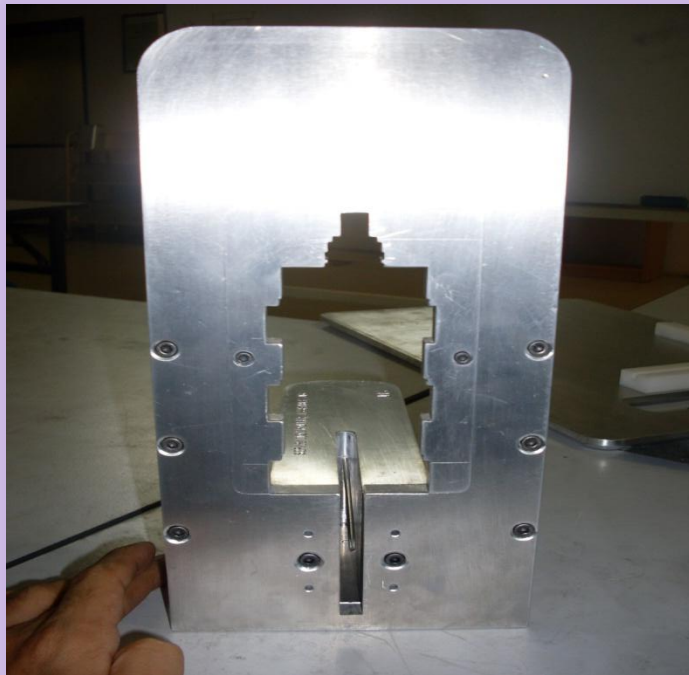
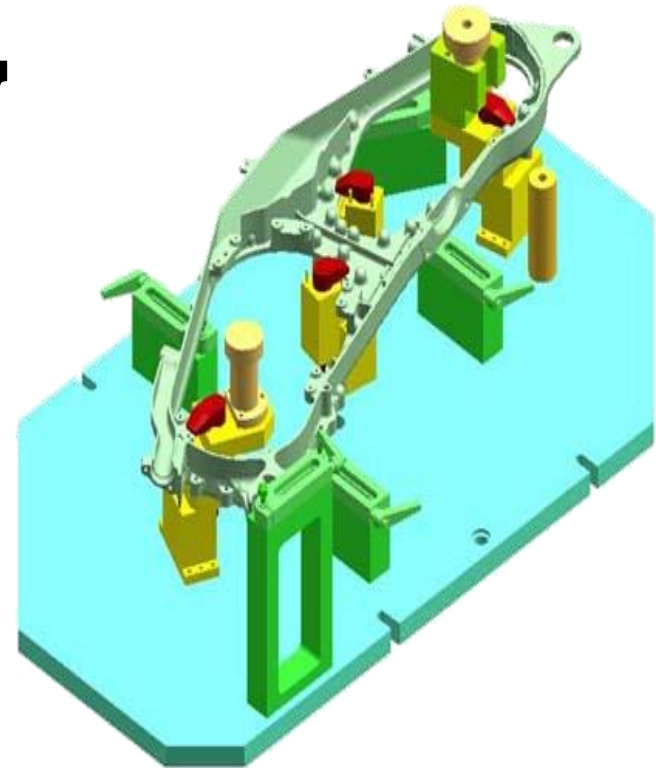


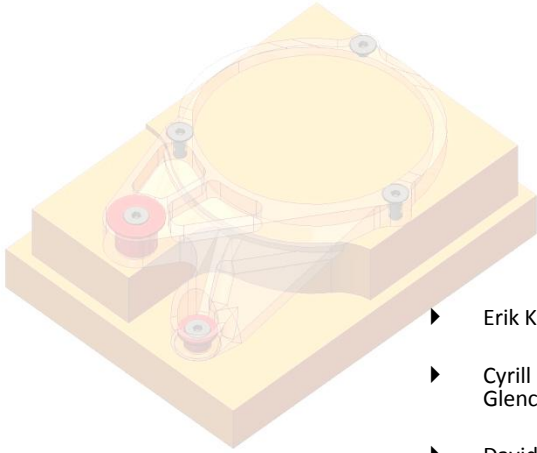
Introduction to Jigs and fixtures



Prepared by:
KZJ
Lecturer
Mechanical Engineering Department
Polytechnic of Seberang Perai
(Manufacturing)

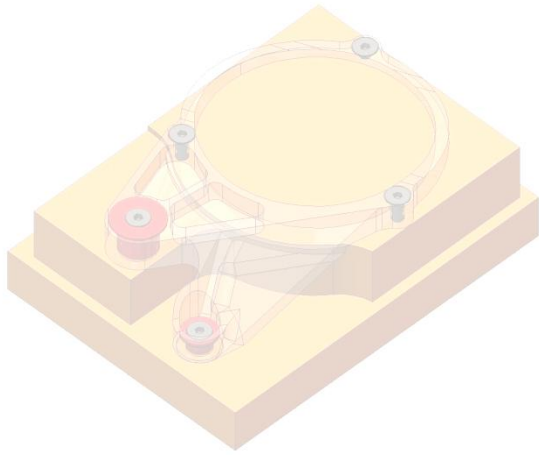


References



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Mass production aims

- High productivity to reduce unit cost
- interchangeability to facilitate easy assembly

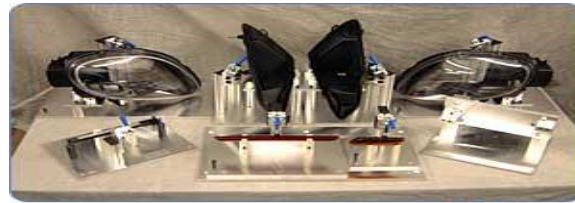
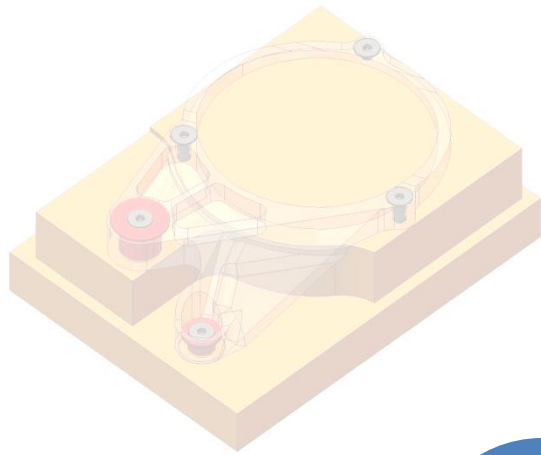
Introduction



Production devices

- Increase the rate of manufacture
- inspection devices to speed-up inspection procedure





