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	TITLE: Dimensioning and Tolerancing Addendum	REVISION: 4
WRITTEN / REVIEWED BY: Dewayne Dimit	APPROVED BY: Truck Design Standards Team	DATE ISSUED: July 2010
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NOTE: This document is required to be revised or reviewed a within a minimum time period as defined in QMS-PR-002.		

INTERNATIONAL TRUCK DIVISION
DIMENSIONING AND TOLERANCING ADDENDUM-2000
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A. INTRODUCTION

International Truck Division has adopted an amended version of the ASME Y14.5M-1994 dimensioning and tolerancing standard (as amended by this addendum) for use on all product engineering documentation.

Note: This addendum is a modification of the 1997 addendum adopted by General Motors Corporation, Chrysler Corporation, and Ford Motor Company. Permission to use and modify this agreement was granted by Alex Krulikowski –GM Team Member of the US Car GD&T Team.

This addendum is created to address the following areas:

1. Select an option from ASME Y14.5M
2. Clarifying a concept from ASME Y14.5M
3. Discouraging the use of a concept from ASME Y14.5M.
4. Including a concept not covered by ASME Y14.5M.

Proposals to revise this addendum are evaluated on an annual basis. When a revision is published, the year of publication will appear in the title of the addendum.

All other standards referenced in ASME Y14.5M have not necessarily been adopted and should not be assumed to be invoked automatically. Current company standards will take precedence unless otherwise specified.

If a conflict exists between ASME Y14.5M-1994 and ASME Y14.5.1M-1994, ASME Y14.5M-1994 is to be used.

Note: Where product engineering documentation is based on this addendum, this fact must be noted on the documentation or in a specification referenced on the document.

B. ACKNOWLEDGMENT

Sections one through six of this document represents the consensus modification by International Truck (Division of International Truck and Engine Corporation) of the members of the US Car Geometric Dimensioning and Tolerancing Team for their sole use (with granted permission).

Team members, whose names appear below, wish to acknowledge the many contributions made by individuals from within their respective organizations, without whose support and assistance this document would not have been possible.

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1. Scope, Definitions, And General Dimensioning

1.1 General

- 1.1.1 Dimensioning And Tolerancing Standard.** Dimensioning and tolerancing shall be in accordance with ASME. Y14.5M-1994 except for the items described in this addendum. References to Y14.5M herein shall mean ASME Y14.5M-1994.

THIS DOCUMENT IS IN ACCORDANCE WITH ASME Y14.5M-1994 AS AMENDED BY THE INTERNATIONAL TRUCK DIVISION DIMENSIONING AND TOLERANCING ADDENDUM—2000.

Figure 1-1 – Note To Invoke International Truck Division Dimensioning and Tolerancing Addendum-2000

- 1.1.2 Titleblock Notes.** The note shown in Fig. 1-1 must appear on drawings, databases, or documents, which are in accordance with the International Truck Division's Dimensioning and Tolerancing Addendum-2000. The note shall be in the titleblock (or in the general notes). The note invokes this addendum.

1.2 Definitions

- 1.2.1 Free State.** The condition where tolerances apply without restraint.

- 1.2.2 Shall:** The word "shall" indicates mandatory requirements

1.3 Default GD&T Tolerance Block (See Figure 1-2)

- 1.3.1 Math Data. (Item#1)** Unless otherwise specified all math data is assumed basic. Geometric tolerances shall be applied. Math Data is the digital, mathematically precise content of the 3D CAD Model. Nominal dimensions of any feature can be derived from the Math Model.

Note: Plus/Minus tolerances used with Math Data specify only the size tolerance of features of size.

- 1.3.2 Profile Tolerance-All Surfaces With Blended Uniformity. (Item#2)** Defines the allowable variation of continuous surfaces. A surface is continuous to the point where the surface has an interrupted change in direction. Blended uniformity requires that the surface is free from interrupted surface variations.

- 1.3.3 Profile Tolerance-All Trim Edges. (Item#3)** Defines the allowable variation of Trim Edges. A Trim Edge is defined as the material thickness of the part at the end of a surface.

- 1.3.4 Hole And Elongated Hole Size Tolerances. (Item #4)** All Holes and Elongated Holes shall have a size tolerance. A plus/minus default tolerance applies to all unspecified holes and elongated holes on the drawing. The nominal sizes for the unspecified holes and elongated holes are defined by math data.

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1.3.5 Positional Tolerance-All Holes. (Items #5) Defines the Positional Tolerance for Cylindrical Features of Size that are not specified by a Feature Control Frame on the drawing.

1.3.6 Positional Tolerance-All Elongated Holes. (Item #6) Defines the Positional Tolerance on Non-Cylindrical Features of Size (Elongated Holes only) that are not defined by a Feature Control Frame on the drawing. The Size, Size Tolerance, and Positional Tolerance of all Features of Size (except Holes and Elongated Holes) must be specified on the drawing.

UNLESS OTHERWISE SPECIFIED:

1.) ALL MATH DATA IS BASIC

2.)

