TEC Optical Sensor Upgrade Procedure (MPE)
FCO CA03738

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Creo Inc.
3700 Gilmore Way
Burnaby, BC
Canada V5G 4M1
(604) 451-2700

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Revision History

Revision	Date	Author	Comments
A	18 Mar 2004	Doug Jeffery	
B	30 Mar 2004	Doug Jeffery	Scope and kit sections revised
C	04 May 2004	Doug Jeffery	Update cable part numbers
D	10 Jan 2005	Doug Jeffery	Revise firmware reference to latest controlled release.
E	30 Mar 2005	Doug Jeffery	Revise part number version of kit and change rod end block part numbers (ECO CA06953)

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1. SCOPE

This procedure is for upgrading TEC sensors on TS4/8 (MPE) output devices (FCO CA03738). This FCO should only be applied if there have been repeated failures of the TEC backbone, clamp micro-switches and/or reed switches. Do not apply this FCO for an individual switch failure.

2. PARTS REQUIRED

For serial numbers TExxx (Trendsetter 400/800), PXxxx (Proofsetter), TNxxx (NEWS)

512-00083C KIT,UPGRADE,ECO CA03738,TS8,CCA which includes:

Creo Part Number	Qty	Item Description
719-00127A	1	DOC,PROC,UPGRADE,TEC OPT,TS8
500-01709A	1	ASSY, EM,TEC OPTICAL BAR,(MPE),TS
503-00050B	1	BRD,ASSY,TEC MAGNET SENSOR I/0
220-00590A	1	CAB,ASSY,TEC,MAG SENS BRD
220-00507A	1	CAB,ASSY,8PG,TEC LCK UNLCK MAG SENS,TSM
220-00508A	1	CAB ASSY,TEC_SENS,+24V PWR,TS4,TS8
220-00512A	1	CAB ASSY, TEC_PWR_ADPTR
220-00514B	1	CAB,ASSY,TEC SENS OUTPUTS,TS4,TS8,CCA
50-2730B	1	ASSY,TEC BACKBONE,TSM
58-0285A	2	FAB,ROD END BLOCK,TEC,TS
55-0757A	2	FTG,AIR CHOKE,0.6MM DIA ORIFICE,3 GROOVE
52-4102	3	NUT,M8,HEX,S-PLATED (additional nuts required for shoulder bolts)
18-3017	3	CAB,TIE,10CM,BLACK
18-3049	5	CAB,TIE,7.5",BLACK WEATHER RESISTANT

3. REMOVING THE OLD TRAILING EDGE BACKBONE

1. Turn off the main air valve and power.
2. Remove the air lines from the TEC lock/unlock cylinder.

Note: Be very careful not to lose the small metal speed control orifices in the end of the hoses. If the air is not turned off prior to taking these hoses off the fitting, the speed control plugs will pop out.

3. Cut the tie wraps that hold the hoses to the TEC backbone.
4. Disconnect the cable from the harness on the away side and cut any tie wraps that hold the cable in place.
5. Remove the shoulder bolts that attach to the rod end bearings on the pneumatic cylinder from both ends of the TEC backbone.
6. Keep the shoulder bolts and round spacers for later use.

7. Remove the TEC backbone.
8. Remove the two TEC reed switch magnets from the backbone and install them on the new backbone (50-2730B) that was shipped with the FCO kit.
9. When you have completed the FCO, please return the old TEC backbone to Creo for re-work.

4. INSTALLING THE NEW TRAILING EDGE BACKBONE (50-2730B)

1. Make sure that the main air valve and power are off.
2. Place the new TEC backbone into the side plate TEC slots.
3. On the away side, use the shoulder bolt and spacer that you removed earlier to attach the backbone to the rod end bearing on the air cylinder.
4. On the home side, insert the two new brass rectangular spacers into the rectangular slots on the **inside** of the backbone and place the rod end bearing between the brass spacers.
5. Insert the shoulder bolt through the brass spacers and the rod end bearing. See Figure 1.

