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9025_service and repair.doc

Title:
9025-XP Service Procedure

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3/7/17

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Scope/Purpose: To define the method used to evaluate and repair the 9025-XP respiratory air monitor.

Process Steps: General Operational checks

With the monitor standing upright and fully charged, connect the compressed air supply line to the supply inlet

Note: If the monitor is lying down when air pressure is applied, the filters can become dislodged and leak

Visually check the flowmeter reading. It should be within 0.5 to 0.9 SCFH. If it is not, adjust the flow level regulator until the reading is at the proper flow level. Visually check the system outlet pressure gauge and adjust if necessary.

Switch the monitor on using the On/Off switch. Once the instrument has gone through the warm up countdown, the gas readings will be displayed on the monitor and the green LED should be illuminated. O₂ should show 20.9% and CO should show 0 ppm. The red low battery indicator should not be illuminated.

To check the low pressure alarm, disconnect the supply air from the inlet. The audible and visual alarms should come on, and the message "Low flow" should appear on the display.

To check the low flow alarm, adjust the supply air to the monitor using the flow rate regulator on the side of the RAM unit until the reading on the flowmeter no longer shows flow to the instrument. The audible and visual alarms should come on, and the message "Low flow" should appear on the display.

To check the battery charger, connect the charger to the charging inlet on the left side of the case. Plug the charger into the mains supply. The light on the charging module should blink then go to a steady red. Once the battery is fully charged (approx 2 hrs depending on charge) the light will turn green, indicating charge is complete.

Visually Check the filter change indicator on the center filter to see if the Red pop-up indicator is showing. If it is, then replace all three filters in the panel.

Process Steps: Maintenance

With the monitor standing upright and fully charged, connect the compressed air supply line to the supply inlet

Note: If the monitor is lying down when air pressure is applied, the filters can become dislodged and leak

		Service Instructions for 9025-XP	
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To perform a calibration on the monitor, you will need the following items: Gas regulator with tubing, 50 ppm CO gas (air bal), a clean air supply or impurity free air gas (synthetic air).

With clean supply air flowing to the monitor, press the center “Zero” button and release it. The message “release unless zero init” shows on the display. If the sensors zero properly, the message “End Cal CO Set” shows on the display. The CO reading should be set to 0 and the O2 reading should show 20.9. To calibrate with CO gas, connect the regulator to the 50 ppm CO gas bottle. Turn off the supply air and the message “Low flow” will appear on the display. Attach the calibration connector to the front panel and turn on the regulator to start the gas flowing. A 60 second countdown should begin alternating with 50 ppm CO on the display. Once calibration is complete, the message “End cal remove gas” will be shown. Remove the calibration gas and the message “Supply on” will appear. Turn the supply air back on and you will see the CO reading begin to decrease back to 0 (Note: The relays and alarms are turned off for 10 minutes after a calibration to allow the sensors to return to zero).

The battery should be kept charged and ready for use. To charge the battery, connect the charger to the charging inlet on the left side of the case. Plug the charger into the mains supply. The light on the charging module should blink then go to a steady red. Once the battery is fully charged (approx 2 hrs depending on charge) the light will turn green, indicating charge is complete. The charger can be left attached to the monitor to maintain a full charge for up to two weeks. The battery should be allowed to run down until the low batt LED lights up at least once every month to prevent low run times from the rechargeable battery.

The housing can be cleaned with a damp cloth if necessary. Never use solvents or detergents to clean a dirty housing as this can damage the sensors or the components.

Visually check the wiring and connections inside the case for damage and proper connection. Repair any frayed wiring or damaged connections. Check for filter leakage and tighten if necessary.

Process Steps: Service

Sensor replacement requires the removal of the sensor block on the inside of the RAM monitor. To gain access to the sensor block, loosen the four large screws on the front panel, and carefully pull the front panel outward until the sensor block can be accessed. Remove the three screws (note location of longer screw) and carefully remove the sensor block by lifting it straight up off of the pcb. Once removed you will see the CO and O2 sensors. The CO sensor plugs directly into the sockets on the main pcb, and the O2 sensor has a wire harness which plugs into the main board below the sensor block. Be sure to remove the shorting clip from a new CO sensor prior to installation. Once the sensor(s) have been replaced, re-assemble the sensor block and RAM faceplate to the monitor



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and allow the monitor to warm up for a few minutes. While the monitor is warming up, if you changed the O2 sensor, you will need to set/check the O2 counts. To do this, press the top select switch and the display will read O2 200. If the number is not at 200, use the O2 count adjustment pot to set the reading to 200. Press the bottom Setup switch to exit the count screen. You will now need to perform a zero initialize to allow the new sensor(s) to zero and calibrate. To perform a zero initialize, with supply air running into the unit, press and hold the zero button on the front of the RAM unit until the message "Initing" appears on the display. Once this message appears, release the zero button. After performing a zero initialize, the unit will need to be zero and gas calibrated.

To replace the rechargeable battery pack, loosen the four screws and remove the lid from the battery box. Disconnect the rechargeable battery pack by cutting the wires that attach the battery to the internal connections. Replace the pack by re-attaching to the same wires from where it was removed, solder the connections and cover the connections with UL rated shrink tubing. Use caution when replacing the battery pack. Shorting out the battery pack can cause high currents and the possibility of fire or explosion. NEVER SHORT TOGETHER THE LEADS FROM THE BATTERY PACK!

Filter replacement is to be carried out when the Red pop-up filter replacement indicator is visible with supply air attached, or air flow is reduced by 8-10 psi. To replace the filters, remove supply air to the system, and depressurize the unit. Unscrew the threaded bowl and the lower filter retainer. Then remove the filter element and clean the bowl and inside of the filter assembly with mild soap and water. Install the new filter and reassemble, tightening hand tight. Apply pressure and check for leaks.

To perform a bump test on the monitor to assure the sensors and alarms are operational, you will need the following items: Gas regulator with tubing, 50 ppm CO gas (air bal), 18% O2 gas (N2 bal)
Connect the regulator to the gas bottle. Loosen the front cover screws on the monitor and pull the front panel of the monitor outward a bit, to gain access to the bump test inlet. Turn on the regulator to start the gas flowing and place the end of the hose over the bump test inlet hole. If using CO gas, the reading should start to climb, the audible alarm should sound at 10 ppm, the red alarm LED on the panel should illuminate, the alarm LED on the outside of the panel should illuminate, and the CO reading on the monitor should start to flash. When testing O2 response, the audible and visual alarms should activate at 19.5% with a steady alarm tone and flashing O2 reading.