

Repair



# RoadLazer™ RoadPak™ Line Striping System

3A1696A  
EN

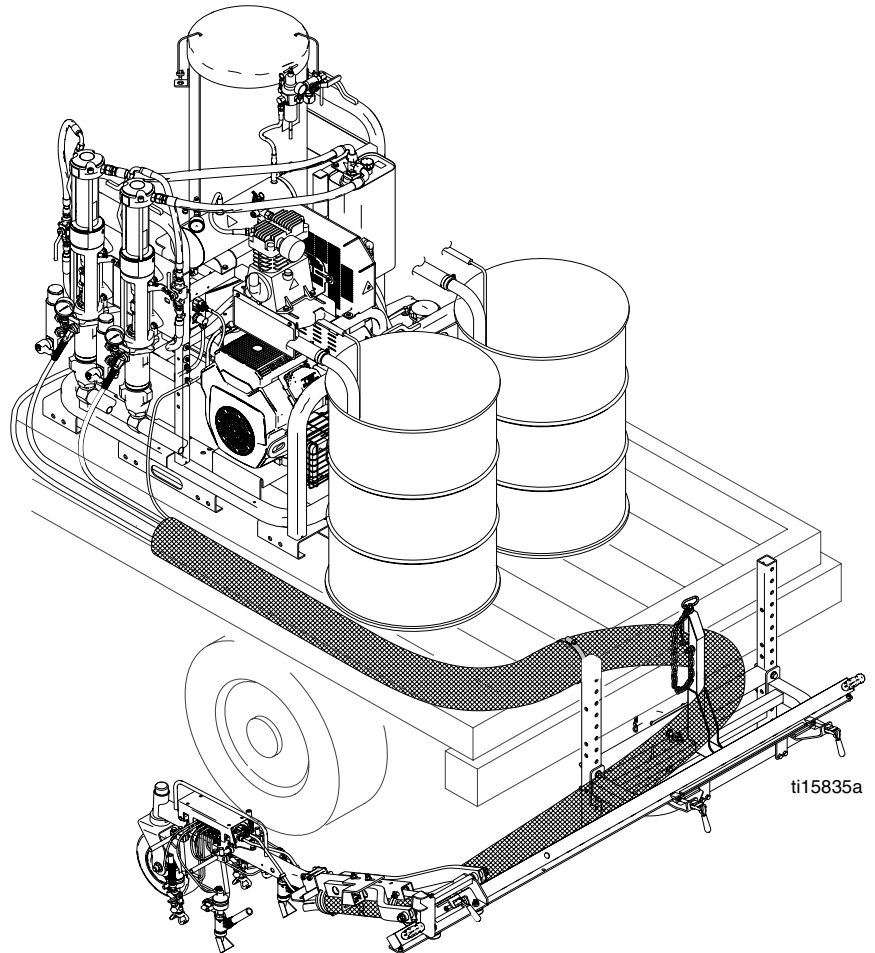
**- For the Application of Road Marking and Reflective Coatings -  
- For Professional Use Only -**

*2900 psi (20 MPa, 200 bar) Maximum Working Pressure*



### **Important Safety Instructions**

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



ti15835a



H003





PROVEN QUALITY. LEADING TECHNOLOGY.

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# Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

 <b>WARNING</b>	
	<p><b>FIRE AND EXPLOSION HAZARD</b></p> <p>Flammable fumes, such as solvent and paint fumes, in <b>work area</b> can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> <li>• Use equipment only in well ventilated area.</li> <li>• Do not fill fuel tank while engine is running or hot; shut off engine and let it cool. Fuel is flammable and can ignite or explode if spilled on hot surface.</li> <li>• Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).</li> <li>• Keep work area free of debris, including solvent, rags and gasoline.</li> <li>• Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.</li> <li>• Ground all equipment in the work area. See <b>Grounding</b> instructions.</li> <li>• Use only grounded hoses.</li> <li>• Hold gun firmly to side of grounded pail when triggering into pail.</li> <li>• If there is static sparking or you feel a shock, <b>stop operation immediately</b>. Do not use equipment until you identify and correct the problem.</li> <li>• Keep a working fire extinguisher in the work area.</li> </ul>
	<p><b>SKIN INJECTION HAZARD</b></p> <p>High-pressure fluid from dispensing device, 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. <b>Get immediate SURGICAL TREATMENT.</b></p> <ul style="list-style-type: none"> <li>• Keep clear of fluid outlet and leaks.</li> <li>• Use guns, hoses and other components with pressure ratings equal to or higher than the pump rating.</li> <li>• Follow the <b>Pressure Relief Procedure</b> before servicing or cleaning.</li> <li>• Do not point dispensing device at anyone or at any part of the body.</li> <li>• Do not stop or deflect leaks with your hand, body, glove, or rag.</li> <li>• Tighten all fluid connections before operating the equipment.</li> <li>• Check hoses and couplings daily. Replace worn or damaged parts immediately.</li> </ul>
	<p><b>MOVING PARTS HAZARD</b></p> <p>Moving parts can pinch, cut or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> <li>• Keep clear of moving parts.</li> <li>• Do not operate equipment with protective guards or covers removed.</li> <li>• Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the <b>Pressure Relief Procedure</b> and disconnect all power sources.</li> </ul>

# ⚠️ WARNING



## EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- 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 from distributor or retailer.
- Do not leave the work area while equipment is energized or under pressure. Turn off all equipment and follow the **Pressure Relief Procedure** when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment.
- Use equipment only for its intended purpose. Call your 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.



## CARBON MONOXIDE HAZARD

Exhaust contains poisonous carbon monoxide, which is colorless and odorless. Breathing carbon monoxide can cause death.

- Do not operate in an enclosed area.



## TOXIC FLUID OR FUMES HAZARD

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read MSDSs 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.



## BURN HAZARD

Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns:

- Do not touch hot fluid or equipment.

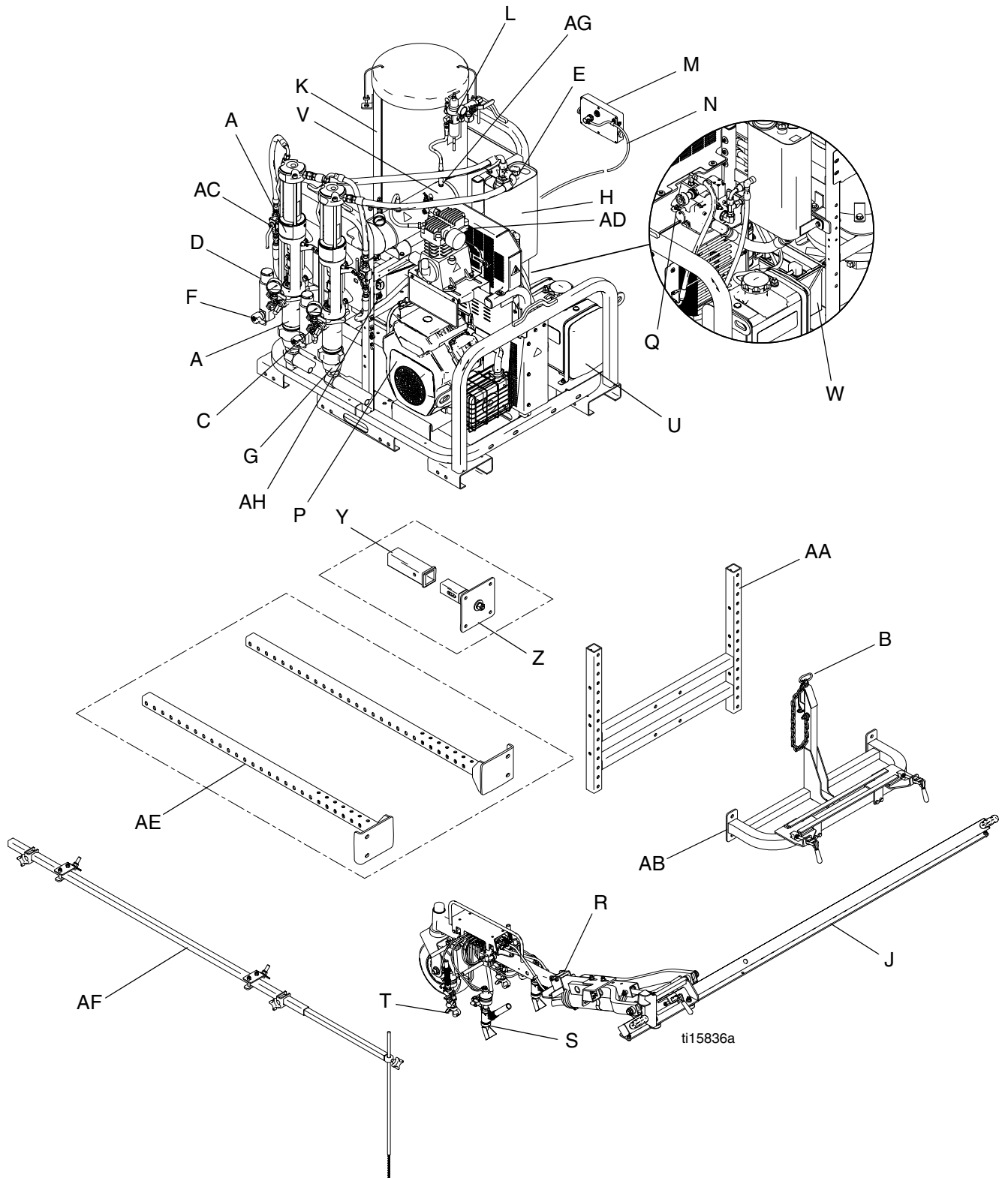


## PERSONAL PROTECTIVE EQUIPMENT

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, hearing loss, inhalation of toxic fumes, and burns. This equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.




