

EL DIABLO



Operator's Manual

Table of Contents

<i>Warranty</i>	2
<i>Safety</i>	3
<i>Operating Procedures</i>	4
<i>Maintenance</i>	7
<i>Troubleshooting</i>	9
<i>Waterflow Diagrams, Diesel Heater Wiring Diagram</i>	11
<i>Electrical Wiring Diagram</i>	12
<i>Diesel Burner Gun</i>	13
<i>Van Layout</i>	14



Congratulations and thank you for purchasing the EL DIABLO truck mounted cleaning system. The EL DIABLO has been designed with simplicity and durability in mind to give you many years of reliable service. Years of experience, engineering, planning, and practical know-how have gone into the design and manufacture of the EL DIABLO. This manual is intended to inform you about the operation and maintenance of your new truck mount. Please take time to read this manual to become familiar with the machine's operating and maintenance procedures. This will be time well spent to help give you years of reliable service from your EL DIABLO.

Truck Mount Limited Warranty

MasterBlend warrants the El Diablo to be free from defects in materials and workmanship when properly operated and maintained in accordance with our Operating and Maintenance instructions. This warranty shall be for periods as listed below. Components, parts, and accessories furnished by other manufacturers are warranted only to the extent of their original manufacturers' warranty. The warranty obligation shall extend from the date of sale to the original purchaser or lessee only. During the warranty period, we will either repair or replace, at our sole option, any part found to be defective upon our examination.

This warranty does not cover normal wear items such as hoses, filters, gaskets, quick disconnects or other parts that may require replacement during normal use. Parts that have been abused or damaged by neglect or freezing conditions will not be warranted. Damage to materials and components due to the use of improper lubricants, chemicals or deposits from poor water quality will not be warranted. There is no warranty on pump or valve seals and o-rings. This warranty does not cover labor, shipping charges, or any other charges in connection with the replacement of defective parts.

This warranty is for the replacement of defective parts or workmanship only. It does not provide in any way for the replacement of entire units due to defective parts or workmanship. This warranty service is an exclusive remedy and MasterBlend will not be liable for any special, indirect, incidental or consequential damages or injury to person or property of any type.

To obtain warranty, contact your distributor or Masterblend at 5285 Fox Street, Denver, Co 80216, 800-525-9644, 303-373-0702. Parts must have an accompanying MasterBlend return authorization number and may not be returned without prior permission and must be returned freight prepaid.

Machine Frame	5 years (excluding paint and abuse or neglect)
Waste Tank	5 years (excluding paint and abuse or neglect)
Engine	2 years (through original manufacturers' warranty)
Blower	2 years (through original manufacturers' warranty)
Water pump	1 year (through original manufacturers' warranty)
120 volt generator	1 year (through original manufacturers' warranty)
Diesel heater and temperature control	1 year
Propane heater	1 year
Belts, Pulleys	90 days
Gauges	90 days (vacuum, pressure, temperature, solution meter)
Switches and electrical items	90 days
Wands and valve bodies	90 days
Pressure regulators and unloaders	90 days

Safety

Please read this manual before operating or maintaining your equipment.

It is recommended that all persons who will be operating or maintaining this equipment should be familiar with this manual. Failure to follow proper procedures could result in damage to the equipment or severe personal injury.

This equipment must be operated only in a well ventilated environment.

The engine and heating system produce carbon monoxide which is an odorless and colorless poison gas. **Do not operate this machine inside an enclosed area or where the exhaust fumes could enter a building through an open door, window, or another opening.**

This equipment has moving parts.

Keep your hands, hair, loose clothing, or any other items away from all moving or rotating parts. **DO NOT** service the equipment while it is operating. **DO NOT** operate the equipment without the safety guards in place. Serious injury may result.

This equipment has hot surfaces.

The components of the machine will be extremely hot during and shortly after operation. **DO NOT** touch any suspected hot areas of the machine without allowing sufficient time for cool down.

This equipment uses Gasoline, Propane or Diesel.

Store fuels in approved containers. Keep away from sparks or open flames. If an odor of gasoline or propane is present, **DO NOT** turn on the equipment or any other accessories until the source of the odor is controlled and the fumes are dissipated.

This equipment contains electrical power sources.

12vdc battery: Batteries can give off explosive gasses that can be ignited by sparks or any ignition source. Use caution when working with or around batteries. Disconnect the negative terminal of the battery before performing repairs to the equipment. Make sure all electrical components are turned off before connecting or disconnecting the battery to avoid a spark at the cable and battery terminal connection.

120 volt generator (diesel heater units only). The generator supplies power to run the Diesel heater and its components.

High pressure and high temperature water

This machine is capable of producing 2000 psi water pressure and 250 + water temperature. All hoses must be capable of withstanding these ranges. Make sure the pressure and temperature are adjusted properly for the cleaning tool being used. Severe injury may occur if caution is not observed while using high pressure and temperature.

Cleanliness

The machine area must be kept clean and free of foreign material that may interfere with the normal operation and safety of the machine.

