VEEDER-ROOT

Manual No: **577014-049** • Revision: **K**

The Red Jacket 4” Submersible Turbine Pump

Installation, Operation and Service

Red Jacket® Quick-Set® Submersible Pump

REDJACKET®

Notice

Veeder-Root makes no warranty of any kind with regard to this publication, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Veeder-Root shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this publication.

Veeder-Root reserves the right to change system options or features, or the information contained in this publication.

Contact Red Jacket Technical Support for additional troubleshooting information at 800-323-1799.

DAMAGE GOODS/LOST EQUIPMENT

Thoroughly examine all components and units as soon as they are received. If any cartons are damaged or missing, write a complete and detailed description of the damage or shortage on the face of the freight bill. The carrier's agent must verify the inspection and sign the description. Refuse only the damaged product, not the entire shipment.

VR must be notified of any damages and/or shortages within 30 days of receipt of the shipment, as stated in our Terms and Conditions.

VEEDER-ROOT'S PREFERRED CARRIER

1. Fax Bill of Lading to V/R Customer Service at 800-234-5350.
2. Call V/R Customer Service at 800-873-3313 with the specific part numbers and quantities that were received damaged or lost.
3. VR will file the claim with the carrier and replace the damaged/missing product at no charge to the customer. Customer Service will work with production facility to have the replacement product shipped as soon as possible.

CUSTOMER'S PREFERRED CARRIER

1. Customer files claim with carrier.
2. Customer may submit a replacement purchase order. Customer Service will work with production facility to have the replacement product shipped as soon as possible.
3. If "lost" equipment is delivered at a later date and is not needed, VR will allow a Return to Stock without a restocking fee.
4. VR will NOT be responsible for any compensation when a customer chooses their own carrier.

RETURN SHIPPING

For the parts return procedure, please follow the instructions in the "General Returned Goods Policy" pages of the "Policies and Literature" section of the Veeder-Root North American Red Jacket Mechanical Products Price Book. Veeder-Root will not accept any return product without a Return Goods Authorization (RGA) number clearly printed on the outside of the package.

RESPONSIBILITIES OF THE INSTALLER AND STATION OWNER

This installation, operation and service instruction manual shall be left with the owner of the service station at which this equipment is installed. Retain these instructions for future use and provide them to persons servicing or removing this equipment.

Introduction

Installation

Service And Repair

Parts Lists

Appendix A: Check Valve/Air Purge Screw Operation

Appendix B: Hardware/Seal Kit O-Ring Gauge

Appendix C: Settings For Motor Protection Device

Appendix D: Field Serviceable NPT Joints

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Introduction

Overview

The Red Jacket Submersible Turbine Pump (STP) assembly for international markets is engineered for advanced safety, environmental protection, serviceability and flow. The Red Jacket STP fits 4-inch NPT threaded thin-wall risers and is available in a variety of horsepowers and lengths.

NOTICE **This information is generated as a consequence of carrying out the ignition hazard assessment.**

Newly designed safety features of The Red Jacket STP

Industry-leading design enhancements for the Red Jacket submersible motor and The Red Jacket STP enable the latest European ATEX safety standards (EN 15268) to be easily complied with. The motor has Encapsulation and Increased Safety protections using increased isolation and clearances between electrical and moving components to reduce the possibility of generating sparks in addition to Flameproof protection with the structural strength and tightness to withstand and contain an explosion.

The unique design enhancements have created multiple levels of safety protection allowing The Red Jacket Submersible Turbine Pump to be certified to be safe and reliably operated even in the most risky and adverse conditions – when a gas group IIA fuel storage tank nears being empty and contains potentially explosive vapors. The pump staging is designed with electrically conductive materials to prevent creation of static electricity.

The packer's extractable section incorporates Increased Safety and Flameproof protections utilizing an improved electrical yoke connection that provides a secondary vapor barrier to prevent fuel vapors from the tank entering the manifold's electrical compartment. In the event of improper power supply shut off during extraction of the pump assembly, it also prevents electrical sparks from coming into contact with vapors or fuel that may be present in the tank chamber or manhole. Separation of Zone 0 (inside the storage tank) and Zone 1 (tank chamber or manhole) is accomplished by the male connector partition wall between the packer and manifold connection. Connection of the UMP wiring is within the Zone 0 boundary (Category 1) and Increased Safety measures inside the flameproof enclosure must be ensured during field wiring connections. The manifold is certified as Category 2 equipment for Zone 1 areas.

An external connection terminal for an equipotential bonding conductor is provided on the side of the manifold.

Service spill elimination

The check valve can be raised to provide a larger path to depressurize the line and return fuel to the tank.

Vacuum monitoring applications

The vacuum sensor-siphon is a monitoring-grade siphon system. It is designed specifically for use in vacuum monitoring applications and to integrate with vacuum sensors. The two-port vacuum sensor-siphon system incorporates a check valve poppet assembly with an inline filter screen that reduces the clogs and failures that can cause false alarms and downtime in vacuum monitoring applications.

Plug-in yoke electrical connection

Safety practice when servicing other STPs requires turning off the circuit breaker, backing off the bolts by up to one inch, and then manually pulling the electrical yoke connection apart. With The Red Jacket STP you turn off the circuit breaker and then simply back off the two nuts holding the extractable in place and the yoke electrical connection is disconnected as the extractable is removed. After service is complete, the electrical circuit reconnects when the two nuts are re-tightened. Safe, simple and easy.

Extractable is easy to service

The Red Jacket STP incorporates industrial die springs that break loose the O-ring seals when the nuts holding the extractable in place are removed. No physical effort or special equipment is required to break the seal. In addition, all connected accessories are attached to the manifold. There is no need to remove accessories, leak detectors, or siphons when service or upgrades require removing the extractable.

Utilize the lifting eyebolt to lift out the extractable unit. Removal of the extractable section of the pump must be conducted with caution. Make certain that the extractable section remains centered within the riser pipe and that no portion of the extractable binds during the removal process. If binding occurs during removal, stop and determine the cause of the binding and correct the situation before proceeding with removal.

Manifold allows for vertical or horizontal discharge

The Red Jacket STP has been designed for vertical product discharge via a 2-inch NPT threaded port, but with adequate swinging radius to allow for the addition of an elbow to accommodate a side discharge. In fact, the discharge is located on the manifold so that a side discharge is on the same plane as previously provided on models with a side discharge port. An adapter with 2-inch BSP threads is provided.

Built-in contractor's box

An electrical connection housing (contractor's box) is built into The Red Jacket STPs manifold and is completely isolated from the fuel path. Unlike other systems, there is no adjustment required to fit the yoke, making this pump easy to install.

Line leak detection facility

A connection port for Veeder-Root/Red Jacket industry leading pressurized line leak detection (PLLD) provides environmental compliance without the fuel flow restrictions of mechanical (MLLD) or electronic (ELLD) systems. The port also provides required connection features for MLLD and ELLD detectors.

Safety Precautions

The following safety symbols are used throughout this manual to alert you to important safety hazards and precautions.

EXPLOSIVE
Fuels and their vapors are extremely explosive if ignited.

FLAMMABLE
Fuels and their vapors are extremely flammable.

ELECTRICITY
High voltage exists in, and is supplied to, the device. A potential shock hazard exists.

TURN POWER OFF
Live power to a device creates a potential shock hazard. Turn Off power to the device and associated accessories when servicing the unit.

⚠WARNING **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION **CAUTION** indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

WEAR EYE PROTECTION
Wear eye protection when working with pressurized fuel lines to avoid possible eye injury.

NOTICE **NOTICE** is used to address practices not related to physical injury.

WEAR GLOVES
Wear gloves to protect hands from irritation or injury.

NO POWER TOOLS
Sparks from power tools (such as drills) can ignite fuels and their vapors.

NO SMOKING
Sparks and embers from burning cigarettes or pipes can ignite fuels and their vapors.

NO OPEN FLAMES
Open flames from matches, lighters, welding torches, etc. can ignite fuels and their vapors.

READ ALL RELATED MANUALS
Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does

TURN OFF CELL PHONES/PAGERS
Sparks from electronic devices in the vicinity of gasoline storage tanks could cause an explosion or fire resulting in bodily injury or death.

⚠ WARNING

This product operates in the highly combustible atmosphere of a gasoline storage tank.

FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.

1. **All installation work must comply with the latest issue of the National Electrical Code (NFPA 70), the Code for Motor Fuel Dispensing Facilities and Repair Garages (NFPA 30A), and any European, national, state, and local code requirements that apply.**
2. **Turn off, tag, and lockout power to the STP before connecting or servicing the STP.**
3. **Before installing pipe threads apply an adequate amount of fresh, UL classified for petroleum, non-setting sealant. For AG applications, Loctite 567 or Gasoila E-seal are recommended on the threads of the Field Serviceable Joint locations shown in Appendix D[1].**
4. **When servicing unit, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.**
5. **To protect yourself and others from serious injury, death, or substantial property damage, carefully read and follow all warnings and instructions in this manual.**

[1]For the AG product, the interface connection to the 2" NPT discharge port on the manifold was evaluated with steel piping during the UL listing evaluation and therefore this material should be used when installing this product. All material must be fully compatible with the products being stored.

In addition to the specified torque values noted in this manual, when properly tightened, all flanged fittings should have metal-to-metal contact.

The Red Jacket Submersible Turbine Pump's A-weighted emission sound pressure level at work stations (inside the sump pit or on forecourt while refueling) does not exceed 70dB.

Warnings and Instructions

⚠WARNING **This section introduces the hazards and safety precautions associated with installing, inspecting, maintaining or servicing this product. Before performing any task on this product, read this safety information and the applicable sections in this manual, where additional hazards and safety precautions for your task will be found. Fire, explosion, electrical shock or pressure release could occur and cause damage to property, environment, resulting in serious injury or death, if these safe service procedures are not followed.**

PRELIMINARY PRECAUTIONS

⚠WARNING **You are working in a potentially dangerous environment of flammable fuels, vapors, and high voltage or pressures. Only trained or authorized individuals knowledgeable in the related procedures should install, inspect, maintain or service this equipment.**

Read the Manual

Read, understand and follow this manual and any other labels or related materials supplied with this equipment. If you do not understand a procedure, call 1-800-323-1719 to locate a qualified technician. It is imperative to your safety and the safety of others to understand the procedures before beginning work. **Make sure your employees and any service contractors read and follow the instructions.**

Follow the Regulations

Applicable information is available in National Fire Protection Association (NFPA) 30A; *Code for Motor Field Dispensing Facilities and Repair Garages*, NFPA 70; *National Electrical Code* (NEC), Occupational Safety and Hazard Association (OSHA) regulations and federal, state, and local codes. All these regulations must be followed. Failure to install, inspect, maintain or service this equipment in accordance with these codes, regulations and standards may lead to legal citations with penalties or affect the safe use and operation of the equipment.

Prevent Explosions and Fires

Fuels and their vapors will explode or burn, if ignited. Spilled or leaking fuels cause vapors. Even filling customer tanks will cause potentially dangerous vapors in the vicinity of the dispenser or island.

Working Alone

It is highly recommended that someone who is capable of rendering first aid be present during servicing. Familiarize yourself with Cardiopulmonary Resuscitation (CPR) methods, if you work with or around high voltages. This information is available from the American Red Cross. Always advise the station personnel about where you will be working, and caution them not to activate power while you are working on the equipment. Use the OSHA Lockout/Tagout procedures. If you are not familiar with this requirement, refer to OSHA documentation.

Working With Electricity Safely

Ensure that you use safe and established practices in working with electrical devices. Poorly wired devices may cause a fire, explosion or electrical shock. Ensure that grounding connections are properly made. Ensure that you do not pinch wires when replacing covers. Follow OSHA Lockout/Tagout requirements. Station employees and service contractors need to understand and comply with this program completely to ensure safety while the equipment is down. Before you start work, know the location of the Emergency Power Cutoff Switch (the E-STOP). This switch cuts off power to all fueling equipment and submerged turbine pumps and is to be used in the event of an emergency. The buttons on the console at the cashier's station WILL NOT shut off electrical power to the pump/dispenser. This means that even if you press a button on the console labeled EMERGENCY STOP, ALL STOP, PUMP STOP, or something similar, fuel may continue to flow uncontrolled.

Hazardous Materials

Some materials may present a health hazard if not handled correctly. Ensure that you clean hands after handling equipment. Do not place any equipment in the mouth.

⚠WARNING FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD RESULT IN PROPERTY DAMAGE, INJURY OR DEATH.

FIRE HAZARD! Do **NOT** use **power tools** (Class I Division I and Class I Division II) during the installation or maintenance of equipment. Sparking could ignite fuel or vapors, resulting in fire.

CHEMICAL EXPOSURE HAZARD! Wear appropriate **safety equipment** during installation or maintenance of equipment. Avoid exposure to fuel and vapors. Prolonged exposure to fuel may cause severe skin irritations and possible burns.

REQUIREMENTS FOR USE

- The Red Jacket STP is designed for use only at facilities dispensing motor fuels.
- Application of The Red Jacket STP must be consistent with NFPA Code 30A, OSHA regulations, and federal, state and local fire codes, and other applicable local regulations.
- The selection of any Veeder-Root product must be based upon physical specifications and limitations and the product's compatibility with the materials to be handled. Veeder-Root makes no warranty of fitness for a particular purpose.
- All Veeder-Root products should be used in accordance with applicable federal, state and local laws, ordinances and regulations.

OPERATING PRECAUTIONS

- **NO SMOKING.** Extinguish all open flames and pilot lights, such as on RV appliances.

TURN OFF cell phones and other electronic devices to prevent sparks which could cause an explosion or fire.

4" The Red Jacket STP Safety Instructions
– SPECIAL CONDITIONS FOR SAFE USE (EN 15268 Compliant)

- ATEX Directive 2014/34/EU and UKCA (United Kingdom Conformity Assessment) approved Red Jacket Submersible Turbine Pump Assemblies shall be marked with the following information:

  Manufacturer:

  Veeder-Root Company
  2709 Route 764
  Duncansville, PA 16635 U.S.A.

  Marking

  Type series
  Serial Number
  Year of Construction

  0598 1180 **II 1/2 G**
  EN15268 IIA T3
  DEMKO 12 ATEX 1247797X
  UL21UKEX2201X
  CAUTION-KEEP COVERS TIGHT WHILE CIRCUITS ARE ALIVE

Instructions:

- All submersible pumping units (UMPs), manifolds and associated equipment shall be installed in accordance with the manufacturer's installation, operation and service manuals supplied.
- All installations shall provide reliable electrical connection between the submersible turbine pumps, frame, piping, manifold or junction box and the tank structure for the electrical protection and equipotential bonding.
- Connection of te motor wiring inside the packer shall be with the supplied T & B butt splice pressure wire connectors and sealed within the 3M Scotchcast epoxy sealant bag.
- Fasteners securing the discharge head shall be replaced only by fasteners provided in kit 144-327-4 and kit 410818-001 for models with the AG prefix.
- The nut securing the packer and manifold assembly is steel with a minimum yield strength of 450 N/mm2.
- The male connector is the partition wall between EPL Ga and Gb. It consists of a plug made from a phenolic material, designation 23570 manufactured by Durez, with a Flammability rating of V-0. It is also filled with a two part epoxy, designation 7136A/B manufactured by Epic Resins.
- The dimensions of the flameproof joints are detailed in drawing no. 410626-001.
- When the submersible pumping unit (UMP) is installed in areas where Category 1 equipment is required, the use of a Motor-Protective Circuit-Breaker (Manual Motor Protector) with phase failure protection as described in the installation instruction manual is necessary to meet Category 1 requirements.
- Compliance with the Essential Health and Safety Requirements has been assured by compliance with: EN ISO 80079-36:2016, EN 13463-3:2005, EN ISO 80079-37:2016, EN 15268:2008, EN 60079-0:2018, EN 60079-1:2014, EN 60079-7:2015/A1:2018, EN 60079-18:2015/A1:2017, EN 60079-26:2015

Regulatory Approvals

All models of The Red Jacket are UL and cUL listed.

Fuel Compatibilities

Pumps are designed to operate in a Class 1, Group D atmosphere and in accordance with CENELEC standard EN 15268 and the European Directive 2014/34/EU "Equipment for Potentially Explosive Atmospheres" (**Ex II 1/2 G IIA T3**). See Table 1 for UMP models and working parameters.

All models of The Red Jacket are UL Listed for the following fuel compatibility							
			Gasoline and up to				
Fuel Oil	100% Diesel	100% Gasoline	10% Ethanol	15% Methanol	20% MTBE	20% ETBE	20% TAME

For Internal Fluid Confining Components, Replace Only With Identical Parts.

All models of The Red Jacket with the AG prefix are UL Listed for the following fuel compatibilities									
					Gasoline and up to				
Fuel Oil	100% Diesel	Diesel and up to 20% Biodiesel	100% Biodiesel	100% Gasoline	85% Ethanol	15% Methanol	20% MTBE	20% ETBE	20% TAME

For Internal Fluid Confining Components, Replace Only With Identical Parts.

The Red Jacket is designed to be compatible with 100 percent gasoline, or diesel and 80 percent gasoline with 20 percent methanol, ethanol, TAME, ETBE, or MTBE. All STPs having the model numbers including the AG prefix are designed to be compatible with 100 percent gasoline, methanol and 90 percent ethanol with 10 percent gasoline and 80 percent gasoline with 20 percent TAME, ETBE, or MTBE; and 100 percent diesel, diesel and up to 100 percent biodiesel; kerosene, fuel oil, avgas, and jet fuel.

Table 1. Maximum Specific Gravity And Maximum Viscosity

UMP Model	Maximum Specific Gravity	Maximum Viscosity
AGUMP75S17-3, UMP75U17-3	0.95	70SSU at 60°F (15°C)
AGUMP150S17-3, UMP150U17-3	0.95	70SSU at 60°F (15°C)
X4AGUMP150S17, X4UMP150U17	0.86	70SSU at 60°F (15°C)
AGP200S17-4, P200U17-4	0.87	70SSU at 60°F (15°C)

Date Code Formatting

DATE CODE

4 02 15

- 15 — Year of manufacture
- 02 — Month of manufacture
- 4 — Week of manufacture starting with the first Monday of the month being week number one.

Installation and Manifold Dimensions

Figure 1 shows several views and dimensions of The Red Jacket Packer/Manifold.

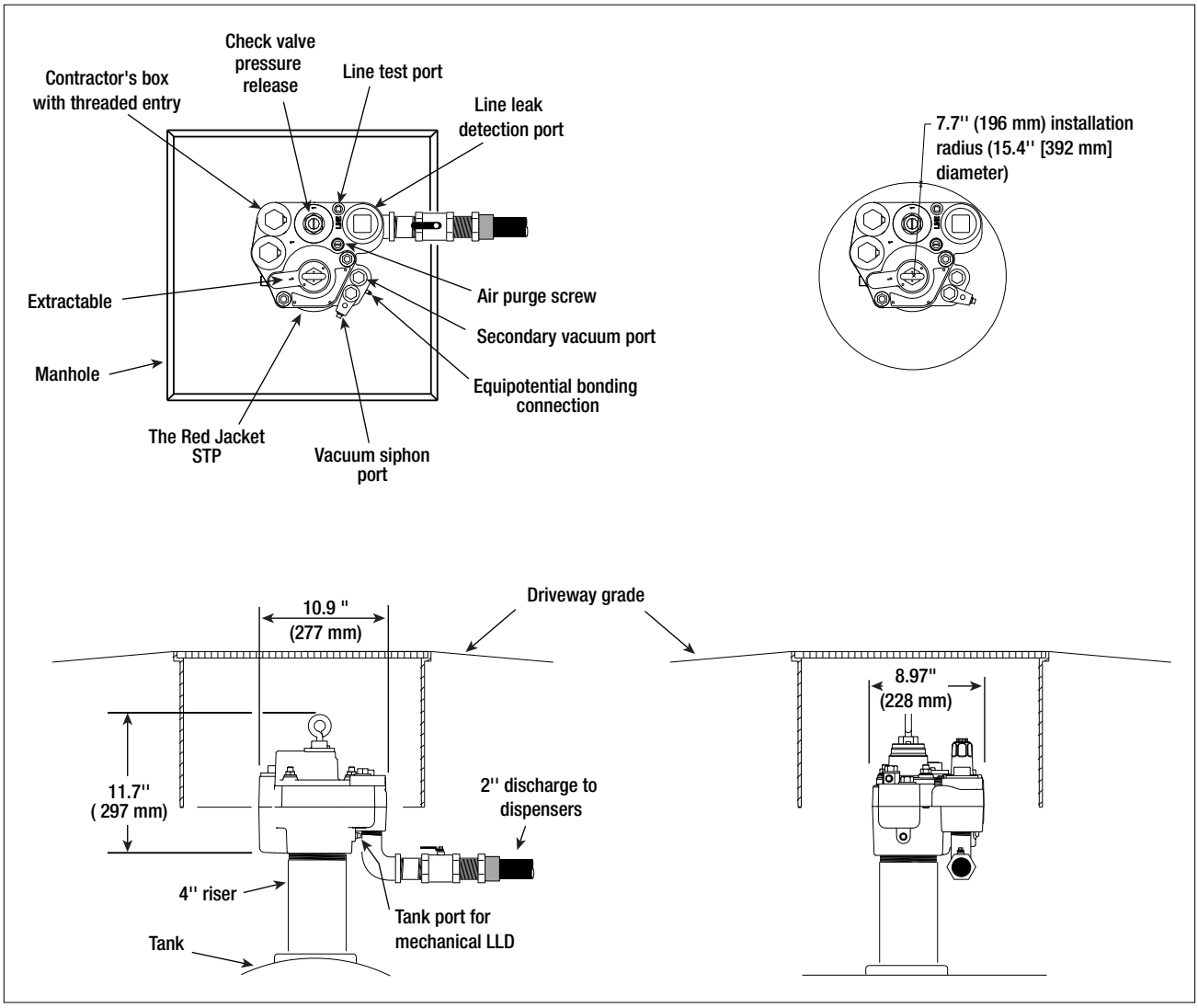


Figure 1. Red Jacket Packer/Manifold Components and Dimensions

Recommended Floating Suction Installation

Figure 2 is an example of a floating suction installation. The floating suction arm can be mounted to pump previous to installing in tank.

NOTICE **Veeder-Root supplies adapter only, not the apparatus.**

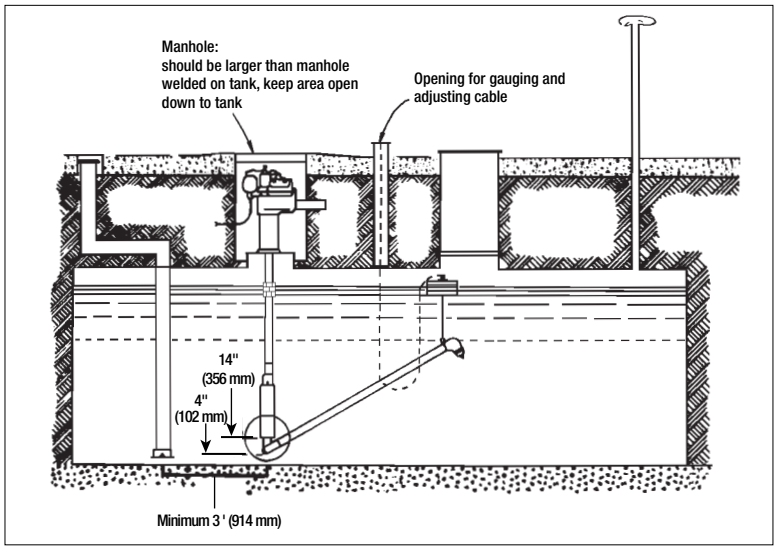


Figure 2. FLoating Suction Installation

Figure 3 is an enlarged view within the circle in Figure 2.

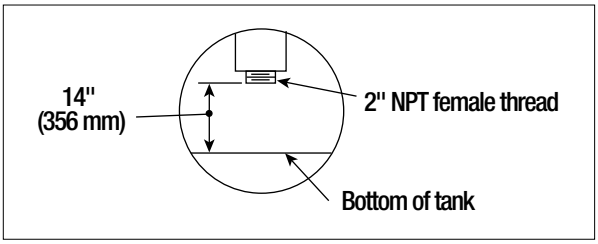


Figure 3. Floating Suction Adapter

Easy service access is provided by unbolting manhole lid through which pump is mounted and removing entire assembly. Use proper thread sealant and insert gasket between flanges of floating suction and pump. This prevents hindrance to pump performance when product level is below this point.

NOTICE **The Red Jacket is a centrifugal type pump and is not designed to pump product when the level is below the minimum submergence level. The minimum fuel level shall be at least 1.18" (30mm) above the highest product intake level at the bottom of the pump motor.**

Dimensions for Pump Selection

The Red Jacket features an adjustable column pipe and electrical conduit that allows the overall length to be adjusted to a wide range of overall pump lengths. By loosening a collet on the column pipe, the length of the pump may be varied by extending or retracting the column pipe. Three sizes of adjustable column pipe are available to cover most pump length requirements (RJ1, RJ2, and RJ3). Figure 4 shows the dimensions needed to ensure a correctly sized pump.

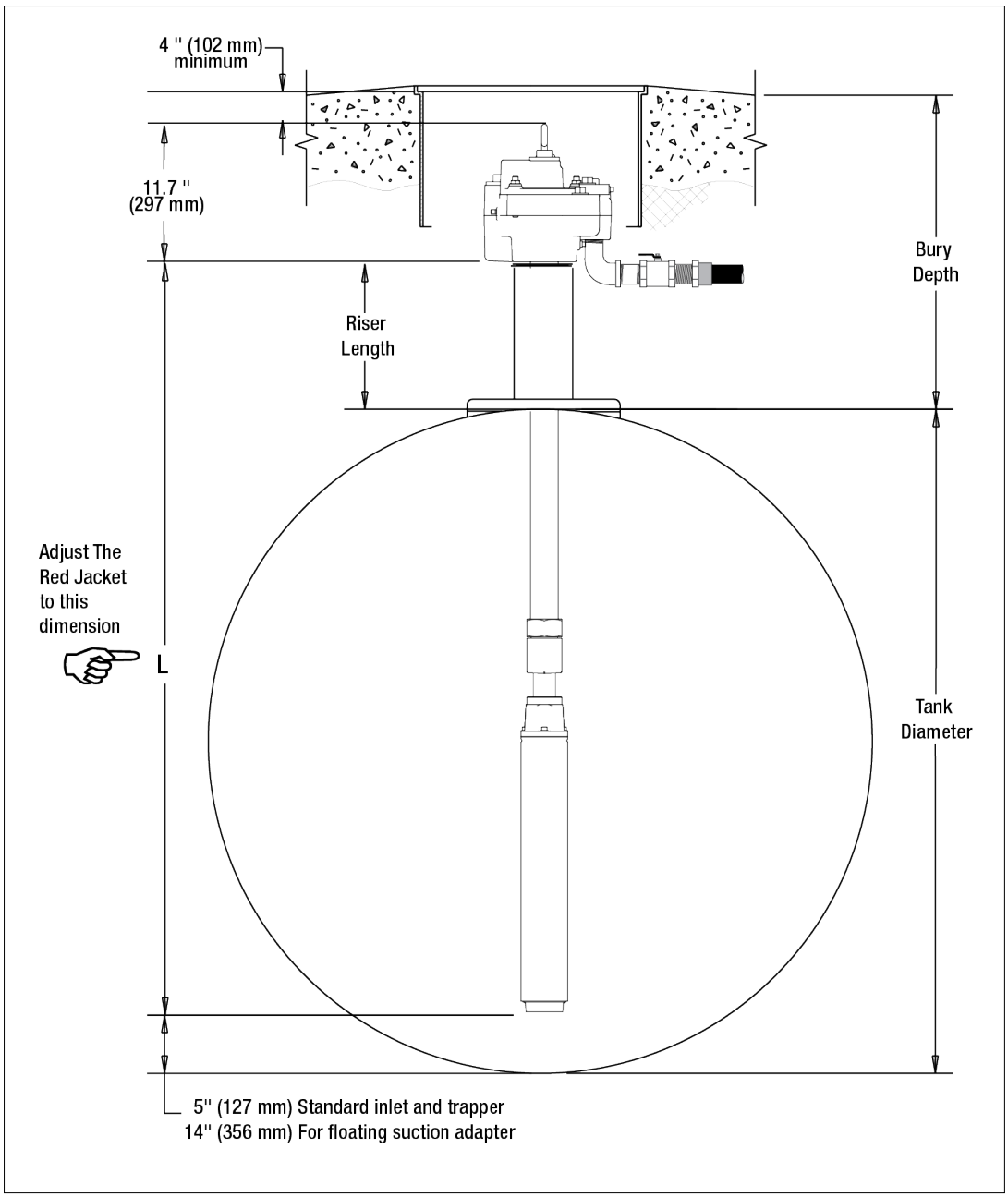


Figure 4. Measuring the Tank (See Table 2 for Adjustment Ranges).

