

### Suggested Service Pak Tools

<b>60129-1</b>	Bearing Extractor Tool	<b>60158-1</b>	Medium Blade Screwdriver
<b>60098-2</b>	Bearing Installation Tool	<b>60157-1</b>	Bypass Nut Driver
<b>60098-4</b>	Body Bearing Installation Tool (.11 - .19 Size Only)	<b>Optional</b>	Rubber Gloves
<b>60154-1</b>	T10 Torx Driver	<b>Optional</b>	Masking Tape
<b>60155-1</b>	T15 Torx Driver	<b>60149-1</b>	D Series Tool Kit (Includes all tools shown above except 60098-4)
<b>60169-1</b>	Hex Key Wrench 9/64"		

Service Pak includes: 2 Gears, 3 O-Rings, 5 Bearings, Silicone Lubrication and Instruction Sheet.

### CAUTION

Warranty will not extend to goods altered or repaired by anyone other than the manufacturer or authorized representative.

Service Paks are designed to be installed by someone familiar with precision mechanical assemblies and tools. Observe reasonable safety precautions, including the use of safety eye-wear when performing the steps listed below.

**Important:** Check the Service Pak parts you have received. Tuthill has changed the Driven Magnet to a “slip fit” design for the Driving Gear Assembly (12). This design does not require a Magnet Clamp Screw (5). If you have received a Service Pak with the “slip fit” design and your Pump has a Magnet Clamp Screw (5) design Driven Magnet (7) you will need to contact the factory and order a “slip fit” Driven Magnet (7). See pictorials at the end of these instructions.

### Disassembly Instructions (Refer to Pages 3 & 4)

1. Provide a clean surface for work area.
2. Remove three Mounting Screws (3) and separate Pump-Head from Drive Housing.  
**Note:** If the Gears are not being replaced and will be reused, after removing the Cap (16) in the next step mark the Gears orientation with a permanent marker. This will allow the Gears to be reassembled in the same orientation. Remove two cap screws (17) with a 9/64 Hex Socket Wrench. Models manufactured prior to 2001 use a T20 Torx Driver.
3. Remove two Cap Screws (17) in the Cap (16) holding the other parts in place and remove the Cap (16), Driven Gear (13), Cavity Plate (15) and two Dowel Pins (14). If the pump is furnished with a Bypass take care not to damage the Poppet (20) sealing surface. Remove Poppet Assembly (20) from Bypass Adjusting Screw (18). Turn Bypass Nut (19) counter-clockwise 1 ½ turns. Hold Bypass Nut (19) against rotation and turn Bypass Adjusting Screw (18) counter-clockwise to remove from Cap (16).
4. Remove six Mounting Plate Screws (1) and remove the Mounting Plate (2) and Magnet Cup (4).  
**Note:** Instructions for “slip fit” Design. Pull the Driven Magnet (7) off the Driving Gear Assembly (12) shaft (no Screw is used in this design). Instructions for Magnet Clamp Screw Design. To prevent damage to the Driving Gear (12) REMOVE Cap (16) BEFORE installing or removing the Magnet Clamp Screw (5). NEVER install or remove the Magnet Clamp Screw (5) with Cap (16) in place. Hold the Driven Magnet (7), Magnet Clamp (6), and Magnet Hub (8) from rotation and turn Magnet Clamp Screw (5) clock-wise (left hand threads) to remove. Magnet Clamp (6) and Magnet Hub (8) are not part of a DX Driven Magnet (7).
5. Remove three O-Rings (9) from the Cap (16) and Body (10). O-Rings (9) may be removed with a blast of compressed air or with a sharp pin.

**Important:** Do not nick or scar the sides of the bearing bores in the steps below.

6. Clamp the Bearing Extractor Tool in a vise and screw the Bearing (11) on the tool and gently tap with a soft mallet while supporting and pulling the Cap (16) or Body (10) to free the Bearing (11). Repeat process until all five Bearings (11) are removed. See Figure 1.
7. Inspect all parts for damage and wear. If wear on Cap (16), Cavity Plate (15) and Body (10) is excessive rebuilding the pump may not be recommended (consult factory).

