Creo Products Inc.

VLF Trendsetter
Planned Maintenance Checklist

Customer:_____ Unit #:_____ Date:_____

Serial #:_____ Customer Support Rep:_____

Customer-Ordered Parts: These parts are not the responsibility of the service engineer to replace. Please ensure that the customer is performing regular maintenance on their system.

Part Number	Quantity	Name of Part	Where used
55-0324	1 (5um)	Particulate filter element	Supply air
55-0325	1 (.01um)	Coalescing filter element	Supply air
55-0326	1 (.003um)	Adsorption filter element	Supply air
55-0346	2	DustLok filter	Power box & fan box
82-1027	1	Head desiccant pouch	Thermal head

PM Parts: These parts need to be shipped to the site for every PM.

Part Number	Quantity	Name of Part	Where used
82-1009	1	Grease for rails: Kluber P/N GL261	Carriage rails
89-0053	1	Loctite #242: medium strength, removable	Various
89-0006	1	Leadscrew Grease: NSK Grease No. 1	Leadscrew
89-0171	1	HPLC grade Acetone	Edge detect strips
89-0091	1	“Alvania” grease	Balance weights
89-0020	1	Lint-free Q-tips	Edge detect strips

It is also recommended that you replace the MOVs (Part #10-3562B) during the PM.

Useful Tools

- 12” t-square
- force gauge (such as fishing scale) with a capacity of 30lbs
- spirit level
- latex gloves (for lubricating the carriage rails)

Please ensure that this procedure is performed at least every 6 months on each customer machine. The frequency should be increased to 3 months at “high risk” sites at the discretion of Creo Service personnel.

Schedule regular PM visits with each customer in your region

Before You Start the PM

Obtain permission from the customer to do the preventive maintenance on the system. An estimated four hours will be needed if a thorough job is done. (Note that firmware upgrades, FCOs, and repairs will add time to this estimate.)

If possible, work with an operator or maintenance person. Explain proper maintenance of the system to them, and point out any lack of operator-level maintenance that you notice. Take inventory of any spares on site as well as parts that should be returned to Creo. Check the Intranet for any FCO upgrades needed.

Logging General Information

Check with the customer to ensure that all information in Creo’s database is correct and up to date (e.g, supervisor/operator names, phone/fax/modem line numbers, address information, Creo Workstation login names/passwords, etc.).

Verify that the customer is performing regular system backups of pertinent files on the Workstation computer. Use the terminal to access the TS Recorder MPE diag port and perform the following checks:

- make a copy of the NVS values using the “fsave all” and “nvs dump diff min” commands[1]
- check the status of the laser using “laser on”, “laser”, and “laser off” [1]
- record laser data below
- list the scorr tables for all media, using the “mode media <n>” and “scorr” commands1

[1] Save the results of all these commands in the workstation service directory (E:\service). It is recommended that you also maintain a copy of this information on your laptop computer.

Laser data

Exposure head serial # TH _____ or HRX _____

Laser power: _____

Current: _____

Laser time (hours): _____

After You Finish the PM

List all parts changed during the PM on your service report. Mandatory parts can be listed as one item under “PM Parts Kit”.

Send a copy of this checklist to Creo Service in Burnaby, and include any additional comments that you may have.

We’d like to update the parts list to include extra parts that would be required during preventive maintenance. Also, feedback on this document would be welcome. Is it too detailed? Not enough detail? Are there other checks and tests that should be performed? Please forward this information to serviceweb@creo.com

VLF Trendsetter Planned Maintenance Checklist

Perform all general maintenance procedures from the VLF Trendsetter Operator Manual. Replace all the filters and any damaged or worn parts. Take note of any questionable areas and check the overall system for rust and paint damage.

General

- There should be no loose screws. Apply LIGHT wrench pressure, as it takes very little force to break the loctite bond. If a screw is loose or removed, re-apply loctite and re-tighten the screw.
- The customer must not use film cleaner on any VLF Trendsetter components. Cleaning of components is to be done with 99% Isopropyl alcohol or HPLC grade acetone only.

Load/Unload Table

- The table should be adjusted properly as described in the *Aligning the Load/Unload Table* procedure (/docs/tblalign.pdf on the Technical Library CD)

Engine

- The supply air should be at adequate pressure before and during machine operation. Type "ale" and check that the air pressure value agrees with the reading on the regulator gauge. Note the system pressure below:

  System pressure: _____ psi

  Pressure regulators should be checked periodically to ensure they are set properly. The regulators used in the VLF engine do not bleed as they are adjusted. They only bleed when the lines are vented. As a result, the regulators should only be adjusted in the direction of increasing pressure (this is clockwise, or an inward turn of the knob). If the knob is adjusted past the desired set pressure point, back out the adjustment knob and re-actuate the motion and adjust again. An inline pressure gauge (93-0005A) can be inserted into the system lines to confirm and set the Roller and Trailing Edge down pressures.

- Your toolbox pressure gauge should be checked for accuracy, since it can be affected by rough handling. Check it against the VLF Trendsetter's transducer. If they disagree, calibrate the transducer with the "cal pressure" command, then accept the transducer's output as correct.

