

**§ 572.34**

**TABLE A—FLEXION PENDULUM DECELERATION VS. TIME PULSE**

Time (ms)	Flexion de- celeration level (g)
10 .....	22.50–27.50
20 .....	17.60–22.60
30 .....	12.50–18.50
Any other time above 30 ms .....	29 maximum.

**TABLE B—EXTENSION PENDULUM DECELERATION VS. TIME PULSE**

Time (ms)	Extension de- celeration level (g)
10 .....	17.20–21.20
20 .....	14.00–19.00
30 .....	11.00–16.00
Any other time above 30 ms .....	22 maximum.

(5) Allow the neck to flex without impact of the head or neck with any object during the test.

[51 FR 26701, July 25, 1986, as amended at 53 FR 8765, Mar. 17, 1988; 62 FR 27514, May 20, 1997]

**§ 572.34 Thorax.**

(a) The thorax consists of the upper torso assembly in drawing 78051-89, re-

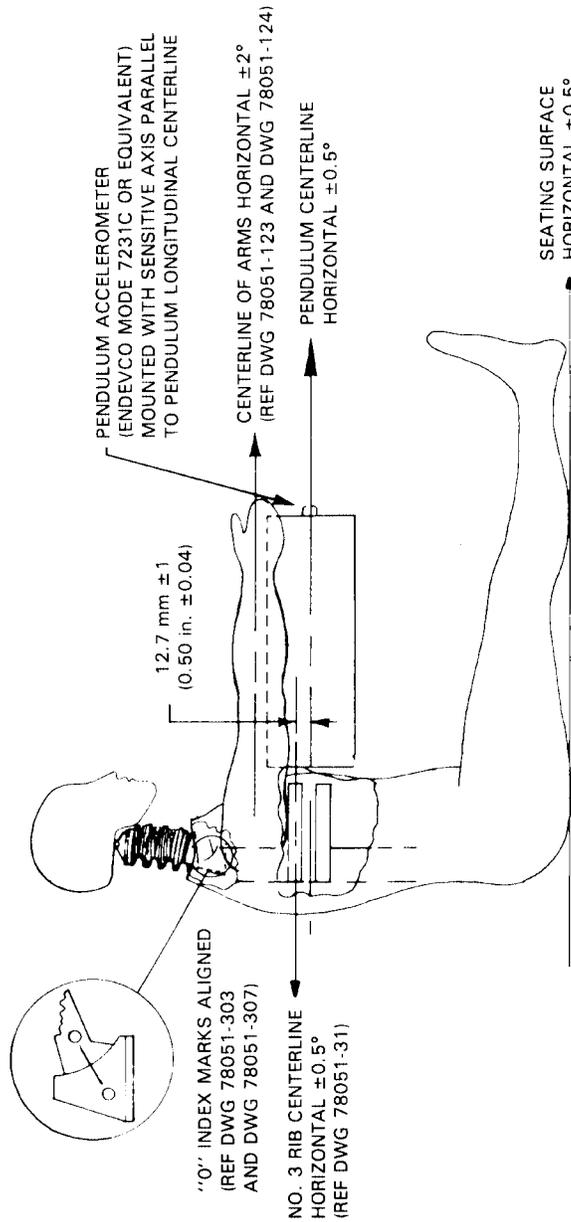
vision K and shall conform to each of the drawings subtended therein.

(b) When impacted by a test probe conforming to §572.36(a) at 22 fps +/- 0.40 fps in accordance with paragraph (c) of this section, the thorax of a complete dummy assembly (78051-218, revision U, without shoes, shall resist with a force of 1242.5 pounds +/- 82.5 pounds measured by the test probe and shall have a sternum displacement measured relative to spine of 2.68 inches +/- 0.18 inches. The internal hysteresis in each impact shall be more than 69% but less than 85%. The force measured is the product of pendulum mass and deceleration.

(c) *Test procedure.* (1) Soak the test dummy in an environment with a relative humidity from 10% to 70% until the temperature of the ribs of the test dummy have stabilized at a temperature between 69 degrees F and 72 degrees F.

(2) Seat the dummy without back and arm supports on a surface as shown in Figure 23, and set the angle of the pelvic bone at 13 degrees plus or minus 2 degrees, using the procedure described in S11.4.3.2 of Standard No. 208 (§571.208 of this chapter).

