Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

AR North America Plunger Pump

Description

AR North America Plunger Pump are designed for high-pressure industrial washing applications. They are constructed of die-cast bodies and feature a forged brass heads with a bayonet style sight glass in the rear and side covers. Internal components include special thick solid ceramic plungers for long life and durability. Precision cast cooling fins are anodized for maximum heat dissipation. Oversized premium SKF tapered roller bearings and the precision die-cast supports assure proper shaft alignment and maximum life. Valve cages of Ultra-Form provide positive seating and extended life, especially designed for high pressure applications. Two-piece connecting rods are a special alloy aluminum-based material oversized for maximum strength and load disbursement. These pumps are designed for gearbox flex coupled or belt drive systems with a 24mm solid crankshaft. Spinning at 1450 RPM, this pump was designed to deliver 3.96 GPM at 7250 PSI.

Figure 1 - SHP

Specifications

(Table A - General Specifications)

	SHP
Rated RPM	1450
Max PSI	7250
Max GPM	3.96
Req. EBHP*	19.7
Est. Gas HP*	26.1
Bore Diameter mm	18
Stroke mm:	15
Inlet Ø in:	1/2 F
Outlet Ø in:	3/8 F
Max Water Temp	140° F
Shaft Size	24mm Solid
Dimensions inches	13.4(L) x 9.7(W) x 6.1(H)

(*) For complete HP requirements see Table B and Table C

(Table B - Electric Motor Horse Power Requires @ Various Pressures and Flows)

Model	FLow GPM	Pump Speed [RPM]	PSI 500	PSI 700	PSI 1000	PSI 1300	PSI 1500	PSI 2000	PSI 2500	PSI 3000	PSI 3500	PSI 4000	PSI 4500	PSI 5000	PSI 7250
SHP	2.70	1000	.93	1.30	1.85	2.41	2.78	3.71	4.63	5.56	6.49	7.41	8.34	9.27	13.44
SHP	3.24	1200	1.11	1.56	2.22	2.89	3.34	4.45	5.56	6.67	7.78	8.89	10.01	11.12	16.12
SHP	3.96	1450	1.36	1.90	2.72	3.53	4.08	5.44	6.79	8.15	9.51	10.87	12.23	13.59	19.70

(Table C - Gasoline Engine Horse Power Requires @ Various Pressures and Flows)

Model	FLow GPM	Pump Speed [RPM]	PSI 500	PSI 700	PSI 1000	PSI 1300	PSI 1500	PSI 2000	PSI 2500	PSI 3000	PSI 3500	PSI 4000	PSI 4500	PSI 5000	PSI 7250
SHP	2.70	1000	1.23	1.72	2.54	3.19	3.68	4.91	6.14	7.36	8.59	9.82	11.05	12.27	17.80
SHP	3.24	1200	1.47	2.06	2.95	3.83	4.42	5.89	7.36	8.84	10.31	11.78	13.25	14.73	21.35
SHP	3.96	1450	1.80	2.52	3.60	4.68	5.40	7.20	9.00	10.80	12.60	14.40	16.20	18.00	26.10

(Table D - Torque Specifications)

Oil Capacity	Manifold (Head)	Piston Nut	Rear Cover	Side Cover	Valve Cap	Connecting Rods	
32	442/(37)	62/(5.2)	89/(7.5)	217/(18)	531/(44)	89/(7.5)	in/lbs:(ft/lbs)

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Specifications (Continued)

