Kodak

Thermal 1.7 Head

Installation Procedure

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Revision History

Revision	Date	Author	Comments
1.0	March 24/99	Ashok Appadurai	Initial release.
1.1	May 15/99	Janice Blok	Expanded to cover both 48V and 24V
1.2	May 19/99	Sohail Zarbafian	Expanded to cover both 48V and 24V
1.3	June 21/00	André Blignaut	Updated diagrams, removed 24V references
A-B	August 15/01	Maureen Gill	Removed note to partially tighten shoulder screws.
A-C	23 Jan 2002	M Gill	Updated links to related documents. Updated logo.
A-D pre-release	28 Nov 2002	Kurt Shelton (Ken DeCarle, editor)	Technical review/edits by Kurt. Edits done by Ken D.
A-D	21 Jan 2003	Kurt Shelton (Ken DeCarle, editor)	Final review by Kurt. Final edits by Ken D.
A-E	09 Aug 2006	Jeff Edgar (Maureen Munroe editor)	Converted to Kodak template. Synchronized with TH1.0 install procedure. Added MCE commands. Updated the head photos.
B-A	17 Sep 2007	J Edgar/M Munroe	Migrated to updated template. Changed location of ground cable. Updated all procedures and added photos.
B-B	03 Oct 2007	J Edgar/M Munroe	Updated or removed all references to the sheet metal connector cover.

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1. LASER SAFETY PRACTICES

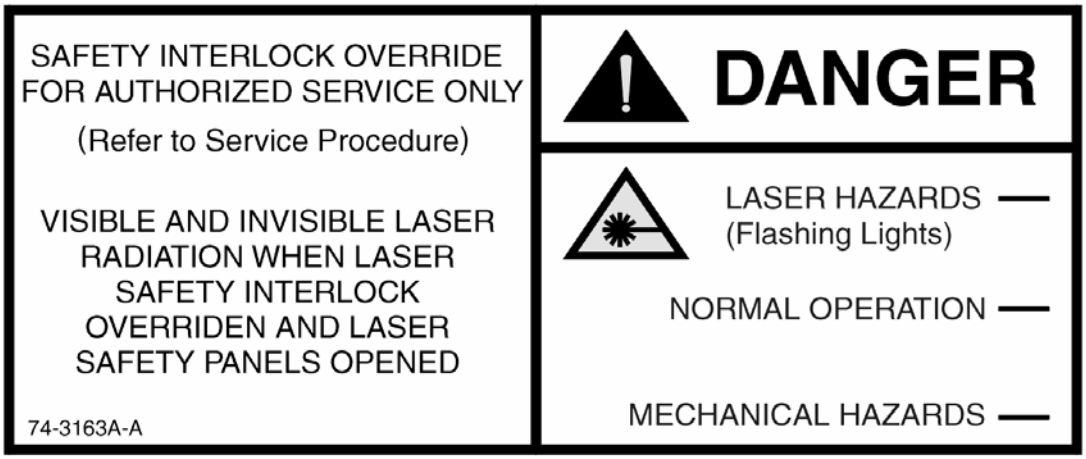
To use this document the FSE (Field Service Engineer) *must* have attended and passed a thermal introductory course and be familiar with the safety precautions when working with a thermal output device.

DANGER:
Disable the write laser before putting the safety interlock override (SIO) key switch into the Laser Hazards position.

Do not proceed if the laser status is not
`write laser state: disabled.`

Make sure that the four LEDs on top of the head are off for this entire procedure. If they are off, the write laser is not turned on.

The safety label below is displayed beside the SIO key switch and inside the power box on the output device:



Service personnel are issued a key (if you lose this key, you must order a replacement).

Note: If there is a spare key under the key switch, remove it. *Do not replace it*. For more details see FCO E040.

DANGER:
Do not tamper with the SIO key switch. The key can only be removed from the key switch while in the middle position (key horizontal). Turning the key to the Laser Hazards position re-energizes the focus laser only.

2. RELATED DOCUMENTS

- *Running and Interpreting Diagnostic Scripts*—in the Field Scripts zip files on the Service Shell site (http://techplanet.creo.com/output/service_tools/service_shell/nav/index.htm)
- Dehumidifier Unit FCO E246: (http://techplanet.creo.com/output/heads/thermal/nav/fcos.htm#next_fail)
- Geometric Correction Parameter Structure: (http://techplanet.creo.com/output/computer_to_plate/trendsetter_3244/content/docs/MCE_Trendsetter_GC_Parameters.pdf)
- **inchgrid.ps**—available from the Test Files page of TechPlanet (http://techplanet.creo.com/common/test_files/test_files.htm#inchgrid)
- Media technical notes—available from the Media TechPlanet site (http://techplanet.creo.com/consumables/media/nav/index.htm)
- Thermal head firmware release notes—available from the Reference page of the Thermal 1/1.7 TechPlanet site http://techplanet.creo.com/output/heads/thermal/nav/reference.htm

The following procedures are available from the Procedures page of the Thermal 1/1.7 TechPlanet site (http://techplanet.creo.com/output/heads/thermal/nav/proced.htm)

- Air Jet Plate Assembly (30-1163A)
- Chiller Maintenance
- Debris Removal Nozzle Cleaning Procedure
- Dehumidifier Unit Installation Procedure
- Lens Cleaning Procedure
- Micro-banding troubleshooting procedures (part number 77-0034A)

3. REQUIRED TOOLS

- 3-mm hex key (T-handle preferred)
- 2-mm hex key (T-handle preferred)
- 2.5-mm hex key (T-handle preferred)
- Standard field service toolkit
- NSK #1 grease (part number 89-0006)
- Tilt viewing tool (lenticular) for 2400dpi (part number 690-00225A)

4. PROCEDURE OVERVIEW

This procedure describes how to install a thermal 1.7 exposure head in a Kodak output device.

The main steps are:

1. Remove the existing thermal head (if required).
2. Mount the head on the carriage.
3. Connect the cables and hoses.
4. Initialize the head.
5. Zero the head.
6. Set up the media.
7. Check and adjust image quality.
8. Back up the NVS parameters.

