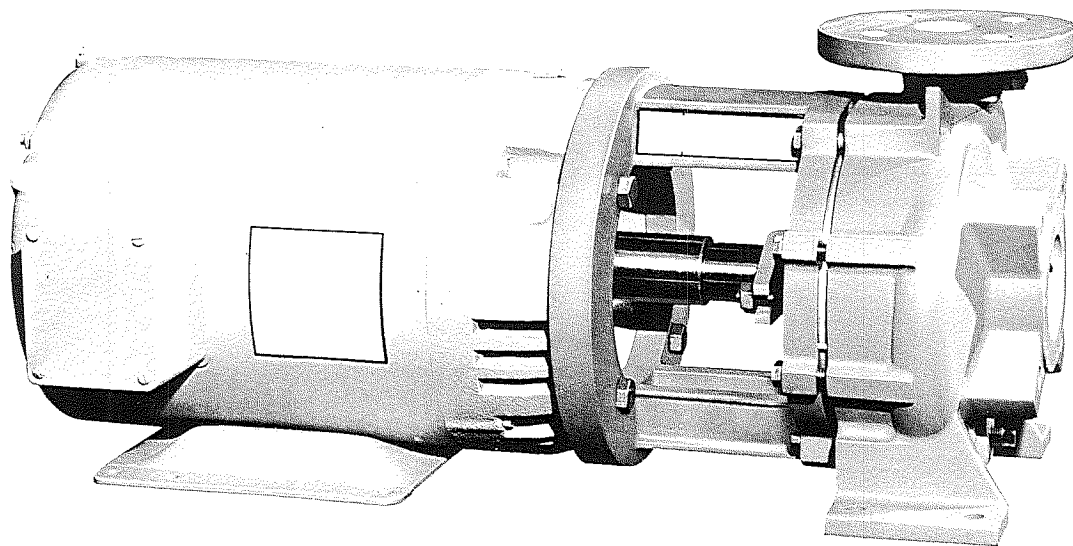




**SyncroFlo, Inc.**

BULLETIN: 29-108.1  
EFFECTIVE: Dec. 15, 1983  
SUPERSEDES:

**SYNCROFLO  
CLOSE COUPLED PUMP  
INSTRUCTIONS**



## DISASSEMBLY AND REASSEMBLY PROCEDURES

The procedures outlined in this section cover the dismantling and reassembly of different types of SyncroFlo close coupled pumps.

When working on the pumps, use accepted mechanical practices to avoid unnecessary damage to parts. Check the condition of all pump parts when the pump is dismantled and replace if necessary.

### GENERAL DISMANTLING INSTRUCTIONS

1. Disconnect the power source to the driver.
2. Close the suction and discharge valves to isolate the pump from the system. Turn off liquid supply and disconnect any piping to the stuffing box.
3. Remove all bolts holding the motor to the foundation.

### DISMANTLING PROCEDURE

#### I. Initial Disassembly

1. Drain the pump by removing the drain plug at the bottom of the casing.

*NOTE: Do not remove the adapter from the motor unless the motor is to be repaired or replaced. If the adapter is removed, it will necessitate repositioning of motor adapter to the motor shaft.*

2. Unbolt the motor adapter from the casing pump by removing capscrews, (7) and where applicable, clamping lugs (9). Pull the entire rotating assembly and motor from the casing leaving the casing connected to the piping unless it is to be repaired, replaced, or if applicable, to have new wear rings installed.
3. Remove the "O" ring (12) from the stuffing box cover and inspect for damage. Replace if necessary.

#### II. Impeller Removal

1. Hold impeller by the outside diameter.
2. Remove the impeller nut (14). To do this, turn the impeller nut counterclockwise as viewed from the suction inlet.
3. Pull the impeller (13) from the shaft and remove the impeller key (19) (Fig. 1, "Impeller Removal")

