

BLUEPRINT READING FUNDAMENTALS

PRESENTED BY

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Blueprint Reading Fundamentals

Course Outline

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Text: *Print Reading for Industry*, by Walter C. Brown and Ryan K. Brown, The Goodheart–Willcox Company, Inc., 2002.

Course Objectives

Participants will be able to:

- I. Visualize three-dimensional objects while viewing two-dimensional drawings**

- II. Interpret the following on engineering drawings:**
- A. Lines**
 - B. Symbols**
 - C. Section Views**
 - D. Threads and Fasteners**
 - E. Dimensioning**
 - F. Tolerancing**
 - G. Machining Specifications and Surface Quality**
 - H. Title Block**
 - I. List of Materials**
 - J. Drawing Notes**
 - K. Drawing Revision Systems**

Print: The Language of Industry

1. **What is a Print?**
2. **Print Reading**
 - A. **Visualization**
 - B. **Interpretation**
3. **Importance of Print Reading**

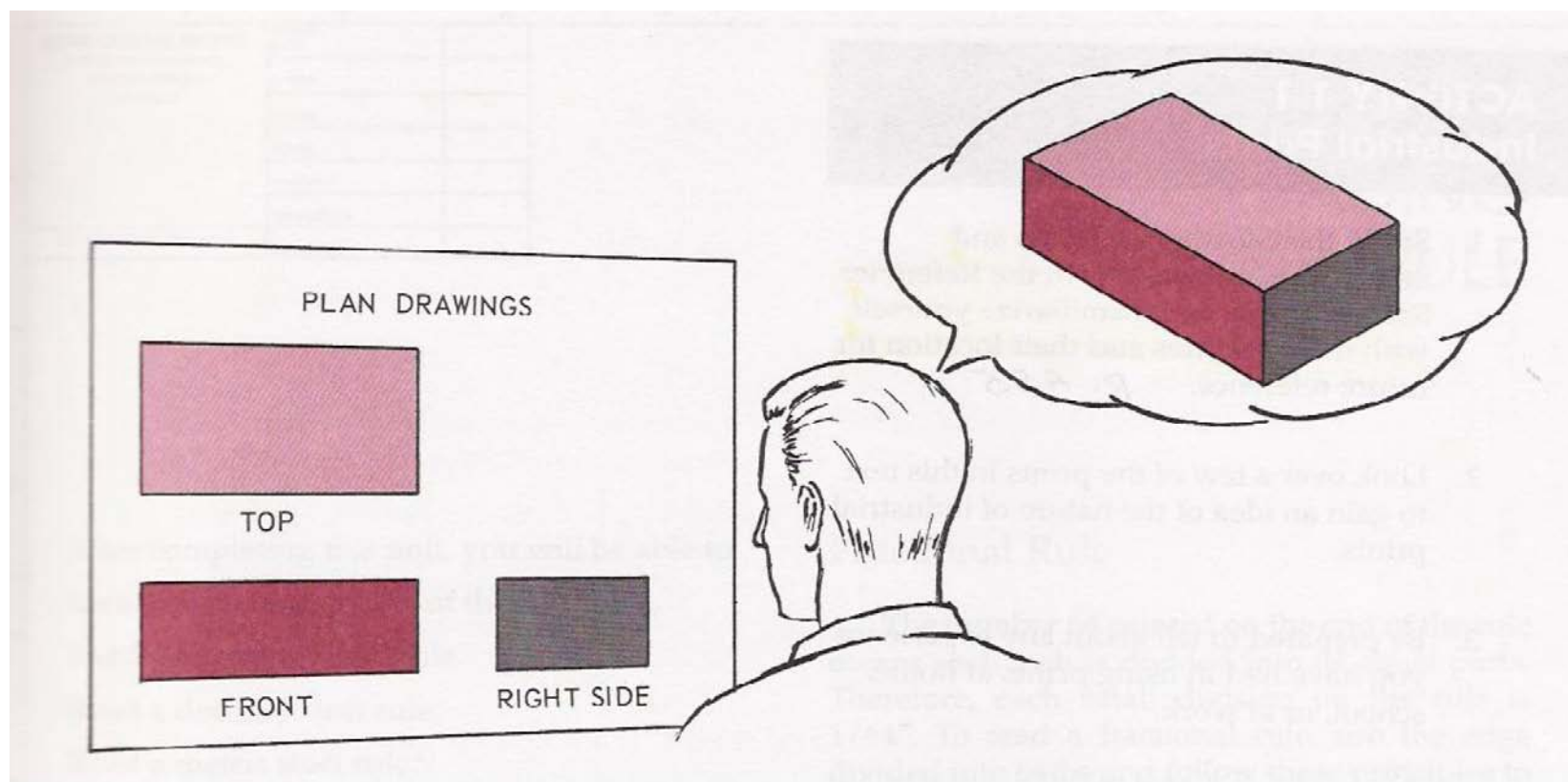
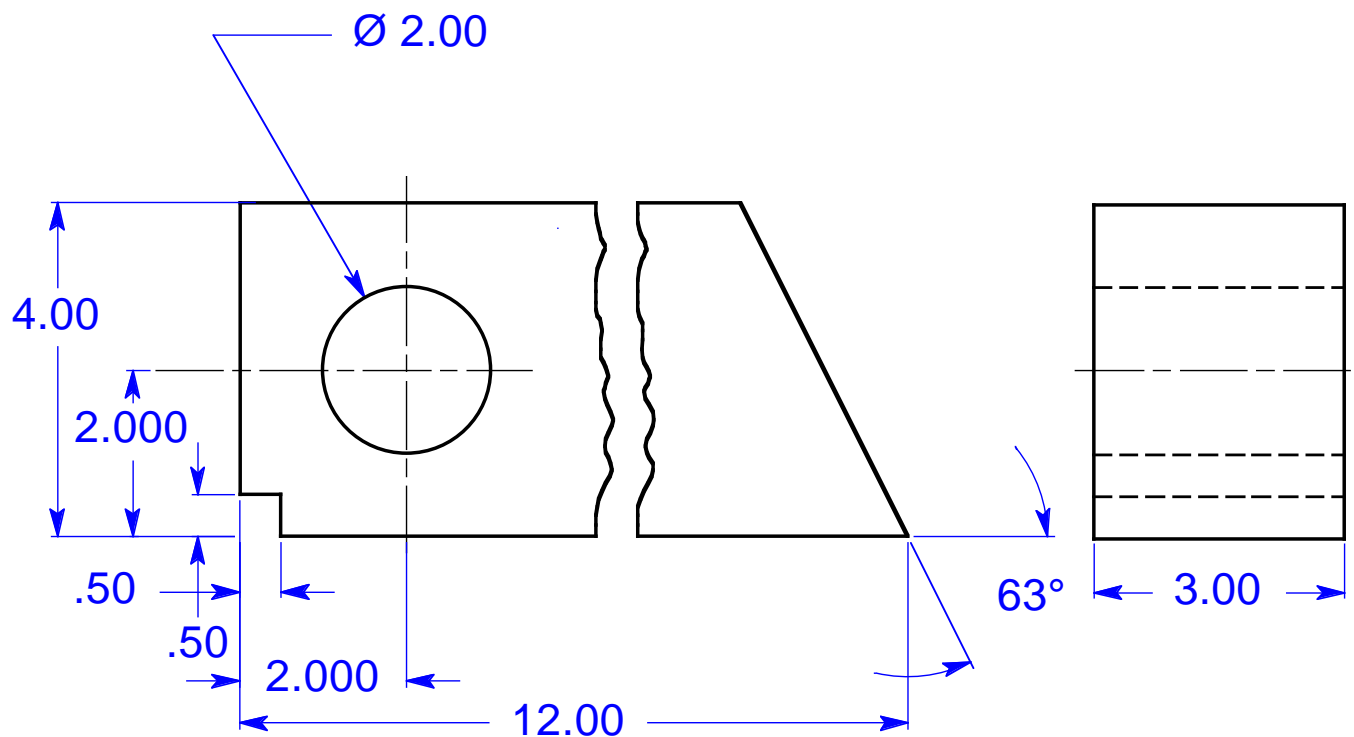


