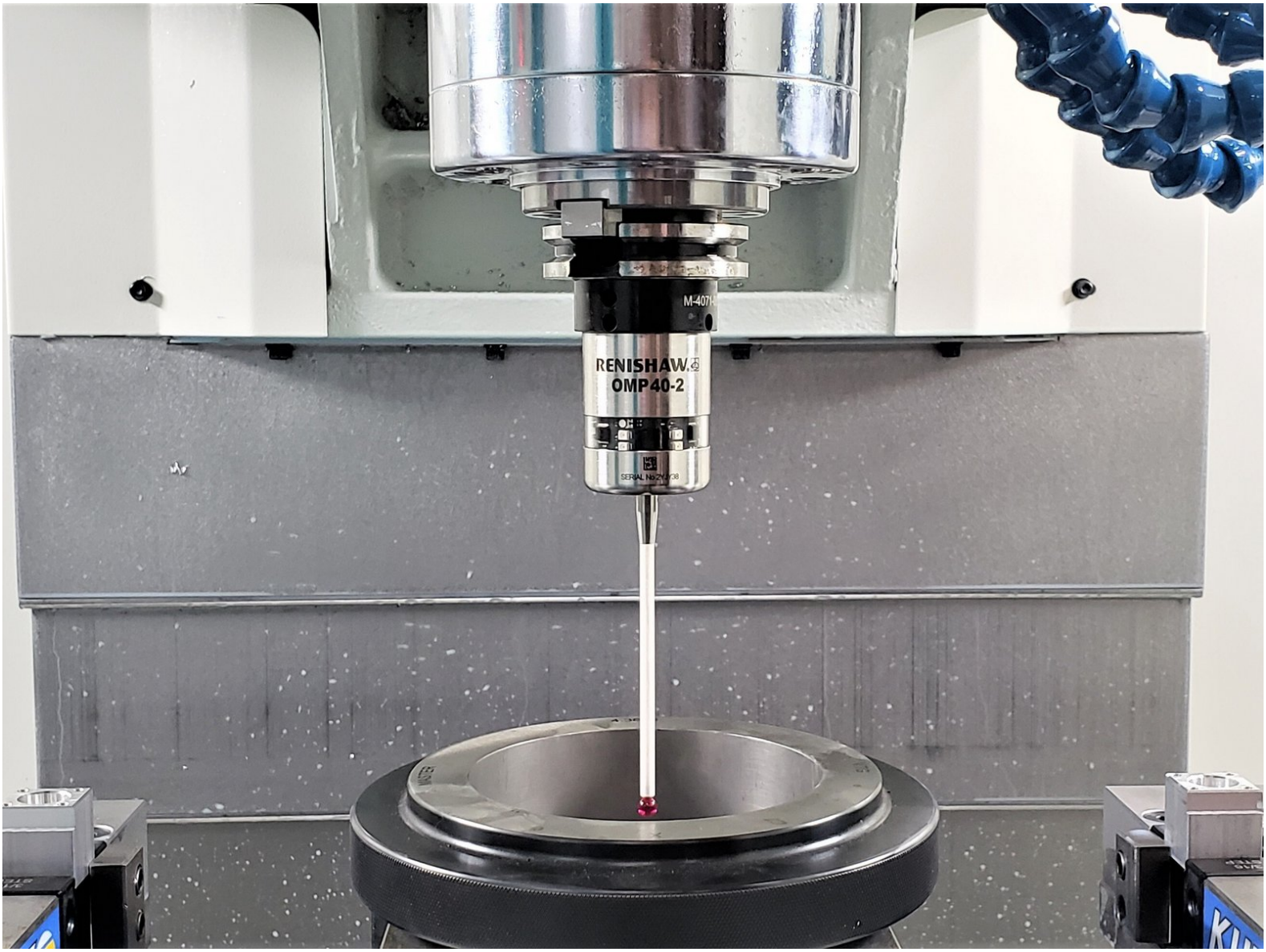
VMCsi Probe Part Option - Set Up & Calibrate Spindle Probe

Written By: Trent Plungas



INTRODUCTION

The OMP40-2 spindle probe (P/N 34080-1) sets part zeros, applies work offsets, and checks part geometry. This guide covers assembling it, teaching it to the control, and calibrating its length and diameter.

The optical receiver must already be installed inside the machine envelope. If it isn't, do that first — see VMCsi Probe Tool and Probe Part Options – Mount Probe Receiver.

This is the part probe. For the OTS tool setter (P/N 34080-2), see VMCsi Probe Tool Option – Set Up & Calibrate Tool Setting Probe.

Two paths through the calibration, depending on what your shop has:

1-2-3 blocks — no special tooling required. Steps 9A, then 11 onward.

Precision Calibration Tool — Steps 9B and 10, then 11 onward.

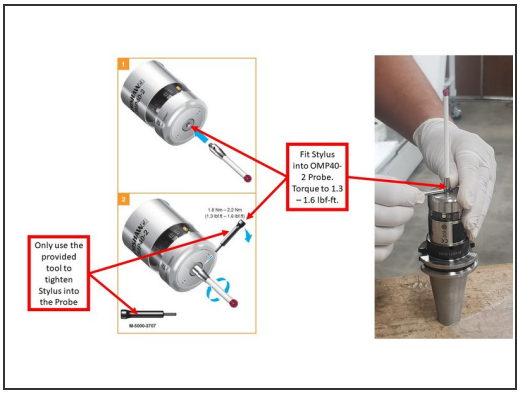
Both paths end at the same place and the calibration steps are identical.

