



**By Vehicle Systems, Inc.**

*Motor Coach Heating Specialists*

## **Shop Manual**

**Model Numbers**

**AHE-100-02S - 12 VDC**

**AHE-200-02S - 24 VDC**

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# Section 1: Aqua-Hot Information

## Overview

### 1.1 Aqua-Hot Component Overview

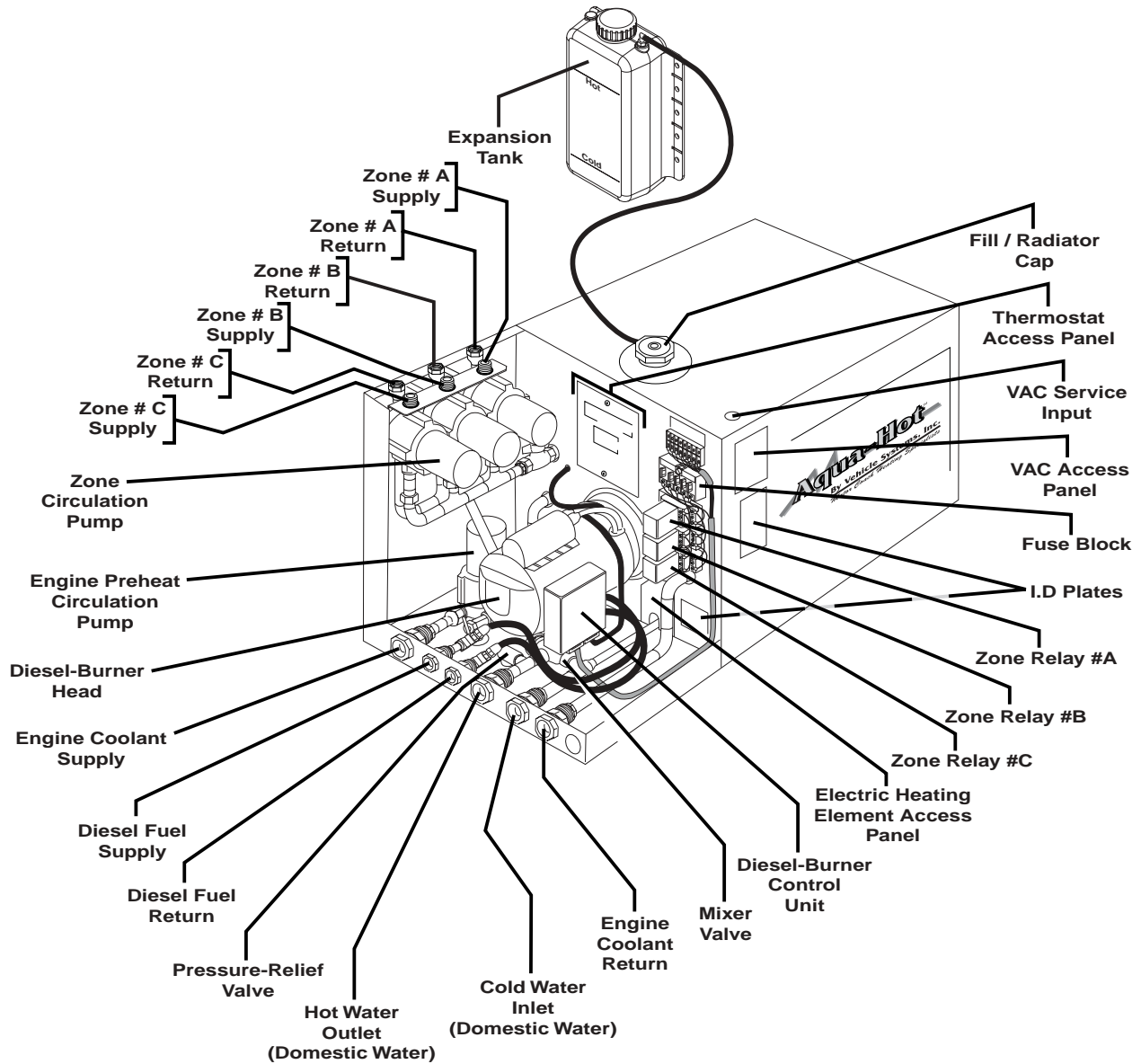


Figure 1

Aqua-Hot  
I.D. Plate

1.2 Aqua-Hot Identification Plate

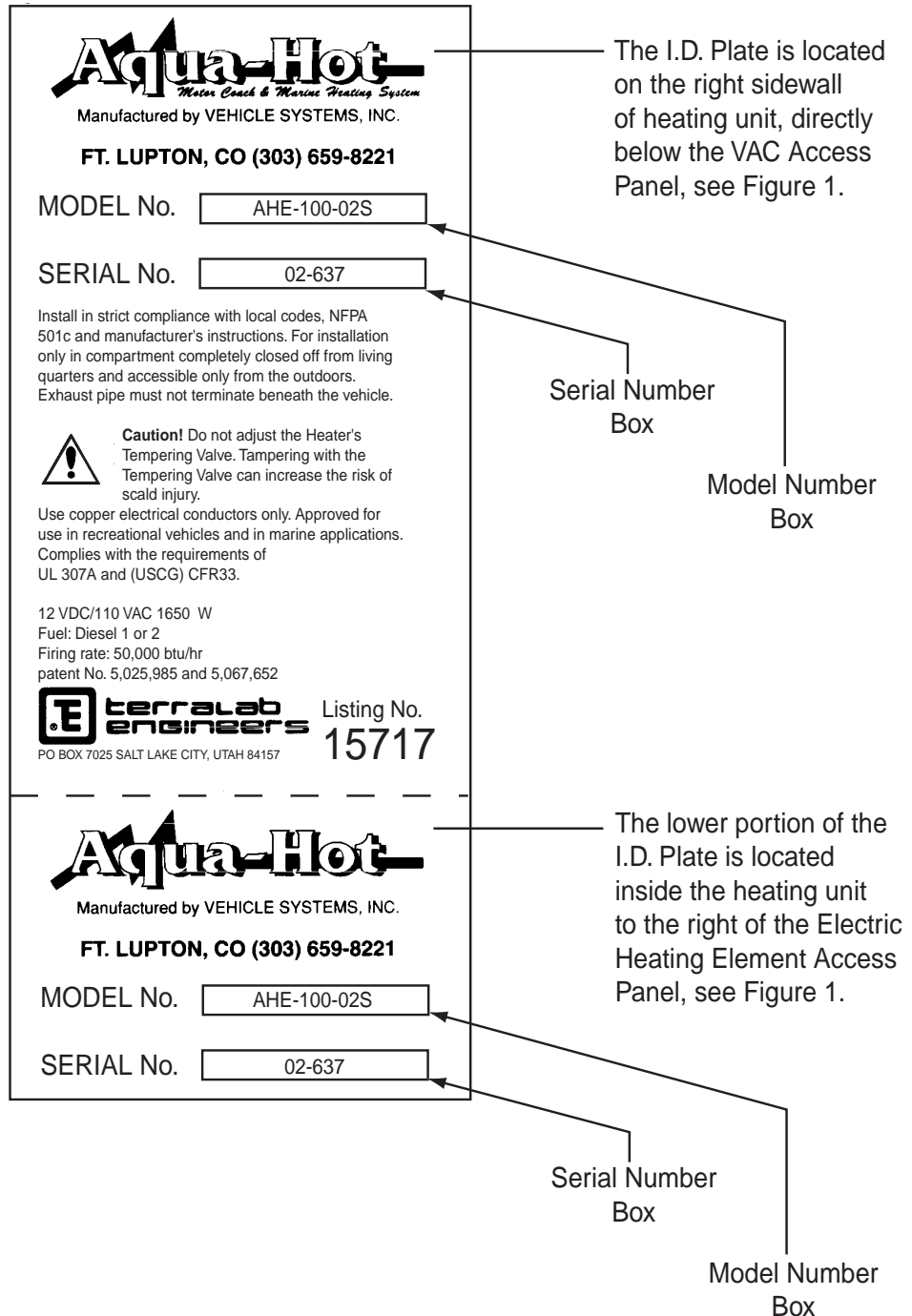


Figure 2

# Section 2: Aqua-Hot Wiring Information

## Wiring Diagram

### 2.1 Wiring Diagram

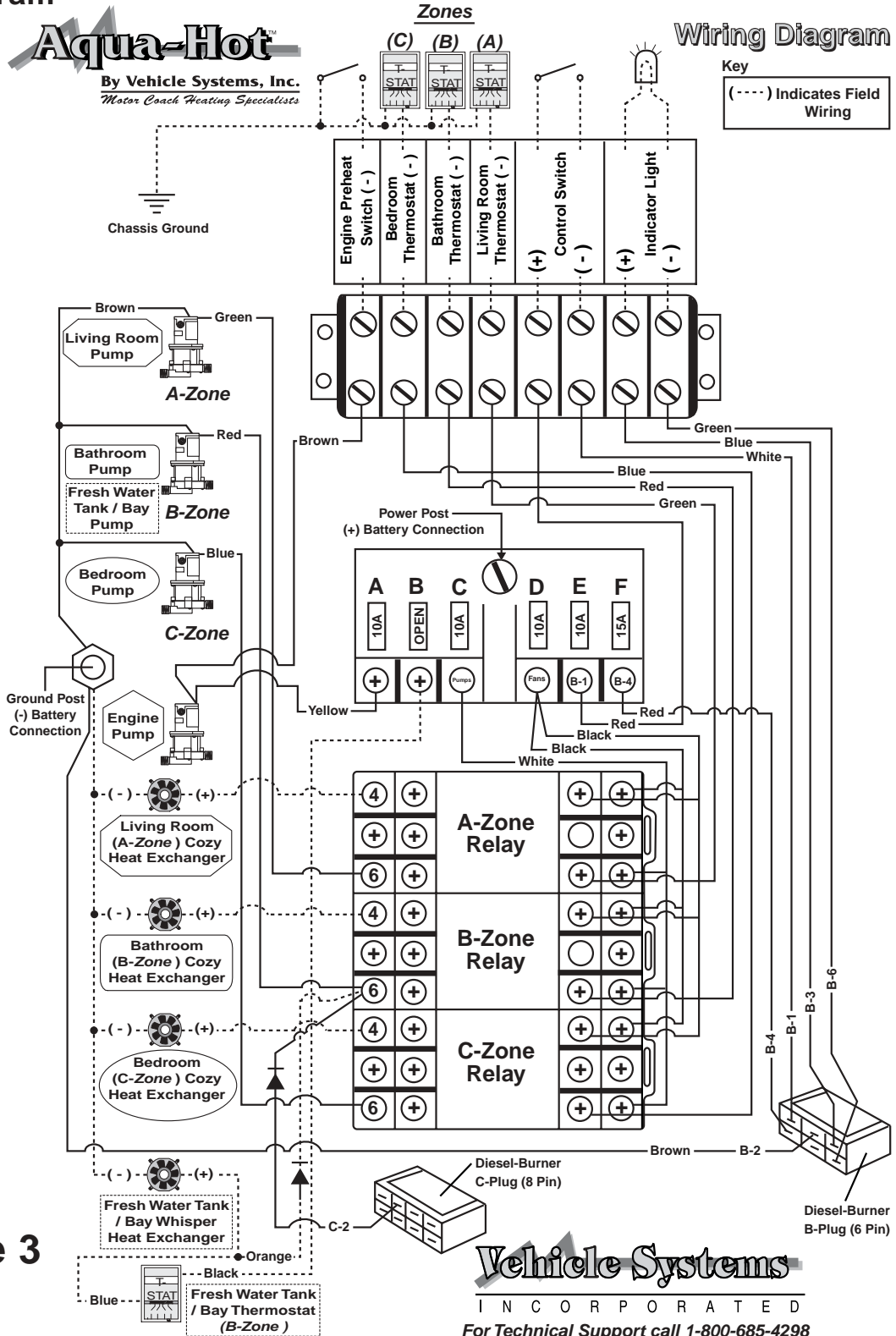


Figure 3

## Control / High-Limit Thermostat Wiring

### 2.2 Control / High-Limit Thermostat Wiring

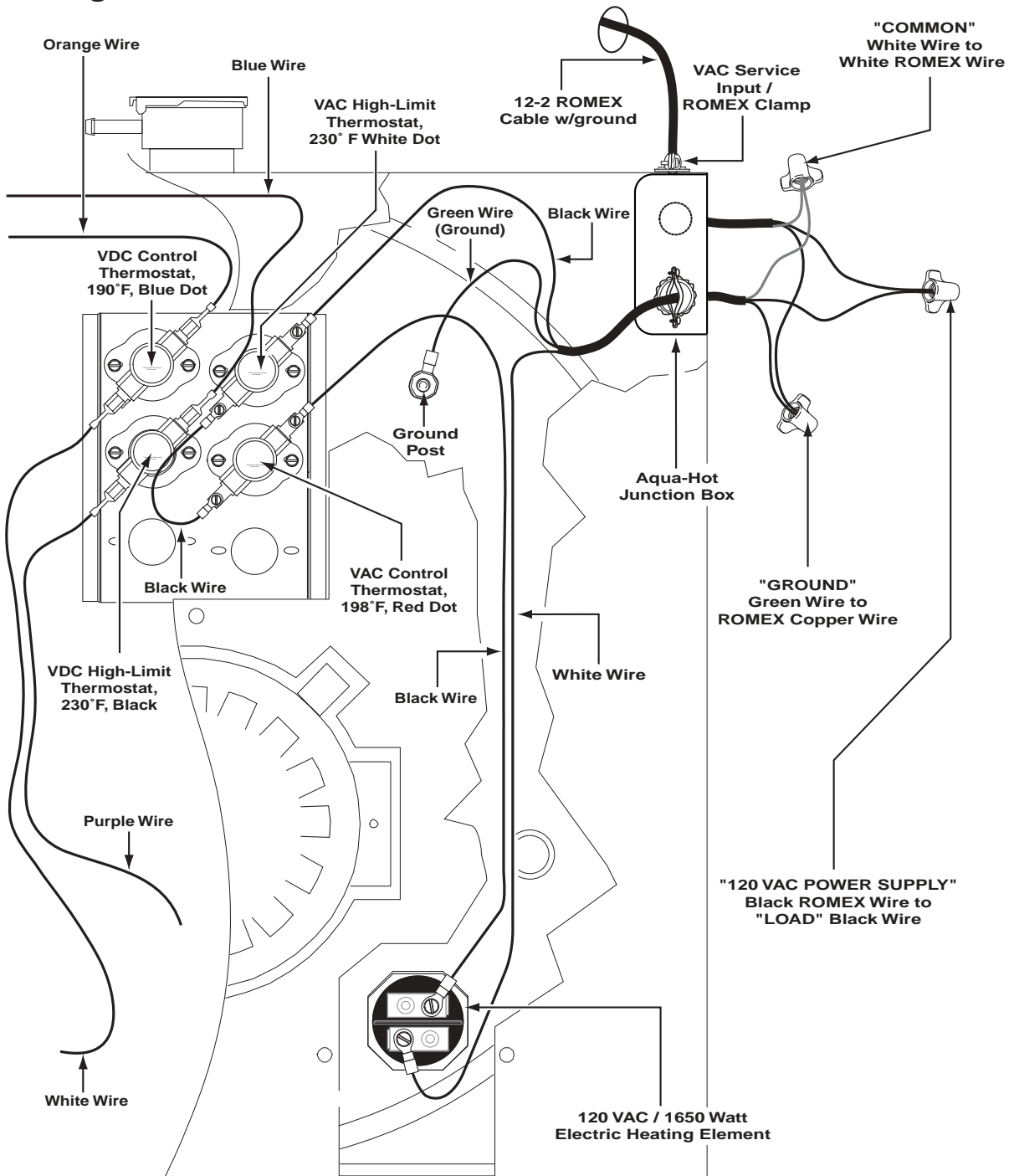


