

Installation Instructions

Part No. 58SX900-061

This furnace twinning kit permits two furnaces to operate as a single unit on the same ductwork. Typical twinned furnaces are shown with the doors removed in Figure 1. The kit is applicable for two upflow furnaces, each designed to deliver sufficient airflow for 48,000- and 60,000-Btuh cooling systems. The furnaces installed with this twinning kit must be of the same model number and size.

NOTE: Only those models and sizes listed in Tables I, II, and III can be twinned.

CAUTION: If standing pilot furnaces are installed with this twinning kit, the use of a vent damper is *not* permitted.

Refer to the basic furnace Installation Instructions and "Procedures for Gas-Fired Furnaces" Installation Instructions (packaged with the equipment) for information not covered in this publication.

NOTE: Read the entire instructions before starting the installation.

The kit contains the following items:

- | | |
|--|-----|
| Control box assembly | (1) |
| Top discharge seal | (1) |
| Snap bushing | (1) |
| Wiring label | (8) |
| Limit reset label | (2) |
| Large wire passage strain-relief bushing | (2) |
| Small wire passage strain-relief bushing | (2) |
| Screw | (5) |
| Installation Instructions | (1) |

Installation of furnaces requires the following steps (sections):

- I. Furnace Installation
- II. Electrical Connections
- III. Venting
- IV. Gas Piping

NOTE: Refer to Installation Instructions packaged with the furnace for clearances, start-up, and maintenance.

I. FURNACE INSTALLATION

The furnaces as shipped are identical. There is no right-hand (RH) or left-hand (LH) unit.

CAUTION: Do not use the rear of furnaces for the return-air duct connection.

The furnaces may be installed on a raised platform or wood floor. The mounting base must be level. See Figure 2 and Table I, II, or III for return-air opening dimensions. Install the furnaces as follows:

1. Position *one* furnace over LH side of return-air opening.

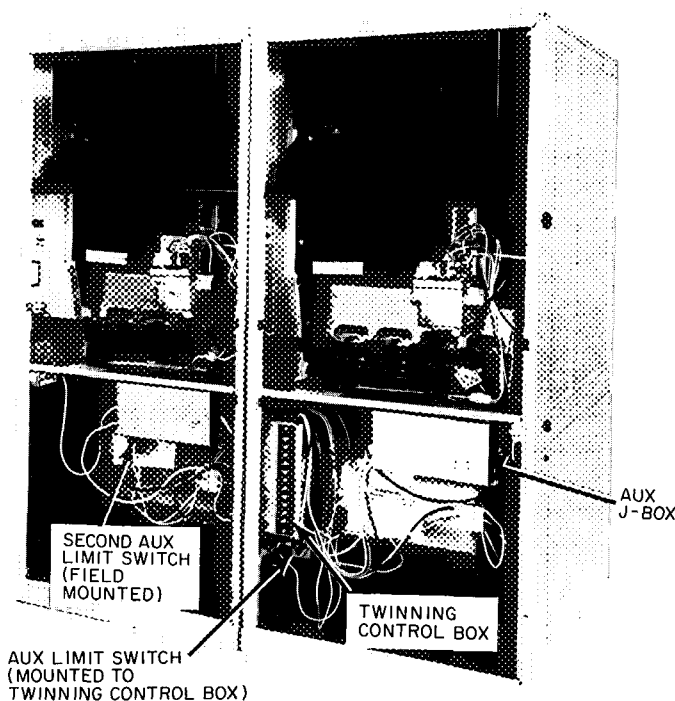


Figure 1 — Twinning Kit Installed

2. Remove screws holding auxiliary junction box (small box located in upper LH corner of blower compartment) of RH unit. Position twinning control box template under blower deck and against front edge of LH side of RH unit as shown in Figure 3. If unit has sound insulation, cut away insulation in area of template. Centerpunch and drill four 3/16-inch holes in locations shown on template.
3. Remove two knockouts located just below blower deck on RH side of LH unit. Depending on furnace model, this will either be two 7/8-inch knockouts or a 3/8- and a 7/8-inch knockout. Knockout removal is facilitated by removing main control box and hanging it on front of blower deck.
4. Remove same knockouts on both sides of RH unit and position unit over RH side of return-air opening. Adjust and shim units as required so that knockout openings are in good alignment, as bushing will be placed in knockouts later in installation.
5. Reinstall auxiliary junction box in upper RH corner as described below:
 - a. Drill two 3/16-inch holes as located by factory indentations in front and back of 7/8-inch knockout in RH casing side. Mount box using these holes.

B. Connecting High-Voltage Wiring in RH Furnace

NOTE: In making the following connections, route the subject wires through the same control box openings as the corresponding wires in the individual furnaces. Refer to Figures 11, 12, 13, and 14.

1. Connect high-voltage power supply leads as shown in Figures 9 and 10.
2. Connect wire marked No.1 to HI terminal on blower control center of furnace.
3. Connect wire No. 2 to LO terminal on blower control center of furnace.
4. Connect wire No.3 and black lead from auxiliary junction box to L1 terminal on blower control center of furnace.
5. Connect wire No. 4 and white common lead from blower to COM terminal on blower control center of furnace.
6. Connect wire No. 8 to terminal No. 1 of blower speed selector.
7. Connect wire No. 7 to terminal No. 3 of blower speed selector.
8. Replace small wire passage strain-relief bushing in lower opening in LH side of furnace control box with one 7/8-inch large wire passage strain-relief bushing provided in kit.

C. Connecting High-Voltage Wiring in LH Furnace

Refer to Figures 11, 12, 13, and 14, then proceed as follows:

1. Remove knockout in RH side of furnace control box in LH unit.
2. Connect high-voltage power supply leads as shown in Figures 9 and 10.

