

**NOTE, YOU MAY WANT TO PRINT THIS GUIDE TO ASSIST YOU IN TROUBLE SHOOTING**

**New information regarding the Ultra Low Sulfur Diesel Fuel**



### Heater Trouble Shooting Guide

Customer Name \_\_\_\_\_ Phone \_\_\_\_\_

#### Step 1. Basic Information on unit:

**Each heater has slightly different operational characteristics**

MODEL NUMBER (D8L etc.)	
SERIES NUMBER (251470GM etc.)	
SERIAL NUMBER	
USAGE (LIVE ABOARD etc.)	
AGE (& TOTAL HOURS if equipped)	
PREVIOUS SERVICE DATE'S	
AGE OF DIESEL FUEL	

#### Step 2. Basic information regarding the failure or problem.

**This information is required to pin point the problem area.**

<b>1. What does the heater do when the switch (thermostat) is turned on?</b> (Example - fan runs - glow plug operates - fuel metering pump is ticking - color of exhaust smoke)
<b>2. If the heater turns off automatically, how many minutes (or seconds) does it take?</b>
<b>3. If the heater turns off automatically, does any of the following occur?</b> A. Exhaust smoke _____, Color _____, B. Is the fuel pump ticking? _____, Is The ticking normal or louder than normal? _____ C. Is the glow plug getting hot? _____, D. Does the heater fan sound normal? _____

4. If the heater ignites, how many seconds does it take, from the moment you turn on the heater until the glow plug turns off?

5. If the heater ignites. Does the heater smoke? \_\_\_\_\_.  
If yes how long does it take for the smoking to clear ? \_\_\_\_\_

6. How long does the heaters blower continue to run after you turn the heater off?.

7. During the cool down period, does the heater smoke heavily out the exhaust?

8. After the heater shuts down, does the heater smoke out of the combustion air intake?

9. Other clues.

### STEP 3. Determine from the information you have been able to gather the basic area of the problem.

Heater does nothing - (Nothing means nothing, no fan, no fuel, no glow plug - NO NOTHING)

Heater tries to ignite but fails (Tries to ignite means the motor, fuel pump and glow plug operate)

Heater ignites, but turns off when the glow plug turns off.

Heater ignites, glow plug goes off, but heater shuts down before thermostat is satisfied.

Heater ignites, heater appears to operate normal, however the exhaust is smoking abnormally on start-up and shut down.

Heater appears to operate normally, except the glow plug life is shorter than it has been.

Heater appears to operate normally, except a fuse or breaker blows or trips for no apparent reason.

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Always remember - There are three elements required to make a fire

**FUEL + OXYGEN + A HEAT SOURCE *for ignition***

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#### WHAT IS MISSING ?

NO FUEL	= NO SMOKE		
LOW FUEL	= WHITE SMOKE	= LOW CO2	HIGH AIR to FUEL
HIGH FUEL	= DARK SMOKE	= HIGH CO2	LOW AIR to FUEL

Step 4. Now that you have determined the basic area of the problem you can work with more detail.

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IF THE HEATER IS EQUIPPED WITH DIAGNOSTICS, DETERMINE THE DIAGNOSTIC CODE.

All of the newer Espar heaters have self diagnostic features. A few models have the diagnostic signal always on, some models you will need to activate the diagnostics by pressing and holding a push button switch for about 3 seconds to activate and some models the diagnostic information must be retrieved by an Authorized Espar service center with special testing equipment.

<b>Heater does nothing.</b>	1. Check & verify that there is power <u>at the heater</u> with a voltmeter or test light. Check fuses and for loose or corroded connections.
	2. Make sure that all switches & thermostats are on.
	3. Check to make sure there is power coming back from thermostat.
	4. Some models do nothing if the glow plug is "open" or disconnected.
	5. Some models do nothing if the fuel metering pump circuit is "open" or disconnected. (Overheat fuse is in this circuit also)
	6. Some models do nothing if the motor fuse in the controller is open or motor is defective. (such as the older D4L, D7L and D12L Models)
	7. Defective control box

<b>Heater runs 5 sec. - then stops</b>	1. Open overheat sensor (safety thermal cutout switch) or blown overheat fuse
	2. Open glow plug circuit
	3. Defective control box

<b>Heater runs 16-30 seconds &amp; stops</b>	1. Low voltage at heater control box power input terminals. Check batteries and all connections, fuses or breakers etc.
	<b>Note: All voltage tests must be taken when heater is in the start mode with the glow plug operating.</b>

<b>Tries to Ignite for 3 min.</b>	1. Check the glow plug and its electrical connections.
	2. Measure the voltage <i>at the heater</i> while glow plug is operating.
	3. Measure the voltage <i>at the glow plug/pin</i> while the plug is operating.
	4. Check the fuel filters).
	5. Is the fuel metering pump "ticking" (check overheat fuse) Check for defective pulse source.
	6. Disconnect fuel line at heater, is there fuel coming out?
	7. Is the exhaust pipe obstructed ? Is drain coil open ?
	8. Is the combustion air intake hose damaged & restricting the combustion air?

