TC820LTYsi Turret Disk Alignment Procedure

Procedure for the alignment of the TC820LTY Turret Disk

Written By: Phillip Brown



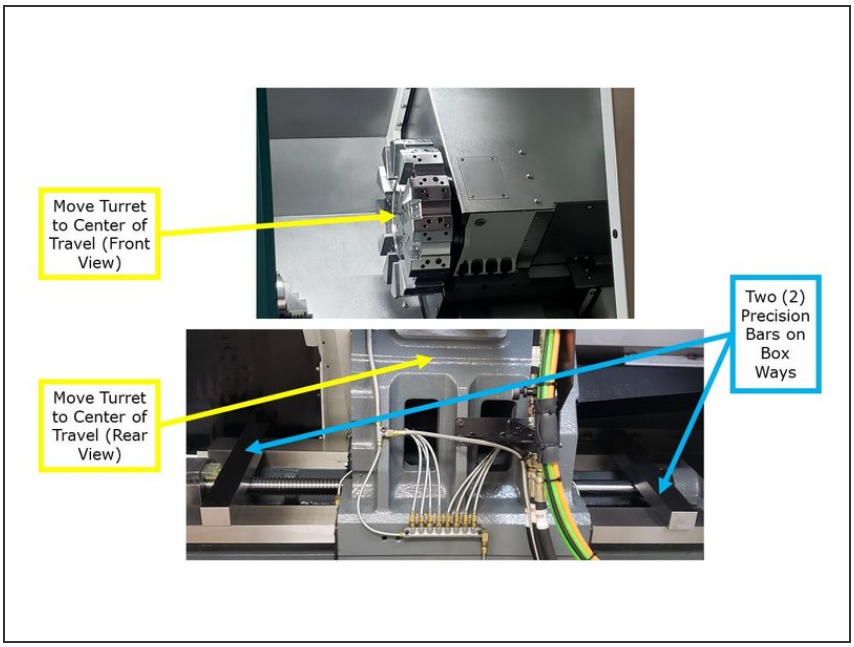
INTRODUCTION

This procedure is designed to guide the user in the inspection and alignment of the live tooling turret disk on the TC820LTYsi machines

TOOLS:

- Torque Wrench With 14mm Box End Adapter (1)
- Dial Indicator (0.0001" resolution) (1)
- Magnetic Base (1)
- 1 each 5 tenths (0.0005") coaxial indicator with .375" pilot (1)
- Coaxial Indicator Adapter (1)
- Boring Bar Holder (1)
- 14mm Allen Wrench (1)

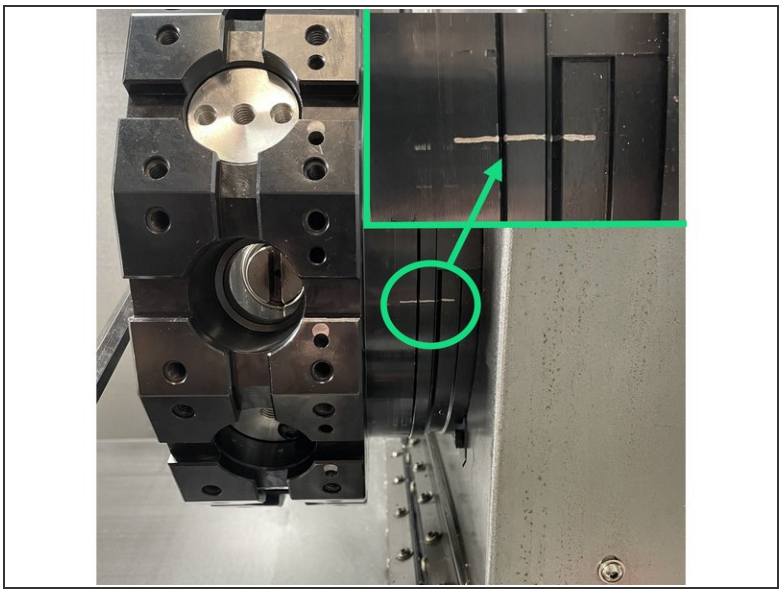
Step 1 — Getting Started



- Before you can get started with the Turret alignment you must be sure the machine is level. If the machine is not level it's bed can become twisted and this can move the machine centers out of alignment. This can make the machine appear to be out of alignment when the machine is actually out of level. Use the below link to level the machine.
  - Link to level the machine: TRAK TC820si & TRAK TC820LTYsi - Leveling

Step 2 — Prep Turret for Realignment

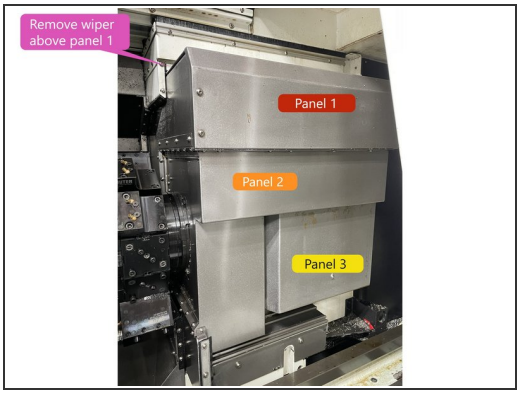




- When starting this procedure for safety reasons please remove all tool holders and confirm the hydraulic pressure is at 50kg.
- The Turret Disk is adjusted when the turret is at the T1 (origin) station with the disk aligned with the alignment mark lines
- In the event that the Turret needs to be realigned due to a crash, the Turret Disk (right hand disk) and the Turret Ring (center ring) may not align with the mark on the Coolant Disk (right hand ring).