# Component Identification





# Component Function

<b>A</b>	RPS 2900 Hydraulic Pump	Provides fluid to be sprayed through the spray gun
<b>B</b>	Stow Bracket Pin	Secures the spray gun boom arm when the RoadLazer is in transport mode
<b>C</b>	Fluid Outlet	Supplies fluid from the displacement pump to the spray gun
<b>D</b>	Fluid Filter	Filters fluid between the fluid source and the spray gun
<b>E</b>	Breather Cap	Provides a means for hydraulic reservoir ventilation, oil check, and fill
<b>F</b>	Pressure Drain Valve	Relieves Fluid Pressure when open
<b>G</b>	Fluid Inlet	Displacement Pump entry for fluid from the paint drums (paint drums not shown)
<b>H</b>	Hydraulic Reservoir	Holds 4 gallons (15.1 liters) of hydraulic oil for the hydraulic pump
<b>J</b>	Slide Beam	Supports the spray gun boom arm
<b>K</b>	Bead Tank	Holds up to 38 gallons of reflective materials or element for single or double drop beading
<b>L</b>	Air Regulator	Allows regulation of the bead tank air pressure
<b>M</b>	Programmable Skipline Controller	Allows the user to program the operation of the RoadLazer
<b>N</b>	I/O Cable	Carries electronic control signals from the Controller to the RoadLazer
<b>P</b>	18 HP Engine	Powers the hydraulic pump and the air compressor
<b>Q</b>	Hydraulic Pressure Control Knob	Provides adjustment of hydraulic pressure (clockwise increases pressure)
<b>R</b>	Spray Gun Boom Arm	Allows striping on either side of the vehicle at adjustable distances
<b>S</b>	Bead Spray Gun	Sprays beads when commanded by the Controller
<b>T</b>	Paint Spray Gun	Sprays fluid when controller by the Controller
<b>U</b>	Fuel Tank	Holds 6 gallons (23 liters) of gasoline
<b>V</b>	Air Accumulator Tank	Helps reduce air temperature from compressor and increases pop-off valve life
<b>W</b>	Battery	Provides power to start the Engine and Control Box
<b>Y</b>	2 in. Hitch Receiver (not provided)	Needed to hook-up the gun arm to the back of a truck
<b>Z</b>	Hitch Insert	Allows the user to connect the gun arm to a single hitch vehicle
<b>AA</b>	Mounting Bracket	Allows the user to connect the gun arm mount to the optimum height
<b>AB</b>	Gun Arm Mount	Supports the main beam and the gun arm
<b>AC</b>	Hydraulic Valve	Valve to shut off/on the hydraulic fluid to the hydraulic motor
<b>AD</b>	Compressor	Provides an air supply for the solenoids and pressurizes the bead tanks
<b>AE</b>	Slide in Mounting Frame	Allows user to connect the gun arm to the RoadPak frame
<b>AF</b>	RoadPak Pointer System	Allows the user an alignment tool
<b>AG</b>	Air Pressure Quick Release	Allows the user to use pressurized air
<b>AH</b>	Electrical Junction Box	Allows the user access to electrical system

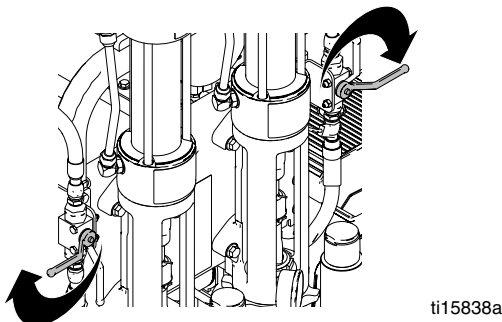
# Pressure Relief Procedures

  
<p><b>INJECTION HAZARD</b></p> <p>The system pressure must be manually relieved to prevent the system from starting or spraying accidentally. Fluid under high pressure can be injected through the skin and cause serious injury. To reduce the risk of an injury from injection, splashing fluid, or moving parts, follow the <b>Pressure Relief Procedure</b> whenever you:</p> <ul style="list-style-type: none"> <li>• are instructed to relieve the pressure</li> <li>• stop spraying</li> <li>• check or service any of the system equipment</li> <li>• install or clean the spray tip</li> </ul>

 
<p><b>FIRE AND EXPLOSION HAZARD</b></p> <p>When Flushing system, always connect grounding cord.</p>

## RPS 2900 Pump Fluid Pressure Relief

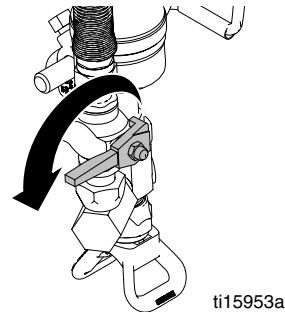
1. Set hydraulic valve to OFF position.



2. Run engine at half throttle.
3. Place empty pail under paint guns to catch drainage.
4. Relieve hose pressure through guns. Use Programmable Skipline Controller to trigger each gun for at least 3 seconds each.

**NOTE:** Always relieve pressure with the guns--not with the filter drain valves.

5. Close paint gun ball valves.

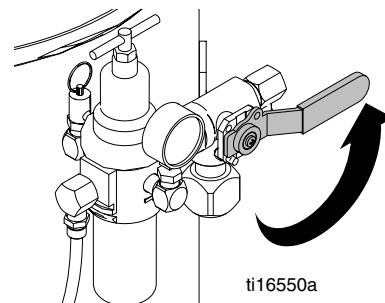


6. Open all drain valves, one at a time.
7. Close valves immediately to prevent paint from drying in system.
8. Shut off engine.

**NOTE:** If you suspect that the spray gun or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, **very slowly** loosen the hose end coupling, and relieve pressure gradually. Then loosen it completely. Then clear the valve or hose.

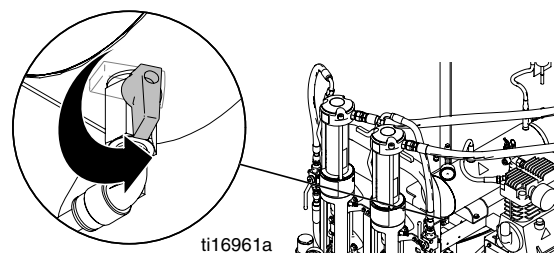
## Bead System Pressure Relief

1. Relieve air pressure in bead tank by turning bead system valve to OFF position.



## Air System Pressure Relief

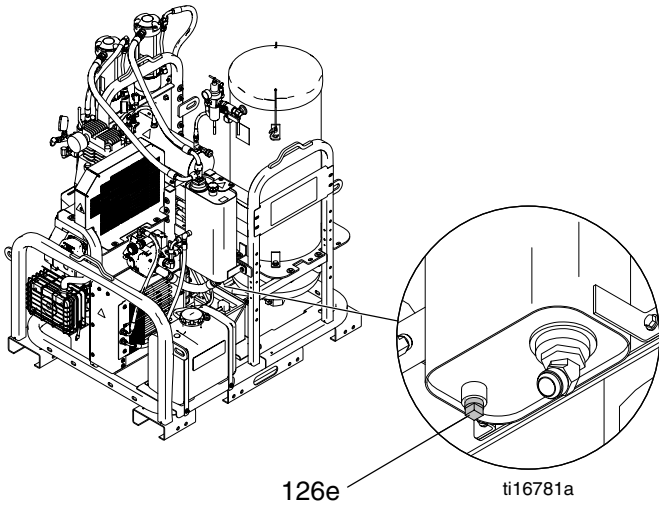
1. Relieve air pressure in air tank by turning air valve to OPEN position.



# Changing Hydraulic Oil

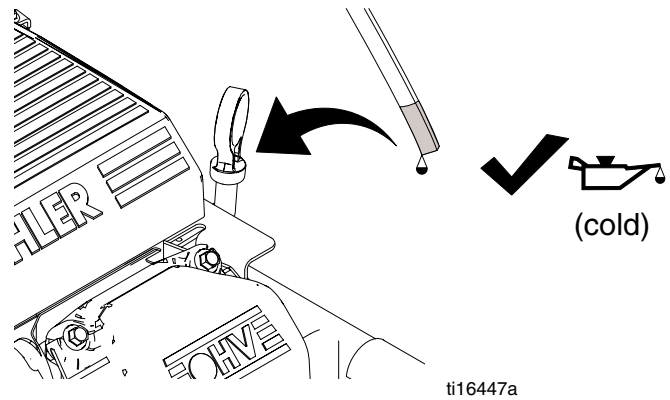
## Drain Oil

1. Use a funnel to drain oil into a drain pan. If a funnel is not available, remove the gas tank and place a drain pan under the oil tank.
2. Unscrew reservoir drain plug (126e) and drain oil from reservoir.



## Refilling Oil

1. Replace drain plug (126e).
2. Fill tank with Graco hydraulic oil, ISO 46.  
**NOTE:** Tank holds approximately 4 gallons. Check dipstick to ensure oil level is at an acceptable level.
3. Replace gas tank if removed.
4. Run the unit and recheck hydraulic oil level. Add oil if necessary.





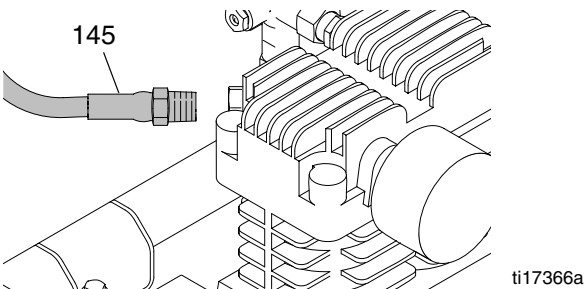
# Compressor Belt and Hydraulic Pump Belt



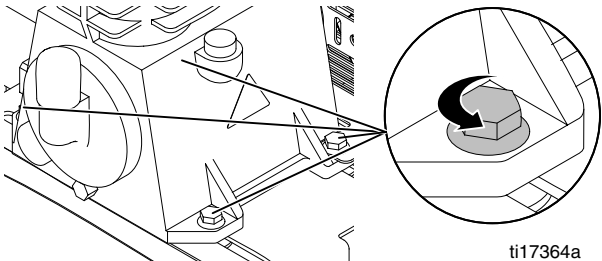
## Belt Removal

**NOTE:** In order to remove the compressor belt, the hydraulic pump belt must first be removed.

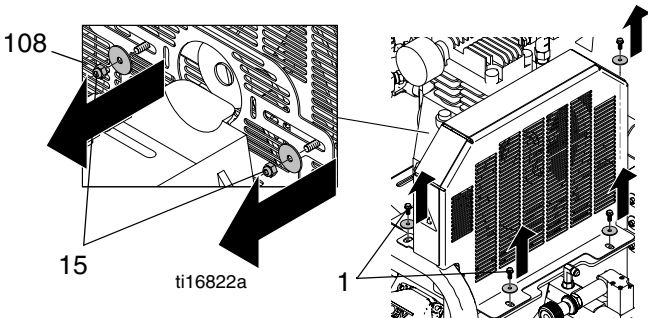
- 1. Remove air line (145) from compressor.



