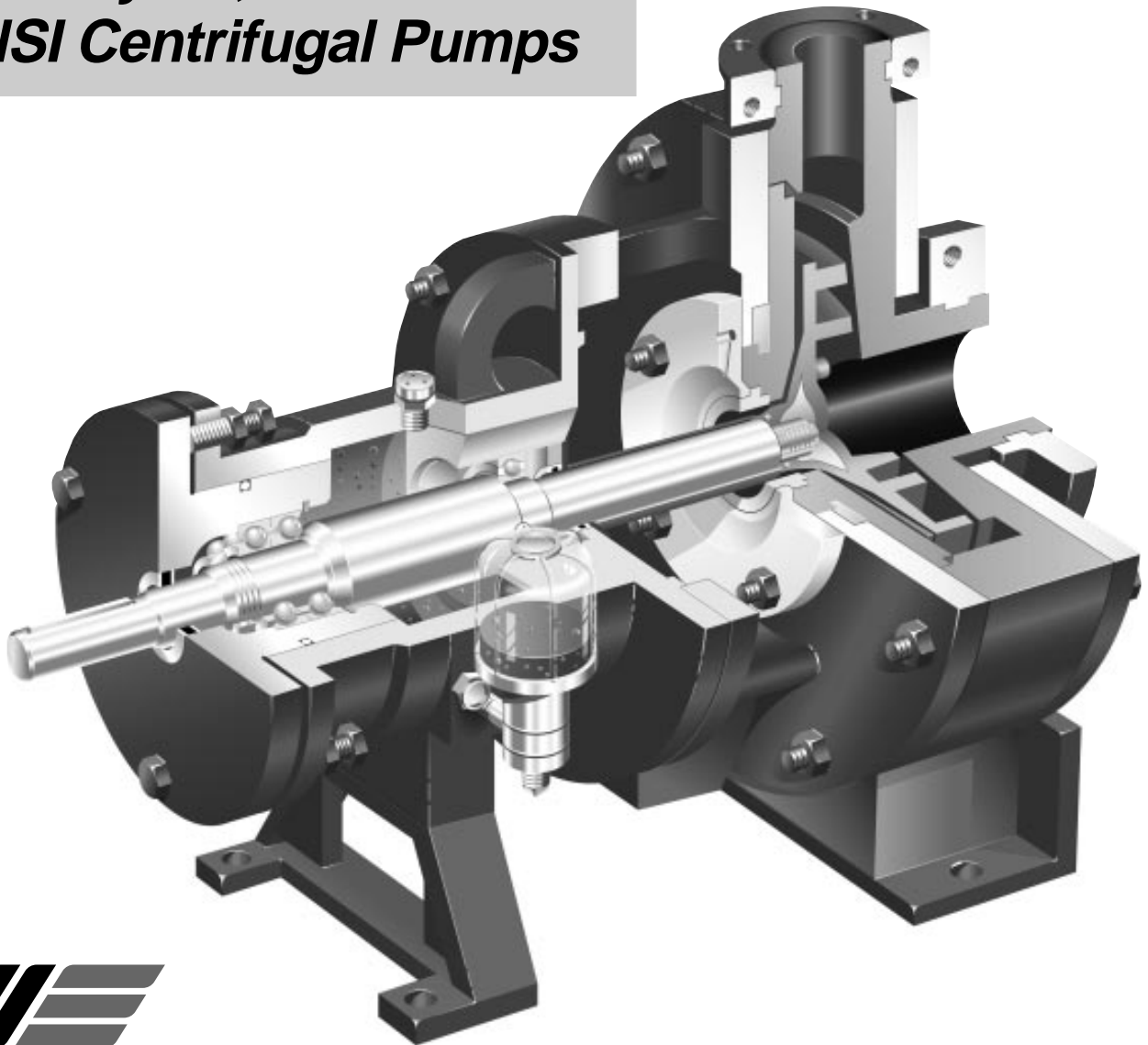


STAN-COR

Installation and Operation Manual

Solid Kynar, Non-Metallic ANSI Centrifugal Pumps



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Introduction

Rev Date 6/15/02

Contents

Introduction	2
General Instructions	2
Installation	3
Operation	5
Service	6
Parts	9
Troubleshooting	10

This manual contains instructions for the installation, operation, and maintenance of the Stan-Cor Pump. Because pump service conditions and specifications vary considerably in different installations, this manual cannot possibly cover every situation, but it should serve as a useful guide. If you have questions, or if there are problems at start-up, contact the Stan-Cor Pump Distributor in your area.

The fluid end of the Stan-Cor Pump is solid, carbon-filled Kynar 370. The physical properties of this material is more than adequate to withstand all loadings encountered through the rated pressure and temperature range for the pump.

Solid-filled Kynar 370 resists chemical attack even when dented or scratched. Solid construction also permits trimming the impeller to precisely tailor performance for each application.

Pump fastener torque specifications given are designed to provide a safe level of loading to effect a good seal without overstressing the nonmetallic materials.

General Instructions

1. On threaded parts, use a torque wrench and torque specifications as noted in the text.
2. Repair the sealing surface with emery paper or equivalent when required.
3. Piping must be anchored and supported.
4. Expansion joints help to isolate the pump from vibration and stress.
5. Kynar impellers can be trimmed in 1/8-in. increments using a standard steel-cutting tool.



Location

Locate the pump near to the liquid source, so that the suction line is short and direct. When practical, locate the pump below the level of the liquid to eliminate the need for priming.

Foundation

The foundation should be sufficiently rigid and substantial to absorb any vibration, and to permanently support the base plate at all points. A concrete foundation, poured on a solid footing of adequate thickness to support the pumping unit, provides the most satisfactory foundation.

