GM	WORLDWIDE ENGINEERING STANDARDS	General Specification	GMW17078

Assist Handle Assembly

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.

Note: The use of **shall** in this document denotes a binding provision that must be adhered to unless a deviation is granted in writing by the responsible Program Team Leadership and/or the component/subsystem Bill of Material (BOM) BOM Family Owner (BFO). The use of **should** denotes a preference or desired conformance, which if not adhered to, must be documented and disclosed to General Motors. Unless otherwise noted, all requirements apply over the conditions and useful life as described herein. General Motors shall be the final arbiter of performance if the requirements stated herein are not objectively defined. The design and execution of the Assist Handle Assembly must be in accordance with the application regulations of Section 2.

1.1 Purpose. This standard is a General Motors Global Document. All requirements herein shall be adhered to as GM Global Requirements for the Assist Handle Assembly except where noted for specific GM programs.

1.1.1 This standard establishes performance requirements, design constraints, and validation requirements for an Assist Handle Assembly. The requirements contained in this document only apply to parts released under this version of requirements when included in supplier Statement of Requirements (SOR).

1.1.2 The Analysis/Development/Validation (ADV) plan shall be complete per SOR Validation Appendix G2 requirements and any new standards/Component Technical Specification (CTS) updates at Integration Vehicle Material Required Date (IV/MRD) included in the Design Review Based on Failure Modes (DRBFM) and/or peer reviews, with validation considerations considered in that process, and effected via Engineering Work Order (EWO) for program specific standard updating. The program team shall contact Global Technology Engineering (GTE) to ensure the latest standard templates are being used.

1.2 Applicability. The main purpose of the Assist Handle Assembly is to provide a decorative, functional trim component to the Overhead System. The Assist Handle Assembly also provides packaging provisions for coat hooks and lighting when required.

1.3 Remarks. The Assist Handle Assembly is listed under the following Uniform Parts Classification (UPC), Functional Name Address (FNA) and Bill of Material (BOM) nomenclature.

- **UPC** = 1C3J
- **FNA** = 4208A and 4300A HANDLE Assembly (ASM) - Roof Rail (R/RL) Assist (ASST)
- **BOM Row** = 433.05 Assist Handle Assembly Row

2 References

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

2.1 External Standards/Specifications.

CMVSS 201	FMVSS 201	GSO 98	TRIAS 48
ECE R21.01	FMVSS 302	ISO/TS 16949	

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2.2 GM Standards/Specifications.

GMW3059	GMW7293	GMW14118	GMW14573
GMW3115	GMW7294	GMW14233	GMW14797
GMW3116	GMW8518	GMW14234	GMW16331
GMW3118	GMW14011	GMW14264	GMW17079
GMW3121	GMW14089	GMW14444	

2.3 Additional References.

- Assist Handle Assembly Best Practices
- Best Practice Number KPAC MVSS201-1
- Best Practice Number KPAC MVSS201-4
- Bill of Process for Assist Handle Assembly Systems
- CG3500
- Design Appearance Requirements (DAR)
- Design Best Practices
- Dimensional Technical Specification (DTS)
- GM Engineering Materials and Process Standards
- GM Global Legal Database
- GM Human Vehicle Integration (HVI) Socrates web site
- GM Legal Staff Requirements
- GM Materials Specification
- GM Supply Power
- Incomplete Vehicle Document
- Manufacturing Technical Specification (MTS)
- Master Process Documents (MPD)
- Owner's Manual
- Recycled Materials File
- Roof Rail Air Bag (RRAB) Subsystem Technical Specification (SSTS)
- Service Manual
- SOR Appendix B
- SOR Appendix C2
- SOR Appendix F5
- SOR Appendix F7
- SOR Appendix F10
- SOR Appendix H
- SOR Validation Appendix G2
- Squeak and Rattle Noise Glossary
- Supplier Process Monitoring Plan
- Vehicle Technical Specification (VTS)
- World Vehicle Regulation Manual (WVRM)

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3 Requirements

3.1 System/Subsystem/Component/Part Definition. The Assist Handle Assembly for a vehicle interior is defined as the part that is shipped to the assembly plant for installation of the component into the vehicle. This typically includes:

- Handle
- Mounting Bezel
- Screws/Fasteners
- Pivot
- Damper
- Spring
- Coat Hook, as required
- Lamp, as required

