

///MACH S E R I E S

MACH I POWER UNIT WITH 4 HORSEPOWER BRIGGS & STRATTON GASOLINE ENGINE



Operating & Maintenance Instructions



240 Warren Street
Dayton, Ohio 45402
(937) 228-2200 Phone
(937) 228-3300 Fax
amres@erinet.com E-mail
<http://www.art4rescue.com>

SECTION I

Safety

1-1. Working Pressure

The pumps maximum working pressure is 10,500 psi (720 bar). Make sure that all hydraulic equipment used with this pump is rated at 10,500 psi operating pressure. If you have any questions contact your distributor or American Rescue Technology, Inc.

1-2. Hydraulic Connections

Never disconnect or connect any pressurized hydraulic hoses or fittings. When making connections with quick disconnect couplings, make sure the couplings are fully engaged. Threaded connections such as hoses, fittings, etc. must be securely tightened and leak free. CAUTION: Loose or improperly threaded fittings can be potentially dangerous if pressurized, however, severe over tightening can cause premature thread failure. Fittings need to be tightened secure and leak free. Never hold or stand directly in line with any hydraulic connection while pressurizing. Never grab, touch or in any way come in contact with a hydraulic pressure leak. Escaping oil can penetrate the skin and serious injury can result. DO NOT SUBJECT HOSE TO POTENTIAL HAZARD SUCH AS SHARP SURFACES, EXTREME HEAT OR HEAVY IMPACT. INSPECT HOSE FOR WEAR BEFORE EACH USE.

1-3. Hot Surfaces

Beware of heated surfaces on the pump and motor. Keep all hoses, hands and clothing away from muffler.

SECTION II

Instructions Before Use

2-1. Motor Oil and Fuel:

1. Above 32 degrees Fahrenheit use S.A.E. 10W30 (Motor only)
2. Below 32 degrees Fahrenheit use S.A.E. 5W20 (Motor only)
3. Oil Sump Capacity -- About 1.3 pints or check dip stick.
4. Use clean, unleaded automotive gasoline (without alcohol)

2-2. Hydraulic Fluid Capacity

Check hydraulic fluid level to prevent possible pump burnout. Fluid level should be approximately 2" from top of reservoir or in the center of the site glass (if equipped). Fluid level should be checked with engine turned off and all tools retracted. Add fluid if necessary. Do not overfill.

2-3. Starting Instructions

Hydraulic control in neutral (center position): Throttle to choke position (extreme right): Grasp starter handle and pull rope out slowly to engagement: Pull rope with a rapid, continuous full stroke and let rewind slowly, and do not allow to snap back. Move the control lever to "high speed" position and then to "run" as the engine warms.

SECTION III

Operation

3-1. Control Valves

Operation of the 3-position 4-way valve: Pushing lever to the right directs the pump output to the right-hand port. Pushing the lever to the left directs the pump output to the left-hand port. Center position is neutral. Pump output is directed back to the reservoir.

3-2. Bleeding the Hydraulic System

Air can be removed from the system by connecting the hose ends together and directing the pump output to that hose. After running this for a few minutes check the fluid level and add fluid if necessary. When the trapped air is removed from the hydraulic circuit, the tools will open and close smoothly.

SECTION IV

Maintenance

4-1. Maintain Fluid Level

Check hydraulic fluid level every 30 hours of operation. Add fluid when necessary. Fluid level should be no more than 2" from the top of the reservoir plate, with motor off.

Completely change fluid every year. The following conditions may require more frequent changes:

- a. High humidity environment and extreme changes in temperature that can cause condensation in reservoir.
- b. Dirty or dusty environments that may contaminate fluid.

4-2. Clean Fluid Filter Screen Once a Year

- a. Remove reservoir plate bolts. Lift pump unit off the reservoir, being careful not to damage gasket.
- b. Unscrew screen from bottom of pump unit and clean with nonflammable solvent
- c. Blow dry and reassemble

4-3. General Maintenance

Keep areas around pump unobstructed to provide good air flow around the motor and pump. Keep the motor and pump as clean as possible.

