



Overhead Miscellaneous Plastic (Sensor Farm Cover, Plastic Dog House/Magnet Towers, Closeout Caps, and Overhead Console Back Plate)

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) 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 Overhead Miscellaneous Plastic must be in accordance with the application regulations of Section 2.

Note: This standard is a General Motors Global Document. All requirements herein shall be adhered to as GM Global Requirements for the Overhead Miscellaneous Plastic except where noted for specific GM programs.

1.1 Purpose. The main purpose of the Overhead Miscellaneous Plastic is to provide requirements for:

- **Sensor Farm Cover** - provides a decorative and functional trim covering of the camera and sensors on the front glass.
- **Inside Rear View Mirror (ISRV) Cover Assembly** - provides a decorative and functional trim covering of the wiring on the front glass.
- **Dog House/Magnet Towers** - provide a solid structure to allow for installation of clips or magnets to the roof metal.
- **Closeout Caps/Covers** - provide a decorative and functional trim covering for openings in the Overhead Assembly to cover sheet metal.
- **Overhead Console Retainer** - provides a secure carrier to allow the console to be attached to the overhead in a method that supports the assembly from the supplier to the main assembly line.
- **Locator Pins** - Provide a method of locating the overhead assembly during installation to the vehicle.
- **Sunroof Trim Ring/Reinforcement** - provides a lightweight reinforcement behind the sunroof opening of the overhead assembly.
- **Headliner Stiffeners/Reinforcements** - provides lightweight reinforcement to the overhead assembly, to help the headliner resist creasing or aid in handling of the overhead.
- **Center Seat Belt Covers** - provide a finished opening for the seat belt to exit the headliner for use by the customer.
- **Headliner Bezels** - provide a finished appearance and hide overhead trim edges at openings in the overhead.
- **Active Noise Cancelling (ANC) Bezel and Microphone Retainer** - provides a finished appearance for the Active Noise Cancelling (ANC) hardware as well as mounting provisions for the ANC Microphone.
- **Center High Mounted Stop Lamp (CHMSL) Cover** - provides a finished appearance and hides the Center High Mounted Stop Lamp (CHMSL) hardware, plus it blocks any stray light emitted from the CHMSL assembly.

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July 2015

Page 1 of 22

1.2 Applicability. This standard established performance requirements, design constraints, and validation requirements for an Overhead Miscellaneous Plastic. The requirements contained in this document only apply to parts released under this version of requirements when included in supplier Statement of Requirement (SOR).

1.2.1 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) be 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 the Global Technology Engineering (GTE) to ensure the latest standard templates are being used).

1.3 Remarks. The Overhead Miscellaneous Plastic is listed under the Uniform Parts Classification (UPC), Functional Name Address (FNA) and Bill of Material (BOM) nomenclature.

Sensor Farm Cover

- **UPC** = 1A2D
- **FNA** = 2934B Cover-W/S M/Func Sen Mt Brkt
- **BOM Row** = 40.3:03 Overhead Miscellaneous Plastic Row

Sensor Farm Cover Closeout

- **UPC** = 1A2D
- **FNA** = 2934K Insert-W/S M/Func Sen Mt Brkt Cvr
- **BOM Row** = 40.3:03 Overhead Miscellaneous Plastic Row

Inside Rear View Mirror (ISRV) Cover Asm

- **UPC** = 12H
- **FNA** = 6353A Cover Asm-I/S RR View Mir Wrg Harn
- **BOM Row** = 40.3:03 Overhead Miscellaneous Plastic Row

Dog House/Magnet Towers

- **UPC** = 1C3M
- **FNA** = 0051D Dog House/Retainer Plate
- **BOM Row** = 433.98 Overhead Miscellaneous Plastic Row

Closeout Caps/Covers

- **UPC** = 1C3M
- **FNA** = 0050L Cover-Bolt Hole
- **BOM Row** = 433.98 Overhead Miscellaneous Plastic Row

Overhead Console Retainers

- **UPC** = 1C3M
- **FNA** = 5652B Plate-Rf Cnsl Bkg
- **BOM Row** = 40.3:03 Overhead Miscellaneous Plastic Row

Locator Plate/Pins

- **UPC** = 1C3M
- **FNA** = 0055B/D Locator/Locator Plate
- **BOM Row** = 433.01.03 Overhead Miscellaneous Plastic Row

