

WPS Power Sprayer Pump

User's Manual & Parts List

MODEL

WPS-30A

50A

70A

100A

150A



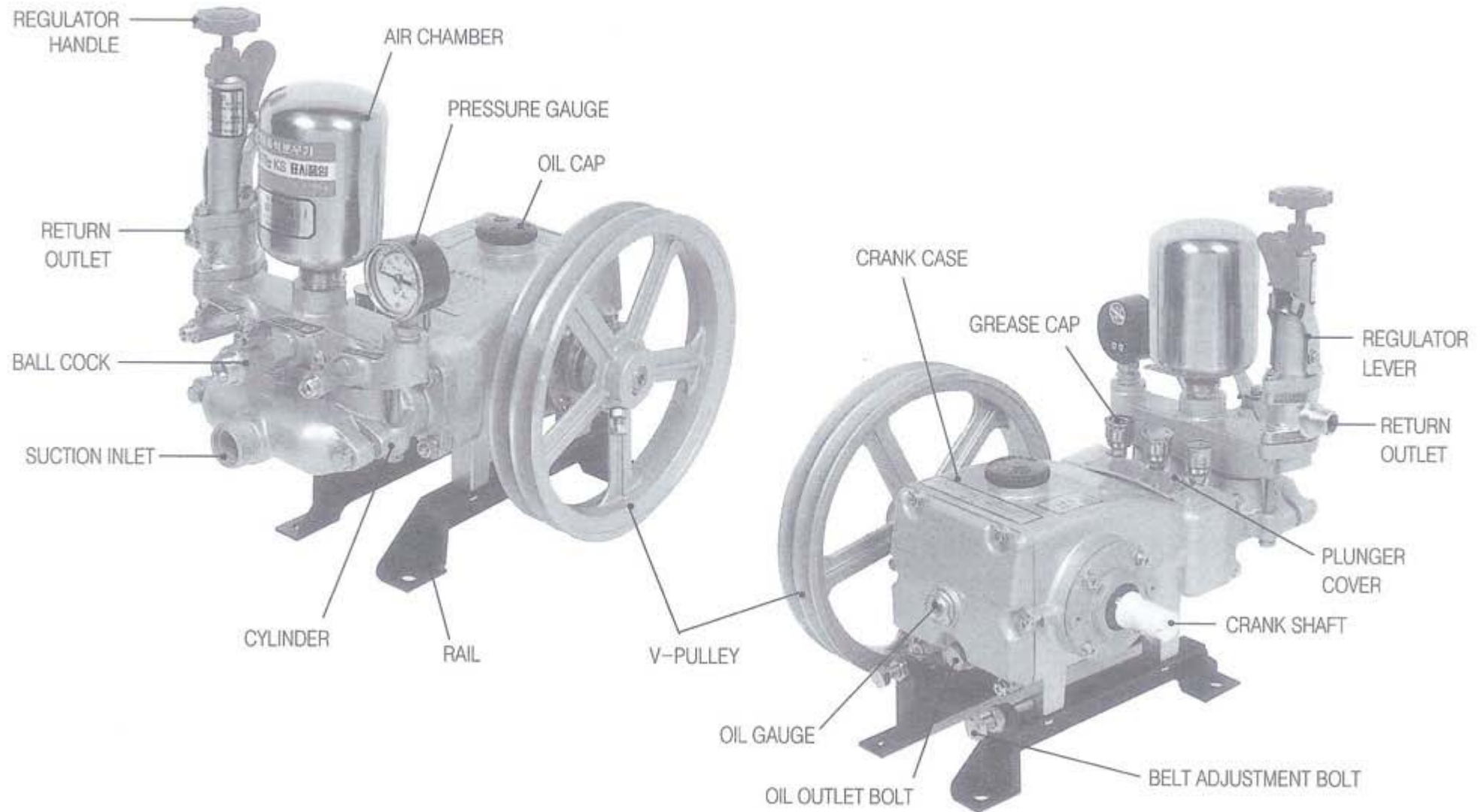
AKORM Corp.

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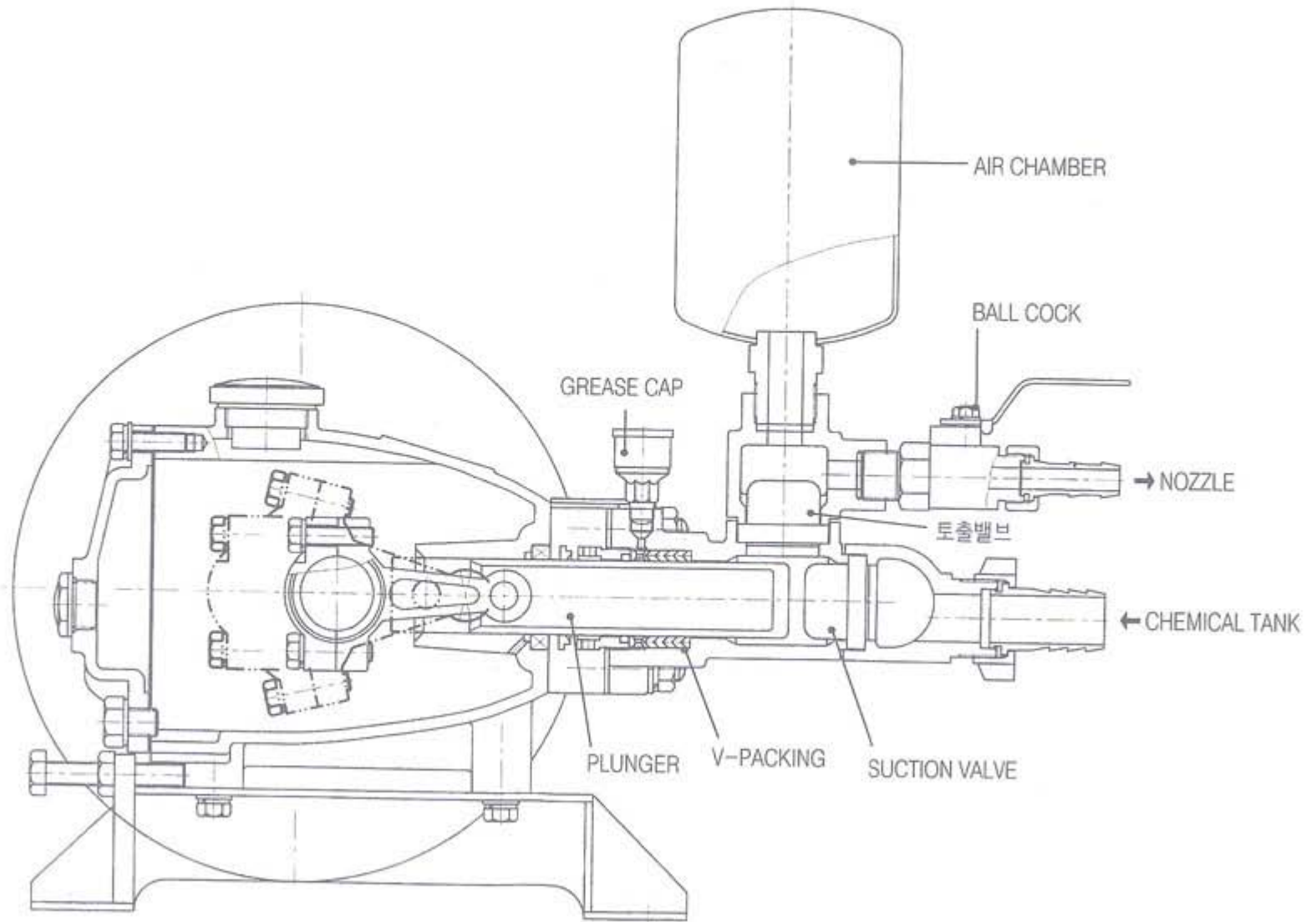
1. Main Parts, Outlook



2. Specification

Item	Model	WPS-30A	WPS-50A	WPS-70A	WPS-100A	WPS-150A
PUMP TYPE		Horizontal 3 Plungers				
POWER TRANSMISSION TYPE		V-Belt (B Type) 2 Pieces				
LENGTH×WIDTH×HEIGHT(mm)		360×267×338	400×285×365	430×310×395	476×367×478	598×448×553
DRY WEIGHT(Kg)		12.5	16.2	18.5	29.0	46.5
PLUNGER BORE×STROKE(mm)		22×24	28×30	32×34	38×38	42×50
REVOLUTION (rpm)	NORMAL	800	750	750	750	700
	IRRIGATION	1200	1200	1200	1200	1200
PRESSURE (kgf/cm ³)	IRRIGATION	10	10	10	10	10
	NORMAL	25	25	25	25	25
	MAX	35	35	35	35	35
SUCTION CAPACITY (ℓ/min)	NORMAL	21.8	41.54	61.49	96.91	145.39
	IRRIGATION	32.8	66	98	155	249
REQUIRED POWER (ps)	NORMAL	1.2	3.0	3.5	6.0	10.0
	NORMAL	1.8	3.6	5.0	8.0	12.0
	MAX	2.5	4.6	6.0	10.0	15.0
OIL CAPACITY(ℓ)		0.8	0.9	1.3	1.8	2.5
SPRAYING CAPACITY (ha/day)		5~8	6~12	12~20	18~25	26~35

3. Characteristics



1. Crankcase and Cylinder

The cylinder made of special cast iron has the rust-resistant film on its surface to ensure superior anti-corrosion. 3 plungers minimize the variation of pressure by making crank pins positioned with 120° angle respectively.

