



Mill - Renishaw Probe Information

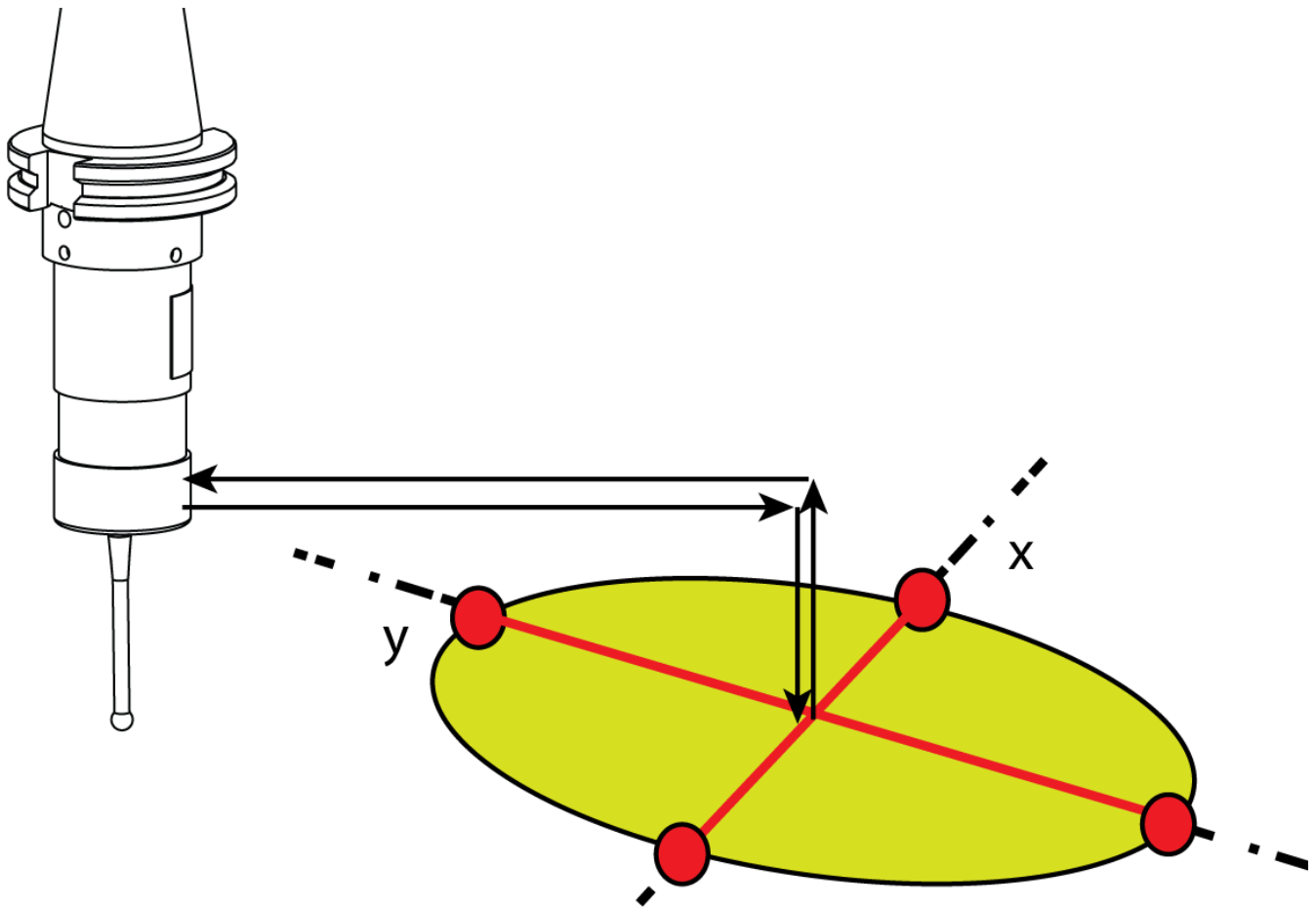


INTRODUCTION

This document tells you how to set up and use these Renishaw probes:

- - Renishaw OMP40-2
- - Renishaw OTS
- - Renishaw OMI

How Renishaw Probes Work



Fundamentally, a probe is a calibrated switch.

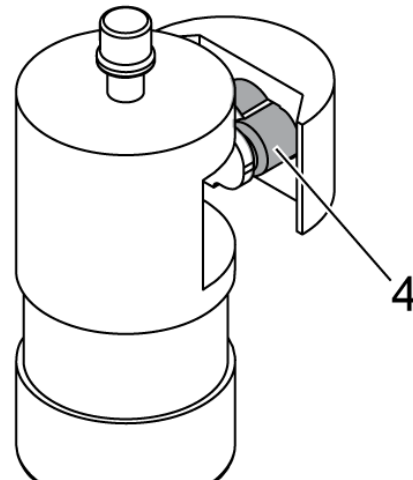
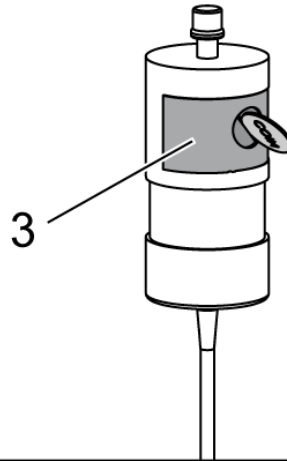
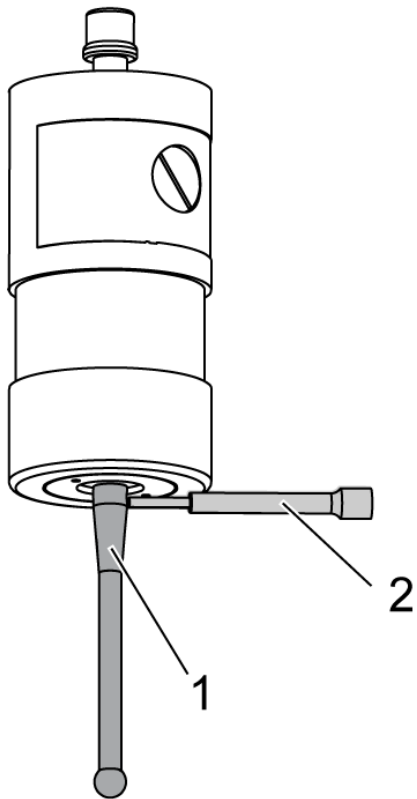
When something touches or presses the probe stylus, the probe sends a "skip" signal to the machine control.

The machine control accurately records the position of the X, Y, and Z axes at the precise time it receives the skip signal.

Probe operation flow:

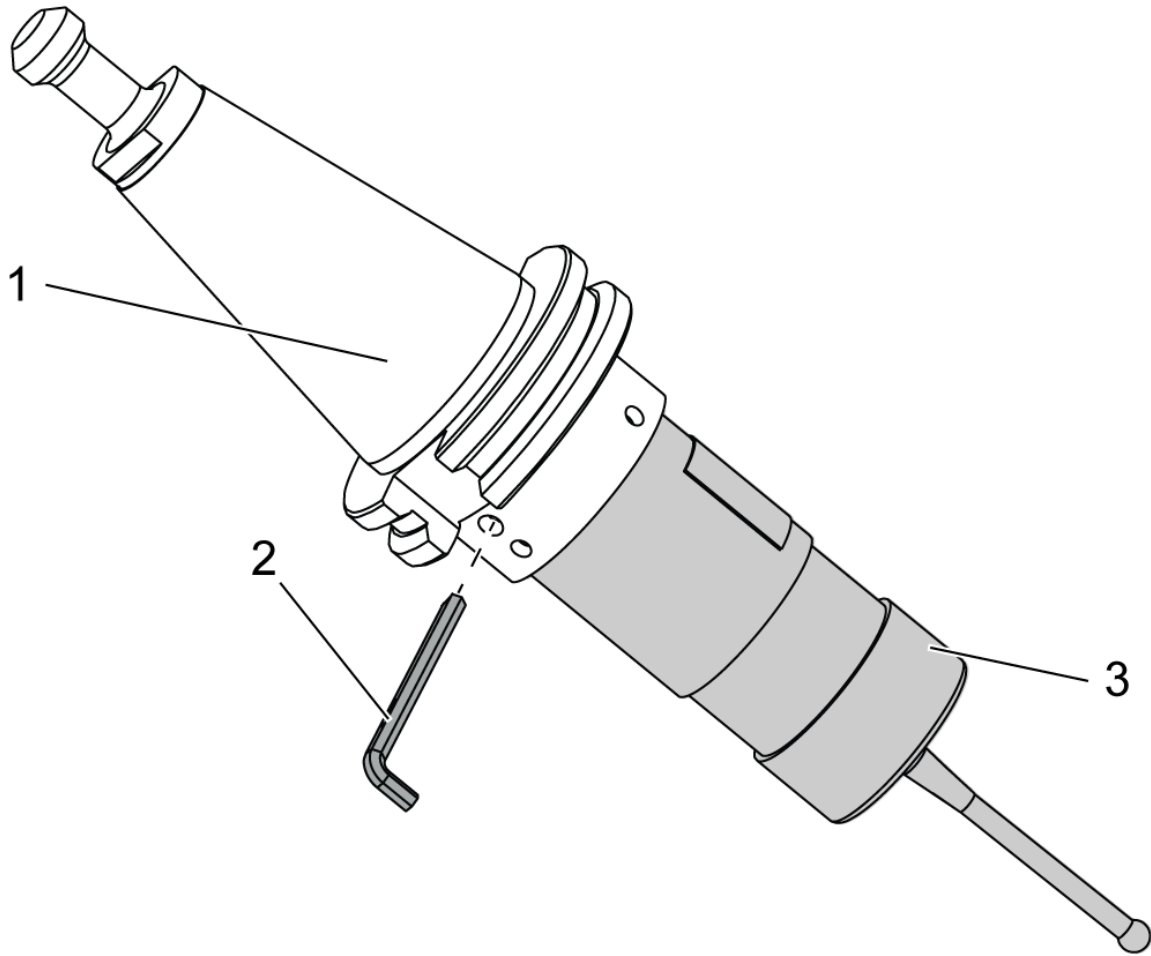
- A start-up macro turns on the probe.
- The macro sets the probe defaults in the control.
- A standard G code defines the probe's path.
- Code G31 allows the machine to move until the probing produces a skip signal.
- Probe macros define the measurement details.
- Probe triggering sends skip signals that determine the machine's position.
- Data is automatically stored in the macro registers.
- The data from the registers is retrieved for process automation.

