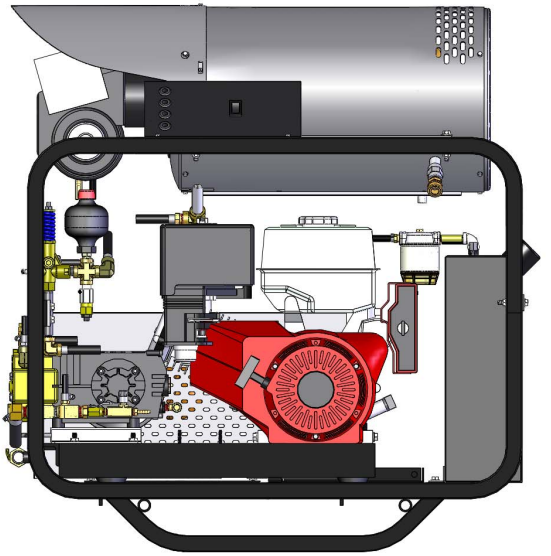
HY-FLO

~SINCE 1977~

"A new generation of quality."

Service Manual



Compact Skid GED Series

Model 4355H

(800) 421-4018

www.hy-floequipment.com

20200506

Register your machine at

warranty.alkota.com

_____

INSTALLATION DATE

_____

MAKE/MODEL **SERIAL NUMBER**

_____

SELLER

_____

ADDRESS **CITY/STATE/ZIP**

English to Metric Conversions		
1 gal/m	=	3.7843 L/m
1 hp	=	.7457 kw
100 psi	=	6.8964 bar
1 ft	=	.3048 m
1 in	=	2.54 cm
1 lb	=	.4536 kg
$\frac{(^{\circ}F - 32)}{1.8}$	=	$^{\circ}C$

WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warning.ca.gov

ADVERTENCIA: Este producto puede exponerle a productos químicos incluso el plomo, que es conocido al Estado de California causar cáncer y defectos de nacimiento u otro daño reproductivo.

AVERTISSEMENT : Ce produit peut vous exposer aux produits chimiques en incluant l'avance, qui est connue à l'État de Californie provoquer le cancer et les anomalies congénitales ou d'autre mal reproducteur.

WARNING:
ADVERTENCIA:
AVERTISSEMENT:

20180730

California Prop 65 Warning

Table of Contents

(800) 421-4018
www.hy-floequipment.com

Quick Machine Checklist

Machine Check List

Gasoline Powered Hot Water Equipment

Daily: _____ Check oil level in motor.

Daily: _____ Check fuel levels. Add diesel or kerosene to black tank marked diesel. Add gasoline to red tank marked gas. DO NOT ADD GAS TO DIESEL TANK - EXPLOSION CAN OCCUR!II

Monthly: _____ Check oil level in pump and inspect belts for wear.

To start machine:

_____ 1. Make sure burner switch is in off position.

_____ 2. Choke engine - start motor. (Starting the motor with the trigger pulled ensures easy start.)

_____ 3. Turn on burner - set temperature gauge to desired temperature.

_____ 4. When finished cleaning - turn off burner and run machine until discharge water is cool.

_____ 5. Pull trigger when machine is off to release pressure in system.

Winterization

To winterize system:

_____ 1. With machine off - close ball valve to water and open valve to antifreeze tank.

_____ 2. Start engine - do not turn on burner.

_____ 3. Run machine with antifreeze valve open until it flows out end of wand, then release trigger and re-pull trigger briefly. System is now antifreezed.

_____ 4. Upon start-up: close antifreeze ball valve and open water valve. Remove nozzle and place end of wand in antifreeze tank. Start machine and run machine until all antifreeze has been recaptured into antifreeze tank.

IMPORTANT: CHECK ANTIFREEZE PROTECTION LEVEL AND MAKE SURE THAT FREEZE LEVEL IS BELOW AMBIENT TEMPERATURES! Freezing will cause extensive damage to equipment.

Specifications

PERFORMANCE

Discharge Volume	
	3.7 gal/m / 14.0 L/m
Pump Head Pressure	
	3500 psi / 242 bar
Combustion Smoke/Bacharach Scale	
	#1 OR #2 SMOKE
Carbon Monoxide Allowed	
	0.01%
Draft/Stack Installation	
	0.2" – 0.04" WC READING
Heat Input	
	235,200 Btu/h / 59,270 kcal/h
Combustion Smoke/Bacharach Scale	
	#1 OR #2 SMOKE

GENERAL

Minimum Inlet Water Pressure	*over 65 psi may require water inlet regulator*
	10 psi / 0.68 bar
Weight	
	705 lbs / 320 Kg
Burner Fuel Tank Capacity	
	11gal / 42 Ltr
Engine Fuel Tank Capacity	
	1.7 gal / 4.4 Ltr.
Dimensions	
	40"" Long x 42 High x 24" Wide
Pump	
	Triplex, Oil Bath Crankcase, Solid Ceramic Plungers
Spray Tip	
	Red (#4 - 0˚) p/n JA0-00040-2 Yellow (#4 - 15˚) p/n JA0-15040-2 Green (#4 - 25˚) p/n JA0-25040-2 White (#4 - 40˚) p/n JA0-40040-2
Belt	
	p/n R02-00245
Coil	
Standard	14" OD x 1/2" ID x 95' Schedule 80
Coil Back Pressure (New)	5 psi / 0.34 bar
Coil Back Pressure Requiring Descaling	50 psi / 3.40 bar

ELECTRICAL

Machine Voltage	
	12v
Battery Cable Negative - Black	
	32” Clmp/Eye p/n F05-00232
Battery Cable Positive + Red	
	32” Clmp/Eye p/n F05-00232-R

Pump Engine

p/n	F05-00488
Make	Honda GX390
Horsepower	13 hp / 9.7 kw
Fuel	Gasoline
Engine Starting	Electric
Engine Air Filter	p/n F05-000462-10
Engine Air Pre-Cleaner	None
Engine Oil Filter	None
Fuel Tank Capacity	6.4 Qt / 6.5 L
Oil Capacity	1.16 Qtl / 6.5 L
Engine Oil Alert	Yes

BURNER

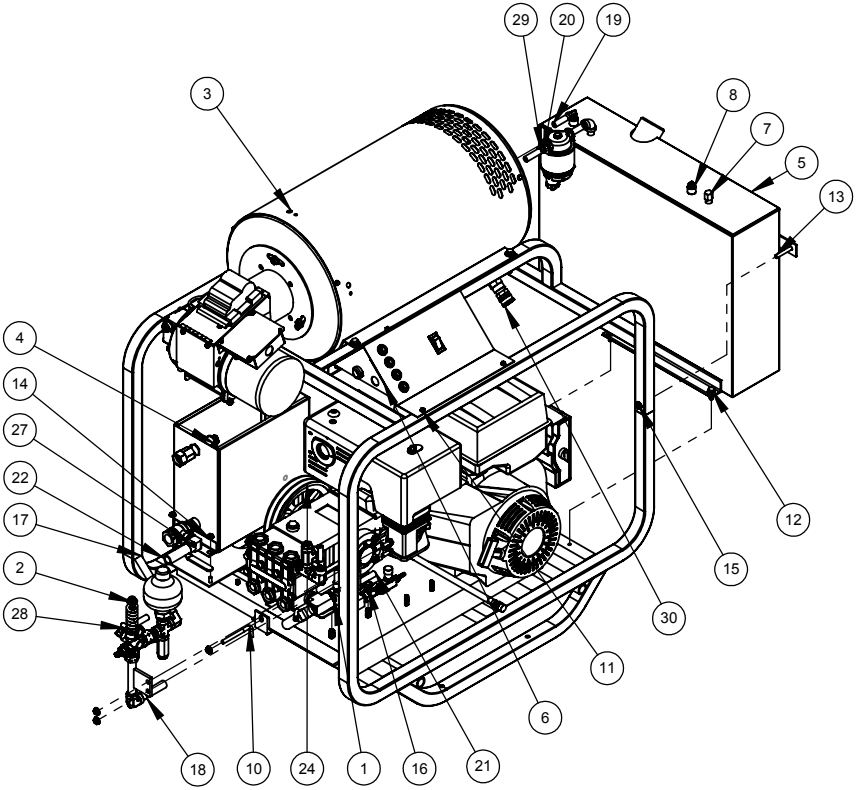
Burner Part Number	V00-173141
Burner Type	Pressure Atomizing
Voltage	12VDC
Horsepower	1/8 HP
Fuel Type	Kerosene, #1 or #2 Diesel
Fuel Pressure	125 PSI / 9 BAR
Fuel Pump	P/N V0014283

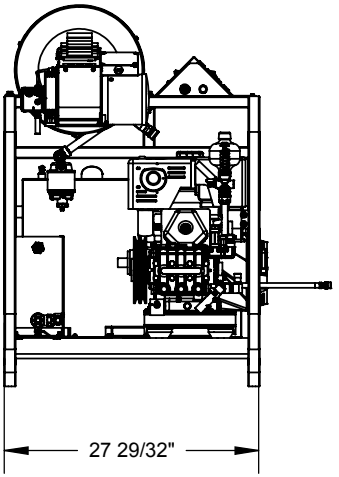
Burner Nozzle	1.50 90 Degree A p/n V1.50 90DA
Fuel Consumption	1.68 Gal/Hr / 6.3 L/Hr
Fuel Pressure	125 Psi

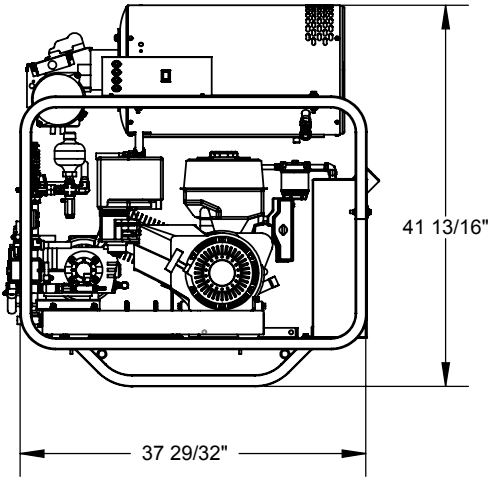
Maintenance Schedule

ENGINE DRIVEN Maintenance Schedule *Pressure Washer Cleaners*	daily	Each HR 1st 8 HRS	AFTER 1ST 50	EVERY 50 HRS	EVRERY 100 HRS	EVERY 500 HRS	YEARLY
Oil Bath Water Pump:							
Oil Level- check and add as needed per PUMP SERVICE insert	•						
Oil Change- drain and refill per PUMP SERVICE insert CAUTION: Used oil must be disposed into an environmentally safe container and brought to an oil recycling center			•			•	
Oil Contamination- milky color indicates water	•						
Hoses:							
Blistering, loose covering	•						
Abrasion of cover exposing reinforcement	•						
Cuts exposing reinforcement	•						
Belts:							
Cracks or fraying	•						
Belt tension- For correct belt tension, see MACHINE MAINTENANCE insert	•						
Filter-Water:							
Check water inlet hose screen for debris		•		•			
Check float tank screen for debris	•						
Leaks:							
Check for water and build up of scale at pipe connections	•						
Guards and Shields:		•					
Check that all guards and shields are in place and secure							
Freezing Temperatures: Freezing temperatures break water pumps and like components. See STORAGE in the MACHINE MAINTENANCE section for cold weather instructions.		•					•
Fuel:							
Adequate fuel supply	•						
Filter-Fuel:							
If contaminants are present see FUEL FILTER insert	•						
Remove and replace fuel filter.						•	
Guards and Shields:							
Check that all guards and shields are in place and secure							•

General Assembly



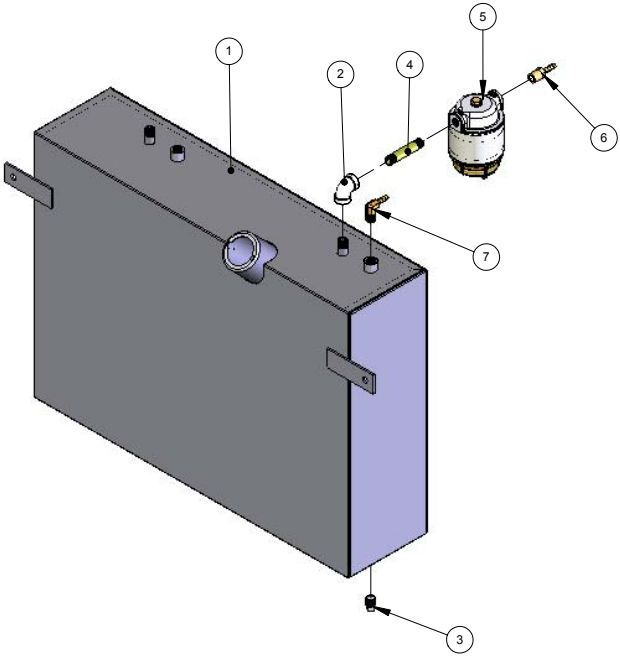




ASSEMBLY, GENERAL
3/5/2008

ITEM NO.	PART NUMBER	PART DESCRIPTION	QTY.
1	4355H-00501	ASSEMBLY, PUMP	1
2	4355H-00515	ASSEMBLY, UNLOADER	1
3	4355H-00657	ASSEMBLY, PRE - CLEANER	1
4	4355H-01121	ASSEMBLY, TANK - FLOAT	1
5	4405F-00126	ASSEMBLY, TANK - FUEL	1
6	4405F-00302	ASSEMBLY, CONTROL PANEL	1
7	E05-10025	CAP, PIPE	1
8	E09-00002-2	PLUG, PIPE	1
9	F04-00342	CLIP, INSULATED - 1/2"	6
10	H03-31311	BOLT,J-5/16-18UNC x 3 1/2	1
11	H04-19011	SCREW, SELF TAP	4
12	H04-31301	SCREW, CAP - 5/16 X 3/4	4
13	H04-31326	CAP, SCREW	2
14	H06-25003	NUT, HEX	4
15	H06-31300	NUT, LOCK - 5/16"	7
16	H06-37500	NUT,LOCK-3/8-16UNC HEX	4
17	K02-03222A2	ASSEMBLY, HOSE - 3/8 x 22""	1
18	K02-03225A2	ASSEMBLY, HOSE - 3/8 x 25"	1
19	K23	HOSE, LOW PERMEATION, BLACK	1
20	K23	HOSE, LOW PERMEATION, BLACK	1
21	K33-00900	HOSE, WATER - 3/8 X 9"	1
22	K60-02300	HOSE, WATER - 5/8 X 23"	1
23	R03-00732	PULLEY,V2AK32H	1
24	R03-00774	PULLEY,DBL V-2AK74H	1
25	R04-00001	BUSHING, PULLEY	1
26	R04-0006	BUSHING, PULLEY	1
27	W02-00031	CLAMP, HOSE	2
28	W02-00032	CLAMP, HOSE	2
29	W02-00033-P	CLAMP, HOSE	4
30	W04-34155-A	COUPLER, QUICK	1

