and in contact with the booster seat back or, if there is no booster seat back, the vehicle seat back. Place the arms at the dummy's sides.

S22.2.1.6.3 If applicable, attach all belts that come with the child restraint that are appropriate for a child of the same height and weight as the 3-year-old child dummy, if any, by following, to the extent possible, the manufacturer's instructions provided with the child restraint for seating children.

S22.2.1.6.4 If applicable, place the Type 2 manual belt around the test dummy and fasten the latch. Remove all slack from the lap belt portion. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this four times. Apply a 9 to 18 N (2 to

4 lb) tension load to the lap belt. Allow the excess webbing in the upper torso belt to be retracted by the retractive force of the retractor.

S22.2.1.7 Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and then close all vehicle doors.

S22.2.1.8 Wait 10 seconds, then check whether the air bag is deactivated.

S22.2.2 *Unbelted tests with dummies.* Place the 49 CFR part 572 subpart P 3-year-old child dummy on the right front outboard seat in any of the following positions (without using a child restraint or booster seat or the vehicle's seat belts):

S22.2.2.1 *Sitting on seat with back against seat back*

(a) Position the dummy in the seated position and place it on the right front outboard seat.

(b) In the case of vehicles equipped with bench seats, position the midsagittal plane of the dummy vertically and parallel to the vehicle's longitudinal centerline and the same distance from the vehicle's longitudinal centerline as the center of the steering wheel. In the case of vehicles equipped with bucket seats, position the midsagittal plane of the dummy vertically such that it coincides with the longitudinal centerline of the seat cushion. Position the torso of the dummy against the seat back. Position the dummy's thighs against the seat cushion.

(c) Allow the legs of the dummy to extend off the surface of the seat.

(d) Rotate the dummy's upper arms down until they contact the seat back.

(e) Rotate the dummy's lower arms until the dummy's hands contact the seat cushion.

(f) Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and then close all vehicle doors.

(g) Wait 10 seconds, then check whether the air bag is deactivated.

S22.2.2.2 *Sitting on seat with back against reclined seat back.* Repeat the test sequence in S22.2.2.1 with the seat back angle 25 degrees rearward of the manufacturer's nominal design position for the 50th percentile adult male.

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If the seat will not recline 25 degrees rearward of the nominal design position, use the closest position that does not exceed 25 degrees.

S22.2.2.3 *Sitting on seat with back not against seat back.*

(a) Position the dummy in the seated position and place it on the right front outboard seat.

(b) In the case of vehicles equipped with bench seats, position the midsagittal plane of the dummy vertically and parallel to the vehicle's longitudinal centerline and the same distance from the vehicle's longitudinal centerline as the center of the steering wheel. In the case of vehicles equipped with bucket seats, position the midsagittal plane of the dummy vertically such that it coincides with the longitudinal centerline of the seat cushion. Position the dummy with the spine vertical so that the horizontal distance from the dummy's back to the seat back is no less than 25 mm (1.0 in) and no more than 150 mm (6.0 in), as measured along the dummy's midsagittal plane at the mid-sternum level. To keep the dummy in position, a material with a maximum breaking strength of 311 N (70 lb) may be used to hold the dummy.

(c) Position the dummy's thighs against the seat cushion.

(d) Allow the legs of the dummy to extend off the surface of the seat.

(e) Position the upper arms parallel to the spine and rotate the dummy's lower arms until the dummy's hands contact the seat cushion.

(f) Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and then close all vehicle doors.

(g) Wait 10 seconds, then check whether the air bag is deactivated.

S22.2.2.4 *Sitting on seat edge, spine vertical, hands by the dummy's sides.*

(a) In the case of vehicles equipped with bench seats, position the midsagittal plane of the dummy vertically and parallel to the vehicle's longitudinal centerline and the same distance from the vehicle's longitudinal centerline as the center of the steering wheel. In the case of vehicles equipped with bucket seats, position the midsagittal plane of the dummy

vertically such that it coincides with the longitudinal centerline of the seat cushion.

(b) Position the dummy in the seated position forward in the seat such that the legs are vertical and the back of the legs rest against the front of the seat with the spine vertical. If the dummy's feet contact the floor pan, rotate the legs forward until the dummy is resting on the seat with the feet positioned flat on the floor pan and the dummy spine vertical. To keep the dummy in position, a material with a maximum breaking strength of 311 N (70 lb) may be used to hold the dummy.

(c) Place the upper arms parallel to the spine.

(d) Lower the dummy's lower arms such that they contact the seat cushion.

(e) Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and then close all vehicle doors.

(f) Wait 10 seconds, then check whether the air bag is deactivated.

