

Troubleshooting Electronic Ignition

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This session is designed to provide a broad approach to troubleshooting electronic ignition systems. Various hearth electronic systems will be discussed as well as common methods of diagnosing most frequently encountered electronic ignition problems.

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ELECTRONIC IGNITION

Things to Make Life Easier

ELECTRONIC IGNITION WITH MODULE

- **Caution:** Electrical supply to be tested is possibly 110 VAC. Precautions should be taken to eliminate the possibility of electrical shock or electrocution. This includes but is not limited to, not touching live electrical equipment while: standing on damp or wet surfaces, standing on metal floors, wearing damp or wet clothing or creating or encountering any condition which would provide a positive ground.

ELECTRONIC IGNITION SYSTEM 120 V INPUT

Set multimeter to VAC setting and to read 120 volts

Place black lead in "COM" port and red lead in "V" port

Insert leads into receptacle. Meter should read 110 volts or higher

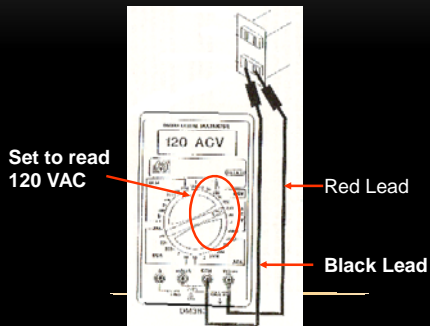
SETTING TO CORRECT RANGE



TESTING POWER SOURCE



Testing Power Source



ELECTRONIC IGNITION SYSTEM 120 V INPUT (CONTINUED)

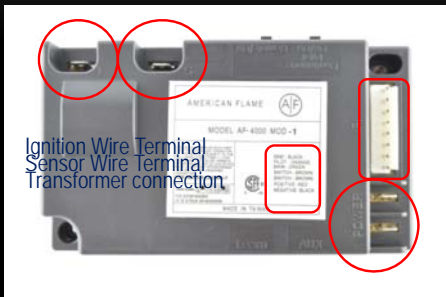
If there is no power:

- Check circuit breaker is on
- Check wiring to "J" box
- Verify receptacle is not switched
- If still no power, have homeowner contact electrician to check system

ELECTRONIC CONTROL MODULE

Control modules vary in their design and function. Some operate off of wall current stepped down through a transformer and others use direct current from a battery pack. Some VAC will take one wire directly from the transformer to the controlling device, others run both wires through the module. What follows is a GENERAL overview for troubleshooting electronic ignition. To better understand, you must know particulars for each system.

AMERICAN FLAME CONTROL MODULE



DEXEN CONTROL MODULE



SIT CONTROL MODULE

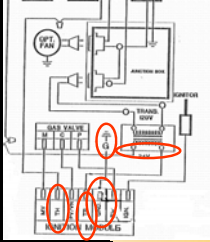


ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

1. Determine voltage being used by the valve/module manufacturer
2. Verify power supply (AC/DC adapter) is present and/or that all batteries are fresh and installed with correct polarity.
3. Verify power supply adapter is producing proper output voltage

ELECTRONIC CONTROL MODULE

No spark at pilot hood



Check voltage through transformer
Or where transformer connects to module and where controlling device wire connects to module
Check for proper ground and continuity of wire

DEXEN TRANSFORMER



TAKING TRANSFORMER READING



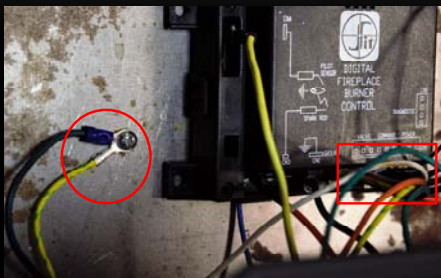
TAKING TRANSFORMER READING



ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

- 4. Verify wiring harness is firmly positioned on harness block and check for damaged wires
- 5. Check ground wire for any damage and verify a good contact to ground. Caution: do not ground to a painted surface
- 6. Make sure transmitter and receiver are communicating

