

Subpart O—Hybrid III 5th Percentile Female Test Dummy, Alpha Version

Source: 65 FR 10968, Mar. 1, 2000, unless otherwise noted.

§ 572.130 Incorporation by reference.

(a) The following materials are hereby incorporated into this Subpart by reference:

(1) A drawings and specification package entitled "Parts List and Drawings, Part 572 Subpart O Hybrid III Fifth Percentile Small Adult Female Crash Test Dummy (HIII-5F, Alpha Version)" (June 2002), incorporated by reference in "572.131, and consisting of:

(i) Drawing No. 880105-100X, Head Assembly, incorporated by reference in §§572.131, 572.132, 572.133, 572.134, 572.135, and 572.137;

(ii) Drawing No. 880105-250, Neck Assembly, incorporated by reference in §§572.131, 572.133, 572.134, 572.135, and 572.137;

(iii) Drawing No. 880105-300, Upper Torso Assembly, incorporated by reference in §§572.131, 572.134, 572.135, and 572.137;

(iv) Drawing No. 880105-450, Lower Torso Assembly, incorporated by reference in §§572.131, 572.134, 572.135, and 572.137;

(v) Drawing No. 880105-560-1, Complete Leg Assembly—left, incorporated by reference in §§572.131, 572.135, 572.136, and 572.137;

(vi) Drawing No. 880105-560-2, Complete Leg Assembly—right incorporated by reference in §§572.131, 572.135, 572.136, and 572.137;

(vii) Drawing No. 880105-728-1, Complete Arm Assembly—left, incorporated by reference in §§572.131, 572.134, and 572.135 as part of the complete dummy assembly;

(viii) Drawing No. 880105-728-2, Complete Arm Assembly—right, incorporated by reference in §§572.131, 572.134, and 572.135 as part of the complete dummy assembly;

(ix) The Hybrid III 5th percentile small adult female crash test dummy parts list, incorporated by reference in §572.131;

(2) A procedures manual entitled "Procedures for Assembly, Disassembly, and Inspection (PADI) Subpart O Hybrid III Fifth Percentile Adult Female Crash Test Dummy (HIII-5F), Alpha Version" (February 2002), incorporated by reference in §572.132.

(3) SAE Recommended Practice J211/1, Rev. Mar 95 "Instrumentation for Impact Tests—Part 1—Electronic Instrumentation", incorporated by reference in §572.137;

(4) SAE Recommended Practice J211/2, Rev. Mar 95 "Instrumentation for Impact Tests—Part 2—Photographic Instrumentation" incorporated by reference in §572.137; and

(5) SAE J1733 of 1994-12 "Sign Convention for Vehicle Crash Testing", incorporated by reference in §572.137.

(b) The Director of the Federal Register approved the materials incorporated by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the materials may be inspected at NHTSA's Technical Reference Library, 400 Seventh Street SW., room 5109, Washington, DC, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/libr_locations.html.

(c) The incorporated materials are available as follows:

(1) The Parts List and Drawings, Part 572 Subpart O Hybrid III Fifth Percentile Small Adult Female Crash Test Dummy, (HIII-5F, Alpha Version) (June 2002), referred to in paragraph (a)(1) of this section and the Procedures for Assembly, Disassembly, and Inspection (PADI) of the Hybrid III 5th Percentile Small Adult Female Crash Test Dummy, Alpha Version, referred to in paragraph (a)(2) of this section are available from Reprographic Technologies, 9107 Gaither Road, Gaithersburg, MD 20877, (301) 419-5070. These documents are also accessible for reading and copying through the DOT Docket Management System.

(2) The SAE materials referred to in paragraphs (a)(3) and (a)(4) of this section are available from the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, Pa. 15096.

[65 FR 10968, Mar. 1, 2000, as amended at 67 FR 46413, July 15, 2002]

§ 572.131 General description.

(a) The Hybrid III fifth percentile adult female crash test dummy is defined by drawings and specifications containing the following materials:

(1) Technical drawings and specifications package P/N 880105-000 (refer to §572.130(a)(1)), the titles of which are listed in Table A;

(2) Parts List and Drawings, Part 572 Subpart O Hybrid III Fifth Percentile Small Adult Female Crash Test Dummy (HIII-5F, Alpha Version) (June 2002) (refer to §572.130(a)(1)(ix)).

Table A

Component assembly	Drawing No.
Head Assembly	880105-100X
Neck Assembly	880105-250
Upper Torso Assembly	880105-300
Lower Torso Assembly	880105-450
Complete Leg Assembly—left	880105-560-1
Complete Leg Assembly—right	880105-560-2
Complete Arm Assembly—left	880105-728-1
Complete Arm Assembly—right	880105-728-2

(b) Adjacent segments are joined in a manner such that, except for contacts existing under static conditions, there is no contact between metallic elements throughout the range of motion or under simulated crash impact conditions.

