Speed Upgrade Procedure

TS4 Devices

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1. INTRODUCTION

This document describes the procedures required to upgrade a Trendsetter 3230 TS4 platform device from a 20W to 40W imaging head. Note that this procedure applies ONLY to **Heidelberg** serial number ranges **Sxx385xxx** and is not available on any Creo TS4 device (serial number range TFxxx)

2. OVERVIEW

In general, the Trendsetter 3230 TS4 platform does not support 40W upgrades. However, newer Heidelberg-built TS4 devices were built to support internal water cooling. This procedure will describe the steps required to upgrade Heidelberg-built Trendsetters with serial number range **Sxx385xxxx**. Other TS4 devices are not supported.

The Sxx385xxxx series of Heidelberg-built Trendsetters have the heat exchanger in place, however, the S models use 20W heads, so the heat exchanger is not used and a 40W and 48V upgrade is required. The F and V model devices use a 40W head, and so only a head replacement and UDRC cabinet is required.

Please read through this entire procedure prior to starting work to ensure you have everything you need to complete the job.

This procedure describes the installation of **02-4405A** - Speed Upgrade 3230 (TS4).

3. 48V CONVERSION (S MODELS ONLY) – 1 HOUR

1. Move the carriage to the center of the engine by typing `carriage moveto 20000`
2. Power down the Trendsetter
3. Disconnect the cabling from the thermal head and remove the head from the Trendsetter. This will not be re-used.
4. Open the power box access panel
5. Disconnect the existing PS5 24V power supply from the floor of the power box by removing the AC primary and DC secondary wiring from the power supply.
6. Remove PS5 from the power box.
7. Install the new PS5/PS6 power supply assembly (10-3919). 10-3919 mounts directly to the floor of the power box where the previous PS5 was located.

Note: The relay on this assembly will not be used, nor will the other parts that came with assembly 10-3939.

8. Attach the AC wiring harness from the original PS5 to the new Aztec PS5 AC input.
9. On the PS5 primary AC cabling harness in the power box, locate the 3 unused and terminated wires; they will be tied back close to PS5. These are the primary AC input wires for PS6.

Connect these 3 wires to the AC input of PS6.

Note: The AC input wiring for PS5 and PS6 are not interchangeable, as PS5 is switched and PS6 is unswitched.

10. Remove the 3x3 to 1x6 adapter from cable 10-3897A at the head end of the cable track and tie back the 2x3 cable (10-3937). This connector is not used on the 40W head.

11. Using an ohmmeter, measure the continuity of 10-3897A between the DC output at each of the 4 wires from the original PS5 and the thermal 1.7x head power connector. This is done to identify the correct wires for connection to the new power supplies.

CAUTION: Incorrect connections can damage the head!

12. Connect the wires to the new PS5/PS6 supplies as follows:

Pin1	PS6+
Pin 3	PS5+
Pin 4	PS6-
Pin 6	PS5-

13. On the relay delay control board (RDC), unplug cable 10-3892 from J10.

14. Remove and discard the short 2 – 3 pin adapter cable plugged into 10-3892.

15. Plug cable 10-3892 into J9 on the RDC.

16. Near the RDC board, locate the unconnected, tied-back, 3-pin connector. Plug this connector into J10 on the RDC board.

4. 40W UPGRADE (S MACHINES ONLY) – 2 HOURS

1. Remove the fan box access panel.

2. Remove the rear fan box dress panel. See Figure 1.



Figure 1: Rear fan box dress panel removed

3. Remove the rear panel.
4. Remove the sheet metal cover from the acoustic enclosure above the fan box shelf. There are 3 screws on the left of this cover and 2 screws on the right side of the fan box. See Figure 2



Figure 2: Fan box filter, shelf, and acoustic chamber cover

5. Remove the desiccant box from the side of the acoustic chamber if it is present.
6. Remove the side and rear walls from the acoustic chamber. These will be replaced later.
7. Remove the fan box shelf.
8. Remove the filter and fan assembly from the bottom of the fan box.
9. Disassemble the filter and fan assembly.
10. Remove the spacer between the filter housing and fan and replace with the Heat Exchanger unit.
11. Add the second inlet ring and fan beside existing fan.
12. Install the filter, fan, and heat exchanger in the fan box.
13. Re-install the shelf, and rear and sidewalls of the acoustic chamber.

14. Install the new 3 ½" hose with adapter collar. This should be installed from the engine compartment and routed from the front of the sidewall to the side of the acoustic chamber. Use silicon as needed. See Figure 3 and Figure 4