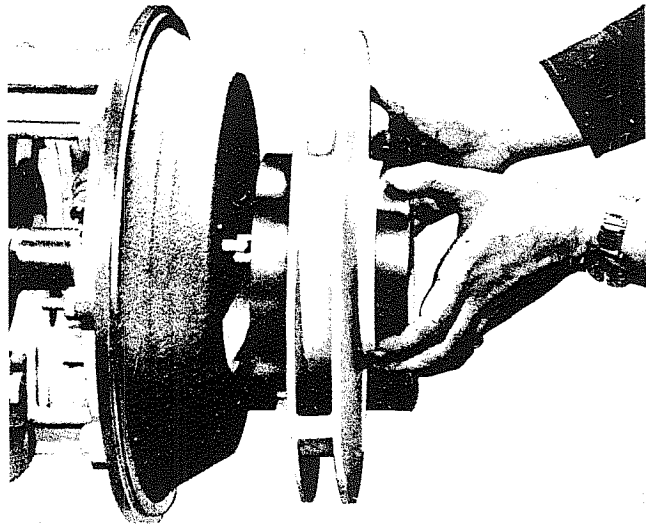


Fig. 1 — Impeller Removal

#### III. Dismantling the Stuffing Box

##### A. Pumps with Mechanical Seals

1. Remove spacer sleeve (4).
2. Remove the two nuts holding the gland to the stuffing box (11).
3. Pull the stuffing box cover off the shaft assembly.

*NOTE: On the larger SyncroFlo pumps, it will be necessary to remove the capscrews holding the stuffing box cover to the motor adapter.*

*NOTE: The mechanical seal (16) should now be exposed on the shaft sleeve. (In some cases, the shaft sleeve may come off the shaft with the stuffing box cover. If this happens, gently press or pull the shaft sleeve and mechanical seal from the stuffing box toward motor side of the stuffing box cover.) This will expose the mechanical seal as above.*

4. Remove the seal from the shaft sleeve, examine for damage, and if necessary replace.
5. Remove the gland (20) shaft sleeve (2) and the deflector (3) from the motor shaft. A puller may be used to remove the shaft sleeve if it does not slide off the motor shaft easily.

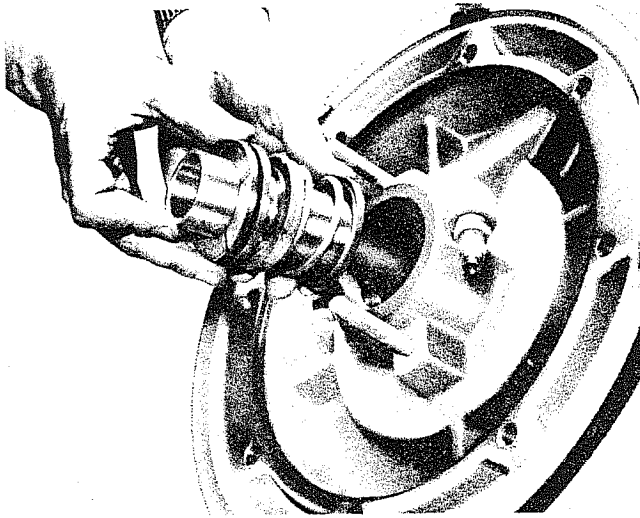


Fig. 2 — Removing Mechanical Seal

*NOTE: Do not remove the adapter from the motor unless the motor is to be repaired or replaced. If the adapter is removed, it will necessitate repositioning of motor adapter to the motor shaft.*

#### IV. Suction and Stuffing Box Wear Ring Removal (Optional)

The optional wear rings are removed from the casing and stuffing box cover by the following method:

1. Drill two axial holes in each wear ring approximately 180 degrees apart being careful not to drill into the casing or stuffing box cover.
2. Split the wearing rings using a chisel.
3. Remove the pieces.

This completes the disassembly of the SyncroFlo close coupled pump.

### ASSEMBLY PROCEDURES

#### I. Motor Adapter Assembly

If necessary, mount the motor adapter (5) to the motor using four capscrews (7). Be certain the adapter is mounted such that the drain hole is on the bottom. Snug, but do not tighten the capscrews as final positioning of the motor adapter to the motor shaft is necessary.

#### II. Motor Adapter Positioning

*NOTE: This procedure may be skipped if the motor adapter was not removed from the motor or if adapter is a registered fit type.*

1. Upend motor and adapter assembly on the motor end.
2. Place a dial indicator on the shaft such that the indicator reads run out between the motor shaft and the casing locating fit on the motor adapter. See Fig. 3

