Service Manual

PLATINUM™ 5 OXYGEN CONCENTRATORS

MODEL IRC5LX (HomeFill™ II compatible)
MODEL IRC5LX02 (With SensO$_2$® and HomeFill™ II compatible)

DEALER: KEEP THIS MANUAL.
THE PROCEDURES IN THIS MANUAL MUST BE PERFORMED BY A QUALIFIED TECHNICIAN ONLY.

INVACARE®

Yes, you can.™

SPECIAL NOTES

WARNING/CAUTION notices used in this manual apply to hazards or unsafe practices which could result in personal injury or property damage.

NOTICE

THE INFORMATION CONTAINED IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE.

WARNING

DO NOT OPERATE THIS EQUIPMENT WITHOUT FIRST READING AND UNDERSTANDING THIS MANUAL. IF YOU ARE UNABLE TO UNDERSTAND THE WARNINGS, CAUTIONS, AND INSTRUCTIONS, CONTACT INVACARE TECHNICAL SERVICES OR A HEALTHCARE PROFESSIONAL (DOCTOR - THERAPIST) BEFORE ATTEMPTING TO USE THIS EQUIPMENT - OTHERWISE SERIOUS INJURY OR PROPERTY DAMAGE MAY RESULT.

SAVE THESE INSTRUCTIONS

DANGER

Users MUST NOT SMOKE while using this device. Keep all matches, lighted cigarettes or other sources of ignition out of the room in which this product is located. NO SMOKING signs should be prominently displayed. Textiles and other materials that normally would not burn are easily ignited and burn with great intensity in oxygen enriched air. Failure to observe this warning can result in severe fire, property damage and cause physical injury or DEATH.

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SAFETY SUMMARY

WARNING

The use of oxygen therapy requires that special care be taken to reduce the risk of fire. Any materials that will burn in air, and some that will not, are easily ignited and burn rapidly in high concentrations of oxygen. For safety concerns, keep all sources of ignition out of the room in which this product is located and away from areas where oxygen is being delivered. Textiles, oil and other combustibles are easily ignited and will burn with great intensity in oxygen-enriched air. NO SMOKING signs should be prominently displayed.

A spontaneous and violent ignition may occur if oil, grease or greasy substances come in contact with oxygen under pressure. These substances MUST be kept away from the oxygen concentrator, tubing and connections, and all other oxygen equipment. DO NOT use any lubricants unless recommended by Invacare.

For optimum performance, Invacare recommends that each concentrator be on and running for a minimum of 30 minutes at a time. Shorter periods of operation may be harmful for maximum product life.

If the concentrator has a damaged cord or plug, if it is not working properly, if it has been dropped or damaged, or dropped into water, call Qualified Technician for examination and repair.

Keep the power cord away from HEATED or HOT surfaces.

DO NOT move or relocate concentrator by pulling on the power cord.

NEVER drop or insert any object into any opening.

NEVER block the air openings of the product or place it on a soft surface, such as a bed or couch, where the air opening may be blocked. Keep the openings free from lint, hair and the like.

Fill humidifier with water to the level shown by the manufacturer. DO NOT overfill.

Invacare recommends that Crush-Proof oxygen tubing (supplied by Invacare) be used with this product and NOT exceed 50 ft. (15.2m) in length.

MAINTENANCE

The Platinum 5 Oxygen Concentrator was specifically designed to minimize routine preventive maintenance at intervals of once per year. Only professionals of the healthcare field or persons fully conversant with this process, such as authorized or factory trained personnel, should perform preventive maintenance or performance adjustments on the oxygen concentrator.

RADIO FREQUENCY INTERFERENCE

Most electronic equipment is influenced by Radio Frequency Interference (RFI). CAUTION should be exercised with regard to the use of portable communications equipment in the area around such equipment.

SAFETY SUMMARY (CONTINUED)

WARNING (CONTINUED)

TO REDUCE THE RISK OF BURNS, ELECTROCUTION, FIRE OR INJURY TO PERSONS.

Avoid using while bathing. If continuous usage is required by the physician's prescription:

- **The concentrator must be located in another room at least seven (7) feet from the bath.**
- **DO NOT come in contact with the concentrator while wet.**
- **DO NOT place or store product where it can drop into water or other liquids.**

DO NOT reach for product that has fallen into water.
UNPLUG IMMEDIATELY.

This device is to be used only in accordance with the prescription of a physician and the Platinum 5 Owner's Manual. If at any time the patient or attendant concludes that the patient is receiving an insufficient amount of oxygen, the supplier and/or physician should be contacted immediately. No adjustments should be made to the flowrate unless prescribed by a physician.

A product should NEVER be left unattended when plugged in.

Close supervision is necessary when this product is used by, on or near children or physically challenged individuals.

The Platinum 5 concentrator is intended to be used only as an oxygen supplement as described in the owner's manual.

DO NOT use parts, accessories or adapters other than those authorized by Invacare.

DO NOT connect the concentrator in parallel or series with other oxygen concentrators or oxygen therapy devices.

Use of some administration accessories or certain humidifiers not specified for use with oxygen concentrator may impact the performance.

In certain circumstances oxygen therapy can be hazardous.
Invacare recommends that you seek medical advice before using this machine.

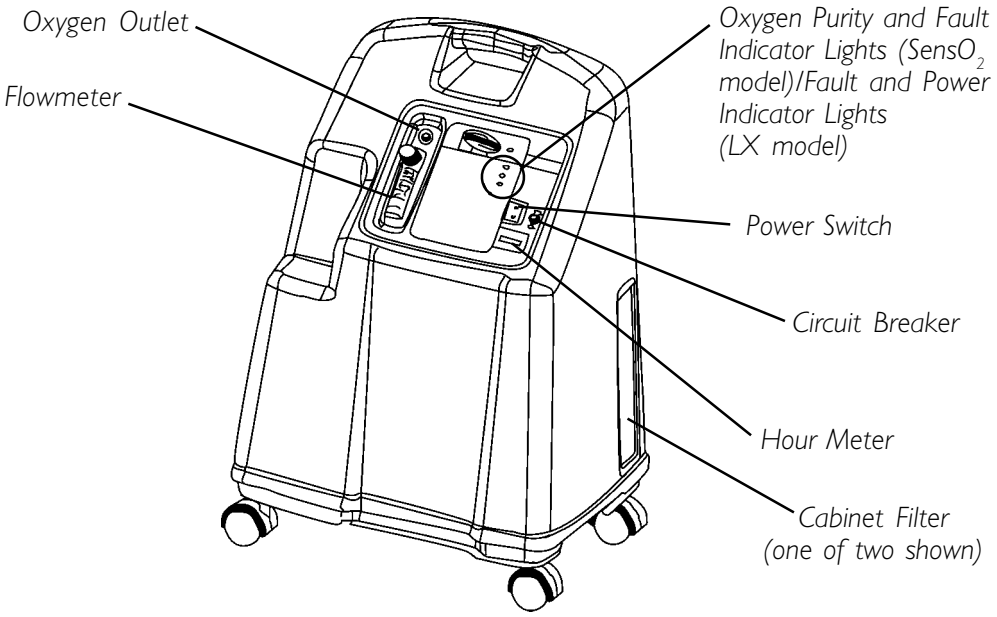
This equipment is to be used as an oxygen supplement and is not considered life supporting or life sustaining.

Avoid creation of any spark near medical oxygen equipment. This includes sparks from static electricity created by any type of friction.

POLARIZED PLUG INSTRUCTION
As a safety feature this appliance has a polarized plug (one blade is wider than the other). This plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician. DO NOT ATTEMPT TO DEFEAT THIS SAFETY FEATURE.

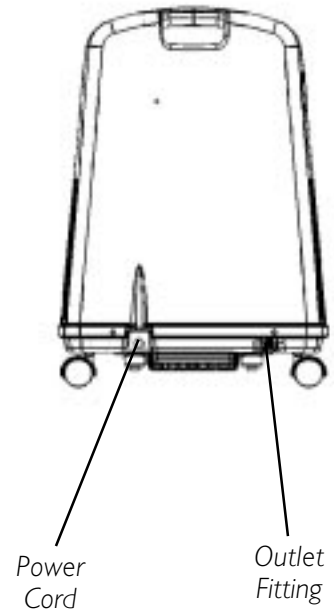
FEATURES

FRONT VIEW



FEATURES - IRC5LX/IRC5LX02

REAR VIEW



ACCESSORIES (NOT SHOWN):

Remote Humidifier/Flowmeter Accessory - IRCRF5

PreciseR$_X$™ Pediatric Humidifier/ Flowmeter Accessory - IRCPF16

Venture® HomeFill II home oxygen compressor - IOH200

NOTE: This outlet fitting is to be used only for filling oxygen cylinders with the Venture HomeFill II home oxygen compressor. The outlet fitting does not affect concentrator performance. Refer to the HomeFill II owner's manual, part number 1100873, for connection and operating instructions. When not in use, the plug provided with the concentrator should be inserted into the outlet fitting. For more information about the HomeFill II, contact your Invacare dealer.

SPECIFICATIONS

ALL MODELS UNLESS NOTED

Electrical Requirements:	120 VAC ± 10% (132 VAC/108 VAC), 60 Hz
Rated Current Input:	4.3 A
Sound Level:	50 dB Average
Operating Altitude:	Up to 6,000 ft. (1828 meters) above sea level without degradation of concentration levels. From 6,000 ft. (1828 meters) to 13,129 ft. (4000 meters) below 90% efficiency.
***Oxygen Output Concentration Levels:**	All IRC5LXO_2/IRC5LX Models 95.6% to 87% at 1/2 to 5 L/min. * *Stated Concentration Levels achieved after initial warm-up period (approximately 30 minutes).*
Maximum Outlet Pressure:	5 ± 0.5 p.s.i. (34.5 ± 3.45 kPa)

IRC5LX INDICATORS:

Label Symbol	Status	Indicator Lights (LED)	
I/O	SYSTEM OKAY	**GREEN**	Indicator Light
🔔	SYSTEM FAILURE	**RED**	Continuous Audible Alarm Sieve-GARD™ Compressor Shutdown **Call Qualified Service Personnel!**

IRC5LXO_2 INDICATORS:

Label Symbol	Status	Indicator Lights (LED)	
O_2	SYSTEM OKAY O_2 Over 85% (± 2%)	**GREEN**	Indicator Light
⚠	O_2 Between 73% (± 3%) to 85% (± 2%)	**YELLOW**	A. Yellow Solid B. Yellow Flashing-Sensor Failure **Call Qualified Service Personnel!**
🔔	SYSTEM FAILURE O_2 Below 73% (± 3%)	**RED**	Continuous Audible Alarm Sieve-GARD™ Compressor Shutdown **Call Qualified Service Personnel!**

SPECIFICATIONS (CONTINUED)

Flow Range:	1/2 - 5 L/min. For flowrates less than 1.0 L/min., we recommend the use of the Invacare Pediatric Flowmeter IRCPF16 Accessory.
Low Flow Alarm:	0 L/min. to 0.5 L/min., RAPID Audible Alarm (Beeping) (No accessories connected).
Average Power Consumption:	400W
Pressure Relief Mechanism Operational at:	35 p.s.i. ± 3.5 p.s.i. (241 kPa ± 24.1 kPa)
Change in maximum recommended flow when back pressure of 7kPa is applied:	0.7 L/min.
Filters:	Cabinet (2), Outlet HEPA, and Compressor Inlet.
Safety System:	Current overload or line surge shutdown. High temperature compressor shutdown. High Pressure Alarm w/compressor shutdown. Low Pressure Alarm w/compressor shutdown. Low Flow Alarm. Battery Free Power Loss Alarm. ***Sens*O$_2$** Oxygen System **(IRC5LXO$_2$)**.
Width:	18-3/8" ± 3/8" (46.7 cm ± 1 cm)
Height:	26-3/8" ± 3/8" (67.0 cm ± 1 cm)
Depth:	14-3/8" ± 3/8" (36.5 cm ± 1 cm)
Weight:	51 lbs. ± 1 lb. (23.2 kg ± 0.5 kg)
Shipping Weight:	58 lbs. ± 1 lb. (26.3 kg ± 0.5 kg)
Operating Ambient Temperature:	50° F - 95° F (10° C - 35° C) at 20-60% relative humidity.
Exhaust Temperature:	Less than Ambient + 35° F (+19° C).
Oxygen Output Temperature:	Less than Ambient + 4° F (+2° C).
Cabinet:	Impact Resistant flame-retardant plastic cabinet that conforms to UL 94-V0.
Regulatory Listing:	DOUBLE INSULATED PRODUCT ETL certified complying with UL 1097, UL 1431 ETL certified to CSA C22.2 No. 68
Electrical:	No Extension Cords.
Placement:	No Closer than 3 inches from any wall, furniture, draperies or similar surfaces.
Relative Humidity:	20-60%
Time of Operation:	Up to 24 hours per day.
Recommended Storage and Shipping Temperature:	-20° F to 150° F (-29° C - 65° C) at 15-95% relative humidity.

SHIPPING AND HANDLING INSTRUCTIONS

Before you install and operate the concentrator, please refer to Platinum 5 owner's manual.

The Platinum 5 concentrator should always be kept in the upright position to prevent cabinet damage while being transported. The shipping container has been designed to assure maximum protection of the concentrator.

If the concentrator is to be reshipped by common carrier, it should be packed in a new carton. Additional cartons are available from Invacare.

The air compressor suspension system has been engineered to withstand severe motion and orientation.

UNPACKING (FIGURE 1)

1. Check for any obvious damage to the carton or its contents. If damage is evident, notify the carrier, or Invacare.
2. Remove all loose packing from the carton.
3. Carefully remove all the components from the carton.

NOTE: Retain carton and packing materials for storage of the Platinum 5.

INSPECTION

1. Examine exterior of the oxygen concentrator for nicks, dents, scratches or other damages. Inspect all components.

STORAGE

1. Store the repackaged oxygen concentrator in a dry area.
2. **DO NOT** place other objects on top of the repackaged concentrator.

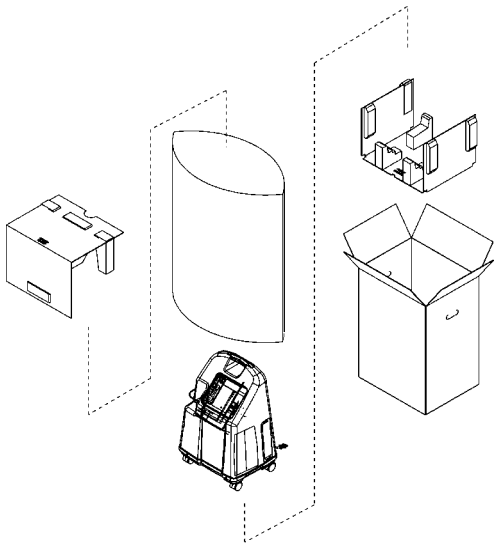


FIGURE 1 - UNPACKING

INSTALLATION / SEQUENCE OF OPERATION

INSTALLATION / VERIFICATION OF BATTERY FREE POWER LOSS ALARM

When your new Platinum 5 concentrator arrives, it should be checked for proper operating conditions.

1. If the unit has been in below-freezing temperatures, allow it to warm up to room temperature before operating.
2. The concentrator may need to be turned on for **4 to 5 seconds** to charge the Battery Free Power Loss Alarm. Connect power cord to outlet and turn the concentrator on. Turn flow control knob counterclockwise and flow will begin immediately. Set flow rate to 5L/min. Let the unit run for 30 minutes then turn unit off.
3. Unplug the power cord and press ON/OFF **(I/O)** switch to the **ON (I)** position. An intermittent audible alarm will sound. This confirms proper operation of the Battery Free Power Loss Alarm. Turn ON/OFF switch **OFF (O)**.
4. Connect power cord to outlet and turn on concentrator. Unit will **BEEP** on start-up.
5. Check the oxygen concentration per specifications after 30-40 minutes running time.

SEQUENCE OF OPERATION

Turning ON (I) the power switch, applies 120 VAC to the compressor motor, hour meter, transformer, cooling fan and the Printed Circuit (P.C.) Board.

Room air enters the compressor via the cabinet filter and the compressor inlet filter. The air is compressed by the wobble pistons in the compressor to a pressure of 21 p.s.i. (144.79 kPa).

As increased pressure creates increased temperature, a heat exchanger is used to lower the temperature before the air enters the 4-way valve. It is then channeled to a sieve bed containing the adsorption material. Restriction downstream of the sieve bed causes pressure to build up inside the sieve bed which is necessary for the adsorption process. A small amount of relatively pure oxygen enters the top of the second bed through a restrictive leak in the P.E. Valve with the balance entering a storage tank. The nitrogen removed is exhausted back from the bed through the 4-way valve into room air. A muffler is located at the exhaust end of the valve to muffle the sound of the exhaust as it exits the concentrator.

The oxygen not being used to exhaust is channeled into the storage tank. The pressurized oxygen is regulated down to 5 p.s.i. (34.4 kPa), enters an accurate flow-measuring device, flows through Outlet HEPA filter, a check valve and out to the patient.

The electrical activation of the 4-way Valve is accomplished every 8 to 15 seconds by the pressure sensor and P.C. Board electronics when the pressure reaches a set point of 21 p.s.i. (kPa). The time between cycles is dependent on altitude, flow rate and internal environmental factors.

A Pressure Equalization (P.E.) valve opens just prior to the shift of the 4-way valve. This allows highly concentrated oxygen to enter the just exhausted bed from the top. This additional pressure allows the bed to start its cycle at a higher pressure. The P.E. Valve will close just after the shift of the 4-way Valve.

If main power is lost, the Battery Free Power Loss Alarm will sound a short **"BEEP"**, with a long pause after. All units are equipped with a diagnostic alarm system that signals if the pneumatic pressure or electrical systems malfunction. The Troubleshooting Guide in this manual explains the alarm system signals and reasons, in detail, for your convenience.

SENSO$_2$ OXYGEN SENSOR TECHNOLOGY - CERAMIC ZIRCONIA SENSOR

Technical Description

The oxygen being produced by the concentrator flows out of the product tank and into the flowmeter. A small flow of oxygen produced by the unit is sent through a precision orifice to the oxygen sensor mounted on the printed circuit board.

As the oxygen enters the sensor, it passes through a screen and contacts the sensing disk.

Electric current flowing through a metal film resistor heats the disk in excess of 300° C. Oxygen molecules contact the electrode of the disk and pick-up extra electrons to become oxygen ions. These oxygen ions are attracted to the electrode on the bottom of the zirconia disk. Because of the crystal structure of the zirconia, only oxygen ions can pass through. When the oxygen ions reach the bottom electrode, the extra electrons are released from the oxygen ions and oxygen molecules return to the air. The number of electrons is directly related to the oxygen concentration. The electrons travel to the P.C. board where they are "counted" and the oxygen concentration "reading" is calculated.

A microprocessor on the P.C. board contains software that interprets the signal being received from the sensor. It compares the signal to clinically acceptable limits. Signals outside of the clinically acceptable limits generate responses in the form of lights, audible indicators, and/or system shut-down.

Operating Sequence

Once the power switch has been turned **ON (I)**, the SensO$_2$ circuit will wait 5 minutes for the concentrator to begin producing clinically acceptable oxygen and the oxygen sensor to stabilize. The **GREEN LIGHT** will illuminate (indicating normal system operation) while the oxygen sensor is warming up.

After 5 minutes, if the oxygen purity exceeds 85% ± 2% the **GREEN LIGHT** will continue to illuminate.