2. Air Chamber

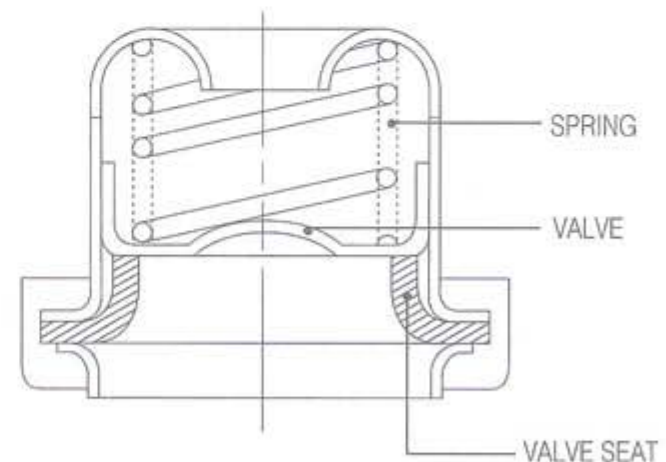
The capacity of air chamber is normally designed 6-7 times as large as the capacity of a stroke of plungers per one revolution of crank. But, ours is designed 12-20 times larger for maximizing the pressure. So, our maximum internal pressure is over 3 times larger than declared maximum pressure.

3. Valve

Simple structure of disk valve allows high vacuum, smooth operation and long durability by precise machining of anti-wearing & anti-corrosive stainless steel.

4. Regulator

The regulator valve, circular valve with ball type, makes pressure control easy.



STRUCTURE OF VALVE

4. Suitable Pulley of Engine or Motor

When you set our Sprayer to a Engine or Motor, you must select the suitable Pulley by following calculation.

a. In case of selecting Engine or Motor Pulley with Sprayer Pulley fixed

Pulley Diameter of the Engine or Motor

$$= \text{Pulley Diameter of Sprayer} \times \frac{\text{Sprayer rpm}}{\text{Engine or Motor rpm}}$$

b. In case of changing the Sprayer Pulley with Engine or Motor fixed

Pulley Diameter of Sprayer

$$= \text{Pulley Diameter of the Engine or Motor} \times \frac{\text{Engine or Motor rpm}}{\text{Sprayer rpm}}$$

For example,

Diameter of Sprayer Pulley : 250 mm

Sprayer Revolution : 750 rpm

Motor Revolution : 1800 rpm

$$\text{Pulley Diameter of Motor} = 250 \times \frac{750}{1800} = 104 \text{ mm}$$

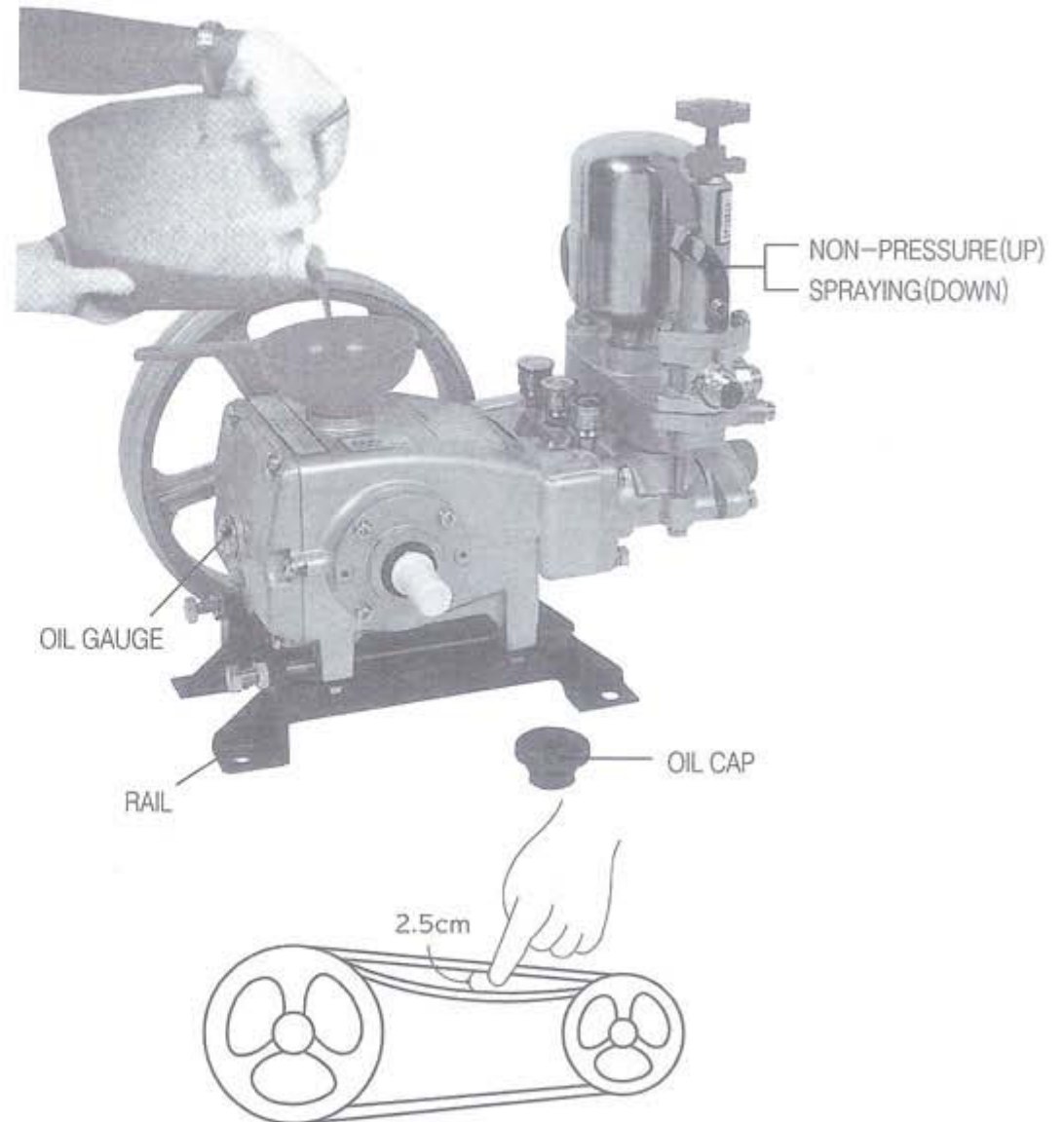
5. How to Operate

1. Preparation

- a. Open the Oil Cap and pour Oil(SAE #20~40) up to the center of Oil Gauge.
- b. Check and tighten every Bolts and Nuts.
- c. Turn the Grease Cap 2-3 times before operation. If the V-Packing is not greased. The V-Packing will be worn quickly and it makes chemical leakage.
- d. Check the Hose Packing before connecting the Hoses to the Suction Inlet and the Return Outlet.
- e. Check the V-Belt and adjusting its tension by the Bolts for Belt Adjustment.

2. Starting

- a. Lift up the Regulator Lever and run a motor.
- b. Put the Return Hose into the chemical tank and check if there are air bubbles from the Hose.
- c. Check if strange sound occurs or not.
- d. Put down the Regulator Lever and the Regulator Handle to "H(High)" or "L(Low)" to adjust the pressure properly and close the Lock Nut after finishing adjustment.



- e. Pressure is down when starting spraying for a second after opening the Ball Valve connected with the Spray Hose.
But, Pressure will be recovered gradually with the Spray Hose fulfilled with chemical.

3. Cautions during operation

- a. Put the Suction Strainer into chemical liquid.
- b. Grease the V-Packing 2-3 times in every 3 or 4 hours' operation by turning the Grease Cap.
- c. Don't run a motor without loading over 5 minutes to avoid the damage of V-Packing, the Plunger or other parts.
- d. In case of occurring sudden troubles such as hose burst while spraying.
lift up the Regulator Lever and close the value connected with the Spray Hose immediately.
- e. Don't work overload.