OMP40-2 Probe



Probe Assembly

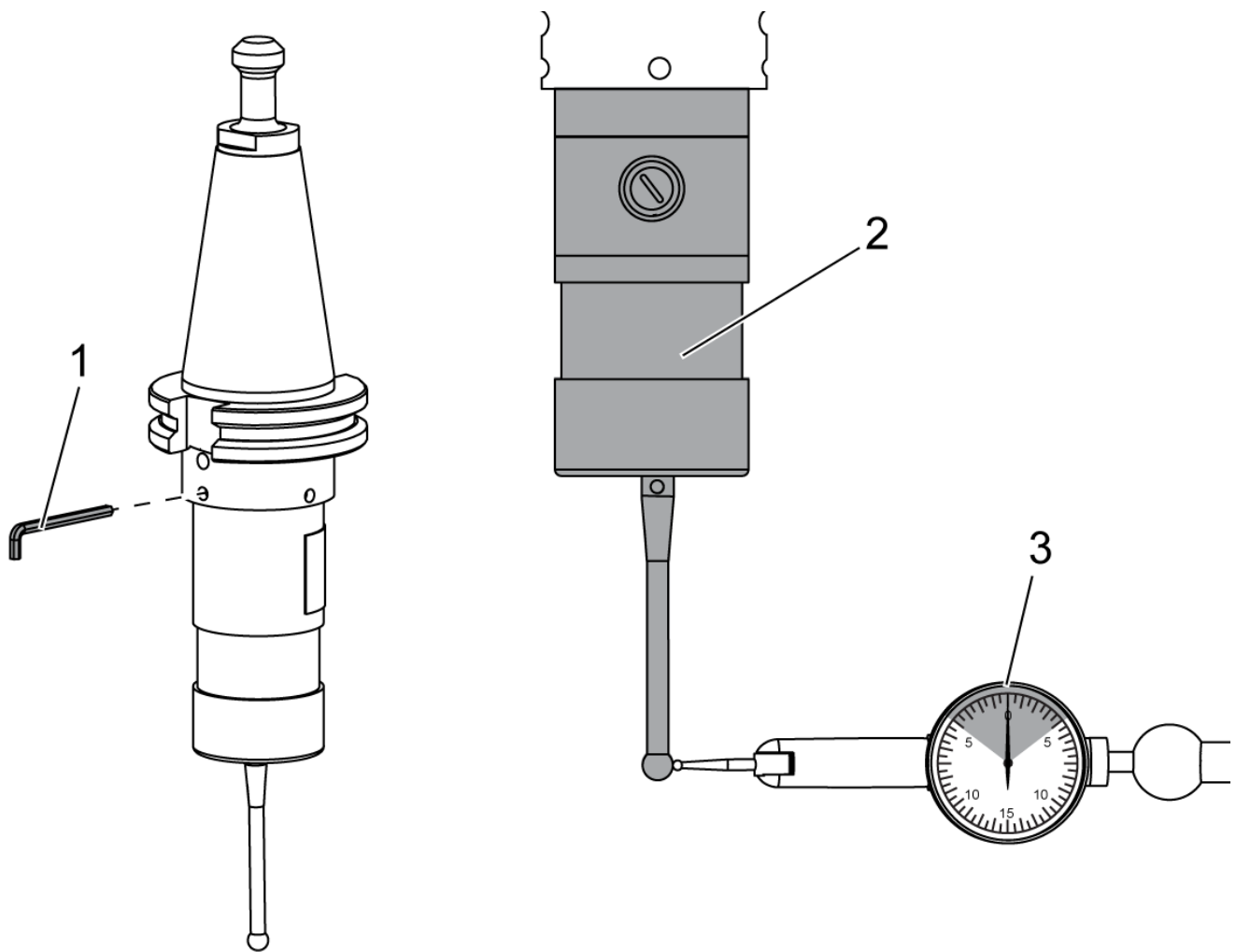
1. Insert the probe stylus [1] into the probe body.
2. Put the shaft of the included probe installation tool [2] through the hole in the stylus and turn the tool until the stylus is tight.
3. Use a coin or flat-bladed screwdriver to loosen the battery compartment [3] screw.
4. Insert batteries [4] into the battery compartment.
5. Install the battery compartment and tighten the screw.



Probe Installation

To install the probe:

- Use the hex wrenches, provided with the probe, to loosen the (6) set screws in the probe toolholder.
- Insert the probe body [3] into the toolholder [1].
- Tighten the (2) 4 mm set screws with the 2 mm hex wrench [2].
- Torque the 4 mm set screws to 2.2 ft-lb (3 Nm).



Use the provided 2 mm hex wrench [1] to tighten the (4) 2mm set screws until the run out on the probe [2] is +/- 0.0004" [3].

Torque the set screws to 9 in-lb (1 Nm).

Probe Test

Place the OMP40-2 probe in the spindle.

In MDI mode, run code:

```
M59 P1134
```

The probe light flashes green.

Touch the stylus.

The machine beeps and the light turns red.

Press **[RESET]**.

The probe turns off.

If the green light does not come, if the machine does not beep, if the light does not turn red, or if the probe does not

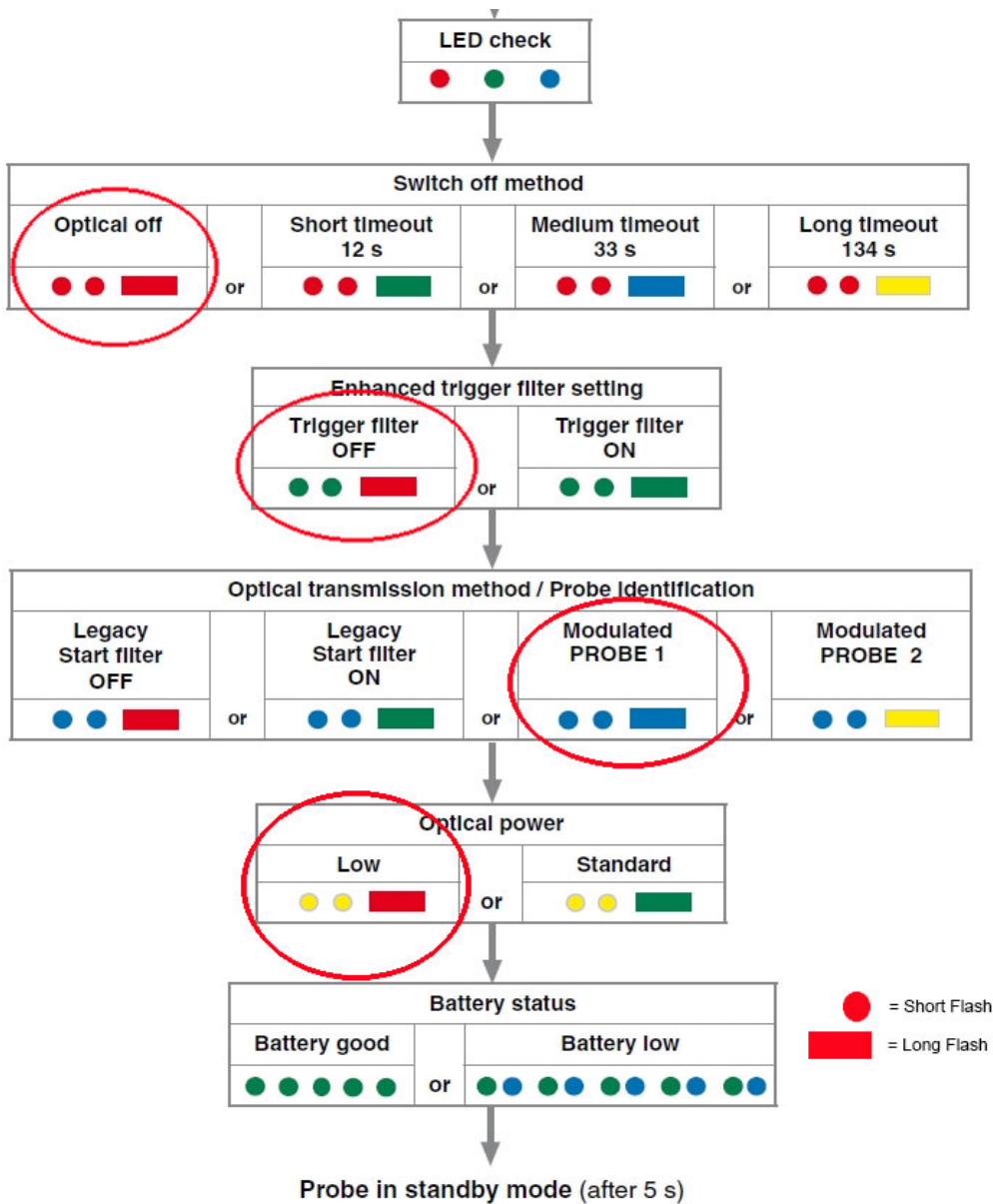
turn off, check the probe settings.

