



OPERATOR'S MANUAL

Ramteq JV Series

Gas Engine / Diesel Fired

READ THIS MANUAL

This manual contains important information for the use and safe operation of your RAMTEQ® machine. **FAILURE TO READ THIS MANUAL AND FOLLOW ITS INSTRUCTIONS PRIOR TO OPERATING OR ATTEMPTING ANY SERVICE OR MAINTENANCE PROCEDURE COULD RESULT IN SERIOUS INJURY OR DEATH TO YOU OR OTHER PERSONS; ALSO DAMAGE TO THE MACHINE OR TO OTHER PROPERTY.**



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Unpacking Instructions

INSPECTION

Carefully unpack your new RAMTEQ equipment by removing the shrink wrap & banding from pallet. Remove the pressure washer from the pallet and check for any physical damage that may have occurred during shipment. Check for all parts specified and shown in figure 1.



INCLUDED PARTS

- Pallet
- Packing Material
- Outer Box
- Pressure Washer Machine
- Operator's Manual
- Wand / Trigger Gun
- Nozzles 0°, 15°, 25°, 40°
- Hose 3/8" X 50'
- QC Hose Fittings

NOTICE

Information in this operator's manual is subject to change without notice.

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Safety Guidelines



READ THIS FIRST! FAILURE TO READ AND OBSERVE ALL WARNING STATEMENTS COULD RESULT IN SEVERE BODILY INJURY OR DEATH, POSSIBLE INJURY TO OTHER PERSONS, DAMAGE TO MACHINE OR OTHER PROPERTY.

- DO NOT operate this machine in areas where open flames are not permitted. DO NOT store or use combustible materials on or near this machine. Use this equipment only in well ventilated areas. Failure to follow this warning may cause carbon monoxide build up, fire or explosion, and possible injury or death.
- DO NOT fill gasoline tank while engine is running. Allow engine to cool before refueling. Should gasoline be spilled, move the machine away from the area of the spill. Do not attempt to restart the machine until the gasoline has fully evaporated.
- DO NOT operate engine if air cleaner or cover directly over the carburetor air intake is removed.
- DO NOT touch hot mufflers, cylinders or fins, as contact may cause burns
- DO NOT operate this machine while under the influence of alcohol, drugs or while fatigued.
- DO NOT direct discharge stream at yourself or others. Risk of injection or injury may occur. Never put your hand or fingers over the spray tip. Do not try to stop or deflect leaks with your hand or body. Always face nozzle and wand to the ground when testing.
- DO NOT operate this machine WITHOUT wearing protective Eye Wear. Gloves, Hard Hat, Mask, Ear Plugs & Steel Toe Work Boots are also recommended, DO NOT wear loose clothing. Keep your body and clothing clear of the engine and discharge stream when the machine is running.
- DO NOT tie back or block trigger gun in OPEN position. Never leave the pressure washer unattended once you have started it. If you leave, shut down machine completely.
- DO NOT overreach or stand on an unstable support while operating this machine. Maintain good footing and balance.
- DO NOT permit this machine to run while unattended or for extended periods of time with trigger gun closed. Damage to pump may occur.
- DO NOT operate this machine in an unsafe manner or around unsupervised children. Keep all other personnel clear while operating this machine. This product should only be operated by trained personnel.
- DO NOT alter original factory settings prior to operating this machine. Risk of injury to yourself or other persons may occur.
- DO NOT remove hoses, guns, nozzles or any components while this machine is still hot or while it is running.
- DO NOT attempt to service this machine before reading the service manual.
- DO NOT use water with a temperature over 140 degrees Fahrenheit
- DO NOT put diesel fuel in to a gasoline tank or gasoline into a diesel tank. Observe correct markings on fuel tanks before filling.
- DO NOT operate this machine without knowing how to stop and bleed water pressures. Know all controls before using this machine.
- DO NOT spray caustic, acids or abrasive fluids through this machine.
- DO NOT permit water to freeze inside this machine. Pump and plumbing damage may occur.
- Use only recommended RAMTEQ parts when servicing this machine.
- RAMTEQ will not be held liable for any unauthorized modifications made to this machine. Any such action will void the warranty.
- When connecting battery, ensure that the RED battery cable is connected to the POSITIVE pole on the battery and the BLACK is connected to the NEGATIVE pole on the battery



Maintenance Instructions

MAINTENANCE PRECAUTIONS

- Do not permit acidic, caustic or abrasive fluids to be pumped through system.
- Periodically clean detergent inlet screen. This will ensure proper flow of water to the pump.
- High mineral content in water may adversely affect your machine and may require the use of a water softener to ensure proper operation.
- NEVER run the pump dry under any circumstances. Doing so will cause extreme damage to the pump.



FAILURE TO MAINTAIN HEAT EXCHANGER COIL MAY RESULT IN A STEAM EXPLOSION WHICH MAY CAUSE SERIOUS INJURY OR DEATH.

HEAT EXCHANGER COIL MAINTENANCE

- Hard water conditions may eventually cause clogging in the heat exchanger coil if left unattended. Scale deposits will compromise the heating efficiency and produce an unsafe condition over time. It may be necessary to descale coil.
- Scale buildup from certain detergents may eventually clog up the heat exchanger coil causing an unsafe condition. Use only recommended detergents for better cleaning efficiency.
- Black carbon deposits that collect on the outside wall of the heat exchanger coil may be a result of using a poor grade of fuel or improper burner operation. Heating fuel should be void of water and sediments to eliminate the possibility of sooting and compromising the efficiency of the coil.

MOVING, STORAGE

- Place machine in covered area when not in use to protect from elements. Protect machine from freezing in cold temperatures by storing in a heated location.

ENGINE MAINTENANCE

- Refer to Engine Manual.

WINTERIZING

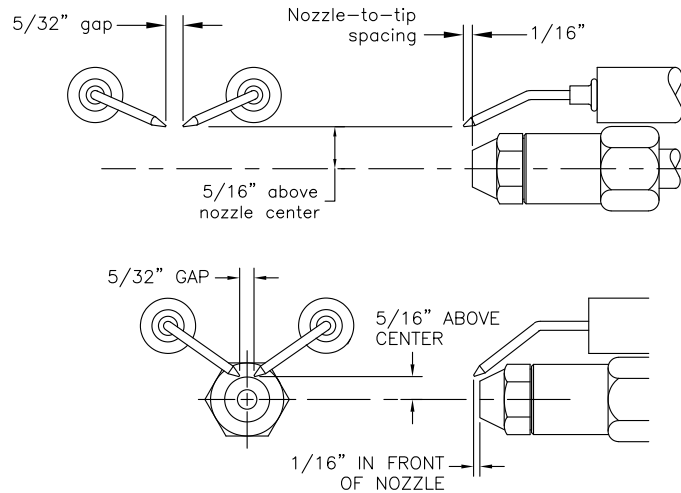
- Non-float Tank Machines: To protect the machine from freezing temperatures while storing or transporting, connect short length of garden hose (approximately 3 ft.) to water inlet connection on machine. Remove the pressure nozzle from the wand and insert the short garden hose end into a container of antifreeze. Place the wand into the antifreeze container and start engine, running machine until antifreeze appears from the end of the wand. Turn engine "OFF" and replace pressure nozzle. Coil up hose and move machine to storage area.



Maintenance Instructions

ELECTRODE SETTINGS

■ Inspection of all wires, spring contacts and electrodes should be done periodically.

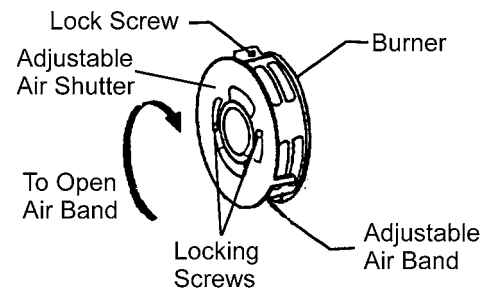


IF BLACK OR WHITE SMOKE VENTS FROM EXHAUST PORT UPON STARTING EQUIPMENT, DISCONTINUE USE AND ADJUST AIR BANDS BEFORE RESTARTING.

OIL BURNER AIR BAND ADJUSTMENT

RAMTEQ sets oil burners at sea level. Air bands may need adjustment at higher elevations to offer enhanced performance of the burner and extended life of the machine.

■ Adjustment of burner is done with pump motor and thermostat set to maximum. Loosen locking screw on air band, then close band until black smoke vents up exhaust vent. Take careful note of air band position when black smoke is first noticed. Slowly open air band until white smoke vents, then turn air band halfway back to where black smoke was first noted. Tighten air band locking screw. When properly set, the unit should NOT have either "black" smoke or "white" smoke during operation.



