

Quick Diagnostics For 2 Stage Furnaces

Tools Required: Multimeter

All tests performed at Control Board.

Wire color codes:

WHITE:

With the ON/OFF Switch turned on, there will always be DC power at the white connection. The thermostat can be turned on or off. If there is no power at this location, check the ON/OFF Switch. If the Switch is in the on position, check to confirm that the Limit Switch is closed. If not, replace the Limit Switch. If the Limit Switch is closed, check to confirm DC coming into red wire into furnace. Correct problem, fuse, or disconnected red wire.

BLACK:

Black wire comes from the Sail Switch. There will be no power at this location unless furnace blower is operating. If the blower is running at least 6 volts and there is no reading on the black connection, replace Sail Switch.

BLUE: 1

Power from the Thermostat. The Thermostat provides power to the furnace as a signal rather than typical, straight DC voltage. With the meter attached to the blue wire, you will see varying voltages displayed, rather than one solid reading like you will see with our standard furnace. If no reading, the Thermostat is probably defective. Before the Thermostat is replaced, check all wiring.

BLUE: 2

Power from Control Board, to the Ignition Board. Reading at the blue 2 is straight DC voltage. There is no reading at this location when the Thermostat is in the fan only mode. When the Thermostat is turned to heat mode, you will see a reading at blue 2. If there is no power on blue 2 when the thermostat is in heat mode, replace the Control Board.

ORANGE:

Ignore

BROWN:

Power from Control Board to third coil on Valve, high heat only. During low heat mode there will be no reading at the brown wire connection. When the mode is changed to high heat there will be a solid voltage reading at this location. If no reading during high heat, replace Control Board.

FURNACE -Electronic Ignition Model

TROUBLE SHOOTING GUIDE

Effective: 8/10/98

Guides are only intended for use on Atwood® products by service technicians who have successfully completed Atwood® training. This guide should be used in conjunction with the appropriate Instruction Manual provided with the product and any applicable Industry Standards. This is not intended to be a complete list. Please direct questions concerning service of Atwood® products to 866-869-3118 option 5 before proceeding.

CAUSE	SOLUTION
BURNER FAILS TO IGNITE AND - BLOWER FAILS TO RUN	
No electrical power to the furnace -----	Reconnect or replace power source.*
Thermostat defective -----	Replace thermostat
Thermostat wires broken or shorted -----	Replace wire or wires*
Current overload protector device -----	Reset circuit breaker. Check amp draw from motor
Defective or tripped (circuit breaker). -----	According to furnace's specifications.
Blower relay defective -----	Replace relay
Wire off motor -----	Reconnect wire
Wire off relay -----	Reconnect wire
Improper ground -----	Clean and secure grounds*
Blower motor defective -----	Replace motor
BLOWER RUNS - BUT FAILS TO IGNITE	
Low Voltage/High Voltage -----	Correct Power Supply*
Gas pressure incorrect -----	Set pressure to a minimum of 11" W.C. with all appliances running. (Replace regulator if not obtainable).*
Furnace grounding wires not secure -----	Clean and secure grounds established*
Air intake restricted -----	Clean air intake.*
12 volt polarity reversed -----	Correct polarity*
Motor running slow -----	Check voltage first. If 12 VDC while running, replace motor.
Exhaust blocked -----	Clean exhaust.*
Combustion air wheel loose -----	Reposition and tighten.
Sail switch defective or wire off -----	Reconnect wire or replace.
Limit switch defective or wire off -----	Reconnect wire or replace.
Edge connector on circuit board dirty -----	Clean with pencil eraser*
Circuit Board defective -----	Clean plug contacts. If still defective, replace. (check on board tester when possible).
Gas valve defective -----	Replace valve or valve coil, depending on problem encountered.
Main burner orifice blocked -----	Clean main burner orifice or replace.
High tension lead wire defective -----	Replace wire
Electrode out of adjustment -----	Adjust electrode (take care not to damage porcelain).
Electrode defective -----	Replace
Obstructed burner head -----	Clean burner head*
BURNER IGNITES BUT IGNITION SYSTEM "LOCKS OUT" AND TURNS BURNER OFF	
Low gas pressure -----	Set pressure to a minimum of 11" W.C. with all appliances running. Replace regulator if not obtainable.*
Exhaust blocked -----	Clean exhaust.*
Combustion air wheel loose -----	Reposition wheel and tighten
Electrodes out of adjustment -----	Adjust electrode according to furnace specifications.
Electrode defective -----	Replace electrode.
Circuit Board defective -----	Clean plug contacts. If still defective, replace. (Check on board tester when possible).
Flame sensor wire between electrode -----	Replace wire
and circuit board defective -----	
Air leakage at gaskets -----	Replace gasket
Defective heat exchanger -----	Replace heat exchanger