Figure 1-4

Copyright by Goodheart-Willcox

Alphabet of Lines



1. Visible (Object)
2. Hidden
3. Center
4. Leader
5. Dimension
6. Extension
7. Break
8. Phantom

Multiview Drawings

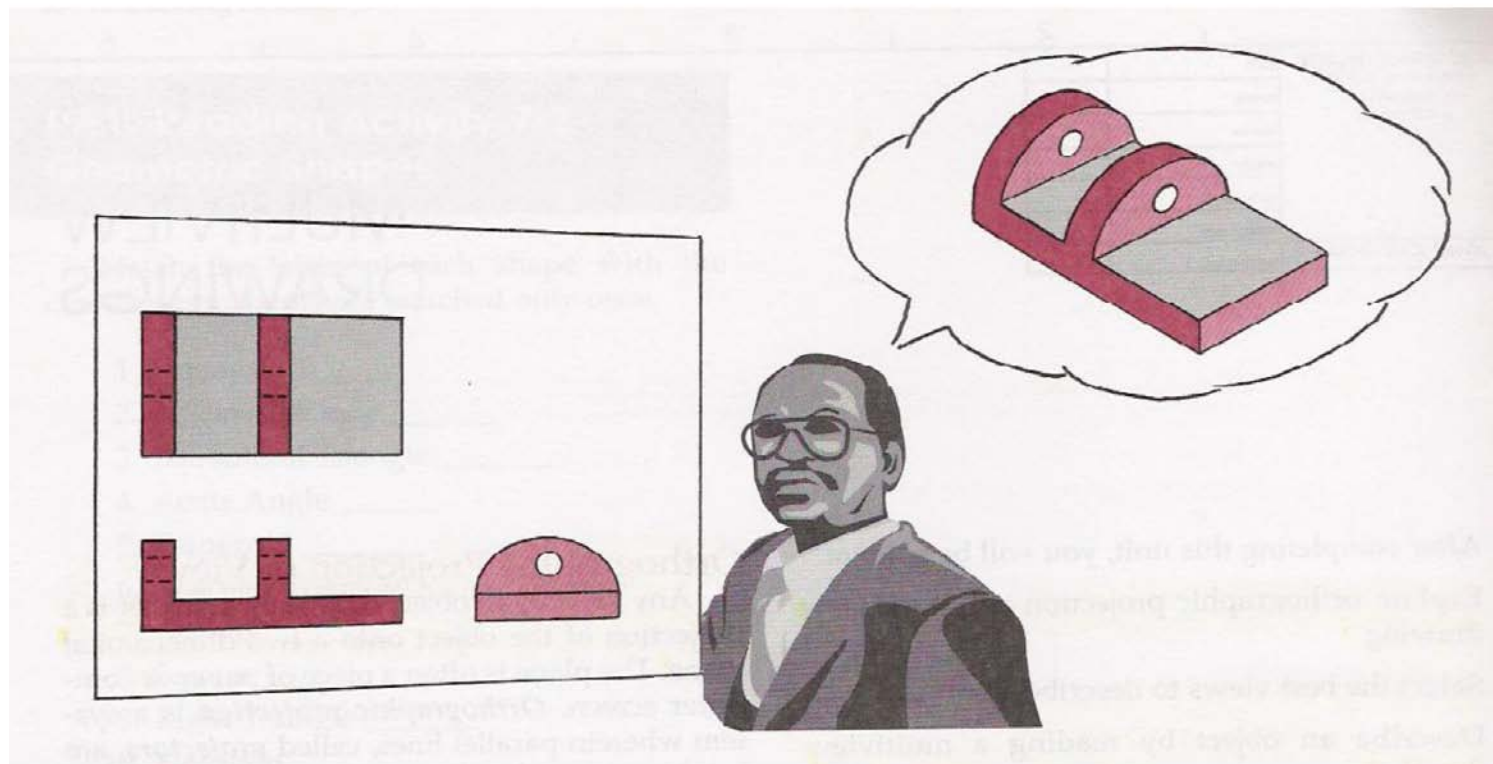


