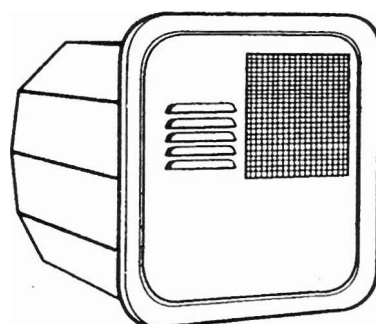


# **SUBURBAN WATER HEATERS**



# **SERVICE MANUAL**



# **DIRECT SPARK IGNITION AND GAS AND ELECTRIC**



# **SUBURBAN**

**SUBURBAN MANUFACTURING COMPANY**  
Post Office Box 399  
Dayton, Tennessee 37321

## SUBURBAN WATER HEATERS

- I. Suburban Manufacturing presents this Service Education Program to better assist technicians in understanding our water heaters.

Our portion of this program will be approximately four hours, in which time we will discuss four major areas: 1) Model Number/General Operating Instructions, 2) Water Heater Overall Construction, 3) Gas and Electric Units, 4) Direct Spark Ignition Units.

Also discussed will be:

- |                             |                          |
|-----------------------------|--------------------------|
| 1) Voltage/Gas Pressure     | 4) Warranty              |
| 2) Gas Leaks                | 5) Basic Troubleshooting |
| 3) Pilot/Burner Adjustments | 6) Helpful Service Hints |

If you have any additional questions, feel free to ask.

Each section will begin with a series of questions that will be answered and should provide you with the ability to make a quick and accurate diagnosis and repair.

### A. Distribution Centers:

Suburban Manufacturing Company  
676 Broadway Street  
Dayton, TN 37321  
Phone: 423-775-2131  
Fax: 423-775-7015

Suburban Manufacturing Company  
55712 County Road 15 South  
Elkhart, IN 46516  
Phone: 219-294-5618  
Fax: 219-293-1685

In Canada:

G.L. Products Limited  
1030 - 8th Line  
Post Office Box 760  
Oakville, Ontario  
CANADA L6J 5C4  
Phone: 416-845-7558  
Fax: 416-845-7875

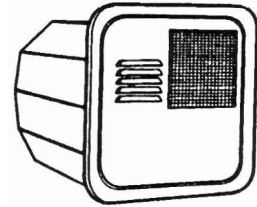
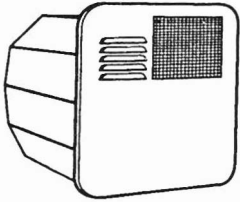
Greg Lund Products Ltd.  
4025 - 9th Street SE  
Calgary, Alberta  
CANADA T2H 2G7  
Phone: 905-243-2792

### B. Necessary tools and equipment to service Suburban Pilot and DSI Water Heaters:

Manometers or U-Tube  
Millivolt Tester  
Voltmeter  
Circuit Board Tester-#5/30  
Gas Thermostat Wrench  
Nut Drivers

Open End Wrench  
Phillips Screwdriver  
Flat Head Screwdriver  
LP Leak Test Liquid  
Pliers

### C. Model Numbers Listing



## Suburban RV Water Heaters

Model Number	Nom. Gals.	BTU/h Input	Height	Width	Depth	Shipping Weight
<b>Standard Pilot</b>						
SW3P	3	9000	12 11/16"	12 11/16"	16 1/8"	30
<b>Super Performance Pilot</b>						
SW6P	6	12000	12 11/16"	12 11/16"	19 3/16"	37
SW10P	10	12000	16 7/32"	16 7/32"	20 1/2"	48
<b>Super Performance Pilot with Reignitor</b>						
SW6PR	6	12000	12 11/16"	12 11/16"	19 3/16"	37
SW10PR	10	12000	16 7/32"	16 7/32"	20 1/2"	48
<b>Super Performance Combination Electric and Pilot</b>						
SW6PE	6	12000	12 11/16"	12 11/16"	19 3/16"	37
SW10PE	10	12000	16 7/32"	16 7/32"	20 1/2"	48
<b>Super Performance Combination Electric and Pilot with Reignitor</b>						
SW6PER	6	12000	12 11/16"	12 11/16"	19 3/16"	37
SW10PER	10	12000	16 7/32"	16 7/32"	20 1/2"	49
<b>Direct Spark Ignition</b>						
SW6D	6	12000	12 11/16"	12 11/16"	19 3/16"	35
SW10D	10	12000	16 7/32"	16 7/32"	20 1/2"	49
<b>Electric and Direct Spark Ignition</b>						
SW6DE	6	12000	12 11/16"	12 11/16"	19 3/16"	37
SW10DE	10	12000	16 7/32"	16 7/32"	20 1/2"	50
<b>Electric and Direct Spark Ignition with Motor Aid</b>						
SW6DEM	6	12000	12 11/16"	12 11/16"	19 3/16"	39
SW10DEM	10	12000	16 7/32"	16 7/32"	20 1/2"	60
<b>Accessories</b>	<b>Description</b>					
520790	Reignitor Kit (Can be field installed on any SW6 Pilot Model after Serial #953401118 and any SW10 Pilot Model after Serial #953601021)					
520773	Reignitor Kit (Can be field installed on any SW Pilot Model)					
6261ACW	Door, Colonial White, SW Model, Radius Corner, 3 and 6 Gallon					
697205	Door, Colonial White, V Model, Radius Corner, 3, 6 and 8 Gallon					
690578	Door, Colonial White, V Model, Square Corner, 3, 6 and 8 Gallon					
520781	Kit to install present V Model Radius Corner Door to SW6 Water Heater					
6255ACW	Door, Colonial White, SW Model, Flush Mount, 3 and 6 Gallon					
697221	Door, Colonial White, V Model, Flush Mount, 6 Gallon					
520771	Kit to install present V Model Flush Mount Door to SW6 Water Heater					
6257ACW	Door, Colonial White, V Model, Radius Corner, 10 Gallon					
697213	Door, Colonial White, V Model, Square Corner, 10 Gallon					
6259ACW	Door, Colonial White, SW Model, Flush Mount, 10 Gallon					
520787	Door Kit (6 Gallon Aluminum Tank Replacement Kit)					

Specifications are subject to change without notice.

**WATER HEATERS AND DOORS ARE SOLD SEPARATELY**

## II. General Operating Instructions

### A. Lighting Instructions

**Gas and Electric** - Read all safety information first. Turn gas cock clockwise to "OFF" position and temperature indicator to the lowest setting. Turn off all electric power to the appliance. Wait 5 minutes for gas to clear the area. Turn gas cock counterclockwise to "pilot" position, press reset button and light pilot, hold down until pilot remains lit. Turn gas cock counterclockwise to "ON" position. If pilot goes out, repeat above procedure. On initial start-up, this may take several times to purge the air from gas lines. Turn on all electrical power if combination electric/gas, and set temperature dial to desired setting.

**Gas and Electric With Reignitor** - Place reignitor control in "OFF" position. Turn gas cock clockwise to "OFF" position, and temperature indicator to lowest setting. Turn off all electric power to appliance and wait 5 minutes for gas to clear. Turn gas supply and electrical power to appliance on. Turn gas cock counterclockwise to "pilot" position, press reset button and switch the electric reignitor module to "ON" position. Spark will start between electrode tip and pilot hood. When pilot lights, the spark will stop. Continue depressing reset button for approximately 1 minute or until light remains lit. On initial start-up, it may take several times to purge air from lines. Turn gas cock counterclockwise to "ON" position and set temperature dial to desired location.

When reignitor switch is in the "ON" position, it will operate automatically when the pilot flame is extinguished. When the vehicle is to be stored or the LP supply is to be turned off, be sure to turn the reignitor control switch to the "OFF" position. This will prevent the battery from being discharged (the reignitor will continue sparking). The reignitor has an alarm that will sound when the pilot is extinguished or the LP supply is turned off.

**Direct Spark Ignition** - Read all safety information provided. Turn off all electrical power to the appliance. Turn off gas supply and wait 5 minutes for gas to clear the area. Turn on gas and electrical supply to the appliance. Turn switch to "ON" position, there will be a 15-second purge before spark. If lockout occurs before main burner lights, turn switch to "OFF" position, wait 5 seconds and turn switch to "ON" position. This will restart the ignition cycle again. On the initial start-up, it may require several ignition cycles to purge all the air from the gas lines.

### B. Voltage/Gas Pressure Requirements

The DSI water heater must have an acceptable DC-voltage range to function properly. An adequate voltage range would be between 10.5 volts DC and 13.5 volts. This voltage must be supplied directly from the battery or from the power converter wired in parallel with the battery.

The LP system working pressure should be 11" of water column (WC). When testing the pressure of the system, at least one other gas appliance needs to be in full operation to get accurate results. Check pressure with manometer at unit and pressure coming through orifice to get correct reading. Adjust accordingly. Do not overfill the propane tanks. The minimum working pressure is 11" WC, while the maximum is 14" WC.

### C. Safety - Gas Leak Check

A leak in the LP gas system is a critical area that involves checking for and then repairing the leak. Most leaks occur when the system is open for service and improperly resealed, when LP tanks are filled, or when appliances are installed. One way to check for leaks is to use a pressure gauge and simply pressurize the system and turn off the gas valve. If pressure drops, find the leak and correct it. A liquid leak solution can be applied to any fitting that was opened. Do not use a soap solution with ammonia, as it is corrosive to brass. Also the electronic gas sniffer is a must for finding leaks in hard-to-reach places.

### III. Water Heater Overall Construction

#### A. Glass-lined Tank

The steel, glass-lined tanks provide long life under varying water conditions. This same construction is what is used for more than 7 million residential water heaters sold annually. The baked-on enamel process reaches temperatures in excess of 1600°F. Three (3) year tank warranty, replaceable anode rod, high output, fast recovery, gas connection supplied, foam jacket on all gas/electric models.