Training of operators

This machine must only be operated by qualified persons who have read this manual and understand the operating characteristics of the machine. Improperly trained persons may damage the equipment or cause personal injury.

Installation

The El Diablo truck mount unit must be securely bolted through the floor of the vehicle in which it is installed. Serious damage to the equipment or personal injury may occur if the machine is not mounted properly.

The El Diablo truck mount weighs approximately 700lbs. The use of a forklift is required when lifting the machine into a vehicle. It is also strongly recommended that a second person be utilized to stabilize the machine while it is on the forklift, due to the center of gravity being heavy to the waste tank side of the machine. Use caution when moving the machine with the forklift to avoid damage to equipment, the vehicle and personal injury.

The El Diablo truck mount can be installed into a 1/2-ton or larger van; however, it is strongly recommended that it be installed into a 3/4-ton or larger van. The machine can be installed in either the side door or rear door of the van. If the machine is installed into the rear doors a vacuum hose reel may be installed next to the machine to maximize van floor space.

Due to irregularities in the van floor it is suggested that wood be placed under the machine to provide a level surface on which the machine is mounted. The wood should be 1/2" or 3/4" exterior grade plywood or equivalent.

The El Diablo has 2 "L"-shaped mounting brackets on the front of the machine and holes pre-drilled into the rear of the heater support on the back of the machine to be used for mounting. There are also mounting tabs on the base of the waste tank that can be used if the situation permits.

Before drilling holes in the van floor, check to ensure that underneath the van floor there are no fuel lines, brake lines, or other obstructions that could cause a safety hazard. Use 3/8" bolts to secure the machine to the van floor. Lock washers and large fender washers are recommended to be used underneath the van. Tighten the bolts until the machine is securely mounted to the floor.

The engine on the El Diablo runs off gasoline, therefore, it is recommended that the vehicle's gasoline fuel tank be accessed. There are several fuel tank hook-up kits available from your supplier for each specific model of vehicle. ***It is recommended that the fuel hook-up kit be installed by only qualified mechanics familiar with this type of modification.***

The optional propane heater will require installation of a propane tank and the lines to connect the tank to the heater. A 10 gallon belly-mount tank is included with the propane package and should be installed on the outside of the van and mounted to the undercarriage of the van. ***The installation of the propane tank and the connections to the heater should be completed by only qualified mechanics familiar with making propane connections.***

If the equipment is to be installed into a trailer, make sure that the fuels are stored in proper tanks for each specific fuel and are stored according to federal, state and local regulations.

Operating Procedures

Check oil levels

Make sure that the engine oil level is in the operating range of the dipstick. Inspect the oil sight gauges on the Cat Pump and the Roots blower to insure correct level of oil. Operating the equipment with improper oil levels can cause damage to the components that is not covered under warranty. (See the **Maintenance** section for the proper oil to be used in the engine, blower, and the pump.)

Check fuel levels

Make sure that there is an adequate supply of gasoline in the gas tank to finish the job. If you are connected to the gasoline tank of the van, it is suggested that the level of fuel be no less than 1/2 tank to avoid running the van out of fuel and being stranded.

On machines using diesel heat, ***use a good grade diesel fuel only (kerosene may also be used)***. Check the level of diesel

in the tank to be sure there is an adequate amount to finish the job. The diesel heater will use approximately 1/2 to 3/4 gallon of diesel per operating hour depending upon the circumstances. Make sure that the supplier for the diesel has a good quality of fuel. If the fuel is contaminated, dispose of it properly and acquire fresh fuel. In some instances a fuel conditioner may be added to help reduce moisture that may accumulate in the tank. Contact your local supplier for suggestions.

On machines with propane heat, assure that there is a sufficient amount of propane in the tank for completing the job.

Check cleaning solution

Inspect the cleaning solution container to assure adequate level of the proper cleaning solution desired, and also that it is the correct cleaning solution for the job. ***If the solution container is run empty, damage to the Cat pump may occur.***

Operating Procedures *(continued)*

Connect hoses to machine

Connect the water supply hose to the water input connection on the front of the machine. Before connecting the hose to the customer's water supply, it is suggested that the faucet be turned on to flush out any debris that may have accumulated, and also to assure an adequate amount of water is supplied from the faucet.

Take the vacuum and pressure hoses into the building to the furthest point that you are going to clean. Connect the hoses to the cleaning tool, and then connect the vacuum hose to the vacuum connection on the waste tank lid and the pressure hose to the pressure out connection on the front of the machine.

Start the engine

Secure the doors of the van so they will not close during machine operation. Pull the choke knob out and move the throttle lever to approximately 1/3 of the way up from the slow position. Turn the key switch to the "Start" position, and hold until the engine starts. (If the engine does not start within 5 seconds, release the key and wait 10 seconds before trying to restart). When the engine starts, release the key switch and slowly push in the choke knob. If the engine stalls, check the oil level to assure proper level, and then repeat the starting procedure. This engine is equipped with an oil level shut down that will stop the engine if there is not sufficient oil level. **If, after 2 or 3 attempts, the engine still stalls, contact your distributor or local service center for assistance. Do not continue to operate the machine or serious engine damage will result that is not covered under warranty.** Allow the engine to run at a low rpm for a couple of minutes to warm up, and then move the throttle lever to the fast position (approx 3000 rpm).