Step 3 — Remove Sheet Metal Covers to Prep For Gearhead Removal



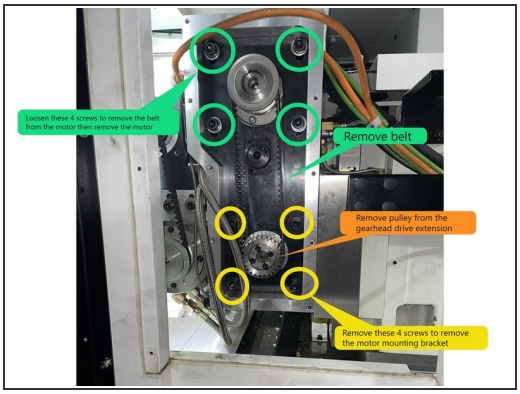


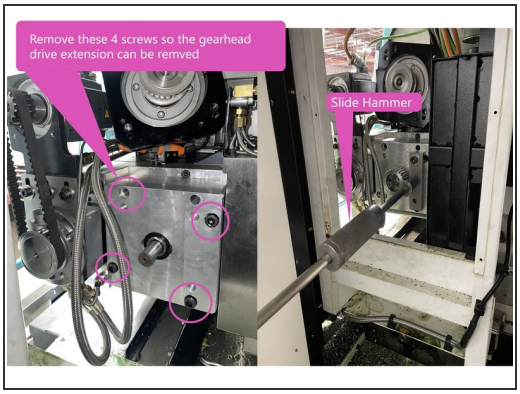


- Remove the rear sheet metal cover.
- Remove the wiper above Panel 1. See Photo 2
- Through the front door remove upper sheet metal panel. There are 10screws in the front and there are 4 screws in the rear of the machine. (Labeled panel 1 in Photo 2)
- Remove middle sheet metal panel (Labeled panel 2 in Photo 2)
- Remove lower sheet metal panel (Labeled panel 3 in Photo 2)
- From the rear of the machine remove the internal covers shown in Photo 3.

Step 4 — Remove Gearhead Motor

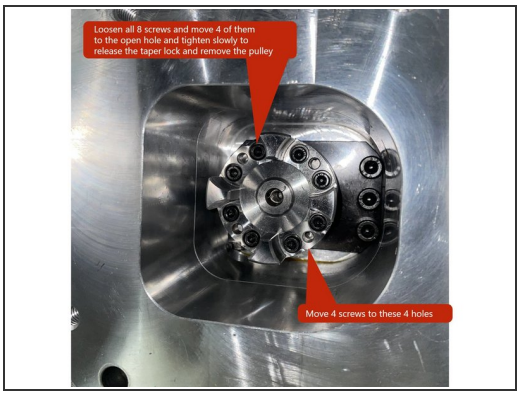


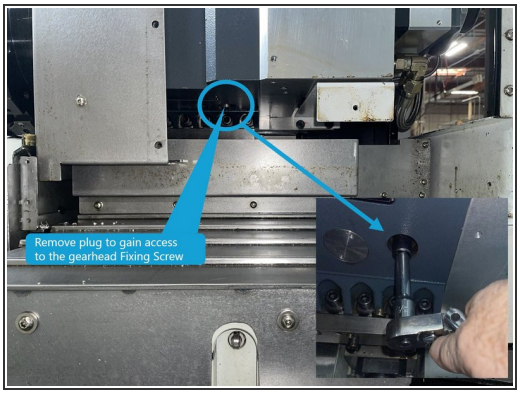


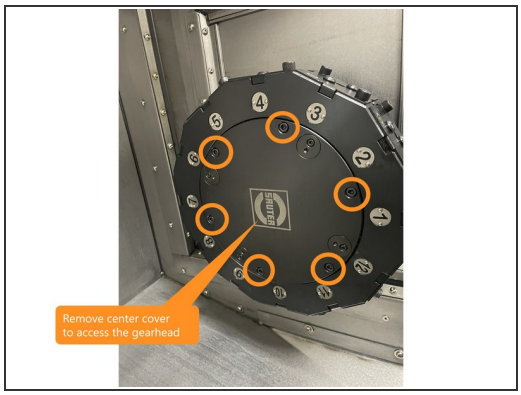


- Remove cover to access the gearhead belt and motor mounting screws.
- Loosen the screws circled in green to loosen and remove the belt. Once the belt is removed, remove the screws to remove the motor.
- ⓘ Caution the motor is heavy you may need another person hold the motor while you remove the screws
- Remove the pulley from the gearhead drive extension.
- Remove the 4 screws that mount the gearhead drive motor mounting casting to the gearhead drive extension assembly and remove the casting.
- Remove the 4 screws that attach the gearhead drive extension. The gearhead drive extension is pinned and can be difficult to remove, attaching a slide hammer and lightly tapping may help get it started.