## Assembly Instructions (Refer to Pages 3 & 4)

1. Clean all parts. Any foreign material clinging to the Driven Magnet (7) can be removed with masking tape.
2. Body Bearing Installation for .11 and .19 size pumps only: Use installation tool 60098-4. Body Bearings (11) should be installed to .135/.145 below the face of the body (10). Install the cap bearings per step # 3.
3. Cap bearings (.11 – 2.3) and Body bearings (.23 to 2.3 only) use installation tool 60098-2. Press bearings into the Cap (16) and Body (10). Bearings (11) should be .002/.005 below the face of the Cap (16) and Body (10). See Figure 2.
4. Apply a thin coat of silicone lubricant (furnished in Service Pak) to three new O-Rings (9) and install in the Cap (16) and Body (10) O-Ring grooves. Omit silicone lubricant if it is incompatible with your pumped fluid.  
**Note:** Instructions for “slip fit” Design. Install Driving Gear Assembly (12); then slip fit Driven Magnet (7) on shaft (no screw required for this design). Instructions for Magnet Clamp Screw Design. Install Driving Gear Assembly (12), Magnet Hub (8), Driven Magnet (7), Magnet Clamp (6) and Magnet Clamp Screw (5). Hold Driven Magnet (7) to prevent rotation and tighten Magnet Clamp Screw (5) counter-clockwise (left hand threads) to 200 in/oz torque (a rubber glove can be used to facilitate holding the Driven Magnet (7)). When performing the following assembly operations DO NOT apply forces to the Driven Magnet (7). Pushing or pulling the Driven Magnet (7) may damage the Driving Gear Assembly (12).
5. Install two Dowel Pins (14) into Body (10) and slip the Cavity Plate (15) over the Dowel Pins (14) against the Body (10) face. The Cavity Plate (15) will fit properly in only one orientation. The Screw holes in the Body (10) and Cavity Plate (15) must align.
6. Install Driven Gear Assembly (13) with the longer shaft extension into the Body (10).
7. If pump is furnished with a Bypass, install Bypass Adjusting Screw (18) through the Bypass Nut (19) and turn clockwise until the Bypass Adjusting Screw (18) is flush with the Bypass Nut (19). Attach Poppet Assembly Spring (20) onto Bypass Adjusting Screw (18).
8. Align Cap (16) with the Driving (12) and Driven (13) Gear Assembly shafts and Dowel Pins (14). Assemble carefully and make certain the Poppet Assembly (20) goes fully into the Poppet hole and seats. See Figure 3.
9. Install two Cap Screws (17) in Cap (16) and torque alternately to 320 in/oz. Torque to 640 in/oz for PTFE O-Rings.
10. Rotate the Driven Magnet (7) by hand to check for any binding during rotation. The Driven Magnet (7) should turn freely. If there is binding determine and remove cause.
11. Install Magnet Cup (4) and Mounting Plate (2) with six Mounting Plate Screws (1). Turn alternately until tight to 320 in/oz.
12. Assemble Pump-Head to Motor and Drive Housing with three Mounting Screws (3). Pump/Motor assembly is now complete.

