PQI
MT PROBING SOLUTIONS

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Non-Contact Tool Setting NC4+

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This presentation will give you step by step instructions on (re)aligning and (re)calibrating your laser tool setting system

Table of Content:

Vertical Alignment LED status

- Fixed Renishaw laser systems, at rest, should always have Green LEDs
- If you have a NC4+ Blue, your status light should be BLUE
  - If they are any other color consult the 'Basic Troubleshooting page'

Renishaw NC4+ Blue

Probe status LED	
Blocked beam / probe triggered	●
Partially blocked beam / probe untriggered	●
Unblocked beam / probe untriggered	●

Renishaw NC4+

Red = no signal

Amber = some signal

Green = good signal

Fixed system adjustment

If laser is moved, update these coordinates
By driving the tool to the center of the laser
And recording the Machine XY position

```
(LASER ALIGNMENT)
(ALIGNMENT ERROR IN #102)
G28G91Z0
G00G40G80G90
G53X-12.8Y-26.46
#3006=150(MOVE TOOL INTO POSITION)
G65P9860T1B1.D2.K5.00012R.62543A-22.30Z.15
M30
```

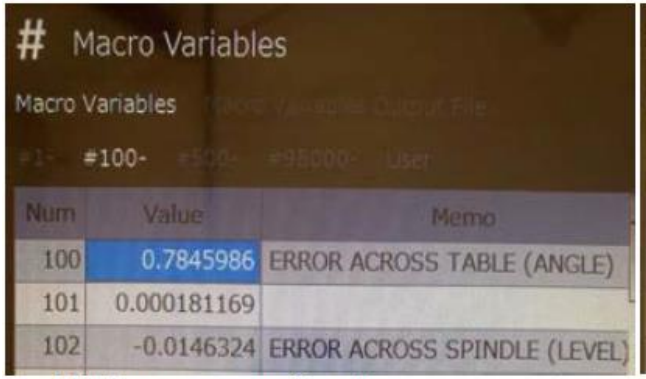
- If you make any adjustments to your laser, you **must** run O8060 (alignment cycle) **then** O8061 (calibration cycle)
- When to align the laser:
  - You hit / bump the laser bracket.
  - If you think the system may have shifted / moved.
  - A change in the machines Grid Shift or Spindle
- Run O8060
  - Use caution when Manually driving the Laser Tool to the beam, as you may be able to crash into the laser body!
  - Looking at the LEDs change its status to 'Broken Beam' with the tool, then slightly back out, restoring the original LED status

Table Axis

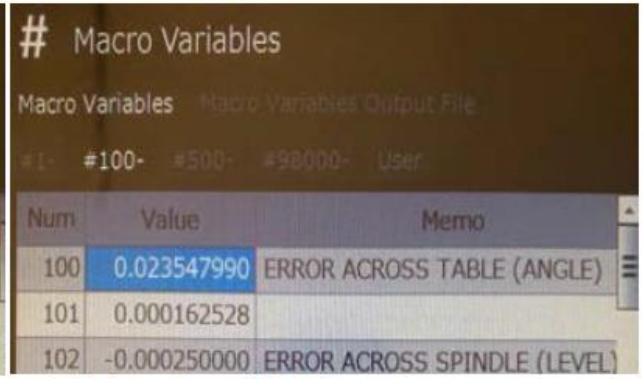
- When the program stops on the M1
- Check Var #100 for alignment of the beam to the table axis. This value is an angle and should be under +/- .5 deg.
  - If #100 is an acceptable number go to page 18
- If you need to adjust lightly tap the connector side of the fixed system left or right
  - Hit cycle start and repeat until an acceptable number is found
- Move on to page 18

*If you need to adjust with a hammer

DO NOT HIT THE LASER HEADS!



This is not an acceptable value.



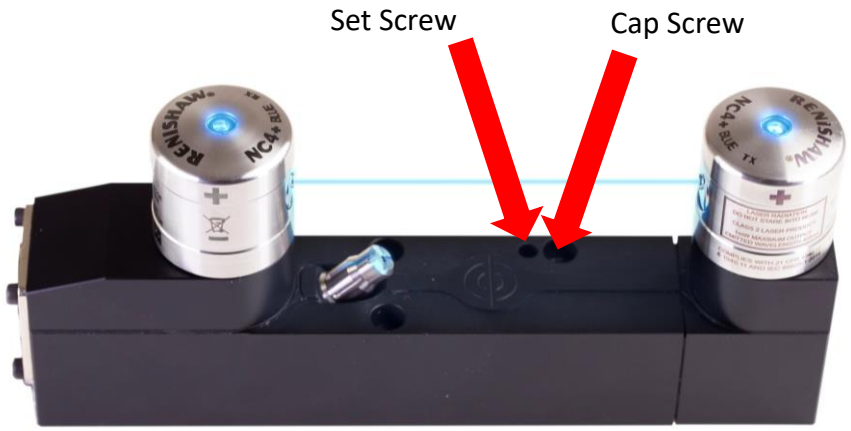
This is an acceptable value.