Step 5 — Remove Pulley From Gearhead and loosen Gearhead Fixing screw

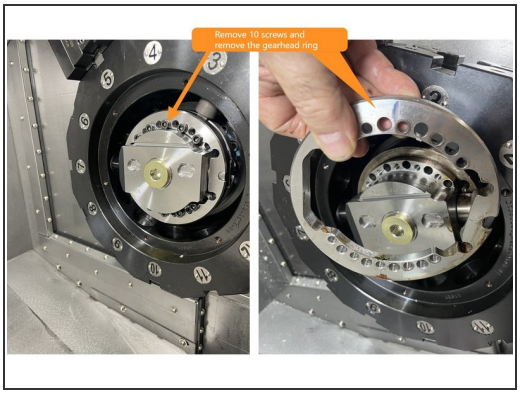


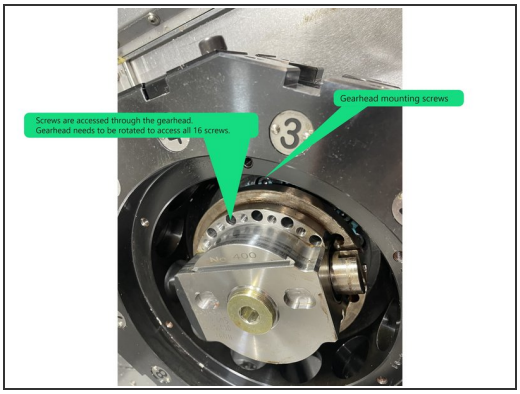


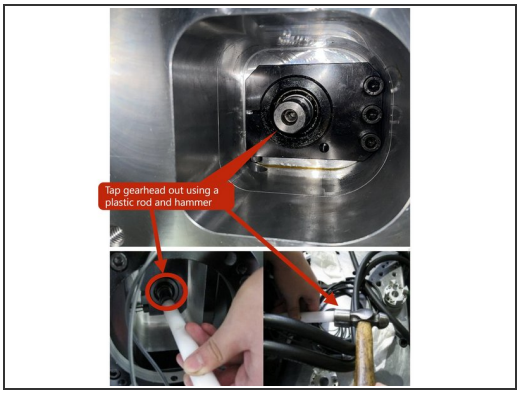


- Remove the pulley from the gearhead.
  - The pulley is a taper lock, to remove it loosen all 8 screws and move 4 of them to the threaded holes and tighten slowly, this will release the taper lock so the pulley can be removed. See Photo 1
- Remove the plug that covers the gearhead fixing screw and loosen the fixing screw.
- To access the gearhead mounting screws remove the front cover on the turret disk.