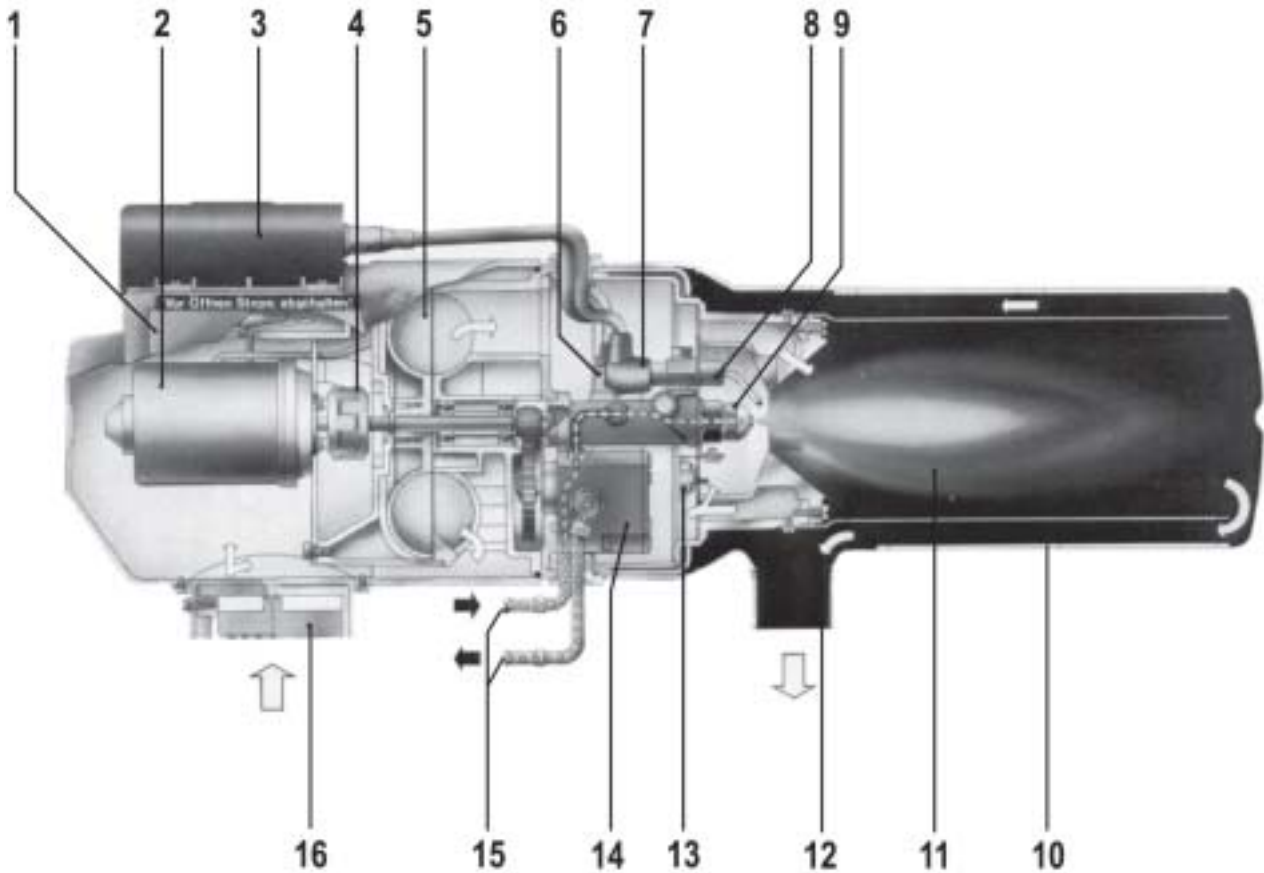
Figure 4

## Section 3: Diesel-Burner Information

### Overview

#### 3.1 Diesel-Burner Component Overview

- |                        |   |
|------------------------|---|
| 1. Control Unit        | 10. Combustion Chamber                                      |
| 2. Motor               | 11. Heat Exchanger  |
| 3. Ignition Coil       | 12. Exhaust Port  |
| 4. Clutch              | 13. Flame Detection Photocell                               |
| 5. Combustion Air Fan  | 14. Fuel Pump   |
| 6. Fuel Solenoid Valve | 15. Fuel Ports (Supply / Return)                            |
| 7. Electrode Holder    | 16. Combustion Air Port (Intake)<br>with Adjustable Shutter |
| 8. Ignition Electrodes |   |