(c) The structural properties of the dummy are such that the dummy conforms to this Subpart in every respect before use in any test similar to those specified in Standard 208, Occupant Crash Protection.

[65 FR 10968, Mar. 1, 2000, as amended at 67 FR 46414, July 15, 2002]

§ 572.132 Head assembly and test procedure.

(a) The head assembly (refer to §572.130(a)(1)(i)) for this test consists of the complete head (drawing 880105-100X), a six-axis neck transducer (drawing SA572-S11) or its structural replacement (drawing 78051-383X), and 3 accelerometers (drawing SA572-S4).

(b) When the head assembly is dropped from a height of 376.0 ±1.0 mm (14.8 ±0.04 in) in accordance with subsection (c) of this section, the peak resultant acceleration at the location of the accelerometers at the head CG may not be less than 250 G or more than 300 G. The resultant acceleration vs. time history curve shall be unimodal; oscillations occurring after the main pulse must be less than 10 percent of the peak resultant acceleration. The lateral acceleration shall not exceed 15 G (zero to peak).

(c) *Head test procedure.* The test procedure for the head is as follows:

(1) Soak the head assembly in a controlled environment at any temperature between 18.9 and 25.6 °C (66 and 78 °F) and a relative humidity from 10 to 70 percent for at least four hours prior to a test.

(2) Prior to the test, clean the impact surface of the skin and the impact plate surface with isopropyl alcohol, trichloroethane, or an equivalent. The skin of the head must be clean and dry for testing.

(3) Suspend and orient the head assembly as shown in Figure 19 of 49 CFR 572. The lowest point on the forehead must be 376.0 ±1.0 mm (14.8 ±0.04 in) from the impact surface. The 1.57 mm (0.062 in) diameter holes located on either side of the dummy's head shall be used to ensure that the head is level with respect to the impact surface.

(4) Drop the head assembly from the specified height by means that ensure a smooth, instant release onto a rigidly supported flat horizontal steel plate which is 50.8 mm (2.0 in) thick and 610 mm (24.0 in) square. The impact surface shall be clean, dry and have a micro finish of not less than 203.2 ×10⁻⁶ mm (8 micro inches) (RMS) and not more than 2032.0 ×10⁻⁶ mm (80 micro inches) (RMS).

(5) Allow at least 2 hours between successive tests on the same head.

§ 572.133 Neck assembly and test procedure.

(a) The neck assembly (refer to §572.130(a)(1)(ii)) for the purposes of this test consists of the assembly of components shown in drawing 880105–250.

(b) When the head-neck assembly consisting of the head (drawing 880105–100X), neck (drawing 880105–250), bib simulator (drawing 880105–371), upper neck adjusting bracket (drawing 880105–207), lower neck adjusting bracket (drawing 880105–208), six-axis neck transducer (drawing SA572–S11), and either three accelerometers (drawing SA572–S4) or their mass equivalent installed in the head assembly as specified in drawing 880105–100X, is tested according to the test procedure in subsection (c) of this section, it shall have the following characteristics:

(1) *Flexion.* (i) Plane D, referenced in Figure O1, shall rotate in the direction of preimpact flight with respect to the pendulum's longitudinal centerline between 77 degrees and 91 degrees. During the time interval while the rotation is within the specified corridor, the peak moment, measured by the neck transducer (drawing SA5572–311), about the occipital condyles may not be less than 69 N-m (51 ft-lbf) and not more than 83 N-m (61 ft-lbf). The positive moment shall decay for the first time to 10 N-m (7.4 ft-lbf) between 80 ms and 100 ms after time zero.

(ii) The moment shall be calculated by the following formula: $Moment (N\cdot m) = M_y - (0.01778m) \times (F_x)$.

(iii) M_y is the moment about the y-axis, F_x is the shear force measured by the neck transducer (drawing SA572–S11), and 0.01778m is the distance from force to occipital condyle.

(2) *Extension.* (i) Plane D, referenced in Figure O2, shall rotate in the direction of preimpact flight with respect to the pendulum's longitudinal centerline between 99 degrees and 114 degrees. During the time interval while the rotation is within the specified corridor, the peak moment, measured by the neck transducer (drawing SA5572–S11), about the occipital condyles shall be not more than –53 N-m (–39 ft-lbf) and not less than –65 N-m (–48 ft-lbf). The negative moment shall decay for the first time to –10 N-m (–7.4 ft-lbf) between 94 ms and 114 ms after time zero.

(ii) The moment shall be calculated by the following formula: $Moment (N\cdot m) = M_y - (0.01778m) \times (F_x)$.

