



Premium Series Professional Pressure Washers



Service/Operation Manual



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WARNING

HANDLE THIS UNIT AS YOU WOULD A LOADED FIREARM!!

High pressure spray can cause extremely serious injury.

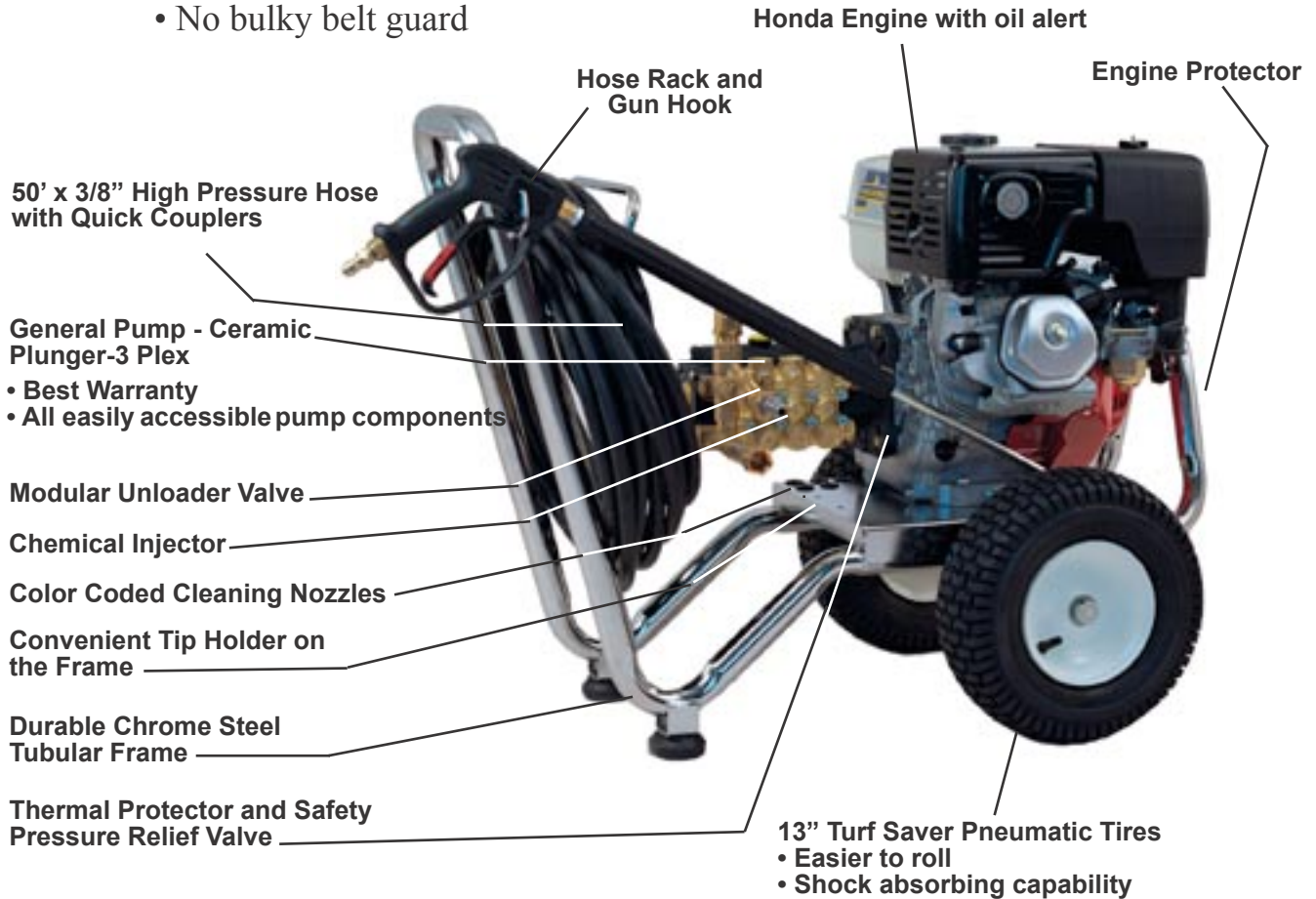
OBSERVE ALL WARNINGS!

Before operating this unit, read and follow all safety warnings and instructions related to the usage of this equipment.

PRESSURE TO SUCCEED

Direct Drive - No Belts

- More compact design
- No belt adjustment required
- No slippage of belts
- No bulky belt guard



Premium Series - Cold Water High Performance Pressure Washers Specifications

Model	P.N.	HP	GPM	PSI
1500-3	163-060	4	2.80	1500
2500-3	163-061	5.5	2.88	2500
3000-4	163-063	11	4.0	3000
2500-5	163-062	11	4.6	3000
4000-3.5	163-064	11	3.5	4000

All pumps come standard with Honda Engine, General Pump, Chemical Injector, 5 Color Coded Cleaning Nozzles, 50' hose, gun

*Picture shown is Model 4000-3.5

WARNINGS



**HIGH PRESSURE SPRAY CAN CAUSE EXTREMELY SERIOUS INJURY.
NEVER PUT YOUR HAND OR FINGERS IN FRONT OF GUN.
NEVER POINT THE GUN AT YOUR BODY OR AT ANYONE ELSE.**

- Always shut off the pump and relieve fluid pressure in system by opening control handle if unit is left unattended or before removing or installing accessories.

⚠ NOTE: Shutting off power by itself may not relieve fluid pressure.

- When control handle is not in use, engage trigger safety to prevent accidental spraying.
- Do not allow kinks to form in hose between pump and control handle as this will reduce safety factor.
- Always wear face shield, eye goggles, gloves and protective clothing, so spray containing chemicals do not contact eyes, ears, nose or skin. If chemicals do contact skin or eyes, flush immediately with large amounts of water and seek medical attention.

WARNING

Do not run the engine in an enclosed area. Exhaust gases contain carbon monoxide, an odorless and deadly poison.

WARNING

Do not run engine at excessive speed. Excessive speeds increase the danger of personal injury and voids warranty.

A FIRE OR EXPLOSION CAN OCCUR RESULTING IN PERSONAL INJURY IF THE FOLLOWING INSTRUCTIONS ARE NOT FOLLOWED:

- DO NOT FILL GASOLINE TANK while engine is running. Allow engine to cool before refueling.
- Do not operate the engine when an odor of gasoline is present or other explosive conditions exist.
- If gasoline is spilled, move machine away from the area of the spill and avoid creating any source of ignition until the gasoline has been cleaned up.
- Do not store, spill or use gasoline near an open flame or devices that utilizes a pilot light or which may cause a spark such as a stove, furnace or water heater.
- Refuel outdoors or in well ventilated areas only.
- DO NOT operate engine without a muffler. Inspect muffler periodically and replace as necessary. Clean muffler area to prevent dirt and combustible material from accumulating.
- Exhaust fumes are poisonous. Do not operate except in open and well ventilated areas.
- Do not operate the engine if air cleaner or cover directly over the carburetor air intake is removed.
- Do not choke carburetor to stop engine.
- Do not tamper with the engine speed.
- Do not touch hot muffler, cylinders or fins as contact may cause burns.
- Dirt or other debris in cooling fins or governor parts, can affect engine speed.
- To prevent hand or arm injury, always pull starter cord rapidly to avoid kickback.
- To prevent accidental starting when servicing, always remove spark plug and insert in holding tab & disconnect negative wire from battery terminal if equipped with a 12 volt starting system.

WARNINGS

ALWAYS:

- Always remember that liquid released at pressure can penetrate skin, causing **SERIOUS** injury. If injury occurs, seek immediate medical attention.
- Always follow all instructions and recommendations when operating equipment.
- Always protect high pressure hose from damage such as from vehicle traffic and sharp edges.
- Always wear protective clothing, gloves and goggles when using any potentially harmful chemicals.
- Always lock gun jet off when removing or changing nozzle.
- Always insure nozzle is secure in coupler before using. Improper installation may cause serious injury or other damage. Test by aiming nozzle at ground prior to use.
- Always insure that water supply is adequate to supply pump. Water supply must deliver 3.5 gallons per minute.
- Always inspect unit, hoses and fittings prior to use.

NEVER:

- Never place hand or any other part of the body in front of spray orifice.
- Never direct spray at self or any other person.
- Never pump any acid or abrasive fluid.
- Never wash electrical equipment or parts.
- Never attempt to repair a damaged high-pressure hose.
- Never allow unit to run more than five minutes without operating gun jet. Water in pump will overheat sufficiently to damage pump. An optional high temperature sensor is available for this unit from Airlessco.

WHILE OPERATING MAINTAIN SUFFICIENT LEVELS OF:

- Fuel - Any fuel intended for automotive use is adequate. Unleaded fuel is recommended to reduce combustion deposits.
- Engine Oil - See engine manual for checking procedure and recommended oil grade.
- Gearbox Oil - Check through sight window on side of gearbox. Replenish with 90 wt. gear oil.
- Pump Oil - Check through sight window on side of pump. Replenish with SAE 20/ 30 oil.

PARTS

INLET WATER FILTER

- The inlet water screen is intended to prevent debris from entering the pump and causing damage. DO NOT OPERATE the machine without the Inlet Water Screen in place.
- The Inlet Water Screen is stainless steel and should be removed and cleaned every 25 hours of operation. If your water conditions are poorer than normal, it should be cleaned more often.

HIGH PRESSURE HOSE

- The hose provided by AIRLESSCO is selected from the finest hoses available and is intended to be used on your machine only.
- DO NOT use pressure hose for any other purpose & do not substitute any other hoses for high pressure hose.
- If the hose becomes frayed or has any cuts on it, the hose must be replaced.
- Do not allow your pressure hoses to be run over by any type of vehicle.

SPRAY GUN- OR CONTROL HANDLE

- The gun included with your machine should always be treated as a loaded firearm.
- HIGH PRESSURE WATER IS DANGEROUS & should never be directed at any person or any body parts.
- Your gun has safety features you should use. The Trigger Lock should be engaged any time gun is not in use.
- DO NOT TAPE OR TIE, in any way render the spring device inoperative.

WAND

- The wand supplied with your machine should be handled with care. If the wand is bent it should be replaced.

CHEMICAL INJECTOR

- Your machine is equipped to use a CHEMICAL INJECTOR for those jobs that require more than water cleaning. The AIRLESSCO CHEMICAL INJECTOR will allow you to soak the surface with a liquid chemical/detergent.
- If you need to use surface conditioners such as soaps and degreasers, you must use a CHEMICAL INJECTOR.
- DO NOT pump any surface conditions or any other medium other than water through the high pressure pump. To do so could damage the pump and void your warranty.

SAND INJECTOR - OPTIONAL ITEM

- AIRLESSCO units are equipped to use a SAND INJECTOR SYSTEM. Water Sandblasting is an extremely effective way of cleaning. The AIRLESSCO SAND BLASTING INJECTOR allows sand to flow into the high pressure water stream to create a powerful cleaning system. Dry sandblasting is being replaced by wet sandblasting. SOME USES: Removing boat barnacles, rust, graffiti and blasting painted surfaces down to metal for repainting.

USERS GUIDE

Prior to Starting:

- Read and understand all warnings before operating equipment.
- Connect standard garden hose to water inlet. Hose must have minimum 5/8 inch diameter. Maximum 50 Ft. length is recommended. Water source must deliver 3.5 gallons per minute either through pressurized system of public utility or similar system or through gravity feed from unpressurized holding tank. Never allow pump to run dry or semi-dry.
- Connect high pressure hose, gunjet, wand assembly to high pressure outlet. Failure to properly lock quick coupler sleeve may result in “blow-out” and loss of quick coupler O-ring.
- Turn water supply fully on.
- Open fuel valve on engine. Turn ignition switch on (if so equipped). Set choke and throttle controls.
- Operate control handle (gun) by squeezing trigger and hold until continuous flow of water emerges.
- Turn pressure adjustment knob fully counterclockwise.

PREPARATION INSTRUCTIONS BEFORE WASHING OR REPAINTING YOUR HOSE

1. Please read all safety warnings.
2. If walls are badly stained, mildewed or soiled, detergents and the Airlessco Chemical Injector are recommended. A strong cleanser or tri-sodium phosphate works well to remove stains. Bleaches help to kill mildew.

USING THE AIRLESSCO CHEMICAL INJECTOR

- *The chemical injector will draw the detergent. It is adjustable for the required ratio.*
- *Wash from the BOTTOM to the TOP so the solution is continually being rewetted and allows the chemical to work.*
- *Rinse from the TOP to the BOTTOM before the chemical dries.*

3. Cover outdoor light and electrical fixtures with plastic bags.
4. Protect flush receptacles with plastic tape. Be sure they are watertight.
5. Note location of vent openings. (Eaves & crawl spaces often have vent openings). Do not spray into these openings.
6. Protect landscape with plastic covers. This helps in clean up. (Especially helpful when using chemicals and when blasting off paint).
7. General washing technique is started from the highest point. When working from a ladder make sure it is sturdy and position the ladder so you are spraying away from yourself. Never spray directly overhead. Be prepared for the initial “kick” that is caused by the high pressure spray.
8. Start flushing debris out of gutters. Use a 15 degree nozzle about 3 feet away.
9. Wash underhang portion of soffit thoroughly, spraying from a distance of 12" to 18".
10. When cleaning the sides of your house work from the top to the bottom using overlapping strokes. If using chemicals or soap apply solution from bottom to top and then rinse from the top to the bottom.
11. When cleaning around windows, approach it cautiously. If panes are not secure or not well caulked they can break from the impact of the high pressure spray. Use a wider nozzle, start from a distance and approach cautiously.

USERS GUIDE

To Operate Unit:

1. Select desired nozzle. Lock control handle (gun or wand) off and install nozzle in quick coupler at end of wand. Insure that coupler sleeve is properly locked by pulling on nozzle.
2. Start engine according to engine manual.
3. Unlock control handle (gun or wand), point wand at ground and operate to test.
4. Adjust pressure of spray to desired level.

TO REMOVE PEELING PAINT:

1. Start at the highest point. Use a 15 degree nozzle.
2. Spray should be directed 4"-12" from the surface at an angle of 45 degrees. This will allow you to work the spray like a chisel.
3. On the soffit, peel at a parallel angle. It will peel off in large sheets if you can get beneath it.
4. Spray in a back & forth motion always trying to get beneath the peeling paint. Be sure to get as much paint off as possible & don't be concerned about the paint that remains, it is bonded well enough to not cause a problem.
5. If paint edges curl up after being pressure washed, use a scraper or steel brush on these areas.
6. Remove loose putty around windows.
7. Spot prime any bare wood areas. When primer has dried apply putty and caulking as necessary.

Chemical Injector:

1. Push end of chemical pick-up tube onto injector inlet.
2. Place filter end of pick-up tube in container of chemical to be dispensed. Unit mixes chemical with water. Ratio is adjustable.
3. Attach proper nozzle to wand. (Injector will draw chemical only with special large orifice, fan pattern nozzle supplied).
4. Operate control handle as usual.
5. After use, remove nozzle from wand and place pick-up tube filter end in container of water. Flush out tube by operating gunjet.

