

(a) Test procedure. (1) Soak the head and neck assembly in a test environment at any temperature between 20.6 and 22.2 degrees C. (69 to 72 degrees F.) and at any relative humidity between 10 percent and 70 percent for a period of at least four (4) hours prior to its application in a test.

(2) Torque the jamnut (78051-64) on the neck cable (78051-301, rev. E) to  $1.35 \pm 0.27$  Nm ( $1.0 \pm 0.2$  ft-lb) before each test.

(3) Using neck brackets 78051-303 and -307, mount the head/neck assembly to the part 572 pendulum test fixture (see §572.33, Figure 22,) so that the midsagittal plane of the head is vertical and perpendicular to the plane of motion of the pendulum's longitudinal centerline (see §572.33, Figure 20, except that the direction of the head/neck assembly is rotated around the superior-inferior axis by an angle of 90 degrees). Install suitable transducers or other devices necessary for measuring the "D" plane (horizontal surface at the base of the skull) rotation with respect to the pendulum's longitudinal centerline. The rotation can be measured by placing a transducer at the occipital condyles and another at the intersection of the centerline of the neck and the line extending from the base of the neck as shown in figure 52.

(4) Release the pendulum and allow it to fall freely from a height to achieve an impact velocity of 6.89 to 7.13 m/s (22.6 to 23.4 ft/sec) measured at the center of the pendulum accelerometer.

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

(6) Time zero is defined as the time of initial contact between the striker plate and the pendulum deceleration medium.

(7) Allow a period of at least thirty (30) minutes between successive tests on the same neck assembly.

(b) Performance criteria. (1) The pendulum deceleration pulse is to be characterized in terms of decrease in velocity as obtained by integrating the pendulum acceleration output.

Time (ms)	Pendulum Delta-V (m/s)
10 .....	1.96 to 2.55.
20 .....	4.12 to 5.10.
30 .....	5.73 to 7.01.
40 to 70 .....	6.27 to 7.64.

(2) The maximum rotation of the midsagittal plane of the head shall be 66 to 82 degrees with respect to the pendulum's longitudinal centerline. The decaying head rotation vs. time curve shall cross the zero angle between 58 to 67 ms after reaching its peak value.

(3) The moment about the x-axis which coincides with the midsagittal plane of the head at the level of the occipital condyles shall have a maximum value between 73 and 88 Nm. The decaying moment vs. time curve shall first cross zero moment between 49 and 64 ms after reaching its peak value. The following formula is to be used to calculate the moment about the occipital condyles when using the six-axis neck transducer:

$$M = M_x + 0.01778 F_y$$

Where  $M_x$  and  $F_y$  are the moment and force measured by the transducer and expressed in terms of Nm and N, respectively.

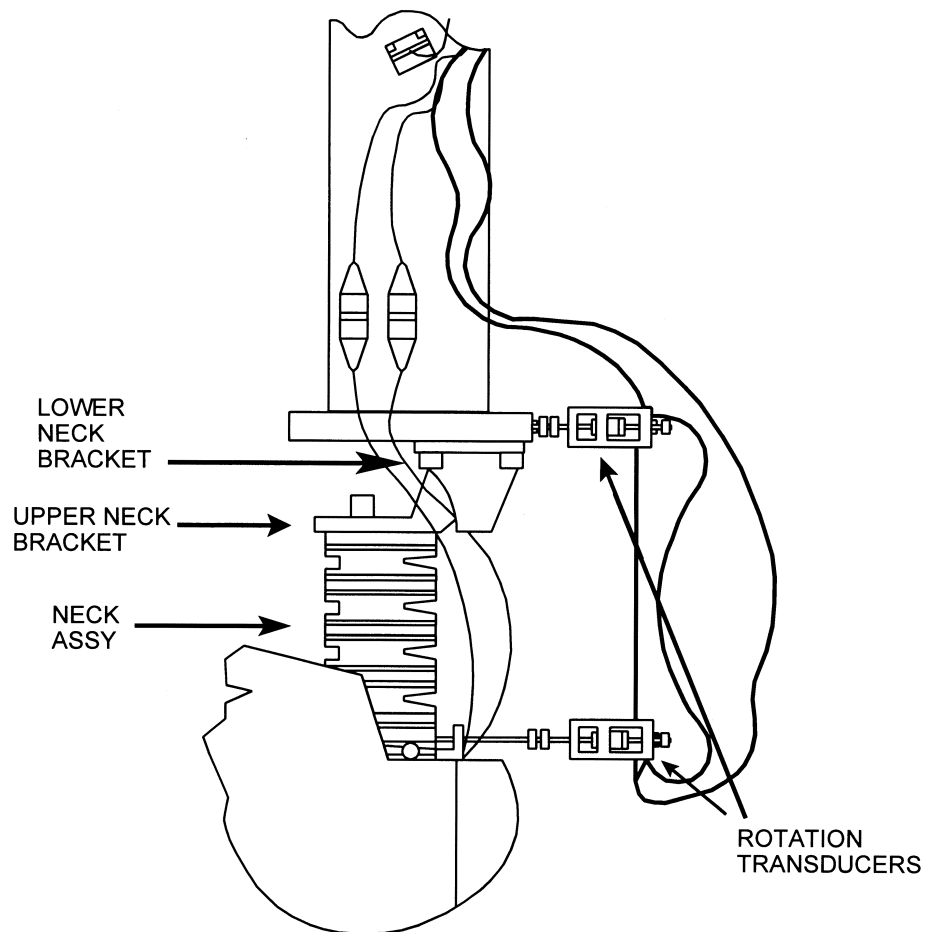
(4) The maximum rotation of the head with respect to the pendulum's longitudinal centerline shall occur between 2 and 16 ms after peak moment.

[63 FR 41470, Aug. 4, 1998, as amended at 66 FR 51882, Oct. 11, 2001]

#### §572.114 Thorax.

The specifications and test procedure for the thorax for the SID/HIII dummy are identical to those applicable to the SID dummy as set forth in §572.42 except that the reference to the SID device found in §572.42(a), (SA-SID-M001A revision A, dated May 18, 1994) does not apply and the reference to the SID/HIII (SA-SIDH3-M001, dated April 19, 1997) is applied in its place.

Figure 52  
NECK PENDULUM TEST



**§ 572.115 Lumbar spine and pelvis.**

The specifications and test procedure for the lumbar spine and pelvis are identical to those for the SID dummy as set forth in § 572.42 except that the reference to the SID device found in § 572.42(a), (SA-SID-M001A revision A, dated May 18, 1994) does not apply and the reference to the SID/HIII (SA-

SIDH3-M001, dated April 19, 1997) is applied in its place.

**§ 572.116 Instrumentation and test conditions.**

(a) The test probe for lateral thoracic and pelvis impact tests are the same as those specified in § 572.44(a).