S22.2.2.5 *Standing on seat, facing forward.*

(a) In the case of vehicles equipped with bench seats, position the midsagittal plane of the dummy vertically and parallel to the vehicle's longitudinal centerline and the same distance from the vehicle's longitudinal centerline as the center of the steering wheel rim. In the case of vehicles equipped with bucket seats, position the midsagittal plane of the dummy vertically such that it coincides with the longitudinal centerline of the seat cushion. Position the dummy in a standing position on the right front outboard seat cushion facing the front of the vehicle while placing the heels of the dummy's feet in contact with the seat back.

(b) Rest the dummy against the seat back, with the arms parallel to the spine.

(c) If the head contacts the vehicle roof, recline the seat so that the head is no longer in contact with the vehicle roof, but allow no more than 5 mm (0.2 in) distance between the head and the roof. If the seat does not sufficiently recline to allow clearance, omit the test.

(d) If necessary use a material with a maximum breaking strength of 311 N (70 lb) or spacer blocks to keep the dummy in position.

(e) Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and then close all vehicle doors.

(f) Wait 10 seconds, then check whether the air bag is deactivated.

S22.2.2.6 *Kneeling on seat, facing forward.*

(a) In the case of vehicles equipped with bench seats, position the midsagittal plane of the dummy vertically and parallel to the vehicle's longitudinal centerline and the same distance from the vehicle's longitudinal centerline as the center of the steering wheel. In the case of vehicles equipped with bucket seats, position the midsagittal plane of the dummy vertically such that it coincides with the longitudinal centerline of the seat cushion.

(b) Position the dummy in a kneeling position in the right front outboard seat with the dummy facing the front of the vehicle with its toes at the intersection of the seat back and seat cushion. Position the dummy so that the spine is vertical. Push down on the legs so that they contact the seat as much as possible and then release. Place the arms parallel to the spine.

(c) If necessary use a material with a maximum breaking strength of 311 N (70 lb) or spacer blocks to keep the dummy in position.

(d) Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and then close all vehicle doors.

(e) Wait 10 seconds, then check whether the air bag is deactivated.

S22.2.2.7 *Kneeling on seat, facing rearward.*

(a) In the case of vehicles equipped with bench seats, position the midsagittal plane of the dummy vertically and parallel to the vehicle's longitudinal centerline and the same distance from the vehicle's longitudinal centerline as the center of the steering wheel. In the case of vehicles equipped with bucket seats, position the midsagittal plane of the dummy

vertically such that it coincides with the longitudinal centerline of the seat cushion.

(b) Position the dummy in a kneeling position in the right front outboard seat with the dummy facing the rear of the vehicle. Position the dummy such that the dummy's head and torso are in contact with the seat back. Push down on the legs so that they contact the seat as much as possible and then release. Place the arms parallel to the spine.

(c) Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and then close all vehicle doors.

(d) Wait 10 seconds, then check whether the air bag is deactivated.

S22.2.2.8 *Lying on seat.* This test is performed only in vehicles with 3 designated front seating positions.

(a) Lay the dummy on the right front outboard seat such that the following criteria are met:

(1) The midsagittal plane of the dummy is horizontal,

(2) The dummy's spine is perpendicular to the vehicle's longitudinal axis,

(3) The dummy's arms are parallel to its spine,

(4) A plane passing through the two shoulder joints of the dummy is vertical,

(5) The anterior of the dummy is facing the vehicle front,

(6) The head of the dummy is positioned towards the passenger door, and

(7) The horizontal distance from the topmost point of the dummy's head to the vehicle door is 50 to 100 mm (2-4 in).

(8) The dummy is as far back in the seat as possible.

(b) Rotate the thighs as much as possible toward the chest of the dummy and rotate the legs as much as possible against the thighs.

(c) Move the dummy's upper left arm parallel to the vehicle's transverse plane and the lower left arm 90 degrees to the upper arm. Rotate the lower left arm about the elbow joint and toward the dummy's head until movement is obstructed.

(d) Start the vehicle engine or place the ignition in the "on" position,

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whichever will turn on the suppression system, and then close all vehicle doors.

(e) Wait 10 seconds, then check whether the air bag is deactivated.

S22.3 *Static tests of automatic suppression feature which shall result in activation of the passenger air bag system.*

S22.3.1 Each vehicle certified to this option shall comply in tests conducted with the right front outboard seating position at the full rearward, middle, and, subject to S16.3.3.1.8, full forward positions. All tests are conducted with the seat height, if adjustable, in the mid-height position.

