

**BULLETIN NO.**

LS-TB-012 V1

**TOPIC**

PC PUMP ROTOR LANDING OVERVIEW

**ISSUE DATE**


MARCH 9 2020

**ISSUED BY**

ENGINEERING

All LSI pump shop personnel have access to our Space Out/Rod Stretch Calculator. They are mandated to use it and provide recommendations with each pump that goes out. This is an excel program that contains proprietary information about our pump designs, so it is not shared externally, but considers the following inputs to calculate the space out recommendation.

- a. Pump Model
- b. Rod Size
- c. Pump Lift
- d. Length of Rods in the Hole
- e. Ideal Distance off tagbar ~ 12inches.
- f. Screenshot of the space out calculator is below.



### Lifting Solutions - PCP Rod Stretch Calculator

1. Select a Pump Model:  2. Select a Rod Size:

Pump Specifications			Rod Specifications		
	Metric	Imperial		Metric	Imperial
Nominal Displacement	0.150 m <sup>3</sup> /day/100rpm	0.944 bbls/day/100rpm	Rod OD	25.4 mm	1.000 in
Rotor Diameter Major	48.06 mm	1.892 in	Rod CSA	507 mm <sup>2</sup>	0.785 in <sup>2</sup>
Rotor Diameter Minor	36.25 mm	1.427 in	Fluid Loading Specifications		
Eccentricity	5.91 mm	0.233 in		Metric	Imperial
Load Bearing Area	2815 mm <sup>2</sup>	4.363 in <sup>2</sup>	Active CSA	2308 mm <sup>2</sup>	3.578 in <sup>2</sup>

Rod Stretch Calculations (Metric)		
Pump Lift (m)	Rod Stretch (mm/m)	Rod Stretch (in/ft)
0	0.00000	0.000000
200	0.04318	0.000158
400	0.08636	0.000316
600	0.12953	0.000474
800	0.17271	0.000632
1000	0.21589	0.000790
1200	0.25907	0.000948
1400	0.30224	0.001106
1600	0.34542	0.001264
1800	0.38860	0.001422
2000	0.43178	0.001580
2200	0.47495	0.001738
2400	0.51813	0.001896
2600	0.56131	0.002054
2800	0.60449	0.002212
3000	0.64767	0.002370

3. Enter Actual Pump Lift :

4. Enter Actual Length of Rods:

5. Ideal Distance of Tagbar (12in):

6. Calculated Rod Stretch (Due to pressure on the top of the pump):

7. Recommended Pick Up After String Weight:

**At the rated pump lift of 1400m with 600m of 1in rods in service, once string weight has been achieved in the blocks, Lifting Solutions recommends a pick up of 19.1in.**

This recommendation is given to the consultant with the pump. Ideally this recommendation is followed, but if not, it can cause issues with our feedback and resolution from the next step.

We have started documenting these recommendations in our product tracking system. This will ensure we are making, communicating, and documenting the recommendation from our side based on the results of the PCP Rod Stretch Calculator. There is also a spot in there for the field contact which will allow trending in the future if needed.

Pump History	
<span>← Previous</span> <span>Next →</span> <span>+ New</span> <span>🗑 Delete</span> <span>↶ Back</span>	
Pump Serial Number:	LSI 015-1400-MN1-S200660-R10677-L-100
Company No:	Crew Energy ▼
Office Contact:	James Kokonas <span>Edit</span>
Field Contact:	<span>Clear</span>
UWI:	100122804508W400
UWI Custom Field:	Wainwright
API	14.583333
Density	968.500000
<span>Get Estimate</span>	
<b>LSI Space Out (String Weight plus):</b>	
Shipped Ref:	SV002574
Installed Date:	01 / 28 / 2019
Installed Rotor Owner:	VORP ▼
Installed Stator Owner:	CLIENT ▼
Pulled Date:	mm / dd / yyyy
Reason for Workover:	▼
Pulled Rotor Owner:	▼
Pulled Stator Owner:	▼
Installed Days:	352
<b>Client Entered Information</b>	
Cumulative Oil:	
Cumulative H <sub>2</sub> O:	
Cumulative Sand:	
Hours On:	
Run Days:	
<span>💾 Save</span>	

The third step is a continuous feedback loop from the pump shop inspections that tells us how we are doing with these recommendations. If any adjustments are to be made, they are made to the above stated ideal distance off tagbar to bring things into better alignment with respect to space out.

Below is a screen clip of the detailed feedback information from our product tracking system.