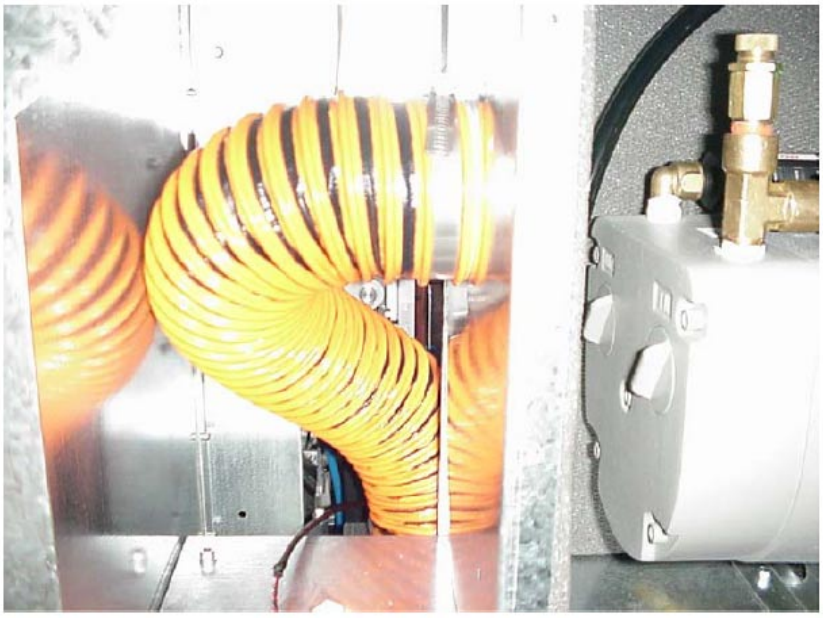


Figure 3: Acoustic chamber air duct routing

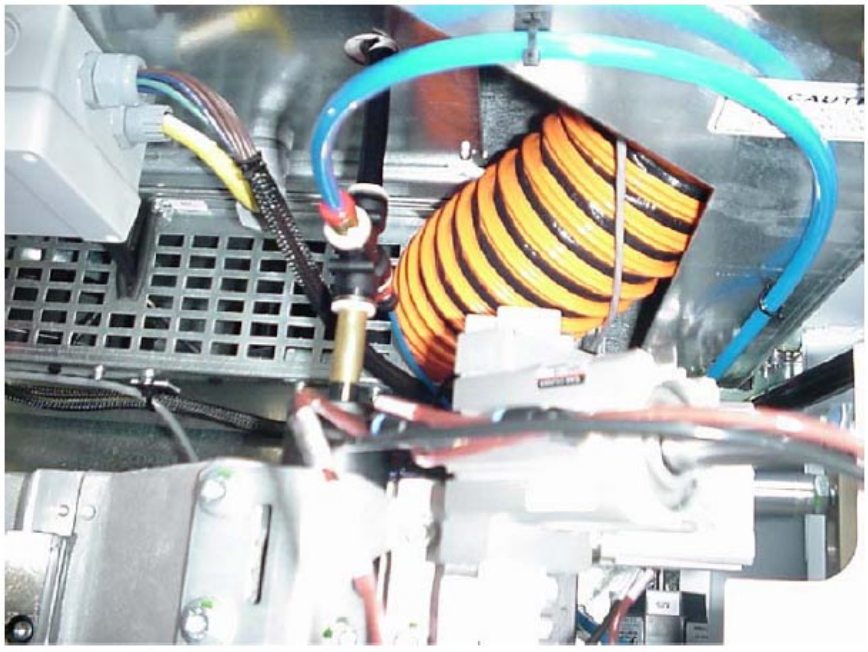


Figure 4: Engine compartment air duct routing

15. Install DHU according to *77-0225 -Dehumidifier Unit Installation Procedure.*

16. Install the water pump on the fan box shelf on the right side.

    - Ensure the blue plastic grommets are in place on the mounting bolts to allow for dampening. Do NOT over tighten the mounting bolts.

- Tighten the bolts finger tight, use Loctite, and ensure the bolts do not protrude past the pemnuts. See Figure 5



Figure 5: Mounted water pump

17. Ground the pump to the fan box shelf using the ground wire.
18. Add the sheet metal covers around the pump outlets on the rear of the fan box.
19. Wire the pump and new fan into junction box on the rear of fan box, being sure to install the capacitor. See Figure 6 for wiring detail

    Use the strain relief on the cables at the junction box.
20. Mount the reservoir bracket to the rear of the frame and mount the reservoir to the bracket.
21. Connect all hoses and route the head hoses through the flex track. See Figure 7 and Figure 8.

