

BD-07a: Set Home (Sundstrand)

SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.
- Spindle rotates and the axis is moved resulting in hazardous conditions for personnel.

EQUIPMENT

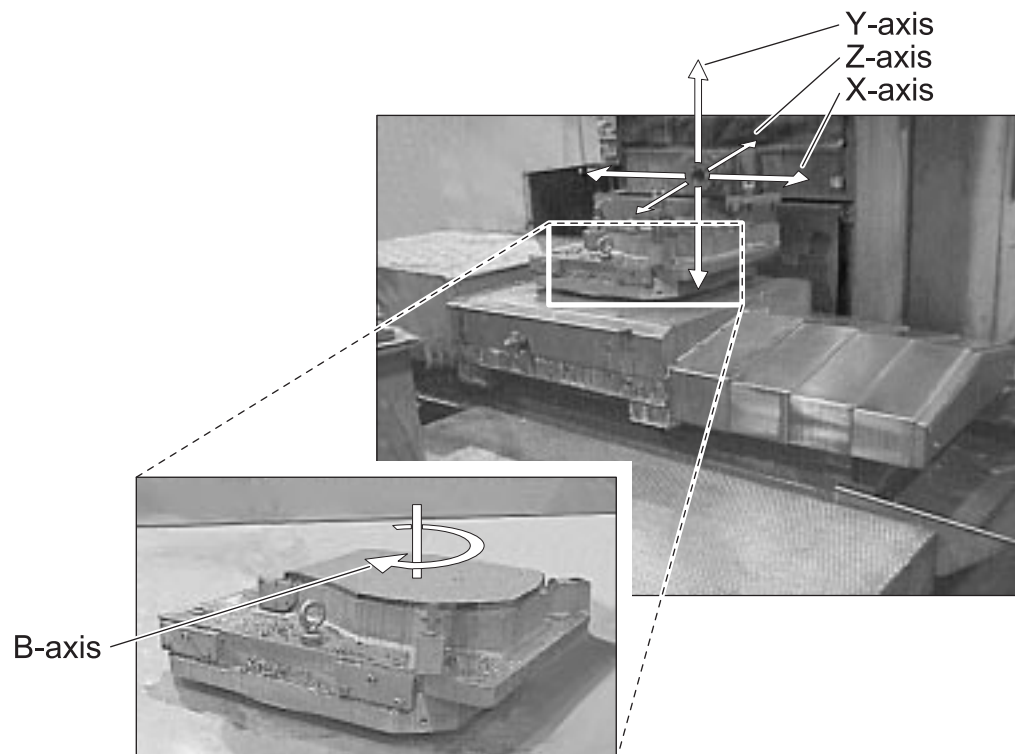
- Test bar
- Dial indicator capable of measuring ten thousandths (0.0001”).
- magnetic base

RESOURCES

- Sundstrand Operator's Manual

Set Home (Sundstrand)

Machine Axes



Note: Verify that the control is set in the Inch mode.

1. Home the axes.

- Set the mode to Auto.
- Type HM_ALL (The _ sign represents pressing the <space> key) and press <Return>.
- Press the <XMIT/Enter> key.
- Press <Cycle Start>.

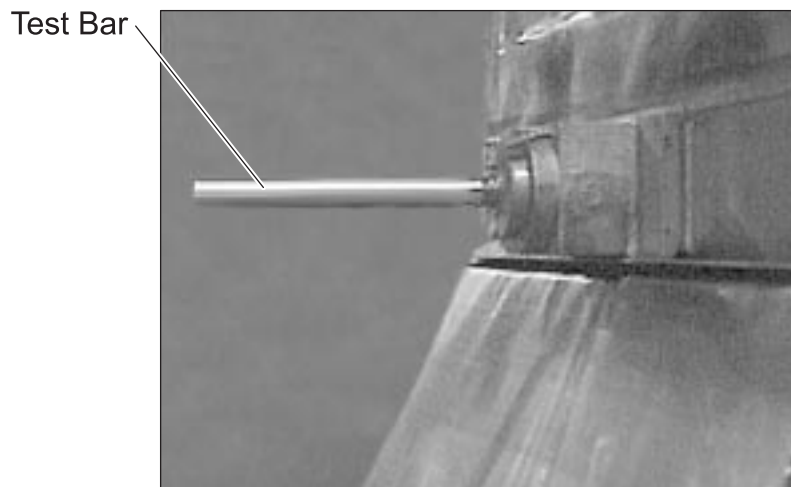
2. Manually remove the tool from the spindle.

- Set the mode to High Jog.
- Move the Y-axis down and Z-axis forward until the tool is reachable.
- Set the mode to Low Jog when close to the table.

Move Spindle to a
Reachable Position



- Set the Mode to manual.
- Turn off the Spindle.
- Press the spindle <UNCL> button to unclamp the tool.
- Remove the tool.

3. Install the test bar.**4. Press the spindle <CLAMP> button.****5. Return the control to MDI.****6. Set the table to center.**

- Type X24.0.
- Press <Return>.
- Press <XMIT/Enter>.
- Press <Cycle Start>.
- Observe the table move to the center position.

7. Exit MDI mode.

- Type EN and press <XMIT/Enter>.

8. Jog the Z-axis until the test bar is over the table.

9. Set up the dial indicator to measure the X-axis.

Dial Indicator
Setup to Measure
the X-axis

Test Bar



- Move the Y-axis (+) and (-) to locate the center of the test bar.