NOTICE **Distance between centerline of UMP and centerline of bottom fill tube should be 3 feet (914 mm) minimum. Air locking of pump after product delivery may occur at distances less than this.**

Specifications

Table 2 shows the adjustable pump lengths by model

Table 2. Distances from Top of Lifting Screw to Inlet

Model#	Retracted		Extended	
	in.	mm	in.	mm
AGP75S17-3RA1, AGP75S17-3RJ1, P75U17-3RJ1	73.0	1853	103.5	2624
AGP75S17-3RA2, AGP75S17-3RJ2, P75U17-3RJ2	103.0	2615	163.5	4148
AGP75S17-3RA3, AGP75S17-3RJ3, P75U17-3RJ3	163.0	4139	223.5	5672
AGP150S17-3RA1, AGP150S17-3RJ1, P150U17-3RJ1	75.0	1903	105.5	2674
AGP150S17-3RA2, AGP150S17-3RJ2, P150U17-3RJ2	105.0	2665	165.5	4198
AGP150S17-3RA3, AGP150S17-3RJ3, P150U17-3RJ3	165.0	4189	225.5	5722
X4AGP150S17RA1, X4AGP150S17RJ1, X4AGP150U17RJ1	75.5	1917	106.0	2688
X4AGP150S17RA2, X4AGP150S17RJ2, X4AGP150U17RJ2	105.5	2679	166.0	4212
X4AGP150S17RA3, X4AGP150S17RJ3, X4AGP150U17RJ3	165.5	4203	226.0	5736
AGP200S17-4RA1, AGP200S17-4RJ1, P200U17-4RJ1	77.5	1975	108.0	2745
AGP200S17-4RA2, AGP200S17-4RJ2, P200U17-4RJ2	107.5	2735	168.0	4270
AGP200S17-4RA3, AGP200S17-4RJ3, P200U17-4RJ3	167.5	4260	228.0	5790

Table 3 shows pump electrical service requirements.

Table 3. Electrical Service Information

Required power supply rating for 3 phase pumps, required rating is 380 - 415 Vac.

UMP Model No.	HP	Hz	PH	Voltage Fluctuation Range		Max. Load Amps	Locked Rotor Amps	Winding Resistance (Ohms)			Setting on Motor Protection Device
				Min.	Max.			Black-Orange	Red-Orange	Black-Red	
AGUMP75S17-3, UMP75U17-3	3/4	50	3	342	457	2.2	8.1	24.4 - 29.6	24.4 - 29.6	24.4 - 29.6	1.8
AGUMP150S17-3, UMP150U17-3	1-1/2	50	3	342	457	3.8	14.1	12.1 - 14.7	12.1 - 14.7	12.1 - 14.7	3.8
X4AGUMP150S17, X4UMP150U17	1-1/2	50	3	342	457	3.8	14.1	12.1 - 14.7	12.1 - 14.7	12.1 - 14.7	3.8
AGUMP200S17-4, UMP200U17-4	2	50	3	342	457	5.0	17.7	9.9 - 12.0	9.9 - 12.0	9.9 - 12.0	4.5

Table 4 lists UMP weights and lengths and Table 5 lists pump shut off pressures.

NOTICE **The weights and lengths listed below are approximate values and will vary due to manufacturing tolerances.**

The optional trapper intake screen is available as a field installed accessory. Trapper options will increase the length of the UMP by 3.3 inches (83 mm). For installation instructions, see Red Jacket installation instructions #051-256-1. For models with floating suction adapter, add 2-3/8 inches (59 mm) and 4 pounds (1.8 kg).

Table 4. UMP Model Dimensions

		Lengths		Weight	
UMP Model	**HP**	**in.**	**mm**	**lb.**	**kg**
UMP75U17-3, AGUMP75S17-3	3/4	19	483	28	12.7
UMP150U17-3, AGUMP150S17-3	1-1/2	21-1/4	540	31	14.1
X4UMP150U17, X4AGUMP150S17	1-1/2	21-3/4	552	32	14.5
UMP200U17-4, AGUMP200S17-4	2	23-3/4	603	36	16.3

Table 5. Approximate Pump Shut Off Pressures

UMP Model	Approximate Shut Off Pressure
AGUMP75S17-3, UMP75U17-3	29 psi (200 kPa) 0.74 SG @ 60°F (15°C)
AGUMP150S17-3, UMP150U17-3	32 psi (220 kPa) 0.74 SG @ 60°F (15°C)
X4AGUMP150S17, X4UMP150U17	39 psi (267 kPa) 0.74 SG @ 60°F (15°C)
AGUMP200S17-4, UMP200U17-4	43 psi (297 kPa) 0.74 SG @ 60°F (15°C)

Installation

Attaching the UMP

Table 6 lists the applicable UMPs for each packer/manifold.

Table 6. UMP and Packer/Manifold Combinations

Packer/Manifold	UMP
AGP200S17-4RJ1, RJ2, RJ3, RA1, RA2, RA3	AGUMP200S17-4
AGP75S17-3RJ1, RJ2, RJ3, RA1, RA2, RA3	AGUMP75S17-3
P75U17-3RJ1, RJ2, RJ3	UMP75U17-3
AGP150S17-3RJ1, RJ2, RJ3, RA1, RA2, RA3	AGUMP150S17-3
P150U17-3RJ1, RJ2, RJ3	UMP150U17-3
X4AGP150S17RJ1, RJ2, RJ3, RA1, RA2, RA3	X4AGUMP150S17
X4P150U17RJ1, RJ2, RJ3	X4UMP150U17
P200U17-4RJ1, RJ2, RJ3	UMP200U17-4

The UMP is identified by the model number marked on the shell. The packer/manifold with piping is identified by the catalog number on the packer nameplate. The hardware kit consists of four 5/16-18 x 1" socket head cap screws, four 5/16 lock washers and one discharge head gasket identified by the kit number 144-327-4 (P/N 410818-001 for AG version) marked on the bag (see Figure 5).

The UMP attaches to the packer/manifold column piping discharge head using hardware kit number 144-327-4 (P/N 410818-001 for AG version).

When servicing unit, use non-sparking tools.

NOTICE **For all models with the 'RA' suffix, take care not to damage the powder coating on the Packer/Manifold and discharge head when placing the pump on the working surface.**

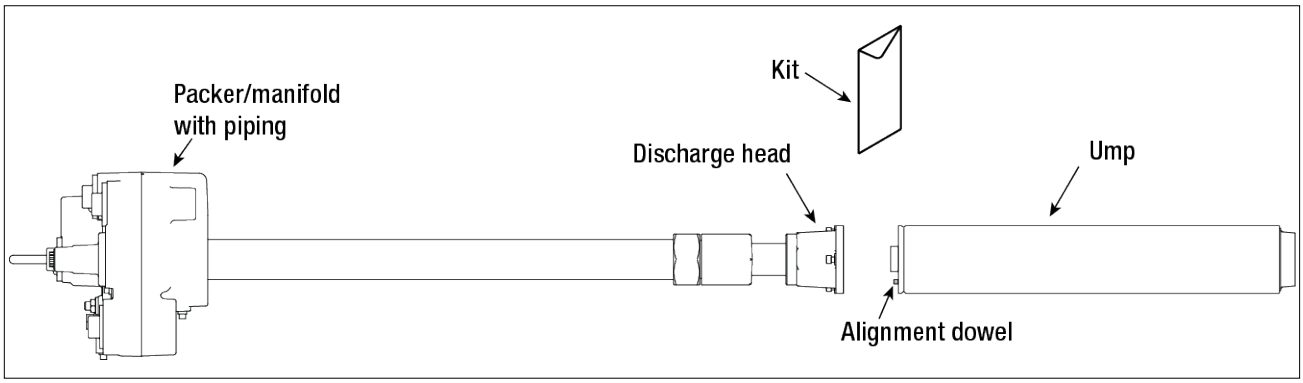


Figure 5. Packer/Manifold with Piping Attaching to UMP

1. Visually inspect the pigtail connector in the end of the discharge head. Be certain the pigtail connector is seated in its socket and its index tab is in the socket's notch (see Figure 6).

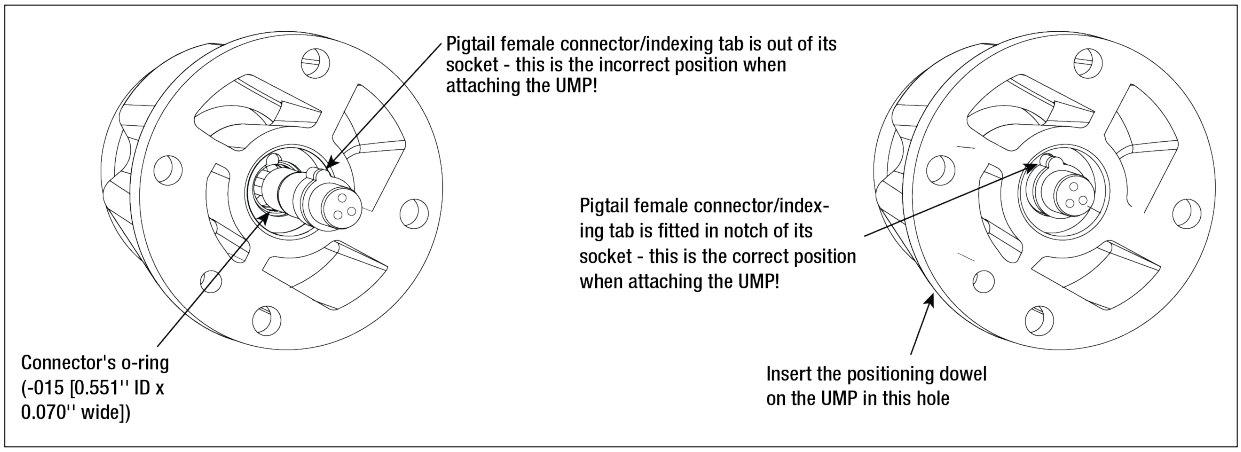


Figure 6. Verifying Pigtail's Female Connector Proper Seating

2. Place the new gasket on the new UMP so that all holes align (see Figure 7).

⚠CAUTION **Gaskets from competitive UMPs will not seal properly and performance will be reduced.**

3. Align the UMP positioning dowel insert in the proper hole in the discharge head (see Figure 6) and push the UMP into position using hand force only. The UMP should be snug against the discharge head prior to installing the UMP retaining bolts.

⚠WARNING **Use hand force to push the UMP onto the discharge head. If the UMP does not seat snug against the discharge head, remove the UMP and correct the problem.**

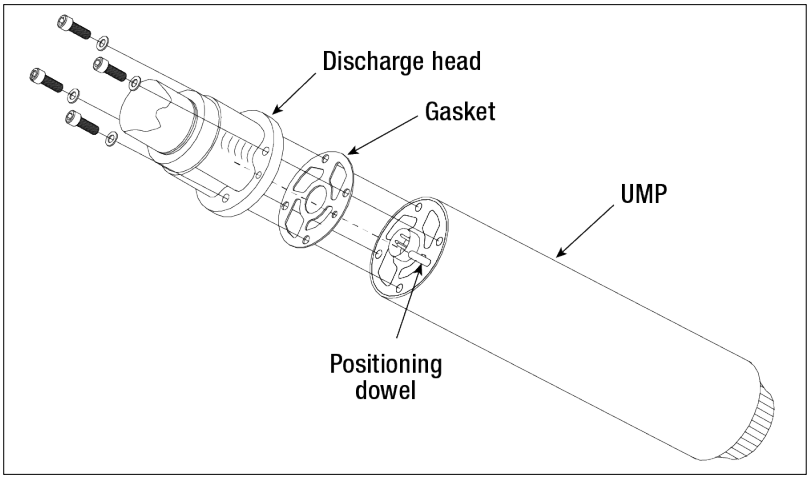


Figure 7. Aligning the UMP Gasket

4. Install the UMP retaining bolts and lock washers (see Figure 7). Snug and then torque the bolts using a cross pattern. Torque to 7 ft-lbs (11 N•m).

⚠WARNING **Do not use the bolts to pull the UMP into position. Use the cross pattern to snug and torque bolts. Do not over torque the bolts. Not following instructions may cause parts to fail.**

⚠WARNING **Fasteners are not metric - use fasteners provided with equipment.**

Installing the Pump

- The Red Jacket STP is designed to operate in a Class 1, Group D atmosphere and in accordance with CENELEC standard EN 15268 and the European Directive 2014/34/EU “Equipment for Potentially Explosive Atmospheres” (Ex II 1/2 G IIA T3).
- The manufacturer may recommend new specification and installation instructions.
- The product temperature must not exceed 105°F (41°C) because the thermal overload protectors in the submersible motor may trip.

1. Before installing pipe threads apply an adequate amount of fresh, UL classified for petroleum, non-setting thread sealant. Tighten the riser pipe in the tank until watertight.

NOTICE **For all models with the ‘RA’ suffix, do not wrench on the powder coated packer/manifold, as this may damage the coating and cause corrosion. Use the manifold installation tool (P/N 410912-001) to tighten the manifold onto the riser pipe. Remove the two die springs which surround the lock-down studs. After the manifold is installed, remove the manifold installation tool and re-install the two die springs. Place the installation tool over the two lock-down studs as shown in Figure 8. If the installation tool handle needs to be extended, procure a piece of square tubing and slide it over the vertical handle and secure using the cotter pin.**

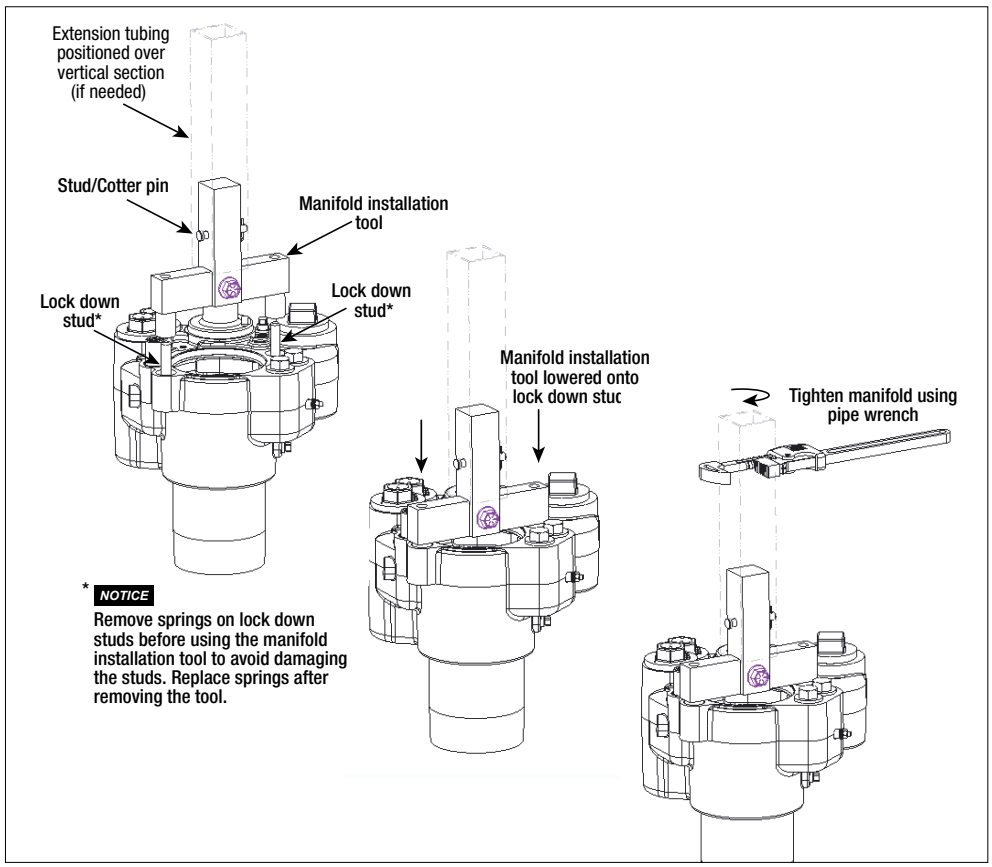


Figure 8. Utilizing the Manifold Installation Tool with RA Model STPs

2. Measure the distance from the bottom of the tank to the top of the 4-inch riser pipe as shown in Figure 9.

   Note: For fixed-length pumps, referencing Figure 11, verify the distance between the bottom of the manifold and the bottom of the UMP is 5 inches (125mm) (15 inches [381mm] for floating suction) shorter than the distance measured in Step 2. Uncoil the pigtail at the top of the packer. Then go to Step 7.

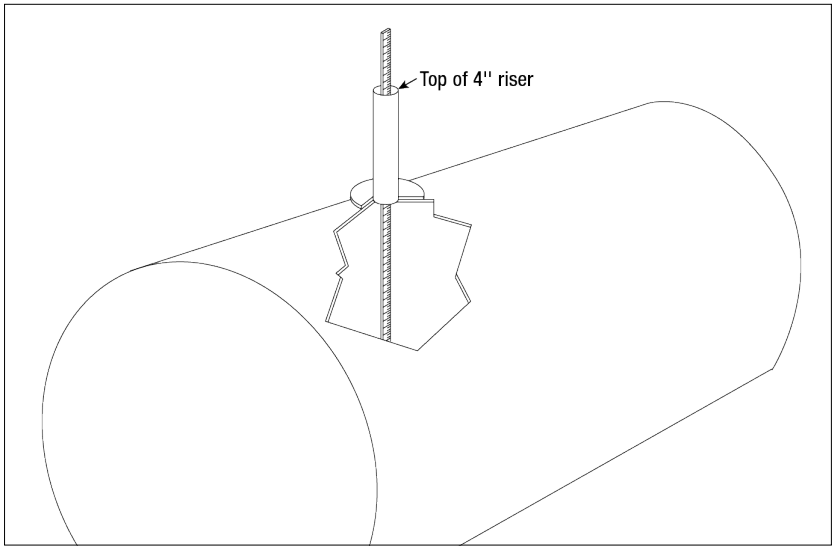


Figure 9. Measuring Tank

3. Uncoil the pigtail at the top of the packer and lay it flat so it will feed into the packer without knotting or kinking.
4. Loosen the clinch assembly on the column pipe by unscrewing the set screw in the side of locking nut, then backing off the locking nut (see Figure 10).

NOTICE **A slight twisting of the UMP will loosen the seals and facilitate adjusting it to the correct length. Do not rotate piping beyond 1/4 turn.**

For all models with the 'RA' suffix, stainless steel lockdown nuts and washers are used and found in the kit. Apply anti-seize (also found in the kit) to the lockdown studs prior to nut and washer installation.

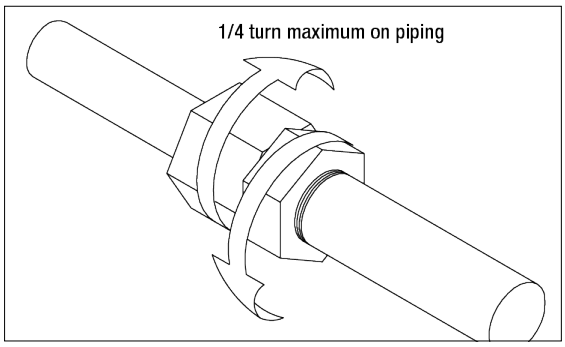


Figure 10. Loosening Locking Nut

5. Referencing Figure 11, pull the UMP end until the distance between the bottom of the manifold and the bottom of the UMP is 5 inches (125 mm) (15 inches [381 mm] for floating suction) shorter than the distance measured in Step 2.

NOTICE **If UMP is equipped with floating suction adapter, see section entitled "Recommended Floating Suction Installation" on page 9.**

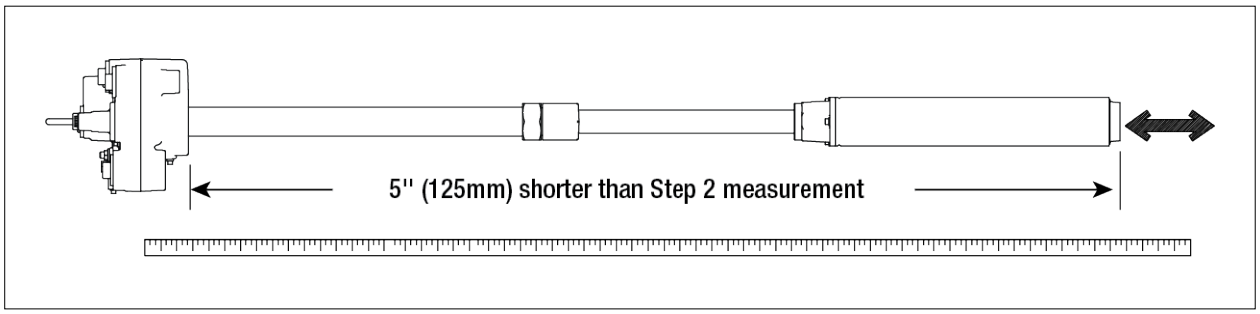


Figure 11. Adjusting Pump Length

⚠WARNING **Take care not to damage the pigtail. If pump is to be adjusted shorter, keep tension on the pigtail to eliminate kinking.**

6. Tighten the column pipe locking nut and torque to 150 ft-lbs (200 N•m) minimum, then torque the set screw in the locking nut to 30 - 35 in. lb. (3.5 - 4 N•m). For all models with the 'RA' suffix, a stainless steel locking nut with three set screws is used. Torque all set screws in the locking nut to 9-11 ft-lbs (12.2-15N•m).
7. Attach the siphon return line tubing to barbed fitting in the base of packer and secure with a clamp (see Figure 12).

NOTICE **Return line should be installed on every application to reduce nuisance trips of electronic tank monitoring.**

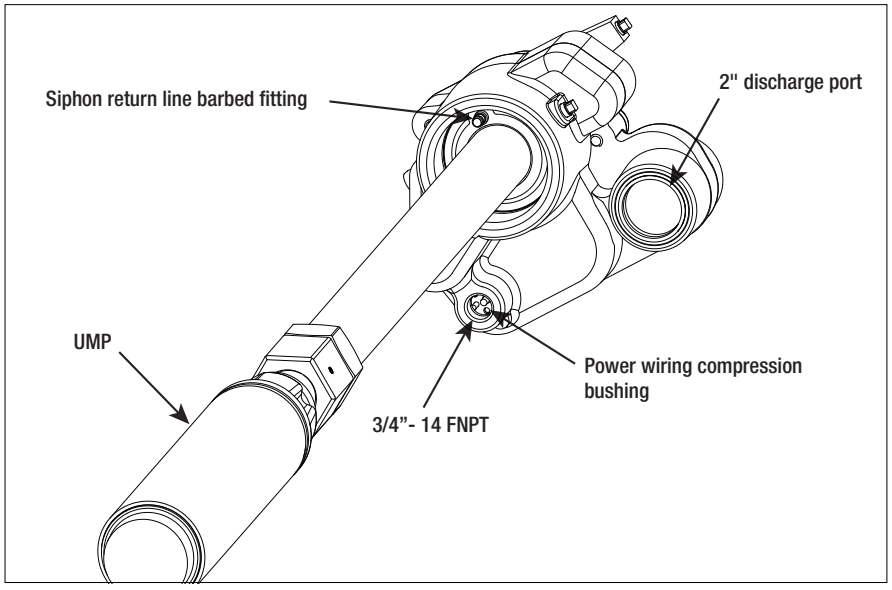


Figure 12. Locating Return Line Fitting on Packer

8. Lay the siphon return line tubing beside the column pipe. Stop 1 - 3 inches (25 - 76 mm) above the discharge head.
9. Secure the siphon return line tubing to the column pipe with tie straps. Locate the tie straps approximately 6 inches (152 mm) from manifold, 6 inches from discharge head and in the middle of the tubing (see Figure 13).

NOTICE **Do not overtighten tie straps as a pinched or flattened return line will restrict flow, interfering with proper operation of siphon system.**

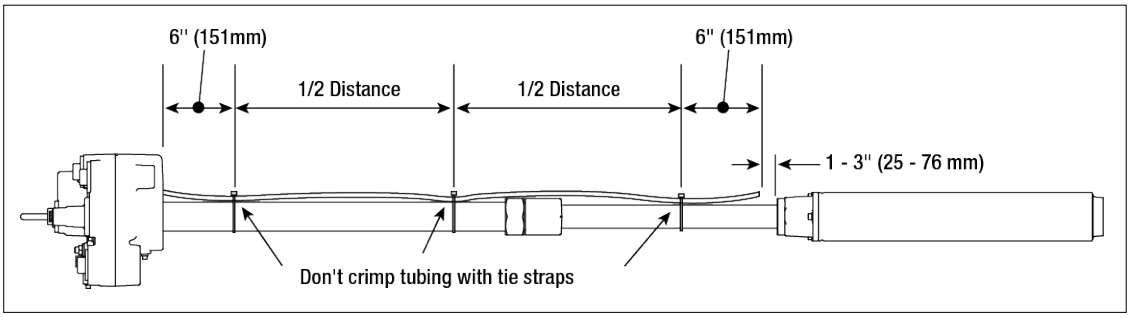
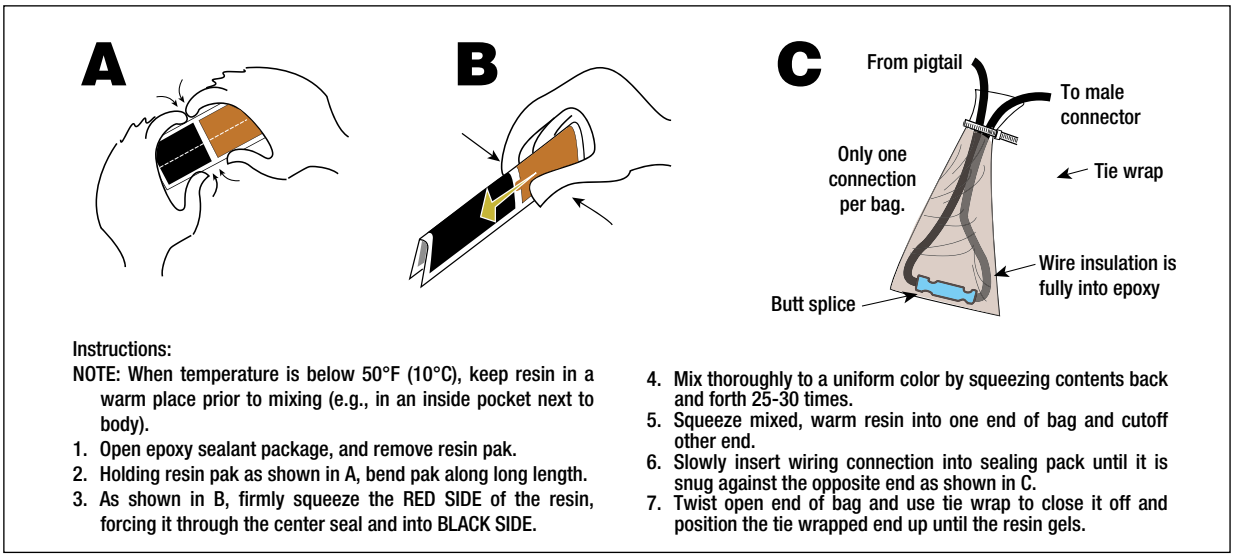


Figure 13. Attaching Return Line Tubing to Pump

10. Carefully pull on the pigtail wires where they exit the packer wiring compartment. Cut pigtail wires approximately 8 inches (200 mm) beyond top of packer. Visually inspect the wire insulation to make sure it is undamaged.
11. There will be three wires to the male connector installed in the packer's housing and three from the three-wire pigtail from the UMP
12. Strip insulation off all six wires 3/8 inches (10 mm).

⚠WARNING **Separation of Zone 0 and Zone 1 is accomplished by the male connector partition wall between the packer and manifold connection. Connection of the UMP wiring is within the Zone 0 boundary and Increased Safety measures inside the flameproof enclosure must be ensured during field wiring connections.**

13. Connect like colored wires from the UMP to like colored wires to the male connector with supplied Thomas & Betts #T&B RBB217 butt splice connectors and making a mechanical crimp.
14. Pull on each wire to verify a reliable crimp was achieved.
15. Insulate the three connections by placing each by itself into an epoxy sealant bag following steps A, B, C below.