Step 6 — Remove the Gearhead



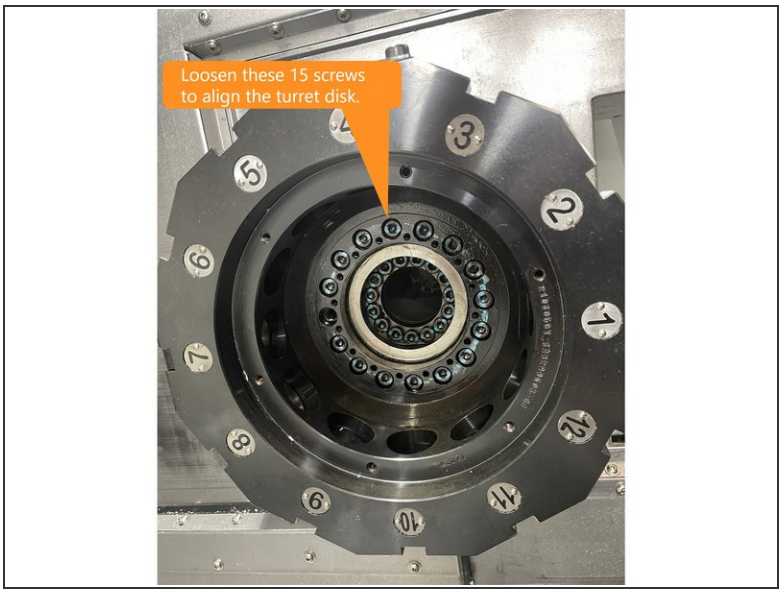


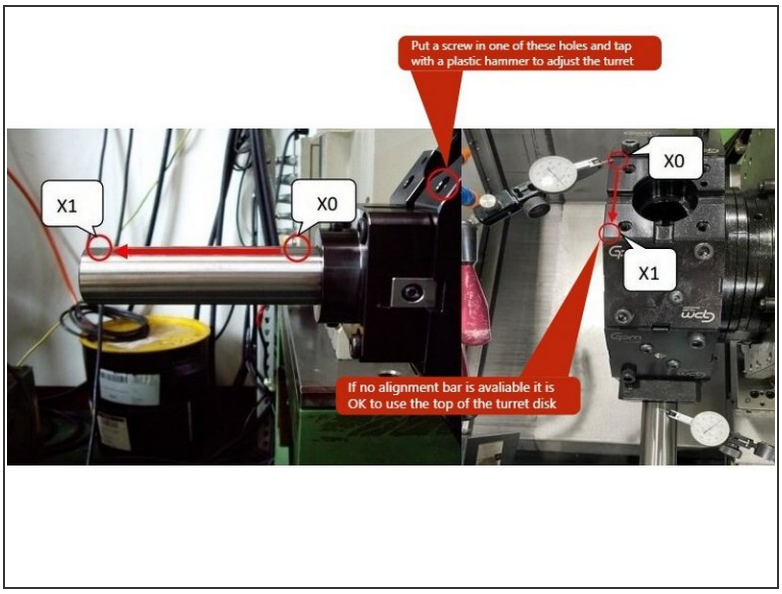


- Remove the gearhead ring. There are 10 screws that attach the gearhead ring to the gearhead, remove them and remove the ring.
- To remove the gearhead there are 16 screws that need to be removed. These screws are accessed through the front of the gearhead. The gearhead needs to be rotated 360 degrees to access all 16 screws. See Photo 2
- Once the gearhead fixing screw is loose and the mounting screws are removed, use a plastic rod and a hammer to slowly tap the gearhead out.

ⓘ ***The Gearhead is a little heavy, have someone in the front of the turret to catch it as it comes out of the turret to prevent it from falling into the machine and possibly doing damage.***

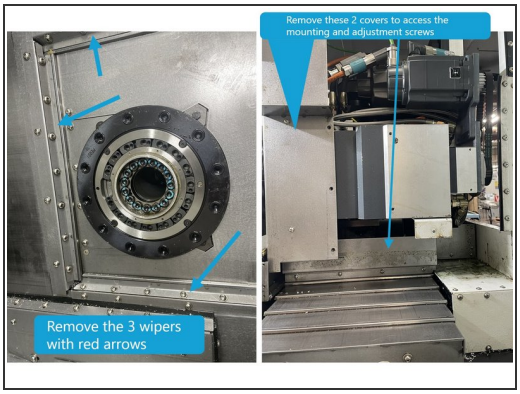
Step 7 — Turret Disk Precision Adjustment

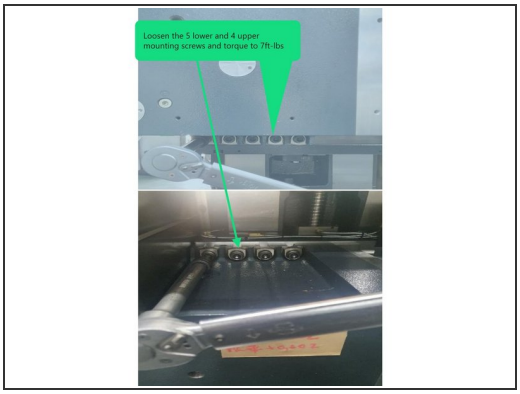


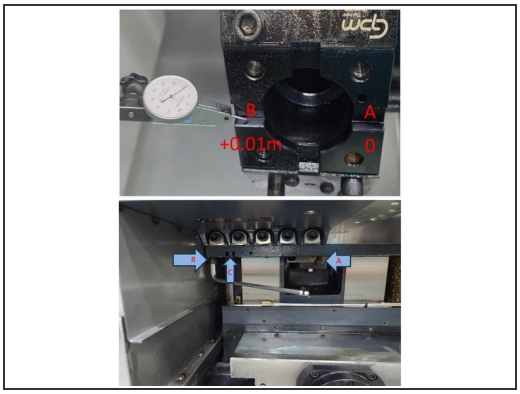


- To align the turret disk loosen the 15 screws mounting the turret disk shown in Photo 1.
- To align the turret disk, set up a dial indicator with a mag base on the tailstock slideway.
- Install a turret alignment bar into the turret in the tool 1 location.
- Zero the indicator on the high point of the alignment bar nearest the turret and move the X Axis towards the end of the alignment bar. The measurement should be within 0.01/90mm (0.0004"/3.5") or less.
- You can put a screw into one of the other tool holder locations and tap it with a plastic tipped hammer to adjust the turret parallelism to the X Axis.
- If no turret alignment bar is available you can use the top surface of the turret disk.
- Once the turret has been aligned torque all 15 screws to 39 Nm (28ft-lbs) in a crossing pattern.

