



Luggage Shade Test Procedure

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 specification supports the technical requirements for luggage shades utilizing a roller shade feature. This includes a stationary rolling luggage shade or rolling luggage shade that moves fore-aft in guide features in the garnish trim. The requirements for the shade are located in the Garnish Subsystem Technical Specification (SSTS) (see GMW14086), while this document provides the test details and data sheet to document test results.

The rolling luggage shade is made of tarp material in a roller-type design, with and without side guide rails, including the removal by disengaging from the body fittings.

Operation is either actively completed by the user when opening and closing the tailgate/liftgate or automatically when tailgate/liftgate is opened, with manual closing.

System may include a hold open slot in the quarter trim. This feature may be either manual, or automatic.

1.2 Applicability. This specification is used to validate the luggage shade for various performance criteria established in the Garnish SSTS (see GMW14086).

This defines the test methods to be used with the requirements of GMW14086 as well as provides the data sheet to document test results.

1.3 Remarks. Not applicable.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3059

GMW14086

GMW14264

GMW14472

2.3 Additional References.

- CG583
- CG1844 SOR Appendix C2
- Part Drawing
- Proving Grounds Rules for Running Lights and Power Windows
- Proving Grounds Traffic Safety Guidelines
- Respective Test Methods

3 Resources

3.1 Facilities.

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

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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.

3.1.2.1 Proving Grounds or similar roads (e.g., Torture Track Left, Belgian Block Wave Road, Rheinstrasse).

3.1.2.2 Climatic Chamber.

3.1.2.3 Durability Test Stand.

3.1.2.4 Test Vehicle or Test Fixture.

3.2 Equipment.

3.2.1 Force gauge with hook and piston.

3.2.2 Steel ruler.

3.2.3 Stop watch.

3.3 Test Vehicle/Test Piece. Complete luggage shade assembly including all attachment features.

3.4 Test Time.

Calendar time: 7 to 14 days

Test hours: 168 hours

Coordination hours: 7 hours

3.5 Test Required Information. See 5.3.

3.6 Personnel/Skills. Test engineer.

4 Procedure

4.1 Preparation. According to the respective test methods. Before each test, the assembly and test setup will be inspected for test readiness, i.e., current design release. A CG583 or test ready form shall be available and approved by the applicable approvers to proceed with testing. Permissible deviations from the requirement values in GMW14086 are documented in either the program CG1844 SOR Appendix C2 or on the Part Drawing under part requirements. Subjective evaluations shall comply with GMW14264.

4.2 Conditions.

4.2.1 Environmental Conditions. According to the respective test methods.

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. See also CG1844 SOR Appendix C2 and comply with respective test methods.

If not otherwise stated, all performance requirements shall be fulfilled within a temperature range of -30 °C to 85 °C. For testing the requirements, the 4.2.2.a thru 4.2.2.c test temperatures shall be selected.

- a. -30 °C ± 3 °C
- b. 23 °C ± 3 °C
- c. 80 °C ± 3 °C

4.3 Instructions. According to the Respective Test Methods.

4.3.1 Appearance.

4.3.1.1 Evaluation of Fit. The test shall determine whether the recommended clearances to the rear backrest, tailgate/liftgate trim and the side garnish trim are complied with.

4.3.1.2 Test of Surface Condition. The surface of the luggage shade shall be subjectively reviewed for:

- Cracks or buckles in the surface.
- Execution of the edge cutout.
- Execution of any welds or bonded locations.
- Uniform surface structure.

4.3.1.2.1 Requirement. The surface appearance shall achieve rating eight (8.0) minimum per GMW14264. The luggage shade shall have a uniform surface structure.

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4.3.2 Haptics. The haptic characteristics, especially the tarp material of the luggage shade, shall be tested and subjectively evaluated. No sharp edges shall be present in the assembly.

4.3.2.1 Requirement. The haptic characteristics of the shade shall achieve rating seven (7) per GMW14264.

4.3.3 Actuation Forces. All force measurements shall be performed three (3) times, with testing also executed at hot, cold and ambient temperatures, unless otherwise stated. The average value shall be derived from the individual measurements.

For all forces that are measured over a distance of > 10 cm, the permitted maximum and minimum values of the force may vary by 20% maximum.

