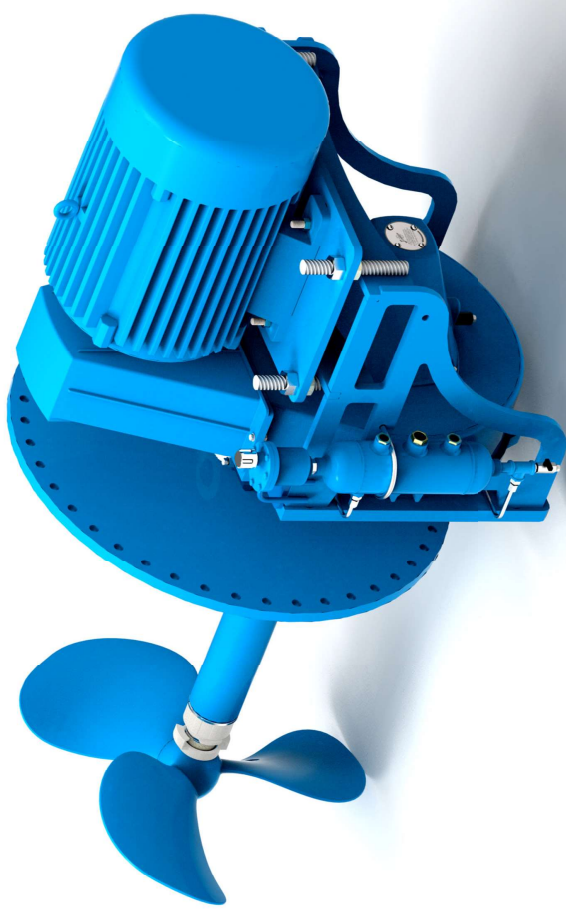


SERIES

800

INSTALLATION AND OPERATIONS MANUAL



When mixers are delivered, check for shipping damage.

Report damage to carrier and Jensen Mixers.

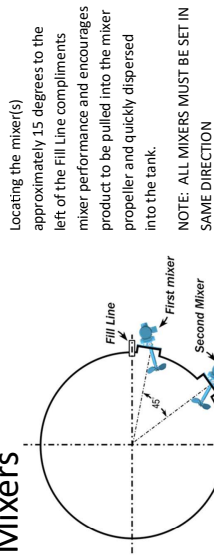
Installation Series 800 Fixed and Vari-Angle Mixers

- Remove blank manway plate from tank nozzle and check Jensen supplied mixer mount for correct size, hole location and orientation.
- Clean gasket surface on tank nozzle and mating flange on mixer mount.
- Mount propeller on shaft (secure both setscrews on propeller lock assembly) confirm manway is large enough for propeller to roll through opening. (See page 4 for propeller roll through opening specs.)
- Install gasket and bolt mixer mount to manway. No additional supports are necessary.
- For units with factory mounted motors, the installation is now complete.
- If motor installed on site; mount the motor to the mounting plate and loosely position the drive pulley on the motor shaft. Install belts and check alignment and belt tension. (See Pg.5)
- Be sure the latch bar bolts are tight, if VA mixer was installed. If any excessive vibration is detected, make sure the propeller tips are not less than 8" (203 mm) from any obstruction.
- Re-install all belt guards.
- Allow enough flexible electrical cable from the rigid conduit to the mixer to allow the VA mixer, (if VA mixer is being installed,) full swing. Follow existing electrical code.

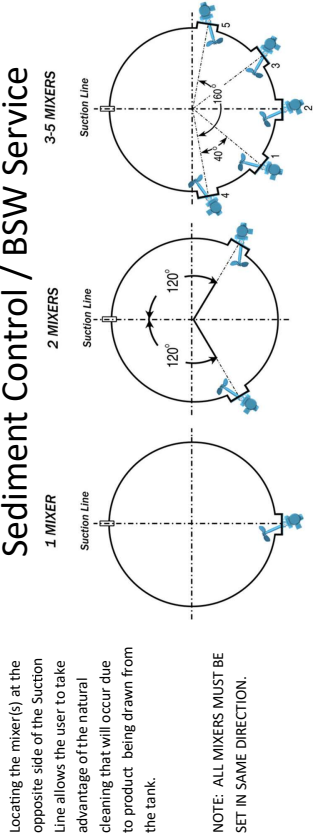


Placement for Jensen Mixers

Blending Service



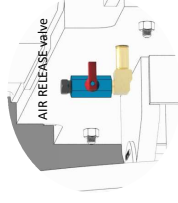
Sediment Control / BSW Service



NOTES

Startup

- Start motor for 5 seconds maximum, to check shaft or propeller rotation. Verify mixer shaft turning clockwise when viewing mixer from behind, looking towards the tank.
- Once tank fluid is above mixer shaft, open AIR RELEASE valve to vent the trapped air and allow tank product to lubricate the seal.
- Fluid must be 10 feet (3 meters) above the propeller for safe operation.
- If any noise other than that of the propeller moving the fluid in the tank or the hum of the motor, shut down motor, investigate and correct.
- Inspect the motor current with an amp meter. Confirm on both electrical legs to that the amperage is less than that printed on the motor name tag.
- Inspect belt deflection and tension after the first 8 hours of operation.
- Units with factory installed actuator, see actuator operation sheet.
- Units should be checked at least once within 24 hours of startup.