16. When finished sealing the wires, coil the wires inside the packer's wiring compartment as neatly as possible (see Figure 15). For clarity, the epoxy packs are shown transparent.
17. Lubricate the O-ring on the packer wiring compartment cover (with lifting eyebolt) with petroleum based jelly. Screw in the packer wiring compartment cover (thread sealant should not be used). Torque to 35 ft-lbs (50 N•m).
18. For all models with the 'RA' suffix, place the supplied plastic protector on the packer wiring compartment cover prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).

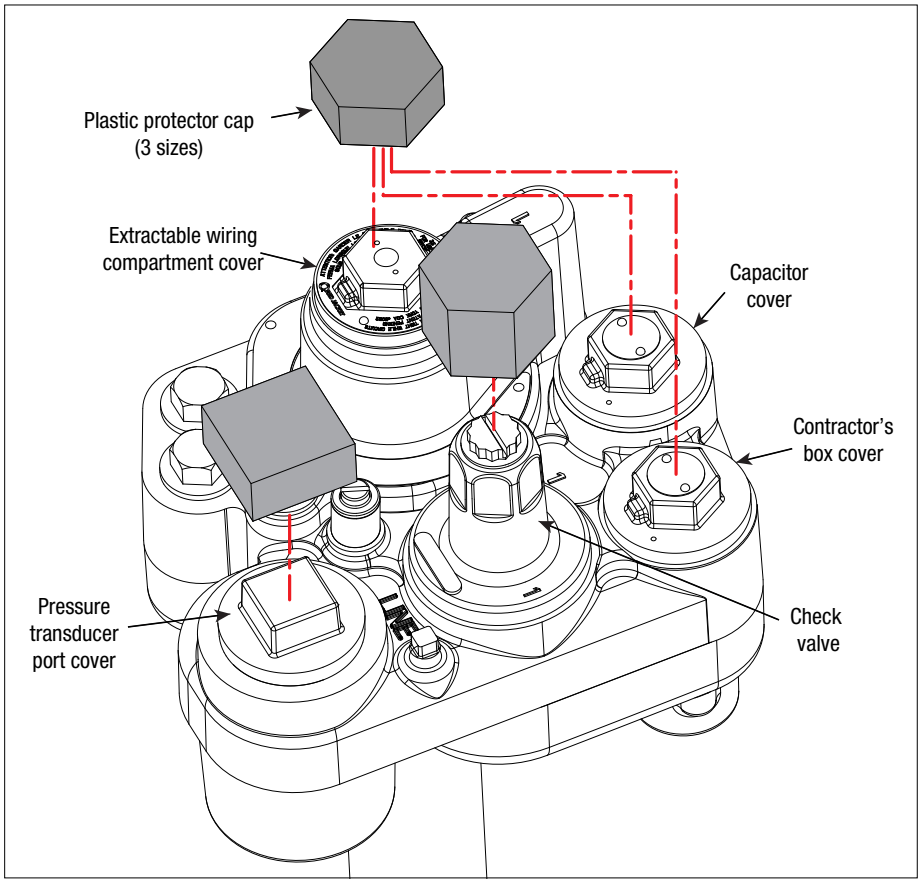


Figure 14. Plastic Protectors Covers for All Models with the 'RA' Suffix

NOTICE **For AG applications Loctite 567 or Gasoila E-Seal is recommended for all field serviceable pipe threads (see Appendix D for Field Serviceable Joint locations).**

⚠WARNING **Confirm that the lifting eyebolt is properly torqued to 10 ft-lbs (13.6 N•m) with a minimum of 6 full threads installed. Occasionally, eyebolts are removed after pump installation and corrosion may occur in the threaded areas of the wiring compartment cover (eyebolt plug) and the eyebolt. If corrosion has occurred, the cover and eyebolt should be replaced.**

19. Utilize the lifting eyebolt to suspend the pump vertically and then install the pump onto the riser pipe using UL classified for petroleum, non-setting thread sealant until watertight and align appropriately to connect to the product line piping.

When servicing equipment, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.

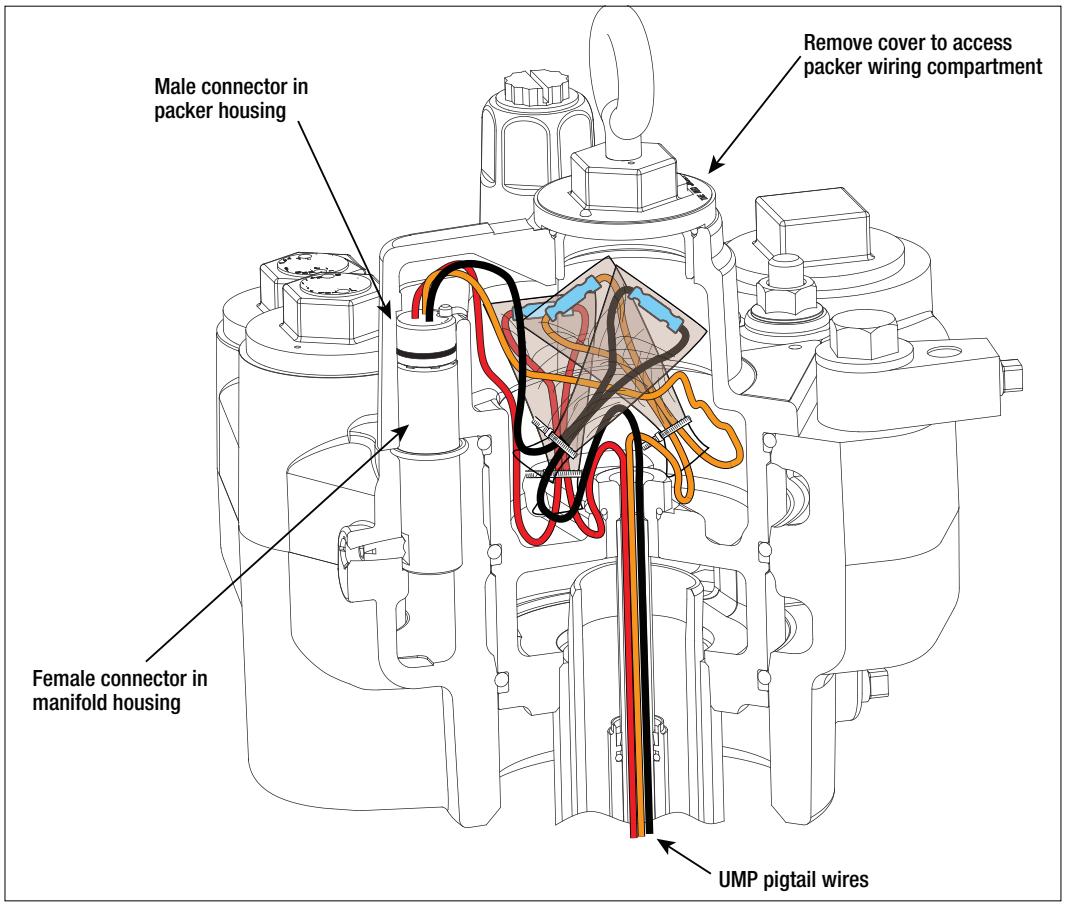


Figure 15. Connecting UMP to Packer Wiring

Wiring Power from the Panel to the Red Jacket STP

⚠WARNING **Disconnect, lock out, and tag the power at the panel before servicing the pump.**

1. Connect electrical conduit approved fittings to power wiring entry at base of manifold's contractors box 3/4"-14 NPT (5 threads minimum engagement) (see cutaway example in Figure 16 for three phase power wiring).

⚠WARNING **For installations requiring ATEX certification, the end user must use an ATEX Ex d IIA certified cable gland or stopping box.**

Use suitable AUS EX, ANZEx or IECEx certified cable gland or flameproof entry device when equipment is installed in accordance with ANZEx certification for connection of the external circuit conductors to the motor conductors used to close the 3/4" - 14 NPT conduit connection.

2. Loosen the two screws in the compression bushing just enough so you can remove the bushing from its socket in the bottom of the manifold's contractor box (see Figure 16). Continue lifting up the bushing until it is accessible. Notice that the top plate of the bushing assembly (facing into the manifold) has a larger diameter than the bottom plate, and that there are two open holes and three holes with plastic rod inserts. The plastic inserts seal the bushing and must remain in any unused hole. For example, bringing three wires from the power panel, use the two empty holes and remove and discard one of the two smaller diameter plastic inserts for the third wire. Push each of the incoming power wires through the empty holes in the bushing assembly. Slide the

bushing assembly down over the power wires until it seats in its socket in the base of the manifold's contractor box leaving sufficient wire lengths for connecting to the pump wires and then tighten the two screws in bushing assembly securely to compress the bushing and seal the wiring entry.

3. There will be three wires to the female connector installed in the manifold housing, one to the ground screw and four from the conduit.
4. Strip insulation off all eight wires 5/16 of an inch (8mm).
5. Connect the orange wire from the manifold's female connector to T1 from the output of the control box.
6. Connect the black wire from the manifold's female connector to T2 from the output of the control box.
7. Connect the red wire from the manifold's female connector to T3 from the output of the control box.
8. Connect the attached ground wire in the manifold to the ground wire from the power panel.
9. Lubricate the O-rings on access covers with petroleum based jelly. Reinstall the access covers. Torque to 35 ft-lbs (50 N•m). Thread sealant should NOT be used.
10. Refer to Figure 17 for three phase pump example wiring diagrams.

NOTICE **For all models with the 'RA' suffix, place the supplied plastic protectors on the access covers prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14) .**

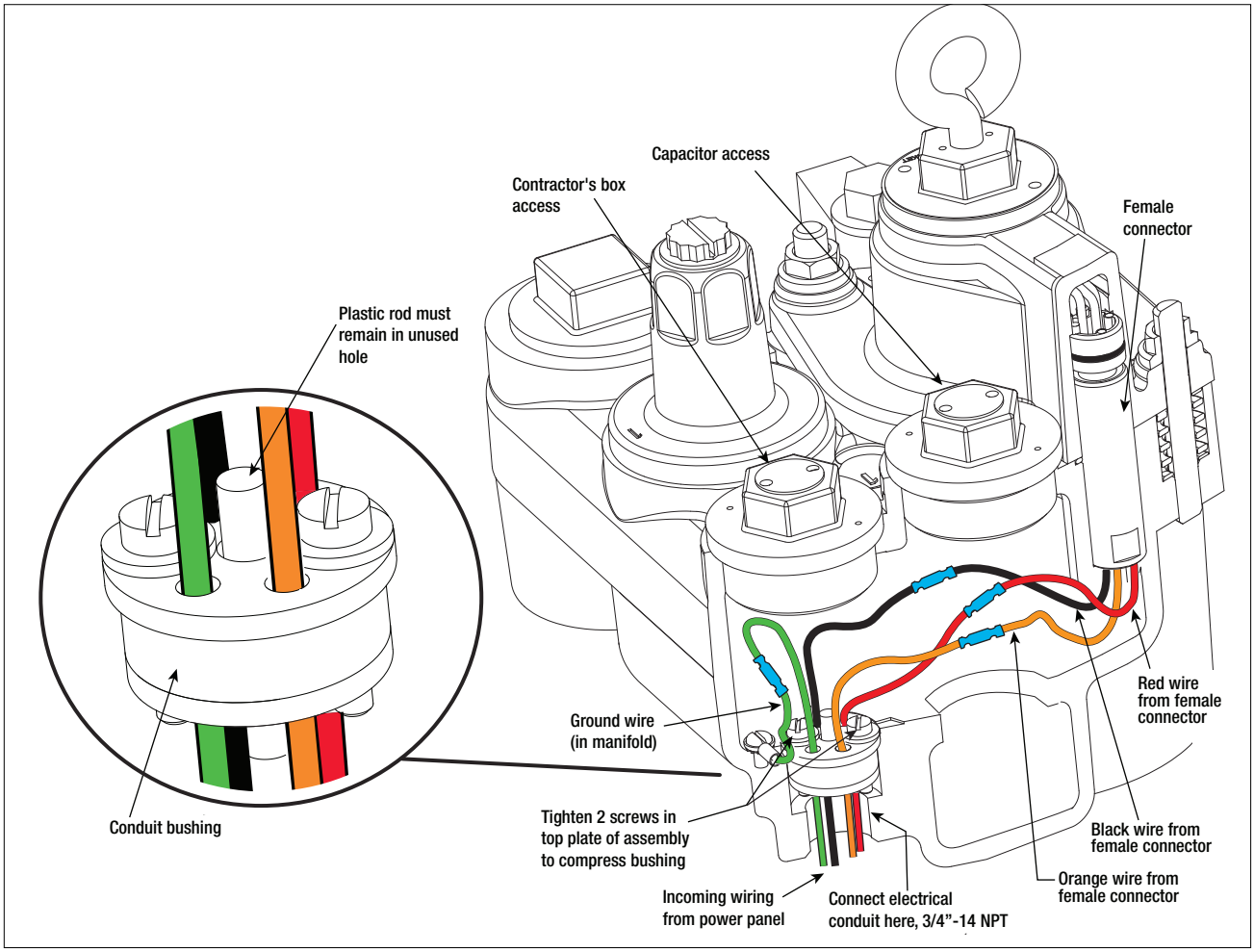


Figure 16. Power Wiring Compression Bushing Installation

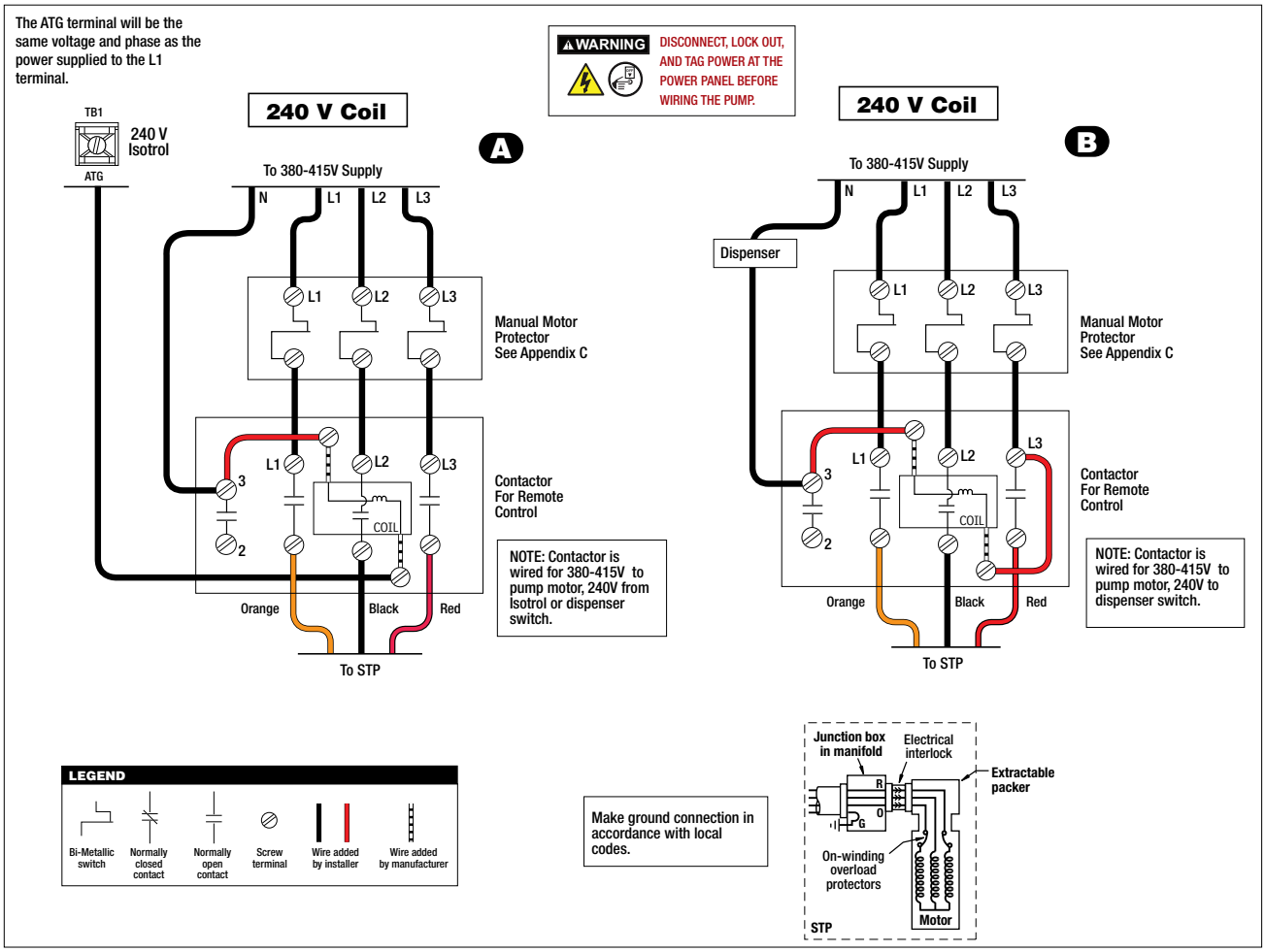


Figure 17. Three Phase Pump Wiring Diagram Examples

Connecting to the External Equipotential Bonding Terminal

A M6 threaded fastener set is provided on the side of the manifold underneath the double siphon port facility (see Figure 18). Connection is to be in accordance with nationally applicable installation regulations using a conductor having a cross-sectional area of at least 4mm^2 (10 AWG).

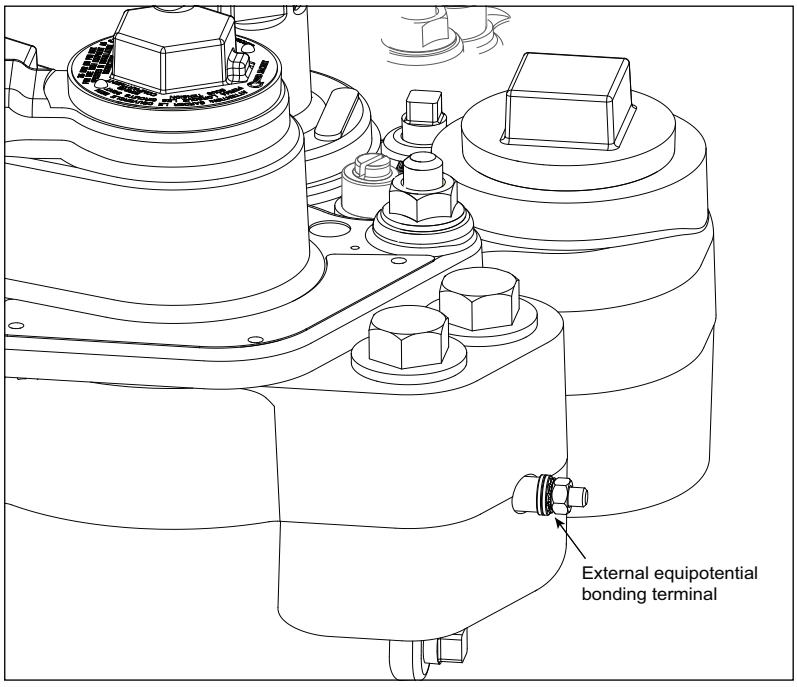


Figure 18. Equipotential Bonding Terminal

Installing Two Pumps for Tandem Operation

When greater flow rates are needed, two pumps may be installed in the same piping system by means of a manifold. If installed according to the Figure 19, tandem systems offer backup support so operations can continue if one pump stops working.

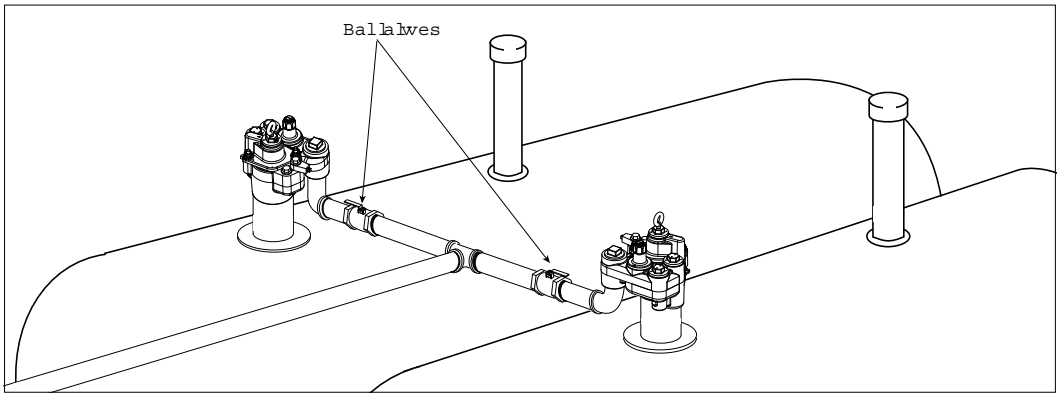


Figure 19. Tandem Pump Installation Example

⚠WARNING **Proper check valves with pressure relief are required to be installed in the discharge line of each pump to prevent product from being pumped through the pressure relief system of the adjacent pump when it is not operating.**

NOTICE **Ball valves should be installed at the pump end of the discharge line for ease of maintenance and troubleshooting (see Figure 19).**

Wiring Three Phase Tandem Pumps

Figure 20 shows the wiring schematic which allows both three phase STPs to operate simultaneously with any combination of dispensers turned on.

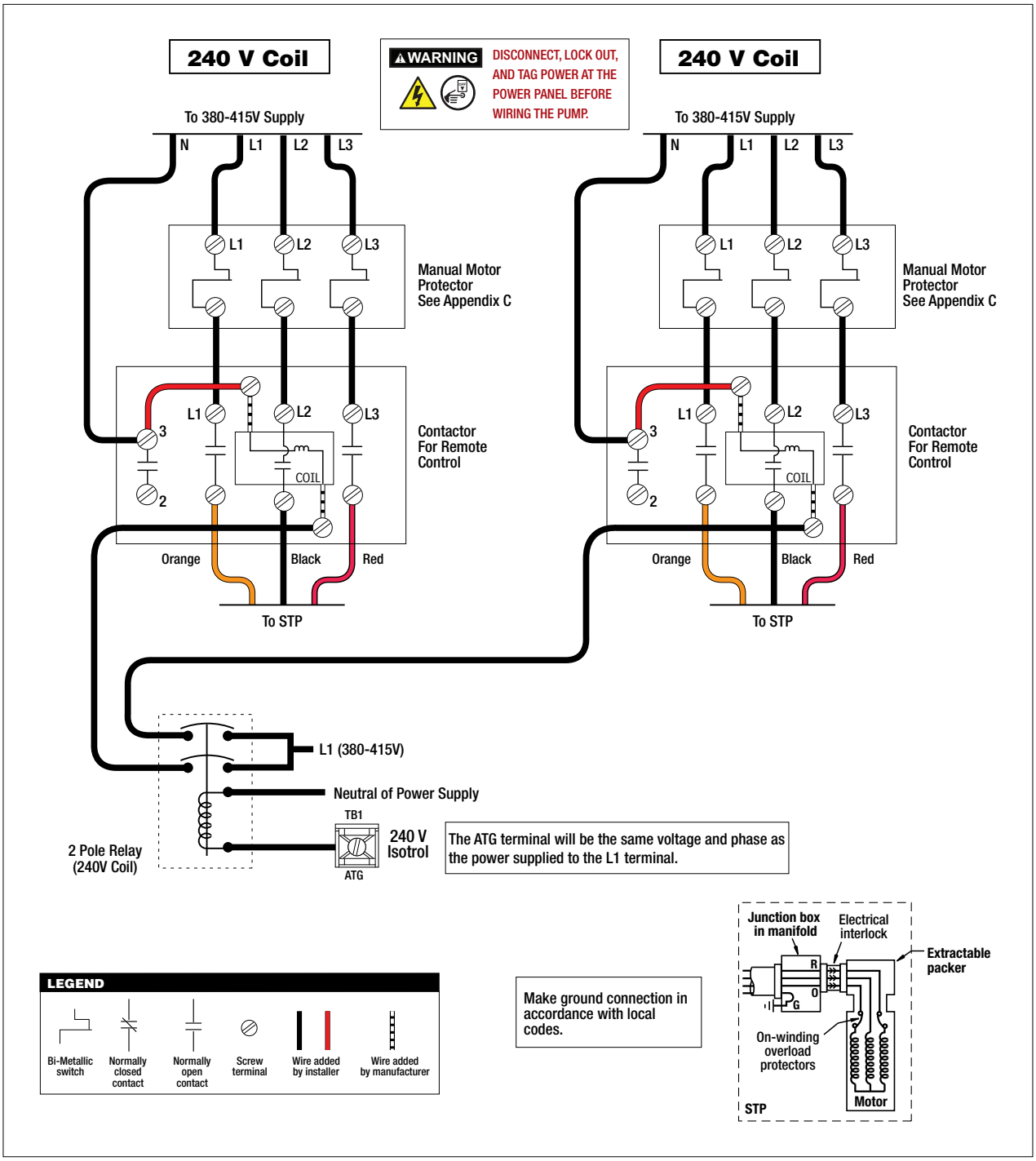


Figure 20. Suggested Wiring for Three Phase Tandem Pumps

Siphon Ports

The siphon port for The Red Jacket STP is in a siphon assembly that fits into one of the two vacuum ports (see Figure 21). The port end can be swiveled after loosening the hex on top to accommodate the incoming siphon tube. Torque the siphon assembly to 15-30 ft-lbs (20-41 N•m) after positioning.

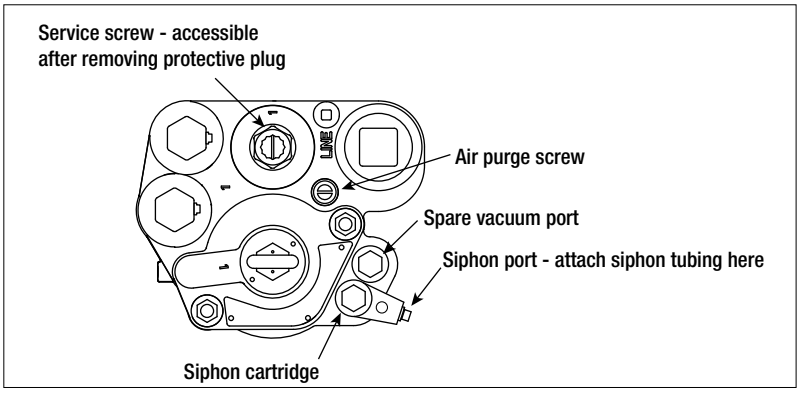


Figure 21. Siphon Connection

NOTICE **The 1/4" NPT plug in the siphon assembly should be removed and the siphon line attached.**

⚠WARNING **Before installing pipe threads, apply an adequate amount of fresh, UL classified for petroleum, non-setting thread sealant. Apply sealant in a manner that prevents it from entering and contaminating hydraulic cavities. For AG applications, Loctite 567 or Gasoila E-Seal is recommended for all field serviceable pipe threads (see Appendix D for Field Serviceable Joint locations).**

Installing a Siphon Assembly

⚠WARNING **Disconnect, lock out, and tag the power at the panel before servicing the pump.**

When servicing equipment, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.

Kits Required:

- Siphon Cartridge Kit (P/N 410151-001)
- AG Siphon Cartridge Kit (P/N 410151-002)

Procedure:

1. If a ball valve is installed down line from the pump, close it.
2. Remove and save the protective plug over the service screw and turn the screw clockwise (see Figure 22). As the screw approaches its bottom position, you will hear the system depressurizing. Continue turning the screw until it can go no further. When the screw is all the way down, backoff the screw 4 turns to lift the check valve and let the fuel drain out of the manifold's hydraulic cavities.
3. Remove one of the two siphon port plugs from the manifold (see Figure 22).
4. Get the siphon cartridge from the kit and apply a coating of petroleum jelly onto the three O-rings on the outside of the siphon cartridge.
5. Insert the siphon cartridge into the siphon port (see Figure 23). Swivel the outlet port of the siphon in the desired direction, and then hand tighten the siphon's retaining hex body. Torque the body to 25 - 30 ft-lbs (34 - 41 N•m).

