

2.062 SQ. IN. MOTOR  
6" STROKE

## 61588-100 HYDRAULIC MOTOR

**IMPORTANT: READ THIS MANUAL CAREFULLY BEFORE INSTALLING,  
OPERATING OR SERVICING THIS EQUIPMENT.**

### GENERAL DESCRIPTION

The 2.062 square inch hydraulic motor is a general purpose power unit and is used on many 2-ball, 4-ball and chop check pumps. It utilizes tie rod type construction for easy serviceability and connects to the various lower pump ends by tie rods for easy operation.

The ARO® 61588-100 hydraulic motor is designed to operate at pressures up to (but not exceeding) 1000 p.s.i. (69 bar) hydraulic pressure.

The 2.062 square inch effective piston area allows the motor to generate up to 2062 lbs of thrust transmitted to the lower pump end.

Hydraulic flow requirements at maximum cycle rate (50 cycles/minute) is 5.5 gallons/minute.

Hydraulic horsepower required to run the motor 50 cycles/minute at 1000 p.s.i. is 3.2 horsepower (a greater motor horsepower is required due to transmission inefficiencies). Power supplies generating less than this will work but at a reduced pressure or cycle rate.



### SERVICE KITS

637164  
USED FOR HYDRAULIC MOTOR REPAIR

### OPERATING AND SAFETY PRECAUTIONS

**WARNING:** The use of parts other than genuine ARO replacement parts may be hazardous and may lead to failure.

**WARNING:** A pressure relief valve must be used to prevent over pressurization of the system. Failure to install such a device will lead to over pressurization and possible component rupture. See next page for information on proper installation.

**WARNING:** Be sure that pressure on motor is relieved before attempting service procedures. Failure to do this could result in serious injury.

Never modify components in the unit. Use only genuine ARO replacement parts to assure safe operation.

**NOTE:** The ARO 61588-100 motor will contain about one pint of hydraulic fluid. Drain fluid before attempting any disassembly.

**NOTE:** Do not disassemble this motor except in a clean area. Any dust or dirt contamination of this assembly will shorten the service life of this motor and other system components.

Inspect system hoses frequently for wear/damage and, if necessary, replace immediately. Never plug hose leaks with your finger, tape or any similar devices.

**WARNING:** Never service or disassemble the unit or unit components without relieving hydraulic system pressure first. The high pressures involved could cause serious injury.

# 61588-100 Hydraulic Motor

ITEM NO.	ARO PART NO.	QTY.	DESCRIPTION
1	61588-1	1	PLUG
2 ✓	61588-2	1	"O" RING
3	61588-3	1	CYLINDER HEAD
4 ✓	61588-4	2	BALL 3/8" S.S.
5 ✓	61588-5	2	TRIP SPRING
6 ✓	61588-6	2	"O" RING
7	61588-7	2	TRIP RETAINER
8	61588-8	3	STANCHION NUT
9	61588-9	3	STANCHION, UPPER
10	61588-10	1	ACTUATOR ASS'Y
11	61588-11	1	CYLINDER
12	61588-12	1	PISTON
13 ✓	61588-13	1	WEAR RING
14 ✓	61588-14	1	PISTON SEAL
15	61588-15	1	PISTON TUBE
16	61588-16	1	MOTOR BASE
17	61588-17	3	LOCK WASHER
18	61588-18	3	HEX.HD.BOLT
19 ✓	61588-19	1	PISTON TUBE SEAL
20 ✓	61588-20	1	PISTON TUBE WIPER
21	61588-21	1	"O" RING
22	61588-22	1	BOTTOM PLUG
23 ✓	61588-23	1	FLEX-LOC NUT
24	61588-24	1	TEE
25 ✓	61588-25	3	"O" RING
26	61588-26	1	SLEEVE RETAINER
27	61588-27	1	SNAP RING
28 ✓	61588-28	2	"O" RING
29	61588-29	1	PISTON RETAINER SCREW
30	61588-30	1	VALVE SPOOL/SLEEVE SET
31 ✓	61588-31	1	"O" RING
32	61588-32	1	TUBE
33	61588-33	1	ELBOW
34	61588-34	1	WASHER
	61588-100	1	HYDRAULIC MOTOR