S22.3.2 Place a 49 CFR part 572 subpart O 5th percentile adult female test dummy at the right front outboard seating position of the vehicle, in accordance with procedures specified in S16.3.3 of this standard, except as specified in S22.3.1. Do not fasten the seat belt.

S22.3.3 Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and then close all vehicle doors.

S22.3.4 Wait 10 seconds, then check whether the air bag system is activated.

S22.4 *Low risk deployment tests.*

S22.4.1 Each vehicle that is certified as complying with S21.4 shall meet the following test requirements with the 49 CFR part 572, subpart P 3-year-old child dummy in both of the following positions: Position 1 (S22.4.2) and Position 2 (S22.4.3).

S22.4.1.1 Locate and mark a point on the front of the dummy's chest jacket on the midsagittal plane which is 114 mm (4.5 in) \pm 3 mm (\pm 0.1 in) along the surface of the skin from the top of the skin at the neck line. This is referred to as "Point 1."

S22.4.1.2 Locate the vertical plane parallel to the vehicle longitudinal centerline through the geometric center of the opening through which the right front air bag deploys into the occupant compartment. This is referred to as "Plane D."

S22.4.1.3 Locate the horizontal plane through the geometric center of the opening through which the right front air bag deploys into the occupant com-

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partment. This is referred to as "Plane C."

S22.4.2 *Position 1 (chest on instrument panel).*

S22.4.2.1 If a seat is adjustable in the fore and aft and/or vertical directions, move the seat to the rear-most seating position and full-down height adjustment. If the seat cushion adjusts fore and aft, independent of the entire seat, adjust the seat cushion to the full-rearward position. If the seat back is adjustable, place the seat back at the manufacturer's nominal design seat back angle for a 50th percentile adult male as specified in S8.1.3 of FMVSS No. 208. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. If adjustable, set the head restraint in the lowest position.

S22.4.2.2 Place the dummy in the front passenger seat such that:

S22.4.2.2.1 The midsagittal plane is coincident with Plane D.

S22.4.2.2.2 The legs are initially vertical to the floor pan. The legs and thighs shall be adjusted to the extent necessary for the head/torso to contact the instrument panel as specified in S22.4.2.3.

S22.4.2.2.3 The upper arms are parallel to the torso and the hands are in contact with the thighs.

S22.4.2.3 Without changing the seat position and with the dummy's thorax instrument cavity rear face vertical, move the dummy forward until the dummy head/torso contacts the instrument panel. If the dummy loses contact with the seat cushion because of the forward movement, maintain the height of the dummy and the angle of the thigh with respect to the torso. Once contact is made, raise the dummy vertically until Point 1 lies in Plane C. If the dummy's head contacts the windshield and keeps Point 1 from reaching Plane C, lower the dummy until there is no more than 5 mm (0.2 in) clearance between the head and the windshield. (The dummy shall remain in contact with the instrument panel while being raised or lowered, which may change the dummy's fore-aft position.)

S22.4.2.4 If possible, position the legs of the dummy so that the legs are vertical and the feet rest flat on the

floor pan of the vehicle. If the positioning against the instrument panel does not allow the feet to be on the floor pan, the feet shall be parallel to the floor pan.

S22.4.2.5 If necessary, material with a maximum breaking strength of 311 N (70 lb) and spacer blocks may be used to support the dummy in position. The material should support the torso rather than the head. Support the dummy so that there is minimum interference with the full rotational and translational freedom for the upper torso of the dummy and the material does not interfere with the air bag.

S22.4.3 *Position 2 (head on instrument panel).*

S22.4.3.1 Place the passenger seat in the full rearward seating position. Place the seat back at the manufacturer's nominal design seat back angle for a 50th percentile adult male as specified in S8.1.3 of FMVSS No. 208. If adjustable in the vertical direction, place the seat in the mid-height position. If the seat cushion adjusts fore and aft, independent of the entire seat, adjust the seat cushion to the full rearward position. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. If adjustable, set the head restraint in the lowest position.

S22.4.3.2 Place the dummy in the front passenger seat such that:

S22.4.3.2.1 The midsagittal plane is coincident with Plane D.

S22.4.3.2.2 The legs are vertical to the floor pan, the back of the legs are in contact with the seat cushion, and the dummy's thorax instrument cavity rear face is vertical. If it is not possible to position the dummy with the legs in the prescribed position, rotate the legs forward until the dummy is resting on the seat with the feet positioned flat on the floor pan, and the back of the legs are in contact with the front of the seat cushion. Set the transverse distance between the longitudinal centerlines at the front of the dummy's knees at 86 to 91 mm (3.4 to 3.6 in), with the thighs and the legs of the dummy in vertical planes.