VERIFYING GROUND AND HARNESS



ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

7. Verify utility has turned on gas supply and all gas valves are in on position


8. Check inlet pressure is correct

ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

No spark at pilot hood

1. Confirm module is not locked out by turning appliance to a non-demanding position, waiting 15 seconds and turning back to a demand position. **If back up batteries are installed, they must also be removed to reprogram.** If there is a spark, module was locked out. If no spark, proceed as follows: _____

BATTERY PACK



ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

No Spark to Pilot Hood

2. Verify transformer is plugged in and connected to module. Check voltage through transformer (voltage generally matches voltage from Dc back up)
3. Verify the "S" sensor wire and the "I" ignition wire are connected to their proper terminals on the module and pilot assembly

ELECTRONIC CONTROL MODULE

Verify wiring for igniter and sensor



ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

No spark at pilot hood

4. Ensure ground wire is properly connected to module and ground
5. Verify gap between electrode and pilot/burner is correct (approx. 1/8")
6. Make sure electrode and pilot hood/burner are clean of any debris

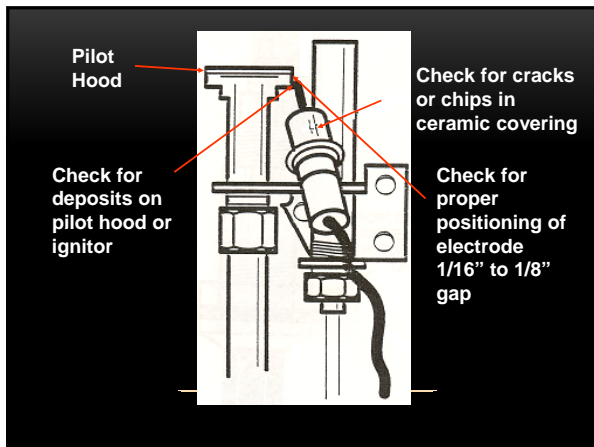
CHECK PILOT ASSEMBLY



ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

No spark at pilot hood

- 7. Check electrode for chips or cracks in porcelain. If either are present, change electrode
- 8. Check continuity on wire between module and electrode. Replace as necessary



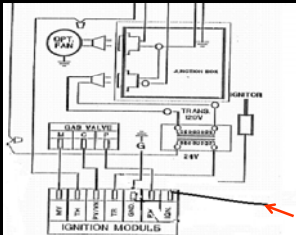
ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

No spark at pilot hood

9. Remove wire from module to electrode at module. Place jumper on terminal at module and place other end 1/8" away from ground. Turn to demand position, if no spark—replace module, if there is a spark—replace electrode

ELECTRONIC CONTROL MODULE

No spark at pilot hood



Disconnect wire to igniter and place jumper on module terminal. Place opposite end 1/8" from ground

ELECTRONIC CONTROL MODULE

Jumping igniter to ground



ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

No spark at pilot hood

- 10. Verify controlling device is wired properly
- 11. Determine if controlling device is good

ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

Pilot flame does not light

- 1. Verify inlet pressure is correct (natural 7-15"wg, propane 11-15"wg)
- 2. Make sure all gas valves are in on position
- 3. Verify gas is going to pilot
- 4. Check if pilot orifice is clear of any debris
- 5. Verify gap between pilot hood/burner and electrode

ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

Pilot flame does not light

- 6. Follow wire from module to controlling device. Disconnect wire at controlling device and check for voltage as designated by Manufacturer.
 - a. If no, check continuity of wire and replace if necessary
 - b. If wire is good but still no voltage, replace module

ELECTRONIC CONTROL MODULE

Pilot flame does not light

Check voltage as designated by Mfr.

