

OPERATOR'S MANUAL HOT WATER PRESSURE WASHER



GF SERIES

KODIAK



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1. Read all safety and operating instructions before using the unit.
2. Read warnings on additive containers.
3. Ventilate work area when using toxic or pungent additives to reduce your exposure to toxic fumes.
4. Use protective wear, especially for the eyes and skin.
5. Be careful of slippery floors. Some additives make a normally safe area extremely slippery and dangerous.
6. Keep children away from the machine and wash area.
7. Do not change nozzle size. Each machine is designed to operate with a specific size nozzle. An incorrect nozzle could cause excessive pressure resulting in pump damage and possible personal injury. Refer to parts list for correct nozzle size.
8. Do not point the nozzle where damage or injury could result. Eg. eyes, skin, people, animals. The water discharge from this unit is under extremely high pressure.
9. Do not point the nozzle toward an electrical outlet as you risk severe shock and personal injury.
10. Use only recommended No. 1 or No. 2 fuel oil in this unit. Do not use gasoline, crankcase drainings, or oil containing gasoline or solvents.
11. Never run the unit in an enclosed area. Exhaust fumes are poisonous. Ensure all areas are properly vented in accordance with local regulating and/or CSA standard B139.
12. Whenever you stop spraying, always engage the safety latch on the trigger gun.
13. Whenever changing nozzles, always turn the engine off and always relieve the pressure by triggering the gun. Always engage the safety latch on the trigger gun. Always change the nozzle with the gun and wand pointed away from you, and never pointed at any person or animal.

WARNING - risk of injection or severe injury. Keep clear of nozzle. Do not direct discharge stream at persons. This equipment is to be used only by trained operators.

Battery Connection for KEH2700GF / KEH3500GF

All models above use a battery with **side post** as shown in the picture below



3/8" screw / 3/8" nut

Side posts

Note use battery group 75 with side posts only. Battery size L 9" x W 7 1/2" x H 7 1/4"
(Width of battery includes side posts)

Caution: Battery can cause electrical shock or fires please exercise extra care when attaching the wires to battery.

As picture shows use red wire on the positive post and use black wire on negative post

Attach wires to the battery post using below process:

First remove plugs on the side post to expose battery terminal holes.

Second use two 3/8" x 1/2" long screws and two 3/8" nuts to attach wires to the battery. Begin placing the red wire followed by the black wire. The 3/8" nuts are used in the place of washers to enable firm attachment of the cable wires on the battery.

Third move the battery into the opening between all thread bolts, while doing this make sure that wires behind the battery do not get pinched.

Final use the bracket already installed on two threaded rods, to fasten the battery so that it is fixed in position.

When unpacking the unit, if you find damage due to shipping, contact your dealer.

INCOMING WATER SUPPLY

Connect a garden hose to the water inlet of the unit. The water supply must be able to deliver 8 gallons per minute at a minimum pressure of 5 psi.

See "Specifications and Features" sheet in this manual.

OUTGOING (HIGH PRESSURE) WATER

To the water outlet fitting, connect the high pressure hose, trigger gun, extension and nozzle.

PUMP - OIL

Before operating the pump, check to see that the oil is level with the dot on the sight gauge which is located at the rear of the pump. The oil level can also be checked using the dipstick which is attached to the oil filler cap. Ensure that the vent hole in the cap/dipstick is clear of dirt. When oil is required, use #20 or #30 non-detergent heavy duty oil.

BURNER - FUEL

Fill the burner fuel tank with no. 1 or no. 2 fuel oil

BATTERY

Battery must be installed before starting the engine. (the engine will start without the battery installed, but damage will occur.)

BURNER START UP INSTRUCTIONS

(In the event that the burner has been replaced)

1. Set the Thermostat substantially above water temperature of the incoming water supply. (In temperate regions, this is around 50 degrees Fahrenheit.)
2. Turn on the burner switch.
3. As soon as the burner motor starts rotating, bleed (prime) the fuel pump. To do this, attach the clear plastic hose over the vent plug. Loosen the plug and catch the fuel in an empty container. Tighten the plug when all the air appears to be eliminated.
4. If the burner stops during bleeding, wait three to five minutes for the control Safety Switch to cool, then reset it manually.
5. If the burner stops after flame is established, additional venting is probably required. Repeat the bleeding procedure.