3.1.1 Appearance. The Assist Handle Assembly shall reflect the vehicle interior-styling theme in accordance with the brand character. It also reflects the design quality as expressed in surface attributes such as material texture, grain, color and gloss, as well as the execution of joints, interfaces (fit, flush and alignment). Statement of Requirements (SOR) Appendix F5 and/or SOR Appendix F10 defines the program grain, color and gloss requirements. The SOR Appendix F7 or SOR Appendix B defines the fit and finish Dimensional Technical Specification (DTS) requirements for execution of joints, and interfaces. The SOR Appendix F7 or SOR Appendix B also provides Key Product Characteristics/Perceived Quality Characteristic (KPC/PQC) and part drawing tolerance and locating requirements.

3.1.2 Content. The required physical and functional content for the Assist Handle Assembly are identified in SOR Appendix B - General Program Description.

3.1.2.1 Physical Content. The required physical and functional content for the Assist Handle Assembly are identified in SOR Appendix B - General Program Description, (e.g., see items; 3.1.2.1a thru 3.1.2.1h).

a. Handle
b. Mounting Bezel
c. Screws/Fasteners
d. Pivot
e. Damper
f. Spring
g. Coat Hook, as required
h. Lamp, as required

Note: Include sub-components that help define the subsystem such as acoustic materials, ingress/egress handles, interior lighting components (e.g., courtesy lamps, reading lamps), coat hooks, fasteners, sealing and anti-itch materials, etc.

3.1.2.2 Functional Content. The Assist Handle Assembly should provide basic functions as described here.

3.1.2.2.1 An aesthetic appearance that covers the sheet metal and is in harmony with the rest of the vehicle interior.

3.1.2.2.2 A secure and stable position when in use to the occupants.

3.1.2.2.3 Kinetic energy absorption to satisfy CMVSS 201U and FMVSS 201U Head Impact requirements.

3.1.2.2.4 A soft feel (tactility) for intentional and unintentional vehicle occupant contacts.

3.1.2.2.5 Color fastness, durability, clean-ability, resistance to environmental influences, and retention of physical integrity.

3.1.2.2.6 Allow for Roof Rail Air Bag (RRAB) deployments.

3.1.2.2.7 A means for providing illumination of the interior for entry, exit and/or reading. (Lighting function as required).

3.1.2.2.8 A means for retaining garments, and hangers (coat hook function as required).

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3.1.2.2.9 A means of assisting occupants with vehicle entry and exit and providing stability.

3.1.3 Ambient Environment. Reference the Vehicle Technical Specification (VTS) for ambient environment. The Assist Handle Assembly must meet the performance requirements identified in this specification while operating within these environmental conditions. Temperature ranges recommended are -30 °C to 85 °C unless otherwise defined in the VTS. VTS documents calling out temperatures outside this range, will require parts to be able to be operated, but not necessarily be fully functional at extreme temperature. Full function shall return to the assembly within the recommended temperature range.

3.1.3.1 Low Temperature Requirement. For the vehicles sold in selected countries only, see Appendix A, Table A1, the cold temperatures can be modified as shown in Table 1.

Table 1: Low Temperature Deviation Temperatures

Assumes Tinted Glass Usage	Low	Normal	High
Overhead Surfaces	-20 °C	Not applicable	95 °C
Relative Humidity	0%	10% to 80%	100%

3.1.3.2 High Temperature Requirement. For the vehicles sold in selected countries only, (See Appendix A, Table A2), the hot temperatures can be modified as shown in Table 2.

Table 2: High Temperature Deviation Temperatures

Assumes Solar Glass Usage	Low	Normal	High
Overhead Surfaces	-30 °C	Not applicable	65 °C
Relative Humidity	0%	10% to 80%	100%

3.1.3.3 Thermal/Humidity Environment. The anticipated operating conditions relative to temperature and humidity are listed in the VTS.

Note: If no requirements are identified in the VTS then default to; 0 to 100% humidity.

3.1.3.4 Shipping and Storage Environment. The anticipated shipping and storage conditions relative to temperature and humidity are 90 °C and 50% Relative Humidity (RH) or program specific. There are shipping conditions which are unique and could be more severe than the environment inside a vehicle. These conditions must be anticipated and designed for when designing garnish trim and when designing shipping containers.

3.1.4 Interfaces.

3.1.4.1 External-To-Vehicle to Subsystem: General Assembly Process. Vehicle Assembly Process imposes product requirements for the Assist Handle Assembly.

