

SURELIGHT and BASIC SURELIGHT IGNITION SYSTEM

I-GENERAL

The SureLight™ and Basic SureLight ignition system consists of a Lennox control board (figure1) and hot surface ignitor . Figures 2 and 3 show the general location of the control board in multi and downflow position units. See table 2 for furnace model / ignition system matchup. Both models are similar except the SureLight board has a designated continuous blower speed and is protected by a circuit breaker located on the control box. Terminal designations are shown in table 3. The Basic SureLight board will energize HEAT-H heating speed for continuous blower and the control circuit is protected by an on board fuse. On both models the board and ignitor work in combination to ensure furnace ignition and ignitor durability. Both models control all major furnace operations. Tables 4 and 5 (Surelight) and tables 6 and 7 (Basic Surelight) show jack plug terminal designations. Both boards also feature two LED lights for trouble shooting (see table 1 for diagnostic codes) and two accessory terminals. Terminal ACC energizes with the indoor blower on the SureLight board and terminal EAC-H energizes with the indoor blower on the Basic Surelight. Terminal HTG ACC energizes when CAI is energized on the SureLight board and terminal HUM-N energizes with CAI on the Basic SureLight board. The SureLight board has a built in heating isolation relay. See wiring diagram for heat anticipator settings.

The ignitor used for both models is made of durable silicon nitride. Ignitor longevity is also enhanced by controlling the temperature of the ignitor. The board finds the lowest ignitor temperature which will successfully light the burner, thus increasing the life of the ignitor.

⚠ IMPORTANT

Ignition control will not operate unless unit is properly grounded. 120V supply must be installed with correct polarity.

**ELECTROSTATIC DISCHARGE (ESD)
Precautions and Procedures**

⚠ CAUTION

Electrostatic discharge can affect electronic components. Take precautions during furnace installation and service to protect the furnace's electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the furnace, the control and the technician at the same electrostatic potential. Neutralize electrostatic charge by touching hand and all tools on an unpainted unit surface, such as the gas valve or blower deck, before performing any service procedure.

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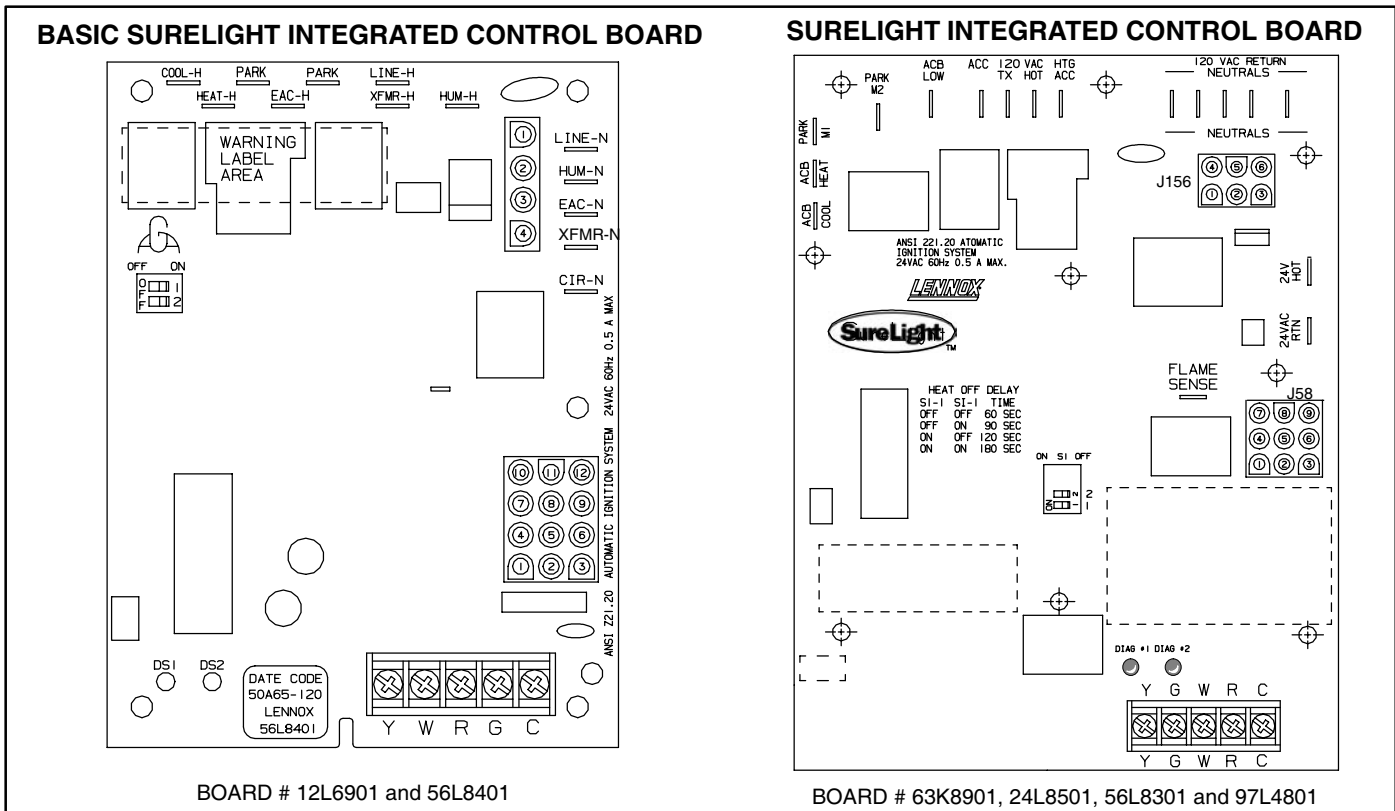


FIGURE 1

Both model boards are equipped with two LED lights for troubleshooting. The diagnostic codes are listed below in table 1.

TABLE 1

| DIAGNOSTIC CODES | | |
|-----------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MAKE SURE TO ID LED'S CORRECTLY: REFER TO INSTALLATION INSTRUCTIONS FOR CONTROL BOARD LAYOUT. | | |
| LED #1 | LED #2 | DESCRIPTION |
| SIMULTANEOUS SLOW FLASH | SIMULTANEOUS SLOW FLASH | Power - Normal operation Also signaled during cooling and continuous fan. |
| SIMULTANEOUS FAST FLASH | SIMULTANEOUS FAST FLASH | Normal operation - signaled when heating demand initiated at thermostat. |
| SLOW FLASH | ON | Primary or Secondary limit open. Units with board 63K8901 or 24L8501 (SureLight) and units with board 12L6901 (Basic SureLight): Limit must close within 5 trials for ignition or board goes into one hour limit Watchguard. Units with board 56L8301, 97L48 (SureLight) and 56L8401 and 10M9301 (Basic SureLight): Limit must close within 3 minutes or board goes into one hour limit Watchguard. |
| OFF | SLOW FLASH | Pressure switch open or has opened 5 times during a single call for heat; OR: Blocked inlet/exhaust vent; OR: Condensate line blocked; OR: Pressure switch closed prior to activation of combustion air blower. |
| ALTERNATING SLOW FLASH | ALTERNATING SLOW FLASH | Watchguard - burners fail to ignite. |
| SLOW FLASH | OFF | Flame sensed without gas valve energized. |
| ON | SLOW FLASH | Rollout switch open. OR: 9 pin (SureLight) or 12 pin (Basic SureLight) connector improperly attached. |
| ON ON OFF | ON OFF ON | Circuit board failure or control wired incorrectly. |
| FAST FLASH | SLOW FLASH | Main power polarity reversed. Switch line and neutral. |
| SLOW FLASH | FAST FLASH | Low flame signal (see note below). Replace flame sense rod. |
| ALTERNATING FAST FLASH | ALTERNATING FAST FLASH | Improper main ground or line voltage below 75 volts; OR: Broken ignitor; OR: Open ignitor circuit. |

NOTE - Slow flash equals 1 Hz (one flash per second). Fast flash equals 3 Hz (three flashes per second). Normal flame signal for SureLight control is 0.61 or greater microamps with a drop out signal of 0.20 or less microamps. Normal flame signal for Basic SureLight is 0.18 or greater microamps with a drop out signal of 0.15 or less microamps.

TABLE 2

| Model | SureLight Ignition System Model - 63K8901, 24L8501, 56L8301, 97L4801 | Basic SureLight Ignition System Model - 12L6901, 56L8401, 10M9301 |
|-------------|----------------------------------------------------------------------------|----------------------------------------------------------------------|
| G23(X) | ✓ | |
| 80MGF | ✓ | |
| G24M | ✓ | |
| G27M | ✓ | |
| G26 / GHR26 | ✓ | |
| 90UGF | ✓ | |
| G32Q/V | ✓ | |
| GHR32Q/V | ✓ | |
| G50UH | ✓ | |
| 80UHG | | ✓ |
| G40UH | | ✓ |

TABLE 3

| IGNITION CONTROL BOARD TERMINAL DESIGNATIONS | | |
|----------------------------------------------|---------------------------|-----------------------------------------|
| SureLight Terminals | Basic SureLight Terminals | Function |
| ACB COOL | COOL-H | Blower -Cooling Speed 120V |
| ACB HEAT | HEAT-H | Blower-Heating Speed 120V |
| ACC | EAC-H | Accessory / Electronic Air Cleaner 120V |
| HTG ACC | HUM-H | Heat Accessory / Humidifier 120V |
| 24VAC HOT | XFMR-H | Transformer 24V Hot |
| 24VAC RTN | XFMR-N | Transformer Neutral |
| HOT | LINE-H | 120V Hot Input |
| NEUTRAL | LINE-N | 120V Neutral |
| PARK (dead) | PARK (dead) | Alternate Speed Taps |
| TX | | 120V To Transformer |
| FLAME SENSE | FLAME SENSE | Flame Sense |
| | HUM-N | Humdifier Neutral |
| | EAC-N | Electronic Air Cleaner Neutral |
| | CIR-N | Blower Neutral |

TABLE 4

| SURELIGHT BOARD J156 (J2) TERMINAL DESIGNATIONS | |
|--------------------------------------------------------|-------------------------------------|
| PIN # | FUNCTION |
| 1 | Ignitor |
| 2 | Not Used |
| 3 | Ignitor Neutral |
| 4 | Combustion Air Inducer Line Voltage |
| 5 | Not Used |
| 6 | Combustion Air Inducer Neutral |

TABLE 5

| SURELIGHT BOARD J58 (J1) TERMINAL DESIGNATIONS | |
|-------------------------------------------------------|---------------------------------------|
| PIN # | FUNCTION |
| 1 | Primary Limit In |
| 2 | Gas Valve Common |
| 3 | Roll Out Switch Out |
| 4 | Gas Valve 24V |
| 5 | Pressure Switch In |
| 6 | Pressure Switch and Primary Limit Out |
| 7 | Not Used |
| 8 | Roll Out Switch In |
| 9 | Ground |

TABLE 6

| BASIC SURELIGHT BOARD J156 (J2) TERMINAL DESIGNATIONS | |
|--------------------------------------------------------------|--------------------------------|
| PIN # | FUNCTION |
| 1 | Combustion Air Inducer Line |
| 2 | Ignitor Line |
| 3 | Combustion Air Inducer Neutral |
| 4 | Ignitor Neutral |

TABLE 7

| BASIC SURELIGHT BOARD J58 (J1) TERMINAL DESIGNATIONS | |
|-------------------------------------------------------------|---------------------|
| PIN # | FUNCTION |
| 1 | Secondary Limit |
| 2 | Not Used |
| 3 | 24V |
| 4 | Not Used |
| 5 | Rollout Switch In |
| 6 | 24V |
| 7 | Primary Limit |
| 8 | Ground |
| 9 | Gas Valve In |
| 10 | Pressure Switch Out |
| 11 | Rollout Switch Out |
| 12 | Gas Valve Out |

G40UH(X) HORIZONTAL POSITION

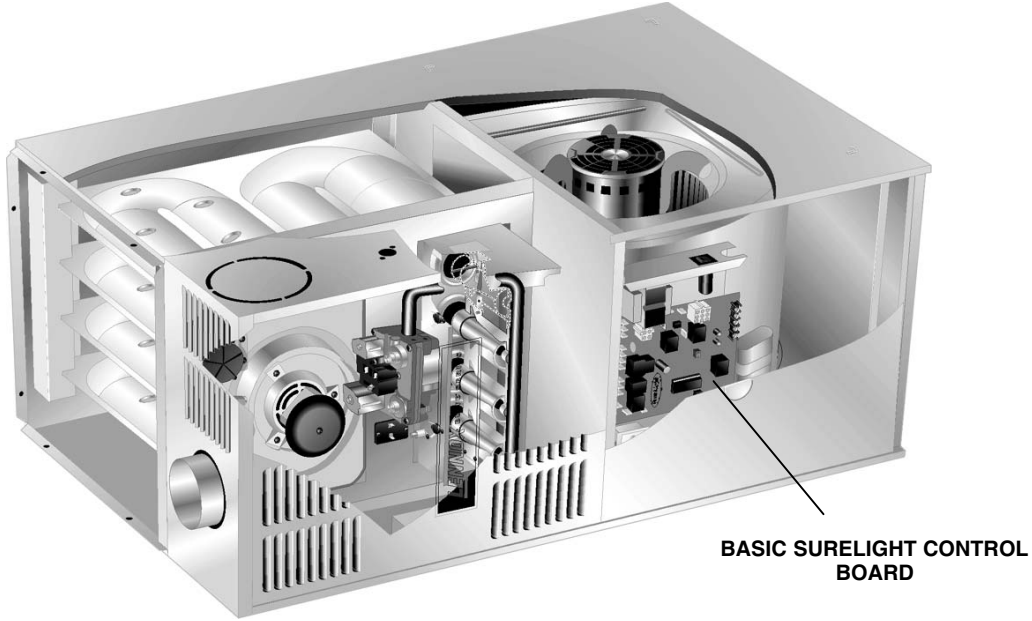


FIGURE 2

G32V

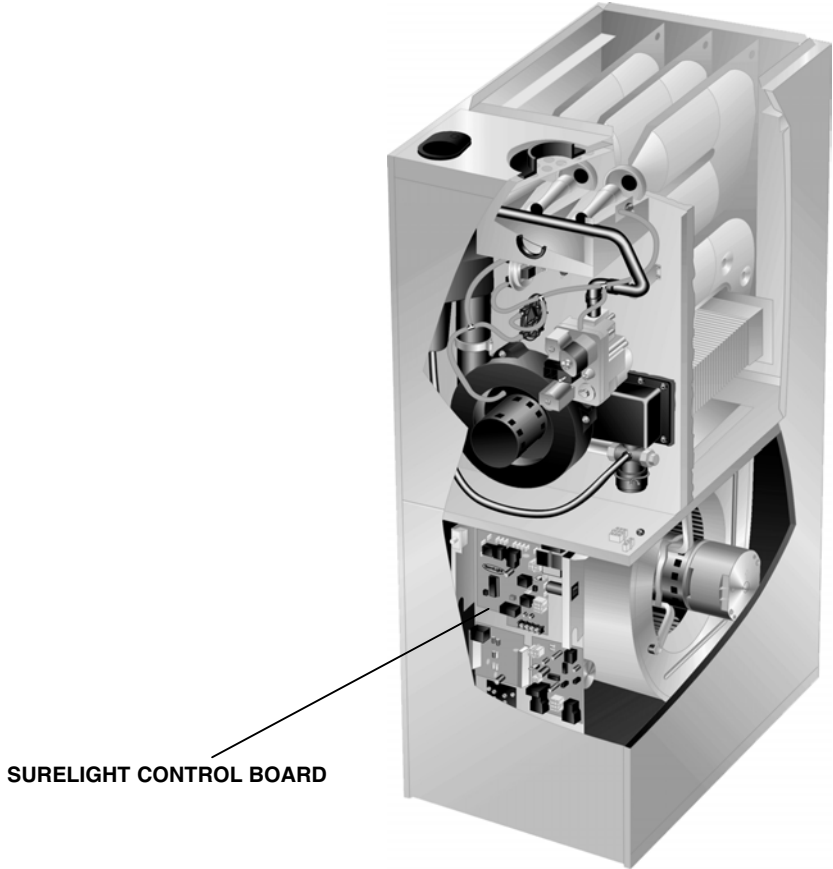


FIGURE 3

II-OPERATION (Both Models)

FAN TIMER CONTROL

The fan on time (during heat mode) of 45 seconds is not adjustable. Fan off time (time that the blower operates after the heat demand has been satisfied) can be adjusted by flipping the dip switches located on the SureLight integrated control. The unit is shipped with a factory fan off setting of 90 seconds. Fan off time will affect comfort and is adjustable to satisfy individual applications. There is no fan-on or fan-off time during cool mode. Fan energizes upon demand for cool and de-energizes when demand is satisfied. See figure 4 for fan-off time adjustment.

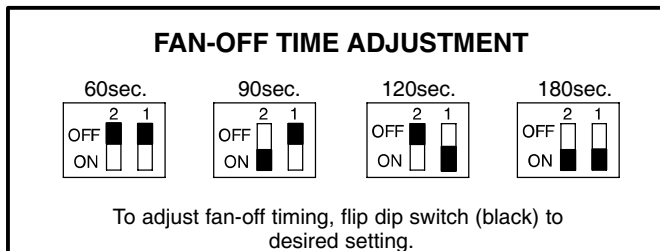


FIGURE 4

ELECTRONIC IGNITION

On a call for heat the control monitors the combustion air blower pressure switch. The control will not begin the heating cycle if the pressure switch is closed (jumpered). Once the pressure switch is determined to be open, the combustion air blower is energized. When the differential in the pressure switch is great enough the pressure switch closes and a 15-second pre-purge begins. If the pressure switch is not proven within 2-1/2 minutes, the control goes into Watchguard-Pressure Switch mode for a 5-minute reset period.

After the 15-second pre-purge period, the ignitor warms up for 20 seconds, during which the gas valve opens at 19 seconds for a 4 second- trial for ignition. See figure 5 . The ignitor energizes for the first second of the 4-second trial.

BOARD 97L4801 and 10M9301 ONLY: ignitor energizes the entire 4 second trial, or until flame is sensed (which ever is first). If ignition is not proved during the 4-second period, the control will try four more times. After a total of five trials for ignition (including the initial trial), the control goes into Watchguard-Flame Failure mode. After a 60-minute reset period, the control will begin the ignition sequence again.

The control board has an added feature that prolongs the life of the ignitor. After the first successful ignition, the control lowers the ignitor temperature on successive calls for heat. The control continues to lower the ignitor tempera-

ture until it finds the lowest temperature that will provide a successful ignition. It finds this by ramping down until the ignitor will not light, then steps up by 3 times. Lower temperature means a cooler ignitor which prolongs ignitor life. This amount is used for 255 cycles . On the 256th call for heat, the control will again ramp down until the lowest ignitor temperature is determined and the cycle begins again.

GAS VALVE

Gas valves used will be manufactured by White Rodgers or Honeywell. The valves are internally redundant to assure safety shut off. The valve on the G27M, G32(V) and GHR32(V) provides two-stage heat. 24VAC terminals on top of the valves are connected to wires from the SureLight ignition control Jackplug J58 (some boards will have J1).

FLAME SENSING AND RECTIFICATION

The SureLight ignition system uses a sensing probe to verify flame conditions through flame rectification. The sensing probe functions quite differently from a thermocouple in a standard furnace.

Flame rectification is the property of a gas flame which permits it to act as a DC current path between two metal objects, when an AC voltage is applied between the two objects that are enveloped in a gas flame. An AC voltage is applied to the flame sensor and burner/burner crossover by the SureLight circuitry. Electrons are discharged alternately from the burner/crossover to the sensor and back. More electrons will hit the burner and crossover than sensor since the grounding area is so much larger. The end result is a pulsating DC current flowing through the flame in one direction (flame sensor to burner crossover) which is of a larger magnitude than the current flowing in the opposite direction (burner crossover to flame sensor). This pulsating DC current is the only type of signal which the SureLight board will accept as proof of flame. See figures 6 , 7 and 8 .

IGNITOR

The SureLight ignitor is made of durable silicon nitride. Ignitor longevity is enhanced by controlling voltage to the ignitor. The board finds the lowest ignitor temperature which will successfully light the burner, thus increasing the life of the ignitor. Due to this feature of the board, voltage cannot be measured so ignitor must be ohmed. Ohm value should be between 10.9 and 19.7. See figures 6 , 7 and 8 for ignitor location.

