

1.7x TEH to TFX Head Upgrade

ThermoFlex

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Revision History

Revision	Date	Author	Comments
A	Sept/99	William Yuen, Mike Milroy, Ian Skinner, Mike Bogelund	Initial Release
B	Oct/99	Malcolm Lidster	Alignment block procedure changes.
C	Dec/99	Chris Dudra	Miscellaneous changes

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CONTENTS

Revision History i

1 Scope 1

2 Safety 1

3 Related Documents 1

4 Overview 2

5 Tools and Materials Required 2

6 NVS Backup 2

7 Procedure 3
- 7.1 Mechanical Preparations for the TFX head: 3
  - 7.1.1 Pre-existing head stage motor check 3
  - 7.1.2 Mechanical Disassembly 3
  - 7.1.3 Replacement of Head Stage Motor Assembly 3
  - 7.1.4 Removal of the Head Stage Assembly 5
- 7.2 Electrical Preparations for the TFX head: 5
  - 7.2.1 Overview 5
  - 7.2.2 Pre-existing cable check 6
  - 7.2.3 Removal of old parts/cables 6
  - 7.2.4 Installation of new parts/cables 8
  - 7.2.5 Voltage Tests 10
- 7.3 Installation of the TFX Adapter and Related Components 11
- 7.4 Carriage Motor and Gear Ratio Change 13
- 7.5 Firmware upgrade 14
- 7.6 System Checks 14

8 Appendix A: Removing the 1.7x TEH..... 16

1 SCOPE

This document describes the conversion from 1.7x TEH to TFX head on the ThermoFlex product. It covers the mechanical, electrical and firmware changes that must be made. It is intended for fully trained and qualified Creo service personnel. The means we do not get into basic details such as how to get into diagnostics mode or that you need to use thread locking compound on all fasteners.

This document describes the upgrade procedure to install the beta configuration of the TFX head. The final production configuration may be significantly altered (i.e. the 5VDC 800W head power supply will likely be moved from beside the head to the power box). Should this become the case, this document will be revised, and this paragraph deleted.

This document applies to ThermoFlex machines that were factory configured for the 1.7x (40W) head. Some differences may be noticed in early Beta machines. Please contact ThermoFlex Product Development for specific issues on early Beta machines.

2 SAFETY

Please exercise the following precautions when working on the ThermoFlex:

- Pay attention to warning labels.
- Do not operate the write laser with the door open
- Do not stare directly at either the write or focus laser beams
- Do not place shiny objects in the path of either laser beam, which may reflect it into the eyes.
- Avoid skin contact with the write laser.

DANGER! Never operate a Thermal Platesetter with the write laser beam on and a door open even if it is technically feasible to bypass the door interlocks.

3 RELATED DOCUMENTS

The following related documents, with the exception of the Firmware Release Notes, are available on the ThermoFlex FCO page of the Creo Customer Support Technical Library. This page is available from the Technical Library CD-ROM from the Creo Service Desk, or online at

http://intranet.creo.com/support/html/ThermoFlex/ecos.htm

Note: It is highly recommended that you have read and fully understand each of these documents before attempting to perform the 1.7x TEH to TFX head upgrade.

- Thermal Firmware Release notes, available on the Internet as described in the Firmware Upgrade Section below (Section 7.4).
- 72-3356A-x-PR TFX Desiccant Box Installation Procedure
- 72-3362A-x-PR TFX Installation Document

- 72-3363A-x-PR TFX Debris Removal Nozzle Installation Document
- 05-0140-x-AD TFX Interface Assembly drawing

Related Drawings and Diagrams:

- 10-4313A-x-AD Cable, Assy, Flextrack, FX1
- 02-4271A-x-WD ThermoFlex Mainframe Wiring Diagram (TFX head)
- 10-4302B-x-AD CAB, ASSY, TFX UPGRADE, PDB(J16), FX1
- 10-4128A-x-AD CAB, ASSY, ACIN(K3)-EHPS, FX1

4 OVERVIEW

The 1.7x to TFX upgrade is broken down into four major steps.

1. Mechanical Preparations for the TFX head
2. Electrical Preparations for the TFX head
3. Installation of the TFX Adapter and Related Components
4. Firmware upgrade

Note: It is strongly recommended that the procedure be performed in the sequence as described in this document. Performing steps out of sequence may result in extra effort and wasted time.

5 TOOLS AND MATERIALS REQUIRED

In addition to the upgrade kit, you will need the following:

- Metric Allen key set
- T-handle 5mm Allen Key (non-ball end)
- AMP pin extraction tool
- NSK No.1 (medium duty) Ballscrew lithium grease
- Loctite 242
- Loctite 409

Note: NSK ballscrew grease is classified as a dangerous good, and cannot be included in the upgrade kit because of trans-border shipping regulations. It is assumed that a Creo FSE will be carrying a small bottle of Loctite 242 Threadlocker in their tool kit. If not, it can generally be purchased locally at auto parts stores.

6 NVS BACKUP

From the diagnostics prompt, perform a “NVS DUMP DIFF” and copy it to a text file on the hard drive. This is a backup of all the non-default values saved in the machine at the time of

the upgrade. It is also prudent to do an "NVS DUMP" and a full firmware backup by entering "FSAVEALL". The information may be useful should data be lost during the upgrade procedures.