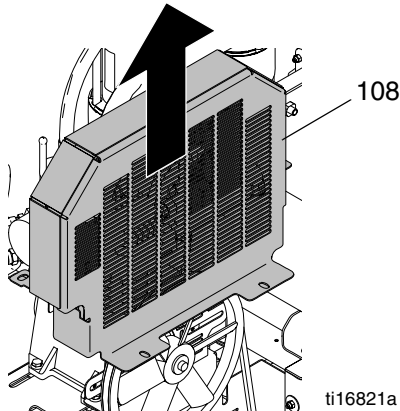
- 2. Loosen four mounting bolts on compressor to reduce compressor belt tension.



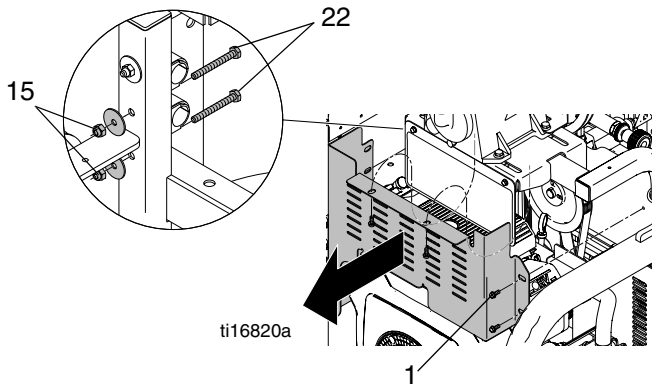
- 3. Remove four screws (1) and two nuts (15) from top belt guard (108).



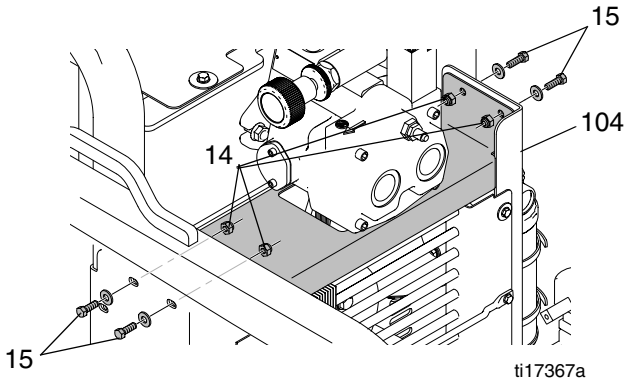
- 4. Remove top belt guard (108).



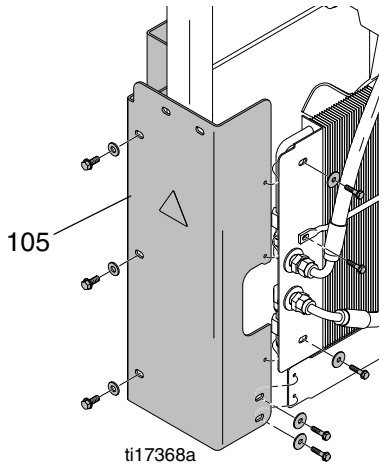
- 5. Remove three screws (1) and two nuts (15) and bolts (22) from front belt guard.



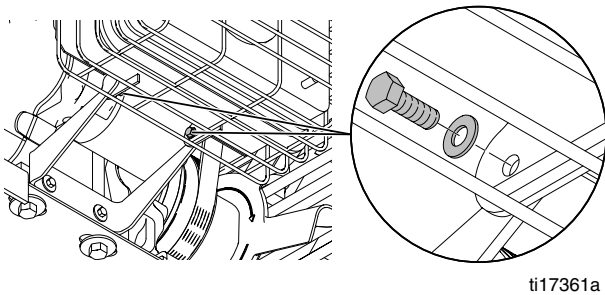
- 6. Remove four nuts (15) and bolts (14) from top fan guard (104) and remove guard.



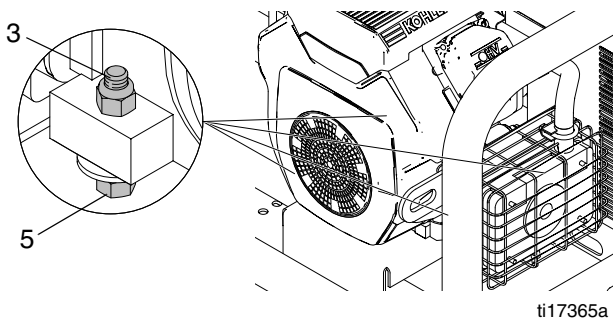
7. Remove eight screws from side guard (105) and remove guard.



8. Remove two screws from engine muffler bracket.



9. Loosen four nuts (5) and bolts (3) which secure engine to relieve tension on hydraulic pump belt.

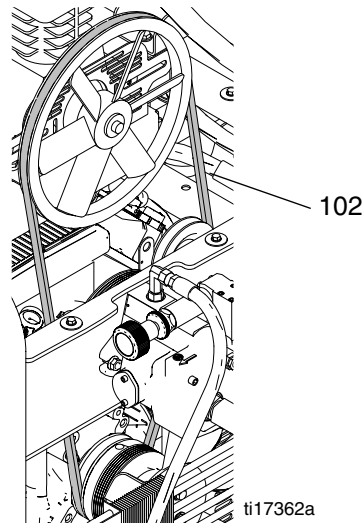


10. Tilt engine back and remove hydraulic pump belt (103). Loop belt around the cooling fan.

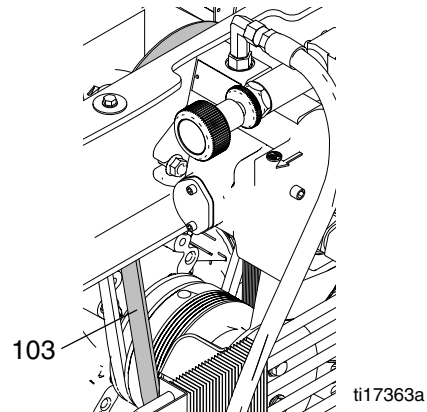
11. If installing a new compressor belt, remove compressor belt (102).

## Belt Installation

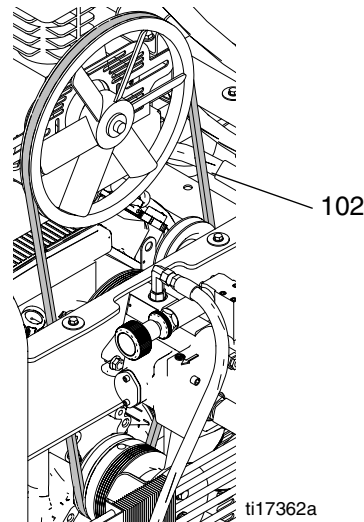
1. Install new compressor belt (102) if necessary.



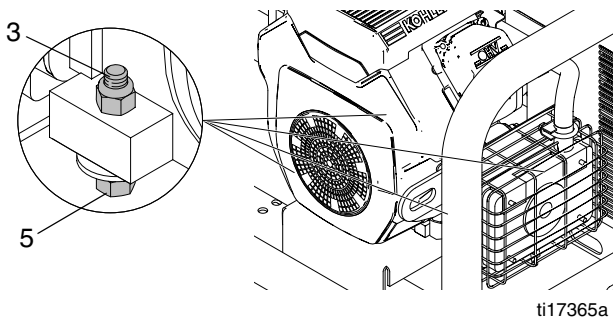
2. Install hydraulic pump belt (103).



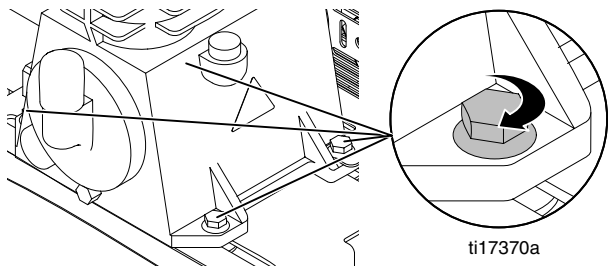
3. Make sure compressor belt (102) is looped around the engine groove, idler pulley and compressor pulley.



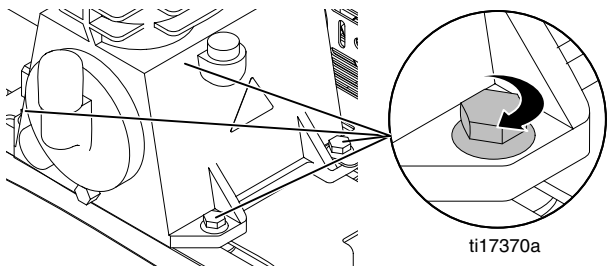
4. Visually inspect and make sure belts will be properly lined up when engine is tightened.
5. Tighten four nuts (5) and bolts (3) to secure engine in place. Visually inspect and make sure hydraulic belt is properly aligned. Repeat until proper alignment is achieved.



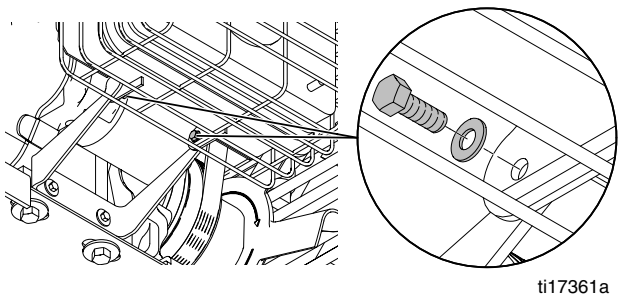
6. Tighten four nuts (5) and bolts (12) so compressor is fairly level. Before completely tightening bolts, tension compressor belt (102) by shifting compressor to the right.



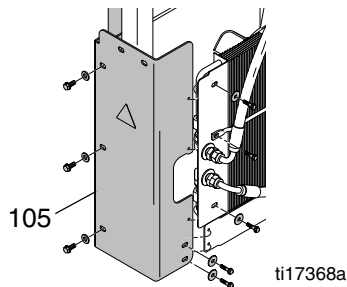
7. Tighten four nuts (5) and bolts (12) to secure compressor in place.