S22.4.3.2.3 The upper arms are parallel to the torso and the hands are in contact with the thighs.

S22.4.3.3 Move the seat forward, while maintaining the thorax instrument cavity rear face orientation until any part of the dummy contacts the vehicle's instrument panel.

S22.4.3.4 If dummy contact has not been made with the vehicle's instrument panel at the full forward seating position of the seat, slide the dummy forward until contact is made. Maintain the thorax instrument cavity rear face vertical orientation, the height of the dummy, and the angle of the thigh with respect to the horizontal.

S22.4.3.5 If head/torso contact with the instrument panel has not been made, maintain the angle of the thighs with respect to the horizontal while applying a force towards the front of the vehicle on the spine of the dummy between the shoulder joints until the head or torso comes into contact with the vehicle's instrument panel.

S22.4.3.6 If necessary, material with a maximum breaking strength of 311 N (70 lb) and spacer blocks may be used to support the dummy in position. The material should support the torso rather than the head. Support the dummy so that there is minimum interference with the full rotational and translational freedom for the upper torso of the dummy and the material does not interfere with the air bag.

S22.4.4 Deploy the right front outboard frontal air bag system. If the frontal air bag system contains a multistage inflator, the vehicle shall be able to comply with the injury criteria at any stage or combination of stages or time delay between successive stages that could occur in a rigid barrier crash test at or below 26 km/h (16 mph), under the test procedure specified in S22.5.

S22.5 *Test procedure for determining stages of air bag systems subject to low risk deployment (low speed crashes) test requirement.*

S22.5.1 The test described in S22.5.2 shall be conducted with an unbelted 50th percentile adult male test dummy in the driver seating position according to S8 of FMVSS No. 208 as it applies to that seating position and an unbelted 5th percentile adult female test dummy either in the right front seating position according to S16 as it applies to that seating position or at any

fore-aft seat position on the passenger side.

S22.5.2 Impact the vehicle traveling longitudinally forward at any speed, up to and including 26 km/h (16 mph) into a fixed rigid barrier that is perpendicular ± 5 degrees to the line of travel of the vehicle under the applicable conditions of S8 and S10 of FMVSS No. 208, and S16 of this standard excluding S10.7, S10.8 and S10.9 of FMVSS No. 208 and S16.3.5 of this standard.

S22.5.3 Determine which inflation stage or combination of stages are fired and determine the time delay between successive stages. That stage or combination of stages, with time delay between successive stages, shall be used in deploying the air bag when conducting the low risk deployment tests described in S22.4, S24.4, and S26.

S22.5.4 If the air bag does not deploy in the impact described in S22.5.2, the low risk deployment tests described in S22.4, S24.4, and S26 shall be conducted with all stages using the maximum time delay between stages.

S23 [Reserved]. See § 571.208, S23.

S24 *Test procedure for S23 of FMVSS No. 208.*

S24.1 *General provisions and definitions.*

S24.1.1 Tests specifying the use of a booster seat may be conducted using any such restraint listed in section D of appendix A of FMVSS No. 208. The booster seat may be unused or have been previously used only for automatic suppression. If it has been used, there shall not be any visible damage prior to the test. Booster seats are to be used in the manner appropriate for a 6-year-old child of the same height and weight as the 6-year-old child dummy.

S24.1.2 Unless otherwise specified, each vehicle certified to this option shall comply in tests conducted with the right front outboard seating position at the full rearward seat track position, the middle seat track position, and the full forward seat track position. If the dummy contacts the vehicle interior, move the seat rearward to the next detent that provides clearance. If the seat is a power seat, move the seat rearward while assuring that there is a maximum of 5 mm (0.2 in) distance between the vehicle interior and the point on the dummy that

would first contact the vehicle interior. All tests are conducted with the seat height, if adjustable, in the mid-height position, and with the seat back angle, if adjustable, at the manufacturer's nominal design seat back angle for a 50th percentile adult male as specified in S8.1.3 of FMVSS No. 208.

S24.1.3 Except as otherwise specified, if the booster seat has an anchorage system as specified in S5.9 of FMVSS No. 213 and is tested in a vehicle with a right front outboard vehicle seat that has an anchorage system as specified in FMVSS No. 225, the vehicle shall comply with the belted test conditions with the restraint anchorage system attached to the vehicle seat anchorage system and the vehicle seat belt unattached. It shall also comply with the belted test conditions with the restraint anchorage system unattached to the vehicle seat anchorage system and the vehicle seat belt attached. The vehicle shall comply with the unbelted test conditions with the restraint anchorage system unattached to the vehicle seat anchorage system.