ELECTRONIC CONTROL MODULE

Pilot flame does not light

Check wiring continuity. If good, and still no voltage replace module. If bad replace wire

ELECTRONIC CONTROL MODULE

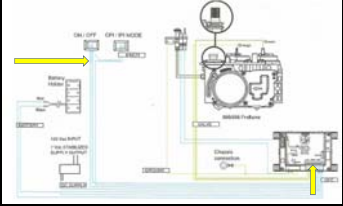
Pilot flame does not light

If voltage is present, check voltage through controlling device. If no voltage in demand position, replace controlling device

ELECTRONIC CONTROL MODULE

Pilot flame does not light

If voltage is present through controlling device, check continuity of wire where it connects to module. If good, replace module, if bad replace wire



ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

Pilot flame does not light

6. continued

- c. If voltage is present, check voltage through controlling device, if no replace controlling device
- d. If voltage is present through controlling device, check for voltage where wire loop returns to module. If no, replace wire.

ELECTRONIC CONTROL MODULE TROUBLESHOOTING (GENERAL)

Pilot flame does not light

7. Determine wire going from module to gas valve controlling pilot. Check wire for continuity. Replace if bad

- a. If designated voltage is present at gas valve, replace valve.

ELECTRONIC CONTROL MODULE
Pilot flame does not light

Check for voltage at wire going to valve where it controls pilot, if voltage present—replace valve. If no voltage check for continuity. If wire is good replace module.

ELECTRONIC CONTROL MODULE
Pilot lit, electrode keeps sparking

1. Make sure pilot flame is engulfing sensor, if not adjust as necessary
2. Verify sensing wire is connected to module and module is grounded
3. Ensure flame sensor and pilot hood are clean of any debris
4. Confirm the flame sensor has continuity, if no replace the flame sensor. If continuity found, replace module

ELECTRONIC CONTROL MODULE
No gas to burner

1. Verify remote sender is turned on
2. Verify controlling device is in demand
3. Make sure valve is in on position
4. Make sure burner supply line is not crimped or obstructed
5. Ensure burner orifice(s) is clear
6. Verify pressure at outlet tap is good

ELECTRONIC CONTROL MODULE

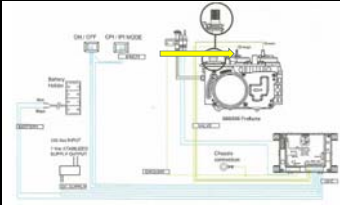
No gas to burner

7. Determine wire going to gas valve that controls burner. Disconnect and check for voltage. If none check wire for continuity
8. If wire is bad, replace if there is continuity, replace module
9. If voltage present, replace gas valve
10. Verify ground is good

ELECTRONIC CONTROL MODULE

No gas to burner

Check for voltage at wire going to valve where it controls burner, if voltage present—replace valve. If no voltage check for continuity. If wire is good replace module.



SIT PRO FLAME

Before proceeding with troubleshooting:

- Verify power supply (AC/DC adapter) is present and that all batteries are fresh and installed with correct polarity**
- Make sure all connections between wire harnesses and system components are proper and positive**
- Make sure communication link between transmitter and receive is established**

SIT PRO FLAME

Before proceeding (continued)

Verify inlet pressure is correct

Verify all gas valves are turned to on position

If actions for troubleshooting do not help, consider replacing wiring harness



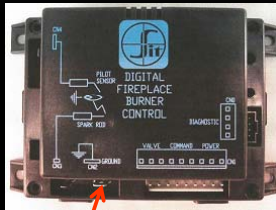


SIT PRO FLAME

No spark at pilot hood:

1. Ensure the DFC is not locked out by turning the unit off then back on. If there is now a spark, unit was locked out
2. Confirm the ground wire is properly connected to the CN2 on the DFC module (yellow wire)
3. Check output of transformer for correct voltage (approximately 6.5 to 7 volts DC)

NO SPARK AT PILOT HOOD



Verify CN2 wire is grounded properly

NO SPARK AT PILOT HOOD



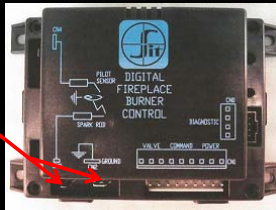
SIT PRO FLAME

No spark at pilot hood (continued)

