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LA-300 五缸柱塞泵用户手册

LA-300 Quintuple Plunger Pump Service Manual

德州利安石油机械有限公司
DE ZHOU L&A PETROLEUM MACHINERY CO.,LTD

在您准备安装和使用钻井泵以前，请您务必阅读这份使用说明书，它将告诉您正确的安装方法与使用规则，这对钻井泵的使用和维护将是十分有益的。

Please make sure to read this user manual, before you prepare to install and use this drilling pump, and it will tell you the correct installation methods and operation rules, which will be very helpful to use and maintenance of this pair of drilling pumps.



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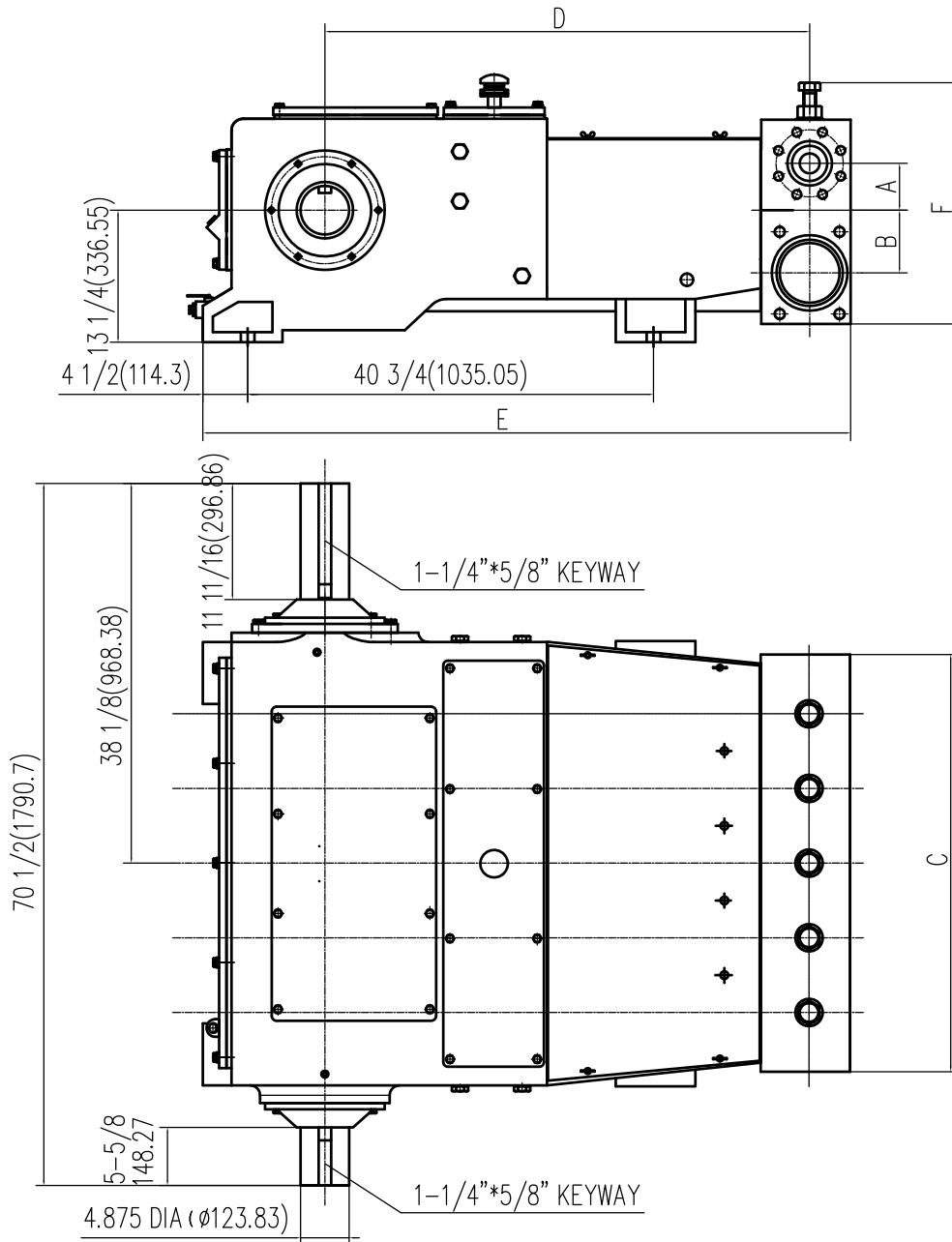
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LA-300 泵外型尺寸图 Overall Dimension Diagram



泵型 Pump Model	法兰连接 Flange Connections		尺寸 (in) Dimension(in)					
	排出管连接 Discharge Connection Sizes	吸入管连接 Suction Connection Sizes	A	B	C	D	E	F
LA-300-5L	4 API 2000RJ	8 ANSI 150 FF	6 1/4	9 1/8	48 1/4	49	68	25 1/8
LA-300-5M	3 NSD 500RJ	6 NSD 600 RJ	4 1/2	6 1/2	41 1/2	48 5/8	65	25 7/16
LA-300-5H	2 ANSI 2500RJ	6 NSD 600RJ	4 1/2	6 1/2	41 1/2	48 5/8	65 1/8	25 5/8

一、LA-300 五缸单作用泵技术规范

Technical specification of LA-300 quintuple plunger single action pump

额定输入 Rated output power	224kw (300HP)
最高冲次 Maximum strokes per minute	400 冲 / 分 (400SPM)
冲程 Stroke	127 mm (5")
最高工作压力 Maximum working pressure	“L” MODEL 1650PSI “M” MODEL 3000PSI “H” MODEL 5000PSI
最大柱塞直径 Maximum plunger diameter	4 "
键 Key	1 1/4" * 5/8" 31.75mm x 15.9mm
重量 (主机) Weight (main frame)	“L” MODEL 3175Kg “M” MODEL 3062Kg “H” MODEL 3103Kg

二、结构特点

Structural characteristics

LA-300 型五缸柱塞泵是一种往复式，容积式，欧式单作用柱塞泵，其额定最大功率是 224KW (300HP)，柱塞直径可以在 1 1/2" - 4" 之间选择，以满足用户对不同压力和排量的要求。所有不同直径柱塞的液力端所配的动力端是相同的，该泵用于间断性油井作业。

Model LA-300 quintuple plunger pump is a reciprocating, positive displacement, European single action plunger pump, It's rated maximum power is 224KW (300HP), Plunger diameter can be between 1 1/2 "-4", to meet the user's requirements for different pressure and displacement..The Fluid ends of all plungers of different diameters have the same power ends.This pump is used for intermittent well operation.

