Trendsetter 400/800 Chemistry-Free Plate Imaging System, UDRC-LC

Installation/ Upgrade Procedure

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Revision History

Revision	Date	Author	Comments
Draft 1	June 29, 2001	Jesse Malm	Initial draft
Draft 2	July 06, 2001	Jesse Malm	Modifications after initial engineering review
Draft 3	Dec 5, 2001	Vince Beyer	Add roller sheath upgrade and 1.7x nozzle version requirement.
Draft 4	Dec 19, 2001	Jesse Malm	Updates to electrical upgrade procedure.
Draft 5/revA	Mar 12, 2002	Vince Beyer	Major update prior to release./ Initial release
Rev B	Sep 19, 2002	Vince Beyer	Change “Processless” to “Chemistry-Free”. Add reference to doc 750-00001A DR Firmware Guide, remove firmware settings tables. Add nozzle pictures. Added MCE based Trendsetter.
Rev C	November 28, 2003	Simon Cheung	Page 11: Replaced spring hose clamp (52-7219) with knuckle nut hose clamp (302-00015)

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1. ABOUT THIS UPGRADE

1.1 Purpose/ Scope

The Trendsetter 400/800 is now capable of imaging Chemistry-Free Plates, resulting in the particulate and gaseous emissions. This upgrade installs an "LC" model Universal Debris Removal Cabinet (UDRC-LC) system on a Trendsetter 400/800, as well as additional machine modifications. All are required for imaging Chemistry-Free plates, such as the Presstek Anthem plate. This is also referred to as the Particulate And Chemical Collection (PACC) system.

This procedure assumes that there is an existing debris removal system in place, and only includes details related to the additional requirements for an UDRC-LC. For more information about upgrading a machine without any debris removal system (such as nozzle and machine hooks installation), you will also need the following document:

Trendsetter 400/800 Upgrade Procedure, Particulate Ablative Media located at:
http://techplanet.creo.com/output/heads/debris_removal/nav/upgrades.htm

This document is also intended to be used as a guide for production staff doing the factory installation of the UDRC-LC system for a Chemistry-Free option Trendsetter order.

1.2 Upgrade Prerequisites

Note: a UDRC-LC cabinet is required for this upgrade. Older 'Morgan' debris removal cabinets (ie larger cabinets with a serial number starting with the prefix DR) will require replacement with a new UDRC-LC. If the site has a UDRC-B cabinet, it can be field upgraded to a UDRC-LC, provided that it is of serial number greater than DC083. UDRC-B cabinets of serial number below DC083 require a replacement UDRC-LC. The procedure for upgrading a UDRC-B to UDRC-LC (for sn above DC083) is described later in this document.

Chemistry-Free media, such as the Presstek Anthem plate, may require a minimum Th1.7 (40 Watt) head. See the media specification sheet for more details.

What Kits to Order for this Upgrade:

For **new devices installs**, the UDRC-LC cabinet and TS400/800 UDRC-LC upgrade kit will be automatically selected when purchasing the Chemistry-Free option Trendsetter.

For **field upgrades**, the following 02-kit can be purchased:

- 02-4497A KM-FG,TS4/8,CHEMISTRY-FREE UPGRADE, UDRC-LC.

When ordering this kit you will need the following information so that this upgrade kit can be properly configured:

- Thermal head serial number and type (20 W Th1.0 head, 40 W Th1.x head, or TH2 head).
- Machine serial number and type (ie TS3, TS4, TS8, or MCE based TS). If unsure, use the serial number format to determine machine type as follows:

TS3	Sxxx
TS4	xx371xxxx OR xx385xxxx
TS8	xx386xxxx OR TExxx
TS MCE	TMxxx

- Device 100 label markings.
- Note serial number of existing UDRC-B, or if there is a Morgan cabinet, or no debris removal system at all.
- Location of upgrade (for power cord purposes).

If there is a 20-Watt head currently installed, and the media requires a 40-Watt upgrade, then a 20-40Watt upgrade kit must also be purchased, contact Trendsetter PSS for more information.

Firmware Requirements

MPE software must be:

- Trendsetter 3244/3230 - version 2.52b or later.
- Trendsetter Spectrum - version 1.61 or later.
- Trendsetter Autoloader – version 1.50 or later.

To download the required firmware, read the release notes for the firmware you are installing.

All versions of MCE firmware support this upgrade.

Site Requirements

Site requirements for a UDRC-LC are different from a UDRC-B system. See the UDRC-L site prep document 72-3725A-A-PR01, link located at:

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

This document should be signed by the Creo FSE and the customer, and sent to Creo according to the instructions within the document.

Additional Tools Required

- Heat gun for drum roller sheath upgrade
- Knife for drum roller sheath upgrade
- Metric Alan Key set
- Wire strippers, soldering iron and solder (for all MPE upgrades only)
- Drill and 3.5 mm (or 1/8 inch) drill bit (for UDRC-B to LC upgrade only)

1.3 Reference Documents

For Firmware Debris Removal Firmware settings look-up tables, check controlled document number 750-00001x-x. This document contains essential information for properly setting up this system. Find the link at:
http://techplanet.creo.com/output/heads/debris_removal/nav/control-set.htm

Trendsetter 400/800 Upgrade Procedure, Particulate Ablative Media:
http://techplanet.creo.com/output/heads/debris_removal/nav/proced.htm

UDRC Installation procedure (very basic overview of unpacking and attaching to machine):
http://techplanet.creo.com/output/heads/debris_removal/nav/install.htm

UDRC-**L** Site Prep Document:
http://techplanet.creo.com/output/heads/debris_removal/nav/install.htm

03-4200X: UDRC Operator's Manual (shipped with UDRC).

MPE Firmware Release Notes for minimum version specified in previous section.

Media Technical Note for relevant Chemistry-Free media:
http://techplanet.creo.com/consumables/media/nav/thermal_plates.htm

2. PROCEDURE OVERVIEW

- Perform Pre-Site Inspection, obtain customer signature on pre-site document.
- Upgrade Firmware (if required).
- Install hooks kit, and/or bulkhead modifications, and/or low profile clamps (if required).
- Set firmware settings including those in DR Firmware Guide, and important new media parameters *ei (emissions intensity)* and *dopt (debris options)*.
- Install new debris removal nozzle (if required).
- Install drum roller sheath.
- Install new bulkhead cable (MPE) or change existing 2-pin cable connector (MCE)
- Install new nozzle sensor.
- Short resistor on TEE board cable (MPE only).
- Install UDRC-LC, or upgrade existing UDRC-BP to UDRC-LC.
- Final mechanical checks.
- Final system testing and verification.

3. FIRMWARE MODIFICATIONS FOR DEBRIS REMOVAL

The UDRC-LC model supports Particulate Only Collection (**POC**) and Particulate and Chemical Collection (**PACC**) debris removal. The base debris removal cabinet UDRC-B **only** supports POC debris removal. For more information on the UDRC-B, please read the firmware release notes.

3.1 Firmware Settings

Media Parameters

WARNING: It is very important to ensure the media parameters *EmissionsIntensity (ei)* and *DebrisOption (dopt)* are set properly for the media type being imaged. Failure to do so could result in the release of potentially hazardous gaseous emissions. These values are documented in the media technical note.

The emissions intensity is set by the command:

>> set media <n> ei <ei value> **(**MCE: **EmissionsIntensity)**

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

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 POC debris removal and replaces the *abl* parameter. Bit positions 3 and 4 are new to UDRC-LC firmware.