- 3. Is a spark seen at the CN3 electrode connection at the DFC module and ground wire? Confirm connection is firmly seated
- 4. Disconnect the electrode from CN3. Attach a jumper wire to CN3. Place other end of jumper 1/8" away from from the ground/valve and turn unit on. If there is a spark, replace electrode. If no spark replace DFC module

NO SPARK AT PILOT HOOD

Make sure there is no spark between CN2 and CN3



NO SPARK AT PILOT HOOD

Jumper CN3 to ground

GROUND



SIT PRO FLAME

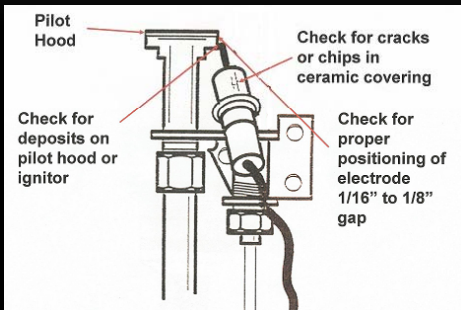
No spark at pilot hood:

- 5. Verify gap between electrode and pilot hood
- 6. Make sure there are no deposits on igniter or pilot hood
- 7. Make sure porcelain on igniter is not cracked. If it is--replace

CHECK PILOT ASSEMBLY



NO SPARK AT PILOT HOOD



SIT PRO FLAME

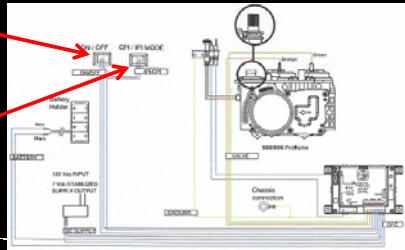
Pilot flame does not light:

1. Check for 3 to 5 volts DC at green wire attached to on/off switch. One lead to green one lead to white. If no, replace DFC module
2. Check continuity through CPI/IPI switch. If no, replace switch
3. Check the blue wire at the CPI switch for about 3 volts. If no, replace DFC module

PILOT DOES NOT LIGHT

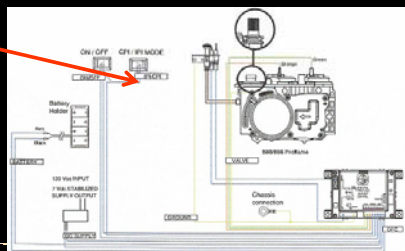
Check for 3 volts at on/off switch

Check continuity through CPI/IPI switch



PILOT DOES NOT LIGHT

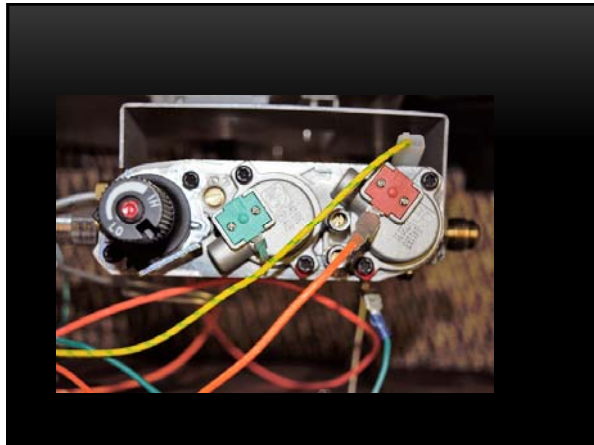
Check for 3 volts at blue wire at CPI switch



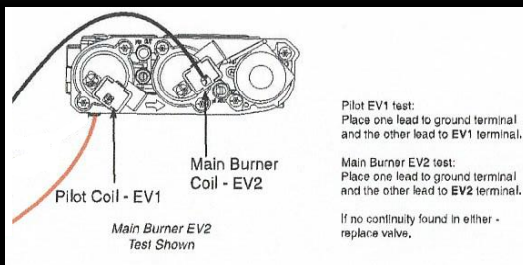
SIT PRO FLAME

Pilot does not light (continued)