**FIGURE 23**  
**TEST SET-UP SPECIFICATIONS**



NOTE: A) NO EXTERNAL SUPPORT IS REQUIRED ON THE DUMMY TO MEET SETUP SPECIFICATIONS  
 B) THE MIDSAGITTAL PLANE OF THE DUMMY IS VERTICAL ( $\pm 1^\circ$ ) AND WITHIN  $2^\circ$  OF THE CENTERLINE OF THE PENDULUM  
 C) THE MIDSAGITTAL PLANE OF THE DUMMY IS CENTERED ON THE CENTERLINE OF THE PENDULUM WITHIN 3 mm (0.12 in.)

(3) Place the longitudinal centerline of the test probe so that it is  $.5 \pm .04$  in. below the horizontal centerline of the No. 3 Rib (reference drawing number

79051-64, revision A-M) as shown in Figure 23.

## § 572.35

(4) Align the test probe specified in § 572.36(a) so that at impact its longitudinal centerline coincides within .5 degree of a horizontal line in the dummy's midsagittal plane.

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

(6) Guide the probe during impact so that it moves with no significant lateral, vertical, or rotational movement.

(7) Measure the horizontal deflection of the sternum relative to the thoracic spine along the line established by the longitudinal centerline of the probe at the moment of impact, using a potentiometer (ref. drawing 78051-317, revision A) mounted inside the sternum as shown in drawing 78051-89, revision I.

(8) Measure hysteresis 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.

[51 FR 26701, July 25, 1986, as amended at 53 FR 8765, Mar. 17, 1988; 62 FR 27518, May 20, 1997; 63 FR 53851, Oct. 7, 1998]

## § 572.35 Limbs.

(a) The limbs consist of the following assemblies: leg assemblies 86-5001-001, revision A and -002, revision A, and arm assemblies 78051-123, revision D and -124, revision D, and shall conform to the drawings subtended therein.

(b) *Femur impact response.* (1) When each knee of the leg assemblies is impacted in accordance with paragraph (b)(2) of this section, at 6.9 ft/sec  $\pm$  0.10 ft/sec by the pendulum defined in § 572.36(b), the peak knee impact force, which is a product of pendulum mass and acceleration, shall have a minimum value of not less than 1060 pounds and a maximum value of not more than 1300 pounds.

(2) *Test procedure.* (i) The test material consists of leg assemblies (86-5001-001, revision A) left and (-002, revision A) right with upper leg assemblies (78051-46) left and (78051-47) right removed. The load cell simulator (78051-319, revision A) is used to secure the knee cap assemblies (79051-16, revision B) as shown in Figure 24.

## 49 CFR Ch. V (10-1-01 Edition)

(ii) Soak the test material in a test environment at any temperature between 66 degrees F to 78 degrees F and at a relative humidity from 10% to 70% for a period of at least four hours prior to its application in a test.

(iii) Mount the test material with the leg assembly secured through the load cell simulator to a rigid surface as shown in Figure 24. No contact is permitted between the foot and any other exterior surfaces.

(iv) Place the longitudinal centerline of the test probe so that at contact with the knee it is collinear within 2 degrees with the longitudinal centerline of the femur load cell simulator.

(v) Guide the pendulum so that there is no significant lateral, vertical or rotational movement at time zero.

(vi) Impact the knee with the test probe so that the longitudinal centerline of the test probe at the instant of impact falls within .5 degrees of a horizontal line parallel to the femur load cell simulator at time zero.

(vii) Time zero is defined as the time of contact between the test probe and the knee.

(c) *Hip joint-femur flexion.* (1) When each femur is rotated in the flexion direction in accordance with paragraph (c)(2) of this section, the femur torque at 30 deg. rotation from its initial horizontal orientation will not be more than 70 ft-lbf, and at 150 ft-lbf of torque will not be less than 40 deg. or more than 50 deg.

(2) *Test procedure.* (i) The test material consists of the assembled dummy, part No. 78051-218 (revision S) except that (1) leg assemblies (86-5001-001 and 002) are separated from the dummy by removing the 3/8-16 Socket Head Cap Screw (SHCS) (78051-99) but retaining the structural assembly of the upper legs (78051-43 and -44), (2) the abdominal insert (78051-52) is removed and (3) the instrument cover plate (78051-13) in the pelvic bone is replaced by a rigid pelvic bone stabilizer insert (Figure 25a) and firmly secured.

(ii) Seat the dummy on a rigid seat fixture (Figure 25) and firmly secure it to the seat back by bolting the stabilizer insert and the rigid support device (Figure 25b) to the seat back of the test fixture (Figures 26 and 27) while