English

Installation, Operation and Maintenance Instructions

ASP Surface Pump

NOV Mono®

MPA551/5

One Company, Unlimited Solutions

Contents

Warranty

Warranty Statement

1. The ASP Water Pumping System manufactured by Mono Pumps are covered by warranty for a period not exceeding twelve months from purchase. There is a twenty-four month warranty on the flexishaft.

2. Mono Pumps will make good by repair, or at their option, the replacement of faulty parts under warranty, providing always that:

   (a) The equipment was correctly installed and properly used in accordance with Mono Pumps Installations and Operating instruction and accepted codes of good engineering practice.

   (b) The claim for goods under warranty arises solely from faulty design, material or workmanship.

   (c) The repair is carried out in the Mono factory or by an authorised agent or distributor appointed by Mono Pumps.

   (d) All freight costs to and from the factory or repair agent are to be paid by the purchaser.

3. In the case of equipment or components which are not of Mono manufacture, but supplied by them, the warranty is limited to that extended by the suppliers or manufacturers of such equipment.

4. Mono Pumps warranty does not cover any of the following:

   (a) Claims for third party liability of damage caused by failure of any of the company's products.

   (b) Damage caused by abnormal operating conditions, war, violence, storm cataclysm or any other force.

   (c) Damage caused by the equipment being used for an application for which it is not recommended.

   (d) Damage caused by sand or abrasive materials, corrosion due to salt water or electrolytic action.

   (e) Damage caused by running the pump dry.

5. The decision of Mono Pumps in relation to any claims or disputes over warranty is final.

6. The warranty is in lieu of all other warranties and conditions expressed or implied, written or oral, statutory or otherwise, which are hereby negated and excluded.

7. This express warranty does not exclude any conditions or warranty implied by the Trade Practices Act 1974 or separate State laws and in addition to any other right, that the original purchasers or any subsequent purchaser may have at law.

In case of claim please contact your Authorised Mono Dealer or contact Mono Pumps (Australia) Pty. Ltd.

Introduction

Introduction

System Overview

The Mono ASP Surface pumping system is designed and manufactured in Australia.

The Mono Pumps ASP has been design tested and proven in the field over a wide range of water pumping applications. It has been designed for maximum efficiency and reliability.

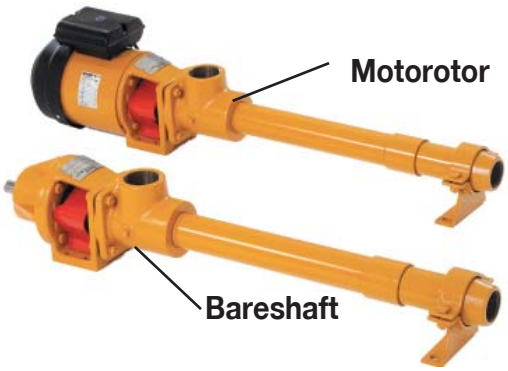
There are two main configurations in the ASP Range:

■ The Motorotor consists of a pump and a direct coupled single phase electric motor, for easy installation and maintenance.

■ The bareshaft unit is a pump which will need a drive connected to it via belts and pulleys. Mono supply complete motorised units with diesel, petrol or electric power plants.

Features

■ The



progressing cavity pump has been designed specifically for water transfer.

■The hard chrome plated rotor provides long life.

■The interference design of the rotor and stator ensure maximised the pumping efficiency and excellent suction lift capabilities.

Intended use

The Mono Agricultural Surface Pump (ASP) is a water transfer pump and has been designed to pump potable water from rivers, dams, ponds or tanks to a desired location.

Warnings

All electrical connections must be carried out by a qualified electrician in accordance with the local regulatory requirements

Ensure the supply voltage is within 240V +/-5%

All pumps must be bolted down to prevent them moving and causing injury or damage

All powered bareshaft units must be mounted on suitable bases and guarded to prevent injury or damage.

Hot Surfaces - During operation motor manufacturer specifications allows a temperature increase of 80 degrees Celsius above ambient temperature.

Heavy Item - Always a multi person or assisted lift.

It is recommended that a pressure relief valve be fitted to the discharge of the pump to prevent over-pressurisation of the system. The relief valve should be set at the minimum pressure rating of any component in the system.

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Specifications

Specifications

Environmental

Storage Temperature:	-10 to 50 deg C
Operating Temperature:	-10 to 40 deg C
IP Rating:	IP55
Humidity:	95% Max.

Note that if the ambient temperature exceeds 30 deg C it is recommended that the stator and motor be protected from direct sunlight with a well ventilated cover.

Water Quality

pH range	6 to 8.5
Hardness Range	2000 mg/L
Salt Concentration	500 ppm

Rotor Selection - Water Temperature

Rotor Standard	10 to 40 deg C
Rotor Mk 3	40 to 70 deg C

Mechanical Specifications

BSP Internal Thread Inlet and Outlet

Direction of rotation

Anticlockwise when viewed from the motor or bearing housing end.

Materials (Excluding Motor)

Pump Barrel:	304 Stainless Steel
Stator:	Natural rubber lining
Rotor:	316 stainless steel
Hard Chrome Plated	
Flexishaft:	Titanium
Mechanical seal:	Carbon/Ceramic/Nitrile:
Mechanical seal holder:	304 Stainless Steel
Discharge Chamber:	Cast Iron