Similar to the *EmissionsIntensity*, the *DebrisOptions* should be set according to the value stated in the media technical note. For imaging Chemistry-Free media, the *dopt* value will be either 4 or 5. 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
0	No whisker jet or debris removal
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 for MPE devices:

set media <n> dopt "hazardous" <debris option> (MCE: **DebrisOptions**)

UDRC-L Enabling Firmware Flags

To tell the device there is a UDRC-L installed, enter the following:

MPE:
```
>> set sys dbin 2
>> set sys scon 1
>> set sys sbaud 9600
```

MCE:
```
>> option debris udrcl enable
```

Debris Parameters (MCE name given in brackets)

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

set debris nsi 1 (MPE only)
set debris nst <value> (MCE: **NozzleSensorType**)
A Setra brand nozzle sensor is required to be installed for the UDRC-LC (unlike POC systems that use a cheaper sensor on the TEE or MCE board). This parameter is used to indicate the type and scale of Setra nozzle pressure sensor being used, and is supplied in the upgrade kit. Installation of this sensor is described later in this document. The firmware default is 0 and **will always need changing** for a UDRC-LC upgrade. Use the reference table in the controlled document 750-00001x-x to determine what *debris nst* corresponds to the sensor type being used, you can find this document at the following link: http://techplanet.creo.com/output/heads/debris_removal/nav/control-set.htm

set debris se <value> (MCE: **SiteElevation**)
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> (MCE: **NozzleFlowConst**)
set debris nfe <value> (MCE: **NozzleFlowExp**)
set debris fmin <value> (MCE: **FlowMin**)
set debris fmar <value> (MCE: **FlowMarginal**)
set debris fl <value> (MCE: **FlowLow**)
set debris fz <value> (MCE: **FlowZero**)
set debris pnmax <value> (MCE: **PressMaxNozzle**)
set debris fmaxdiff <value> (MCE: **FlowMaxDiff**)
These values are to be set depending on the type of debris removal nozzle installed; their values should always be checked in the **controlled document 750-00001x-x**. Please always refer to this document since the **firmware default values are not always correct**, and these settings are subject to change with advancements in debris removal technology and

understanding. The document also contains parameter descriptions for all settings in *set debris.* Find this document at the following techplanet site:
http://techplanet.creo.com/output/heads/debris_removal/nav/control-set.htm

```
set debris bfc <value>        (MCE: BellmouthFlowConst)
set debris bfe <value>        (MCE: BellmouthFlowExp)
```

These UDRC-L bellmouth calibration parameters have been updated from their original settings, so the firmware default values are likely incorrect, and should be updated according to the table in the DR Firmware Guide document at the above link.

Debris Firmware Commands (MPE and MCE)

The command syntax for determing 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

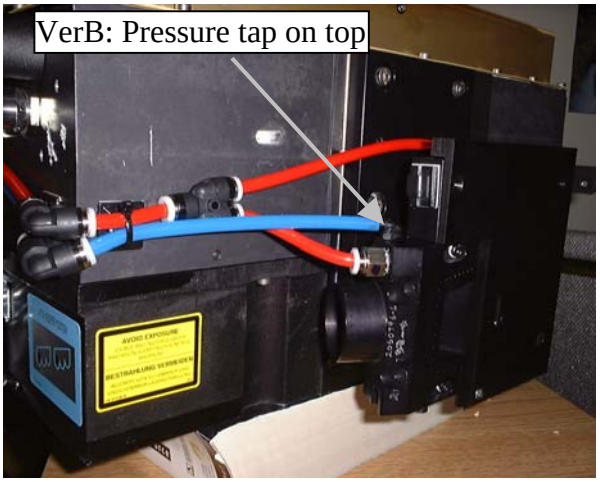
The <**debris option**> parameter may be one of **whisker**, **poc**, **pacc**, or **a numeric dopt value** from the table above (i.e. **debris 4 on** will enable the PACC debris removal, but not the whisker jet).

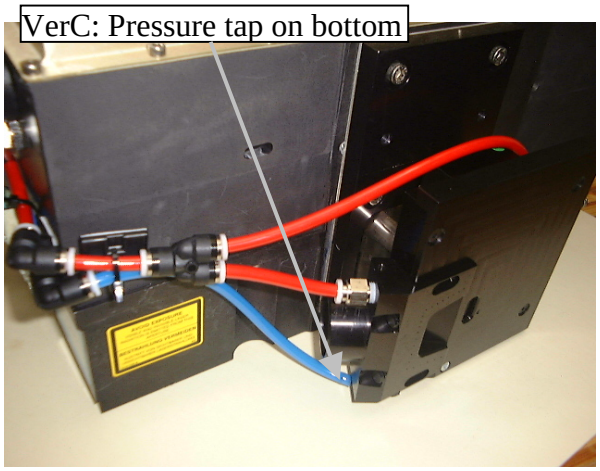
After setting all the firmware parameters described in this section, save them all to NVS, and reset the machine.

4. DETAILED PROCEDURE

See the Appendix for a list of parts in the upgrade kit.

4.1 Upgrading the TH1.x Nozzle





Version B nozzle (or earlier) **Version C Nozzle**

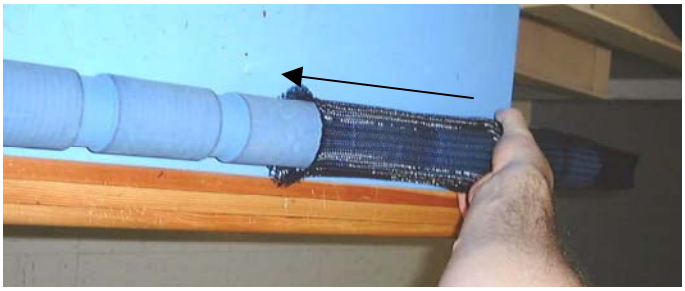
If when ordering the Chemistry-Free upgrade kit, the machine already has a TH 1.x debris removal nozzle, then you will need to know if the debris removal nozzle is at least version C (50-2113C, ECO E445), since it is required for this system upgrade. This is identifiable by the location of the blue pressure sensor hose plugged into the vacuum suction nozzle. Only version C or later nozzles have the blue hose plugged into the **bottom** of the nozzle. Older versions have the blue hose plugged into the top or the nozzle, or no blue hose at all.

A version C nozzle should come with the upgrade kit, if the upgrade includes a brand new UDRC-LC. The assumption is that machines with an upgradable UDRC-B, are new enough that they will have the ver C nozzle. If the nozzle needs to be upgraded, but one wasn't provided in the upgrade kit, then **order a version C nozzle for the next visit**.

4.2 Upgrading the Drum Roller

For Chemistry-Free plates, the drum roller needs a special sheath installed to avoid debris accumulation/ redeposit.

1. Remove the drum roller by pulling out the two pins. Remove the 2 sensor blocks from the ends of the roller, noting the proper orientation for reassembly later.
2. Cover the drum roller with the 2m long black nylon webbing (18-3225). This can only be done by pushing and sliding it on.

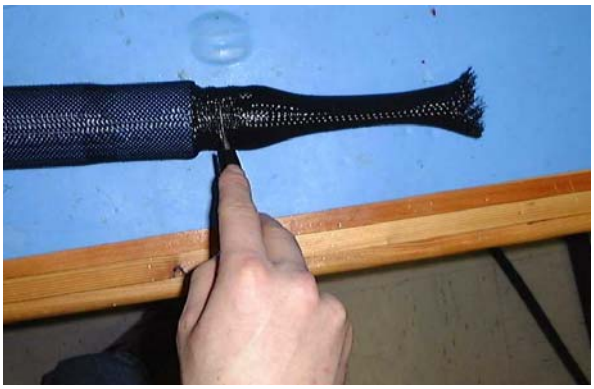


3. Make sure the webbing is as tight against the roller as possible by sliding your hand up and down the roller to iron out any wrinkles.

Use a heat source such as a heat gun or lighter on the webbing at the metal ends of the roller to shrink and harden the webbing to hold it onto the roller. Then cut the excess amount off with a knife. Re-heat any frayed edges to clean up the cut.

Caution: to not over heat the webbing as holes can easily be burned into it.







