



# SERVICE BULLETIN

SP2017-006

Revision 0

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Before performing any service always follow applicable safety precautions.

## Burner Troubleshooting

**Affected Products:** P250 and P265 Electronic Pilot Natural or Liquid Propane (LP) 120v Gas Burners

**Affected Serial Range:** N/A

**Related Issue #:** N/A

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### Secondary Distribution:

Service technicians within the Distributor’s organization.

Service companies.

### For Additional Information:

Southern Pride Technical Support: (800) 437-2679

## WARNINGS



### DANGER:

Improper installation, alteration, adjustment, service, or maintenance could result in severe injury, death, or cause property damage. Read the installation, operating, and maintenance instructions thoroughly before installing or servicing this equipment.



### WARNING: FOR YOUR SAFETY IF YOU SMELL GAS.....

1. Open windows.
2. Do not touch electrical switches.
3. Extinguish any open flames.
4. Immediately call your gas supplier.



### WARNING: CARBON MONOXIDE POISONING HAZARD

Carbon monoxide is a colorless, odorless gas that can kill. Follow these rules to control carbon monoxide.

- Do not use the smoker if in an unvented, enclosed area. Carbon monoxide may accumulate.
- Allow only qualified burner service technician to adjust the burner. Special instruments and training are required.
- Read the Owner's Manual before using.



### WARNING: ELECTRIC SHOCK HAZARD

Follow these rules to avoid electric shock.

- Use only a properly grounded circuit.
- Do not spray water directly on electrical components.
- Turn off power before servicing.
- Read the Owner's Manual before using.



### CAUTION:

Metal parts and surfaces of this smoker become extremely hot when in operation. To avoid burns, always use hand protection when operating the smoker.

## SECTION 1: OPERATION OF BURNER

### Burner Specifications:

Smokers use the following burners:

P265-EP Burner:	MLR Series	P250-EP Burner:	BBR Series
	Rolltisserie Series		SP Series
	SRG Series		SPK Series
			SPX Series
			XLR Series

Exploded views of burner components can be found at: <https://www.southernpride.com/exploded-views>

### IMPORTANT ITEMS TO CHECK BEFORE FIRING THE BURNER

1. Gas line **MUST** be installed by a qualified technician and in accordance with the Owner's Manual.
2. Gas line **MUST** include an easily accessible manual shutoff valve, drip leg, and pressure gauge port.
3. Gas pipe size **MUST** be in accordance with the Pipe Capacity Chart in the Owner's Manual.
4. Gas line **MUST** be tested for leaks under pressure.
5. Gas line **MUST** be purged to remove any air in the system.

Firing Capacity				
Firing Rate Btu	65,000	75,000	125,000	150,000
KW	19	22	37	44
MLR-150	X			
SPX-300		X		
SRG-400	X			
SPK-500		X		
SP-700				X
MLR-850			X	
SPK-1000				X
SPK-1400				X

Main Orifice Size Chart		
65,000 Btu/hr	Natural Gas	#26 (.147")
65,000 Btu/hr	LP Gas	#43 (.089")
75,000 Btu/hr	Natural Gas	#19 (.166")
75,000 Btu/hr	LP Gas	#37 (.104")
125,000 Btu/hr	Natural Gas	#5 (.205")
125,000 Btu/hr	LP Gas	1/8" (.125")
150,000 Btu/hr	Natural Gas	#1 (.228")
150,000 Btu/hr	LP Gas	#29 (.136")

	Gas Supply Line Pressure		Manifold Pressure	
	Minimum	Maximum	Minimum	Maximum
<b>Natural</b>	4.5" w.c. 11.2 mbar	10.0" w.c. 24.9 mbar	3.0" w.c. 7.5 mbar	3.5" w.c. 8.7 mbar
<b>LP</b>	11.0" w.c. 27.4 mbar	13.0" w.c. 32.4 mbar	9.5" w.c. 23.7 mbar	10.0" w.c. 24.9 mbar

Pilot Orifice Size Chart	
<b>Natural</b>	BCR-24
<b>LP</b>	BCR-18

## STARTING AND SHUTTING DOWN THE BURNER

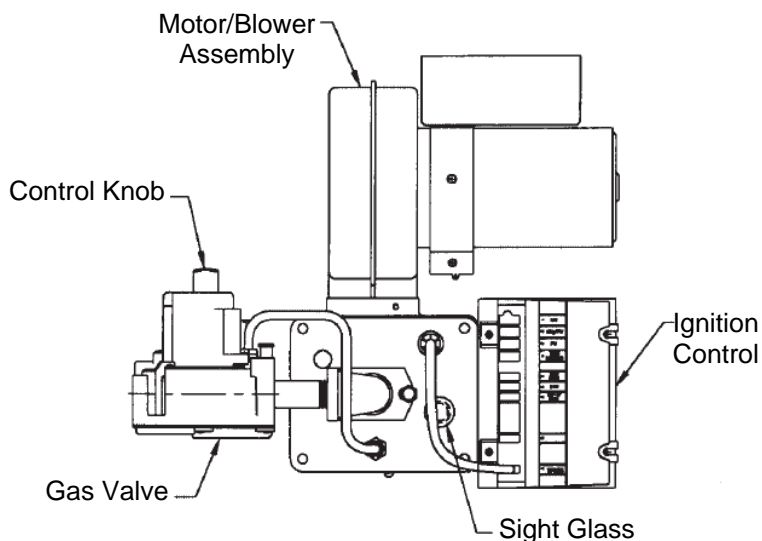
Starting the Burner:

1. Gas supply must be on, product loading doors closed.
2. For smokers equipped with the standard CV thermostat:  
Main power switch on, thermostat set to the desired cooking temperature.  
For smokers equipped with the optional cook and hold thermostat:  
Press the cook temp button and use the up or down buttons to select the desired cooking temperature. Press the cook time button to select the desired cook time. Press the hold button to select the desired holding temperature or to turn hold off the hold feature. Press the start/stop button to start the menu.
3. The burner should light and bring the smoker up to the set point temperature.