Step 8 — Alignment of the Turret Vertical Accuracy

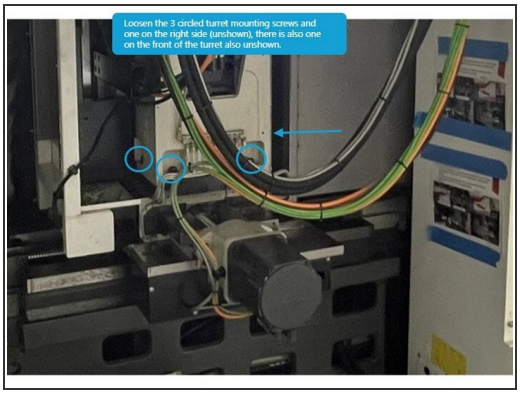




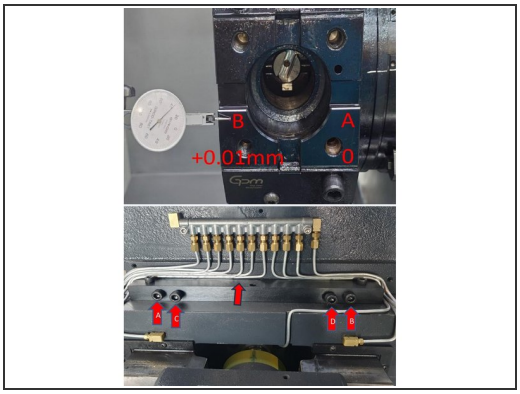


- To access the turret mounting and adjsument screws remove the 3 wipers and 2 covers shown in photo 1.
- Loosen the 5 lower and 4 upper mounting screws and torque to 7ft-lbs (100kgf/cm).
- Set up your dial indicator to measure the turret surface shown in Photo 2. Zero at point "A" and measure to point "B". Using the adjustment screws Loosen screw "C" to adjust screw "B" or tighten screw "C" to adjust screw "A". The parallelism of this surface should be 0.0004"/3.5 (0.01mm/90mm) or less.
- Once the turret parallelism is adjusted to within spec, torque the mounting screws to 28ft-lbs. Recheck the parallelism to verify it didn't change when the screws were torqued.

Step 9 — Alignment of the Turret Horizontal Accuracy

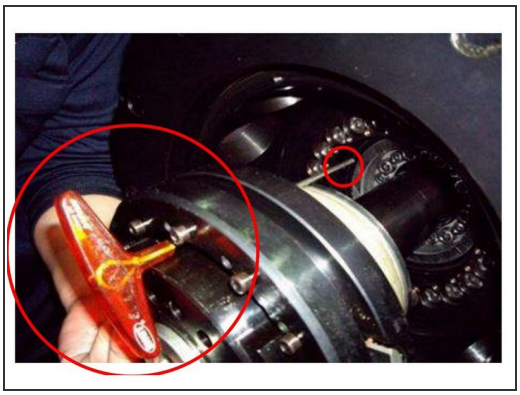


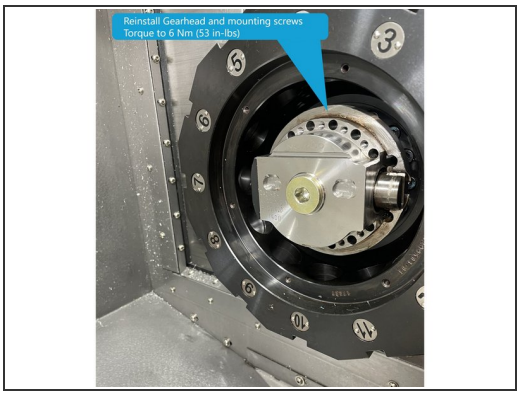


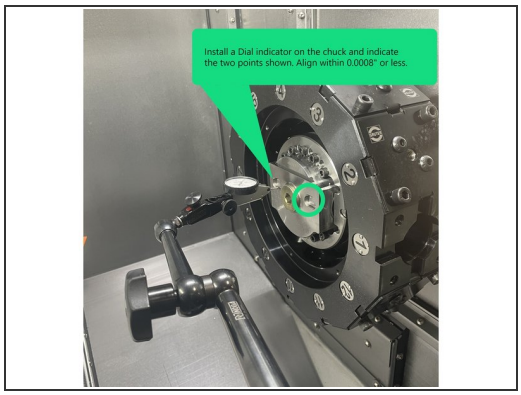


- Loosen the 5 turret mounting screws shown in photo 1, and torque to 7ft-lbs. To access the right side mounting screw you will need to move the Z Axis to the limit farthest from the spindle.
- You will need to use a special torque wrench with 14mm box end adapter and a 14mm hex bit cut to the required length. See Photo 2
- Set up your dial indicator to measure the turret surface shown in Photo 3. Zero at point "A" and measure to point "B".
- To adjust the Horizontal accuracy use the screws marked A, B, C & D below in photo 2. You can loosen A to adjust C or loosen B to adjust D to bring the horizontal accuracy of the turret back to within 0.0004"/3.5 (0.01mm/90mm). See Photo 3
- Once the horizontal accuracy of the turret has been adjusted back into spec, torque the mounting screws to 187ft-lbs. Recheck the accuracy to verify it didn't change when the mounting screws were torqued.