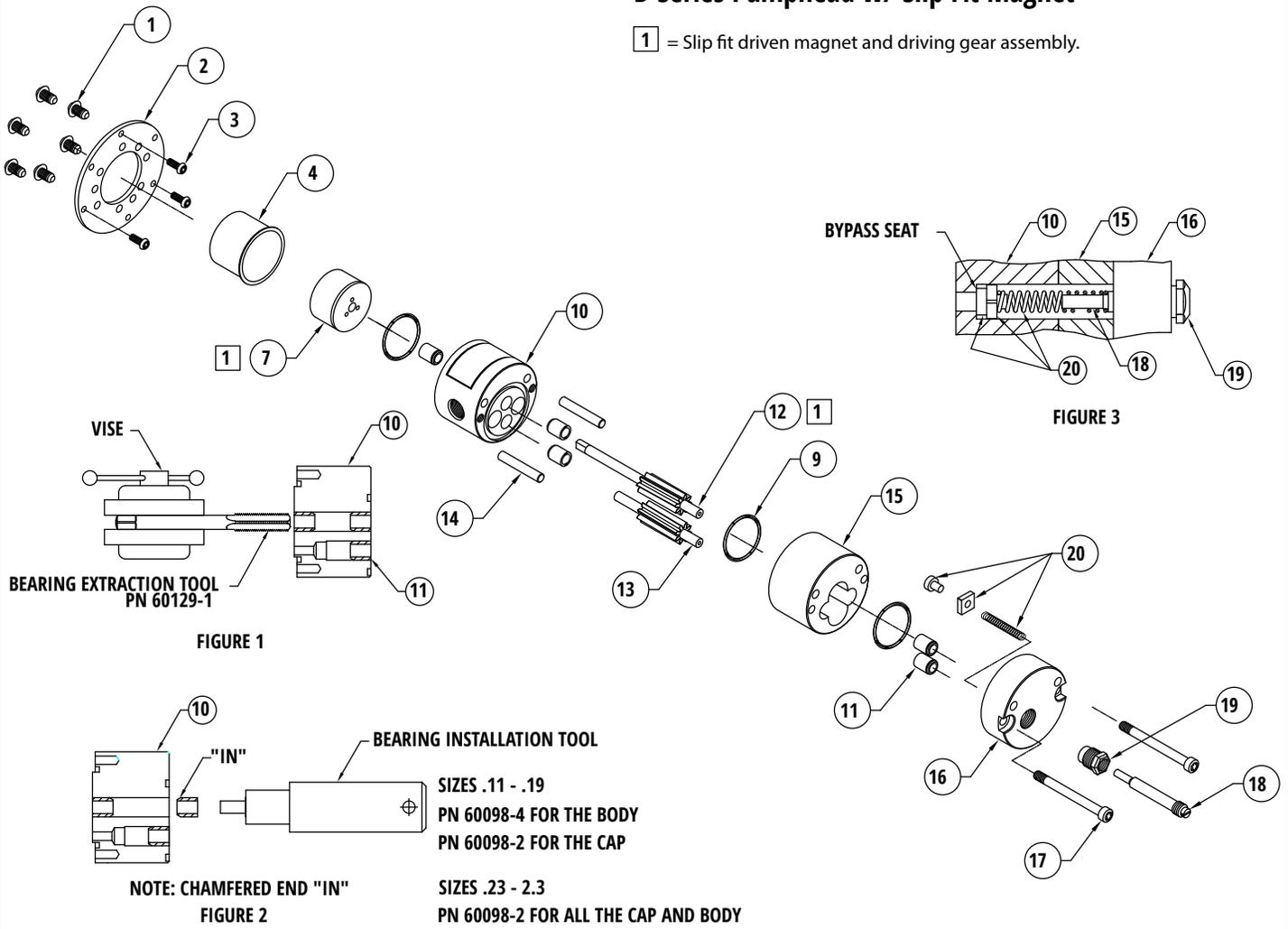
**Note:** New parts may exhibit slight interference with mating surfaces. An initial “run-in” period may be required to allow the gears to seat. Rebuilt pumps may initially decouple below normal differential pressure or produce less than normal flow-rate until mating parts have fully seated during initial period of operation.

## Parts List & Drawing

1. Mounting Plate Screws	6. Magnet Clamp	11. Bearing	16. Cap
2. Mounting Plate	7. Driven Magnet	12. Driving Gear Assembly	17. Cap Screw
3. Pump Mounting Screws	8. Magnet Hub	13. Driven Gear Assembly	18. Bypass Adjusting Screw
4. Magnet Cup	9. O-Ring	14. Dowel Pin	19. Bypass Nut
5. Magnet Clamp Screw	10. Body	15. Cavity Plate	20. Bypass Spring, Guide & Poppet Assembly

