

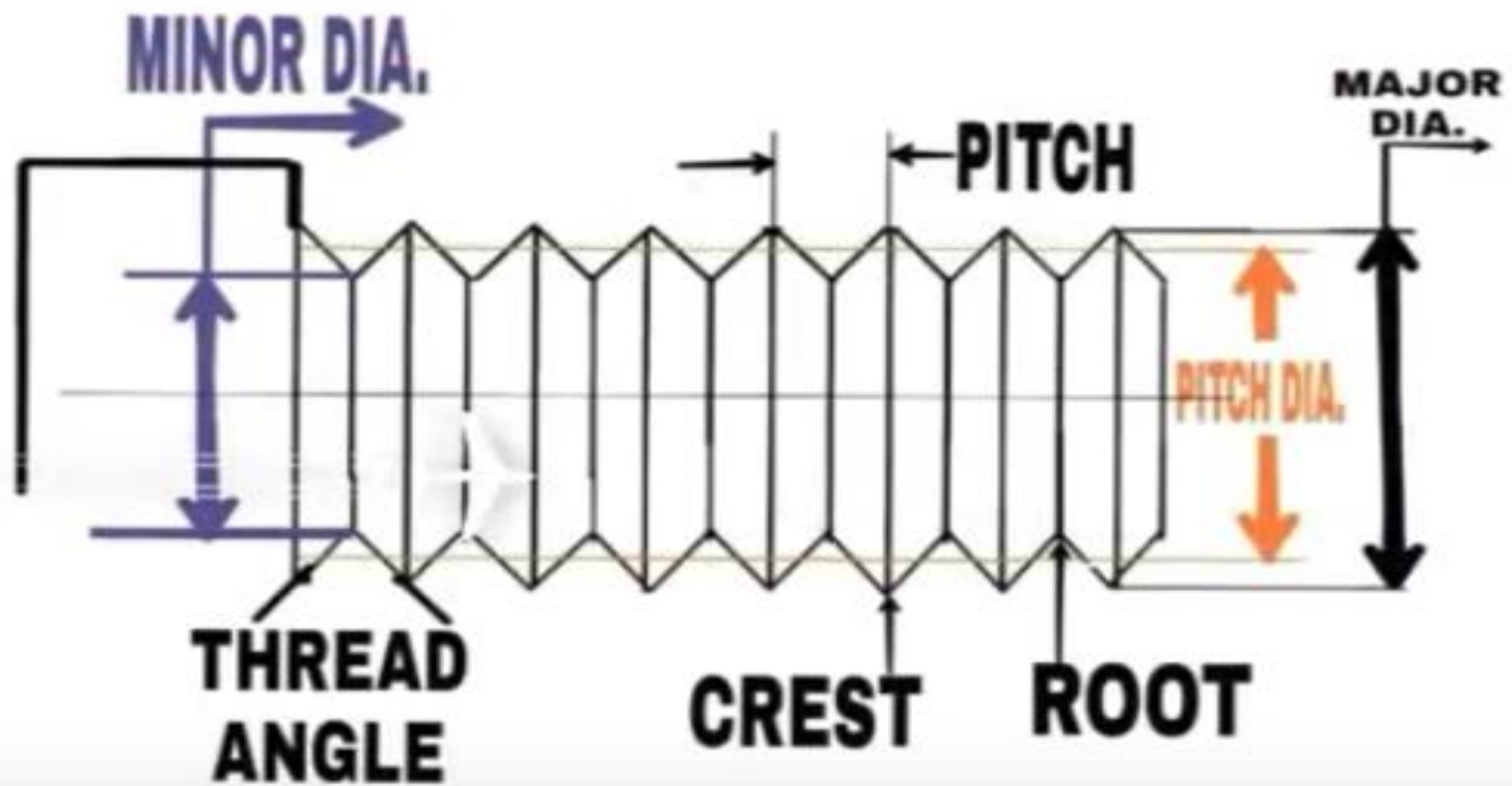
Experiment No: 5

- Title: Direct and indirect measuring instruments like Screw pitch gauge, radius gauge, small hole gauge, Telescopic gauge and Feeler gauge..