Probe Settings

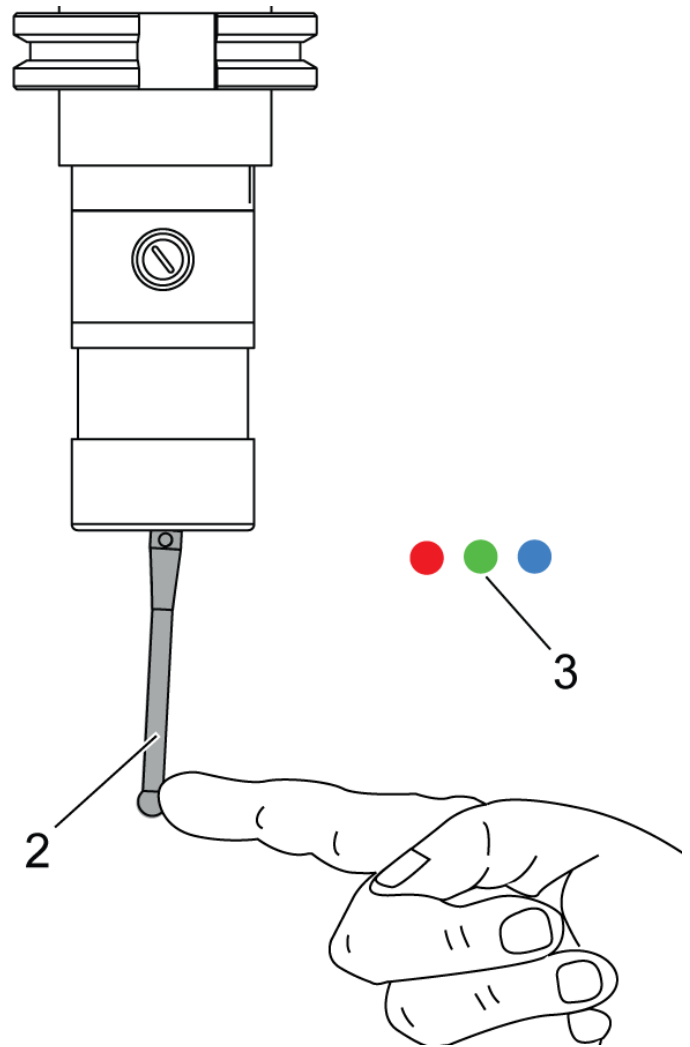
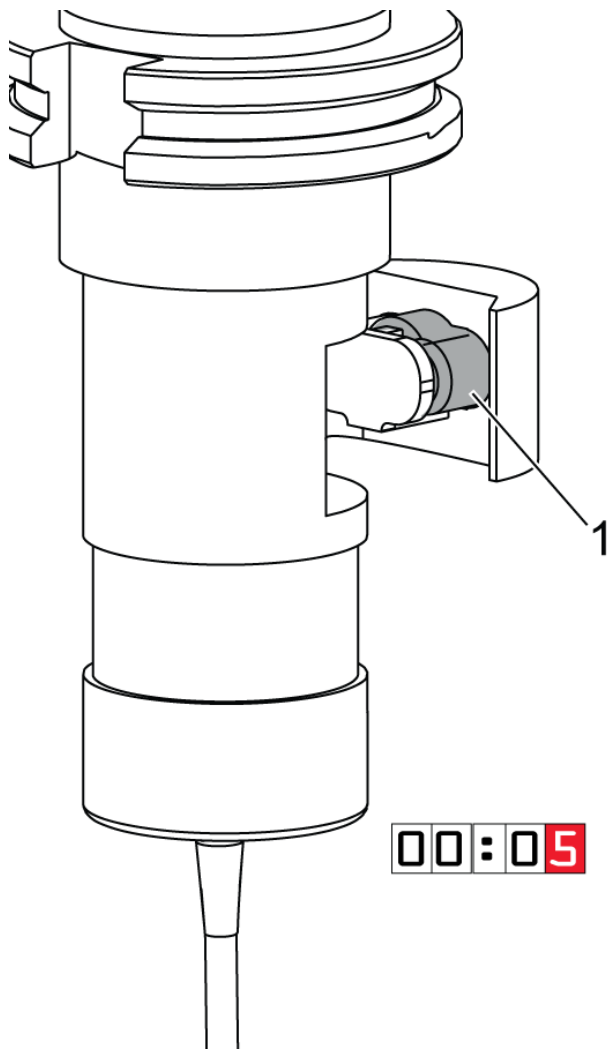
Remove the batteries from the probe for at least 5 seconds.

Replace the batteries.

important: Do not touch the probe stylus during the initial probe setup.



After the batteries have been replaced, the probe light will flash in a specific sequence.

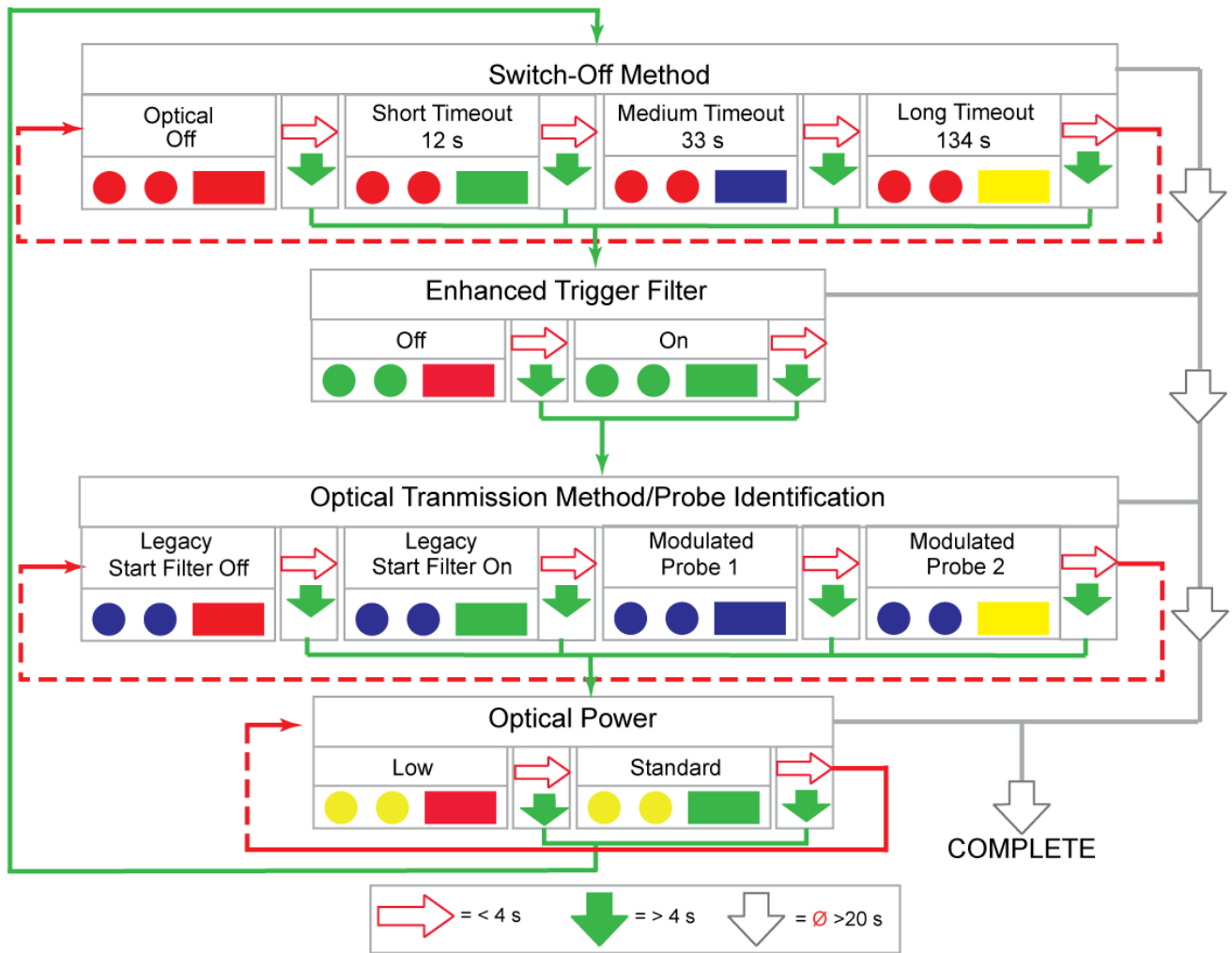


Change Probe Settings

To change the probe settings, remove the batteries [1] for at least 5 seconds.