5. REMOVE THE EXISTING HEAD (IF REQUIRED)

Note: This procedure explains how to remove a thermal 1.7 head only.

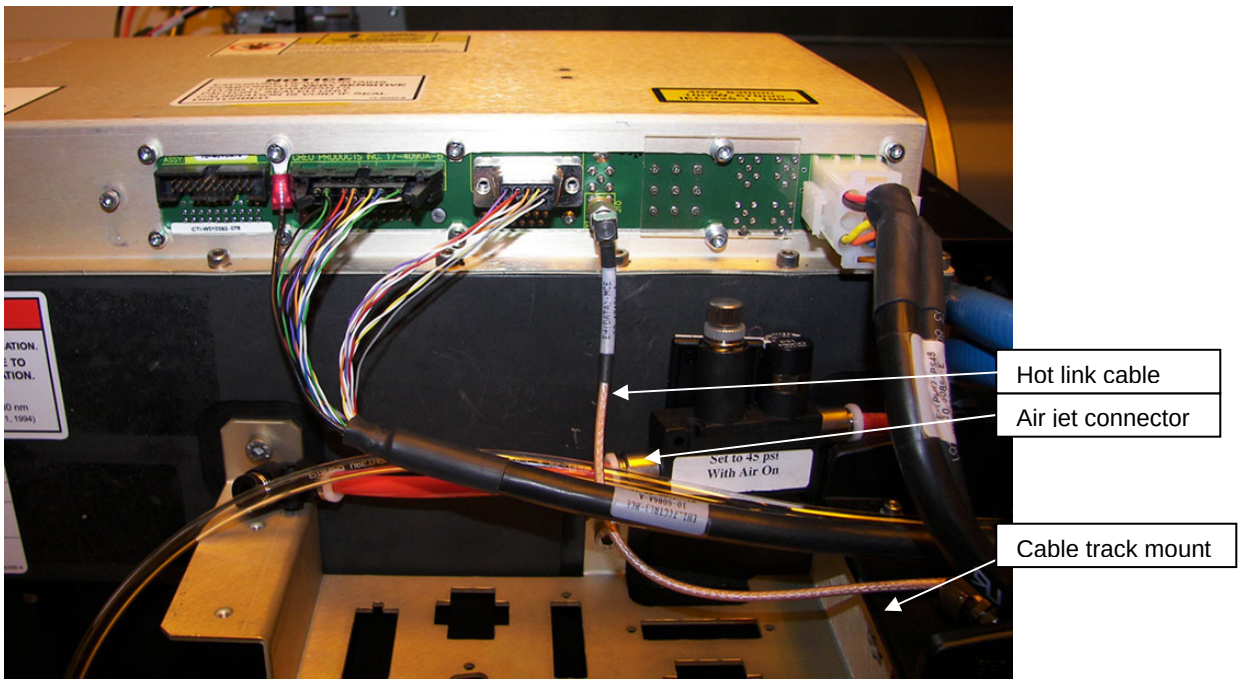


Figure 1: Connections on the TH1.7 head

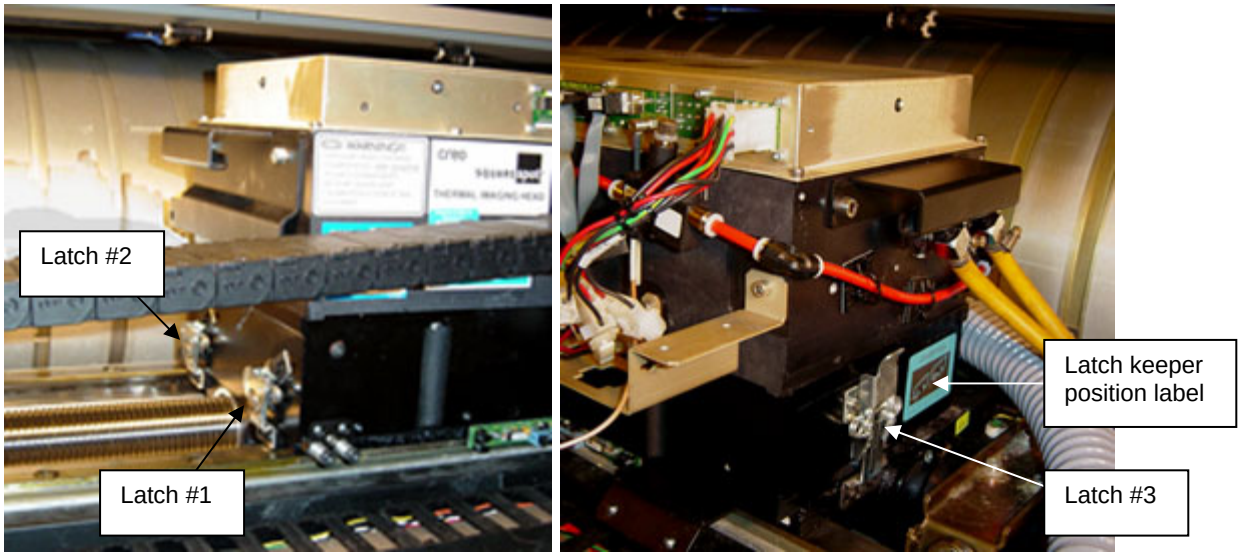


Figure 2 Latches on the TH1.7 head

1. Make a backup of the existing NVS parameters.
   - MPE: Type `>>nvs dump diff` and `>>nvs dump` and save the resulting files.
   - MCE: Type `>>prm save all` and save the resulting file.

Note: See the latest thermal head firmware release notes for more information.

2. Turn off the device.
3. Turn off the power to the chiller or heat exchanger.
4. Make sure there is a static-safe, clean work surface for you to put the head on. Put on an antistatic wrist strap.

WARNING: The autofocus laser diode is very static-sensitive. You must wear an antistatic wrist strap whenever you handle a thermal head.

5. If applicable, remove the sheet metal cover from the head connectors.

   Note: Do not transfer the cover to the new head. Return it with the old head.

