



prestige

Solo 110

Water Boiler



SERVICE TECHNICIAN'S

TROUBLE SHOOTING GUIDE

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Definitions

WARNING

Indicates a potentially hazardous situation which, if ignored, can result in death, serious injury or substantial property damage.

NOTICE

Indicates special instructions on installation, operation or maintenance, which are important to the equipment/product, but not related to personal injury hazards.

WARNING

This guide is to be used in conjunction with the PRESTIGE Installation and Maintenance manual. Procedures and servicing listed in this manual must be performed by a qualified service technician, installer, service agency or gas supplier. Any procedures or service performed by an unqualified individual or service agency can result in severe personal injury, death or substantial property damage.

Introduction

This guide is to be used in conjunction with the Triangle Tube PRESTIGE Boiler Installation and Maintenance Manual.

Good Troubleshooting Practices

Before leaving for the job site:

Check your parts and tools

- Test equipment and tools you will need:
 - Electrical meter that tests both voltage and continuity
 - Temperature gauge or metering device
 - Manometer
 - Combustion Analyzer
 - Standard tools of the trade (wrenches, screwdrivers...)
- Parts to solve most problems
 - Control module BPRKIT18
 - Transformer with surge protection BPRKIT19
 - Blower with gasket BPRKIT13

Review all appropriate manuals before leaving for the job site

At the job site:

- Clarify problem
- Have the PRESTIGE manual and any other wiring, zone control or piping diagrams, or installation guides readily available.

REMEMBER

Follow the Troubleshooting Guide step by step, always double checking your results. Skipping steps or not completing steps can lead to wrong conclusions, repeated visits to the job site, unhappy customers and unnecessary warranty claims.

WARNING

Label all wires and wire connections prior to disconnecting when servicing any boiler controls. Wiring errors can cause improper and dangerous operation. Always disconnect the power supply to the boiler before servicing. Failure to comply could result in severe personal injury, death or substantial property damage.

WARNING

Never bypass (jumper) any boiler control or device except for momentary testing when troubleshooting the boiler as outlined in this guide, severe personal injury, death or substantial property damage can result.

Initial Troubleshooting Checks

- Ensure all wire connectors to the control module and sensors are securely connected.
- Ensure the maximum gas supply pressure does not exceed 13" w.c during flow or no flow conditions.
- Ensure the gas supply pressure is a minimum 5" w.c during flow conditions (burner firing on all gas appliances).

Control Module Fuses

NOTICE

The control module contains 2 internal replaceable fuses. Ensure the fuses are in working condition prior to replacing the control module or any boiler component. If one of the fuses has blown, it will prevent the control module and/or boiler components from operating properly.

To check or replace the control module fuses:

1. Disconnect the external power supply to the boiler.
2. Remove the front jacket panel of the boiler by removing the mounting screws along the top edge.
3. Remove the black plastic housing cover off the control module. Use care not to damage the cover when removing it.
4. Inspect both fuses to determine if blown.
5. The control module is supplied from the factory with 2 spare fuses, a 5 amp fast acting fuse and a 4 amp slow acting fuse, attached to the control module cover.
6. When replacing the fuses ensure the amp rating and type of the fuse matches the replacement fuse. Reference Fig. 1, page 4 for amperage and location of the fuses.

WARNING

Do not bypass any fuse with a jumper. Do not replace any fuse with a fuse that is not specified. Failure to comply could result in severe personal injury, death or substantial property damage.

7. Re-install the control module cover and the front jacket panel when completed.

8. Reconnect the external power supply to the boiler and perform the verification of operation steps as outline in the Prestige Installation Manual.

WARNING

After completing any servicing of the boiler verify proper operation of the boiler. Steps to verify proper operation are outlined in the Start-Up Preparation in the PRESTIGE Installation manual. Failure to comply could result in severe personal injury, death or substantial property damage.

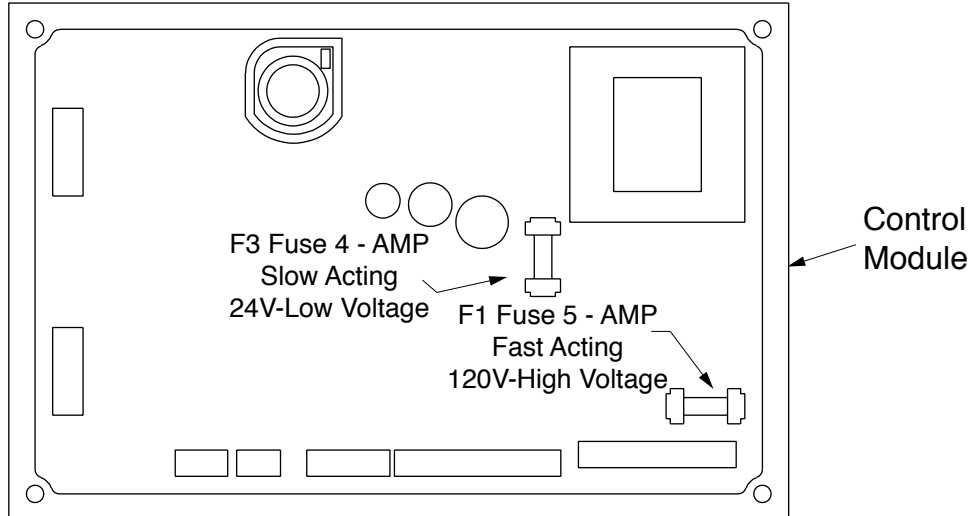


Fig. 1 Control Module Fuse Locations (Housing Cover Removed)




Standby Mode

After the boiler is turned on, the control panel will display STANDBY mode as shown in the figure above.

This is the standard mode for the PRESTIGE. The control automatically returns to this mode after 20 minutes if no keys have been pressed on the display. Any parameters that were modified are then enabled.

The first character shows (on the left side of the display) the current status of the boiler depending on the condition of both the boiler and the burner. The last 3 characters indicate the start temperature. See page 8 for additional information.

If the burner is blocked due to a “soft” lockout, the display alternates between a 9 followed by the boiler outlet temperature and “b” with a two digit error code. See page 9 - 12 for detailed information on the corrective and preventive actions for the soft lockouts.

Display	Boiler function
	Internal check
	Test function: Burner on, high fire mode
	Test function: Burner on, low fire mode












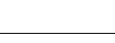










TO TEMPORARY PLACE THE BURNER INTO HIGH FIRE MODE: press the **MODE** button with + button simultaneously.

TO TEMPORARY PLACE THE BURNER INTO LOW FIRE MODE: press the **MODE** button with - button simultaneously.

NOTICE

The control module will maintain the fixed firing rate for approximately 10 minutes before defaulting to normal operating conditions.

Press the + and - button simultaneously to deactivate the high or low fire mode.