SPRAY NOZZLE CHART

Nozzle	Gallons per Minute at																				
	1000 PSI	1200 PSI	1400 PSI	1600 PSI	1800 PSI	2000 PSI	2200 PSI	2400 PSI	2600 PSI	2800 PSI	3000 PSI	3200 PSI	3400 PSI	3600 PSI	3700 PSI	4000 PSI	4200 PSI	4400 PSI	4600 PSI	4800 PSI	5000 PSI
2.0	1.00	1.10	1.18	1.26	1.34	1.41	1.48	1.55	1.61	1.67	1.73	1.79	1.84	1.90	1.92	2.00	2.05	2.10	2.14	2.19	2.40
2.25	1.13	1.23	1.33	1.42	1.51	1.59	1.67	1.74	1.81	1.88	1.95	2.01	2.07	2.13	2.16	2.25	2.31	2.36	2.41	2.46	2.52
2.5	1.25	1.37	1.48	1.58	1.68	1.77	1.85	1.94	2.02	2.09	2.17	2.24	2.30	2.37	2.40	2.50	2.56	2.62	2.68	2.74	2.80
2.75	1.38	1.51	1.63	1.74	1.84	1.94	2.04	2.13	2.22	2.30	2.38	2.46	2.54	2.61	2.64	2.75	2.82	2.88	2.95	3.01	3.07
3.0	1.50	1.64	1.77	1.90	2.01	2.12	2.22	2.32	2.42	2.51	2.60	2.68	2.77	2.85	2.89	3.00	3.07	3.15	3.22	3.29	3.35
3.25	1.63	1.78	1.92	2.06	2.18	2.30	2.41	2.52	2.62	2.72	2.81	2.91	3.00	3.08	3.13	3.25	3.33	3.41	3.49	3.56	3.63
3.5	1.75	1.92	2.07	2.21	2.35	2.47	2.60	2.71	2.82	2.93	3.03	3.13	3.23	3.32	3.37	3.50	3.59	3.67	3.75	3.83	3.91
4.0	2.00	2.19	2.37	2.53	2.68	2.83	2.97	3.10	3.22	3.35	3.46	3.58	3.69	3.79	3.85	4.00	4.10	4.20	4.29	4.38	4.47
4.5	2.25	2.46	2.66	2.85	3.02	3.18	3.34	3.49	3.63	3.76	3.90	4.02	4.15	4.27	4.33	4.50	4.61	4.72	4.83	4.93	5.03
5.0	2.50	2.74	2.96	3.16	3.35	3.54	3.71	3.87	4.03	4.18	4.33	4.47	4.61	4.74	4.81	5.00	5.12	5.24	5.36	5.48	5.59
5.5	2.75	3.01	3.25	3.48	3.69	3.89	4.08	4.26	4.43	4.60	4.76	4.92	5.07	5.22	5.29	5.50	5.64	5.77	5.90	6.02	6.15
6.0	3.00	3.29	3.55	3.79	4.02	4.24	4.45	4.65	4.84	5.02	5.20	5.37	5.53	5.69	5.77	6.00	6.15	6.29	6.43	6.57	6.71
6.5	3.25	3.56	3.85	4.11	4.36	4.60	4.82	5.03	5.24	5.44	5.63	5.81	5.99	6.17	6.25	6.50	6.66	6.82	6.97	7.12	7.27
7.0	3.50	3.83	4.14	4.43	4.70	4.95	5.19	5.42	5.64	5.86	6.06	6.26	6.45	6.64	6.73	7.00	7.17	7.34	7.51	7.67	7.83
7.5	3.75	4.11	4.44	4.74	5.03	5.30	5.56	5.81	6.05	6.27	6.50	6.71	6.91	7.12	7.21	7.50	7.69	7.87	8.04	8.22	8.39
8.0	4.00	4.38	4.73	5.06	5.37	5.66	5.93	6.20	6.45	6.69	6.93	7.16	7.38	7.59	7.69	8.00	8.20	8.39	8.58	8.76	8.94
8.5	4.25	4.66	5.03	5.38	5.70	6.01	6.30	6.58	6.85	7.11	7.36	7.60	7.84	8.06	8.18	8.50	8.71	8.91	9.12	9.31	9.50
9.0	4.50	4.93	5.32	5.69	6.04	6.36	6.67	6.97	7.26	7.53	7.79	8.05	8.30	8.54	8.66	9.00	9.22	9.44	9.65	9.86	10.06
9.5	4.75	5.20	5.62	6.01	6.37	6.72	7.05	7.36	7.66	7.95	8.23	8.50	8.76	9.01	9.14	9.50	9.73	9.96	10.19	10.41	10.62
10.0	5.00	5.48	5.92	6.32	6.71	7.07	7.42	7.75	8.06	8.37	8.66	8.94	9.22	9.49	9.62	10.00	10.25	10.49	10.72	10.95	11.18
11.0	5.50	6.02	6.51	6.96	7.38	7.78	8.16	8.52	8.87	9.20	9.53	9.84	10.14	10.44	10.58	11.00	11.27	11.54	11.80	12.05	12.30
12.0	6.00	6.57	7.10	7.59	8.05	8.49	8.90	9.30	9.67	10.04	10.39	10.73	11.06	11.38	11.54	12.00	12.30	12.59	12.87	13.15	13.42
12.5	6.25	6.85	7.40	7.91	8.39	8.84	9.27	9.68	10.08	10.46	10.83	11.18	11.52	11.86	12.02	12.50	12.81	13.11	13.40	13.69	13.98
13.0	6.50	7.12	7.69	8.22	8.72	9.19	9.64	10.07	10.48	10.88	11.26	11.63	11.99	12.33	12.50	13.00	13.32	13.63	13.94	14.24	14.53