The base plate should be installed in a level position. The size and location of the base mounting holes are shown on the certified Stan-Cor Dimension Drawing. For a general piping layout, use the dimensions shown on the back page.

Fig. 1 shows a typical arrangement for bolting the base to the foundation.

Note: For a detailed description of proper procedures for grouting base plates, refer to the Hydraulic Institute Standards.

Coupling Alignment

Good service life of the pump and driver depends upon good alignment through the flexible coupling. If the electric motor was mounted at the factory, the pump and motor were in alignment when shipped. The alignment between the driver and pump should be inspected after installation to ensure that transportation or other handling has not caused misalignment. Poor alignment may cause failure of the coupling, pump, or motor bearings, or of either shaft. The recommended procedure for coupling alignment is to use a dial indicator, as shown in Fig. 2 and Fig. 3.

- To measure offset misalignment, attach the dial indicator to one coupling half, with the indicator button resting on the O.D. of the other coupling half.
- To measure angular misalignment, position the indicator so that the button rests on the face, near the O.D., of the other coupling half.

Rotate the shaft and dial indicator one full revolution while the other shaft remains stationary, and note the T.I.R. Unless otherwise specified by the coupling manufacturer, offset misalignment should be limited to 0.010 in T.I.R. and angular misalignment should be limited to 0.005 in T.I.R. Adjust the alignment by loosening the driver or pump mounting bolts and retightening or shimming as required.

Note: For more information on coupling alignment, refer to the Hydraulic Institute Standards.

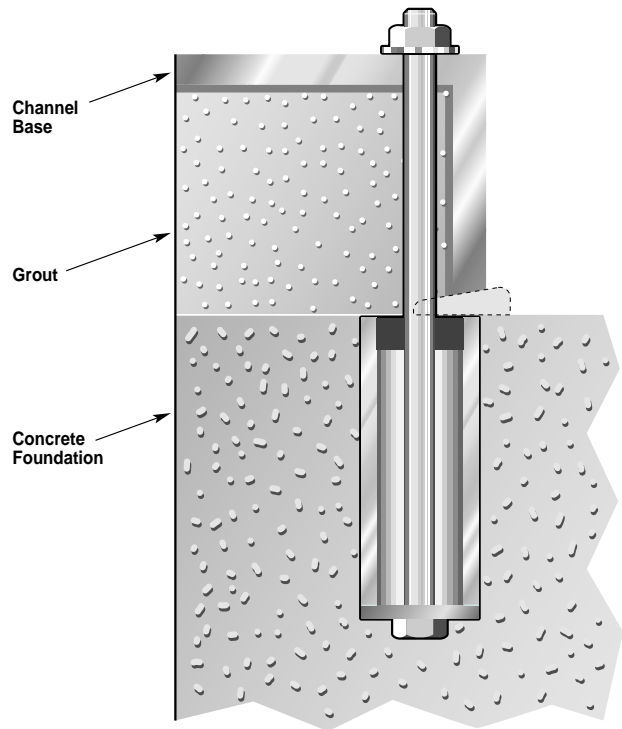


Fig. 1: Foundation and Base Plate

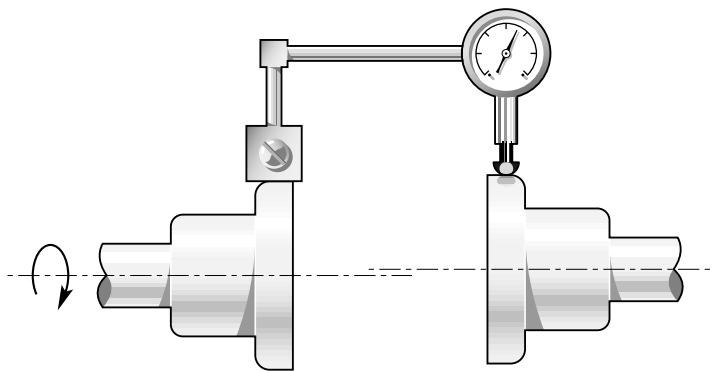


Fig. 2: Measuring Offset Misalignment

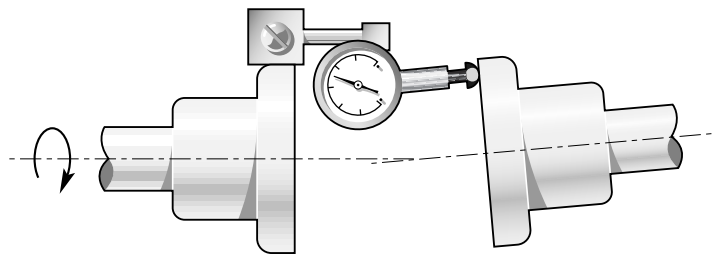


Fig. 3: Measuring Angular Misalignment

Installation

Rev Date 6/15/02

Caution: Piping must not be connected to the pump until the grout has hardened and the foundation bolts and pump holddown bolts have been tightened.

Anchor the piping independently of the pump and as near to it as possible. Pipe companion flanges should line up naturally with pump flanges. **Do not draw the pipe to the pump with flange bolts.** TFE envelope gaskets are recommended to effect a seal with minimum torque on flange bolts.

While the pump may be operated satisfactorily without expansion joints, we recommend that an FEP or TFE expansion joint (Fig. 4) be used on the suction and discharge flanges. Expansion joints eliminate undue strains caused by piping misalignment and/or temperature variations.

Arrange the piping so that corrosives can be flushed from the pump before it is opened for service. Installation of tees in the suction and discharge piping between the pump and the shutoff valves, with a drain valve connected to the branch of the tee, to permit flushing of the pump before removing it from the line.