Cutting Tools



Bending,
Forming and
Drawing

Workholding
Devices

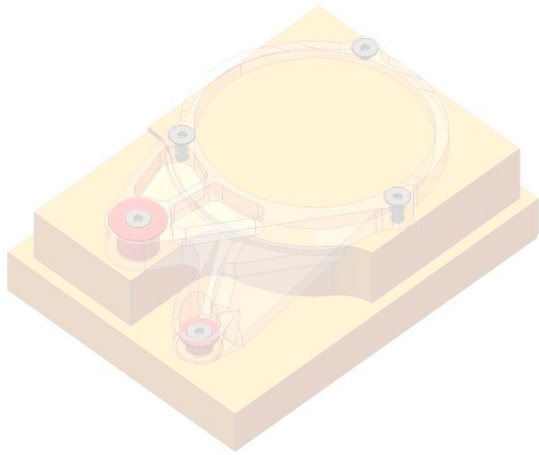


Types of Tools

for
Inspection
and Gaging

for Casting





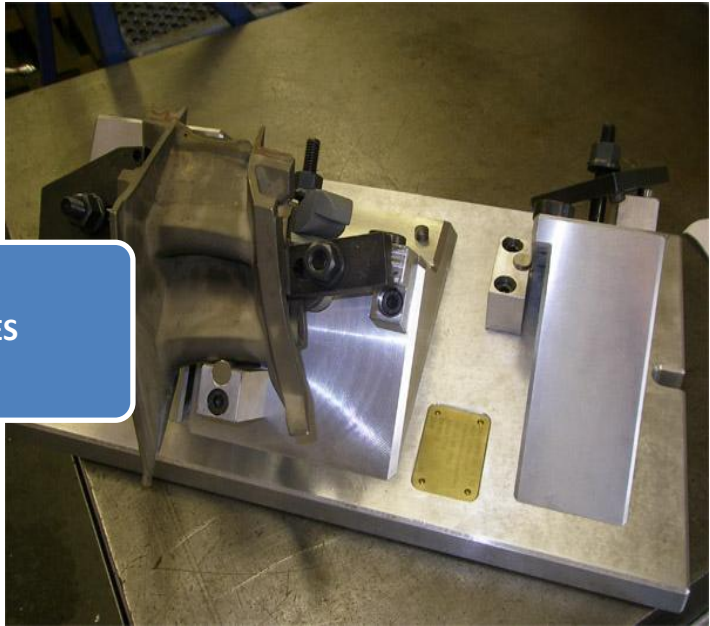
workholders
with/without tool
guiding/setting
arrangement



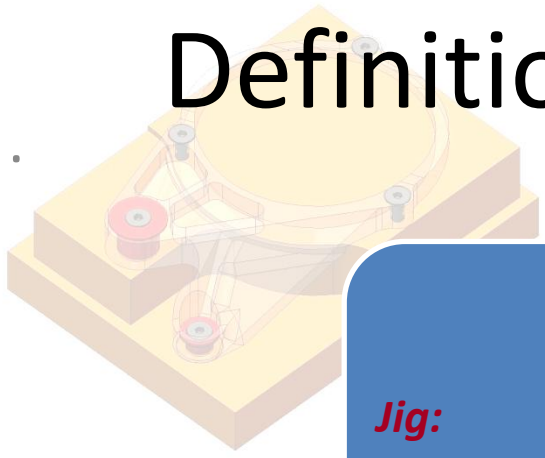
JIGS



FIXTURES



Definitions



Jig:

- A Jig is defined as the device which holds and positions the workplace, locates or guides the cutting tool related to the workplace and usually
- is not fixed on the machine table

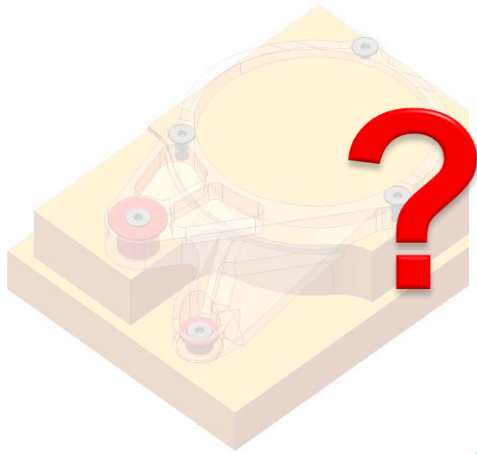
Fixture:

- A fixture is a work holding device which holds and positions the workplace,
- but does not guide or locate or position the cutting tool.



TOOL ENGINEERING

JIGS AND FIXTURES



What are Jigs and Fixtures

Member of the American Society of Tool Engineers; Author of "Tools, Modern Gaging and Grinding," "Modern Gaging Practice," "Fixtures for Turning, Boring and Grinding," "Punches, Dies and Gages," etc.