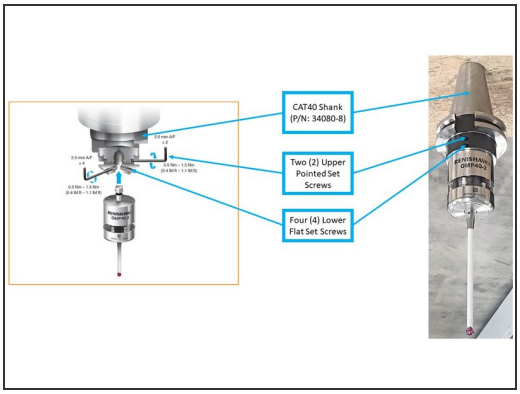
TOOLS:

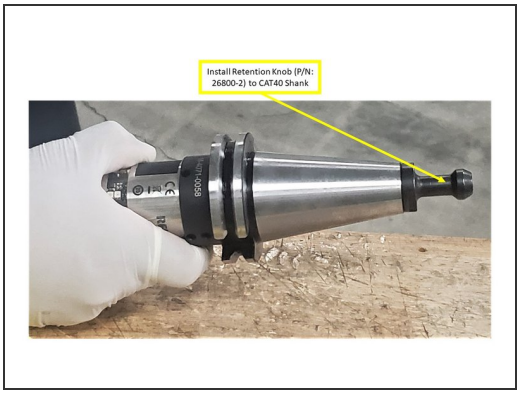
- Ring Gauge (1)
- Dial Indicator (1)
- 8" Dial Caliper (1)
- 1-2-3 blocks (2)
- Calibration Tool (1)
- Flat head screwdriver (1)

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Step 1 — Assemble the OMP40-2



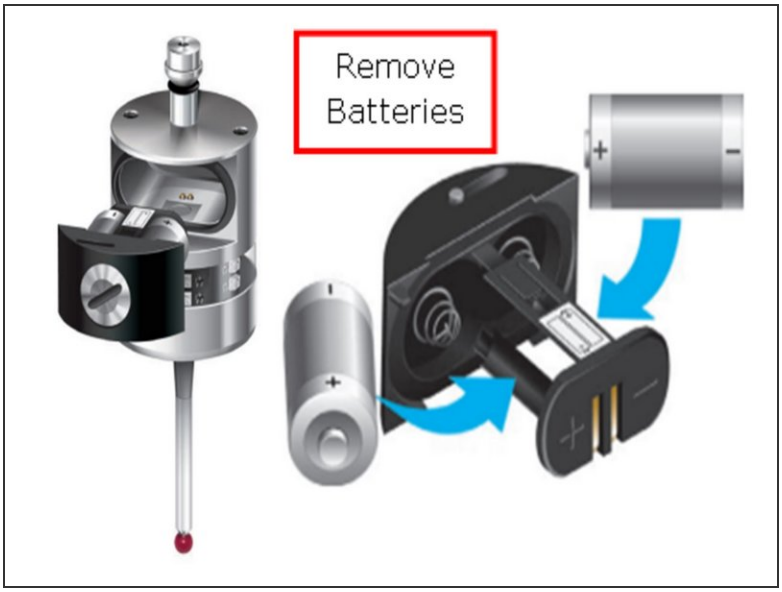


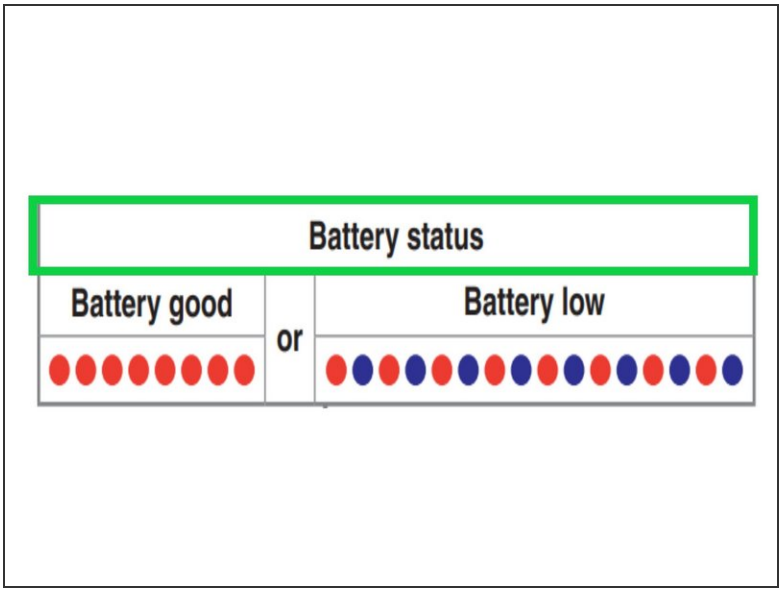


- Thread the stylus (P/N 34080-5) into the probe using the Renishaw-supplied tool.
- **Torque the stylus to 1.3 – 1.6 lbf-ft.**

  ⚠ Use only the supplied tool. It flexes before it can over-torque and damage the probe.
- Insert the probe into the CAT40 shank (P/N: 34080-8).
- Tighten the six shank set screws with a 2 mm Allen wrench: two upper pointed, four lower flat.
  - **Torque all six to 0.4 – 1.1 lbf-ft.**
- Install the retention knob (P/N: 26800-2) into the CAT40 shank.