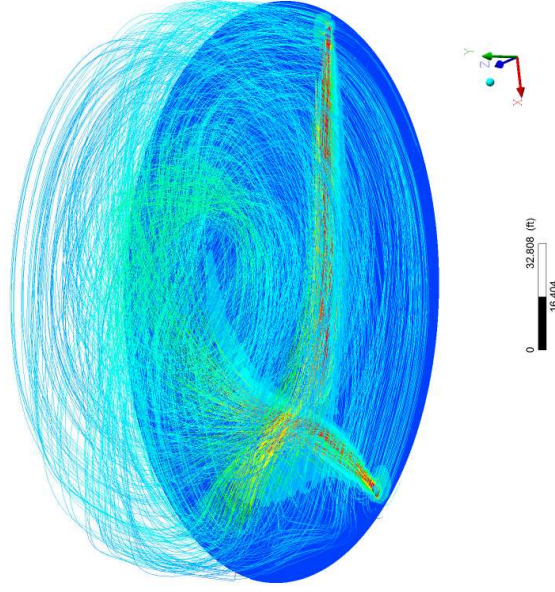
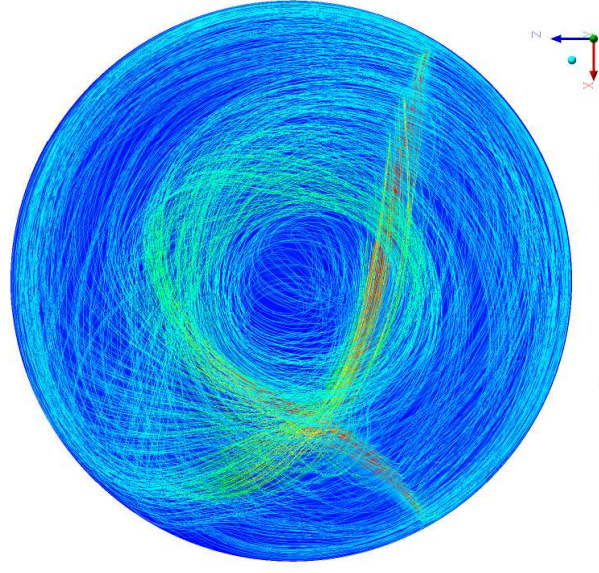
Recommended Operation:

- Existing sediment accumulation; operate mixer continuously provided fluid level exceeds 10 feet (3 meters) from floor and sediment content in outgoing stream is acceptable. Recommended angle variation positions adjusted monthly; -30° to -5° to 30° then repeat.
- Sediment control on clean tanks; start mixer 8 hours before pump-out. Continue until tank is half full. This procedure will need to be modified to suit climate and conditions. In controlling sediment, angle variation need be made only about once each month.

Periodic Maintenance:

The maintenance schedule based on operation of 8 hours/day.

- WEEKLY: Observe Center Sight Glass on Sentry System for fluid, this will be indication of seal issues.
- WEEKLY: Check external moving parts for abnormal wear.
- MONTHLY: Check for noise and vibration during operation. (See Troubleshooting if occurs)
- MONTHLY or AS NEEDED: Check belt deflection, wear and condition.
- QUARTERLY: Grease hinge zerk if Jensen Actuator is installed.

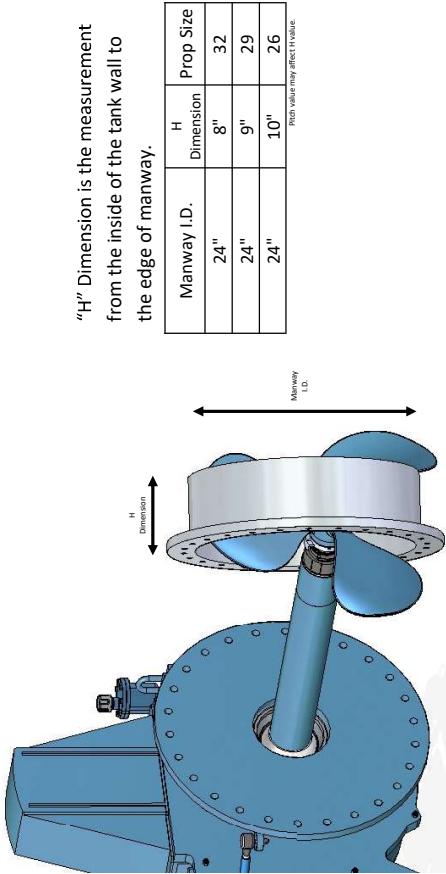


Propeller Clearance & Fluid Levels

Almost every vibration problem experienced with Jensen Mixers has proved to be a result of too little clearance between tank walls or floors and the mixer propeller. Operation of mixers with low fluid levels in the tank will cause air to be drawn into the propeller flow stream and will also cause vibration.