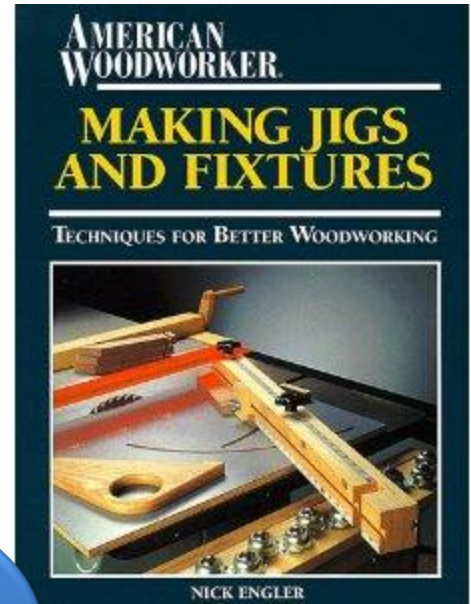
Why they are important

Design of Milling Fixture

Specific Application

Basic jigs and fixtures

Resources for selecting & purchasing



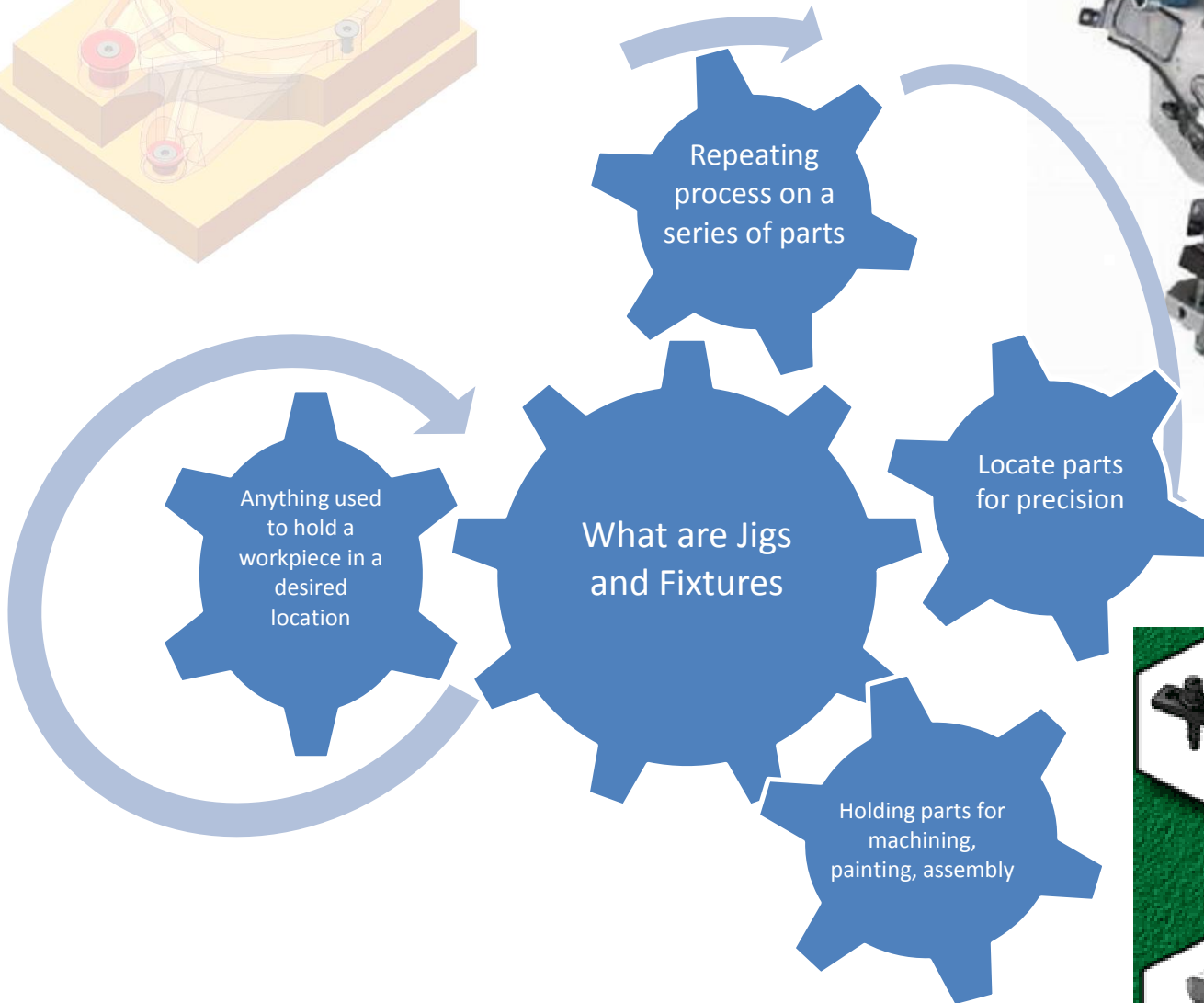
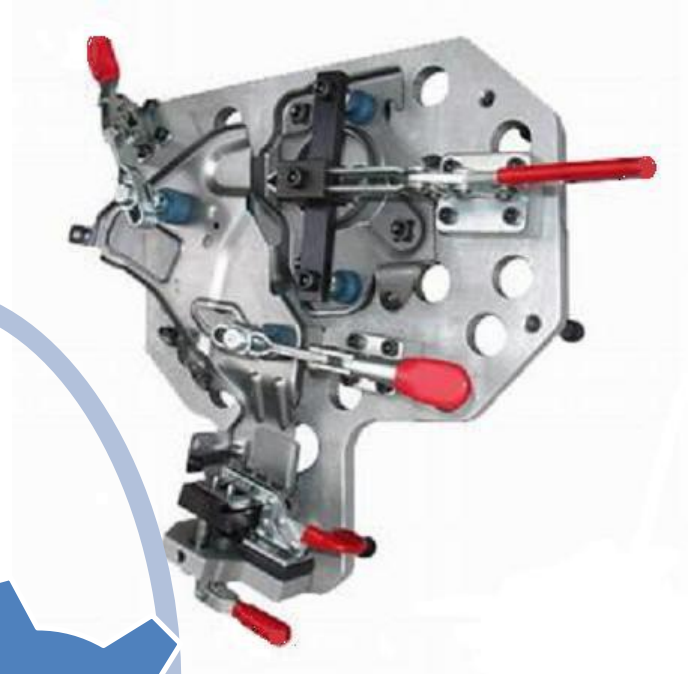
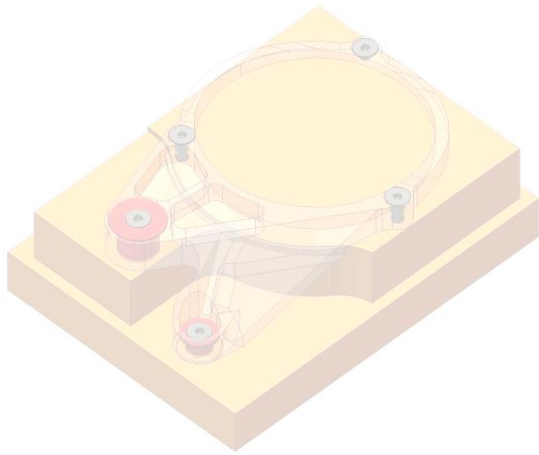
Jig and Fixture Design

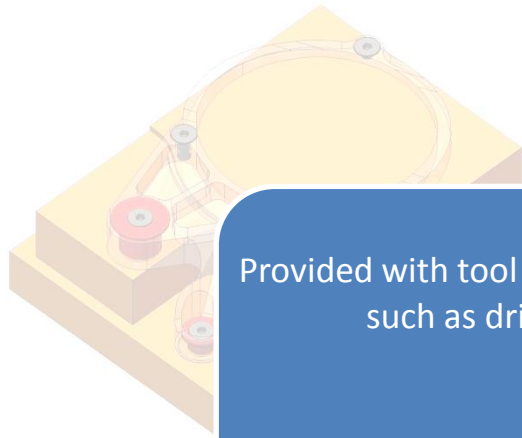
Fifth Edition



Edward G. Hoffman





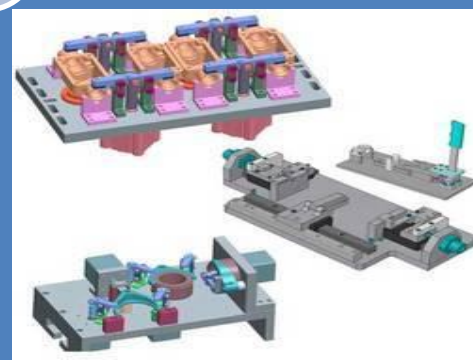


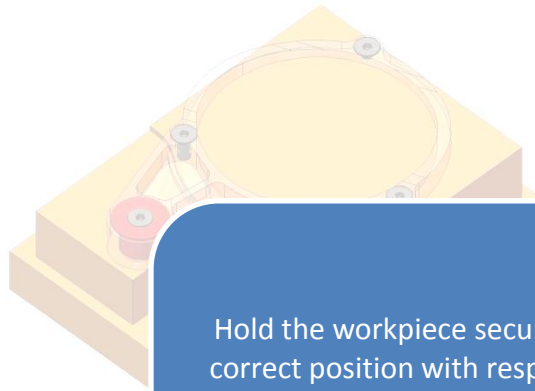
Provided with tool guiding elements such as drill bushes

Guiding the tool to the correct position on the workpiece

Jigs

Rarely clamped on the machine table because it is necessary to move the jig on the table to align the various bushes in the jig with the machine spindle





Hold the workpiece securely in the correct position with respect to the machine/cutter during operation

