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CVK500 - VENTILATOR PM KIT (10.4" GUI)

CVK501 - VENTILATOR PM KIT (WITH LAMPS - 9.4" GUI)

INSTALLATION INSTRUCTIONS

These instructions describe how to perform the 10,000 hour Preventative Maintenance on the Covidien 840 Ventilator. This Preventative Maintenance includes replacement of the Air Inlet Filter and the Oxygen Inlet Filter. Instructions for replacement of the Backlights for the 9.4" GUI (Graphic User Interface) is included in the CVK501 kit only. The Backlights on the 10.4" GUI do not require replacement.

Warning: To avoid the possibility of physical injury it is recommended that the service technician complete the Covidien training class geared specifically to the Covidien 840 Ventilator before attempting this planned maintenance. It is also recommended that the service technician have a copy of the OEM service manual available before proceeding.

Warning: Ensure that all electrostatic discharge processes are followed whenever handling the internal components and circuit boards of the 840 Ventilator. This should include a wrist strap, static dissipating surface mats and a correctly attached ground cord.

Before beginning the PM:

- 1) Run an Electrical Safety Test (EST) as described in the Covidien 840 Ventilator System service manual.
- 2) Place the ventilator into Service Mode as described in the Covidien 840 Ventilator System service manual.
- 3) Review and download the contents of the System Diagnostics Log and the Extended Self-Test and Short Self-Test (SST) Logs.
- 4) Run the Extended Self-Test as described in the Covidien 840 Ventilator System Service Manual.
- 5) Turn the ventilator power off and unplug from the wall outlet.
- 6) Disconnect the high-pressure gas lines from the ventilator.
- 7) Disconnect the Backup Power Supply (if present) from the Breath Delivery Unit.

Removing the Inspiratory Module:

- 1) Inspect the Air Water Trap bowl. Drain water from bowl if necessary.
- 2) Remove the Facia Panel, retain screws for replacement later.
- 3) Remove and retain for replacement later the two screws securing the Inspiratory Module to the Breath Delivery Unit (see Figure 1).
- 4) Firmly grasp the bottom of the Inspiratory Module by the Air/Oxygen fittings and pull the Module out of the Breath Delivery Unit. Place the Module on a firm, electro-static safe surface.

Replacing the Oxygen Inlet Filter with O-Ring, Sintered Bronze Filter and Spring:

- 1) Using an adjustable wrench loosen the Oxygen Inlet Filter bowl (see Figure 1). Finish unscrewing the bowl by hand and retain with O-Ring for reuse later.
- 2) Unscrew the Oxygen Inlet Filter element and discard along with the attached O-Ring.

- 3) Remove Sintered Filter and Spring from threaded cavity and discard.
- 4) Insert new Spring into the threaded cavity and place the Sintered Bronze Filter (rough side down) over the Spring ensuring that the Sintered Filter is lying flat.
- 5) Verify that the Oxygen Inlet Filter O-Ring is in place and install the new Filter element over the Sintered Filter. Screw the new filter and O-Ring into the threaded cavity until it is snug.
- 6) Reinstall the Oxygen Inlet Filter bowl and O-Ring over the Oxygen Inlet Filter ensuring O-Ring and bowl are properly seated. Screw the bowl into place until it is snug. **Do not overtighten the bowl.**

Replacing the Air Inlet Filter:

- 1) Drain any remaining condensate from the Air Inlet Filter Housing by unscrewing the drain plug at the bottom of the bowl. Tighten plug when finished.
- 2) Unscrew the Air Inlet Filter bowl (see Figure 1) and retain along with its' O-Ring for later use.
- 3) Unscrew the Air Inlet Filter with O-Ring and discard.
- 4) Verify that the Air Inlet Filter O-Ring is properly seated and screw the filter in place until snug. Make sure that the O-Ring makes contact with the Breath Delivery Unit chassis.
- 5) Replace the Air Inlet Filter bowl and O-Ring ensuring O-Ring and bowl are properly seated. Screw the bowl into place until it is snug. **Do not overtighten the bowl.**

Test the Inspiratory Module for leaks:

- 1) Connect compressed air and oxygen sources to the Inspiratory Module.
- 2) Using a small brush, apply leak detector fluid to the oxygen and air inlet bowls. Verify that the bowls are not leaking. If a connection leaks, repair and retest as needed.
- 3) Disconnect compressed air and oxygen sources from the Inspiratory Module.
- 4) Dry all leak detection fluid from the chassis.

Reinstall the Inspiratory Module:

- 1) Grasp the bottom of the Inspiratory Module by the Air/Oxygen fittings. Align the Inspiratory Module with the slots in the Inspiratory Compartment.
- 2) Carefully slide the Module into the Inspiratory Compartment and to the back of the Breath Delivery Unit chassis until completely seated.
- 3) Reinstall the two screws that secure the Module to the Breath Delivery chassis. **Do not overtighten.**
- 4) Install the facia panel ensuring that the lip of the panel is installed under the rim of the Breath Delivery Unit plastic housing. Gently press the Facia Panel into position.
- 5) Re-install the two screws securing the Facia Panel to the Inspiratory Module. Tighten the screws until snug. **Do not overtighten.**
- 6) Re-install the backup power cable and AC power cord.

Performance verification procedures:

- 1) Place the Ventilator into Service Mode. Let the Ventilator warm up for 10 minutes and run the following procedures as described in the Covidien 840 Ventilator Service Manual:
 - a) Flow Sensor calibration
 - b) Expiratory Valve calibration
 - c) Atmospheric Pressure Transducer calibration
 - d) Extended Self-test (EST)
 - e) Ventilator Inoperative test (VENT INOP TEST)
- 2) Run the Short Self-test (SST)
- 3) Calibrate the Oxygen Sensor using 100% O2/CAL 2 min key.
- 4) Run the Performance Verification as described in the Covidien 840 Ventilator System service manual. Make any needed repairs before returning the Ventilator to use.
- 5) Fill out and attach the PM sticker (included in the kit) to the Breath Delivery Unit and update the Ventilator Maintenance Records.

Figure 1 - The Inspiratory Module