6. Disconnect the following cables:
   A. 20-pin ribbon cable (EH-BP)
   B. 9-pin EH-BP DB-9 connector (diagnostic)
   C. Data link cable (EH-BLKHD hotlink)
   D. 3 x 3 Molex® connector (power cable)

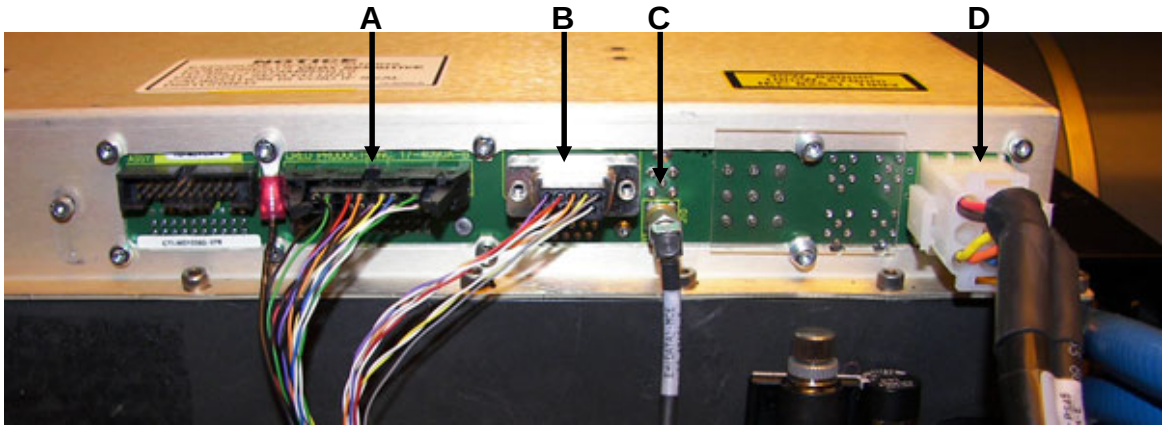


Figure 3: Disconnect the cables

7. Use a 2.5-mm hex key to remove the ground cable from the thermal head. Replace the screw on the head.

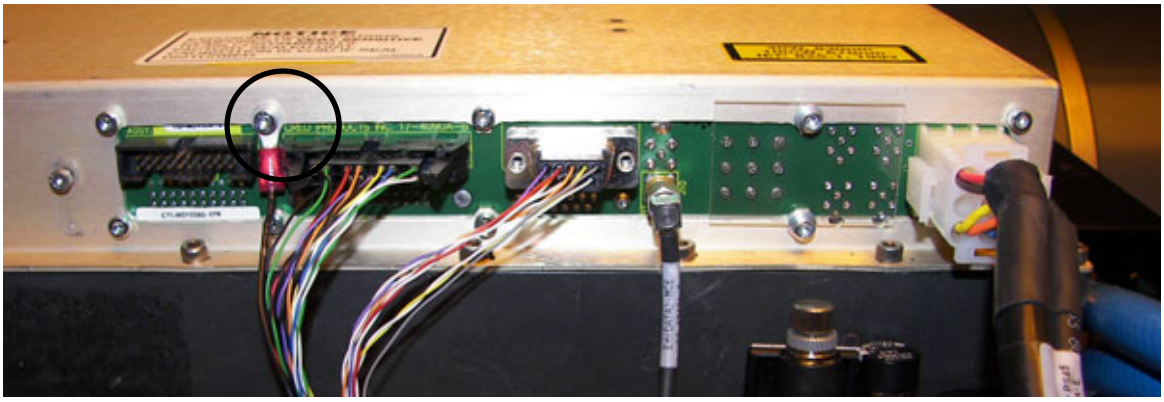


Figure 4: Remove the ground cable

8. Disconnect:
   - the air jet plate tubes from their connectors on the thermal head
   - the two coolant hoses
   - If applicable, disconnect cables for the leadscrew temperature sensor and the home and away board

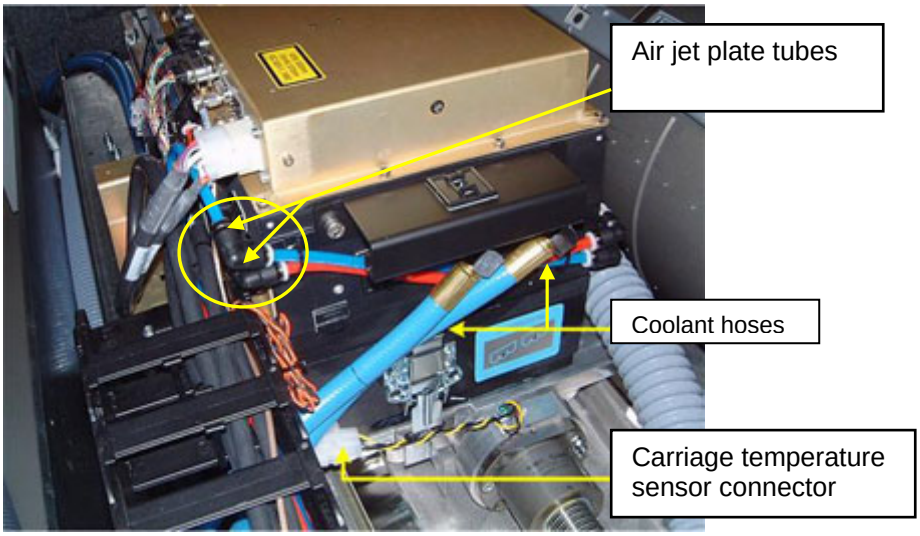


Figure 5: Coolant, air jet plate tube and carriage temp sensor connectors

9. Use a flathead screwdriver to loosen the screw of the UDRC hose clamp, and then remove the UDRC hose.



Figure 6: Disconnect the UDRC hose

10. Disconnect the DHU air tubes and Molex® connector (if applicable).

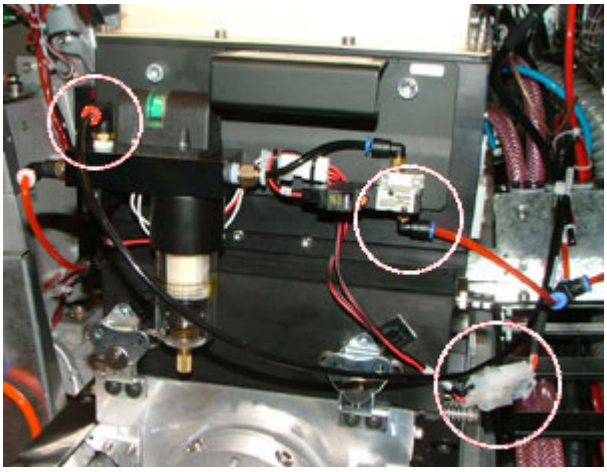


Figure 7: Disconnect the DHU

11. Remove the screws holding the cable track onto the bracket on the head.
12. Release the two butterfly latches located on the home side of the thermal head and stow them for transport in the clip as shown.