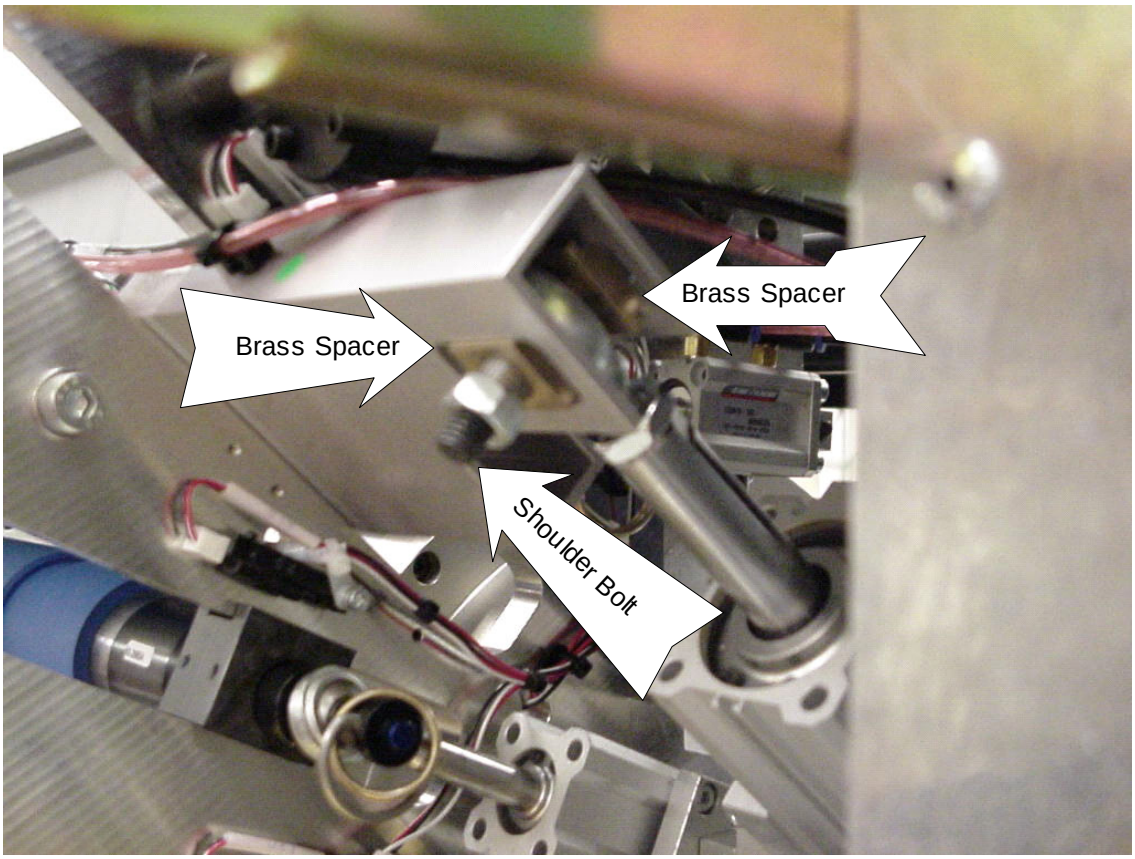


Figure 1: Home side TEC backbone cylinder rod end

6. Install and tighten the nuts on each of the shoulder bolts. Also install the two extra M8 nuts (52-4102) on each shoulder bolt . (Additional nut not shown in Figure 1)

7. Insert the lock and unlock hoses back into the lock/unlock cylinder fittings.

   Note: Ensure that the speed control orifices (55-0757A) are inserted into the ends of each hose. If the air is turned on with these hoses disconnected, the orifices will blow out and will be difficult to find due to their small size.

5. INSTALLING THE TEC SENSOR BAR

1. Mount the sensor bar as shown in Figure 2 and Figure 3. Use the M8 bolts, nuts and washers to attach the bar to both the home and away side of the engine side plates.

   Make sure the nuts are snug but not tight. The bar should move with light resistance using finger pressure.

2. Install the M6 setscrews into both the home and away part of the sensor bar as shown in Figure 2 and Figure 3.

   You will install the M6 nuts used for locking the setscrews once the optimum position has been determined according to section *6- Adjustment and Testing*.