1. 动力端

Power end

机架 铸件应力消除处理，获得良好的刚性和高强度，精密镗削加工。

The Frame The frame is made of casting and stress relief treated to obtain the good rigidity and high strength. Then precision boring machining.

曲轴 由整体合金钢锻造、热处理加工而成，精磨曲轴轴颈由 4 个重型圆柱滚子轴承支承。

Crankshaft The crankshaft is made of alloy steel forged and processed by heat treatment and supported by 4 heavy duty cylindrical roller bearings.

连杆 由高强度铸钢精加工而成，两端轴伸出部分，任一端均可安装皮带轮。

Connecting Rod It is made of high strength cast steel. Belt pulley may be mounted on either end of the extensions of the shaft.

十字头 由高强度球墨铸铁精加工而成。

Crosshead It is made of high strength ductile iron.

2. 液力端

Fluid end

液缸 整体式设计，由高强度合金钢（或按客户要求材质铝青铜，不锈钢等）锻造整体加工而成。

Hydraulic cylinder The integral design is made of high strength alloy steel (or according to customer requirements, such as aluminum bronze, stainless steel, etc) forging.

柱塞盘根 自调式盘根总成精密压制纤维强化压环 精密加工的青铜接合环不同成分的盘根适用于各种常用的介质有盐酸水泥压裂砂浆烃类甲苯等适应环境温度和液体温度范围广。

Plunger Packing Self-adjusting disc assembly precision pressed fiber reinforced ring precision machining bronze joint ring different components of disc are suitable for a variety of common media such as hydrochloric acid cement fracturing mortar hydrocarbon toluene to adapt to the environmental temperature and liquid temperature range.

吸入口 有两个吸入口，左右吸入口可连接替换式吸入法兰。

Inlet. There are two suction inlet left and right connecting alternative suction flanges.

排出口 有两个排出口 左右排出口可连接替换式排出法兰。

Outlet. There are two row outlets left and right to connect the replacement discharge flange.

三、性能参数表

Performance parameters table

LA-300 泵英制参数 Parameters of Pump English Units			冲次 / 分 Strokes/ minute	100RPM	200RPM	250RPM	300RPM	350RPM	400RPM
泵型 Pump	柱塞直径 Plunger diameter (in)	压力 Pressure (psi)	加仑 / 转 Gallon/ revolution	加仑 / 分 (GPM) Gallon/minute (GPM)					
LA-300-L	4	851	46.6284	136.0	272.0	340.0	408.0	476.0	544.0
	3.75	969	40.9820	119.5	239.1	298.8	358.6	418.4	478.1
	3.5	1112	35.6999	104.1	208.2	260.3	312.4	364.4	416.5
	3.25	1290	30.7820	89.8	179.6	224.5	269.3	314.2	359.1
	3	1514	26.2285	76.5	153.0	191.2	229.5	267.7	306.0
	2.75	1650	22.0392	64.3	128.6	160.7	192.8	225.0	257.1
LA-300-M	2.75	1801	22.0392	64.3	128.6	160.7	192.8	225.0	257.1
	2.5	2180	18.2142	53.1	106.2	132.8	159.4	185.9	212.5
	2.375	2415	16.4383	47.9	95.9	119.9	143.8	167.8	191.8
	2.25	2691	14.7535	43	86.1	107.6	129.1	150.6	172.1
	2.125	3000	13.1598	38.4	76.8	96.0	115.1	134.3	153.5
	2	3000	11.6571	34	68.0	85.0	102.0	119.0	136.0
LA-300-H	2	3406	11.6571	34	68.0	85.0	102.0	119.0	136.0
	1.875	3875	10.2455	29.9	59.8	74.7	89.6	104.6	119.5
	1.75	4449	8.9250	26	52.1	65.1	78.1	91.1	104.1
	1.625	5000	7.6955	22.4	44.9	56.1	67.3	78.6	89.8
	1.5	5000	6.5571	19.1	38.2	47.8	57.4	66.9	76.5
取机械效率 $\eta=90\%$ ，充满系数 $\alpha=100\%$ ，容积效率 100% Mechanical efficiency $\eta=90\%$, coefficient of admission $\alpha=100\%$ and volume efficiency 100%									

LA-300 泵公制参数 Parameters of Pump Metric Units			冲次 / 分 Strokes/ minute	100RPM	200RPM	250RPM	300RPM	350RPM	400RPM
泵型 Pump	柱塞直径 Plunger diameter (mm)	压力 Pressure (kpa)	升 / 秒 // 转 L/Sec/ revolution	升 / 秒 (L/Sec)					
LA-300-L	102	5871	0.0858	8.6	17.2	21.5	25.7	30.0	34.3
	95	6680	0.0754	7.5	15.1	18.9	22.6	26.4	30.2
	89	7663	0.0657	6.6	13.1	16.4	19.7	23.0	26.3
	83	8893	0.0566	5.7	11.3	14.2	17.0	19.8	22.7
	76	137	0.0483	4.8	9.7	12.1	14.5	16.9	19.3
	70	11376	0.0406	4.1	8.1	10.1	12.2	14.2	16.2
LA-300-M	70	12421	0.0406	4.1	8.1	10.1	12.2	14.2	16.2
	64	15029	0.0335	3.4	6.7	8.4	10.1	11.7	13.4
	60	16653	0.0302	3.0	6.0	7.6	9.1	10.6	12.1
	57	18555	0.0271	2.7	5.4	6.8	8.1	9.5	10.9
	54	20684	0.0242	2.4	4.8	6.1	7.3	8.5	9.7
	51	20684	0.0215	2.1	4.3	5.4	6.4	7.5	8.6
LA-300-H	51	23483	0.0215	2.1	4.3	5.4	6.4	7.5	8.6
	48	26719	0.0189	1.9	3.8	4.7	5.7	6.6	7.5
	44	30672	0.0164	1.6	3.3	4.1	4.9	5.7	6.6
	41	34474	0.0142	1.4	2.8	3.5	4.2	5.0	5.7
	38	34474	0.0121	1.2	2.4	3.0	3.6	4.2	4.8
取机械效率 $\eta=90\%$, 充满系数 $\alpha=100\%$, 容积效率 100% Mechanical efficiency $\eta=90\%$, coefficient of admission $\alpha=100\%$ and volume efficiency 100%									

