CONTROLLED DOCUMENT

AMERICAN STAINLESS PUMPS
Stainless Steel Pumps for the Commercial Marketplace

WORK INSTRUCTION

Work Instruction No.	**WI_AB_CXXXXXXXXX**						
Author	Matt Beckerdite	**Rel. Date**	11/26/13	**Rev.**	a		
Description	Assembly of Model SSPC closed impeller pump						
Safety Equipment	 Flexible Gloves to protect against cuts						
Safety Guidelines							
Equipment and Tools	See Step 1 that describes the tools used						

Introduction: This procedure describes the process for assembling a Model SSPC enclosed impeller pump. These pumps have a catalog number that begin with a C1 and C2. The BOM will list the specific parts used such as o-rings, mechanical seals, cases, motor etc.

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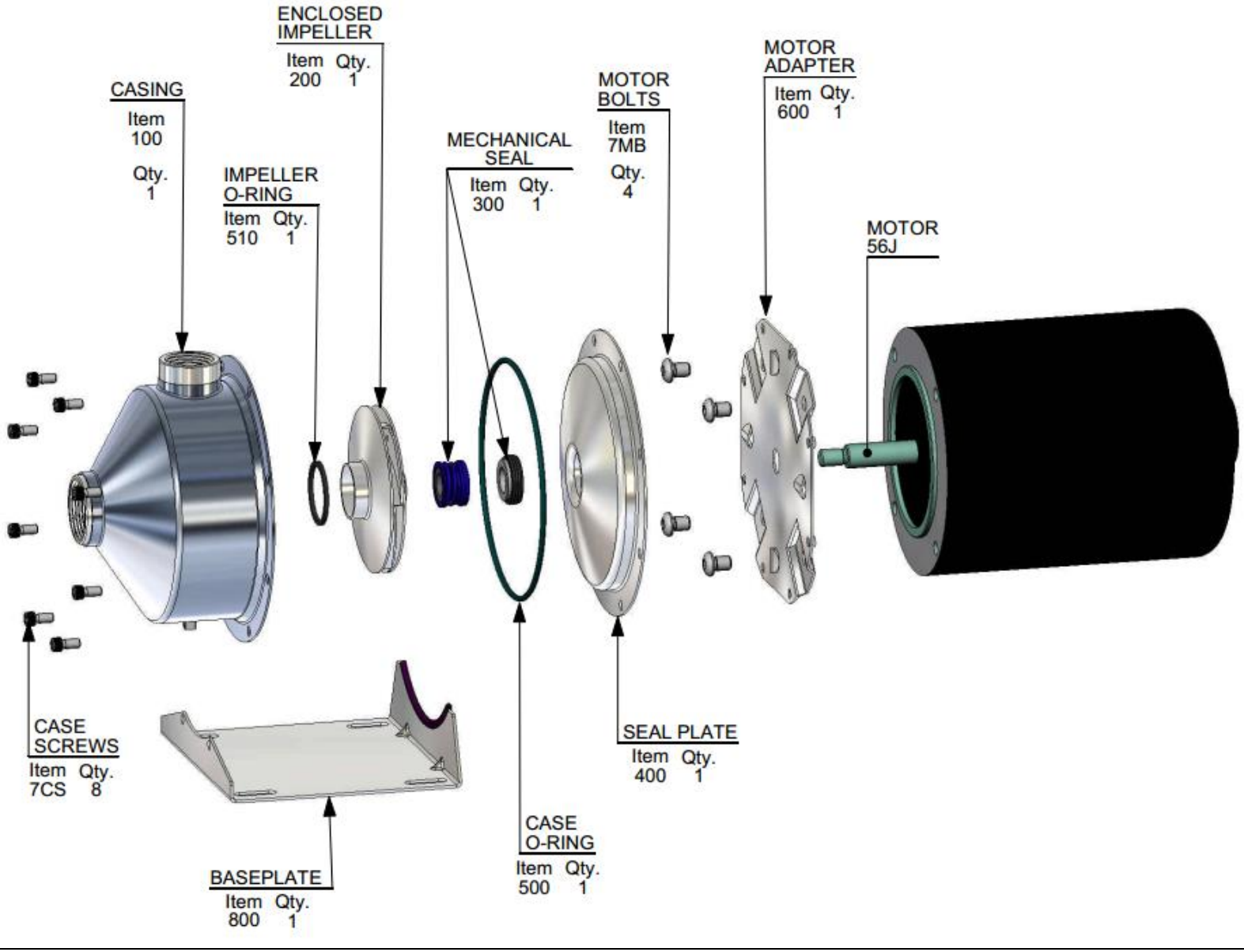
Exploded View Diagram of SSPC Pump Assembly