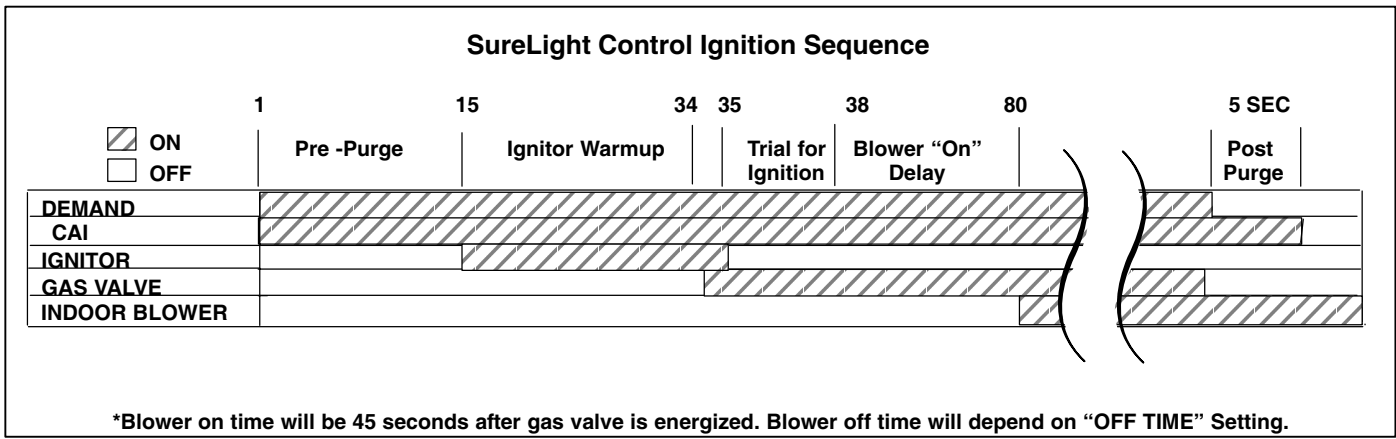


FIGURE 5

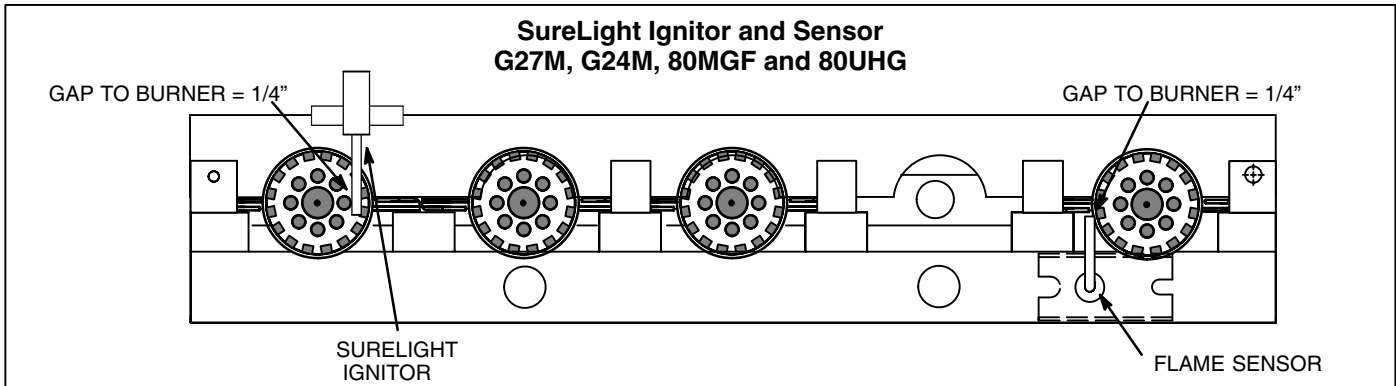


FIGURE 6

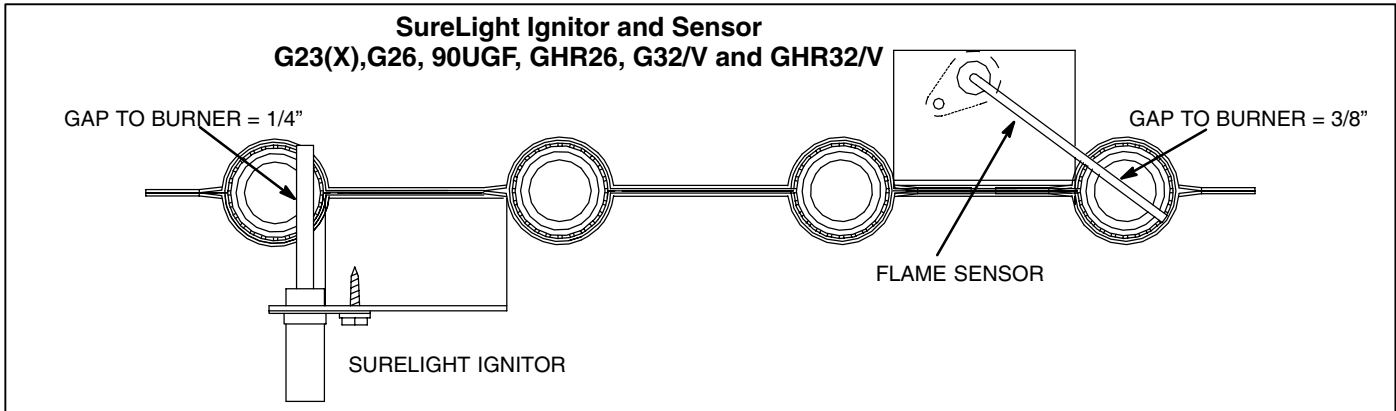


FIGURE 7

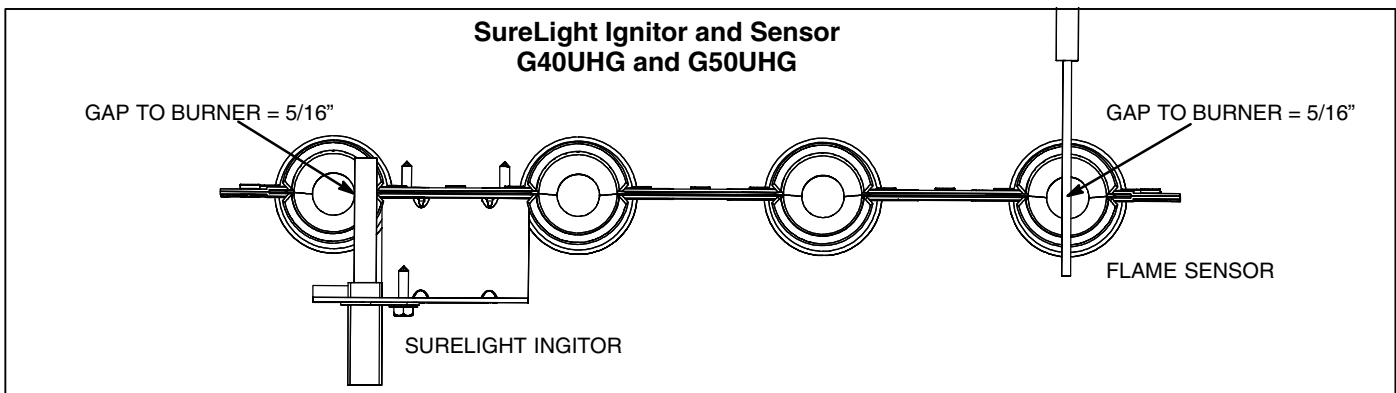
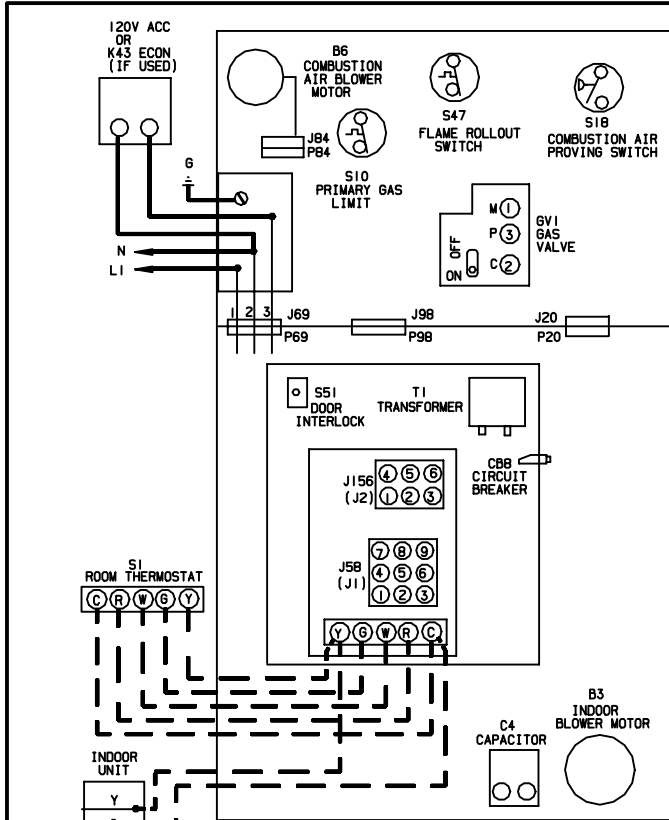


FIGURE 8

III-SEQUENCE OF OPERATION AND WIRING DIAGRAM A-G23



THERMOSTAT HEAT ANTICIPATION SETTINGS

| |
|-----------------------------|
| .65 AMP HONEYWELL VALVE |
| .50 AMP WHITE-RODGERS VALVE |

JACKPLUG CHART

| | |
|---------|----------------------------|
| J. P20 | JACK/PLUG-GAS |
| J. P58 | JACK/PLUG-BURNER CONTROL |
| J. P69 | JACK/PLUG-BLOWER DECK |
| J. P84 | JACK/PLUG-COMB. AIR BLOWER |
| J. P98 | JACK/PLUG-BLOWER DECK |
| J. P156 | JACK/PLUG-INDUCER(R33) |
| J. P158 | JACK/PLUG-IGNITION |

BLOWER SPEED CHART

| UNIT | FACTORY CONNECTED SPEED TAPS | | | | | MOTOR SPEEDS AVAILABLE |
|----------------------------------|------------------------------|--------|---------|--------|-------|------------------------|
| | COOL | HEAT | ACB LOW | M1 | M2 | |
| 02-50, 03-100 | YELLOW | YELLOW | RED | --- | --- | 3 |
| 02/3-75, 03-50 | YELLOW | YELLOW | --- | --- | BROWN | 4 |
| 03/4-100, 125 | YELLOW | YELLOW | --- | --- | BROWN | 4 |
| 04/5-75 | BLACK | RED | YELLOW | BLUE | BROWN | 5 |
| 04/5-100 | --- | YELLOW | RED | BLUE | BROWN | 5 |
| 05/6-125, 150 | --- | BLUE | RED | YELLOW | BROWN | 5 |
| HI ← BLOWER SPEED SELECTION → LO | | | | | | |
| SPEED TAPS | BLACK | BROWN | YELLOW | RED | --- | 3 |
| | BLACK | BROWN | YELLOW | RED | --- | 4 |
| | BLACK | BROWN | BLUE | YELLOW | RED | 5 |

WARNING- ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

NOTE- IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

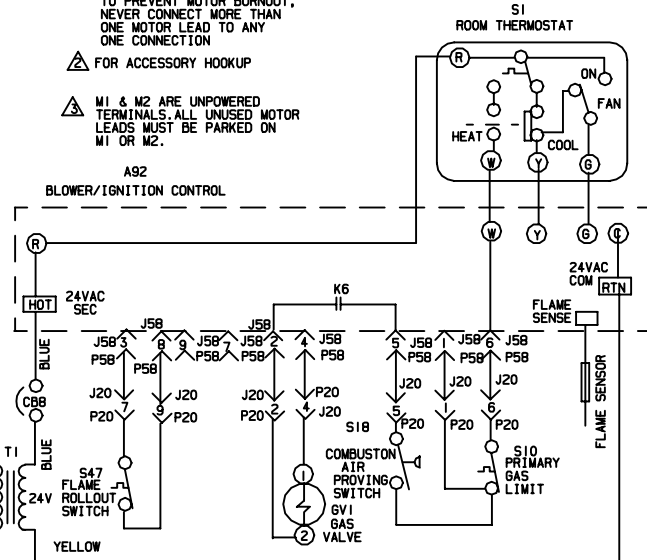
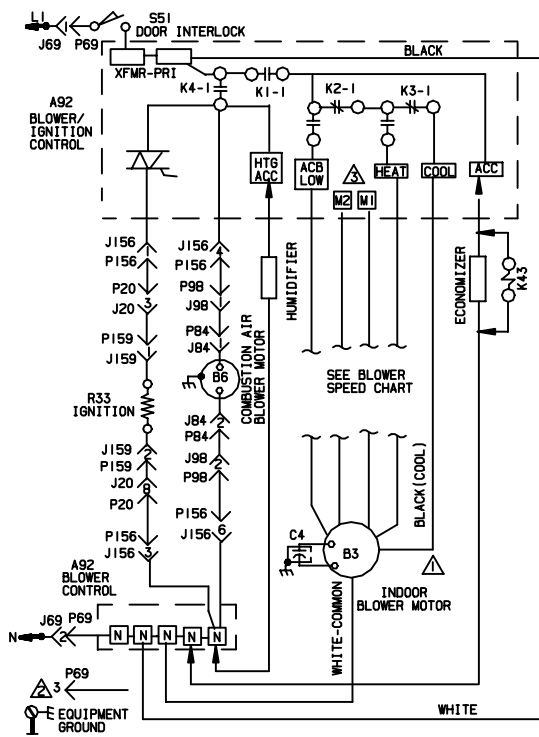
— LINE VOLTAGE FIELD INSTALLED
- - - CLASS II VOLTAGE FIELD WIRING

← DENOTES OPTIONAL COMPONENTS

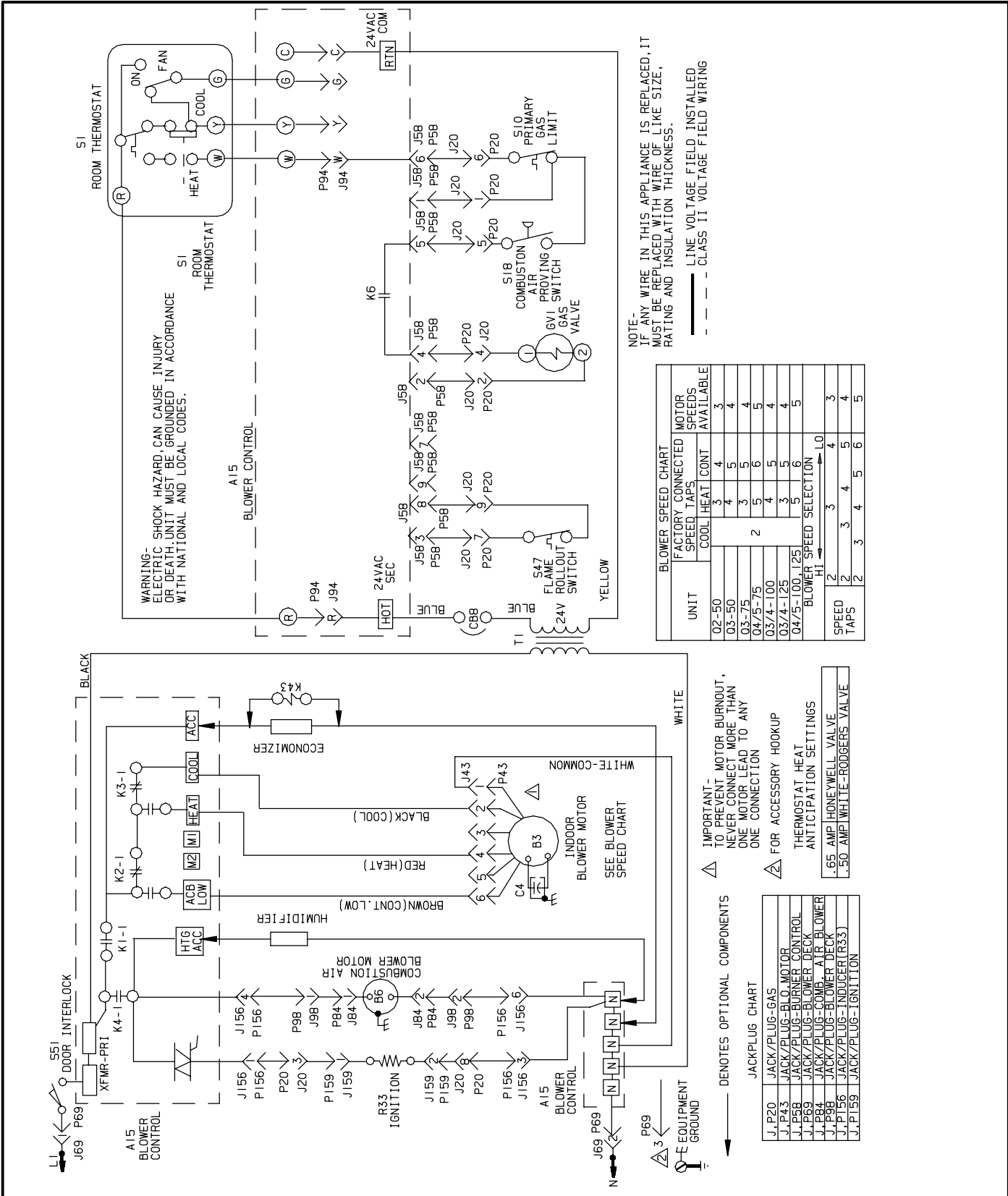
⚠ IMPORTANT- TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION

⚠ FOR ACCESSORY HOOKUP

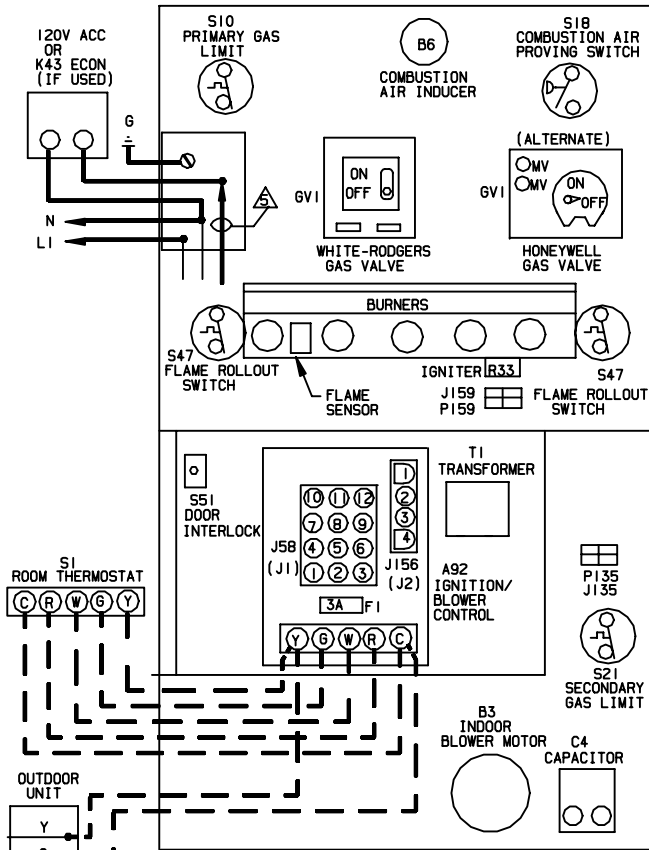
⚠ M1 & M2 ARE UNPOWERED TERMINALS. ALL UNUSED MOTOR LEADS MUST BE PARKED ON M1 OR M2.



| | | |
|-------------------------------|------------------|---------------------|
| LENNOX Industries Inc. | | WIRING DIAGRAM 8/98 |
| HEATING UNITS-GAS | | |
| 62302-50-5, 6 | 62303-100-5, 6 | 62305/6-125-5, 6 |
| 62303-50-5, 6 | 62303/4-100-5, 6 | 62305/6-150-5, 6 |
| 62302/3-75-5, 6 | 62304/5-100-5, 6 | |
| 62304/5-75-5, 6 | 62303/4-125-5, 6 | |
| SECTION A | | |
| Supersedes Form No. | Rev. Form No. | |
| | 532, 862W | |
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D-G40UH



| UNIT | FACTORY CONNECTED SPEED TAPS | | | | MOTOR SPEEDS AVAIL. | SECONDARY LIMITS USED |
|---------|------------------------------|--------|--------|--------|---------------------|-----------------------|
| | COOL | HEAT | PARK | PARK | | |
| 24A-045 | | RED | YELLOW | --- | 3 | N/A |
| 36A-070 | | RED | YELLOW | BROWN | 4 | 2 |
| 36B-090 | | BROWN | YELLOW | RED | 4 | 1 (RIGHT) |
| 48B-090 | | YELLOW | RED | BROWN | 4 | 2 |
| 48C-110 | BLACK | BROWN | RED | YELLOW | 4 | 1 (RIGHT) |

| BLOWER SPEED SELECTION | | | |
|------------------------|-------|--------|--------|
| HI | --- | --- | LO |
| SPEED TAPS | BLACK | YELLOW | RED |
| | | | 3 |
| | BLACK | BROWN | YELLOW |
| | | | 4 |

THERMOSTAT HEAT ANTICIPATION SETTINGS

| |
|-----------------------------|
| .65 AMP HONEYWELL VALVE |
| .50 AMP WHITE-RODGERS VALVE |

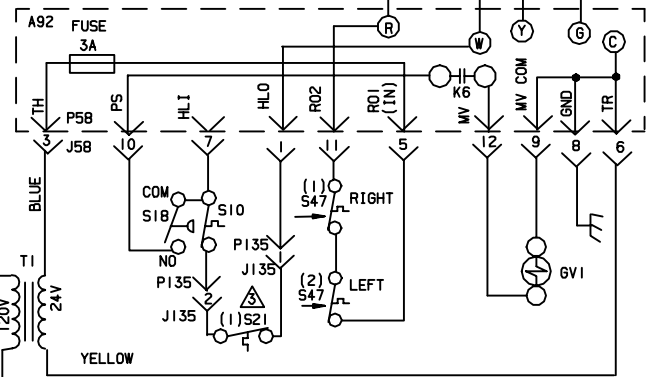
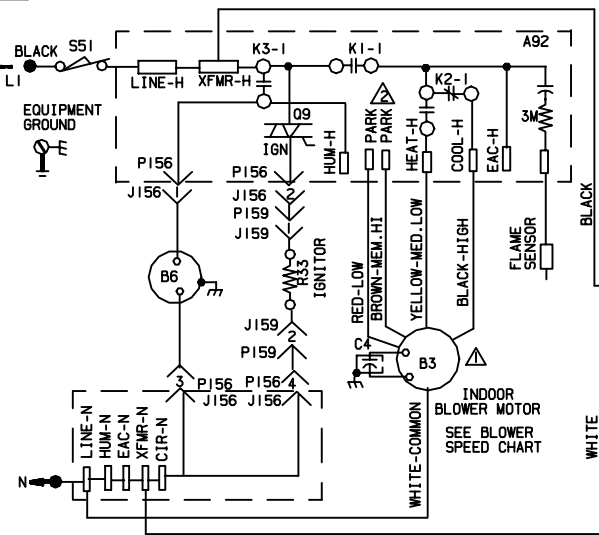
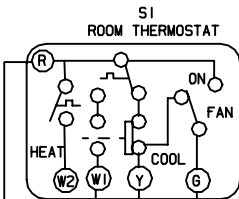
| JACKPLUG CHART | |
|----------------|---------------------------|
| J.P58 | JACK/PLUG-BURNER CONTROL |
| J.P135 | JACK/PLUG-SECONDARY LIMIT |
| J.P156 | JACK/PLUG-INDUCER/IGNITER |
| J.P159 | JACK/PLUG-IGNITION |

NOTE- IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

- ⚠ IMPORTANT- TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION.
- ⚠ PARK TERMINALS ARE UNPOWERED TERMINALS. ALL UNUSED MOTOR LEADS MUST BE WIRED TO A PARK TERMINAL.