四、安装与使用

Installation and use

1. 拆卸缸套程序

Procedures to dismantle the cylinder liner

(1) 旋转曲轴，直到介杆向前进。拆卸介杆到十字头锁紧螺丝。并将介杆从十字头上松开 1/4 圈。

Rotate the crankshaft until the intermediate rod is all the way forward. Remove the intermediate rod to crosshead lock screw, and brake the intermediate rod loose from the crosshead one-fourth turn.

(2) 当介杆处于向前位置时，在盘根盒中向前滑动柱塞。

With the intermediate rod in the forward position, slide the plunger forward in the stuffing box.

(3) 旋转曲轴，直到介杆处于曲轴行程的后位置。旋开介杆和止油头螺丝，然后将杆和止油头作为一个总成拆卸下来。

Rotate the crankshaft until the intermediate rod is in the back position of its stroke. Unscrew at the intermediate rod and the intermediate rod wiper retainer cap crews then remove the rod and retainer as one assembly.

(4) 柱塞现在可以从盘根盒中滑出，并通过空档取出。

The plunger can now be slide back out of the stuffing box and removed through the cradle chamber.

(5) 拆卸盘根盒螺帽、油嘴和盘根。

Remove the stuffing box nut, lube fitting, and packing.

2. 安装盘根盒和柱塞程序

Procedures to install the stuffing boxes and plungers

(1) 旋转曲轴，直到介杆处于吸入行程的末端。

Rotate crankshaft until the intermediate rod is at the end of the suction stroke.

(2) 安装了盘根盒填料和柱塞后，将总成滑入导孔。如果正确对齐和润滑，盘根盒将很容易滑动到位。用法兰压紧时，应确保润滑油嘴孔在顶部。

With the stuffing box packing and plunger installed, slide the assembly into the pilot bore. If properly aligned and lubricated, the stuffing box will slide easily into place. When a flanged retainer is used with the stuffing box, make certain the lubrication fitting hole is at the top.

(3) 将盘根盒六角螺母紧固到扭矩值 : 800ft-lbs

Tighten stuffing box hex nuts to the torque values: 800ft-lbs.

(4) 在介杆上安装橡胶挡板（如果使用），用螺纹连接或卡箍连接柱塞和介杆。确保配合表面清洁，无刻痕和毛刺。

Install rubber baffle (if used) on intermediate rod and connect plunger to intermediate rod with threaded connection or clamped connection. Make sure the mating surfaces are clean and free from nicks and burrs.

(5) 旋紧盘根盒锁紧螺母。

Adjust stuffing box nut.

(6) 盘泵检查各部是否有卡阻现场。

Run the pump and check if there is any jam spot in different parts.

正常情况下，更换柱塞泵三只盘根盒需 3-4 小时。

Normally, it takes 3 to 4 hours to change the three stuffing boxes of the plunger pump.

五、泵的启动及操作

Starting and operation of the pump

1. 动力端的准备工作

Preparation for the power end

柱塞泵出厂前已完全组装好，并经过负荷运转试验，润滑油已从动力端放出。在泵运转前要进行下述的操作和检查。

The plunger pump has already been completely well assembled before delivery from the factory, and has been subjected to the load running test, while lubricating oil has been discharged out from the power end. It is required to make undermentioned operations and inspections before operation of the pump.

开动一台新泵或重新开动一台久停不用的泵时，首先打开泵上的上罩，检查动力端内腔里是否有凝集润滑油。如果有凝集润滑油，打开泵两侧的管堵，放出集存的油，并冲洗动力端内腔。然后按下述要求将一定牌号和数量的润滑油注入动力端油池内，同时打开十字头孔盖，用机油枪将润滑油喷到导板上并盘车数圈，以保证启动泵时立即得到润滑：

When a new pump is started or a pump that has not been used for a long time, firstly open the inspection cover on the pump, before lubricating oil is filled, to examine whether or not lubricating oil has possibly been agglutinated in the inner chamber of the power end, and open the pipe plugs on the two sides of the pump, discharge out the accumulated oil, and flush the inner chamber of the power end. Then fill certain brand and amount of lubricating oil into the oil sump of the power end according to the undermentioned requirements, and at the same time open the crosshead hole cover, use oil gun to spray the lubricating oil onto the guide plate and turn the engine for a number of circles, to ensure that lubrication is available immediately when pump is started.