Propeller Diameter	Fluid Level Above Propeller Centerline	Clearance between Prop Tip & Floor
35" (889mm)	10' (3.1m)	12" (305mm)
32" (813mm)	8' (3.1m)	12" (305mm)
29" (737mm)	7' (2.1m)	12" (305mm)
26" (660mm)	6' (1.9m)	10" (254mm)
23" (584mm)	6' (1.9m)	8" (203mm)

Propeller Manway Roll Through Clearances.



Manway I.D.	H Dimension	Prop Size
24"	8"	32
24"	9"	29
24"	10"	26

*From inside tank, offset 1/4" radius.

Example: A 32" propeller will rotate through a 24" opening provided the depth of opening is 9" or less

LONG TERM STORAGE

Jensen recommends long term (more than 90 days) storage procedures to protect mixers from atmospheric corrosion, physical damage and other harmful effects. Proper storage is especially important in corrosive or high humidity environments. Store and maintain related equipment (motors, control panels and similar devices) supplied by Jensen according to manufacturers' instructions. Failure to store and protect Jensen mixers properly may void any warranty, expressed or implied.

Pre-storage Inspection

When mixers are delivered, check impellers, impeller shafts and gearbox for shipping damage. Report damage to carrier and Jensen Mixers. Protect any carbon steel components from corrosion and check protective shipping coatings. Renew if necessary. Use heavy grease with corrosion inhibitor or thick spray such as Holt Lloyd Corp. LPS-3. New gear drives do not require additional internal protective procedures if storage is less than 90 days.

Storage Locations

Each type of storage location requires different procedures.

- Location 1 (preferred): a dry, enclosed, temperature and humidity controlled environment. Relative humidity of 40% or lower is ideal.
- Location 2 (acceptable): a dry, enclosed area such as a warehouse. (Marginally acceptable is an open shed with concrete floor).
- Location 3 (not recommended): outdoors under waterproof covering or mounted in operating location.

Storage Preparation and Maintenance

Jensen recommends the customer store mixers mounted on factory-provided skids in original crating.

- Store each drive unit in its operating position, then fill gearbox to proper level with recommended lubricant. Rotate coupling until drive output shaft makes two complete revolutions.
- Connect motor heaters, if supplied to a proper power source.
- On side-entering mixer drives without motors installed, cover coupling half with heavy plastic sheet or bag and secure with cord or adhesive tape. On 500 Series mixers, wrap exposed mechanical seal with paper impregnated with corrosion inhibitor, then overwrap with plastic sheet. Cover motors and mixers with plastic or tarpaulins; secure.
- Check at 30-day intervals. Rotate motor shafts and rotate couplings for three or more complete rotations of output shafts.
- Store and maintain mixers according to location-specific instructions.

Location-Specific Storage Instructions

- Location 1.** Perform preparation and maintenance step 4 above.
- Location 2.** Cover motor completely but do not seal off to prevent accumulation of moisture. Cover gear drive securely. Extreme conditions may require use of portable dehumidifiers or placement of renewable desiccant bags under coverings.
- Location 3.** Cover motor completely but do not seal off to prevent accumulation of moisture. Cover gear drive securely. Secure all coverings against wind and rain. Extreme conditions may require placement of renewable desiccant bags under coverings.

Preparation for Service after long term storage:

- Remove all protective materials and coverings. Wipe off dirt and oil.
- Check greased bearings; re-grease if necessary.
- Pour 32oz. tank compatible lubrication fluid into air vent to pre-lubricate seal. Hand rotate mixer through three full prop revolutions.
- If applicable: Drain 10 percent of storage lubricant volume to remove condensed moisture. Adjust lubricant level with proper lubricant. Putting mixers in service with contaminant-free storage lubricant is permissible.
- Check alignment of motor couplings. Follow procedures in manual.
- Review mixer manual thoroughly and follow installation, start up and operating procedures.