Piping (Suction)

Properly selected and installed suction piping is extremely important to eliminate vibration and cavitation in the pump. Vibration can cause mechanical seal damage or undue bearing loads.

The suction line should be equal to or larger than the pump suction.

The capacity of a centrifugal pump should never be adjusted by throttling the suction line. Install a positive shutoff valve of a type to cause minimum turbulence in the suction line — to permit the closing of the line and removal of the pump for inspection and maintenance.

The suction line should be designed to eliminate any air pockets. The piping should gradually slope downward to the source of supply to eliminate air pockets.

The suction line should have a straight section into the pump of a length equivalent to at least ten times its diameter: e.g., a 4 inch diameter suction line should have 40 inches of straight run.

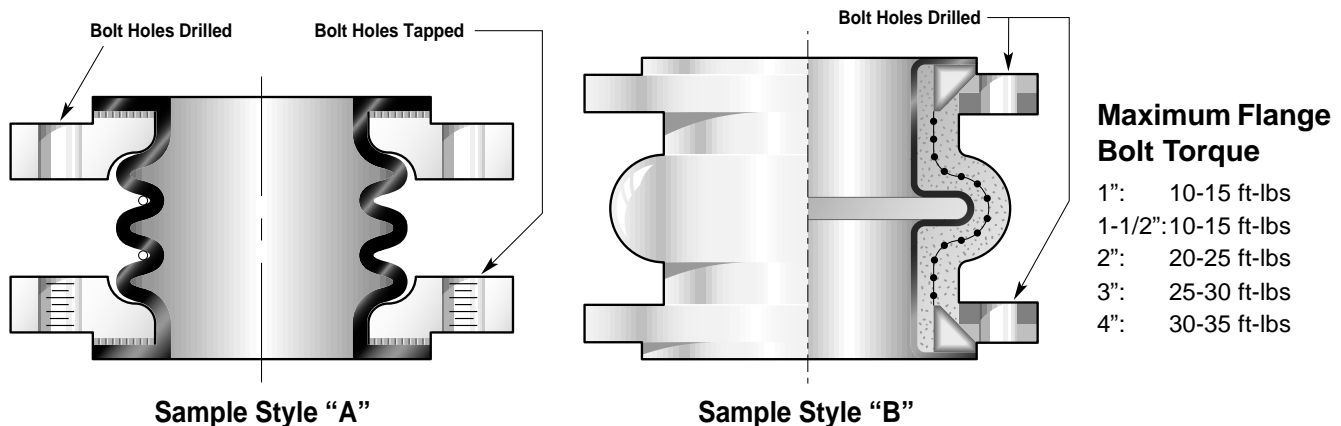
Piping (Discharge)

Install a positive shutoff valve in the discharge piping to permit inspection and maintenance of the pump.

All piping should be independently supported and accurately aligned. **The pump must not support the weight of the pipe or compensate for misalignment.**

If operating conditions are not known with enough accuracy, provide a throttle valve in the discharge line to ensure that the pump operates at the design point.

Fig. 4:
Expansion Joints



Preparation For Operation

Caution: the following preparation must be done before the pump is operated for the first time. Failure to follow these instructions will result in serious damage to the pump.

Initial Lubrication

Note: Oilers are set at the factory to their lowest position. This setting places the oil level just below the center of the bottom ball of the bearing when the housing is level. Higher levels may cause churning and overheating of the bearings; lower levels may not provide enough lubrication and may promote rapid wear. **The correct oil level will be visible at the center of the sign oil gauge.**

Standard pumps are shipped with empty oil reservoirs. **Oil must be added before operating the pump.** Attach the oiler to the bearing housing, fill the bottle with oil, and place it in position. Continue filling the bottle until it remains full of oil. Do not add oil to the reservoir except through the oiler bottle.

Use a good grade of SAE 10W30 oil.

Keep the air vent clean to prevent pressure buildup caused by normal heating that occurs in operation. A Trico Optomatic Oiler No. EB-64 with a 4-oz capacity bottle is used. **The correct bottle must be used with the corresponding oiler body.**

Mechanical Seals

When mechanical seals are furnished with the pump, the description and identification are indicated on the order writeups, which are a part of the order acknowledgment, dimension print, and packing list. The seals are installed and adjusted at the factory. To properly prepare the seal for operation, various cooling and flushing flows may have to be connected. Liquid from an outside source may be required. Connect necessary cooling and flushing flows to the seal, and be sure it is turned on before starting the pump.

Important Precautions

Check the following items before starting the pump:

- Pump rotates freely by hand
Important: The motor rotation must be checked before connecting the shaft coupling. Incorrect pump rotation for even a short time will dislodge the impeller and damage the impeller or casing, or both. The pump shaft must turn clockwise when viewed from the motor end.
- Coupling is aligned
- Oiler is full and oil level is correct
- Suction valve is fully open
- Pump and suction line are full of fluid
- Water is supplied to stuffing box or gland flush

Priming

Vent all air from the suction line, and fill the line with liquid. Start the pump with the discharge valve cracked open. After the discharge pressure stabilizes, gradually open the discharge valve to the required position. If flow is lost, close the discharge valve and wait a few seconds for the discharge pressure to rebuild.

Continued flowing difficulty indicates an improper selection or installation. Running the pump too long with improper prime may destroy the sealing faces of the mechanical seal. It may also cause mechanical damage from pulsation and interference between rotating and stationary components.

Thermal shock may crack the ceramic stationary seat if the temperature is raised from room temperature to 250°F in less than 30 seconds.