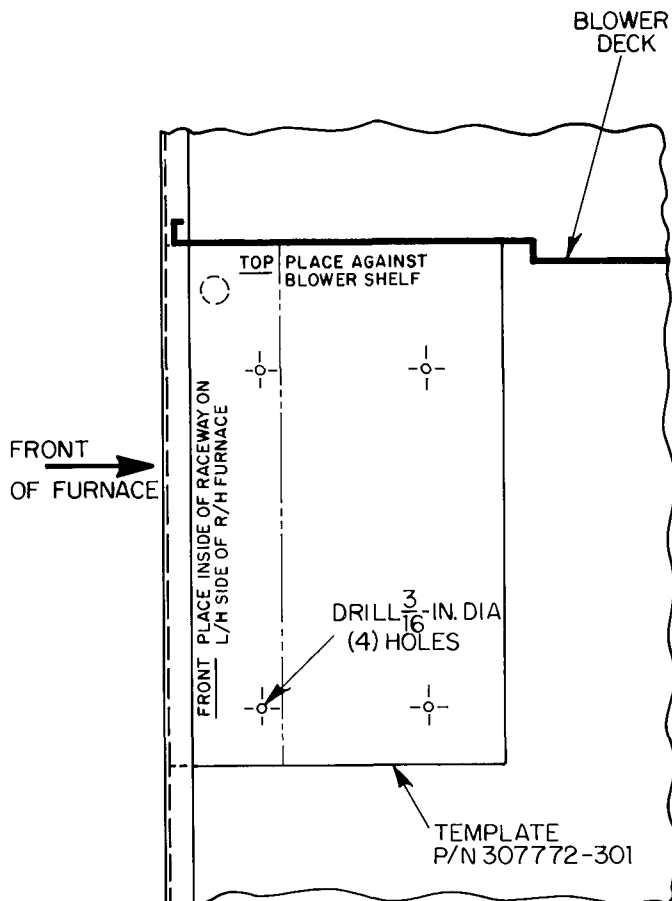


Figure 3 — Positioning of Template in RH Furnace

3. Remove wires No. 13 and No. 14 from unmounted auxiliary limit switch and set switch aside. Feed wires in this bundle through upper hole (7/8-inch) between two units. Install one 7/8-inch large wire passage strain-relief bushing provided in kit. Be sure strain-relief bushing seats firmly in opening.
4. Connect wire No. 9 and black lead from auxiliary junction box to L1 terminal on blower control center of furnace.
5. Connect wire No. 5 to LO terminal on blower control center of furnace.
6. Connect wire No. 10 to terminal 3 of blower speed selector.
7. Connect wire No. 11 to terminal 1 of blower speed selector.
8. Replace strain-relief bushing in LH side of furnace control box and install one 7/8-inch small wire passage strain-relief bushing provided in kit in RH side of control box.
9. Position twinning control box in blower compartment of RH furnace as shown in Figure 3. Mount control box with blunt-tip screws provided in kit.

CAUTION: Make sure blower motors are wired to operate on the same speed tap.

D. Connecting Low-Voltage Wiring

Refer to Figures 11, 12, 13, and 14, then proceed as follows:

1. Using minimum 3-wire thermostat cable cut to proper length, make following connections between low-voltage strips on RH furnace control box and twinning control box:
 - a. R to R1
 - b. GC to G1
 - c. W to W1.
2. Route adequate length of thermostat cable through 3/8-inch diameter or lower of two 7/8-inch diameter holes near top of twinning control box so one end is in each furnace. Install either 3/8-inch snap bushing or one 7/8-inch strain-relief bushing provided with kit, depending on size of hole in unit. Make following connections between low-voltage strips of LH furnace control box and twinning control box.
 - a. R to R2
 - b. W to W2
3. Position mounting tab of second auxiliary switch in back lower-left corner of LH control box alongside of transformer mounting screw, and mark mounting screw hole. See Figure 1.
4. Drill hole using 1/8-inch drill and mount limit switch.

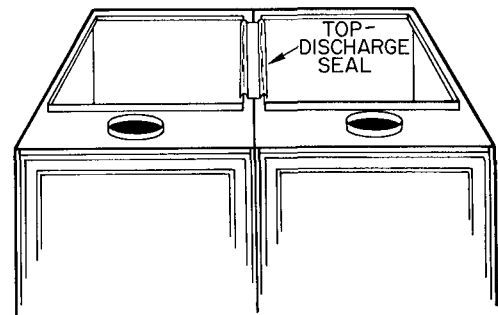


Figure 4 — Installation of Seal

5. Connect wires 13 and 14 to LH auxiliary limit switch. Polarity is unimportant.
6. Replace LH control box cover. It may be necessary to trim 1/16 inch from control box cover to clear bracket.
7. Attach one each of limit reset labels provided in kit to top side of blower deck in each furnace.
8. From eight labels supplied, select appropriate wiring connection label and schematic label for model of units being installed. Attach connection label over factory wiring label on blower door of LH unit. Attach schematic label over factory wiring label on blower door of RH unit.
9. Dress wires with ties provided in kit.

III. VENTING

A. Natural and Induced-Combustion Furnaces

The furnaces may be vented individually if desired, or a breaching design, as shown in Figure 5, may also be used. The furnaces should be located to minimize the vent length and number of elbows between the breaching and the vertical stack. It is recommended that there be at least 4 feet of vertical stack (3 feet for induced-combustion units) between the furnace and the breaching. The breaching and vent pipe after the breaching should be sized to handle the combined gas input of both furnaces, and the horizontal runs of vent