Material Standards

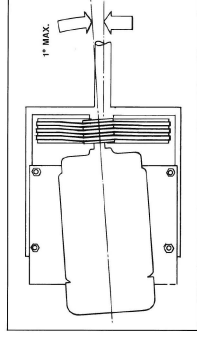
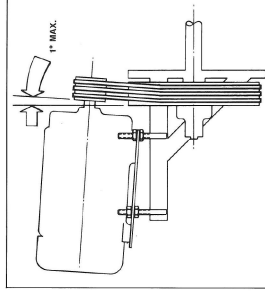
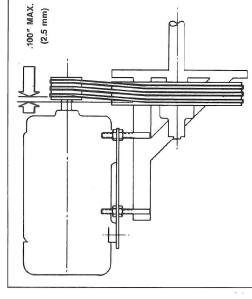
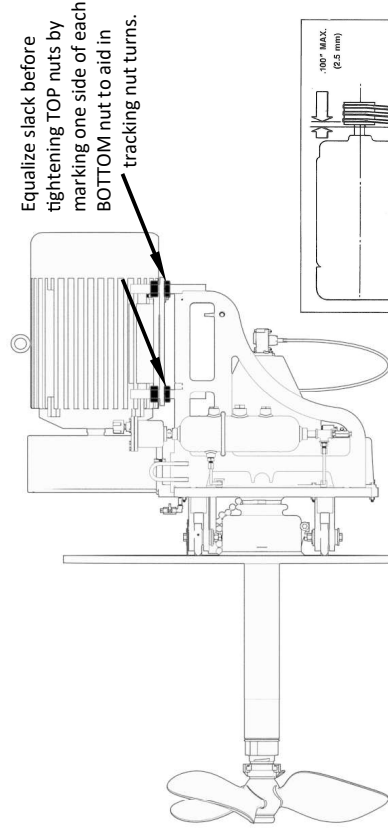
Parts & Materials	American	British	German
Cover & Housing			
Aluminum Casting 356-T6	ASTM B108 Cl. SG70A		DIN 1725
Aluminum Casting 319F	ASTM B108 Cl. SC64D		DIN 1725
Body			
Iron Casting	ASTM A48 Cl. 25		DIN 1693
Adapter			
Carbon Steel Plate	ASTM A283 Gr. D	BS.4360	DIN 17100
Round Electric Weld Tube	ASTM A500 Gr. B		
Weld Filler Rod	ASTM A233 Type 7024		
Weld Filler Rod	ASTM A316 Type 7018		
Motor Mount			
Carbon Steel Plate	ASTM A283 Gr. D	BS.4360	DIN17100
Carbon Steel Square Type	ASTM A500 Gr. B		
Weld Filler Rod	ASTM A233 Type 24		
Mixer Mount			
Carbon Steel Plate	ASTM A283 Gr.D	BS.4360	DIN 17100
Shaft			
Stainless Steel Rod	ASTM A182		
Propeller			
Cast Steel	ASTM 216 Gr. 70		
Weld Filler Rod	ASTM A233 Type 7024		
Lock Ring & End Bushings			
Stainless Steel Type 316SS	ASTM A351 Gr. CF8M		
Bolts & Nuts			
Stainless Steel Gr.2	ASTM A307		DIN 1711
Alloy Steel Gr.5	ASTM A449		
O-Rings			
Viton GFLT	ASTM D2000-7B Spec. AMS 7278		

Motor Belt Alignment

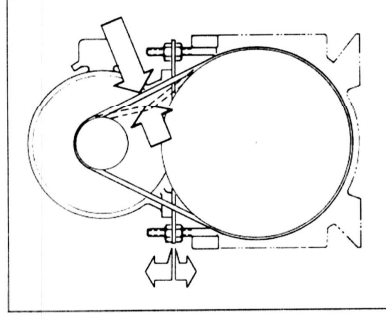
V-Belt and Cog Belt Drive Maintenance:

- Check alignment of pulleys.
- Maintain uniform tension.
- Avoid heat above 140°F. (60°C)
- Keep drives well ventilated.

- Never use belt dressing.
- Worn sheaves reduce belt life.
- Do not allow oil on belts.
- Never force belts onto sheaves.

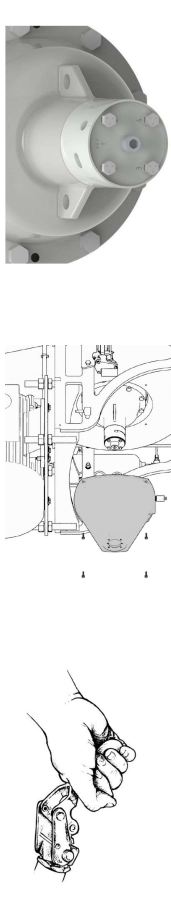


BELT DEFLECTION SHOWN

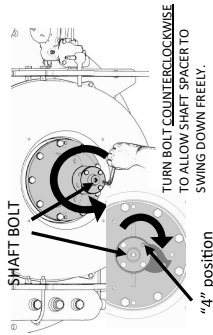


PETRO-BLOCK ANNUAL CYCLE

REQUIRED TOOLS: (1) 1/2" WRENCH, (2) 9/16" WRENCHES, (1) 3/8" ALLEN KEY, (1) 3/16" ALLEN KEY, (1) 3/4" SOCKET, (2) FLATHEAD SCREWDRIVERS, (1) 2" ADJUSTABLE WRENCH
Before any work is performed VERIFY lock out/tag out of mixer.