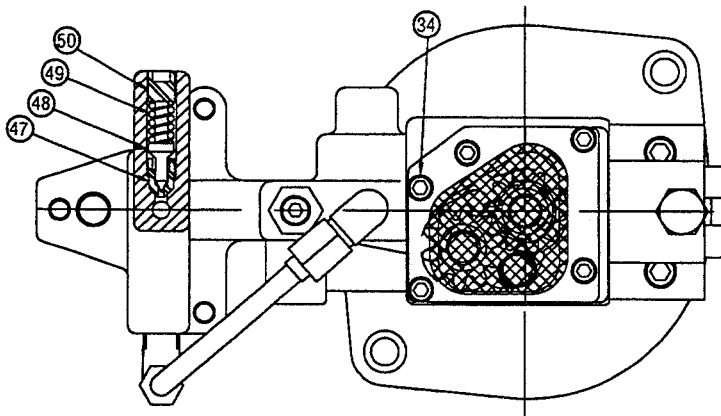
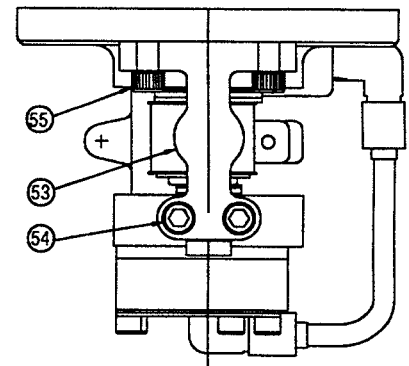
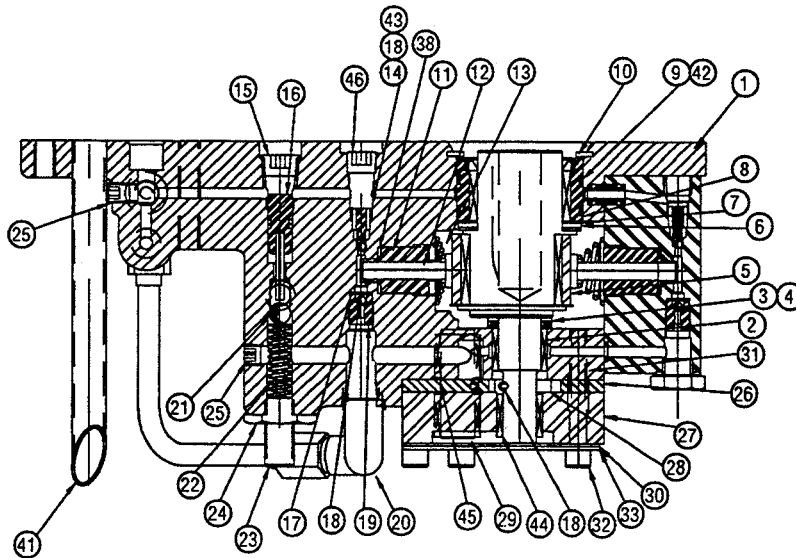
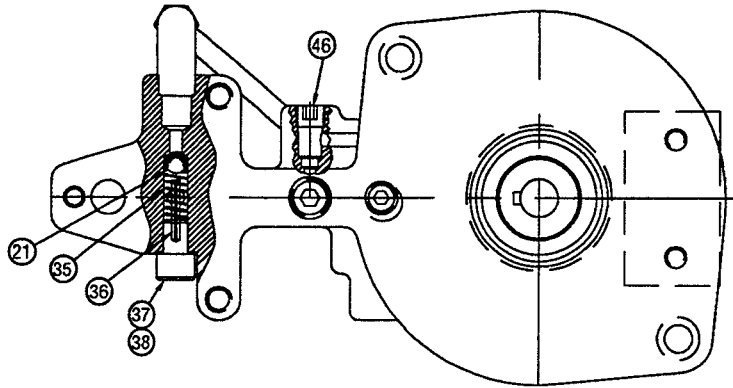
4-4. Flushing the Pump.

If you suspect your pump has been contaminated or discover sludge or other deposits on internal components, you should thoroughly flush the pump.

- a. Remove the old fluid from the reservoir and thoroughly clean reservoir and pump.
- b. Refill with a clean nonflammable flushing fluid.
- c. Reassemble the pump and motor to reservoir.
- d. Run the pump in no load condition for 1 or 2 minutes maximum.
- e. Remove the motor and pump assembly. Drain the flushing fluid and reclean the inside of the reservoir.
- f. Refill the reservoir with hydraulic fluid and reassemble the pump.