	3	A	B (M)	C (M)
---	---	---	-------	-------

ALL SURFACES WITH BLENDED UNIFORMITY.

3.)

	3	A	B (M)	C (M)
---	---	---	-------	-------

ALL TRIM EDGES.

Figure 1-2 – Default GD&T Tolerance Block

***Note:** Datum reference and tolerances in Figure 1.2 are for example only and shall be specified to reflect individual drawing requirements.*

1.4 Fundamental Rules. Add a new rule (o) to paragraph 1.4 of Y14.5M dimensions apply after heat treatment and/or plating but before painting.

1.5 Dimensions Not To Scale. Add the following sentence to paragraph 1.7.9(b) of Y14.5M. “Complete agreement” means the accuracy shall be within the capability of the CAD system.

1.6 Repetitive Features Or Dimensions. Delete the last sentence of paragraph 1.9.5 of Y14.5M and replace with the following sentence:

***Note:** Where used with a basic dimension, the “X” shall be placed outside the basic dimension frame.*

2. General Tolerancing And Related Principles.

2.1 Perfect Form At MMC Not Required. Add the following to paragraph 2.7.2 of Y14.5M:

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“On a drawing where a titleblock (or general) note is used to override Rule #1, the effects of Rule#1 may be reinstated for an individual feature of size. This is done by adding a straightness tolerance of zero at MMC to the feature of size.”

- 2.2 Relationship Between Individual Features.** In paragraph 2.7.3 of Y14.5M options (a) or (b) are recommended. Option (c) or (d) are not recommended.
- 2.3 Applicability of RFS, MMC, and LMC** In paragraph of 2.8 of Y14.5M, *Alternative Practice* (b) is not recommended.
- 2.4 Statistical Tolerancing.** The use of statistical tolerancing as described in paragraph 2.16 of Y14.5M is not recommended.
- 2.5 Baseline Dimensioning.** When possible, the use of baseline dimensioning relative to datum features is required. The use of chain dimensioning should be avoided. Refer to figures 2-1 through 2-3 for examples. Overall dimensions take precedence over baseline dimensions. Refer to figures 2-2 and 2-3 for examples. Refer to paragraph 2.6 of ASME Y14.5M for additional information.

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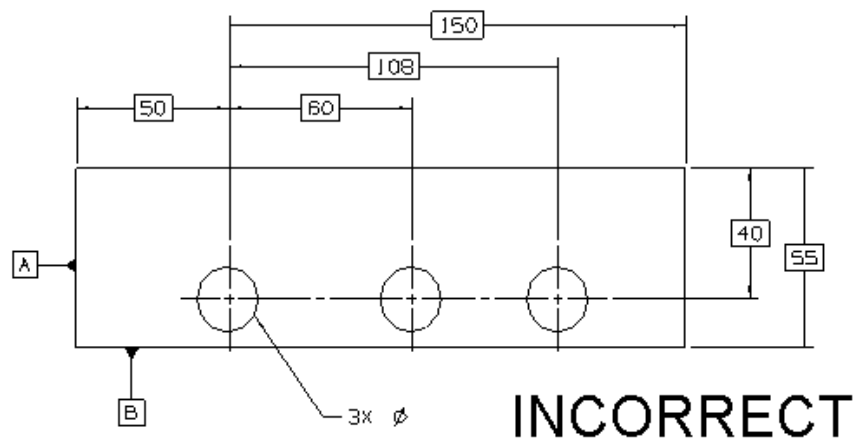
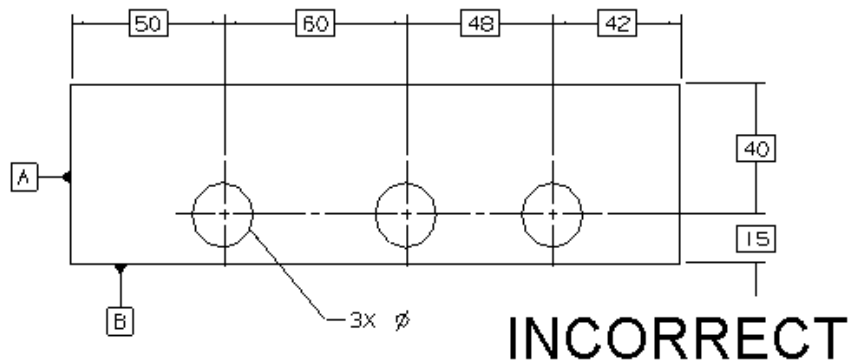
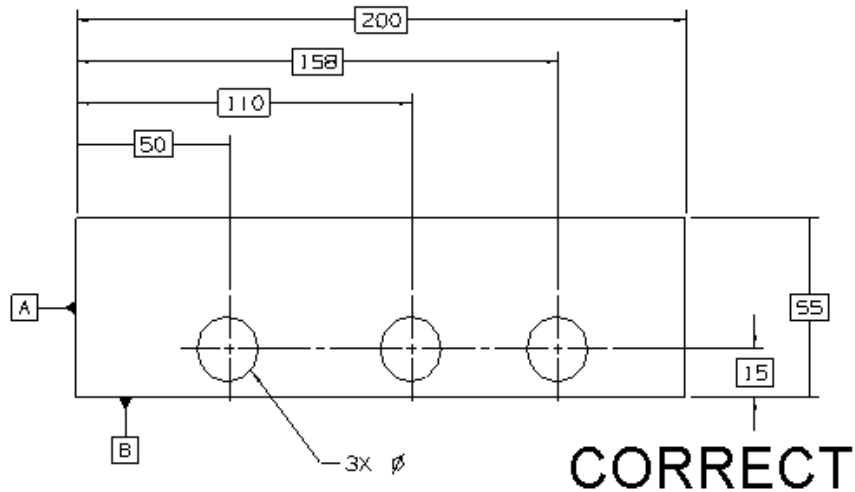