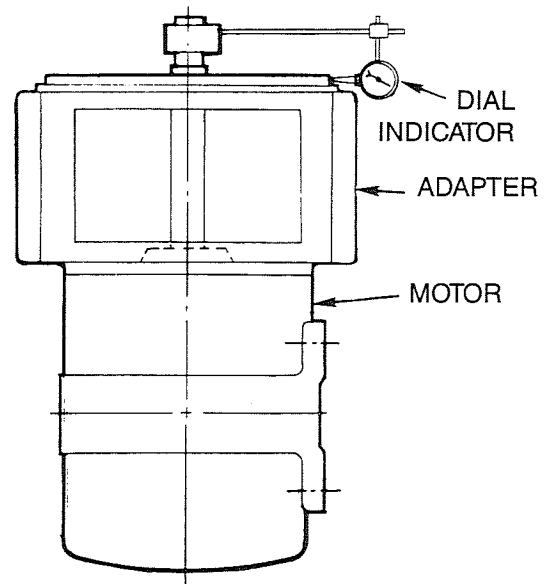


Fig. 3 — Dial Indicating the Motor Adapter

3. While rotating the motor shaft, gently tap the motor adapter with a soft headed hammer to bring total indicator run out between the motor shaft and the adapter fit to less than .002".

*NOTE: This tolerance is closer than that of the fits between the motor face and the motor adapter.*

4. Once the motor adapter is positioned, tighten the four capscrews holding the motor adapter to the motor.

*NOTE: If no dial indicator is available, positioning may be performed in one of the following two methods:*

#### Method #1

Use this method if the casing has been removed from the suction and discharge piping.

1. Complete the “Stuffing Box Assembly” and “Impeller Installation” procedures and the “Final Assembly Procedure” up to and including step two. (Pg. 3 & 4)
2. Position the motor to the pump by upending the assembly on the motor end and tapping the pump with a soft headed hammer in different directions until the impeller can be turned freely in the casing.
3. Once the pump has been positioned, tighten the four capscrews (7) holding the motor adapter to the motor.
4. Proceed with steps three through seven of the final assembly procedure. (Pg. 4)

#### Method #2

Use this method if the casing has not been removed from the suction and discharge piping.

1. Complete the “Stuffing Box Assembly” and “Impeller Installation” procedure and the “Final Assembly Procedure” up to and including step two. (Pg. 3&4)
2. Using a pry bar, gently nudge the motor around until the impeller turns freely in the casing.
3. Once the impeller turns freely, tighten the four capscrews (7) holding the motor adapter to the motor.
4. Proceed with steps three through (7) in the final assembly procedure (4).

### III. Stuffing Box Assembly

*NOTE: There are two pipe taps on the stuffing box; one closer to the gland, and one farther away from the gland.*

*The stuffing box cover should be positioned with the pipe tap closer to the gland in the most accessible position.*

*For ease of assembly, install pipe fittings in the stuffing box pipe taps before assembling stuffing box on the motor adapter.*

#### A. General Assembly

1. Install the two gland retaining studs (18) into the stuffing box cover.
2. Screw the impeller stud (15) into the end of the motor shaft using a locking compound on the stud.

#### B. Mechanical Seal Installation

1. Install the rotating and stationary elements of the mechanical seal (16) on the shaft sleeve (2) being certain that the two wearing surfaces face each other.
2. Place the seal spring retainer into stuffing box.
3. Place seal spring into stuffing box.
4. Place sleeve and seal assembly into stuffing box with rotating half of seal installed closest to the impeller.
5. Install the seal gland (20) (flat side toward stuffing box) on the stuffing box using the gland studs (18) and gland nuts (17). Tighten gland nuts evenly until the gland is approximately 1/8" from the stuffing box.
6. Slide the deflector ring (3) onto the motor shaft.
7. Slide the stuffing box cover, seal, and sleeve assembly onto the motor shaft being certain the stuffing box is closest to the motor adapter. To prevent any leakage, use Dow Corning Silicone Rubber #732-WHII or equal lubricating sealant between the shaft and shaft sleeve.
8. If applicable, bolt the motor adapter to the stuffing box using capscrews (7).

### IV. Impeller Installation

1. Slide the spacer sleeve (4) over the shaft sleeve and into the stuffing box.
2. Install the impeller key into the keyway on the impeller side of the motor shaft.
3. Slide the pump impeller (13) onto the motor shaft.
4. Screw the impeller nut (14) onto the pump shaft until finger tight. Hold the outside diameter of the impeller and tighten (clockwise as viewed from the suction inlet) the impeller nut to 25-30 ft. lbs.
5. Tighten gland evenly against the stuffing box.

