MODELS AND SPECIFICATIONS

MODEL	PWC 1500-3	PWC 1500-4
PART NO.	193-002	163-002
MAX PSI	1500	1500
MAX GPM	3 GPM	4 GPM
MIN TIP SIZE	4	5
ENGINE HP	5 HP	5 HP
WEIGHT	66 LBS	79 LBS
NOZZLES	THREE-0°,25°,40° FAN	THREE-0°,25°,40° FAN
PUMP	TT9071GBF	T991
UNLOADER	W1-0	W2
GEAR REDUCER		GR750
STARTING	——————RECOIL START——————	

OIL REQUIREMENTS:

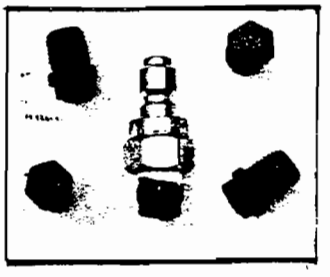
PUMP	SAE 10W/30
GEAR REDUCER	90W HYPOID GEAR LUBE NON FOAM
ENGINE	SAE 10W/40 DETERGENT

TIP ORDERING CHART - STATE MODEL WHEN ORDERING TIPS

AIRLESSCO PRESSURE WASHERS

NOZZLE PART NO.	DEGREE OF FAN		193-002 1500-3	163-004 1500-4
78-00040	0		X	
78-00050	0			X
78-00060	0			
78-15040	15		X	
78-15050	15			
78-15060	15			
78-25040	25			
78-25050	25			X
78-25060	25			
78-40040	40			
78-40050	40			
78-40060	40			
78-40300	40	CHEM. INJ.	X	X

Part No. 78-xxxx, PW. Nozzle &
Part No. 176-004, Quick Disconnect

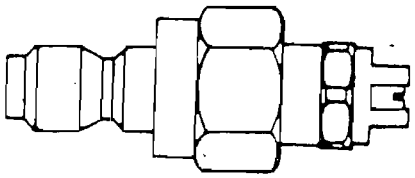


5397 COMMERCE AVENUE, MOORPARK, CALIFORNIA 93021-1764 • (805) 523-0211

TIPS: (OR NOZZLES)

THE QUICK COUPLER 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 quick coupler into place can result in personal injury and loss of "O" ring on 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 that moving the wand closer to and farther from the area to be cleaned will also change the way the machine will work for you.

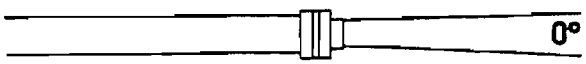
You should always start each new job away from the target and move closer as you see the need. Be careful: you can damage some surfaces if the pressure is too concentrated and too close.

AIRLESSCO PRESSURE WASHER NOZZLE SELECTION GUIDE

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

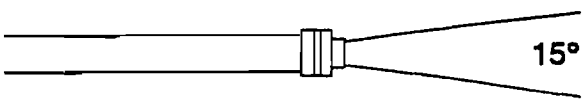
THE 0 DEGREE NOZZLE

This is a blasting nozzle. It delivers a very concentrated stream of water. Care should be used to avoid damaging wood or fragile surfaces.
WARNING: This nozzle (0 degree) must not be used on rental machines supplied to homeowners or non-contractors.

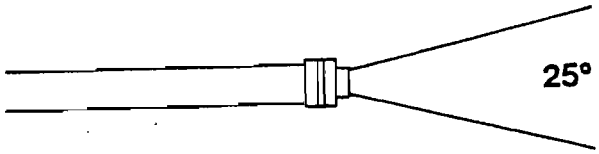


THE 15 DEGREE NOZZLE - 3-4"

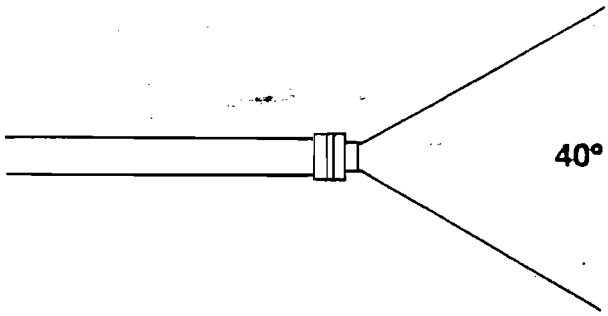
This is a chiseling nozzle. The spray should be directed at a 45 degree angle to the surface and used like a scraper to remove paint, grease and dirt. This is the most used tip of all.



THE 25 DEGREE NOZZLE - 5-6"
This is a flushing nozzle. It gives wider coverage and is used when the area being cleaned would be damaged by a narrower tip.



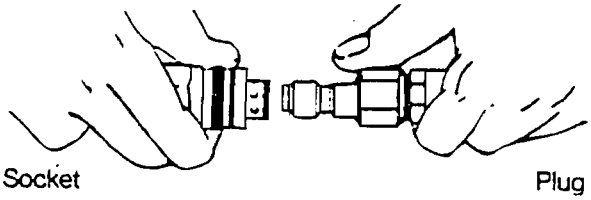
THE 40 DEGREE NOZZLE - 8 - 10"
This is a wash nozzle. Its wide spray pattern disperses the water pressure over a large area and is recommended for rinsing and moderate washing.



TIPS WILL WEAR in time. The more you use a tip the more it will wear. A worn tip will cause a significant DROP IN PRESSURE. Replace your tips as needed.

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. "Snap" home the collar. 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 than 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

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 you water conditions are worse than normal it should be cleaned more often.

HIGH PRESSURE HOSE:

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

SPRAYGUN ST-2000

The gun included with your machine should always be treated as a loaded firearm.

HIGH PRESSURE WATER IS DANGEROUS and should never be directed at any person or any parts of your body.

Your gun has safety features you should use. The Trigger Lock should be in place any time the gun is not being used. The gun also has a spring loaded trigger so that is closed when the trigger is released.

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 AIRLESSCO 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 or detergent.

If you need to use SURFACES CONDITIONERS SUCH AS SOAPS AND DEGREASERS YOU MUST USE A CHEMICAL INJECTOR.

DO NOT PUMP ANY SURFACE CONDITIONERS 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:

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, graffitti, blasting painted surfaces down to metal for repainting.

EQUIPMENT CARE AND MAINTENANCE

PRESSURE PUMP:
- Use SAE 10/30 or SAE 20/30 or SAE 30 non detergent, non foaming oil
- Change oil after first fifty (50) hours of operation; thereafter every five-hundred (500) hours of operation.
- Check oil level before starting: the oil must be in line with the red spot in the center of the sight glass.
- Never run the pump dry: always turn on the water supply before starting the pump.
- Never pump chemicals or acids through your pump, use a chemical injector. Pump must be protected from freezing conditions.(See instructions below)

GASOLINE ENGINE:
- Read your engine operation manual for type of oil, when to change oil and preventative maintenance.
- Never tamper with engine speed.

