

Repair-Parts



PredatorTM Proportioner

311327 rev.B

***For spraying polyurethane foam and polyurea coatings.
Not for use in explosive atmospheres.***

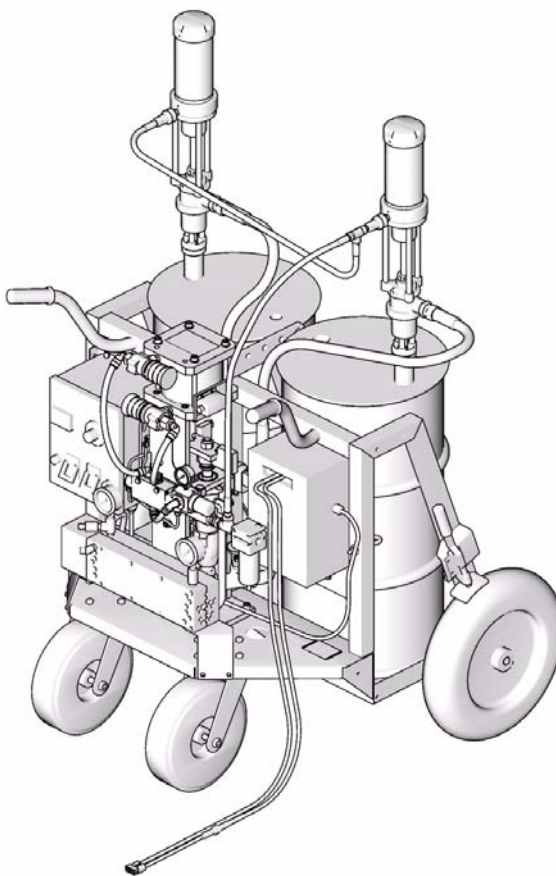
Model 288400

*1600 psi (11.0 MPa, 110 bar) Maximum Working Pressure
230 V, 60 Hz; 30 Amps; 5000 Total Heater Watts*



Important Safety Instructions

Read all warnings and instructions in this manual.
Save these instructions.



TI9514a

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Related Manuals

311326	Predator Proportioner Operation
309577	Displacement Pump Instructions and Parts



Warnings

The following general warnings are for the setup, use, grounding, maintenance, and repair of this equipment. Additional, more specific warnings may be found throughout the body of this manual where applicable. *Symbols appearing in the body of the manual refer to these general warnings. When these symbols appear throughout the manual, refer back to these pages for a description of the specific hazard.*




 WARNING	
	<p>ELECTRIC SHOCK HAZARD</p> <p>Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> • Turn off and disconnect power cord before servicing equipment. • Use only grounded electrical outlets. • Use only 3-wire extension cords. • Ensure ground prongs are intact on sprayer and extension cords. • Do not expose to rain. Store indoors.
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear • Clothing and respirator as recommended by the fluid and solvent manufacturer • Gloves • Hearing protection
	<p>TOXIC FLUID OR FUMES HAZARD</p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> • Read MSDS's to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
 	<p>SKIN INJECTION HAZARD</p> <p>High-pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment.</p> <ul style="list-style-type: none"> • Do not point gun at anyone or at any part of the body. • Do not put your hand over the spray tip. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Do not spray without tip guard and trigger guard installed. • Engage trigger lock when not spraying. • Follow Pressure Relief Procedure in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.

 WARNING	
	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc). • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Ground all equipment in the work area. See Grounding instructions. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. • If there is static sparking or you feel a shock, stop operation immediately. Do not use equipment until you identify and correct the problem. • Keep a fire extinguisher in the work area.
	<p>PRESSURIZED ALUMINUM PARTS HAZARD</p> <p>Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in pressurized aluminum equipment. Such use can cause serious chemical reaction and equipment rupture, and result in death, serious injury, and property damage.</p>
	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine Graco (ASM) replacement parts only. • Do not alter or modify equipment. • Use equipment only for its intended purpose. Call your Graco distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations.
	<p>MOVING PARTS HAZARD</p> <p>Moving parts can pinch or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> • Keep clear of moving parts. • Do not operate equipment with protective guards or covers removed. • Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the Pressure Relief Procedure in this manual. Disconnect power or air supply.
	<p>BURN HAZARD</p> <p>Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns, do not touch hot fluid or equipment. Wait until equipment/fluid has cooled completely.</p>

Before Beginning Repair





						
Repairing this equipment requires access to parts which may cause electric shock or other serious injury if work is not performed properly. Electrical troubleshooting must be done by a qualified electrician. Be sure to shut off all power to the equipment and lock out power at the source before repairing.						

Flushing

						
Flush equipment only in a well-ventilated area. Do not spray flammable fluids. Do not turn on heaters while flushing with flammable solvents.						

- Flush out fluid with new fluid, or flush out old fluid with a compatible solvent before introducing new fluid.
- Use lowest possible pressure when flushing.
- To flush entire system, circulate through gun fluid manifold (with manifold removed from gun).
- Always leave some type of fluid in system. Do not use water.

Pressure Relief Procedure

						
Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing or moving parts.						

1. Select Park on Pump Control Switch.
2. Turn off feed pumps.
3. Trigger gun to relieve pressure.
4. Close gun inlet valves.
5. Close fluid supply inlet valves.
6. Service spray gun. See corresponding spray gun manual.

Troubleshooting

Primary Heating System



Before performing any troubleshooting procedures:

1. Relieve pressure, page 5.
2. Turn OFF red main power disconnect.
3. Allow equipment to cool.

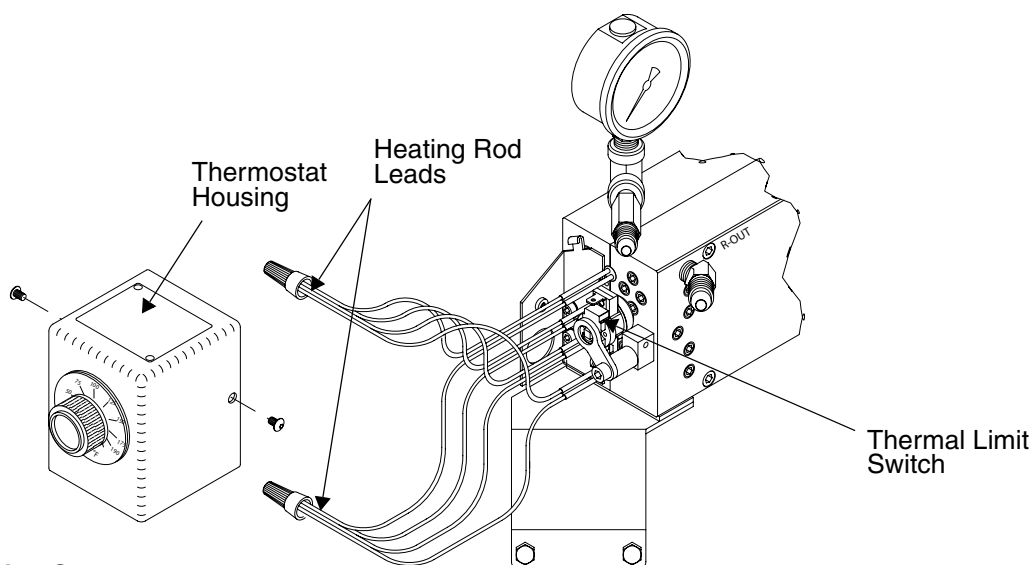


FIG. 1: Primary Heating System

(For complete **Electrical Schematic**, see page 27)

Problems

Try the recommended solutions in the order given for each problem to avoid unnecessary repairs. Also, determine that all circuit breakers, switches, and controls are properly set and wiring is correct before assuming there is a problem.

Problem	Solution
No heat, amber pilot light does not cycle on.	1
Partial heat, amber pilot light on continuously	2

Solutions

1. The **Thermostat** or **Thermal Limit Switch** is not functioning properly.
 - a. **Thermostat Check** - The amber pilot light will only be on when the temperature of the primary

heater is below the temperature setting of the thermostat. Turn the thermostat up (clockwise) to check the operation of the heater and then reset to the desired setting. If this does not solve the problem, continue to Step b.

- b. **Thermal Limit Switch.** When moving the unit, it is possible that the thermal limit switch may trip in transit. If this happens, reset the limit switch and monitor the operation of the heater to ensure the switch has not tripped as a result of a heater malfunction.

To reset the Thermal Limit Switch:

- 1b. Turn OFF the main switch and primary heater circuit breaker.
2. Turn OFF and lock out power at the source.

