# Air Jet Plate

## Installation Document

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**30-1163C-B-PR01**

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# Revision History

| Revision | Date | Author | Comments |
|---|---|---|---|
| B-A | Jan 26, 2001 | Lauren Walker / Vince Beyer | Accommodates version B of assembly and version B of DR nozzle. Airjet plate used is version B with gasket. |
| C-A | Jan 10, 2003 | Vince Beyer | Update for version C, which incorporates the air purge. Update Creo logo. |
| C-B | July 10, 2003 | Vince Beyer | Minor changes wrt release of new stand-alone airjet plate field upgrade kit. |
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# 1. REQUIRED TOOLS

- 1/8” Hex Key
- 2.5mm Hex Key
- 3 mm Hex Key
- 7mm wrench (or small crescent wrench)
- Knife, Diagonal Cutters, or Scissors for Cutting Tubing

# 2. LIST OF MATERIALS

The kitted assembly, 30-1163C, should contain the following parts:

- Air jet plate assembly with air jet and air purge plumbed to a barb wye fitting, and foam gasket installed.
- QTY 3, M4x12 Flathead Screws (0050)
- QTY 2, 10-32 x $^{3}/_{8}$” Button Head Screws (0070)
- QTY 2, M5 Lock Washers (0080)
- QTY 1, Mounting Bracket (0090)
- QTY 1, M4x20 Cap Screw (0100)
- QTY 1, ¼” plug (0130)
- QTY 1, “Y” Pneumatic Fitting, ¼” Tubing (0150)
- QTY 2, Elbow Fitting, ¼” Tubing (0180)
- QTY 1, Elbow Fitting, Adapts ¼” Tubing To 6mm Tubing (0200)
- QTY 0.85m, of Red ¼” Pneumatic Tubing (0140)
- QTY 6, Adhesive Cable Tie Mounts (0160)
- QTY 10, Cable Ties (0170)
- QTY 1, Labeled Pressure Regulator With Gauge

# 3. RELATED DOCUMENTS

- Thermal 1.0 Head Installation Document
- Thermal 1.7 Head Installation Document

# 4. ABOUT THE AIR JET PLATE

The air jet replaces the whisker jet in functionality. Its purpose is to blow the byproducts of imaging various media away from the write beam, thus preserving image quality. Without this, image artifacts such as ticks and wisps may be seen on the imaged plate. Version C and later incorporate an airpurge, which maintains positive pressure in the shutter cavity to help prevent debris contamination of the shutter and lens.

This document pertains only to version B or later of the air jet plate assembly (30-1163B or later), which uses air jet plates of version B or later (57-5776B-A or later). Front and back

views of 57-5776C-A are shown in figure 1 below. This document details the physical installation of the air jet plate on the Thermal Head.

## 5. PREREQUISITES

If the output device has $^{5}/_{32}$" pneumatic tubing for the compressed air supply to the head (through the cable track), it will provide insufficient flow and an upgrade to 6mm or ¼" is required. In a pinch, for devices without a debris removal cabinet, the smaller $^{5}/_{32}$" tube can be used, in some installations the necessary airflow may be attainable or very close to the specification of 45 psig at the pressure regulator.

**Note:** The output device must be capable of providing a consistent air supply of 160 SCFH at a static pressure of 45 psig at the Thermal Head.

Consult output device documentation on debris removal installation for further details.

**CAUTION: This kit is equipped with adapters to accommodate 6mm or ¼" pneumatic tubing in the output device.** While these two sizes are close, they are not compatible with one another. Please use the correct-sized fitting. This air jet plate kit is NOT compatible with suction nozzles of version/revision PRIOR to 50-2117B-A. Incompatible suction nozzles are identifiable by an adjustable throttle valve or speed control installed in the inlet to the air curtain.