Figure 8-1

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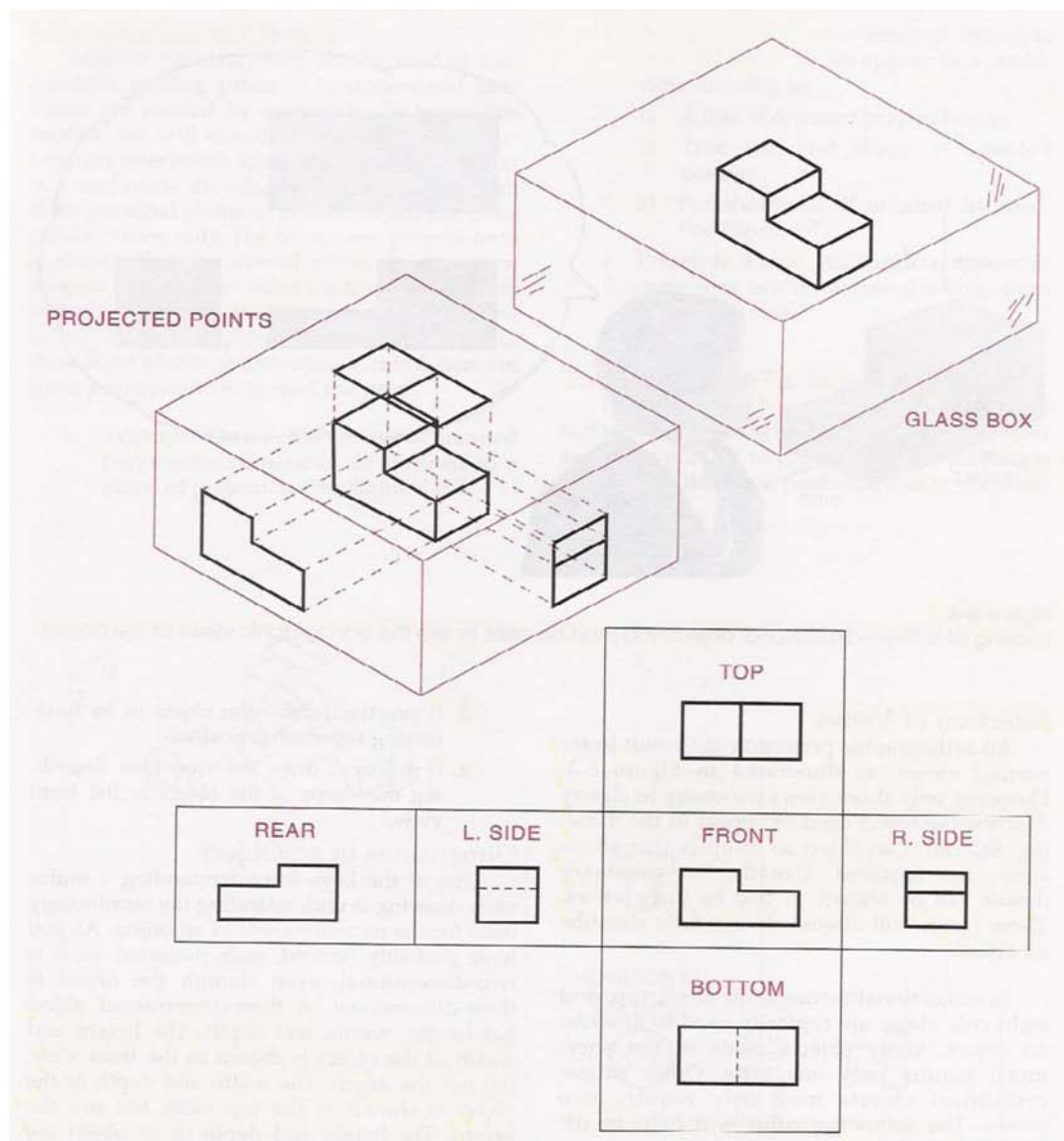


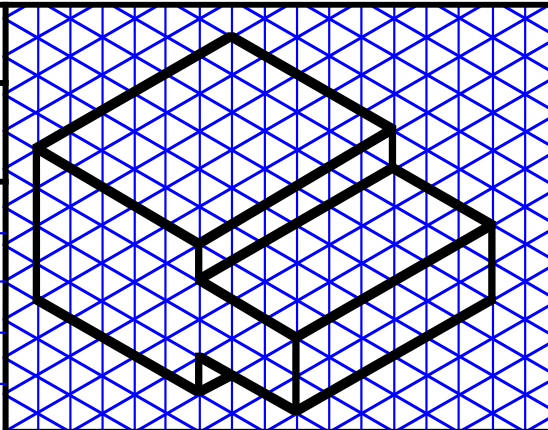
Figure 8-3

PICTORIAL

Drawn by

FILE NO.