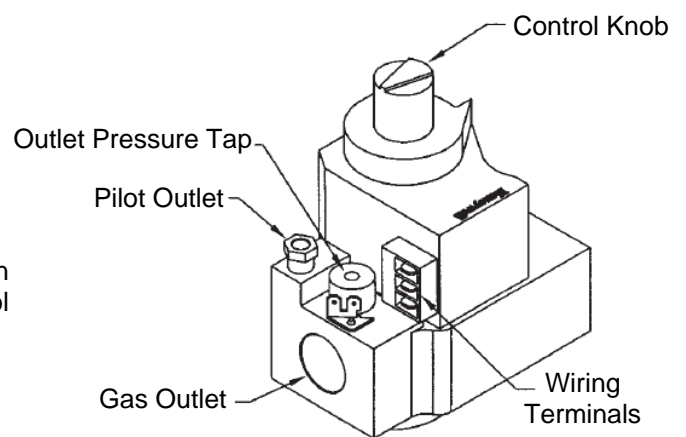
Shutting Down the Burner:

1. For smokers equipped with the standard CV thermostat:  
Main power switch off, or press the down button on the thermostat until "OFF" is displayed.  
For smokers equipped with the optional cook and hold thermostat:  
Press the start/stop button until "idLe" is displayed.

### Burner Overview



**Burner - Electrical Pilot**



**Combination Gas Valve**

## SEQUENCE OF FENWAL IGNITION CONTROL MODULE (CURRENT MODULE)

### First Stage: Trial for Pilot Ignition

On every call for heat (system start), ignition control perform a self-check routine, flash the diagnostic LED and move to trial for ignition. During the trial for ignition the pilot gas valve is energized and sparking commences. The main gas valve remains de-energized until the pilot flame is detected. Should pilot fail to light or the pilot flame is not detected the pilot valve will de-energize and the ignition control goes through an inter-purge delay. After the inter-purge delay, the ignition control will try an additional ignition attempt and if no flame is detected it will repeat the inter-purge delay one more time before trying a final time for ignition. If no flame is detected on the final trial, then the pilot gas valve will de-energize and control will go into a “lock-out” condition. If this occurs, proceed to the section Safety Lock-Out.

### Second Stage: Main Burner Operation

When the pilot flame is established the ignition control’s flame sensing circuit detects the flame current and shuts the spark generator off. At the same time the main gas valve operator is opened in the gas control, allowing gas flow to the main burner. The pilot flame ignites the main burner conventionally.

### Safety Lock-Out

The trial for ignition timer circuit starts timing the moment the trial for pilot ignition starts. If the designated trial for ignition time expires prior to the detection of a pilot flame, the ignition control will try two additional ignition trials after an inter-purge delay before each trial. If no flame is detected after three trials for ignition, the control will go into a “lock-out” condition. Before another attempt to start the burner can be made, the ignition control must be reset.

For smokers equipped with the standard CV thermostat:

- Turn the main power switch to the OFF position, or adjust the thermostat below the set point temperature, or until it displays “OFF”.
- Wait one minute and then turn the main power switch to the ON position, or reset the thermostat to the desired cooking temperature.

For smokers equipped with the optional cook and hold thermostat:

- Press the start/stop button until “idLe” is displayed.
- Wait one minute and then restart the cook cycle by pressing the start/stop button.
- Alternatively, the control will automatically reset after 7 minutes if the control does not sense a rise in temperature inside the smoker. This will allow the burner to go through another trial for ignition as described above. If after another full three tries for ignition the burner does not fire the control will display “Bfail” to indicate the burner failed to light after 6 trials for ignition and will turn the burner output off.

If normal ignition does not occur, use Section 3: Servicing and Troubleshooting to determine the problem.

## SEQUENCE OF HONEYWELL IGNITION CONTROL MODULE (OBSOLETE MODULE)

### First Stage: Trial for Pilot Ignition

On every call for heat (system start), the ignition control opens the pilot gas valve operator in the gas control. This allows gas to flow to the pilot burner. Simultaneously, the electronic spark generator in the S8600 produces a 15,000 volt spark pulse output. This voltage produces a spark at the pilot burner igniter-sensor rod, igniting the gas flowing around the electrode. If the pilot flame is not detected during the trial for pilot ignition, the ignition control will go into a “lock-out” condition. If this occurs, proceed to the section Safety Lock-Out.

### Second Stage: Main Burner Operation

When the pilot flame is established the ignition control’s flame sensing circuit detects the flame current and shuts the spark generator off. At the same time the main gas valve operator is opened in the gas control, allowing gas flow to the main burner. The pilot flame ignites the main burner conventionally.

### Safety Lock-Out

The trial for ignition timer circuit starts timing the moment the trial for pilot ignition starts. If the designated trial for ignition time expires prior to the detection of a pilot flame, the ignition control will go into a “lock-out” condition. Before another attempt to start the burner can be made, the ignition control must be reset.

For smokers equipped with the standard CV thermostat:

- Turn the main power switch to the OFF position, or adjust the thermostat below the set point temperature, or until it displays “OFF”.
- Wait one minute and then turn the main power switch to the ON position, or reset the thermostat to the desired cooking temperature.

For smokers equipped with the optional cook and hold thermostat:

- Press the start/stop button until “idLe” is displayed.
- Wait one minute and then restart the cook cycle by pressing the start/stop button.
- Alternatively, the control will automatically reset after 7 minutes if the control does not sense a rise in temperature inside the smoker. This will allow the burner to go through another trial for ignition as described above. If after the trial for ignition the burner does not fire the control will display “Bfail” to indicate the burner failed to light after 2 trials for ignition and will turn the burner output off.

