



SUBMERSIBLE TURBINE

ASSEMBLY MANUAL

TABLE OF CONTENTS

SUBMERSIBLE TURBINE KIT

Recommended Equipment	2
Assembly Instructions	3-9
Special Tools	10-12

RECOMMENDED EQUIPMENT

MACHINERY AND TOOLS

The minimum basic hand tools and equipment needed for submersible turbine assembly:

1. Assembly Fixture Kit – 305386901 (see Special Tools section, pages 10-12, for additional information)
2. Collet Hammer for 5" and 6" STS – 305385101
3. Collet Hammer for 8" and 9" STS – 305385102
4. Allen wrenches – SAE or standard (preferably T-handle design)
 - 5/32" is used for sand collar set screws
 - 1/8" is used for motor coupling set screws
 - 3/8" for STS upthrust adjustment
5. Combination wrench or socket and ratchet set
 - 5/16" for cable guard screws
 - 7/16" for 6" sub-turbine bowl bolts
 - 9/16" for 8" sub-turbine bowl bolts
 - 1-1/8" for upthrust lock nut
6. Flat-head or standard large screwdriver
7. Ball peen hammer
8. Set of 1/8" stamps for imprinting nameplate information and date code
9. Dow Corning® 111 Valve Lubricant and Sealant (food grade grease)
10. Loctite® 243
11. Fine emery cloth or steel wool for deburring purposes

Additional machinery and/or equipment will be required if the assembler desires the ability to cut and deburr shafting and cable guards or remove and install bronze bearings.

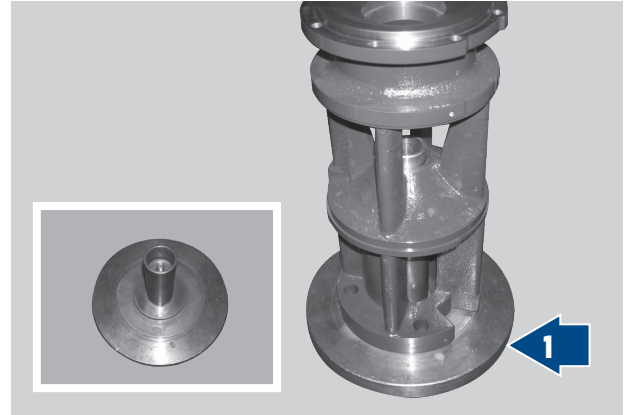
OPTIONAL TOOLS AVAILABLE

1. 5" or 6" STS Bowl Bolt Assembly Tool – 305471902
2. 8" or 9" STS Bowl Bolt Assembly Tool – 305471998

ASSEMBLY INSTRUCTIONS

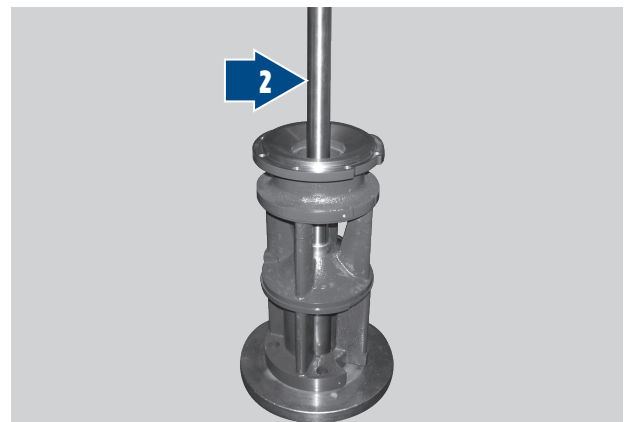
1. Place the bracket on the vertical build fixture.

- See Special Tools section (pages 10-12) for fixture dimensions.
- Bronze bearing is pre-installed into the motor bracket.



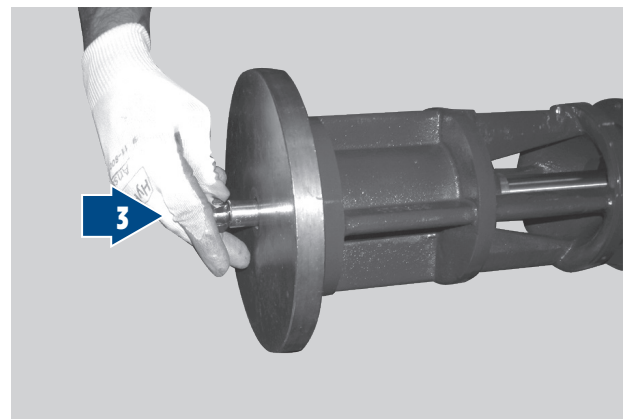
2. Inspect shaft straightness. The pump shaft must be straight to within 0.002" total indicator runout (TIR) when the shaft is supported at each end. Shaft straightening should be done mechanically and without using heat.

