

INSTRUMENT PANEL LABORATORY IMPACT TEST PROCEDURE—KNEE-LEG AREA—SAE J338

SAE Recommended Practice

Report of Body Engineering Committee approved May 1968.

1. Scope—This SAE Recommended Practice describes a laboratory test procedure for evaluating the knee and leg impact characteristics of such areas of a motor vehicle instrument panel as may be required to meet impact performance requirements established for the protection of lap-belted front seat occupants.

2. References

2.1 Applicable instrument panel performance requirements including their associated definition of "knee-leg impact area."

2.2 SAE J984 and SAE J977.

3. Items to be Measured

3.1 The following items shall be measured:

3.1.1 **IMPACT VELOCITY**—The velocity of the bodyform at the moment of contact with the test specimen.

3.1.2 **ACCELERATION-TIME OR FORCE-TIME HISTORY OF THE BODYFORM**
The tangential acceleration-time or force-time curve of the axis of symmetry of the bodyform during the period of contact with the test specimen.

3.1.3 **START OF IMPACT**—An electrical contact shall be placed on the sample such that an indicating mark will register on the record when the bodyform initially contacts the test specimen.

3.2 Measurement of the following items is optional:

3.2.1 **REBOUND VELOCITY**—The maximum velocity of the bodyform after it breaks contact with the test specimen.

3.2.2 **DYNAMIC BODYFORM DISPLACEMENT**—The maximum penetration of the bodyform after initial contact with the test specimen.

4. Location and Direction of Impact—Within the knee-leg impact area, all impacts shall be conducted in accordance with the following procedure:

4.1 Select impact points within the impact area as defined by the

applicable performance requirement.

4.2 In side view, position the applicable knee-leg template (or other device) graphically in contact with the selected impact point. (This may produce graphic interference with other portions of the panel.) This positioning should consider the vehicle package drawing and the applicable performance requirement. (See Fig. 1.)

4.3 At each impact point, the direction of travel of the leading point of the bodyform shall be:

4.3.1 In side view, perpendicular to a line drawn through the impact point and through the ankle pivot of the template when the template is positioned as outlined in paragraph 4.2.

4.3.2 In plan view, in a vertical plane perpendicular (± 10 deg) to the panel contour.

4.4 Impacting Bodyform Positioning—Perform the following graphical procedures on the knee-leg template:

(a) Construct a line through the knee-ankle pivot points of the template.

(b) Determine the intersection of the knee-ankle line with the uppermost boundary on the lower leg segment of the template.

(c) Construct a line perpendicular to and intersecting the knee-ankle line 3.25 in. below point determined in step b. Label this line as the "template line."

4.4.1 For impact points below the "template line" (below-the-knee impact points), the impacting bodyform shall be positioned so that its leading point shall coincide with the impact point. (See Fig. 1.)

4.4.2 For impact points above the "template line" (knee impact points), the bodyform shall be positioned so that it is tangent to the template profile (Fig. 2) at the impact point. (For this case, the leading point may not be coincident with the impact point.)

4.5 If an impact point is not statically contactable by the impacting bodyform (Fig. 3), the bodyform shall be positioned so that, if it should sufficiently collapse the panel to reach the impact point during

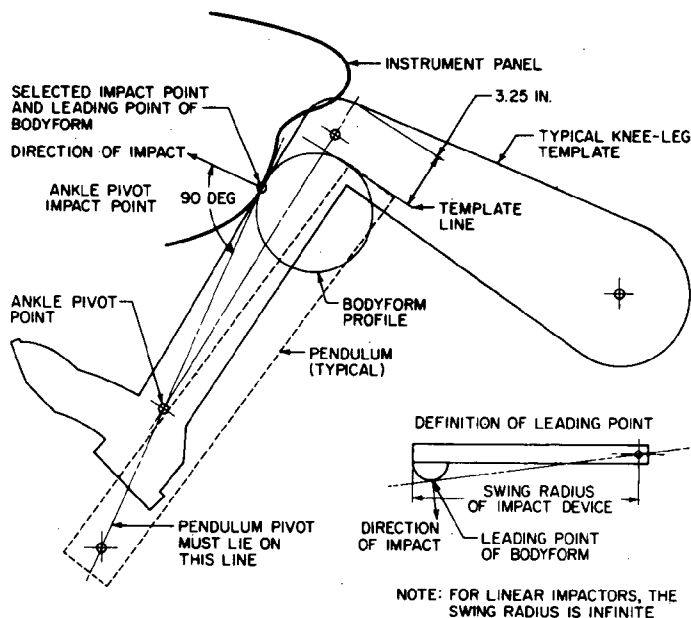


FIG. 1—BODYFORM POSITIONING AND DIRECTION OF IMPACT FOR "BELOW-THE-KNEE" IMPACT POINTS (PARAGRAPH 4.4.1)