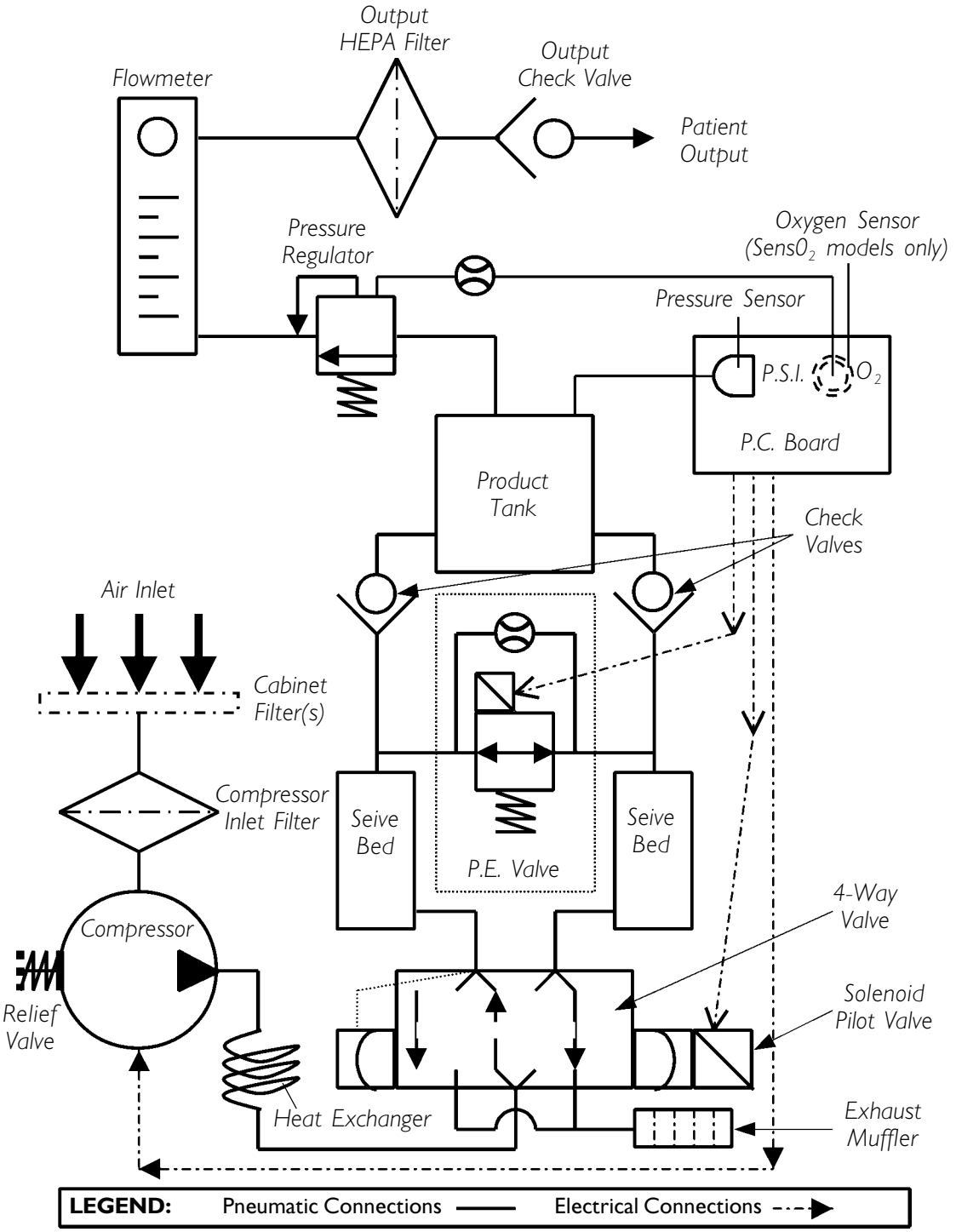
If the oxygen level is not above 85% ± 2% after the first 5 minutes, the system will continue to monitor the O_2 and wait for a maximum of 30 minutes from start-up to reach 85% ± 2% before activating an alarm. Environmental factors such as low voltage, high altitude, or age of the machine will affect the time required to reach 85% ± 2%.

If the oxygen level is not above 85% ± 2% within the first 30 minutes, the oxygen concentration alarm sequence will activate and the unit will shut down.

When oxygen concentration is above 85% ± 2%, the sensor measures oxygen purity every 10 minutes. If a reading falls below 85% ± 2%, a **YELLOW LIGHT** will illuminate. If the oxygen purity falls below 73% ± 3% the **RED LIGHT/Alarm/Shut-Down** mode will activate.

PNEUMATIC DIAGRAM

PLATINUM 5 OXYGEN CONCENTRATOR



TROUBLESHOOTING GUIDE

SYMPTOM:	PROBABLE CAUSE:	SOLUTION:
NORMAL OPERATION: **Internal Status Indicators:** **RED: Off** **GREEN: Off** Unit plugged in, power switch on. Single beep on start up.	No problems.	System Okay.
POWER LOSS: **Internal Status Indicators:** **RED: Off** **GREEN: Off** Unit unplugged, power switch on, alarm off.	No problems.	Battery Free Circuit drained. Plug in cord and turn power switch **ON (I)** to recharge.
POWER LOSS: **Internal Status Indicators:** **RED: Off** **GREEN: Off** Unit plugged in, power switch on, alarm off. Battery Free circuit drained.	1. No power at outlet.	1. Check electrical outlet with a table lamp or voltmeter set on 150-200 VAC scale. If outlet isn't working, check protective device in home's electrical panel or consult an electrician. Also ensure that unit is properly plugged in. DO NOT use extension cords. Move to another outlet or circuit.
	2. Power cord. a. Frayed. b. Broken or damaged spade. c. Spade connector from power cord loose or disconnected **(inside back of unit)**.	2a. Replace cord. 2b. Replace power cord connectors on plug. 2c. Reattach connector.
	3. **ON/OFF (I/O)** switch. a. Disconnected wire. b. Faulty switch.	3a. Check all electrical connections to the **ON/OFF (I/O)** switch for any disconnected wires. 3b. If the concentrator does not come on at all and wiring is intact, color code and remove wires one at a time. Remove and replace with new one. Transfer wires from old switch to new switch one at a time to the matching contact.

NOTE: Refer to the Repair/Replacement Guide in this manual for proper replacement or adjustment procedures.

TROUBLESHOOTING GUIDE

SYMPTOM:	PROBABLE CAUSE:	SOLUTION:
POWER LOSS (Continued):	4. Circuit breaker tripped	4. Reset breaker. *NOTE: Breaker may trip to safeguard concentrator during a power surge. If breaker trips immediately, there is a probable short in the unit. Check for pinched or charred wires. If the breaker does not trip, run unit for approximately two (2) hours. If breaker trips again, there is an internal problem. Contact* ***INVACARE TECHNICAL SERVICE at 1-800-832-4707.***
	5. P.C. board. a. Damaged. b. Loose or damaged connector.	5a. Replace **(SECTION 11).** 5b. Repair or replace connector.
INTERNAL POWER LOSS $SensO_2$: **Internal Status Indicators:** **RED: Off** **GREEN: Off** Alarm may or may not be on. **Control Panel Indicators:** **RED: Off** **YELLOW: Off** **GREEN: Off** Fan operates, compressor not operating.	1. Transformer assembly. a. Faulty. b. Connector loose or disconnected. c. Faulty wiring. 2. P.C. board. Faulty.	 1a. Replace **(SECTION 12).** 1b. Reattach connector. 1c. Replace transformer assembly **(SECTION 12).** 2. Replace P.C. board **(SECTION 11).** Unit requires retiming after P.C. board replacement **(SECTION 18).**
HIGH PRESSURE: **Internal Status Indicators:** **RED: One (1) Flash** **GREEN: Two (2) Flashes** Unit plugged in, power switch on, continuous alarm. Compressor shut down.	1. P.C. board. a. Malfunction b. Disconnected wire. c. Shifting valve at pressures greater than 25 p.s.i.	 1a. Set flow to max L/min. for concentrator. Check voltage across Pilot Valve 1 on 200 volt scale. If meter reads 0 volts when unit is turned on, replace P.C. board **(SECTION 11).** 1b. Check spade connectors on pilot valves 1 or 2 and connectors on P.C. board. 1c. Replace P.C. board **(SECTION 11).** Unit may require retiming after P.C. board replacement **(SECTION 18).**

NOTE: Refer to the Repair/Replacement Guide in this manual for proper replacement or adjustment procedures.

TROUBLESHOOTING GUIDE

SYMPTOM:	PROBABLE CAUSE:	SOLUTION:
HIGH PRESSURE: (Continued):	2. 4-way Valve a. Not shifting.	 2a. If voltage rises to approximately 24 volts D.C. when unit shuts down, P.C. board is functioning properly. Replace 4-way valve **(SECTION 16).**
	b. Bad coil.	2b. Replace 4-way valve **(PROCEDURE 16).**
	3. Sieve beds. Contaminated.	3. Replace sieve beds **(SECTION 4).**
LOW PRESSURE: **Internal Status Indicators:**	1. Compressor inlet filter dirty or plugged.	1. Replace compressor inlet filter **(SECTION 2).**
RED: One (1) Flash **GREEN: One (1) Flash** **Or** **RED: One (1) Flash** **GREEN: Three (3) Flashes**	2. Compressor. a. Leaks at fittings or tubing. b. Leaking or defective relief valve. c. Insufficient voltage at outlet.	 2a. Replace or repair. 2b. Repair leak or replace. 2c. **DO NOT** use extension cords. Use another outlet.
	d. Worn cup seals or gaskets.	2d. Rebuild top end of compressor **(SECTION 2).**
Control Panel Indicators: **RED: On** **YELLOW: Off** **GREEN: Off**	3. Heat exchanger a. Leak at tubing or body chamber. b. Inspect tubing and heat exchanger.	 3a. Replace or retighten. 3b. Replace or retighten tubing. Replace heat exchanger **(SECTION 8).**
Unit plugged in, power switch on, continuous audible alarm. Compressor shut down (Failure to cycle due to low pressure).	4. Regulator cracked or leaking.	4. Replace **(SECTION 6).**
	5. P.E. valve leaking.	5. Replace P.E. Valve. Check voltage at P.E. Valve connector on 24 volt D.C. scale. The P.E. Valve activates or energizes approximately one (1) second prior to the activation of the 4 way valve with approximately 24 volts. If voltage is in excess of 24 volts consistently, replace the P.C. board. If the P.C. board voltage acts normally, replace the P.E. valve **(SECTION 3).** **NOTE: Check for leaks starting at the compressor output through all the pneumatic connections. Major leaks will cause system pressures to remain below adequate shift (exhaust) pressures and will cause compressor shut down.**

NOTE: Refer to the Repair/Replacement Guide in this manual for proper replacement or adjustment procedures.

TROUBLESHOOTING GUIDE

SYMPTOM:	PROBABLE CAUSE:	SOLUTION:
DEFECTIVE PARTS: **Internal Status Indicators:**	1. Defective main valve coil.	1. Replace main valve. 1a. Replace main valve coil.
RED: One (1) Flash **GREEN: Five (5) Flashes** **Or** **RED: Two (2) Flashes** **GREEN: Three (3) Flashes**	2. Connector loose. 3. Defective P.C. board.	2. Reattach connector. 3. Replace P.C. board.
Control Panel Indicators: **RED: On** **YELLOW: Off** **GREEN: Off** Unit plugged in, power switch on, continuous audible alarm. Compressor shut down	1. Defective P.E. valve. 2. Connector loose. 3. Defective P.C. board.	1. Replace P.E. valve. 2. Reattach connector. 3. Replace P.C. board.
Unit not operating: **Alarm: on or off**		
Internal Status Indicators: **RED: Two (2) Flashes** **GREEN: Four (4) Flashes**	P.C. board Failure.	Replace P.C. board.
Or **RED: Two (2) Flashes** **GREEN: Five (5) Flashes**	P.C. board Failure.	Replace P.C. board.
LOW CONCENTRATION: **NOTE: Check for O_2 purity using a calibrated Oxygen Analyzer at Test Point 1 (OXYGEN OUTLET) of the concentrator.**	1. Cabinet filters dirty.	1. Clean or replace **(SECTION 2).**
	2. Compressor inlet filter dirty.	2. Replace **(SECTION 2).**
	3. Compressor.	
	a. Defective.	3a. Replace compressor **(SECTION 7).**
	b. Faulty capacitor.	3b. Replace capacitor **(SECTION 7).**
Internal Status Indicators:	c. Bad motor windings.	3c. Replace compressor **(SECTION 7).**
	d. Worn seals.	3d. Rebuild top end of compressor **(SECTION 2).**
RED: Two (2) Flashes **GREEN: One (1) Flash** **73% Shutdown**	e. Bad bearings.	3e. Replace compressor **(SECTION 7).**
	f. Leak at fittings or tubing.	3f. Replace fittings or tubing.
Control Panel Indicators:	g. Leaky or defective relief valve.	3g. Replace relief valve.
SensO_2 ONLY:	h. Insufficient voltage **(outlet)**.	3h. **DO NOT** use extension cords.
RED: On **YELLOW: Off** **GREEN: Off**	4. Heat exchanger.	
	a. Leak at tubing or body chamber.	4a. Replace or retighten.
	b. Inspect tubing and heat exchanger.	4b. Replace or retighten tubing. Replace heat exchanger **(SECTION 8).**

NOTE: Refer to the Repair/Replacement Guide in this manual for proper replacement or adjustment procedures.

TROUBLESHOOTING GUIDE

SYMPTOM:	PROBABLE CAUSE:	SOLUTION:
LOW CONCENTRATION (Continued): For SensO_2 units, the **RED** indicator will signal extremely low purity and will be accompanied by a continuous audible alarm and a system shutdown. Repairs are required.	5. Regulator cracked or leaking.	5. Replace **(SECTION 6).**
	6. Exhaust muffler dirty or plugged.	6. Replace **(SECTION 2).**
	7. Fan a. Not operating. Unit overheating.	7a. Leads to fan disconnected. Reconnect **(SECTION 10).**
	b. Faulty fan.	7b. Replace **(SECTION 10).**
	8. Sieve beds defective	8. Replace **(SECTION 4).**
	9. Tubing kinked or blocked.	9. Repair or replace.
	10. P.C. board a. Shifts at wrong pressures.	10a. Check pressure at product tank. Pressure should rise to 21 p.s.i. at shift point. If not, replace P.C. Board **(SECTION 21).**
	11. Flowmeter. a. Flowmeter opened beyond maximum flow rate.	11a. Return flow to maximum setting.
	b. Cracked or broken fitting.	11b. Replace fitting.
	c. Input tubing leaking or loose.	11c. Repair or replace.
	12. Timing.	12. To accommodate for varying tolerances when replacing components, an adjustable timer is used to control the shifting of the Platinum 5 Pressure Equalization **(P.E.)** Valve **(SECTION 18).**
	13. P.E. valve. a. Bad coil.	13a. Replace P.E. valve **(SECTION 3).**
	b. Restrictor blockage.	13b. Replace P.E. valve **(SECTION 3).**
	14. Inspect P.C. board restrictor tubing for kinks or tears.	14. Replace P.C. board. Unit may need retiming after board replacement **(SECTION 11).**
FLUCTUATING FLOW:	1. Regulator/Flowmeter. a. Incorrectly set regulator.	1a. Check pressure at oxygen outlet. Adjust regulator **(SECTION 6).**

NOTE: Refer to the Repair/Replacement Guide in this manual for proper replacement or adjustment procedures.

TROUBLESHOOTING GUIDE

SYMPTOM:	PROBABLE CAUSE:	SOLUTION:
FLUCTUATING FLOW: (Continued)	b. Flowmeter malfunction.	1b. If flow is still unstable, check for leaks starting at the compressor outlet fitting through all pneumatic connections. If no leaks are found and flow is still fluctuating, replace the regulator **(SECTION 6).** If pressure at test point is within spec (5 p.s.i. ± 0.2 max. [34.4 kPa ± 6.89]), replace flowmeter **(SECTION 14).**
	2. Outlet HEPA filter a. Dirty or plugged	2a. If low flow conditions persists, replace outlet HEPA filter.
UNIT EXCESSIVELY LOUD:	1. Pneumatic exhaust. a. Muffler cracked, damaged or missing	1a. Replace **(SECTION 2).**
	b. Muffler tubing disconnected or damaged.	1b. Reconnect or replace tubing.
	2. Compressor inlet filter missing.	2. Replace compressor inlet filter.
	3. Compressor.	3. Replace Compressor. Internal damage **(SECTION 7).**
UNIT OVERHEATS:	1. Base exhaust vent plugged or restricted.	1. Place unit at least 3-inches from any wall. DO NOT place unit on pile or shag carpeting that may restrict air flow.
	2. Cabinet filters dirty or blocked.	2. Clean or replace **(SECTION 2).**
	3. Fan. a. Leads to fan disconnected.	3a. Reconnect leads.
	b. Defective fan.	3b. Replace fan **(SECTION 10).**
	c. Fan installed upside down.	3c. Install fan with air flow arrow pointing down **(SECTION 10).**
	4. Heat exchanger. a. Dirty or plugged.	4a. Clean heat exchanger **(SECTION 2).**
	b. Damaged.	4b. Replace heat exchanger **(SECTION 8).**

NOTE: Refer to the Repair/Replacement Guide in this manual for proper replacement or adjustment procedures.

TROUBLESHOOTING GUIDE

SYMPTOM:	PROBABLE CAUSE:	SOLUTION:
UNIT OVERHEATS:	5. Compressor. a. Defective. b. Faulty capacitor. c. Bad motor windings. d. Worn seals. e. Bad bearings. 6. Line voltage excessive **(surge).**	5a. Replace compressor **(SECTION 7).** 5b. Replace capacitor **(SECTION 7).** 5c. Replace compressor **(SECTION 7).** 5d. Replace compressor **(SECTION 7).** 5e. Replace compressor **(SECTION 7).** 6. Have line voltage inspected by certified electrician. A voltage regulator may be required and is obtainable from your local electric company.
OXYGEN PURITY: GOOD **Internal Status Indicators:** **Control Panel Indicators:** **RED: Off** **YELLOW: On** **GREEN: On** After 30 minutes of run time, unit operates normally, oxygen purity within normal range. Green or Yellow panel indicator should illuminate.	1. P.C. board defective.	1. Replace P.C. board **(SECTION 11).** Unit may need retiming after P.C. board replacement **(SECTION 18).**
UNIT NOT OPERATING, **Internal Status Indicators:** **RED: Off** **GREEN: Off** **Control Panel Indicators:** **RED: Off** **YELLOW: Off** **GREEN: Off** Power Switch ON. Continuous audible alarm.	1. Transformer assembly. a. Assembly connector disconnected. b. Faulty transformer assembly.	1a. Reattach connector. 1b. Replace transformer assembly **(SECTION 12).**

NOTE: Refer to the Repair/Replacement Guide in this manual for proper replacement or adjustment procedures.

TROUBLESHOOTING GUIDE

SYMPTOM:	PROBABLE CAUSE:	SOLUTION:
UNIT OPERATING, Internal Status Indicators: **RED: Three (3) Flashes** **GREEN: One (1) Flash** **Control Panel Indicators:** **RED: Off** **YELLOW: Flashing** **GREEN: On**	1. Internal repairs required.	1. Replace SensO_2 circuit board **(SECTION 11).**
Low-Flow Alarm does not activate on flows less than 0.5 L/min	1. System leak. 2. Defective check valves.	1. Repair leak in product tank, regulator, tubing, fittings, or flow meter. 2. Replace check valves.

NOTE: Refer to the Repair/Replacement Guide in this manual for proper replacement or adjustment procedures.

NOTE: On models manufactured after 12/02, the Error Code displayed on the internal status indicators is maintained in memory to aid in repairs. The Error Code must be cleared from the unit's memory after fixing the fault. The Error Code memory will be cleared after turning power on and off five times after the fault was detected.

Section 1 - Cabinet - includes the following:
Removing Cabinet

REMOVING CABINET (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove the four (4) mounting screws that secure cabinet assembly to the base assembly.
3. Lift the cabinet straight up.

NOTE: When required, vacuum inside of the cabinet and exposed foam insulation.

4. To re-install cabinet, reverse STEPS 2-3.

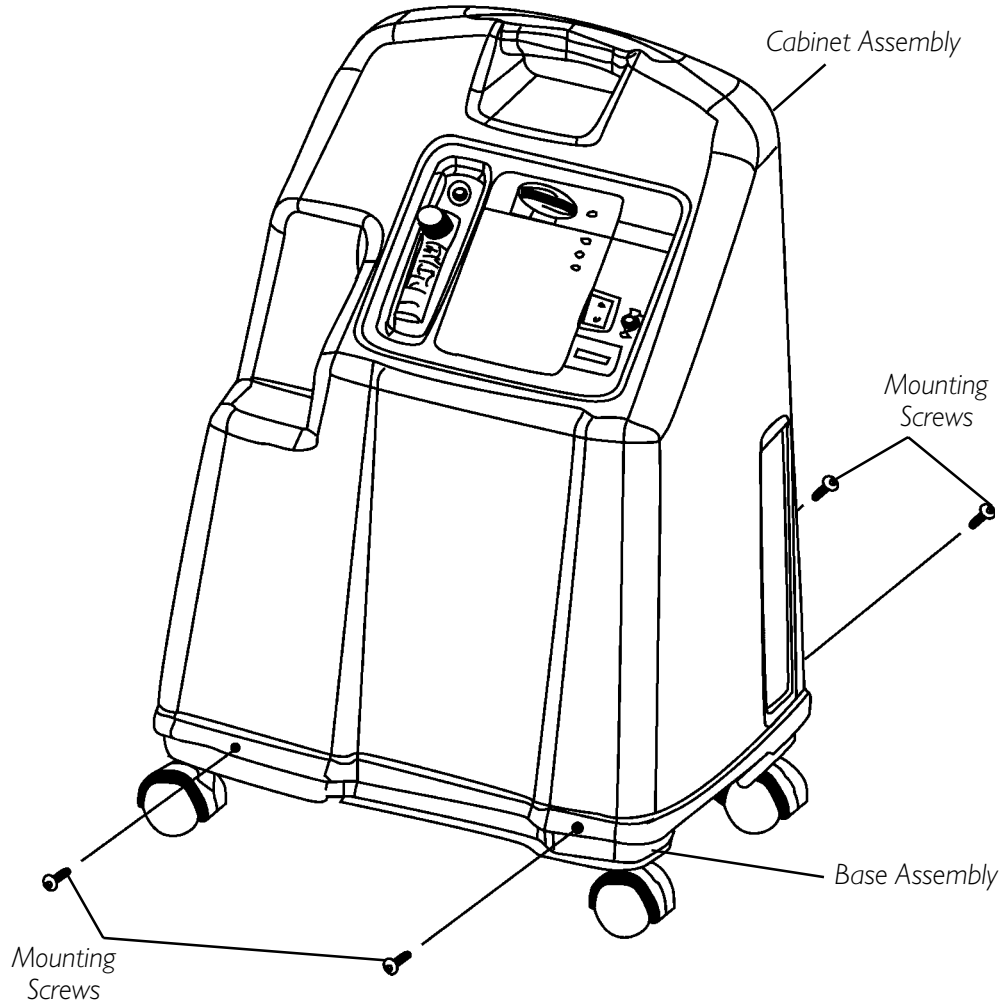


FIGURE 1 - REMOVING CABINET

Section 2 - Preventive Maintenance - includes the following:
Cleaning the Cabinet Filters
Replacing the Outlet HEPA Filter
Replacing the Compressor Inlet Filter
Exhaust Canister/Exhaust Muffler
Rebuilding Thomas Model 2660 Compressor - 5 Liter
Preventive Maintenance Record

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

NOTE: The Platinum 5 Concentrators are specifically designed to minimize routine preventive maintenance at intervals of once per year. In places with high dust or soot levels, maintenance may need to be performed more often. The following must be performed at a minimum of one (1) year in service to assure years of additional reliability (Refer to TROUBLESHOOTING GUIDE for plugged filter symptoms). Only qualified technicians should perform preventive maintenance on the concentrator. Power should be disconnected before beginning preventive maintenance on the Invacare concentrator.