	9. Is the motor running slow ?
	10. Is the combustion air solenoid operating (Older D4L, D7L and D12L)
	11.
	If this heater has been in severe service, such as live aboard or used as primary dock side heat, or has been installed for 2 to 3 years, the heater may require a "burner service".

Heater ignites, but shuts off at 3 minutes.	<p>1. Check the heater temperature switch (thermo-switch). <i>Note some models the switch is normally open &amp; some are normally closed.</i></p> <p>2. Note: many of the newer models use 2 - 90 second start attempts with a purge period in between, this will result in a longer than 3 minute attempt to start. For these heaters the symptom is that the heater shuts off after the second attempt to start.</p>
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Heater fan runs, no glow plug or fuel.	1. Check the heater temperature switch (thermo-switch). It may be in the "hot" position - Heater is still in cool down.
	2. Defective control box

Ignites & runs OK, but stops before thermostat switches off	1. Check the fuel filters.
	2. Check fuel pumps).
	3. Clean the thermostat contacts (excludes electronic thermostats).
	4. Check for loose wiring connections.
	5. Check for high voltage. Measure voltage when it shuts off.
	6. Check for low voltage. Measure voltage when it shuts off.
	7. Is this a problem only when the engine is running?

Ignites & runs normal, - excessive smoking starting and stopping	1. Normally a symptom of clogged or partially clogged atomizer in models D3L, D7L, D12L AND D12W. Clean or replace atomizer.
	2. Other models may require burner service to remove any carbon deposits.
	3. White smoke = unburned fuel.

Heater runs OK, Blower runs over 3-4 min. on cool down	1. Check temperature switch (thermo-switch)
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	2. Sticking relay in control box.
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Glow plug is failing more often than normal	1. Check glow plug voltage regulator, if equipped.
	2. Check glow plug electrical connections.
	3. Check & clean glow plug socket, clean or replace glow plug socket screen.
	4. Burner may require service.
	5. Check fuel filters & fuel flow.
	6. Check burner efficiency by measuring CO2 and exhaust smoke content.
	7. Glow plug voltage too high or too low.
	8. If coil is collapsed but clean, look for loose elect connections, fuel filters (low fuel), high or low voltage.
	9. If plug has excessive carbon buildup, look for a dirty burner, dirty glow plug socket and - or screen, proper fuel quantity and measure CO2
	10. Check air supply to glow plug for blockage.
	11. Make sure glow plug is tightened enough to seal completely

Heater operates OK, but fuse or breakers blow for no apparent cause	1. <u>Over heat fuse or breaker.</u> Make sure there has been no damage to the ducting, too many registers closed, something sucked into the intake. Measure air temperature out of the heater (at 18" from discharge)
	2. <u>Main power or motor fuse.</u> Inspect the fuse holder, if there is any corrosion or signs of heating, replace the fuse holder. <b>Use only approved fuse holders.</b>

Heater smokes all the time.	1. Verify the motor rpm, it may be too slow.
	2. Verify that the exhaust does not have any restrictions. If there is a deposit build up inside the pipe, it requires cleaning.
	3. Measure the fuel quantity, it may be too high.
	4. Measure the burner efficiency (CO2)

Note: = Only applies to certain models.

**This guide is designed to help you analyze and do very basic troubleshooting only. Many procedures will require additional service manuals, test equipment and specialized or advanced training.**

**West Coast Authorized Espar Dealer List**

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**ESPAR HEATER MODELS**

## Request for Service Information

You will need to select the heater model and series number.

Heater model examples are "D1L, D1LC, D1LCC".

The **series number** will start with 25 for all diesel heaters and 20 for gasoline vehicle heaters. Such as 25-1380-XX.

the most important number is the series number. As you can see there have been several models with the basic designation of "D1L" which means, the heater operates on diesel fuel (D), the heat output is approximately 1,000 to 1,800 watts(1) and the method of delivering the heat is hot air (L). When the heater delivers the heat via hot water the letter changes to (W)

There may be additional letters after the "L" or "W", these indicate the configuration of the heater.

There may be additional numbers in the series number, these numbers are not required.

Select "Model and Series number

(D1L = Model - 25-1380 = Series)

D1L #25-1380

Enter description of information you require.

If you require assistance in the repair or troubleshooting please put in as much information as you can.

**"It does not work"** is not acceptable and the request will be ignored.

Information submitted by: (\*= required field)

Name\*

Address

City\*

State\*

Zip

E-mail\*

Submit

Reset

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**Store Hours**

**Monday - Friday 8:30 - 5:00**

**Saturday 9:00 - Noon**

*closed holiday weekends*