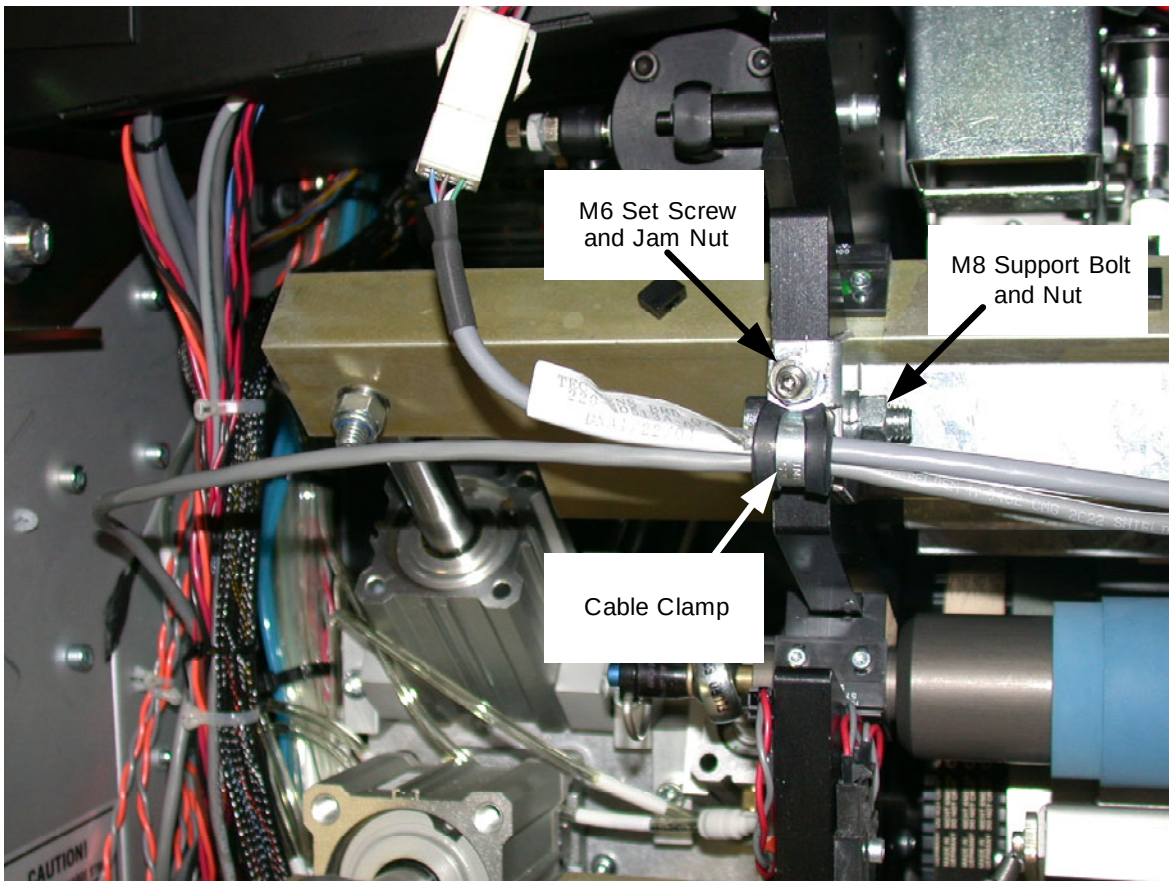


Figure 2: Away side TEC sensor mounting bar and screw

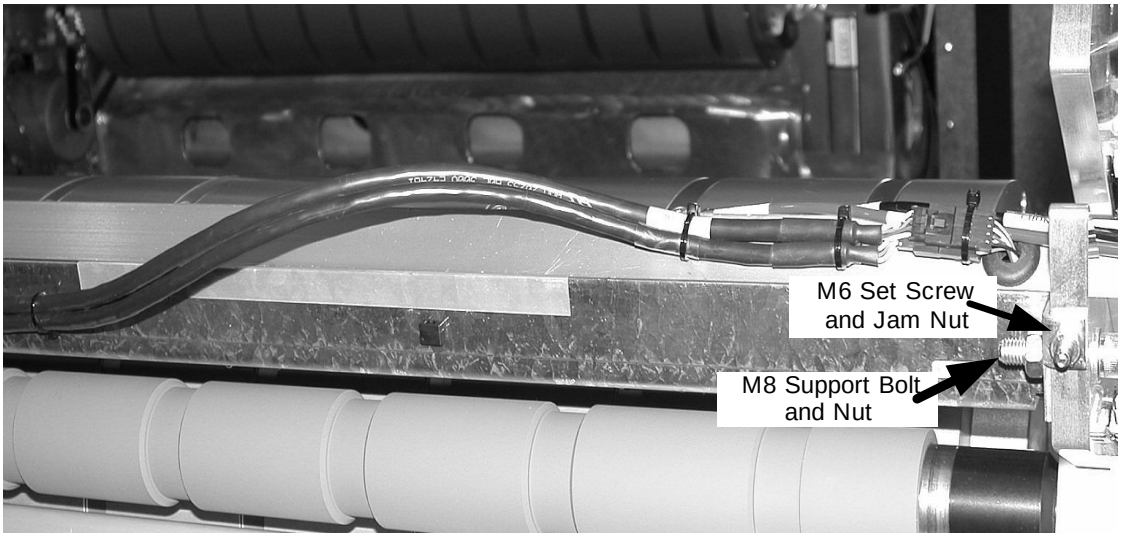


Figure 3: Home side TEC sensor mounting bar and screw

3. Route the power cable (220-00508A) to the power box.

   For Base Trendsetters:

   Plug in the (220-00508A) power cable directly into the connector on the 24 Volt power supply (PS2).

   For TS AL, Spectrum, TS NEWS:

   It may be easier to remove the PS2 power supply to install the adapter cable (220-00512A).

   - Install the adapter cable (220-00512A) on to the outputs of the 24 Volt power supply. (PS2).
   - Plug the adapter cable (220-00512A) into the power cable (220-00508A).

