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Introduction

1.1. This document describes the procedure for cleaning the NORM Torque Sensor Stator Board.

2. Procedure

2.1. Set the dynamometer tilt to 0 degrees.

2.2. Position the input adapter at 6:00.

2.3. Set the ROM stops against the input adapter to hold it in-place.

2.4. Remove the set-screw from the side of the input adapter.

2.5. Loosen the large screw at the top of the input adapter. ***Note:*** *As you loosen the screw, the screw head will contact the pin. As you continue to loosen the screw the head will push-up against the pin and then act like a spreader to open-up the input adapter at the split and help remove the adapter from the shaft. After contacting the pin you should only need to turn the screw slightly to spread the input adapter enough to enable removal.*

Figure 1 Input Adapter Main Bolt

2.6. Make sure the input adapter is oriented so the slot in the adapter is aligned with the red line on the ROM ring label. This aligns the safety hook at the bottom of the adapter with a cut-out in the ROM ring so the input adapter can be removed.

2.7. Install the knee-hip adapter on the system. You can either pull on the knee-hip adapter or gently tap the top and bottom of the adapter with a rubber mallet to remove the input adapter from the shaft. If the adapter feels stuck on the shaft, loosen the large screw a bit more.

Figure 2 Removing the Input Adapter

2.8. After removing the input adapter, rotate the dynamometer tilt to 90 degrees (straight up).

2.9. Make sure the ROM stops are closed.

2.10. Remove the eight screws holding the ROM ring to the dynamometer housing and remove the ROM ring.

2.11. Remove the metal EMI Can (Figure 10 – Item 22) from the dynamometer.

2.12. Remove the Torque Board Shield (Figure 10 – Item 14).

2.13. Gently unplug the torque board connector by grasping the white connector body.

2.14. Loosen the two set-screws at the side of the torque board mounting piece.

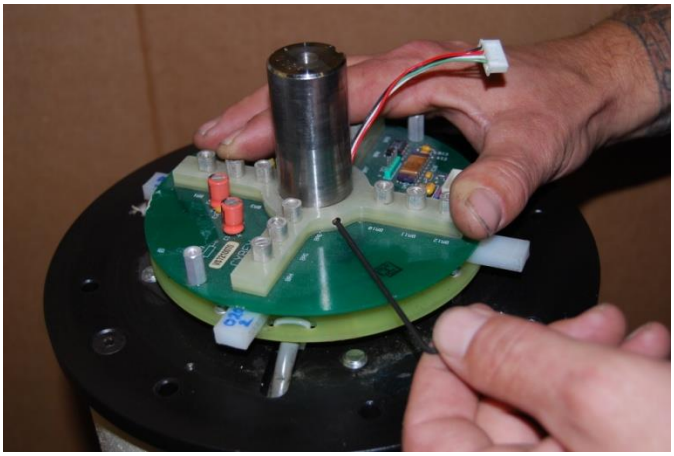

Figure 3 Torque Board Set Screws

2.15. Gently remove the torque board from the shaft. Be sure the torque sensor cable is lying in the channel as you lift the board off and that the cable is not pinched between the board and the shaft.

2.16. At the bottom of the torque board are the brushes. ***Note:*** *The brushes are very delicate and will break if they are hit from the side.*

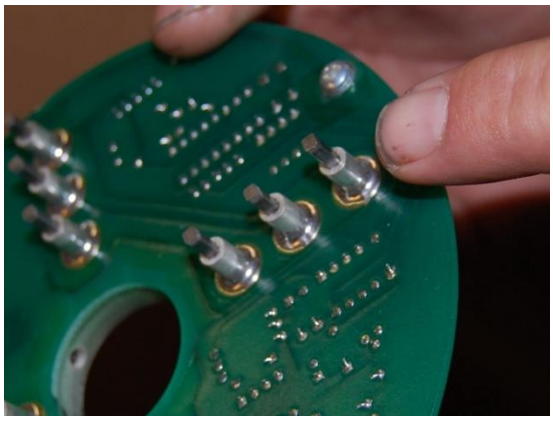

Figure 4 Torque Board Brushes

2.17. The brushes are spring-loaded. Gently push down on each brush ¼ inch to confirm it retracts into its' holder and returns. Any brushes which bind-up or do not spring back should be replaced.

2.18. Using a clean, soft cloth and rubbing alcohol, wipe around the stator board following the circular tracks to remove any graphite brush dust from the board. ***Note:*** *Wipe in the direction of the tracks. Do not wipe diagonally across the tracks.*