7 PROCEDURE

Note: Item numbers in this document refer to the Bill of Material of the upgrade kit (05-0140 Kit, Upgrade, ECO D301, 1.7x-TFX Head, FX1).

7.1 Mechanical Preparations for the TFX head:

Prior to beginning the upgrade procedure, ensure all sub-systems are working properly.

7.1.1 Pre-existing head stage motor check

Note: Due to the relocation of the head stage driver board, the wiring of the older version of the head stage stepper motor assembly may be too short (<300mm length). If the cable is too short, the original motor assembly 11-0577A-A must be replaced by 11-0577B-A, as part of the following procedure. Otherwise, if the length of the cable attached to the motor assembly is >300mm, the motor assembly does not need to be replaced. The replacement motor assembly shipped with the upgrade kit can then be returned to Creo Annacis.

7.1.2 Mechanical Disassembly

1. Initialize the machine with the `ALE INIT` command. Move the carriage to the middle of the machine using the `CARRIAGE MOVETO 40000` command.
2. Unload any media that is still on the drum. Remove the debris removal nozzle from the front of the 1.7x TEH.
3. Type `STAGE INSTALL` to move the head stage to its away position.
4. Power down the machine. Disconnect and remove the 1.7x TEH (refer to Appendix A**,** if required). Leave the H/A board cables and head stage driver board cables connected at this time.
5. Remove the clamps and bracket that retain the debris removal hose and coolant hose. Save the clamps and fasteners, as they are reused later in the upgrade procedure.
6. If you have determined in step 7.1.1 that the head stage motor assembly needs to be replaced continue with the Replacement of Head Stage Motor Assembly (Section 7.1.3). If you do not need to change the motor assembly, proceed to Section 7.1.4.

7.1.3 Replacement of Head Stage Motor Assembly

1. Re-apply power to the machine and use the command `MASK RANGE CREO` to cancel the maximum range values.
2. `SET AL HSAP 10000` to set the head stage away position maximum step value. This allows the motor leadscrew to be driven out of the motor.

3. `STAGE MOVETO 8200` will drive the leadscrew out of the motor and against the recovery spring. When the leadscrew leaves the motor nut, a clicking sound can be heard. Enter `STAGE STOP` when the motor starts clicking.

WARNING: Avoid manually moving the head stage upper plate while the leadscrew nut is in contact with the recovery spring. Doing so could cause permanent damage to components of the assembly.

4. Turn off the power to the machine. Disconnect the stepper motor from the driver board and remove the head stage driver board assembly.

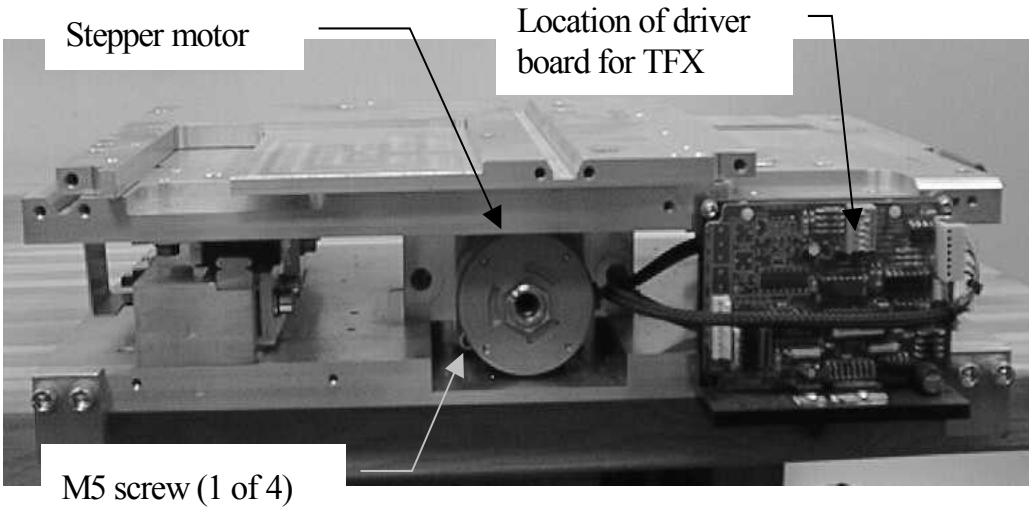


Figure 1: Head stage Motor and driver board assembly

5. Remove the four M5 screws securing the motor to the head stage and lift the motor out (see Figure 1). Save the fasteners, as they are reused to install the new stage stepper motor assembly.

6. Lubricate the rotor nut of the new head stage stepper motor assembly (#1000) with NSK Grease No.1 (Medium Duty). Fit the motor to the mounting face, being careful to feed the leadscrew into the rotor nut. Reinstall and tighten the four M5x14 screws, using Loctite 242 on the screw threads.

7. Restart the machine and issue a `STAGE INIT` command to move the head stage to the 'Home' position. In doing so, the leadscrew will be drawn back into the rotor nut. The clicking sound should disappear and the head stage top plate should move towards the home position (away from the drum). Verify that the stage has reached the home tab (illuminated LED above the H/A board optical sensor) and the step motor counter status was reset to "1". You may issue the `STAGE` command to check the status.