GEAR REDUCER (CLOSE COUPLER):
- Change oil every 500 hours.
- Use 90 W oil Hypoid/Antifoam
- Check oil daily.

WATER FILTER:
- Never run the pump without a water filter.
- Clean the filter every 25 hours of operation.

IMPORTANT:
- Turn the machine off and relieve pressure from hose and system before disconnecting hoses, shut off gun or nozzles.
- Turn the machine off and relieve presure whenever the unit is left unattended.

NOTE ******** NOTE**

DAMAGE DUE TO FREEZING IS NOT COVERED UNDER WARRANTY

If freezing conditions are prevalent in your area, use the following procedure to prevent damage to your Unit.

1. Put switch to "OFF" position.
2. Remove the spark plug wire from the spark plug and pull starter rope or push starter button (if provided) to turn the engine over a few times to get excess water out of the pump.
3. Drain the High Pressure Hose after disconnecting.
4. Make sure to remove all water from all parts of the system.
5. Alternate method: Use a 50% solution of Anti-Freeze. Make sure entire system is included.

AFTER EACH USE ALWAYS WIPE ENTIRE UNIT DOWN (WAIT UNTIL ENGINE IS COOL) WITH CLEAN DRY CLOTH AND RETURN TO STORAGE.

COMPACT by Durotech OPERATING INTRUCTIONS

High Pressure Water Cleaning Equipment PW1500

PRIOR TO STARTING:

- See reverse side. Read all instructions and manuals before operating equipment.
- Connect standard garden hose to water inlet (see illustration). Hose must have minimum ¾ 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. A spare O-ring is attached to the machine.
- Turn water supply fully on.
- Open fuel valve on engine. Turn ignition switch on (if so equipped). Set choke and throttle controls.
- Operate gunjet by squeezing trigger and hold until continuous flow of water emerges.
- Turn pressure adjustment knob fully counter-clockwise.

TO OPERATE UNIT:

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

MACHINE IS NOW READY FOR USE.

TO USE 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 approximately 18:1.
3) Attach proper nozzle to wand. (Injector will draw chemical only with special large orifice, fan pattern nozzle supplied).
4) Operate gunjet 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.

PREPARATION INSTRUCTIONS BEFORE WASHING OR REPAINTING YOUR HOUSE.

1. Please read all safety warnings on reverse.
2. If walls are badly stained, mildewed or soiled, detergents and the Airlessco Chemical Injector is 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 at a ratio of 12 to 1.
   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 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 also. (Especially helpful when using chemicals and when blasting off paint.)
7. General Washing Technique is starting from the highest point. When working from a ladder make sure it is sturdy and position 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 thoroughly underhang portion of soffit, 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 at a distance and approach cautiously.

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 use a more parallel angle. It will peel off in large sheets if you can get beneath it.
4. Spray in a back and forth motion always trying to get beneath the peeling paint. Be sure to get as much paint as will come off and 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 do puttying and caulking as necessary.

REMEMBER, although prepartion 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.

WARNING

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 gunjet 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:

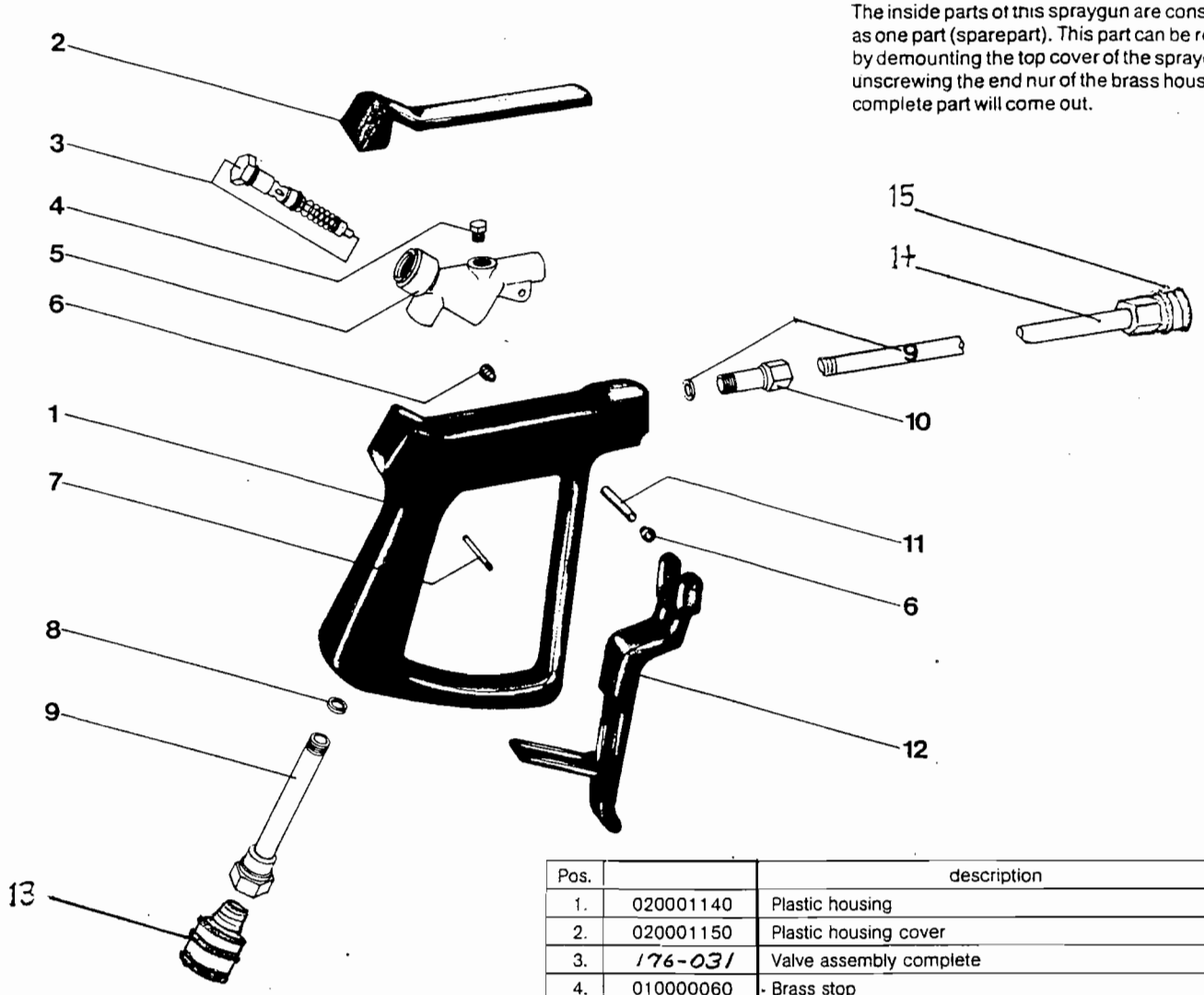
- Never place hand or any other part of the body in front of spray orifice.
- Never direct spray at self or any other person.
- Never pump any acid or abrasive fluid.
- Never wash electrical equipment or parts.
- Never attempt to repair a damaged high-pressure hose.
- Never allow pump to run dry or semi-dry.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

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.

