

# SPI\_0070-811-225 Column Z

## How to replace the OTC Column Z

**APPLICABLE TO:** Precision i5



**SPARE PART:** 0070-811-225 Column Z

### TOOLS NEEDED:

- Standard Service tools.
- Torque wrench 10-30 Nm (with 5mm Allen key extension).
- Loctite 243 or eqv. thread locking compound.
- Loctite 2701 or eqv. thread locking compound.
- Assorted cable ties
- Service laptop.
- RS-232 Service cable  
p/n 1100-810-201.
- Installation & Service manual.



**NOTE!** Read this document in its entirety before starting the replacement work.

### PROTECTIVE MEASURES:

#### **CAUTION!**

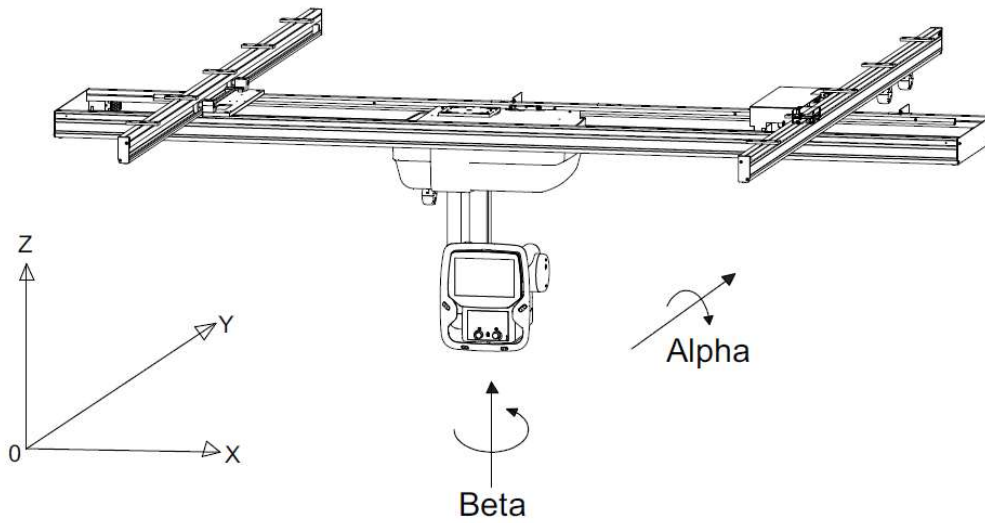
*Printed circuit boards contain electrostatic highly sensitive components requiring particular care in their handling. Ground before making contact and place only on a conductive surface.*

#### **CAUTION!**

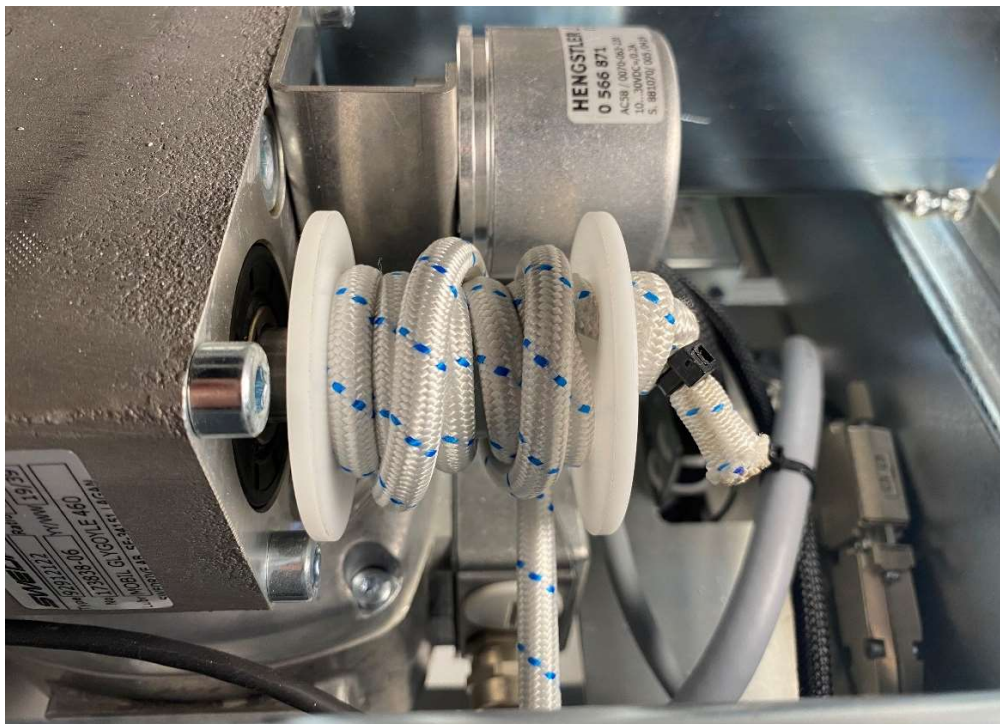
*Remaining energy may exist when the equipment is switched off. Always wait at least 15 seconds before working on the system.*

**ACTION STEPS:**

1. Start with the OTC positioned in its Beta 0° position. See picture below.



2. If possible, move the OTC in Z direction to a low position to relieve tension from the elastic cable lifting cord and make it easier to remove ceiling wagon covers. If the column cannot be moved, temporarily lift a couple of laps off the spool to relieve tension.



