

Installation Instructions

GENERAL

These instructions cover installation of an ECM blower accessory on 2- and 3-ton cooling 58SSB 060 and 080 furnaces. ECM blower accessory Part No. 58SSB900131 is used on 2-ton cooling 58SSB060 furnace and Part No. 58SSB900141 is used on 3-ton cooling 58SSB080 furnace.

Each ECM blower kit comes completely assembled with an ECM blower motor and controller, and interface circuit board. See Table 1 for a list of parts in assembly shown in Fig. 1.

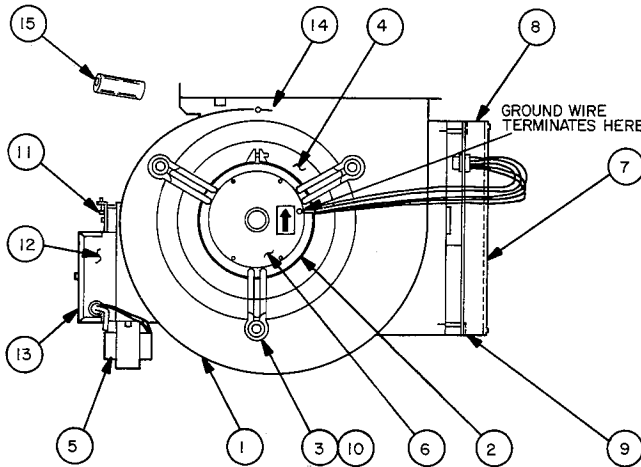


Fig. 1 — ECM Blower Kit

ECM blower kit is used in conjunction with following variable speed outdoor units:

38EV024320
38EV036320
38QV024320
38QV036320

This ECM blower is controlled by outdoor unit and provides variable airflow across furnace coil in response to variable demand on heat pump or air conditioner. For emergency heat, interface circuit board allows furnace control board to operate ECM blower at a fixed rate of

speed. This speed is normally adjusted to midpoint of rating plate temperature rise range. Interface circuit board also powers a Parker indoor thermostat, Part No. HH05ZA001.

Installation of indoor coil expansion valve, and start-up and adjustment instructions are covered in Installation, Start-Up and Service Instructions for the 38EV, QV outdoor units. See detailed system operation and control in the 38EV, QV system operation and troubleshooting guide.

⚠ WARNING

Turn off power at main disconnect switch before starting installation to avoid possibility of electrical shock.

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INSTALLATION

The following steps should be performed by a qualified service person:

1. Turn off power at main disconnect.
2. Remove blower door.
3. Remove control box from bottom side of blower shelf and position out of way.
4. Remove electrical leads from numbered side of blower speed selector.
5. Remove screws securing blower assembly to blower shelf and slide blower assembly out of furnace.
6. Unpackage ECM blower assembly and set the minimum and maximum torque settings on ECM blower control via access in lower mounting bracket as shown in Fig. 2.

Table 1 — ECM Blower Kit Parts List

ITEM	DESCRIPTION	QUANTITY	58SSB900131 PART NO.	58SSB900141 PART NO.
1	Housing-Blower	1	58SSB309891-701	58SSB309891-702
2	Band-Motor Mount	1	HC98ZZ480	HC98ZZ480
3	Arm-Motor Mount	3	HC98ZZ242	HC98ZZ248
4	Wheel-Blower	1	LA22RA101	LA22RA100
5	Transformer	1	HT01AW232	HT01AW232
6	Motor (ECM)	1	HC42SE113	HC42SE113
7	ECM Motor Controller	1	HR46KH001	HR46KH001
8	Top Blower Control Bracket	1	58SSB308056-201	58SSB308056-201
9	Bottom Blower Control Bracket	1	58SSB308056-202	58SSB308056-202
10	Grommet-Isolator	3	09-0135	09-0135
11	Interface Board	1	HK42FA002	HK42FA002
12	Interface Box	1	58SSB309863-401	58SSB309863-401
13	Interface Box Cover	1	58SSB309864-301	58SSB309864-301
14	Cutoff, Blower	1	79725-2	79725-3
15	Electrical Noise Suppressor	1	HK99FA001	HK99FA001