CLEANING THE CABINET FILTERS (FIGURE 1 & 2)

NOTE: Perform this procedure as needed depending upon the environment the concentrator is used in.

NOTE: There are two (2) cabinet filters. One (1) is located on each side of the cabinet (FIGURE 1).

1. Remove each filter and **CLEAN AT LEAST ONCE A WEEK** depending on environmental conditions. Refer to FIGURE 2.

NOTE: Environmental conditions that may require more frequent cleaning of the filters include but are not limited to: high dust, smoking, air pollutants, etc.

2. Clean the cabinet filters with a vacuum cleaner or wash in warm soapy water and rinse thoroughly. Refer to FIGURE 2.
3. Dry the filters thoroughly before reinstallation.

FIGURE 1 - CABINET FILTER LOCATION

CAUTION

DO NOT operate the concentrator without the filters installed.

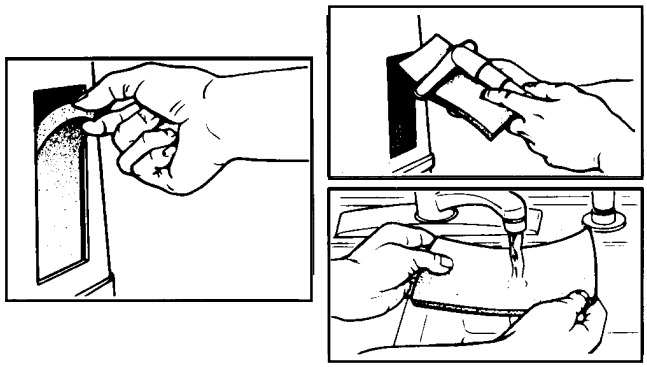


FIGURE 2 - CLEANING THE CABINET FILTERS

REPLACING THE OUTLET HEPA FILTER (FIGURE 3)

NOTE: The Outlet HEPA filter can be checked by performing the following procedure.

1. Turn the concentrator on and adjust the flowmeter to the maximum flow of the unit.
2. Observe the flowmeter's flow indicator while connecting a 50 foot cannula tube to the outlet barb of the concentrator.
3. If the flow indicator fluctuates, the Outlet HEPA filter may need replacement. Refer to TROUBLESHOOTING GUIDE section on fluctuating flow.

To replace the Outlet HEPA filter, perform this procedure as needed depending on the Outlet HEPA filter check results.

1. Unplug the unit.
2. Locate the filter access and humidifier adapter storage plate located on the side of the concentrator.

3 Insert a flathead screwdriver in the plate groove on the top edge of the plate and gently pry the humidifier adapter storage plate open. Refer to FIGURE 3, DETAIL "A" to remove the plate.

4. Remove plate and set aside.
5. Grasp the existing Outlet HEPA filter and disconnect from the short silicone tube. Refer to FIGURE 3, DETAIL "B".
6. Disconnect existing Outlet HEPA filter from the long silicone tube. Refer to FIGURE 3, DETAIL "B".

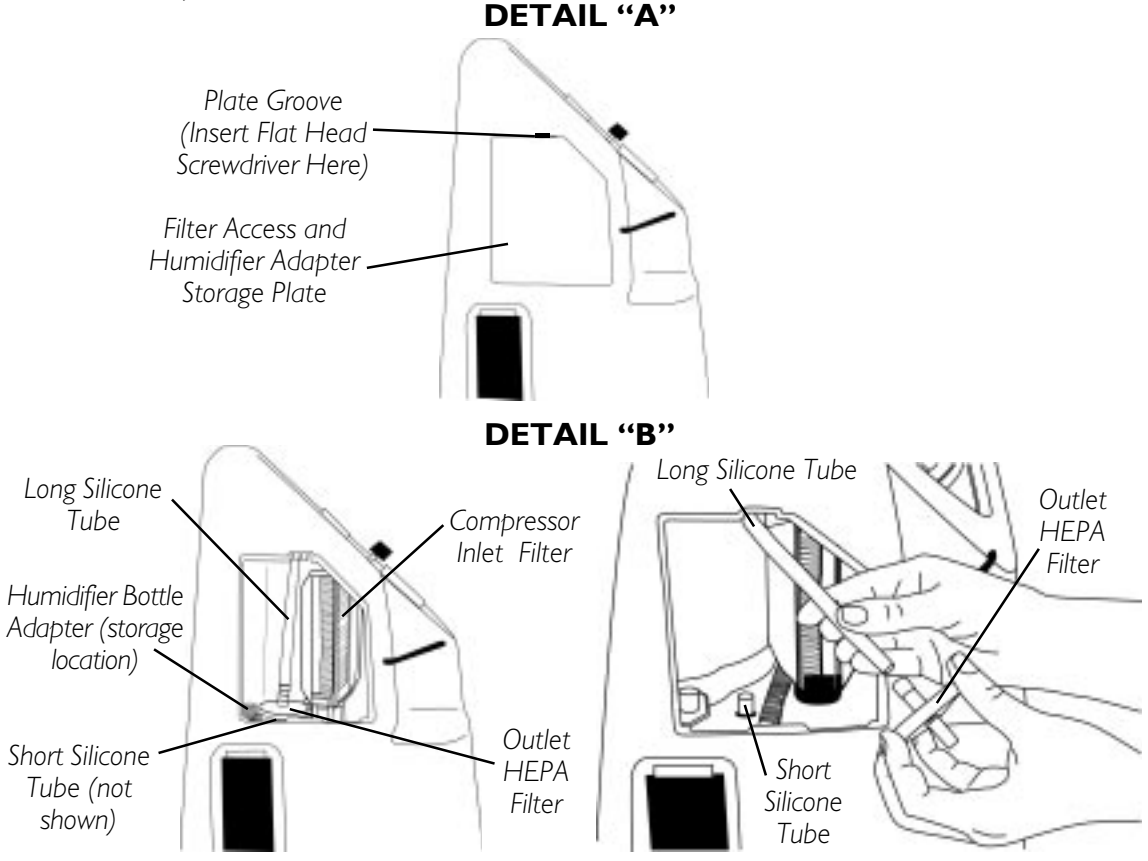


FIGURE 3 - REPLACING OUTLET HEPA FILTER

7. Discard existing Outlet HEPA Filter.
8. Attach NEW Outlet HEPA Filter to short and long silicone tubes.
9. Reinstall Filter Access and Humidifier Adapter Storage plate.

REPLACING THE COMPRESSOR INLET FILTER (FIGURE 3 AND 4)

NOTE: Perform this procedure as needed depending upon the environment the concentrator is used in.

1. Unplug the unit.
2. Locate the filter access and humidifier adapter storage plate located on the side of the concentrator.
3. Insert a flathead screwdriver in the plate groove on the top edge of the plate and gently pry the humidifier adapter storage plate open to remove the plate. Refer to FIGURE 3, DETAIL "A" in the Replacing the Outlet HEPA filter procedure in this section of the manual.
4. Grab the compressor inlet filter and pull downward. Refer to FIGURE 4.
5. Discard the existing compressor inlet filter.
6. Install NEW compressor inlet filter by inserting the filter opening into the rubber base.
7. Push the filter down until the rubber base touches the edge of the filter.
8. Reinstall the filter access and humidifier adapter storage plate.

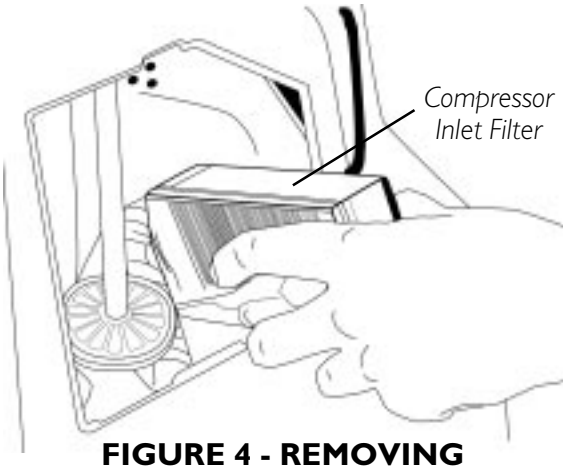


FIGURE 4 - REMOVING COMPRESSOR INLET FILTER

EXHAUST CANISTER/EXHAUST MUFFLER (FIGURE 5)

NOTE: The following should be performed at 20,000 hour intervals although these procedures can be performed as needed depending upon the environment the concentrator is exposed to.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove mounting screw(s) from rear of sound box.
4. Disconnect and remove the manifold exhaust tubing from the barbed fittings on top of the exhaust canister.
5. Unscrew **(counterclockwise)** the exhaust muffler located on the exhaust canister.
6. Inspect exhaust canister to ensure the barbed fittings are clear and do one of the following:
   a) Replace exhaust canister and muffler if plugged or restricted.
   b) Install only **NEW** exhaust muffler if exhaust canister is in good condition.

7. Install **NEW**/re-install existing exhaust canister by reversing STEPS 3-4.
8. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

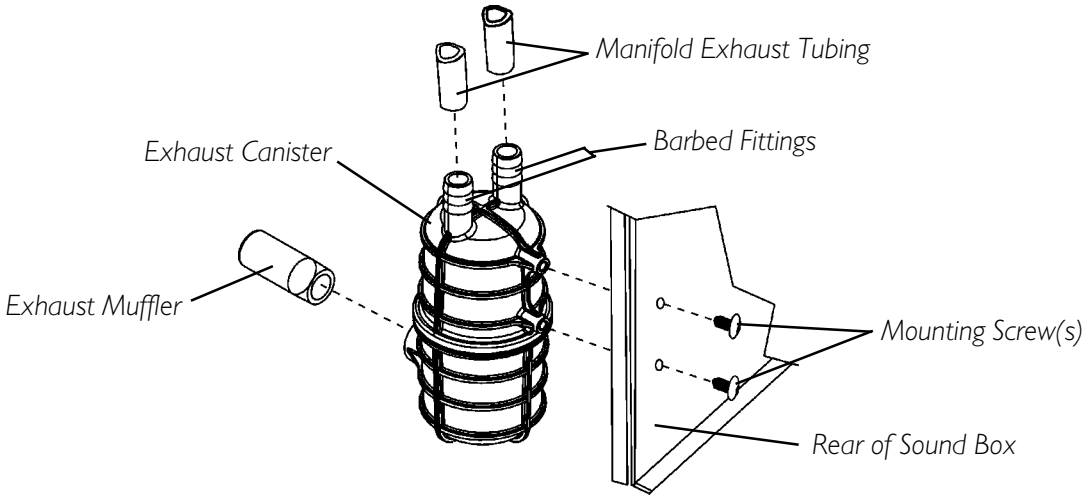


FIGURE 5 - EXHAUST CANISTER/EXHAUST MUFFLER

CLEANING THE HEAT EXCHANGER (FIGURE 6)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.

WARNING

Use care not to deform heat exchanger when installing, removing or cleaning.

3. Remove heat exchanger. Refer to SECTION 8 - REPLACING THE HEAT EXCHANGER.
4. Remove screw securing heat exchanger standoff to the soundbox.
5. Remove excess dirt using compressed air or vacuum.
6. Reinstall the heat exchanger. Refer to SECTION 8 - REPLACING THE HEAT EXCHANGER.
7. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

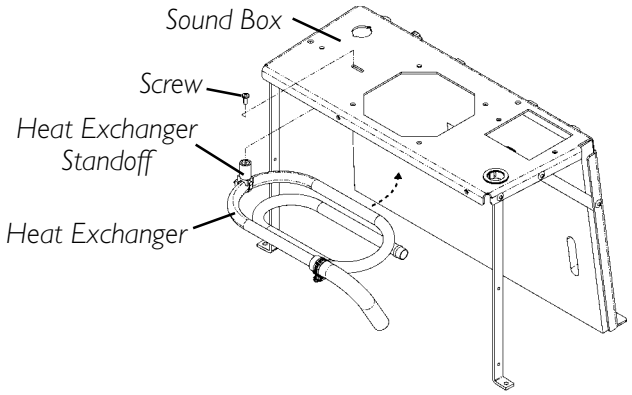


FIGURE 6 - CLEANING THE HEAT EXCHANGER

REBUILDING THE THOMAS MODEL 2660 COMPRESSOR - 5 LITER

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

NOTE: This kit is designed for rebuilding the Thomas Model 2660 Series compressor. The serial number is located on the front of the compressor. If the serial number does not begin in this way, this kit will not work.

The 5-Liter Thomas 2660 Series Compressor Rebuild Kit contains the following:

DESCRIPTION	QUANTITY
Teflon® Piston Cups	2
Aluminum Piston Sleeves	2
Flapper Valves - Intake and Exhaust	4
Valve Keepers	4
O-Ring - Sleeve	2
Valve Plate Gaskets	2
Head Mounting Screws	8
Valve Screws	4
Valve Restraints	2
Piston Cup Retainer Screws	2

Tools Required:

Torque wrench that has an inch-pound scale (for head screws, set screws, flapper valve screw, and pipe plugs)

Torx® T-25 drive for torque wrench (for head screws or flat blade)

1/8-inch Allen wrench attachment for torque wrench (for eccentric set screw)

Flat blade screwdriver attachment or 1/4-inch hex socket for torque wrench (for flapper valve screw)

Phillips screwdriver attachment for torque wrench (for retainer screws)

WARNING

DO NOT lubricate or use oil on any moving parts. The compressor eccentric uses a precision sealed bearing. Therefore additional lubrication isn't necessary.

REMOVING COMPRESSOR AND COMPRESSOR HEADS (REFER TO FIGURE 7).

Compressor.

1. Unplug concentrator and carefully remove compressor from concentrator. Refer to SECTION 7 - REPLACING COMPRESSOR ASSEMBLY OR CAPACITOR.

Compressor Head Plate.

1. Clean loose dirt from the outside of the compressor.
2. Use the Torx® T-25 torque wrench and loosen the eight (8) head screws.
3. Note head placement before removing compressor heads.
4. Remove the compressor head plate.

Valve Plates.

1. Note the position of the plates before removing.
2. Lift off the valve plate on one side.
3. Repeat for the other side.

NOTE: Note the position of the tab on valve plate for reassembly (FIGURE 7).

NOTE: To avoid confusion, ONLY service one (1) end of the compressor at a time.

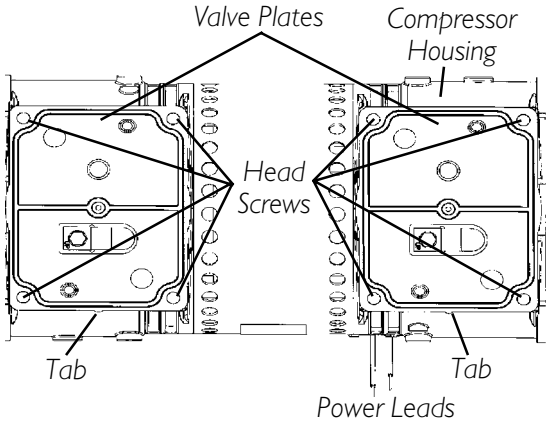


FIGURE 7 - REMOVING COMPRESSOR ANC COMPRESSOR HEADS

Fan.

1. Remove the fan by pulling it straight off the motor shaft grabbing the center housing. DO NOT pull the fan blades.

NOTE: Note position of fan/orientation for reassembly.

Connecting Rod/Eccentric Assembly.

1. Rotate shaft to align the eccentric's set screw with the access hole in the bottom of the compressor housing.
2. Insert the 1/8-inch allen wrench into the access hole in the bottom of the compressor housing.
3. Loosen the set screw 1/4 turn.
4. Rotate connecting rod to top dead center (180°) and slide the connecting rod/ eccentric assembly off the shaft through the opening in the housing.
5. Secure the rod assembly in a fixture.
6. Remove the sleeve from the connecting rod and discard.

Piston Cup.

1. Remove the torque screw (discard) from the piston cup retainer (retain for reassembly).
2. Remove the piston cup (discard) and wipe debris from the top of the connecting rod with a clean damp cloth.

O-ring, Intake Valve Keeper and Valve Keeper Strip.

1. Remove the O-ring, intake valve flapper and valve keeper strip from the bottom of the valve plate. Discard all.
2. Clean the bottom of the valve plate with a clean, soft cloth.

Exhaust Valve Flapper, Valve Restraint and Valve Keeper Strip.

1. Remove the exhaust valve flapper, valve restraint and valve keeper strip from the top of the valve plate. Discard all.
2. Clean the top of the plate with a clean, soft cloth.

Gasket.

1. Remove the OLD gasket from the top of the valve plate and discard.
2. Clean the valve plate with a clean, soft cloth.

REBUILDING COMPRESSOR - REFER TO FIGURES 8-10

NOTE: Before reassembly, wipe any residue from all components with a clean soft cloth.

Gasket.

1. Install NEW gasket; seating the gasket firmly in the groove at the top of the valve plate with your finger or blunt object.

CAUTION

Make sure that the O-ring is NOT twisted when seated in the groove of the top of the valve plate.

Exhaust Valve Flapper, Valve Restraint and Valve Keeper.

1. Install the NEW exhaust valve flapper, valve restraint and valve keeper strip to the top of the valve plate with the valve flapper screw (FIGURE 8).

NOTE: Torque flapper screws to 12-inch lbs.

O-ring, Intake Valve Flapper and Valve Keeper Strip.

1. Install the NEW valve keeper strip on top of the NEW intake valve flapper so that the word "UP" is visible. Fasten with the valve flapper screw. Refer to FIGURE 9.
2. Install the NEW O-ring, seating it firmly into the grove with your finger or blunt object.

NOTE: Torque flapper screws to 12-inch lbs.

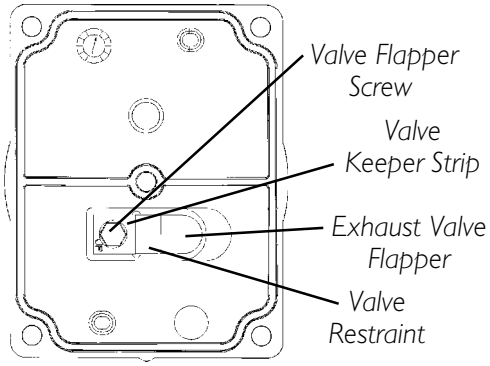


FIGURE 8 - INSTALL THE NEW EXHAUST VALVE FLAPPER, VALVE RESTRAINT AND VALVE KEEPER STRIP

Piston Cup.

1. Place cylinder sleeve over rod top with smooth edge facing up.
2. Place piston cup on rod top making sure it is CENTERED.
3. Place retainer on top of piston cup and seat retainer in rod top pocket, making sure the retainer and cup align properly along with screw holes.
4. Insert new screw into rod top and torque to 30-inch lbs.

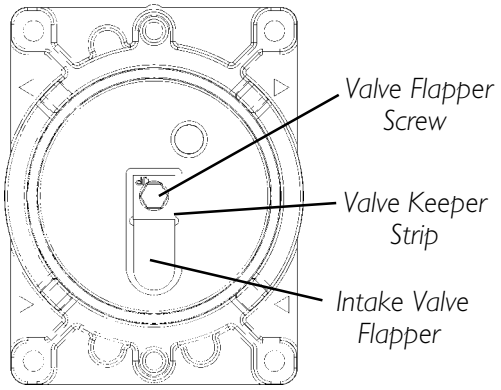


FIGURE 9 - INSTALL O-RING, INTAKE VALVE FLAPPERAND VALVE KEEPER STRIP

Connecting Rod/Eccentric Assembly.

1. With gloved-hand or clean cloth, pre-form piston cup if necessary.
2. Gently slide cylinder sleeve up and over cup to fully form it.

WARNING

DO NOT lubricate or use oil on any moving parts. The compressor eccentric uses a precision sealed bearing.