40 SERIES GAS

PUMP ASSEMBLIES 18948

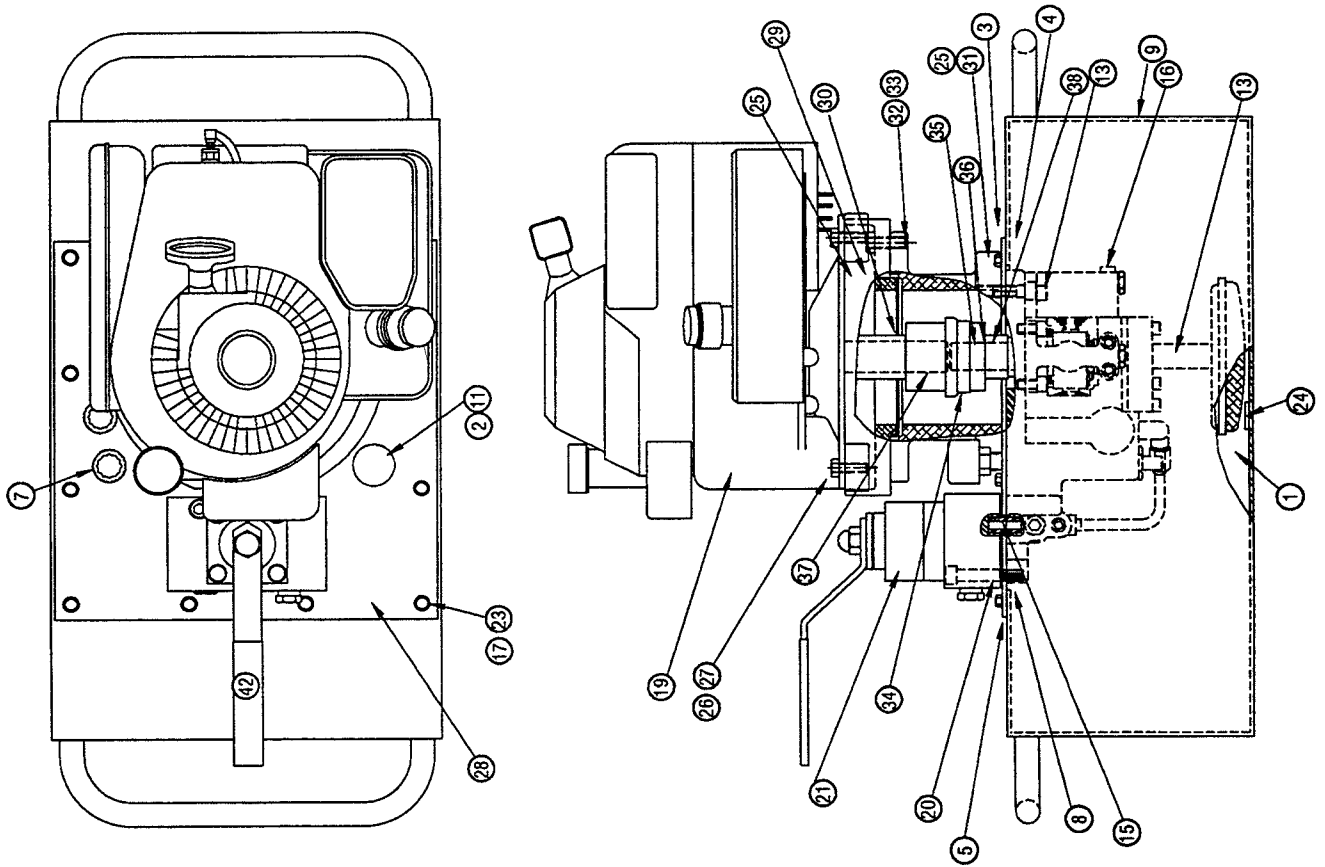


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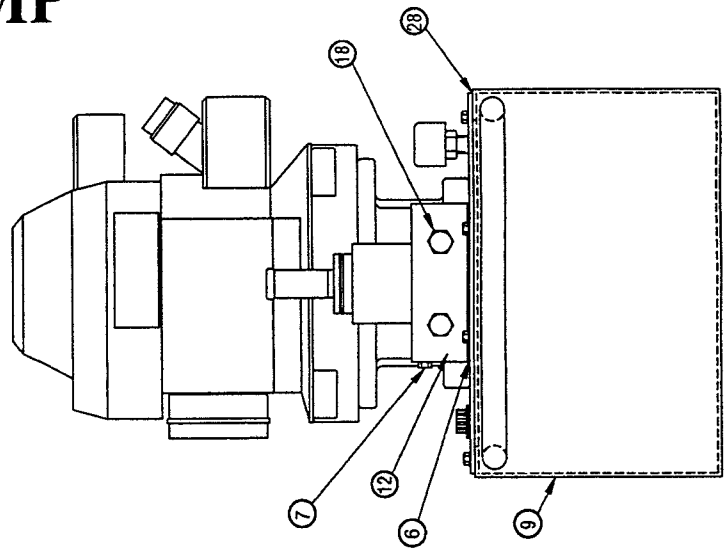
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40 SERIES GAS

ITEM	PART NO.	QTY.	DISCRIPTION	ITEM	PART NO.	QTY.	DISCRIPTION
1	68507	1	2 Piston Pump Body	45	68892	1	Retaining Ring
2	68360	1	Roller Bearing	46	81093	2	Pipe Plug
3	66033	1	Thrust Bearing	47	68004	1	Ext. Relief Seat
4	66474	2	Race Bearing	48	68003	1	Ext. Relief Cone
5	68906	1	Ecc. Shaft Assm.	49	66085	1	Valve Relief Spring
6	66106	1	Thrust Bearing	50	66083	1	Adjust Screw
7	66108	1	Race Bearing	53	68502	1	Piston Block Assm.
8	68829	1	Adaptor Shaft Assm.	54	82892	2	SHCS 5/16-24 X 2
9	56020322	2	O-Ring	55	82687	2	Screw
10	68978	1	Retaining Ring				
11	68945	1	Adaptor Piston .225 Dia.				
12	67868	1	Piston .225 Dia				
13	68340	1	Piston Spring				
14	68810	1	Ball Stop				
15	93950	1	1/4 Socket Pipe Plug				
16	68535	1	Piston Unloading Assm.				
17	66043	1	Ball Retainer				
18	90906	5	803C-7D Ball Bearing				
19	66046	1	Intake Seat				
20	68851	1	Tube Assm.				
21	91701	2	R102-10B Ball Bearing				
22	68981	1	Spring				
23	68242	1	Set Screw				
24	68920	1	Nut-Hex Jam				
25	97641	2	Soc Pipe Plug Steel				
26	68848	1	Center Plate .11				
27	68849	1	Bottom Plate				
28	68883	2	Gear Pump				
29	68850	1	Shaft-Idler				
30	68921	1	Screen				
31	68894	2	Guide Tube				
32	68255	4	Screw				
33	68927	1	Plate-Screen Mount				
34	89148	1	Screw				
35	68225	1	Spring				
36	81332	1	Roll Pin 1/8 x 15/16				
37	68226	1	Ball Stop Screw				
38	85726	2	Gasket				
41	68569	1	Return Tube				
42	69513	2	Backup Washer				
43	66042	1	Spring				
44	68891	3	Bearing				