8. Type `STAGE INSTALL` to move the stage to the 'Away' position where it stops, reads the step counter and resets the value of the `AL HSAP` nvs value. Save the new value by typing `NVS SAVE AL HSAP`.

7.1.4 Removal of the Head Stage Assembly

1. If the power was reapplied to the machine in Section 7.1.3, power down the machine now. Disconnect the H/A board cables and stage stepper driver board cables.
2. Remove the four M6 screws securing the head stage to the carriage. These fasteners are accessible through clearance holes in the upper plate. Use a non-ball end 5mm T-handle Allen key to access the screw in the corner closest to the drum on the encoder side. The other three fasteners can be accessed using a standard 90deg 5mm Allen key. Save the fasteners, as they are used to reinstall the head stage later.

   Note: Do not disturb the stage home/away tabs. If you move the tab locations, you will need to reposition them following the ***Adjusting ThermoFlex Head Stage Tab Settings*** procedure as found in the ThermoFlex Technical Library.
3. Remove the head stage assembly from the machine and place it on a work surface. Remove the 1.7x TEH fastening brackets, spacers, and guide rods from the head stage top plate. Clean all grease and dirt from the head stage top plate.
4. Remove and discard the lower hose bracket from the carriage.

Note: To avoid disturbing the tabs in the following step, **remove and replace the screws one at a time**. (See Step 2 of this section if the tabs are disturbed.)

5. Replace the four M4x12 screws mounting the Head Stage H/A tabs with four M4x10 screws (#0070). This is necessary to provide clearance for the adapter plate mounting fasteners. Use Loctite 242 on the new screws.

7.2 Electrical Preparations for the TFX head:

7.2.1 Overview

The 1.7x to TFX head cable upgrade procedure is fairly simple. The general steps are as follows:

1. Inspect cables currently installed in the flextrack. See **Section 7.2.2 Pre-Existing cable inspection.**
2. Remove the write laser power supply and cable from within the powerbox.
3. Remove a few power box and flextrack cables and relay
4. Install a new TFX head power supply relay.
5. Install several new cables inside the powerbox.
6. Replace the flex track housing with a larger one.
7. Install new and replacement cables and pneumatic tube in the flex track.
8. Test the power supply and cable output voltages

7.2.2 Pre-existing cable check

There are three cables located within the flex track that should be inspected prior to beginning, as they may need to be upgraded. Some ThermoFlex recorders being upgraded to TFX heads may have shipped with the latest version and revision of cable installed, in which case the factory-installed cable may be left in place. Make note of which cables need replacing (if any), and proceed to the next step. Replacement cables are included in the upgrade kit.

Old Cable Part Number	New Cable Part Number (Item #)	Reason for Replacement	Factory Installed Cable
10-3519A-C	10-3519A-D (#1010)	Original cable too short	
10-3828A-B	10-3828A-C (#1020)	Original cable too short	
10-3840B-A	10-3840C-A (#1030)	Adds desiccant box fan power cable	