Display	Boiler function
	STANDBY, no demand for heat
	Fan prepurge (10 seconds) or post purge cycle
	Ignition sequence
	Burner ON for space heating (CH)
	Burner ON for domestic water heating (DHW)
	Pre-check for air flow prior to prepurge cycle
	Burner OFF due to reaching temperature set point
	Post pump cycle for primary space heating (1 minute)
	Post pump cycle for domestic hot water (30 seconds)
	Burner blocked:
	Supply temperature too high (203°F). Burner will remain OFF until outlet temperature drops below 200°F
	Return temperature too high (203°F). Burner will remain OFF until temperature drops below 200°F
	Return temperature is measured higher than supply temperature. Burner will remain OFF until corrected.
	Supply temperature increased too quickly. Burner will remain OFF for a 10 minute period. Burner will recycle, increasing waiting period 1 minute for a max. 15 minutes
	Factory supplied LWCO pressure device or external limit (terminals 15 & 16) is OPEN. Burner off for 150 seconds, auto reset.
	No blower signal
	Blower signal present, Burner will remain OFF until condition terminates
	Temperature rise between the supply and return is more than 72°F. Burner will remain OFF for 150 seconds. Burner will recycle increasing waiting period 1 minute for a max. 20 cycle.
	Short circuit measured across flue temperature sensor terminals. Burner OFF until corrected.
	Open circuit measured across the flue temperature sensors.
	Flue temperature greater than 241°F less than 250°F. Burner off for 150 seconds
	Wait for the blower to start

Control Module Display - General

Parameter Mode **P P P P**





To access PARAMETER mode when the system is in STANDBY mode, press the MODE button once.

To scroll through the list of parameters, simply press the "STEP" button. To modify a parameter value, use the + or - keys. Then press "STORE" to save the value you just changed. The display flashes once to confirm the data has been saved.

To activate the parameters you changed, press MODE once more (which brings you into the INFORMATION mode). However, if you do not press a key, the system returns to STANDBY mode after 20 minutes and automatically enables the changes.

Key: Display



Key: Screen	Description of parameters
 1150	Domestic Hot Water Setting
 2001	Domestic Hot Water Setup (See Note 1)
 3001	Space Heating Mode (See Note 2)
 4100	Maximum temperature in space heating (CH) mode. In applications using an outdoor sensor, this is the boiler outlet target temperature at an outdoor temperature of 0°F

Note 1: This parameter should not be changed from the factory setting. The performance of the DHW will be affected and can become unreliable.

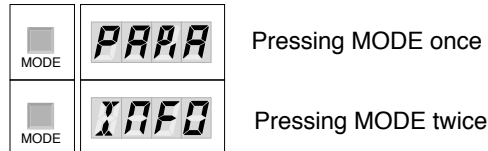
Note 2: This parameter should not be changed from the factory setting. The performance of the CH (central/space heating) will be affected and can become unreliable.










Information Mode **I N F O**

To switch from STANDBY mode to INFORMATION mode, press MODE twice.

Press STEP until the system displays the information you need. The point located behind the first position flashes to indicate that the boiler is in INFO mode.

Key: Display



Key: Display	Description of parameters
 1100	Measured outlet (supply) water temperature
 2160	Measured inlet (return) water temperature
 3.18	This parameter is not used
 4.55	Measured outdoor temperature (Optional outdoor sensor required)
 5150	Measured flue temperature
 6100	Calculated (target) outlet water temperature
 7.00	Rate of increase in the outlet water temperature °F/sec
 8.00	Rate of increase in the return water temperature °F/sec
 9.32	This parameter is not used

If STEP is pressed after parameter 9, the display will show A-32.

Error Hard Lockout Mode

If a fault occurs while the boiler is running, the system goes into lockout and the display starts to flash with the first digit as an **E** and the next two digits give the code for this fault.

For detailed information on the corrective and preventive actions for the hard lockout, see pages 13-18.

Display	Hard Lockout
E 00	Flame detected prior to burner startup
E 02	Failed ignition after 5 attempts
E 03	Gas valve harness not properly connected
E 04	Power supply lost after lockout occurred
E 05	Internal control failure
E 06	Internal control failure
E 07	Internal control failure
E 08	Internal control failure
E 09	Internal control failure
E 11	Internal control failure
E 12	External limit (terminal 13 & 14) control is OPEN
E 13	Internal control failure
E 14	Internal control failure
E 15	Internal control failure
E 16	Internal control failure
E 17	Internal control failure
E 18	Supply Temperature exceeds 212°F
E 19	Return temperature exceeds 212°F
E 25	Supply temperature increased too rapidly
E 28	No blower signal present
E 29	Blower signal does not reset to zero
E 31	Supply temperature sensor is short circuited
E 32	Return temperature is short circuited
E 36	Supply temperature sensor is OPEN
E 37	Return temperature sensor is OPEN
E 44	Internal control failure
E 52	Flue temperature exceeds 250°F
E 60	Internal Control error - failure to read parameters
E 61	Internal control failure
E 65	Inadequate power supply to the fan

Boiler control display is blank

- Check for 120 volts at terminals 1 and 2 of the 120V terminal strip
 - If no power is measured check the external power supply, external fuse or breaker.
- Check the internal fuse F1 by locating the control module and removing the black housing. The internal Fuse F1 is located in the lower right corner of the control module and positioned in a horizontal manner as shown in Fig. 1, page 4. 120 volts should be measured across the fuse. See Servicing Tips and Instructions, page 3, for accessing the internal fuses of the control module.
 - If fuse F1 has blown and 120 volts is not present, replace the fuse with a 5-amp fast acting fuse. Check the boiler wiring for possible causes for the fuse to blow.
- Check boiler internal wiring, ensure all wiring is in good condition and all control module and boiler connections are secure.
 - Correct any wiring or wiring components if needed. If problem continues replace the control module.

Boiler display shows a 0 for the first digit on the left followed by 2 or 3 digits (boiler temperature)

- Check to see if room and DHW thermostats are satisfied.
 - If the thermostats are satisfied the boiler is off due to no call for heat. Turn up a thermostat and the boiler should begin ignition sequence.
- If the room thermostat or DHW thermostat is calling for heat and the boiler is not firing and the boiler is below the maximum operating temperature.
 - Check for 24 volts across the control module internal fuse F3, which is located toward the middle of the control and positioned vertically see Fig. 1 page 4. If necessary replace the fuse. See Servicing Tips and Instructions, page 3, for accessing the internal fuses of the control module.
 - Check and verify Parameters 2 and 3 are correct as outlined on page 6. Both parameters should be set as "01", which turns DHW and CH modes ON.
 - Temporarily jump low voltage terminals 7 and 8 on the 24V terminal strip. If boiler operates check the room thermostat wiring and thermostat control. Replace as needed. Remove jumper when completed.
 - Temporarily jump low voltage terminals 11 and 12 on the 24V terminal strip. If boiler operates check the DHW thermostat wiring and thermostat control. Replace as needed. Remove jumper when completed.
 - Disconnect power to the boiler. Check all wiring and wiring connections and compare to the wiring diagram. Ensure all wiring and wiring connection are in good condition and secure. If necessary, replace complete wiring harness.
 - If all the above steps fail to resolve the problem, replace the control module.

Boiler display shows a number of 1 to 8 for the first digit on the left followed by 2 or 3 digits (boiler temperature)

- The boiler is in normal operating mode. Reference the boiler installation manual for detailed explanation of the boiler operation.

Soft Lockout Error Code

The boiler will display Soft Lockout with a flashing “9”, then “b” as the first digit on the left of the display followed by a steady two digit code. The boiler will automatically reset a Soft Lockout once the condition has been corrected and returned to standard operating condition.