Sunroof Trim Ring/Reinforcement

- **UPC** = 1C3M
- **FNA** = 0100B Sunroof Reinforcement Ring
- **BOM Row** = 433.98 Overhead Miscellaneous Plastic Row

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July 2015

Page 2 of 22



Documents

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Headliner Stiffeners/Reinforcements

- **UPC** = 1C3M
- **FNA** = 0052B Stiffener-Hdlnng T/Pnl
- **BOM Row** = 40.3:03 Overhead Miscellaneous Plastic Row

Center Seat Belt Covers/Backing Plate

- **UPC** = 1A2R
- **FNA** = 2644B Bezel RR Seat Ctr Belt Opng
- **BOM Row** = 40.3:03 Overhead Miscellaneous Plastic Row

Headliner Bezels

- **UPC** = 1C3M
- **FNA** = See SOR Appendix B
- **BOM Row** = 40.3:03 Overhead Miscellaneous Plastic Row

ANC Bezel

- **UPC** = 12L
- **FNA** = 2099B Grille Active Noise Cancellation Mic
- **BOM Row** = 40.3:03 Overhead Miscellaneous Plastic Row

ANC Microphone Retainer

- **UPC** = 12L
- **FNA** = 0365A Microphone Active Noise Canc
- **BOM Row** = 40.3:03 Overhead Miscellaneous Plastic Row

CHMSL Cover

- **UPC** = 1C3M
- **FNA** = See SOR Appendix B
- **BOM Row** = 40.3:03 Overhead Miscellaneous Plastic Row

2 References

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

2.1 External Standards/Specifications.

CMVSS 201	FMVSS 101	FMVSS 209	TRIAS 48
CMVSS 302	FMVSS 201	FMVSS 302	TS 16949
ECE R21.01	FMVSS 205	GSO 98	
ECE R43	FMVSS 208	KMVSS Article 95	

2.2 GM Standards/Specifications.

GMW3059	GMW6992	GMW14124	GMW15609
GMW3115	GMW7293	GMW14234	GMW16331
GMW3116	GMW7294	GMW14444	GMW16793
GMW3118	GMW8518	GMW14573	
GMW3121	GMW14011	GMW14797	
GMW3232	GMW14089	GMW14892	

2.3 Additional References.

- Best Practices (The supplier shall work with the GM Design Release Engineer to comprehend this requirement).
- Best Practice Number KPAC MVSS 201-X
- Design Appearance Requirements (DAR)

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July 2015

Page 3 of 22



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- Development Planning Schedule
- Dimensional Technical Specification (DTS)
- GM Global Legal Database
- GM Human Vehicle Integration (HVI) Socrates Web site
- GM Legal Staff Requirements
- GM Supply Power
- Human Factors Design Objectives (HFDO)
- Manufacturing Technical Specification (MTS)
- Master Process Documents (MPD)
- Owner's Manual
- Part Global Dimensioning and Tolerancing (GD&T) Drawing
- Potential Contaminants Section of the Program Specific Vehicle Technical Specification (VTS)
- Program-Specific Assembly Procedures
- SOR Appendix B (CG2360)
- SOR Appendix C2 (CG2180)
- SOR Appendix F5 (CG2186)
- SOR Appendix F7
- SOR Appendix F10
- SOR Appendix H (CG3503)
- SOR Validation Appendix G2 (CG1419)
- Squeak and Rattle Noise Glossary
- Supplier Process Monitoring Plan
- Vehicle Technical Specification (VTS)
- World Vehicle Regulation Manual (WVRM)

3 Requirements

3.1 System/Subsystem/Component/Part Definition. The Overhead Miscellaneous Plastic shall cover the Body in White (BIW) Upper Inner Structure, and give an integrated impression and convey a quality image, when applicable. The Overhead Miscellaneous Plastic will provide provisions for mounting the other components of the Roof Trim Subsystem (RTS), when applicable.

