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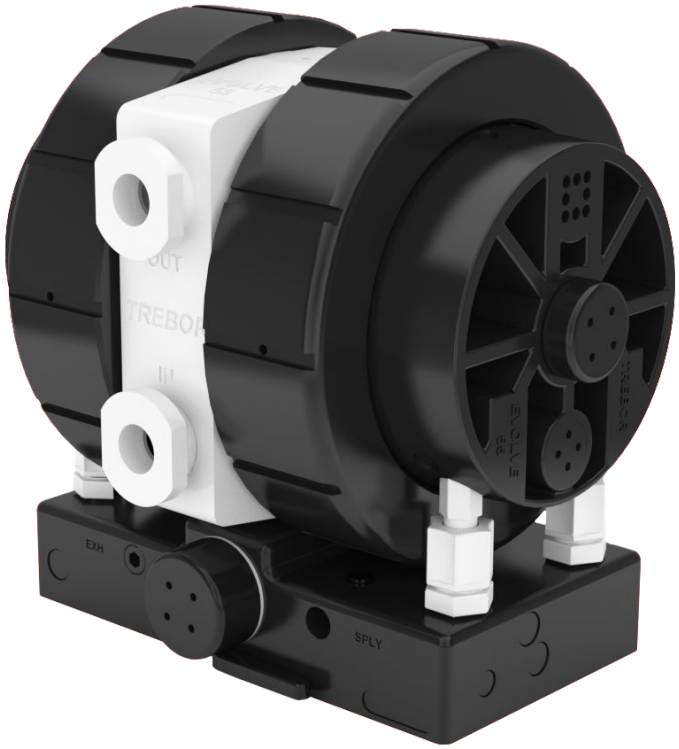
EVOLVE 55D PUMP

Operation / Maintenance Manual



PATENTS: U.S.05971402, U.S.05370507, U.S.06106246, U.S.13/536,439 6/26/2026 – ME55D-C

CONTENTS

1 INSTALLATION

1.1 UNPACKING

After unpacking, the pump should be checked for any damage that may have occurred during shipment. Damage should be reported to the carrier immediately.

The following items should be included within the shipping container:

Qty	Item	Description
1	Pump	Evolve 55D Pump

1.2 UTILITIES / CONNECTION

It is recommended that the pump be positioned within 15° from level to maintain self-priming ability and pumping efficiency. Allow sufficient room for tubing connectors. The pump mounts on a quick-change base for easy installation.

The pump has an exhaust location on the backside of the pump base. The exhaust location requires 1/2” (12mm) minimum clearance behind the master head. Care should be taken to prevent flooding the exhaust port when the pump is located in a wet bench plenum. To connect the remote exhaust, see Section 1.3 below.

Air Inlet: 1/4” FNPT (3/8” Dia. [8mm] supply tube minimum).

Air Supply: 20-100 psig (.14 - .69 MPa) clean dry air or nitrogen (see Performance Charts, Section 3.1).

Fluid Ports: Inlet/Outlet adaptor fittings and Surge Suppressor require torque application during pump installation. See Section 2 for connection diagram and torque values.

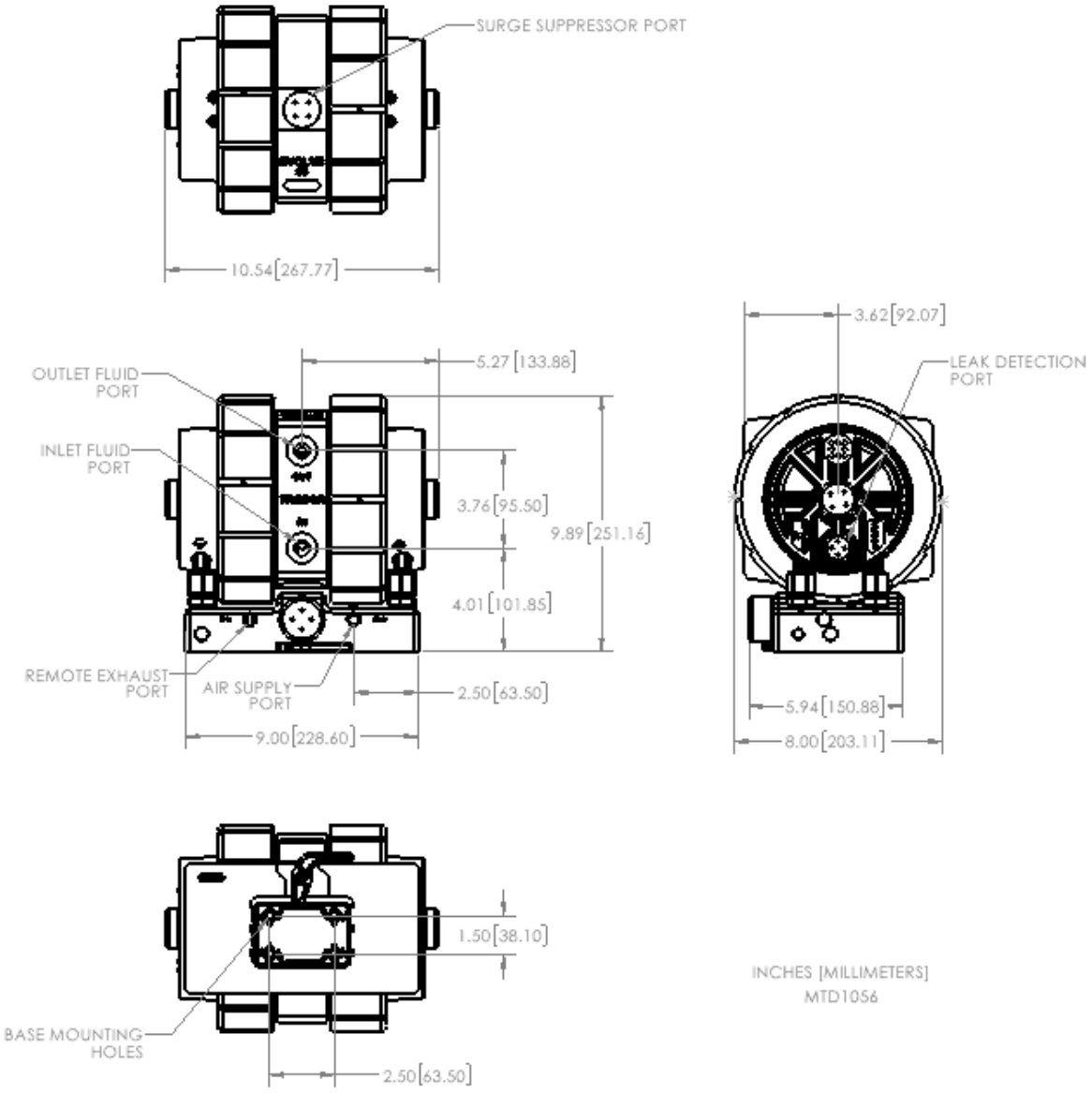


Figure 1-1: Dimensional Views

ATTENTION: The pump should be operated with clean, dry air or nitrogen. Particulate, water and oils in the air supply can damage the pump.

NOTE:

1. It is recommended that a filter be placed on the discharge side of the pump.
2. Although extensive efforts are made to deliver pumps to our customers completely dry, new pumps may contain residual moisture from their final DI water test.

1.3 REMOTE EXHAUST CONNECTION

Some installations may benefit from remotely exhausting air from the pump to eliminate unwanted air turbulence or to prevent potentially damaging chemical vapors from entering the pump air cavities.

- Remove existing Muffler Assembly from the pump base.
- Install Exhaust Plug in Exhaust Port.
- Remove Pipe Plug (¼" NPT) from the pump base. Install the appropriately sized fitting and tubing (not provided) to remote exhaust.

