



Hood Prop Rod 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. This standard provides a procedure for an evaluation of prop rod retention when an open hood in a vehicle is subjected to push up or shake inputs, or the prop rod is subjected to inadvertent bump inputs. The inputs are applied by evaluators in a subjective (non-standard) manner.

1.2 Applicability. This standard is to be used on all vehicles having a hood which is held open with a prop rod.

1.3 Remarks. The inputs to the hood or prop rod are based on a number of different events (e.g., wind gusts, plant line loads as the vehicle is moved on the assembly line, inadvertent customer bump, etc.)

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 Test Sign-off Sheet
- CG4871 Videos for Hood Prop Rod Retention Test

3 Resources

3.1 Facilities. A test laboratory with resources to conduct the test per GM and local safety requirements is required. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

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. For test vehicle or Body In White (BIW) buck setup:

3.2.1 Bedplate. Approximately 4 m (length) × 4 m (width) of bedplate space is needed, depending on the length and width of the buck/vehicle. Alternatively, the vehicle could be set up on a flat floor.

3.2.2 Overhead Crane. An overhead crane or other lifting device of sufficient capacity to lift the body structure and allow installation onto bedplate.

3.2.3 Fixtures for proper restraining of the vehicle or buck.

3.2.4 Floor jacks and supports to adjust incline/decline angles to $\pm 11^\circ$.

3.3 Test Vehicle/Test Piece. A vehicle/buck representing production content and build with a fully trimmed hood assembly, hood hinges, prop rod, and prop rod to body attachments. A body buck can be used in place of the vehicle but ground to hood height must be equal to vehicle level to get valid test results. The test property must be fixtured as necessary to prevent unsafe movement of the property during test inputs.

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3.4 Test Time.

Calendar time: 3 d

Test time: 6 h

3.5 Test Required Information. Hood, prop rod and related hardware design and build level must be confirmed to be worthy of test readiness.

3.6 Personnel/Skills. Test engineer must know how to safely secure the test area and test property during the all test conditions.

4 Procedure

4.1 Preparation.

4.1.1 Confirm that the latest version of hardware is being utilized.

4.1.2 BIW buck as test property: The body must be tied down to prevent any movement.

4.1.3 Full Vehicle as test property: The vehicle should be constrained by blocks/chokes so that the tires cannot roll.

4.1.4 Open the hood and support it with the prop rod. For safety during the test, place a support fixture or its equivalent to prevent the hood from unintended closure. An example is shown in Figure B1.

4.2 Conditions.

4.2.1 Environmental Conditions. Test at ambient room temperature.

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.

4.2.3 Safety Instructions. See also, Section 6.

4.2.3.1 Conduct the test in a secured a test area (preferred in a test lab that meets all safety requirements/codes) with controlled perimeter and at ambient temperature.

4.2.3.2 Use of orange cones or caution tape is recommended in an open work area.

4.2.3.3 Set up the test vehicle on a flat and dry surface with open hood supported by the prop rod such that if the hood drops due to prop rod disengagement, the hood will be caught safely and prior to causing any injury to the participants. (See Figure B1 and Figure B2 in Appendix B for examples.)

4.3 Instructions.

4.3.1 Before start of test, the hood system must be signed off for test worthiness using CG583 form for design and build of prop rod, hood and hinges. The performance (pass/fail) requirements and test method must be specified.

4.3.2 Park the test vehicle/buck safely. Use of parking brake and/or tire blocks is recommended, if applicable.

4.3.3 Position the vehicle/buck horizontally (for the level surface) or at 20% grade (for the incline/decline surface). The evaluator shall be standing at a level that simulates standing on the ground level for that vehicle attitude (0 degree, 11° incline and 11° decline). A shop ladder may be required to accomplish this.

4.3.4 Record the results in Data Sheet A1 in Appendix A.

4.3.5 The hood should be set up in the open position with the use of the prop rod. The test engineer or design release engineer must ensure that the prop rod is engaged properly with the intended slot for the prop rod.

4.3.6 Where possible, a video camera may be used to record all inputs and results.

4.3.7 At minimum, representatives from Design Release, Validation and Testing must complete the subjective tests. Invite additional participants from Analysis, Vehicle Program, Safety and System Engineering groups as needed.

4.3.8 Trim Push Test. Apply reasonable push up loads to the trim attachment locations to make sure that the prop rod remains engaged. This condition simulates plant installation of the trim components such as hood blanket, bumpers, seals, etc. For example videos, refer to CG4871 Videos for Hood Prop Rod Retention Test.

4.3.8.1 Do not intentionally bump the prop rod at the same time.

4.3.8.2 Record the results in Data Sheet A1 in Appendix A.

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4.3.9 Hood Shake Test. Apply shake inputs to the hood in the on center and off center positions (anywhere on the hood). For example videos, refer to CG4871 Videos for Hood Prop Rod Retention Test.

For each of the three locations;

4.3.9.1 Apply subjective shake inputs with one or both hands on the hood for 30 s.

4.3.9.2 Do not touch the prop rod during the test.

4.3.9.3 Record the results in Data Sheet A1 in Appendix A.

4.3.10 Prop Rod Bump Test. Bump the prop rod in any direction from any location on the rod. The intent is to simulate a person who is fixing something under hood gets up with a tool or wrench in the hand and accidentally bumps the rod. For example videos, refer to CG4871 Videos for Hood Prop Rod Retention Test.

4.3.10.1 Do not push up on the hood while bumping the prop rod.

4.3.10.2 Record the results in Data Sheet A1 in Appendix A.

4.3.11 If the prop rod disengages during the test, document all information about the inputs in the Problem Resolution Tracking System (PRTS).

4.3.12 If the prop rod remains engaged through all the subjective evaluations, the prop rod is considered to have met minimum acceptable requirement.

4.3.13 Set the test property in incline position of 20% grade (11°) and repeat the Trim Push, Hood Shake and Prop Rod Bump tests. See Figure B3.

4.3.14 Set the test property in decline position of 20% grade (11°) and repeat the Trim Push, Hood Shake and Prop Rod Bump tests. See Figure B4.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. Not applicable.

5.3 Test Documentation. The test report should include summary of data from data sheets collected from each evaluator. A template of the data sheet is included in this procedure.

6 Safety

This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.

7 Notes

7.1 Glossary. Not applicable.

7.2 Acronyms, Abbreviations, and Symbols.

BIW	Body in White
GSSLT	Global Subsystem Leadership Team
PRTS	Problem Resolution Tracking System

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