| 9. Fuel Nozzle         |   |

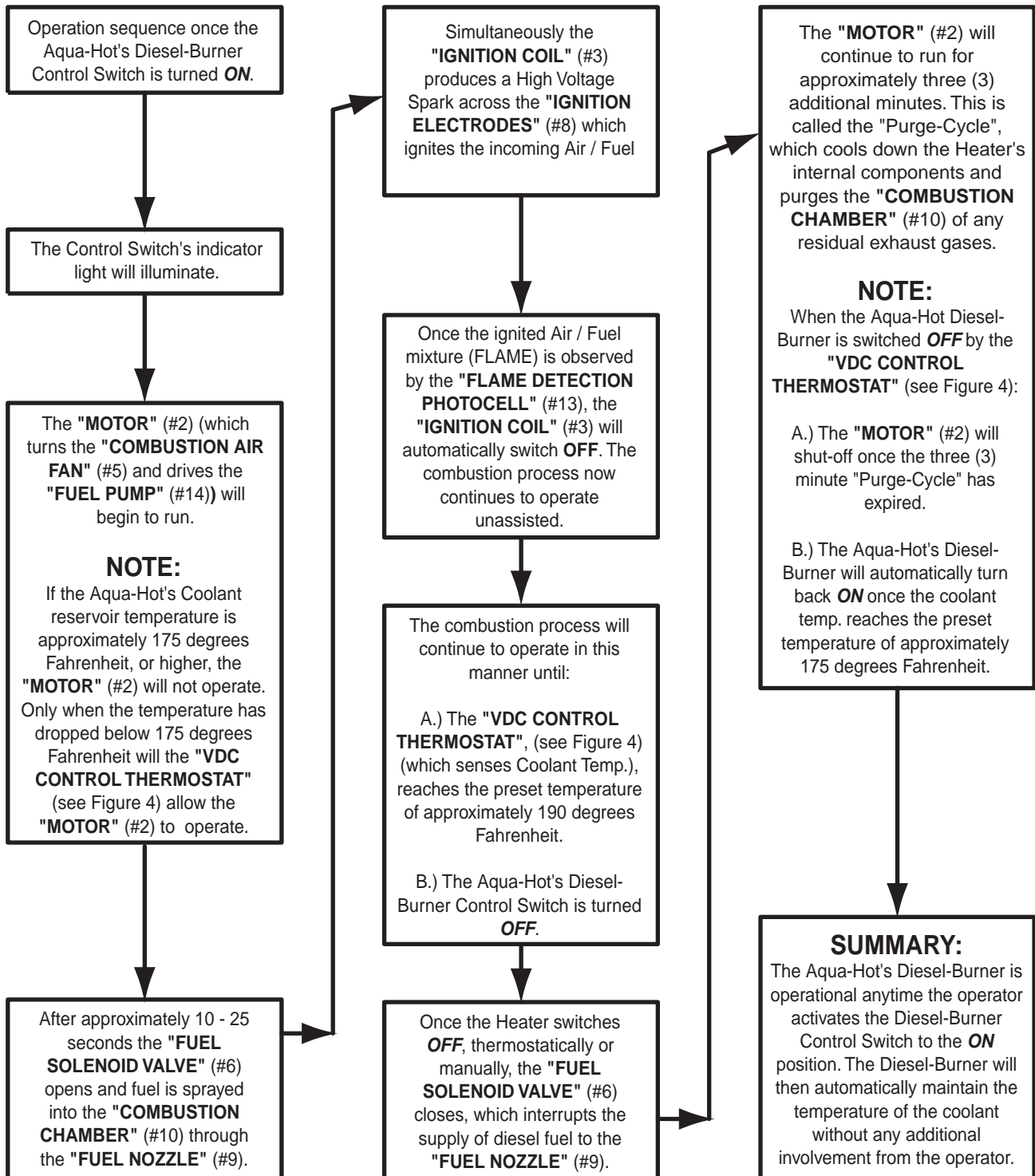


**Figure 5**

## Diesel-Burner Operational Flow-Chart

### 3.2 Operational Flow-Chart

~ Reference Figure 5 for all numbers indicated inside parenthesis. (i.e #8).





# Section 3: Diesel-Burner Information

## Diesel Burner I.D. Plate

### 3.3 Diesel-Burner Identification Plate

Fabrikschild-Duplikat gultig nur zusammen mit Original		
<b>Webasto</b> Thermosysteme GmbH MADE IN GERMANY		
HEIZGERAT Typ	DBW 2010.75	Model Type
Spannung / El. Leistung	12 V / 60W	Voltage / Wattage
Warmestrom	13,2 kW	
Brennstoff	Diesel	Fuel Type
zul. Betriebsüberdruck	2 bar	
Prufzeichen	~	
Fabriknummer	1B230410	Serial Number (230410)
Inbetriebnahmejahr	2001 2002 2003	

