



Global Master Cylinder Cap Technical Specification

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 specification establishes the quantitative requirements for a master cylinder cap that will be used to cover and vent the brake master cylinder reservoir. The cap is required to cover the reservoir to prevent contamination from entering the safety critical subsystem of the motor vehicle, the brake system. Venting of the cap to atmospheric pressure is required to ensure pressure is not built up excessively within the master cylinder reservoir. The cap shall pass all the requirements in this standard at worst case conditions (material properties, dimensions, etc.)

1.2 Applicability. The cap will be applied to passenger cars and light trucks globally, including Department of Transportation (DOT) 3 and DOT 4 brake fluid applications.

1.3 Remarks. GM Engineering, specifically the Bill of Materials (BOM) BOM Family Owner (BFO), maintains and modifies this document from a template standpoint.

2 References

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

2.1 External Standards/Specifications.

CMVSS 105	UN R13H	FMVSS 135	ISO 9128
CMVSS 135	FMVSS 105		

2.2 GM Standards/Specifications.

GMW3059	GMW14089	GMW16072
GMW3356	GMW14573	

2.3 Additional References.

- GM Material Compatibility Matrix
- GM Material Isolation Guide
- GP-3 of General Motors Targets for Excellence Standard
- GP-7 of General Motors Targets for Excellence Standard
- Part Number (PN) 20760280
- Part Number 22688449
- Part Number 22795537
- Potential Failure Mode and Effects Analysis (PFMEA) Reference Manual, Automotive Industry Action Group

3 Requirements

3.1 System/Subsystem/Component/Part Definition.

3.1.1 Appearance.

3.1.1.1 Color. The cap shall be black with text as detailed in 3.1.1.2. GM Engineering must approve any deviations.

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3.1.1.2 Identification.

3.1.1.2.1 There shall be three (3) basic cap variants depending on platform requirements specified in the program specific component technical specification:

- DOT 3 Cap.
- DOT 4 Cap.
- DOT 3 Cap with Federal Motor Vehicle Safety Standard (FMVSS) 105/135 (Canadian Motor Vehicle Safety Standard (CMVSS) 105/135) wording for use in North America.

3.1.1.2.2 DOT 3 Cap (except for North America) and DOT 4 Cap shall have ISO 9128 symbol (see Figure 1), owner's manual reference (see Figure 1), and "DOT 3" or "DOT 4" (depending on fluid used) brake fluid callout on the base surface of the cap. The cap shall be black (598F Anthracite), with Grain = GMGF 002 Rio, and Gloss = PGH. The ISO 9128 symbol shall be yellow (Pantone 116 or equivalent as per GMW14089) and the lettering shall be white as per the underhood appearance Notice of Action. The ISO brake symbol is required by United Nations (UN) Regulation 13 H (UN R13H) and shall be 20 mm x 20 mm in size. The owner's manual symbol shall be 6 mm x 8 mm in size. The DOT lettering shall be 5 mm in height. Reference GMW14089. Label/paint performance shall be in accordance with GMW14573.

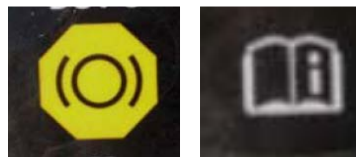


Figure 1: ISO Brake Fluid Cap Symbol and Owner's Manual Reference Symbol

3.1.1.2.3 DOT 3 Cap for North America shall have the FMVSS 105 and FMVSS 135 (CMVSS 105 and CMVSS 135) wording and ISO symbol. The letters must be at least 3.2 mm (1/8 in) high. The lettering shall be white in color, and the ISO symbol shall be yellow as shown in Figure 1. The ISO symbol shall be 15 mm x 15 mm in size.

3.1.1.2.3.1 See Table 1 for symbol wording.

Table 1: Warning Verbiage for Labels

Version	Verbiage
English Version	Warning: Clean filler cap before removing. Use only DOT 3 fluid from a sealed container.
French Version	Avertissement: Nettoyer le bouchon de remplissage avant de l'enlever. Utiliser seulement du liquide DOT 3 provenant d'un contenant scellé.
Alternative French Version	Attention: Nettoyer Le Bouchon Avant Depose. N'Employer Que Du Liquide De Frein DOT 3 Provenant D'Un Bidon Scelle.

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3.1.1.2.3.2 The general layout of the text for the cap shall be as shown in Figure 2.

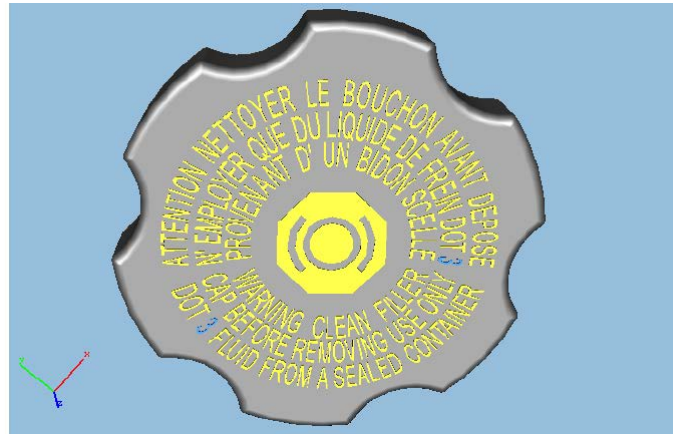


Figure 2: General Layout for DOT 3 Cap for North America

3.1.1.2.3.3 Shape of the cap shall be the same as Part Number (PN) 22688449.

3.1.1.2.3.4 GM reserves the right to restrict the use of any supplier identification placed on the component. Identification and marking shall be in accordance with GP-7 of General Motors Targets for Excellence Standard.

3.1.2 Content.

3.1.2.1 Physical Content. Not applicable.

3.1.2.2 Functional Content. Not applicable.

3.1.3 Ambient Environment. The cap shall be designed to operate underhood under the temperature and humidity ranges shown in Table 2.

Table 2: Underhood Temperature and Humidity Range

Requirement	Cap Assembly
Minimum Temperature	-40 °C
Maximum Sustained Temperature (> 10 minutes)	100 °C
Minimum Excursion Temperature (< 10 minutes)	-40 °C
Maximum Excursion Temperature (< 10 minutes)	120 °C
Shipping Temperature	-50 °C
Relative Humidity Range	0% to 100%

3.1.4 Interfaces.

3.1.4.1 Reservoir Neck. The cap shall be designed to interface with the reservoir neck shown in Appendix A, Figure A1.

3.1.4.2 Assembly/Disassembly. The torque required to remove the reservoir cap must exceed 0.5 N·m and shall not exceed 14 N·m. The torque required to install the reservoir cap shall not exceed 5 N·m to GM reservoir PN 22795537 matching the dimensions in Appendix A, Figure A1.

3.1.5 Usage Definition. Not applicable.

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