Install the batteries.

Deflect and hold the stylus [2] until it has completed the light sequence [3].





The probe settings are arranged in (4) option groups, **Switch-Off Method**, **Enhanced Trigger Filter**, **Optical Transmission Method/Probe Identification**, and **Optical Power**.

To move from one group to the next, touch the probe stylus with your finger for more than 4 seconds.

To select the next option within a group, press the stylus for less than 4 seconds.





To exit the setup, leave the stylus untouched for 20 or more seconds.

Setting Examples

Enhanced Trigger Filter	
Trigger Filter Off	Trigger Filter On
	



Enhance Trigger Filter is set to **Off** by default.

If the machine is getting 1092 alarms, it is having a problem with vibration. Change this setting to **On** to solve the problem.

Optical Transmission Method/Probe Identification			
Legacy Start Filter Off	Legacy Start Filter On	Modulated PROBE 1	Modulated PROBE 2
			

The **Optical Transmission Method/Probe Identification** option group is set to **PROBE 1** by default.

If this probe is used on an older machine with a wired table probe, this must be set to **Legacy Start Filter Off**.

Optical Power	
Low	Standard
	

Optical Power is set to Low by default.

If the machine is getting 1093 alarms, change the setting to ***Standard***.

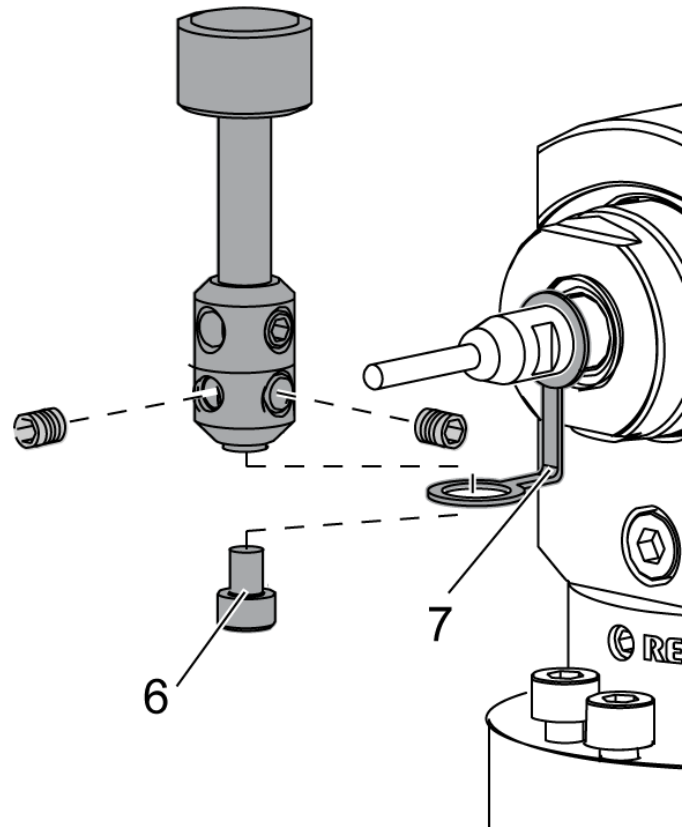
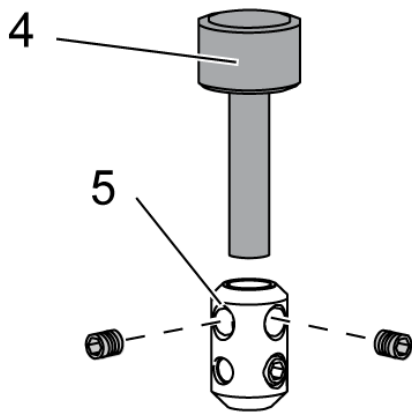
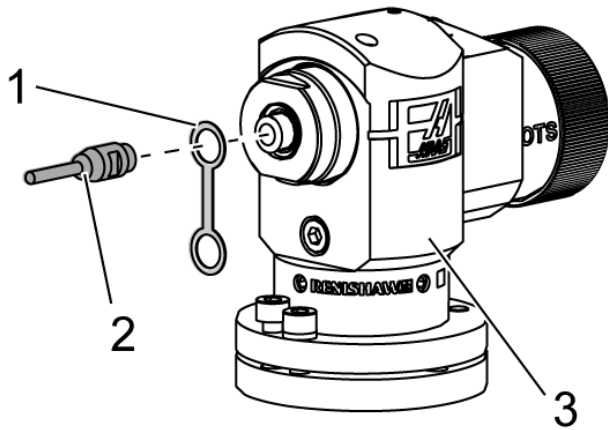
OMP40-2 Macro Variables

There are several very useful macro variables that you can find in the **MACRO VARIABLE** screen, under the **[CURNT COMDS]** button.

Useful OMP40-2 Variables:

- 556: (XRAD) Stylus X calibration radius
- 557: (YRAD) Stylus Y calibration radius
- 558: (XOFF) X axis stylus offset (run out)
- 559: (YOFF) Y axis stylus offset (run out)
- 560: Tool number for the OMP40-2 probe

OTS Probe



Probe Assembly

Place the retainer strap [1] over the shaft mount on the probe body [3].

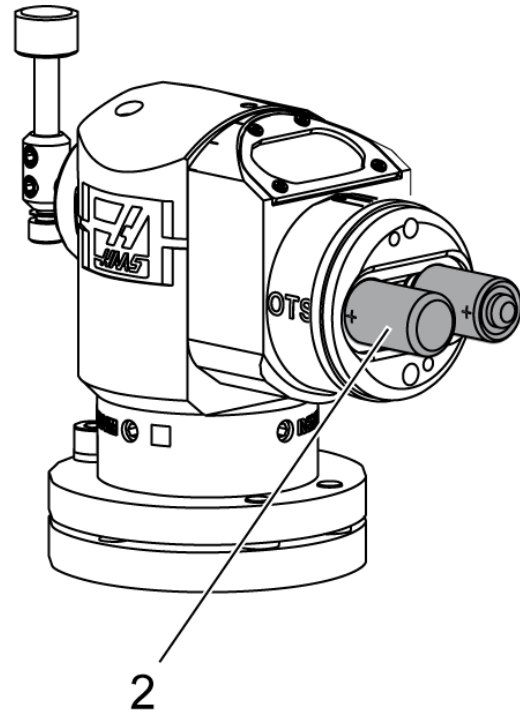
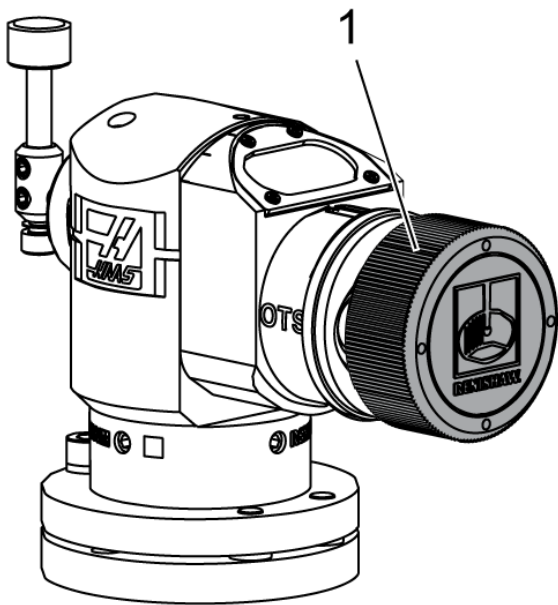
Install the shaft [2] into the shaft mount. Tighten the shaft with the included open-end wrench.

Insert the sensor [4] into the sensor mount [5]. Tighten the included set screws with the included screwdriver.

Bend the retainer strap 90 degrees as shown [7].

Place the sensor assembly onto the probe shaft. Tighten the included set screws with the included screwdriver.

Attach the retainer strap to the bottom of the sensor assembly with the included screw [6].

