



A GORMAN-RUPP COMPANY

Series 400B Diaphragm Pump Repair Kit

Fill-Rite (Filcon™ Black Diaphragms): Repair Kit # 400KTH1456
Sotera Systems (Santoprene® Green Diaphragms): Repair Kit 400KTH1457



The following is the procedure for installation of the 400KTH1456 or 400KTH1457 Pump Repair Kits. This kit allows you to replace necessary seals, valves, and other components to help renew the performance of your 400B series Fill-Rite / Sotera pump. If you should have questions or difficulty with the following procedure, please contact Customer Service at 1-800-634-2695 (M-F 8-5 ET).



WARNING! If you find the diaphragms have leaked in your 400B pump, the oil in the pump might be contaminated. As a precaution, the oil should be replaced if the diaphragms have leaked. Drain the oil through the two sight caps on the front of the pump housing, and refill with 16 ounces of SAE 30W automotive grade oil. The oil level should come to the bottom of the sight caps on the front of the pump housing with the pump sitting level. Note that Fill-Rite / Sotera requires annual oil changes for maintenance purposes.



IMPORTANT: Read this entire document thoroughly and completely prior to beginning any work on the pump. Read and understand all the **WARNING / CAUTION / IMPORTANT** informational boxes to insure a safe and complete repair.

