

CPT

Constant Pressure Turbine

Installation, Operation, Service and
Repair Parts

QUANTUM CPT SUBMERSIBLE PUMP MANUAL: INSTALLATION AND OPERATION

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CERTIFICATIONS AND LISTINGS

CE DECLARATION OF CONFORMITY

- Directive on electromagnetic compatibility no. 89/336/EEC, amended by 93/68/EEC and subsequent modifications.
- Directive with regard to machines no 89/392/EEC and subsequent modifications.



This symbol on the product's nameplate
means it is listed by
Underwriters Laboratories



This symbol on the product's nameplate
means it is listed by
The Canadian Standards Association

A handwritten signature in black ink, appearing to read 'Charles F. Whelan', written over a horizontal line.

Vice President, Engineering

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ABOUT THIS MANUAL

This preface describes the organization of this manual, explains symbols and typographical conventions used, and defines vital terminology. This manual is for personnel who install Red Jacket submersible pumps for petroleum. It contains the information required for working in “the pit.”

ORGANIZATION

This manual is organized into five chapters:

“**Chapter 1:** Introduction” gives a brief description of each of the major features of the product

“**Chapter 2:** Red Jacket CPT Submersible Pump” describes the basic components of the system.

“**Chapter 3:** Installing the Quantum CPT Pump” provides safety notices and gives step-by-step instructions for installing the Quantum CPT pump, Quantum CPT replacement pump, and Tandem Pumps. It also describes how to adjust the Pressurstat.

“**Chapter 4:** Testing the Installation” describes how to test the piping and tank following the installation.

“**Chapter 5:** Service and Repair” describes how to remove a pump and replace the UMP as well as information on replacing the Pressurstat.

It also contains a table of figures, a list of abbreviations, appendix with the parts list.

TYPOGRAPHICAL CONVENTIONS

The various symbols and typographical conventions used in this manual are described here.



Indicates a **tip** or reminder.

TERMINOLOGY

The following defined terms are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning use of the product.

DANGER

Indicates the presence of a hazard that will cause severe personal injury, death, or substantial property damage if ignored.

WARNING

Indicates the presence of a hazard that can cause severe personal injury, death, or substantial property damage if ignored.

CAUTION

Indicates the presence of a hazard that will or can cause minor personal injury or property damage if ignored.

NOTICE

Indicates special instructions on installation, operation, or maintenance that are important but not related to personal injury hazards.

ABBREVIATIONS AND SYMBOLS

\perp	Chassis ground (see also GND)
\sphericalangle	Earth ground
Ω	Ohm, resistance
μF	Microfarad (10^{-6} farad)
AG	Alcohol-gasoline blends
C	Centigrade
CPT	Constant Pressure Turbine
EPA	Environmental Protection Agency
F	Fahrenheit
ft-lb	Foot-pound
GND	Ground
gph; gpm	Gallons per hour; Gallons per minute
hp	Horsepower
Hz	Hertz
in-lb	Inch-pound
ISO	International Organization for Standardization
kg	Kilogram
kPa	KiloPascals
mm	Millimeter
N•m	Newton-meter
NEC	National Electrical Code
NFPA	National Fire Protection Association
NPT	National Pipe Thread
PH	Phase
psi; psig	Pounds per square inch; Pounds per square inch gauge
SG	Specific Gravity
SSU	Saybolt Seconds Universal, a measure of viscosity
UL	Underwriters Laboratories Inc.
UMP	Unit motor pump; Pump-motor assembly
VAC	Voltage—alternating current
V	Volt
VDC	Voltage—direct current

CHAPTER 1: INTRODUCTION

OVERVIEW

This chapter explains the following:

- ◇ Features of the Red Jacket Quantum CPT Submersible Pump
 - Constant Pressure Output
 - Line-Leak Detection
 - Stand-alone Pump Operation
 - Tandem Pump Operation
 - Quick-Set Feature

FEATURES OF THE RED JACKET QUANTUM CPT SUBMERSIBLE PUMP

Constant Pressure Output

In 1996, EPA limited the maximum flow rate at the nozzle to 10 gallons per minute (gpm). Limiting the flow rate serves two purposes:

1. It controls spitback from fuel tanks.
2. It increases compatibility with carbon canisters placed on vehicles to capture vapors that escape during refueling. The Red Jacket CPT (Constant Pressure Turbine) submersible pump uses controlled pressure technology. This technology measures the pressure downline from the pump with a pressure transducer. The controller reads the pressure directly from the transducer and varies the speed of the pump to maintain a constant fuel flow. During installation, the installer sets the required pressure at the controller to maintain delivery of a maximum of 10 gpm to the island dispenser regardless of the number of nozzles operating.

Line-Leak Detection

The Red Jacket CPT uses controlled pressure technology not only to control the flow rate of the pump but also to perform line-leak detection. The pressure transducer, which senses the line pressure to control flow rate when the pump is on, also measures line pressure when the pump is off to determine if a leak exists. The same algorithm used for electronic leak detection in Red Jacket's ST Series is used in the CPT pumps. Electronic leak detection does not restrict fuel flow.

The CPT pump can operate in conjunction with existing Red Jacket electronic line-leak detection products, such as the ST, RLM, or PPM, or the line-leak detection feature of the CPT Controller can be activated. (See the "CPT Controller Manual" for information on how to activate the electronic line-leak detection.)

Stand-alone Pump Operation

The CPT Controller's microprocessors are preprogrammed from the factory for stand-alone operation. Instructions in the "CPT Controller Manual" explain how to set the DIP switches for stand-alone operation and how to set the pump pressure to achieve the maximum flow rate of 10 gpm.

Tandem Pump Operation

When two CPT pumps are required to maintain proper flow, their controllers can be programmed to operate in tandem. The installer can designate one controller as the master unit and the other as the auxiliary unit. The master controller monitors line pressure and determines which pump will react to the dispense-enable signal and when a supplemental pump is required.

When the master controller receives the dispense-enable signal, the primary pump starts. The controller varies the speed of the pump depending on the pressure in the line. When the primary pump can no longer maintain proper pressure, the secondary pump comes on to supplement the pressure and maintain proper flow.

This feature allows the pumps to alternate and prevents the problem of having one tank run dry. It also ensures that one pump does not wear excessively. For each dispensing cycle, the master controller determines which CPT will be the primary pump. The master controller also performs line-leak detection, if required.

Quick-Set Feature

The Quick-Set feature is an adjustable column pipe and electrical conduit that is standard on the quantum submersible pump. The Quick-Set feature allows the overall length to be adjusted to cover 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 compressing the column pipe length.

Three sizes are available, QS1, QS2, QS3, covering most pump length requirements.

CHAPTER 2: RED JACKET CPT SUBMERSIBLE PUMP

OVERVIEW

This chapter explains the following:

- ◇ Basic Components of a CPT Submersible Pump
 - Controller
 - Pump
 - Pressure Transducer and Intrinsic Safety Barrier Kit
 - Quick-Set Feature
- ◇ CPT Pump Specifications
- ◇ CPT Pump Types
- ◇ Manifold Dimensions
- ◇ Dimensions for Pump Selection
- ◇ Floating Suction Installation

BASIC COMPONENTS OF A CPT SUBMERSIBLE PUMP

The Red Jacket CPT system has three main components:

- a controller,
- a pump, and
- a pressure transducer and intrinsic safety barrier kit.

Controller

The CPT Controller is a metal enclosure that houses a three-board assembly: the Inverter board, the Capacitor board, and the Processor board. (See the “CPT Controller Manual” for details.)

Pump

The CPT submersible pump has a 2-hp motor with a two-stage pump end. The motor has ports that allow more flow through the internal components for cooling. The maximum pressure is 45 psi.

Pressure Transducer and Intrinsic Safety Barrier Kit

The pressure transducer consists of a 0–50 psig pressure transducer with a .5–4.5 VDC output. This is the same transducer as used in other Red Jacket line-leak detection systems. The Intrinsic Safety (I.S.) Barrier can be installed in a single wiring configuration.

- **I.S. Barrier in the Conduit Box.** For systems that have the pump power wiring and transducer wiring in the same conduit, a barrier must be installed in the conduit box of the submersible pump. This barrier is assembled in a 2 1/4-in. conduit box plug.

See the “CPT Controller Manual” for instructions on installing the intrinsic safety barrier kit.

Quick-Set Feature

The Quick-Set feature comes in three basic sizes: QS1, QS2, and QS3. The lengths (compressed to extended) for the CPT pump are:

- QS1 — 74.0 to 104.5 inches (1882 to 2653 mm)
- QS2 — 104.0 to 164.5 inches (2644 to 4177 mm)
- QS3 — 164.0 to 224.5 inches (4168 to 5701 mm)

The above dimensions are measured from the bottom of the pump to the top of the Pressurstat.

CPT PUMP TYPES

The Red Jacket Quantum CPT submersible pumps are UL listed (Class 1, Group D atmosphere) and designed to be compatible with 100% gasoline, or diesel and 80% gasoline with 20% methanol, ethanol, TAME, ETBE or MTBE. All UMPs having the model numbers including the AG prefix are designed to be compatible with 100% gasoline, methanol, ethanol or diesel and 80% gasoline with 20% TAME, ETBE or MTBE.

