

# KENCO ENGINEERING COMPANY

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## RK-KPFS-PAD-CONV AND RK-KPFS-PAD-CONV-T INSTALLATION & OPERATION INSTRUCTIONS

### GENERAL DESCRIPTION

The KENCO Model KPFS pneumatic float switch uses a block and bleed style pneumatic valve. Up until May of 2022, the block and bleed port has utilized a needle style valve. The needle style valve proved itself to be extremely robust and was one of several features that contributed to making the KPFS the most reliable pneumatic level controller on the market today. Unfortunately, due to circumstances beyond the control of Kenco Engineering, the needle used in the KPFS is no longer available. To remedy this situation, our engineering team developed a new block and bleed valve seat for the pneumatic valve that utilizes an elastomeric pad seal in place of the needle. Our in-house testing has proven this pad to be as robust and reliable as the needle and possibly even simpler to maintain. These instructions detail the steps required to convert a KPFS from the needle style block and bleed valve to the elastomeric pad style block and bleed valve.

**IMPORTANT -** A special magnet changing tool is required to perform the needle-to-elastomeric pad conversion described in these instructions. This tool is provided in the RK-KPFS-PAD-CONV-T conversion kit and can be reused. Since this tool adds cost to the kit, Kenco Engineering offers the kit without the tool for those who have purchased the "-T" version and have the tool on hand. The kit number without the tool is RK-KPFS-PAD-CONV. Remember, only purchase the RK-KPFS-PAD-CONV version of this kit if you already possess one or more of the magnet changing tools.

**STEP 1:**  
 Start by removing the valve and switch cover. Remove the two screws holding the valve in place and remove the valve. The large o-ring on the valve will be captured, but the two smaller o-rings that go around the screws will probably be loose. Remove these and set them aside for now. Remove the two screws holding the switch assembly and pull the switch assembly from the KPFS Switch Body. If the KPFS has a needle retainer, the needle should be captured in the retainer on the switch assembly. If not, the needle will probably be laying loose inside the switch body or may still be in the valve. Locate the needle and discard. See Figure 1.

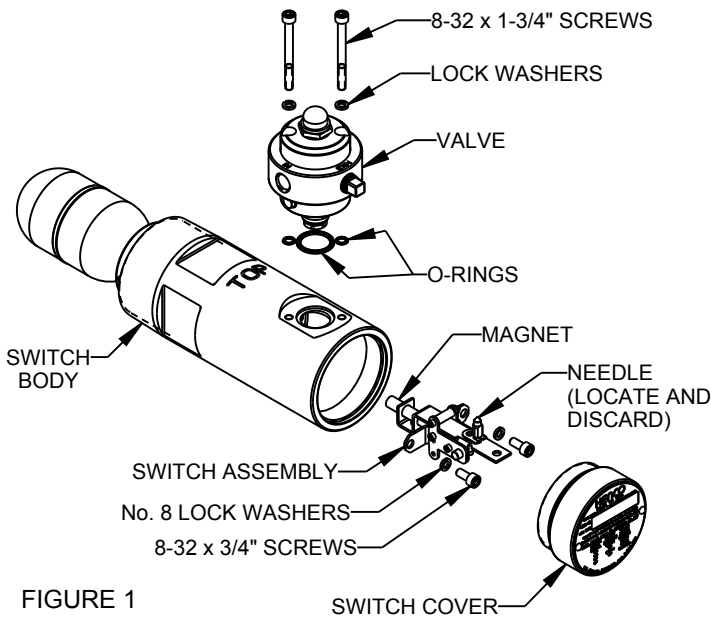
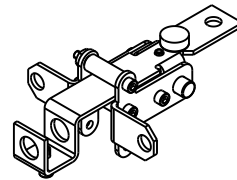


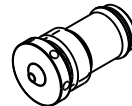
FIGURE 1

### RK-KPFS-PAD-CONV KIT CONTENTS

(magnet changing tool included in RK-KPFS-PAD-CONV-T kit only)



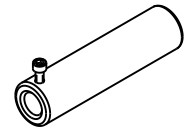
ELASTOMERIC PAD STYLE SWITCH ASSEMBLY (X 1)