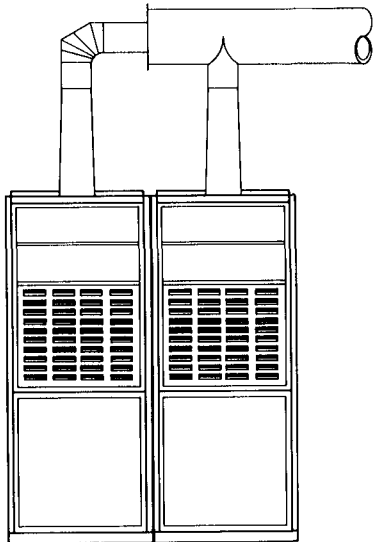


Figure 5 — Venting Natural Draft and Induced-Combustion Furnaces

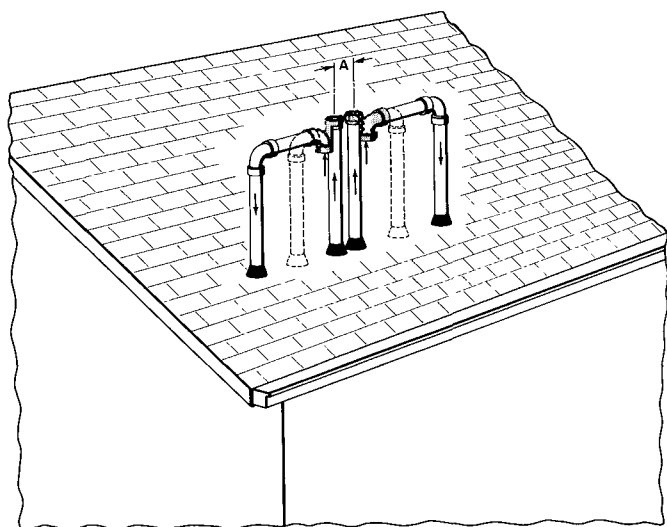


Figure 6 — Rooftop Termination (Preferred, Solid Lines; Option, Dashed Lines)

pipe should be pitched upward as specified in the National Fuel Gas Code NFPA No. 54-1984/ANSI Z223.1 1984. The complete vent system must comply with Part 7 of the Fuel Gas Code.

B. Direct Vent Furnaces

Each furnace must be individually vented. Do *not* common-vent or breach-vent these furnaces. Follow the requirements in the Installation Instructions packaged with each furnace and vent terminal kit for pipe: material, sizing, and installation.

Refer to Figures 6, 7, or 8 for proper termination. It is important that the vent terminations be made as shown to avoid recirculation of flue gases.

The A dimension in Figures 6, 7, and 8 is 4 inches for 2-inch pipe systems and 5-1/4 inches for 3-inch pipe systems.

IV. GAS SUPPLY PIPING

CAUTION: The furnaces must be plumbed with a single gas supply shutoff valve. Individual furnaces should not have their own shutoff.

Refer to basic furnace Installation Instructions for start-up, service, and other venting and piping information.

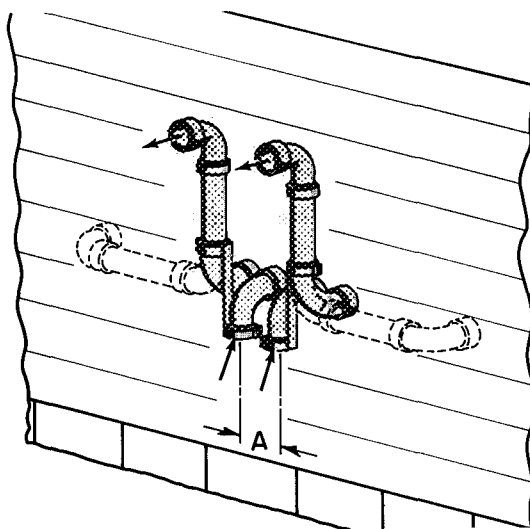


Figure 7 — Sidewall Termination Above Snow Level or Grade (Preferred, Solid Lines; Option, Dashed Lines)

