POLITEKNIK NILAI

Jabatan Pengajian Politeknik

MECHANICAL ENGINEERING DEPARTMENT

WORKSHEET JJ 203 – MECHANICAL WORKSHOP PRACTICE 2 (MACHINING)

Title : Machine Shaft

Introduction :

The lathe is a machine tool used principally for shaping pieces of metal (and sometimes wood or other materials) by causing the workpiece to be held and rotated by the lathe while a tool bit is advanced into the work causing the cutting action. The basic lathe that was designed to cut cylindrical metal stock has been developed further to produce screw threads, tapered work, drilled holes, knurled surfaces, and crankshafts. Modern lathes offer a variety of rotating speeds and a means to manually and automatically move the cutting tool into the workpiece. Mechanical Workshop Practice 2, Machining, exposes the students to well know about cut groove and bore hole using the lathe mahine with two types of chuck which is three and four jaw chuck and also how to measuring and testing on finished workpieces.

Objective :

i) Perform rightfully eccentric turning on a workpiece using parting tool bits according to prescribed procedures.

ii) Perform rightfully parting operations on a workpiece using parting tool bits according to prescribed procedures.

iii) Perform rightfully boring operations on a workpiece using boring tool bits according to prescribed procedures.

Tools :

Lathe Machine, Tool Bits (parting and boring), Vernier Caliper and 'L' square.

Acceptance limits :