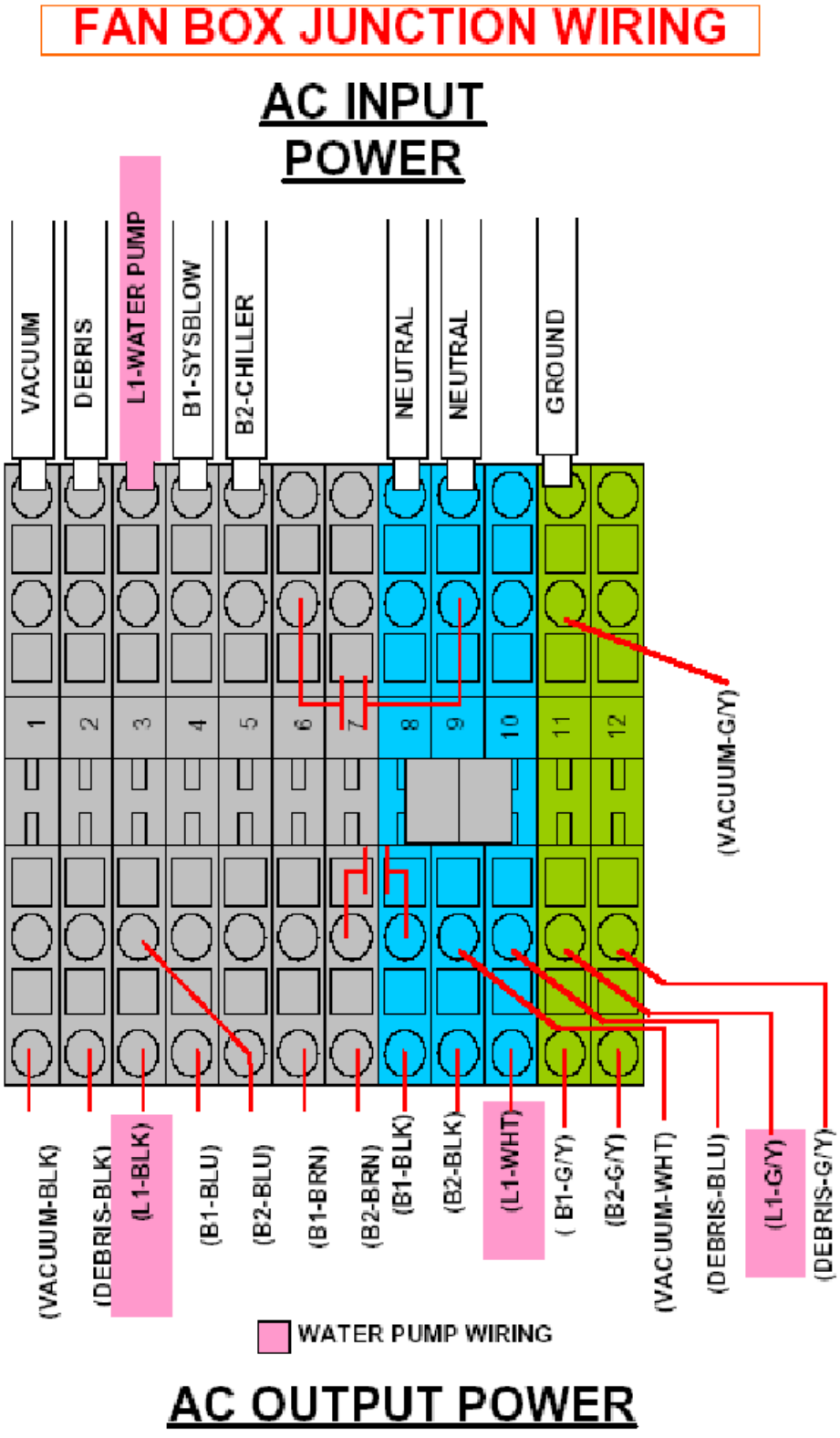


Figure 6: Fan box junction wiring

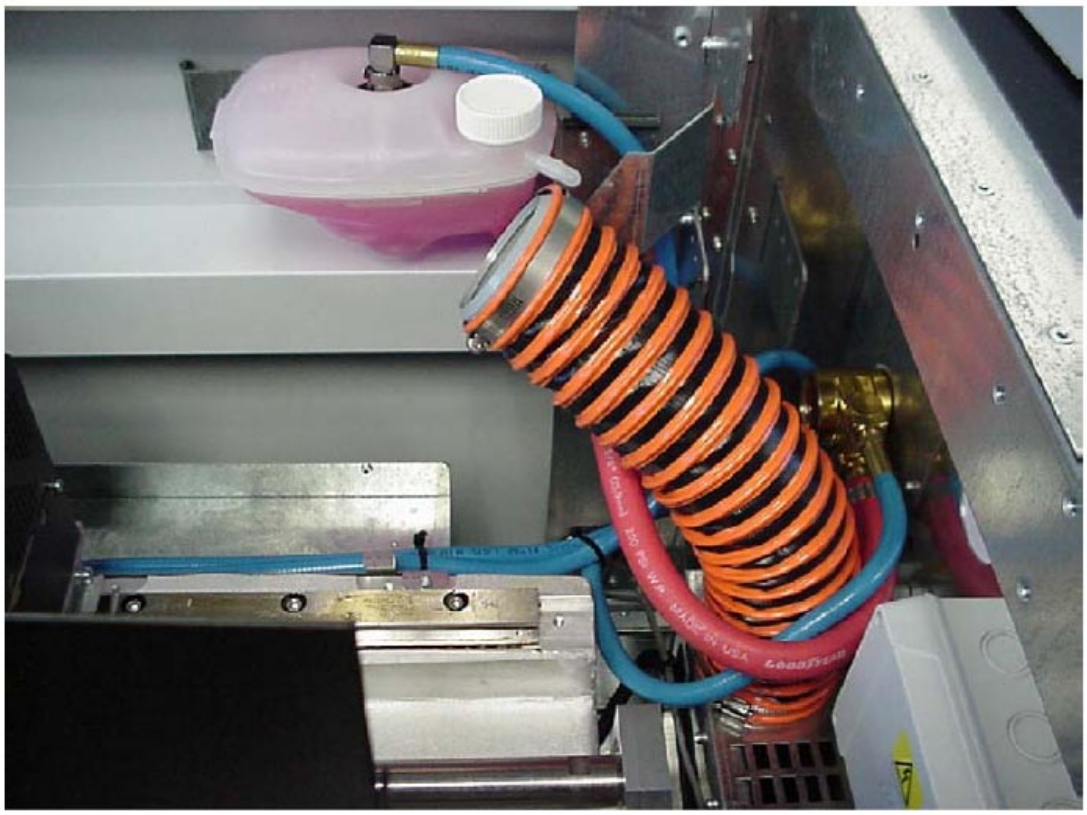


Figure 7: Cooling hose routing and reservoir mounting

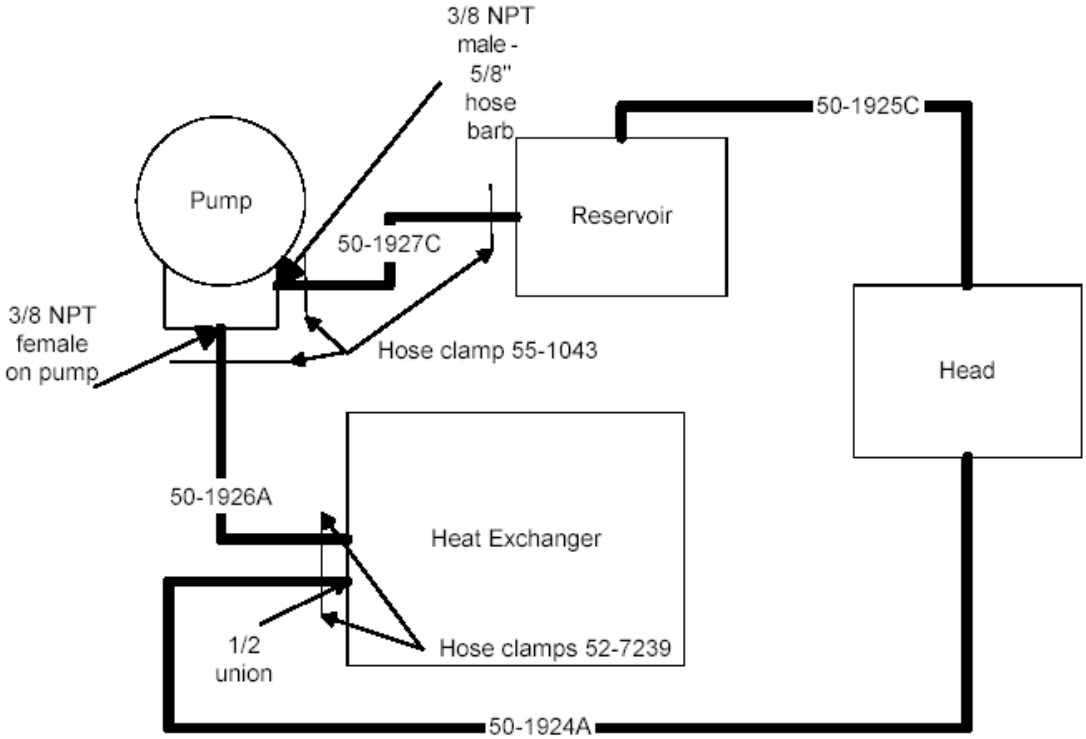


Figure 8: Hose routing schematic

5. LOW PROFILE CLAMPS– 1 HOUR

Note: Do not use this procedure if #8 is marked on the 100 label.

1. Clean the groove on the underside of the new low profile clamps with alcohol.
2. For each of the 6 low profile clamps, remove the paper backing from 9 of the lead weights and firmly press them into the groove on the back of the clamp as shown in Figure 9.

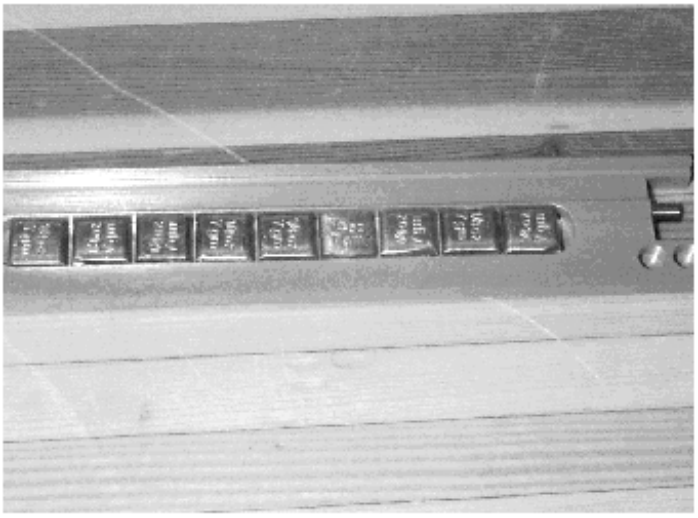


Figure 9: Low profile clamp with weights

3. Remove the old clamps from the drum, being sure to retain the springs and pivot block screws. The pivot blocks MUST be replaced, as the hole is in a different location.

Note: The extruded drum and cast drum have different LEC spring sizes. Spares of both spring types are included in the low profile LEC kit. PLEASE be sure to use the correct size spring in the event of a replacement.

4. Re-install the springs into the drum along with the lead-weighted clamps and new pivot blocks.
   Be sure to use the shorter pivot blocks on the outside drum positions.
5. Use Loctite 242 on the pivot block screws and torque them to 3Nm.
   Do NOT over tighten the pivot block screws.
6. Press down on the clamps to make sure the springs are seated, that the clamps are not binding, and they are functioning properly.

5.1 Backbone and LEC Gap adjustment

1. Remove leading edge clamp (LEC) backbone and film guide from device
2. Separate the film guide from the LEC backbone
3. Remove film guide clevis, nut, and washer from the LEC backbone

4. Apply Loctite 242© to the clevis and re-install it in the backbone without the nut and washer.
   Ensure the screw is threaded deep enough to allow the clevis to sit flush on the backbone.
   See Figure 10