Code	Error Condition	Correcting Error Condition
b- 18	High Temperature Limit, Boiler Supply	<p>If the primary boiler supply water temperature exceeds 203°F, the burner will shut down until both the supply and return temperature drops 9°F below the original set point temperature. The boiler circulator will continue operating.</p> <ul style="list-style-type: none"> • This problem should only occur if the heat load demand is less than the low input-firing rate of the boiler, typically found on small single heat zones. <ul style="list-style-type: none"> - Verify the boiler and heating system are filled with water and the LWCO is operating properly. - Ensure the boiler and heating system have been properly purged and there is no entrapped air. - Inspect and verify heating system piping and its components. Ensure piping is per the recommendations given in the Prestige Installation Manual or per other approved/recognized designed configurations. • Use a temperature-metering device to measure the supply water temperature leaving the boiler. Compare this measured temperature with the display temperature (INFO Mode display, “1” is the first digit on the left followed by the temperature.) <ul style="list-style-type: none"> - Replace the supply temperature sensor if the temperature comparison is largely varied. - Replace the control module if the sensor replacement does not resolve the problem. • Ensure system and/or zone circulators are operating properly
b- 19	High Temperature Limit, Boiler Return	<p>If the primary boiler return water temperature exceeds 203°F, the burner will shut down until both the supply and return temperature drops 9°F below the original set point temperature. The boiler circulator will continue operating.</p> <ul style="list-style-type: none"> • This problem rarely occurs unless the boiler experiences an Error Code 18 and the system is charged with a water temperature in excess of 203°F <ul style="list-style-type: none"> - Verify the boiler and heating system are filled with water and the LWCO is operating properly. - Ensure the boiler and heating system have been properly purged and there is no entrapped air. - Inspect and verify heating system piping and its components. Ensure piping is per the recommendations given in the Prestige Installation Manual or per other approved/recognized designed configurations. - Ensure the boiler piping is correct and the water flow is not reversed or pipes are cross connected. • Use a temperature-metering device to measure the return water temperature entering the boiler. Compare this measured temperature with the display temperature (INFO Mode display, “2” is the first digit on the left followed by the temperature.) <ul style="list-style-type: none"> - Replace the return temperature sensor if the temperature comparison is largely varied. - Replace the control module if the sensor replacement does not resolve the problem.

Code	Error Condition	Correcting Error Condition
b- 24	High Temperature Limit, Boiler Supply and Return	<p>If the primary boiler return water temperature exceeds the boiler supply temperature, the burner will shut down until the boiler return temperature drops below the boiler supply temperature. The boiler circulator will continue operating.</p> <ul style="list-style-type: none"> The following items should be checked: <ul style="list-style-type: none"> Verify the boiler and heating system are filled with water and the LWCO is operating properly. Ensure the boiler and heating system have been properly purged and there is no entrapped air. Inspect and verify heating system piping and its components. Ensure piping is per the recommendations given in the Prestige Installation Manual or per other approved/recognized designed configurations. Ensure the boiler piping is correct and the water flow is not reversed or pipes are cross connected. Use a temperature-metering device to measure the supply water temperature leaving the boiler. Compare this measured temperature with the display temperature (INFO Mode display, "1" is the first digit followed by the temperature.) <ul style="list-style-type: none"> Replace the supply temperature sensor if the temperature comparison is largely varied. Use a temperature-metering device to measure the return water temperature entering the boiler. Compare this measured temperature with the display temperature (INFO Mode display, "2" is the first digit followed by the temperature.) <ul style="list-style-type: none"> Replace the return temperature sensor if the temperature comparison is largely varied. Replace the control module if the sensor replacement does not resolve the problem.
b- 25	High Temperature Limit, Boiler Supply	<p>If the primary boiler supply water temperature rate of increase is deemed too quick, the burner will shut down for a 10 minute period. If the condition is not corrected during the next cycle, the burner shut down period of 10 minutes will increase an additional minute. The boiler will continue for 5 cycles until a "hard" lockout will occur.</p> <ul style="list-style-type: none"> This problem will occur if the flow rate on the boiler is too low. Check for the following conditions: <ul style="list-style-type: none"> Verify the boiler and heating system are filled with water and the LWCO is operating properly. Ensure the boiler and heating system have been properly purged and there is no entrapped air. Inspect and verify heating system piping and its components. Ensure piping is per the recommendations given in the Installation Manual or per other approved/recognized designed configurations. Verify and ensure the boiler space heating CH circulator is operating properly. <ul style="list-style-type: none"> Check and verify 120V at the circulator wiring in the circulator junction box. If no voltage is measured, check circulator wiring and connections. Check and verify 120V at the MCBA control module along terminals X1-4 and X1-3. If no voltage is measured, replace control

Soft Lockout Error Code

Code	Error Condition	Correcting Error Condition
b- 25	High Temperature Limit, Boiler Supply (continued)	<p>module. Check circulator wire harness and replace if needed if voltage is measured at the control module.</p> <ul style="list-style-type: none"> • Verify and ensure the external DHW circulator is operating properly. <ul style="list-style-type: none"> - Check and verify 120V at the circulator wiring in the circulator junction box. If no voltage is measured, check circulator wiring and connections. - Check and verify 120V at the 120V terminal strip, terminals 4 and 5 inside the boiler enclosure. Check circulator wire harness and replace if needed if voltage is measured at the control module.
b- 26	LWCO Device	<p>If the LWCO device is determined to be open by the control module the boiler will remain in a shut down mode until the condition is corrected. Once the condition is corrected the boiler will remain in the shut down mode for an additional 150 seconds before startup.</p> <ul style="list-style-type: none"> - Check the pressure gauge on the boiler and ensure the system is at minimum 10 psig. - Ensure proper operation of the boiler make up system and fill valve. • Check continuity across the LWCO terminals for closed contacts if the boiler system pressure gauge reads 10 psig or greater. <ul style="list-style-type: none"> - Replace the LWCO device if the continuity shows an open circuit and the system pressure is 10 psig or greater. - Check the wiring and contacts from the LWCO to the control module terminals if the continuity check shows a close circuit. Replace the low voltage wiring harness if needed. - Replace control module if the replacement of the wiring harness does not resolve the problem.
b- 28	Blower Assembly	<p>Will occur if during the ignition sequence the blower does not start. The boiler display will indicate a status code of 5 during the ignition sequence.</p> <ul style="list-style-type: none"> • Disconnect the connector at the blower. Restart the boiler sequence and check for 35Vdc at the connector between the black and white wires (pin 1 & 5). <ul style="list-style-type: none"> - If 35Vdc is not present at the connector, inspect the wiring harness and replace if necessary. Replace the control module if wire harness replacement does not resolve the problem. -- If 35Vdc is present at the connector, reconnect the wire harness to the blower and ensure a secure connection. Replace the blower assembly if problem is not resolved.
b- 29	Blower Assembly	<p>The control module is detecting the blower in operation when it should not be.</p> <ul style="list-style-type: none"> • Check and verify the wiring from the blower to the control module is correct as shown in the appliance wiring schematic, page 22. <ul style="list-style-type: none"> - Replace the wiring harness from the control module to the blower. Replace the blower if the replacement of the wiring harness does not resolve the problem. Replace control module if blower replacement does not resolve the problem.