10. Determine test bar runout.

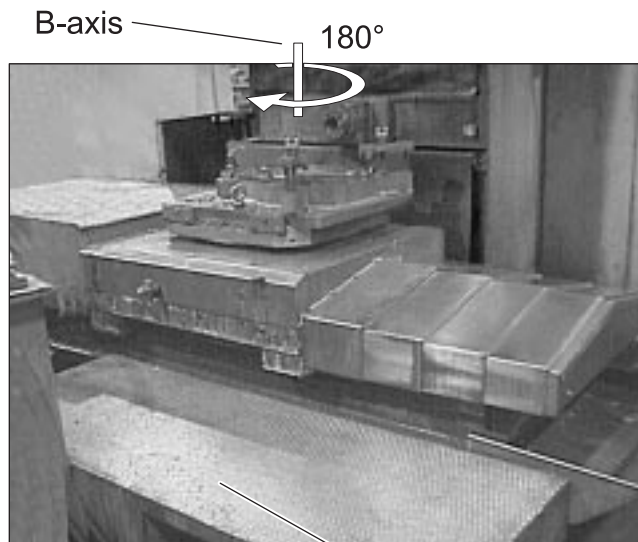
- Turn on the spindle at a low RPM (20 RPM or less).
- Zero the indicator on the mean of the test bar runout.

Rotate to Zero
Indicator

Zero



11. Note the Y and Z axes positions.
12. Move the Y and Z axes for proper clearance to allow the B-axis rotation.
13. Rotate the B-axis 180°.



STAND CLEAR While
B-axis is Rotated

14. Return the Y and Z axes to the same position.
15. Measure the X-axis again.
 - Compare the indicator readout to the reading in step 10.
16. Calculate the amount that the tool bar is off center.

Note: Off center is the difference in the expected value for the X-axis (in this case 24") and the actual value (the value displayed when you are located to within .0002") displayed on the control panel.

- If the measurement is greater in the right hand direction of the indicator, the change is positive (an increase); if the measurement is greater in the left hand direction, the change is negative (a decrease).
- Increment the axis 1/2 the calculated value in the required direction.
- Reset the indicator to zero.

- Repeat steps 10-16 until the reading is within .0002 inches.

17. Ask the Electrician to compensate the X-axis from the feedback device, if necessary.

- Type PI and press <Return>, then <XMIT/Enter>.
- Turn off the axes.
- Monitor the X-axis value on the control panel, communicating with the Electrician as the feedback device is adjusted to read 24 inches.

Y-axis

18. Home the axes.

- Set the mode to Auto.
- Type HM_ALL and press <Return>.
- Press the <XMIT/Enter> key.
- Press <Cycle Start>.

19. Manually remove the tool from the spindle.

- Set the mode to High Jog.
- Move the Y-axis down and Z-axis forward until the tool is reachable.
- Set the Mode to manual.
- Turn off the Spindle.
- Press the spindle <UNCL> button to unclamp the tool.
- Remove the tool.

20. Install the test bar.

21. Press the spindle <CLAMP> button.

22. Return the control to MDI.



23. Set the table to center.

- Type X24.0.
- Press <Return>.
- Press <XMIT/Enter>.
- Press <Cycle Start>.
- Observe the table move to the center position.

24. Setup the indicator to measure the Y-axis.

Note: This measurement is from the centerline of the spindle to the top of the table.

- Check the indicator with the master gauge.
- Set up the 4 1/2" dial indicator.

25. Move the Y-axis 5.5" above the table.

- This value is the radius of the test bar plus the dimension of the dial indicator.
- Jog the Z-axis (-) as far as possible without going into overtravel.
- Set the indicator on the table as close to the spindle face as possible.
- Slide the indicator back and forth to find the center of the test bar.
- Start the spindle at 20 RPM or less.

26. Increment the Y-axis until the mean of the test bar runout is zero on the indicator.**27. Ask the Electrician to compensate the Y-axis from the feedback device, if necessary.**

- Type PI and press <Return>, then <XMIT/Enter>.
- Turn off the axes.
- Monitor the Y-axis value on the control panel, communicating with the Electrician as the feedback device is adjusted to read 5.5 inches.

Z-axis**28. Home the axes.**

- Set the mode to Auto.
- Type HM_ALL and press <Return>.
- Press the <XMIT/Enter> key.
- Press <Cycle Start>.

29. Manually remove the tool from the spindle.

- Set the mode to High Jog.
- Move the Y-axis down and Z-axis forward until the tool is reachable.
- Set the Mode to manual.
- Turn off the Spindle.
- Press the spindle <UNCL> button to unclamp the tool.
- Remove the tool.


30. Install the test bar.**31. Press the spindle <CLAMP> button.****32. Return the control to MDI.****33. Set the table to center.**

- Type X24.0.
- Press <Return>.
- Press <XMIT/Enter>.
- Press <Cycle Start>.
- Observe the table move to the center position.

34. Setup the indicator to measure the Z-axis.

Note: This measurement is from the centerline of the spindle to the front of the table.

35. Move the Y-axis to 10" above the tabletop.

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36. **Measure the Z-axis.**
 - Slowly move the Z-axis to the appropriate test bar gauge length. (Length should be marked on the test bar.)
 37. **Locate the magnetic base indicator on the table with the indicator reading the bottom end of the test bar with one revolution of pre-load.**
 38. **Move the Y-axis an additional 10" in the positive direction.**
 39. **Rotate the B-axis 180°.**
 40. **Lower the Y-axis as close as possible to the indicator.**
 41. **Place a Jo-block against the end of the test bar and indicator.**
 42. **Increment the Z-axis 1/2 the difference in the indicator readings.**
 43. **Repeat steps 34-42 until the indicator reading is within .0002 inches.**
 44. **Ask the Electrician to compensate the Z-axis from the feedback device, if necessary.**
 - Type PI and press <Return>, then <XMIT/Enter>.
 - Turn off the axes.
 - Monitor the Z-axis value on the control panel, communicating with the Electrician as the feedback device is adjusted to read the gauge length as calculated in step 36.