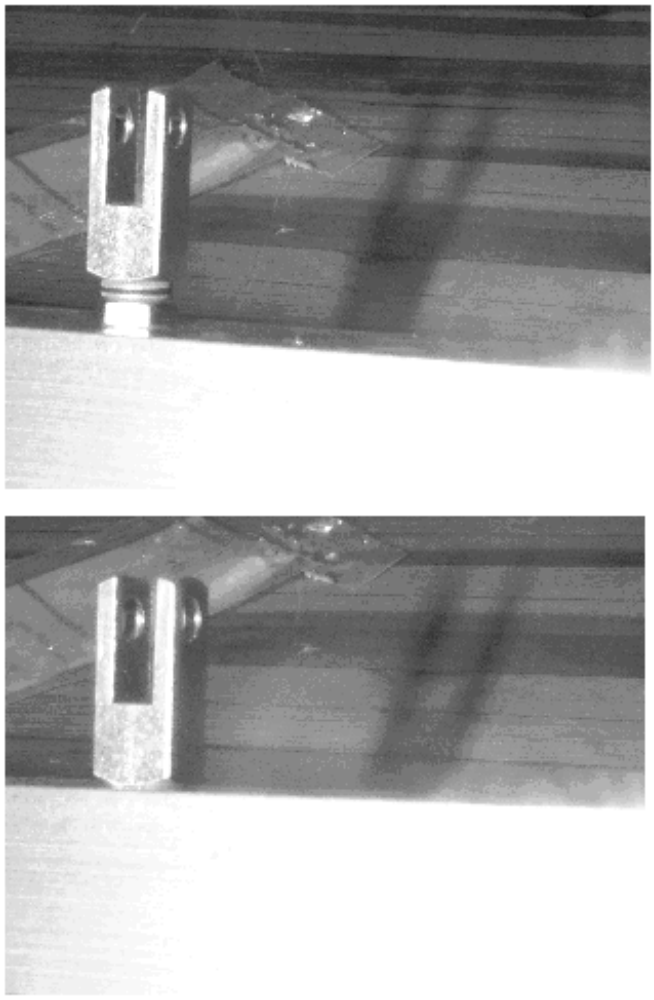


Figure 10: Film guide on LEC

5. Re-adjust the clamp gap according to the LEC clamp specifications.
6. Install the film guide on the LEC.
7. Adjust the space between the closed film guide and the drum according to the film guide specifications.

6. HEAD AND UDRC INSTALLATION – 4 HOURS

6.1 Installing debris hooks and nozzle/internal hose kits

1. Position the carriage in the middle of the engine if it is not already there.
2. Attach the hose tray to the existing cable tray. (Use foam tape on the legs of the hose tray to eliminate vibration.)

3. Attach the hose support plate (57-4976) and bracket (57-5790) to the carriage.
4. Attach the two hose clamps (52-4940) to the hose support bracket. See Figure 11

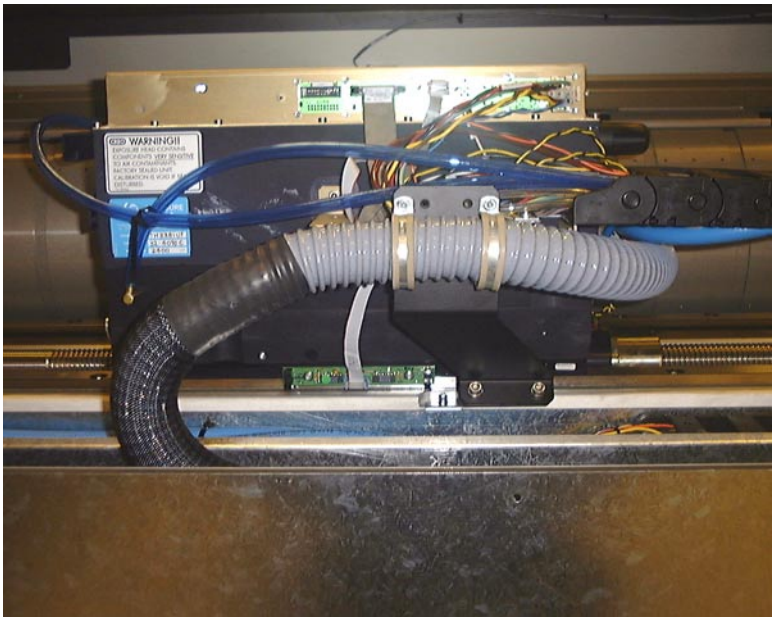


Figure 11: Hose support tray and bracket

5. Remove the fan box blanking panel and attach the bulkhead plate to the rear of the fan box. See Figure 12



Figure 12: Bulkhead plate

6. Attach the DB15 connector on the external chiller/debris cable harness 10-4567 to the inside of the bulkhead and route the other end to the power box.
   Leave the shorter section in the fan box
7. Remove cable 10-3893 from J19 on the TEE board.
8. Plug the 2x6 mate-n-lock connector on 10-4567 into J19 on the TEE board.
9. Plug 10-3893 into the 2x6 mate-n-lock on 10-4567, creating a pass-through

10. Locate cable bundle 10-3926, plugged into J20 on the TEE board.
    Unplug 10-3996 from the 2x3 mate-n-lock on this cable bundle and plug the 2x3 mate-n-lock from 10-4567 into it.

11. Plug 10-3996 back into the 2x3 female on 10-4567, creating a pass-through

12. Locate cable 10-3927 behind the fan box. This cable should terminate at an unconnected 2x3 mate-n-lock secured to the rear of the fan box duct chamber in the engine compartment.

13. Plug the remaining 2x3 mate-n-lock connector from 10-4567 into 10-3927

14. Route the 6mm blue air tube (56-1242) from a location close to the head through the flex track to the TEE board

15. Attach fitting 55-0686 to the TEE board end of the tube. Then attach, the fitting to the TEE board as shown in Figure 13

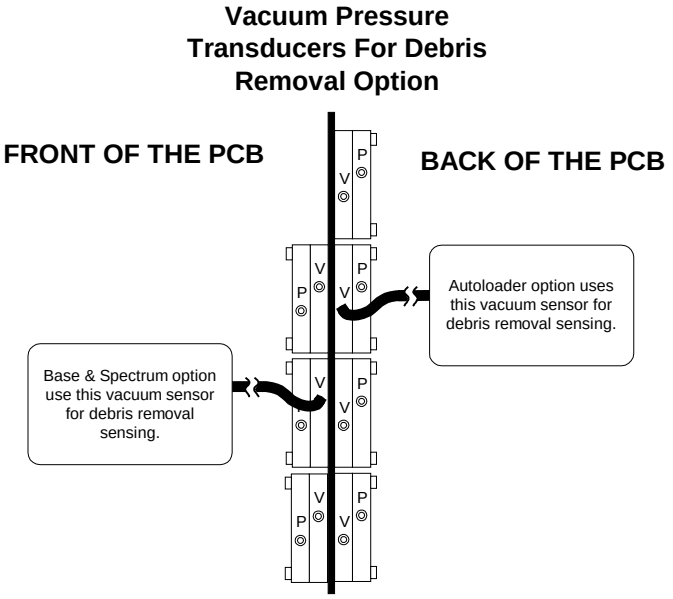


Figure 13: TEE board connections

6.2 Manifold Modifications

Note: Do not use this procedure if #3 is marked on the 100 label. These modifications apply to devices that don't have the 6mm airline on the manifold.