Diesel-Burner I.D. Plate is located on the left side of the Diesel-Burner Head

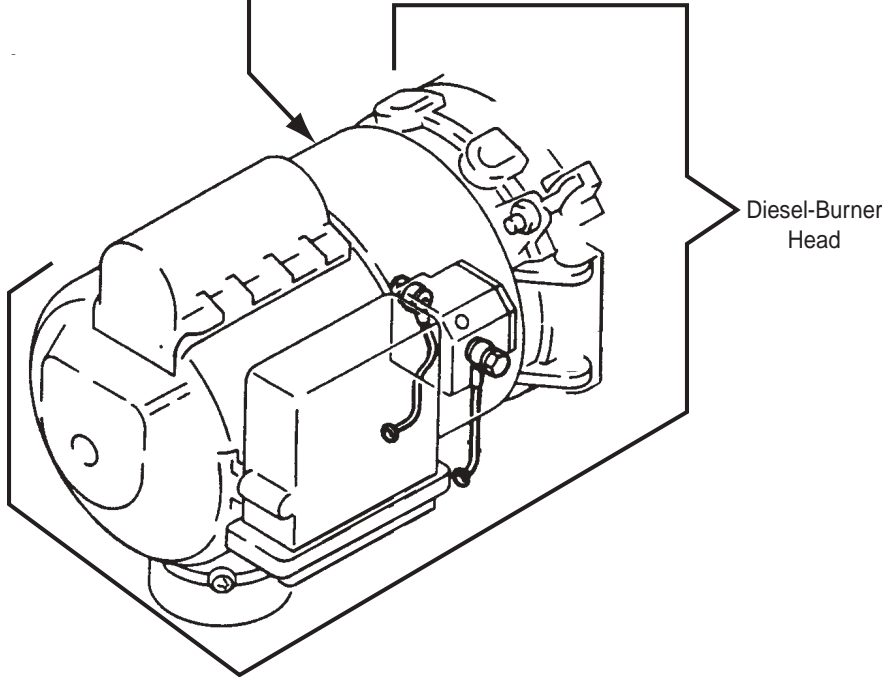


Figure 6

**Control Unit Wiring**

4.1 Control Unit Wiring

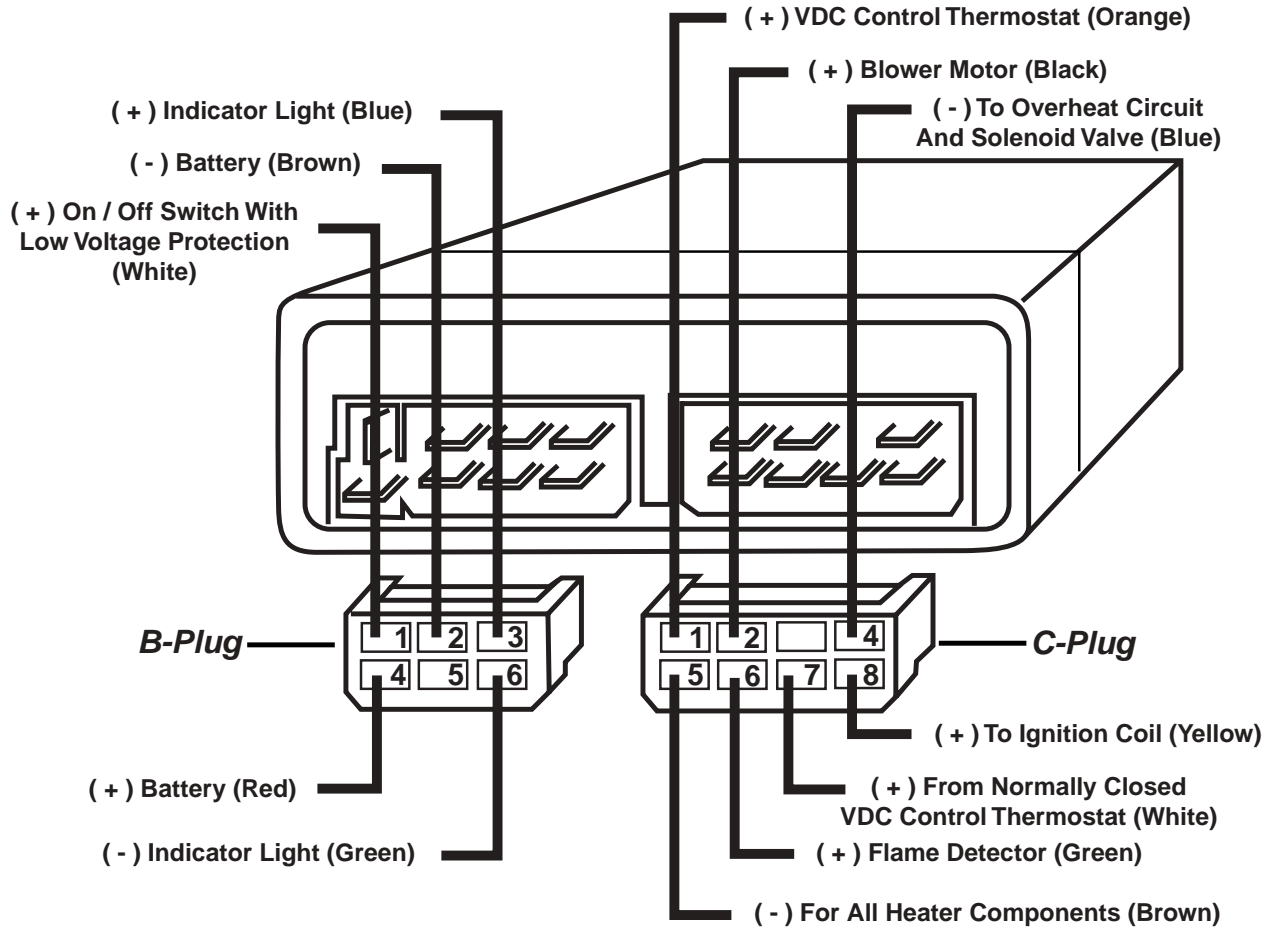


Figure 7

## Section 5: Diesel-Burner Service, Maintenance, and Repair Information

### ■ Upkeep

#### 5.1 General Maintenance

##### Monthly

Check the Aqua-Hot's solution of water and antifreeze to ensure that it is at the proper level. Do this by visually checking the coolant level in the Aqua-Hot's Expansion Tank, see Figure 1. This should be checked only when the Aqua-Hot is at full operating temperature, "HOT."



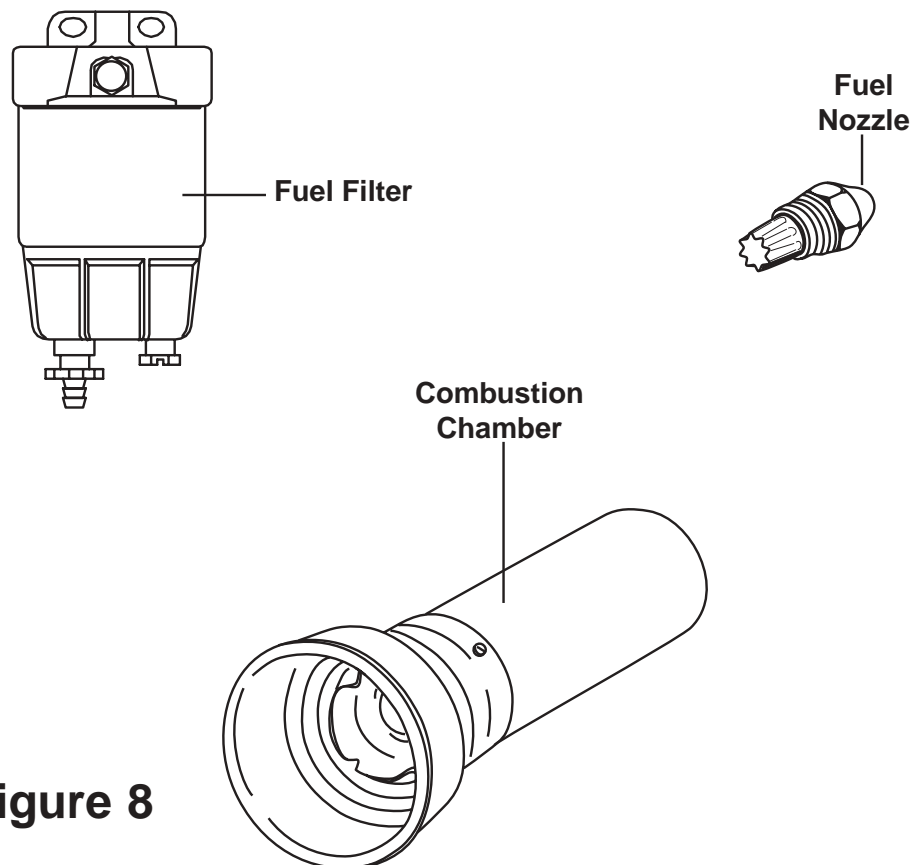
##### Annually

**CAUTION:** Before cleaning or servicing, disconnect all power supplies.

It is ideal to have your Aqua-Hot tuned-up yearly. A tune-up should consist of a Fuel Nozzle and Fuel Filter replacement and a thorough cleaning of the Combustion Chamber, if necessary, see Figure 8. This simple tune-up will keep your Aqua-Hot running smoothly throughout the year. This annual tune-up will also allow service personnel to inspect for wear and tear of other components.



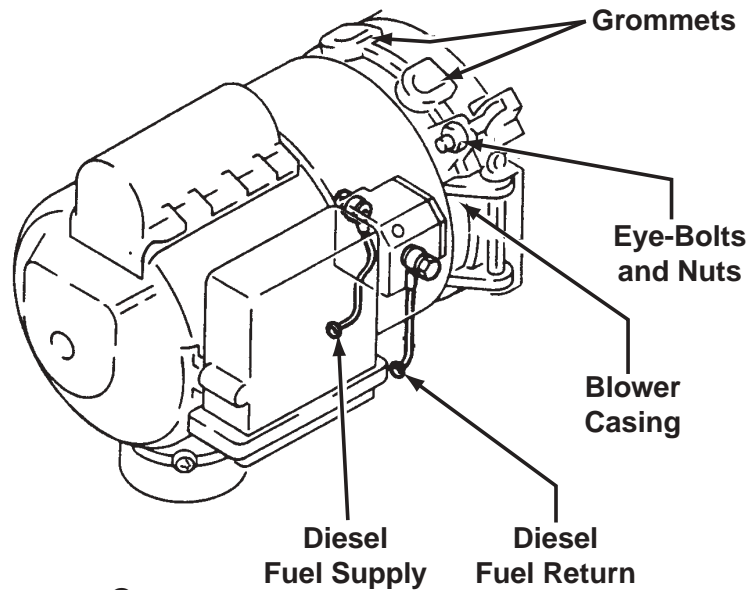
**CAUTION:** Operating the Aqua-Hot's Diesel-Burner or the 120 VAC Electric Heating Element without the water and antifreeze solution will cause **serious damage** to the Heater.



**Figure 8**

### Detaching Diesel-Burner Head

#### 5.2 Detaching the Diesel-Burner Head



**Figure 9**



#### Instructions For Detaching the Diesel-Burner Head from the Aqua-Hot

**CAUTION:** Before detaching the Diesel-Burner Head, disconnect all power supplies.

1. Loosen the two Eye-Bolt Nuts and swing the Eye-Bolts out of the way.
2. With both hands, carefully pull the Diesel-Burner away from the Aqua-Hot, approximately 4-5 inches. Please note that you may have to lift the head slightly while pulling it away from the Aqua-Hot.
3. Rotate the head approximately 90 angular degrees to the right or until all the internal components are visible.

**NOTE:** It may be necessary to disconnect the two RED wires, which are connected to pin #6 of the B-Zone relay, when rotating the head beyond 90 degrees, see Figure 3.