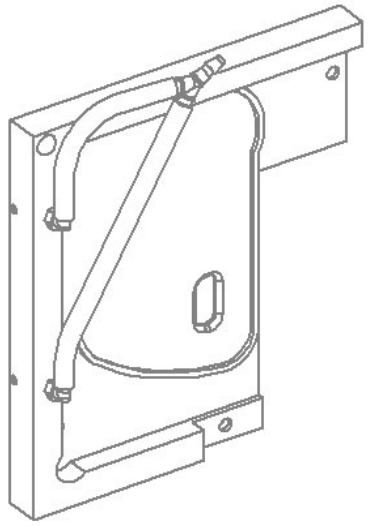


**Figure 1. Back View of Version C Air Jet Plate (57-5776C-A).**

## 6. INSTALLATION ON THE THERMAL HEAD

To properly install the air jet plate, you must complete sections 6.1 to 6.3.

## 6.1 Prepare the head

1. Remove the thermal head from the output device as detailed in the Thermal Head Installation Document (refer to the Related Documents section for details).

2. Remove the existing quick-release fitting from the bottom of the shutter block with a 7mm wrench (or crescent wrench). Leave the fitting attached to the $^{5}/_{32}$" tubing, bundle the tubing, and secure to the back of the Thermal Head as shown in Figure 2 below.

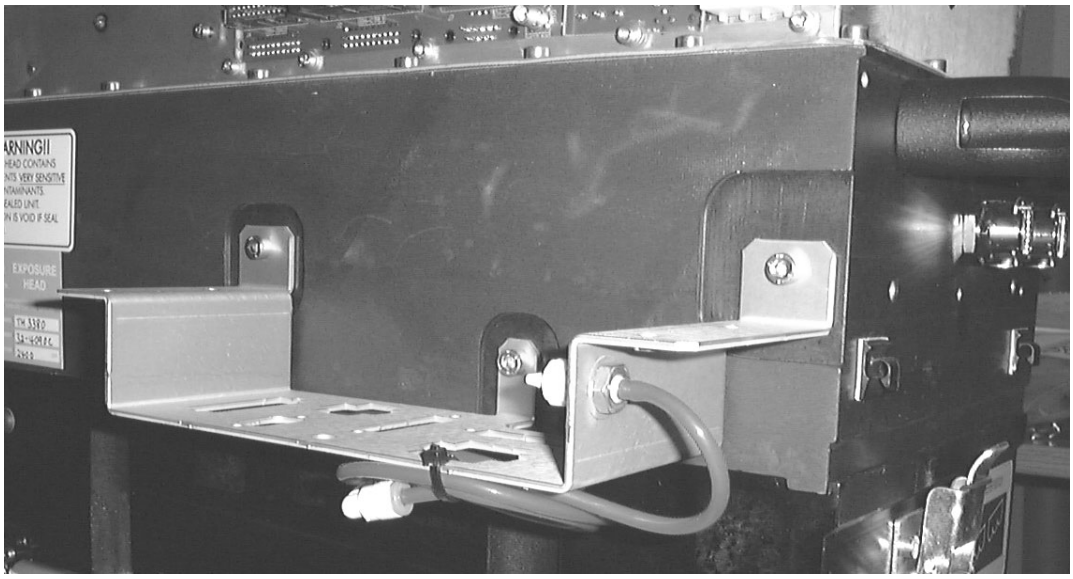


**Figure 2 Original Whisker Jet Tubing Disconnected and Secured**

3. If an older air jet plate is installed (57-5776A-F or earlier, identifiable by 3, not 4 mounting screws), remove the three mounting screws and remove the plate. Make sure the front of the shutter block is clean and free of any sealants that may have been used. Remove the attached tubing from the head and any throttle valves.

**Note:** Since the head is being removed this is a good time to do a thorough cleaning of the lens and shutter sensor on the thermal head as well as the debris nozzle if a UDRC system is installed, see links under cleaning heading at:

http://techplanet.creo.com/output/heads/thermal/nav/proced.htm

**Note:** If a suction nozzle is installed, and has an adjustable speed control or throttle installed then it must also be upgraded to version 50-2117B or later.