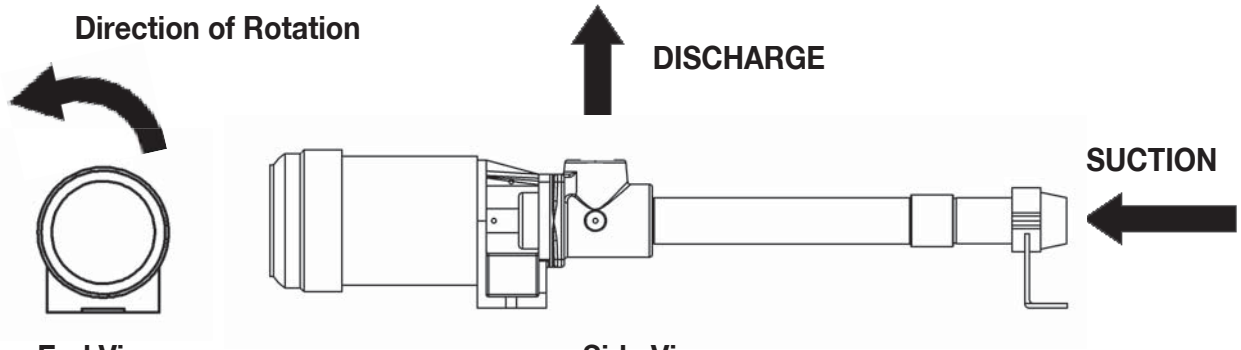
Motor (Motorotor Only)

Voltage 240 Volts AC +/- 5%
Maximum Motor Starts per hour: 10
Motor fitted with thermal cut out with manual reset.

Maximum Design Pump Pressure

ASP310	600 kPa
ASP320	1200 kPa
ASP410	600 kPa
ASP420	1200 kPa (1000kpa on Motorotor)
ASP440	2400 kPa
ASP510	600 kPa
ASP520	1200 kPa
ASP610	600 kPa
ASP620	1200 kPa

Note: Pumps are capable of much higher pressure if flow of pump is reduced. Running at over design pressure will reduce the life of the pump.



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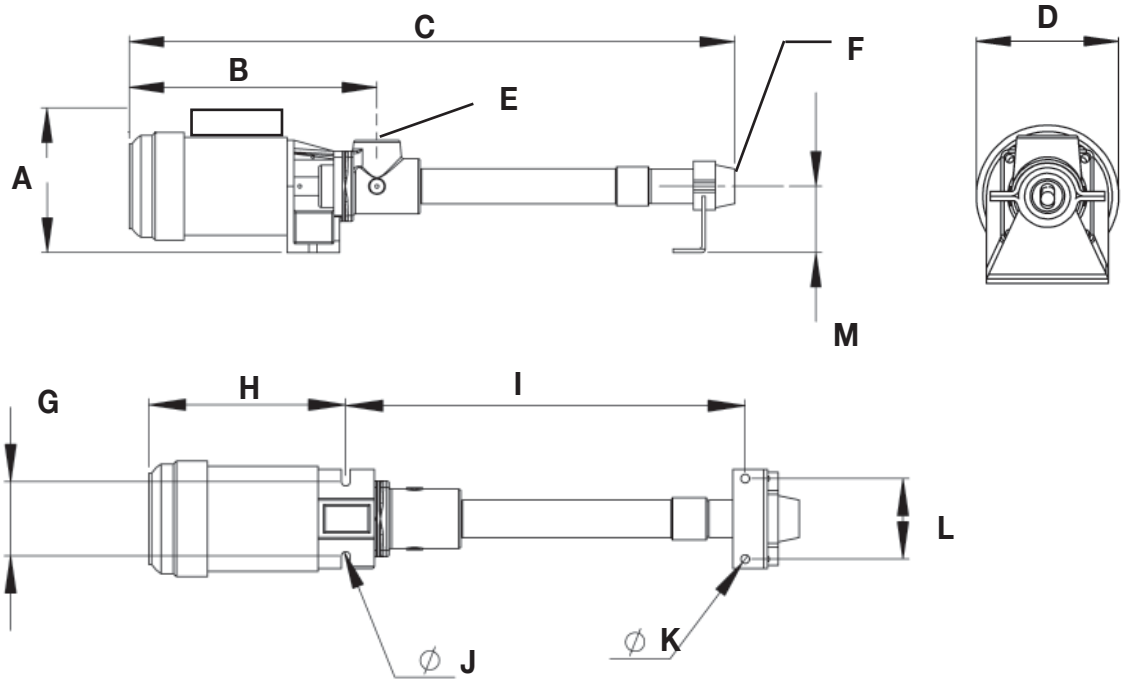
Specifications

Dimensions - Motorotor

Pump Model	Power	Voltage	Current (Amps)		Dimensions (mm)					
	(KW)		Run	Start	A	B	C	D	E	F
ASP310MR4	0.56	240VAC	3.6	19.62	260	384	1004	187	2”	1 1/2”
ASP310MR6	0.37	240VAC	2.65	13.17	260	409	1029	187	2”	1 1/2”
ASP320MR4	1.1	240VAC	6.27	33.67	260	421	1166	187	2”	1 1/2”
ASP320MR6	0.75	240VAC	5.23	25.8	260	459	1204	187	2”	1 1/2”
ASP410MR4	1.1	240VAC	6.27	33.67	260	421	1080	187	2”	1 1/2”
ASP410MR6	0.75	240VAC	5.23	25.8	260	459	1118	187	2”	1 1/2”
ASP420MR4	1.7	240VAC	9.37	52	260	459	1257	187	2”	1 1/2”
ASP510MR4	1.7	240VAC	9.37	52	260	459	1233	187	2”	1 1/2”

Pump Model	Dimensions (mm)							Weight (kg)
	G	H	I	J	K	L	M	
ASP310MR4	120	273	645	14	14	130	115	30
ASP310MR6	120	298	645	14	14	130	115	32
ASP320MR4	120	310	769	14	14	130	115	34
ASP320MR6	120	348	769	14	14	130	115	36
ASP410MR4	120	310	982	14	14	130	115	40
ASP410MR6	120	348	982	14	14	130	115	46
ASP420MR4	120	348	822	14	14	130	115	41
ASP510MR4	120	348	832	14	14	130	115	43