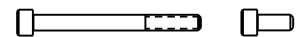
ELASTOMERIC PAD ADJUSTABLE BLEED VALVE SEAT (X 1)



.050" HEX ALLEN WRENCH (X 1)



MAGNET CHANGING TOOL (INCLUDED IN "-T" VERSION OF KIT ONLY)



8-32 X 1-3/4" & 8-32 X 3/4" SCREWS (X 2 EACH)



NO. 8 LOCK WASHER (X 4)



O-RINGS, 1 LARGE & 2 SMALL

**IMPORTANT - STEP 2** involves removing the magnet from the existing KPFS switch assembly lever arm and installing it in the new switch assembly lever arm included in the conversion kit. This is a critical operation and special care must be taken! The distance from the face of the magnet to the end of the lever arm (dimension "A" in Figure 2) is critical. A special magnet changing tool per Kenco P/N 89987 must be utilized! Failure to place the magnet in the new switch assembly at the same distance from the end of the lever arm as it was in the original lever arm could cause the KPFS to operate erratically or not at all.

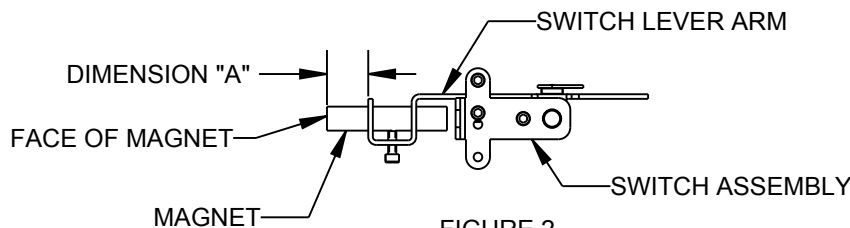


FIGURE 2

**STEP 2:**

Before loosening the magnet retainer screw, measure distance "A" (See Figure 2 on Page 1) and write it down. Calipers or a depth micrometer will provide the most accurate measurement. At a minimum, use a machinist scale with increments down to 1/64". This will be used to confirm that the magnet was transferred properly. Once the distance from the end of the magnet to the end of the lever arm is documented, the magnet removal process can begin. Start by inserting the magnet changing tool (P/N 89987) over the end of the magnet until it is up against the lever arm as shown in Figure 3. It is recommended that the screw in the tool is facing up. With tool squarely against end of lever arm, tighten the screw in the tool. The tool should now be secured to the magnet.