7.2.3 Removal of old parts/cables

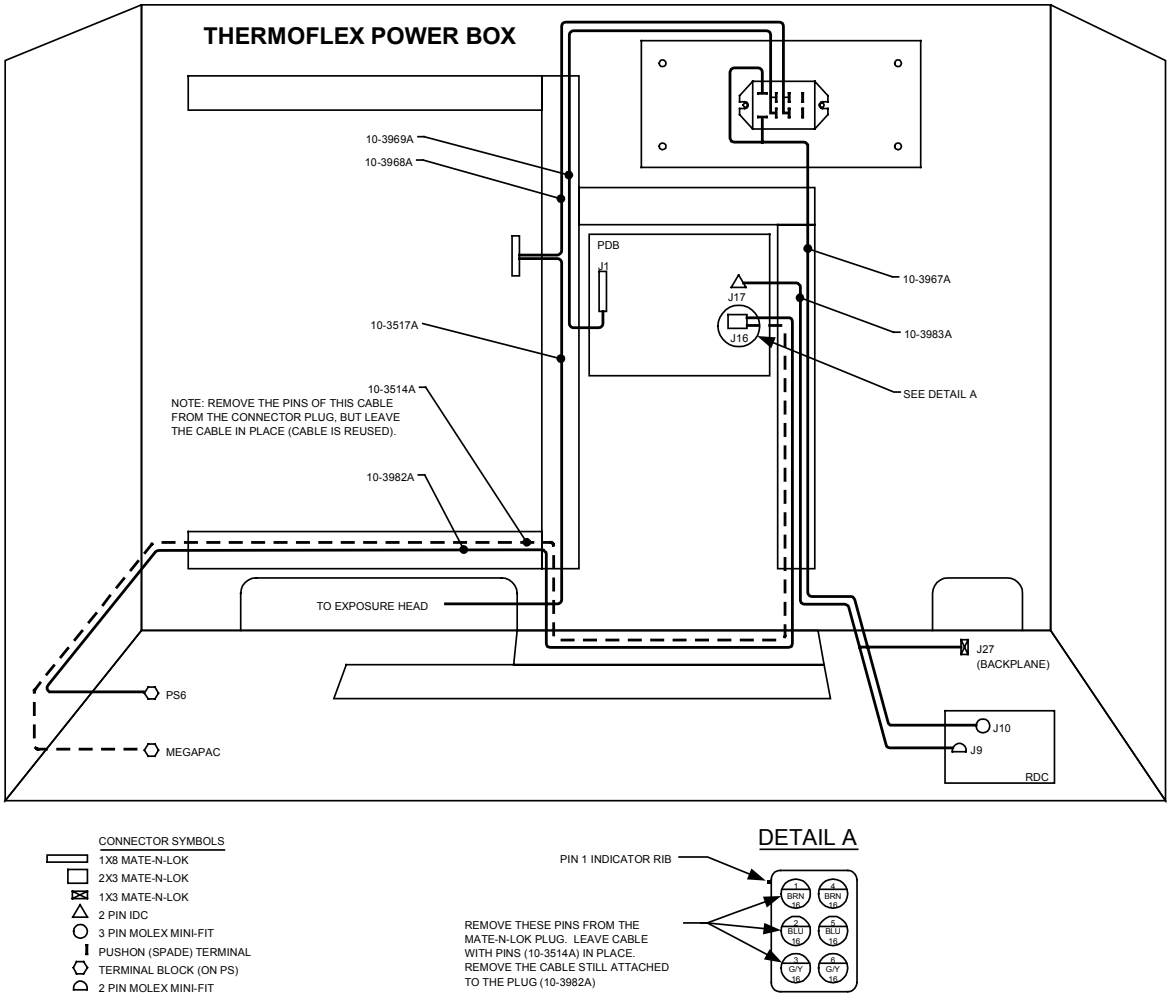
1. Power down the ThermoFlex Recorder, and switch off power to the recorder at the circuit breaker panel. Do not unplug the main power cord, as this would break the recorders grounding connection and leave it vulnerable to ESD damage of electronic components.
2. Double check that power is off at the power distribution board using a multi-meter.
3. Disconnect the wires attached to PS6 (on top of MegaPac) and the two mounting screws, and remove the power supply. Cover the ring terminals attached to the DC output terminals of PS6 with electrical tape, fold the wires back, and secure them to the cable with a cable tie (the cable is still used to carry 48VDC power from PS5 to the head, but the leads previously connected to PS6 are no longer used).
4. Open up the flex track. To do this, the entire assembly must be unmounted and flipped over. Remove the fasteners securing the flex track end link to the cable tray. Flip the flex track over in the cable tray and carefully open up the entire length.
5. Remove the lid of the cable ducts directly behind the power box and leading from the power box to the TEE board. Cut all cable ties holding the round flexible sheathing onto the cable bundle emerging from the flextrack, and remove the sheathing.
6. Disconnect the 6 wires to relay 15-3278 (above the PDB), and remove the relay and its mounting plate.

7. Following Figure 2, carefully remove the following cables.

Cable Part Number	Description	Connection 1	Connection 2
10-3517A	Cab,Assy,EH-PDB,TSV	10-3968A	1.7x TEH
10-3967A	Cab,Assy,RDC-Focus EL,TSV	Relay	RDC(J10)
10-3968A	Cab,Assy,Adapt,EH-Focus Rel,TSV	Relay	10-3517A
10-3969A	Cab,Assy,PDB-Focus Rel,TSV	Relay	PDB(J1)
10-3982A	Cab,Assy,PDB-LPS2,1.7x,TSV	PDB(J16)	PS 6
10-3983A	Cab,Assy,BP-PDB-RDC,1.7x,TSV	PDB(J17)	RDC(J9)
10-3514A	Cab,Assy,MegaPac AC Input,TSV	MegaPac	See Note Below

Note: Cable 10-3514A, which connects PDB J16 to the input of the MegaPac, is not to be removed. Instead, use an AMP Mate-n-Lok pin extractor tool to remove the three pins indicated in Figure 2 from the 6 pin Mate-N-Lok plug connected to J16(PDB). These pins will be installed into the connector of a new cable.

Figure 2: Cables to remove from the Power Box



8. Remove any of the flextrack cables that require upgrading as noted in Section 7.2.2.

9. Carefully remove the EMI bonding strap from the original flextrack. The bonding strap will be re-used in the new cable track, so be careful while unpeeling the strip from the

last link of the original cable track. A replacement bonding strap is included in the kit in case the factory installed one is damaged beyond reuse, but it is time-consuming to install a new strap.

10. Lift the cables out and remove the flex track from the machine.

11. Lay the new, larger flex track (#1040) and end brackets (#1050) in the flextrack tray. Ensure the length is 93 links. Install the bonding strap on the new cable track. Refer to drawing 10-4313A-x-AD.

12. Lay the existing cables into place in the new flextrack.

7.2.4 Installation of new parts/cables

Cable Assemblies

1. Mount the new K3 relay (#1085) and its plate (#1090) in the same location as the original relay plate using the supplied M3 screws (#1100), washers (#1110), and lock nuts (#1170). Mount the relay and bracket in the orientation shown in Figure 3.