- If the shafts are cut to length, be sure the cut is square and chamfer the end.
- Shafts are offered "cut to length" for standard stage counts and as double keyed sections in lengths of 4', 6', 8' and 10'.



3. Tip the assembly over and hand-tighten the fixture bolt with a wrench.

- See Special Tools section (pages 10-12) for fixture bolt size.



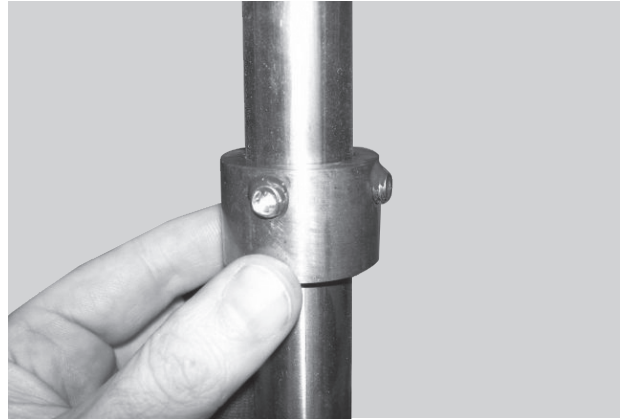
4. Apply Loctite® 243 to set screws of the sand collar.

Thread set screws into the sand collar. Make sure set screws do not stick out into ID of the sand collar.

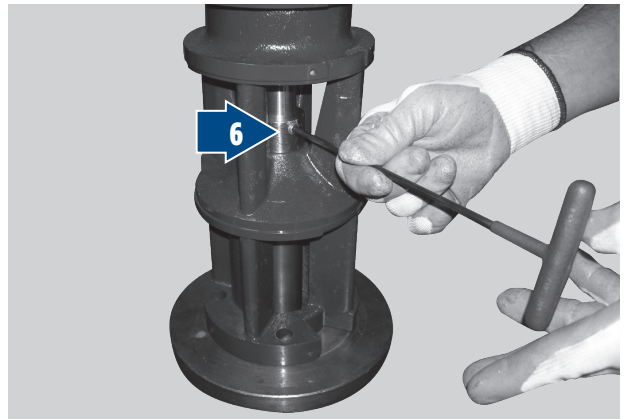


ASSEMBLY INSTRUCTIONS

5. Install the sand collar onto the shaft and push over bracket bearing until seated.

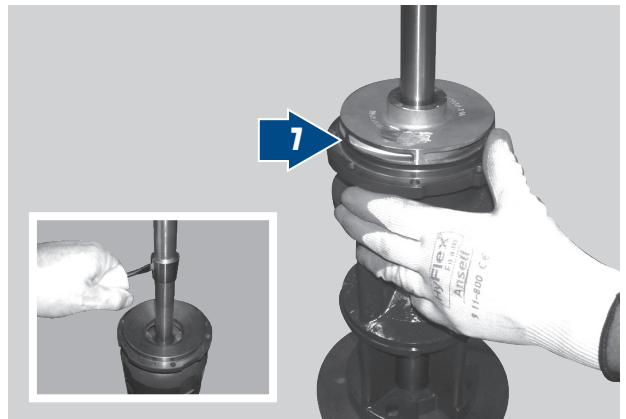


6. Tighten the sand collar set screws to 100-120 lb-in.



7. Install the impeller onto the shaft and position the bottom against the bracket/bowl. Slide the collet onto the shaft and position into impeller. A flat screwdriver may be needed to spread collet while sliding.

- When using a mix of impeller trims, always start the sub-turbine build with the largest impeller diameter, A-Trim, followed by the B-Trim, and ending with the C-Trim impellers.



8. Drive the collet into the impeller using the collet drive hammer. Collet will not drive flush. Continue to hammer the collet until the impeller is secure on the sub-turbine shaft.



ASSEMBLY INSTRUCTIONS

9. Slide the bowl onto the shaft.
 - For 6" STS, align the cable guard indentions on the outside of the bowl.
10. Secure the bowl with bowl bolts (an impact or torque wrench is recommended).

5" STS: Torque bolts to 7-8 lb-ft. All stages will receive 12 bolts.