1. Replace the 4 mm speed control on the manifold with the 6mm speed control (55-1038).

2. Route the 6mm air tube (56-3290) from the speed control or reducer through the flex track, , and make sure that the tube is close to its final location at the head.

6.3 Installing the UDRC-B and Internal Components Kit

6.3.1 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.
2. Route the debris collection hose through the clamps on the hose bracket.
3. 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.
4. Lay the hose in the hose tray.
5. Feed the bulkhead end of the debris collection hose through the bulkhead and rear dress panel as shown in Figure 14.

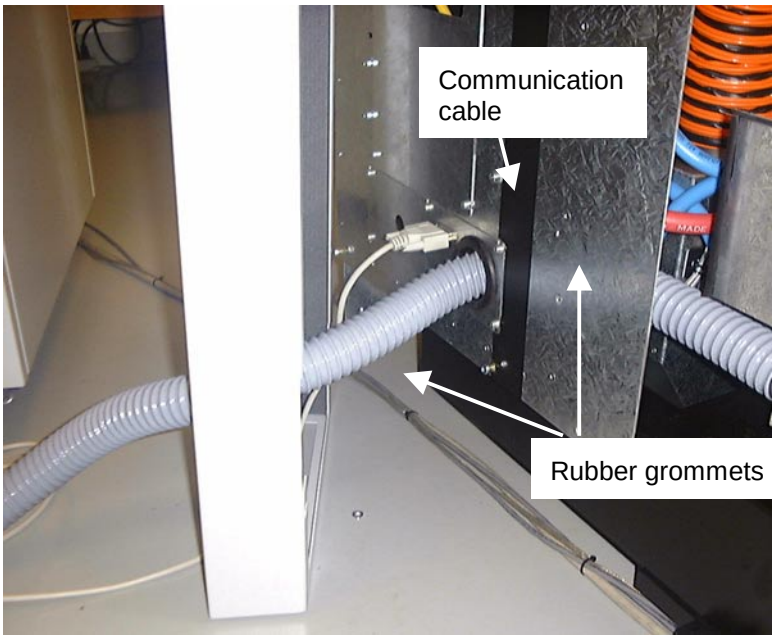


Figure 14: Debris hose bulkhead routing

6. Secure with the rubber grommets (59-3504) at both locations.
   Note: the latest bulkhead panel is that shown in Figure 12
7. If the canister hose and the debris collection hose are different sizes, use the adaptor fitting to join the 1.75" ID canister hose to the debris collection hose (shown in Figure 15), otherwise use the straight 1.5” pipe.

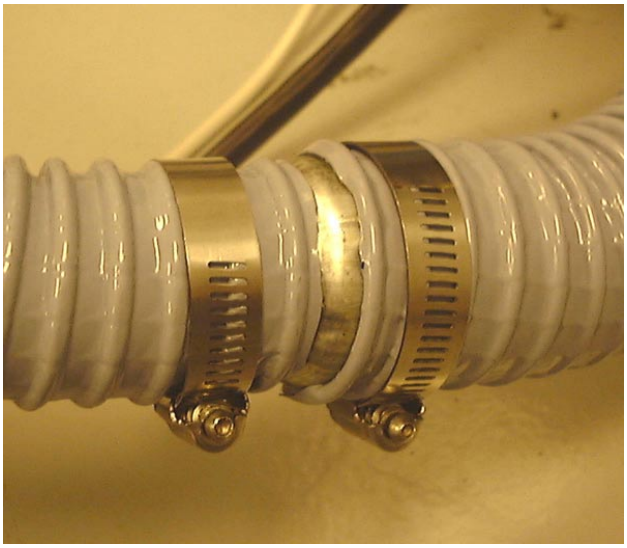


Figure 15: Reducer

Some devices 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 Figure 12

8. Attach the DB15 communication cable (16-3877) to the bulkhead.
9. Replace the rear dress panel of the fan box.
10. Attach the canister hose to the canister with clamp (52-4558)
11. Connect the DB15 communication cable to the canister.
12. Attach the power cord to the canister.
13. Install the filter in the canister if not already in place.

6.3.2 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. **Note: The head must have #6 marked on the 100 label to accept the new air jet plate.**

The purpose of the air jet 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 in Figure 16