3. Remove the thermostat housing by removing the two mounting screws and carefully pulling the housing away from the heater.
4. Push in the red reset button on the switch.
5. If the Thermal Limit Switch does not feel as though it reset, then disconnect one lead from the Thermal Limit Switch and read continuity across the switch with an ohmmeter. If there is no continuity, the switch is defective and must be replaced.
6. If this does not solve the problem, replace the thermostat.
7. Move the thermostat housing back into place and install the two mounting screws.
8. Switch on the electrical power and monitor the operation of the primary heater to ensure it is functioning properly.
9. **Heating Rods** - The primary heater contains four 1250-watt (38.7 ohms each) heating rods wired in parallel.

To check that all rods are operational, proceed as follows:

- a. Turn OFF all switches and lock out incoming power at the source.
- b. Remove the thermostat housing by removing the two mounting screws and carefully pulling the housing away from the heater.

- c. Remove the heating rod wire nuts. Separate the heating rod leads from the wire harness and read the resistance across the four heating rods with an ohmmeter. The combined resistance should be 9.6 ohms. A higher resistance indicates that at least one of the rods is not working. If this is the case, proceed to Step d.
- d. Disconnect the heating rods and measure the resistance of each rod. Each rod should measure 38.7 ohms.
- e. Reconnect the heating rods and recheck the resistance.
- f. Move the thermostat housing back into place and install the two mounting screws.
- g. Switch on the electrical power and monitor the operation of the primary heater to ensure it is functioning properly.

The design of the primary heater allows it to maximize the heat transfer from the power available. However, under certain conditions, reducing the flow rate is necessary when the heater is not available to reach the required temperature.

Proportioning System



Problems

Try the recommended solutions in the order given for each problem to avoid unnecessary repairs. Also, determine that all circuit breakers, switches, and controls are properly set and wiring is correct before assuming there is a problem.

Problem	Solution
Proportioning pump does not hold pressure when installed.	1
Proportioning pump does not build pressure on the upstroke.	1,6
Pressure imbalance between pumps.	2,3,1
Cavitation in the proportioning pump.	2,3,1
Pump movement is erratic.	5,6
Failure of pump to reverse.	4,5,6

Solutions

- Leaking Ball Check Valve** - Determine which inlet ball check valve or piston ball check valve is leaking. If the pump (A or R) is losing pressure on the upstroke, check the piston ball check valve of the respective pump. If the pump is losing pressure on the downstroke, check the inlet ball check valve of the respective pump. To repair, see manual 309577.
- Pressure/Chemical Imbalance** - To troubleshoot this problem, first determine the following two points:

First - Which chemical did not exit the mixing chamber?

Determine the first point by checking the color of the material exiting the gun. Since two-component foam systems are usually a combination of light and dark material, the missing or under-proportioned material can be readily determined in most cases.

Second - Why did the chemical fail to get there?

The second point is due to a restriction in the gun or because the proportioning pump did not function

properly in pumping its designed volume. This is determined by checking the chemical pressure gauges on the unit. Focus on the pressure gauge corresponding to the missing chemical.

After determining the missing or under-proportioned material, observe the chemical pressure gauges on the problem side of the unit to see if the malfunction is due to a restriction at the gun or a lack of material produced by the pump. To prevent misinterpretation, focus on the pressure gauge corresponding to the missing chemical.

For example: Assume that the R-component is not reaching the mixing chamber. Spray off target and note the resin pressure gauge; if the resin gauge is considerably higher than the isocyanate gauge, the problem is within the gun. Refer to the gun manual to resolve the problem. If the resin gauge is considerably lower than the isocyanate gauge, see Solution 3.

- Cavitation** - Formation of a partial vacuum or void created within the pump cylinder during the fill stroke. It is actually a "short fill", since the fill chamber is not completely full of chemical when the pump reverses to start the discharge stroke. Cavitation occurs when the proportioning pump demands a greater volume of material during its fill stroke than the supply system can deliver.

The most common causes of cavitation are as follows:

- The transfer pump cannot handle the supply requirement or is malfunctioning. The Graco-Gusmer 2:1 transfer pump is recommended for use with the unit. Also recommended is a minimum of 3/4 in. diameter hose, as short as possible.
- The chemical is too viscous to pump properly. Consult your chemical supplier for the recommended material temperature required to maintain a viscosity of 250 to 1500 centipose.

- c. Inlet strainer screen is restricted. Service as required.
- d. An inlet ball check and/or seat o-ring that does not properly seal will permit some of the proportioned material to flow back towards the supply drum. When this happens, the proportioning pump will not pump the proper volume of material during the discharge stroke and an off-ratio condition will result. This malfunction will appear almost identical to cavitation, but somewhat less severe.
4. **Pilot Valves** - Check each valve for proper operation. If either valve is defective or damaged, replace both valves.
5. **Damaged Piston Packing** - Check piston packing set for mars or scoring. Replace piston packing set if damaged.
6. **Air Motor Assembly** - Check air motor cylinder and lubricate if necessary. Also, check o-rings and seals for wear and/or damage. Replace if necessary.

Hose Heat System



Problems

To avoid unnecessary repairs, try the recommended solutions in the order given for each problem. Before assuming there is a problem, determine that all circuit breakers, switches, and controls are properly set.

Problem	Solution
Hose warm but does not reach temperature or takes too long to reach temperature.	1,2,5,6,7
Hose does not heat; Light on.	2,3,4,7
Hose Heat Circuit Breaker trips or fuse blows.	2
Hose temperature not maintained during flow.	1,2,5,6,7
Hose or hoses adjacent to the unit are warm - hoses downstream are cold.	4

Solutions


1. **Hose Length** - The hose heat system of the Predator is designed to maintain the chemical temperature developed by the primary heaters with up to 310 feet of hose. (Hose lengths greater than this require the use of an auxiliary hose heat system. Call Graco-Gusmer for details). In addition, if ambient temperature is too cold, the hose circuit may not have enough power to maintain the chemical temperature.
2. **Hose Heater Power Control** - Ensure that the power control is adjusted until the ammeter reads 15 amps (do not exceed 15 amps).
3. **Hose Heat Fuse** - With the main power OFF and locked out at the source, remove the fuse and check it for continuity or simply replace it with a new one.



Replace the fuse with one of the same rating. A substitute may damage the equipment and would create a potential source of injury to the operator.

4. **Hose Heating Element** - With the hose heat circuit breaker OFF, check to see that the Power-Lock connectors on the hoses and all electrical connections between the hoses and unit are tight. If these connections are secure and hose heat is not present, perform a systematic search for the electrical fault. To search for the electrical fault, proceed as follows:
 - a. With the hose heat circuit breaker OFF and the power control turned fully counterclockwise, starting at the gun whip, unplug the Power-Lock connectors and plug the hose troubleshooting jumper plug (included with accessory package) into the last "upstream" segment of hose.
 - b. Turn ON the hose heat circuit breaker and turn the hose heater power control (clockwise) until the ammeter reads 15 amps. If hose heat is restored, then the fault is within the gun whip.

If hose heat is not restored, turn the hose heater power control fully counterclockwise, then turn OFF the hose heat circuit breaker and the main power disconnect and proceed with the steps below:

						
<p>The hose heat transformer voltage must be set to match the hose length in use. Too much power will cause the hose heat circuit fuse to fail. Too little power will result in insufficient hose heating.</p>						

- c. Adjust the tap setting of the hose heat transformer to match the next shortest length of heated hose (see Hose Heat Power Pack on page 24).
- d. Unplug the next set of Power-Lock connectors and plug the hose jumper plug into the last "upstream" segment of hose.
- e. Restore electrical power, switch ON the hose heat circuit and adjust the hose heater power control to 15 amps.

If hose heat is restored, then the fault is within the last unplugged segment of hose.

If hose heat is not restored, turn the hose heater

power control fully counterclockwise, then turn OFF the hose heat circuit breaker and the main power disconnect and repeat Steps c through e until the fault is located.



5. **Primary Heat and Hose Heat Temperature Setting** - The purpose of the hose heater is not to add heat but rather to maintain the temperature developed by the primary heater. If indications are that the hose heater is not maintaining temperature during flow, check that the primary heater and hose are set for the same temperature or reduce the output.
6. **Low Line Voltage** - The hose heat system operates at 220 Volts. Low line voltage will significantly reduce power available and the heater will not perform to its full capability at maximum hose length. A qualified electrician should determine the secondary amperage of the hose heat circuit and adjust the tap setting as required to achieve a secondary amperage of 45-50 amps.
7. **Hose Heat Transformer Tap Setting** - The transformer voltage is adjustable to accommodate between 35 ft and 310 ft of hose. Ensure that the proper tap setting is selected for the hose length in use. (See Hose Heat Power Pack on page 24).