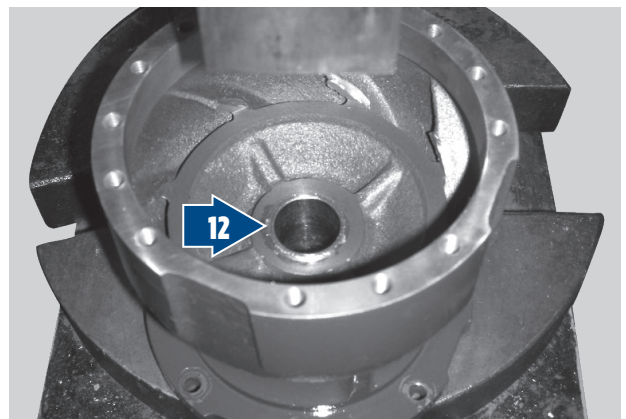
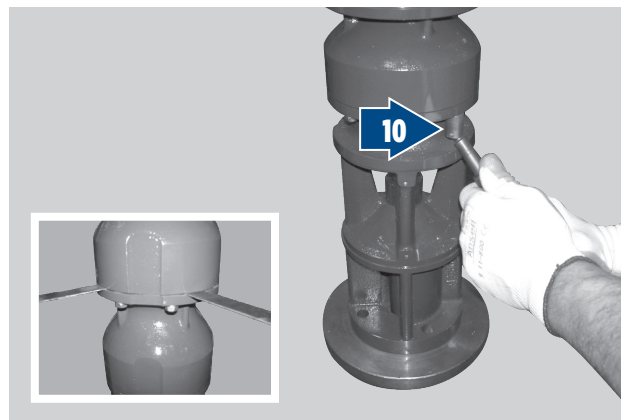
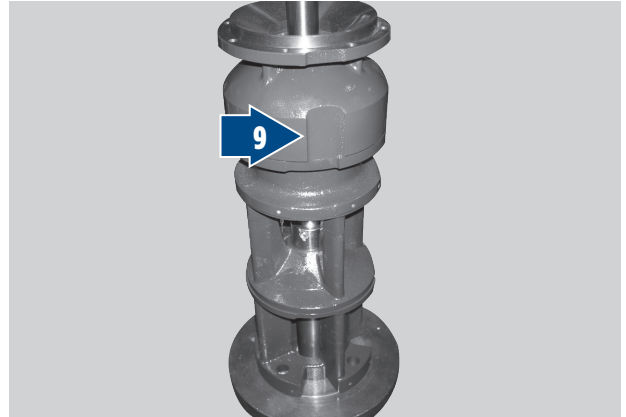
6" STS: Torque bolts to 7-8 lb-ft. Stages 1 through 9 will receive 8 bolts. The top of stage 9 and higher will receive 14 bolts due to the use of XP bowls.

 - For 100 gpm 6" STS pumps longer than 13 stages, use three 0.030" shims between the next set of bowls after installing the 10th bowl (as depicted in the picture). Tighten bowl bolts to snug. After bowl bolts are snug, install the impeller and collet. Next, remove the shims and tighten the bowl bolts normally. Repeat shimming procedure for all remaining stages until all impellers are installed.

8" STS: Torque bolts to 18-20 lb-ft. Stages 1 through 12 will receive 8 bolts. The top of stage 13 and higher will receive 16 bolts due to the use of XP bowls.

9" STS: Torque bolts to 18-20 lb-ft. All stages will receive 16 bolts.
11. Repeat steps 7 through 10 for all stages up to the last bowl.

Do not install an impeller between the last bowl and the discharge bracket.
12. Press top bearing into the top bowl assembly.



ASSEMBLY INSTRUCTIONS

13. Fill discharge 1/4 full with Dow Corning® 13 111 grease.



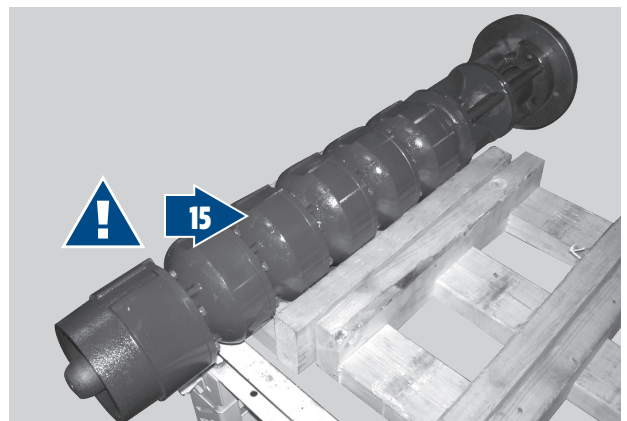
14. Attach the discharge with bolts as in steps 10-11.