**NOTE!** See guide 0200-095-235 for methods to manually move the column.

3. Release and remove the two screws for the larger right-hand cover of the ceiling wagon.



4. Remove the cover.
5. Release and remove the five screws for the smaller left-hand cover of the ceiling wagon.



6. Mark the position of the cable holder.



7. Release and remove the two Torx T20 screws for the cable holder and hang down the cable.



8. Secure the elastic lifting cord and untie the knot. Pull the cord through the cable holder and the hole in the left-hand cover. Secure the elastic lifting cord temporarily with a knot.
9. Remove the cover.



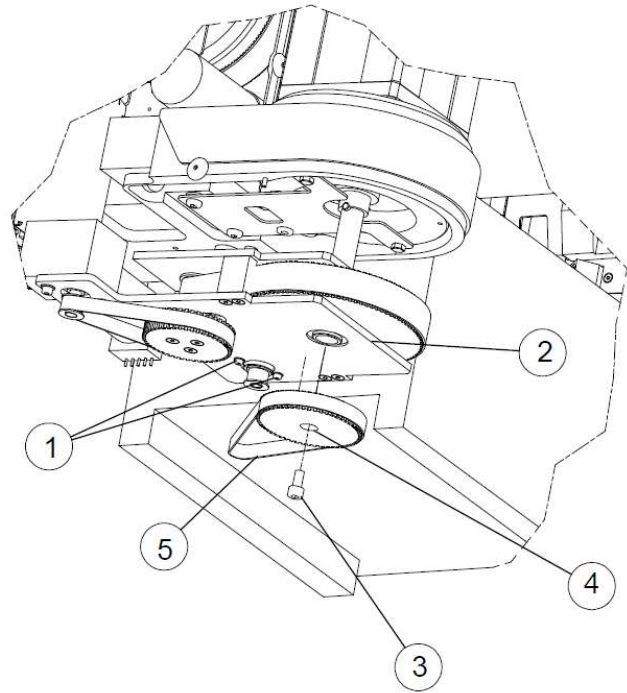
10. If possible, move the OTC in X/Y/Z directions to a comfortable working position that enables access to the beta rotation at the bottom of the column.

11. Remove the Alpha and Beta covers.

**NOTE!** Support the beta motor unit to prevent it from falling.

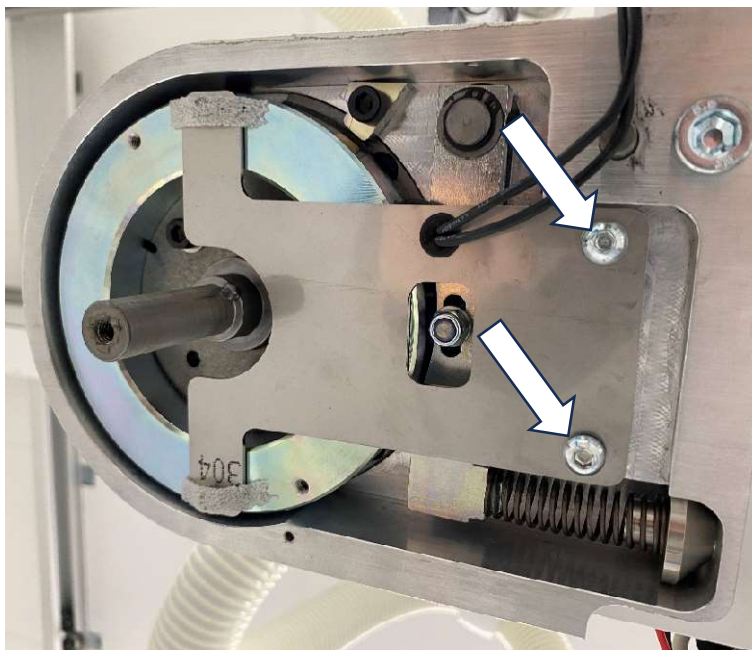
12. Release and remove screw (3), pulley (4) and belt (5).

13. Remove the beta motor unit (2) by sliding it downwards. The units should slide down on its shaft. Use a screwdriver to carefully pry it down if necessary.

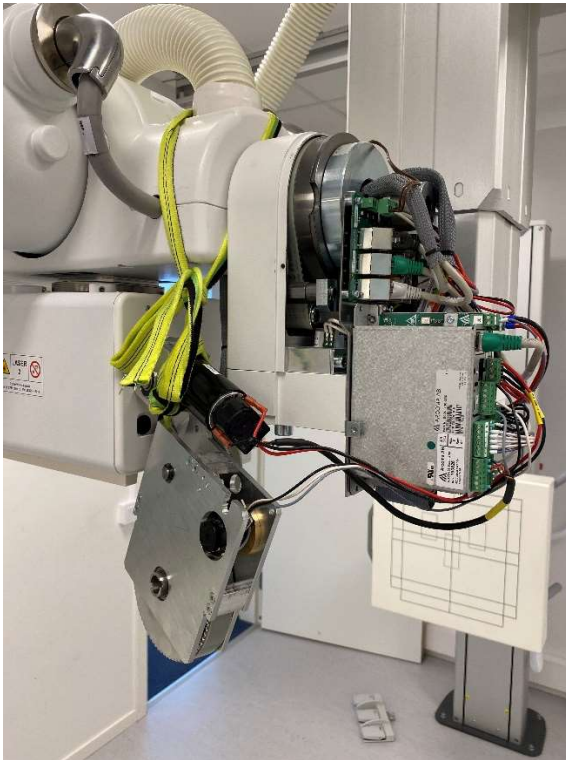


14. Leave the cables for the beta motor unit connected. Support the unit to prevent it from falling. **NOTE!** The unit must not hang from its cables!

