Trendsetter 800/400

Upgrade Procedure, Particulate Ablative Media, UDRC-B

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Revision History

Revision	Date	Author	Comments
Draft 1	Nov 6 00	Darcy Priest/Frances Caton	
Draft 2	Dec 12 00	Frances Caton	Removed rotary joint installation section.
Draft 3	Feb 9 01	Frances Caton	Modified to add TS3/8 procedures for bulkhead and external-chiller/debris harness
A-B	April 19, 2001	Frances Caton	Added air jet plate modifications from ECO E010.
A-C	July 9, 2001	Frances Caton	Made the procedure universal for debris removal - removed sections on modifications for high speed. Added information about the bulkhead. Changed "non-hazardous" to particulate.
A-D	Dec 3, 2001	Vince Beyer/Frances Caton	Change to DR nozzle - moving the pressure tap from top to bottom of the nozzle.
A-E	April 8, 2002	Vince Beyer/ Frances Caton	Add new bulkhead, new upgrade kit pn's, new debris related firmware commands/ settings.
A-F	Sept 16, 2003	Vince Beyer	Add reference to new DR Firmware Guide doc, some general document clean-up.
A-G	May 30, 2005	Ming Zhang	Add links to assembly drawings.
A-H	Oct 14, 2005	Janet Waterman	Add TS3 HDM serial numbers

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CONTENTS

Revision History i

1. About this upgrade 3
   - 1.1 Purpose 3
   - 1.2 Site Requirements: 3
   - 1.3 Upgrade Prerequisites 3
     - What Kits to Order for this Upgrade: 3
     - Firmware Requirements 4
     - Additional Tools Required 5
   - 1.4 Reference Documents 5

2. Debris Removal Related Firmware Settings/ Modifications 5
   - 2.1 Media Parameters 5
   - 2.2 Sys Parameters 6
   - 2.3 Debris Parameters and Commands 6

3. Firmware Modifications for Old Debris Removal Firmware 7
   - 3.1 Firmware Commands to Operate and Display Status of Debris Removal System (Old Firmware) 7
   - 3.2 Filter-present Indication and Masking (Old Firmware) 7
   - 3.3 Vacuum Setpoints (Old Firmware) 8

4. Detailed procedure 9
   - 4.1 Upgrading Firmware and Machine Parameters 9
   - 4.2 Removing the V-Head 9
   - 4.3 Installing the Debris Hooks Kit and Nozzle/ Internal Hose kit 9
   - 4.4 Manifold Modifications 11
   - 4.5 Installing Low Profile LEC Clamps 11
   - 4.6 Installing the UDRC-B and Internal Components Kit 11
     - Installing Hoses and Communications Cable from Machine to Canister 11
     - Installing the Air Jet Plate and Nozzle on the Head 13
     - Re-Installing the V head 15
   - 4.7 Final Mechanical Checks 16
   - 4.8 Final integration and testing 16

1. ABOUT THIS UPGRADE

1.1 Purpose

This upgrade adds a Universal Debris Removal Cabinet – Base Model (UDRC-B) to a Trendsetter-based machine. The debris removal system extracts and filters any airborne particulate emissions produced when imaging. This upgrade is performed for many reasons such as speed upgrades, media changes, or as a service prescription for sites with excessive debris related service calls.

To upgrade to a UDRC-LC, Processless Plate Imaging System, you will need to consult the document: "TS800 Processless Plate Imaging System, UDRC-LC, Installation/ Upgrade Procedure". The UDRC-LC document references this document since it assumes that the machine is already upgraded to accept a UDRC-B, therefore the content of this document may also be required for Processless Plate Imaging System upgrades.

1.2 Site Requirements:

The site prep document for the UDRC is now required for all installations. Refer to the debris removal site on the Tech Planet for details:

http://techplanet.creo.com/output/heads/debris_removal/nav/install.htm

1.3 Upgrade Prerequisites

What Kits to Order for this Upgrade:

There are 2 possible methods of ordering this upgrade:

1. Customers may purchase this upgrade (available on the price list). This should be done through order management by ordering the **02-4468A** upgrade kit. When ordering this kit, Order Management will require information such as machine location, type, and serial number, to properly configure this 02-kit.

2. Service personnel should order this as a free upgrade for customers that require at least 2 service visits/ year attributed to debris, for example cleaning the final lens on the laser head, or the drum encoder, or the edge detect strip. For these cases, use the **02-4468A** configurable kit and email it to UDRC.Order@creo.com.

For reference, here are the parts that will be driven by the 02-4486A kit:

Note: the 02-4468A kit will automatically select the proper kits:

- ❑ 11-0866A: Universal Debris Removal Cabinet, UDRC-BP.
- ❑ **One of**: 11-1068B for North America/ Japan **or** 11-1069B for Rest of World. This is the box accompanying the UDRC with power cord (region specific) and external hose.
- ❑ **One of**: 50-2406A for Thermal 1.x heads **or** 50-2407A for Thermal 2.x heads. This is the debris removal nozzle and internal hose kit.

