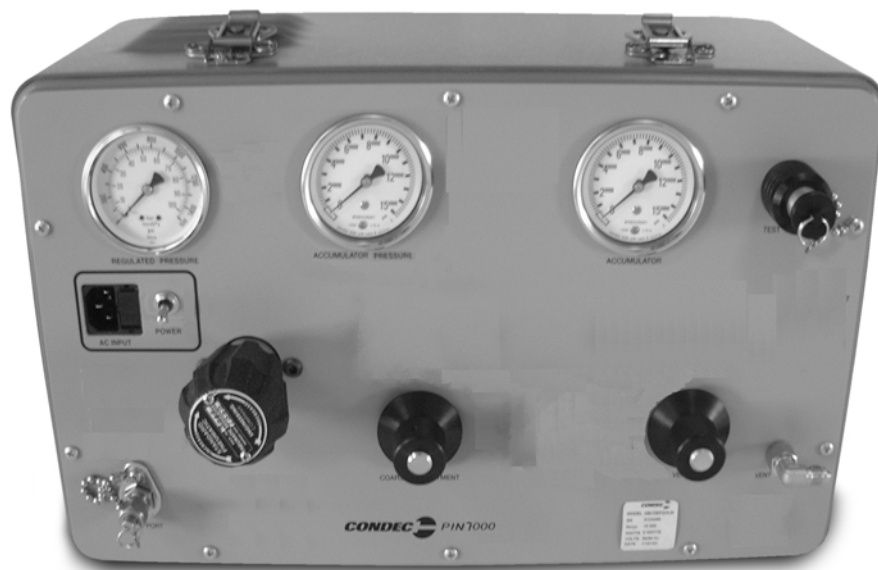


PIN7000 & PIN7010

*Portable & Rack-mountable Pneumatic
High Pressure Intensifier Console*

Operation and Maintenance Manual



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Contents

About This Manual	1
1.0 Introduction	1
2.0 Operation	3
2.1 Optional External Pressure Cylinder (PN 59533) Filling Procedure	3
2.2 Initial Setup Procedure.	3
2.3 Operating Instructions	4
3.0 Maintenance & Service	5
3.1 Troubleshooting.	5
3.2 Maintenance & Service Procedures	5
3.2.1 Panel/Chassis Removal and Installation	6
3.2.2 Accumulator, Intensifier & MPV Valves (PN 65076) Removal	7
3.2.3 MPV Valve, Valve Seat Removal	8
3.2.4 MPV Valve, Valve Seat Installation.	8
3.2.5 Accumulator, Intensifier and MPV Valves, Panel Installation.	9
3.2.6 MPV Pressure Valve, Adjustment Procedure.	9
3.2.7 MPV Vent Valve, Adjustment Procedure	10
3.2.8 Accumulator Assembly, O-ring (PN 58051) Replacement, Filter (PN 56993) Cleaning	11
3.2.9 Intensifier Assembly, O-rings/Seals Replacement	11
3.2.10 Regulator (Standard Pneumatic) and Solenoid Removal	14
3.2.11 Regulator (Standard Pneumatic) and Solenoid Installation.	14
3.2.12 Panel Gauge Removal and Installation	15
3.2.13 Test Port Quick-Connect Fitting (PN 59004) and Filter (PN 54188), Removal and Installation	15
3.2.14 Test Port (output) Hose Quick-Connect Fitting and Filter (PN 56991), Removal and Installation.	16
3.2.15 Input Port Filter (PN 54188), Removal and Installation	16
3.2.16 Input Port Hose Quick-Disconnect Female Fitting, Removal and Installation	17
3.2.17 AC Fuse (PN 57472), Removal and Installation	17
3.2.18 Panel Mounted AC Power/EMI Line Filter (PN 58870), Removal and Installation	18
3.2.19 Power Switch (PN 60307), Removal and Installation	18
3.2.20 Pump Control Board Assembly, Removal and Installation	18
3.3 MPV Valve Assembly (PN 65076) Parts List.	20
3.4 Intensifier Assembly Parts List	21
4.0 Model Number System	27
5.0 Options, Replacement Kits	28
6.0 Specifications	29
PIN7000/PIN7010 Warranty and Return Policy	30
PIN7000/PIN7010 Return Material Authorization Form	31

About This Manual

This manual is intended for use by service technicians responsible for installing and servicing PIN7000/PIN7010 pressure intensifiers.

The PIN7000 portable pneumatic pressure intensifier and the rack-mounted PIN7010 are rugged, compact instruments manufactured by Condec. They are designed for custom use and ease of operation.

This manual has been written to give the user a simple and clear explanation of how to operate and maintain these instruments.



Caution

Before attempting to use either style pressure intensifier, the following instructions must be carefully read and understood by personnel using the equipment. This is a high-pressure system. It is strongly recommended that only personnel formally trained in the use of pneumatic pressure equipment be permitted to operate it. Potentially dangerous conditions can be produced through negligent handling or operation of the console due to the high pressure output of the unit.

These units are strictly for use with pneumatic pressures. Erroneous readings and potential damage can result from the introduction of hydraulic fluids into the internal tubing lines.



Authorized distributors and their employees can view or download this manual from the Condec distributor site at www.4condec.com.

1.0 Introduction

The PIN7000/PIN7010 pressure intensifier is an electro-mechanical device that utilizes our precision MPV type micro-metering valves for pressure adjustment and venting. The unit has one test port, one input port and three front panel gauges, for the operator to monitor accumulator pressure, regulated input pressure, and intensified output pressure. The pressure regulator acts as a pressure limiter so that the operator can adjust input system pressure to 1/10 of the target value. Fill and test hoses are supplied for the customer. A front panel switch provides selection of the desired pump control mode, momentary (jog) or continuous. For field use, the PIN7000 has a optional 83.3 cubic foot, 2,216 PSI cylinder available to provide many hours of use.

The PIN7000 and rack-mounted PIN7010 instruments offer a combination of features, performance, versatility and reliability not previously available in a pressure intensified instrument. Some of the features are listed below:

- Switch-selectable pressure pump control mode, momentary (jog) and continuous.
- Pressure monitoring: Three front panel mounted gauges provide excellent readability.
- Using a manually adjustable regulator, the maximum system input pressure is adjusted to slightly above 1/10 desired value of the full scale range of the device being tested. By using this technique, the device that is to be pressurized is fully protected from being inadvertently over-pressurized.
- Portable: These compact, self-contained systems are easily carried and operated by only one person. Total weight is approximately 38 lbs.
- Pressure Source: Nitrogen or clear dry air is supplied by the customer. In either instrument, the pressure source drives a pneumatically operated 10 to 1 intensifier contained within the PIN7000/PIN7010. Therefore, a 1,000 PSI input is amplified to 10,000 PSI. An optional external supply cylinder may be purchased that will contain a volume of 83.3 standard cubic feet off nitrogen and provide up to 2,216 PSIG of pressure for calibration and test.
- Simple Operation: All controls, indicators and pressure ports (PIN7000 only) are accessible from the front panel. Accompanying operator's manual provides clear, concise instructions for system operation.
- Safe, Clean Operation: All pressure components are made of stainless steel and proof-tested to at least 150% of maximum operating pressure. In addition, the system contains a high-pressure burst disk to protect both the operator and system components from harm in the event of inadvertent over-pressurization.

In addition to the features, the PIN7000/PIN7010 pressure intensifier is easy to use. Two MPV style micro-metering valves are provided to control the internally intensified nitrogen while the output pressure gauge indicates the magnitude of the applied test pressure. Over-pressure protection is provided through a fully-adjustable pressure regulator, which is manually set for each new device being tested.

Figure 1-1 provides an overview of the PIN7000/PIN7010's function.

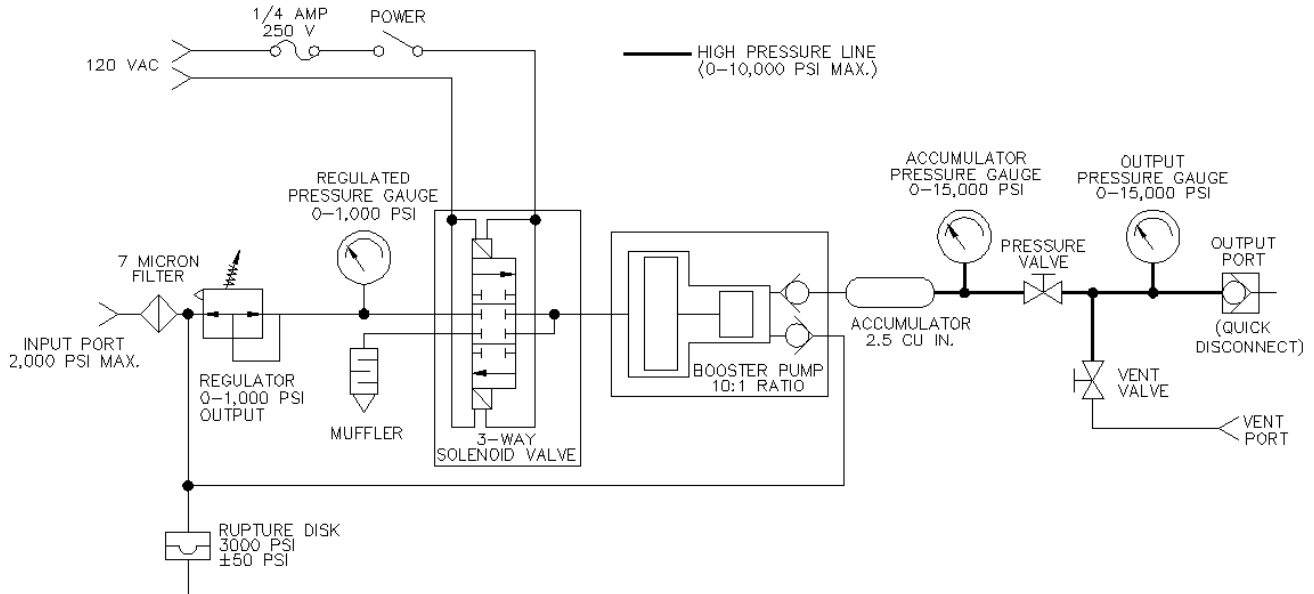


Figure 1-1. PIN7000/PIN7010 Flow Diagram

2.0 Operation

2.1 Optional External Pressure Cylinder (PN 59533) Filling Procedure

NOTE: Condec strongly recommends that the external nitrogen supply cylinder be pressure-tested and re-certified every five years from date cylinder was manufactured per U.S. DOT. 3AL Regulation, Title 49 CFR, parts 173 and 178.

To initially fill or refill the external pressure cylinder (2,216 PSI max.), proceed as described below.

1. Close the *CYLINDER* valve by rotating clockwise until it stops.
2. Connect the customer supplied fill hose, to a clean regulated nitrogen source, with an output pressure gauge and vent valve.
3. Connect the other end of the customer supplied fill hose to the female CGA-580 brass *CYLINDER* valve fitting.
4. Open the *CYLINDER* valve by rotating counter-clockwise until it stops.
5. Slowly open the valve on the nitrogen source and allow the gas to flow into the pressure cylinder. The customer supplied output pressure gauge indicates the amount of pressure within the internal cylinder.

NOTE: Cylinder is equipped with a rupture disk.

6. Use the following procedure to fill the cylinder:
 - a) Fill cylinder to 1,000 PSI at a rate of charge equal to a minimum of two minutes, then wait five minutes for system to stabilize.
 - b) Fill cylinder from 1,000 PSI to 2,216 PSI at a rate of charge equal to a minimum of two minutes.
 - c) Wait five minutes for cylinder to stabilize before using.
7. Close the *CYLINDER* valve by rotating clockwise until it stops. Vent nitrogen source and remove fill hose.

2.2 Initial Setup Procedure

To prepare for actual intensifier usage, see Figure 2-1 below and proceed as follows:

1. Check that the *PRESSURE* valve (11) is closed (rotate clockwise until it stops) and that the Vent valve (12) is open (two turns counter-clockwise from its stop). Verify that the *REGULATOR* (10) is closed (rotate counter-clockwise until it stops).
2. Plug in the power cord (1).
3. Connect the male end of the test hose to the *TEST PORT* (9) fitting.
4. Connect the swivel fitting end (7/16-20) of the test (output) hose to the input of the device to be pressurized using adapters if required. Tighten all connections properly.
5. **Optional External Cylinder:** Connect the male end of the input hose (3) to the female CGA-580 brass *CYLINDER* (5) valve fitting.
Other: Connect the male end of the input hose (3) to the female CGA-580, customer supplied, pressure source.
6. Connect the swivel fitting end (7/16-20) of the input hose (3) to the *INPUT PORT* (4) fitting. Tighten all connections properly.