#### B. Anode Protection - Water Heater

Each Suburban water heater is equipped with a replaceable anode rod. The sacrificial anode equalizes aggressive water action providing cathodic protection for the tank. The anode rod is a very important factor in tank life and should only be removed for inspection of draining. Replacement of the anode rod is recommended when consumption or weight loss is greater than 75%. With regular inspection and replacement of the anode (part number 231419), tank life can be greatly extended. Frequency of anode replacement will vary depending on the water conditions and usage.

#### C. Temperature and Pressure Valve

Temperature and pressure relief valves will normally drip during heating cycles. In a closed system, a liquid will expand when heated and cause a rise in temperature and pressure. How much is excessive and why only sometimes? Here are six basic reasons:

1. The temperature and pressure of incoming water.
2. The cleanliness of the thermostat or "probe" position of valve.
3. The pressure setting of relief valve (150 PSI).
4. Age and condition of the spring assembly inside valve.
5. The temperature setting of preset or manual thermostat.
6. The evaluation and atmospheric pressure at which the heater is used.

#### D. Winterization/Flushing Instructions

If the RV is to be stored during winter months, the water heater must be drained to prevent damage from freezing. The following steps can be followed to do this:

1. Turn off power and gas.
2. Turn off pressure pump or your water hook-up source.
3. Open both hot and cold water faucets.
4. Open drain on water heater.
5. Follow RV manufacturer's instructions for draining entire water system.

#### E. Odor from Hot Water System

Odor from the hot water system is not a service problem, and many water supplies contain sufficient amounts of sulphur to produce an odor. The odor is similar to rotten eggs and is often referred to as sulphur water. It is not harmful - only unpleasant to smell. Sulphur water can be caused by a chemical action or by bacteria. The solution to eliminate is heavy chlorination of the water system. Add about six ounces of heavy chlorine (common household liquid bleach) to each ten gallons in the water tank. Then run the heavy chlorinated water throughout the system, opening each faucet one at a time until you smell the chlorine. Let the RV sit for a few days and the chlorine should take care of the problem. Then you'll need to take care of the chlorine. You may consider adding a filtering system that removes chlorine and prevents sulphur water.

## IV. Gas and Electric Units

### A. Gas Control System

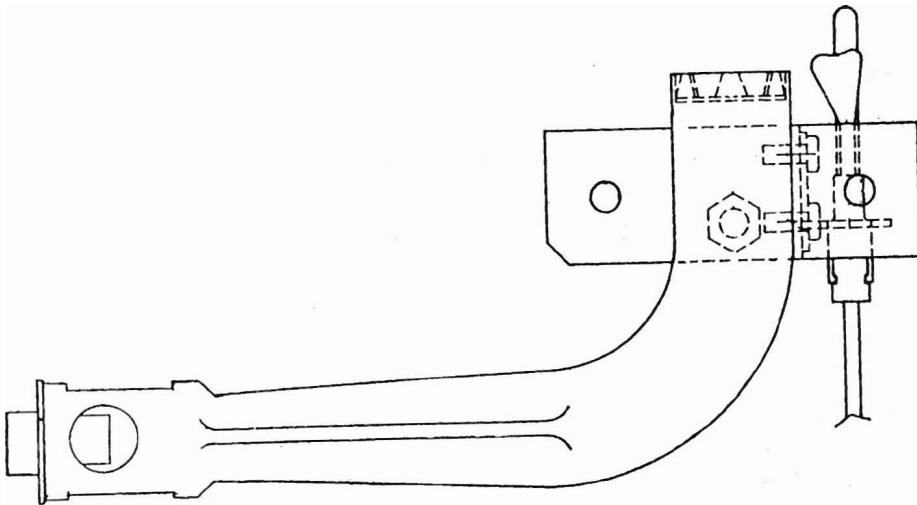
#### 1. Pilot Adjustment

##### a) Pilot will not come on:

- 1) Possible malfunction of the bottle gas regulator. Gas pressure should be 11" WC. Test and adjust at regulator.
- 2) Clogged pilot orifice - clean or replace.
- 3) Gas control defective; no gas flow - remove and replace.

##### b) Pilot will not stay on:

- 1) Improper pilot flame; should be a blue or orange-blue flame.
- 2) Obstructed pilot orifice - clean or replace.
- 3) Loose or weak thermocouple. Thermocouple can be checked with voltmeter, checking millivolts when flame is present. If loose, tighten; if defective, replace.
- 4) A defective E.C.O. switch or magnet in gas control - disconnect thermocouple from gas control. Check for continuity between control housing and center of thermocouple fitting (do not touch the threaded portion with probe). If no continuity, replace the gas control.



## A. Gas Control System (continued)

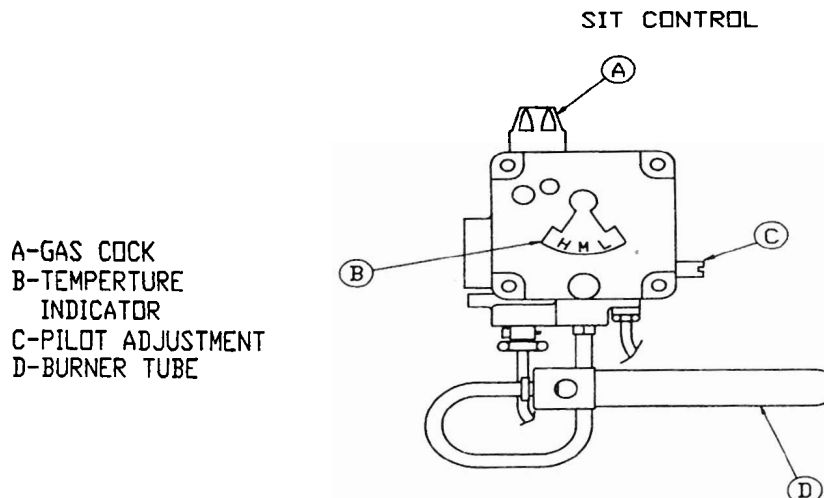
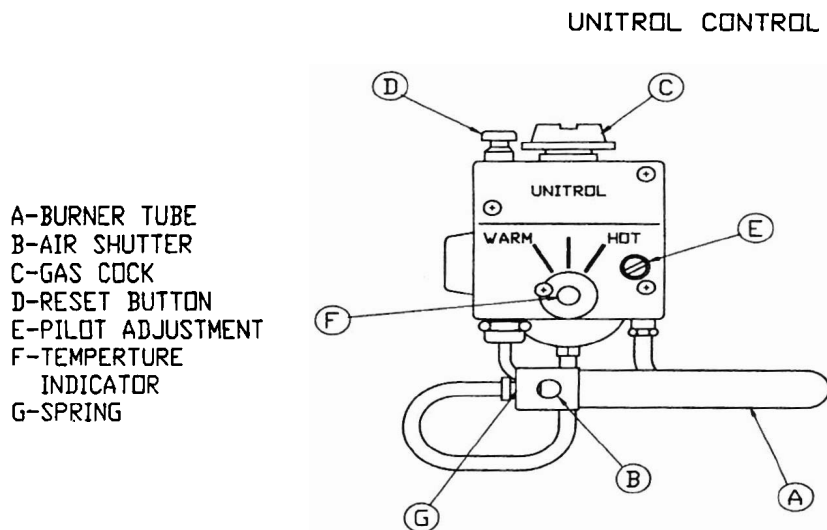
### 2. Burner Adjustment

#### a) Erratic main burner flame sputtering yellow:

- 1) Incorrect gas pressure - check for correct gas pressure coming through main burner orifice; should be 11" WC.
- 2) Check for blockage or obstruction in main burner orifice. Remove and clean with alcohol and compressed air. Do not enlarge orifice hole. Clean main burner if necessary.
- 3) Misalignment of main burner - check for correct alignment.
- 4) Burner flashback - check main burner orifice. Must be properly seated into main burner - (straight in line with tube).
- 5) Sooting - can be caused by thermostat not shutting off completely or other obstructions or blockage in flue box.

#### b) Main burner will not ignite:

- 1) Incorrect gas pressure - check for correct gas pressure coming through main burner orifice; should be 11" WC.
- 2) Main burner orifice could be blocked - remove and clean with alcohol or compressed air. Do not enlarge orifice hole.
- 3) Lint or dirt in burner tube - clean burner tube.
- 4) Gas control valve defective - no gas flow through valve. Remove and replace.



## **A. Gas Control System (continued)**

### **3. Temperature Adjustment**

#### **a) Water too hot:**

- 1) Thermostat set too high. Adjust temperature to lower selection accordingly.
- 2) Check Orifice size, check gas pressure.

#### **b) Not enough hot water:**

- 1) Thermostat set too low. Adjust temperature to higher selection.
- 2) Misalignment of main burner - adjust and realign elbow on burner tube.
- 3) Obstruction in main burner or air intake - clean accordingly.
- 4) Main burner orifice too small or clogged - remove and clean or replace.
- 5) Thermostat gas control out of calibration - replace.

## **B. Gas Ignition System**

### **1. Reignitor**

A reignitor eliminates the need for matches to light the pilot. It will maintain a pilot flame under windy conditions, and has an alarm which will sound when the pilot flame is extinguished or if the LP gas supply is turned off. It is available on all pilot models. A reignitor can be field installed.

### **2. Installation and Operation**

See Field Instructions for Reignitor Control.



## C. Electric System

### 1. Electric Thermostat And Element

Electric water heaters are designed to operate with a minimum amount of service problems. The most common trouble with electric water heaters results from energizing the heater before it is filled with water.

Check the following items:

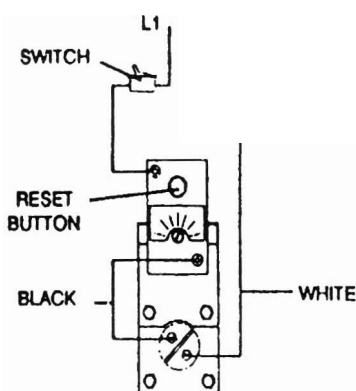
- Check the circuit breaker in the coach to make sure it has not tripped.
- Check for 120-volt AC to the ON/OFF switch (lower left hand corner of the control pan) on gas/electric water heater. If voltage is present on one side of the switch and the heater still doesn't work, replace switch.
- Press the reset button on the heater. Located in the control pan.
- If, after pressing the reset button and turning the power back on, the heater still fails to operate, turn off the power and check all wire connections.
- After the first four steps have been followed, the heating element should be checked for continuity with a voltmeter or other testing device. If defective, replace the element.