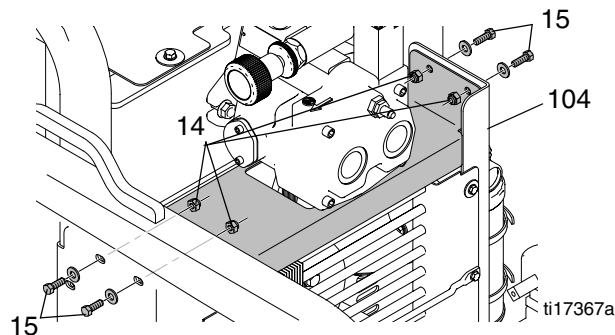
8. Install two screws securing muffler bracket to engine.



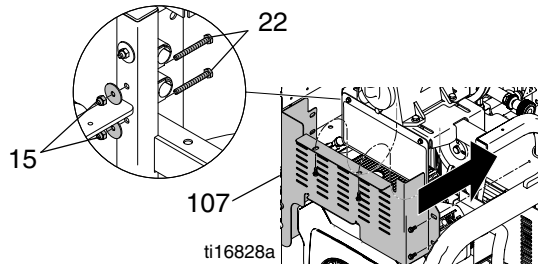
9. Install side guard (105) by tightening eight screws.



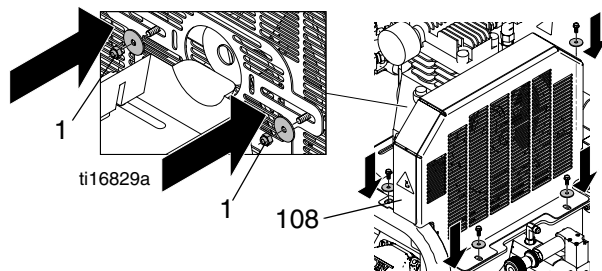
10. Install top fan guard (104) by tightening four bolts (14) and nuts (15).



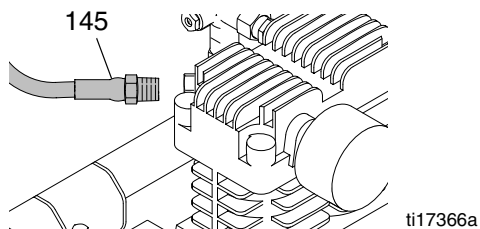
11. Install front belt guard (107) by tightening three screws (1) and two nuts (15) and bolts (22).



12. Install top belt guard (108) by tightening four screws (1) and two nuts (15).



13. Install the air line (145) to the compressor.

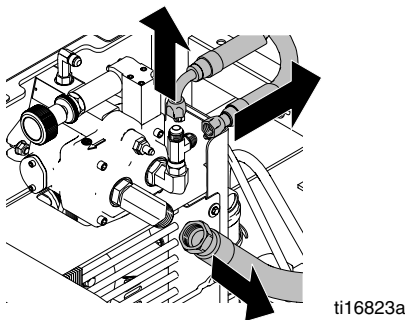


# Hydraulic Pump Replacement

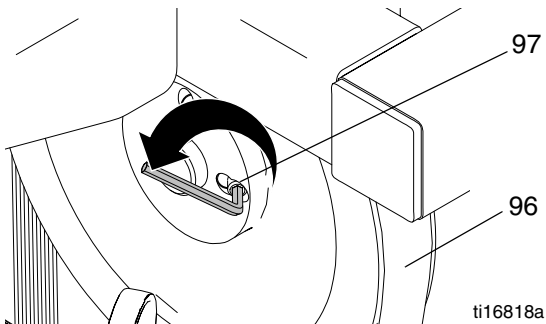


## Removal

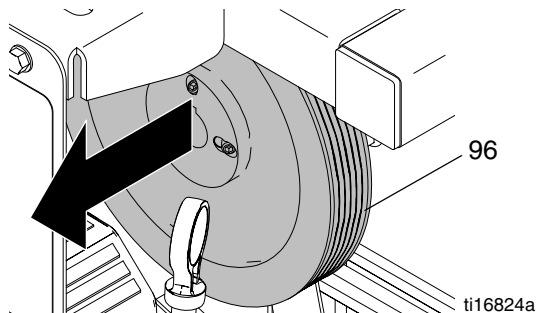
1. Perform **Pressure Relief Procedures**, page 7.
2. Drain and **Change Hydraulic Oil**, page 8.
3. Remove hydraulic pump belt, see **Compressor Belt and Hydraulic Pump Belt Removal**, page 9.
4. Unscrew suction line connections to hydraulic pump. Place a container under hoses to catch any dripping oil.



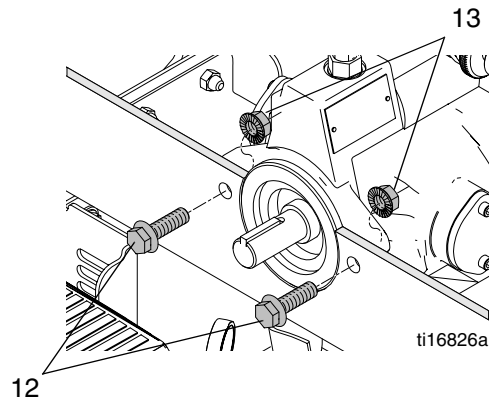
5. Loosen set screws (97) on front of large pulley (96).



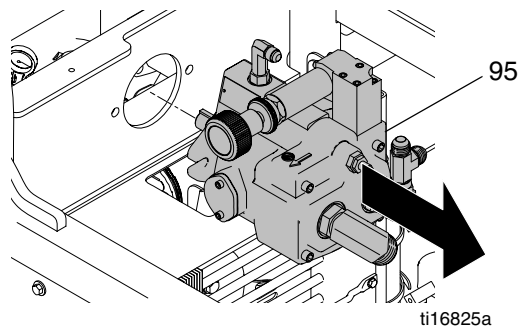
6. Remove pulley (96) from hydraulic pump shaft. Remove idler pulley (101) if necessary.



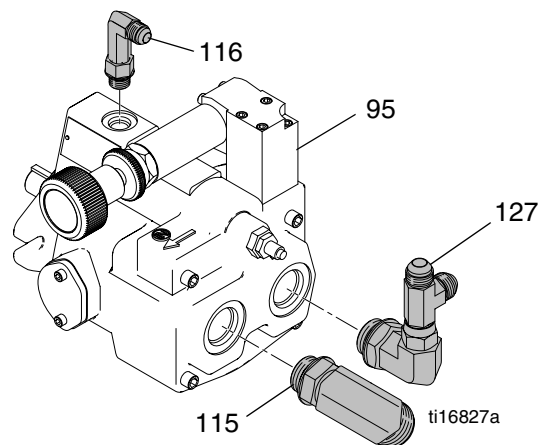
7. Remove nuts (13) and bolts (12) from pump frame.



8. Remove hydraulic pump (95).

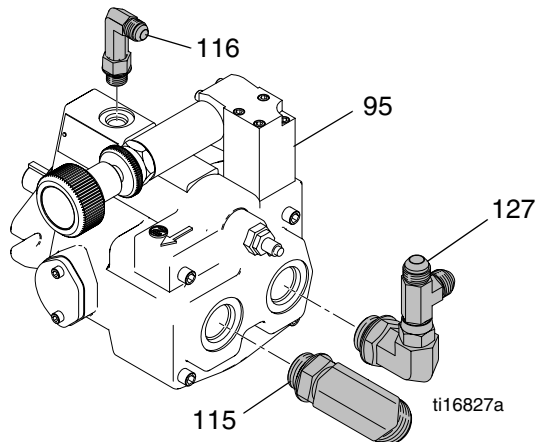


9. Remove fittings (115, 116, 127) from pump (95) and set aside to use on the new pump.



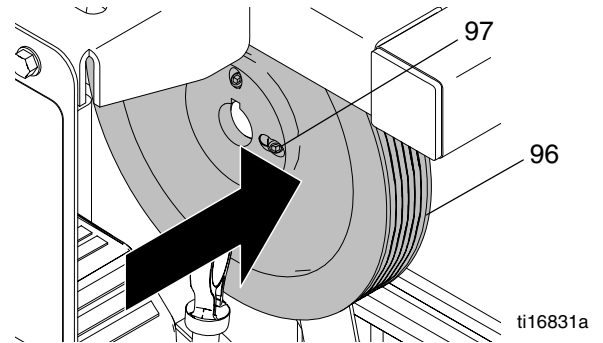
## Installation

1. Install fittings (115, 116, 127) from old pump onto new pump. Torque fittings (116, 127) to 600 +/- 10 in-lb (67.8 N•m). Torque fitting (115) to 450 in-lb (50.8 N•m)



**NOTE:** Fill pump casing with hydraulic oil before installing fitting (115).

2. Install new pump (95) to frame.
3. Install bolts (12) and nuts (13). Torque to 225 +/- 10 in-lb (25.42 N•m).
4. Replace large pulley (96) on hydraulic pump shaft.



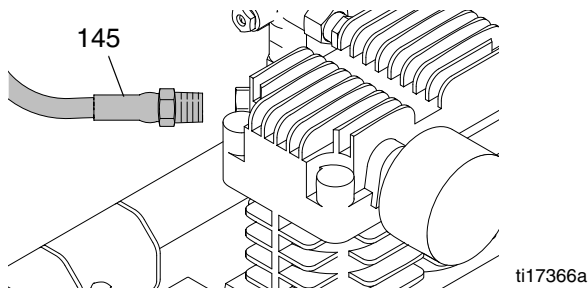
5. Align pulley (96) on shaft.
6. Replace set-screw (97). Tighten and torque to 60 +/- 2 in-lb (6.8 +/- 0.2 N•m).
7. Install compressor belt (102) first, then install hydraulic pump belt (103) (see **Compressor Belt and Hydraulic Pump Belt Installation**, page 9).
8. Install hydraulic fluid lines to the hydraulic pump and tighten fittings.
9. Refill **Hydraulic Supply System**, see page 8.