4. Remove any tubing clips or tie wraps attached to the shutter block and the thermal head as these may obstruct installation of the air jet plate. Identify what version of the shutter block is installed on the laser head as the installation procedure will differ slightly between the two. Note that a suction nozzle for ablative media may only be installed on the new shutter block.

   - The **new** shutter block has a **cutout for nozzle clearance**, a **flush face**, and **two 10-32 tapped holes** on the bottom feeding the two old whisker jets (vertical, 45˚). This version is shown in Figure 3.

- The **old** shutter block has **no nozzle cutout**, **sunshade recesses on the face**, may only have a **single 10-32 tapped hole** on the bottom, and a one or three whisker jets (vertical, horizontal, 45˚)

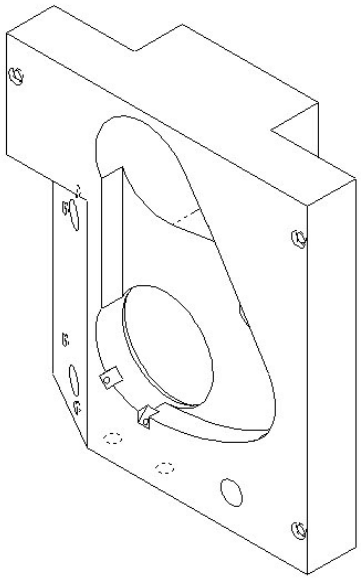


**Figure 3 New Shutter Block**

## 6.2 Install the air jet plate

1. Install the mounting bracket as shown in Figure 4 below. Loosely bolt on the two 10-32 button head screws and M5 washers**.** For **old shutter blocks,** if there is only one 10-32 threaded hole, just use a single 10-32 screw to affix the mounting bracket.

**Note:** Do not use metric hex keys to install the 10-32 screws as the screw heads can be easily stripped. The proper, $^{1}/_{8}$" imperial hex key should be used.

2. Mount the air jet plate assembly to the shutter block with three M4 flat-head screws, and the single M4 cap screw. For **old shutter blocks, where sunshade recesses are present,** use three M4 washers on each flat head mounting screw, between the air jet plate and the shutter block to take up the space in the recess.

**CAUTION: Failure to add these washers on old shutter blocks may bend the air jet plate outwards and possibly cause a mechanical interference with the clamps on the output device.**

3. The longer, M4 cap screw is threaded into the PEM nut in the bracket as shown in Figure 4 below.

4. Tighten the mounting bracket.

5. Tighten each of the 4 air jet plate screws in steps, moving between screws so that the gasket is compressed uniformly.