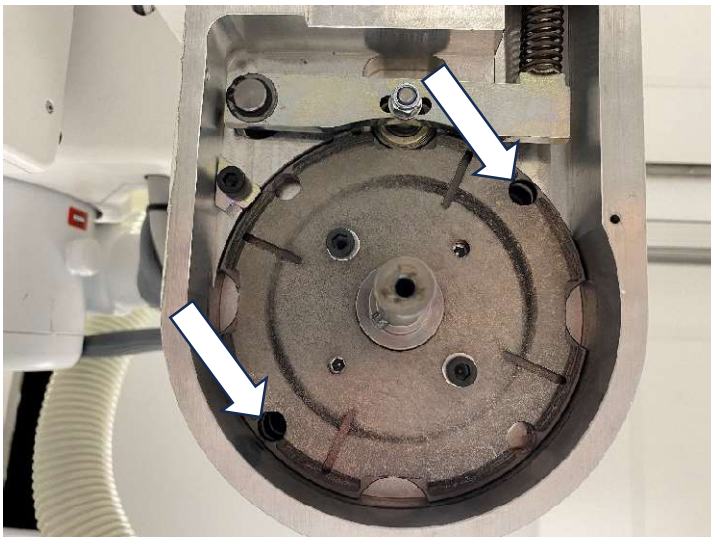
15. Release and remove the two screws for the Beta magnet. Support the magnet while pressing the Alpha/Beta brake release button to disengage the brake magnet. **NOTE!** Distance washers are present behind the bracket. These washers must be restored later when the magnet is reattached.



16. Disconnect the cable for the Beta magnet from 1.3RCC01 J8 and remove the unit.
17. Hang the beta motor unit from a strap or similar. It needs to stay electrically connected for the upcoming steps when the column is moved.



18. Turn beta 90° to gain access to the column screws.
19. Release and remove the two visible column screws (front right and back left, M6x35). The tube head is now only fixed with the two remaining screws that will be removed in a later step. **Proceed with caution.**



20. Turn beta back to its 0° position.

21. Move the OTC to a secure location where the tube head can be supported after it has been detached from the column.

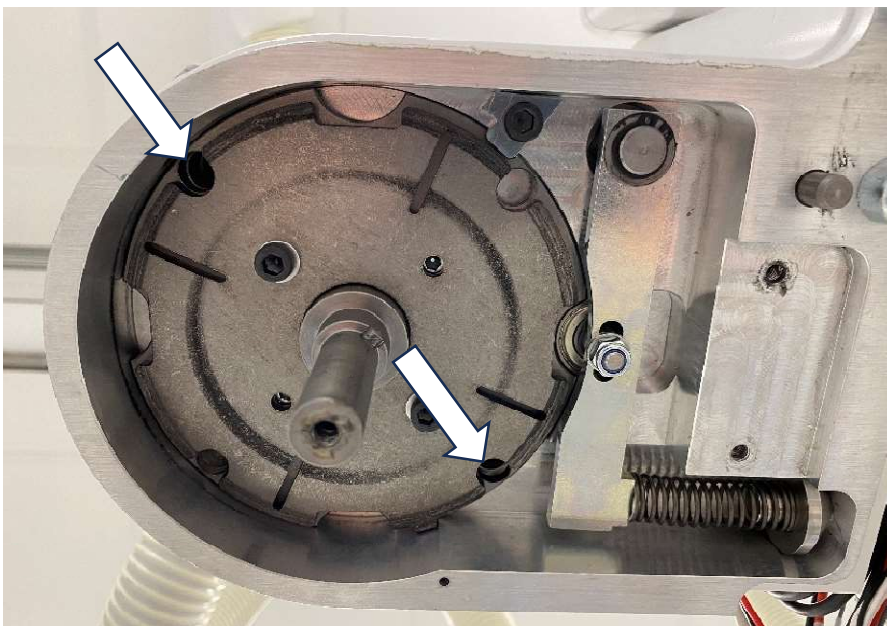
The tabletop is good to use as it allows movement both up/down and in the X/Y directions. Make sure to protect the tabletop.