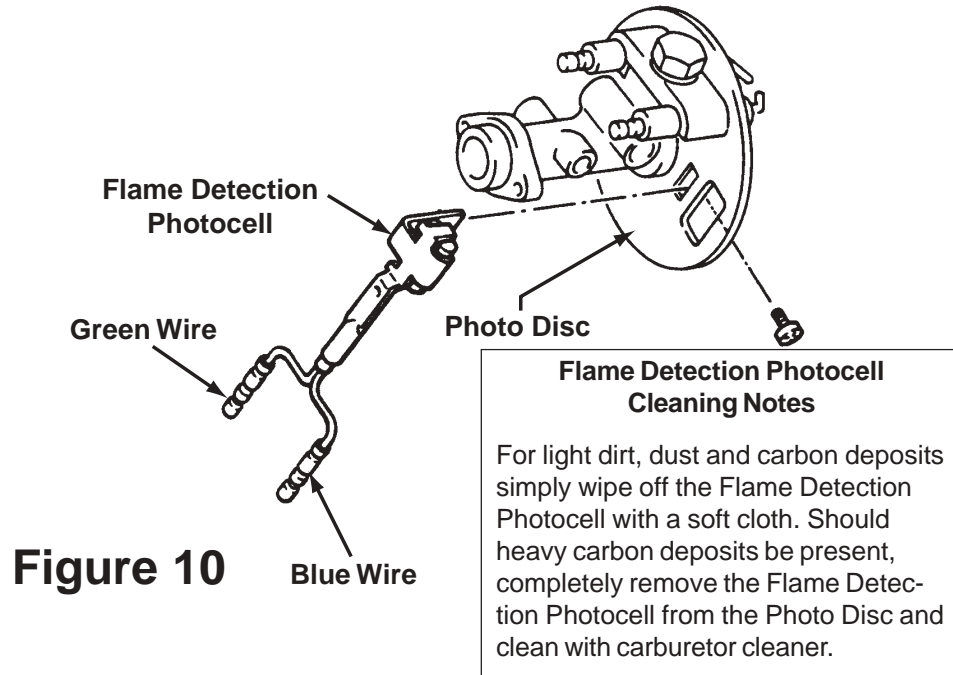


**CAUTION:** When reattaching the Diesel-Burner Head to the Aqua-Hot, be sure to properly align the head and **DO NOT** over tighten the Eye-Bolt Nuts. An improper alignment and or an over tightening of the Eye-Bolt Nuts can cause damage to the Diesel-Burner Head's aluminum-cast housing (Blower Casing), see Figure 9.

## Section 5: Diesel-Burner Service, Maintenance, and Repair Information

### Flame Detection Photocell

#### 5.3 Flame Detection Photocell

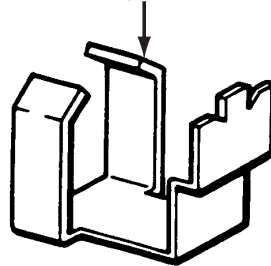


### Ignition Electrodes

#### 5.4 Ignition Electrodes

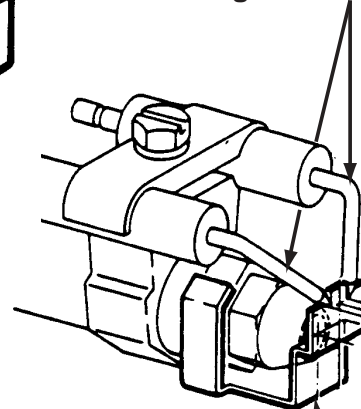
**Note:** Electrode Adjustment Gauge is located on the outside surface of the Diesel-Burner on the lefthand side.

#### Electrode Adjustment Gauge



**Note:** Once adjustment is complete, remove Electrode Adjustment Gauge and reattach to Diesel-Burner.

#### Ignition Electrodes

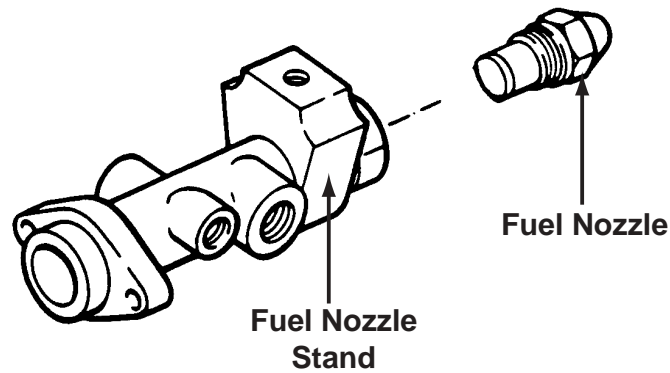


**Figure 11**

**Adjustment gauge properly positioned**

### Fuel Nozzle

#### 5.5 Fuel Nozzle

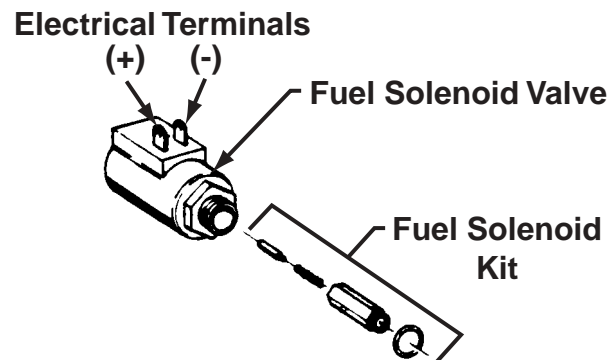


**Note:** When replacing the Fuel Nozzle, be sure to tighten the Nozzle, then loosen 1/4 turn and firmly retighten. This will establish a seated fit and avoid any leaks.

**Figure 12**

### Solenoid Valve

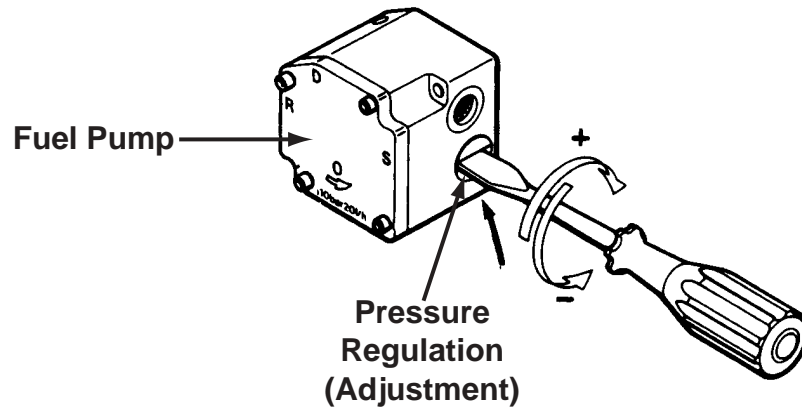
#### 5.6 Fuel Solenoid Valve



**Figure 13**

## Fuel Pump

### 5.7 Fuel Pump

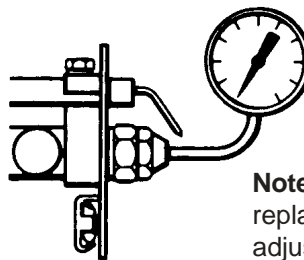


**Note:** Adjust fuel pressure to 145 PSI.

(+) Clockwise rotation increases fuel pressure.

(-) Counter Clockwise rotation decreases fuel pressure.