3.1.4.1.1 Modularity: Component Retention to Substrate. The extent of modularity is program and/or region specific. When modularity is required the Assist Handle Assembly shall be securely retained to the Overhead Substrate in such a manner as to withstand the rigors of shipping and the vehicle assembly process.

3.1.4.1.2 Ergonomics During Assembly. The installation process of the Assist Handle Assembly shall meet GM ergonomic and assembly requirements in all regions (i.e., weight, fastener insertion force, etc.) Requirements can be found in GMW14234. Additionally, all installation related Occupational Safety and Health Administration (OSHA) requirements shall be met in North America.

3.1.4.2 Subsystem to Subsystem. The following paragraphs describe interfaces between the Assist Handle Assembly and other subsystems with which it has a physical or functional relationship.

3.1.4.2.1 Assist Handle Assembly Best Practices. The Assist Handle Assembly shall conform to the Assist Handle Assembly Best Practices located in Enterprise Engineering Knowledge System (E2KS). The Assist Handle Assembly Best Practice Knowledge Set is stored in Interior Community of Practice (CoP). A detailed list of Assist Handle Assembly Best Practices will be located in SOR Appendix B.

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3.1.4.2.2 Safety Management.

3.1.4.2.2.1 Head Impact. The Assist Handle Assembly contributes to vehicle compliance with FMVSS 201U-Upper Interior Impact. The Assist Handle Assembly shall include energy absorbing features that contribute to vehicle-level compliance to the requirements of FMVSS 201U. The Assist Handle Assembly shall be designed to meet all applicable Best Practices included in the FMVSS 201U Knowledge Set. Contact the appropriate safety performance engineer for details and requirements.

3.1.4.2.2.1.1 In the initial design of the Assist Handle Assembly, the Assembly shall be restricted to the design features listed in Best Practice Number KPAC MVSS201-1, and packaging boundaries found in KPAC MVSS201-4, or the most recent successors. Deviations from these Best Practices require the approval of the responsible FMVSS 201 Performance Engineer and the BOM Leader.

3.1.4.2.2.2 Roof Rail Air Bag. All vehicles, which incorporate Roof Rail Air Bag (RRAB) are to meet the following:

The Assist Handle Assembly shall provide all necessary requirements and accommodations for the Roof Rail Air Bag by performing as further indicated in this section.

3.1.4.2.2.2.1 Attachments/Anchors: The Assist Handle Assembly shall have sufficient points of attachment to withstand the deployment loads of the RRAB without substantially dislodging from design. The number and location of added fasteners will vary depending on included hard fastening points and deployment forces imparted to the Roof Trim Subsystem (RTS).

3.1.4.2.2.2.2 Deployment: The Assist Handle Assembly structural/mechanical properties shall meet the deployment mode requirements by flexing as necessary.

3.1.4.2.2.2.3 Air Bag Performance: The Assist Handle Assembly shall not detrimentally delay Air Bag deployment per GMW3115, GMW3118 and GMW3121 or direction granted by the responsible vehicle performance engineer, through temperature ranges of -30 °C to +85 °C.

Any components or fragments of the Assist Handle Assembly that partially or fully separate from the Roof Trim Subsystem (through fracture or dislodging) shall be evaluated for functional deficiency or injury potential to the occupant during the RRAB deployment through temperature ranges of -30 °C to +85 °C. Any component that diminishes the function of the RRAB or is judged to have injury potential shall be corrected-as evaluated by the RRAB/Assist Handle Assembly Product Development Team (PDT) members.

The Assist Handle Assembly shall not damage the RRAB itself during deployment.

The Assist Handle Assembly shall not present sharp or rough edges that may cut or snag the RRAB during deployment.

The Assist Handle Assembly shall not prevent the RRAB from meeting the deployment requirements as specified in GMW3115, GMW3118 and GMW3121.

For system validation with environmentally conditioned components, aging of the Assist Handle Assembly shall be completed according to GMW3118 unless otherwise stated in the SOR Validation Appendix G2; aging of the RRAB shall be completed according to the RRAB Subsystem Technical Specification (SSTS). System testing shall be completed according to RRAB validation specification.

3.1.5 Usage Definition. The range of physical dimensions of the user population for which the Assist Handle Assembly requirements herein apply are bounded by the 5th percentile female and the 95th percentile male.