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Step 1	**Tools**
  	(Air) ratchet with ¼" socket Drain plug installation bit (1/4" square socket by 3/8" Square socket for drain plug) Extended allen bits: -3/16" allen for case screws (Qty 8) -7/32" allen for adapter screws (Qty 4)  Tool Rack with all the necessary bits
 	Electric Drill (for removing wire cover screws) ¼" hex drill bit (for removing wire covers)
Step 2 (3 phase motors only)	**Drill and tap the motor**
STOP Single Phase motors shall skip this step!!! 	If the motor is a 3-phase motor, it has the capability of rotating in either direction. In order to keep the impeller from spinning off the shaft during a startup that rotates the motor in the incorrect direction (counter clockwise), a locking screw and washer is used with thread-locking compound. See work instruction WI_M_DTMOT for details on this procedure. Nidec motors will use a ¼-20" LH rotation screw and come tapped from the factory, while all others use a ¼"-28 RH rotation locking screw. This hole is drilled and tapped at ASP.
Step 3	**Gather Parts**
	Gather the parts located on the work order/BOM.

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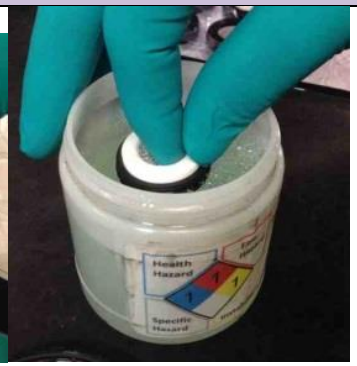
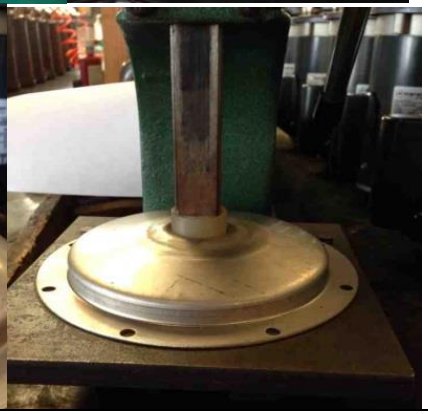
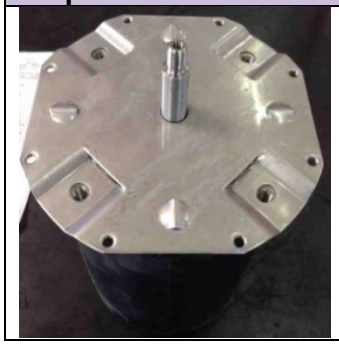
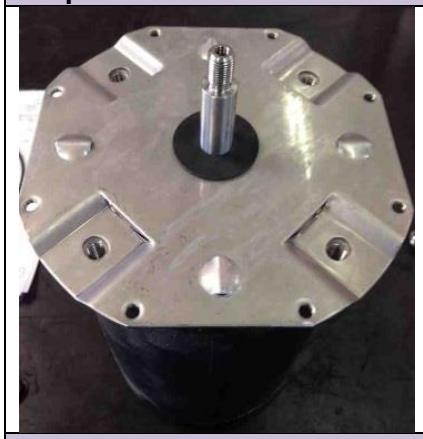
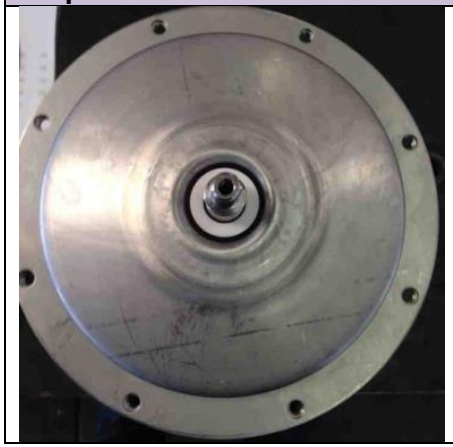
Step 4	**Remove back plug from motor**
 	The motor manufacturer supplies a plug in the back of the motor. It can be seen in this picture as a black plug at the center of the motor. This plug must be removed in order to access the shaft during impeller installation. The wire box cover shall also be removed in preparation for testing. (In the field, the motor may be wired by accessing the wire port in the back/side of the motor and installing an elbow.)
Step 5	**Install Stationary Seal into Sealplate**
   	Using gloves to protect the seal faces from debris, dirt and fingerprints, massage the seal into the seal seat (rubber). The seat needs to sit flat against the bottom of the seal seat. Any tilt could lead to reduced seal life. Dip the seal seat (rubber) into the pre-prepared lubricating solution (non-abrasive dish soap/water combo). Be careful not to get solution on the face of the seal. Any solution on the face of the seal may cause the stationary face to stick to the rotating face. Place the stationary seal into the sealplate (as pictured). Using the arbor press, place the sealplate into the proper location on the arbor press plate. The press and plastic tool should come down directly into the center of the seal without touching the sides. Pull down on the press handle and press the stationary half of the seal down until it is stopped by the sealplates bore. Rotate the sealplate 90 degrees and press, repeating 3 times until four sides of the seal have been pressed down, ensuring the seal sits flat in the sealplate.