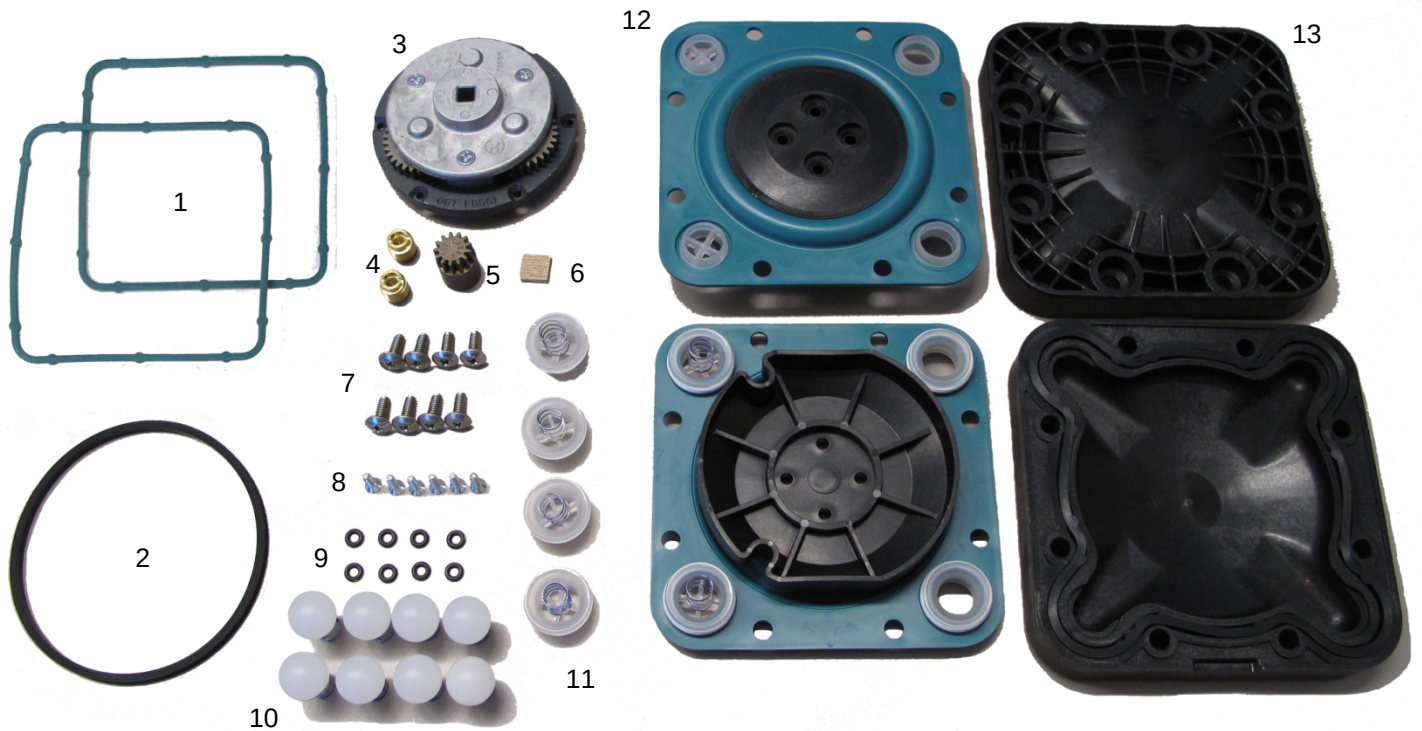


CAUTION: USE ONLY HAND TOOLS during this procedure. **HAND START ALL FASTENING HARDWARE** to be certain they are not cross-threaded before using hand tools to complete their installations. **DO NOT USE POWER TOOLS DURING ANY PART OF THIS PROCEDURE!**



CAUTION: Flush pump thoroughly and completely with water, then drain all fluid, release any pressure in the pump system, and disconnect power before servicing pump.

400B Series Pump Rebuild Kit Contents

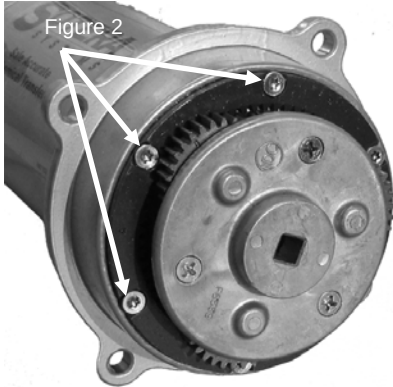


Kit 400KTH1456 & 400KTH1457		
#	Description	Qty
1	Flange Gasket	2
2	Motor Gasket	1
3	Gear Assembly	1
4	Insert Threaded ¼ - 20 Repair – Oversized	2
5	Drive Gear	1
6	Rotor Key	1
7	0.190 24 0.500 THMS 18-8SS Phillips Head Screw	8
8	0.138 32 0.500FHMS Zinc Thread Screw	6
9	O-Ring -007 EPDM (for piston screws)	8
10	Ball Check Valve .688 Diameter	8
11	Valve Spring Retainer	4
12	Santoprene (Green) Diaphragm Assembly	2
	Filcon (Black) Diaphragm Assembly	
13	Diaphragm Cap w/ Integral Gasket	2

Gear Pack Replacement Procedure

1) Position the pump on a solid surface with the diaphragm pump assembly down and the motor up.

2) Remove the 4 bolts from the flange and lift the motor off the diaphragm assembly (Figure 1). Retain the bolts for reinstallation.



3) Remove the 6 small screws that hold the gear pack to the motor (Figure 2).

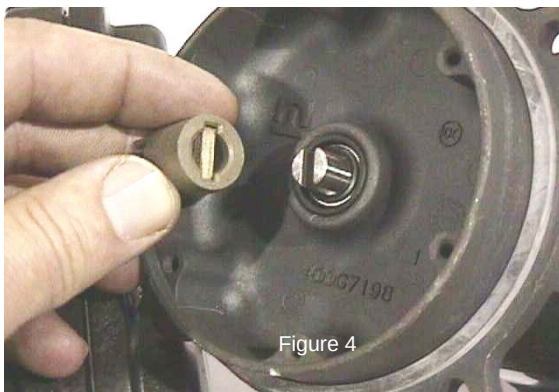
4) Remove the gear pack from the motor (Figure 3). You may have to tap the gear pack lightly to get it to separate from the motor.



5) Remove the drive gear and drive key (Figure 4).