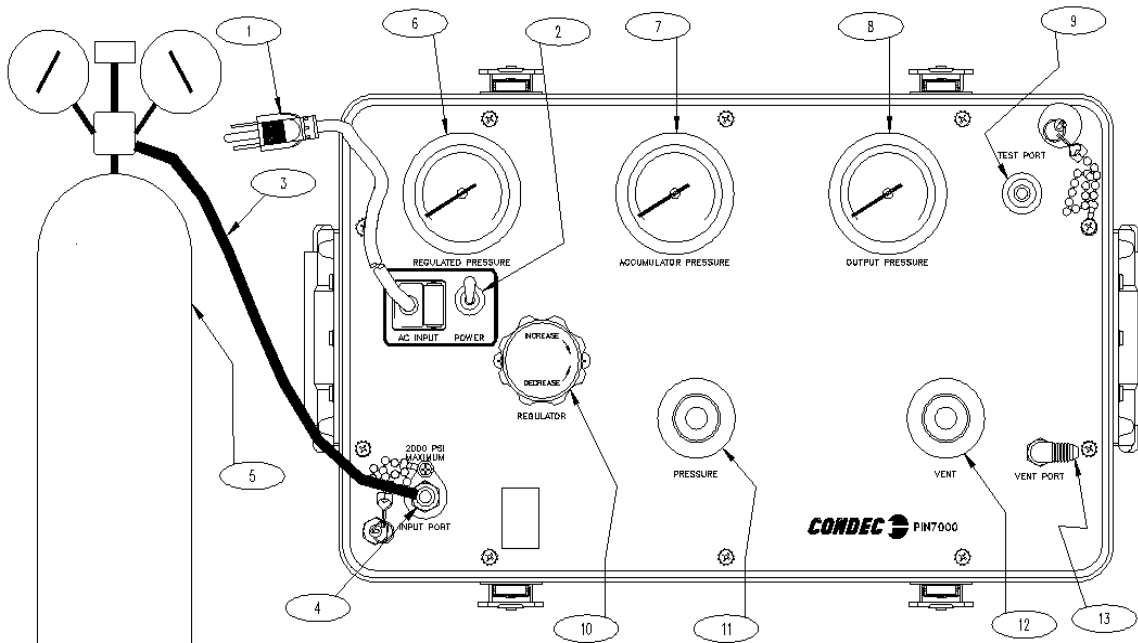


Figure 2-1. Initial Setup/Operating

NOTE: PIN7000 shown, AC Input (1), Test Port (9) and Input Port (4) are on back side of PIN7010 Rack Mountable Intensifier.

2.3 Operating Instructions

NOTE: See Figure 2-1, when following these steps.

1. Optional External Cylinder: Open the cylinder valve (5) by rotating counter-clockwise slowly until it stops.
Other: Open the, customer supplied, pressure source valve.
2. Using the REGULATOR (10), adjust the maximum intensifier pump input pressure, as read by the REGULATED PRESSURE gauge (6), to 1/10 of the target value. The unit utilizes an internal intensifier with a 10:1 ratio. As an example, setting regulated pressure to 300 PSI would generate an output pressure of 3,000 PSI. Using this technique, the device to be pressurized, is fully protected from being accidentally over-pressurized.
3. To generate pressure, enable the POWER switch (2) and monitor the pressure as it builds in the ACCUMULATOR PRESSURE gauge (7). Turn the POWER switch (2) off when 10% more than the target pressure has been achieved.

NOTE: The intensifier POWER switch (2) can be operated in two modes. The up position is continuous and the down position is momentary/jog.

4. To apply pressure, the VENT valve (12) must be closed. Open the PRESSURE valve (11), slowly counter-clockwise, while monitoring the OUTPUT PRESSURE gauge (8), until reaching the target value.
5. Use either the PRESSURE (11) or VENT valve (8) to obtain a specific pressure reading. Both provide precise control. As the pressure approaches the desired value, the valve being used for control should be rotated slowly clockwise to its closed position.

NOTE: Use the intensifier POWER switch (2) if the ACCUMULATOR PRESSURE gauge (7) reading falls below required target pressure value.

3.0 Maintenance & Service

This section outlines the mechanical and basic electrical repair procedures for the PIN7000/PIN7010.

3.1 Troubleshooting

Use Table 3-1 below for information on troubleshooting the PIN7000/PIN7010.

Symptom	Problem	Remedy
OUTPUT PRESSURE gauge slowly decreases over time.	Leak in system.	Check all compression and pipe fittings with Snoop®, bottle of liquid leak gas detector (PN 64781).
OUTPUT PRESSURE gauge increases or decreases when OUTPUT PRESSURE or VENT valves are closed.	No Pressure or Vent control.	Replace valve seats or O-rings in valves; check valve needles.
Unit does not cycle when Pump Control switch is on.	Fuse blown on Pump Control Board. No power.	Replace fuse. Check that power is on.
Unit cycles, but does not pressurize.	Debris in check valve seat in intensifier, deformity in seat. No supply pressure.	Remove seats in intensifier and clean and/or replace. Check to see if there is sufficient supply pressure.

Table 3-1. PIN7000/PIN7010 Troubleshooting

3.2 Maintenance & Service Procedures

The repair procedures cover the major components and sub-assemblies which are critical to the proper functioning of the calibrators and that need periodic maintenance over the life of the unit.



Caution

Only those persons who are formally trained as skilled technicians should attempt to repair these units. All safety precautions should be observed due to the presence of electrical and high-pressure components. Unit must always be unplugged from power source and vented.

®Snoop is a registered trademark of

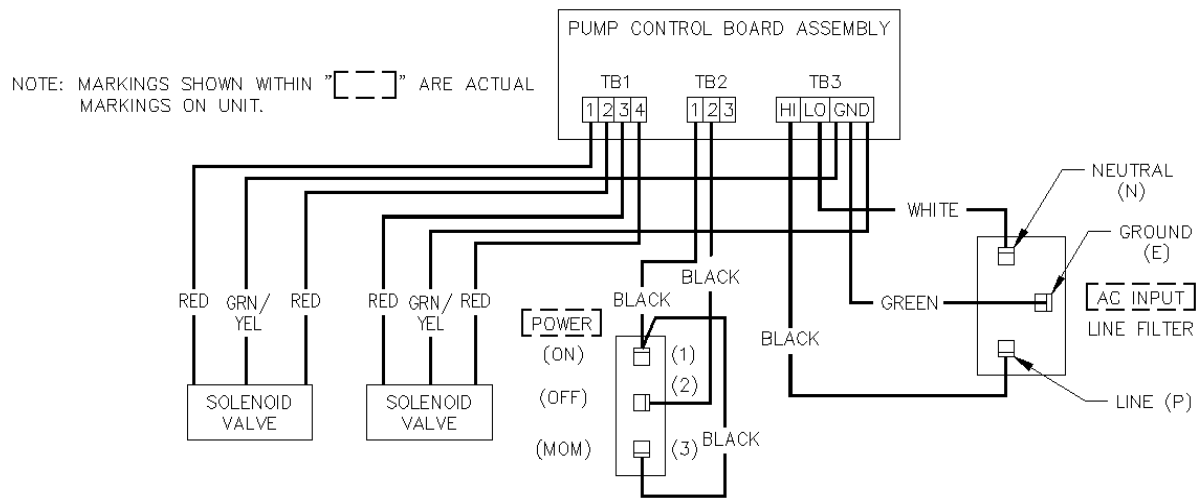


Figure 3-1. PIN7000/PIN7010 Wiring Diagram

3.2.1 Panel/Chassis Removal and Installation

PIN7000 Removal

Tools required: Phillips screwdriver

1. Loosen and remove the 10 screws (PN 14862) that secure the panel assembly to the enclosure.
2. Lift the panel and chassis by first grasping the regulator knob and test port and second, grasping under the panel edges. Tilt the panel at an angle by lifting the right side before the left side as you face the panel. Ensure that the wire harnesses do not catch and snag.
3. Gently set the panel/chassis assembly on a bench top. It can be rested on the panel bottom with the accumulator supported by a screwdriver handle.

PIN7000 Installation

Tools required: Phillips screwdriver

1. Lift the panel and chassis by first grasping the regulator knob and test port.
2. Gently place panel/chassis assembly into enclosure. Tilt the panel at an angle by lifting the right side before the left side as you face the panel. Ensure that the wire harnesses do not catch and snag.
3. Align mounting holes and install the 10 screws (PN 14862) that secure the panel assembly to the enclosure.

PIN7010 Removal

Tools required: Phillips screwdriver

1. Loosen and remove the 14 screws (PN 14861) from top, bottom, and sides that secure the panel assembly to the enclosure. Also, loosen and remove the three screws (P/N 14861) from the rear of unit that secure the enclosure to the TEST PORT/AC INPUT/INPUT PORT panel.
2. Lift the panel and chassis by grasping the handles located on the front of the rack mountable panel. Ensure that the wire harnesses do not catch and snag.
3. Gently set the panel/chassis assembly on a bench top. It can be rested on the panel bottom with the accumulator supported by a screwdriver handle.

PIN7010 Installation

Tools required: Phillips screwdriver

1. Lift the panel and chassis by grasping the handles located on the front of the rack mountable panel.

2. Gently place panel/chassis assembly into enclosure. Ensure that the wire harnesses do not catch and snag.
3. Align mounting holes and install 14 screws (PN 14862) from top, bottom, and sides that secure the panel/chassis assembly to the enclosure. Also, align mounting holes and install the three screws (PN 14862) from the rear of unit that will secure the enclosure to the TEST PORT/AC INPUT/INPUT PORT panel.

3.2.2 Accumulator, Intensifier & MPV Valves (PN 65076) Removal

Tools required: Phillips screwdriver
 11/32" Wrench or nutdriver
 .061" Hex wrench
 7/16" Open end wrench

NOTE: See Table 3-2 on page 19 and Figure 3-2 on page 22 for additional MPV valve parts information. See Table 3-3 on page 21 and Figure 3-2 on page 22 for additional intensifier parts information.

1. Vent the system to atmosphere before attempting to work on the unit. Disconnect the power cord from the power source.
2. Remove front panel from its enclosure as described in Section 3.2.1 and carefully set on a bench top.
3. Using a 7/16" wrench, remove the following tubing sections:
 - Accumulator to intensifier outlet (1/4" dia.)
 - Intensifier assembly to solenoid tee fitting (1/4" dia.)
 - Vent valve tee to output pressure gauge (1/8" dia.)
 - PIN7010 only: Pressure valve tee to test port fitting
 - Accumulator to pressure valve fitting (1/8" dia.)
 - Accumulator to accumulator pressure gauge (1/8" dia.)
 - Pressure valve tee to vent valve tee (1/8" dia.)
4. Loosen and remove the six screws that secure the two clamps that hold the intensifier and accumulator.
5. Remove the accumulator by sliding out.
6. Loosen the fitting nut at the intensifier end of the long 1/4" diameter tubing section that connects the solenoid valve to the intensifier. There is no need to remove the tubing.
7. Remove the two clamps and the intensifier.
8. Using a 7/16" wrench, remove the following tubing section:
 - Vent port to vent valve outlet (1/8" dia.)
9. Remove the panel knobs from the Pressure and Vent valves using the .061" hex wrench.
10. Loosen and remove the two panel screws (PN 60837) from the panel front that secure the valves to the panel.
11. Remove the five retaining nuts and lock washers that secure the chassis to the panel.
12. Lift the chassis enough to allow the MPV valves to clear and remove the valves.
13. Reposition the chassis over the mounting studs and secure with at least two nuts.

3.2.3 MPV Valve, Valve Seat Removal

Tools required: A/R solvent (de-natured alcohol)
 Socket wrench
 3/4" Socket
 Needle housing socket (65580)
 Hex wrench (.050")
 Hex wrench (.061")
 Needle-nose pliers
 Tube fluorinated Krytox grease (PN 55593)
 Electric hand drill
 No. 43 drill bit
 No. 4-40 tap
 Tap handle
 Small hammer

NOTE: See Table 3-2 on page 19 and Figure 3-2 on page 22 for additional parts information.