Fuel Tank Assembly

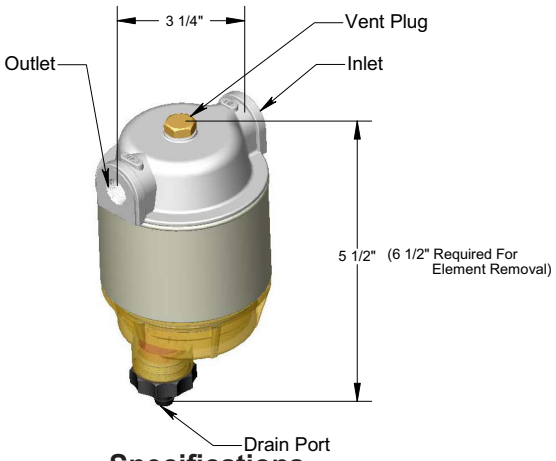


ASSEMBLY, TANK - FUEL
p/n: 4405F-00126
10/22/2009 - 10 Gallon

ITEM NO.	PART NUMBER	PART DESCRIPTION	QTY.
1	4405F-00125	TANK, FUEL	1
2	E08-00005-2	ELBOW,1/4FNPT	1
3	E09-00002-2	PLUG, PIPE	1
4	E13-00025-48	NIPPLE, PIPE	1
5	V04-00308	FILTER, FUEL	1
6	W02-10019-8	BARB, HOSE	1
7	W02-10031	BARB, HOSE	1

Fuel Filter
Specifications, Trouble Shooting

p/n V04-00308



Specifications

Maximum Flow	15 GPM / 57 LPM
Maximum Filtration	2 Microns
Maximum Temperature	212˚F / 100˚C
Weight	1.0lbs / 340km
Inlet	¼ NPT
Outlet	¼ NPT

All dimensions are in inches unless otherwise noted.
25.4 mm = 1 inch

Maintenance Procedures

Priming the machine

Shut off the fuel tank valves. Spin off the clear bowl, fill with clean fuel and coat the round gasket (3) with fuel. Reinstall the clear bowl and tighten ¼ to 1/3 turns after the gasket contacts the upper housing. Turn on the fuel tank valves. Start the machine and check that there are no leaks.

Draining water

Check the collection bowl daily. Drain off water contaminants by unscrewing the clear bowl turning counter-clockwise. Start the machine and allow air to purge from the fuel system prior to operating the equipment.

Element replacement frequency

Frequency of element replacement is determined by contamination level in the fuel. Replace the element every 500 hours.

Note: Foul smelling diesel fuel is an indication of microbiological contamination. A change in fuel source is recommended. Always carry a spare filter element as one tank full of contaminated fuel will plug the fuel filter element prematurely.

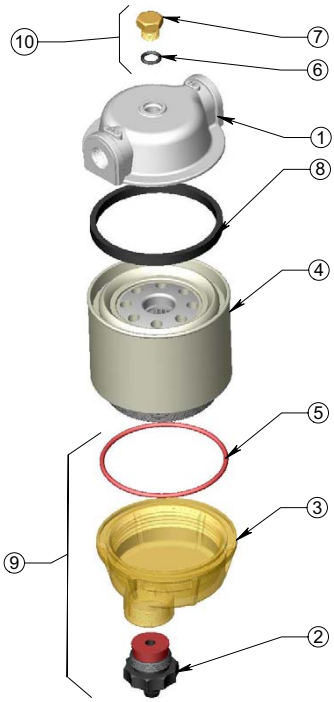
Element replacement procedure

1. Shut off the fuel tank valves.
2. Unscrew the clear bowl turning counter-clockwise.
3. Remove and discard the filter element.
4. Follow listed procedures under “PRIMING.”

Maitennace Schedule

Filter, Fuel
p/n V04-00308

Maintenance Schedule	Weekly	EVRERY 100 HRS
Gaskets		
Inspect for deterioration or tearing.	•	
Remove and replace.		•
Bowls		
Inspect rim of bowl to insure it is free of nicks, cracks, or scratches.	•	
Filter Element		
Inspect for damage or deterioration.	•	
Remove and replace.		
Fuel Bowl		
If contaminants are found, check more frequently.	•	

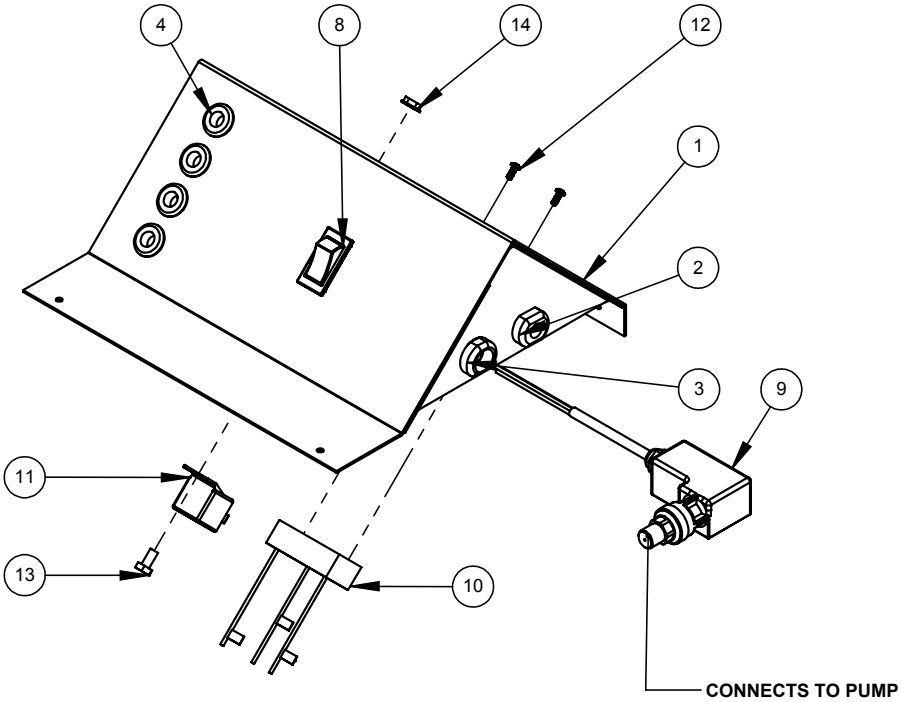


PART LIST			
ITEM	PART NUMBER	PART DESCRIPTION	QTY
1	V04-00308-02	Housing, Upper	1
2	V04-00308-07	Assembly, Drain	1
3	V04-00308-K	Bowl, Amber – 3”	1
4	V04-00308-01	Element, Filter	1
5	V04-00308-05	O-Ring – 3/32CS x 2 1/2ID	1
6	V04-01300-08	O-Ring – 1/16CS x 5/16ID	1
7	----------	Plug, Pipe	1
8	V04-00308-03	Ring, Flat	1
9	V04-00308-K	Kit, Replacement Bowl	1
10	V04-00308-04	Vent Plug & O-ring	1

Troubleshooting

Trouble	Possible Cause	Remedy
Fuel bowl leaking	Deteriorated gasket	Remove and
	Housing cracked	Remove and replace housing
	Bowl rim cracked, nicked, ors cracked	Remove and replace bowl
	Gasket missing	Replace gasket
	Loose fuel bowl	Tighten fuel bowl onto filter
Air leaking into system (indicated by air bubbles in bowl during operation)	Cracked component	Inspect filter bowl, filter housing, and gasket
	Loose filter bowl	Tighten fuel bowl onto fuel filter
	Loose valve assembly	Tighten valve assembly