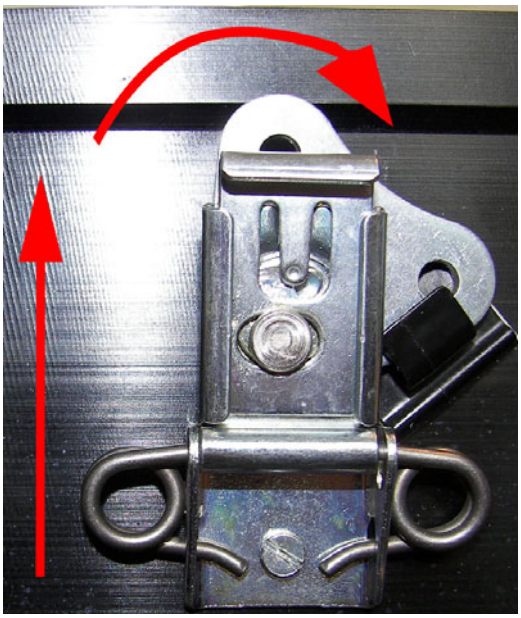


Figure 8: Stowing a latch

Note: Stowing the latches prevents them from catching on the latch holders when the thermal head is removed from the device.

13. Release the single latch on the away side of the head (latch #3), and fold the handle up.

14. Using a 3-mm hex key, loosen the two shoulder screws that compress the springs.

Note: The screws must disengage from the carriage.

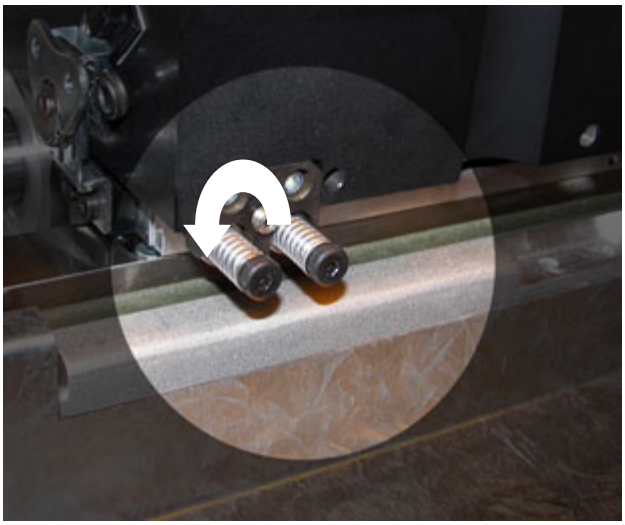


Figure 9: Loosen the shoulder screws

15. Lift the head and remove it from the device. Gently place the head on a static-safe, clean work surface.

WARNING: The TH1.7 head weighs 23kg. This represents a serious back injury risk.

- Lift the head from a kneeling position.
- Keep the weight as close to your body as possible throughout the entire lift.

CAUTION: Be careful not to bump the lens, shutter, or autofocus actuator.

16. Remove the DHU and debris removal nozzle from the head. Save them for use on the replacement head.

6. MOUNT THE HEAD ON THE CARRIAGE

If you completed section 5, go to section 6.2.

6.1 Prepare the Device

1. Turn off the device.
2. Put on an antistatic wrist strap.

WARNING: The autofocus laser diode is very static-sensitive. You must wear an antistatic wrist strap whenever you handle a thermal head.

6.2 Install the Head

1. Install the DHU and debris removal nozzle (if required). If this is a head replacement, transfer these parts from the old head.
2. The latch keeper for latch #3 (on the away side of the carriage) has three possible positions (see Figure 10). Position the latch keeper in the position indicated on the latch keeper position label on the head (see Figure 2).

Note: If necessary, use a 3-mm hex key to loosen the M5 screws that attach the adjustable latch keeper to the carriage and move it to the correct position.

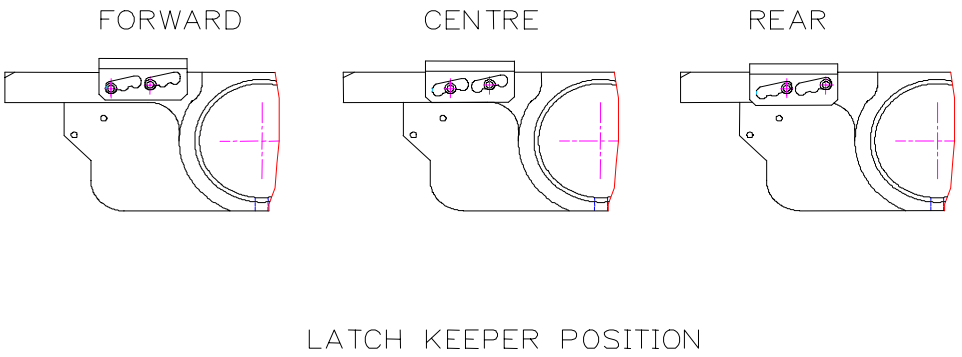


Figure 10: Adjustable latch keeper position

3. Apply a small amount of NSK grease #1 to the carriage surfaces that contact the head (see Figure 11: Carriage grease points):

- Squaring rods
- Keeper of latch #1

Note: Do not apply grease to the other keepers.

- Thrust button at the end of the squaring rod
- Flat surface at the away end of the carriage (the tilt screw pad)

CAUTION: The mounting system will not work without grease. High friction between the head and carriage may skew the head.