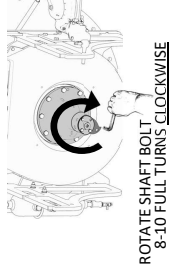


1. Pull the red handle to engage the PETRO-BLOCK
2. Remove yoke cover (and actuator if attached)



4. Using the 3/8" Allen key turn the shaft bolt in the center counterclockwise 1-2 rotations to loosen the shaft spacer.

If mixer is in product open vent before trying to drawing shaft backwards!
5. Remove the 3/8" bolt in the "4" position (lower right) and allow the shaft spacer to swing freely.



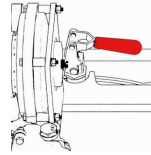
6. Using the Allen key, turn the shaft bolt clockwise, drawing shaft backwards until it comes to a stop (approximately an inch/ 20cm).

If mixer is in product open vent before trying to drawing shaft backwards!

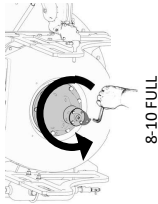
7. Now is the time to reset the red handle of the PETRO-BLOCK to the down position.



3. Position yoke with tabs horizontally and the "4" at the rear on the lower right with the arrow pointing UP.



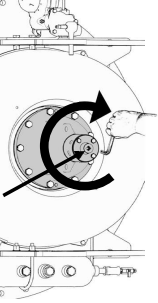
RETURNING THE MIXER TO A RUN POSITION



1. Turn allen key COUNTER-CLOCKWISE to extend shaft into RUNNING position.



2. Rotate in SHAFT SPACER to install. Install retaining bolt previously removed into hole marked "4".



3. Turn allen key CLOCKWISE to seat shaft against SHAFT SPACER
4. Reinstall covers and actuator.

LIMITED WARRANTY

Jensen Mixers are warranted against defects in materials or workmanship for a period of 12 months following date of purchase. This warranty is limited to replacement or repair of the agitator by Jensen only and does not cover consequential damages, removal, freight or re-installation. Electric motors are warranted by their respective manufacturers and are excluded from the Jensen warranty.

- Jensen will repair or replace, without charge, any part or parts which prove to be defective, under normal and proper use, within twelve months from the date of shipment.
- Jensen will not be held liable for any claims or charges for labor and/or parts resulting from repair or modification of Jensen products without prior written approval.
- Sub-assemblies installed on Jensen mixers, but not manufactured by Jensen, are covered by the original manufacturer's guarantee and are excluded from the guarantee.
- In no case shall Jensen's liability exceed the cost of repair or replacement of the mixer involved.
- Jensen will supply increased horsepower or additional mixers, without charge, should any mixer fail to satisfactorily perform the process for which it was recommended.
- Mixers must be installed and operated in accordance with Jensen's formal recommendation.
- All pertinent process data must be supplied to Jensen prior to the issuance of a formal recommendation.
- Recommendations issued by Jensen representatives, or agents, shall not be binding unless confirmed, in writing, by Jensen.
- It shall be Jensen's prerogative to determine what course of action is most satisfactory in the event of a claim on the process guarantee.
- The process guarantee shall be valid for twenty-four months following the date of shipment.
- In no event shall Jensen be liable for special or consequential damages.
- No other guarantees, express or implied, shall be applicable.



To: Distribution
From: Applications Engineering
Re: API 650 Torque Values
Date: February 2004

Bolt Torque Values for API 650 Roof Manholes and Shell Manholes

Roof Manholes

Roof manholes should not present any sealing problems since they see no pressure or media. The 20" and 24" standard roof manholes use 16 and 20, 5/8" bolts respectively. API 650 specifies full-face gaskets. We would recommend the following torques for full-face gaskets.

20" Roof Manhole – 78 ft.lbs. to 120 ft.lbs. (23,400 psi to 60,000 psi bolt stress)

(Resulting Gasket Stress = 600 psi to 923 psi)

24" Roof Manhole – 73 ft.lbs. to 120 ft.lbs. (21,900 psi to 60,000 psi bolt stress)

(Resulting Gasket Stress = 600 psi to 986 psi)

The available gasket stresses shown above are well suited for rubber gaskets. To safely attain these torque values ASTM A193 B7 bolts are required.

Shell Manholes

Shell manholes see head pressure from the liquid media inside the vessel. API 650 specifies that "long fiber sheet" gaskets be used. For all the manhole sizes, Garlock's minimum compressive stresses can not be achieved. However, compressed non-asbestos materials have worked successfully. This can be attributed to the fact that we are sealing against liquid and the pressures are very low. The torques given in the following tables are based on developing a bolt stress of 60,000 psi to 75,000 psi in ¾" bolts, specified for all the shell manhole sizes. Therefore, ASTM A193 B7 or bolting with equal or greater yield strength must be used.

Gasket Compressive Stresses for Ring Gaskets (psi)				
Nominal Shell Manhole Size	Number of ¾" Bolts	Gasket Stress at 60ksi Bolt Stress	Bolt Torque at 60ksi Bolt Stress	Bolt Torque at 75ksi Bolt Stress
20"	28	2648 psi	200 ft.lbs.	250 ft.lbs.
24"	28	2252 psi	200 ft.lbs.	250 ft.lbs.
30"	42	2757 psi	200 ft.lbs.	250 ft.lbs.
36"	42	2330 psi	200 ft.lbs.	250 ft.lbs.