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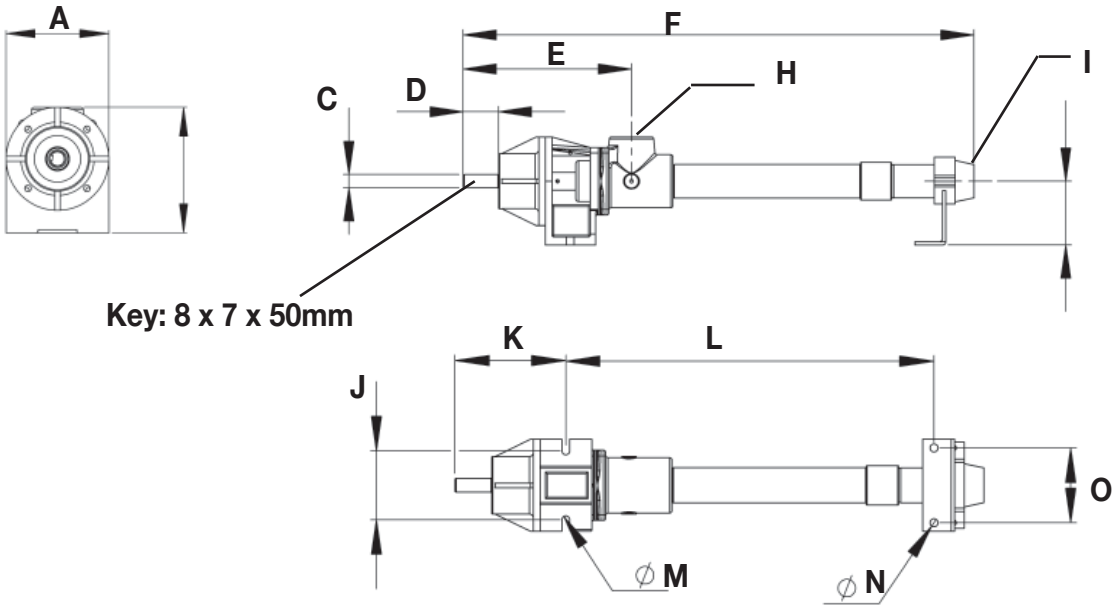
Specifications

Dimensions - Bareshaft

Pump Model	Dimensions (mm)								
	A	B	C	D	E	F	G	H	I
ASP310BS	187	195	24	64	305	925	115	2”	1 1/2”
ASP320BS	187	195	24	64	305	1050	115	2”	1 1/2”
ASP410BS	187	195	24	64	305	964	115	2”	1 1/2”
ASP420BS	187	195	24	64	305	1104	115	2”	1 1/2”
ASP440BS	187	195	24	64	305	1383	115	2”	1 1/2”
ASP510BS	187	195	24	64	305	1079	115	2”	2”
ASP520BS	187	195	24	64	305	1390	115	2”	2”
ASP610BS	187	195	24	64	305	1192	115	2”	2 1/2”
ASP620BS	187	195	24	64	305	1407	115	2”	2 1/2”

Pump Model	Dimensions (mm)							Weight (kg)
	J	K	L	M	N	O	P	
ASP310BS	120	194	645	14	14	130	115	23
ASP320BS	120	194	769	14	14	130	115	24
ASP410BS	120	194	683	14	14	130	115	24
ASP420BS	120	194	822	14	14	130	115	26
ASP440BS	120	194	1102	14	14	130	115	27
ASP510BS	120	194	832	14	14	130	115	28
ASP520BS	120	194	1153	14	14	130	115	29
ASP610BS	120	194	952	14	14	130	115	30
ASP620BS	120	194	1167	14	14	130	115	31



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Installation

Installation Procedure

The following describes the installation of the Pump.

The Warranty does not cover damage due to running the pump dry.

Note that the Warranty does not cover damage to the motor or pump caused by water quality outside the limits specified in the Specifications section of this manual.

Installing the Pump

The pump should be bolted down on to a concrete plinth of sufficient size and strength for the pump.

It is essential that the pump and suction line are filled with water before starting the pump. If the pump and suction line are drained for any reason or left standing without running for an extended period of time, the pump and suction line must be refilled before starting. Running the pump dry for even a few revolution could damage the stator.

All pipe work should be connected, ensuring there are no leaks. Note the discharge or delivery port is the one closest to the motor or bearing housing.

The motor and pump should be covered to protect them from the elements. Note the motor is rated IP55

All electrical connections other than the plug and socket must be carried out by a qualified electrician.

Mono recommend

■ A “U” tube be fitted to the suction port to ensure water is always retained in the pump.

■ A foot valve is fitted to the suction line. Ensure that the foot valve is mounted vertically, as most types will not work if inclined.

■ All pipe work is buried to prevent the water in the pipe from freezing or boiling.

■ The use of bends not elbows

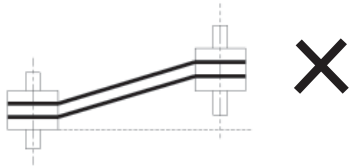
■ Keeping the suction line as short as possible

Belt Driven Bareshaft Pumps

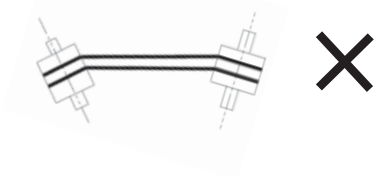
Ensure that the pump and engine pulleys are correctly aligned and that drive ratios are designed so that the pump speed will not exceed the maximum rating of 1500 rpm.

The belt tension is to be set as per the belt manufactures specification. Over tensing the belt will put extra load on the pump and motor bearings, thus reducing the life of the pump.

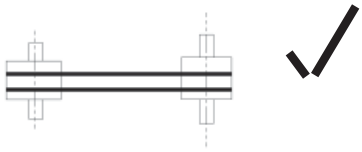
Shafts are parallel, but out of alignment



Shafts are not parallel to each other



Correct Alignment



IMPORTANT NOTE

- Motor speeds have been selected to achieve peak performance from drives.
- The motors have not been set to run at the specified speeds and can run faster or slower depending on actual throttle settings.
- Mono recommends that the motor speed is measured at the time of commissioning the unit and speed limit screw set to prevent overspeed.
- Operating the motor at speeds faster or slower than the design speed can result in damage to either the pump or the motor.