(iii) M_y is the moment about the y-axis, F_x is the shear force measured by the neck transducer (drawing SA572–S11), and 0.01778 m is the distance from force to occipital condyle.

(3) Time-zero is defined as the time of initial contact between the pendulum striker plate and the honeycomb material. All data channels shall be at the zero level at this time.

(c) *Test Procedure.* The test procedure for the neck assembly is as follows:

(1) Soak the neck assembly in a controlled environment at any temperature between 20.6 and 22.2 °C (69 and 72 °F) and a relative humidity between 10 and 70 percent for at least four hours prior to a test.

(2) Torque the jam nut (drawing 9000018) on the neck cable (drawing 880105–206) to 1.4 ±0.2 N-m (12.0 ±2.0 in-lb).

(3) Mount the head-neck assembly, defined in subsection (b) of this section, on the pendulum described in Figure 22 of 49 CFR 572 so that the midsagittal plane of the head is vertical and coincides with the plane of motion of the pendulum as shown in Figure O1 for flexion tests and Figure O2 for extension tests.

(4)(i) Release the pendulum and allow it to fall freely from a height to achieve an impact velocity of 7.01 ±0.12 m/s (23.0 ±0.4 ft/s) for flexion tests and 6.07 ±0.12 m/s (19.9 ±0.40 ft/s) for extension tests, measured by an accelerometer mounted on the pendulum as shown in Figure 22 of 49 CFR 572 at the instant of contact with the honeycomb.

(ii) Stop the pendulum from the initial velocity with an acceleration vs. time pulse which meets the velocity change as specified below. Integrate the pendulum acceleration data channel to obtain the velocity vs. time curve:

Table B—Pendulum Pulse

Time ms	Flexion		Extension	
	m/s	ft/s	m/s	ft/s
10	2.1–2.5	6.9–8.2	1.5–1.9	4.9–6.2

20	4.0–5.0	13.1–16.4	3.1–3.9	10.2–12.8
30	5.8–7.0	19.5–23.0	4.6–5.6	15.1–18.4

[65 FR 10968, Mar. 1, 2000, as amended at 67 FR 46414, July 15, 2002]

§ 572.134 Thorax assembly and test procedure.

(a) Thorax (Upper Torso) Assembly (refer to §572.130(a)(1)(iii)). The thorax consists of the part of the torso assembly shown in drawing 880105–300.

(b) When the anterior surface of the thorax of a completely assembled dummy (drawing 880105–000) is impacted by a test probe conforming to section 572.137(a) at 6.71 ± 0.12 m/s (22.0 ± 0.4 ft/s) according to the test procedure in subsection (c) of this section:

(1) Maximum sternum displacement (compression) relative to the spine, measured with chest deflection transducer (drawing SA572–S5), must be not less than 50.0 mm (1.97 in) and not more than 58.0 mm (2.30 in). Within this specified compression corridor, the peak force, measured by the impact probe as defined in section 572.137 and calculated in accordance with paragraph (b)(3) of this section, shall not be less than 3900 N (876 lbf) and not more than 4400 N (989 lbf). The peak force after 18.0 mm (0.71 in) of sternum displacement but before reaching the minimum required 50.0 mm (1.97 in) sternum displacement limit shall not exceed 4600 N.

(2) The internal hysteresis of the ribcage in each impact as determined by the plot of force vs. deflection in paragraph (1) of this section shall be not less than 69 percent but not more than 85 percent. The hysteresis shall be calculated by determining the ratio of the area between the loading and unloading portions of the force deflection curve to the area under the loading portion of the curve.

(3) The force shall be calculated by the product of the impactor mass and its deceleration.

(c) *Test procedure.* The test procedure for the thorax assembly is as follows:

(1) The dummy is clothed in a form fitting cotton stretch above-the-elbow sleeved shirt and above-the-knee pants. The weight of the shirt and pants shall not exceed 0.14 kg (0.30 lb) each.

(2) Soak the dummy in a controlled environment at any temperature between 20.6 and 22.2 °C (69 and 72 °F) and a relative humidity between 10 and 70 percent for at least four hours prior to a test.

(3) Seat and orient the dummy on a seating surface without back support as shown in Figure O3, with the limbs extended horizontally and forward, parallel to the midsagittal plane, the midsagittal plane vertical within ± 1 degree and the ribs level in the anterior-posterior and lateral directions within ± 0.5 degrees.

(4) Establish the impact point at the chest midsagittal plane so that the impact point of the longitudinal centerline of the probe coincides with the midsagittal plane of the dummy within ± 2.5 mm (0.1 in) and is 12.7 ± 1.1 mm (0.5 ± 0.04 in) below the horizontal-peripheral centerline of the No. 3 rib and is within 0.5 degrees of a horizontal line in the dummy's midsagittal plane.

