

Insert Pump Anchor

Assembly, Inspection and Operating Procedure

Assembly

1. Gather the components that make up the slip assembly (Fig. 1). Fasten the slip assembly together using a riveting machine (refer to appendix for detailed instruction on riveting)
2. Slide the completed slip assembly onto the top of the insert pump anchor mandrel. Make sure the dowel pin located on the inner diameter of the timing collar is lined up and "in" the track slotted on the body of the mandrel. (Fig.2)
3. Check threads and surfaces of mandrel and remaining components for unconformities. Slide the guide ring onto the top of the mandrel, keeping the chamfered side up. Slide the split cone onto the mandrel with the prongs facing.
4. Ensure the mandrel threads are clean and apply the Bostik Never Seez Pure Nickel Special Compound directly on the threads. Thread the rubber mount onto the top of the mandrel. The rubber element side should seat onto the beveled end of the split cone.

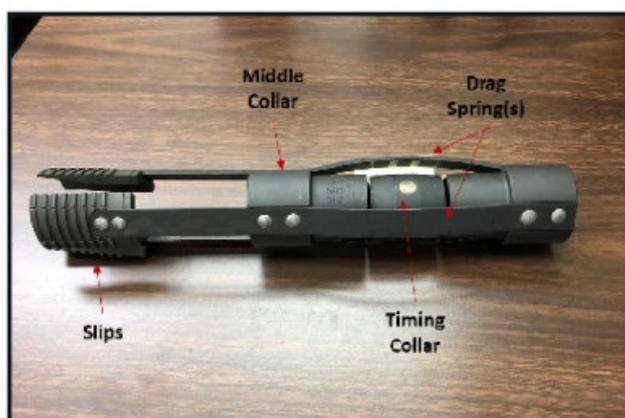


Fig. 1



Fig. 2

5. Thread on and tighten the top bushing to the top of the mandrel using a flat wrench and friction wrench (Fig. 3). Then tighten the rubber mount up to the top bushing by hand.
 - a) When tightening the top bushing to the rubber packing element on the mandrel be sure to only tighten to "hand-tight". Excessive tightening will cause the rubber packing element to expand prematurely and could create issues when running tool downhole

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6. Clean the threads at the bottom of the mandrel and apply the Bostik Never Seez Pure Nickel Special Compound on the threads. Thread on and tighten the bottom bushing to the bottom of the mandrel using a flat wrench.
7. Prepare the anchor for shipping/transport. Make sure the slip assembly is in the run position and wrap the anchor in Styrofoam wrapping. Carefully place the wrapped anchor into thick cardboard box for shipping.



Fig. 3

Testing & Quality Inspection

1. Visually inspect the insert pump anchor and its components for any flaws.
2. Confirm that the dowel pin is in the track slotted on body of mandrel. Timing collar shouldn't be able to spin axially.
3. Actuate the slip assembly up and down to confirm that the pin can navigate through the running and setting slots on the mandrel body. Also confirm that the slips open along the cone when tool is in the "set" position.

