Angle Plate

Sine Base with Centers

Instruction Manual

To ensure correct use, please read this instruction manual carefully before use. After reading, keep it in a safe place where the user can always refer to it.

OBISHI KEIKI SEISAKUSHO Co., Ltd.

Safety Precautions

※Before use, please read this instruction manual carefully and use the product correctly.

※The precautions shown here are intended to ensure the safe and proper use of the product and to prevent any potential hazards to the user.

※The precautions are categorized into three levels — **Danger, Warning, and Caution** — to clearly indicate the severity and urgency of potential harm or damage that may occur if the product is mishandled.

<table>
<tr><th colspan="3">For Safe and Proper Use</th></tr>
<tr><td colspan="3">This instruction manual includes various symbols and pictograms throughout the text to ensure correct use of the product and to prevent harm or damage to the user.

The symbols and their meanings are as follows.

● Please read the text after fully understanding the symbols and their meanings.
● After reading, be sure to keep this manual in a place where anyone using the product can easily refer to it at any time.
● All of these are safety-related instructions, so please be sure to follow them.</td></tr>
<tr><td colspan="2">⚠ Danger</td><td>This indicates situations where incorrect handling could result in imminent risk of death or serious injury.</td></tr>
<tr><td colspan="2">⚠ Warning</td><td>This indicates situations where incorrect handling could potentially result in death or serious injury.</td></tr>
<tr><td colspan="2">⚠ Caution</td><td>This indicates situations where incorrect handling may result in injury to persons or only property damage.</td></tr>
<tr><td rowspan="3">Examples of symbols</td><td>  </td><td>The △ symbol indicates the presence of danger, warning, or caution messages, with specific precautions described within the figure.
(The left figure is used to indicate general danger, warning, or caution without specifying details.)</td></tr>
<tr><td>  </td><td>The ○ symbol indicates prohibited actions, with specific precautions described within or below the figure.
(The figure on the left is used for general prohibition notices without specifying particular actions.)</td></tr>
<tr><td>  </td><td>The ● symbol indicates mandatory actions, with specific instructions detailed within the figure.
(The figure on the left is used for general mandatory actions or instructions without specifying details.)</td></tr>
</table>

Sine Base with Centers Instruction Manual

1. Product Features

・Use gauge blocks to set the angle.

・Suitable for measuring workpieces with angled surfaces such as tapers.

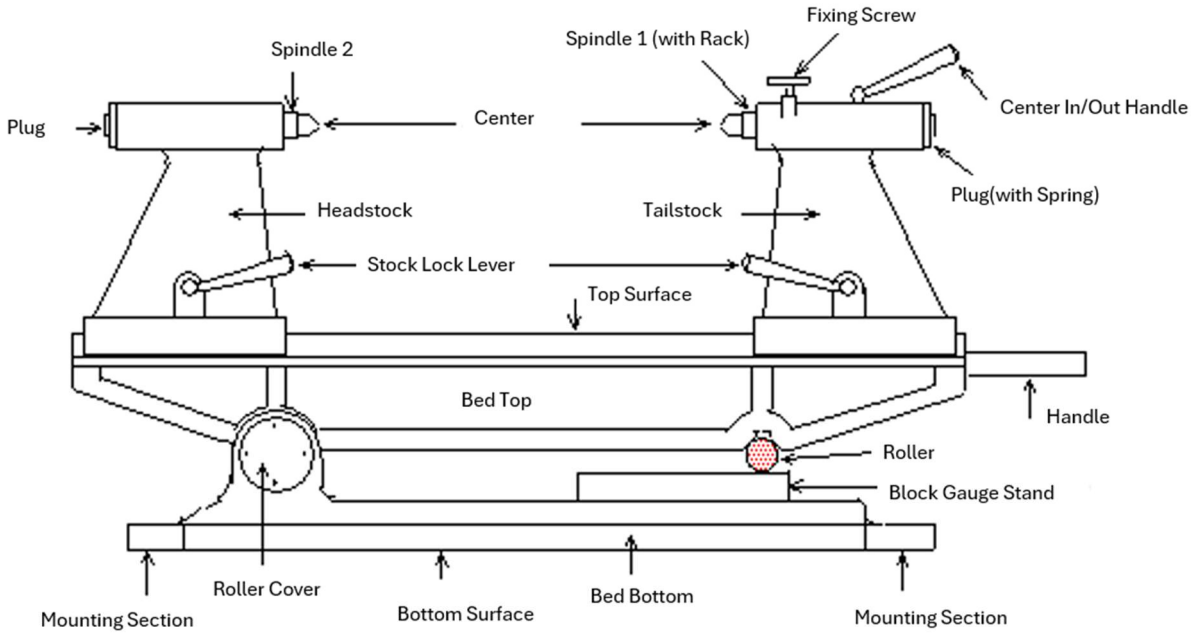
・The bed top surface can also be used for measuring the angle of flat workpieces.