CPT PUMP SPECIFICATIONS

TABLE A

Electrical Service Information

UMP Model No.	HP	Volts		Max. Load Amps	Winding Resistance (Ohms)		
		Min.	Max.		Black Yellow	Red Yellow	Black Red
AGUMP200T20-2	2	200	250	12	2 - 3	2 - 3	2 - 3
UMP200U20-2	2	200	250	12	2 - 3	2 - 3	2 - 3

Weights and Length

Final Weight - QS2 (including UMP)	162 lb. (73.5 kg)
UMP Weight	37 lb. (16.8 kg)
Controller Weight	25 lb. (11.3 kg)
UMP Length	20.1 in. (510 mm)

MANIFOLD DIMENSIONS

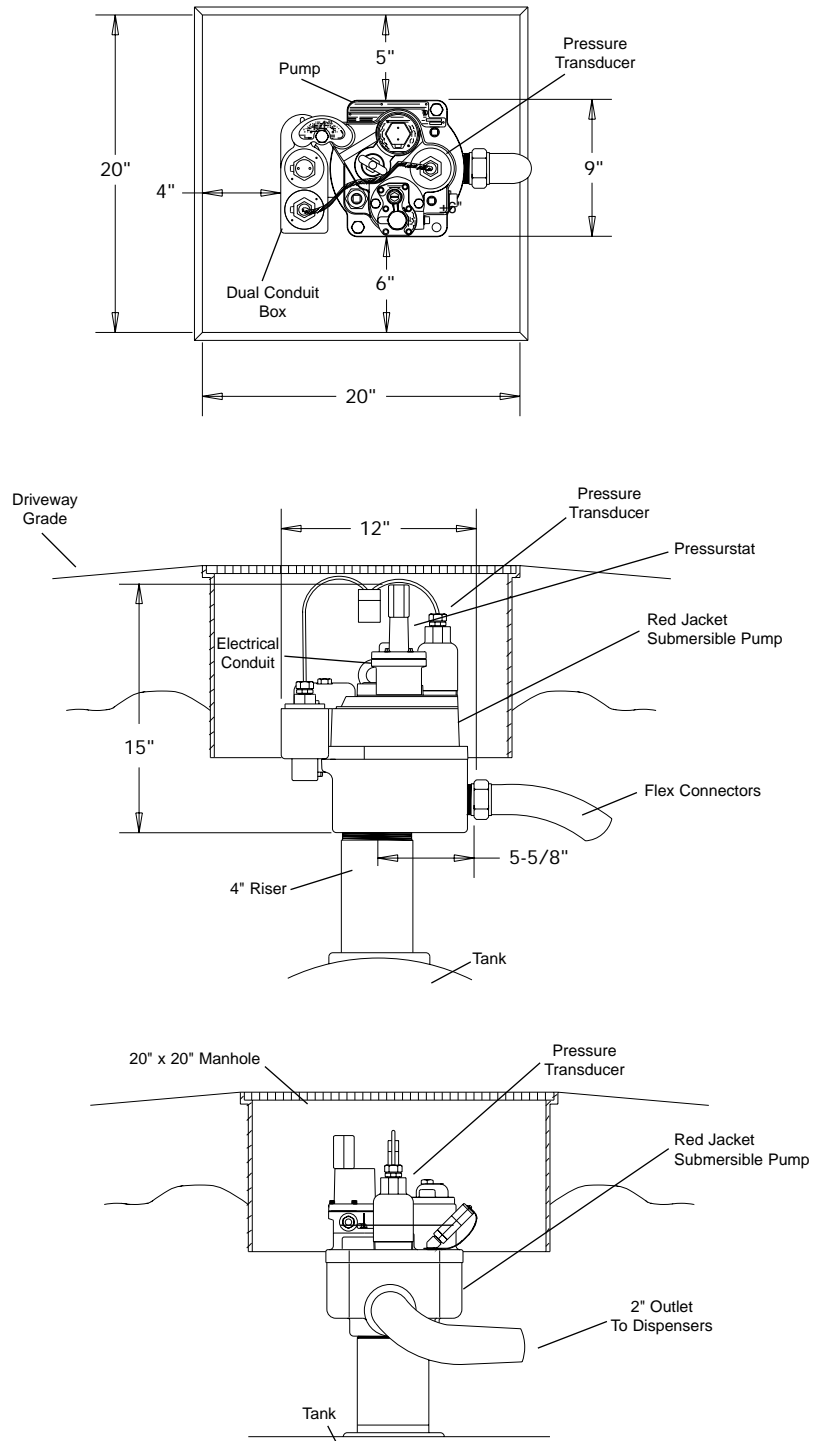


Figure 2.1 Manifold Dimensions

DIMENSIONS FOR PUMP SELECTION

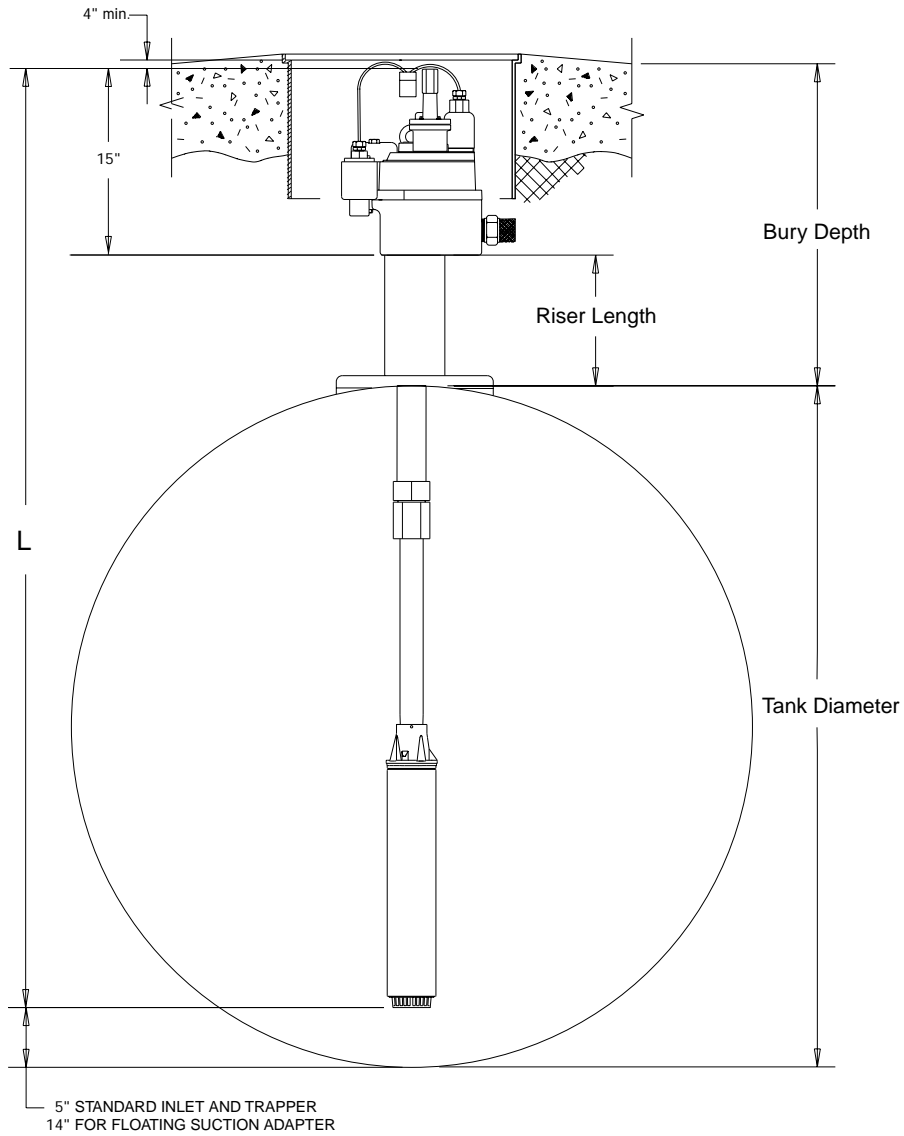


Figure 2.2 *Measuring the tank (See Quick-Set Feature on page 4, this lists adjustment range for QS1, QS2 and QS3 with CPT pump.)*

NOTICE

Distance between center line of pump motor and center line of bottom fill tube should be 3 foot minimum. Air locking of pump after product delivery may occur at distances less than this.

RECOMMENDED FLOATING SUCTION INSTALLATION

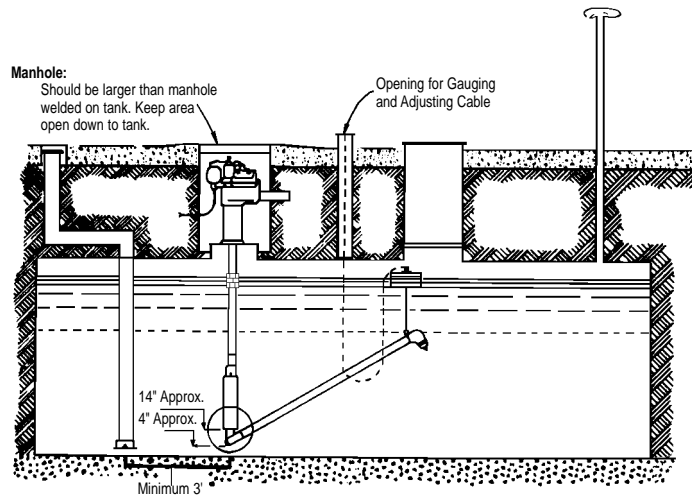


Figure 2.3 Floating suction installation

NOTICE

We supply adapter only; not the apparatus.