2. Following Figure 3, install the following cables into the powerbox:

Kit Item Number	Cable Part Number	Description	Connection 1	Connection 2
#1120	10-4128A	Cab,Assy,ACIN(K3)-EHPS,FX1	K3 Relay	TFX Head PS
#1080	10-4302B	Cab,Assy,MegaPac AC-PDB(J16),TFX Upgrade,FX1	PDB(J16)	K3 Relay
#1095	10-4412A	Cab,Assy,K3-PDB(J17)-RDC(J9),FX1	PDB(J17)	K3/RDC(J9)
#1135	10-xxxxA	Cab,Assy,EHPS-GND,TFX,FX1	PB GND	TFX Head PS GND

Route cables 10-4128A and 10-xxxxA out of the power box and through the flextrack.

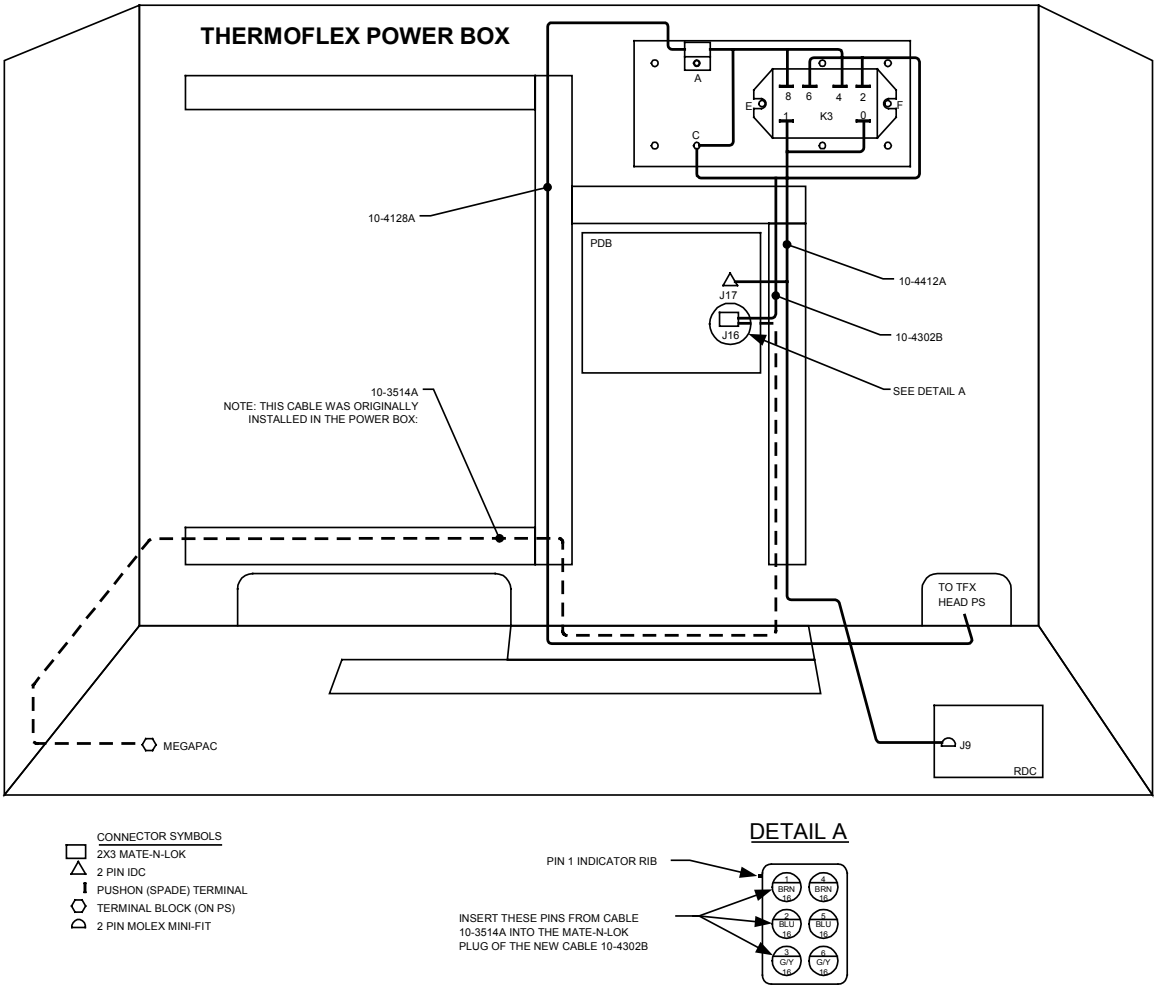
3. Secure the grounding wires from cables 10-4302B (#1080) and 10-4128A (#1120) to the stud labeled “C” on the relay mounting plate (#1090) using the washers (#1110 & #1160) and lock nuts (#1170) provided. Install a cable clamp (#1125) onto the exposed braided shielding of cable 10-4128A, and secure the clamp to the stud marked “A” on the relay bracket.

4. Insert the three pins from cable 10-3514A (extracted in section 7.2.3) into pin positions 1,2 & 3 of the plug of cable 10-4302B (#1080). Refer to Figure for the pinout.

5. Install any cables that require upgrading (from Section 7.2.2). Lay the cables in the flextrack, and route them into the power box to their connection points.

6. Install a new serial cable for head diagnostics (#1130). Neatly store the excess serial cable length behind the machine connection bulkhead.