SPRAY GUN ST-2000

The inside parts of this spraygun are constructed as one part (sparepart). This part can be replaced by demounting the top cover of the spraygun, by unscrewing the end nur of the brass housing the complete part will come out.

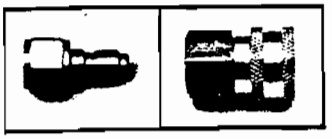


Pos.		description
1.	020001140	Plastic housing
2.	020001150	Plastic housing cover
3.	176-031	Valve assembly complete
4.	010000060	Brass stop
5.	010001370	Brass housing
6.	020001180	Brass stop ST-2000
7.	040000031	Stainless steel pin 5 x 20
8.	030000175	Washer
9.	176-024	Inlet complete, see description on Data-leaflet
10.	176-023	Outlet complete, see description on Data-leaflet
11.	010001390	Brass pin
12.	176-026	Trigger complete
13.	100-021	3/8" Quick Disconnect Female
14.	176-003	Wand
15.	176-00	1/4" Quick Disconnect Female

Part No. 176-001 Gun Only
Part No. 176-001 W/F Gun, Wand and Quick Disconnects

HIGH PRESSURE QUICK DISCONNECT FITTINGS

DO NOT USE ON AIRLESS SPRAY HOSE.
Made of brass and/or plated steel. The fittings eliminate the need to "screw" on hose. Just a quick push pull and you have a secure connection. The 3/8" size is used for water outlet and hose.
FOR QUICK DISCONNECT SYSTEM ORDER PART NOS. 001-020 AND 100-022.



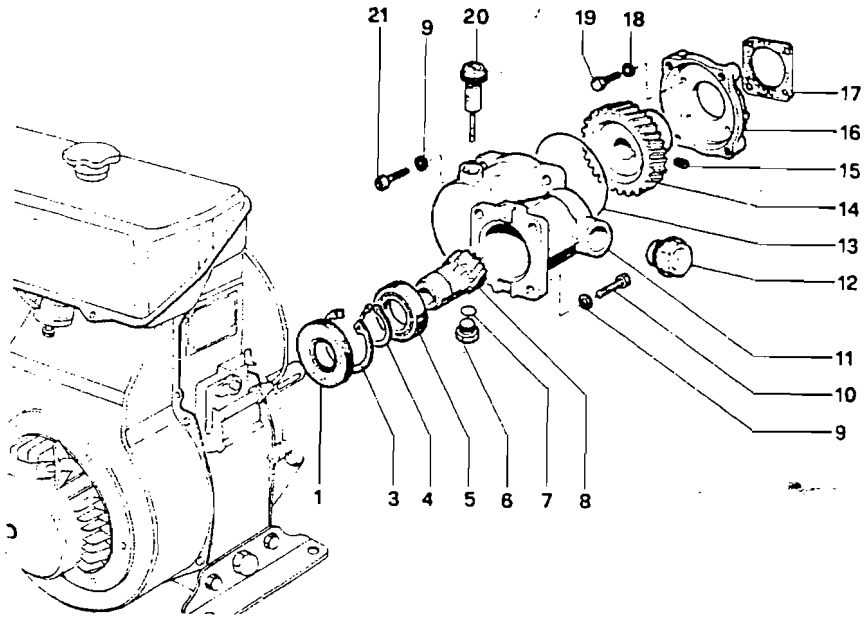
100-020 100-022

100-020 QUICK DISC 3/8NPTF 3T21
100-022 QUICK DISC 3/8NPTF 3S21

GEAR REDUCERS FOR GAS ENGINES GR750

MODEL PWC 1500-4
PART NO. 163-002

No.	Description	Part No.
1.	Oil Seal	90.1674.00
3.	Retaining Ring	90.0850.00
4.	Retaining Ring	90.0695.00
5.	Ball Bearing	91.8464.00
6.	Cap	98.2100.00
7.	O Ring	90.3833.00
8.	Pinion Gear	10.0205.55
9.	Washers (8)	96.7014.00
10.	Screws (4)	99.2740.00
11.	Reducer Box	10.0203.22
12.	Oil Level Indicator	97.5968.00
13.	O Ring	90.4141.00
14.	Ring Gear	10.0206.55
15.	Screw	99.3017.00
16.	Flange Adapter	10.0204.22
17.	Gasket	10.0207.84
18.	Washers (4)	96.6938.00
19.	Screws (4)	99.1882.00
20.	Oil Dip Stick	98.2103.00
21.	Screws (4)	99.3084.00

