



H-Point Measurement: Competitive

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This document provides test methods for evaluating the competitive Hip Point (H-Point) measurement. This procedure is to be used on competitive/Non-GM vehicle seat measurements.

1.2 Applicability. This procedure is to be used on competitive/Non-GM vehicle seat measurements. These test procedures apply to complete seat systems (production seats or prototypes built at the intended manufacturing quality); Testing must be performed on complete seat backs and complete seat cushions. Tests performed on subsystems or individual components will not be considered valid. For convenience and simplicity, many terms associated with H-Point devices use human body parts in their name. However, terms should not be construed as measures that indicate interaction with any or all occupants concerning accommodation, human capabilities, or comfort. H-Point devices do not represent the size or posture of any category of occupant.

1.3 Remarks. The tools and procedures for determining seat coordinate positions used in this document are based on the SAE J826 H-Point Machine.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

SAE J826

SAE J4003

2.2 GM Standards/Specifications.

None

3 Resources

3.1 Facilities. Tests are to be performed in a climate controlled area capable of maintaining a constant temperature of $23^{\circ}\text{C} \pm 4^{\circ}\text{C}$ and a relative humidity of $50\% \pm 5\%$.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment.

3.2.1 SAE J826 H-Point Machine (HPM).

3.2.2 Coordinate Measuring Machine (CMM).

3.2.3 Level.

3.2.4 Muslin Cloth.

3.2.5 Ruler/Measuring Stick.

3.2.6 Inclinator/Angle Measuring Device.

3.2.7 SAE J826 H-Point Manikin. Body element weights of the HPM are placed at the corresponding centers of gravity to provide seat penetration equivalent to a 75 kg (165 lb) person to the seat. All joints of the HPM machine shall be checked for free movement, noticeable friction shall not appear.

3.2.8 Calibration and Equipment. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.3 Test Vehicle/Test Piece. A complete seat, mounted in the vehicle or in a suitable buck that represents proper pedal and seat position characteristics. A suitable buck is the preferred method.

3.3.1 Seat Buck. The measuring buck enables H-Point measurement independent of the vehicle (Figure 1). The measuring buck consists of a rectangular base standing on four feet. In order to level the support horizontally, the feet shall be adjustable in height by screws. Adjustment shall be made by means of a level. The foot rest for the legs of the HPM machine are located at the front of the buck. The foot rest shall be designed to allow vertical and horizontal continuous adjustment to simulate different vehicles. The heels of the HPM machine are supported on a level surface covered with suitable textiles whereas the soles are put on a plate, adjustable in angle.

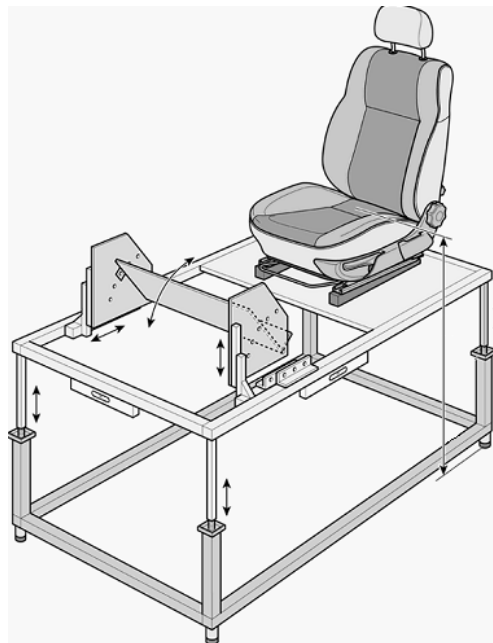


Figure 1: Seat Testing Buck

3.4 Test Time.

Calendar time:	0.5 d
Test time:	2 h
Coordination time:	2 h

3.5 Test Required Information. Vehicle and model of seat being tested.

3.6 Personnel/Skills. Test requires an engineer or technician capable of running test machinery.

4 Procedure

4.1 Preparation.

4.2 Conditions. As specified in SAE J826, the specimen should be conditioned for at least 4 h before being tested, so as to allow the seat components to reach room temperature, $23\text{ }^{\circ}\text{C} \pm 4\text{ }^{\circ}\text{C}$ and a relative humidity of $50\% \pm 5\%$. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.2.1 Environmental Conditions.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 Buck Setup. The buck should be sufficiently mounted or weighed down so as to ensure the buck does not move in any direction during testing. Ensure the buck is level. If it is not level, adjust the mount until level. Adjust the foot rest to match the position of the corresponding vehicle. Suitable carpet should be placed where the feet of the manikin will be set. Set the track angle according to that of the corresponding vehicle.

4.3.2 Vehicle Setup. The vehicle is to be raised and leveled in such a way that it cannot be moved vertically when weight is added. An example of this is to set blocks or jack stands under points specified by the manufacturer. Once the vehicle is raised, it must be level. This is to be verified with a level, both across the rocker panel and along the length of the vehicle on the rocker panel. The accelerator pedal is to be blocked so that it is rigid in the un-depressed position.

Once the vehicle has been raised and leveled, measure the seat track angle using a digital protractor and photograph the measurement as shown in Figure 2. When using a buck, the seat must be mounted such that the track angle on the buck is the same as in the vehicle after the vehicle has been leveled.

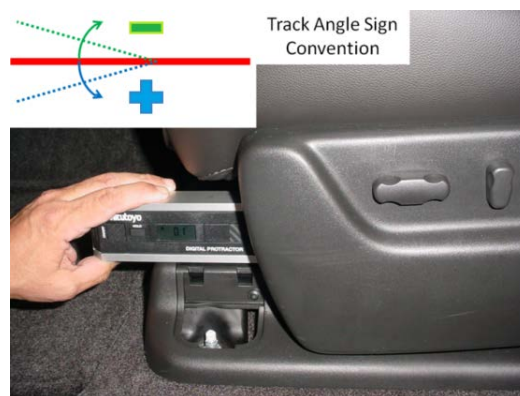


Figure 2: Track Angle Measurement

4.3.3 Reference Coordinates. Once the vehicle is leveled, a reference coordinate system needs to be established. This coordinate system will need to be established with three reference features: a plane, a line and a point. It is recommended that after the reference coordinate system is collected, it be offset forward so that all scanned points on the seat are on the same side of the origin of the coordinate system. For example, the X and Z coordinates are positive, Y coordinates are positive on driver's side and negative on passenger side.

4.3.4 Seat Conditioning and Recovery. As specified in SAE J826, if the seat being measured has never been flexed, a person, roughly 75 kg, shall sit in the seat to compress the cushion and backrest. Before the test, the seat should be allowed to rest for at least 0.5 h without any load.

4.3.5 Muslin Cloth. When the HPM is loaded in a seat, it is necessary to first cover the entire seating surface of the seat with a muslin cloth, so that the HPM does not come in direct contact with the seating surface.

4.3.6 Competitive H-Point Procedure. The purpose of the competitive H-Point is to compare the seat properties when benchmarking vehicles.

4.3.6.1 Seat Position and Travel Measurements. Before taking the H-Point measurement with the seated HPM, these reference measurements will be taken. Place several pieces of tape on top of each other on the forward and rear of the side shield. Use a point probe to make a divot in the tape (Figure 3). This will be the reference point on the seat to measure travel box and seat position within the travel box.