Turn on the water pump

Turn the Pump Clutch switch on to engage the water pump for pressure. The water pressure gauge should begin to register pressure within 5 to 10 seconds. If the gauge does not begin to read pressure, turn the Pump Clutch switch to the off position and refer to the troubleshooting section. **Do not continue to operate the pump without pressure showing on the pressure gauge or serious pump damage will occur that is not covered under warranty. For water extraction only, do not engage the water pump. Do not leave the Pump Clutch switch in the on position for more than 4 or 5 minutes without activating a cleaning tool. Pump seal damage will occur.**

Set water pressure

Set the water pressure at the desired pressure for the cleaning job. Adjust the water pressure by turning the pressure regulator knob on the front of the machine. For the most accurate setting, adjust the pressure when the cleaning tool is activated. When using the optional propane heater, do not exceed 1000 psi maximum pressure (800 psi operating pressure).

Set cleaning solution level

Adjust the cleaning solution level by turning the black knob on the solution meter counter clockwise to open. To accurately adjust the amount of solution to be used, the cleaning tool must be activated. Set the level of solution accordingly, as the job and type of solution being used requires.

Turn on the heater

Diesel: Check to make sure that the engine RPM is set to 3000 ± 100 . Turn the heater switch located on the front of the machine to the on position. Set the thermostat to the desired temperature for the job. The heater will activate only when the cleaning tool is activated and the temperature of the water is below the set temperature on the thermostat.

Propane: Turn on the propane by opening the valve on the propane tank. Turn the heater gas control knob to the "Pilot" position. Press down and hold the pilot knob for approximately 5 seconds then begin pressing the piezo igniter repeatedly until the pilot flame ignites. Continue to hold the pilot knob down for 20 to 30 seconds or until the pilot flame stays lit when the pilot knob is released. Turn the gas control knob to the "On" position. Turn the thermostat knob to the desired temperature setting for the job.

If the heater goes out during operation, turn the heater gas control valve to the "Off" position and wait 5 minutes before relighting.

Complete the cleaning job

After the previous steps have been completed, continue with the normal cleaning procedures as required by the job. **Do not lay the cleaning tool down for more than 4 or 5 minutes without activating the solution flow, or pump seal damage will occur.**

During operation, occasionally check out the gauges on the machine to assure that the settings that were previously done are still correct, i.e. water pressure and temperature, engine rpm, solution metering, etc. Adjust as necessary.

Shutdown Procedures

Turn off heater and solution meter

Diesel: Turn the heater switch to the off position. Turn the solution meter knob clockwise to the off position. Activate the cleaning tool to cool down the water temperature and to flush out the cleaning solution.

Propane: Turn the gas control knob to the off position. Turn the solution meter knob clockwise to the off position. Activate the cleaning tool to cool down the water temperature and to flush out the cleaning solution. Close the valve on the propane tank to shut off the propane supply.

Turn off the water pump

Turn off the Pump Clutch switch and activate the cleaning tool to release pressure in the hoses.

Turn off the engine

Move the throttle lever to approximately 1/2 throttle. Allow the engine to run for several minutes to cool down. **On the last job of the day, spray WD-40 (or an equivalent) for 5 to 10 seconds into the Blower Lube located on the upper front panel.** (Note: When spraying the WD 40 the engine should be at operating speed and a vacuum load applied.) Move the throttle lever to the idle position and turn the key switch to off.

Retrieve and store cleaning tools and hoses

Make sure all hoses, cleaning tools and accessories that were used on the job are properly stored in the vehicle.

Empty waste tank

When emptying the waste tank, follow local, state, and federal laws concerning waste water disposal. Waste water should be disposed of only into drain systems that connect to a municipal sanitary sewage treatment plant!

Make sure the engine is turned off before draining the waste tank. Connect the drain hose to the drain valve on the waste tank and open the valve. Remove the waste tank lid and lift out the lint basket and clean out any debris that has accumulated then re-install basket in tank. Inspect the blower lint screen for any build up of debris. Remove and clean screen then re install. **Do not operate machine without the blower lint screen installed or serious damage to the blower will occur that is not covered under warranty.**

Rinse out the waste tank at the end of the cleaning day using fresh water to prevent an accumulation of debris in the bottom.

Maintenance

DO NOT perform any maintenance procedures while the equipment is running. Moving parts and hot components may cause personal injury or damage to components may occur.

This section of your machine manual may very well be the most important section of the manual that you read. The proper care and maintenance of your El Diablo truck mount is essential for a safe and reliable long life to your investment.

Engine

Check the engine oil level daily when the engine is turned off and is in a level position. The oil level should be between the upper limit and the low limit marks on the dipstick. ***Operating the engine with improper oil level can cause engine damage that is not covered under warranty.***

Change the oil after the first 20 hours and then every 100 hours thereafter. Use SAE 30W with an API SERVICE CATEGORY SJ or higher motor oil (see Honda owners manual). The engine holds approximately 1.16 US qt with out an oil filter change and approximately 1.48 US qt with an oil filter change. It is recommended that the oil be warm so it will drain more quickly and efficiently.