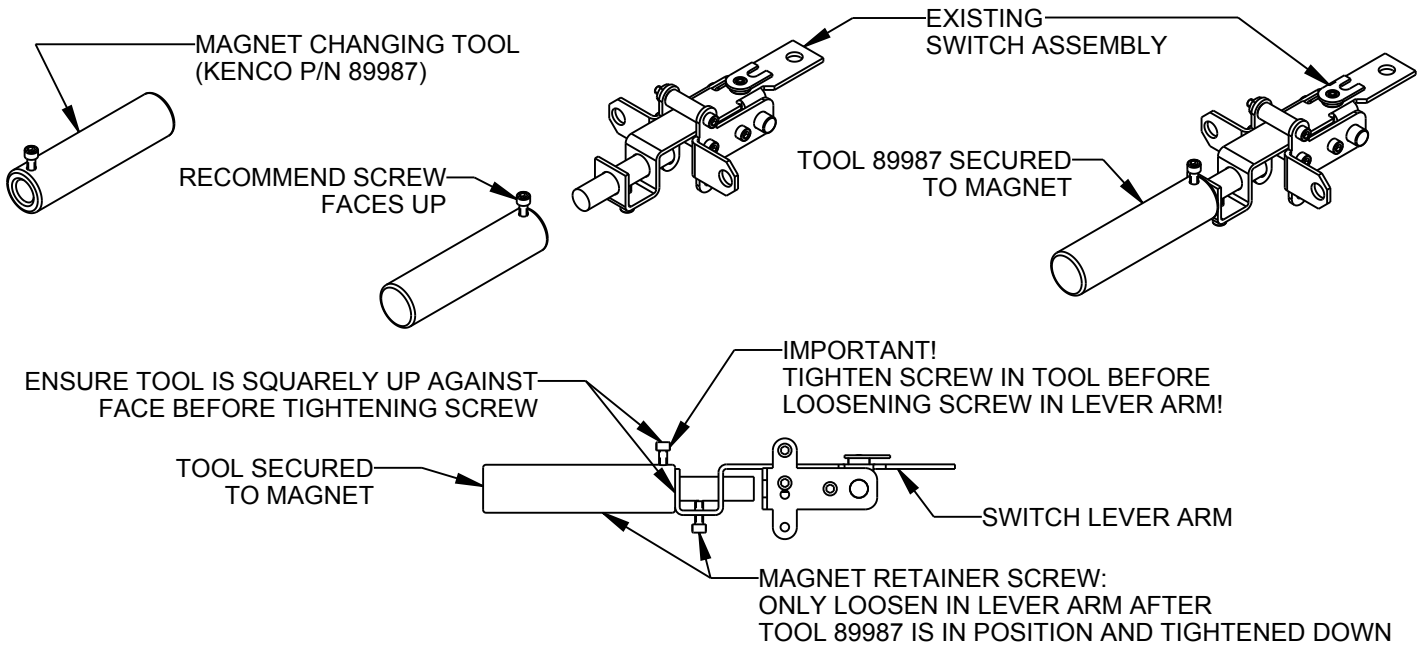


FIGURE 3

**STEP 3:**

Once the tool is secured to the magnet, the magnet retainer screw in the existing switch lever arm can be loosened (See Figure 3). At this point, the magnet should be securely held by tool 89987 and can be removed as shown in Figure 4. Since the existing switch assembly will not be reused, it can be discarded once the magnet is removed.

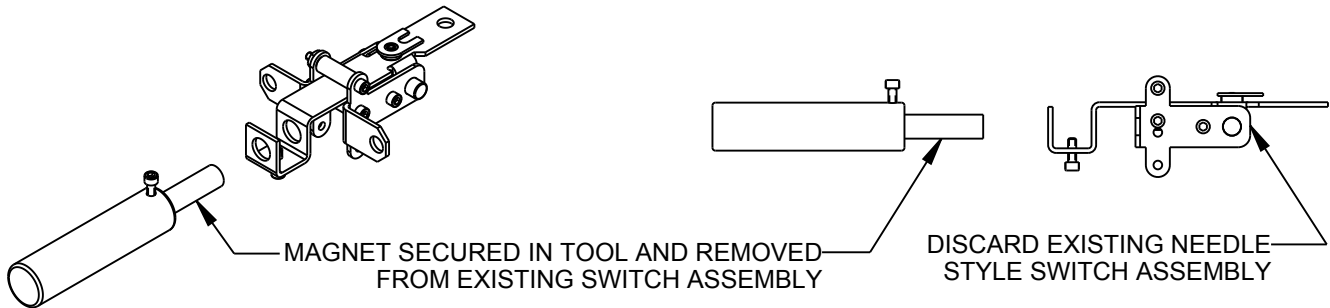


FIGURE 4

**STEP 4:**

Locate the new switch assembly with the elastomeric pad. To install the magnet in the new switch assembly, simply reverse steps 2 and 3. Start by inserting the magnet in the lever arm of the new switch assembly. With the magnet changing tool squarely up against the end of the lever arm, tighten the magnet retainer screw in the lever arm to secure the magnet in the switch assembly. With the magnet secured to the switch assembly, loosen the magnet changing tool screw and remove the magnet changing tool. Check Dimension "A" and make sure it is within  $\pm .016"$  ( $\pm 1/64"$ ) of the original measurement documented from Figure 2. See Figure 5.