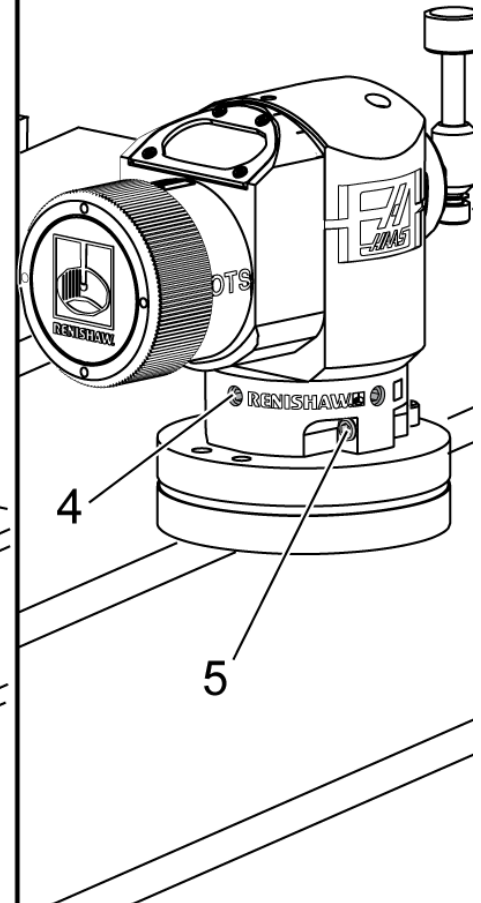
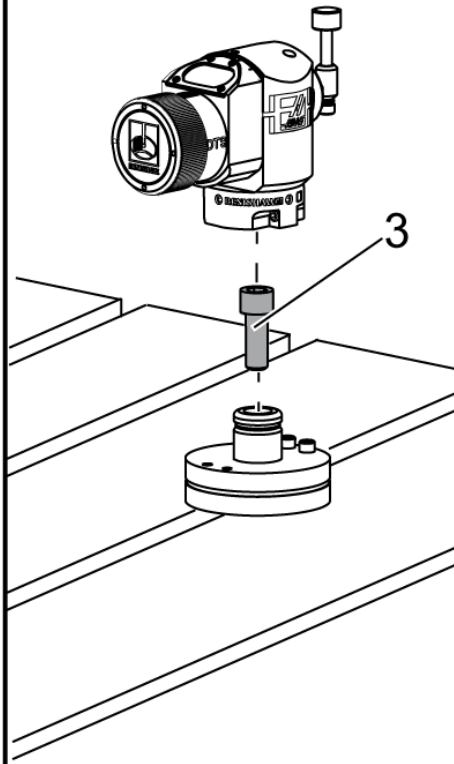
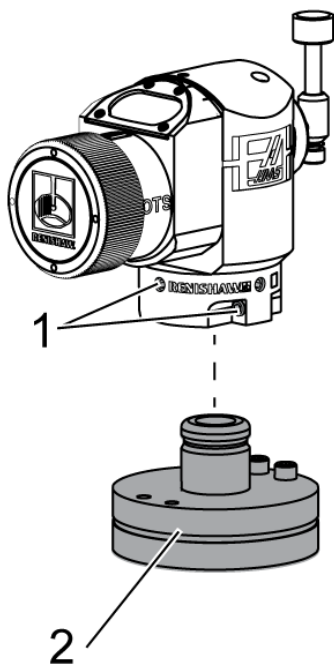


Battery Installation

remove the battery cover [1].

On new probes, make sure to remove the plastic shield between the batteries [2] and the contacts.

Do not touch the stylus when changing the batteries.



Mount to Table

Loosen the (6) set screws [1] around the probe body.

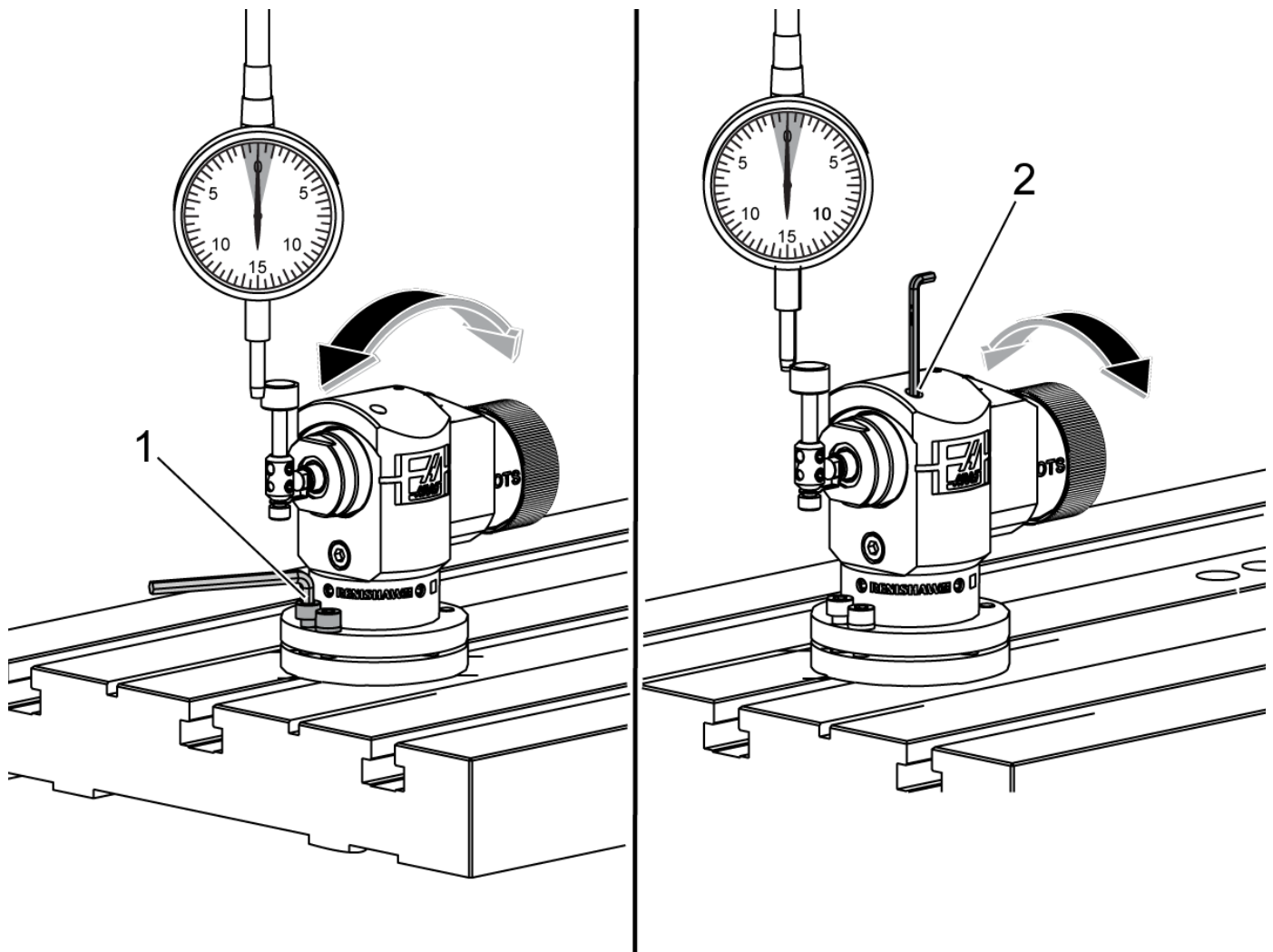
Remove the base [2] from the probe body.

Use a 3/8" - 16 x 1 socket head cap screw [3] to anchor the base to the machine table.

Place the probe body on the base.

Tighten the (4) base mount set screws [4] to 0.81 ft-lb (1.1 Nm).