✓ PARTS INCLUDED IN SERVICE KIT 637164

## DISASSEMBLY

1. Remove plug (1) and remove "O" ring (2).
2. Unthread tube (32) Note: Do not remove tee (24) and elbow (33) if possible.
3. Remove stanchion nuts (8) and washers (34).
4. Raise the cylinder head (3) high enough to secure the shifter actuator rod (10) with vise grips. Place a socket wrench on the flex-loc nut (23) and remove nut.
5. Lift cylinder head (3) from upper stanchions (9). Remove "O" ring (28) from cylinder head (3).
6. Carefully lift cylinder (11) and entire piston assembly (29,12,15,22) before removing from motor base (16).
7. Separate the cylinder (11) from the piston assembly. Remove "O" ring (28) from motor base (16).
8. Remove piston seal (14) and wear ring (13) from piston (12).
9. Note: A special tool may be required for installation of piston tube seal (19). This tool is available from a hydraulic supplier such as Parker. Consider this before removing it. Remove wiper (20)

10. If further disassembly is required, such as removal of piston tube (15), shifter/actuator assembly (10) or valve spool/sleeve set (30) see next section.

## Removal of Valve Spool/Sleeve set (30)

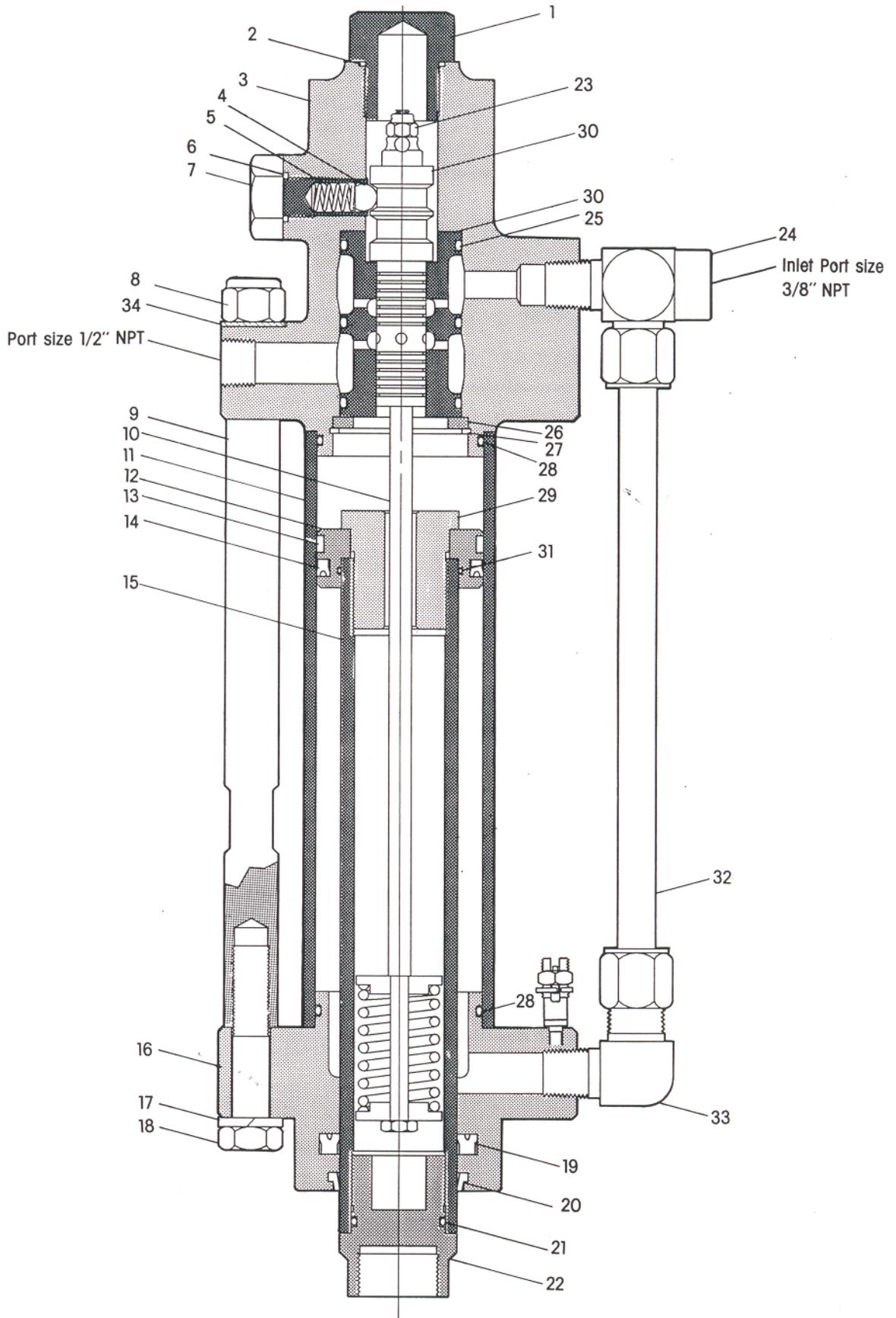
1. Remove trip retainer (7) along with "O" rings (6), trip springs (5) and balls (4) from cylinder head (3).
2. Remove snap ring (27) and sleeve retainer (26) from cylinder head (3). Remove valve spool/sleeve set (30) by pushing them carefully down through the cylinder head (3). Note: Be very careful when removing this set. The finish of the part is critical for proper motor performance. Any nicks or scratches may damage this set.