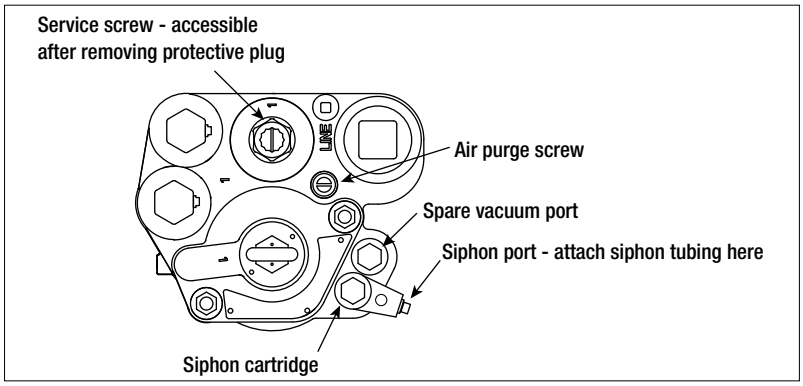


Figure 22. Siphon Ports

6. Remove the 1/4" NPT plug from the siphon outlet port and attach siphon system tubing.

⚠WARNING **Before installing pipe threads, apply an adequate amount of fresh, UL classified for petroleum, non-setting thread sealant. Apply sealant in a manner that prevents it from entering and contaminating hydraulic cavities. For AG applications, Loctite 567 or Gasoila E-Seal is recommended for all field serviceable pipe threads (see Appendix D for Field Serviceable Joint locations).**

7. Turn the service screw counterclockwise all the way up. As the screw approaches its top position, the check valve will drop into position.
8. Replace the protective plug over the service screw and fully thread into place to ensure a good seal.
9. Turn the air purge screw 2 - 3 turns counterclockwise (see Figure 22).

⚠WARNING **The air purge screw is retained by a hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.**

10. Turn the pump on and let it run for about 2 minutes to purge air from the manifold's hydraulic cavities. While the pump is still running, turn the air purge screw clockwise until it is completely closed.
11. If applicable, open the ball valve down line from the pump.

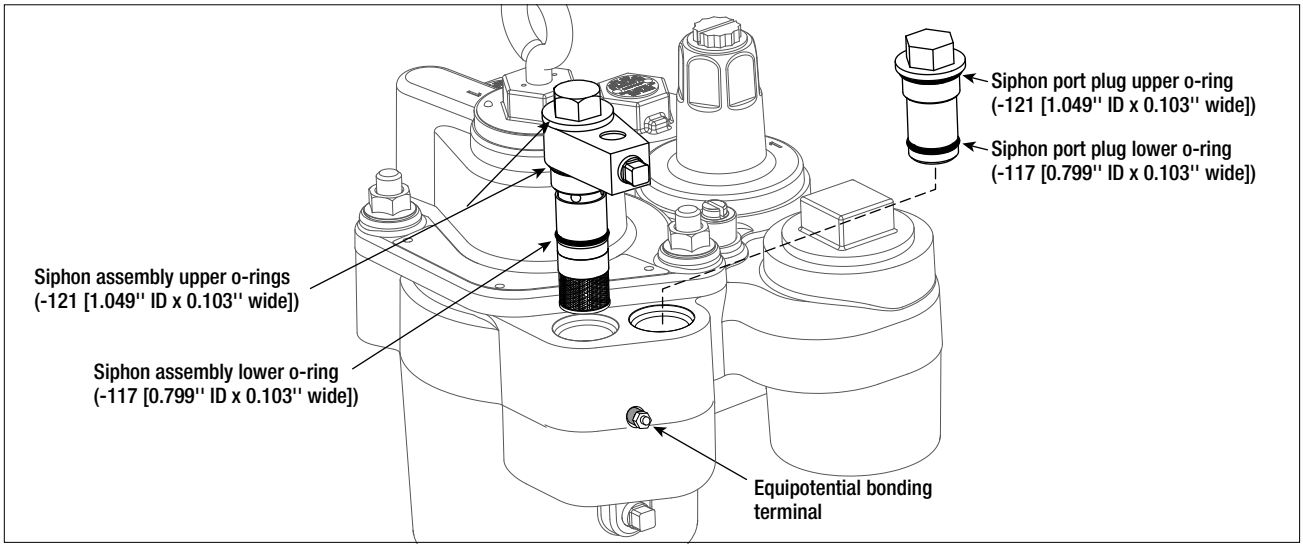


Figure 23. Inserting Siphon Assembly into Manifold

Installing an Electronic Line Leak Detector Transducer or Mechanical LLD

WARNING **Disconnect, lock out, and tag power at the panel before servicing the pump.**

When servicing equipment, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.

Parts Required:

- Electronic or mechanical line leak detector
- Hardware/Seal kit (AG) P/N 410154-001

Procedure:

1. If a ball valve is installed down line from the pump, close it.
2. Remove and save the protective plug over the service screw and turn the screw clockwise (see Figure 24). As the screw approaches its bottom position, you will hear the system depressurizing. Continue turning the screw until it can go no further. When the screw is all the way down, back off the screw 4 turns to lift the check valve and let the fuel drain out of the manifold's hydraulic cavities.
3. Remove the 2" NPT plug from line leak detector port.

   For all models with the 'RA' suffix, place the supplied plastic protector on the 2" NPT plug (see Figure 14) prior to torquing to avoid damaging the powder coating and causing corrosion.

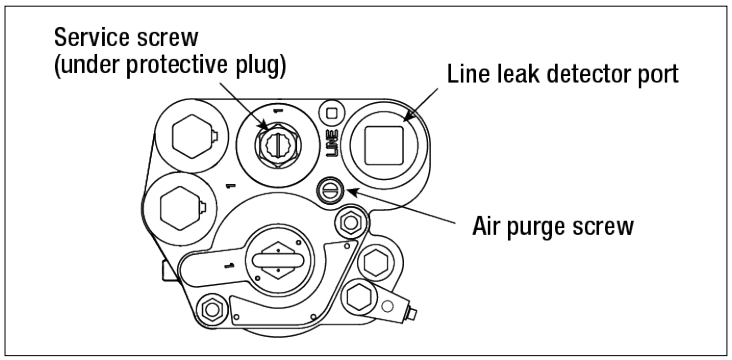


Figure 24. Locating Discharge Port Plug for Line Leak Transducer

4. Install leak detector/transducer into the 2" NPT port as per instructions included with device.
5. Turn the service screw counterclockwise all the way up. As the screw nears its top position you will hear the check valve drop into position. Replace the protective plug over the service screw and fully thread into place to ensure a good seal.
6. Open the air purge screw 2 - 3 turns counterclockwise (see Figure 24).

WARNING **The air purge screw is retained by a hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.**

7. Turn the pump on and let it run for about 2 minutes to purge air from the manifold's hydraulic cavities. While the pump is still running, turn the air purge screw clockwise until it is completely closed.
8. If applicable, open the ball valve down line from the pump.

Initial Start Up of Pump

1. If a ball valve is installed down line from the pump, close it.
2. Open the air purge screw 2 - 3 turns counterclockwise (see Figure 21).

⚠WARNING The air purge screw is retained by a hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.

3. Turn the pump on and let it run for about 2 minutes to purge air from the manifold's hydraulic cavities. While the pump is still running, turn the air purge screw clockwise until it is completely closed.
4. If applicable, open the ball valve down line from the pump.
5. Turn on the pump and purge system of air by pumping at least 15 gallons (57 liters) through each dispenser. Begin with the dispenser furthest from the pump and work back toward the pump.
6. Pump start up is now complete.

NOTE: For Three Phase Pumps Only!

Where it is not convenient to predetermine the power supply phase rotation, proper rotation can be determined by pump performance. Pump head pressure and capacity will be considerably less than rated when rotating backwards.

Connect the pump leads to terminal T1, T2, and T3 of the contactor observing color code shown in Figure 17 A and B. With ample product in the tank and the system purged of air, start the pump and make a pressure gauge reading of the system pressure with the ball valve closed; or, open valve and calculate pumping rate.

Next, shut-off power and reverse power leads at T1 and T2. Repeat either pressure or capacity tests, as described above. If results are higher than the first test, the rotation of the second test is correct. If the second test gives lower performance than the first, reconnect the power leads to T1 and T2 (as under test 1) for correct rotation.

Where the power supply has been properly marked L1, L2, and L3 in accordance with accepted phase rotation standards, it is possible to predetermine the proper rotation of these units. The pump power leads are color coded orange, black, and red, and if connected through the magnetic starter to L1, L2, and L3 respectively, the UMP will rotate in the correct direction. It is recommended, however, that the performance tests always be made whether or not the power supply has been properly 'phased out'.

Pump Tests

Verifying Relief Pressure

The relief pressure is factory set to 19 to 25 psi (131 - 172 kPa). There are two methods used to verify the relief pressure setting;

- The pressure reading can be taken from the control unit of an electronic line leak detection system if one is in operation. Observe the pressure that occurs after the pump turns off - this is the relief pressure.
- Pressure may be observed using a gauge attached at the impact valve or to the pump's line test port (see Figure 25).

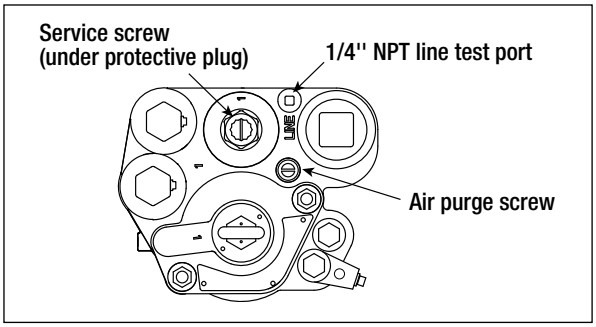


Figure 25. Locating Pump Line Test Port

Checking Relief Pressure at the Pump

WARNING **Disconnect, lock out, and tag power at the panel before servicing the pump.**

When servicing equipment, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.

Equipment required:

- Pressure gauge with appropriate fittings to connect to the 1/4'' NPT line test port

Procedure:

1. If a ball valve is installed down line from the pump, close it.
2. Remove and save the protective plug over the service screw and turn the screw clockwise (see Figure 25). As the screw approaches its bottom position, you will hear the system depressurizing. Continue turning the screw until it can go no further. When the screw is all the way down, back off the screw 4 turns to lift the check valve and let the fuel drain out of the manifold's hydraulic cavities. Continue to turn the screw all the way counterclockwise. When the screw is almost up, the check valve will drop down into position.
3. Remove the line test port plug (see Figure 25) and attach test gauge.
4. Open the air purge screw 2 - 3 turns counterclockwise (see Figure 25).

WARNING **The air purge screw is retained by a hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.**

5. Turn the pump on and let it run for about 2 minutes to purge air from the manifold's hydraulic cavities. While the pump is still running, turn the air purge screw clockwise until it is completely closed.
6. Turn off the pump and measure the relief pressure.
7. Turn the service screw clockwise. As the screw approaches its bottom position, you will hear the system depressurizing. Continue turning the screw until it can go no further. When the screw is all the way down, back off the screw 4 turns to lift the check valve and let the fuel drain out of the manifold's hydraulic cavities.
8. Turn the service screw counterclockwise all the way up. As the screw nears its top position you will hear the check valve drop into position. Replace the protective plug over the service screw and fully thread into place to ensure a good seal.

9. Remove the test gauge. Apply an adequate amount of fresh, UL classified for petroleum, non-setting thread sealant on the 1/4'' NPT plug and replace it in the line test port. Torque the plug to 14 to 21 ft-lbs (19.4 to 29 N•m).
10. Turn the air purge screw 2 - 3 turns counterclockwise.

⚠WARNING **The air purge screw is retained by a hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.**

11. Turn the pump on and let it run for about 2 minutes to purge air from the manifold's hydraulic cavities. While the pump is still running, turn the air purge screw clockwise until it is completely closed.
12. The pump is now ready for normal operation.
13. If applicable, open ball valve down line from the pump.

Testing the Line

⚠WARNING **Disconnect, lock out, and tag power at the panel before servicing the pump.**

When servicing equipment, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.

Equipment required:

- Pressure generating equipment with appropriate fittings to connect to the 1/4'' NPT line test port

Procedure

1. Block lines at each dispenser.
2. Remove and retain the protective plug over the service screw and turn the screw clockwise (see Figure 25). As the screw approaches its bottom position, you will hear the system depressurizing. Continue turning the screw until it can go no further.
3. Remove line test port plug (see Figure 26). Apply line test pressure at line test port (50 psi [345 kPa] maximum).

⚠WARNING **Excessive pressure (above the normal test pressure of 50 - 55 psi [345 - 380 kPa]) may damage check valve seat and other system components.**

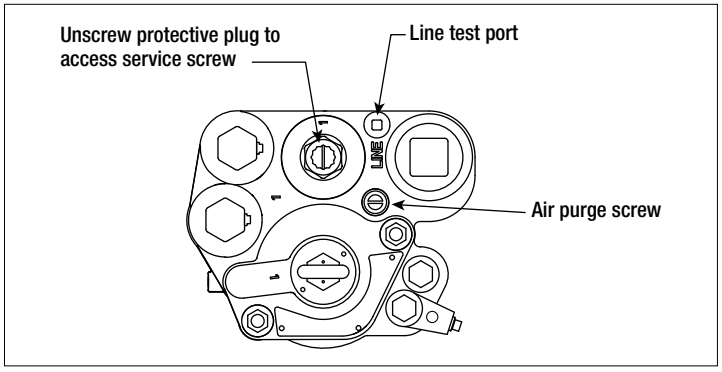


Figure 26. Service Screw, Line Test Port, and Air Purge Screw Locations

4. Depressurize the line (as per Step 2 above) and remove test fixture. Apply an adequate amount of fresh, UL classified for petroleum, non-setting thread sealant on the 1/4'' NPT plug and replace it in the line test port. Torque the plug to 14 to 21 ft-lbs (19.4 to 29 N•m).
5. Turn the service screw counterclockwise all the way up. As the screw nears its top position you will hear the check valve drop into position. Replace the protective plug over the service screw and fully thread into place to ensure a good seal.
6. Turn the air purge screw 2 - 3 turns counterclockwise (see Figure 26).

⚠WARNING The air purge screw is retained by a hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.

7. Turn the pump on and let it run for about 2 minutes to purge air from the manifold's hydraulic cavities. While the pump is still running, turn the air purge screw clockwise until it is completely closed.
8. The pump is now ready for normal operation.
9. If applicable, unblock lines at each dispenser.

Testing the tank

⚠WARNING  **Disconnect, lock out, and tag power at the panel before servicing the pump.**

 **When servicing equipment, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.**

Equipment required:

- Pressure generating equipment with appropriate fittings to connect to the 1/4'' NPT tank test port

Procedure:

1. Remove and retain the protective plug over service screw and turn the screw clockwise (see Figure 26). As the screw approaches its bottom position, you will hear the system depressurizing. Continue turning the screw until it can go no further.
2. Remove and save the 1/4 '' NPT tank test port plug and attach tank testing equipment (see Figure 27).

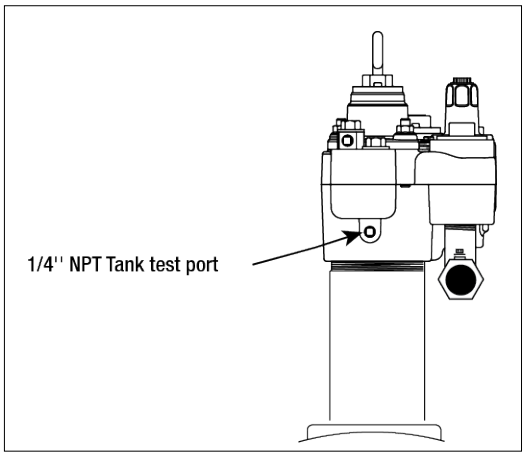


Figure 27. Manifold Tank Test Port

3. Depressurize tank and remove testing equipment. Apply an adequate amount of fresh, UL classified for petroleum, non-setting thread sealant on the 1/4'' NPT plug and replace it in the tank test port. Torque the plug to 14 to 21 ft-lbs (19.4 to 29 N•m).

NOTICE **For AG applications Loctite 567 or Gasoila E-Seal is recommended for all field serviceable pipe threads (see Appendix D for Field Serviceable Joint locations).**

4. Turn the service screw counterclockwise all the way up. As the screw nears its top position you will hear the check valve drop into position. Replace the protective plug over the service screw and fully thread into place to ensure a good seal.
5. Turn the air purge screw 2 - 3 turns counterclockwise (see Figure 26).

⚠WARNING **The air purge screw is retained by a hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.**

6. Turn the pump on and let it run for about 2 minutes to purge air from the manifold's hydraulic cavities. While the pump is still running, turn the air purge screw clockwise until it is completely closed.
7. The pump is now ready for normal operation.

Replacing the UMP

⚠WARNING **Disconnect, lock out, and tag power at the panel before servicing the pump.**

When servicing equipment, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.

Kit Required:

- UMP Replacement Kit, P/N 144-327-4 (P/N 410818-001 for AG Applications)
- Hardware/Seal Kit, P/N 410154-001
- Die Spring Kit, P/N 410485-001 (P/N 410906-001 for 'RA' models)

Procedure:

1. If a ball valve is installed down line from the pump, close it.
2. Remove the two extractable lock-down nuts and discard them (see Figure 28). The springs on the lock-down studs between the extractable's flange and the manifold will push the extractable up, breaking the seals.

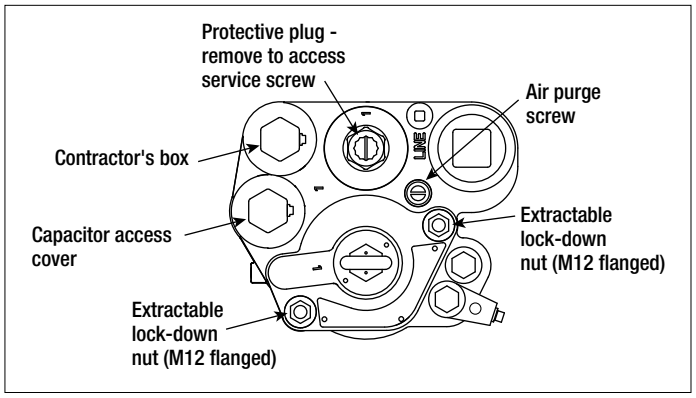


Figure 28. Extractable Lockdown Nuts

⚠WARNING **Confirm that the lifting eyebolt is properly torqued to 10 ft-lbs (13.6 N•m) with a minimum of 6 full threads installed. Occasionally, eyebolts are removed after pump installation and corrosion may occur in the threaded areas of the wiring compartment cover (eyebolt plug) and the eyebolt. If corrosion has occurred, the cover and eyebolt should be replaced.**

3. Utilize the lifting eyebolt to lift out the extractable unit and place it on a clean surface. **Removal of the extractable section of the pump must be conducted with caution.** Make certain that the extractable section remains centered within the riser pipe and that no portion of the extractable binds during the removal process. If binding occurs during removal, stop and determine the cause of the binding and correct the situation before proceeding with removal.

NOTICE **For all models with the 'RA' suffix, take care to not damage the powder coating on the Packer/Manifold and Discharge Head when placing the pump on the working surface.**

4. Remove the old UMP by removing the four bolts holding the discharge head as shown in Figure 29. Discard the old gasket and fasteners.
5. Visually inspect the pigtail connector in the discharge head - replace if damaged. Be certain the indexing tab of the pigtail is seated in the notch of the discharge head.

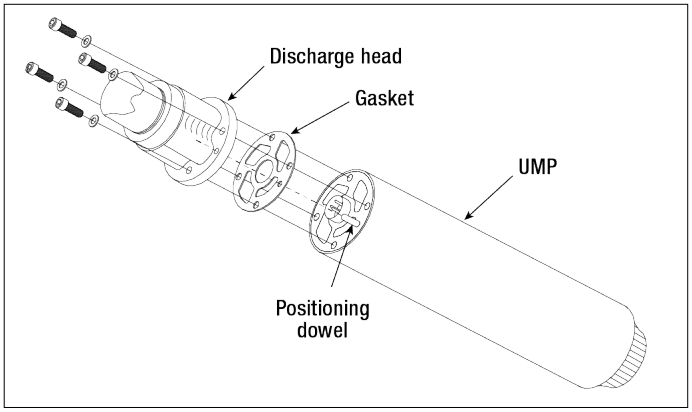


Figure 29. UMP Bolts and Gasket

6. Pull the pigtail connector in the discharge head out far enough to see the O-ring in the sidewall of its socket (see Figure 30). Remove the connector's O-ring from the connector's socket and discard it. Get a 0.551" ID x 0.070" wide O-ring from the Hardware/Seal Kit and lubricate it with petroleum jelly. Slide the new O-ring over the pigtail connector and push it in the groove in the wall of the connector's socket. Lubricate the pigtail connector body with petroleum jelly and push it back into its socket, making sure its index tab is in the socket's notch.

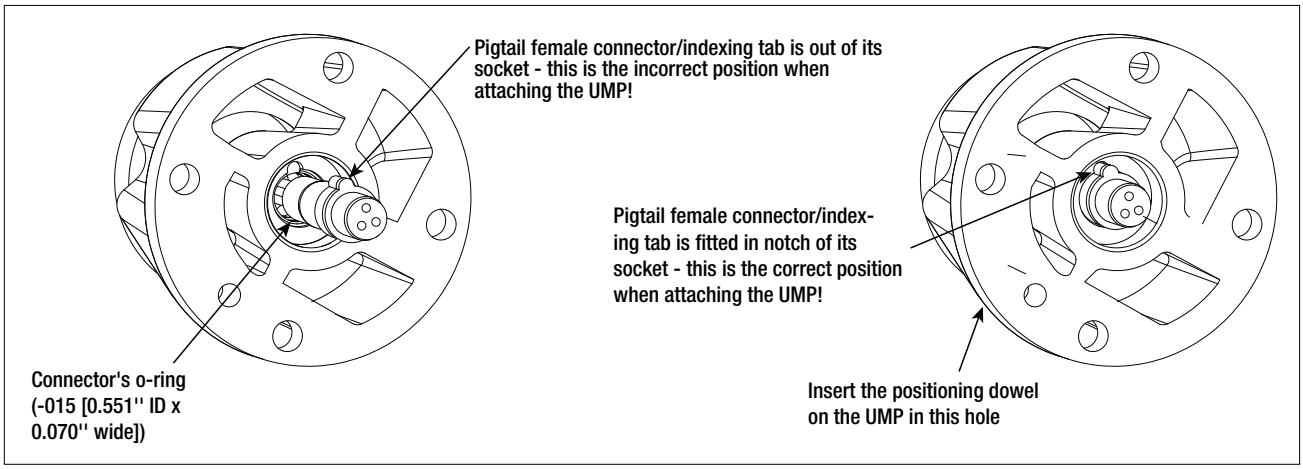


Figure 30. Verifying Pigtail's Female Connector Proper Seating

7. Place the new gasket from the UMP replacement kit on the new UMP so that all the holes align.

⚠CAUTION Gaskets from competitive UMPs will not seal properly and performance will be reduced.

8. Align the UMP positioning dowel so it inserts in the proper hole in the discharge head (see Figure 30) and push the UMP into position using hand force only. The UMP should be snug against the discharge head prior to installing the UMP retaining bolts.

⚠WARNING **Use hand force to push the UMP onto the discharge head. If the UMP does not seat snug against the discharge head, remove the UMP and correct the problem.**

9. Install the four UMP retaining bolts and lock washers. Snug and then torque the bolts using a cross pattern technique to 7 ft-lbs (11 N•m).

⚠WARNING **Do not use the bolts to pull the UMP into position. Use the cross pattern to snug and torque the bolts. Do not over torque the bolts. Not following these instructions may cause parts to fail.**

10. Get the three extractable O-ring seals (3.975'' ID x 0.210'' wide [upper], 3.850'' ID x 0.210'' wide [middle], and 3.725'' x 0.210'' wide [lower]) from the Hardware/Seal Kit. The three O-rings are very close in size so take extra care to distinguish each one before replacing them in the extractable. Lubricate each O-ring with petroleum jelly and then install them in their assigned grooves in the extractable (see Figure 31).

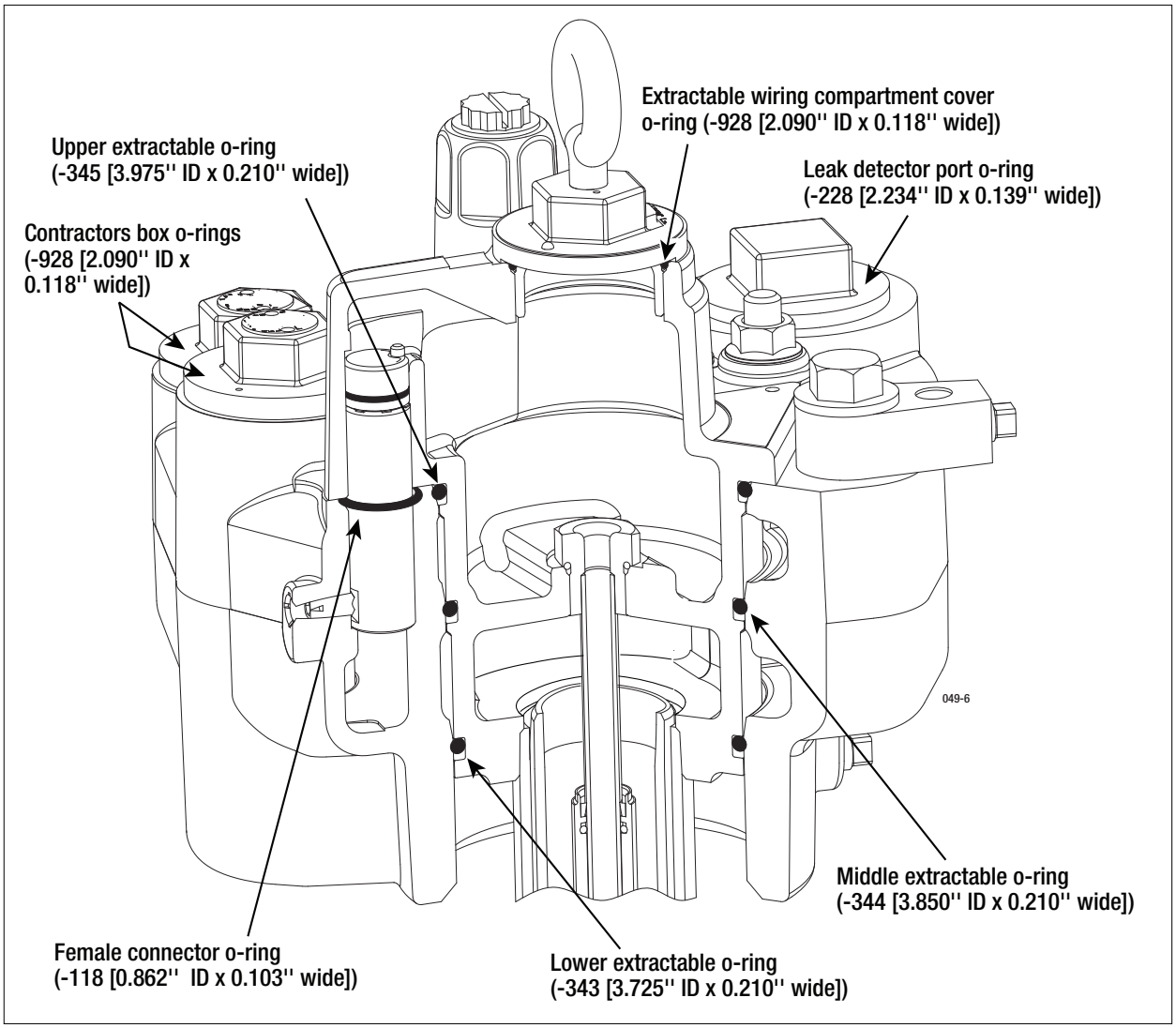


Figure 31. Locating Packer and Manifold O-rings

11. Remove the manifold's female connector's O-ring (see Figure 31). Get a 0.862'' ID x 0.103'' wide O-ring from the Hardware/Seal Kit and lubricate it with petroleum jelly. Slide the O-ring over the female connector and push it down into its groove.

12. Reinstall the extractable unit into the manifold and tank. Torque the extractable lock-down nuts in an alternating pattern to 50 ft-lbs (68 N•m).

NOTICE **Remove the springs around the lock-down studs and replace with the springs from the kit.**

For all models with the 'RA' suffix, stainless steel lockdown nuts and washers are used and found in the kit. Apply anti-seize (also found in the kit) to the lockdown studs prior to nut and washer installation.

13. Turn the air purge screw 2 - 3 turns counterclockwise (see Figure 28).

⚠WARNING **The air purge screw is retained by a hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.**

14. Turn the pump on and let it run for about 2 minutes to purge air from the manifold's hydraulic cavities. While the pump is still running, turn the air purge screw clockwise until it is completely closed.
15. If applicable, open the ball valve down line from the pump.

Replacing the Check Valve Assembly

⚠WARNING  

Disconnect, lock out, and tag power at the panel before servicing the pump.

When servicing equipment, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.

