

**INSTALLATION, SERVICE AND REPAIR INSTRUCTIONS**

**LOBE PUMP**



**FDP+**

# **READ AND UNDERSTAND THIS MANUAL IN ORDER TO INSTALL, OPERATE OR SERVICE TO FLUSSMANN FLOW LOBE PUMPS.**

Flussmann Flow recommends users of Lobe Pumps and its designs follow the latest Industrial Safety Standards. At a minimum, these should include the industrial safety requirements established by:

- 1-Safety and Health Administration (OSHA)**
- 2-Occupational National Fire Protection Association (NFPA)**
- 3-National Electric Code (NEC)**
- 4-American National Standards Institute (ANSI)**

Severe injury or death can result from electrical shock, burn or unintended actuation of equipment. Recommended practice is to disconnect and lockout industrial equipment from power sources, and release stored energy, if present. Before putting Flussmann equipment into operation, the operator shall analyze the application for all foreseeable risks, their likelihood to occur and the potential consequences of the identified risks as per ISO 31000 and ISO/IEC 31010 in their actual current version.

**Locking and Interlocking Devices:** These devices should be checked for proper working condition and capability of performing their intended functions. Make replacements only with the original renewal parts or kits. Adjust or repair in accordance with the manufacturer's instructions.

**Periodic Inspection:** Equipment should be inspected periodically. Inspection intervals should be based on environmental and operating conditions and adjusted as indicated experience. At a minimum, an initial inspection within 3 to 4 months after installation is recommended.

**Replacement Equipment:** Use only replacement parts and devices recommended by the manufacturer to maintain the integrity of the equipment. Make sure the parts are properly matched to the equipment series model, serial number and revision level of the equipment.

## **WARNINGS**

- 1-**Read the instructions before installing the pump and starting it up. Always follow the guidelines for assembly in order to achieve optimum operational reliability.
- 2-**Always check that the specifications of the motor and the motor control unit are correct, particularly in operating environments where there may be a risk of explosion.
- 3-**Pumps should only be installed, disassembled, repaired and assembled by personnel trained in servicing pumps.
- 4-**Always ensure that all electrical installation is carried out by qualified staff.
- 5-**Never hose down or clean the electric motor directly with water or cleaning fluid. If the motor will be used in a washdown environment a washdown designed motor must be used.
- 6-**Never dismantle the pump before the motor has been disconnected from the power supply. Remove the fuses and disconnect the cable from the motor terminal box.
- 7-**Never dismantle the pump until the isolating valves on the suction and discharge side have been closed.
- 8-**Always ensure that all pipe connections have been fitted and tightened properly before the pump is started. If the pump is used for hot/or hazardous fluids, special precautions must be taken. In such cases follow the local regulations for personal safety when working with these products.
- 9-**Always wear personal protective equipment according to the requirements.
- 10-**Make sure product links and power cables are laid in suitable guides/trays.
- 11-**Always ensure that no debris of any kind is present in the pump.
- 12-**Always ensure that the pump and the motor shafts are properly aligned.
- 13-**Always ensure that suction and discharge valves isolating the pump are fully open before starting the pump.
- 14-**Never close or obstruct the outlet of the pump as the pressure in the system will increase above the specified maximum pressure of the pump and cause damage to the pump.
- 15-**Never put hands or fingers into a pump while it is in operation since there are rotating parts in the pump.
- 16-**The pump components and piping may contain sharp edges. Handle the screws carefully since they may be sharp. Wear gloves while installing and servicing the pump to help avoid injuries from these hazards.
- 17-**Never touch the gear case during operation. The surface temperature of the gear case can get above 70 °C when running at 1000-3500 RPM. The pump cover and the body may be cold or hot depending on the product.
- 18-**Never touch the motor and the motor shroud (if supplied) during operation, it may be very hot.
- 19-**Never drop parts on the floor.
- 20-**Make sure to keep the work area clear of machine parts, tools, product lines, foreign materials, and power cables to avoid potential hazards.

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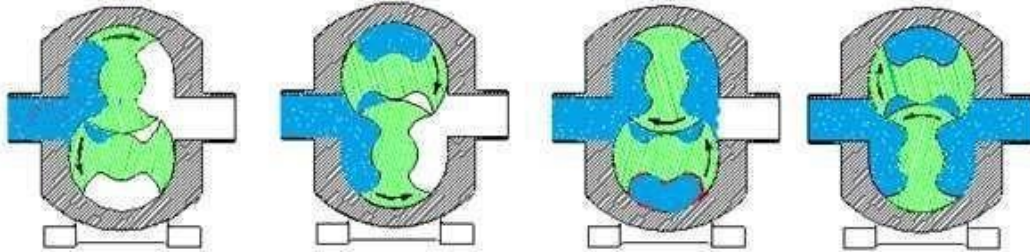
## 1-PUMP TYPES AND DESCRIPTION

### a. Equipment Description

The lobe pumps in FDP+ series are widely contained in positive displacement rotary pumps used for viscous liquids.

The use of this equipment for the food, cosmetics and chemical industries is suitable. The Lobe pump range meets the robustness, reliability and hygienic requirements in the industries mentioned above.

The modular design makes it suitable for part replacement between different pumps.



#### Working Principle

When the lobes return, one lobe begins to move away from the other, resulting in a partial vacuum and moving towards the liquid pumping room. Lobes continue to spin with successive movements and continue to move forward. It is important to note that the small gaps between the lobes and the gaps between the lobes and the pump body are quite closed. The pump body is fully filled and the liquid flows into the lobes, hitting the empty walls and completing the pump.