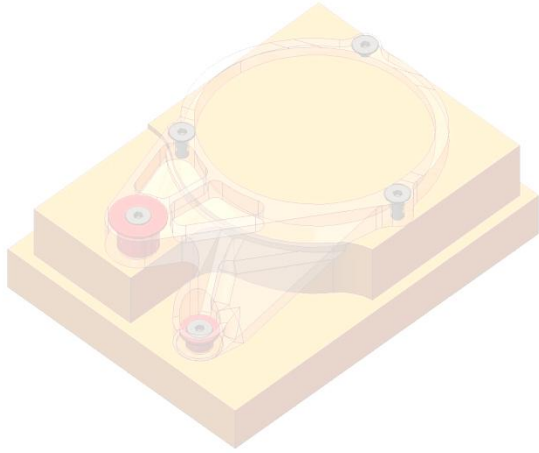
Not used as guided in a jig

Fixtures

Used for setting the tool with respect to the workpiece/fixture

Often clamped to the machine table





Why are they important in Machine design

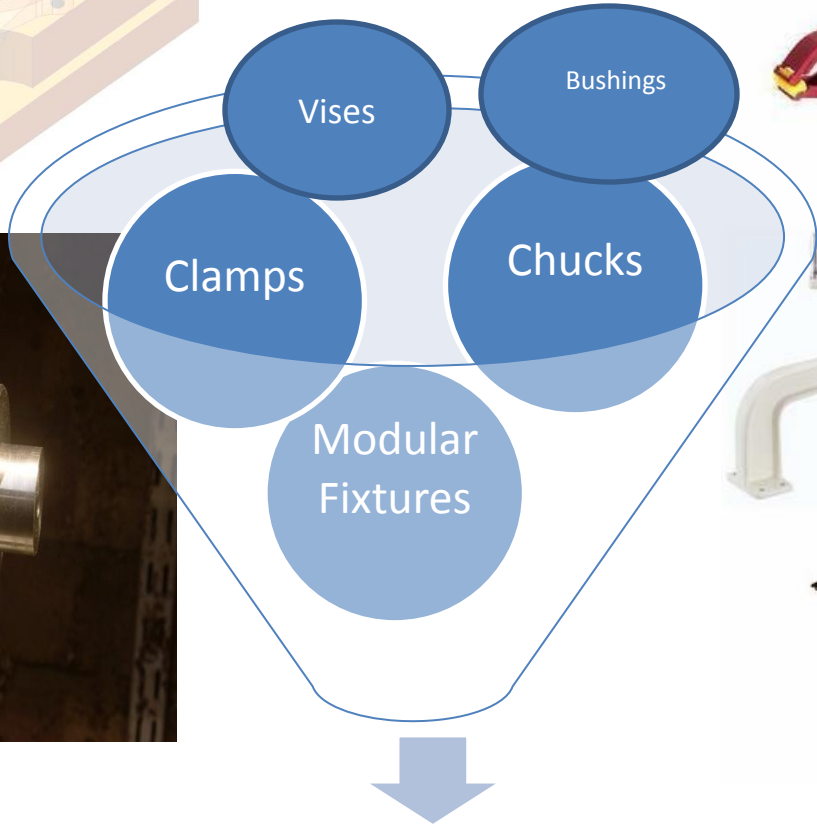
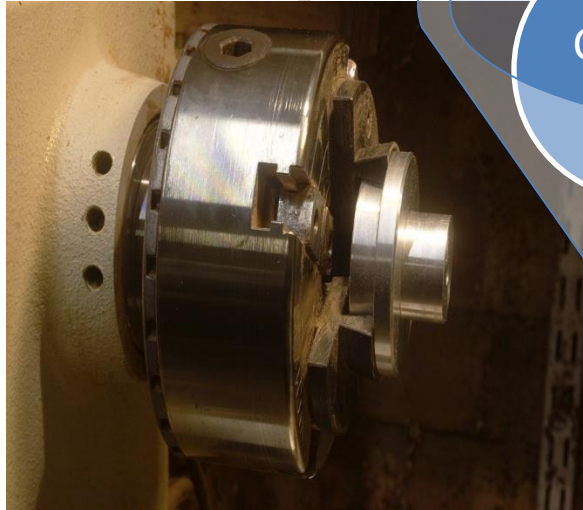
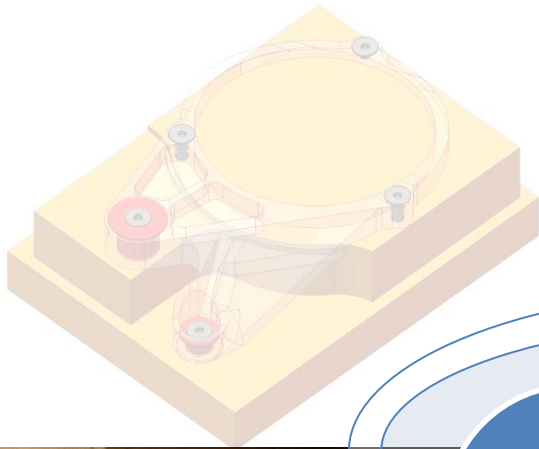
Parts should be designed to accommodate standard fixturing components

Decreases expenditure on quality control of machined parts as fixtures facilitate uniform quality in manufacturing,

Designs should accommodate fast and repeatable fixturing

Increases machining accuracy because of precise location with fixtures,

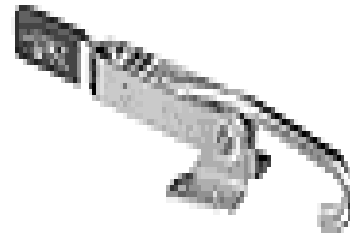
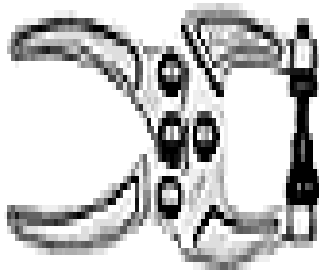
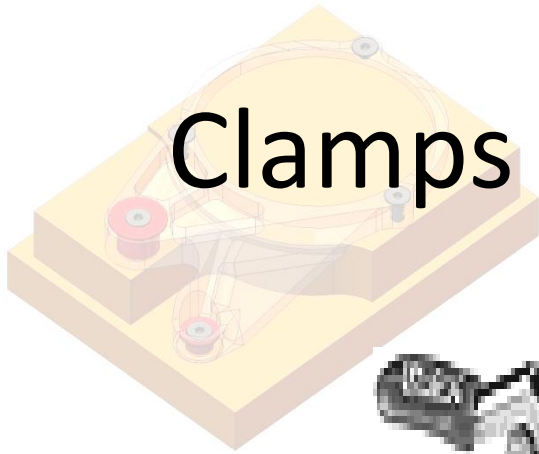