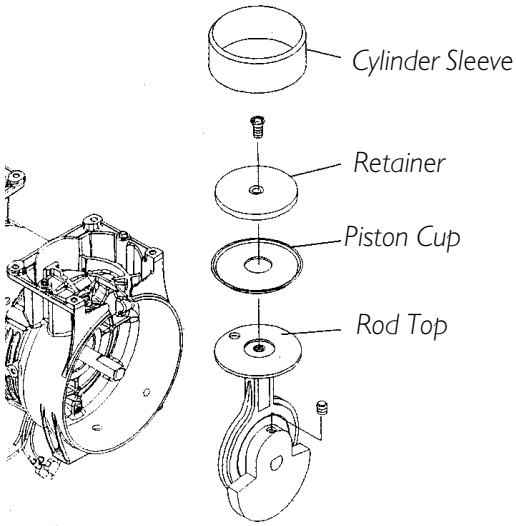
CAUTION

DO NOT crimp the piston cup when you replace the sleeve. If the cup is crimped, it MUST be replaced.

3. With bearing side (FIGURE 10) of connecting rod/eccentric assembly facing the center (motor) of the compressor, slide the assembly onto the shaft bringing it flush to the motor bearing.

NOTE: Make sure the eccentric setscrew is positioned over the flat of the shaft.

4. Tighten set screw to 40-inch lbs.
5. Hold the sleeve down to the housing with one (1) hand and slowly rotate the eccentric with the other hand to ensure all the components are aligned properly.



NOTE: As the piston travels up and down it will also rock from side-to-side. This is a feature of the WOB-L Piston.

FIGURE 10 - CONNECTING ROD/ ECCENTRIC ASSEMBLY

Fan.

1. Reinstall the fan onto the shaft in original orientation.

Valve Plate.

2. With the sleeve located and firmly seated on the housing, replace the valve plate in the same manner as it was. Refer to FIGURE 8.

NOTE: Make sure the top edge of the sleeve locates in the O-ring groove in the bottom of the valve plate.

CAUTION

Make sure that the O-ring is NOT twisted when seated in the groove of the bottom of the valve plate.

Compressor Heads.

1. Place the heads on top of the valve plates.
2. Tighten the head screws in a criss-cross pattern to 40-inch lbs.

Compressor.

WARNING

To avoid personal injury or property damage, rotate the fan by hand prior to connecting the unit to a power source. Check for suction at the air inlet by placing your finger over the port as you rotate the fan. You should feel a slight suction with each rotation of the fan. If you DO NOT feel a suction but you feel or hear a thump as you turn the fan, DO NOT connect the unit to a power source. Review the assembly procedure for possible error.

3. Reinstall compressor. Refer to SECTION 7 - REPLACING COMPRESSOR ASSEMBLY OR CAPACITOR.

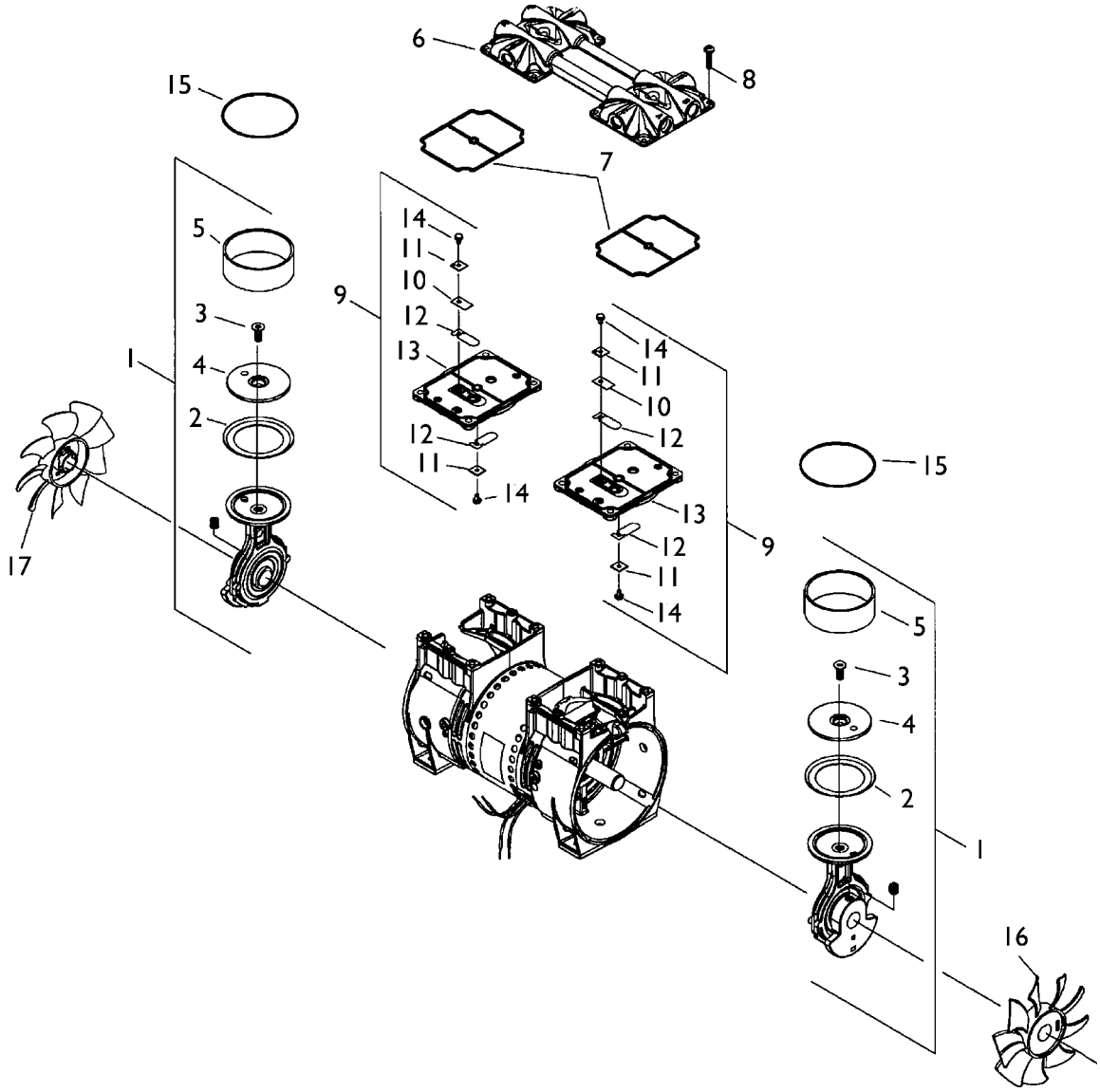
4. Run unit and check for leaks around compressor hoses and compressor tubes. Refer to SECTION 19 - LEAK TEST.
5. Take pressure readings to ensure proper system pressures. Refer to SECTION 21 - SIEVE BED PRESSURE TAP-IN KIT INSTALLATION AND BED PRESSURE CHECK.

FIELD SERVICE PARTS LIST FOR THOMAS 2660 SERIES COMPRESSOR

Item No.	Part No.	Qty. Per Asmbly	Qty. Per Unit	Description
1	See Chart	—	2	Connecting Rod, Eccentric & Bearing Assembly
2	624277	1	2	Piston Cup
3	625776	1	2	Screw - Piston Cup Retainer
4	626175	1	2	Piston Cup Retainer
5	618114	1	2	Cylinder Sleeve
6	See Chart	—	1	Head
7	623143	—	2	O-Ring - Head Gasket
8	625175	—	8	Screw - Head
9	621591	—	2	Valve Plate Assembly
	638574	—	1	Valve - Pressure Relief-Not Shown (115 V.)
10	617177	1	2	Valve Restraint
11	617562	2	4	Valve Keeper Strip
12	621485	2	4	Valve Flapper - Intake & Exhaust
13	621641	1	2	Valve Plate
14	625094	2	4	Screw - Valve Flapper
15	623137	—	2	O-Ring Valve Plate
16	638281	—	1	Fan - Gray
17	638282	—	1	Fan - Black

2660CE37-989 COMPRESSOR

Item	Part No.	Qty.	Description
1	607731	2	Connecting Rod, Eccentric & Bearing Assembly
6	665167	1	Head



COMPRESSOR PARTS LEGEND	
1. Connecting Rod, Eccentric & Bearing Assembly	10. Valve Restraint
2. Piston Cup	11. Valve Keeper Strip
3. Screw - Piston Cup Retainer	12. Valve Flapper - Intake & Exhaust
4. Piston Cup Retainer	13. Valve Plate
5. Cylinder Sleeve	14. Screw - Valve Flapper
6. Head	15. O-Ring Valve Plate
7. O-Ring - Head Gasket	16. Fan - Gray
8. Screw - Head	17. Fan - Black
9. Valve Plate Assembly	

FIGURE 6 - COMPRESSOR EXPLODED VIEW

PREVENTIVE MAINTENANCE RECORD

INVACARE OXYGEN CONCENTRATOR

Yes, you can:

MODEL NO. IRC_____ SERIAL NO._____

ON EACH INSPECTION																		
Record Date of Service																		
Record Elapsed Hours On Hour Meter																		
Clean Cabinet Filter(s)																		
Check Prescribed L/min. Flow Rate																		
EVERY 90 DAYS																		
Check Oxygen Concentration **(UNITS WITHOUT *SENSO*$_2$)**																		
ANNUALLY or DURING PREVENTIVE MAINTENANCE SCHEDULE																		
Clean/Replace Cabinet Filter(s)																		
Check Outlet HEPA Filter																		
Check Compressor Inlet Filter																		
Check Oxygen Concentration **(*SENSO*$_2$ MODELS)**																		
Check Power Loss Alarm																		
AS REQUIRED																		
Clean Heat Exchanger																		
Replace Exhaust Muffler																		
Rebuild Top End of Compressor																		

PREVENTIVE MAINTENANCE

Section 3 - P.E. Valve - includes the following:
Replacing P.E. Valve - ONLY

REPLACING P.E. VALVE - ONLY (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove spade connectors from P.E. valve assembly.
4. Remove tie-wraps from P.E. valve tubing.
5. Remove P.E. valve assembly from tubing.

CAUTION

If P.E. valve is not to be installed immediately, plug the P.E. valve tubing to prevent sieve bed contamination.

6. Install new P.E. Valve assembly immediately, by reversing STEPS 3-5.

NOTE: After replacing P.E. valve, retiming of the concentrator may be necessary. Refer to SECTION 18 - TIMING OF THE PLATINUM 5 CONCENTRATOR.

7. Run unit and check for leaks. Refer to PROCEDURE 19 - LEAK TEST.
8. Reinstall cabinet. Refer to PROCEDURE 1 - REMOVING CABINET.

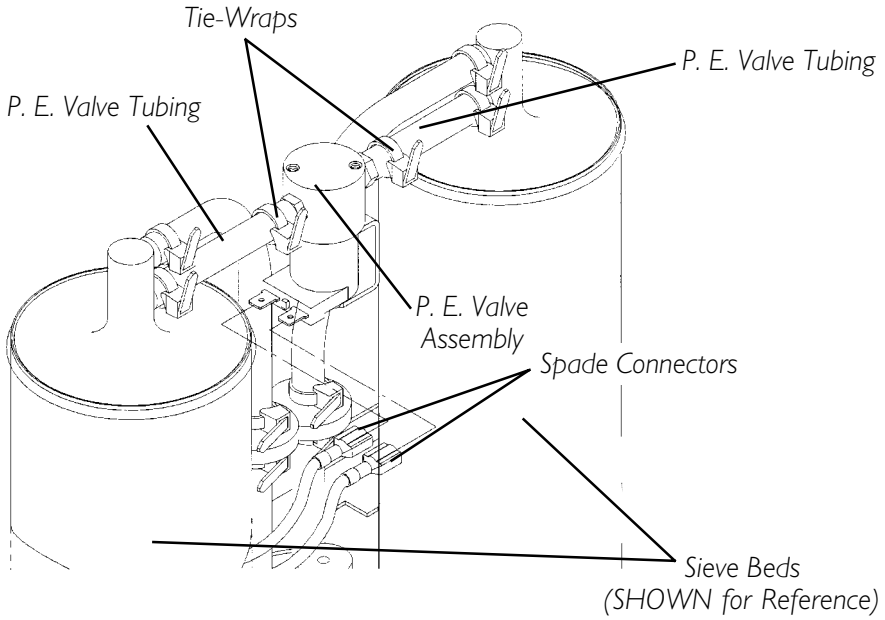


FIGURE 1 - REPLACING P.E. VALVE

Section 4 - Replacing Sieve Beds - includes the following:
Replacing Sieve Beds

REPLACING SIEVE BEDS (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

NOTE: Always replace sieve beds in pairs to ensure that both beds are in optimum condition.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove tie-wraps and disconnect P.E valve and sieve bed tubing from top of sieve beds.
4. Remove large tie-wraps.
5. Loosen adjustable clamps on sieve beds. Slide clamps down below the adjustable clamp hangers.
6. Lift sieve beds up and rest sieve beds on top rear of base.
7. Remove tie-wraps and reinforced tubing from bottom of both sieve beds and remove sieve beds.

CAUTION

DO NOT remove plastic caps from NEW sieve bed fittings until ready to install NEW beds. Severe sieve contamination can occur if uncapped beds are exposed to air.

8. Remove plastic caps from the top and bottom fittings of the NEW sieve beds.
9. Install new sieve beds reversing STEPS 3-7.

NOTE: After replacing sieve beds, retiming is necessary. Refer to SECTION 18 - TIMING OF THE PLATINUM 5 CONCENTRATOR.

10. Run unit and check for leaks. Refer to SECTION 19 - LEAK TEST.
11. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

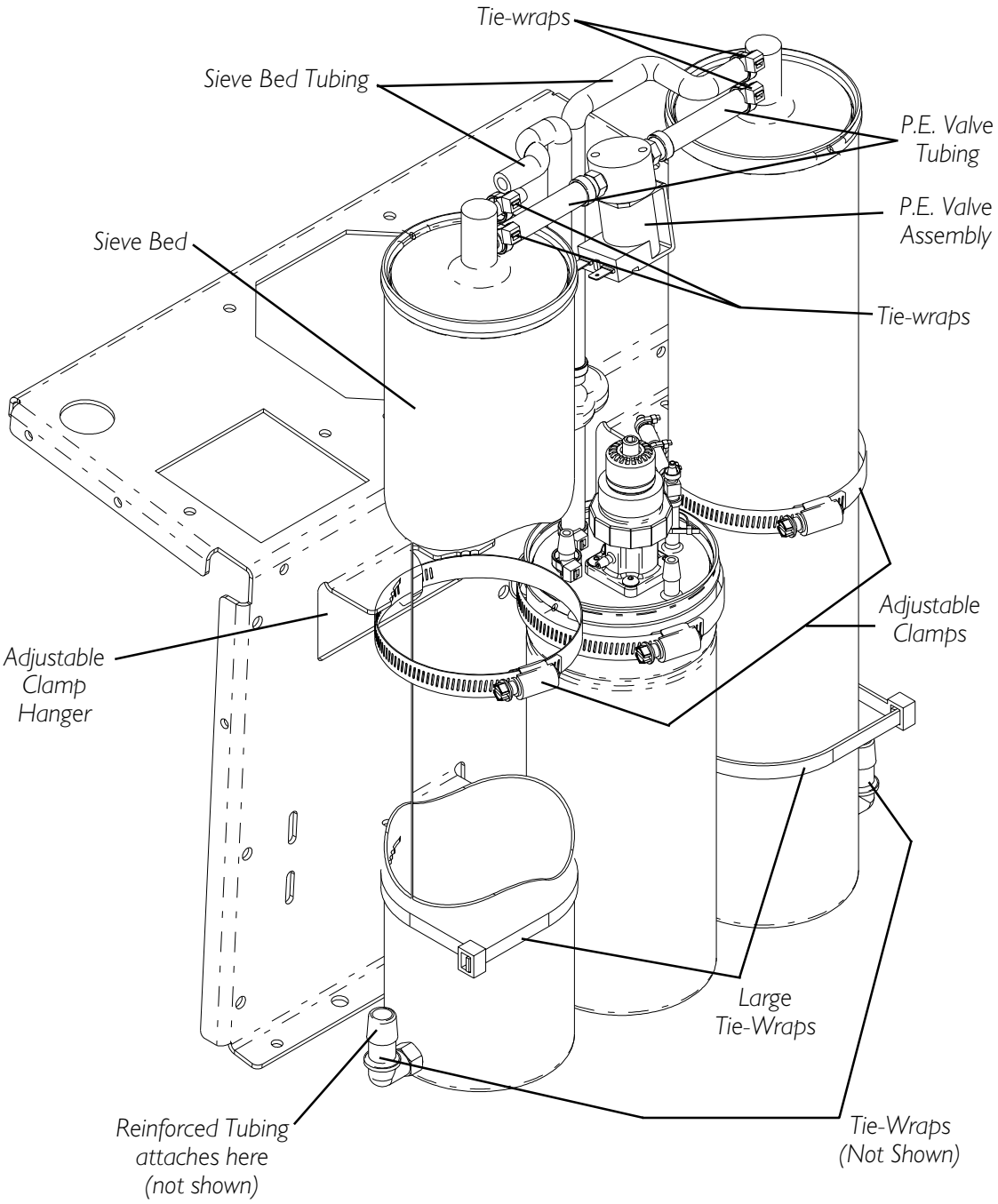


FIGURE 1 - REPLACING SIEVE BEDS

Section 5 - Replacing Check Valves - includes the following:
Replacing Check Valves

REPLACING CHECK VALVES (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to PROCEDURE 1 - REMOVING CABINET.

NOTE: Replace one or both check valves when performing this procedure. The check valves are one-way directional and can be checked by passing air through them. Air should flow in one direction ONLY.

3. Loosen adjustable clamp on product tank, slide clamp down below the adjustable clamp hanger, and pull product tank forward to access check valve(s).
4. Remove tie-wraps from top and bottom of the check valve(s) and disconnect check valve(s) from 1/4 inch PVC tubing.

WARNING

The check valves are one-way directional and MUST be installed correctly. The letters "VAC" are printed on the check valves. The check valves MUST be installed with the "VAC" on the UNDERSIDE of the check valve. Low system pressures and eventual bed contamination will result if check valves are not properly installed.

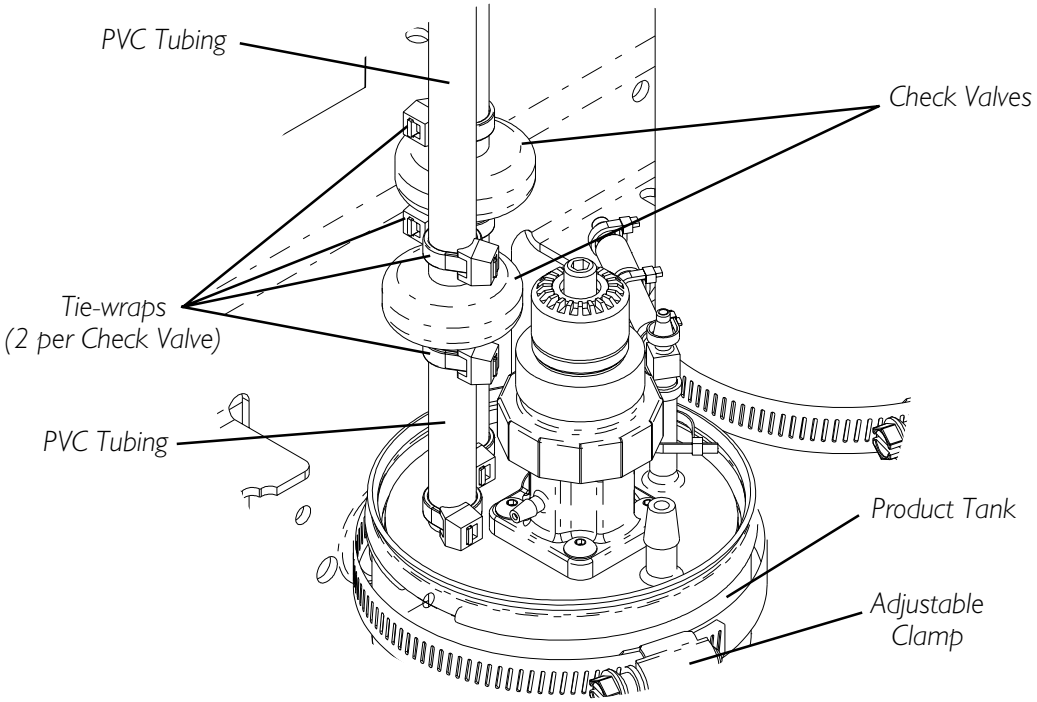


FIGURE 1 - REPLACING CHECK VALVES

5. Install the **NEW** check valve(s) into the 1/4-inch PVC tubing.
6. Make sure "VAC" is on the UNDERSIDE of the Check Valve to ensure proper orientation of check valves when installing.
7. Secure the check valve(s) by installing new tie-wraps to the 1/4-inch PVC tubing where previously removed.

NOTE: If 1/4-inch PVC tubing is damaged in any way, replace the section of 1/4-inch PVC tubing before installing check valve(s).

8. Run unit and check for leaks. Refer to SECTION 19 - LEAK TEST.
9. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

Section 6 - Replacing/Adjusting Regulator - includes the following:
Replacing Regulator
Adjusting Regulator

REPLACING / ADJUSTING REGULATOR

REPLACING REGULATOR (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Loosen adjustable clamp on product tank and slide clamp down below the adjustable clamp hanger. Refer to FIGURE 1 - DETAIL "A".
4. Pull product tank back and up to access regulator.