### Fuel Pressure Gauge

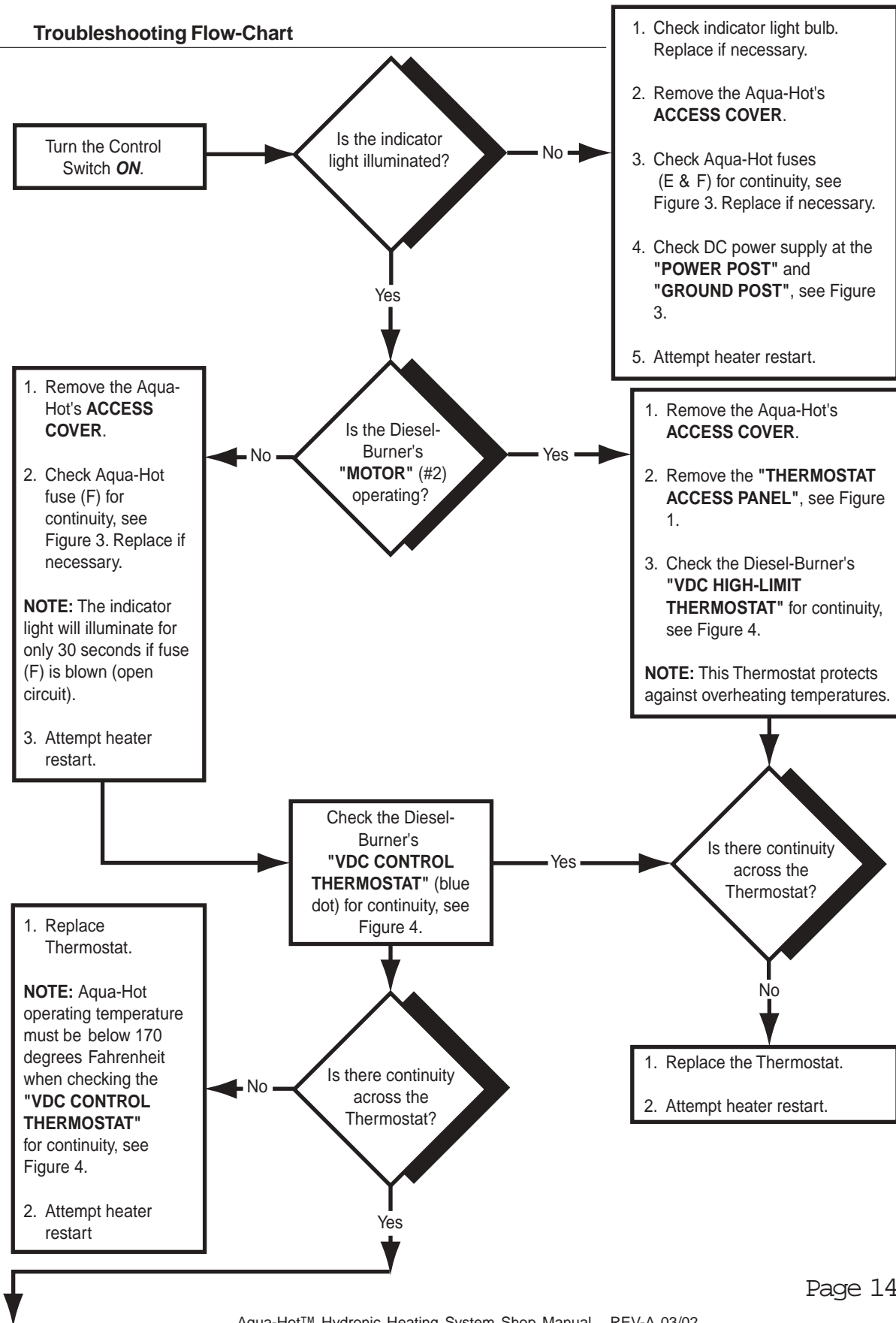


**Note:** Fuel Pressure gauge replaces the Fuel Nozzle when adjusting fuel pressure.

**Figure 14**

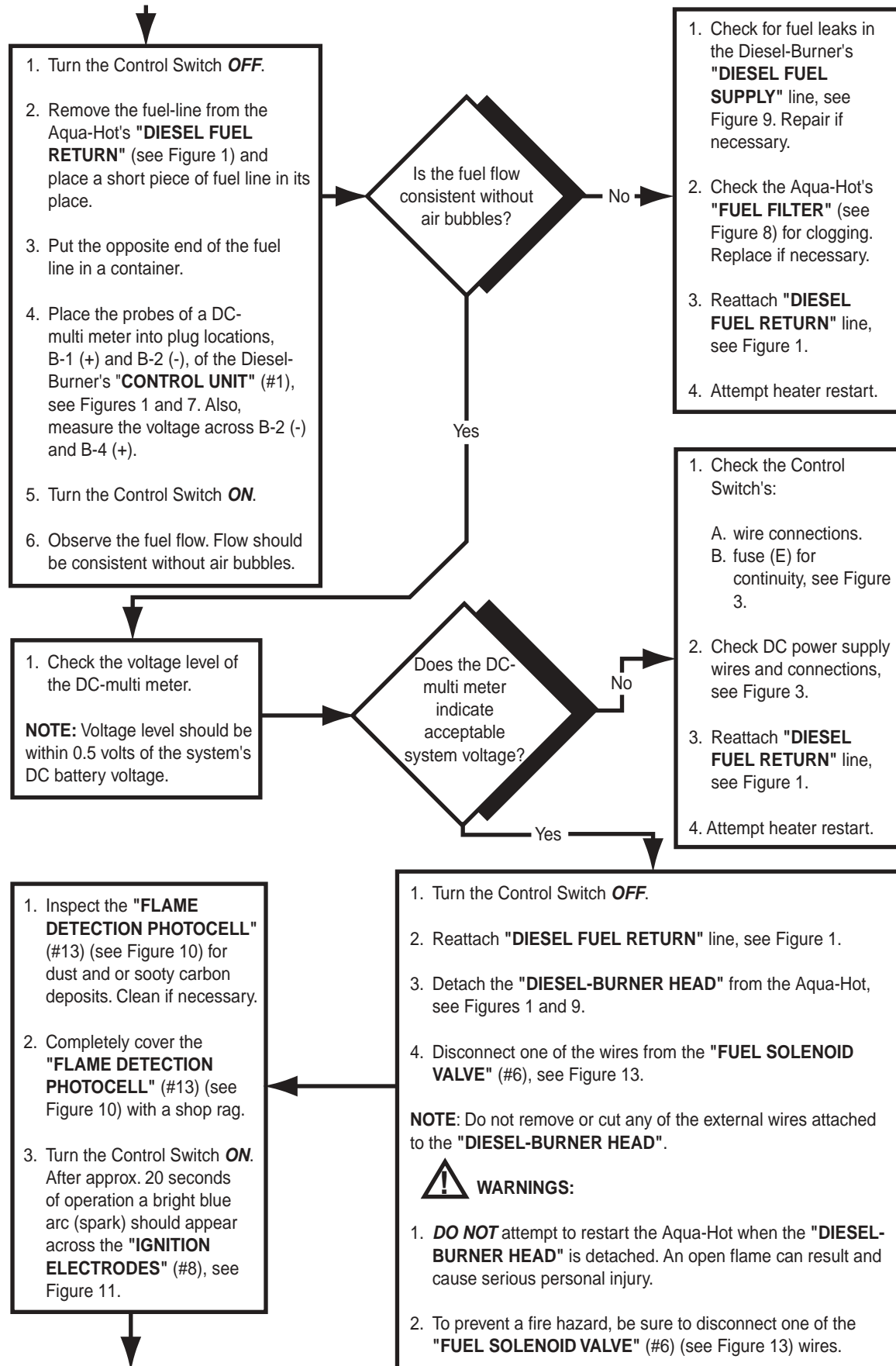
Troubleshooting  
Flow-Chart

6.1 Troubleshooting Flow-Chart

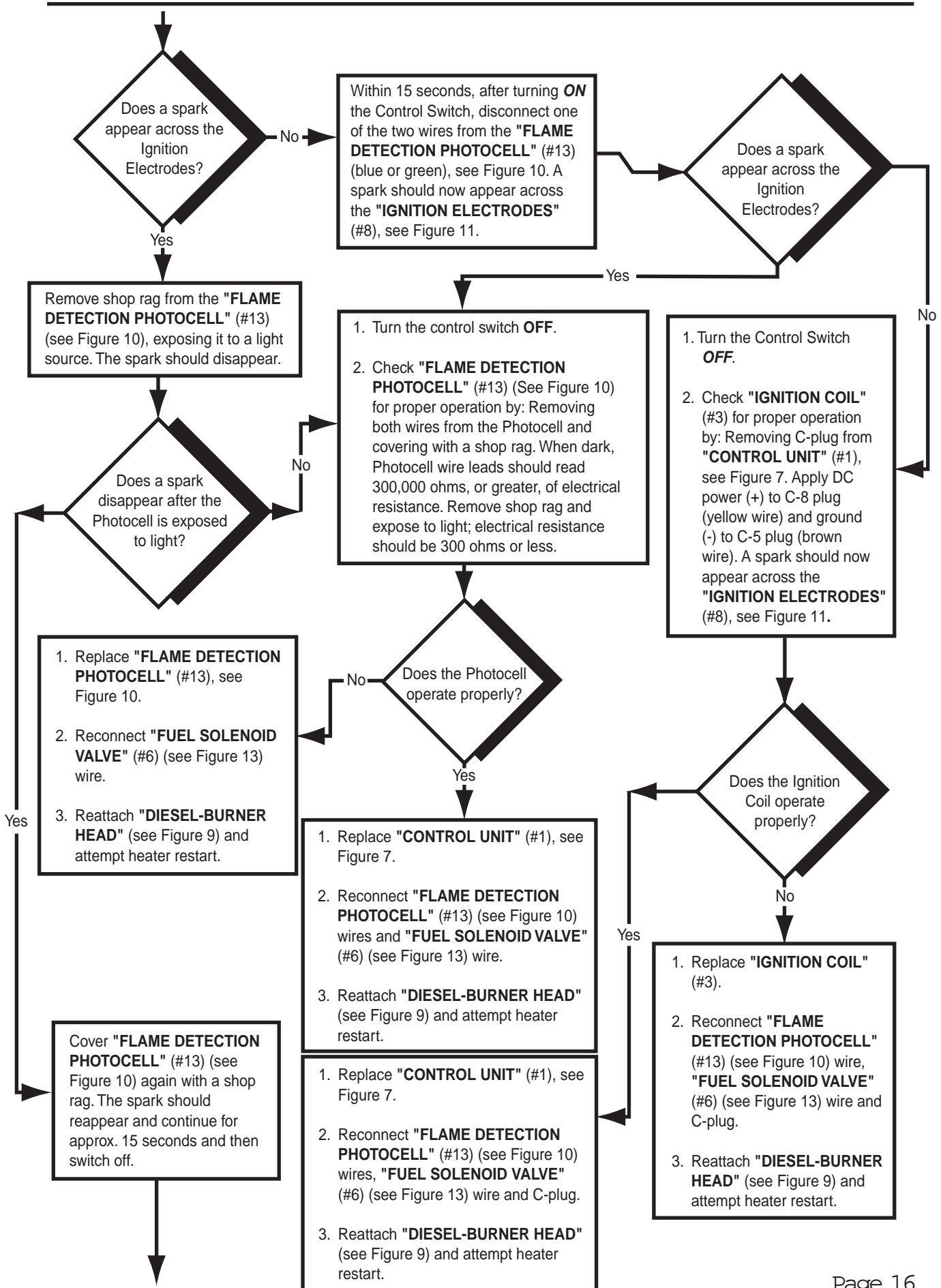




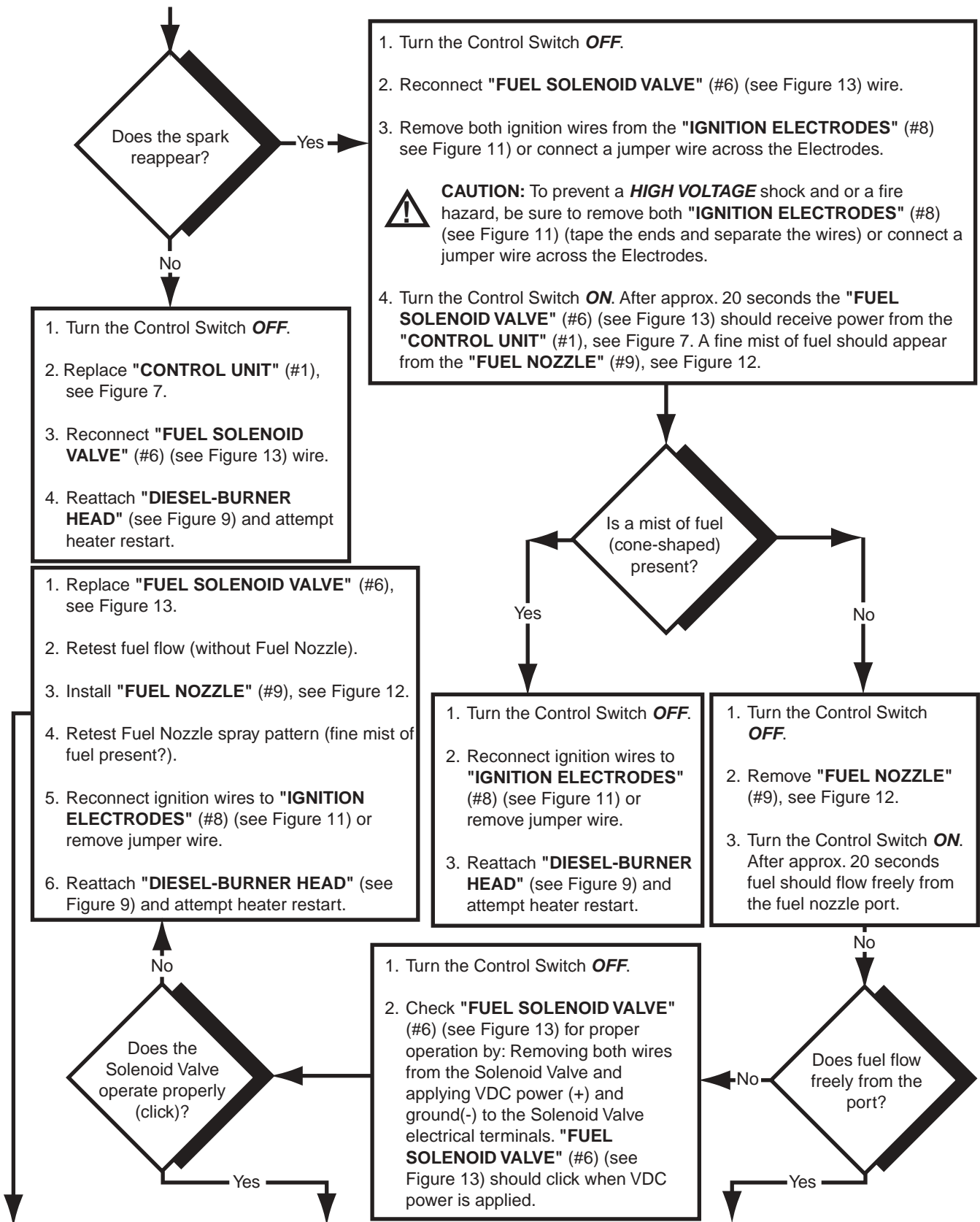
## Section 6: Troubleshooting



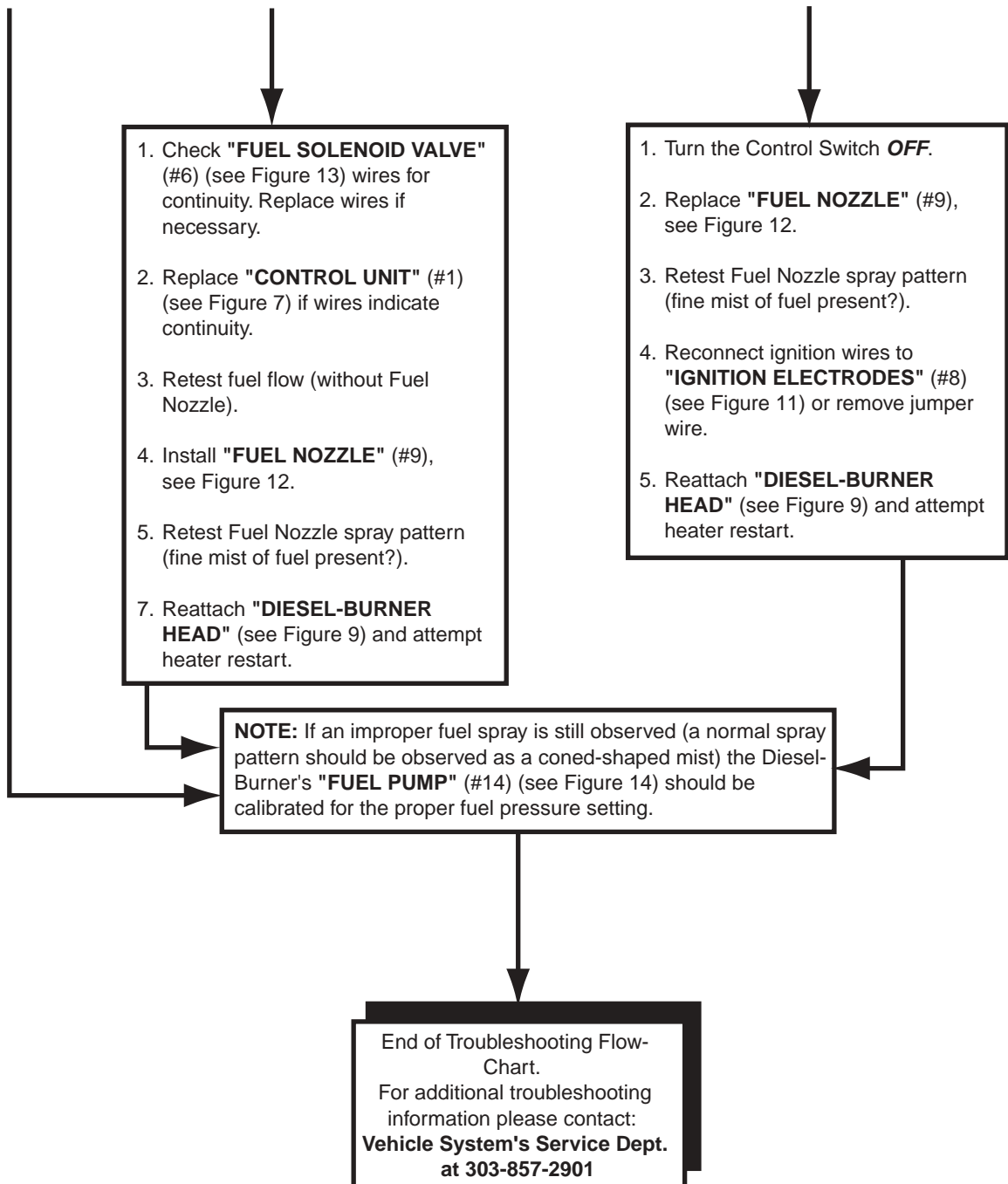
## Section 6: Troubleshooting



## Section 6: Troubleshooting



## Section 6: Troubleshooting



# WARRANTY POLICY

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### - FOR AQUA-HOT MODELS -

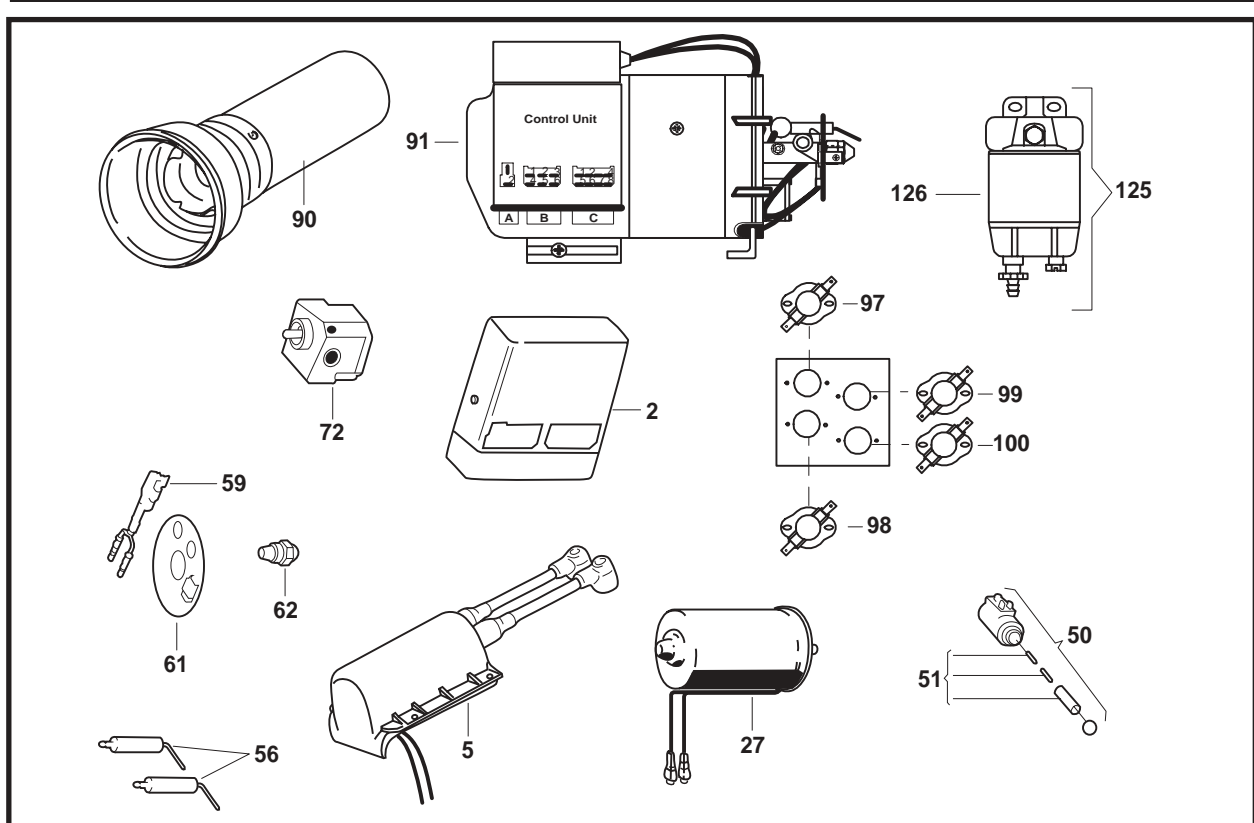
Vehicle Systems Inc. warrants the AQUA-HOT Heater, to the original owner, to be free from defects in material and workmanship under design usage and service conditions for a period of two (2) years on parts and labor beginning on the date of purchase of the vehicle. Replacement parts are covered for the remainder of the heating system's warranty or for six months (180 days) whichever is greater.

**This warranty does not apply to damage or failure of the AQUA-HOT Heater or the vehicle into which it was installed due to improper installation, assembly, maintenance, abuse, neglect, accident, or the use of parts not supplied by Vehicle Systems Inc. Vehicle Systems is not responsible for incidental or consequential damages.