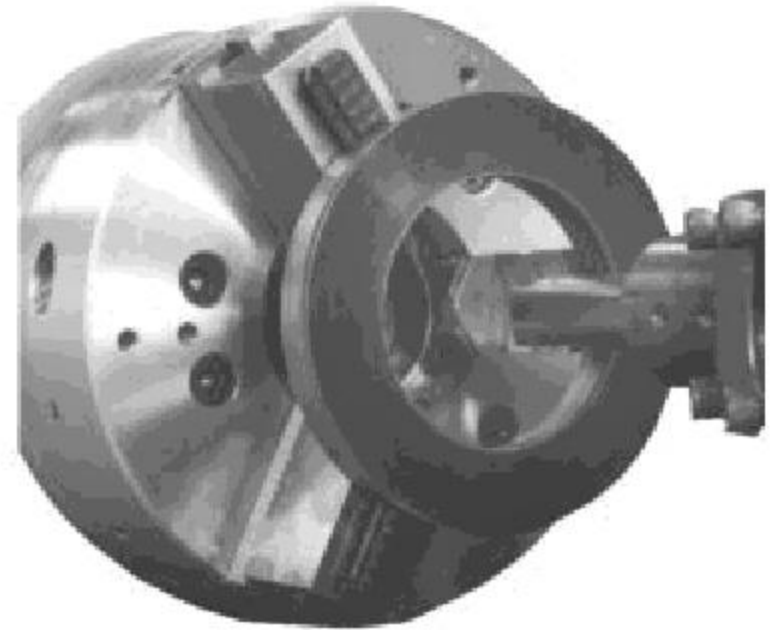
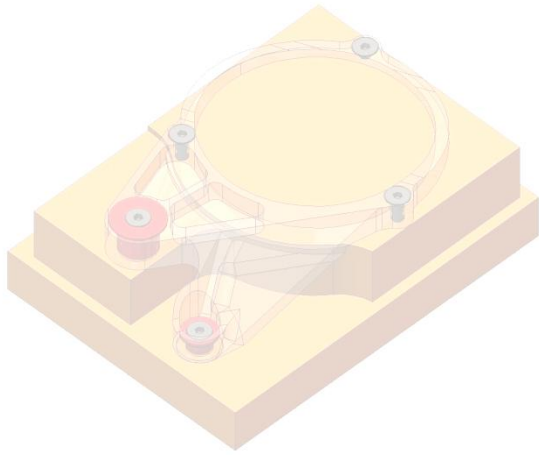
Basic categories jig & Fixtures



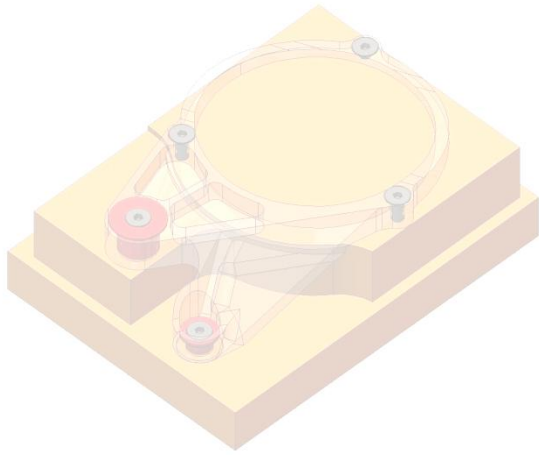
Clamps



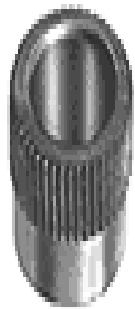
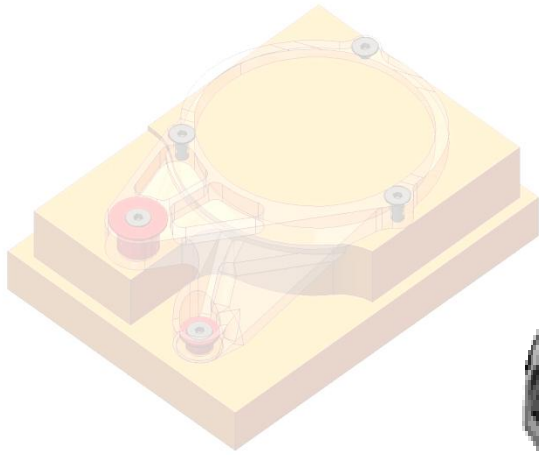
Chucks



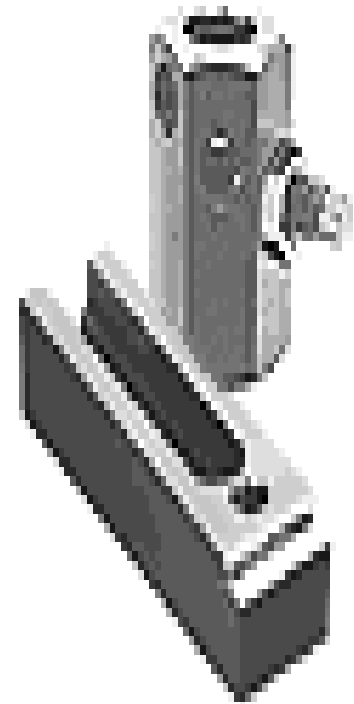
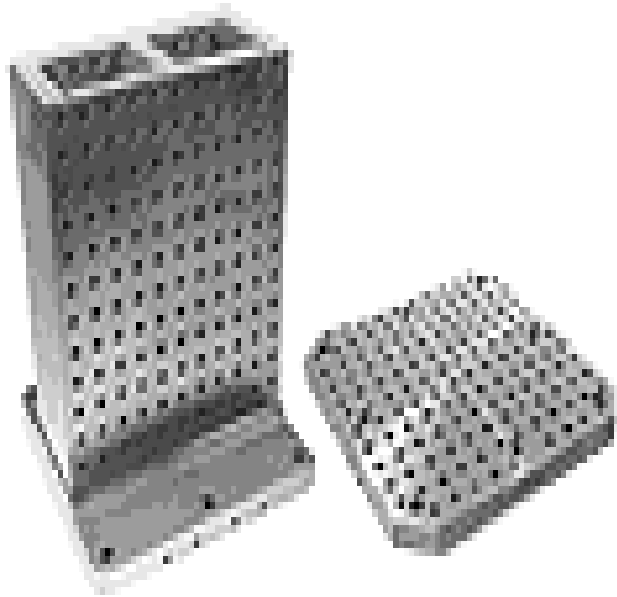
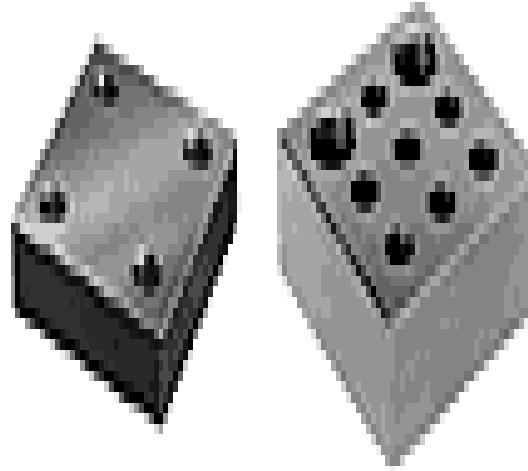
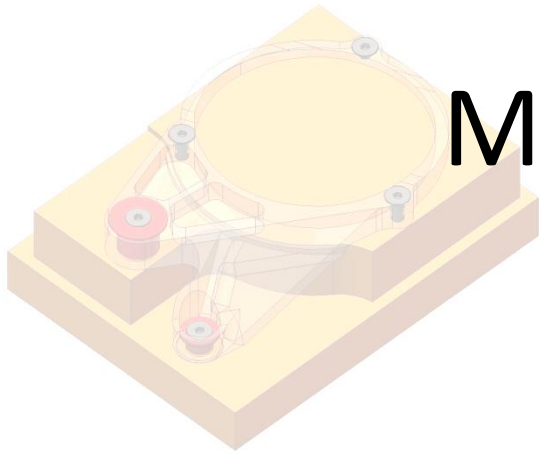
Vises