Code	Error Condition	Correcting Error Condition
b- 30	High Temperature Limit, Boiler Supply and Return Temperature Differential is greater than 72°F	<p>If the primary boiler water temperature differential between the supply and the return is too high (greater than 72°F), the burner will shut down for a 150 second period. The circulator will continue circulating until the start of the next cycle. If the condition is not corrected during the next cycle, the burner shut down period of 150 seconds will increase an additional minute. The boiler will continue for 22 cycles until a “hard “ lockout will occur.</p> <ul style="list-style-type: none"> • This problem will occur if the flow rate and demand on the boiler is too low. Check for the following conditions: <ul style="list-style-type: none"> - Verify the boiler and heating system are filled with water and the LWCO is operating properly. - Ensure the boiler and heating system have been properly purged and there is no entrapped air. - Inspect and verify heating system piping and its components. Ensure piping is per the recommendations given in the Installation Manual or per other approved/recognized designed configurations. - Ensure the piping system pressure drop is within the flow rate parameters of the circulator. • Verify and ensure the boiler space heating CH circulator is operating properly. <ul style="list-style-type: none"> - Check and verify 120V at the circulator wiring in the circulator junction box. If no voltage is measured, check circulator wiring and connections. - Check and verify 120V at the MCBA control module along terminals X1-4 and X1-3, see page 22. If no voltage is measured, replace control module. Check circulator wire harness and replace if needed if voltage is measured at the control module. • Verify and ensure the external DHW circulator is operating properly. <ul style="list-style-type: none"> - Check and verify 120V at the circulator wiring in the circulator junction box. If no voltage is measured, check circulator wiring and connections. - Check and verify 120V at the 120V terminal strip between terminals 4 and 5 inside the boiler enclosure. Check circulator wire harness and replace if needed if voltage is measured at the control module.
b- 35	Flue Temperature Sensor	<p>The control module detects a short or jumped out condition of the flue temperature sensor. This code will also appear briefly prior to a “hard” lockout if the flue gas temperature exceeds 250°F. The burner will remain off until the condition is corrected.</p> <ul style="list-style-type: none"> • Inspect the flue temperature sensor and wiring, ensure it is secure and in good condition, replace as needed. <ul style="list-style-type: none"> - Replace the sensor and wiring if problem persists. If replacement of sensor and wiring does not resolve the problem, replace the control module.

Soft Lockout Error Code

Code	Error Condition	Correcting Error Condition
b- 40	Flue Temperature Sensor	<p>The control module detects the flue temperature sensor as “open”, which is typically an improper or missing connection at the sensor.</p> <ul style="list-style-type: none"> Inspect the flue temperature sensor and wiring, ensure it is secure and in good condition, replace as needed. <ul style="list-style-type: none"> Replace the sensor and wiring if problem persists. If replacement of sensor and wiring does not resolve the problem, replace the control module.
b- 52	Flue Temperature Sensor	<p>The control module detects the flue temperature greater than 241°F, less than 250°F. Burner off for 150 seconds.</p> <ul style="list-style-type: none"> This is an indication the heat exchanger flue ways may need cleaning. Reference the Maintenance section of the installation manual for procedures on cleaning the flue side of the heat exchanger. Isolate the boiler from the boiler system piping and drain the boiler heat exchanger. Flush the boiler heat exchanger several times, checking the discharge water for signs of scale or sediment. Inspect the flue temperature sensor and wiring, ensure it is secure and in good condition, replace as needed. <ul style="list-style-type: none"> Replace the sensor and wiring if problem persists. If replacement of sensor and wiring does not resolve the problem, replace the control module.
b- 65	Blower Assembly	<p>The control module does not detect proper blower operation during a call for heat.</p> <ul style="list-style-type: none"> Disconnect the 35Vdc connector at the blower. Restart the boiler sequence and check for 35Vdc at the connector between the black and white wires (pin 1 & 5). <ul style="list-style-type: none"> If 135Vdc is not present at the connector, inspect the wiring harness and replace if necessary. Replace the control module if the wire harness replacement does not resolve the problem. If 35Vdc is present at the connector, reconnect the wire harness to the blower and ensure a secure connection. Replace the blower assembly if problem is not resolved.

Hard Lockout Error Code

The boiler will display a Hard Lockout with an **E** as the first digit on the left of display followed by a two-digit code. The boiler must be manually reset by pressing the RESET button on the display once the condition has been corrected. A Hard Lockout will occur when boiler conditions, that are considered critical in terms of safety, are not met or exceeded.

Code	Error Condition	Correcting Error Condition
E- 00	Flame Detection Error	<p>This error will occur if the control module detects a burner flame (flame signal) prior to the ignition sequence.</p> <ul style="list-style-type: none"> This problem maybe related to the burner operating too hot due to poor combustion. The flame pattern and combustion should be tested at both high fire and low fire inputs. The flame should be completely on the burner head and blue without yellow tips. Reference page 5 regarding high and low fire input procedures. Reference page 20 for combustion requirements. <ul style="list-style-type: none"> If the flame is not deemed acceptable and the application is propane, check and verify the propane orifice for proper size (orifice size 0.204", # 52). Ensure the propane orifice is properly seated in the gas valve gasket. Inspect the burner head through the burner sight port during shut down sequence of the boiler. <ul style="list-style-type: none"> If the flame remains after the shut down sequence, the gas valve maybe leaking. Check and verify the gas pressure is less than 13 inches w.c. If the gas pressure is less than 13 inches w.c., replace the gas valve.
E- 02	Failed Ignition Error	<p>This error will occur if the boiler has failed to establish flame detection during the ignition sequence. The lockout will occur after 5 tries.</p> <ul style="list-style-type: none"> If no ignition spark occurs during the ignition sequence: <ul style="list-style-type: none"> Check the ignition electrode cable, the electrode boot connector and all connections, ensure all are in good condition. Replace if damaged. Inspect the insulation of the electrode cable and the electrode igniter; ensure there is no damage. Replace as needed. Check the ground lead for a secure connection from the control module ground to the burner mounting plate. Use a ground continuity check to verify a good ground. If there is an ignition spark during the ignition sequence, but no flame: <ul style="list-style-type: none"> Verify the manual shutoff valve on the gas supply piping is in the OPEN position. Check and verify the gas pressure at the inlet of the valve during ignition sequence. Ensure the gas pressure maintains a minimum 5 inches w.c during ignition sequence. Note: All gas appliances within the building should be operating during this measurement. Check and verify all gas piping is free of obstructions and has been purged of all air. Check the gas meter for indications of gas flow during the ignition sequence. Remove the ignition electrode to inspect for damage. Clean any white oxides off the electrode if necessary. Replace the electrode if damaged or will not clean. Replace the gas valve rectifier cable. Remove and inspect the gas valve and venturi gas ports. Ensure ports are free of obstructions.

Hard Lockout Error Code

Code	Error Condition	Correcting Error Condition
E- 02	Failed Ignition Error (continued)	<ul style="list-style-type: none"> - If the above items have been completed and verified, replace the gas valve. • Flame is established during the ignition sequence, but not maintained. This problem may be due to low flame signal detection by the control module. <ul style="list-style-type: none"> - Inspect the flame pattern on the burner head during high and low fire inputs. Inspect and clean the burner head if necessary. Replace the burner head if damage. Reference page 5 regarding high and low fire input procedures. - Check the input rate of the boiler at the gas meter during high fire input. If the gas meter measured rate is not at or below 15% of the boiler rating, replace the gas valve. <p>Note: The length of venting and combustion air piping will affect the measure boiler rating.</p> <ul style="list-style-type: none"> - Check the ground lead for a secure connection from the control module ground to the burner mounting plate. Use a ground continuity check to verify a good ground. - Remove the ignition electrode to inspect for damage. Clean any white oxides off the electrode if necessary. Replace the electrode if damaged or will not clean. - If the above items have been completed and verified, replace the control module.
E- 03	Gas Valve Harness	<ul style="list-style-type: none"> • Ensure gas valve rectifier cable is properly connected to the gas valve and secured. <p>Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the rectifier cable.</p>
E- 04	Loss of Power	<p>This error will occur if power to the boiler is lost after a lockout has occurred. The boiler must be manually reset and the original lockout code will be lost.</p> <ul style="list-style-type: none"> • This error will also occur if the service technician tries to reset a hard lockout by turning the boiler OFF and then ON as an attempt to reset the boiler.
E- 05	Internal Failure	Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.
E- 06	Internal Failure	Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.
E- 07	Internal Failure	Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.
E- 08	Internal Failure	Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.
E- 09	Internal Failure	Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.