6" and 8" STS: Ensure the cable guard holes on the discharge are lined up with the cable guard holes on the motor bracket.

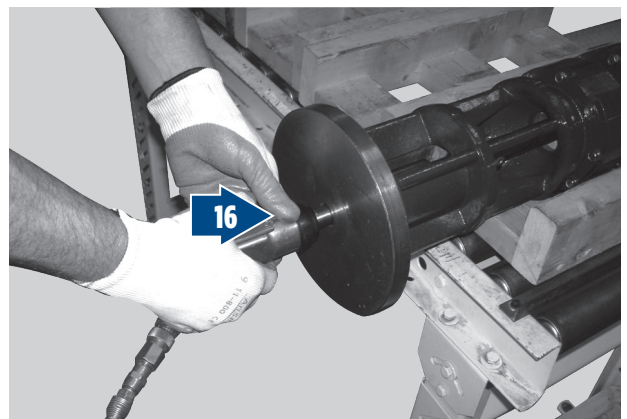


15. Lift the pump with proper support and lay down horizontally.

CAUTION Prevent from rolling.

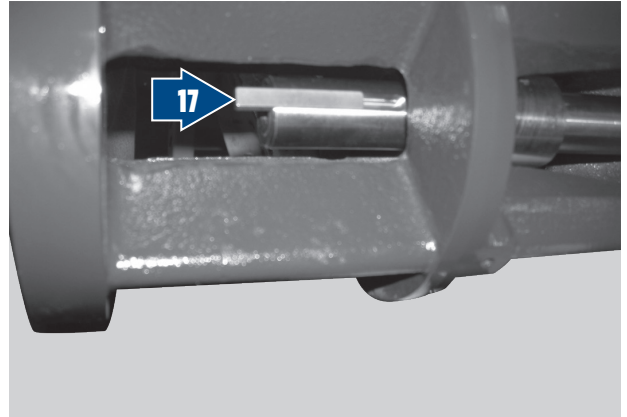


16. Remove the fixture bolt from the pump shaft.
Use the impact wrench as necessary.

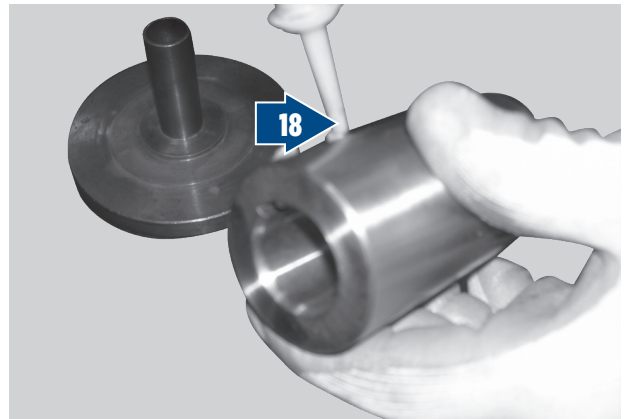


ASSEMBLY INSTRUCTIONS

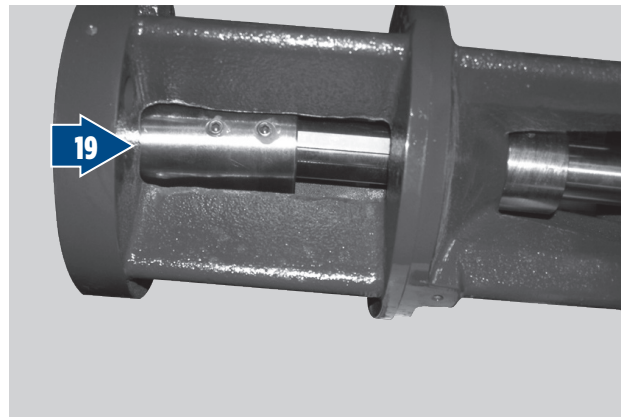
- 17.** Place key on the pump shaft as shown.



- 18.** Apply Loctite® 243 to the motor coupling set screws. Install set screws so they are clear of the keyway.