使用极压（EP），无腐蚀，防泡沫的齿轮润滑油，规定如下：

Use extreme pressure (EP), non-corrosive, and anti-foam gear lubricating oil, and the specifications are given as follows:

美制单位 U.S UNITS:

U.S. UNITS OF MEASURE	
Temperature	AGMA Industrial EP Gear Oil
+50°F to +155°F	AGMA No. 6 EP or ASTM/ISO Grade No. 320 (viscosity 1335 to 1632 SSU 100°F)
+20°F to +100°F	AGMA No. 5 EP or ASTM/ISO Grade No. 220 (viscosity 918 to 1122 SSU 100°F)
-20°F to + 60°F	AGMA No. 2 EP or ASTM/ISO Grade No. 68 (viscosity 284 to 347 SSU 100°F)

公制单位 METRIC UNITS:

METRIC UNITS OF MEASURE	
Temperature	AGMA Industrial Gear Oil
+10°C to +68°C	AGMA No. 6 EP or ASTM/ISO Grade No. 320 (Viscosity 228-352 cSt at 37.8°C)
-7°C to +38°C	AGMA No. 5 EP or ASTM/ISO Grade No. 220 (Viscosity 198-242 cSt at 37.8°C)
-29°C to +16°C	AGMA No. 2 EP or ASTM/ISO Grade No. 68 (Viscosity 61-75 cSt at 37.8°C)

加油量：至油标尺高油位，约 45.4 升（12 加仑）。

Filling Amount: to the high oil level of the oil pointer, about 45.4L（12Gallon）

在泵运转 15 分钟以后，再次检查油面，停泵大约 5 分钟使油平稳后，检查油标尺，由于有一定量的润滑油停滞在十字头以及机壳空腔，可能使油位下降视需要补充一定量的润滑油。

After the pump has run for 15min, examine the oil level again, and examine the oil leveler, after the pump has been stopped for about 5min to stabilize the oil. As certain amount of lubricating oil stays behind in the crosshead and the empty chamber of the case, the oil level may likely drop, to be supplemented with certain about of lubricating oil as required.

2. 液力端的准备工作

Preparation for hydraulic end

检查柱塞端的盘根盒，柱塞和阀是否装配正常，泵排出管线阀门是否打开。

Examine whether or not stuffing box, plunger, and valve of the hydraulic end are normally assembled, and whether or not the valve of the discharge line for the drilling pump is opened.

起动前，必须在液缸里灌满泥浆或水，以免发生气穴现象，已经发生气穴现象的泵，不能在有压力的情况下解除气穴，所以要打开通向泵的阀门，作“小循环”运转，让泵运转到所有空气都被排除为止，这样可以保证钻柱塞泵运行平稳，并延长易损件的寿命。

Prior to start, it is required to fill up mud slurry or water in the hydraulic cylinder, to avoid cavitation. As to the pump that has encountered cavitation, the effect shall not be removed under the situation when there is pressure. Therefore, the valve leading to the drilling pump shall be opened, to make “minor-circulation” operation, and allow the pump to run until all the air is removed, thus to be able to ensure a steady operation of the plunger pump, and extend the service life of the wearing parts.

检查安全阀安全设定压力是否与柱塞相应压力匹配。详见安全阀使用说明书

Examine whether or not the safety pin of the safety valve has been inserted on the pin hole of corresponding pressure of the plunger. Refer to the Safety Valve Operating Manual for details.

3. 起动后的工作

Work after Start

泵的转数最好慢慢提高，这样做可使吸入管线内液体流速的增加跟上柱塞的速度，不致发生气穴现象。

It is advisable for the number of pump revolutions to be slowly increased, which may enable the increase in the flow speed of the fluid sucked into the pipeline to keep up with the speed of plunger, not giving rise to cavitation.

在自然吸入情况下，泵的最高转数决定于泵在吸入行程中是否吸足液体，这个极限转数在不同的情况下是不一样的，根据吸入管线的设计和有效压头而异，也根据液体情况而异（如泥浆比重、粘度和所含的气体），操作人员根据泵的声音来判断是否出现气穴或吸入不良，以便及时采取措施。

Under the circumstance of natural suction, the maximum number of pump revolution depends on whether or not fluid has been sufficiently sucked during the suction stroke, and this limiting number of revolutions is different under different situations, varying according to the design of the suction line and the effective pressure head, or according to the situation of mud as well (such as the specific weight, viscosity, and the contained gas amount of the mud). Operator judges whether or not cavitation has occurred or the suction is poor according to the sound of the pump, so that the measures can be timely taken.

检查动力端各个轴承部位，十字头导板等位置的温度是否过高和有异常响声、异常现象等，一般油温升不超过 45°C。

Examine whether or not temperature in the positions of respective places of bearing on the power end, and the crosshead guide plate, etc is too high or anomalous sound, and anomalous effect exists there, and generally the oil temperature shall not exceed 50°C.

4. 润滑

Lubrication

对运动的机械零件进行充分的润滑是很重要的，它直接影响机械零件的极限寿命，要使泵动力端获得最长的无故障寿命，就必须进行常规的保养和检查，以保证适量的清洁的润滑油流到各运动零件上。

It is very important to make full lubrication to the moving mechanical parts, and it directly affects the limit service life of the mechanical parts. Routine maintenance and inspection must be performed, if it is intended for the power end to get the longest fault-free service life, to ensure that proper amount of clean lubricating oil can flow onto respective moving parts.

柱塞泵是“飞溅”润滑。主轴承是通过车架上的孔油润滑。曲轴轴承是由飞溅和低速通过轴销从十字头储油池润滑。介杆是由十字头的飞溅润滑。

Plunger Pump are “splash” lubricated. The main bearings are receive oil through ports in the frame. Crankshaft bearings are fed by splash and low speed through roll pins from the crosshead reservoir. Intermediate rods are lubricated from the splash they receive from the crosshead.

泵工作时，每班巡回检查一次机架内的油位，使之保持在油标尺的满位标记上。

When pump is under operation, each working shift takes one patrol inspection for the oil level of the mainstock, for it to be kept on the full-level mark of the oil pointer.

在动力端的十字头部位两侧有沉淀池，溅入池内的油污应进行沉淀，沉淀池排油盖位于十字头检查门下方的机架两侧，每月检查一次，打开两侧的排污盖，从沉淀池排出沉渣的油污，这样要损失约一定数量油，因此要补充一定数量的润滑油。

The settling tanks are available on the two sides of the crosshead part on the power end, and the oil stain splashed into the tank shall be settled. The oil discharge covers of the settling tank are located on the both sides of the frame under the access door of the crosshead, to be examined once a month, by opening the blow-down covers on the two sides, to discharge out the sedimentary oil stain from the settling tank, to lose some oil this way, for this reason it is required to make up certain amount of lubricating oil.