- ⚠ FOR CORRECT NUMBER OF SECONDARY LIMITS USED, SEE SECONDARY LIMIT SECTION OF BLOWER SPEED CHART.
- ⚠ (G40UH-36B-090 ONLY) DO NOT USE RED (LOW SPEED) MOTOR LEAD FOR HEATING. LEAVE ON PARK.

⚠ FIELD SUPPLIED ACC. WIRE.



WARNING- ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

— LINE VOLTAGE FIELD INSTALLED
 - - - CLASS II VOLTAGE FIELD WIRING

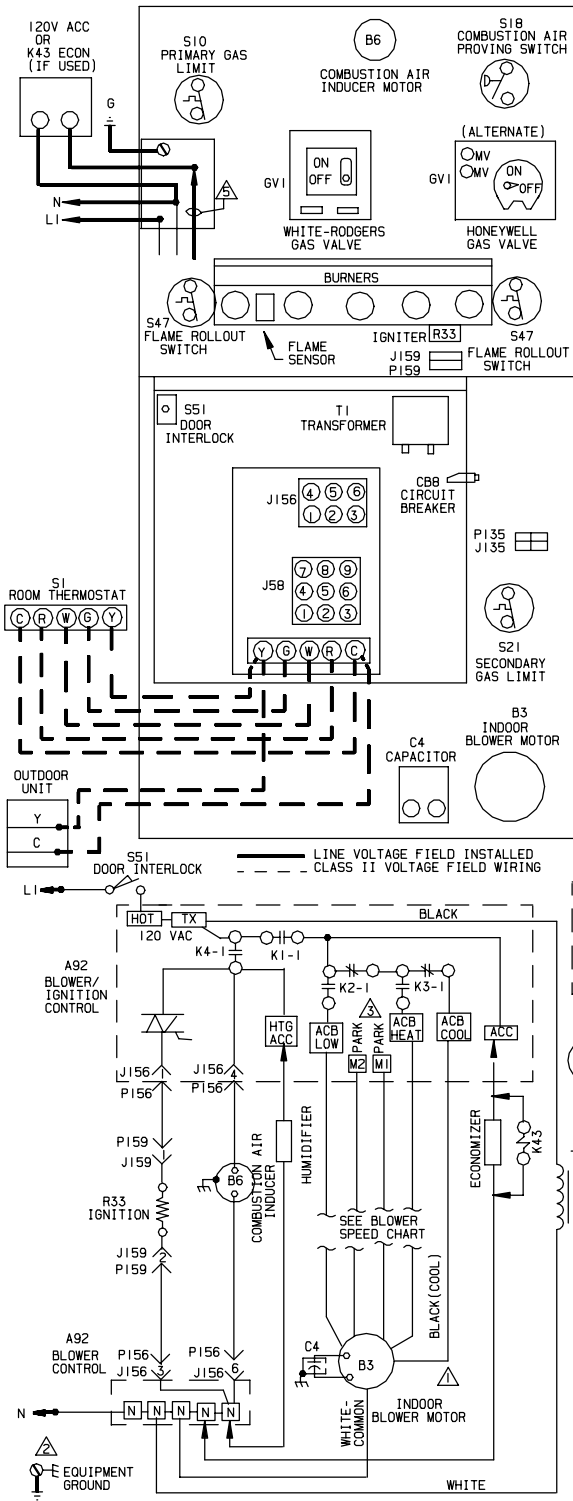
← DENOTES OPTIONAL COMPONENTS

| LENNOX® HEATING UNITS-GAS | |
|---------------------------|------------|
| 640UH-24A-045-01,02 | |
| 640UH-36A-070-01,02 | |
| 640UH-36B-090-01,02 | |
| 640UH-48B-090-01,02 | |
| 640UH-48C-110-01,02 | |
| 0600 | Supersedes |
| New Form No. | |
| 533,004W | |

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E-G50UH



| UNIT | FACTORY CONNECTED SPEED TAPS | | | | MOTOR SPEEDS AVAILABLE | SECONDARY LIMITS USED |
|---------|------------------------------|------|---------|--------|------------------------|-----------------------|
| | COOL | HEAT | ACB LOW | PARK | | |
| 24A-045 | YELLOW | RED | ---- | ---- | 3 | N/A |
| 36A-070 | YELLOW | RED | ---- | BROWN | 4 | 2 |
| 36B-090 | BROWN | RED | YELLOW | ---- | 4 | 1 (RIGHT) |
| 48B-090 | YELLOW | RED | ---- | BROWN | 4 | 2 |
| 48C-110 | BROWN | RED | ---- | YELLOW | 4 | 1 (RIGHT) |
| 60C-110 | YELLOW | RED | ---- | BROWN | 4 | N/A |

BLOWER SPEED SELECTION

| | | | | | |
|------|-------|--------|--------|-----|---|
| HI ← | BLACK | YELLOW | RED | 3 | |
| | BLACK | BROWN | YELLOW | RED | 4 |

THERMOSTAT HEAT ANTICIPATION SETTINGS

| | |
|---------|---------------------|
| .65 AMP | HONEYWELL VALVE |
| .50 AMP | WHITE-RODGERS VALVE |

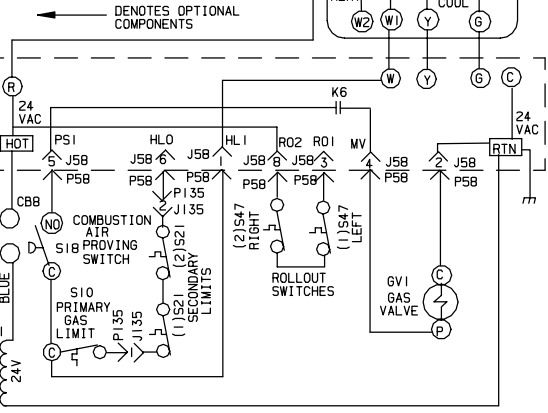
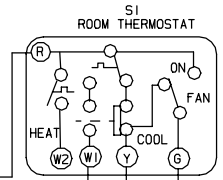
JACKPLUG CHART

| | |
|--------|---------------------------|
| J.P58 | JACK/PLUG-BURNER CONTROL |
| J.P135 | JACK/PLUG-SECONDARY LIMIT |
| J.P156 | JACK/PLUG-INDUCER/IGNITER |
| J.P159 | JACK/PLUG-IGNITION |

WARNING-
ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

NOTE-
IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

- ⚠ **IMPORTANT-** TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION.
- ⚠ **PARK TERMINALS ARE UNPOWERED TERMINALS.** ALL UNUSED MOTOR LEADS MUST BE WIRED TO A PARK TERMINAL.
- ⚠ **FOR CORRECT NUMBER OF SECONDARY LIMITS USED, SEE SECONDARY LIMIT SECTION OF BLOWER SPEED CHART.**
- ⚠ **(650UH-36B-090 ONLY) DO NOT USE RED (LOW SPEED) MOTOR LEAD FOR HEATING SPEED. LEAVE ON PARK OR USE FOR CONTINUOUS AIR CIRCULATION (ACB LOW).**
- ⚠ **FIELD SUPPLIED ACC. WIRE.**



| LENNOX® HEATING UNITS-GAS | |
|---------------------------|--------------------------|
| 650UH-24A-045-01, 02, 03 | 650UH-60C-110-01, 02, 03 |
| 650UH-36A-070-01, 02, 03 | 650UH-48C-135-01, 02, 03 |
| 650UH-36B-090-01, 02, 03 | 650UH-60D-135-01, 02, 03 |
| 650UH-48B-090-01, 02, 03 | 650UH-60D-155-01, 02, 03 |
| 650UH-48C-110-01, 02, 03 | |
| Supersedes | |
| 0500 000, 000W | |
| New Form No. | |
| 533, 354W | |

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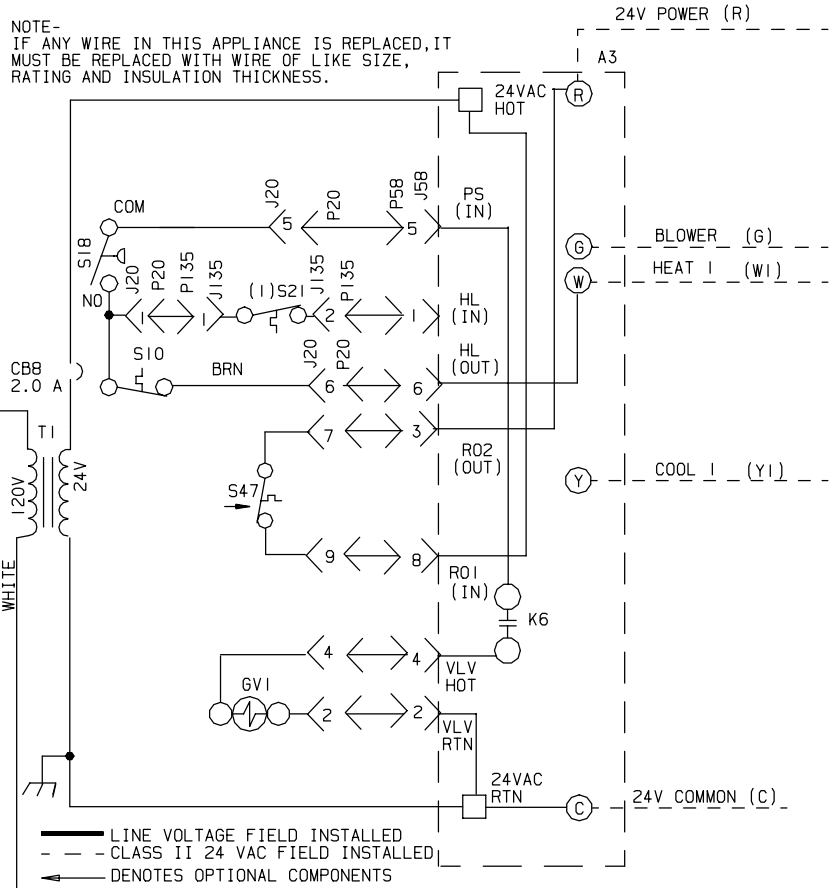
F-GHR26

| KEY | DESCRIPTION |
|------|------------------------------|
| A3 | CONTROL, BURNER, IGNITION |
| B3 | MOTOR, BLOWER |
| B6 | MOTOR, COMBUSTION AIR BLOWER |
| C4 | CAPACITOR, BLOWER MOTOR |
| CB8 | CIRCUIT BREAKER |
| GV1 | VALVE, GAS |
| J20 | JACK, GAS |
| J43 | JACK, BLOWER MOTOR |
| J58 | JACK-BURNER, CONTROL |
| J84 | JACK-COMB. AIR BLOWER |
| J96 | JACK, POWER INTERFACE |
| J98 | JACK, BLOWER DECK-CONTROL |
| J135 | JACK, SECONDARY LIMIT |
| J156 | JACK, INDUCER/IGNITOR |
| J159 | JACK, IGNITOR |
| P20 | PLUG, GAS |
| P43 | PLUG, BLOWER MOTOR |
| P58 | PLUG, BURNER CONTROL |
| P84 | PLUG-COMB. AIR BLOWER |
| P98 | PLUG, POWER INTERFACE |
| P98 | PLUG, BLOWER DECK-CONTROL |
| P135 | PLUG, SECONDARY LIMIT |
| P156 | PLUG, INDUCER/IGNITOR |
| P159 | PLUG-IGNITOR |
| S10 | LIMIT, PRIMARY, GAS |
| S18 | SWITCH, COMB. AIR BLWR PROVE |
| S21 | LIMIT, SECONDARY |
| S47 | SWITCH, ROLL OUT |
| S51 | SWITCH, DOOR INTERLOCK |
| T1 | TRANSFORMER, CONTROL |

| BLOWER SPEED CHART | | | | |
|--------------------|-----------------------------|------|------|------------------------|
| UNIT | FACTORY CONNECTED SPEED TAP | | | MOTOR SPEEDS AVAILABLE |
| | COOL | HEAT | CONT | |
| 02-45/60 | 2 | 4 | 5 | 4 |
| 03-60/75 | 2 | 4 | 5 | 4 |
| 04-75, 3/4-100 | 2 | 4 | 5 | 5 |
| 04/5-100/120 | 2 | 5 | 6 | 5 |
| 02-75 | 2 | 3 | 5 | 4 |
| 04/5-140, 3/4-120 | 2 | 3 | 6 | 5 |

| BLOWER SPEED SELECTION | | | | |
|------------------------|-----------|---|---|---|
| SPEED TAP | HI ← → LO | | | |
| | 2 | 3 | 4 | 5 |
| 2 | 3 | 4 | 5 | 6 |

NOTE- IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

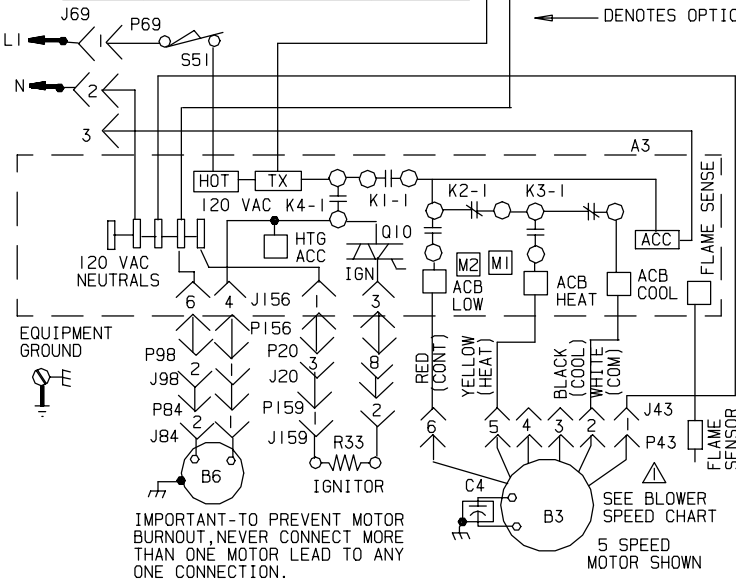


— LINE VOLTAGE FIELD INSTALLED
 - - CLASS II 24 VAC FIELD INSTALLED
 ← DENOTES OPTIONAL COMPONENTS

WARNING- ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

TO CHANGE MOTOR SPEED TAP AND FOR BLOWER SPEED SELECTION PROCEDURE, REFER TO INSTALLATION INSTRUCTION

SET THERMOSTAT HEAT ANTICIPATION FOR GHR26 SERIES UNITS AS FOLLOWS:
 HONEYWELL VALVE7
 WHITE ROGERS VALVE5



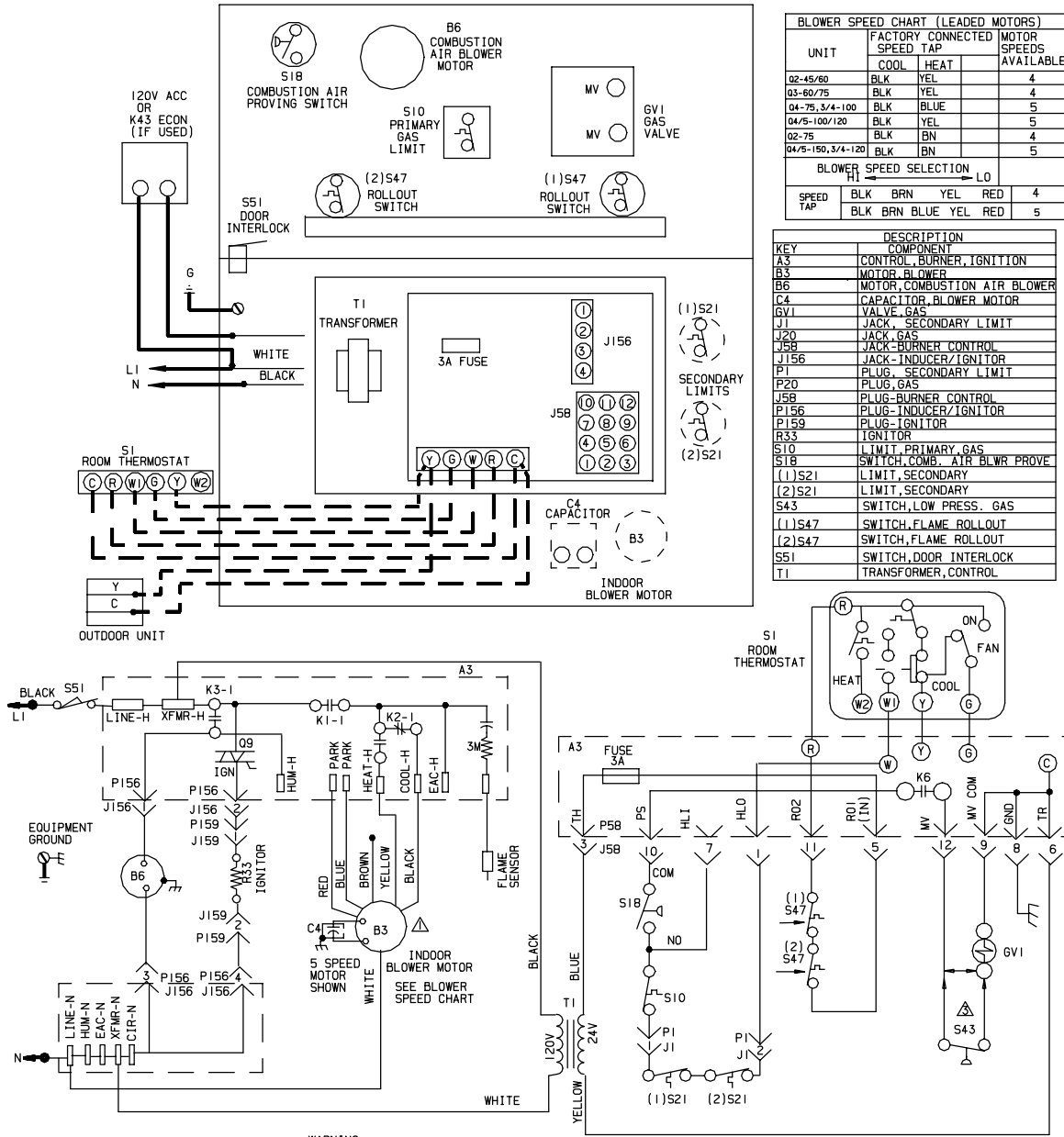
IMPORTANT-TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION.

| | | |
|-------------------------------------------|----------------|-------|
| LENNOX [®] Industries Inc | WIRING DIAGRAM | 10/97 |
| HEATING UNITS-GAS | | |
| GHR26Q2/3-50-2, 3 | | |
| GHR26Q3-75-2, 3 | | |
| GHR26Q3/4-100-2, 3 | | |
| GHR26Q4/5-100-2, 3 | | |
| GHR26Q4/5-120-2, 3 | | |
| SECTION A | 120/60/1 | |
| Supersedes Form No. | New Form No. | |
| | 532, 630W | |