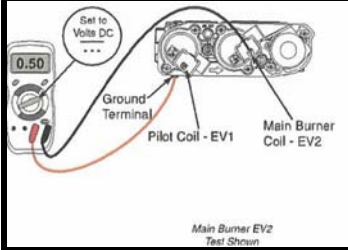
4. Check continuity at the EV1 pilot coil to ground. If no continuity, replace valve
5. Confirm the orange wire is connected to EV1 pilot coil
6. Check the voltage at EV1 pilot coil to ground. When switched on, there should be 5 to 6 volts DC for 2 seconds to open valve then drops to ~~5 DC to continue~~ holding open. If no voltage, replace DFC module



PILOT DOES NOT LIGHT



PILOT DOES NOT LIGHT



Place one lead to ground terminal and the other lead to EV1 to test pilot coil or EV2 to test main burner coil

When switch turned on, meter should read 5 VDC for 2 seconds, then drop to approx. 0.5 VDC

No voltage present—replace DFC

Note: Pilot must prove before EV2 test shows voltage

SIT PRO FLAME

Pilot flame does not light:

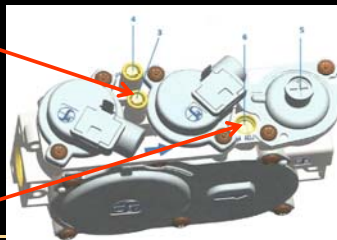
7. Check incoming pressure
8. Verify gas is flowing to pilot. Adjust pilot flow or replace crimped pilot tubing
9. Verify pilot orifice is clear and pilot primary air opening is clean. Replace orifice or pilot assembly if necessary
10. Verify gap between pilot hood and igniter

PILOT DOES NOT LIGHT

Check incoming pressure

Check to see if pilot tubing is crimped.

Adjust pilot as necessary



SIT PRO FLAME

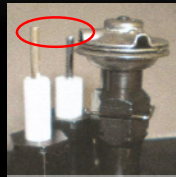
Pilot lit, electrode keeps sparking

1. Make sure pilot flame is engulfing sensor, if no adjust as necessary
2. Verify sensing wire is connected to DFC and DFC is grounded
3. Ensure flame sensor and pilot hood are clean
4. Confirm the flame sensor has continuity, if no replace the flame sensor. If continuity found, replace DFC module

ELECTRODE KEEPS SPARKING

Make sure pilot flame engulfs flame sensor

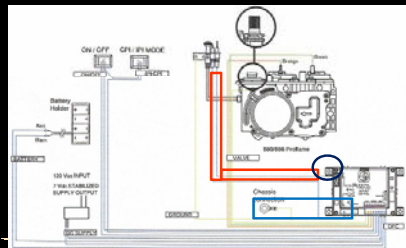
Ensure sensing rod and pilot hood are clean



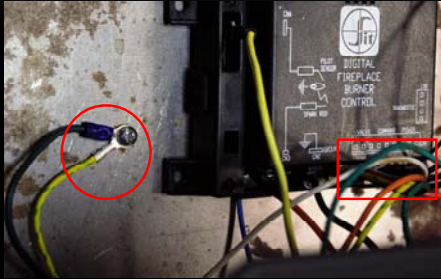
ELECTRODE KEEPS SPARKING

Check continuity of sensing wire.

Check to make sure it is connected to DFC and DFC is grounded



GROUND FROM DFC



SIT PRO FLAME

Burner does not come on

1. Check batteries in sender and receiver
2. Check receiver switch is set to remote
3. Check transmitter is turned on
4. Ensure receiver and sender are synchronized
5. Verify thermostat is in demand position

SIT PRO FLAME

Burner does not come on

6. Make sure pilot is positioned to provide ignition
7. Verify burner orifice is clear and correct size
8. Remove wiring harness from EV2 of gas valve (red base) and verify voltage at ignition between the EV1 terminal and the ground connection on the (continued)



SIT PRO FLAME

Burner does not come on

8. (continued) valve body. Voltage should be between 3 and 6 volts DC to open valve. Then .5 to 1 volt to hold valve open
9. Check outlet pressure



SIT PRO FLAME

Burner flame does not modulate

1. Check modulator for continuity. Disconnect the black plug from wiring harness. On back side, place one lead on orange wire and other on yellow. Reading should be approximately 26 ohms. Also check continuity between black and yellow wires. Ohms should be same as above.