GET THE MOST FROM YOUR MACHINE

- Select the right tip for the job.
- Never allow anyone into your work area & risk injury.
- Approach target from a slight angle ("sweep" surface).
- Always wear face shield and eye protection.
- Turn machine off and relieve pressure from hose & system before disconnecting hoses, control handle (gun) or tips.
- Cover any exposed electrical sockets, plugs, lights or other exposed electrical connections.
- Do not kink the high pressure hose, the wires inside may bend and become weak or break.
- Always consider which way the wind is blowing to avoid overspraying.
- Spray surface conditioners so you are "Up Wind".
- Never allow surface conditioners, soap or other chemicals to get on vegetation. Use plastic sheeting to protect.
- Keep the quick couplers out of dirt and sand. If they should have dirt or other debris on them, clean the quick coupler thoroughly before using.
- Do not allow your hand or body to come in contact with water spray. **HANDLE AS YOU WOULD A LOADED FIREARM!!**

REMEMBER, although preparation is hard work it will mean extra years of good protection and good looks.

0° For Power Blasting - Delivers very concentrated stream of water. Exercise caution as the impact force can damage soft surfaces.

15° For Chiseling & Stripping Action - Quickly removes blistered and peeling paint or other residues. Spray should be directed at 45° angle.

25° For Power Cleaning & Flushing - The perfect wider spray angle for effectively washing away dirt, mud and grime.

40° For Moderate Washing & Rinsing - Its wide spray pattern "sweeps" surfaces clean.

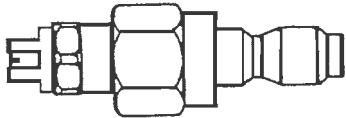
TIPS AND NOZZLES

TIPS OR NOZZLES

The Quick Couplet Tips or Nozzles are inserted into the end of the wand by means of a Quick Coupler. Tips are supplied in the four most popular sizes & can do many jobs for you. You **MUST** seat the tip into the quick coupler firmly and make sure the quick coupler is closed. If you have a leak at the tip around the quick coupler, you have lost the O-Ring inside the quick coupler. If lost, the O-Ring **MUST BE REPLACED!**

⚠ CAUTION

Failure to lock the quick coupler into place can result in personal injury and loss of the O-Ring on a female coupler. Danger signals are indicated by water leakage.



Learning what each tip can do for you will make your AIRLESSCO machine more valuable and will allow you to do your cleaning jobs faster and more effectively. By experimenting, you will find that different tips do the job better and moving the wand closer to and farther from the area to be cleaned will also change the way the machine will work for you.

You should always start each new job away from the target and move closer as you see the need. Be careful, you can damage some surfaces if the pressure is too concentrated and too close.

NOZZLE SELECTION GUIDE

The pressure and volume of a pressure washer is determined by the size of the opening (orifice) in the nozzle. There are numbers on the nozzle which explain it's size. The first two numbers indicate the size of the spray angle. (00 means 0 degree, 15 means 15 degrees etc...) The last number indicates the size of the orifice. This is not a measurement of an inch, but a standardized measurement.

THE 0 DEGREE NOZZLE –

This is the blasting nozzle. It delivers a very concentrated stream of water. Care should be used to avoid damaging wood or fragile surfaces. **WARNING:** This nozzle must not be used on rental machines supplied to homeowners or non-contractors.



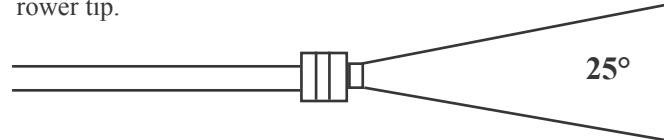
THE 15 DEGREE NOZZLE – 3/4"

This is a chiseling nozzle. The spray should be directed at a 45 degree angle to the surface and used like a scraper to remove paint, grease and dirt. This is the most used tip of all.



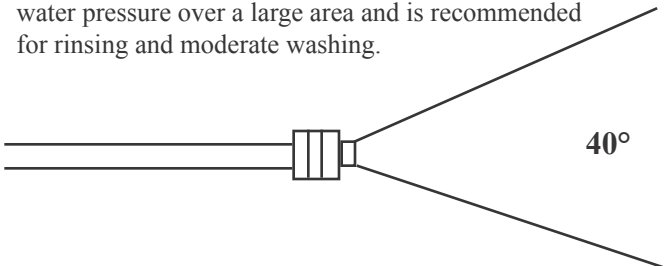
THE 25 DEGREE NOZZLE – 5-6"

This is a flushing nozzle. It gives a wider coverage and is used if the area being cleaned would be damaged by a narrower tip.



THE 40 DEGREE NOZZLE – 8-10" –

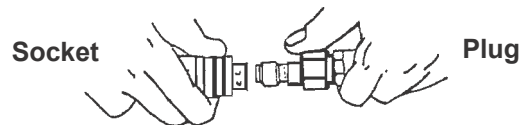
This is a wash nozzle. Its wide spray pattern disperses the water pressure over a large area and is recommended for rinsing and moderate washing.



TIPS WILL WEAR IN TIME. THE MORE YOU USE A TIP, THE MORE YOUR TIP WILL WEAR. A WORN TIP WILL CAUSE A SIGNIFICANT DROP IN PRESSURE. CHECK AND REPLACE YOUR TIPS FREQUENTLY.

QUICK COUPLER

The quick coupler allows you to attach different devices together quick and secure. To use, simply slide the collar back and insert the plug. Make sure the plug is securely seated. It's always a good idea to "tug" on the two parts to make sure they are firmly seated together.



Always make sure the O-Ring is in place inside the quick coupler. To see if the O-Ring is in place, make sure the Pressure Washer is off and all system pressure has been relieved, then you may look into the quick coupler at the collar (female) side of the quick coupler. You will be able to see the O-Ring inside. If the O-Ring is missing, it must be replaced to ensure a good pressure seal.

CLEANING NOZZLE RATING CHART

The chart below provides gallons per minute for a 0° cleaning nozzle used on different PSI (pounds per square inch) pressure washers. For example, a 2000 PSI pressure washer with a 0° No. 4.5 cleaning nozzle will produce 3.1 gallons per minute. This chart can also assist in determining the proper nozzle size for a particular pressure washer if the operating pressure and gallons per minute rating are known. For example: a pressure washer rated at 3000 PSI @ 3.5 GPM, would require a No. 4 cleaning nozzle.

NOTE: The proper nozzle size for each pressure washer can be found on the machine specification plate (located on the frame).

Nozzle Orifice Size	PSI							
	1000	1500	2000	2500	3000	3500	4000	5000
3.0	1.8	2.1	2.4	2.6	2.8	2.8	3.35	
4.0	2.0	2.4	2.8	3.1	3.5	3.7	4.0	4.5
4.5	2.2	2.7	3.1	3.5	3.8	4.2	4.5	5.0
5.0	2.5	3.1	3.5	3.9	4.3	4.7	5.0	5.6
5.5	2.8	3.4	3.9	4.3	4.8	5.1	5.5	6.2
6.0	3.0	3.7	4.2	4.7	5.2	5.6	6.0	6.7
6.5	3.3	4.0	4.6	5.1	5.6	6.1	6.5	7.3
7.0	3.5	4.3	4.9	5.5	6.1	6.6	7.0	7.8
7.5	3.8	4.6	5.3	5.9	6.5	7.0	7.5	8.4
8.0	4.0	4.9	5.7	6.3	6.9	7.4	8.0	8.9
8.5	4.3	5.2	6.0	6.7	7.4	8.0	8.5	9.5
9.0	4.5	5.5	6.4	7.1	7.8	8.4	9.0	10.1

TROUBLE SHOOTING

PROBLEM	CAUSE	REMEDY
Low Pressure	<ul style="list-style-type: none"> • Worn nozzle • Air leak in inlet plumbing • Relief valve stuck, partially plugged or improperly adjusted • Valve seat worn • Inlet suction strainer clogged or improperly sized • Worn packing; Abrasives in pumped fluid or severe cavitation; Inadequate water • Fouled or dirty inlet or discharge valves. Leaky discharge hose 	<ul style="list-style-type: none"> • Disassemble, reseal and reassemble • Clean, adjust relief valve; check for worn and dirty valve seats • Clean, use adequate size; check more frequently • Install proper filter, suction at manifold must be limited to lifting less than 20 feet of water or -8.5 PSI vacuum. • Clean inlet and discharge valve assemblies • Replace worn valves, valve seats and/or discharge hose
Pump runs extremely rough, pressure very low	<ul style="list-style-type: none"> • Restricted inlet or air entering the inlet plumbing • Inlet restrictions and/or air leaks; Stuck inlet or discharge valve 	<ul style="list-style-type: none"> • Proper size inlet plumbing; check for air tight seal. • Replace worn cup or cups; clean out foreign material, replace worn valve
Water leakage from under manifold; Slight leakage	<ul style="list-style-type: none"> • Worn packing 	<ul style="list-style-type: none"> • Install new packing
Oil leak between crankcase and pumping section	<ul style="list-style-type: none"> • Worn crankcase, piston rod seals O-ring on plunger 	<ul style="list-style-type: none"> • Replace crankcase piston rod seals; Replace O-rings
Oil leaking in the area of crankshaft	<ul style="list-style-type: none"> • Worn crankshaft seal or improperly installed oil seal O-ring • Bad bearing 	<ul style="list-style-type: none"> • Remove oil seal and replace damaged O-ring and/ or seals • Replace bearing
Excessive play in the end of the crankshaft pulley	<ul style="list-style-type: none"> • Worn main bearing form excessive tension on drive belt 	<ul style="list-style-type: none"> • Replace crankcase bearing and/or tension drive belt
Water in crankcase	<ul style="list-style-type: none"> • May be caused by humid air condensing into water inside the crankcase • Worn packing and/or piston rod sleeve, & O-rings on plunger retainer 	<ul style="list-style-type: none"> • Change oil intervals; use any high grade automotive 30 weight non detergent oil • Replace packing, replace O-rings
Oil leaking from underside of crankcase	<ul style="list-style-type: none"> • Worn crankcase piston rod seals 	<ul style="list-style-type: none"> • Replace seals
Oil leaking at the rear portion of the crankcase	<ul style="list-style-type: none"> • Damaged crankcase, rear cover O-ring, drain plug O-ring or slight glass O-ring 	<ul style="list-style-type: none"> • Replace specific O-ring
Loud knocking noise in pump	<ul style="list-style-type: none"> • Pulley loose on crankshaft • Broken or worn bearing 	<ul style="list-style-type: none"> • Check key and tighten set screw • Replace bearing
Frequent or premature failure of the packing	<ul style="list-style-type: none"> • Scored, damaged or worn plunger • Overpressure to inlet manifold • Abrasive material in the fluid being pumped • Excessive pressure and/or temperature of fluid being pumped • Over pressure of pumps • Running pump dry 	<ul style="list-style-type: none"> • Replace plungers • Reduce inlet pressure • Install proper filtration on pump inlet plumbing • Check pressure and fluid inlet temperature; be sure they are within specified range. • Reduce pressure • Do not run pump without water

PUMP SERVICING PROCEDURE

Valve Assemblies

1. All inlet and discharge valves can be serviced without disrupting the inlet discharge plumbing. The inlet and discharge valves are the identical in all models.
2. To service any valve, remove valve cap and extract valve assembly.
3. Examine O-rings and replace if there is any evidence of cuts, abrasions, or distortion.
4. Remove valve assembly (retainer, spring, valve, valve seat) from valve cavity.
5. Remove O-ring from valve cavity.
6. Only one valve kit is necessary to repair all the valves in the pump. The kit includes new O-rings, valve seat, poppet, spring and retainer, all pre-assembled.
7. Install new O-ring in valve cavity.
8. Insert assembly into valve cavity.
9. Replace valve cap and torque to specifications.

Removing Manifold Head

1. Remove the fasteners retaining head.
2. Separate head from crankcase.

Note: It may be necessary to tap the head lightly with a rawhide mallet to loosen.

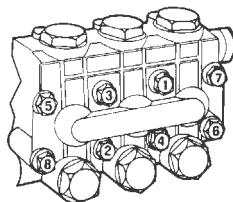
▲ CAUTION

When sliding head from crankcase use caution not to damage plungers.

3. The V-packing assemblies may come off with the head. At this point, examine plungers. Plunger surfaces should be smooth and free from scoring or pitting; if not, replace.
4. Reinstall manifold head and torque to specifications per sequence described below.

Torque Sequence For Tightening Head

Install all head bolts finger tight. Torque to 10 foot pounds in sequence as shown below, then retorque to specifications again in sequence.

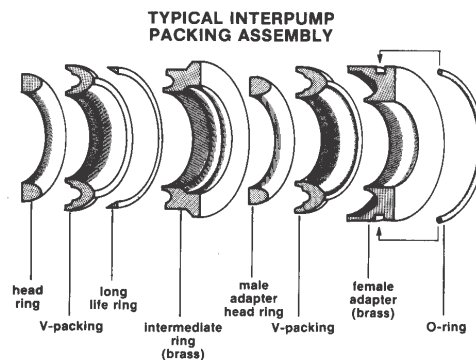


Replacing Plungers

1. Remove stainless steel piston screw and plunger from piston.
2. If slinger washer comes off with plunger, be certain this is replaced before new plunger is installed.
3. Separate piston screw from plunger.
4. Install new O-Ring and PTFE backup-ring on piston screw. Note: A film of grease on the outside of the O-Rings insures a better installation.
5. Carefully press piston screw into plunger.
6. Slide new plunger over the piston guide and torque to specifications.

Replacing V-Packings

1. Remove manifold from crankcase.
2. Insert proper extractor collet through main seal retainer. Tighten collet and extract retainers, v-packings and head rings.
3. Place proper insertion tool in cylinder and install front head ring, v-packing and long life ring and press firmly into cylinder until they will go no further using proper insertion tool.
4. Insert intermediate seal retainer, pressing it firmly into cylinder until it will go no further using proper insertion tool. Install rear head ring, v-packing and main seal retainer into cylinder in order shown and press firmly into cylinder.
5. Repeat this sequence for each cylinder.
6. Coat each plunger with grease and carefully remount manifold. Torque head to specifications.



SPECIFICATIONS - MODEL 1500-3

PART NUMBER 163-060

Specifications	
Pump Model	1500-3
Maximum Volume	2.8 GPM
Maximum Discharge Pressure	1500 PSI
Maximum Pump Speed	3400 RPM
Maximum Inlet Pressure	125 PSI
Maximum Inlet Vacuum	3 ft. water (2.6 in. Hg)
Bore	.591 in./ 15mm
Stroke (in./mm)	.260/ 6.6
Crankcase Oil Capacity	11.2 oz.
Maximum Fluid Temperature	165°F
Inlet Port Thread	3/8 -19 BSPP-F
Discharge Port Thread	1/4 - 19 BSPP-F
Shaft Diameter	3/4 in. / 19 mm
Weight	11.4 lbs.
Dimensions	7.2 x 7.2 x 5.5 in.