Also the following additional parts according to the serial number of the machine:

Machine Type	Serial Number Range	Additional Part Numbers Required (descriptions below)
TS8	TE380 and above	No additional parts required
TS8	TE103-TE379	57-9042B
TS8	TE035-TE102 or xx3860020 and above	11-0898A
TS8	TE001-TE034 or xx3860001-xx3860019	11-0898A, 50-2268A
TS4	xx3850031 and above	11-0898A
TS4	xx3850001-xx3850030	11-0898A, 50-2268A
TS4	xx371xxxx	Upgrade Not Available
TS3	S162 and above* or xx3631xxx *	11-0898A, 50-2268A, 50-2269A
TS3	S001-S161	Upgrade Not Available
TS News	TN001-TN036	11-0898A
TS News	TN036 and above	No additional parts required

*TS3 machines below S230 may also require additional manifold modifications requiring a hole saw (see Manifold Modifications section below).

Here are the descriptions of the part numbers in the table above:

- ❑ 11-0898A: Debris Hooks Kit.
- ❑ 57-9042B: TS8 Debris Removal Bulkhead
- ❑ 50-2268A: Low Profile Clamps Kit
- ❑ 50-2269A: TS3 Bulkhead

Firmware Requirements

MPE software must be at least:

- Trendsetter 800/400 - 2.50
- Trendsetter Spectrum - 1.4
- Trendsetter Autoloader - 1.42

Changes to debris removal related functions have undergone major changes starting with the following versions of MPE firmware:

- Trendsetter 800/400 - 2.52
- Trendsetter Spectrum – 1.61
- Trendsetter Autoloader - 1.50

All versions of Trendsetter MCE firmware also have this new debris removal module.

Commands for each type of firmware are detailed in section 2 or 3 below, referred to as either '**new**' or '**old**' debris removal firmware. To download the required software, read the release notes for the firmware you are installing.

Additional Tools Required

- Foam tape for legs of hose tray
- 1/8" hex key
- 2.5mm and 3mm hex keys
- 7mm wrench (or small crescent wrench)
- Sticky backed anchors #18-3061
- Hole saw for TS3 machines below S230

1.4 Reference Documents

- Thermal Head 1.7x Installation Procedure #77-0074A
- 750-00001A: Debris Removal Firmware Guide, Parameter Values, Descriptions and Flowchart: http://techplanet.creo.com/output/heads/debris_removal/nav/control-set.htm

2. DEBRIS REMOVAL RELATED FIRMWARE SETTINGS/ MODIFICATIONS

2.1 Media Parameters

The previous debris related configuration options in the *media* NVS subsystem (*set media <n> abl*, *set media <n> dr*) have been replaced by *set media <n> dopt* which uses bit positions to enable or disable debris options, and is now password protected (see below). Bit position 0 (decimal 1) is for the whisker jet and replaces the *dr* parameter. Bit position 1 (decimal 2) is for **P**articulate **O**nly **C**ollection (POC) debris removal and replaces the *abl* parameter. Bit positions 3 and 4 are for **P**articulate **A**nd **C**hemical **C**ollection (PACC), for the UDRC-LC processless debris removal option.

It is possible to view the values permitted for this parameter on the device by using the *debris option* command. The following table summarizes the possible values for *set media <n> dopt*:

Debris Option	Options Enabled
1	Whisker jet only
2	POC debris removal only (no whisker jet)

3	Whisker jet and POC debris removal
4	CTP PACC debris removal only (no whisker jet)
5	Whisker jet and CTP PACC debris removal

Due to the potential for releasing regulated emissions when PACC debris removal is not enabled when required, the parameter *set media <n> dopt* is protected from inadvertent modification by means of a password. In order to set a value for this parameter, use the following command:

`set media <n> dopt "hazardous" <debris option>`

2.2 Sys Parameters

The parameters *sys dbin*, *sys scon*, and *sys sbaud* are used to configure the device to support each type of debris removal. For the UDRC-B, the following *sys* subsystem values must be used:

`set sys dbin 1`

`set sys scon 0`

2.3 Debris Parameters and Commands

Refer to 750-00001x-x at:
http://techplanet.creo.com/output/heads/debris_removal/nav/control-set.htm

Here are the required firmware settings under the debris module, accessed under *set debris*:

`set debris nsi 1`
The nozzle sensor is required to be installed for any UDRC.

`set debris nst <value>`
This parameter is used to indicate the type of nozzle pressure sensor installed. Please refer to document *750-00001x Debris Removal Firmware Guide* for the look-up table for the nozzle sensor being used. The default nst value is generally 0, which is the setting for the Motorolla pressure sensor on the TEE or MCE boards.