   **Do not overtighten the air jet plate mounting screws.**

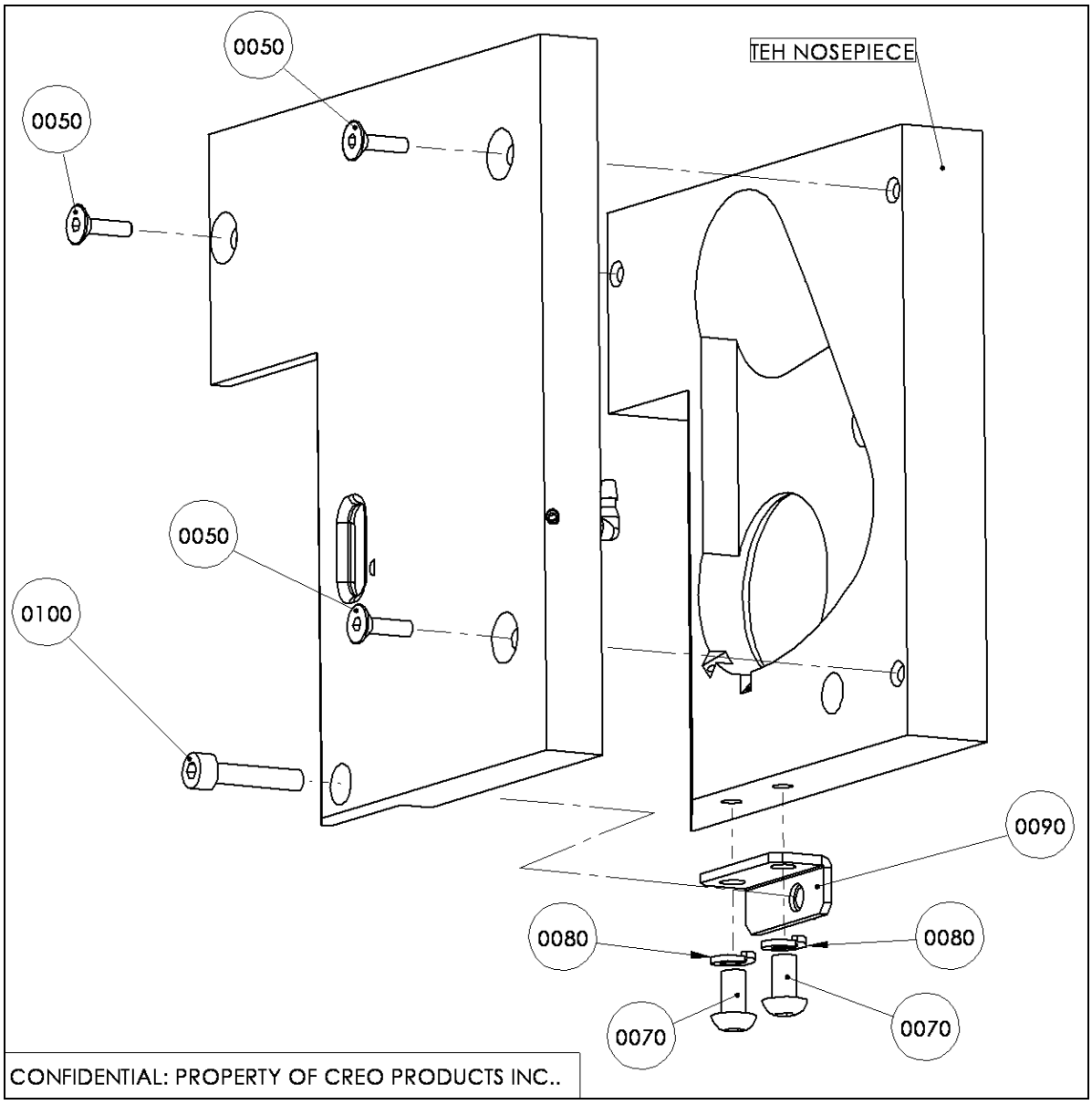



**Figure 4 Installation Diagram of Air Jet Plate (Ver B shown) on New Shutter Block**

6. Cut ~200mm of red, ¼" pneumatic tubing and slide one end over the barb wye fitting on the air jet plate assembly, as shown in Figure 5 below.

7. Insert the plastic, ¼" plug into the "Y" fitting included with the kit and mount the fitting on the pneumatic tubing as shown in Figure 5 below. The plugged "Y" fitting allows for later addition of a suction nozzle.

8. Cut ~80mm of red tubing and insert into the single end of the "Y" fitting. Insert the other end of this tubing into a ¼" elbow fitting provided in the kit as shown in Figure 5.

9. Trim the tubing for the best fit, and secure them to the front of the head with an adhesive cable tie mount and a cable tie provided as shown in Figure 5.

10. Before adhering the cable tie mounts to the Thermal Head, clean the areas on the head where the cable tie mounts will be installed with alcohol or acetone to remove any residue. Do not over tighten the cable ties as this may crimp the tubing.

