SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

# SURFACE VEHICLE RECOMMENDED PRACTICE

An American National Standard

SAE J934

REI. SEP1998

Issued 1965-07
Reissued 1998-09

Superseding J934 JUN97

## Vehicle Passenger Door Hinge Systems

***1.*** ***Scope—***The scope of this SAE Recommended Practice is to establish recommended uniform test procedures and minimum static load requirements for vehicle passenger door hinge systems. Tests are described that can be conducted on test fixtures and equipment in laboratory test facilities.

The test procedures and minimum performance requirements outlined in this document are based on currently available engineering data. It is intended that all portions of the document be periodically reviewed and revised as additional knowledge regarding vehicle hinge system performance under impact conditions is developed.

***2.*** ***References—***There are no referenced publications specified herein.

***3.*** ***Definitions***

**3.1** **Hinge System—**That system used to position the door relative to the body structure and control the path of the door swing for passenger ingress and egress.

**3.2** **Hinge Assembly—**That portion of the hinge assembly comprised of a pair of pivotally interconnected hinge members.

**3.3** **Hinge Components**

3.3.1 DOOR MEMBER—That portion of the hinge assembly normally affixed to the door structure and constituting the swinging member.

3.3.2 BODY MEMBER—That portion of the hinge assembly normally affixed to the body structure and constituting the fixed member.

3.3.3 HINGE PIN—That portion of the hinge assembly normally interconnecting the body and door members and establishing the swing axis.





**TO PLACE A DOCUMENT ORDER; (724) 776-4970 FAX: (724) 776-0790**
**SAE WEB ADDRESS http://www.sae.org**

## *4. Basic Requirements*

**4.1 Longitudinal Load—**A vehicle passenger door hinge system, when tested as prescribed under test procedure in 5.1, must be capable of withstanding an ultimate longitudinal load of 11 100 N.

**4.2 Transverse Load—**A vehicle passenger door hinge system, when tested in accordance with the test procedures in 5.2, must be capable of withstanding an ultimate transverse load of 8900 N.

## *5. Static Tests*

### 5.1 Longitudinal Load

5.1.1 PURPOSE—To determine the ability of the vehicle hinge system to withstand a test load in the longitudinal vehicle direction.

5.1.2 EQUIPMENT

a. Tensile testing machine.
b. A typical static test fixture is illustrated in Figure 1.