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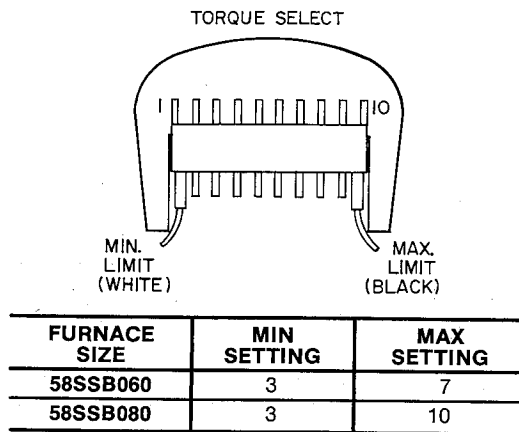


Fig. 2 — Torque Setting

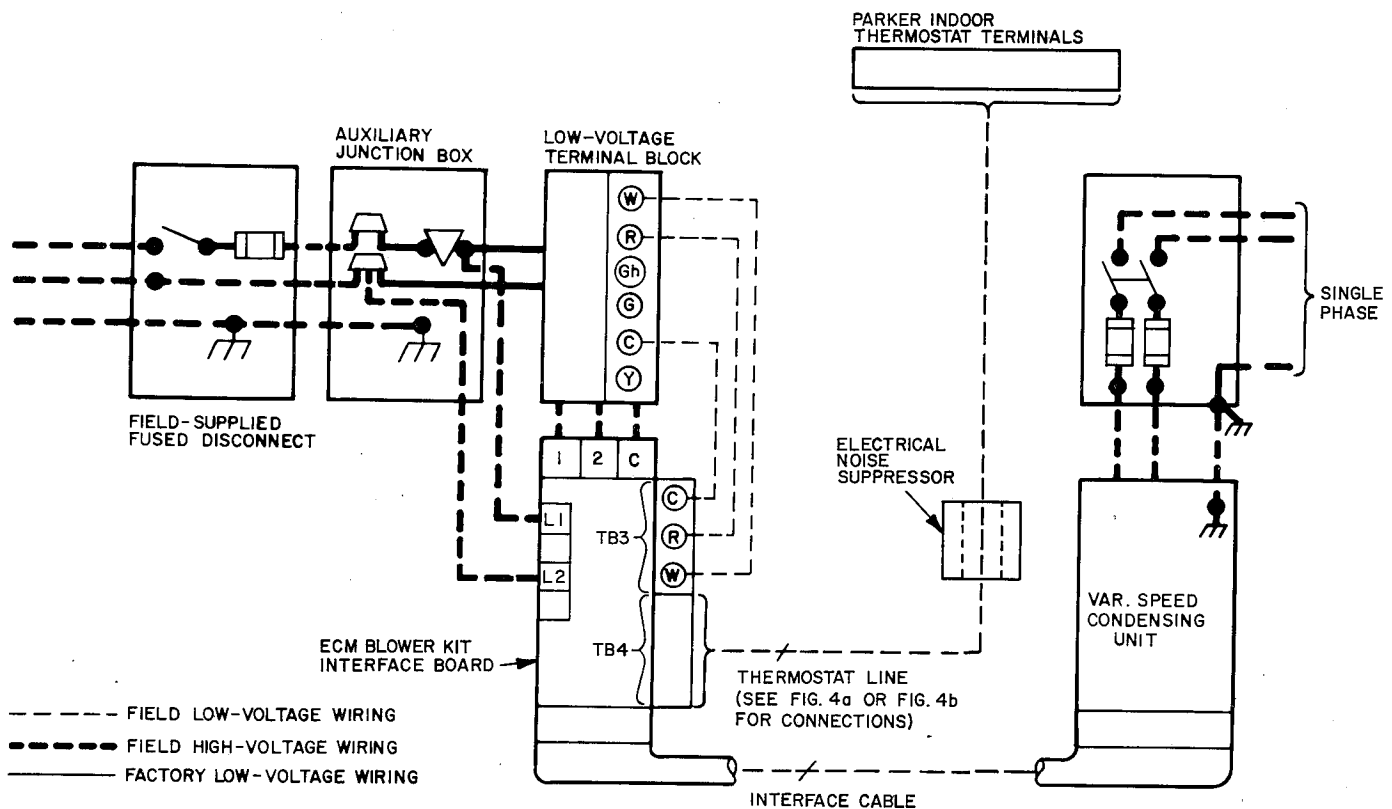
7. Slide ECM blower assembly into furnace and tighten screws to secure blower assembly to the blower shelf.
8. Reinstall furnace control box on bottom side of blower shelf.
9. Connect electrical leads from furnace control previously used as blower speed selector taps to numbered connector which is panel mounted on the left side of the interface control box. Black lead to position 1, red lead to position 2, white lead to position C.
10. Double-check to make sure main power disconnect is off.