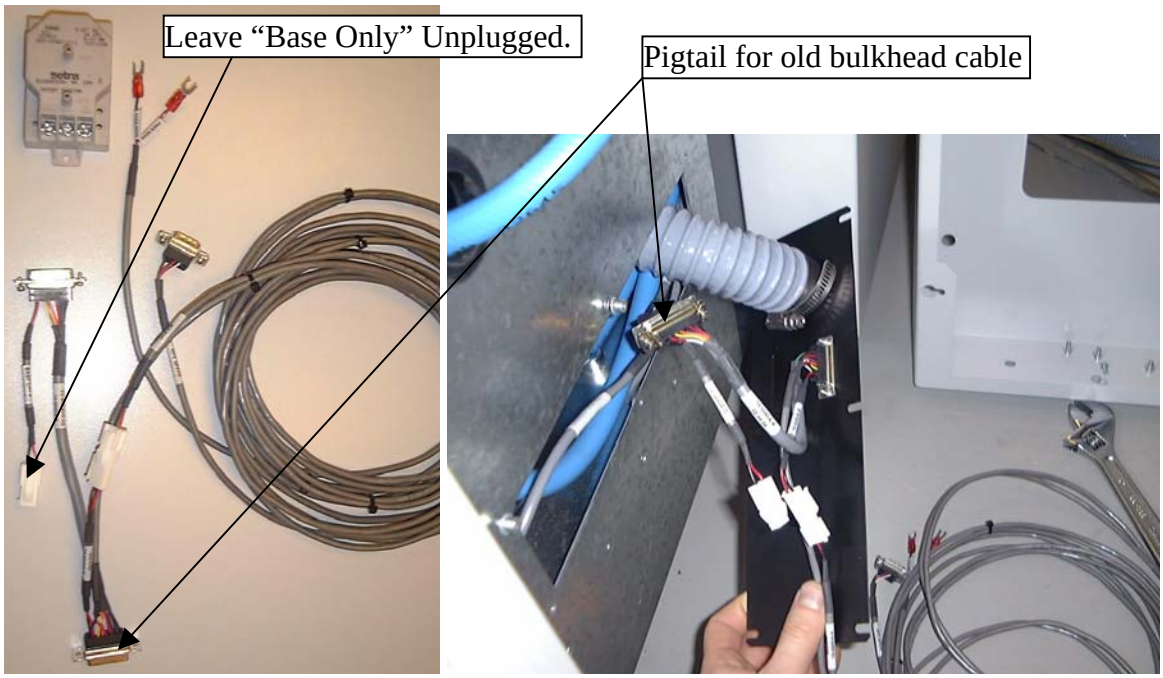
4. If the webbing is loose or can still be easily pulled over the edge of the roller, you can secure the webbing in place with some black tape or a zap strap. If the webbing is loose at the end it may eventually retract over the roller after loading many plates.

5. The customer can be instructed to clean off the drum roller with a damp cloth periodically (no soap or detergents), since it still may accumulate some debris off the plates.

4.3 Installing the 10-5045x Upgrade Cable and Setra Nozzle Sensor (MPE only)

1. Remove the rear fan box dress panel and blanking panel. Remove the bulkhead from the rear of the fan box. (Note the bulkhead is shown with hose and communications cable connected.) Remove the external 15 pin cable from the bulkhead, then remove the 15pin connector anchored from the inside of the bulkhead.

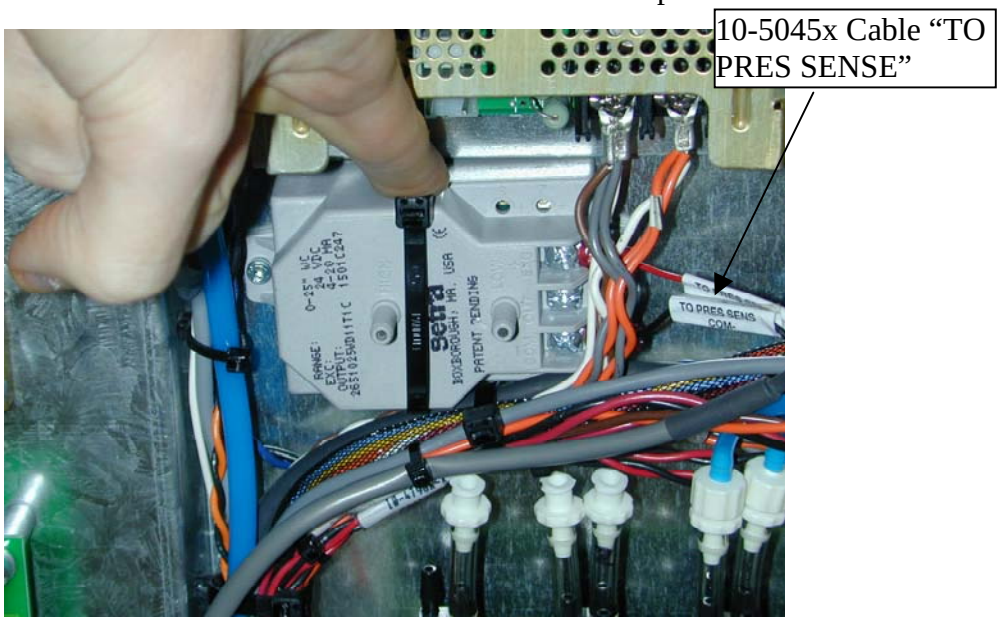
2. Attach the 15pin male connector on 10-5045x (included in the upgrade kit) to the current bulkhead cable 10-4567x (or 10-3770x for TS3 machines). Secure using two 4-40 screws and nuts supplied. Attach the 15pin female connector to the bulkhead. Attach the 2pin connectors labeled "TO BULKHD" together. **Do NOT connect the connector labeled "BASE ONLY."** This connector should be left unconnected.



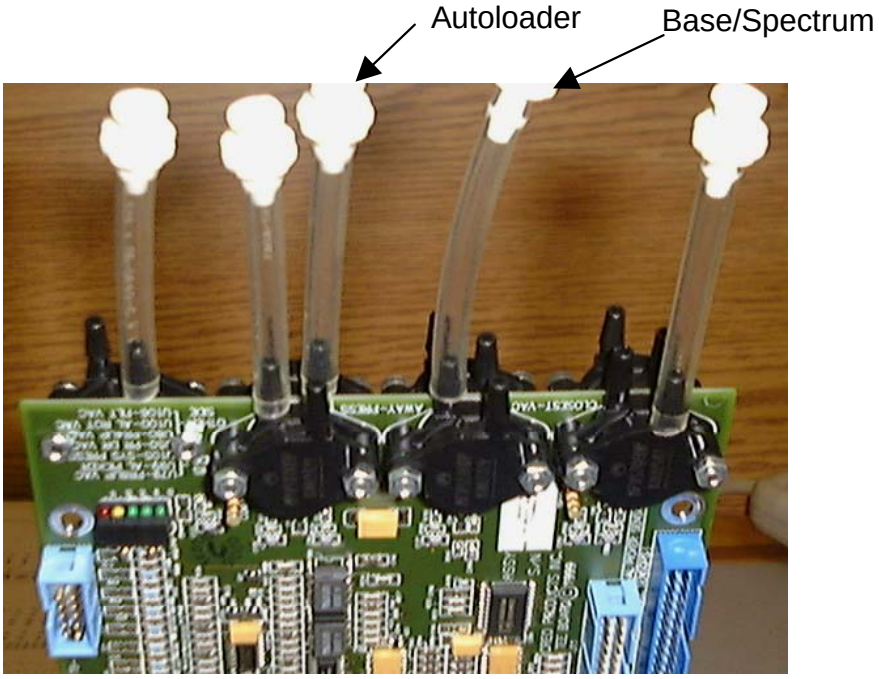
3. Feed the cable underneath the frame, ensuring it is at least **30cm** away from the orange Hotlink connection. Feed the end 40cm of the cables labeled "TO MPE SPARE RS232" and "TO PRES SENSE" into the electronics box. You may need to remove the strain relief on the cables already entering the electronics box to do this. After the cables are fed through, re-install the strain relief.

4. Re-install the debris bulkhead panel.

5. Attach an adhesive cable tie mount (18-3061) to the power box as shown below, just above the pressure sensors on the TEE board. You may want clean the surface of the mounting location to ensure good adhesion. Use two cable ties (18-3049) to attach the pressure sensor (13-5127) by wrapping them around the sensor between the two input ports. Tighten the cable tie and cut the excess end of the tie wrap.