CAUTION - Do not attempt to start the burner when excess fuel has accumulated, or when the furnace or boiler is full of vapor, or when the combustion chamber is hot.

ADJUSTING THE BURNER

Allow sufficient air to obtain a clean looking flame by loosening the lock screws and moving the air shutter, and if necessary, the bulk air band.

DRAFT CONTROL ADJUSTMENTS

The unit is set up in the factory to burn cleanly into atmospheric conditions. Therefore if a chimney is fitted to the machine, an "O" draft would be the optimum condition.

FINAL AIR-ADJUSTMENTS

Allow at least ten minutes for warm-up, and longer if the unit is new, in order to burn off the oil deposits on the heat exchanger and other surfaces. Check and adjust all controls. (See Manufacturer's Instructions sheets.) Test the primary control Safety Switch to insure a safety shutdown will occur in the event of equipment malfunction.

NOTE - The settings below have already been completed for this unit, so the following instructions for adjusting apply only if a new burner or coil is installed.

OPERATION

STARTING THE PRESSURE WASHER

1. Make sure that the burner switch is "OFF", and that all other switches are in the "OFF" position.
2. Connect water supply to the Washer.
- (. Pick up spray gun and hold it firmly, and pull on the gun trigger to evacuate all air in the system.
-). Release gun trigger.

STARTING THE ENGINE

1. Hold securely and open the Trigger Gun to reduce the load on the engine.
 2. Turn the Engine Switch on.
 - (. Start Engine.
 -). Advance the throttle to bring the engine to full speed.
- Caution - The force of the water leaving the nozzle causes a kick-back or recoil at the trigger gun.

BURNER START UP

Turn Burner Switch to "ON".

SEE PAGE 5 FOR DETAILED BURNER START UP INSTRUCTIONS.

WARNING - Do not use gasoline, crankcase oil, any oil-containing gasoline, or any other volatile substance.

CAUTION - Do not run the fuel pump dry. Always check the fuel level in the tank before running the washer.

CHANGING PRESSURE

The variable Unloader Valve is already set to full pressure. Do not adjust the Unloader past the maximum pressure, as this will not increase the performance, and the excessive shutoff pressure will damage the Washer.

CLEANING CHEMICALS

For chemical application, insert soap nozzle at the end of the lance. To change concentration, adjust metering valve toward open or close. Use only chemicals with a PH between 7.0 and 10.0.

STOPPING THE WASHER

1. Ensure Chemical Valve is "OFF", then shut off Burner Switch.
2. Pump cold water through the Washer for two minutes.
3. Retard the throttle until the engine to idling.
4. Shut off Engine Switch and turn on Trigger Gun to release pressure in the line.

SAFETY COMPONENTS

UNLOADER VALVE

The Unloader Valve allows all of the water delivered by the pump to return to the pump suction side. If the trigger gun is closed or "OFF", the Unloader Valve goes into the "bypass mode" and the pump runs without pressure. However, the pump may be severely damaged, due to excessive overheating, if left running in the "bypass mode" or "gun-off" situation for more than 6 minutes.

SAFETY RELIEF VALVE

The Relief Valve prevents the machine from being subjected to abnormally high pressures. If this situation occurs, the valve will blow off relieving the pressure in the coil. This valve may also operate if the unloader is adjusted too high.

PRESSURE SWITCH

The Pressure Switch ensures that there is pressure, and therefore there is water flow at the head of the pump. This control does not operate at less than 300 psi. Therefore if the pump is on "bypass mode", the burner will not operate.

THERMOSTAT

The built-in thermostat allows temperature adjustment up to 212 °F

1. Check for SYSTEM LEAKS. Leaks in the pressure side of the system can cause premature wear (or even failure) of the pump. The WARNING signal for this kind of leak is "frequent" cycling of the unloader. ("FREQUENT" means more than once every 2 minutes in the "Gun-Off" position.) Check the gun and swivel joints for leaks.
2. Check the OIL LEVEL at least once a week. Add ONLY the type and grade of oil specified for this pump. (See "Specifications and Features" sheet.)
3. CHANGE OIL as recommended.
4. After you use chemical additives, thoroughly FLUSH the system with clean water.
5. Never run the washer without water. TURN WATER ON FIRST.
5. PROTECT FROM FREEZING! When transporting your washer in temperatures below 32°F (0°C), WINTERIZE the pump, hoses and gun.

