

**Mechanical Engineering Department**  
**ME372 – Machining (Machine Tool Lab)**

**Experiment No. \_\_\_\_\_**

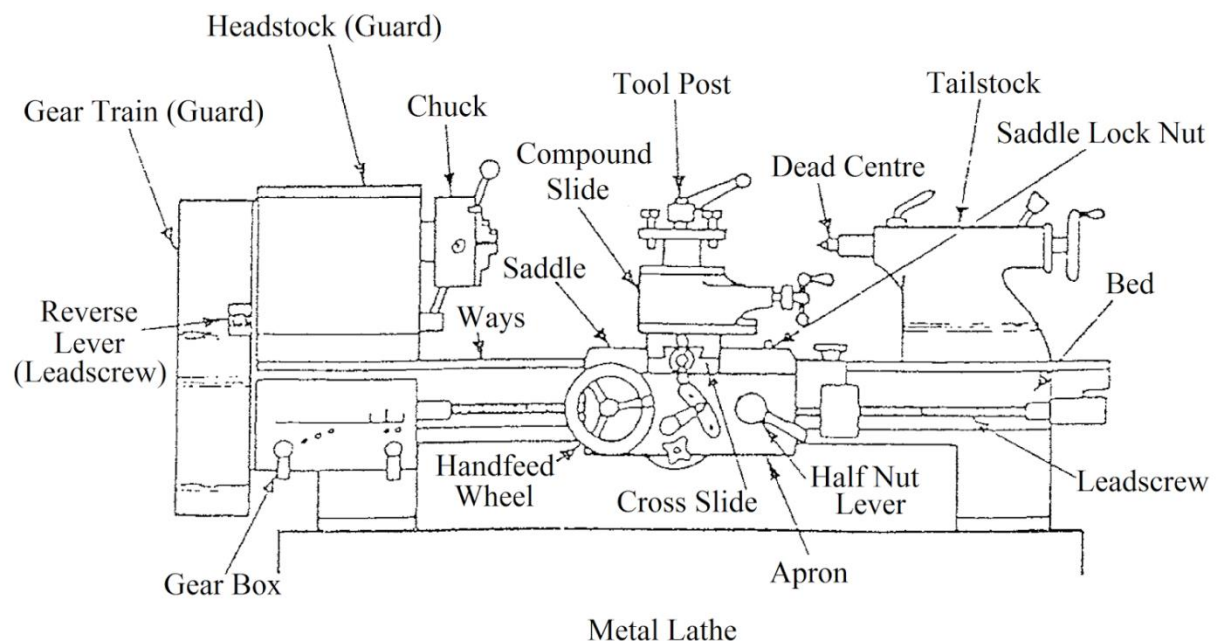
**AIM:** To perform the Alignment tests on the lathe machine.

**Theory:** The quality and accuracy of the finished work depends on the accuracy of the machine tools used in their production. The machine tools must be able to produce jobs of given accuracy within prescribed limits consistently.

The alignment test is carried out to check the grade of manufacturing accuracy of the machine tool. It consists of checking the relationship between various machine elements (such as bed, table, spindle etc.,) when the machine tool is idle and unloaded.

**Definitions:**

**Straightness:** A line located in a plane is deemed to be straight over a given length when all its points are contained between two straight lines parallel to the general direction of the line, whose relative distance is equal to the tolerance. The general direction of the line or representative line shall be defined so as to minimize the straightness deviation.



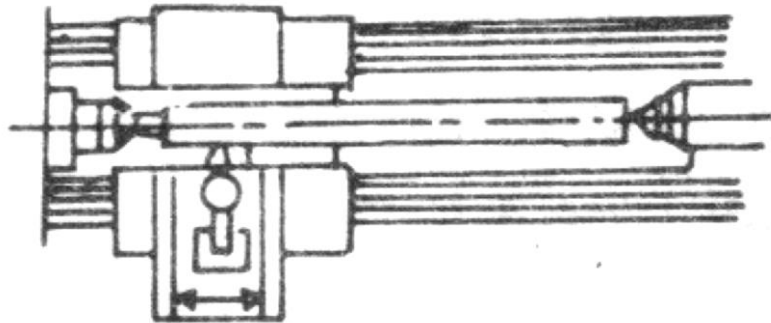
**Procedure:**

**A. Straightness of saddle in horizontal plane**

1. The mandrel is held between the centres.
2. The dial indicator is mounted on the saddle.
3. The spindle of the dial indicator is allowed to touch the mandrel.
4. The saddle is then moved longitudinally along the length of the mandrel.
5. Readings are taken at different places.

*Permissible error: 0.02 mm over length of mandrel.*

Readings			
Actual error			

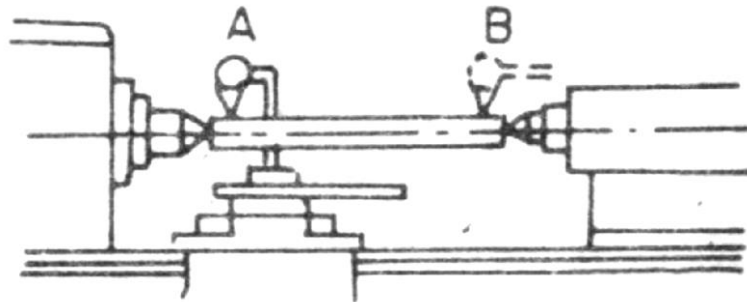


### B. Alignment of both the centres in the vertical plane

1. The mandrel is held between the centres.
2. The dial indicator is mounted on the saddle in the vertical plane as shown in fig.
3. Then the saddle along with the dial gauge is travelled longitudinally along the bed ways, over the entire length of the mandrel.
4. Readings are taken at different places.