Repair

Proportioning Pumps

When the proportioning pumps are functioning properly, it is not unusual for a trace amount of resin or isocyanate chemical to seep past the pump packing onto the pump shaft. Maintain proper packing adjustment to minimize seepage. Routinely inspect the shaft and wipe away any residue when the unit is turned off. Disassemble and clean both proportioning pumps annually. Inspect the pistons and cylinders for marks or scratches, which may cause leakage or damage to packings. As a preventative maintenance precaution, it is recommended that the piston and cylinder packings be replaced during the annual cleaning. (Refer to page 16 of the **Parts** section for reference.)

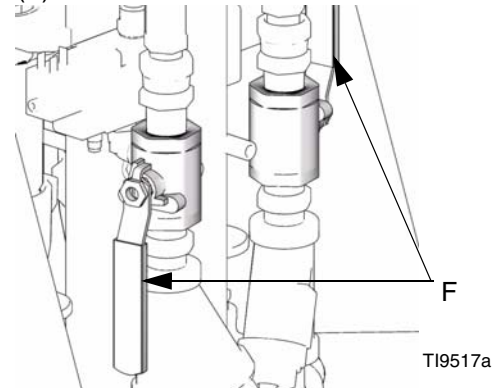
Pump Removal

						
<p>Air motor shaft, yoke, pump rod, and connecting rod move during operation. Moving parts can cause serious injury such as pinching or amputation. Keep hands and fingers away from connecting rod during operation.</p>						

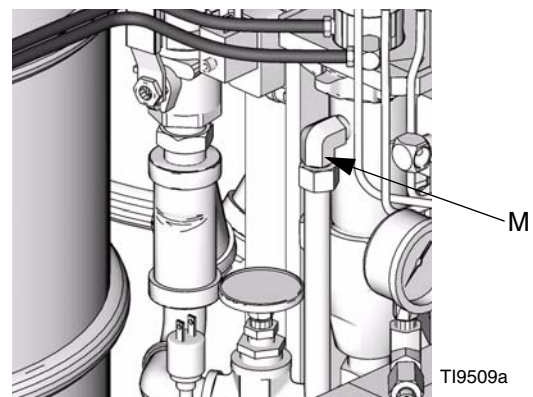
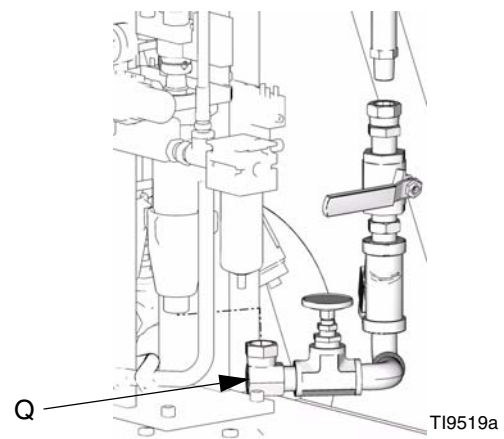
 See manual 309577 for pump repair instructions.

1. Shut off Primary Heater Switch and Hose Heater Switch.
2. Perform **Pressure Relief Procedure**, page 5.
3. Perform **Flushing**, page 5.
4. Turn Main Disconnect Switch OFF and disconnect power supply.

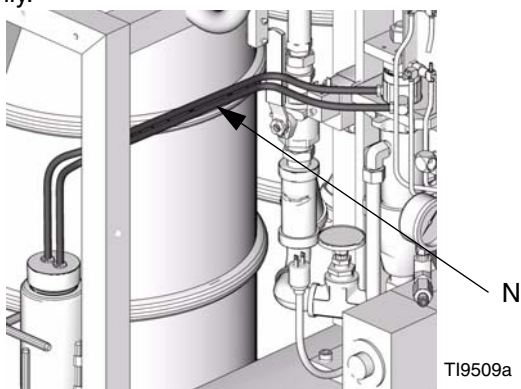
5. Shut off both feed pumps and close both inlet supply valves (F).



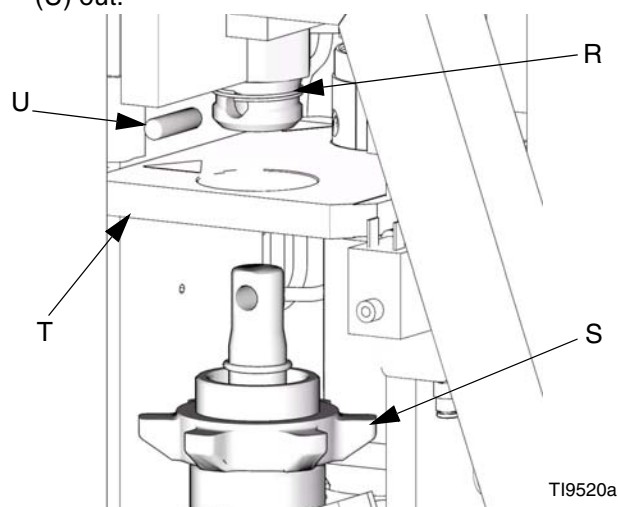
6. Shut off air supply.
7. Disconnect fitting at inlet (Q) and outlet (M).



8. Disconnect tubes (N) from Iso Lube Pump on A side only.



9. Push retaining wire clip (R) up. Push retaining pin (U) out.

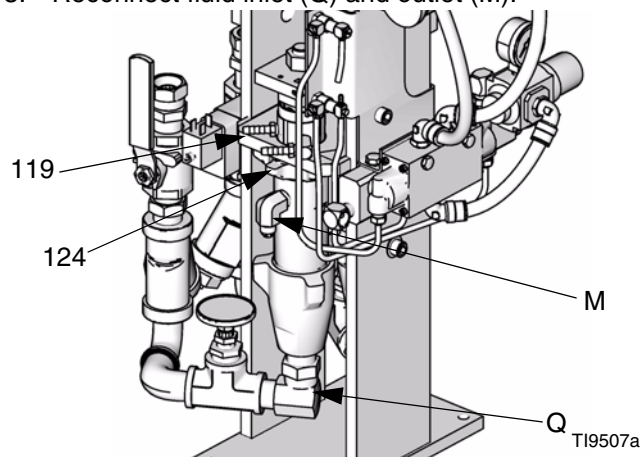


10. Loosen locknut (S) by hitting firmly with a non-sparking hammer.
11. Unscrew pump out of pump mounting plate (T).

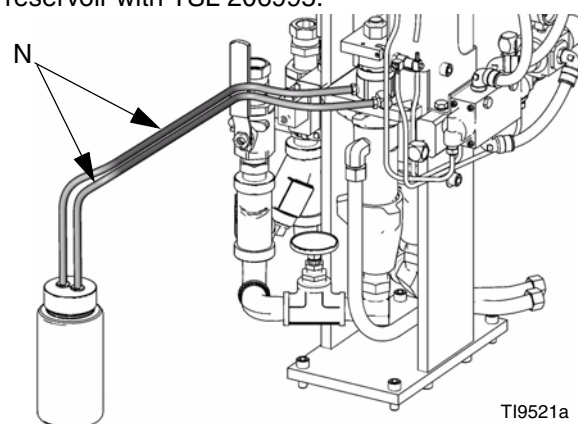
Pump Installation

1. Ensure locknut (124) is screwed on pump with flat side up. Grease pump mounting threads in mounting plate (119) with lithium grease. Screw pump into pump mounting plate until top of pump thread is above mounting plate 1/2 to 1 1/2 threads above flush.
2. Align pump rod hole with link hole. Push retaining pin (137) in. Pull retaining wire down to cover pin ends.

3. Reconnect fluid inlet (Q) and outlet (M).




4. Tighten locknut (124) by hitting firmly with a non-sparking hammer.
5. *For Iso A pump only:* reconnect two tubing lines (N) from Iso Pump Lube reservoir. Flush and refill reservoir with TSL 206995.



6. Refill Resin B pump wet cup with TSL 206995.

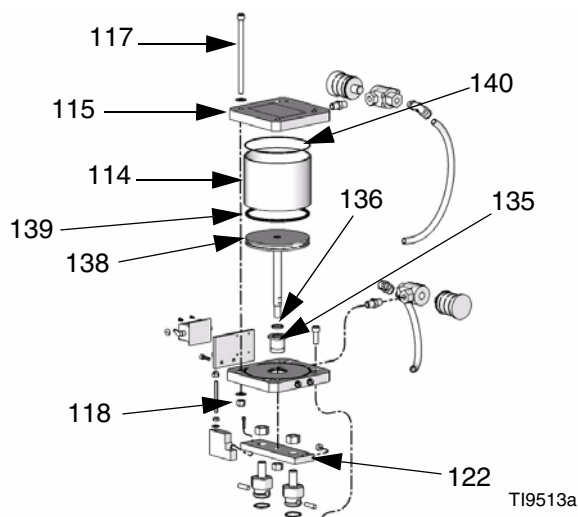
Air Motor

See **Air Motor Assembly** on page 20.