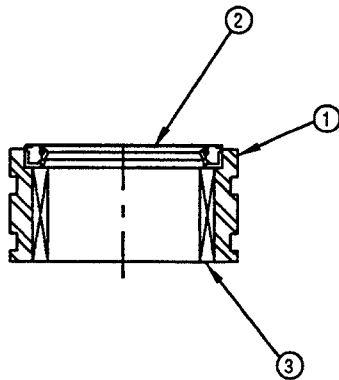
GASOLINE POWER PUMP





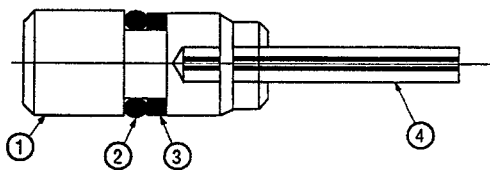
ITEM	PART #	DESCRIPTION	ITEM	PART #	DESCRIPTION
1	18135	OIL	20	93599	MANIFOLD SCREW
2	68000	BREATHER VENT	21	18379	VALVE
3	66012	MOTOR GASKET	22	69026	PIN-DOWEL
4	68231	PUMP GASKET	23	65892	WASHER
5	66014	RES. GASKET	24	66021	MAGNET
6	68251	VALVE GASKET	25	66121	RISER PLATE
7	68258	PLUG SAE #4	26	97268	SCREW
8	68551	PUMP GASKET	27	86513	SCREW
9	69090	RESERVOIR	28	68682	COVER PLATE
10	69042	HANDLE	29	85454	ENGINE ADAPTER
11	87492	PIPE PLUG	30	68163	SPACER-COUPLING
12	68433	MANIFOLD	31	68124	MOTOR ADAPTER
13	93594	SCREW-MOTOR	32	93544	SCREW
14	68571	FILLER PLUG	33	93943	LOCK WASHER
15	68963	VALVE ADPT. ASM.	34	68164	FLEX COUPLING
16	18948	PUMP ASM	35	69294	STUB SHAFT
17	86095	SCREW-COVER	36	68119	KEY
18	87145	PLUG-SHIPPING	37	96550	RETAINING KEY
19	68311	GAS MOTOR	38	69298	SPACER COUPLING

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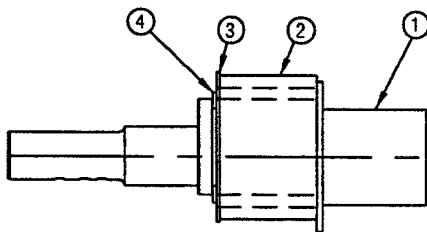
Assembly #68829

Item	Part No.	Description	Qty.
1	68219	Adapter-Shaft	1
2	66030	Bearing	1
3	68901	Seal	1



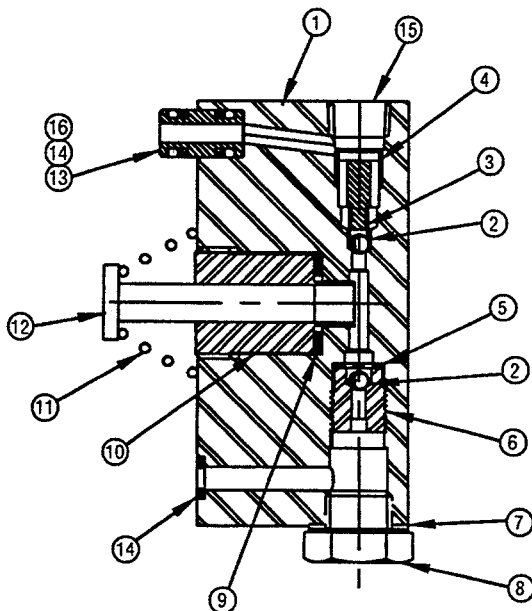
Assembly #68535

Item	Part No.	Description	Qty.
1	68209	Piston	1
2	5602010	O-Ring	1
3	68145	Back-Up Ring	1
4	93837	Roll Pin	1