4. Cautions After operation

- a. Clean the inside of sprayer sufficiently by spraying clean water.
- b. After finishing spraying clean water, make pressure "o" by turning the Regulator Handle to "L(Low)" direction.
- c. Lift up the Regulator Lever and lift up the Suction Hose for exhausting air through the Return Hose.
Be careful not to run without loading over 5 minutes. After that, turn off power.
- d. Clean the Strainer.

5. Storage

- a. Put good grease into the V-packing always.
- b. Remove the V-Belt from the pulley. Otherwise the belt will be loosened.
- c. Drain Oil from the Crankcase for storing the unit for an extended period(over 6 months.)
- d. Remove water from the Sprayer and the Hose not to be broken due to freezing.

6. Trouble & Measure

Condition	Cause	Measure
No Suction	<ul style="list-style-type: none"> - Air supply through bursted hose - Stuffed Suction Valve - Worn out Valve(Suction, Discharge) - Stuffed Valve(Suction, Discharge) by dust or dirt - Air supply through worn V-Packing - Not evenly tightened Connecting Bolts of Cylinder & Suction Inlet, Discharge Outlet - Incorrect assembly of Suction Hose or No Packing - Stuffed Strainer by dust or dirt - Floating Strainer 	<ul style="list-style-type: none"> - Replace it - Clean the Valve and Valve Seat - Replace it - Disassemble and clean it - Replace it - Tighten them equally - Assemble the Suction Hose correctly or fit Packing - Brush and clean it - Put it into chemical liquid
Not Increased Pressure	<ul style="list-style-type: none"> - Stuffed inlet of Pressure Gauge - Worn Valve and Valve Seat(Regulator) - Stuffed Valve (Regulator, Suction, Discharge) by dust or dirt - Pressure Gauge out of order - Too much Spraying quantity and Less or no Returning quantity 	<ul style="list-style-type: none"> - Disassemble and clean it - Replace it - Disassemble and clean it - Replace it - Adjust the Return rate to 10~30% of Suction quantity
Violent Trembling the Indicator of Pressure Gauge	<ul style="list-style-type: none"> - Regulator Press Bar out of order - Stuffed Strainer by dust or dirt - Worn Valve and Valve Seat(Regulator) - Stuffed Valve(Regulator) by dust or dirt - Bended Suction Hose - Problem in Suction Valve - Loosened V-Belt 	<ul style="list-style-type: none"> - Check the Bellows Packing - Clean it - Replace it - Disassemble and clean it - Release the bended Suction Hose - Disassemble and check it - Tighten it

Condition	Cause	Measure
Too much bubble from Return Hose	<ul style="list-style-type: none"> - Bended Suction Hose - Damaged Packing of Suction Hose - Bursted Suction Hose - Loosened Connecting Nuts for Cylinder - Worn V-Packing 	<ul style="list-style-type: none"> - Release the bended Suction Hose - Replace it - Replace it - Tighten the Nuts evenly - Replace it
Big decrease of pressure in spraying after adjustment of pressure	<ul style="list-style-type: none"> - Too little Return quantity(less than 10%) <ol style="list-style-type: none"> 1) Low RPM of Sprayer 2) Much spraying quantity due to worn nozzle 3) Many spraying holes in nozzle 4) Long Spraying Hose 5) Small sized Spraying Hose - Regulator out of order <ol style="list-style-type: none"> 1) Spring in trouble 2) Regulator Press Bar in trouble 3) Worn Regulator valve seat 	<ul style="list-style-type: none"> - Increase RPM - Replace it - Use the nozzle with less spraying holes - Reduce the length of hose - Replace bigger one - Replace it - Disassemble and check it - Replace it
Big spraying particle	<ul style="list-style-type: none"> - Little suction quantity - Wide nozzle hole due to abrasion - Many spraying holes in nozzle - Long and small-sized Spraying Hose - Decreased pressure 	<ul style="list-style-type: none"> - Increase RPM - Disassemble and check it - Use the nozzle with less spraying holes - Replace it with suitable one - Increase pressure using the Regulator
Strange sound from the inside Crankcase	<ul style="list-style-type: none"> - Loosened Connecting Rod Bolt - Damaged parts in Crankcase - Broken Bearing 	<ul style="list-style-type: none"> - Tighten it - Disassemble and check it - Replace it
Chemical leakage into Crankcase	<ul style="list-style-type: none"> - Worn Oil Seal - Plunger in trouble <ol style="list-style-type: none"> 1) Return part 2) Head part 	<ul style="list-style-type: none"> - Check and replace the V-packing, Water-proof Packing, Plunger and Oil Seal - Replace it - Weld it if possible

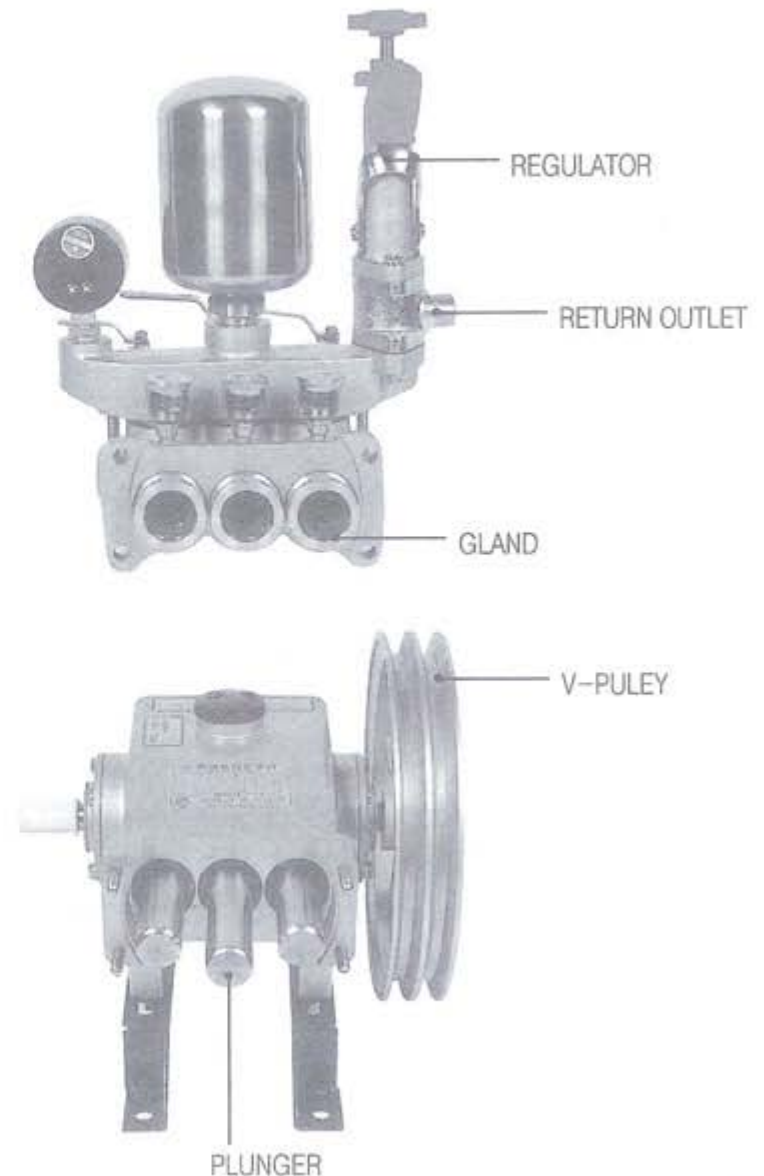
7. Replacement or Disassembly of Main Parts

1. Replacement of the N-packing

- a. Remove the Plunger Cover.
- b. Turn the Gland anti-clockwise a little with a Adjusting Gland Bar.
- c. Loosen 4 pieces of connecting the Nuts between the Crank case and the Cylinder, and pull off the Cylinder while turning the V-Pulley slowly.
- d. Remove the Gland, pull out the Grease Ring and the V-Packing.
- e. Check the V-packing and the V-packing Supporter.
- f. Replace them if they are worn out. Grease inside the V-packing and the Grease Ring after putting the V-packing Supporter, the V-packing, and the Grease Ring in order. Tighten the Gland properly.
- g. If it is difficult to fix the Cylinder, push the Cylinder strongly while turning the V-Pulley.