(5) Impact the thorax with the test probe so that at the moment of contact the probe's longitudinal center line falls within 2 degrees of a horizontal line in the dummy's midsagittal plane.

(6) Guide the test probe during impact so that there is no significant lateral, vertical or rotational movement.

(7) No suspension hardware, suspension cables, or any other attachments to the probe, including the velocity vane, shall make contact with the dummy during the test.

[65 FR 10968, Mar. 1, 2000, as amended at 67 FR 46415, July 15, 2002]

§ 572.135 Upper and lower torso assemblies and torso flexion test procedure.

(a) *Upper/lower torso assembly.* The test objective is to determine the stiffness effects of the lumbar spine (drawing 880105–1096), and abdominal insert (drawing 880105–434), on resistance to articulation between the upper torso assembly (drawing 880105–300) and the lower torso assembly (drawing 880105–450) (refer to §572.130(a)(1)(iv)).

(b)(1) When the upper torso assembly of a seated dummy is subjected to a force continuously applied at the head to neck pivot pin level through a rigidly attached adaptor bracket as shown in Figure O4 according to the test procedure set out in subsection (c) of this section, the lumbar spine-abdomen assembly shall flex by an amount that permits the upper torso assembly to translate in angular motion relative to

the vertical transverse plane 45 ± 0.5 degrees at which time the force applied must be not less than 320 N (71.5 lbf) and not more than 390 N (87.4 lbf), and

(2) Upon removal of the force, the torso assembly must return to within 8 degrees of its initial position.

(c) *Test procedure.* The test procedure for the upper/lower torso assembly is as follows:

(1) Soak the dummy in a controlled environment at any temperature between 18.9 and 25.6 °C (66 and 78 °F) and a relative humidity between 10 and 70 percent for at least four hours prior to a test.

(2) Assemble the complete dummy (with or without the legs below the femurs) and attach to the fixture in a seated posture as shown in Figure O4.

(3) Secure the pelvis to the fixture at the pelvis instrument cavity rear face by threading four 1/4 inch cap screws into the available threaded attachment holes. Tighten the mountings so that the test material is rigidly affixed to the test fixture and the pelvic-lumbar joining surface is horizontal.

(4) Attach the loading adapter bracket to the spine of the dummy as shown in Figure O4.

(5) Inspect and adjust, if necessary, the seating of the abdominal insert within the pelvis cavity and with respect to the torso flesh, assuring that the torso flesh provides uniform fit and overlap with respect to the outside surface of the pelvis flesh.

(6) Flex the dummy's upper torso three times between the vertical and until the torso reference plane, as shown in Figure O4, reaches 30 degrees from the vertical transverse plane. Bring the torso to vertical orientation and wait for 30 minutes before conducting the test. During the 30 minute waiting period, the dummy's upper torso shall be externally supported at or near its vertical orientation to prevent it from drooping.

(7) Remove all external support and wait two minutes. Measure the initial orientation angle of the torso reference plane of the seated, unsupported dummy as shown in Figure O4. The initial orientation angle may not exceed 20 degrees.

(8) Attach the pull cable and the load cell as shown in Figure O4.

(9) Apply a tension force in the midsagittal plane to the pull cable as shown in Figure O4 at any upper torso deflection rate between 0.5 and 1.5 degrees per second, until the angle reference plane is at 45 ± 0.5 degrees of flexion relative to the vertical transverse plane.

(9) Continue to apply a force sufficient to maintain 45 ± 0.5 degrees of flexion for 10 seconds, and record the highest applied force during the 10-second period.

(10) Release all force at the attachment bracket as rapidly as possible, and measure the return angle with respect to the initial angle reference plane as defined in paragraph (6) 3 minutes after the release.

§ 572.136 Knees and knee impact test procedure.

(a) *Knee assembly.* The knee assembly (refer to §§572.130(a)(1)(v) and (vi)) for the purpose of this test is the part of the leg assembly shown in drawing 880105-560.

(b)(1) When the knee assembly, consisting of sliding knee assembly (drawing 880105-528R or -528L), lower leg structural replacement (drawing 880105-603), lower leg flesh (drawing 880105-601), ankle assembly (drawing 880105-660), foot assembly (drawing 880105-651 or 650), and femur load transducer (drawing SA572-S14) or its structural replacement (drawing 78051-319) is tested according to the test procedure in subsection (c), the peak resistance force as measured with the test probe-mounted accelerometer must be not less than 3450 N (776 lbf) and not more than 4060 N (913 lbf).

(2) The force shall be calculated by the product of the impactor mass and its deceleration.