- a. The Overhead Miscellaneous Plastic covers portions of the vehicle's roof underside while enhancing the vehicle's interior appearance. In some applications, this panel also may be required to provide structural reinforcement to the roof panel of the vehicle, or Overhead Assembly.
- b. The Overhead Miscellaneous Plastic for a vehicle interior is defined as the parts that are shipped to the assembly plant or Value Added Assembler (VAA) or Supplier Tier 1, for installation to the vehicle or overhead assembly. This typically can include:
 - Sensor Farm Cover
 - Dog House/Magnet Towers
 - Closeout Caps/Covers
 - Overhead Console Back Plate
 - Locator Pins
 - Sunroof Trim Ring/Reinforcement
 - Headliner Stiffeners/Reinforcements
 - Center Seat Belt Covers

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July 2015

Page 4 of 22

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- ANC Grilles
- Overhead Bezels
- CHMSL Cover
- c. Features may need to be provided for a Value Added Assembler (VAA) to assemble components to the Overhead Substrate. The Overhead Miscellaneous Plastic supports safety requirements for interior occupant impact and field of vision.

3.1.1 Appearance. The customer visible Overhead Miscellaneous Plastic 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). SOR Appendix F5 and/or SOR Appendix F10 defines the program grain, color and gloss requirements. The SOR Appendix F7 defines the fit and finish Dimensional Technical Specifications (DTS) requirements for execution of joints, and interfaces. The SOR Appendix F7 also provides Key Product Characteristics (KPC)/Perceived Quality Characteristic (PQC) and part drawing tolerance and locating requirements. The color, pattern, aesthetics and other related qualities shall be evaluated and approved by the responsible engineering department as an acceptable match to the engineering approval sample when viewed under conditions set forth in GMW6992.

3.1.1.1 Covers or caps may be released to cover all visible headliner trim edges in an aesthetic manner. Additionally, the Miscellaneous Plastic shall not demonstrate the following conditions when viewed from a normal standing or sitting position, inside or outside of the vehicle.

- Pin Holes
- Cut Edges
- Flow Lines
- Blisters
- Cracks
- Intake Point
- Discoloring
- Varnish Burrs
- Sink Marks
- Flashes
- Tool Parting Lines
- Frayed Material

3.1.2 Content.

3.1.2.1 Physical Content. The typical content of Overhead Miscellaneous Plastic system shall consist of Sensor Farm Cover, Dog House/Magnet Towers, Closeout Caps, and the Overhead Console Back Plate. The required physical and functional content for the Overhead Miscellaneous Plastic are identified in SOR Appendix B - General Program Description.

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), Overhead Substrates, fasteners, sealing and anti-itch materials, etc.

3.1.2.2 Functional Content. The Overhead Miscellaneous Plastic should provide the basic functions described.

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 for all components, which are functional to the occupants.

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

3.1.2.2.4 Color fastness, indentation recovery, durability, cleanability, resistance to environmental influences, and retention of physical and structural integrity.

3.1.2.2.5 Structural reinforcement of the vehicle roof panel.

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July 2015

Page 5 of 22

3.1.2.2.6 Vibration damping of the vehicle roof panel.

3.1.2.2.7 A secure and stable support for attachments or fasteners.

3.1.2.2.8 A secure and stable carrier for the Overhead Console, Sun Visor, Assist Handles, etc.

3.1.3 Ambient Environment. Reference the Vehicle Technical Specification (VTS) for ambient environment. The Overhead Miscellaneous Plastic 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. Sensor Farm Covers, ISRV Covers and CHMSL Covers or materials mounted in close proximity with all vehicle glazing will see higher temperatures and should be heat stable to a minimum temperature of 105 °C.

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 Miscellaneous Plastic Trim and when designing shipping containers. (Parts located in the vehicle that test at 105 °C are exempt from this requirement, due to the heat stability demonstrated in the normal testing such as environmental stability.)

3.1.3.4.1 Clip Retention in Shipping and Storage Environment. The retention force of the clip to the fastener retaining feature shall be in a range of 10 N to 30 N. The insertion force of the clip to the fastening retaining feature shall be in a range of 1 N to 20 N.

3.1.3.4.2 Adhesion in Shipping and Storage Environment. Adhesively applied components shall remain retained to trim at the elevated temperatures used in shipping environments. Anticipated temperatures are 90 °C and 50% Relative Humidity (RH) or program specific. To check the adhesion, run the Adhesion test per GMW14892, using the preceding temperature. Do not use the full environmental cycle, but soak the trim in a chamber for 4 h, prior to testing the trim. For Pressure Sensitive Adhesive (PSA) applications, ensure the backing film/tape remains intact to the adhesive throughout the test. At end of test, backing will remain 100% attached to the adhesive on the entire adhesive surface.