Kits Required:

- Check Valve Housing Kit (P/N 410152-001 [Standard] or 410152-002 [High Pressure]) P/N 410152-005 for 'RA' models, OR Check Valve Kit (P/N 410153-001 [Standard] or 410153-002 [High Pressure]) and Hardware/Seal Kit, P/N 410154-001

Procedure:

1. If a ball valve is installed down line from the pump, close it.
2. Remove and save the protective plug over the service screw and turn the screw clockwise (see Figure 28 on page 33). As the screw approaches its bottom position, you will hear the system depressurizing. Continue turning the screw until it can go no further. When the screw is all the way down, backoff the screw 4 turns to lift the check valve and let the fuel drain out of the manifold's hydraulic cavities. Continue to turn the screw counterclockwise until you hear the check valve drop down into position.
3. Unscrew the check valve housing. Lift the spring and check valve out of the manifold. Discard the O-ring from the housing and from the check valve.

NOTICE **If replacing the check valve O-ring, avoid twisting or rotating the O-ring as it is being installed on the check valve.**

For all models with the 'RA' suffix, place the supplied plastic protector on the Check Valve Housing prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).

4. Get the new check valve and spring from the kit. If you have the Check valve housing kit, get the new housing and O-ring (2.609'' ID x 0.139'' wide) from the kit, if you only have the check valve kit, get a new 2.609'' ID x 0.139'' wide housing O-ring from the Hardware/Seal Kit.

5. Lubricate the new housing O-ring and the new 1.859" ID x 0.139" wide O-ring on the check valve with petroleum jelly.
6. With its lubricated O-ring in place, insert the check valve onto its seat in the manifold, and place the new spring over the check valve (see Figure 32). Place the check valve housing with O-ring over the spring and check valve and screw it in hand tight. Torque the housing to 40 - 50 ft-lbs (54 - 67 N•m).
7. Replace the protective plug over the service screw and fully thread into place to ensure a good seal.
8. Open the air purge screw 2 - 3 turns counterclockwise (see Figure 28).

⚠WARNING **The air purge screw is retained by a hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.**

9. Turn the pump on and let it run for about 2 minutes to purge air from the manifold's hydraulic cavities. While the pump is still running, turn the air purge screw clockwise until it is completely closed.
10. If applicable, open the ball valve down line from the pump.

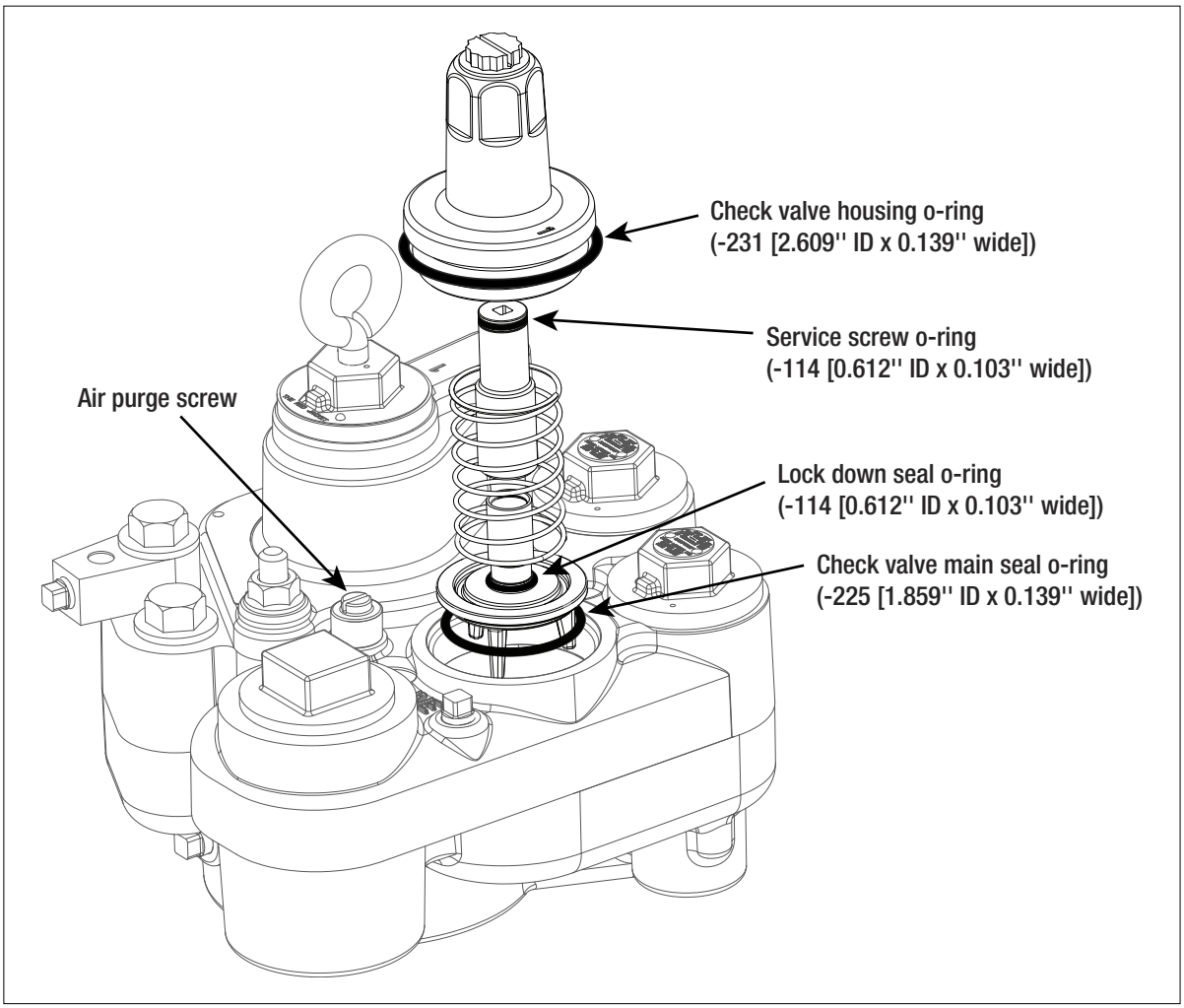


Figure 32. Inserting Check Valve Assembly into Manifold

Replacing the Conduit Bushing

Disconnect, lock out, and tag power at the panel before servicing the pump.

When servicing equipment, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.

Parts Required:

- Conduit Bushing (P/N 410486-001)
- Hardware/Seal Kit, P/N 410154-001

Procedure:

1. Remove the contractor's box cover (Figure 16). Remove and discard the O-ring from the cover. Set aside the cover.

NOTICE **For all models with the 'RA' suffix, place the supplied plastic protector on the Contractor's Box Cover prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).**

2. Locate the conduit bushing at the base of the contractor's box (see Figure 16 on page 21). Note that the incoming power wires connect to the pump wiring. Make a note of which incoming wire connects to which pump wire then cut the incoming power wires from the pump wires and discard the connectors.
3. Loosen the two screws in the conduit bushing just enough so the bushing can be lifted from its socket in the bottom of the manifold's contractor box. Continue lifting the bushing up, until it is free of the power wires. Notice that the top plate of the bushing assembly (facing into the manifold) has a larger diameter than the bottom plate, and that there are plastic rod inserts in the unused holes. The plastic inserts seal the bushing and must be in any unused hole.
4. Orient the replacement bushing so the screws are facing up, and push each of the incoming power wires through an empty hole in the bushing. Leave the plastic rod inserts in any unused holes.
5. Slide the bushing down over the power wires until it seats in its socket in the base of the manifold's contractor box leaving sufficient wire length for connecting the pump wires and then tighten the two screws in the top plate of the bushing assembly to compress the bushing and seal the wiring entry.
6. Strip insulation off all eight wires 5/16 of an inch (8mm).
7. Reconnect the power wires to the pump wires as recorded in Step 2 above.
8. Get a 2.090'' ID x 0.118'' wide O-ring from the Hardware/Seal Kit. Lubricate the O-ring with petroleum jelly and slide it over the cover's threads up to the flange. Reinstall the cover. Do not use thread sealant. Torque the cover to 35 ft-lbs (50 N•m).

NOTICE **For all models with the 'RA' suffix, place the supplied plastic protector on the Contractor's Box Cover prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).**

Replacing the Pigtail

WARNING **Disconnect, lock out, and tag power at the panel before servicing the pump.**

When servicing equipment, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.

Kits Required:

- UMP Replacement Kit P/N 144-327-4 (P/N 410818-001 for AG Applications)
- Pigtail (P/N 410156-001)
- UMP Wire Termination and Sealing Kit (P/N 410697-001)
- Hardware/Seal Kit, P/N 410154-001
- Die Spring Kit, P/N 410485-001 (P/N 410906-001 for 'RA' models)

Procedure:

1. If a ball valve is installed down line from the pump, close it.
2. Remove the two extractable lock-down nuts and discard them (see Figure 33). The springs on the lock-down studs between the extractable's flange and the manifold will push it up, breaking the seals.

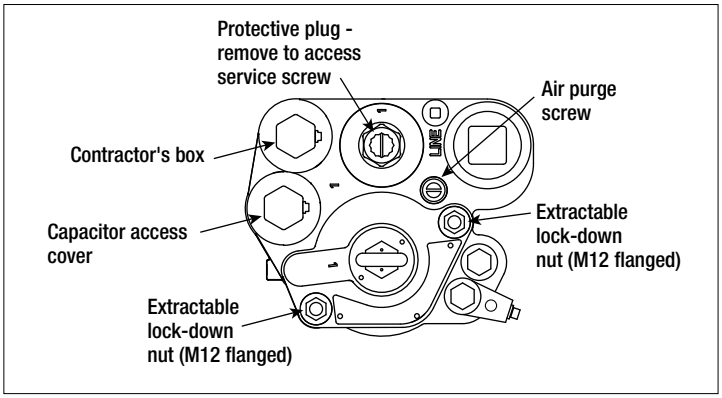


Figure 33. Extractable Lockdown Nuts

WARNING **Confirm that the lifting eyebolt is properly torqued to 10 ft-lbs (13.6 N•m) with a minimum of 6 full threads installed. Occasionally, eyebolts are removed after pump installation and corrosion may occur in the threaded areas of the wiring compartment cover (eyebolt plug) and the eyebolt. If corrosion has occurred, the cover and eyebolt should be replaced.**

3. Utilize the lifting eyebolt to lift out the extractable unit and place it on a clean surface. **Removal of the extractable section of the pump must be conducted with caution.** Make certain that the extractable section remains centered within the riser pipe and that no portion of the extractable binds during the removal process. If binding occurs during removal, stop and determine the cause of the binding and correct the situation before proceeding with removal.
4. Remove the UMP by removing the four bolts holding the discharge head as shown in Figure 29 on page 34. Discard the old gasket and fasteners.

5. Remove the packer wiring compartment cover. Remove and discard the O-ring from the cover and set aside the cover. Observe the three wiring connections sealed in the compartment. Make a note of which wire from the packer connects to which wire from the pigtail (it should be like colored wires connecting to like colored wires). Cut the wires close to the epoxy-filled bags and discard the bags.

NOTICE **For all models with the 'RA' suffix, place the supplied plastic protector on the Packer Wiring Compartment Cover prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).**

6. Look at the end of the discharge head. Pull the pigtail connector out of its socket in the discharge head and remove and discard the pigtail. Remove the O-ring in the sidewall of the connector's socket in the discharge head.
7. Get the new pigtail assembly and uncoil the pigtail so it lays flat.
8. Get a 0.551'' ID x 0.070'' wide O-ring from the Hardware/Seal Kit. Lubricate the O-ring with petroleum jelly and insert it in the sidewall of the connector's socket in the end of the discharge head.
9. Push the pigtail wires into the connector's socket until they exit into the packer's wiring compartment. At the discharge (connector) end of the pigtail, rub some petroleum jelly over the connector's outside surface and push it into its socket in the discharge head. Take care to align the connector index tab with the notch in the socket as shown in the drawing on the right in Figure 30 on page 34.
10. Place the new gasket from the UMP replacement kit on the new UMP so that all the holes align.

⚠CAUTION **Gaskets from competitive UMPs will not seal properly and performance will be reduced.**

11. Align the UMP positioning dowel so it inserts in the proper hole in the discharge head (again ref. Figure 30 on page 34) and push the UMP into position using hand force only. The UMP should be snug against the discharge head prior to installing the UMP retaining bolts.

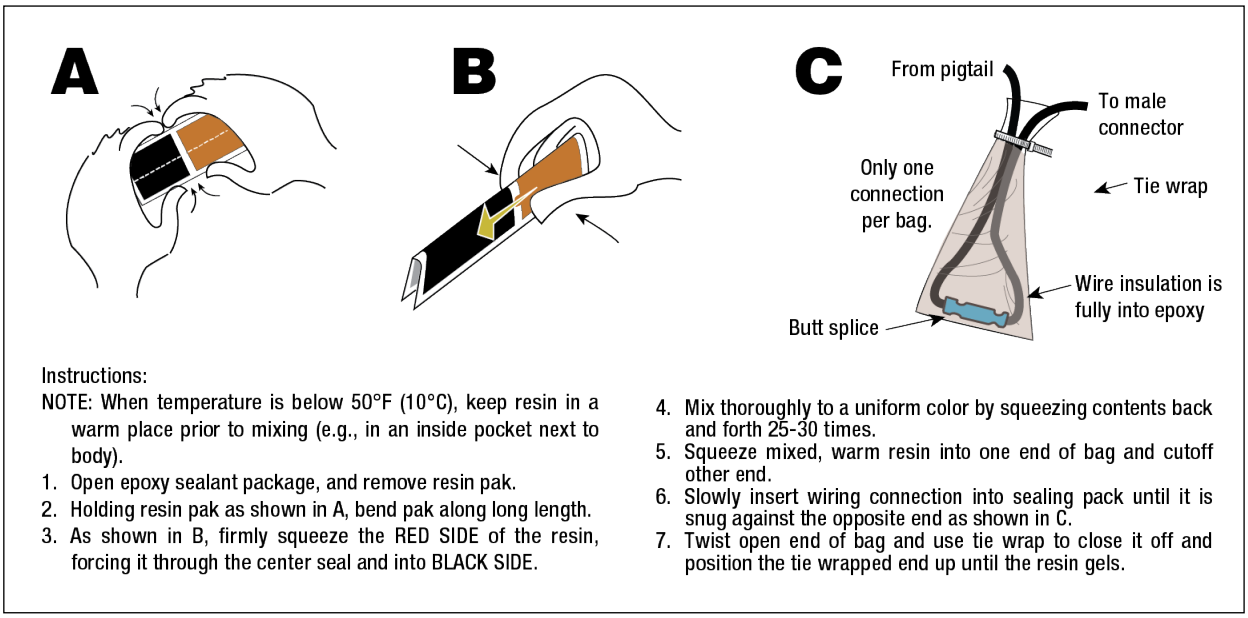
⚠WARNING **Use hand force to push the UMP onto the discharge head. If the UMP does not seat snug against the discharge head, remove the UMP and correct the problem.**

12. Install the four UMP retaining bolts and lock washers. Snug and then torque the bolts using a cross pattern technique to 7 ft-lbs (11 N•m).

⚠WARNING **Do not use the bolts to pull the UMP into position. Use the cross pattern to snub and torque the bolts. Do not over torque the bolts. Not following these instructions may cause parts to fail.**

13. Carefully pull on the pigtail wires where they exit the packer wiring compartment. Cut pigtail wires approximately 8 inches (200 mm) beyond top of packer. Visually inspect the wire insulation to make sure it is undamaged.
14. There will be three wires to the male connector installed in the packer's housing and three from the three-wire pigtail from the UMP. Strip insulation off all six wires 5/16 inches (8 mm).
15. Connect like colored wires from the UMP to like colored wires to the male connector with supplied butt splice connectors and making a mechanical crimp. (Note: refer to notes made in Step 7 before connecting these wires). Pull on each wire to verify a reliable crimp was achieved.

16. Insulate the three connections by placing each by itself into an epoxy sealant bag following steps A, B, C below.



Instructions:

NOTE: When temperature is below 50°F (10°C), keep resin in a warm place prior to mixing (e.g., in an inside pocket next to body).

1. Open epoxy sealant package, and remove resin pak.
2. Holding resin pak as shown in A, bend pak along long length.
3. As shown in B, firmly squeeze the RED SIDE of the resin, forcing it through the center seal and into BLACK SIDE.
4. Mix thoroughly to a uniform color by squeezing contents back and forth 25-30 times.
5. Squeeze mixed, warm resin into one end of bag and cutoff other end.
6. Slowly insert wiring connection into sealing pack until it is snug against the opposite end as shown in C.
7. Twist open end of bag and use tie wrap to close it off and position the tie wrapped end up until the resin gels.

17. When finished sealing the wires, coil the wires inside the packer's wiring compartment as neatly as possible (see Figure 15 on page 20).

18. Get a 2.090" ID x 0.118" wide O-ring from the Hardware/Seal Kit. Lubricate the O-ring on the packer wiring compartment cover (with lifting eyebolt) with petroleum based jelly. Screw in the packer wiring compartment cover (thread sealant should not be used) and torque to 35 ft-lbs (48 N•m).

NOTICE **For all models with the 'RA' suffix, place the supplied plastic protector on the Packer Wiring Compartment Cover prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).**

19. Get the three extractable O-ring seals (3.975" ID x 0.210" wide [upper], 3.850" ID x 0.210" wide [middle], and 3.725" x 0.210" wide [lower]) from the Hardware/Seal Kit. The three O-rings are very close in size so take extra care to distinguish each one before replacing them in the extractable. Lubricate each O-ring with petroleum jelly and then install them in their assigned grooves in the extractable - see Figure 31 on page 35.

20. Remove the manifold's female connector's O-ring - see Figure 31 on page 35. Get a 0.862" ID x 0.103" wide O-ring from the Hardware/Seal Kit and lubricate it with petroleum jelly. Slide the O-ring over the female connector and push it down into its groove.

NOTICE **Remove the springs around the lock-down studs and replace with the springs from the kit.**

For all models with the 'RA' suffix, stainless steel lockdown nuts and washers are used and found in the kit. Apply anti-seize (also found in the kit) to the lockdown studs prior to nut and washer installation.

21. Reinstall the extractable unit into the manifold and tank. Install the new extractable lock-down nuts from the kit and torque them in an alternating pattern to 50 ft-lbs (68 N•m).

22. Turn the air purge screw 2 - 3 turns counterclockwise (see Figure 33).

⚠WARNING **The air purge screw is retained by a hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.**

23. Turn the pump on and let it run for about 2 minutes to purge air from the manifold's hydraulic cavities. While the pump is still running, turn the air purge screw clockwise until it is completely closed.
24. If applicable, open the ball valve down line from the pump.

Replacing the Packer-to-Manifold Wiring Connectors

Disconnect, lock out, and tag power at the panel before servicing the pump.

When servicing equipment, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.

Kits Required:

- Electrical Connector kit (P/N 410694-001)
- UMP Wire Termination and Sealing Kit (P/N 410697-001)
- Hardware/Seal Kit, P/N 410154-001
- Die Spring Kit, P/N 410485-001 (P/N 410906-001 for 'RA' models)

Special tools - not supplied in kits:

- 3/16'' hex wrench, medium point felt-tip pen, small piece of masking tape, small ruler and needle-nose pliers or long-nose locking pliers

Procedure:

1. If a ball valve is installed down line from the pump, close it.
2. Remove the two extractable lock-down nuts (see Figure 28 on page 33). The springs on the lock-down studs between the extractable's flange and the manifold will push it up, breaking the seals.

WARNING **Confirm that the lifting eyebolt is properly torqued to 10 ft-lbs (13.6 N•m) with a minimum of 6 full threads installed. Occasionally, eyebolts are removed after pump installation and corrosion may occur in the threaded areas of the wiring compartment cover (eyebolt plug) and the eyebolt. If corrosion has occurred, the cover and eyebolt should be replaced.**

3. Utilize the lifting eyebolt to lift out the extractable unit and place it on a clean surface. **Removal of the extractable section of the pump must be conducted with caution.** Make certain that the extractable section remains centered within the riser pipe ant that no portion of the extractable binds during the removal process. If binding occurs during removal, stop and determine the cause of the binding and correct the situation before proceeding with removal.
4. Remove the packer wiring compartment cover (see Figure 31 on page 35). Remove and discard the O-ring from the cover and set aside the cover. Observe the three wiring connections sealed inside the compartment. Make a note of which wire from the packer connects to which wire from the pigtail (it should be like colored wires connecting to like colored wires). Cut the wires close to the epoxy-filled bags and discard the bags.

NOTICE **For all models with the 'RA' suffix, place the supplied plastic protector on the Packer Wiring Compartment Cover prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).**

5. Locate the male connector inside the packer (see Figure 34).
6. Place a mark on the facing of the Packer using a felt pen to indicate the position of the index hole (see Figure 36).

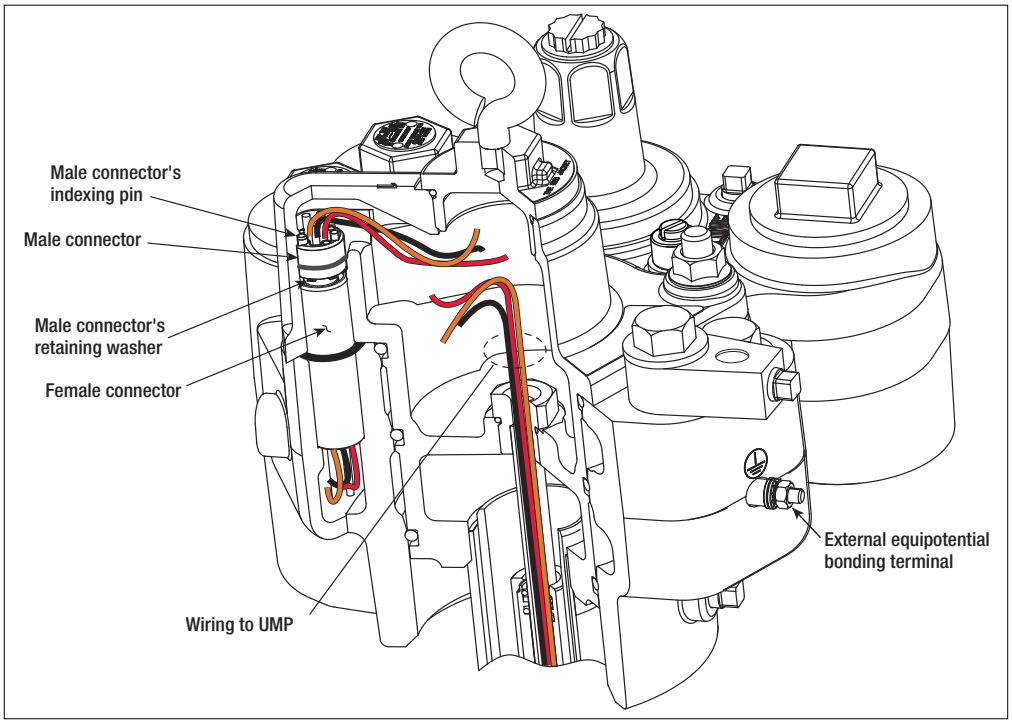


Figure 34. Packer-to-Manifold Wiring Connectors

7. Use a pair of needle-nose pliers or long-nose locking pliers to remove the retaining washer that holds the male connector in its socket.
8. Remove the male connector with O-ring.
9. Get the new male connector and retaining washer from the electrical connector kit.
10. Notice the small indexing pin on the back of the male connector (see Figure 35).

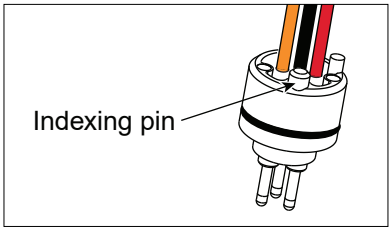


Figure 35. Male Connector's Index Pin

11. The index pin on the back of the male connector must seat in the index hole in the base of its packer socket (see Figure 36) for the male connector to be correctly oriented relative to the female connector.

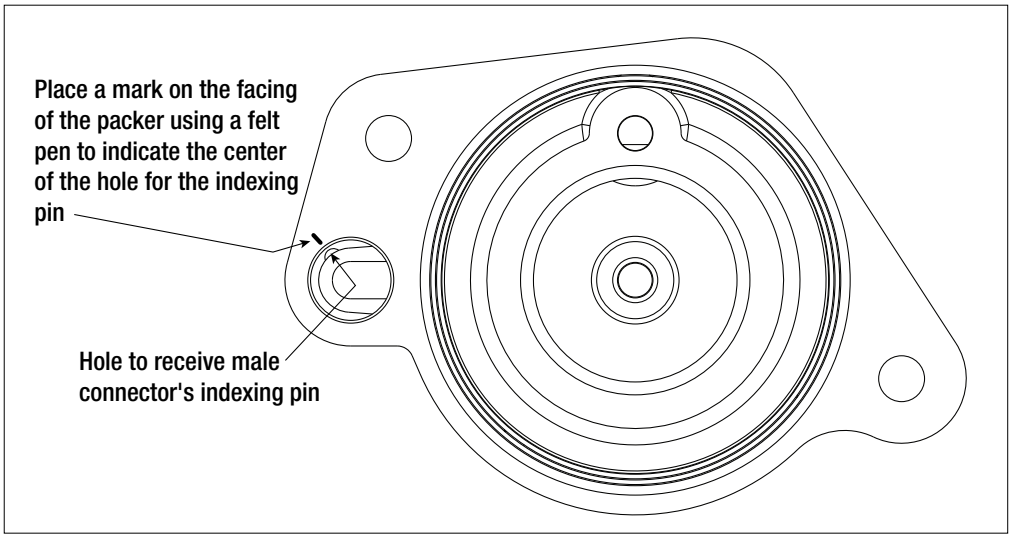


Figure 36. Male Connector Socket in Base of Packer

12. Place a small piece of masking tape on the pin side of the male connector in line with the indexing pin (see Figure 37).

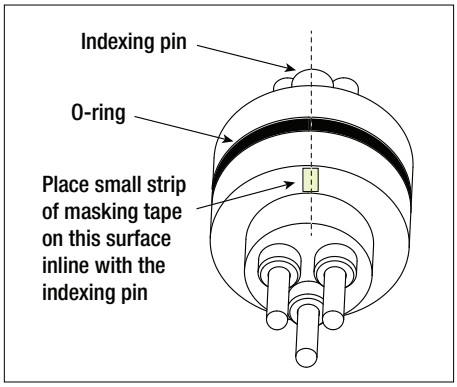


Figure 37. Placing Masking Tape Alignment Marker on Male Connector

13. Lubricate the O-ring on the male connector with petroleum jelly.
14. Thread the wires of the new male connector down into the socket and out through the opening in the base of the socket into the packer wiring compartment. Gently pull the wires into the wiring compartment as you align the masking tape mark on the male connector with mark on the packer facing. When you have pushed the male connector all the way into its socket it should not rotate if the indexing pin is in the index hole. Using the small ruler, measure the distance from the packer facing down to the male connector, it should be a little more than 1-3/8'' (35mm) (see Figure 38). Holding the wires tight to keep the male connector index pin in position, insert the retaining washer (with upturned teeth facing out) into the socket forcing it down against the male connector (a thin wall, deep socket can aid in seating the retaining washer firmly against the male connector). Recheck the 1-3/8'' (35mm) measurement after installing the retaining washer to confirm that the male connector is at the proper depth.