- **Objectives:**
 - i. know how to use a radius gauge, screw gauge and feeler gauge,
 - ii. know how to use a small hole gauge and telescopic gauge,
 - iii. understand difference between direct and indirect instruments

SCREW THREADS

Screw thread is a continuous helical groove of specified cross-section produced on the external or internal surface.



MAJOR DIAMETER

It is an imaginary largest diameter of thread which would touch the crests of internal or external thread.

PITCH DIAMETER

It is a theoretical diameter between the major and minor diameter of screw threads.

MINOR DIAMETER



It is an imaginary smallest diameter of thread which would touch the roots of an external thread.

PITCH



Pitch of a thread is the distance measured parallel to the axis from a point on a thread to the corresponding points on adjacent thread

FLANK



Flank of thread are straight edges which connect the crest with root of thread.

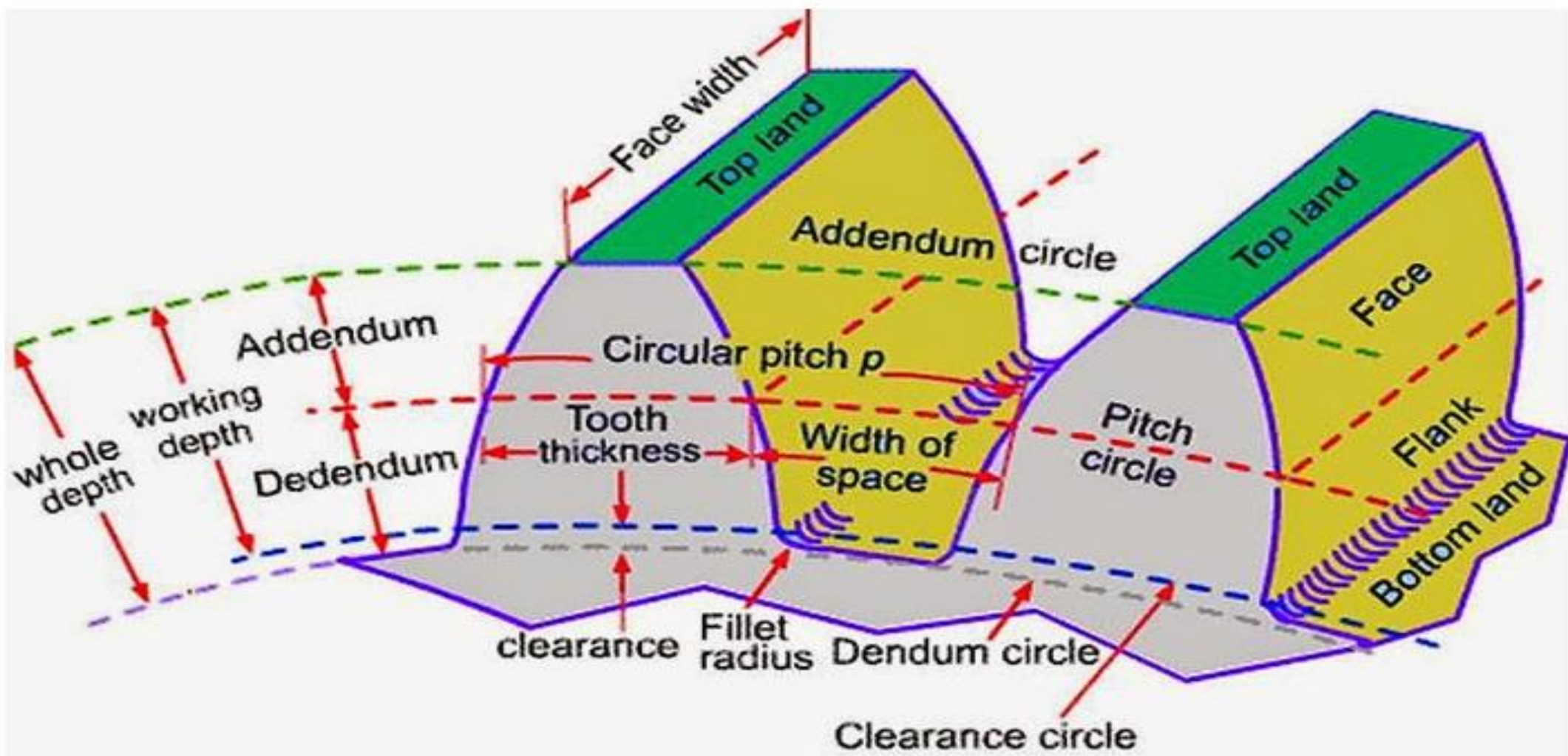
HELIX ANGLE

On straight thread, It is the angle made by the helix of the thread at the pitch line with the axis.

THE LEAD



It is the distance the nut moves parallel to the screw axis when the nut is given one turn.



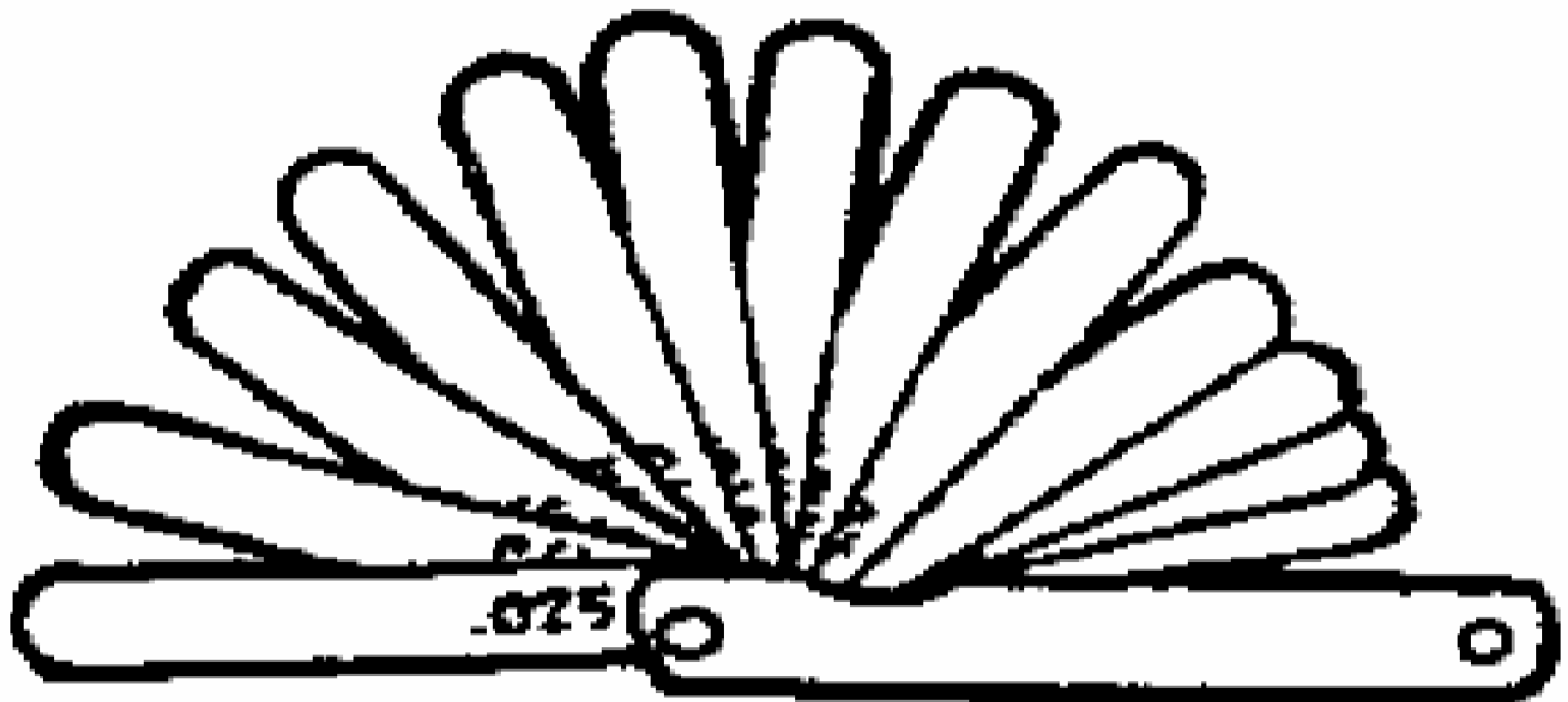
Theory: (A) Radius Gauges:

- Radius gauges are employed for checking external and internal radii on a curved surface. Radius gauges consists of set of blades. Corresponding radius is permanently marked on each blade. The set of blades with internal radius on one side and external radius on the other so that it may be suitable for checking fillets as well as radius. The passage of light between the gauge and the work allows the radius to be checked properly.



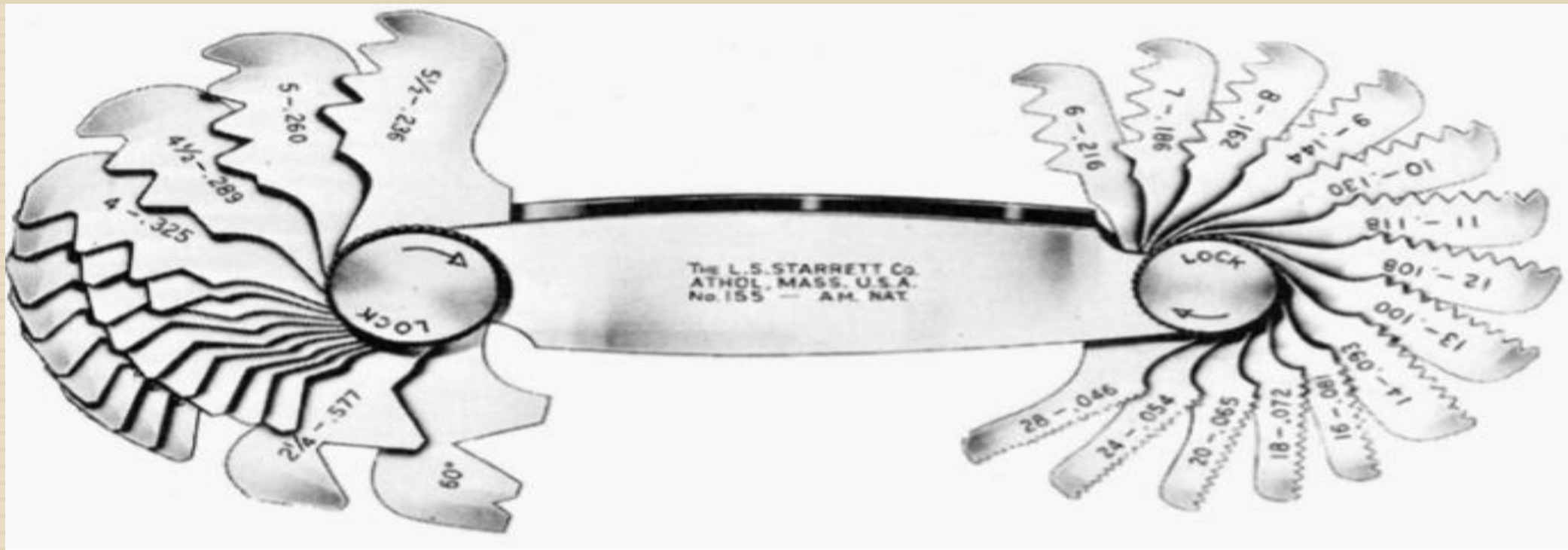
(B) Feeler Gauge:

- Feeler gauge is used to measure the clearance between the two mating parts. For example, it can be used in gauging of the clearance between the piston and cylinder and also for adjusting the spark plug between the distributor points of an automobile. The feeler gauge set consists of narrow strips of sheet steel of different thickness assembled together in holder. A set of feeler gauge consists of series of blades of thickness varying from 0.03mm to 1 mm. The width of blade is 12 mm at heel and tapered for outer part of their length so that the width of tip is 6mm.