3.2 Product Characteristics. The extent of modularity is program and/or region specific. When modularity is required the Assist Handle Assembly shall be securely retained to the overhead substrate in such a manner as to withstand the rigors of shipping and the vehicle assembly process.

3.2.1 Performance Requirements. The following paragraphs specify the functional performance requirements for the Assist Handle Assembly. The component is to perform as specified prior to and after exposure to durability and environmental conditioning as designated.

3.2.1.1 Material and Part Performance: Material and material related part performance requirements are specified in the SOR Appendix F10. The Assist Handle Assembly shall meet the appropriate material related part performance requirements per GMW14444. **Note:** The following approvals shall be required as applicable: plastic, paint, textile, construction and color approval as defined in SOR Appendix F10. Additionally, adhesive requirements will be contained in the SOR Appendix F10, if required.

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3.2.1.2 Color/Gloss/Grain/Appearance. The requirements for the Assist Handle Assembly relative to color/gloss/grain/appearance are identified in SOR Appendix F5 and later a color and trim Design Appearance Requirements (DAR).

3.2.1.3 Interior Fittings. The Assist Handle Assembly shall meet Export ECE R21.01, CMVSS 201 and FMVSS 201 requirements for all countries that a vehicle is being exported to per program.

3.2.1.4 Other Regulatory Requirements. The Assist Handle Assembly shall meet FMVSS 302 and other flammability requirements, including TRIAS 48 and GSO 98.

3.2.1.5 Assist Handle Assembly (Roof Rail Mounted). The Assist Handle Assembly aids occupants with riding stability, ingress, and egress to the vehicle. It shall also meet the following:

3.2.1.5.1 The Assist Handle Assembly shall have a primary attachment to the body structure using Taptite 2000 threaded fasteners or other GM approved fasteners.

3.2.1.5.2 For installation, there shall be an operator assist feature to hold the handle open, allowing access to install the threaded fastener.

3.2.1.5.3 For attachment clips, the installation loads shall be less than 50 N for palm installation, 15 N for finger or thumb installation, and shall meet the ergonomics guidelines as called for in 3.1.4.1.2.

3.2.1.5.4 Assist Handle Ultimate Load. The Assist Handle ultimate load requirement is program specific relative to standard performance, as shown in Figure 1, Force S1 and as identified below.

3.2.1.5.4.1 Standard Ultimate Load Performance: New Corporate Common Component (CCC) or program-specific assist handles shall run a component level test, to define the packaging envelope, as well as confirm the handle withstands the following loads:

- 1000 N Vertical +23 °C
- 750 N Vertical Load +85 °C
- 700 N Load at 45 Degree Pull in Vehicle Position +23 °C
- Load shall be applied for a minimum 30 s: Width of load strap is 50 mm, load should be applied at a rate of 35 N/s. Parts shall soak at each temperature for a minimum of 1 h before having load applied.

3.2.1.5.4.1.1 All programs using the assist handle shall demonstrate vehicle level compliance: Using Computer Aided Engineering (CAE), model the 1000 N vertical load at +23 °C. If CAE is not available, run the 1000 N vertical load at ambient in a vehicle to ensure the full system meets requirements. The assist handle assembly shall withstand a downward vertical load that is held for 30 s and shall not have loss of function and show no signs of material degradation or deformation. If physical testing is required, the assist handle shall be fixtured in sheet metal or mounted in vehicle.

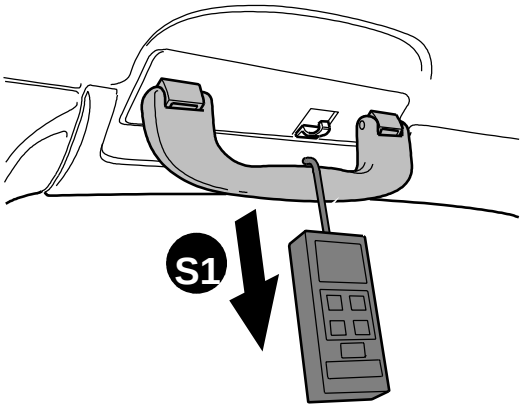

Figure 1: Ultimate Load in Vertical Direction (S1 = Force S1)

3.2.1.5.4.2 Pull Down Moment (Hinged Handles). The Assist Handle shall not move under its own weight with the vehicle in rest or in motion in all driving conditions. Normally this movement would be observed in the Squeak and Rattle Requirements of 3.2.1.5.4.3.

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