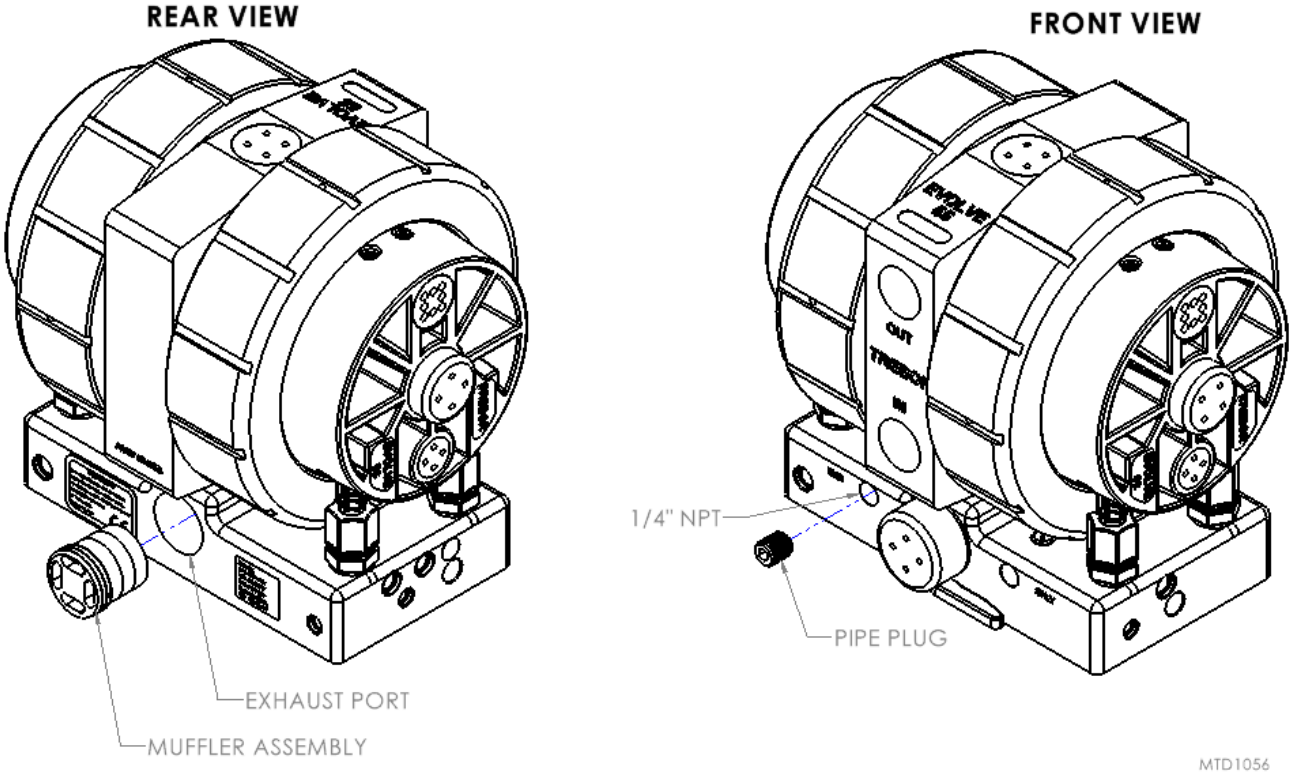


Figure 1-2: Remote Exhaust Connection

NOTE: To maintain optimum pump performance use 3/8" (8mm) tubing minimum at a length of 10 ft. (3 meters) maximum.

2 OPTIONS

2.1 FLUID PORT CONNECTION OPTIONS

NOTE:

1. Use O-ring to seal stainless steel or other rigid plumbing.
2. If torque is applied from the pump outward toward the Swagelok fitting, the resulting axial pressure can separate the seal from the gasket at the pump, which may lead to a leak.
3. PTFE tape is NOT designed to serve as a permanent sealing solution and may result in premature failure and potential leakage at the fluid port over time.

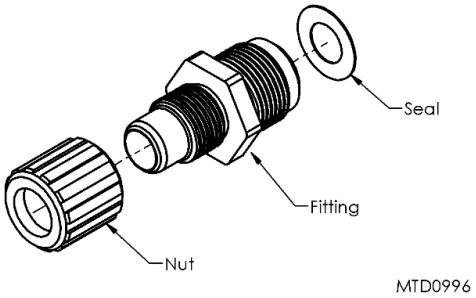


Figure 2-1: Fluid Port Adapters

Available Group Fittings:

- ¾” Male Flare Connection (BK037)
- 1” Male Flare Connection (BK039)
- ¾” PFA Pipe Connection (G12000)
- ¾” PFA Tube Connection (AK157)
- ¾” Pillar Connection (G12X12)
- ¾” Female NPT Connection (AK159)

2.2 FLUID FITTINGS / SURGE SUPPRESSOR CONNECTION

Surge Suppressor	Assembled Height: mm (IN)
MODEL SS40	373 (14.7)
MODEL SS85	435 (17.1)
MODEL SS95	356 (14.0)

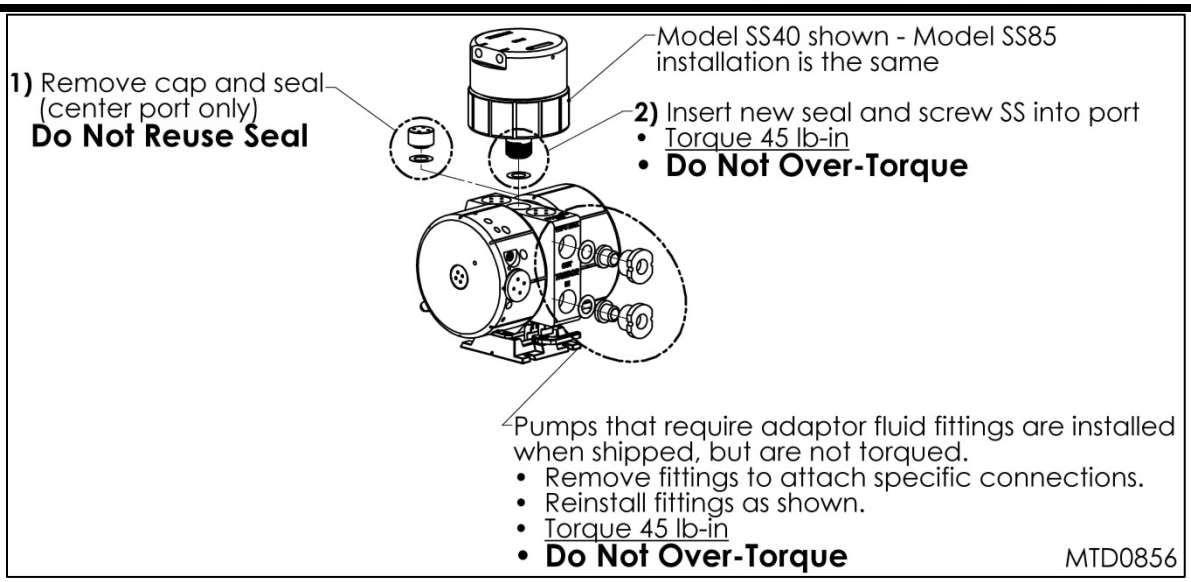


Figure 2-2: Generic Connection Diagram

NOTE: See Surge Suppressor Operation Manual for detailed installation instructions.

2.3 OPTIONAL LEAK SENSING

2.3.a Installation

- Remove plug and seal from port. Probe is self-sealing.
- Install probe assembly into leak sensor port.
- Thread probe cap into port. (NOTE: Do not overtighten; damage to threads will occur).
- Push protective tubing into probe cap.
- Connect fiber optic cable to sensor (NOTE: Minimize bends in fiber optic cable to 2" radius minimum to help ensure optimum signal strength). Fiber optic cable can be cut to desired length using the cable cutter provided.