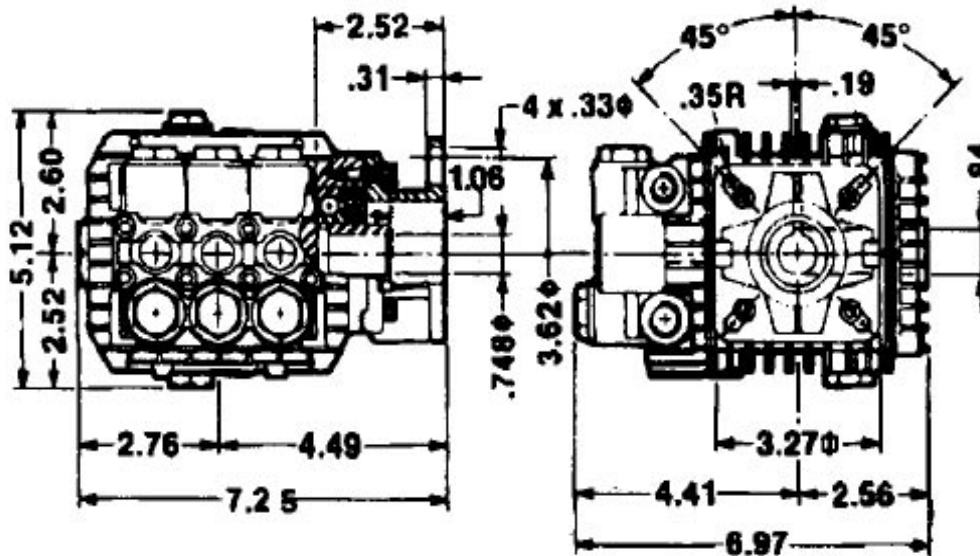
TORQUE SPECS*

Position	Ft. - lbs.	Position	Ft. - lbs.
2	29.4	23	13.2
6	14.7	26	11.0
9	8.8	34	7.3
16	33.1		

*Decrease torque by 20% if threads are lubricated.

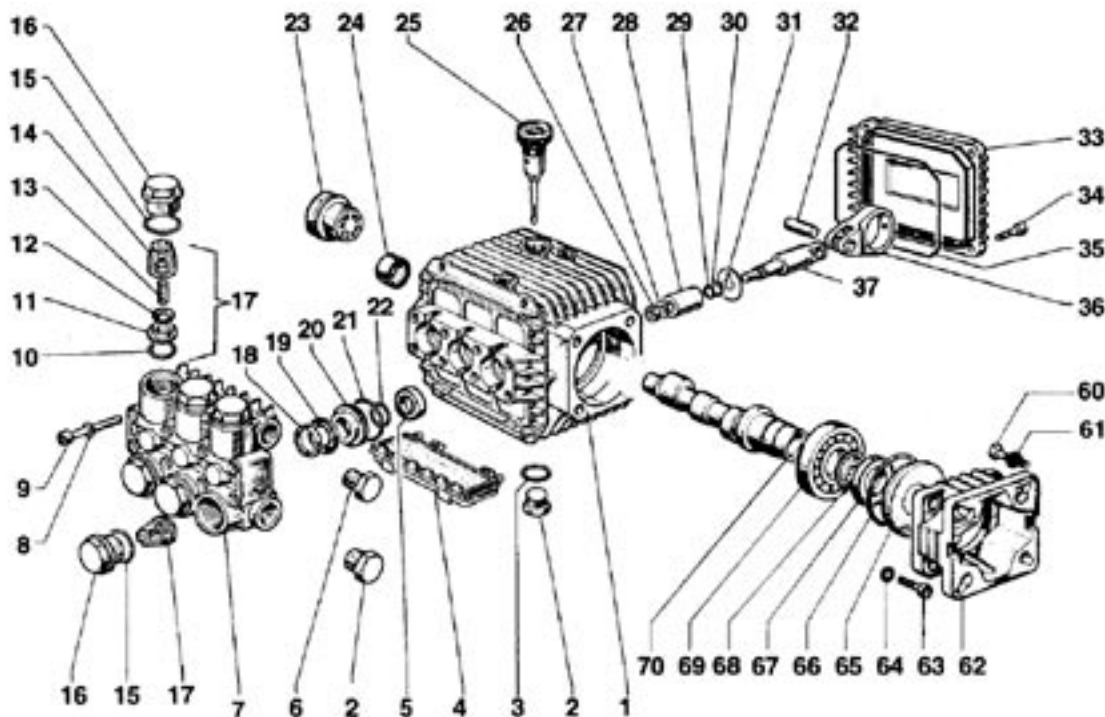
*For Position Number Reference Parts Breakdown Page 12.

MODEL 1500-3 DIMENSIONAL DRAWING



PARTS BREAKDOWN - MODEL 1500-3

PART NUMBER 163-060



ITEM	PART #	DESCRIPTION	KIT	QTY.	ITEM	PART #	DESCRIPTION	KIT	QTY.
1	51.0106.22	Crankcase		1	26	92.2216.00	Nut, M8		3
2	98.2100.00	Plug, 3/8-BSPP		2	27	96.7008.00	Washer, M8		3
3	90.3833.00	O-Ring, .549 x .103		1	28	51.0400.09	Plunger (15mm)		3
4	51.2091.02	Protector		1	29	90.3572.00	O-Ring, .208 x .070		3
5	90.1565.00	Oil Seal	83	3	30	90.5022.00	Back-up Ring		3
6	98.2041.00	Plug		1	31	96.7070.00	Washer, Flinger		3
7	51.1200.41	Manifold, Brass		1	32	97.7310.00	Connecting Rod Pin		3
	51.1200.22	Manifold, Aluminum			33	51.1600.22	Crankcase Cover		1
8	96.6938.00	Washer, M6.4, Schnorr		12	34	99.1867.00	Screw		4
9	99.1943.00	Screw, M6 x 40		12	35	90.3917.00	O-Ring		1
10	90.3841.00	O-Ring, .674 x .103	1	6	36	51.0300.22	Connecting Rod		3
11	36.2003.66	Valve Seat	1	6	37	61.0500.56	Piston Guide		3
12	36.2001.76	Valve Plate	1	6	60	99.2730.00	Screw, 5/16"		4
13	94.7376.00	Spring	1	6	61	96.7014.00	Washer, M8.4, Schnorr		4
14	36.2002.51	Valve Cage	1	6	62	10.0346.22	Flange		1
15	90.3847.00	O-Ring, .797 x .103	84	6	63	99.1867.00	Screw, M6 x 18		4
16	98.2218.00	Valve Cap	84	6	64	96.6938.00	Washer, M6.4, Schnorr		4
17	36.7032.01	Valve Assembly	1	6	65	50.2115.51	Spacer		1
18	51.100.51	Head Ring	96,97	3	66	90.4097.00	O-Ring, 2.187 x .139		1
19	90.2620.00	Packing	96,97	3	67	90.1644.00	Oil Seal		1
20	51.0800.70	Packing Retainer	86,96	3	68	90.0667.00	Snap Ring		1
21	90.3604.00	O-Ring, .989 x .070	86,96,97	3	69	20.2835.21	Bearing		1
22	90.3835.00	O-Ring, .594 x .103	86,96,97	3	70	51.0211.35	Crankshaft		1
23	97.5968.00	Slight Gauge		1					
24	91.8015.00	Needle Bearing		1					
25	98.2103.00	Oil Dip Stick		1					

REPAIR KITS

KIT NO.	1	83	84	86	96	97
ITEM NO.S INCLUDED IN KIT	10, 11, 12 6, 7, 8 (17)	5	15, 16	20, 21, 22	18, 19, 20, 21, 22	18, 19, 21, 22
NUMBER OF ASSEMBLIES IN KIT	6	3	6	3	1	3
NUMBER OF CYLINDERS KIT WILL SERVICE	3	3	3	3	1	3

SPECIFICATIONS - MODEL 2500-3

PART NUMBER 163-061

Specifications	
Pump Model	2500-3
Maximum Volume	3.2 GPM
Maximum Discharge Pressure	2500 PSI
Maximum Pump Speed	3400 RPM
Maximum Inlet Pressure	125 PSI
Maximum Inlet Vacuum	3 ft. water (2.6 in. Hg)
Bore	.709 in./ 18 mm
Stroke (in./mm)	.370 in./ 9.4 mm
Crankcase Oil Capacity	11.2 oz.
Maximum Fluid Temperature	165°F
Inlet Port Thread	3/8 -19 BSPP-F
Discharge Port Thread	1/4 - 19 BSPP-F
Shaft Diameter	.945 in./ 24 mm
Weight	11.2 lbs.
Dimensions	7.0 x 6.9 x 5.1 in.

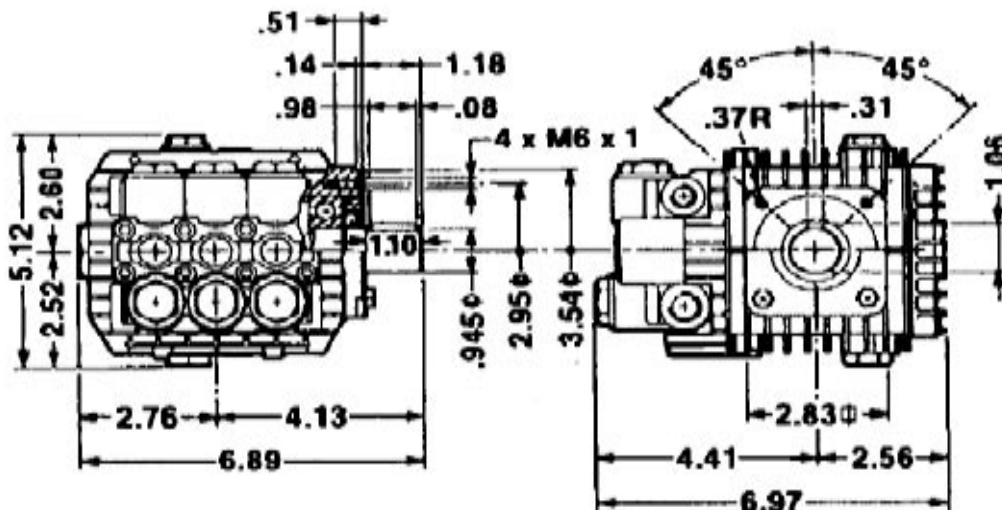
TORQUE SPECS*

Position	Ft. - lbs.	Position	Ft. - lbs.
2	29.4	23	13.2
6	14.7	26	11.0
9	8.8	34	7.3
16	33.1	39	7.3

*Decrease torque by 20% if threads are lubricated.

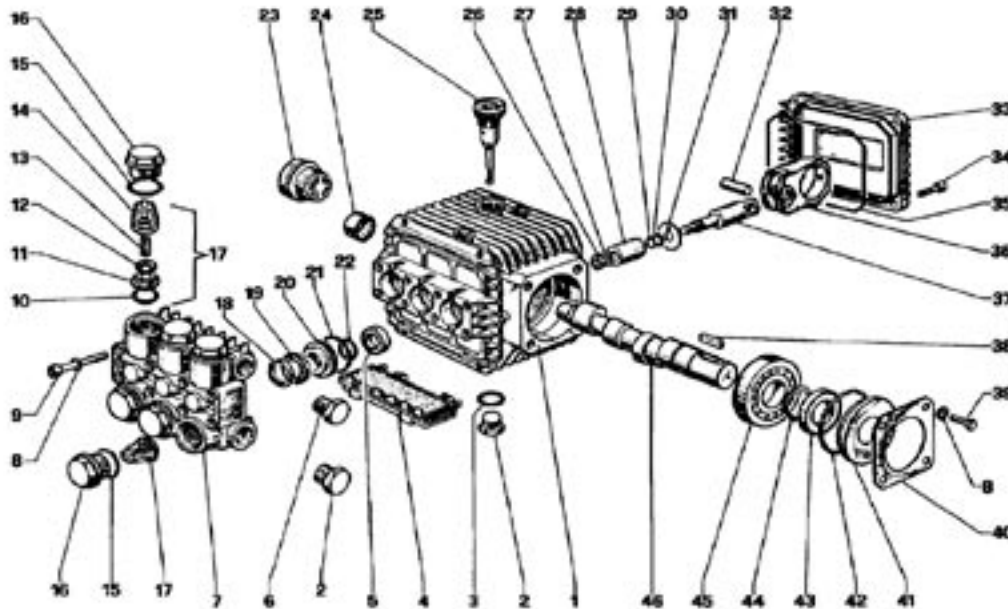
*For Position Number Reference Parts Breakdown Page 14.

MODEL 2500-3 DIMENSIONAL DRAWING



PARTS BREAKDOWN - MODEL 2500-3

PART NUMBER 163-061



ITEM	PART #	DESCRIPTION	KIT #	QTY.	ITEM	PART #	DESCRIPTION	KIT #	QTY.
1	51.0106.22	Crankcase		1	20	51.0800.70	Packing Retainer	86,96	3
2	98.2100.00	Plug		2		51.0803.70	18mm	139,140	
3	90.3833.00	O-Ring		1	21	90.3604.00	O-Ring	86,96,97	3
4	51.2091.02	Protector		1			18mm	139,140,141	
5	90.1565.00	Oil Seal	83	3	22	90.3835.00	O-Ring	86,96,97	3
6	98.2041.00	Plug		1		90.3843.00	18mm	139,140,141	
7	51.12200.41	Manifold, Brass		1	23	97.5968.00	Slight Gauge		1
8	96.6938.00	Washer		8	24	91.8015.00	Needle Bearing		1
9	99.1943.00	Screw		8	25	98.21103.00	Oil Dip Stick		1
10	90.3841.00	O-Ring	123	6	26	92.2216.00	Nut		3
11	36.2003.66	Valve Seat	123	6	27	96.7008.00	Washer		3
12	36.2001.76	Valve Plate	123	6	28	51.0400.09	Plunger - 15mm		3
13	94.7376.00	Spring	123	6		51.0401.66	Plunger - 18mm		
14	36.2025.51	Valve Cage	123	6	29	90.3572.00	O-Ring		3
15	90.3847.00	O-Ring		6	30	90.5022.00	Back Up Ring		3
16	98.2216.00	Valve Cap		6	31	96.7070.00	Flinger Washer		3
17	36.7115.01	Valve Assembly	123	6	32	97.7310.00	Connecting Rod Pin		3
18	51.1000.51	Head Ring	96,97	3	33	51.1600.22	Crankcase Cover		1
	51.1001.51	18mm	140,141		34	99.1867.00	Screw		4
19	90.2620.00	Packing	96,97	3	35	90.3917.00	Cover O-Ring		1
	90.2681.00	18mm	140,141						

REPAIR KITS

KIT NUMBER	83	86 (15mm)	96 (15mm)	97 (15mm)	123	139 (18mm)	140 (18mm)	141 (18mm)
ITEM NO.S INCLUDED IN KIT	5	20,21 22	18,19 20,21, 22	18,19 21,22	6,7,8 10,11,12 (17)	20,21 22	18,19 20,21 22	18,19 21,22
NUMBER OF ASSEMBLIES IN KIT	3	3	1	3	6	3	1	3
NUMBER OF CYLINDERS KIT	3	3	1	3	3	3	1	3

SPECIFICATIONS - MODEL 2500-5

PART NUMBER 163-062

Specifications	
Pump Model	2500-5
Maximum Volume	4.6 GPM
Maximum Discharge Pressure	3000 PSI
Maximum Pump Speed	3400 RPM
Maximum Inlet Pressure	125 PSI
Maximum Inlet Vacuum	3 ft. water (2.6 in. Hg)
Bore	.591 in./ 15 mm
Stroke (in./mm)	.433/ 11
Crankcase Oil Capacity	14.0 oz.
Maximum Fluid Temperature	165°F
Inlet Port Thread	1/2-14 BSPP-F
Discharge Port Thread	3/8-19 BSPP-F
Shaft Diameter	1.0 in./ 25.4 mm
Weight	19.1 lbs.
Dimensions	8.8 x 9.7 x 6.5 in.