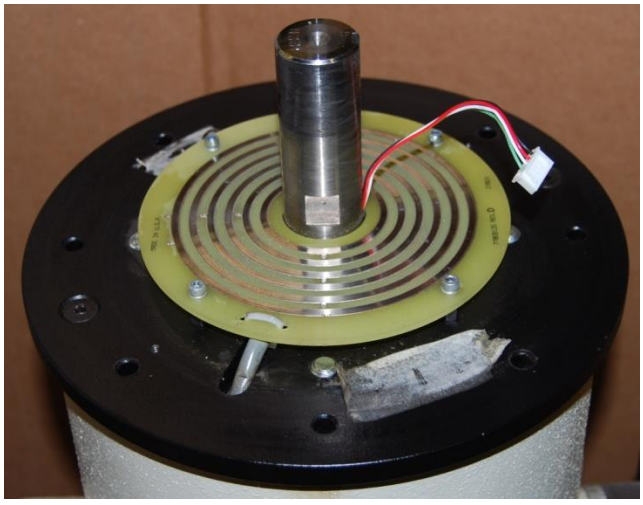

Figure 5 Stator Board

2.19. Inspect the wiring underneath the stator board to assure it is not in contact with the motor bearing (Figure 6). If it is in-contact, it can cause the insulation on the stator board cable to wear away. Gently re-route the wire away from the bearing.

Figure 6 Stator Wire Contacting Motor Bearing

2.20. Re-install the torque board. ***Note:*** *Make sure the torque sensor cable is laying in the shaft track and is not pinched by the board as the board is re-installed. Also, notice the flats on the torque shaft. The torque board set screws must face the center of the flats.*

2.21. The torque board should be installed approximately 0.370" above the stator board. As you tighten the set-screws, jiggle the board slightly to assure the set-screws are facing the center of the shaft flats. ***Note:*** *CSMi uses custom spacing tools to install the torque board (white plastic spacer shown below). Contact CSMi Service if you would like a set of spacers.*

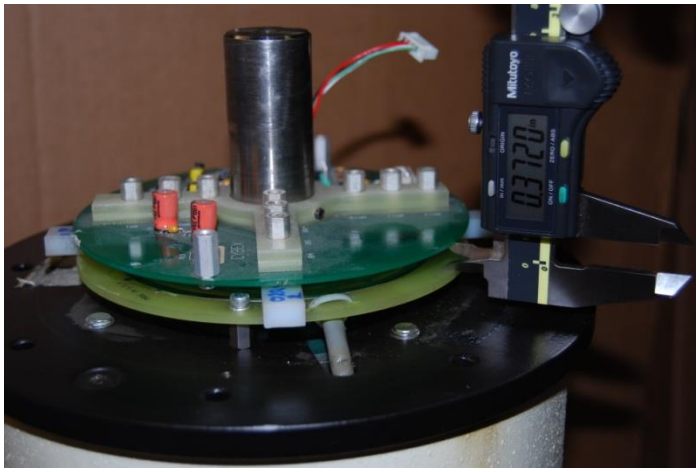

Figure 7 Torque Board Spacing

2.22. Plug the torque sensor connector back into the board. ***Note:*** *There are alignment tabs on the connector to assure the correct orientation.*

2.23. Re-install the Torque Board Shield (14).

2.24. Re-install the metal EMI Can (22).

2.25. Re-install the ROM ring. Apply blue Loctite to the ROM Ring Screws and tighten to 100 INCH-POUNDS (70 NEWTON-CENTIMETERS). (Figure 8, Items 33 and 41).

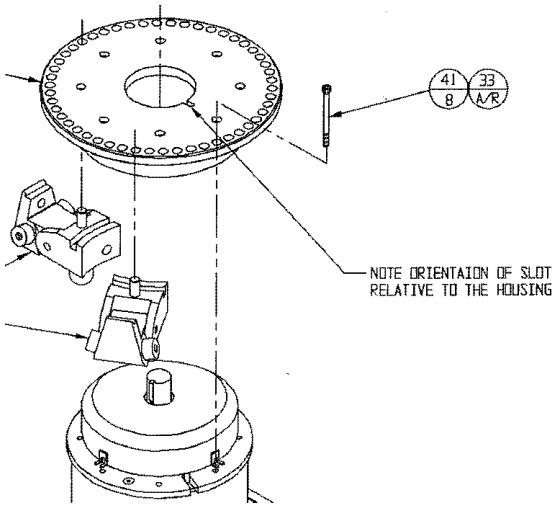

Figure 8 ROM Ring Installation Torque

2.26. Set the dynamometer tilt to 0 degrees.

2.27. Place the woodruff key fully in the input adapter notch and then re-install the adapter on the input shaft. If necessary, gently tap the adapter on using a rubber mallet. ***Note:*** *When placing the woodruff key in the input adapter place the side which was contacted by the set-screw in the same location to assure the key fits onto the shaft.*