Maintenance

Maintenance

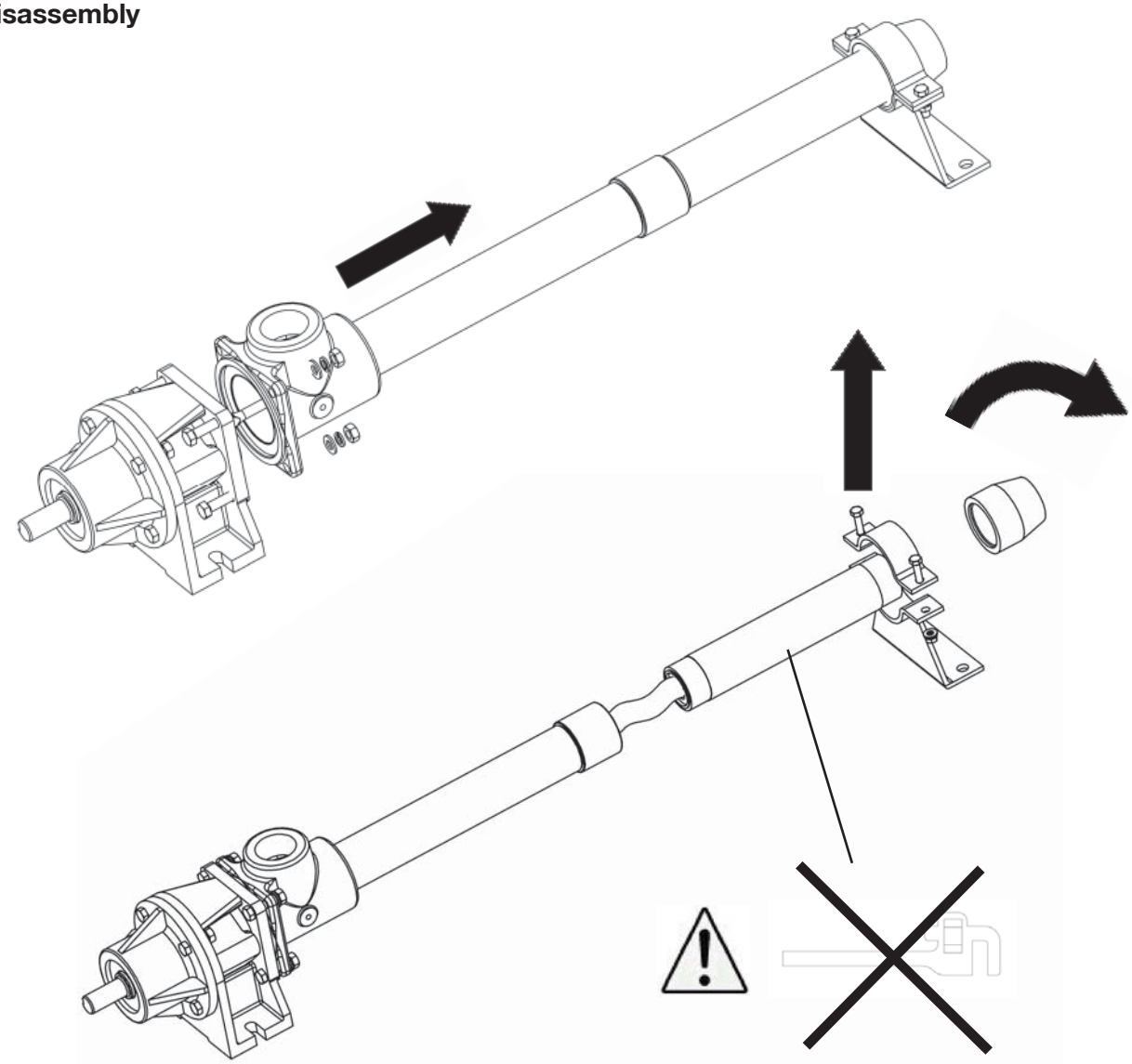
Once the pump is installed it should be regularly checked for correct operation.

Particular attention should be paid to bearing noise and water leakage through the mechanical seal.

If water is found to be leaking through the mechanical seal the pump should be disassembled and the seal inspected for wear and or cracks. If the seal is worn or otherwise damaged, it should be replaced. Motor or bearing damage as a result of a worn mechanical seal will not be covered by warranty.