Change the oil filter at least every 200 hours. Use only a genuine Honda oil filter or a filter of equivalent quality **specified for your engine model**. Check the air filter every 50 hours and replace as necessary. Replace the spark plugs every 300 hours. For more specific engine maintenance procedures see the Honda Engine Owners Manual.

Use only unleaded gasoline with a pump rating of 86 octane or higher.

Blower

The El Diablo uses a Roots URI-J DSL blower that is splash lubricated by gear oil on both the front and back of the blower. There are sight gauges on the side of each gear case for checking the oil level. The gear boxes are filled with ROOTS SYNTHETIC OIL. It is highly recommended that ROOTS SYNTHETIC OIL be used to maintain optimum performance. The gear oil should be changed after the first 100 hours of operation, then every 1000 hours thereafter. To drain the oil, remove the drain plug in the bottom of the gear case and allow the oil to drain out. It is recommended that the oil be warm so it will drain more quickly and efficiently. To refill the gear case, remove the top plug and fill until the oil reaches the middle of the oil sight gauge on the side of the gear case. The front and rear gear case must be serviced individually.

At the end of each working day, lubricate the lobes in the blower by spraying WD-40 (or equivalent) for 5 to 10 seconds into the Blower Lube located on the front panel of the machine. If the blower is going to be shut down for an extended time, it is espe-

cially important that this be done to protect the lobes from rusting.

(Note: When spraying the WD 40 the engine should be at operating speed and a vacuum load applied.)

Cat Pump

The crank case on the Cat Pump is filled with special CAT PUMP CRANKCASE OIL. The oil should be changed after the first 50 hours of operation then every 500 hours thereafter. Use only CAT PUMP CRANKCASE OIL to maintain optimum performance. The oil level should be at the middle to the top of the red dot in the oil sight gauge located on the pump housing.

Belt and Coupler

Belt tension is adjusted by first removing the belt guard. Then loosen the four generator mounting bolts. Slide the generator to tighten the belt. Make sure the generator base is parallel with the mounting plate to assure belt alignment before tightening bolts. Reinstall the belt guard.

A spare belt is already installed at the factory. To install a new spare belt or to replace the coupler sleeve, loosen the generator as previously described above, and then loosen the two set screws in the engine coupling flange. The flange will slide on the shaft to open up a gap in the coupler assembly to allow a new belt or coupler sleeve to be installed.

Heater

Propane: *It is suggested that monthly the propane lines and connections be sprayed with a soap and water solution to assure that the connections are secure and there is no possibility of a propane leak.*

The propane burner jets should be removed and the orifices cleaned approximately every 500 hours or when the flame of the burner does not burn properly.

Diesel: *It is suggested that approximately every 500 hours the burner gun assembly be removed from the top of the heater and the electrodes be inspected for proper adjustment (see diagram).* While the burner gun assembly is removed this is a good time to replace the fuel nozzle. Also inspect the interior of the burner chamber for any excess soot build up. ***These maintenance procedures may best be done by your distributor or a qualified diesel heater technician.***

There is an inline fuel filter that should be replaced at the 500 hour interval. It is also a good idea to inspect the quality of the fuel on a regular basis. Carefully inspect for moisture buildup inside the fuel tank. If there is any moisture present in the fuel, an additive for diesel fuel may be added accordingly to the amount of fuel in the tank.

Service Item	Service Interval (hours)					
	Daily	50	100	200	500	1000
ENGINE						
Oil	Check	1st Change @ 20 Hours	X			
Oil Fiter		1st Change @ 20 Hours		X		
Air Filter		X		Replace		
Spark Plug					Replace gap .028 - .031	
Valve Clearance					Check ⁽¹⁾	
Fuel Filter					Replace	
Combustion Chamber					Check ⁽¹⁾	
BLOWER						
Crankcase Oil			1st Change			Change
Lube Impellers	X					
Clean Lint Screen	Every Job X					
Clean Lint Basket	Every Job X					
CAT PUMP						
Crankcase Oil		1st Change			Change	
Belt Tension			X			
PROPANE HEATER						
Check Propane Connections for Leaks			X			
Check Burner Jets					X	
DIESEL HEATER						
Change Fuel Filter					X	
Check Burner Gun					X (See diagram)	

(1) See Your Honda Dealer

Troubleshooting

DO NOT perform any maintenance procedures while the equipment is running. Moving parts and Hot components may cause personal injury or damage to components may occur.