- The floating suction arm can be mounted to pump previous to installing in tank.

See example of adaptation to floating suction assembly below.

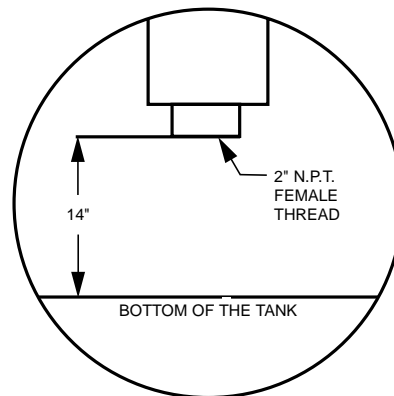


Figure 2.4 Floating suction adapter

- 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 presents hindrance to pump performance when product level is below this point.

NOTICE

Red Jacket pumps are centrifugal type pumps and as such are not designed to pump product when the level is below the bottom end of the pump/motor assembly.

CHAPTER 3: *INSTALLATION*

OVERVIEW

This chapter explains the following:

- ◇ Installation Safety Notices
- ◇ Installing a Quantum CPT Replacement Pump
- ◇ Installing the Quantum CPT Pump with Quick-Set Feature
- ◇ Installing Two Quantum CPT Pumps for Tandem Operation
- ◇ Adjusting the Pressurstat

INSTALLATION SAFETY NOTICES

ATTENTION INSTALLER: Read this important safety information before beginning work.

DANGER

This product operates in the highly combustible atmosphere of a gasoline storage tank. To protect yourself and others from serious injury, death, or substantial property damage, carefully read and follow all warnings and instructions in this manual.

WARNING

Failure to follow all instructions in proper order can cause personal injury or death. Read all instructions before beginning installation. All installation work must comply with the latest issue of the National Electrical Code (NFPA 70), the Automotive and Marine Service Code (NFPA 30A), and any national, state, and local code requirements that apply.

WARNING

Only trained and qualified personnel may install, program, and troubleshoot Red Jacket equipment. Hazards can cause severe personal injury, death, or substantial property damage if ignored.

DANGER

Voltage stored in the capacitor bank of the CPT Controller presents a risk of **POTENTIALLY LETHAL ELECTRICAL SHOCK EVEN AFTER THE POWER IS DISCONNECTED**. After disconnecting the power, wait about 2–5 minutes, or until the red Capacitor Charge light on the Inverter board shuts off, before servicing or removing the controller.

WARNING

Red Jacket Constant Pressure Turbines (CPT's) are designed to pump gasoline or diesel fuel with a maximum viscosity of 70 SSU at 60 F.

NOTICE

As the product is pumped, it cools and lubricates the UMP.

WARNING

The product temperature must not exceed 105 F because the thermal overload protectors in the CPT submersible motors may trip.

WARNING

Red Jacket CPT gasoline pumps are designed to operate in a Class 1, Group D atmosphere.

NOTICE

Specifications and installation instructions may change if the manufacturer recommends changes.

INSTALLING A QUANTUM CPT REPLACEMENT PUMP

Red Jacket Replacement Pump model number AGP200T20-2YR with suffixes QS1, QS2, and QS3 for use with UL Listed Controller model number CPT-P200T20-AFC is designed to replace Red Jacket fixed speed model numbers AGP33R1, P33R1, AG75S1, P75S1, AGP150S1, P150S1, X3AGP150S1, X3P150S1, X5AGP150S1 and X5P150SI with or without suffixes “Y”, T1, T2, T3 and T4.

Red Jacket Replacement Pump model number P200U20-2YR with suffixes QS1, QS2, and QS3 for use with UL Listed Controller model number CPT-P200T20-AFC is designed to replace Red Jacket fixed speed model numbers P33R1, P75S1, P150S1, X3P150S1, and X5P150SI with or without suffixes “Y”, T1, T2, T3 and T4.

The Replacement Pump Kit contains: Hardware/Seal kit part number 144-209-4 (AG) or 144-329-4 (20%) (Qty 1 each: Packer O-ring (8" OD), Pac/Man seal (2" OD) and Qty 2 each: 1/2-13 x 1 1/4 lock down Bolts, 3/8-16 x 1 1/4 Bolts) and one of the following:

- Quick-Set models: AGP200T20-2YRQS1, P200U20-2YRQS1, AGP200T20-2YRQS2, P200U20-2YRQS2, AGP200T20-2YRQS3 or P200U20-2YRQS3.

Suggested tools (non sparking): 3/4" wrench, pipe wrench (Quick-Set models), 9/16" wrench, screw driver, wire cutter and wire stripper.

NOTICE

If there is a need to utilize the 2" port on the packer, other than to connect the transducer, an alternate location on the pipeline within the sump area must be created for the transducer.

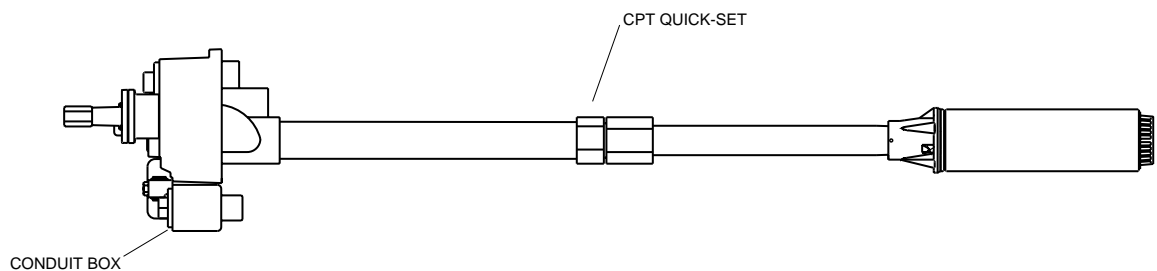


Figure 3.1 CPT Replacement Pump

DANGER

ALWAYS DISCONNECT and LOCK or TAG OUT the power before starting to service the pump

- 1: Remove existing Red Jacket pump. (See “Removing the Pump” in chapter 5.)
- 2: Remove the cover of the fixed speed pump conduit box.
- 3: Pull wires out of conduit box.

- 4: Remove wire nuts and disconnect wires.
- 5: Remove the two bolts that hold the conduit box to the manifold.
- 6: Disconnect conduit from conduit box. Discard old conduit box.
- 7: Chip sealing compound out of seal-off fittings or spin off fittings and replace, pull fixed speed pump wires from conduit. Run CPT wires per "Running and Attaching Output Power" section in CPT manual.
- 8: Uncrate the new CPT Replacement Pump, yoke and conduit box kit.
- 9: Attach new conduit box to the existing manifold using two 3/8-16 x 1 1/4" bolts from the Hardware/Seal Kit (AG Kit part number 144-209-4 or 20% kit part number 144-329-4). Complete installation through step 22 before tightening. Torque to 20-45 ft lb (27-61 N•m).

NOTICE

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 socket head cap screws, four 5/16 lock washers and one discharge head gasket. It is identified by the kit number 144-327-4 marked on the bag.

TABLE B

Packer/Manifold	UMP
AGP200T20-2YQS1, QS2, QS3 AGP200T20-2YRQS1, QS2, QS3	AGUMP200T20-2
P200U20-2YQS1, QS2, QS3 P200U20-2YRQS1, QS2, QS3	UMP200U20-2

The UMP attaches to the packer/manifold with piping using hardware kit #144-327-4.

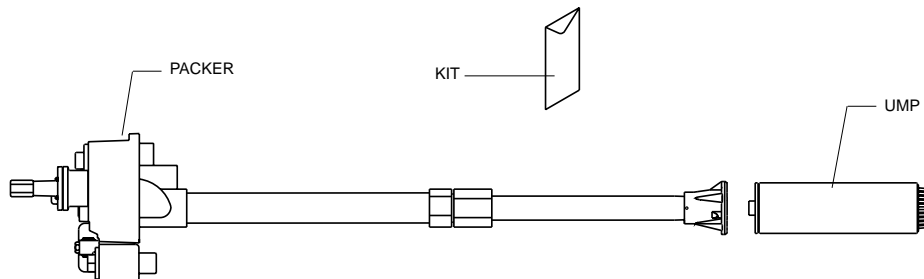


Figure 3.2 Attaching the UMP



Suggested tools (non-sparking): 3/4" wrench, pipe wrench, 1/4" allen wrench, 9/16" wrench, screw driver, wire cutter and wire stripper.

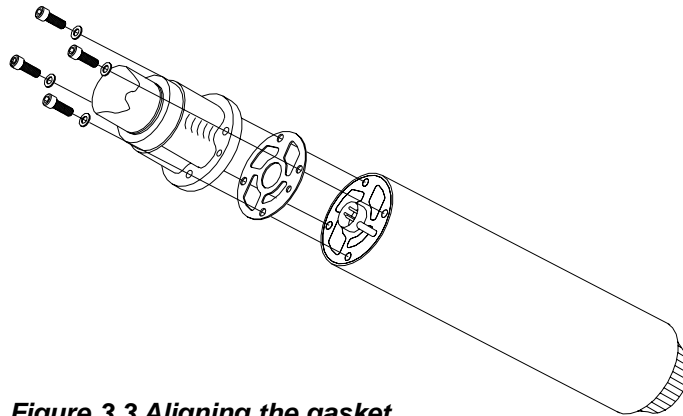


Figure 3.3 Aligning the gasket

10: Place the new gasket on the new UMP so that all the holes align.