2.3.b Sensor Signal Specifications

- The sensor signal is normally closed. In the event of a leak, no light signal is returned to the sensor.

NOTE: See your fiber optic sensor installation instructions for proper connection and adjustment.

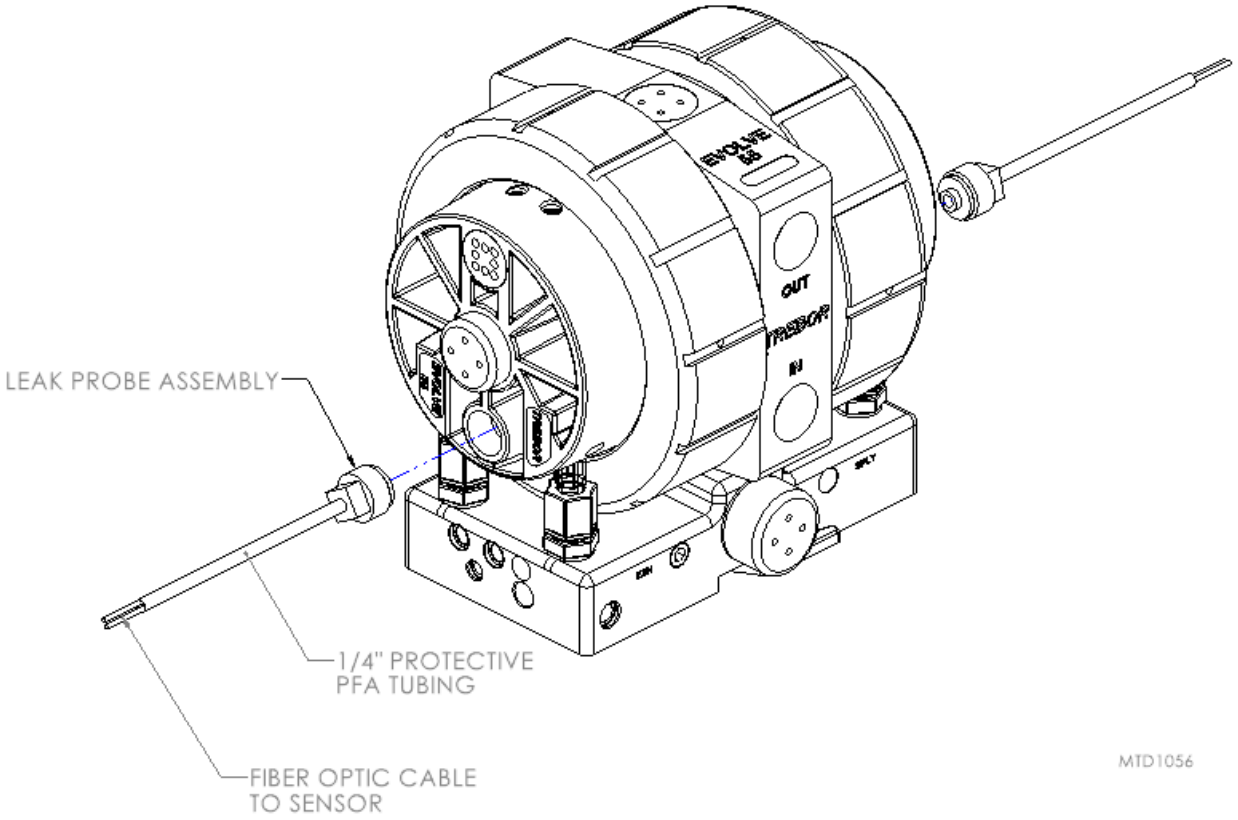


Figure 2-3: Generic Leak Probe Assembly

3 START-UP

- Pump air supply pressure must be regulated. (See Figure 3-2: Pressure vs. Fluid Temperature Chart).
- Open the fluid suction (IN) line valve, if necessary.
- Open the fluid discharge (OUT) line valve, if necessary.
- Start slowly with air regulator at low (> 20 psi) pressure setting. Increase pressure to attain desired flow, up to the maximum rating (See Section 3.1).
- Refer to Troubleshooting, Section 5, if pump fails to start.

ATTENTION: Prolonged periods (> 5 minutes) of dry running can damage critical internal pump parts.

CAUTION: When handling potentially dangerous fluids under pressure, the pump and its fittings should be placed in an enclosure away from operators.

3.1 PERFORMANCE CHARTS

Pumping capacity is a function of air supply pressure and volume, suction head, suction line restrictions, discharge head, discharge line restriction, and fluid specific gravity and viscosity.

NOTE: Specification to be used to size regulators and control valves.

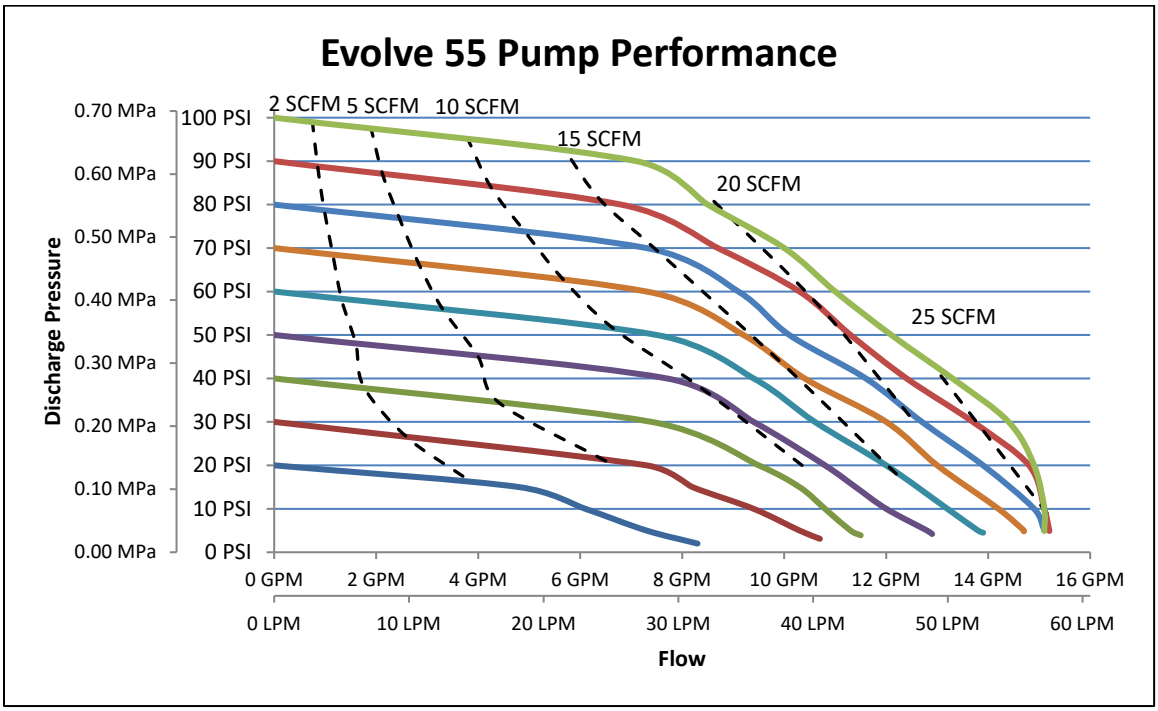


Figure 3-1: Pump Performance Curves with Air Consumption

NOTE: Test information is based on specific conditions and limited sampling. Use for general reference only.