NOTE: On concentrator models with the SensO_2 unit ONLY; remove the 1/8-inch tubing to oxygen sensor housing.

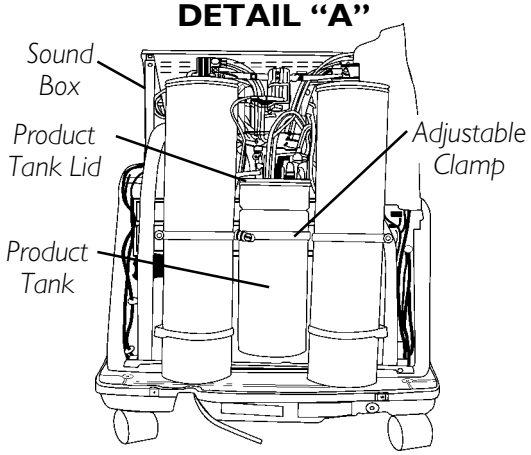
5. Remove the four (4) mounting screws that secure regulator to product tank cap. Refer to FIGURE 1 - DETAIL "B".
6. Remove regulator from product tank lid ensuring that the "O" rings are removed.

NOTE: Clean mounting surface of product tank lid. Ensure that the two (2) "O" rings for the NEW regulator are installed onto the ports (underside) of the NEW regulator before installation.

WARNING

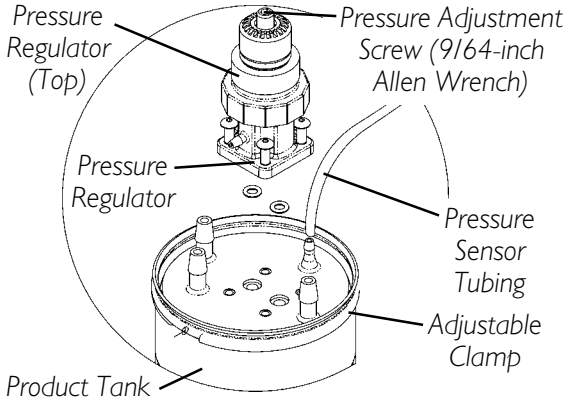
Ensure proper installation of regulator. Note flow arrow on regulator. This MUST face toward the front of unit or flow will be interrupted causing system shutdown.

DETAIL "A"



NOTE: The adjustable clamp hanger is not shown. It is located behind the product tank and is attached to the sound box.

DETAIL "B"



NOTE: Sieve Beds (Removed for Clarity)

FIGURE 1 - REPLACING REGULATOR

7. Install new regulator onto product tank by reversing STEPS 5 and 6.
8. Torque mounting screws to 5 ± 1-inch lbs.
9. Re-install product tank and secure with the adjustable clamp.
10. Adjust regulator pressure if necessary. Refer to FIGURE 2, ADJUSTING REGULATOR in this SECTION.
11. Run unit and check for leaks. Refer to SECTION 19 - LEAK TEST.
12. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

ADJUSTING REGULATOR

1. Turn unit **ON (I)**.
2. Install pressure gauge onto oxygen outlet.

NOTE: Check O_2 pressure at oxygen outlet. It should read a steady 5 p.s.i. ± 0.5 p.s.i. If pressure is not in specification, proceed to STEP 3. If pressure falls within specification, no adjustment is needed.

3. Unplug unit.
4. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
5. Move product tank back to access regulator. Refer to SECTION 6 - REPLACING/ADJUSTING REGULATOR - Replacing Regulator FIGURE 1.
6. Plug unit in and turn power switch **ON (I)**.
7. Locate the pressure adjustment screw in center of pressure regulator top.
8. Insert a 9/64-inch Allen wrench into the pressure adjustment screw.
9. While reading pressure gauge, turn pressure adjustment screw:
   a) CLOCKWISE to **increase** output pressure or;
   b) COUNTERCLOCKWISE to **decrease** output pressure.
10. Adjust until pressure reads a steady 5 p.s.i. ± 0.5 p.s.i.
11. Once desired pressure is achieved, reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

NOTE: If you are unable to adjust or mantain 5 p.s.i. ± 0.5 p.s.i., refer to the TROUBLESHOOTING GUIDE in this manual for assistance.

Section 7 - Compressor- includes the following:
Replacing Compressor Assembly or Capacitor

REPLACING COMPRESSOR ASSEMBLY OR CAPACITOR

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

REPLACING COMPRESSOR ASSEMBLY (FIGURE 1)

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Loosen clamps and disconnect intake hose and compressor output hose (blue) from compressor assembly.
4. Remove compressor wires from wire clamps or tie-wraps and disconnect motor connector from the main harness connector.

NOTE: Motor connector goes through grommet before reaching the main harness connector.

5. Remove protective boot on capacitor.
6. Disconnect capacitor wires from the top of the capacitor.

NOTE: Re-use the protective capacitor terminal boot if the replacement parts do not provide one.

7. Remove (2) mounting screws that secure the compressor restraint bracket and remove the bracket.
8. Tilt compressor assembly toward front of unit and lift out.
9. Reverse STEPS 3-7 to install new compressor assembly.
10. Run unit and inspect for leaks. Refer to SECTION 19 - LEAK TEST.
11. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

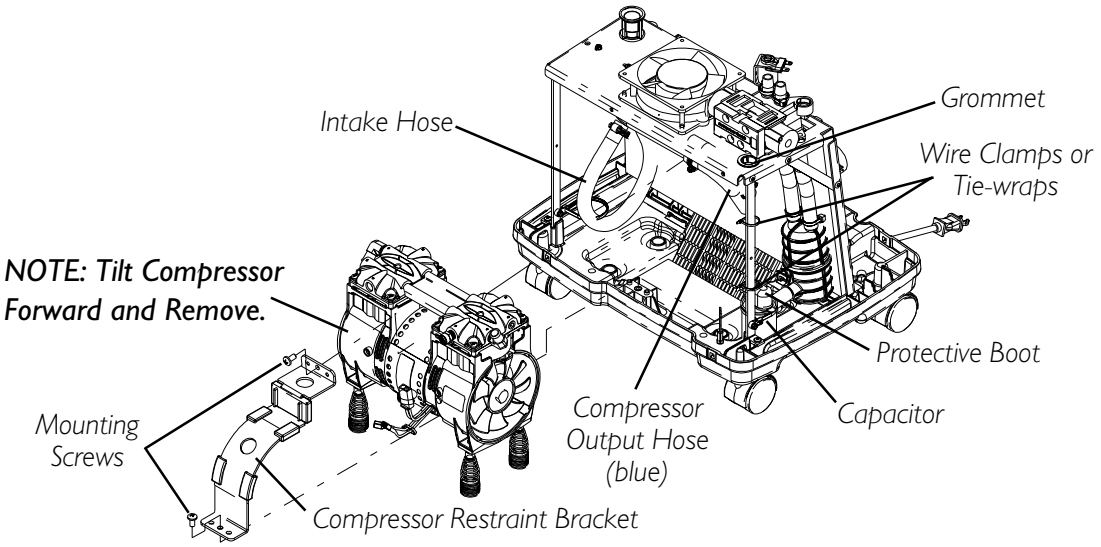


FIGURE 1 - REPLACING COMPRESSOR ASSEMBLY

REPLACING CAPACITOR (FIGURE 2)

1. Unplug the unit.
2. Remove the cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove terminal boot to reveal capacitor wires.
4. Disconnect the spade connectors from the capacitor terminals.
5. Remove the screw that secures the capacitor clamp to the soundbox brace.
6. Remove the capacitor from the concentrator base assembly.
7. Install NEW capacitor by reversing STEPS 2-6.
8. Re-install the cabinet. Refer to SECTION 1 - REMOVING CABINET.

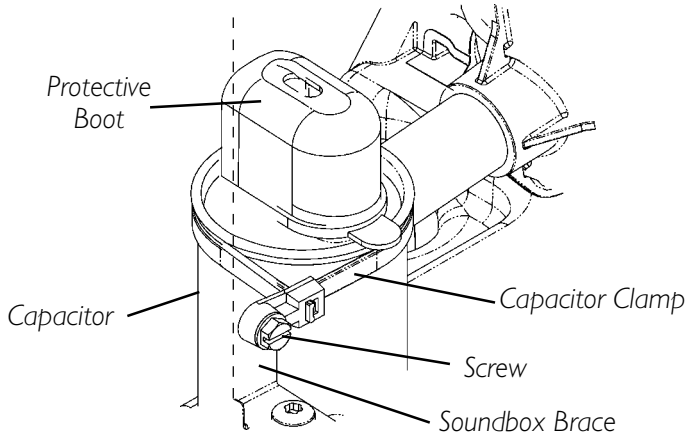


FIGURE 2 - REPLACING CAPACITOR

Section 8 - Replacing Heat Exchanger - includes the following:
Replacing Heat Exchanger

REPLACING HEAT EXCHANGER (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.

CAUTION

Use care not to deform heat exchanger when installing, removing or cleaning.

3. Loosen the adjustable clamps on the compressor output hose (blue) and valve manifold input hoses at the front and rear of the heat exchanger.
4. Remove screw securing heat exchanger standoff to the soundbox.
5. Move the heat exchanger out to access the hoses and remove them from the heat exchanger.
6. Remove heat exchanger.
7. Reverse STEPS 3-6 to install new heat exchanger.
8. Run unit and check for leaks. Refer to SECTION 19 - LEAK TEST.
9. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

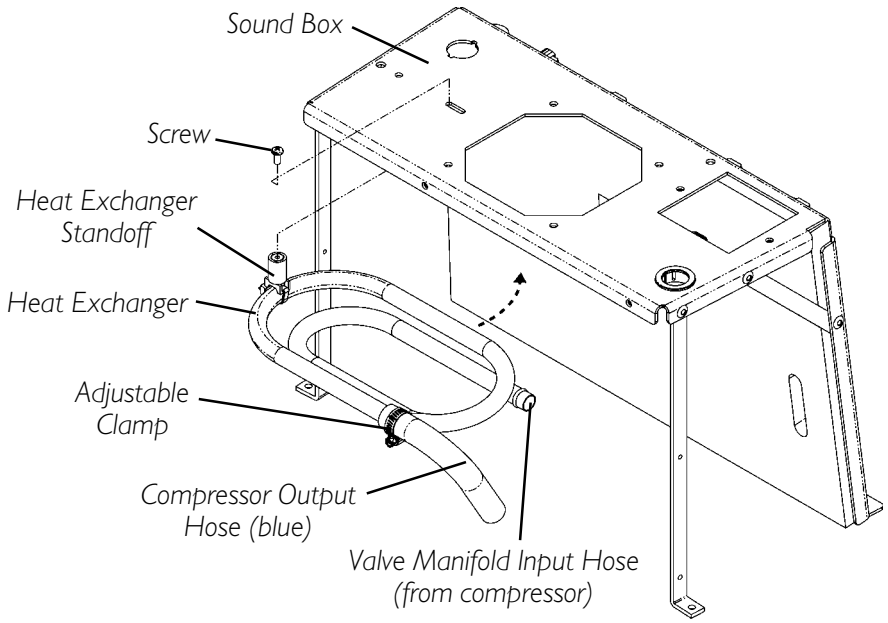


FIGURE 1 - REPLACING HEAT EXCHANGER

Section 9 - Removing Control Panel - includes the following:
Removing Control Panel

REMOVING CONTROL PANEL (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove the two (2) upper mounting screws that secure the control panel.
4. Loosen the two (2) lower mounting screws that secure the control panel.
5. Cut the tie-wraps that secure the 1/8-inch I.D. pressure sensor tubing to the product tank connection and remove tubing.
6. Remove the 1/4-inch I.D. tubing from the top and bottom barbed fittings of the flowmeter and the patient outlet barbed fitting behind the control panel.

NOTE: On SensO$_2$ models the oxygen sensor tube attached to the side of the regulator must also be released.

7. Disconnect the 9 or 10-pin connector from P.C. board.
8. Disconnect the 8-pin connector from P.C. board.
9. Remove spade connectors from circuit breaker, hour meter and ON/OFF (I/O) switch. **(Jumper wire harness from ON/OFF switch to circuit breaker does not have to be removed)**.
10. Remove control panel and reverse STEPS 3-10 to re-install control panel.
11. Run unit and check for leaks at pressure sensor tubing on product tank cap. Refer to SECTION 19 - LEAK TEST.
12. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

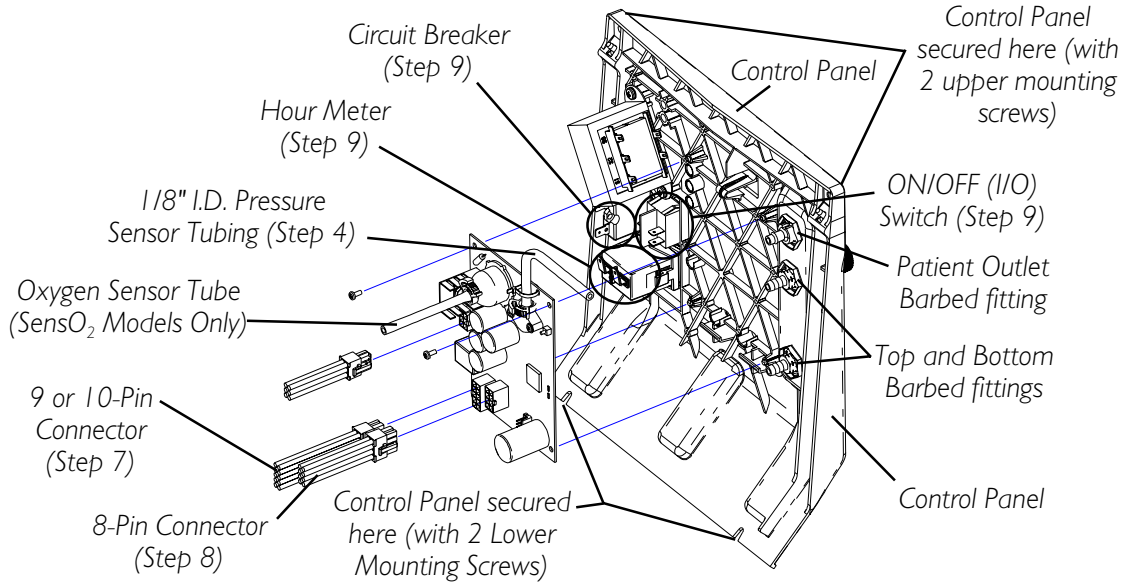


FIGURE 1 - REMOVING CONTROL PANEL

Section 10 - Replacing Cooling Fan - includes the following:
Replacing Cooling Fan

REPLACING COOLING FAN (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
4. Remove compressor assembly. Refer to SECTION 7 - REPLACING COMPRESSOR ASSEMBLY OR CAPACITOR.
5. Remove heat exchanger. Refer to SECTION 8 - REPLACING HEAT EXCHANGER.
6. Disconnect and remove spade connectors from fan terminals on back side of cooling fan. Refer to FIGURE 1.
7. Remove four (4) mounting screws securing the cooling fan to the sound box. Refer to FIGURE 1.
8. Remove existing cooling fan. Refer to FIGURE 1.

CAUTION

Fan must be positioned properly so air from the fan blows DOWN onto the compressor (see air flow arrow on back of fan) or damage to the unit will occur.

9. Reinstall heat exchanger. Refer to SECTION 8 - REPLACING HEAT EXCHANGER.
10. Reinstall compressor. Refer to SECTION 7 - REPLACING COMPRESSOR ASSEMBLY OR CAPACITOR.
11. Reinstall control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
12. Plug unit in and check for leaks. Refer to SECTION 19 - LEAK TEST.

NOTE: Run unit for at least 30 minutes. If unit runs properly, replace cover; if not, call Invacare Technical Service.

13. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

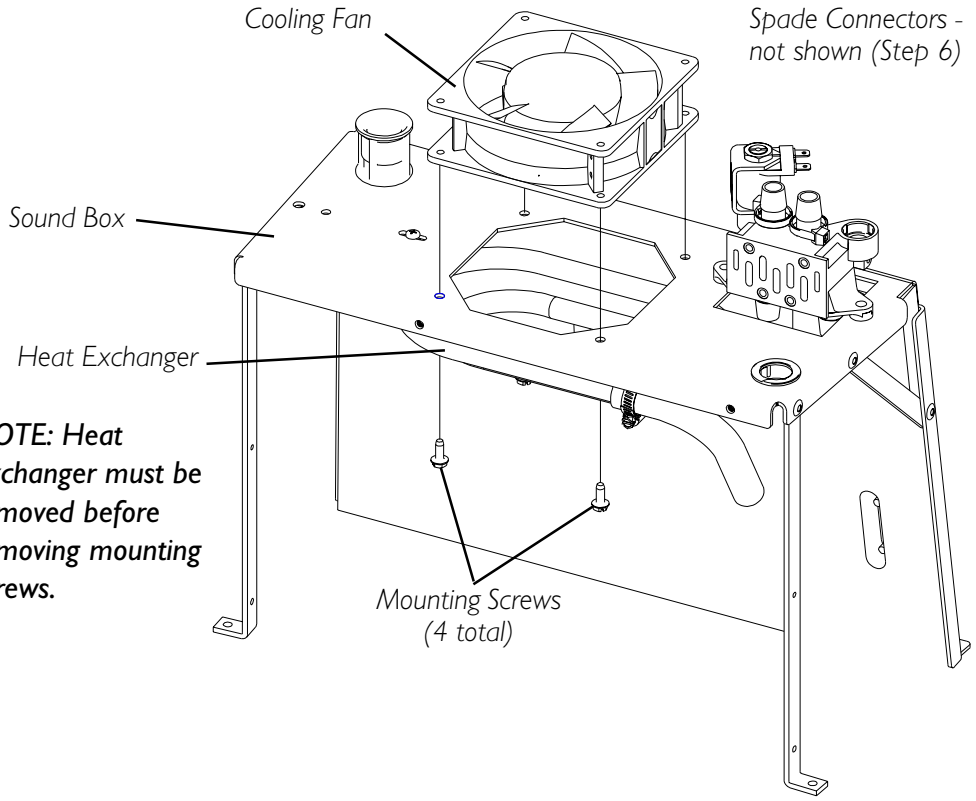


FIGURE 1 - REPLACING COOLING FAN

Section 11 - Replacing P.C. Board - includes the following:
Replacing P.C. Board(s)

REPLACING P.C. BOARD (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.

WARNING

ONLY QUALIFIED SERVICE TECHNICIANS SHOULD MAKE ANY CHANGES TO THIS EQUIPMENT.

Follow these pre-cautions to prevent damage to the P.C. boards:

Before handling any P.C. boards, you need to be properly grounded to prevent static damage to the components of the board. A Static Cuff must be worn and properly grounded using an alligator clip. Electrical conduit or a water pipe is normally sufficient when a known good ground is not available.
Care should be taken to ensure that the alligator clip contacts with bare metal surface.

When removing quick disconnects terminals, DO NOT pull on wire itself as damage to the connection may occur. Hold down the P.C. board with one hand and use an upward force with a slight rocking motion to remove the terminals.

Before installing any P.C. boards, ensure that all insulators are in place.

4. **Disconnect the following:**
   a) Wiring Harness from 9 or 10-Pin wiring harness connector
   b) Wiring Harness from 8-Pin wiring harness connector
   c) Transformer harness connector

WARNING

DO NOT remove sensor tubing from P.C. Board. Remove from tee fitting or regulator ONLY. Damage to sensor assembly could occur.

   d) Pressure sensor tubing FROM product tank, NOT P.C. Board.
   e) If applicable, Oxygen Sensor tubing from Regulator Fitting. Refer to SECTION 9 - REMOVING CONTROL PANEL.

5. Remove the two mounting screws on top corners of P.C. board. Bend latching tab up to release P.C. board from control panel.