If normal ignition does not occur, use Section 3: Servicing and Troubleshooting to determine the problem.

## SECTION 2: GENERAL SERVICING INSTRUCTIONS



### WARNING:

**Gas burners require an experienced technician for proper service and adjustment. If the burner does not appear to be operating properly, DO NOT ATTEMPT TO ADJUST THE BURNER YOURSELF, but call in a competent service technician.**

A smoker owner should be able to check several possible causes of shutdown before calling in a service technician. The following check list may eliminate the need for a service call or at least provide information for the service technician.

1. Check to be sure there is electrical power to the smoker.
2. Check that the gas shut off valves in the supply line to the smoker are turned on.
3. Product loading doors must be closed.
4. Check thermostat. Make sure that it is set at the desired cook temperature. If the thermostat appears to be damaged have it replaced or repaired.
5. Check that the main power switch is on for smokers with the CV control. For smokers with the cook and hold control, make sure the control is on and not off or in idle or pause.
6. With the thermostat set 10 degrees above the temperature inside the smoker, the burner should start automatically. If it does not start, check pilot. If no flame is visible, turn the burner off, wait 1 minute and turn it back on. If the burner still does not light contact a technician.
7. To see a list of service agents in your area go to [www.southernpride.com](http://www.southernpride.com), click on Service and Support and then Service Company Locator. Type in your zip code for a list of service companies nearest you.

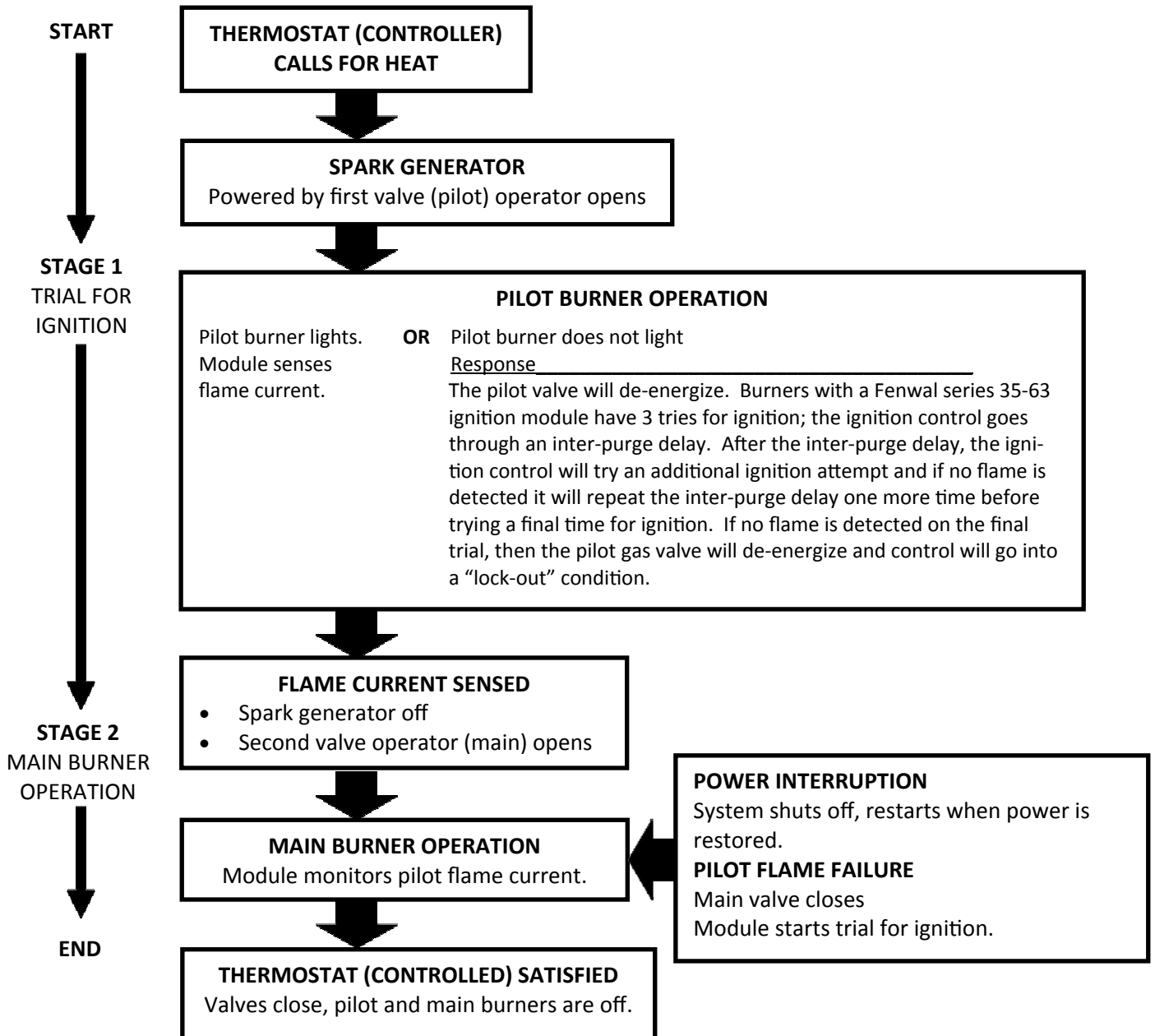
It is advisable, periodically, to visually inspect the burner. Check air inlet blower to make sure it is not clogged or blocked. Check air shutter to make sure that it has not been tampered with, make sure that it is in the same position as when final adjustments were made. Check blower wheel to see if it is dirty or full of grease and creosote. Open observation door and check pilot flame. If the flame does not appear normal or if in doubt, call a service technician. The areas around the burner should be kept clear and free of combustible materials, gasoline and other flammable vapors and liquids. The flow of combustion and ventilating air to the burner must not be blocked or obstructed in any manner.

