

# INSERTABLE PROGRESSING CAVITY PUMPS (iPCP) SPECIFICATIONS

**EXPERIENCE  
PERFORMANCE.**

# INSERTABLE PROGRESSING CAVITY PUMPS

The Lifting Solutions (LS) Insertable Progressing Cavity Pump (iPCP) is a thru-tubing pump that is installed with the rod string inside the production tubing and landed in the production zone. The main advantage of using an iPCP is to eliminate the need to pull tubing on pump-related workovers. This significantly reduces the cost associated with pulling the tubing and downtime during workovers.

Most iPCP completions are installed with a pre-existing Pump Seating Nipple (PSN) on the tubing string, in some cases, the iPCP can be combined with different downhole seating tools that eliminate the requirement of a Pump Seating Nipple (PSN).

## KEY FEATURES

### HAMMER TAIL

- This feature is located at the bottom of the rotor and allows for the entire rotor to be pulled to the top of the stator before unseating.
- The hammer tail engages with a “unseating ring” in the seating mandrel assembly that acts as a “no-go” during uninstallation or flush-by work-over.
- This design eliminates the requirement for any “flush tubes” and reduces the entire length of the iPCP assembly.
- The hammer tail is designed to safely drift the stator and locate the rotor in the stator during landing/seating.

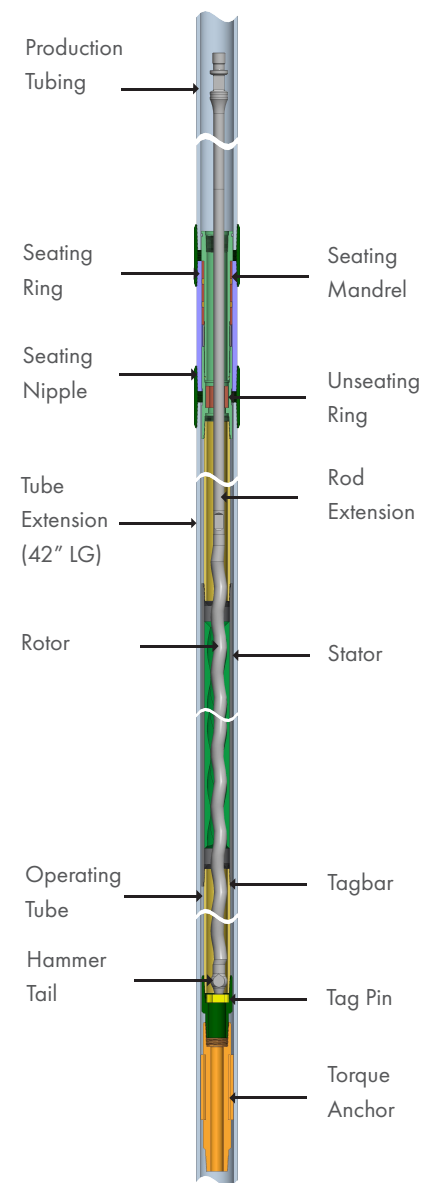
### MULTI-SIZE SEATING RINGS

- The Artificial Lift sector has multiple PSNs that are utilized in the industry with a range of inside diameters (IDs).
- The LS iPCP is designed with three different sizes of seating rings to accommodate the PSN ID tolerances in the market.
- The design gives operators the added advantage of using existing PSN already installed in the tubing completions, especially for artificial lift conversions.

### STATOR DISCHARGE SEAL

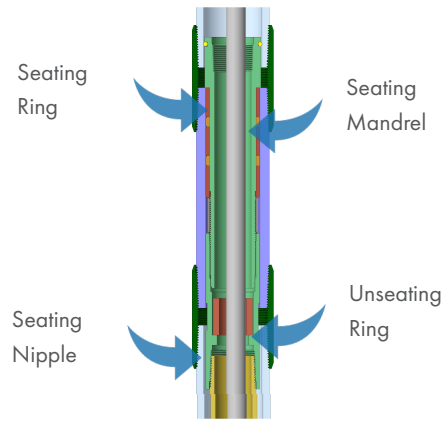
- The LS iPCP discharge seal and seating assembly are located at the top of the insert pump assembly. This enables use in applications with sand/abrasive production.
- The discharge seal isolates the pump discharge from the PSN and seating ring annulus to avoid any “sand packing” that would otherwise present unseating challenges and affect the normal operation of the PCP.
- When the sand is kept above the discharge of the pump, it is either produced or flushed back through the pump during flush-bys.