Step 2 — Initialize the battery



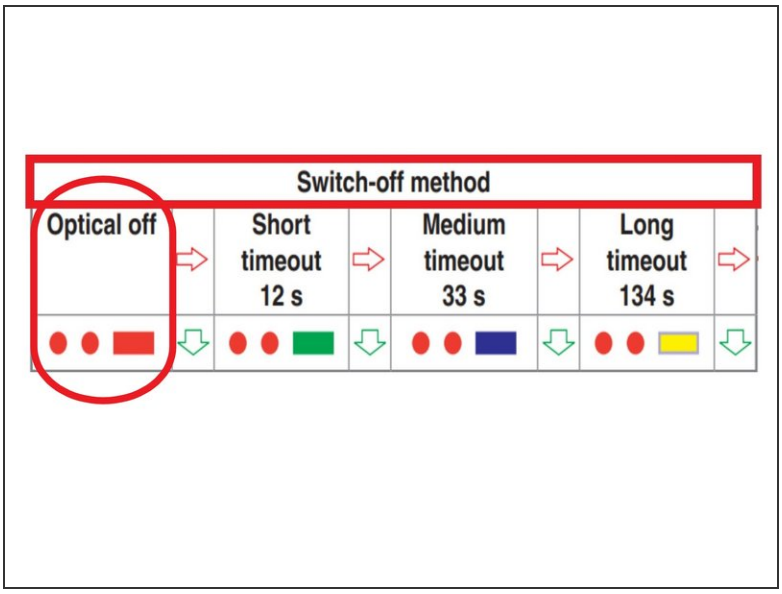


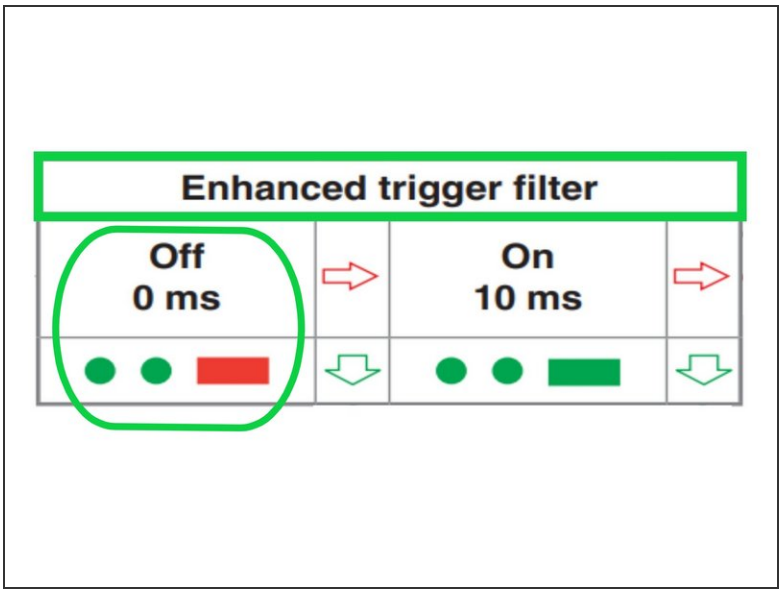
- Remove the battery cover with a flat head screwdriver.
- Take the batteries out, wait 5 seconds, reinstall them, and secure the cover.

  ⚠ Keep coolant and debris out of the battery compartment.
- Watch the LED flash **red → green → blue**.
- At the blue flash, **deflect and hold the stylus** to enter configuration mode.

  ⚠ Do not remove the batteries while the probe is in configuration mode.
  - To exit at any time, leave the stylus untouched for 20 seconds.
- Battery status flashes: 8 red = good. Red + blue repeating = replace the battery.

Step 3 — Set switch-off method and trigger filter

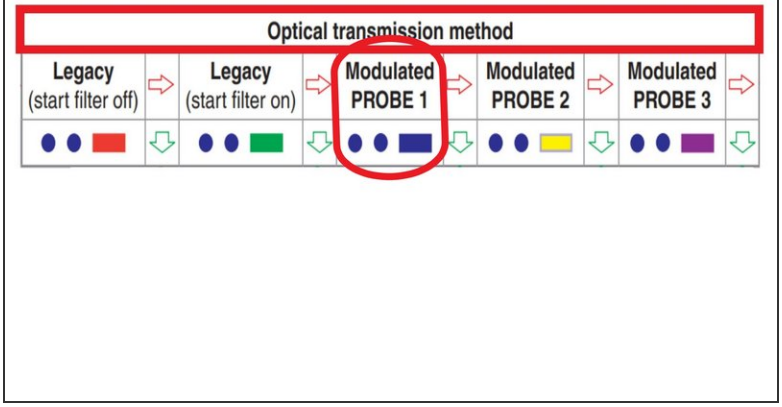


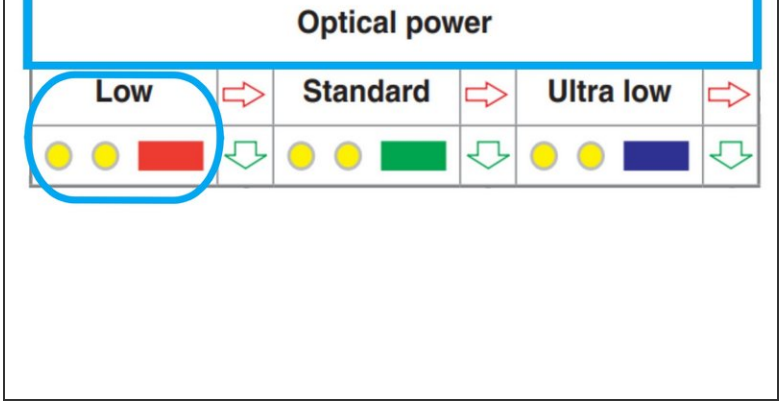


- You are still holding the stylus deflected from Step 2. The probe walks you through four menus in order: switch-off, trigger filter, transmission, optical power.
- How the menus work, the same for all four:
  - Deflect and release quickly (about 1 second) to step to the next option.
  - Deflect and hold 4+ seconds to accept the option shown and move to the next menu.
- Set these:
  - **Switch-off method: Optical off**. Menu header is two red flashes then a long red flash.
  - **Enhanced trigger filter: On, 10 ms**. Menu header is two green flashes then a long red flash.

⚠ Leave the trigger filter on. It is what keeps machine vibration from producing false triggers, and a false trigger mid-cycle reads as a bad calibration, not as a fault.

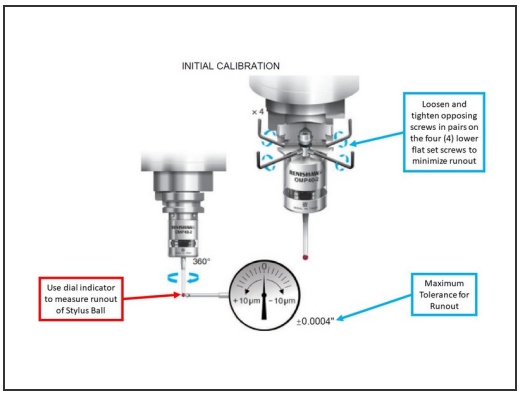
Step 4 — Set transmission and optical power

