



Dimensional Engineering Global General Notes

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 Scope.

This standard defines the generic content, format, and configuration of standardized general notes applied to 3-dimensional Embedded Geometric Dimensioning and Tolerancing (EGDT) (3-Dimensional Graphical Representation (3D) EGDT) datasets and/or 2-dimensional Geometric Dimensioning and Tolerancing (2-Dimensional Graphical Representation (2D) Geometric Dimensioning and Tolerancing (GD&T)) drawings. This standard shall apply to all global regions.

1.1.1 Figure Notes. Notes within figures that are shown as upper case are intended to appear on finished 2D drawings or 3D datasets. Notes in lower case are explanatory only and are not intended to appear on finished 3D EGDT datasets or 2D GD&T drawings.

1.1.2 Keyword Application. The words “shall/must/required” describe an absolute requirement. Procedural steps or processes defined by these words must be followed.

The words “should/preferred/recommended” describe preferences. Procedural steps or processes defined by these words must be followed whenever there is no valid reason to do otherwise.

The words “acceptable/allowed/may/might” grant permission. The use of these words does not require or recommend the practice or procedure they specify; nor do they forbid or discourage alternative practices.

1.2 Application of the Notes.

1.2.1 The General Note. General notes provide additional information intended to clarify requirements for items shown on 3D datasets and/or 2D drawings. General notes are designed to support 3D EGDT dataset and 2D GD&T drawing creation and are intended to be in compliance with American Society of Mechanical Engineers (ASME) Y14.5 as amended by the GMW16812 and all relevant infoBOOK requirements.

1.2.1.1 General Note Usage. The use of general notes support a tolerancing method which allows for simplified drawing/dataset creation that provides fully contented part drawings and/or datasets. The arrangement of general notes shown on 3D EGDT datasets or 2D GD&T drawings shall not be interpreted as an order of precedence or sequence of priority unless specified as such on the drawing or dataset.

1.2.1.2 General Note Intent. The content and format of general notes are meant to apply globally and shall be used in all regions.

1.2.1.3 Globalization. The purpose of general notes globalization is to establish a common baseline for uniform communication practices and 3D EGDT dataset/2D GD&T drawing content. Regardless of the designated homeroom region, a 3D EGDT dataset or 2D GD&T drawing may be used by other regions to produce new or carryover parts/assemblies without requiring the drawing or dataset to be revised or recreated to satisfy specific regional requirements.

1.3 Definitions. The following terms are defined as to their use within this standard.

1.3.1 “New” 3D EGDT Dataset. A “new” 3D EGDT dataset is any part or assembly math model designated as an initial release, requiring new tooling and/or checking fixtures, that contains associative embedded geometric dimensions, tolerances and/or notes (EGDT/Product Manufacturing Information (PMI)).

1.3.2 “New” 2D GD&T Drawing. A “new” 2D GD&T drawing is any drawing designated as an initial release requiring new tooling and/or checking fixtures. Program content may indicate that individual parts or

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assemblies are derived from existing programs, however, when tooling and/or checking fixtures are new construction, the drawing shall be considered “new”.

2 References

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

2.1 External Standards/Specifications.

ASME Y14.5

2.2 GM Standards/Specifications.

GMW15541

GMW16812

2.3 Additional Reference.

GM infoBOOK (GD&T Requirements, Embedded GD&T Application Requirements and all relevant infoBOOK requirements)

3 Requirements

3.1 The 3D Model View and 2D Drawing Formats. All regions are required to place essential general notes information in the same location on all 2D drawings and appropriate 3D model views. Constancy in format and language used to express essential information is recommended.

3.2 Implementation.

3.2.1 All Regions. This standard shall apply to all “new” 3D EGDT datasets and all “new” 2D GD&T drawings created after the release of this document. All 3D EGDT datasets and 2D GD&T drawings shall make use of the Global General Notes Format as defined within this document and supported by other standards and/or documents identified in the reference section of this document.

3.2.2 New 3D EGDT Datasets and 2D GD&T drawings. All “new” 3D EGDT datasets and “new” simplified 2D GD&T drawings shall be created and formatted per the guidelines contained within the applicable infoBOOK documents – Global GD&T Drawing Format Requirements (GGDFR), GD&T Requirements, and Embedded GD&T Application Requirements.

3.3 General Notes.

3.3.1 Global Detail General Note. See Appendix B, Figure B1.

3.3.2 Global Assembly General Note. See Appendix B, Figure B2, Figure B3 and Figure B4.

Note: Global assembly general notes are used on all 2D control drawings and 3D control datasets where it would be inappropriate to apply detail default tolerances. All critical dimensional requirements must be clearly identified within the body of the 2D drawing or the 3D dataset with feature control frames and/or tolerance dimensions with tolerance values determined by acceptable methods of variation analysis.