# D Series Pumphead w/ Slip Fit Magnet

**1** = Slip fit driven magnet and driving gear assembly.



# D Series Pumphead w/ Open Magnet

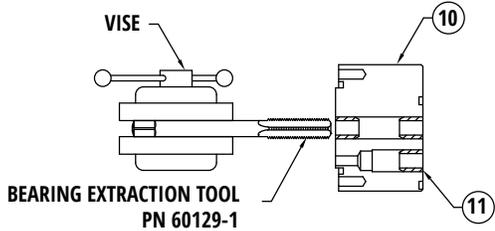
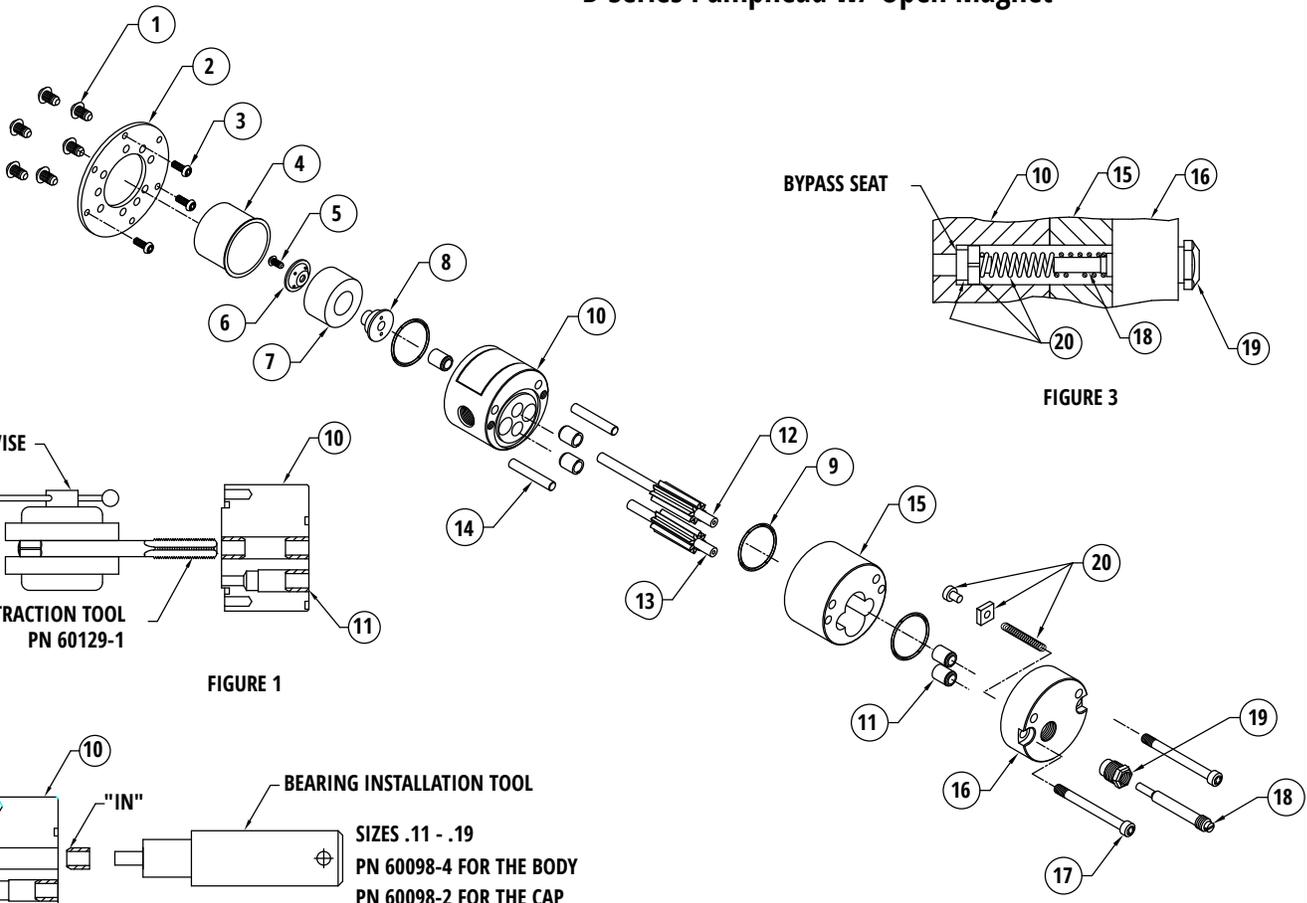
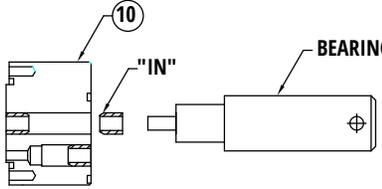


FIGURE 1



NOTE: CHAMFERED END "IN"  
FIGURE 2

**BEARING INSTALLATION TOOL**  
 SIZES .11 - .19  
 PN 60098-4 FOR THE BODY  
 PN 60098-2 FOR THE CAP  
 SIZES .23 - 2.3  
 PN 60098-2 FOR ALL THE CAP AND BODY

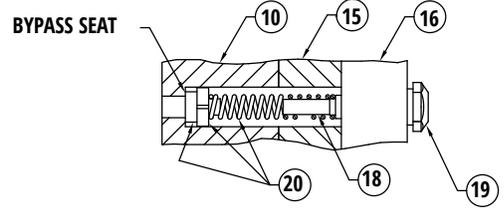


FIGURE 3