**

The intent of this warranty is to protect the end user of the heating system from such defects which would occur in the manufacture of the product. The warranty is not intended to protect the end user from problems which are outside the ability of Vehicle Systems' control.

To obtain warranty repair authorization or for additional information, please contact our **Technical Support Department** at **1-800-685-4298 (8 AM to 5 PM) Mountain Standard Time.**

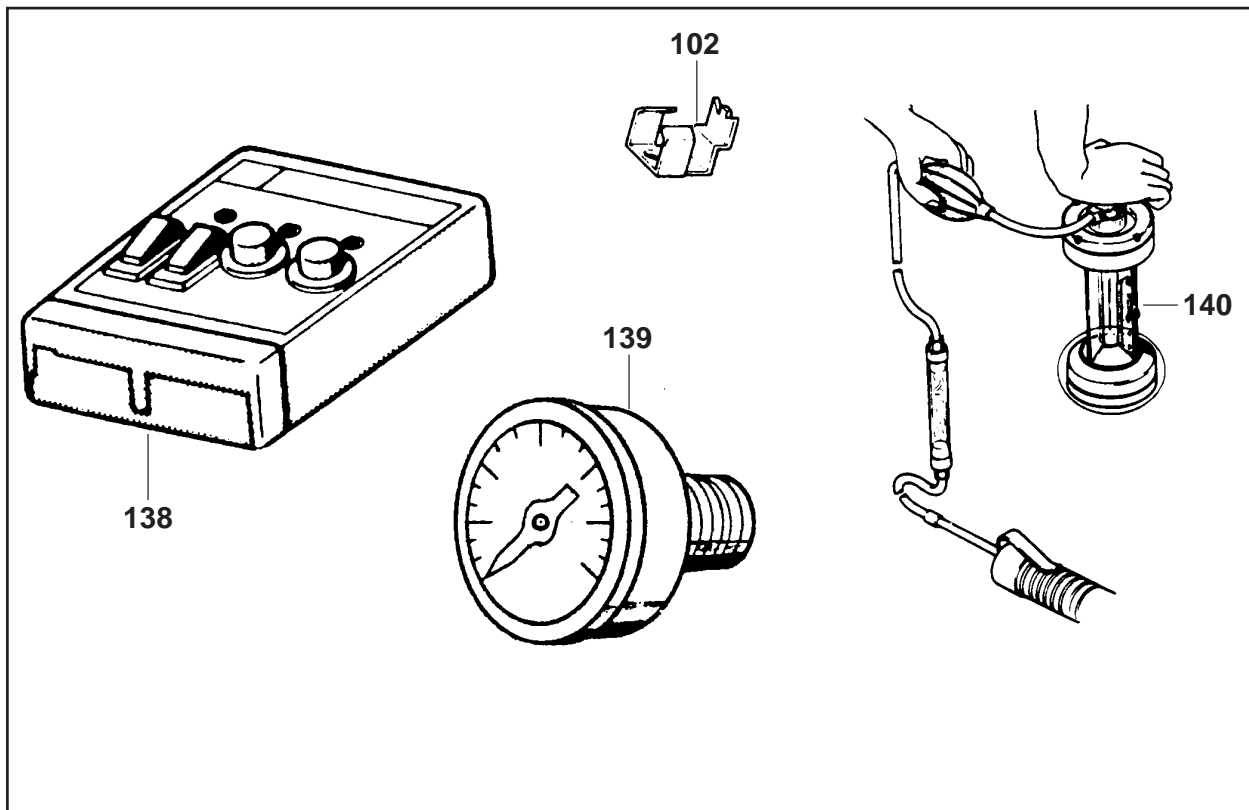
## Section 8: Parts List



2	WPX-287-962	Control Unit, 12 VDC, DBW 2010-300, AH/HH/WH
2*	WPX-306-07B	Control Unit, 24 VDC, DBW 2010-300, AH/HH/WH
5	WPX-101-838	Coil, Ignition, 12 VDC, DBW 2010-300, AH/HH/WH
5*	WPX-101-846	Coil, Ignition, 24 VDC, DBW 2010-300, AH/HH/WH
27	WPX-425-060	Motor, Combustion Air/Fuel Pump, 12 VDC, DBW-2010, AH/HH/WH
27*	WPX-425-079	Motor, Combustion Air/Fuel Pump, 24 VDC, DBW-2010, AH/HH/WH
50	WPX-322-083	Valve, Fuel Solenoid, 12 VDC, DBW 2010-300, AH/HH/WH
50*	WPX-322-091	Valve, Fuel Solenoid, 24 VDC, DBW 2010-300, AH/HH/WH
51	WPX-386-650	Valve, Kit, Fuel Solenoid, DBW 2010-300, AH/HH/WH
56	WPX-274-313	Electrode, Ignition, DBW-2010, AH/HH/WH
59	WPX-638-78A	Sensor, Flame, DBW 2010-300, AH/HH/WH