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An EnPro Industries Company

MECHANICAL SEAL REPLACEMENT

Before any work is performed **VERIFY** lock out/tag *Off Mixer*; followed by a *draining* the Sentry System tank
REQUIRED TOOLS: (1) 1/2" WRENCH, (2) 9/16" WRENCHES, (1) 3/8" ALLEN KEY, (1) 3/16" ALLEN KEY, (1) 3/4" SOCKET, (2) FLATHEAD SCREWDRIVERS, (1) 2" ADJUSTABLE WRENCH



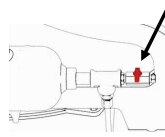
1. Pull the red handle to engage the PETRO-BLOCK



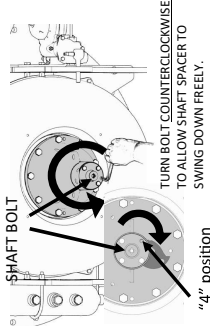
2. Remove yoke cover (and actuator if attached)



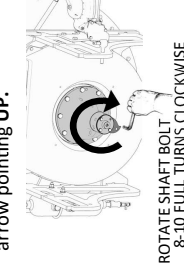
3. Position yoke with tabs horizontally and the "4" at the rear on the lower right with the arrow pointing **UP**.



Drain as much fluid as possible from the valve at the base of the Sentry tank; removing the vent assembly from the top of the Sentry tank (this will be your fill location when ready)

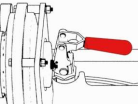


4. Using the 3/8 Allen key turn the shaft bolt in the center counterclockwise 1-2 rotations to loosen the shaft spacer.



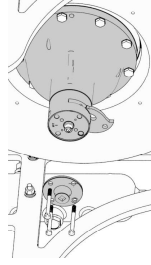
ROTATE SHAFT BOLT
8-10 FULL TURNS COUNTERCLOCKWISE

6. Using the Allen key, turn the shaft bolt clockwise, drawing shaft backwards until it comes to a stop (approximately an inch/20cm).

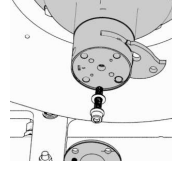


7. Now is the time to reset the red handle of the PETRO-BLOCK to the down position.

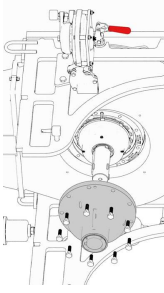
8. Rotate the yoke **counterclockwise** approximately 45°. The mixer should now be locked off and ready for maintenance.



9. Remove the 3 remaining 3/8" bolts in the rear, along with the yoke button and the shaft spacer.



10. This will allow for access to the shaft bolt and thrust end to be removed.

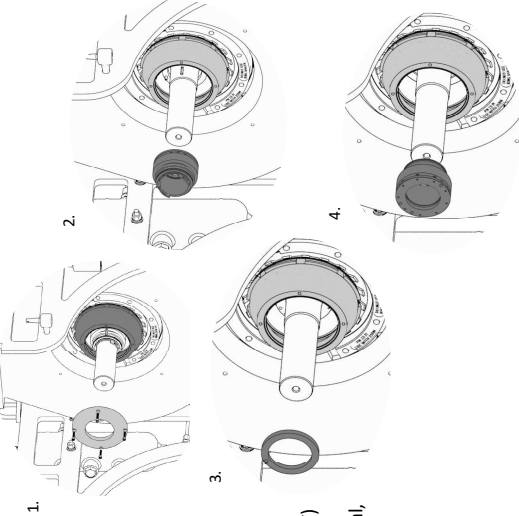


11. Then remove the 1/2" bolts for the yoke and remove the yoke (may need to use provided jack bolt holes for removal) Remove the KEY.

DOUBLE MECHANICAL SEAL

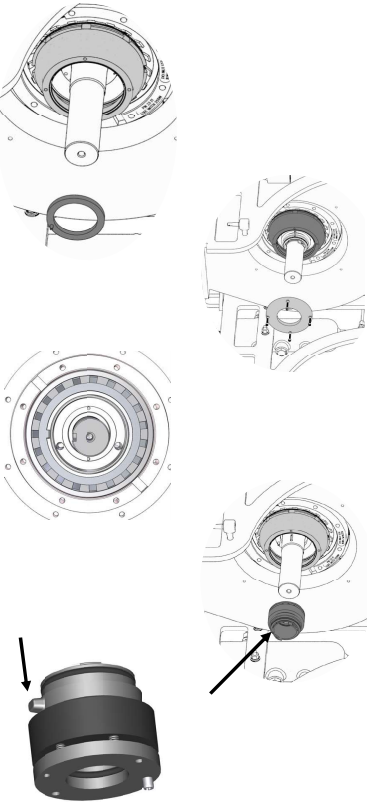
With most of the fluid drained:

- 1. Remove the (4) Allen head bolts from the cap (some remaining fluid may leak out so be prepared for that)
- 2. Remove the cap (most likely the rear seal will come out with the cap), or remove seal.
- 3. Remove the aluminum spacer ring. (875 ONLY)
- 4. Use 2 bolts from the cap to attach to front seal, and with 2 screwdrivers pry the tool and seal from the body cavity.