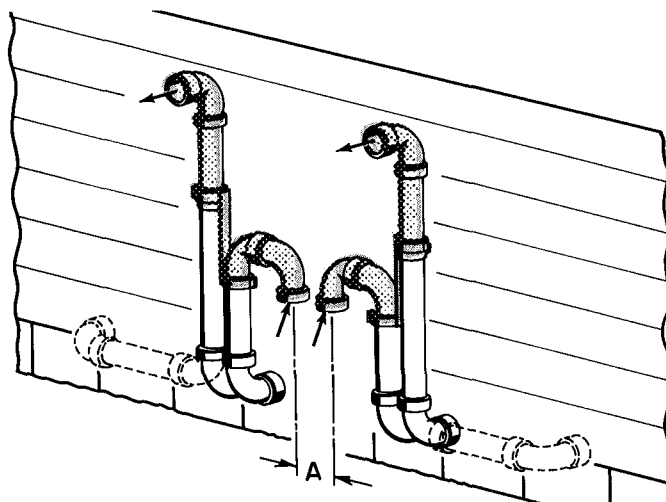
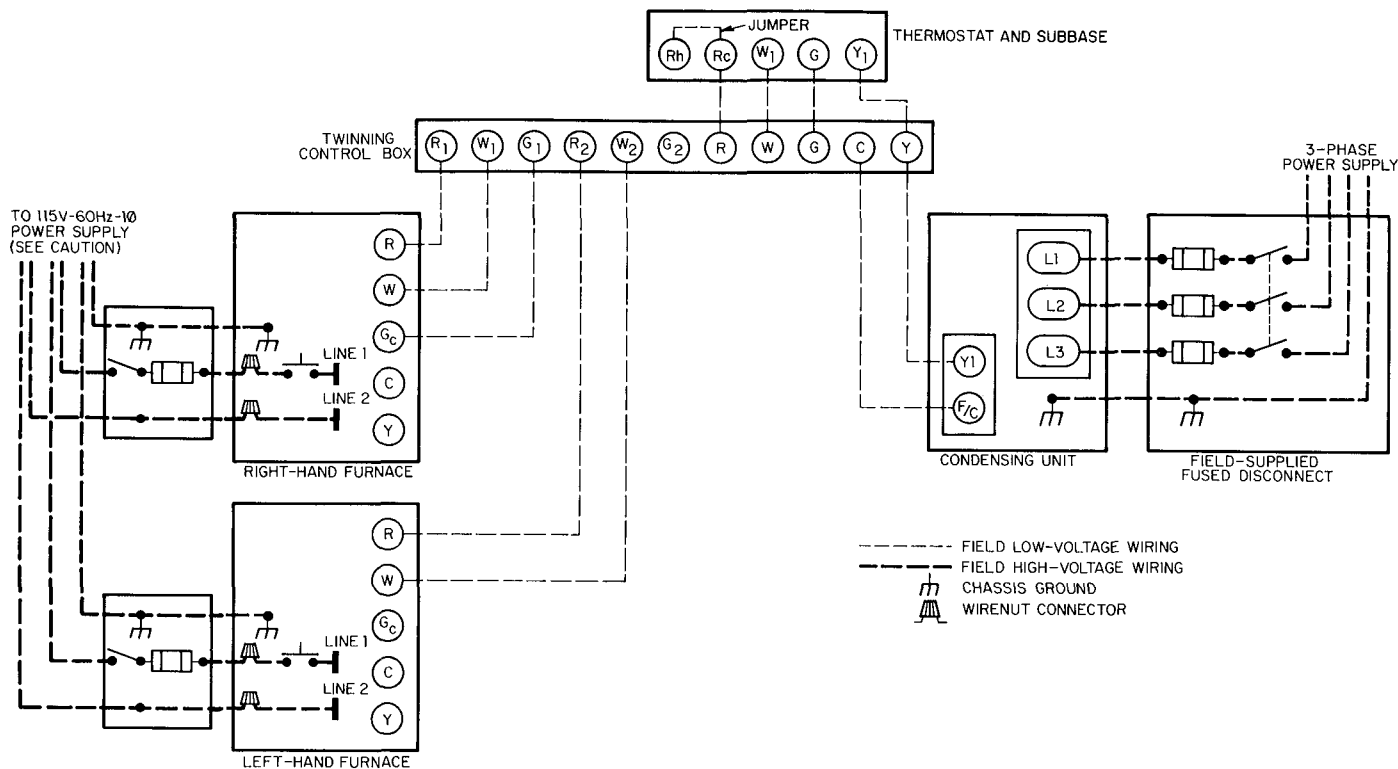
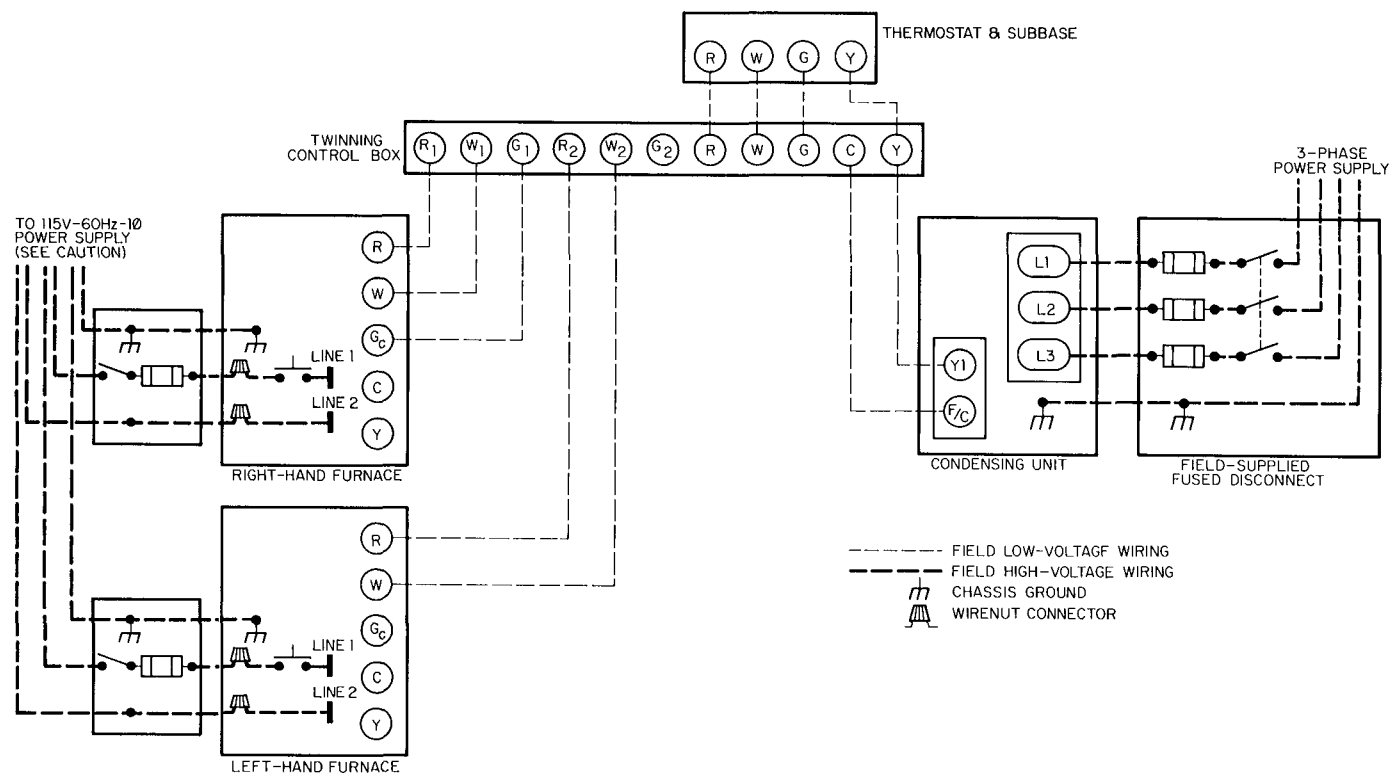


Figure 8 — Sidewall Termination Below Snow Level or Too Close to Grade (Preferred, Solid Lines; Option, Dashed Lines)



SINGLE-STAGE HEATING & SINGLE-STAGE COOLING (Automatic Changeover)

Figure 9 — Field High- and Low-Voltage Wiring

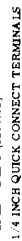


SINGLE-STAGE HEATING & SINGLE-STAGE COOLING (Manual Changeover)