(c) *Test procedure.* The test procedure for the knee assembly is as follows:

(1) Soak the knee assembly in a controlled environment at any temperature between 18.9 and 25.6 °C (66 and 78 °F) and a relative humidity from 10 to 70 percent for at least four hours prior to a test.

(2) Mount the test material and secure it to a rigid test fixture as shown in Figure O5. No part of the foot or tibia may contact any exterior surface.

(3) Align the test probe so that throughout its stroke and at contact with the knee it is within 2 degrees of horizontal and collinear with the longitudinal centerline of the femur.

(4) Guide the pendulum so that there is no significant lateral vertical or rotational movement at the time of initial contact between the impactor and the knee.

(5) The test probe velocity at the time of contact shall be 2.1 ± 0.03 m/s (6.9 ± 0.1 ft/s).

(6) No suspension hardware, suspension cables, or any other attachments to the probe, including the velocity vane, shall make contact with the dummy during the test.

[65 FR 10968, Mar. 1, 2000, as amended at 67 FR 46415, July 15, 2002]

§ 572.137 Test conditions and instrumentation.

(a) The test probe for thoracic impacts, except for attachments, shall be of rigid metallic construction and concentric about its longitudinal axis. Any attachments to the impactor, such as suspension hardware, impact vanes, etc., must meet the requirements of §572.134(c)(7). The impactor shall have a mass of 13.97 ± 0.23 kg (30.8 ± 0.5 lbs) and a minimum mass moment of inertia of $3646 \text{ kg}\cdot\text{cm}^2$ ($3.22 \text{ lbs}\cdot\text{in}\cdot\text{sec}^2$) in yaw and pitch about the CG of the probe. One-third (1/3) of the weight of suspension cables and any attachments to the impact probe must be included in the calculation of mass, and such components may not exceed five percent of the total weight of the test probe. The impacting end of the probe, perpendicular to and concentric with the longitudinal axis of the probe, has a flat, continuous, and non-deformable 152.4 ± 0.25 mm (6.00 ± 0.01 in) diameter face with a minimum/maximum edge radius of $7.6/12.7$ mm ($0.3/0.5$ in). The impactor shall have a $152.4\text{--}152.6$ mm ($6.0\text{--}6.1$ in) diameter cylindrical surface extending for a minimum of 25 mm (1.0 in) to the rear from the impact face. The probe's end opposite to the impact face has provisions for mounting of an accelerometer with its sensitive axis collinear with the longitudinal axis of the probe. The impact probe has a free air resonant frequency of not less than 1000 Hz, which may be determined using the procedure listed in Docket No. NHTSA-6714-14.

(b) The test probe for knee impacts, except for attachments, shall be of rigid metallic construction and concentric about its longitudinal axis. Any attachments to the impactor, such as suspension hardware, impact vanes, etc., must meet the requirements of §572.136(c)(6). The impactor shall have a mass of 2.99 ± 0.23 kg (6.6 ± 0.5 lbs) and a minimum mass moment of inertia of $209 \text{ kg}\cdot\text{cm}^2$ ($0.177 \text{ lb}\cdot\text{in}\cdot\text{sec}^2$) in yaw and pitch about the CG of the probe. One-third (1/3) of the weight of suspension cables and any attachments to the impact probe may be included in the calculation of mass, and such components may not exceed five percent of the total weight of the test probe. The impacting end of the probe, perpendicular to and concentric with the longitudinal axis of the probe, has a flat, continuous, and non-deformable 76.2 ± 0.2 mm (3.00 ± 0.01 in) diameter face with a minimum/maximum edge radius of $7.6/12.7$ mm ($0.3/0.5$ in). The impactor shall have a $76.2\text{--}76.4$ mm ($3.0\text{--}3.1$ in) diameter cylindrical surface extending for a minimum of 12.5 mm (0.5 in) to the rear from the impact face. The probe's end opposite to the impact face has provisions for mounting an accelerometer with its sensitive axis collinear with the longitudinal axis of the probe. The impact probe has a free air resonant frequency of not less than 1000 Hz, which may be determined using the procedure listed in Docket No. NHTSA-6714-14.

(c) Head accelerometers shall have dimensions, response characteristics, and sensitive mass locations specified in drawing SA572-S4 and be mounted in the head as shown in drawing 880105-000 sheet 3 of 6.

(d) The upper neck force/moment transducer shall have the dimensions, response characteristics, and sensitive axis locations specified in drawing SA572-S11 and be mounted in the head neck assembly as shown in drawing 880105-000, sheet 3 of 6.