PUMP MAINTENANCE

- Fill crankcase to dot on oil gauge window per specifications with the specific oil recommended by the pump manufacturer. Ensure the right oil for specific pump as it may vary.
- Change oil after **50 Hour Break-in Period**.
- Change oil at every **500 Hour Intervals** thereafter.

UNLOADER ADJUSTMENT

■ This RAMTEQ machine has the unloader correctly set at the the factory. Setting an unloader is a difficult job without the proper equipment and training. Should the need arise to change the unloader settings, please contact your local dealer.



Operating Instructions

LOCATION GUIDELINES

- Locate the machine on a solid and level surface so that engine and pump crankcase oil lubricate components properly. Avoid areas where water can build up in the working area. Possible injury may result.
- Locate the machine in a well-ventilated area and away from flammable materials or fumes. Be sure ventilation warnings are observed. Keep pressure washer at least 18" away from flammable materials.
- Locate the machine so the operator has easy access to the jetter/pressure washer and its controls. Locate the machine so that it is protected from external damage.
- To prevent damage and excessive hose wear, locate the unit so that the hose does not cross traffic areas.

STARTING THE MACHINE

Following the steps below will insure successful operation:

- Read this manual completely before attempting to start the machine.
- Check the fuel tank and fill with a good grade of gasoline (87 octane minimum) for gas engines and a high quality diesel fuel for diesel engines.
- Check the engine oil level and fill with appropriate oil.
- Check the pump oil level and fill with SAE 30w *non-detergent* oil if needed.
- Pull trigger on gun until a steady stream of water comes out the nozzle. This purges any air in the system.
- Slide fuel switch to the RIGHT and slide choke switch to the LEFT (closed position).
- Turn ON/OFF switch (on engine) to "ON".
- Open water flow to reduce back pressure in pump. (Back pressure can overpower electric starter, preventing ignition.)
- Turn key to start gas engine and allow RPM to develop.
- Check for leaks in the system and cycle trigger gun to insure bypass is adjusted correctly. Repair any leaks and correct unloader adjustment if needed. Turn off machine before attempting any repairs.

STOPPING THE MACHINE

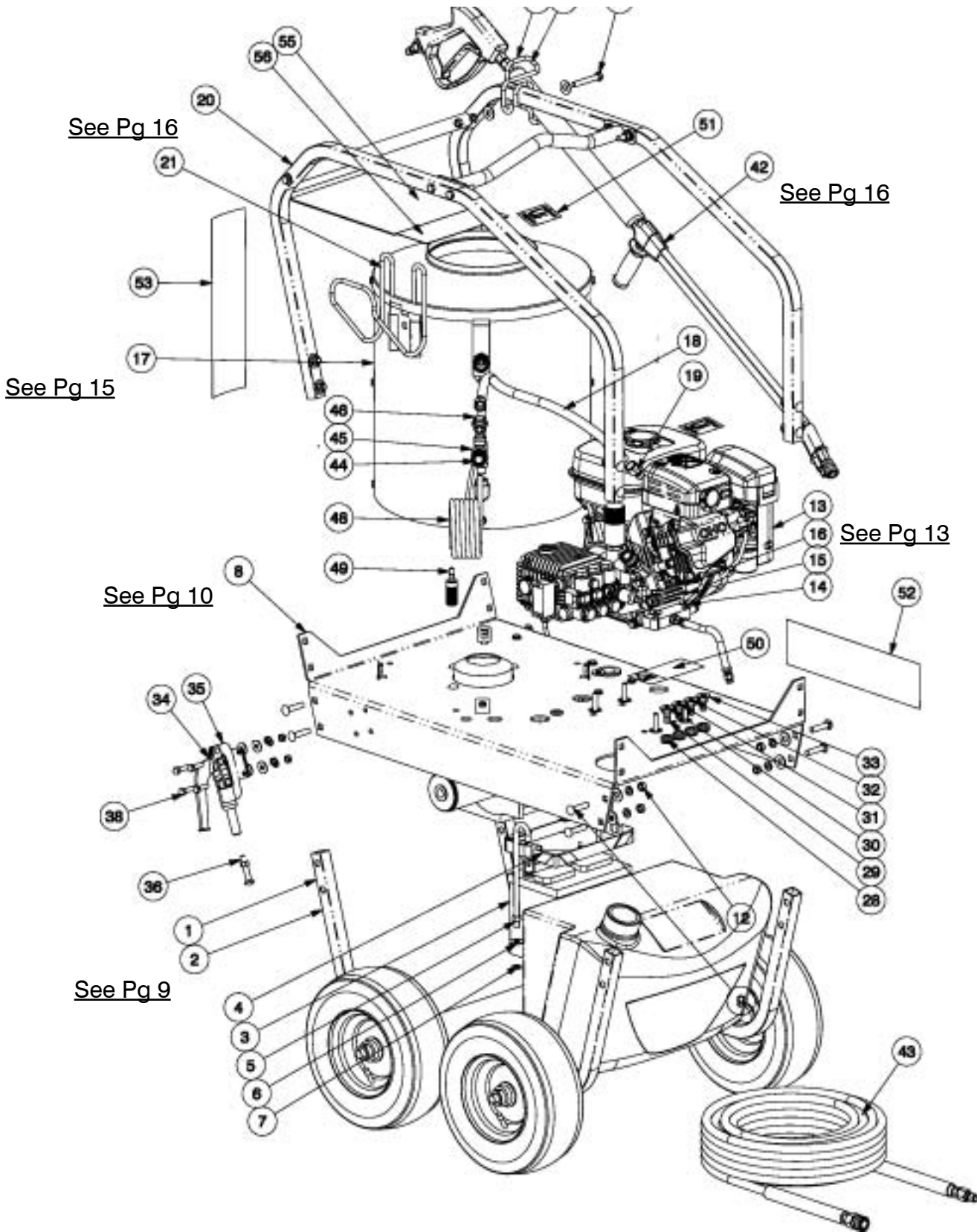
- Turn engine to "OFF".
- Pull gun trigger to release water pressure from system.
- Disconnect wand & gun assembly.
- Wind up pressure hose.

CAUTION

- Always wear protective safety gear, such as, but not limited to, rain coat or coveralls, rubber boots, face shield or goggles, gloves and hearing protection.
- Do not run the machine for more than two minutes with water flow shut off (by-pass mode). This will over heat the jetter and could cause personal injury.
- Do not run hot water thru this pump. Hot water will damage the pump, and will void the warranty.