2. Replacement of the Valve

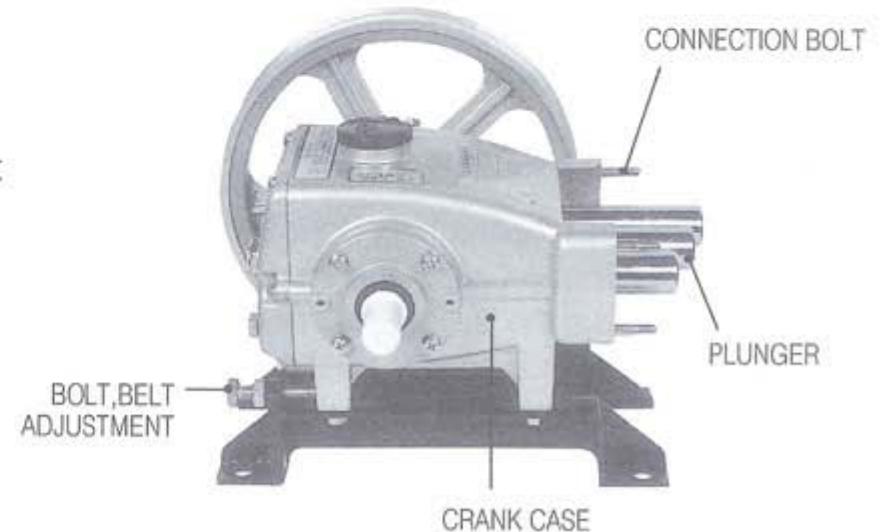
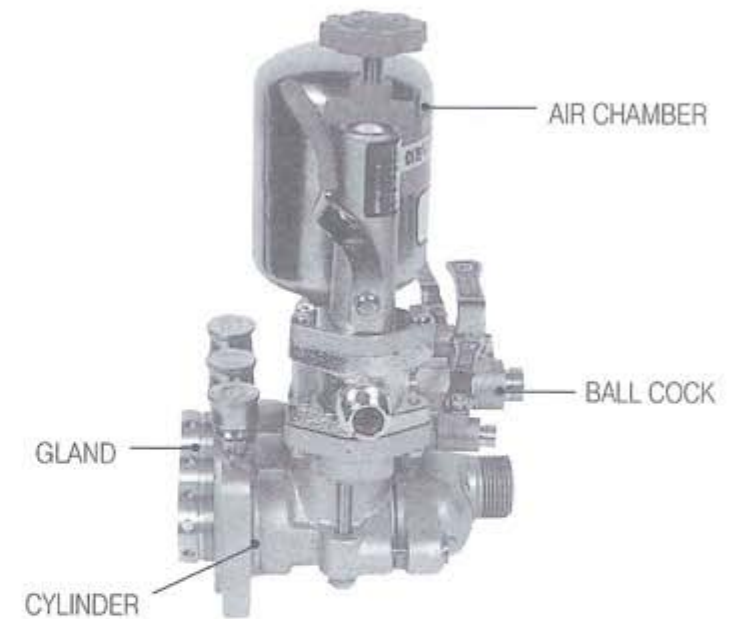
- a. Loosen Connecting Bolts between the Suction Inlet or the Discharge Outlet and the Cylinder.
- b. Pull out the Valve and check it.
- c. If there is a scratch on the Valve and the Valve Seat, remove the scratch with a sand-paper. In case of deep scratch or holes, replace the valve.



- d. Put grease on Valve Packing a little, and the insert Suction Valve into the Suction Inlet and the Discharge Valve into the Cylinder.
- e. Assemble all the parts and tighten Connecting Bolts equally.

3. Replacement of the Plunger from Connecting Rod

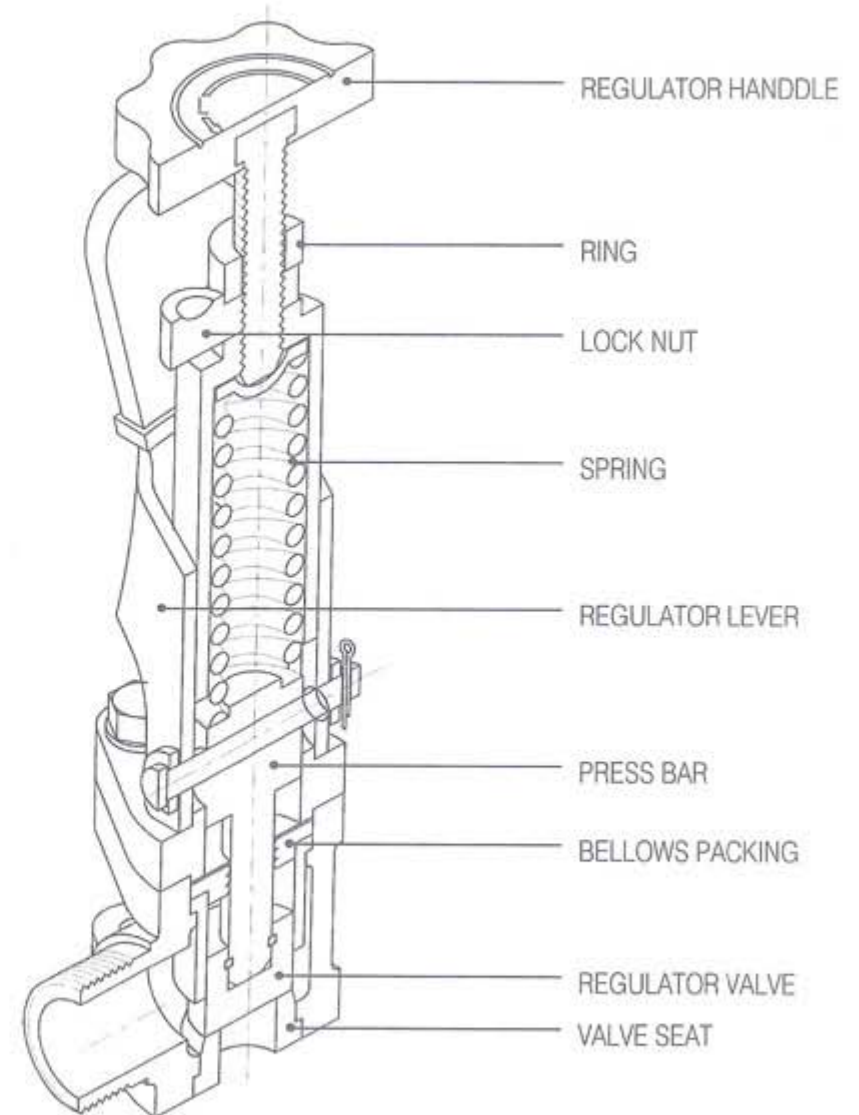
- a. Pull out the Cylinder.
- b. Loosen the Oil Outlet Bolt and drain oil by inclining the Crankcase.
- c. Loosen 6 pieces of the Crankcase Cover Bolts and remove the Cover packing.
- d. Loosen the Connecting Rod Bolts with the box spanner and pull the lower part of Rod not to touch the crank.
- e. Loosen the V-Pulley Bolt and disassemble the Key and Pulley.
- f. Loosen Bolts on both sides of the Bearing case.
- g. Put a wood stick or soft steel on one side of the Crankshaft and hit gently on it with a hammer. then the Bearing case and the Crankshaft will be separated from the Crankcase.
- h. Pull out the Connecting Rod and the Plunger.
- i. Replace the Connecting Rod and the Plunger if they are worn out or broken down.
- j. Assemble all the part in the reverse order of disassembly.



4. Disassemble of the Regulator

- a. Loosen the Regulator Handle and Lift up the Regulator Lever to release the elasticity of spring.
- b. Loosen the Bolts of Regulator Spring Case.
- c. Pull out the Regulator Spring Case and check the parts inside of the Spring Case.
- d. Loosen bolts between the Regulator Body and the Discharge Outlet, and then pull out the Regulator Body.
- e. Check and replace the Regulator Valve and the Valve Seat.
- f. Assemble all the parts.