S24.1.4 Do not attach any tethers.

S24.1.5 The definitions provided in S16.3.1 through S16.3.10 apply to the tests specified in S24.

S24.1.6 For leg and thigh angles, use the following references:

S24.1.6.1 *Thigh*—a straight line on the thigh skin between the center of the 5/16–18 UNC–2B threaded access hole in the upper leg clamp (drawing 127–4004, 6 YR H3—upper leg clamp) and the knee screw (part 9000248 in drawing 127–4000–1 & –2, leg assembly).

S24.1.6.2 *Leg*—a straight line on the leg skin between the center of the lower leg screw (part 9001170 in drawing 127–4000–1 & –2, leg assembly) and the knee screw (part 9000248 in drawing 127–4000–1 & –2, leg assembly).

S24.2 *Static tests of automatic suppression feature which shall result in deactivation of the passenger air bag.* Each vehicle that is certified as complying with S23.2 of FMVSS No. 208 shall meet the following test requirements.

S24.2.1 Except as provided in S24.2.2, conduct all tests as specified in S22.2, except that the 49 CFR part 572 subpart N 6-year-old child dummy shall be used.

S24.2.2 *Exceptions.* The tests specified in the following paragraphs of S22.2 need not be conducted: S22.2.1.5, S22.2.2.3, S22.2.2.5, S22.2.2.6, S22.2.2.7, and S22.2.2.8.

S24.2.3 *Sitting back in the seat and leaning on the right front passenger door.*

(a) Position the dummy in the seated position and place the dummy in the right front outboard seat. For bucket seats, position the midsagittal plane of the dummy vertically such that it coincides with the longitudinal center line of the seat cushion. For bench seats, position the midsagittal plane of the dummy vertically and parallel to the vehicle's longitudinal centerline and the same distance from the longitudinal centerline of the vehicle as the center of the steering wheel.

(b) Place the dummy's back against the seat back and rest the dummy's thighs on the seat cushion.

(c) Allow the legs and feet of the dummy to extend off the surface of the seat. If this positioning of the dummy's legs is prevented by contact with the instrument panel, move the seat rearward to the next detent that provides clearance. If the seat is a power seat, move the seat rearward, while assuring that there is a maximum of 5 mm (0.2 in) distance between the vehicle interior and the part of the dummy that was in contact with the vehicle interior.

(d) Rotate the dummy's upper arms toward the seat back until they make contact.

(e) Rotate the dummy's lower arms down until they contact the seat.

(f) Close the vehicle's passenger-side door and then start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system.

(g) Push against the dummy's left shoulder to lean the dummy against the door; close all remaining doors.

(h) Wait 10 seconds, then check whether the air bag is deactivated.

S24.3 Static tests of automatic suppression feature which shall result in activation of the passenger air bag system.

S24.3.1 Each vehicle certified to this option shall comply in tests conducted with the right front outboard seating position at the full rearward seat track

position, the middle seat track position, and, subject to S16.3.3.1.8, the full forward seat track position. All tests are conducted with the seat height, if adjustable, in the mid-height position.

S24.3.2 Place a 49 CFR part 572 subpart O 5th percentile adult female test dummy at the right front outboard seating position of the vehicle, in accordance with procedures specified in S16.3.3 of this standard, except as specified in S24.3.1. Do not fasten the seat belt.

S24.3.3 Start the vehicle engine or place the ignition in the "on" position, whichever will turn on the suppression system, and then close all vehicle doors.

S24.3.4 Wait 10 seconds, then check whether the air bag system is activated.

S24.4 *Low risk deployment tests.*

S24.4.1 Each vehicle that is certified as complying with S23.4 of FMVSS No. 208 shall meet the following test requirements with the 49 CFR part 572 subpart N 6-year-old child dummy in both of the following positions: Position 1 (S24.4.2) or Position 2 (S24.4.3).

S24.4.1.1 Locate and mark a point on the front of the dummy's chest jacket on the midsagittal plane which is 139 mm (5.5 in) \pm 3 mm (\pm 0.1 in) along the surface of the skin from the top of the skin at the neckline. This is referred to as "Point 1."

S24.4.1.2 Locate the vertical plane parallel to the vehicle longitudinal centerline through the geometric center of the opening through which the right front air bag deploys into the occupant compartment. This is referred to as "Plane D."

S24.4.1.3 Locate the horizontal plane through the geometric center of the opening through which the right front air bag deploys into the occupant compartment. This is referred to as "Plane C."