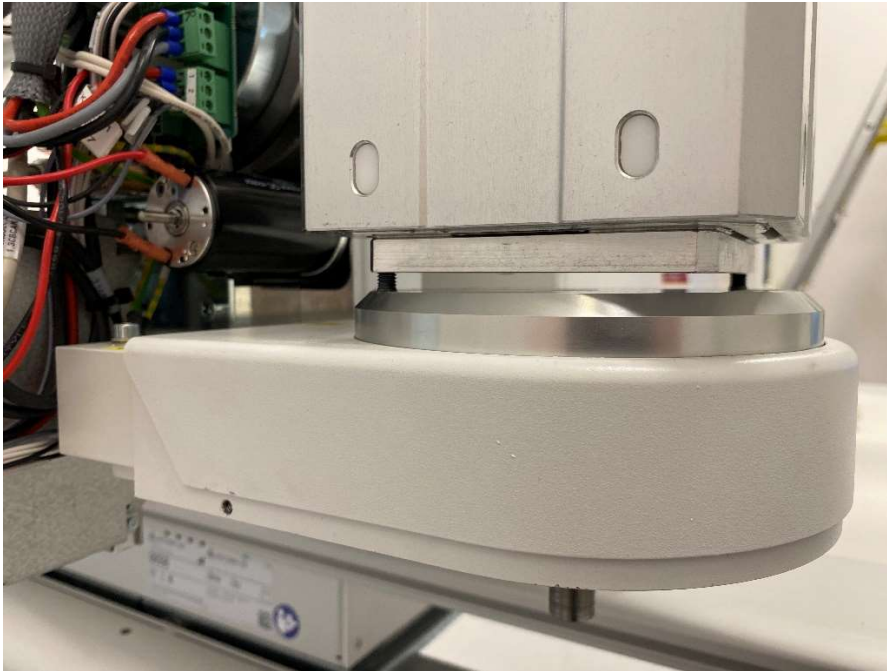
22. Make sure that the tube head rests securely on the tabletop.

23. Locate the two now visible column screws (front left and back right, M6x35).

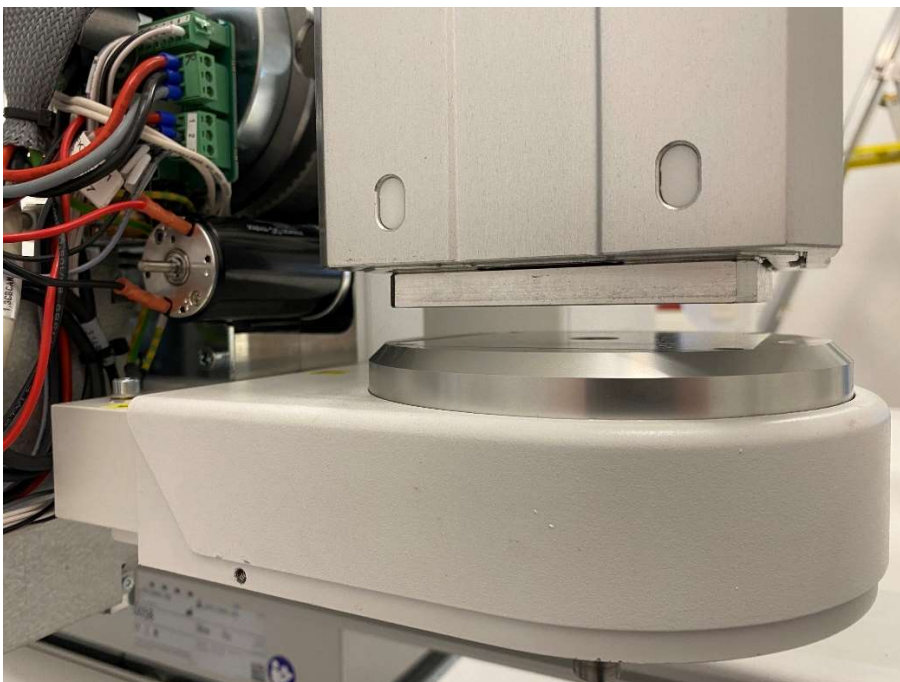
**NOTE!** Removing the two screws will separate the tube head from the column. Make sure its rests securely!



24. Release the two remaining screws little by little while monitoring the gap between column and tube head that appears when the screws are released. Make efforts to keep the tube head stable and parallel with the column while continuing to release the screws.