(e) The thorax accelerometers shall have the dimensions, response characteristics, and sensitive mass locations specified in drawing SA572-S4 and be mounted in the torso assembly in triaxial configuration within the spine box instrumentation cavity and as optional instrumentation in uniaxial for-and-aft oriented configuration arranged as corresponding pairs in three locations on the sternum on and at the spine box of the upper torso assembly as shown in drawing 880105-000 sheet 3 of 6.

(f) The optional lumbar spine force-moment transducer shall have the dimensions, response characteristics, and sensitive axis locations specified in drawing SA572-S15 and be mounted in the lower torso assembly as shown in drawing 880105-450.

(g) The optional iliac spine force transducers shall have the dimensions and response characteristics specified in drawing SA572-S16 and be mounted in the torso assembly as shown in drawing 880105-450.

(h) The pelvis accelerometers shall have the dimensions, response characteristics, and sensitive mass locations specified in drawing SA572-S4 and be mounted in the torso assembly in triaxial configuration in the pelvis bone as shown in drawing 880105-000 sheet 3.

(i) The single axis femur force transducer (SA572-S14) or the optional multiple axis femur force/moment transducer (SA572-S29) shall have the dimensions, response characteristics, and sensitive axis locations specified in the appropriate drawing and be mounted in the femur assembly as shown in drawing 880105-500 sheet 3 of 6.

(j) The chest deflection transducer shall have the dimensions and response characteristics specified in drawing SA572-S51 and be mounted to the upper torso assembly as shown in drawings 880105-300 and 880105-000 sheet 3 of 6.

(k) The optional lower neck force/moment transducer shall have the dimensions, response characteristics, and sensitive axis locations specified in drawing SA572-S27 and be mounted to the upper torso assembly as shown in drawing 880105-000 sheet 3 of 6.

(l) The optional thoracic spine force/moment transducer shall have the dimensions, response characteristics, and sensitive axis locations specified in drawing SA572-S28 and be mounted in the upper torso assembly as shown in drawing 880105-000 sheet 3 of 6.

(m) The outputs of acceleration and force-sensing devices installed in the dummy and in the test apparatus specified by this part shall be recorded in individual data channels that conform to SAE Recommended Practice J211/10, Rev. Mar95 "Instrumentation for Impact Tests;—Part 1—Electronic Instrumentation," and SAE Recommended Practice J211/2, Rev Mar95 "Instrumentation for Impact Tests—Part 2—Photographic Instrumentation", (refer to §§572.130(a)(3) and (4) respectively) except as noted, with channel classes as follows:

(1) Head acceleration—Class 1000

(2) Neck:

(i) Forces—Class 1000

(ii) Moments—Class 600

(iii) Pendulum acceleration—Class 180

(iv) Rotation potentiometer—Class 60 (optional)

(3) Thorax:

(i) Rib acceleration—Class 1000

(ii) Spine and pendulum accelerations—Class 180

(iii) Sternum deflection—Class 600

(iv) Forces—Class 1000

(v) Moments—Class 600

(4) Lumbar:

(i) Forces—Class 1000

(ii) Moments—Class 600

(iii) Torso flexion pulling force—Class 60 if data channel is used

(5) Pelvis:

(i) Accelerations—Class 1000

(ii) Iliac wing forces—Class 180

(6) Femur forces and knee pendulum—Class 600

(n) Coordinate signs for instrumentation polarity shall conform to the Sign Convention For Vehicle Crash Testing, Surface Vehicle Information Report, SAE J1733, 1994–12 (refer to section 572.130(a)(4)).

(o) The mountings for sensing devices shall have no resonance frequency less than 3 times the frequency range of the applicable channel class.

(p) Limb joints must be set at one G, barely restraining the weight of the limb when it is extended horizontally. The force needed to move a limb segment shall not exceed 2G throughout the range of limb motion.

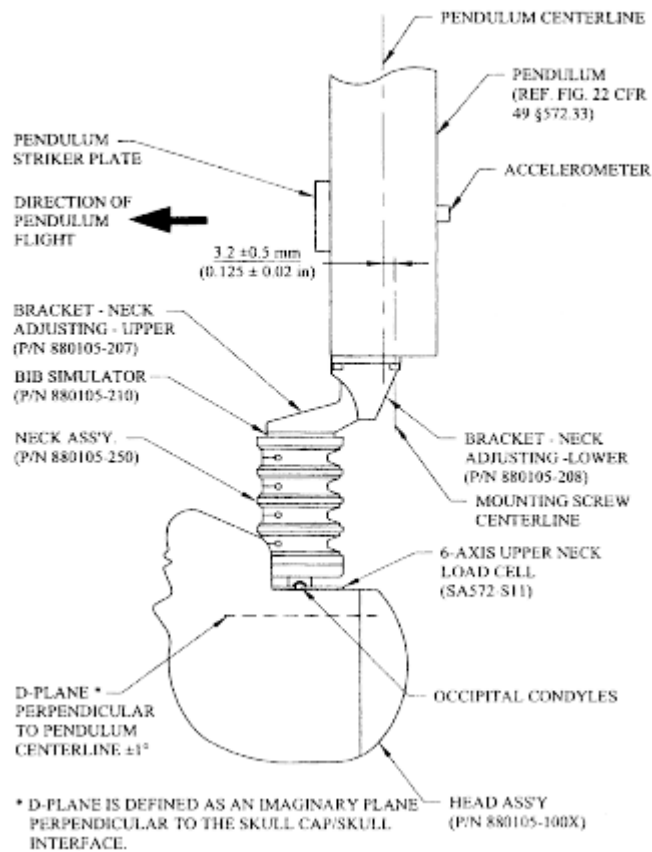
(q) Performance tests of the same component, segment, assembly, or fully assembled dummy shall be separated in time by not less than 30 minutes unless otherwise noted.