In steps 11 through 14, the 115-v power leads to ECM blower kit connects in parallel with furnace 115-v power supply. To do this:

11. Remove cover of auxiliary junction box.

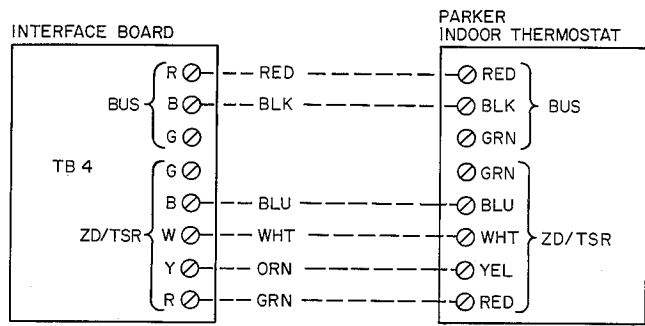
12. Remove strain relief securing the power leads in place on the auxiliary J-box.
13. Route power leads from ECM blower kit through opening in back of auxiliary junction box. Disconnect black lead from furnace control at door switch, and connect black lead with 3/16-in. piggy-back quick-connect from ECM blower kit in its place. Then reconnect black lead from furnace control to 3/16-in. male quick-connect provided on piggyback connector. Remove wire connecting white lead of furnace control to line voltage common line. Connect white wire from ECM blower kit and reinstall wire nut.
14. Make sure all power leads are secured in place using the strain relief provided with this kit.
15. Reinstall cover to auxiliary junction box.
16. Disconnect all existing thermostat leads from the furnace control board if applicable.
17. Connect W, R, and C from terminal block TB3 labeled, HEAT, on interface circuit board located on front of blower housing to their respective thermostat connections on furnace control board, labeled (W, R, C) using field-supplied thermostat wire cut 6 in. in length and stripped 1/4 in. on each end. See Fig. 3.
18. Install thermostat following instructions included with outdoor section. For single zone applications, route 6-conductor thermostat wire into furnace through one of the knock-outs in the cabinet. Multi-zone applications require only 3-conductor wire.
19. Slide electrical noise suppressor provided, over thermostat wire before making electrical connections (see Fig. 3) at blower assembly.

NOTE: For electrical interference and noise, refer to 38EV, QV outdoor section Installation, Start-Up and Service Instructions.



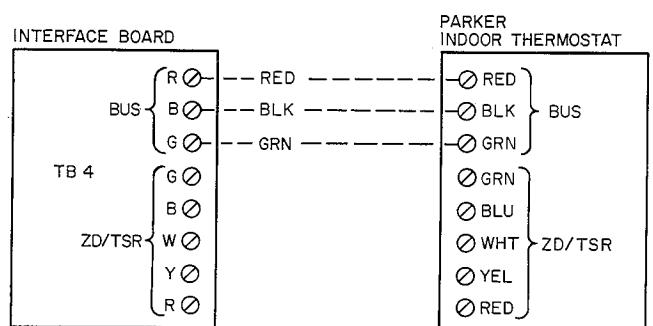
NOTE: If any of the original wire as supplied must be replaced, use same type or equivalent wire.