NOTICE

Gaskets from competitive UMPS will not seal properly and performance will be reduced.

CAUTION

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.

11: Lubricate o-ring and pigtail with petroleum based jelly.

12: Align the UMP positioning dowel and boss with the proper holes in the discharge head 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.

NOTICE

Use hand force to put the UMP onto the discharge head. If the UMP does not seat properly, snug against the discharge head, remove the UMP and correct the problem.

NOTICE

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.

13: Install the UMP retaining bolts and lock washers. Snug and then torque the bolts using a cross pattern. Torque to 7 ft-lb. (11 N•m).

NOTICE

Confirm length of pump prior to installation. See “Installing Quantum CPT Pump with Quick-Set Feature” for sizing information.

14: Install the CPT Replacement Pump into the manifold and 4-in. riser.

15: Align the positioning dowel of the manifold with the holes in the packer.

16: Push the packer as far as possible against the manifold.

17: Insert the lock-down bolts and torque to 45–55 ft-lb (61–75 N•m).

18: Swing the electrical connector into place.

19: Torque the electrical connector bolt to 25–50 ft-lb (34–68 N•m).

20: Tighten conduit box bolts (3/8-16 x 1-1/4) per step 9. (See the “CPT Controller Manual for instructions on field-wiring the pump.)

INSTALLING THE QUANTUM CPT PUMP

Installation Safety Notices

ATTENTION INSTALLER: Read this important safety information before beginning work.

DANGER

This product operates in the highly combustible atmosphere of a gasoline storage tank. To protect yourself and others from serious injury, death, or substantial property damage, carefully read and follow all warnings and instructions in this manual.

WARNING

Failure to follow all instructions in proper order can cause personal injury or death. Read all instructions before beginning installation. All installation work must comply with the latest issue of the National Electrical Code (NFPA 70), the Automotive and Marine Service Code (NFPA 30A), and any national, state, and local code requirements that apply.

WARNING

Only trained and qualified personnel may install, program, and troubleshoot Red Jacket equipment. Hazards can cause severe personal injury, death, or substantial property damage if ignored.

WARNING

Before installing pipe threads apply an adequate amount of fresh, UL Classified for petroleum, Non-setting thread sealant.

Attaching the UMP

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 socket head cap screws, four 5/16 lock washers and one discharge head gasket. It is identified by the kit number 144-327-4 marked on the bag.

The UMP attaches to the packer/manifold with piping using hardware kit #144-327-4.

TABLE C

Packer/Manifold	UMP
AGP200T20-2YQS1, QS2, QS3 AGP200T20-2YRQS1, QS2, QS3	AGUMP200T20-2
P200U20-2YQS1, QS2, QS3 P200U20-2YRQS1, QS2, QS3	UMP200U20-2



Suggested tools (non-sparking): 3/4" wrench, pipe wrench, 1/4" allen wrench, 9/16" wrench, screw driver, wire cutter and wire stripper.

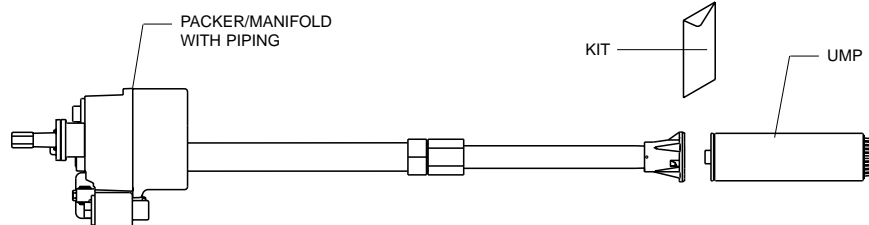


Figure 3.4 Attaching the UMP

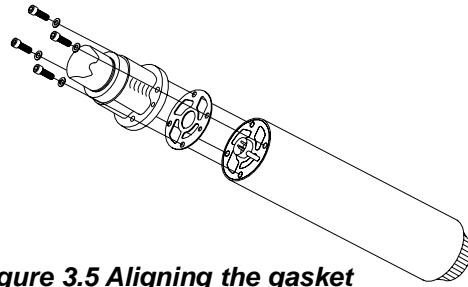


Figure 3.5 Aligning the gasket

- 1: Place the new gasket on the new UMP so that all the holes align.

NOTICE Gaskets from competitive UMPS will not seal properly and performance will be reduced.

CAUTION 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.

- 2: Lubricate o-ring and pigtail with petroleum based jelly.
- 3: Align the UMP positioning dowel and boss with the proper holes in the discharge head 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.

NOTICE Use hand force to put the UMP onto the discharge head. If the UMP does not seat properly, snug against the discharge head, remove the UMP and correct the problem.

NOTICE 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.

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

NOTICE Red Jacket gasoline pumps are designed to operate in a Class 1, Group D atmosphere.

NOTICE Specifications and installation instructions may change if the manufacturer recommends changes.

NOTICE The product temperature must not exceed 105° F (41° C) because the thermal overload protectors in the submersible motors may trip.

- 5: Install the riser pipe into the 4-in. tank opening. Use thread sealant. Tighten the riser pipe in the tank until watertight.
- 6: Measure the distance from the bottom of the tank to the top of the 4-in. riser pipe shown in figure 3.6.

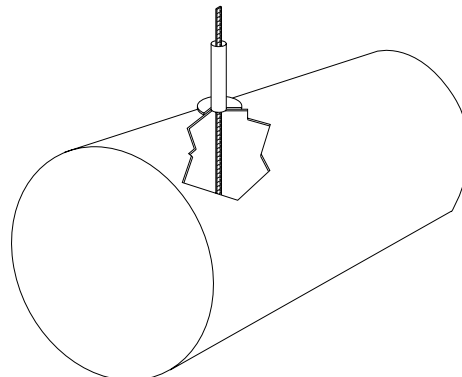


Figure 3.6 Measuring tank

- 7: Uncoil the pigtail and lay it flat so it will feed into the packer without knotting or kinking.
- 8: Loosen the clinch assembly starting by loosening the set screw in the side of locking nut, then loosen locking nut.

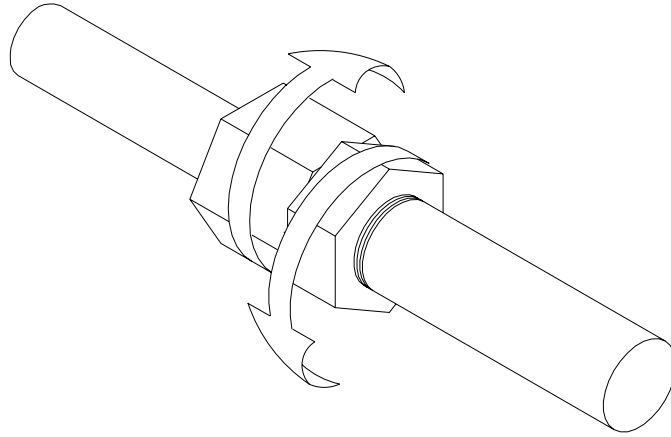


Figure 3.7 Loosen the fittings

- 9: Pull the UMP end until the distance between the bottom of the manifold and the bottom of the UMP is 5 inches (125mm) shorter than the distance measured in step 2 (see figure 3.8). (If floating suction adapter is utilized, pull UMP until the distance between the bottom of the manifold and bottom of floating suction adapter is 14 inches shorter than that measured in step 7.)

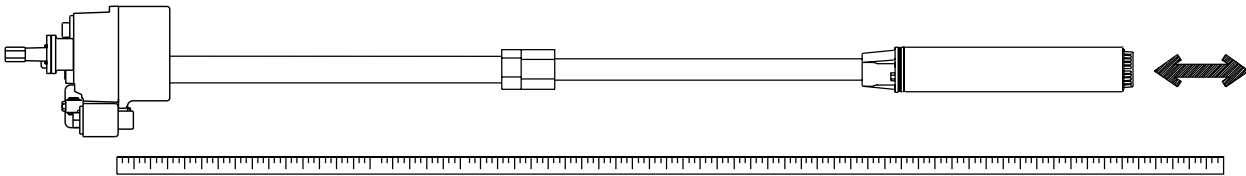


Figure 3.8 Adjusting the pump

NOTICE

Take care not to damage the pigtail. If pump is to be adjusted shorter, tension must be kept on pigtail to eliminate kinking.

- 10: Tighten locking nut and torque to 150 ft-lb (200 N•m) minimum, then torque the set screw to 30-35 in lb (3.5-4 N•m).

NOTICE

Return line should be installed on every application to insure against nuisance trips of electronic tank monitoring.

- 11: Attach tubing to barbed fitting, secure with clamp
- 12: Lay tubing beside column pipe. Cut off 1-3 inches (25-70 mm) above discharge head.
- 13: Secure tube to column pipe with tie straps. Locate tie straps approximately 6 inches, (152 mm) from packer, 6 inches (152 mm) from discharge head and middle of tubing.
- 14: Install the manifold onto the riser pipe using thread sealant while making the proper alignment of the manifold and piping. Tighten the manifold until watertight.
- 15: Remove cover from wiring compartment.
- 16: Pull pigtail wires into wiring compartment.
- 17: Cut pigtail wires leaving approximately 8-inches (200 mm) hanging out of wiring compartment.
- 18: Strip back insulation of all wires 3/8-inch (10 mm).
- 19: Attach like colored wires using provided wire nuts.
- 20: Install excess wire into wiring compartment. Replace wiring compartment cover. Torque to 35 ft-lb (50 N•m). Thread sealant should not be used.
- 21: Install eyebolt plug using approved non setting thread sealant and torque to 50 ft-lb (70 N•m).