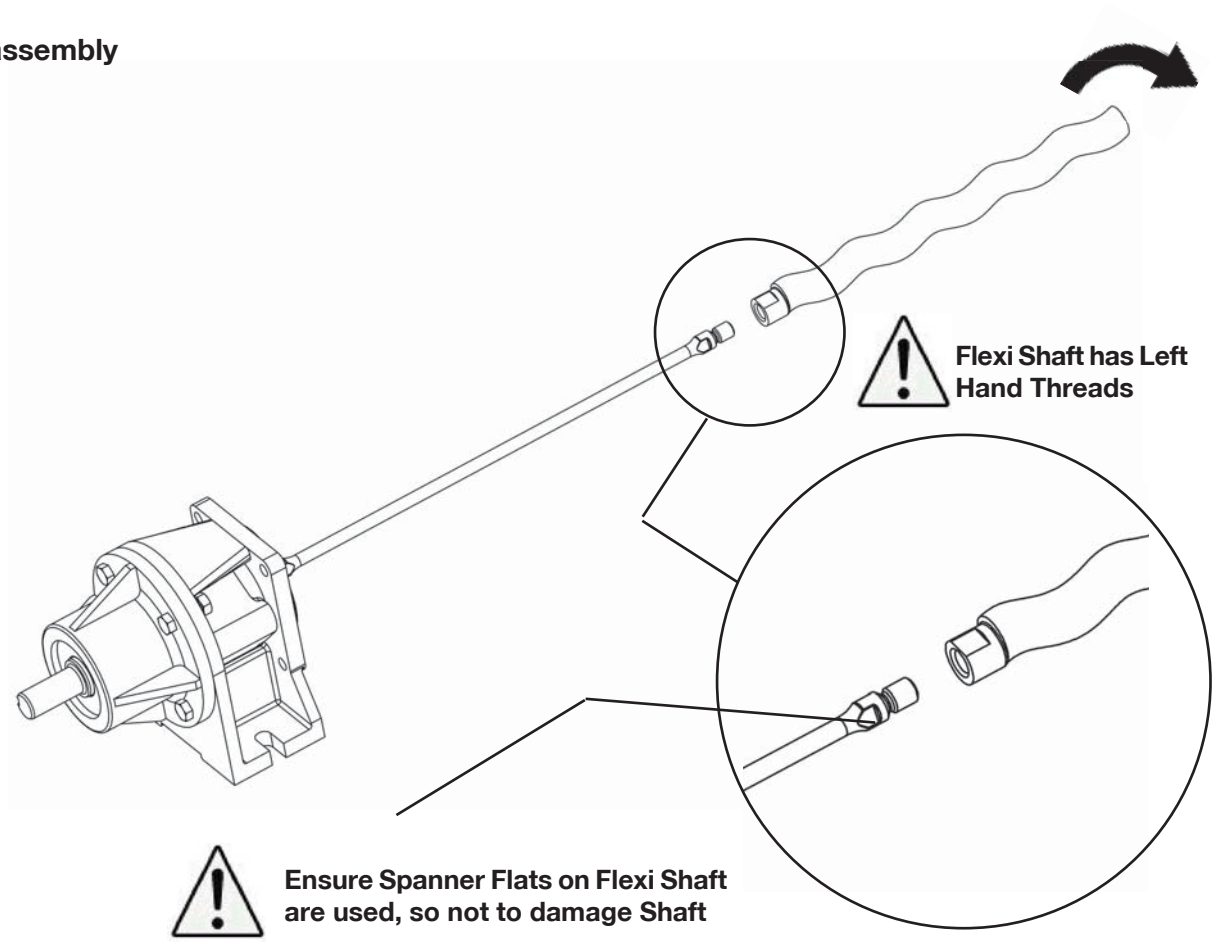
The bearings are seal lubricated bearing which should not require any attention unless they have worn out, in which case they should be replaced.