Assembly #69082 - AIR
Assembly #68906 - GAS

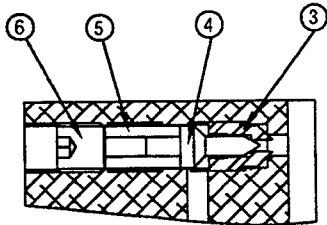
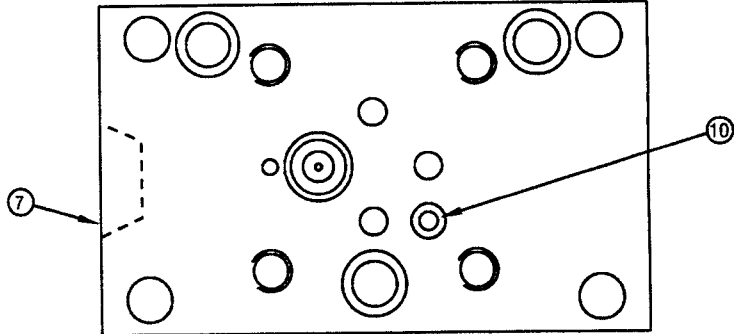
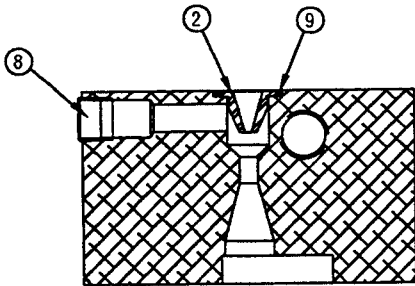
Item	Part No.	Description	Qty.
1	68859	Shaft Ecc. - AIR	1
1	68907	Shaft Ecc. - GAS	1
2	69081	Ecc. Bearing Assembly	1
3	66108	Race Bearing	1
4	67863	Retaining Ring	1



Assembly #68832 & #68502

Item	Part No. 68832	Part No. 68502	Description	Qty.
1	68501	68501	Piston Block	1
2	90906	90906	Ball St 803C-7D	2
3	66042	66042	Spring	1
4	68810	68810	Ball Stop	1
5	66043	66043	Ball Retainer	1
6	66046	66046	Intake Seat	1
7	86269	86269	Gasket	1
8	68825	68825	Screw	1
9	85727	85727	Gasket	1
10	68915	68945	Adapter	1
11	68340	68340	Spring Piston	1
12	68830	67868	Piston (Pump)	1
13	68970	68970	Adapter Assembly	1
14	5602008	5602008	O-Ring	3
15	93949	93949	SOC Pipe Plug 1/8	1
16	56080087	56080087	Back-Up Ring	2

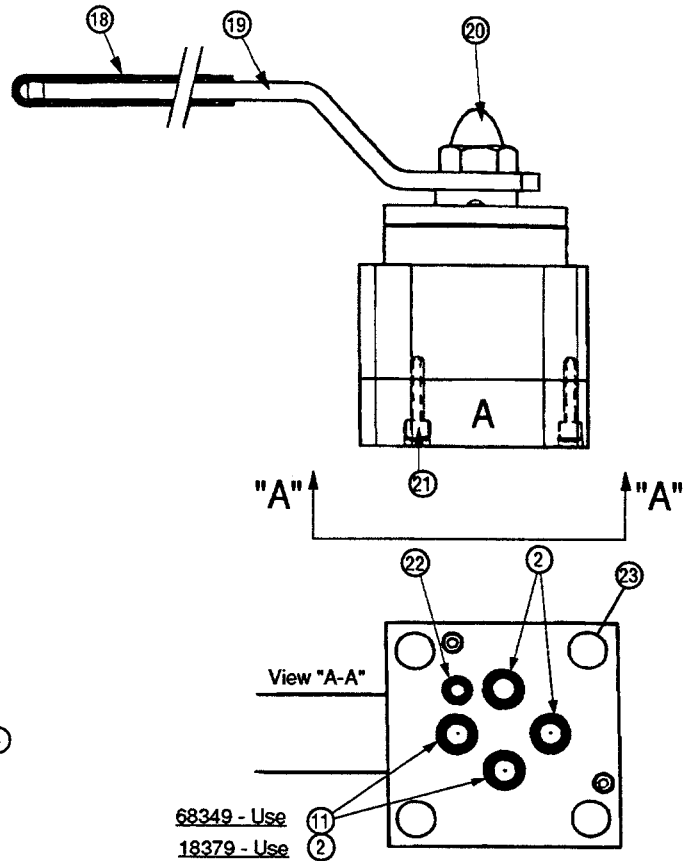
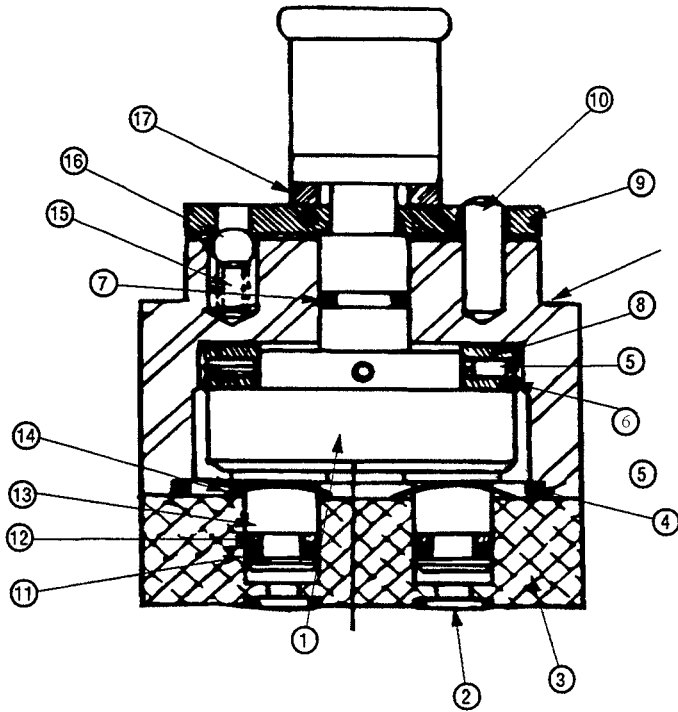
3 WAY & 4 WAY VALVE MANIFOLD