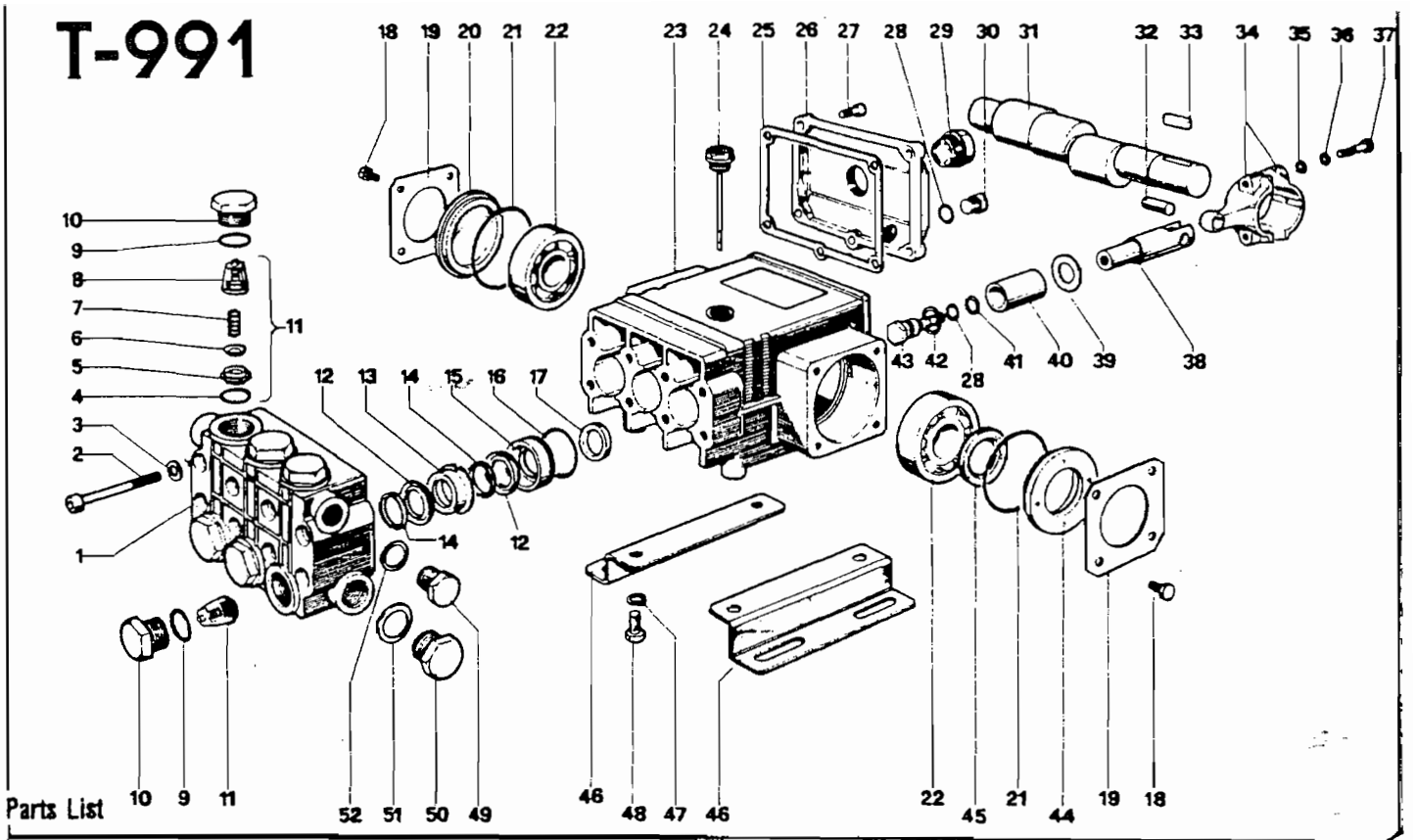


Features

- Eliminates need for belts and pulleys
  Saves time and money
- Compact design for easier enclosure
  Reduces size of mounting base
- Oversized bearing system is self-aligning
  Reduces load on motor bearings and pump bearings
- Self contained lubrication system
  Uses 90W gear lube for quiet, long life operation
  Protects pump from failure due to gearbox oil loss
  Protects gearbox from failure due to oil loss in pump
- Large, helical cut, hardened steel gears for quiet operation
- Large capacity crankcase
- Reversible mounting for right or left hand drive gas engines
  Includes reversible dipstick and oil level sight glass
- Model GR 750 for 3/4-inch keyed shaft

SPECIFICATIONS	GR750
Maximum BHP (Engine HP)	4 [5]
Maximum Engine RPM	3400
Reduction Ratio	2.4:1
Pump Speed	1450 RPM
Oil Capacity (90W hypoid gear lube)	5.5 oz.
Weight	4.5 lb.
Fits Engine Shaft Diameter	3/4 inch
Maximum Shaft Extension	2 3/8 inches

T-991



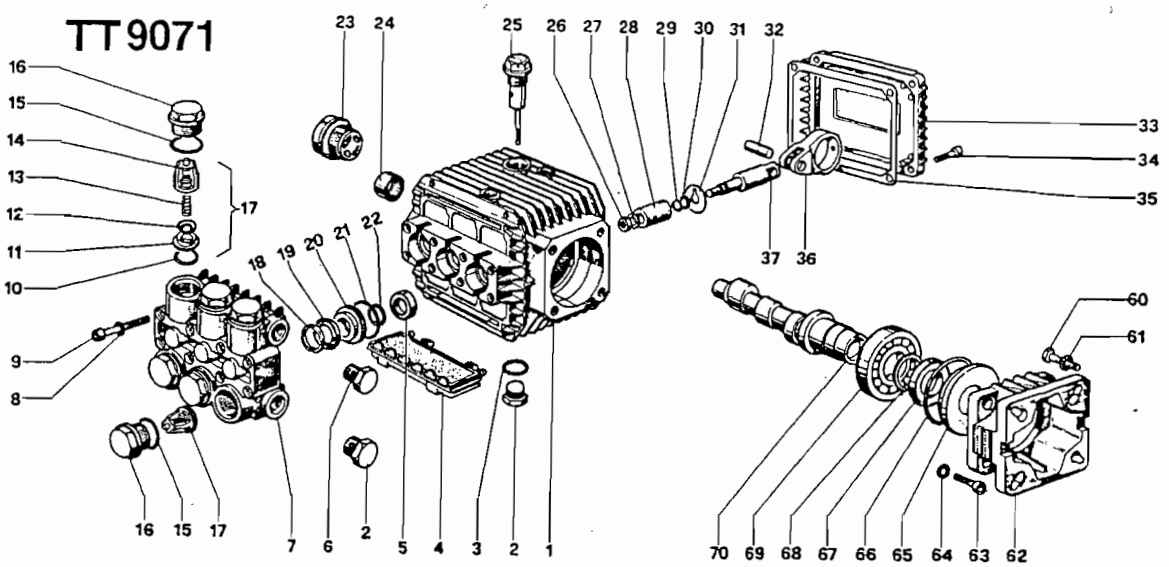
No.	Description		Part No.
1.	Pump Head-Brass		50.1207.41
2.	Screws (8)		99.3175.00
3.	Washers (8)		96.7014.00
4.	O Rings (6)	Kit 1	90.3841.00
5.	Valve Seats (6)	Kit 1	36.2003.66
6.	Valve Plates (6)	Kit 1	36.2001.76
7.	Springs (6)	Kit 1	94.7376.00
8.	Valve Guide (6)	Kit 1	36.2002.51
9.	O Rings (6)	Kit 4	90.3847.00
10.	Caps (6)	Kit 4	98.2220.00
11.	Valve Assembly (6)	Kit 1	36.7032.01
12.	Packings (6)	Kit 19, 27	90.2703.00
13.	Intermediate Rings (3)	Kit 20, 27	50.2166.70
14.	Head Rings (6)	Kit 21, 27	50.1000.51
15.	Packing Retainers (3)	Kit 22, 27	50.0805.70
16.	O Rings (3)	Kit 22, 27	90.3612.00
17.	Oil Seals (3)	Kit 23	90.1614.00
18.	Screws (8)		99.1807.00
19.	Crankcase Covers (2)		50.1500.74
20.	Spacer		50.2116.51
21.	O Rings (2)		90.4097.00
22.	Ball Bearings (2)		91.8329.00
23.	Crankcase		50.0104.22
24.	Oil Dip Stick		98.2103.00
25.	Cover Gasket		50.2119.84
26.	Crankcase Cover		50.1603.22
27.	Screws (5)		99.1837.00
28.	O Rings (4)	Kit 6	90.3585.00