`set debris se <value>`
This is the elevation at the installation site in meters. Elevations of some 85,000 locations around the world may be found at http://www.worldclimate.com . The barometric (or atmospheric) pressure varies with elevation and weather conditions. The variation in barometric pressure with weather conditions only introduces a small error and is neglected. The change in barometric pressure with elevation is, however, considerable, and must be accounted for.

`set debris nfc <value>`
`set debris nfe <value>`
These nozzle calibration values are to be set based on the current debris removal nozzle being used, which for Trendsetters would be TH1.x or TH2.x. Please consult the document *750-00001x Debris Removal Firmware Guide* for the latest nozzle specific firmware settings.

The command syntax for determining the debris removal status (replacing the previous command of **dr)** is as follows:

`Syntax: debris [option | (<#>|(whisker|poc|pacc)) [<on|off>] | all off]`

Typical operations are:

debris - displays current task state

debris <debris option> - displays status of debris removal type(s)

debris <debris option> <on|off> - enables/disables specified debris removal type(s)

debris option – displays available debris options and values for those options

The <**debris option**> parameter may be one of **whisker**, **poc**, **pacc**, or **a numeric dopt value** from the table above (i.e. **debris 3 on** will enable the whisker jet and POC debris removal).

After setting all the firmware parameters described in this section, save them all to NVS, and reset the machine.

3. FIRMWARE MODIFICATIONS FOR OLD DEBRIS REMOVAL FIRMWARE

3.1 Firmware Commands to Operate and Display Status of Debris Removal System (Old Firmware)

`dr on | off`	Manually turns the debris cabinet blower motor on and off
`dr on`	Starts the debris cabinet blower motor and shows the corrected/nulled vacuum pressure at the nozzle. The blower automatically turns off after 10 minutes, if no imaging is initiated. In normal operation, the blower turns off 10 minutes after the end of the last plot.
`dr`	Lists status of the debris blower

3.2 Filter-present Indication and Masking (Old Firmware)

The filter canister has a plunger-style, filter-present switch at the bottom of the filter canister. The installation of a filter causes this switch to close.

The firmware does not allow the debris cabinet to operate without a filter. (Operator message displayed is “External Debris Blower Filters Not Present”.) However, the filter-present switch can be masked using the “`mask on`” command, for example, “`mask on 34`” for TSAL. To find the mask for other devices, enter “`mask`” and check the mask table under Dblower Filter Fault.

3.3 Vacuum Setpoints (Old Firmware)

An analog sensor system monitors the performance of the debris removal system. Vacuum pressure at the nozzle is routed through a 6mm (OD) blue suction hose to the vacuum sensor port on the TEE board.

Three vacuum setpoints can be set using `set sys dbls #.` Messages appear advising the operator that the filter is Full, almost Full, and/or Nozzle Blocked. The following operator prompts only come up with Print Console, and only when plotting:

- pressure low warning - "External Debris Blower Filters Almost Full (Vacuum Level %d is below %d) "
- pressure too low - "External Debris Blower Not Connected or Filters Full (Vacuum Level %d is below %d) "
- pressure too high - "External Debris Blower System Blocked (Vacuum Level %d is above %d) "
- filter full digital signal (from cabinet) - "External Debris Blower Filters Full"
- filter absent digital signal (from cabinet) - "External Debris Blower Filters Not Present"

Vacuum Setpoint	Possible Causes	Effect	Error Message
Low Stop dbls 10" H_2O	Filter full Severe leaks Hoses or sensor lines not connected Failure of analog board/jumper	Unsolicited error message every 10 seconds. System will suspend at the end of the plot. **Should be fixed ASAP**	External Debris Blower Not Connected or Filters Full (Vacuum Level # is below #)
Low Warning dblw 12" H_2O	Filter almost full Severe leaks Hoses or sensor lines not connected Failure of analog board/jumper	Unsolicited error message every 10 seconds. Problems are less severe than under Low Stop causes.	External Debris Blower Filters Almost Full (Vacuum Level # is below #)
High Stop dbhs 30" H_2O	The inlet of the debris nozzle is blocked	Unsolicited error message every 10 seconds. System will suspend at the end of the plot.	External Debris Blower System Blocked (Vacuum Level # is above #)

4. DETAILED PROCEDURE

4.1 Upgrading Firmware and Machine Parameters

For a detailed procedure to back up and restore NVS parameters, read the release notes for the firmware you are installing. See the following link to firmware for any machine: http://techplanet.creo.com/firmware/index.html