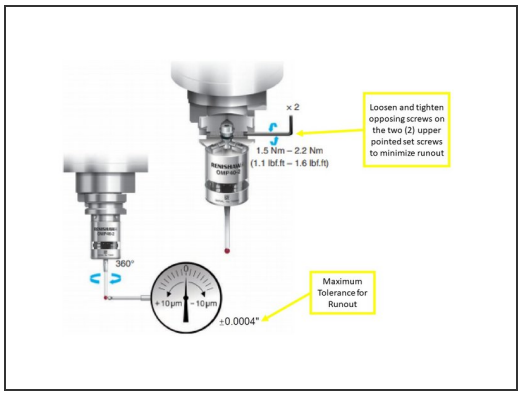


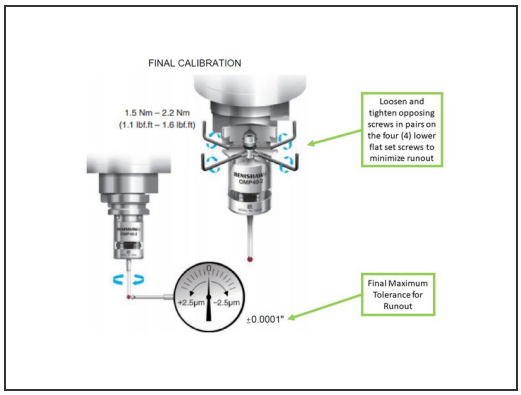


- **Optical transmission method: Modulated, PROBE 1**. Cycle until the probe flashes blue only, then hold 4+ seconds.
- **Optical power: Low**. Cycle until you see two yellow flashes then a long red flash.
- Leave the stylus untouched for 20+ seconds to save and exit configuration mode.

Step 5 — Dial in stylus runout



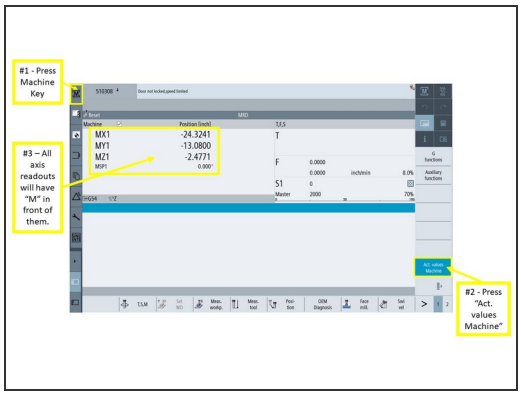




- Load the OMP40-2 probe into the spindle.
- Use a dial indicator to check runout at the ruby tip while turning the spindle by hand.
- For initial calibration, keep runout within **±0.0004**".
- Adjust the four lower flat set screws in opposing pairs to reduce runout.
- Fine-tune using the two upper pointed set screws, also in opposition.
- For final calibration, reduce runout to **±0.0001**" or better.
- Re-adjust the lower screws as needed.
- Finish by adjusting the upper screws until final tolerance is achieved.

Step 6 — Create OMP40-2 Probe as New Tool in Control

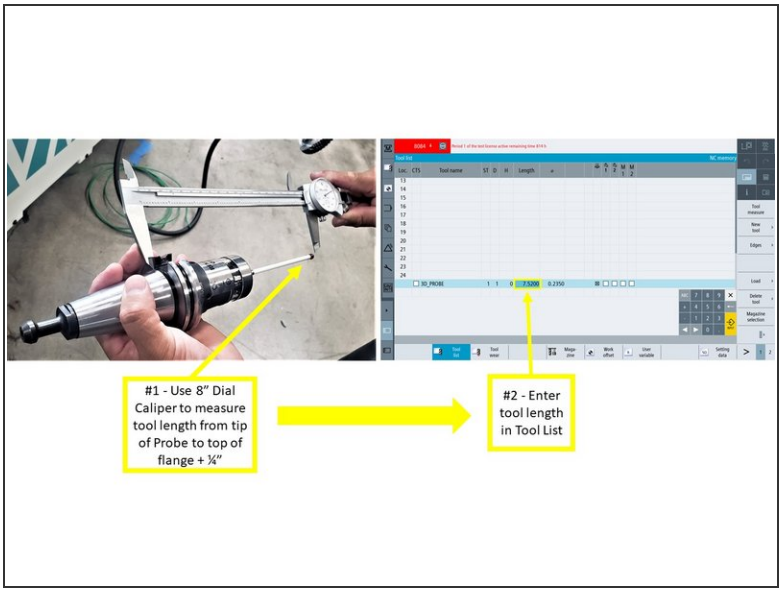


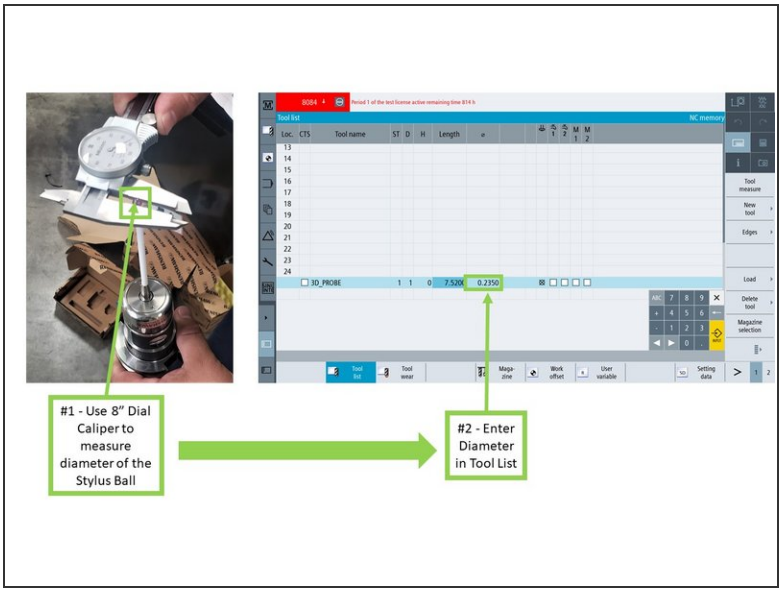




- MCP: press **[JOG]**.
- Touchscreen: **[M]** → **[Act. values Machine]**.
  - Axis labels change to MX1, MY1, MZ1. You are now reading machine coordinates.
- **[Tool List]** → choose a location outside the ATC range, not #1–24.
- **[New tool]** → **710 – 3D probe** → **[OK]**.