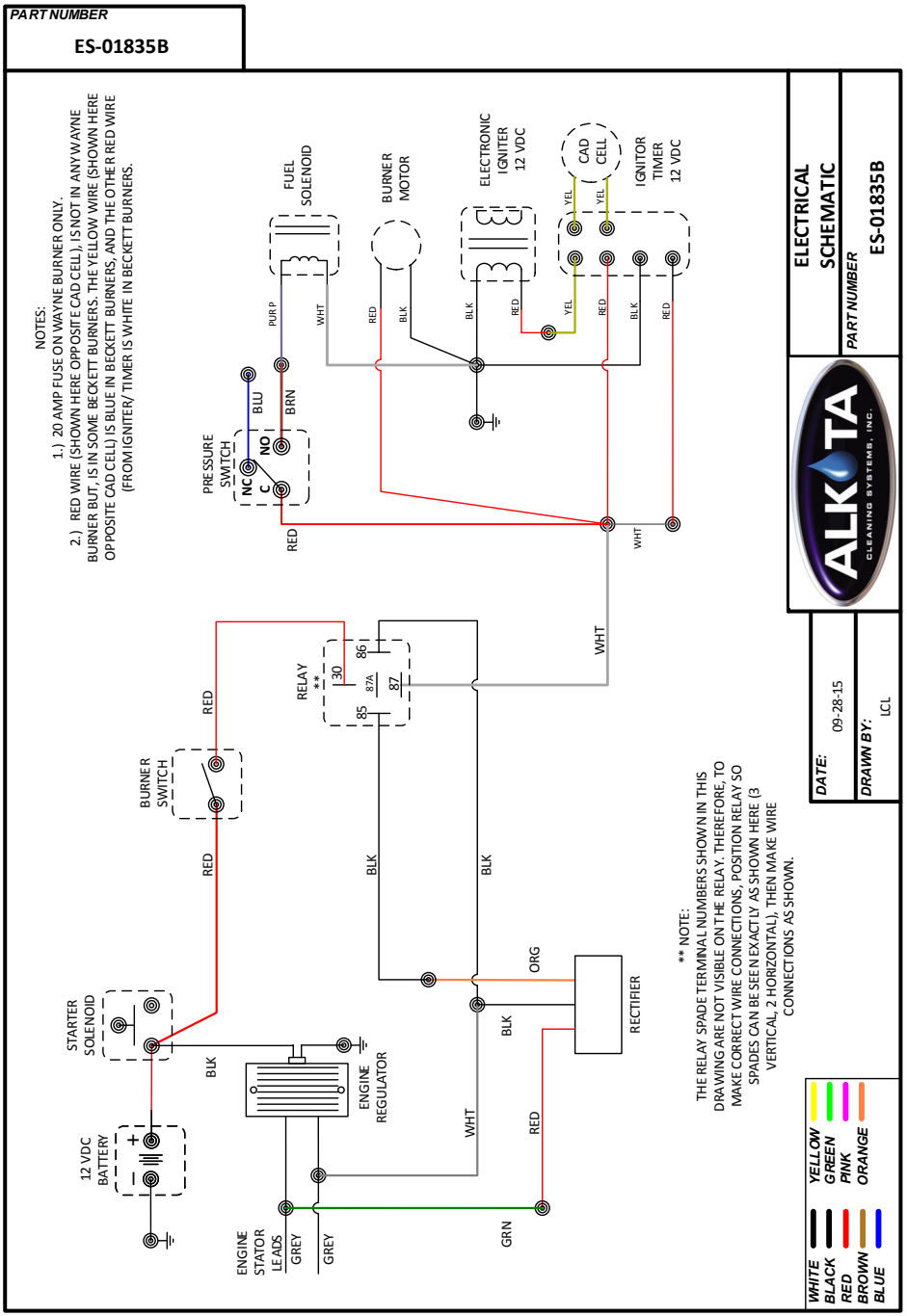
Assembly, Control Panel



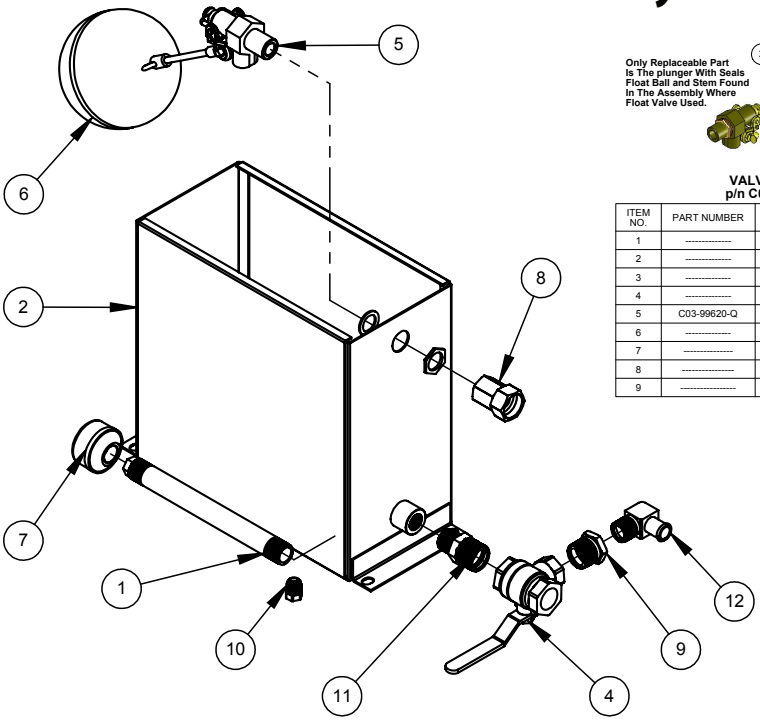
ASSEMBLY, CONTROL PANEL
2/27/2011

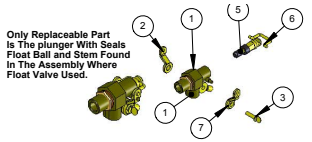
ITEM NO.	PART NUMBER	PART DESCRIPTION	QTY.
1	4355H-00301	WELDMENT,CONTROL PANEL	1
2	F04-00411	BUSHING, STRAIN RELIEF	1
3	F04-00411	BUSHING, STRAIN RELIEF	2
4	F04-00451	GROMMET, RUBBER	4
5	F04-00615	TERM, SPLICE	4
6	F04-00616	TERM, INSULATOR	4
7	F04-00618	INSULATED SPADE	7
8	F04-00693	SWITCH, ROCKER	1
9	F04-00790	SWITCH, PRESSURE	1
10	F05-00168A	MODULE, RECTIFIER	1
11	FA5-00063	RELAY, AUTOMOTIVE	1
12	H04-13808	SCREW, MACHINE	2
13	H04-25000	SCREW, CAP	1
14	H06-25003	NUT, HEX	1

Electrical Schematic



Float Tank Assembly





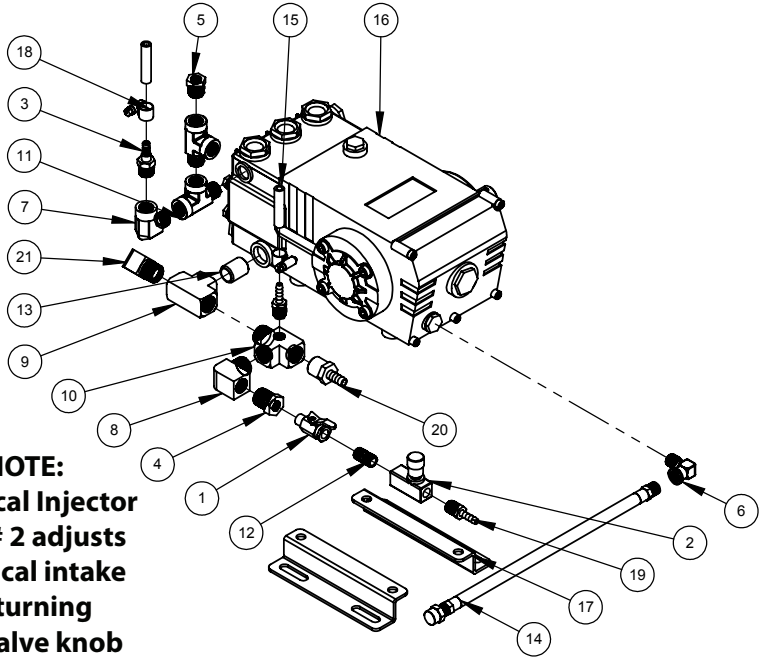
VALVE, FLOAT
p/n C03-00620-Q

ITEM NO.	PART NUMBER	PART DESCRIPTION	QTY.
1	----------	HOUING-VALVE	1
2	----------	ARM,PLUNGER	1
3	----------	NUT,WING	1
4	----------	ARM,BALL	1
5	C03-99620-Q	PLUNGER	1
6	----------	LINK,PLUNGER	1
7	----------	ARM,PLUNGER	1
8	----------	WASHER, FIBER	1
9	----------	NUT, HEX	1

ASSEMBLY, TANK - FLOAT
2/28/2008

ITEM NO.	PART NUMBER	PART DESCRIPTION	QTY.
1	4120-10540P	ASSEMBLY, RESTRICTOR	1
2	5305A-04120	WELDMENT, TANK - FLOAT	1
3	AR14-00300	ROD,THREAD 1/4-20UNC X 3	1
4	C03-00216-4	VALVE, BALL - 3-WAY	1
5	C03-00620-Q	VALVE, FLOAT	1
6	C03-00622-B	BALL,FLOAT-PLASTIC	1
7	C04-00120	FILTER, SOAP SCREEN	1
8	C05-00273	ADAPTER, GARDEN HOSE	1
9	E04-00009-48	BUSHING, PIPE	1
10	E09-00002-P	PLUG, PIPE - NYLON	1
11	E15-R0006-4	NIPPLE, HEX	1
12	W02-10057-8	BARB, HOSE	1

Water Pump



NOTE: Chemical Injector Item # 2 adjusts chemical intake by turning the valve knob after opening valve item #1

ASSEMBLY, PUMP
2/29/2008

ITEM NO.	PART NUMBER	PART DESCRIPTION	QTY.
1	C03-00120	VALVE,BALL-1/4"MNPT x 1/4"FNPT	1
2	C03-00310-2	VALVE, METERING	1
3	C09-00008	VALVE, EASY START	1
4	E04-00005-48	BUSHING, PIPE	1
5	E04-00016-58	BUSHING, 3/8 - 1/4	1
6	E08-00006-48	ELBOW, PIPE	1
7	E08-00011-58	ELBOW, PIPE	1
8	E08-00017-48	ELBOW, STREET	1
9	E10-00005-4	TEE, PIPE	1
10	E10-00018-4	TEE, STREET	1
11	E10-00021-58	TEE, STREE - 3/8	2
12	E13-00010-48	NIPPLE, PIPE	1
13	E15-00010-48	NIPPLE, CLOSE - 1/2"NPT	1
14	K21-02214-1/4	ASSEMBLY, HOSE-OIL, DRAIN	1
15	K31-00900	HOSE, WATER	1
16	N07-00016-LH	PUMP,WATER-TS1511 4GPM @3500PSI 1450RPM	1
17	N07-40046-P1	RAIL, PUMP - W/HOLES	1
18	W02-00033	CLAMP, HOSE	2
19	W02-10019-8	BARB, HOSE	2
20	W02-10030-8	BARB, HOSE	1
21	W02-10057-8	BARB, HOSE	1

Injector, Chemical - Downstream

p/n C03-00310-2

Downstream Injector Operation

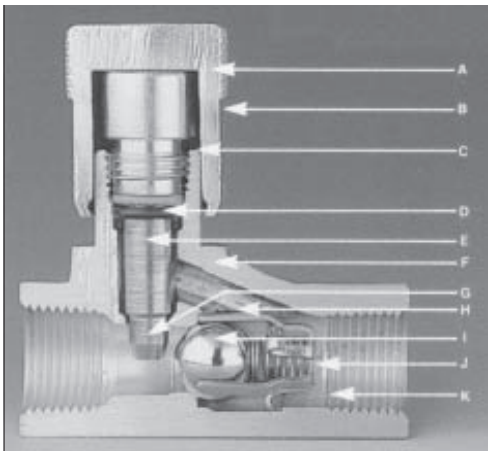
A downstream injector works by maintaining a certain psi on the pump side of the injector by means of an orifice installed into the injector body. When the psi drops by at least a 30% differential on the outlet side of the injector it creates a vacuum draw that pulls your pre mixed chemical solution into the injector body and mixes it with the flow of water traveling through the injector and out the hose and gun assembly of the pressure washer.

You should never use anything but pressure washer safe cleaning solutions. Use of other chemicals such as bleach will damage seals and o-rings in the gun, wand, hoses and pumps. What chemicals can be used? Use only chemicals designed for pressure washer use (pressure washer approved). They will not damage your pressure washer, plus they are biodegradable and environmentally friendly.

Operation:

1. Connect the chemical line & filter screen onto the injector making sure the injector is closed.
2. Place the suction filter into a container chemical and attach the black low pressure soap nozzle to the tip of the wand.
3. Start your pressure washer as normal and turn the injector open. You are always supposed to soap from the bottom up and rinse from the top down.
4. When you are done applying cleaning solution onto the surface, turn off the chemical adjustable knob and replace the soap nozzle with a 0º (red color) or 15º (yellow color) nozzle to remove loosened dirt.

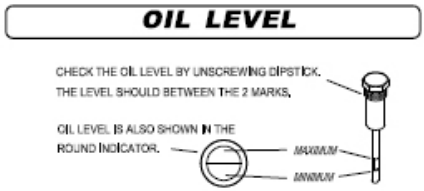
A. Control Knob
B. Locking set screw
C. Brass retainer
D. Buna-N o-ring seal
E. Needle valve
F. Housing
G. 4 stage needle
H. Orifices
I. Stainless steel ball
J. Ball cage
K. Check valve



Pump Maintenance

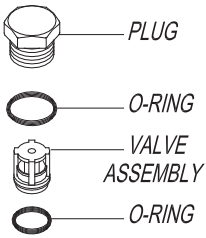
General

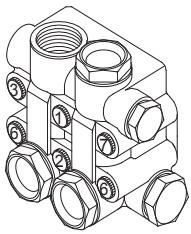
PACKING EXTRACTION KIT P/N Z09-00028
COMPLETE TOOL KIT P/N Z09-00021



Valve Service

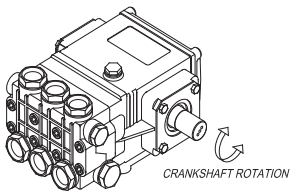
1. Remove the plugs holding the valve assemblies.
2. Remove and discard o-rings from the plugs. Clean plugs with solvent or soap and water. Allow to dry.
3. Using needle nose pliers, fingers, or hook shaped tool, remove the valve assemblies from the head. Remove and discard the o-rings from the valve assemblies and/or head. Examine each valve assembly and discard damaged parts. Refer to the PUMP BREAKDOWN for part numbers of any replacement items.
4. Clean any accumulated debris from the valve cavities and flush with water.
5. Wash the valve assemblies in clean water and rinse. While still wet, test each valve assembly by sucking on the valve seat. A properly sealing valve will allow a good vacuum to be developed and maintained, while a malfunctioning valve will not. Good valve assemblies should be set aside for installation in step 7.
6. Malfunctioning valve assemblies must be replaced.
7. Lubricate a new o-ring with the pump crankcase oil and install into valve cavity in the head. Install a good valve assembly into the cavity as illustrated.
8. Lubricate a new o-ring with pump crankcase oil and place on a plug cleaned in step 2 above.
9. Install a plug into the pump head. Tighten plug by hand.
10. Torque the plug to the value indicated in the TORQUE section of the pump specifications.
11. Repeat steps 7 through 11 for remaining valve assemblies.





Head Removal

1. Remove the cap screws holding the pump head to the crankcase. A metric tool is required for this step. Be careful not to lose the washer on each cap screw.
2. Remove the head by rotating the crankshaft and tapping the head away from the crankcase with a soft mallet. Keep rear surface of the head parallel to the front surface of the crankcase to prevent binding on the plungers.
3. Once the head is removed, protect the plungers from damage.



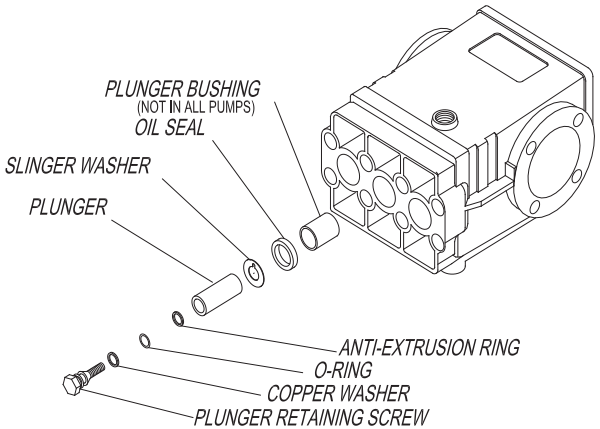
Plunger Service

1. Remove pump head per HEAD REMOVAL.
2. Remove any packings and retainers left on the plungers by pulling them straight off.
3. Examine each plunger, looking for a smooth surface free of any scoring, cracks, or pitting. Any defective plungers should be removed per PLUNGER REMOVAL.
4. Discard and replace any defective plungers.
5. Reinstall the plunger per PLUNGER INSTALLATION.
6. Reinstall head per HEAD INSTALLATION.

Plunger Removal

NOTE: When the plunger screw is removed, it is important to install new o-ring, anti-extrusion, and copper washers.