**FIGURE 2-1: USE OF BASELINE DIMENSIONING FROM DATUM FEATURES
-SURFACES AS DATUM FEATURES-**

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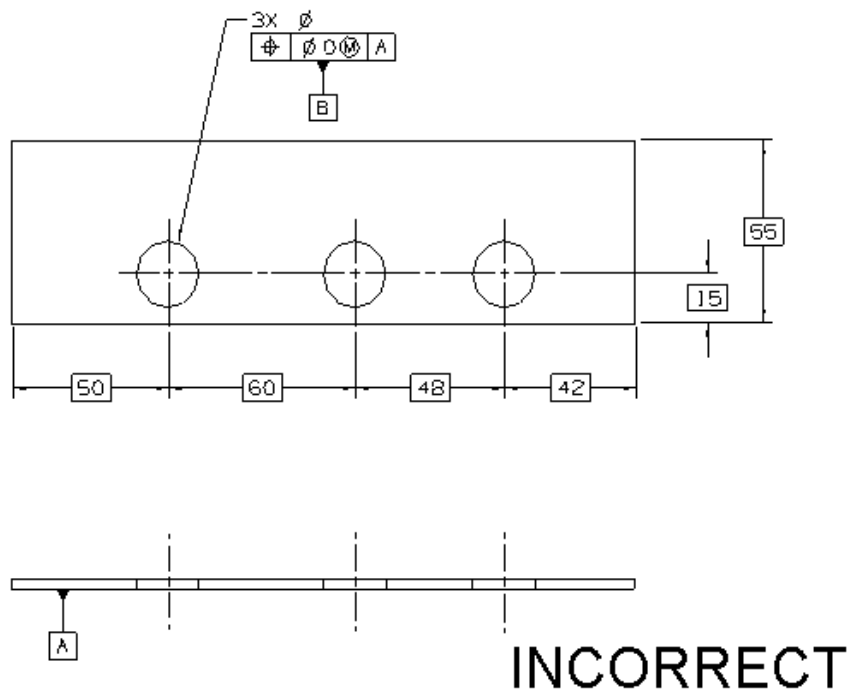
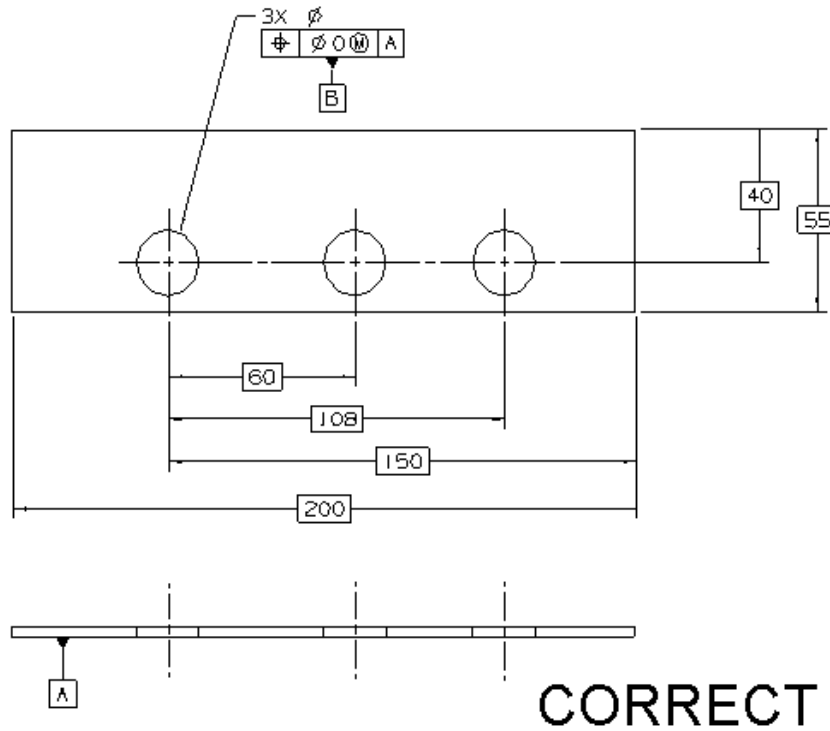


**FIGURE 2-2: USE OF BASELINE DIMENSIONING FROM DATUM FEATURES
-ARRAY OF HOLES AS DATUM FEATURES-**

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