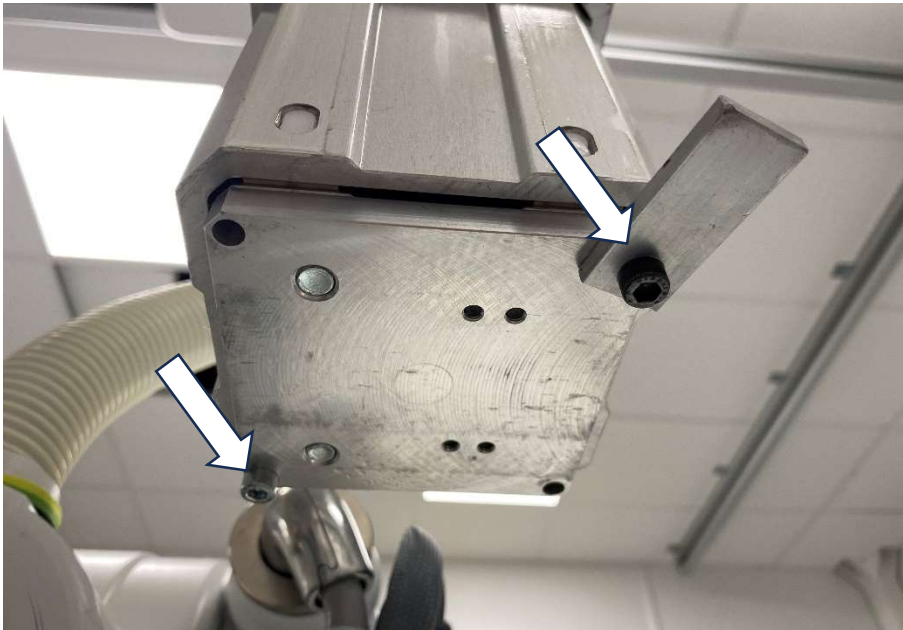


25. Remove the screws.



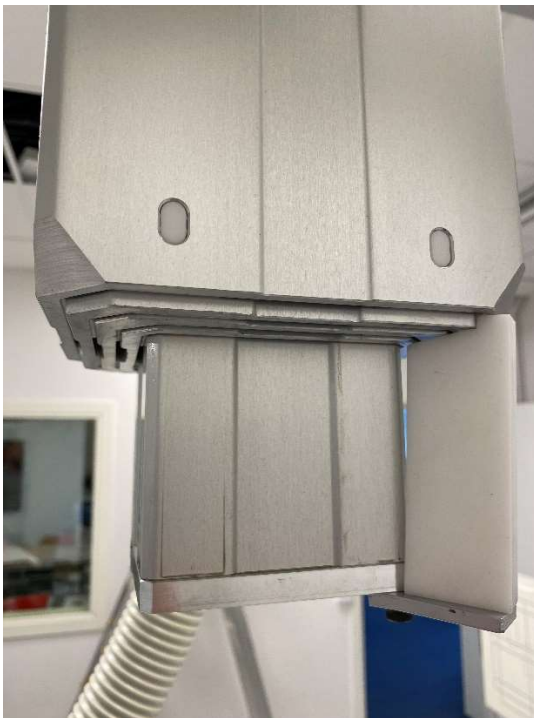
26. Move the column a small distance upwards from the buttons of the display unit (or move the table down), move just enough to access the column bottom plate.

27. Mount the two screws for the column support piece (p/n 55-020) as shown in the picture below. This will protect the column from damage during the coming steps.



28. Lift the outer column segments upwards and position the column support piece (p/n 55-020).
29. Move the column upwards from the buttons of the display unit until the outer column segment rests on the support piece like in the picture below.

NOTE! It may be necessary to apply some weight on the column to make it move without the weight of the tube head. Use the parts for the support piece and pull carefully downwards while moving up.



30. Make sure the tube head rests securely on the tabletop.

31. Disconnect the column motor cable.



*Column motor connections to 1.2RE01 (wire 1-3 and PE).*



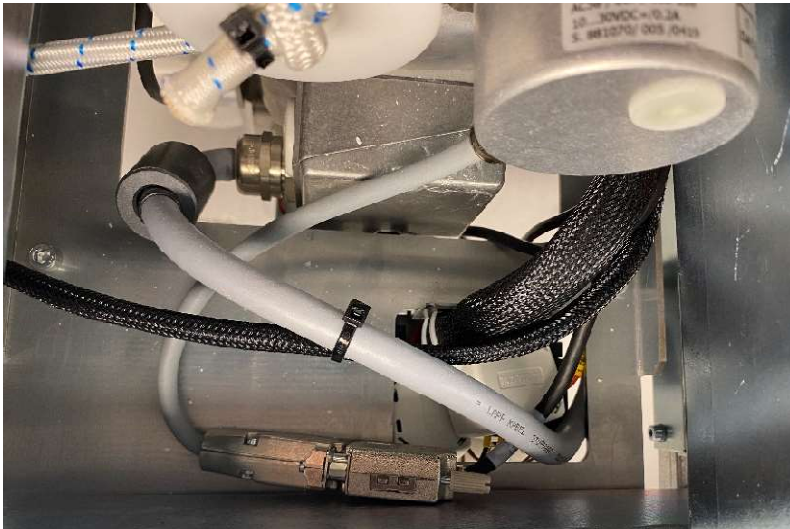
*Column motor connections to 1.2FC01 (wire 4-5).*