Step 7 — Enter probe length and diameter

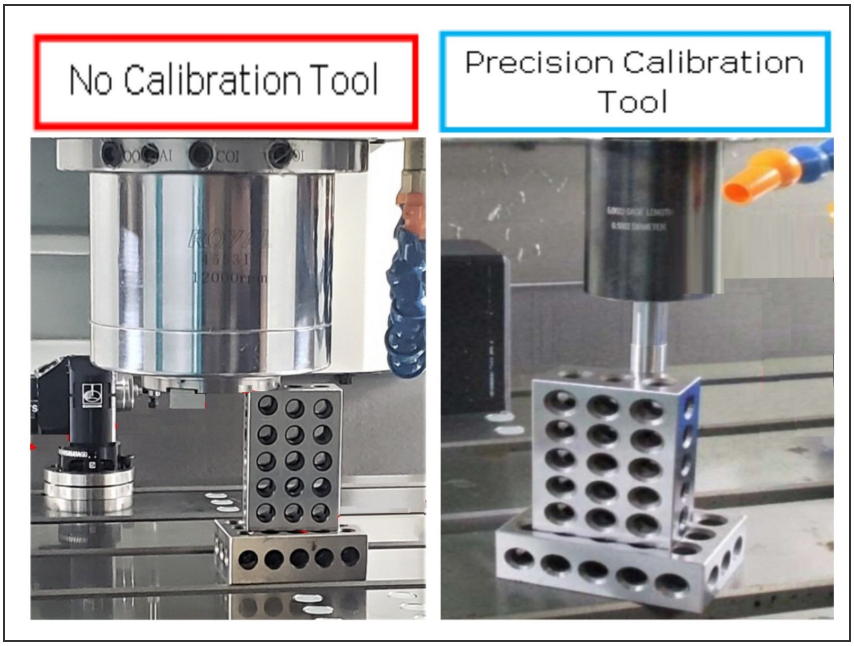




- **Length:** measure from the stylus tip to the top of the flange with the 8" caliper, then **add 0.25"**. Enter in **[Length]**.
- **Diameter:** measure the ruby, or read it off the packaging. Enter in **[ø]**.

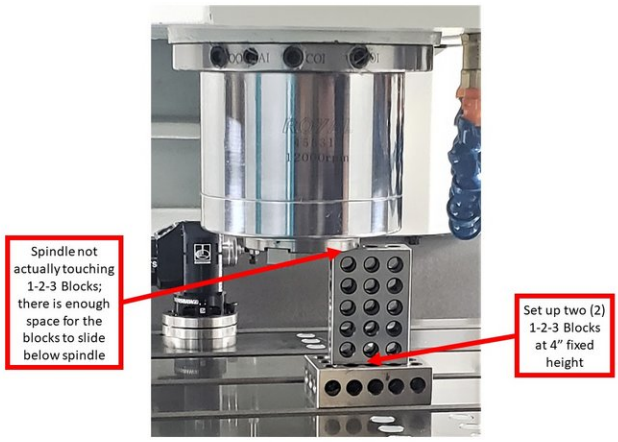
ⓘ This is a seed value, not the final length. The calibration step measures the probe and writes the exact length back into the tool data. What you enter here only has to be close enough for that first run to be accepted.

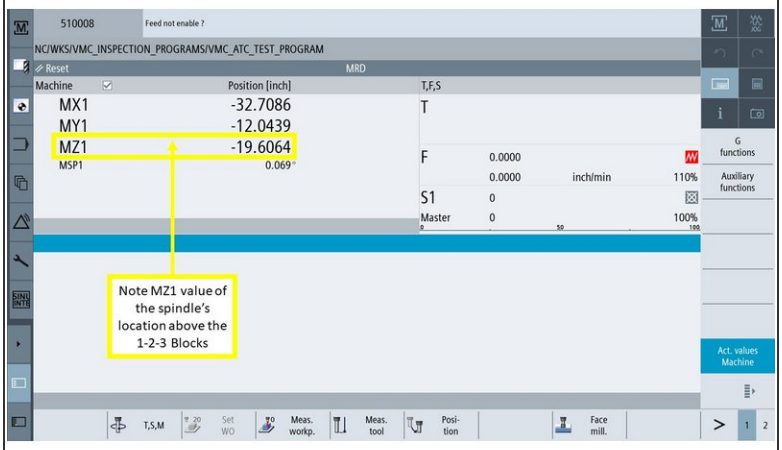
Step 8 — Select Steps Based Upon Calibration Tool



- Determine which calibration tool your shop is using.
- **No Calibration Tool:**
  - Use Steps 9
- **Precision Calibration Tool:**
  - Use Steps 10 -12

Step 9 — No Tool: Set Spindle Above Fixed Height



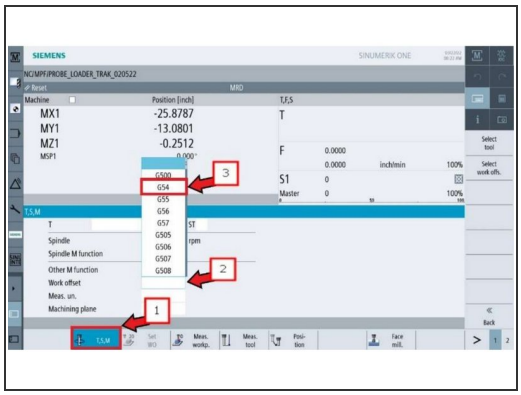


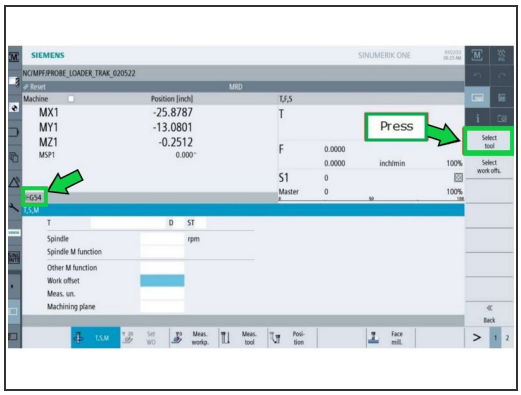
- Stack two 1-2-3 blocks vertically to create a 4" fixed height on the machine table.
- Jog the spindle down until it just blocks the stacked blocks from sliding underneath.
- Carefully jog the spindle up until the blocks slide freely beneath the spindle.