### b. Activity Area

The biggest advantage of flussmann lobe pumps is that it has a variety of capacities for viscous liquids from 1 mPa.s to 10000 mPa.s. In addition, the capability of this pump is minimal deterioration in liquid products that need careful use and liquids with soft solids in it.

**Table 1 Design&Capacity**

<b>Design &amp;Capacity</b>	<b>Discharge Capacity lt/100 rev (Tri-Lobe)</b>	<b>Discharge Capacity lt/100 rev (Bi-Wing)</b>
<b>FDP+ A-25</b>	18	21
<b>FDP+ A-40</b>	20	23
<b>FDP+ A-50</b>	25	29
<b>FDP+ B-40</b>	32	37
<b>FDP+ B-50</b>	40	46
<b>FDP+ B-65</b>	43	59
<b>FDP+ C-65</b>	87	100
<b>FDP+ C-80</b>	102	118
<b>FDP+ C-100</b>	125	144
<b>FDP+ D-100</b>	195	225
<b>FDP+ D-125</b>	244	281

**Cleaning:**

Particular attention has been paid to meet the cleaning requirements in the pump structure. Grooves and dead gaps are strictly kept to a minimum. There is also no liquid entrance between shafts and lobes.

**c.Proper Use**

- 1**-It is used for use in machines and industrial enterprises.
- 2**-It should only be used for defined and confirmed purchases.
- 3**-It should only be used for the specified job.
- 4**-It should only be used at corresponding dust limits.
- 5**-Only the defined operation should be used in temperature and pressures.

## 2.MANUAL CONTENT

### a.Legal Content

Flussmann does not take responsibility for impairments and damages caused by specified causes;

- 1-Inappropriate use.
- 2-System modification by the non-authorized manufacturer.
- 3-Inappropriate operation of the pump system.
- 4-It's an inaccurate process.
- 5-Non-observation in the technical document.

### b. Warranty

The use of spare parts not provided by flussmann, the opening of the machine by third parties without flussman written consent, and the failure to take into account the instructions in this manual eliminate flussmann warranty liability.

### c. Security



**Electrical studies should be carried out by qualified personnel.**



**The driver system poses a danger to the life and environment of staff working in specified situations:**

- The staff working with the driver system are not qualified personnel.
- The driver system is not used correctly.
  
- If appropriate measures are taken, there will be no material damage when there is a mistake in the operation of the driver system.
- When a fault is detected, the driver system should never be run.
- The pump should never be operated without revised that all components and connections are correct.
- No parts should be touched during the operation of the pump and cannot be operated without any part of the pump. Because each part has its own function.
- Particular attention should be paid to the liquid contained during pump repair. This liquid may be harmful to health or at high temperature. You must disconnect all electrical currents before disassembly.

### 3.LOGISTICS

#### a.Move

FDP+ pumps and pump units are very heavy for manual transport. For this purpose, it must be carried with the appropriate tools. The weights of the models are given in the table below.

**Table 2** Pump weight with bare shaft tip

Pump Models	KG Pump Weight kg
FDP+ A-25	23
FDP+ A-40	23
FDP+ A-50	23
FDP+ B-40	36
FDP+ B-50	38
FDP+ B-65	38
FDP+ C-65	82
FDP+ C-80	82
FDP+ C-100	85
FDP+ D-100	170
FDP+ D-125	172

#### b.Storage

If the pump is not used immediately, appropriate storage conditions must be ensured. There is no need to take special precautions in dry environments for one-year periods, it should be protected from dust and light.

-Electrical current connections must be disconnected from the pump to prevent the engine from running during the disassembly or when the washing process begins.

-When the liquid temperature inside the equipment is high, the equipment should be cooled until it arrives at room temperature.

-The valves of the fluid absorption and thrust are closed, fluid is discharged from the pipe and pump. Necessary precautions should be taken for each pumped liquid.

-After leaving the fluid pump, the pump must be cleaned.



**A qualified personnel should do the dismantling of the pump and the assembly of the pump, the pump can be broken in the wrong process.**



**If lubrication is performed before the installation of the ring and shaft arms of the pump, the mounting process can be made more easily.**



## 4. INSTALLATION

### a. Location Piping

The pump and pump unit is located close to the suction tank (see 'Pump installation' section.), and if the liquid level in the corresponding tank is lower than the level of static manometer absorption head is at maximum. Minimal levels of elbow and fittings are used in suction and discharge pipes to reduce friction losses. In this way, the suction conditions are improved and maximum efficiency is achieved from the pump.

#### Accessibility

The pump is placed accordingly to the driver unit in order to perform inspections and revisions. For the necessary inspections, gaps around the pump and pump unit should be left, and for repair operations, the pump must be separated from other units. The necessary cavities are left in front and behind to remove the FDP+ pumps.

If the total mass does not exceed 22 kilograms, pump and pump units are placed caviar to remove the equipment.

The pump and pump unit are placed close to the drainage floor.

#### Setting up in an external environment

External installation is done only with special installations if there are implicit systems allowed. Consult flussmann before installation.

#### Setting up indoors

Place the pump with proper ventilation. Start the pump to be prepared according to the instructions provided by the manufacturer.



