



Endgate Strength

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. The purpose of the test is to determine vehicle endgate assembly strength when being statically loaded.

1.2 Applicability. This procedure applies to pickup trucks and multi-purpose vehicles which have an endgate closure panel and a truck bed.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

2.3 Additional References.

CG583 Development/Validation Test and Vehicle Review Form (ID): Located in General Forms and Templates in GM Global Document Management (GDM) database.

Vehicle Technical Specifications (VTS)/Subsystem Technical Specifications (SSTS): Reference Vehicle or Subsystem Technical Specifications. These include 55.02 Rear End Closures, Paragraph Titles include:

- "Cable Strength Test."
- "Endgate Concentrated (Hoof) Load."
- "Endgate Mid-Position Load."
- "Endgate Push Open Load."
- "Longitudinal Static Load Test."
- "Ramp Load."
- "Strength Requirements."

(ID) = This document is limited to internal use within General Motors and shall not be accessed outside this company. Contact the GM Lead Engineer for further instructions.

3 Resources

3.1 Facilities.

- Major Facility: An equipped facility capable of meeting test requirements.
- Minor Facility: A suitable bedplate for secure anchoring of body or vehicle and test equipment.

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.

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3.2 Equipment.

- 3.2.1 A suitable bedplate to hold a test buck or vehicle and allow it to secure properly.
- 3.2.2 One (1) piece of 50 mm x 50 mm tubing long enough to span the entire width (laterally) of the endgate.
- 3.2.3 One (1) piece of 50 mm x 50 mm tubing long enough to span the entire length (longitudinal) of the endgate.
- 3.2.4 One (1) piece 125 mm x 125 mm plate for local loading.
- 3.2.5 A suitable source to apply a controlled load (hydraulic actuator, pneumatic actuator, weights, etc.)
- 3.2.6 A set of suitable supports and cross beam to anchor the load bearing source.
- 3.2.7 A suitable load bearing device or substitute that will measure the controlled weight or load.
- 3.2.8 Four (4) dial indicators or equivalent tool to measure permanent deformation.
- 3.2.9 Blocks or dynamometer pedestals to isolate the suspension if a vehicle is used for this procedure.
- 3.2.10 If actuators are used for test, use a hand-held level to locate the actuator straight vertically.

3.3 Test Vehicle/Test Piece.

3.3.1 Body or vehicle with the closure panel, hinges, and weather strip (if applicable), lock, strikers, handles, or any necessary option installed, or required by the requesting engineer. It is recommended that the body be subjected to the production-intent assembly and paint process to ensure representative strength characteristics. It is also recommended that the test parts/assembly be dimensionally certified before testing is started.

Note: A new sample is not required for each test, if the Test Engineer and Requesting Engineer determine that the tested sample is sufficient for further testing.

3.4 Test Time.

Calendar time:	3 d
Test time:	18 h
Coordination time:	30 h

3.5 Test Required Information. The requesting engineer is responsible for providing specifications appropriate to the particular vehicle line being tested. **Reference Subsystem Technical Specifications (SSTS) paragraph numbers, if applicable.**

3.5.1 The following information is required to run this test:

- 3.5.1.1 The maximum payload capacity of the vehicle.
- 3.5.1.2 Torque specifications for hinges, strikers, fasteners, etc.
- 3.5.1.3 Condition of the body reviewed and approved.
- 3.5.1.4 Subsystem Technical Specification (SSTS) requirements of the peak static load.
- 3.5.1.5 Number of samples to be tested.

3.6 Personnel/Skills. Prior experience in setting up and running similar tests and experience in the use of the referenced test equipment are critical to achieving the estimated times shown in 3.4 Test Time.

4 Procedure

4.1 Preparation. Required: The CG583 form must be completed and all responsible engineers must approve the test setup by signature on the form.