Maximum Operating Conditions

Note: These maximum operating conditions apply to pumps which are exposed to room temperatures without external insulation.

Maximum operating temperature and pressure conditions are shown in Fig. 5 below.

Notes:

- Maximum service temperature for all Kynar pumps: 250°F.
- For insulated pumps, multiply "Maximum Discharge Pressure" by 0.8.
- Higher maximum discharge pressures are allowed for A50, A60, or A70 pumps when pipe stress is removed from the discharge flange. Contact the factory for details.

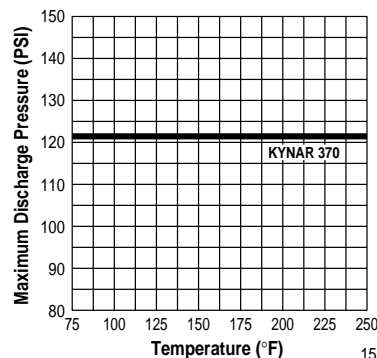


Fig. 5A:
Pump Size AA, AB
without insulation on
atmospheric side

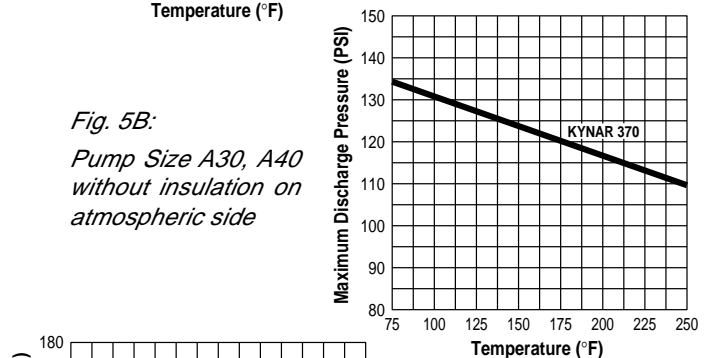


Fig. 5B:
Pump Size A30, A40
without insulation on
atmospheric side

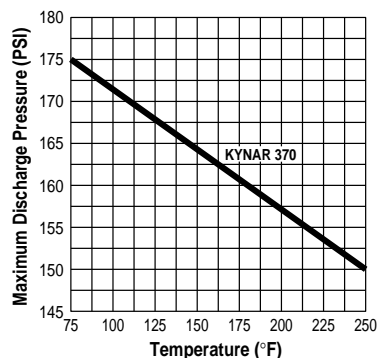


Fig. 5C:
Pump Size A50, A60,
A70 without insulation
on atmospheric side



Pump Records

Maintain data cards or pump records whenever possible. **This will provide ready access to information for ordering spare parts, and for evaluating pump and mechanical seal performance.** The following information should be included in these records:

- Pump size and serial number
- Pump model number, impeller diameter, and material of construction
- Mechanical seal manufacturer, type, code, and drawing number
- Motor horsepower and speed of operation
- Service conditions
- Frequency of operation
- Record of maintenance, including parts usage and general condition of pump
- Nomenclature and part number of replacement items.

Disassembly

Note: Refer to drawing on page 9 for part identification.

1. Lock out power to the pump driver.
2. Close the suction and discharge valves. Flush the pump through the bypass system.
3. Remove the coupling spacer.
4. Remove the drain plug (24). Drain the oil from the frame (18).
5. Remove the rear pump-to-base mounting bolts from the frame support (19).

Note: On AA and AB models, the frame support (19) is part of the frame (18).

6. Remove the eight casing nuts (41). Remove all casing bolts (35) except the lower two.
7. Remove the frame (18), shaft (5), and impeller (3) as an assembly. The casing (1) may be left attached to the piping.
8. Remove the oiler assembly (23) — not shown in Fig. 7.
9. Remove the coupling half from the pump shaft.
10. Remove the casing O-ring (4) from the back cover (2).

Caution: Do not remove the impeller by striking it with a hammer or similar object.

11. With a special wrench (see note below), hold the shaft at the key on the coupling end.

Note: An impeller removing wrench can be easily made by welding two steel bars to an old coupling hub.

12. Turn the impeller (3) until the wrench contacts the work table on the right-hand side as seen from the impeller end of the pump.

13. Using a firm grip, spin the impeller to the left, impacting the wrench on the work table. After a few impacts, the impeller should screw off easily.

14. Remove the sleeve O-ring from the impeller.

15. Remove the nuts (40-A) from either the gland (30) or stuffing box (46).

16. Remove the frame-adaptor nuts (40-C), and carefully pull the frame assembly and shaft, along with the mechanical seal and gland, away from the adaptor and back cover.

17. **Single Outside Seal.** Loosen the mechanical seal drive collar on the seal until it is completely free on the shaft.

Double Internal Seal. The seal is housed inside a stuffing box. Enter through the top 1/4-in. outlet and use an Allen wrench to disengage the seal set screw.

18. Remove the shaft sleeve (6), along with the mechanical seal and gland (30) or stuffing box (46).

Note: If you are replacing or installing a mechanical seal or shaft sleeve, no further disassembly is required.

19. If further disassembly is required, remove the adaptor/cover nuts (40-B). Remove the back cover (2) and mounting plate (28).

20. Remove the deflector (26), which is lightly press-fit on the shaft.

21. Remove the three bolts (36) securing the bearing housing (15) to the frame (18).

22. Remove the bearing housing (15) and shaft from the frame, being careful to support the impeller end of the shaft.

Note: It may require a few light taps with a soft-nosed hammer on the impeller end of the shaft to slide it out of the bearing frame.

23. Remove the O-ring (16) from the bearing housing.

24. Using a Truarc pliers No. S-6700 (No. S-6500 for AA or AB pumps), remove the tapered snap ring (17) from its groove in the I.D. of the bearing housing.