1. Secure the valve body by its center portion, in a bench vise, with the valve knob pointing upward.
2. Using the .061" hex wrench, loosen and remove the knob insert (6) and the nylon washer (14) from the valve stem (3).
3. Using the .050" hex wrench, loosen and remove the set screw (13) and lock nut (12).
4. Loosen the 3/4" locknut (11) on the valve threaded needle housings (2).
5. Using the needle housing socket (65580) and socket wrench, loosen and remove the needle/housing assembly (2, 3).
6. Remove the valve stem seat (10) and valve needle seat (5) using the needle-nose pliers.
7. Remove the inner and outer O-rings (19, 18) and back-up rings (7, 9) from the valve stem seats and wash all parts in solvent (de-natured alcohol).
8. To remove valve seat (4) from valve, blow compressed air through the inlet and outlet fittings. If this is unsuccessful, the center hole will have to be drilled and a tap used to extract the seat (steps 9-12).
9. Using the hand drill with the No. 43 bit, carefully drill out the seat hole, ensuring that the drill does not touch the hole in the valve body housing directly beneath the seat.
10. Blow out any chips from the seat area using compressed air.
11. While holding the 4-40 tap steady and perpendicular to the seat, slowly turn until the tap starts to engage the seat.
12. When the tap has engaged into the seat, use a small hammer and gently knock upward against the tap handle to extract the seat.
13. After the seat has been removed, blow any remaining chips from the seat area.

3.2.4 MPV Valve, Valve Seat Installation

Tools required:

- Needle-nose pliers
- Tube fluorinated Krytox grease (PN 55593)
- No. 43 drill
- A/R solvent (de-natured alcohol)
- Hex wrench (.050")
- Hex wrench (.061")
- Torque wrench
- Socket wrench
- 3/4" Socket
- Needle housing socket (PN 65580)

NOTE: See Table 3-2 on page 19 and Figure 3-2 on page 22 for additional parts information.

1. Install a new seat (4) by placing it into the seat well with the needle-nose pliers. Ensure that the seat is centered within the cavity and gently tap it with a blunt end of a drill bit to install.
2. Install the valve needle seat (5) with the smaller diameter end facing outward.
3. Install new O-rings (19, 18) and back-up rings (7, 9) inside and outside of the valve needle seat. Coat all O-rings and back-up rings with fluorinated Krytox grease before installation. Make sure that the rings are installed in the proper order.
4. Install the valve stem seat (10) by grasping the small diameter end with the needle-nose pliers and positioning in the valve cavity, then gently pushing with the blunt end of a drill bit.
5. Disassemble the valve needle (3) from its housing (2) and check for any burrs or dirt on the threads which might interfere with smooth operation.
6. Clean both the needle (3) and housing (2) in solvent, dry the parts and apply a small amount of fluorinated Krytox grease to the needle threads before reassembly.
7. Assemble the Valve Needle (3) into the valve needle housing (2) and turn it until it stops.
8. Reinstall the needle/housing assembly into the valve cavity until finger tight.
9. Mount the valve body (1) in a vise. Torque the needle/housing assembly to 325 in-lb. using the needle housing socket (PN 65580) and torque wrench.
10. Install the housing lock nut (11) onto the housing (2) and tighten until snug with the 3/4" socket.
11. Using the .050" hex wrench, install and tighten the lock nut (12) and set screw (13).
12. Install the nylon washer (14) and knob insert (6) over the valve needle (3) shaft, align the set screws (17) with the indents and tighten with the .061" hex wrench.

3.2.5 Accumulator, Intensifier and MPV Valves, Panel Installation

Tools required: 7/16" open end wrench
Phillips screwdriver
Hex wrench (.061")
Snoop, liquid leak gas detector (PN 64781)
11/32" Open end wrench (thin)

NOTE: See Table 3-2 and Figure 3-2 on page 22 for additional parts info (* denotes reference to Figure 2-1 on page 4).

1. If not already done, remove the panel knobs from the PRESSURE and VENT valves using the .061" hex wrench.
2. With the panel facing down against the bench, if not already done, remove the five retaining nuts and lock washers that secure the chassis to the panel. Lift up the chassis enough so that the MPV valves are able to clear.
3. Install the two mounting screws (PN 60837) from the panel front and tighten until snug.
4. Secure the chassis to the panel with the five nuts and lock washers (tighten until snug).
5. Install the MPV valve knob (15) onto the knob insert (6). Repeat for other MPV valve knob. Align the set screws (16) with the indentations on the knob insert and tighten until snug using the .061" hex wrench.

NOTE: To perform the valve adjustments, follow the procedure in Section 3.2.6 and 3.2.7 after completing the following steps.

6. Using a 7/16" wrench, install the following tubing section that goes from vent port to MPV vent valve outlet (1/8" dia.).
7. Replace the intensifier and the two clamps.
8. Realign and tighten the fitting nut at the intensifier end of the long 1/4" diameter tubing section that connects the solenoid valve to the intensifier.
9. Replace the accumulator by sliding in through the clamps.
10. Thread and tighten the six screws that secure the two clamps that hold the intensifier and accumulator.
11. Using a 7/16" wrench, realign and tighten the following tubing sections:
 - Pressure valve tee to vent valve tee (1/8" dia.)
 - Accumulator to accumulator pressure gauge (1/8" dia.)
 - Accumulator to pressure valve fitting (1/8" dia.)
 - PIN7010 only: Pressure valve tee to test port fitting (1/8" dia.)
 - Vent valve tee to output pressure gauge (1/8" dia.)
 - Intensifier assembly to solenoid tee fitting (1/4" dia.)
 - Accumulator to intensifier outlet (1/4" dia.)
12. Plug power cord into outlet. Using a pressure source connected to the input port (*4) set input pressure to 100 PSI. Open REGULATOR until REGULATED PRESSURE gauge (*6) rises to 100 PSI. Enable the POWER switch (2) and monitor the pressure as it builds in the ACCUMULATOR PRESSURE gauge (*2). Turn the POWER switch (*2) off when 1,000 PSI has been achieved. Check all fittings for leaks. If there are no leaks vent system and remove pressure source.

NOTE: See Section 2.2 on page 3 for pressure source connection procedure.

13. Install panel/chassis assembly in its enclosure as described in Section 3.2.1 on page 6.

3.2.6 MPV Pressure Valve, Adjustment Procedure

Tools required: Hex wrench (.050")
Hex wrench (.061")

NOTE: See Table 3-2 and Figure 3-2 on page 22 for additional parts information (* denotes reference to Figure 2-1 on page 4).

1. Turn the supply pressure regulator off.
2. If not already done, remove the valve knob (15) using the .061" hex wrench.
3. Verify the power cord is plugged in.
4. Using a .050" hex wrench, loosen the set screw (13) on the MPV valve locknut (12) and turn the locknut clockwise to its stop.

5. Check to see that the knob insert (6) is securely fastened to the valve shaft (3). If it is loose, re-tighten the set screws (17) with the .061" hex wrench.
6. Close the PRESSURE valve by turning the knob insert (6) clockwise until you feel the valve needle seat on the O-ring (valve is now in closed position).
7. With a pressure source connected to the INPUT PORT (*4). Use the REGULATOR (*10), to increase the regulated pressure (monitor REGULATED PRESSURE gauge) to 1,000 PSI. Enable the POWER switch (2) and monitor the pressure as it builds in the ACCUMULATOR PRESSURE gauge (*7). Turn the POWER switch (2) off when above 8,000 PSI has been achieved.
8. Open the VENT valve (*12) to atmosphere, then close the VENT valve (*12).
9. Slowly open the PRESSURE valve by turning the knob insert (6) counter-clockwise until you notice the OUTPUT PRESSURE gauge (*8) increase. Then turn the knob insert slightly clockwise until the pressure stops rising.
10. Mark a radial line at the 12 o'clock position on the knob insert (6).
11. Turn the knob insert (6) clockwise to move the mark to the 6 o'clock position.
12. Turn the locknut (12) counter-clockwise until it contacts the bottom of the stop washer (14). Tighten the set screw (13) on the locknut with the .050" hex wrench.
13. Install the PRESSURE valve knob (15) on the knob insert (6) and align the set screws (16) with the indentations on the knob insert.
14. Tighten the set screws (16) with the .061" hex wrench. The PRESSURE valve is now adjusted.

3.2.7 MPV Vent Valve, Adjustment Procedure

Tools required: Hex wrench (.050")
 Hex wrench (.061")

NOTE: See Table 3-2 and Figure 3-2 on page 22 for additional parts information (* denotes reference to Figure 2-1 on page 4).

1. Turn the supply pressure regulator off.
2. If not already done, remove the valve knob (15) using the .061" hex wrench.
3. Verify the power cord is plugged in.
4. Using a .050" hex wrench, loosen the set screw (13) on the MPV valve locknut (12) and turn the locknut clockwise to its stop.
5. Check to see that the knob insert (6) is securely fastened to the valve shaft (3). If it is loose, re-tighten the set screws (17) with the .061" hex wrench.
6. Close the PRESSURE valve by turning the knob insert (6) clockwise until you feel the valve needle seat on the O-ring (valve is now in closed position).
7. With a pressure source connected to the INPUT PORT (*4). Use the REGULATOR (*10), to increase the regulated pressure (monitor REGULATED PRESSURE gauge) to 1,000 PSI. Enable the POWER switch (*2) and monitor the pressure as it builds in the ACCUMULATOR PRESSURE gauge (*7). Turn the POWER switch (*2) off when above 8,000 PSI has been achieved.
8. Close the VENT valve (*12), then open the PRESSURE valve (*11).
9. Slowly open the VENT valve by turning the knob insert (6) counter-clockwise until you notice the OUTPUT PRESSURE gauge (*8) decrease. Then turn the knob insert slightly clockwise until the pressure stops lowering.
10. Mark a radial line at the 12 o'clock position on the knob insert (6).
11. Turn the knob insert (6) clockwise to move the mark to the 6 o'clock position.
12. Turn the locknut (12) counter-clockwise until it contacts the bottom of the stop washer (14). Tighten the set screw (13) on the locknut with the .050" hex wrench.
13. Install the VENT valve knob (15) on the knob insert (6) and align the set screws (16) with the indentations on the knob insert.
14. Tighten the set screws (16) with the .061" hex wrench. The VENT valve is now adjusted.

3.2.8 Accumulator Assembly, O-ring (PN 58051) Replacement, Filter (PN 56993) Cleaning

Tools required: Phillips screwdriver
5/8" Open end wrench
Adjustable wrench
A/R 1/4" wide teflon tape, (PN 60575)
Tube fluorinated Krytox grease (PN 55593)
A/R solvent (de-natured alcohol)

Disassembly:

1. Remove accumulator assembly from PIN7000/PIN7010 per Section 3.2.2 on page 7.
2. Place accumulator body in vise, using flats.
3. Remove plug adapter fitting (PN 57134) using adjustable wrench.
4. Remove O-ring (PN 58051) and back-up ring (PN 59735).
5. Remove accumulator body from vise and place adapter fitting in vise, using flats, threads facing upwards.
6. Remove filter retainer fitting (PN 57811) using wrench.
7. Remove plug adapter fitting from vise, turn up side down, and remove filter.
8. Clean the filter (PN 56993) in solvent (de-natured alcohol) and blow-dry with compressed air.

Assembly:

1. Place filter (PN 56993) into filter retainer fitting (PN 57811).
2. Finger tighten filter retainer fitting into plug adapter fitting (PN 57134).
3. Place plug adapter fitting (PN 57134) in a vise and tighten filter retainer fitting.
4. Grease O-ring/back-up ring groove on plug adapter fitting.
5. Grease both sides of O-ring (PN 58051) and back-up ring (PN 59735). Then install backup ring onto plug adapter fitting, followed by O-ring.

NOTE: Use pointed bent pick when installing O-ring to prevent damage. Verify backup ring split is properly aligned.

6. Place accumulator body in vise using flats. Grease accumulator body in O-ring seat area, then slowly thread plug adapter fitting using an adjustable wrench into accumulator body.

NOTE: To help seat back-up ring hand tighten plug adapter fitting close to bottoming, then wrap an 8" piece of 22 AWG, solid buss wire around the edge of back-up ring within gap between accumulator body and plug adapter fitting. Pull buss wire ends to squeeze back-up ring into proper position within accumulator body. Verify backup ring split is properly aligned and overlapping properly.

7. Tighten plug adapter fitting.
8. Install accumulator assembly into PIN7000/PIN7010 per Section 3.2.5 on page 9.

3.2.9 Intensifier Assembly, O-rings/Seals Replacement

Tools required: Phillips screwdriver
5/8" Open end wrench
1/4" Hex key
3/16" Hex key
3/8" Hex key
Adjustable wrench
Check valve seat tool (PN 70711)
Fitting holder tool (PN 70710)
Tapered packing retainer tool (PN 70712)
Check valve fitting tool (PN 70709)
A/R 1/4" wide teflon tape, (PN 60575)
Tube fluorinated Krytox grease (PN 55593)
Oil lubricant, (PN 60944)
A/R solvent (de-natured alcohol)

NOTE: See Table 3-3 on page 21 and Figure 3-2 on page 22 for additional parts information.