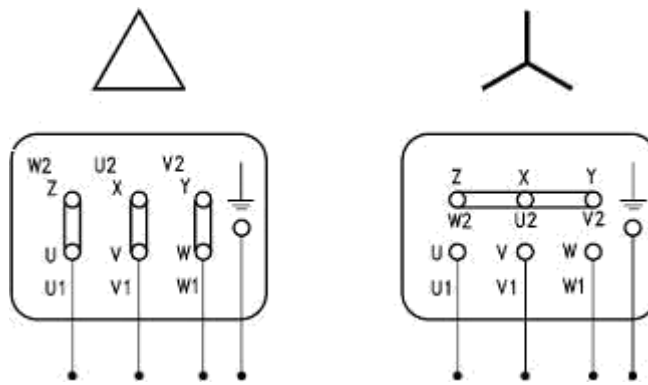
**When a flammable and explosive liquid is pumped, an appropriate connection should be used. By connecting the grounding wire to the components of the unit, damage caused by static electricity is reduced.**

Use explosion-resistant engines in accordance with local regulations. Provide appropriate merge protections and appropriate connections.

### b. Electric Connections



**A qualified element performs electrical connections. Take steps to avoid errors in wiring and connections.**



Electrical Connections

	Connection U=...	
	3x220	3x380
	motor	
220/380	Δ	Y
380	-	Δ

CONNECTION

**Refer to the supplier's instructions before connecting the engine to the power supply. Use pumps with increased initial torque for single-phase engines. Provide high enough start torque for motorized pumps with a frequency converter and provide the necessary cooling at high speeds. Set up an independent fan if necessary.**



Electrical equipment, terminal and control system components can carry electrical current when disconnected. If you have any contact with them, the operator's life may be in danger and can cause irreparable damage to the material.

## 5. STARTING UP AND MAINTENANCE

### a. Starting Up

- Fully open the insulation valves on the suction and discharge line.
- During the washing process of the mechanical seal, fluid flow and pressure should be adjusted.
- The pump's suction line must be filled with liquid. Arrangements must be made for this.



**it should never be operated when the pump is empty. Washing should be provided if necessary.**

- If there is heating or cooling jacket at the pump, the insulation valves are opened to absorb the heating and cooling agents. The liquid inside the pump and pump is expected for about 15 minutes to reach the required service temperature.
- A few manual changes are made to the pump shaft and ensure that the pump is not blocked.
- Open the insulation valves that enter the mechanical seal washing unit.
- Check to see if the pump is working safely.
- Start the pump.
- Check if absolute input pressure is sufficient, there should be no absorbed steam inside the pump.

-Look at the minimum pressure curve required above the steam pressure.

-Check the drain pressure.



**A closing valve mounted on the suction pipe should not be used to regulate the flow rate. This should be completely open during the operation of the pump.**

-Check the installed fluid flow.

-Check for mechanical seals and connections.



**When there is no fluid flow from the pump, when leakage occurs and excessive noise occurs, the pump should be stopped immediately. The pump must be checked without running. If abnormal reactions continue, you should contact the pump manufacturer or contacts immediately and ask for service.**

-Set up the security valves

#### **b. Maintenance**



**Incomplete and incorrect repairs, errors occur in the operation of the pump, causing high repair costs and long-term deterioration. Therefore, attention should be paid to the instructions in this section. During maintenance on the pump, preventive maintenance and installation movement should be monitored according to the instructions. If these instructions are not followed, the pump and pump unit is in serious danger at the operator. Only qualified personnel should perform the repair process. Protective clothing should be worn to protect against possible hazards, corrosive substances and high temperature. The staff should read the instructions of the department on the work it will do. Flussmann assumes no responsibility for any accidents and damages that occur if the instructions specified here in are not followed.**

**c.Possible Errors and Solutions**

Table 3 Operation Problems

Possible errors	Overload of engines	Insufficient discharged flow rate	Pressure on the draining side absence	Irregular discharge flow rate or pressure	Noise and vibration	Pump blockage	Overheating of the pump	Abnormal wear	Mechanical seal leakage	
Possible causes	1		X							
	2		X	X	X	X				
	3			X						
	4		X		X	X		X		
	5		X		X	X		X		
	6			X	X	X				
	7		X	X		X		X		
	8	X	X			X	X	X		
	9	X	X		X	X	X	X		
	10		X							
	11		X			X	X	X	X	
	12	X			X	X		X		
	13		X			X				
	14		X							
	15					X			X	
	16	X					X	X	X	
	17									X
	18									X
	19					X	X		X	
	20	X				X	X	X		
	21	X				X	X	X		
	22	X				X	X	X		
	23	X				X		X		
	24	X				X	X	X	X	
	25					X	X		X	
	26	X				X	X	X		
	27									X

Table 4 Possible causes and solutions

Possible Causes		Solutions
1	Wrong turn direction	Reverse the direction of rotation
2	Inadequate NPSH	Increase to the appropriate NPSH: <ul style="list-style-type: none"> <li>- Upgrading the suction tank</li> <li>- Pump</li> <li>- Reduce speed</li> <li>- Increasing the diameter of the suction pipe</li> <li>- Shorten the suction pipes and Simplify</li> </ul>
3	Failure to clean the pump	Clean the pump
4	Cavitation	Increase the suction pressure.
5	Pump air sucking	The suction pipe and the whole to check their connections.
6	Blockage of the suction pipe	The suction pipe and, if applicable to control the filters.
7	Incorrect setting of security valve	Check security valve settings To.
8	Too high discharge pressure	If necessary, the diameter of the drain pipe will increase and the head side reduce loss.
9	The viscosity of liquidity is too high	<ul style="list-style-type: none"> <li>- Reduce pump speed</li> <li>- Reducing viscosity, for example, by heating the liquid.</li> </ul>
10	Very low liquid viscosity	<ul style="list-style-type: none"> <li>- Increasing pump speed</li> <li>- Increasing viscosity, for example, increasing the liquid by cooling</li> </ul>
11	The temperature of the liquid is too high	By cooling the liquid, the temperature Reducing.
12	Very high pump speed	Reducing pump speed.
13	Attrition of the lobes	Changing lobes.
14	Very low pump speed	Increasing pump speed.
15	Being a very corrosive product	Hardened lobe hubs Use.
16	Worn bearings	Change the bearings to the pump check.
17	Worn or damaged mechanical sealing Part	Mechanical sealing part Change.
18	No use of O-rings suitable for liquid	Suitable O-ring forms control with the supplier.
19	Worn gears	Change gears or reapply.