25. Remove the shaft (5) and bearings (11 and 12) from the bearing housing.

Note: The bearings are not press-fit into the housing, so the shaft can be removed with light blows from a mallet.

26. Pry the tab of the lock washer (13) out of the groove in the lock nut (14). Remove the lock nut and washer.

27. Press the bearings (11 and 12) from the shaft.

28. If the oil seals (20 and 21) are to be replaced, drive them from their bores.

Inspection

Impeller. Replace if the impeller shows excessive erosion (especially on the pump-out vanes on the back side of the impeller), corrosion, extreme wear, or vane breakage. The O-ring groove and impeller hub must be in good condition. Check the impeller balance.

Shaft. Check for runout to see that the shaft has not been bent. If runout exceeds 0.002 in., replace the shaft. Bearing seats and the oil seal area must be smooth and free of scratches or grooves. The shaft threads must be in good condition. Replace the shaft if necessary.

Shaft Sleeve. The sleeve surface in the stuffing box must be smooth and free of grooves. If grooved, replace it.

Mechanical Seal. The seal faces, gaskets, and shaft sealing components must be in perfect condition or excessive leakage may result. Replace worn or damaged parts.

Ball Bearings. Replace bearings if worn, loose, or rough and noisy when rotated. Do not unwrap new bearings until ready for use. Replacement bearings must be of the proper size and type as supplied with the original equipment.

Oil Seals. Replace if torn or otherwise damaged.

Note: *The oil seals are held by a press fit. The lips on the seals must face inward (toward the bearings).*

General. All parts should be clean before reassembly. This is especially important at the retaining ring and O-ring grooves, threads, gasket surfaces, and bearing and bearing housing lubricated areas. Remove any burrs with crocus cloth.

Reassembly

1. Lubricate the shaft liberally with grease in the area where the outboard bearings (12) seat. **The outboard bearings are angular-contact duplex-mounted and must be installed facing the proper direction.** Start the first bearing so that it is square with the shaft and the stamped face is away from the shaft shoulder. Press the bearing onto the shaft until it seats against the shoulder. **Press only on the inner race.** Lightly lubricate the shaft again with grease and start the second bearing so that the stamped faces of the bearings are together. Press the second bearing onto the shaft until it seats against the first bearing. Install the lock washer (13) and lock nut (14). Tighten the lock nut firmly until one washer tab aligns with a slot in the nut. Bend the lock washer tab into the slot.
2. Place the tapered snap ring (17) loosely over the shaft so that the tapered side faces away from the outboard bearing.
3. Lubricate the shaft lightly with wheel grease in the area where the inboard bearing (11) mounts. Start the bearing squarely on the shaft. Press the bearing onto the shaft until it seats against the shoulder. **Press only on the inner race.**
4. Lubricate the sealing element of the outboard oil seal (21) (grease on outside of seal and inside of housing). Press the oil seal into the bearing housing (15) until it is flush with the outboard surface.

5. Lubricate the area of the shaft which enters the outboard oil seal. Start the shaft and outboard bearings squarely into the bearing housing. Be careful that the shaft enters the oil seal properly. The outer races may be mounted with a hand push or light tapping. **Apply force only to the outer race.** The bearings should bottom out in the bearing housing, just exposing a tapered groove in the I.D. of the housing.

Note: *The beveled face of the snap ring must face out of the bearing housing.*

Using a Truarc pliers No. S-6700 (No. S-6500 for AA or AB pumps), install the snap ring in this groove.

6. Grease the sealing element of the inboard oil seal (20). Press the oil seal into the frame (18) until it is flush with the outside surface.
7. Install the O-ring (16) into the groove in the O.D. of the bearing housing. Lubricate the O.D. of the housing and the I.D. of the frame with grease.
8. Guide the impeller end of the shaft into the frame and through the inboard seal until the bearing housing flange stops against the frame.

Inspect the seal for proper fit. Use a small dull tool to push the seal into place if needed.

Build from the back and go forward.

9. **Loosely install the three bolts (36) and nuts (40-D) which secure the housing to the frame, and tighten them hand-tight. Install three jam bolts (37) and jam nuts (40-D) in the threaded holes of the frame flange.**
10. **On pump sizes other than AA or AB, secure the frame support (19) to the frame using two cap screws (38).**
11. Drive the sleeve drive pin (9) into its hole in the shaft until it bottoms out with a punch.
12. Carefully press the deflector (26) over the shaft. Do not break.
13. Install the sight oil gauge (22), oiler assembly (23), drain plug (24), and breather (25) in the appropriate tapped holes in the frame.
14. Place the casing (1), front plate (31), and casing support (32) in position, if they were removed.
15. Use socket-head cap screws (42 and 43) to reinstall the suction and discharge flanges (33 and 34), if they were removed.

Note: *The torque values given below are a guide for initial assembly of new components at room temperature. Extended service life and/or operating temperature extremes may require different values, based on your judgment.*

16. With the back cover (2) and mounting plate (28) assembled, place the back cover on a flat surface with the mounting plate studs facing up.
17. Place the adaptor (27) over the studs in the mounting plate (28). Secure with four hex nuts (40-B). **Torque to 3-5 ft-lbs (2-4 ft-lbs on AA or AB pumps).**

Note: *If a double seal is used, ignore steps 18-20 and go on to step 21.*



Reassembly – Single Seal

18. If a single seal is to be installed, place the stationary seat (with gaskets) in position in the back cover. Secure the gland (30) to the mounting plate studs (28), using hex nuts (40-A).