Roller

- The roller should be set at 55-60 psi. The roller pressure regulator is mounted on the engine manifold.
  [For film and delicate media (e.g, Fuji LH-PI), roller pressure should be 15 psi.]
- The roller movement should be smooth and symmetrical.
- You should be able to spin each roller segment freely by hand when the backbone is up.
- The roller should be clean

Leading Edge/Trailing Edge Actuator and Clamps

- Trailing edge down pressure should be set at 30 psi. The trailing edge down pressure regulator is located on the middle of the hose tray below the plate flyoff detector.
- Down speed of one of the cylinders should be set just slightly slower than the other to reduce the impact of the TE clamps hitting the drum. (Refer to /docs/v_tecspd.pdf on the Technical Library CD for more information.)
- Trailing edge clamps should be free of debris attracted to the magnets.
- TE cylinder rod ends should be adjusted such that the plastic LEC end stops are firmly against the drum when the LEC is down and engaged. This results in an LEC gap clearance of 3mm (1/8”).
- TE cylinder rod ends should be adjusted so that when the backbone is down and engaged with the TE clamps on the drum, the gap is 0.25mm (0.01”) to 0.50 mm (0.02”) from the TE clamps. Pull the retracted backbone out by hand when this is done to remove the slop in the assembly. This adjustment must be made in conjunction with the LE clamp clearance specified above. Adjust so that both criteria are met as closely as possible.
- TE lock/unlock mechanism should operate properly, with the TE actuator bar holding the clamps against the drum. Disconnect the air lines from the lock/unlock cylinder and then manually move the locking mechanism back and forth. Some friction is to be expected, but the mechanism should not catch or bind.
- Sensors should be adjusted by manually moving the backbone (with the system air off) and using a tester to provide the feedback. The diagnostic terminal should not be used as it does not give an indication of where during the actuation the sensor actually trips, only that it has tripped by the end of stroke.

  Note: Backbone mechanical adjustments should be checked prior to adjusting the sensors.

  Plug a sensor tester into the reed switch. The backbone sensors and sensor magnets must be set so that the magnets are about 2mm from the sensor and sensor cables with the backbone slop (axial to the drum) pulled toward the sensor in question. In addition, the sensor must still trip properly with the backbone axial slop pushed away from the sensor in question. In this case the sensor should trip about 3 mm (1/8”) to 5 mm (3/16”) from the end of stroke, and must stay on until the end of stroke.

Balance Weights

- Balance actuation release tip diameters must not be over D12.5mm (D0.492”). Measure them and replace, if needed, with the latest revision.
- Balance weight hall sensors should turn on at least 1.5 mm from the end of the cylinder stroke, and should be set to turn on just after the cylinder tip has released the detonate pin.
- Balance release tips, engagement rings and balance races should be greased as required using a mineral oil or Lithium grease (Shell Alvania.)
- Balance weight mechanism should operate smoothly. If it doesn’t, set the balancing mechanical and nvs parameters as described in *Adjusting the Balance Actuation Assemblies* (/docs/bwass.pdf on the Technical Library CD).

  Note: The actuator and release mechanism must be perfectly aligned so that the release tip inserts smoothly; otherwise the cylinders will be seen to flex on their mounting brackets during actuation. To test for misalignment, disconnect the air supply, hold the drum in a balance détente position, and manually insert the release tip. You will be able to see and feel the tip hit one side of the engagement ring.

Timing

- The **“***time engin*e” command must result in actuation timings within the following range (see /docs/v_bbtime.pdf” for details).

VLF Engine Actuation Timing

	desired	**acceptable**
LE extend/retract	0.7 +/-0.1 s	0.4 to 1.1 s
RL extend/retract	0.6 +/-0.1 s	0.4 to 1.1 s
trailing edge retract(down)	2.0+/-0.2 s	1.5 to 3.0 s
trailing edge extend(up)	0.8+/-0.1 s	0.7 to 1.5 s
trailing edge lock	0.4+/-0.1 s	0.3 to 0.8 s
balance extend/retract	0.3+/-0.1 s	0.2 to 0.8 s

- Encoder disk must be clean (see *Creo Encoder Cleaning Procedure* (doc #73-3289A)).
- Drum motor belt must be free of tension and wear. See *Adjusting the Drum Drive Motor Belt for Tension and Squareness* (/docs/v_drmblt.pdf).
- Carriage motor belt must be free of tension and wear. See *Replacing and Adjusting the Carriage Belt* (/docs/vl_cbelt.pdf).

- Carriage rails and leadscrew should be properly lubricated. See *Lubricating the Carriage Tracks and Ballscrew* (/docs/lubscrew.pdf on the Technical Library CD).

Power & Electronics Cabinet:

- There should be no loose terminal screws. With the power off, check that all terminal screws are tight on the input side of the Megapac power supply, the Thermal Head power supply, and the EMI filter.
- MOVs on the Power Distribution Board should be replaced.
- Voltages on the ALE board testpoints should be:

  12V: _____volts (± 0.6V)

  5V: _____volts (± 0.25V)

  -12V: _____volts (± 0.6V)

- Voltages direct from the power supplies should be:

  24V: _____volts (±1.2V) (Megapac)

  24V: _____volts (±1.2V) (Head power supply)

- All cooling and air flow fans should have an adequate air flow and noise level

VLF Trendsetter Main Frame:

- All gas struts should be free from leaks and failure.
- Door seals should be free from wear.
- The paint should not be excessively damaged. Note any damage and report it to Creo.
- Panels and skins should be undamaged. Note any damage and report it to Creo.
- Plate exit door should be undamaged and should not have any loose parts.
- Plate exit door actuators should operate symmetrically and smoothly, and should not have any loose parts or wear.
- Air filters should be clean.
- Air filter water traps should be free from water, dirt, or oil.

Workstation

- Air filters should be clean (notify Operator if they are clogged).
- All cables should be properly seated. Check them with the power off.
- Terminal screen should be clean.

- Operators should be backing up disks.

Comments

Customer Support Engineer Signature **Date**