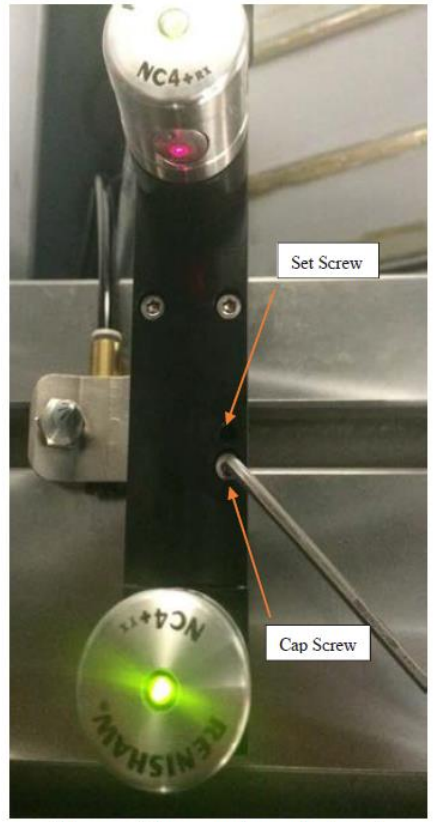
Set screw / Cap screw type adjustment.
Direct table mount.

Loosen / Tighten type adjustment.
PQI provided riser mount.

Spindle Axis

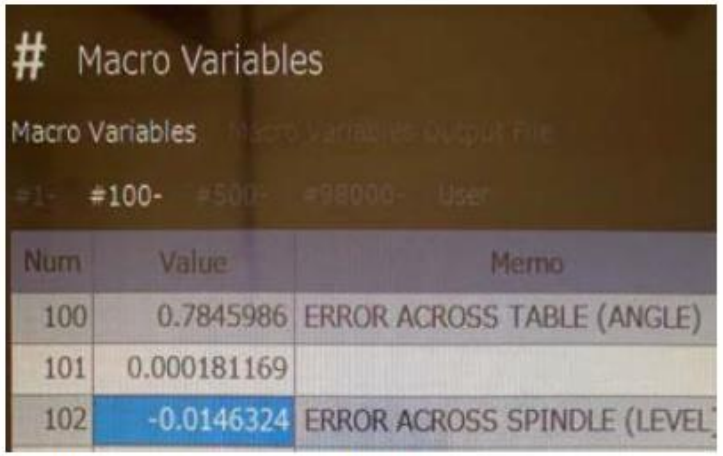
- Check Var #102 for the alignment along the spindle axis. This value should be less then +/-.001in.
- To adjust along the spindle axis you must adjust the level of the base. Depending on the setup on your machine the adjustment will either be by a set screw/cap screw type or a loosen/tighten type of setup.
  - If the NC4+ base is installed directly on the table then it will be the set screw/cap screw type setup.
  - If the NC4+ base is installed on a “riser” provided by PQI then the adjustment will be a loosen/tighten type setup. (next page)
- When adjusting with a M3 Alan-wrench, make sure to loosen first then tighten the opposite.





Set screw / Cap screw type adjustment.
Direct table mount.

- Make slight adjustments Hitting cycle start and repeat until #102 is an acceptable value
- Check that your Cap and Set Screws are snug. Run it one more time to ensure you still have good numbers
- If #100 and #102 are acceptable you **MUST** now run O8061



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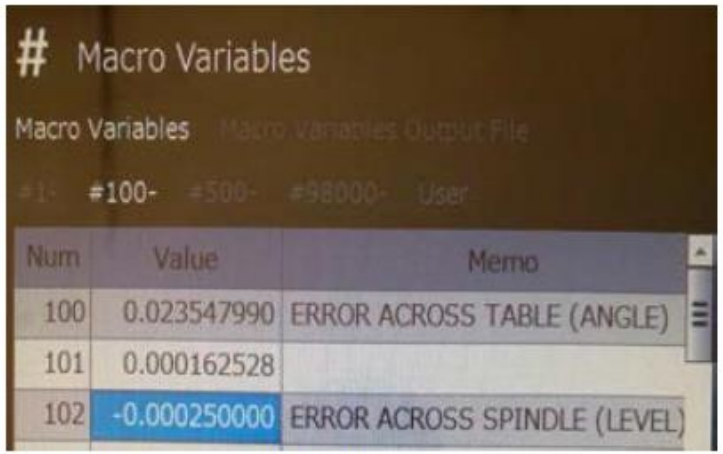
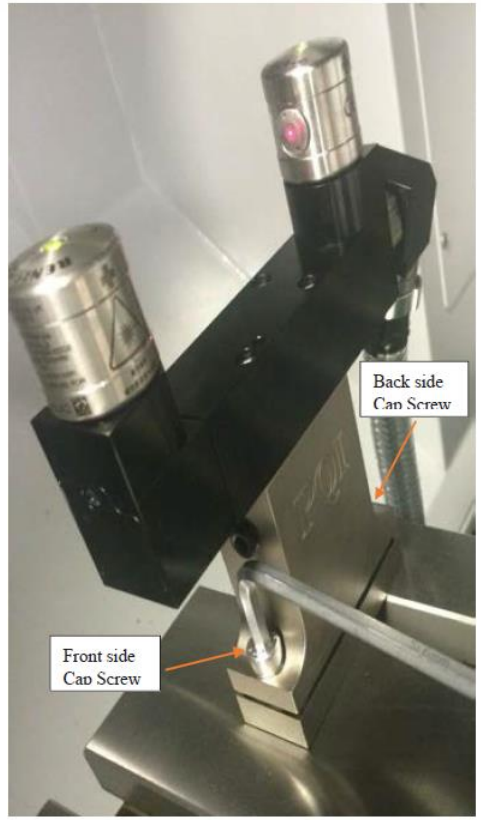