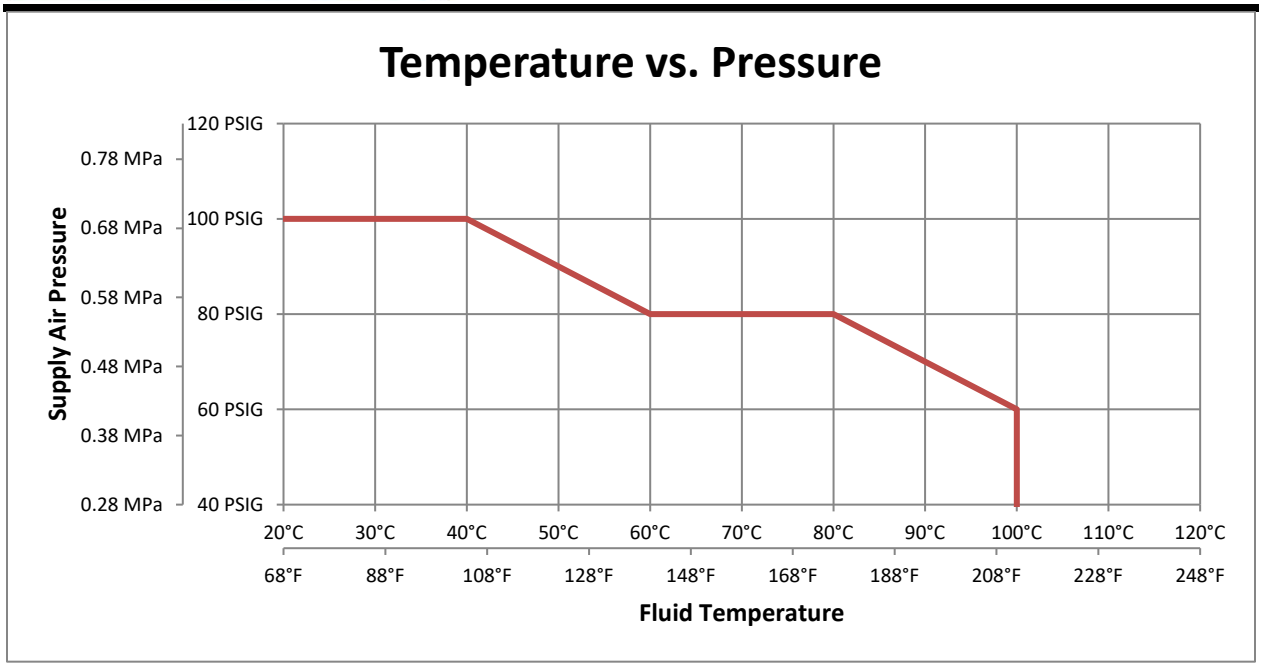


Figure 3-2: Pressure vs. Fluid Temperature Chart
Recommended Maximum Pump Operating Levels

NOTE:

1. This graph is not representative of all operating conditions – customer's specific application results may vary.
2. Be sure that fittings and tubing used are capable of these operating conditions.

Noise level while operating is approximately 80 dB

4 MAINTENANCE

Trebor pump maintenance can be divided into two categories: air system maintenance and fluid system maintenance. The purpose of air system maintenance is to prevent air system failures such as stalling or erratic cycling. The purpose of fluid system maintenance is to maintain suction and lift capabilities.

Pump Rebuild Service

Trebor International provides a factory rebuild service for customers using Trebor products. Trebor will rebuild any standard pump (exclusive of options). Please contact Trebor International Sales Department about current rebuild pricing. The fixed rebuild price includes a factory rebuild and parts equivalent to the standard rebuild kit. Each factory rebuild comes with a new one-year warranty. Repairs requiring more extensive part replacements will be quoted prior to proceeding with the pump rebuild. If the pump has exceeded its useful life and cannot be rebuilt, the customer may elect to purchase a new Trebor pump. If the customer chooses not to rebuild or replace the pump, an evaluation charge will be required.

All returned pumps are to be shipped freight prepaid with a valid Purchase Order for the cost of rebuild service. Please contact Trebor International prior to returning your pump to obtain an RMA Number and Pump Return Data Sheet to ensure proper safety precautions. Each pump will be evaluated and repaired within 5 working days of the receipt of pump at Trebor facility.

4.1 PREVENTIVE MAINTENANCE SCHEDULE

The following maintenance schedule is recommended to optimize pump performance and minimize failures. Certain operating conditions that require more frequent maintenance intervals have been noted. In positive pressure inlet conditions where suction or lift is not required, fluid system maintenance may be extended.

Adhering to the recommended preventative maintenance schedule along with periodic inspection of the pump will ensure continued efficient operation and overall reliable pump performance.

It is recommended that the Preventive Maintenance Record (Section 4.1.a) be copied, maintained and kept with this unit for future reference.

EVOLVE 55D Maintenance Schedule

	Install	30 Days	3 Months	6 Months	9 Months	12 Months	15 Months	18 Months	21 Months	24 Months
Quick Exhaust Seal										R
Muffler Media										R
Shaft Seal and Shaft										R
Check Balls and O-Rings										R
Diaphragms										R
Check Plug Seal										R
Suction and Discharge Check Cage										I
I=Inspect, R=Replace										

4.1.a Preventive Maintenance Record

Company Name: ____

Company Address: ____

____

Product: EVOLVE 55D Serial Number: ______________

Date: ________ Tech: _____ Notes: ______________________________

Date: ________ Tech: _____ Notes: ______________________________

Date: ________ Tech: _____ Notes: ______________________________

Date: ________ Tech: _____ Notes: ______________________________

Date: ________ Tech: _____ Notes: ______________________________

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4.2 RECOMMENDED SPARE PARTS

KRE55D-00-A Spares Rebuild Kit, which includes:

Part No	Qty	Description			
KME55D-00-A	1	**Maintenance Kit**			
		Includes:	(2)	AK123	Distribution Pilot Assy
			(1)	AK205-01	Muffler Assembly
			(2)	L0197	Detent Leg
			(1)	L0145	Detent Ring
			(2)	BK017	Assembly, Muffler
KDE55D-00-A	1	**Diaphragm Kit**			
		Includes:	(2)	BK019	Diaphragm
			(2)	BK020	Wear Resist Diaphragm
98001415	4	Check Ball, PTFE			
98002334	4	O-ring, -312 PTFE			
98003079	2	Shaft Seal			
BK032	1	Shaft			
AK153	2	Check Cap Seal			
AM084	1	Damper Port Seal			
TJ006	16	Diaphragm Retention Pin, PP			

4.3 TOOLS

The following tool kit is recommended as standard service equipment.

KTE55-00-A Tool Kit, which includes:

Part No	Qty	Description
98003108	1	Torque Wrench, 30-150 ft.-lbs., 1/2” Drive Handle
98003150	1	Tool Case, Large, Maxim, w/Foam
98003305	1	Drive Handle
98003306	1	Wrench, Adj., 15/16”
98004281	1	Tool Case, Large, w/Foam
T0126	1	Tool, Shaft Insert
T0129	1	Tool, Strap Wrench, Maxim
T0132	1	Rebuild Fixture
T0144	1	Tool, Wedge, Head Removal
T0146	1	Tool, Pin, 3/4x1/4 Drive
T0147	1	Tool, Pin, 1x1/4 Drive
T0148	1	Tool, Pin, 1/2x1/4 Drive
T0149	1	Tool, Pin, Optic Cap, 3/4
T0175	1	Tool, Diaphragm Pin, E55
Optional:		
T0203	1	Tool, Socket, Union Nut, M50
T0203-01	1	Tool, Socket, Union Nut, M50 (For pump mounted to base)