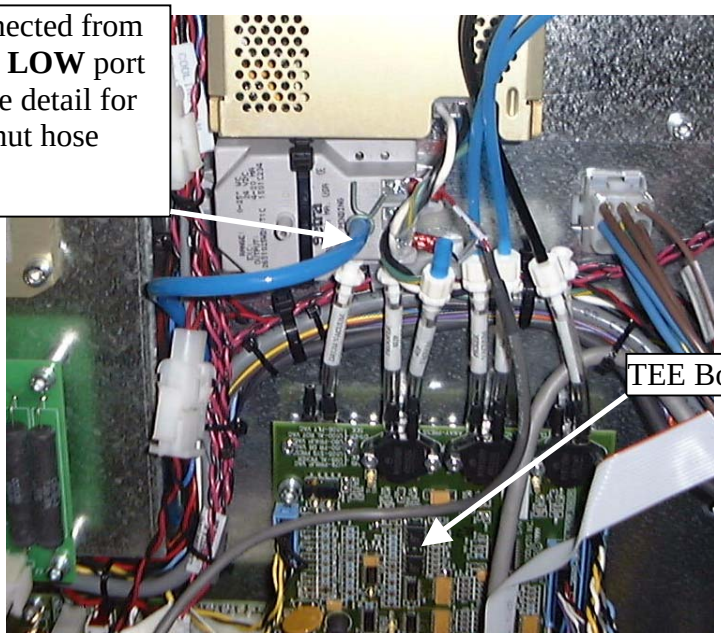


6. Connect the cable marked "TO PRES SENSE" to the newly installed pressure sensor and connect the cable marked "TO MPE SPARE RS232" to the MPE backplane "SPARE" port. Disconnect the pressure tap at the white fitting attaching to the TEE board as shown in the photo below. **The pressure tap to remove varies depending upon if the machine is a Base, Spectrum, or Autoloader.** It is easiest to cut the blue hose and leave the white fitting on the TEE board.

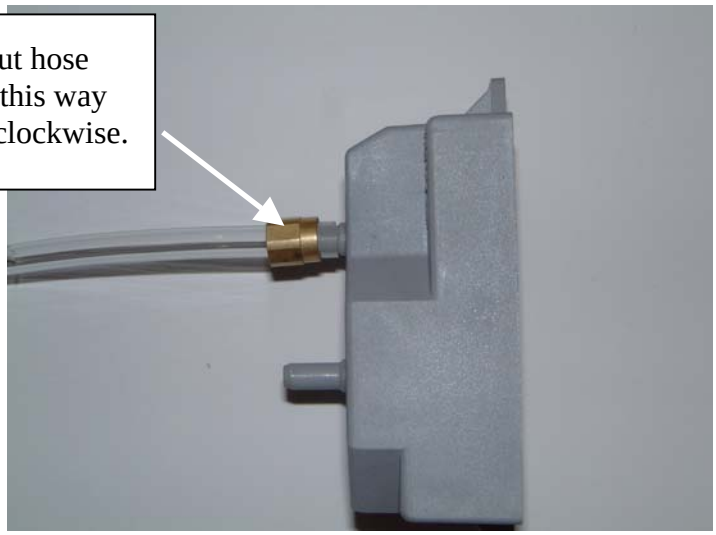


7. Attach the blue hose into the LOW port of the Setra sensor. Use a knuckle nut hose clamp (302-00015) to secure the blue hose onto the Setra sensor.

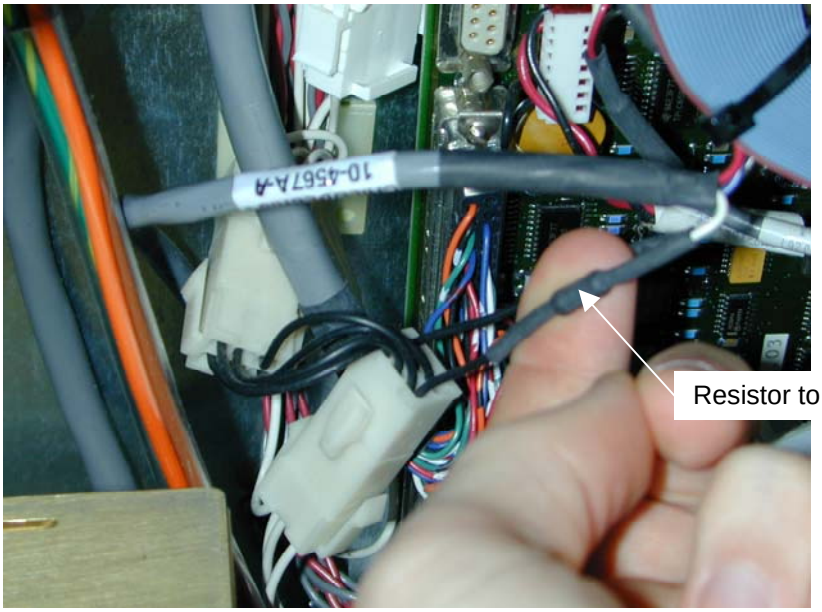
Install the tube disconnected from the TEE board into the **LOW** port of the Setra sensor. (see detail for installing the knuckle nut hose clamp).

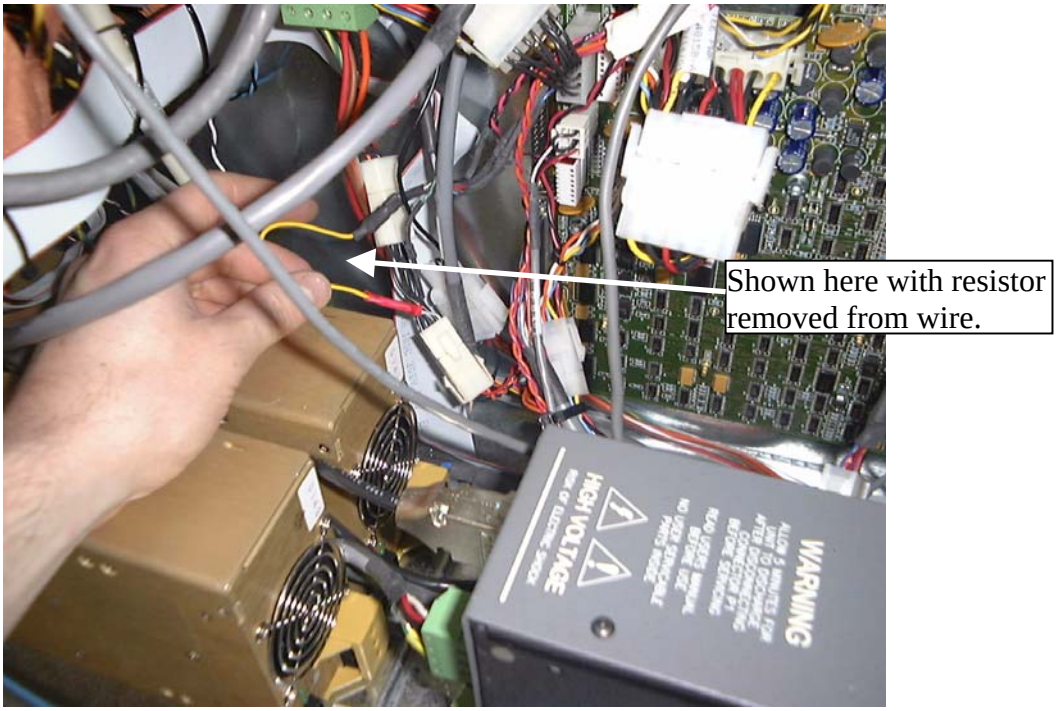


insert the knuckle nut hose clamp (302-00015) this way and tighten the nut clockwise.