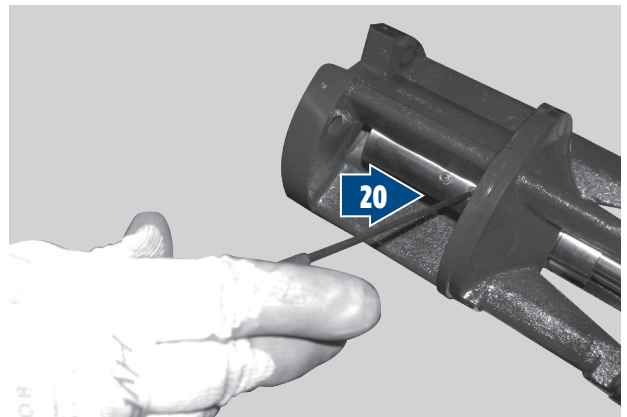
- 19.** Aligning the key, slide coupling onto the shaft until seated.



- 20.** Tighten the set screws onto the key.

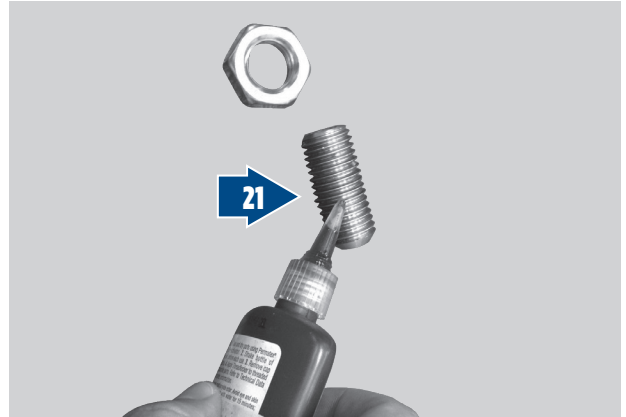
Torque Values:

- 5x6, 6x6, 8x6, and 9x6 = 50-60 lb-in.
- 8x8, 9x8, and 9x10 = 100-120 lb-in.

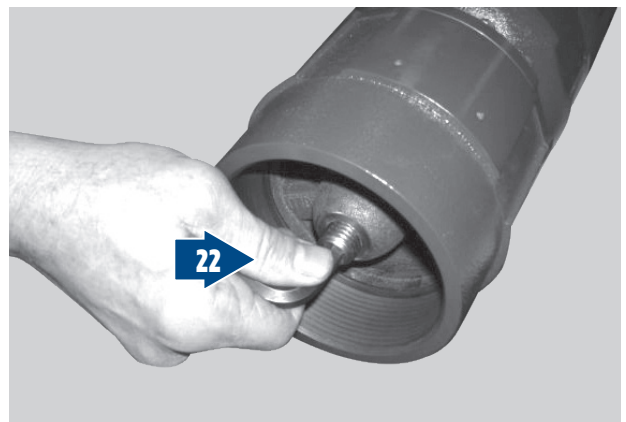


ASSEMBLY INSTRUCTIONS

- 21.** Apply a small bead of Loctite® 243 to the upthrust bolt.



- 22.** Install the upthrust bolt into the discharge until contact is made with the top of the shaft and all downplay is taken up.

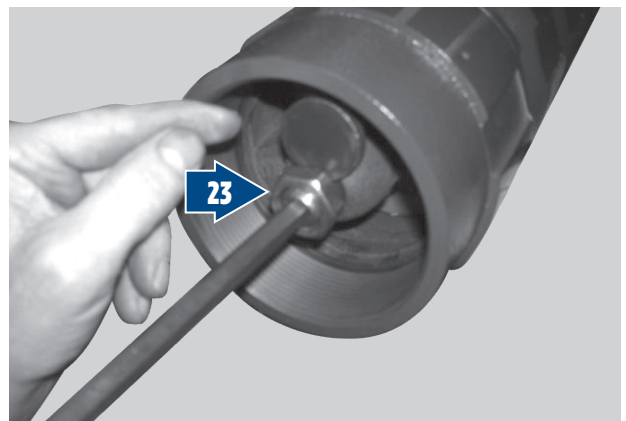


- 23.** Unscrew bolt and nut together until the upthrust spacer can be installed between the nut and the discharge bearing housing.