For Replacement Models

(Refer to chapter 3 installing Quantum CPT replacement pump.)

- 1: Measure from bottom of tank to top of manifold.
- 2: Remove the packer assembly and UMP from the carton. Attach UMP to packer piping. Uncoil the pigtail and lay it flat so it will feed into the packer without knotting or kinking.
- 3: Loosen the clinch assembly fittings, starting with the joint closest to the discharge head as shown in figure 3.7.
- 4: Pull the UMP end until the distance between the bottom of the packer flange and the bottom of the pump UMP is 4 inches shorter than the distance measured in step 1.

INSTALLING TWO CPT 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 illustration below (figure 3.9), tandem systems offer backup support so operations can continue if one pump stops working.

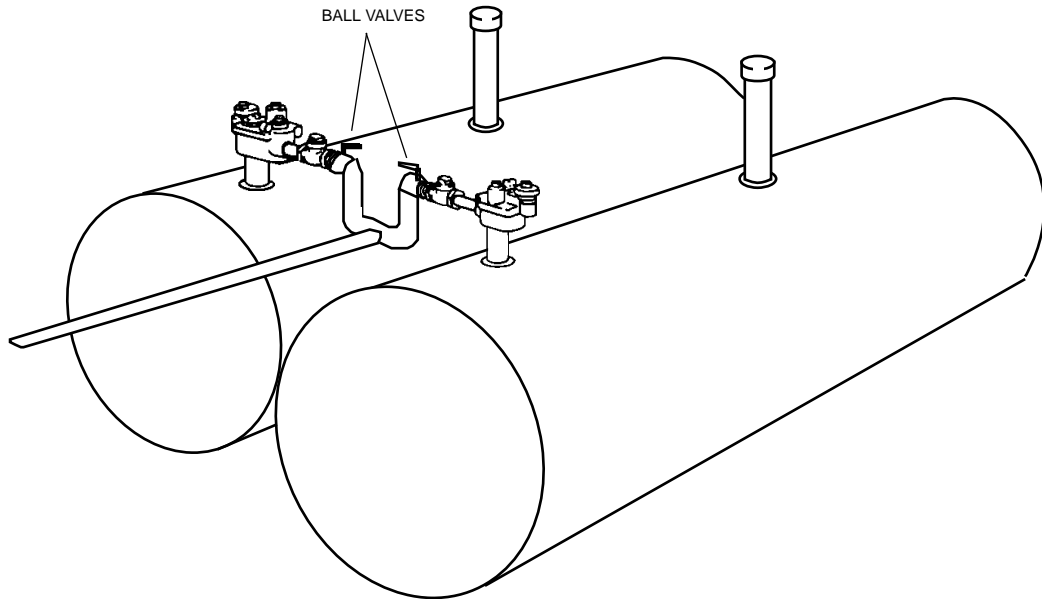


Figure 3.9 Tandem pumps

WARNING

Adjust the Pressurstat on both packers to maximum relief pressure by rotating fully clockwise. If maximum pump pressures are NOT a minimum of 5 PSI below the Pressurstat relief setting then 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.



The check valves are not available from Red Jacket and should be purchased locally.



Ball valves should be installed at the pump end of the discharge line for ease of maintenance and troubleshooting.

ADJUSTING THE PRESSURSTAT

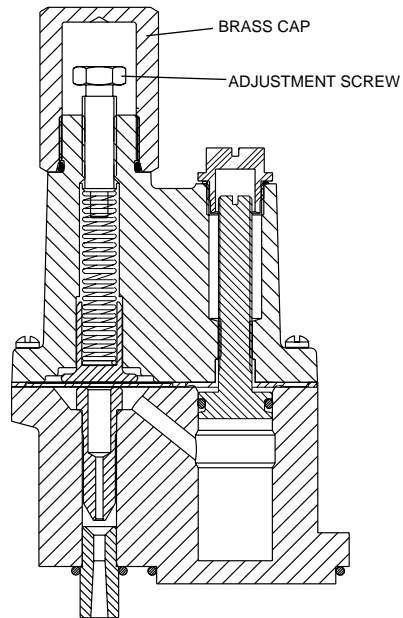


Figure 3.10 Pressurstat

DANGER

Always DISCONNECT and LOCK or TAG OUT the power before starting to service the pump.

The Pressurstat contained in this package is an adjustable model. All Pressurstats are factory set at relief pressures of 23 psi (160 kPa) to 28 psi (195 kPa) but can be adjusted to a maximum of 40 psi (276 kPa) to 45 psi (310 kPa) by turning down the adjustment screw.

This adjustment feature allows the use of the Red Jacket pump with electronic line leak detection systems that require higher relief such as that which is available on the CPT.

- 1: Remove the brass cap (Fig. 3.10).
- 2: Turn down the adjustment screw (Fig. 3.10). Tightening the screw clockwise will increase the pressure. When the adjustment screw is fully down, the relief pressure is approximately 40 psi (276 kPa) to 45 psi (310 kPa). Fully up will result in relief pressures between 0 psi (0 kPa) and 3 psi (20 kPa).
- 3: Replace brass cap until it bottoms out. Hand tightening is sufficient as the O-ring completes the seal.

There are two methods 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, or from a tech pod which plugs in to the CPT door. Observe the pressure that occurs after the pump turns off — this is the adjusted relief pressure.

- Pressure may be observed using a gauge attached at the impact valve or the line test port at the pump. Observe the pressure that occurs after the pump turns off — this is the adjusted relief pressure.

NOTICE

The primary siphon system for the Quantum is the brass fixture located beside the Pressurstat. The 3/8" NPT plug in the fixture should be removed and siphon check valve with siphon line attached to the fixture in that port (See Fig 3.11).

NOTICE

It is strongly recommended that the primary siphon be used. If this recommendation is ignored and siphon lines are attached to the Pressurstat, the 5 psi (34 kPa) rule comes into effect. The pump must be able to create 5 psi more than what the Pressurstat relief pressure is set at.

For example: if a relief pressure of 25 psi (170 kPa) is desired, the CPT Controller must be set at 30 psi (210 kPa) minimum.

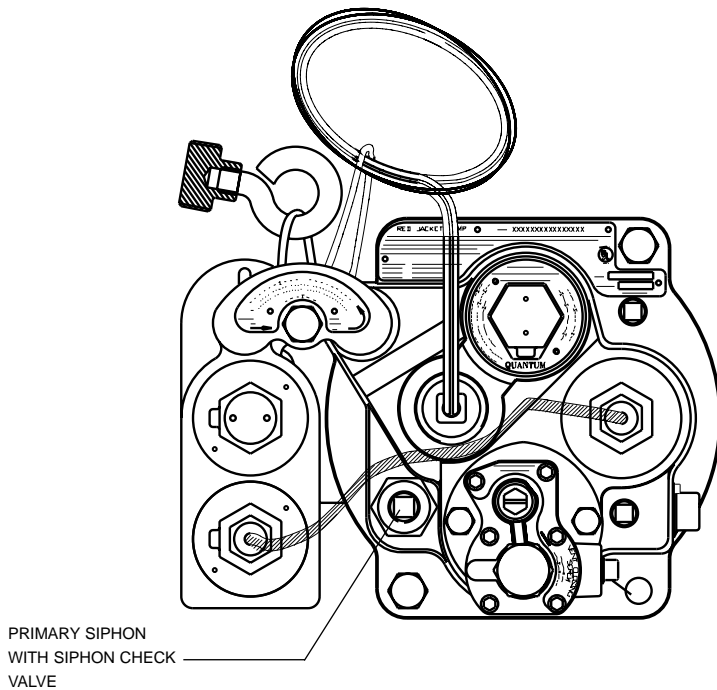


Figure 3.11 Primary Siphon

CHAPTER 4: TESTING THE INSTALLATION

OVERVIEW

This chapter explains the following:

- ◇ Testing Safety Notices
- ◇ To Test the Piping
- ◇ To Test the Tank

TESTING SAFETY NOTICES

NOTICE

ALWAYS DISCONNECT and LOCK or TAG OUT the power before starting to service the pump.

TO TEST THE PIPING.

- 1: Block lines at each dispenser. (Trip dispenser shear valve.) Remove line test plug for this test. (See Fig 4.2)
- 2: Close pump check valve by turning the vent closing screw as far down as possible. (See Fig 4.1)

CAUTION

Excessive pressure (above normal test pressure of 50–55 psi (345–380 kPa)) may damage check valve seat and other system components.