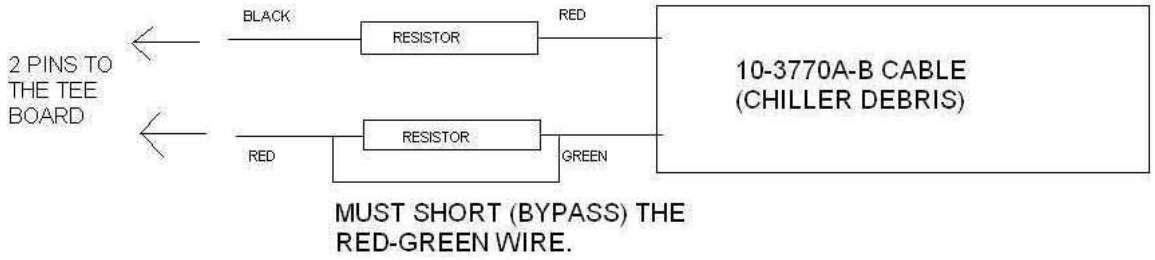
8. If this is a **TS3 machine**, proceed to step 9 and ignore step 8**.** Using a pair of wire strippers, cut the wire and strip back at least 8mm insulation on either side of the heatshrinked resistor on the **white wire of 10-4567x**, close to the TEE board. Cut a 50mm length of 22AWG wire and strip 8mm of wire on either end. Solder the 22AWG wire between the stripped sections of the white wire, or if you don't have any solder, use the two splice connectors provided to connect the shorting wire.

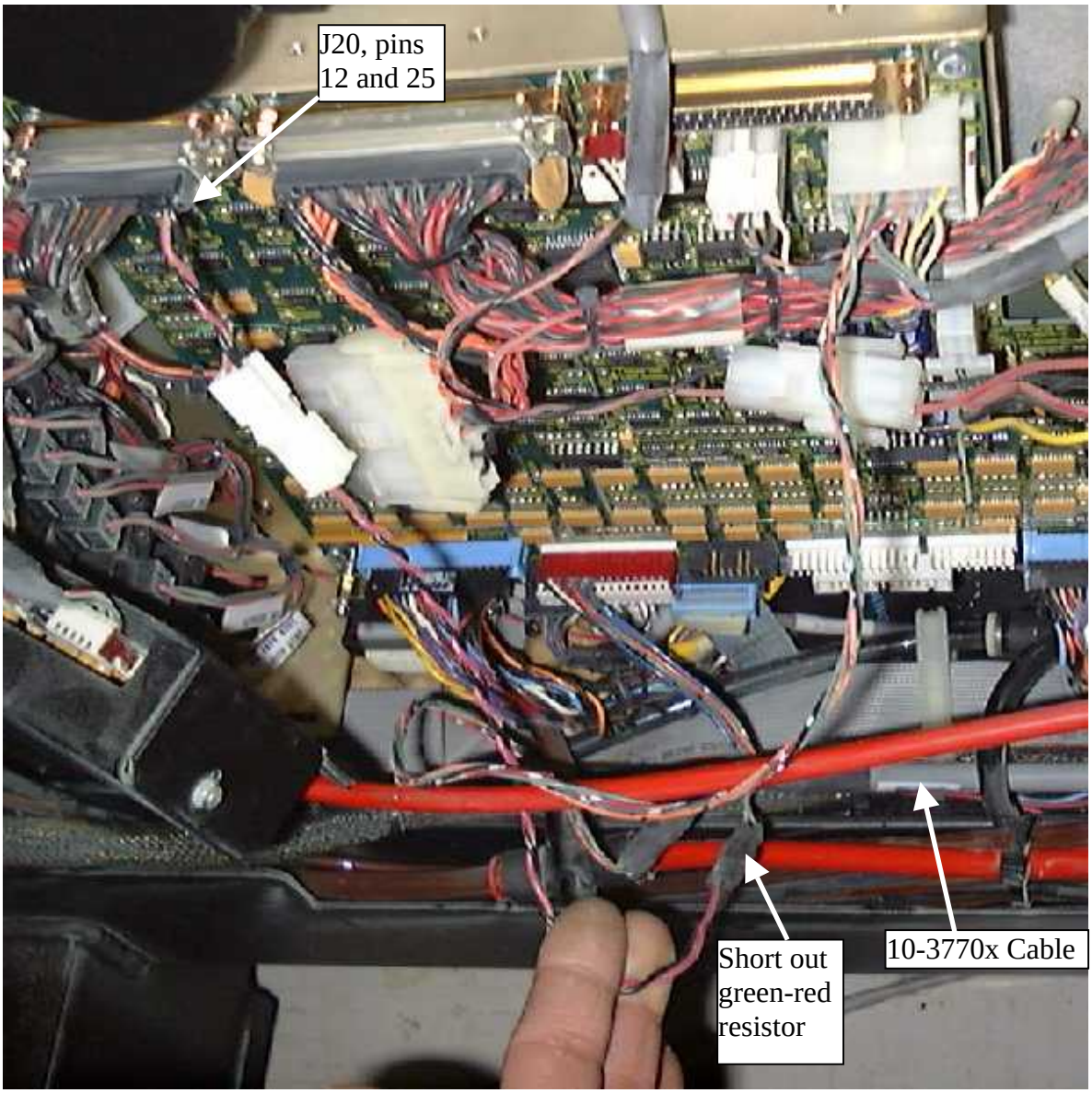




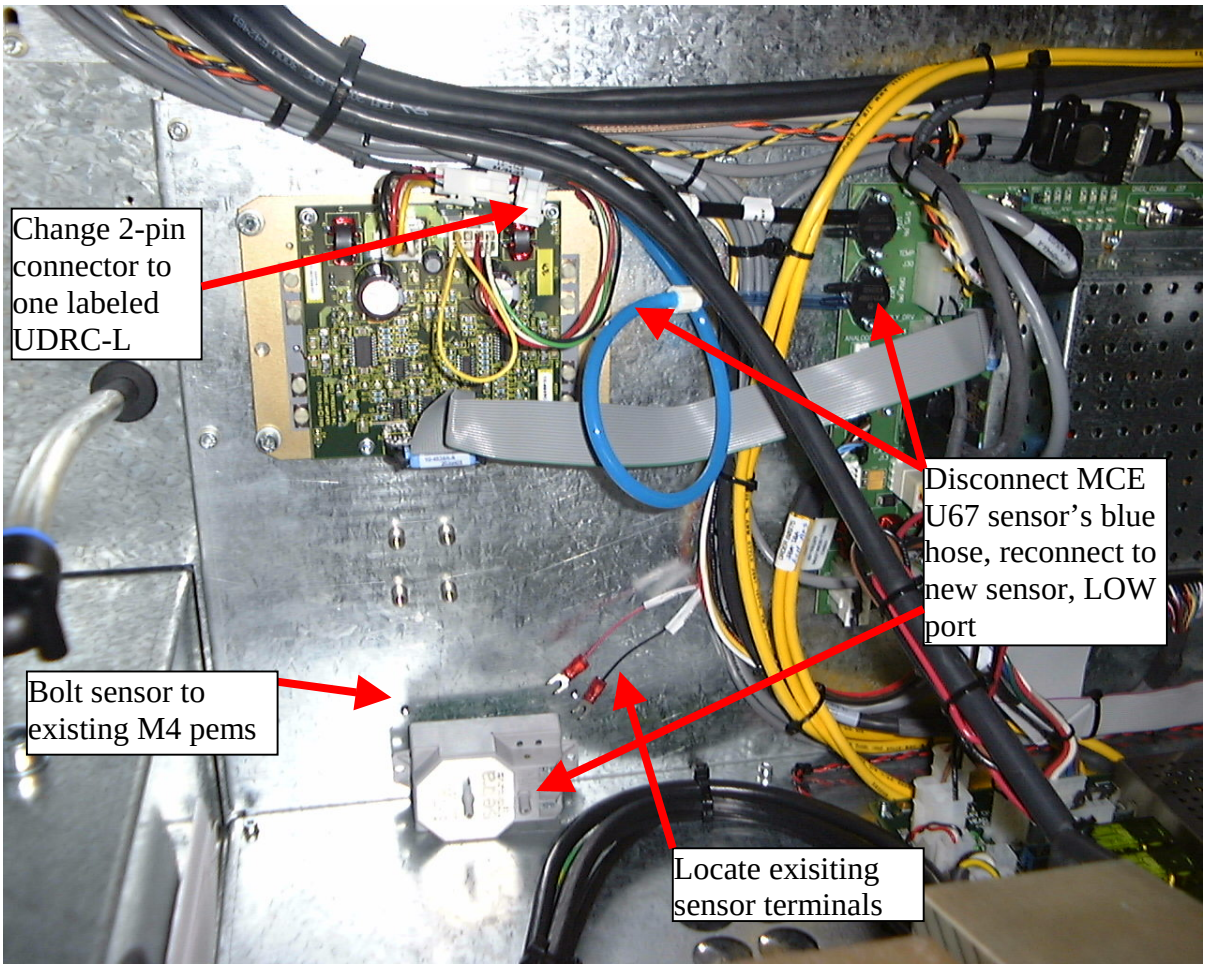
9. Only perform this step if you are upgrading a TS3 machine. Locate the 10-3770x cable near the TEE board (it may be labeled "chiller/debris"). There are many wires coming from this cable, locate the two wires with resistors heat-shrinked together matching the colour scheme in the figure below. Short out the green to red resistor using solder and