Disassembly Rings and Seals:

1. Remove intensifier assembly from PIN7000/PIN7010 per Section 3.2.2 on page 7.
2. Remove the 10 cap screws (1) and washers (2) from the end cap which has the single elbow fitting (23).
3. Remove the end cap (3) and O-ring (4).
4. Remove the piston (18).
5. Remove the small piston retainer (24) and three piston rings (22).
6. Remove the large piston O-ring (21) and two packing retainers (20).

Disassembly of Check Valves:

1. Remove inlet check valve fitting (12) and outlet (16) port.
2. For the outlet valve, remove, in order, the spring housing (8), spring (9), poppet (10) and seat (11).
3. For the inlet valve remove, in order, the seat (15), poppet (10) and spring (9).

Reassembly of Check Valves:

NOTES:

Clean all parts with solvent and use shop air hose to remove any dust particles from all mechanical parts, except screws and washers. Replace all damaged parts with new ones.

For ease of assembly and to prevent damage to parts it is recommended to use the following tools during assembly:

- check valve seat tool (PN 70711)
- fitting holder tool (PN 70710)
- tapered packing retainer tool (PN 70712),
- check valve fitting tool (PN 70709)

For the outlet valve:

1. Assemble spring (9) and check valve (10) into spring housing (8).
- 1.1. Press check valve seat (11) into spring housing (8), using large diameter end of check valve seat tool (PN 70711). Be sure check valve seat (11) is seated. Coat grease in bottom groove marks, in hole of end cap (19) where fitting item (16) goes.

NOTE: *The larger of the 2 seats belongs to the outlet check valve. Very important not to get grease in counter-sunk hole located at center of groove marks.*

- 1.2. Place grease on bottom of items (11/8) sub-assembly.

NOTE: *Very important not to get grease on item 10.*

- 1.3. Slide (11/8) sub-assembly into end cap (19), until properly seated on bottom. Thread high pressure tube fitting (16) into end cap (19) and tighten using a 5/8" wrench.
2. For the inlet valve, perform the following steps:
 - 2.1. Thread AN side of inlet check valve fitting (12) into fitting holder tool (PN 70710).
 - 2.2. Place a small amount of grease (PN 55593) on inlet check valve fitting (12) between groove area and top of fitting to enable ease of installation of packing retainer (13).
 - 2.3. Place tapered Packing Retainer Tool (PN 70712), stepped part, into hole in packing retainer (13). Place grease on sides of tool.
 - 2.4. Slide packing retainer (13) onto packing retainer tool (PN 70712) and down into groove of inlet check valve fitting (12).
 - 2.5. Remove packing retainer tool (PN 70712) and wipe the grease from tool.
 - 2.6. Grease both sides of O-ring (14) and install into groove on inlet check valve fitting (12).
 - 2.7. Use stepped part of packing retainer tool (PN 70712) on check valve seat (15) to install into recessed end of inlet check valve fitting (12). Check valve seat (15) must seat flat. If needed, tap tool very lightly to seat, but make sure no damage occurs to inlet check valve fitting (12).
 - 2.8. If required, tap round dowel (25) into hole on threaded shaft of piston ring retainer (24). Leave extra material protruding from both sides of shaft. Trim round dowel (25), using cutters, to top of threads on both sides. Thread piston ring retainer (24) into piston (18), two or three turns, to form threads on round dowel (25). Remove piston ring retainer (24) from piston (18).
 - 2.9. Grease inside wall of end cap (19) where inlet check valve fitting (12), sub-assembly, O-ring & backup ring will touch.
 - 2.10. Place spring (9) and check valve (10) into end cap (19).

- 2.11. Thread "AN" side of inlet check valve fitting (12), sub-assembly into Fitting Holder Tool (PN 70710). Now place sub-assembly into Check Valve Fitting Tool (PN 70709), such that, flat side of item (15) goes through beveled side of tool.
- 2.12. Slide item (12) back and forth in tool a few times to align O-ring and backup ring. Remove sub-assembly from check valve fitting tool (PN 70709) and unthread from fitting holder tool (PN 70710). Thread item (12) sub-assembly into end cap (19), where spring (9) and check valve (10) were previously installed. Tighten using a 5/8" wrench.

Reassembly of Rings and Seals:

NOTE: Clean all parts with solvent and use shop air hose to remove any dust particles from all mechanical parts, except screws and washers. Wipe the bores of the intensifier housing with a clean cloth before installing the piston. Replace all damaged parts with new ones.

1. Smear a medium amount of grease in O-ring cavity on piston (18). Grease both sides of the two backup rings (20) and O-ring (21). Install into groove on piston (18).

NOTE: Split of each backup ring, item 20, must be 180° from each other and ends overlapping properly.

2. Lightly coat edges of backup rings (20) and O-ring (21) with oil lubricant (PN 60944).
3. Lightly coat both inside diameters of housing (17) with oil lubricant.
4. Place grease on piston ring retainer (24) where piston rings (22) seat.
5. Place grease on both sides of the three piston rings (22) and install the three piston rings (beveled sides aligned) onto piston ring retainer (24).
6. Slide piston (18) into housing (17), being careful not to damage wall areas. Slide until smaller diameter of piston (18) is exposed from side of housing (17).
7. Thread item (24), with the three piston rings (22) into piston (18) approximately four turns.
8. Stand housing (17) on end, with piston ring retainer (24) facing upward. Push piston ring retainer to verify it will go into housing fully. Top of piston ring retainer (24) must be slightly below surface of housing (17).
9. Place housing (17) on its side. Place 3/16" hex key in piston ring retainer (24) and 1/4" hex key in piston (18). Rotate 1/4" hex key to tighten.
10. Remove the 3/16" hex key and verify piston (18) will rotate. If piston rotates remove 1/4" hex key. If it doesn't rotate, loosen piston slightly.
11. Grease both sides of O-ring (4), and end cap (3) O-ring groove. Then install O-ring (4) into groove of end cap (3).
12. Place housing (17) sub-assembly with large I.D. upward and install end cap (3) into housing (17).
13. Place cap screw (1) through washer (2) and thread finger tight into end cap (3). Repeat for the other nine cap screws.
14. Use torque wrench and 1/4" hex key socket to torque each bolt to 325 in/lbs.

NOTE: Torque cap screws in a side to side pattern, (do not use a circular pattern), and in small increments to ensure end cap, item 3, is seated flat to housing surface.

15. If previously removed, place 1/4" Teflon tape, two turns, on 90° NPT elbow (23). Thread and tighten 90° NPT elbow (23) into end cap (3). Align so that 90° NPT elbow (23) is parallel with the small hole located on the side of housing (17).
16. Grease both sides of O-ring (7) and O-ring seat area on end cap (19). Install O-ring (7) onto end cap (19) and in turn place onto housing (17). Orient such that the small hole located on housing side is on your left at the "9 o'clock" position. The inlet check valve fitting (12) placement hole located on end cap (19) must be at the 6 o'clock position.
17. Place cap screw (5) through washer (6) and end cap (19) and thread finger tight into housing (17). Repeat for the other nine cap screws. Use torque wrench and 3/8" hex key socket to torque each bolt to 325 in/lbs.

NOTE: Torque cap screws in a side to side pattern (do not use a circular pattern) and in small increments to ensure end cap (item 19) is seated flat to housing surface.

18. Install intensifier assembly into PIN7000/PIN7010 per Section 3.2.5 on page 9.

3.2.10 Regulator (Standard Pneumatic) and Solenoid Removal

Solenoid 120 VAC input - PN 56851, Solenoid 220 VAC input - PN 54366

Tools required: Phillips screwdriver
 7/16" Open end wrench
 9/16" Open end wrench
 A/R 1/4" wide teflon tape, (PN 60575)
 A/R 1/2" wide teflon tape, (PN 60911)
 1/2" Socket
 Socket wrench
 1/4" Hex wrench

NOTE: See Figure 3-3 on page 22.

1. Vent any remaining gas from the system to atmosphere. Disconnect the power cord from the power source.
2. Remove front panel from its enclosure as described in Section 3.2.1 on page 6, and carefully place on a bench top.
3. Remove regulator knob cap and two screws that secure the round plate.
4. Loosen and remove the locknut using a 1/2" socket while holding the knob. Remove the knob by turning counter-clockwise.
5. (PIN7010 Only) Loosen tube nuts on INPUT PORT and TEST PORT fittings. Remove the two screws and AC INPUT/INPUT PORT/TEST PORT panel.
6. Remove all tubing sections that connect to the regulator/solenoid assembly.
7. Loosen the mounting collar in the panel rear using a 1/4" hex wrench.
8. Remove the regulator/solenoid assembly by sliding out from the panel rear.
9. Mount the regulator in a bench vise by the flats in the base.
10. Note the orientation of the solenoids, as well as the inlet and outlet fittings in the regulator. Remove the fittings and any remnants of teflon tape from the pipe threads.

3.2.11 Regulator (Standard Pneumatic) and Solenoid Installation

Solenoid 120 VAC input - PN 56851, Solenoid 220 VAC input - PN 54366

Tools required: Phillips screwdriver
 7/16" Open end wrench
 9/16" Open end wrench
 A/R 1/4" wide teflon tape, (PN 60575)
 A/R 1/2" wide teflon tape, (PN 60911)
 Snoop, liquid leak gas detector (PN 64781)
 1/2" Socket
 Socket wrench

1. Wrap two layers of teflon tape on the pipe threads of each fitting, and using previously noted orientation, install into the inlet and outlet of the regulator. Ensure that each, as well as, solenoids are oriented properly. Use a bench vise when doing this.
2. Insert the new regulator/solenoid assembly into the panel through hole. Pass the adjusting end through the mounting ring. *Do not tighten cap screw until adjusting knob is installed.*
3. Install the tubing sections to the inlet and outlet fittings.
PIN7010 only: Replace the AC INPUT/INPUT PORT/TEST PORT panel and two mounting screws. Thread and tighten tube nuts on INPUT PORT and TEST PORT fittings.
4. Install the adjusting knob on the threaded shaft by turning clockwise. Turn adjusting knob on threaded shaft until bottomed and install locking nut and tighten. Turn knob until it bottoms. Position the regulator so that the bottom of the knob is 1/2" from the panel surface, then tighten the cap screw on the mounting collar.
5. Using a pressure source connected to the INPUT PORT (4), set REGULATOR (10) pressure to 100 PSI. Enable the POWER switch (2) and monitor the pressure as it builds in the ACCUMULATOR PRESSURE gauge (7). Turn the POWER switch (2) off when 1,000 PSI has been achieved. Check all fittings for leaks. If there are no leaks vent system and remove pressure source.

NOTE: See Figure 2-1 on page 4 for items in parenthesis.

6. Install panel/chassis assembly in its enclosure as described in Section 3.2.1 on page 6.

3.2.12 Panel Gauge Removal and Installation

- Regulated pressure gauge (PN 59751), 0–1,500 PSIG
- Accumulator or Output pressure gauge (PN 59696), 0–15,000 PSIG

Tools required: Phillips screwdriver
7/16" Wrench
9/16" Wrench
A/R 1/4" wide teflon tape (PN 60575)
Snoop, liquid leak gas detector (PN 64781)

Panel Gauge Removal

1. Vent any remaining gas from the system to atmosphere. Disconnect the power cord from the power source.
2. Remove front panel from its enclosure as described in Section 3.2.1 on page 6, and carefully place on a bench top.
3. Disconnect the tubing section that connects to the gauge fitting.
4. Loosen the two thumb-nuts that hold the gauge mounting U-clamp.
5. While gripping the square portion of the gauge port with the 9/16" wrench, remove the tube connector fitting from the gauge.
6. Remove the two thumb-nuts, the mounting U-clamp, and the gauge.

Panel Gauge Installation

1. Before installing a new gauge, wrap two layers of new teflon tape on the port.
2. Install gauge into panel, secure with U-clamp and tighten the two thumb screws.
3. While gripping the square portion of the gauge port with the 9/16" wrench, tighten the Female Tube Connector onto the gauge.
4. Attach the tubing section that connects to the gauge fitting.
5. Using a pressure source connected to the INPUT PORT (4), set REGULATOR (10) pressure to 100 PSI. Enable the POWER switch (2) and monitor the pressure as it builds in the ACCUMULATOR PRESSURE gauge (7). Turn the POWER switch (2) off when 1,000 PSI has been achieved. Check all fittings for leaks. If there are no leaks vent system and remove pressure source.

NOTE: See Figure 2-1 on page 5 for items in parenthesis.