## iPCP INSERT ASSEMBLY

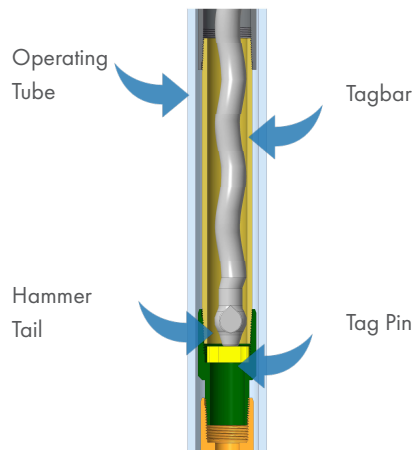


# INSERTABLE PROGRESSING CAVITY PUMPS

## SEATING ASSEMBLY TOP DETAIL



## SEATING ASSEMBLY BOTTOM DETAIL



## BENEFITS

- iPCPs reduce workover time and associated costs of pulling the tubing during bottom hole pump replacement.
- Insertable PCPs reduce downtime associated with lost or deferred production during workovers iPCPs have the ability to be flushed by pulling the hammer tail on the rotor up above the stator to allow reverse fluid flow without unseating the pump.
- An integrated torque anchor at the bottom of the stator assembly contains torque and prevents backoff of the iPCP assembly components.
- Pulling the tubing requires a high-capacity service rig. With iPCPs, workovers can be limited to smaller flush-by and/or rod rigs thereby reducing service and maintenance costs.
- iPCPs allow for volume/lift changes without pulling the tubing to permit well optimization with minimal downtime or associated workover costs.
- When combined with other specialized downhole seating/sealing tools, the modified assembly allows for pump landing depth changes and well optimization without a seating nipple located in the tubing string.
- When tubing is kept in place during pump changes, all associated downhole monitoring systems and associated cabling can be kept in place during workovers.
- iPCP component reusability allows for additional cost savings associated with the initial investment.

