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2. REFERENCE

2.1 Applicable Publication

The following publication forms a part of this specification to the extent specified herein. The latest issue of SAE publication shall apply.

2.1.1 SAE Publication

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J33 Definitions for Snowmobiles

3. DEFINITIONS

3.1 Snowmobile Seat

The seat includes the cover, energy-absorbing materials, and substrates (if any).

3.2 Baseline

The baseline is the starting reference plane of the seat from which total penetration is determined. It is taken as the top plane of the seat at the fore-aft position designated for the snowmobile occupant(s).

3.3 G

Symbol for the dimensionless ratio of any acceleration to the acceleration of gravity.

3.4 t_p

Time duration impact to peak deceleration, in milliseconds.

3.5 t_h

Time duration from impact to 1/2 value of peak deceleration, in milliseconds.

4. DYNAMIC CUSHIONING TESTING METHOD

4.1 Scope

This procedure provides a uniform method for measuring, with a high degree of reproducibility, dynamic cushioning properties such as the deceleration-time history profile of a standard buttocks form ("missile") impacting seat test specimens. The results from this testing method can be related to the performance requirements necessary to limit spinal injury to snowmobile riders and passengers.

4.2 Apparatus

4.2.1 Testing Machine

Any design of dynamic testing apparatus will suffice when the following criteria are met. See Figure 1.

- 4.2.1.1 The weighted missile can be held in readiness for impact, released upon command, and guided to the point of impact.
- 4.2.1.2 The test specimen should be supported on a foundation which under impact will not deflect more than 1% of the thickness of the specimen.
- 4.2.1.3 The deceleration-time profile, as illustrated in Figure 2, can be read out and recorded on an instrument, such as an oscilloscope, starting at the time of initial contact of the missile on the seat.

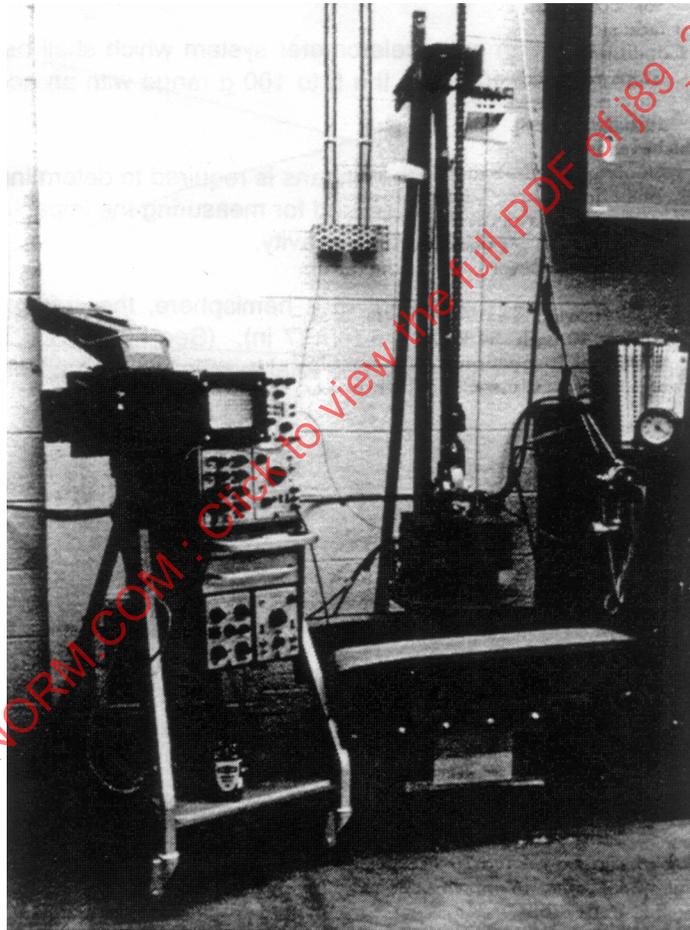
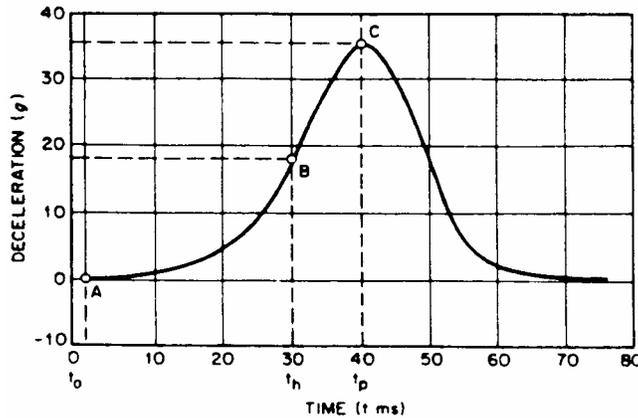


FIGURE 1 - DYNAMIC TESTING APPARATUS



TRACE ABC = G-TIME TRACE WHERE:

A = START OF IMPACT

B = $\frac{1}{2}$ PEAK g ($\frac{1}{2}$ C)

C = PEAK DECELERATION (g MAX)

FIGURE 2 - TYPICAL G-TIME TRACE

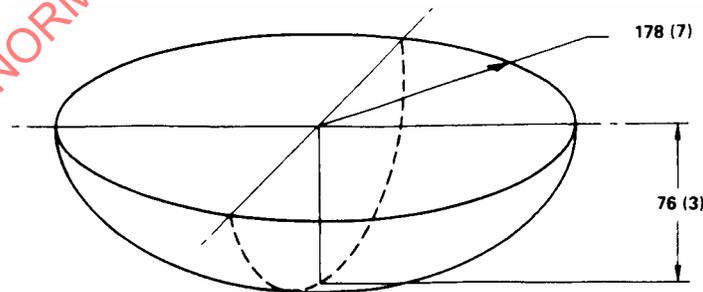
4.2.2 Sending Devices

4.2.2.1 The missile shall be equipped with an accelerometer system which shall be capable of measuring single impacts of short duration (less than 0.105 s) in the 5 to 100 g range with an accuracy of $\pm 2\%$ throughout the duration of the pulse.

4.2.2.2 A penetration measuring device or some other means is required to determine the exact starting time of the penetration. A velocity measuring device shall be used for measuring the impacting velocity of the missile if the missile is not totally free to fall under the influence of gravity.

4.2.3 Missile

The missile shall be a rigid segment of a hemisphere, the sphere having a radius of 245 mm (9.65 in) and the segment having a radius of 178 mm (7 in). (See Figure 3). The top surface of the missile must be designed to accommodate weights to provide total missile mass capability of 90.7 kg (200 lb).



SEGMENT OF SPHERE OF RADIUS = 245 (9.65)

NOTE: DIMENSIONS ARE mm (in)

FIGURE 3 - SEAT IMPACT FORM

4.2.4 Recording Equipment

The acceleration-time recording equipment should be capable of recording impacts compatible with the accuracy of the accelerometer. Some type of triggering device will be necessary for the recording device.