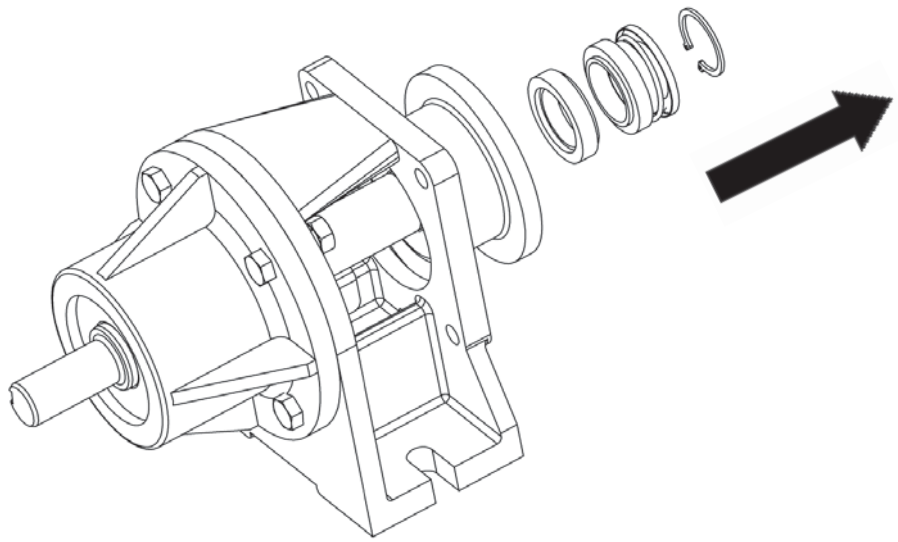
Disassembly



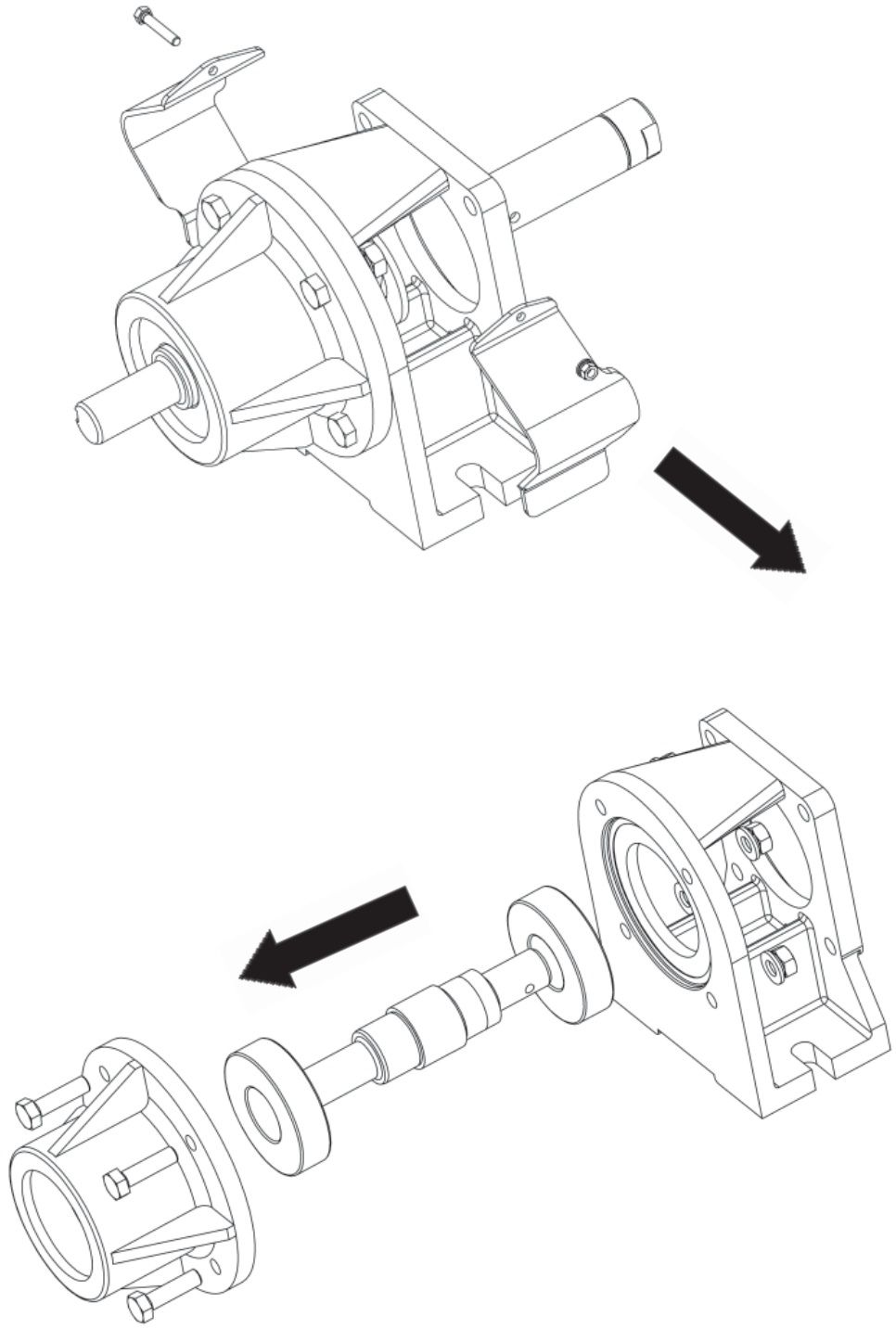
Do Not Use pipe wrench on Stator Barrel, as compression may effect pump performance