# APPLICATION AND TECHNICAL SPECIFICATIONS

## 2-7/8" INSERT PC PUMP SPECIFICATIONS

LS 2-7/8" Insert PC Pump Specifications								Stator Details						Rotor & Rod Details										
Volume (/ day/100rpm)		Rated Lift		Pump Torque		Overall Length		Stator Connection		Weight		Max. OD		Rod Connection	Max. Torque		Contour Length		Rod Stickup		Weight		Max. OD	
(m3)	(bbls)	(m)	(ft)	(Nm)	(ft*lbs)	(m)	(in)	Top	Bottom	(kg)	(lbs)	(mm)	(in)		(Nm)	(ft*lbs)	(m)	(in)	(mm)	(in) 19.0	(kg)	(lbs)	(mm)	(in)
2	13	900	3000	24	18	1.17	46	1.660-in. EUE BOX 1.660-in. EUE PIN		11.3	25	57.2	2.25	5/8-in. API Pin	273	201	2.13	84	483	19.0	10.0	22	27.5	1.08
		1200	3900	33	24	1.57	62			15.4	34	57.2	2.25				2.54	100			10.9	24	27.5	1.08
		1500	4900	41	30	1.96	77			19.5	43	57.2	2.25	or			2.92	115			12.2	27	27.5	1.08
		1800	6000	49	36	2.36	93			23.1	51	57.2	2.25	7/8-in. API Box			3.33	131			13.2	29	27.5	1.08
		2400	7900	65	48	3.15	124			31.3	69	57.2	2.25	4.11			162	15.4			34	27.5	1.08	
4	25	900	3000	49	36	1.98	78	1.660-in. EUE BOX 1.660-in. EUE PIN		19.5	43	57.2	2.25	5/8-in. API Pin	273	201	2.95	116	483	19.0	12.2	27	27.5	1.08
		1200	3900	65	48	2.64	104			26.3	58	57.2	2.25				3.61	142			14.1	31	27.5	1.08
		1500	4900	81	60	3.30	130			32.7	72	57.2	2.25	or			4.27	168			15.9	35	27.5	1.08
		1800	6000	98	72	3.96	156			39.0	86	57.2	2.25	7/8-in. API Box			4.93	194			17.7	39	27.5	1.08
		2400	7900	130	96	5.28	208			52.2	115	57.2	2.25	6.25			246	21.3			47	27.5	1.08	
7	44	900	3000	85	63	2.97	117	1.660-in. EUE BOX 1.660-in. EUE PIN		29.5	65	57.2	2.25	5/8-in. API Pin	273	201	3.94	155	483	19.0	15.0	33	28.1	1.11
		1200	3900	114	84	3.96	156			39.0	86	57.2	2.25				4.93	194			17.7	39	28.1	1.11
		1500	4900	142	105	4.95	195			49.0	108	57.2	2.25	or			5.92	233			20.4	45	28.1	1.11
		1800	6000	171	126	5.94	234			58.5	129	57.2	2.25	7/8-in. API Box			6.91	272			23.1	51	28.1	1.11
		2400	7900	228	168	7.92	312			78.0	172	57.2	2.25	8.89			350	28.6			63	28.1	1.11	
11	69	900	3000	134	99	3.96	156	1.660-in. EUE BOX 1.660-in. EUE PIN		39.0	86	57.2	2.25	5/8-in. API Pin	327	241	4.93	194	483	19.0	19.1	42	29.1	1.15
		1200	3900	179	132	5.28	208			51.7	114	57.2	2.25				6.25	246			23.1	51	29.1	1.15
		1500	4900	224	165	6.60	260			64.9	143	57.2	2.25	or			7.57	298			27.2	60	29.1	1.15
		1800	6000	268	198	7.92	312			77.6	171	57.2	2.25	7/8-in. API Box			8.89	350			31.3	69	29.1	1.15
18	113	600	2000	146	108	3.96	156	1.660-in. EUE BOX 1.660-in. EUE PIN		39.0	86	57.2	2.25	5/8-in. API Pin	327	241	4.93	194	483	19.0	19.1	42	29.1	1.15
		900	3000	220	162	5.94	234			58.1	128	57.2	2.25	or			6.91	272			25.4	56	29.1	1.15
		1200	3900	293	216	7.92	312			77.6	171	57.2	2.25	7/8-in. API Box			8.89	350			31.3	69	29.1	1.15
23	145	500	1600	156	115	3.96	156	1.660-in. EUE BOX 1.660-in. EUE PIN		39.0	86	57.2	2.25	5/8-in. API Pin	327	241	4.93	194	483	19.0	19.1	42	29.1	1.15
		750	2500	235	173	5.94	234			58.1	128	57.2	2.25	or			6.91	272			25.4	56	29.1	1.15
		1000	3300	312	230	7.92	312			77.6	171	57.2	2.25	7/8-in. API Box			8.89	350			31.3	69	29.1	1.15