SIT PRO FLAME

Burner flame does not modulate

2. For manual Hi/Lo version rotate Hi/Lo knob on front of gas valve. If there is no change, replace valve

3. For stepper motor, check for proper wiring and inspect for damage. If so replace gas valve.

Replace Transmitter _____

Replace receiver _____

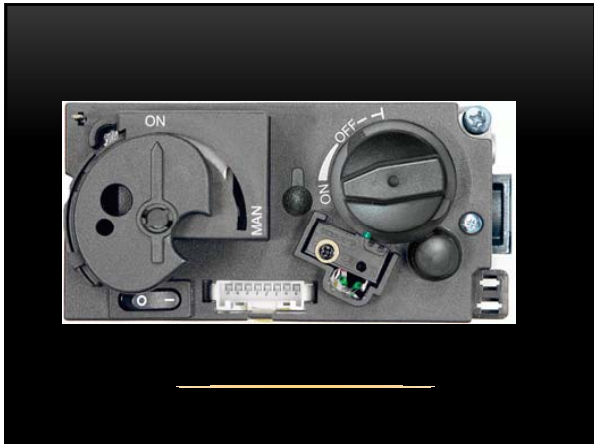
MAXITROL GV60

Motor does not turn

1. Receiver must learn new code

Press and hold the receiver's reset button until you hear 2 beeps. After the 2nd signal and within 20 seconds press the down arrow on the remote handset until you hear an additional long beep confirming the new code is set





MAXITROL GV60

Motor does not turn

2. Check batteries
3. Reposition the antenna
4. Verify receiver and transmitter are operating properly
5. Check wiring at valve for damage, replace valve as necessary
6. Bent pins on wire connector

MAXITROL GV60

No tone, no ignition

1. Replace receiver and reprogram
2. Replace batteries on receiver

No ignition—one 5 second tone

1. On/off switch in off position
2. Loose wire
3. Bad receiver
4. Bent pins or bad valve

MAXITROL GV60

No pilot flame—continues sparking

1. Air in supply line
2. Check spark gap and wiring connection
3. Make sure thermocouple interrupter is not over tightened
4. If over tightened, replace valve and thermocouple interrupter
5. Bad receiver _____

MAXITROL GV60

Pilot is lit but continues to spark. Valve shuts off between 10 and 30 seconds. Valve operates manually

1. Bad receiver _____

MAXITROL GV60

Valve shuts off between 10 and 60 seconds. Does not operate manually

1. Not enough voltage from thermocouple or too much resistance in line circuit. 5mV needed at spade connector beside magnet nut

Check on/off switch, temperature switches, receiver and thermo current connections for resistance _____

MAXITROL GV60

Valve shuts off between 10 and 60 seconds. Does not operate manually

- 2. Bad thermocouple
- 3. Low inlet pressure
- 4. Bad valve

MAXITROL GV60

No gas to burner

- 1. Manual override knob in MAN position
- 2. Valve turned to pilot position
- 3. Low inlet pressure
- 4. Bad valve

DEXEN ELECTRONIC IPI

No pilot flame –module not locked out

- 1. Verify integrity of electrical connections and make sure they are in accordance with the relevant system wiring diagram. "S" wire to sensor and "I" to ignition
- 2. Check gas pressure
- 3. Check supply line for obstructions

DEXEN MODULE



DEXEN ELECTRONIC IPI

No pilot flame –module not locked out (continued)

4. Verify pilot orifice is clear and correct size
5. Is pilot properly adjusted
6. Verify controlling devices in demand position
7. Is gas valve getting correct voltage to correct terminals to open pilot portal (1.5 to 3 VDC), if no replace gas valve

