



Mechanically Attached Exterior Part Retention

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 this procedure is to determine if mechanically attached exterior moldings meet the retention requirements of the Technical Specification (SSTS or CTS).

1.2 Applicability. This test procedure is to be used for pillar appliques and moldings, wheel opening moldings, wheel flare moldings, body side moldings, rocker moldings, vents, scoops and mud guards that are mechanically attached with molded retention features, post applied clips, fasteners or any combination of these attachment types. This procedure is not for parts that are only adhesively attached.



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 – To ensure the correct parts and test setup.
- Exterior Trim SSTS
- Greenhouse Molding CTS

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3 Resources

3.1 Facilities. GM test lab.

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.

3.2 Equipment. The following items are typically required to perform this test. Other equipment may be substituted at the discretion of the testing facility as long as it provides the same data with equivalent accuracy and is approved by the requesting engineer.

3.2.1 Fixture. Not required.

3.2.2 Test Supports. The test part must be attached to the vehicle using the production level process and attachments.

3.2.3 Instrumentation. Not required.

3.2.4 Handheld Force Gauge. A handheld tension/compression force gauge with a minimum capability of 500 N.

3.2.5 Handheld force gauge attachments.

3.2.6 Force Gauge Application Pads. A hook or suction cup attachment is required for the pull tests. In addition, a force gauge attachment is required for the peel test as shown in Figure 3. Also, a rigid steel rod or aluminum bar is required for the mud guard test.

3.2.7 Gap and flush measurement tools.

3.2.8 A loading rod or bar.

3.2.9 Miscellaneous Tools.

3.2.9.1 Paint Pen. A paint pen is required to mark the pull locations.

3.2.9.2 Drill Motor and Drill Bit. A drill motor with a 8 mm drill bit is required to drill holes into the molding/applique assemblies at the pull locations in order to use the handheld force gauge hook attachment.

3.3 Test Vehicle/Test Piece.

3.3.1 Test Vehicle. The molding assemblies used for Product Validation (PV) shall be completed assemblies manufactured using the production tools at the home location. This includes: production fixtures, production weld equipment and the production process.

3.3.2 The Subsystem Validation Engineer (SVE) and Design Release Engineer (DRE) will determine if a Body-In-White (BIW), Integration Vehicle (IV) or vehicle component (i.e. door, hatch, etc.) is acceptable for this test, if not, this test will require a Product/Process Validation Vehicle (PVV) or later built vehicle.

3.3.3 Sample Size. One vehicle set is required for this test.

3.4 Test Time.

Calendar time: 1 d

Test time: 4 h per molding

Coordination time: 4 h

3.5 Test Required Information. The peak pull and peel forces recorded during test.

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.

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4 Procedure

4.1 Preparation. Suction cups, wire loops or zip ties can be used to pull parts. When using zip ties (loops), drill 8.0 mm holes in parts with 18 mm spacing centerline to centerline as shown in Figure 1. The hole spacing will ensure the zip tie does not tear the plastic during the test. Verify that the part release or change level is correct. Record this information on Data Sheet A1.

4.1.1 Inspect that all components of the part/assembly and vehicle are correctly assembled and absent of any damage. Review and complete the CG583 before start of test.

4.1.2 Test Piece Constraints. Attach molding assembly to the vehicle. If applicable, use a torque wrench to verify that the minimum torque specification is used for all attachments.

4.2 Conditions.

4.2.1 Environmental Conditions. Perform measurements at $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ (ambient).

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 A-Pillar Moldings.

4.3.1.1 Pull Test.

4.3.1.1.1 Using a handheld force gauge with a suitable attachment, hook, peel or suction cup, pull as specified at an approximate rate of 1 cm/s until the force value meets the requirement outlined in the SSTs.

4.3.1.1.2 Pull locations are defined as follows: 50 mm from the ends of the part and in the center as shown in Figure 1. Drill 8.0 mm holes, spaced 18 mm apart in the moldings at the three locations explained above. Use zip ties to create loops for pulling at shown in Figure 1.

4.3.1.1.3 Review program SSTs for peel and retention values.

4.3.1.1.4 After hooking force gage to upper zip tie loop, pull upward perpendicular to windshield surface until requirement in SSTs is reached. Do not pull to failure (exceeding retention requirement). This may damage and influence remaining retention pulls.

4.3.1.1.5 Repeat 4.3.1.1.4 for middle and lower positions.

4.3.1.1.6 Record force measurements in Data Sheet A1 in Appendix A.

4.3.1.2 Peel Test.

4.3.1.2.1 Using a handheld force gauge with a suitable attachment, hook, peel or suction cup, pull as specified at an approximate rate of 1 cm/s until the force value meets the requirement outlined in the SSTs.

4.3.1.2.2 A peel test is required when an edge of the A-pillar molding is subjected to potential customer impact. Peel locations should be at the ends of the part in the customer exposed area.

4.3.1.2.3 Review program SSTs for peel values.

4.3.1.2.4 Use a force gage with a peel adaptor as shown in Figure 3 to hook under applique at the following positions: Upper and lower edge Pull perpendicular to part surface until requirement in SSTs is reached. Do not pull to failure (exceeding retention requirement). This may damage and influence remaining retention pulls.