6. Position **NEW** P.C. board.
7. Reverse STEPS 4 and 5. Be sure all tie-wraps removed from tubing connections are replaced.
8. Reinstall control panel. Refer to SECTION 9- REMOVING CONTROL PANEL.
9. Run concentrator to ensure unit operates to specifications.
10. After replacing P.C. board, retiming may be necessary. Refer to SECTION 18 - TIMING THE PLATINUM 5 OXYGEN CONCENTRATOR.
11. Check for leaks at pressure sensor tubing on product tank cap. Refer to SECTION 19 - LEAK TEST.
12. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

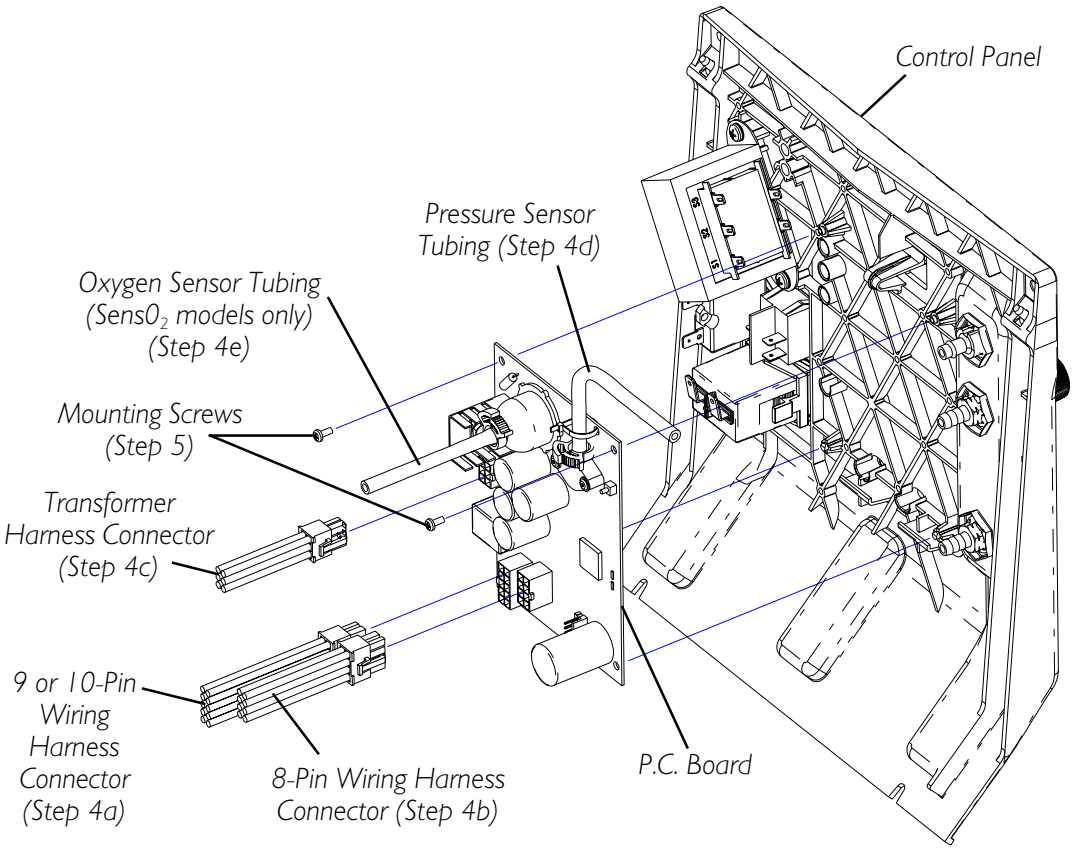


FIGURE 1 - REPLACING P.C. BOARD(S)

Section 12 - Replacing Transformer Assembly - includes the following:
Replacing Transformer Assembly

REPLACING TRANSFORMER ASSEMBLY (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
4. Locate the transformer assembly in the upper left corner on the back of control panel.
5. Unplug the transformer connector from the P.C. board.
6. Remove the two (2) keps screws that secure transformer to the back of the control panel.
7. Reverse STEPS 5-6 to install **NEW** transformer. Torque keps screw to 13.5 ± 1-inch lbs.
8. Reinstall control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
9. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

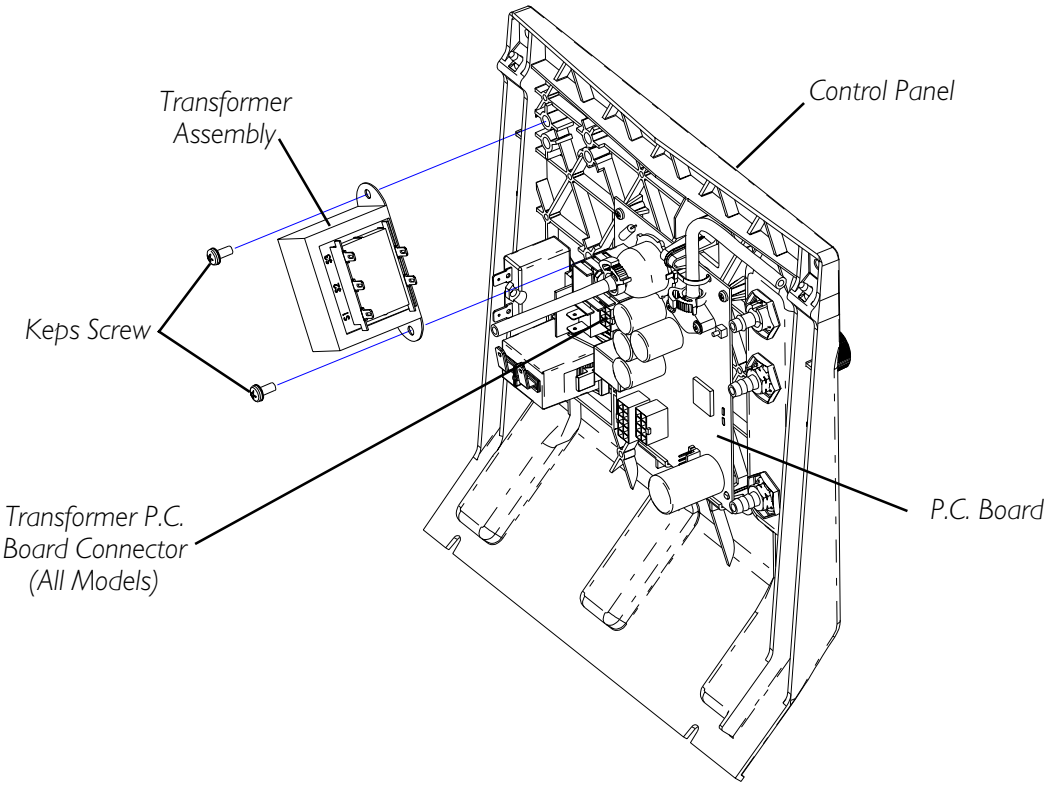


FIGURE 1 - REPLACING TRANSFORMER ASSEMBLY

Section 13 - Replacing On/Off Switch - includes the following:
Replacing On/Off Switch

REPLACING ON/OFF SWITCH (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
4. Remove and code the four (4) spade connectors from back of existing On/Off switch.
5. Compress retaining grips on back of existing On/Off switch and push switch out through front of control panel.

NOTE: Ensure proper orientation of the ON/OFF (I/O) switch and wiring connections before installation. Refer to Figure 1, Detail "A" and Detail "B" below.

WARNING

DO NOT install the ON/OFF (I/O) switch upside down. Universal OFF (O) symbol should be at bottom and Universal ON (I) symbol should be at the top. Possible damage to the concentrator may result if not properly installed.

6. Reverse STEPS 4-5 to secure **NEW** ON/OFF (I/O) switch.
7. Reinstall control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
8. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

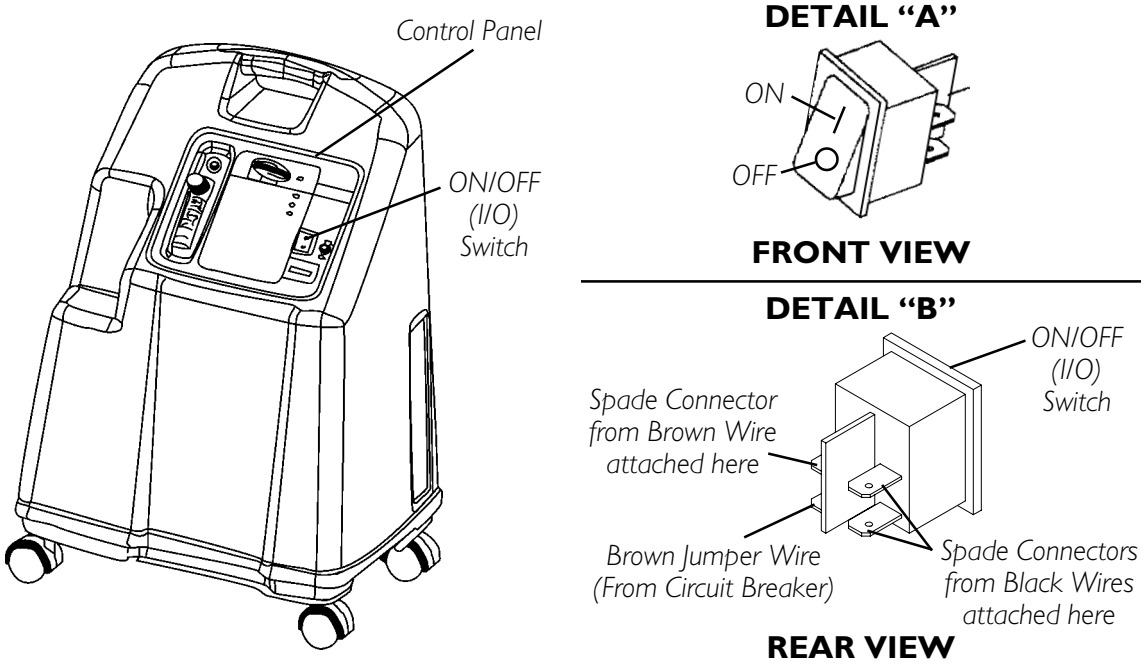


FIGURE 1 - REPLACING ON / OFF SWITCH

Section 14 - Replacing Flowmeter - includes the following:
Replacing Flowmeter

REPLACING FLOWMETER (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.

NOTE: Note the location of the PVC tubing for accurate replacement after new flowmeter is installed.

4. Remove palnuts that secure flowmeter to the control panel.
5. Remove flowmeter from front of control panel.
6. Install new flowmeter reversing STEPS 4-5.
7. Reinstall control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
8. Run unit and check for leaks where 1/4-inch PVC tubing engages flowmeter fittings. Refer to SECTION 19 - LEAK TEST.
9. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

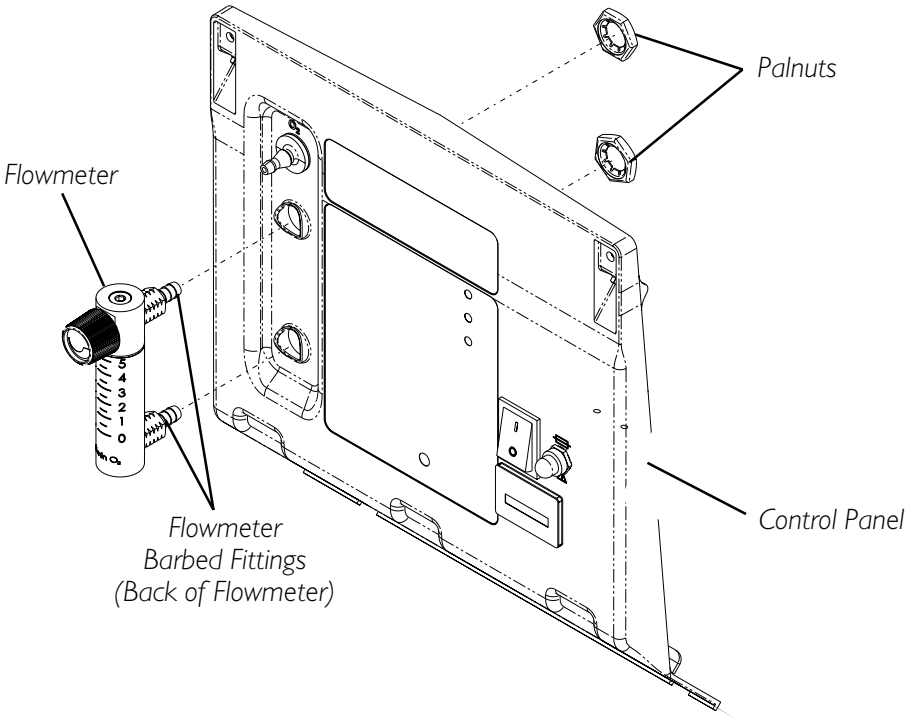


FIGURE 1 - REPLACING FLOWMETER

Section 15 - Replacing Hour Meter - includes the following:
Replacing Hour Meter

REPLACING HOUR METER (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
4. Remove and code the two (2) hour meter connectors and wires connected to back of hour meter.
5. Spread retaining clips on hour meter housing that secure hour meter to control panel.
6. Remove hour meter by pushing meter through front of control panel.
7. Install new hour meter reversing STEPS 4-6.
8. Reinstall control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
9. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

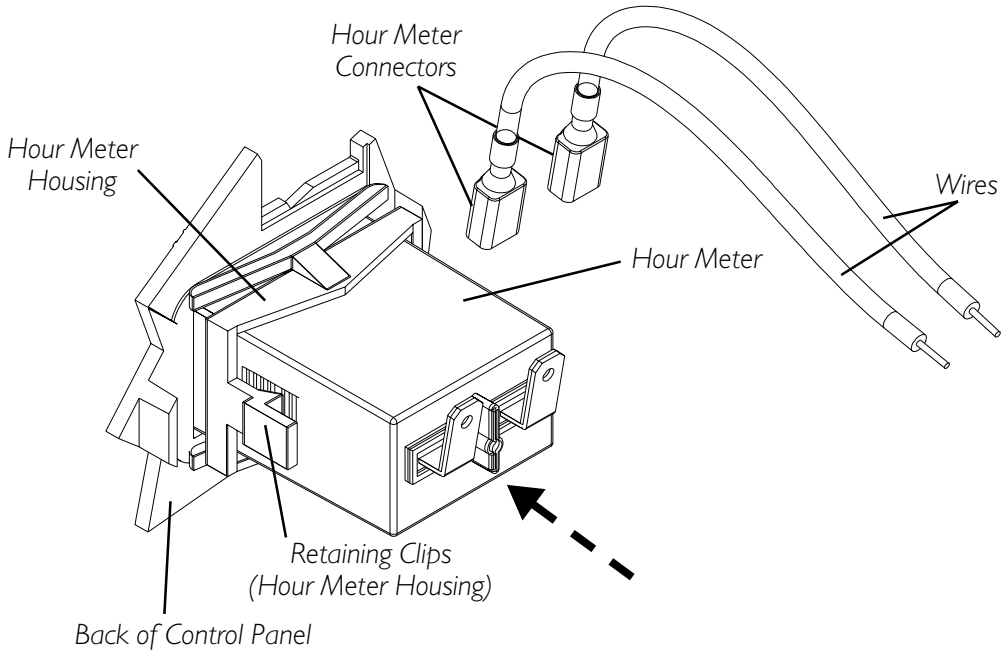


FIGURE 1 - REPLACING HOUR METER

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

REPLACING 4-WAY VALVE (FIGURE 1)

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
4. Remove the four (4) mounting screws that secure the 4-way valve to the manifold assembly.
5. Position **NEW** 4-way valve onto manifold assembly and loosely install mounting screws through 4-way valve and into manifold assembly.

WARNING

Torque sequence and specification MUST BE adhered to or possible damage to the 4-way valve could result.

6. Tighten mounting screws in the sequence described below. Refert to FIGURE 1.
7. Pre-torque the mounting screws to 10 ± 2-inch lbs. using the torque sequence.
8. The mounting screws can be now be torqued to 22 ± 2-inch lbs. in the same sequence.

STOP!

THIS IS A MAINTENANCE FREE VALVE. OPENING THE VALVE WILL VOID ANY AND ALL WARRANTIES APPLICABLE TO THE VALVE.

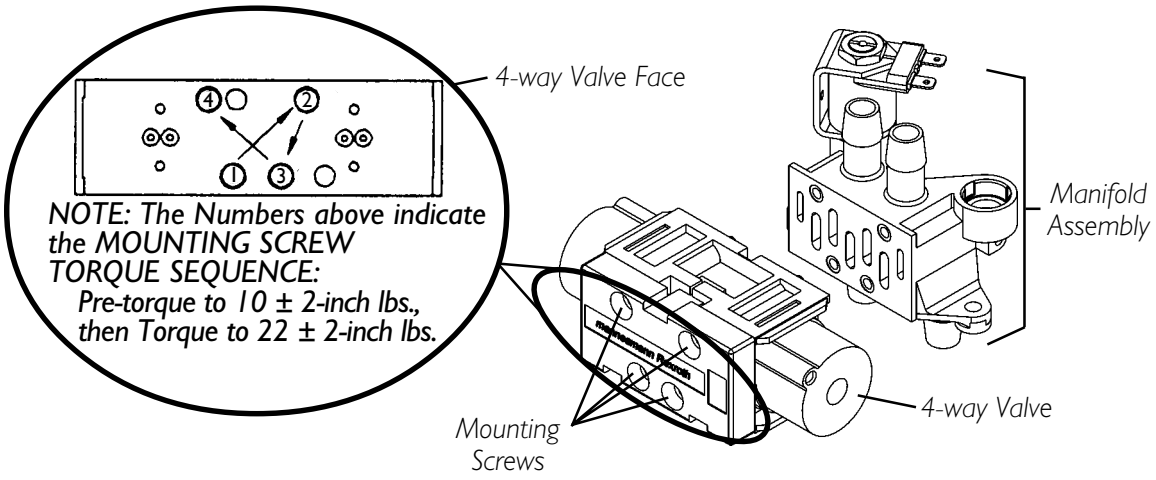


FIGURE 1 - REPLACING 4-WAY VALVE

REPLACING 4-WAY VALVE MANIFOLD ASSEMBLY (FIGURE 2)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
4. Remove the tie-wraps connecting the sieve bed hoses to top of manifold assembly. Refer to FIGURE 2.
5. Remove sieve bed hoses from manifold assembly.
6. Remove and code the two (2) spade connectors from the valve pilot on top of the manifold assembly.
7. Remove the mounting screw(s) that secures exhaust canister assembly to rear of the sound box. Refer to SECTION 2 - PREVENTIVE MAINTENANCE.
8. Remove muffler from exhaust canister by turning counter-clockwise.
9. Loosen the adjustable clamp that secures valve manifold input hose to heat exchanger.
10. Remove hose from end of heat exchanger.
11. Remove the two (2) mounting screws, washers (1 per side) and bushings (2 per side) securing the 4-way valve/manifold assembly to top of sound box.
12. The 4-way valve/manifold assembly can be removed from the concentrator by lifting the assembly straight up through the cutout in the sound box.
13. Remove 4-way valve from manifold assembly. Refer to SECTION 16 - REPLACING 4-WAY VALVE/MANIFOLD ASSEMBLY. Refer to FIGURE 1.
14. Remove exhaust canister w/hoses from manifold.
15. Loosen the adjustable clamp on valve manifold input hose to bottom center port of manifold assembly. Refer to FIGURE 2.
16. Remove valve manifold input hose from bottom center port of manifold assembly. Refer to FIGURE 2.
17. Reverse STEPS 13-17 to re-assemble.
18. Slide 4-way valve/manifold assembly complete through the cutout in top of sound box then install the two (2) mounting screws, washer and bushings into the manifold to secure the 4-way valve assembly to the top of sound box.
19. Reverse STEPS 4-10.
20. Reinstall control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
21. Plug unit in and turn power **ON (I).**
22. Run unit and check for leaks at hose connections. Refer to SECTION 19 - LEAK TEST.
23. Check for proper system operation. Refer to the SPECIFICATION section of this manual.
24. Re-install cabinet. Refer to SECTION 1 - REMOVING CABINET.

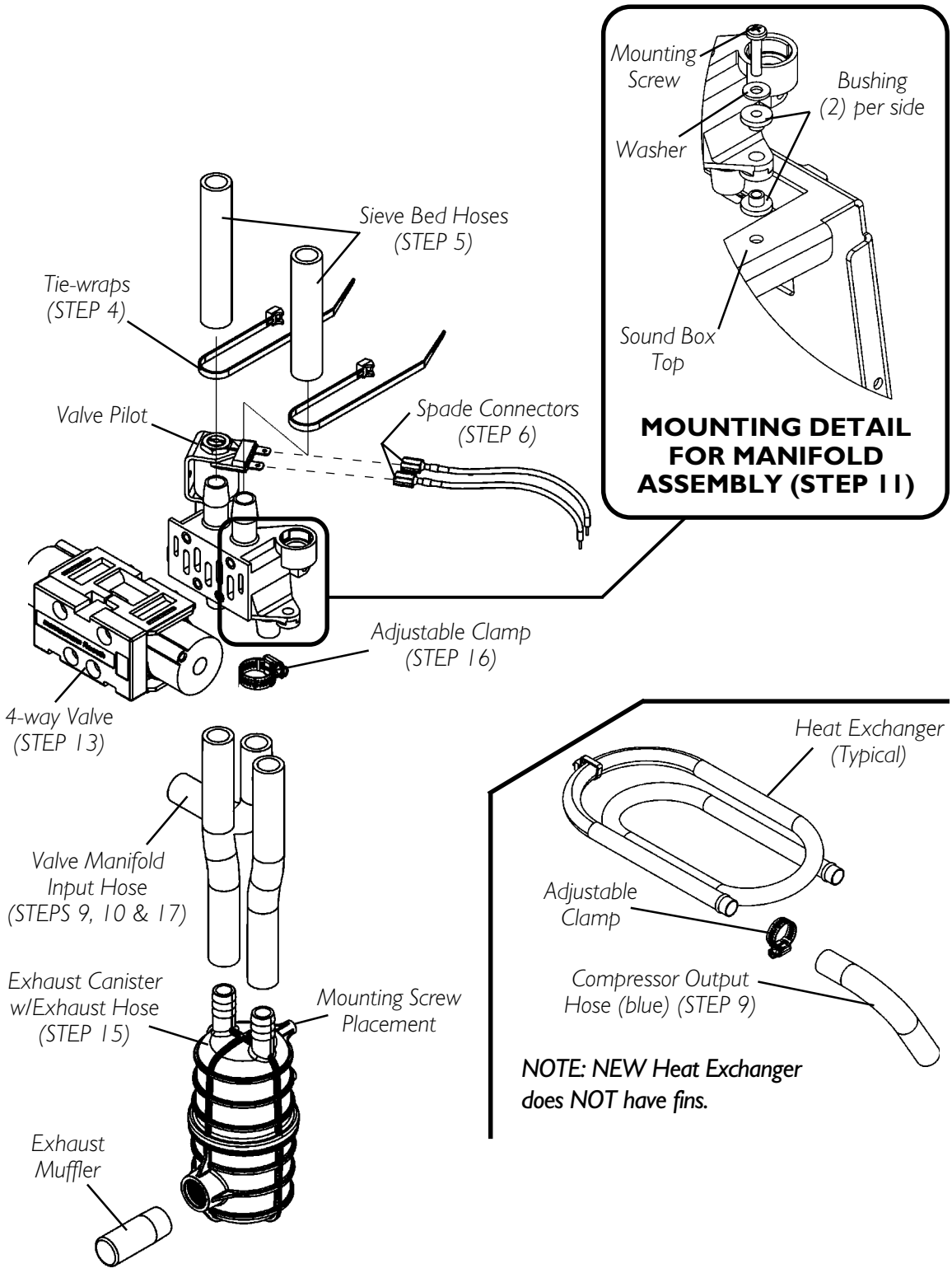


FIGURE 2 - REPLACING 4-WAY VALVE MANIFOLD ASSEMBLY

REPLACING PILOT VALVE POPPETS AND "O" RINGS (FIGURES 3 & 4).