Figure 10 — Field High- and Low-Voltage Wiring

LEGEND

- 1A-TRANSFORMER (N.C.)
1B-RELAY, COOLING SPST (N.O.)
1C-RELAY, INTERLOCK SPST (N.O.)
2A-RELAY, HEATING SPST (N.C.)
2B-RELAY, COOLING SPST (N.O.)
3A-RELAY, COOLING SPST (N.O.)
3B-RELAY, COOLING SPST (N.O.)
3C-RELAY, COOLING SPST (N.O.)
4A-CAPACITOR
4B-BOARD, P.C. PUMPS (CONTROL)
5A-RELAY, INTERLOCK SPST (N.O.)
5B-SWITCH, AUXILIARY LIMIT (N.C.)
5C-SWITCH, AUXILIARY LIMIT (N.C.)
6A-RELAY, COOLING SPST (N.O.)
6B-SWITCH, BLOWER DOWN INTERLOCK SPST (N.O.)
6C-CONNECTOR, BLOWER MOTOR
11C-LINK, FUSIBLE (OVER-TEMPERATURE)
11E-GROUND, EQUIPMENT
11F-PART OF TWIN KIT



NOTE: See other furnace blower door for complete schematic diagram.

Figure 11 – Model 58GP Connection Diagram

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[illegible]

Figure 12 — Models 58GS and 58GSC Connection Diagram

Figure 13 — Model 58SSB Connection Diagram

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--- FIELD WIRING (24VAC)
 --- FACTORY WIRING (120VAC)
 --- FACTORY WIRING (24VAC)
 --- FIELD WIRING (120VAC)
 ■ 1/4 INCH QUICK CONNECT TERMINALS

1083-CONNECTOR, EDGE (INDUCER CONTROL BOARD-20K7)
1084-CONNECTOR, PILOT (SGT)
1085-FACTORY TEST POINTS (NOT FOR FIELD USE)
1086-CONNECTOR, BLOWER MOTOR
1087-CONNECTOR, PILOT SPJCE
1C-LINK, FUSIBLE (OVER-TEMPERATURE)
1E-GROUND, EQUIPMENT
1I-RESISTOR, ADJUSTABLE (OFF-TIME)
1PI-TEST POINT
1P-PART OF TWIN KIT

[illegible]

1A-TRANSFORMER (1*)
1A1-RELAY, COOLING SPST (N, 3) *
1A2-RELAY, INTERLOCK SPST (N, O) *
2D-RELAY, INDUCER MOTOR DPST (N, 3)
2D1-RELAY, HEATING DPST (N, O) *
2D2-RELAY, LO SPEED DPST (N, 3) *
2D3-RELAY, HEATING BLOWER (BFR) DPST (N, C) *
2F-RELAY, COOLING BLOWER (CFR) DPST (N, C) *
3A-MOTOR, INDUCER
3A-MOTOR, BLOWER
4A-CAPACITOR
5F-VALVE, GAS (REDUNDANT)

NOTE: See other furnace blower door for complete schematic diagram. (For natural gas installations only.)