FORMULAS

Nozzles:

Impact Force (lbs.) = .0526 x GPM x √PSI

Nozzle # = GPM x $\frac{4000}{\sqrt{PSI}}$

GPM= Nozzle # x $\frac{PSI}{\sqrt{4000}}$

PSI = $(GPM/Nozzle\ \#)^2$ x 4000

Horse Power:

$\frac{GPM \times PSI}{1714}$ = Hydraulic HP

$\frac{GPM \times PSI}{1457}$ = EBHP

$\frac{EBHP \times 1457}{PSI}$ = GPM

$\frac{EBHP \times 1457}{GPM}$ = PSI

HP loss due to altitude = 3% per 1000 FT above sea level

Pump Speed and Flow:

$\frac{Rated\ GPM}{Rated\ RPM} = \frac{Desired\ GPM}{Desired\ RPM}$

$\frac{Motor\ Pulley\ Ø}{Pump\ RPM} = \frac{Pump\ Pulley\ Ø}{Motor\ RPM}$

CONVERSIONS

Gallons x 3.785412 = Liters
Gallons x 128 = Oz.
PSI x .06896 = Bar
Bar x 14.5038 = PSI
1 inch = 25.4 millimeters
Liters x .2642 = Gallons (US)
Ft. Lbs. x 1.356 = Newton Meters
Inch Lbs. x .11298 = Newton Meters
Newton Meters x .737562 = Ft. Lbs. (force)
Newton Meters x 8.85 = In. Lbs. (force)
Temperature = 1.8(C° + 17.78) = F°,.555(F° - 32) = C°
1 U.S. Gallon of freshwater = 8.33 lbs.
1 PSI = 2.31 feet of water
1 PSI = 2.04 inches of mercury
1 Foot of water = .433 PSI
1 Foot of water = .885 inches of mercury
1 Meter of water = 3.28 feet of water
Kilograms x 2.2 = Lbs.

Model SHP

Specifications (Continued)