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Remove control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.
4. Locate pilot valve on 4-way valve manifold assembly.

NOTE: Pilot valve can be accessed while the 4-way valve and sieve bed hoses are intact on the concentrator.

NOTE: DO NOT remove spade connectors from pilot valve coils. Simply lay coils with spade connectors aside while performing this installation.

5. Hold pilot valve stem with the flat blade screwdriver and turn the 9/16-inch locknut counterclockwise one (1) complete turn.
6. Unscrew the pilot valve stem assembly from the manifold while leaving the coil with yoke and locknut intact on stem.
7. Remove pilot valve poppet from inside the pilot valve stem.

STOP!

DO NOT REMOVE THE COIL YOKE FROM THE COIL. The washer between the bottom of the yoke and the bottom of the coil MUST NOT BE REMOVED otherwise components may be damaged in reassembly.

8. Set aside the coil with yoke and pilot valve stem assembly with the wires still intact.

WARNING

DO NOT use sharp tools to remove "O" ring from plastic manifold opening. Damage to the plastic manifold and/or plastic manifold airflow passage may occur (FIGURE 3).

9. Remove poppet and "O" ring from manifold opening.
10. Discard old poppet and "O" ring.
11. Install NEW "O" ring into the opening in the plastic manifold housing.

WARNING

DO NOT overtighten pilot valve stem when installing it into plastic manifold. Damage to the rubber "O" ring and/or plastic manifold may occur.

12. Install NEW slotted poppet into the bottom of the pilot valve stem with tapered end facing to the bottom (FIGURE 3).
13. Install pilot valve stem and NEW slotted poppet with coil (with yoke and locknut intact) into manifold opening.

14. Use a flat blade screwdriver, and tighten pilot valve stem clockwise until snug. **Reference: Torque to 25-inch lbs. ± 5-inch lbs.**.
15. Install NEW label onto pilot valve coil yoke.

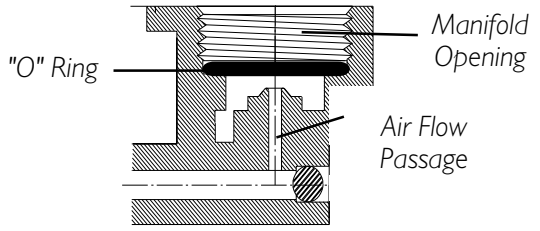


FIGURE 3 - REMOVING/ INSTALLING "O" RINGS

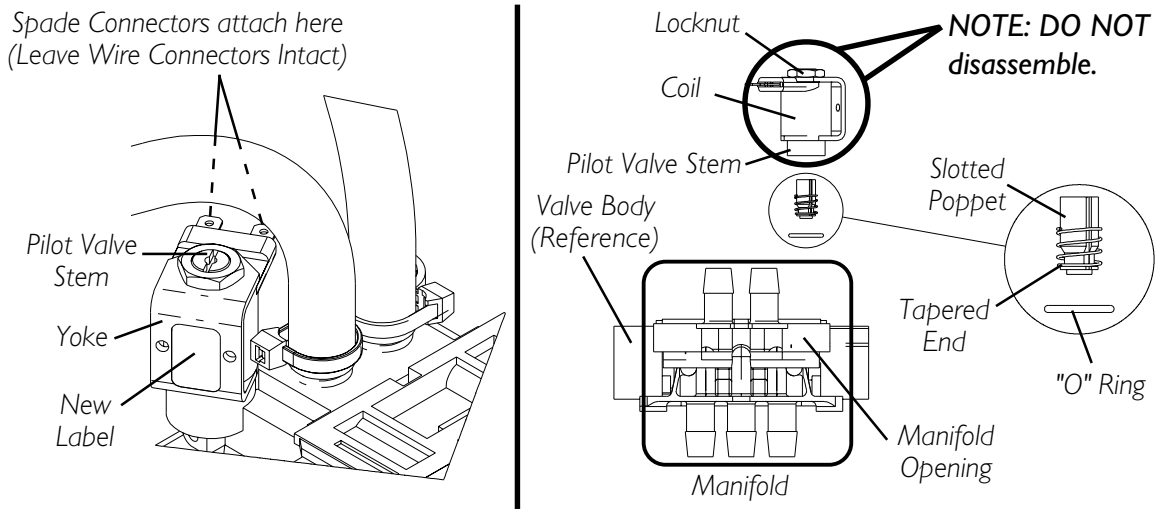


FIGURE 4 - REMOVING/INSTALLING PILOT VALVE POPPETS AND "O" RINGS

16. Position pilot valve coil with yoke at an approximate 60° angle to the right (**as viewed from the front of valve**) to ensure spade connectors are not pulled or tensioned after reinstallation.
17. Use the flat blade screwdriver and hold the pilot valve stem in place.
18. Tighten locknut clockwise with the 9/16-inch wrench until snug to secure the stem and coil with yoke. **DO NOT OVERTIGHTEN**. (**Reference: Torque to 20-inch lbs. ± 3-inch lbs.)**.

WARNING

DO NOT overtighten locknut when installing it onto pilot valve stem. Damage to the plastic manifold may occur.

19. Reinstall control panel. Refer to SECTION 9 - REMOVING CONTROL PANEL.

WARNING

Ensure that hoses behind control panel DO NOT contact cooling fan after control panel reinstallation.

20. Plug power cord in and turn concentrator ON (I) to ensure proper operation.
21. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.
22. If any difficulties are encountered in this installation, contact **Invacare Technical Service at (800) 832-4707 or in Florida (407) 321-5630**.

Section 17 - Purity Indicators - includes the following:
SensO$_2$ Alarm Indicators

SENSO$_2$ ALARM INDICATORS

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

OPERATION

The Platinum 5 with SensO$_2$ Concentrator is equipped with an oxygen purity indicator. This feature monitors the purity level of the oxygen generated by the concentrator. If purity falls below alarm thresholds, indicator lights on the control panel will illuminate.

NOTE: Concentrator may be used during the initial start warm-up time (approximately 30 minutes) while waiting for the O_2 purity to reach maximum.

When the unit is turned on, the green light will come on (SYSTEM OK/ O_2 greater than 85%). After 5 minutes, the oxygen sensor will be operating normally and will control the indicator lights depending on oxygen concentration values. The explanation of the indicator light functions are as follows:

INDICATOR LIGHTS (FIGURE 1)

GREEN LIGHT (O_2**)** - Normal Operation

YELLOW LIGHT (⚠ **)** - Call Supplier **IMMEDIATELY**. You may continue to use the concentrator unless instructed otherwise by your supplier. Be certain that **BACKUP OXYGEN** is nearby.

RED LIGHT (🔔 **)**- Total unit shutdown. Switch **IMMEDIATELY** to **BACKUP OXYGEN** supply. Call Supplier **IMMEDIATELY**.

GREEN LIGHT - with **YELLOW LIGHT FLASHING** - Call Supplier **IMMEDIATELY**. Oxygen sensor malfunctioning; you may continue to use the concentrator.

NOTE: Indicator lights are visible only when lit.

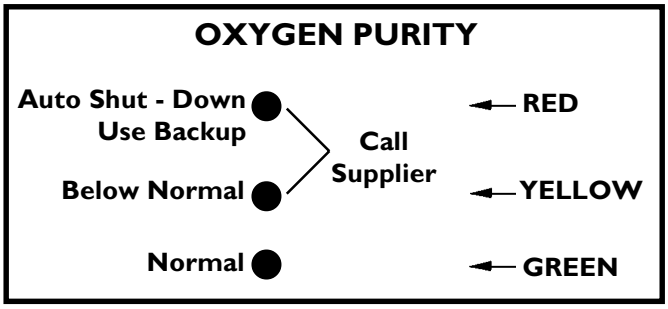


FIGURE 1 - INDICATOR LIGHTS

INDICATORS- IF YOUR UNIT DOES NOT FEATURE THE O_2 SENSOR

LX MODELS INDICATOR LIGHT EXPLANATION (FIGURE 2):

RED LIGHT (🔔)- Total Unit Shut-Down. Switch **IMMEDIATELY** to a **BACK-UP OXYGEN** supply. Call Supplier **IMMEDIATELY**.

GREEN LIGHT (I/O)- ON/OFF. System okay.

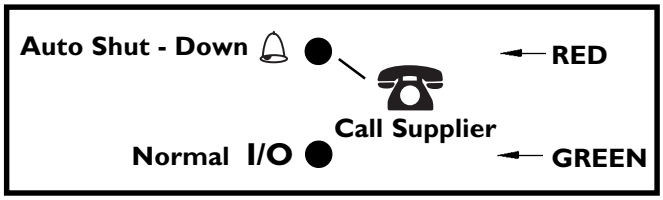


FIGURE 2 - DISPLAY CONTROL PANEL

Section 18 - Timing The Platinum 5 Concentrators - includes the following:
Timing the Platinum 5 Concentrators

TIMING THE PLATINUM 5 CONCENTRATORS (FIGURE 1)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

WARNING

Use extreme care when making adjustments to the timing switch. DO NOT allow screwdriver or your hands to contact the P.C. Board when unit is plugged in and ON. Turn unit OFF and unplug before adjusting timing switch. Electrical shock is possible.

To accommodate the varying tolerances when replacing components, an adjustable timer is used to control the shift time of the pressure equalization (P.E.) valve. The SensO_2 board allows for automatic (microprocessor controlled) adjustments of the P.E. shift times. Non-SensO_2 boards allow for manual adjustment.

TO AUTOTUNE:

1. Turn power OFF (O) and unplug the unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Plug the unit in and turn the power ON (I).
4. Wait for the main valve shift:
   a) If the board is new, the front panel RED indicator light will slowly blink, indicating autotune has initiated.
   b) If the board is used and has performed autotuning before, press and release the small pushbutton switch near the pressure sensor.
   c) The front panel RED indicator light will slowly blink, indicating the unit is autotuning and automatically adjusting the P.E. valve timing.
5. Set the output flow to 5.0 L/min. during autotuning.
6. The GREEN (onboard) diagnostic light will flash the current value of the P.E. valve timing number.
7. Place the cover back on the unit but do not install the cover screws. Let the unit run until autotuning is completed.
8. When autotuning is complete, the RED front panel indicator light will change from a slow blinking to a flashing of the final P.E. valve timing number.
9. Turn the unit off and then back on. The timing value is stored in memory for future use.
10. If the unit is turned off before an autotune cycle is completed, the P.E. valve timing will not be stored or updated. If the board is new, autotuning must be successfully completed BEFORE the unit can be placed into service.
11. After a successful autotune, run the unit for 30 minutes and verify that the oxygen concentration output of the unit is within specification.

12. If the oxygen output concentration is not within specification, rerun the autotune again at 5 L/min.
13. Reinstall the cover screws.

TO MANUAL TUNE:

1. Turn power OFF (O) and unplug the unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Plug unit in but DO NOT turn ON (I) until instructed to below.
4. Locate the timing switch on the upper right corner of the P.C. board near the pressure sensor.
5. Insert a small common or flathead screwdriver into the adjustment screw of the timing switch.
6. Set the timing switch initially at the number "7" position.
7. Turn unit ON (I) and wait 15 minutes for unit to stabilize.
8. If after 15 minutes of run time the concentration is below specification, change setting to a number one (1) position lower than the previous setting.
9. Let unit run 10 minutes. If concentration is lower still, change the switch to number two (2) positions higher.

NOTE: You will find that the concentrator will perform better at either the higher or lower setting. The normal adjustment range is between timing positions 3 and A.

10. Continue to change setting one (1) step at a time (up or down) until the concentration is the highest value achievable. Refer to CONCENTRATION LEVELS Chart in this SECTION of the manual.
11. Once concentration has reached specification, retiming is complete.
12. Reinstall cabinet. Refer to SECTION 1 - REMOVING CABINET.

CONCENTRATION LEVELS CHART - (IRC5LX/IRC5LXO2)

L/Min.	O2 Level
1 L/min.	**95.6% to 93%**
2 L/min.	**95.6% to 93%**
3 L/min.	**95.6% to 93%**
4 L/min.	**95.6% to 91%**
5 L/min.	**95.6% to 87%**

Section19 - Leak Test - includes the following:
Leak Test

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

LEAK TEST (FIGURES 1-3)

1. Unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Turn the concentrator ON (I).
4. Let concentrator run for 20 minutes.

WARNING

Apply small amount of leak test solution to fittings only. Avoid all other components. DO NOT leak test 4-way valve body. Carefully leak test for pressure leaks around Sieve Bed Hoses at 4-way valve. DO NOT allow leak test solution to enter into 4-way valve and system.

5. With "leak-test" or equivalent soapy water, leak test the following:
   a) The two (2) sieve bed hoses at the top of 4-way Valve and hose to bottom center port on 4-way Valve. Refer to FIGURE 1.

NOTE: Refer to SECTION 2 - PREVENTIVE MAINTENANCE for maintenance of heat exchanger and filters.

   b) Hose connections to top and bottom fittings of sieve beds.
   c) P.E. Valve hose connections on top of sieve beds. Refer to FIGURE 2.
   d) Hose fittings at product tank cap and check valves. Refer to FIGURE 2.
   e) The front and rear fittings on heat exchanger. Refer to FIGURE 3.
6. Replace any tubing that appears cracked, worn, etc.
7. Re-install cabinet. Refer to SECTION 1 - REMOVING CABINET.
8. See SPECIFICATIONS section of this manual for Concentration Levels. If low concentrations are observed, refer to the TROUBLESHOOTING GUIDE in this manual.

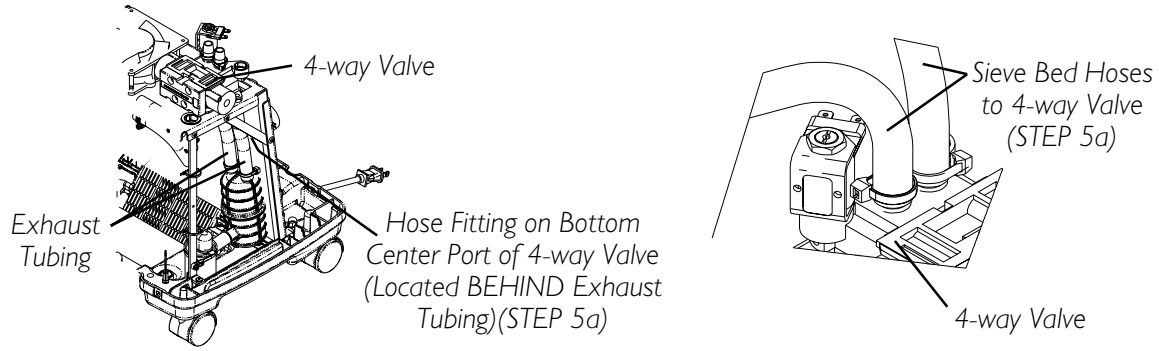


FIGURE 1 - 4-WAY VALVE HOSES

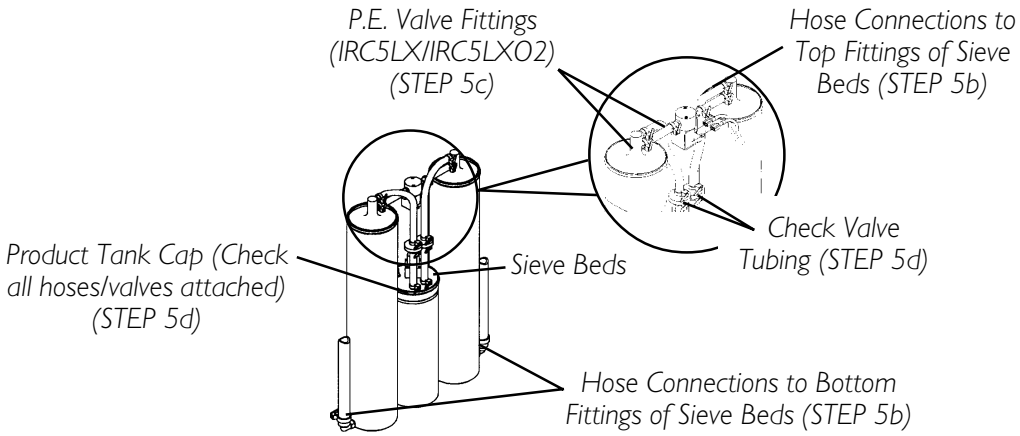


FIGURE 2 - SIEVE BED AND PRODUCT TANK HOSES

NOTE: NEW heat exchanger does NOT have fins.

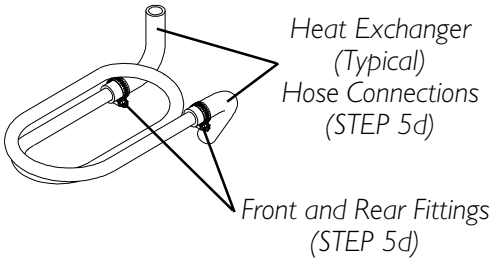


FIGURE 3 - HEAT EXCHANGER HOSES

Section 20 - Alarm and Sensor Test - includes the following:
Alarm and Sensor Test

ALARM AND SENSOR TEST

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

WARNING

CHECK ALARMS PERIODICALLY FOR PROPER FUNCTION.

To check each alarm, perform the following:

1. **POWER LOSS -** With the unit running, remove the line cord from power source. The power loss alarm mode should sound the audible alarm immediately or within 30 seconds.

NOTE: With the unit unplugged and inoperable for a short period of time, the battery free circuit will be drained. If power failure alarm does not sound with unit unplugged and power switch on, the battery free circuit is drained. It will recharge when unit is plugged in and switched on.

2. **LOW PRESSURE TEST-** There are two (2) separate failure modes for Low Pressure.
   a. Low product tank pressure. **(Pressure in tank drops below a preset value, typically 7 p.s.i)**.
   b. Failure to reach the set point pressure within a prescribed time limit, or Timeout Failure.

Test each in the following manner:

LOW PRESSURE TEST (FIGURE 1).

c1. With unit running, set flow at maximum rating. When the main valve switches, pull the stem on the compressor relief valve out as far as it will go and hold it. The low pressure alarm should activate within 30 seconds. Refer to FIGURE 5 for SHUTDOWN MODE.

c2. With unit running, set flow at maximum rating. Remove the pressure sensor tubing (tie-wrap) from the top of the product tank. The low pressure alarm should activate within 30 seconds. Refer to FIGURE 5 for SHUTDOWN MODE. Replace tubing and tie wrap.

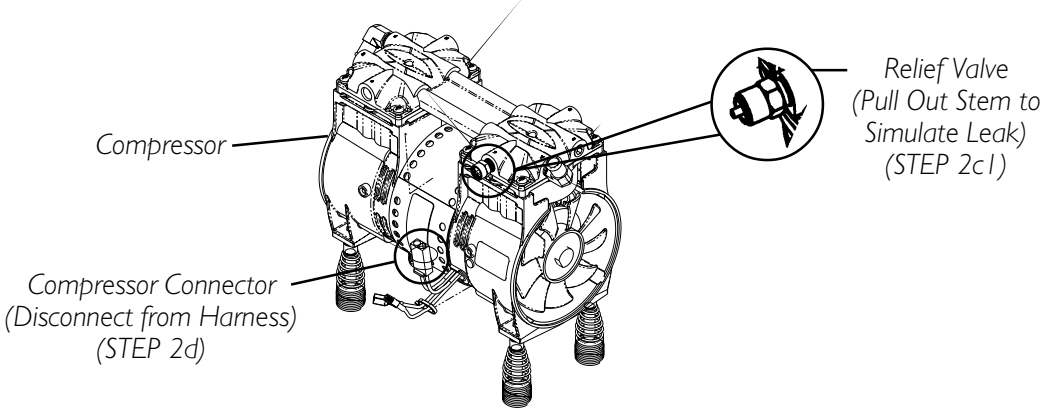


FIGURE 1 - LOW PRESSURE TEST

TIME-OUT TEST (FIGURE 1)

d. With unit **OFF (O)**, disconnect the compressor connector from the main wiring harness. Plug unit in and turn power **ON (I)**. The Time-Out Failure alarm should activate within 40 seconds. Refer to FIGURE 5 for SHUTDOWN MODE.