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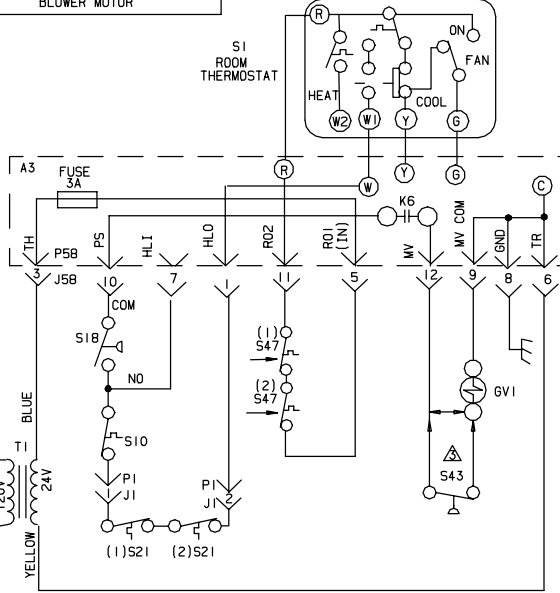
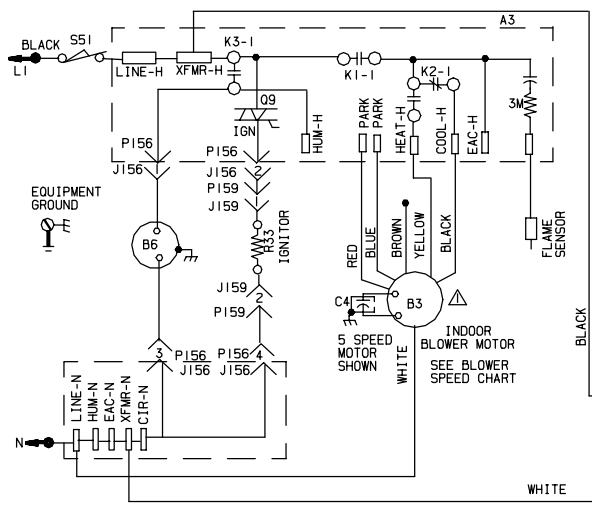
H-80UHG



| UNIT | FACTORY CONNECTED SPEED TAP | | MOTOR SPEEDS AVAILABLE |
|-------------------|-----------------------------|------|------------------------|
| | COOL | HEAT | |
| 02-45/60 | BLK | YEL | 4 |
| 03-60/75 | BLK | YEL | 4 |
| 04-75, 3/4-100 | BLK | BLU | 5 |
| 04/5-100/120 | BLK | YEL | 5 |
| 02-75 | BLK | BN | 4 |
| 04/5-150, 3/4-120 | BLK | BN | 5 |

| SPEED TAP | BLOWER SPEED SELECTION | | | |
|-----------|------------------------|-----|-----|-----|
| | HI | LO | LO | LO |
| | BLK | BRN | YEL | RED |
| | BLK | BRN | BLU | YEL |
| | | | | RED |
| | | | | 5 |

| KEY | DESCRIPTION |
|--------|------------------------------|
| A3 | CONTROL, BURNER, IGNITION |
| B3 | MOTOR, BLOWER |
| B6 | MOTOR, COMBUSTION AIR BLOWER |
| C4 | CAPACITOR, BLOWER MOTOR |
| GV1 | VALVE, GAS |
| J1 | JACK, SECONDARY LIMIT |
| J20 | JACK, GAS |
| J58 | JACK, BURNER CONTROL |
| J156 | JACK, INDUCER/IGNITOR |
| P1 | PLUG, SECONDARY LIMIT |
| P20 | PLUG, GAS |
| J58 | PLUG, BURNER CONTROL |
| P156 | PLUG, INDUCER/IGNITOR |
| P159 | PLUG, IGNITOR |
| R33 | IGNITOR |
| S10 | LIMIT, PRIMARY GAS |
| S1B | SWITCH, COMB. AIR BLWR PROVE |
| (1)S21 | LIMIT, SECONDARY |
| (2)S21 | LIMIT, SECONDARY |
| S43 | SWITCH, LOW PRESS. GAS |
| (1)S47 | SWITCH, FLAME ROLLOUT |
| (2)S47 | SWITCH, FLAME ROLLOUT |
| S51 | SWITCH, DOOR INTERLOCK |
| T1 | TRANSFORMER, CONTROL |



IMPORTANT-
TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION. TAPE ALL UNUSED MOTOR LEADS SEPARATELY.

FOR PROPANE/LP ONLY

WARNING-
ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

NOTE-
IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

— LINE VOLTAGE FIELD INSTALLED
- - CLASS II 24 VAC FIELD INSTALLED
— DENOTES OPTIONAL COMPONENTS

LENNOX Industries Inc. WIRING DIAGRAM 3/98

HEATING UNITS-GAS DSI

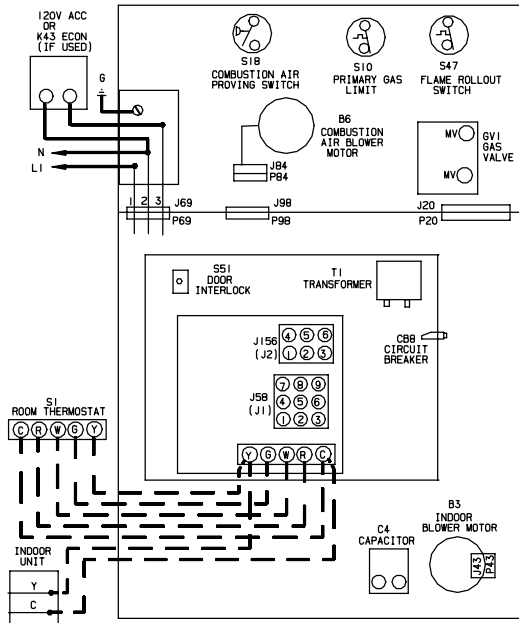
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 80UH63(X)-60/75-2 80UH65/5(X)-100/120-2
 80UH64(X)-75-2

SECTION A

Supersedes Form No. New Form No. 532, 785W

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I-90UGF



WARNING-
 ELECTRIC SHOCK HAZARD CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

NOTE-
 IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

— LINE VOLTAGE FIELD INSTALLED
 - - - CLASS II VOLTAGE FIELD WIRING

← DENOTES OPTIONAL COMPONENTS

- ⚠ IMPORTANT - TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION
- ⚠ FOR ACCESSORY HOOKUP

TERMOSTAT HEAT ANTICIPATION SETTINGS

| |
|-----------------------------|
| .65 AMP HONEYWELL VALVE |
| .50 AMP WHITE-RODGERS VALVE |

JACKPLUG CHART

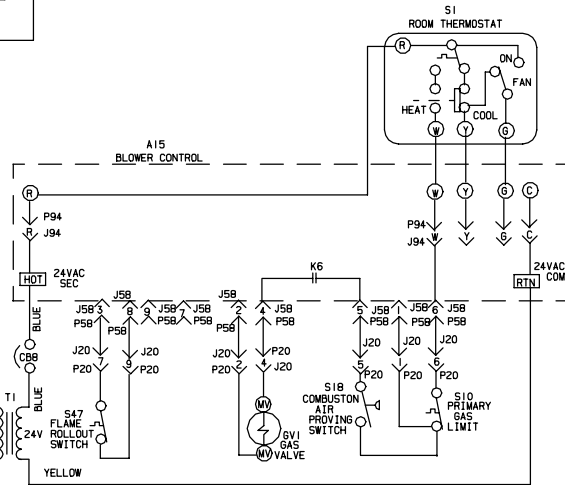
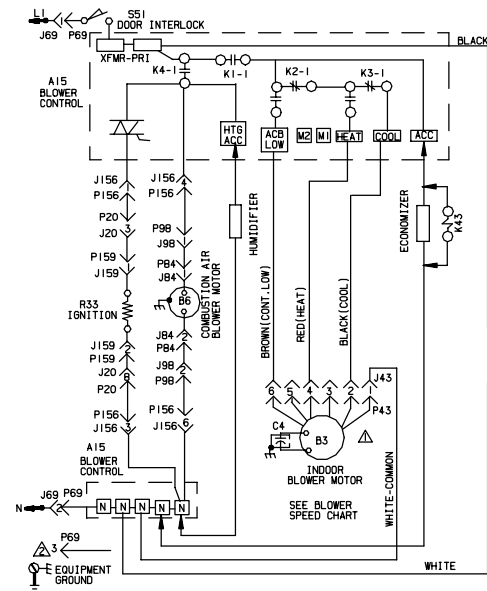
| | |
|---------|----------------------------|
| J, P20 | JACK/PLUG-GAS |
| J, P43 | JACK/PLUG-BLD. MOTOR |
| J, P58 | JACK/PLUG-BURNER CONTROL |
| J, P68 | JACK/PLUG-BLOWER DECK |
| J, P84 | JACK/PLUG-COMB. AIR BLOWER |
| J, P98 | JACK/PLUG-BLOWER DECK |
| J, P158 | JACK/PLUG-INDUCER(R33) |
| J, P159 | JACK/PLUG-IGNITION |

BLOWER SPEED CHART

| UNIT | FACTORY CONNECTED SPEED TAPS | | | MOTOR SPEEDS AVAILABLE |
|----------|------------------------------|------|-------|------------------------|
| | COOL | HEAT | CONT. | |
| A2-50 | 3 | 4 | 3 | 3 |
| A3-50 | 4 | 5 | 4 | 4 |
| A3-75 | 3 | 5 | 4 | 4 |
| A3/4-100 | 2 | 4 | 5 | 4 |
| A4/5-125 | 5 | 6 | 5 | 5 |

BLOWER SPEED SELECTION

| SPEED TAPS | S1 | | | | | |
|------------|----|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 2 | 2 | 3 | 4 | 5 | 4 | 3 |
| 3 | 3 | 4 | 5 | 6 | 5 | 4 |



LENNOX Industries Inc. WIRING DIAGRAM 6/97

HEATING UNITS-GAS

| | |
|---------------|------------------|
| 90UGF A2-50-3 | 90UGF A3/4-100-3 |
| 90UGF A3-50-3 | 90UGF A4/5-125-3 |
| 90UGF A3-75-3 | |

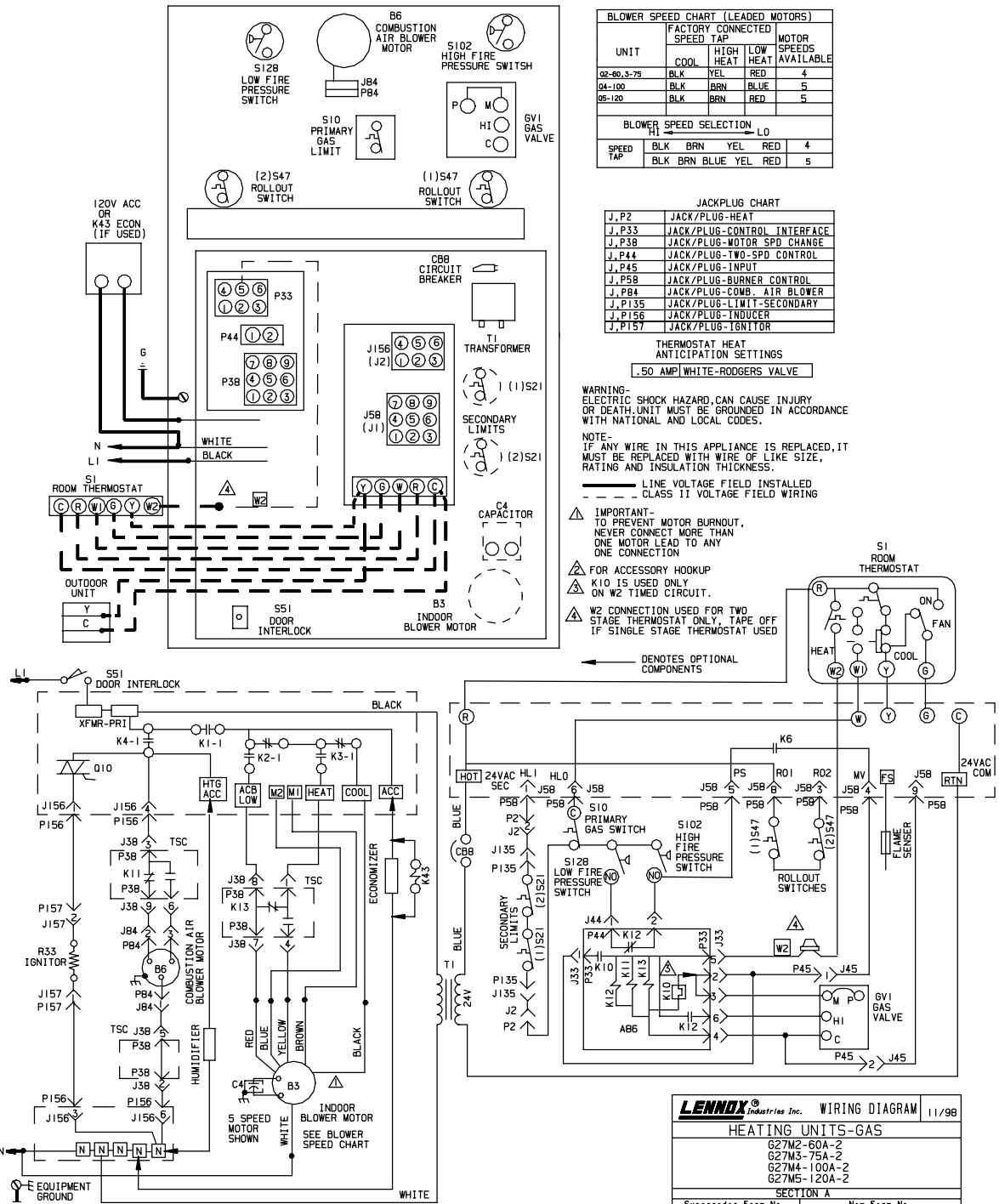
SECTION A

| | |
|---------------------|--------------|
| Supersedes Form No. | New Form No. |
| | 532, 563W |

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Sequence of Operation G23X / 80MGF / G26 / GHR26 / 90UGF / 80UGH / G24M G40UH/G50UH

- 1 - When there is a call for heat, W1 of the thermostat energizes W of the furnace control with 24VAC.
- 2 - S10 primary limit switch and S47 rollout switch are closed. Call for heat can continued.
- 3 - SureLight control energizes combustion air inducer B6. Combustion air inducer runs until S18 combustion air prove switch closes (switch must close within 2-1/2 minutes or control goes into 5 minute Watchguard Pressure Switch delay). Once S18 closes, a 15-second pre-purge follows.
- 4 - SureLight control energizes ignitor. A 20-second warm-up period begins.
- 5 - Gas valve opens for a 4-second trial for ignition.
- 6 - Flame is sensed, gas valve remains open for the heat call.
- 7 - After 45-second delay, SureLight control energizes indoor blower B3.
- 8 - When heat demand is satisfied, W1 of the indoor thermostat de-energizes W of the SureLight control which de-energizes the gas valve. Combustion air inducer B6 continues a 5-second post-purge period, and indoor blower B3 completes a selected OFF time delay.



BLOWER SPEED CHART (LEADED MOTORS)

| UNIT | FACTORY CONNECTED SPEED TAP | | | MOTOR SPEEDS AVAILABLE |
|-------------|-----------------------------|-----------|----------|------------------------|
| | COOL | HIGH HEAT | LOW HEAT | |
| 02-60, 3-75 | BLK | YEL | RED | 4 |
| 04-100 | BLK | BRN | BLUE | 5 |
| 05-120 | BLK | BRN | RED | 5 |

BLOWER SPEED SELECTION

| SPEED TAP | SELECTION | | | |
|-----------|-----------|-----|------|-----|
| | BLK | BRN | YEL | RED |
| 4 | | | | LO |
| 5 | BLK | BRN | BLUE | RED |

JACKPLUG CHART

| | |
|--------|-----------------------------|
| J.P2 | JACK/PLUG-HEAT |
| J.P33 | JACK/PLUG-CONTROL INTERFACE |
| J.P38 | JACK/PLUG-MOTOR SPD CHANGE |
| J.P44 | JACK/PLUG-TWO-SPD CONTROL |
| J.P45 | JACK/PLUG-INPUT |
| J.P58 | JACK/PLUG-BURNER CONTROL |
| J.P84 | JACK/PLUG-COMB. AIR BLOWER |
| J.P135 | JACK/PLUG-LIMIT-SECONDARY |
| J.P156 | JACK/PLUG-INDUCER |
| J.P157 | JACK/PLUG-IGNITOR |

THERMOSTAT HEAT ANTICIPATION SETTINGS
 .50 AMP WHITE-RODGERS VALVE

WARNING- ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

NOTE- IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

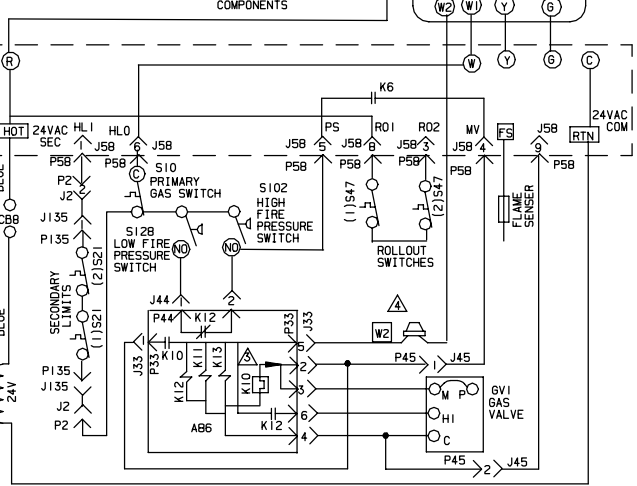
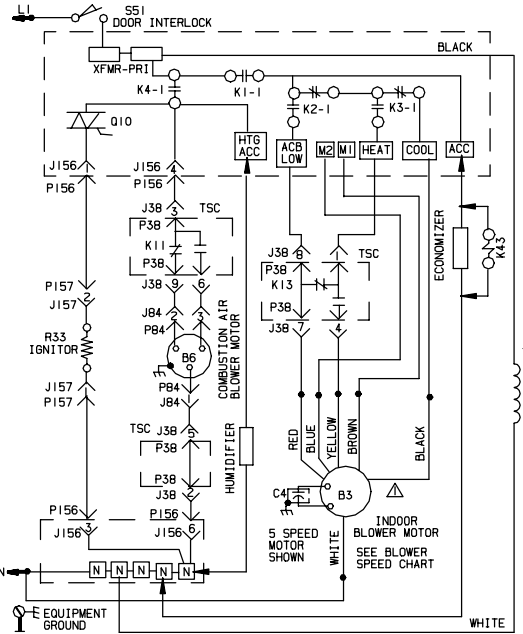
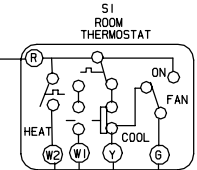
— LINE VOLTAGE FIELD INSTALLED
 - - - CLASS II VOLTAGE FIELD WIRING

⚠ **IMPORTANT-** TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION

⚠ **FOR ACCESSORY HOOKUP** K10 IS USED ONLY ON W2 TIMED CIRCUIT.