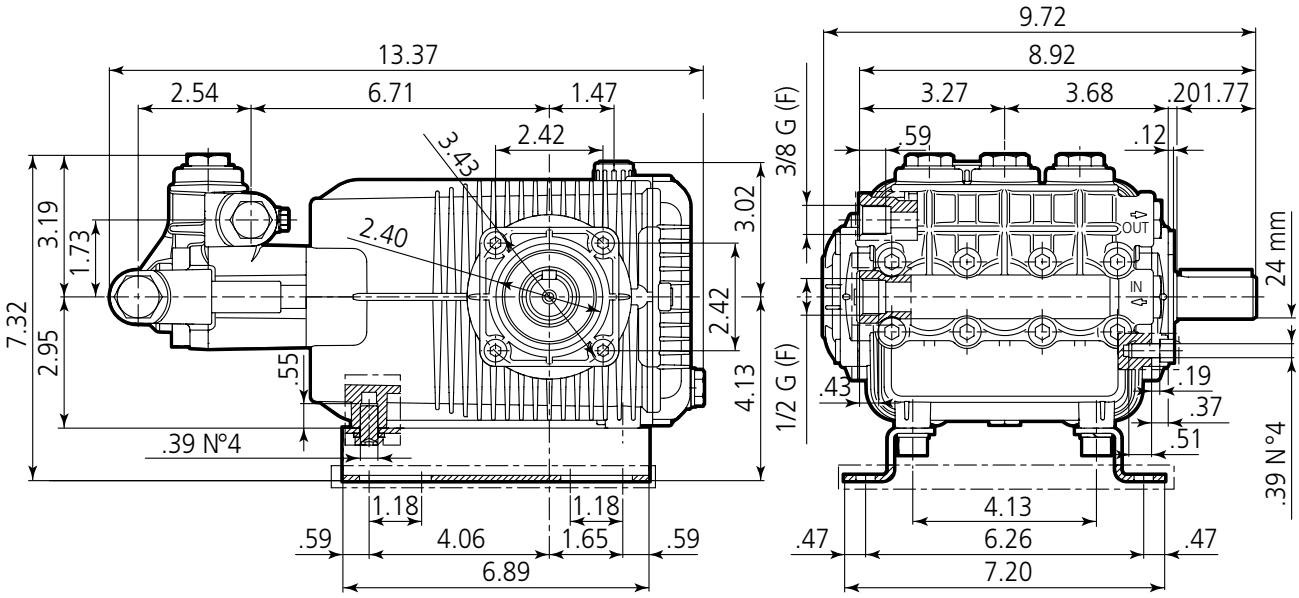

Figure 2

Overall Dimension in inches:

SHP	13.4(L) x 9.7(W) x 6.1(H)

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AR North America Plunger Pump

General Safety Information

GASOLINE DRIVE PUMPS

***WARNING** The pump is designed to pump non-flammable or non-explosive fluids. These pumps are intended to pump clean filtered water only.*

***WARNING** Do not operate in or around an explosive environment.*

***WARNING** Always wear safety glasses or goggles and appropriate clothing.*

***WARNING** Do not alter the pump from the manufacturers design.*

***WARNING** Do not allow children to operate the pump.*

***WARNING** Never point the high-pressure discharge at a person, any part of the body or animals.*

***WARNING** Do not operate gasoline engines in a confined area; always have adequate ventilation.*

***WARNING** Do not exceed the pump specifications in speed or pressure. (See Table A)*

***WARNING** Maximum water temperature is 140°F.*

***WARNING** Adequate protective guards must cover all moving parts. Perform routine maintenance on the pump and components.*

***WARNING** Use only components that are rated for the flow and pressure of the pump, this would include hose, fittings, safety valves, spray guns etc.*

ELECTRIC DRIVE PUMPS

***WARNING** Your power supply must conform to the system requirements.*

***WARNING** The motor must be grounded. Use GFCI plugs and receivers.*

***WARNING** Do not handle the pump/motor with wet hands.*

***WARNING** Only use power cords that are in good condition.*

***WARNING** Never pull the unit by the power cord.*

***WARNING** Never spray or clean the unit with water*

***WARNING** Failure to follow these warnings may result in personal injury or damage to property.*

Installation

BELT DRIVE SYSTEMS

1. Mount the pump securely to the base plate. (See Figure 3). For new installation a mounting rail kit is required, refer to breakdown.

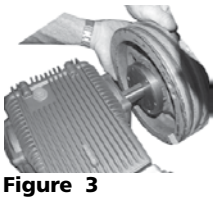

Figure 3

2. Install the pump pulley on the crankshaft. It should be as far onto the shaft as possible.
3. Align the pulleys so they are in line. (See Figure 4)

Figure 4

4. Use a belt tension gauge to assure proper tension (too much tension can cause bearing failure or damage the belts as well as cause other problems). (See Figure 5)

Figure 5

5. Installation complete.

Maintenance

SERVICING THE VALVES

The inlet and discharge valves in the SHP pumps are all the same. The valves are located under the six 21mm hex plugs. The inlet valves are located on the lower row and the discharge valves are located on the top row of the pump head.