(C) Screw Pitch Gauge:

- Screw pitch gauge is used to check the pitch of screw thread. They quickly determine the pitch of thread by matching the teeth on the strips with the teeth on the work.

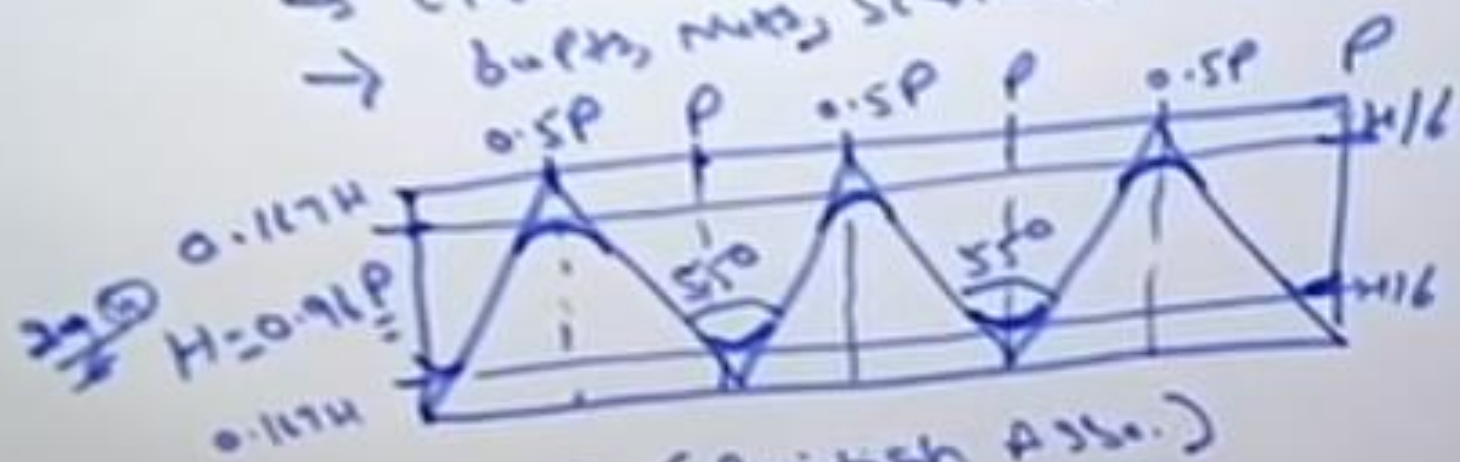


① B.S.W (British Stand. Whitworth)

→ 55° ✓

→ CREST or Root = Round ✓

→ $0.5P$, $0.5P$, $0.5P$, $0.5P$, $0.5P$



② B.A (British Assn.)