Main Assy Exploded View



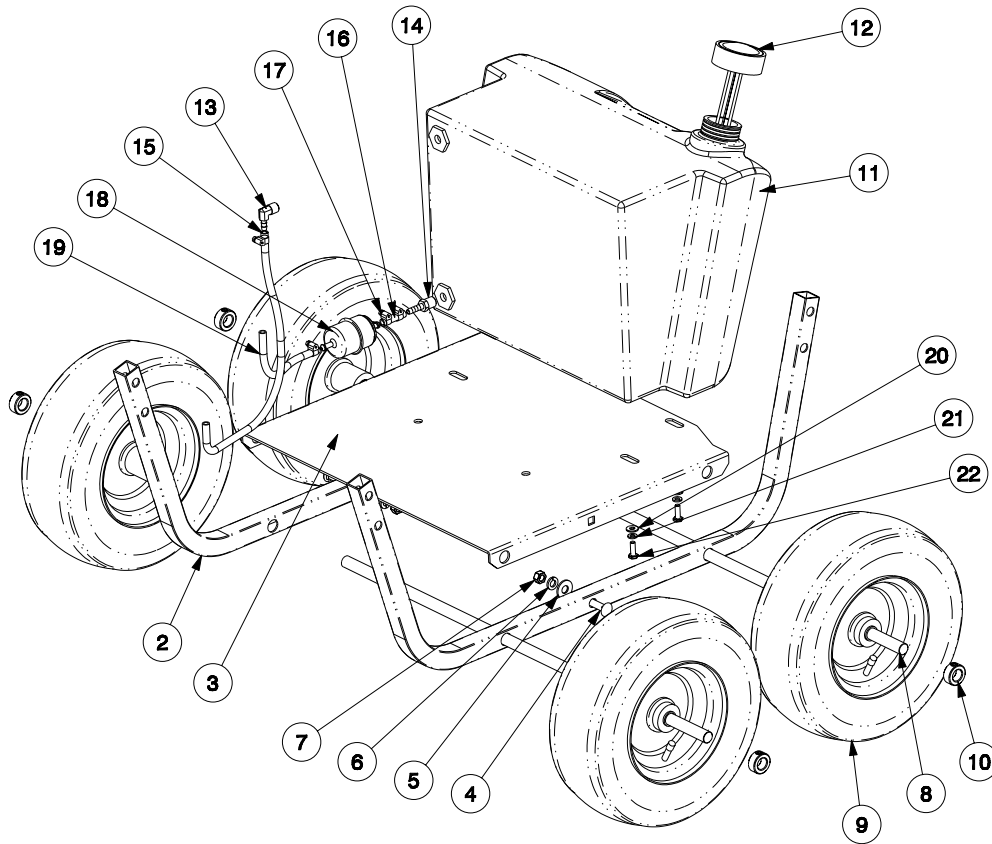


Main Assy Parts List

No.	Part Number	Description	Qty.	
	1	050-01002-01	Top Level Assy, JV Gas	1
See Pg 9	2	050-01018-01	Base Assy, JV Series	1
	3	591-00001-02	Battery 12V, Group U1, 230 Crank Amps	1
	4	591-00003-01	Retainer, Battery	1
	5	504-00008-04	J Bolt, 3/8" x 8" L	2
	6	513-00010-04	Washer, SP, 3/8" ID, 1" OD, .083 Thk	2
	7	513-00004-01	Washer, SP, Hel Sprg Lk, 3/8", SAE	2
See Pg 10	8	050-01024-01	Power Plate Assy, JV Gas	1
	9	505-00006-06	Bolt, SP, Carriage, 3/8-16 x 1.75"	8
	10	513-00010-04	Washer, SP, 3/8" ID, 1" OD, .083 Thk	8
	11	513-00004-01	Washer, SP, Hel Sprg Lk, 3/8", SAE	8
	12	508-00001-03	Nut, SP, Hex, 3/8-16	8
See Pg 13	13	050-01025-01	Engine & Pump Assy, JV Gas	1
	14	513-00009-03	Washer, SP, 5/16" ID, .875" OD, .083 Thk	4
	15	513-00003-01	Washer, SP, Hel Sprg Lk, 5/16", SAE	4
	16	508-00001-02	Nut, SP, Hex, 5/16-18	4
See Pg 15	17	050-01021-01	Coil, Shell & Plumbing Assy, JV Series	1
	18	284-00010-09	Hose assy, 23" L, 3/8", 4000PSI@250F, HP	1
	19	552-00004-03	QC plug, sp, 3/8", nptf	1
See Pg 16	20	050-01022-01	Frame Assy, Upper Roll Cage, JV Series	1
	21	180-00133-01	Cord Holder, Bent Wire, Chrome Plate	1
	22	050-08500-01	Wand Holder Assy, LH	1
	23	180-004290-1	Wand Holder, Left Hand	1
	24	513-00010-04	Washer, SP, 3/8" ID, 1" OD, .083 Thk	2
	25	505-00003-09	Bolt, SP, Hex, 3/8-16 x 2.5"	1
	26	513-00004-01	Washer, SP, Hel Sprg Lk, 3/8", SAE	1
	27	508-00001-03	Nut, SP, Hex, 3/8-16	1
	28	567-00001-01	Grommet	4
	29	050-08501-01	Nozzle Set, #3.5 @ 0, 15, 25, 40 Degrees	1
	30	270-00001-01	Nozzle, water, #3.5, 0.0 deg, QC	1
	31	270-00001-02	Nozzle, water, #3.5, 15 deg, QC	1
	32	270-00001-03	Nozzle, water, #3.5, 25 deg, QC	1
	33	270-00001-04	Nozzle, water, #3.5, 40 deg, QC	1
	34	050-01110-01	Brake Assy	1
	35	171-00001-01	Brake Assy, NV/JV Series	1
	36	505-00006-07	Bolt, SP, Carriage, 3/8-16 x 2.0"	1
	37	508-00001-03	Nut, SP, Hex, 3/8-16	1
	38	505-00002-03	Bolt, SP, Hex, 5/16-28 x 1.0"	4
	39	513-00009-03	Washer, SP, 5/16" ID, .875" OD, .083 Thk	4
	40	513-00003-01	Washer, SP, Hel Sprg Lk, 5/16", SAE	4
	41	508-00001-02	Nut, SP, Hex, 5/16-18	4
See Pg 16	42	055-08500-01	Wand Assy, Dual Lance, Gun & QC's	1
See Pg 16	43	055-08501-01	Hose Assy, 50' 4000 psi with QC's	1
	44	055-08502-01	Downstream Injection Plumbing Assy	1
	45	554-00007-03	QC Coupler Socket, brs, 3/8", nptf	1
	46	579-00004-04	Injector, detergent, BE#85.300.090	1
	47	552-00004-03	QC plug, sp, 3/8", nptf	1
	48	285-00002-01	Tubing, Clear, 1/4" ID, 3/8" OD x 48"	1
	49	570-00002-01	Check Valve, plastic, .25", w/ screen	1
	50	305-00005-01	Label, Fuel, Diesel	1
	51	305-00009-01	Label, Caution, Hot!	2
	52	305-00004-02	Label, Operating Instructions, Horizontal	1
	53	305-00043-01	Label, Warning, Vertical, gas/electric	1
	55	332-00001-01	Bag, Poly, 4 mil, 12 x 15 ziplock	1
	56	300-00015-01	Manual	1