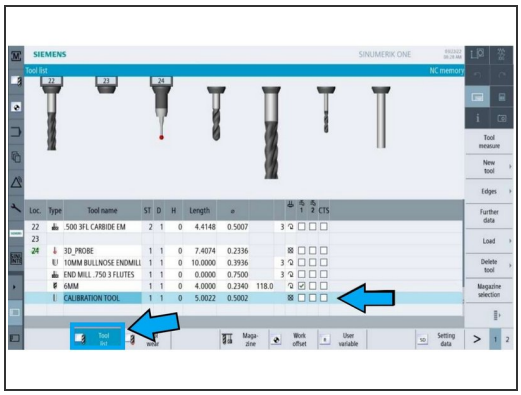
⚠ The spindle should be slightly above the blocks—not touching them.

- **Record the MZ1 value** shown on the screen at this height.
- This value will be used later in **Step 15** to calibrate probe length.

Step 10 — Calib. Tool: Set Work Offset

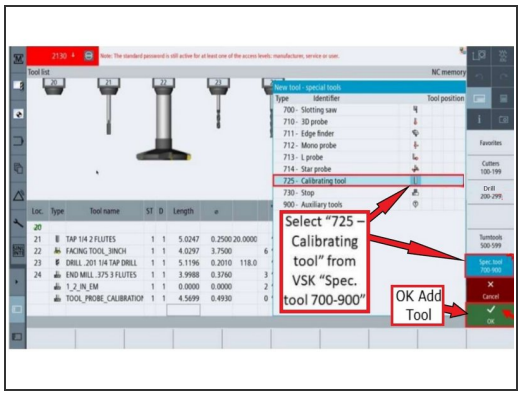


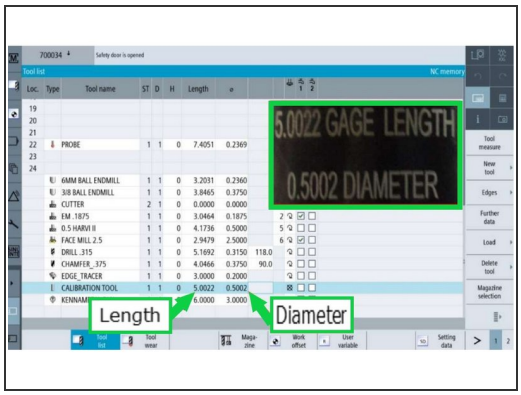


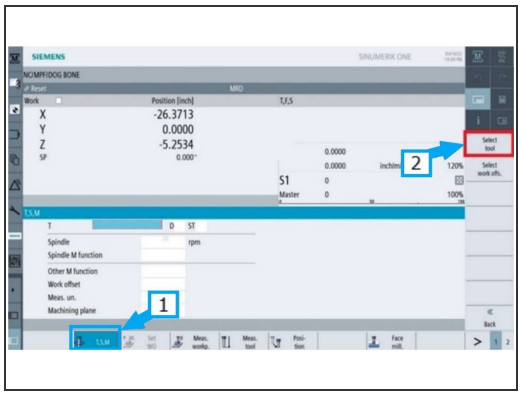


- Press **[T, S, M]** on the touchscreen.
- Press **[Work offset]** to open the offset menu.
- Select an available offset (e.g., G54) from the list.
- Press **[CYCLE START]** on the MCP to activate the selected offset.
- Confirm the offset name (e.g., G54) appears on the screen.
- Press **[Select tool]** to begin loading the calibration tool.
  - If the calibration tool is already listed in the Tool List, **skip to Step 13**.
  - If **not**, continue to **Step 11** to manually add the calibration tool.

Step 11 — Calib. Tool: Manually Load Tool

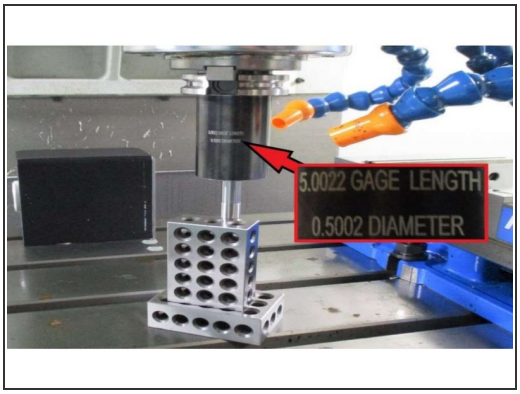




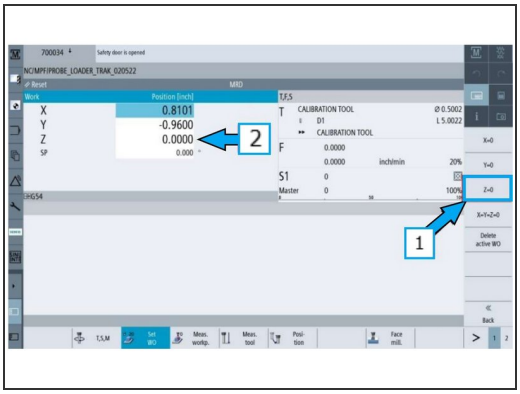


- In the **[New tool – favorites]** window, press **[Spec. tool 700–900]**.
- Select **[725 – Calibrating tool]** as the tool type.
- Press **[OK]** to add it to the Tool List.
- Once added, enter the tool length and diameter using the on-screen keypad.
- Refer to the engraved values on the calibration tool body for accurate measurements.
- To insert the tool, press **[JOG]** on the MCP.
- Press **[T, S, M]**, then press **[Select tool]**.
- Load the calibration tool into the spindle, and press **[CYCLE START]**.