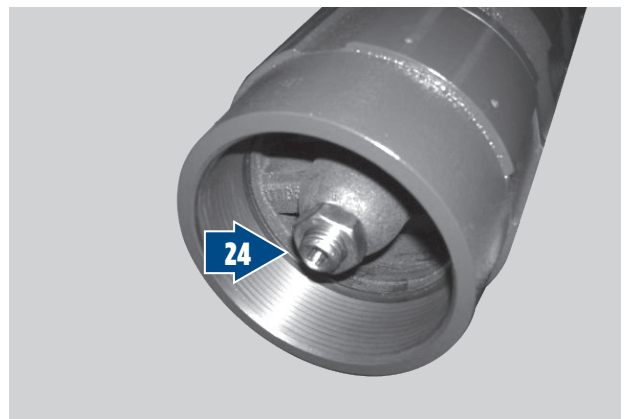
5" or 6" STS: Spacer thickness = 0.221"

8" or 9" STS: Spacer thickness = 0.250"

- An alternative procedure to using the spacer is to back out the 5" or 6" STS upthrust bolt 2-1/4 turns or the 8" or 9" STS upthrust bolt 2-1/2 turns, then secure the position by tightening the lock nut.

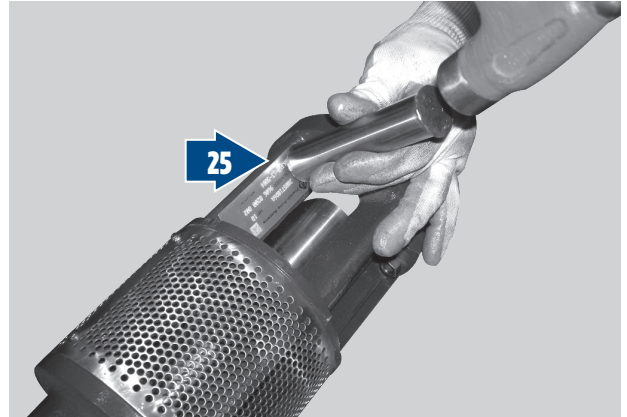


- 24.** Remove spacer and tighten the lock nut against the discharge, holding the bolt constant and without rotation.

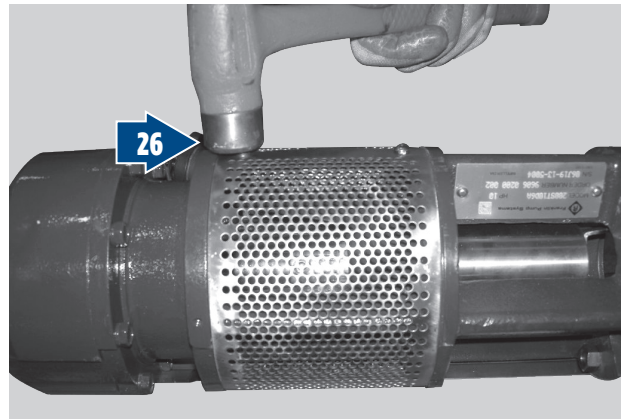


ASSEMBLY INSTRUCTIONS

- 25.** Install the nameplate onto the bracket.



- 26.** Install the suction screen using the supplied drive screws.



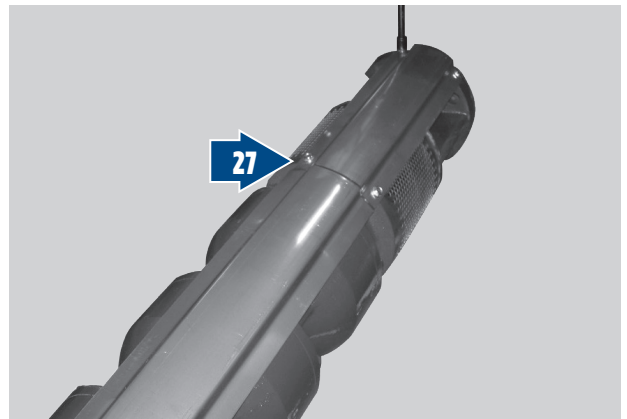
- 27.** Cable guard installation:

5" STS: Install the cable guard using the supplied screws and cable clamp. Torque screws to 20-23 lb-in. Install the cable clamp between the discharge and top bowl, as noted in picture.

6" STS: Install the cable guard using the supplied screws. Torque screws to 20-23 lb-in.

8" STS: Install the cable guard using the supplied screws. Torque screws to 20-23 lb-in.

9" STS: Install the cable guard using the supplied screws. Torque screws to 20-23 lb-in. Install the cable clamp between the discharge and top bowl, as noted in picture.