※ Refer to Part List for easy Assembly and Disassembly



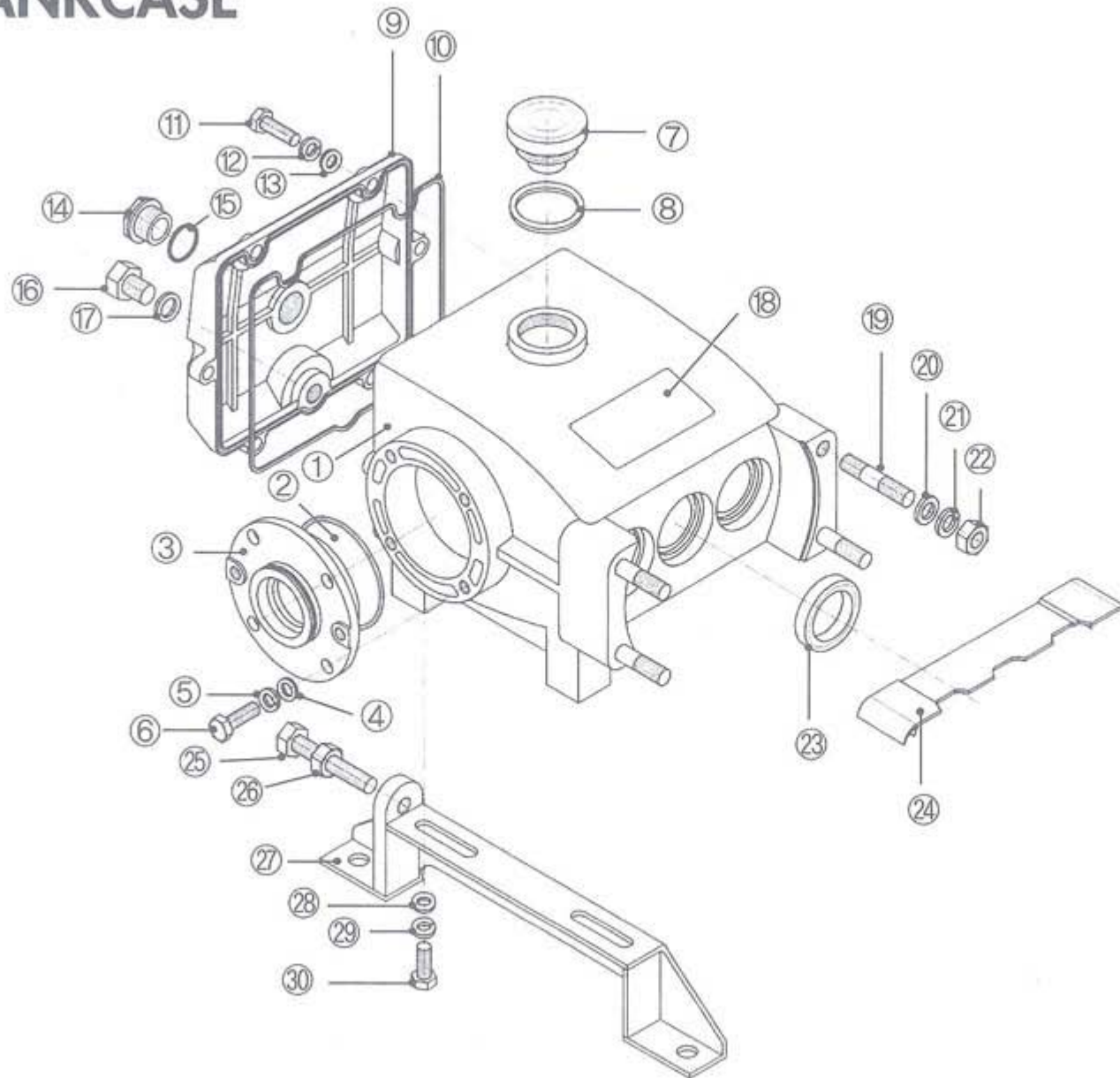


8. Part List

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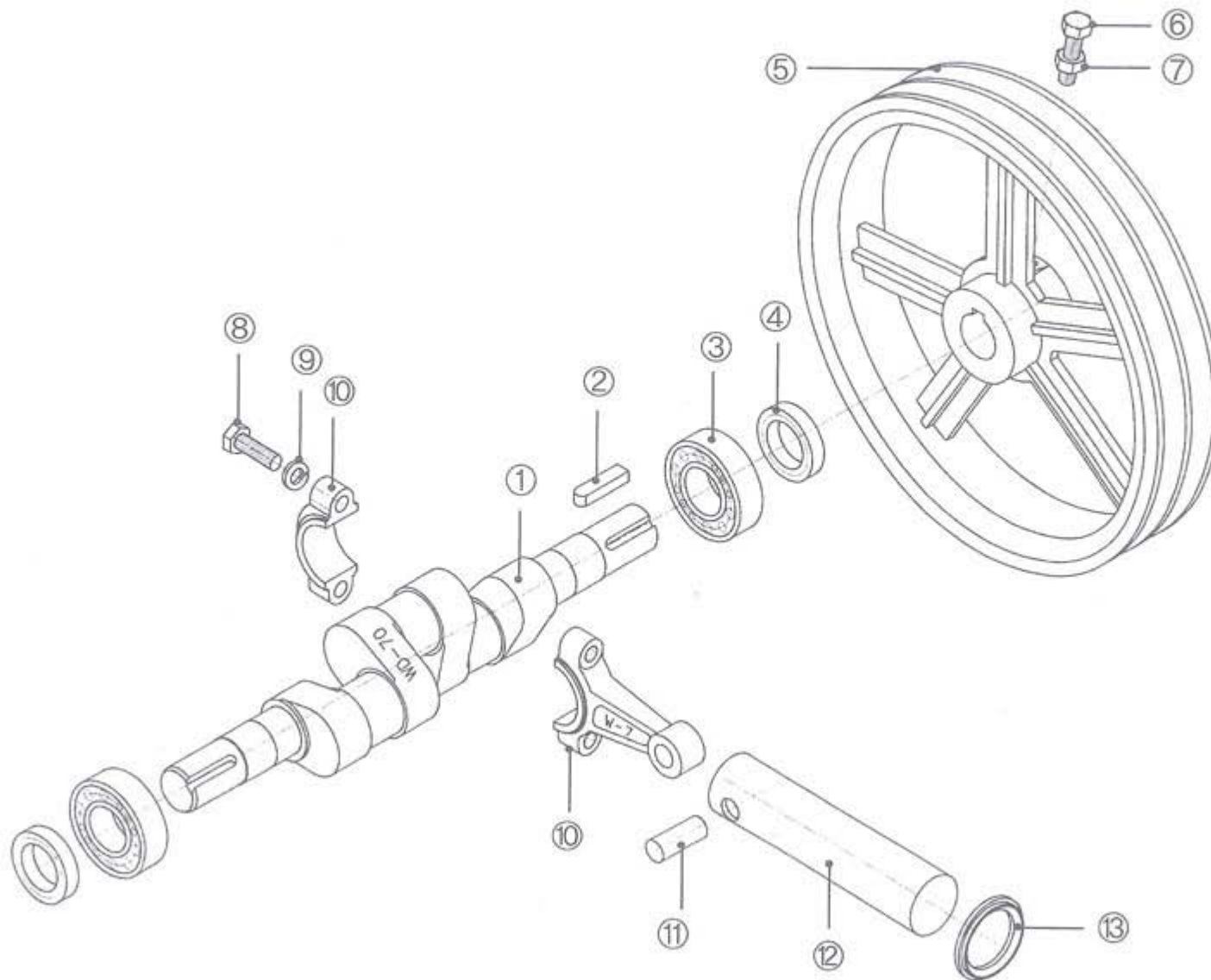
1. CRANKCASE



1. CRANKCASE

NO	Item	Spec.	Quantity					NO	Item	Spec.	Quantity					
			30A	50A	70A	100A	150A				30A	50A	70A	100A	150A	
1-1	CRANKCASE		1	1	1	1	1	20	FLAT WASHER, CYLINDER	FW8	4	4				
2	O-RING, BEARING CASE		2	2	2	2	2			FW10			4	4		
3	BEARING CASE		2	2	2	2	2			FW12						4
4	FLAT WASHER, BEARING CASE	FW6	8	8				21	SPRING WASHER CYLINDER	SW8	4	4				
		FW8			8	8	8			SW10			4	4		
5	SPRING WASHER, BEARING CASE	SW6	8	8						SW12						4
		SW8			8	8	8	22	NUT, CYLINDER	M8	4	4				
6	BOLT, BEARING CASE	M6	8	8						M10			4	4		
		M8			8	8	8			M12						4
7	OIL CAP		1	1	1	1	1	23	OIL SEAL, PLUNGER	Ø22×35×7	3					
8	PACKING, OIL CAP		1	1	1	1	1			Ø28×40×8		3				
9	CRANKCASE COVER		1	1	1	1	1			Ø32×45×8			3			
10	PACKING, CRANKCASE		1	1	1	1	1			Ø38×52×10				3		
11	BOLT, CRANKCASE COVER	M6	6	6							Ø42×65×12					
		M8			6	6	6	24	COVER, PLUNGER		1	1	1	1	1	
12	SPRING WASHER, CRANKCASE COVER	SW6	6	6				25	BOLT, BELT ADJUSTMENT	M8	2					
		SW8			6	6	6			M10		2	2	2	2	2
13	FLAT WASHER, CRANKCASE COVER	FW6	6	6				26	LOCK NUT, BELT ADJUSTMENT	M8	2					
		FW8			6	6	6			M10		2	2	2	2	2
14	OIL GAUGE		1	1	1	1	1	27	RAIL (RIGHT, LEFT)		2	2	2	2	2	
15	O-RING, OIL GAUGE		1	1	1	1	1	28	FLAT WASHER, RAIL	FW8	4	4	4	4		
16	BOLT, OIL OUTLET	M8	1							F W10						4
		M12		1	1	1	1	29	SPRING WASHER, RAIL	SW8	4	4	4	4		
17	PACKINGM, OIL OUTLET		1	1	1	1	1			SW10						4
18	NAME BOARD		1	1	1	1	1	30	BOLT, RAIL	M8	4	4	4	4		
19	STUD BOLT, CYLINDER	M8	4	4						M10						4
		M10			4	4										
		M12					4									