DOUBLE SEAL INSTALLATION

- 1. Install NEW MECHANICAL SEAL noting the stationary pin on SEAL.
- 2. MECHANICAL SEAL stationary pin should be in contact with either anti-rotation pins located at the 3 or 9 O'clock position in the seal chamber.
- 3. Install seal drive spacer, confirm SEAL DRIVE RING drive pin is in the 12 o'clock position.



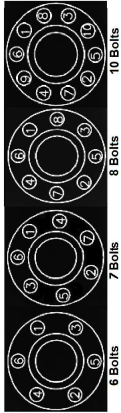
- 4. Install second seal with the drive notch located over keyway slot.
- 5. Install double seal cap.

AFTER SEAL INSTALLATION FOLLOW STEPS ON THE Mechanical Seal Change / Main Bearing Change IN ORDER OF 11,10,9,8,6,5,4,3,2
COMPLETE the Jensen Sentry System Recharge/Flush Procedure (Pg.12)

TORQUES

Fastener Location	830 Bolt Size/Torque	875 Bolt Size/Torque
Belt Cover	$\frac{3}{8}$ 120 in-lb	$\frac{3}{8}$ 120 in-lb
Yoke / Hub	$\frac{1}{2}$ 30 ft-lb	$\frac{1}{2}$ 30 ft-lb
Pulley / Hub	$\frac{1}{2}$ 30 ft-lb	$\frac{1}{2}$ 30 ft-lb
Body / Adapter	$\frac{1}{2}$ 30 ft-lb	$\frac{5}{8}$ 70 ft-lb
Yoke & Prop / Shaft	$\frac{1}{2}$ 30 ft-lb	$\frac{1}{2}$ 30 ft-lb
Bearing Retainer / Body	$\frac{3}{8}$ 10 ft-lb	$\frac{5}{16}$ 75 in-lb

Bolt torque Specifications: Shown is the bolt tightening sequences for typical applications. The sequence shown is for fully torqued bolts. The sequence shown is the flange out or parallel. The first time around tighten to approximately 1/2 of the final torque, and then repeat the sequence, tightening to the suggested torque limit.



Trouble Shooting Guide

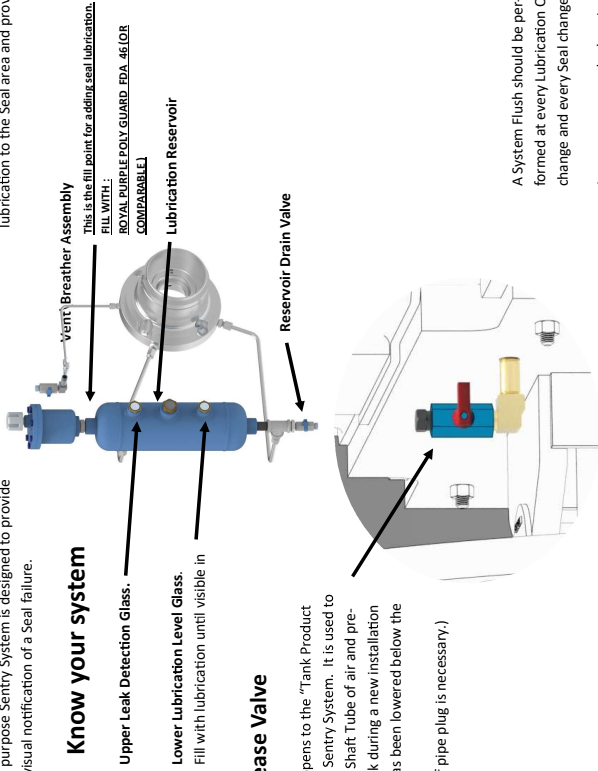
1. Oil leakage from belt covers	A. Faulty or worn mechanical seal. B. Faulty O-Ring.
2. Noisy Belts	A. Misaligned motor. B. Oil on belt wearing surface. C. Loose belt.
3. Vibration If Vibration above .5 IN/SEC PEAK LEVELS is observed shut unit down.	A. Not enough clearance between propeller and tank wall. B. Bent or damaged propeller blade. C. Not enough fluid above mixer shaft. D. Bad main bearing. E. Worn shaft bearing. F. Motor running backwards. G. Diffuser or other inlet pointed toward mixer. H. Change of Tank fluid conditions.
4. Excessive belt wear	A. Check for belt slip or worn pulley. B. Check for oil or rubber solvent on belt pulleys. C. Check for heat or chemical fumes. Belt should not get above 140 F. (60 C) D. Check motor misalignment. E. Check Belt Tension.
5. Hot electric motor	A. Current overload. B. Bad motor bearing. C. Change of Tank fluid conditions.