Tools required: 8mm hex socket, 10mm socket, 21mm socket, ratchet, mechanics pick and torque wrench, EZ out or slide hammer and loc-tite.

VALVE REMOVAL

1. Remove the valve cap. (See Figure 6)

Figure 6

2. Inspect the valve cap O-ring and back-up ring for any damage, replace if necessary. **NOTE**: The O-ring is on

Model SHP

Maintenance (Continued)

the bottom of the groove and the back-up ring is above it.

3. Discharge valve removal. Use either the special removal slide hammer or an EZ out. Screw either tool into the hole on the top of the valve cage and pull out. If the cage separates from the seat use a reversible pliers to grab the seat - twist while applying pressure and pull out. (See Figure 7)

Figure 7

4. Inlet valve removal. The inlet valves are accessed through the plunger cylinders. The removal process is the same as the discharge valves. **NOTE:** Piston guides and high-pressure seals need to be removed. See #5 in servicing seals)

DISCHARGE AND INLET VALVE ASSEMBLY

1. Place the complete valve assembly squarely into the port, use a 3/8" socket on an extension to push into place. (See Figure 8)

Figure 8

2. Install the valve cap and torque to the proper specification. (See Figure 9)
(See Table D or parts breakdown)

Figure 9

SERVICING THE PACKINGS/SEALS

Tools required: 8mm hex socket, ratchet, (2) long screwdrivers, reversible pliers, mechanics pick and torque wrench.

To access the water seals for inspection or replacement, you will first need to remove the head of the pump.

DISASSEMBLY

1. First remove the eight 8mm head bolts.

2. Place the screwdrivers as shown between the head and crankcase of the pump, lifting one up and the other down. The head should start to lift off of the plungers. (See Figure 10)

Figure 10

3. When you remove the head you may notice that some of the water seals have stayed on the plungers and some in the head. To remove the seals from the plungers simple turn the assemblies and pull off. (See Figure 11)

Figure 11

4. If the seal assemblies are in the head use the reversible pliers to grab the seal retainer on the inside of the outside ring, twist the retainer in either direction (this is done to free the retainer O-ring which is stuck to the manifold) and lift out. (See Figure 12)

Figure 12

5. Pull out the front piston guide, with the reversible pliers or with your finger (See Figure 13)

Figure 13

6. With your finger remove the fiber support ring pull the high-pressure seal and head ring out of the head. (See Figure 14)

Figure 14

7. The low-pressure seal is located in the brass seal retainer. Pull the low-pressure seal and support ring from the retainer. (See Figure 15)

Figure 15

8. Remove the seal retainer O-ring with the mechanics pick. (See Figure 16)

Figure 16

ASSEMBLY

1. Install the plastic high pressure seals head ring into the head (the flat side is on the bottom).

2. Install the high-pressure seal. Place the seal so the open "U" portion is toward the head ring. You need to place the seal at an angle and pull and push to work the seal into position with your fingers (do not use any tools you may damage the seal). Make sure the seal is totally seated against the head ring.

3. Place the fiber high-pressure seal support ring squarely over the high-pressure seal.

4. place the front piston guide squarely over the high pressure seal.

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AR North America Plunger Pump

Maintenance (Continued)

5. Installing the low-pressure seal with the closed flat side of the seal pointing at the guide opening (The "U" side goes onto the head ring). (See Figure 17)

Figure 17

6. Install the retainer O-ring.

7. Place the white support ring (flat side centered on top of the front piston guide).

8. Squarely seat the retainer into the head and push with even pressure until it snaps into position. (See Figure 18)

Figure 18

SERVICING THE PLUNGERS

If the plungers are not damaged they do not need any servicing.

Tools required: 10mm socket, ratchet, mechanics pick, taper blade gasket scraper, thread sealant and torque wrench.

NOTE: Be very careful when working with the plungers, they are made from ceramic which is brittle and can be damaged.