- 3: Apply line test pressure at line test port. (50 psi (345 kPa) maximum). (See Fig 4.2)

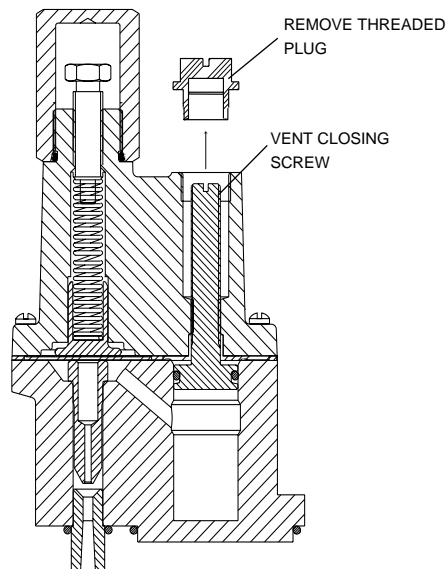


Figure 4.1 Closing the check valve

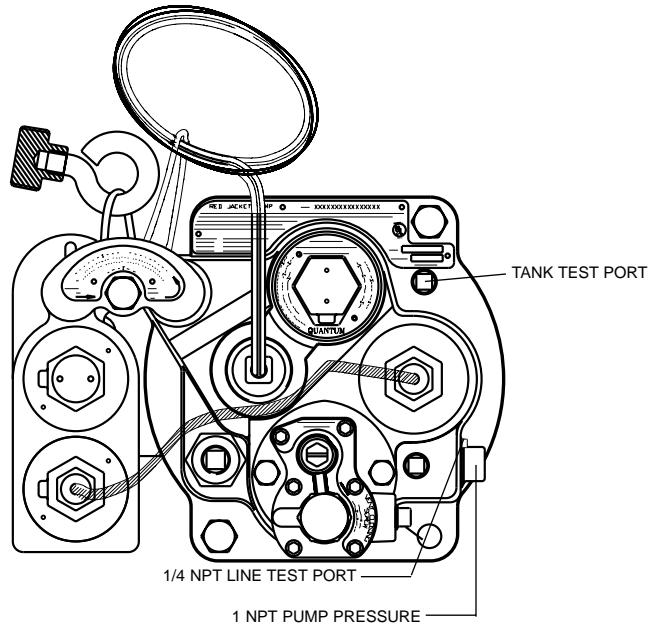


Figure 4.2 Line test port

To Test Tank

- 1: Close pump check valve by turning the vent closing screw as far down as possible. Apply tank test pressure at tank test port. (See Fig 4.2)
- 2: After completion of line and/or tank tests, release pressure by turning the vent closing screw as far up as possible. (See Fig 4.1)
- 3: After the installation is completed and tests have been made, purge system of air by pumping at least 15 gallons (57 liters) through each dispenser. Begin with the dispenser furthest from pump and work toward the pump.

CHAPTER 5: SERVICE AND REPAIR

OVERVIEW

This chapter explains the following:

- ◇ Technical Support
- ◇ Removing the Pump
- ◇ Replacing the UMP
- ◇ Replacing the Pressurstat

TECHNICAL SUPPORT

For technical assistance 24 hours a day, call

1-800-777-2480.

Please have your Red Jacket Technical Support ID number when calling.

See the Parts List in Appendix A.

See Limited Warranty on back page.

REMOVING THE PUMP

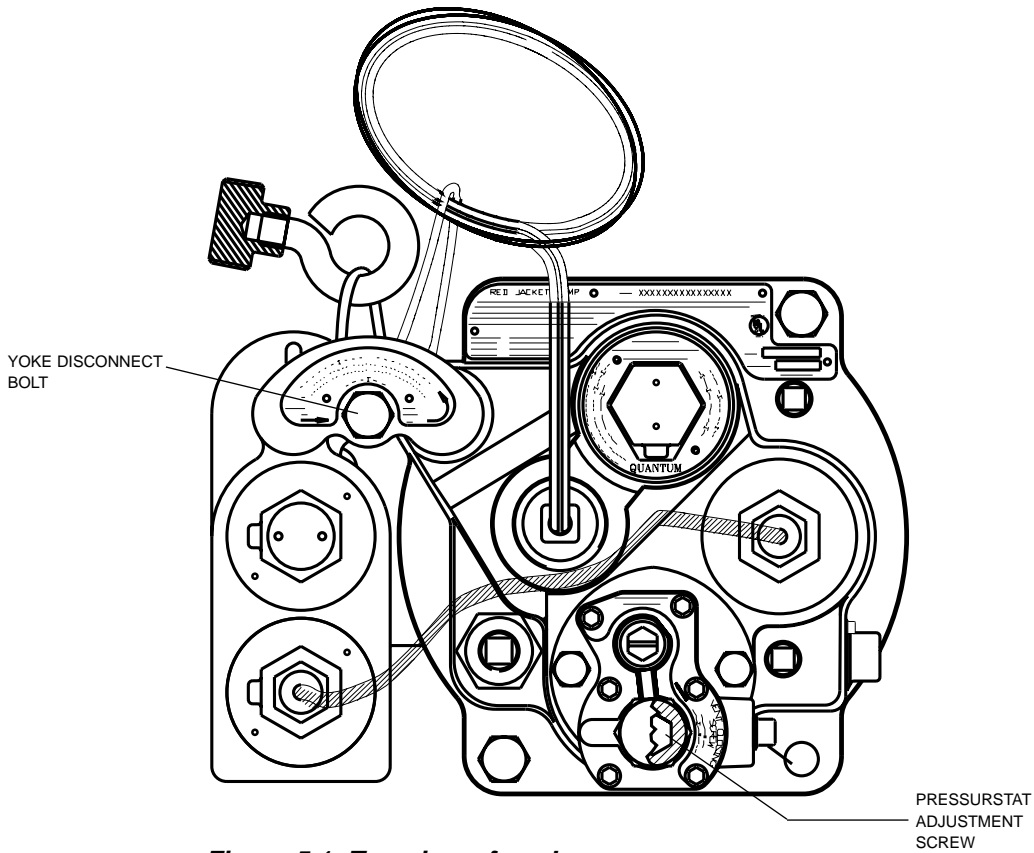


Figure 5.1 Top view of packer

DANGER

ALWAYS DISCONNECT and LOCK or TAG OUT the power before starting to service the pump.

- 1: Back out the electrical yoke disconnect bolt.
- 2: Swing the electrical connector aside.
- 3: If a siphon system is in place, disconnect the siphon tubing. If ball valves are installed, close them.
- 4: To relieve pressure, turn Pressurstat adjustment screw counter clockwise until line pressure is relieved, allow excess pressure to flow into the tank.
- 5: Lift out the extractable unit.
- 6: Allow pump to drain into the tank before complete extraction.

CAUTION

DO NOT damage the surface above the discharge port. The O-ring below the leak detector port seals on this surface.

NOTICE

Before replacing the extractable portion, make sure that the packer O-ring and discharge O-ring seal surfaces are clean. New O-rings should be installed.

REPLACING THE UMP

To replace a Red Jacket UMP, follow these instructions.

DANGER

ALWAYS DISCONNECT and LOCK or TAG OUT the power before starting to service the pump.

- 1: Remove the extractable portion of the old pump from the tank as described above.

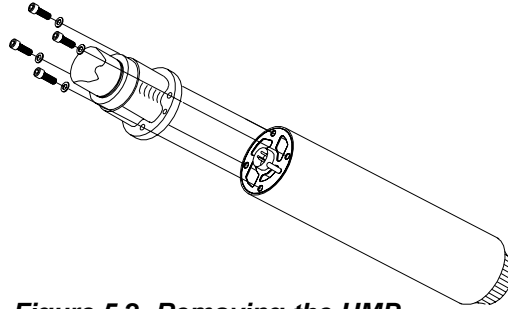


Figure 5.2 Removing the UMP

- 2: Remove the old UMP by removing the four bolts from the discharge head as shown in figure 5.2.
- 3: Rock the unit while pulling away from the discharge head until it is free.
- 4: Replace the old gasket with the new one provided. Place the new gasket on the new UMP so that all the holes align.

NOTICE

Gaskets from competitive UMPS will not seal properly and performance will be reduced.

CAUTION

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.

- 5: Lubricate o-ring and pigtail with petroleum based jelly.

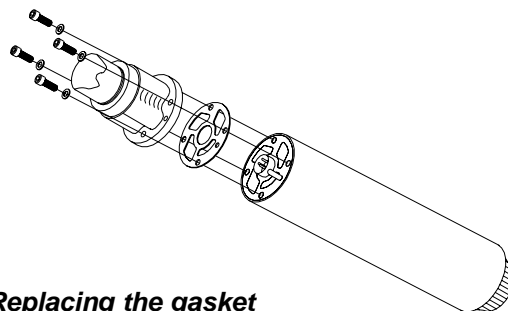


Figure 5.3 Replacing the gasket

- 6: Align the UMP positioning dowel and boss with the proper holes in the discharge head 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.

NOTICE

Use hand force to put the UMP onto the discharge head. If the UMP does not seat properly, snug against the discharge head, remove the UMP and correct the problem.

NOTICE

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 these instructions may cause parts to fail.

- 7: Install the UMP retaining bolts and lock washers. Snug and then torque the bolts using a cross pattern. Torque to 7 ft-lb. (11 N•m).
- 8: Replace the packer o-ring and the discharge o-ring seals.
- 9: Reinstall the extractable portion into the tank, using the steps previously described under “Installing the CPT Pump” in Chapter 3.

NOTICE

Before replacing the extractable, make sure that the surfaces of the packer O-ring and the discharge O-ring seals are clean.

- 10: Check the pump for leaks while the pump is operating.

REPLACING THE PRESSURSTAT

DANGER

ALWAYS DISCONNECT and LOCK or TAG OUT the power before starting to service the pump. Then bleed off any residual pressure from the system.

Disable the Pump

- 1: Back out the electrical yoke disconnect bolt.
- 2: Swing the electrical connector aside.
- 3: Relieve the pressure, back out Pressurstat adjustment screw to allow excess pressure to flow out to the tank.