## V. Final Assembly

*NOTE: When assembling the rotating assembly to the casing, be certain that the pump feet are parallel to the motor feet.*

1. Place the "O" ring casing seal (12) around the "O" ring seat on the stuffing box cover.
2. Carefully slide the motor, motor adapter, stuffing box assembly into the casing being sure not to pinch the "O" ring. Insert the capscrews (7) through the frame and into the casing (the large SyncroFlo pumps use capscrews and clamping lugs (9) to hold the motor adapter to the casing. Tighten opposite capscrews evenly around the adapter until the stuffing box has been drawn evenly into the casing. Then alternately torque each capscrew to 25 ft. lbs.
3. If necessary, connect the suction and discharge piping to the pump.
4. Secure the motor foot.
5. Connect the flushing water system to the stuffing box.
6. If the pump is to be started, be sure flushing is provided to the stuffing box.
7. Connect the power to the motor. **CHECK THE MOTOR ROTATION.**
8. If the suction pressure is 20 PSIG or less bypass piping (6) is required.

This completes the assembly of the SyncroFlo close coupled pump.

## GENERAL MAINTENANCE

Operating conditions vary so widely that to recommend one schedule of preventative maintenance for all centrifugal pumps is not possible. Yet some sort of regular inspection must be planned and followed. We suggest a permanent record be kept of the periodic inspections and maintenance performed on your pump. This recognition of maintenance procedure will keep your pump in good working condition and prevent costly breakdowns.

One of the best rules to follow in the proper maintenance of your centrifugal pump is to keep a record of actual operating hours. Then, after a predetermined period of operation has elapsed, the pump should be given a thorough inspection. The length of this operating period will vary with different applications, and can only be determined from experience. New equipment, however, should be examined after a relatively short period of operation. The next inspection period can be lengthened somewhat. This system can

be followed until a maximum period of operation is reached which should be considered the operating schedule between inspections.

## BEARING LUBRICATION — GREASE

Grease lubricated ball bearings are packed with grease at the factory and ordinarily will require no attention before starting provided the pump has been stored in a clean, dry place prior to its first operation. The bearings should be watched the first hour or so after the pump has been started to see that they are operating properly.

The importance of proper lubrication cannot be over emphasized. It is difficult to say how often a bearing should be greased, since that depends on the conditions of operation. It is well to add one ounce of grease at regular intervals, but it is equally important to avoid adding too much grease. For average operating conditions, it is recommended that 1 oz. of grease be added at intervals of three to six months, and only clean grease be used. It is always best if unit can be stopped while grease is added to avoid overloading.

*NOTE: Excess grease is the most common cause of overheating.*

The bearing frame should be kept clean, since any contamination of foreign matter which gets into the housing will destroy bearings in a short time. When cleaning bearings, use a bearing cleaning solvent, or an industrial cleaning solvent. Do not use gasoline. Use lint free cloths. Do not use waste rags.

