



Child Restraint Fitment Study

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 is to summarize the considerations and steps necessary to conduct a Child Restraint System (CRS) Fitment Study/Child Restraint System Evaluation (CRS-Eval). The Fitment Study is a means to determine the ease of installation and removal of child restraint systems utilizing the Lower Anchors and Top Tethers for Children (LATCH) system and the vehicle safety belts (as applicable) in all rear seating positions. It is applicable to all rear seating positions in all GM vehicles sold in North America.

Note: This procedure may be used to perform a fitment series on a GM vehicle with various seating configuration's.

Note: It is not the intent of this document to provide the level of detail necessary to evaluate each function when conducting a test. See best practice for further detail. The supplier shall work with the GM Design Responsible Engineer to comprehend this requirement.

1.2 Applicability. It applies to all rear seating positions in all GM vehicles sold in North America.

1.2.1 Guidance for interpreting Federal Motor Vehicle Safety Standards (FMVSS) requirements may be obtained from Safety Regulations and Certification. (See FMVSS 225).

1.3 Remarks. This procedure has been written to incorporate the procedures common to the Fitment Study.

1.3.1 The test procedures and conditions pertinent to this specific test configuration or any additional considerations in a given test shall be found in corresponding procedures.

1.3.2 It is advantageous to obtain data from each vehicle seating configuration from a vehicle program to demonstrate fitment of the North American market child restraint systems to that vehicle. It remains the responsibility of the Validation Engineer or other GM responsible engineer to select a suitable vehicle and reconcile the various test conditions and considerations to accomplish this objective.

2 References

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

2.1 External Standards/Specifications.

FMVSS 213 FMVSS 225

2.2 GM Standards/Specifications.

None

2.3 Additional References.

- Best Practice SAFINT-16. The supplier shall work with the GM Design Responsible Engineer to comprehend this requirement.
- CRS-Eval Workbook Cover Page/Test Request
- Owner's Manual

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3 Resources.

3.1 Facilities. The Vehicle Safety and Crashworthiness Laboratory (VSCL) Suppression Lab at Milford Proving Ground or an indoor/garage facility equipped with the current list of Child Restraint Systems (CRS) used for the fitment study.

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.

3.2.1 Test facility as described in 3.1.

3.2.2 Still imaging for photo-imaging documentation purposes, available at facility described in 3.1.

3.2.3 FMVSS 213 compliant CRS identified in the current CRS Fitment Study list, as determined by the Child Safety Vehicle Performance Owner (VPO). If issues are encountered, additional current CRS may be evaluated to gain a better understanding of the issue.

3.2.4 Hand fixture/force gauge provided by test requester for CRS installation effort measurements at bight line of the seat. See Figure 3.

3.3 Test Vehicle/Test Piece. A test vehicle as supplied by the vehicle platform. Integration Vehicle Engineering Release (IVER) vehicle/test vehicle with production intent equipment, including but not limited to, Lower Anchors and Top Tethers for Children (LATCH) components, leather/vinyl vehicle rear seats and head restraints, seatbelts, buckles, trim, etc. Essentially, any component that may interface with a child restraint system installation needs to be production intent. A test vehicle will need to be obtained for every vehicle seat configuration of every vehicle program unless a vehicle seat can be judged from another configuration, or if the seats can be changed within the vehicle.

3.4 Test Time.

Calendar time: 3 days

Test hours: Not applicable

Coordination hours: Not applicable

Note: Consider prep and actual test. Analysis of data is separate time.

3.5 Test Required Information. CRS-Eval Workbook/Test Series.

3.6 Personnel/Skills. Certified Child Passenger Safety Technician, technician to support retrofits, data processor, imager and engineering personnel trained in the procedure, methods and equipment used.

4 Procedure

4.1 Preparation. The test requester/validation engineer shall provide the information to complete a CRS-Eval Workbook Cover Page/Test Request to the Vehicle Safety and Crashworthiness Laboratory (VSCL) engineer/appropriate engineer.

4.1.1 Preliminary Vehicle Preparation. There may be part retrofits and modifications to the test vehicle prior to the start of the physical test build. This is to ensure the test vehicle represents current designs/production intent. These will be defined in the comments section of the CRS-Eval Workbook Cover Page/Test Request. The requester needs to ensure that the test property represents production intent prior to the assessment.

4.1.2 Set-up. The seat being evaluated and the seat immediately in front of the seat being evaluated should be positioned in mid fore/aft and full down with the seat backs set at design angle. If needed, the seat(s) can be adjusted to provide the minimum amount of space needed for proper installation. When seat adjustment is needed it should be conducted in this sequence:

- The seat being evaluated should be moved rearward (if the seat is adjustable).
- The seat immediately in front of the seat being evaluated should be moved forward, and
- Finally, the seatback immediately in front of the seat being evaluated should be angled forward.

All seat adjustments should be measured and documented in the CRS-Eval Workbook.

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