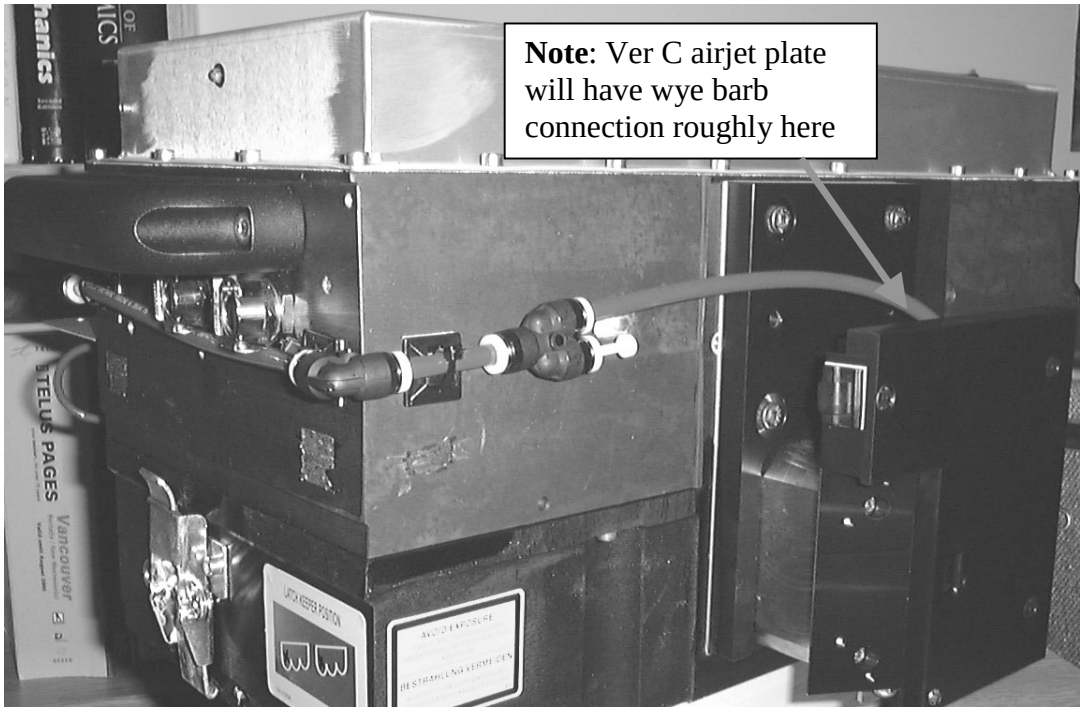



**Figure 5 Layout of Tubing and Fittings**

11. Cut ~230mm of red pneumatic tubing and insert into the ¼" elbow fitting at the front of the Thermal Head. Run this tubing along the side of the head, below the quick release fittings for the cooling hoses.