新泵累积运转 300 小时后应更换全部动力端润滑油，然后每六个月时间检查一次，如油里有磨粒或腐蚀性化合物，应一次把油排出，并对油池进行冲洗，然后加入新油。排油口在泵的机架后端。在冲洗时，要彻底清洗各油槽和十字头导板上面的油腔。定期检查润滑油的状况。由于空气的潮气、水分、灰尘、及泥浆的侵入，更需要经常的换油。

All the lubricating oil for the power end shall be replaced after the new pump has cumulatively operated for 300h, to be examined once for every 6 months afterwards. If abrasive particles or corrosive chemicals exist in the oil, the oil shall be discharged out for a single time, and the oil tank shall be flushed, for new oil to be filled then. The oil discharge outlets are located on the two sides and back end of the pump. The oil chambers on respective oil grooves and crosshead guide plate shall be thoroughly cleaned, at flushing. The condition of the lubricating oil shall be periodically inspected. It is moreover required to replace the oil frequently, due to the intrusion of the humidity, moisture, and dust in the air, as well as the mud.

六、保养

Maintenance

1. 每天的保养工作

Daily maintenance

- (1) 停泵每班检查一次动力端的油位。

Stop the pump every shift and check the oil level of the power end.

- (2) 观察盘根盒与柱塞的工作情况，不应有明显的偏磨和液体漏失。

Observe the working condition of stuffing box and plunger, there shall be no obvious eccentric wear and fluid leakage or loss.

- (3) 保证柱塞都得到充分的冷却与润滑液的供应。

Ensure the enough cooling for plunger and the supply of lubrication liquid.

- (4) 柱塞泵安装完毕之后，第一次运转几小时后，应当重新检查一下柱塞螺纹的上紧力矩。

After the plunger pump is installed and few hours of the first running, recheck the tightening torque of the plunger thread.

- (5) 每天检查一次排出空气包的压力，保证它的充气程度符合规定要求。

Check the pressure of the discharge pulsation dampener once a day, to ensure that the gas charging level meet specified requirements.

2. 每周的保养工作

Weekly maintenance

- (1) 每周把液缸上的阀盖卸开，把阀盖丝扣和阀箱丝扣上的淤泥与其它脏物清洗干净，然后在清理干净的丝扣上涂一层丝扣油，以防扣磨蚀，擦伤和咬死（建议采用铅基丝扣油）。

Remove the valve cover in the hydraulic cylinder every week, clean off the mud and other dirt on the screw thread of valve cover and module thread, then coat the screw thread with a layer of screw thread oil to avoid thread wear, scratch and dead locking (It is suggested to use lead-base screw thread oil).

- (2) 检查阀和阀座的磨耗情况，把磨损或刺坏了的阀座换掉。

Check the wear condition of the valve and valve seat, and change the broken or pricked valve seat, if necessary.

- (3) 检查柱塞，如磨耗大或刺坏必须更换。

Check the plunger. It must be changed if the wear is serious or it is pricked.

3. 月的保养工作

Monthly maintenance

- (1) 每六个月把动力端内油槽的沉淀池（十字头下面），中的脏油放掉加以清洗，并加入新油。

Discharge the dirty oil in the precipitating tank (below the crosshead) of the oil tank in the power end, clean it and inject new oil every six months.

- (2) 每六个月检查导板与十字头之间的间隙，间隙太大应调整。

Check the clearance between the guide place and crosshead every six months. If the clearance is too large, it shall be adjusted.

- (3) 液力端的所有双头螺柱和螺母，都要检查一次上紧程度。

Tightening of all stud bolts and nuts of the lucid end shall be checked once.

4. 年度保养工作

Annual maintenance

每隔一年或两年，检查曲轴轴承，连杆轴承，十字头轴承，是否松动，如果发现有的地方应当对泵进行一次更加彻底的检查并采取纠正措施。

Check the crank bearing, connecting rod bearing, crosshead bearing, and for looseness every one or two years. If any, a more thorough check and corrective action must be taken.

七、贮藏

Storage

动力端：

如果泵的停车时间超过三个月，应当把液力端提起垫高使泵向动力端倾斜，然后，将油槽和沉淀池内的油放空，洗干净作长期贮备。

Power End: if the time for the pump to be stopped for operation for more than 3 months, the hydraulic end shall be lifted and filled up, for the power end of the pump to be inclined. Then the oil grooves and settling tanks shall be emptied, and cleaned up, for long-term preservation.

液力端：

卸下液缸的阀、柱塞，盘根盒，彻底清理液缸内部和所有的零件，在整个液缸阀和零件上都要涂防锈油，清防止生锈。

Hydraulic End Remove the valve, plunger, stuffing box on the hydraulic cylinder, thoroughly clean the inside of the hydraulic cylinder and all the parts. It is required to coat antirust oil on the entire hydraulic cylinder valve and the parts, to prevent rust.

每月把泵检查一次，并转动齿轮一次，如有必要重新涂防锈油。

Examine the pump once a month, and turn the gear once, for antirust oil to be re-coated if necessary.

贮藏后重新开动

Restart of storage

贮藏一段时间后重新开动泵时，不管是现场用的泵，还是刚从工厂送来的新泵，都必彻底检查，确定它有没有损坏零件，以及所有零件是否都装配良好，如果不注意下列各点，可能会引起严重破坏事故。

When the pump is restarted after storage for a period of time, no matter it is the pump used on site or the new pump just delivered from factory, it shall be thoroughly inspected without exception, to make sure as to whether or not it has the damaged parts, and whether or not all the parts are well assembled. It may likely give rise to severe destructive accident, if attention is not paid to the following points.