1. When the plunger screw is removed, it is important to install a new o-ring, anti-extrusion, and copper washers.
2. Remove the plunger retaining screw by turning counterclockwise. Remove and replace copper washer.
3. Remove and discard o-ring and anti-extrusion ring from retainer screw.
4. Remove the plunger from the cross head and examine it for cracks, scoring, or pitting.
5. Remove and discard copper flinger washer, clean with solvent and allow to dry.

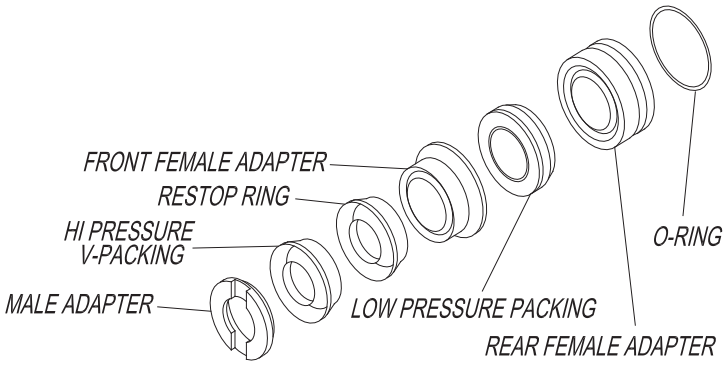


Plunger Installation

1. Install the copper flinger washer onto the cross head.
2. Slide the plunger onto the crosshead.
3. Lubricate an o-ring with crankcase oil and install into the groove on the plunger screw. Install the anti-extrusion ring into the groove next to the o-ring. NOTE: The o-ring should be nearest the screw head and the anti-extrusion ring nearest the threads.
4. Apply a drop of thread sealant to the threads of the retainer screw.
5. Thread the plunger retainer screw into the cross head making sure the copper flat washer is installed onto the screw.
6. Torque the plunger retainer screw to the value indicated in the torque section of the pump specifications.

Packing Service

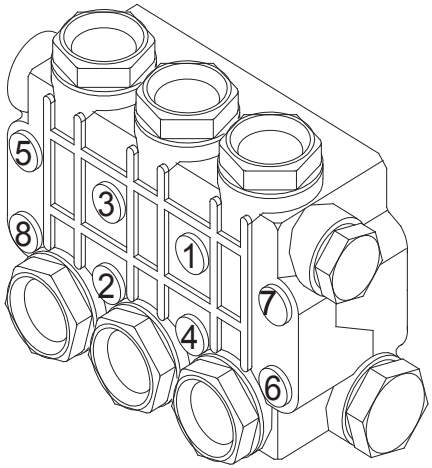
1. Remove the head per PUMP HEAD REMOVAL.
2. Remove any packings and female adapters left on the plungers by pulling them straight off. Insert proper packing extractor onto the extractor hammer. Insert packing extractor and tool through the packings and adapters remaining in the head. Tighten the hammer and remove the remaining items in the head. Remove packings and o-rings from adapters. Discard the o-rings and packings.
3. Clean the packing canities in the head and rinse with clean water.
4. Clean exposed plungers. Clean male and female adapters with soap and water and allow it to dry.
5. Examine male and female adapters, discard worn items. Trial fit the female adapters into the head checking for binding or damage. Discard and replace damaged items
6. Lubricate packing cavities in the head and all packings and adapters with pump crankcase oil.
7. Lay head on the bench with packing cavities up. Install one male adapter in each cavity with the flat side down.
8. Install one v-packing into each cavity with the lips pointing down. A packing insertion tool of the appropriate size is recommended for this operation.
9. Install the re-stop ring with the lips pointing down.
10. Install a front female adapter into each cavity with the flat side up. Make certain the adapter goes all the way down into the cavity.
11. Install the low pressure packing with the flat side down.
12. Install the rear female adapter into each cavity with the lips pointing down.
13. Lubricate o-rings with pump crankcase oil and install one into the groove of each adapter.
14. Install one adapter and o-ring into each cavity with the flat side up. Each adapter and o-ring assembly should push into the head to approximately 1/16 inch of being flush with the surface of the head. Only hand pressure should be required to perform this operation. This step is VERY IMPORTANT. If the rear female adapter does not fit is obtained, proceed to step 16. If a proper fit is not obtained, remove the female adapters from the offending cavity and reinstall items per steps 8 through 15.
15. Install head per HEAD INSTALLATION.



Head Installation - Torque Sequence
Freezing conditions - Pump Oil Change

Head Installation

1. Prepare pump head per instructions in PACKING SERVICE.
2. Rotate the plungers so the outer plungers are projecting the same distance from the crankcase.
3. Lubricate the exposed plungers with crankcase oil.
4. Start the head onto the plungers and, using a soft mallet, tap the head evenly until it comes in contact with the crankcase.
5. Start the cap screws through the head and into the crankcase. Do not forget the lock washer on each screw.
6. Tighten all cap screws by hand.
7. Torque the cap screws to the value indicated in the TORQUE section of PUMP SPECIFICATIONS. Torque the cap screws in the order listed below.



ACCESSORIES

Oil – Case (6) One Pint Bottles	p/n N07-OILCA
Oil – Bottle (1) One Pint Bottle	p/n N07-OILCA-1

Kit N07-OIL CA

Kit N07-OIL CA-1

Oil Change

We recommend the first oil change after the first 50 hours, with the pump stopped and the oil still warm. This change is not recommended because the oil has lost its properties, but rather to eliminate the impurities that have gotten into the oil during the running-in phase. If these impurities are not removed, but are allowed to remain in the oil, they may cause premature wear to the moving parts and the oil seals. After this initial change, the oil can then be changed every three months or 300 hours of operation thereafter.
Please note: If the pump works in conditions with high humidity and with sharp temperature changes, it is possible that condensation will appear inside the crankcase, which mixing with the oil can change its properties. This is easy to see because the oil changes to a white, milky color.
If the pump does not have excessive water leaking from the packings, and the oil becomes milky, the oil has to be changed more frequently.
The percentage of water in the oil must not exceed 20%.

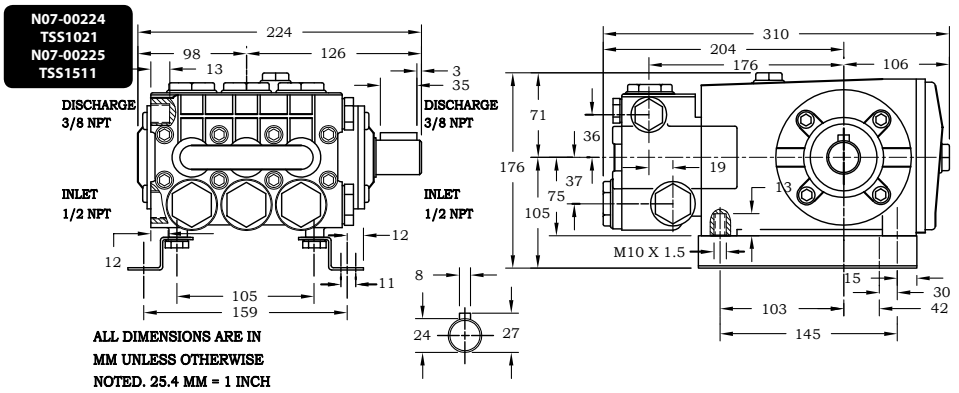
Freezing Conditions / long Time Storage

1. Drain all of the water out of the pump.
2. Run a 50% solution of RV or
non-toxic/biodegradable antifreeze through the pump.
3. Flush the pump with fresh water before the next use.
4. In freezing conditions failure to do this may cause internal pump damage.
5. For long periods of storage in
non-freezing areas the solution will keep the seals and O-rings lubricated.

Pump
Specifications

20140530

p/n N07-00224, N07-00225



Pump Specifications

Pump Model	N07-00224 TS1021		N07-00225 TS1511
Maximum Volume (GPM)	4.5	5.6	4.0
Max. Discharge Pressure (PSI)	3500	1700	3500
Maximum Pump Speed (RPM)	1125	1450	1450
Maximum Inlet Pressure	125 PSI		
Maximum Inlet Vacuum	9 ft. water (7.9 in. Hg)		
Bore	.787 in. / 20 mm		
Stroke	.472 in. / 12 mm		
Crankcase Oil Capacity	40.6 oz.		
Crankshaft Rotation	Clockwise & Counterclockwise		
Maximum Fluid Temperature	165˚F		
Inlet Port Thread	1/2-14 BSPP-F		
Discharge Port Thread	3/8-19 BSPP-F		
Shaft Diameter	.945 in. / 24 mm		
Weight	32 lbs.		
Dimensions	12.2 x 9.2 x 6.9 in.		

TORQUE

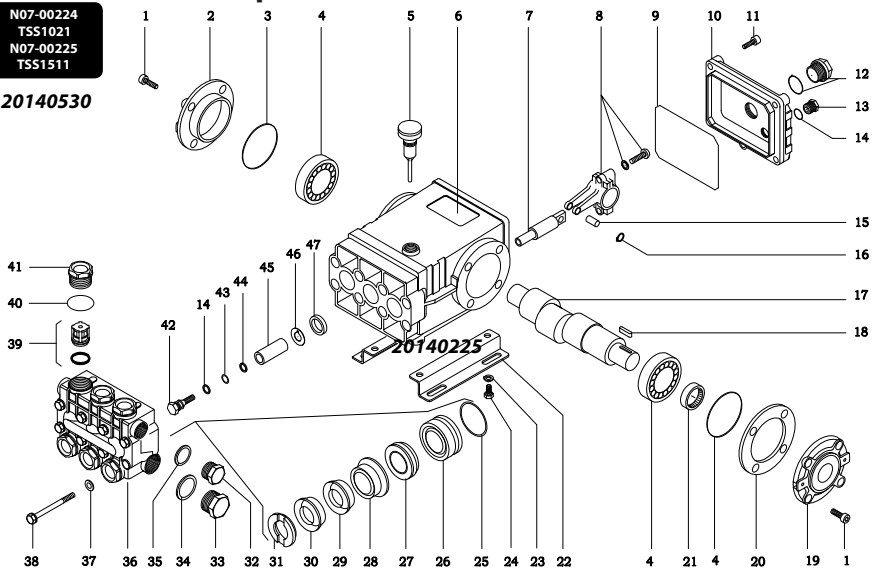
Valve Plug (Item 41)	95.9 ft lbs / 130 N-M
Mount to Crankcase (Item 24)	29.4 ft lbs / 40 N-M
Connecting Rod cap to Connecting Rod (Item 8	14.7 ft lbs / 20 N-M
*Plunger Screw to Crosshead(Item 42)	14.7 ft lbs / 20 N-M
Rear Crankcase cover to Crankcase (Item 27)	7.3 ft lbs / 10 N-M
Head to Crankcase (Item 38)	22.1 ft lbs / 30 N-M
Bearing Retainer (Item 1)	14.7 ft lbs / 20 N-M
Oil Level Indicator (Item 29)	14.7 ft lbs / 20 N-M

Exploded View

p/n N07-00224, N07-00225

N07-00224
TSS1021
N07-00225
TSS1511

20140530



Item	Part No.	Description
1	N07-40018	Screw, Cap
2	N07-40020	Retainer, Bearing – Closed
3	N07-40021	O-Ring
4	N07-60022	Bearing, Roller
5	N07-40024	Dipstick, Oil
6	N07-40023	Crankcase
7	N04-60038	Crosshead
8	N07-40034	Cover, Crankcase
9	N07-70025	O-Ring
10	N07-16026	Cover, Rear – O-Ring
11	N07-60027	Screw, Cap
12	N07-20029	Indicator, Oil Level
13	N07-20030	Plug, Pipe
14	N07-20042	Washer, Flat
15	N07-40032	Pin, Crosshead
16	N07-40053	Ring, Retaining
17	N07-40031	Crankshaft (N07-00225)
17	N07-60031	Crankshaft (N07-00224)
18	N07-40033	Key
19	N07-40019	Retainer, Bearing – Open
*20	N07-40035	Shim
*21	N07-40045	Seal, Oil
22	N07-40046	Mount, Pump
23	N07-40047	Washer, Lock
24	N07-40048	Screw, Cap

Item	Part No.	Description
25	N07-40016	O-Ring
26	N07-40015	Adapter, Female – Rear 20mm
27	N07-40012A	Packing, V – Low Pressure
28	N07-34013	Adapter, Female – Front
29	N07-40062	Ring, Restop
30	N07-40012	Packing, V – High Pressure
31	N07-99007	Adapter, Male – 20mm
32	N07-20049	Plug, Pipe
33	N07-20050	Plug, Pipe
34	N07-20051	Washer, Flat
35	N07-20011	Washer, Flat
36	N07-22401	Head, Pump – Brass
37	N07-40003	Washer, Flat
38	N07-40002	Screw, Cap
39	N07-99001	Kit, Valve (6)
39A	N07-20004	O-Ring
40	N07-20009	O-Ring
41	N07-22410	Plug, Pipe
42	N07-20043	Screw, Plunger
43	N07-20028	O-Ring
44	N07-20041	Ring, Anti-Extrusion
45	N07-40040	Plunger – 20mm
46	N07-20039	Washer, Flat – Copper
47	N07-99002	Seal, Oil – (3 in Kit)
48	N07-40044	Bushing