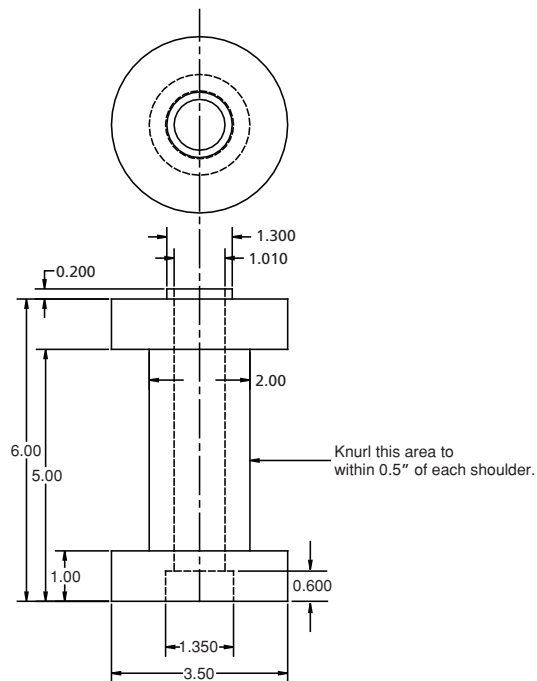


SPECIAL TOOLS

COLLET HAMMER TOOLS

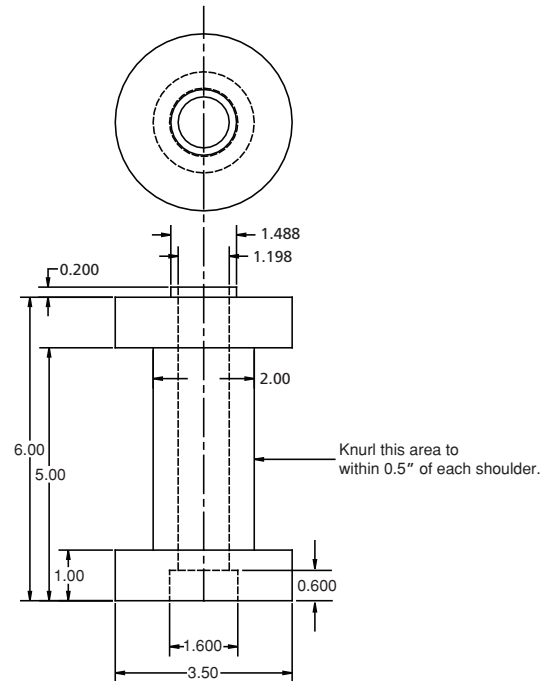
5" or 6" STS

Item #305385101



8" or 9" STS

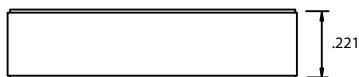
Item #305385102



UPTHRUST SPACERS

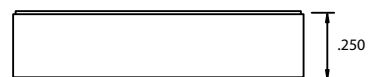
5" or 6" Upthrust Spacer

Item #305472501



8" or 9" Upthrust Spacer

Item #305472502



Note: An alternative procedure to using the spacer is to back out the 5" or 6" STS upthrust bolt 2-1/4 turns or the 8" or 9" STS upthrust bolt 2-1/2 turns, then secure the position by tightening the lock nut.

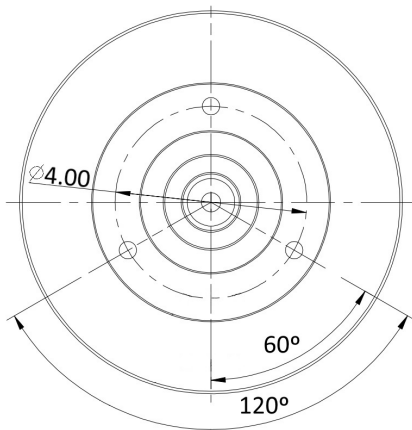
SPECIAL TOOLS

5x6, 6x6, 8x8, 9x8, and 9x10 ASSEMBLY FIXTURE KIT

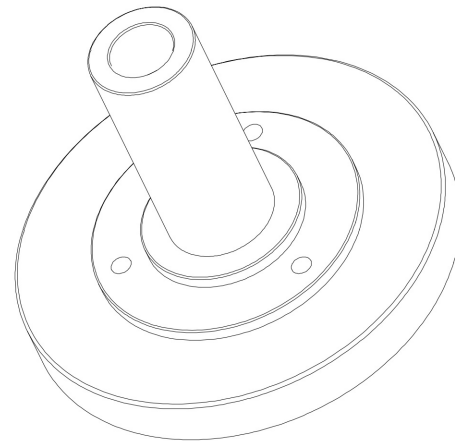
STS assembly fixture for 5x6, 6x6, 8x8, 9x8, and 9x10 configurations.