As mentioned above, always refer to the reference tables at the beginning of the Debris Removal Parameters Document 750-00001x-x for the latest debris removal parameters at the following link:

http://techplanet.creo.com/output/heads/debris_removal/nav/control-set.htm

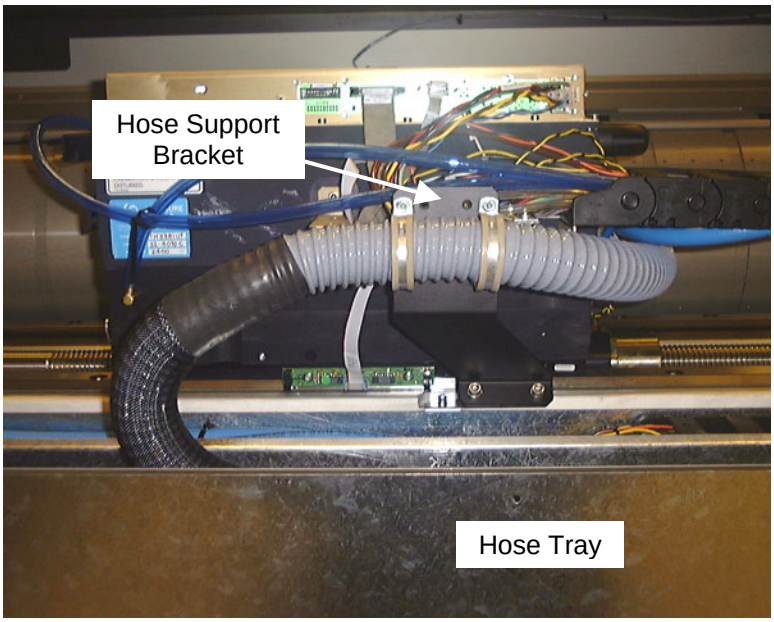
4.2 Removing the V-Head

1. Position the carriage mid-way along the track.
2. Disconnect hoses, cables and flex track from the head.
3. Remove the head from the carriage.

4.3 Installing the Debris Hooks Kit and Nozzle/ Internal Hose kit

Skip this section if you have a TS8 machine **with** #6 marked on the 100 label.

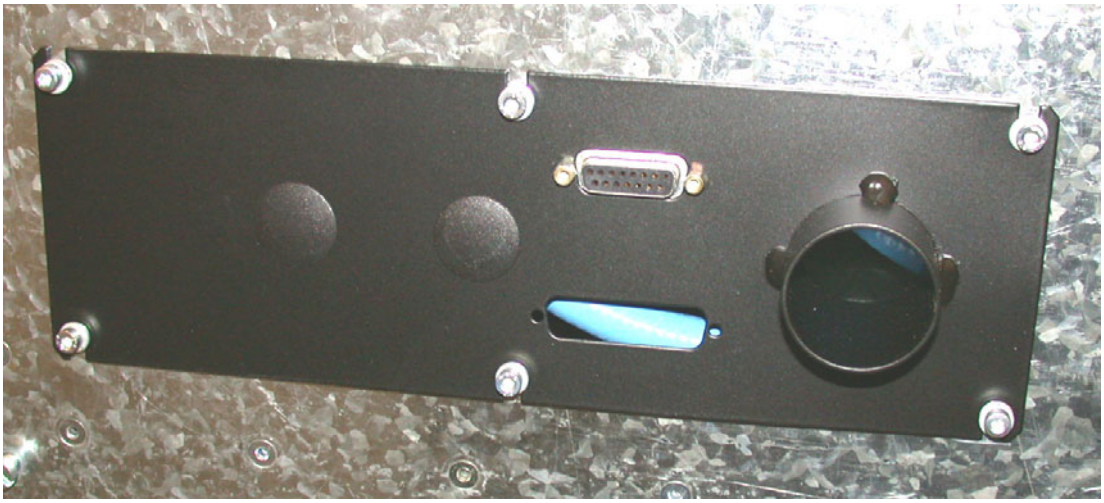
1. Attach the hose tray to the existing cable tray. (Use foam tape on the legs of the hose tray to eliminate vibration.)



2. Attach the hose support plate and bracket (#57-4976x and #57-5790x) to the carriage.
3. Attach the two hose clamps (#52-4940) to the hose support bracket - see photo above.

4. **Do NOT do this next step if you have a TS3 machine - the harness is already in place with the chiller**. Attach the external-chiller/debris cable harness (#10-4567x) to the inside of the bulkhead (i.e.; the side that faces into the inner workings). The external-chiller/debris cable harness attaches near the desiccant box in the fanbox and also in the power box. Reference the following assembly drawings for connection details:

   10-3926x – TechPlanet / Trendsetter 400/800 / parts/tools / cables / MPE cables
   10-4567x – TechPlanet / Trendsetter 400/800 / parts/tools / cables / MPE cables