Figure 14 — Model 58SX Connection Diagram

SCHEMATIC DIAGRAM FOR 58GP INSTALLATIONS

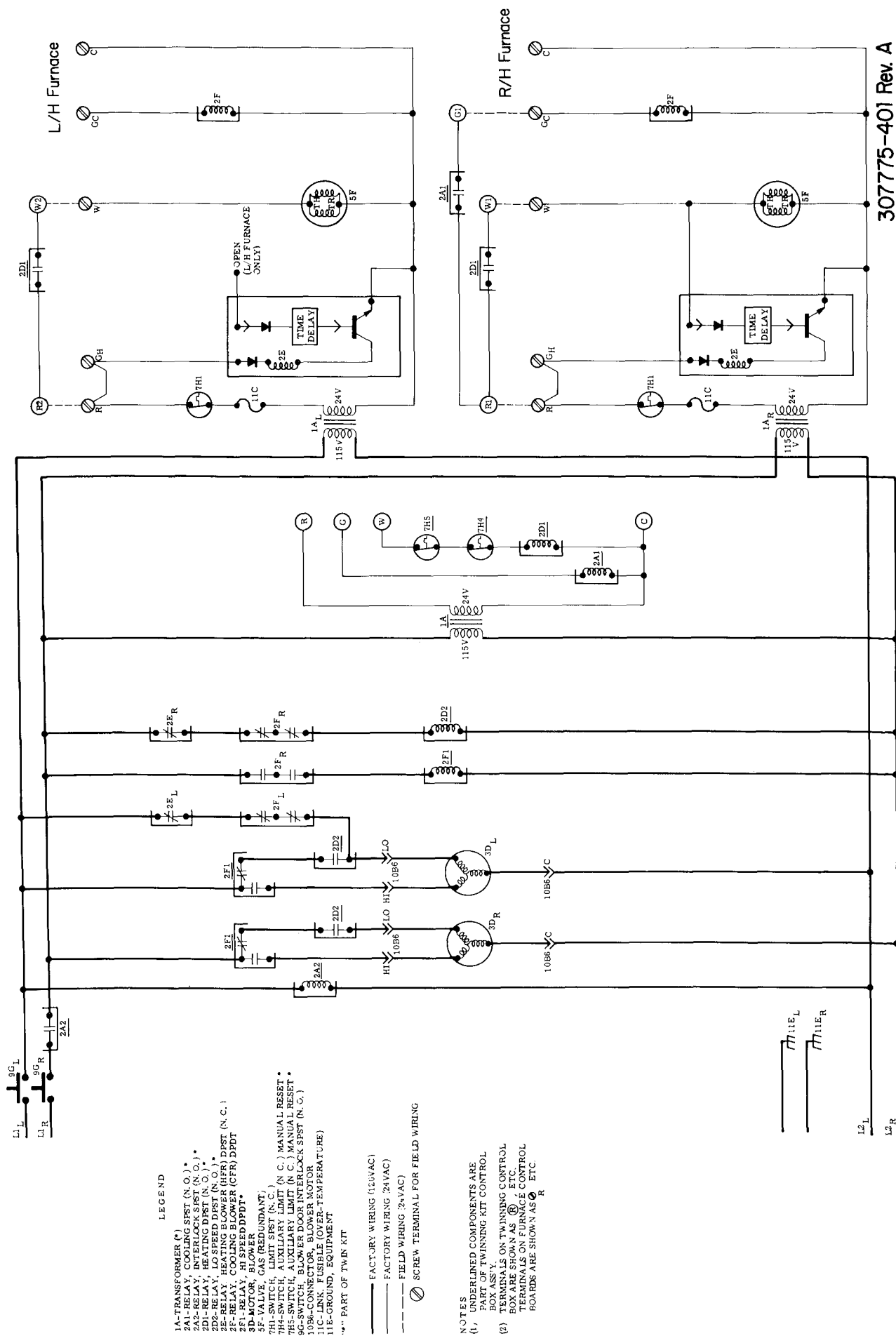
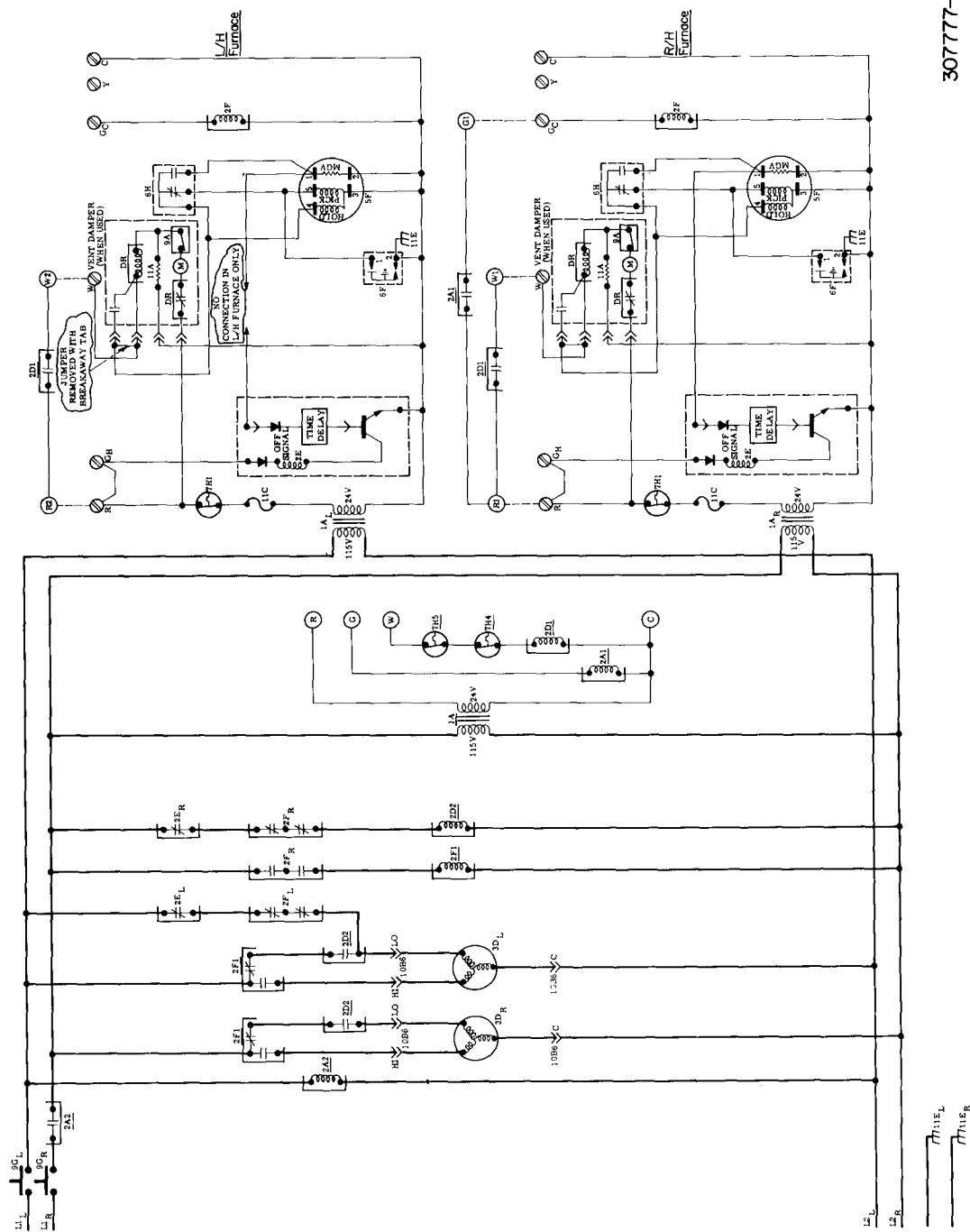


Figure 15 — Model 58GP Schematic Diagram

307775-401 Rev. A

SCHEMATIC DIAGRAM FOR 58GS AND 58GSC INSTALLATIONS



NOTES:

(1)	UNDERLINED COMPONENTS ARE PART OF TWINNING AIR CONTROL BOX ASSY.
(2)	TERMINALS ON TWINNING CONTROL BOX ARE SHOWN AS (B), ETC. TERMINALS ON FURNACE CONTROL BOARDS ARE SHOWN AS (C), ETC.