・The centers can be engaged and disengaged with a lever for one-touch operation.

Note: The test bar is not included.

Note: Gauge blocks are not included.

2. Names of Parts and External View



3. Specifications

Code No.	Nominal	Size (L × W × H mm)	Center Distance (mm)	Center Height (mm)	Use Center	Roller Pitch Distance (mm)	Height Parallelism (μm)	Mass (kg)
NJ101	300	560 × 130 × 310	270	150	Tungsten Carbide MT-1	300 ±0.005	5	36

4. Instructions for Use

A） Since the roller center distance is maintained, it is possible to measure tapered workpieces as shown in Figure 2. The measurement procedure is as follows:

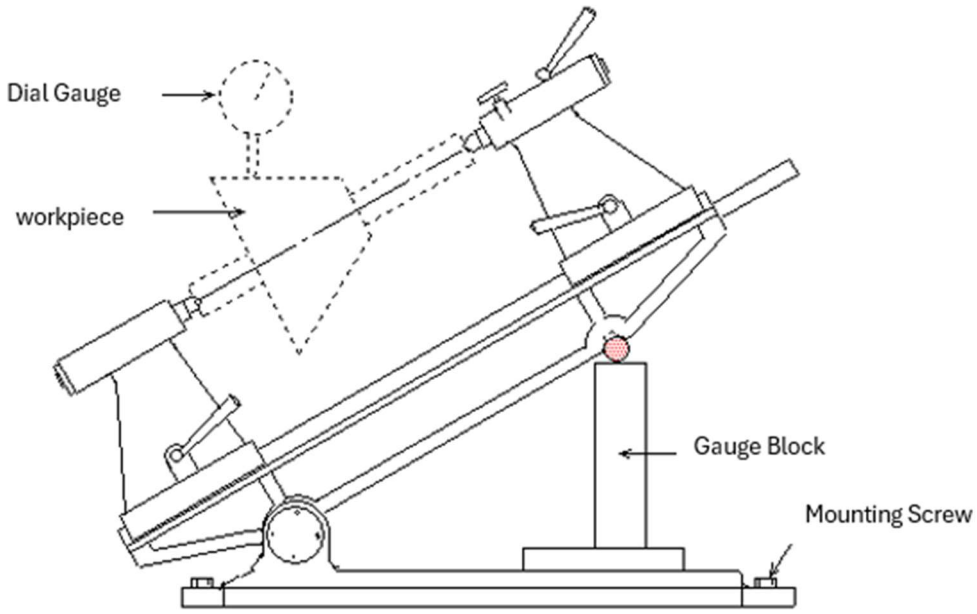


Figure 2. Measurement of a Tapered Workpiece

① Fix the sine base to the reference surface plate or equivalent by using the mounting screws on the mounting section of the bottom surface.

② Wipe the centers and the workpiece clean, and mount the workpiece between the centers.

③ Prepare gauge blocks that match the taper angle of the workpiece.

④ Lift the bed, place the gauge blocks on the block gauge stand, and gently lower the rollers of the sine base onto the gauge blocks.

(Do not apply strong impact to the rollers, as this may damage them and prevent accurate measurement.)

Note: Always place the gauge blocks at the center of the rollers. If they are not centered, the instrument may tilt and the gauge blocks may fall, causing injury.

⑤ Bring the stylus of the dial gauge into contact with the workpiece, rotate the workpiece, and measure the deflection of the pointer.

Slide the stand with the dial gauge attached over the reference surface plate to measure the straightness and other characteristics of the workpiece.

⑥ After finishing the operation, lift the bed, remove the gauge blocks, and gently lower the bed onto the block gauge stand.

⑦ Remove the workpiece and loosen the mounting screws.

B) Workpieces without tapers can also be measured in the same way as with a standard eccentricity tester (Figure 3).

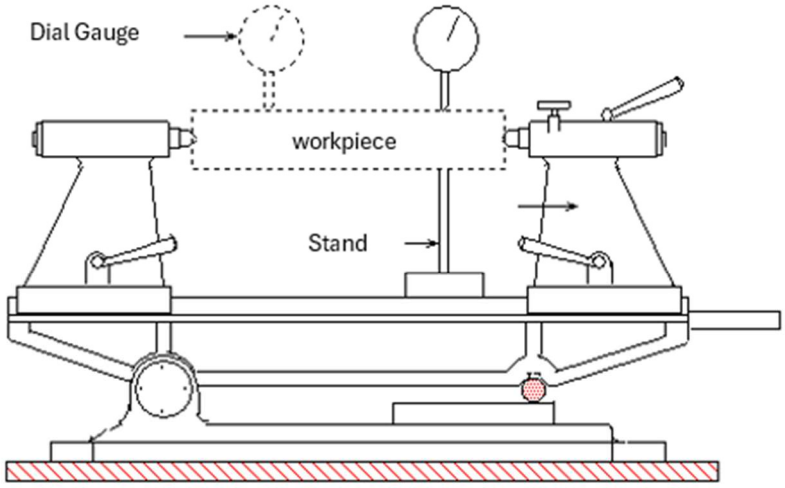


Figure 3. Measurement of a Workpiece without Taper

① Mount the workpiece on this instrument.