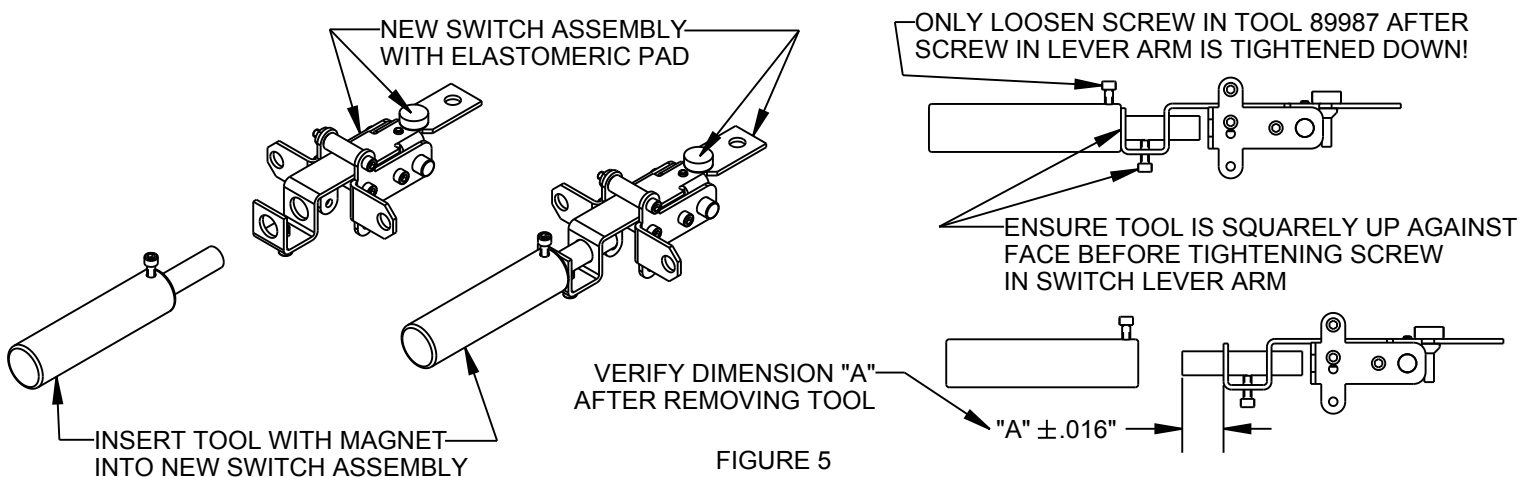


FIGURE 5

**STEP 5:**

With the magnet installed, the new elastomeric pad style switch assembly should look as shown below. The switch assembly can now be installed in the switch body. Simply reverse the removal steps to reinstall. There are new screws and lock washers provided in the conversion kit, but these are not necessary if the original hardware is in good shape. Make sure the elastomeric pad on the switch assembly is facing up, or towards the valve mounting surface of the switch body. See Figure 6 for details.

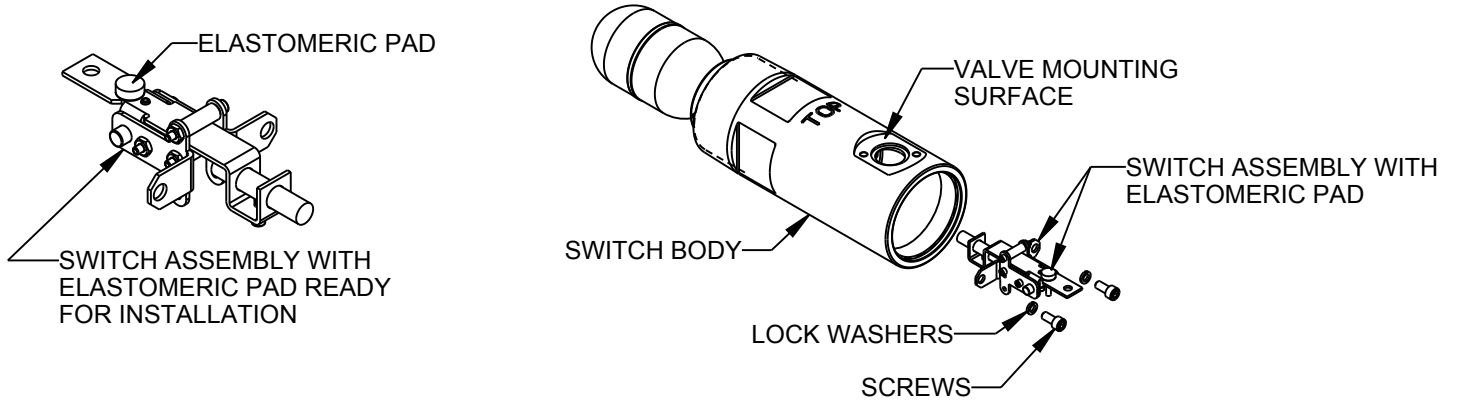


FIGURE 6

**STEP 6:**

Next, replace the existing adjustable needle seat in the valve with the new elastomeric pad style adjustable bleed valve seat. To remove the adjustable needle seat from the valve, loosen the set screw locking it in place and unscrew it. Note that with the needle seat removed there is a spring visible inside the valve. This spring will probably stay inside the valve, but if it does come out, simply reinstall it. Discard existing needle seat after removal. See Figure 7.