Replace the Pressurstat

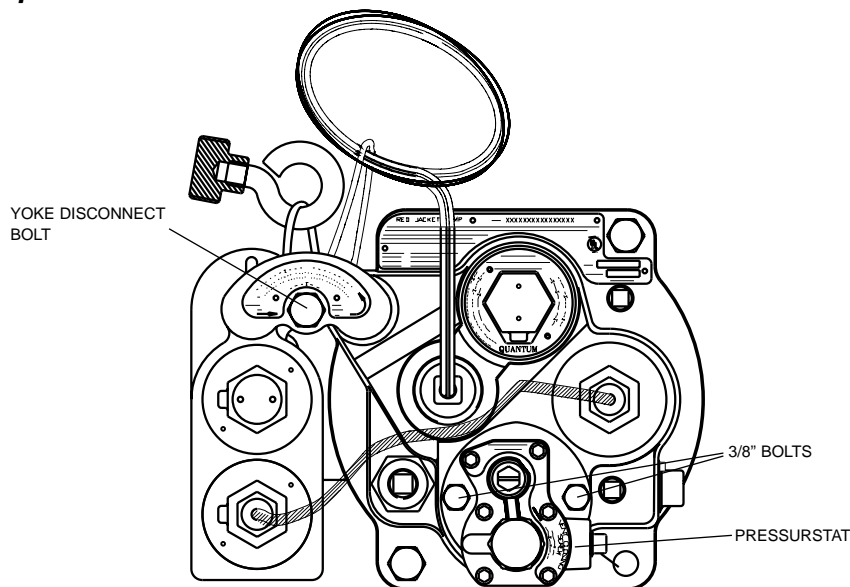


Figure 5.4 Packer with Pressurstat

- 1: Remove the old Pressurstat assembly by first disconnecting the siphon tubing (if a tank siphon is installed).
- 2: Remove the two 3/8-in. bolts.
- 3: Carefully lift the Pressurstat and remove it from the packer. The old check valve and spring will be resting on top of the check valve seat.

NOTICE The check valve and spring should be replaced if they are damaged or worn.

- 4: Carefully set the new Pressurstat and its three new O-rings into place; then, replace the two 3/8-in. bolts. Torque to 38-42 ft-lb (52 to 57 N•m).
- 5: Check the seating pressure of the Pressurstat for proper setting. (See CPT Controller Manual for instructions.)

APPENDIX A: PARTS LIST

OVERVIEW

This appendix include the following information:

- ◇ Customer Service Number
- ◇ Parts List for Quantum CPT Final
 - Transducer Components
 - Packer-Manifold Parts
 - Yoke Assembly and Conduit Box Parts
 - Pump Parts

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 **1-800-262-7539** of **any equipment damage or missing equipment**.

The following pages list the parts for the packer-manifold, transducer and CPT pumps.

A dash in a table cell indicates the item is not required for that type of pump.

PACKER-MANIFOLD — PART 1

ITEM	PART #	DESCRIPTION	QTY
1	026-205-1	SCREW — 1/2-13 x 1 1/4 UNC	2
2	027-031-1	PLUG — PIPE 1/4" NPT	2
3	244-006-5	TRANSDUCER — PRESSURE	1
4	027-084-1	PLUG — PIPE 3/8" NPT	3
5	026-176-1	SCREW — 3/8-16 x 3/4 UNC	2
6	144-230-5	KIT — SIPHON NOZZLE	1
7	288-053-5	SIPHON — CHECK VALVE	1
8	311-026-5	BARRIER — INTRINSIC SAFETY	1
9	067-281-5	PLUG — ASSY CONDUIT BOX	2
10	144-226-5	KIT — 3 WIRE YOKE & CONDUIT BOX	1

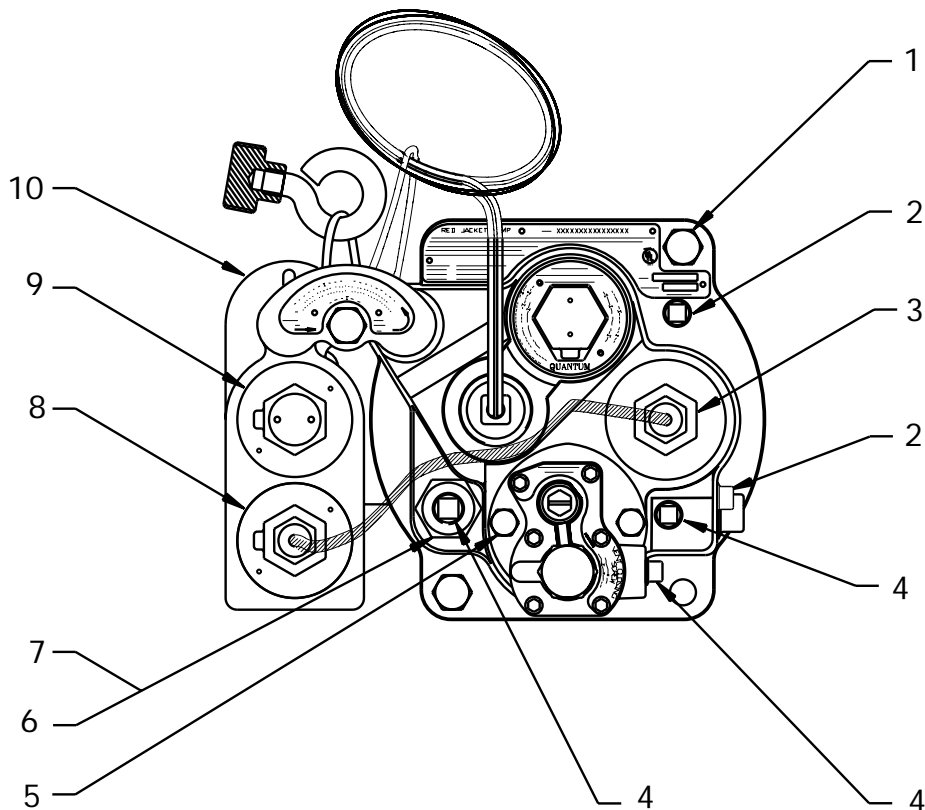


Figure A.1 Parts for packer-manifold, top view

PACKER-MANIFOLD — PART 2

ITEM	PART #	DESCRIPTION	QTY
11	067-283-5	PLUG — ASSY WIRING COMPARTMENT	1
12	264-158-5	PACKER SUB ASSEMBLY	1
13	072-542-1	O-RING — VITON (-443)	1
14	080-951-1	KIT — CHECK VALVE & SPRING	1
15	323-002-5	KIT — PRESSURSTAT (ADJ.)	1

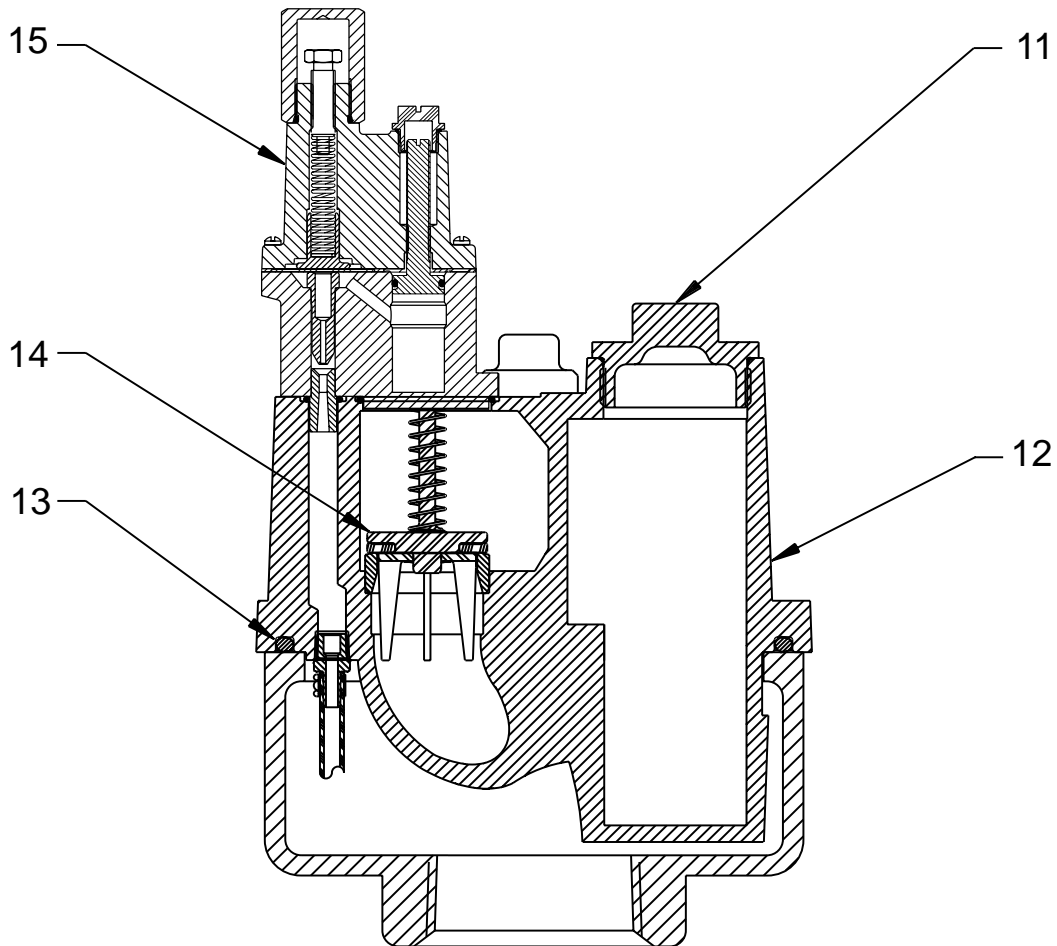


Figure A.2 Parts for packer-manifold, side view

TRANSDUCER COMPONENTS

ITEM	PART #	DESCRIPTION	QTY
1	RE196-108	KIT — EPOXY SCOTCHCAST	1
2	244-006-5	TRANSDUCER — PRESSURE	1
3	076-380-5	SEAL — PAC/MAN GFLT	1
4	311-026-5	BARRIER — INTRINSIC SAFETY	1
5	036-064-1	BOLT — EYE	1