No.	Description		Part No.
29.	Oil Level Indicator		97.5968.00
30.	Cap		98.2041.00
31.	Crankshaft USA Version T991		50.0218.35
32.	Wrist Pins (3)		97.7330.00
33.	Key		91.4878.00
34.	Connecting Rods(3) T991		50.0300.01
35.	Washers (6)		96.6940.00
36.	Washers (6)		96.6938.00
37.	Screws (6)		99.1927.00
38.	Piston Guides (3)		50.0501.56
39.	Washers (3)		96.7286.00
40.	Pistons (3)		50.0404.09
41.	Anti-extrusion Rings (3)	Kit 6	90.5067.00
42.	Washers (3)	Kit 6	96.7280.00
43.	Piston Screws (3)	Kit 6	47.2195.66
44.	Spacer		50.2115.51
45.	Oil Seal		90.1634.00
46.	Pump Feet (2)		50.2000.74
47.	Washers (4)		96.7016.00
48.	Screws (4)		99.3037.00
49.	Cap		98.2100.00
50.	Cap		98.2176.00
51.	Washer		96.7514.00
52.	Washer		96.7380.00

REPAIR KITS **T-991,**

KIT NO.	1	4	6	19	20	21	22	23	27
	VALVE ASSEMBLY	VALVE CAP ASSEMBLY	PISTON RETAINER	PACKING	INTERMEDIATE RING	HEAD RING	PACKING RETAINER	PISTON OIL SEAL	PACKING ASSEMBLY
ASSEMBLY (POS. NO.)	4, 5, 6, 7, 8	9, 10	28, 41, 42, 43	12	13	14	15, 16	17	12, 13, 14, 15, 16
NO. OF ASSEMBLIES	6	6	3	6	3	6	3	3	1

TT 9071



POS.	CODE	DESCRIPTION		POS.	CODE	DESCRIPTION	
1	51.0106.22	CRANKCASE	1	25	98.2103.00	OIL DIP STICK	1
2	98.2100.00	CAP	2	26	92.2216.00	NUT	3
3	90.3833.00	O-RING	1	27	96.7008.00	WASHER	3
4	51.2091.02	PROTECTOR	1	28	51 0400.09	PISTON	3
5	90.1565.00	KIT 83 OIL SEAL	3	29	90.3572.00	VITON O-RING	3
6	98 2041.00	DRAIN PLUG	1	30	90.5022.00	ANTI-EXTRUSION RING	3
7	51.1200.41	MANIFOLD-BRASS	1	31	96.7070.00	WASHER	3
8	96.6938.00	WASHER	8	32	97.7310.00	CONNECTING ROD PIN	3
9	99.1943.00	SCREW	8	33	51.1600.22	CRANKCASE COVER	1
10	90.3841.00	O-RING	6	34	99 1867.00	SCREW	4
11	36.2003.66	VALVE SEAT	6	35	51.2101.84	COVER GASKET	1
12	36.2001.76	VALVE PLATE	6	36	51 0300.22	CONNECTING ROD	3
13	94.7376.00	SPRING	6	37	51.0500.56	PISTON GUIDE	3
14	36 2002.51	VALVE GUIDE	6	60	99 2730.00	SCREW	4
15	90.3847.00	O-RING	6	61	96.7014.00	WASHER	4
16	98.2218.00	CAP	6	62	10 0346.22	FLANGE	1
17	36.7032.01	(KIT1) VALVE	6	63	99.1867.00	SCREW	4
18	51 1000.51	(KIT 90) HEADRING	3	64	96.6938.00	WASHER	4
19	90.2620.00	PACKING	3	65	50.2115.51	CRANKCASE/CVER/SPACER	1
20	51 0800.70	PACKING RETAINER	3	66	90.4097.00	O-RING	1
21	90.3604.00	O-RING	3	67	90.1644.00	OIL SEAL	1
22	90.3835.00	O-RING	3	68	90.0667.00	CIRCLIP	1
23	97.5968.00	OIL LEVEL INDICATOR	1	69	91.8373.00	TAPER ROLLER BEARING	1
24	91 8014.00	NEEDLE BEARING	1	70	51.0211.35	CRANKSHAFT	1

REPAIR KITS

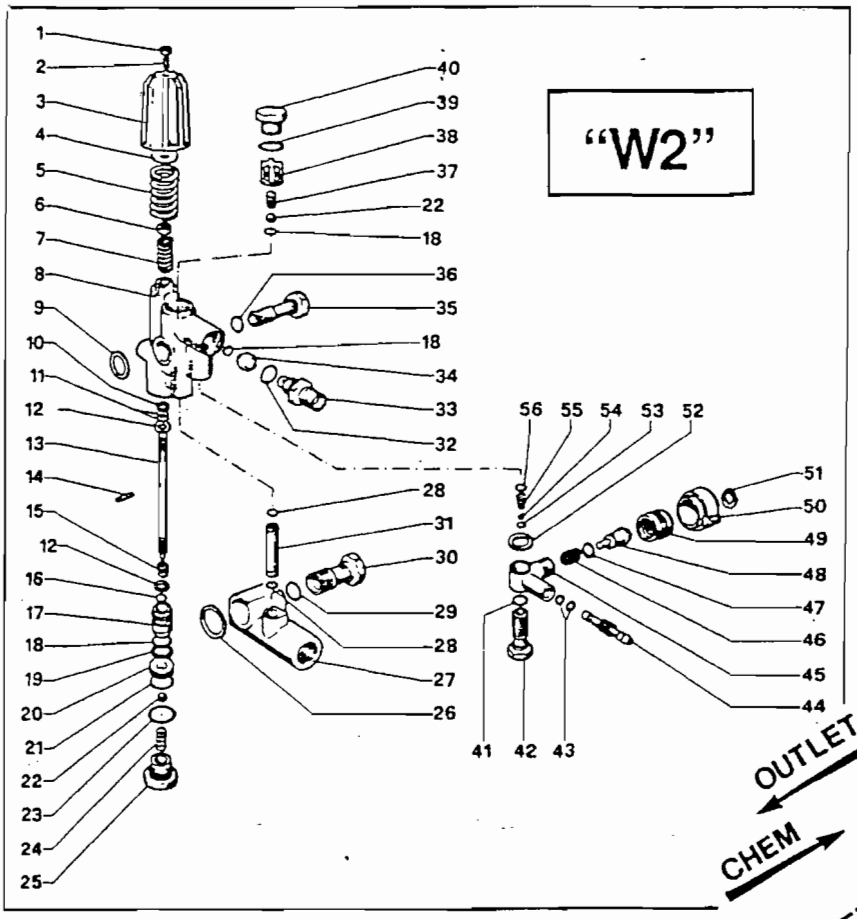
KIT	KIT 1	KIT 83	KIT 84	KIT 86	KIT 96	KIT 97
Positions Included	10-11-12 13-14 (17)	5	15-16	20-21 22	18-19 20-21 22	18-19 21-22
N. pcs.	6	3	6	3	1	3