3.1.3.5 Contaminants. The contaminants which may come in contact with the Overhead Miscellaneous Plastic are described in the Potential Contaminants Section of the Program Specific VTS.

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July 2015

Page 6 of 22

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3.1.4 Interfaces.

3.1.4.1 External-To-Vehicle to Subsystem: General Assembly Process. Vehicle Assembly Process imposes product requirements for the Overhead Miscellaneous Plastic.

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 Overhead Miscellaneous Plastic 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 Roof Trim Subsystem Mechanical Integrity during Assembly. The Roof Trim Subsystem (RTS) with added Miscellaneous Plastic Stiffeners (if applicable) shall have sufficient stiffness to permit handling without folding during installation and sufficient toughness and resiliency to avoid any noticeable crease lines/marks after installation is complete. Program-Specific Assembly Procedures apply and are listed in the Value Added Assembler (VAA) SOR if applicable.

3.1.4.1.3 Ergonomics during Assembly. The installation process of the Overhead Miscellaneous Plastic 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. Interfaces between Overhead Miscellaneous Plastic and other subsystems with which it has a physical or functional relationship.

3.1.4.2.1 Overhead Miscellaneous Plastic Best Practices. The Overhead Miscellaneous Plastic shall conform to the Overhead Miscellaneous Plastic Best Practices located in Enterprise Engineering Knowledge System, (E2KS). The Overhead Miscellaneous Plastic Best Practice Knowledge Set is stored in Interior Community of Practice (CoP). The supplier shall work with the GM Design Release Engineer to comprehend this requirement.

3.1.4.2.2 Safety Management.

3.1.4.2.2.1 Head Impact. The Overhead Miscellaneous Plastic contributes to vehicle compliance with FMVSS 201U-Upper Interior Impact. The Overhead Miscellaneous Plastic shall include energy absorbing features that contribute to vehicle-level compliance to the requirements of FMVSS 201U. The Overhead Miscellaneous Plastic 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. The supplier shall work with the GM Design Release Engineer to comprehend this requirement.

3.1.4.2.2.1.1 The initial design of the Overhead Miscellaneous Plastic shall be restricted to the design features listed in Best Practice Number KPAC MVSS 201-X, or its most recent successor. Deviations from this Best Practice require the approval of responsible FMVSS 201 Performance Engineer on the program. All countermeasures must meet the requirements of the Materials Specification GMW15609. The supplier shall work with the GM Design Release Engineer to comprehend this requirement.

3.1.4.2.2.2 Roof Rail Airbag. For all vehicles, which incorporate Roof Rail Airbag (RRAB), the following requirements apply:

The Overhead Miscellaneous Plastic shall provide all necessary requirements and accommodations for the Roof Rail Airbag by performing as further indicated in this section.

3.1.4.2.2.2.1 Attachments/Anchors. The Overhead Miscellaneous Plastic shall have sufficient points of attachment to withstand the deployment loads of the RRAB without substantially dislodging from design position excepting the surfaces immediately over and outboard of the RRAB. The number and location of added fasteners will vary depending on included hard fastening points and deployment forces imparted to the Roof Trim System (RTS).

3.1.4.2.2.2.2 Deployment. The Overhead Miscellaneous Plastic will flex as necessary to meet the RRAB deployment requirements. The interfaces with Garnish and the Overhead substrate structural/mechanical properties shall meet the deployment mode requirements by flexing as necessary. It may be necessary to add stiffeners, scoring and/or a formed bend-lines etc., in the B-surface to retard/promote bending during deployment. Any needed hinge or fold line shall be defined in math, and shall be generally reproducible. The hinge or fold line shall not create show side appearance related items including read-through, surface flaws, etc.

3.1.4.2.2.2.3 Airbag Performance. The Garnish Trim System (GTS)/Roof Trim Subsystem (RTS) shall not detrimentally delay airbag deployment per GMW3115, GMW3118 and GMW3121 or direction granted by the responsible vehicle performance engineer, through temperature ranges of -30 °C to +85 °C.

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July 2015

Page 7 of 22



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