12. Insert the end of this tubing into a second ¼" elbow fitting.

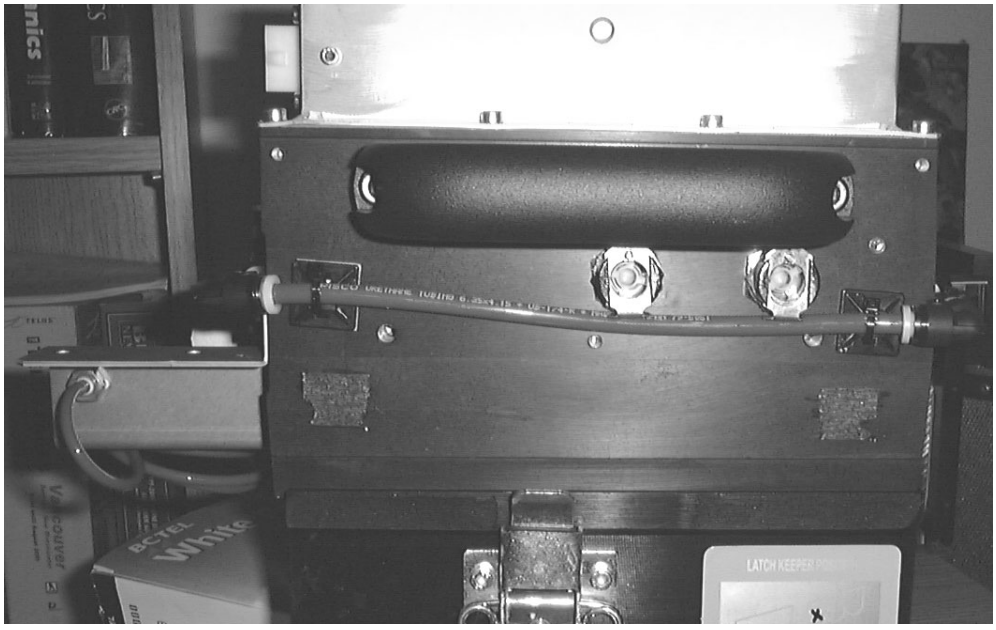


**Figure 6 Routing of Tubing on the Side of the Thermal Head**

13. Trim the tubing for the best fit and secure to the side of the head with two adhesive cable tie mounts and cable ties provided. This configuration is shown in **Error! Reference source not found.**.

14. Install the regulator as shown in Figure 7. Make sure the arrow on the regulator points in the direction of flow, and the markings on the gauge face outward. The gauge can be rotated into the proper position.

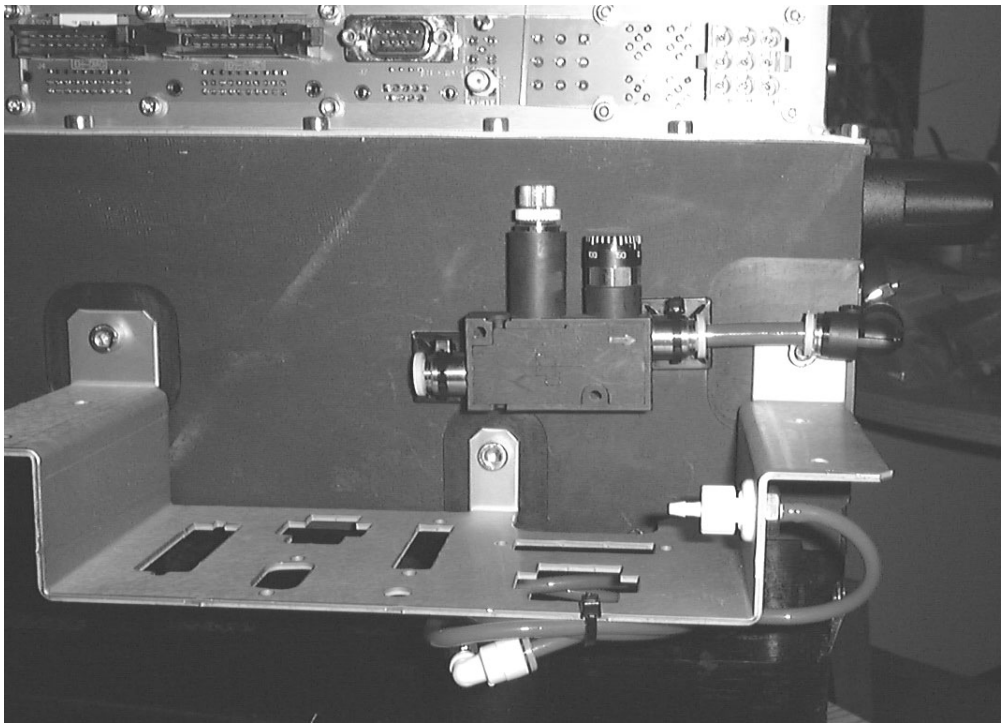


**Figure 7 Regulator Installed at Rear of Thermal Head**

15. Secure the regulator to the back of the Thermal Head with cable tie mounts and cable ties. Make sure there is no interference with the cable track or cables.