⚠ **W2 CONNECTION USED FOR TWO STAGE THERMOSTAT ONLY, TAPE OFF IF SINGLE STAGE THERMOSTAT USED**

← DENOTES OPTIONAL COMPONENTS



LENNOX Industries Inc. WIRING DIAGRAM 11/98

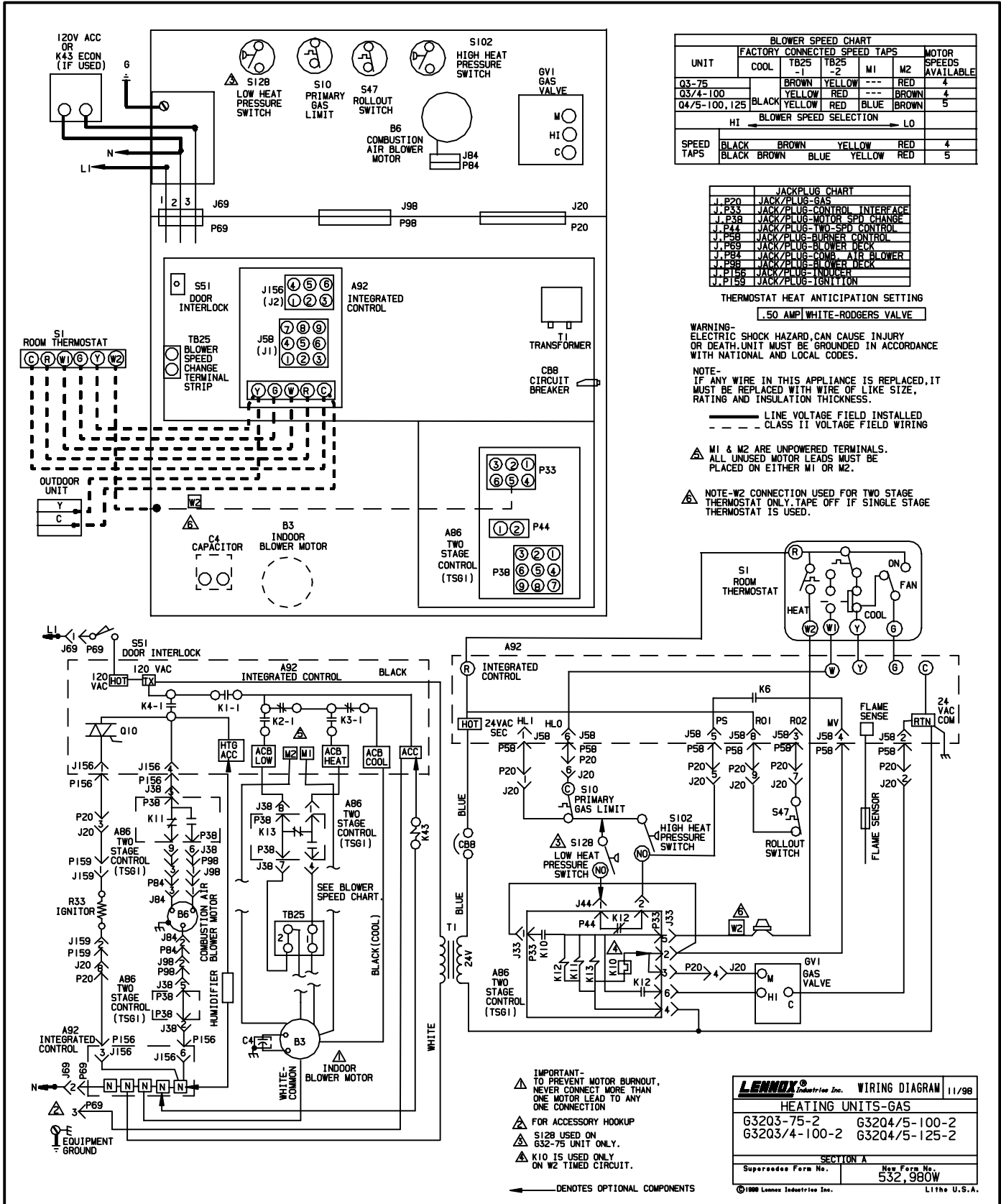
HEATING UNITS-GAS

627M2-60A-2
 627M3-75A-2
 627M4-100A-2
 627M5-120A-2

SECTION A

Supersedes Form No. 532,791W New Form No. 532,982W

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BLOWER SPEED CHART

| UNIT | FACTORY CONNECTED SPEED TAPS | | | | MOTOR SPEEDS AVAILABLE |
|---------------|------------------------------|---------|---------|------------|------------------------|
| | COOL | TB25 -1 | TB25 -2 | M1 M2 | |
| 03-75 | BROWN | YELLOW | --- | RED | 4 |
| 03/4-100 | YELLOW | RED | --- | BROWN | 4 |
| 04/5-100, 125 | BLACK | YELLOW | RED | BLUE BROWN | 5 |

HI ← BLOWER SPEED SELECTION → LO

| SPEED TAPS | BLACK | BROWN | YELLOW | RED | | |
|------------|-------|-------|--------|--------|-----|---|
| | | | | | | 4 |
| | BLACK | BROWN | BLUE | YELLOW | RED | 5 |

JACKPLUG CHART

| | |
|--------|-----------------------------|
| J.P20 | JACK/PLUG-GAS |
| J.P33 | JACK/PLUG-CONTROL INTERFACE |
| J.P39 | JACK/PLUG-MOTOR SPD CHANGE |
| J.P44 | JACK/PLUG-TWO SPD CONTROL |
| J.P58 | JACK/PLUG-BURNER CONTROL |
| J.P69 | JACK/PLUG-BLOWER DECK |
| J.P84 | JACK/PLUG-DOWNDRAFT BLOWER |
| J.P88 | JACK/PLUG-BLOWER DECK |
| J.P158 | JACK/PLUG-INDUCER |
| J.P159 | JACK/PLUG-IGNITION |

☐ THERMOSTAT HEAT ANTICIPATION SETTING
 .50 AMP WHITE-RODGERS VALVE

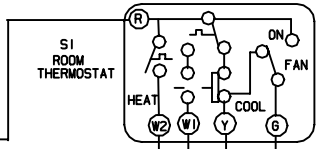
WARNING- ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

NOTE- IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

— LINE VOLTAGE FIELD INSTALLED
 - - - CLASS II VOLTAGE FIELD WIRING

⚠ M1 & M2 ARE UNPOWERED TERMINALS. ALL UNUSED MOTOR LEADS MUST BE PLACED ON EITHER M1 OR M2.

⚠ NOTE-W2 CONNECTION USED FOR TWO STAGE THERMOSTAT ONLY. TAPE OFF IF SINGLE STAGE THERMOSTAT IS USED.



- ⚠ IMPORTANT- TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION
- ⚠ FOR ACCESSORY HOOKUP
- ⚠ S128 USED ON 632-75 UNIT ONLY.
- ⚠ K10 IS USED ONLY ON W2 TIMED CIRCUIT.

← DENOTES OPTIONAL COMPONENTS

LENNOX Industries Inc. WIRING DIAGRAM 11/98

HEATING UNITS-GAS

| | |
|---------------|---------------|
| 63203-75-2 | 63204/5-100-2 |
| 63203/4-100-2 | 63204/5-125-2 |

SECTION A

| | |
|---------------------|--------------|
| Supersedes Form No. | New Form No. |
| | 532, 980W |

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| BLOWER SPEED CHART | | |
|-----------------------------|------|--------|
| VSPZ FACTORY SPEED SETTINGS | | |
| UNIT | HEAT | ADJUST |
| V3-75 | 4 | 3 |
| V5-100 | 4 | 2 |
| V5-125 | 4 | 2 |

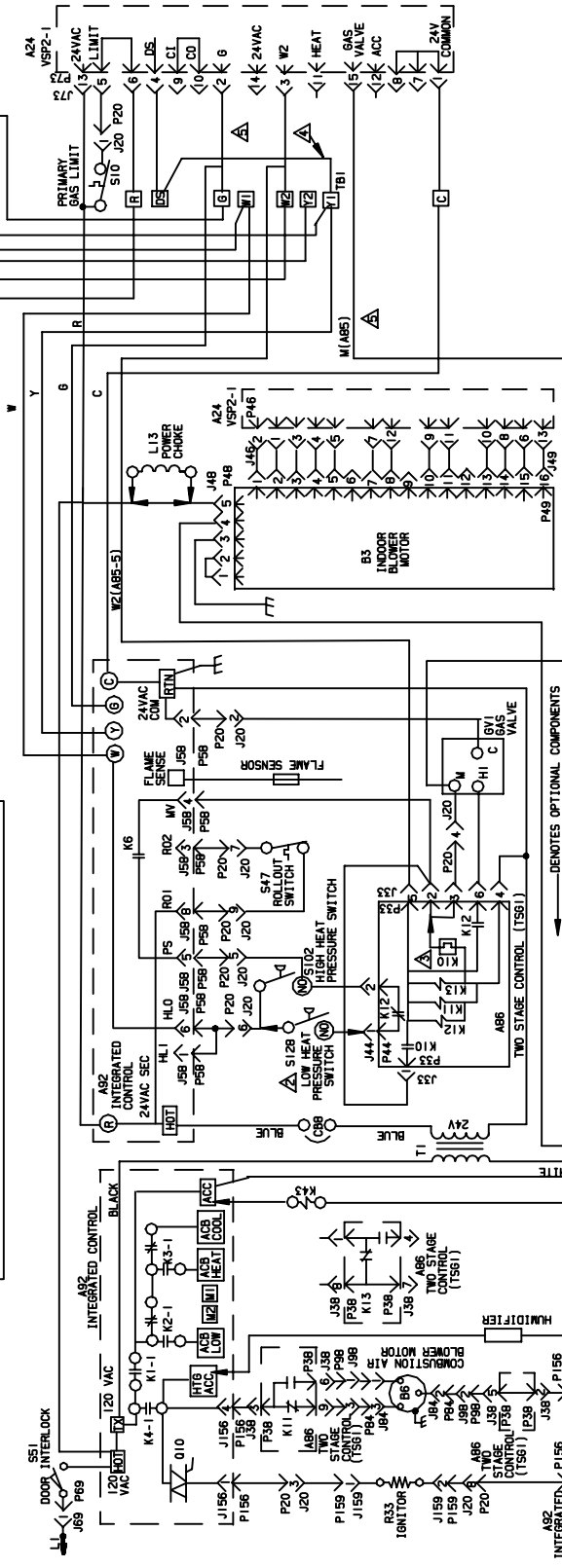
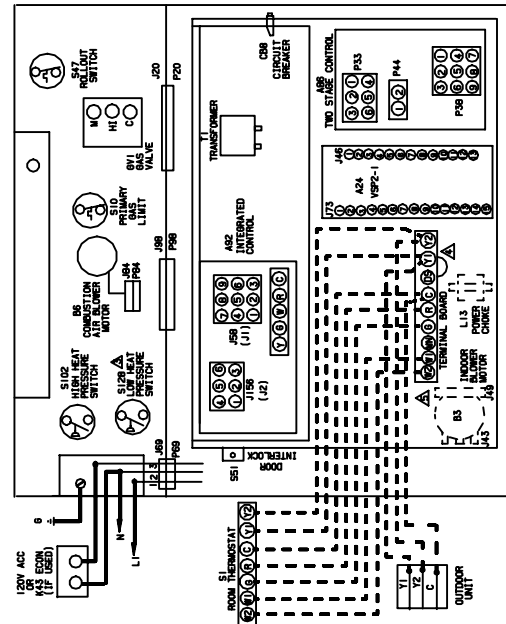
| JACKPLUG CHART | |
|----------------|-----------------------------|
| J.P20 | JACK/PLUG-GAS |
| J.P33 | JACK/PLUG-CONTROL INTERLOCK |
| J.P38 | JACK/PLUG-MOTOR SPD CHANGE |
| J.P43 | JACK/PLUG-THRESHOLD CONTROL |
| J.P48 | JACK/PLUG-THRESHOLD CONTROL |
| J.P53 | JACK/PLUG-BLOWER DECK |
| J.P58 | JACK/PLUG-COMB. AIR BLOWER |
| J.P63 | JACK/PLUG-BLOWER DECK |
| J.P68 | JACK/PLUG-BLOWER DECK |
| J.P73 | JACK/PLUG-INDUCER |
| J.P78 | JACK/PLUG-IGNITION |

TERMOSTAT HEAT ANTICIPATION SETTING
 [50 AMP WHITE-RODGERS VALVE]

WARNING: ELECTRIC SHOCK HAZARD. CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDING IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

NOTE: ANY WIRE IN THIS WIRE RANGE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF THE SAME SIZE, RATING AND INSULATION THICKNESS.

--- LINE VOLTAGE FIELD WIRING



△ FOR ACCESSORY HOOKUP
 △ S120 USED ON 632-75 UNIT ONLY.
 △ K10 IS USED ONLY ON W2 TIMED CIRCUIT.

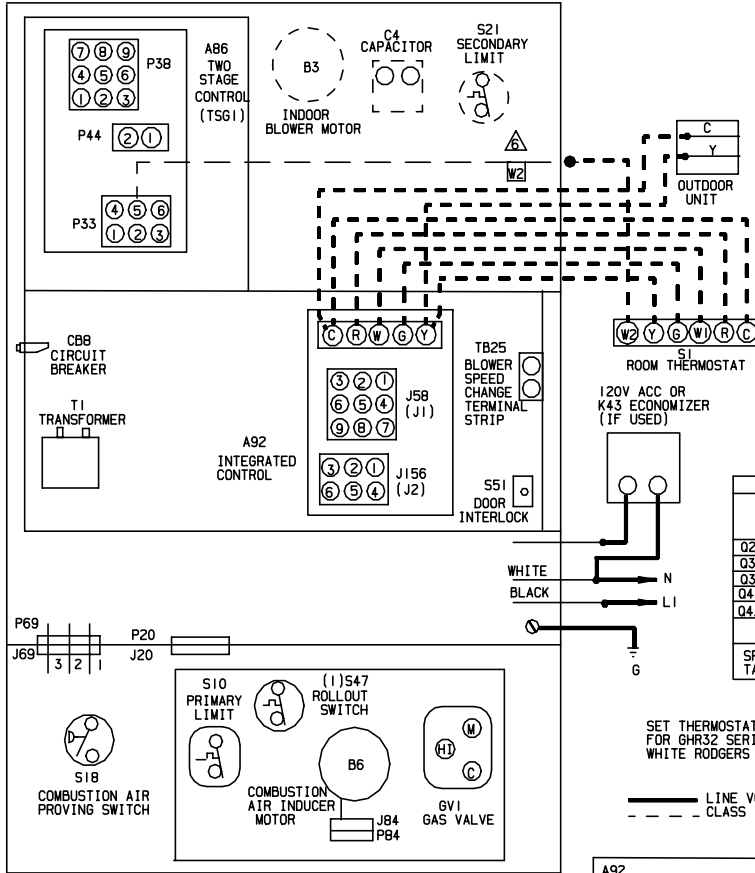
--- DENOTES OPTIONAL COMPONENTS

△ JUMPER FROM U5 TO Y1 IS FACTORY WIRING FOR TWO STAGE COOLING MODE. JUMPER WIRE FROM Y1 TO Y2.

NOTE: W2 ON TERMINAL BOARD IS USED FOR TWO STAGE THERMOSTAT AND HARMONIC REDUCING JUMPER W2 TO W1. JUMPER WIRE WITH SINGLE WIRE STAGE THERMOSTAT.

LENNOX Heating & Air Conditioning Inc.
 HEATING UNITS-GAS
 632V3-75-1-P
 632V5-100-1-P
 632V5-125-1-P
 SECTION A
 Supp. No. 552,908W
 Rev. 552,981W
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M-GHR32



WARNING-
ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

NOTE-
IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

- ⚠ MI & M2 ARE UNPOWERED TERMINALS. ALL UNUSED MOTOR LEADS MUST BE PLACED ON EITHER MI OR M2.
- ⚠ NOTE-W2 CONNECTION USED FOR TWO STAGE THERMOSTAT ONLY. TAPE OFF IF SINGLE STAGE THERMOSTAT IS USED.

JACKPLUS CHART

| | |
|---------|-----------------------------|
| J. P20 | JACK/PLUG-GAS |
| J. P33 | JACK/PLUG-CONTROL INTERFACE |
| J. P38 | JACK/PLUG-MOTOR SPD CHANGE |
| J. P44 | JACK/PLUG-TWO-SPD CONTROL |
| J. P58 | JACK/PLUG-BURNER CONTROL |
| J. P69 | JACK/PLUG-BLOWER DECK |
| J. P84 | JACK/PLUG-COMB. AIR BLOWER |
| J. P98 | JACK/PLUG-BLOWER DECK |
| J. P156 | JACK/PLUG-INDUCER |
| J. P159 | JACK/PLUG-IGNITION |

BLOWER SPEED CHART

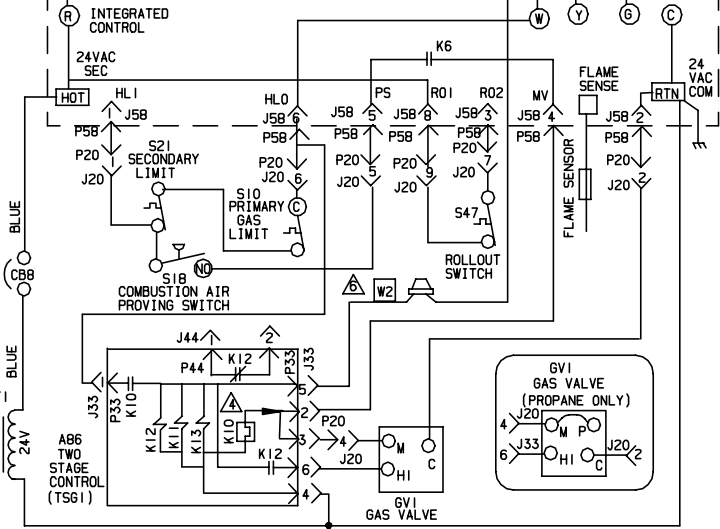
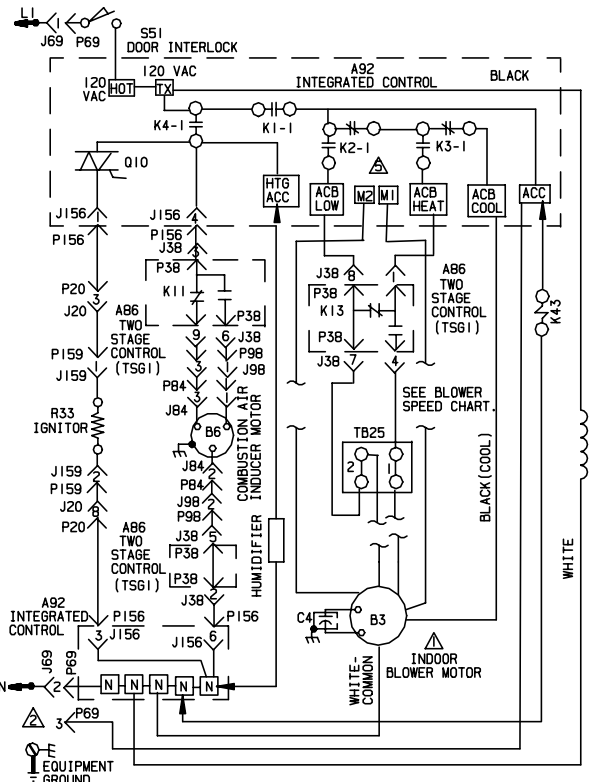
| UNIT | FACTORY CONNECTED SPEED TAPS | | | | MOTOR SPEEDS AVAILABLE |
|----------|------------------------------|------------|-----------|--------|------------------------|
| | COOL | HEAT | ACB LOW | M1 M2 | |
| Q2/3-50 | | YELLOW RED | ---- | BROWN | 4 |
| Q3-75 | | YELLOW RED | ---- | BROWN | 4 |
| Q3/4-100 | | YELLOW RED | ---- | BROWN | 4 |
| Q4/5-100 | BLACK | YELLOW RED | BROWN | BLUE | 5 |
| Q4/5-120 | | BLUE | RED BROWN | YELLOW | 5 |

BLOWER SPEED SELECTION

| SPEED TAPS | BLOWER SPEED SELECTION | | | |
|------------|------------------------|--------|------------|----|
| | HI | LO | LO | LO |
| BLACK | BROWN | YELLOW | RED | 4 |
| BLACK | BROWN | BLUE | YELLOW RED | 5 |

SET THERMOSTAT HEAT ANTICIPATION FOR GHR32 SERIES UNITS AS FOLLOWS:
WHITE RODGERS VALVE... .5

— LINE VOLTAGE FIELD INSTALLED
- - - CLASS II VOLTAGE FIELD WIRING



- ⚠ IMPORTANT - TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION
- ⚠ FOR ACCESSORY HOOKUP
- ⚠ K10 IS USED ON TWO-STAGE ONLY

LENNOX® HEATING UNITS-GAS

GHR32 SERIES

Supersedes Form No. 0300

New Form No. 533,079W

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| JACKPLUG CHART | |
|----------------|-----------------------------|
| J.P20 | JACK/PLUG-GAS |
| J.P33 | JACK/PLUG-CONTROL INTERFACE |
| J.P38 | JACK/PLUG-MOTOR SPD CHANGE |
| J.P44 | JACK/PLUG-TWO-SPD CONTROL |
| J.P88 | JACK/PLUG-BURNER CONTROL |
| J.P89 | JACK/PLUG-BLOWER DECK |
| J.P84 | JACK/PLUG-COMB. AIR BLOWER |
| J.P88 | JACK/PLUG-BLOWER DECK |
| J.P156 | JACK/PLUG-INDUCER |
| J.P159 | JACK/PLUG-IGNITION |

| BLOWER SPEED CHART | | | | |
|--------------------|------|-----|------|--------|
| UNIT | HIGH | LOW | HEAT | ADJUST |
| V3-75 | 4 | 3 | 3 | NORM |
| V5-100 | 4 | 2 | 1 | NORM |
| V5-125 | 4 | 3 | 2 | NORM |