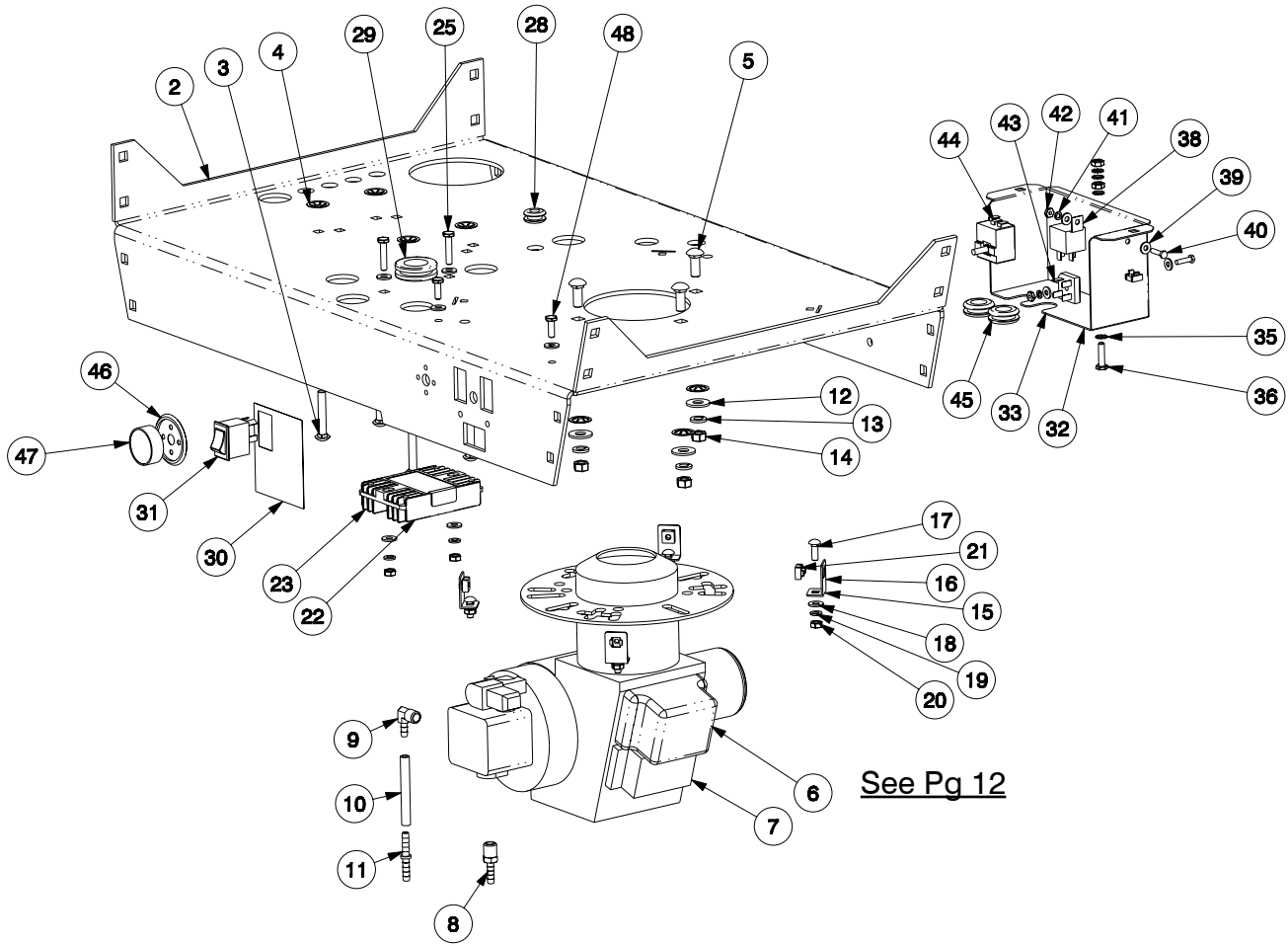
Base Assy Parts List



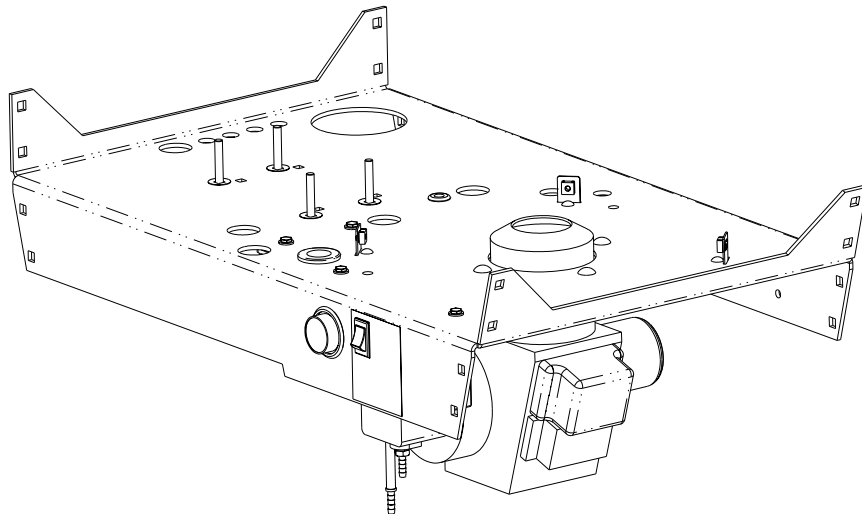
No.	Part Number	Description	Qty.
1	050-01018-01	Base Assy, JV Series	1
2	180-00462-01	Frame, Lower, JV Series	2
3	180-00461-01	Base, JV Series	1
4	505-00006-06	Bolt, SP, Carriage, 3/8-16 x 1.75"	2
5	513-00010-04	Washer, SP, 3/8" ID, 1" OD, .083 Thk	2
6	513-00004-01	Washer, SP, Hel Sprg Lk, 3/8", SAE	2
7	508-00001-03	Nut, SP, Hex, 3/8-16	2
8	175-00001-05	Axle, SS, 5/8" x 28.75"	2
9	170-00015-01	Wheel, pneu, 12", tubetype, 1 pc hub, 5/8 brg	4
10	516-00001-01	Bushing, Wheel Collar, 5/8"	4
11	190-00005-01	Tank, fuel, 7 gal, black	1
12	140-00001-01	Cap, fuel guage, diesel, black, one way vent	1
13	530-00002-02	Elbow, brs, 14 nptm x 1/4 barb, 90 deg	1
14	522-00001-01	Conn, hose end, 14 nptm x 1/4 barb	1
15	280-00003-01	Fuel line, 1/4" ID x 3/8" OD, black x 20" L	1
16	280-00003-01	Fuel line, 1/4" ID x 3/8" OD, black x 3" L	1
17	557-00001-01	Hose clamp, SS, 1/4" - 5/8"	4
18	577-00002-01	Filter, fuel, inline	1
19	280-00003-01	Fuel line, 1/4" ID x 3/8" OD, black x 10" L	1
20	513-00008-01	Washer, SP, Plain, 1/4, Narrow	4
21	513-00002-01	Washer, SP, Hel Sprg Lk, 1/4", SAE	4
22	505-00001-02	Bolt, SP, Hex, 1/4-20 x .75"	4