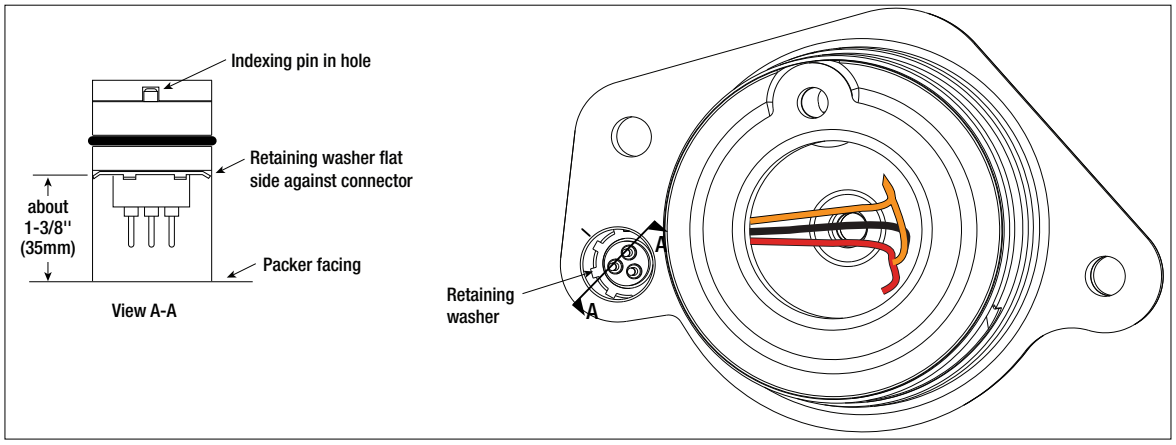
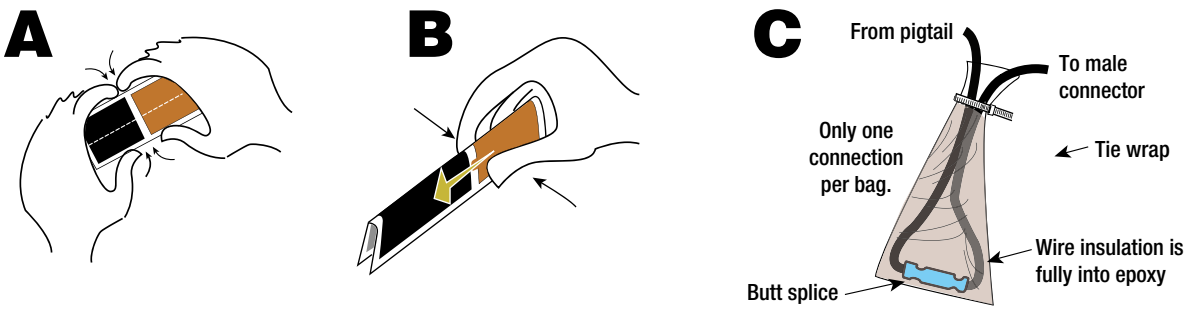


Figure 38. Correct Depth of Male Connector in Packer Socket

15. Strip insulation off all six wires 5/16 of an inch (8mm).
16. Connect like colored wires from the UMP to like colored wires to the male connector with supplied butt splice connectors and making a mechanical crimp. (Note: refer to notes made in Step 4 before connecting these wires).
17. Pull on each wire to verify a reliable crimp was achieved.
18. Insulate the three connections by placing each by itself into an epoxy sealant bag following steps A, B, C below.



Instructions:

NOTE: When temperature is below 50°F (10°C), keep resin in a warm place prior to mixing (e.g., in an inside pocket next to body).

1. Open epoxy sealant package, and remove resin pak.
2. Holding resin pak as shown in A, bend pak along long length.
3. As shown in B, firmly squeeze the RED SIDE of the resin, forcing it through the center seal and into BLACK SIDE.
4. Mix thoroughly to a uniform color by squeezing contents back and forth 25-30 times.
5. Squeeze mixed, warm resin into one end of bag and cutoff other end.
6. Slowly insert wiring connection into sealing pack until it is snug against the opposite end as shown in C.
7. Twist open end of bag and use tie wrap to close it off and position the tie wrapped end up until the resin gels.

19. When finished sealing the wires, coil the wires inside the packer's wiring compartment as neatly as possible (see Figure 15 on page 20).
20. Get a 2.090"ID x 0.118" wide O-ring from the Hardware/Seal Kit. Lubricate the O-ring on the packer wiring compartment cover (with lifting eyebolt) with petroleum based jelly. Screw in the packer wiring compartment cover (thread sealant should not be used) and torque to 35 ft-lbs (50 N•m).

21. Remove capacitor access cover (see Figure 39). Remove and discard the O-ring from the cover and set aside the cover. Observe the three wiring connections from the female connector. Make a note of which wire from the connector connects to which wire from the incoming power wiring. Cut the incoming power wires from the female connector wires and discard the connectors.

NOTICE **For all models with the 'RA' suffix, place the supplied plastic protector on the Capacitor Access Cover prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).**

22. Using a 3/16" hex wrench, turn the set screw that holds the female connector in place about 1-1/2 turns counterclockwise until you can lift out the connector (see Figure 39).

⚠WARNING **Do not try to remove the set screw.**

23. Get the new female connector and its 0.862" ID x 0.103 wide O-ring from the kit. Push the three wires coming out of the connector down through the opening in the base of its socket and into the capacitor well. As you pull on its wires in the capacitor well, lower the connector with the flat cut in the side of the connector facing its retaining set screw. With the connector as far down as it can go (sitting on the ridge in the base of its socket), tighten the set screw firmly against the connector. As the set screw tightens it should rotate the connector to its proper position relative to the male connector.
24. Strip insulation off all six wires 5/16 of an inch (8mm).
25. Reconnect the connector's three wires as per your notes made in Step 21 above.
26. Get a 2.090" ID x 0.118" wide O-ring from the Hardware/Seal Kit and lubricate with petroleum jelly. Insert this O-ring on the capacitor cover and screw in the cover. Do not use thread sealant. Torque the cover to 35 ft-lbs (50 N•m).

NOTICE **For all models with the 'RA' suffix, place the supplied plastic protector on the Capacitor Access Cover prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).**

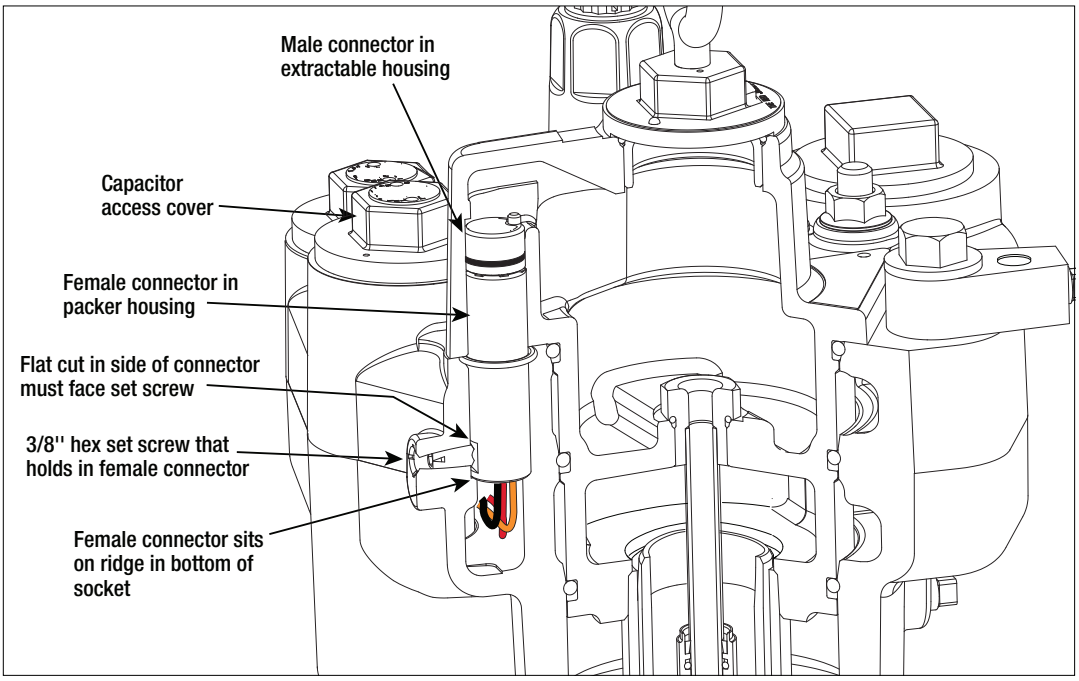


Figure 39. Female Connector Set Screw Location

27. Remove the manifold's female connector's O-ring. Get the 0.862'' ID x 0.103'' wide O-ring from the connector kit and lubricate it with petroleum jelly. Insert this O-ring in its groove in the manifold around the female connector (see Figure 34 on page 43).
28. Get the three extractable O-ring seals (3.975'' ID x 0.210'' wide [upper], 3.850'' ID x 0.210'' wide [middle], and 3.725'' x 0.210'' wide [lower]) from the Hardware/Seal Kit. The three O-rings are very close in size so take extra care to distinguish each one before replacing them in the extractable. Lubricate each O-ring with petroleum jelly and then install them in their assigned grooves in the extractable (see Figure 31 on page 35).

NOTICE **For all models with the 'RA' suffix, stainless steel lockdown nuts and washers are used and found in the kit. Apply anti-seize (also found in the kit) to the lockdown studs prior to nut and washer installation.**

NOTICE **Remove the springs around the lock-down studs and replace with the springs from the kit.**

29. Reinstall the extractable unit into the manifold and tank. Torque the extractable lock-down nuts in an alternating pattern to 50 ft-lbs (68 N•m).
30. Turn the air purge screw 2 - 3 turns counterclockwise (see Figure 33).

NOTICE **For all models with the 'RA' suffix, stainless steel lockdown nuts and washers are used and found in the kit. Apply anti-seize (also found in the kit) to the lockdown studs prior to nut and washer installation.**

⚠WARNING **The air purge screw is retained by a hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.**

31. Turn the pump on and let it run for about 2 minutes to purge air from the manifold's hydraulic cavities. While the pump is still running, turn the air purge screw clockwise until it is completely closed.
32. If applicable, open the ball valve down line from the pump.

Replacing the Air Purge Screw

⚠WARNING  

Disconnect, lock out, and tag power at the panel before servicing the pump.

 **When servicing equipment, use non-sparking tools and use caution when removing or installing equipment to avoid generating a spark.**

Kits Required:

- Air Purge Screw Kit (P/N 410484-001)
- Hardware/Seal Kit (P/N 410154-001)

Special tool required: T-handle 1/4'' hex drive

Procedure:

1. If a ball valve is installed down line from the pump, close it.
2. Remove and save the protective plug in the top of the check valve housing and turn the service screw clockwise (see Figure 40). As the screw approaches its bottom position, you will hear the system depressurizing. Continue turning the screw until it can go no further. When the screw is all the way down, back off the screw 4 turns to lift the check valve and let the fuel drain out of the manifold's hydraulic cavities.

3. Unscrew the check valve housing. Notice that the check valve and spring are still attached to the service screw. Remove and discard the housing O-ring (see Figure 32 on page 37). Set the housing/check valve assembly aside.

NOTICE **For all models with the 'RA' suffix, place the supplied plastic protector on the Check Valve Cover prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).**

4. Remove the 2'' NPT plug, LLD transducer, or MLLD from the line leak detector port in the manifold. Remove the O-ring from the device and discard.

NOTICE **For all models with the 'RA' suffix, place the supplied plastic protector on the 2" NPT plug prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).**

5. Locate the air purge screw on the top of the manifold (Figure 40).
6. The air purge screw has a hitch pin that is set in the horizontal position to prevent removal of the screw (see Figure 44).
7. Accessing the the hitch pin through the check valve port, use your forefinger to push the pin all the way in as far as you can. As you unscrew the screw, the pin will be forced down into the vertical position as it contacts the surface of the manifold's cavity.
8. Lubricate the three O-rings on the new screw with petroleum jelly and install it with the hitch pin pushed on and hanging in the vertical position (see Figure 43).

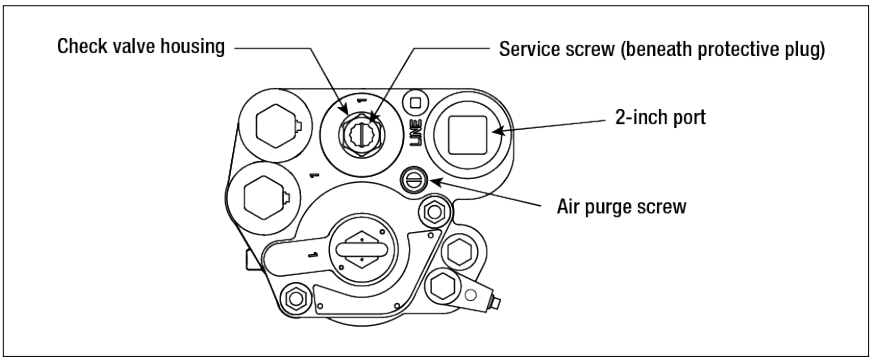


Figure 40. Air Purge Screw Location

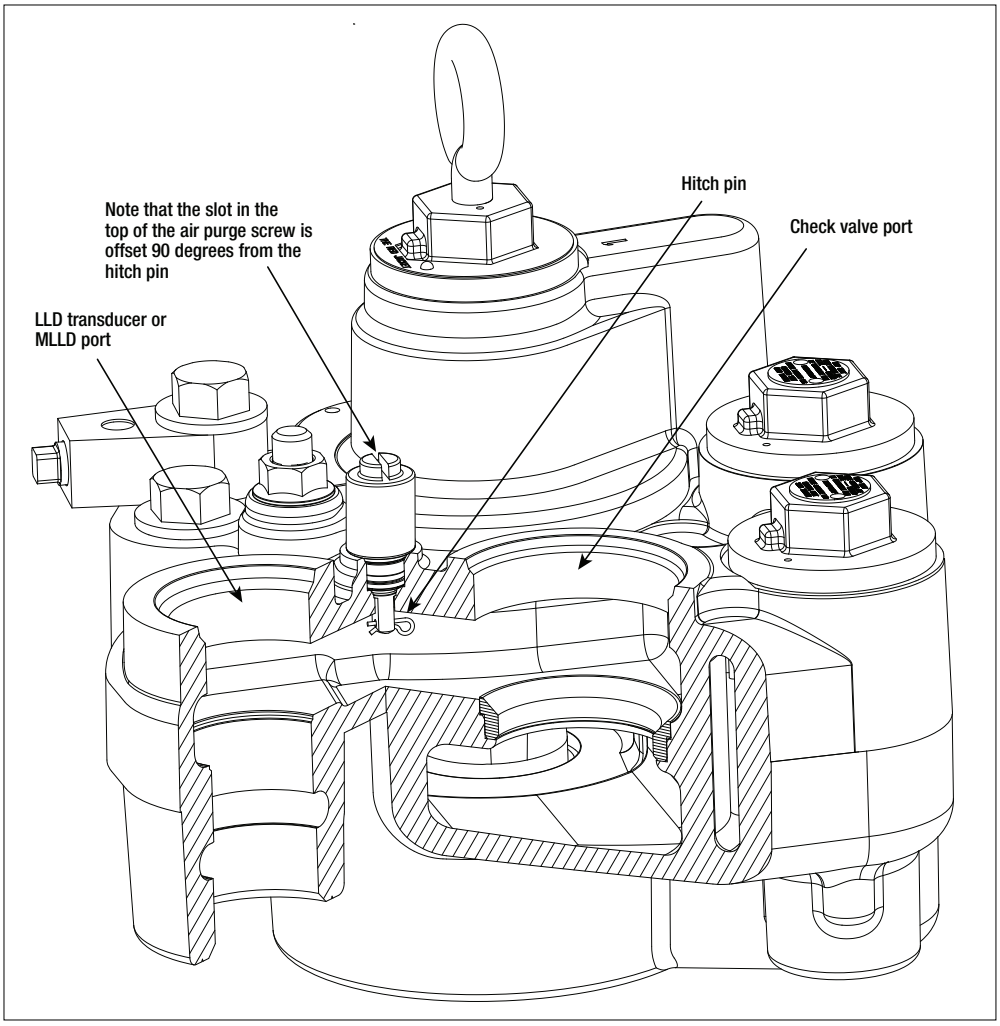


Figure 41. Air Purge Screw Hitch Pin

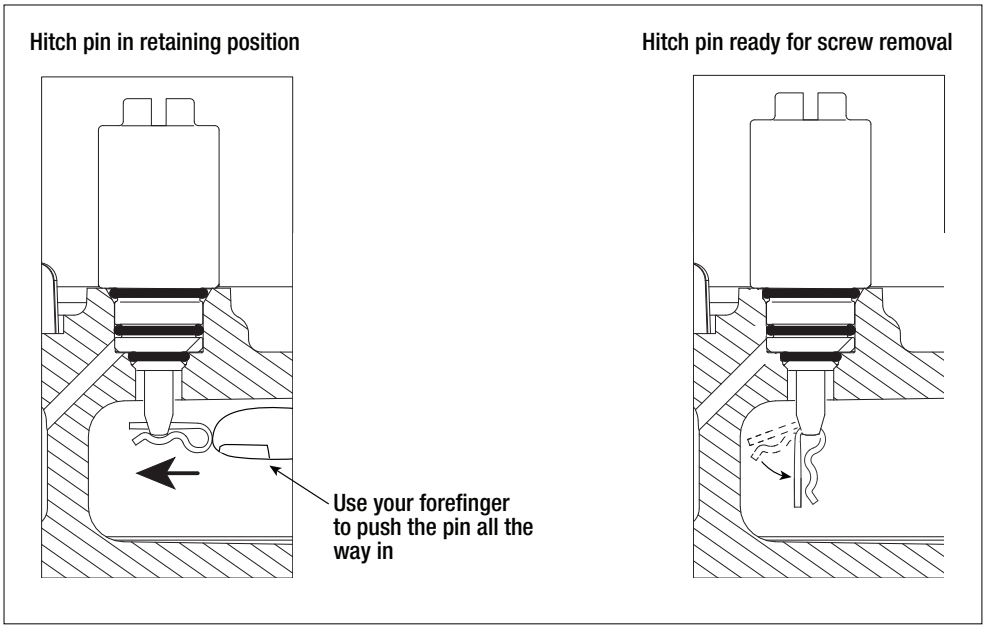


Figure 42. Positioning the Hitch Pin to Allow Air Purge Screw Removal

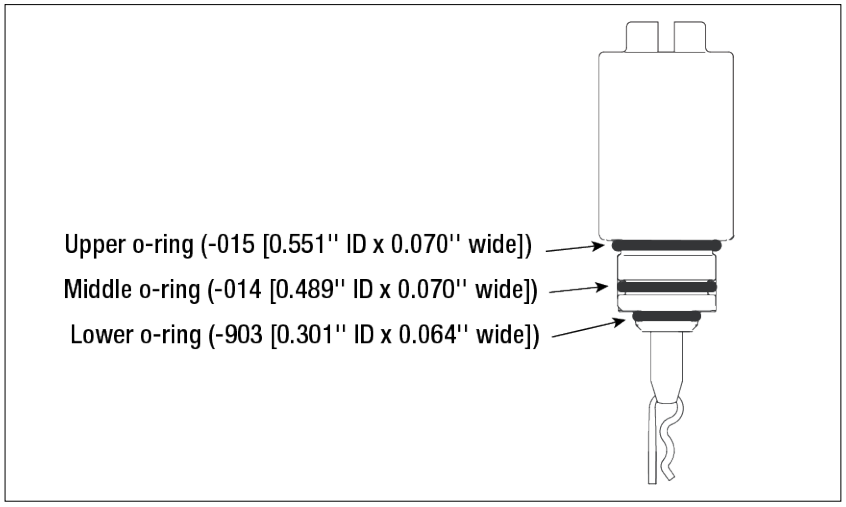


Figure 43. Hitch Pin in Position to Install Air Purge Screw

9. When the screw is turned clockwise all the way down, but not tight, use the forefinger of one hand to push the hitch pin up as shown in left diagram 1 of Figure 44.
10. While holding the hitch pin up with the forefinger of one hand, place the gloved forefinger of your other hand against the end of the pin as shown in diagram 2 of Figure 44.
11. Push the end of the pin with the gloved forefinger until it snaps into the retaining position as shown in diagram 3 of Figure 44.

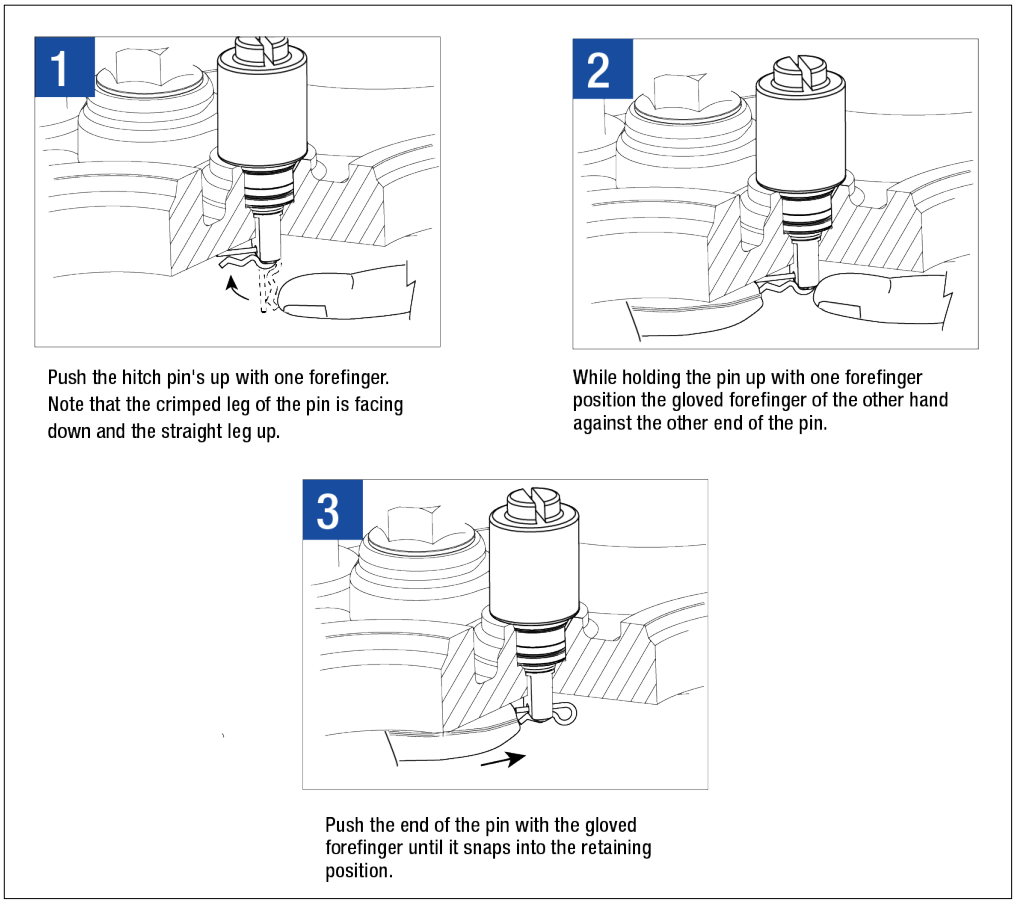


Figure 44. Installing Air Purge Screw Hitch Pin in the Retaining Position

12. If you removed the 2''NPT plug to access the screw, get a new 2.234" ID x 0.139" wide O-ring from the Hardware/Seal Kit and install it on the 2" NPT plug. Lubricate the O-ring with petroleum jelly and install the plug into the leak detector port. Torque the plug to 20 - 50 ft-lbs (27 - 67 N•m).

NOTICE **For all models with the 'RA' suffix, place the supplied plastic protector on the 2" NPT plug prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).**

13. If you removed a line leak detector to access the air purge screw, apply an adequate amount of fresh, UL classified for petroleum, non-setting thread sealant to the threads of the leak detection device and screw it into the 2'' port. Torque the device until leak free.
14. Get a new check valve housing O-ring (2.609'' ID x 0.139'' wide) from the Hardware/Seal Kit. Lubricate the O-ring with petroleum jelly and install it on the valve as shown in Figure 32 on page 37.
15. Screw the check valve into its port in the manifold. Torque the housing to 20 - 50 ft-lbs (27 - 67 N•m). Turn the service screw all the way up (CCW). You will hear the check valve drop into position just before the screw is all the way up. Replace the protective plug over the service screw and fully thread into place to ensure a good seal.

NOTICE **For all models with the 'RA' suffix, place the supplied plastic protector on the Check Valve Cover prior to torquing to avoid damaging the powder coating and causing corrosion (see Figure 14).**

16. Screw the air purge screw all the way down (cw), then back it off 2 - 3 turns counterclockwise.

⚠WARNING **The air purge screw is retained by the hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.**

17. Turn the pump on and let it run for about 2 minutes to purge air from the manifold's hydraulic cavities. While the pump is still running, turn the air purge screw clockwise until it is completely closed.
18. Open the ball valve down line from the pump.

Parts Lists

Customer Service Number

After unpacking the equipment, please inspect the parts. Make sure all accessories are included and that no damage occurred during shipping. Report any damage to the shipper immediately and inform a customer service representative at 1-800-873-3313 of any equipment damage or missing parts.

Pump Parts

Table 7 lists the international pump parts list.

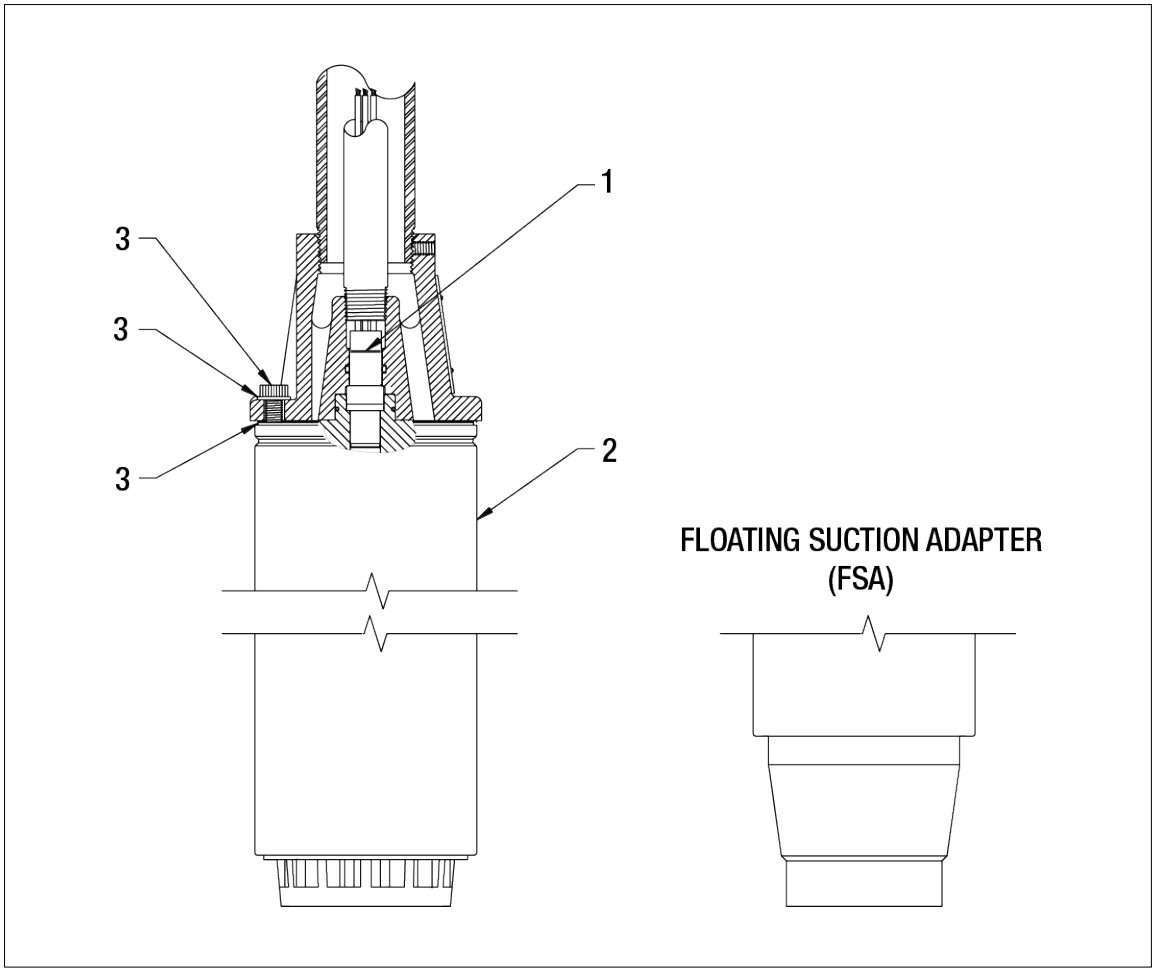


Figure 45. Pump Parts

Table 7. International Pump Parts List

Item (ref. Figure 45)	Part No.	Description	INTL
1	410156-001	20 ft. pigtail	1
2	410184-034	UMP75U17-3 W/2" Discharge head	1
2	410184-036	UMP150U17-3 W/2" Discharge head	1
2	410184-038	X4UMP150U17 W/2" Discharge head	1
2	410184-033	UMP75U17-3	1
2	410184-035	UMP150U17-3	1
2	410184-041	AGUMP75S17-3	1
2	410184-043	AGUMP150S17-3	1
2	410184-053	AGUMP75S17-3 W/FSA	1
2	410184-054	AGUMP150S17-3 W/FSA	1
2	410184-037	X4UMP150U17	1
2	410184-051	X4UMP150U17 W/FSA	1
2	410184-045	X4AGUMP150S17	1
2	410184-055	X4AGUMP150S17 W/FSA	1
2	410184-049	UMP75U17-3 W/FSA	1
2	410184-050	UMP150U17-3 W/FSA	1
2	410184-039	UMP200U17-4	1
2	410184-047	AGUMP200S17-4	1
2	410184-040	UMP200U17-4 W/2” Discharge Head	1
2	410184-052	UMP200U17-4 W/FSA	1
2	410184-056	AGUMP200S17-4 W/FSA	1
2	410184-042	AGUMP75S17-3 W/ 2” DH	1
2	410184-044	AGUMP150S17-3 W/ 2” DH	1
2	410184-046	X4AGUMP150S17 W/ 2” DH	1
2	410184-048	AGUMP200S17-4 W/ 2” DH	1
	410146-003	PACMAN-P75U17-3 (packaged) - 20%	1
	410148-003	PACMAN-P150U17-3 (packaged) - 20%	1
	410150-003	PACMAN-X4P150U17 (packaged) - 20%	1
	410163-003	PACMAN-P200U17-4 (packaged) - 20%	1
	410161-001	Seal - Conduit Adapter Assembly	1
1	410697-001	UMP Wire Termination and Sealing Kit	1
3	144-327-4	Kit - flex siphon/UMP (includes gasket, lock washers and bolts)	1
	144-194-5	Trapper - Retrofit (not shown)	1
3	410818-001	Kit - flex siphon/UMP AG (incl. gasket, lock washers & bolts)	1
	410146-004	PACMAN-AGP75S17-3 (Packaged)	1
	410148-004	PACMAN-AGP150S17-3 (Packaged)	1
	410150-004	PACMAN-XAGP150S17 (Packaged)	1
	410163-004	PACMAN-AG200S17-4 (Packaged)	1

Siphon Cartridge Kit Parts

Table 8 lists the 410151-001 Siphon Cartridge Kit & 410151-002 AG Siphon Cartridge Kit parts lists.