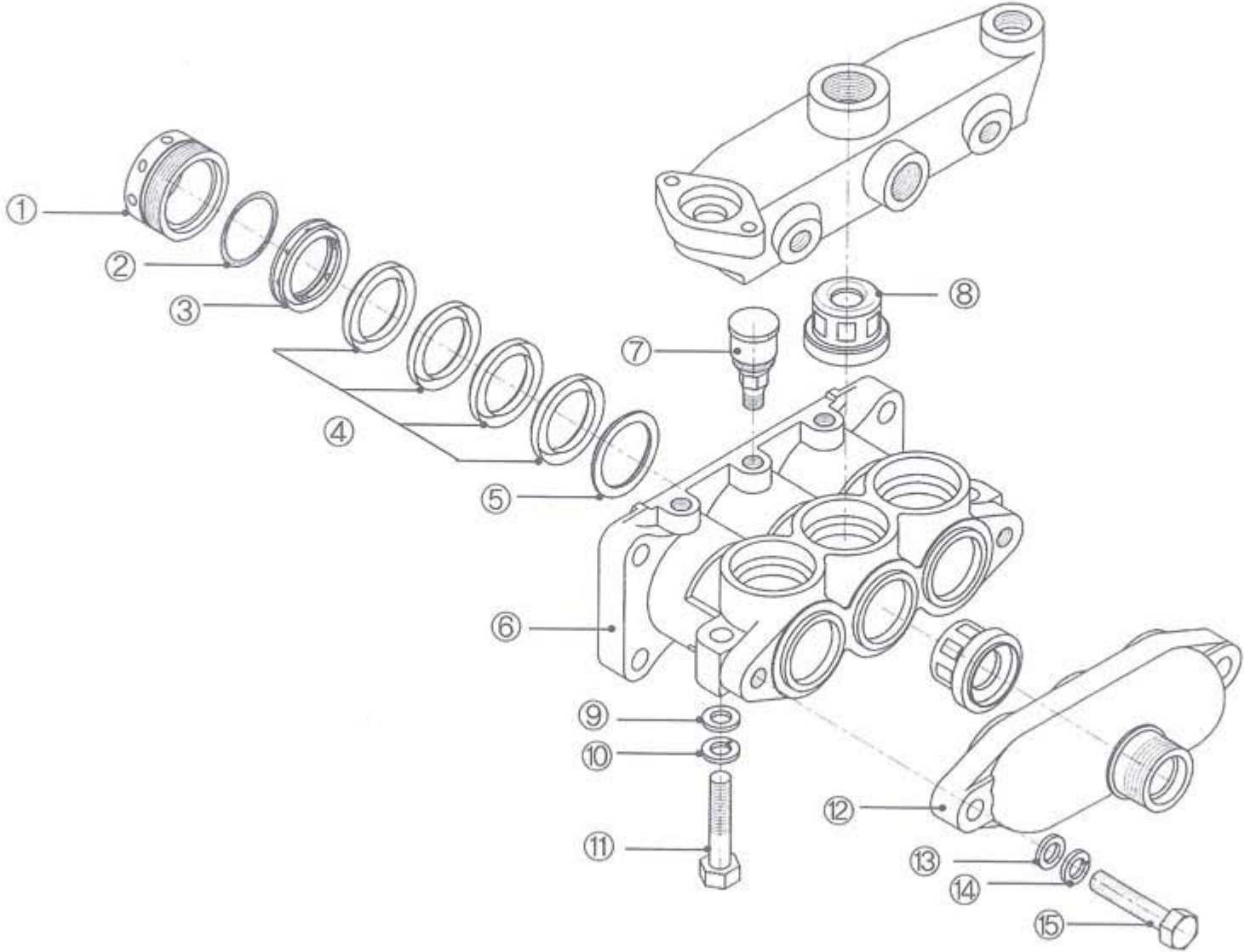
2. CRANK SHAFT



2. CRANK SHAFT

No	Item	Spec.	Quantity				
			WPS-30A	WPS-50A	WPS-70A	WPS-100A	WPS-150A
2-1	CRANK SHAFT		1	1	1	1	1
2	KEY	6×6	1	1			
		8×7			1	1	
		12×8					1
3	BALL BEARING	#6304	2				
		#6204		2			
		#6205			2		
		#6206				2	
		#6308					2
4	OIL SEAL, CRANK SHAFT	Ø20×35×7	2	2			
		Ø25×38×7			2		
		Ø30×42×8				2	
		Ø40×55×8					2
5	V-PULLEY		1	1	1	1	1
6	BOLT, V-PULLEY	M8	1	1	1	1	1
7	LOCK NUT, V-PULLEY	M8	1	1	1	1	1
8	BOLT, CONNECTING ROD	M8	4	6	6	6	
		M10					6
9	SPRING WASHER, CONNECTING ROD	SW8	4	6	6	6	
		SW10					6
10	CONNECTING ROD		3	3	3	3	3
11	PLUNGER PIN		3	3	3	3	3
12	PLUNGER		3	3	3	3	3
13	WATERPROOF PACKING		3	3	3	3	3

3.CYLINDER

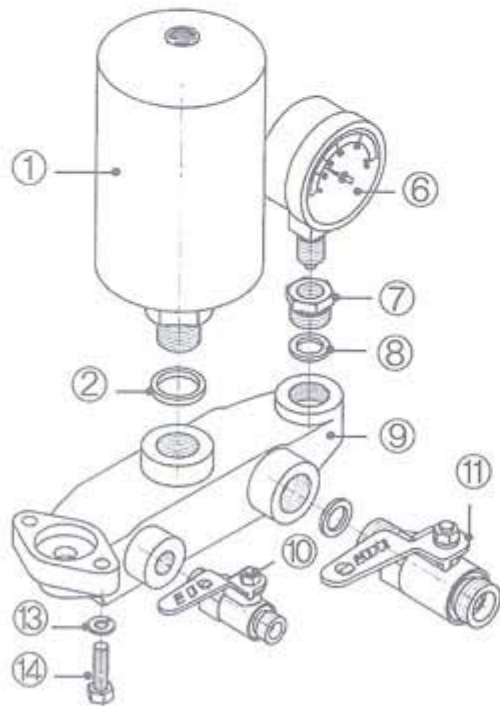


3.CYLINDER

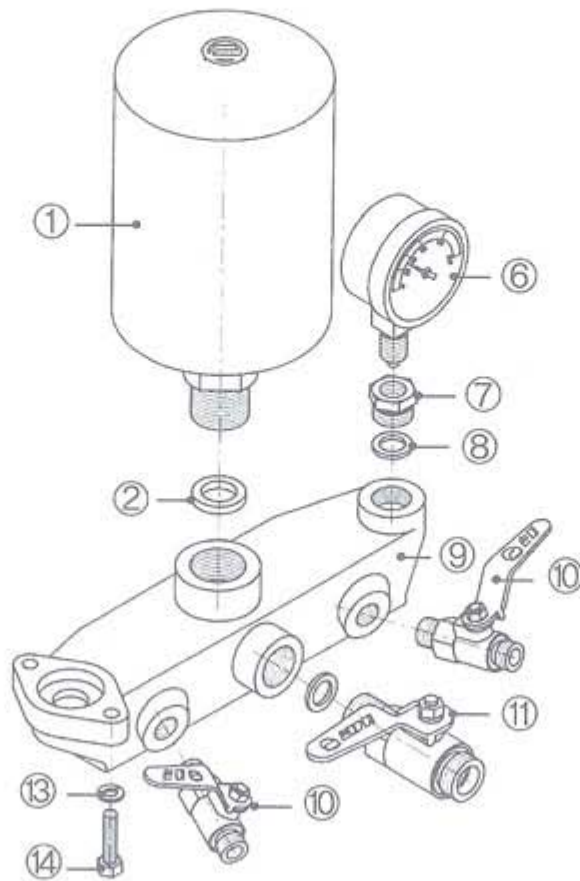
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			30A	50A	70A	100A	150A				30A	50A	70A	100A	150A	
3-1	GLAND		3	3	3	3	3	11	BOLT,	M8	2	2		2		
2	O-RING, GLAND		3	3	3	3	3		DISCHARGE OUTLET	M10				2		2
3	GREASE RING		3	3	3	3	3	12	SUCTION INLET		1	1	1	1	1	
4	V-PACKING	Ø22	9					13	FLAT WASHER,	FW8	2	2		6		
		Ø28		9					SUCTION INLET	FW10				2		6
		Ø32			12			14	SPRING WASHER,	SW8	2	2		6		
		Ø38				12			SUCTION INLET	SW10				2		6
		Ø42					12		15	BOLT,	M8	2	2		6	
5	V-PACKING SUPPORTER		3	3	3	3	SUCTION INLET	M10					2		6	
6	CYLINDER		1	1	1	1	1									
7	GREASE CAP		3	3	3	3	3									
8	VALVE ASSEMBLY		6	6	6	6	6									
9	FLAT WASHER,	FW8	2	2		2										
	DISCHARGE OUTLET	FW10			2		2									
10	SPRING WASHER	SW8	2	2		2										
	DISCHARGE OUTLE	SW10			2		2									