WINTERIZING YOUR PRESSURE WASHER

(This is also good practice if the cleaner is to remain unused for more than 3-4 weeks.)

WITH A FLOAT BOX

1. Shut off the water supply, and disconnect hose.
2. You need a short (2' length) of hose with a male garden hose fitting on one end.
3. Connect the short hose to the inlet of the machine.
4. Put the other end of the water hose into a container of windshield washer or anti-freeze.
5. Turn on the Cleaner and open gun until liquid comes out of the nozzle "foamy" or "soapy".
6. Put gun in "OFF" position for 5 seconds to get antifreeze into bypass line. Shut off motor, unit is now winterized.

CAUTION - If your hose is longer than 35 feet, the float box may empty before the liquid from the nozzle gets foamy. If this happens, refill the float box with antifreeze and continue.

WITHOUT A FLOAT BOX

1. Shut off the water supply and disconnect hose.
2. You need a short (2 feet length) of hose with a male garden hose fitting on one end.
3. Connect the short hose to the inlet of the machine.
4. Put the other end of the hose into a container of windshield washer or antifreeze.
5. Turn on Cleaner and open gun until liquid comes out of nozzle "foamy" or "soapy".
6. Put gun in OFF position for 5 seconds to get antifreeze into bypass line. Shut off motor or engine.
7. Unit is now winterized.

Clean Heating Coil - Remove burner from coil by removing the four flange mount nuts. Inspect inside of combustion chamber and if it is heavily sooted so that air passage could be a serious problem, clean the air passage with a heavy duty vacuum. Run machine at full pressure and check the inside coil for leaks.

Check Oil Filter - Loosen nut cap of oil filter until cup and filter element can be removed. Replace the filter element. At this time, check for water and sediment in the filter cup. Finally, clean the cup with fuel oil.

Check Oil Pump Screen - (ONLY if pump is not working properly): Remove the back of the oil pump taking care not to lose any of the small pieces from inside the pump. The screen is a steel mesh cylinder inside the pump.

Check for water and sludge. Clean with fuel oil and replace.

Coil Maintenance - Liming of the coils is caused by mineral deposits from the water and occurs in hard water areas. The deliming procedure requires special caution and tools to perform. We recommend that you call your local service person if problems arise.

CHECKING FOR SCALE OR LIMING IN THE COIL

1. Remove outlet orifice and check for any liming. Clean the orifice if needed.
2. Remove outlet gun and hose.
3. Install a pressure gauge between the unloader and coil inlet.
4. Turn on the pump without the water outlet gun or outlet orifice. If the pressure reading is above 50 psi, have your machine descaled. Else, reassemble the machine.

DESCALING

If pressure drop in the coil is over 50 psi - descaling is recommended. Descaling requires the use of highly corrosive chemicals. It also requires the use of goggles and special protective clothing.

1. This procedure requires a 20L pail of descaling chemical.
2. Plumb the pump suction into the pail of descaling compound with a screen on the end of the suction line.
3. Plumb a hose from the machine outlet back in the pail of descaling compound.
4. Turn the pump on and circulate the compound through the machine for about 20 minutes.
5. After that time the chemical being pumped out of the coil should be running thin and dirty rather than foaming heavily.
6. Remove the extra plumbing and reconnect machine together and run clean cold water through the machine for five minutes.