Power Plate Assy Exploded View



Power Plate Assy Assembled View



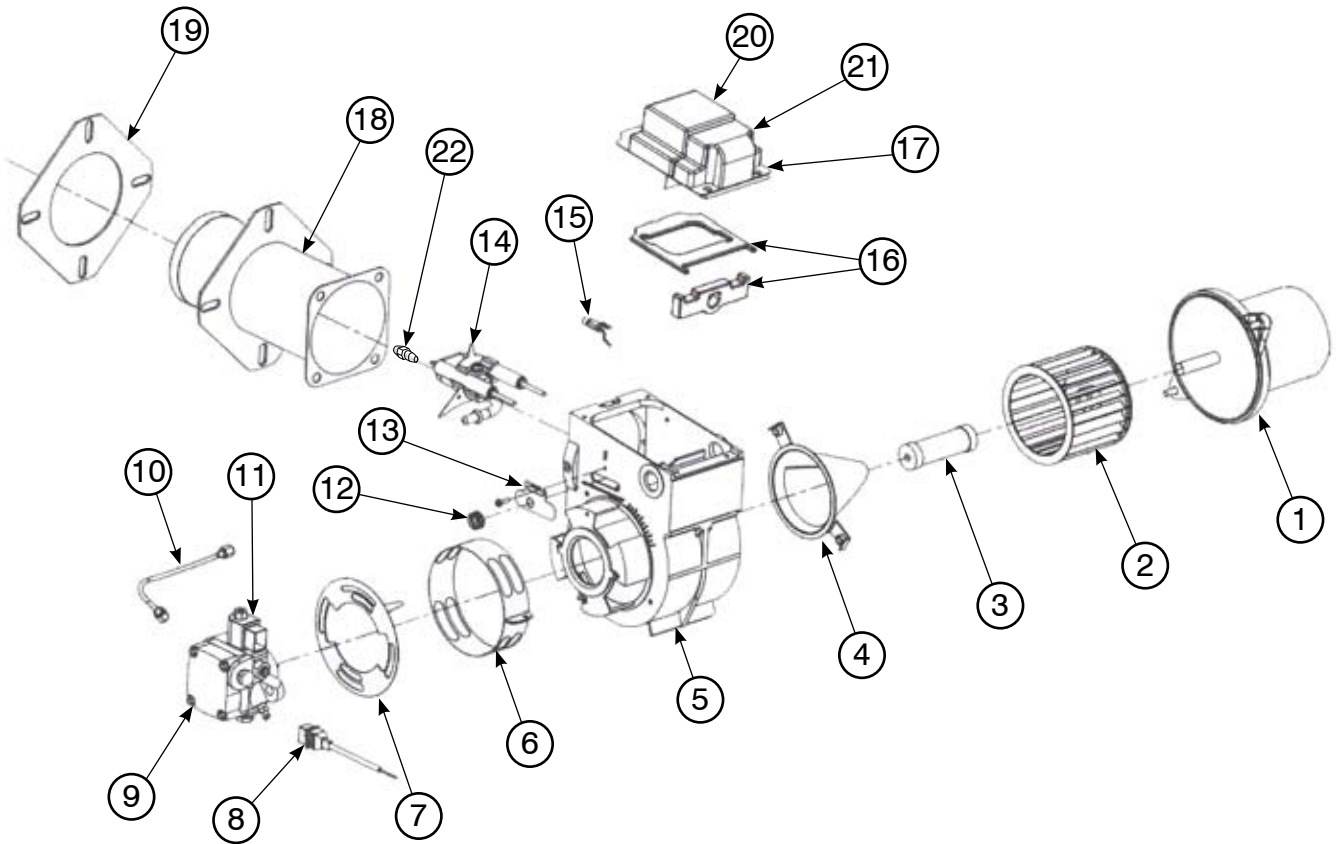


Power Plate Assy Parts List

No.	Part Number	Description	Qty.
1	050-01024-01	Power Plate Assy, JV Gas	1
2	180-00460-01	Power Plate - JV Series	1
3	505-00005-07	Bolt, SP, Carriage, 5/16-18 x 2.0"	4
4	508-00007-02	Pushnut, SP, 5/16"	7
5	505-00006-03	Bolt, SP, Carriage, 3/8-16 x 1.0"	3
6	050-01120-01	Burner Assy, Beckett, RTQ202	1
7	250-00005-01	Burner, Beckett, 465 004BDC	1
8	522-00001-01	Conn, hose end, 14 nptm x 1/4 barb	1
9	530-00002-02	Elbow, brs, 14 nptm x 1/4 barb, 90 deg	1
10	280-00003-01	Fuel line, 1/4" ID x 3/8" OD, black x 3" L	1
11	522-00001-02	Conn, hose mender, brs, 1/4 barb x 1/4 barb	1
12	513-00010-04	Washer, SP, 3/8" ID, 1" OD, .083 Thk	3
13	513-00004-01	Washer, SP, Hel Sprg Lk, 3/8", SAE	3
14	508-00001-03	Nut, SP, Hex, 3/8-16	3
15	050-01100-01	Shell Mounting Hardware (4X)	1
16	180-00153-01	Tab, burner plate	4
17	505-00004-02	Bolt, SP, Carriage, 1/4-20 x .75"	4
18	513-00008-01	Washer, SP, Plain, 1/4, Narrow	4
19	513-00002-01	Washer, SP, Hel Sprg Lk, 1/4", SAE	4
20	508-00001-01	Nut, SP, Hex, 1/4-20	4
21	508-00002-01	Nut, SP, Cage, 1/4-20, .064-.105	4
22	050-01102-01	Electrical Assy, NV/JV Gas	1
23	N/A	Regulator (provided with Robins Engine)	1
24	513-00008-01	Washer, SP, Plain, 1/4, Narrow	6
25	505-00001-04	Bolt, SP, Hex, 1/4-20 x 1.25"	2
26	513-00002-01	Washer, SP, Hel Sprg Lk, 1/4", SAE	2
27	508-00001-01	Nut, SP, Hex, 1/4-20	2
28	567-00001-01	Grommet	1
29	567-00022-01	Grommet	1
30	305-00040-02	Label, Burner Only Control	1
31	450-00001-01	Switch, Rocker, Low Amp	1
32	050-01103-01	Electrical Closeout Assy, NV/JV Gas	1
33	180-00430-01	Closeout, Controls, NV/JV Series	1
34	508-00002-01	Nut, SP, Cage, 1/4-20, .064-.105	2
35	513-00015-01	Washer, SP, ext star, 1/4"	4
36	505-00001-03	Bolt, SP, Hex, 1/4-20 x 1.0"	1
37	508-00001-01	Nut, SP, Hex, 1/4-20	2
38	455-00002-01	Relay, 12V, VF441F11, Omron #G8JN1C7THFDC12	1
39	513-00007-01	Washer, SP, Flat, No 10	4
40	505-00007-02	Bolt, SP, Hex, No. 10-24 x .75"	2
41	505-00001-02	Washer, SP, Hel Sprg Lk, No. 10-24, SAE	2
42	508-00001-04	Nut, SP, Hex, #10-24	2
43	455-00001-01	Rectifier, GBPC2506	1
44	573-00001-01	Thermostat, 194 degree, 100438	1
45	567-00018-01	Grommet	2
46	N/A	Plate, Thermostat (part of 573-00001-01)	1
47	N/A	Knob, Thermostat (part of 573-00001-01)	1
48	505-00001-02	Bolt, SP, Hex, 1/4-20 x .75"	2



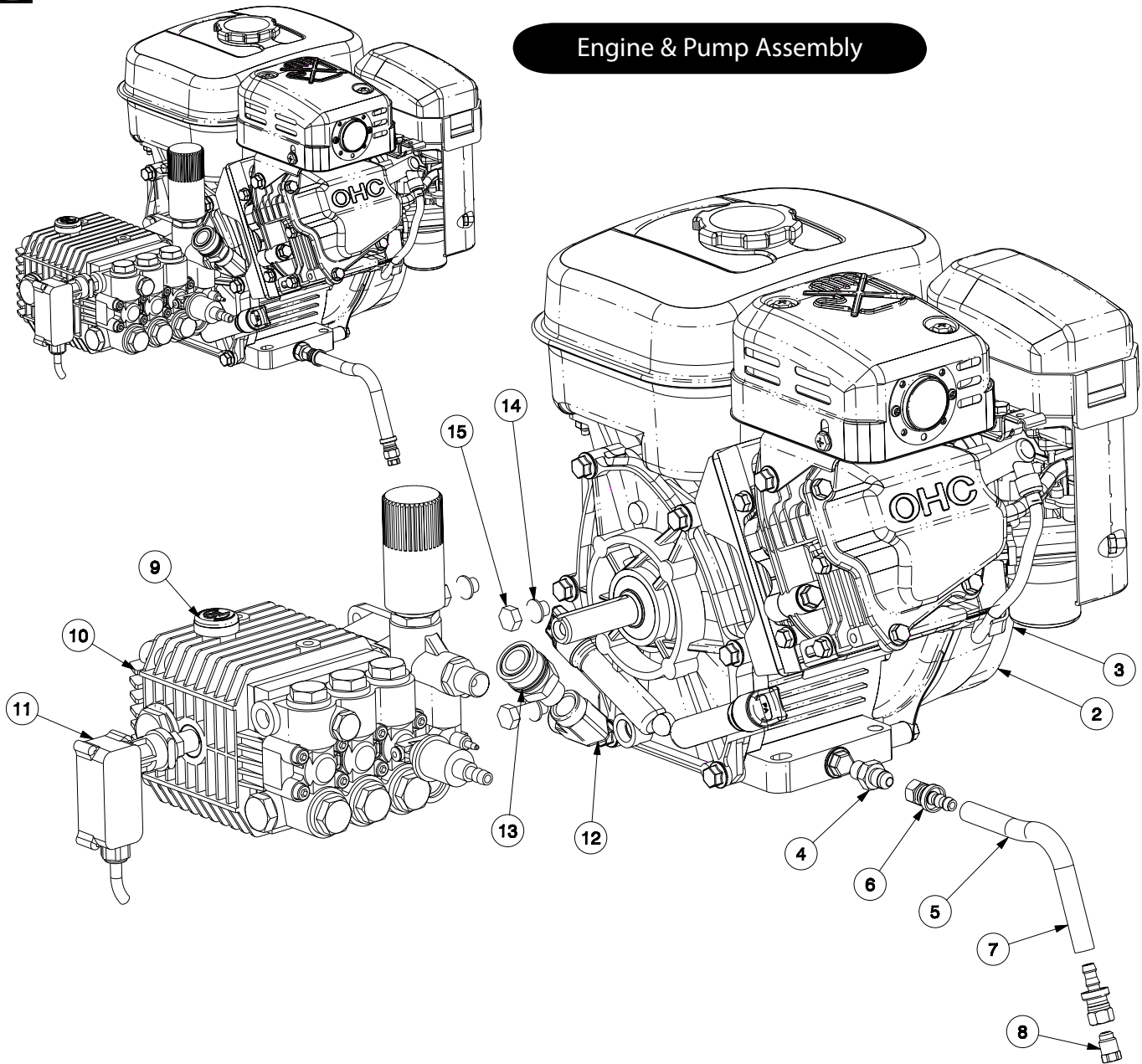
12V Burner Assembly



Ref.#	Beckett Part #	BE Part #	Description
1	21699UF	254-00002-02	DC Motor
2	2140401	253-00004-01	Blower Wheel
3	21405	254-00001-11	Coupling
4	31231U	259-00006-01	Air Guide
5	5874BKU	259-00007-01	Burner Housing - Black
6	5151501	259-00005-01	Air Band
7	3494	259-00008-01	Air Shutter 8 Slot
8	21807	252-00014-01	Cord Set
9	218440ZU	251-00002-03	Pump (CleanCut)
10	21877U	252-00010-01	Tube assembly
11	21754U	252-00007-01	12 volt Coil
12	3666	252-00013-01	Escutcheon plate spline nut
13	3493	252-00012-01	Escutcheon plate
14	5700	258-00006-01	Electrode kit
15	7492	252-00009-01	Cad cell detector
16	51411	252-00011-01	Ignitor gasket kit
17	51776U	252-00005-02	Ignitor w/ICB
18	Specify		Air tube assemblies
19	31802	256-00002-01	Flange mounting gasket
20	7435U	252-00005-01	Ignitor only
21	51663	252-00006-01	Ignitor Control Board
22		245-00007-14	Burner Nozzle, 1.75, 90A