② Place the stand with the dial gauge attached onto the instrument.

③ Bring the stylus of the dial gauge lightly into contact with the highest point of the workpiece.

④ Rotate the workpiece and record the deflection of the pointer.

5. Adjustment Method

【Adjustment of the Stock Lock Lever】

① Loosen the stock lock lever.

② Move the stock so that the convex piece under the stock protrudes slightly outside the bed T-slot.

③ Rotate the convex piece.

④ Return the stock onto the bed, tighten the stock lock lever, and check its position.

⑤ Move the stock along the bed and make sure it moves smoothly.

⑥ If readjustment is required, repeat steps 1–5.

Note: If the convex piece is higher than the top surface of the T-slot, it will not fit into the slot.

Note: The adjustment range is extremely small, so handle with care.

【Adjustment of the Center In/Out Handle】

① As shown in Figure 4, loosen the set screw for fixing the plug and remove the plug. Since a spring is inserted, take care not to let the plug fly out.

② Loosen the set screw for fixing the center in/out handle, lift the handle, and remove it.

③ Rotate the center in/out handle to the desired position and insert it so that it meshes with the rack.

④ Move the center in/out handle back and forth and check its position again.

⑤ After confirmation, install the set screw for fixing the center in/out handle.
Caution: If overtightened, the center in/out handle will not move.

⑥ Insert the spring, press in the plug, and install the set screw for fixing the plug.

⑦ If readjustment is required, repeat steps 1–6.

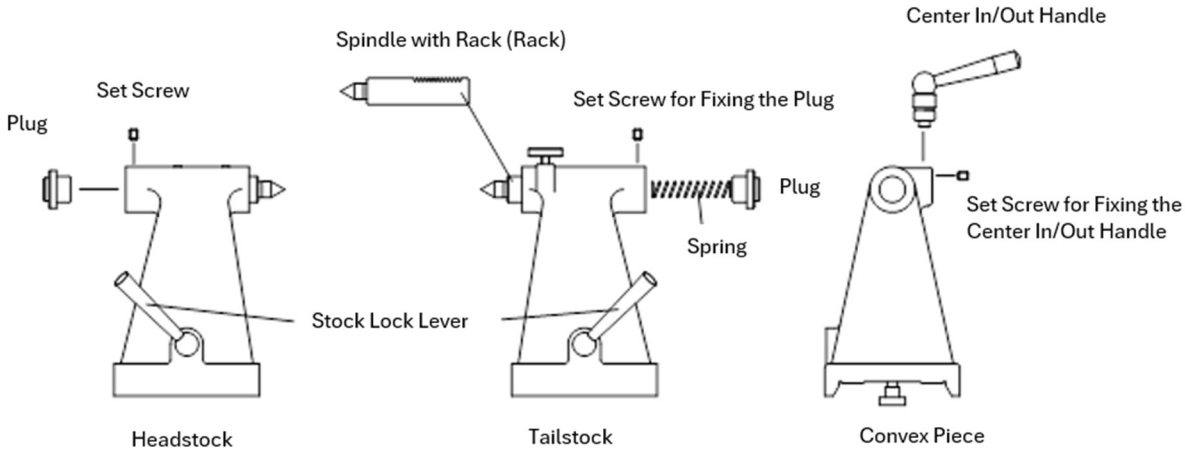


Figure 4. Adjustment of the Convex Piece and the Center In/Out Handle

6. Replacement of the Center

If damage (such as chipping or wear) is found on the tip of the center, replace the center with a new one immediately.

Headstock Side

① Loosen the set screw and remove the plug.

② Prepare a push rod, insert it into the stock, and remove the center.

③ Insert a new center.

④ To protect the tip of the center, place a wooden block or similar material against it and tap lightly with a plastic hammer.

⑤ Reattach the plug and set screw.

Tailstock Side

① Remove the fixing screw.

② Loosen each set screw and remove the plug and the center in/out handle.

Caution: Since a spring is inserted, take care not to let the plug fly out.