Pump Kits

Kit N07-99001

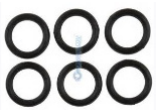
Kit N07-99002

Kit N07-99003

Kit N07-9904F

Kit N07-99006

Kit N07-99007



Kit N07-99010

Kit N07-99028

Kit N07-99069

Kit N07-99071

Kit N07-OIL CA

Kit N07-OIL CA-1

PARTS PACKAGES

Part No.	Description	Item	QTY
N07-99001	**Valve Assemblies**		
	Ass'y, check valve	39	6
	O-Ring	39A	6
N07-99002	**Oil Seals**		
	Oil Seals	47	3
N07-99003	**Crankshaft Seal**		
	Seal, Crankshaft	12	2
N07-99004F	**Kit, Plugs & O-Ring**		
	Plug, Pipe	41	6
	O-ring	40	6
N07-99006	**Kit, Plunger Screw & "O-Rings"**		
	Screw, Plunger	42	3
	Washer, Flat	14	3
	O-Ring	43	3
	Ring, Anti-extrusion	44	3
	Washer, Flat	46	3
N07-99007	**Adapter, Male**		
	Adapter, Male	44	6
N07-99010	**Rear Adapters**		
	Adapter, Female	26	3
	O-Ring	25	3
N07-99028	**Plunger Packing w/ Retainer**		
NOTE: Order three for complete pump.	O-Ring	25	1
	Packing, V-Lo Press	26	1
	Retainer, Packing	27	1
	Adapter, Female	28	1
	Ring, Restop	29	1
	Packing, V-Hi Press	30	1
	Adapter, Male	31	1
N07-99069	**Retainer & O-Rings**		
	Packing, V-Hi Press	30	3
	Ring, Restop	29	3
	Packing, V-Lo Press	27	3
N07-99071	**Adapter, Front**		
	Packing, V-Lo Press	27	3
	Adapter, Female	26	3

ACCESSORIES

Oil – Case (6) One Pint Bottles	p/n N07-OILCA
Oil – Bottle (1) One Pint Bottle	p/n N07-OILCA-1

Pump Maintenance Record

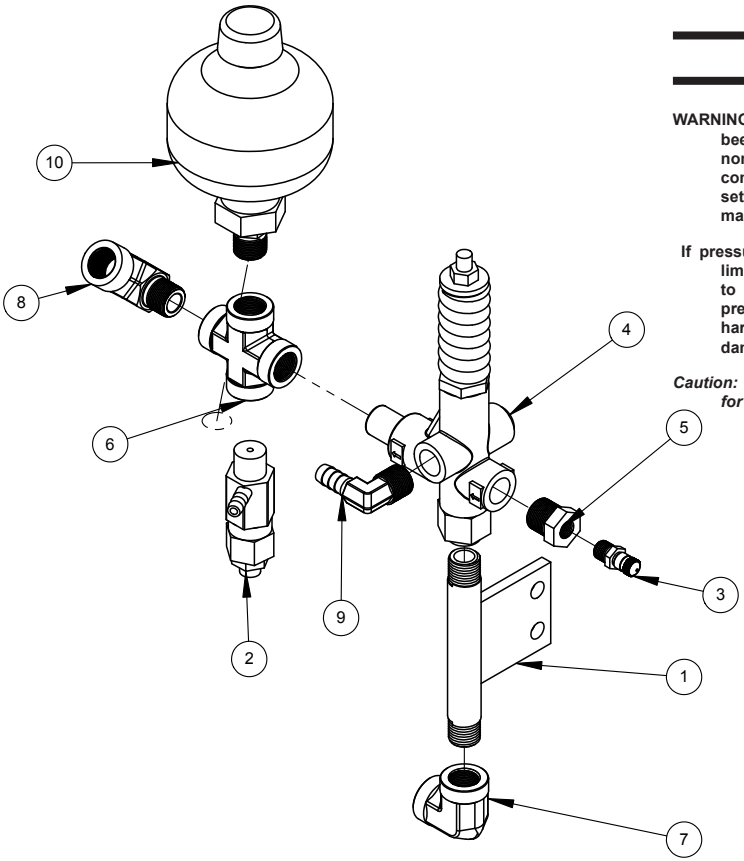
Oil Change

Month/Day/Year	Operating Hours	Oil Brand & Type

Pump Service

Month/Day/Year	Operating Hours	Type of Service

Unloader Assembly



Relief Valve

WARNING: The relief valve has been factory set and is a field nonadjustable part. Please contact the factory before setting the valve and will void the manufacturer warranty.

If pressure from should exceed safe limits it will automatically open to relieve dangerous system pressure overloads which can harm equipment and can also be dangerous for the operator.

Caution: Inspect relief valve annually for any obstruction.

ASSEMBLY, UNLOADER
p/n 4355H-00515
01/02/2018

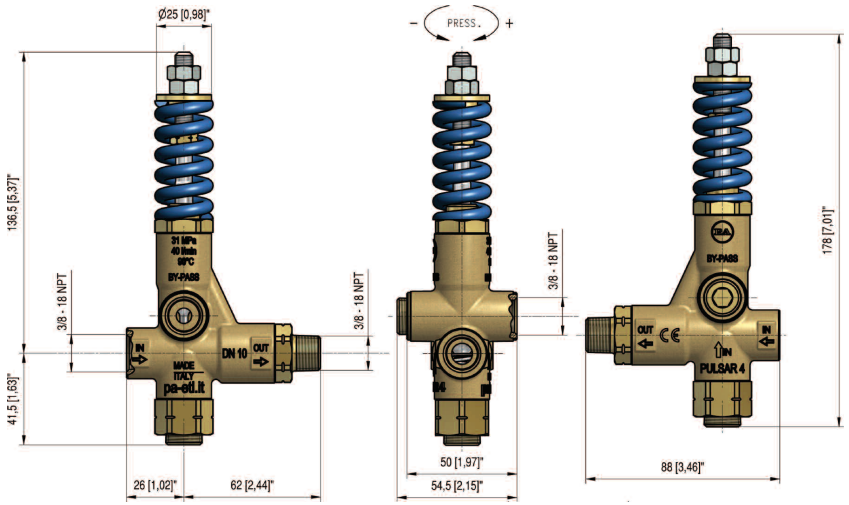
ITEM NO.	PART NUMBER	PART DESCRIPTION	QTY.
1	4355EB-00514	BRACKET, UNLOADER - VALVE	1
2	C03-00509-45	VALVE, RELIEF - SS	1
3	C03-00810	VALVE, AIR	1
4	C07-04506	VALVE UNLOADER	1
5	E04-00002-58	BUSHING, PIPE	1
6	E07-00006-5	CROSS, PIPE - HIGH PRESSURE	1
7	E08-00010-5	ELBOW, PIPE	1
8	E08-00011-58	ELBOW, PIPE	1
9	W02-10040-8	BARB, HOSE	1
10	Y01-00123	ACCUMULATOR	1

Specifications

p/n C07-04506 - 11/22/2017

Specifications

Maximum Flow	10.5 gal/m / 40L/m
Unloading Press	
Rated	4050 psi / 280 bar
Max	4500 psi / 310 bar
Maximum Temperature	195˚F / 88˚C
Weight	1.54 lbs / 700 G
Bypass	3/8 FNPT
Inlet	3/8 FNPT
Discharge	3/8 MNPT



Parts List

p/n C07-04506 - 11/22/2017

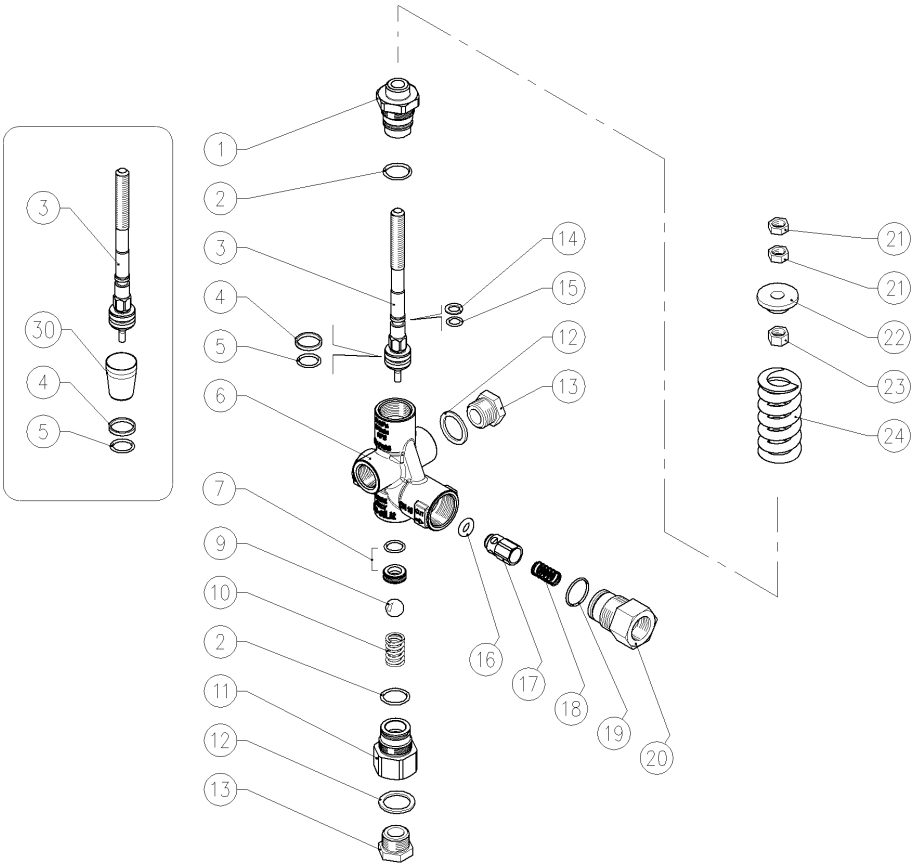
Item	Part Number	Description	Qty	Kit
1	C07-04504-11	Guide, Piston	1	
2	C07-04504-01	O-Ring	2	*
3	C07-04504-09	Piston – SS	1	
4	C07-04504-02	Ring, Back-Up	1	*
5	N07-20028	O-Ring	1	*
6	----------	Housing	1	
7	C07-04500A-05	Kit Seat & O-Ring	1	*
7A	C07-02300-08	O-Ring 1/16CS x 11/16OD	1	
9	C07-04500-03	Ball, SS-13/32	1	
10	C07-02700-06	Spring, 1.6x11x20MM	1	
11	C07-04506-04	Coupling, Inlet 3/8 NPT SS	1	
12	N16-28110084	Washer, Flat	2	
13	C07-04504-05	Plug-3/8NPT	2	
14	C07-04504-07	Ring, back-up	1	*
15	P04-00215	O-Ring, 1.78 x 6.07mm	1	*
16	C07-03200-20	O-Ring, 3 x 6mm	2	*
17	C07-04500-15	Valve, Check	1	
18	C07-01009A-18	Spring, Compression	1	
19	C07-04504-16	O-Ring, 1/16cs x 5/8	1	*
20	C07-04506-10	Fitting, Outlet – 3/8”M SS	1	
21	C07-04504-14	Nut, Hex	2	
22	C07-04504-13	Follower, Spring	1	
23	C07-04504-15	Nut, Hex - Brass	1	
24	C07-04500-13	Spring, Comp. Blue	1	
	C07-9904504	**Kit, Repair - Parts Package**		*

ATTENTION: the nut in position 21 is a mechanical security device that limits the maximum pressure; it must absolutely NOT be removed.

MAINTENANCE STANDARD: every 400 working hours, check and lubricate the seals with water resistant grease.

Maintenance - Exploded View

p/n C07-04506 - 11/11/2017



UNLOADER PRESET AT FACTORY – DO NOT READJUST

Unloading Adjustment – Adjustment only after repair or replacement

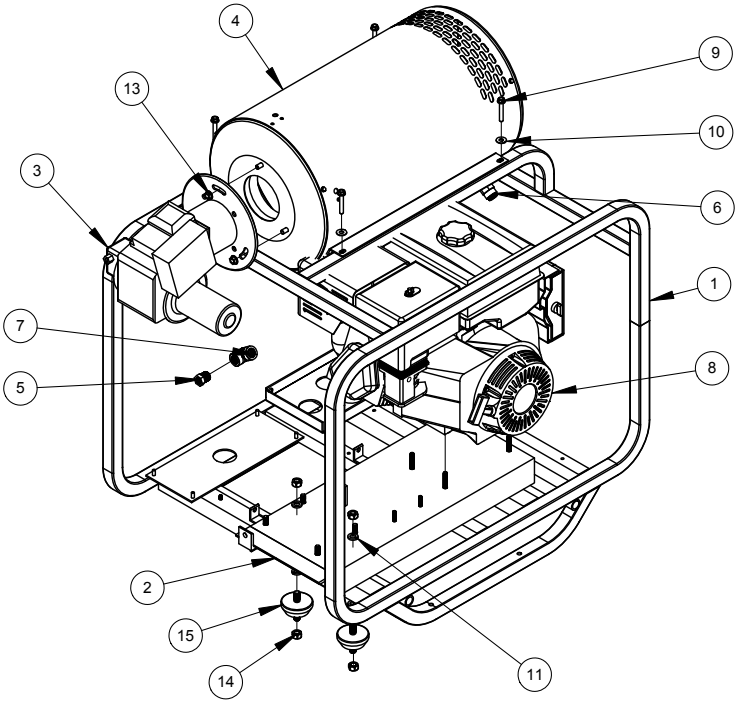
1. Install an appropriate pressure gauge in pump head outlet. The gauge should have a range twice the operating pressure.
2. Install the spray nozzle in the end of the wand.
3. Ensure the relief valve is set properly.
4. Loosen top lock nut (upper Item 21) and turn the nut (lower Item 21) counter clockwise until minimum spring tension.
5. With machine turned on, open the trigger gun, start the pump, and observe pressure gauge reading. Slowly loosen the nut (lower Item 21) until pressure starts to drop on the gauge.
6. Tighten adjusting nut (lower Item 21) on the unloader. Pressure should start to increase. Tighten adjusting nut (lower Item 21) until pressure stops climbing.
7. Close and open the trigger gun to check unloading pressure and bypass function of the unloader valve. The unloading pressure should not exceed operating pressure more than 400 PSI.
8. Lock the setting by tightening the lock nut (upper Item 21).