S24.4.2 *Position 1 (chest on instrument panel).*

S24.4.2.1 If a seat is adjustable in the fore and aft and/or vertical directions, move the seat to the rearmost seating position and full down height adjustment. If the seat cushion adjusts fore and aft, independent of the entire seat,

adjust the seat cushion to the full rearward position. If the seat back is adjustable, place the seat back at the manufacturer's nominal design seat back angle for a 50th percentile adult male as specified in S8.1.3. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. Position an adjustable head restraint in the lowest position.

S24.4.2.2 Remove the legs of the dummy at the pelvic interface.

S24.4.2.3 Place the dummy in the front passenger seat such that:

(a) The midsagittal plane is coincident with Plane D.

(b) The upper arms are parallel to the torso and the hands are next to where the thighs would be.

(c) Without changing the seat position and with the dummy's thorax instrument cavity rear face 6 degrees forward of the vertical, move the dummy forward until the dummy head/torso contacts the instrument panel. If the dummy loses contact with the seat cushion because of the forward movement, maintain the height of the dummy while moving the dummy forward. If the head contacts the windshield before head/torso contact with the instrument panel, maintain the thorax instrument cavity angle and move the dummy forward such that the head is following the angle of the windshield until there is head/torso contact with the instrument panel. Once contact is made, raise or lower the dummy vertically until Point 1 lies in Plane C. If the dummy's head contacts the windshield and keeps Point 1 from reaching Plane C, lower the dummy until there is no more than 5 mm (0.2 in) clearance between the head and the windshield. (The dummy shall remain in contact with the instrument panel while being raised or lowered which may change the dummy's fore-aft position.)

S24.4.2.4 If necessary, material with a maximum breaking strength of 311 N (70 lb) and spacer blocks may be used to support the dummy in position. The material should support the torso rather than the head. Support the dummy so that there is minimum interference with the full rotational and translational freedom for the upper

torso of the dummy and the material does not interfere with the air bag.

S24.4.3 *Position 2 (head on instrument panel).*

S24.4.3.1 Place the passenger seat in the full rearward seating position. Place the seat back at the manufacturer's nominal design seat back angle for a 50th percentile adult male as specified in S8.1.3 of FMVSS No. 208. If adjustable in the vertical direction, place the seat in the mid-height position. If the seat cushion adjusts fore and aft, independent of the entire seat, adjust the seat cushion to the full rearward position. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. Position an adjustable head restraint in the lowest position.

S24.4.3.2 Place the dummy in the front passenger seat such that:

(a) The midsagittal plane is coincident with Plane D.

(b) The legs are perpendicular to the floor pan, the back of the legs are in contact with the seat cushion, and the dummy's thorax instrument cavity rear face is 6 degrees forward of vertical. If it is not possible to position the dummy with the legs in the prescribed position, rotate the legs forward until the dummy is resting on the seat with the feet positioned flat on the floor pan and the back of the legs are in contact with the front of the seat cushion. Set the transverse distance between the longitudinal centerlines at the front of the dummy's knees at 112 to 117 mm (4.4. to 4.6 in), with the thighs and the legs of the dummy in vertical planes.

(c) The upper arms are parallel to the torso and the hands are in contact with the thighs. S24.4.3.3 Move the seat forward, while maintaining the thorax instrument cavity rear face orientation until any part of the dummy contacts the vehicle's instrument panel.

S24.4.3.4 If dummy contact has not been made with the vehicle's instrument panel at the full forward seating position of the seat, slide the dummy forward on the seat until contact is made. Maintain the thorax instrument cavity rear face orientation, the height of the dummy, and the angle of the thigh with respect to the horizontal.

S24.4.3.5 If head/torso contact has not been made with the instrument panel, maintain the angle of the thighs with respect to the horizontal while applying a force towards the front of the vehicle on the spine of the dummy between the shoulder joints until the head/torso comes into contact with the vehicle's instrument panel.

S24.4.3.6 If necessary, material with a maximum breaking strength of 311 N (70 lb) and spacer blocks may be used to support the dummy in position. Material should support the torso rather than the head. Support the dummy so that there is minimum interference with the full rotational and translational freedom for the upper torso of the dummy and the material does not interfere with the air bag.

S24.4.4 Deploy the right front outboard frontal air bag system. If the frontal air bag system contains a multistage inflator, the vehicle shall be able to comply with the injury criteria at any stage or combination of stages and at any time delay between successive stages that could occur in a rigid barrier crash at speeds up to 26 km/h (16 mph) under the test procedure specified in S22.5.

S25 [Reserved]. See § 571.208, S25.