 Air Motor Seal Repair Kit 255057 is available to change all air motor seals.

1. Raise retaining spring (141) and knock retaining pins (137) out of pump rod slots. Leave yoke (122) and link (121) in place.
2. Press in tube fitting ferrules and pull out tubing to disconnect air lines.

3. Remove four bolts (117) to remove entire air motor assembly.



4. Remove lock nut (118) from piston rod (138) and remove pump yoke (122).
5. Remove four lock nuts (118), washers (116), and tie-rod bolts (117).
6. Lift top plate (115) and remove from air cylinder (114).
7. Push piston rod assembly out of air cylinder and replace piston o-ring (139) and lubricate.
8. Replace bottom plate bearing (135), u-cup seal (136), and lubricate. Ensure the open end of the u-cup seal faces up.
9. Replace top and bottom o-rings (140) in plates. Use lubricant to hold in place.
10. Assemble in reverse order.
11. Torque tie rod bolts in small increments evenly to 17-22 in-lbs (3•4 Nm).

Primary Heater

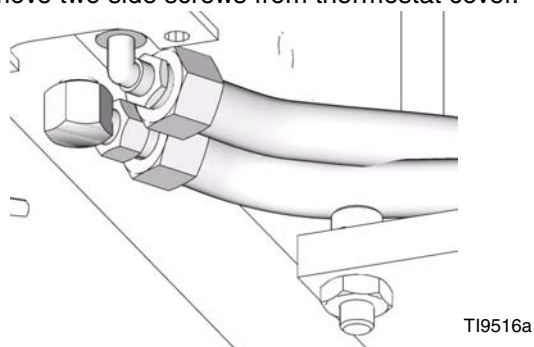
Read Warnings on page 3. Wait for heater to cool before repairing.						

1. Turn Main Disconnect Switch OFF.
2. Perform **Pressure Relief Procedure**, page 5.
3. Wait for heater to cool.

4. Perform **Flushing**, page 5.

Removal

1. Disconnect two fluid lines at bottom of heater.
2. Disconnect upper fluid hose from fittings.
3. Remove two side screws from thermostat cover.



4. Disconnect two main power leads from wire harness.
5. Remove four screws underneath heater. Retain four thermal barrier spacers for later installation.
6. Pull heater assembly out and remove from unit.

Service

See **Parts** on page 16 for servicing.

Installation

Reconnect and install primary heater in reverse order of removal steps.

Fluid Inlet Filter Screen



A Y-line filter screen before each proportioning pump traps solid matter to ensure proper operation of ball check valves in pump base. Inspect and clean both screens. See Predator Proportioner Operation manual (311326).



Regularly clean isocyanate pump screen during start-up procedure. This minimizes moisture contamination problems by immediately flushing out any isocyanate residue at start of dispensing operation.

Remove and clean filter screens as follows:

1. Follow **Pressure Relief Procedure**, page 5.
2. Place a rag beneath filter base to catch drain-off of chemical when removing screen plug.
3. Loosen screen plug just enough to allow material to drain out onto rag.
4. Unthread screen plug and remove it.
5. Pull screen out of strainer. Clean or replace. See **Accessories**, page 15, for alternate mesh size.
6. Thoroughly clean screen gasket and material inside strainer.
7. Position screen on shoulder of plug and screw securely back into strainer.
8. Reconnect transfer pump air supply and open material inlet supply valve. Ensure there are no leaks and wipe equipment clean.

Isocyanate Pump Lubricant



Check pump lubricant daily. Change lubricant before it becomes a gel or when its color darkens. The time interval between changes due to gel formation will depend on environmental conditions.

Change lubricant as follows:

1. Lift lubricant reservoir out of bracket and remove reservoir from cap.
2. Flush reservoir thoroughly and fill 3/4 full with TSL 206995.
3. Thread reservoir back onto cap assembly and return it to bracket.

The lubrication system is now ready for operation. No priming is required.

Accessories

260652 Predator Material Supply Kit

Pumps, hoses, and mounting hardware to supply fluids to unit.

246483 Air Supply Kit

Hoses and fittings to supply air to feed pumps, agitator, and gun air hose. Included in feed pump kits; see manual 309827.

255057 Air Motor Seal Kit

Includes piston rod seal and bearing. Also includes piston and cylinder o-rings.

TSL (Throat Seal Liquid)

Part Description

206995 1 qt. (1 liter) bottle
206996 1 gal. (3.8 liter) container

Heated Hoses

Hoses are available in 50 ft (15.2 m) and 25 ft (7.6 m) lengths with a 1/4 in. (6 mm), 3/8 in. (10 mm), or 1/2 in. (13 mm) diameter. Hoses are also available maximum fluid pressures of 2000 psi (14 MPa, 140 bar) or 3500 psi (24 MPa, 241 bar). See manual 309572.

Heated Whip Hoses

Hoses are available in 10 ft (3 m) length with a 1/4 in. (6 mm) or 3/8 in. (10 mm) diameter. Hoses are also available maximum fluid pressures of 2000 psi (14 MPa, 140 bar) or 3500 psi (24 MPa, 241 bar). See manual 309572.

Fusion Spray Gun

Air purge gun available in round or flat spray pattern; see manual 309550. Mechanical purge gun available in round or flat spray pattern; see manual 309856.

Y-Strainer Screen

Replacement strainer screen for fluid Y-strainer; 20 mesh.

Part Description

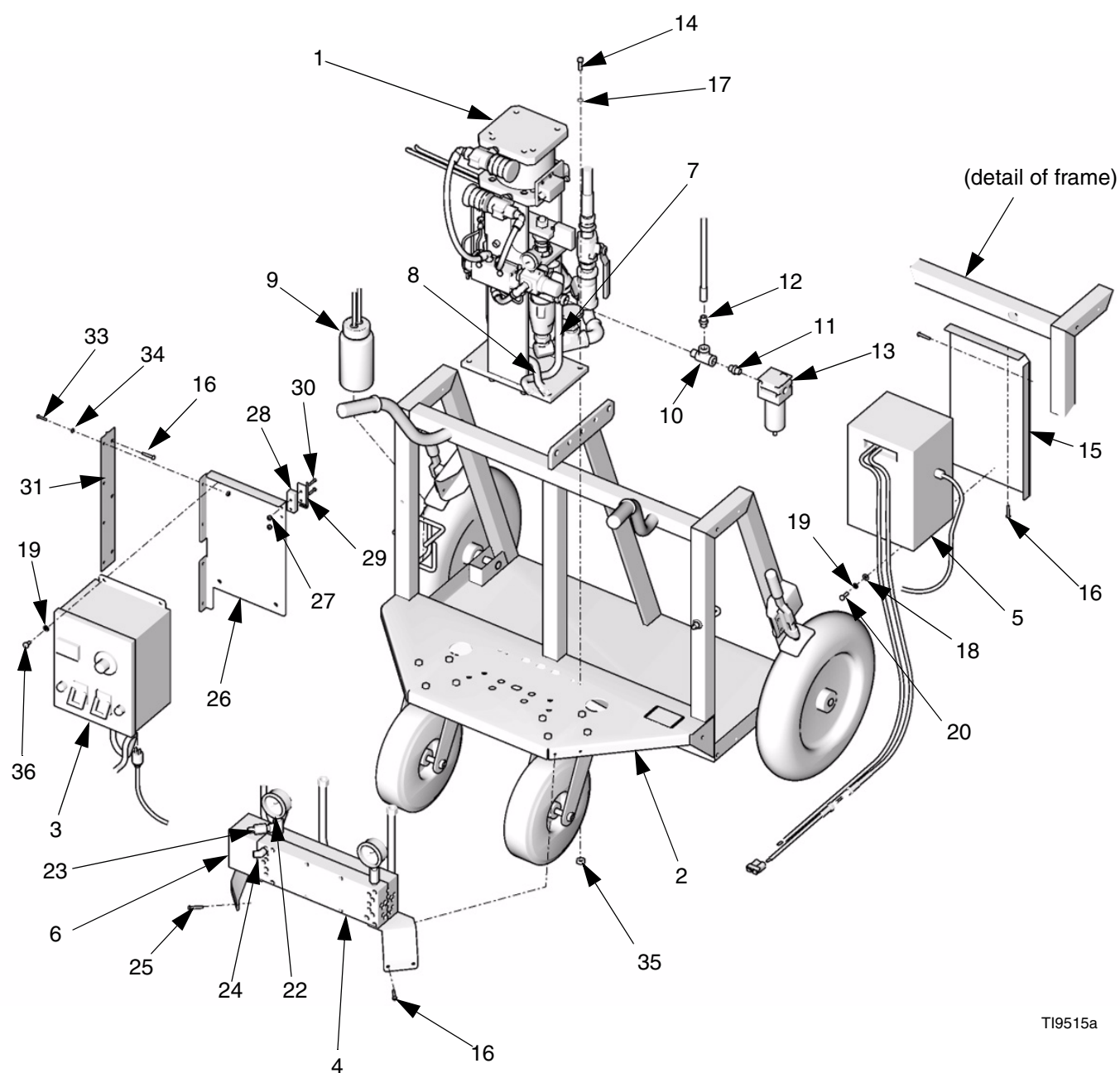
180199 20 mesh; as shipped
255082 80 mesh (2 pack)
255083 80 mesh (10 pack)

Recommended Spare Parts

Keep the following spare parts on hand to reduce downtime.