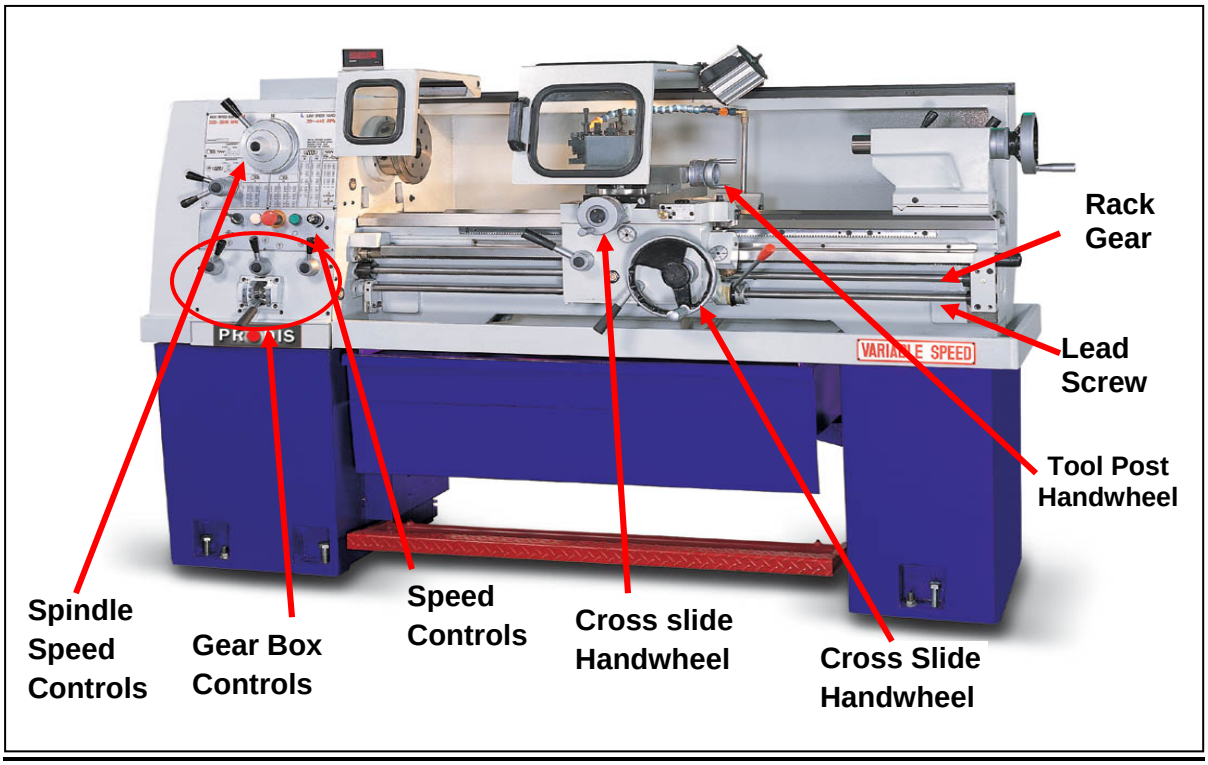
Diameter : ± 0.50mm

Length : ± 0.50mm

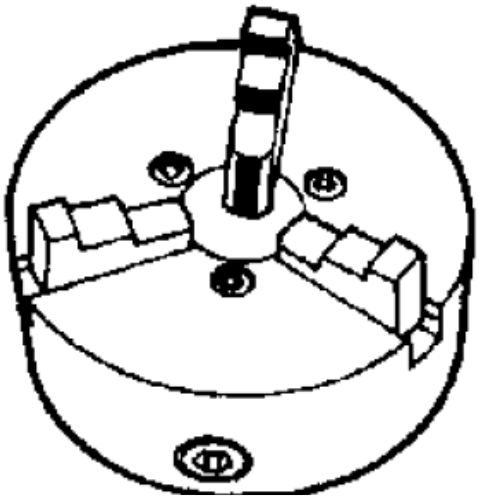
Materials :

Mild Steel Ø50 x 70mm

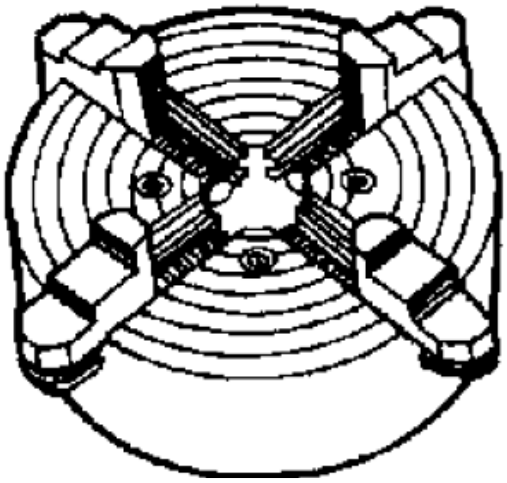
Machine Description and Workpiece Specification