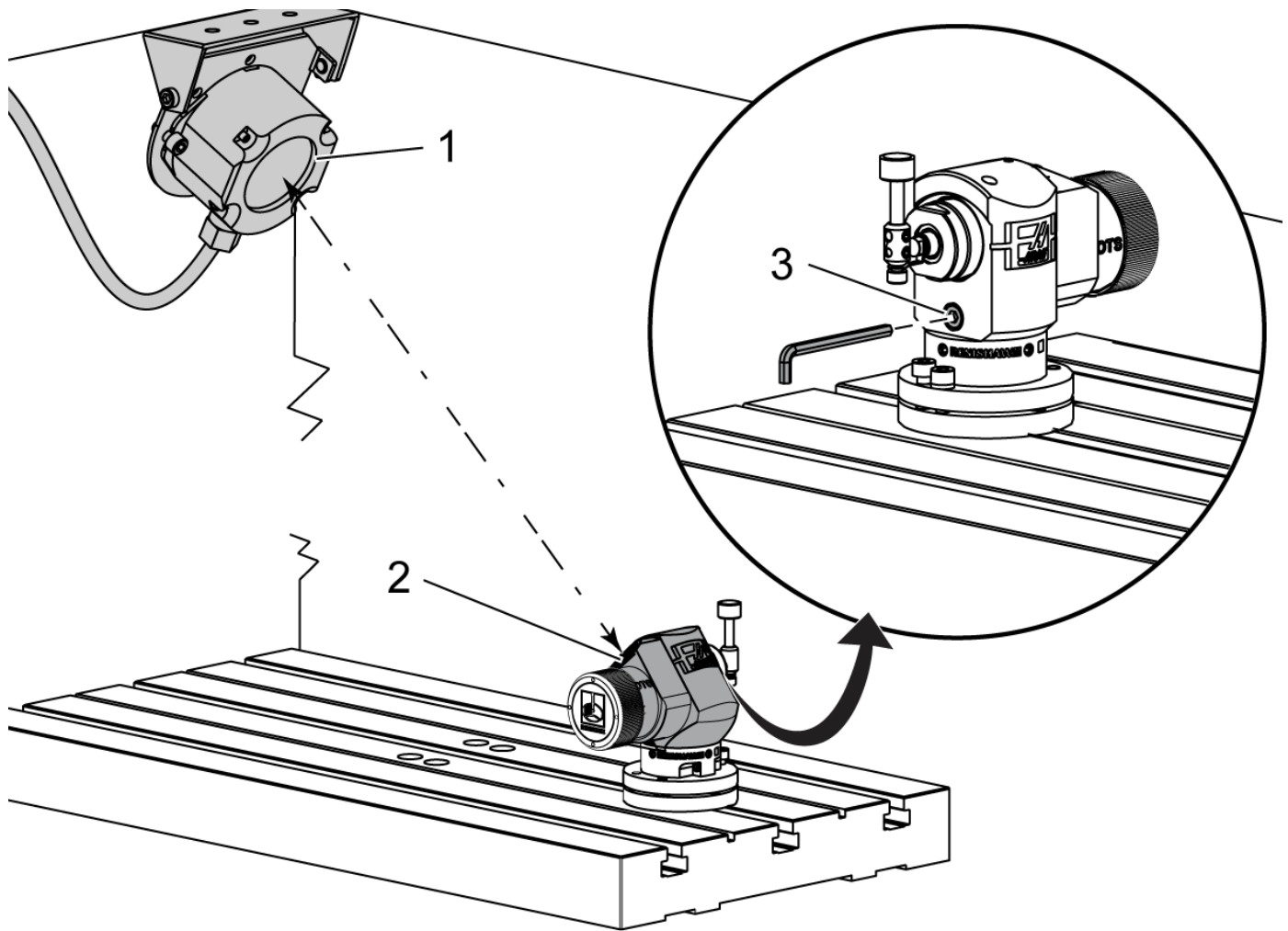
Tighten the (2) base rotation set screws [5] to 0.81 ft-lb (1.1 Nm).



Stylus Alignment

Adjust the (2) screws [1] at the probe base to align the stylus front-to-back to within ± 0.0001 ".

Adjust the (2) screws [2] on the probe body to align the stylus side-to-side to within ± 0.0001 ".



Probe Alignment

Loosen the set screw [3] beneath the sensor.

Turn the probe body so that the data transmission window [2] points at the OMI receiver [1].

Tighten the set screw.

Communications Test

Make sure the probe has an unobstructed line of sight to the OMI receiver.

Enter the MDI mode on the control.

Run this code:

```
M59 P1133
```

```
G04 P1.0
```

```
M59 P1134
```

The probe light flashes green.

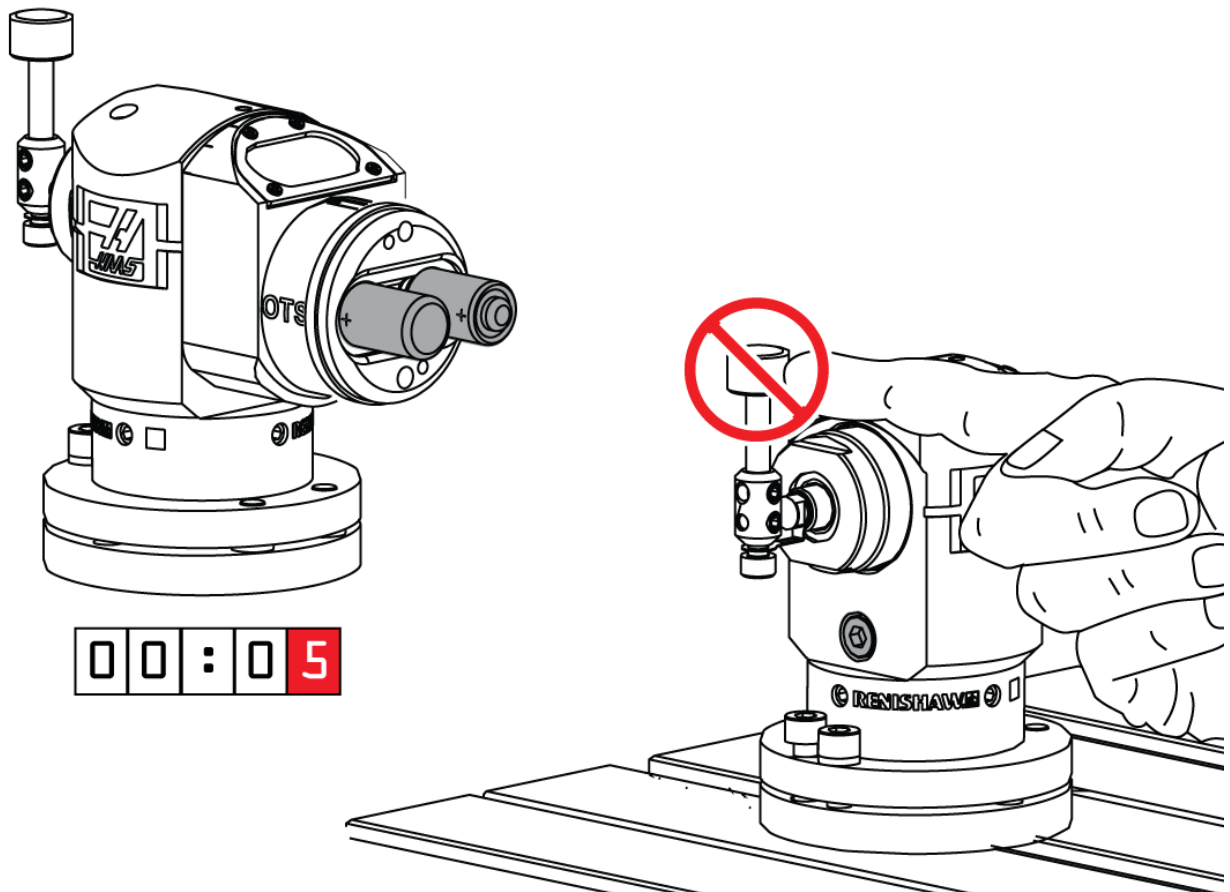
Touch the stylus.

The machine beeps and the probe light turns red.

Press **[RESET]**.

The probe turns off.

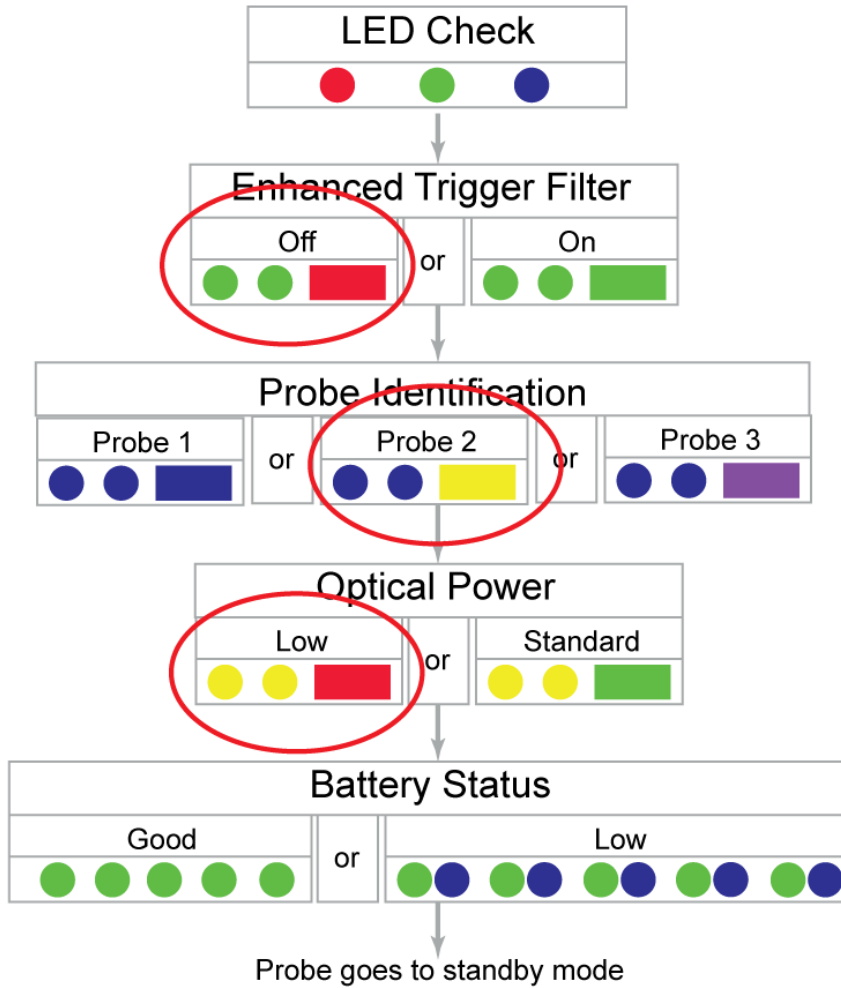
If the probe does not perform as outlined, check the settings.