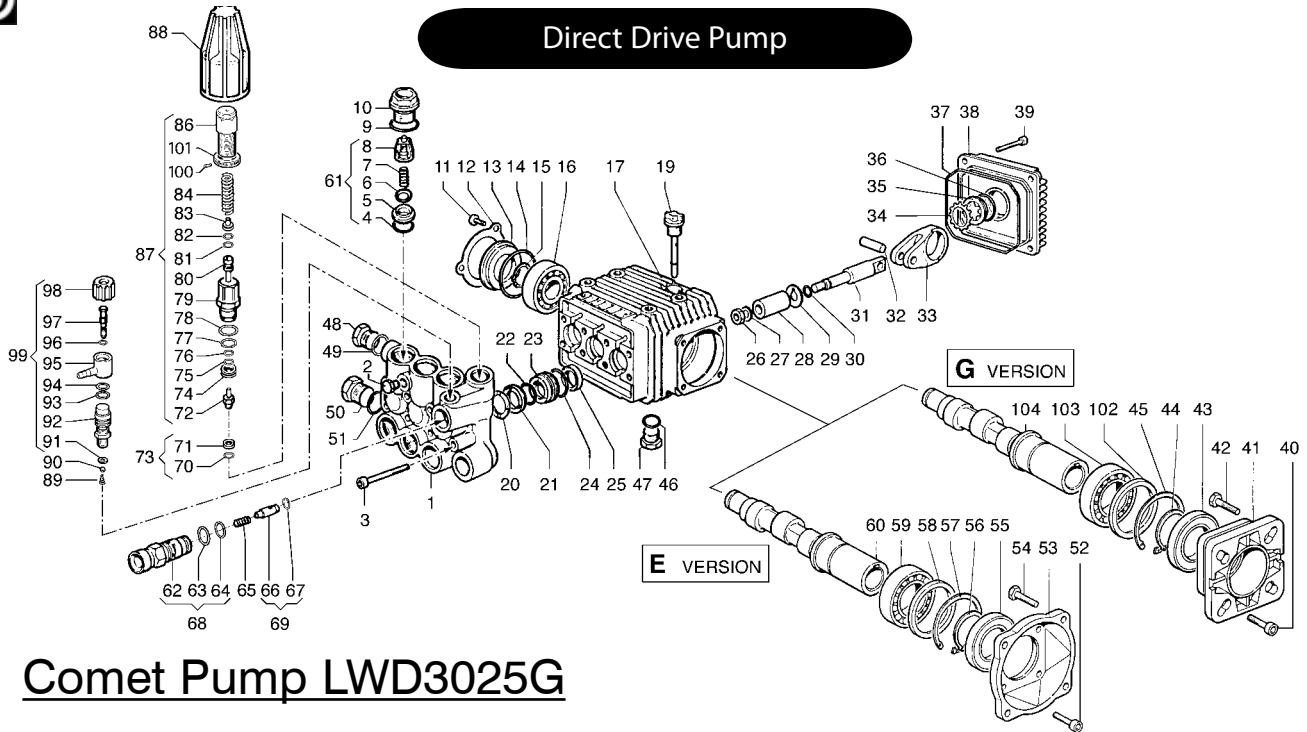
Engine & Pump Assembly



No.	Part Number	Description	Qty.
1	050-01025-01	Engine & Pump Assy, JV Gas	1
2	050-01121-01	Engine Assy, Robins 7HP, JV Gas	1
3	206-00036-01	Engine, Gas, 7HP, Robins-Subaru Shaft	1
4	518-00007-01	Conn, brs, M12 x 1 thread x #4 flare	1
5	050-01122-01	Drain Hose Assy, Robins 7HP, JV Gas	1
6	281-00001-01	Swivel, brs, #4 jic fem x 1/4 barb	2
7	280-00003-01	Fuel line, 1/4" ID x 3/8" OD, black	1
8	518-00006-01	Plug, brs, #4 male flare	1
9	050-01123-01	Pump Assy, JV Gas	1
10	220-00135-01	Pump, General, TP2530J34UI	1
11	574-00002-01	Pressure Switch	1
12	528-00002-03	Elbow, 3/8 nptf x 3/8 nptf, 90 deg	1
13	554-00006-03	QC coupler socket, brs, 3/8", nptm	1
14	N/A	Washer, 5/16" (supplied with pump)	4
15	N/A	Bolt, Hex, 5/16 x 1", (supplied with pump)	4



Direct Drive Pump



Comet Pump LWD3025G

POS. ITEM	CODICE PART No.	KIT KIT	DESCRIZIONE DESCRIPTION	Q.tà Qty.	MODELLI MODELS
1	3218.0112.00		MANIFOLD Ø 15 mm	1	
2	3202.0018.00		CAP G1/8	1	
3	3609.0152.00		SCREW M6X55	8	
4	1210.0046.00	A-D	O-RING 2,62X 17,13 mm	6	
5	3009.0087.00	A	VALVE SEAT	6	
6	3604.0017.00	A	VALVE PLATE	6	
7	1802.0177.00	A	SPRING	6	
8	1205.0025.00	A	VALVE GUIDE	6	
9	1210.0048.00	A-D	O-RING 2,62X 20,24 mm	6	
10	3202.0155.00		CAP	6	
11	3609.0088.00		SCREW M5X10	3	
12	1004.0012.00		CRANKCASE COVER	1	
13	0402.0172.00		SPACER	1	
14	1210.0386.00	D	O-RING 3,53X44,04 mm	1	
15	3019.0011.00		SNAP RING	1	
16	0438.0069.00		BALL BEARING 20X52X15 mm	1	
17	0403.0128.00		CRANKCASE	1	
19	3200.0051.00		OIL DIPSTICK	1	
20	0009.0196.00	B	HEAD RING Ø15 mm	3	
21	1241.0034.00	B	PACKING Ø15 mm	3	
22	1241.0030.00	B	PACKING 15X22X5,5 mm	3	
23	0009.0198.00		PACKING RETAINER Ø15 mm	3	
24	1210.0223.00	B-D	O-RING 1,78X26,7 mm	3	
25	0019.0095.00	D	OIL SEAL 15X24X5 mm	3	
26	0600.0048.00	C	NUT	3	
27	2811.0080.00	C	WASHER 8,2X14X1,5 mm	3	
28	0202.0020.00	C	PISTON Ø15 mm	3	
29	2812.0038.00	C	WASHER	3	
30	1210.0055.00	C-D	O-RING 1,78X 6,07 mm	3	
31	2409.0044.00		PISTON GUIDES	3	

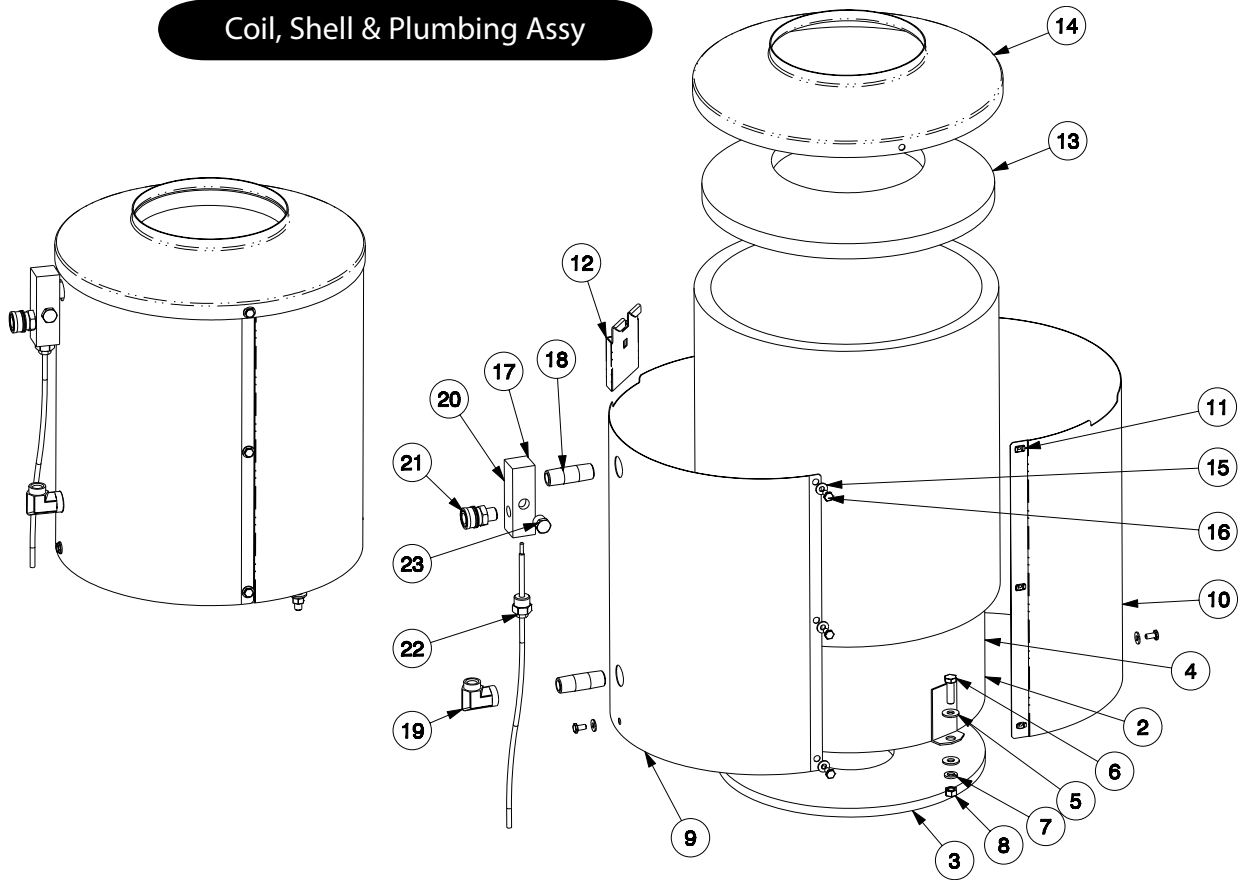
POS.	CODICE	KIT	DESCRIZIONE	Q.tà Qty.	MODELLI MODELS
32	3011.0014.00		WRIST. PIN	3	
33	0205.0050.00		CON. ROD	3	
34	3019.0033.00		SNAP RING Ø18 mm	1	
35	3201.0010.00		OIL INDICATOR	1	
36	1210.0333.00	D	O-RING 1,78X23,52 mm	1	
37	1210.0206.00	D	O-RING 2,62X101,27 mm	1	
38	0402.0142.00		CRANKCASE COVER	1	
39	3609.0041.00		SCREW M6X25	4	
46	1210.0441.00	D	O-RING 2x14 mm	1	
47	3200.0007.00		CAP 3/8GAS OT58	1	
48	3200.0007.00		CAP 3/8GAS OT58	1	
49	2811.0084.00		WASHER 16,7X22X1,5 mm	1	
50	3202.0015.00		CAP G1/2	1	
51	2811.0086.00		WASHER 21,2X27X1,5 mm	1	
51	1220.0030.00		VALVE ASS. BLY.	6	
62	3410.0290.00	E	INJECTOR BODY M22 x 1,5	1	
	3410.0288.00	E	INJECTOR BODY 3/8" NPT	1	
63	1210.0398.00	E-F	O-RING	1	
64	1210.0402.00	E-F	O-RING	1	
65	1802.0179.00	E	SPRING	1	
66	2409.0076.00	E	CHECK VALVE	1	
67	1210.0397.00	E-F	O-RING	1	
68	3410.0289.00		INJECTOR BODY KIT M22 x 1,5	1	
	3410.0287.00		INJECTOR BODY KIT 3/8" NPT	1	
69	2409.0075.00		CHECK VALVE KIT	1	
70	1210.0403.00	E-F	O-RING 1,78X8,73 mm VT	1	
71	3009.0122.00	E-F	VALVE SEAT	1	
72	3002.0508.00	E-F	HOUSING WITH BALL	1	
73	3009.0013.00		SEAT KIT	1	
74	0009.0204.00	E-F	RING	1	
75	0009.0205.00	E-F	BACK RING	1	
76	1210.0405.00	E-F	O-RING	1	
77	1210.0404.00	E-F	O-RING	1	
78	1210.0407.00	E-F	O-RING	1	
79	0204.0045.00	E	HOUSING	1	
80	2409.0077.00	E-F	PISTON ROD	1	
81	1210.0406.00	E-F	O-RING	1	