Engine

Hard starting or won't start	<p>Check fuel in fuel tank to assure proper level and not contaminated.</p> <p>Check fuel pump for operation.</p> <p>Check battery and battery connections. Make sure they are clean and tight and battery is charged.</p> <p>Check fuse located behind key switch. Replace if blown.</p> <p>Check waste tank water level. Drain if necessary.</p> <p>Check waste tank float switch to make sure it is not stuck.</p> <p>Inspect spark plugs and spark plug wires. Clean or replace spark plugs if necessary.</p>
Engine runs but loses power	<p>Check fuel for good quality.</p> <p>Check fuel filter. Replace if restricted.</p> <p>Check air filter for cleanliness. Replace if necessary.</p> <p>Check spark plugs for proper gap and condition.</p> <p>Make sure waste tank lint screen is clean.</p> <p>Check engine oil level.</p> <p>Check fuel pump for proper operation.</p>

Vacuum

Vacuum is weak	<p>Make sure waste tank lint screen is clean.</p> <p>Check that the waste tank lid is on properly.</p> <p>Check to make sure the waste tank gasket is in good shape.</p> <p>Check to make sure the waste tank drain valve is closed.</p> <p>Check the vacuum hoses and cleaning tool for clogs.</p> <p>Make sure engine is at proper operating rpm (3000).</p> <p>Check waste tank inlet and lint basket for restrictions.</p>
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Water Pressure

Low or no water pressure on gauge	<p>Check incoming water supply for sufficient volume and pressure.</p> <p>Check float in water tank to make sure it is not stuck or clogged.</p> <p>Check level of cleaning solution in solution container and make sure hose is below solution level.</p> <p>Check to make sure the pump clutch is engaging.</p> <p>Check pump belt tension to make sure it is not slipping.</p> <p>Check adjustment of pressure regulator to make sure it has not backed off.</p> <p>Check jets on cleaning tool for correct size and excessive wear of opening.</p> <p>Check filter screen in bottom of fresh water tank.</p> <p>Heating coil has scale build-up.</p>
Low water pressure at tool but good pressure on gauge	<p>Jet on cleaning tool partially clogged.</p> <p>Quick disconnects on hoses worn and not making good connection.</p> <p>Pressure hoses between machine and cleaning tool damaged or restricted.</p> <p>Bad valve on cleaning tool.</p>

Troubleshooting (continued)

DO NOT perform any maintenance procedures while the equipment is running. Moving parts and Hot components may cause personal injury or damage to components may occur.

Heater – Propane:

No heat or low heat

Check to make sure fuel tank is turned on and has an adequate supply of fuel.
Check to make sure the pilot light is lit and gas control valve is turned on.
Check that the thermostat knob is set at the desired temperature.
Check the jet in the cleaning tool to make sure it is not wore out allowing excessive water flow.
Check for scale build up in the heating coil.
Inspect the burner for proper flame color. Clean jet orifices.
Burner will not light
Check to make sure fuel tank is turned on and has an adequate supply of fuel.
Make sure gas control knob is set to pilot and the pilot knob is being depressed fully.
Check the igniter electrode for proper spark and adjustment.
Burner will not stay lit
Make sure the pilot flame is contacting the thermocouple. Replace thermocouple if necessary.
Make sure there is no breeze or air movement to blow out pilot flame.

Heater – Diesel:

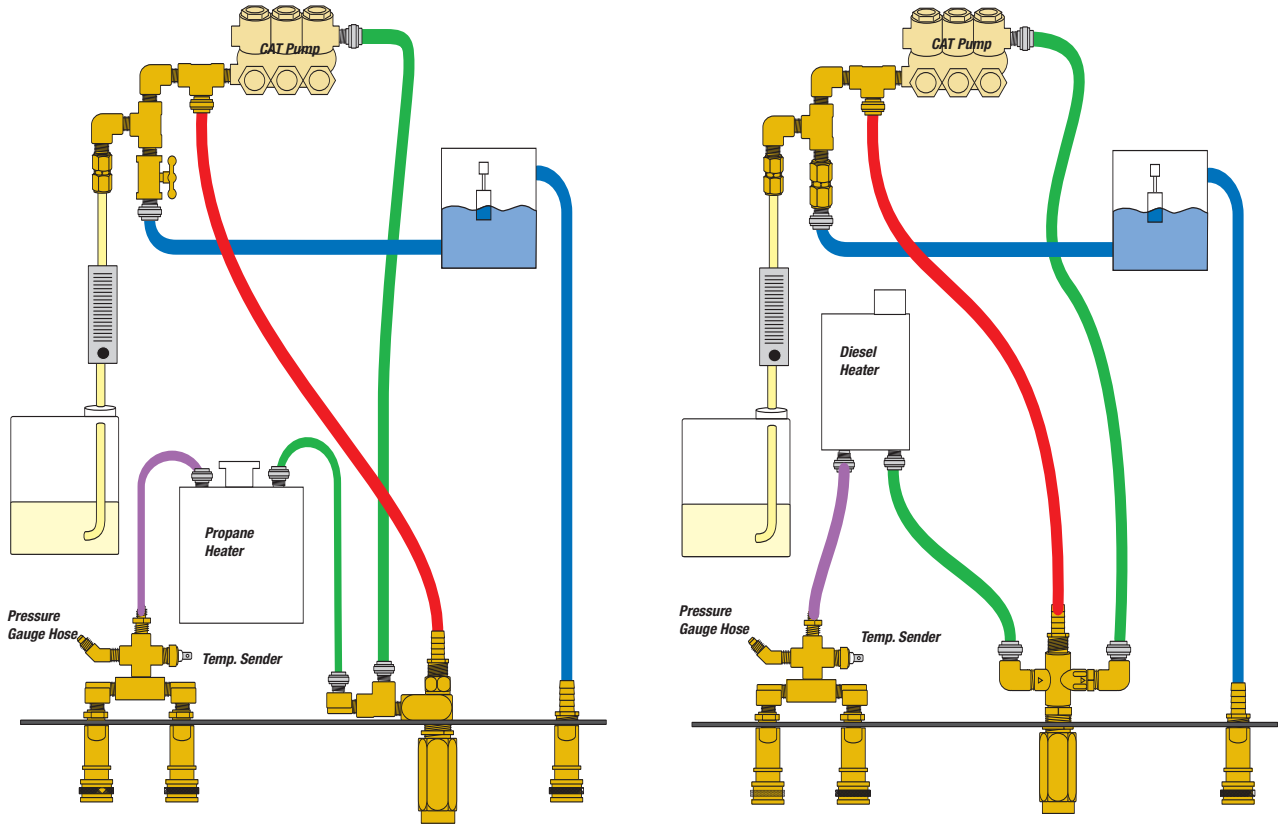
No heat or low heat

Check the fuel tank for an adequate supply of fuel and the fuel lines are connected.
Inspect fuel for quality.
Make sure the generator is functioning correctly.
Make sure the heater switch is on.
Check that the thermostat knob is set at the desired temperature.
Check electrical connections on heater switch and in the heater electrical box.
Check water flow from cleaning tool:
There should be at least 1.0 gpm to activate heater

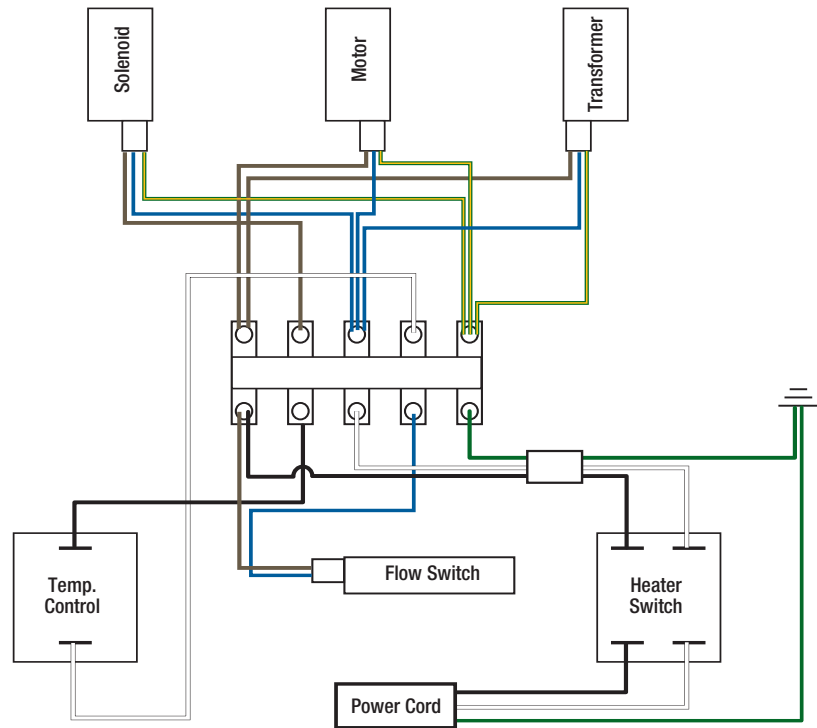
- If flow is less than 1.0gpm, check for restrictions in hoses and cleaning tool, as well as scale build up.
- If flow is greater than 1.0 gpm check water flow switch for proper operation.

Check for fuel return back to fuel tank.
Check fuel solenoid for proper operation.
Check for spark at the burner electrodes.
Check the burner electrodes for proper adjustment.
Check burner fuel spray nozzle.