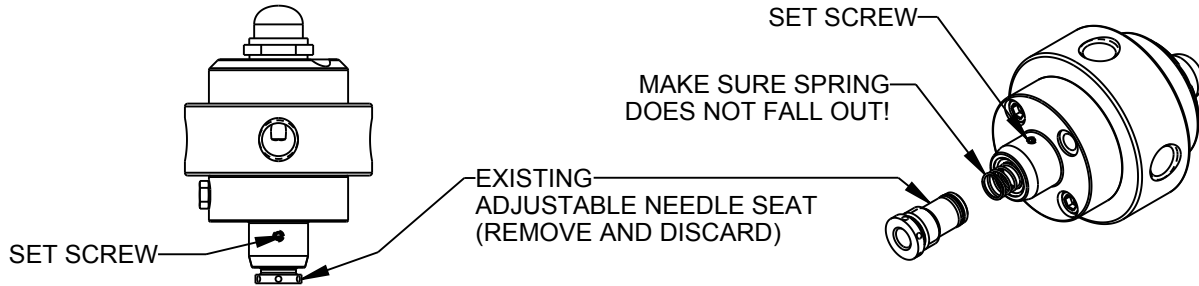


FIGURE 7

**STEP 7:**

Before installing the new adjustable bleed valve seat, make sure the set screw is backed out enough to allow it to be installed and that the spring is still in the valve base. Also verify that factory installed and lubricated o-ring is on the adjustable bleed valve seat and is not damaged. Install the adjustable bleed valve seat by screwing it into the valve base. Screw it all the way in until it bottoms out and leave it that way for now. It will be unscrewed to the proper height after the valve is installed and adjusted. Finish by tightening the set screw until it is just snug. This will make sure the set screw does not hang up on the switch body during installation. See Figure 8.

Important! Screw the adjustable bleed valve seat all the way in until it bottoms out on the valve and there is no gap between the adjustable bleed valve seat and valve base. This will ensure it does not interfere with and damage the elastomeric pad when the valve is installed.

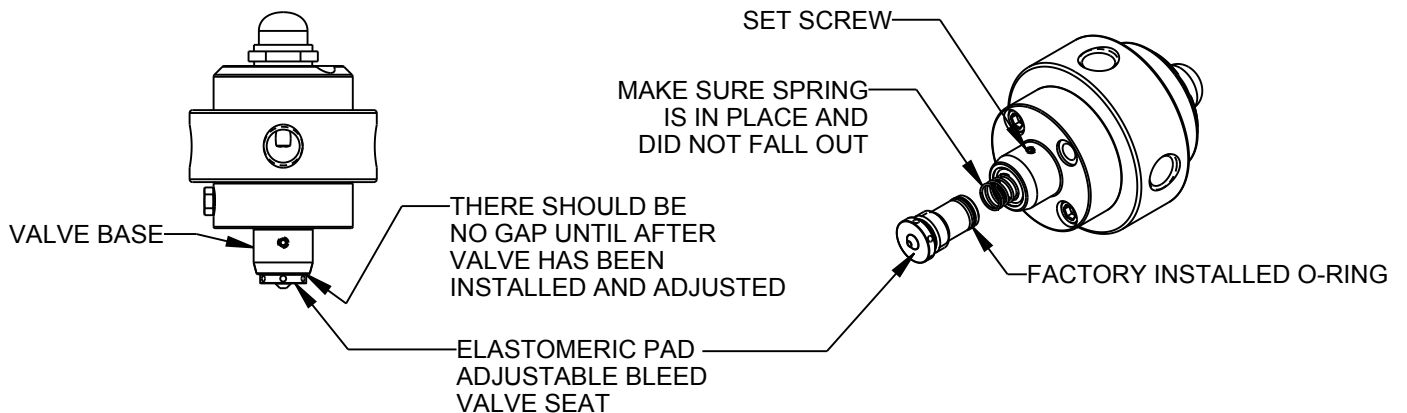


FIGURE 8

At this point, the new switch assembly with the elastomeric pad should be installed in the KPFS switch body and the adjustable bleed valve seat should be installed in the valve. Both should look like the illustrations in Figure 9.