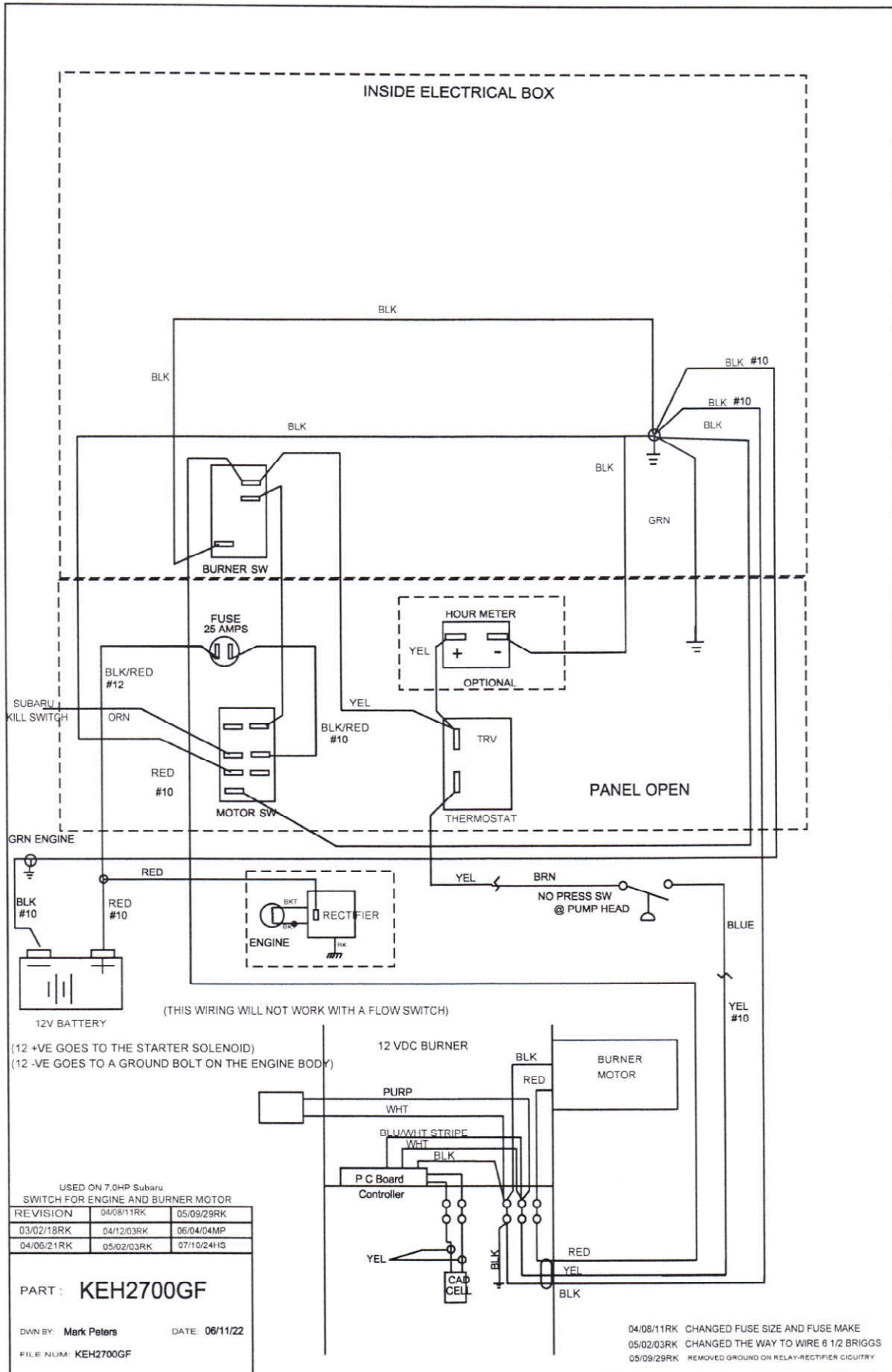
SETTING THE COMBUSTION EFFICIENCY OF THE BURNER

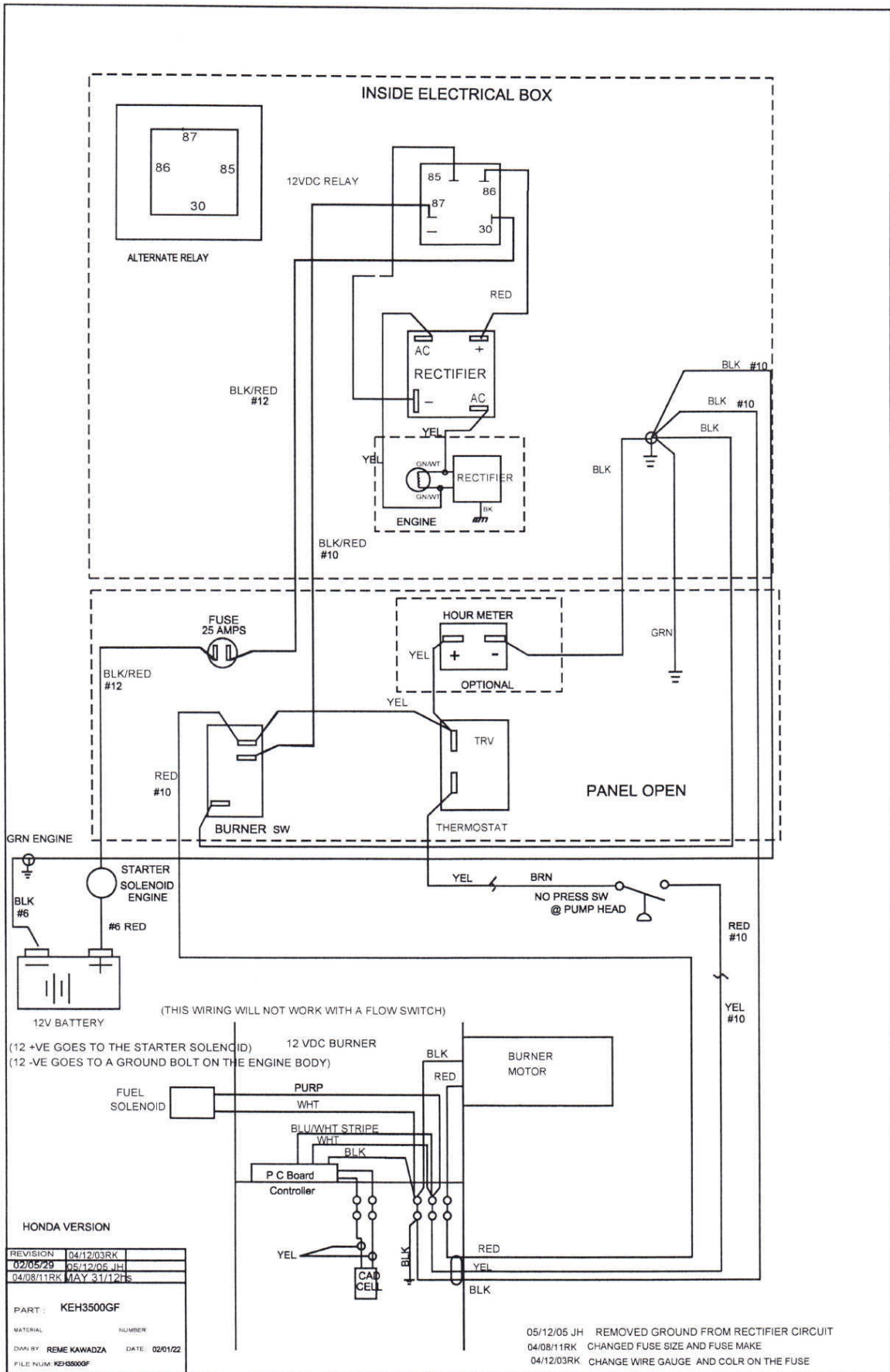
1. Remove the flame tube assembly from the burner.
 - a. Remove any heavy sooting on spinner head.
 - b. Change oil nozzle.
 - c. Change electrode insulators if cracked.
 - d. Check electrode points for excessive wear and replace.
2. Check spark gap of transformer.
3. Ensure that the fan moves freely.
4. Fire the burner and check the exhaust gas with a smoke tester. Using the suitable test instruments for smoke and CO_2 or O_2 set the air settings to obtain a trace of smoke. Measure the CO_2 and the O_2 at this point and add sufficient air to reduce the CO_2 or increase the O_2 by one percent (1%) as an insurance margin, unless otherwise specified by the appliance manufacturer's instructions EXAMPLE: 13% CO_2 & a trace of smoke reduced to 12% CO_2 .
5. Tighten all locking screws after the final adjustments are made.
6. Start and stop the unit several times to ensure that there are no significant rumbles or pulsations.