Figure 3: Cables to Install and Routing in Power Box



7. Lay the new air tube (#1140) in the flextrack, and ensure there is 500mm coming out the end of the flextrack on the head side. Tie wrap the loose end of the tube to another cable. Snake the tube through the plastic conduit on the bottom of the chassis towards the TEE board, and up the frame post towards the pneumatic manifold. Tie wrap (#1150) one end close to the air solenoids above the TEE board.

8. Ensure that all cables have the correct length of cable emerging from the head end of the flextrack (refer to drawing 10-4313A). Tidy the cables through the flextrack as best as possible. Ensure that the cables are not drawn tight through the flextrack, and are not excessively slack. Try to keep the ribbon cables grouped together.

9. Close up the flex track.

10. Flip the flextrack over, and re-fasten the motor drive side end bracket to the cable tray using the M3 screws (#1060) and washers (#1070) supplied.

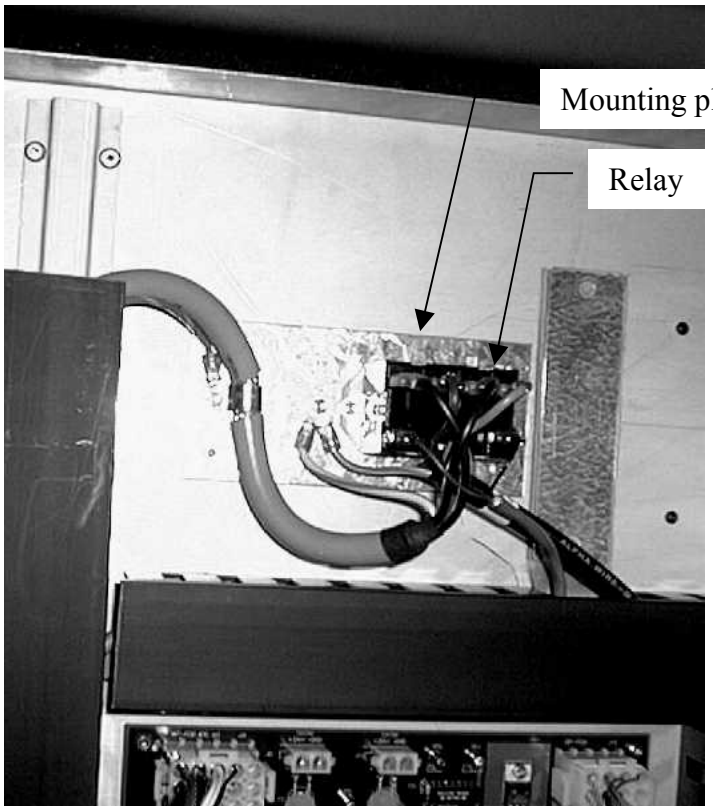


Figure 4 : Installed K3 Relay

TFX Head Grounding

11. The TFX head case is not grounded directly. The ground path is through IOP adapter cable (10-3896B) 9 pin connector (pin 7), which connects to the PS5 black ground wire. Locate this wire by first locating the two black wires connected to the DC output of PS5. Find the third identical black wire from the same cable harness. This wire is not connected in 1.7x Head machines and maybe hidden within the cable tracks. Route and secure this wire to a ground point in the power box.

7.2.5 Voltage Tests

1. The TFX head power supply cable 10-4128A (#1120) is terminated in three non-insulated fork terminals. Before proceeding with the voltage tests, wrap these lugs with electrical tape.
2. Power up the ThermoFlex.
3. Ensure the safety override keyswitch is in the "Normal" position, and measure the following test points:

Cable	Connector	Pin (+)	Pin (-)	Expected Voltage
10-3840C	2 pin (to desiccant box)	1	2	+12Vdc

10-3840C	3 pin (to stepper board)	3	1	+24Vdc
10-4128A	3 spade lugs to 800W supply (power down the machine and unwrap the electrical tape before proceeding)	BLK	BLK	200-240Vac

4. Turn the safety override keyswitch to the "Laser/Mechanical" position, and measure the following test points:

Cable	Connector	Pin (+)	Pin (-)	Expected Voltage
10-4128A	3 spade lugs to 800W supply (power down the machine and re-wrap the electrical tape when finished)	BLK	BLK	0Vac

5. Power down the ThermoFlex.

7.3 Installation of the TFX Adapter and Related Components

1. Most ThermoFlexes have the debris removal hose looped inside the coolant hoses in the wire troth. Remove both the debris hose and the coolant hoses from the wire troth, and lay the debris removal hose under the coolant hose.

2. Install the new lower hose bracket onto the carriage (#0010) using the two M5 screws (#0020). The bracket must be located in the encoder end pocket.

3. Clean the mounting surfaces on the carriage and the pads on the bottom plate of the head stage assembly.

4. Place the head stage assembly onto the carriage. The V-groove should be towards the machine encoder end. Push the head stage towards the drum until the alignment blocks contact the carriage reference surface.

5. Slide the head stage assembly sideways until the encoder side edges align and the four mounting holes on the bottom plate line up with the tapped holes on the carriage.

6. Ensure the stage bottom plate is sitting flat on the carriage top surface and that the alignment blocks are still firmly contacting the carriage reference surface. While reinstalling the four M6x30 screws to secure the stage assembly onto the carriage, lightly push the stage assembly towards the drum to ensure proper registration.