Trouble Shooting

Troubleshooting – C07-04506 – 11/22/2017

Trouble	Possible Cause	Remedy
Frequent valve recycles	Damaged check valve O-ring	Remove and replace
	Leaking connections	Check or renew
	Restricted bypass or too small diameter of the bypass hose	Clean or adapt passage diameter
Valve does not reach pressure	Piston O-rings worn out	Remove and replace
	Debris between seat and shutter	Clean the seat
	Seat worn out	Remove and replace
	Nozzle worn out	Remove and replace
	Incorrect choice of nozzle	Fit with smaller nozzle
High pressure peaks at gun closure	There is not a minimum of 5% of total flow discharged in bypass	Reset Correctly
	Excessive flow in bypass	Change type of valve or adjust passages
	Adjustment with spring totally compressed	Loosen adjustment screw and eventually fit with smaller nozzle
Valve does not discharge at low pressure at gun closure	Jammed check valve	Clean or replace
	Debris on check valve	Clean

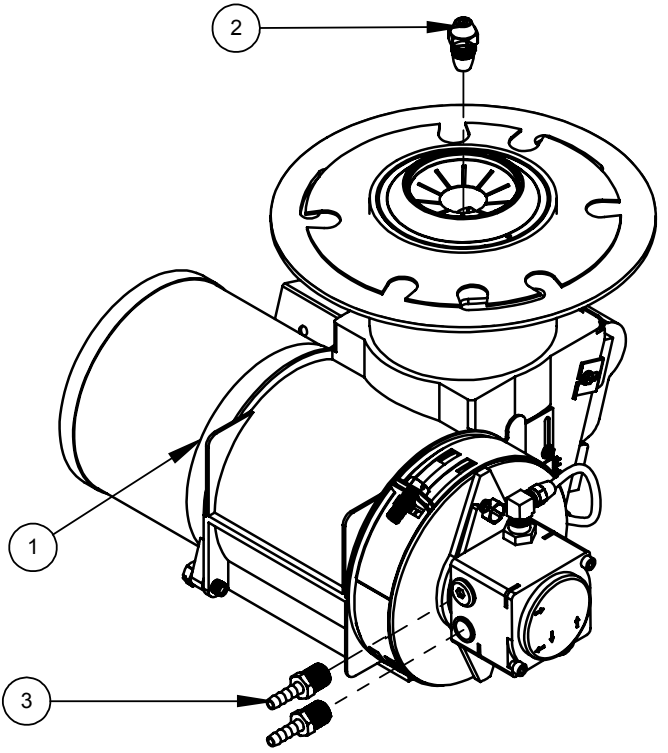
Pre-Cleaner Assembly



ASSEMBLY, PRE - CLEANER
p/n 4355h-00657
12/11/2019

ITEM NO.	PART NUMBER	PART DESCRIPTION	Default /QTY.
1	4355H-00130	WELDMENT, FRAME	1
2	4355H-00134	WELDMENT, CHANNEL	1
3	4405F-00400	ASSEMBLY, BURNER - 12VDC	1
4	4405F-05105	WELDMENT, CHASSIS	1
5	E04-00006-48	BUSHING, PIPE	1
6	E06-00008-1	COUPLING, HEX	1
7	E08-00016-5	ELBOW, FORGED	1
8	F05-00488	13HP HONDA	1
9	H04-31326	CAP, SCREW	4
10	H05-31300	WASHER, FLAT - 5/16	4
11	H05-50001	WASHER, HELICAL LOCK - 1/2"	8
12	H06-31300	NUT, LOCK - 5/16"	4
13	H06-37500	NUT,LOCK-3/8-16UNC HEX	3
14	H06-50002	NUT,1/2-13UNC HEX ZINC PLATED	8
15	H10-50000	MOUNT, SHOCK	4
16	K21-02214-12MM	ASSEMBLY, HOSE - DRAIN 3/8" X 14", W/12MM X 1.5	1
17	F04-00430	BOOT,BATTERY-8 TO 2 GAUGE WIRE,RED	1

Oil Burner



ASSEMBLY, BURNER - 12VDC
2/27/2008

ITEM NO.	PART NUMBER	PART DESCRIPTION	QTY.
1	V00-173140	BURNER, OIL	1
2	V1.50 90DA	NOZZLE, BURNER	1
3	W02-10019-8	BARB, HOSE	2

Burner Maintenance
Fuel Filter, Adjustment Air Band , Fuel Pressure

Air Band Adjustment

Note: The air band adjustment on this burner has been preset at the factor (elevation approximately 1400 feet). On equipment installed where elevation is substantially different, the air band(s) must be readjusted.

1. Loosen the cap screw retaining the air bands.
2. Move the air bands as indicated below with the machine in operation. Note: The air band should be set so the exhaust gives the smoke spot specified in the GENERAL section of the MACHINE SPECIFICATIONS on a Shell-Bacharach scale. If a smoke tester is not available, a smoky exhaust, oily odor, or sweet smell indicates insufficient air while eye-burning fumes indicate too much air.
3. Tighten the cap screw retaining the air bands.

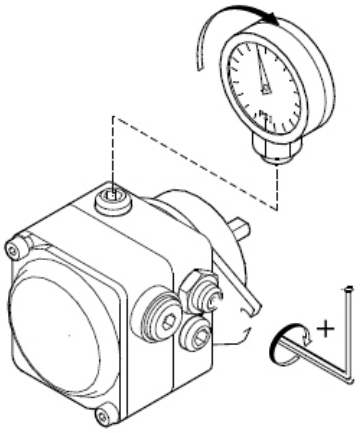
Fuel Pump Filter

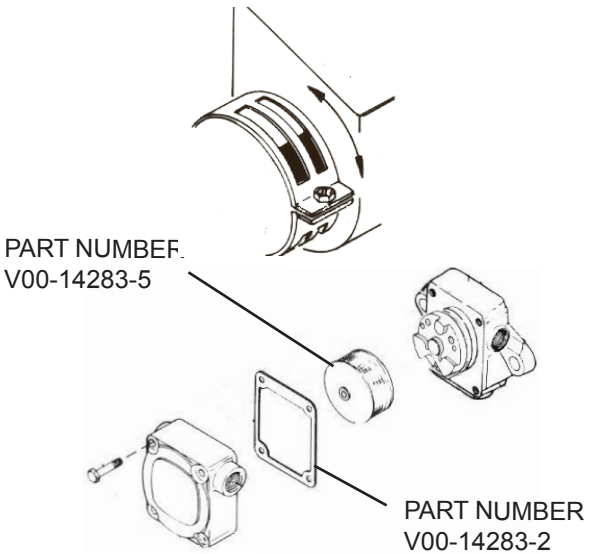
Suntec Pump

1. Shut off fuel supply.
2. Loosen the 4 screws holding the cover to the fuel pump housing.
3. Take cover and cover gasket off and pull strainer off of pump housing.
4. Clean out any dirt remaining in the bottom of strainer cover. If there is evidence of rust inside of the unit, be sure to remove water in supply tank and fuel filter.
5. Turn on fuel supply. Failure to do so will result in fuel pump damage.

Fuel Pump Pressure Adjustment

1. Install a 0-200 PSI Pressure Gauge.
2. Remove Plug on top of the fuel pump.
3. Insert a 1/8" Allen Wrench and turn clockwise to increase pressure and counter clockwise to decrease.
4. Remove Gauge and reinstall plug.

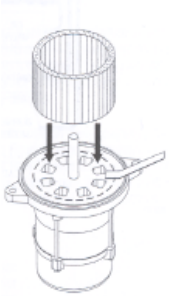




Blower Fan Replacement, Transformer Test, Bus Bar Alignment

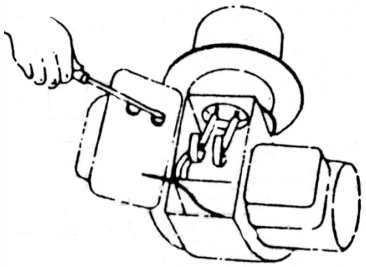
Blower Fan Replacement

1. Shut off power to the burner and disconnect wires.
2. Loosen the two screws securing blower motor and fan to the housing.
3. Remove the blower.
4. Install the blower onto the shaft and place .030 feller gauge on the motor as shown, sliding blower until it contacts feeler the gauge. Rotate wheel until set screw is centered on the flat of the motor shaft. Tighten set screws onto motor shaft.
5. Reinstall motor and blower assembly.
6. Reconnect wires and turn on power.



Transformer Test

1. Remove burner junction box cover.
2. Turn on burner and make sure ignition transformer is receiving rated voltage.
3. Turn off burner.
4. Loosen screw and swing transformer away from burner gun assembly.
5. Turn on burner.
6. Short the high voltage terminals.
7. Open gap by drawing screwdriver away from one electrode while touching the other.
8. The spark should jump between 5/8 inches and ¾ inches, if it doesn't jump, replace the transformer.
9. Turn burner off.
10. Partially close transformer. Check if buss bars align and contact transformer electrodes. If buss bars do not contact, see Buss Bar Alignment.
11. Close transformer, reposition retainer clip and tighten



⚠ WARNING

Use screwdriver with a well insulated handle to avoid shock.

CORRECT

INCORRECT

Buss Bar Alignment

1. With burner off, loosen screw and swing the transformer away from burner gun assembly.
2. Inspect the buss bars and transformer electrodes for pitting or corrosion.
3. Partially close the transformer. Check if the buss bars contact and are in alignment with transformer electrodes.
4. Proper adjustment is obtained by gently bending the buss bars until they spring against, parallel, and are in full contact with the transformer electrodes.
5. With buss bars aligned, carefully close and fasten the transformer.

Burner Gun Removal & Replacement, Accessories, Elctrode Adjustment

Burner Gun Removal & Installation

1. Disconnect the fuel line from the burner gun assembly oil line fitting. Loosen the other end of the line and swing line out of the way.
2. Remove the retaining nut.
3. Loosen screw and swing transformer away from burner gun assembly.
4. Carefully remove the burner gun assembly.
    1) Check and replace electrode insulators if cracked.
    2) Clean burnt buss bars.
    3) Clean carbon off electrodes.
    4) Clean carbon off oil nozzle (use caution not to scratch face of nozzle or orifice).
    5) Check for a loose oil nozzle. Note: Check with dealer and/or replace nozzle with proper nozzle.
5. Gently replace burner gun assembly in air tube. CAUTION: Do not force. Forcing will cause electrode misalignment.
6. Reinstall the retaining nut.
7. Reinstall the oil line making sure both ends are tight.
8. Partially close transformer. Check if buss bars align and contact the transformer electrodes. If buss bars do not contact, see Buss bar Alignment.
9. Close transformer, reposition retainer and tighten screw.

Accessories

p/n Y01-00041	Gauge-0- 200 PSI
p/n Z09-00004	Bacharach Smoke Tester
p/n Y01-00090	Allen Wrench 1/8" #8
p/n z01-00092	Fuel Nozzle Changing Wrench

Z01-00095

Electrode Assembly Adjustment

1. Loosen screws holding electrode assemblies.
2. Raise electrode tips 5/32" above surface plane or end of oil nozzle.
3. Place each electrode tip 5/16" from center of spray nozzle hole, maintaining previous measurement.
4. Spread electrode tips to 1/8" gap maintaining previous measurements.
5. When the proper measurements are obtained, gently tighten screws that hold electrode assembly in place. CAUTION: Do not over tighten, as this will cause the electrode insulator to fail.