4. Use the eight M3 screws and washers provided to attach the TEC Optical Sensor I/O board (503-00050B) to the standoffs on the sensor bar.

Note: Be sure to wear a static wrist strap when handling all electronic circuit boards.

5. Attach cable 220-00590A to J1 on the I/O board. See Figure 4.

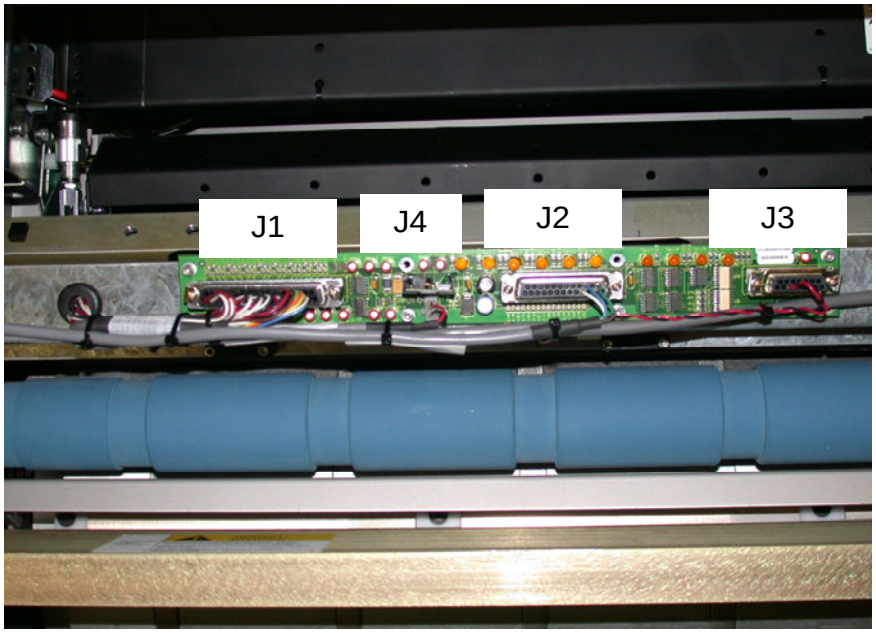


Figure 4: TEC sensor board connections, sensor bar, and cable support

6. Attach cable 220-00514B to J2 and J3 on the I/O board.
7. Attach cable 220-00508A to J4 on the I/O board.
8. Tie wrap the cables together, ensuring that all conductors entering connectors are not stressed. See Figure 4.
9. Connect the TEC optical lock and unlock sensors to the high flex cable (A). Use the labeling on the cable to identify lock and unlock. See Figure 4 and Figure 5.