If the water heater becomes too hot and activates the reset control, push the reset switch pad.

In cases, where the water is too hot and the high limit control is not shutting off the heater, it is possible that the thermostat is loose from its bracket and is not being held tightly against the tank.

## WIRING DIAGRAM (120 VAC)

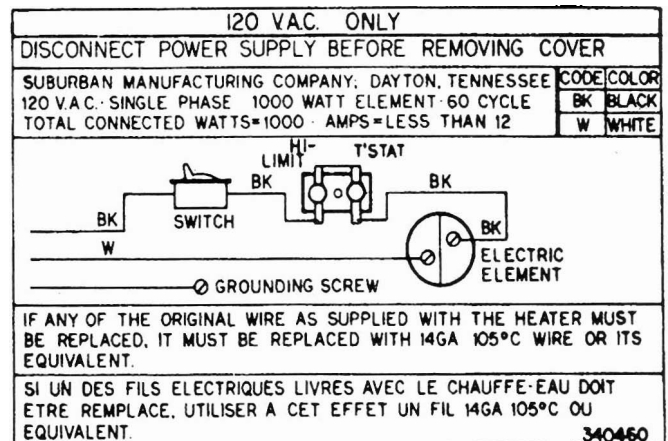
**"V" Model**



ROBERTSHAW  
THERMOSTAT ONLY

If any of the original wire as supplied with the heater must be replaced. It must be replaced with 14 GA. 105 C wire or its equivalent

**SW Model**

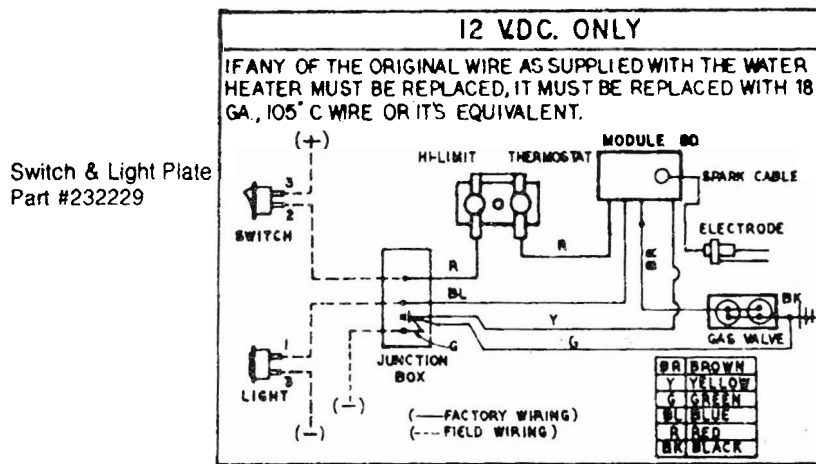


## V. Direct Spark Ignition

### A. Understanding the Operating System

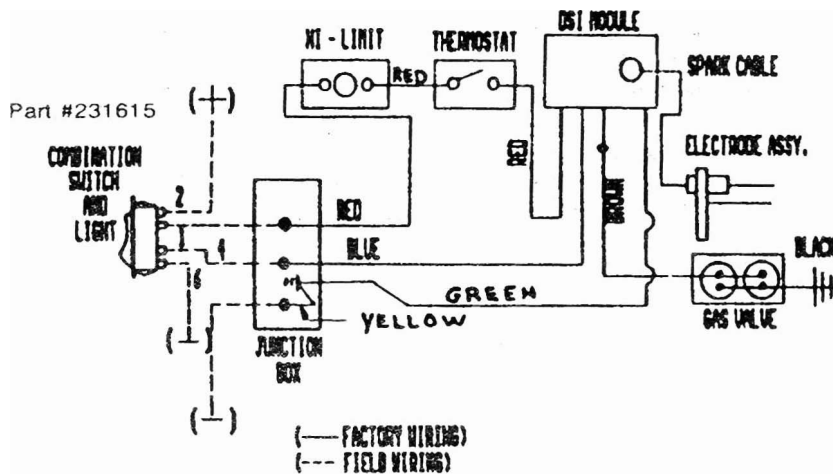
The direct spark ignition water heater must not only have the correct gas pressure but a DC voltage range between 10.5 volts DC and 13.5 volts. This voltage should be supplied directly from the battery or from the "filtered" circuit of a converter. On a call for heat, voltage is applied to the ignitor across terminals 1 (power) and 6 (ground) of the input connector. A high voltage spark is then generated from the spark electrode to ground. Simultaneously, the gas valve is energized. At the start of each heating cycle, there is a 15 second purge followed by a 6.8 second trial for ignition. Sparking ceases as soon as a constant flame is present. Once the flame is established, sparking will cease and the "flame rod" will provide flame monitoring for the remainder of the heat cycle. If the flame is extinguished during the cycle, it will spark automatically in an attempt to re-establish the flame. If lockout occurs, the valve closes, turning on the red light in the ON/OFF switch.

### SW WIRING DIAGRAM



### "V" MODEL WIRING DIAGRAM

#### 12 VOLT DC - WIRING DIAGRAM



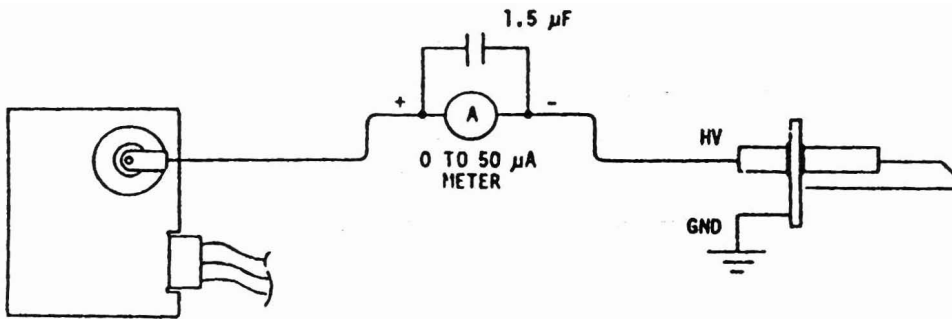
## APPLICATION NOTE FLAME CURRENT MEASUREMENT

### Local Flame Sensing (Single Spark and Sense)

With power off, connect a DC microammeter (D'Arsonval movement type) as shown in the diagram below. (The meter should be protected from high voltage surges which could damage the meter movement. A  $1.5\mu\text{F}$  200 volt film capacitor across the meter terminals or lead wires will provide adequate protection.) The lead wires and terminals must be isolated from other surfaces to prevent the H.V. signal from arcing to ground during the trial-for-ignition period.

Apply power. Once the flame is established and the sparks shut off, a flame sense current of  $1.5\mu\text{A}$  DC minimum is required for proper operation.

**CAUTION:** Due to possible conditions, do not touch the microammeter or lead wires during the flame sense test. Always remove power before any adjustments.



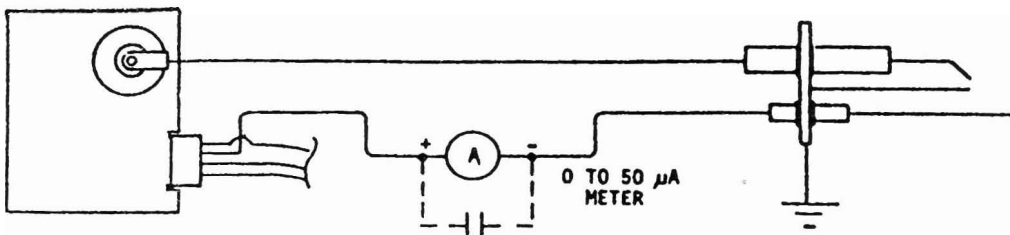
Local Flame Sensing (Single Spark and Sense)

### Remote Flame Sensing

With power off, remove the sense wire from the electrode terminal and install a DC microammeter in series with the electrode terminal and sense wire, as shown in the diagram below.

Apply power. Once flame is established, a flame sense current of  $1.5\mu\text{A}$  DC minimum is required for proper operation.

When Remote Flame Sensing is used, it is not necessary to employ the  $1.5\mu\text{F}$  protection capacitor across the meter. However, since it does not affect the performance of the microammeter, it may remain in place at all times.