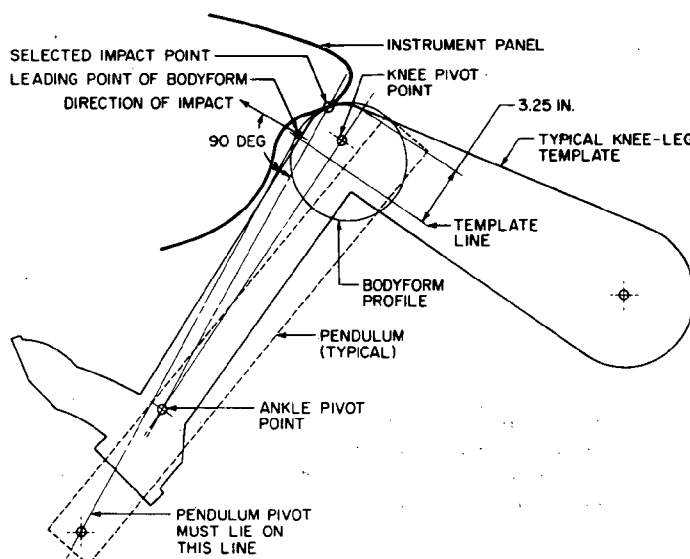


FIG. 2—BODYFORM POSITIONING AND DIRECTION OF IMPACT FOR KNEE IMPACT POINTS (PARAGRAPH 4.4.2)

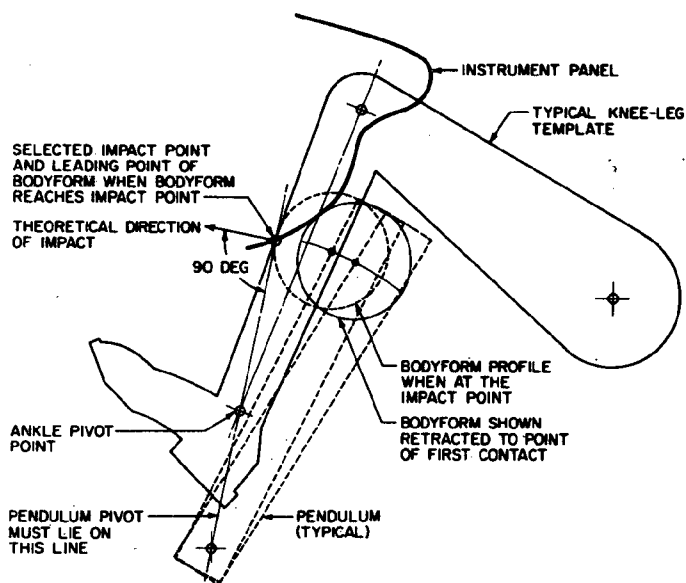


FIG. 3—BODYFORM POSITIONING AND DIRECTION OF IMPACT FOR "STATICALLY UNCONTACTABLE" IMPACT POINTS (PARAGRAPH 4.5)

the test, its direction of travel and position at this point shall be as specified in paragraphs 4.3 and 4.4.

5. Impact Test Velocity—This velocity must be specified by the applicable performance requirements.

6. Test Equipment and Instrumentation

6.1 The test equipment shall consist of a 40 lb effective weight impact device capable of being accelerated to the desired velocity. The instrument panel assembly shall be mounted in the actual vehicle or on a fixture that is at least as rigid as the actual vehicle mounting.

6.2 The metal bodyform specified in SAE J984 or its equivalent shall be used.

6.3 The bodyform shall have sufficient offset with respect to its supporting structure to preclude contact of the structure with the instrument panel assembly during the impact.

6.4 Any system of instrumentation that will measure the items in paragraph 3 and meet the performance requirements of SAE J977 is acceptable.

7. Test Procedure

7.1 Full width instrument panel assemblies will be used.

7.2 Any substructures, braces, instruments, etc., located between the instrument panel and firewall which could significantly influence the impact performance of the installed panel assembly shall be included in the specimens tested.

7.3 All samples shall be maintained at an ambient temperature ranging between 70-85 F for 12 hr prior to testing.

7.4 Impact the samples.

7.5 Record the test data, post-impact condition of the sample, and any unusual conditions.

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