4.3.1.2.5 Repeat section 4.3.1.2.4 for lower position if applicable.

4.3.1.2.6 Record force measurements in Data Sheet A1 in Appendix A.

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Figure 1: A-Pillar Molding, A-Pillar Molding Pull and Preparation

4.3.2 Pillar Appliques.

4.3.2.1 Pull Test.

4.3.2.1.1 Using a handheld force gauge with a suitable attachment, hook, peel or suction cup, pull as specified at an approximate rate of 1 cm/s until the force value meets the requirement outlined in the SSTs.

4.3.2.1.2 Pull locations are defined as follows: Center of the part (Pluck) as shown in Figure 2. Use zip ties to create loops for pulling at shown in Figure 2. Drill 8.0 mm holes, spaced 18 mm apart in the applique.

4.3.2.1.3 Review program SSTs for retention values.

4.3.2.1.4 After hooking force gage to zip tie loop, pull outward perpendicular to part surface until requirement in SSTs is reached. Do not pull to failure (exceeding retention requirement). This may damage and influence remaining retention pulls.

4.3.2.1.5 Repeat 4.3.2.1.4 for lower position, 15 mm from lower edge.

4.3.2.1.6 Record force measurements in Data Sheet A1 in Appendix A.

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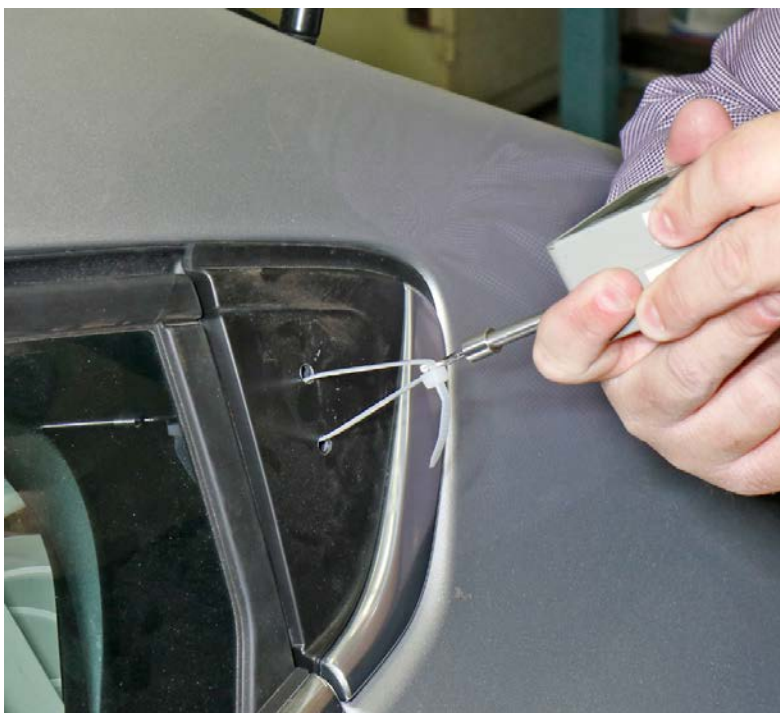


Figure 2: Pillar Applique Pluck

4.3.2.2 Peel Test.

4.3.2.2.1 Using a handheld force gauge with a suitable attachment, hook, peel or suction cup, pull as specified at an approximate rate of 1 cm/s until the force value meets the requirement outlined in the SSTs.

4.3.2.2.2 A peel test is required when an edge of the applique is subjected to potential customer impact or contact. Peel locations should be along the leading edge of the part in the customer exposed area as shown in Figure 3.

4.3.2.2.3 Review program SSTs for peel values.

4.3.2.2.4 Use a force gage with a peel adaptor as shown in Figure 3 to hook under applique at the following positions: 15 mm from upper and lower edge. Pull perpendicular to part surface until requirement in SSTs is reached. Do not pull to failure (exceeding retention requirement). This may damage and influence remaining retention pulls.

4.3.2.2.5 Repeat 4.3.2.2.4 for lower position, 15 mm from lower edge.

4.3.2.2.6 Record force measurements in Data Sheet A1 in Appendix A.

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Figure 3: Pillar Applique Peel

4.3.2.3 Angled Peel Test.

4.3.2.3.1 Using a handheld force gauge with a suitable attachment, hook, peel or suction cup, pull as specified at an approximate rate of 1 cm/s until the force value meets the requirement outlined in the SSTs.

4.3.2.3.2 An angled peel test is required when an edge of the applique is subjected to potential customer impact or contact. Angled peel locations should be along the leading edge of the part in the exposed area as shown in Figure 4. Use zip ties to create loops for pulling as shown in Figure 4. Drill 8.0 mm holes, spaced 18 mm apart.

4.3.2.3.3 Review program SSTs for peel values.

4.3.2.3.4 After hooking the force gage to the zip tie loop, pull rearward approximately 30° from part surface until the requirement in the SSTs is obtained. Do not pull to failure (exceeding retention requirement). This may damage and influence remaining retention pulls.

4.3.2.3.5 Record force measurements in Data Sheet A1 in Appendix A.



Figure 4: Pillar Applique - 30° Angle Pull

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