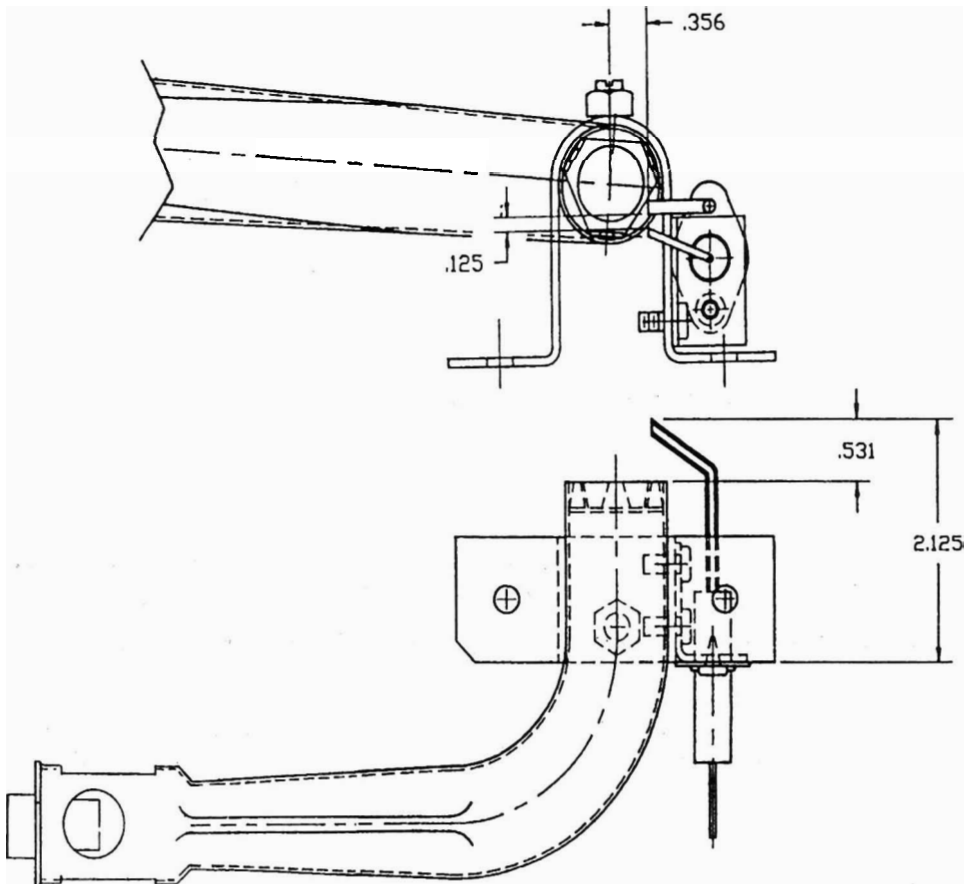
Remote Flame Sensing

## B. Diagnosis and Repair

### 1. Flashback in Burner Tube

- a) Incorrect gas pressure. Gas pressure should be 11" WC.
- b) Misalignment of burner tube. Burner orifice should be positioned down the center. Burner should be aligned with gas valve.

SW Series Burner and Electrode Diagram

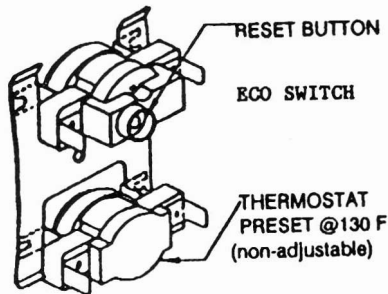


## B. Diagnosis and Repair (continued)

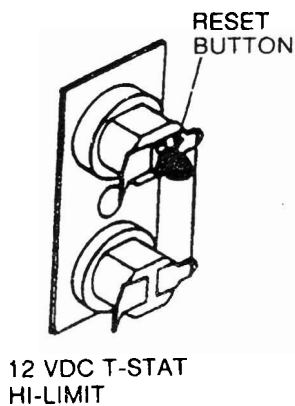
### 2. Thermostat Failure and ECO Switches

Suburban's direct spark ignition water heaters have a preset thermostat of 130°F that is non-adjustable. It is also equipped with a high temperature limit (E.C.O.) as a cut-off device. Temperatures above 180°F will cause manual reset button to trip, shutting down the main burner. To activate the burner, the water temperature must be below 100°F, push the reset button to reactivate the burner. Make sure the thermostat bracket is holding both switches tight against the water heater to ensure that both of them sense correctly. Check all wire terminals and voltage through the E.C.O. and thermostat.

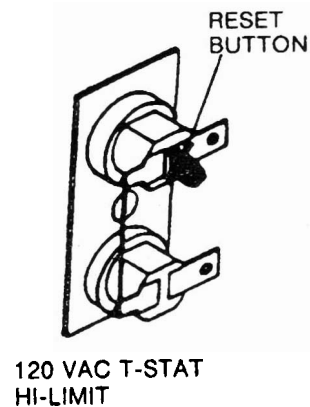
#### THERMOSTAT AND MANUAL RESET MODEL "V" SERIES UNITS



#### THERMOSTAT AND MANUAL RESET Models: SW6D, SW6DE, AND SW6DM



#### THERMOSTAT AND MANUAL RESET Models: SW6PE, SW6PER, SW6DE



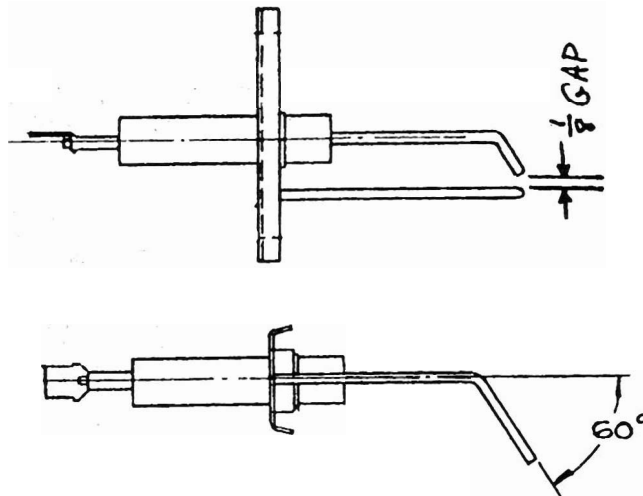
## B. Diagnosis and Repair (continued)

### 3. The Electrode Assembly

Positioning of the electrode assembly is very important. The gap between spark and ground should be  $\frac{1}{8}$ " (see diagram below). The spark and ground probe should not be grounded to the flame spreader or any other metal object in the combustion chamber. The sensing probe relays to the circuit board a signal that a flame is present. This signal is a small DC current which can be measured directly with a 0 to 50 microamp meter. Although the minimum flame current necessary to keep the ignitor from going into lockout is 1.5 microamps, the meter readings should be 3.0 microamps or higher.

To measure flame current, first shut off the power to the system and then remove the flame sensing lead wire from the electrode terminal and insert the microamp meter in series with the sensor electrode and ground. "Plus" terminal of meter to component board and "negative" terminal to sensing electrode. Energize the ignitor. If microamps too small, check the following:

- Check for correct input polarity. Terminal 1 should be "hot" (12 volts DC) with respect to ground. Terminal 6 is neutral, or zero voltage, with respect to ground.
- Improper grounding - if a flame is present during the trial for ignition period but the system shuts down, make sure the burner is properly grounded. If not, the system will go into lockout.
- Check the electrode ceramic for cracks or carbon. Make sure the electrode is free form carbon deposits and is not corroded or pitted.
- Check electrode leads for corrosion at the terminals. If there is corrosion, clean it off.
- Check the sensor wire continuity. If defective, replace it.
- Re-position the electrode assembly and check the spark gap. If the gap is too wide, damage to the ignitor can result.



### **3. The Electrode Assembly (continued)**

If no spark is present, check the following:

- a) Check for voltage to the circuit board. Terminal 1 should have voltage. If no voltage, clean wire connections at circuit board with pencil eraser.
- b) If still no voltage, check voltage through E.C.O. and thermostat. Make sure there are good connections and voltage present. If voltage is present on one side but not the others, replace thermostat or E.C.O.
- c) If voltage is present through E.C.O. and thermostat to the module board, and no sparking occurs, replace the circuit board.
- d) After replacing the circuit board, if there is still no spark, check the high voltage wire for cracks or breaks, and replace if necessary.

### **4. Gas Valve Malfunction**

With power supplied to ignitor, sparking should occur and the gas valve should open simultaneously.  
If sparking occurs but the valve does not open, check the following:

- a) Place a voltmeter between terminal 4 on the input connector and ground (or across the valve). Recycle the ignitor by turning the ON/Off switch to "off" for 5 seconds and then back on to determine if voltage is present at the valve.
- b) If voltage is present and the valve still does not open, remove wires from valve terminals and retest the valve on a known voltage source. If valve still does not function, it should be replaced.
- c) Check the circuit board connector for good connections.
- d) If voltage is not present at terminals 4 and 6 or at the valve, replace the circuit board.

### **5. Circuit Board Failure**

- a) Check for the correct voltage (between 10.5 volts and 13.5 volts DC). Excessive voltage will damage the circuit board.
- b) Check spark gap. If the gap is too wide and arcing to ground, damage can occur to the circuit board.

# **LIMITED WARRANTY**

## **SUBURBAN RECREATIONAL VEHICLE WATER HEATER**

### **LIMITED ONE YEAR WARRANTY**

This Suburban product is warranted to the original purchaser to be free from defects in material and workmanship under normal use and maintenance for a period of one year from date of purchase whether or not actual use begins on that date. It is the responsibility of the consumer/owner to establish the warranty period. Suburban does not use warranty registration cards for its standard warranty. You are required to furnish proof of purchase date through a Bill of Sale or other payment record.

Suburban will replace any parts that are found defective within the first year and will pay a warranty service allowance directly to the authorized Suburban Service Center at rates mutually agreed upon between Suburban and its authorized service centers. Replacement parts will be shipped FOB the shipping point within the Continental United States, Alaska and Canada to authorized service centers performing such repairs. All freight, shipping and delivery costs shall be the responsibility of the owner. The exchanged part or unit will be warranted for only the unexpired portion of the original warranty. Before having warranty repairs made, confirm that the service agency is an authorized service center for Suburban. DO NOT PAY THE SERVICE AGENCY FOR WARRANTY REPAIRS; SUCH PAYMENTS WILL NOT BE REIMBURSED.

Suburban reserves the right to examine the alleged defect in the water heater or component parts, and it is the owner's obligation to return the water heater and/or component parts to Suburban or its representative. When returning a water heater, it must include all component parts and the serial number plate. Returned component parts must be individually tagged and identified with the water heater's model number, serial number and date of installation.

For warranty service, the owner/user should contact the nearest authorized Suburban Service Center, advising them of the model and serial numbers (located on the water heater) and the nature of the defect. Transportation of the unit to and from the Service Center and/or travel expenses of the Service Center to your location is the responsibility of the owner/user. A listing of authorized Service Centers is included in the owner's packet supplied with the water heater and a current listing may be obtained from Suburban. If you cannot locate an authorized service center locally, the service agency chosen to perform warranty repairs must contact our Service Department at 423-775-2131 for authorization. Unauthorized repairs made will not be paid by Suburban.