Part	Description
245971	PUMP, resin (B) side
246421	KIT, repair, pump, resin (B), 245971
246831	PUMP, iso (A) side
15C851	KIT, repair, pump, iso (A), 246831
246963	KIT, wet cup for pump 246831
206995	FLUID, TSL, 1 qt
101078	STRAINER, Y, 20 mesh
180199	FILTER, y-strainer, 20 mesh
114228	ELEMENT, air filter, 5 micron
255057	KIT, seal, air motor
108636	MUFFLER, 2 pack

Parts

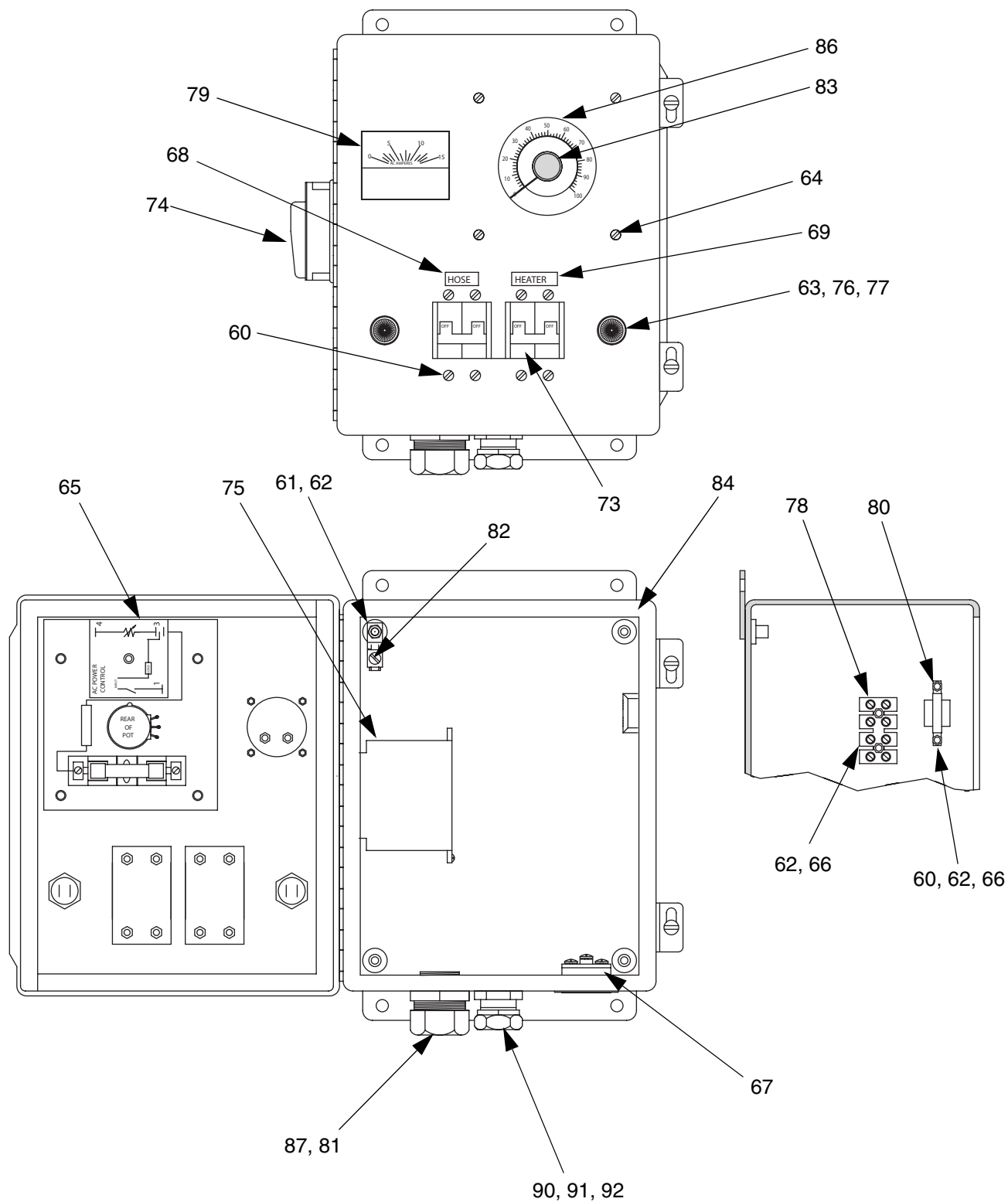


TI9515a

Parts - Main Assembly

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
1	288362	PUMP, air motor	1	22	296171	GAUGE, pressure, 0-3000 psi	2
2	297647	CART, mobile	1	23	297637	CAP PLUG, 1/2 in. JIC	1
3	297519	CONSOLE, electrical	1	24	297638	CAP PLUG, 9/16 in. JIC	1
4	297528	HEATER, primary	1	25	297639	SCREW, cap, button head	2
5	297652	POWER SUPPLY, 70 V	1	26	297508	PLATE, control	1
6	297485	THERMOSTAT	1	27	C19158	SCREW, mach, slotted round hd	2
7	15J759	HOSE, pump, 14.5 in.	1	28	297547	SHIM	1
8	15J760	HOSE, pump, iso	1	29	297642	HINGE, spring, left	1
9	246995	BOTTLE, assy	1	30	109466	NUT, lock, hex	2
10	803088	FITTING, tee, street	1	31	297548	HINGE	1
11	297436	FITTING, straight, nipple, hex	1	32	C19293	NUT, hex, machine	4
12	297591	FITTING, straight, nipple	1	33	297640	SCREW, cap, button head	4
13	297452	FILTER, air	1	34	100718	WASHER	4
14	100004	SCREW, cap, hex hd	4	35	100340	NUT	4
15	297509	PLATE, transformer	1	36	100333	SCREW, cap, hex hd	4
16	297582	SCREW, hex washer	11	52	309577	MANUAL, instruction	1
17	106115	WASHER, lock (hi-collar)	4	* Not shown.			
18	100086	WASHER, plain	1				
19	100016	WASHER, lock	5				
20	100022	SCREW, cap, hex hd	1				
21*	297546	LABEL, thermal switch	2				