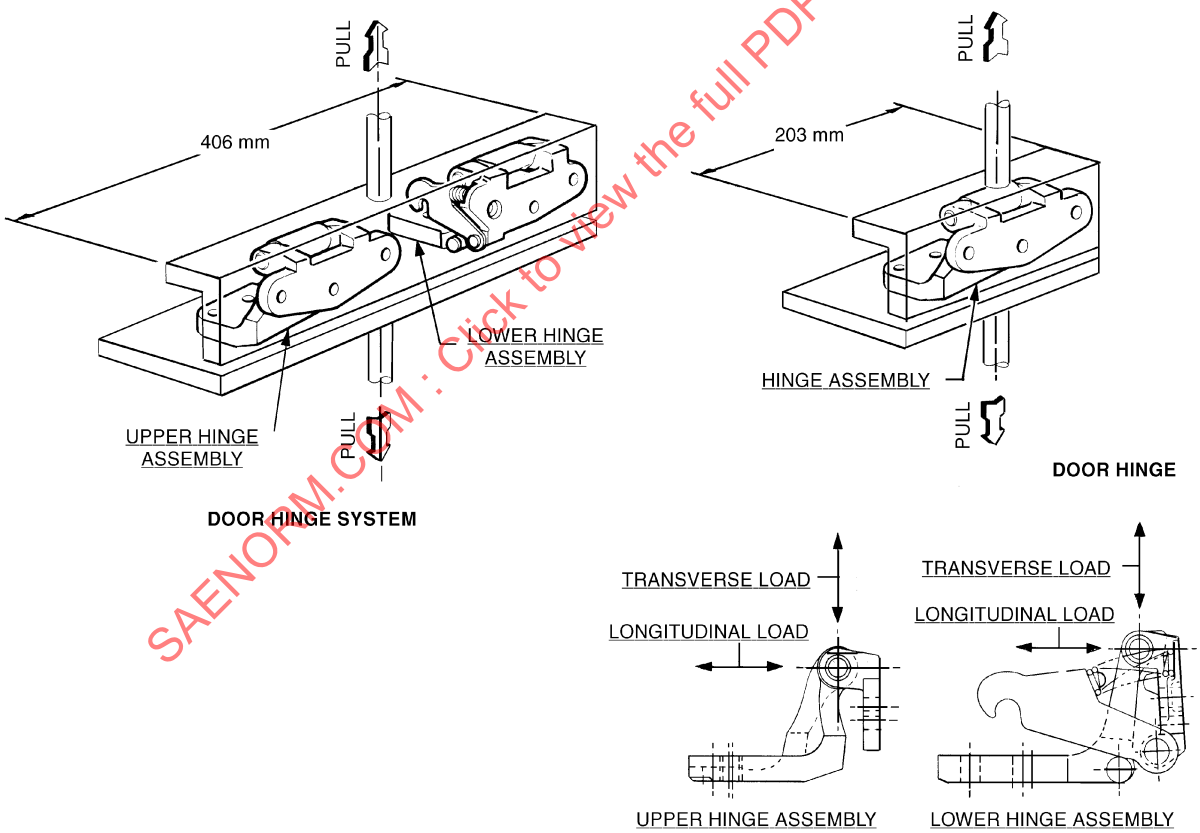


FIGURE 1—STATIC LOAD FIXTURES (TRANSVERSE LOAD)

5.1.3 OPERATION

a. Attach a test fixture to the mounting provision of the hinge system. Hinge attitude must simulate vehicle position (door fully closed) relative to the hinge centerline. For test purposes, the distance between the extreme end of one hinge in the system to the extreme end of another hinge in the system is to be set at 406 mm. The load is to be applied equidistant between the linear center of the engaged portions of the hinge pin and through the centerline of the hinge pin in the longitudinal vehicle direction.
b. Apply the test load at a rate not to exceed 50 mm/min until failure. Failure to consist of separation of either hinge. Record maximum load.

**5.2 Transverse Load**

5.2.1 PURPOSE—To determine the ability of the vehicle hinge system to withstand a test load in the transverse vehicle direction.

5.2.2 EQUIPMENT

a. Tensile testing machine.
b. A typical static test fixture is illustrated in Figure 1.

5.2.3 OPERATION

a. Attach the test fixture to the mounting provisions of the vehicle hinge system. Hinge attitude must simulate vehicle position (door fully closed) relative to the hinge centerline. For test purposes, the distance between the extreme end of one hinge in the system to the extreme opposite end of another hinge in the system is to be set at 406 mm. The load is to be applied equidistant between the linear center of the engaged portions of the hinge pins and through the centerline of the hinge pin in the transverse vehicle direction.
b. Apply the test load at a rate not to exceed 50 mm/min until failure. Failure to consist of separation of either hinge. Record maximum load.

***6. Single Hinge Evaluation***

**6.1 Introduction—**In some circumstances, it may be necessary to conduct evaluations of individual hinges in a hinge system. In such cases, the results for an individual hinge, when tested in accordance with the procedures in 6.2, shall be such as to indicate that system requirements in 4.1 and 4.2 are met. (Example: An individual hinge in a two-hinge system must be capable of withstanding 50% of the load requirements of the total system.)

**6.2 Test Procedures**

6.2.1 LONGITUDINAL LOAD—Attach a test fixture to the mounting provision of the hinge. Hinge attitude must simulate the vehicle position (door fully closed) relative to the hinge centerline. For test purposes, the load is to be applied equidistant between the linear center of the engaged portions of the hinge pin and through the centerline of the hinge pin in the longitudinal vehicle direction.

Apply the test load at a rate not to exceed 50 mm/min until failure (failure to consist of separation of either hinge). Record maximum load.

6.2.2 TRANSVERSE LOAD—Attach the test fixture to the mounting provision of the vehicle hinge. Hinge attitude must simulate the vehicle position (door fully closed) relative to the hinge centerline. For test purposes, the load is to be applied equidistant between the linear center of the engaged positions of the hinge pin and through the centerline of the hinge pin in the transverse vehicle direction.

Apply the test load at a rate not to exceed 50 mm/min until failure (failure to consist of separation of either hinge). Record maximum load.

PREPARED BY THE SAE LATCH AND HINGE SUBCOMMITTEE