Any time you remove a plunger it is recommended you replace the slinger washer and top plunger washer. The washers are a cushion for the ceramic plunger and compress when first used. By not replacing these parts you run the risk of breaking a plunger or having a water leak.

DISASSEMBLY

1. Remove the plunger retainer bolt and copper washer. (See Figure 19)

Figure 19

2. Twist and pull the plunger off the plunger rod. (See Figure 20)

3. Remove the brass slinger. At this point clean any thread locker that is left on the plunger rod and retaining bolt threads.

Figure 20

ASSEMBLY

1. Install the slinger washer.

2. Install the plunger onto the rod. Make sure it is fully seated against the rod. (See Figure 21)

Figure 21

3. Install the small copper washer on the plunger bolt and place a small quantity of thread sealant in the thread. Install the plunger bolt and tighten to the required torque. (See Figure 22) (See Table D or parts breakdown)

Figure 22

PUMP HEAD TO DRIVE END INSTALLATION

1. Turn the crankshaft to align the plungers as shown. (See Figure 23)

Figure 23

2. Place the head evenly onto the plungers and push it until it makes contact with the drive end of the pump. (See Figure 24)

Figure 24

3. Torque the head bolt as shown in the tightening sequence diagram. (See Figure 25 & 26) (See Table D or parts breakdown)

Figure 25

Figure 26

OIL CHANGE

Change oil after first 50 hours of use. Then every 500 hours. Refer to parts breakdown for oil type.