NOTE: If any alarm fails to perform to specification, contact Invacare Technical Service.

HIGH PRESSURE TEST (FIGURE 2)

High Pressure - Occurs when pressure in product tank rises beyond a preset value, typically 23 p.s.i. ± 1 p.s.i.

Main Valve Coil - Alarm sequence occurs when the main valve coil, connection or P.C. Board Circuitry has failed.

3. With the unit running and flow set at 5 L/min., remove one (1) orange wire from the main valve coil. The main valve coil alarm should activate within 40 seconds. Refer to FIGURE 5 for SHUTDOWN MODE.

NOTE: If any alarm fails to perform to specification, contact Invacare Technical Service.

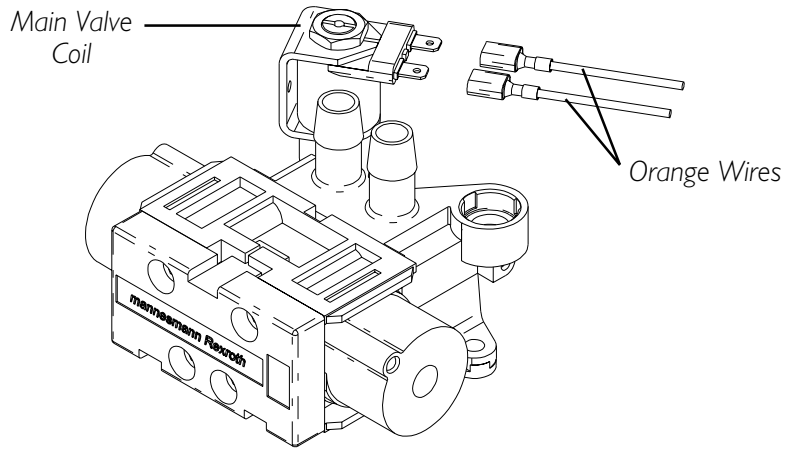


FIGURE 2 - HIGH PRESSURE TEST

4. **OXYGEN SENSOR -** Alarm sequence occurs when concentration levels fall below a preset value, typically 73% ± 3% or 85% ± 2%. This failure indicates a catastrophic failure of any component mechanical or electrical. This test is performed in a series of STEPS.

Test in the following manner:

OXYGEN SENSOR TEST (FIGURE 3)

a. Turn unit **ON (I)**. Set output flow at 5 L/min.

b. Monitor the $\mathbf{O_2}$ level.

c. With the $\mathbf{O_2}$ level greater than 85% after 5 minutes, the **GREEN** panel indicator light will remain illuminated.

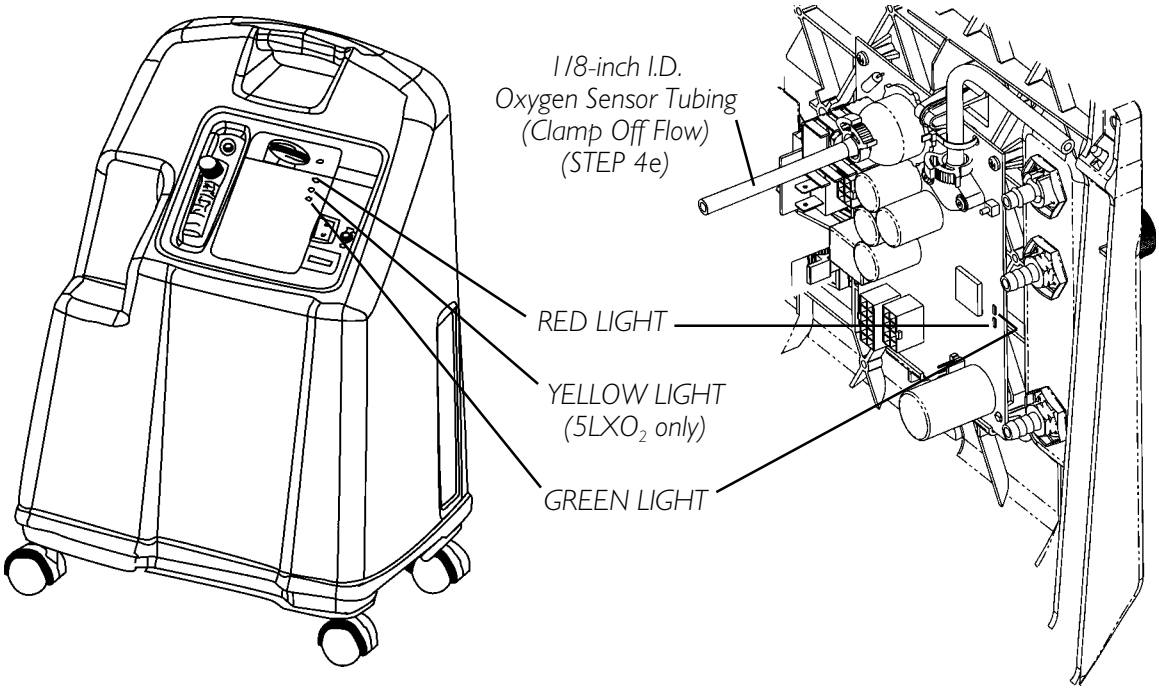
d. Slowly adjust flow beyond maximum rated flow until you can achieve a concentration level greater than 75% but less than 84%. Within 30 minutes the **YELLOW** panel indicator light will illuminate and the unit will continue to run.

e. Clamp off the 1/8-inch oxygen sensor tubing between the oxygen sensor and the product tank regulator.

WARNING

Use care not to cut oxygen sensor tubing when clamping the oxygen sensor tubing.

f. Within 30 minutes, the Oxygen Sensor Alarm should activate and the RED panel light indicator will illuminate. The compressor will shut down with the alarm.



INDICATORS

***Sens*O$_2$® Alarm Thresholds:**

Label Symbol	Status	Indicator Lights	
O_2	SYSTEM OKAY O_2 Over 85% (± 2%)	**GREEN**	Indicator Light
⚠	O_2 Between 73% (± 3%) to 85% (± 2%)	**YELLOW**	A. Yellow Solid B. Yellow Flashing-Sensor Failure *Call Qualified Service Personnel!
🔔	SYSTEM FAILURE O_2 Below 73% (± 3%)	**RED**	Continuous Audible Alarm Sieve-GARD™ Compressor Shutdown *Call Qualified Service Personnel!

FIGURE 3 - OXYGEN SENSOR TEST

P.E. VALVE COIL TEST (FIGURE 4)

P.E. Valve Coil - Alarm sequence occurs when the P.E. Valve Coil, connection or P.C. Board Circuitry has failed.

5. With the unit running and flow set at 5 L/min., remove one (1) yellow wire from the P.E. valve coil. The P.E. valve coil alarm should activate within 10 seconds. Refer to FIGURE 5 for SHUTDOWN MODE.
6. Reinstall cabinet. **(Refer to PROCEDURE 1 - REMOVING CABINET)**.

NOTE: If any alarm fails to perform to specification, contact Invacare Technical Service.

NOTE: If problems arise during test, contact Invacare Technical Service for further assistance.

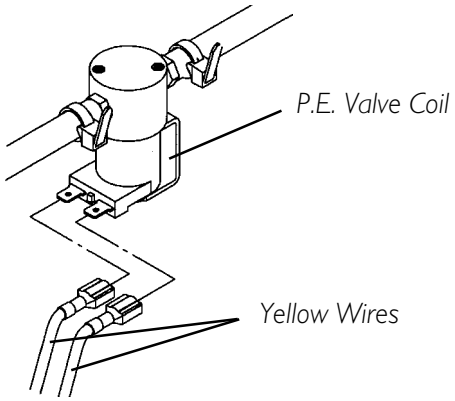


FIGURE 4 - P.E. VALVE COIL TEST

Your Invacare concentrator is now ready for an additional year. Use the **PREVENTIVE MAINTENANCE RECORD** in this manual to record date and number of hours when preventive maintenance was performed on the concentrator, or any repairs made.

OXYGEN CONCENTRATOR
Refer To Service Manual
DIAGNOSTIC ALARM SYSTEM

...ADJUSTMENTS BY UNAUTHORIZED PERSONNEL VOIDS WARRANTY...

ALARM	LED FLASHES RED	LED FLASHES GREEN	PROBABLE CAUSE
BEEP AT START UP	0	0	NO PROBLEM, SYSTEM OK
SHORT BEEP WITH LONG PAUSE	0	0	MAIN POWER LOSS
CONTINUOUS	1	1	LOW PRESSURE; MAJOR LEAK
CONTINUOUS	1	2	HIGH PRESSURE; NO SWITCHING
CONTINUOUS	1	3	TIME OUT FAILURE; COMPRESSOR
CONTINUOUS	1	5	PILOT VALVE CIRCUIT
CONTINUOUS	2	1	73% SHUTDOWN; LOW O_2
CONTINUOUS	2	3	PE VALVE COIL
CONTINUOUS	2	4	EEPROM FAILURE
CONTINUOUS	3	1	OXYGEN SENSOR FAILURE

NOTE: CYCLE POWER ON AND OFF FIVE (5) TIMES TO CLEAR INTERNAL FAULT CODE.

PREVENTIVE MAINTENANCE SCHEDULE

1115180

Cabinet Filter(s)	Clean Weekly, Replace as Needed
Heat Exchanger	Clean as Needed
Compressor Inlet Filter	Check Annually or During Scheduled PM
Outlet HEPA Filter	Check Annually or During Scheduled PM
Compressor	Rebuild as Needed
Exhaust Muffler	Replace as Needed

PERFORMANCE SPECIFICATION

Flow: 0.5 to 5.0 L/min.
Oxygen Concentration: 95.6% to 87%

Section 21 - Sieve Bed Pressure Check - includes the following:
Sieve Bed Pressure Tap-In Kit Installation
Sieve Bed Pressure Check

SIEVE BED PRESSURE TAP-IN KIT INSTALLATION AND BED PRESSURE CHECK (FIGURES 1, 2 & 3)

WARNING

TO PREVENT ELECTRICAL SHOCK, ALWAYS DISCONNECT CONCENTRATOR FROM ELECTRICAL OUTLET BEFORE SERVICING.

DISASSEMBLY

1. Turn power OFF (O) and unplug unit.
2. Remove cabinet. Refer to SECTION 1 - REMOVING CABINET.
3. Turn unit so the back faces you.
4. Loosen and lower the adjustable clamp on the product tank.
5. Pull product tank up and back to access the check valve PVC tubing.
6. Locate the check valve and PVC tubing to your right.
7. Cut the PVC tubing below the check valve in half.

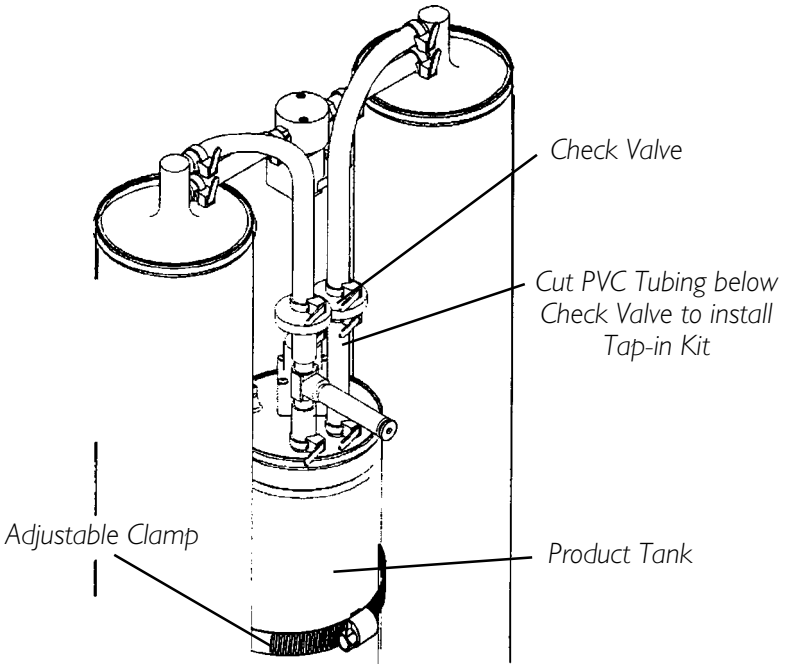


FIGURE 1 - DISASSEMBLY

INSTALLATION (FIGURE 2)

1. Insert the "T" fitting into the ends of the PVC tubing.
2. Secure 1/4-inch clamps to each end of the PVC tubing "T" fitting connection.
3. Attach the 1/4 x 2-inch silicone tubing to the **NEW** "T" fitting and secure with a 1/4-inch clamp.
4. Insert plug into the open end of the 1/4 x 2-inch silicone tubing.
5. Secure with a 1/4-inch clamp.

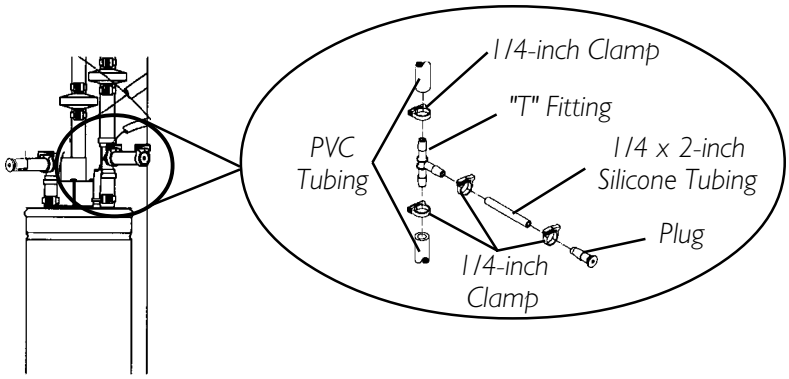


FIGURE 2 - INSTALLATION

PRESSURE TESTING (FIGURE 3)

1. Remove plug and connect pressure gauge to the 1/4 x 2-inch silicone tubing and secure with a 1/4-inch clamp.
2. Check each connection to make sure they are tight.
3. Turn the concentrator **ON (I)**.

NOTE: Adjust the concentrator to MAXIMUM Rated liter flow (5 L/min.).

NOTE: Wait approximately 5 minutes to allow system pressures to achieve proper equillibrium before testing.

4. The pressure in the concentrator should rise within 20 seconds to 21 p.s.i.g. ± 0.3 and shift the 4-way valve to the opposite sieve bed.
5. After the 4-way valve shift, the pressure in the concentrator will drop to 14 p.s.i.g. ± 2 before rising within 20 seconds to 21 p.s.i.g. ± 0.3 and shift the 4-way valve to the opposite sieve bed.
6. If pressure reading is 21 p.s.i.g. ± 0.3 when both valve shifts are made, proceed to STEP 8.

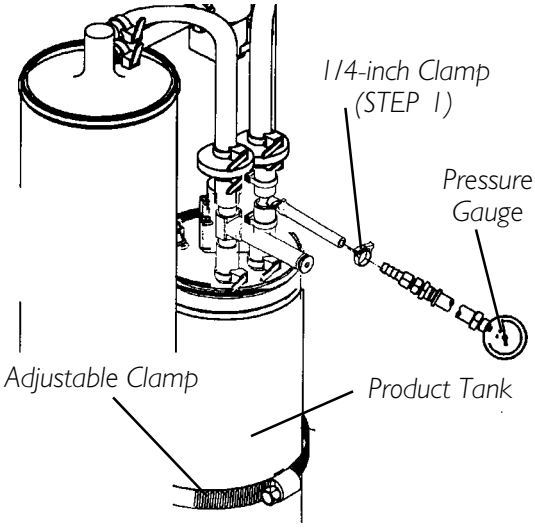


FIGURE 3 - PRESSURE TESTING

7. If pressure in the concentrator does not fall into the specifications listed above, refer to the TROUBLESHOOTING section in this manual.
8. Turn the concentrator **OFF (O)**.
9. Unclamp the pressure gauge and remove it from the "T" fitting.

AFTER TESTING (FIGURE 4)

1. Insert 1/4-inch plug and 1/4 x 2-inch silicone tubing onto the "T" fitting and secure with 1/4-inch clamp.
2. Reinstall the cabinet. Refer to SECTION 1 - REMOVING CABINET.

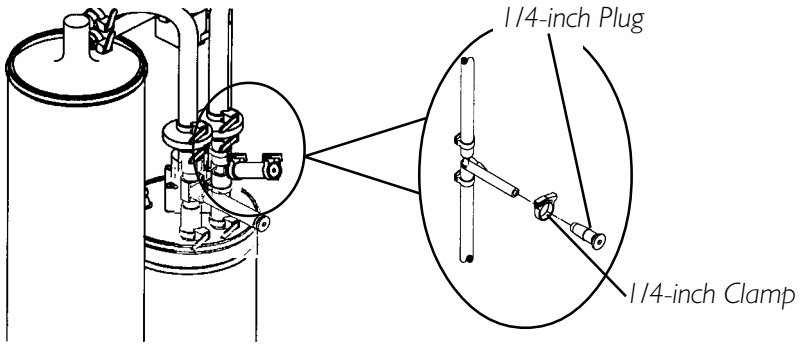


FIGURE 4 - AFTER TESTING

LIMITED WARRANTY

NOTE: THE WARRANTY BELOW HAS BEEN DRAFTED TO COMPLY WITH FEDERAL LAW APPLICABLE TO PRODUCTS MANUFACTURED AFTER JULY 4, 1975.

This warranty is extended only to original purchaser of our products.This warranty gives you specific legal rights and you may also have other legal rights which may vary from state to state.

Invacare Corporation warrants its Platinum Oxygen Concentrator to be free from defects in materials and workmanship from date of purchase for a period of five (5) years

The 4-way valve body carries a lifetime warranty from date of purchase. DO NOT OPEN OR ATTEMPT TO SERVICE VALVE BODY. This will void any and all warranty applicable to the valve body. If within such warranty period any such product shall be proven to Invacare Corporation's satisfaction to be defective, such product shall be repaired or replaced, at Invacare Corporation's option. This warranty only applies to the labor for repairs performed by the Invacare Service Department or authorized Invacare Authorized Service Centers. It does not apply to the labor performed by the purchaser or user. This warranty does not include normal wear and tear or shipping charges. Invacare Corporation's sole obligation and your exclusive remedy under this warranty shall be limited to such repair or replacement. Routine maintenance items, such as filters, are excluded from this warranty.

For warranty service, please contact Invacare Corporation's service department at the toll free number on the back cover.

Upon receiving notice of an alleged defect in a product, Invacare Corporation will issue a serialized return authorization. It shall then be the responsibility of the purchaser to return the entire unit or remove, at purchaser's cost, the defective component part(s) identified, pack the component part(s) in a manner to avoid shipping damage and to ship the component part(s) to either Invacare Corporation's plant or service center as specified by Invacare Corporation in advance. Defective component part(s) must be returned for warranty inspection using the serial number as identification within thirty (30) days of return authorization date. Do not return products to our factory without prior consent. C.O.D. shipments will be refused; please prepay shipping charges.

LIMITATIONS AND EXCLUSIONS: THE FOREGOING WARRANTY SHALL NOT APPLY TO PRODUCTS SUBJECTED TO NEGLIGENCE, ACCIDENT, IMPROPER OPERATION, MAINTENANCE OR STORAGE, SOOT OR SMOKE-FILLED ENVIRONMENTS, OR OTHER THAN NORMAL APPLICATION, USE OR SERVICE, OR TO PRODUCTS MODIFIED WITHOUT INVACARE CORPORATION'S EXPRESS WRITTEN CONSENT (INCLUDING, BUT NOT LIMITED TO, MODIFICATION THROUGH THE USE OF UNAUTHORIZED PARTS OR ATTACHMENTS) OR TO PRODUCTS DAMAGED BY REASON OF REPAIRS MADE TO ANY COMPONENT WITHOUT THE SPECIFIC CONSENT OF INVACARE CORPORATION OR TO PRODUCTS DAMAGED BY CIRCUMSTANCES BEYOND INVACARE CORPORATION'S CONTROL.

THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTIES WHATSOEVER, WHETHER EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTIBILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND THE SOLE REMEDY FOR VIOLATIONS OF ANY WARRANTY WHATSOEVER, SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT PERSUANT TO THE TERMS CONTAINED HEREIN. THE APPLICATION OF ANY IMPLIED WARRANTY WHATSOEVER SHALL NOT EXTEND BEYOND THE DURATION OF THE EXPRESS WARRANTY PROVIDED HEREIN. INVACARE SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES WHATSOEVER.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGE, OR LIMITATION OF HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE EXCLUSION AND LIMITATION MAY NOT APPLY TO YOU.

THIS WARRANTY SHALL BE EXTENDED TO COMPLY WITH STATE/PROVINCIAL LAWS AND REQUIREMENTS.

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Yes, you can.

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