Hard Lockout Error Code

Code	Error Condition	Correcting Error Condition
E- 11	Internal Failure	Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.
E- 12	External Limit Lockout	<ul style="list-style-type: none"> An external limit control connected at the 24V terminal strip, between terminals 13 and 14 is open, breaking the circuit. Determine reason for the limit to be open and correct condition. <ul style="list-style-type: none"> If no external limit is used, then check and verify connection of the factory applied jumper across terminals 13 and 14. If the external limit is closed, then check the boiler internal wiring connections and repair or replace if necessary. Remove the external limit and apply a temporary jumper across terminals 13 and 14 and verify operation.
E- 13	Internal Failure	Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.
E- 14	Internal Failure	Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.
E- 15	Internal Failure	Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.
E- 16	Internal Failure	Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.
E- 17	Internal Failure	Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.
E- 18	High Temperature Limit, Supply Temperature	<p>This error will occur if the boiler supply water temperature exceeds 212°F.</p> <ul style="list-style-type: none"> The following items should be checked: <ul style="list-style-type: none"> Verify the boiler and heating system are filled with water and the LWCO is operating properly. Ensure the boiler and heating system have been properly purged and there is no entrapped air. Inspect and verify heating system piping and its components. Ensure piping is per the recommendations given in the Installation Manual or per other approved/recognized designed configurations. Use a temperature-metering device to measure the supply water temperature leaving the boiler. Compare this measured temperature with the display temperature (INFO Mode display, "1" is the first digit followed by the temperature.) <ul style="list-style-type: none"> Replace the supply temperature sensor if the temperature comparison is largely varied. Replace the control module if the sensor replacement does not resolve the problem.

Hard Lockout Error Code

Code	Error Condition	Correcting Error Condition
E- 19	High Temperature Limit, Return Temperature	<p>This error will occur if the boiler return water temperature exceeds 212°F.</p> <ul style="list-style-type: none"> This problem rarely occurs unless the boiler experiences an Error Code 18 and the system is charged with a water temperature in excess of 212°F. The following items should be checked: <ul style="list-style-type: none"> Verify the boiler and heating system are filled with water and the LWCO is operating properly. Ensure the boiler and heating system have been properly purged and there is no entrapped air. Inspect and verify heating system piping and its components. Ensure piping is per the recommendations given in the Installation Manual or per other approved/recognized designed configurations. Ensure the boiler piping is correct and the water flow is not reversed or pipes are cross-connected. Use a temperature-metering device to measure the return water temperature leaving the boiler. Compare this measured temperature with the display temperature (INFO Mode display, "2" is the first digit followed by the temperature.) <ul style="list-style-type: none"> Replace the return temperature sensor if the temperature comparison is largely varied. Replace the control module if the sensor replacement does not resolve the problem.
E- 25	High Temperature Limit, Supply Temperature rate of increase	<p>This error will occur if the boiler supply water temperature rate of increase is deemed too rapid. The control module will display a soft lockout of b_25 and initiate a recycle sequence. After 5 cycles the boiler will go into a hard lockout.</p> <ul style="list-style-type: none"> This problem will occur if the flow rate and demand load on the boiler are too low. Check for the following conditions: <ul style="list-style-type: none"> Verify the boiler and heating system are filled with water and the LWCO is operating properly. Ensure the boiler and heating system have been properly purged and there is no entrapped air. Inspect and verify heating system piping and its components. Ensure piping is per the recommendations given in the Installation Manual or per other approved/recognized designed configurations. Verify and ensure the boiler central heating CH circulator is operating properly. <ul style="list-style-type: none"> Check and verify 120V at the circulator wiring in the circulator junction box. If no voltage is measured, check circulator wiring and connections. Check and verify 120V at the MCBA control module along terminals X1-4 and X1-3. If no voltage is measured, replace control module. Check circulator wire harness and replace if needed if voltage is measured at the control module. Verify and ensure the external DHW circulator is operating properly. <ul style="list-style-type: none"> Check and verify 120V at the circulator wiring in the circulator junction box. If no voltage is measured, check circulator wiring and connections. Check and verify 120V at the 120V terminal strip between terminals 4 and 5 inside the boiler enclosure. Check circulator wire harness and replace if needed, if voltage is measured at the control module.

Hard Lockout Error Code

Code	Error Condition	Correcting Error Condition
E- 28	Blower Assembly	<p>This error will occur if during the ignition sequence the blower does not start. The boiler display will indicate a status code of 5 during the ignition sequence for 4 minutes before locking out.</p> <ul style="list-style-type: none"> • Disconnect the connector at the blower. Restart the boiler sequence and check for 35Vdc at the connector between the black and white wires (pin 1 & 5). <ul style="list-style-type: none"> - If 35Vdc is not present at the connector, inspect the wiring harness and replace if necessary. Replace the control module if wire harness replacement does not resolve the problem. - If 35Vdc is present at the connector, reconnect the wire harness to the blower and ensure a secure connection. Replace the blower assembly if problem is not resolved.
E- 29	Blower Assembly	<p>The control module is detecting the blower in operation when it should not be.</p> <ul style="list-style-type: none"> • Check and verify the wiring from the blower to the control module is correct as shown in the appliance wiring schematic, page 22. <ul style="list-style-type: none"> - Replace the wiring harness from the control module to the blower. Replace the blower if the replacement of the wiring harness does not resolve the problem. Replace control module if blower replacement does not resolve the problem.
E- 31	Boiler Supply Temperature sensor	<p>The control module detects a short or jumped out condition of the boiler supply (outlet) temperature sensor.</p> <ul style="list-style-type: none"> • Inspect the boiler supply temperature sensor and wiring, ensure it is secure and in good condition, replace as needed. <ul style="list-style-type: none"> - Replace the sensor and wiring if problem persists. If replacement of sensor and wiring does not resolve the problem, replace the control module.
E- 32	Boiler Return Temperature sensor	<p>The control module detects a short or jumped out condition of the boiler return (inlet) temperature sensor.</p> <ul style="list-style-type: none"> • Inspect the boiler return temperature sensor and wiring, ensure it is secure and in good condition, replace as needed. <ul style="list-style-type: none"> - Replace the sensor and wiring if problem persists. If replacement of sensor and wiring does not resolve the problem, replace the control module.
E- 36	Boiler Supply Temperature sensor	<p>The control module detects the boiler supply (outlet) temperature sensor as an open circuit.</p> <ul style="list-style-type: none"> • Inspect the boiler supply temperature sensor and wiring, ensure it is secure and in good condition, replace as needed. <ul style="list-style-type: none"> - Replace the sensor and wiring if problem persists. If replacement of sensor and wiring does not resolve the problem, replace the control module.