HOT WATER MODEL	KEH2700GF	KEH3500GF
Pressure PSI	2500	3500
Volume GPM (US)	2.7	4
Nozzle Size	4	4
Water Temperature °F	175° - 212°	175° - 212°
Engine Gas HP	7 Subaru EX	13 Honda GX
Note - Water temperature varies with the volume and pressure setting, and water inlet temperature		
VOLTAGES	KEH2700GF	KEH3500GF
Burner	12 Volt	12 Volt
Burner BTU	170,000	300,000
Firing Rate GPH (US)	0.74	1.98
Fuel pressure PSI	140	140
Fuel Nozzle	1.00 90°A	1.75 80°A
Fuel Oil Type	No. 1 or No. 2	No. 1 or No. 2
SAFETY COMPONENTS	KEH2700GF	KEH3500GF
Unloader	Standard	Standard
Pressure Switch	Standard	Standard
Adjustable Thermostat	Standard	Standard
Pressure Relief Valve	Standard	Standard
FEATUTRES	KEH2700GF	KEH3500GF
Shut off gun	2900PSI	4500PSI
Wand	48" Lance	48" Lance
Hose / rating	50 FT / 250°F	50 FT / 250°F
Portable model	Standard	Standard
Paint - Epoxy Powder	Standard	Standard
Downstream Injector	Standard	Standard
Coil - Pipe Schedule	80	80
Pump MFG	Interpump	Interpump
Oil for Pump	SAE 20W or 30W	SAE 20W or 30W
Dimensions (LxWxH) in.	42 x 18 x 32	43 x 29 x 46
Weight (Pounds)	384	440

TROUBLE	POSSIBLE CAUSE	REMEDY
Low Pressure	Leaks in water system	Tighten all fittings.
	Insufficient water supply	Fill tank or increase line size to machine.
	Outlet orifice worn or wrong size	Replace with correct orifice. CAUTION: Do not use smaller than recommended. Excessive pressure will damage pump.
	Gun control unloader valve bypass leak	Repair or replace unloader valve.
	Dirty or worn check valves in pump	Replace or clean. Refer to high pressure pump manual.
	Cylinder cups leaking and/or worn cylinder sleeves	Replace. Refer to high pressure pump manual.
Excessive Pressure	Outlet orifice restricted	Remove orifice at tip of gun and clean. Flush coil with water before replacing.
	Scale or dirt in coils	De-scale coils.
	Pump speed too high	Check water output GPM.
Relief Valve Operates	Relief valve set at low pressure	Re-adjust relief valve.
	Relief valve dripping after adjustment	Replace valve.
	Unloader valve stuck	Repair unloader valve.
Weak or no chemical at nozzle	Clogged soap screens	Clean or replace.
	Air leak around soap siphon check valve and/or metering valve leaking	Tighten all fittings and tubing.

TROUBLE	POSSIBLE CAUSE	REMEDY
Burner will not ignite	No fuel	Fill fuel tank and check fuel filter for water and other contaminants.
	Electrodes out of alignment	Adjust.
	Electrode insulator failure	Check for breaks, cracks, or spark trails – Replace.
	Water flow switch not closing	Adjust, repair or replace.
	Fuel solenoid valve not opening	Clean, repair or replace.
	Weak transformer	Clean and check transformer terminals. Replace if necessary. Check for spark.
	Plugged oil nozzle	Replace (do not clean).
	Faulty burner oil pump	Adjust or replace.
Unit smokes	Improper fuel	Use No. 1 or No. 2 Fuel oil.
	Air to burner insufficient	Air adjustment or burner – Remove soot from coils.
	Fuel nozzle interior loose	Replace nozzle.
Water temperature too low	Thermostat adjustment	Adjust the thermostat to desired temperature.
	Coils liming up	Descale.
	Improper combustion	Readjust burner.





Effective May 1, 2002

This product is warranted to be free from defects in materials and workmanship under normal use and service, for a period of one year from the date of purchase, unless stated otherwise below, when operated and maintained in accordance with the Maintenance and Operation Instructions supplied with the unit. The warranty does not cover misuse or negligence.

This warranty is extended only to the original purchaser. Hoses, spray guns, wands and other accessories are warranted for 30 days. Warranty is void if repairs are attempted by anyone other than an Authorized Service Centre.