32. Disconnect the guard plate cable from the Guard-board PCB.

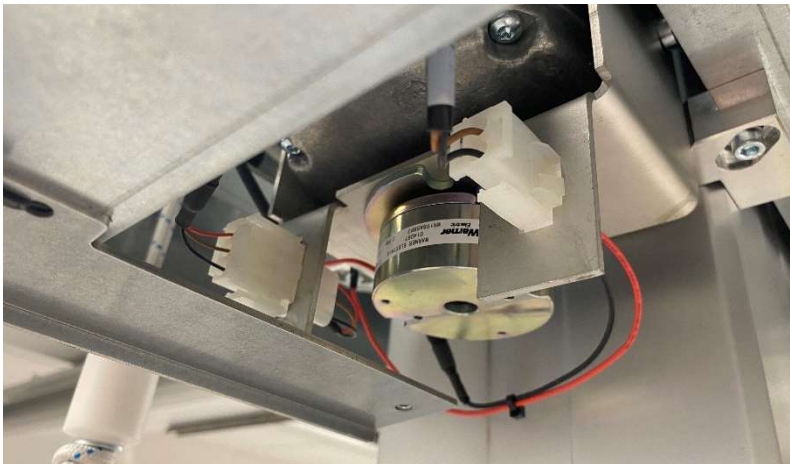


*Cable from the Guard plate*

33. Disconnect the column encoder cable (D-sub).



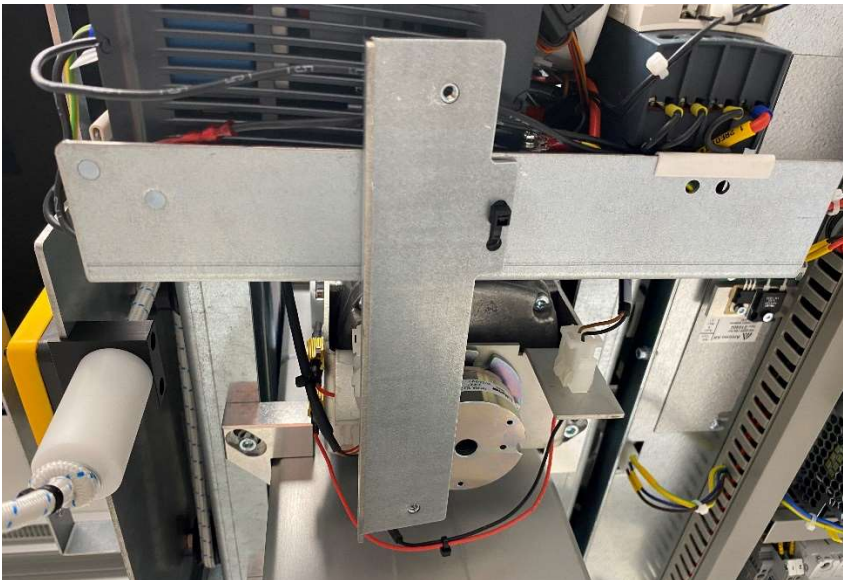
34. Disconnect column signal cables on 1.ZJ01 and 1.ZJ02.



35. Release the screws for the column support blocks and push them to their respective outer position.



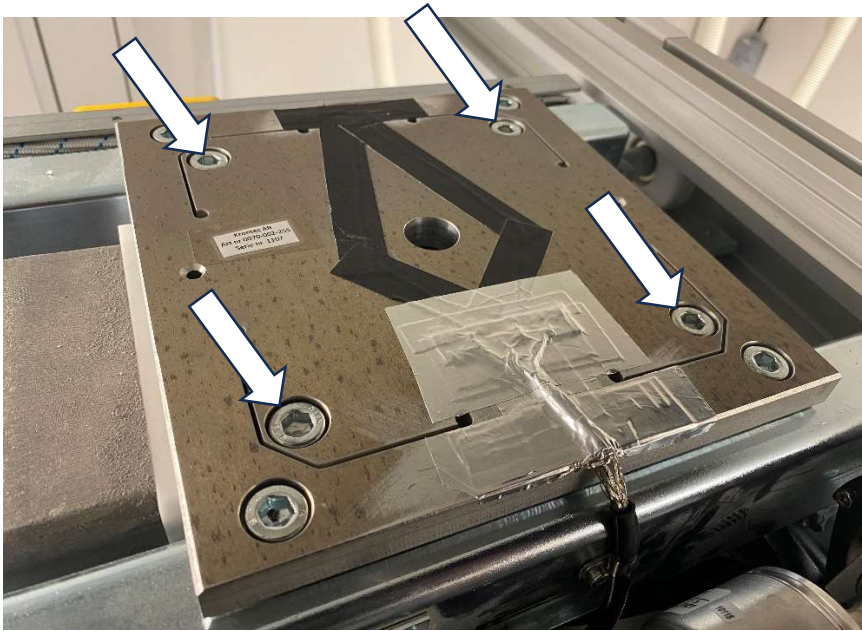
36. Cut the cable tie and remove the bracket for the cover to create clearance for the column to come down.



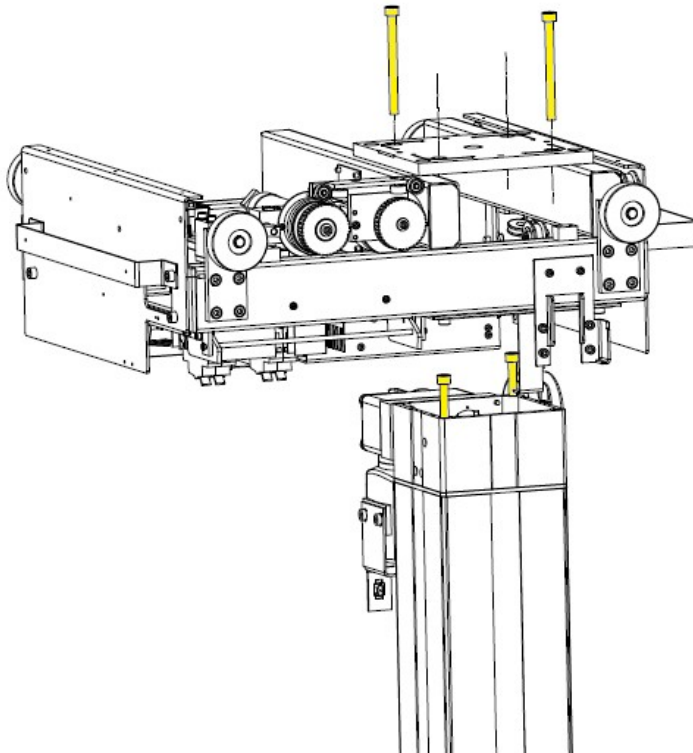
37. Place a lifting device under the column base to support it.