6. Install panel/chassis assembly in its enclosure as described in Section 3.2.1 on page 6.

3.2.13 Test Port Quick-Connect Fitting (PN 59004) and Filter (PN 54188), Removal and Installation

Every two months, a coating of fluorinated Krytox grease should be applied to the inner seal of the test port fitting. The pressure cap (PN 58216) should be plugged in whenever the unit is not in use.

NOTE: For simplest method, apply fluorinated Krytox grease to the outside surface between sealing lip and end of mating pressure cap. Do not put grease on flat end of tip, as this may allow grease to enter system. Vent unit line pressure to atmosphere. Plug pressure cap into test port. Rotate pressure cap clockwise and counter-clockwise to transfer fluorinated Krytox grease to O-ring seal.

If there is leakage out of the port when the pressure cap is in place, replace the port fitting.

Tools required: Phillips screwdriver
11/16" Open end wrench
Adjustable wrench
9/16" Open end wrench
A/R solvent (de-natured alcohol)
A/R 1/4" wide Teflon tape (PN 60575)
A/R 1/2" wide Teflon tape (PN 60911)
Tube fluorinated grease (PN 55593)
Snoop, liquid leak gas detector (PN 64781)

1. Vent any remaining gas from the system to atmosphere. Disconnect the power cord from the power source.
2. Remove front panel from its enclosure as described in Section 3.2.1 on page 6, and carefully set on a bench top.

3. Loosen and remove the tubing end nut from the reducing tube fitting (PN 59830).

NOTE: Use PN 54047 for reducing tube fitting field replacement.

4. Loosen and remove the reducing tube fitting and filter (PN 54188) from the test port quick-connect fitting.
5. Clean the filter (PN 54188) in solvent (de-natured alcohol) and blow-dry with compressed air.
6. Grasp the test port quick-connect fitting on the flats from the rear of panel with a 11/16" wrench and using an adjustable wrench, turn the locknut counter-clockwise. Remove locknut.
7. Remove old and install new test port quick-connect fitting (PN 59004) through front of panel.
8. Thread and tighten locknut by grasping the test port quick-connect fitting on the flats from the rear of panel with a 11/16" wrench and using an adjustable wrench, turn the locknut clockwise.
9. Slide filter (PN 59764) into reducing tube fitting and install into the test port quick-connect fitting.
10. Replace and tighten the tubing end nut on the reducing tube fitting.
11. Using a pressure source connected to the INPUT PORT (4), set REGULATOR (10) pressure to 100 PSI. Enable the POWER switch (2) and monitor the pressure as it builds in the ACCUMULATOR PRESSURE gauge (7). Turn the POWER switch (2) off when 1,000 PSI has been achieved. Check all fittings for leaks. If there are no leaks vent system and remove pressure source.

NOTE: See Figure 2-1 on page 4 for items in parenthesis.

12. Install panel/chassis assembly in its enclosure as described in Section 3.2.1 on page 6.

3.2.14 Test Port (output) Hose Quick-Connect Fitting and Filter (PN 56991), Removal and Installation

Tools required: 5/8" Open end wrench
3/4" Open end wrench
13/16" Open end wrench
A/R solvent (de-natured alcohol)
Tube fluorinated grease (PN 55593)

Removal:

1. Loosen and unthread quick-connect fitting assembly from test port hose using 3/4" and 5/8" wrenches.
2. Remove cheat seal pad (PN 54854) from AN thread side of adapter fitting (PN 60803)
3. Place quick-connect fitting assembly in a vise using filter fitting (PN 59588) as clamping area.
4. Loosen and unthread quick-connect fitting (PN 59034) using 13/16" wrench.
5. Remove filter fitting (PN 59588) from vise.
6. While holding filter fitting (PN 59588) vertically, remove filter (PN 56991) and then O-ring (PN 55608) from filter fitting.
7. Inspect and clean parts in solvent (de-natured alcohol) and blow-dry with compressed air. Replace worn or damaged parts with new ones.

Installation:

1. Grease inside cavity on bottom flat (none allowed in hole) of quick-connect fitting (PN 59034).
2. Grease O-ring seat groove area in filter fitting (PN 59588).
3. Grease both sides of O-ring (PN 55608). While holding filter fitting (PN 59588) vertically, place O-ring (PN 55608) and then filter (PN 56991) into filter fitting (PN 59588).
4. Thread quick-connect fitting (PN 59034) onto filter fitting (PN 59588).
5. Place filter fitting (PN 59588) in a vise and tighten quick-connect fitting (PN 59034) using 13/16" wrench.
6. Remove from vise.
7. Place a cheat seal pad, (PN 54854) on AN part of assembly and thread into test port (output) hose. Tighten assembly using 5/8" and 3/4" wrenches.

3.2.15 Input Port Filter (PN 54188), Removal and Installation

The port filter is a sintered element filter, which is easily removed for inspection and cleaning.

Tools required: Phillips screwdriver
7/16" Open end wrench
9/16" Open end wrench
A/R solvent (de-natured alcohol)
Snoop, of liquid leak gas detector (PN 64781)

Input Port Filter Removal

1. Vent any remaining gas from the system to atmosphere. Disconnect the power cord from the power source.
2. Remove front panel from its enclosure as described in Section 3.2.1 on page 6, and carefully place on a bench top.
3. Loosen and remove the tubing end nut from the tube union (PN 59886).
4. Loosen and remove the tubing end nut from the input port bulkhead AN fitting (PN 59707).
5. Remove the tube union (PN 59886), port connector (PN 59746) and filter from the bulkhead AN fitting (PN 59707).

NOTE: Use PN 55705 for port connector field replacement.

6. Clean the filter (PN 54188) in solvent (de-natured alcohol) and blow-dry with compressed air.

Input Port Filter Installation

1. To reinstall, reverse the order of steps 3, 4 and 5 of the "Input Port Filter Removal" procedure above.
2. Using a pressure source connected to the INPUT PORT (4), set REGULATOR (10) pressure to 100 PSI. Enable the POWER switch (2) and monitor the pressure as it builds in the ACCUMULATOR PRESSURE gauge (7). Turn the POWER switch (2) off when 1,000 PSI has been achieved. Check all fittings for leaks. If there are no leaks vent system and remove pressure source.

NOTE: See Figure 2-1 on page 4 for items in parenthesis.

3. Install panel/chassis assembly in its enclosure as described in Section 3.2.1 on page 6.

3.2.16 Input Port Hose Quick-Disconnect Female Fitting, Removal and Installation

Tools required: 3/4" Open end wrench
 9/16" Open end wrench
 A/R solvent (de-natured alcohol)
 A/R 1/2" wide Teflon tape (PN 60911)

Removal:

1. Loosen and unthread quick-disconnect fitting from input hose using 3/4" and 9/16" wrenches.
2. Remove cheat seal pad (PN 54854) from "AN" thread side of adapter fitting (PN 60803) and place CGA-580 nipple (PN 57150) pressure fitting in vise, holding by flats located on nipple.
3. Loosen and unthread adapter fitting (PN 60803) from CGA-580 nipple pressure fitting using a 3/4" wrench.
4. Remove CGA-580 nut (PN 57154) by sliding over threads of CGA-580 nipple pressure fitting.
5. Remove remnants of teflon tape from fittings.
6. Inspect and clean parts in solvent (de-natured alcohol) and blow-dry with compressed air. Replace worn or damaged parts with new ones.

Installation:

1. Wrap two turns of 1/2" Teflon Tape around threads of CGA-580 nipple (PN 57150) pressure fitting.
2. Hold CGA-580 nipple pressure fitting in vise by flats located on nipple.
3. Slide CGA-580 nut (PN 57154) over threads of CGA-580 nipple pressure fitting.
4. Thread and tighten adapter fitting (PN 60803) onto CGA-580 nipple pressure fitting using a 3/4" wrench.
5. Remove assembly from vise and install a cheat seal pad (PN 54854) on AN thread side of adapter fitting (PN 60803).
6. Thread into input hose and tighten using 3/4" and 9/16" wrenches.

3.2.17 AC Fuse (PN 57472), Removal and Installation

1. Disconnect the power cord from the power source and line filter. Remove the fuse holder at AC INPUT.
2. Inspect fuse. If blown, replace with 1/2 Amp 250 Volt, 20mm x 5mm diameter (PN 57472).
3. Replace the fuse holder at AC INPUT location.

3.2.18 Panel Mounted AC Power/EMI Line Filter (PN 58870), Removal and Installation

NOTE: See Figure 3-1 on page 6 for wiring diagram.

Tools required: Phillips screwdriver
 1/4" Open end wrench or nutdriver
 A/R soldering iron
 A/R shrink sleeving (PN 60735)
 A/R heat gun

1. Disconnect the power cord from the power source and line filter. Remove front panel from its enclosure as described in Section 3.2.1 on page 6, and carefully set on a bench top.
2. Remove the three cable connectors from the line filter terminals.

NOTE: Some units may not have connectors and will require wire leads to be unsoldered.

3. Loosen and remove the line filter retaining nuts on the rear of panel.

NOTE: Some units may have screws on the front panel.

4. Remove the AC line filter.
5. To install a new line filter, reverse the order of steps 1 through 4. Connect (or solder) wires to the new line filter as follows:

Green wire to terminal (E) Ground
White wire to terminal (N) Neutral
Black wire to terminal (P) Line

3.2.19 Power Switch (PN 60307), Removal and Installation

NOTE: See Figure 3-1 on page 6 for wiring diagram.

Tools required: Phillips screwdriver
 Flat screwdriver
 1/4" open end wrench or nutdriver
 A/R soldering iron
 A/R shrink sleeving (PN 60735)
 A/R heat gun

Removal:

1. Disconnect the power cord from the power source and line filter. Remove front panel from its enclosure as described in Section 3.2.1 on page 6, and carefully set on a bench top.
2. Remove the two black wires from pump control board TB2 terminals 1 and 2.
3. Loosen and remove the nut on the panel front and remove the switch from the panel rear.
4. Unsolder and remove the three wires from the switch terminals.

Installation:

1. Use shrink sleeving over wires/terminals for protection. Connect and solder the harness wires to the new switch terminals per the following:

	<u>Terminal</u>	<u>Function</u>
Rear of Switch	1	On
	2	Off
	3	Momentary

Black wire to switch terminal 1
Black wire to switch terminal 2
Black jumper wire between switch terminals 1 & 3

2. Install the new switch through the rear of panel. Rotate switch so that the momentary position is toward bottom of panel and secure it from the front of panel with the mounting nut.
3. Replace the two black wires to the pump control board TB2. Connect terminal 1 of switch to terminal 1 of TB2, and terminal 2 of switch to terminal 2 of TB2.
4. Install panel/chassis assembly in its enclosure as described in Section 3.2.1 on page 6.

3.2.20 Pump Control Board Assembly, Removal and Installation

NOTE: See Figure 3-1 on page 6 for wiring diagram.

120 VAC input - PN 56679, 220 VAC input - PN 56682

Tools required: Phillips screwdriver
 Flat blade screwdriver (small)
 11/32" Open end wrench or nutdriver

Removal of Pump Control Board:

1. Disconnect the power cord from the power source and line filter. Remove front panel from its enclosure as described in Section 3.2.1 on page 6, and carefully set on a bench top.
2. Disconnect the wires from the terminal blocks located on the pump control board assembly.

NOTE: It may be helpful to mark ends of wire with location.

3. Loosen and remove the four nuts that hold the pump control board and remove the board.

Installation of Pump Control Board:

1. Position the new board over the four standoffs and install four nuts. Tighten the nuts until snug.
2. Connect the wires to the terminal blocks located on the pump control board assembly.

NOTE: Refer to the wiring diagram Figure 3-1 on page 6.