Electrical Console



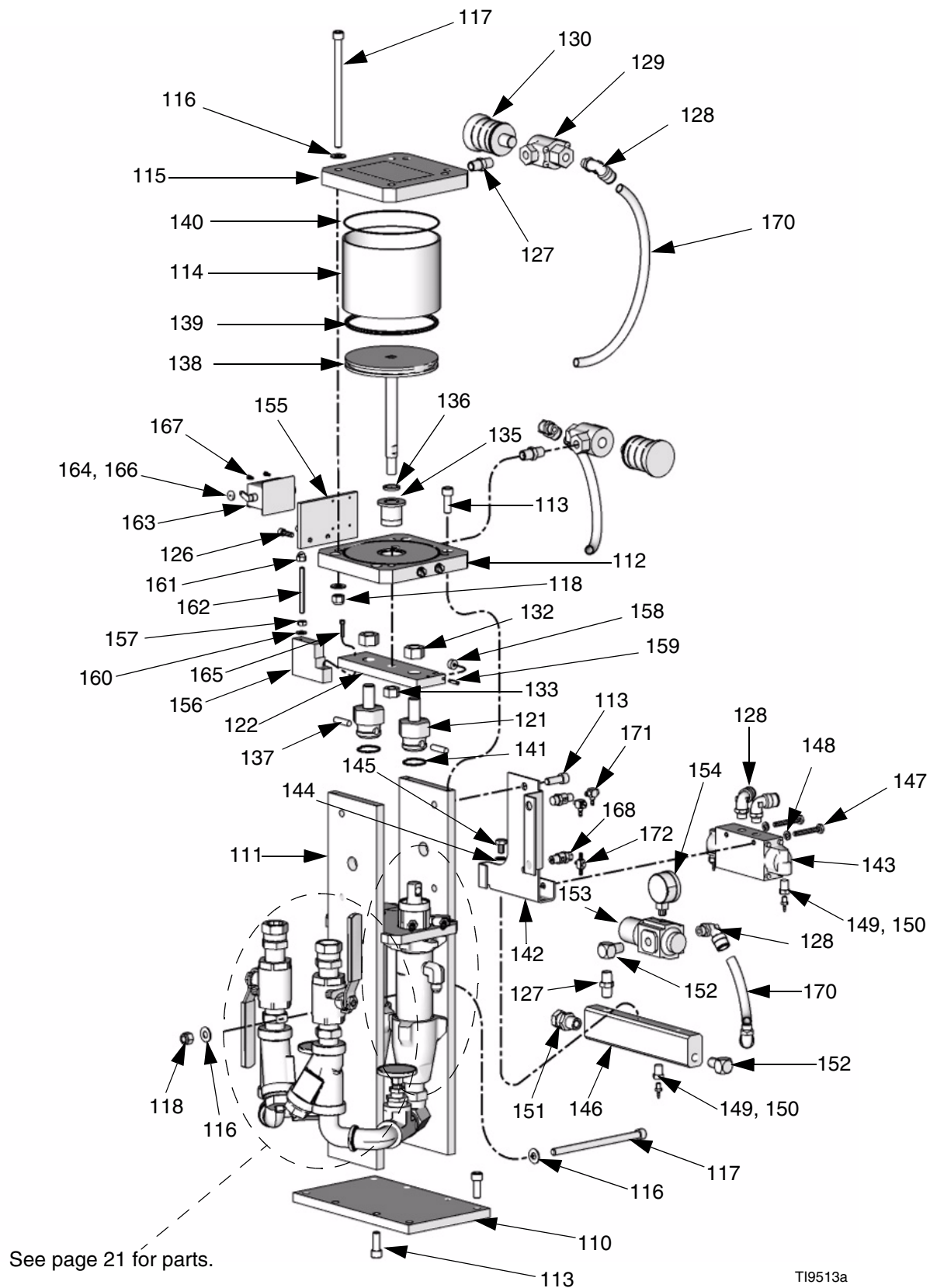
Parts - Electrical Console

Ref.	Part	Description	Qty.
60	297621	SCREW, machine, button head	10
61	100518	SCREW, mach, pnhd	3
62	103181	WASHER, lock ext	6
63	297623	LENS, amber	2
64	297624	SCREW, machine, round head	4
65	297622	CONTROL, phase	1
66	100072	NUT, hex mscr	5
67	297625	SOCKET, hose	1
68	297520	LABEL, hose	1
69	297521	LABEL, heater	1
70▲	297513	LABEL, caution	1
73	297626	CIRCUIT BRKR, 25 amp	2
74	295210	SWITCH, operator handle	1
75	297627	SWITCH, disconnect	1
76	297628	LIGHT, bulb	2
77	297629	LIGHT, base	2
78	297630	BLOCK, terminal, 12 position	1
79	297631	AMMETER, 0-15 amp	1
80	297632	TRANSFORMER	1
81	297633	FITTING, strain relief	1
82	297634	TERMINAL, LUG, #10	1
83	297635	KNOB	1
84	297522	CONSOLE, electrical	1
85*▲	297524	LABEL, warning, 7 amps	1
86	297523	LABEL, indicator	1
87	295269	NUT, lock, hubble	1
90	297570	CONNECTOR, straight	1
91	297571	NUT, lock	1
92	297572	RING, sealing	1
103*	196222	LABEL, ID	1

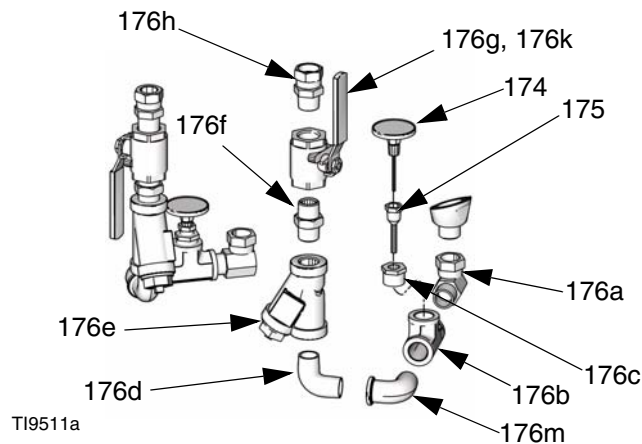
* Not shown.

▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.

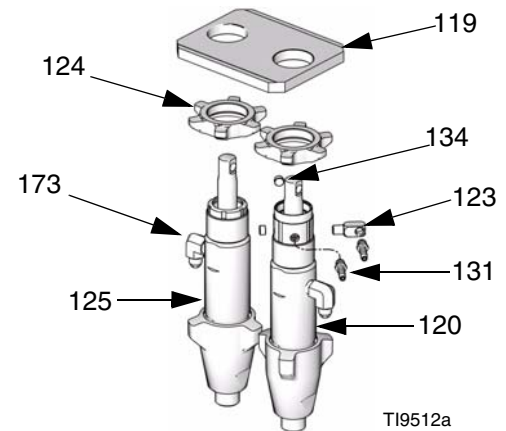
Air Motor Assembly



Air Motor Assembly



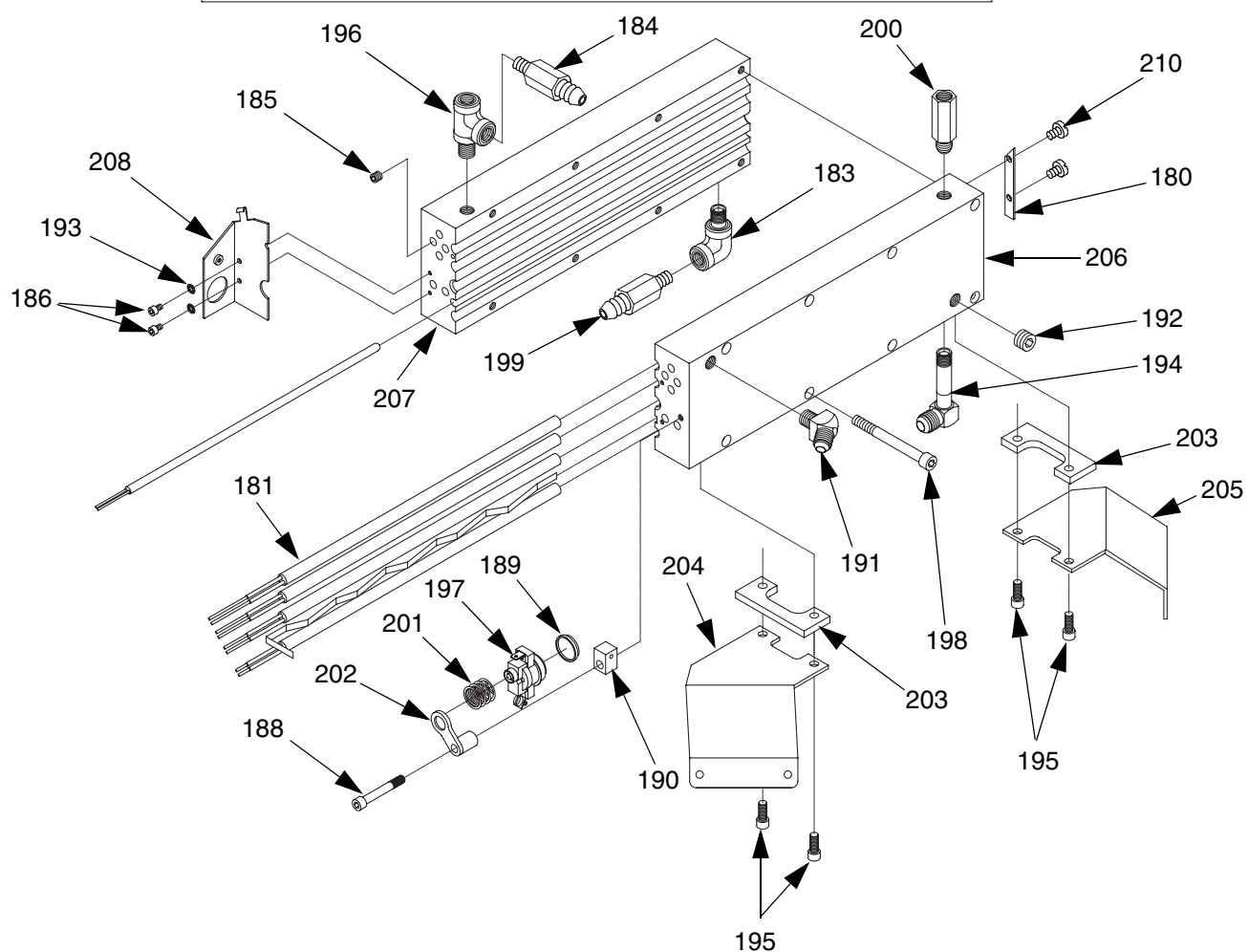
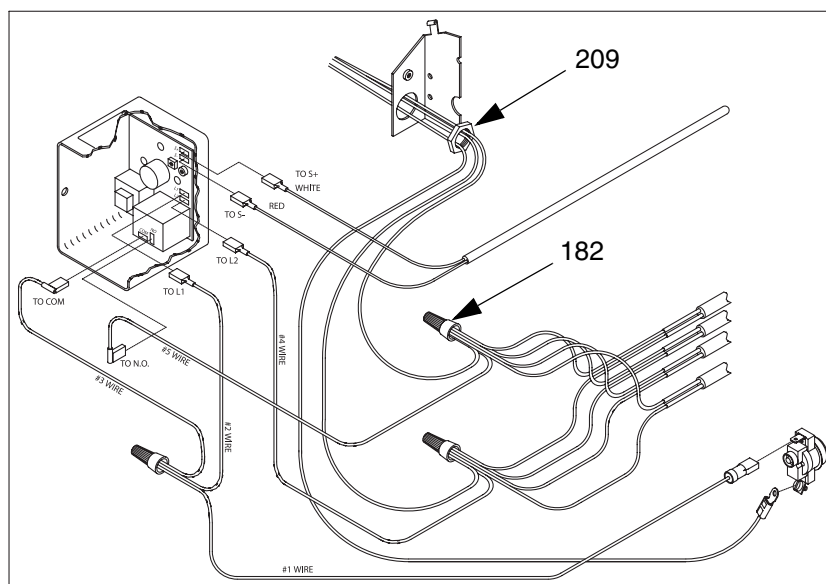
TI9511a