4. AIR CHAMBER

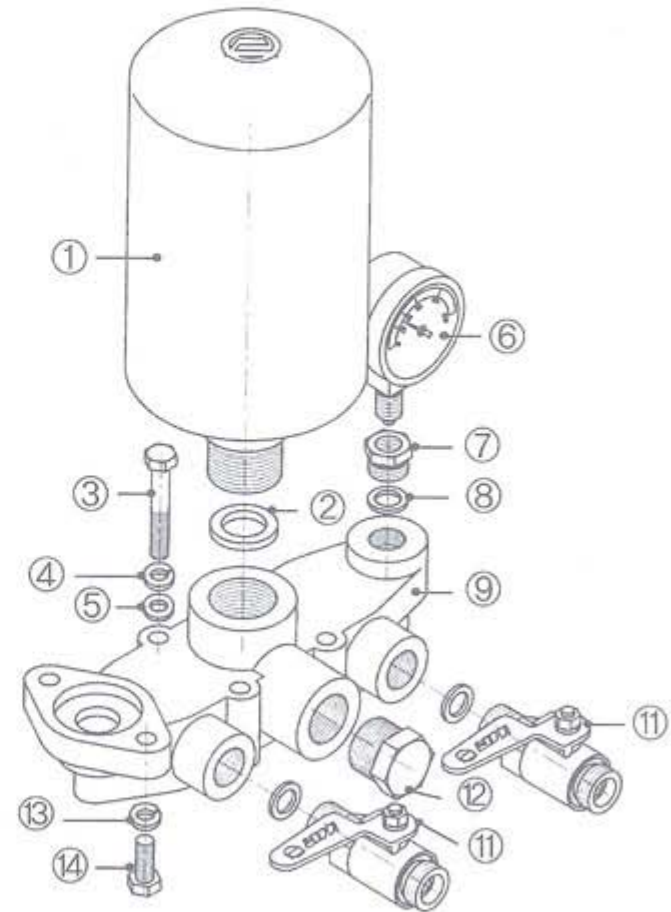
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<WPS-50A, 70A>



<WPS-100A, 150A>

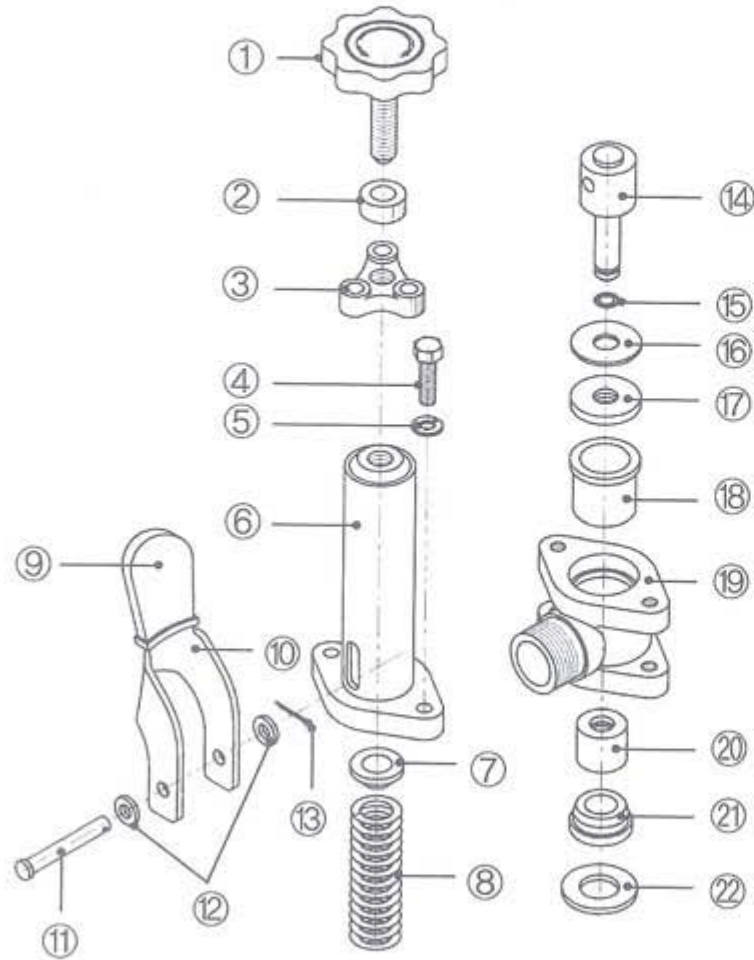


4. AIR CHAMBER

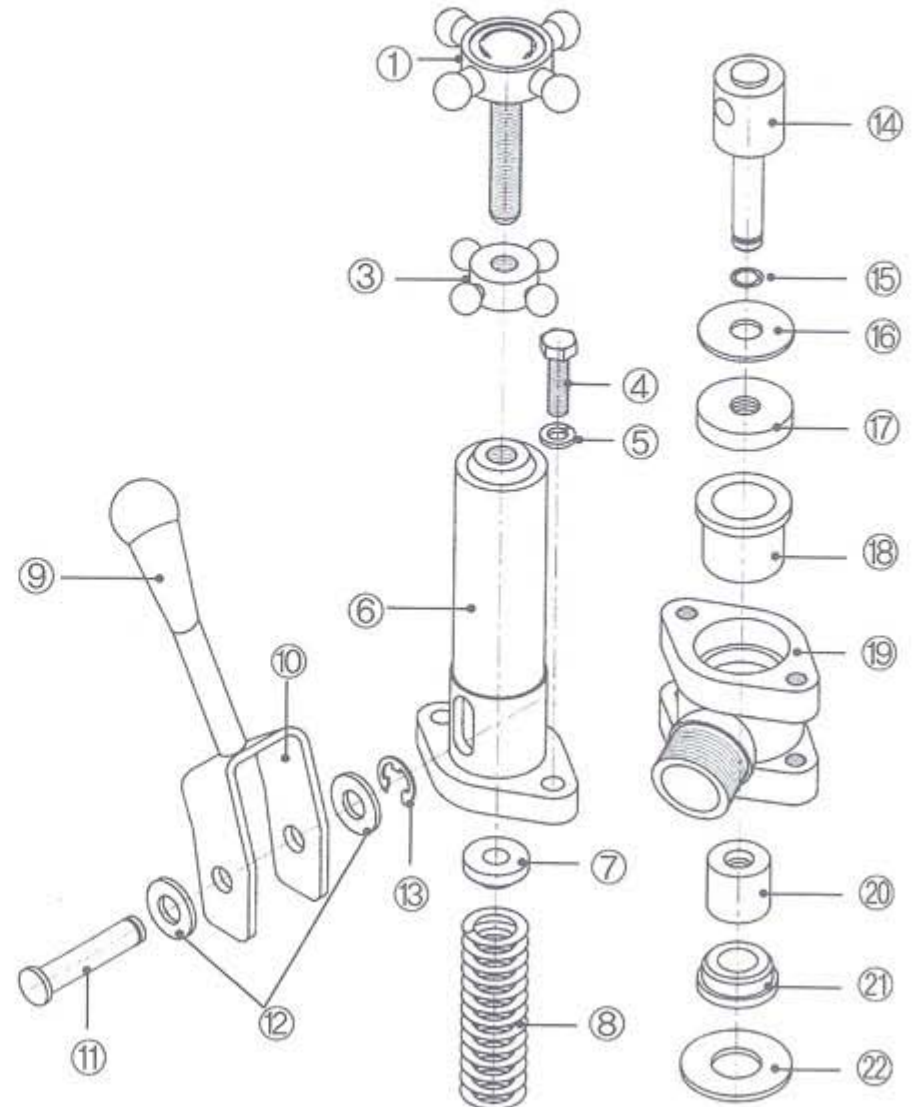
No	Item	Spec.	Quantity				
			WPS-30A	WPS-50A	WPS-70A	WPS-100A	WPS-150A
4-1	AIR CHAMBER		1	1	1	1	1
2	PACKING, AIR CHAMBER		1	1	1	1	1
3	BOLT, DISCHARGE OUTLET	M8				4	
		M10					4
4	SPRING WASHER, DISCHARGE OUTLET	SW8				4	
		SW10					4
5	FLAT WASHER, DISCHARGE OUTLET	FW8				4	
		FW10					4
6	PRESSURE GAUGE		1	1	1	1	1
7	DOUBLE NUT, PRESSURE GAUGE		1	1	1	1	1
8	PACKING, PRESSURE GAUGE		1	1	1	1	1
9	DISCHARGE OUTLET		1	1	1	1	1
10	BALL COCK	Ø8.5	1	2	2		
11	BALL COCK	Ø13	1	1	1	2	
		Ø19					2
12	PLUG				1	1	
13	SPRING WASHER, REGULATOR	SW6	2	2	2		
		SW8				2	2
14	BOLT, REGULATOR	M6	2	2	2		
		M8				2	2