    For output devices equipped with metric tubing in cable track, install the 6mm to ¼" adapter elbow (identifiable by one black, one white collar) at the inlet of the regulator, with a short piece of red ¼" tubing.

## 6.3 Configure the device

1. Re-install the Head on the carriage as per the Thermal Head Installation Document (refer to the Related Documents section).

**Note:** Make sure it is seated against the z-locating set-screw.

2. Connect the compressed air supply tubing in the cable track to the regulator.

    - If 6mm tubing is used in the cable track (for example, on newer Trendsetters), then the 6mm to ¼" adapter elbow (0020) must be installed at the inlet to the pressure regulator with a short piece of ¼" tubing.
    - If $^{5}/_{32}$" tubing is installed in the cable track, then this should be upgraded to either ¼" or 6mm diameter tubing to get sufficient flow to the airjet plate.

3. **Before imaging or spinning the drum, idle the drum and rotate slowly by hand, checking that there is no mechanical interference between the air jet plate components and the drum clamps.**

4. As the air jet blows directly onto the media, and near the imaging optics, it is important that the air used be clean and dry. Inspect the output device compressed air filters (consult device documentation) and confirm that they are in good condition. If the filters appear dirty, they should be replaced. Consult the appropriate output device documentation.

5. Locate the output device air manifold and inspect the solenoid for the air jet supply tubing (usually marked "TEH" or "Thermal"). If there is a throttle valve or speed control installed on this solenoid, then it should be replaced with a straight fitting, or if this is impossible, opened completely.

6. With the air jet device air turned on (for example, "act dblow on") adjust the regulator installed on the back of the Thermal Head until it reads 45 psi. This will provide a constant flow to the air jet regardless of moderate fluctuations in the output device manifold pressure.

   **Troubleshooting**: If a pressure of 45 psi is not obtainable, do the following:

   - Confirm that any speed control or throttle valves installed inline with the air jet supply tubing up-stream of the pressure regulator on the Thermal Head are opened completely and try to re-set the regulator pressure to 45 psi
   - Check for crimped tubing. Repair any crimps found and try to re-set the regulator pressure to 45 psi.
   - If $^{5}/_{32}$" tubing is used in the device cable track, upgrade it to 6mm or ¼" – see output device documentation. Try to re-set the regulator pressure to 45 psi.

7. Re-zero the Head and complete the re-installation.

**Note:** When moving the head on the carriage with the set-screw, ensure that there is sufficient clearance between the air jet plate components and the drum clamps.

8. The air jet plate may affect the optimum exposure required by the media, so a proper media setup should be done during the Thermal Head re-installation. Consult the appropriate media set-up documents.

9. Confirm that the air jet plate is effective in eliminating ablation related artifacts (for example, tick marks), and that the air jet is not lifting the edge of the plate (this appears as a section of the plate edge that is out of focus and underexposed). Please see the Troubleshooting section for further details.

# 7. TROUBLESHOOTING

## 7.1 Plate Lifting and Tick Marks

**Plate lifting** occurs if the air jet is blowing too hard. When the first few or last few swaths are being imaged, the strong air jet can cause the plate edge to flutter. This appears on the image as a section at the edge that goes in and out of focus.

Newer versions of firmware on most output device platforms have a new *delayed whisker jet* feature, typically located in the media parameters or in the *set sys* subsystem. Use this tool to prevent plate lifting by delaying the onset of the airjet.

**Tick marks** occur if the air jet is not blowing away debris hard enough. A plot 12 (100% solid) is the best pattern to diagnose tick mark problems.

- The objective in setting the appropriate air pressure is to find an air pressure that provides high enough flow to kill tick marks, but low enough not to cause the plate to lift.
- Adjust the air pressure regulator appropriately to fix whichever problem is present. There has never been a situation yet where both problems occur simultaneously.
- To confirm that plate lifting is the problem of the apparent focus problem, the air pressure can be set to 0 psi, and if the focus problem goes away, then it was caused by plate lifting.