# Compressor Replacement

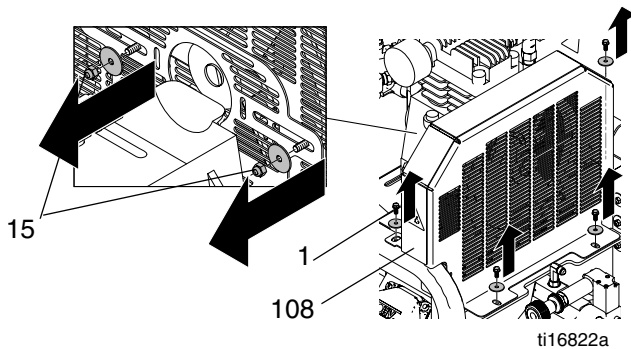


## Removal

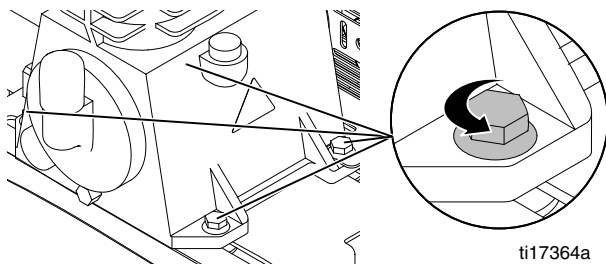
1. Perform **Pressure Relief Procedures**, page 7.
2. Remove air line (145) from compressor.



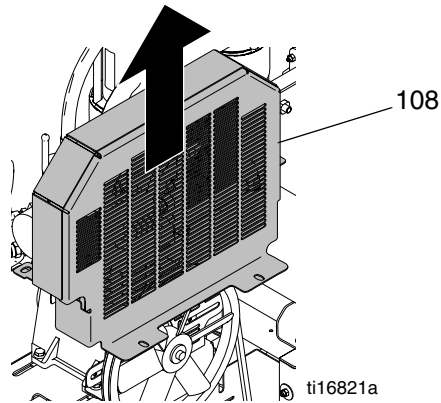
3. Remove four screws (1) and two nuts (15) securing top belt guard (108).



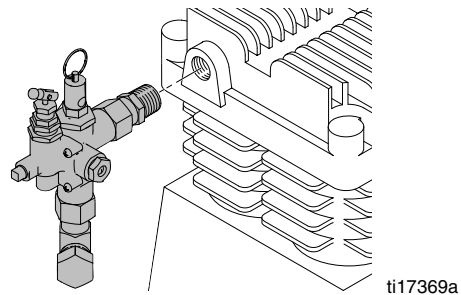
4. Loosen four mounting bolts on compressor to reduce compressor belt tension.



5. Remove top belt guard (108).

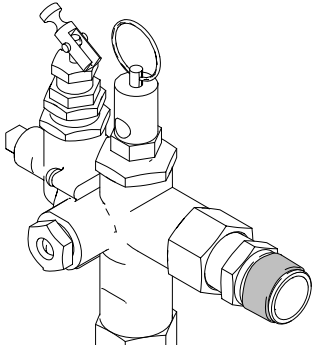


6. Remove belt from compressor pulley. If belts needs to be replaced, see **Compressor Belt and Hydraulic Pump Belt Replacement**, page 9.
7. Unscrew relief valve assembly from the old compressor.



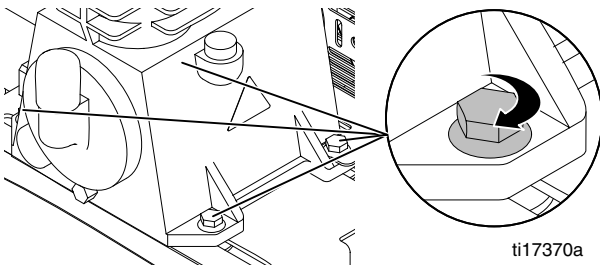
## Installation

1. Apply high temperature thread sealant to threads of relief valve and screw in relief valve to new air compressor.



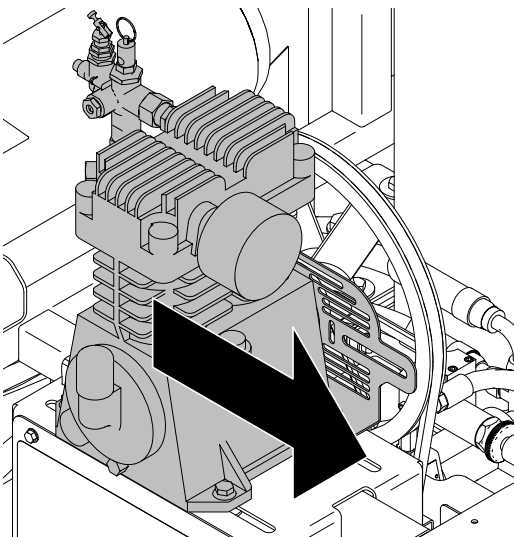
ti17378a

2. Hand-tighten four bolts (12) and nuts (5) to hold compressor (100) and belt guard (101) to frame.



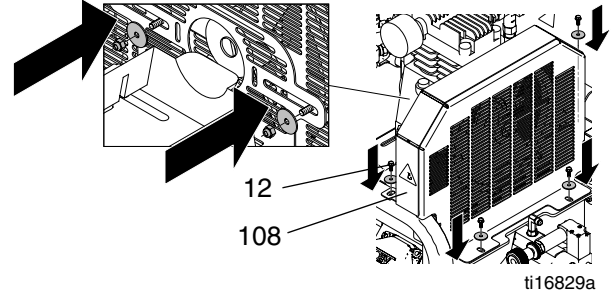
ti17370a

3. Loop compressor belt (102) onto idler pulley, engine pulley, and compressor pulley. **NOTE:** Make sure belt is in the proper track.
4. Tighten four nuts (5) and bolts (12) so that compressor is fairly level. Before completely tightening the bolts, tension compressor belt (102) by shifting compressor to the right.



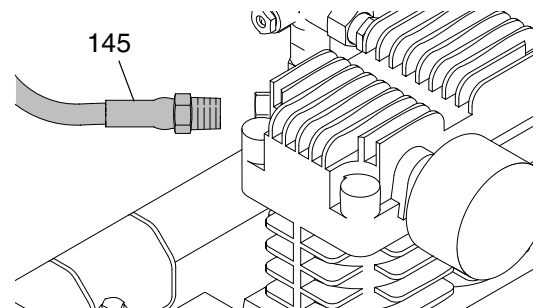
ti17486a

5. Tighten four nuts (5) and bolts (12) to secure compressor.
6. Install top belt guard (108) by tightening four screws (1) and two nuts (15).



ti16829a

7. Install air line (145) to compressor.



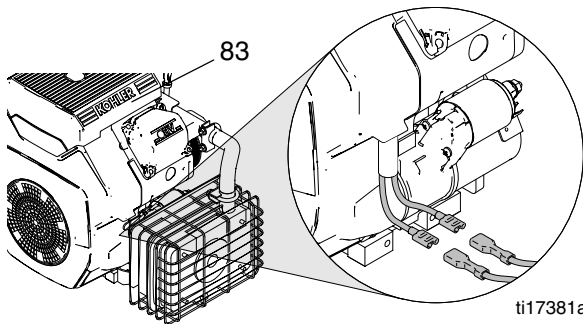
ti17366a

# Engine Replacement



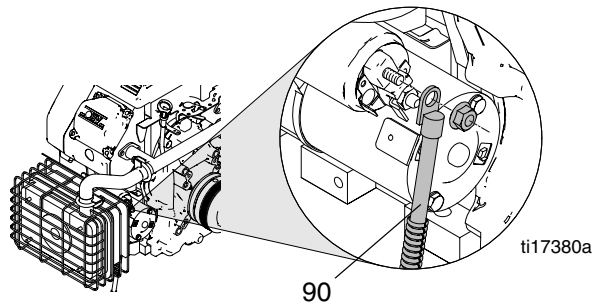
## Engine Removal

1. Perform **Pressure Relief Procedure**, page 7.
2. **Disconnect ground terminal of battery, then disconnect the positive terminal.**
3. Disconnect white and yellow electrical wires located behind muffler.



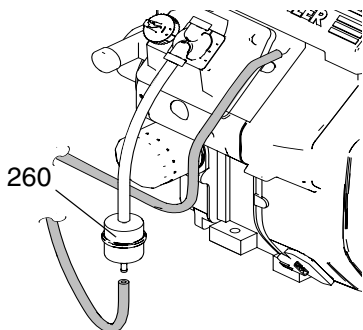
ti17381a

4. Disconnect the positive red wire (90) attached to the engine.



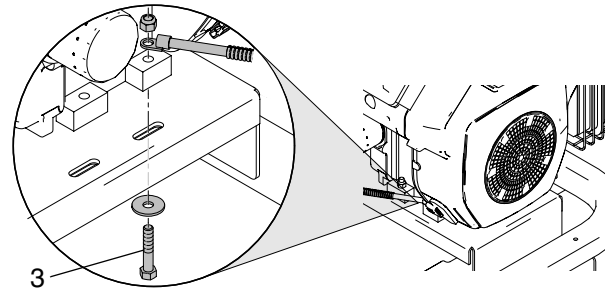
ti17380a

5. Disconnect gas line (260) and the evaporation line (261) from the engine.



ti17379a

6. Remove belts, see **Compressor Belt and Hydraulic Pump Belt Replacement**, page 9.
7. Remove four bolts (3) from the engine (which will also disconnect the ground wire).