7. Install the desiccant box bracket (#0030) onto the head stage bottom plate (encoder end) using the four M4 screws (#0040).

   Note: Temporarily remove the stepper driver board assembly from the head stage assembly. Clean all surfaces of the TFX adapter plate (#0050) and secure two alignment blocks (#0045) onto the adapter plate reference surface using one M6 screw (#0046) for

each block. Position the adapter plate onto the head stage top plate by butting the alignment blocks against the stage reference surface, with the encoder side edges aligned. While installing the fasteners (#0080, #0085, #0090, #0100), lightly push the adapter plate towards the drum to ensure proper registration.

Note: Not all the fastener holes in the adapter plate are utilized. Refer to drawing 05-0140-x-AD for details.

8. Remove the RH alignment block and re-install the driver board.

9. Remove the positive and negative output terminal jumpers supplied with the new PS (#0210). Install the new positive (#0230) and negative (#0240) terminal brackets onto the power supply using the fasteners supplied with the power supply. Verify the marked polarity on the brackets with the polarity markings on the power supply.

10. Fasten the TFX head power supply mounting plate (#0200) to the bottom of the TFX head power supply (#0210) with four M4 screws (#0220). Install the power supply and mounting plate onto the TFX adapter plate (#0050) with four M6 screws (#0250).

11. Mount the upper cable/hose bracket (#0260) with two M6 screws (#0270). Secure the flex track, coolant hose, and debris removal hoses to this bracket with supplied fasteners (#0280, #0290, #0300, #0310), reusing the clamps the originally held the hoses. The debris removal hose must loop to the outside of the coolant hoses. The debris removal hose should extend 625mm beyond the edge of the bracket. The coolant hoses should be mounted with the second clamp 25mm from the end of the sleeve containing both hoses.

12. Connect the TFX Head PS AC input cable 10-4128A (#1120) to the new power supply (#0210). Wire BLK 1 goes to Line, BLK 2 goes to Neutral, and G/Y goes to Gnd on the power supply terminal block. Refer to the ThermoFlex mainframe wiring diagram (02-4271A-x-WD01) or drawing 10-4302B-x for details.

13. Attach grommet strips (#0320) to the power supply terminal enclosure (#0330) using Loctite 409 adhesive. Refer to drawing 05-0140 for details.

14. Mount the power supply terminal enclosure (#0330) to the power supply using the fasteners provided (#0340, #0350, #0360). Install a cable ground clamp (#1125) on the exposed braided shielding of the TFX head AC input cable (#1120), and mount the ground clamp to the PS terminal enclosure using an M5 screw (#0370) and lock washer (#0380) supplied.

15. The direction of coolant flow is important in the TFX unit. The flow must go into the diode plate (encoder end of the head). Mark the ends of the cooling hoses with arrows to indicate the flow direction with permanent marker. Label the coolant flow direction at the imaging head, bulkhead, and chiller terminations.

16. Install the TFX Head debris removal nozzle kit (#2000) as outlined in the ***60W TEH Debris removal Installation Document (***72-3363A-x-PR).

17. Install the TFX head flexure blades (#3010) and flexure blade radius blocks (#3020) using M5 washers (#3040 and #3050) and screws (#3060). Refer to drawing 05-0140-x for the mounting locations. Install and connect the TFX head (#3000) as detailed in the ***60W TEH installation document (***72-3362A-x-PR***)***.

18. Connect the air circulation hoses between the desiccant box (#0030) and the TFX head. For more details on desiccant box installation and maintenance schedules, refer to the *TFX Desiccant Box Installation Procedure (72-3356A-x-PR)* Connect the power cable to the desiccant box and insert the four mounting studs into the mating grommets in the bracket. Ensure the fan is operating and install a new desiccant pouch. The humidity indicator should return to a blue color within several hours.

19. Tidy the routing of the hoses and wires in the powerbox and the flextrack. Reinstall the flexible sheathing onto the cable bundle emerging from the flextrack at the power box end, and secure it in place with cable ties. Reinstall all cable duct lids.

20. Shut off the compressed air supply to the recorder at the filter/regulator.

21. Disconnect the 5/32" pneumatic tube that previously ran through the flextrack from its fitting on the pneumatic manifold. The hose should have been plumbed to a solenoid labeled "DJET" or "DBLOW". Remove and discard the 5/32" tube. Remove and discard the 5/32" tube fitting from the manifold.

22. Install a new ¼" tube fitting (#1145) on the manifold in place of the fitting just removed. Trim the ¼" tube (#1140) installed in section 7.2.4 to length and install it into the fitting.

23. Switch on the compressed air supply to the recorder.

7.4 Carriage Motor and Gear Ratio Change

The vibration characteristics of the carriage drive system require the use of a different motor and gear ratio at the speeds the TFX machine will be running.

1. Ensure the ThermoFlex Recorder is powered down.

2. Disconnect the carriage motor cable from the machine wiring harness. Remove the carriage motor drive belt cover from the stepper mount casting.

3. Remove the two screws securing the fan shroud assembly and set the assembly aside.

4. Loosen the carriage motor mounting screws to relieve the tension on the timing belt. Remove the timing belt. Fully remove the carriage motor, fasteners, thermal gasket, and nut plate.