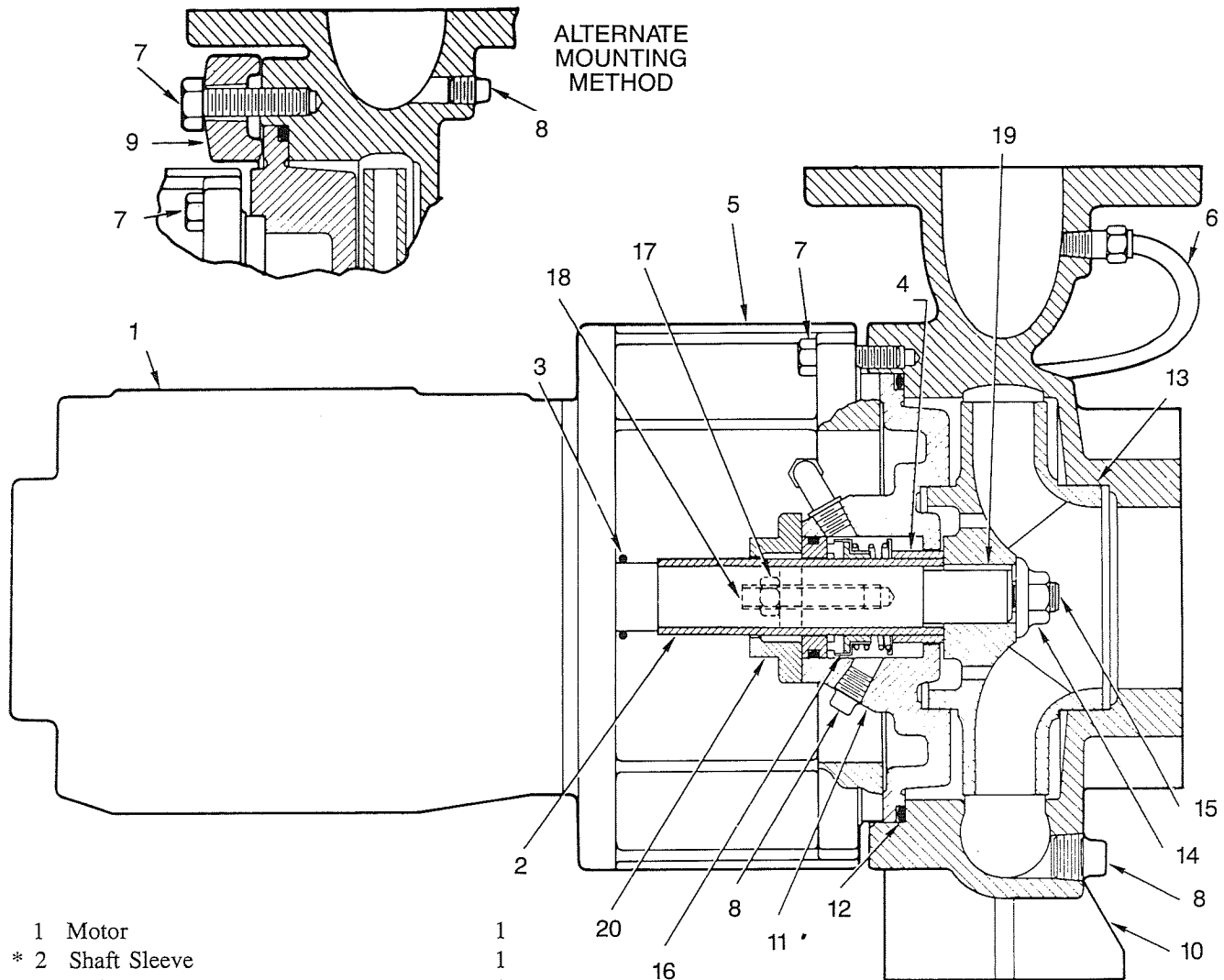
A regular ball bearing grease should be used, but a standard commercial vaseline can be substituted if necessary.

Do not use graphite. A No. 1 or 2 grease is generally satisfactory for operation at ordinary temperatures, the lighter grease for operation at high speed or low room temperature.

Mineral greases with a soda soap base are recommended. Grease made from animal or vegetable oils are not recommended due to danger of deterioration and forming of acid. Most of the leading oil companies have special bearing greases which are satisfactory.

The maximum desirable operating temperature for ball bearings is 180 °F. Should the temperature of the bearing frame rise above 180 °F, the pump should be shut down to determine the cause.

When ordering replacement parts please specify system number, production number, pump number, pump size, part name and description.



- |      |                                    |         |
|------|------------------------------------|---------|
| 1    | Motor                              | 1       |
| * 2  | Shaft Sleeve                       | 1       |
| 3    | Deflector                          | 1       |
| * 4  | Spacer Sleeve                      | 1       |
| 5    | Motor Adapter                      | 1       |
| ** 6 | By Pass Piping Kit                 | 1       |
| 7    | Bolts - Miscellaneous<br>with lugs | 8<br>16 |
| * 8  | Pipe Plugs                         | 1       |
| 9    | Clamping Lug                       | 8       |
| 10   | Casing                             | 1       |
| 11   | Stuffing Box Cover                 | 1       |
| 12   | "O" Ring, Casing Seal              | 1       |
| 13   | Impeller                           | 1       |
| *14  | Impeller Nut                       | 1       |
| *15  | Shaft Stud                         | 1       |
| *16  | Mechanical Seal                    | 1       |
| *17  | Gland Nut                          | 2       |
| *18  | Gland Stud                         | 2       |
| *19  | Key Impeller                       | 1       |
| *20  | Gland                              | 1       |
|      | Optional Components                | 1       |
| 21   | Wear Ring, Suction                 | 1       |
| 22   | Wear Ring, Stuffing Box            | 1       |

PUMP WITH OPTIONAL WEAR RINGS

NOTE: Parts with \* are included in SyncroFlo's Complete Kit

\*\* on applications with a suction pressure of 20 psi or less.