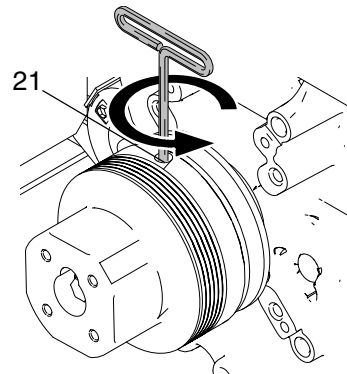


ti17384a

8. Use a lift ring to lift and turn the engine (83) to remove it from the frame. See engine manual for lift locations.

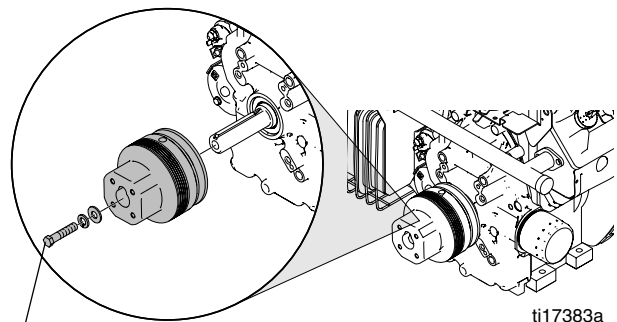
## Pulley Removal

1. Loosen set screw (21) located on the side of the pulley.



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2. Remove bolt (19) in the center of pulley.



ti17383a

3. Remove pulley from engine

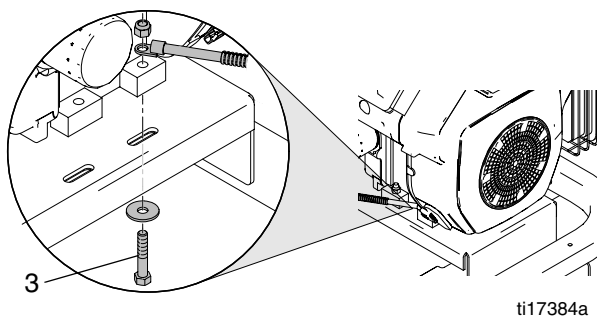


### Pulley Installation

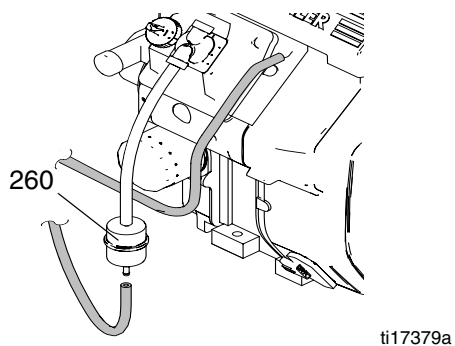
1. Position new pulley on engine.
2. Install bolt (19), washer (4), and lock washer (20) in center of pulley. Torque to 125 +/- 10 in-lb (14.1 +/- 1.1 N•m).
3. Tighten set screw (21). Torque to 60 +/- 2 in-lb (25.4 N•m).

### Engine Installation

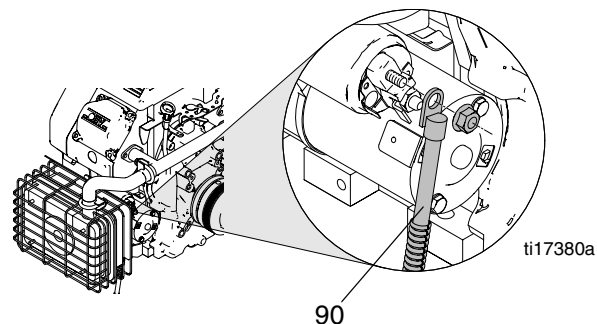
1. Use a lift ring to turn the engine and insert it into the frame.
2. Connect ground wire and hand-tighten four bolts (3) into engine.



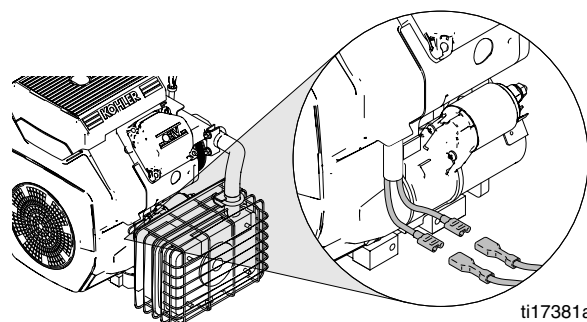
3. Replace belts, see **Compressor Belt and Hydraulic Pump Belt Replacement**, page 9.
4. Connect evaporation line (261) and connect gas line (260).



5. Connect positive red wire (90) to engine.



6. Connect yellow and white electrical wires behind muffler.



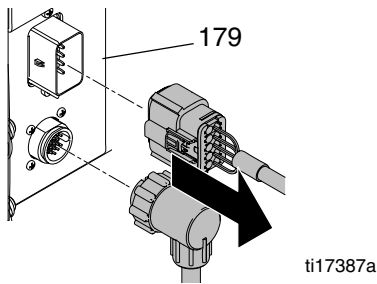
7. Connect positive terminal of battery, then connect ground terminal.

# Junction Box Circuit Board Replacement

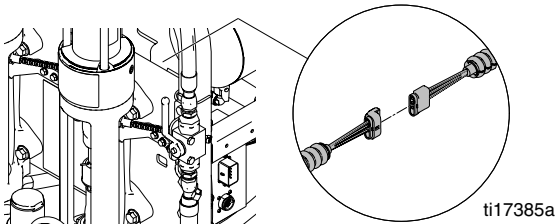


## Removal

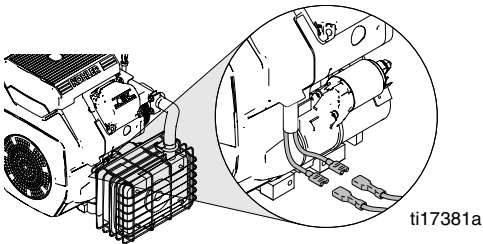
1. Disconnect ground terminal of battery and then disconnect positive terminal of battery.
2. Remove red and black wires from battery area.
3. Unplug control cable and gun arm cable from junction box (179).



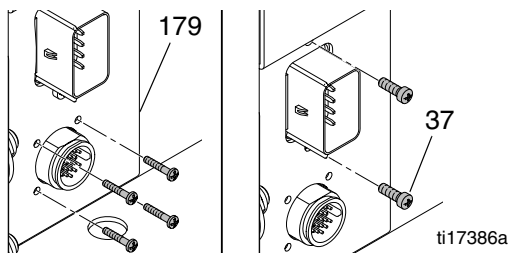
4. Disconnect pump counter wires.



5. Disconnect white and yellow wires behind engine muffler.



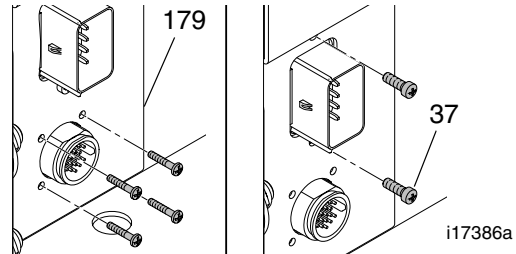
6. Remove four screws (38) and two screws (37) from junction box (179).



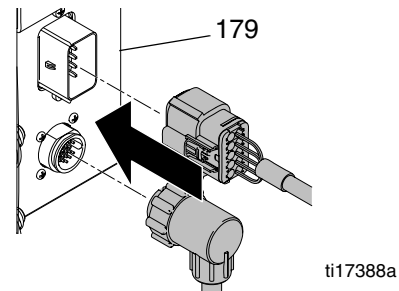
7. Remove circuit board (178) from junction box (179).

## Installation

1. Insert circuit board (178) into junction box (179).
2. Replace four screws (38) and two screws (37) to secure circuit board to junction box (179).

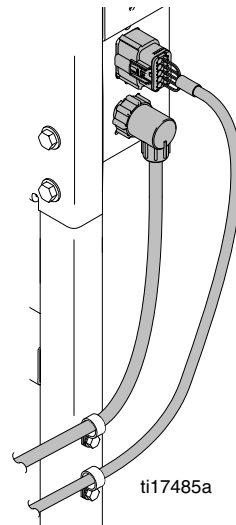


3. Reconnect pump counter wires and engine wires.
4. Plug in control cable and gun arm cable.



**NOTE:** Make sure control cable and gun arm cable have proper strain relief to prevent damage to connections.

5. When all maintenance is finished, reattach battery connections.



# Troubleshooting



Before you proceed with Troubleshooting, perform **Pressure Relief Procedure**, page 7.

Check everything in the troubleshooting tables before you disassemble any equipment.

## Paint Guns and Bead Guns

PROBLEM	CAUSE	SOLUTION
Paint guns not spraying	Clogged tips	Clean tips
	Fuse (20A) is blown	Check 20A fuse between engine and solenoid air valve connector.
	Gun arm safety switch	Check to make sure connectors on gun arm safety switch are properly attached. When gun arm is in down position, measure 12V across the switch terminals to ensure it is working properly. Replace switch if necessary.
	Air compressor and unloader valve	<ol style="list-style-type: none"> <li>1. Turn toggle switch at top of unloader (148) to horizontal. NOTE: Unloader bypasses air when system pressure reaches approximately 115-120 psi (8 bar).</li> <li>2. Turn off bead tank air valve (184) to isolate system.</li> <li>3. If no leaks, check paint gun actuation air lines.</li> </ol>
	Paint gun actuation airline	<ol style="list-style-type: none"> <li>1. Remove actuation air lines from paint gun.</li> <li>2. Trigger skipline controller.</li> <li>3. If air flows from airline, repair paint gun (manual 308613). If air does not flow, check solenoid valves.</li> </ol>
	Solenoid valves	<ol style="list-style-type: none"> <li>1. Go to diagnostic screen and check to see if all solenoids are being recognized by RoadPak Skipline Controller (manual 3A1215).</li> <li>2. Remove solenoid valve cover (519).</li> <li>3. Check for broken wiring or a damaged plug (see <b>Wiring Diagram</b>, page 25).</li> <li>4. Check for 12V DC between red wire and ground.</li> </ol>
	Programmable Skipline Controller	<ol style="list-style-type: none"> <li>1. Go to diagnostic screen and make sure all switches are properly working (manual 3A1215).</li> <li>2. Inspect wiring and plugs for damage.</li> <li>3. Replace any damaged wiring or plugs (manual 3A1301).</li> </ol>

PROBLEM	CAUSE	SOLUTION
Bead guns not spraying	Paint guns and bead guns	If paint guns and bead guns are not working, check paint guns first.
	Bead tank air valve	Turn bead tank valve ON
	Nozzles plugged	<ol style="list-style-type: none"> <li>1. Turn off air pressure.</li> <li>2. Remove nozzles and clean out any plugging.</li> <li>3. If paper or other debris is constantly plugging nozzles use a filter when loading bead tank (standard window screen works fine).</li> <li>4. With nozzles removed, apply air to bead tank. Spray beads into dry container.</li> <li>5. Check if beads are wet. If beads are wet, remove beads from bead tank and replace with dry beads.</li> </ol>
	Solenoid valves	<ol style="list-style-type: none"> <li>1. Go to diagnostic screen and check to see if all solenoids are being recognized by RoadPak Skipline Controller (manual 3A1215).</li> <li>2. Remove solenoid valve cover (590).</li> <li>3. Check for broken wiring or a damaged plug (see <b>Wiring Diagram</b>, page 25).</li> <li>4. Check for 12V DC between red wire and ground.</li> </ol>
	Programmable Skipline Controller	<ol style="list-style-type: none"> <li>1. Go to diagnostic screen and make sure all switches are properly working (manual 3A1215).</li> <li>2. Inspect wiring and plugs for damage.</li> <li>3. Replace any damaged wiring or plugs (manual 3A1301).</li> </ol>
Actual line length not matching programmed line length	Out of calibration	<ol style="list-style-type: none"> <li>1. Follow calibration in Programmable Skipline Controller manual 3A1215.</li> <li>2. Spray one or two test skips and measure actual length. If actual length is longer than programmed length, increase Paint Gun ON delay. If actual length is shorter than programmed length, increase Paint Gun OFF delay.</li> </ol>
Actual cycle not matching programmed cycle	Out of calibration	Follow calibration procedure in Programmable Skipline Controller manual 3A1215.
Bead guns not synchronizing with paint guns	Out of calibration	<ol style="list-style-type: none"> <li>1. Follow calibration in Programmable Skipline Controller manual 3A1215.</li> <li>2. If beads start before paint, add delay time to Bead ON Delay. If paint starts before beads, add equal delay time to both Paint ON and Paint OFF Delays (this does not affect paint skip line length).</li> <li>3. If beads end before paint, add delay time to Bead OFF Delay. If beads end after paint, add equal delay time to both Paint ON, Paint OFF and Bead ON Delays. This shifts everything forward.</li> </ol>