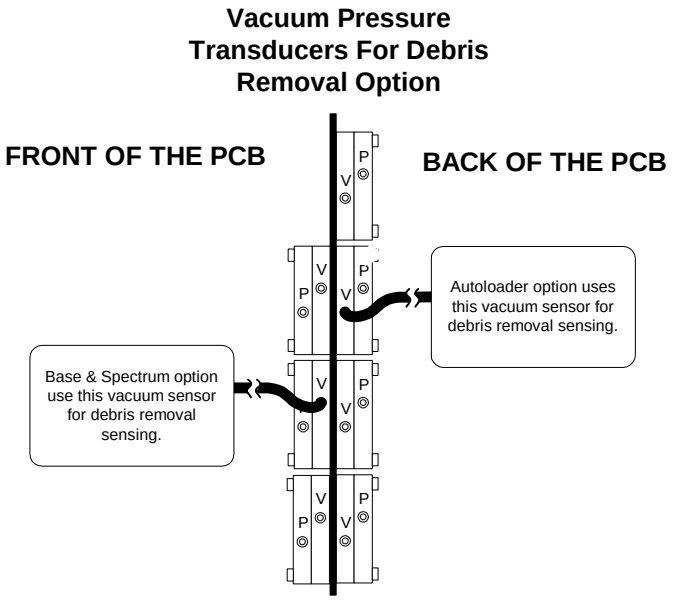


5. Remove the rear fan box dress panel and blanking panel. Attach the bulkhead to the rear of the fan box.

   Note: For a **TS3,** the fan box is on the opposite side of the machine than the one shown. Modify the existing bulkhead with kit #50-2269x to provide an exit for the debris removal hose. If the machine serial number is less than S230, then your machine doesn't have a removable plate. You'll have to drill a hole in the bulkhead plate.

6. Route the 6mm blue air tube (#56-1242) from a location close to the head through the flex track to the TEE board (used to read pressure at the nozzle and feed it back to firmware for diagnostic purposes).

7. Attach fitting #55-0686 to the TEE board end of the tube. Then attach the fitting to the TEE board as shown in the drawing below.



4.4 Manifold Modifications

These modifications apply to machines that don't have the 6mm air line on the manifold:

- TS8 machines without #3 marked on the 100 label
- TS4 machines without #9 marked on the 100 label and all TS3 machines

1. For TS4 and TS8 machines, replace the 4 mm speed control on the manifold with the 6mm speed control (#55-1038). For TS3, use a #55-1133 reducer to connect to the 4 mm air jet at the manifold.

2. For all machines, route the 6mm air tube (#56-3290) from the speed control or reducer through the flex track ending up close to its final location at the head (head is still out of the machine).

4.5 Installing Low Profile LEC Clamps

Replace clamps and pivots for any all TS3 machines and TS4 machines that don't have #8 on the 100 Label. Use low profile clamp #50-2114x (includes pivot). The existing pivot blocks are to be replaced with #57-6851x and #57-7698x (for TS3, at ends only). See the separate upgrade document at:
http://techplanet.creo.com/output/heads/debris_removal/nav/upgrades.htm

4.6 Installing the UDRC-B and Internal Components Kit

Installing Hoses and Communications Cable from Machine to Canister

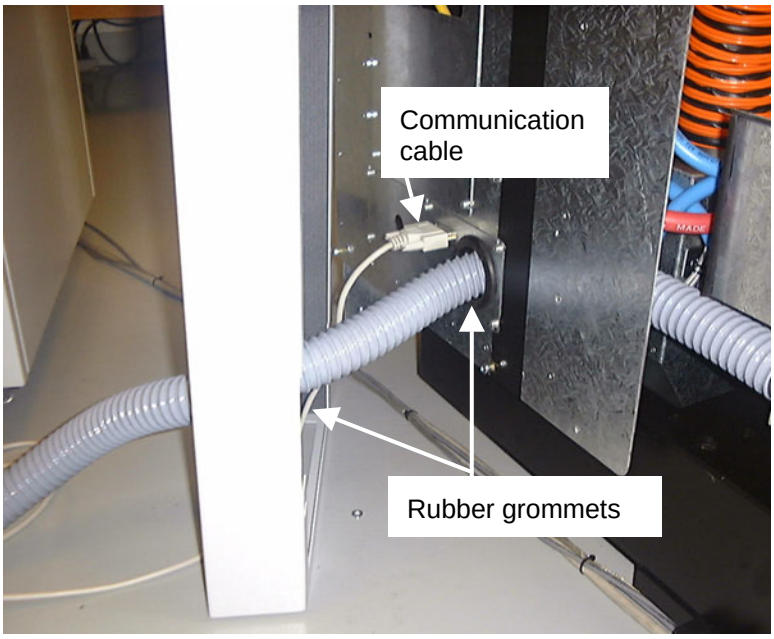
The debris collection hose looks like an ordinary vacuum cleaner hose except the center section is enclosed in a black sheath. The shorter section of uncovered hose goes to the nozzle on the head and the longer section goes through the bulkhead to the canister.