Step 6	Inspecting the Installed Seal for Proper Installation
	View the seal from the backside to ensure the seal has been pressed all the way into the sealplate bore. There should be no gap present between the seal and the bore.
Step 7	**Setup Motor for Component Installation and Remove Slinger**
	Setup the motor on its rear end. The motor shaft should be sticking up into the air. Remove the rubber slinger from the motor. If a slinger is not present, collect a slinger from the “SLINGER” box/tray for later installation. The slinger spins and kicks off any water drops during operation, preventing it from getting into the motor.
Step 8	**Install Adapter Plate**
	Install the adapter plate onto the motor. The 4 bolt holes should line up with the motor mounting holes.

Step 9	**Re-install Slinger**
	Place the slinger back over the shaft and press it against the adapter plate
Step 10	**Install Adapter Plate Screws**
 	Install the 4 motor mounting bolts by hand. This prevents the threads from galling or breaking with installation using an air ratchet. Tighten the motor bolts completely, using the air ratchet. The bolts should be approximately 12 ft-lbs and can be verified with a torque wrench.
Step 11	**Install the Sealplate**
	Locate the sealplate carefully over the shaft. The seal should not touch the shaft during assembly. This will prevent the seal face from chipping or becoming damaged. When the sealplate is tight against the motor adapter plate, the motor shaft should not be touching the stationary seal. Press the flanges of the sealplate and motor adapter plate together with your hands for an approximate location. The gap surrounding the shaft should be very close to concentric. If the gap does not seem concentric, the motor adapter plate shall be inspected for proper tab height and dimensions. See QA.

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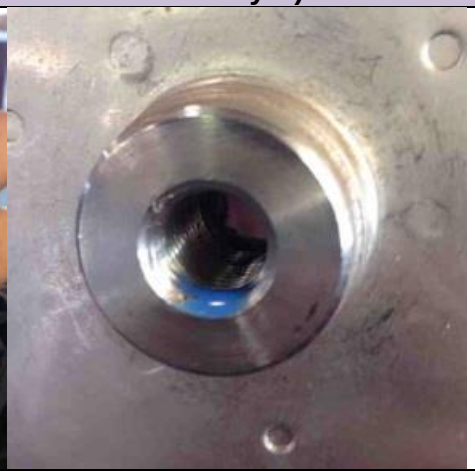
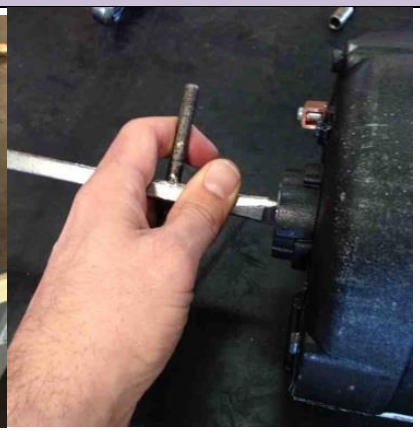
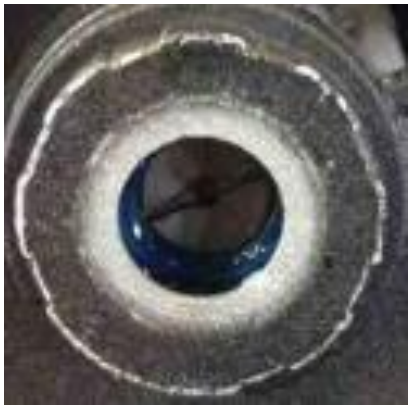
Step 12	**Installing the O-Ring and Rotating Half of the Mechanical Seal**
	Install the o-ring onto the sealplate as shown in the picture. The o-ring should not be twisted or rolled. Place one side of the o-ring over the sealplate. With two fingers, stretch the o-ring over the other side while being careful not to roll the o-ring. Ensure the o-ring is flat against the flange of the sealplate.
Step 13 (3 phase, 3HP and 5HP motors only!!!)	**Applying Thread Locking Compound to the Impeller Threads**
 	**(3 phase, 3HP and 5HP motors only!!!)** Apply a drop of thread locking compound to the impeller threads prior to installation.  This process will help prevent the impeller from spinning off the shaft during a reverse rotation. When the impeller is screwed onto the motor shaft, the thread locking compound will screw into the threads along the entire shaft.