3.3.3 Format Requirements. There are two formats associated with the creation and display of global general notes content.

- Simple 2D drawings (drafting annotation)
- EGDT 3D datasets (model annotation)

3.3.3.1 Notes Placement (Simple 2D drawings). All general notes applied to simple 2D drawings reside on page 3 of the 2D drawing format. General notes should appear in the top right hand side of the page, aligned with the assembly diagram (see Figure A1).

3.3.3.1.1 Text Requirements.

- Text Size = 2.5
- Text Style = Blockfont
- Layering = 253

3.3.3.1.2 General Flag Note Requirements

- Symbol Size = 8.0
- Text Size = 2.5

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- Text Style = Blockfont
- Layering = 253

3.3.3.1.3 Structures/Closures Hex Flag Note Requirements.

- Symbol Size = 8.0
- Text Size = 2.5
- Text Style = Blockfont
- Layering = 253

3.3.3.1.4 “Tuning” Flag Note Requirements.

- Symbol Size = 12.7
- Text Content = 1
- Text Size = 2.5
- Text Style = Block font
- Layering = 253

3.3.3.1.5 Datum Target Symbol Requirements.

- Symbol Size = 12.7
- Text Content = A1
- Text Size = 2.5
- Text Style = Block font
- Layering = 253

3.3.3.2 Notes Placement (EGDT 3D datasets). All general notes applied to 3D datasets reside on the appropriate standard modeling view.

EGDT general notes should appear in the top right hand side of the model view boundary. The placement of general notes shall be similar to those applied to 2D GD&T drawings (see Figure A2).

3.3.3.2.1 Text Requirements

- Text Size = 2.5
- Text Style = Block font
- Layering = 252

3.3.3.2.2 General Flag Note Requirements

- Symbol Size = 8.0
- Text Size = 2.5
- Text Style = Block font
- Layering = 252

3.3.3.2.3 Structures/Closures Hex Flag Note Requirements. Hexagonal flag notes currently shown on certain simple 2D GD&T drawings shall not be used on new 3D EGDT datasets that include model based EGDT/PMI.

3.3.3.2.4 “Tuning” Flag Note Requirements

- Symbol Size = 12.7
- Text Content = 1
- Text Size = 2.5
- Text Style = Block font
- Layering = 252

3.3.3.2.5 Datum Target Symbol Requirements

- Symbol Size = 12.7

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- Text Content = A1
- Text Size = 2.5
- Text Style = Blockfont
- Layering = 252

3.3.4 Individual General Note Management.

The Global General Note Format consists of three (3) specific note types:

1. General Information Notes
2. Default Notes
3. Flag Notes

The type of general notes applied to 3D EGDT datasets and 2D GD&T drawings are dependent on the structure of the drawing or dataset (detail, assembly, control, etc.) General note content is determined by the specific part or assembly type (interior trim, chassis/suspension, sheet metal structure, etc.) Various options apply to specific general note types and influence the content of the notes shown on each 3D EGDT dataset or 2D GD&T drawing.

3.3.4.1 General Information Notes. General information notes are designed to provide general or instructional information that would apply to an entire part or assembly but is not specifically communicated by other note types shown on 3D EGDT datasets or 2D GD&T drawings.

General information note content is determined by specific commodity requirements and should be grouped together on page 3 of the 2D drawing format or the general notes model view.

3.3.4.1.1 Common General Information Notes. Common general information notes are those which are included on all 3D EGDT datasets and/or 2D GD&T drawings. Examples of common general information notes are shown in Figure A3.

3.3.4.1.2 Selective General Information Notes. Selective general information notes are those which are selectively applied to a 3D EGDT dataset or 2D GD&T drawing based on the specific requirements of the part or assembly. Examples of selective general information notes are shown in Figure A4.

3.3.4.1.3 Dimensional Deviation Note. A dimensional deviation note is a general information note that may be applied to a 3D EGDT dataset or 2D GD&T drawing in cases where approved specification adjustments and/or manufacturing capability allowances are required.

The specification adjustments are determined by the Production Part Approval Process (PPAP) or other quality assessment activities and documented within a specific exceptions report that is referenced in the body of the note (see Figure A5).

3.3.4.2 Default Notes. Default notes identify predetermined conditions or dimensional requirements that are generically applied to a part or assembly, and/or specific feature types unless otherwise specified directly within the body of a 3D dataset or 2D drawing.

Default note content is determined by specific commodity requirements and should be grouped together on page 3 of the 2D drawing format or the general notes model view.