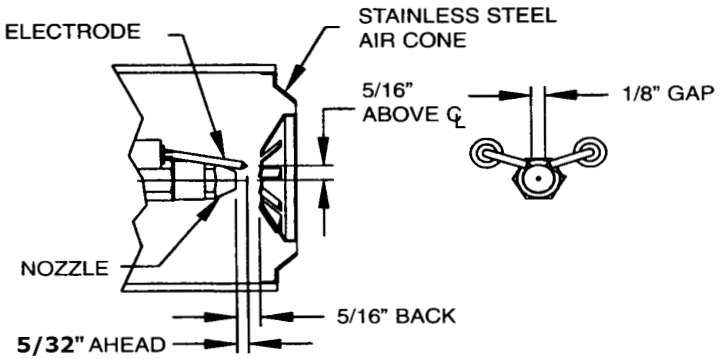
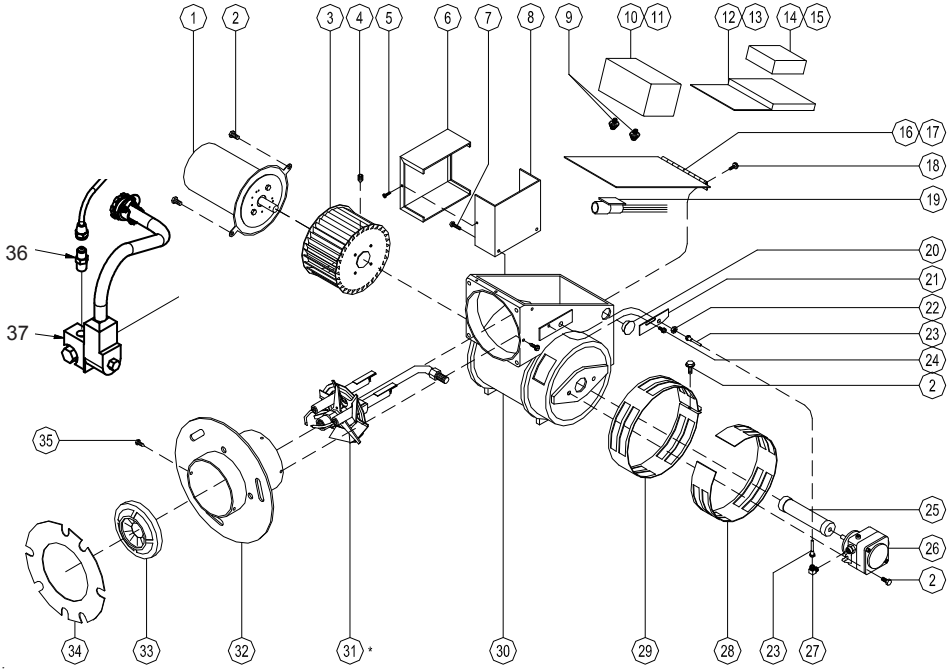


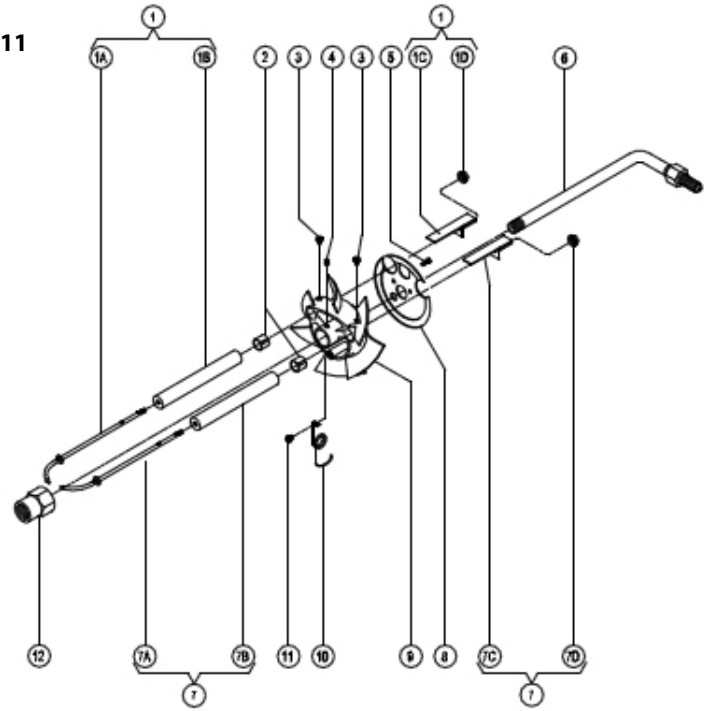
FIGURE 1

Burner Breakdown

V00-173141



V-30537-011



Burner Parts List
Burner Breakdown Parts List
p/n V00-173141

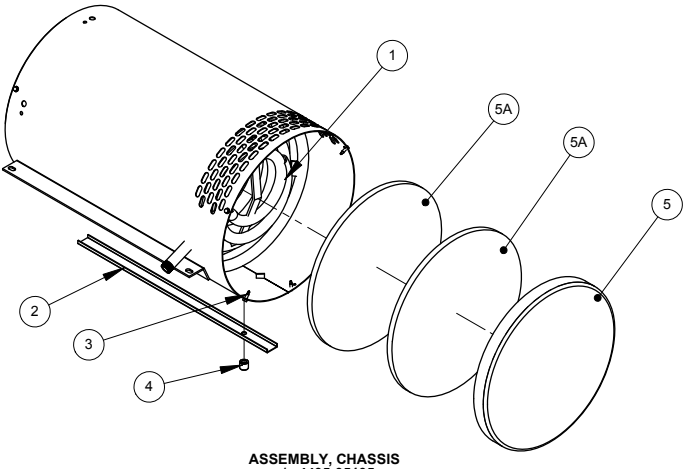
20200124

Item	Part No.	Description
1	V-101126-002	Kit, Motor/Adapter
1A	V-21993-006	Motor, El.–12VDC 3900 RPM
1B	---	Adapter, Motor
1C	---	Bushing
1D	V-101119-001	Coupling, Shaft
2	H04-19000	Screw, Self Tap
3	V00-101317001	Fan, Burner w/ Set Screw
4	H04-31302	Screw, Set
5	V-100603	Screw
6	V-62899-001	Cover, Control Box
7	H04-19010	Screw, Machine
8	V-63355-001	Box, Control – Side Mount
*9	V-100732-001	Spring, Comp.
*10	V-101308-001	Igniter, 12V
*11	V-100603-016	Screw, Self Tap
*12	V-100730-003	Mount, Igniter
*13	V-100603-015	Screw, Self Tap
*14	V-100889-002	Timer, Igniter – 12V
15	V00-12694	Screw, Machine
*16	V-21723-014	Cover, Housing – Rear Hinge
17	V-101256-001	Gasket, Cover – Rear Hinge
18	H04-31301	Screw, Self Tap
*19	V04-00401	Detector, Cad Cell
20	V-12689	Plug
21	V00-13392	Cover, Slot
22	V00-14296	Nut, Lock – Oil Line
23	V00-14452-1	Line, Oil
24	H04-31313	Screw, Cap
25	V-101119-001	Coupling, Shaft
26	V00-14283	Pump, Fuel
27	V00-13494-1	Elbow, Flare
28	V-20602-002	Band, Air – Outer
29	V-20601-002	Band, Air – Inner
30	V-21866-002	Assembly, Housing
31	V-30537-011	Assembly, Gun
32	V-22045-001	Air Tube
33	V00-14160	Cone, Air - #4A
34	V00-12484	Gasket
35	V00-12699	Screw, Air Cone
36	V00-14222	Fitting, Flare
37	F04-00979	Valve, Fuel Solenoid
37A	V13-00664	Coil, solenoid 12VDC
*	V-101385-KIT	Kit, 12V Ignitor

Burner Gun Breakdown Parts List
p/n V-30537-011

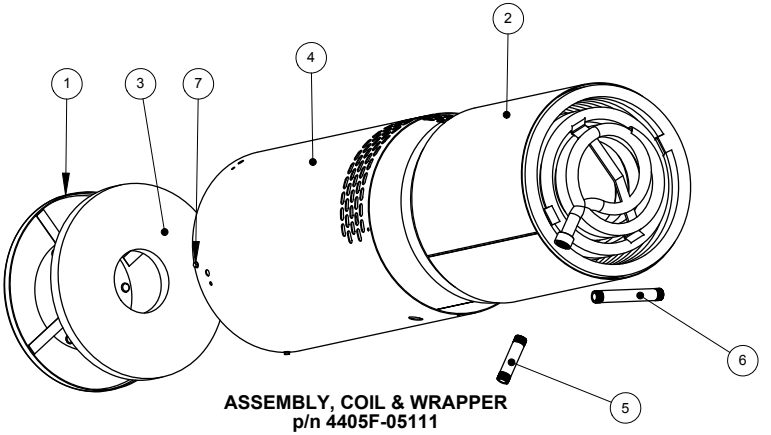
Item	Part No.	Description
1	V-100597-002	Ass'y, Electrode – RH
*1A	---	Stem, Electrode – RH
1B	V00-12574	Insulator, Electrode
1C	V-13499-002	Bar, Buss – T
1D	V00-13110	Nut, Pal
2	V00-12408	Bushing, Insulator
3	V00-12694	Screw, machine
4	H04-19002	Screw, Set
5	V00-12695	Screw, Machine
6	----------	Assembly, Oil Pipe – 7"
7	V-100598-002	Ass'y, Electrode – LH
*7A	----------	Stem, Electrode – LH
7B	V00-12574	Insulator, Electrode
7C	V-13499-002	Bar, Buss – T
7D	V00-13110	Nut, Pal
8	V00-13409	Plate, Baffle – 2 1/2"
9	V00-14310	Support, Electrode
10	V00-14442	Spring, Electrode Support
11	H04-16400	Screw, Thread Cutting
12	V00-12362	Adapter, Nozzle

Coil Assembly



ASSEMBLY, CHASSIS
p/n 4405-05105

ITEM NO.	PART NUMBER	PART DESCRIPTION	QTY.
1	4405F-05111	COIL & WRAPPER	1
2	AS16-92021PB	CHANNEL,FORMED	1
3	H04-19011	SCREW, SELF TAP	4
4	E06-00002-3	COUPLING, HALF	1
5	4355E-00117	WELDMENT, HEAD	1
5A	Z01-05002	INSULATION - 1 X 13 7/8" DIA.	2



ASSEMBLY, COIL & WRAPPER
p/n 4405F-05111

ITEM NO.	PART NUMBER	PART DESCRIPTION	QTY.
1	350-00116	HEAD, BURNER -14" with Insulation	1
2	4405f-00206	WELDMENT, COIL	1
3	90-00119	INSULATION, CREAMIC	1
5	E15-00035-9	NIPPLE, PIPE - GS	1
6	E15-00055-9	NIPPLE, PIPE - GS	1
7	H04-19011	SCREW, SELF TAP	4

Troubleshooting
Pump

Trouble	Possible Cause	Remedy
Oil leaking in the area of water pump crankshaft	Worn crankshaft seal, bad bearing, grooved shaft, or failure of retainer o-ring.	Remove and replace.
Excessive play on crankshaft	Defective bearings.	See “Worn bearing.”
	Excess shims.	Set up crankshaft.
Loud knocking in pump	Loose connecting rod screws.	Tighten connecting rod screws per PUMP SPECIFICATIONS
	Worn connecting rod.	Replace connecting rod per PUMP MAINTENANCE.
	Worn bearings.	Replace bearings per PUMP MAINTENANCE.
	Loose plunger bushing screw.	Tighten plunger screw per PUMP SPECIFICATIONS.
Oil leaking at the rear portion of the pump	Damaged or improperly installed oil gauge window gasket or rear cover.	Replace gasket or o-ring.
	Oil gauge loosed.	Tighten oil gauge.
	Rear cover screws loose.	Tighten rear screws to torque values in PUMP SPECIFICATIONS.
	Pump overfilled with oil, displaced through crankcase breather hole in oil cap/dipstick.	Drain oil. Refill to recommended oil level as stated in OIL LEVEL in PUMP MAINTENANCE.
Water in crankcase	May be caused by humid air condensing into water inside.	Maintain or step up lubrication schedule.
	Worn or damaged plunger screw o-ring.	Remove and replace. See PLUNGER SERVICE in PUMP MAINTENANCE.
Worn bearing	Excessive belt tension.	See BELT TENSION in MACHINE MAINTENANCE.
	Oil contamination.	Check oil type and change intervals per PUMP SPECIFICATIONS.
Short bearing life	Excessive belt tension.	See BELT TENSION in MACHINE MAINTENANCE.
	Misalignment between pump and motor.	Re-align pump and motor.
	Oil has not been changed on regular basis.	Check oil type and change intervals per PUMP SPECIFICATIONS.
Short seal life	Damaged plunger bushing.	Replace plunger bushing.
	Worn connecting rod.	Replace connecting rod.
	Excess pressure beyond the pump’s maximum rating.	Match pressure stated in PUMP SPECIFICATIONS.
	High water temperature.	Lower water temperature stated in PUMP SPECIFICATIONS.

Pump Troubleshooting Continued

Dirty or worn check valves	Normal wear.	Remove and replace.
	Debris.	Check for lack of water inlet screens.
Presence of metal particles during oil change	Failure of internal component.	Remove and disassemble to find probable cause.
	New pump.	New pumps have machine fillings and debris and should be drained and refilled per PUMP SPECIFICATIONS.
Water leakage from under head	Worn packing.	Install new packing.
	Cracked/scored plunger.	Remove and replace plunger.
	Failure of plunger retainer o-ring.	Remove and replace plunger retainer o-ring.
Loud knocking noise in pump	Pulley loose on crankshaft.	Check key and tighten set screw.
	Defective bearing.	Remove and replace bearing.
	Worn connecting rod, crankshaft, or crosshead.	Remove and replace.
Frequent or premature failure of the packing	Scored, damaged, or worn plunger.	Remove and replace plungers.
	Overpressure to inlet manifold.	Reduce inlet pressure.
	Abrasive material in the fluid being pumped.	Install proper filtration on pump inlet pumping.
	Excessive pressure and/or temperature of fluid being pumped.	Check pressures and fluid inlet temperature. Be sure they are within specified range.
	Over pressure of pumps.	Reduce pressure.
	Running pump dry.	Do not run pump without water.
Low Pressure	Dirty or worn check valves.	Clean/replace check valves.
	Worn packing.	Remove and replace packing.
	Belt slipping.	See BELT TENSION in MACHINE MAINTENANCE.
	Improperly sized spray tip or nozzle.	See MACHINE SPECIFICATIOSN for specified spray tip or nozzle.
	Inlet filter screen is clogged.	Clean inlet filter screen.
	Pitted valves.	See VALVE SERVICE in PUMP MAINTENANCE.
Erratic pressure; pump runs rough	Dirty or worn check valves.	Clean/replace check valves.
	Foreign particles in valve assemblies.	
	High inlet water temperature.	See temperature in PUMP SPECIFICATIONS.