Jensen Sentry System Recharge/Flush Procedure

Jensen's dual purpose Sentry System is designed to provide visual notification of a Seal failure.

Lubrication to the Seal area and provide a

Know your system



Air Release Valve

This Valve opens to the "Tank Product Side" of the Sentry System. It is used to "bleed" the Shaft Tube of air and prevent Air Lock during a new installation or if Tank has been lowered below the Shaft Tube. (Removal of pipe plug is necessary.)

A System Flush should be performed at every Lubrication Oil change and every Seal change.

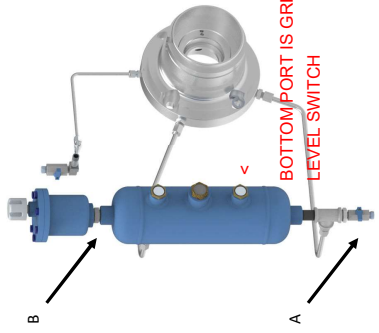
Jensen recommends changing the Seal Lubrication Oil every 6 months. More or Less time between oil change intervals may be possible depending on climate, run time, product and other factors. Oil quality should be checked monthly.

SYSTEM FLUSH

The purpose of a System Flush is to clean the seal chamber of debris and other unwanted contaminants that may have collected.

To perform the system flush a containment vessel (bucket) and an adjustable wrench will be needed. **Mixer unit must be powered down.**

- 1) Remove the plug from the base of the Valve (A). Place containment vessel under the Reservoir Valve and rotate the valve handle to the open position and empty contents into containment vessel.
- 2) With valve open, pour FLUSHING fluid into Leak Detection Fill Inlet (B). Jensen recommends flushing with the Royal Purple Poly Guard FDA 46. Add approximately 2-3 quarts and let the system drain.
- 3) Close Reservoir Valve and replace inlet plug. Refill Reservoir to center of lower sight-glass. Power up mixer for 3-5 minutes.
- 4) Remove Vent/Breather Assembly and open Reservoir Valve to drain contents. Add 2-3 quarts and let the contents drain. Close Reservoir Valve, replace Reservoir Valve plug and fill to center of the lower sight-glass. Replace Vent/Breather Assembly and power up Mixer. This will complete the System Flush.



SINGLE MECHANICAL SEAL

With most of the fluid drained:

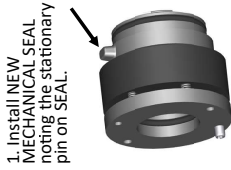
- Remove the seal drive ring from the cavity (some remaining fluid may leak out so be prepared for that).

- Use (2) ¼" bolts to attach tool to front seal, using 2 screwdrivers pry the seal from the body cavity.

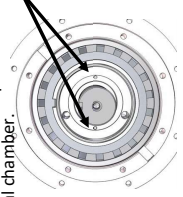


- Extreme caution should be taken to not damage the Inner LIP-SEAL, failure will require replacement of LIP-SEAL.
- Reverse steps after installation of new MECHANICAL SEAL.
- **WARNING: YOU MUST ALIGN SEAL DRIVE RING HOLE WITH SEAL DRIVE PIN.**
- **PERFORM SYSTEM FLUSH OF SENTRY SYSTEM Pg. 11**
- If debris is unreachable continue with steps 8-12 SEAL CHAMBER CLEANING.

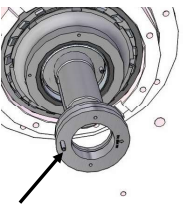
SEAL INSTALLATION



1. Install NEW MECHANICAL SEAL pin should be in contact with either anti-rotation pins located at the 3 or 9 O'clock position in the seal chamber.



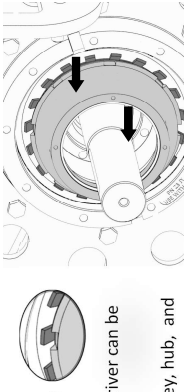
3. Install seal drive ring, confirming SEAL DRIVE RING drive pin is in the 12 O'clock position.



AFTER SEAL INSTALLATION FOLLOW STEPS ON THE Mechanical Seal Change / Main Bearing Change IN ORDER OF 1,10,9,8,6,5,4,3,2 COMPLETE the Jensen Sentry System Recharge/Flush Procedure

MAIN BEARING REMOVAL

1. With the seals removed, the tab on the lock washer can be pried up and clear of the retainer ring
2. By threading bolts from the cap onto the retainer ring, a screwdriver can be used to aid in unscrewing the retainer ring
3. With the retainer ring and lock washer removed, the driven pulley, hub, and subsequently the main bearing may now be replaced



JENSEN OFFERS A FULL FACTORY RECONDITIONING PROGRAM—CONTACT YOUR LOCAL REP FOR DETAILS.