Fig. 3 — Field High- and Low-Voltage Wiring Diagram



----- FIELD-SUPPLIED WIRE

4a — SINGLE ZONE



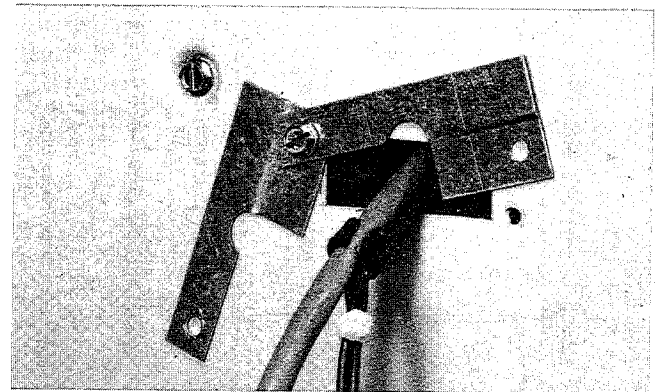
----- FIELD-SUPPLIED WIRE

4b — MULTI-ZONE

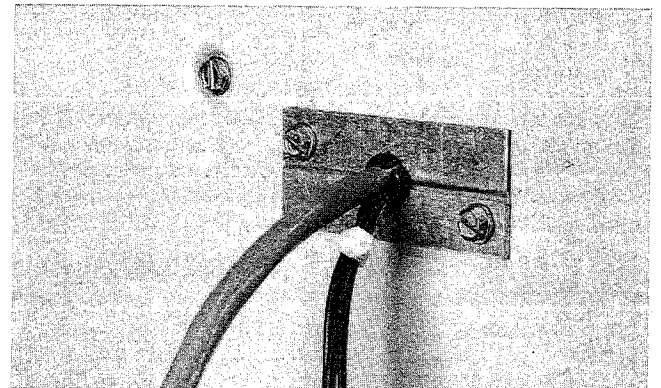
Fig. 4 — Thermostat Connections

20. Strip thermostat wire leads back 1/8-in. and make connections to blower kit interface board as shown in Fig. 4a or 4b. Slide noise suppressor down thermostat wire and position close to interface board.
21. Route interface cable provided with Model 38EV or QV outdoor unit to furnace, as described in Model 38EV, QV installation instructions.
22. To permit routing of interface cable into furnace blower compartment it is necessary to modify furnace cabinet according to the following procedure, referring to Fig. 5.
 - a. Provided with kit are 2 sheet metal covers, screws and snap bushing. See Fig. 5. Use one cover as a template. Mark and drill two 1/8-in. diameter mounting screw holes in either side of furnace cabinet.

NOTE: Be sure to locate cable entry hole where cable does not interfere with interior furnace components. Also, before making hole be sure cable reaches proper receptacle (P1) on blower accessory interface board.
 - b. Use a chassis punch or similar tool to cut a 1/2-in. x 1-5/8 in. rectangular cable entry opening between the 2 sheet metal cover mounting screw holes to permit passage of interface cable connector.
 - c. Mount the 2 sheet metal covers loosely to cabinet with one screw. See Fig. 5.
 - d. Route interface cable through cable entry hole into furnace blower compartment to receptacle P1 of blower accessory interface board. Connector is polarized so it cannot be mounted in wrong direction. Be sure spring clips on connector lock in place to secure connector. Secure cable ground wire to convenient interface board mounting screw.
 - e. Mount indoor coil solenoid expansion valve (SEV) as described in Model 38EV, QV outdoor section installation instructions. Route 4-lead wire harness from SEV through interface cable entry hole to interface board polarized receptacle P2.
 - f. Open snap bushing provided and install bushing around interface cable and 4 SEV leads at cable entry hole with large rim of bushing facing outward from cabinet.
 - g. Slide 2 sheet metal covers together around bushing and secure covers loosely with remaining mounting screw. Adjust cable and leads to allow slack inside cabinet for strain relief.
 - h. Tighten both sheet metal cover mounting screws with bushing positioned to protect cable and leads from metal edges of cable entry hole.