3.3.4.2.1 Common Default Notes. Common default notes, in most cases, contain generic information that require a selection among available options (e.g., restrained or unrestrained) or the addition of a tolerance value ("most common") and/or a datum reference frame within an appropriate feature control frame shown on the general notes model view of a 3D EGDT dataset or the general notes page of a 2D GD&T drawing (see Figure A6 and Figure A7).

3.3.4.2.2 Selective Default Notes. Selective default notes contain specific information (inspection instructions, clamp force specifications, etc.) which are selectively applied to a 3D EGDT dataset or 2D GD&T drawing based on the specific requirements of the part or assembly (see Figure A8, Figure A9, and Figure A10). Most selective default notes are commodity specific.

3.3.4.3 Flag Notes. Flag notes identify conditions or dimensional requirements that only apply at specific areas or locations of a part or assembly. Each individual flag note shall be identified with an appropriate flag note symbol (see Figure A11). Any generic flag note which is not used in a particular application shall not be included within the general notes shown on 3D datasets or 2D drawings.

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3.3.4.3.1 Structures/Closures Hex Flag Notes. Structures/Closures hex flag notes are used to support the 2D simplified drawing creation process. These hex flag notes are intended to minimize the need to create complete feature control frame displays for each dimensional requirement of a part or assembly. Each Structures/Closures hex flag note included in the general notes set is associated with a specific feature control frame. The specified feature control frames shall include an appropriate tolerance value ("most common") and an appropriate datum reference frame as required (see Figure A12).

Structures/Closures hex flag notes shall not be used on 3D EGDT datasets because the hex note symbols and their corresponding feature control frames shown on the general note model view are not associative (linked) to the appropriate model features.

3.3.4.3.2 "Tuning" Flag Note. A "tuning" flag note is used to identify specific feature(s) on a part or assembly that are intended to be "tuned" or adjusted during part fit/function matching events to achieve "higher level" vehicle dimensional requirements (see Figure A13).

3.3.5 Boundary Keyword Usage. In applications where a default or flag note shown in the general notes set is used to indicate a positional tolerance applied to a noncircular or irregular feature of size on a maximum material condition (MMC) or least material condition (LMC) basis, the keyword "BOUNDARY" may be placed beneath the appropriate feature control frame, but is not required.

4 Notes

4.1 Glossary.

Assembly Dataset: An assembly dataset is a 3D EGDT dataset created to document the dimensional requirements applied to a group of components which will be shipped to a General Motors assembly center as an assembled unit. The complete assembly is considered a single detail part.

Assembly Drawing: An assembly drawing is a 2D GD&T drawing created to document the dimensional requirements applied to a group of components which will be shipped to a General Motors assembly center as an assembled unit. The complete assembly is considered a single detail part.

Chart Dataset: A chart dataset is a 3D EGDT dataset created to document the dimensional requirements applied to a group of parts or assemblies that share similar or identical design geometry. Chart datasets are used to identify the common dimensional requirements that apply to all variants of a particular design as well as the specific dimensional requirements that apply to the unique features of each individual variant of the design. A chart dataset consists of all the math data files associated with each part released on the chart.

Chart Drawing: A chart drawing is a 2D GD&T drawing created to document the dimensional requirements applied to a group of parts or assemblies that share similar or identical design geometry. Chart drawings are used to identify the common dimensional requirements that apply to all variants of a particular design as well as the specific dimensional requirements that apply to the unique features of each individual variant of the design on a single document.

Control Dataset: A control dataset is a 3D EGDT dataset created to document the dimensional requirements applied to subassemblies and/or components assembled at a General Motors vehicle assembly center. All components included in a 3D control dataset represent assembly plant stock, shipped parts/assemblies, and/or other control dataset assemblies.

Control Drawing: A control drawing is a 2D GD&T drawing created to document the dimensional requirements applied to subassemblies and/or components assembled at a General Motors vehicle assembly center. All components included in a 2D control drawing are from assembly plant stock, shipped parts/assemblies and/or other control drawing assemblies.

Dataset: A dataset is a collection of one or more computer files that contain (directly or by reference) the graphic and/or textual representation of the physical and functional requirements of a part or assembly.

Default: A default is a predetermined condition (such as; restrained or unrestrained) or value (such as; dimensional tolerance or surface finish) which is generally applied to a given part or assembly in cases where other specific conditions or values are not otherwise specified within the body of a 3D dataset or 2D drawing.

Default Note: Default notes support the drawing detailing process by eliminating the need to fully content a 3D EGDT dataset or 2D GD&T drawing by allowing the general identification of requirements which, "Unless Otherwise Specified", represent the default requirements applied to the individual part or assembly. The

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