6) Insert the new drive key

into the new drive gear that were included in this kit, and install the new drive gear on the motor shaft (Figure 4).



7) Install the new gear pack assembly onto the drive gear by rotating the pack until the gears mesh with the drive gear and the pack can drop into place.

CAUTION: USE ONLY HAND TOOLS during this procedure. **HAND START ALL FASTENING HARDWARE** to be certain they are not cross-threaded before using hand tools to complete their installations. **DO NOT USE POWER TOOLS DURING ANY PART OF THIS PROCEDURE!**

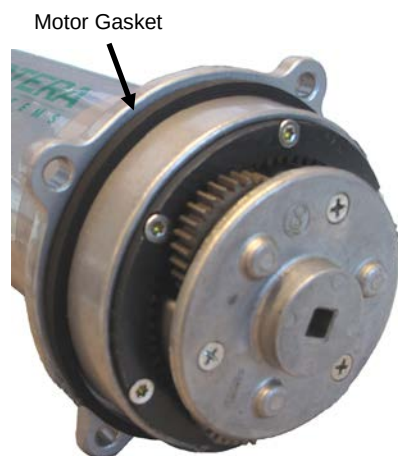


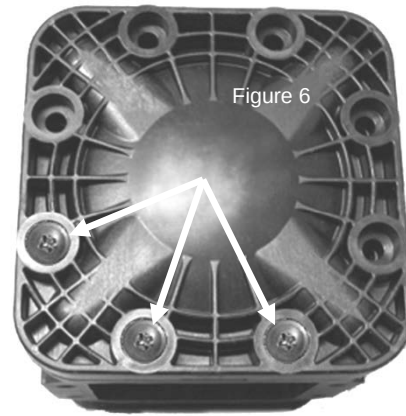
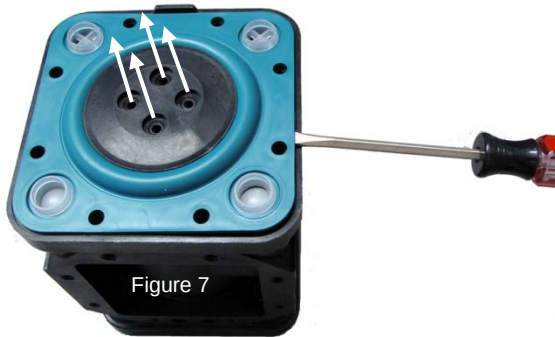
Figure 5

8) Locate the 6 new screws supplied with this kit used to install the gear pack to the motor. Place a small drop of Loc-Tite® on the threads and install the gear pack using the new screws. Tighten by hand until the screw heads are flush with the gear surface. **DO NOT OVER-TIGHTEN!**

9) Replace the motor gasket (Figure 5), then reinstall the motor on the diaphragm pump body using the 4 bolts removed in step 2. Tighten the bolts to 50 in lbs.

Diaphragm Replacement Procedure

- 1) Place the Diaphragm Assembly on a solid work surface with the diaphragm end facing up.
- 2) Remove and retain the 8 fastening screws and lift off the diaphragm cover. This will expose the diaphragm and valve assembly (figure 6).



- 3) Remove the 4 screws holding the diaphragm to the piston. Gently pry the diaphragm up using a flat blade screw driver. Carefully lift the diaphragm from the pump housing (figure 7).



CAUTION: Use extreme caution when prying the diaphragm out of place as the plastic pump housing can be damaged. The diaphragm assembly seats and seals against the pump surface.