### SECTION 3: SERVICE AND TROUBLESHOOTING

#### CLEANING OF BURNERS (BY SERVICE TECHNICIAN ONLY):

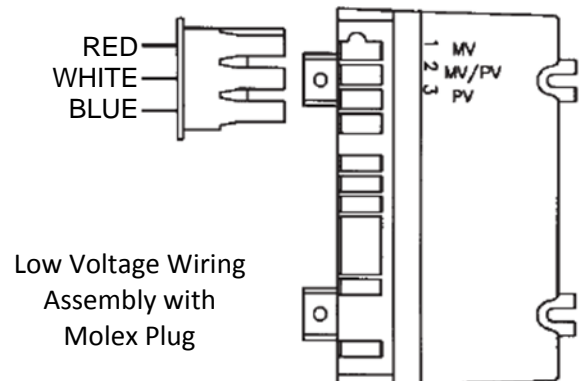
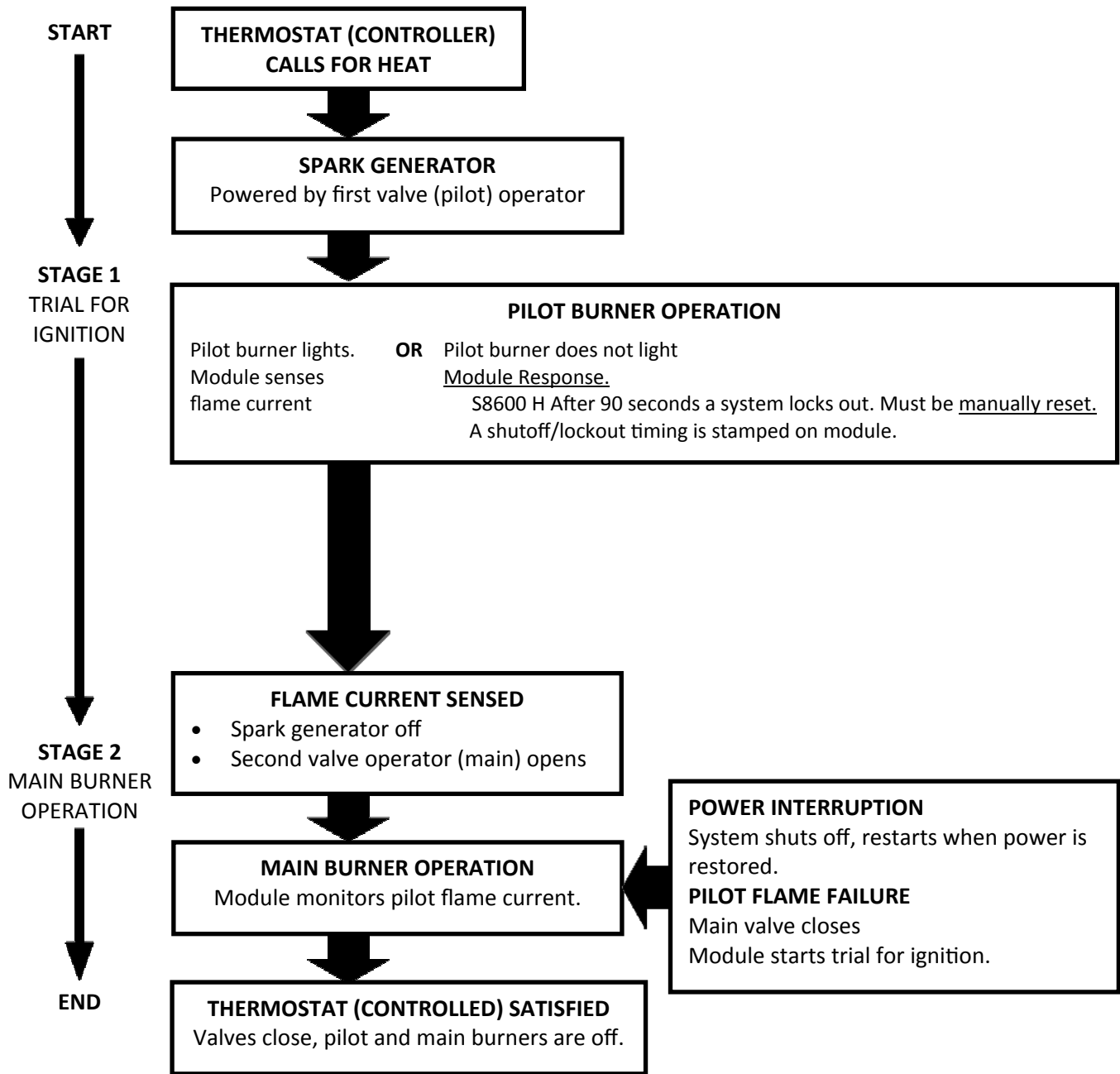
1. Remove the burner from the smoker and visually inspect the blast tube for any deterioration.
2. Inspect pilot burner for dust or corrosion and clean if necessary.
3. Check pilots, thermo-couples, electrodes, etc. with illustrations in this manual for proper locations.
4. Check flame spreaders for any deterioration and replace if necessary.
5. Remove corrugated flame ring from the end of the venturi and clean. Visually inspect the inside of the venturi for any excessive rust or corrosion and clean if necessary.
6. Replace corrugated flame ring and reinstall burner.