3. Install panel/chassis assembly in its enclosure as described in Section 3.2.1 on page 6.

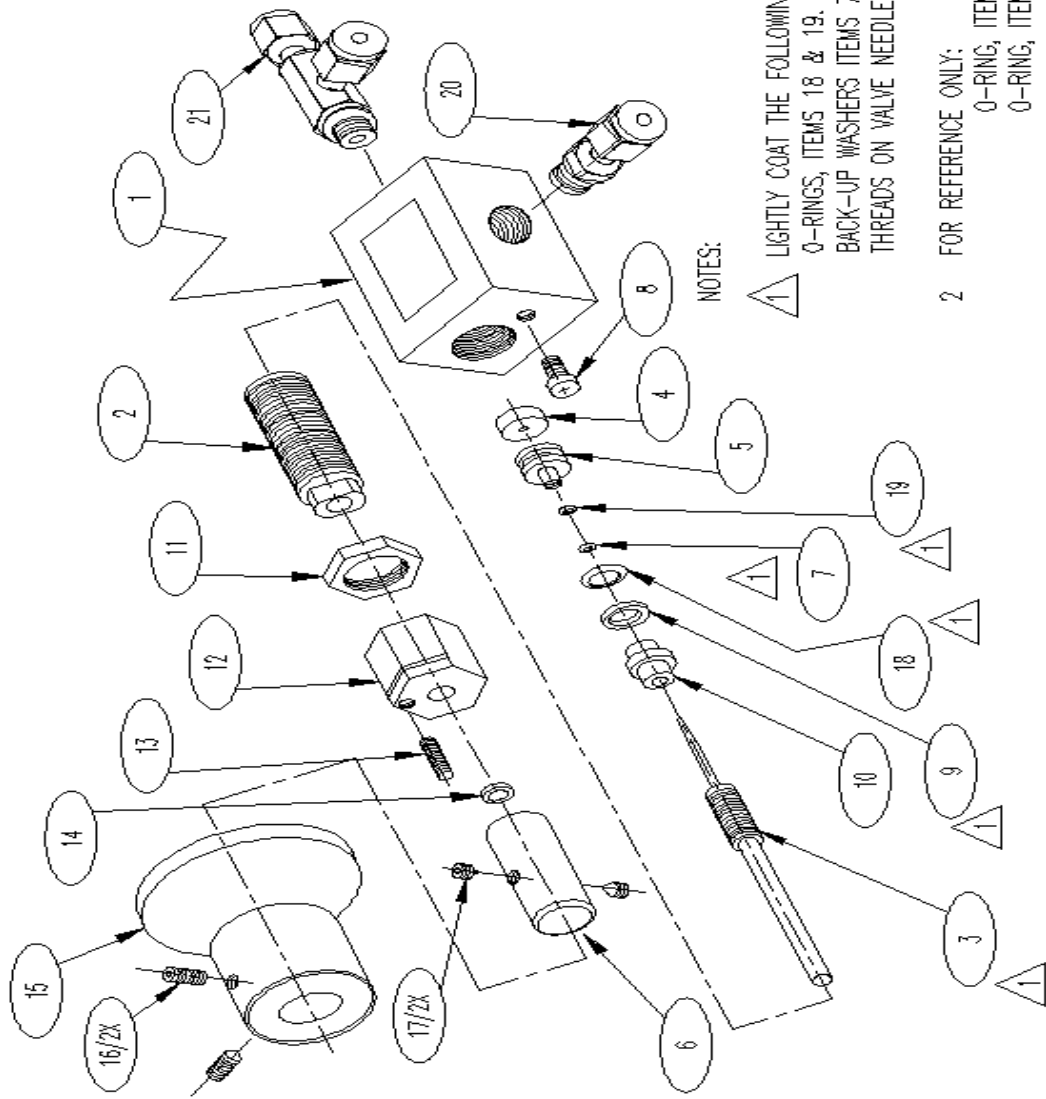
3.3 MPV Valve Assembly (PN 65076) Parts List

The following table lists the component parts of the MPV.

* Part must be ordered separately.

Ref Number	PN	Description	Quantity
1	54193	Valve body	1
2	54540	Housing, valve needle	1
3	59551	Valve needle	1
4	55896	Valve, seat	1
5	59045	Valve, needle seat	1
6	57889	Knob Insert	1
7	55570	Washer, backing	1
8	60837	Screw, mach-pan HD	1
9	60633	Retainer, packing	1
10	59387	Valve seat, stem	1
11	57482	Nut, valve needle housing	1
12	54401	Locknut	1
13	60202	Setscrew, hex housing	1
14	59245	Washer, flat	1
15	58079	*Knob	1
16	59322	*Setscrew	2
17	59383	Setscrew	2
18	55569	O-ring, Fluorocarbon (Viton) color black w/white dot	1
19	55552	O-ring, Fluorocarbon (Viton), color black w/white dot	1
20	*59731	Fitting, Male Connector 1/4 Tube	1
21	*59872	Fitting, Male Run Tee 1/4 Tube	1

Table 3-2. MPV Valve Assembly Parts List



NOTES:

- 1 LIGHTLY COAT THE FOLLOWING WITH LUBRICANT, PART NO. 55593:
 O-RINGS, ITEMS 18 & 19.
 BACK-UP WASHERS ITEMS 7 & 9.
 THREADS ON VALVE NEEDLE, ITEM 3.

2 FOR REFERENCE ONLY:

- O-RING, ITEM 18, .239 ID
- O-RING, ITEM 19, .042 ID

3.4 Intensifier Assembly Parts List

Ref Number	PN	Description	Quantity
1	59328	Screw, cap, socket	10
2	60704	Washer, flat	10
3	59548	Cap, end	1
4	55589	O-ring, Buna-N (Nitrile) 70 Durometer color black	1
5	59333	Screw, cap, socket head	10
6	59508	Washer, flat	10
7	55579	O-ring, Flourocarbon (Viton) 90 Durometer color black w/white dot	1
8	60133	Housing, spring	1
9	60343	Spring	2
10	57410	Check valve	2
11	56714	Seat, check valve	1
12	57236	Fitting, check valve inlet	1
13	54456	Retainer, packing backup	1
14	55596	O-ring, Flourocarbon (Viton) 90 Durometer color black w/white dot	1
15	57114	Seat, check valve	1
16	59785	Adapter, High Pressure 1/4 NPT Male to Swagelok	1
17	60333	Housing, piston	1
18	59070	Piston	1
19	58786	Cap, end	1
20	60579	Retainer, packing	2
21	55600	O-ring, Buna-N (Nitrile) 70 Durometer color black	1
22	54614	Ring, piston	3
23	59794	Elbow, 90 Tube to Male NPT	1
24	58752	Retainer, piston ring	1
25	69435	Dowel, round	1

Table 3-3. Intensifier Parts List

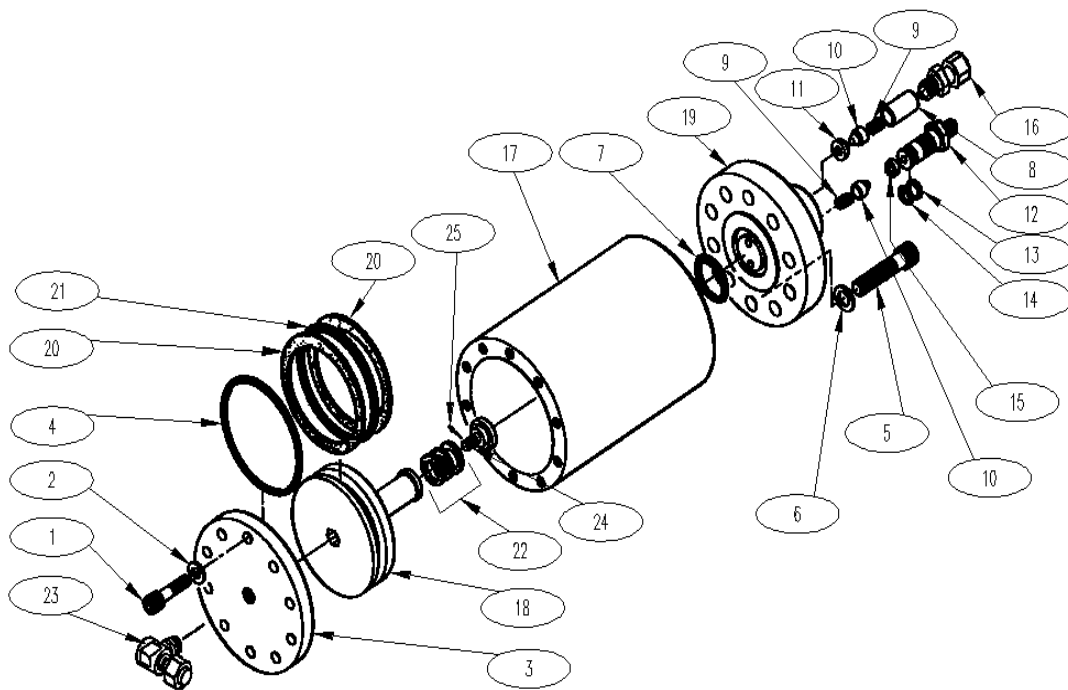
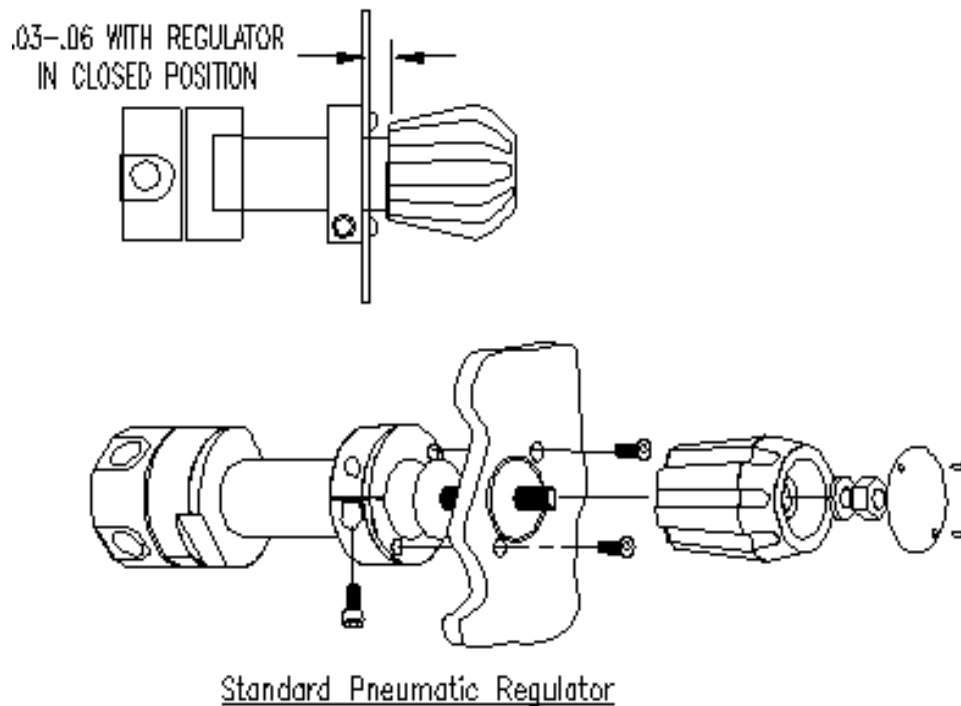
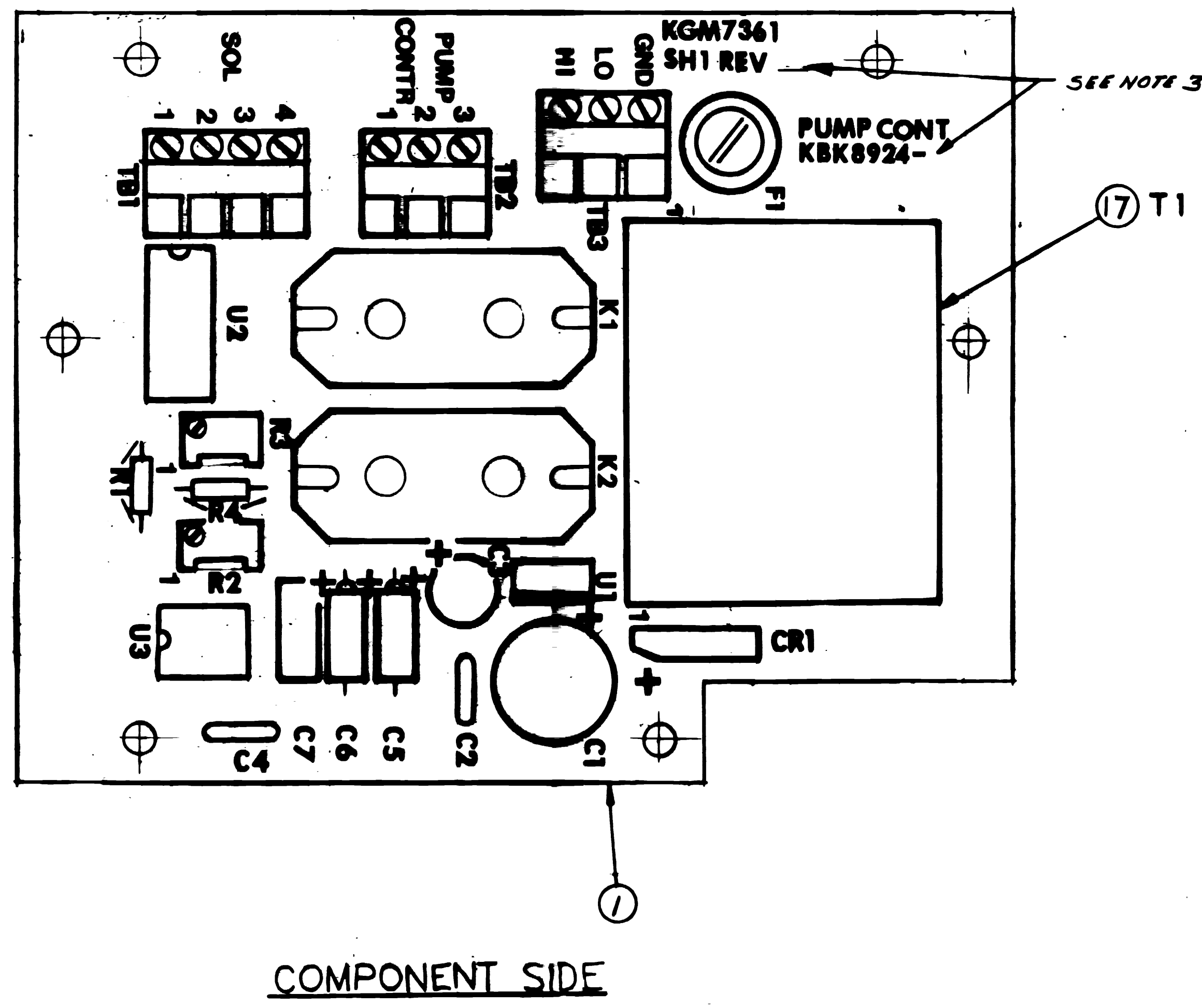
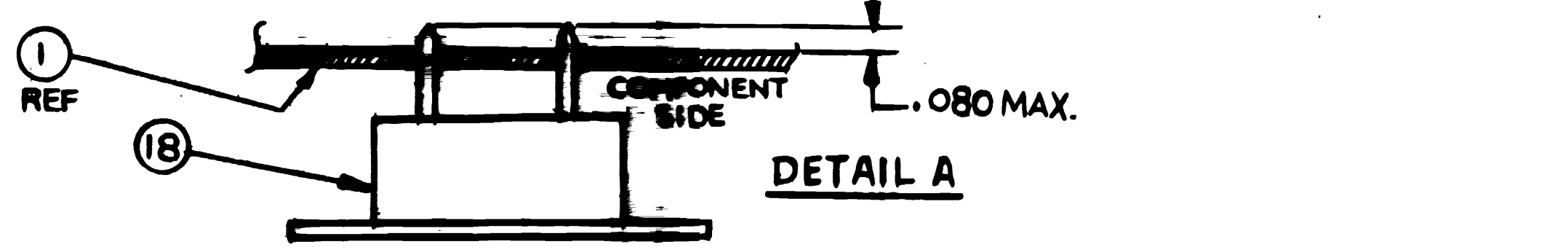