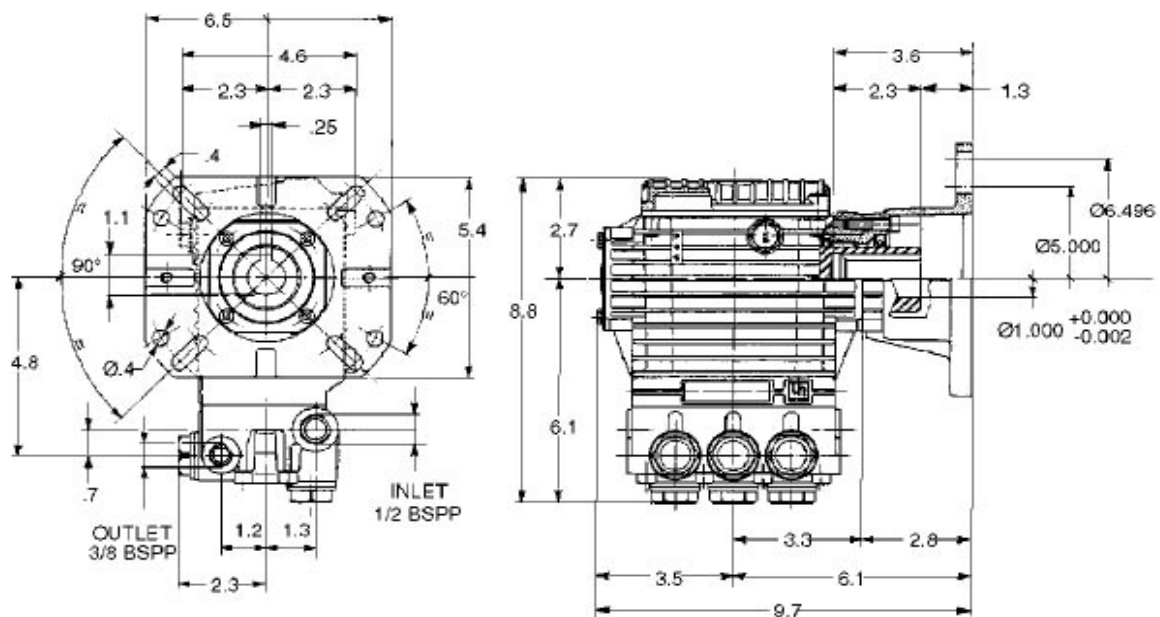
TORQUE SPECS*

Position	Ft. - lbs.	N-M	Position	Ft. - lbs.	N-M	Position	Ft. - lbs.	N-M
2	14.7	20	28	14.7	20	50	9.6	13
10	73.7	100	35	11.0	15	79	14.7	20
12	7.3	10	46	29.4	40	84	7.3	10
26	7.3	10	47	29.4	40			

*Decrease torque by 20% if threads are lubricated.

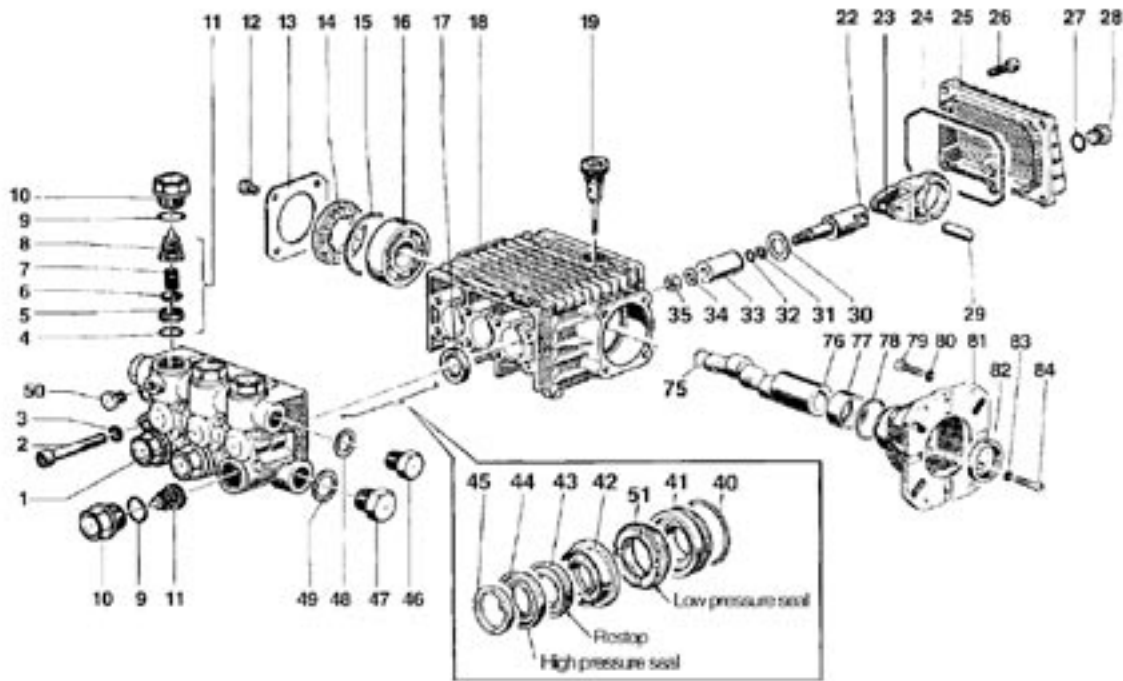
*For Position Number Reference Parts Breakdown Page 16.

MODEL 2500-5 DIMENSIONAL DRAWING



PARTS BREAKDOWN - MODEL 2500-5

PART NUMBER 163-062



ITEM	PART #	DESCRIPTION	KIT #	QTY.	ITEM	PART #	DESCRIPTION	KIT #	QTY.
1	44.1200.41	Manifold (15mm)		1	30	96.7350.00	Washer		3
2	99.3175.00	Screw		8	31	90.5022.00	Anti-Extrusion Ring		3
3	96.7014.00	Washer		8	32	90.3572.00	O-Ring		3
4	90.3841.00	O-Ring	123	6	33	52.0400.09	Plunger, 15mm		3
5	36.2003.66	Valve Seat	123	6	34	96.7008.00	Washer		3
6	36.2001.76	Valve	123	6	35	92.2216.00	Nut		3
7	94.7376.00	Spring	123	6	40	90.3612.00	O-Ring	125,130	3
8	36.2025.51	Valve Cage	123	6	41	44.0800.70	Packing Retainer	125,130	3
9	90.3847.00	O-Ring	124	6	42	52.2166.70	Intermediate Ring	89,130	3
10	98.2226.00	Cap Screw	124	6	43	90.2622.00	Packing	88,130	3
11	36.7115.01	Valve Assembly	123	6	44	90.2620.00	Packing	88,130	3
12	99.1807.00	Screw		4	45	51.1000.51	Head Ring	90,130	3
13	50.1500.74	Bearing Cover		1	46	98.2100.00	Cap Screw		1
14	44.2118.01	Spacer		1	47	98.2176.00	Cap Screw		1
15	90.4097.00	O-Ring		1	48	96.7380.00	Washer		1
16	91.8328.00	Ball Bearing		1	49	96.7514.00	Washer		1
17	90.1614.00	Oil Seal	23	3	50	98.1966.00	Cap Screw		1
18	44.0100.22	Crankcase		1	51	90.2617.00	Seal, Low Pressure	88,130	3
19	98.2103.00	Oil Dip Stick		1	75	90.0635.00	Retaining Ring		1
22	44.0500.66	Plunger Guide		3	76	44.0212.65	Crankshaft		1
23	44.0300.22	Connecting Rod		3	77	91.8568.00	Roller Bearing		1
24	90.3920.00	O-Ring		1	78	90.4097.00	O-Ring		1
25	44.1600.22	Rear Cover		1	79	99.2755.00	Screw, 5/16" x 1		4
26	99.1837.00	Screw		5		99.3345.00	Screw, 3/8" x 1		4
27	90.3585.00	O-Ring		1	80	96.7020.00	Washer, 08 mm		4
28	98.2041.00	Cap Screw		1		96.7104.00	Washer, 010 mm		4
29	97.7340.00	Pin		3	81	10.0518.22	Gas Flange		1

REPAIR KITS

KIT NUMBER	23	88	89	90	123	124	125	130
ITEM NO.S INCLUDED IN KIT	17	43,44, 51	42	45	4,5,6 7,8, (11)	9,10	40,41	40,41,42 43,44,45, 51
NUMBER OF ASSEMBLIES IN KIT	3	3/6	3	6	6	6	3	1
NUMBER OF CYLINDERS KIT WILL SERVICE	3	3	3	3	3	3	3	1

SPECIFICATIONS - MODEL 3000-4

PART NUMBER 163-063

Specifications	
Pump Model	3000-4
Maximum Volume	4.0 GPM
Maximum Discharge Pressure	3000 PSI
Horsepower	12.3 GBHP
Maximum Pump Speed	3400 RPM
Maximum Inlet Pressure	125 PSI
Maximum Inlet Vacuum	Flooded
Bore	.591 in./15 mm
Stroke (in./mm)	.394 in./10mm
Crankcase Oil Capacity	14.0 oz.
Maximum Fluid Temperature	165°F
Inlet Port Thread	1/2-14 BSPP-F
Discharge Port Thread	3/8-19 BSPP-F
Shaft Diameter	1.0 in./ 25.4 mm
Weight	18 lbs.
Dimensions	8.4 x 8.4 x 6.5 in.

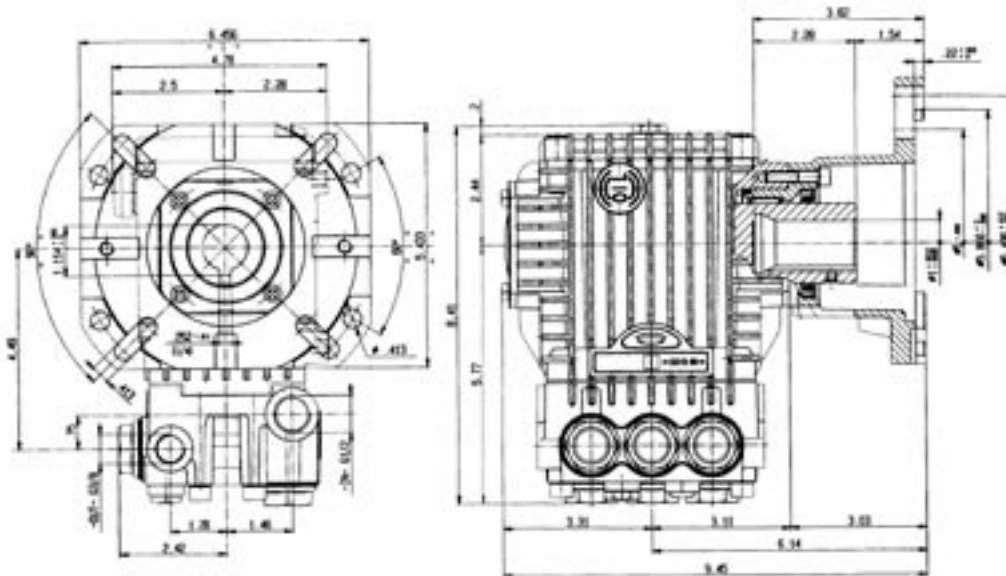
TORQUE SPECS*

Position	Ft. - lbs.	N-M	Position	Ft. - lbs.	N-M	Position	Ft. - lbs.	N-M
2	14.7	20	28	14.7	20	83	14.7	20
10	73.7	100	35	11.0	15	88	7.3	10
12	7.3	10	46	29.4	40			
26	7.3	10	47	29.4	40			

*Decrease torque by 20% if threads are lubricated.

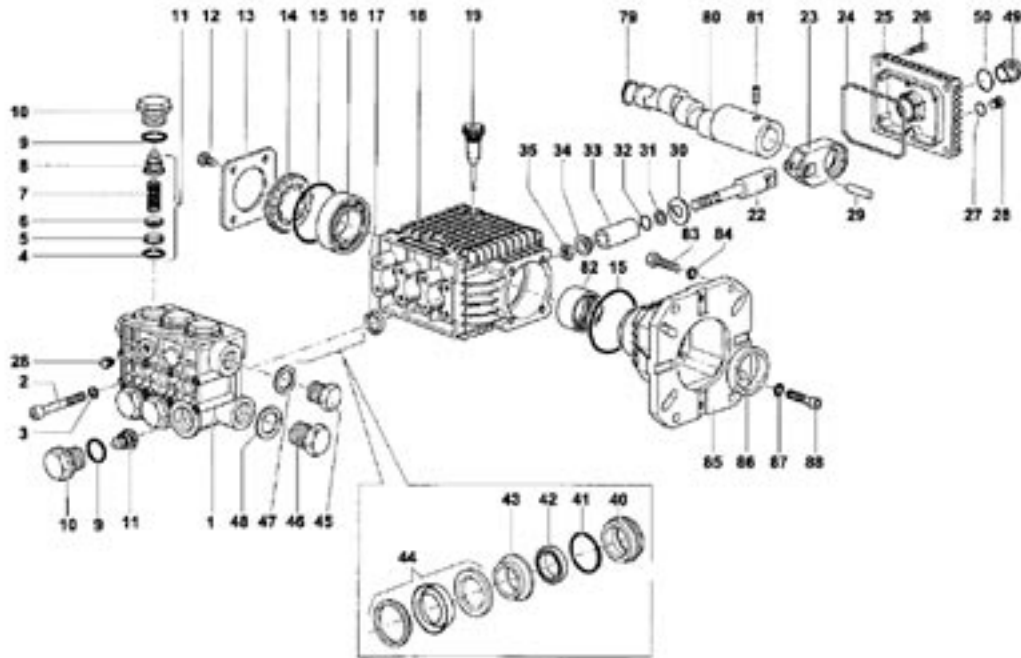
*For Position Number Reference Parts Breakdown Page 18.