## Removal of Piston Tube

1. Place piston tube assembly (29,12,15,22) in horizontal position with lower plug (22) in heavy vise. Note: Never clamp on the piston tube (15).
2. Grip the flats of the piston retainer screw (29) and unthread. Note: This joint has been treated with a thread locking compound. It may require extra torque to unfasten.
3. Remove "O" ring (31) from piston (12).

## REASSEMBLY

1. Install piston tube seal (19) and wiper (20) into motor base (16). Install "O" ring (28) in motor base (16).
2. Slide piston tube assembly (22,15) into motor base (16) from below.
3. Insert "O" ring (31) into piston (12). Place piston (12) onto piston tube (15).
4. Clean and coat threads of the piston retainer screw (29) with Loctite sealant and place shifter actuator assembly (10) with piston retainer screw (29) into piston tube (15). Tighten piston retainer screw (29) securely. Note: Be careful not to scratch piston tube (15).
5. Put piston seal (14) and wear ring (13) on piston (12).
6. Push piston tube (15) to the top of its stroke and place cylinder (11) over piston tube (15). Seat the cylinder (11) on the motor base (16).
7. Replace three "O" rings (25) on valve sleeve (30).
8. Push the valve sleeve/spool set (30) straight into the cylinder head (3).
9. Place sleeve retainer (26) behind the valve sleeve spool set (30) and retain this with the snap ring (27).
10. If tee (24) and elbow (33) have been removed, wrap threads in teflon® tape and reassemble. Note: The excessive use of this tape could contaminate the hydraulic fluid. Be sure female thread is clean from any old tape before reinstallation. Do not use the tape on the first several male threads when reinstalling.
11. Attach tube (32) to elbow (33).
12. Place "O" ring (28) on cylinder head (3) and lower cylinder head (3) onto cylinder (11), shifter actuator assembly (10) and upper stanchions (9).
13. Raise the cylinder head (3) to apply vise grips to the shifter actuator rod (10). Pass the shifter actuator rod (10) through the valve spool (30). Clean and Loctite the shifter rod (10) threads and install and tighten flex-loc nut (23).
14. Thread cylinder plug (1) and "O" ring (2) into cylinder head (3). Insert balls (4), springs (5) and thread trip retainer (7) and "O" rings (6) into cylinder head (3).
15. Place stanchion nuts (8) and washers (34) on upper stanchions (11). Tighten stanchion nuts (8) alternately.
16. Attach tube (32) to tee (24) by tightening swivel.



## TROUBLE SHOOTING FOR HYDRAULIC MOTOR

The simplest way to troubleshoot a system is to include plenty of gauges in the design. These will help to follow the path of hydraulic fluid and simplify the proper diagnosis.

- Pump problems will typically occur in one of two areas:
  1. The Hydraulic Motor Section.
  2. The Lower Pump Section.

\_\_\_ Determine which section is affected.

### Hydraulic Motor Problems

- **PROBLEM**

\_\_\_ Cause, solution.

- **Pump will not cycle.**

\_\_\_ No pressure to hydraulic motor, see next section.

\_\_\_ Restricted return lines, clean obstruction.

\_\_\_ Damaged hydraulic motor, service hydraulic motor.

- **No pressure to Hydraulic Motor.**

\_\_\_ Fluid bypassing through relief valve, set relief valve to higher setting.

\_\_\_ Flow control valve shut, open flow control valve.

\_\_\_ Fluid bypassing ("short circuiting") through open valves and system leaks, check system for "short circuits".

**WARNING: REFER TO OPERATING AND SAFETY PRECAUTIONS CONCERNING SERVICE UNDER PRESSURE. (Page 2.)**

\_\_\_ Be sure to eliminate any possible non-pump problems before suspecting pump malfunction and continuing.