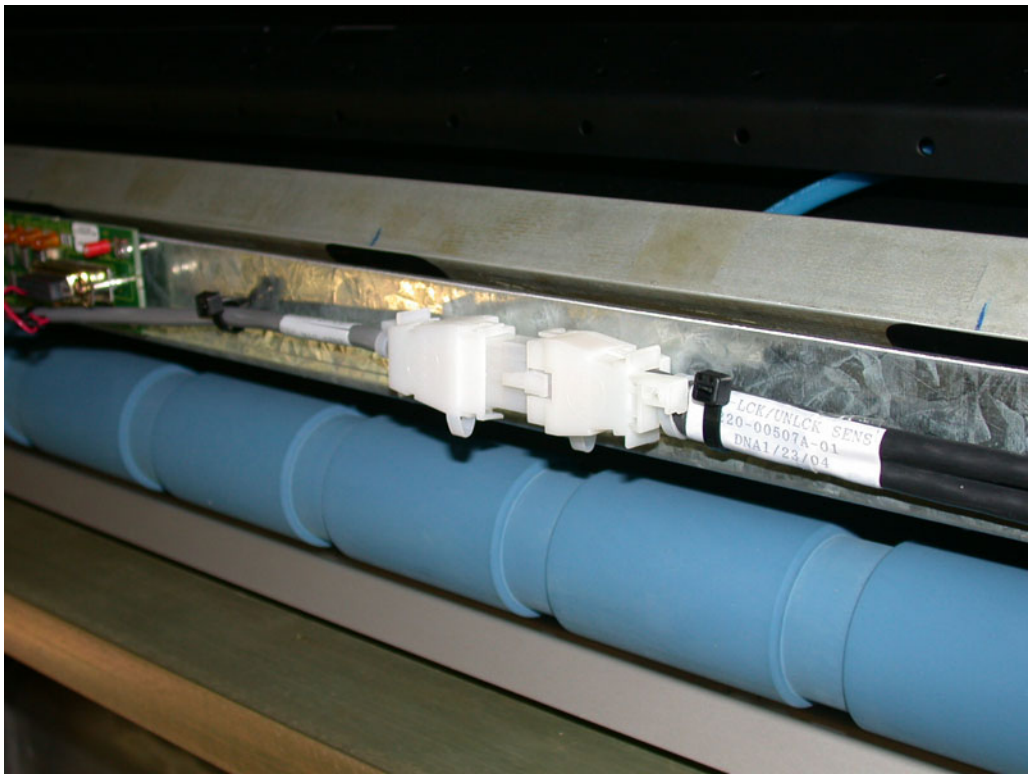


Figure 5: Cable connections for 220-00590A to 220-00507A

10. Loop the cables from the sensor bar to the TEC backbone, and fasten them as shown in Figure 6. Ensure that the loop is large enough so that the cables do not rub against the sensor bar as the backbone moves up and down.

Note: The last cable mount is not used to hold down these cables, but serves to attach cables inside the sensor bar.

11. Ensure that the speed control orifices (55-0757A) are in place before connecting the red and black hoses to the hose fittings on the lock/unlock cylinder at the home end. The kit contains 2 orifices in case they are needed.

12. Tie wrap the hoses and the sensor connectors to the top of the TEC backbone and ensure that they do not interfere with the up and down travel of the backbone. See Figure 6.