COVER DISASSEMBLED WITH SNAP BUSHING ATTACHED TO LEADS



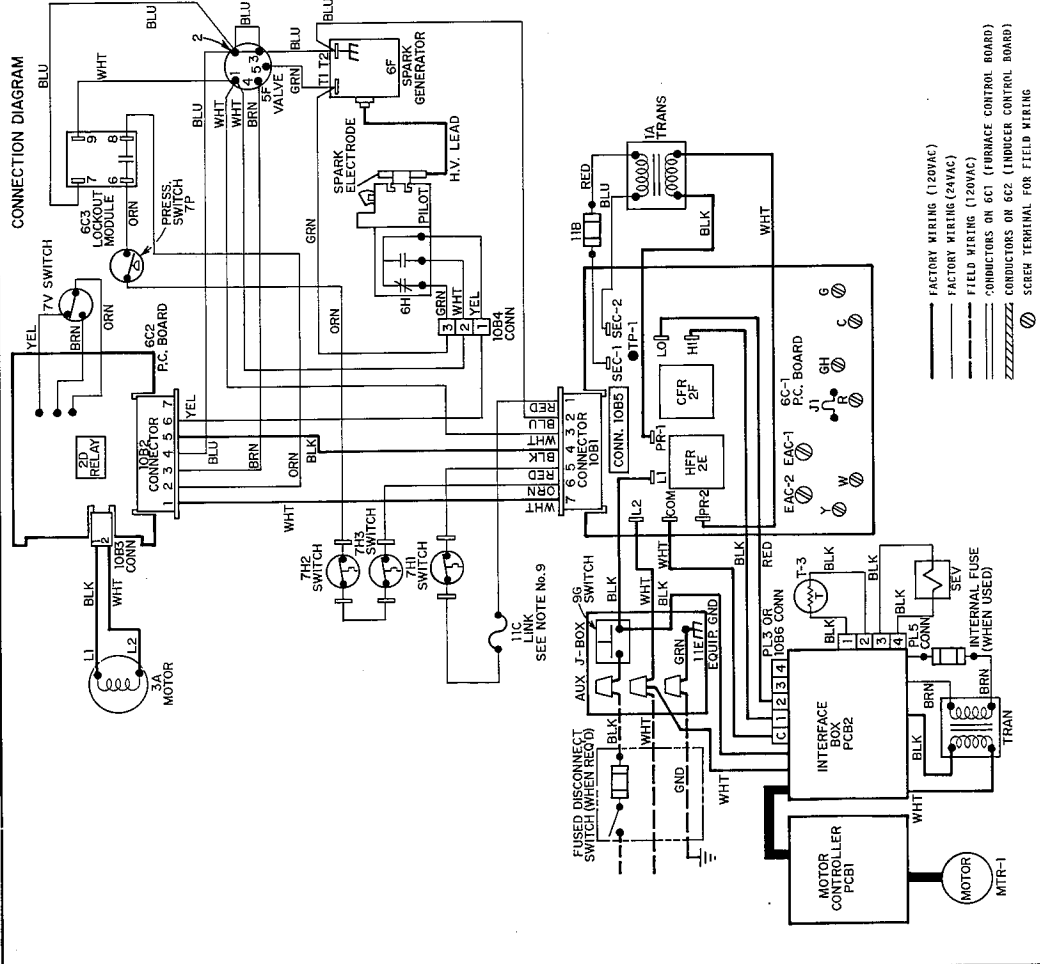
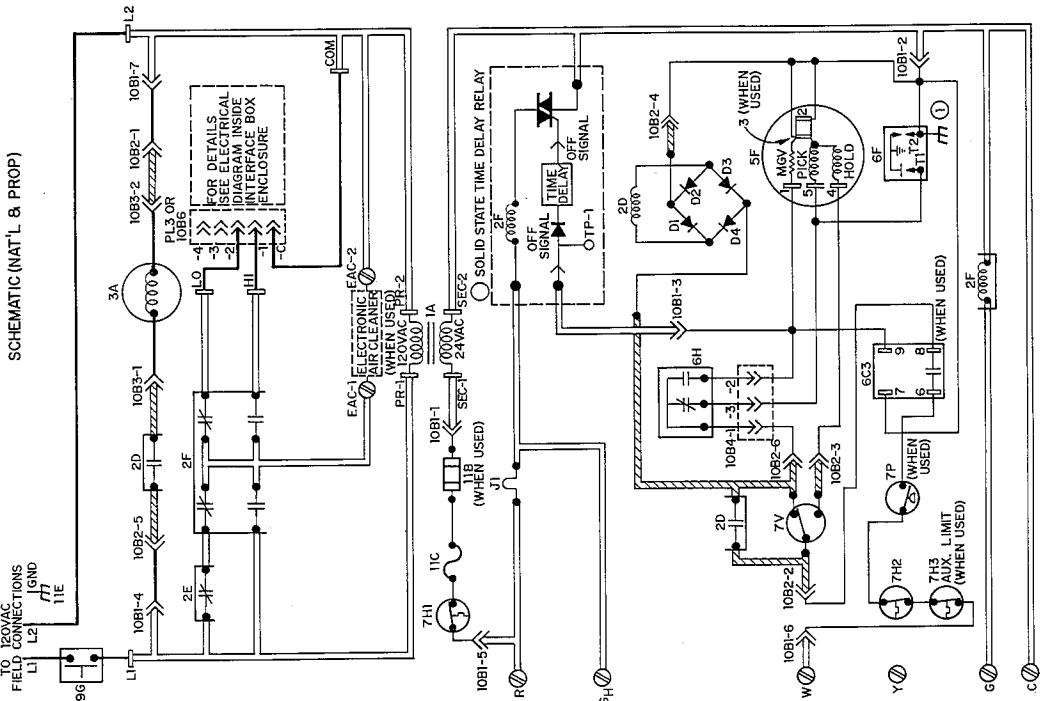
COVER FULLY ASSEMBLED