MODEL 3000-4 DIMENSIONAL DRAWING



PARTS BREAKDOWN - MODEL 3000-4

PART NUMBER 163-063



ITEM	PART #	DESCRIPTION	KIT #	QTY.	ITEM	PART #	DESCRIPTION	KIT #	QTY.
1	63120041	Manifold, 15 mm		1	31	660024	Anti-extrusion Ring		3
2	99319200	Screw, M8 x 65		8	32	701009	O-ring		3
3	96701400	Lockwasher, M8.4		8	33	52040009	Ceramic Plunger, 15 mm		3
4	90384100	O-ring	123	6	34	44211570	Bushing		3
5	36200366	Valve Seat	123	6	35	92221500	Nut, M8		3
6	36200176	Valve Plate	123	6	40	63080070	Seal Retn'r, 15 mm	162,166	3
7	94737600	Spring	123	6	41	90360800	O-ring	166,167	3
8	3620551	Valve Cage	123	6	42	90260800	Seal, L.P, 15 mm	160,166	3
9	90384700	O-ring	124	6	43	63216070	Int. Ring, 15 mm	164,166	3
10	98222600	Valve Cap	124	6	44	90261200	Packing Ass'y, 15 mm	160,166	3
11	36711501	Valve Assembly	123	6	45	98210000	Plug, 3/8" G		1
12	99180700	Screw, M6 x 10		8	46	98217600	Plug, 1/2" G		1
13	50150074	Bearing Cover		1	47	96738000	Washer, M17.5		1
14	44211801	Oil Level Indicator		1	48	96751400	Washer, M21.5		1
15	90409700	O-ring		2	49	63210051	Oil Level Indicator		1
16	91832900	Ball Bearing		1	50	90405100	O-ring		1
17	90159500	Oil Seal	159	3	79	90063500	Retaining Ring		1
18	63010022	Crankcase		1	80	63027765	Crankshaft, 6.5		1
19	98210300	Oil Dip Stick		1		63028065	Crankshaft, 8		1
22	63050066	Plunger Guide		3		63028465	Crankshaft, 10		1
23	63030022	Connecting Rod		3	81	99179000	Screw, M6 x 6		1
24	90392000	O-ring, Cover		1	82	91856800	Roller Bearing		1
25	63160022	Rear Crankcase Cover		1	83	99334500	Screw, 3/8 x 1"		4
26	99183700	Screw, M6 x 14		4	84	96710400	Washer		4
27	701013	O-ring		1	85	10051822	Flange 1", gas engine		1
28	98204100	Plug, 1/4" G		2	86	90169000	Oil Seal		1
29	97733500	Connecting Rod Pin		3	87	96693800	Washer		4
30	96707500	Flinger Washer		3	88	99191200	Screw, M6 x 30		4

REPAIR KITS

KIT NUMBER	123	124	159	160	162	164	166
ITEM NO.S INCLUDED IN KIT	4,5,6,7,8 (11)	9,10	17	42,44	40	43	40,41,42,43,44
NUMBER OF ASSEMBLIES IN KIT	6	6	3	3	3	3	1
NUMBER OF CYLINDERS KIT WILL SERVICE	3	3	3	3	3	3	1

SPECIFICATIONS - MODEL 4000-3.5 PART NUMBER 163-064

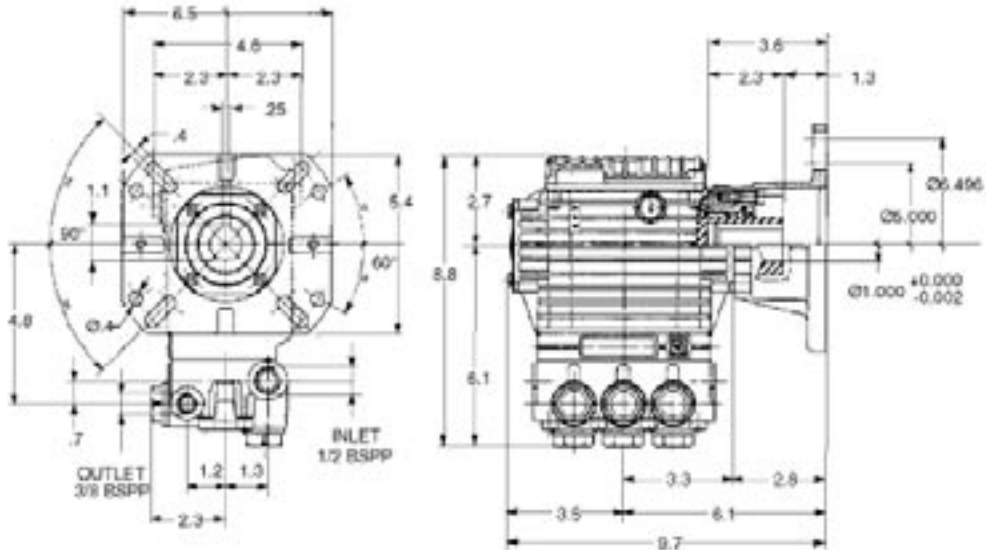
Specifications	
Pump Model	4000-3.5
Maximum Volume	3.5 GPM
Maximum Discharge Pressure	4000 PSI
Maximum Pump Speed	3400 RPM
Maximum Inlet Pressure	125 PSI
Maximum Inlet Vacuum	Flooded
Bore	.512 in./13 mm
Stroke (in./mm)	.433 in./11 mm
Crankcase Oil Capacity	14.0 oz.
Maximum Fluid Temperature	165°F
Inlet Port Thread	1/2-14 BSPP-F
Discharge Port Thread	3/8-19 BSPP-F
Shaft Diameter	1.0 in./ 25.4 mm
Weight	20 lbs.
Dimensions	8.8 x 9.7 x 6.5 in.

TORQUE SPECS*

Position	Ft. - lbs.	N-M	Position	Ft. - lbs.	N-M	Position	Ft. - lbs.	N-M
2	14.7	20	28	14.7	20	50	9.6	13
10	73.7	100	33	6.6	9	79	14.7	20
12	7.3	10	46	29.4	40	84	7.3	10
26	7.3	10	47	29.4	40	*Decrease torque by 20% if threads are lubricated.		

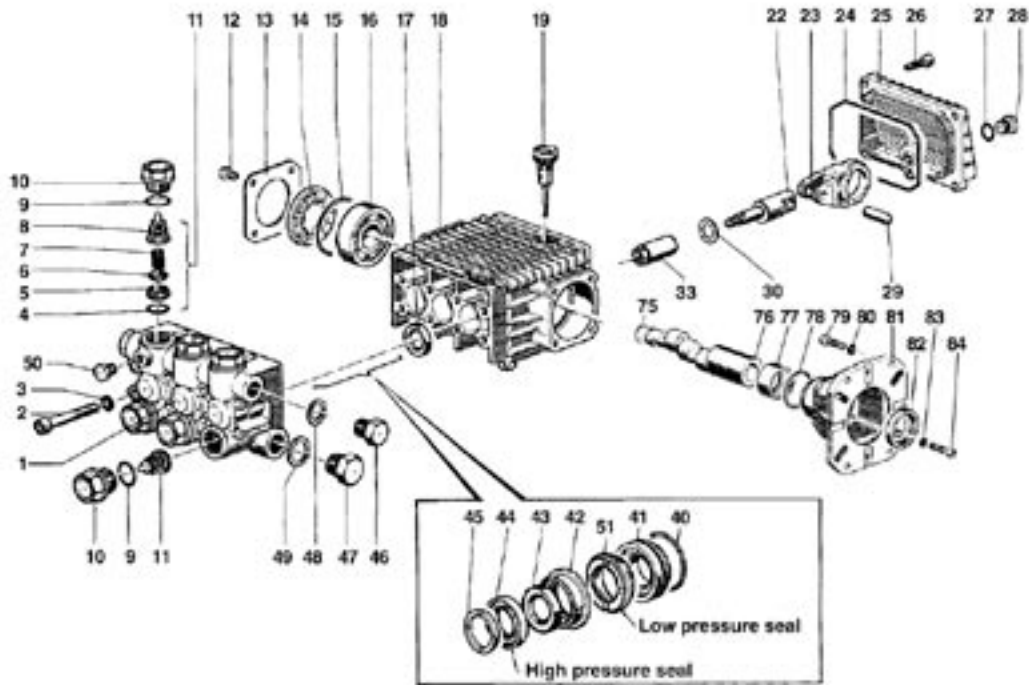
*For Position Number Reference Parts Breakdown Page 20.

MODEL 4000-3.5 DIMENSIONAL DRAWING



PARTS BREAKDOWN - MODEL 4000-3.5

PART NUMBER 163-064



ITEM	PART #	DESCRIPTION	KIT #	QTY.	ITEM	PART #	DESCRIPTION	KIT #	QTY.
1	44120641	Manifold		1	30	96696700	Washer		3
2	99317500	Screw		8	33	44040266	Plunger, 13 mm		3
3	96701400	Washer		8	40	90361200	O-Ring	152,156	3
4	90384100	O-Ring	123	6	41	44080370	Packing Retainer	152,156	3
5	36200366	Valve Seat	123	6	42	44216270	Intermediate Ring	154,156	3
6	36200176	Valve	123	6	43	90507600	Packing	153,156	3
7	94737600	Spring	123	6	44	90260200	Packing	153,156	3
8	36202551	Valve Cage	123	6	45	44100251	Head Ring	155,156	3
9	90384700	O-Ring	124	6	46	98210000	Cap Screw		1
10	98222600	Cap Screw	124	6	47	98217600	Cap Screw		1
11	36711501	Valve Assembly	123	6	48	96738000	Washer		1
12	99180700	Screw		4	49	96751400	Washer		1
13	50150074	Bearing Cover		1	50	98196600	Cap Screw		1
14	44211801	Spacer		1	51	90260300	Seal, Low Pressure	153,156	3
15	90409700	O-Ring		1	75	90063500	Retaining Ring		1
16	91832800	Ball Bearing		1	76	44021265	Crankshaft		1
17	90161400	Oil Seal	23	3	77	91856800	Roller Bearing		1
18	44010022	Crankcase		1	78	90409700	O-Ring		1
19	98210300	Oil Dip Stick		1	79	99275500	Screw, 5/16 x 1		4
22	44050166	Piston Guide		3		99334500	Screw, 3/8 x 1		4
23	44030022	Connecting Rod		3	80	96702000	Washer, 08 mm		4
24	90392000	O-Ring		1		96710400	Washer, 010 mm		4
25	44160022	Rear Cover		1	81	10051822	Gas Flange		1
26	99183700	Screw		5	82	90169000	Oil Seal		1
27	90358500	O-Ring		1	83	96693800	Washer		4
28	98204100	Cap Screw		1	84	99191200	Screw		4
29	97734000	Pin		3					

REPAIR KITS

KIT NUMBER	23	123	124	152	153	154	156
ITEM NO.S INCLUDED IN KIT	17	4,5,6,7,8,(11)	9,10	40,41	43,44,51	42	40,41,42,43,44,45,51
NUMBER OF ASSEMBLIES IN KIT	3	6	6	3	3	3	1
NUMBER OF CYLINDERS KIT WILL SERVICE	3	3	3	3	3	3	1

APPLICATION & INSTALLATION OF THE UNLOADER VALVE

APPLICATION

This product is to be used with clean, fresh water. For different or corrosive liquids, contact the Technical Support Department. With not-clean liquids, appropriate filtration should be installed. Select the valve based on the nominal operating rating: system rated pressure, maximum flow and maximum temperature.

Under no circumstances should the pressure of the system exceed the maximum rated pressure of any component. When installed on hot water cleaners, this valve is to be installed before the boiler.

INSTALLATION

On a system that produces hot water, consider installing safety devices which limit the accidental increase of the fluid temperature. Always install a safety valve to protect the operator and system. Choose a correct nozzle size, able to discharge regularly, on bypass, at least 5% of the total flow of the system, in order to achieve a constant pressure and avoid troublesome pressure spikes.

When the nozzle wears, the pressure drops. After installing a new nozzle, re-adjust the system to the original pressure setting.

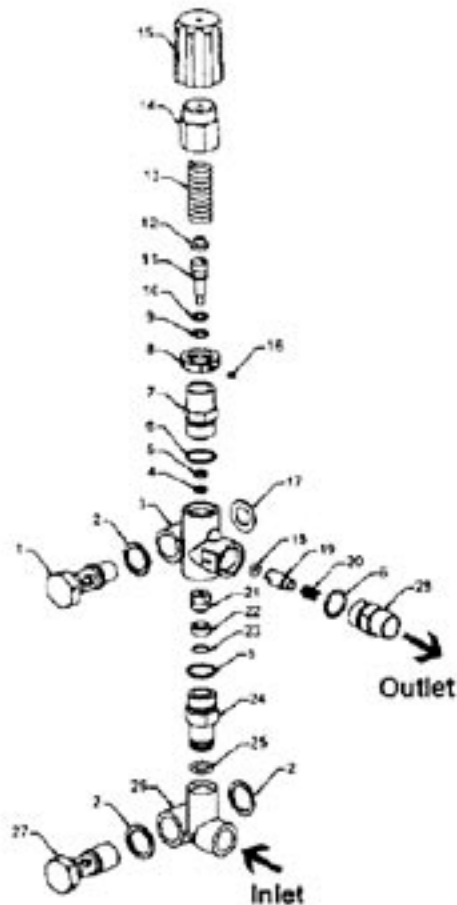
TROUBLESHOOTING UNLOADER VALVE

<u>PROBLEM</u>	<u>CAUSES</u>	<u>SOLUTION</u>
Unloader cycles	<ul style="list-style-type: none"> • Damaged seat or cone • Fitting Leaking • Restricted bypass 	<ul style="list-style-type: none"> • Replace • Check and renew • Clean or adapt
Unloader does not come up to pressure	<ul style="list-style-type: none"> • Unloader not properly sized • Foreign materials between seat and shutter • Piston O-Ring worn out • Nozzle worn out 	<ul style="list-style-type: none"> • Select proper spring or new unloader • Clean the seat • Replace • Replace
Pressure peaks	<ul style="list-style-type: none"> • Spring totally compressed • Excessive flow in bypass • There is not a min. 5% of total flow in bypass 	<ul style="list-style-type: none"> • Loosen and change nozzle size • Select another unloader • Adjust size of piping
Unloader does not bypass at low pressure	<ul style="list-style-type: none"> • Check valve jammed • Check valve O-Ring worn out • Foreign materials on valve 	<ul style="list-style-type: none"> • Clean or replace • Replace • Clean
Chemical Injector does not draw solution	<ul style="list-style-type: none"> • Foreign matter in chemical hose • Foreign matter in check valve • Insufficient pressure drop across injector 	<ul style="list-style-type: none"> • Clean • Clean • Put system in low pressure mode • Shorten discharge hose • Check spray tip

UNLOADER VALVE FOR MODELS: 1500-3 & 2500-3

Specifications	
Part Number	YVB135KDM
Maximum Volume	6.5 GPM
Rated Discharge Pressure	2300 PSI
Maximum Discharge Pressure	3400 RPM
Maximum Temperature	195° F
Port Size Inlet	3/8" BSPP-F
Port Size Outlet	3/8" BSPP-M
Dimensions	5.75 x 3.0 x 1.75 in.
Weight	1.4 lb.
Material	Brass, Stainless Steel Plastic, Buna-N

