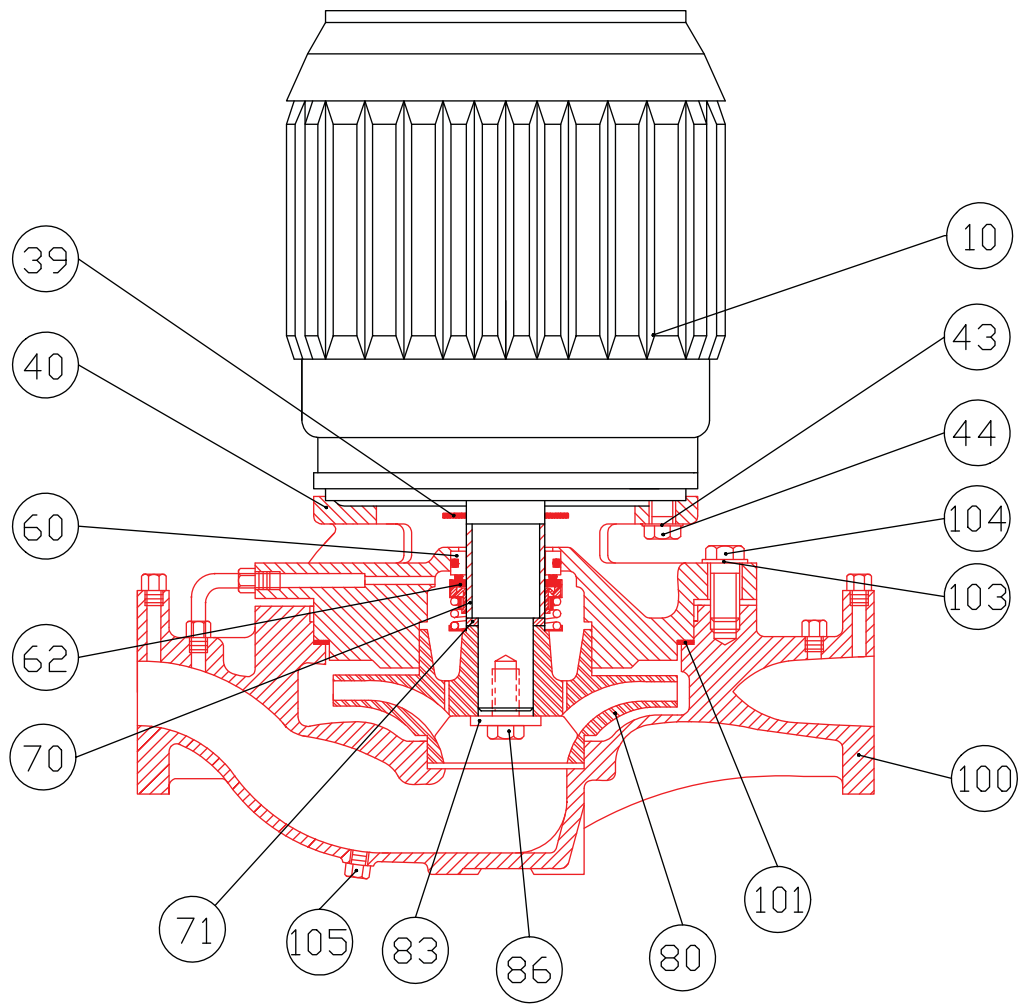


**SERVICE WORK INSTRUCTIONS**

**SERIES 4380 & 4360D  
CLOSE COUPLED VERTICAL IN-LINE PUMP  
(JM/JP MOTOR FRAME)**



For other Armstrong instructions pertaining to 4360D & 4380 pumps please refer to: *Installation & Operating – File: 43.64, Shaft Sleeve Replacement – File: 6042.25, Mechanical Seals Kits – File: 6040.60*

The Series 4360D and 4380 pumps are motor mounted or “close coupled” type Vertical In Line pumps, on which are mounted vertical shaft-down ball bearing motors. Each pump and motor unit is pipe mounted and as such relies on the piping only for support. The piping support is designed for the weight of the piping, liquid, pump and motor and other pipe fittings. The pumping unit should not be independently secured to the building structure. If the pump is mounted separately to any structure, the pump must be isolated from the piping with flexible piping connections. For units with larger motors it is advisable to install a permanent device for lifting the rotating assembly out of the pipe mounted casing to service the unit.

## BREAKDOWN PROCEDURES:

### CAUTION

Exercise extreme care when handling power wiring. Ensure that the fuses are removed or breaker disconnected in the power line to the motor. Power disconnect should be within sight of the pump being serviced and tagged with the reason for disconnection.

## 1. ELECTRICAL WIRING

- If the pump and/or motor assembly is to be serviced on a bench, the motor wiring must be disconnected.

## 2. ISOLATION VALVES

- If the system is not drained: Ensure that the suction and discharge piping isolation valves are closed. Remove drain plug [105] from the bottom of the casing and drain the pump.

## 3. PREPARE ASSEMBLY FOR REMOVAL

- Secure the motor [10], by lifting straps, to an overhead chainfall or similar lifting device. The device must be designed to lift the weight of the unit safely. Raise the lifter to bring the lifting straps taut. Disconnect the flush/vent tubing assembly and place carefully to one side. Remove the casing capscrews and washers [103 & 104]. Pry bars may then be inserted between the casing [100] and adapter [40]. Care should be taken not to apply pressure to the outside diameter of the adapter, to prevent possible breakage, outside pressure should be on the casing only.

## 4. REMOVE ROTATING ASSEMBLY

- The rotating assembly (Motor, adapter and impeller [10, 40 & 80]) may now be lifted out of the casing.