the spare wire supplied, or in the absence of solder, use the splice connectors supplied. The red and black wires should be connected to pins 12 and 25 on connector J20 on the TEE board.





4.4 Install Setra Nozzle Sensor (MCE only)



1. Change the 2-pin connector on the debris cable from the current one, labeled *UDRC-B*, to the unconnected one labeled *UDRC-L*.
2. Locate the existing pressure sensor terminals and connect them according to the labels.
3. Bolt the Setra sensor to the existing frame mounts with 2 M4 screws.
4. Disconnect the blue sensor hose from U67 on the MCE board. Connect it to the LOW port on the Setra sensor with a hose clamp (see close-up of connected sensor in MPE section above).

4.5 Installing the UDRC-LC

For information on how to uncrate the UDRC, connect the UDRC-LC to the output device, and install the chemical and particulate filters in the UDRC-LC, please refer to the UDRC installation document:

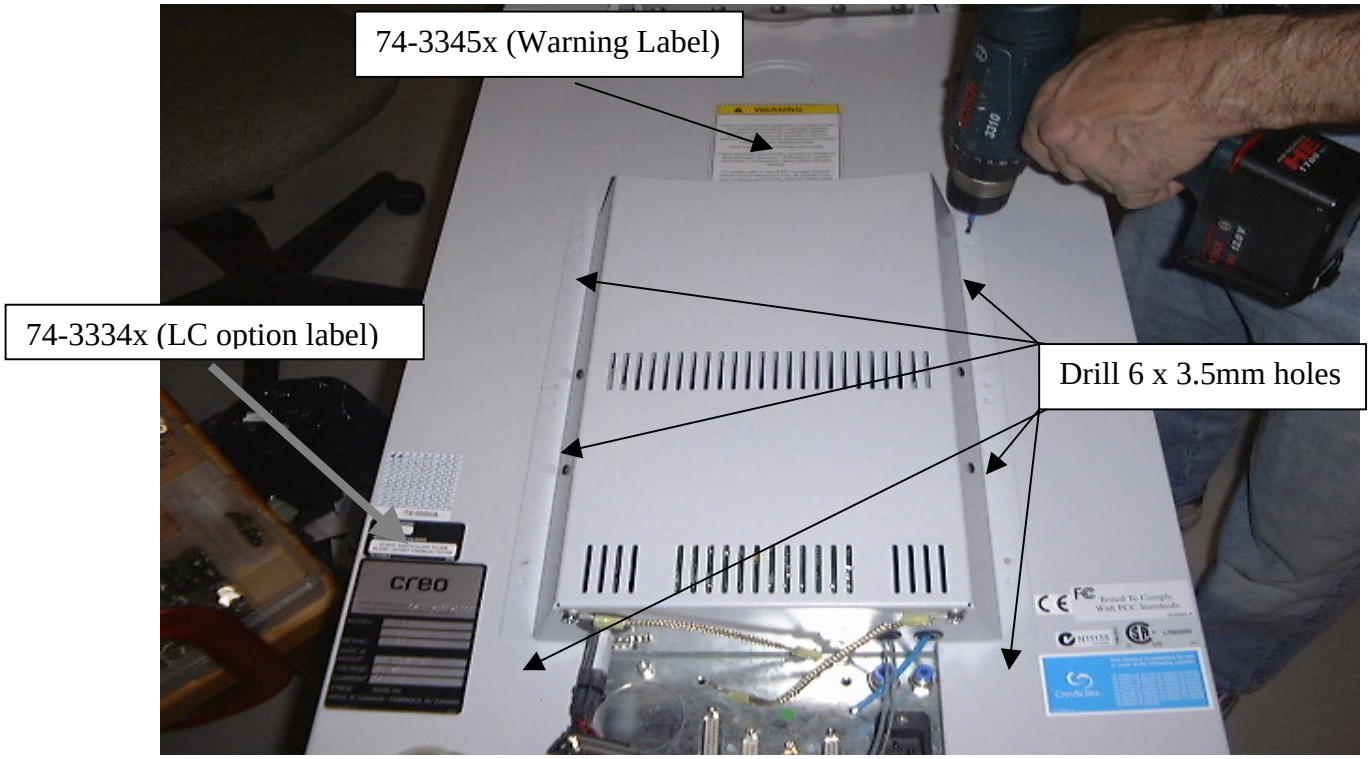
http://techplanet.creo.com/output/heads/debris_removal/nav/install.htm

Please refer to section 5 below if you are upgrading an existing UDRC-BP to a UDRC-LC.