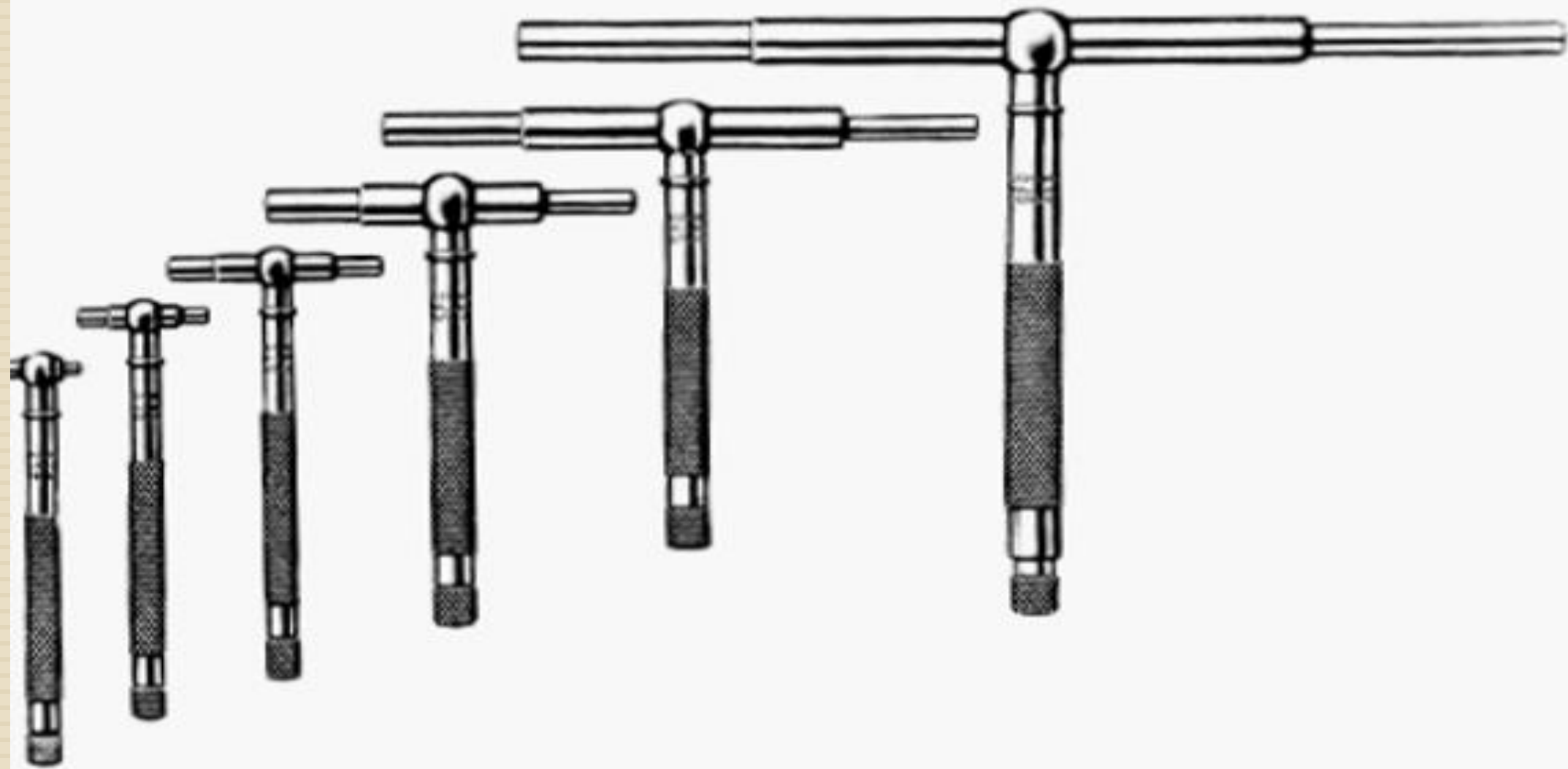
→ 47.5°

→ CREST or Root = Round

(D) Small Hole Gauge:

- Small hole gauges are used to measure the diameter of holes of smaller size and they are used specially when holes are drilled in the inside area of workpiece and measurement is not possible by the use of direct instruments like vernier caliper and micrometers.