## 5. ROTATING ASSEMBLY NOTES

- The impeller [80] is fastened directly to the motor shaft and must be removed in order to replace the mechanical seal assembly [60/62]. This may be accomplished on a safe surface near the installation or, more conveniently, on a work bench.

## 6. IMPELLER CAPSCREW

- The impeller [80] should be prevented from rotating while the impeller capscrew [86] is loosened. A heavy screwdriver may be inserted between the impeller blades to enable the impeller capscrew [86] to be backed off with a socket wrench. Remove the impeller capscrew and washer [86 & 83].

## 7. PUMP IMPELLER

- Using wheel pullers, with the jaws behind the rear shroud of the impeller [80] (Behind a vane at each side) pull the impeller free of the pump shaft. Impellers that are difficult to remove may be loosened by heating the impeller hub with a torch during the pulling process. Remove the impeller from the motor shaft. Note the impeller key and shaft sleeve spacer [71]. Remove both for storage.

## 8. REMOVE MECHANICAL SEAL FROM MOTOR SHAFT

- The mechanical seal spring usually comes free with the impeller. The mechanical seal rotating element [62] must be pried loose with pry bars or screwdrivers, placed under each side of the seal drive band. Leverage is applied against the adapter. Once loosened, the seal may be pulled free of the shaft.  
Do not damage the carbon face when removing the rotating assembly. It may be needed for analysis if seal failure investigation is required.

## 9. REMOVE SEAL SEAT FROM ADAPTER

- The mechanical seal seat [60], typically O-ring or L-cup mounted Silicon Carbide material, is pried loose from the recess in the adapter. If the seat cannot be removed in this manner, remove the motor capscrews [44] and separate the adapter [40] from the motor [10]. A screwdriver may then be used to push the seat out of the adapter from the rear.

## 10. REMOVE OLD CASING GASKET

- The former casing gasket [101] should be scraped from the casing and adapter, leaving clean surfaces for the new gasket. (A standard putty knife and wire brush are useful for this purpose)

## **ASSEMBLY PROCEDURES:**

### **11. REPLACE MECHANICAL SEAL**

- Clean the shaft sleeve [70] surface, ensuring all the former seal elastomer pieces have been removed. Inspect for damage. Replace if necessary. (See separate instructions for removal of the shaft sleeve [File No. 6042.25]). Inspect the water slinger [39] and replace if damaged
- Install a new seal seat [60] in the adapter cavity, being sure the lapped (polished) side of the insert is facing up. Ensure that the cavity has been thoroughly cleaned. Lubricate the seat O-ring or L-cup with a small amount silicon or glycerine lubricant and press down, straight and even, into the cavity. Do not press the seat in with bare fingers, use a clean cloth or the cardboard disc typically supplied with the seal. Contamination of the polished and lapped seat face could cause leakage. If the adapter was removed from the motor, replace now, taking care that the seal seat is carefully guided over the motor shaft.
- Lubricate the inside of the seal rotating assembly [62] with a small amount of silicon or glycerine lubricant and slide onto the shaft sleeve [70] with a twisting motion, carbon face first, until the carbon face is pressed firmly against the seal seat [60]. Pressing on the seal rotating assembly metal parts, with a screw driver, all the way around the seal, will ensure that the faces are mated properly. Remove the spring retainer from the seal spring and place the seal spring over the seal rotating assembly. Series 4360D and 4380 units with frame 56C motors will have a shaft extension in place of an extended JM/JP shaft. This should be treated in exactly the same manner as described above for seal replacement.

### **12. REPLACE PUMP IMPELLER**

- Install the shaft sleeve spacer [71] and impeller key on the shaft and place the seal spring retainer onto the impeller hub register. Slide the impeller in place on the motor shaft.
- Take care and ensure that the seal spring is kept in place on the seal rotating assembly and fits well into the retainer on the impeller hub.

### **13. TIGHTEN IMPELLER CAPSCREW**

- It is good practice to replace self locking screws, once removed. Install the impeller capscrew and washer [83 & 86]. Hold the impeller the same way as when the capscrew was successfully loosened (Bar or screw driver placed carefully between the impeller blades) and tighten the capscrew with a socket wrench.

### **14. INSTALL NEW CASING GASKET**

- Insert new casing gasket [101] into the gasket cavity in the casing.

### **15. LOWER ROTATING ASSEMBLY INTO PLACE**

- The rotating assembly (Motor, adapter and impeller combination) may now be lowered into place in the casing.

### **16. CASING CAPSCREWS**

- The casing capscrews [104] are now installed and evenly tightened with a wrench. Tighten the capscrews a little at a time, **diagonally** across the casing, to assure even gasket pressure.  
Replace the flush/vent tubing assembly

### **17. ISOLATION VALVES**

- Replace the casing drain plug and open the suction and discharge isolation valves.

### **18. MOTOR WIRING**

- The motor conduit and its wiring are now replaced. If the motor is new, double check that the voltage and rpm are identical to the original motor.
- Be sure to check rotation of the motor after rewiring if the motor is three phase and correct if necessary, by switching any two lead wires.
- Ensure that the pump is filled with water before operating to check rotation.

### **19. CONDUIT BOX COVER**

- The conduit box cover is replaced after checking the motor rotation. The pump may now be placed in operation.

S. A. Armstrong Limited  
23 Bertrand Avenue  
Toronto, Ontario  
Canada, M1L 2P3  
T: 416-755-2291  
F: 416-759-9101

Armstrong Pumps Inc.  
93 East Avenue  
North Tonawanda, New York  
U.S.A. 14120-6594  
T: 716-693-8813  
F: 716-693-8970

Armstrong Integrated Limited  
Wenlock Way  
Manchester  
United Kingdom, M12 5JL  
T: +44 (0) 8444 145 145  
F: +44 (0) 8444 145 146