Model SHP

WINTER OR LONG TIME STORAGE

1. Drain all of the water out of the pump.

2. Run a 50% solution of a RV or non-toxic/biodegradable antifreeze through the pump.

3. Flush the pump with fresh water before the next use.

4. In freezing conditions failure to do this may cause internal pump damage.

5. For long periods of storage in non-freezing areas the solution will keep the seals and O-rings lubricated.

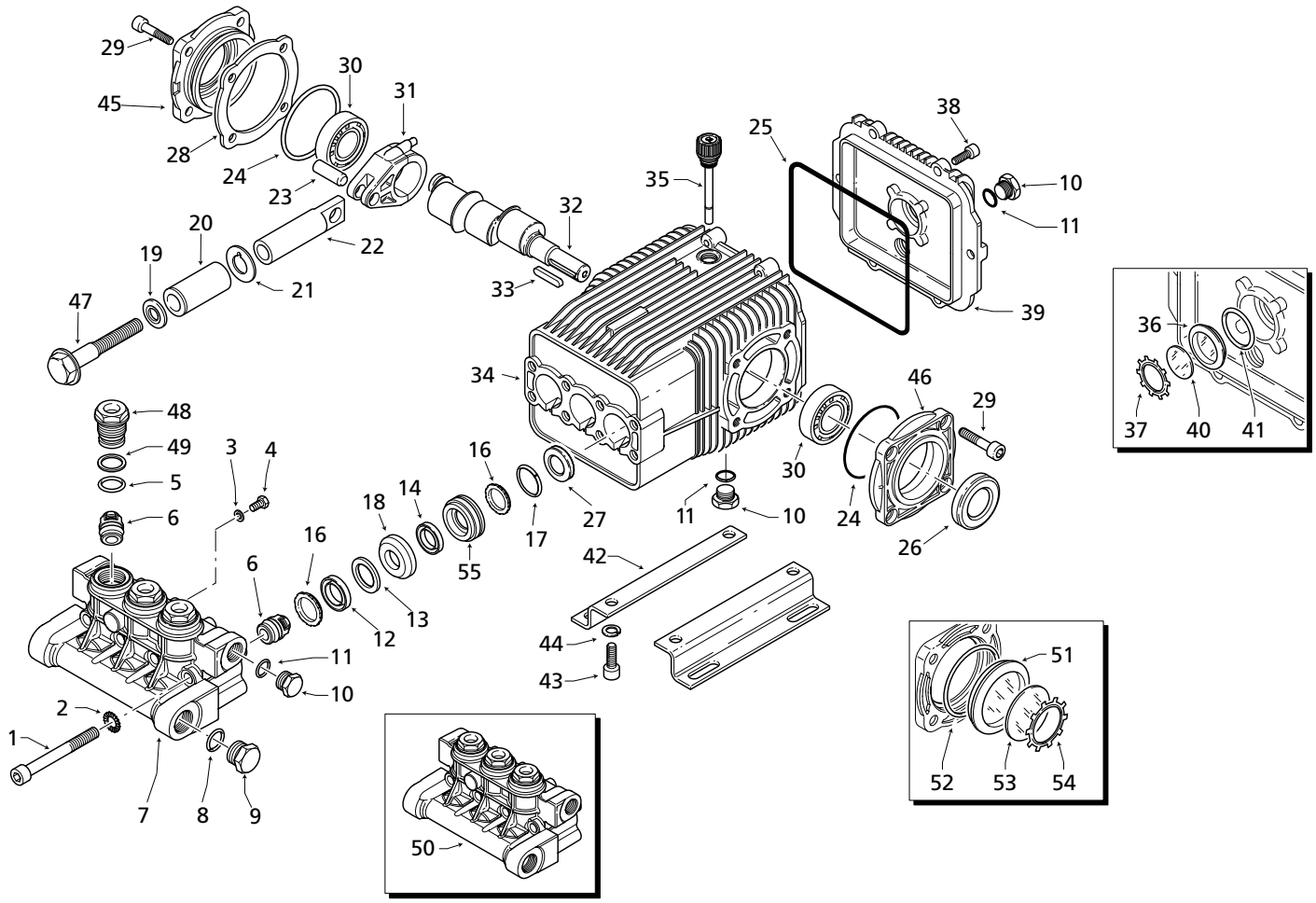

Figure 27 - Repair Parts Illustration for SHP Plunger Pump

Model SHP

Repair Parts List

Ref No.		Description	Part Number for Model: SHP15.50	Qty
1		Head bolt	850260	(442 in/lbs) 8
2		Washer	650530	8
3		Bolt	2460810	3
4		Washer	1982570	3
5		O-Ring	880830	3
▲		Valve kit Includes:	2185	
6	▲	Complete valve	1949052	6
7		Pump head	1942190	1
8		O-Ring	180101	1
9		1/2" Plug	820361	1
10		3/8" Plug	1980740	3
11		O-Ring	740290	3
■		Water seal kit Includes:	2874	
12	■	High pressure seal	1941200	3
13	■	Ring	1941050	3
14	■	Spacer	1941030	3
15	■	Low pressure seal	1941350	3
16	■	Support ring	1941190	3
17	■	O-Ring	820490	3
●		Piston guide Includes:	42120	
18	●	Front piston guide	1942470	3
19		Washer	1340600	3
◆		Piston kit Includes:	2872	
20	◆	Piston	1941020	3
21		Spacer	1383190	3
22		Guiding piston	1940960	3
23		Con rod pin	1940060	3
▼		Oil seal kit Includes:	2873	
24	▼	O-Ring	1941380	2
25	▼	O-Ring	1940410	1
26	▼	Oil seal	820680	1
27	▼	Oil seal	1940560	3
28		Shim 0.05 mm	1941390	1
28		Shim 0.10 mm	1941400	1
28		Shim 0.19 mm	1941410	1
28		Shim 0.25 mm	1941420	1
29		Bolt	850370	(217 in/lbs) 8
30		Bearing	1140410	2
31		Con rod	1940050	(89 in/lbs) 3
32		Crankshaft 24mm	1940980	1
33		Key	650250	1
34		Pump housing	1941330	1
35		Plug	1140370	1
36		Oil sight glass	1260250	1
37		Snap ring	1260430	1
38		Bolt	1200430	(89 in/lbs) 6
39		Complete cover	1949010	1
40		Sight glass back cover	1780690	1
41		O-Ring	1140450	1
42		Rail 1-1/4"	1940370	2
43		Bolt	1940380	4
44		Washer	200231	4
45		Complete side cover	1949011	1
46		Open bearing support	1941240	1
47		Piston-fixing screw	1941640	(62 in/lbs) 3
48		Valve cap	1940940	(531 in/lbs) 3
49		Back-up ring	1941070	3
50		Pump head assembly	1949215	1
51		Oil sight glass	1941270	1
52		O-Ring	100410	1
53		Disc	1941260	1
54		Snap ring	1941290	1
55		Rear piston guide	1942480	3
(Δ) Not shown		Specially formulated oil	AR64516	2
(†) Not shown		1-1/4" mounting rail kit	2748	1