Table 8. Siphon Cartridge Kit Parts List

Item (ref. Figure 46)	Part No.	Description	Qty.	Part Illustration
Siphon Cartridge Kit				
1	410255-001	Siphon assembly	1	
AG Siphon Cartridge Kit				
1	410255-002	AG Siphon assembly	1	

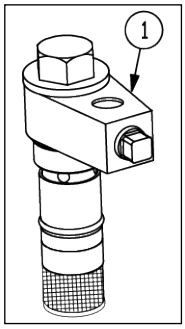


Figure 46. Siphon Cartridge Kit

Check Valve Housing Kit Parts

Table 9 lists the 410152-001 Check Valve Housing Kit and 410152-002 High Pressure Check Valve Housing Kit parts lists.

Table 9. Check Valve Housing Kits Parts Lists

P/N 410152-001 Check Valve Housing Kit Parts List				P/N 410152-002 High Pressure Check Valve Housing Kit Parts List			
Item (ref. Figure 47)	**Part No.**	**Description**	**Qty.**	**Item (ref. Figure 47)**	**Part No.**	**Description**	**Qty.**
1	410016-002	Housing assembly - chk/rlf vlv	1	1	410016-002	Housing assembly - chk/rlf vlv	1
2	410753-001	Spring	1	2	410753-001	Spring	1
3	410022-005	Poppet assembly - chk/rlf vlv	1	3	410022-006	Poppet assembly - chk/rlf vlv	1
P/N 410152-005 RA Check Valve Housing Kit Parts List				**P/N 410152-006 RA High Pressure Check Valve Housing Kit Parts List**			
Item (ref. Figure 47)	**Part No.**	**Description**	**Qty.**	**Item (ref. Figure 47)**	**Part No.**	**Description**	**Qty.**
1	410016-004	Housing assembly - chk/rlf vlv	1	1	410016-004	Housing assembly - chk/rlf vlv	1
2	410753-001	Spring	1	2	410753-001	Spring	1
3	410022-005	Poppet assembly - chk/rlf vlv	1	3	410022-006	Poppet assembly - chk/rlf vlv	1
4	410908-001	Powder coat protector	1	4	410908-001	Powder coat protector	1

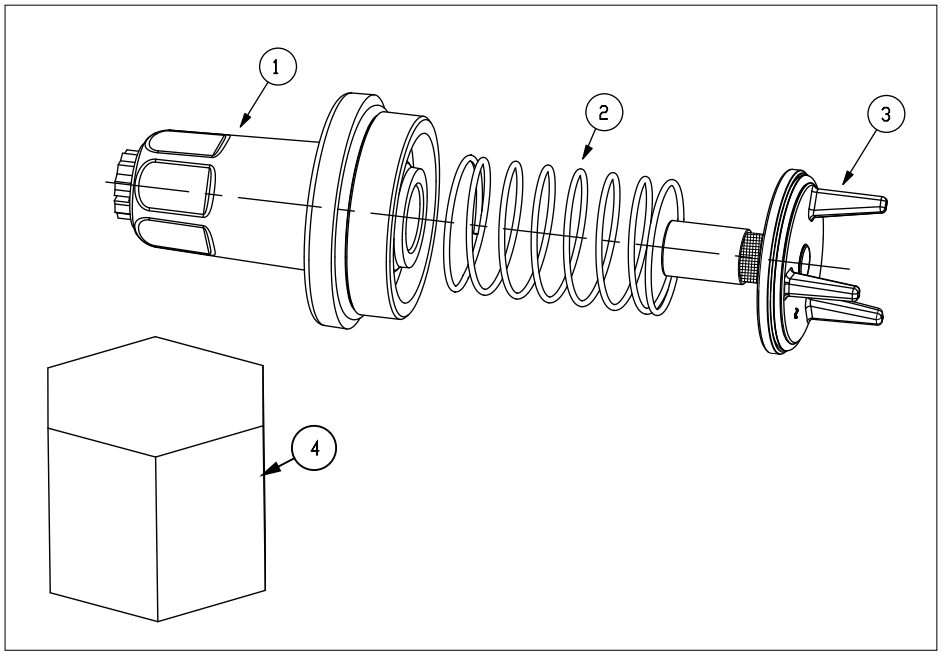


Figure 47. Check Valve Housing Kit

Check Valve Kit Parts

Table 10 lists the 410153-001 Check Valve Kit parts list.

Table 10. 410153-001 Check Valve Kit Parts List

Item (ref. Figure 48)	Part No.	Description	Qty.
1	410022-005	Poppet assembly - check relief valve	1
2	410753-001	Spring	1

Table 11 lists the 410153-002 Hi Pressure Check Valve Kit parts list.

Table 11. 410153-002 Hi Pressure Check Valve Kit Parts List

Item (ref. Figure 48)	Part No.	Description	Qty.
1	410022-006	Hi press poppet assembly - check relief valve	1
2	410753-001	Spring	1

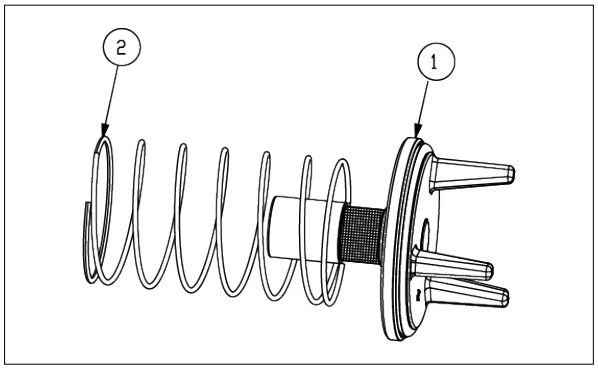


Figure 48. Check Valve Kit

Conduit Bushing Kit Parts

Table 12 lists the 410486-001 Conduit Bushing Kit parts list.

Table 12. 410486-001 Conduit Bushing Kit Part List

Item (ref. Figure 49)	Part No.	Description	Qty.
1	410301-001	Bushing - Conduit	1

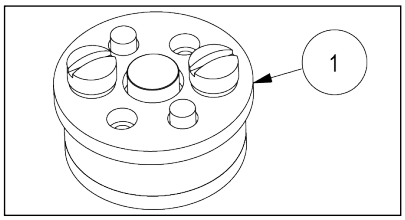


Figure 49. Siphon Cartridge Kit

Hardware/Seal Kit Parts

Table 13 lists the 410154-001 Hardware/Seal Kit parts list.

Table 13. 410154-001 Hardware/Seal Kit Parts List

(Ref. Figure)	Part No.	Description	Qty.
Figure 31 on page 35	072-541-1	O-ring - 118-FKM	1
Figure 32 on page 37	072-578-1	O-ring - 225-FKM	1
Figure 32 on page 37	072-685-1	O-ring - 114-FKM	2
Figure 31 on page 35	072-686-1	O-ring - 228-FKM	1
Figure 31 on page 35	072-720-1	O-ring - 928-FKM	3
Figure 31 on page 35	579005-001	O-ring - 343-FKM	1
Figure 31 on page 35	579005-002	O-ring - 344-FKM	1
Figure 31 on page 35	579005-003	O-ring - 345-FKM	1
Figure 23 on page 26	579005-004	O-ring - 117-FKM	2
Figure 23 on page 26	579005-005	O-ring - 121-FKM	4
Figure 32 on page 37	579005-006	O-ring - 231-FKM	1
Figure 43 on page 50	579005-007	O-ring - 014-FKM	1
Figure 43 on page 50	579005-009	O-ring - 903-FKM	1
Figure 6 on page 14, Figure 30 on page 34, and Figure 43 on page 50	072-690-1	O-ring - 015-FKM	2
Figure 28 on page 33	410127-001	Nut - flanged - M12x1.75-6H	2
Figure 43 on page 50	579014-002	Hitch pin	1
Appendix B	577013-835	O-ring gauge	1

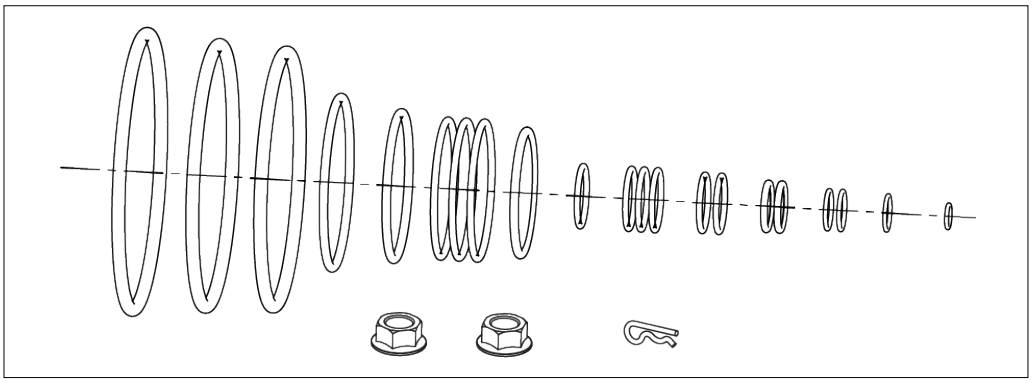


Figure 50. Hardware/Seal Kit

Electrical Connector Kit Parts

Table 14 lists the 410694-001 Electrical Connector Kit parts list.

Table 14. 410694-001 Electrical Connector Kit Parts List

Item (ref. Figure 51)	Part No.	Description	Qty.
1	410607-001	Connector - male	1
2	410117-001	Connector - electrical	1
3	072-541-1	O-ring - 118 - FKM	1
4	072-214-1	Ring - internal lock - 5/8” ID x 7/8” OD	1

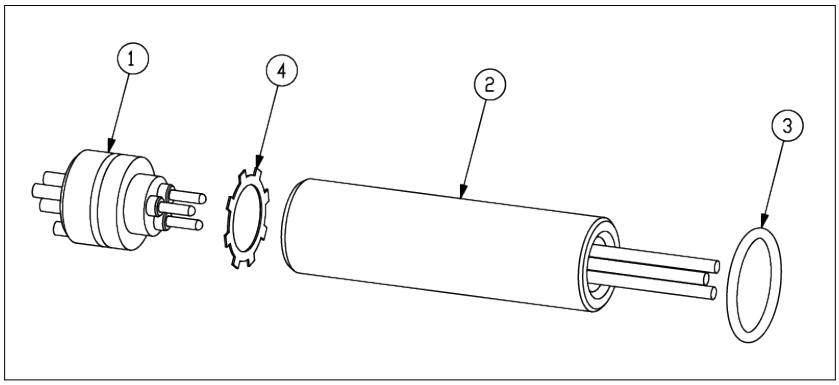


Figure 51. Electrical Connector Kit

UMP Wire Termination And Sealing Kit Parts

Table 15 lists the 410697-001 UMP Wire Termination And Sealing Kit parts list.

Table 15. 410697-001 UMP Wire Termination And Sealing Kit Parts List

Item (ref. Figure 51)	Part No.	Description	Qty.
1	081-112-1	Connector - Terminal	7
2	514100-304	Epoxy Sealant Pack	3
3	510901-337	Cable Tie	3

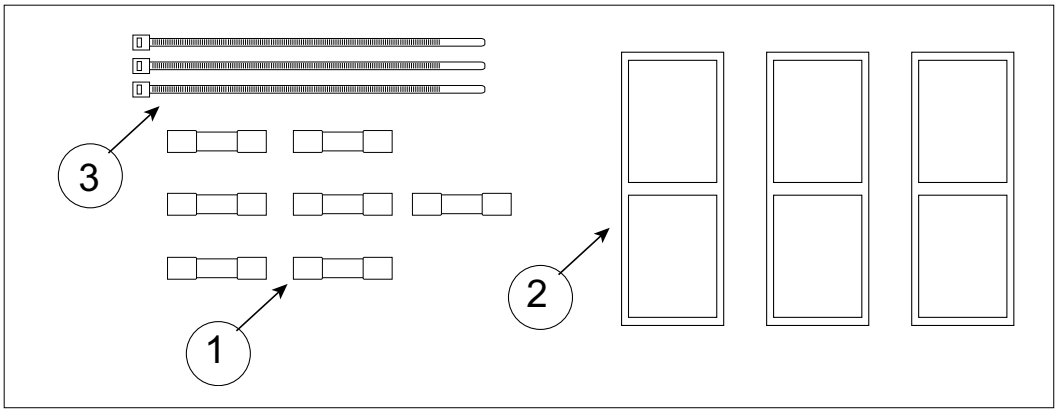


Figure 52. UMP Wire Termination and Sealing Kit

Die Spring Kit Parts

Table 16 lists the 410485-001 Die Spring Kit parts list.

Table 16. 410485-001 Die Spring Kit Parts List

Item (ref. Figure 53)	Part No.	Description	Qty.
1	410133-001	Die spring	2

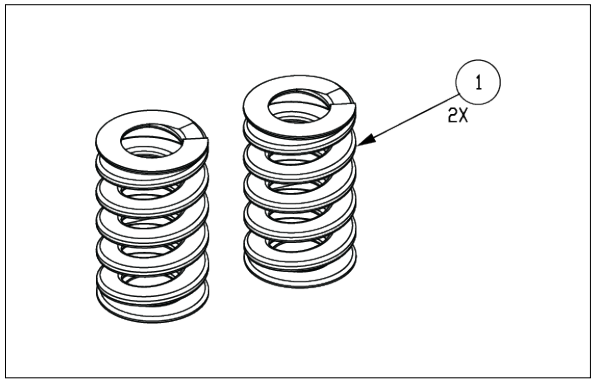


Figure 53. Die Spring Kit

RA Die Spring Kit Parts

Table 17 lists the 410906-001 RA Die Spring Kit parts list.

Table 17. 410906-001 RA Die Spring Kit Parts List

Item (ref. Figure 54)	Part No.	Description	Qty.
1	410133-002	Spring - die, stainless steel	2
2	579301-001	Washer - flat-531 x 1.062 x 0.095, stainless steel	2
3	410823-001	Nut - hex stud cover	2
4	579165-001	Anti-seize compound - metal free - stick - 20g	1

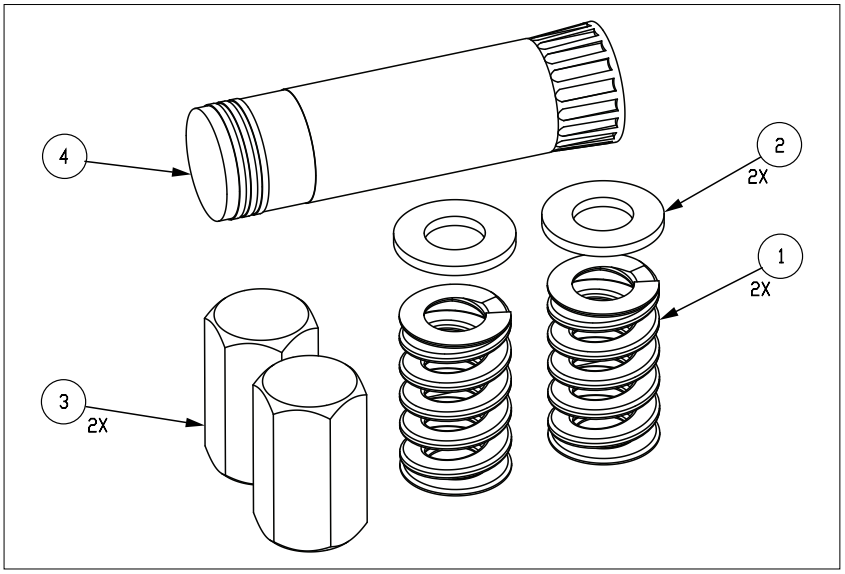


Figure 54. RA Die Spring Kit

Air Purge Screw Kit Parts

Table 18 lists the 410484-001 Air Purge Screw Kit parts list.

Table 18. 410484-001 Air Purge Screw Kit Parts List

Item (ref. Figure 55)	Part No.	Description	Qty.
1	410064-001	O-ring-015-FKM	1
2	410134-002	Screw - air purge - SST	1
3	579005-007	O-ring-014-FKM	1
4	579005-009	O-ring-903-FKM	1
5	579014-002	Clip - hitch pin clip- SST	1

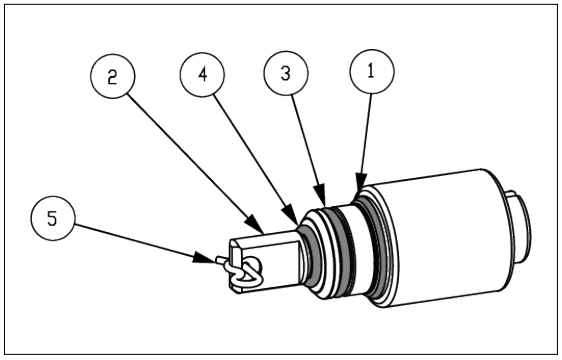


Figure 55. Air Purge Screw Kit

Conduit Box Plug Kit Parts

Table 19 lists the 067-258-5 Conduit Box Plug (STD) Kit parts list.

Table 19. 067-258-5 Conduit Box Plug (STD) Kit Parts List

Item (ref. Figure 56)	Part No.	Description	Qty.
1	067-258-4	Conduit plug assembly (STD)	1

Table 20 lists the 067-259-5 Conduit Box Plug (AG) Kit parts list.

Table 20. 067-259-5 Conduit Box Plug (AG) Kit Parts List

Item (ref. Figure 56)	Part No.	Description	Qty.
1	067-259-4	Conduit plug assembly (AG)	1

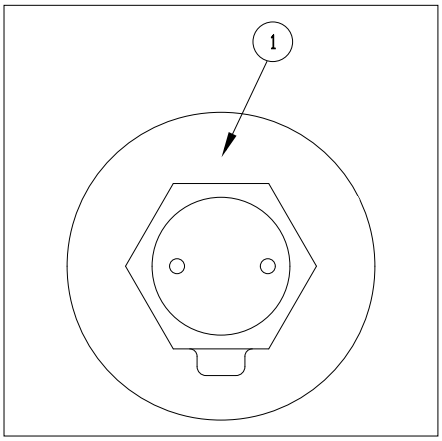


Figure 56. Conduit Box Plug Kit

Table 21 lists the 410905-001 RA Conduit Box Plug Kit parts list.

Table 21. 410905-001 RA Conduit Box Plug Kit Parts List

Item (ref. Figure 57)	Part No.	Description	Qty.
1	410855-001	Plug-conduit box - powder coated	1
2	072-656-1	O-Ring- 1.750 I.D. x 0.118 W (-928)-FKM	1
3	410695-002	Nameplate-conduit box cover-SST	1
4	579300-001	Screw-#2 X 3/16 drive-SST	2
5	410907-001	Protector-conduit plug	1

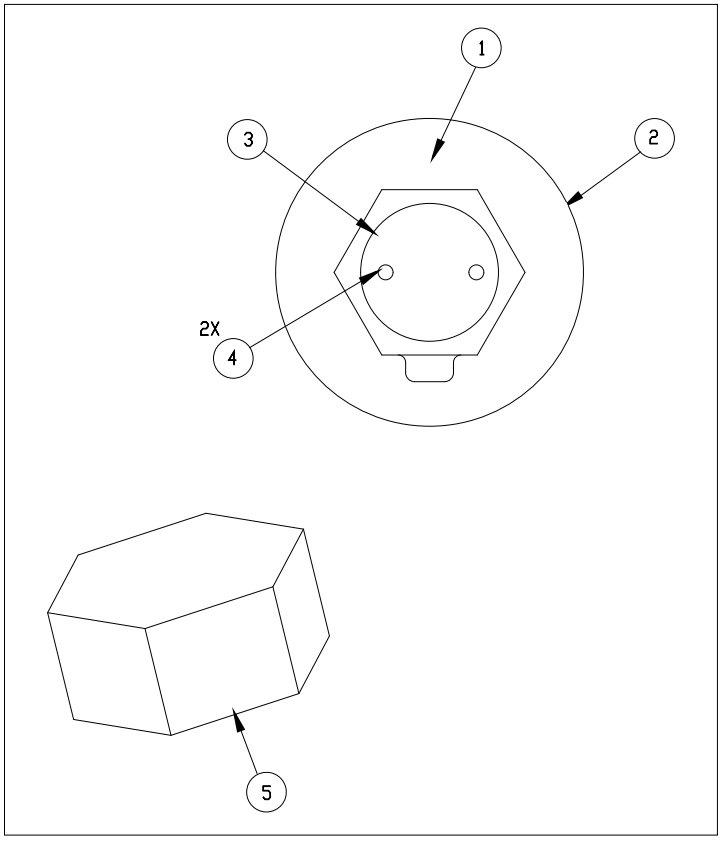


Figure 57. RA Conduit Box Plug Kit

Eyebolt Plug Kit Parts

Table 22 lists the 410482-001 Eyebolt Plug Kit parts list.

Table 22. 410482-001 Eyebolt Plug Kit Parts List

Item (ref. Figure 58)	Part No.	Description	Qty.
1	410118-001	Plug-lifting eyebolt-mach-painted	1
2	036-064-1	Eyebolt-lifting	1
3	072-720-1	O-ring-928-FKM (conduit box plugs)	1
4	410126-001	Nameplate-lifting plug	1
5	026-236-1	Screw-#2 X 3/16 drive	2

Table 23 lists the 410482-002 RA Eyebolt Plug Kit parts list.

Table 23. 410482-002 RA Eyebolt Plug Kit Parts List

Item (ref. Figure 58)	Part No.	Description	Qty.
1	410118-002	Plug-lifting eyebolt-mach-coated	1
2	410844-001	Eyebolt-0.500-13-stainless steel	1
3	072-720-1	O-ring-928-FKM (conduit box plugs)	1
4	410126-005	Nameplate-lifting plug-Red Armor™	1
5	579300-001	Drive screw-#2 X 0.188 LG-SST	2
6	410907-001	Protector-conduit plug	1

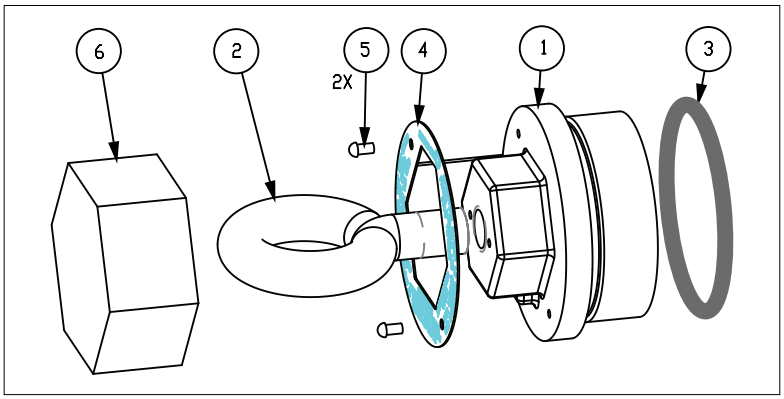


Figure 58. Eyebolt Plug Kit

Siphon Dummy Plug Kit Parts

Table 24 lists the 410483-001 AG Siphon Dummy Plug Kit parts list.

Table 24. 410483-001 AG Siphon Dummy Plug Kit Parts List

Item (ref. Figure 59)	Part No.	Description	Qty.
1	410081-001	Port plug - siphon	1
2	579005-004	O-ring 0.813 I.D. x 0.09 W (-117) - FKM	1
3	579005-005	O-ring 1.063 I.D. x 0.09 W (-121) - FKM	1

Table 25 lists the 410483-002 RA Siphon Dummy Plug Kit parts list.

Table 25. 410483-002 RA Siphon Dummy Plug Kit Parts List

Item (ref. Figure 59)	Part No.	Description	Qty.
1	410081-002	Port plug - siphon	1
2	579005-004	O-ring 0.813 I.D. x 0.09 W (-117) - FKM	1
3	579005-005	O-ring 1.063 I.D. x 0.09 W (-121) - FKM	1

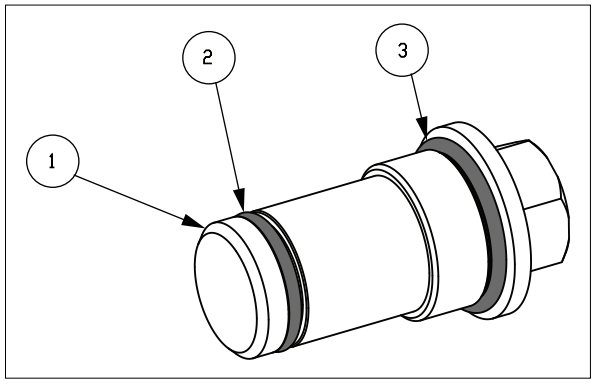


Figure 59. Siphon Dummy Plug Kit

Manifold Installation Tool Kit

Table 26 lists the 410912-001 Manifold Installation Tool Kit parts list.

Table 26. 410912-001 Manifold Installation Tool Kit Parts List

Item (ref. Figure 60)	Part No.	Description	Qty.
1	410890-001	ASM - Manifold install tool	1

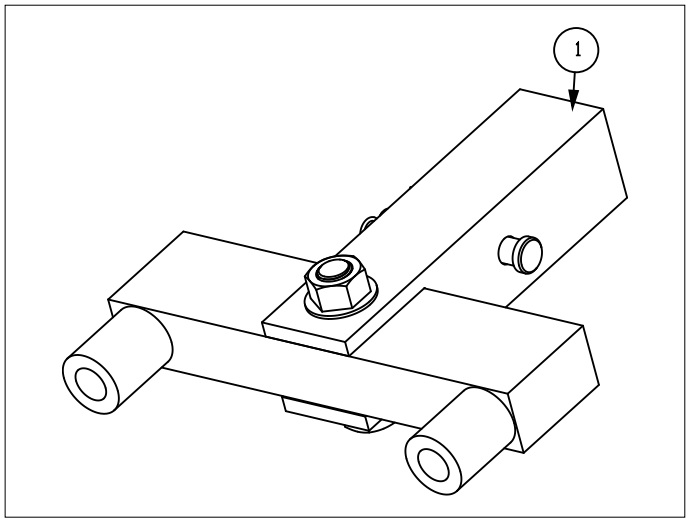


Figure 60. Manifold Installation Tool Kit

Powder Coat Protector Kit

Table 27 lists the 410911-001 Powder Coat Protector Kit parts list.