DRAWING



Section Views

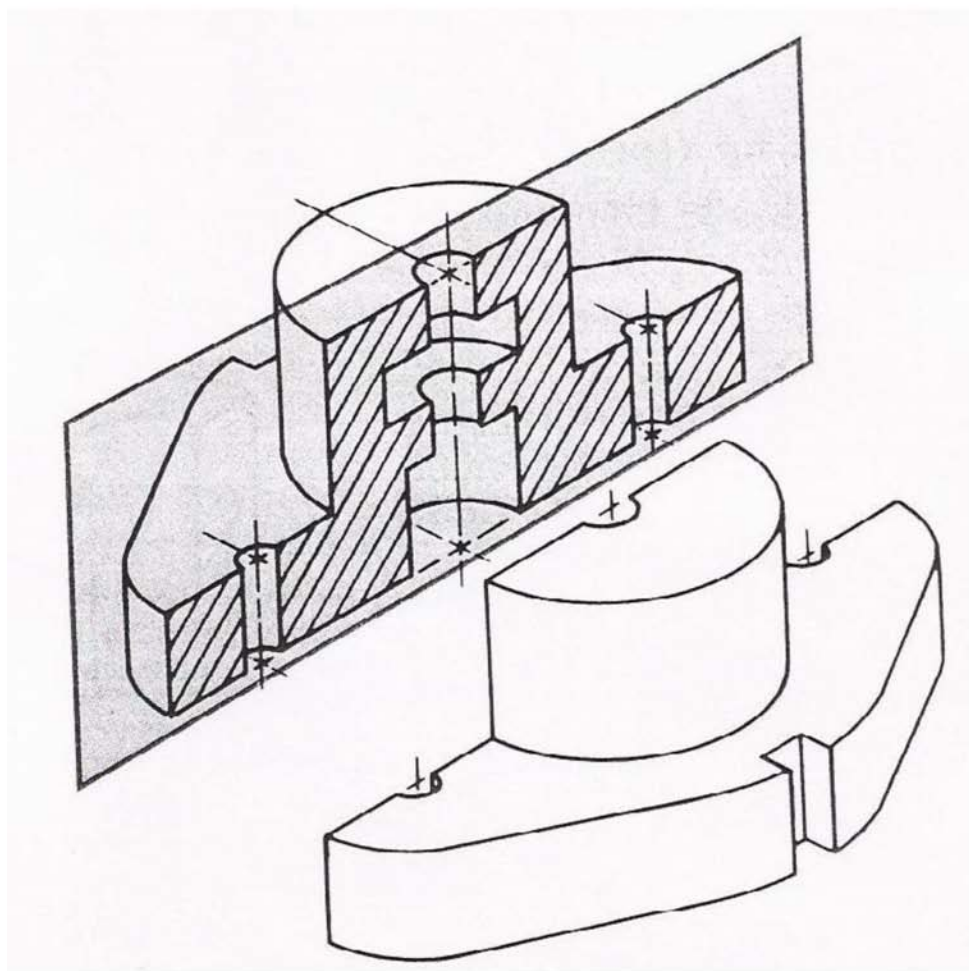


Figure 10-1

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