S26 *Procedure for low risk deployment tests of driver air bag.*

S26.1 Each vehicle that is certified as complying with S25.3 of FMVSS No. 208 shall meet the requirements of S25.3 and S25.4 with the 49 CFR part 572 subpart O 5th percentile adult female dummy in both of the following positions: Driver position 1 (S26.2) and Driver position 2 (S26.3).

S26.2 *Driver position 1 (chin on module).*

S26.2.1 Adjust the steering controls so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If there is no setting at the geometric center, position it one setting lower than the geometric center. Set the rotation of the steering wheel so that the vehicle wheels are pointed straight ahead.

S26.2.2 Locate the vertical plane parallel to the vehicle longitudinal axis which passes through the geometric center of the opening through which the driver air bag deploys into the oc-

cupant compartment. This is referred to as "Plane E."

S26.2.3 Place the seat in the full rearward seating position. If adjustable in the vertical direction, place the seat in the mid-height position. If the seat cushion adjusts fore and aft, independent of the entire seat, adjust the seat cushion to the full rearward position. If the seat back is adjustable, place the seat back at the manufacturer's nominal design seat back angle for a 50th percentile adult male as specified in S8.1.3 of FMVSS No. 208. If the seat cushion contains an independent seat cushion angle adjustment mechanism, adjust the seat cushion angle to the middle of the range of seat cushion angles. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. Position an adjustable head restraint in the lowest position.

S26.2.4 Place the dummy in the driver's seat such that:

S26.2.4.1 The midsagittal plane is coincident with Plane E.

S26.2.4.2 The legs are perpendicular to the floor pan and the back of the legs are in contact with the seat cushion. The legs may be adjusted if necessary to achieve the final head position.

S26.2.4.3 The dummy's thorax instrument cavity rear face is 6 degrees forward (toward the front of the vehicle) of the steering wheel angle (*i.e.*, if the steering wheel angle is 25 degrees from vertical, the thorax instrument cavity rear face angle is 31 degrees).

S26.2.4.4 The initial transverse distance between the longitudinal centerlines at the front of the dummy's knees is 160 to 170 mm (6.3 to 6.7 in), with the thighs and legs of the dummy in vertical planes.

S26.2.4.5 The upper arms are parallel to the torso and the hands are in contact with the thighs.

S26.2.5 Maintaining the spine angle, slide the dummy forward until the head/torso contacts the steering wheel.

S26.2.6 While maintaining the spine angle, adjust the height of the dummy so that the bottom of the chin is in the same horizontal plane as the highest point of the air bag module cover (dummy height can be adjusted using

the seat height adjustments and/or spacer blocks). If the seat prevents the bottom of the chin from being in the same horizontal plane as the module cover, adjust the dummy height to as close to the prescribed position as possible.

S26.2.7 If necessary, material with a maximum breaking strength of 311 N (70 lb) and spacer blocks may be used to support the dummy in position. The material should support the torso rather than the head. Support the dummy so that there is minimum interference with the full rotational and translational freedom for the upper torso of the dummy and the material does not interfere with the air bag.

S26.3 Driver position 2 (chin on rim).

S26.3.1 Place the seat in the full rearward seating position. If adjustable in the vertical direction, place the seat in the mid-height position. If the seat cushion adjusts fore and aft, independent of the entire seat, adjust the seat cushion to the full rearward position. If the seatback is adjustable, place the seat back at the manufacturer's nominal design seat back angle for a 50th percentile adult male as specified in S8.1.3 of FMVSS No. 208. If the seat cushion contains an independent seat cushion angle adjustment mechanism, adjust the seat cushion angle to the middle of the range of seat cushion angles. Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position. Position an adjustable head restraint in the lowest position.

S26.3.2 Adjust the steering controls so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If there is no setting at the geometric center, position it one setting lower than the geometric center. Set the rotation of the steering wheel so that the vehicle wheels are pointed straight ahead.

S26.3.3 Locate the vertical plane parallel to the vehicle longitudinal axis which passes through the geometric center of the opening through which the driver air bag deploys into the occupant compartment. This is referred to as "Plane E."

S26.3.4 Place the dummy in the driver's seat position such that:

S26.3.4.1 The midsagittal plane is coincident with Plane E.

S26.3.4.2 The legs are perpendicular to the floor pan and the back of the legs are in contact with the seat cushion. The legs may be adjusted if necessary to achieve the final head position.

S26.3.4.3 The dummy's thorax instrument cavity rear face is 6 degrees forward (toward the front of the vehicle) of the steering wheel angle (*i.e.*, if the steering wheel angle is 25 degrees from vertical, the thorax instrument cavity rear face angle is 31 degrees).