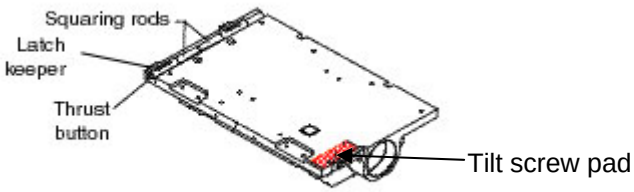


Figure 11: Carriage grease points

4. Pick up the head by the handles and gently lower the head onto the carriage. Align the V-groove on the underside of the thermal head with the

squaring rods on the carriage base. Be careful not to bump the lens, shutter, or autofocus actuator.

WARNING: The TH1.7 head weighs 23kg. This represents a serious back injury risk.

- Keep the weight as close to your body as possible throughout the entire lift.
- Where possible, lift the head from a kneeling position.

Note: The head may rock a little on the carriage, but the head is fully supported by the squaring rod and the tilt screw.

5. Ensure that the hook of latch #3 is resting on the outside of the adjustable latch keeper and that the tilt screw is resting on the carriage. For correct and incorrect positioning see Figure 12 and Figure 13.

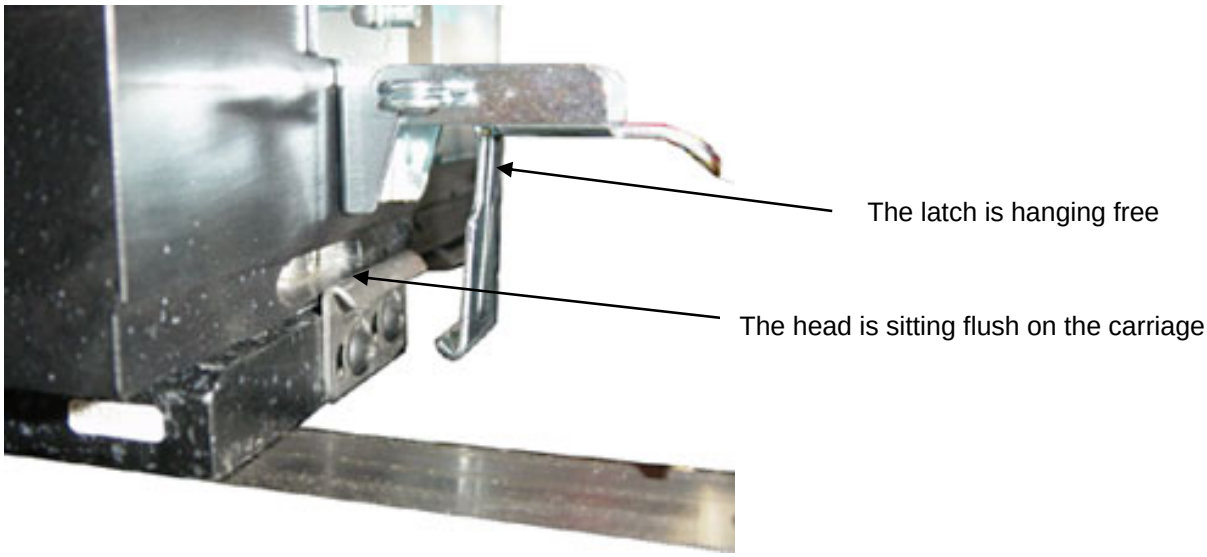


Figure 12: Latch 3 in the correct position

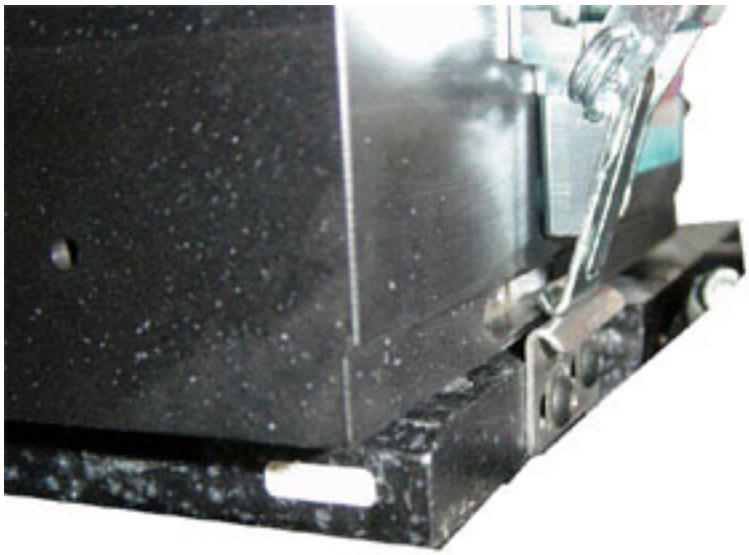


Figure 13: Latch 3 in an incorrect position

6. Tighten the two shoulder screws (beside the positioning screw) to compress the springs. Do not tighten them all the way. The springs should *not* be fully compressed.

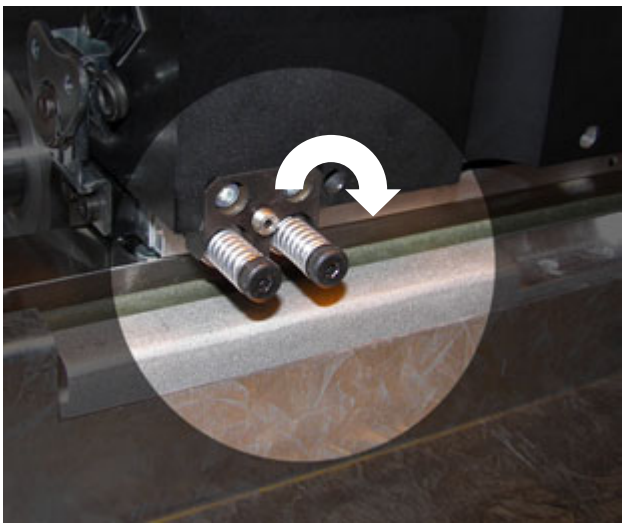


Figure 14: Tighten the shoulder screws

7. Turn the drum once by hand to ensure that the clamps on the drum do not collide with the head.

WARNING: If you do not check that there is enough clearance between the clamps and the head, the head and the clamps can be severely damaged.