4.4 PARTS ILLUSTRATION

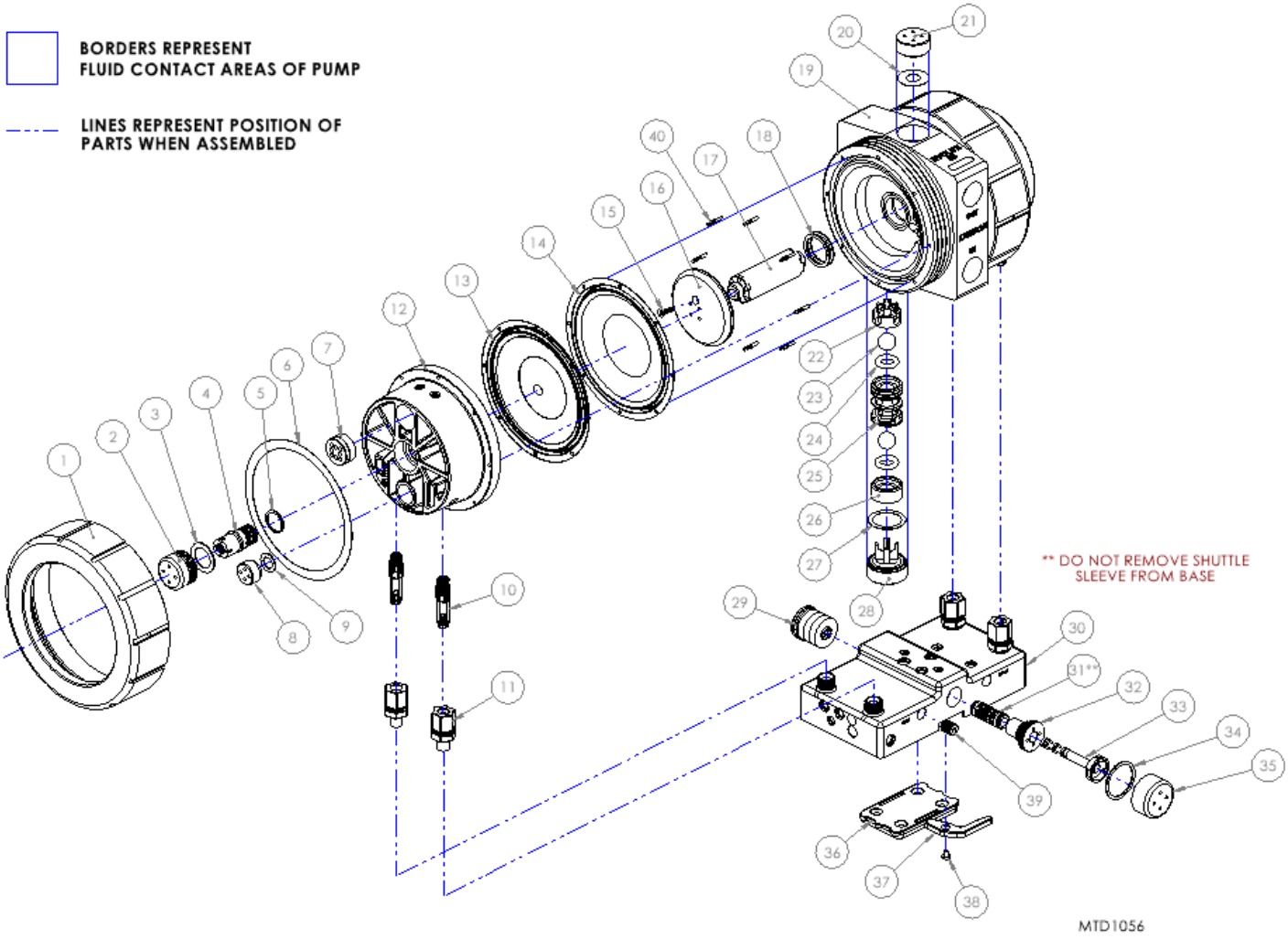

Figure 4-1: Evolve 55D Itemized Parts

4.5 PARTS LIST

ILL NO	PART NO	QTY	DESCRIPTION	PM YEAR #	MATERIAL
1	AK003	2	PP Union Nut (optional)		PP
1	AK003-01	2	PVDF Union Nut		PVDF
2	AK116	2	Pilot Cap		PP
3	AM020	2	Pilot Cap Seal		PTFE
4	AK123	2	Smart Pilot Assembly	2	PEEK, PTFE, PPS
5	AK120	2	Pilot Sleeve Seal		PTFE
6	AK097	2	Slip Washer		PTFE
7	BK017	2	Muffler Assembly, Head	2	PP
8	AM040	2	Leak Port Plug		PP
9	AM037	2	Leak Port Seal		PTFE
10	AK182	4	Transfer Tube		PFA
11	98003260	4	Jaco Fittings (¼" pipe to ½" tube)		PP
12	BK004	2	Pump Head		PP
13	BK020	2	Evolve Wear Resist Diaphragm		PTFE/PFA
14	BK019	2	Evolve Diaphragm		PTFE
15	98003911	2	Flathead Screw (#10-24X3/4)		PTFE
16	BK033	2	Push Plate		PTFE
17	BK032	1	Shaft	2	PTFE
18	98003079	2	Shaft Seal	2	PTFE
19	BK001	1	Pump Body		PTFE
20	AM084	1	Damper Port Seal	2	PTFE
21	AM075	1	Damper Port Plug		PTFE
22	AK026	2	Discharge Check Cage	2	PTFE
23	98001415	4	Check Ball	2	PTFE
24	98002334	4	Check O-Ring	2	PTFE
25	AK068	2	Suction Check Cage	2	PTFE
26	AK066	2	Suction Seat		PTFE
27	AK153	2	Check Port Seal	2	PTFE
28	AK149	2	Suction Plug		PTFE
29	AK205-01	1	Muffler Assembly, Base	2	PP
30	BK014	1	Distribution Control Base		PP
31	AK058	1	Shuttle Sleeve Assembly		Ceramic, PTFE
32	L0105	1	Detent Adapter		PP
33	L0131	1	Spool Assembly, High Load	2	Ceramic, PEEK
34	L0113	1	Detent Cap Seal		PTFE
35	L0104	1	Detent Cap		PTFE
36	AK088	1	Mounting Base		PP
37	AK108	1	Locking Lever		PP
38	98003071	3	Screw, PP		PP
39	98003080	1	¼" NPT Plug		PP
40	TJ006	16	Diaphragm Retention Pin		PP

4.6 CLEAN-UP

To help remove potentially dangerous chemicals prior to service or shipment, the pump should be flushed with DI water or disassembled and thoroughly cleaned. Allow DI water to flush through the inlet and out the outlet to prevent pressure build up.

CAUTION: When handling pump, wear appropriate personal protection gear, including safety glasses.

4.7 DISASSEMBLY

During the life of the pump, it will be necessary to perform certain preventative maintenance procedures to ensure its continued high performance. This section and the next (4.8 assembly) are provided for the user's convenience in disassembly and re-assembly procedures.

4.7.a Head Removal

- Loosen quick grip nuts on the transfer tubes from the Jaco fittings in the base using 13/16" open-end wrench.
- Remove pump assembly from the pump control base.
- Immerse or flush the pump assembly using DI water and a neutralizing agent.
- Install mounting fittings in pump fluid adapter ports and lock body into bench mounting fixture.

NOTE: Securely attach mounting fixture to work surface using hardware provided.