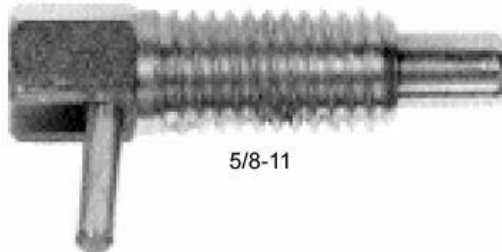
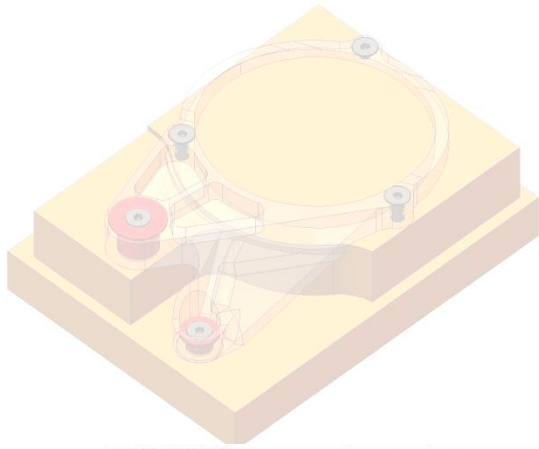
Bushings



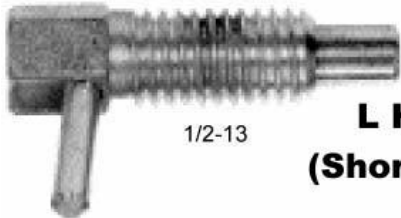
Modular Fixturing



Application

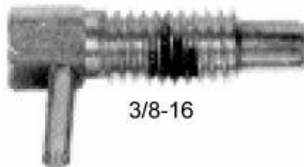


5/8-11



1/2-13

**L Handle
(Short Stroke)**

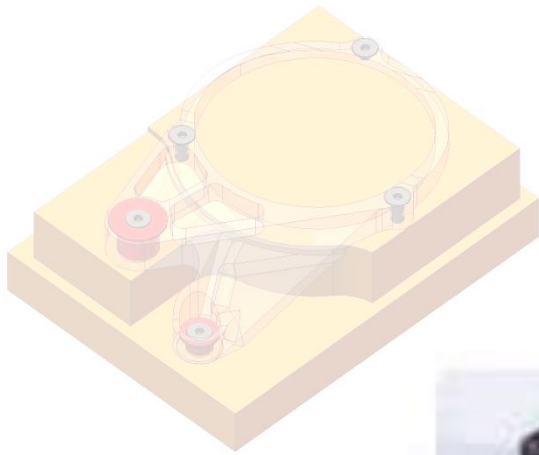


3/8-16



1/4-20





Differentiate between Jigs and Fixture

From the construction point of view:



Jigs:

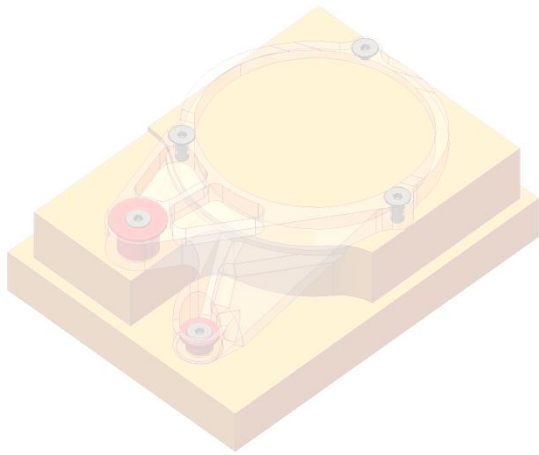
- Jigs are lighter in weight.
- Jigs hold the work piece, locate and guide the tool.
- Used for particularly drilling, tapping operations.



Fixtures:

- hold the work and position the work but do not guide the tool
- generally heavier and are bolted rigidly on the machine table
- utilized for holding the work in milling, grinding, planing or turning operation





Locating elements

position the workpiece
accurately with respect to the
tool guiding or setting
elements in the fixture

Elements of Jigs and Fixtures

Tool Guiding and Setting Elements

Guide accurately to the workpiece

Clamping Elements

hold the workpiece
securely in the located
position during operation.





*Skill
Reduction*

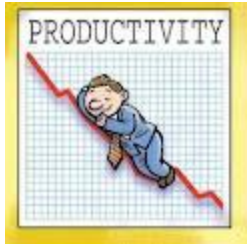
Interchangeability
fit properly in assembly and all similar components are interchangeable

It eliminates marking out, measuring and setting methods before machining.

Advantages

Productivity

facilitate uniform quality in manufacture (machinery accuracy).