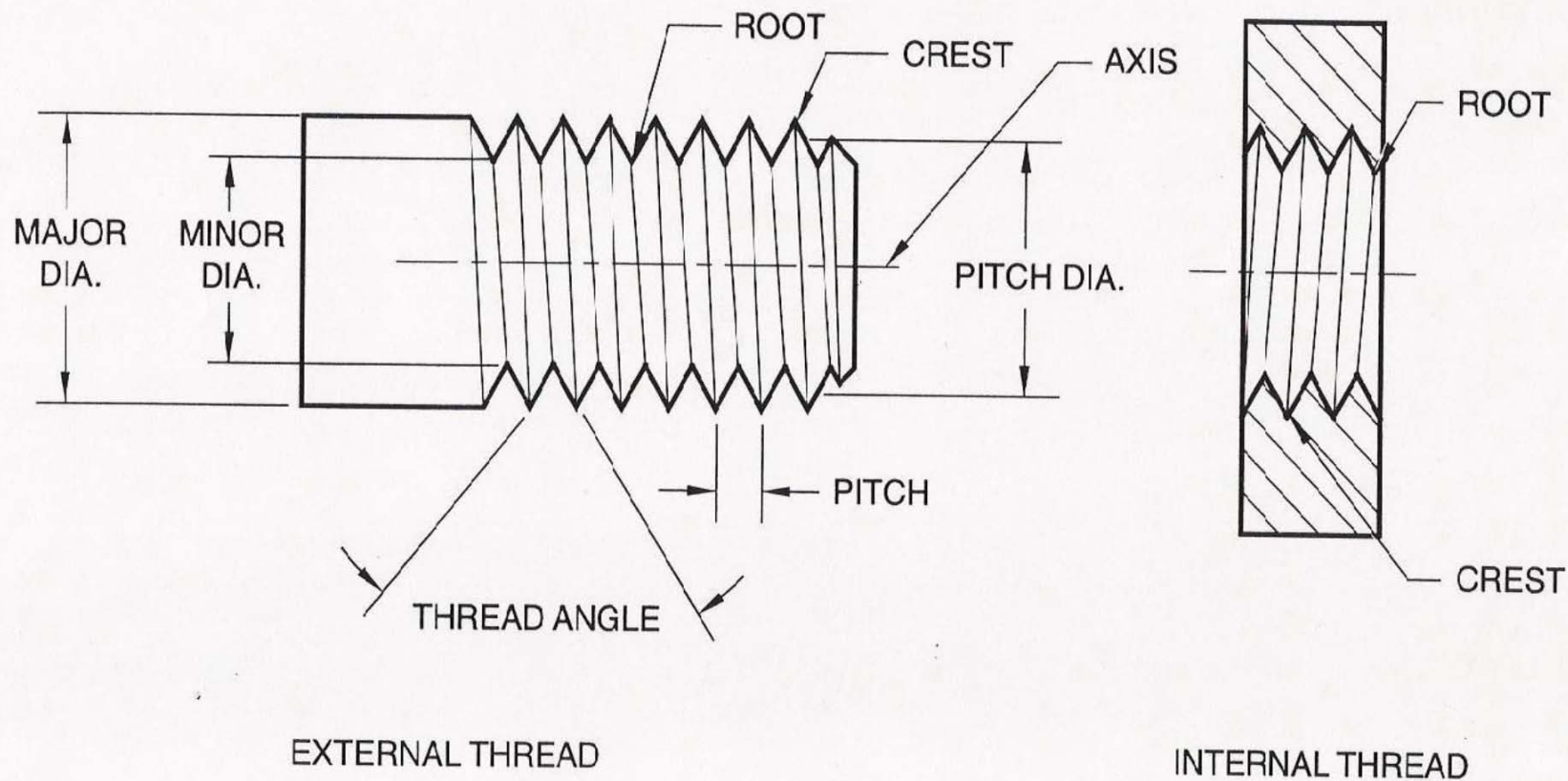
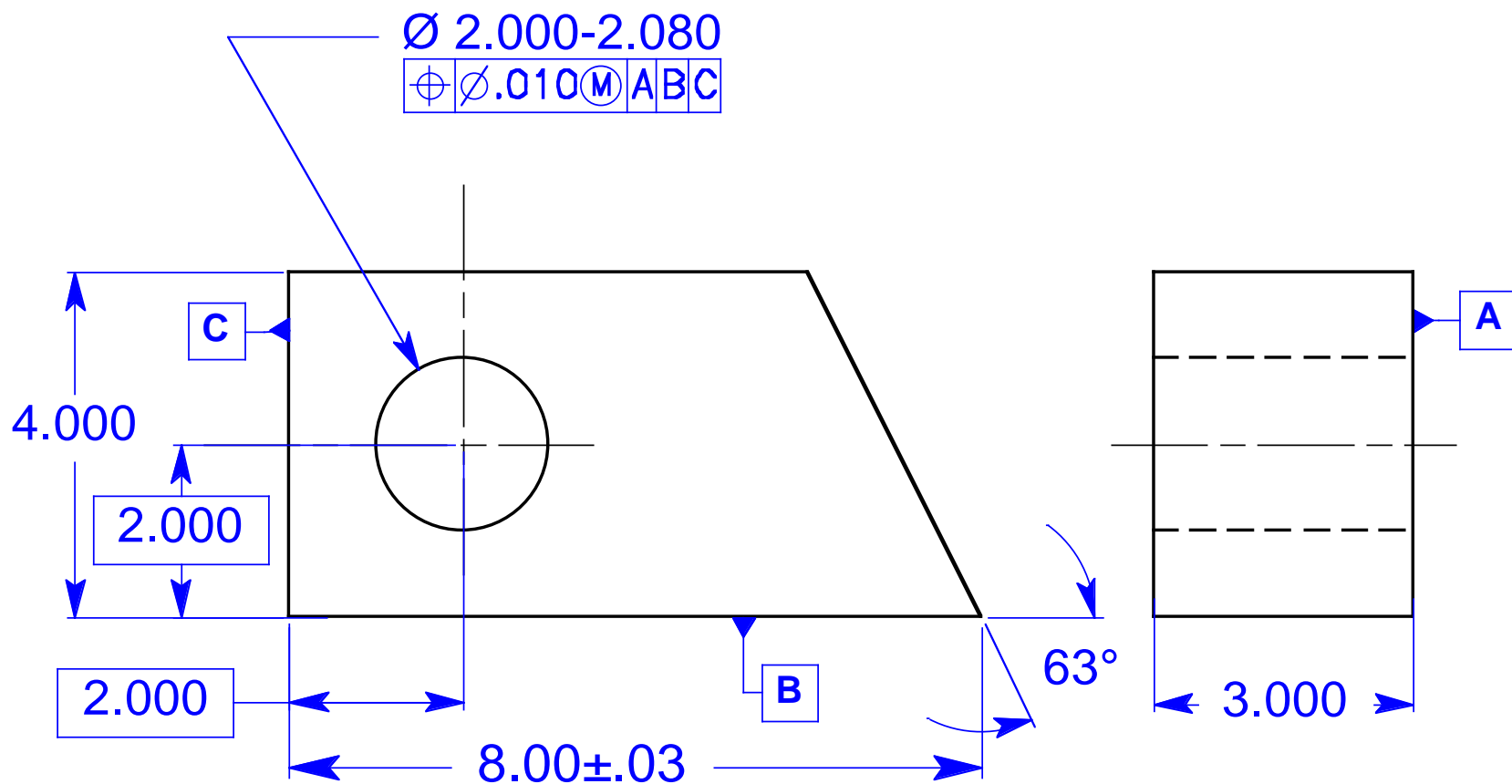