### **LIMITED THREE YEAR WARRANTY ON TANK**

The inner tank is further warranted to be free from defects in material and workmanship for three years from the date of original purchase. A replacement water heater will be provided under the same conditions as stated in the one year warranty EXCEPT no labor reimbursement will be provided.

### **LIMITATION OF WARRANTIES**

ALL IMPLIED WARRANTIES (INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY) ARE HEREBY LIMITED IN DURATION TO THE PERIOD FOR WHICH EACH LIMITED WARRANTY IS GIVEN. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. THE EXPRESSED WARRANTIES MADE IN THIS WARRANTY ARE EXCLUSIVE AND MAY NOT BE ALTERED, ENLARGED, OR CHANGED BY ANY DISTRIBUTOR, DEALER OR OTHER PERSON WHOMSOEVER.

### **SUBURBAN WILL NOT BE RESPONSIBLE FOR:**

1. Normal maintenance as outlined in the installation, operating and service instructions owner's manual including cleaning of component parts and cleaning or replacement of the burner orifice. Any water damage arising, directly or indirectly, from any defect in the water heater or component parts or from its use.
  2. Initial checkouts and subsequent checkouts which indicate the water heater is operating properly, or diagnosis without repair.
  3. Damage or repairs required as a consequence of faulty or incorrect installation or application not in conformance with Suburban instructions.
  4. Failure to start and/or operate due to loose or disconnected wires; water or dirt in controls, fuel lines and gas tanks; improper gas pressure; low voltage.
  5. Cleaning or adjustment of components; electrode, burner tube, pilot and thermocouple.
  6. Costs incurred in gaining access to the water heater.
  7. Parts or accessories not supplied by Suburban.
  8. Freight charges incurred from parts replacements.
  9. Damage or repairs needed as a consequence of any misapplication, abuse, unreasonable use, unauthorized alteration, improper service, improper operation or failure to provide reasonable and necessary maintenance.
  10. Suburban products whose serial number has been altered, defaced or removed.
  11. Suburban products installed or warranty claims originating outside the Continental U.S.A., Alaska, Hawaii and Canada.
  12. Damage as a result of floods, winds, lightning, accidents, corrosive atmosphere or other conditions beyond the control of Suburban.
  13. ANY SPECIAL, INDIRECT OR CONSEQUENTIAL PROPERTY, ECONOMIC OR COMMERCIAL DAMAGE OF ANY NATURE WHATSOEVER. Some states do not allow the exclusion of incidental or consequential damages, so the above limitation may not apply to you.
- NO REPRESENTATIVE, DEALER OR OTHER PERSON IS AUTHORIZED TO ASSUME FOR SUBURBAN MANUFACTURING COMPANY ANY ADDITIONAL, DIFFERENT OR OTHER LIABILITY IN CONNECTION WITH THE SALE OF THIS SUBURBAN PRODUCT.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

### **IF YOU HAVE A PRODUCT PROBLEM**

#### **FIRST:**

If your RV has its original water heater and is still under the RV manufacturer's warranty, follow the steps described in your RV owner's manual.

#### **SECOND:**

Contact a conveniently located authorized Suburban Service Center. A list of such service centers is enclosed with Suburban's Installation, Operating and Service Instructions book. Describe to them the nature of your problem, make an appointment, if necessary, and provide for delivery of the water heater to the selected service center.

#### **THIRD:**

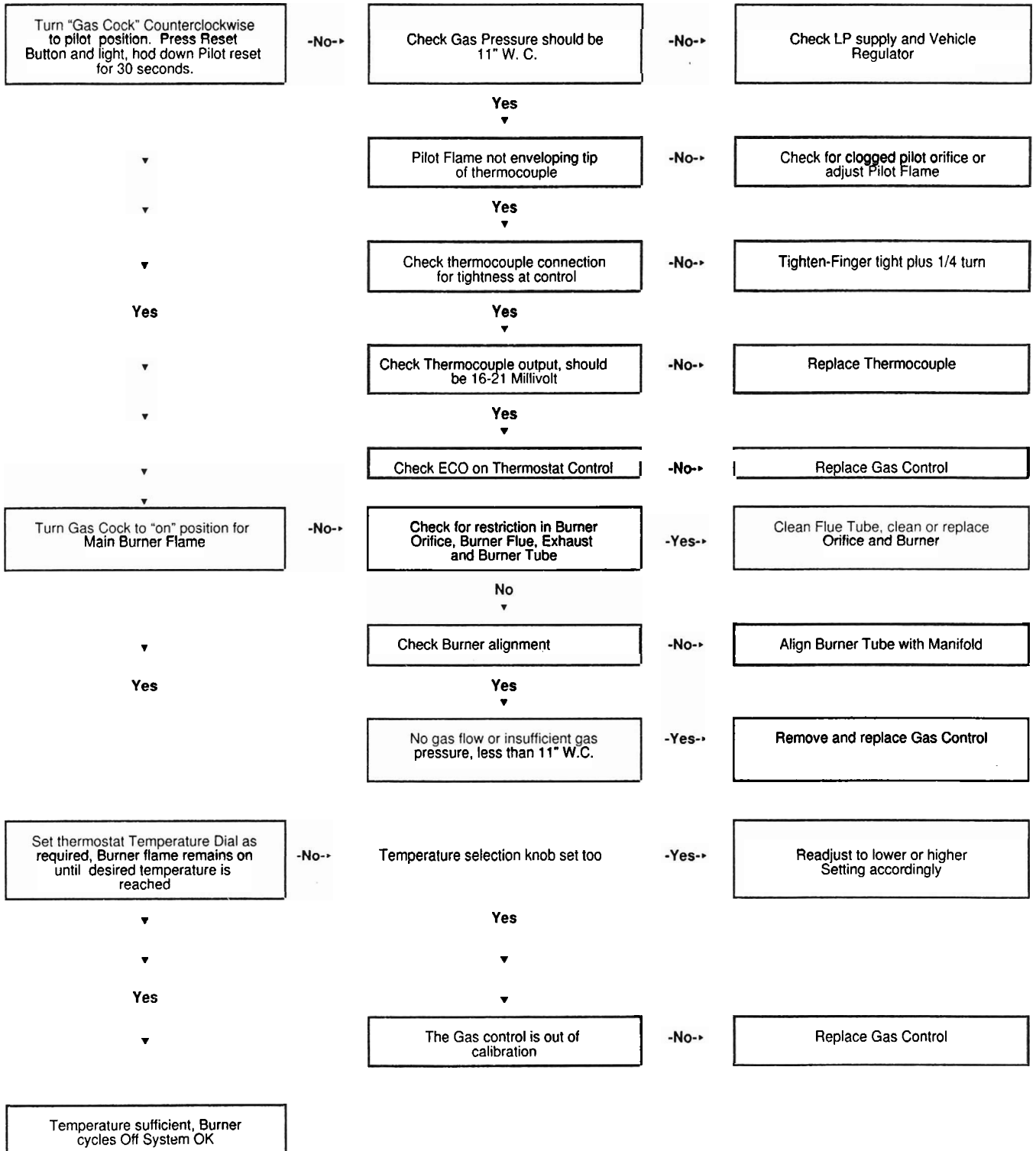
Contact: Suburban Manufacturing Company  
Customer Service Department  
Post Office Box 399  
Dayton, Tennessee 37321  
(423) 775-2131



# TROUBLE SHOOTING GUIDE

## SUBURBAN MODELS WATER HEATER

### PILOT IGNITION SECTION



**Note:** Some external weeping of popoff valve is normal to allow for expansion of the water.

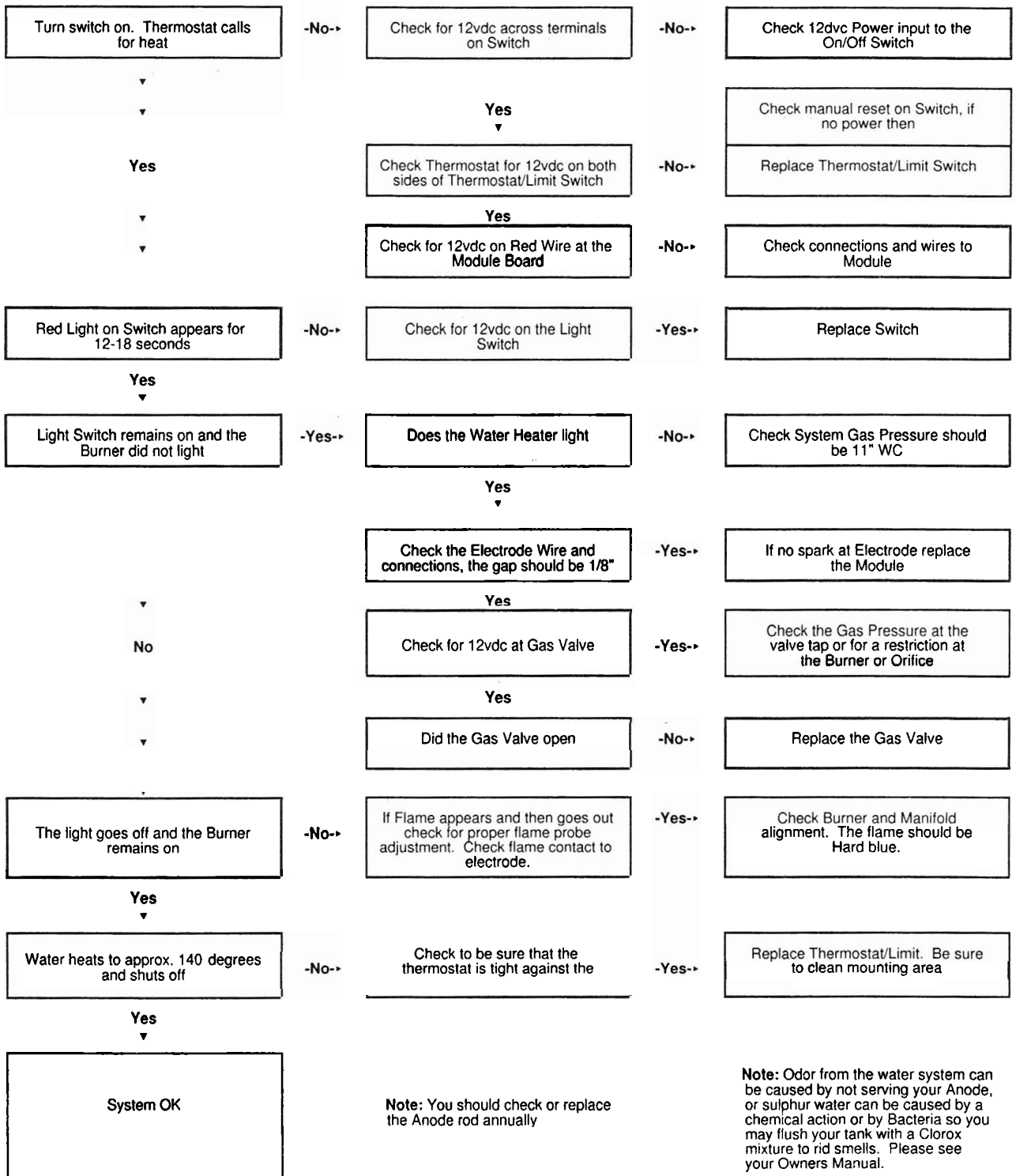
**Note:** You should check or replace the Anode Rod annually