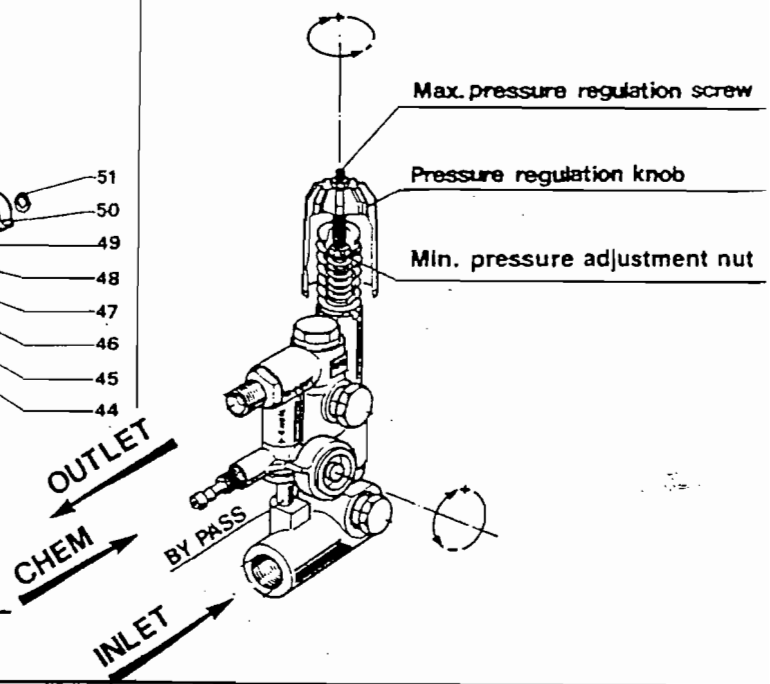
DECEMBER 01, 1987

PART NO. 163-012A

REGULATOR

UNLOADER "W2"





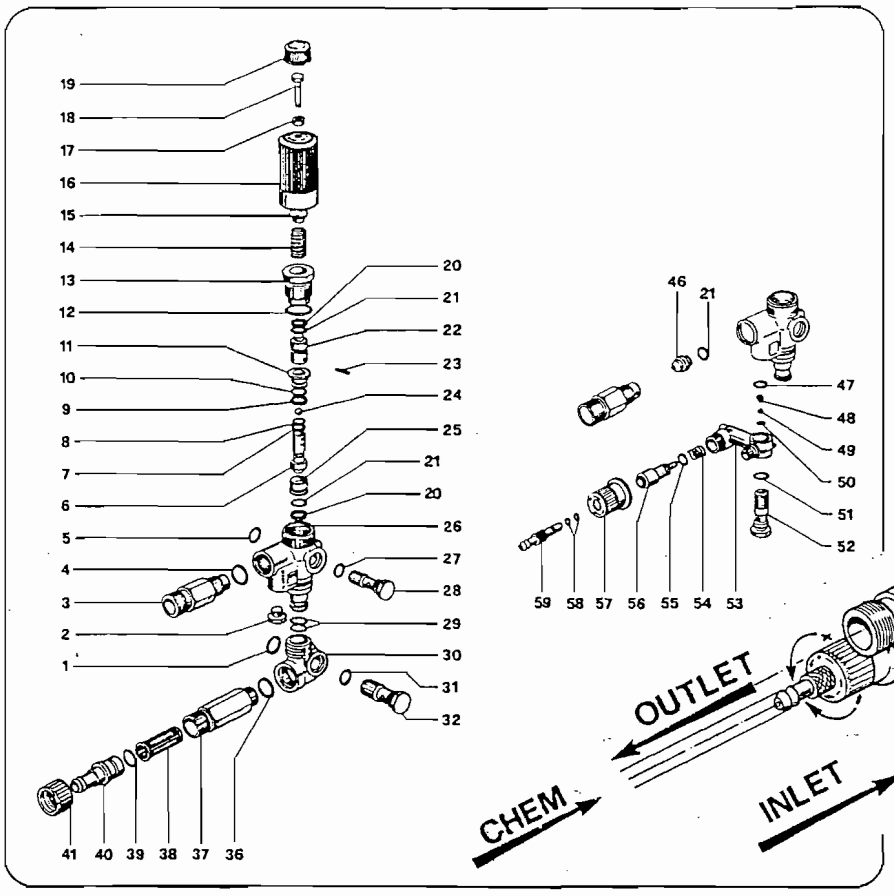
NO.	DESCRIPTION		PART NO.	NO.	DESCRIPTION		PART NO.
1	Nut		92.2020.00	29	O-ring	Kit 93	90.3841.00
2	Screw		99.1848.00	30	Fixing screw		36.3139.70
3	Pressure regulation knob		36.3145.02	31	By-pass tube		36.3138.93
4	Cap		36.3141.64	32	O-ring, viton	Kit 94	90.3832.00
5	Spring	Kit 93	94.7516.00	33	Nipple		10.0078.70
6	Nut		92.2200.00	34	Nozzle		10.0076.66
7	Spring		94.7400.00	35	Fixing screw		36.3140.70
8	Valve body		36.3134.41	36	O-ring	Kit 93	90.3827.00
9	Washer		96.7380.00	37	Spring	Kit 93	94.7355.00
10	Anti Extrusion ring	Kit 93	90.5033.00	38	Valve guide	Kit 93	36.3104.51
11	O-ring, viton (2)	Kit 93	90.3577.00	39	O-ring	Kit 93	90.3839.00
12	Washer(2)		96.7009.00	40	Cap		98.2152.00
13	Piston guide		36.3143.73	41	O-ring	Kit 94	90.3585.00
14	Spring pin		97.6660.00	42	Chemical valve seat		36.2563.70
15	Spring	Kit 93	94.7384.00	43	O-ring(2)	Kit 94	90.3570.00
16	O-ring	Kit 93	90.3574.00	44	Hose barb fitting		36.2566.70
17	Valve piston		36.3142.66	45	Injector body		36.3146.41
18	O-ring(3)	Kit 93-94	90.3822.00	46	Spring	Kit 94	94.7383.00
19	Anti extrusion ring	Kit 93	90.5065.00	47	O-ring, viton	Kit 94	90.3580.00
20	Valve seat	Kit 93	36.3137.66	48	Shutter		36.3147.70
21	O-ring	Kit 93	90.3593.00	49	Knob insert		36.3148.70
22	Ball(2)	Kit 93	97.4838.00	50	Injector regulation knob		36.3149.51
23	O-ring	Kit 93	90.3843.00	51	Circlip		90.0545.00
24	Spring	Kit 93	94.7374.00	52	Washer		96.7280.00
25	Cap		36.3136.70	53	O-ring, viton	Kit 94	90.3572.00
26	Washer		96.7514.00	54	Ball	Kit 94	97.4782.00
27	Connector body		36.3135.22	55	Taper spring	Kit 94	94.8217.00
28	O-ring(4)	Kit 93	90.3576.00	56	O-ring	Kit 94	90.3582.00