- **Pump runs poorly.**

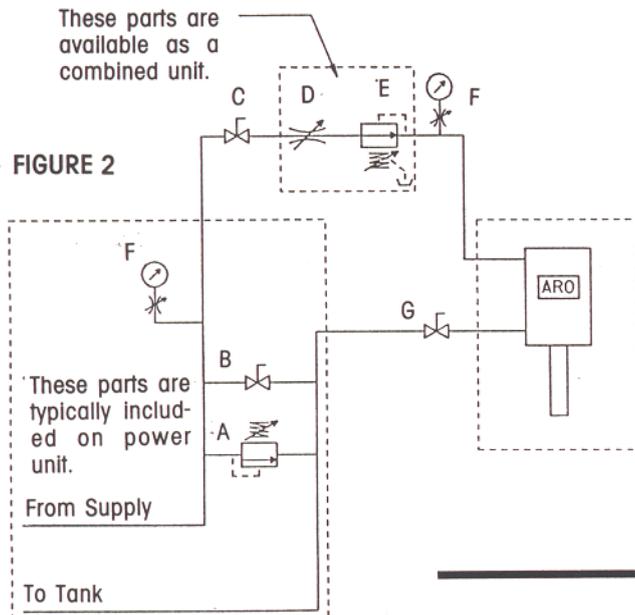
\_\_\_ Restricted supply/return lines, clear obstruction.

\_\_\_ Damaged hydraulic motor, service hydraulic motor.

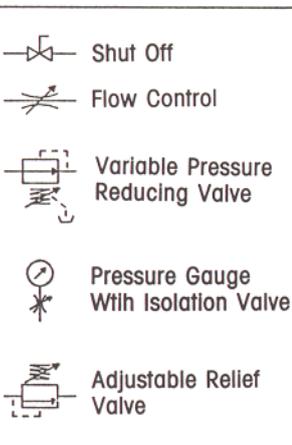
### TYPICAL SINGLE PUMP INSTALLATION

These parts are available as a combined unit.

**FIGURE 2**



Be sure return lines are sized larger than supply lines and similarly pressure rated.



A The Adjustable Relief Valve is installed to prevent over pressurization of the hydraulic system. It is adjusted to bypass hydraulic fluid back to tank in the event of a rise in pressure upstream of the valve

B This Shut-off Valve is used to open/close a direct line between the supply and return lines. (Bypassing everything else in the system. This should be closed during normal operation.)

C This Shut-Off Valve, along with valve G, is used to isolate the pump unit from the supply lines for service. They are open during normal operation. **WARNING: Pump unit may still be under pressure even with these valves closed. Be sure all pressure to the unit is relieved before servicing. Never use valve G to regulate fluid flow.**

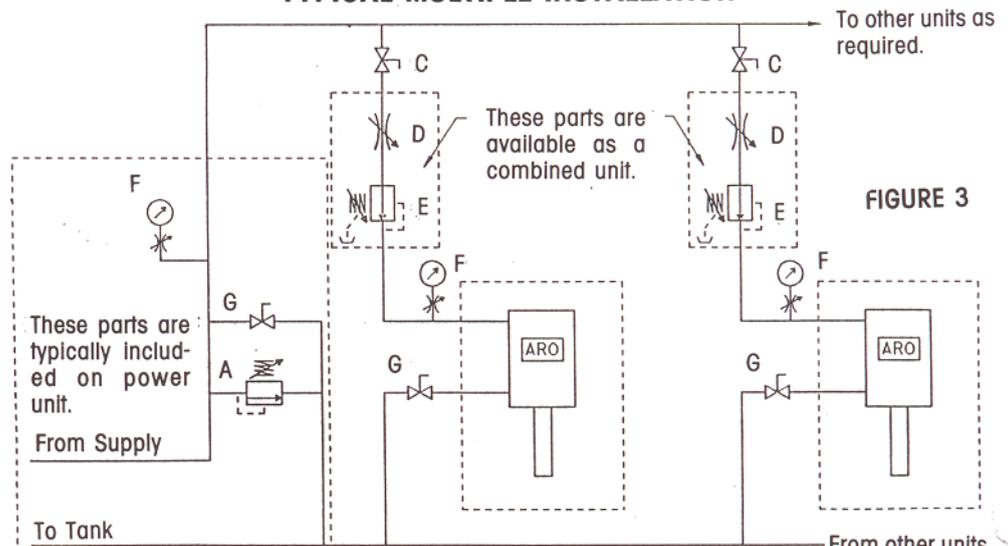
D The Flow control Valve is used to vary the flow rate of the pump unit

E The Variable Pressure Reducing valve is used to control pressure downstream. It is used to set the pumping pressure. (with a single pump this unit isn't needed.)

F The Pressure Gauge should be used with an isolation valve to preserve the integrity of the gauge. It identifies system pressure.

NOTE: All lines leading back to tank should be free of restriction and should be sized larger than the supply lines. The bypass line should be larger than the supply line.

### TYPICAL MULTIPLE INSTALLATION



Be sure return lines are sized larger than supply lines and similarly pressure rated.