Hard Lockout Error Code

Code	Error Condition	Correcting Error Condition
E- 37	Boiler Return Temperature sensor	<p>The control module detects the boiler return (inlet) temperature sensor as an open circuit.</p> <ul style="list-style-type: none"> Inspect the boiler return temperature sensor and wiring, ensure it is secure and in good condition, replace as needed. <ul style="list-style-type: none"> Replace the sensor and wiring if problem persists. If replacement of sensor and wiring does not resolve the problem, replace the control module.
E- 44	Internal Failure	<p>Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.</p>
E- 52	Flue Temperature Sensor	<p>The control module detects the flue temperature exceeding the 250°F limitation of the boiler.</p> <ul style="list-style-type: none"> This is an indication the heat exchanger flue ways may need cleaning. Reference the Maintenance section of the installation manual for procedures on cleaning the flue side of the heat exchanger. Isolate the boiler from the boiler system piping and drain the boiler heat exchanger. Flush the boiler heat exchanger several times, checking the discharge water for signs of scale or sediment. Inspect the flue temperature sensor and wiring, ensure it is secure and in good condition, replace as needed. <ul style="list-style-type: none"> Replace the sensor and wiring if problem persists. If replacement of sensor and wiring does not resolve the problem, replace the control module.
E- 60	Internal Failure	<p>Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.</p>
E- 61	Internal Failure	<p>Reset the boiler control module and retry ignition sequence and boiler operation. If problem continues, replace the control module.</p>
E- 65	Blower Assembly	<p>The control module does not detect proper blower operation during a call for heat.</p> <ul style="list-style-type: none"> Disconnect the 35V dc connector at the blower. Restart the boiler sequence and check for 35Vdc at the connector between the black and white wires (pin 1 & 5). <ul style="list-style-type: none"> If 35Vdc is not present at the connector, inspect the wiring harness and replace if necessary. Replace the control module if the wire harness replacement does not resolve the problem. If 35Vdc is present at the connector, reconnect the wire harness to the blower and ensure a secure connection. Replace the blower assembly if problem is not resolved.

WARNING

The installation and startup of the PRESTIGE should be performed by a qualified installer / service technician. The startup procedures should include a complete combustion test. The complete combustion test must also be performed after any adjustments to the factory settings on the burner. Failure to comply with these requirements can result in severe personal injury, death or substantial property damage.

Combustion Test Guidelines

- The combustion test should be conducted using an electronic combustion analyzer or at a minimum a “Fyrite” type CO2 analyzer.
- The combustion test sample can be taken from the test port located on the vent adapter of the PRESTIGE.
- Ensure the vent and combustion air piping are completely installed prior to startup and conducting a combustion test.
- The combustion test should be conducted, at a minimum, when the unit is at high fire input.

Combustion Parameters

	Natural Gas	Propane
O2 Min	2.30%	2.70%
O2 Max.	5.30%	4.70%
CO2 Min	8.80%	10.70%
CO2 Max	10.50%	12.00%

Combustion Adjustment

WARNING

To perform the following procedure it is essential the service technician reads and follows the procedures closely. After any adjustments are completed it is essential to perform a combustion check before proceeding with further steps. Failure to comply with these procedures can result in personal injury, death or substantial property damage.

If the O₂ level measured during the combustion test is below 2.3% for natural or 2.7% for propane:

OR

If the CO₂ level measured during the combustion test is above 10.5% for natural or 12.0% for propane:

Adjust the gas valve throttle screw, a brass screw within a sleeve located on the upper portion of the venturi as follows:

1. Ensure the PRESTIGE is OFF and no “calls for heat” are initiated.
2. Using a flat head screwdriver, turn the throttle screw clockwise (inward) a 1/4 of a full turn. It is important to note the initial start point of the screw prior to any adjustments.
3. Place the PRESTIGE back into service and conduct a combustion test.
4. If necessary, repeat the adjustment steps until the desired combustion level is met. NEVER adjust the throttle screw more than full turns from its initial start point.

WARNING

Adjusting the throttle screw clockwise (inward) decreases the volume of gas injected into the burner. Adjustments beyond 2 full turns clockwise will greatly affect the operation of the burner and result in unstable combustion conditions.

WARNING

DO NOT adjust the throttle screw counter-clockwise beyond the initial factory set point. Adjustments counter-clockwise beyond the factory set point will increase the volume of gas injected into the burner, resulting in possible unstable combustion conditions and potential dangerous levels of CO.

Internal Wiring

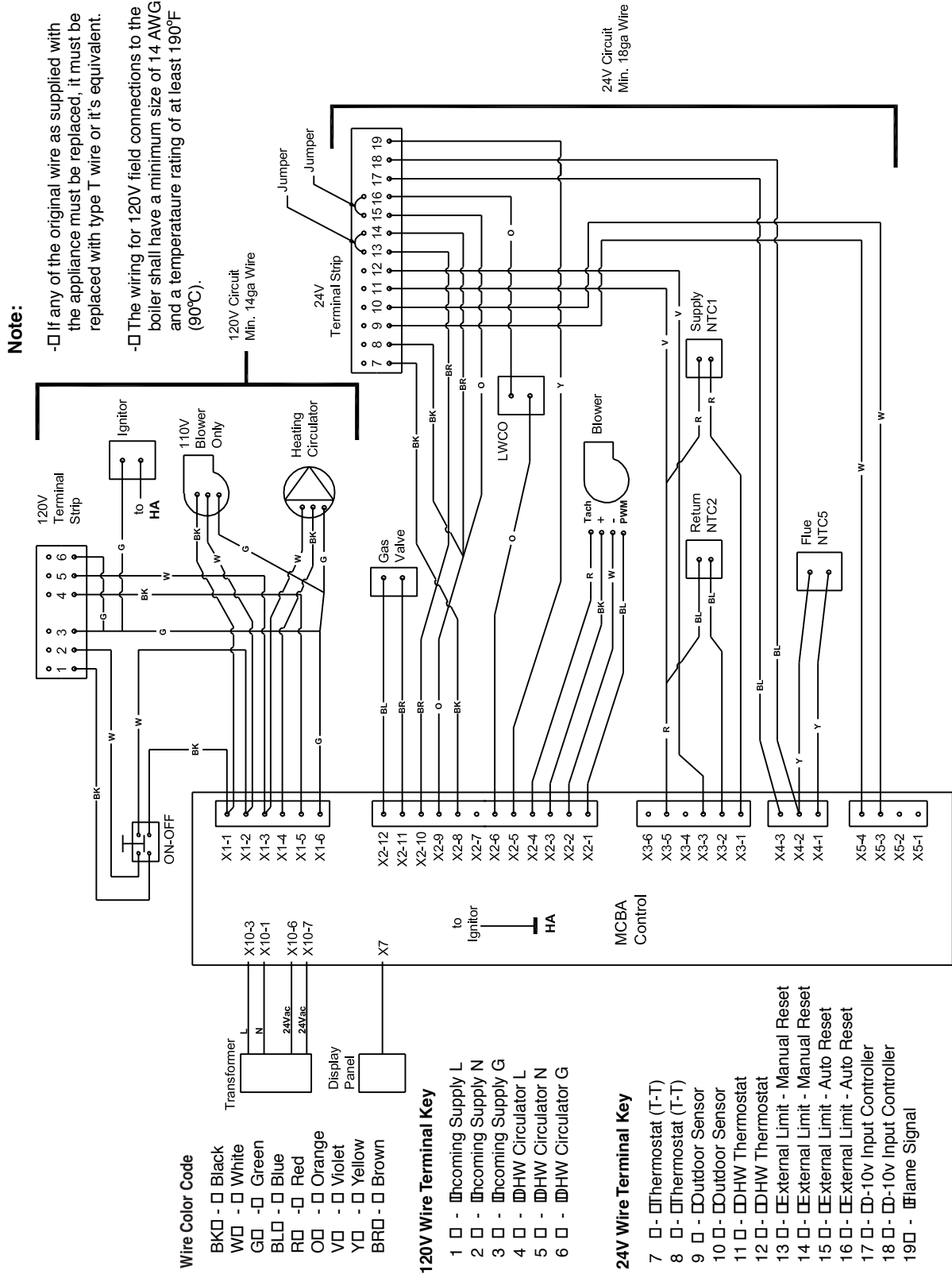
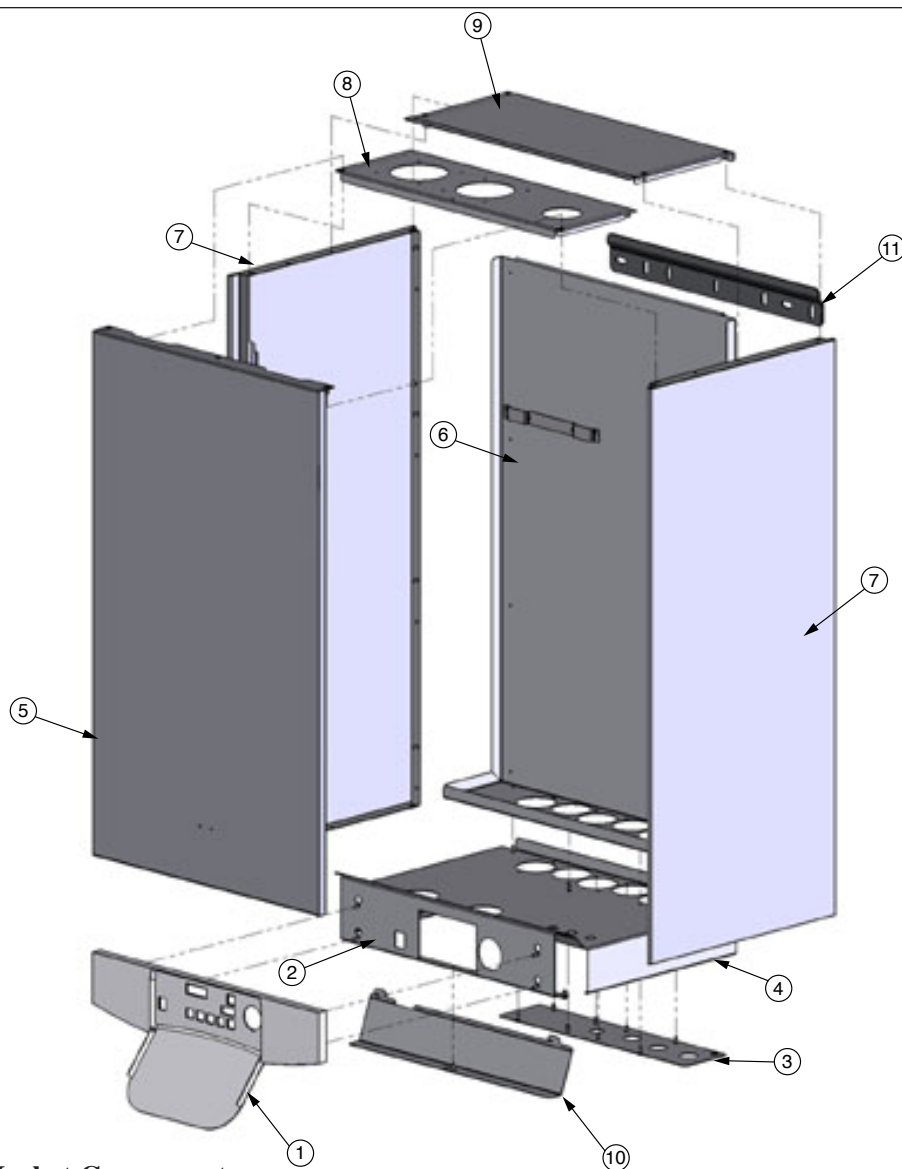