TI9512a

Ref. Part	Description	Qty.	Ref. Part	Description	Qty.
110 15J138	PLATE, base, pump	1	148 100016	WASHER, lock	2
111 15J131	PLATE, side	2	149 297438	FITTING, adapter	3
112 15J587	PLATE, cylinder, air, bottom	1	150 297429	FITTING, straight	5
113 C19837	SCREW, cap, socket hd	10	151 155665	UNION, adapter	1
114 297411	CYLINDER, air	1	152 100840	FITTING, elbow, street	1
115 15J586	PLATE, cylinder, air, top	1	153 116513	REGULATOR, air	1
116 101971	WASHER, thrust	8	154 111598	GAUGE, pressure, air	1
117 120557	SCREW, cap, socket head	5	155 297549	PLATE, counter	1
118 101566	NUT, lock	5	156 297551	BRACKET, yoke	1
119 15J133	PLATE, mounting, cylinder	1	157 100015	NUT, hex mscr (not shown)	2
120 246831	PUMP, displacement, w/lube, 0.552	1	158 297371	ROLLER	1
121 15J132	LINK, connecting	2	159 297383	STUD, operating	1
122 15J684	PLATE, yoke, pump	1	160 100086	WASHER, plain	1
123 191892	FITTING, elbow, street, 90 deg	1	161 100029	NUT, cap, hex	1
124 193031	NUT, retaining	2	162 297584	STUD, threaded	1
125 245971	PUMP	1	163 297585	COUNTER, mechanical	1
126 112166	SCREW, cap, sch	2	164 297552	WHEEL, counter	1
127 156971	FITTING, nipple, short	3	165 295709	SCREW, cap, socket head	1
128 114128	FITTING, elbow, male, swivel	6	166 295695	SCREW, cap, buttoned	1
129 297439	VALVE, quick exhaust	2	167 295203	SCREW, cap, 6-32 x 1/4, bh	4
130 108636	MUFFLER	2	168 297440	VALVE, pilot	2
131 116746	FITTING, barbed, plated	2	169 297442	TUBE	3
132 120553	NUT, center lock, 5/8-18	2	170 054760	TUBE, polyurethane, rnd, black	3
133 120552	NUT, center lock, 1/2-20	1	171 297370	CONNECTOR, tube, air	3
134 104765	PLUG, pipe headless	2	172 297430	FITTING, tee	1
135 15J149	BUSHING, rod, air motor	1	173 261840	FITTING, elbow, male	1
136 120554	SEAL, u-cup, bevel lip	1	174 102124	THERMOMETER, dial	2
137 183210	PIN, str, hdls	2	175 15D757	HOUSING, thermometer, viscon hp	2
138 297372	PISTON, air, w/ rod	1	176 288356	KIT, fluid inlet, pair	1
139 296113	O-RING, #350,buna-n	1	176a	FITTING, union, adapter, 90 deg	2
140 296112	O-RING, #049,buna-n	2	176b	TEE, pipe 3	2
141 183169	SPRING, retaining	2	176c	BUSHING, pipe	2
142 15J614	BRACKET, mounting, control	1	176d	FITTING, elbow, pipe, male	2
143 297389	VALVE, pilot	1	176e	STRAINER, y	2
144 109468	SCREW, cap, hex hd	2	176f	FITTING, nipple, hex	2
145 100186	WASHER, lock, internal tooth	2	176g	VALVE, ball, 3/4 npt	2
146 297527	MANIFOLD, air	1	176h	FITTING, union, 3/4 mpt x 1/2 fpt	1
147 102313	SCREW, cap, hex, 1/4	2	176k	FITTING, swivel	1
			176m	ELBOW, 90 deg	2