Torque the nuts to the following value (do not over torque!):

- 1-3/8" Dia. Shaft: 2-4 ft-lbs
- 1-7/8" Dia. Shaft: 3-5 ft-lbs
- 2-1/4" Dia. Shaft: 3-7 ft-lbs

19. Clean the shaft sleeve with alcohol. With the frame fixed to the work table, place the single rotating assembly on the shaft sleeve (6), and slide the assembly to the end of the sleeve. When installing the sleeve, be sure that the sleeve drive pin (9) engages the notch in the sleeve. (This can be verified by rotating the shaft.)

20. Carefully install the adaptor, back cover, and seal stationary assembly over the shaft and sleeve. Secure with four bolts (39) and hex nuts (40-C).

Reassembly – Double Seal

Note: If a double seal is to be installed, be sure that the set screws are backed out enough so as not to damage the shaft sleeve.

21. If a double seal is to be installed, place the seal rotating element in the center of the shaft sleeve (6). Place the stationary seat (with gaskets) in the back cover, then set the rotating element (with shaft sleeve, 6) on the stationary seat. Be sure the impeller end of the sleeve is pointed down.

22. After installing the outside stationary face in the stuffing box (46), carefully place the stuffing box over the double seal and mounting plate (28) studs, **ensuring that the arrow on the stuffing box flange is pointing up toward the slot on the adaptor (27). Torque the hex nuts to the values indicated in step 18.** Locate the set screw under the top hole, and hold it in position using an Allen wrench.

23. Carefully slide the shaft sleeve, along with the attached stuffing box, adaptor, and back cover, over the shaft. Be sure that the sleeve drive pin (9) engages the notch in the sleeve I.D. Secure the adaptor to the frame with four bolts (39) and nuts (40-C).

24. Check that the O-ring (8) is installed in the counterbore of the impeller, then screw the impeller securely onto the shaft. The O-ring can be held in position by placing a small dab of grease under it in a couple locations.

25. Place the casing O-ring (4) over the back cover (2).

26. Secure the frame adaptor to the casing (1), using eight bolts (35) and hex nuts (41). **Torque to the following values:**

- AA, AB Pumps: 12-13 ft-lbs
- A30-A70 Pumps: 28-32 ft-lbs

Torque Specifications

Casing Bolts

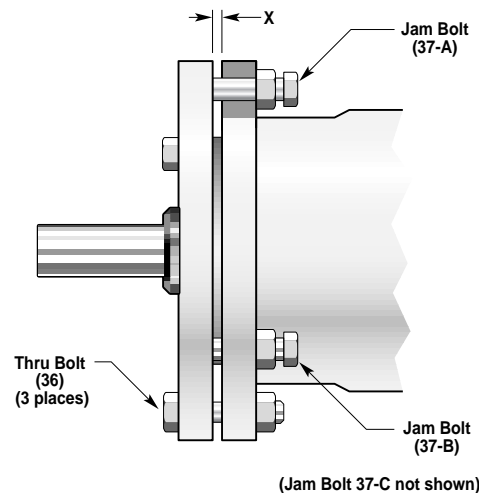
- AA, AB: 12-13 ft-lbs
- A30-A70: 28-32 ft-lbs

Gland/Stuffing Box Nuts

- 1-3/8" Dia. Shaft: 2-4 ft-lbs
- 1-7/8" Dia. Shaft: 3-5 ft-lbs
- 2-1/4" Dia Shaft: 5-7 ft-lbs

Note: Excessive torque loads on gland nuts may break back cover.