PART NO. 188-359 W1-1
PART NO. 193-004 W1-0

REGULATOR UNLOADER

"W1"-1

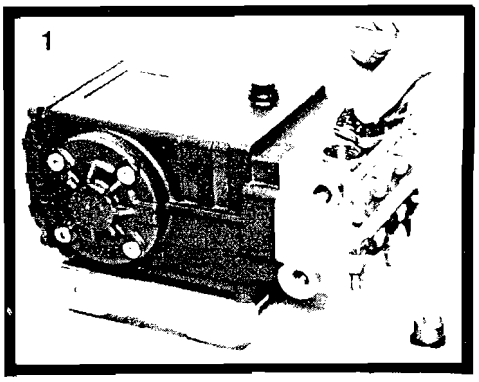
"W1"-0

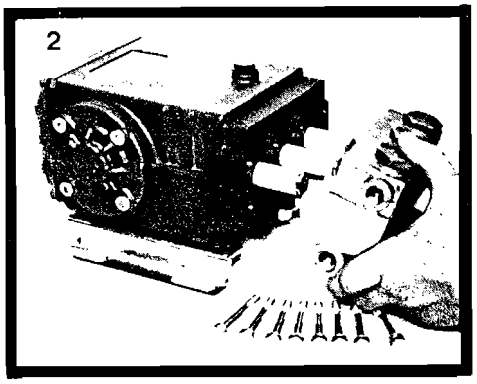


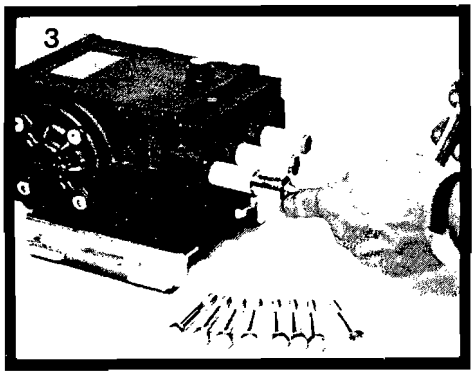
KIT N.	KIT 94	KIT 98
Positions Included Posizioni incluse	4-21-47-48-49-50-51-54 55-58	6-7-8-9-10-11-12-13-20-21-22-23-24-25
N. Pcs.	1	1

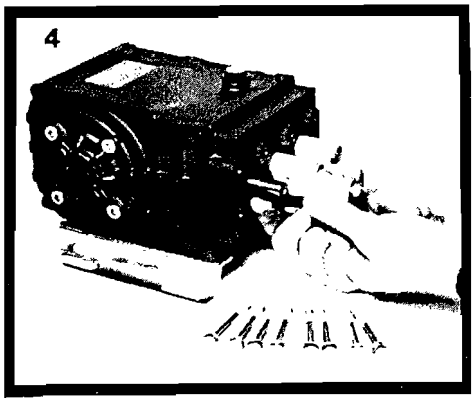
POS.	CODE	DESCRIPTION	#PCS.		POS.	CODE	DESCRIPTION	
1	90.3839.00	O-RING	1		47	90.3582.00	O-RING	1
2	98 2057.00	PLUG	1		48	94.8217.00	TAPER SPRING	1
3	10.0318.70	NIPPLE	1		49	97.4782 00	BALL	1
4	90 3832.00	VITON O-RING	1		50	90.3572.00	VITON O-RING	1
5	90.3833.00	O-RING	1		51	90.3585.00	O-RING	1
6	36.3167.66	VALVE	1		52	36.2563.70	CHEM VALVE SEAT	1
7	90.5025.00	ANTIEXTRUSION RING	1		53	36 2562 51	CHEM INJEC BODY	1
8	90 3575.00	O-RING	1		54	94.7383.00	SPRING	1
9	90.5075.00	ANTIEXTRUSION RING	1		55	90.3580.00	VITON O-RING	1
10	90 3589.00	O-RING	1		56	36.2564.70	INJECTOR SHUTTER	1
11	36.3165.70	VALVE GUIDE	1		57	36.2565.51	CHEM REGULAT. KNOB	1
12	90 3847.00	O-RING	1		58	90.3570.00	O-RING	2
13	36.3166.70	BUSHING GUIDE	1		59	36 2566.70	HOSE BARB FITTING	1
14	94 7436.00	SPRING	1		46	10.0076-66	NOZZLE W1-1	1
15	36.3169.70	SPRING PLATE	1		46	10.0151-66	NOZZLE W1-0	1
16	36.3171.02	KNOB	1		27	90.3820.00	O-RING	1
17	92.2200.00	NUT	1		28	36 2567.70	VALVE BOLT	1
18	99 3052 00	SCREW	1		29	90.3825.00	O-RING	2
19	36.3172.51	CAP	1		30	36 3152.22	CONNECTOR	1
20	90 5065.00	ANTIEXTRUSION RING	2		31	90.3827.00	O-RING	1
21	90.3822.00	O-RING	3		32	36.2568.70	VALVE BOLT	1
22	36.3168.66	CONTROL PISTON	1		36	90.3591.00	O-RING	1
23	97.6132.00	PIN	1		37	36 2584 70	SUCTION NIPPLE	1
24	97.4800 00	BALL	1		38	92.8925.00	FILTER	1
25	36.3164.66	VALVE SEAT	1		39	90.3828.00	O-RING	1
26	36 3163.41	VALVE BODY	1		40	36.2569.70	INLET HOSE/BARB FIT	1
					41	10 0119.02	NUT	1

PROCEDURE FOR SERVICING PUMPS









The Valve Assemblies

Photo 1

1) All inlet and discharge valves can be serviced without disrupting the inlet or 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.