(1) 把动力端和液力端的盖子都打开，彻底检查，清理所有零件和加工面，检查所有轴承，保证它们都是清洁而且情况良好，在动力端加润滑油，加至规定油位。在轴承处加油，并使它流到轴承里面去。

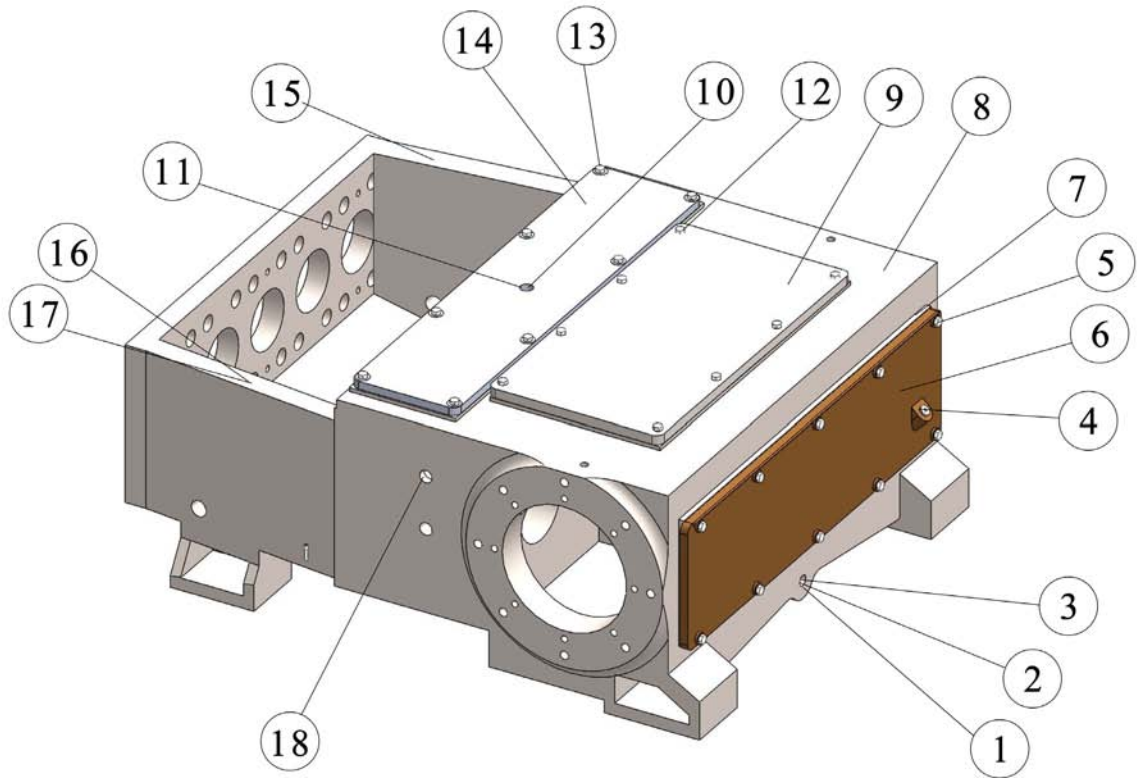
Open all the covers of the power end and the hydraulic end, to thorough examine and clean up all the parts and the processing surfaces, and examine all the bearings, to ensure that they are all clean and under good conditions. Fill lubricating oil at the power end, to be filled to the specified oil level. Fill oil into the lubricating oil distribution grooves, and have it flow into the bearings.

(2) 阀、柱塞和液力端的所有零件必须正确安装并处于良好状态，上紧螺栓、双头螺栓、压紧阀盖、缸盖等。

All the parts for the valve, the plunger, and the hydraulic end must be correctly installed and under good conditions. The tighten bolts, the double-ended bolts and tighten valve cover and cylinder head shall be tightened.

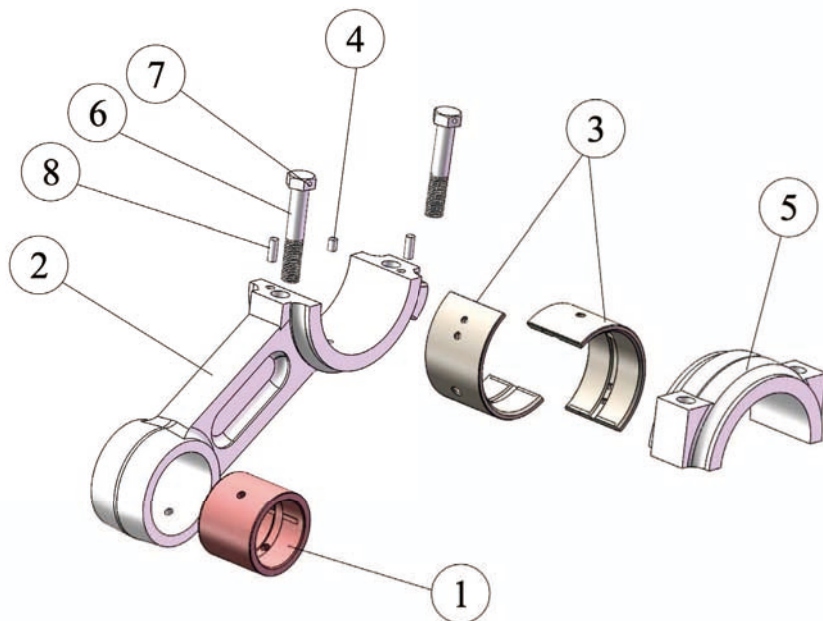
零 部 件 手 册

1. 机架总成 FRAME GROUP



序号 No.	图号 Drawing No.	名称 Name	数量 Qty.
1	6874012	丝堵 1" Plug	1
2	S-101	球阀 1" Ball valve	1
3	Q-101	对丝 1" Nipple	1
4	2400054	油尺 Gage	1
5	7000305-11	螺栓 Screw	10
6	1716515	前侧板 Plate ,Power end rear cover	1
7	1716102	密封条 Gasket	1
8	1716001	泵壳 Frame	1
9	1713014	上盖板 Plate ,Power end top cover	1
10	L-101	滤清器 Cap	1
11	7802020	滤清器接头 Seat	1
12	7000305-12	螺栓 Screw	8
13	7000305-11	螺栓 Screw	8
14	1713013	观察板 Plate,crosshead cover	1
15	1713015	盖板 Plate	1
16	1713016	螺母 Nut	4
17	7113017	螺柱 Stud.	4
18	5874009	丝堵 Plug	5