NOTE! When the four mounting bolts are removed in the next step the column can separate from the gearbox. See the following steps to prevent damage.

38. Remove the mounting bolts at the top plate. Only the inner bolts. Bring down the column carefully using the lifting device and stop as soon as it is possible to perform the next step.



39. When the column has been lowered enough to create clearance, use two of the removed screws to temporarily secure the gearbox on the column. See picture below.  
NOTE! Failure to perform this step can damage the column.



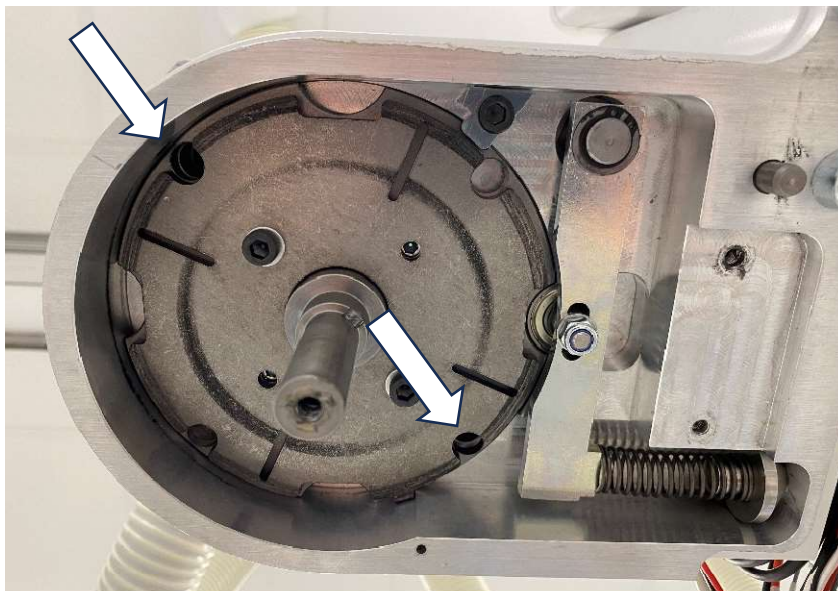
40. Lower the column carefully and remove it from the OTC. Be careful when passing through the hole of the mounting plate. If it is too tight the encoder may need to be removed.



47. Move the column downwards to approximately the same height as the tube head resting on the tabletop.
48. Remove the parts for the column support piece.

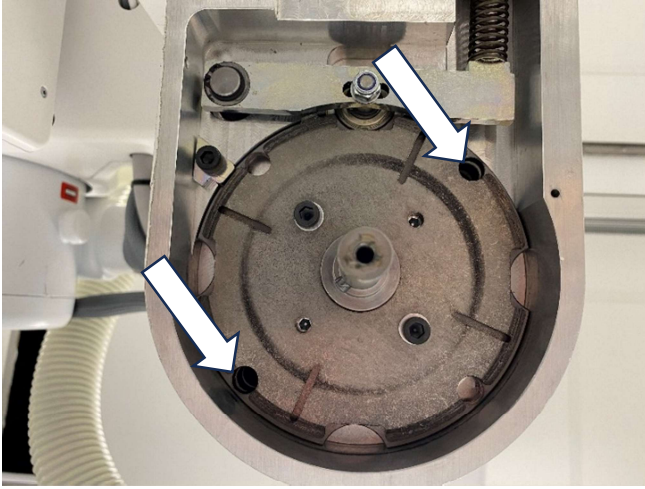


49. Adjust table height if necessary and move the tabletop to align the tube head with the column mounting holes.
50. Apply Loctite 243 to two of the new column screws (p/n 54-030, M6x35) from the spare part (front left and back right). Mount the screws and tighten with a torque of 10 Nm.

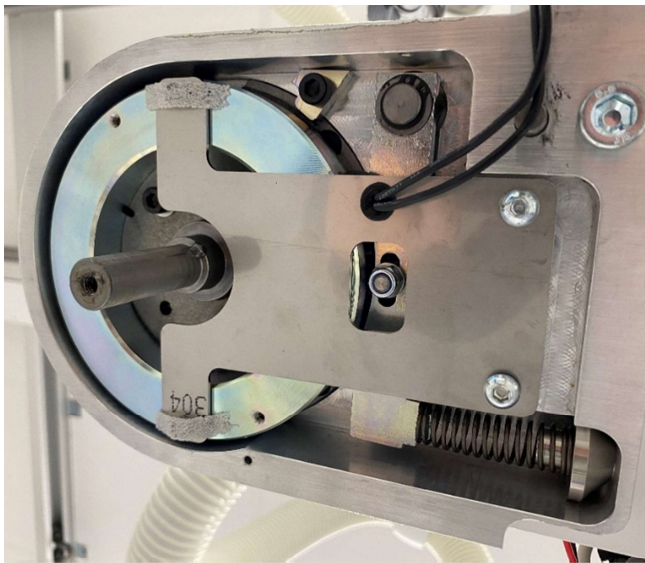


51. Turn Beta 90° to access the second set of column screws.

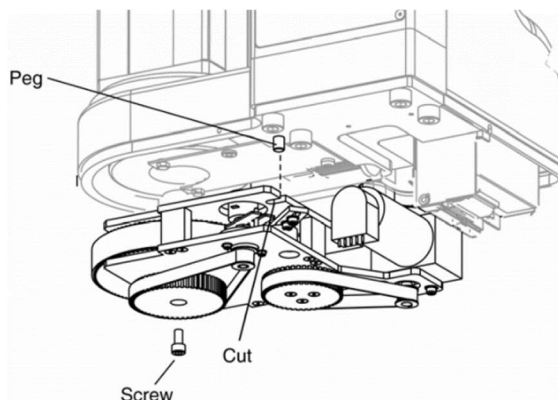
52. Apply Loctite 243 to the two column screws (front right and back left, M6x35). Mount the screws and tighten with a torque of 10 Nm.