Fig. 2: Appliance Wiring Schematic


Fig. 3: Prestige Jacket Components

Item	Part No.	Description
1	PSCS01	Display/Control Panel
2	PSCS02	Display Back Panel
3	PSJKT01B	Connection Flange Panel
4	PSJKT02B	Base Panel
5	PSJKT01F	Front Jacket Panel
6	PSJKT01R	Rear Jacket Panel
7	PSJKT01S	Side Jacket Panel (Left and Right)
8	PSJKT01T	Top Jacket Panel - Front
9	PSJKT02T	Top Jacket Panel - Rear
10	PSJKT03	Control Cover Panel
11	PSRKT21	Wall Mounting Bracket with Hardware

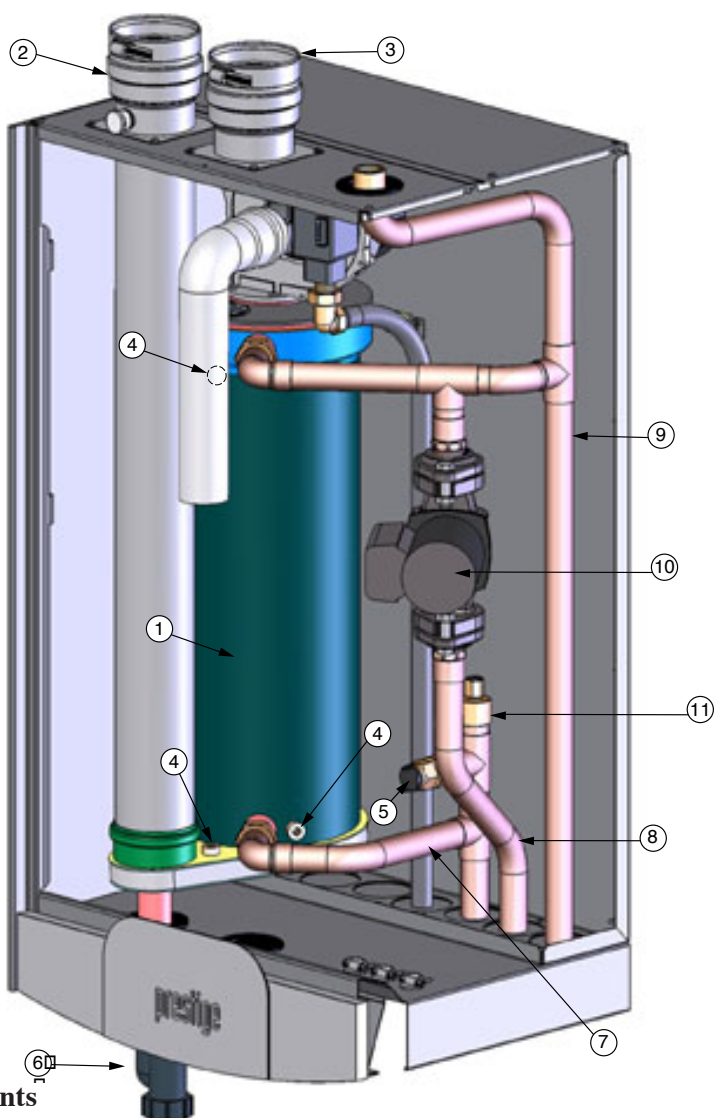


Fig. 4: Prestige Internal Components

Item	Part No.	Description
1	PSRKIT01	Heat Exchanger Body
2	PSRKIT02	Vent Outlet Adapter
3	PSRKIT03	Combustion Air Inlet Adapter
4	PSRKIT04	NTC Sensor (NTC1, NTC2 and NTC5)
5	PGRKIT20	LWCO Pressure Device
6	PSRKIT05	Condensate Drain Assembly
7	PSRKIT06	Boiler Piping - Return Assembly
8	PSRKIT07	Boiler Piping - Supply Short Assembly
9	PSRKIT08	Boiler Piping - Supply Long Assembly
10	HMVCIR02	Circulator
11	--	Pressure Gauge Fitting