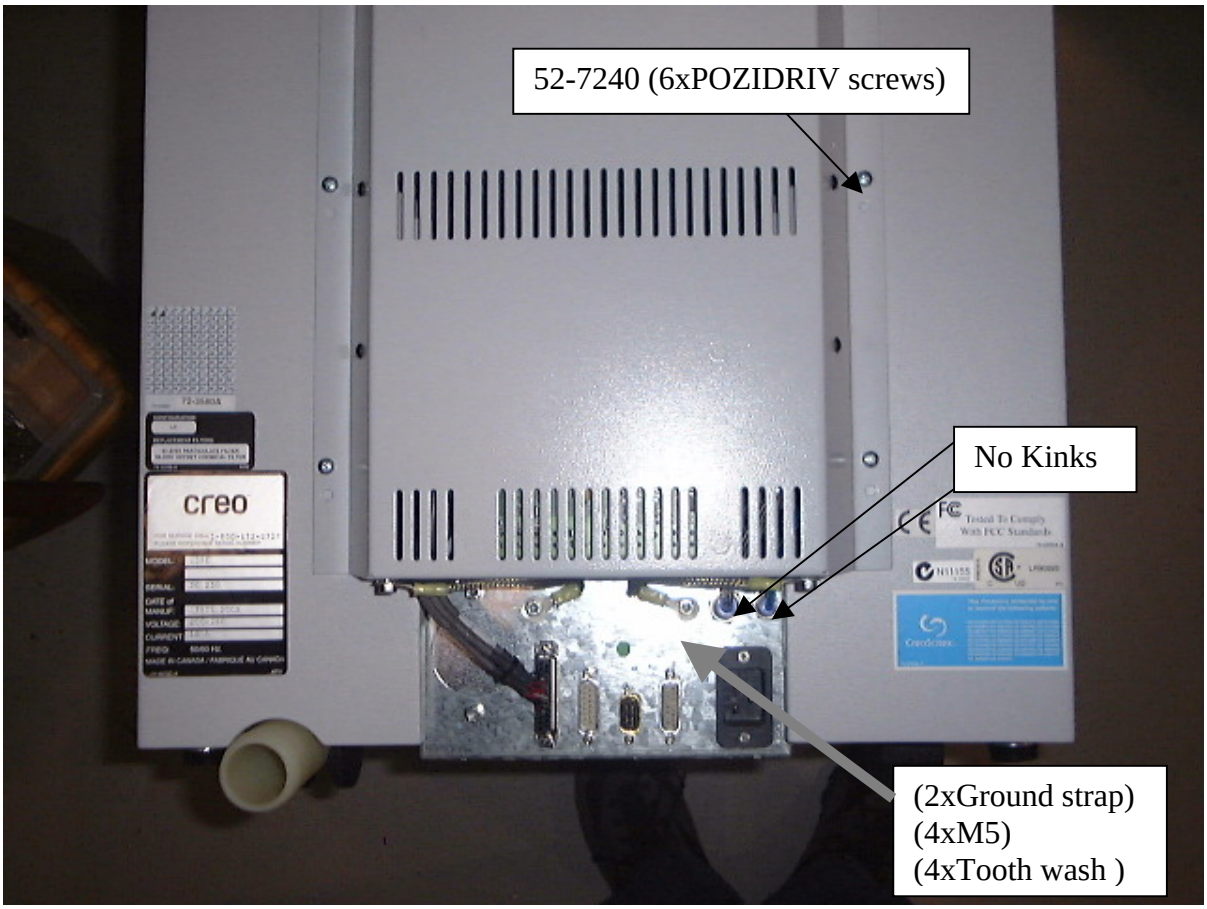
5. UDRC-B TO UDRC-LC FIELD UPGRADE

This section is **only** for upgrades that have an existing UDRC-B of serial number DC083 and greater. You will need to have provided this information when ordering the 02 Chemistry-Free upgrade kit to receive the proper components for this

1. Turn the UDRC on its side, and line up the backpack assembly as shown in the picture below.
2. Check that all existing labels are not covered by the backpack (this will likely be required for UDRC's below serial number DC180). Replace or move any covered stickers as necessary (stickers provided in kit as backups if necessary). Add all new stickers also provided, so that the final sticker arrangement matches the picture below.
3. Using the backpack as a guide, drill 6 3.5-mm diameter pilot holes. Note that there are 6 pairs of holes available on the backpack. The second hole at each location is there if the first drilling attempt was botched for whatever reason.



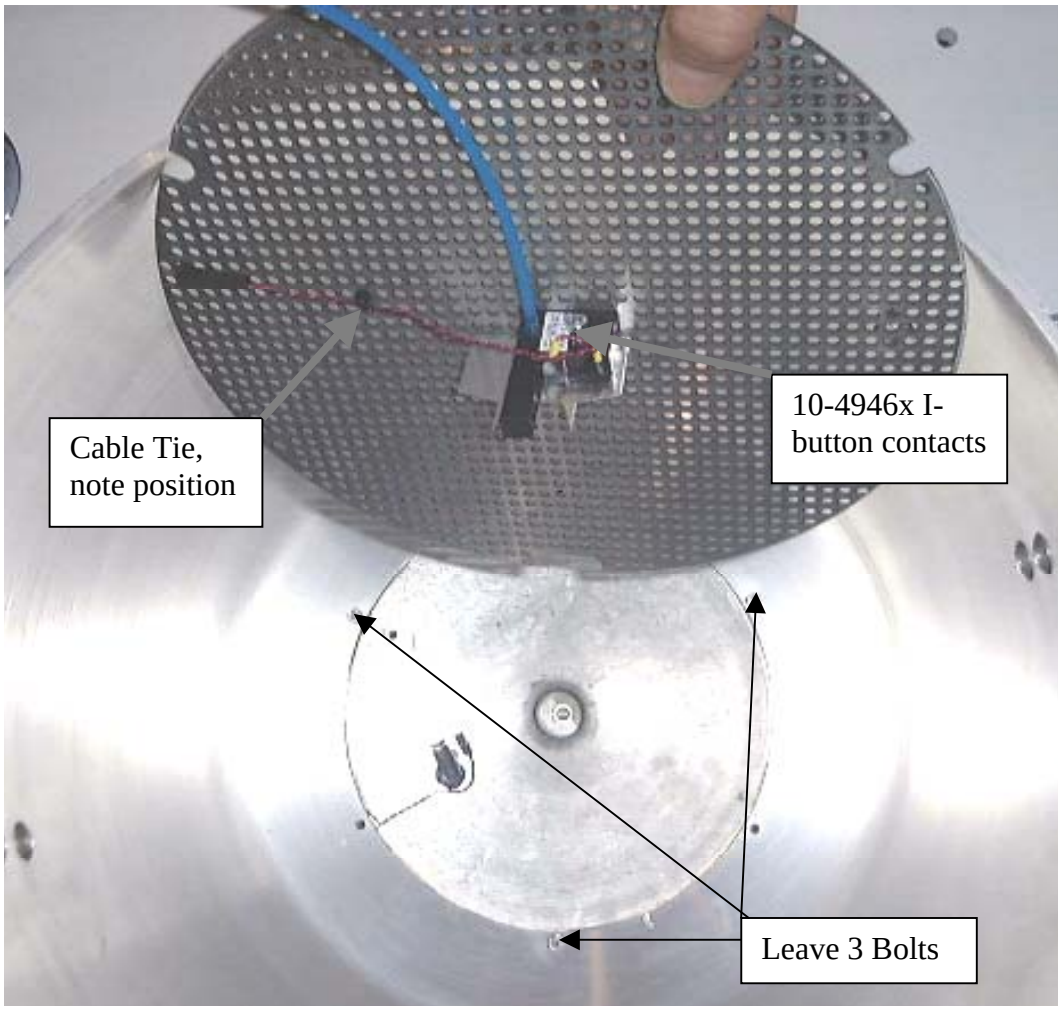
4. Connect the 2 sensor tubes from the backpack to the UDRC (ensuring a proper, firm connection). Make sure the tubes are not kinked with the backpack in it's proper position.
5. Connect the cable from the backpack to the UDRC. Use the 6 screws (52-7240) to attach the backpack to the UDRC.
6. Install the two ground straps, with toothed washers **between** the backpack and the UDRC.

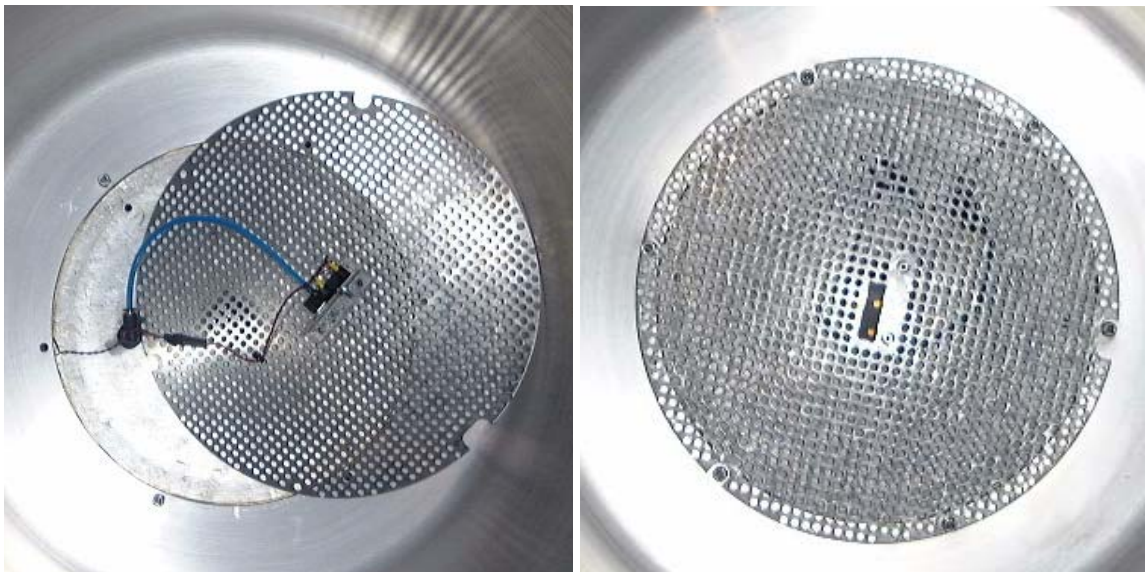


1. Return the UDRC to the upright position. Remove the tall particulate only filter and spacer. Unscrew the **3 bolts only** holding down the screen, to remove the screen. There should still be 3 other bolts, which hold down the filter canister.