If necessary, adjust the head back by turning the positioning screw clockwise.

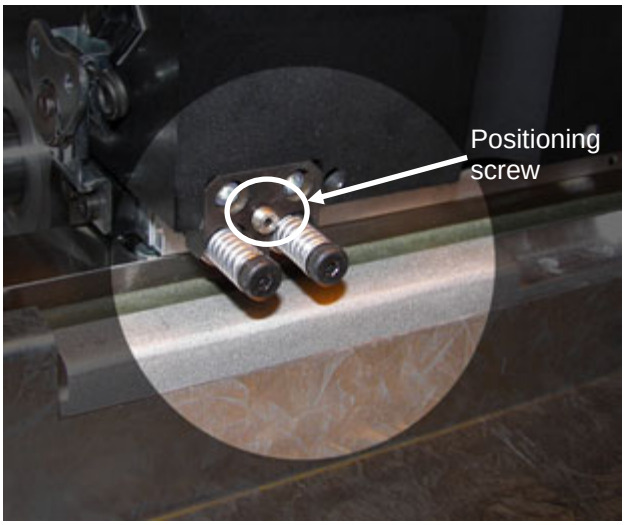


Figure 15: Positioning screw

8. Lock the latch on the home side, furthest from the drum (latch #1) onto its holder.

7. CONNECT THE CABLES AND HOSES

1. Connect the cable track to the cable track mount.
2. Connect the DHU tubes and the Molex® connector.

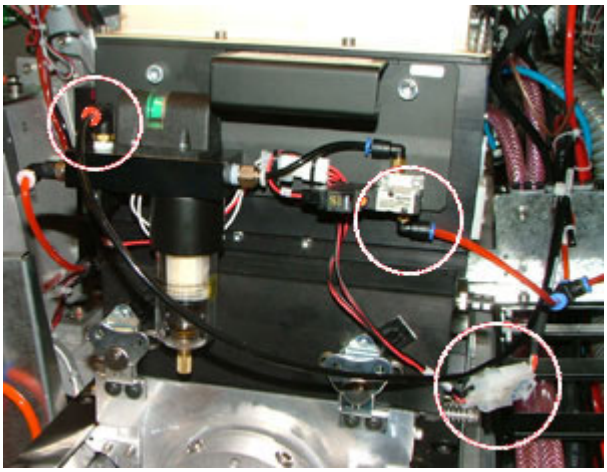


Figure 16: DHU connections

3. Connect the UDRC hose.



Figure 17: UDRC hose connection

4. If applicable:
   - Connect the 10-pin ribbon cable (HA-BP cable) to the home/away board on the carriage.
   - Connect the leadscrew temperature sensor cable (1x3 Molex® connector). For the cable location, see Figure 5.
5. Connect the air jet regulator.
6. Connect the two coolant hoses.
7. Connect the following cables to the head connector panel:
   A. 20-pin header cable (EH-BP, head data)
   B. 9-pin EH-BP DB-9 connector (diagnostic)
   C. coaxial cable (EH-BLKHD hotlink)
   D. 3x3 Molex® connector for 48V power