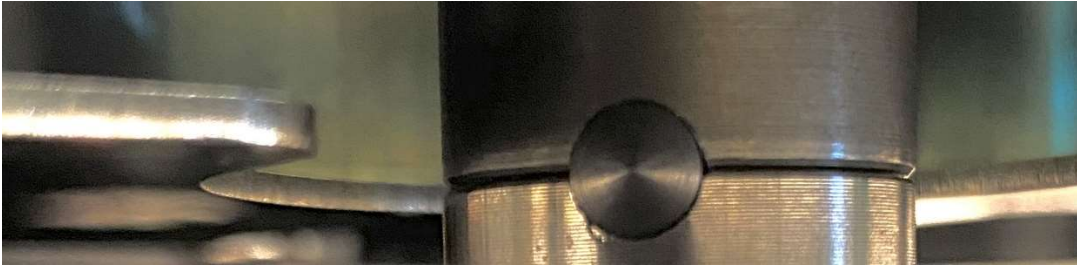
53. Apply Loctite 243 to the screws and re-assemble the Beta brake magnet. Make sure that the appropriate amount of distance washers is used.



54. Re-assemble the beta motor unit on the center shaft. Slide it upwards and make sure the peg fits the cut out (see picture below).

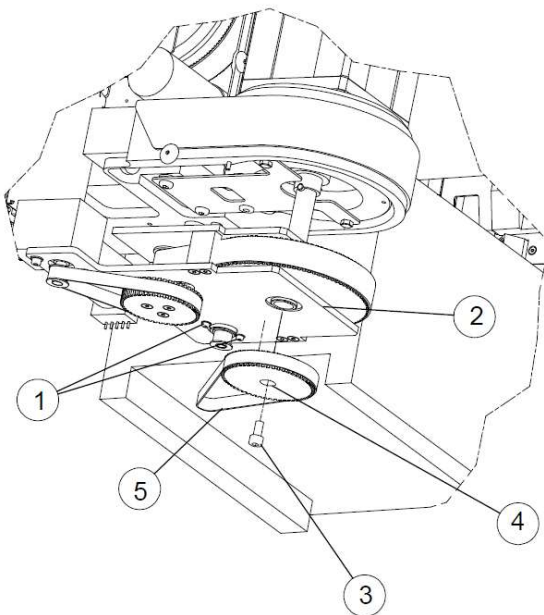


55. Also make sure that the beta rotation fits correctly on the cylindrical pin of the shaft. Turn the big wheel of the beta motor unit manually if necessary.

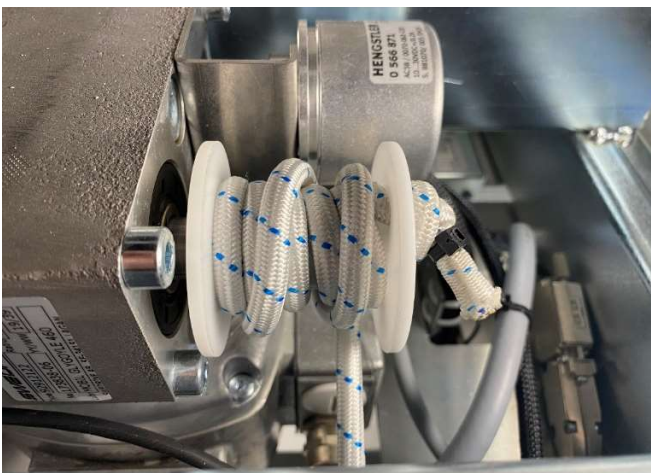


56. Apply Loctite 243 on the screw (3). Mount the pulley (4), belt (5) and screw. Tighten the screw (3) with a torque of 10Nm.

NOTE! Releasing screws (1) may be necessary to mount the belt (5).



57. Restore original elastic cord tension in case it has been changed in earlier steps of the replacement.



58. With everything back in place and all cables connected. Restart the system from the generator mini console.



59. Follow the procedure in the Installation & Service manual to Calibrate the Z axis.

*Ref: Calibration of Z-axis*

60. Follow the procedure in the Installation & Service manual to Calibrate the Beta axis.

*Ref: Calibration of Beta-axis.*

**NOTE!** Pay attention to the information in the manual about the potentiometer value. It should be around 2375 in the beta 0° position (3050 at the positive end stop position).

61. Check the Z Guard function and if necessary, follow the procedure in the Installation & Service manual to Calibrate the Guard.

*Ref: Calibration of Guard function (Z-axis).*

62. Run autopositions for all workspaces and confirm that the system works as intended.

63. Re-assemble all covers.

**END OF DOCUMENT**