#### SEQUENCE OF OPERATION - FENWAL IGNITION CONTROL MODULE





## SEQUENCE OF OPERATION - HONEYWELL IGNITION CONTROL MODULE



## TROUBLESHOOTING GUIDE (FENWAL OR HONEYWELL IGNITION CONTROL MODULE)

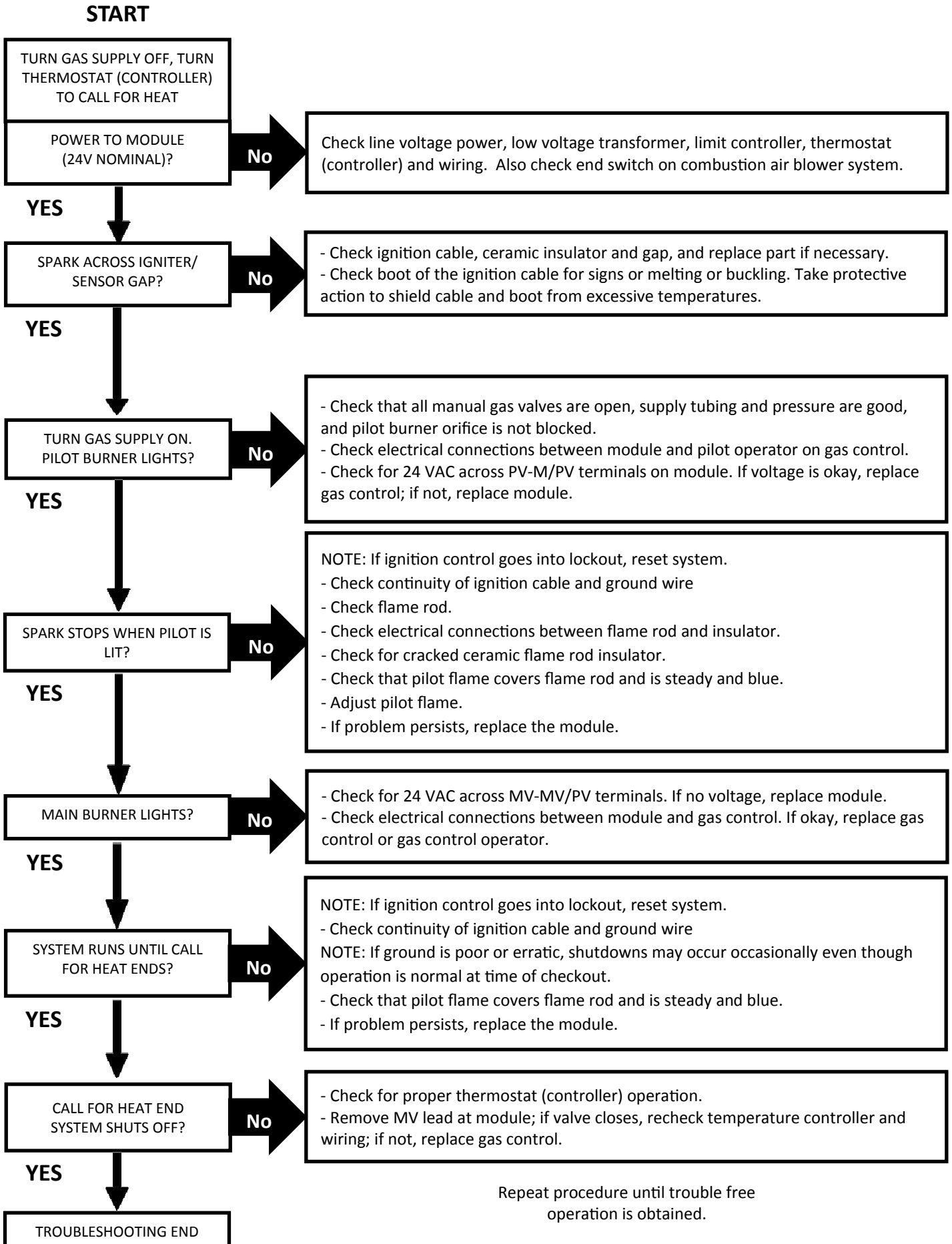
1. Start the system by setting the thermostat or controller above required temperature.
2. Observe system response. Establish type of malfunction or deviation from normal operation.
3. Use the flowchart on the next page to check for normal system operation by following instruction question in box. If the condition is true or okay (answers yes), go down to next box underneath, if the condition is not true or not okay (answers no), go right to the next box alongside.
4. Continue checking and answering conditions in each box encountered, until a problem and/or the repair are explained.
5. After any maintenance or repair, the troubleshooting sequence should be repeated until the troubleshooting procedure ends with normal system operation.

**IMPORTANT:** The ignition control module cannot be repaired. If troubleshooting procedure indicates a malfunction in the ignition control module, it must be replaced. Intermittent pilot systems should be serviced only by trained and experienced personnel.

### TROUBLESHOOTING CHART (FENWAL IGNITION CONTROL MODULE)

Symptoms	Possible Causes
1. PILOT DOES NOT LIGHT.	<ul style="list-style-type: none"> <li>a. Air in gas line.</li> <li>b. High or low gas pressure.</li> <li>c. Blocked pilot orifice.</li> <li>d. Broken or damaged ignition cable.</li> </ul>
2. MOTOR DOES NOT RUN.	<ul style="list-style-type: none"> <li>a. Thermostat or limit defective or improperly set.</li> <li>b. Relay or transformer defective.</li> <li>c. Motor burned out.</li> <li>d. Improper wiring.</li> </ul>
3. MOTOR RUNNING BUT NO FLAME.	<ul style="list-style-type: none"> <li>a. Very low or no gas pressure to pilot.</li> <li>b. High gas pressure to pilot.</li> <li>c. Defective regulator.</li> </ul>

## BURNER TROUBLESHOOTING FLOWCHART



## PRELIMINARY CHECKS, DIAGNOSIS, AND SERVICE HINTS

Although the following tests can be made using standard volt meter, it is quicker and more convenient to use a Fenwal Model 05-125539-001 Test Adapters.

### 1. Input Polarity

If a spark is present and the gas valve opens for the flame establishing period but the control locks without sensing flame, check the input voltage at terminals 1 and 6 for the proper polarity. Terminal TH or 24V should be “hot”; 24VAC (05-16) with respect to ground. Terminal GND is neutral, or zero voltage, with respect to ground.