Assembly #68433 3 Way Manifold
Assembly #68392 4 Way Manifold

Item	Part No. 68433	Part No. 68392	Description	Qty.
1	68196	68002	Subplate	1
2	68197	----	Nozzle-Valve	1
3	68004	68004	Seat - External Relief	1
4	68003	68003	Cone - External Relief	1
5	66085	68085	Spring Relief Valve	1
6	66083	68083	Adjustable Screw	1
7	84084	84084	Flush SOC 3/8-18PTF	3
8	81093	----	Pipe Plug	2
9	5602014	----	O-Ring	1
10	5602008	5602008	O-Ring	1

VALVE ASSEMBLY



68349 - Use
18379 - Use

ITEM	PART NO.	QTY. 18379	QTY. 68349	DESCRIPTION
1	68160	1	1	Rotor Assembly
2	56020112	4	2	O-Ring
3	68180	1	1	Subplate-Valve.
4	5602225	1	1	O-Ring
5	68026	2	2	Thrust Washer
6	68155	1	1	Thrust Bearing
7	5602012	1	1	O-Ring
8	68035	1	1	Upper Valve Blk.
9	68024	1	1	Detent & Stop Pit.
10	93804	1	1	Driv-Lok Pin
11	5602011	3	6	O-Ring
12	65882	3	4	Back-up Washer
13	68181	3	4	Shear Seal
14	68028	3	4	Spring Washer
15	68025	1	1	Detent Spring
16	92549	1	1	Ball .250 Dia.
17	68032	1	1	Washer-Handle
18	68157	1	1	Flat Grip
19	68033	1	1	Handle
20	68034	1	1	Acom Nut 1/2-20
21	85317	2	2	Soc. Hd. Capscrew
22	5602008	1	1	O-Ring
23	93598	4	4	Valve Mounting



SECTION V

Troubleshooting:

1. Sporadic Tool Action
 - a. Air in hydraulic system. See Section 3-2 for correct bleeding procedure
 - b. Check reservoir fluid level
2. Motor Will Not Start
 - a. Check manufacturer's operating instructions
3. Noisy Operation
 - a. Air in system. See section 3-2 for bleeding procedure.
 - b. Be sure the hydraulic fluid is filled to normal level.
 - c. Check all points where air might leak into system.
4. Hydraulic Fluid is Over Heating
 - a. Check for high pressure leakage on upper pressure plate
 - b. Fluid level is low. Fill reservoir to proper level.
5. Pump Runs but Will Not Pump Fluid
 - a. Pump is not primed. Run pump a few minutes tipping from side to side.
 - b. Damaged O-rings. Take to nearest service center or contact American Rescue Technology, Inc.
 - c. Defective control valve. Take to nearest service center or contact American Rescue Technology, Inc.
6. Hydraulic Fluid is Leaking
 - a. Check fluid level, possibly too high.
 - b. Loose hose or coupler. Tighten if necessary.
 - c. Cracked reservoir. Replace.
 - d. Check filler cap or breather. Tighten or replace if necessary.