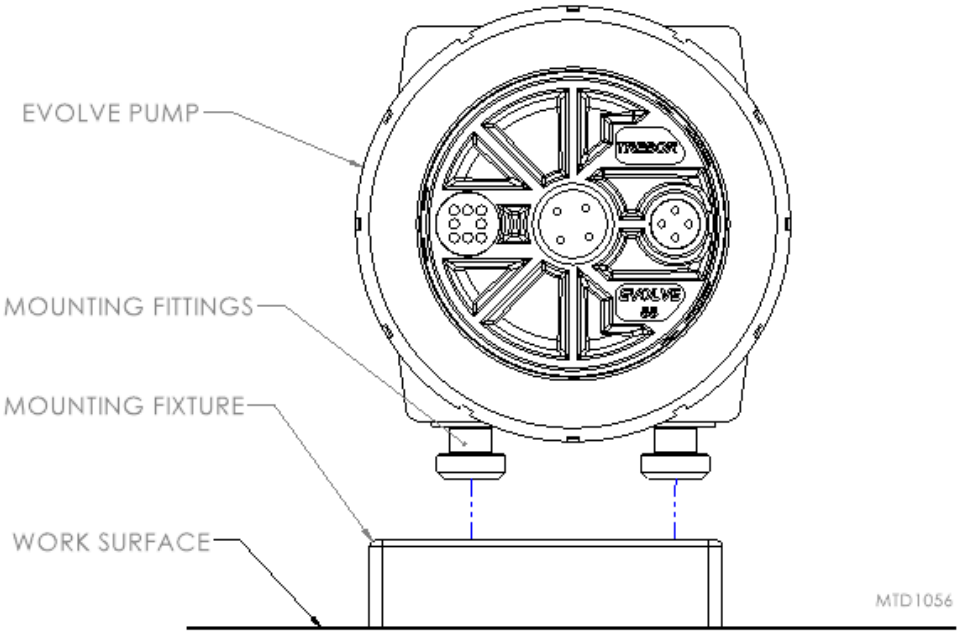

Figure 4-2: Pump and Mounting Fixture

- Remove the transfer tubes from pump heads (using latex gloves to assist grip).
- Remove the leak port plug and seal.
- Remove the smart pilot cap, seal, and smart pilot assembly.
- Remove the muffler assembly.
- Using the torque tool, turn the union nuts counterclockwise to remove.
- Remove head and check diaphragms for cracks or cuts.
- To remove diaphragms, slit diaphragm with a sharp knife and pull the diaphragms from the grooves. **(Do not pry on diaphragm seal groove, as this will damage the sealing surface).**

⚠ **CAUTION:** Following disassembly, parts should be thoroughly washed to be free from chemical residue for handling purposes.

4.7.b Body Disassembly

- Remove flat head screw from push plate.
- Unscrew push plate from the shaft in a counterclockwise direction. Pull other push plate and shaft from pump body.
- Remove suction plugs and seal on bottom of pump body using 1” pin tool.
- Remove suction seat using 1” pin tool.
- Remove ball and O-ring.
- Unscrew suction check using 1” pin tool turning it counterclockwise.
- Remove second set of O-rings and balls and pull-out discharge check cage.
- Remove shaft seals from pump shaft seal groove in the center of the shaft bore using the tip of a razor knife. Take care not to damage the shaft bore. NOTE: Do not reuse seals.
- Remove damper plug and seal using 3/4” pin tool.

4.7.c Control Base Disassembly

- Unlock control base from quick-change mount by pulling out lever on front of base to unlock mount. Then slide the base back until it stops. Lift base off mount.
- Using pH test strips evaluate whether base has any contamination in air passages, especially the muffler area. If present, neutralize using best methods prior to disassembly.
- Unscrew and loosen Jaco nut until transfer tubes can be removed. Do not remove the Jaco fitting from the base unless the fitting is damaged.
- Unscrew and remove muffler assembly from base using the 1” pin tool.
- Unscrew and remove the shuttle cap and seal.
- Remove shuttle spool assembly from detent adapter.
- Remove detent legs and detent ring from spool.
- Remove detent adapter from base using 3/4” pin tool.
- **Do not remove** the shuttle sleeve from the shuttle bore.

4.7.d Pump Cleaning

- Gently spray clean with DI water, or rinse by dunking all components in DI water, to remove any trace materials remaining after disassembly.

4.8 ASSEMBLY

Prior to beginning assembly, inspect all parts to ensure they are clean and dry. Wear clean protective gloves. Precautions should be exercised to prevent contaminating any of the air chamber surfaces with chemicals during handling.

4.8.a Control Base Assembly

- Thread detent adapter into shuttle bore using 3/4" pin tool. (Detent adapter must be flush against base as shown in Figure 4-3). Torque to 45in-lbs.

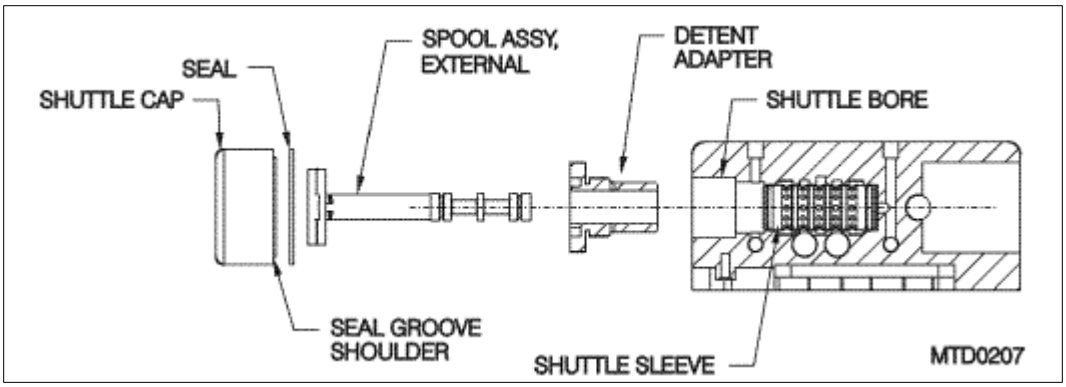

Figure 4-3: Shuttle Assembly Diagram

4.8.b Shuttle spool assembly instructions (See Figure 4-4 for details)

- Hold shuttle spool (item 1) upright and align slot and in detent legs (item 2) with notch on shuttle spool.
- Apply pressure upward onto base of detent legs with thumb and index finger.
- Tilt the detent ring (item 3) over one of the legs and align the groove on the inside of the detent ring with the end of the detent leg. Tilt the other side of the ring down, expanding it slightly, so that the other detent leg snaps into the detent ring groove.

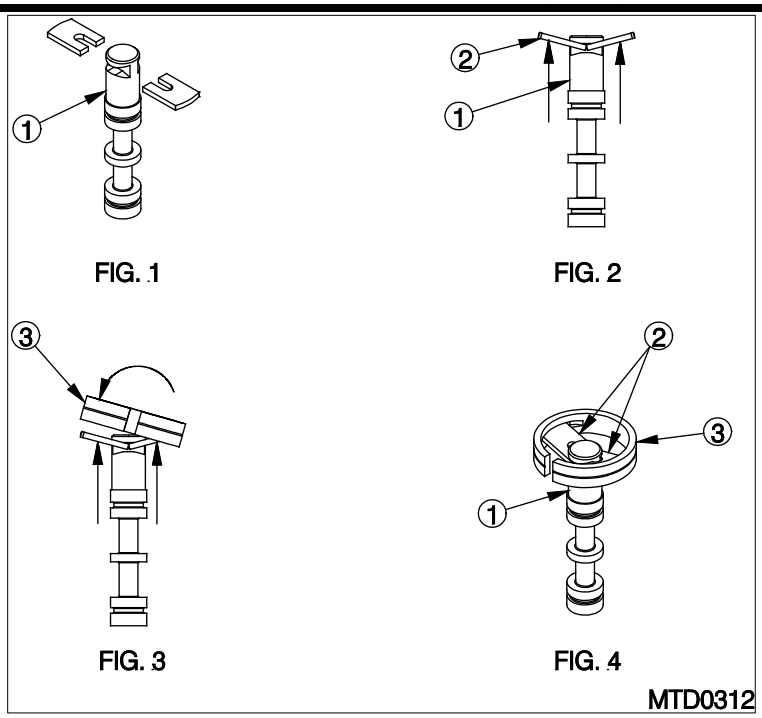

Figure 4-4: Shuttle Spool Assembly

- Insert spool assembly into shuttle sleeve (do not lubricate spool or sleeve).
- Install seal onto seal groove shoulder of shuttle cap.
- Thread shuttle cap into head. Ensure that seal fully seats onto cap. (No gap should show between seal and cap shoulder). Torque to 40 in-lbs.