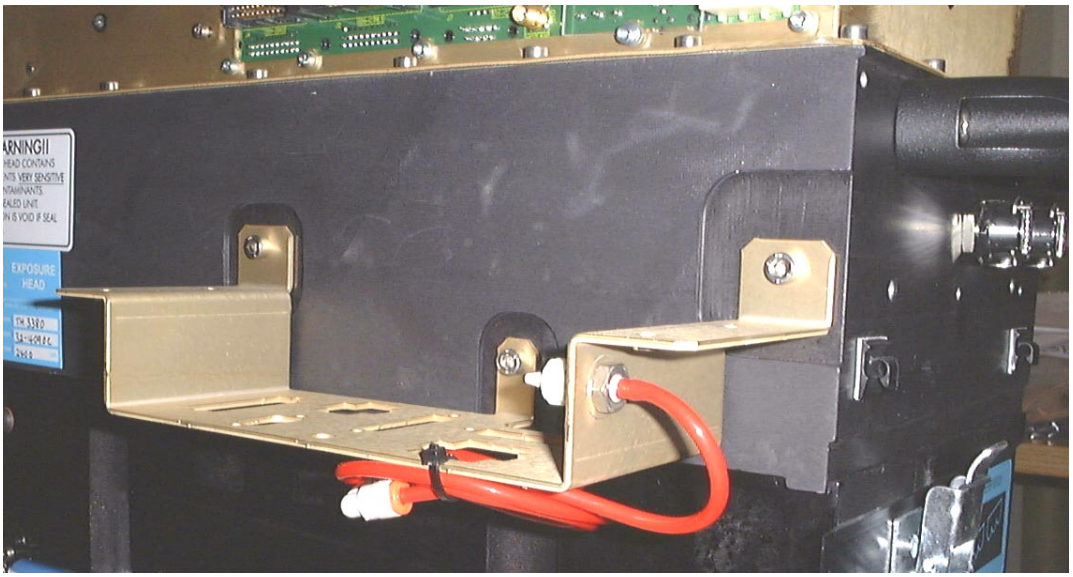


Figure 16: whisker jet hose tied back

2. Attach the air jet plate (30-1163B) to the shutter block as shown in Figure 17.

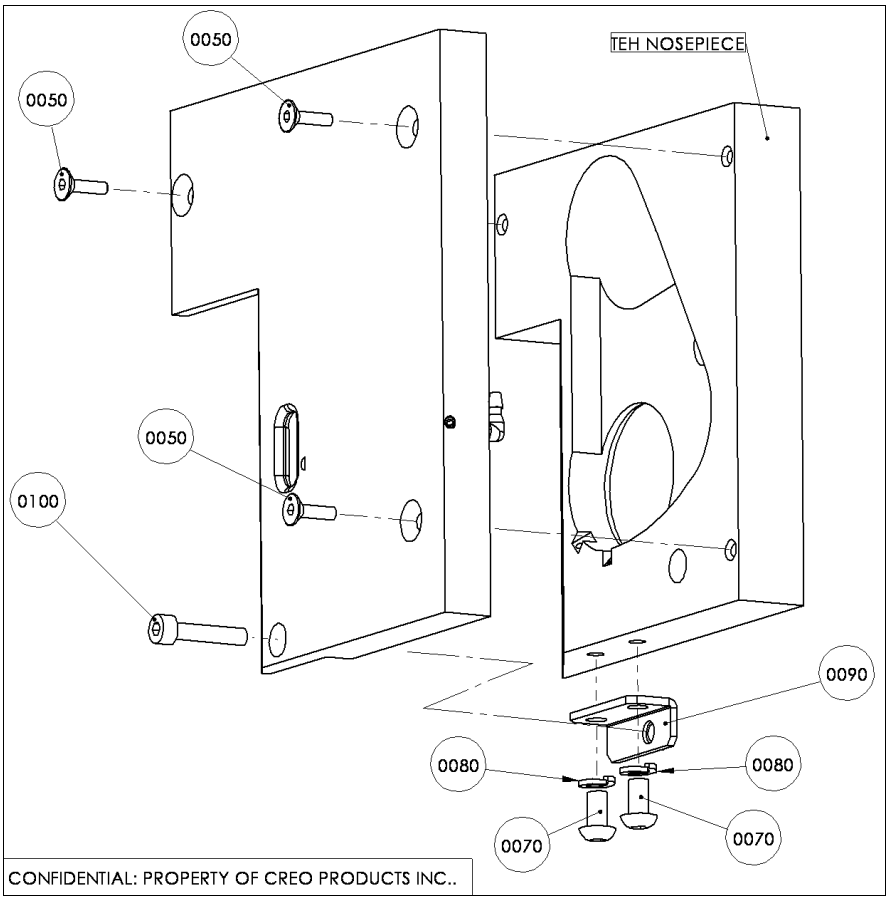


Figure 17: Shutter plate installation

3. Install the debris nozzle (50-2117C) so it will be as flush to the drum as possible. See Figure 18

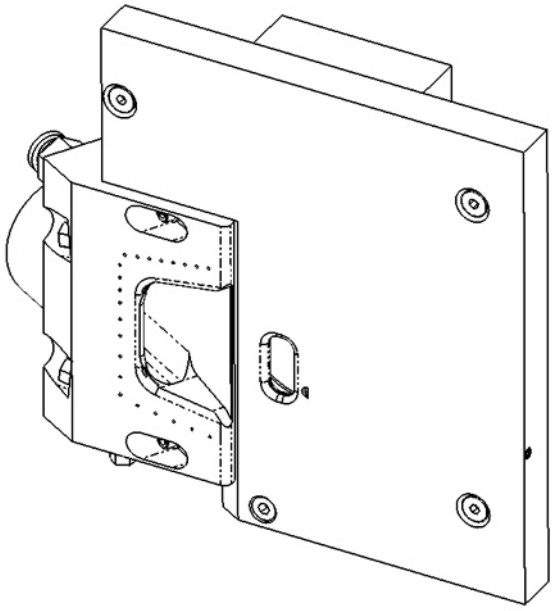
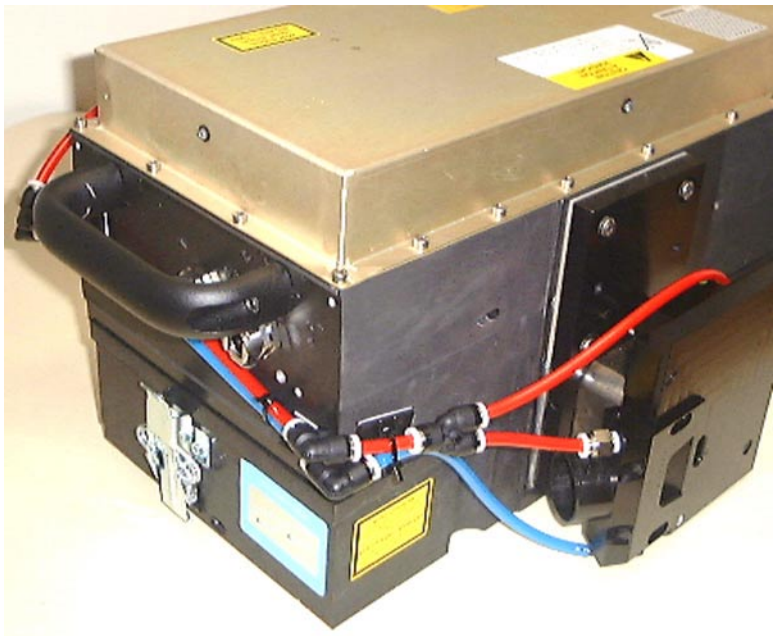