Step 12 — Calib. Tool: Set Z Axis to Zero

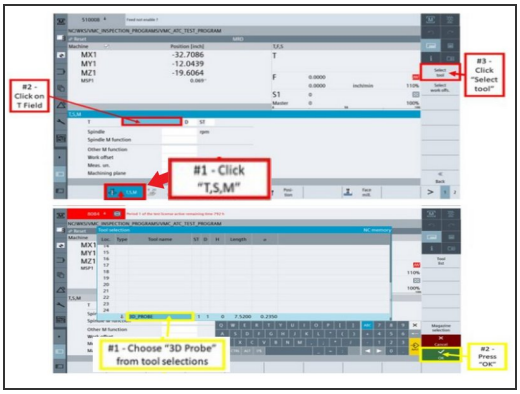




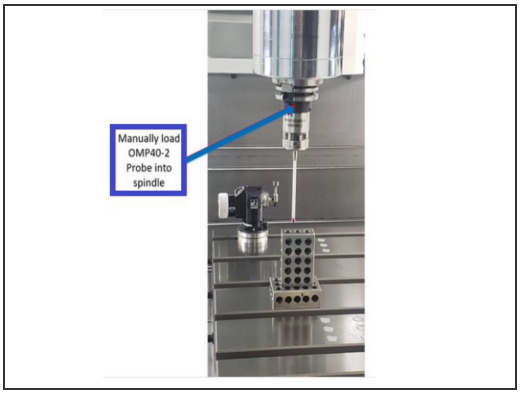


- Lower the calibration tool below the height of the stacked 1-2-3 blocks.
- Slowly raise the tool until the blocks just slide underneath it without contact.
- Press **[Act. values Machine]** to toggle off machine values—this switches the display to work offset values.
- Press **[Z=0]** on the vertical softkey panel.
- Confirm the Z-axis display now shows 0, setting your reference point.

Step 13 — Load OMP40-2 Probe Into Spindle

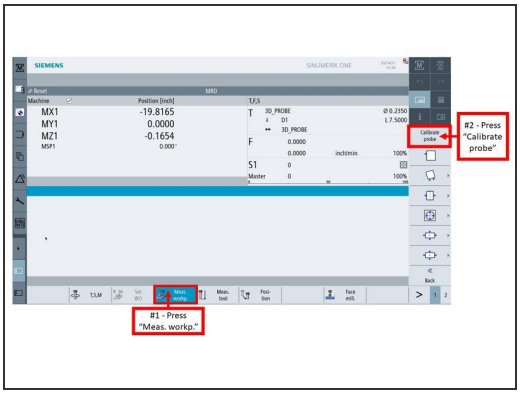


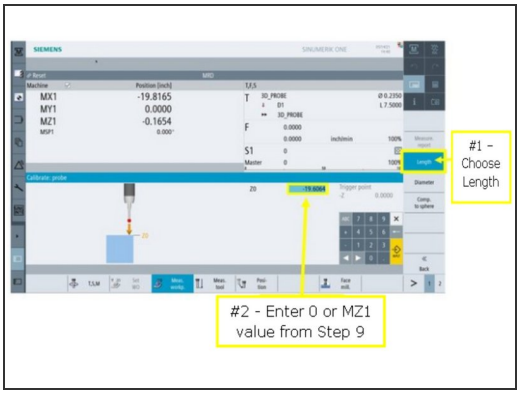


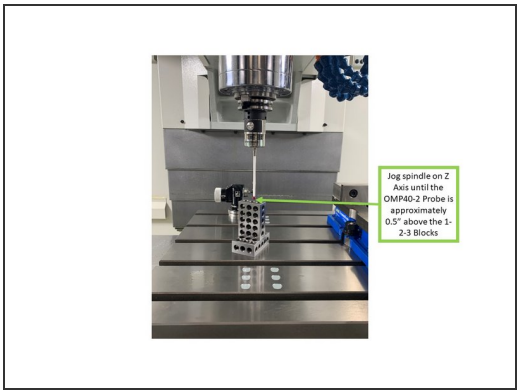


- Press **[T, S, M]** on the touchscreen.
- Click on the T field, then press **[Select tool]**.
- In the Tool Selection window, choose the 3D Probe Tool you previously created.
- Press **[OK]** to confirm the tool selection.
- Press **[CYCLE START]** on the MCP.
- Press **[DOOR OPEN]** to unlock the machine door.
- Insert the OMP40-2 probe into the spindle.
- After loading, verify the T field now displays the 3D Probe Tool.