Step 14	**Installing the Impeller**
 	 Screw the impeller onto the motor shaft in a clockwise direction. In order to completely tighten the impeller, place a screwdriver into slot located in the back of the motor and spin the impeller.  The impeller needs to completely butt up against the shoulder of the shaft. Failure to do so may result in damage to the impeller and the motor during startup.
Step 15 (For 3 Phase motor Only)	**Installing the thread locking Compound**
 **Skip this step if the motor is single phase!!!**  	Place a drop of thread locking compound onto the threads of the locking screw. The compound should cover approximately 75% of the threads. Too much compound will make the impeller very difficult to remove after some time in the field.

Step 16 (For 3 Phase motor Only)	Installing the Locking Screw and Washer
Skip this step if the motor is single phase!!!  	Place the screw listed on the work order BOM into the motor shaft. -Left Hand screws will be rotated counter clockwise to tighten (Nidec Motors) -Right Handed screws will be tightened clockwise to tighten Rotate the screw by hand until it stops at the impeller hub. Tighten the screw to approximately 8 ft-lbs. The lock washer should not move or wiggle. Test that the washer is tight by trying to wiggle it with your hand. If the washer moves, the motor shaft is not tapped far enough and the pump needs to be disassembled (or a shorter locking screw may be used if in the field).
Step 17	**Install the Drain Plug into the Case**
 	Using the 1/4” square socket by 3/8” Square socket for drain plug, tighten the drain plug assembly into the case. Once the air ratchet stops, turn the drain plug another 60 degrees by hand to ensure it is sealed. The drain plug should still have a minimum of 1 thread showing. If there is not 1 thread showing, the port threads are too deep and the case may leak from these threads. A new case is required. See QA for instructions. (In the field, more Teflon tape or plumbers tape may be added to the drain plug.)
Step 18	**Installing the Suction O-Ring**
 	Place the suction o-ring into the groove of the suction nozzle. The o-ring should float in the groove and should not be pinched or rolled.

Step 19	**Installing the Case Assembly**

Place the case onto the sealplate, over the o-ring.

Ensure the holes in the case flange, sealplate, and motor adapter are aligned by placing an extended 3/16” allen bit through the holes. Wiggle the bit to line up all the holes.

By hand, thread the case bolts through the 8 holes in the case flange and into the motor adapter plate.

Leave the bottom 2 screws out if using a stainless steel baseplate. (Check the BOM on the work order). This can be seen in the picture on the right.

If using a baseplate, inspect the baseplate to ensure the rubber cushion is installed on the radius of the baseplate. If not, install the rubber trim.

Install the bolts on top of the baseplate, sandwiching the baseplate between the screw and the case flange.

Tighten the screws in a crisscross pattern until tight (approximately 8 ft-lbs) using the air ratchet and a 3/16” allen bit.

Step 20	Inspecting the Assembly for Proper Baseplate
	If the motor is a footed motor, or an assembly with no base (catalog number ends with L), skip this step. Set the motor on its foot/base. Check the base to ensure the radius of the baseplate matches the motor diameter. If not, contact the shop supervisor for further instruction. The baseplate on the BOM may need to be changed.
Step 21	**Label Placement**
 	The pump nameplate shall be placed next to the discharge nozzle. The rotation arrow shall be pointed in the clockwise direction, noting the proper rotating direction of the motor shaft and impeller. The label with thread direction and locking screw thread information shall be placed next to the discharge nozzle, opposite the pump nameplate. The labels shall be a minimum of ½" from the discharge port radius and shall be parallel to the case flange. Crooked labels/nameplates are not acceptable.
Step 22	**Inspecting the suction Nozzle for Location**
	The top of the suction nozzle must be level with the ground. If the suction nozzle threads are crooked, it may not fit into the customers' system if hard piped. Place the pump onto the flat plate located next to the assembly bench. Zero out the level on the same plate. Place the level on top of the suction nozzle and verify the suction nozzle is within tolerance. Acceptable levels are within ±1.1 degrees from flat. If the level is not acceptable, either the motor register is off or the discharge nozzle is not in the correct location. Contact QA immediately.

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Step 23	**Completed Assembly**
	A completed pump assembly with a stainless steel baseplate can be seen in the picture on the left

Date	Revision	Change
11/26/13	A	Initial Release by Matt Beckerdite