61	WPX-887-71A	Photo Disc, DBW-2010, AH/HH/WH
62	WPX-886-41A	Nozzle, Fuel, .35 GPH, DBW-2010, AH/HH/WH
72	WPX-502-05A	Pump, Fuel, 10 Bar, DBW 2010-300, AH/HH/WH
90	WPX-265-53A	Combustion Chamber, DBW-2010, AH/HH/WH
91	WPE-905-83A	Burnerhead, Modified, VSI DBW-2010, 12 VDC, AH
91*	WPE-905-84A	Burnerhead, Modified, VSI DBW-2010, 24 VDC, AH
97	ELE-L08-190	Thermostat, VDC Control, 190° F, Blue Dot, AH
98	ELE-L08-230	Thermostat, VDC High-Limit, 230° F, Black, AH
99	ELE-254-010	Thermostat, VAC High-Limit, 230° F, White Dot, AH
100	ELE-010-198	Thermostat, VAC Control, 198° F, Red Dot, AH
125	FLX-120-VS1	Filter, Fuel, System, 10 Micron, AH/HH
126	FLX-R12-TRA	Filter, Fuel, Spin-On Element, 10 Micron, AH/HH

\* Asterick denotes 24 volt model

## Section 9: Special Tools



102	WPX-310-646	Gauge, Adjustment, Electrode, DBW 2010-300, AH/HH/WH
138	WPX-440-280	Control Box, Tester, DBW 2010-300, AH/HH/WH
139	WPE-600-190	Gauge Kit, Fuel Pressure, DBW 2010-300, AH/HH/WH
140	*****	Tester, CO-2, DBW 2010-300, AH/HH/WH
		Order item #140 from a Grainger Industrial Supply Store near you or visit the Grainger website at <a href="http://www.grainger.com">www.grainger.com</a> . (Grainger Part# 6T153)

# Vehicle Systems

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I N C O R P O R A T E D

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