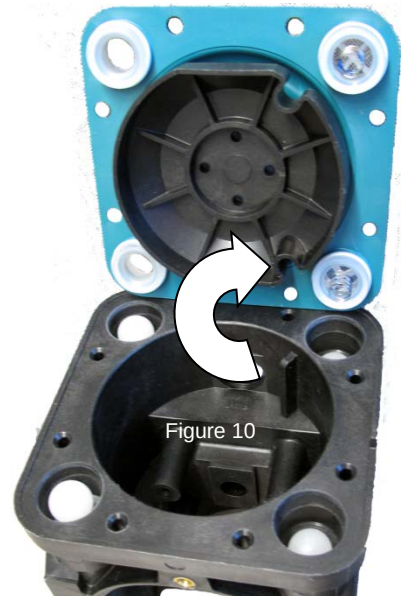
- 4) Using a pair of needle nose pliers, carefully reach into the outlet check valve wells and remove the valve spring base (figure 8). Insert the new valve spring base provided with this kit. Use an appropriately sized deep well socket to press the new valve spring base uniformly into the well **using thumb pressure only**. Be certain the base seats correctly and completely in the bottom of the well, and the spring is properly seated on the retaining tangs.



- 5) Replace the 4 check valve balls in the wells (figure 9).

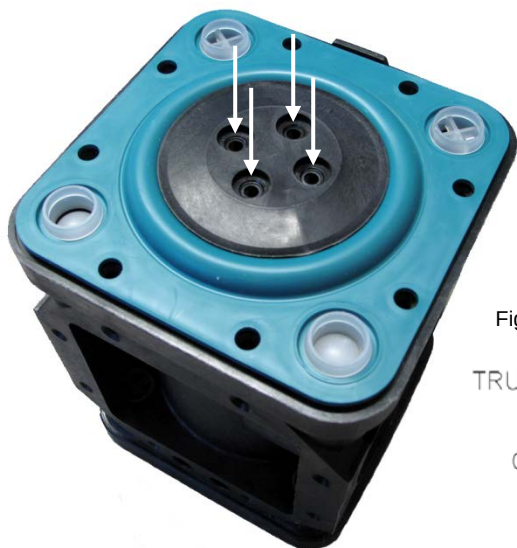


- 6) Install new diaphragm. The diaphragm should only install one way. Use the "Key Slot" to guide you; the slot on the diaphragm base will align with the tab molded into the pump housing (figure 10).





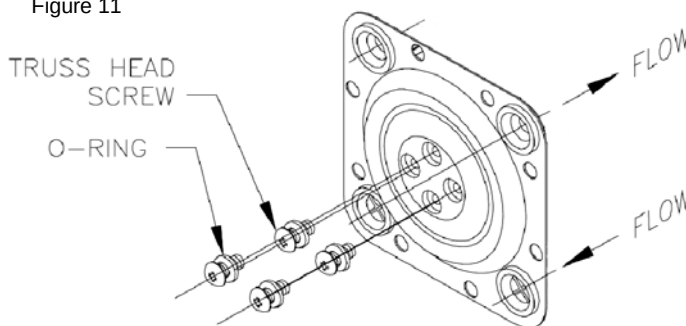
CAUTION: USE ONLY HAND TOOLS during this procedure. **HAND START ALL FASTENING HARDWARE** to be certain they are not cross-threaded before using hand tools to complete their installations. **DO NOT USE POWER TOOLS DURING ANY PART OF THIS PROCEDURE!**



7) Seat the diaphragm firmly into place.

8) Place the 4 small O-rings on the 4 truss head screws that secure the diaphragm to the piston. Place a drop of blue Loc-Tite® on the threads of each screw. Install the 4 screws & O-rings into the piston through the holes in the center of the diaphragm (figure 11). **HAND TIGHTEN THEM INTO THE DIAPHRAGM PLATE UNTIL SNUG (35 in*lbs.).**

Figure 11



9) Lay the pump diaphragm cover upside down on the work surface to access the gasket. Inspect the gasket to be certain it is in good physical condition, with no pinches, tears, or other possible damage. Be certain the gasket is inserted correctly and completely into the groove in the cap. It must seal flush to the diaphragm and cap when the cap is installed (figure 12).