*indicates NOT covered under warranty.

continued backside

CAUSE	SOLUTION
SOOTING (caused by lazy yellow flame)	
Low gas pressure -----	*Set pressure to a minimum of 11" W.C. with all appliances running. Replace regulator if not obtainable.
Low voltage -----	Correct power supply*
Air leakage at gaskets -----	Replace gaskets
Combustion wheel installed backwards or loose -----	Reposition wheel and tighten.
Blockage in heating chamber or burner head -----	Clean or replace
Faulty motor -----	Replace motor
Wrong vent kit or draft cap -----	Replace with correct vent kit or draft cap
FAN RUNS CONTINUOUSLY WITH THERMOSTAT "OFF"	
Defective thermostat -----	Replace thermostat
Shorted thermostat leads -----	*Replace wire or wires
Defective relay -----	Replace relay
LIMITING = BURNER CYCLING ON AND OFF - BLOWER RUNS CONSTANTLY WITH THERMOSTAT ON	
Restricted or insufficient discharge ducting -----	a. Ducting must meet furnace's minimum requirements.* b. No excess ducting or unnecessary bends.* c. All closeable registers must be fully open and unrestricted.*
Furnace over fired -----	Set gas pressure to a minimum of 11" W.C. with all appliances running replace regulator, if not obtainable. Also, check main burner orifice, it must comply with furnace's specifications.*
Restricted return air supply -----	Make sure return air meets furnace minimum requirements.*
Defective limit switch -----	Replace limit switch
BLOWER SHUTS OFF AT SAME TIME BURNER SHUTS OFF	
Wired wrong -----	*Correct wiring
Faulty relay -----	Replace relay.
BLOWER VIBRATES OR IS NOISY	
Motor mount loose -----	Tighten motor mounting bracket a. Ducting must meet furnace's minimum requirements* b. No excess ducting or unnecessary bends.* c. All closeable registers must be fully open and unrestricted.
Damaged blower wheel -----	Replace blower wheel.
Motor shaft bent -----	Replace motor
INSUFFICIENT HEAT	
Furnace under fired -----	1. Set gas pressure to 11" W.C. with all appliances running, replace regulator if not obtainable. Also, check main burner orifice, it must comply with furnace's specifications. 2. Check ducting and return air according to furnaces specifications.*
Furnace improperly sized for coach/or conditions -----	Replace furnace with proper size.