Step 14 — Calibrate Probe Length

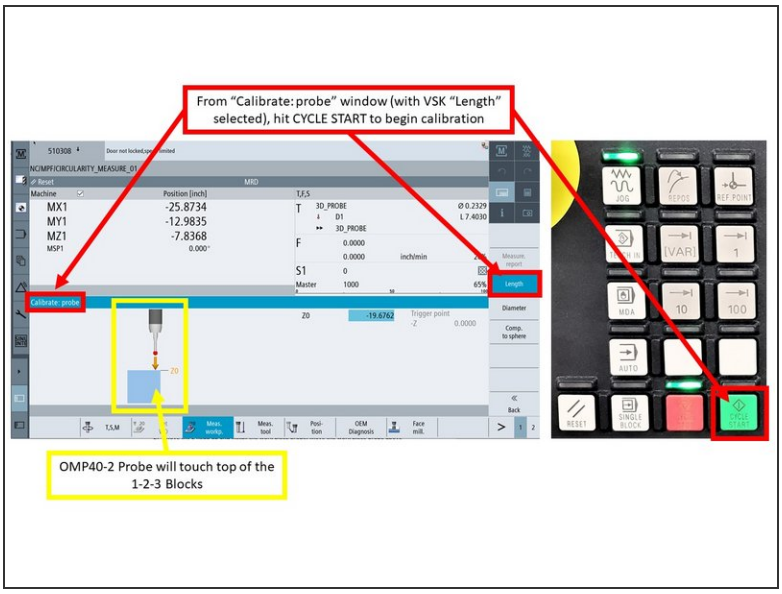


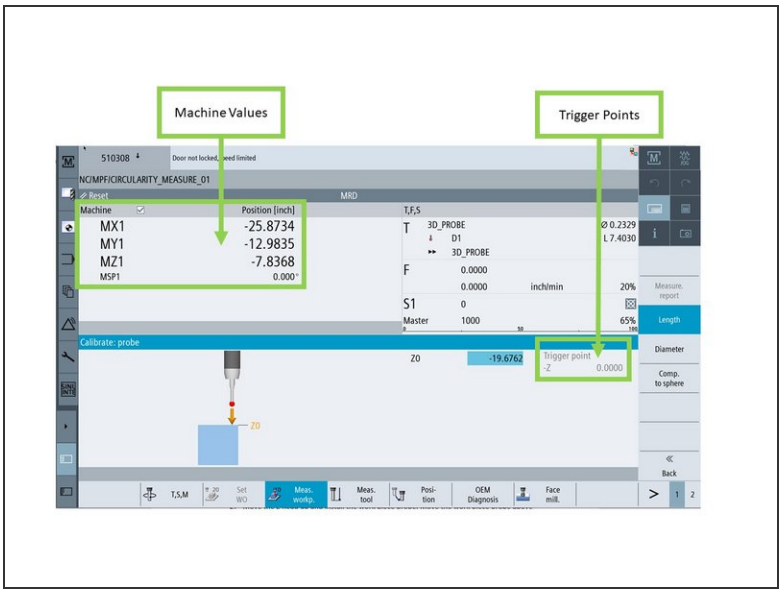




- Press **[Meas. workp.]** on the touchscreen.
- Press **[Calibrate probe]** to open the calibration window.
- In the calibration window, press **[Length]** to begin length calibration.
- If you're **not** using a **calibration tool**, enter the MZ1 value recorded in Step 9 into the Z0 field.
- If you **are** using a **calibration tool**, enter 0 in the Z0 field.
- Jog the Z-axis down until the OMP40-2 probe is about 0.5" above the 1-2-3 blocks.
- Confirm that the setup is correct before proceeding to calibration in the next step.

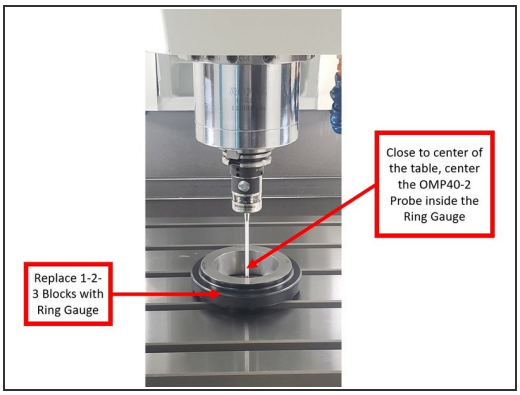
Step 15 — Calibrate Probe Length Continued

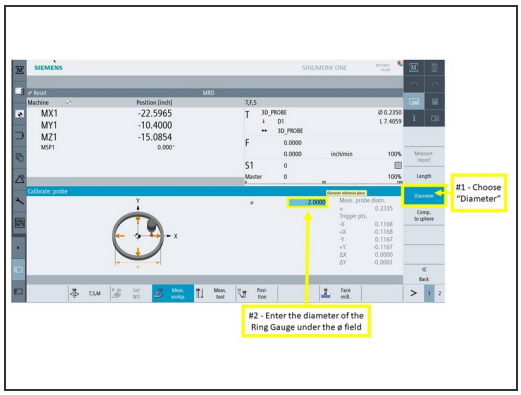


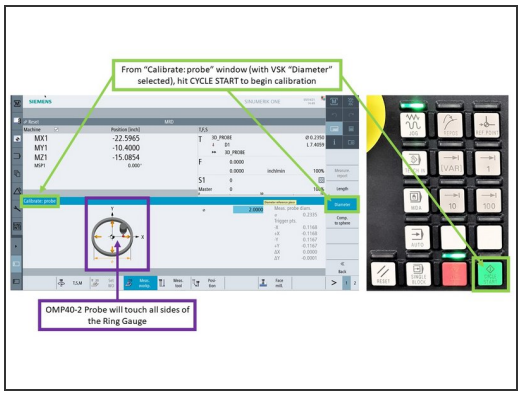


- With the probe positioned above the 1-2-3 blocks, press **[CYCLE START]** on the MCP.
- The probe will automatically move down and touch the top of the blocks to measure its length.
- Once complete, the Calibrate: probe window will display the machine values and trigger points.
- Repeat the probe length calibration **three** times to ensure consistent results.
- After each run, check that the machine values and trigger points **remain stable and repeatable**.

Step 16 — Calibrate Probe Diameter

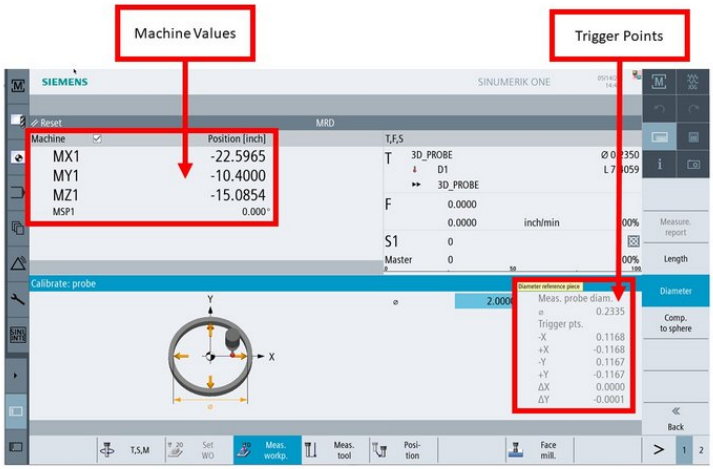






- Remove the 1-2-3 blocks from the worktable.
- Place the ring gauge near the center of the table.
- ⓘ Secure the ring gauge using magnets, clamps, or other stable supports to prevent movement.
- Jog the spindle so the probe's stylus ball sits inside the center of the ring gauge, below the rim.
- On the Calibrate: probe window, press **[Diameter]**.
- Enter the known diameter of the ring gauge into the ø field.
- Press **[CYCLE START]** on the MCP to begin the calibration cycle.
- The probe will automatically touch all inner sides of the ring gauge to determine diameter.

Step 17 — Calibrate Probe Diameter (Continued)



- After the cycle completes, the Calibrate: probe window will display the machine values and trigger points.
- Run the diameter calibration **three times** to verify consistency.
- After each cycle, confirm the machine values and trigger points are repeatable.
- If the results vary between runs, lower the program feedrate and repeat the process.

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