Figure 11-1 Thread Terms & Definitions

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Dimensions and Tolerances



UNLESS OTHERWISE SPECIFIED

.XX = ± .01

.XXX = ± .005

Angles = ± 1°

Specification and Callouts for Machine Processes

1. Drills and Reamers
2. Counterbore, Spotface, and Countersink
3. Broach
4. Surface Texture

Print Documentation

000 REV	1	0250-01536	3	2	1
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NOTES: UNLESS OTHERWISE SPECIFIED,

- ALL NOTES SHALL BE IN SEQUENTIAL ORDER OF OPERATION, AND SHALL BE MODIFIED TO MEET DESIGN REQUIREMENTS.
- SHEET 2, 3, AND 4 ARE STANDARD NOTES USED ON ENGINEERING DRAWINGS. GROUP BLOCKED UNDER COMMODITY CODE.
- SHEET 5 AND 6 ARE GENERAL NOTES INDIVIDUALLY BLOCKED AND USED IN ACCORDANCE WITH DESIGN REQUIREMENTS.
- SHEET 7 IS SPECIFIC TO GAS LINE NOTES. GROUP BLOCKED.

REV	DESCRIPTION	BY	DATE	APR
A	REL PER ECO 80580	D.B.	9/24/99	G.C.
001	REV PER ECO 136673	D.B.	12-20-00	LLS
002	REV PER ECO 163143	B.C.	09-13-01	B.C.

5	8	INSERT, THD, .250-20, SST	KEENSERT KNH420J	OR EQUIVALENT
4	24	INSERT, THD, .190-24, SST	HELICOIL 1185-3CN-02856	OR EQUIVALENT
3	2	DOWEL PIN, ϕ .250X.375L, SST	BERG #D17-8	OR EQUIVALENT
2	2	DOWEL PIN, ϕ .125X.375L, SST	BERG #D14-8	OR EQUIVALENT
1	AR	6061-T6 AL		

ITEM #	QTY	DESCRIPTION
		NEXT ASSY

APPROVALS	DATE	UNLESS OTHERWISE SPECIFIED: ALL DIMS IN INCHES, & INCLUDE CHEM. APPLIED/PLATED FINISH. REMOVE BURRS & SHARP EDGES. DO NOT SCALE DRAWING.	SURFACES 63 ✓	ABC Corp 123 Main Street USA
DWN HOWARD TANG	8/16/00			TITLE ADAPTER, BOTTOM, 300MM SIP CU, 18.500 ID.
CHECK				
ENGR HOWARD TANG	8/16/00			
MFG ENG HOHN YU	8/16/00			
APPD		MAT'L SEE BOM		SIZE D