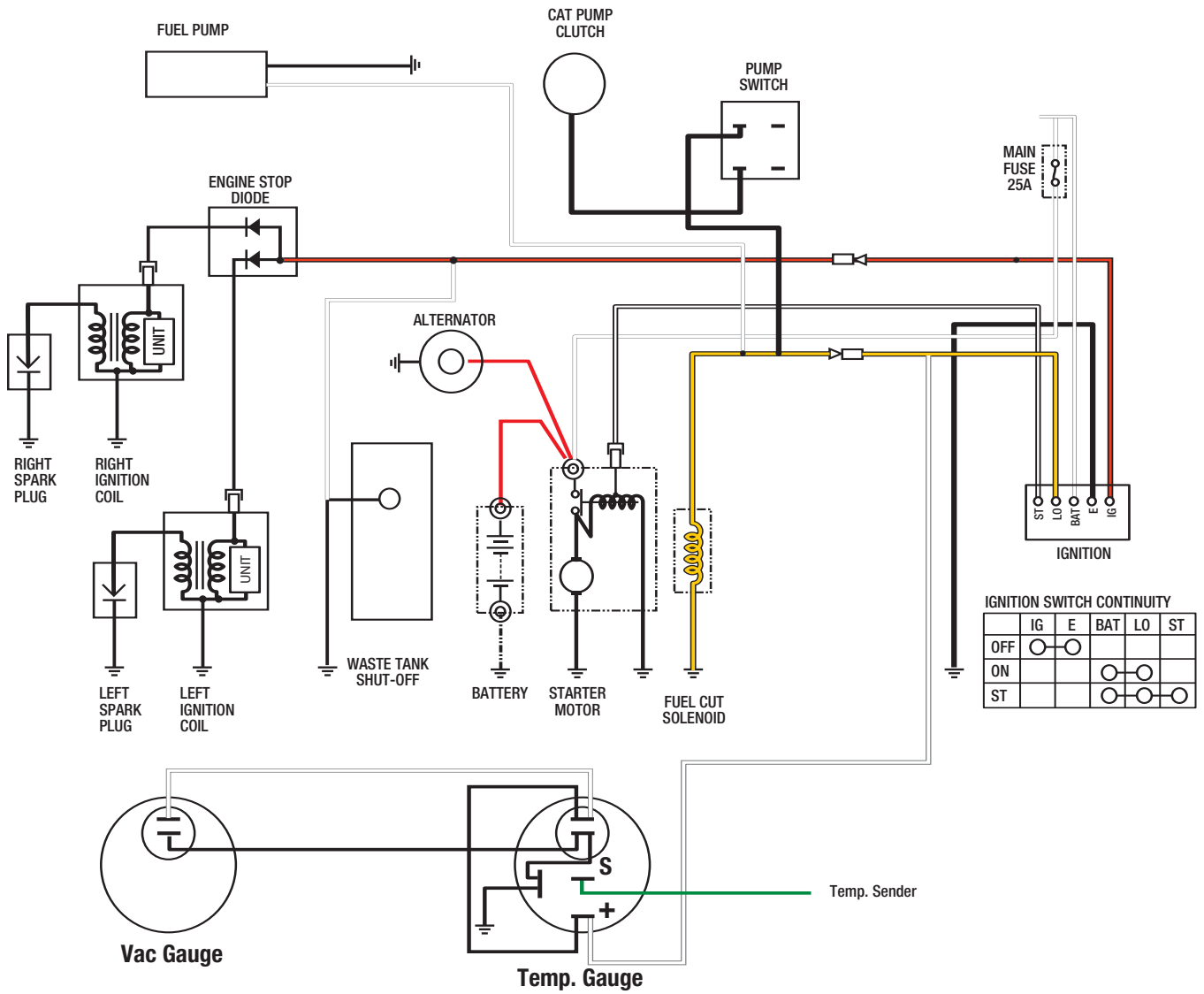
Waterflow Diagram



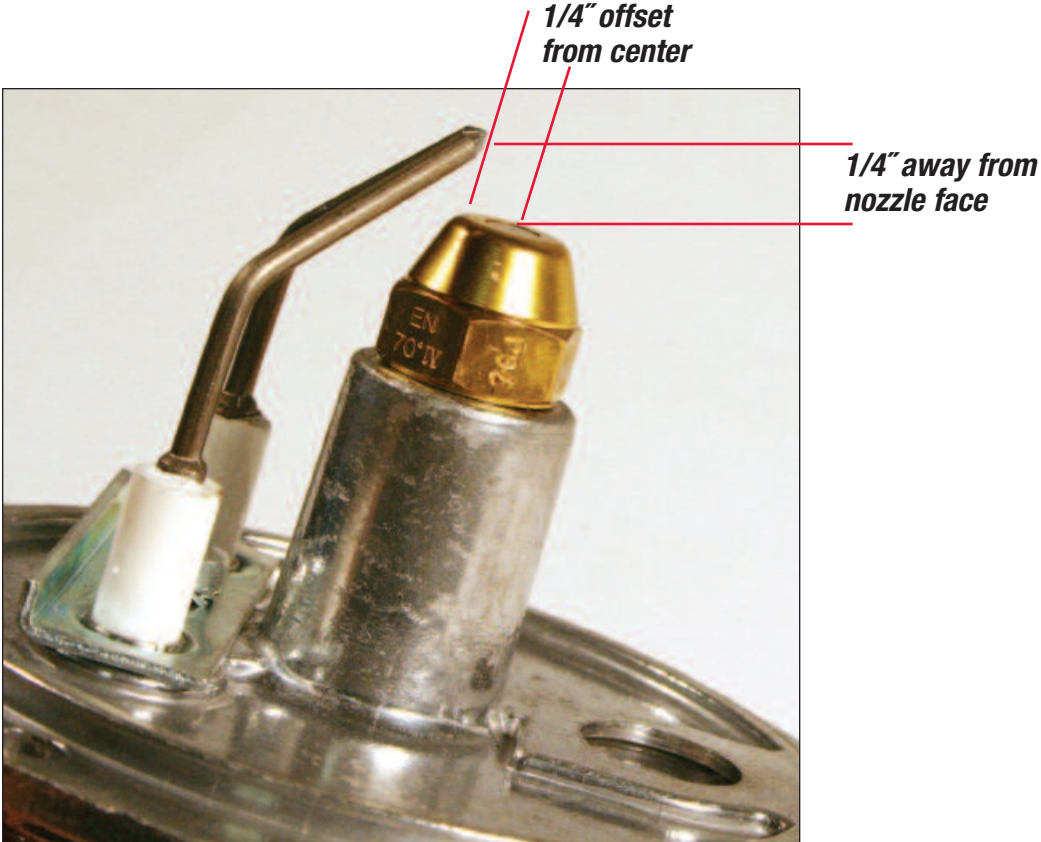
Diesel Heater Wiring Diagram



Wiring Diagram



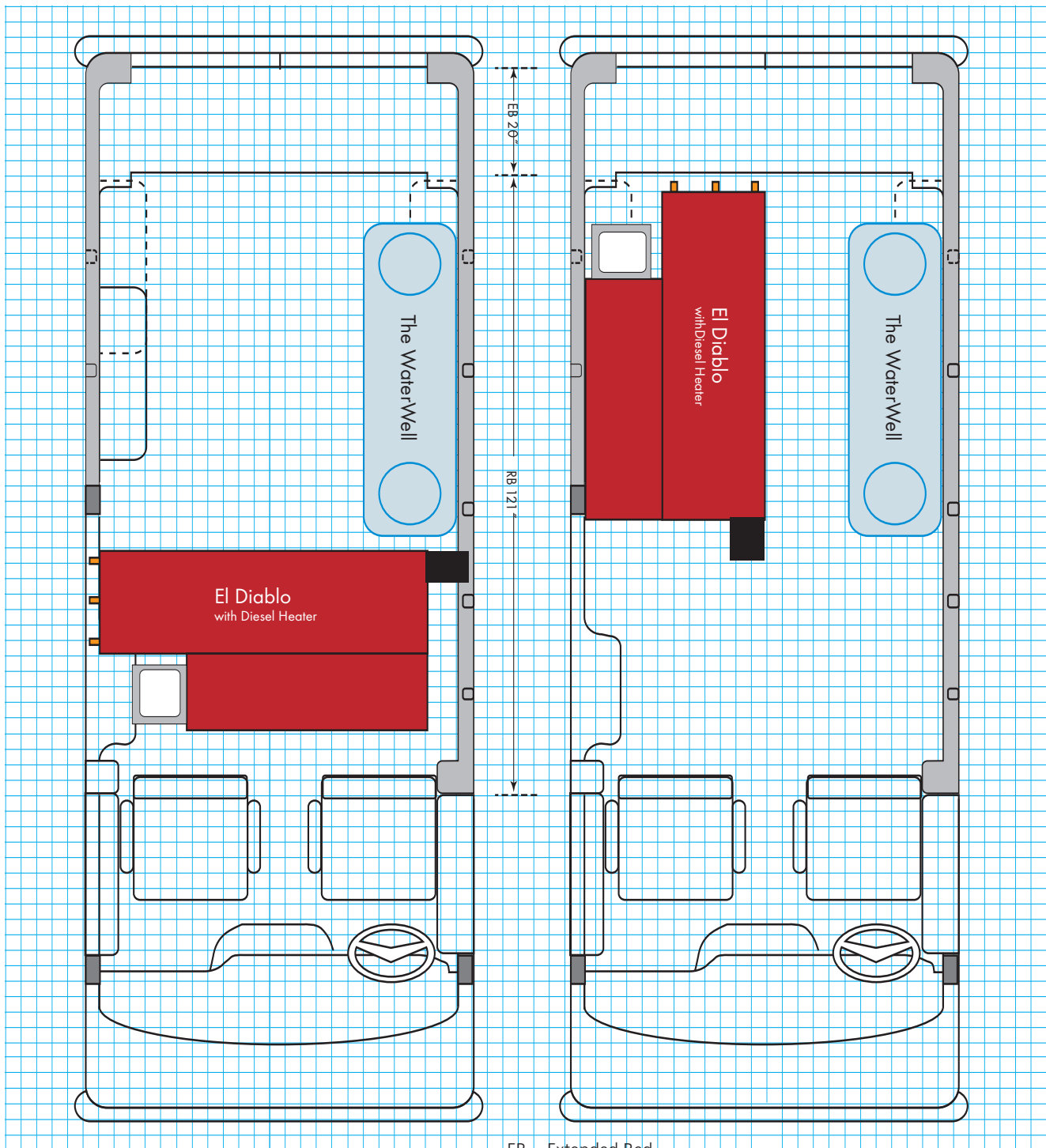
Diesel Burner Gun



Van Layout

El Diablo
With Diesel Heater
Side Mounted

El Diablo
With Diesel Heater
Rear Mounted



EB = Extended Bed
RB = Regular Bed

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