20	Insufficient oil level in lubrication	Fill with oil.
21	Use of oil not suitable for lubrication	Using the appropriate oil.
22	Friction of lobes	- Reduce the temperature. - Lower the drain pressure. - Set the transaction.
23	Slip-on-link shifts	Fix the connection.
24	Voltage in the pipeline	Free of tense pipelines connecting to the pumps.
25	Having foreign bodies in liquidity	Insert a filter into the suction pipe.
26	The pump and the electric motor are not fixed on the base	Tightening ensures that the pipelines are not stretched and that the connections checking their alignment.
27	The spring tension of the mechanical seal is very low it being.	Set the adjustment specified in this guide Make.



If these problems continue to last, stop the pump immediately. Contact the pump manufacturer or contact.

#### d. Material transformation



To protect the environment, help recycle all materials , according to local regulations enacted by each region.

- The procedures are as follows.
- Disconnect and comply with hydraulic technical standards.
- Clean all components in the pump without sending it to the separator.

## 6.ASSEMBLY AND DISASSEMBLY

### a.Things to pay attention

There are a number of factors to consider before starting pump disassembly: Shafts and surfaces must be protected with an anticorrosive primer.

If the pump is used for a long time and then taken to the tank; After the process in the pump is finished, all the substances in it must be cleaned

### b.Housing Disassembly

1-Remove to the pump cover



2- Remove the rotor retaining bolts . To remove the rotor retaining bolts, place the dowel between the rotors. Turn the first rotor bolt counter-clockwise



3-Remove to the o-ring



4-Remove to the mechanical seal



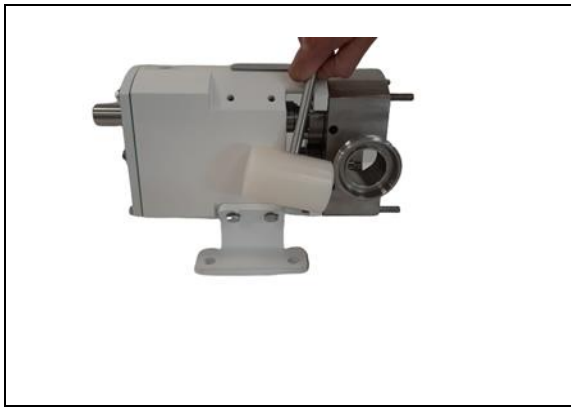
5-Remove to the o-ring



6-Remove to the housing. Note: (use a plastic hammer)







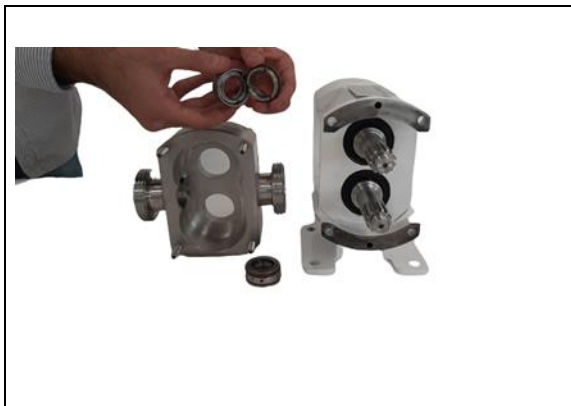
7-Remove to the screw. Then remove to the mechanical seal protection cover.



8-Remove to the o-ring.



9-Remove to the mechanical seal.



10-Remove to the o-ring.



**c:Gear box disassembly:**

1-Remove to the allen screw then remove to the gear box cover.



2-Remove to the cylinder head bolts.



3-Remove to the dragging bushing and drive shaft gear.





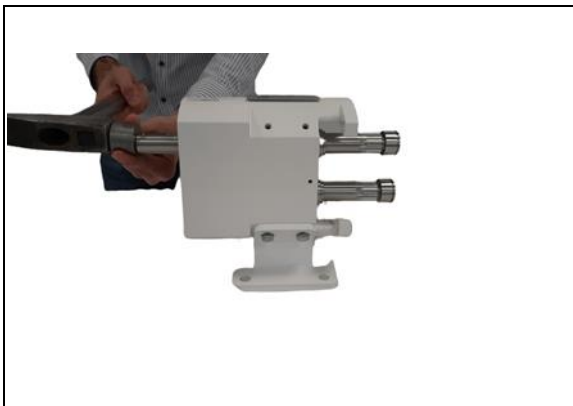
4- The housing part is attached to the lobe and a piece of wood is compressed between it. The shaft is then secured and moved to the dismantling phase.



5- Remove to the safety washer and safety nut.