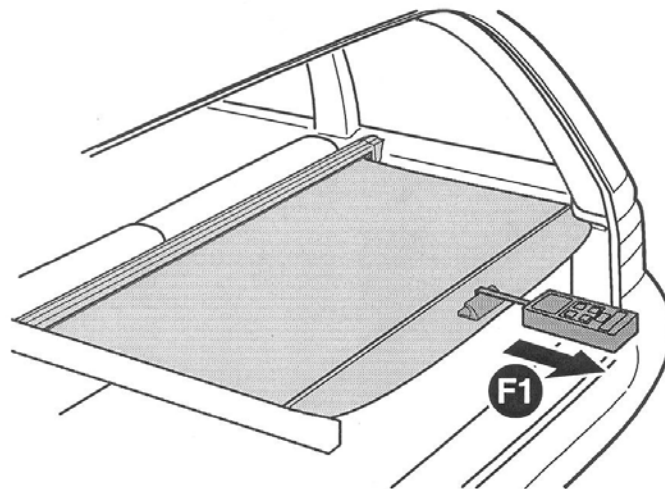
4.3.3.1 Sliding Force of the Shade, Opening and Closing. Force to engage rod ends to open/close shade. This test measures the force required to slide both rod ends of the shade into the guide tracks (squirrel tail) in the garnish that will hold the shade in the open position. This does not include the force to slide the rod ends past the stops, if present.

4.3.3.1.1 The opening force shall be measured using a force gauge with hook. To measure the opening force, the hook will be placed in the handle. The shade will be pulled open while engaging the rod ends into the garnish guides that will hold the shade in the open position.

4.3.3.1.2 The closing force shall be measured using a force gauge with hook. To measure the closing force, the hook will be placed in the handle location, if applicable or center back edge of the part if no handle is present. The shade will be pulled, so the rod ends disengage the garnish guides.

Sliding force of roller shade: F_1 applied in direction of operation (see Figure 1).

Figure 1: Opening and Closing Force of Roller Shade



Key: Closing/Opening Force = F_1 .

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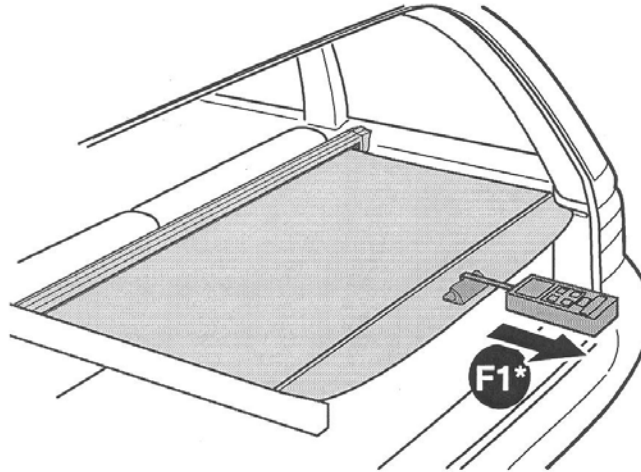
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4.3.3.2 Extension Force of Roller Shade. This tests the extension or unrolling force of the shade and does not include the engagement of the rod ends to the garnish stop or plastic guides.

The extension force of the roller shade shall be measured using a force gauge with hook (see Figure 2). The hook is applied to the base of the handle or in the center of the shade opening. The force shall be measured beginning with the roller stored fully in the cartridge and the test will extend the shade to the fully extended state without engaging the garnish stop.

Figure 2: Extension Force of Roller Shade



Key: Extension Force = $F1^*$.

4.3.3.3 Release Force for Shade Cassette to Garnish. This tests the force needed to release the shade cassette from the garnish retention features behind the seating area.

The release force for the cassette shall be measured using a force gauge with hook or piston (see Figure 3). Requirement from GMW14086: Assembly release force from garnish trim features: $F2$.

How to release the shade cassette is design dependent. Therefore the test and requirements may need to be adjusted. Any adjustment to the requirements shall be listed in CG1844 SOR Appendix C2.

The common features used to release the cassette can include:

- A sliding spring loaded end cap
- A release lever
- A release button

The release force is the force which shall be applied to the release mechanism so that the shade cassette can be removed from the garnish trim (see Figure 3).

For the case that the release process is a combination of several steps, i.e., pressing a button, and then sliding an end cap, the release force and measurement of the release force shall be broken down accordingly.

For all measurements, regardless of which system is used, the direction of measurement is always the direction of actuation. This means that for a release movement which follows a reference circle, the measurement is done tangentially to the path of the circle.

Note: No squeaking noises are permissible during actuation.

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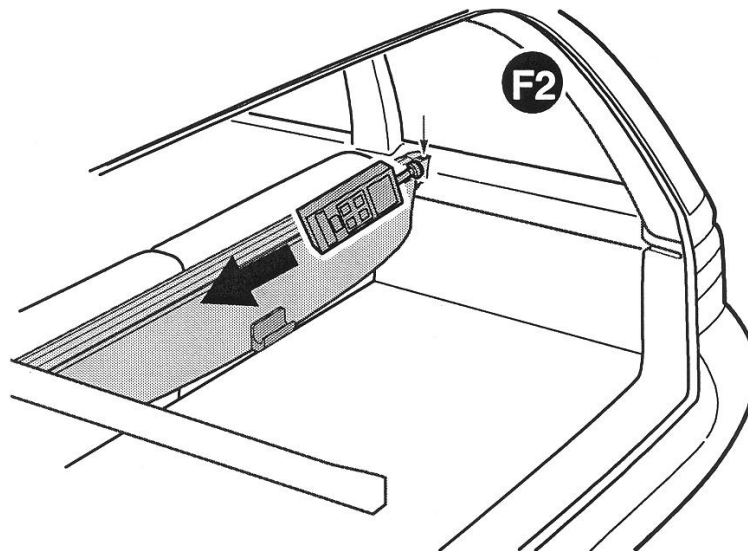
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Figure 3: Release Force for Roller Shade Cassette