CONFIDENTIAL: THIS DOCUMENT AND THE INFORMATION CONTAINED IN IT ARE CONFIDENTIAL, AND CANNOT BE COPIED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN CONSENT OF ABC Corp	FINISH ---	SCALE 1: 2	SHEET 1 OF 5	REV 001
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4	3	2	0250-01536-001	1
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Dwg No. 0250-01536
 SHEET 1
 REV 002

THE TITLE BLOCK

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES TOLERANCES: 1 PLACE DIMS: +/- .1 (K) 2 PLACE DIMS: +/- .03 3 PLACE DIMS: +/- .005 ANGULAR: +/- 1° FRACTIONAL: +/- 1/32	PROJECT NO. PR - 101		BROWN ENGINEERING (A)				
	APPROVALS		DATE		PISTON (C)		
	DRAWN (J) RKB	6 / 10					
	CHECKED <i>EKG</i>	6 / 12		(E)	SIZE B	FSCM NO. (H)	DWG NO. 5409-3 (B)
MATERIAL CRS	APPROVED <i>JS</i>	6 / 15		SCALE 1 = 1 (G)	WEIGHT .234 (F)	SHEET 1 OF 1 (D)	
FINISH NONE	ISSUED <i>WSG</i>	7 / 2					

Figure 19-1.

Most title blocks contain similar information.

List of Materials

6	4	INSERT, THD, .375-16, SST	KEENSERT KNH616J	OR EQUIVALENT
5	8	INSERT, THD, .250-20, SST	KEENSERT KNH420J	OR EQUIVALENT
4	24	INSERT, THD, .190-24, SST	HELICOIL 1185-3CN-02856	OR EQUIVALENT
3	2	DOWEL PIN, ϕ .250X.375L, SST	BERG #D17-8	OR EQUIVALENT
2	2	DOWEL PIN, ϕ .125X.375L, SST	BERG #D14-8	OR EQUIVALENT
1	AR	6061-T6 AL		
ITEM #	QTY	DESCRIPTION		
NEXT ASSY	APPROVALS	DATE	<p>UNLESS OTHERWISE SPECIFIED: ALL DIMS IN INCHES, & INCLUDE CHEM. APPLIED/PLATED FINISH. REMOVE BURRS & SHARP EDGES. DO NOT SCALE DRAWING.</p> <p>ABC Corp 123 Main Street USA</p> <p>TITLE ADAPTER, BOTTOM, 300MM SIP CU, 18.500 ID.</p>	
	DWN HOWARD TANG	8/16/00		
	CHECK			
	ENGR HOWARD TANG	8/16/00		
	MFG ENG HOHN YU	8/16/00		
	APPD			
<p>CONFIDENTIAL: THIS DOCUMENT AND THE INFORMATION CONTAINED IN IT ARE CONFIDENTIAL, AND CANNOT BE COPIED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN CONSENT OF ABC Corp</p>			<p>TOL'S: .XX: \pm.01 .XXX: \pm.005 ANGLES: \pm.5°</p>	<p>SURFACES 63 ✓</p>
			MAT'L SEE BOM	<p>SIZE DWG NO. 0040-48381 REV 001</p>
			FINISH --	<p>SCALE 1:2 SHEET 1 OF 5</p>

Drawing Notes

8

7

NOTES: UNLESS OTHERWISE SPECIFIED.

- 1. APPLICABLE STANDARDS/SPECIFICATIONS:**
ASME Y14.5M-1994, DIMENSIONING AND TOLERANCING
ASW A2.4 WELD SYMBOLS AND NONDESTRUCTIVE TESTING
ASME Y1.1-1989, ABBREVIATIONS

- 2. ALL BEND AND RELIEF RADII TO BE MINIMUM.**

- 3.**  **INSTALL PER MANUFACTURERS' INSTRUCTIONS.**

- 4. WELDING TO BE CONTINUOUS AND GROUND TO MATCH BEND RADIUS.**

- 5.**  **SILKSCREEN PER DRAWING SPEC 0070-20500**

- 6. FINISH: CHEM FILM PER MIL-C-5541, CLASS 1A, CLEAR.**

- 7.**  **SPECIFY SUPPLIER ID PER DRAWING SPEC 0250-01022. LOCATE APPROXIMATELY WHERE SHOWN.**

- 8. CLEAN AND PACKAGE PER DRAWUNG SPEC 0250-70551. LOCATE APPROXIMATELY WHERE SHOWN.**

- 9. PACKAGE FOR SHIPMENT PER DRAWING SPEC 0250-00089.**

D

C