DEXEN ELECTRONIC IPI

No pilot flame –module not locked out (continued)

8. Verify gap between igniter and sensing rod/pilot hood is correct and not being grounded
9. Check voltage reading at transformer. Reading should be between 2.8 and 3.4 VAC

DEXEN ELECTRONIC IPI

No pilot flame –module not locked out (continued)

10. Turn on/off switch to off. Disconnect I wire from module. Turn switch back on and hold a grounded wire about 3/16" away from I terminal. If no spark, replace module. If spark, check wire for continuity

DEXEN ELECTRONIC IPI

Module locked out—no spark at pilot hood prior to lock out

1. Check spark electrode and reposition
2. Check pilot orifice Replace if necessary
3. Verify integrity of electrical connections and make sure they are in accordance with wiring diagram
4. Replace module
5. Check batteries
6. Unlock module

DEXEN ELECTRONIC IPI

Module locked out—spark was present at pilot hood

1. Verify integrity of electrical connections and make sure they are in accordance with wiring diagram
2. Adjust pilot in accordance with Manufacturer's instructions
3. Verify pilot tubing is not crimped
4. Verify ground
5. Check pilot orifice for obstructions
6. Check for proper pressure

DEXEN ELECTRONIC IPI

Spark continues while pilot is ON

1. Clean pilot sensing rod(s) and replace pilot assembly if necessary
2. Check for proper grounding
3. Replace module

DEXEN ELECTRONIC IPI

Main burner lights when only the pilot should light

1. Replace module if there is current going to improper gas valve terminals
2. Replace gas valve if module is sending signal to proper terminals

DEXEN ELECTRONIC IPI

Pilot does not hold flame

1. Verify pilot flame engulfs the tip of sensing electrode. Adjust pilot or replace pilot assembly
2. Clean electrical connections of sensing electrode and module sense cable connection
3. Replace damaged sensing cable

DEXEN ELECTRONIC IPI

Pilot does not hold flame (continued)

- 4. Verify pilot is properly grounded
- 5. Check pilot orifice and clean or replace as needed
- 6. Adjust pilot as necessary

DEXEN ELECTRONIC IPI

Main burner will not light

- 1. Make sure supply line is not crimped
- 2. Verify electrical connections are correct
- 3. Make sure valve is in ON position and that controlling devices are in demand
- 4. Make sure pilot directional hood is properly positioned

DEXEN ELECTRONIC IPI

Main burner will not light (continued)

- 5. Check voltage at valve and replace valve as necessary
- 6. Replace module if no signal to gas valve
- 7. Check ground
- 8. Check outlet pressure

DEXEN ELECTRONIC IPI

Main burner will not close

1. Make sure there are no shorts in wiring going to controlling devices
2. Verify electrical connections integrity and wiring is in accordance with manufacturer's instructions
3. Check outlet pressure and make sure it is not too high

DEXEN ELECTRONIC IPI

Main burner will not close (continued)

4. Verify if voltage is present at gas valve and replace gas valve if no voltage present
5. If voltage is present at gas valve in a non-demand condition, replace module

FLAME APPEARANCE

Cause	Flame Problem	Source
Insufficient Air	Floating Flames (aldehydes, CO)	Air shutter Venting Air restrictor (DV)

FLAME APPEARANCE

Cause	Flame Problem	Source
Excess Air	Lifting Flames No Yellow Flashback (aldehydes, CO)	Air shutter Cracked burner

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FLAME APPEARANCE

Cause	Flame Problems	Source
Insufficient Gas	Small Flames Fluctuating Flames Flashback (aldehydes, CO)	Orifice/ports clogged Restricted, clogged gas line Low gas pressure Non-uniform (regulator) Underrating (orifice small)

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FLAME APPEARANCE

Cause	Flame Problems	Source
Excess Gas	Lifting/Blowing Flames Flame Rollout Fluctuating Flames	Input Rate Pressure Regulator

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