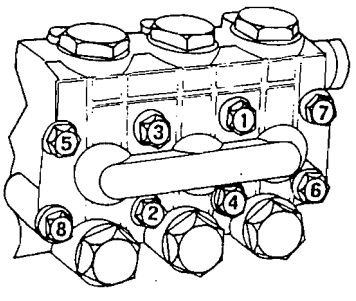
Removing Manifold Head

Photo 2

1) Remove the fasteners retaining head.
2) Separate head from crankcase. NOTE: It may be necessary to tap head lightly with 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.

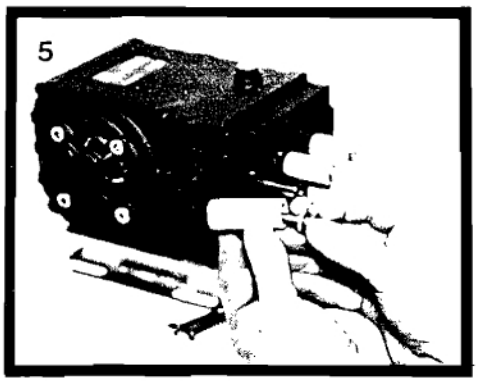
TORQUE SEQUENCE FOR TIGHTENING HEAD

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



Replacing Plungers

Photo 3, 4 and 5

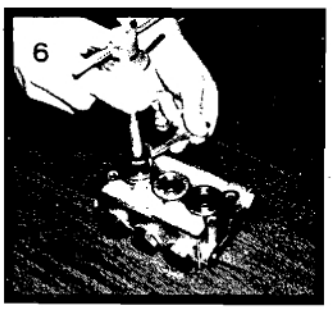


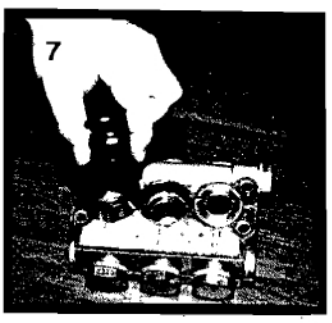
1) Remove stainless steel piston screw and plunger from piston rod.
2) If slinger washer comes off with plunger, be certain this is replaced before new plunger is installed.
3) Separate piston screw from plunger.
4) Install new o-ring and PTFE backup-ring on piston screw.

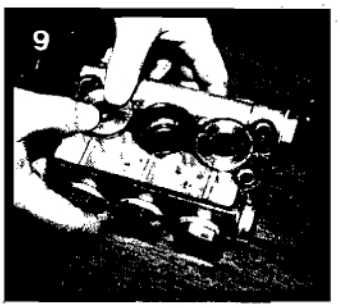
   NOTE: A film of grease on the outside of the o-rings insures a better installation.
5) Carefully press piston screw into plunger.
6) Slide new plunger over the piston guide and torque to specifications.

Replacing V-Packings

Photo 6, 7, 8 and 9

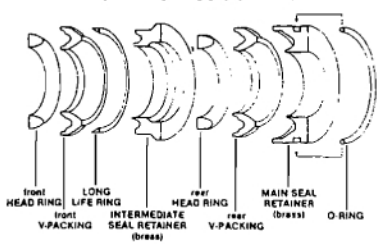






1) Remove manifold from crankcase.
2) Insert proper extractor collet through main seal retainer. Tighten collet and extract retainers, v-packings and head rings.
3) Place proper insertion tool in cylinder and install front head ring, v-packing and long life ring and press firmly into cylinder until they 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.

TYPICAL GENERAL PUMP PACKING CROSS SECTION



TROUBLE SHOOTING

PROBLEM	CAUSE	REMEDY
Pulsation	Faulty pulsation damper.	Check precharge; if low, recharge it or install a new one.
Low Pressure	Worn nozzle.	Replace nozzle, of proper size.
	Belt slippage.	Tighten or replace; use correct belt.
	Air leak in inlet plumbing.	Disassemble, reseal and reassemble.
	Relief valve stuck, partially plugged or improperly adjusted valve seat worn.	Clean, adjust relief valve; check for worn and dirty valve seats. Kit available.
	Inlet suction strainer clogged or improperly sized.	Clean. Use adequate size. Check more frequently.
	Worn packing. Abrasives in pumped fluid or severe cavitation. Inadequate water.	Install proper filter. Suction at inlet manifold must be limited to lifting less than 20 feet of water or -8.5 PSI vacume.
	Fouled or dirty inlet or discharge valves.	Clean inlet and discharge valve assemblies.
	Worn inlet, discharge valve blocked or dirty.	Replace worn valves, valve seats and/or discharge hose.
	Leaky discharge hose.	
Pump runs extremely rough, pressure very low	Restricted inlet or air entering the inlet plumbing.	Proper size inlet plumbing; check for air tight seal.
	Inlet restrictions and/or air leaks. Stuck inlet or discharge valve.	Replace worn cup or cups, clean out foreign material, replace worn valves.
..er leakage from under. manifold. *Slight Leakage	Worn packing.	Install new packing.
Oil leak between crankcase and pumping section.	Worn crankcase piston rod seals O-rings on plunger retainer worn.	Replace crankcase piston rod seals. Replace O-rings.
Oil leaking in the area of crankshaft.	Worn crankshaft seal or improperly installed oil seal-O-ring.	Remove oil seal retainer and replace damaged O-ring and/or seals.
	Bad bearing.	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 crankcase.	May be caused by humid air condensing into water inside the crankcase.	Change oil intervals. Use any high grade automotive 30 weight nondetergent oil.
	Worn packing and/or piston rod sleve, O-rings on plunger retainer worn.	Replace packing. Replace O-rings.
Oil leaking from underside of crankcase.	Worn crankcase piston rod seals.	Replace seals.
Oil leaking at the rear portion of the crankcase.	Damaged crankcase, rear cover O-ring, drain plug O-ring; or sight glass O-ring.	Replace cover O-ring, drain plug O-ring, or sight glass O-ring.
Loud knocking noise in pump.	Pulley loose on crankshaft.	Check key and tighten set screw.
	Broken or worn bearing.	Replace bearing.
Frequent or premature failure of packing.	Scored, damaged or worn plunger.	Replace plungers.
	Overpressure to inlet manifold.	Reduce inlet pressure.
	Abrasive material in the fluid being pumped.	Install proper filtration on pump inlet plumbing.
	Excessive pressure and/or temperature of fluid being pumped.	Check pressures and fluid inlet temperature; be sure they are with in specified range.
	Over pressure of pumps.	Reduce pressure.
	Running pump dry.	Do not run pump without water.