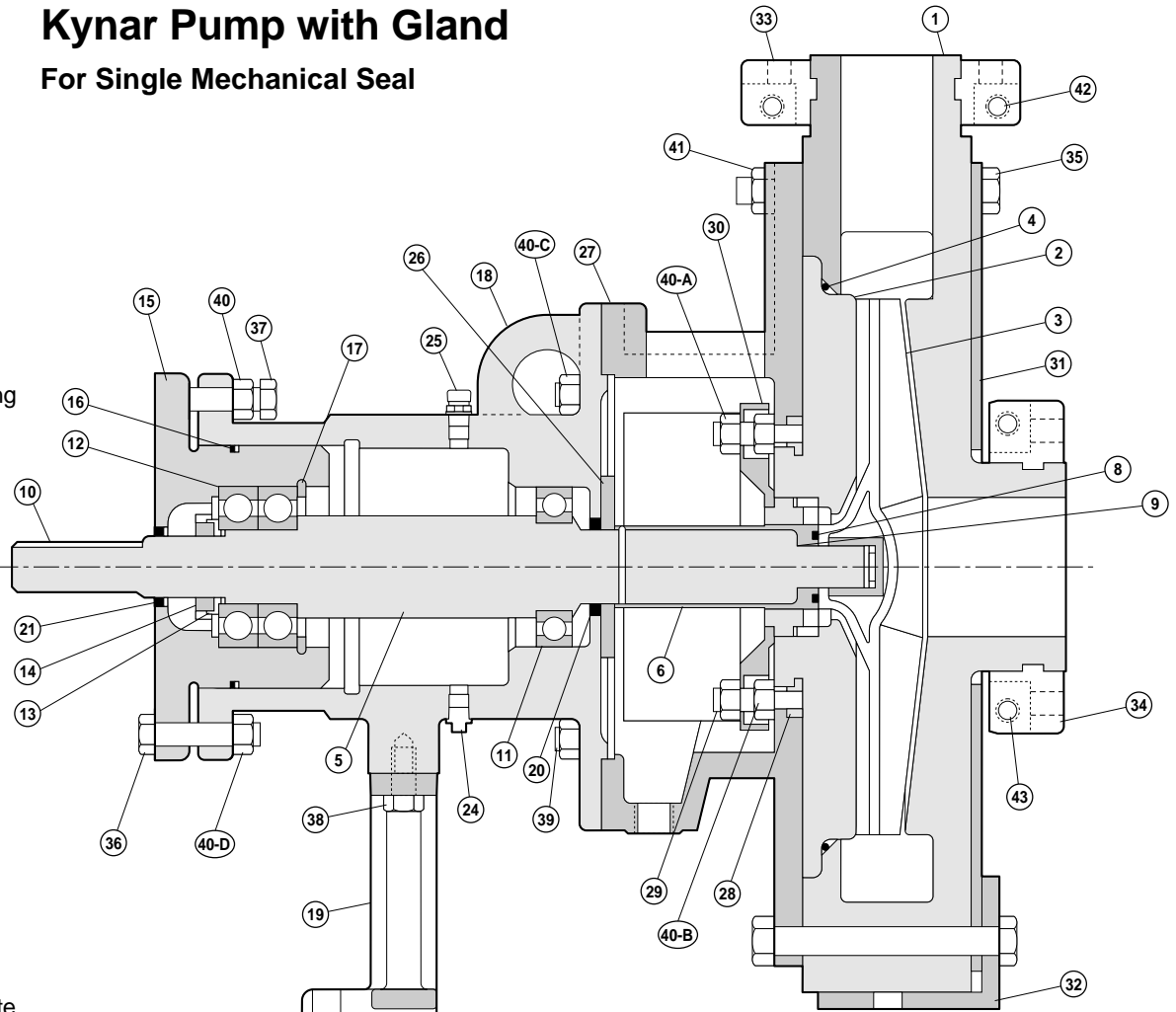
Setting The Impeller Clearance



1. Using the jam bolt (37-A), move the impeller and shaft assembly until the impeller touches the back cover.
2. With all bearing housing thru-bolts (36) and jam bolts (37-A, 37-B, 37-C) loose, slowly move the housing forward with one thru-bolt, while you rotate the shaft by hand. Continue until the impeller touches the front casing.
3. Screw the jam bolt (37-A) toward the bearing housing until it touches the housing. **Tighten the jam nut on the jam bolt.**
4. Again check that all thru-bolts are loose and, using the jam bolt (37-B), screw the bearing housing backward while slowly turning the shaft by hand **until the impeller touches the back cover.**
5. With a feeler gauge, measure the gap between the jam bolt (37-A) and the bearing housing.
6. Divide the distance in half, and back up jam bolt (37-B) half the total axial distance ("X"). **At this point, secure jam bolt (37-B) with its jam nut.**
7. Secure the bearing housing against jam bolt (37-A), and bring up jam bolts (37-A) and (37-C) and the thru-bolts (36).
8. **Single Mechanical Seal.** Refer to the seal manufacturer's recommendations, and secure the seal to the shaft sleeve by tightening the set screws or clamp.
Double Mechanical Seal. The seal length is preset by the stuffing box, and only the set screws need to be tightened. Use an Allen wrench through the flush tap.

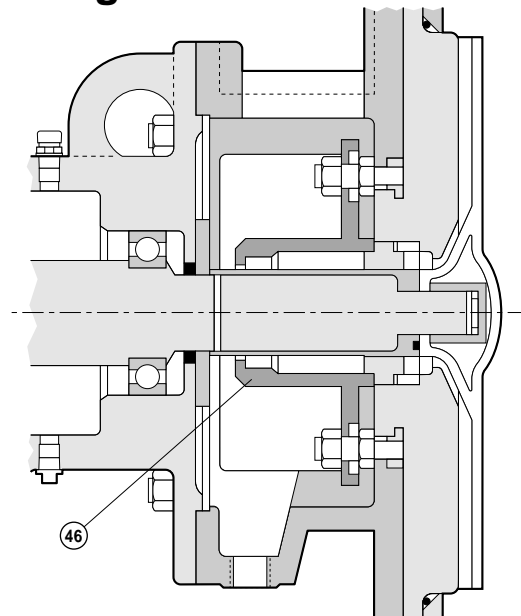
- 1 Casing
- 2 Cover, back
- 3 Impeller
- 4 Seal, casing
- 5 Shaft
- 6 Sleeve, shaft
- 8 O-ring, sleeve
- 9 Pin, sleeve drive
- 10 Key, shaft
- 11 Bearing, inboard
- 12 Bearing, outboard
- 13 Lockwasher, bearing
- 14 Locknut, bearing
- 15 Housing, bearing
- 16 Seal, bearing housing
- 17 Ring, bearing retaining
- 18 Frame
- 19 Support, frame
- 20 Seal, inboard oil
- 21 Seal, outboard oil
 - Gauge, sight oil
 - Oiler assembly
- 24 Plug, pipe
- 25 Breather
- 26 Deflector
- 27 Adaptor
- 28 Plate, mounting
- 29 Stud, mounting plate
- 30 Gland
- 31 Plats, front
- 32 Support, casing
- 33 Flange, split
- 34 Flange, split
- 35 Screw, hex-head cap
- 36 Screw, hex-head cap
- 37 Screw, hex-head cap
- 38 Screw, hex-head cap
- 39 Screw, hex-head cap
- 40 Nut, hex
- 41 Nut, hex
- 42 Screw, socket-head cap
- 43 Screw, socket-head cap
- Not Illustrated

Kynar Pump with Gland For Single Mechanical Seal



Kynar Pump with Stuffing Box For Double Mechanical Seal

(Other parts are the same as above)



