

Module 500 – Lesson One: ENGINEERING DRAWINGS II

Lesson Description:

A basic lesson on engineering/technical drawings, blueprints and pictorials used in metalforming. Lesson includes parts of a drawing, line convention, symbols, basic orthographic views, isometric projection and GD&T. Students will learn the major views and view orientation of an orthographic projection. Included in the lesson is an introduction to features common to metalformed parts. *Prerequisite:* Module 400, *Measurement & Engineering Drawings Lesson Two.*

Learning Objectives:

At the completion of this lesson, the student will be able to:

- ◆ Locate Title Block, revision level, and scale information and explain the importance of each.
- ◆ Distinguish an isometric projection from an orthographic projection and explain the differences of each.
- ◆ Identify and apply principles (rationale and application) of orthographic projection (i.e., most common views used, most important view, orientation of the three views, etc.).
- ◆ Match a part with a basic 3-view print.
- ◆ Given two views, identify the missing third view from a choice of four possible responses.
- ◆ Identify and explain common line types used on prints.
- ◆ Identify drafting symbols and selected features associated with metalforming (i.e., shearforms, bends, extrusions, notches, holes, thread callouts, etc.).
- ◆ Identify 12 basic GD&T symbols and provide a working definition of each.
- ◆ Find important dimensions on the print and identify the tolerance for each dimension.
- ◆ Read and interpret various blueprints/drawings from an actual metalforming shop.

Methods of Instruction:

Lecture, hands-on application exercises, simulations, and real-world examples.

Methods of Evaluation:

Class presentations, hands-on demonstrations (*Skill Checks*), and written tests/exams (*PROficiency Practices and Assessment*) during and after training.

Lesson Materials Provided by PMA:

- ◆ *PMAEF Student Resource Book – Engineering Drawings II*
- ◆ Engineering Drawings with associated parts
- ◆ Student Handouts
- ◆ *PMAEF Instructor’s Guide* with *SMART* Lesson Plans, Prints/Drawings, *Skill Checks* and *PROficiency Practices & Assessment*
- ◆ Transparencies
- ◆ PMAEF Item Bank (assessment questions) for construction of final examination.
- ◆ List of recommend student reading and study materials (textbooks, articles, etc.).

Lesson Topics & Content Outline:

- ◆ **Introduction to Engineering Drawings and Blueprints**
 - The History of Drawings
 - Formats, General Practices and Sizes
 - ANSI Y14.5M '82/95 Basic Interpretation/History.
- ◆ **Parts of a Blueprint**
 - Title Block
 - Revision Block and Scale Information
 - Tolerance Information
 - Notes – General and Specific
 - Field – Object Area.
- ◆ **Views & Rotations**
 - Isometric Views
 - Orthographic Views
 - One and Two View Drawings (rationale and application)
 - 3rd Angle Projections.
 - Basic Size – Actual Size
- ◆ **Lines & Types**
 - Object
 - Hidden
 - Center Line
 - Dimension & Extension
 - Viewing Plane
 - Cutting Plane
 - Section
 - Break, Breakout, etc.
- ◆ **Symbols & Features**
 - Basic Drafting Symbols
 - Visible Features.
- ◆ **Dimensioning & Tolerancing Practices**
 - Binding and Controlled Documents
 - Tolerance (+/- and maximum/minimum)
 - Commonly Used GD&T Symbols and Their Meaning.
 - ANSI, ISO/QS-9000

❖ **End of Lesson Exam** (*PROficiency Assessment*)

☞ Note: See SMART Lesson Plan contained in the Instructor's Guide for detailed instruction content, flow of lesson, and in-training assessments (*PROficiency Practices* and *Skill Checks*). Instructor may provide additional prints/drawings with associated piece parts.