PROBLEM	CAUSE	SOLUTION
Paint guns not turning off immediately or at all	Valve needed	<ol style="list-style-type: none"> <li>1. Spray needle with light coat of lubricant. Use air hose or water hose to break up and remove solidified beads.</li> <li>2. Replace needle, seat, and packings (see Repair Kit 238339).</li> </ol>
Gun arm wobbling or hopping excessively	Swivel nut	<p><b>Gun arm wobbles</b></p> <ol style="list-style-type: none"> <li>1. Remove dust cap (547).</li> <li>2. Tighten boom arm swivel nut (504) until swivel has slight restriction.</li> </ol> <p><b>Gun arm hops</b></p> <ol style="list-style-type: none"> <li>1. Lower air pressure in gun arm wheel.</li> <li>2. Replace damaged gas shock (507).</li> </ol>
Excessive overspray on gun arm wheel	Paint guns out of position	<ol style="list-style-type: none"> <li>1. Angle paint guns back 15° to 20°.</li> <li>2. Coat wheel and gun arm parts with non-stick cooking oil, light oil, silicon, or Auto Mask ZEP to prevent paint from sticking to them.</li> </ol>
Pulsation in spray pattern	Low or erratic pressure in paint pump	<ol style="list-style-type: none"> <li>1. Check paint supply and suction inlet screens.</li> <li>2. Replace spray tips.</li> <li>3. Check outlet filter.</li> <li>4. Replace packings. Clean and service intake valve and piston valve.</li> </ol>

## Programmable Skipline Controller

PROBLEM	CAUSE	SOLUTION
Controller not turning on	Fuse, battery, or wiring	<ol style="list-style-type: none"> <li>1. Check fuse located next to 12V RoadLazer battery.</li> <li>2. Check battery voltage. Replace if necessary.</li> <li>3. Inspect wiring at battery for corrosion. Inspect control cable for damage.</li> </ol>
Controller shutting down or cutting out during striping	Battery or wiring	<ol style="list-style-type: none"> <li>1. Check battery voltage. A weak battery can drop voltage low enough to cause intermittent shut down.</li> <li>2. Check wiring.</li> <li>3. Ground control box to vehicle chassis.</li> </ol>
System Delay not turning on	System not configured for striping or is shut off	<ol style="list-style-type: none"> <li>1. Remove gun arm from stowed position, and start up engine. System delay will not turn on unless you are ready to stripe.</li> <li>2. System Delay must be turned back on after engine is turned off.</li> </ol>
Controller not displaying MPH (KM/H), or readout is erratic	Gun arm sensor or sensor wiring	<ol style="list-style-type: none"> <li>1. Check sensor (524) located on gun arm wheel assembly. Set sensor approximately 1/8 in. (3 mm) from target plate.</li> <li>2. Check sensor head for damage. Replace if damaged.</li> <li>3. Check sensor wiring by removing solenoid valve cover (519).</li> </ol>
System Delay actual distance not precisely matching programmed distance	Programmed distance needs fine tuning	<ol style="list-style-type: none"> <li>1. This is usually true. Get it as close as possible, then spray one additional test line and try to hit the start point.</li> <li>2. Measure difference between start point and where paint guns turn on. If paint guns turn on before start point, add measured difference to current system delay distance. If paint guns turn on after start point, subtract measured difference.</li> </ol>

## Air and Bead System

PROBLEM	CAUSE	SOLUTION
Belts squealing during engine startup	Compressor belt needs tightening or replacing	See <b>Air Compressor Belt Replacement</b> , page 9.
Paint guns not spraying when empty bead tank is empty	All of air supplied by air compressor is rushing out of bead gun nozzles. In turn, system air pressure cannot build enough to trigger guns. This is normal.	Fill bead tank with beads or turn off air supply to bead tank.
No system pressure	Compressor bypassing air continuously	<ol style="list-style-type: none"> <li>1. Make sure silver switch on top of unloader valve (148) is turned horizontally.</li> <li>2. Move silver switch on top of unloader valve (148) up and down. This might loosen a sticky valve.</li> <li>3. Replace unloader valve (148).</li> </ol>
Beads not dispensing properly	Excessive water or moisture in bead tank	<ol style="list-style-type: none"> <li>1. Only pressurize reflective materials when dispensing. Small air leaks at gun nozzle or air fittings cause continuous moisture to be pumped into tank.</li> <li>2. For areas of extreme humidity a Bendix air dryer or equivalent may be installed in air line bead tank. Typically when beads are used continuously, they do not spend enough time in tank to collect enough moisture to be a problem. Usually it is continuous stencil painting for long periods of time with little bead consumption and high humidity that can cause problems.</li> </ol>
Low system pressure	Excessive air leaks	<ol style="list-style-type: none"> <li>1. Fix all air leaks before they become a problem. Air leaks can eventually starve system air supply.</li> <li>2. Most air leaks occur at bead tank outlet fitting. If fitting leaks air, completely remove it and use thread tape and liquid thread sealant before reinstalling it.</li> </ol>
No beads dispensing	Beads have solidified	<ol style="list-style-type: none"> <li>1. Never store RoadLazer with reflective materials in tank for long periods of time.</li> <li>2. Remove aluminum fitting from bottom of tank. Flush out solidified beads.</li> <li>3. Use air hose or water hose to break up and remove solidified beads from tank.</li> </ol>

## Kohler Engine

PROBLEM	CAUSE	SOLUTION
Engine not starting	Programmable Skipline Controller is shut off, or engine is out of fuel	<ol style="list-style-type: none"> <li>1. Turn on Programmable Skipline Controller. Engine will not start with control off.</li> <li>2. Check fuel supply.</li> <li>3. See Kohler engine instruction manual.</li> </ol>
Engine stalling	Engine fuel tank is empty or not breathing, or engine oil is low.	<ol style="list-style-type: none"> <li>1. Check fuel supply. Open breather on fuel tank. Check engine oil level.</li> <li>2. See Kohler engine instruction manual.</li> </ol>

## Paint Pumps

PROBLEM	SOLUTION
Pumps wearing prematurely	<p>Reduce premature pump wear and costly down-time with the following tips:</p> <ul style="list-style-type: none"> <li>• Keep piston throat full of TSL</li> <li>• If possible, shorten lines to reduce pump back pressure</li> <li>• Use Graco strainer at pump inlet to filter-out dried paint and debris</li> <li>• Inspect internal suction hoses for paint build-up, which can cause pump starving</li> <li>• Replace pump packings seasonally to increase piston and sleeve life</li> <li>• Always keep hydraulic reservoir full to reduce heat build-up</li> </ul>

## Paint and Paint Manufacturers

PROBLEM	SOLUTION
Do not know what type of paint to use	<p>When ordering paint from manufacturer:</p> <ul style="list-style-type: none"> <li>• Inform paint suppliers of type of equipment to be used (RoadLazer), filter screen sizes (30 mesh) and tip sizes (33 to 45 thousands)</li> <li>• Require that paint must pass through a 30-mesh filter with minimal filter plugging</li> </ul> <p>Things to know about waterborne paint and striping equipment:</p> <ul style="list-style-type: none"> <li>• Flush waterborne paints from system if system is not used on a regular basis. Waterborne paints do not dilute easily. Use warm soapy water to flush system.</li> <li>• Waterborne paints will not redissolve. Dried paint film in paint containers or paint suction lines must be removed. Graco offers a Suction Line Strainer Kit 24G774 that should be installed at least 2 ft from pump inlet to remove contamination. Strainers must be cleaned regularly to avoid pump starving or cavitation.</li> <li>• Waterborne paints cannot freeze or tolerate temperatures above 120° F (49° C). Consult paint manufacturer.</li> <li>• With age, waterborne paint pigments settle to bottom of container. Never use settled paint without agitating. It is important to order fresh paint. Require paint manufacturers to supply manufactured dates and stagger shipments throughout striping season.</li> </ul>

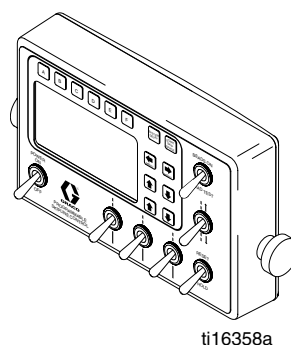


# Wiring Diagrams

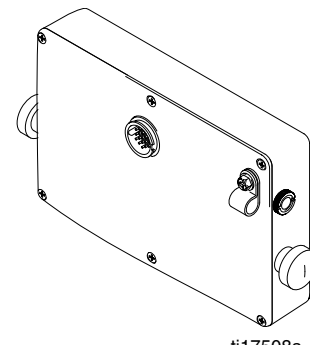
## Schematics - 24F472, Controller

### Control Cable Diagram for RoadPak System

Contact	Description	Action
1	12 VDC	Supply Voltage
2	Leave Open - Do Not Connect	
3	Leave Open - Do Not Connect	
4	Sensor, pump (1)	Input
5	Sensor, pump (2)	Input
6	Paint Gun (1) Solenoid 1	Output (1 amp Max)
7	Paint Gun (2) Solenoid 3	Output (1 amp Max)
8	Paint Gun (3) Solenoid 5	Output (1 amp Max)
9	Bead Gun (1) Solenoid 2	Output (1 amp Max)
10	Bead Gun (2) Solenoid 4	Output (1 amp Max)
11	Bead Gun (3) Solenoid 6	Output (1 amp Max)
12	Engine Shutdown (ground)	
13	Ground **	
14	Ground **	
15	Ground **	
16	Sensor Distance	Input
17	Ground **	
18	Leave Open - Do not connect	