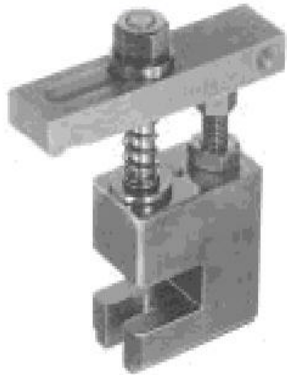
Examples - I

High Rise Clamps

Standard Nose

Tapped Nose

Gooseneck



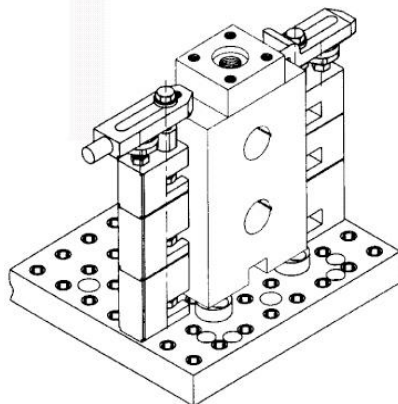
Mini



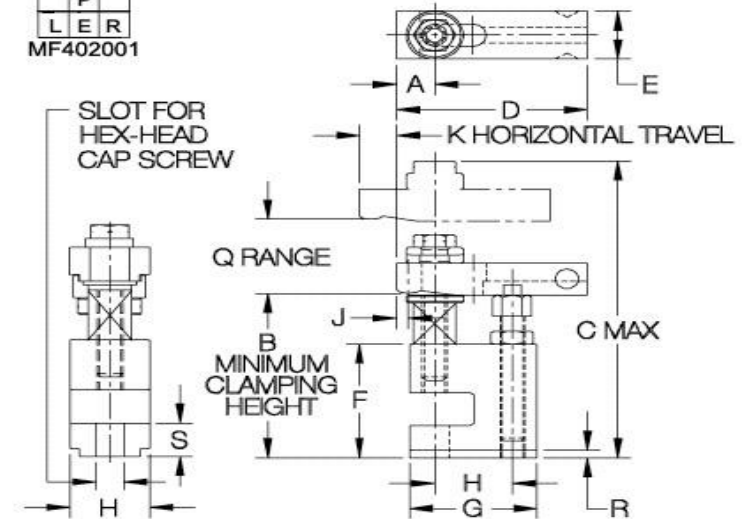
Mini Standard Heavy



Standard Heavy



MFHRC
P
L E R
MF402001

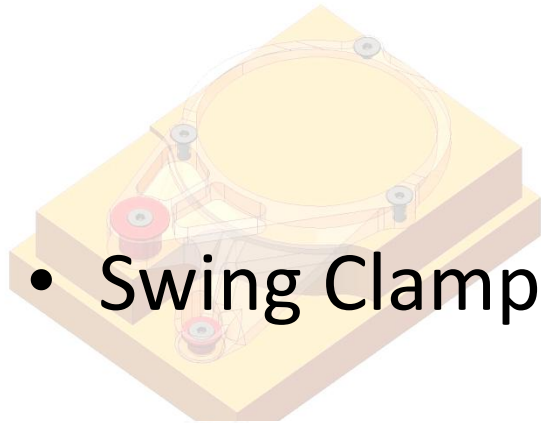


- High-Rise Clamps can be stacked on Narrow Riser Blocks and Spacer Blocks to reach tall workpieces

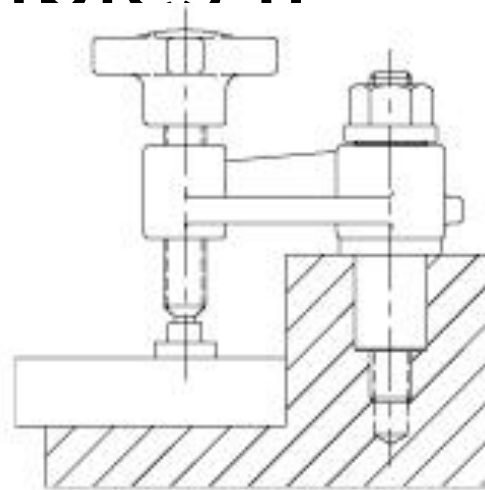


Examples II

- Swing Clamp

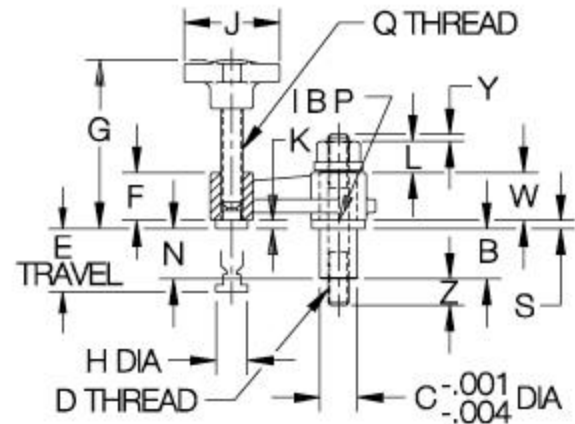
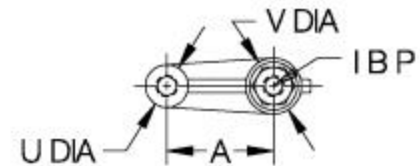


Knob Handle
Post Mounted



SWA	
P	
L	ER

1SWA1

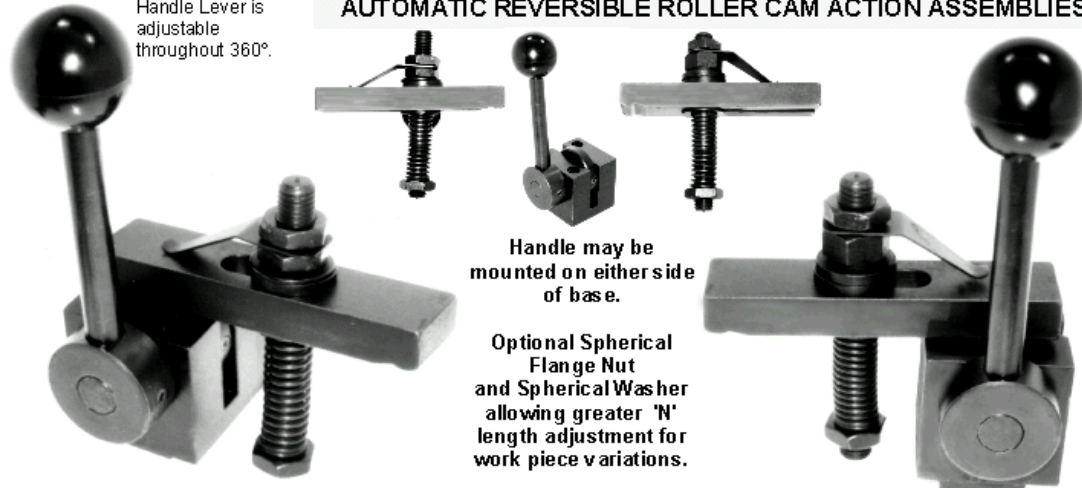


Examples III

AUTOMATIC REVERSIBLE ROLLER CAM ACTION ASSEMBLIES

Automatic Reversible Cam Action Workholding Assemblies

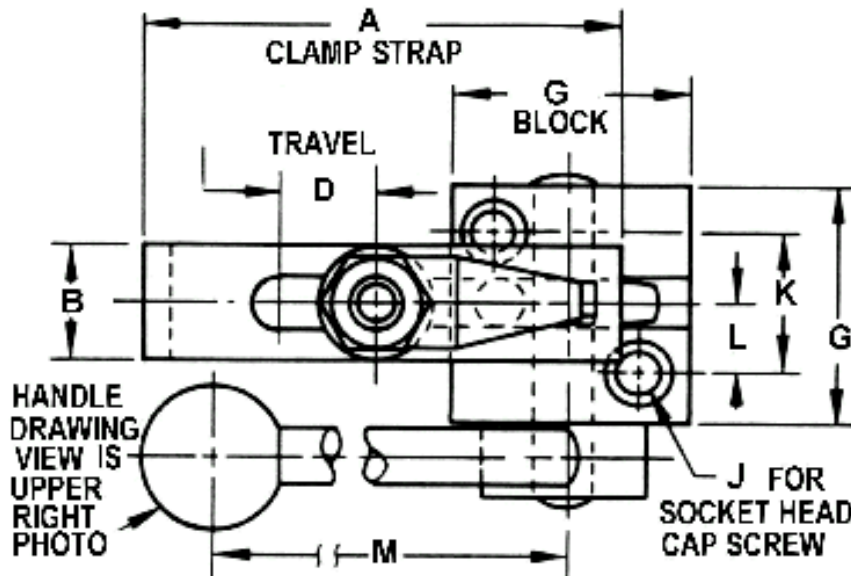
Handle Lever is adjustable throughout 360°.