Disassembly





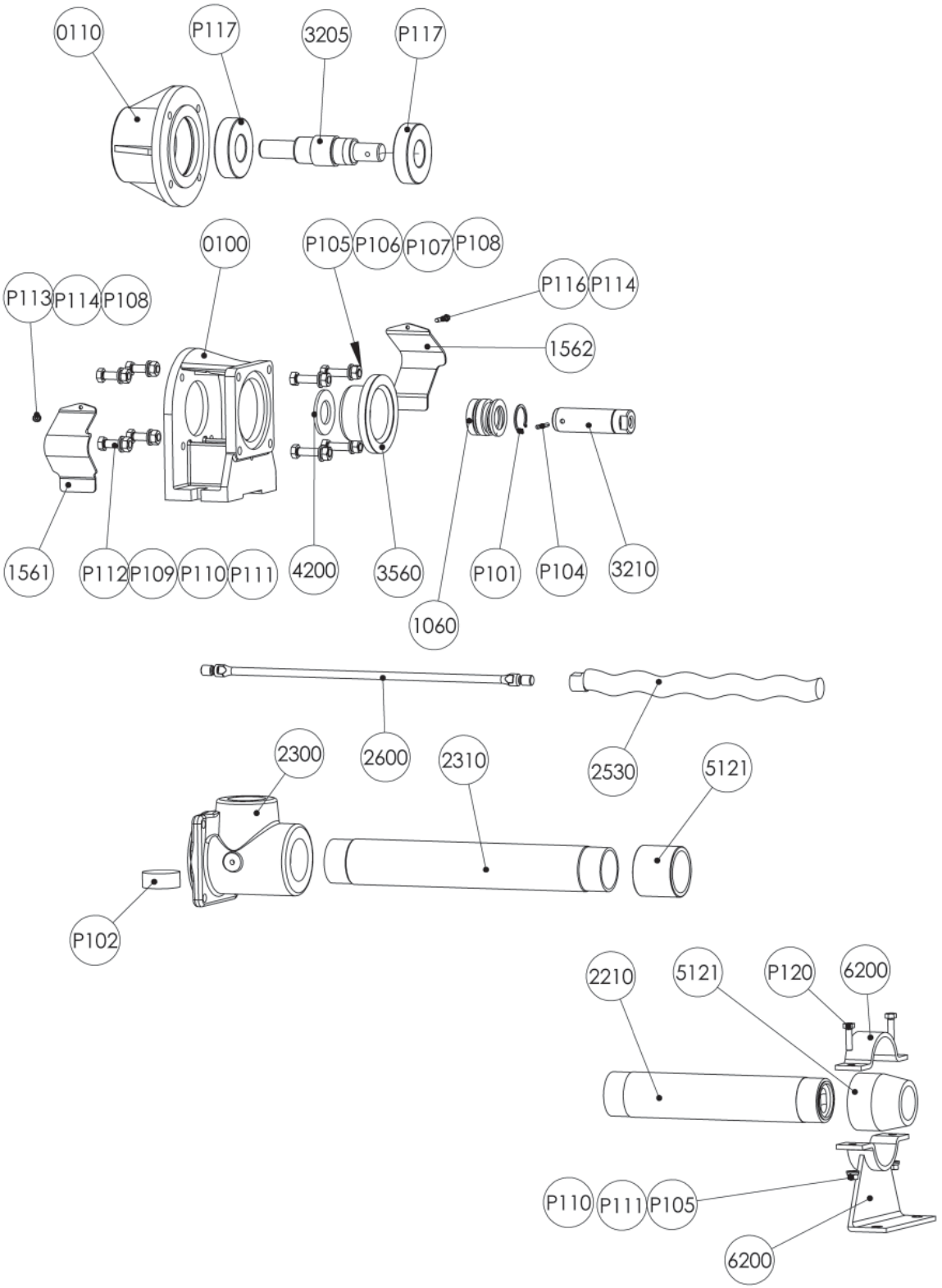
Disassembly



Fault Finding

Fault Finding Guide			
Problem	**Possible cause**	**Symptoms of fault**	**Remedial action**
Pump will not run	over load trip out	motor does not turn or hum	reset over load on motor by pressing the red button on the motor
	Power turned off	motor does not hum or turn	check all fuses and switches
	locked pump	motor hums and trips out overload	turn pump by hand to free it
	blown start capacitor on motor		check motor and capacitor
Pump not performing correctly	worn rotor and stator	pump runs at full speed with reduced water out put	dismantle pump, inspect and replace as required
	block suction or delivery line	pump runs nosily, reduce water output, excessive pressure reading on pressure gauge	check and remove blockages
	hole or air leak in suction line	excessive air at deliver point	repair or replace as required
	hole or leak in discharge line	reduced water output at end of delivery line. Wet area along line of delivery pipe	locate and repair or replace as required
Pump is very noisy	exceeded suction capabilities of pump	reduced water output, noisy pump making a hammering sound	check NPSH of system, make appropriate correction to reduce the suction pressure
	worn stator	making a slapping sound, reduced water output	dismantle, check stator for wear and replace if necessary
Pump will not prime	worn stator	once running the pump making a slapping sound, reduced water output	dismantle, check stator for wear and replace if necessary
	hole or air leak in suction line	once running the pump delivers excessive air at delivery point	repair or replace as required
Pump turns backwards after it stops	faulty foot valve		repair or replace as required
Pump runs but will not pump	Pump is running backwards	pump is running clockwise when viewed from the motor or bearing housing end	change direction of rotation
	rotor or flexishaft have unscrewed		dismantle, inspect and reassemble replacing any damaged parts
	broken flexishaft		dismantle, check flexishaft replace if necessary
	worn rotor and stator	can hear water sloshing around in the pump	dismantle, check rotor and stator for wear and replace if necessary

Spare Parts



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Spare Parts

REF:	DESC.	Qty.	ASP310	ASP320	ASP410	ASP420	ASP440	ASP510	ASP520	ASP610	ASP620
0100	BODY	1	CD ASP510 0100								
0110	BEARING HOUSING	1	CD E012 0110								
1060	MECH. SEAL	1	OO CP800 1060				OO ASP440 1050	OO CP800 1060			
1561	THROWER GUARD (LHS)	1	PS E012 1561								
1562	THROWER GUARD (RHS)	1	PS E012 1562								
2020	GASKET	1	ZG AB1 2020								
2210	STATOR	1	RA 310 2210	RA 320 2210	RA 410 2210	RA 420 2210	RA 440 2210	RA 510 2210	RA 520 2210	RA 610 2210	RA 620 2210
2300	DISCHARGE CHAMBER	1	CD AGM520 2300							CD ASP620 2300	
2310	PUMP BARREL	1	SB ASP420 2310					SB ASP510 2310	SB ASP520 2310	SB ASP620 2310	
2530	ROTOR MK1	1	SB AGR310 2530	SB AGR320 2530	SB AGR410 2530	SB AGR420 2530	SB AGR440 2530	SB ASP510 2530	SB 520 2530	SB 610 2530	SB 620 2530
2600	FLEXISHAFT	1	UM ASP420 2600						UM ASP620 2600		
3205	BEARING SHAFT	1	MM ASP420 3205								
3210	MAIN SHAFT	1	SB ASP420 3210				SB ASP440 3210	SB ASP420 3210	SB ASP620 3210		
3560	SEAL HOUSING	1	SB ASP510 6560								
4200	THROWER	1	RR CP800 4200								
6200	SUPPORT FOOT	1	MB ASP420 6200							MB ASP620 6200	
5121 A	STATOR ADAPTOR	1	MW SOC 200					CF 520 5120		CD ASP620 5121	
5121 B	BUSH	1	CD 320 5121					CF 520 5120		CD 640 5121	
P100	CIRCLIP (80mm)	1	C102800P								
P101	CIRCLIP (32mm)	1	C106324P								
P102	PRESSURE GAUGE	1	SWP-10006				SWP-10007		SWP-10006		
P103	TAPER PLUG	1	P100232S								
P104	PIN	1	P704252F								
P105	HEX NUT (M10)	4	N114102F								
P106	WASHER (M10)	8	W114052F								
P107	SPRING WASHER (M10)	4	W114252F								
P108	HEX BOLT (M10 X 70)	4	K114342F								
P109	HEX NUT (M8)	4	N113102F								
P110	WASHER (M8)	8	W113052F								
P111	SPRING WASHER (M8)	4	W113252F								
P112	HEX BOLT (M8 X 40)	4	K113282F								
P113	HEX NUT (M5)	1	N111100F								
P114	WASHER (M5)	1	W111050F								
P115	SPRING WASHER (M5)	1	W111251F								
P116	HEX BOLT (M5 X 25)	1	F111220F								
P117	BEARINGS	2	A170352B								
P120	HEX SCREW (M10 x 30)	1	F114242F								
P125	SHAFT KEY	1	K120850P								