FURNACE - Pilot Model

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CAUSE	SOLUTION
BURNER FAILS TO IGNITE AND - BLOWER FAILS TO RUN	
No electrical power to the furnace	Reconnect or replace power source.*
Current overload protector device	Reset circuit breaker. Check amp draw from motor defective or tripped (circuit breaker).according to furnace's specifications.
Thermostat defective	Replace thermostat.
Thermostat wires broken	Replace wire or wires.
Thermostat located in high area	Relocate thermostat.
Blower motor defective	Replace motor.
Blower relay defective	Replace relay.
Wire off motor	Reconnect wire.*
Wire off relay	Reconnect wire.*
Improper ground	Clean and secure grounds.*
BLOWER RUNS - BUT FAILS TO IGNITE	
Low Voltage/High Voltage	Correct power supply.*
12 volt polarity reversed	Correct polarity.*
Furnace grounding wires not secure	Clean and secure grounds established*
Gas valve defective	Replace valve or valve coil, depending on problem encountered.
Gas pressure incorrect	*Set pressure to a minimum of 11" W.C. with all appliances running. (Replace regulator if not obtainable).
Limit switch defective or wire off	Reconnect wire or replace.
Sail switch defective or wire off	Reconnect wire or replace.
Burner orifice blocked	Clean main burner orifice or replace.
Combustion air wheel loose	Reposition and tighten.
Burner head adjustment	Reposition and tighten. Adjust burner according to furnace specifications.
Exhaust blocked	Clean exhaust.*
Air intake restricted	Clean air intake.*
Broken or loose wire	Replace or tighten*
Motor running slow	Check voltage first. If 12 VDC while running, replace motor.*
Pilot orifice plugged	Clean or replace orifice
Thermocouple defective	Replace thermocouple
Pilot assembly defective	Replace pilot assembly
BURNER CYCLING ON AND OFF - BLOWER RUNS CONTINUOUSLY WITH THERMOSTAT "ON"	
Restricted return air supply	Make sure return air meets furnace's minimum requirements.
Restricted discharge duct system	a. Make sure ducting meets furnace's minimum requirements.* b. Make sure there is no excess ducting or unnecessary bends.* c. Make sure any closeable registers are fully open and unrestricted.
Defective limit switch	Replace limit switch.*
Furnace over fired	Set gas pressure to a minimum of 11" WC with all appliances running. Replace regulator if not obtainable. Also, check main burner orifice, it must comply with furnace's specifications.

*indicates NOT covered under warranty.

CAUSE	SOLUTION
BLOWER SHUTS OFF AT SAME TIME BURNER SHUTS OFF	
Faulty relay -----	Replace relay
Thermostat wired wrong -----	Correct wiring*
BURNER FAILS TO IGNITE AND - BLOWER FAILS TO RUN	
No electrical power to the furnace -----	Reconnect or replace power source.*
BLOWER VIBRATES OR IS NOISY	
Damaged blower wheel -----	Replace blower wheel.
Motor shaft bent -----	Replace motor
Loose motor -----	Tighten motor mounting bracket.
Restricted discharge duct system -----	a. Make sure ducting meets furnace's minimum requirements.*
	b. Make sure there is no excess ducting or unnecessary bends.*
	c. Make sure any closable registers are fully open and unrestricted.*
PILOT FAILS TO IGNITE OR STAY LIT	
Plugged pilot orifice -----	Clean or replace pilot orifice.
Electrode out of adjustment -----	Adjust electrode to furnace's specifications.
Pilot tube defective -----	Replace tube.
Piezo sparker defective -----	Replace sparker
Defective thermocouple -----	Replace thermocouple.
Defective valve -----	Replace valve.
Vent kit not sealed -----	Seal vent where it meets with the furnace.*
MICA window missing -----	Replace MICA
Combustion air hose plugged or collapsed -----	Replace combustion hose
Water in propane -----	Add alcohol to the propane bottles.*
Burner plate gasket or pilot gasket not sealed -----	Replace gaskets
LAZY FLAME (yellow)	
High gas pressure -----	*Set pressure to a minimum of 11" W.C. with all appliances running. Replace regulator if not obtainable.
Burner out of adjustment -----	Adjust burner according to furnace specification.
Combustion wheel installed backwards or loose -----	Reposition wheel and tighten.
Air leakage at gaskets -----	Replace gaskets
Low voltage -----	Correct power supply*
FAN RUNS CONTINUOUSLY WITH THERMOSTAT "OFF"	
Shorted thermostat leads -----	Replace wire or wires.
Defective relay -----	Replace relay
Defective thermostat -----	Replace thermostat
INSUFFICIENT HEAT	
Furnace under fired -----	1. Set gas pressure to 11" W.C. with all appliances running, replace regulator if not obtainable. Also, check main burner orifice, it must comply with furnace's specifications.*
	2. Check ducting and return air according to furnaces specifications.
Furnace limiting -----	Check ducting and return air. It must comply with furnace's specifications.*

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