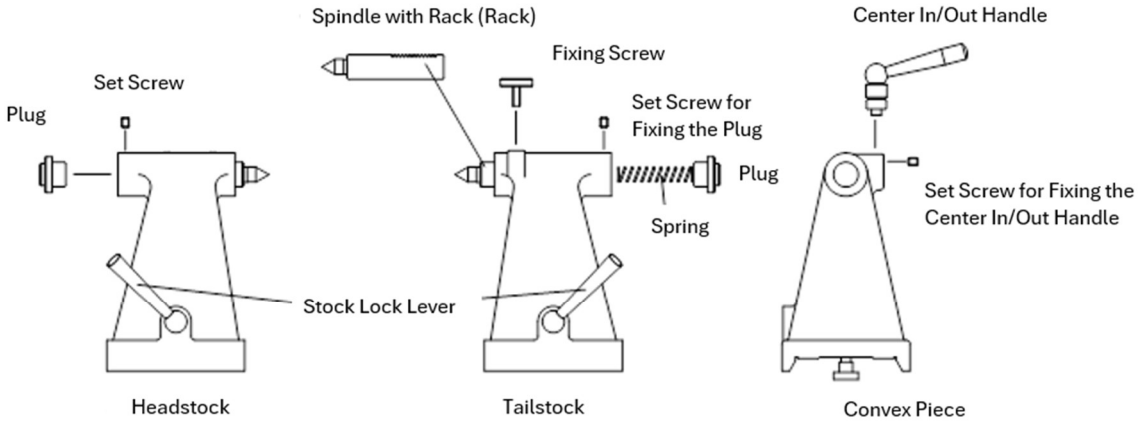
③ Pull out the spindle with rack.

④ Insert a push rod into the spindle with rack and tap lightly to remove the center.

⑤ To protect the tip of the center, place a wooden block or similar material against it and tap lightly with a plastic hammer.

⑥ Insert the spindle and the center in/out handle, and adjust their positions.

⑦ Secure the spindle, insert the spring, attach the plug and set screws, and finally install the fixing screw.



7. Precautions for Use

① Clean the Precision Surface and the measurement surface of the workpiece before use.

● ② Handle the instrument carefully during use and storage to avoid impact or shock.

③ Allow the instrument to acclimate to the ambient temperature before use.

④ Do not use or store the instrument in places with drastic temperature changes.

⑤ When installing this instrument on a surface plate, check the load capacity of the surface plate (maximum concentrated load mass, JIS B 7513 Table 5).

⑥ Do not apply excessive load or impact to the bed or centers.

△ ⑦ Before mounting the workpiece, always make sure that the stock is securely fixed.

If the stock is not fixed, the spring force inside the tailstock may cause the stock to move, resulting in the workpiece coming off the centers and falling.

⑧ Check that the center holes of the workpiece are properly engaged with the centers of this instrument.

If they are not properly engaged, the workpiece may fall when released.

⑨ When removing the workpiece, firmly support it with your hand or an equivalent fixture while removing it.

⑩ When moving the stock, always move it gradually and carefully.

If it is moved too much at once, the stock may slip on the bed and collide with the opposite stock, causing damage to the centers.

In particular, when the distance between the centers is narrow, lightly tap the rear of the stock and adjust it slowly.

⑪ The parallelism between the bottom surface of the bed and the centers is not guaranteed in the initial state.

Always check the parallelism during use and make adjustments as necessary.

⑫ When moving this instrument, always move it with the stocks fixed.

Note: When transporting by vehicle, insert cardboard or similar material between the two stocks and secure them firmly with string or other means to prevent movement, even if the fixing handle loosens due to vibration.

⑬ Do not place this instrument in locations subject to vibration or other similar conditions.

● ⑭ After use, always apply rust prevention treatment and store the instrument in its storage case.

⑮ If there are scratches or damage, have the instrument repaired and inspected. Remove minor scratches on the Precision Surface locally with an Arkansas stone or similar before use.

⑯ Check the instrument for abnormalities before use in the following cases:

・When the instrument has been dropped.

・When an object has been dropped onto the instrument.

⑰ Check the accuracy regularly before using the product.

△ ⑱ If the product has sharp edges, handle it carefully to avoid injuring your fingers or other parts of your body.

⑲ For heavy products, handle placement and other operations with two or more people, and take care to avoid injury.

△ ⑳ Wear protective gloves and safety glasses as necessary to prevent injury while working.

△ ㉑ Do not use this product if it is damaged or deteriorated, as it may cause injury or accidents.

△ ㉒ If an injury occurs, give first aid immediately and seek medical attention if necessary.

Contact Information

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Head Office and Factory

Design, development, manufacturing, and calibration services for precision measuring instruments (levels, surface plates, straight edges, reference measuring instruments, square rulers, blocks, dial gauge stands, comparators, angle measuring instruments, bench centers, squareness measuring instruments).