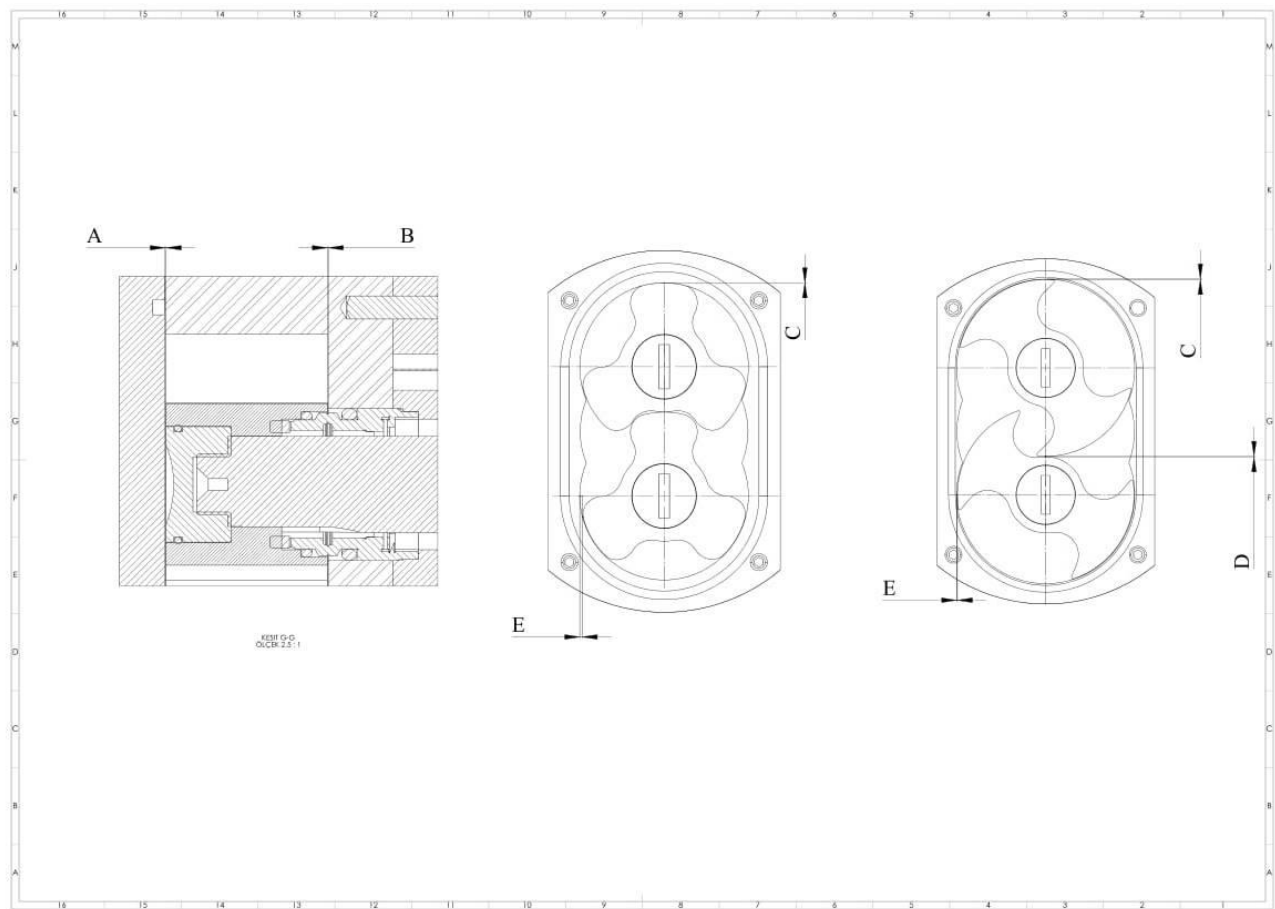


6- In the knock operation, the lobe screw is installed to prevent damage to the gears, with the hammer and metal piece, it is hit hard on the shaft. That way the shafts will be dismantled.



## d: Lobe Assembly Details

Settings must be made first before new lobes are connected.



	A	B	C	D	E
FDP+ A-25	0,2	0,15	0,2	0,2	0,4
FDP+ A-40					
FDP+ A-50					
FDP+ B-40	0,25	0,2	0,25	0,25	0,5
FDP+ B-50					
FDP+ B-65					
FDP+ C-65	0,35	0,25	0,35	0,35	0,65
FDP+ C-80					
FDP+ C-100					
FDP+ D-100	0,45	0,35	0,45	0,45	0,95
FDP+ D-125					

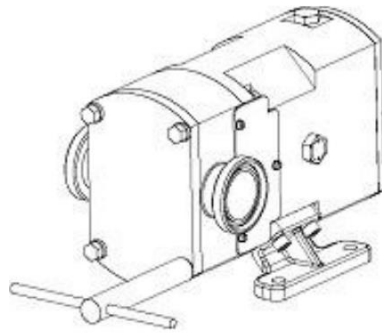
-Slide the lobes, such as Shaft arms, onto the shaft.

-When turning the shaft drive, be careful not to touch each other lobes. Necessary adjustments are made.

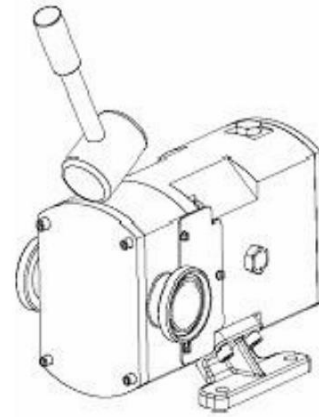
-Check that the O-rings of the Lobe screws are in good condition and place them in the grooves.

-Install screw lobes and washers. Tighten the screws with the wrench. A block of nylon or wood is placed between the lobes to prevent emergency turns.