Figure 3-2. Intensifier Exploded View



Standard Pneumatic Regulator

Figure 3-3. Standard Pneumatic Regulator Mounting



ZONE	LTR	DESCRIPTIONS	DATE	APPROVED
-		REL. ON C/ND1347	7/10/86	[Signature]
B		C/ND1353-REV. PER C/N	7/2/86	[Signature]
C		C/ND1627, REV. OUTLINE CONF.	7/2/87	[Signature]
D		C/ND1750 COMPONENT DETAILS AND T1 CALL-OUT ADDED TO PICTURE	2/4/88	[Signature]
E		C/ND1781 ADDED DETAIL A	4/13/88	[Signature]
F		C/N D3729, ITEM 19 WAS KP350	4-7-88	ABZ
G		C/N D3753-SEE C/N FOR DETAILS	8-18-88	ABZ

RLWS DR-WING NO. 56679
 PART NOS AND/OR DRAWING NOS ADDED
 5: RLL DATE 12/9/99

-1= 56679
 -2= 56682

QTY	ITEM NO.	NOMENCLATURE OR DESCRIPTION	DWG SIZE	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	REMARKS
-	1	25 SOCKET	B	KE251C	XU3	8 PIN	
-	1	24 SOCKET	B	KE251A	XU2	14 PIN	
-	2	23 TERMINAL BLOCK	B	KUH3300A	TB2, TB3	3 TERMINAL	
-	1	22 TERMINAL BLOCK	B	KUH3300C	TB1	4 TERMINAL	
-	1	20 FUSE HOLDER, VERT	A	KS351B	XF1		
-	1	19 FUSE, CARTRIDGE	A	KP350K	F1	.2 AMP	
-	2	18 RELAY, DC/AC	B	KMK431C	K1, K2	NOTE 4	
-	1	17 TRANSFORMER	B	KM7301A	T1		
-	1	16 DIODE, FULL WAVE BRIDGE	B	KGF327A	CR1	MDA101A	
-	2	14 CAPACITOR, ELECTROLYTIC	B	KGE311R	C5, C6	22µF ±10% 15V	
-	1	13 CAPACITOR, ELECTROLYTIC	B	KLY311C	C3	100µF ±20% 16V	
-	2	12 CAPACITOR, CERAMIC	A	KHV311A	C2, C4	.01µF ±20% 100V	
-	1	11 CAPACITOR, ELECTROLYTIC	B	KLY311A	C1	1000µF ±20% 16V	
2*	-	10 WIRE, 22 AWG	-	m22759/11-22-0	NOTE 8		
-	1	9 POTENTIOMETER	C	KDU338AH	R3	50K	
-	1	8 POTENTIOMETER	C	KDU338AF	R2	10K	
-	1	7 RESISTOR, FIXED	C	KFU310DH	R4	10K ±5% 1/4W	
-	1	6 RESISTOR, FIXED	C	KFU310BN	R1	2K ±5% 1/4W	
1	-	5 ASSY PUMP CONTROL	-	KBK8924-1	NOTE 8		
-	1	4 I.C. TIMER	B	KBT1918A	U3	NE555V	
-	1	3 I.C. HEX INV/BFR	C	KAG1918AG	U2	7416	
-	1	2 I.C. REGULATOR	C	KHY1918A	U1	78M05	
-	1	1 PRINTED WIRING BD.	C	KGM7361			

- NOTES:
- FOR SCHEMATIC SEE C SIZE KDW7316
 - OBSERVE POLARITY OF DIODES, LED'S, DISPLAYS, AND CAPACITORS
 - STAMP APPLICABLE DASH NUMBERS, REVISION, AND DATE AT FINAL ASSEMBLY USING BLACK INDELIBLE INK. CHARACTERS TO BE MIN. .12 HIGH.
 - SEAT EACH COMPONENT AS FLAT TO P.C. BOARD AS DEVICE ALLOWS, EXCEPT K1 & K2 PER DETAIL A
 - CAPACITORS WITH VOLTAGE RATINGS GREATER THAN THOSE SHOWN MAY BE USED IF PHYSICAL SIZE AND LEAD SPACING ARE EQUIVALENT.
 - USE ONLY FREON, SUCH AS "FREON TMS" FOR CLEANING
 - TEST PROCEDURE(S): KAD8317.
 - FOR 220VAC:
 CUT JUMPER WIRE INTO 2, 1" LONG PIECES
 CUT CLAD AND ADD JUMPER WIRES PER FIGURE 1,
 REMARK ASSEMBLY "KBK8924-2."

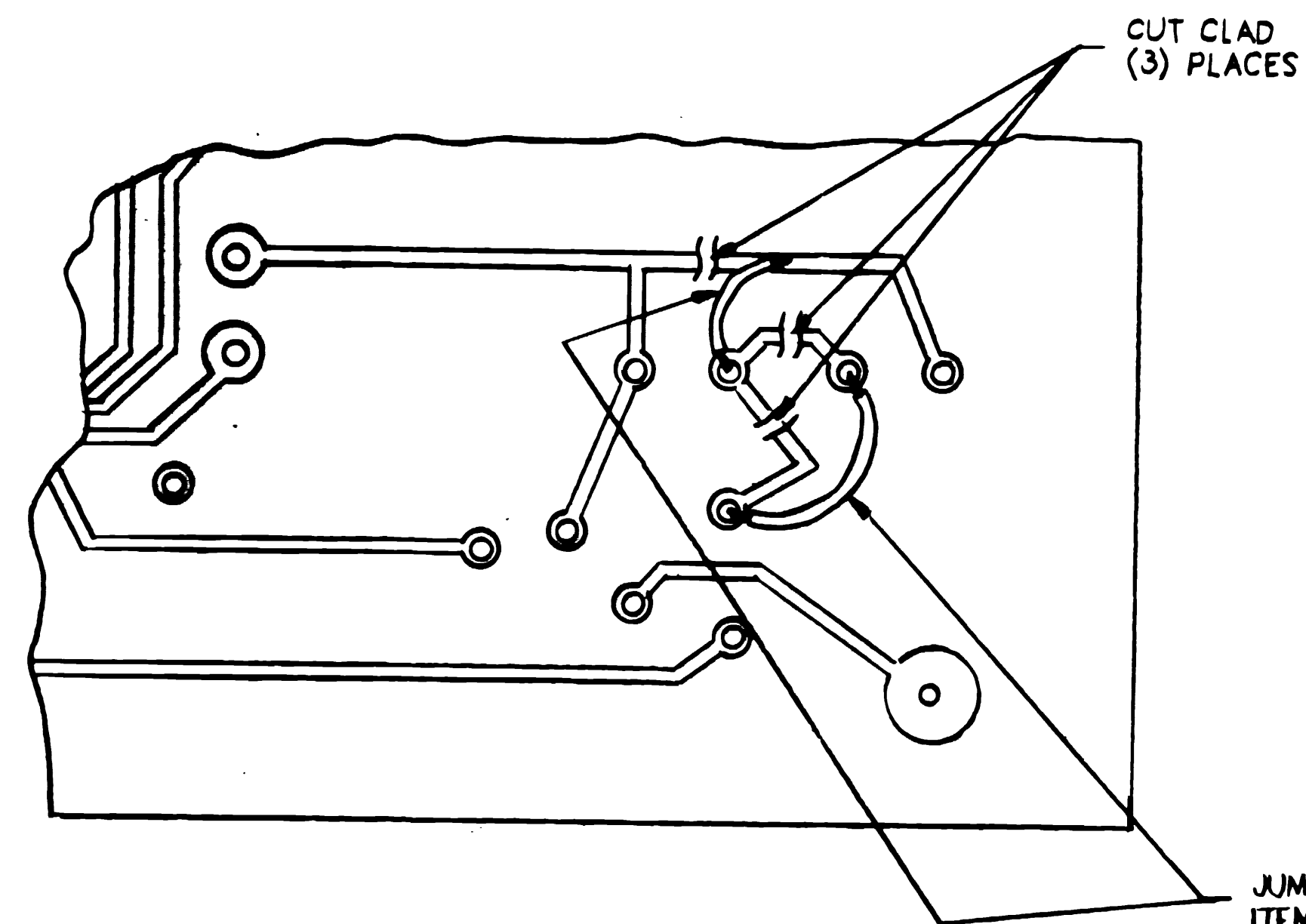


FIGURE 1
 CIRCUIT SIDE OF PRINTED WIRING BOARD
 KGM7361, PART OF PUMP CONTROL
 ASSEMBLY KBK8924-1
 (NO SCALE)

JUMPER WIRE, BLACK
 ITEM 10, (2) PLACES

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

J .03 FRACTIONS .01 .005 ANGLES 31/200.