### 2. Improper Grounding

If a flame is present during the Trial for Ignition period but the system shuts down, ensure that the burner is properly grounded. If the burner is not grounded, the flame monitoring signal will not function and the system will go into lockout. Check for loose or corroded terminals and replace if necessary. Ensure good electric connection by scraping paint or any other foreign matter off the area where ground connection is made.

It is equally important to be certain that the electrode bracket assembly is properly grounded. The bracket should be common with the ground lead on the input connector (ground terminal 6). If the bracket is not properly grounded, damage to the ignitor can result.

### 3. Inoperative High Voltage

If there is no spark or sparking is intermittent, check the following after disconnecting voltage to the system.

- a. Check spark gap. Gap should be  $1/8$  (3.2mm) +/-  $1/32$ " (.8mm) from H.V. to ground.

**CAUTION: NEVER REPLACE THE COMPONENT BOARD WITHOUT FIRST CHECKING TO ENSURE THAT THE ELECTRODE HAS THE PROPER GAP. IF THE GAP IS TOO WIDE, DAMAGE TO THE IGNITOR CAN RESULT.**

- b. Check electrode leads and determine there is no corrosion at the terminals. If there is corrosion, clean it off. **DO NOT USE LIQUIDS TO CLEAN TERMINALS.** Use steel wool or a small wire brush to clean.
- c. Check ceramic insulators for cracks, foreign matter, and carbon. If there are cracks, replace electrodes. If there is carbon or foreign matter, clean it off. **DO NOT USE LIQUIDS TO CLEAN.** Use steel wool or a small wire brush to clean.
- d. Check high voltage lead wire for cracks or breaks. If there are cracks, breaks or chafing, replace high voltage wire.
- e. Check to ensure that the high voltage terminal is clear of dust, moisture or any foreign matter that could create high voltage leakage to ground.

## PRELIMINARY CHECKS, DIAGNOSIS, AND SERVICE HINTS (CONTINUED)

### 4. Valve Malfunction

With power applied to the ignitor, sparking should occur and the solenoid valve should open simultaneously. If sparking occurs but the valve does not open, place a volt meter between Terminal PV1 and ground (or across valve). If valve does not function with voltage, it should be replaced. If the voltage is not present at Terminals PV1 and ground (or across valve), the control should be replaced.

### 5. Electrode Placement

- a. Electrode should be placed so optimum flame current is achieved for proper application.
- b. Flame should not impinge on any portion of ceramic insulator.

### 6. Flame Current

The flame detector circuit uses the ionized gas flame to conduct the flame signal. This signal is a small DC current which can be measured directly with a 0 to 50 microamp meter.

The minimum flame current necessary to keep the Honeywell or Fenwal control from going into lockout is 0.8 microamps, the lowest recommended flame current is 1.5 microamps for Honeywell or Fenwal ignition controls.

To measure flame current, first shut off the power to the system and then connect a DC micro amp meter to the FC+ and FC- terminals. Energize the ignitor. If the meter reads below zero, shut the system off and reverse the meter leads.

Once the flame is established, assure that the flame current is above the minimum specified. If not, assure that the system has the proper input voltage, and then adjust the pilot line gas pressure until flame current is increased.

Once the flame is has been established and the system is in its heat cycle, occasional sparking may occur. This is common in some installations and is not significant. Sparking will not damage the ignitor.

## **SECTION 4: COMPONENT TROUBLESHOOTING AND DIAGNOSIS**

### **24 VOLT TRANSFORMER MALFUNCTION**

The 24 volt transformer has a 115 volt primary side with a 24 volt secondary circuit. To check the transformer, simply apply 115 volts to the black and white leads. If the transformer is working correctly, 24 volts will be present across the two yellow leads. If the multimeter does not register 24 volts then the transformer needs to be replaced. The transformer will not function unless 115 volts are present across L1 and neutral.

### **COMBUSTION FAN END SWITCH**

The 115 volt motor is equipped with a centrifugal end switch. The purpose of the end switch is to ensure that the combustion fan motor has reached the proper operating RPM which is generally about 3400 rpm. If the end switch fails to close then the 24 volt circuit to the gas primary is interrupted and the gas valve will not open. If the blower motor has 115 volts applied but is not rotating then the motor assembly must be replaced. Lastly if the motor is not rotating, the centrifugal switch will not make and 24 volts will not be present at the gas primary control.

### **IGNITER ROD**

The igniter rod is responsible for conveying the spark to a grounding rod in an appropriate location to ignite the gas and air mix. The igniter rod gap should be 1/8", larger gaps will create ignition problems. If the igniter rod is cracked, sparking sound will be heard inside the burner air tube but ignition will not occur and lockout will occur.

## MORE SERVICE HINTS

THERMOSTAT CALLS FOR HEAT AND THE FOLLOWING CONDITIONS OCCUR:

1. PROBLEM: The combustion fan motor is not operating.

Possible Reasons:

- a. Power is not on.
- b. Circuit breaker tripped.
- c. Thermostat in the off position.
- d. Bad thermostat.
- e. Blower wheel jammed.
- f. Debris stuck in blower wheel blades.
- g. 24 volt transformer is not functioning properly.
- h. Motor shorted out due to over voltage.