(r) Surfaces of dummy components may not be painted except as specified in this subpart or in drawings subtended by this subpart.

[65 FR 10968, Mar. 1, 2000, as amended at 67 FR 46415, July 15, 2002; 74 FR 29894, June 23, 2009]

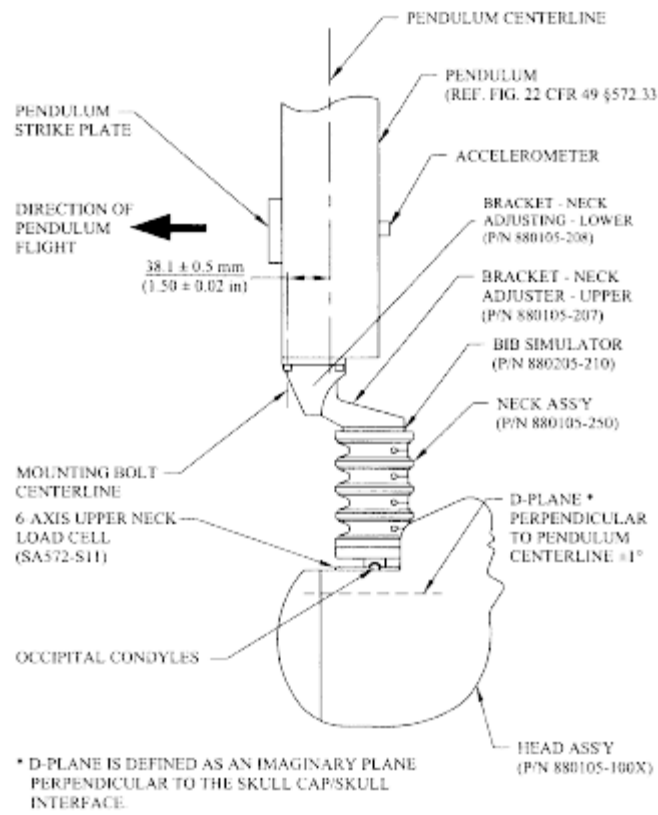
Figures to Subpart O of Part 572

FIGURE O1
NECK FLEXION TEST SETUP SPECIFICATIONS



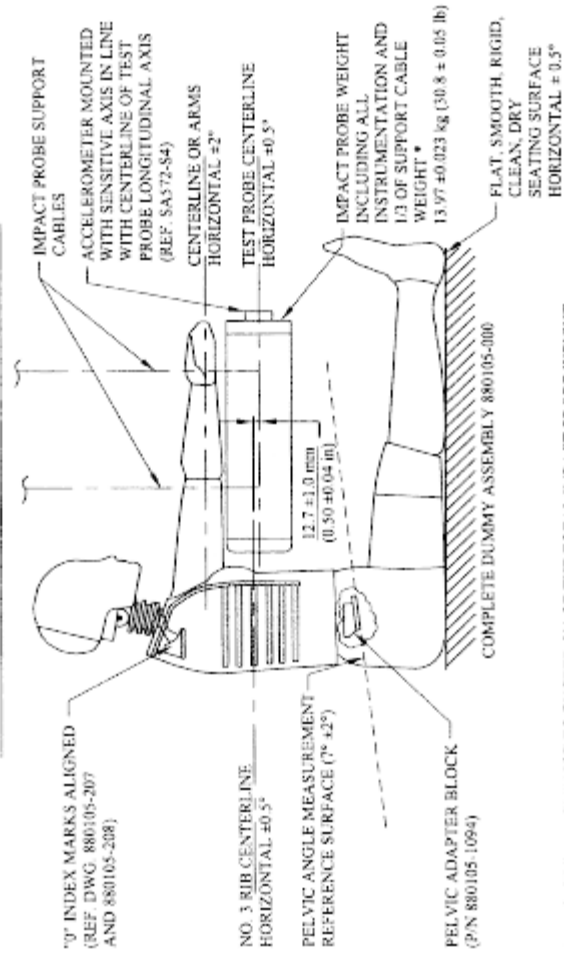
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FIGURE O2
NECK EXTENSION TEST SETUP SPECIFICATIONS