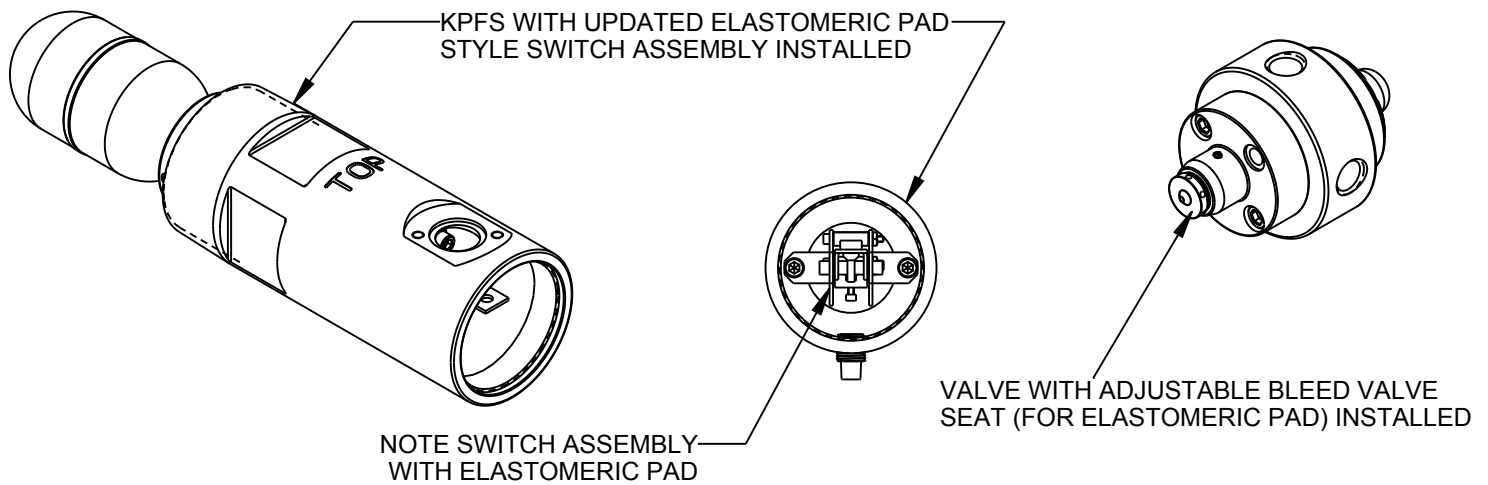


FIGURE 9

**STEP 8.**

To install the valve onto the valve body, reverse step 1, but do not install the switch cover until after the valve is installed and has been properly adjusted. New screws and o-rings are provided if needed, but are not necessary if the original hardware is in good shape. Start by verifying the set screw is screwed in all the way. This will ensure it is not protruding out of the valve base and will clear the switch body when installed. Slide the large o-ring over the valve base. Insert the screws and lock washers into the bolt holes of the valve. Slide the two small o-rings over the screws. Tip: A little grease can be put on o-rings to help hold them in place. Note the orientation of the valve. The exhaust port should be facing the rear of the switch body. Carefully lower the valve down onto the switch body. Double check the valve seat to verify that it is screwed all the way in per Step 7. Not being screwed all the way in can put excessive force on the elastomeric pad which could damage it. With the valve properly oriented, tighten the two screws holding the valve to the switch body.