**Note:** Odor from the water system can be caused by not servicing your Anode, or sulphur water can be caused by a chemical action or by Bacteria so you may flush your tank with a Clorox mixture to rid smells Please see your Owners Manual.

# TROUBLE SHOOTING GUIDE

## SUBURBAN MODEL SW6 WATER HEATER

### SPARK IGNITION SECTION

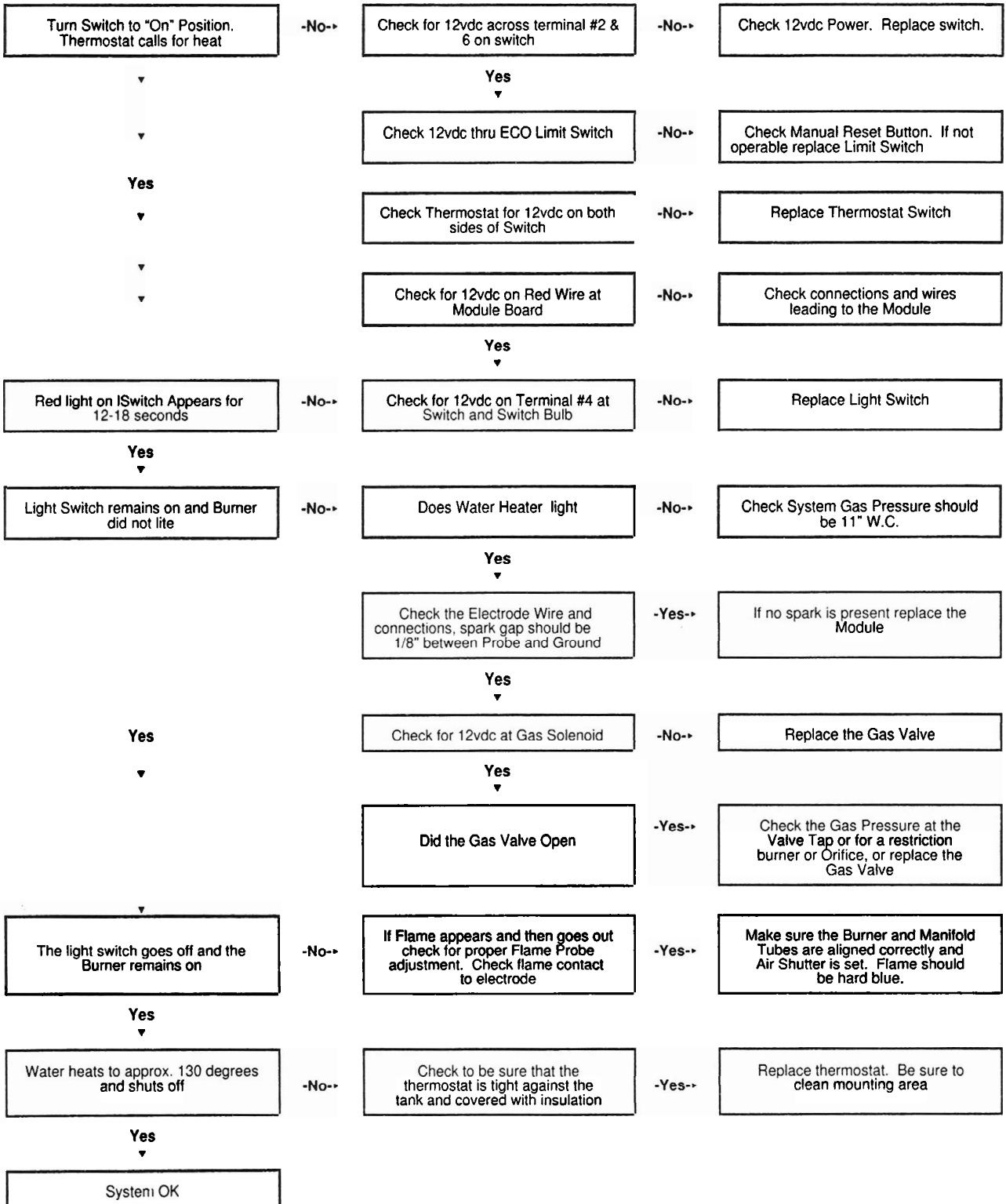


Note: Some external weeping may occur at the T&P (Temperature Pressure Relief) to allow for water expansion when heated

# TROUBLE SHOOTING GUIDE

## SUBURBAN MODELS VDSI WATER HEATERS

### SPARK IGNITION SECTION

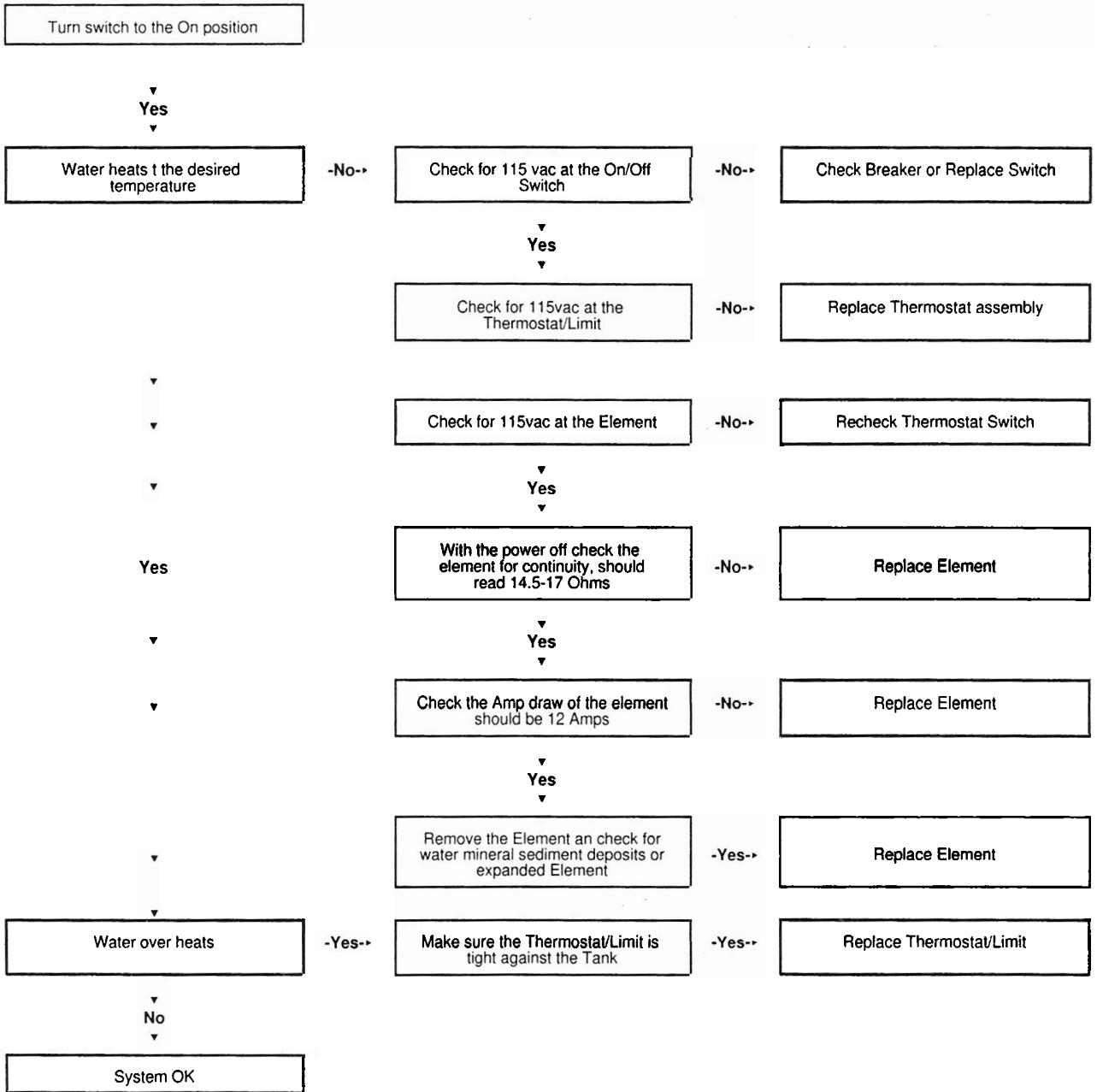


**Note:** External weeping of popoff valve is normal to allow for expansion of the water

**Note:** You should check or replace the Anode Rod annually

**Note:** Odor from the water system can be caused by not servicing your Anode or sulphur water can be caused by a chemical action or by bacteria so you may flush your tank with a Clorox mixture to rid smells. Please see your Owners Manual.