THERMOSTAT HEAT ANTICIPATION SETTING
 50 AMP WHITE-RODGERS VALVE

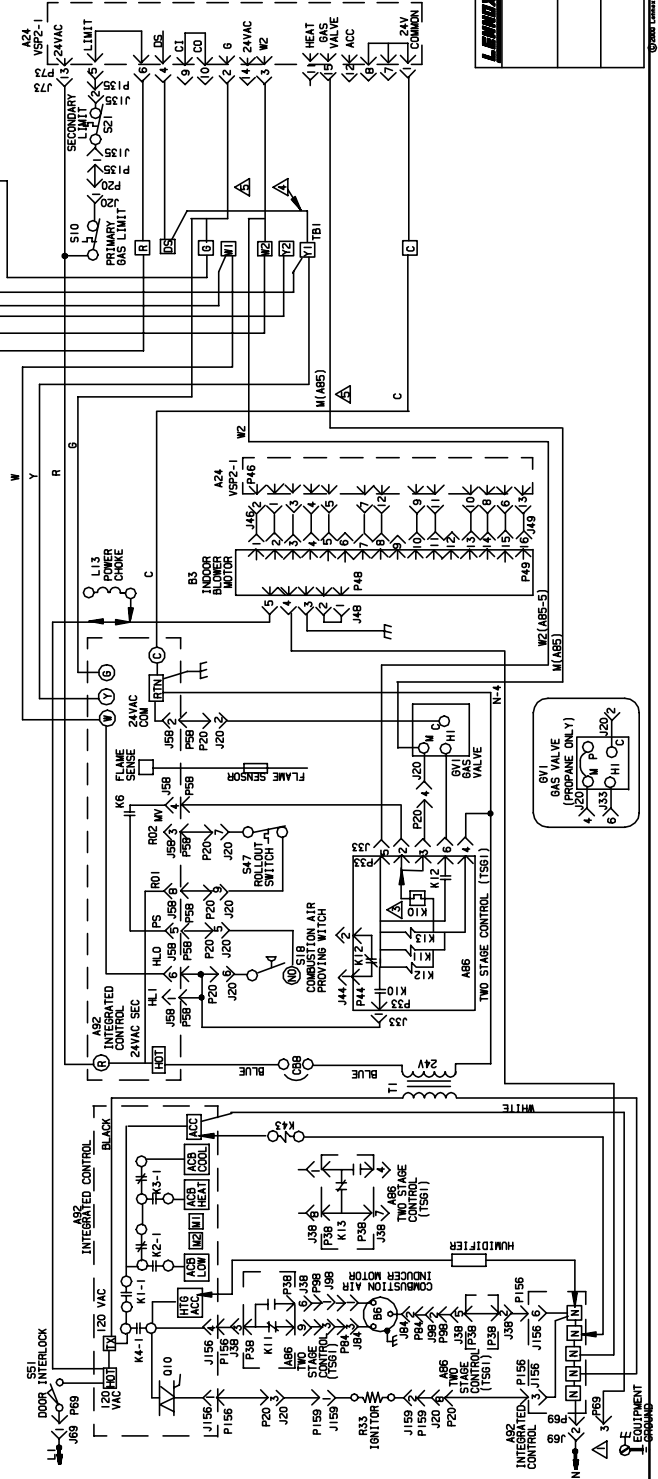
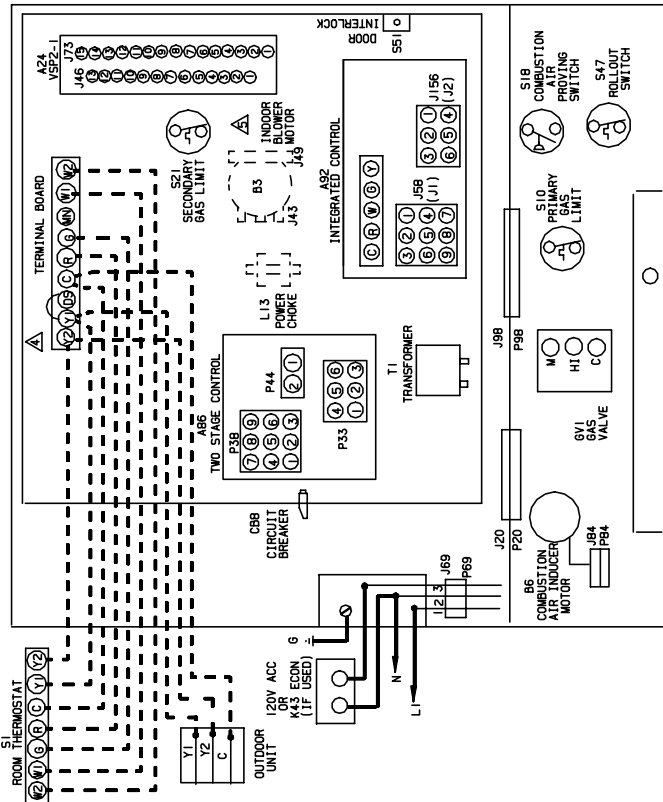
WARNING- ELECTRIC SHOCK HAZARD CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

NOTE- IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

— LINE VOLTAGE FIELD INSTALLED
 --- CLASS II VOLTAGE FIELD WIRING

— DENOTES OPTIONAL COMPONENTS

- △ FOR ACCESSORY HOOKUP
- △ S128 USED ON 632-75 UNIT ONLY.
- △ K10 IS USED ONLY ON W2 TIMED CIRCUIT.
- △ JUMPER FROM BS TO Y1 IS FACTORY WIRING FOR SINGLE STAGE COOLING. MOVE JUMPER WIRE FROM Y1 TO Y2.
- △ NOTE: W2 ON TERMINAL BOARD IS USED FOR TWO STAGE THERMOSTAT AND HARMONY. DO NOT JUMPER W2 TO W1 ON TERMINAL BOARD WITH SINGLE STAGE THERMOSTAT.



| HEATING UNITS-GAS | |
|-------------------|--------------------------|
| GHR32V3-75-1 | Supplement Form No. 0300 |
| GHR32V5-100-1 | Supplement Form No. 0300 |
| GHR32V5-100-1 | Supplement Form No. 0300 |

New Form No. 533, 080W
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Sequence of Operation G27M / G32 / G32V - GHR32 / GHR32V

Ignitor operation will vary between SureLight boards. Boards 56L83, 24L85 and 63K89 will energize the ignitor for the first second of the 4-second ignition trial. Board 97L48 will energize the ignitor for the full 4-second ignition trial.

- 1 - When there is a call for heat, W1 of the thermostat energizes W of the furnace control with 24VAC.
- 2 - SureLight control runs self-check for S10 primary limit switch and S21 secondary limit switch normally closed contacts. The control also checks S18 combustion air prove switch and S102 high fire pressure switch normally open contacts.
- 3A **Single-stage Mode, Single-Stage Thermostat** SureLight control energizes combustion air inducer B6 on high speed. Combustion air inducer runs until S102 high fire pressure switch closes (switch must close within 2-1/2 minutes or control goes into 5 minute Watchguard-Pressure Switch delay). A 15-second pre-purge follows after S102 closes.
- 3B **Two-stage Mode, Single-Stage Thermostat** SureLight control energizes combustion air inducer B6 on low speed. Combustion air inducer runs until combustion air inducer switch S18 closes (switch must close within 2-1/2 minutes or control goes into 5 minute Watchguard-Pressure Switch delay). A 15-second pre-purge follows once S18 closes.
- 3C **Two-stage Mode, Two Stage Thermostat** SureLight control energizes combustion air inducer B6 on low speed. Combustion air inducer runs until combustion air inducer switch S18 closes (switch will close within 2-1/2 minutes or control goes into 5 minute Watchguard-Pressure Switch delay). A 15-second pre-purge follows once S18 is closes.
- 4 - SureLight control energizes ignitor. A 20-second warm-up period begins.
- 5A **Single-stage Mode, Single-Stage Thermostat** Gas valve is energized on first stage heat (low). Gas valve opens for a 4 second trial for ignition. Flame is sensed. After 8 seconds from when gas valve opens, valve energizes on second stage (high heat).
- 5B **Two-stage Mode, Single-Stage Thermostat** Gas valve is energized on first stage. Gas valve opens for a 4-second trial for ignition. Signal is sent from control module to two-stage control board to begin W2 (second-stage) ON delay.
- 5C **Two-Stage Mode, Two Stage Thermostat** - Gas valve is energized on first stage only. Gas valve opens for a 4-second trial for ignition.
- 6 - Flame is sensed, gas valve remains open for the heat call.
- 7A **Single-stage Mode, Single-Stage Thermostat** After 45-second delay, indoor blower B3 is energized on high heating speed.
- 7B **Two-stage Mode, Single-Stage Thermostat** After 45-second delay, indoor blower B3 is energized on low speed.
- 7C **Two-Stage Mode, Two Stage Thermostat** After 45-second delay, indoor blower B3 is energized on low speed.
- 8A **Two-stage Mode, Single-Stage Thermostat** Second stage time on delay complete (8, 12, or 15 minutes). Gas valve opens, indoor blower B3 remains energized on heating speed.
- 8B **Two-Stage Mode, Two Stage Thermostat** Call for second stage heat comes from indoor thermostat.

HEATING SEQUENCE OF OPERATION

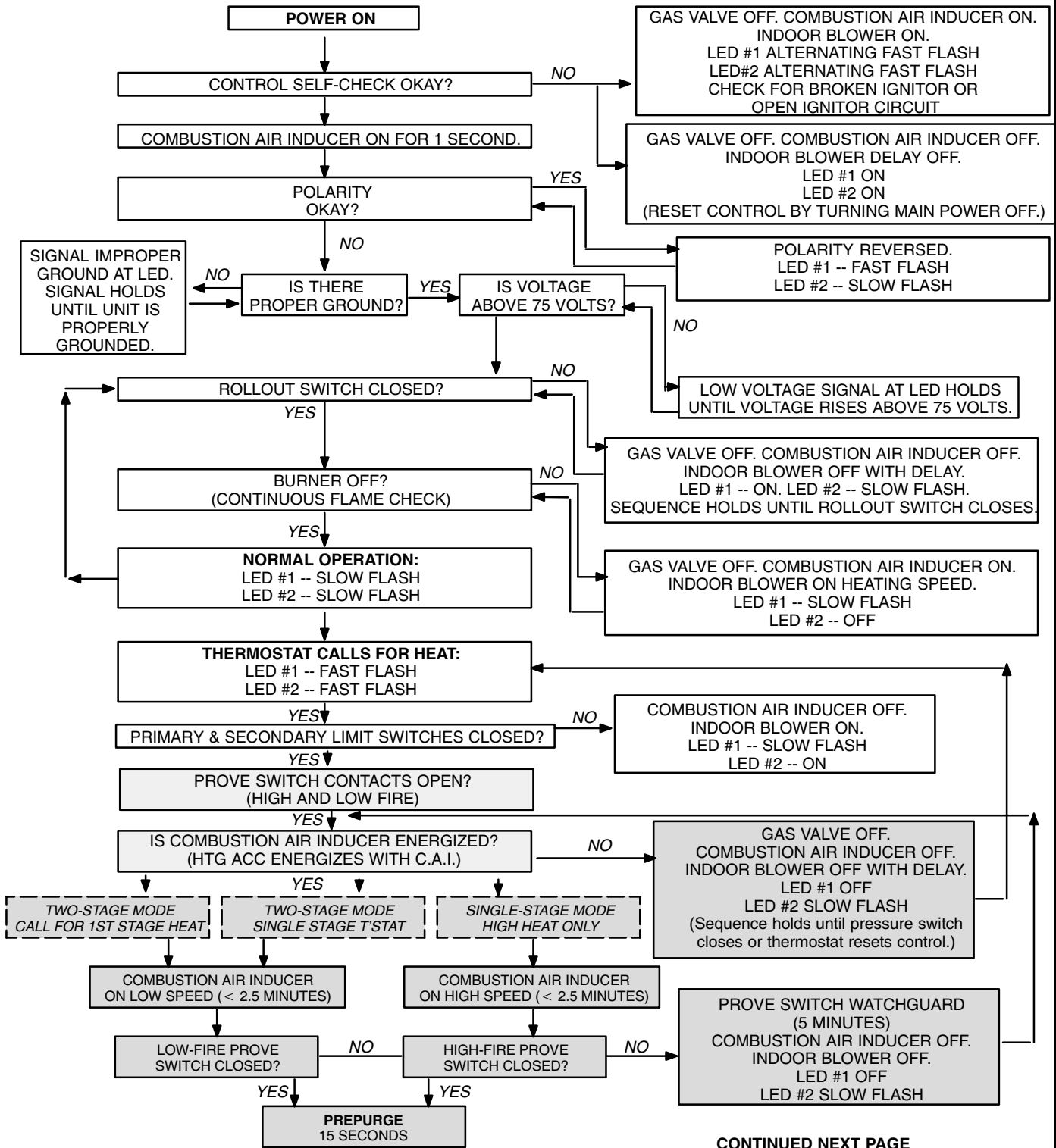
G26, GHR26, 90UGF, G24M, G23X, 80MGF, G27M, G32, G32V, GHR32, GHR32V and G50UH SEQUENCE

*G26, GHR26, 90UGF, G24M, G23X, 80MGF and G50UH SEQUENCE ONLY

G27M, G32, G32V, GHR32 and GRH32V SEQUENCE ONLY

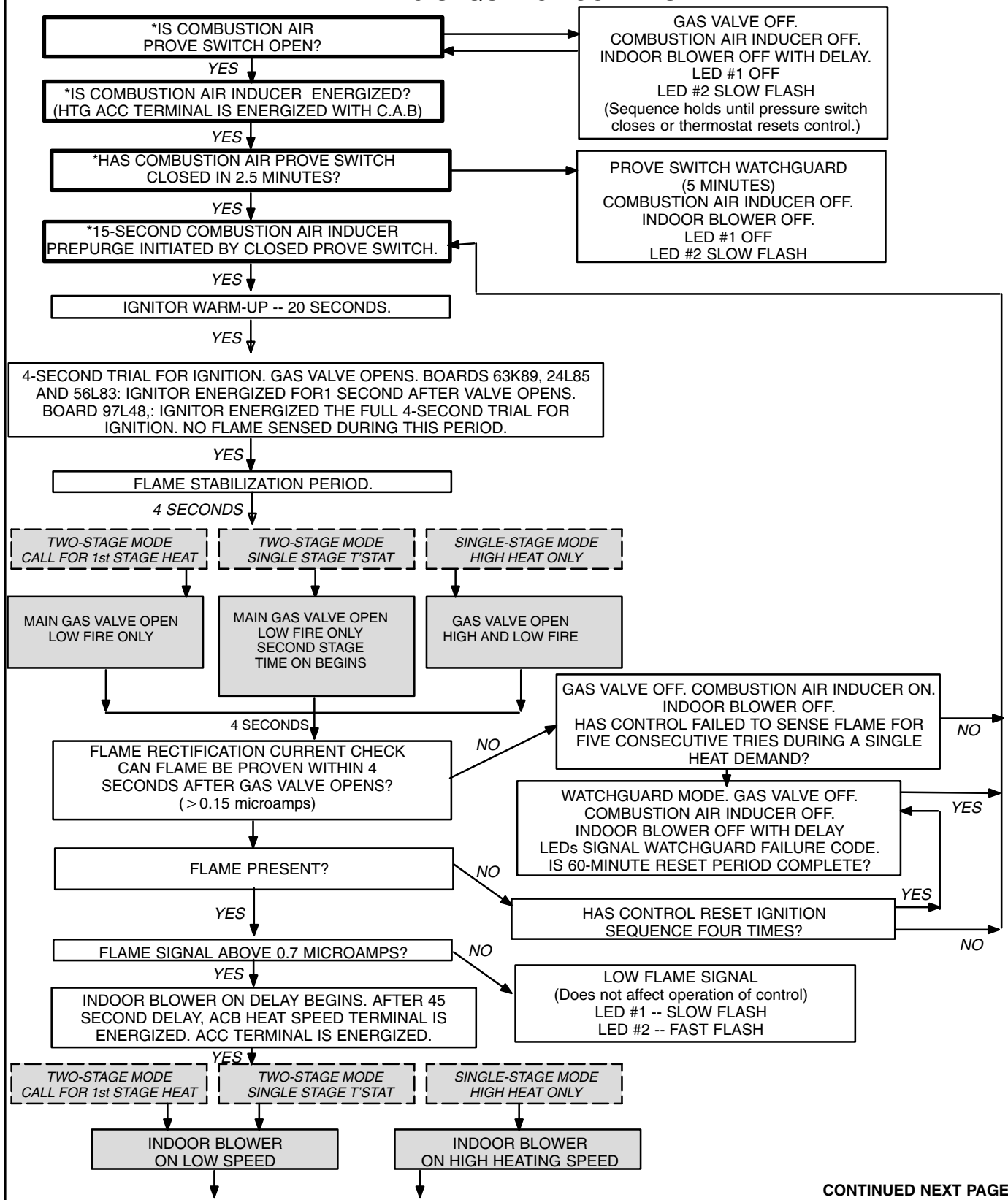
NORMAL HEATING MODE

ABNORMAL HEATING MODE



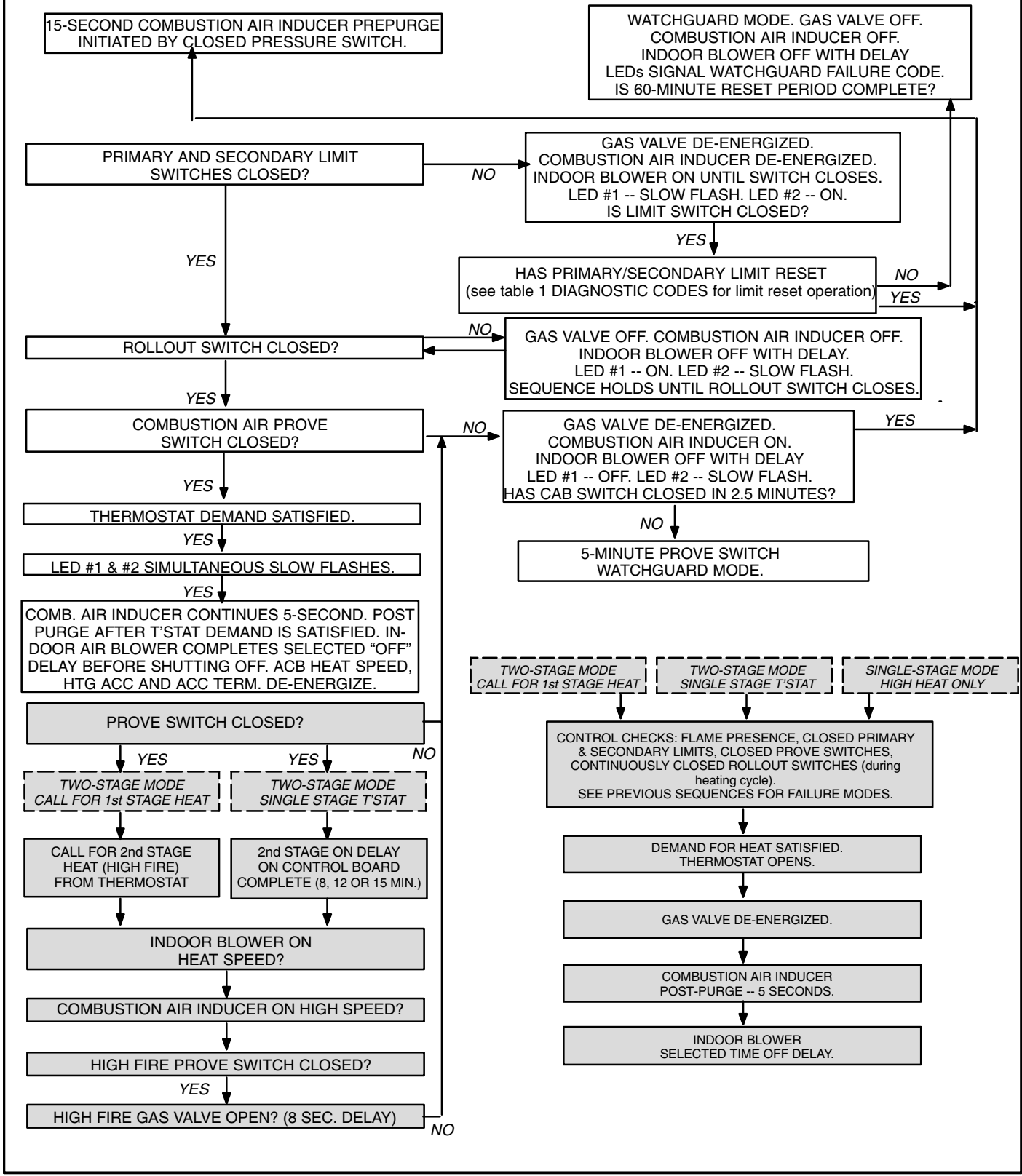
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HEATING SEQUENCE CONTINUED



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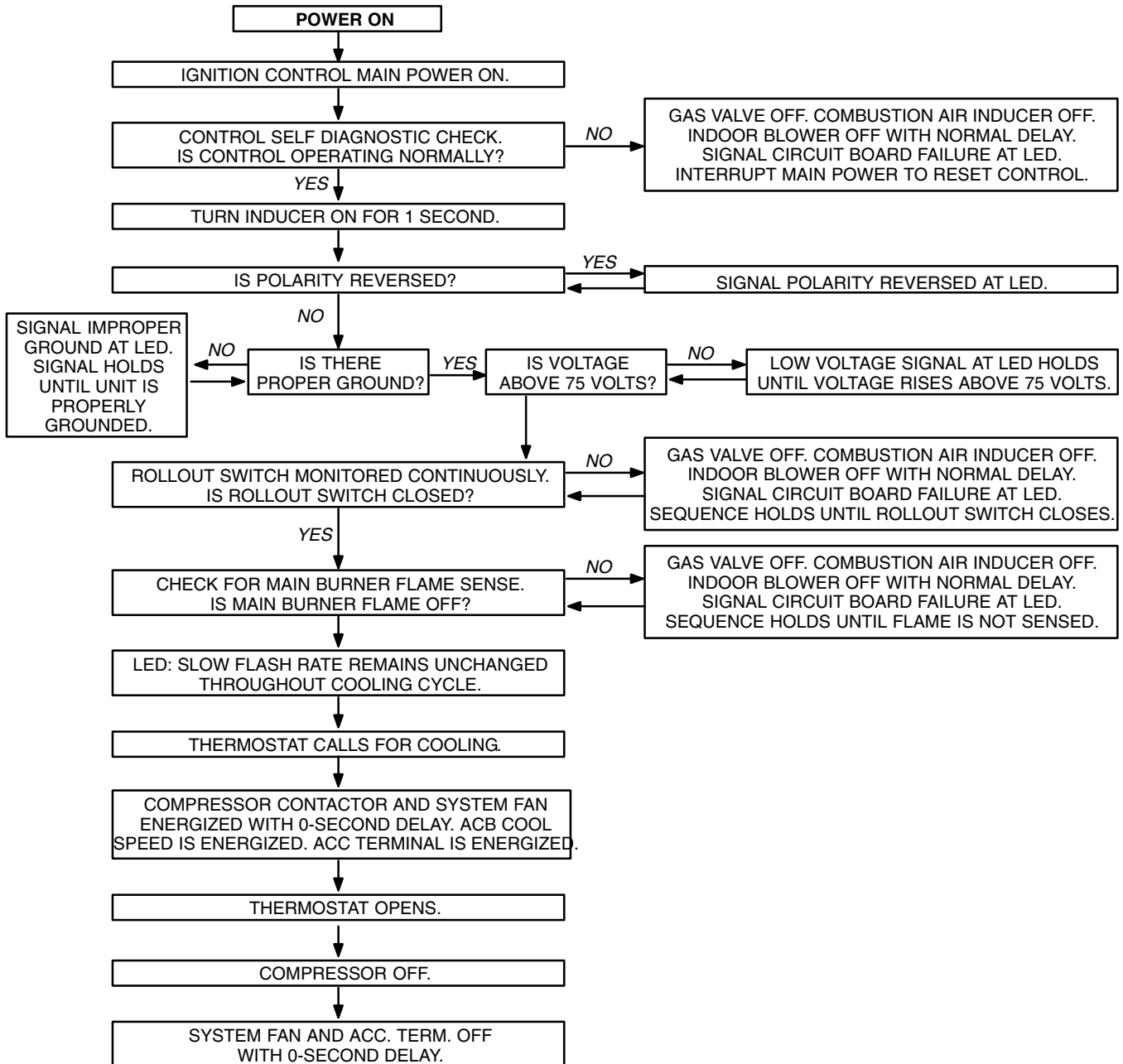
HEATING SEQUENCE CONTINUED