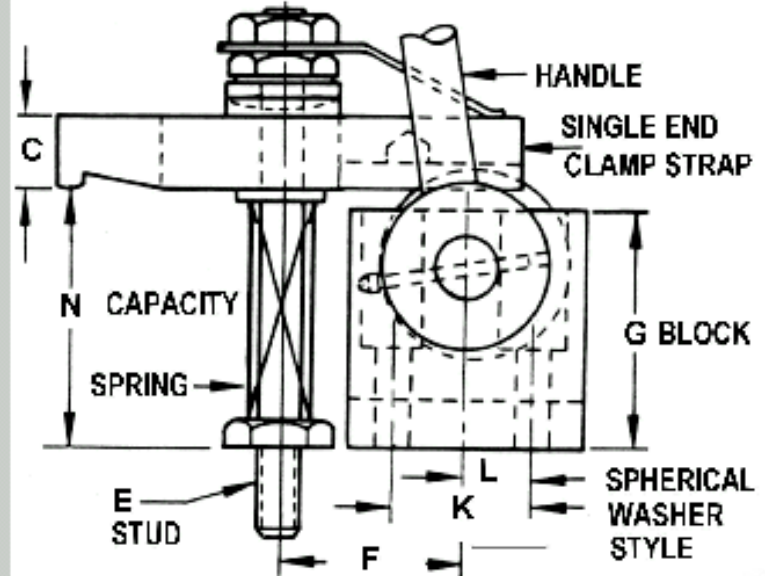
Handle may be mounted on either side of base.

Optional Spherical Flange Nut and Spherical Washer allowing greater 'N' length adjustment for work piece variations.

TOP VIEW WITH HANDLE DRAWING FOR FLANGE NUT STYLE



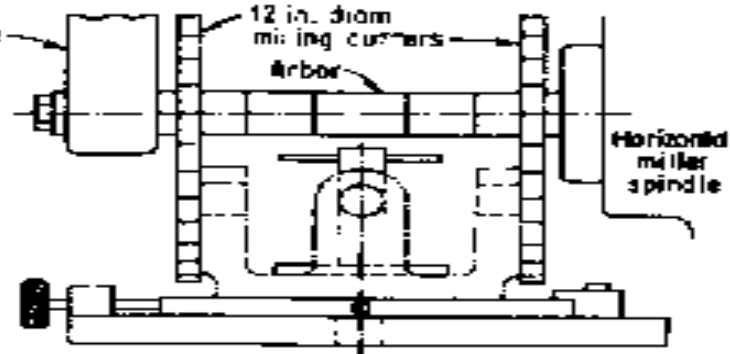
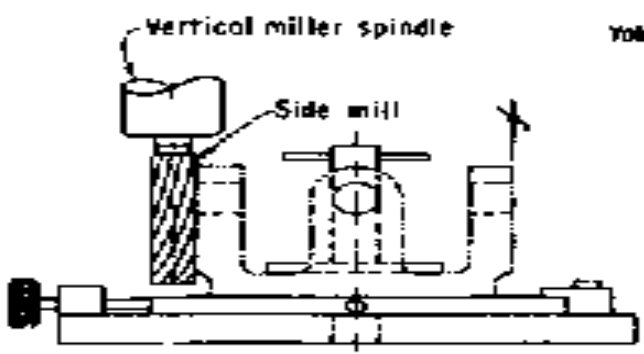
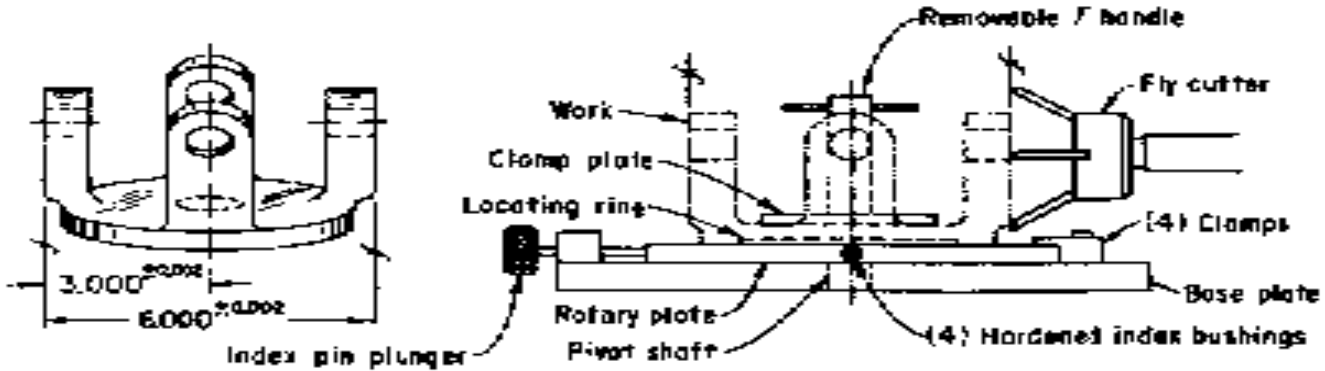
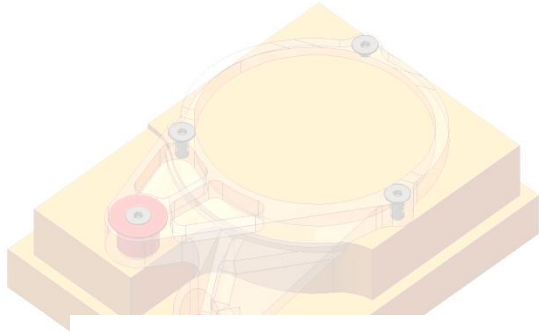
BOTTOM VIEW SPHERICAL WASHER STYLE

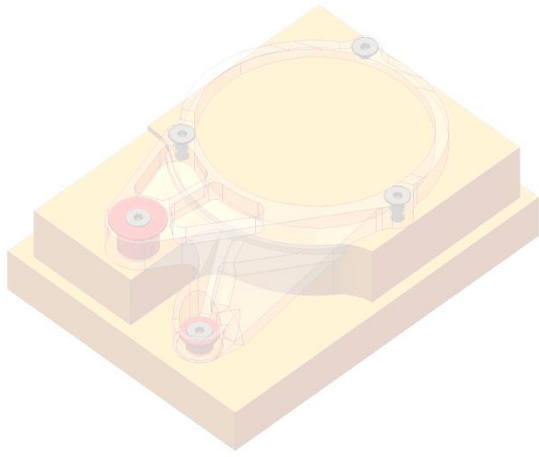


All machinery parts are manufactured from steel and hardened. Black Oxide finish per Mil-Spec CB 924A



Milling Fixture





The end