If a difficulty develops with the product, you should contact the nearest Authorized Repair Centre or KODIAK office. Only these locations are authorized to make repairs to the product or replacement of defective parts, which will be done at no charge within a reasonable time after receipt of the product. Units or parts should be returned at the customer's expense to the nearest KODIAK location or Authorized Service Centre. Pack unit in a strong carton and pad tightly to avoid damage. Damage in transit is not covered by warranty. Include original purchase receipt with any claim (but keep a copy for your files).

KODIAK liability under warranty is limited to repair of the product and/or replacement of parts and is given to the purchaser in lieu of all other remedies including incidental and consequential charges. There are no expressed warranties other than those specified herein.

SPECIAL WARRANTIES	WARRANTY PERIOD
Honda Engine (warranted by Honda) please refer to your engine owners manual.	3 year parts and labour
Interpump / General Pump Limited Warranty (see attached for details)	5 years non-wear parts
Fabricated Components (frame, coil skin, coil cap, handle, belt guard)	1 year parts, 1 year labour
Burner, Transformer, Control Switch, Safety Switch	1 year parts and labour
Schedule 80 Heating Coil Limited Warranty *(see below)	5 year parts, 1 year labour
Schedule 40 Heating Coil	2 year parts, 1 year labour
* Limited Coil Warranty (Schedule 80 only)	
100% cost of coil replacement, for up to 3 years, including 1 year labour.	
50% cost of coil replacement, for up to 4 years, not including labour.	
25% cost of coil replacement, for up to 5 years, not including labour.	

We must receive the coil serial number section of the coil to substantiate the warranty claim.

We will not replace coils under warranty if the coils have been subjected to misuse such as:

1. Freezing 2. Lime Deposit 3. Other foreign material deposit 4. Shock or Vibration

Any replacement during the warranty period will have a warranty of one (1) year, or the balance of the original warranty, whichever is greater.

Contact your dealer for sales and service support. For your nearest dealer, contact KODIAK, Laval, Quebec, Canada at 1-888-332-4012.

Warranty for Pumps on **KODIAK** Pressure Washers

January 1, 2002

The following statement is intended to assist our customers in understanding the terms of our warranty, the circumstances under which we will honour claims and the procedure for making such claims.

KODIAK warrants each pump manufactured by Interpump and General Pump to be free of defects in material and workmanship for a period of (5) five years from the date of shipment. In addition, KODIAK warrants all forged brass manifolds to be free of defects in material and workmanship and from damage resulting from freezing for the life of the pump. Liability under this warranty is on all non-wear parts and limited to the repair and replacement of any pump returned to KODIAK which upon inspection, is judged to be defective due to workmanship or material failure. Any product returned to KODIAK should be shipped freight prepaid to:

KODIAK
4101 Industriel Blvd.
Laval, Quebec Canada
H7L 6G9

and must display a Return Goods Authorization number obtained from KODIAK Inside Sales Department 1-888-332-4012

In the course of marketing or servicing the customer or potential customer's needs, KODIAK will use its best judgement in its recommendations. However, the ultimate responsibility for product application decisions shall rest with the customer. The sole and only warranty made by KODIAK is the limited warranty described above. KODIAK makes no other warranty of any kind, expressed or implied, including any implied warranty or merchantability or of fitness for a particular use or purpose. KODIAK disclaims and denies any liability for any direct, indirect, special incidental or consequential damages which may be suffered as a result of sale, delivery, servicing, use, loss of any product, downtime, labour, freight or other charges not expressly included herein. The only liability and the total liability of KODIAK under this warranty or in any claim involving KODIAK is expressly limited to the replacement or purchase price of the product.

The following items are not warranted due to matters beyond KODIAK's control.

1. Normal wear and tear on parts that are considered standard wear parts;
2. Defects caused by the fault or negligence of the buyer or third buyer;
3. Use of unauthorized repair parts;
4. Modifications made by the customer;

This warranty statement supercedes and replaces non-dated warranties or previously dated warranties and applies to pressure washers shipped after January 1, 2002. The Interpump and General Pump pumps included on pressure washers from KODIAK will be eligible for warranty consideration as outlined above.