2. PROBLEM: Combustion fan motor runs but ignition sequence does not occur.

Possible Reasons:

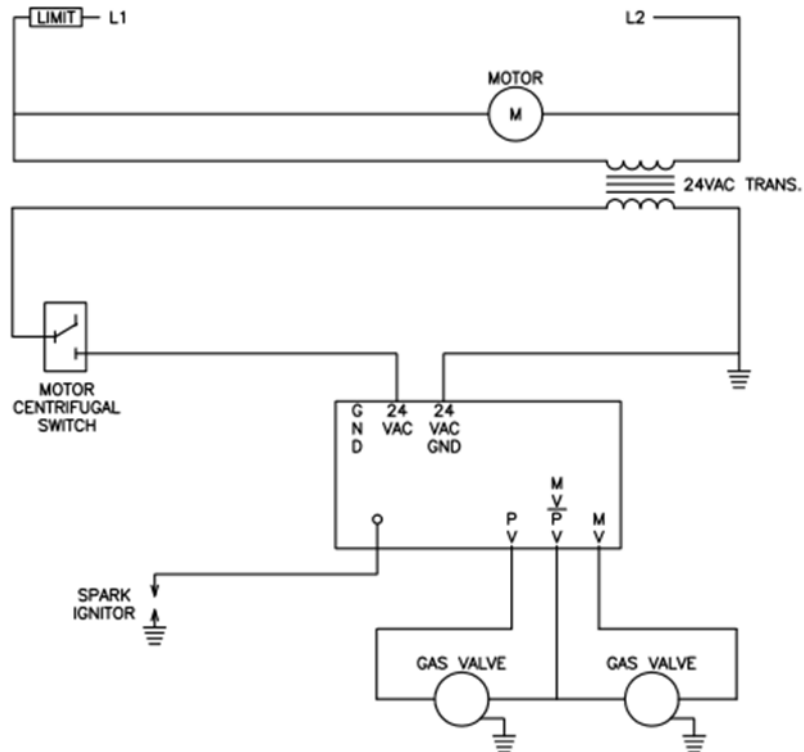
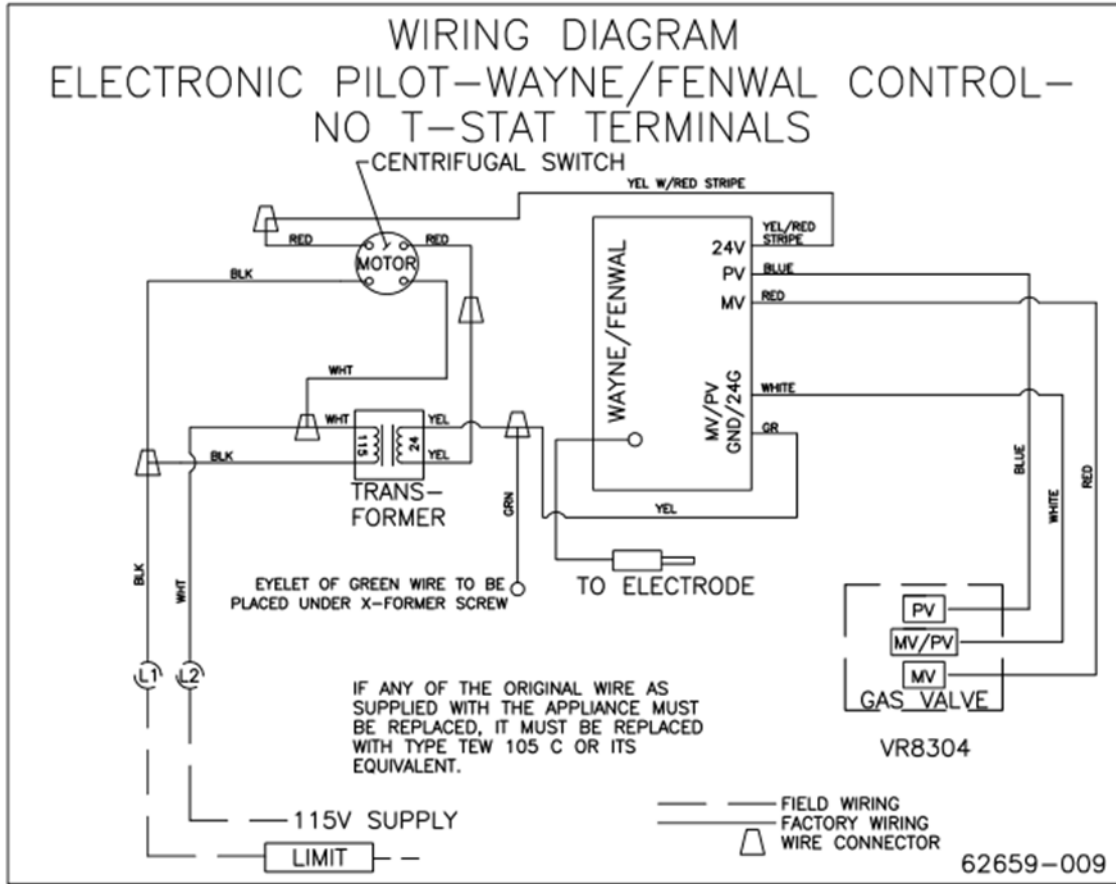
- a. Blower motor end switch not closed which completes the 24 volt circuit to the gas primary.
- b. The blower motor is not reaching full rpm due to debris on wheel.
- c. Low voltage to the blower motor.
- d. Loose connections on the 24 volt circuit after the end switch.
- e. The gas primary control is defective and must be replaced.

3. PROBLEM: Combustion fan motor runs and ignition sequence initiated but goes into lockout.

Possible Reasons:

- a. Spark electrode rod is cracked shorting spark to ground.
- b. Loose connection on spark electrode rod.
- c. Gas primary control not allowing 24 volts to gas valve.
- d. Gas valve shorted out or defective.
- e. No ground between burner and appliance.
- f. Spark electrode location shifted.
- g. Ignition wire insulation melted and is grounding out on burner.
- h. Gas supply is not turned on.
- i. Gas manifold pressure is too high.
- j. Gas manifold pressure is too low.
- k. High negative draft conditions.
- l. Gas supply line is undersized.
- m. Multiple appliances operating on undersized line.
- n. Insufficient combustion air flow.
- o. Incorrect air shutter adjustment allowing too much combustion air to enter burner.