Table 27. 410911-001 Powder Coat Protector Kit Parts List

Item (ref. Figure 61)	Part No.	Description	Qty.
1	410907-001	Protector - conduit plug	1
2	410908-001	Protector - check valve	1
3	410909-001	Protector - MLD plug	1

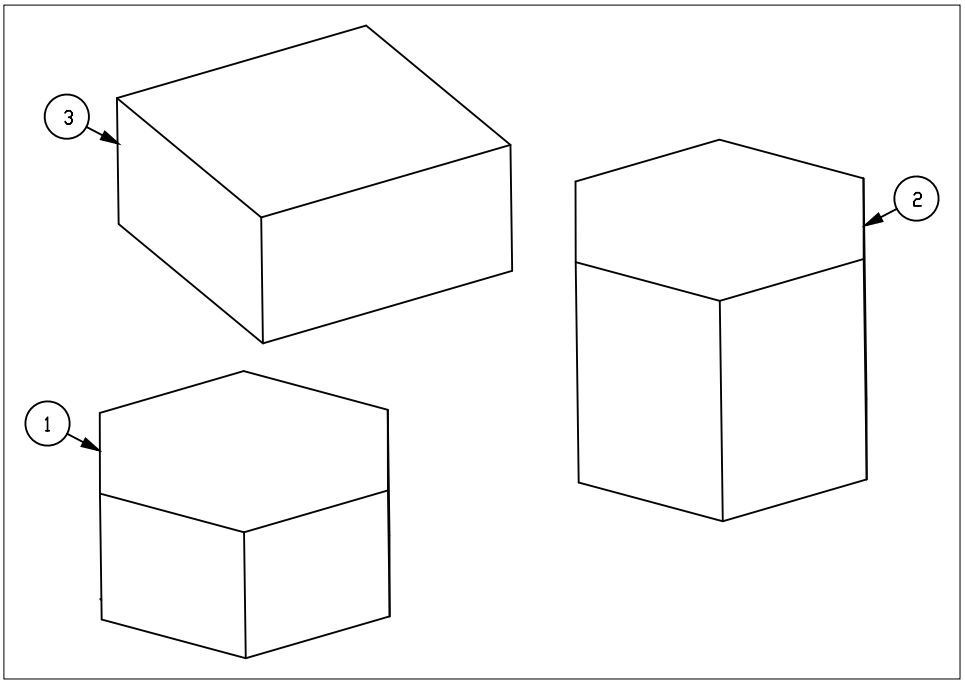


Figure 61. Powder Coat Protector Kit

Appendix A: Check Valve/Air Purge Screw Operation

This appendix discusses the theory of operation of the Red Jacket STP's check valve and air purge screw.

Check Valve Operation

Pump On

As shown in the check valve cutaway diagram in Figure A-1, when the pump is On, the check valve is opened by fuel flow.

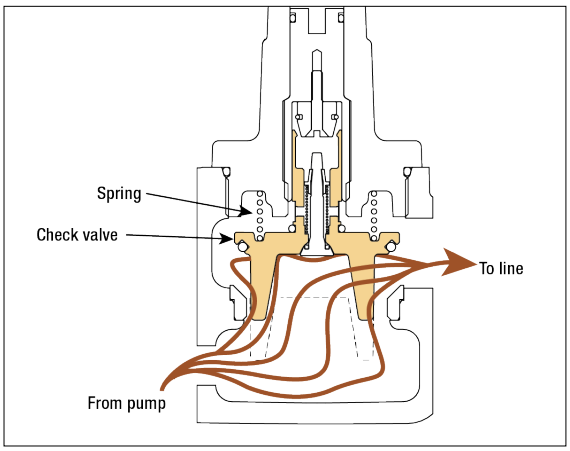


Figure A-1. Pump On condition

Pump Off

When the pump shuts off, the check valve reseats isolating the line. As pressure in the line builds due to thermal expansion, the excess pressure vents through the relief valve back into the tank as shown in Figure A-2.

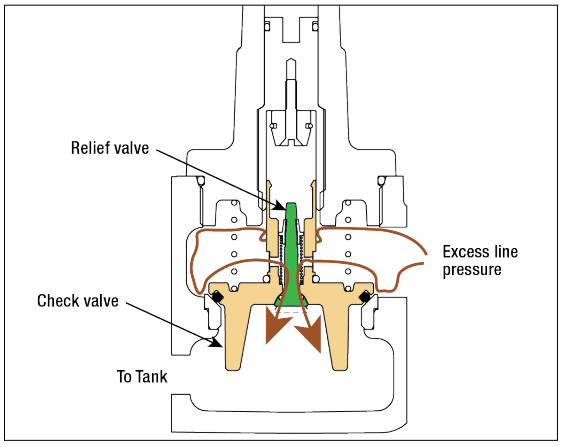


Figure A-2. Relief valve vents excess line pressure

Locking Down Check Valve for Line Testing

Turning the service screw all the way clockwise, seals the relief valve and at the same time locks down and seals the check valve as shown in Figure A-3. The line is now isolated for pressure testing.

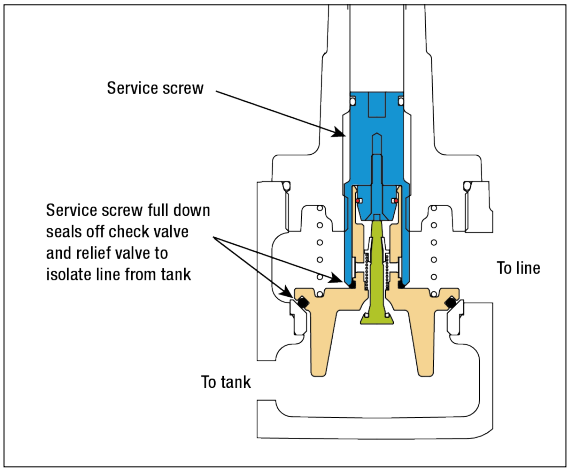


Figure A-3. Locking down the check valve for line testing

Removing Check Valve

When removal of the check valve is desired, turn the service screw clockwise until it is all the way down as shown in Figure A-4. At about 7.5 clockwise turns, the relief valve will open (you will hear line pressure vent) and the service screw will lock onto the check valve. When you have turned the service screw all the way down, back off 3 or 4 turns (counterclockwise) and wait a few seconds for the product in the manifold to drain out. Unscrew the check valve housing and remove the complete valve assembly.

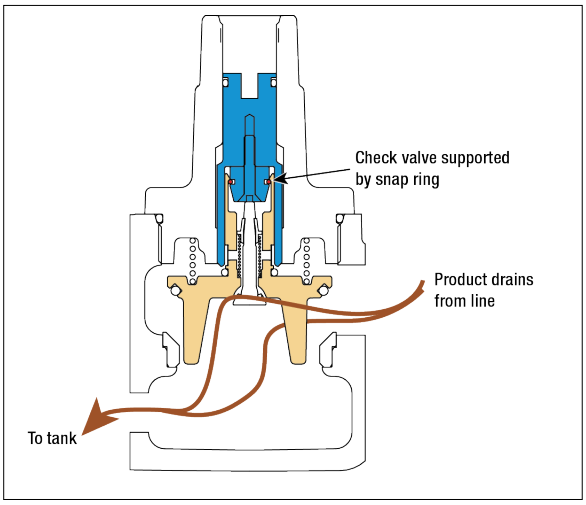


Figure A-4. Removal of check valve assembly for service

How the Service Screw Lifts the Check Valve

When you turn the service screw clockwise 7.5 turns to push open the relief valve stem, a slightly compressible snap ring in the service screw squeezes past a rim on the inside of the top edge of the check valve as shown in Figure A-5. As the service screw is turned counterclockwise, the snap ring rises beneath the rim lifting the check valve. The check valve continues to rise as the service screw is turned ccw until the outer edge of the check valve contacts the bottom surface of the check valve housing (when you are unscrewing the service screw you will feel this 'stop'. Continuing to turn the service screw until it is all the way up, compresses the snap ring until it is past the rim to a degree that the spring in the check valve (and gravity) forces the check down onto its seat in the manifold. All the way up is the normal operating position of the service screw.

Always make sure to reinstall the plastic protective cap and fully thread it into place to ensure a good seal.

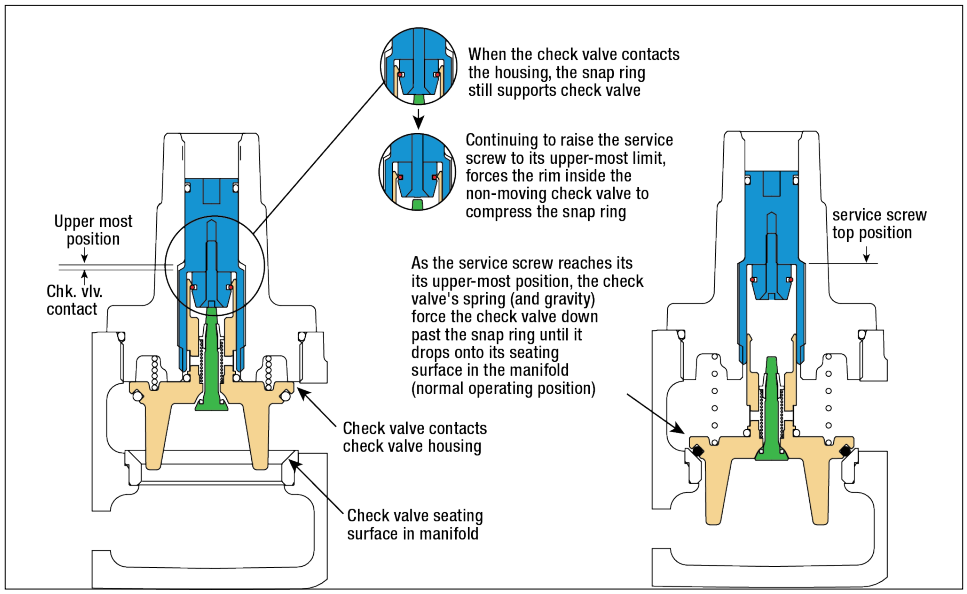


Figure A-5. Returning the check valve to its normal operating position

Air Purge Screw Operation

The air purge screw is used to rid air from the line and manifold hydraulic cavities after opening a port in the manifold (e.g., after installing a line leak detector). When repairs to the pump have been made, the technician will need to purge the air within the manifold as shown in diagram 1 of Figure A-6. The air purge screw is rotated 2-3 turns counterclockwise, then the pump is turned on.

⚠CAUTION The air purge screw is retained by the hitch pin to limit travel. Do not attempt to rotate beyond 3 turns.

As the pump runs, any air in the cavities is pushed through the small tank return port as shown in diagram 2. After the pump has run for about 2 -3 minutes the air will have been removed from the manifold and piping as shown in diagram 3. While the pump is still running, turn the air purge screw clockwise until it is completely closed. Open the ball valve down line from the pump.

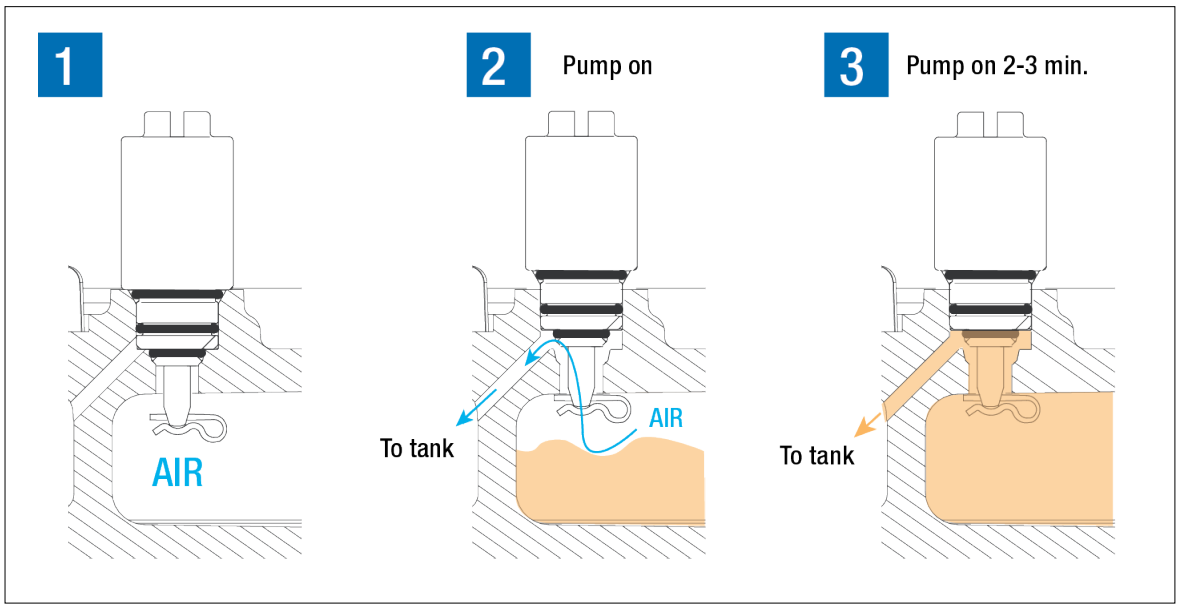
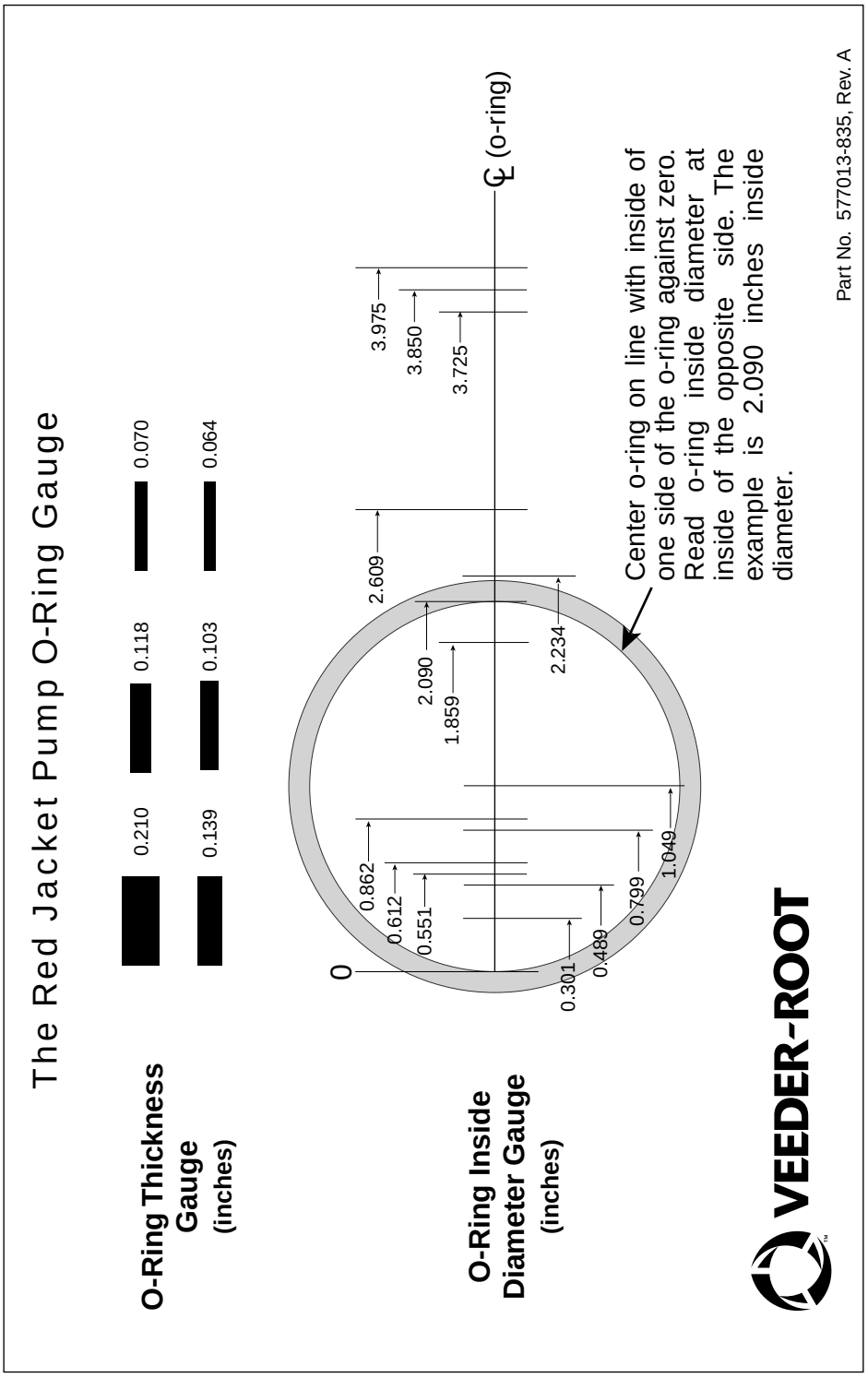


Figure A-6. Purging air from manifold

Appendix B: Hardware/Seal Kit O-Ring Gauge



Appendix C: Settings For Motor Protection Device

When the submersible pumping unit (UMP) is installed in areas where Category 1 equipment is required, the use of a Motor-Protective Circuit-Breaker (Manual Motor Protector) with phase failure protection is necessary to meet Category 1 requirements. The Manual Motor Protector must be certified for use with The Red Jacket Submersible Turbine Pump Assembly.

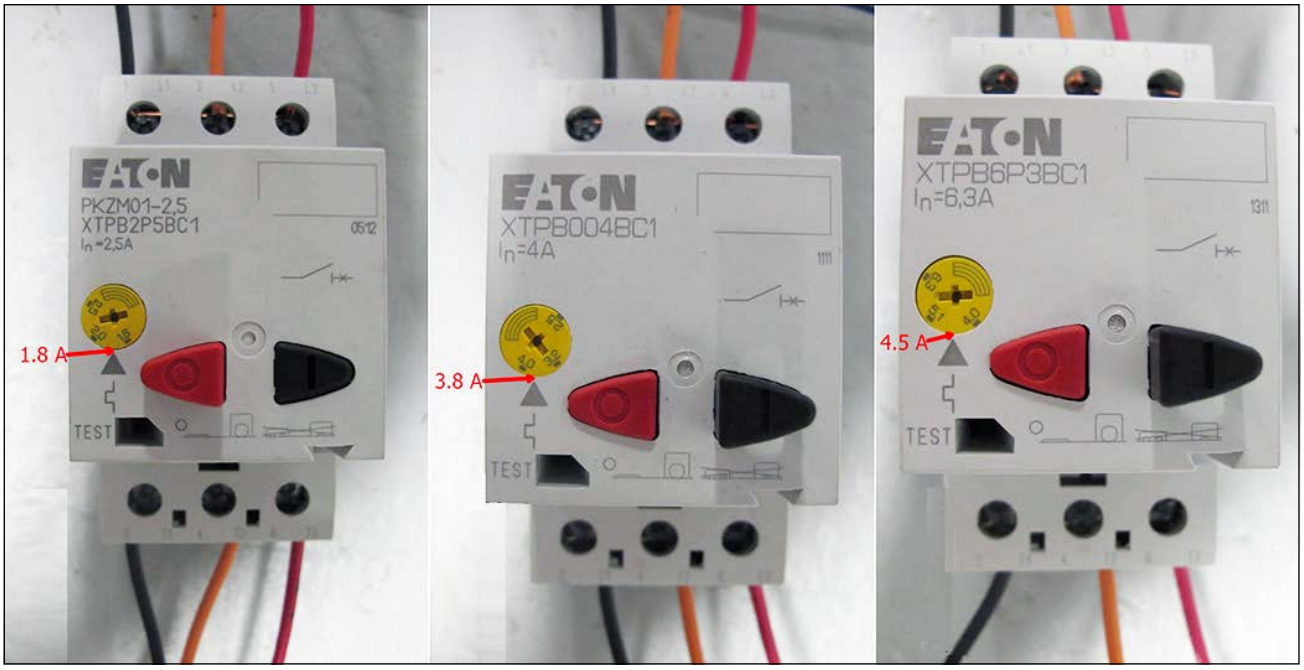
Before commissioning, the effectiveness of the motor protective device must be checked for functionality by rotating the amperage dial to the minimum setting while the pump is running and noting that the device trips. Then make sure the device is reset and the dial turned back to its original protective setting.

The functionality of the motor protection device must be checked at appropriate intervals, but as least once per year.

During normal operation, faults causing the device to trip need to be remedied before the equipment is put back into service.

The following Manual Motor Protectors have been certified for use with The Red Jacket Submersible Turbine Pump Assembly.

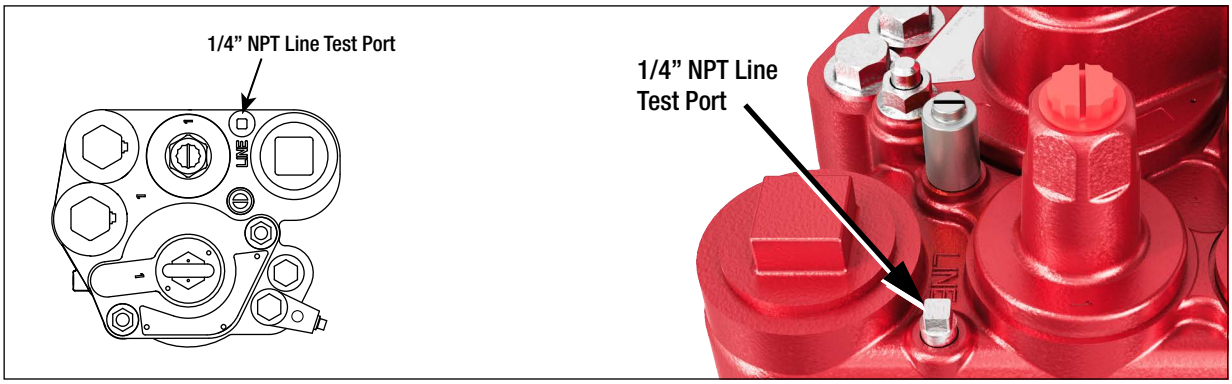
Submersible Turbine Pump Model	Maximum Adjustment On Motor Protector	Moeller Catalog Number	Moeller Catalog Number	Eaton Catalog Number	Eaton Catalog Number
P75U17-3, AGP75U17-3	1.8	PKZM0-2.5	PKZM01-2.5	XTPR2P5BC1	XTPB2P5BC1
P150U17-3, AGP150U17-3	3.8	PKZM0-4	PKZM01-4	XTPR004BC1	XTPB004BC1
X4P150U17, X4AGP150U17	3.8	PKZM0-4	PKZM01-4	XTPR004BC1	XTPB004BC1
P200U17-4, AGP200U17-4	4.5	PKZM0-6.3	PKZM01-6.3	XTPR6P3BC1	XTPB6P3BC1



Appendix D: Field Serviceable NPT Joints

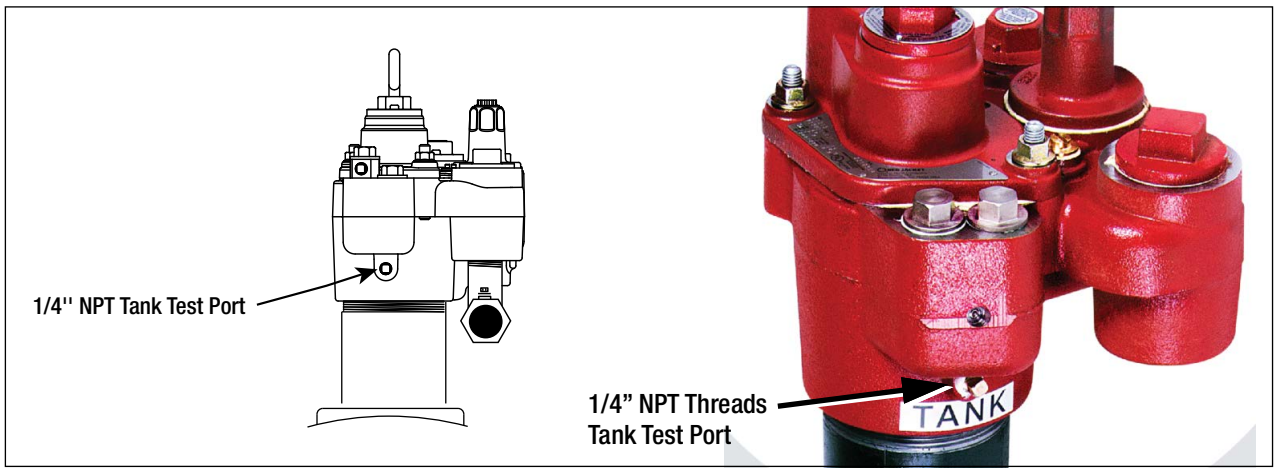
For AG applications, Gasoila E-seal or Loctite 567 thread sealants are recommended on the threads of each of the five Field Serviceable NPT Joint locations shown in this appendix.

1. 1/4" NPT Line Test Port

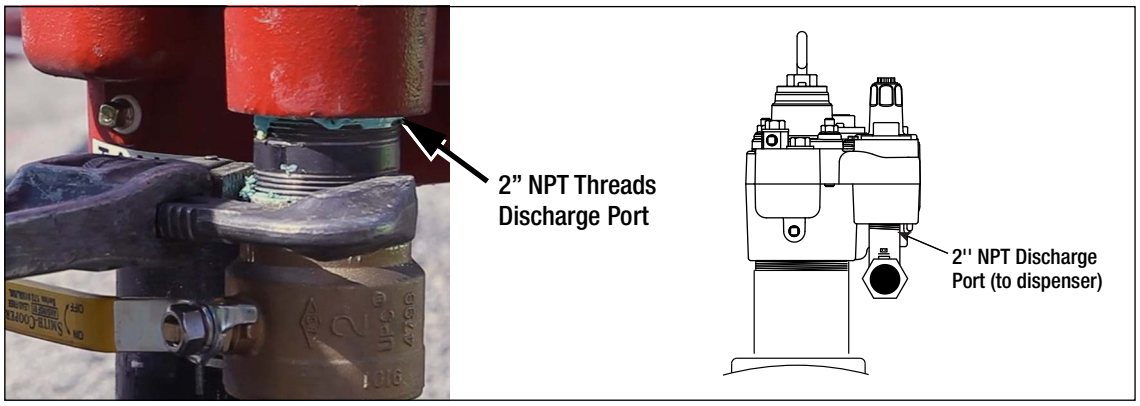


2. 2" NPT Leak Detector Port

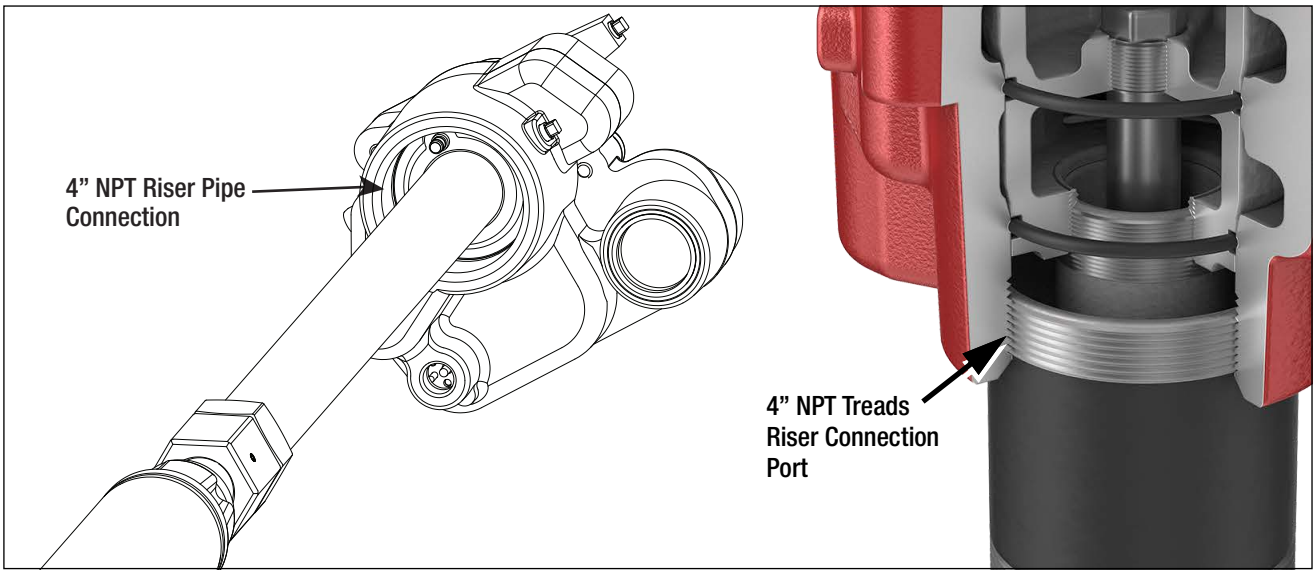
3. 1/4" NPT Tank Test Port



4. 2" NPT Discharge Port (To Dispenser)



5. 4" NPT Threaded Connection For Riser Pipe.



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