




Introduction to Manufacturing Hand Tools

Objective 1: Describe the Function and Operation of a Bench Vise

Bench Vise Components




The bench vise is made up of nine different components. They are:

- ✓ Handle
- ✓ Movable Jaw
- ✓ Fixed Jaw
- ✓ Serrated Steel Jaw Inserts
- Vise Jaw Caps
- Swivel Base
- Swivel Lock
- Anvil

Introduction to the Manual Milling Machine

Objective 1: Describe the Operation of a Mill

Milling Machine Parts Identification



Although different mills are not the same in appearance, they should all have the same twenty parts.

- ✓ Base
- ✓ Column
- Knee
- Vertical Traverse Crank
- Saddle
- Cross Traverse Handle
- Table
- Table Traverse Handle
- Ram
- Toolhead

Several of the mill's parts are in the toolhead. Those parts will be discussed next.

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Machine Tools 2 Interactive Multimedia Curriculum.  
Requires customer-supplied manual milling machine.



Student Reference Guide

## Learning Topics:

- Manufacturing Hand Tools
- Bench Vise
- Hacksaw
- Fire Operations
- Round Stock Layout
- Milling Machine Components
- Milling Machine Safety
- Milling Machine Operation
- Milling Processes
- Milling a Step
- Milling Slots
- Milling Pockets

Amatrol's Machine Tools 2 Learning system (96-MP2) begins by explaining how to use basic hand tools, like a hacksaw and a file, and then focusses on manual milling machine operation and its real-world applications. The milling machine is a flexible and widely-used piece of industrial equipment that is utilized extensively in machine shops and maintenance departments. This learning system requires Amatrol's Machine Tools 1 Learning System, a manual milling machine with tooling and raw materials.

The Machine Tools 2 Learning system includes interactive multimedia curriculum, an instructor's guide, install guide, and a student reference guide. These learning materials will be used to cover major topics like milling machine components, safety, operation, and how to mill steps, slots and pockets. Amatrol's renowned curriculum features an unmatched breadth and depth of topics and skills to prepare learners to be successful members of the advanced manufacturing workforce.

The 96-MP2 is part of Amatrol's Machining program. Amatrol's Machining program brings a highly-focused, streamlined set of skills to this program area. In addition to the three Machine Tools learning systems, Amatrol also offers CNC Machines 1 through 3 for all high school learners. These CNC courses utilize a Denford Micromill to teach valuable CNC skills.



## Technical Data

Complete technical specifications available upon request.

**Interactive Multimedia Curriculum (MB702)**

**Instructor's Guide (CB702)**

**Installation Guide (DB702)**

**Student Reference Guide (HB702)**

### Additional Requirements:

Machine Tools 1 Learning System (96-MP1)

Manual Milling Machine with Tooling

Manual Mill Raw Materials

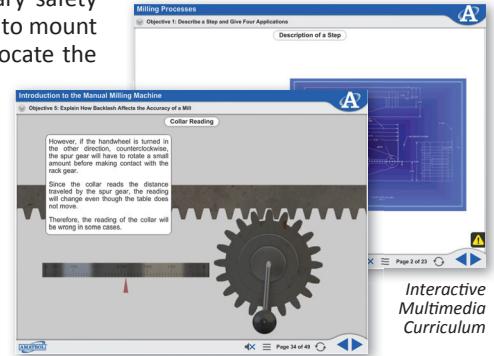
Computer, see requirements: <http://www.amatrol.com/support/computer-requirements/>

## Use Real-World Equipment to Mill Steps, Slots, and Pockets

This system requires a manual milling machine with tooling, including collets, machinist's parallels, a variety of end mills, and cold rolled steel for raw material. These components will be used to practice a variety of step-by-step hands-on skills include: using a milling machine micrometer collar to control table movement; facing a piece of stock to length; milling a step on a part using layout lines; milling a slot to a specific depth; and milling a pocket in a part.

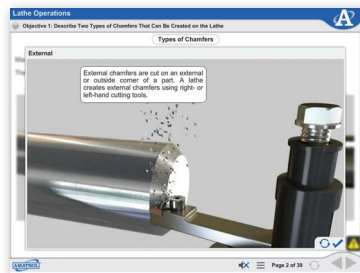
## Vibrant Interactive Multimedia Curriculum Cover Operation, Function and Application of Manual Milling Machines

The Machine Tools 2 Learning System's in-depth curriculum covers manufacturing hand tools and manual mill operation and process. Specific examples of learning topics include: the function and operation of a hacksaw; the necessary safety rules to follow before and during mill use; how to mount and align a workpiece; and methods used to locate the tool position when milling a step. This vibrant interactive multimedia curriculum features all of the depth of subject for which Amatrol is famous with the addition of stunning 3D animations, videos, interactive quizzes and exercises, and voiceovers of all text.



Interactive  
Multimedia  
Curriculum

## Expand Your Machine Tools Knowledge to Include Manual Lathes



96-MP3 Multimedia Showing Types of Chamfers  
in Lathe Operation

In addition to the knowledge and skills presented in this learning system, Amatrol offers even more Machine Tools training! Machine Tools 3 (96-MP3) focuses on the manual lathe through topics like: roughing and finishing operations, cutting chamfers, grooving operations, and threading operations.

## Complimentary Student Reference Guide

A sample copy of the Machine Tools 2 Student Reference Guide is also included with the system for your evaluation. Sourced from the system's curriculum, the Student Reference Guide takes the entire series' technical content contained in the learning objectives and combines them into one perfectly-bound book. Student Reference Guides supplement this course by providing a condensed, inexpensive reference tool that learners will find invaluable once they finish their training, making it the perfect course takeaway.



Student Reference Guide



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