

Combination Test

- Overview
 - Quasi-static bench test (latch and striker)
 - Tests side hinged (except cargo) doors in the fully latched position
 - Developed to primarily simulate the force conditions causing near side door openings in side impacts (primary longitudinal and a compliant of lateral force loading)
 - Also, developed to simulate force loading causing “bypass” door openings
 - Additional component test for latch in primary position
- Performance requirement
 - The door latch and striker, when in the fully latched position and mounted in a simulated fixture, shall not separate when simultaneously loaded with a 16,000 N longitudinal compressive force and a 6,650 N lateral tensile force applied to the latching system for a period of not less than 10 seconds after the load forces are achieved.
- Test Procedure
 - The test is designed to simultaneously load the latch/striker in compression along the vehicle’s longitudinal axis and in tension along the vehicle’s transverse axis. Movement of the latch is constrained in a direction along the vehicle’s transverse axis. The latch and striker, in their primary latch position, are simultaneously loaded such that: (1) a constant tension force of 6,650 N is applied by a transverse loading device, and (2) while maintaining the constant transverse load, a compression load through the striker along the vehicle longitudinal axis is then applied at a rate of 10 mm per minute up to a load of 16,000 N.
- NHTSA Testing
 - 1993-1994
 - 12 doors tested from 1983-1991 vehicles
 - Average test failure load = 16,790 N
 - Minimum test failure load = 8,841 N
 - Maximum test failure load = 28,786 N
 - 2000-2001
 - 21 doors tested from 1993-1998 vehicles
 - Minimum test failure load = 8,785 N
 - Maximum test failure load = 27,929 N
 - Average test failure load = 16,043 N
 - NASS weighted - average test failure load = 16,000 N
- Reports
 - DOT HS 808 188, “Door Latch Integrity Study: Evaluation of Door Latch Failure Modes”, January 1994.
 - Howe, G., Leigh, M., Willke, D., “Door Latch Integrity Study: Engineering Analysis and NASS Case Review”, December 1991, NHTSA Docket 94-70-N02-006
- Diagram (see next page)

New Combination Test (Quasi-Static)

For Side Hinged Doors (except cargo) in Primary Latched Position

The door latch and striker, in a simulated fixture shall maintain and separate for at least 10 seconds after achieving a longitudinal compressive force of 16,000 N and a lateral tensile force of 6,650 N.