————— FACTORY WIRING (120VAC)
 ————— FACTORY WIRING (24VAC)
 - - - - - FIELD WIRING (24VAC)
 ○ SCREW TERMINAL FOR FIELD WIRING
 ■ 1/4 INCH QUICK CONNECT TERMINALS

LEGEND

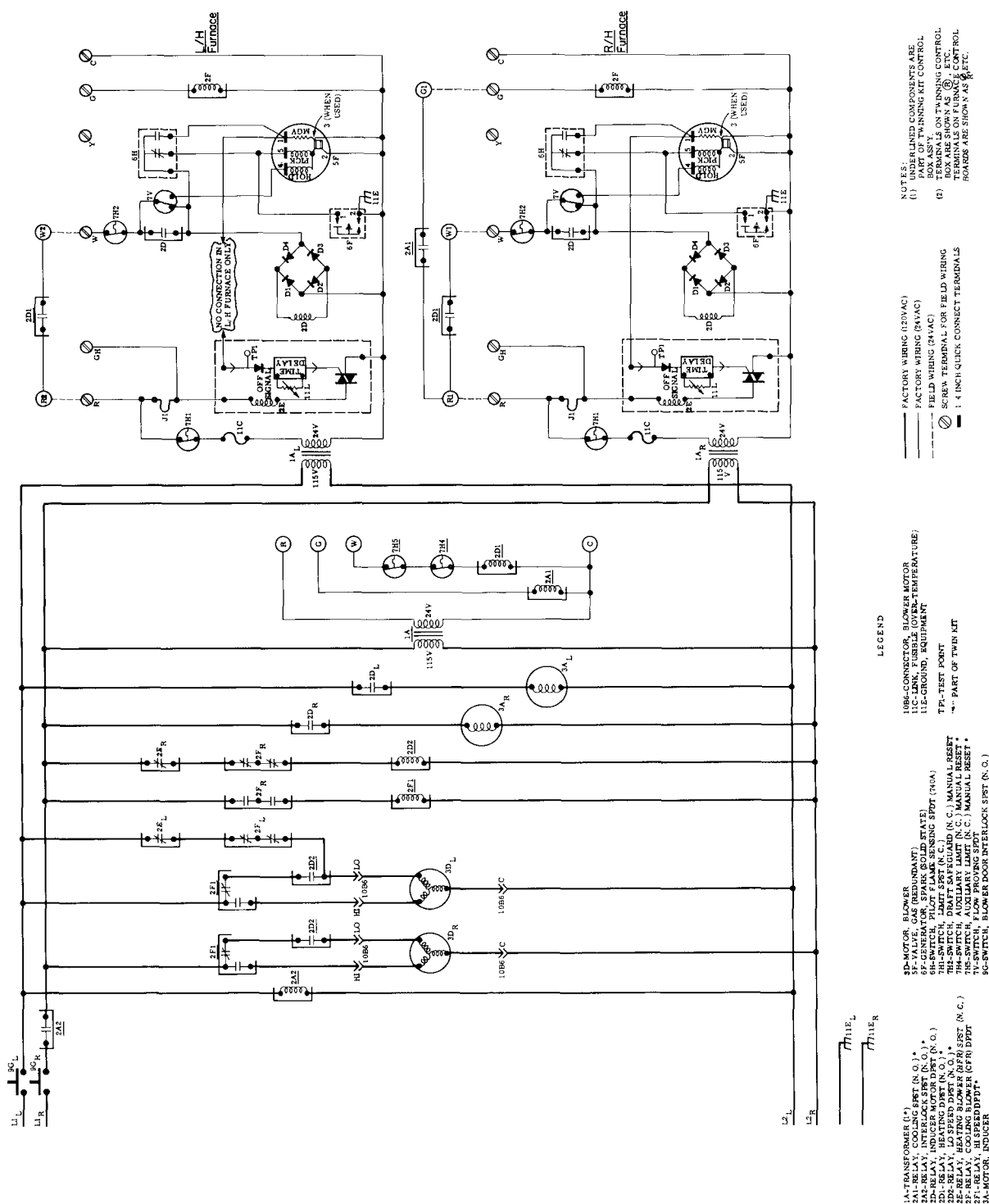
1A-TRANSFORMER (12)
1B-RELAY, COOLING FST (N.O.)
1C-RELAY, INTERLOCK FST (N.O.)
2A-RELAY, HEATING FST (N.O.)
2B-RELAY, HEATING FST (N.O.)
3A-REF-RE-RELAY, HEATING BLOWER (RFR) DPST (N.C.)
3B-REF-RE-RELAY, HEATING BLOWER (CFR) DPST (N.C.)
4A-RELAY, COOLING FST (N.O.)
4B-RELAY, COOLING FST (N.O.)
5A-VALVE, GAS (REDUNDANT)
5B-VALVE, GAS (REDUNDANT)
6-GENERATOR, SPARK (SOLID STATE)
7-SWITCH, PILOT FLAME SENSING (STT) (4C)
7H-SWITCH, LIMIT STT (N.C.)
7H-SWITCH, LIMIT STT (N.C.)
8-SWITCH, AUXILIARY (N.C.)
8-SWITCH, AUXILIARY (N.C.)
9C-SWITCH, BLOWER DROO INTERLOCK FST (N.C.)
10B-CONNECTOR, BLOWER MOTOR
11-TEMPERATURE, BLOWER MOTOR
11-TEMPERATURE, BLOWER MOTOR
12-PISTON OF TWIN KTY
13-PART OF TWIN KTY

NOTE. See other furnace blower door for pictorial connection diagram.