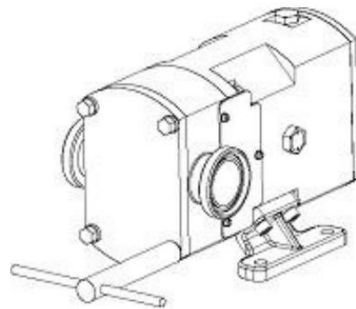
-Check that the alignment of the front of both lobes is the same.



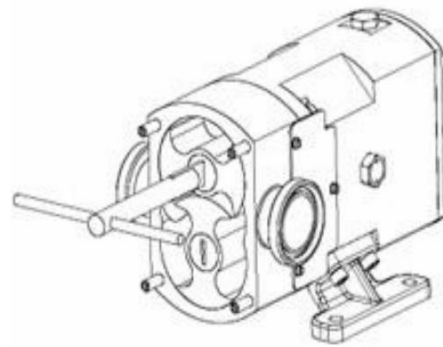
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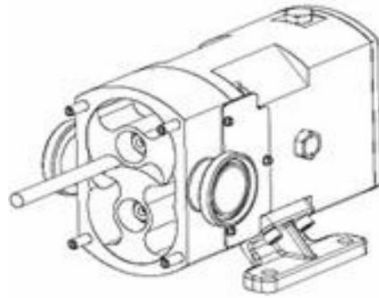
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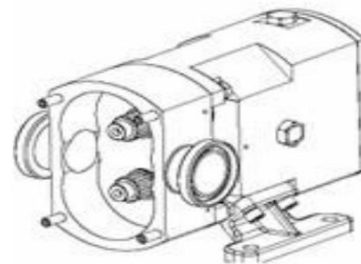
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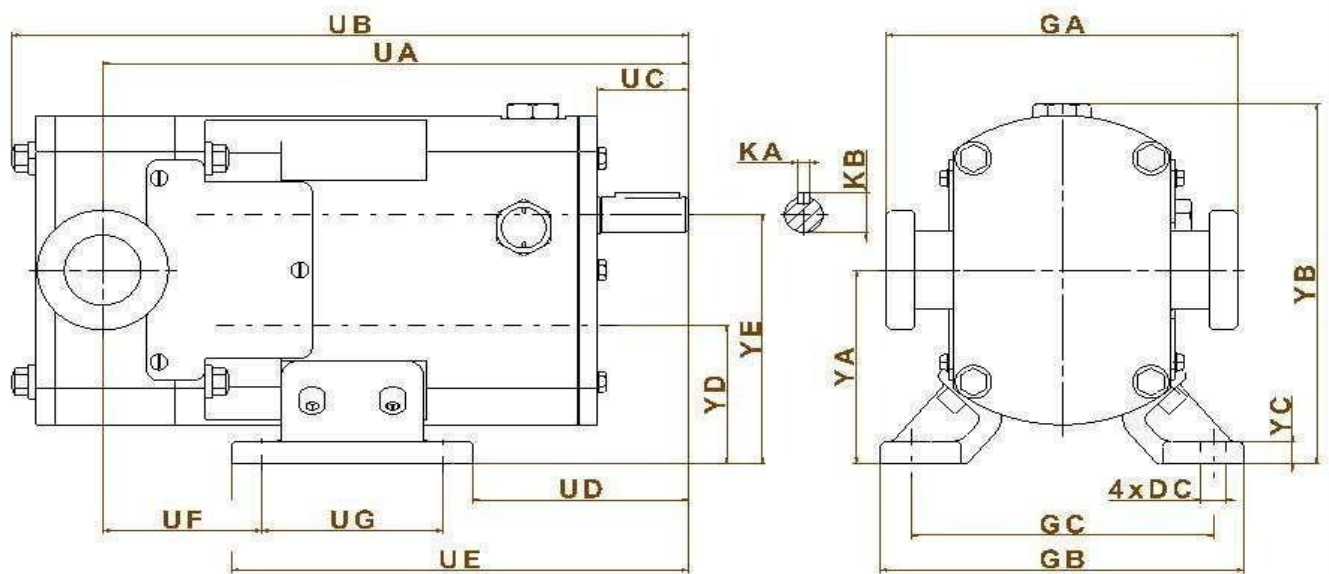
#### e.Motor

**Disassembly:** First, the back cover and shaft are taken. After these parts are taken, the engine is taken from the mounting support section.

**Assembly:** The engine is installed on the mounting support so that the equipment shaft slides over the engine shaft. Finally, the back cover is placed appropriately.

## 7. TECHNICAL DETAILS

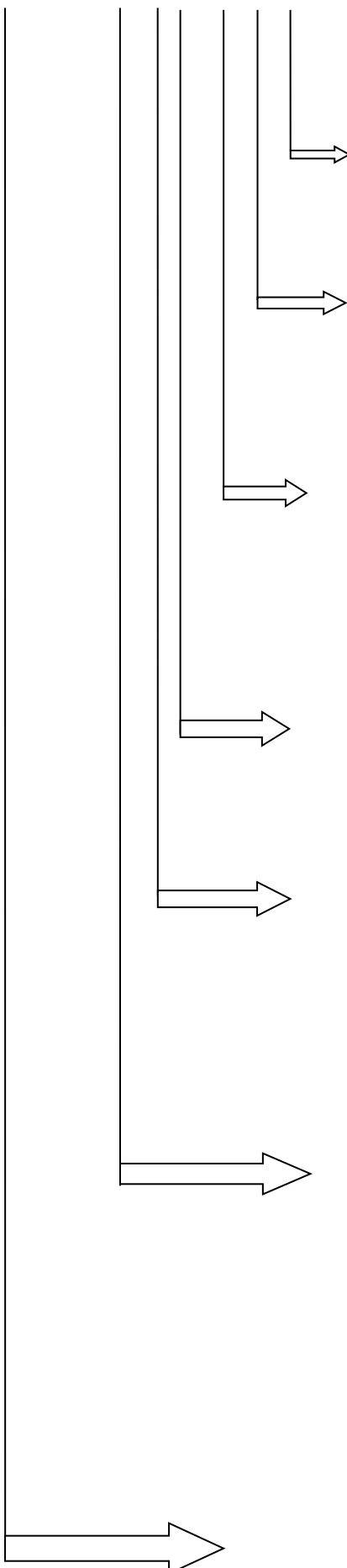
Measures:



TYPE	UA	UB	UC	UD	UE	UF	UG	GA	GB	GC	YA	YB	YC	YD	YE	KA	KB	GAP	DC
FDP+ A 25	277	322				66		166											
FDP+ A 40	277	326	45	106,5	226,5	66	90	174	140	110	123	229	6	75	100	8	28,3	24	12
FDP+ A 50	283	338				72		178											
FDP+ B 40	327	385				59		195											
FDP+ B 50	333	395	55	128	288	65	120	199	163	133	138	262	6	87,5	120	8	32	28	14
FDP+ B 65	341	412				73		209											
FDP+ C 65	430	510				81		244											
FDP+ C 80	432	517	85	175	375	88	150	254	194	154	176	327	8	115	150	10	41	38	16
FDP+ C 100	442	536				98		272											
FDP+ D 100	525	627				108		313											
FDP+ D 125	538	653	103	222	442	121	170	323	213	173	220	405	12	135	200	14	48,5	45	16
FDP+ D 150	550	668				133		343											

8.MODEL TYPE:

FDP+ A-25.SS.1.3. D.V.00



JACKET OPTIONS	
J	ROTOR CASING JACKET
J1	FULLY JACKET
J2	FRONT COVER HEATING JACKET
00	NO OPTION

ELASTOMER	
E	EPDM (STANDARD)
V	VITON (FKM)
N	NBR

CONNECTION TYPE	
C	TRI CLAMP
S	SMS
F	FLANGED
W	WELD
D	UNION
G	GEAR
K	CAMLOCK

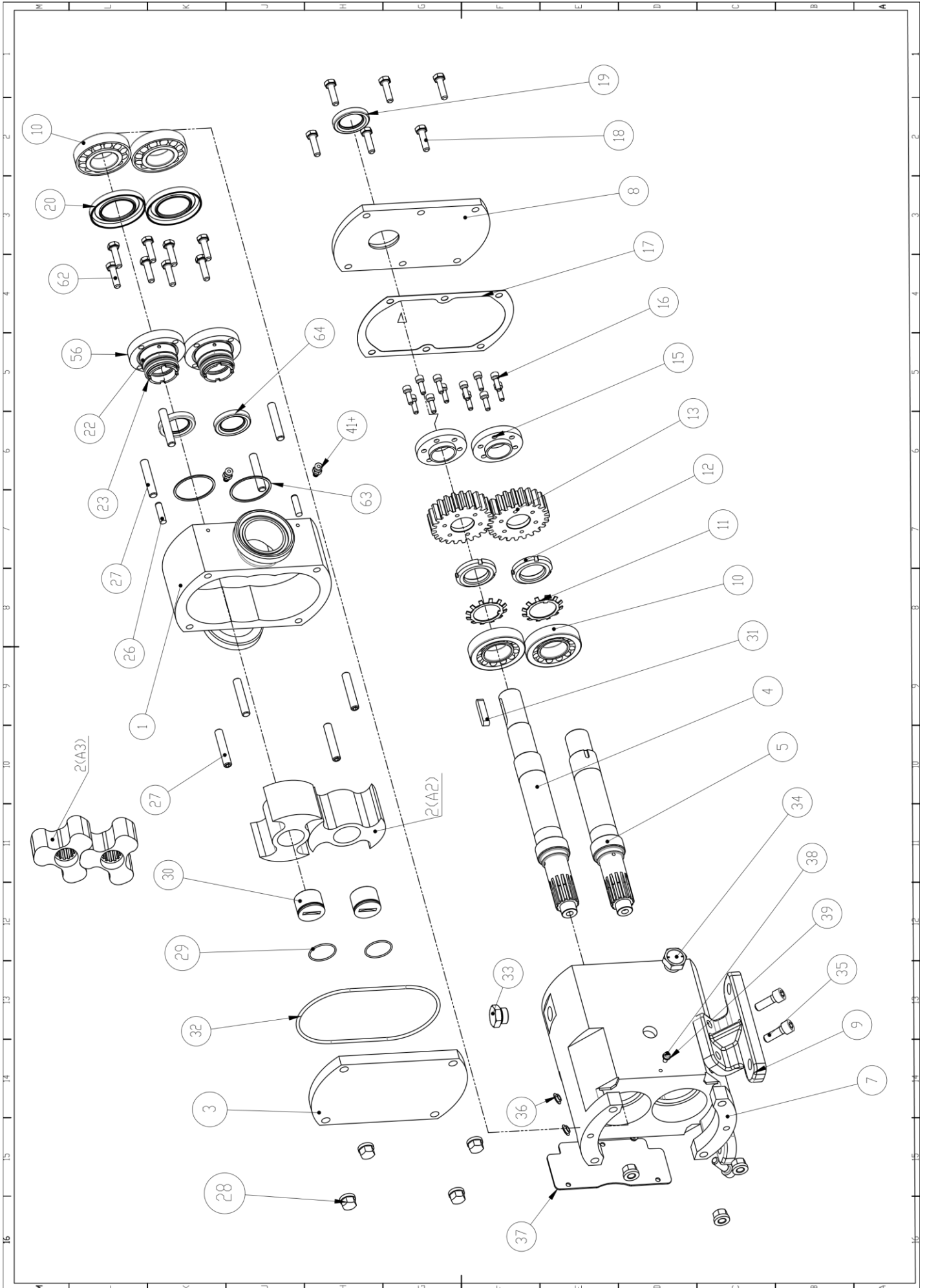
HARDENING	
1	CASING ONLY (ARMOLOY)
2	CASING (ARMOLOY) AND ROTORS
3	WITHOUT HARDENING
4	ROTORS ONLY