Fig. 5 — Cable Entry Hole and Cover

23. Peel off backing from wiring diagram and stick on top of previous furnace wiring diagram located on inside of blower access panel.
24. Reinstall control and blower access panels. See Fig. 3 for a wiring diagram showing proper field high- and low-voltage wiring. Make all electrical connections in accordance with National Electrical Code and any local codes or ordinances that might apply.
25. Clean 2-in. x 3-in. area next to unit rating plate.
26. Peel backing from auxiliary rating plate and stick to clean area next to unit rating plate.

NOTE: DO NOT apply auxiliary rating plate on top of the unit rating plate. Make sure both rating plates are legible after installation.

SCHEMATIC (NAT'L & PROP)



- NOTES:
1. T2-INTERIALLY CONNECTED TO EQUIPMENT GROUND SPARK GENERATOR (6F)
 2. RELAY (24) CONTACTS ARE NORMALLY CLOSED UNTIL 120VAC IS APPLIED TO FURNACE
 3. IF ANY OF THE OBSERVABLE WIRE AS SUPPLIED MUST BE REPLACED
 4. IF ANY OF THE OBSERVABLE WIRE AS SUPPLIED MUST BE REPLACED
 5. BLOWER MOTOR (MTR-1) HAS A THERMAL OVERLOAD SWITCH. FOR AVERAGE BLOWER MOTOR (MTR-1) FACTORY INSTALLATION INSTRUCTIONS FOR DETAILS ON OPTIMUM SPEED SELECTION.
 6. USE COPPER WIRE ONLY BETWEEN THE DISCONNECT SWITCH AND THE UNIT.
 7. PRESSURE SWITCH (7P) IS USED FOR PROPANE ONLY.
 8. PRESSURE SWITCH (7P) IS USED FOR PROPANE ONLY.
 9. FUSIBLE LINK USAGE, 1 REQD. ON UPLINK & 3 REQD. ON DOWNLINK/INDUCER MOTOR (MTR-1) IS USED FOR PROPANE ONLY.
 10. NATURAL GAS.
 11. 2AMP FUSE IN SECONDARY OF TRANSFORMER FOR CANADIAN UNITS ONLY.