S26.3.4.4 The initial transverse distance between the longitudinal centerlines at the front of the dummy's knees is 160 to 170 mm (6.3 to 6.7 in), with the thighs and legs of the dummy in vertical planes.

S26.3.4.5 The upper arms are parallel to the torso and the hands are in contact with the thighs.

S26.3.5 Maintaining the spine angle, slide the dummy forward until the head/torso contacts the steering wheel.

S26.3.6 While maintaining the spine angle, position the dummy so that a point on the chin 40 mm below the center of the mouth (chin point) is in contact with the rim of the uppermost portion of the steering wheel. If the dummy's head contacts the vehicle windshield or upper interior before the prescribed position can be obtained, lower the dummy until there is no more than 5 mm (0.2 in) clearance between the vehicle's windshield or upper interior, as applicable.

S26.3.7 If the steering wheel can be adjusted so that the chin point can be in contact with the rim of the uppermost portion of the steering wheel, adjust the steering wheel to that position and readjust the spine angle to coincide with the steering wheel angle. Position the dummy so that the chin point is in contact with the rim of the uppermost portion of the steering wheel.

S26.3.8 If necessary, material with a maximum breaking strength of 311 N (70 lb) and spacer blocks may be used to support the dummy in position. The material should support the torso rather than the head. Support the dummy

so that there is minimum interference with the full rotational and translational freedom for the upper torso of the dummy and the material does not interfere with the air bag.

S26.4 Deploy the left front outboard frontal air bag system. If the air bag system contains a multistage inflator, the vehicle shall be able to comply with the injury criteria at any stage or combination of stages or time delay between successive stages that could occur in a rigid barrier crash at speeds up to 26 km/h (16 mph) under the test procedure specified in S22.5.

S27 through S29 [Reserved] See § 571.208, S27 through S29.

[69 FR 3840, Jan. 27, 2004]

§ 571.209 Standard No. 209; Seat belt assemblies.

S1. *Purpose and scope.* This standard specifies requirements for seat belt assemblies.

S2. *Application.* This standard applies to seat belt assemblies for use in passenger cars, multipurpose passenger vehicles, trucks, and buses.

S3. *Definitions. Adjustment hardware* means any or all hardware designed for adjusting the size of a seat belt assembly to fit the user, including such hardware that may be integral with a buckle, attachment hardware, or retractor.

Attachment hardware means any or all hardware designed for securing the webbing of a seat belt assembly to a motor vehicle.

Automatic-locking retractor means a retractor incorporating adjustment hardware by means of a positive self-locking mechanism which is capable when locked of withstanding restraint forces.

Buckle means a quick release connector which fastens a person in a seat belt assembly.

Emergency-locking retractor means a retractor incorporating adjustment hardware by means of a locking mechanism that is activated by vehicle acceleration, webbing movement relative to the vehicle, or other automatic action during an emergency and is capable when locked of withstanding restraint forces.

Hardware means any metal or rigid plastic part of a seat belt assembly.

Load-limiter means a seat belt assembly component or feature that controls tension on the seat belt to modulate the forces that are imparted to occupants restrained by the belt assembly during a crash.

Nonlocking retractor means a retractor from which the webbing is extended to essentially its full length by a small external force, which provides no adjustment for assembly length, and which may or may not be capable of sustaining restraint forces at maximum webbing extension.

Pelvic restraint means a seat belt assembly or portion thereof intended to restrain movement of the pelvis.

Retractor means a device for storing part or all of the webbing in a seat belt assembly.

Seat back retainer means the portion of some seat belt assemblies designed to restrict forward movement of a seat back.

Seat belt assembly means any strap, webbing, or similar device designed to secure a person in a motor vehicle in order to mitigate the results of any accident, including all necessary buckles and other fasteners, and all hardware designed for installing such seat belt assembly in a motor vehicle.

Strap means a narrow nonwoven material used in a seat belt assembly in place of webbing.

Type 1 seat belt assembly is a lap belt for pelvic restraint.

Type 2 seat belt assembly is a combination of pelvic and upper torso restraints.

Type 2a shoulder belt is an upper torso restraint for use only in conjunction with a lap belt as a Type 2 seat belt assembly.

Upper torso restraint means a portion of a seat belt assembly intended to restrain movement of the chest and shoulder regions.

Webbing means a narrow fabric woven with continuous filling yarns and finished selvages.

S4. Requirements.

S4.1(a) *Incorporation by reference.* SAE Recommended Practice J211-1 rev. December 2003, "Instrumentation for Impact Test—Part 1—Electronic Instrumentation," is incorporated by reference in S5.2(j) and is hereby made