Step 10 — Reinstall Gearhead and Align

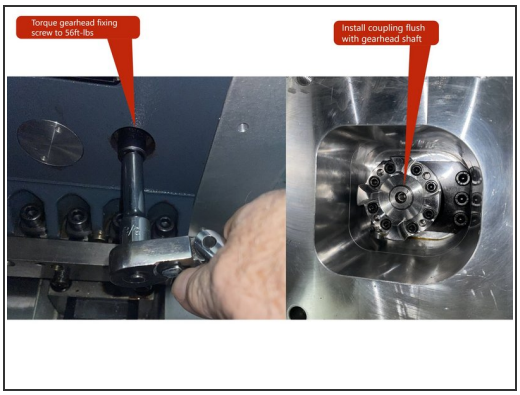


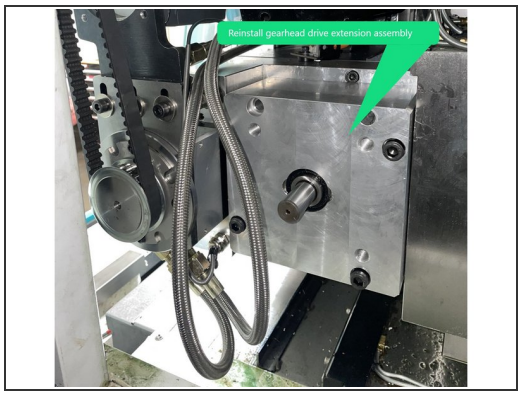


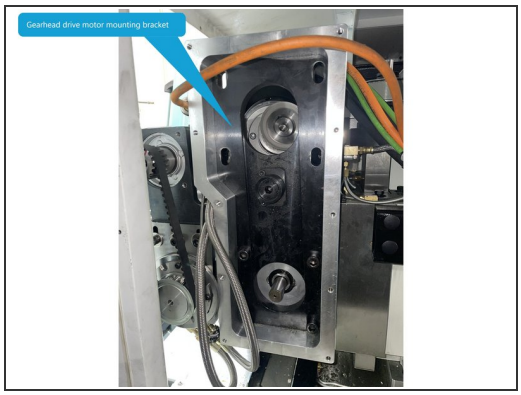


- When reinstalling the Gearhead use a T-Handle wrench (2.5mm or 3mm) to go through the fixing screw access hole, the fixing screw flange hole on the gearhead and into the turret disk hole to align the gearhead to the turret disk. See Photo 1
- Reinstall the gearhead and all 16 screws. You will need to rotate the Gearhead 360 degrees to access all 16 screws. Torque the screws to 6 Nm (53 in-lbs) in a crossing pattern.
- Once the turret has been aligned and the gearhead has been installed the gearhead needs to be aligned.
  - To align the gearhead install a dial indicator and a mag base on the chuck and indicate the points shown in Photo 2. The measurement should be within 0.02mm (0.0008") or less.

Step 11 — Reinstall Coupling and Gearhead Drive Extension

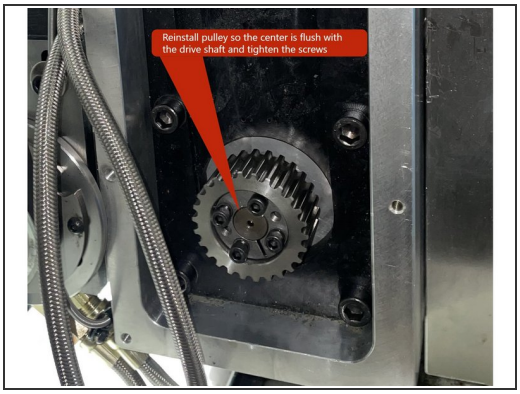


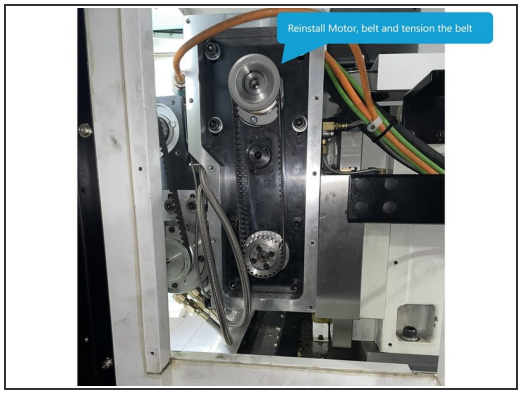




- Once the gearhead has been aligned torque the gearhead fixing screw to 56ft-lbs. Next install the coupling flush with the gearhead shaft as shown in Photo 1. Tighten the screws in a crossing pattern to lock the taper lock to the gearhead drive shaft.
- Reinstall the gearhead drive shaft extension assembly.
- Reinstall the gearhead drive motor mount.