Troubleshooting

Rev Date 6/15/02

Causes	Noise/ Vibration	No Flow	Not Enough Flow	Not Enough Pressure	Excess Power Required	Intermittent Flow	Short Bearing Life
Pump not primed	—	X	X	—	—	—	—
Speed too low	—	—	X	X	—	—	—
Excessive discharge head	—	X	X	—	—	—	—
Insufficient NPSH available	X	X	X	—	—	X	—
Impeller clogged	—	X	X	—	—	X	—
Wrong direction of rotation	—	—	X	X	—	—	—
Plugged suction or discharge line	X	X	X	—	—	—	—
Foot valve or suction line not immersed enough	—	X	X	—	—	X	—
Impeller damaged	—	X	X	X	—	—	—
Shaft packing or seal defective	—	—	X	X	—	—	—
Impeller diameter too small	—	—	X	X	—	—	—
Impeller diameter too large	—	—	—	—	X	—	X
Excessive amount of air or gas in liquid	—	—	—	X	—	X	—
Speed too high	—	—	—	—	X	—	X
Total head lower than design	—	—	—	—	X	—	—
Specific gravity or viscosity too high	—	—	X	—	X	—	X
Bent shaft	X	—	—	—	X	—	X
Improper electric motor wiring or voltage	—	—	—	—	X	—	—
Rotating elements bind	X	—	—	—	X	—	X
Leaky suction line or shaft seal	—	X	X	—	—	X	—
Misalignment	X	—	—	—	X	—	X
Bearings worn	X	—	—	—	—	—	X
Impeller out of balance	X	—	—	—	—	—	—
Suction or discharge piping not anchored	X	—	—	—	—	—	—
Improper foundation	X	—	—	—	—	—	—
Insufficient discharge head (excessive flow)	X	—	—	X	X	X	X
Improper lubricant or level	—	—	—	—	—	—	X
Impeller clearance too large	—	—	X	X	X	—	—



Note: *The troubleshooting of mechanical seals is ordinarily left to the seal manufacturer. However, the fact that Stan-Cor pumps are nonmetallic presents some possible problems that are particularly germane to plastic pumps. Refer also to Fig. 8 for a general guide to troubleshooting centrifugal pumps.*

Leakage At Rotating Face Of Mechanical Seal

Improper Setting of Rotating Member. Check the operating length of the mechanical seal to be sure the seal is set according to the manufacturer's recommendations:

- If too **long**, the spring force may not be sufficient to seal off at the rotating face.
- If too **short**, the spring force may be excessive and result in premature wear of rotating elements. Examine the rotating face for evidence of chemical attack.

Foreign particles Between Rotating Member and Stationary Seat. The mating surfaces of the rotating element and the stationary seat are highly polished, and the introduction of any foreign particles results in abrasion and leakage. These particles may be introduced on reassembly, or may precipitate from the fluid being pumped (e.g., crystallization in a saturated fluid). To reduce the possibility of foreign particles on reassembly, be very careful to keep both elements of the mechanical seal free of dust prior to assembly. Wipe the mating surfaces with a lint-free cloth saturated with clean, light oil. A double seal with flush may be required when solids are excessive.

Stationary Seat Cracked or Chipped. Check the stationary seat element for cracks or chips on the sealing surface which could cause excessive wear and leakage at the rotating face.

Mechanical Defects. Check the rotating member of the mechanical seal for defects in the body or clamp ring.

Leakage Behind Rotating Face Or At Clamp Ring Of Mechanical Seal

Mechanical Defects. Check the rotating member of the mechanical seal for defects in the body or clamp ring.

Teflon Bellows Not Concentric with Shaft. Apply Light pressure to the O.D. of the spring adaptor, while you rotate the impeller shaft until radial runout is eliminated.

Surface Defect in Shaft Sleeve. Check the surface of the shaft sleeve under the rotating member for scratches, indentations, or foreign particles which may cause leakage. Minor imperfections can be removed with emery paper.

Leakage Behind Retainer Gland From Stationary Seat

Foreign Particles Under Gaskets. Check the seat gaskets and back cover to be sure that they are clean and free of foreign particles.

Stationary Seat Cocked. If the retainer gland is not tightened squarely, the seat may be cocked, permitting leakage past the gaskets. Readjust the four hex nuts which hold the retainer gland in place, until leakage stops. Place the ceramic stationary seat into the back cover by hand: do not use the retainer gland to force the seat into position. Excessive torque loads on gland nuts may break the back cover.

Stationary Seat Cracked or Chipped. Slide the rotating element and retainer gland back, if possible, and inspect the stationary seat. Check carefully for hairline cracks or chips in the sealing area.



Limited Warranty

Wanner Engineering, Inc. extends to the original purchaser of equipment manufactured by it and bearing its name, a limited one-year warranty from the date of purchase against defects in material or workmanship, provided that the equipment is installed and operated in accordance with the recommendations and instructions of Wanner Engineering, Inc. Wanner Engineering, Inc. will repair or replace, at its option, defective parts without charge if such parts are returned with transportation charges prepaid to Wanner Engineering, Inc., 1204 Chestnut Avenue, Minneapolis, Minnesota 55403.

This warranty does not cover:

1. The electric motors (if any), which are covered by the separate warranties of the manufacturers of these components.
2. Normal wear and/or damage caused by or related to abrasion, corrosion, abuse, negligence, accident, faulty installation or tampering in a manner which impairs normal operation.
3. Transportation costs.

This limited warranty is exclusive, and is in lieu of any other warranties (express or implied) including warranty of merchantability or warranty of fitness for a particular purpose and of any noncontractual liabilities including product liabilities based on negligence or strict liability. Every form of liability for direct, special, incidental or consequential damages or loss is expressly excluded and denied.



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