4.2 Conditions. Not applicable.

4.2.1 Environmental Conditions. This test is performed at ambient condition only.

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 Set Up Instructions. Perform any functional or operational evaluations as needed. Specifically, cycle the closure panel at least five (5) full cycles to ensure proper seating of all system components. Then perform any functional checks on the endgate. Measure gaps and flushness around perimeter of endgate. Observe any irregular sounds or erratic operation indicating a potential problem with the assembly or design, and verify issues

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with requesting engineer. The condition of the test property should be reviewed by the requesting engineer to make sure that the correct parts are being tested and that the gaps, fits, and performance is understood prior to the start of test.

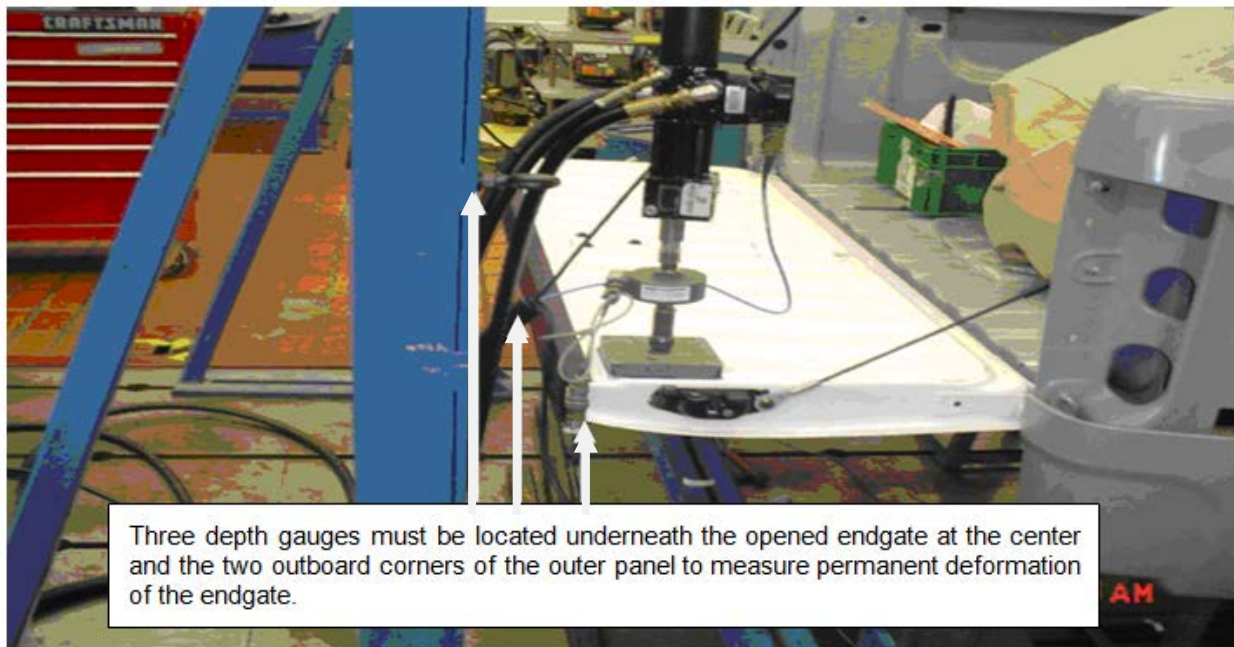
4.3.2 Isolate the pickup box and frame or vehicle body from the suspension so that the vehicle or box will not move when the endgate is statically loaded. See Figures 1 and 2.

4.3.3 Set up actuator to be perpendicular to the bedplate. See Figures 1 and 2. For all of the following load cases, the actuator should slowly and steadily apply the load.



Note: The body or vehicle is tied down and supported. Shown in the figure is the body on jack stands being anchored to a bed plate.

Figure 1: Body in Anchored Position



Three depth gauges must be located underneath the opened endgate at the center and the two outboard corners of the outer panel to measure permanent deformation of the endgate.

Note: The actuator is positioned perpendicular to the plane of the endgate. Shown in this illustration is the hoof load test.

Figure 2: The Actuator in Ready Position to the Endgate and the Outer Panel Dial Indicator Placement

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