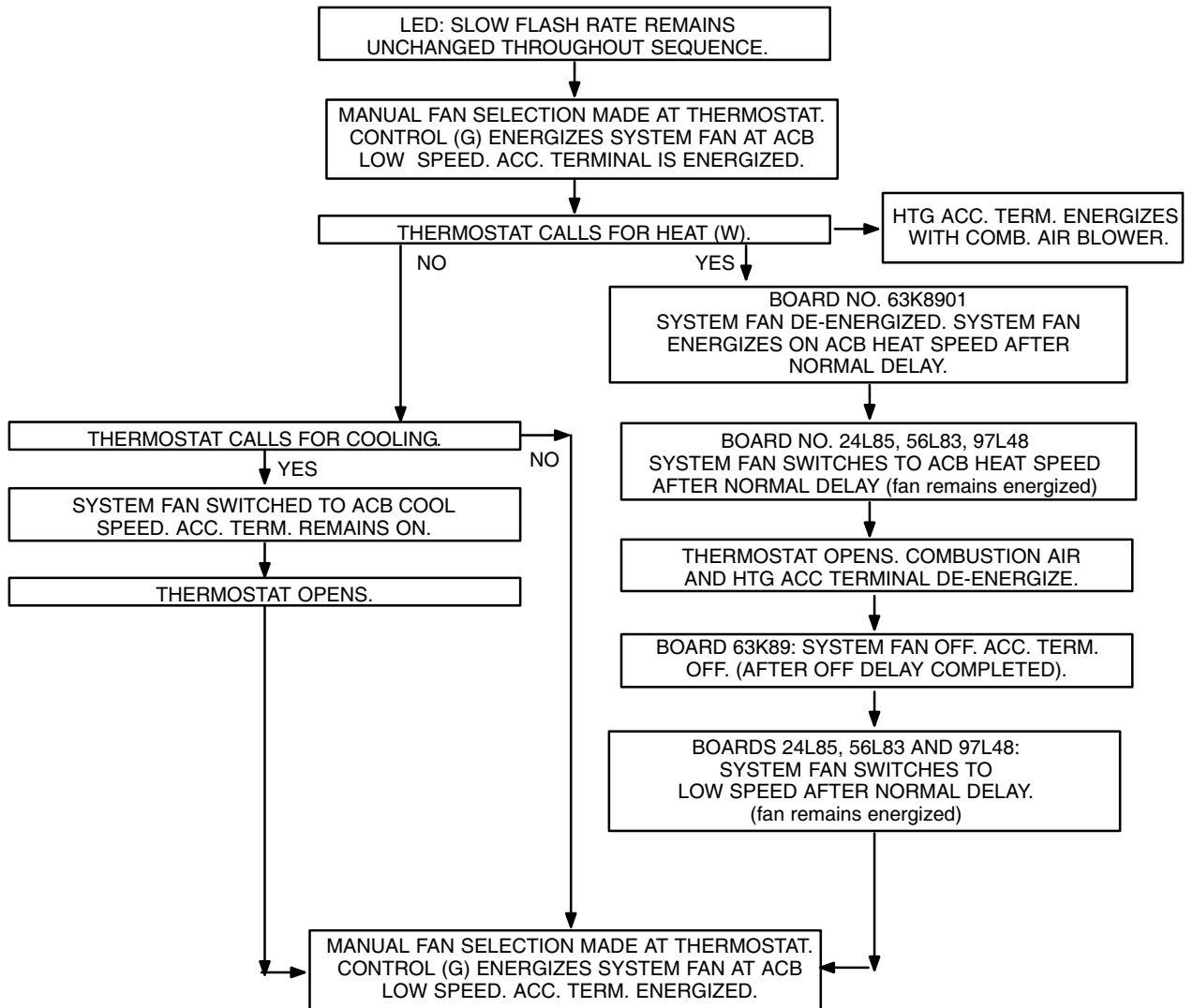
COOLING SEQUENCE OF OPERATION

NORMAL COOLING MODE

ABNORMAL COOLING MODE



CONTINUOUS LOW SPEED FAN SEQUENCE OF OPERATION SURELIGHT CONTROL

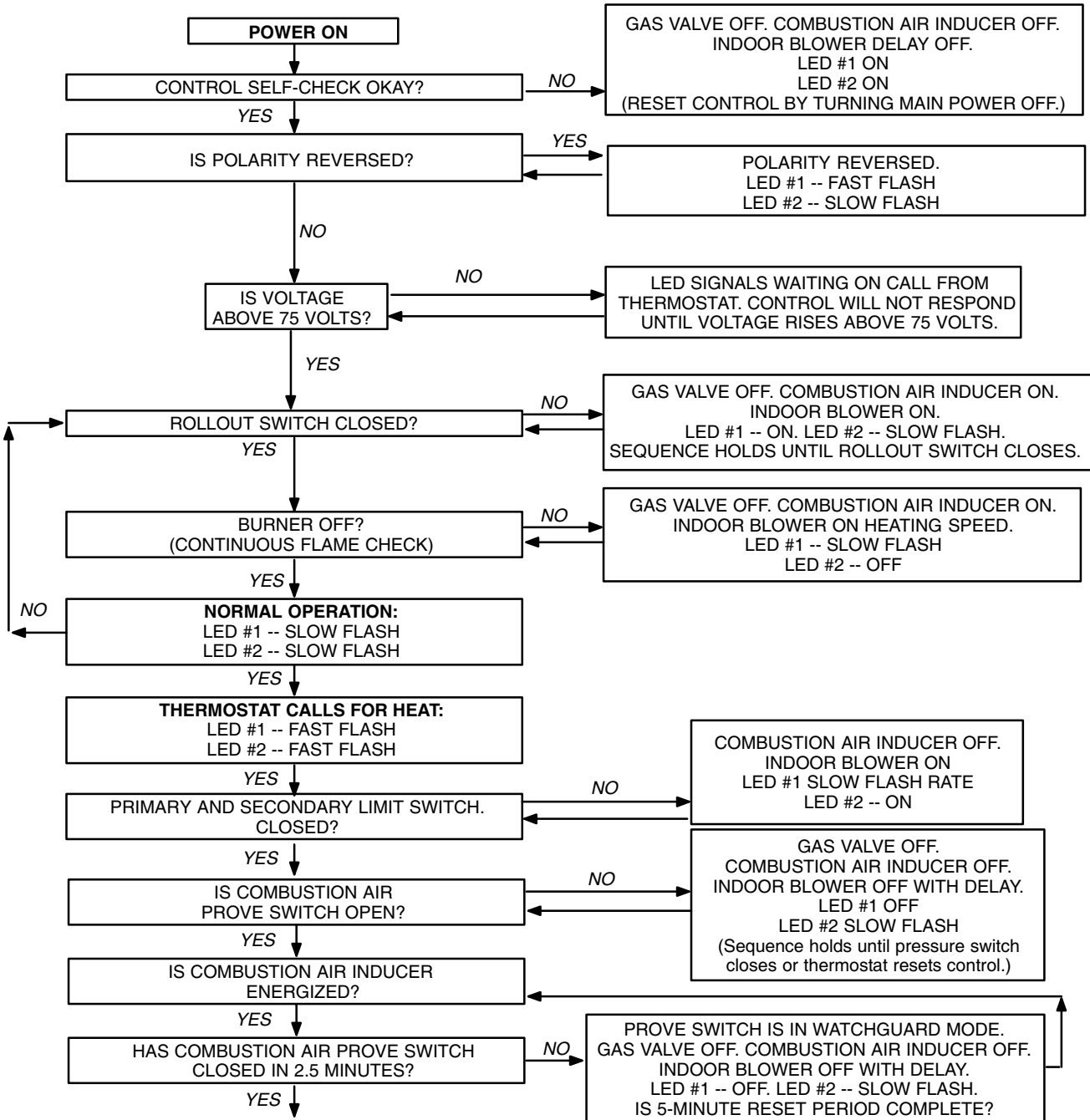


HEATING SEQUENCE OF OPERATION

G40UH and 80UHG
ONLY SEQUENCE

NORMAL HEATING MODE

ABNORMAL HEATING MODE

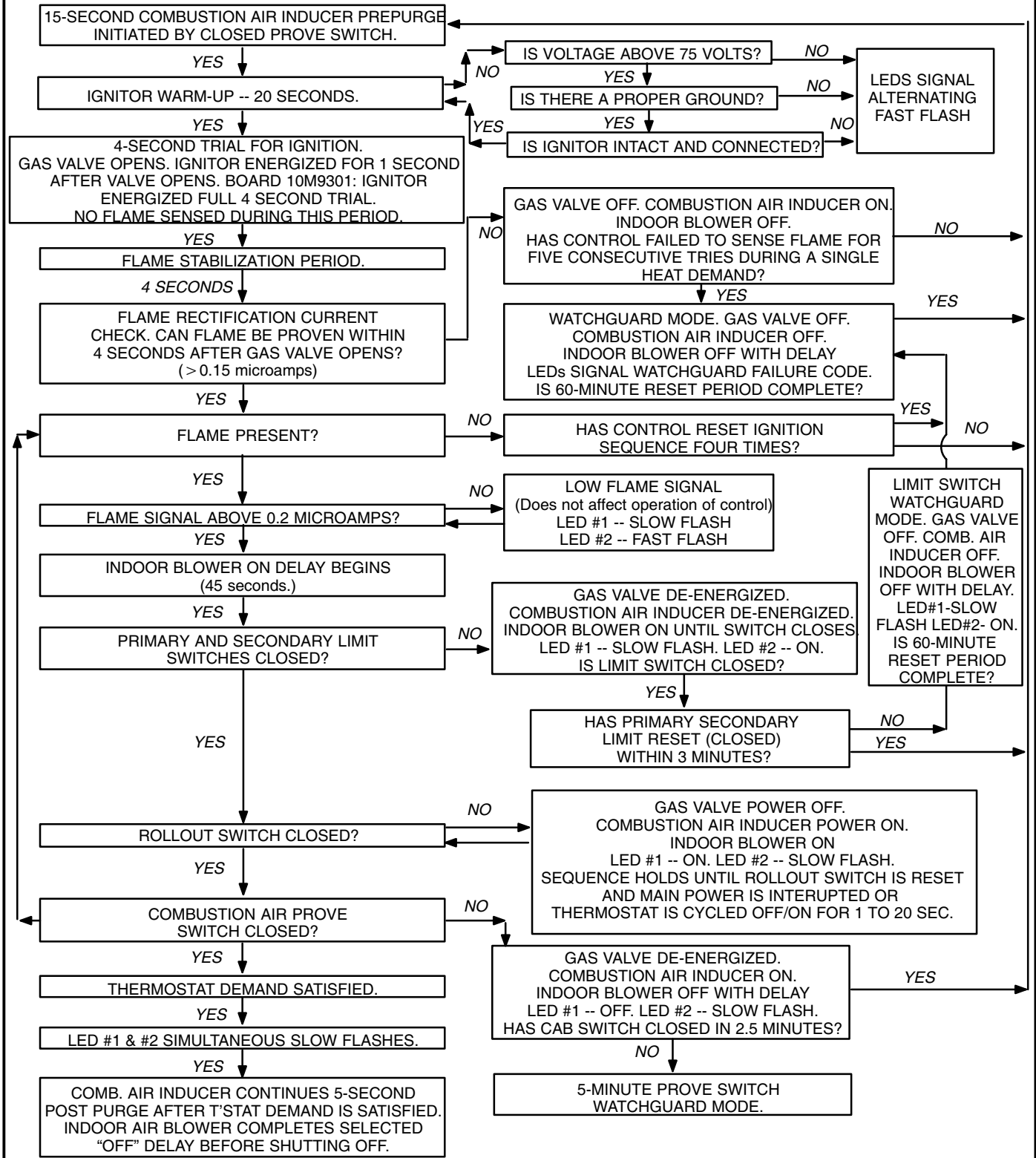


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HEATING SEQUENCE CONTINUED

NORMAL HEATING MODE

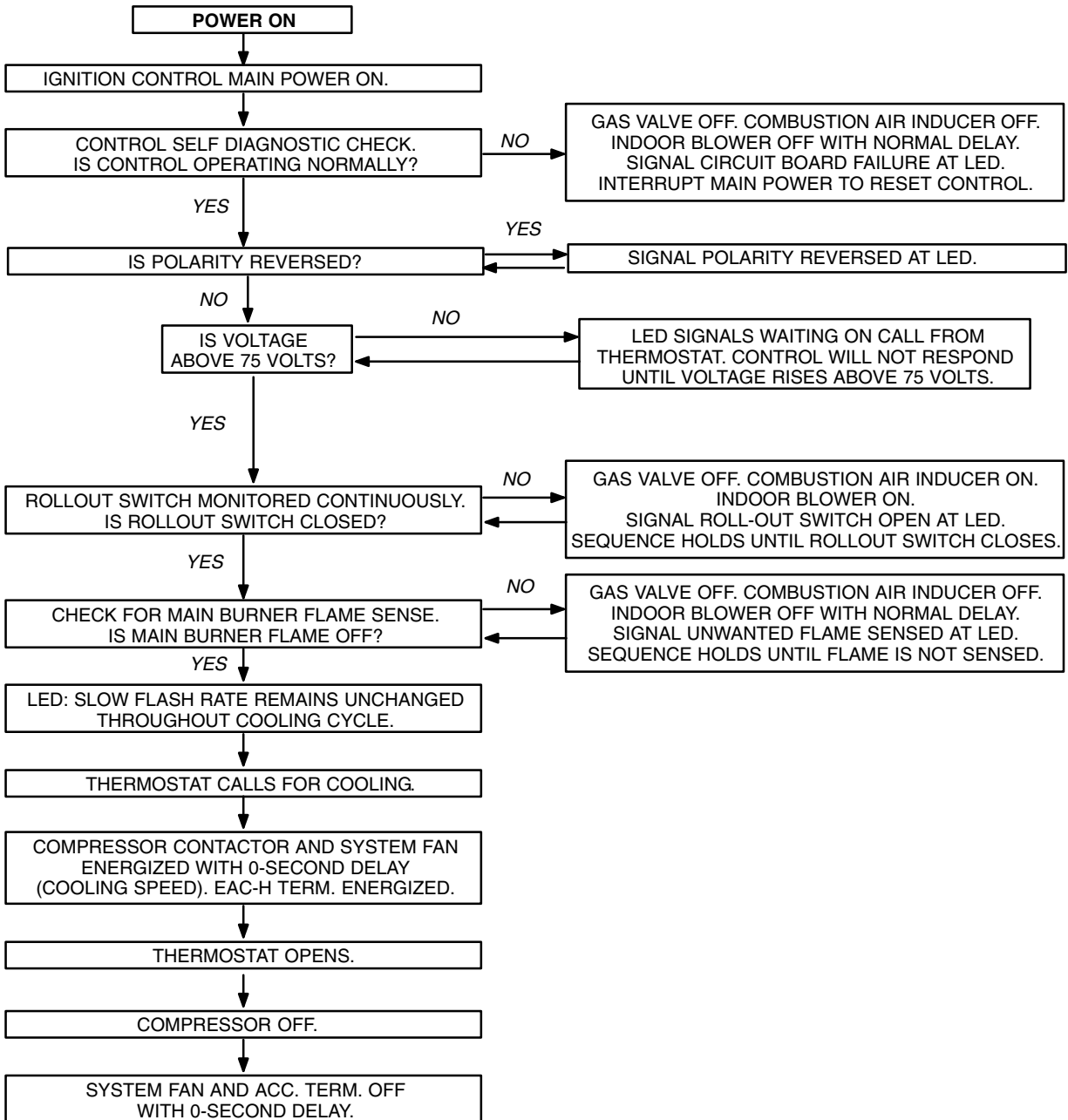
ABNORMAL HEATING MODE



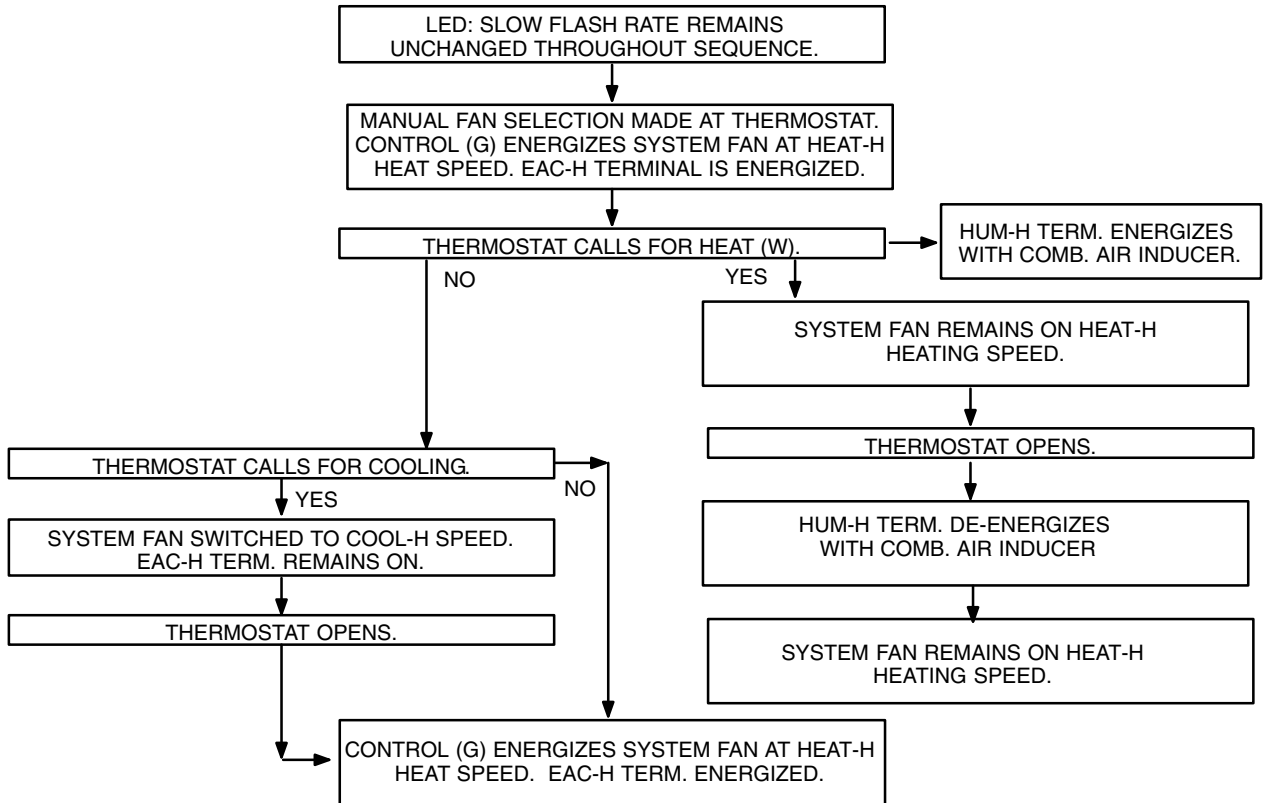
COOLING SEQUENCE OF OPERATION

NORMAL COOLING MODE

ABNORMAL COOLING MODE



SURELIGHT CONTROL CONTINUOUS HEAT SPEED FAN SEQUENCE OF OPERATION



SURELIGHT - TROUBLE SHOOTING GUIDE

UPON INITIAL POWER UP, REMOVE ALL THERMOSTAT DEMANDS TO THE UNIT

| PROBLEM: 1 UNIT FAILS TO OPERATE IN THE COOLING, HEATING, OR CONTINUOUS FAN MODE | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Condition | Possible Cause | Corrective Action / Comments |
| <p>1.1</p> <p>- Both diagnostic lights fail to light up.</p> <p>LED#1-Off LED#2-Off</p> | <p>1.1.1</p> <p>Main voltage 120V not supplied to unit.</p> | <p>ACTION 1 - Check 120V main voltage. Determine cause of main power failure.</p> |
| | <p>1.1.2</p> <p>Miswiring of furnace or improper connections.</p> | <p>ACTION 1 - Check for correct wiring of 120V to power make up box and transformer. ACTION 2 - Check 24V wiring to control board.</p> |
| | <p>1.1.3</p> <p>Circuit breaker tripped or fails to close.</p> | <p>ACTION 1 - Replace circuit breaker if it is reset but does not have continuity. ACTION 2 - If circuit breaker still trips, check for short.</p> |
| | <p>1.1.4</p> <p>Door interlock switch failure.</p> | <p>ACTION 1 - Check that door switch is activated when door is closed. ACTION 2 - Check wire connections to switch, replace loose connectors. ACTION 3 - Check continuity of switch in closed position. Replace if defective.</p> |
| | <p>1.1.5</p> <p>Transformer Failure.</p> | <p>ACTION 1 - Check that transformer output is 24V. Replace if defective.</p> |
| | <p>1.1.6</p> <p>Failed control board.</p> | <p>ACTION 1 - If all the above items have been checked, replace board.</p> |
| <p>1.2</p> <p>- Diagnostic lights flash the roll-out code.</p> <p>LED#1-On, LED#2-Slow Flash</p> | <p>1.2.1</p> <p>Roll-out switch open.</p> | <p>ACTION 1 - Manually reset the roll-out switch by pushing the top button. ACTION 2 - Determine the cause of the roll-out switch activation before leaving furnace.</p> |
| | <p>1.2.2</p> <p>Roll-out switch failure.</p> | <p>ACTION 1 - Check continuity across roll-out switch. Replace roll-out switch if switch is reset but does not have continuity.</p> |
| | <p>1.2.3</p> <p>Miswiring or improper connections at roll-out switch.</p> | <p>ACTION 1 - Check wiring connections to switch.</p> |
| | <p>1.2.4</p> <p>Pin connector failure</p> | <p>ACTION 1 - Check pin connector for proper connection to control board. ACTION 2 - Check continuity of the multi plug pin.</p> |
| <p>1.3</p> <p>- On initial power-up the comb. air blower does not energize. - Diagnostic lights flash the reverse polarity code.</p> <p>LED#1-Fast Flash, LED#2-Slow Flash.</p> | <p>1.3.1</p> <p>120V main power polarity reversed.</p> | <p>ACTION 1 - Check the 120V has line and neutral correctly input into control. ACTION 2 - Reverse the line and neutral at the 120V field connection.</p> |
| <p>1.4</p> <p>- On initial power up the combustion air blower does not energize. - Diagnostic lights flash normal power on operation.</p> <p>LED#1-Slow Flash LED#2-Slow Flash</p> | <p>1.4.1</p> <p>Open combustion air blower motor circuit.</p> | <p>ACTION 1 - Check for 120V to combustion air blower. If no power, check wire and connections.</p> |
| | <p>1.4.2</p> <p>Failed combustion air blower motor.</p> | <p>ACTION 1 - If power is present at blower, replace blower.</p> |