# APPLICATION AND TECHNICAL SPECIFICATIONS

## 3-1/2" INSERT PC PUMP SPECIFICATIONS

LS 3-1/2" Insert PC Pump Specifications								Stator Details						Rotor & Rod Details										
Volume (/day/100 rpm)		Rated Lift		Pump Torque		Overall Length		Stator Connection		Weight		Max. OD		Rod Connection	Max. Torque		Contour Length		Rod Stickup		Weight		Max. OD	
(m3)	(bbls)	(m)	(ft)	(Nm)	(ft*lbs)	(m)	(in)	Top	Bottom	(kg)	(lbs)	(mm)	(in)		(Nm)	(ft*lbs)	(m)	(in)	(mm)	(in)	(kg)	(lbs)	(mm)	(in)
7	44	1000	3300	95	70	2.44	96	1.900-in. EUE BOX	1.900-in. EUE PIN	28.6	63	69.9	2.75	7/8-in. API Pin	556	410	3.4	134	582	22.9	27.2	60	37.7	1.49
		1500	4900	142	105	3.66	144			42.6	94	69.9	2.75				4.62	182			34	75	37.7	1.49
		2000	6600	190	140	4.88	192			56.7	125	69.9	2.75				5.84	230			41.3	91	37.7	1.49
		2250	7400	214	158	5.49	216			64	141	69.9	2.75				6.45	254			44.9	99	37.7	1.49
		2500	8200	237	175	6.1	240			71.2	157	69.9	2.75				7.06	278			48.5	107	37.7	1.49
		3000	9800	285	210	7.32	288			85.3	188	69.9	2.75				8.28	326			55.3	122	37.7	1.49
9	57	900	3000	110	81	2.74	108	1.900-in. EUE BOX	1.900-in. EUE PIN	32.2	71	69.9	2.75	7/8-in. API Pin	556	410	3.71	146	582	22.9	29	64	37.7	1.49
		1200	3900	146	108	3.66	144			42.6	94	69.9	2.75				4.62	182			34	75	37.7	1.49
		1500	4900	183	135	4.57	180			53.5	118	69.9	2.75				5.54	218			39.5	87	37.7	1.49
		1800	6000	220	162	5.49	216			64	141	69.9	2.75				6.45	254			44.9	99	37.7	1.49
		2400	7900	293	216	7.32	288			85.3	188	69.9	2.75				8.28	326			55.3	122	37.7	1.49
17	107	900	3000	207	153	3.96	156	1.900-in. EUE BOX	1.900-in. EUE PIN	46.3	102	69.9	2.75	7/8-in. API Pin	556	410	4.93	194	582	22.9	35.8	79	38.4	1.51
		1200	3900	277	204	5.28	208			61.2	135	69.9	2.75				6.25	246			43.5	96	38.4	1.51
		1500	4900	346	255	6.6	260			76.7	169	69.9	2.75				7.57	298			51.3	113	38.4	1.51
		1800	6000	415	306	7.92	312			92.1	203	69.9	2.75				8.89	350			59	130	38.4	1.51
24	151	750	2500	244	180	4.27	168	1.900-in. EUE BOX	1.900-in. EUE PIN	49.4	109	69.9	2.75	7/8-in. API Pin	556	410	5.23	206	582	22.9	37.6	83	38.4	1.51
		1000	3300	325	240	5.69	224			66.2	146	69.9	2.75				6.65	262			45.8	101	38.4	1.51
		1250	4100	407	300	7.11	280			82.6	182	69.9	2.75				8.08	318			54.4	120	38.4	1.51
		1500	4900	488	360	8.53	336			99.3	219	69.9	2.75				9.50	374			62.6	138	38.4	1.51
29	182	600	2000	236	174	4.27	168	1.900-in. EUE BOX	1.900-in. EUE PIN	49.4	109	69.9	2.75	7/8-in. API Pin	556	410	5.23	206	582	22.9	37.6	83	38.4	1.51
		900	3000	354	261	6.40	252			74.4	164	69.9	2.75				7.37	290			49.9	110	38.4	1.51
		1200	3900	472	348	8.53	336			99.3	219	69.9	2.75				9.50	374			62.6	138	38.4	1.51
39	245	500	1600	264	195	4.27	168	1.900-in. EUE BOX	1.900-in. EUE PIN	49.4	109	69.9	2.75	7/8-in. API Pin	556	410	5.23	206	582	22.9	37.6	83	38.4	1.51
		750	2500	397	293	6.40	252			74.4	164	69.9	2.75				7.37	290			49.9	110	38.4	1.51
		1000	3300	529	390	8.53	336			99.3	219	69.9	2.75				9.50	374			62.6	138	38.4	1.51
50	315	400	1300	271	200	4.27	168	1.900-in. EUE BOX	1.900-in. EUE PIN	49.4	109	69.9	2.75	7/8-in. API Pin	556	410	5.23	206	582	22.9	37.6	83	38.4	1.51
		600	2000	407	300	6.40	252			74.4	164	69.9	2.75				7.37	290			49.9	110	38.4	1.51
		800	2600	542	400	8.53	336			99.3	219	69.9	2.75				9.50	374			62.6	138	38.4	1.51

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