Figure 18: nozzle installed on plate

4. Use sticky-backed anchors to attach the air supply lines and elbows to the head as shown in Figure 19



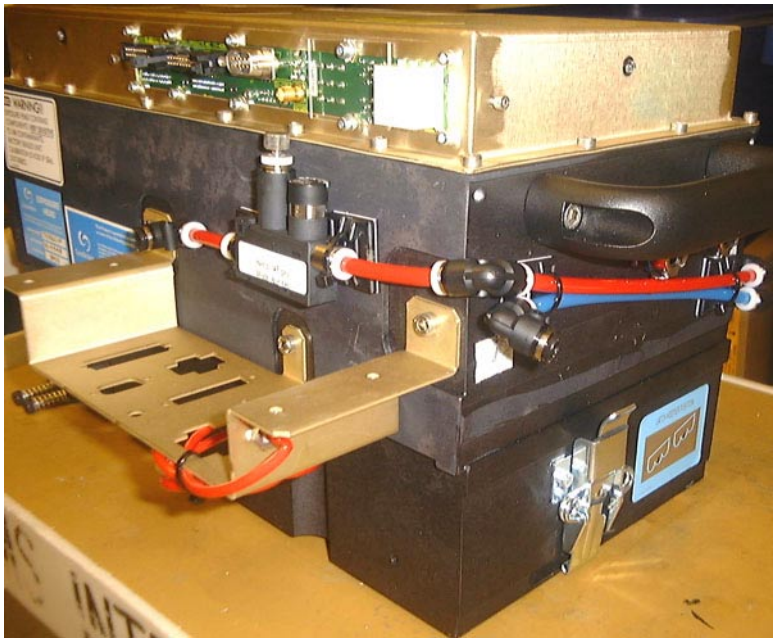


Figure 19: Head hose dressing

6.3.3 Re-Installing the V head

1. Re-install the head. See *77-0074 - 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.

7. FINAL MECHANICAL CHECKS

1. Check all connections to the head – electrical cables, liquid cooling lines, airline, and debris hose.
2. Ensure that the head ground wire ring terminal is installed with a star washer under the screw attaching the flex track bracket to the head.
3. Cycle the carriage head along the full length of the track to check the location of the tie wrap, and adjust if necessary.

4. Check the tightness of all clamps on debris hose.
5. Check the integrity of all electrical connections on the bulkhead connector panel.
6. Clean all horizontal surfaces around the engine.
7. Check the hose connections and electrical connections to the filter unit.
8. Check the clearance between nozzle and clamps.

8. FIRMWARE – 2 HOURS

Please ensure you have the latest controlled release for the TS4 installed. (See http://techplanet.creo.com/output/computer_to_plate/trendsetter_3244/nav/control-set.htm or http://techplanet.creo.com/output/computer_to_plate/trendsetter_al/nav/control-set.htm)

For full UDRC functionality, the firmware version must be at least 2.52b. For TS4 AL, the firmware must be at least 1.52. This procedure will not include information on how to control and query debris removal for older firmware.

8.1 Media Parameters (New Functionality)

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

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 chemistry-free 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

Note: ** All options not indicated on this table are invalid on TS800/400.

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**>

The emissions intensity is set by the command:

Set media <n> ei <ei value>

Note: always check the current `ei` value for the relevant media since this value is subject to change with advancements in filter design, or media testing.

The emissions intensity is only used in conjunction with the UDRC-LC, for the purposes of chemical filter life monitoring. This document is limited in scope to the UDRC-B (no chemical filter). For regular media (that is, non-chemistry-free, such as the Anthem plate), the `ei` value may be left at its default.

8.2 Sys Parameters (New Functionality)

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

8.3 Debris Parameters and Commands (New Functionality)

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 *750-00001 - 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 Motorola 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 negligible. 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 *750-00001 - 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 device.

8.4 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 device:

http://techplanet.creo.com/firmware/index.html

Read the detailed instructions on loading the firmware in the firmware release notes for that version, and also familiarize yourself with any new parameters or features. As mentioned above, always refer to the *Debris Removal Parameters Document 750-00001* for the latest debris removal parameters at the following link:

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

9. FINAL INTEGRATION AND TESTING

1. Power-up the device.
2. Set the pressure for the head's air supply:
   - activate the air jet supply with `act dblow on`, or `debris 1 on`
   - set the pressure on the gauge to the value indicated on the gauge's sticker
3. Perform function tests
4. To start or stop debris removal:

   `act dr on|off` OR `debris 3 on`

5. To display the status of the debris removal system:

dr OR `debris`