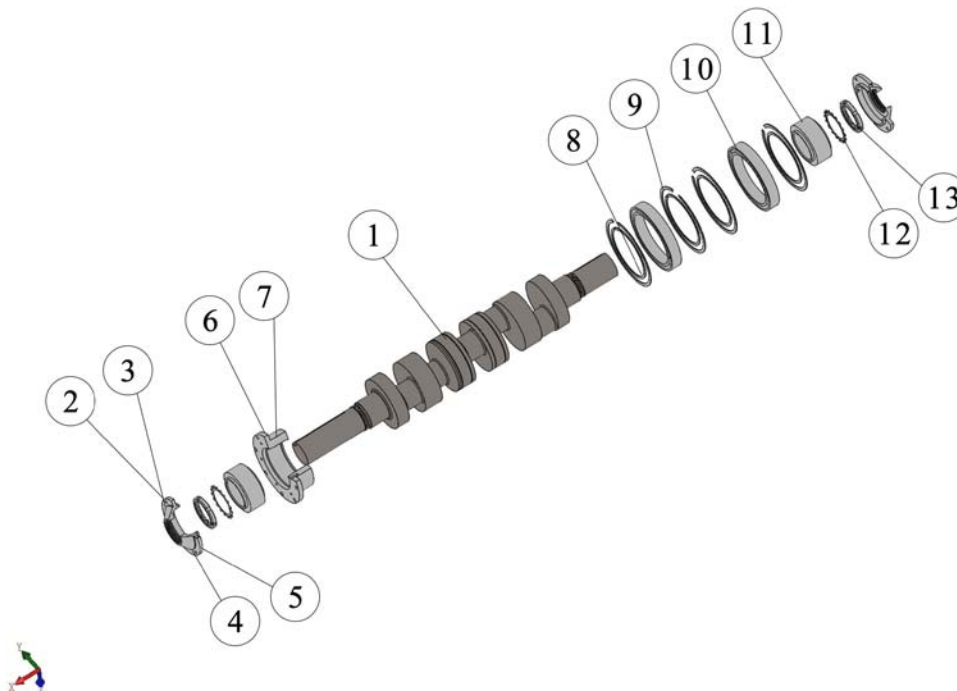
2. 连杆总成 CONNECTING ROD



序号 No.	图号 Drawing No.	名称 Name	数量 Qty.
1	1716030	十字头销衬套 Bushing pin	5
2	G1716004	连杆 Rod connecting	5
3	1716012	曲轴衬套 Bushing crankshaft	5
4	1716000	销子 Pin	5
5		连杆上盖 Top rod, connecting	5
6	21032044	螺栓 Screw	10
7		铁丝 Wire	按需 as required
8	1716001	销子 Pin	10

3. 曲轴壳、曲轴及轴承组件

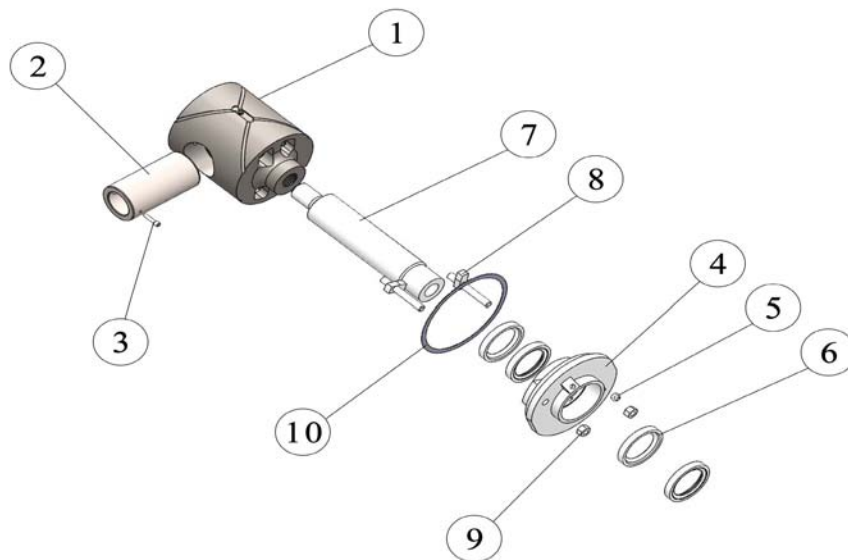
ECCENTRIC SHAFT & BEARING GROUP



序号 No.	图号 Drawing No.	名称 Name	数量 Qty.
1	X17-3412	曲轴 Crankshaft	1
2		铁丝 Wire	按需
3	2400930	螺栓 Screw	24
4	1713022	端盖 Retainer	2
5	1713010	密封垫 Gasket	2
6	1713008	密封条 Gasket	1
7	1713007	主轴承端盖 Cage, main bearing	1
8	1716018	卡簧 Ring, snap	4
9	1716019	卡簧 Ring, snap	4
10	ZT-0056	轴承 Bearing	2
11	ZB-10500	轴承 Bearing	2
12	7610050	锁紧垫片 Lock washer	2
13	6304048	锁紧螺母 Locknut	2