2.28. Tighten the large input adapter bolt to 100 FOOT-POUNDS (135 NEWTON-METERS) (Figure 9).

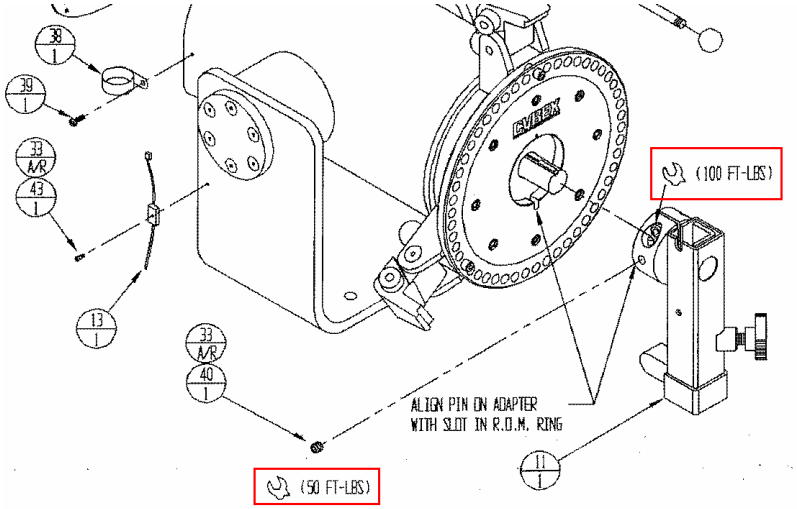

Figure 9 Input Adapter Installation Torque

2.29. Apply blue Loctite to the input adapter set-screw and tighten to 50 FOOT-POUNDS (67 NEWTON-METERS). (Figure 9, Items 33, 40).

2.30. The cleaning procedure is now complete.

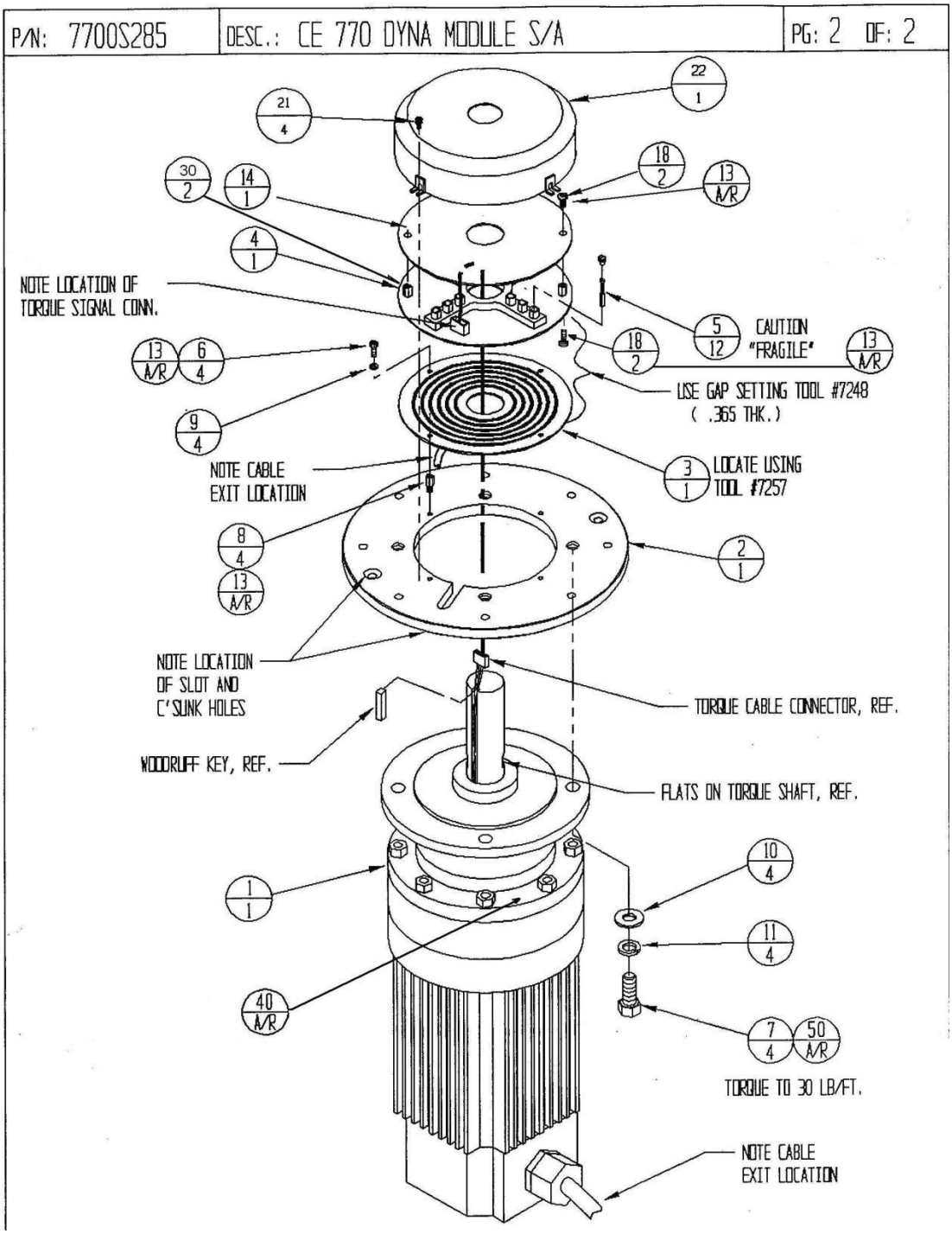

Figure 10 Dynamometer Exploded View