CENTRE LATHE MACHINE

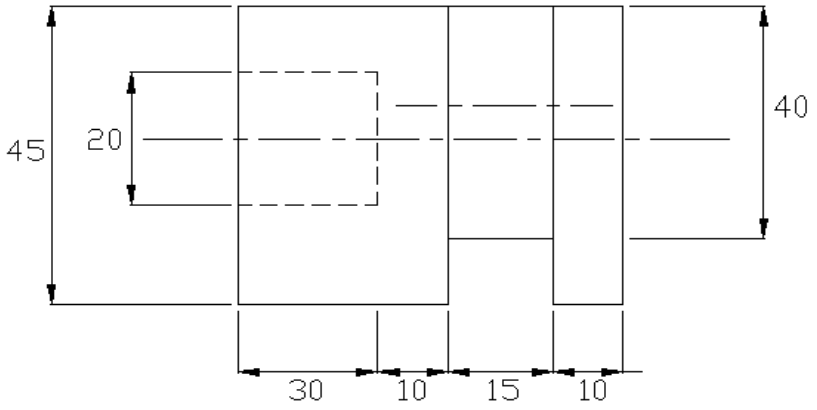


Three Jaws Chuck



Four Jaws Chuck

THREE AND FOUR JAWS CHUCK



TITLE	MACHINE SHAFT	DEPARTMENT	MECH. ENGIN.	PROGRAME	DKM2
MUKAH POLYTECHNIC SARAWAK		COURSE NAME	MWP 2	TIME ALLOC.	12H

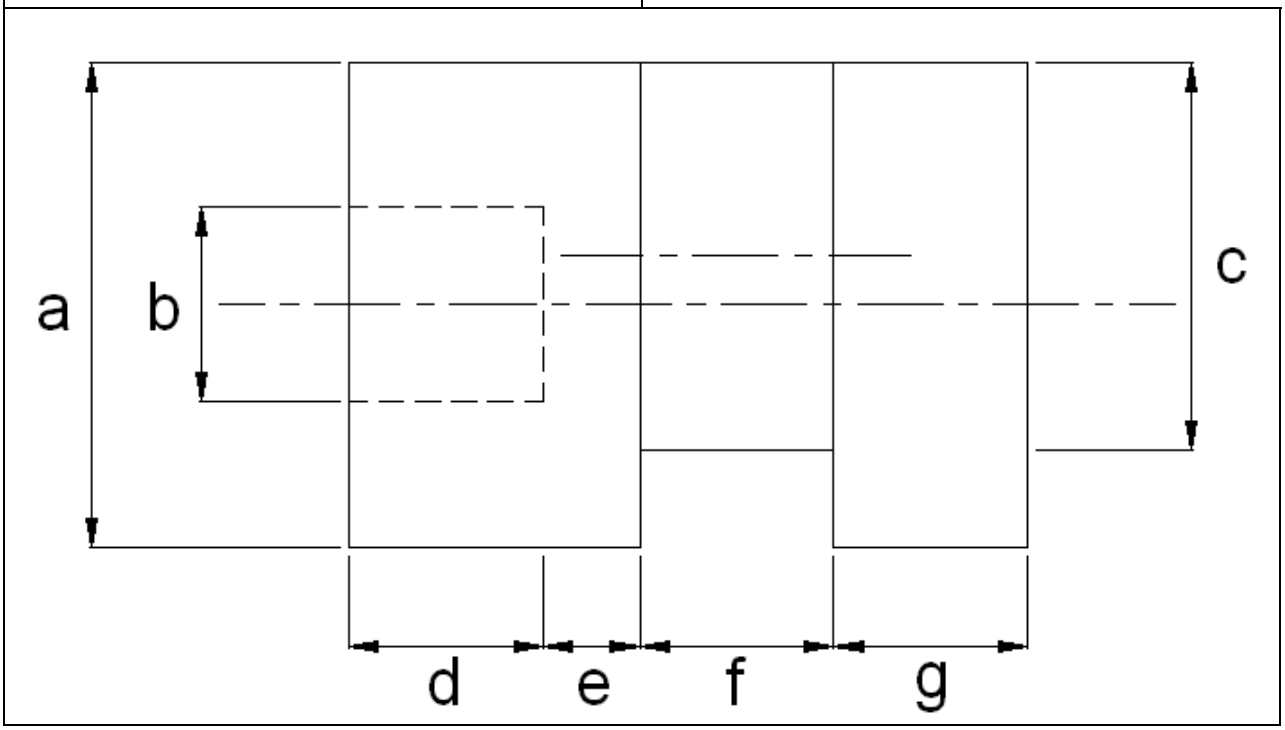
WORKPIECE SPECIFICATION

Precaution:

i. **Before starting any lathe operations, always prepare yourself by rolling up your shirt sleeves and removing your watch, rings, and other jewelry that might become caught while you operate the machine.**
ii. **Avoid loose fitting clothing.**
iii. **Keep floor around lathe machine clean and free of oil and grease.**
iv. **Follow job specifications for the speed, feed and depth of cut for materials being turned. Make sure all work runs true and centered.**
v. **Inspect chucks for wear or damage. Flying pieces can be very dangerous.**
vi. **Be sure the work area is clear of obstructions that you might fall or trip.**
vii. **Always use assistance when handling large workpieces or large chucks.**
viii. **Handle heavy chucks with care and protect the lathe ways with a block of wood when installing a chuck.**
ix. **Shut off the power supply to the motor before mounting or removing accessories.**
x. **Always stop the lathe before making adjustments.**
xi. **Be alert to the location of the cutting tool while you take measurements or make adjustments**
xii. **Use slower speed until workpiece is balanced.**
xiii. **Keep your eyes on the job, don't look away while cutting.**
xiv. **Do not changes spindle speeds until the lathe comes to a complete stop.**
xv. **Handle sharp cutters, centers, and drills with care.**
xvi. **Remove chuck keys and wrenches before operating**
xvii. **Always wear protective eye protection.**
xviii. **Know where the emergency stop button is before operating the lathe.**
xix. **Use t-hock or a brush to remove chips, never used your hands.**
xx. **Report any damage to machines/equipment as this could cause an accident.**
xxi. **Keep the workshop clean and tidy at all times.**

Practice Result:

Vernier Calipar			
a =	mm	±	mm
b =	mm	±	mm
c =	mm	±	mm
d =	mm	±	mm
e =	mm	±	mm
f =	mm	±	mm
g =	mm	±	mm



Practice Test

i. ___Facing_____ **is an operation of reducing the length of a workpiece.**

ii. _____Boring_____ **is an operation of enlarging of a hole already made in a workpiece.**

iii. **For turning small taper on long workpieces, the suitable method is**
   a. **By swivelling the compound rest of tool post.**
   b. **By offsetting the tail stock.**
   c. **None of the above.**
   d. **All of the above.**

v. **The chuck used for setting up of heavy an irregular shaped workpiece should be:**
   a. **Three jaw chuck.**
   b. **Four jaw chuck.**
   c. **Magnetic chuck.**
   d. **Drill chuck.**

iv. **Describe, with the help of suitable sketches, the various types of tool bits (eccentric turning, parting and boring) used in a lathe.**

v. **Give a brief description of eccentric turning?**