Pump Repair Kits

Part #	Description	Qty.	Comet Part #
221-00310-02	Check Valve Kit	1	5025.0011.00
221-00302-01	Packing Kit	1	5019.0035.00
221-00300-01	Piston Kit	1	2409.0071.00
221-00315-03	Oil Seals	3	0019.0095.00



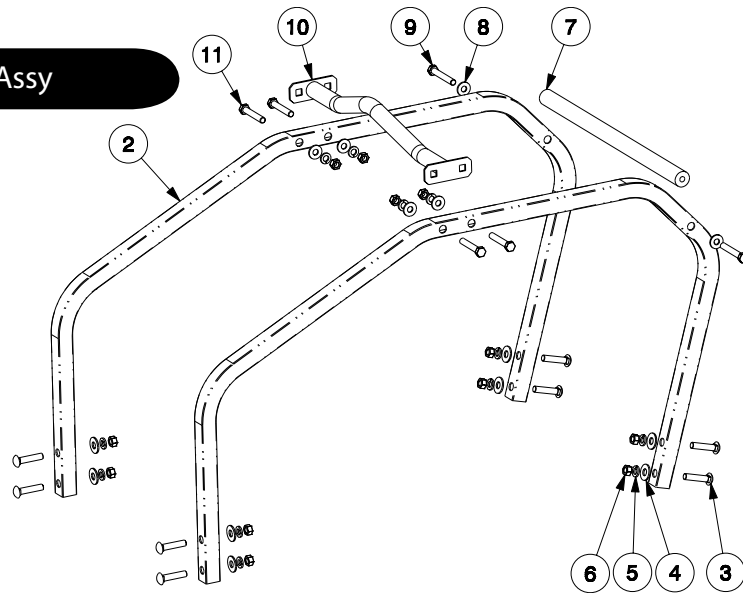
Coil, Shell & Plumbing Assy



No.	Part Number	Description	Qty.
1	050-01021-01	Coil, Shell & Plumbing Assy, JV Series	1
2	050-01118-01	Coil & Shell Assy, Short, 16" Round Shell	1
3	191-00007-01	Insulation, blanket, 0.5", 24" wide, 4#	1
4	155-00001-02	Coil, small, diesel fired, round feet	1
5	513-00009-02	Washer, SP, Plain, 5/16, Wide	4
6	505-00003-04	Bolt, SP, Hex, 3/8-16 x 1.25"	2
7	513-00004-01	Washer, SP, Hel Sprg Lk, 3/8", SAE	2
8	508-00001-03	Nut, SP, Hex, 3/8-16	2
9	180-00423-02	Shell, Stationary, 16", Short	1
10	180-00424-02	Shell, Removable, 16", Short	1
11	508-00002-01	Nut, SP, Cage, 1/4-20, .064-.105	6
12	180-00132-01	Bracket, Cord Holder	1
13	191-00009-01	Insulation cap, 16" x 8"	1
14	180-00425-01	Coil Cap, 16" x 8"	1
15	513-00008-01	Washer, SP, Plain, 1/4, Narrow	8
16	505-00001-01	Bolt, SP, Hex, 1/4-20 x .5"	8
17	050-01119-01	Coil Plumbing, 16", Round, JV Elec	1
18	524-00004-02	Pipe nipple, galv, 1/2 nptm x 2.50", shc 80	2
19	528-00003-01	Elbow, sp, 1/2 nptf x 3/8 nptf, sch 90	1
20	185-00001-01	Manifold, outlet	1
21	554-00006-03	QC coupler socket, brs, 3/8", nptm	1
22	N/A	Thermostat probe (part of P/N 573-00001-01)	1
23	518-00004-01	Plug, brs, 3/8" pipe	1

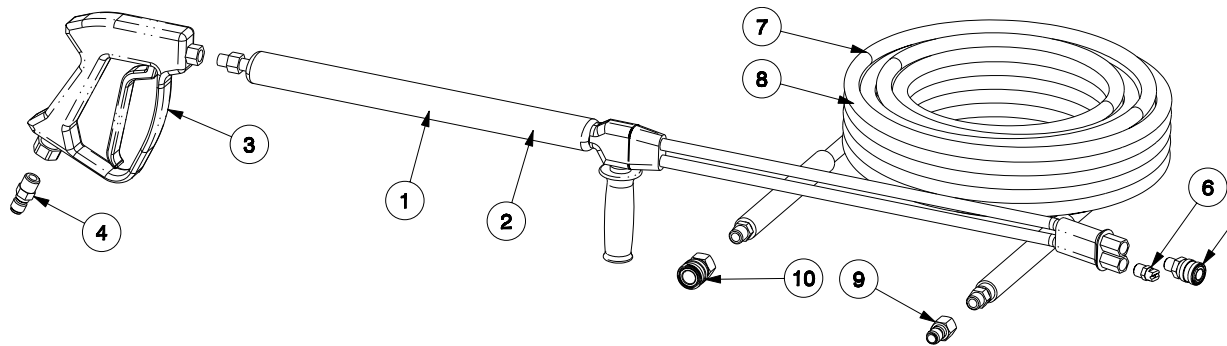


Upper Frame Assy



No.	Part Number	Description	Qty.
1	050-01022-01	Frame Assy, Upper Roll Cage, JV Series	1
2	180-00463-01	Frame, Upper, JV Series	2
3	505-00006-06	Bolt, SP, Carriage, 3/8-16 x 1.75"	8
4	513-00010-04	Washer, SP, 3/8" ID, 1" OD, .083 Thk	8
5	513-00004-01	Washer, SP, Hel Sprng Lk, 3/8", SAE	12
6	508-00001-03	Nut, SP, Hex, 3/8-16	12
7	180-00428-01	Handle	1
8	513-00009-02	Washer, SP, Plain, 5/16, Wide	6
9	505-00003-09	Bolt, SP, Hex, 3/8-16 x 2.5"	2
10	180-00418-01	Lifting Bar Assy, NV/JV Series	1
11	505-00003-08	Bolt, SP, Hex, 3/8-16 x 2.25"	4