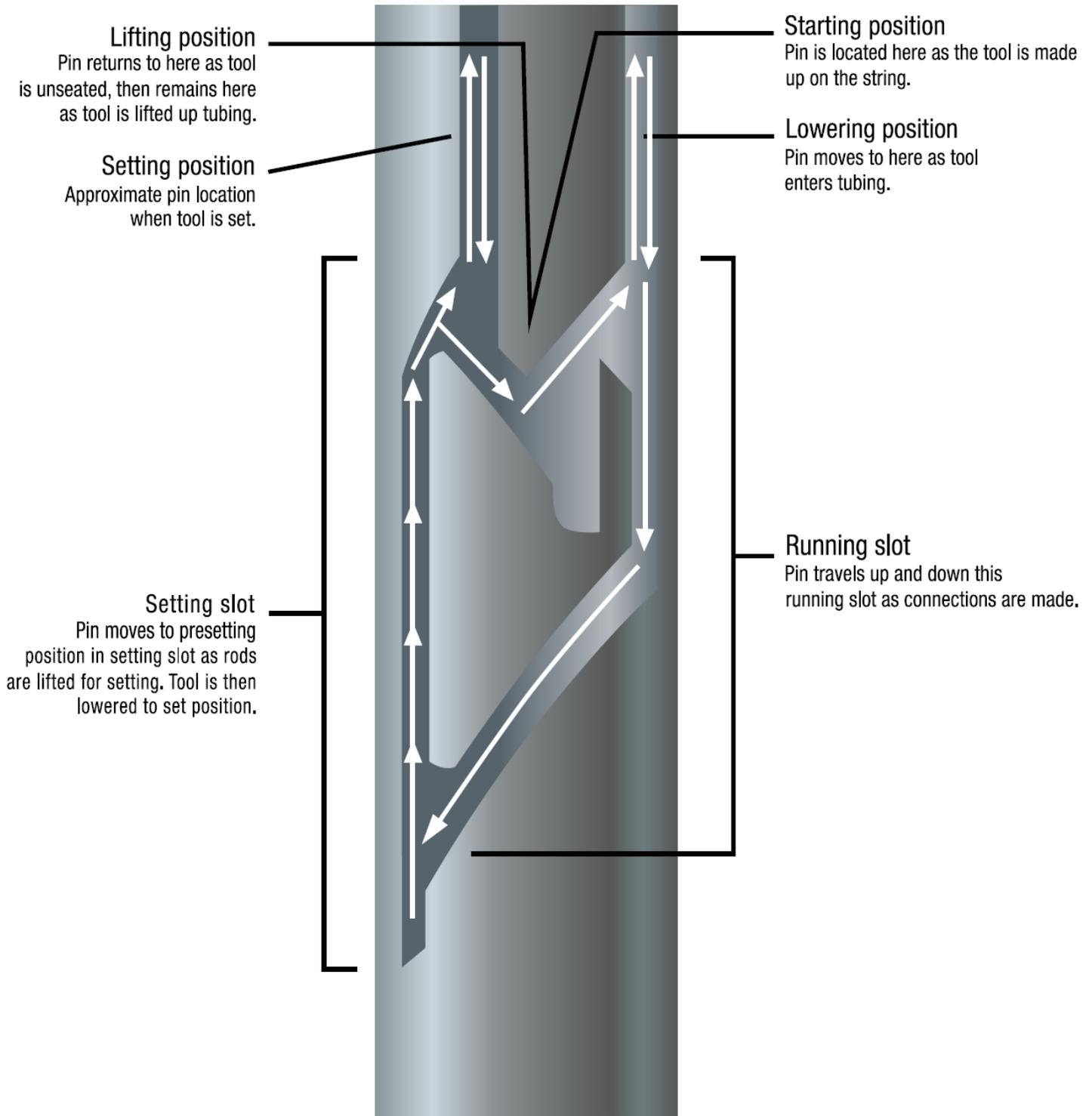
Operating Procedure

Refer to diagram for reference throughout procedure.

1. Record the pump stroke and setting stroke of the anchor (24" or 48"). This figure represents the upward movement of the rod string necessary to transfer dowel pin from the running slot to the setting slot.
2. Attach the anchor to the pump and start running assembly into the tubing with dowel pin in the starting position.
3. Run pump to the desired depth. Attach polished rod and lower to the point established for bottom of stroke. Raise the polished rod by the distance established in Step 1, then lower the full weight of rods onto the anchor to set and preload the packoff.
4. To reset the anchor, unseat it with a straight pull on the rod string. Then raise or lower it to desired setting position and reset as explained in Step 3.

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Pin location during setting, releasing, or resetting.

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Appendix

- 1.0 Slip Assembly Riveting Procedure
 - 1.1 Ensure there are multiple hands to operate the process.
 - 1.2 Connect riveting machine to hydraulic pump.
 - 1.2.1 Ensure gauges are properly connected.
 - 1.3 Place drag spring over one of the collars
 - 1.3.1 Ensure smaller diameter end of collar is facing inward.
 - 1.3.2 Ensure flat end of spring is parallel with larger diameter end of collar.
 - 1.4 Place rivet in one of the holes.
 - 1.4.1 Lightly tap rivet with hammer to initially set it
 - 1.5 Place assembly under the riveting machine.
 - 1.5.1 Slide collar over mandrel.
 - 1.6 Use the riveting machine to fully set the rivet.
 - 1.6.1 One hand will hold the assembly in place, while the second hand operates the pump/machine.
 - 1.6.2 Set to pressure of about 2500 psi.
 - 1.7 Place rivet in the second hole of the assembly.
 - 1.8 Repeat steps 5.3-5.6 for the remainder of the springs
 - 1.9 Slide the timing collar in between the assembly springs.
 - 1.10 Place second collar under the spring
 - 1.10.1 Smaller diameter facing inward toward timing collar.
 - 1.10.2 Place under middle set of holes in spring.
 - 1.11 Repeat steps 1.3-1.7 for all holes in collar.
 - 1.12 Place slip under remaining sets of holes in spring.
 - 1.13 Place rivet in hole.
 - 1.14 Place assembly under riveting machine.
 - 1.14.1 Set rivet to about 2500 psi.
 - 1.14.2 For 2-7/8" slip, do not exceed 2700 psi.
 - 1.14.3 Doing so will cause slip to crack.
 - 1.15 Repeat steps 1.11-1.13 for remaining springs.

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Specifications

TUBING SIZE	2-3/8	2-7/8	3-1/2	4-1/2
Head Threads – Upper pin-end Head OD (in.)	1.4704 – 14 1.850	1.8024 – 14 2.290	2.1095 – 11-1/2 2.840	--- 3.790
Rubber OD (in.) ID (in.)	1.81 1.00	2.25 1.46	2.74 1.97	3.77 ---
Split Cone OD (in.)	1.83	2.29	2.86	3.799
Body OD (in.) ID (in.)	1.187 0.690	1.610 1.130	2.062 1.375	2.620 ---
Coupling Threads – lower box-end (in.) OD Coupling (in.)	1 NPT 1.86	1-1/4 NPT 2.29	1-1/2 NPT 2.73	--- 3.73
Assembly Length (in.)	47.9	48-1/2	50-1/2	---

Working Specifications

Tubing ID (in.)	1.995	2.441	2.992	3.958
Tubing Weight (lb/ft)	4.70	6.50	9.30	12.75
Minimum weight req'd set anchor (lbf)	1,500	2,000	2,500	3,000
Rubber (standard) working temperature, °F (°C)	-40/+250 -40/+121	-40/+250 -40/+121	-40/+250 -40/+121	--- ---
Viton ** working temperature, °F (°C)	-40/+400 -40/+204	-40/+400 -40/+204	-40/+400 -40/+204	-40/+400 -40/+204

BUILT TO LAST

Made to Perform

Headquarters

811 Willow Oak Dr,
Missouri City, TX 77489
(281) 495-1100

Midland Campus

3427 E Hwy 158,
Midland, TX 79706
(432) 967-5575

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