*Permissible error: 0.02 mm over 600 mm length of mandrel (Tail stock centre is to lie higher only).*

Readings			
Actual error			



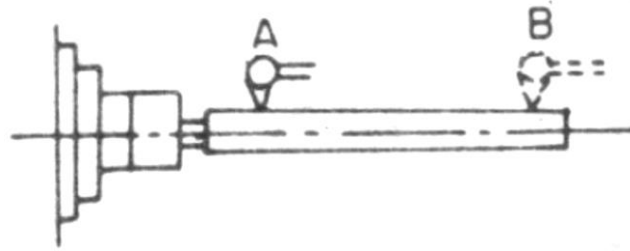
### C. True running of the spindle

1. The test mandrel is held on the head stock.
2. The dial gauge is mounted on the saddle and is made to touch the mandrel.
3. The saddle is then travelled longitudinally along the bed ways.
4. Readings are taken at the different points.

*Permissible error: 0.01 mm at position A and 0.02 mm at position B.*

Position 1	Dial gauge reading	Actual error
Position 2	Dial gauge reading	Actual error

Position 3		



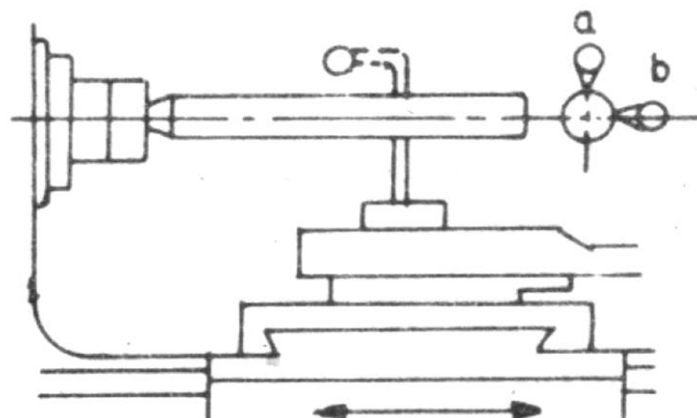
#### D. Parallelism of main spindle to saddle movement.

(a) In a vertical plane      (b) In horizontal plane

1. The dial gauge is mounted on the saddle.
2. The gauge spindle is made to touch the mandrel (300 mm) and the saddle is moved to and fro.
3. It is checked in vertical as well as in horizontal plane.

*Permissible error:* (a) 0.02/300 mm mandrel rising towards free end only. (b) 0.02/300 mm mandrel inclined at free end towards tool pressure only.

Vertical plane	Dial gauge reading	Actual error
Horizontal plane		

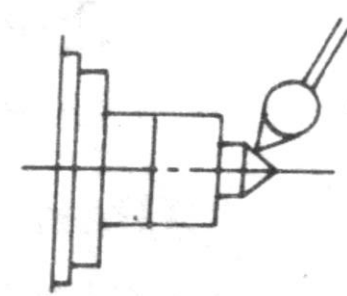


#### E. True running of head stock centre

1. The live centre is held in the tail stock spindle and it is rotated.

2. Its trueness is checked by means of a dial gauge as shown in fig.

*Permissible error:* 0.01 mm

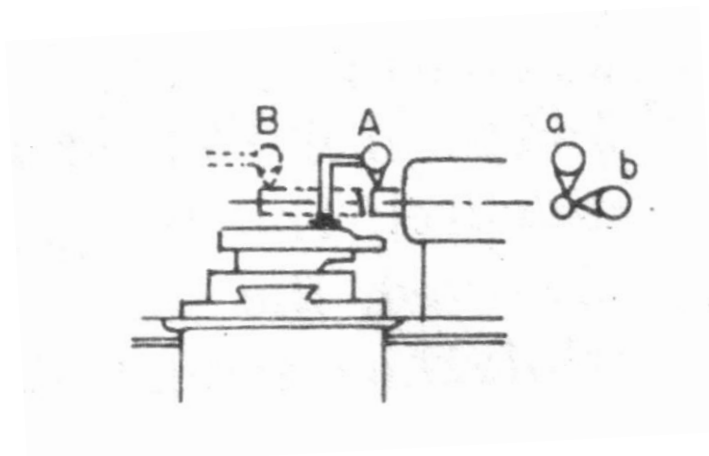


#### **F. Parallelism of the tail stock sleeve to saddle movement.**

1. Tail stock is fed outwards.
2. The dial gauge is mounted on the saddle.
3. Its spindle is touched to the sleeve at one end and then saddle is moved to and fro.
4. It is checked in H.P. and V.P. also.

*Permissible error:* (a) 0.01/100 mm Tailstock sleeve rising towards free end only. (b) 0.01/100 mm Tailstock sleeve inclined towards tool pressure only.

Vertical plane	Dial gauge reading	Actual error
Horizontal plane		



**Results:** The Alignment tests of a lathe machine have been performed.