ATTENTION: Threads should be snug. Do not overtighten.

- **Perform these steps only if the Jaco fitting was removed during disassembly.**
    - Inspect Jaco fittings for damage.
        - *If damaged, replace with black polypropylene Jaco Fittings (Jaco Part No. 10-8-4-P-PG. These parts can be ordered from Trebor or purchased separately).*
    - Apply PTFE thread tape to the NPT threads on the Jaco fittings.
        - Do not tape more than ½ of the threads.
    - Thread the fittings into pump base
        - Depth is .08 inch from bottom of wrench hex to top of pump base as shown. See Figure 4-5. Loosen the nut.

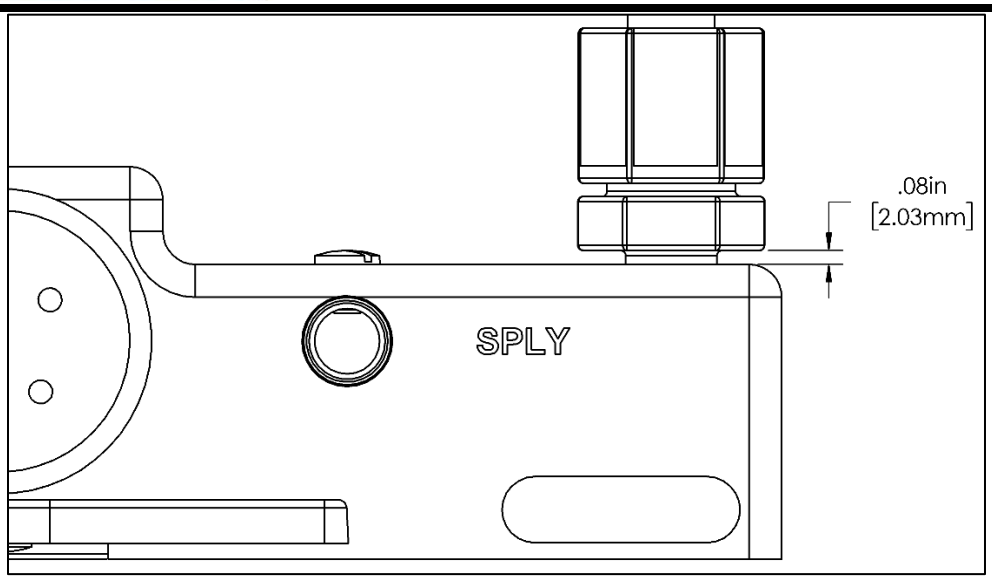

Figure 4-5: Jaco Fitting Final Position

- Thread muffler assembly into base using 3/4” pin tool.

4.8.c Body Assembly

- Install seal and damper plug into body using 3/4” pin tool, torque to 50in-lbs.
- Remove pump from assembly fixture.
- Turn pump upside down to access check bores.
- Install discharge check cage into bore making sure small end fits into relief in bottom of bore.
- Drop ball into check cage, then O-ring.
- Install suction sleeve into the bore; tighten using 1” pin tool. Tighten until engagement with O-ring is achieved, then unthread the sleeve a quarter turn. Do not overtighten as damage may occur.
- Install second ball into check cage, then O-ring.
- Install suction seat using the 1” pin tool. Tighten until engagement with O-ring is achieved, then unthread the seat a quarter turn.
- Install check seal onto check bore shoulder and thread suction plug into bore using 1” pin tool, torque to 60in-lbs.
- Repeat for the second bore.
- Install two shaft seals in shaft bore groove with slits 180° apart.

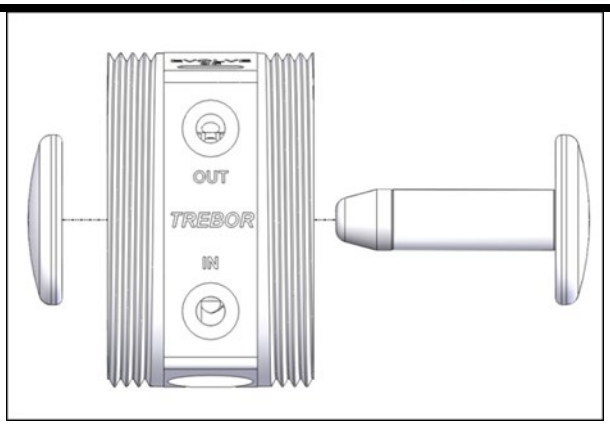

Figure 4-6: Shaft Insert Diagram with Tool

- Thread one push plate onto shaft until push plate bottoms out on shaft shoulder.
- Tighten push plate to 48 oz-in, then rotate clockwise until locking screw hole is aligned with the next available hole in shaft. The first push plate can be visually aligned separate from the body.
- Install push plate locking screw. Tighten to 12 oz-in.
- Thread shaft onto shaft insert tool and insert shaft into bore. See Figure 4-6. This prevents damage to the PTFE shaft seals and prevents dislodgement of shaft seals.
- Insert shaft through shaft bore as shown.
- Thread on remaining push plate until push plate bottoms out on shaft shoulder.
- The second push plate, while in the pump body, cannot be visually aligned.
- Tighten push plate to 48 oz-in, then insert alignment pin into locking screw hole. Rotate push plate clockwise until locking screw hole is aligned with the next available hole in shaft and alignment pin drops into the shaft hole.
- Remove alignment pin.
- Install push plate locking screw. Tighten to 12 oz-in.

4.8.d Head and Body Assembly

- Install the mounting fittings in the pump fluid adapter ports.
- Thread union nut on one side hand tight. Do not install head or diaphragm at this point. This will protect body during initial pump assembly.
- Place pump body with the union nut on the table.
- Place one head on the table with the air chamber facing up.
- Insert 8 PP pins into the 8 small holes around the circumference of the main seal.
- Install both diaphragms (make sure the wear resist disk is facing the pump head) onto the head, ensuring that the PP pins pass through all 8 holes in both diaphragms.

- While holding the diaphragms in place, lift the pump head and place it on the pump body. Ensure the transfer tube port openings are directed toward the bottom of the pump. Fit all 8 PP pins into the holes in the pump body.
- While holding the pump head in place, position the slip ring onto the pump head.
- Thread the union nut onto the pump body and tighten by hand.
- Turn the pump over and remove the union nut.
- Repeat the process of installing the diaphragms over the PP pins on the head and attach the head to the body with the second union nut.
- Using the Strap Wrench (T0129) and the torque wrench (98003108), tighten the union nuts slowly to 107 ft.-lbs. Repeat for the second union nut. (Torque includes strap wrench offset.) Torque range 95 to 118 ft-lb.
- If using the T0203/T0203-01 M50 Union Nut Socket Tool, the torque is 140 ft-lb with a range of 125 to 155 ft-lb.

4.8.e Final Assembly

- Place smart pilot seal onto smart pilot assembly. Thread smart pilot assembly into pump head. Apply 35 in-lbs. with pin tool.
- Insert pilot cap seal into port. Thread pilot cap into port. Apply 40 in-lbs. with pin tool.
- Thread muffler assembly into pump head. Apply 35 in-lbs. with pin tool.
- Place leak seal into leak port. Thread plug into leak port. Apply 35 in-lbs. torque.
- Thread transfer tube into head ports using Latex gloves for added grip. Ensure that the shoulder of the transfer tube touches the flat surface around the port hole.
- Repeat for second pump head.
- Place control base on mounting base. Slide base forward. Slide locking lever to secure base.
- Ensure that the quick grip nuts on the Jaco fittings are loosely attached.
- Carefully guide the transfer tubes into the Jaco fittings. Gently manipulate the pump until all four transfer tubes are fully seated in the Jaco fittings.
- Hand-tighten all four of the quick grip nuts. Then use a wrench to turn the nuts 1½ to 2 more turns to fully seal the fitting.
- Follow pump connection instructions above.