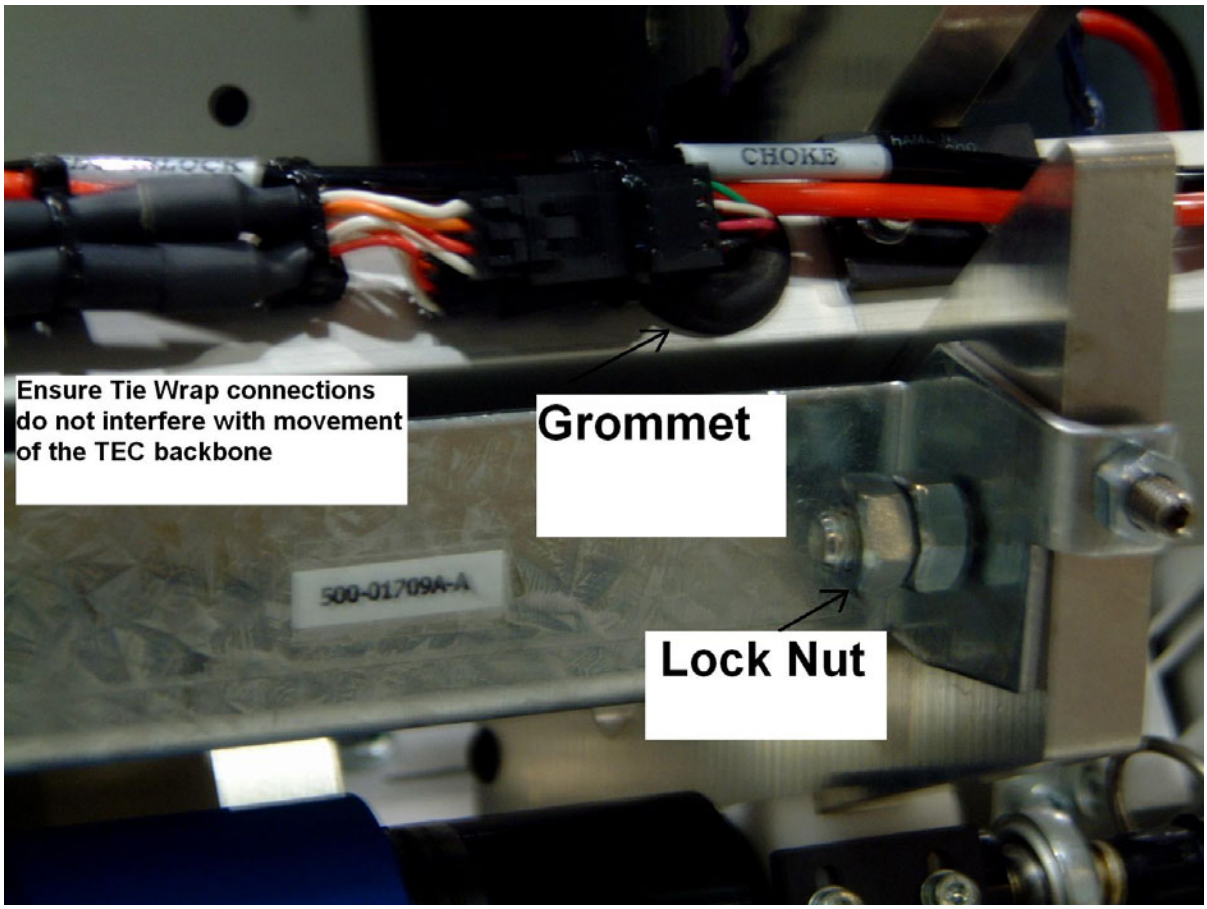


Figure 6: Home side TEC lock/unlock cable loop

13. Turn the power and main air valve back on.

6. ADJUSTMENT AND TESTING

There are 6 LEDs on the sensor board labeled Sens1 to Sens6. Each LED corresponds to a TEC clamp on the backbone from left to right When the TEC clamps are attached to the TEC backbone, and the TEC backbone is in the extend (up) position, Sens1 to Sens6 LEDs on the board should all be on.

1. Adjust the setscrew on the away side by turning it in a clockwise direction until you see all 6 LEDs on the board go on.

   Note: As you turn the setscrews, the sensor bar will move in an arc. While adjusting the setscrew ensure that the end of the M6 setscrew always remains touching the side plate.

2. Turn the away side setscrew another 1/2 turn and stop.

3. Tighten the lock nut on the away side, ensuring that the bar does not move and the setscrew is continuously touching the side plate.

4. Turn the home side setscrew until the setscrew touches the side plate.
5. Turn the home side setscrew another 1/4 turn and stop.
6. Tighten the lock nut on the home side, ensuring that the bar does not move and the setscrew is continuously touching the side plate.
7. Tighten the M8 nuts on both the home and away side plates, ensuring that the bar does not move and the setscrew is continuously touching the side plate.

   The LEDs should now go on and off simultaneously as the backbone extends and retracts.
8. Test the device by removing one clamp from the drum and making sure that it detects the missing clamp.
9. Confirm the function of the lock and unlock sensors using the `getclamp`, `putclamp` and `tec` commands as follows:
   - Turn the drum to the park position (`set al ppos`) and hold it there.
   - Move the TEC backbone into the drum (`tec on`)
   - Unlock the TECs (`tec unlock`)

   Query the TEC lock sensor (`tec`). The locked sensor should read false and the unlock sensor should read true.

   The locked sensor should read false and the unlock sensor should read true.
   - Lock the TECs (`tec lock`).

   Query the TEC lock sensor (`tec`). The locked sensor should read true and the unlock sensor should read false.
10. Test the device for loading and unloading plates.
11. Mark the 100 label as follows:
    - For TS8 (MPE) s/n TExxx, mark #22
    - For Trendsetter NEWS (MPE), s/n TNxxx, mark #13

Note: Firmware in the latest controlled release is required for this assembly to operate reliably.