Excessive vibration	Dirty or worn check valves	See “Dirty or worn check valves.”
Scored plungers	Abrasive material in fluid being pumped.	Install proper filtration on pump inlet plumbing.
Fitted plungers	Cavitation.	Decrease inlet water temperature and/or increase inlet water pressure.
Cavitation	High inlet fluid temperature, low inlet pressure.	Lower inlet fluid temperature and raise inlet fluid pressure.

Burner

Trouble	Possible Cause	Remedy
Burner will not ignite	Electrodes out of alignment.	See “ADJUSTING ELECTRODE ASSEMBLY” in BURNER MAINTENANCE SECTION.
	Electrode insulator failure.	Remove and replace if there are breaks, cracks, or spark trails.
	Water flow switch not closing.	Adjust, repair, or replace switch.
	Vacuum switch not closing.	Adjust, repair, or replace switch.
	Temperature control switch not closing.	Adjust or replace the TEMPERATURE CONTROL.
	Fuel solenoid valve not opening.	Clean, repair, or replace solenoid.
	Weak transformer.	Clean and check transformer terminals. Check transformer for spark pre “TRANSFORMER TEST” in BURNER MAINTENANCE SECTION.
	Faulty cad cell (if equipped).	Clean and test cad cell, replace if required.
	Faulty primary control (if equipped).	Replace primary control.
	Burner motor thermal protector locked out.	See “Burner motor thermal protector locked out.”
	Wiring.	All wire contacts are to be clean and tight. Wire should not be cracked or frayed.
	Burner switch.	Test switch operation. Remove and replace as necessary.
	Pump pressure.	See “Low fuel pressure.”
	Venting.	A downdraft will cause delayed ignition. Soot deposits on the coil and burner can interrupt air flow, and cause shorting of the electrodes. Clean as required.
	Sooting.	Soot deposits on the coil and burner can interrupt air flow, and cause shorting of the electrodes. Clean as required.
	No fuel.	See “No fuel.”

Burner Troubleshooting Continued

No fuel	Clogged fuel filter.	Remove and replace filter per FUEL FILTER SECTION.
	Fuel leak.	Repair as necessary.
	Kinked or collapsed fuel line.	Remove and replace fuel line.
	Low fuel pressure.	See “Low fuel pressure.”
	Faulty burner oil pump.	Adjust pressure or replace.
	Air leak in intake lines.	Tighten all fittings.
	Clogged burner nozzle.	Remove and replace (do not clean).
Low fuel pressure	Clogged fuel filter.	See “No Fuel.”
	Clogged fuel pump filter screen.	Remove pump cover and clean strainer using a brush and clean fuel oil, diesel oil or kerosene.
	Fuel oil too viscous.	Operate a lighter oil or in warmer area.
	Air leaks in intake lines.	Tighten all fittings.
	Kinked or collapsed fuel line.	Remove and replace.
	Burner shaft coupling slipping.	Remove and replace.
	Fuel nozzle worn.	Remove and replace with specified nozzle on BURNER ASSEMBLY.
	Faulty oil pump.	Remove and replace.
Pulsating pressure	Partially clogged fuel pump strainer or filter.	Remove and replace strainer per FUEL PUMP FILTER in OIL BURNER MAINTENANCE section.
	Air leaking around fuel pump cover.	Check fuel pump cover screws for tightness and damaged gasket.
Unit smokes	Improper fuel.	Refuel with FUEL specified on MACHINE SPECIFICATIONS.
	Air to burner insufficient.	See AIR BAND ADJUSTMENT in OIL BURNER MAINTENANCE section.
	Fuel nozzle interior loose.	Replace nozzle.
	Water in fuel	Inspect fuel filter for water presence.
	Gun out of alignment.	Bend oil pipe to center burner nozzle.
Burner motor thermal protector kicked out	Low voltage.	Voltage must match those specified in the BURNER section of MACHINE SPECIFICATIONS section.
	Fuel too viscous.	See “Low fuel pressure.”
	Fuel pump defective.	Check that fuel pump turns freely.
	Motor defective.	Call service technician or take motor to repair/ warranty station.

Burner Troubleshooting Continued

Delayed ignition (rumbling, noise starts)	Dirty or damaged electrodes.	Clean or replace.
	Air adjustment open too far.	Readjust per AIR BAND ADJUSTMENT in OIL BURNER MAINTENANCE section.
	Poor fuel spray pattern.	Remove and replace with fuel nozzle specified in BURNER ASSEMBLY.
	Incorrect electrode setting.	Readjust per ADJUSTING ELECTRODE ASSEMBLY in OIL BURNER MAINTENANCE section.
	Weak transformer.	See TRANSFORMER CHECK on OIL BURNER MAINTENANCE section.
Burner does not electrically come on	Burner motor reset button tripped.	Reset if necessary. CAUTION: Do not keep hitting the "reset" button if you have oil pressure you are just filling the burner combustion chamber with oil and if ignited will cause an explosion.
	High limit temp control reset tripped if so equipped.	Reset if necessary.

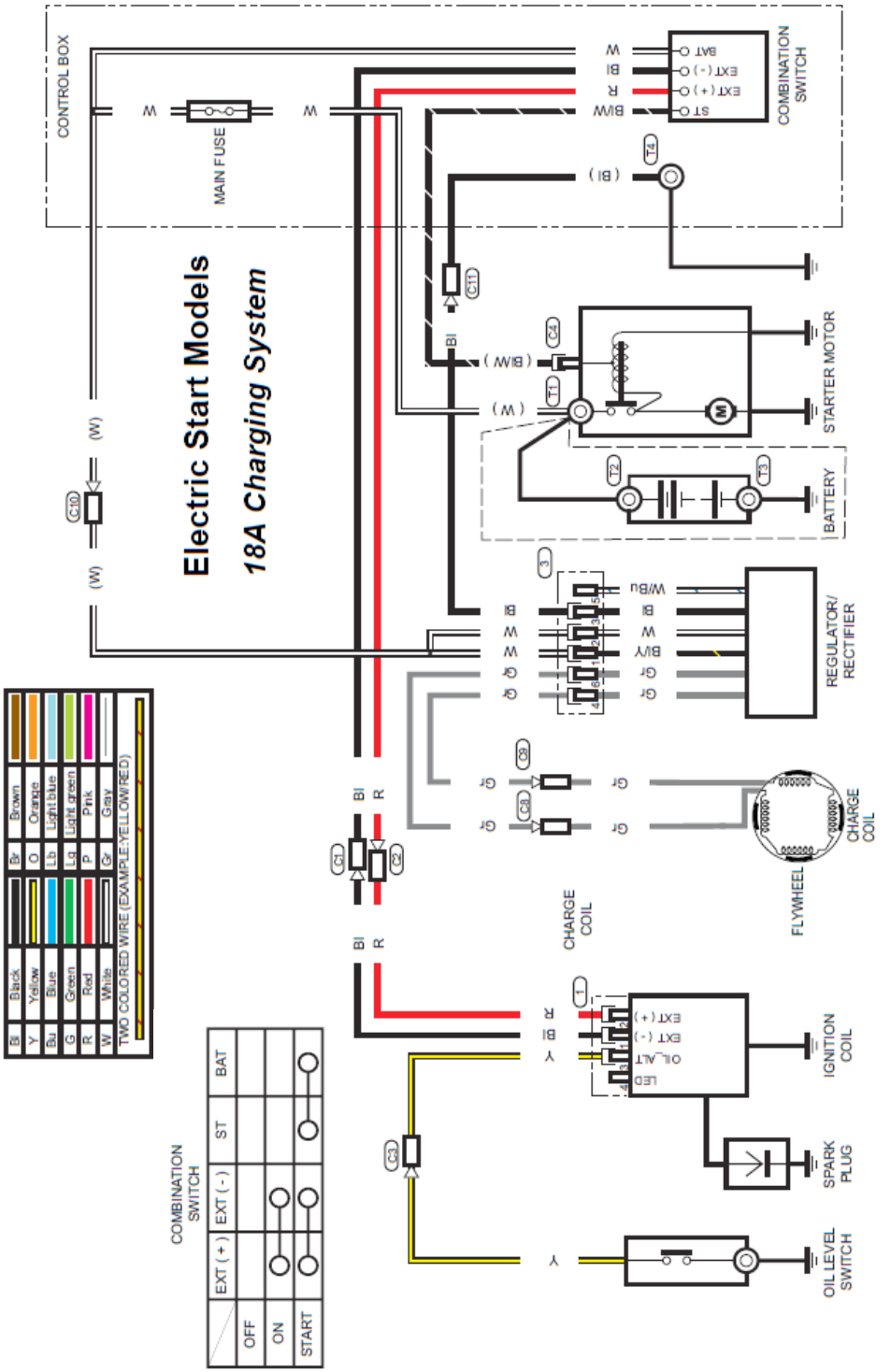
Water Heater

Trouble	*Possible Cause*	*Remedy*
Machine will not rise to operating temperature	Low fuel pressure.	See BURNER on MODEL SPECIFICATIOSN for specified pressure.
	Water in fuel piping.	Drain fuel tank and remove and replace filter per FUEL FILTER INSERT.
	Fuel filter clogged.	Remove and replace fuel filter element per FUEL FILTER INSERT.
	Poor combustion.	See "Poor combustion."
	Improper fuel supply.	Use fuel specified in BURNER section of the MODEL SPECIFICATIONS.
	Temperature control inoperative (if equipped).	See TEMPERATURE CONTROL INSERT.
Machine overheats	Insufficient water.	See "Low operating pressure" on MACHINE TROUBLESHOOTING insert.
	Temperature control inoperative.	See TEMPERATURE CONTROL INSERT.
	Improper fuel supply.	Use fuel specified in BURNER section of the MODEL SPECIFICATIONS.
Dry steam (very little moisture, very hot steam)	Insufficient water.	See "Low operating pressure" on MACHINE TROUBLESHOOTING insert.
	Improper fuel supply.	Use fuel specified in BURNER section of the MACHINE SPECIFICATIONS.
	Improper fuel pressure.	See BURNER on MODEL SPECIFICATIONS for specified pressure.

Water Heater Troubleshooting Continued

Machine smokes (sweet smelling exhaust)	Improper fuel supply.	Use fuel specified in BURNER section of MODEL SPECIFICATIONS.
	Insufficient combustion air.	See AIR BAND ADJUSTMENT on OIL BURNER MAINTENANCE insert.
	Leaking fuel system.	Correct leakage problem.
	Clogged or improper burner nozzle.	Remove (DO NOT CLEAN) and replace nozzle per BURNER ASSEMBLY INSERT.
	Loose burner nozzle.	See BURNER MAINTENANCE insert.
Machine fumes (exhaust burns eyes)	Too much combustion air.	See BURNER TROUBLESHOOTING insert.
	Improper fuel pressure.	See FUEL on MODEL SPECIFICATIONS for specified pressure.
Excessive oil dripping from laydown coil condensate.	Loose nozzle.	See BURNER TROUBLESHOOTING insert.
	Fuel pressure too high.	See FUEL PRESSURE ADJUSTMENT section on BURNER MAINTENANCE insert.
	Burner nozzle defective.	Remove and replace with appropriate nozzle found on the BURNER ASSEMBLY or BREAKDOWN insert.
	Incorrect burner nozzle.	Remove and replace with appropriate nozzle found on the BURNER ASSEMBLY or BREAKDOWN insert.
Poor combustion	Low fuel pressure.	See “Low fuel pressure” on BURNER TROUBLESHOOTING insert.
	Improper fuel supply.	See “Low fuel pressure” on BURNER TROUBLESHOOTING insert.
	Insufficient combustion air.	See AIR BAND ADJUSTMENT section on OIL BURNER MAINTENANCE.

Schematic, Engine



Warranty Policy

Machines are guaranteed to be free from defects in material or workmanship under normal use and service for period of one year after delivery from the factory. Any part (other than vendor items) that is determined to be warranty will be repaired or replaced at **NO CHARGE** provided the warranty registration form is filled out in its entirety and the part is sent back freight prepaid. Any replacement parts accepted as warranty will be returned to you freight prepaid.

Our heating coil will carry a seven-year prorated warranty credit. The manufacturer will repair or replace the coil without charge for five years after delivery date from the factory for any defect in the coil that was caused by workmanship or defective steel. After the five years have expired, the credit will be prorated as follows:

First 5 years	100% Credit
Years 6 & 7	50% Credit
After 7 Years	No Credit Allowed

All parts supplied to us by other manufacturers will be subject to their guarantee and warranty. Generators, motors, and engines are required by vendors to be repaired or replaced by authorized warranty repair stations. The manufacturer will assist you in locating warranty stations around the country in cases where that is necessary. Select items carry a six-month warranty such as unloaders, triggers guns, etc.

The manufacturer, at its option, will repair or replace defective parts only, and does not allow for field labor charges for removal, installation, analysis, travel expense, or special freight expenses incurred for replacement parts.

Warranty does not apply to normal wear and tear including, but not limited to, freezing damage, freight damage, damage caused by misuse or misapplication, chemical related failures, contaminated filters and screens, moisture related fuel pump failures, stuck check valves, pump packings or seals, nozzles or orifices, paint, hoses, and gauges.

HY-FLO

~SINCE 1977~

"A new generation of quality."

For full warranty information, contact your delivering distributor or contact the manufacturer at info@warrantysvc.com