1. Loosen the clamps on the hose bracket mounted to the carriage. Route the debris collection hose through the clamps on the hose bracket. Position the clamps at the end of

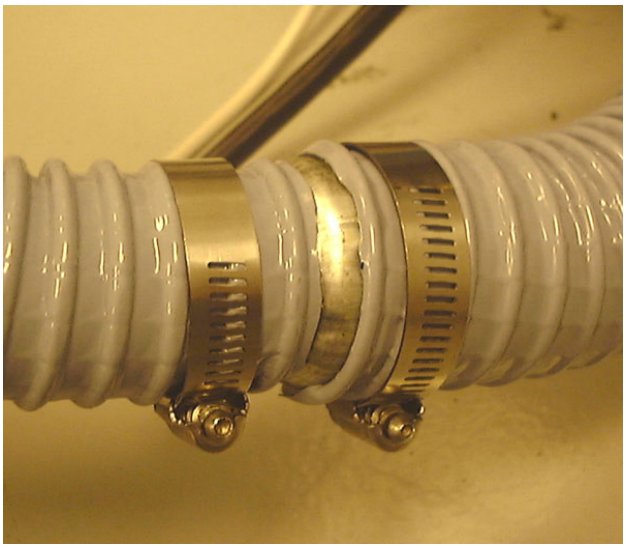
the black section nearest the nozzle end of the debris collection hose. Do not tighten the clamps so the hose can be adjusted at a later step.

2. Lay the hose in the hose tray.

3. Feed the bulkhead end of the debris collection hose through the bulkhead and rear dress panel. Secure with the rubber grommets (#59-3504) at both locations. **Note:** the bulkhead for TS3 is on the opposite side and looks slightly different than shown in the photo below, also, the latest bulkhead panel is that shown above in section 4.4.



4. The canister hose and the debris collection hose may be different sizes. If so, use the adaptor fitting to join the 1.75" ID canister hose to the debris collection hose (shown below), otherwise use the straight 1.5” pipe. Some machines have a direct connection in the bulkhead and don’t need any adaptor. Secure each hose with a clamp (#52-4558). This is not necessary with the new bulkhead shown in section 4.4 above.



5. Attach the DB15 communication cable (#16-3877) to the bulkhead.
   Note: if the device has a chiller, then leave the communication connection between the chiller and the machine as is. Use the DB15 communication cable to daisy chain from the chiller to the canister.

6. Replace the rear dress panel of the fan box.

7. Attach the canister hose to the canister with clamp (#52-4558).

8. Connect the DB15 communication cable to the canister. Attach the power cord to the canister.

9. Install the filter in the canister if not already in place.

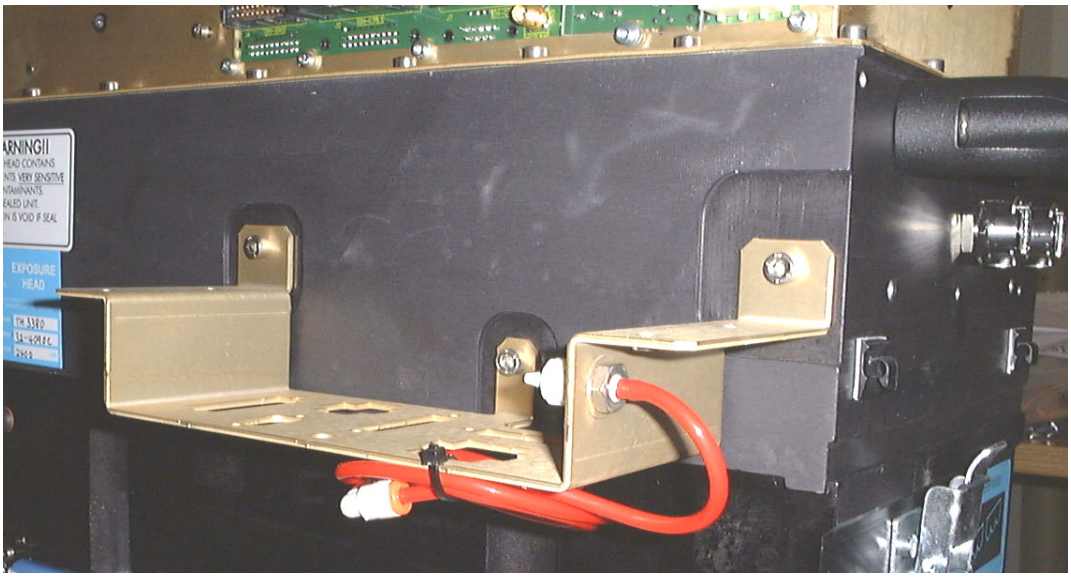
Installing the Air Jet Plate and Nozzle on the Head

The procedure given in this section describes how to fit the head with an air jet plate that replaces the whisker jet in functionality. (The head must have #6 marked on the 100 label to accept the new air jet plate.) Its purpose is to blow the byproducts of imaging away from the write beam to preserve image quality. The air jet consumes a small amount (10 cfh @ 50 psig, typical) of compressed air taken from the air supply line to the head.