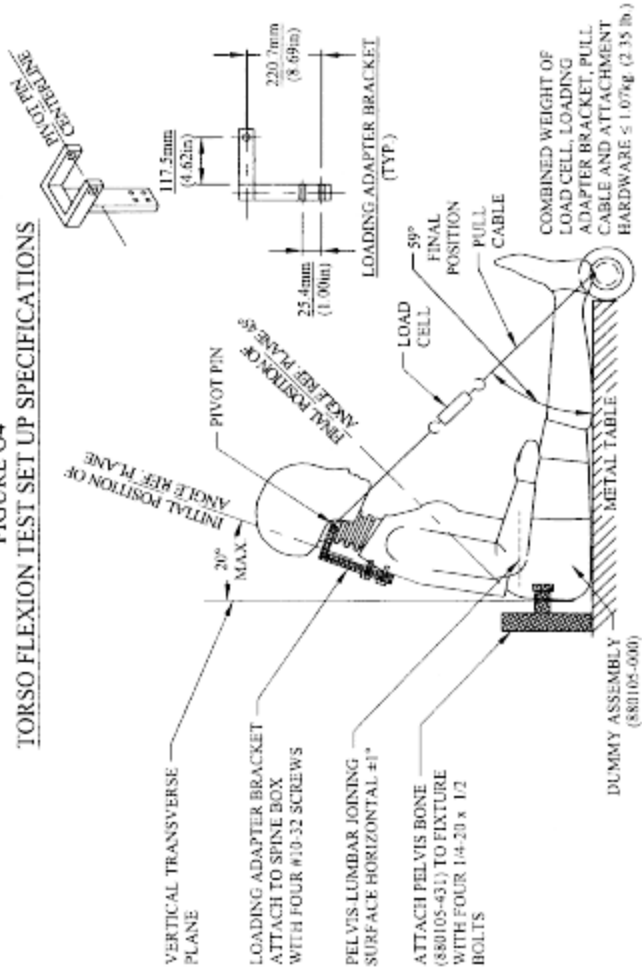
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FIGURE 03
THORAX IMPACT TEST SETUP SPECIFICATIONS



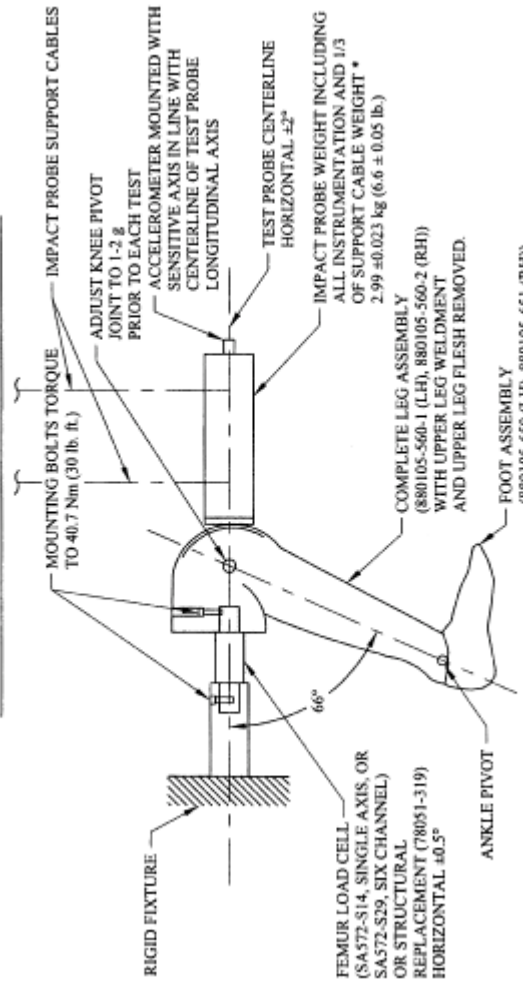
* 1/3 CABLE WEIGHT NOT TO EXCEED 5% OF THE TOTAL IMPACT PROBE WEIGHT

FIGURE O4
TORSO FLEXION TEST SET UP SPECIFICATIONS



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FIGURE O5
KNEE IMPACT TEST SETUP SPECIFICATIONS



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[65 FR 10968, Mar. 1, 2000, as amended at 67 FR 46415, July 15, 2002]