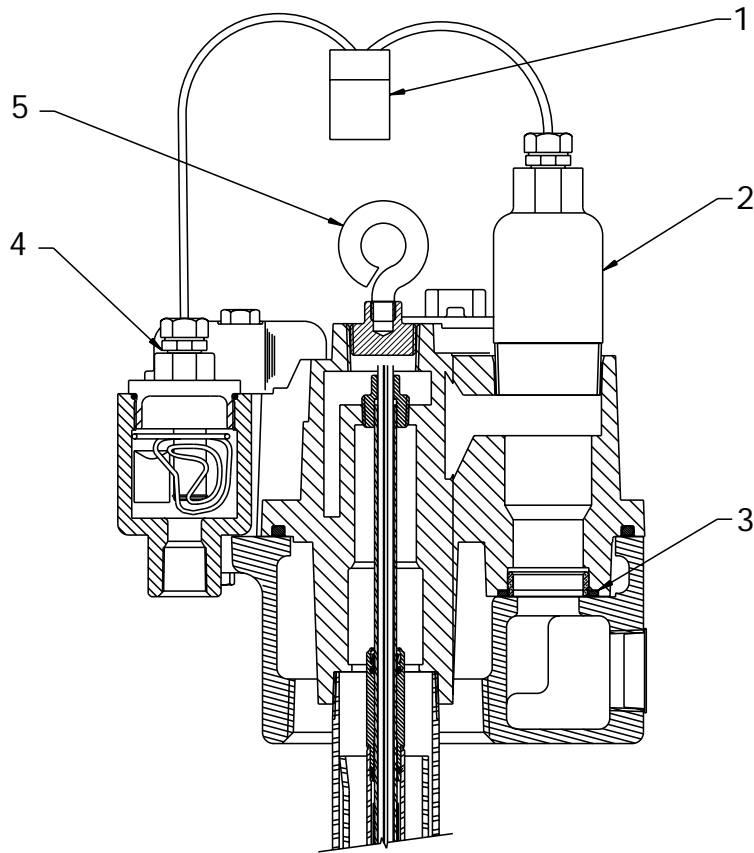


Figure A.3 Transducer components

YOKE ASSEMBLY AND CONDUIT BOX PARTS

ITEM	PART #	DESCRIPTION	QTY
1	113-555-5	CONNECTOR — MALE (3-WIRE)	1
2	072-492-1	RING — SNAP	1
3	313-038-5	CONNECTOR — REPAIR (3-WIRE)	1

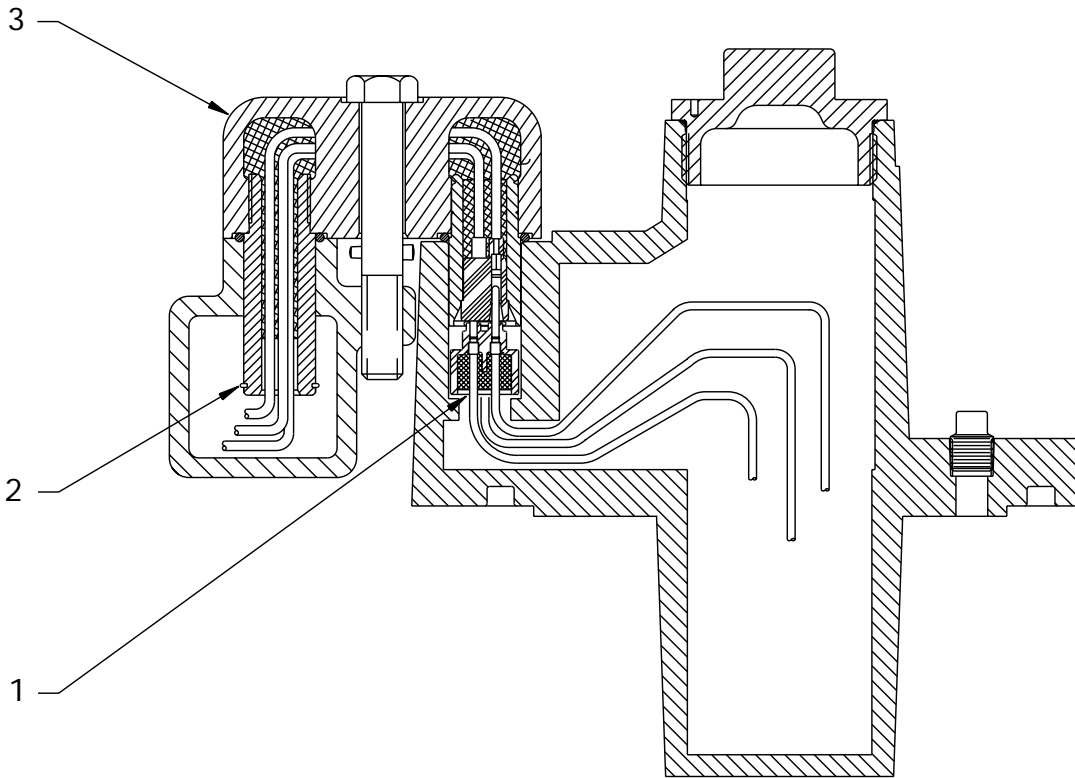


Figure A.4 Yoke assembly and conduit box

PUMP PARTS LIST

ITEM	PART #	DESCRIPTION	QTY
1	144-091-5	KIT — PIGTAIL	1
2	072-528-1	O-RING GFLT (-113)	1
3	852-175-5	AGUMP200T20-2	1
3	852-209-5	UMP200U20-2	1
3	852-181-5	AGUMP200T20-2 W/FSA	1
3	852-210-5	UMP200U20-2 W/FSA	1
4	144-327-4	KIT — FLEX SYPHON/UMP (INCLUDES GASKET, LOCKWASHERS AND BOLTS)	1
--	144-194-5	TRAPPER — RETROFIT (NOT SHOWN)	1

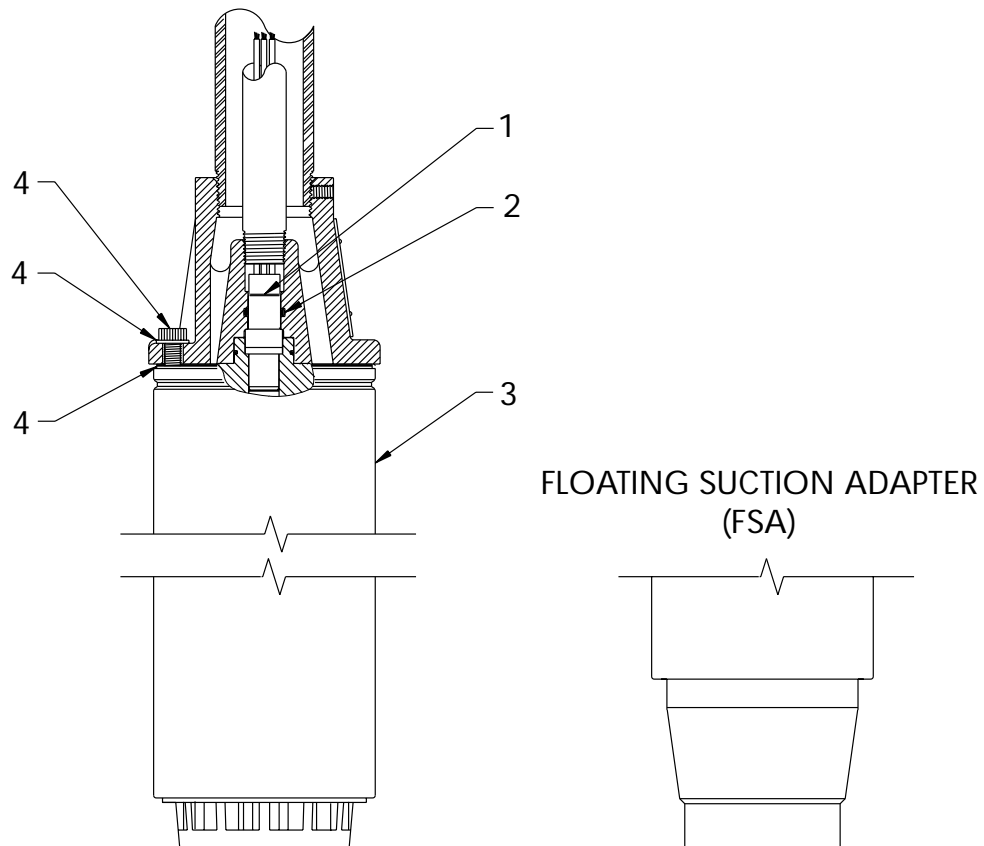


Figure A.5 Pump



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