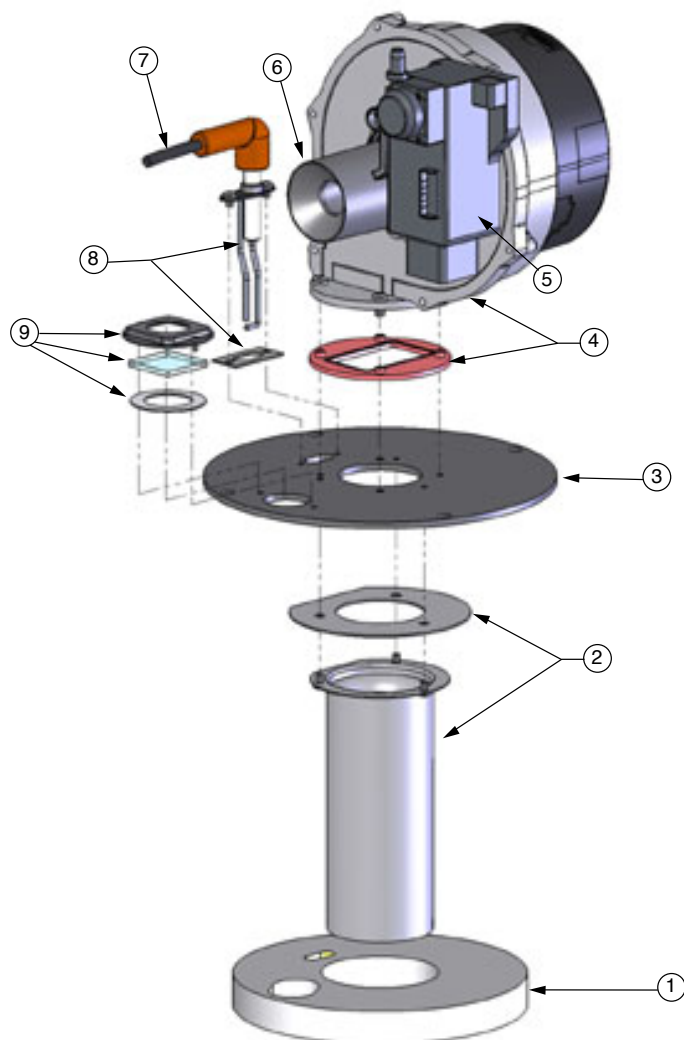


Fig. 5: Prestige Burner Components

Item	Part No.	Description
1	PSRKIT09	Combustion Chamber Insulation
2	PSRKIT10	Burner Head with Gasket - Natural
	PSRKIT11	Burner Head with Gasket - Propane
3	PSRKIT12	Burner Plate
4	PSRKIT13	Blower with Gasket
5	PGRKIT01	Gas Valve
6	--	Venturi -001
7	PSRKIT14	Ignition Cable
8	PSRKIT15	Igniter with Gasket
9	PSRKIT16	Sight Glass Assembly (Glass, Gasket and Bracket)
10	--	Propane Orifice 0.204" (#52) - Not Shown
11	--	Burner Plate Gasket - Not Shown

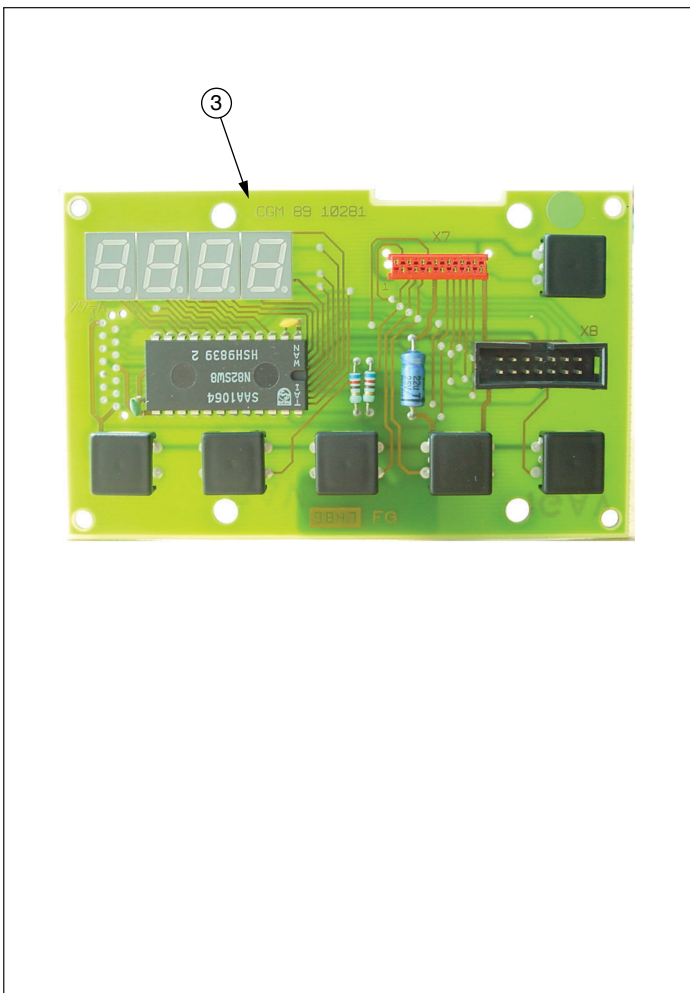
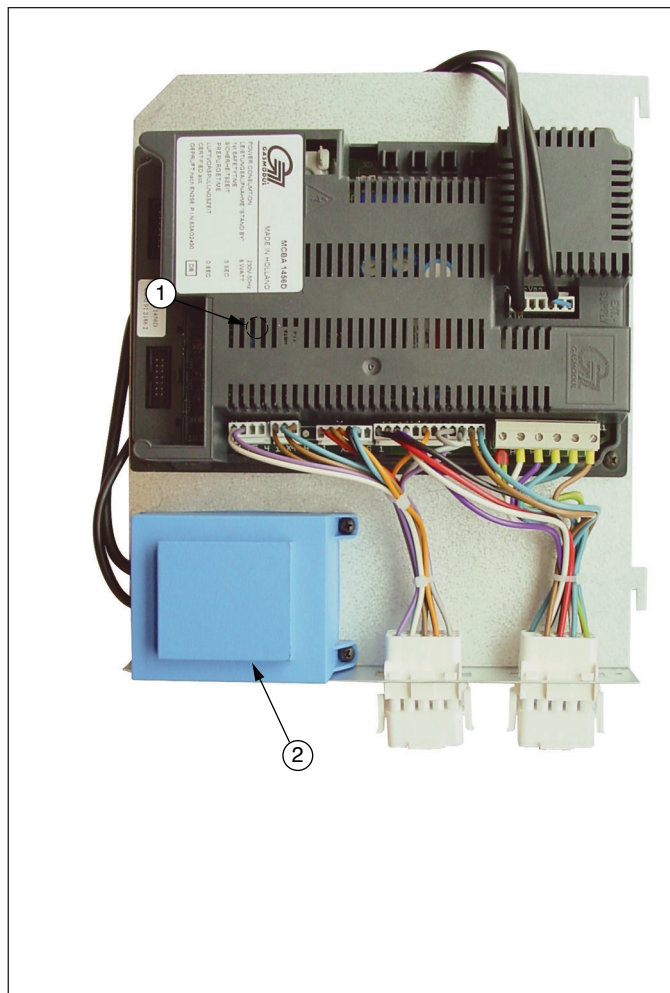


Fig. 6: Prestige Electronic Components

Item	Part No.	Description
1	PSRKIT18	Prestige Control Module
2	PSRKIT19	Transformer with Surge Protection
3	PSRKIT20	Prestige Control Module Display
4	PSRKIT17	Pressure Gauge - Not shown

For additional Technical Assistance Contact:

Triangle Tube Engineering Department

Tel: (856) 228-8881

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