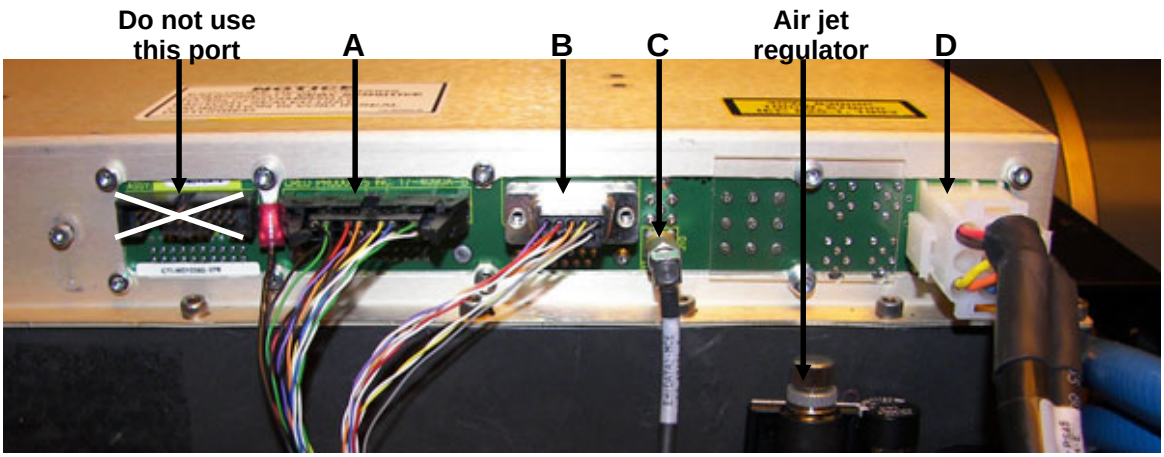


Figure 18: Cable connections

8. Attach the ground cable as shown. Attach it under the screw located between the 20-pin connector and the unused port.

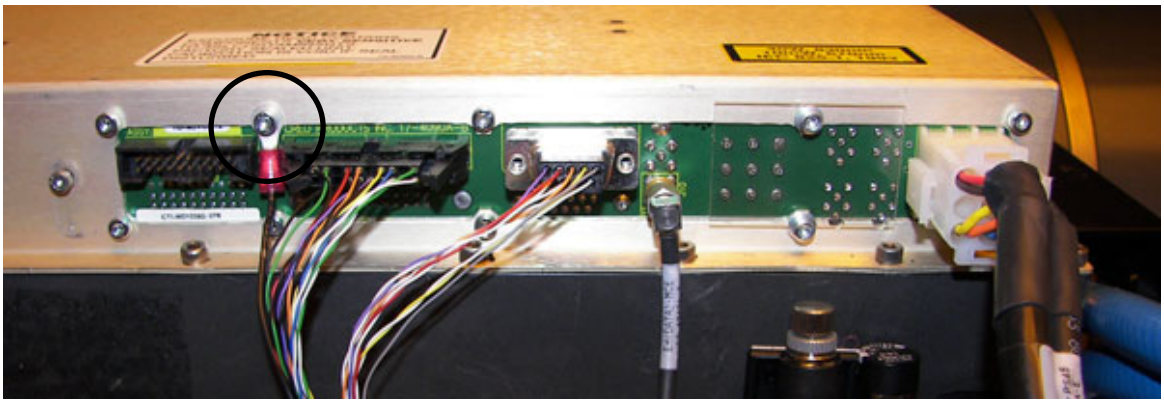


Figure 19: Attach the ground cable

8. INITIALIZE THE HEAD

1. Close all access panels.
2. Turn on the air supply and electrical power to the device.
3. Turn on the power to the chiller or heat exchanger. Check that the set point is at 30°C and that there is enough coolant in the chiller reservoir.
4. Check the serial data communications with the head by typing the command `>>laser`.
5. MPE only: Save all the head data to the MPE nvs by typing the commands:

   ```
   >>nvs save head

   >>nvs save hdm
   ```

Note: This is necessary when the head is connected to the MPE for the first time (for example, during an MPE board replacement or field swap of a thermal head), because the `HEAD`, `HDP`, and `HDM` NVS parameters saved in the MPE will not match those saved in the head.

9. ZERO THE HEAD

9.1 Adjust the NVS Settings

1. Type:
   - MPE: `>>mode media N` (where `N` is the media type being loaded on the drum)
   - MCE: `>>media N` (where `N` is the media type being loaded on the drum)

Note: If the media the customer is using is not set up, you need to populate a new media slot with the relevant nvs settings. See the section “Setting the Media/Med and HDM Parameters” in the media technical note.

2. Load a plate on the drum.
3. Type MPE: `>>set state plate_loc d` or MCE: `>>loaded`, and check the following parameters to ensure they are correct for the loaded plate:

MPE	MCE	
`type (media_type)`	`media type`	media type, number from 1 to 8
`msz (mscan_size)`	`mainscan length`	mainscan, size of plate in mm
`ssz (sscan_size)`	`subscan length`	subscan, size of plate in mm
`thk (plate_thickness)`	`thickness`	plate thickness, microns

9.2 Zero the Focus Error

Correctly zeroing the head ensures that optimum focus performance will be achieved over the full range of plate thicknesses.

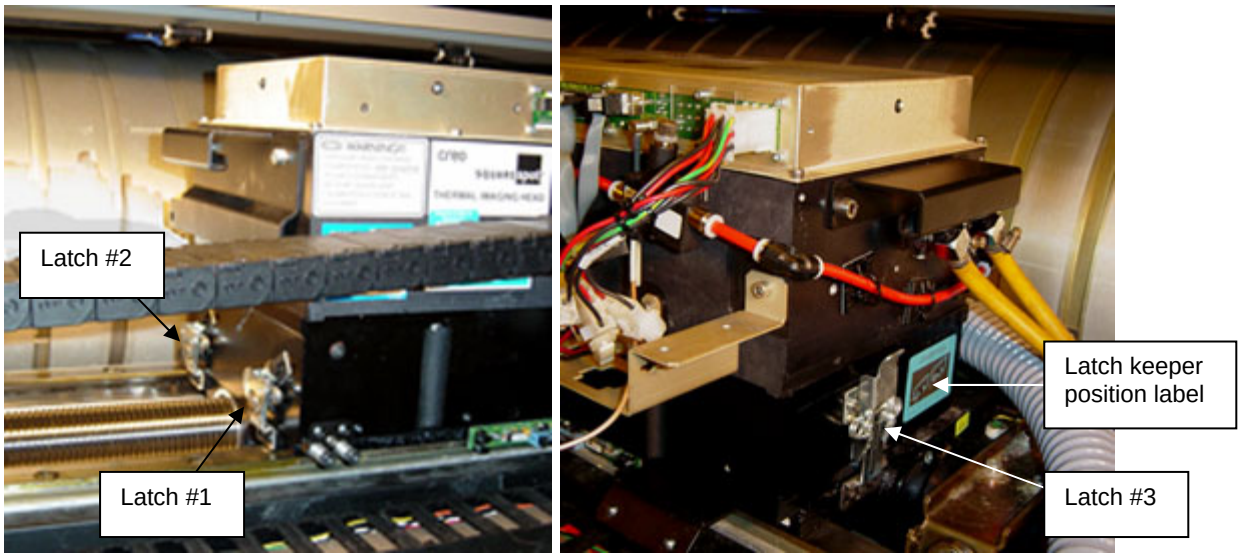


Figure 20: Latches on the TH1.7 head

1. Put on an antistatic wrist strap.
2. Disable the write laser by typing:

MPE	MCE
`>>laser off`	`>>laser off`
`>>set head wenable 0`	`>>set head wenable 0`
`>>nvs save head`	`>>laser` (verify that the write laser is disabled)
`>>laser` (verify that the write laser is disabled)	

3. Override the access panel safety interlock circuit by turning the key switch to the Laser Hazard position. The override LEDs on the panel start flashing.
4. Remove the relevant access panels of the output device to gain access to the head and make sure that the LED's on the thermal head are off.

DANGER! Close the access panels immediately if the red LEDs on the thermal head are flashing.

5. Position the head in the center of the plate. Confirm that none of the latches are trapped between the head and the carriage.
6. Confirm that latch #1 is already properly locked.
7. Type `head install on`. While monitoring the readout, use a 2-mm hex key to adjust the positioning screw to maximize the sum signal while minimizing the error. Adjust the positioning screw until the error is as close as possible to zero.

Typical values are:

- sum `(s)`: represents the amount of light reaching the autofocus sensor. The value is ideally 1000 if the value for `media n sr` is correct.
- difference `(d)`: Difference value; not important for this procedure
- error `(e)`: as close to zero as possible; between –25 and +25

WARNING:
Never try to turn the head positioning screw when latches #2 or #3 are locked—it will damage the ultra-fine thread of the set screw. When adjusting the screw, only latch #1 should be locked.