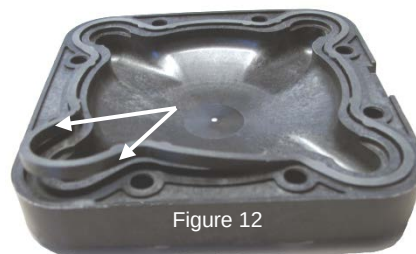


Figure 12

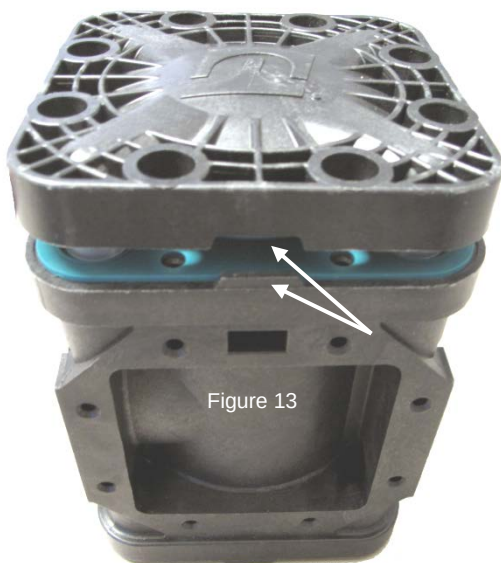


Figure 13

10) Install the cap over the diaphragm. The cap has a slot molded into it to insure proper alignment (figure 13). Insert the screws back into their holes and **HAND START** the threading process. Once they have begun to thread back into the housing use a **HAND SCREWDRIVER** to screw them back into place (50 in* lbs. for a Phillips head screw, 75 in*lbs for T30 TORX bit).

11) Flip the diaphragm body over and repeat the process for the second diaphragm assembly.

Insert Replacement

If an insert or 6-lobe head PTS Screw strips out from the pump body, this kit comes with two oversized inserts that will allow you to repair that condition. The following is the procedure for installing an oversized insert.

Phillips Head Screw.
Tighten to 50 in lbs.



T30 6-lobe head PTS Screw.
Tighten to 75 in lbs.

Override Insert Replacement

- 1) If a standard insert strips, remove it from the pump body.
- 2) Drill the hole out the hole with a 3/8" drill. Allow the drill to bottom out in the hole **BUT DO NOT PUSH IT THROUGH THE BODY** (figure 14).



CAUTION: DO NOT allow the drill to continue all the way through the valve body.

- 3) Put a 1/16" chamfer at the top of the hole.
- 4) Using a short 1/4 - 20 bolt with a nut (as shown below), drive the insert into the pump body until the top of the insert is flush with the body surface (figure 15). Remove any plastic flash around the



ole with a knife to leave a smooth surface.





CAUTION: USE ONLY HAND TOOLS during this procedure. **HAND START ALL FASTENING HARDWARE** to be certain they are not cross-threaded before using hand tools to complete their installations. **DO NOT USE POWER TOOLS DURING ANY PART OF THIS PROCEDURE!**

Inlet and Outlet Flange Gasket Replacement

If the repair or cleaning of your 400B series pump requires you to remove the Inlet or Outlet flange, the gaskets should be replaced. This kit includes both the Inlet and Outlet flange gaskets.

- 1) Remove the 8 screws that hold the flange to the pump body, and gently remove the flange.
- 2) Pull the old gasket out of the groove in the flange and discard.
- 3) Install the new gasket in the groove, **making sure the gasket is seated properly, and not twisted, pinched, or loose.**
- 4) Reinstall the flange.



Fill-Rite / Sotera Technical Service Information is written for authorized Distributors. They are not intended for distribution to retail consumers. Repairs and procedures described herein are for trained professional technicians using the appropriate tools and genuine Fill-Rite / Sotera parts. Questions regarding this information should be directed to Fill-Rite / Sotera Customer Service at 1-800-634-2695 or visit us online at www.fillrite.com.