



Determination of the Deck Lid Bounce Back Behavior

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 Test Procedure determines the bounce back behavior of the deck lid after touching the end stop in the full open position while opening.

1.2 Applicability. This procedure applies to all passenger cars having a power or manual deck lid system.

1.3 Remarks.

1.3.1 This standard is written for power deck lids and manually operated deck lids with an automatic opening system (full free rise design) and manual lifting systems as “release and lift”, “pop & hang” and “perfect counterbalanced”.

The intention of this Test Procedure is to record the Decay Curve of the deck lid while hitting against the end stop in full open position. The procedure is considered to be applied mainly when matching the end stop dampening or for benchmark. The bounce back behavior evaluation is neither durability nor a stiffness test. It is a functional test including the bounce back evaluation method and analysis.

1.3.2 The determination of the over swing and bounce back decay curve has to be in accordance with the customer requirement for a good bounce back behavior.

1.3.3 It is important

- to consider the test temperature especially for deck lids with gas strut feature
- to consider the vehicle position (level, incline and decline)

due to a noticeable influence of the test result.

1.3.4 For power deck lids & automatic opening system with full free rise it is assumed that the customer will only handle the deck lid without applying any effort while self-actuating opening. As an exception, a deck lid with full free rise but without a dampening gas strut should be discussed in a particular case if a misuse test is required or not. For manually operated deck lids, requiring customer input for a full opening of the deck lid, a normal and abusive usage has to be investigated.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW14264

2.3 Additional References.

Subsystem Technical Specification (SSTS) 55.02.05 Deck lid.

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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.

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.

3.1.3 Test area with level surface and ambient temperature ($+22 \pm 3$) °C.

3.2 Equipment.

3.2.1 Hardware.

3.2.1.1 Tripod or rack for fixing the velocity meter.

3.2.1.2 Floor jack and jack stands with enough travel to raise the vehicle to a specified incline or decline angle.

3.2.2 Instrumentation.

3.2.2.1 Measuring system (rate gyro, measuring amplifier).

3.2.2.2 Velocity meter.

3.2.2.3 Protractor.

3.3 Test Vehicle/Test Piece. A vehicle or test rack with all test relevant components installed.

3.4 Test Time.

Calendar time: 1 day

Test hours: 5 h

Coordination hours: 1 day

3.5 Test Required Information. The requesting engineer is responsible for providing specifications appropriate to the particular vehicle line being tested (reference SSTS paragraph numbers if applicable, see 2.3).

Testing worst case scenarios may uncover some potential problems. Discuss with requesting engineer if testing should include some worst case scenarios. Depending on which test is being performed and which level of parts or systems is being tested, consider if any of the following may apply: Tolerance stack-ups, build variations, misalignment, minimum/maximum fastener torque(s), lubrication, environmental extremes, location of customer representative load application, symmetry (Left Hand vs. Right Hand), color, mold or die source, etc.

The following specifications or information are required to run this test:

3.5.1 Environmental conditions (especially for deck lids with gas strut feature).

3.5.2 Vehicle level requirement (level, incline or decline).

3.5.3 Position of Velocity Meter at the bottom line of the deck lid (see Figure 4).

3.5.4 Distance hinge pivot – deck lid bottom line.

3.5.5 In case of a manually operated deck lid with a full free rise feature after unlatching but without any dampening character in the full open position (as for example a gas strut), a decision is necessary if a misuse test is required or not

Notes:

- The angle of incline or decline may greatly affect the bounce back behavior. Testing in the inclined and declined condition simulates customer use when parked on a driveway with a slope or when parked on a hill.
- It is assumed, the influence of “green” or “aged” seals, bumper preload and seal margin is insignificant for power deck lids and deck lid designs with an automatic opening system and shall be disregarded. For other deck lid systems, these criteria do not apply.

3.6 Personnel/Skills. Prior experience in setting up and running similar tests.

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4 Procedure

4.1 Preparation.

4.1.1 Vehicle Setup. Power deck lids and automatic opening system with full free rise & manual deck lid systems.

Figure 1: Test Set up “Deck Lid Opening Velocity” measured 5° from the Static Full Open Position



Figure 2: Test Set up “Deck Lid Opening Velocity”, Interrupter and sensor of the Velocity Meter aligned without contact while opening of the deck lid



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