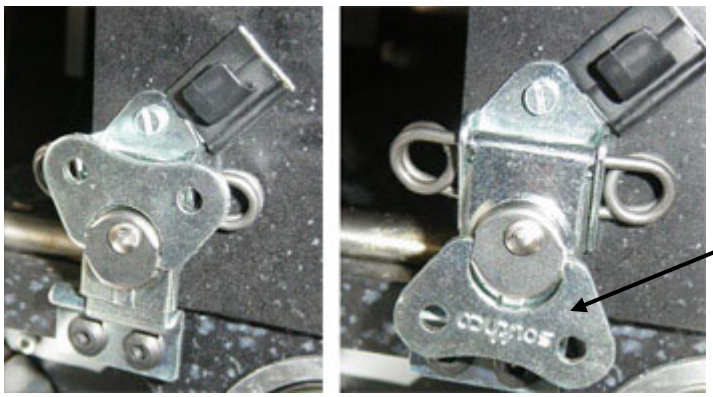
8. Lock latch #2 (See Figure 20) and note the error value.

Note: The error value will change to approximately –50. This is normal.

9. Unlock latch #2 and adjust the set screw to adjust the error to compensate for the change. For example, if the error value went from 0 to –50 after locking latch #2, move the head to +50.
10. Lock latch #2. Ensure that the error value is between -25 and +25. If the value is out of this range, repeat step 9.

11. Lock latch #3. Ensure that the error value is still between -25 and +25. If the value is out of this range, unlock latch #3 and repeat steps 9 and 10.

WARNING: Always fold the handle on latch #2 into the up position. If you do not, it may contact the leadscrew bearing housing at the home end of the engine and prevent full carriage movement.



Correct and incorrect positions for latch # 2

12. Turn off the data streaming by typing:

```
>>head install off
```

13. Set the `sr` value. Type

```
>>focus cal reflect
>>set hdm N sr X
```

`N` = the media number

`X` = the sr value

14. MPE only: Save this value by typing `>>nvs save hdm`

10. SET UP THE MEDIA

1. Check the edge detection. Type:
   - MPE: `>>plot edge`
   - MCE: `>>edge test`
2. Close all access panels and remove the SIO key.
3. Re-enable the write laser using these commands:

MPE	MCE
`>>set head wenable 1`	`>>set head wenable 1`
`>>nvs save head`	`>>reset`
`>>reset`	

4. Set up the media using the appropriate media technical note on TechPlanet (http://techplanet.creo.com/consumables/media/nav/medialist.htm).

11. CHECK AND ADJUST THE IMAGE QUALITY

1. Check for debris artifacts by imaging a plot 1. Examine the plate for signs of tick or whisker marks.

Note: For more details on identifying and correcting tick and whisker marks, see *Air Jet Plate Installation Document* (PN 30-1163C).

2. Check the tilt by inspecting the 3-pixel horizontal line section of the plot 1 using a loupe or the lenticular tool. The horizontal bars should line up at the swath boundaries (see Figure 21).

Note: For instructions on adjusting tilt and using the lenticular tool, see *Adjusting Tilt on a Thermal Head*.

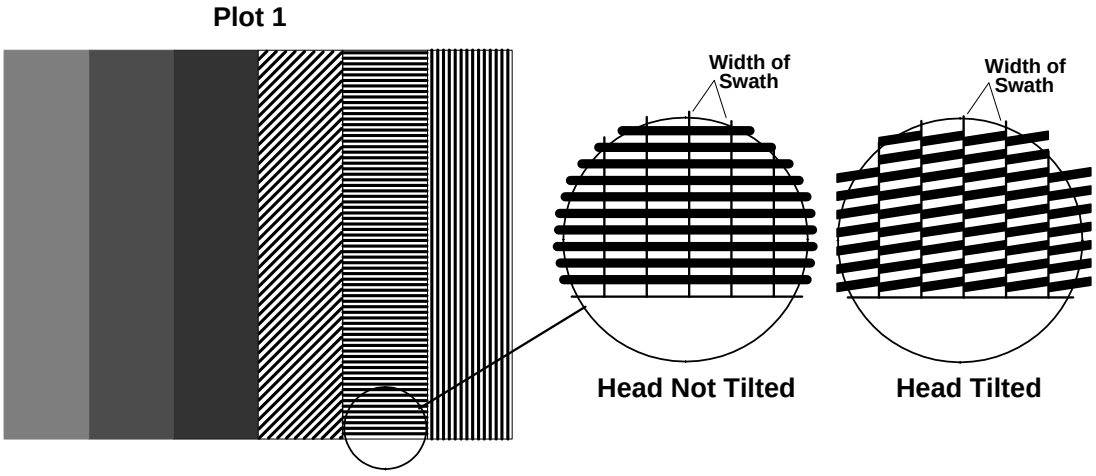


Figure 21: Head tilt

3. Check the geometric correction by first checking the registration.
   a. Plot **inchgrid.ps** from the workstation or run internal plot 100.
   b. Using the inchgrid alignment tool, check that the plot is 1 inch from the LEC edge of the plate. If it's not, make note of the original setting of the parameter `mssa` and adjust it as necessary. Type:

      MPE: `>>set gc mssa xxxx`

      MCE: `>>set gc mshift 1 xxxx`

      For more details, see Geometric Correction Parameter Structure: (http://techplanet.creo.com/output/computer_to_plate/trendsetter_3244/content/docs/MCE_Trendsetter_GC_Parameters.pdf)

   c. Repeat steps 1 and 2 until the registration is accurate.

Note: Use the procedure *Geometric Correction* if the device is to be aligned with another Kodak SQUAREspot®-equipped platesetter at the customer site.

d. MPE only: Save the `mssa` parameter by typing:

```
>>nvs save gc mssa
```

12. BACK UP THE NVS PARAMETERS

Back up the NVS parameters when the head installation is complete and you are satisfied with the image quality.

1. MCE only: Type `>>prm save all`
2. MPE only: Back up the NVS parameters by typing `>>nvs dump`
3. Save the backup file on the workstation in a service directory, and name the file TH*nnn.dd.mm.yyyy*.cfg where *nnnn* is the head serial number.