4.9 TESTING

4.9.a Performance Test

- Connect the pump to a fluid and air supply. See above instructions.
- With the air supply at 0 psi open the air supply valve.
- Increase the air pressure until the pump starts to cycle.
- Record the start pressure, Target = 28psig.
- Pump must prime and even cycling must be achieved before continuing.

- Increase pressure to 60 psi and allow pump to run for 5 minutes.
- Check for fluid leaks, listen for air leaks, and check for irregular operation.
- Close the air supply valve and disconnect the pump.
- If required, prepare the pump for drying.

4.9.b Pump Drying Procedure

- Connect vacuum hose to fluid discharge.
- Connect purge line to fluid inlet.
- Apply 60 psig air pressure to the fluid inlet.
- Cycle pump & vacuum dry by rotating pump side to side for 30 seconds.
- Turn off Air Supply and allow the pump to purge for 5 minutes.

4.9.c Dry Suction Test

- Connect to air supply. See above instructions.
- Connect a vacuum capable line with instrumentation to the pump fluid inlet.
- Apply 20 psig air pressure to the pump.
- Measure and Record the Suction Value.
- Target = 12 in-Hg.

5 TROUBLESHOOTING

Pump Will Not Start, Fails to Operate

Cause:	Solution:
• Insufficient air pressure	• Must be minimum 20 psig at pump air connection.
• Insufficient air volume (low supply pressure during running)	• See Performance Charts (3.1) for requirements. • Check for both regulator and control valve C_vs >.85 capabilities.
• Fluid discharge line blocked • Downstream valve closed, filter plugged or other obstruction	• Remove obstruction.
• Pilot valve failure	• Inspect and replace pilot valve assembly.
• Detent failure	• Inspect detent legs for worn or damaged parts.

Bubbles in Fluid Discharge

Cause:	Solution:
• Leaking fluid inlet fitting	• Tighten fittings or replace adapter seal.
• Leaking main seal	• Tighten heads to 125 ft.-lbs • Replace diaphragms. • Check head and body grooves for nicks or scratches.
• Pump inlet line pressure reached saturation point (due to high suction requirement)	• Increase diameter of suction supply line (reduces restriction). Reduce output flow.
• Ruptured (perforated) diaphragm • Check bore caps leaking	• Replace diaphragms. • Tighten check bore caps or replace seals.

Fluid Leaks

Cause:	Solution:
• Leaking main seal	• Tighten heads to 125 ft.-lbs. • Replace diaphragms. • Check head and body seal grooves for nicks and scratches.
• Check bore cap	• Tighten, or remove and replace seal.
• Ruptured diaphragm(s) can result in fluid leaks through air exhaust port	• Replace diaphragms and any parts that may have been damaged by fluid exposure.

Erratic Cycling

Cause:	Solution:
• Pilot valve failure	• Inspect and replace pilot valve body and pilot.
• Suction line restricted (cavitation)	• Reduce fluid restriction.
• Detent failure	• Inspect and replace spool assembly.
• Check ball(s) not seating	• Check O-rings, check balls, and check cages for damage; replace them if necessary. • Make sure check balls move freely in sleeves.
• Over pressurization of pump discharge	• Reduce discharge pressure by reducing restriction.

6 WARRANTY CE

EVOLVE 55 PUMP

Trebor International, Inc. (“Trebor”) warrants to the original end-use purchaser that no product sold by Trebor that bears a Trebor brand* (“Trebor Product”) shall fail under normal use and service due to a defect in material or workmanship for **24 months** from date of shipment from Trebor’s factory.

If Trebor determines that Trebor Product has failed under normal use and service due to a defect in material or workmanship within the warranty period for such Trebor Product, Trebor will repair or replace such Trebor Product at no charge to the original end-use purchaser. The determination to repair or replace it shall be made by Trebor in its sole discretion. The repaired or replacement Trebor Product shall be shipped to the original end-user purchaser freight collected unless the original end-user purchaser makes other arrangements for shipment. The original end-user purchaser shall bear all risk of loss or damage during shipment. Repaired and replacement Trebor Product shall be warranted only for the remainder of the original warranty period.

The above warranty and repair or replacement obligation does not apply if: (i) a Trebor Product is altered, changed, modified or tampered with in any way, other than an alteration, change or modification made by or with the authorization of Trebor, (ii) a Trebor Product is damaged after deposit with the carrier for shipment, (iii) a Trebor Product is not used and maintained in accordance with Trebor’s recommended operating and maintenance manuals, instructions and procedures, (iv) a Trebor Product is not properly incorporated or installed in, or not properly combined with, another product, component or part with which such Trebor Product is used (“Other Product”), (v) the failure or substandard performance of a Trebor Product is directly or indirectly attributable to, or directly or indirectly results from or arises out of, the failure or substandard performance of an Other Product, (vi) the failure or substandard performance of a Trebor Product is directly or indirectly attributable to, or directly or indirectly results from or arises out of, compliance with any design, specification or requirement of the original end-use purchaser, (vii) a Trebor Product is used in a manner, with a substance or for a purpose

other than the normal manner, substance and purpose for which it is intended or is otherwise subjected to abnormal use or service, (viii) a Trebor Product is subjected to a power surge, brown out or other similar occurrence, or (ix) the failure or substandard performance of a Trebor Product is directly or indirectly attributable to, or directly or indirectly results from or arises out of, normal wear and tear of the Trebor Product (including, without limitation, things such as worn seals, clogged passages or values, damage due to corrosive, insoluble, or abrasive substances, etc.).

To be eligible for warranty repair or replacement, the original end-use purchaser must notify Trebor of the Trebor Product failure in writing within the warranty period for such Trebor Product and, if requested by Trebor, the product must be promptly returned for inspection and evaluation, freight prepaid, to either Trebor’s factory at 8100 South 1300 West, West Jordan, Utah 84088 or to a Trebor authorized distributor.

The original end-user purchaser must also promptly provide Trebor or its authorized distributor with all such information as either of them may request concerning the maintenance, operation, use and failure of any Trebor Product that is claimed to have failed due to a defect in material or workmanship. Return of a Trebor Product to Trebor's factory requires a Return Material Authorization (RMA) from Trebor, and the RMA number must be included with the returned Trebor Product. The original end-user purchaser shall bear all risk of loss or damage during shipment.

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Under no circumstances shall Trebor have (i) any liability for any claim, loss, damage, injury, liability, obligation, cost or expense that directly or indirectly relates to or arises out of the use or failure of any product or (ii) any liability for any penalties or any indirect, consequential, incidental, special, punitive or reliance damages, including, without limitation, lost or unrealized sales, revenues, profits, income, cost savings or business, lost or unrealized contracts, loss of goodwill, damage to reputation, loss of property, loss of material being processed, loss of information or data, loss of production, downtime, or increased costs, even if Trebor is advised or placed on notice of the possibility of such damages and notwithstanding the failure of any essential purpose of any product.

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In any event, Trebor's total liability to any purchaser or user of any product shall limited to the original price paid to Trebor for such product.

No Trebor distributor or other person is authorized to modify this Standard Limited Warranty or impose any liability or obligation on Trebor other than expressly provided herein.

7 CONTACT INFORMATION

7.1 GENERAL CONTACT INFORMATION

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7.3 REGIONAL REPRESENTATIVES

Web: http://www.treborintl.com/about_contact_us.asp#