Step 12 — Reinstall Belt and Motor



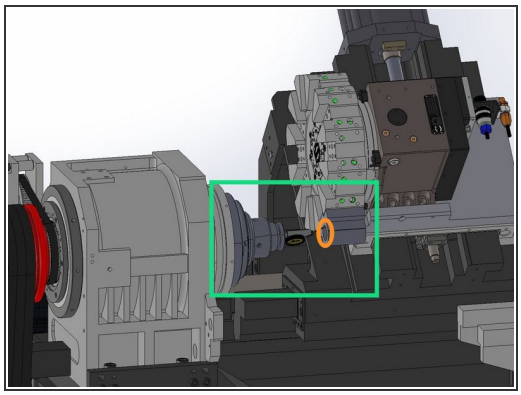


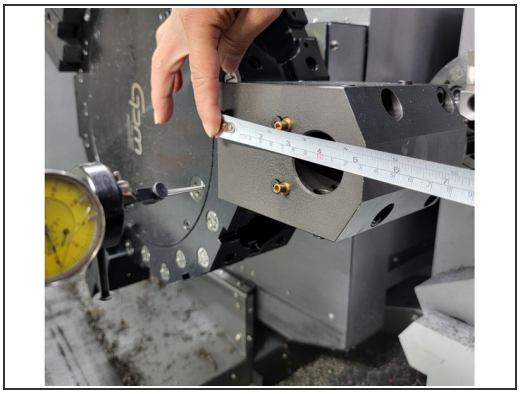


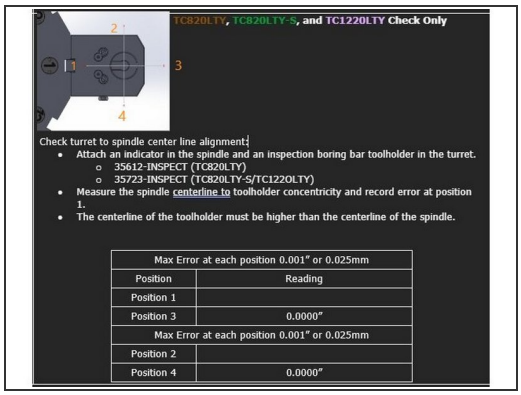
- Reinstall the pulley to the gearhead drive extension so that the center is flush with the drive shaft and tighten the taper lock screws.
- Reinstall the motor to the motor mount then reinstall the belt. Once the belt is installed tension the belt to 110 Hz, and tighten the motor mounting screws.
- Reinstall motor mount cover to motor mount and reattach cables and oil lines to the cover as seen in Photo 3.

This document was generated on 2026-08-13 10:09:45 PM (MST).

Step 13 — Spindle to Turret Centerline Concentricity Check







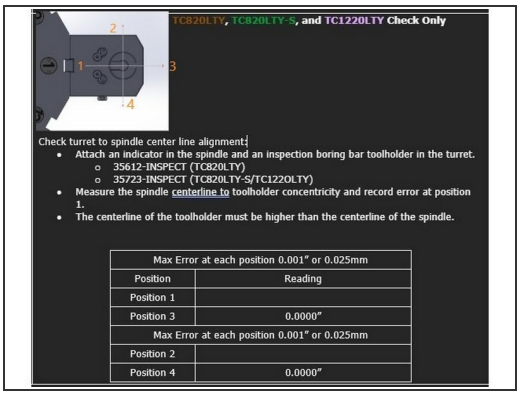
ⓘ Once the horizontal and vertical accuracy has been aligned you need to check the Spindle to turret centerline concentricity. To do this install a 5C Collet Chuck with a 0.375" High Accuracy Collet.

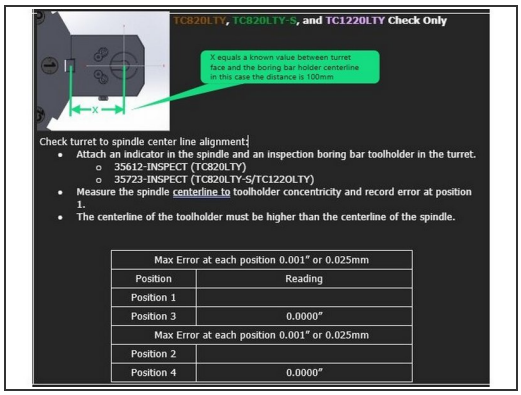
ⓘ Clean the 5C Collet Chuck with WD-40 or an equivalent, and use a fine grit deburring stone to check for dinks or high spots on the mounting and measuring faces.

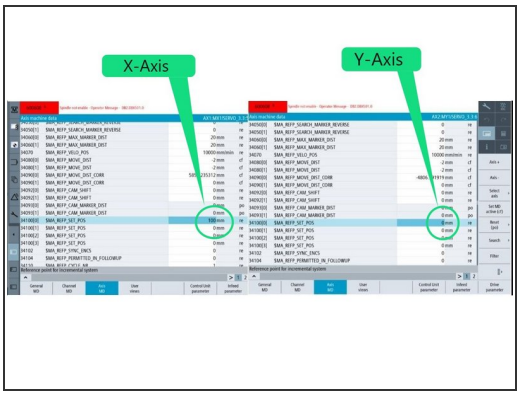
- Attach an inspected Boring Bar Tool Holder to the Turret, the offset between the turret face and center of the bore must be known. Install the 5C collet chuck onto the spindle face. Using a high accuracy 5C Collet install a Co-Axial dial indicator so it is centered on the Spindle rotary axis.
- Position the indicator so it is measuring on the ID of the boring bar holder and adjust the axis so the turret is close to the centerline of the spindle. The X-Axis should be at the value equal to the offset between the turret face and the center of the bore on the Boring Bar Holder. The Y-Axis should be positioned on 0.
- Starting with the Co-Axial indicator set to Zero at position 3 (see photo 3), rotate the spindle 360° and record the indicator movement at positions 1, 2, and 4.