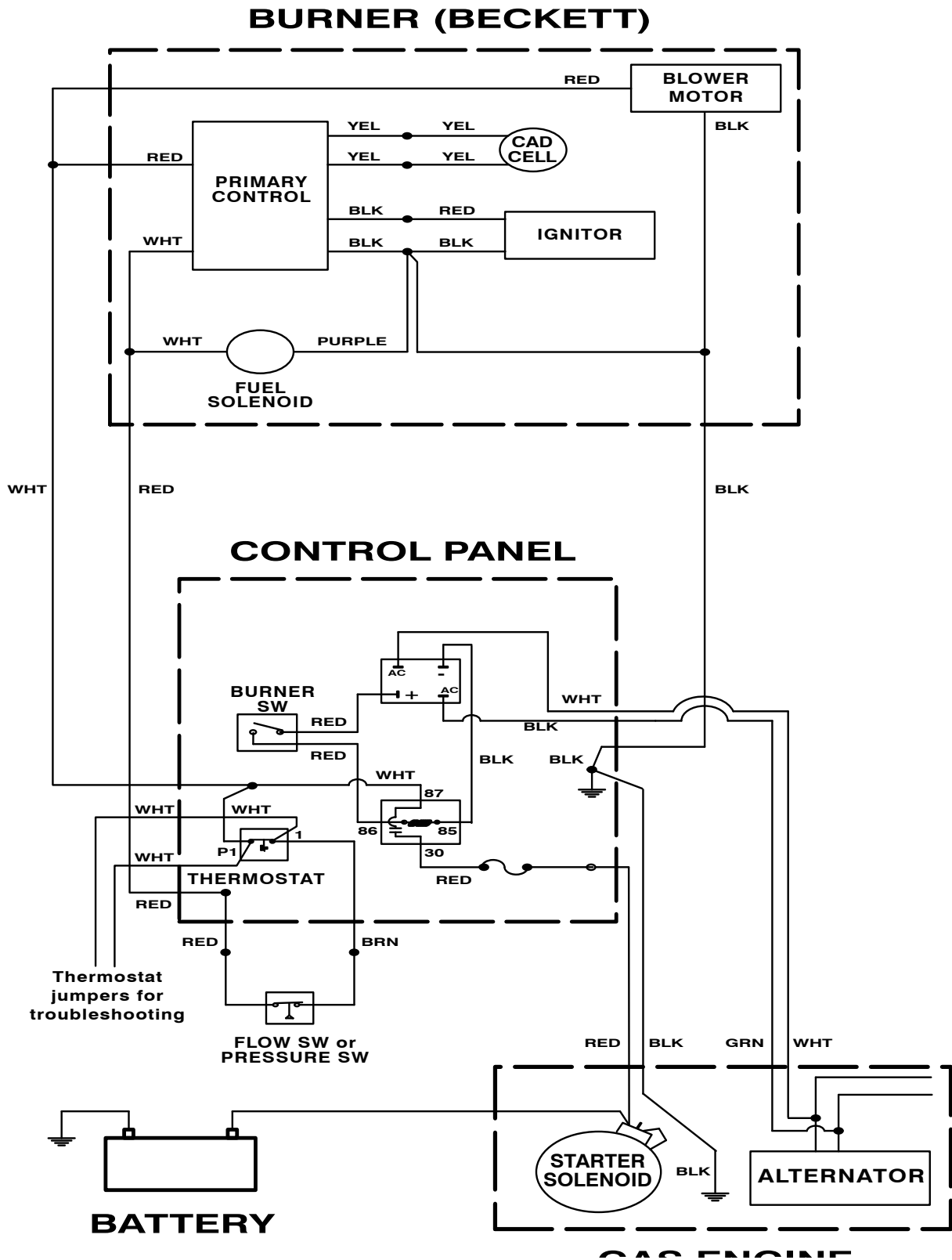
Dual Lance & Hose Assy's



No.	Part Number	Description	Qty.
1	055-08500-01	Wand Assy, Dual Lance, Gun & QC's	1
2	265-00002-01	Dual Lance, 8107-1101, Comet 15*, 42"SS	1
3	275-00001-01	Gun, ST1500	1
4	522-00003-03	QC Plug, SP, 3/8" nptm	1
5	554-00006-02	QC Coupler Socket, brs, 1/4", nptm	1
6	270-00038-01	Nozzle, Water, SS, 1/4", soap, #40, 15 deg	1
7	055-08501-01	Hose Assy, 50' 4000 psi with QC's	1
8	284-00007-02	Hose Assy, 50', 4000 psi @ 250 F, swivel	1
9	552-00004-03	QC plug, sp, 3/8", nptf	1
10	554-00007-03	QC Coupler Socket, brs, 3/8", nptf	1



Wiring Diagram





Troubleshooting

problem	cause	action
Low Water Pressure	Insufficient water source Old or incorrect nozzle Plumbing or hose leak Obstruction in spray nozzle Unloader valve worn Pump valves dirty or worn	Check hose size/water source Replace nozzle Tighten, repair or replace leak Clean or replace nozzle Replace unloader Clean or replace packing/valves
No Chemical Flow	Detergent valve closed Low detergent level Chemical screen dirty	Open detergent valve Fill detergent container Clean detergent screen
Burner Not Igniting	No fuel Burner switch turned off Thermostat set too low Clogged fuel filter Defective pressure switch Clogged burner nozzle Fuel pump malfunction	Fill fuel tank with proper fuel Turn burner switch on Reset thermostat Replace fuel filter Replace pressure switch Replace burner nozzle Replace fuel pump
Excessive Burner Smoke	Improper fuel being used Water contamination in fuel Improper air band adjustment Low fuel pressure Air leaks in fuel lines Soot on coils/burner assembly Dirty burner nozzle	Use Diesel #1/#2 or Kerosene Drain fuel and replace with new Readjust air band/altitude Adjust to specifications Check for air leaks or bubbles Clean coils/burner assembly Clean or replace burner nozzle
Pressure Relief Valve Leaks	Nozzle is dirty Defective relief valve Unloader adjusted incorrectly Restriction on discharge hose Scale restricting flow in coil	Clean or replace nozzle Replace relief valve Adjust unloader valve Remove nozzle and flush line Clean coil
Engine Will Not Start	Throttle lever off No fuel in engine Bad fuel or wrong fuel in engine Worn, foul, or dirty spark plug(s) Pressure build up in pump	Turn throttle lever to "on" position Fill fuel tank if needed Check to ensure correct fuel in tank Check spark plugs Squeeze trigger on gun
Engine Runs Rough/No Power	Low oil level Dirty air filter Bad fuel or wrong fuel in engine Worn, foul, or dirty spark plug(s) Overchoking	Check oil level, fill if needed Check and replace air filter if needed Check to ensure correct fuel in tank Check spark plugs Open choke fully and crank engine
Pump Noisy	Air in suction line Pump valves dirty Check valve springs worn Incoming water too hot	Check inlet water fittings Clean/replace pump valves Replace check valves Reduce temperature/ambient
Water In Oil	High humidity environment Oil seal worn Plunger packing worn	Change oil frequently Check and replace oil seal Check and replace packing
Water Dripping/Pump	Plunger packing is worn Plunger retainer oil ring worn Cracked ceramics	Install new packing kit Replace oil ring Replace ceramics
Fluctuating Pressure	Valves worn Dirt or blockage in valves Pump sucking air Worn plunger packing	Replace with valve kit Clean or replace valve Check water/detergent supply Replace packing kit
Pump Head Overheating	Extended period in bypass	Pull trigger gun for water flow



WARRANTY

MANUFACTURER LIMITED WARRANTY

ENGINES

Honda GX Series Engines; TWO years from date of purchase Honda will repair or replace any manufacturer defect at their expense. To be handled by Honda Service Centers. See owners Manual for details.

PUMPS

Pump manufacturers offer a "one and five" limited warranty on tri-plex ceramic plunger type pumps, from date of purchase.

The body, head and power train of the pump is warranted for 5 years from date of purchase against manufacturer defects. See owners manual for details. The valves, packings and "o" rings are warranted for one year from date of purchase against manufacturer defects. See owner's manual for details. NOTE - Over Heated Pumps void all warranties.

LIMITATION OF LIABILITY

RAMTEQ and Equipment Manufacturer liability for special, incidental, or consequential damages is expressly disclaimed. In no event shall any liability exceed the purchase price of the product in question. The warranty contained herein is in lieu of all other warranties express or implied, including any implied warranty of fitness for particular purpose.

NOTE - It is understood that a manufacturers limited warranty pertains to equipment used in it's prescribed manner, without abuse, and does not include wear and tear.

NOTE - All freight charges incurred from manufacturer's warranty situations are the responsibility of the customer.

Specifications, Warranties and Pricing are subject to change without notice.

*Refund does not include shipping/handling fees. No refund will be given for installation kits. Customer is responsible for lost or misdirected packages. It is recommended that the customer insure the package for its full retail value. This warranty does not cover or include any damage as a result of acts of God, improper installation, alteration, negligence or abuse.