Figure 16 — Models 58GS and 58GSC Schematic Diagram

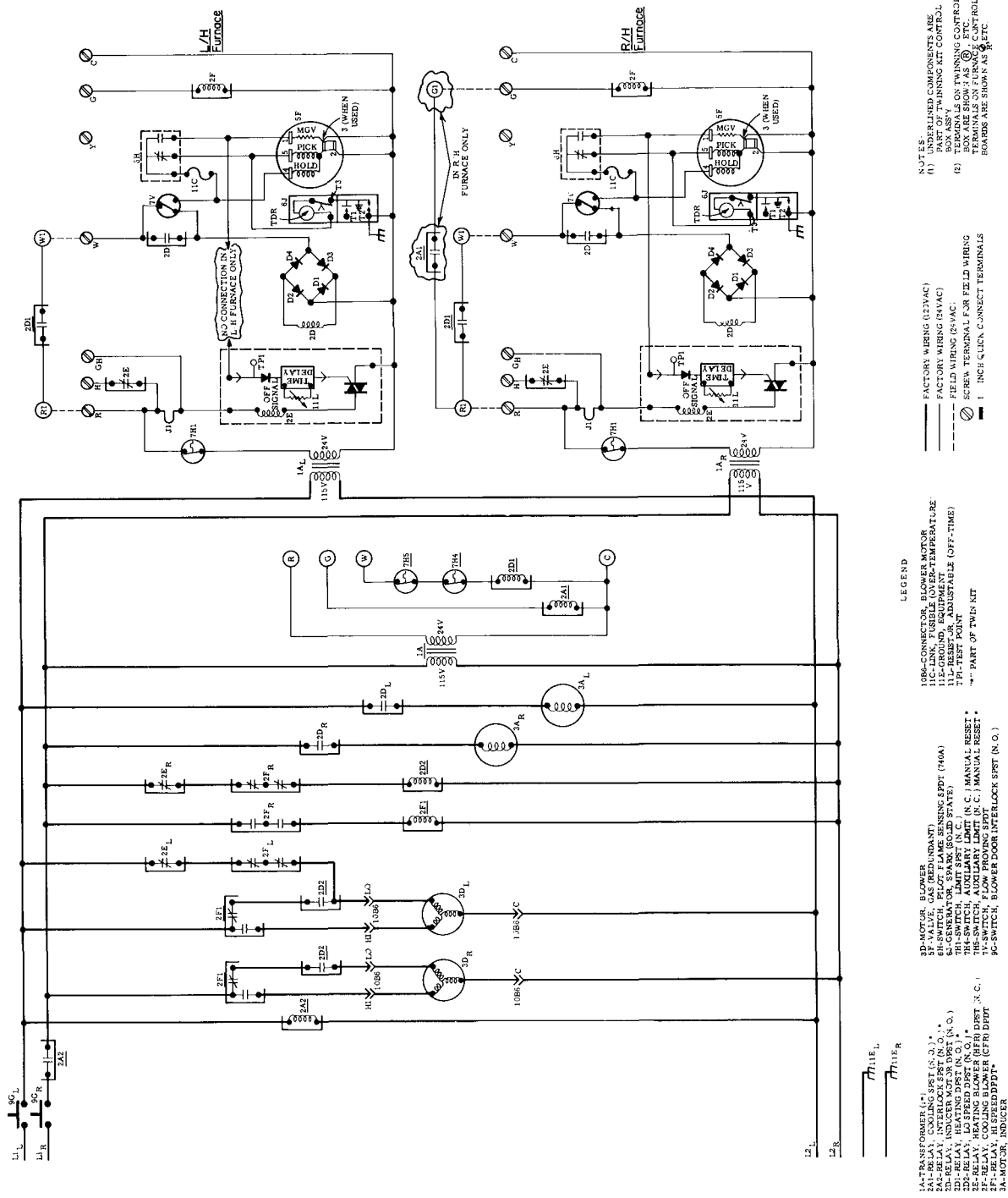
307777-401 Rev.B

SCHEMATIC DIAGRAM FOR 58SSB INSTALLATIONS



NOTE. See other furnace blower door for pictorial connection diagram. (For natural gas installations only.)

SCHEMATIC DIAGRAM FOR 58SX INSTALLATIONS



308083-401 Rev.A

Figure 18 — Model 58SX Schematic Diagram

NOTE: See other furnace blower door for pictorial connection diagram. (For natural gas installations only.)

V. SEQUENCE OF OPERATION

Refer to any of the wiring schematics, Figures 15 through 18. Refer to the individual Installation Instructions for furnace operation details.

A. Heating Mode

1. With LH furnace blower door in place and 115V supplied to LH unit, the coil of relay 2A2 is energized, closing contacts 2A. Power is also available to the N.C. contacts of the LH furnace heating fan relay and to terminal No. 1 of relay 2F1.
2. With the RH furnace blower door in place and 115V supplied to RH unit, and with the contacts of relay 2A2 closed, power is now available to main transformer 1A, terminal No. 4 of relay 2F1, the N.C. contacts of heating fan relay in the RH furnace, and the N.O. contacts of cooling fan relay.

Note that the twinning kit 24-volt circuit is dead unless both blower doors are in place. Line voltage is still present in the twinning control box unless both blower doors are removed.

3. The thermostat "calls for heat," closing the R-W circuit and energizing the coil of relay 2D1 through the N.C. contacts of auxiliary limits 7H4 and 7H5.
4. Both sets of N.O. contacts on relay 2D1 are now closed, energizing the R-W circuits of each furnace.

5. After the normal "on" time delay, the coil of heating fan relay in the RH unit is de-energized, allowing its contacts to close, and energizing the coil of relay 2D2. Note that the coil of the LH unit heating fan relay remains energized and its contacts stay open, as a result of the LH time-delay circuit being disconnected during installation.
6. Power is now delivered through the N.C. contacts of relay 2F1 and the N.O. contacts of relay 2D2 to the heating speed tap of both blowers.
7. The main R-W circuit opens when the thermostat is satisfied, de-energizing relay 2D1 and opening the R-W circuit of each furnace. The RH unit heating fan relay is energized after the normal "off" time delay, de-energizing relay 2D2 and the blowers.

B. Cooling Mode

1. Steps 1 and 2 under "Heating Mode" apply to the cooling mode also.
2. The thermostat "calls for cooling," energizing circuits R, G, and Y. The R and Y circuit starts the outdoor units. Simultaneously, the R-G circuit is closed in the twinning control box, energizing relay 2A1 and the R-GC circuit on the RH furnace control board, which energizes the RH cooling fan relay.
3. At this time, the N.O. contacts on the RH unit cooling fan relay close, energizing relay 2F1. The N.C. contacts close, powering the high-speed tap on both blower motors.