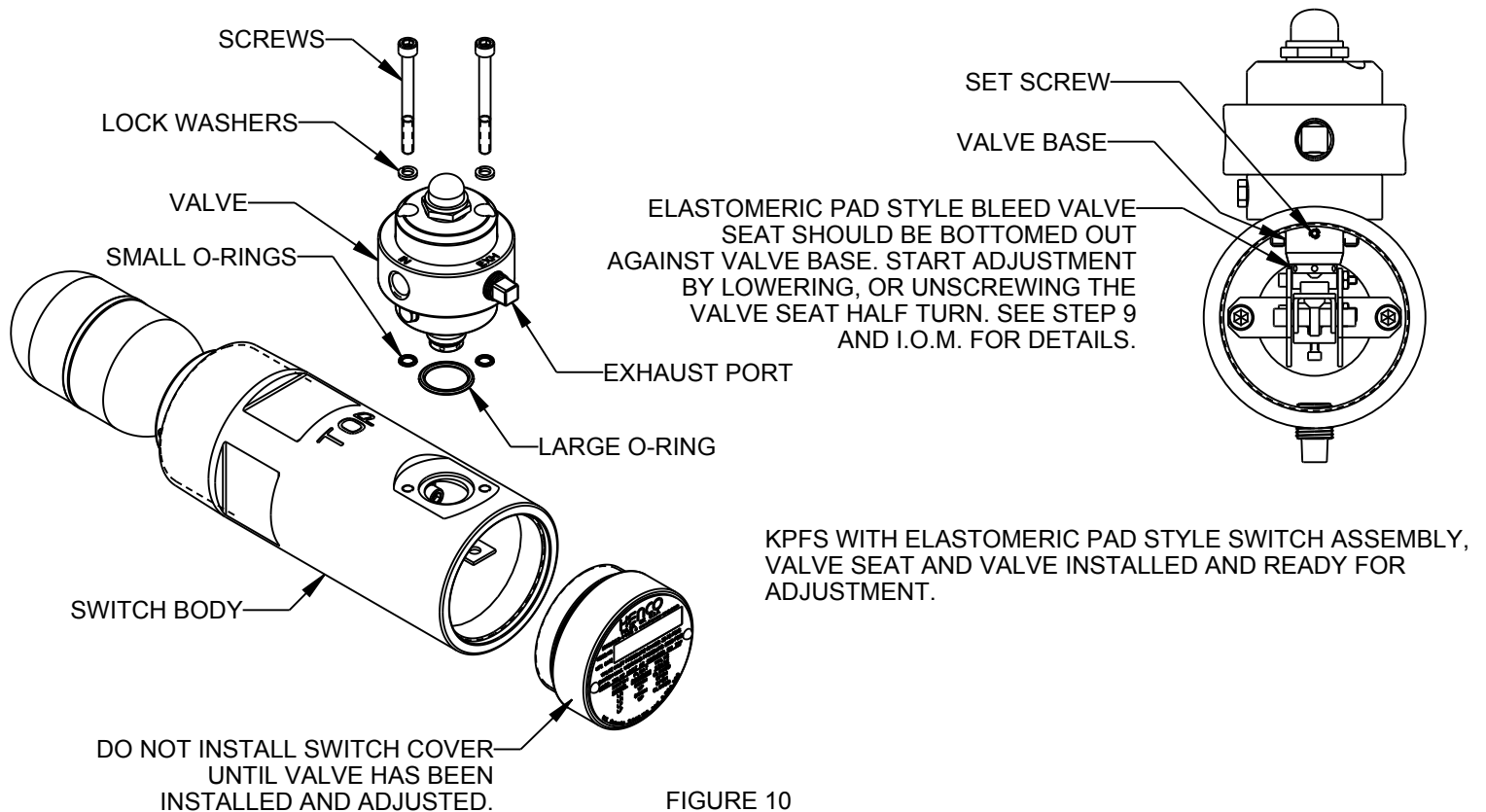


FIGURE 10

**STEP 9.**

Before the KPFS can be put back in service, the elastomeric pad style adjustable bleed valve seat must be adjusted. A good starting point for this adjustment is to lower the elastomeric pad style bleed valve seat half a revolution from its bottomed out position against the valve base. This equates to 3 strokes with the included .050" hex key (allen) wrench. There are 6 holes in the elastomeric pad style bleed valve seat therefore, 3 strokes equates to half a turn. Before starting this procedure, make sure the liquid level is below the KPFS. This will ensure the float is in the down position, or "valve closed" position. The KPFS must be in the valve closed position before beginning the adjustment procedure. See "Valve Setup" in the "KPFS Pneumatic Float Switch Installation/Operation Instructions" included in this kit for the full details on the valve adjustment of the elastomeric pad style bleed valve.