5. REGULATOR

<WPS-30A, 50A, 70A>



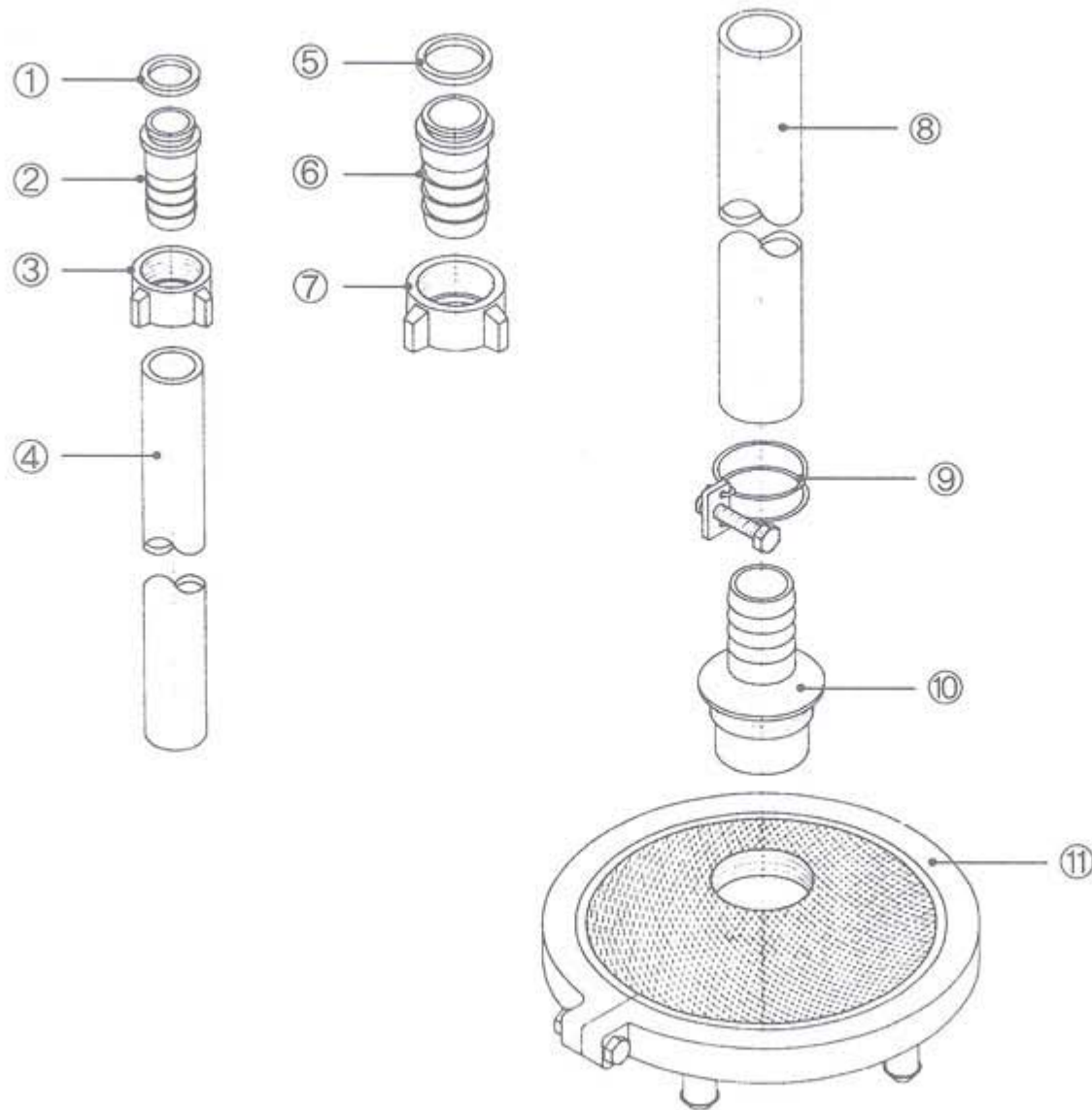
<WPS-100A, 150A>



5. REGULATOR

NO	Item	Spec.	Quantity					NO	Item	Spec.	Quantity				
			30A	50A	70A	100A	150A				30A	50A	70A	100A	150A
5-1	REGULATOR HANDLE		1	1	1	1	1	11	PIN, REGULATOR		1	1	1	1	1
2	RING, REGULATOR HANDLE		1	1	1	1	1	12	WASHER, REGULATOR		1	1	1	1	1
3	LOCK NUT, REGULATOR HANDLE		1	1	1	1	1	13	STOPPER, REGULATOR		1	1	1	1	1
4	BOLT, REGULATOR SPRING CASE	M6	2	2	2			14	REGULATOR PRESS BAR		1	1	1	1	1
		M8				2	2	15	O-RING, REGULATOR PRESS BAR		1	1	1	1	1
5	SPRING WASHER, REGULATOR SPRING CASE	SW6	2	2	2			16	FLAT WASHER	STAINLESS	1	1	1	1	1
		SW8				2	2	17	BELLOWS PACKING		1	1	1	1	1
6	REGULATOR SPRING CASE		1	1	1	1	1	18	GUIDE, REGULATOR		1	1	1	1	1
7	SPRING STOPPER REGULATOR		1	1	1	1	1	19	REGULATOR BODY		1	1	1	1	1
8	SPRING, REGULATOR		1	1	1	1	1	20	REGULATOR VALVE	CERAMIC	1	1	1	1	1
9	HANDLE, REGULATOR LEVER		1	1	1	1	1	21	REGULATOR VALVE SEAT	CERAMIC	1	1	1	1	1
10	REGULATOR LEVER		1	1	1	1	1	22	FLAT PACKING, REGULATOR		1	1	1	1	1

6. STRAINER & SUCTION HOSE

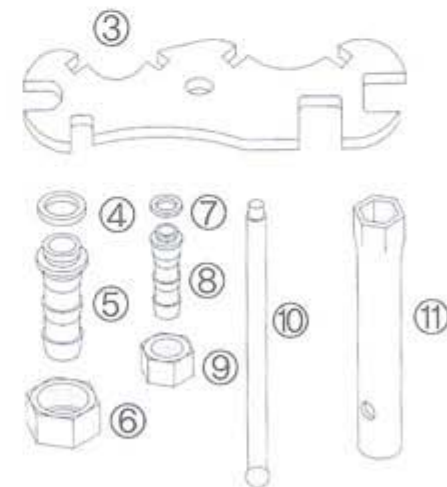


6. STRAINER & SUCTION HOSE

No	Item	Spec.	Quantity				
			WPS-30A	WPS-50A	WPS-70A	WPS-100A	WPS-150A
6-1	PACKING, RETURN HOSE		1	1	1	1	1
2	NIPPLE, RETURN HOSE		1	1	1	1	1
3	NUT, RETURN HOSE		1	1	1	1	1
4	RETURN HOSE	Ø13	1	1			
		Ø19			1		
		Ø25				1	1
5	PACKING, SUCTION HOSE		1	1	1	1	1
6	NIPPLE, SUCTION HOSE		1	1	1	1	1
7	NUT, SUCTION HOSE		1	1	1	1	1
8	SUCTION HOSE	Ø19	1				
		Ø25		1	1		
		Ø32				1	
		Ø38					1
9	BAND, SUCTION HOSE		1	1	1	1	1
10	NIPPLE, STRAINER		1	1	1	1	1
11	STRAINER		1	1	1	1	1

7. TOOLS & ACCESSORY

NO	Item	Spec.	Quantity					NO	Item	Spec.	Quantity				
			30A	50A	70A	100A	150A				30A	50A	70A	100A	150A
7-1	TOOL BAG		1	1	1	1	1	6	NUT	Ø13	1	1	1	2	
2	INSTRUCTION MANUAL		1	1	1	1	1			Ø19					
3	SPANNER		1	1	1	1	1	7	HOSE PACKING	Ø8.5	1	2	2		
4	HOSE PACKING	Ø13	1	1	1	2		8	HOSE NIPPLE	Ø8.5	1	2	2		
		Ø19					2	9	NUT	Ø8.5	1	2	2		
5	HOSE NIPPLE	Ø13	1	1	1	2		10	GLAND ADJUSTING BAR		1	1	1	1	1
		Ø19					2	11	BOX SPANNER		1	1	1	1	





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