  ⓘ **The maximum permitted error is 0.001" [0.025mm]. The centerline of the toolholder in the Y Axis must be higher than the centerline of the spindle.**
- Repeat check at turret position 7.

Step 14 — Adjustment of Spindle to Turret Centerline Concentricity

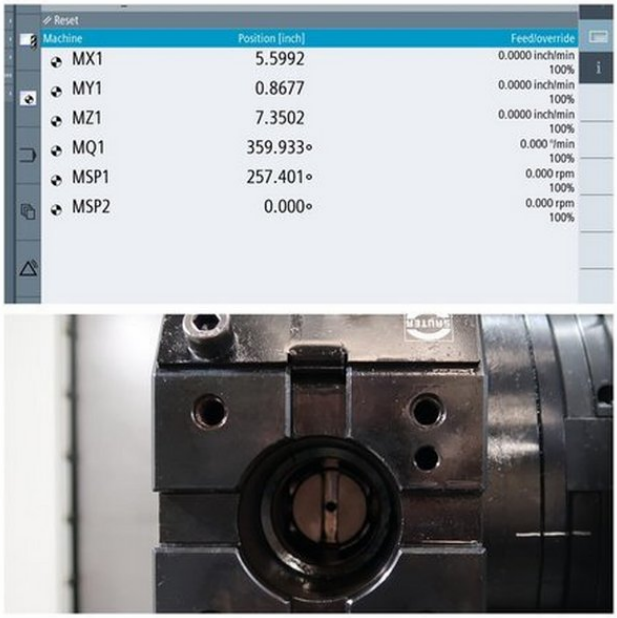






- To align the turret centerline with the main spindle move the X and Y axis positions until the centerline of the tool holder bore is within spec of the spindle centerline.
- Starting with the digital indicator set to Zero at position 3, rotate the spindle 360° and record the indicator movement at positions 1, 2, and 4.
  - ⓘ **The maximum permitted error is 0.001" [0.025mm]. The centerline of the toolholder in the Y Axis must be higher than the centerline of the spindle.**
- Verify parameter settings MD 34100[0]:
  - X-Axis MD 34100[0]: Set to the value between the turret mounting face and the centerline of the tool holder bore. In this case it is 100mm as shown in photos 2 and 3.
  - Y-Axis MD 34100[0]: Set to 0.
- Change parameter setting MD 34210[0] to 1 for the X and Y Axis. Press Jog -> Ref Point on the MCP and set the Feed Override to 0%.
- Press and hold the "X" and "+" buttons on the MCP to reset the X-Axis position. Press and Hold the "Y" and "+" buttons on the MCP to reset the Y-Axis position.

Step 15 — Reference Live Tooling Spindle

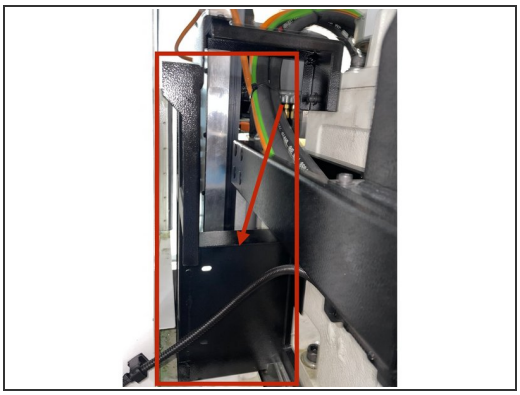


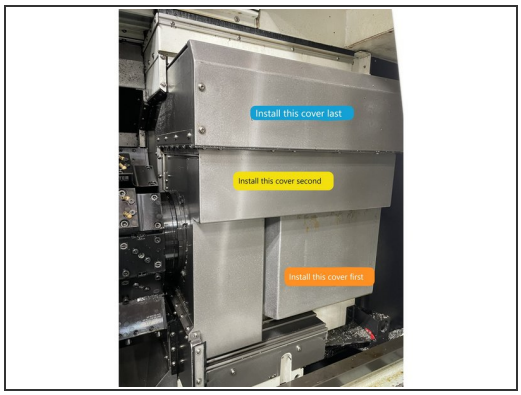
- Before you reinstall all of the covers you need to reference the live tooling spindle. To do so use the link below to use the Reference Live Tooling Spindle procedure below:

⚠ ***Caution do not skip this step. The turret will not be able to index a live tool into the tool working position if this isn't aligned properly.***

- TC820LTYsi- Reference Live Tooling Spindle (S2)

Step 16 — Reinstall Covers and Clean Machine







- Reinstall this inside cover.
- Install the lower cover first.
- Install the middle cover second.
- and the top cover last.
- Install the cover, once installed put a small bead of clear silicone all the way around the edges of the cover.

ⓘ ***Before putting silicone around the edges of this cover, clean any remaining silicone from the cover and mating surface from when the cover was removed.***