This is an acceptable value.



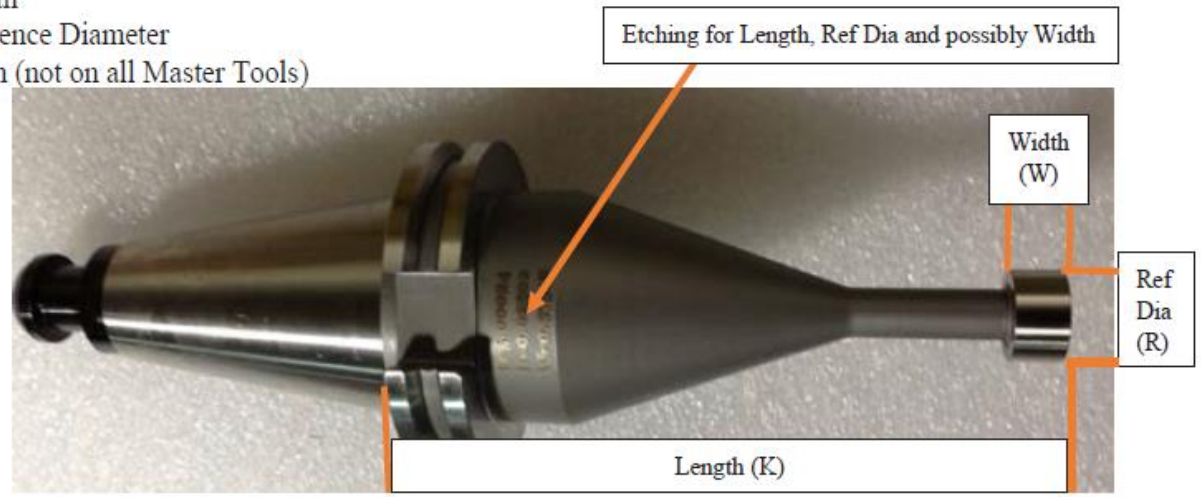
Loosen / Tighten type adjustment.
PQI provided riser mount.

Calibration

- Double check that all values match your master tool exactly:
  - K (tool length)
  - R (reference tool diameter)
  - W (tool width)
  - Y (tool radius – .055 in)
- Run O8061
- After calibration Var #520-#531 are populated (This depends on the O9460 or O9760 settings program. The program number will depend on the age of Renishaw software.
  - O9760 = TSM1(push in measurement)

  or
  - O9460 = TSM2(pull out measurement)) will be updated with the Laser Calibration values.
    - #120=520(BASE NUMBER)
- Do **NOT** overwrite the values in these macro variables with your own cycles.
- Now your laser is ready to use.

K= Length
R= Reference Diameter
W=Width (not on all Master Tools)




```
(LASER CALIBRATION)
G91G28Z0
G90G80G49G40G0
G65P9861B1.T1K5.00012R.62543Z.15
G65P9861B1.T1K5.00012R.62543Z.15Y.272W.37436
M30
```

***NEWER SOFTWARE VERSIONS ONLY REQUIRES ONE 9861 LINE

```
(LASER CALIBRATION)
G91G28Z0
G90G80G49G40G0
G65P9861B1.T1K5.00012R.62543Z.15Y.272W.37436
M30
```

Basic Troubleshooting

- If you have Red LED status
  - Check to see machine air is ON and air is coming out of laser heads
  - Check to see if Transmitting laser is hitting the Receiving head on center
- Amber LEDs
  - Re-align and Re-Calibrate laser
- Green / Amber rapidly flashing LEDs
  - Switch the set-up Switch 2 on the laser interface (page 6) for 5 seconds and then switch back.
- Is the laser-beam a ‘shotgun pattern’ not a ‘pin-point’
  - Clean laser heads
- LEDs on laser won’t turn on
  - Contact PQI
    - Office: 763-249-7149
    - Toll Free: 800-772-0620

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