ALL MACH. SURFACES DRILL HOLES PER AND 10307 BURRENS AND SHARP EDGES PER J2L315 45° CHAMFER FIRST THREAD TOLERANCES PER ANSI Y14.5-1973 COML TOL APPLY TO STOCK SIZES

DRAWN: S. New 7-9-86
 CHECKED: [Signature]
 ENGR: S.V. 7-10-86
 RELEASED: [Signature] 7-10-86

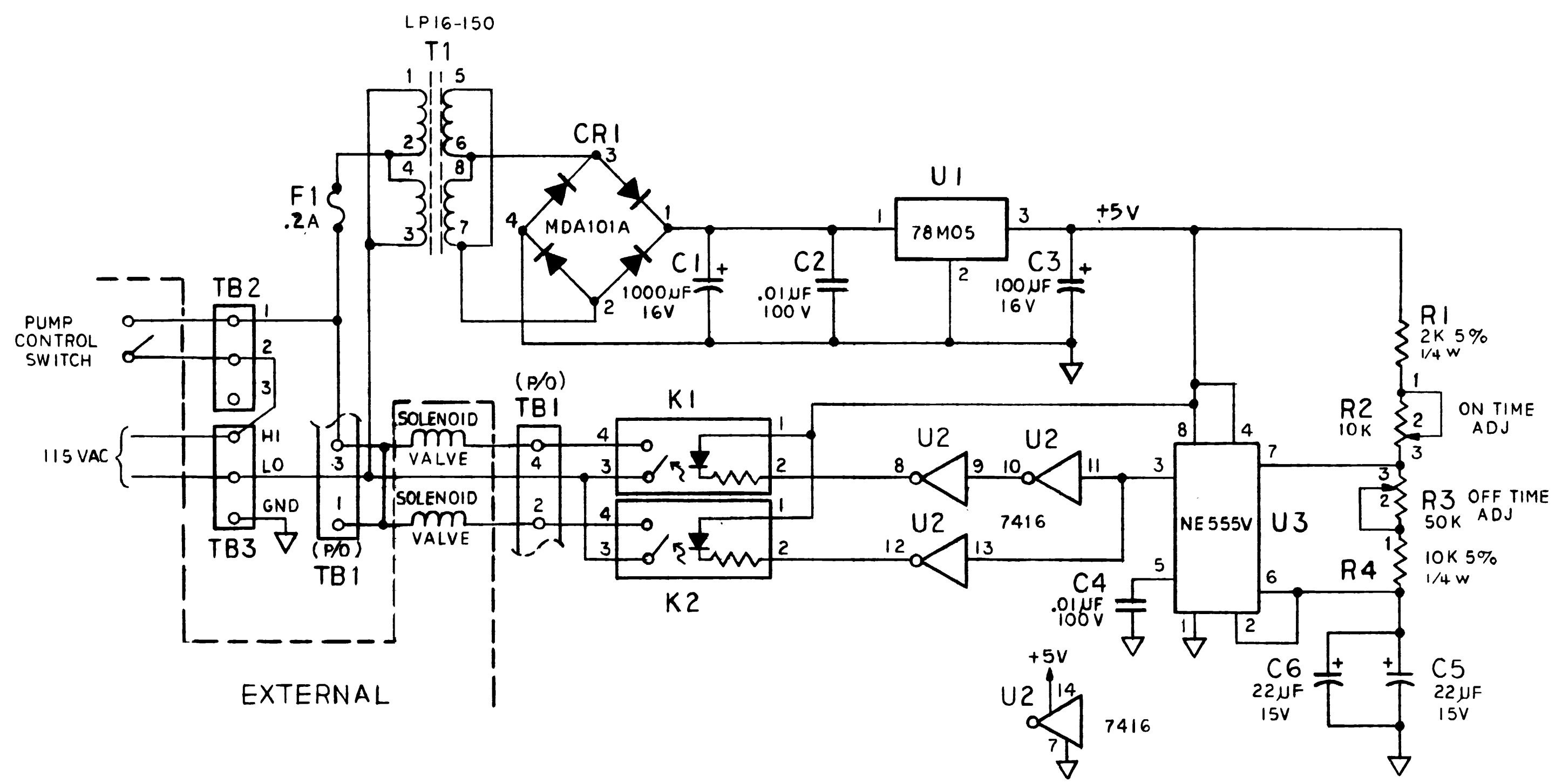
F.T.N CONSOLIDATED CONTROLS
 BETHEL, CT 06801

PUMP CONTROL
 ASSEMBLY

MATERIAL: [Blank]
 FINISH: [Blank]

SIZE: [Blank] FSCM NO. 02750 DWG NO. KBK8924
 SCALE: 2:1 WT: [Blank] SHEET 1 OF 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
-		REL ON C/ND0817	2/18/85	<i>[Signature]</i>
A		ENGINEERING RELEASE	1/16/02	TLH <i>[Signature]</i>



D
C
B
A
MILFORD BLUEPRINT

UNLESS OTHERWISE SPECIFIED UNITS TO BE INCHES ALL THREADS TO BE CLASS 2 ALL DIMENSIONS APPLICABLE AFTER TREATMENT		THIS DRAWING AND ALL INFORMATION CONTAINED HEREIN IS AND REMAINS THE PROPERTY OF RICE LAKE WEIGHING SYSTEMS INC. AND IS CONFIDENTIAL. IT IS SUBMITTED AND MAY BE USED ONLY IN CONNECTION WITH RICE LAKE WEIGHING SYSTEMS' PROPOSAL AND/OR ITS CUSTOMERS' ORDERS. IT SHALL NOT BE DISCLOSED TO OTHERS OR COPIED WITHOUT RICE LAKE WEIGHING SYSTEMS' SPECIFIC WRITTEN CONSENT AND SHALL BE IMMEDIATELY RETURNED UPON REQUEST.	
MATERIAL	DO NOT SCALE DRAWING	DRAWING TOLERANCES UNLESS OTHERWISE SPECIFIED	
TREATMENT	FOR RLWS USE ONLY	SURFACE FINISH	TOL. DECIMAL
	0	✓	2 PLC ±.01 3 PLC ±.005 ANGLE ±1'
THIRD ANGLE PROJECTION		TITLE	
MFG. ENG. APPROVED DES. ENG. APPROVED		RICE LAKE WEIGHING SYSTEMS	
JEW 2-28-85 S.V. 2-28-85		DWG NO. 70901	
CKD. J. Welsh 2-18 DR. BY SCL 7-3-84		SCALE SHEET 1 OF 1 REVISION A	

4

3

2

1

4

3

2

1

4.0 Model Number System

PIN7000- ____

PIN7010- ____

|

|

+-----+-----+

| POWER REQUIREMENTS |

A - 120 VAC 50/60 Hz

B - 220 VAC 50/60 Hz

+-----+-----+

A - Standard

(Only applicable letter)

5.0 Options, Replacement Kits

There are numerous replacement part numbers mentioned throughout manual that can be ordered.

MPV O-Ring Replacement Kit (Data Sheet # 65308):

- Fluorocarbon “Viton” (standard).....PN 55277
- Nitrile Buna-N.....PN 58499
- Ethylene-PropylenePN 58506
- Silicone.....PN 58509
- NeoprenePN 58515

NOTE: A small coating of Fluorinated Krytox grease, (PN 55593), should be applied to both sides of O-ring prior to installation.

- Pressure Trap (Data Sheet # 58596).....PN 58478
- Test Port (output) Quick-Disconnect Male Hose fittingPN 55542
- Input Port Hose Nitrogen Bottle Mating fitting (one each of the following)
 - Cheat Seal Pad.....PN 54854
 - Hose Adapter fittingPN 60803
 - CGA-580 NipplePN 57150
 - CGA-580 NutPN 57154

NOTE: For Input Port Quick-Disconnect Female Hose fitting assembly instructions see Section 3.2.16 on page 17.

Test Port (output) Hose, with Quick-Disconnect Male fitting:

- 5' Long.....PN 55280

Input Port Hose, with Nitrogen Bottle Mating fitting:

- 4' Long.....PN 55360
- 10' Long.....PN 55366
- 15' Long.....PN 55369
- 20' Long.....PN 55375

External Pressure Cylinder w/ Shut-off Valve, Rupture Disk and Carrying Handle..... PN 59533

6.0 Specifications

Operating Temp: +40° to +122°F (+4.4° to +50.0° C)
Storage Temperature: 0° to +185° F (-17.8° to +85°C)
Pressure Media: Dry gaseous nitrogen, standard

Optional External Pressure Cylinder:

Capacity: 83.3 ft³ N₂ @ 2,216 PSIG
Volume: 960 in³
Rating: 2,216 psig
Test Pressure: 3,694 psig
Material: Aluminum

Regulated Pressure Gauge:

Size: 2-1/2 in. diameter
Range: 0–3,000 PSIG
Test Pressure: 4,500 PSIG

Accumulator and Output Pressure Gauges:

Size: 2-1/2 in. diameter
Range: 0–15,000 PSIG
Test Pressure: 22,500 PSIG

Over-pressure Rupture Disk:

Rating: 3,000 PSIG, nominal
Type: Stainless steel outer case

Pressure Media Filter:

Rating: 20 microns, Test Port and Input Port
40 microns, Test Port Hose
Type: Field replaceable

MPV Pressure and Vent Valves:

Type: Micro-metering with replaceable soft seat
Material: Aluminum knobs, black anodized
All other parts 300 series stainless steel

Internal Piping:

Tubing: 1/8 in. O.D., 0.035 in. wall thickness, seamless Cu.
1/4 in. O.D., 0.035 and 0.065 in. wall thickness, seamless 304 Stainless Steel

Couplings: **Stainless Steel, Swagelok type**

Input Port:

Style: 1/4" 37° AN flare male
Pressure Rating: 2216 PSIG connected
Material: 300 series Stainless Steel

Test Port:

Pressure Rating: 10,000 PSIG.
Material: 300 series Stainless Steel

Vent Port:

Style: 1/4" 37° AN male
Pressure Rating: 10,000 PSIG
Material: 300 series Stainless Steel

Pressure Hoses:

Quantity Supplied: Two; one input, one output
Length: 4 ft. nominal, input hose
5 ft. nominal, output hose
Style: Input hose - Nylon-lined core tube with synthetic fiber braid and polyester cover. Fitted with CGA-580 (Brass) nipple fitting on one end and 1/4" 37° female AN swivel pressure fitting on opposite end.
Output hose - Nylon-lined core tube with synthetic fiber braid and polyurethane cover. Fitted with quick-disconnect plug (St Stl) on one end and 1/4" 37° female AN swivel tube coupling on the other.

Regulator:

Type: Single stage, self-venting, non-bleed
Pressure Rating: 3,000 PSIG max. inlet

Carrying Case PIN7000 only:

Type: Aluminum case with latched cover and handle
Material thickness: 0.090 in., nominal
Finish: Enamel paint, textured finish
Color: Gray

Control Panel:

Material: Aluminum (5052-H32)
Thickness: 0.125 in
PIN7000 Finish: Gray enamel paint with black silkscreen nomenclature
PIN7010 Finish: Dark Tan enamel paint with black silkscreen nomenclature

Physical Specifications:

Weight: 46 lbs including all hoses and cables
PIN7000 Case Dim's: 11" wide x 18" long x 11.5" high
PIN7010 Case Dim's: 19" wide x 8.1" deep x 10.5" high (Case Dimensions excluding front handles).

7.0 PIN7000/PIN7010 Warranty and Return Policy

If possible, please save original packing material which is specifically designed for the unit. Should it be necessary to ship the unit back to the factory, a suitable shipping container must be used along with sufficient packing material. Do not put a shipping label on the unit as a "suitable shipping container." Some units have been severely damaged this way. This is a delicate, precision instrument. Any damage incurred because of poor packaging procedures will ultimately result in added service charges and longer turn-around times.



Caution

Vent all pressure lines and the nitrogen cylinder, if applicable, to the atmosphere before shipping.

When factory service is required, send in only the unit for repair. Retain fittings, nitrogen cylinder, manuals, etc. at your facility. However, if there is a problem with a particular part, send in that part with the unit.

If a unit is found to be defective, it may be returned to our repair facility at the following address:

CONDEC
3 SIMM LANE
DOOR D, UNIT 2A
NEWTOWN, CT 06470

ATTN: PRESSURE PRODUCTS/REPAIR LAB

Each unit's I.D. plate is stamped with a date code (week/year) prior to shipment. Our warranty is twelve (12) months from that date code and includes repair and/or replacement of the unit at our, Newtown facilities at no charge. Units subjected to abuse or damaged by external influences, are not covered under warranty.

If the unit is found to be out of warranty, an evaluation charge of not less than fifty (U.S.) dollars (\$50.00) will be charged. Please note on any attached paperwork if a repair estimate is required or if there are any other specific instructions.

Please be explicit as to the nature of the problem and/or its symptoms. Your documentation will save needless time and expense. Also, please include a return shipping address (with a street address) and a contact name with fax and telephone numbers. Contact numbers are necessary to provide a job estimate and in case further questions arise at the factory.

PIN7000/PIN7010 Return Material Authorization Form

The repair lab is also equipped to do calibrations on our calibrators and pressure standards. Calibrations include a certification and are traceable to N.I.S.T.

COMPANY NAME:

STREET:

CITY, STATE, ZIP:

TELEPHONE:

FAX:

CONTACT PERSON:

MODEL NUMBER: _____ SERIAL NUMBER: _____

PROBLEM WITH UNIT (PLEASE BE SPECIFIC):

IS THIS A WARRANTY REPAIR? () YES () NO

SHIP TO Address:

COMPANY NAME:

STREET:

CITY, STATE, ZIP:

ATTN:

CONDEC • 3 SIMM LANE • DOOR D, UNIT 2A • NEWTOWN, CT 06470

ATTN: PRESSURE PRODUCTS/REPAIR LAB

TEL: 888-295-8475 • FAX: 203-364-1556 or 715-234-6967

WEB SITE: www.4condec.com