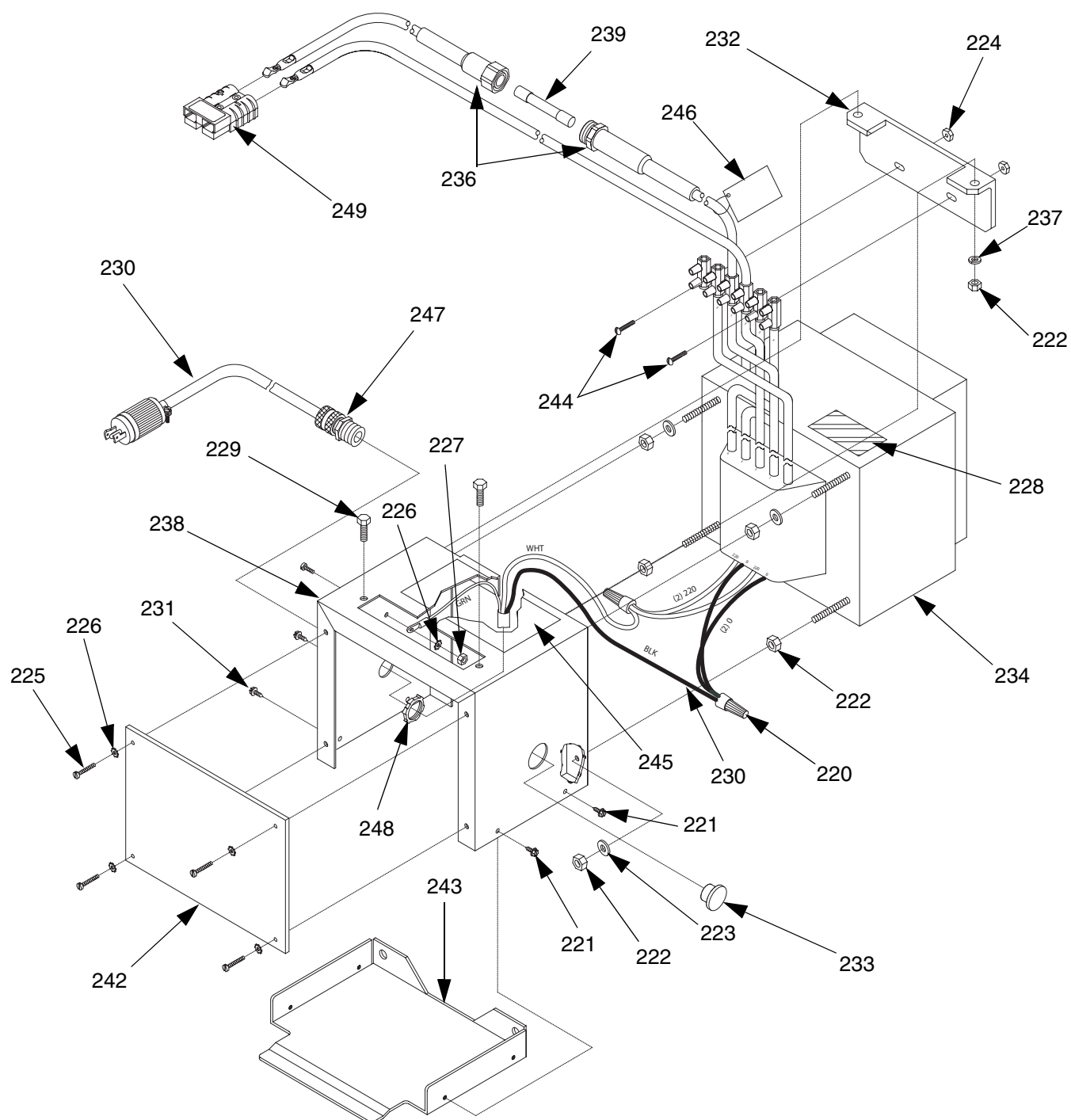
Primary Heater Assembly



Primary Heater Assembly

Ref. Part	Description	Qty.	Ref. Part	Description	Qty.
180 297529	STOP	1	196 116504	FITTING, tee, run	1
181 297530	ELEMENT, heating	4	197 297328	THERMOSTAT, 195 deg, n.c.	1
182 295731	NUT, wire	2	198 297258	SCREW, cap, socket head	8
183 297245	FITTING, elbow, 90, st, 1/4 x 1/4	1	199 297588	FITTING, straight, nipple	1
184 297586	FITTING, straight, nipple	1	200 297534	BUSHING	1
185 297531	SPRING, leaf	1	201 297589	SPRING, wave	1
186 295662	PLUG, pipe	42	202 297535	BRACKET, mounting, switch	1
187 295732	SCREW, cap, sh, 8-32 x 1/4lg	2	203 297538	INSULATOR, thermo	2
188 596936	SCREW, cap socket hd 1/4-20 x 1.5	1	204 297540	BRACKET, heater, left	1
189 297532	PLATE, heat transfer	1	205 297539	BRACKET, heater, right	1
190 297533	BRACKET, mounting, cover	1	206 15J584	HEATER, R, half	1
191 297423	FITTING, elbow, 45	1	207 15J585	HEATER, A, half	1
192 295225	PLUG, pipe, flush	2	208 297545	BRACKET, thermo	1
193 157021	WASHER, lock, int	2	209 295269	NUT, lock, hubble	2
194 297587	FITTING, elbow, 90	1	210 100903	SCREW, mach, rdh	2
195 112166	SCREW, cap, sch	4			

Hose Heat Power Pack



Hose Heat Power Pack (Power Supply)

Ref.	Part	Description	Qty.
220	295731	NUT, wire	3
221	295732	SCREW, cap, sh, 8-32 x 1/4lg	4
222	100015	NUT, hex mscr	8
223	100086	WASHER, plain	2
224	100284	NUT, hex mscr	2
225	100518	SCREW, mach, pnhd	5
226	103181	WASHER, lock ext	5
227	100072	NUT, hex mscr	1
228▲	297513	LABEL, caution	1
229	100333	SCREW, cap, hex hd	2
230	297511	CABLE, power	1
231	297512	BOX, cover, transformer	1
232	297650	BRACKET, mounting, block, terminal	1
233	297596	PLUG	1
234	297658	TRANSFORMER, 220/70V	1
235	297598	BLOCK, terminal, 6 position	1

Ref.	Part	Description	Qty.
236*	297330	FUSE, 50A SC-50 bussman	2
237	100016	WASHER, lock	2
238▲	189930	LABEL, caution	1
239	297599	HARNESS, wire, hose, heater	1
240	297600	CONNECTOR, hose	1
241	311438	MANUAL, instructions	1
242	297515	COVER, front	1
243	297516	COVER, bottom	1
244	C19158	SCREW, mach, slotted round hd	2
245	297649	LABEL, transformer, 70V	1
246	297648	LABEL, setting, power pack	1
247	295268	BUSHING, hubble	1
248	295269	NUT, LOCK, hubble	1
249	117789	CONNECTOR, hose, elect	1

▲ *Replacement Danger and Warning labels, tags, and card are available at no cost.*

* *Not shown.*

Pneumatic Schematic

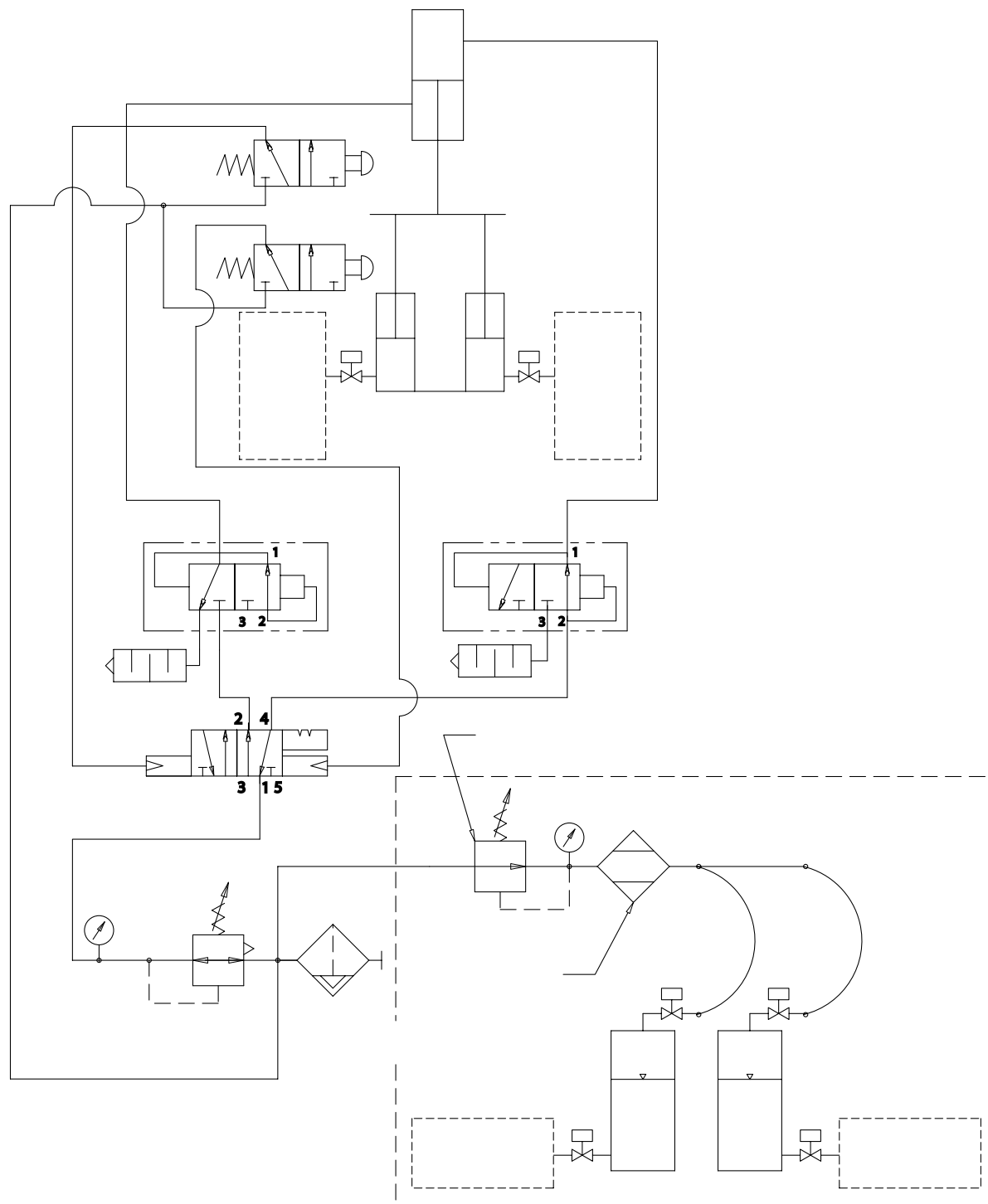
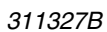


FIG. 2: Pneumatic Schematic

FIG. 3: Electrical Schematic





A series of horizontal lines for writing, consisting of 20 lines in total. Each line is preceded by a small vertical margin line on the left side.

Technical Data

Maximum working pressure	1600 psi (11.0 MPa, 110 bar)
Maximum fluid temperature	190°F (88°C)
Maximum output (may vary due to operating conditions)	16 lb/min (7.25 kg/min)
Viscosity range	250-1500 centipoise
Maximum material inlet pressure	400 psi (2.7 MPa, 27 bar)
Voltage requirement +/- 10%	230V, 60 Hz
Amperage requirement	30 Amps
Total heater watts	5000 W
Inlet filter size	80 mesh standard (optional - 60/40 mesh)
Component B (resin) inlet	3/4 npt(f)
Component A (isocyanate) inlet	1/2 npt(f)
Maximum heated hose length	310 ft. (95 m)
Height	50 in. (127 cm)
Width	41 in. (104 cm)
Depth	28 in. (71 cm)
Weight	225 lbs. (102 kg)
Wetted parts	Carbon steel, stainless steel, chrome, aluminum, Fluoroelastomer, PTFE, nylon

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