PARTS BREAKDOWN FOR YVB135KDM



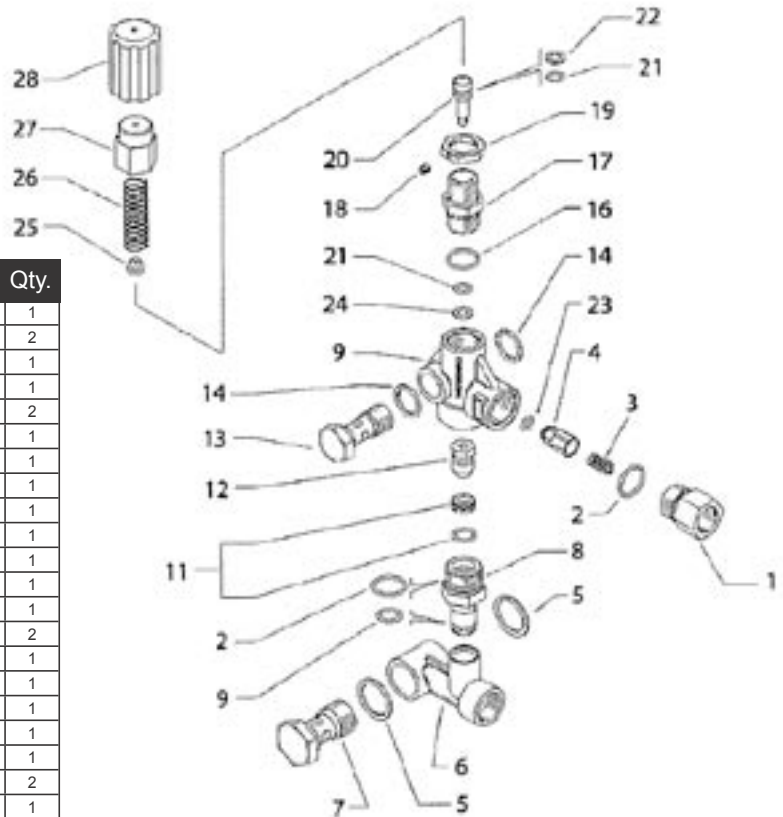
Item	Part #	Description	Kit	Qty
1	Y60.0385.31	Banjo Bolt 1/4" BSPP, Brass		1
2	Y14.4100.00	Washer, 3/8" BSPP, Steel With Rubber Insert		3
3	Y60.0801.35	Housing, Brass		1
4	Y10.4006.00	Back-Up Ring, 8.6 mm x 6 mm	*	1
5	Y10.3051.01	O-Ring, 70 Duro, Buna-N, .239" ID x .070" CS	*	1
6	Y10.3066.00	O-Ring, 70 Duro, Buna-N, .614" ID x .070" CS	*	3
7	Y60.0303.31	Piston Housing		1
8	Y60.0319.31	Lock Nut, M18 x 1		1
9	Y10.3055.00	O-Ring, 70 Duro, Buna-N, .301" ID x .070" CS	*	1
10	Y10.4008.00	Backup Ring, 11 mm x 8 mm	*	1
11	Y60.0331.51	Piston M5, Stainless Steel	*	1
12	Y60.0310.61	Spring Seat		1
13	Y60.0313.61	Spring, White		1
14	Y60.0304.31	Knob, Brass		1
15	Y60.0315.84	Adjustment Knob, Plastic		1
16	Y16.2100.00	Set Screw		1
17	Y14.3813.22	Washer, Aluminum, 13 mm x 22 mm		1
18	Y10.3125.00	O-Ring, 70 Duro, Buna-N, .157" ID x .098" CS	*	1
19	Y60.0308.31	Check Valve		1
20	Y60.0312.51	Spring, Stainless Steel, Check Valve		1
21	Y60.0333.21	Ball & Housing M5	*	1
22	Y60.0311.51	Seat, 12 mm x 7 mm	*	1
23	Y10.3005.00	O-Ring, 70 Duro, Buna-N, .394" ID x .039" CS	*	1
24	Y60.0382.31	Bypass Fitting		1
25	Y10.3109.96	O-Ring, 70 Duro, Viton, .406" ID x .094" CS		1
26	Y60.0821.35	Manifold, Brass		1
27	Y60.0803.31	Banjo Bolt 3/8" BSPP, Brass		1
28	Y60.0305.31	Outlet Fitting, 3/8" BSPP-M		
*	Y60.0398.24	Repair Kit		

UNLOADER VALVE FOR MODELS: 2500-5 & 3000-4

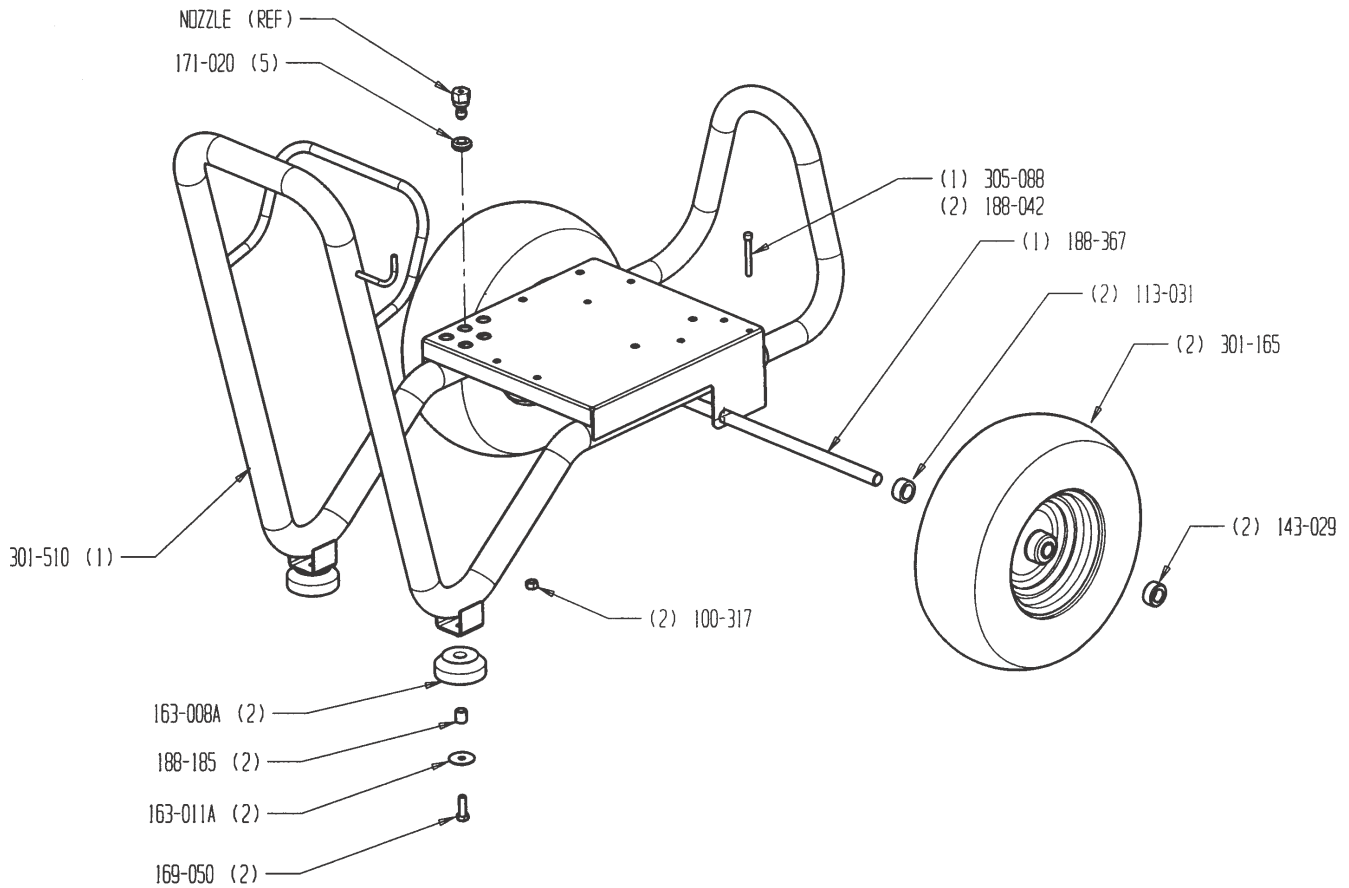
Specifications	
Part Number	YVB75KDMN
Maximum Volume	8.0 GPM
Rated Discharge Pressure	3200 PSI
Maximum Discharge Pressure	3650 RPM
Maximum Temperature	195° F
Port Size Inlet	1/2" BSPP-F
Port Size Outlet	3/8" BSPP-M
Dimensions	6.25 x 4.5 x 1.0 in.
Weight	2.0 lb.
Material	Brass, Stainless Steel Plastic, Buna-N

PARTS BREAKDOWN FOR YVB75KDMN

Item	Part #	Description	Qty.
1	Y60005831	Outlet Fitting, 3/8 BSP	1
2	Y10307002	O-Ring, .739 x .070	2
3	Y60005351	SS Spring, .453 x .028	1
4	Y60005231	Hex Check Valve	1
5	Y14410100	Gasket 1/2" BSP	2
6	Y60078335	Manifold, 1/2" BSPP-F	1
7	Y60100831	Hollow Screw, 1/2", Zinc	1
8	Y60093131	Seat Holder, L 16 mm	1
9	Y10310996	O-Ring, .406 x .095 Viton	1
10	Y60078435	Brass Valve Body	1
11	Y60025920	SS Seat, 8.5 mm	1
12	Y60170821	SS Shutter M6	1
13	Y60100731	Hollow Screw, 3/8" BSPP	1
14	Y14410000	Gasket, 3/8" BS	2
16	Y10306801	O-Ring, .676 x .070	1
17	Y60070831	Piston Housing	1
18	Y16210000	Set Screw, M4 x 4	1
19	Y60101831	Ring Nut, M18 x 1	1
20	Y60070451	SS Piston	1
21	Y10316900	O-Ring, .237 x .104	2
22	Y10402300	Backup Ring, .433 x .251	1
23	Y10321300	O-Ring, .237 x .119	1
24	Y10402400	Backup Ring, .451 x .276	1
25	Y60031061	Spring Seat, Zinc Plated	1
26	Y60031361	White Spring	1
27	Y60030431	Brass Cap	1
28	Y60031584	Plastic Knob	1



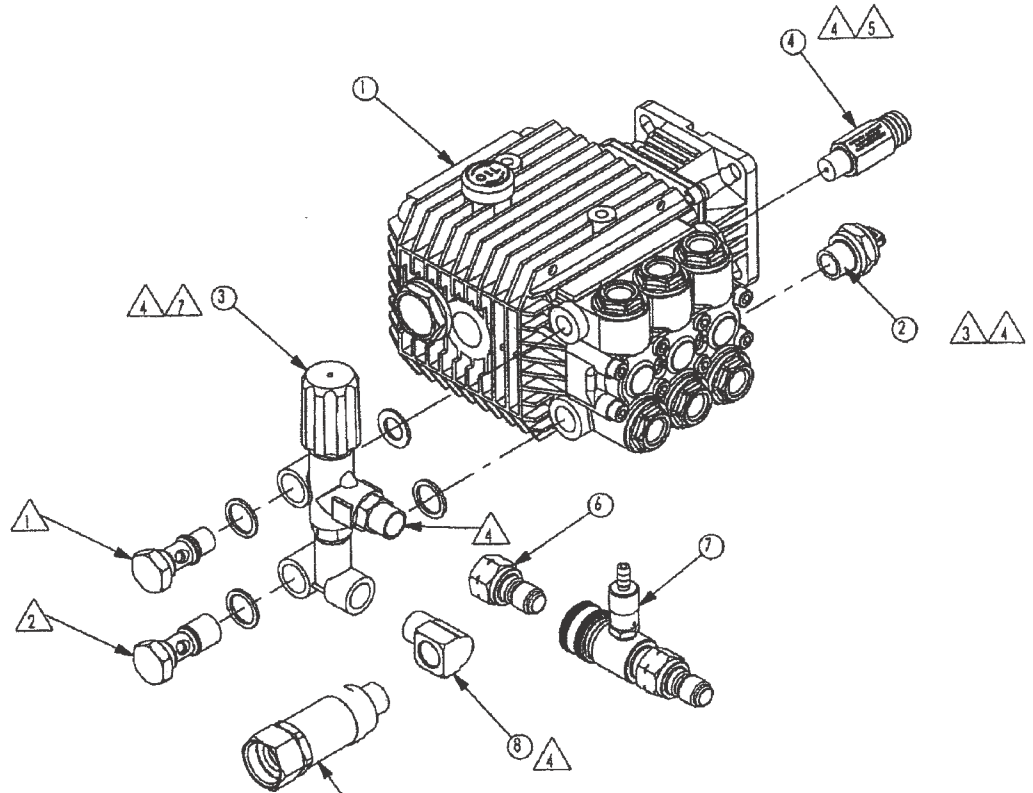
FRAME ASSEMBLY PART NO. 163-055



PART #	DESCRIPTION
100-317	Nut, 5/16-18" Centerlock
113-031	Spacer, 5/8 ID x 1.0"
188-367	Axel 5/8 x 21.81" Long
143-029	Set Collar 5/8" ID
163-008A	Rubber Foot
163-011A	Washer, 1.25 x .312"
169-050	Screw, 5/16-18 x 1.00 HX HD
171-020	Grommet 9307K25 McMaster
188-042	Nut, 1/4"-20 NY-LOCK
188-185	Spacer, .25 x .088W x .55"
301-165	Wheel, 13 x 500-6 Tubeless
301-510	Frame Weldment, LB/PW
305-088	Screw, 1/4"-20 x 2" SC HD

***Note:** For smaller frame part numbers Please call Airlessco's Technical Service at 805-523-0211 ext. 1751.

PUMP ASSEMBLY - PRESSURE WASHER MODEL 1500-3

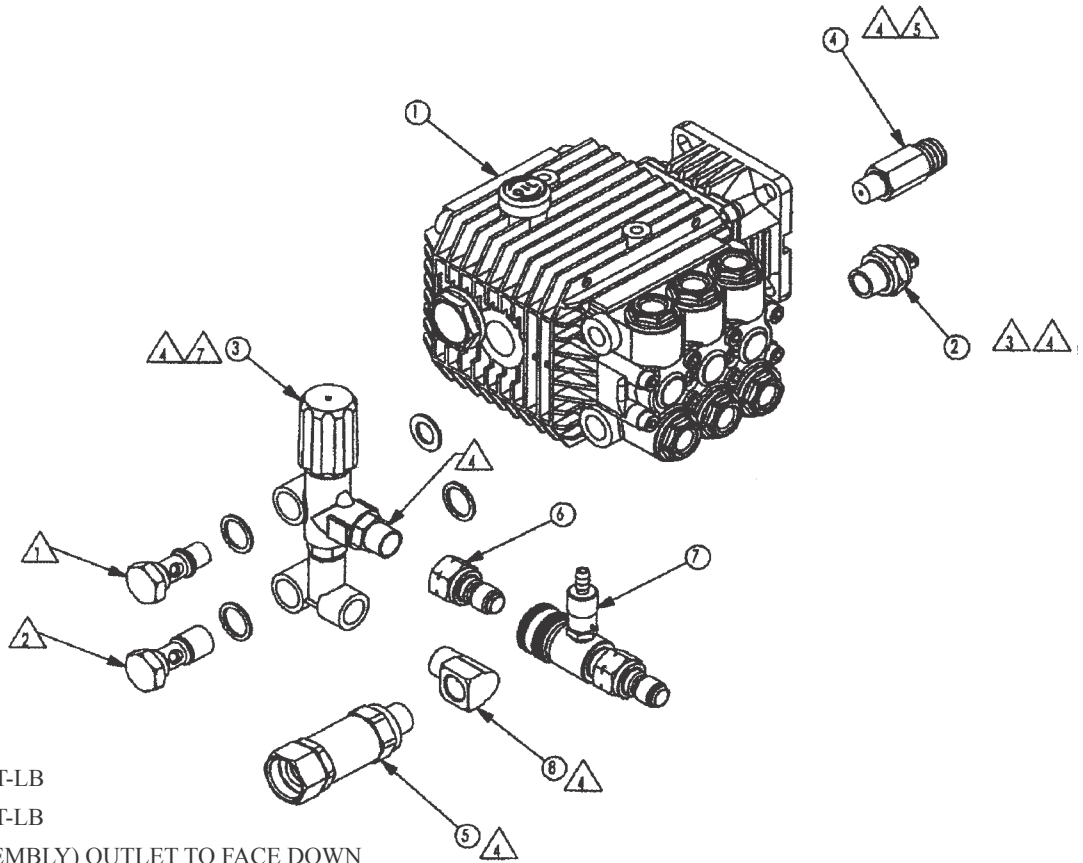


NOTES:

- △ TORQUE TO 24 FT-LB
- △ TORQUE TO 27 FT-LB
- △ ITEM 2 (PTP ASSEMBLY) OUTLET TO FACE DOWN
- △ AT ASSEMBLY APPLY ITEM 8 (PTFE TAPE) TO THREADS
- △ SET ITEM 4 (SAFETY RELIEF VALVE) TO OPEN AT 2200 \pm 50 PSI
- 6. TEST SPECIFICATIONS: (TEST WITH #4.5 NOZZLE)
FLOW RATE 2.8 GPM @ 3400 RPM
OPERATING PRESSURE 1500 \pm 50 PSI
LOCK UP PRESSURE: 1900 PSI MAXIMUM
- △ AFTER TEST APPLY ITEM 9 (ANAEROBIC THREAD SEALANT - BLUE)
TO THE SET SCREW OF ITEM 3 (UNLOADER) LOCKING RING A/R

ITEM	PART #	DESCRIPTION	QTY.
1	163-060	PUMP MODEL 1500-3	1
2	100557	PTP ASSEMBLY 3/8" NPTF	1
3	YVB135KDM	UNLOADER - 6.6 GPM - 2300PSI	1
4	GRV36614	1/4 NPT, 3000 PSI, SAFETY RELIEF ASS'Y	1
5	100650	ASSEMBLY, INLET FILER, 3/8 NPT	1
6	520135	NIPPLE, 3/8 QD x 3/8 NPTF	1
7	100634	INJ. ASSEMBLY, ADJ. .083, 3/8 QD	1
8	680016	ELBOW, 90°, 3/8 NPT-FX 3/8 NPT-M	1
9	800013	PTFE THREAD SEALING TAPE 1/2"	A/R
10	800001	ANAEROBIC THREAD SEALANT- BLUE	A/R
11	600035	PARTITION 10 3/8 x 40 5/8	A/R
12	600036	PARTITION 10 3/8 x 35 7/16	A/R
13	600037	PAD 35 1/4 x 40 9/16	A/R

PUMP ASSEMBLY - PRESSURE WASHER MODEL 2500-3

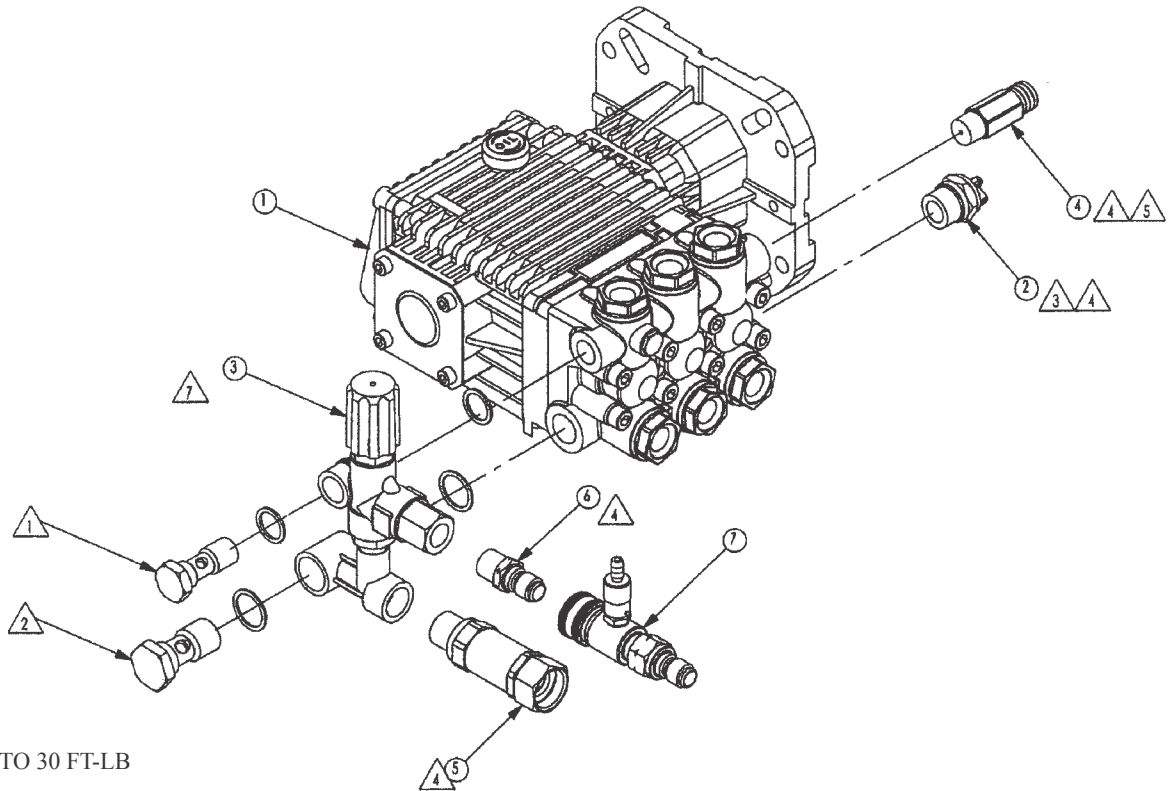


NOTES:

- △ TORQUE TO 24 FT-LB
- △ TORQUE TO 27 FT-LB
- △ ITEM 2 (PTP ASSEMBLY) OUTLET TO FACE DOWN
- △ AT ASSEMBLY APPLY ITEM 8 (PTFE TAPE) TO THREADS
- △ SET ITEM 4 (SAFETY RELIEF VALVE) TO OPEN AT 2600 ± 50 PSI
- 6. TEST SPECIFICATIONS: (TEST WITH #4.0 NOZZLE)
FLOW RATE 3.0 GPM @ 3400 RPM
OPERATING PRESSURE 2000 ± 50 PSI
LOCK UP PRESSURE: 2400 PSI MAXIMUM
- △ AFTER TEST APPLY ITEM 9 (ANAEROBIC THREAD SEALANT - BLUE) TO THE SET SCREW OF ITEM 3 (UNLOADER) LOCKING RING A/R

ITEM	PART #	DESCRIPTION	QTY.
1	163-061	PUMP MODEL 2500-3	1
2	100557	PTP ASSEMBLY 3/8" NPTF	1
3	YVB135KDM	UNLOADER - 6.6 GPM - 2300PSI	1
4	GRV36614	1/4 NPT, 3000 PSI, SAFETY RELIEF ASS'Y	1
5	100650	ASSEMBLY, INLET FILER, 3/8 NPT	1
6	520135	NIPPLE, 3/8 QD x 3/8 NPTF	1
7	100634	INJ. ASSEMBLY, ADJ. .083, 3/8 QD	1
8	680016	ELBOW, 90°, 3/8 NPT-FX 3/8 NPT-M	1
9	800013	PTFE THREAD SEALING TAPE 1/2"	A/R
10	800001	ANAEROBIC THREAD SEALANT- BLUE	A/R
11	600035	PARTITION 10 3/8 x 40 5/8	A/R
12	600036	PARTITION 10 3/8 x 35 7/16	A/R
13	600037	PAD 35 1/4 x 40 9/16	A/R

PUMP ASSEMBLY - PRESSURE WASHER MODEL 2500-5

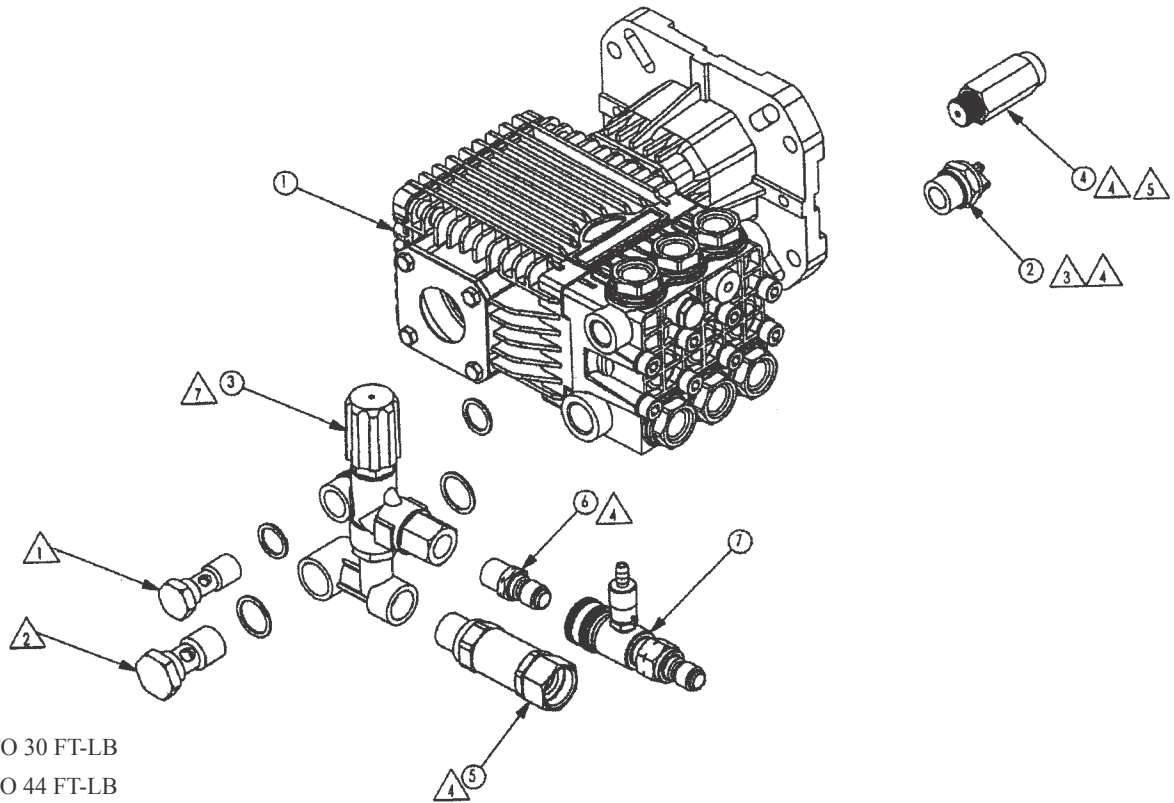


NOTES:

- △ TORQUE TO 30 FT-LB
- △ TORQUE TO 44 FT-LB
- △ ITEM 2 (PTP ASSEMBLY) OUTLET TO FACE DOWN
- △ AT ASSEMBLY APPLY ITEM 9 (PTFE TAPE) TO ITEM 2 (PTP), ITEM 4 (SAFETY RELIEF VALVE), ITEM 5 (FILTER) AND ITEM 6 (NIPPLE).
- △ SET ITEM 4 (SAFETY RELIEF VALVE) TO OPEN AT 4700 ± 50 PSI
- 6. TEST SPECIFICATIONS: (TEST WITH #5.5 NOZZLE)
FLOW RATE: 4.6 GPM @ 3400 RPM
OPERATING PRESSURE 2500 ± 100 PSI
LOCK UP PRESSURE: 4500 PSI MAXIMUM
- △ AFTER TEST APPLY ITEM 12 (ANAEROBIC THREAD SEALANT - BLUE) TO THE SET SCREW OF ITEM 3 (UNLOADER) LOCKING RING A/R

ITEM	PART #	DESCRIPTION	QTY.
1	163-062	PUMP MODEL 2500-5	1
2	100558	PTP ASSEMBLY 1/2" NPTF	1
3	YVB135KDMN	UNLOADER - 10 GPM - 4050 PSI	1
4	100534	3/8 NPT, 6000 PSI, SAFETY RELIEF VALVE	1
5	100649	ASSEMBLY, INLET FILER, 1/2 NPT	1
6	520136	NIPPLE, 3/8 QD x 3/8 NPT-M 416 SS	1
7	100634	INJ. ASSEMBLY, ADJUSTABLE .083	1
8	800013	PTFE THREAD SEALING TAPE 1/2"	A/R
9	800001	ANAEROBIC THREAD SEALANT- BLUE	A/R
10	600035	PARTITION 10 3/8 x 40 5/8	A/R
11	600036	PARTITION 10 3/8 x 35 7/16	A/R
12	600037	PAD 35 1/4 x 40 9/16	A/R

PUMP ASSEMBLY - PRESSURE WASHER MODEL 3000-4

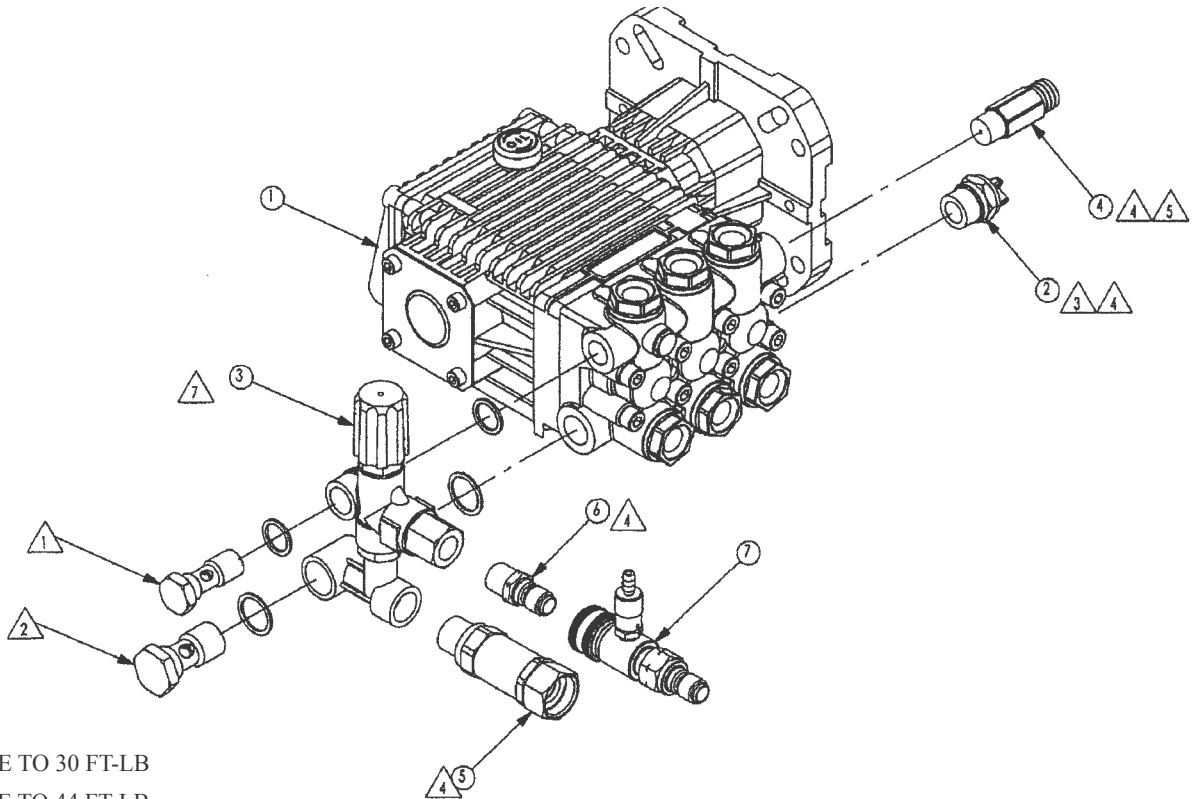


NOTES:

- △ TORQUE TO 30 FT-LB
- △ TORQUE TO 44 FT-LB
- △ ITEM 2 (PTP ASSEMBLY) OUTLET TO FACE DOWN
- △ AT ASSEMBLY APPLY ITEM 9 (PTFE TAPE) TO ITEM 2 (PTP), ITEM 4 (SAFETY RELIEF VALVE), ITEM 5 (FILTER) AND ITEM 6 (NIPPLE).
- △ SET ITEM 4 (SAFETY RELIEF VALVE) TO OPEN AT 3700 ± 50 PSI
- 6. TEST SPECIFICATIONS: (TEST WITH #4.5 NOZZLE)
FLOW RATE: 3.85 MIN. GPM @ 3400 RPM
OPERATING PRESSURE 3000 ± 100 PSI
LOCK UP PRESSURE: 3500 PSI MAXIMUM
- △ AFTER TEST APPLY ITEM 12 (ANAEROBIC THREAD SEALANT - BLUE) TO THE SET SCREW OF ITEM 3 (UNLOADER) LOCKING RING A/R

ITEM	PART #	DESCRIPTION	QTY.
1	163-063	PUMP MODEL 3000-4	1
2	100558	PTP ASSEMBLY 1/2" NPTF	1
3	YVB135KDMN	UNLOADER - 10 GPM - 4050 PSI	1
4	100534	3/8 NPT, 6000 PSI, SAFETY RELIEF VALVE	1
5	100649	ASSEMBLY, INLET FILER, 1/2 NPT	1
6	520136	NIPPLE, 3/8 QD x 3/8 NPT-M 416 SS	1
7	100634	INJ. ASSEMBLY, ADJUSTABLE .083	1
8	800013	PTFE THREAD SEALING TAPE 1/2"	A/R
9	800001	ANAEROBIC THREAD SEALANT- BLUE	A/R
10	600035	PARTITION 10 3/8 x 40 5/8	A/R
11	600036	PARTITION 10 3/8 x 35 7/16	A/R
12	600037	PAD 35 1/4 x 40 9/16	A/R

PUMP ASSEMBLY - PRESSURE WASHER MODEL 4000-3.5



NOTES:

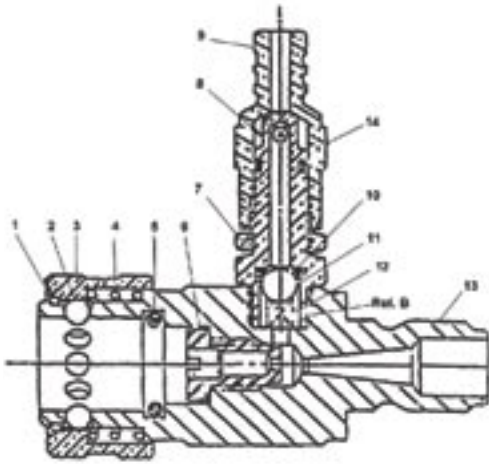
- △ TORQUE TO 30 FT-LB
- △△ TORQUE TO 44 FT-LB
- △△△ ITEM 2 (PTP ASSEMBLY) OUTLET TO FACE DOWN
- △△ AT ASSEMBLY APPLY ITEM 9 (PTFE TAPE) TO ITEM 2 (PTP), ITEM 4 (SAFETY RELIEF VALVE), ITEM 5 (FILTER) AND ITEM 6 (NIPPLE).
- △△△ SET ITEM 4 (SAFETY RELIEF VALVE) TO OPEN AT 4700 ± 50 PSI
- 6. TEST SPECIFICATIONS: (TEST WITH #3.5 NOZZLE)
 FLOW RATE: 3.5 GPM @ 3400 RPM
 OPERATING PRESSURE 4000 ± 100 PSI
 LOCK UP PRESSURE: 4500 PSI MAXIMUM
- △ AFTER TEST APPLY ITEM 12 (ANAEROBIC THREAD SEALANT - BLUE) TO THE SET SCREW OF ITEM 3 (UNLOADER) LOCKING RING A/R

ITEM	PART #	DESCRIPTION	QTY.
1	163-064	PUMP MODEL 4000-3.5	1
2	100558	PTP ASSEMBLY 1/2" NPTF	1
3	YU4050KDM	UNLOADER - 10 GPM - 4050 PSI	1
4	100534	3/8 NPT, 6000 PSI, SAFETY RELIEF VALVE	1
5	100649	ASSEMBLY, INLET FILER, 1/2 NPT	1
6	520136	NIPPLE, 3/8 QD x 3/8 NPT-M 416 SS	1
7	100634	INJ. ASSEMBLY, ADJUSTABLE .083	1
8	800013	PTFE THREAD SEALING TAPE 1/2"	A/R
9	800001	ANAEROBIC THREAD SEALANT- BLUE	A/R
10	600035	PARTITION 10 3/8 x 40 5/8	A/R
11	600036	PARTITION 10 3/8 x 35 7/16	A/R
12	600037	PAD 35 1/4 x 40 9/16	A/R

DOWNSTREAM CHEMICAL INJECTORS - OPTIONAL ITEM

FEATURES

1. Streamline your combination injector/quick disconnect assembly with this latest one piece style design.
2. Brass construction with stainless steel ball.
3. Inconel Spring
4. Built in 3/8" socket and 3/8" plug available with inlet or discharge on plug side of assembly.



Item #	Part #	Description & Number Req'd
1	7219	Snap Ring (1)
2	7087D2	Ball (9)
3	7201	Sleeve (1)
4	7199	Spring (1)
5*	7109D40	O-Ring (1)
6	7268	Orifice #3 (1)
7	7488	Jam Nut (1)
8	7487	Retainer Barb (1)
9	7486	Adjusting Barb (1)
10*	7109D22	O-Ring (1)
11*	7087D6	Ball (1)
12*	5037D5	Spring (1)
13	7524	Body (1)
14*	7109D28	O-Ring (1)
Ref. B	Apply Loctite #242; Torque to 100 in./lb.	
*INDICATES ITEMS IN REPAIR KIT 7525K		

AIRLESSCO PART NUMBER USED ON MODEL NUMBER

* For older pressure washer models only. New models come equipped with injector.

176-030B	Adjust Chemical Injector	PWD 3000-3.5 PWD 2000-4 PWD 2500-5
176-030C	Adjust Chemical Injector	PWD 3000-6

REPAIR KIT

Part Number 176-050 Chemical Injector Repair Kit 7525K
Use chemical injectors in conjunction with nozzle 78-40300.

OPERATING INSTRUCTIONS

Fit chemical injector on downstream side of pump and regulator.
Connect chemical injector to lance, open valve on injector and operate.
Wash from the bottom up and rinse from the top down.
Clean injector after use by sucking clean water through the injector.
DO NOT USE WITH PAINTS OR ACIDS.



SANDBLAST KIT - OPTIONAL ITEM

PART NUMBER 176-040

For suction fed injection of sand into the water stream for abrasive cleaning. (High pressure spray tip not included.)

SPECIFICATIONS

Maximum Pressure	3500 PSI (241 bar)
Maximum Temperature	200 F (93 C)
Weight	13 lbs. (5.9 kg)
Material	Plated Carbon Steel, Aluminum, Carbide, Rubber.



PARTS LIST

ITEM	PART #	DESCRIPTION	QTY.
1	103202	Nozzle, Sand	1
2	700005	Gasket	1
3	103201	Housing, Mixing Head	1
4	202003	Thumbscrew	1
5	530010	Adapter, Tip	1
6	176-006	Coupler, Male, Quick Disconnect	1
7	680001	Hosebarb	1
8	176-018	Hose Clamp	2
9	176-016	Hose, Sand	1
10	176-017	Probe, Sand	1

*P.N. 10200001 Sandblasting kit complete

** Gun, Wand not included.

(A 15 spray angle spray tip of the appropriate orifice size for your equipment must be used for proper operation.)

OPERATION

1. Place the sand induction probe in the sand supply container.
2. Connect and open the water supply line before starting the unit.
3. Trigger the gun to relieve air in the equipment.
4. Start the unit.
5. Trigger the gun to activate the spray.

CAUTION

Always test spray on scrap material first! High pressure spray can damage the surface if the sandblaster is held too close.

6. Check the distance you will need to hold the spray nozzle from the surface by starting to spray at the scrap of material from a distance of several feet. Gradually move closer, checking frequently to see if the high pressure spray is damaging the surface.
7. See Application below for the type of sand recommended for your work surface.

NOTES: Always point the sand nozzle downward when not spraying. This will prevent water from entering the sand supply. If water does get into the sand supply hose, remove the probe from the sand, hold gun trigger open, and let the hose air dry. Always be sure sand hose is dry before using.

- Keep the sand covered to prevent the over spray from wetting the sand.
- Do not allow small fragments of sand bags to fall into sand supply. Small paper fragments could prevent sand flow.

SHUTDOWN

After sandblasting operation is complete, remove the probe from the sand, trigger the gun to clear the hose and probe of sand. Remove the hose from the mixing head and rinse with water to remove all the sand, before storage. Before using the gun for other applications be sure to reinstall the tip guard, nozzle and male quick coupler.

SANDBLASTING APPLICATION

APPLICATION

SAND USAGE: with 2500 PSI – 5 GPM, 9 lb. per min.

<u>Removal of:</u>	<u>Sand Mesh</u>	<u>Sand Type</u>	<u>Blasting Angle</u>
Paint from Metal	20/40	Round Silica	0-30 degrees
Paint from Masonry	20/40	Round Silica	0-20 degrees
Rubber Base Paint from Masonry	10/35	Angular	0-15 degrees
Paint from Wood (Coarse, rough, cut)	40/60	Round	1-10 degrees
Paint from Wood (Smooth, drift wood)	20/40	Round	1-10 degrees
Metal Scale	20/40	Round	0-15 degrees
Rust	16/50	Angular	0-25 degrees

TROUBLESHOOTING - SANDBLASTING

NO SAND

<u>Problem</u>	<u>Solution</u>
Plugged Sand Probe	Clear obstruction
Plugged Gun	Inspect mixing chamber
Wet Sand	Dry or replace sand
Low Vacuum	Air leak in system - fix

NOT ENOUGH SAND

<u>Problem</u>	<u>Solution</u>
Incorrect Water Nozzle	Change to 15° nozzle
Collapsed Hose	Replace hose/remove restriction
Partial Obstruction to Probe	Clear rocks/paper from probe inlet
Low Sand Level	Change probe to new bag of sand

LIMITED WARRANTY

Durotech Co. warrants the Airlessco spray unit to be free of defects in material and workmanship under normal use and service in accordance with Durotech Co.'s recommendations. This warranty extends to the original purchaser for a period of twelve (12) months from date of purchase. The warranty registration card must be signed by the distributor and the original purchaser and then returned to Durotech Co. within ten (10) days from date of purchase, or otherwise warranty is void. This warranty does not apply to damages or wear caused by abrasion, corrosion, misuse, negligence, accident, faulty installation or tampering in a manner to impair normal operation. If inspection by Durotech Co. or authorized distributor does not disclose any defect in workmanship or material, repair will be made at a reasonable charge to the customer. The foregoing warranty to repair or replace is the only warranty, either expressed, implied or statutory, upon which said unit is sold. All other damages, liabilities or warranties, statutory or otherwise, are hereby expressly waived by the purchaser.

Pressure Washer Warranty Periods

Pump- 12 Months Accessories- 3 Months Gear Box- 12 Months
Airlessco Warranty- 12 Months Engine- As per engine manufacturer warranty

Model # _____ Purchased by: _____
Serial # _____ Address: _____
Pump # _____
Part # _____ Distributor: _____
Engine # _____ Address: _____
Date of Purchase: _____

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This warranty registration section must be filled and signed by the distributor and purchaser and returned to Durotech Co. within ten (10) days from the date of purchase, otherwise warranty is void.

Model # _____ Purchased by: _____
Serial # _____ Address: _____
Pump # _____
Part # _____ Distributor: _____
Engine # _____ Address: _____
Date of Purchase: _____

I hereby certify that I have received:
1. Airlessco spray unit in good order;
2. Safety and operating instructions from distributor.

I hereby certify that I have given safety and operating instructions to the purchaser.

Purchaser's Signature

Distributor's Signature
(Authorized Representative)



* Note: Keep this top portion in the manual for future reference on the Limited Warranty.

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*Note: Cut and send this portion of the page to register your warranty to:

Airlessco by Durotech Co.
P.O. Box 8006
Moorpark, CA 93020-8006

PRESSURE WASHER ACCESSORIES

PRESSURE WASHER GUN

PN 176-070 Gun complete with fittings and wand



PRESSURE WASHER CLEANING NOZZLES

Pressure washer nozzles come in several sizes and spray angles. They are sized by the volume of water they will allow through the orifice, so you can change the width of the spray but not the volume. For more power use a narrow nozzle and move close to the work. For a large area use a wider nozzle. The most effective cleaning range is within 12 inches of the surface.

PN 176-069 Pressure washer nozzles for 3.5 g.p.m. units.
PN 176-065 Pressure washer nozzles for 4.0 g.p.m. units.
PN 176-066 Pressure washer nozzles for 5.0 g.p.m. units.
PN 176-067 Pressure washer nozzles to use in conjunction with a chemical injector.

**4 pack of quick disconnect tips includes 0, 15, 25 & 40 degrees.



TURBO NOZZLES

Turbo nozzles are zero degree nozzles that spin and cause the high pressure stream to be broken up. This action intensifies the cleaning power of the water. The circular pattern hits a wide area and also helps remove loose paint and dirt. Turbo nozzles help smaller pressure washers perform like larger models.

PN 176-061 Turbo nozzle for 3.5 to 4 GPM machines
PN 176-062 Turbo nozzle for 5 to 6 GPM machines
PN 176-025 Repair Kit for 176-051 - Old Model
PN 176-055 Repair Kit for 176-052 - Old Model
PN 176-063 Repair Kit for 176-061
PN 176-064 Repair Kit for 176-062



PRESSURE WASHER ACCESSORIES

PRESSURE WASHER HOSE

Pressure washer hose comes with 3/8" male fittings, with one end having a swivel to connect to the gun. The hose has a wire braid for strength and rubber outer cover to resist abrasion. For convenience you can use quick disconnects at each end of the hose, gun and pump.

PN 176-002 3/8" x 50' 3000 PSI hose
PN 176-022 3/8" x 50' 4500 PSI hose



HIGH PRESSURE QUICK DISCONNECT FITTINGS

Quick disconnects are used to make connecting and disconnecting hoses, guns and tips, quick and easy. Quick disconnects are only for use with pressure washers and should not be used on an airless spray hose.

PN 100-020 Thread 3/8" F with M nipple, use on the hose and high pressure outlet.
PN 100-022 Thread 3/8" F with F coupler, use on the other end of the hose.
PN 100-021 Thread 3/8" M with F coupler, for the gun handle.
PN 176-005 Thread 1/4" F with F coupler, for the wand.
PN 176-004 Thread 1/4" M with M nipple, for the tip.



PRESSURE WASHER TEST GAUGE

High pressure liquid filled gauges are used to test the working pressure of a pressure washer. They are designed to work to a maximum pressure of 4000 to 5000 psi.

PN 100-039 Test gauge assembly for pressure washers complete with quick disconnects.