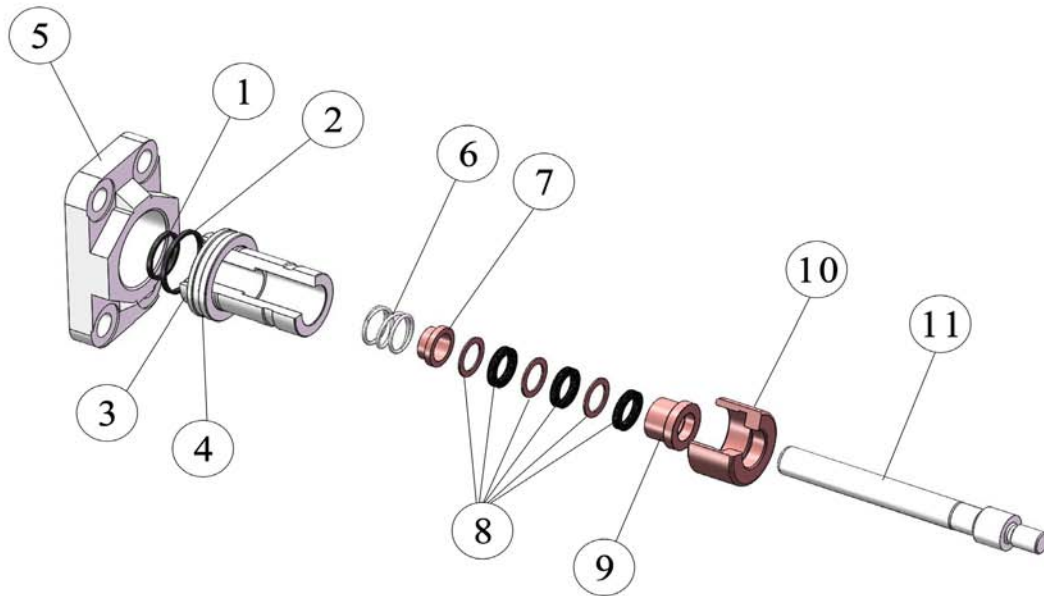
4. 十字头及止油头组件

CROSSHEAD & OIL STOP HEAD GROUP



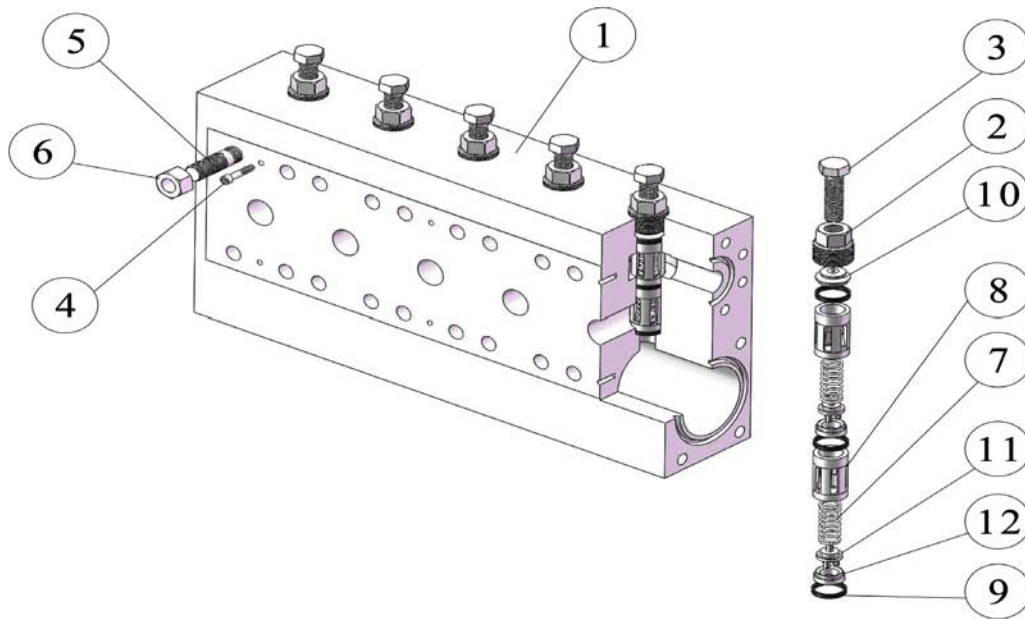
序号 No.	图号 Drawing No.	名称 Name	数量 Qty.
1	1716005	十字头 Crosshead	5
2	1716008	十字头销子 Pin	5
3	2400930	螺栓 Screw	10
4	1716009	止油头 Retainer	5
5	72\805052	油杯 Fitting	5
6	1713297	油封 Seal	20
7	340-023	介杆 Intermediate rod	5
8	1716031	螺栓 Screw	10
9	6308080	螺母 Nut	10
10	1716017	密封垫 Gasket	10

5. 盘根盒、柱塞及盘根 STUFFING BOX, PLUNGERS & PACKING



序号 No.	图号 Drawing No.	名称 Name	数量 Qty.
1	2410031-334-2	密封圈 Seal, stuffing box	5
2	2410031-334-1	密封圈 Seal, stuffing box	5
3	342-919	盘根盒 Stuffing box	5
4	342-907	定位套 Adapter	5
5	1716034	压盖 Retainer, stuffing box	5
6	342-240	弹簧 Spring	5
7	342-346	支撑铜套 Follower	5
8	342-746	盘根组件 Packing	5
9	342-546	压紧铜套 Gland	5
10	342-913	盘根螺母 Nut	5
11	1712038	柱塞 Plunger	5

6. 液力端 FLUID END

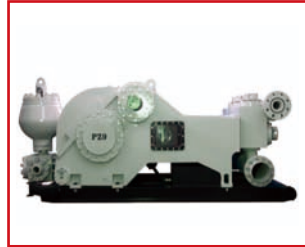


序号 No.	图号 Drawing No.	名称 Name	数量 Qty.
1	17137714	阀箱 Cylinder	1
2	17094842	阀盖 Cover	5
3	1713410	螺栓 Screw	5
4	6908036	内六角螺栓 Screw	6
5	10032367	螺栓 Stud	20
6	6300220	螺母 Nut	20
7	1817030-25S	弹簧 Spring	10
8	1812585-4C	阀盖 Cage	10
9	1712373	密封圈 Seal	15
10	17134172	压盖 Retainer	5
11	1817030-25VB	阀体 Valve body	10
12	1817030-25VS	阀座 Valve seat	10

泥浆泵系列 MUD PUMP



LW440/LW446



PZ7/8/9

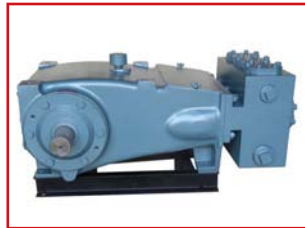


F800-F1600

柱塞泵系列 PLUNGER PUMP



LG3



L59T



LHE215



LEE165



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