2. Screw in the I-button contact assembly (10-4946x), included in the flow sensing kit, into the screen as shown in the picture below. Secure the I-button cable to the screen with a small cable tie as shown.

3. While replacing the screen in the filter canister, make the electrical and hose connections to the UDRC as shown. Carefully replace the screen, ensuring that the cable and hose to not get pinned between the Bellmouth and the I-button holder on the screen. Reattach the 3 bolts for the screen.





4. Install the chemical filter ring spacer, then chemical filter, then re-use the particulate filter spacer between the chemical and particulate filters, install the short particulate filter and close the lid. (link to document with picture of this in sec 4.4)

The UDRC-B is now a UDRC-LC. Return to section 4.4 above, to complete the system upgrade.

6. FINAL MECHANICAL CHECKS

1. Check all connections to head – electrical cables, liquid cooling lines, air line, blue nozzle vacuum sensor 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.

7. FINAL INTEGRATION, TESTING AND TROUBLESHOOTING

The following should always be performed as part of a field or factory installation, to ensure proper functioning of the UDRC-LC with the output device.

1. Power-up the machine.
2. Check that all firmware parameters are updated as in section 3 above (including media parameters *EmissionsInensity* and *debrisOptions* for the new Chemistry-Free media being set up). Save nvs changes and **reset** the machine.

   Hint: If you can't set the *dopt* parameter to 4 or 5, that's because it's password protected! (see firmware section above).
3. Turn on the UDRC under LC control by using *debris x on*, where *x* is 4 or 5 depending on the *media x dopt* parameter required for the Chemistry-Free media being used.
4. If the debris cabinet doesn't turn on or stay on, troubleshoot as necessary according to the error message received. The troubleshooting guide can be found on the intranet in the UDRC firmware troubleshooting section.

   Hint: if you type the command *debris option*, you get a list of available options. If you don't see option 4 and 5 on the list, try rotating the chemical filter by 90 degrees to re-establish the electrical connection to the filter. Always reset the machine after doing the above for the machine to recognize the change.

   Another Hint: If the cabinet turns on momentarily but doesn't stay on, you can use the *act dr on* command to force the cabinet to stay on. This is helpful in diagnosing problems from the flow and pressure sensor readings, while the cabinet is on. **Always** turn off the cabinet with *act dr off* command if turned on with *act dr on*.

5. If the UDRC-LC does stay on, type *debris x* (again *x* is 4 or 5). Note the *Filter Usage* value displayed after the message *Currently a CTP filter is installed in UDRC:*

6. Note the vacuum flow rates (in SCMH) of the Nozzle and Bellmouth labeled *Nozzle Flow* and *Bellmouth Flow*. These should read the same value to within FlowMaxDiff parameter (= 8.5 SCMH typically). If the flow rates are more than 3 SCMH apart, then there is a risk of an error occurring in the future.

   Double-check the sensor line connections. If there are no leaks, follow the procedure in the parameter values section at the beginning of the DR Firmware Guide for changing the nozzle flow calibration parameters. If this procedure does not produce an error-free condition, please also escalate this to the Creo response center's UDRC Product Support Specialist.

7. Turn off the UDRC-LC by entering *debris x off*.

8. **After** having imaged at least 1 Chemistry-Free plate (such as during the media setup or any test plate), check that the chemical filter usage is being logged. Type *debris x*, to query the *Filter Usage* value. Ensure that this value is greater than the *Filter Usage* value prior to imaging the plate(s). If not, then double-check all firmware settings from section 3, especially *media ei* and *dopt* values.

APPENDIX A: LIST OF MATERIALS FOR UPGRADE KIT

NOTE: All part numbers are subject to change without update to this document. Please always refer to the BoM in SAP for the most current part numbers and versions.

All materials listed are part of the 02-4497 UDRC-LC Field Upgrade kit:

Here are the materials supplied in the 11-1115A kit, used for all MPE UDRC-LC machine upgrades:

- 18-3225 TUBE,SHEATHING,EXPANDO,1.75",BLK (3 Meters)
- 10-5045A CAB,ASSY,UDRC-L UPGRADE,TS8
- 16-3356 WIRE,22AWG,RED (50mm length)
- 13-5127 SENS,PRES,0-25"WC
- 18-3061 CAB,TIE,ADH MNT,1"SQ,CENTRE HOLE,BLK
- 18-3049 CAB,TIE,7.5" (X2)
- 302-00015 KNUCKE NUT CLAMP, HOSE
- 52-4514 SCRW,4-40*5/8,SOCK-CAP,SS (X2)
- 52-4449 NUT,4-40,S-PLATED (X2)
- 16-3308 CONN,TERM,SPLICE,22-18AWG,CRIMP,RED (X2)

Here are the materials supplied in the 518-00412A kit, used for all MCE UDRC-LC machine upgrades:

- 18-3225 TUBE,SHEATHING,EXPANDO,1.75",BLK (3 Meters)
- 13-5127 SENS,PRES,0-25"WC
- 302-00015 KNUCKE NUT CLAMP, HOSE
- 52-3018 SCRW,M4*10 (X2)

Here are the materials supplied for upgrades, which are dependant on the machine's current configuration. They will be automatically selected when ordering the 02-4497A kit, by providing accurate device documentation.

- 11-0937A ASSY,EM,PART.&CHEM,WH-GRY,UDRC-LC (supplied for upgrades of machines without a UDRC-B or with a UDRC-B of sn less than DC083)
- 11-1113A UDRC-B TO LC FIELD UPGRADE KIT. (Only supplied for B to LC field upgrades for UDRC's of sn DC083 or greater)
    - 11-1114A ASSY,EM,SENSING SYSTEM,WH-GRY,UDRC-L

  - New L-option Labels: 74-3334B (LC Option label), 74-3345A (Gas and Particulate Warning label)
  - Replacement Labels: 74-3192A (100-label), 74-3294A (FCC), 74-3014B (CSA), 74-3309A (C-Tick), 74-3064A (CE), 74-3305A (Patents).
  - 50-2281B ASSY, MECH, CHEM FILTER, UDRC-LC
  - 57-8791C FAB, PART FILTER, 13.9*12, UDRC-L
  - 57-9014C FAB, SPACER, CHEM FILTER, UDRC-L
  - 03-4200A DOC, OPERATORS MANUAL, UDRC

- 50-2406A KIT,UDRC,INTERNAL COMPONENTS,TH1.7,TS (supplied for Th1.7x upgrades of machines without any existing debris removal system)
- 50-2113C TH1.x DEBRIS REMOVAL NOZZLE KIT (supplied separately for upgrades of machines with existing debris removal systems, if TH1.7 nozzle is not ver C)
- 50-2407A KIT,UDRC,INTERNAL COMPONENTS,TH2,TS (supplied for all upgrades of machines without an existing debris removal system, that have a TH2 head)
- 11-1068B or 11-1069B: UDRC power attachment kits for either North America/Japan OR Rest of World, respectively.
- 11-0898A KIT,EM,TRENDSETTER DEBRIS HOOKS, UDRC (supplied depending on machine serial number)
- 50-2268A KIT,MECH,V2.0 SPEED/DEBRIS UPG,LE CLAMPS (supplied depending on machine serial number)
- 50-2269A KIT,MECH,V2.0 SPEED/DEBRIS UPG,TS3 BLKHD (supplied for TS3 machines only)
- 57-9042B FAB,BULKHEAD,PROCESS,TS2637 (supplied depending on machine serial number)
- 518-00412A KIT,UPGRADE,ECO CA00386,UDRC L,TS (supplied for MCE based machines without ECO CA00386)