5. Install the new carriage motor assembly (#0500) and new belt (#0510) using the original nut plate, thermal gasket, and fasteners. The new carriage drive belt is not long enough to be slipped over the carriage and ballscrew pulleys with the carriage motor mounting screws started. It is recommended that belt be slipped in place onto the pulleys before the mounting fasteners are started. Do not tighten the fasteners at this time.

6. Tension the carriage drive belt as detailed on the Customer Support Technical Library under "Replacing and Adjusting the Carriage Drive Belt" procedure.

   http://intranet.creo.com/support/html/ThermoFlex/proced.htm

7. Connect the carriage motor cable to the machine wiring harness and reinstall the fan shroud assembly.

8. Set the following NVS parameters to ensure proper carriage speeds are maintained:

```
SET CARRIAGE MSPEED 500
SET CARRIAGE ISPEED 500
SET CARRIAGE GEARING 6
SET CARRIAGE STEPS 400
```

Save these new machine settings:

```
NVS SAVE CARRIAGE
```

9. Verify the carriage traverses the entire length of its operation without stalling or loosing steps. Ensure the belt does not rub against the stepper mount.

10. Reinstall the carriage driver belt cover.

7.5 Firmware upgrade

The machine configuration will determine the version of firmware required.

Newer machine configurations may be visually identified by the presence of drum vacuum pipes along the front of the engine casting. If your machine has this configuration, please use ThermoFlex f/w version 1.00 or higher.

Older machine configurations can be identified by the presence of drum vacuum piping and valves behind the engine casting, below the flextrack and hose tray. Older machines require ThermoFlex f/w version 0.90.

Follow the upgrade procedure as laid out in the release notes.

Both versions of firmware (with release notes) can be found at:
http://intranet.creo.com/support/firmware/CTP/ThermoFlex/thermal/versions.htm

Select the link to the desired version and a self-extracting zip file will be downloaded. The file will contain the firmware and release notes.

7.6 System Checks

Checking for Mechanical Interference

1. Initialize the carriage and stage:

```
CARRIAGE INIT
STAGE INIT
```

Move the stage into the stage install position:

```
STAGE INSTALL
```

2. Idle the drum and rotate the drum by hand:

```
DRUM IDLE
```

Check to ensure there is clearance between the drum registration bar and all components of the TFX upgrade.
Move the carriage down the drum 10 inches:

```
CARRIAGE MOVETO 10000
```

Recheck the clearance between the drum registration bar and all head and debris nozzle components.

3. Place the table in the down position. Remove both side panels and set the safety interlock switch to "Laser / Mechanical Hazards" Override position.

4. Cycle the carriage through its full travel and watch the newly installed components on the carriage for mechanical interference. Be ready to activate the abort switch if required.

5. Re-route any hoses that may be a problem.

Testing the TFX Head Safety Loop

1. Initialize the machine with the `ALE INIT` command.

2. Set the safety interlock switch position to normal and close all interlock switched panels on the machine.

3. Issue a plot command. E.g. `PLOT 0 10`.

4. Open any interlock switched panel while being careful not the look into the machine. The plot should abort immediately. If the plot does not abort, issue a `PLOT STOP` command and check the wiring for errors.

Plot Quality

1. Produce diagnostics plots to verify the proper setup of the TFX head and the Debris Removal system. Refer to the TFX Installation Document (72-3362A-x-PR) or TFX Debris Removal Nozzle Installation Document (72-3363A-x-PR) as required for details on adjustments and settings to achieve optimal imaging performance.

8 APPENDIX A: REMOVING THE 1.7X TEH.

This procedure details the removal of a 1.7 thermal head. It has been copied from document 77-0074A Installation Procedure for the 1.7X TEH on Creo Output Devices.

1. Make full backups of the existing NVS parameters and recorder firmware by saving nvs dump diff, nvs dump, and fsaveall files. Refer to Thermal Head Firmware release notes for instructions on backing up the recording firmware and NVS parameters.
2. Remove power from the Output Device by using the power switch.
3. Turn off the power to the chiller.
4. Put on a wrist anti-static strap.



WARNING:
The autofocus laser diode, which is exposed on some heads once the cover of the PD board has been removed, is very static-sensitive.

5. Unplug all the cables from the head, carriage home and away board, and head stage including the leadscrew temperature sensor cable.
6. Disconnect the air jet from the fitting on the head connectors support bracket.
7. Disconnect the coolant hoses from the head by pressing on the release mechanism of the hose fitting on the head. Hold a rag or a tissue under the fitting as the hose is removed to catch the small amount of coolant that will weep from the fitting as it is disconnected.
8. Remove the screws holding the cable track onto the bracket on the head (screws may be standard rather than metric).
9. Cam mounting system: loosen and remove the locking cam securing the head to the carriage.
10. Latch mounting system: release latches #2 and #3. Using a 3mm t-handle hex key, fully loosen the shoulder screws that compress the springs holding the head in position. Release latch #1.
11. Lift the head and remove it from the ThermoFlex recorder.



WARNING:
Be careful not to bump the lens, shutter, or autofocus actuator on any protrusions.