PC Pump Pulled (Summary)															2020-01-15
Company = Crew Energy															
Sort by: Pulled asc															
Location	Company	Installed	Serial Number	Field	UWI	License No	Rotor Disposition	Stator Disposition	Pulled Date	Reason for WO	Landed	IN (off TAG)	Stator Condition	Rotor Condition	Run Days
Lloydminster	Crew Energy	2018-05-11	LSI 015-1400-MN1-S200029-R10043-P-100	Marsden	191/11-32-043-22W3/00	11C459	Sent for Rechrom	Discarded	2018-07-18	Inspect Pump	GOOD	20	Burnt	Heat Checked	68
Lloydminster	Crew Energy	2018-07-13	LSI 043-1500-MN1-S200217-R10232-P-150	Marsden	111/11-29-045-26W3/00	12J204	Good (Used)	Good (Used)	2018-08-14	Rod Failure	GOOD	21	N/A	N/A	32
Lloydminster	Crew Energy	2018-07-18	LSI 010-1800-MN1-S200234-R10287-P-100	Marsden	191/11-32-043-22W3/00	11C459	Sent for Rechrom	Discarded	2018-10-04	Low Pump Efficiency	HIGH	26	Burnt	Heat Checked	78
Lloydminster	Crew Energy	2018-08-11	LSI 010-1800-MN1-S200360-R10376-P-150	Lashburn	191/06-17-049-24W3/00	11C218	Held for Rechrom	Discarded	2018-10-05	Low Pump Efficiency	EXTREME	34	Burnt	Heat Checked	55
Lloydminster	Crew Energy	2018-08-30	LSI 013-1500-SN1-S200326-R10342-P-150	Lashburn	191/06-16-048-24W3/00	081018	Sent for Rechrom	Discarded	2018-10-09	Low Pump Efficiency	GOOD	20	Burnt	Heat Checked	40
Lloydminster	Crew Energy	2018-05-01	LSI 010-1800-MN1-S200057-R10107-P-100	Wainwright	100/12-28-045-08W4/00	0452501	Good (Used)	Good (Used)	2019-01-28	Rod Failure	GOOD	15	Good	Good	272
Lloydminster	Crew Energy	2018-10-21	LSI 020-1800-MN1-S200362-R10378-P-150	Wildmere	103/13-20-048-05W4/00	0490203	Good (Used)	Good (Used)	2019-02-22	N/A	GOOD	12	Good	Good	124
Lloydminster	Crew Energy	2018-05-25	LSI 010-1800-SN1-S200061-R10067-P-150	Baldwinton	191/11-31-043-22W3/00	11C604	Held for Rechrom	Discarded	2019-03-03	No Pressure Test	HIGH	24	Burnt	Heat Checked	282
Lloydminster	Crew Energy	2019-02-19	LSI 015-1400-SN1-S200520-R10539-P-100	Lashburn	131/14-23-046-24W3/00	05F285	Discarded	Discarded	2019-05-01	N/A	LOW	1	Burnt	Heat Checked	71
Lloydminster	Crew Energy	2019-05-22	LSI 015-1400-MN1-S200573-R10560-P-100	Lone Rock	121/07-05-046-27W3/00	12F185	Good (Used)	Good (Used)	2019-05-28	Blown Drain	HIGH	24	Good	Good	6
Lloydminster	Crew Energy	2019-05-24	LSI 015-1400-SN1-S201268-R11283-P-150	Lashburn	121/10-23-049-24W3/00	99E058	Held for Rechrom	Discarded	2019-07-05	Sand	GOOD	12	Burnt	Heat Checked	42
Lloydminster	Crew Energy	2019-06-07	LSI 015-1800-MN1-S201434-R11438-P-100	Nielburg	191/06-32-043-22W3/00	11C439	Good (Used)	Good (Used)	2019-07-10	No Pressure Test	GOOD	20	Good	Pitting	33
Lloydminster	Crew Energy	2018-06-27	LSI 015-1800-MN1-S200164-R10181-P-100	Baldwinton	191/16-32-043-22W3/00	10L047	Held for Rechrom	Discarded	2019-10-15	Low Pump Efficiency	GOOD	14	Burnt	Heat Checked	475
Lloydminster	Crew Energy	2018-04-28	LSI-PV 015-1200-SN1-S200197-R10158-P-150	Marsden	111/06-04-045-24W3/00	03H419	Discarded	Discarded	2019-11-06	Low Pump Efficiency	LOW	0	General Wear	Base Metal Wear	557
Lloydminster	Crew Energy	2019-03-20	LSI 028-1600-MN1-S200084-R10120-L-150	Swimming	104/12-14-052-07W4/02	0482574	Held for Rechrom	Discarded	2019-11-20	No Pressure Test	GOOD	17	External Hole	General Wear	245
Lloydminster	Crew Energy	2019-04-05	LSI 028-1600-MN1-S200091-R10119-L-150	Tangleflags	111/01-28-051-24W3/00	13B278	Held for Rechrom	Discarded	2019-12-02	N/A	GOOD	16	External Hole	General Wear	241
Lloydminster	Crew Energy	2020-01-02	LSI 043-1500-MN1-S2002633-R12569-P-150	Lone Rock	111/13-29-046-26W3/00	14I053	Good (Used)	Good (Used)	2020-01-06	Sand	LOW	0	Good	Good	4
Lloydminster	Crew Energy	2019-11-28	LSI 015-1800-MN1-S201434-R11438-P-100				Good (Used)	Good (Used)	2020-01-11	Blown Drain	EXTREME	37	Good	Good	44
Total Pumps: 18 Average Run Days: 148.3															

In addition, this feedback loop is typically shared in our quarterly pump review meetings. Below is a graphical snapshot based on the inspections performed.