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AR North America® Plunger Pump

Troubleshooting Chart

Symptoms	Possible Cause(s)	Corrective Action
Oil Leak Between Crankcase and Pumping Section	Worn rod oil seals	Replace crankcase piston rod seals
Frequent or Premature Failure of the Packing	1. Cracked, damaged or worn plunger	1. Replace plungers
	2. Overpressure to inlet manifold	2. Reduce inlet pressure
	3. Material in the fluid being pumped	3. Install proper filtration on pump inlet plumbing
	4. Excessive pressure and/or temperature of fluid being pumped	4. Check pressure and fluid inlet temperature; be sure they are within specified range
	5. Running pump dry	5. Do not run pump without water
Pump Runs but Produces no Flow	Pump is not primed	Flood suction then restart pump
Pump Fails to Prime	Air is trapped inside pump	Disconnect discharge hose from pump. Flood suction hose restart pump and run pump until all air has been evacuated
Pump Looses Prime, Chattering Noise, Pressure Fluctuates	1. Air leak in suction hose or inlet	1. Remove suction line and inspect it for a loose liner or debris lodged in hose. Avoid all unnecessary bends. Do not kink hose
	2. Clogged suction strainer	2. Clean strainer
Low Pressure at Nozzle	1. Unloader valve is bypassing	1. Make sure unloader is adjusted properly and bypass seat is not leaking
	2. Incorrect or worn nozzle	2. Make sure nozzle is matched to the flow and pressure of the pump. If the nozzle is worn, replace
	3. Worn packing or valves	3. Replace packing or valves
Pressure Gauge Fluctuates	1. Valves worn or blocked by foreign bodies	1. Clean or replace valves
	2. Packing worn	2. Replace packing
Low Pressure	1. Worn nozzle	1. Replace with nozzle of proper size
	2. Belt slippage	2. Tighten or replace with correct belt
	3. Air leak in inlet plumbing	3. Disassemble, reseal and reassemble
	4. Relief valve stuck, partially plugged or improperly adjusted valve seat worn	4. Clean and adjust relief valve; check for worn or dirty valve seats
	5. Worn packing. Abrasive in pumped in cavitation. Inadequate water	5. Install proper filter. Suction at inlet manifold must be limited to lifting less then 20 feet of water or 8.5 psi vacuum.
	6. Worn inlet, discharge valve blocked or dirty	6. Replace inlet and discharge valve
Pump Runs Extremely Rough, Pressure Very Low	Inlet restrictions and/or air leaks. Stuck inlet or discharge valve	Clean out foreign material. Replace worn valves
Water Leakage from Under Manifold. Slight Leak	Worn packing or cracked plunger	Install new packing or plunger
Oil Leaking in the Area of Crankshaft	1. Worn crankshaft seal or improperly installed oil seal O-ring	1. Remove oil seal retainer and replace damaged O-ring and/or seals
	2. Bad bearing	2. Replace bearing
Excessive Play in the End of the Crankshaft Pulley	Worn main bearing from excessive tension on drive belt	Replace crankcase bearing and/or tension drive belt
Water in Crankshaft	1. Humid air condensing into water inside the crankcase	1. Change oil intervals
	2. Worn packing and/or cracked plunger	2. Replace packing. Replace plunger
Loud Knocking Noise in Pump	1. Cavitation or sucking air	1. Check water supply is turned on
	2. Pulley loose on crankshaft	2. Check key and tighten set screw
	3. Broken or worn bearing	3. Replace bearing

Notes

NORTH AMERICA
First Choice When Quality Matters

AR North America® Plunger Pump

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