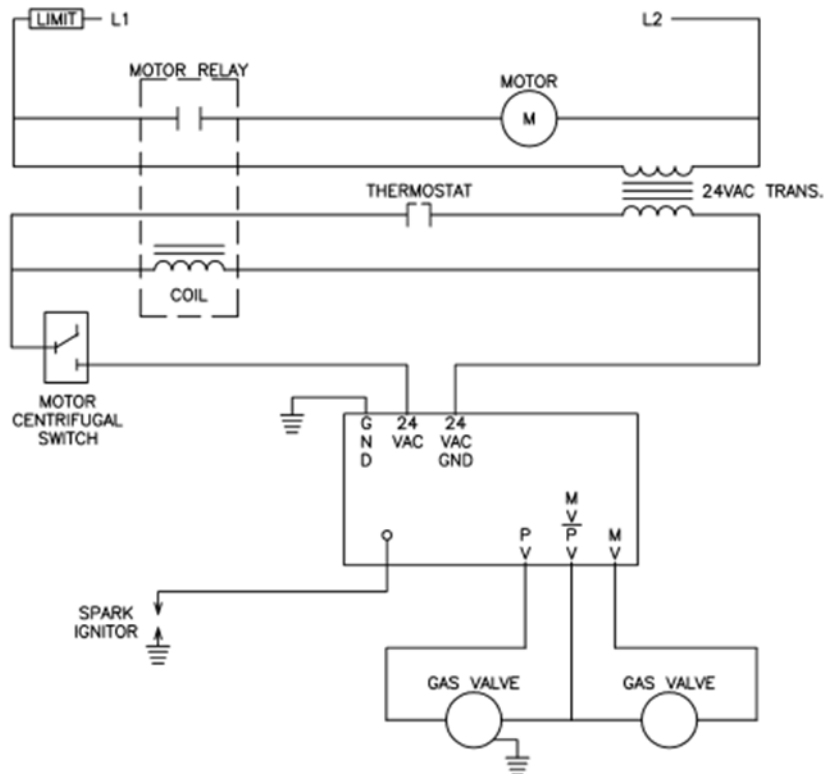
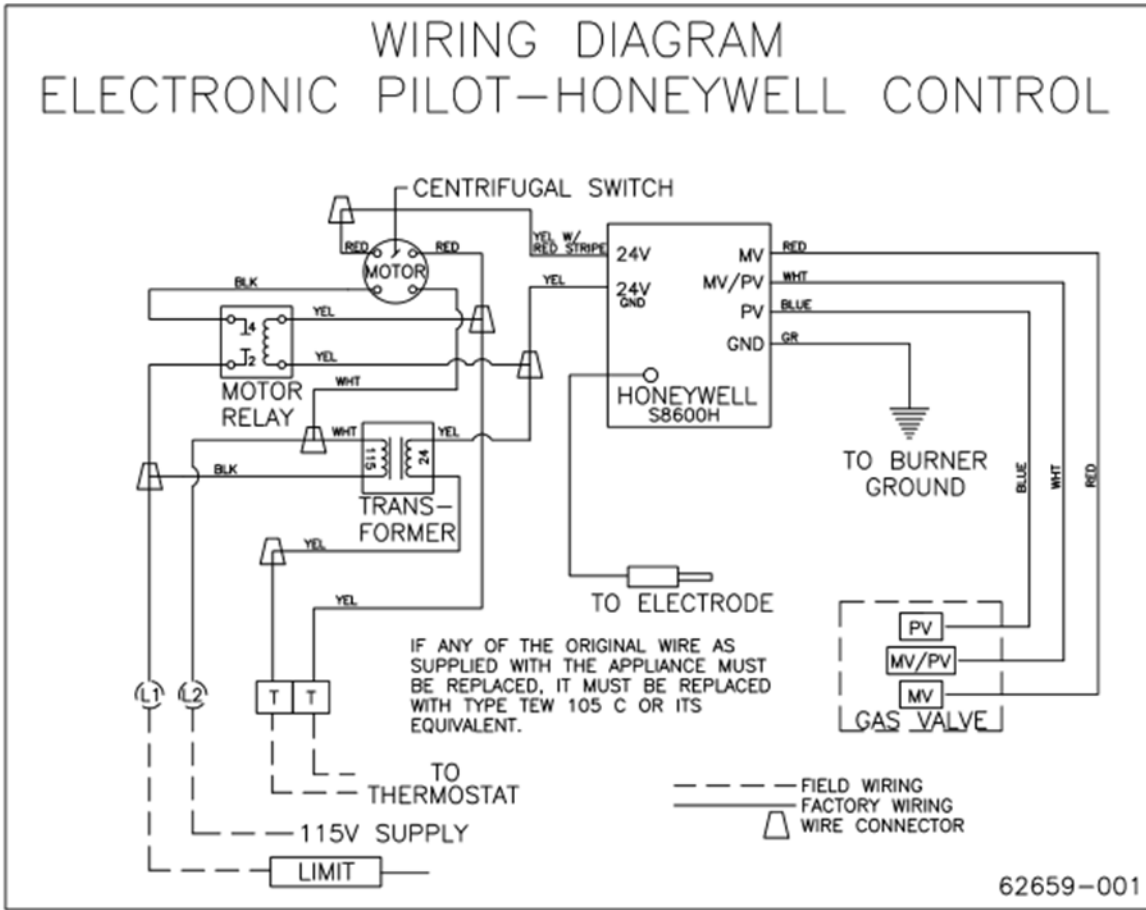
# WIRING DIAGRAM FOR FENWAL CONTROL EQUIPPED BURNER



LADDER WIRING DIAGRAM



WIRING DIAGRAM FOR HONEYWELL CONTROL EQUIPPED BURNER



LC LADDER WIRING DIAGRAM