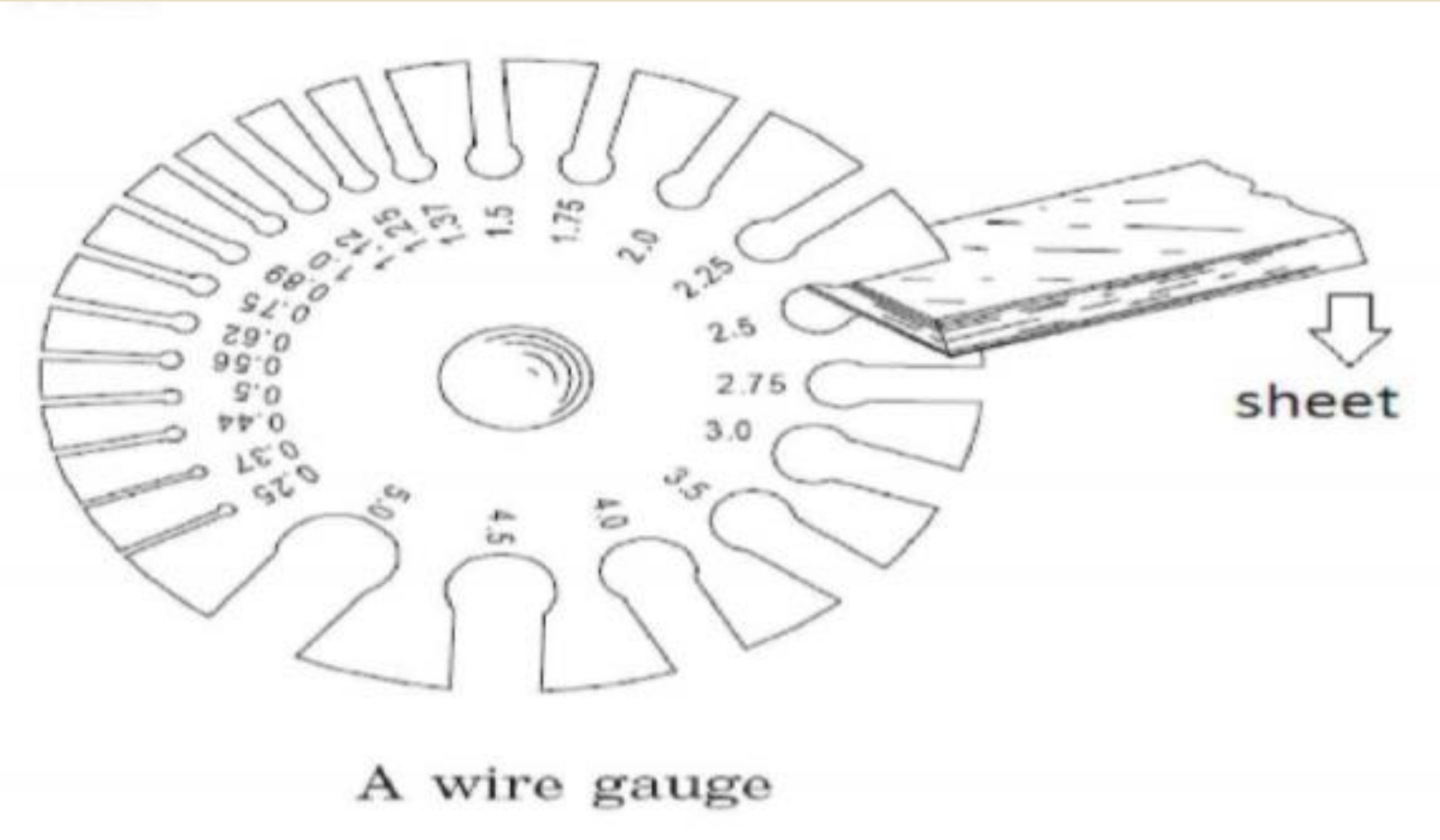




(E) Telescopic Gauge:

- Telescopic gauges are indirect and non- graduated instruments used for linear measurement. They are used in the situations where other instruments like Vernier caliper and micrometer cannot approach the contours of workpiece whose dimension is to be measured. For example for T slot measurement, intermediate bore diameter.

Wire Gauge



Observation Table:

Sr. No	Name of instrument	Observation