Kit includes 5", 6", 8", and 9" Assembly Fixture, 8x6 and 9x6 Assembly Plate, Plate Screws, and Shaft Bolts.

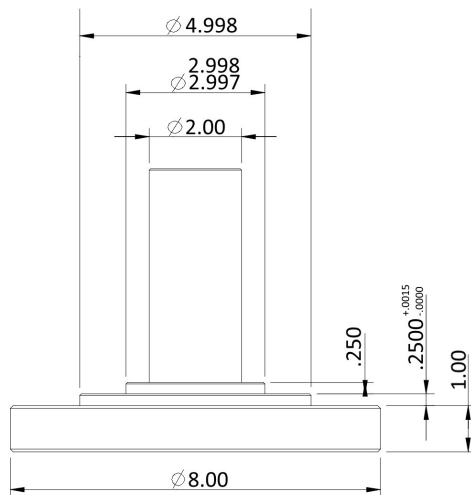
Item #305386901



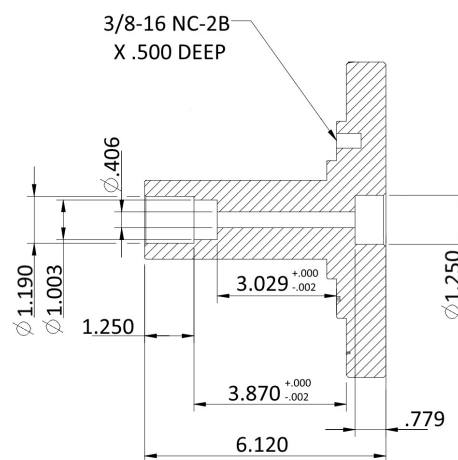
Top View



Isometric View



Side View



Cross Section

Note: Use 3/8-16 UNC -x 4" long bolt to hold shaft for 5" or 6" turbine assembly.

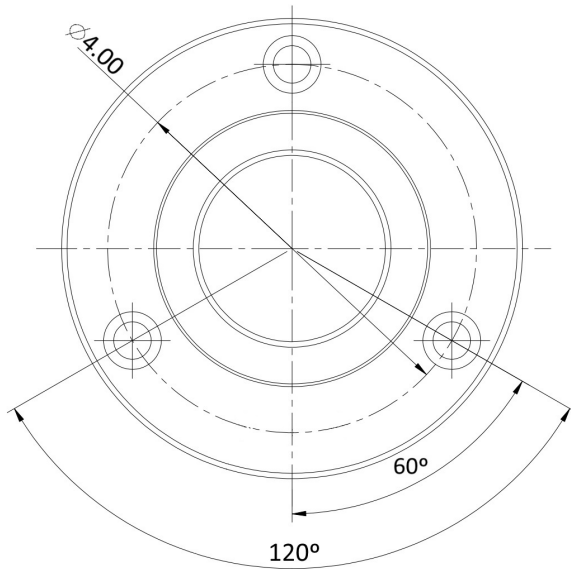
Use 3/8-16 UNC -x 4 -1/2" long bolt to hold shaft for 8" or 9" turbine assembly.

SPECIAL TOOLS

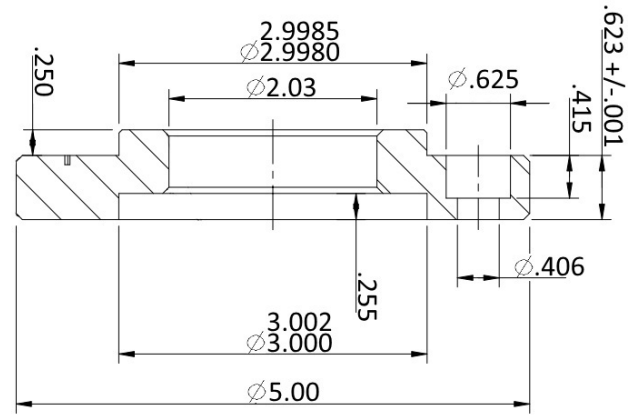
8x6 and 9x6 ASSEMBLY FIXTURE KIT

STS fixture adapter plate for 8x6 and 9x6 configurations.

Item #305386901



Top View



Side View

NOTES

TOLL FREE HELP FROM A FRIEND

1-800-348-2420

FAX: 1-260-827-5102

Phone Franklin's toll free SERVICE HOTLINE for answers to your pump and motor installation questions. When you call, a Franklin expert will offer assistance in troubleshooting and provide immediate answers to your system application questions. Technical support is also available online.

Visit our website at

www.franklinwater.com



Franklin Electric