# TROUBLE SHOOTING GUIDE SUBURBAN MODEL WATER HEATER ELECTRIC ELEMENT SECTION



**Note:** Some external weeping may occur at the T&P (Temperature Pressure Relief) to allow for water expansion when heated

**Note:** You should check or replace the Anode rod annually

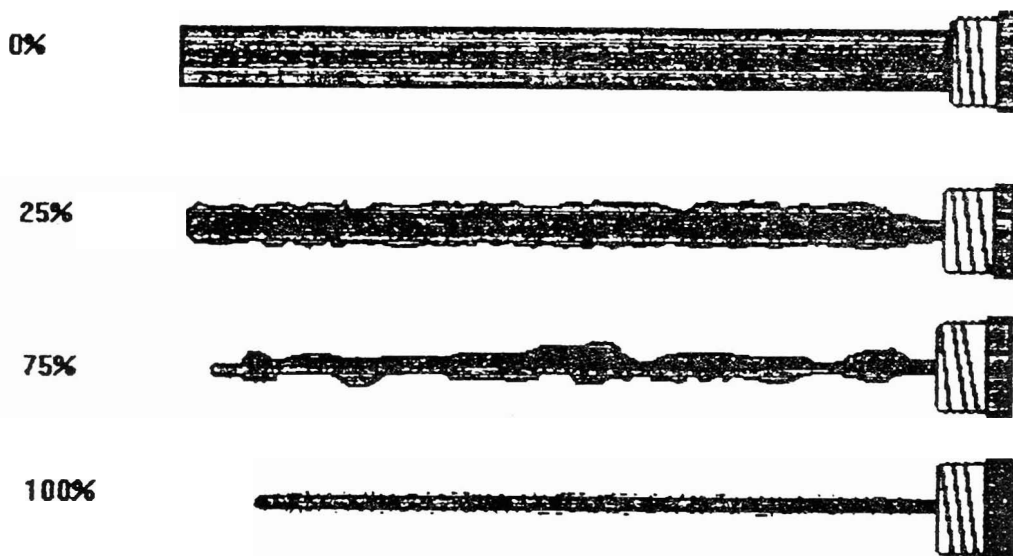
**Note:** Odor from the water system can be caused by not servicing your Anode, or sulphur water can be caused by a chemical action or by Bacteria so you may flush your tank with a Clorox mixture to rid smells. Please see your Owners Manual.

# SERVICE BULLETIN

TECHNICAL SERVICES INFORMATION  
WATER HEATERS - ALL MODELS  
ANODE ROD INFORMATION  
TSI: RV94-560 DATE: 05/09/94

TO: Suburban Distributors  
Service Centers  
OEM Accounts

SUBJECT: SUBURBAN DYNATRAIL WATER HEATERS - ANODE ROD INFORMATION



Replacement of the anode rod is recommended when consumption or weight loss is greater than 75%. The sacrificial anode equalizes aggressive water action providing cathodic protection for the tank. The anode is a very important factor in tank life and should only be removed for inspection or draining.

**OPERATING THE WATER HEATER WITHOUT THE ANODE, VOIDS SUBURBAN'S LIMITED WARRANTY.**

## PARTS ILLUSTRATION AND REPLACEMENT PARTS LIST

**Only factory authorized parts are to be used. Do not attempt to repair defective parts.**

When ordering repair parts from your dealer or a distributor, always give the following information:

1. Part Number (Not Item No.)
2. Part Description
3. Model No. and Serial No. of your Heater
4. Number of Parts Required

### PARTS LIST FOR MODELS SW6P • SW6PR • SW6PE • SW6PER • SW6D • SW6DE (Figure 17)

Item No.	Description	Part Number					
		SW6P	SW6PR	SW6PE	SW6PER	SW6D	SW6DE
1	Module Board	-----	-----	-----	-----	231741	231741
	Fastener Module Board Cover (2 Required)	-----	-----	-----	-----	121866	121866
	Cover, Module Board	-----	-----	-----	-----	090470	090470
	Bushing, Snap 1/2"	-----	-----	-----	-----	070270	070270
	Reignitor Support (2 Required)	-----	121864	-----	121864	-----	-----
	Reignitor	-----	231620	-----	231620	-----	-----
	Bushing, Snap 7/8"	-----	-----	-----	-----	230218	230218
8	Bushing, Snap 1/2"	-----	-----	-----	-----	070270	070270
9	Bushing, Strain Relief 7/8"	-----	-----	-----	-----	510405	510405
10	D.C. Junction Box Assembly	-----	-----	-----	-----	090451	090451
11	Screw #8 x 3/8 Hex H.D. (2 Required) (Junction Box Mounting)	-----	-----	121669	121669	121669	121669
12	Back Assembly, Flue Collector	101682	101682	101682	101682	101682	101682
13	Front, Flue Collector	101659	101660	101659	101660	101661	101661
14	Valve, Pressure Relief	160926	160926	160926	160926	160926	160926
15	Screw #10 x 1/4	121577	121577	121577	121577	121577	121577
15A	Screw #10 x 3/8 (2 Required)	121252	121252	121252	121252	121252	121252
16	Cover, Thermostat/Hi-Limit	-----	-----	090466	090466	090454	090467
17	Gasket, Thermostat Cover	-----	-----	070987	070987	070987	070987
18	Screw #8 x 3/8 Hex HD (2 Required)	-----	-----	121669	121669	121669	121669
19	Grommet	-----	-----	070874	070874	070874	070874
20	Screw 8-32 x 3/8 Hex HD	-----	-----	-----	-----	121407	121407
21	Screw 8-32 x 3/8 Hex HD	121407	121407	121407	121407	-----	-----
22	Bracket, Electrode Mounting	-----	-----	-----	-----	063187	063187
23	Electrode	-----	-----	-----	-----	232258	232258
24	Screw 8-32 x 3/8 Hex HD (1 Required)	-----	-----	-----	-----	121407	121407
25	Pilot Burner/thermocouple Assembly	161097	161097	161097	161097	-----	-----
26	Electrode, Reignitor	-----	232360	-----	-----	-----	-----
27	Screw #8 x 3/8 Hex HD (3 Required)	-----	-----	121669	121669	-----	121669
28	Cover, Element	-----	-----	090445	090445	-----	090445
29	Gasket, Element Cover	-----	-----	070988	070988	-----	070988
30	Burner Assembly	010815	010815	010815	010815	010815	010815
31	Orifice, Cup #58	180297	180297	180297	180297	180297	180297
32	1/4 Loxit Nut (2 Required)	171463	171463	171463	171463	171463	171463
33	Electric Element with Gasket	-----	-----	520789	520789	-----	520789
34	Bushing, Strain Relief	-----	070841	-----	070841	-----	-----
35	Anode	231624	231624	231624	231624	231624	231624
36	Bushing, Snap 1/2"	-----	-----	-----	-----	070270	070270
37	Bushing, Snap 3/8"	-----	-----	-----	-----	070483	070483
38	Bushing, Snap 1/2"	-----	-----	070270	070270	-----	070270
39	Switch, Electric Element	-----	-----	232259	232259	-----	232259
40	Gas Fitting	-----	-----	-----	-----	170374	170374
41	Bracket, Valve Mounting	-----	-----	-----	-----	063243	063243
42	Valve, Gas (LP)	-----	-----	-----	-----	161109	161109
43	Manifold, Outlet	-----	-----	-----	-----	171420	171420
44	Manifold, Outlet	171421	171421	171421	171421	-----	-----
45	#10 x 3/8 (4 Required)	-----	-----	-----	-----	121252	121252
46	Screw #8-32 x 3/8 Hex HD, THD, Cutter (2 Required)	-----	-----	-----	-----	121855	121855
47	Thermostat/Valve (Robert Shaw)	161112	161112	161112	161112	-----	-----
48	Elbow	171394	171394	171394	171394	-----	-----
49	Nut 10-32 Keps (One Per Switch)	-----	-----	121698	121698	121698	121698
50	Switch Assembly, 12 V.D.C. T-Stat/Hi-Limit	-----	-----	-----	-----	232319	232319
52	Switch Assembly, 120 V.A.C. T-Stat/Hi-Limit	-----	-----	232317	232317	-----	232317
53	Screw #8 x 3/8 Hex HD (2 Required)	-----	-----	121669	121699	121699	121699
54	Cover, Junction Box	-----	-----	090447	090447	090447	090447
55	Grommet, Gas Inlet	070989	070989	070989	070989	070989	070989
56	Bushing, Snap 7/8"	-----	-----	230218	230218	-----	230218
57	A.C. Junction Box Assembly	-----	-----	090450	090450	-----	090450
58	Nut, 10-24 Keps (Green)	-----	-----	121576	121576	121576	121576
59	Bushing, Snap 7/8"	-----	-----	230218	230218	-----	230218
60	Foam Jacket (2 Required) (With any order for Foam Jacket, also order Banding Kit 520772)	101593	101593	101593	101593	101593	101593
61	Switch, Lamp and Plate Assembly	-----	-----	-----	-----	232229	232229
62	Screw 10-24 x 1/2 Whiz Lock (2 Required)	121459	121459	121459	121459	121459	121459
63	Burner Bracket Assembly	063244	063244	063244	063244	063244	063244
64	Nut 1/4-20 Hex Keps	121474	121474	121474	121474	121474	121474