ROTOR TYPE	
1	WING LOBE
2	TRILOBE
3	BI-LOB
4	BI-WING
5	GEAR

SEAL TYPE	
SC	SINGLE SEAL (SiC/CARBON)
SS	SINGLE SEAL (SiC/SiC)
DSC	DOUBLE (SiC/CARBON-SiC/CARBON)
DSS	DOUBLE (SiC/SiC-SiC/CARBON)
TT	SINGLE SEAL (TUNGSTEN/TUNGSTEN)
DTT	DOUBLE (TUNGSTEN/TUNGSTEN-SiC/CARBON)
LS	LIP SEAL
PC	SINGLE SEAL(STAINLESS STEEL/CARBON)
DPC	DOUBLE (STAINLESS STEEL/CARBON)
F	FLUSHING (ADD BEGINNING OF LETTER)
Y	GLAND PACKING
G	GARLOCK
O	O-RING
TK	SINGLE SEAL KNIFE EDGE (TUNGSTEN/TUNGSTEN/VITON)

MODEL TYPE
FDP+ A-25
FDP+ A-40
FDP+ A-50
FDP+ B-40
FDP+ B-50
FDP+ B-65
FDP+ C-65
FDP+ C-80
FDP+ C-100
FDP+ D-100
FDP+ D-125





10.LOBE PUMP PART LIST

TABLE 5

FDP + LOBE PUMP PART LIST				
POZ NO	PART NO	DESCRIPTION	MATERIAL	PCS
01	FDP+ A 000 01	HOUSING	AISI 316	1
02-A2	FDP+ A 000 02	LOBE A 2 (WING LOBE)	AISI 316	2
02-A3	FDP+ A 000 02	LOBE A 3 (TRI LOBE)	AISI 316	2
03	FDP+ A 000 03	PUMP COVER	AISI 316	1
04	FDP+ A 000 04	DRIVE SHAFT	AISI 329	1
05	FDP+ A 000 05	DRIVEN SHAFT	AISI 329	1
07	FDP+ A 000 07	GEAR BOX	GG-15	1
08	FDP+ A 000 08	GEAR BOX COVER	ST 37	1
09	FDP+ A 000 09	GEAR BOX LEG	ST37	2
10	FDP+ A 000 10	BALL BEARING 32006	TS 11706	4
11	FDP+ A 000 11	SAFETY WASHER 30	TS 3573	2
12	FDP+ A 000 12	SAFETY NUT M	TS 3573	2
13	FDP+ A 000 13	DRIVE SHAFT GEAR M2	15 Cr 13	2
15	FDP+ A 000 15	DRAGGING BUSHING	Ck 45	2
16	FDP+ A 000 16	CYLINDER HEAD BOLTS M8x25	8.8	12
17	FDP+ A 000 17	GEAR BOX COVER SEAL	Klingrit 0,5 mm	1
18	FDP+ A 000 18	ALLEN SCREW M6x25	8.8	6
19	FDP+ A 000 19	RADIAL LIP SEAL	NB	1
20	FDP+ A 000 20	RADIAL LIP SEAL	NB	2
22M A	FDP+ A 000 22M A	MECHANICAL SEAL ROTARY PART	CARBON	2
22M B	FDP+ A 000 22M B		SILICONE	2
22M C	FDP+ A 000 22M C		TUNGSTEN	2
23M A	FDP+ A 000 23M A	MECH SEAL STATIONARY PART	STAINLESS STEEL	2
23M B	FDP+ A 000 23M B		SILICONE	2
23M C	FDP+ A 000 23M C		TUNGSTEN	2
26	FDP+ A 000 26	PIN	Fe 50k	2
27	FDP+ A 000 27	STUD	AISI 316	8
28	FDP+ A 000 28	WING NUT	AISI 316	8
29	FDP+ A 000 29	O RING	EPDM	2
30	FDP+ A 000 30	LOBE SCREW	AISI 329	2
31	FDP+ A 000 31	KEY	C 45	1
32	FDP+ A 000 32	COVER O RING	EPDM	1
33	FDP+ A 000 33	OIL PLUG G	11SMPb30	1
34	FDP+ A 000 34	OIL GAUGE G	11SMPb30	1
35	FDP+ A 000 35	CYLINDER HEAD BOLTS	8.8	4
36	FDP+ A 000 36	PLUG	RUBBER	2
37	FDP+ A 000 37	PROTECTOR	-----	2
38	FDP+ A 000 38	FLAT BOLT M5x10	4.8	6
39	FDP+ A 000 39	WASHER	100HV	6
41	FDP+ A 000 41	FITTING	-----	4

56	FDP+ A 000 56	MECHANICAL SEAL PROTECTION COVER	AISI-304	2
62	FDP+ A 000 62	BOLT M8X30	AISI-304	6
63	FDP+ A 000 63	O RING	EPDM	2
64	FDP+ A 000 64	RADIAL LIP SEAL	NB	2