Check Settings

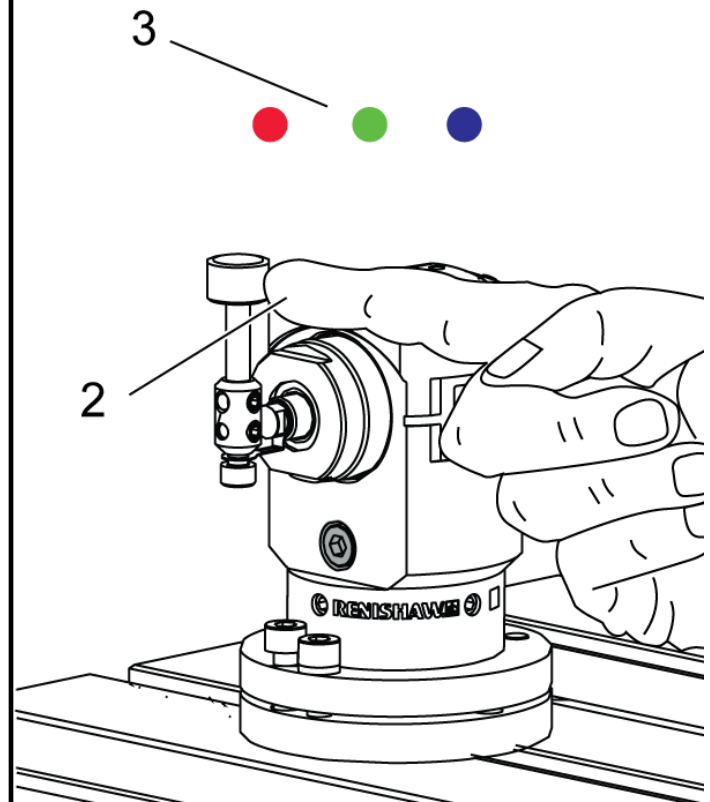
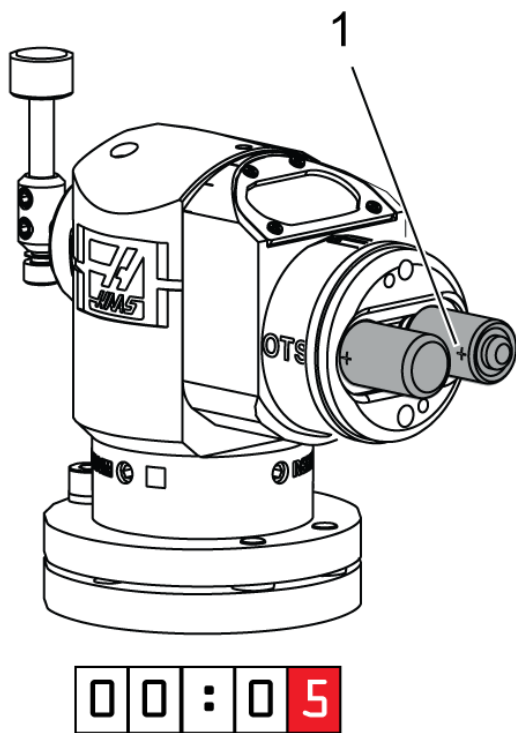
To check the settings, remove the batteries for at least 5 seconds.

Do not touch the stylus while checking the settings.



Factory Default Light Sequence

When the batteries are replaced, the probe flashes a sequence of lights that show the factory default settings.

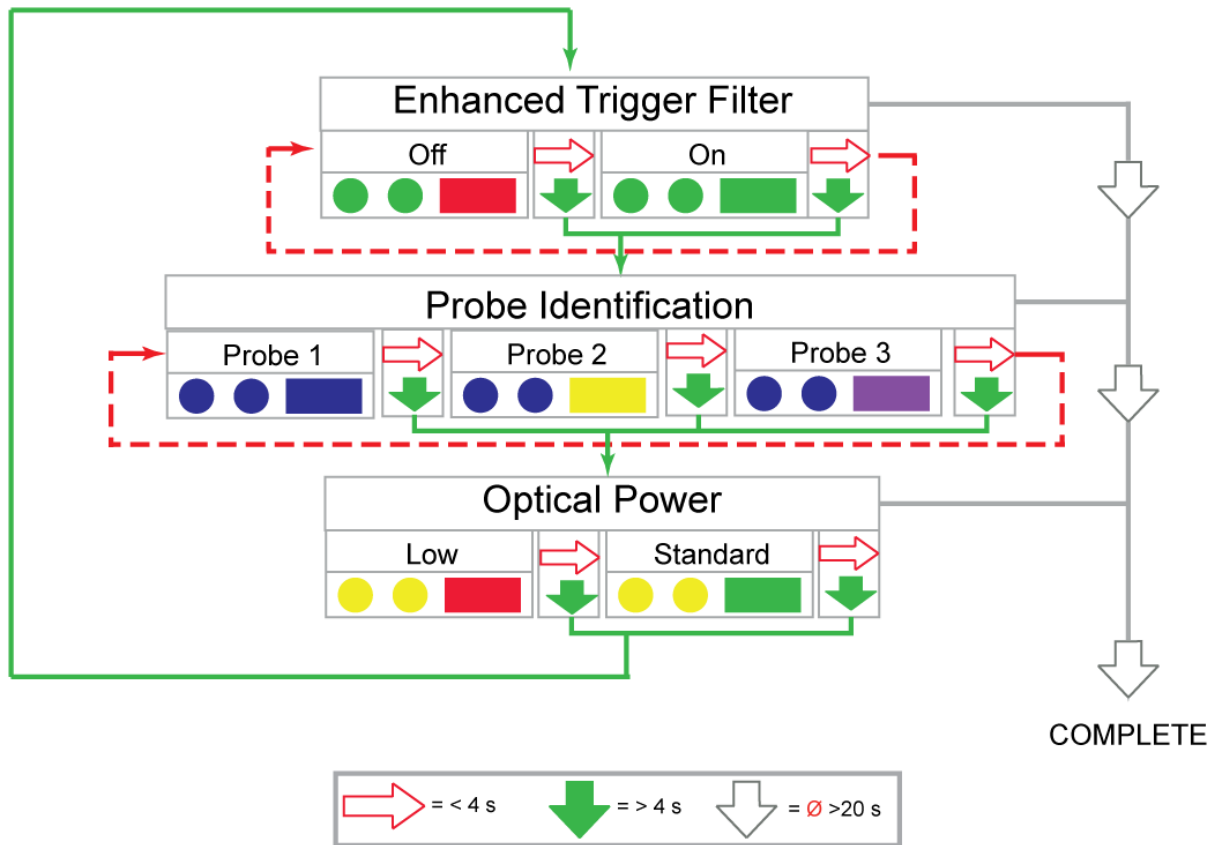


Change Settings

To change the settings, remove the batteries [1] for at least 5 seconds.

Gently press the stylus [2] until the LED check light sequence [3] has completed.

Release the stylus.



The probe settings are arranged in 3 option groups, **Enhanced Trigger Filter**, **Probe Identification**, and **Optical Power**.

To move from one group to the next, touch the probe stylus with your finger for more than 4 seconds.

To select the next option within a group, press the stylus for less than 4 seconds.

To exit the setup, leave the stylus untouched for 20 or more seconds.

Setting Examples

Enhanced Trigger Filter	
Trigger Filter Off	Trigger Filter On
● ● ■	● ● ■

Enhance Trigger Filter is set to **Off** by default.

If the machine is getting 1092 alarms, it is having a problem with vibration. Change this setting to **On** to solve the problem.

Optical Power		
Low	or	Standard
● ● ■		● ● ■

The factory default for the **Optical Power** setting is **Low**.

If the machine is getting 1093 alarms, try set **Optical Power** to **Standard**.