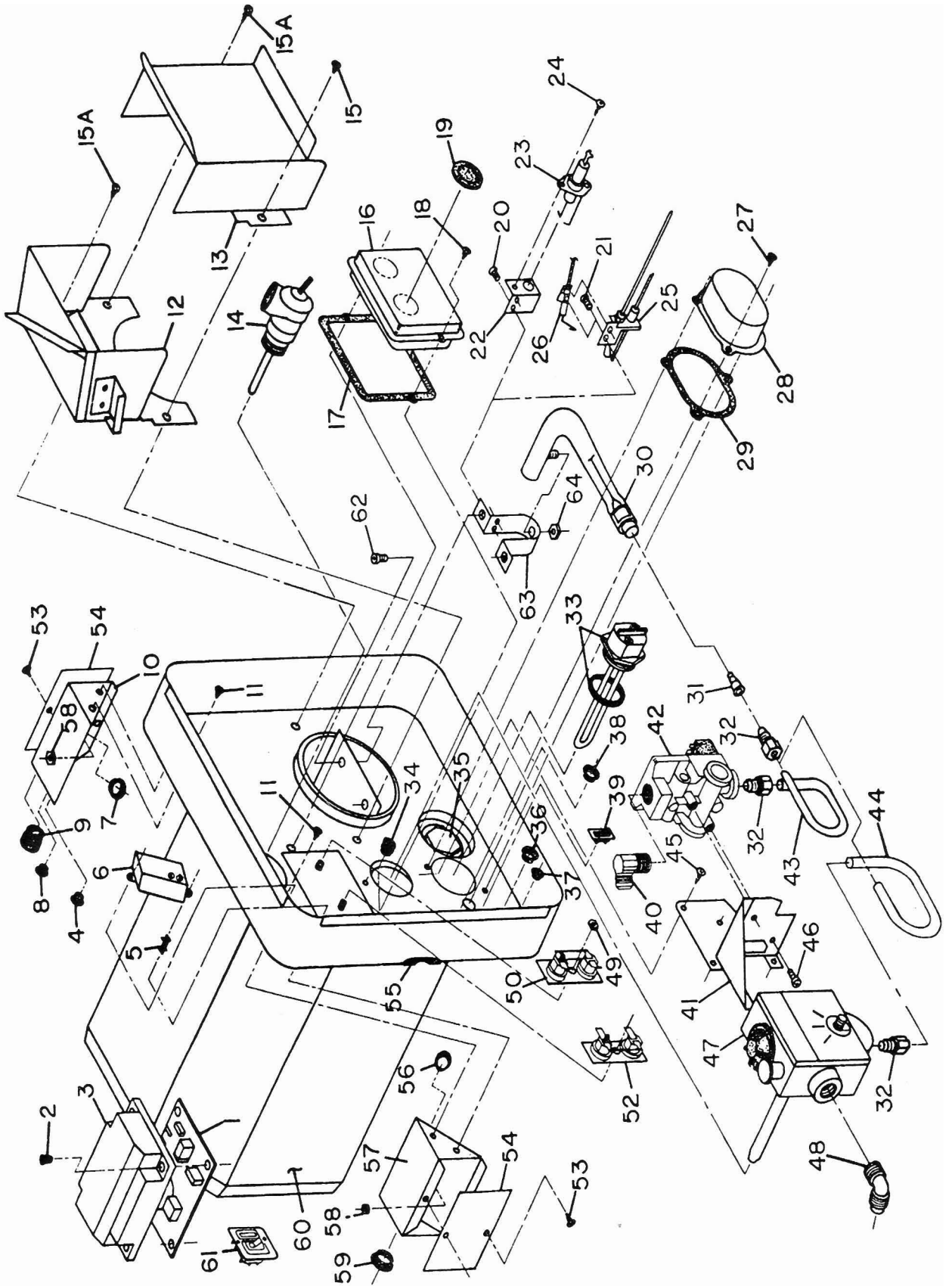


Figure 17

## PARTS LIST FOR MODEL SW6DM (Figures 18 and 19)

Item No.	Description	Part Number SW6DM	Item No.	Description	Part Number SW6DM
1	Cover, Module Board	090340	20	Screw 8-32 x 3/8 Hex HD (1 Required)	121407
	Screw 10 x 3/8 (3 Required)	121252	21	Electrode	232258
	Screw 8 x 3/8 Hex HD (2 Required)	121669	22	Bracket, Electrode Mounting	063187
	Cover Junction Box	090344	23	Burner Assembly	010815
	Screw 10-32 x 3/8 (Green)	121702	24	Orifice, Cup #58	180297
	Screw 6 x 5/8 (2 Required)	121357	25	1/4 Loxit Nut (2 Required)	171463
	Switch, Lamp and Plate Assembly	232229	26	Valve, Gas (LP)	161109
8	Bushing, Snap 7/8"	230218	27	Manifold Outlet	171420
9	Insulator, Module Board	070807	28	Screw 10 x 3/8 (4 Required)	121252
10	Module Board	232391	29	Screw 8-32 x 3/8 Hex HD THD Cutter (2 Required)	121855
11	Back Assembly, Flue Collector	101682	30	Bracket, Valve Mounting	063243
12	Valve, Pressure Relief	160926	31	Gas Fitting	170374
13	Gasket, Thermostat Cover	070987	32	Switch Assembly 12 V.D.C. T-Stat/Hi-Limit	232319
14	Cover, Thermostat/Hi-Limit	090454	33	Nut 10-32 Keps	121698
15	Screw 8-32 Hex HD (2 Required)	121407	34	Bushing, Snap 3/8"	070483
16	Screw 8 x 3/8 Hex HD (2 Required)	121669	35	Bushing, Snap 1/2"	070270
17	Front, Flue Collector	101661	36	Anode	231624
18	Screw 10 x 1/4	121577	37	Grommet, Gas Inlet	070989
18A	Screw 10 x 3/8 (2 Required)	121252	38	Screw 10-24 x 1/2 Whiz Lock (2 Required)	121459
19	Grommet	070874	39	Burner Bracket Assembly	063244
			40	Nut 1/4-20 Hex Keps	121474

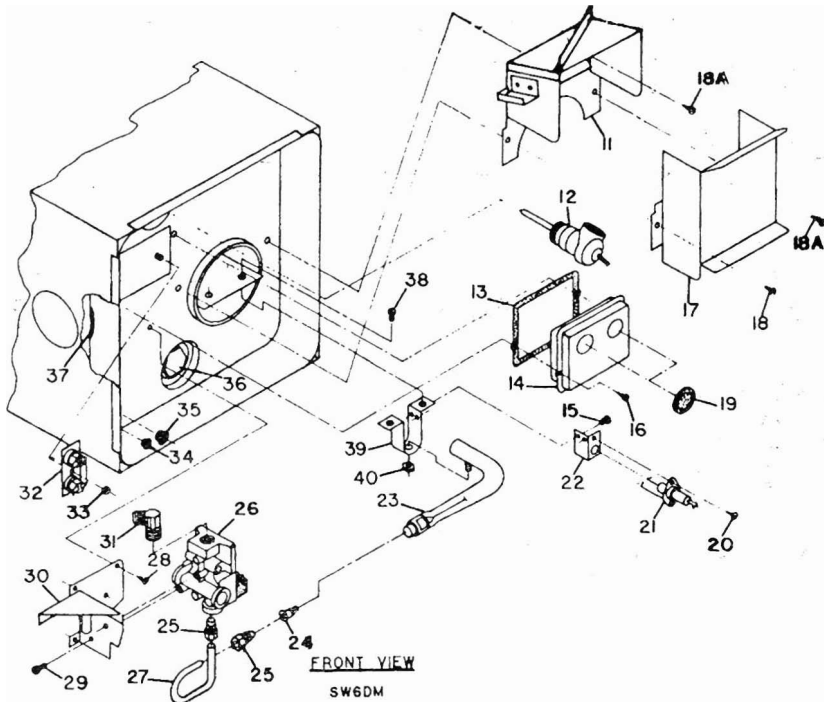
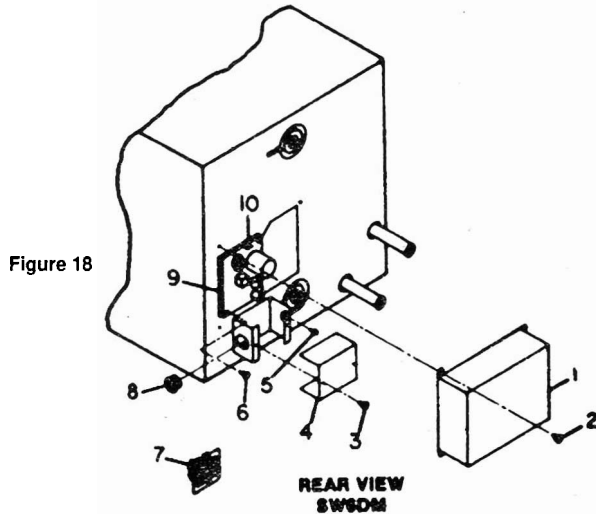


Figure 19





**SUBURBAN MANUFACTURING COMPANY**  
Post Office Box 399  
Dayton, Tennessee 37321  
423-775-2131  
Fax: 423-775-7015

**WARRANTY FLAT RATE LABOR SCHEDULES**

**RECREATIONAL VEHICLE WATER HEATERS (ALL MODELS)**

Replace Gas Control Valve (Pilot Models) .....	1.00
Replace Gas Control Valve (Electronic Models) .....	.50
Replace Thermocouple - Pilot Assembly .....	.50
Replace Pressure Relief Valve .....	.50
Replace Main Burner Orifice and/or Burner Tube .....	.50
Replace Module Board .....	.50
Replace Reignitor .....	.20
Replace Door Assembly .....	.30
Replace Element .....	.50
Replace Electric Thermostat .....	.50
Replace ECO and Thermostat .....	.50
Replace On/Off Light Switch .....	.50
Replace Water Heater .....	1.00
Replace Electrode .....	.50

For repairs that are not listed, contact Suburban Factory Service Department for approval and authorization number. All flat rates include diagnostic/set-up time and gas leak test.

NOTE: When more than one component is defective, compute the total of both replacement times but only one set-up time.

Claims for repairs which exceed the published flat rate time schedule will not be covered. Contact the Factory Service Department if assistance is required to diagnose or troubleshoot.

## TOP VIEW OF WATER TANK