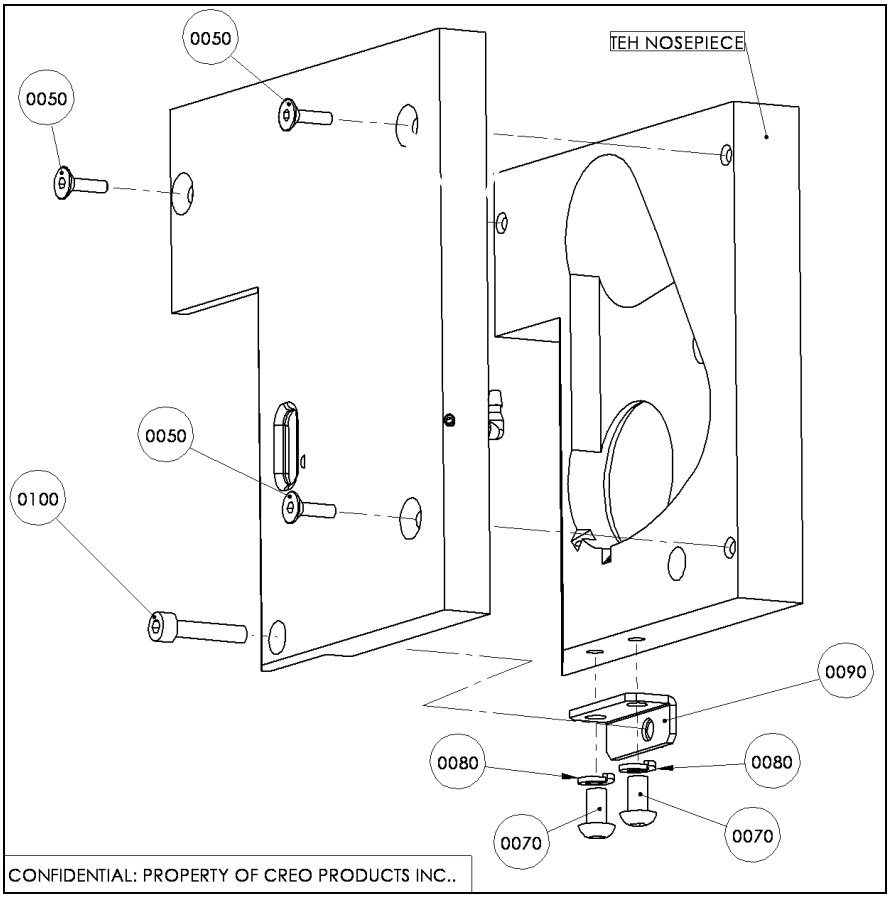
The head is also fitted with a debris removal nozzle, which has three ports:

- A debris suction port for the 1-1/2" vacuum hose
- A throttle valve that regulates (100 cfh @ 45 psig, typical) the air supplied to the Air Curtain. This compressed air is taken from the air supply line off the manifold.
- A vacuum sensor port for the vacuum sensor line

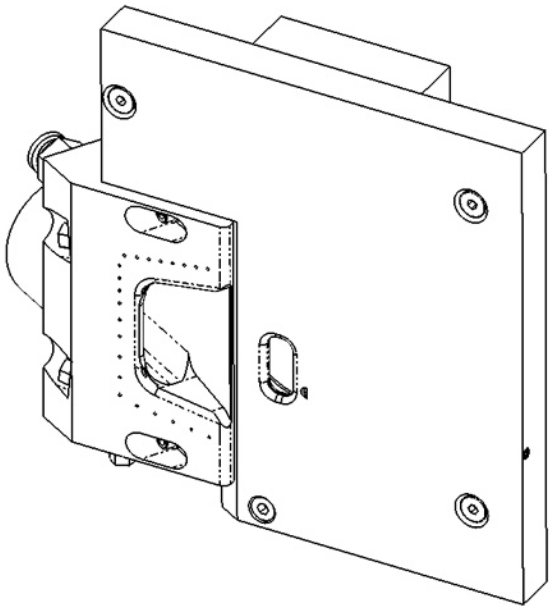
1. Remove the entire piece of red tubing that goes to the whisker jet and unscrew the hose fitting. Secure as shown.