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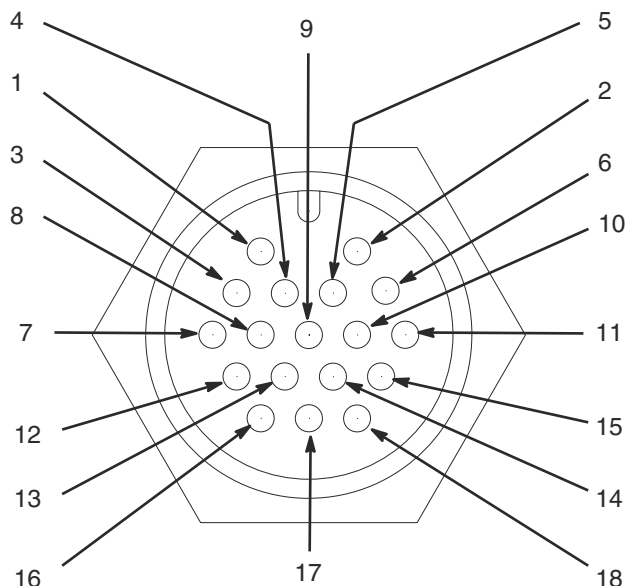


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### Alternative Pin Arrangement for OEM Applications

**NOTE:** Pin 18 must be grounded to activate this configuration.

Contact	Description	Action
1	12 VDC	Supply Voltage
2	Sensor Distance ++	Input ++
3	Sensor, safety, guns	Input
4	Sensor, pump (1)	Input
5	Sensor, pump (2)	Input
6	Paint Gun (1) Solenoid 1	Output (1 amp Max)
7	Paint Gun (2) Solenoid 3	Output (1 amp Max)
8	Paint Gun (3) Solenoid 5	Output (1 amp Max)
9	Bead Gun (1) Solenoid 2	Output (1 amp Max)
10	Bead Gun (2) Solenoid 4	Output (1 amp Max)
11	Bead Gun (3) Solenoid 6	Output (1 amp Max)
12	Engine shutdown (ground)	
13	Ground **	
14	Ground **	
15	Ground **	
16	Sensor Pump (3)	Input
17	Ground **	
18	Ground **	



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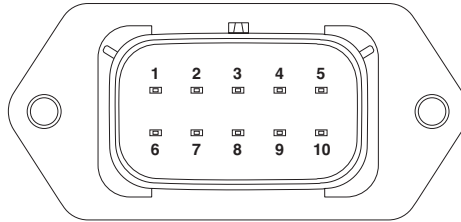
**NOTE:** All inputs are for open-collector/pull-down/NPN/Sinking Sensors unless otherwise noted.

\*\* All ground pins MUST be connected to ground

++ input for pull-up/PNP/Sourcing Sensor

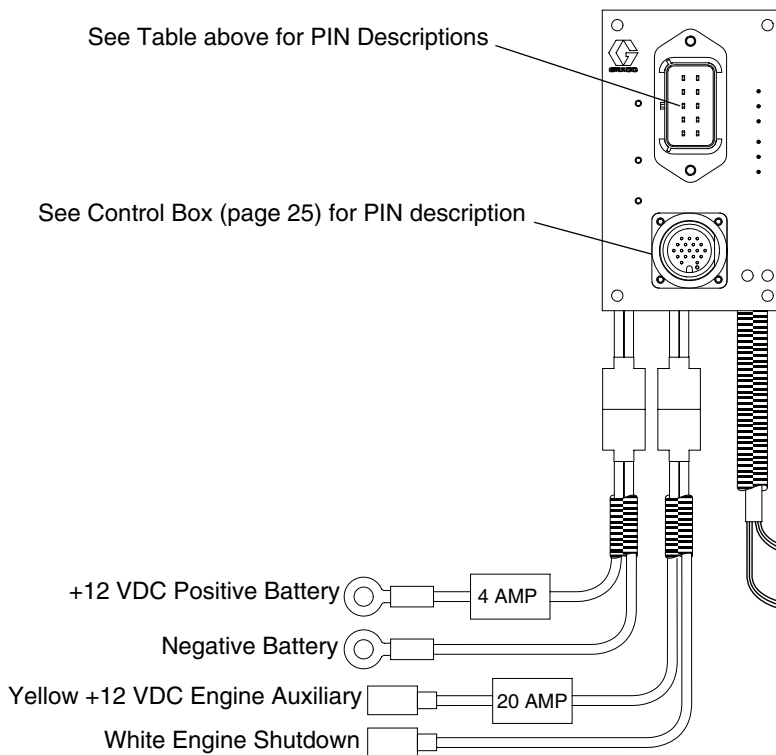
## Schematics - 24F922, Board Interconnect

PIN	Description
1	Paint Gun (1) Solenoid 1
2	Bead Gun (1) Solenoid 2
3	Paint Gun (2) Solenoid 3
4	Bead Gun (2) Solenoid 4
5	Paint Gun (3) Solenoid 5
6	Bead Gun (3) Solenoid 6
7	Wheel Sensor Signal
8	Wheel Sensor Ground
9	Wheel Sensor Power + 12 VDC
10	Solenoid Power + 12 VDC

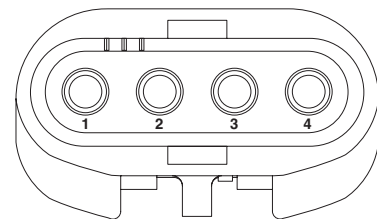


See Table above for PIN Descriptions

See Control Box (page 25) for PIN description

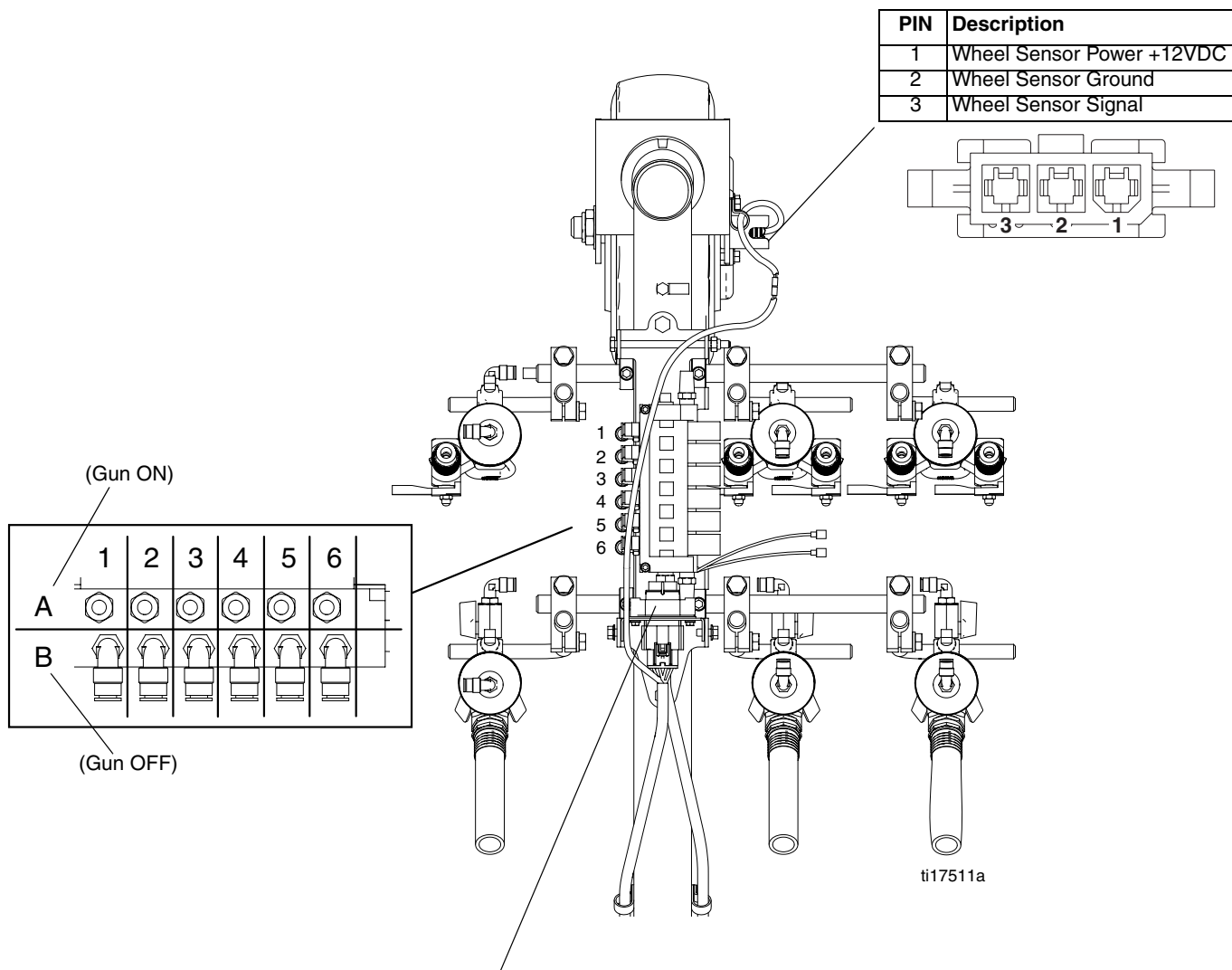


PIN	Description
1	Not Used
2	Pump Counter Signal
3	Pump Counter Ground
4	Pump Counter Power +12VDC



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# Schematics - 16G049, Valve Air Solenoid



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Safety Switch 123885

# Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

**THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

**GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO.** These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

## **FOR GRACO CANADA CUSTOMERS**

The Parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés, à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

# Graco Information

For the latest information about Graco products, visit [www.graco.com](http://www.graco.com).

**TO PLACE AN ORDER**, contact your Graco distributor or call 1-800-690-2894 to identify the nearest distributor.

*All written and visual data contained in this document reflects the latest product information available at the time of publication. Graco reserves the right to make changes at any time without notice.*

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