| PROBLEM 1: UNIT FAILS TO OPERATE IN THE COOLING, HEATING, OR CONTINUOUS FAN MODE | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Condition | Possible Cause | Corrective Action / Comments |
| <p>1.5</p> <ul style="list-style-type: none"> - On initial power-up the combustion air blower remains energized. - Diagnostic lights flash the improper main ground. <p>LED#1-Alternating Fast Flash LED#2-Alternating Fast Flash</p> | <p>1.5.1</p> <p>Improper ground to the unit.</p> | <p>ACTION 1 - Check that the unit is properly ground. ACTION 2 - Install a proper main ground to the unit</p> |
| | <p>1.5.2</p> <p>6-Pin connector is improperly attached to the circuit board.</p> | <p>ACTION 1 - Check 6-pin connector for proper installation. Correctly insert connector into control.</p> |
| | <p>1.5.3</p> <p>Line voltage is below 75V.</p> | <p>ACTION 1 - Check that the line voltage is above 75V. Determine cause of voltage drop and supply correct voltage to the control.</p> |
| PROBLEM 2: UNIT FAILS TO OPERATE IN THE COOLING OR HEATING MODE, BUT COMBUSTION AIR BLOWER OPERATES CONTINUOUS. UNITS WITH CONTROL BOARDS DATE CODED AFTER NOV. 1 1997, WILL OPERATE IN COOLING BUT NOT IN THE HEATING MODE, WITH COMBUSTION AIR BLOWER CYCLING 5 SECONDS ON 55 SECONDS OFF. | | |
| Condition | Possible Cause | Corrective Action / Comments |
| <p>2.1</p> <ul style="list-style-type: none"> - On initial power-up the combustion air blower remains energized. - Diagnostic lights flash the improper main ground. - Units with control boards date coded after Nov.1 1997; combustion air blower will cycle 5 seconds on 55 seconds off. <p>LED#1-Alternating Fast Flash LED#2-Alternating Fast Flash</p> | <p>2.1.1</p> <p>Open ignitor circuit.</p> | <p>ACTION 1 - Check for correct wiring and loose connections in the ignitor circuit. Check multi-plug connections for correct installation.</p> |
| | <p>2.1.2</p> <p>Broken or failed ignitor.</p> | <p>ACTION 1 - Unplug ignitor and read resistance across ignitor. If resistance does not read between 10.9 and 19.7 ohms, replace the ignitor.</p> |
| PROBLEM 3: UNIT FAILS TO FIRE IN THE HEATING MODE, COMBUSTION AIR BLOWER DOES NOT ENERGIZE | | |
| Condition | Possible Cause | Corrective Action / Comments |
| <p>3.1</p> <ul style="list-style-type: none"> - Unit operates with a cooling or continuous fan demand. - Combustion air blower will not start with a Heating demand. - Diagnostic lights flash the limit failure mode. <p>LED#1-Slow Flash, LED#2-On</p> | <p>3.1.1</p> <p>Primary or secondary (if equipped) limit open.</p> | <p>ACTION 1 - Check continuity across switch(es). Switches reset automatically upon cool down. ACTION 2 - Check for restrictions on blower inlet air (including filter) and outlet air. Determine cause for limit activation before placing unit back in operation.</p> |
| | <p>3.1.2</p> <p>Miswiring of furnace or improper connections at limit switch(es).</p> | <p>ACTION 1 - Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.</p> |
| <p>3.2</p> <ul style="list-style-type: none"> - Unit operates with a cooling and continuous fan demand. - Combustion air blower will not start with a Heating demand. - Diagnostic lights flash the pressure switch failure code. <p>LED#1-Off, LED#2-Slow Flash</p> | <p>3.2.1</p> <p>Miswiring of furnace or improper connections to combustion air blower.</p> | <p>ACTION 1 - Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.</p> |
| | <p>3.2.2</p> <p>Pressure switch stuck closed.</p> | <p>ACTION 1 - Check that the pressure switch is open without the combustion air blower operating. Replace if defective.</p> |

PROBLEM 3: UNIT FAILS TO FIRE IN THE HEATING MODE, COMBUSTION AIR BLOWER DOES NOT ENERGIZE (CONT.).

| Condition | Possible Cause | Corrective Action/Comments |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 3.3 - Unit operates with a cooling and continuous fan demand. - Combustion air blower will not start with a Heating demand. - Diagnostic lights flash the pressure switch failure code 2.5 minutes after heating demand. LED#1-Off, LED#2-Slow Flash | 3.3.1 Miswiring of furnace or improper connections to combustion air blower. | ACTION 1 - Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections. |
| | 3.3.2 Combustion air blower failure. | ACTION 1 - If there is 120V to combustion air blower and it does not operate, replace combustion air blower. |

PROBLEM 4: UNIT FAILS TO FIRE IN THE HEATING MODE, COMBUSTION AIR BLOWER ENERGIZES, IGNITOR IS NOT ENERGIZED.

| Condition | Possible Cause | Corrective Action/Comments |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.1 - Unit operates with a cooling and continuous fan demand. - Combustion air blower energizes with a heating demand. - Diagnostic lights flash the pressure switch failure code 2.5 minutes after heating demand. LED#1-Off LED#2-Slow Flash | 4.1.1 Pressure switch does not close due to incorrect routing of the pressure switch lines. | ACTION 1 - Check that the pressure switch lines are correctly routed. Correctly route pressure switch lines. |
| | 4.1.2 Pressure switch does not close due to obstructions in the pressure lines. | ACTION 1 - Remove any obstructions from the the pressure lines and/or taps. |
| | 4.1.3 Pressure switch lines damaged | ACTION 1 - Check pressure switch lines for leaks. Replace any broken lines. |
| | 4.1.4 Condensate in pressure switch line. | ACTION 1 - Check pressure switch lines for condensate. Remove condensate from lines. Check that the condensate lines are located correctly. |
| | 4.1.5 Pressure switch does not close due to a low differential pressure across the pressure switch. | ACTION 1 - Check the differential pressure across the pressure switch. This pressure should exceed the set point listed on the switch. ACTION 2 - Check for restricted inlet and exhaust vent. Remove all blockage. ACTION 3 - Check for proper vent sizing and run length. See installation instructions. |
| | 4.1.6 Wrong pressure switch installed in the unit, or pressure switch is out of calibration. | ACTION 1 - Check that the proper pressure switch is installed in the unit. Replace pressure switch if necessary. |
| | 4.1.7 Miswiring of furnace or improper connections at pressure switch. | ACTION 1 - Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections. |
| | 4.1.8 Pressure switch failure. | ACTION 1 - If all the above modes of failure have been checked, the pressure switch may have failed. Replace pressure switch and determine if unit will operate. |

PROBLEM 5: UNIT FAILS TO FIRE IN THE HEATING MODE, COMBUSTION AIR BLOWER ENERGIZES, IGNITOR IS ENERGIZED.

| Condition | Possible Cause | Corrective Action/Comments |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p align="center">5.1</p> <ul style="list-style-type: none"> - Unit operates with a cooling and continuous fan demand. - Combustion air blower energizes with Heating demand. - Ignitor is energized but unit fails to light. <p>LED#1-Alternating Slow Flash LED#2-Alternating Slow Flash</p> | 5.1.1 Check that gas is being supplied to the unit. | ACTION 1 - Check line pressure at the gas valve. Pressure should not exceed 13" WC for both natural and propane. Line pressure should read a minimum 4.5" WC for natural and 8.0"WC for propane. |
| | 5.1.2 Miswiring of gas valve or loose connections at multi-pin control amp plugs or valve. | ACTION 1 - Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections. |
| | 5.1.3 Defective gas valve or ignition control. | ACTION 1 - Check that 24V is supplied to the gas valve approximately 35 seconds after heat demand is initiated. ACTION 2 - Replace the valve if 24V is supplied but valve does not open. ACTION 3 - Replace the control board if 24V is not supplied to valve. |

PROBLEM 6: BURNERS LIGHT WITH A HEATING DEMAND BUT UNIT SHUTS DOWN PREMATURELY

| Condition | Possible Cause | Corrective Action/Comments |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p align="center">6.1</p> <ul style="list-style-type: none"> - Burners fire with a heating demand. - Burners light but unit shuts off prior to satisfying T-stat demand. - Diagnostic lights flash the pressure switch code. <p>LED#1-Off LED#2-Slow Flash</p> | 6.1.1 Wrong concentric vent kit used for terminating the unit. | ACTION 1 - Check vent termination kit installed. 1-1/2" dia. concentric vent (kit60G77) for 50 and 75 inputs and 2" dia. concentric vent (kit 33K97) for 100 &125 inputs. |
| | 6.1.2 Condensate drain line is not draining properly. | ACTION 1 - Check condensate line for proper vent slope, and any blockage. Condensate should flow freely during operation of furnace. Repair or replace any improperly installed condensate lines. |
| | 6.1.3 Low pressure differential at the pressure switch. | ACTION 1 - Check for restricted vent inlet or exhaust. Remove all blockage. ACTION 2: Check for proper vent sizing. See installation instructions. |
| <p align="center">6.2</p> <ul style="list-style-type: none"> - Combustion air blower energizes with a heating demand. - Burners light but fail to stay lit. - After 5 tries the control diagnostics flash the watchguard burners failed to ignite code. <p>LED#1-Alternating Slow Flash LED#2-Alternating Slow Flash</p> | 6.2.1 Sensor or sense wire is improperly installed. | ACTION 1 - Check that sensor is properly located and that the sense wire is properly attached to both the sensor and the control. |
| | 6.2.2 Sensor or sense wire is broken. | ACTION 1 - Check for a broken sensor. ACTION 2 - Test continuity across the sense wire. If wire or sensor are damaged replace the component. |
| | 6.2.3 Sensor or sensor wire is grounded to the unit. | ACTION 1 - Check for resistance between the sensor rod and the unit ground. ACTION 2 - Check for resistance between the sensor wire and the unit ground. ACTION 3 - Correct any shorts found in circuit. |
| | 6.2.4 Control does not sense flame. | ACTION 1 - Check the microamp signal from the burner flame. If the microamp signal is below 0.70 microamps, check the sense rod for proper location or contamination. ACTION 2 - Replace, clean, or relocate flame sense rod. If rod is to be cleaned, use steel wool or replace sensor. DO NOT CLEAN ROD WITH SAND PAPER. SAND PAPER WILL CONTRIBUTE TO THE CONTAMINATION PROBLEM. NOTE: Do not attempt to bend sense rod. |

PROBLEM 6: BURNERS LIGHT WITH HEATING DEMAND BUT UNIT SHUTS DOWN PREMATURELY (CONT.)

| Condition | Possible Cause | Corrective Action/Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p align="center">6.3</p> <ul style="list-style-type: none"> - Combustion air blower energizes with a heating demand. - Burners light. - Roll-out switch trips during the heating demand. - Diagnostic lights flash roll-out failure. <p>LED#1-On LED#2-Slow Flash</p> | <p align="center">6.3.1</p> <p align="center">Unit is firing above 100% of the nameplate input.</p> | <p>ACTION 1 - Check that the manifold pressure matches value listed on nameplate. See installation instructions for proper procedure.</p> <p>ACTION 2 - Verify that the installed orifice size match the size listed on the nameplate or installation instructions.</p> <p>ACTION 3 - Check gas valve sensing hose to insure no leaks are present.</p> <p>ACTION 4 - Check the input rate to verify rate matches value listed on nameplate.</p> |
| | <p align="center">6.3.2</p> <p align="center">Gas orifices leak at the manifold connection.</p> | <p>ACTION 1 - Tighten orifice until leak is sealed. NOTE: Be careful not to strip orifice threads. ACTION 2 - Check for gas leakage at the threaded orifice connection. Use approved method for leak detection (see unit instructions).</p> |
| | <p align="center">6.3.3</p> <p align="center">Air leakage at the connections between the primary heat exchanger, secondary heat exchanger, and combustion air blower.</p> | <p>ACTION 1 - Check for air leakage at all joints in the heat exchanger assembly. Condition will cause high CO₂ with high CO.</p> <p>ACTION 2 - Seal leakage if possible, replace heat exchanger if necessary, tag and return heat exchanger to proper Lennox personnel.</p> |
| | <p align="center">6.3.4</p> <p align="center">Insufficient flow through the heat exchanger caused by a sooted or restricted heat exchanger.</p> | <p>ACTION 1 - Check for sooting deposits or other restrictions in the heat exchanger assembly. Clean assembly as outlined in instruction manual.</p> <p>ACTION 2 - Check for proper combustion. See table 8 or 9 for proper CO₂. CO should measure below .04% (400PPM) in an air-free sample of flue gases for either NG or LP.</p> |
| | <p align="center">6.3.5</p> <p align="center">Burners are not properly located in the burner box.</p> | <p>ACTION 1 - Check that the burners are firing into the center of the heat exchanger openings. Correct the location of the burners if necessary.</p> |
| <p align="center">6.4</p> <ul style="list-style-type: none"> - Combustion air blower energizes with a heating demand. - Burners light roughly and the unit fails to stay lit. - Diagnostic lights flash watchguard flame failure. <p>LED#1-Alternating Slow Flash LED#2-Alternating Slow Flash</p> | <p align="center">6.4.1</p> <p align="center">Recirculation of flue gases. This condition causes rough ignitions and operation. Problem is characterized by nuisance flame failures.</p> | <p>ACTION 1 - Check for proper flow of exhaust gases away from intake vent. Remove any obstacles in front of the intake and exhaust vent which would cause recirculation.</p> <p>ACTION 2 - Check for correct intake and exhaust vent installation. See instructions</p> |
| | <p align="center">6.4.2</p> <p align="center">Improper burner cross-overs</p> | <p>ACTION 1 - Remove burner and inspect the cross-overs for burrs, or any restriction or if crossover is warped. Remove restriction or replace burners.</p> |

| PROBLEM 6: BURNERS LIGHT WITH HEATING DEMAND BUT UNIT SHUTS DOWN PREMATURELY (CONT.) | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>6.5</p> <ul style="list-style-type: none"> - Combustion air blower energizes with a heating demand. - Burners light. - Diagnostic lights flash watch guard flame failure. - NOTE" Unit might go into 60 minute Watchguard mode depending on intermittent nature of sensor signal. <p>LED#1-Alternating Slow Flash LED#2-Alternating Slow Flash</p> | <p>6.5.1</p> <p>Loose sensor wire connection causes intermittent loss of flame signal.</p> | <p>ACTION 1 - Check that the sensor is properly located.</p> <p>ACTION 2 - Check that the sense wire is properly attached to both the sensor and the control. Pay extra attention to the pin connectors.</p> |
| PROBLEM 7: CONTROL SIGNALS LOW FLAME SENSE DURING HEATING MODE | | |
| Condition | Possible Cause | Corrective Action/Comments |
| <p>7.0</p> <ul style="list-style-type: none"> - Unit operates correctly but the diagnostic lights flash low flame sense code. <p>LED#1-Slow Flash LED#2-Fast Flash</p> | <p>7.1.1</p> <p>Sense rod is improperly located on the burner.</p> | <p>ACTION 1 - Check the sense rod for proper location on the burner. Properly locate the sense rod or replace if rod cannot be located correctly.</p> |
| | <p>7.1.2</p> <p>Sense rod is contaminated.</p> | <p>ACTION 1 - Check sense rod for contamination or coated surface. Clean the sense rod with steel wool or replace sensor. DO NOT USE SAND PAPER TO CLEAN ROD. SAND PAPER WILL CONTRIBUTE TO THE CONTAMINATION PROBLEM.</p> |
| PROBLEM 8: INDOOR BLOWER FAILS TO OPERATE IN COOLING, HEATING, OR CONTINUOUS FAN MODE | | |
| Condition | Possible Cause | Corrective Action/Comments |
| <p>8.0</p> <ul style="list-style-type: none"> - Indoor blower fails to operate in continuous fan, cooling, or heating mode. | <p>8.1.1</p> <p>Miswiring of furnace or improper connections at control or indoor blower motor.</p> | <p>ACTION 1 - Correct wiring and/or replace any loose connections. Check for correct wiring and loose connections.</p> |
| | <p>8.1.2</p> <p>120V is not being supplied to the indoor air blower or blower motor failure.</p> | <p>ACTION 1 - Check for 120V at the various calls for indoor blower by energizing "Y", "G", and "W" individually on the low voltage terminal strip. Note that when "W" is energized, the blower is delayed 45 seconds. If there is 120V to each motor tap but the blower does not operate, replace the motor.</p> |
| | <p>8.1.3</p> <p>Defective control board</p> | <p>ACTION 1 - If there is not 120V when "Y", "G", or "W" is energized, replace the control.</p> |
| PROBLEM 9: RF STATIC DURING TIME FOR IGNITION | | |
| Condition | Possible Cause | Corrective Action/Comments |
| <p>9.0</p> <ul style="list-style-type: none"> - AM radio interference. | <p>9.1.2</p> <p>Ignitor operation</p> | <p>ACTION 1 - Call Technical Support, Dallas.</p> |

**TABLE 8
80% EFFICIENCY MODELS**

| CO2 AT *STEADY STATE OPERATION | | |
|---------------------------------------|----------------|----------------|
| UNIT | NATURAL | PROPANE |
| G23(X) | 6.5% - 8.5% | 8.0% - 9.5% |
| G24M | 6.0% - 8.0% | 6.5% - 8.5% |
| 80MGF | 6.0% - 8.0% | 6.5% - 8.5% |
| 80UHG | 6.0% - 8.0% | 6.5% - 8.5% |
| **G27M | 6.0% - 8.5% | N/A |
| G40/50UH (X)-24A-45 | 4.5% - 6.5% | 5.8% - 7.8% |
| G40/50UH(X)-36A-070 | 5.8% - 7.8% | 6.8% - 7.8% |
| G40/50UH(X)-36B090 | 6.2% - 8.2% | 6.7% - 8.6% |
| G40/50UH(X)-48B-090 | | |
| G40/50UH(X)-48C-110 | 5.9% - 7.9% | 7.5% - 9.5% |

* Furnace firing at least 15 minutes.

** Furnace firing on high fire.

**TABLE 9
90% EFFICIENCY MODELS**

| CO2 AT *STEADY STATE OPERATION | | | | |
|---------------------------------------|-----------------|----------------|-----------------|----------------|
| UNIT | MIN VENT | | MAX VENT | |
| | NATURAL | PROPANE | NATURAL | PROPANE |
| G26 | 6.0% - 8.0% | 7.0% - 9.0% | 6.0% - 8.0% | 7.0% - 9.0% |
| GHR26 | 6.0% - 8.0% | 7.0% - 9.0% | 6.0% - 8.0% | 7.0% - 9.0% |
| 90UGF | 6.0% - 8.0% | 7.0% - 9.0% | 6.0% - 8.0% | 7.0% - 9.0% |
| **G32Q/V | 6.9% - 8.4% | 7.5%-9.0% | 7.3% - 8.8% | 8.2%-9.5% |
| **GHR32Q/V | 6.0% - 8.0% | 7.0% - 9.0% | 6.0% - 8.0% | 7.0% - 9.0% |

* Furnace firing at least 15 minutes.

** Furnace firing on high fire.

SERVICE NOTES