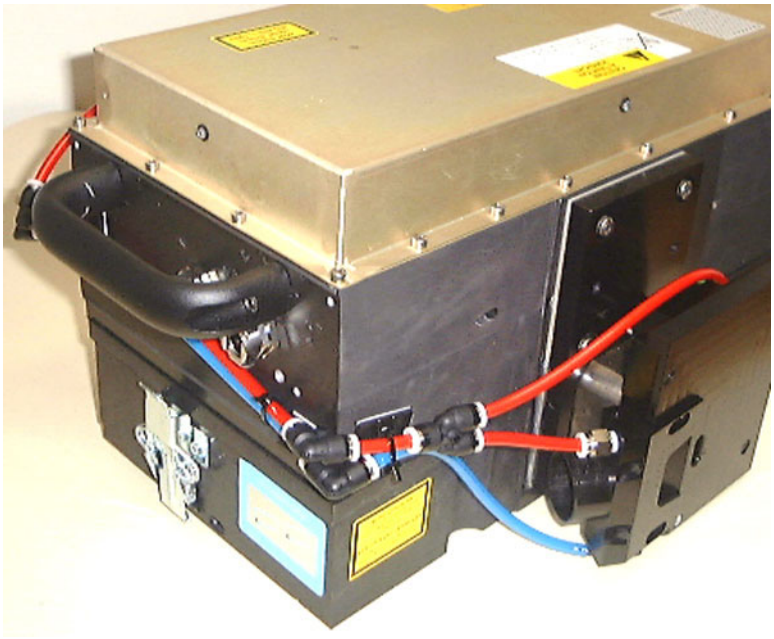
2. Attach the air jet plate (#30-1163B) to the shutter block as shown.

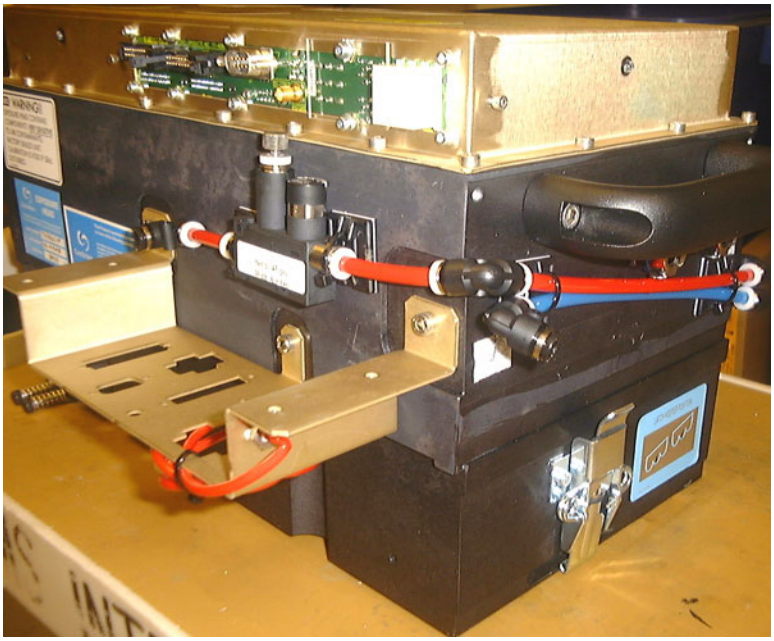


3. Install the debris nozzle (#50-2117C) so it will be as flush to the drum as possible.



4. Use sticky backed anchors to attach the air supply lines and elbows to the head as shown in the photo:





Re-Installing the V head

1. Re-install the head. See 77-0074x Thermal Exposure Head 1.7x Installation Procedure.
2. Check the clearance between the nozzle/plate and the drum clamps (1 mm min). If there is any sign of contact, adjust the head away and run a focus series to determine the final head position. Also check the tightness of the screws holding the Leading Edge Clamps.
3. Connect the 6 mm air line coming from the manifold. to the red tubing on the head

4. Connect the blue air tube (that was routed to the TEE board) to the blue tubing on the head.
5. Connect the debris collection hose to the head with clamp #52-4558. Make sure the clamp is rotated so that it's easily accessible with a screwdriver.
6. Pull the slack out of the hose and then tighten the two clamps on the hose support bracket.

4.7 Final Mechanical Checks

1. Check all connections to head – electrical cables, liquid cooling lines, air line, and debris hose. Ensure head ground wire ring terminal is installed with star washer under the screw attaching the flex track bracket to the head.
2. Cycle the carriage head along the full length of the track to check the location of the tie wrap, and adjust if necessary.
3. Check the tightness of all clamps on debris hose.
4. Check the integrity of all electrical connections on bulkhead connector panel.
5. Clean all horizontal surfaces around engine.
6. Check the hose connections and electrical connections to the filter unit and to the chiller, if installed.
7. Check the clearance between nozzle and clamps.

4.8 Final integration and testing

1. Power-up the machine.
2. Set the pressure for the head's air supply:
   - first activate the air jet supply with >>`act dblow on`, or `>>debris 1 on`
   - then set the pressure on the guage to the value indicated on the gauge's sticker
3. Perform function tests
   - To start or stop debris removal:
     `act dr on|off` OR
     `debris 3 on`
   - To display the status of the debris removal system:
     `dr` OR
     `debris 3`