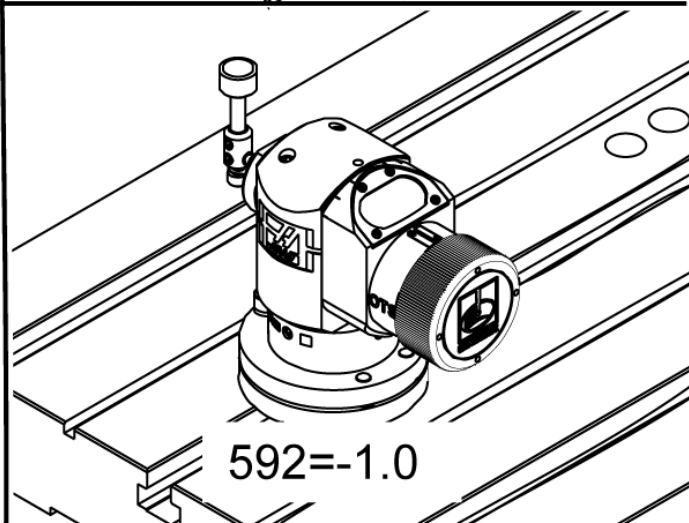
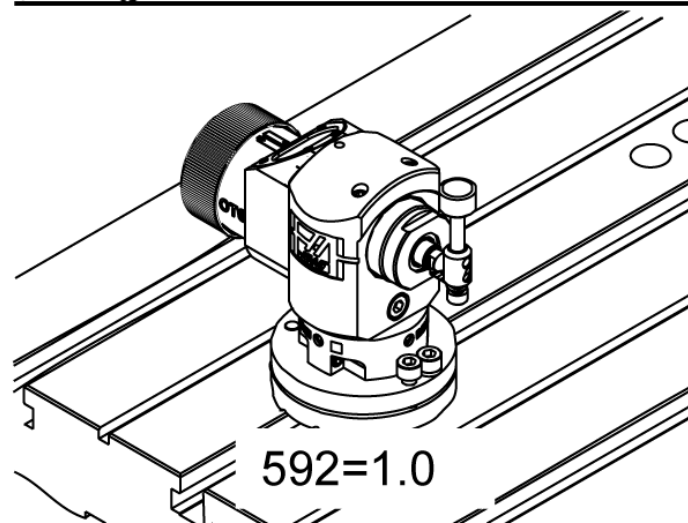
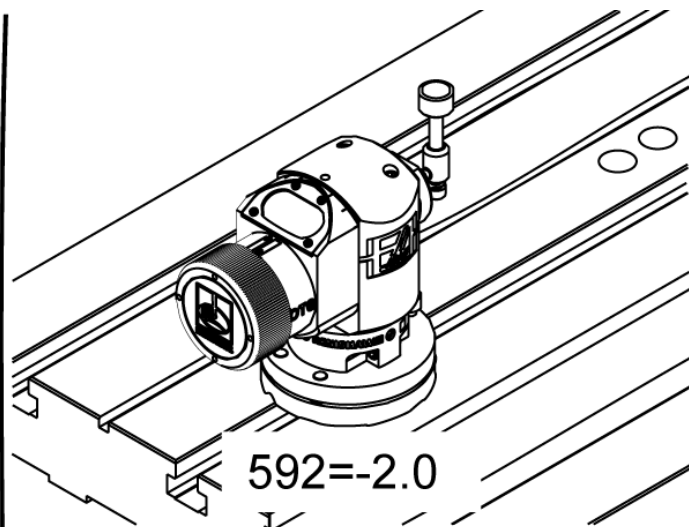
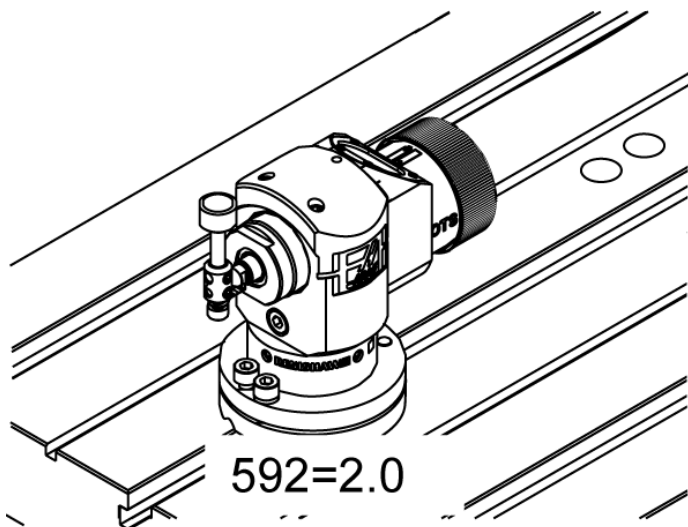
Set the OTS Direction

Macro variable 592 changes the radius offset direction so the tool will not hit the probe body when moving off center to compensate for the tool radius.

When the probe is calibrated using the WIPS calibration pages, this variable is automatically set to 2.

When the probe is calibrated using the VQC calibration pages, tyou have the choice of entering 2 or -2 in to the variable.

If the probe is mounted in a different orientation, you may need to change variable 592 so the tool will move away from the probe body during the rotating tool length cycle.



Macro variable #592 can be set to 1.0, -1.0, 2.0, or -2.0, depending upon orientation of the probe.

#592=1.0, diameter along the X Axis setting: rotating length cutter radius offset setting in the Y- direction.

#592=-1.0, diameter along the X Axis setting: rotation length cutter radius offset setting in the Y+ direction.

#592=2.0, diameter along the Y Axis setting: rotating length cutter radius offset setting in the X- direction.

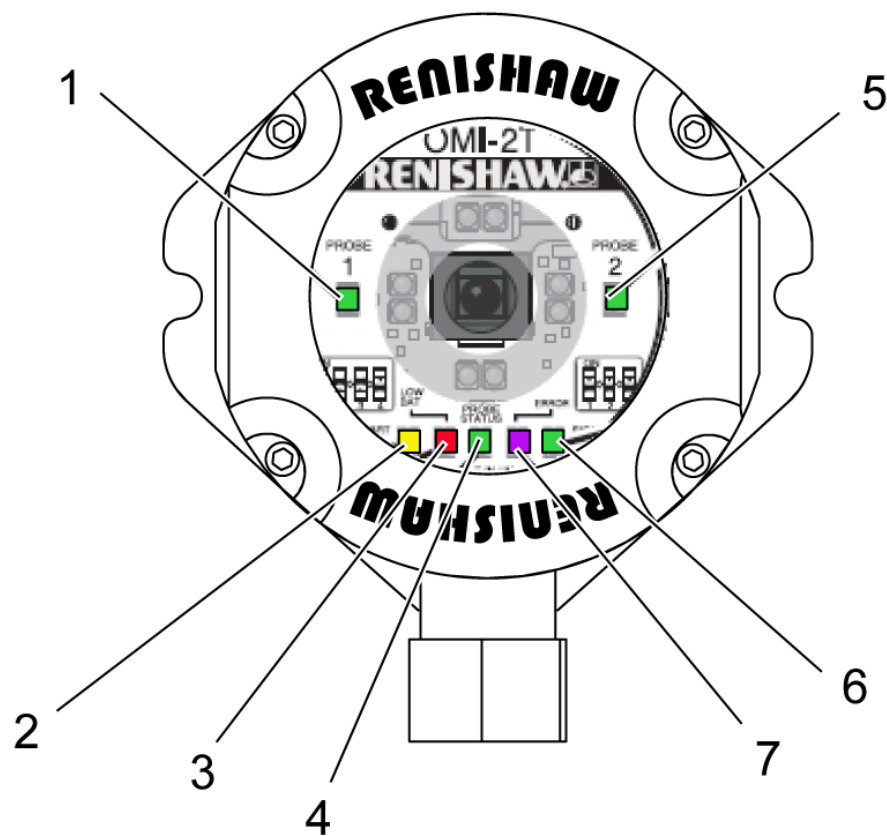
#592=-2.0, diameter along the Y Axis setting: rotation length cutter radius offset setting in the X+ direction.

OTS Macro Variables

- 582: OTS stylus Z location, non rotating tools
- 583: OTS stylus Z locations, rotating tools
- 584: Stylus size for diameter setting
- 585: X axis stylus center location
- 586: Y axis stylus center location
- 587: Z approach position (used in length and diameter probing only). The first fast positioning move to the position where the tool offset is applied (height above stylus).
- 588: Z clearance position (used in length and diameter probing only). The position above the stylus for clearance moves around the stylus (height above stylus).
- 589: Tools above this diameter rotate (used in length and diameter probing only)
- 590: Maximum cutter diameter size (used in length and diameter probing only)

- 592: Probe orientation. This defines the diameter measuring axis, and the radius offsetting direction for rotating length setting.

OMI Optical Machine Interface



Renishaw OMI Light Information

- 1 - Probe 1
 - Green: OMI-2T/OMI-2H only
- 2 - Start
 - Yellow: Start
- 3 - Low Battery
 - Red: Battery low
- 4 - Probe Status
 - Green: Probe seated
 - Red: Probe triggered
- 5 - Probe 2
 - Green: OMI-2T/OMI-H only
- 6 - Signal
 - Green: Signal good

- Yellow: Interference or weak signal
- Red: No signal
- 7 - Error
 - Red: No probe transmission
 - Blue: Refer to user's guide
 - Yellow: Refer to user's guide
 - Purple: Refer user's guide

More Information

You can find more probe information on the HAAS SERVICE GUIDE Including probe calibration information and a video on how to use the probe system.

On the Haas Service Guide, follow this route:

- Diagnostic Search
 - Mechanical/Electrical
 - Vertical
 - Probing
 - Apply