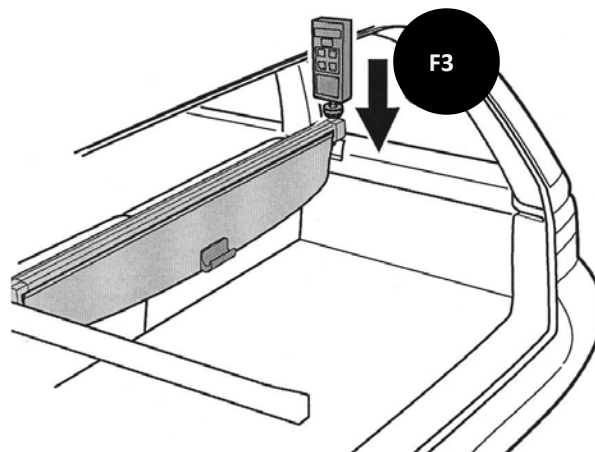
Key: Release Force = F2.

4.3.3.4 Insertion Force for Shade Cassette. This tests the force required to engage the cassette to any retaining features in the garnish trim.

The insertion force for the cassette shall be measured using a force gauge with piston (see Figure 4). The measurement is applicable to systems which are engaged by pushing or sliding the cassette end caps into the rests on the garnish, and shall exclude the efforts required to use the actuation feature, when present in the design (see Figure 4 example of side inserting force).

Note: Insertion force into the garnish features: F3.

Figure 4: Insertion Force for the Shade Cassette



Key: Insertion Force = F3 or F3LH/F3RH, Left Hand (LH), Right Hand (RH).

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4.3.3.5 Engagement Force of Rod Ends to the Garnish Stops. The engagement of the shade rod ends to the garnish stops, if present, shall be measured using a force gauge with hook (see Figure 5).

Note: Engagement force of rod ends to garnish stops: F4 (see Figure 5).

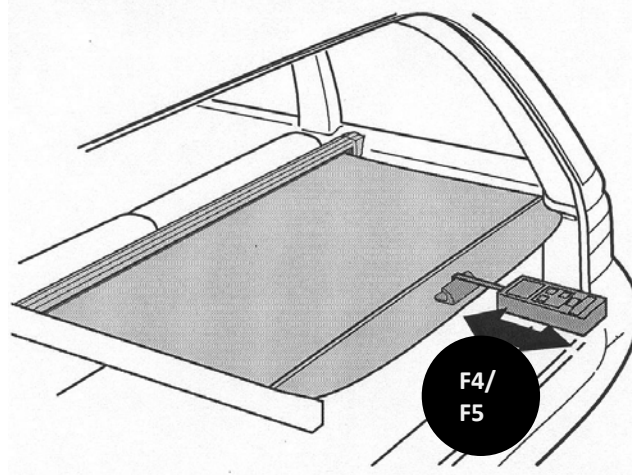
The engagement force is the force which shall be applied to the rod ends of the shade to fully extend and hold the shade in the rest or open position.

The force shall be measured in the direction of actuation.

If the rear guides have to be pulled or pushed through grooves or similar to reach the mounting position, this area is measured as well.

The force application point is at the handle (see Figure 5), unless the GM Product Development Team (PDT) defines differently.

Figure 5: Engagement/Disengagement Force of Rear Supporting Tube



Key: Engagement Force = F4, Disengagement Force = F5.

4.3.3.6 Disengagement Force of Rod Ends to the Garnish Stops. Test setup and measuring equipment as in 4.3.3.5, however force is applied in the opposite direction, i.e., the required force, to unhook the rear retention, is measured.

Note: Disengagement force of side rear supporting tube: F5 (see Figure 5).

4.3.3.7 Handle activation force to use the comfort hold open position (upper pillar trim position) or usage open (lower garnish) guide. This is the release feature of the handle, which allows the customer to touch the handle portion of the shade, and release the shade from the garnish retention feature/stop.

The activation force shall be measured using a force gauge with hook or piston.

Note: Activation force of handle: F6 (see Figure 6).

A force gauge is applied at the point furthest away from the pivot and presses or pulls the handle from the closed position until the handle releases the shade into the guided position in the track.

During the measurement or movement, the piston shall always be vertical to the handle (see Figure 6).

The activation force of the handle F6 is the maximum value measured during the activation process.

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