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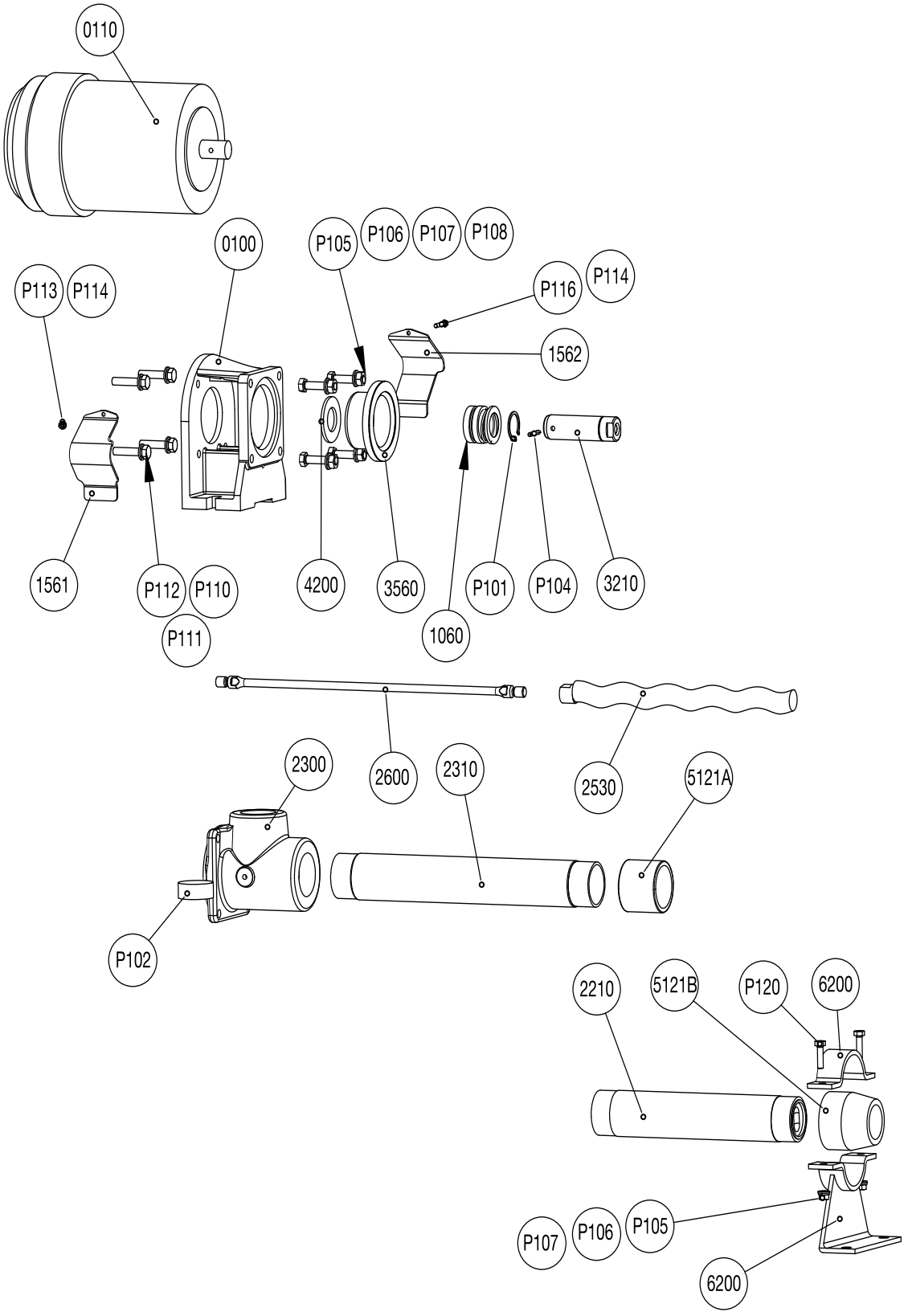
Spare Parts



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Spare Parts

REF:	DESC.	Qty.	ASP310	ASP320	ASP410	ASP420	ASP510
0100	BODY	1	CD ASP510 0100				
0110	MOTOR 240V 4 POLE	1	ASP0561TF4P	ASP1101TF4P		ASP1701TF4P	
0110	MOTOR 240V 6 POLE	1	ASP0371TF6P	ASP0751TF6P		N/A	
1060	MECH. SEAL	1	OO CP800 1060				
1561	THROWER GUARD (LHS)	1	PS E012 1561				
1562	THROWER GUARD (RHS)	1	PS E012 1562				
2020	GASKET	1	ZG AB1 2020				
2210	STATOR	1	RA 310 2210	RA 320 2210	RA 410 2210	RA 420 2210	RA 510 2210
2300	DISCHARGE CHAMBER	1	CD AGM520 2300				
2310	PUMP BARREL	1	SB ASP420 2310				SB ASP510 2310
2530	ROTOR MK1	1	SB AGR310 2530	SB AGR320 2530	SB AGR410 2530	SB AGR420 2530	SB ASP510 2530
2600	FLEXISHAFT	1	UM ASP420 2600				
3210	MAIN SHAFT	1	SB ASP420 3210				
3560	SEAL HOUSING	1	SB ASP510 6560				
4200	THROWER	1	RR CP800 4200				
6200	SUPPORT FOOT	1	MB ASP420 6200				
5121 A	STATOR ADAPTOR	1	MW SOC 200				CF 520 5120
5121 B	BUSH	1	CD 320 5121				CF 520 5120
P101	CIRCLIP (32mm)	1	C106324P				
P102	PRESSURE GAUGE	1	SWP-10006				
P103	TAPER PLUG	1	P100232S				
P104	PIN	1	P704252F				
P105	HEX NUT (M10)	4	N114102F				
P106	WASHER (M10)	8	W114052F				
P107	SPRING WASHER (M10)	4	W114252F				
P108	HEX BOLT (M10 X 70)	4	K114342F				
P109	HEX NUT (M8)	4	N113102F				
P110	WASHER (M8)	4	W113052F				
P111	SPRING WASHER (M8)	4	W113252F				
P112	HEX BOLT (M8 X 35)	4	K113262F				
P113	HEX NUT (M5)	1	N111100F				
P114	WASHER (M5)	1	W111050F				
P115	SPRING WASHER (M5)	1	W111251F				
P116	HEX BOLT (M5 X 25)	1	F111220F				

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Perth	T.	08 9303 0444	F.	08 9303 4430
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