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Fig. 6 — Schematic Wiring Diagram

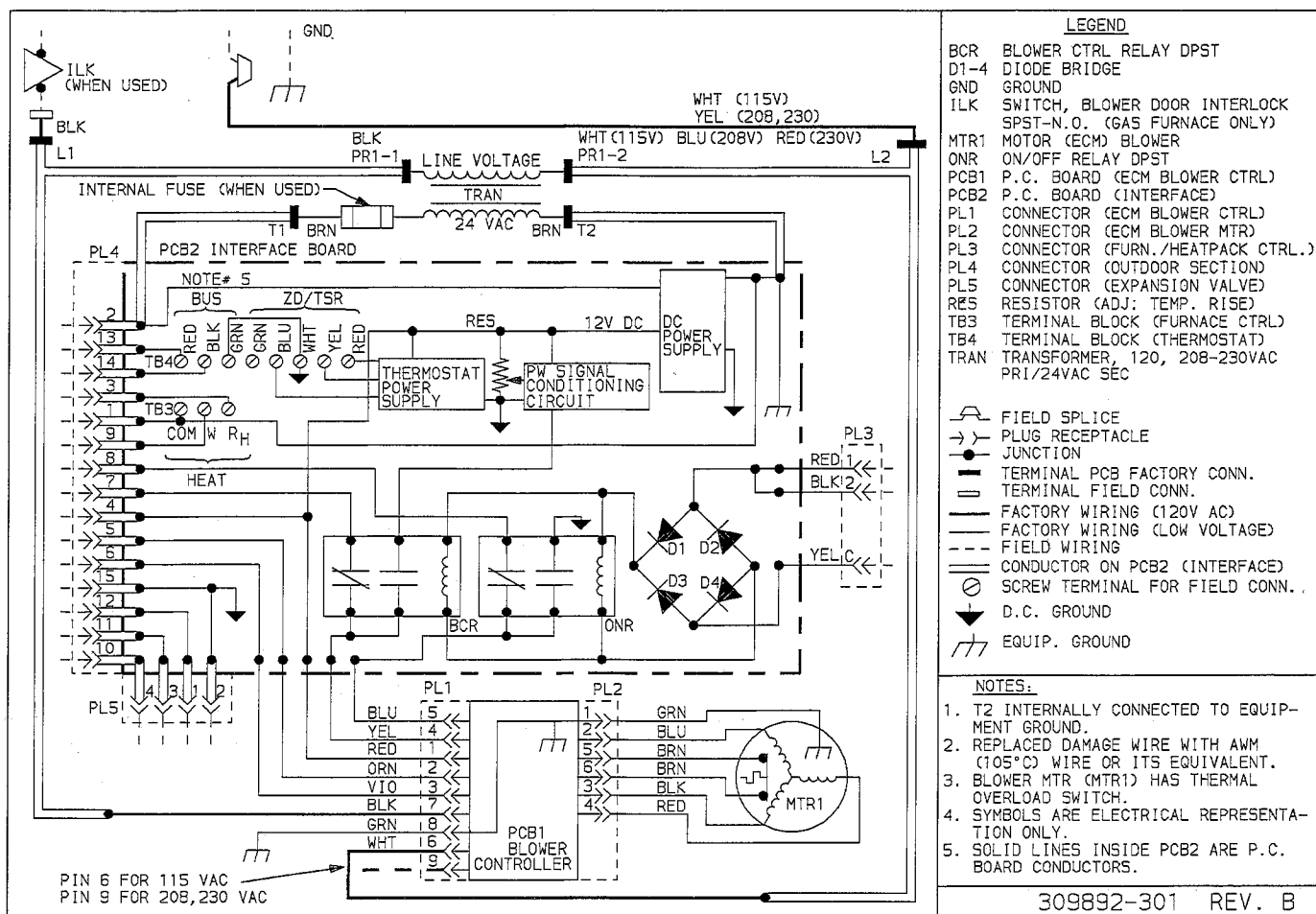


Fig. 7 — ECM Blower Kit Line-to-Line Wiring Diagram

SEQUENCE OF FURNACE OPERATION

Heating Cycle — The control circuit of furnace shown in schematic wiring diagrams, Fig. 6 and 7, results in the following sequence of operation for the heating cycle when used with ECM blower kit:

- When blower door is in place, 120 volts is supplied through blower door interlock 9G. Both transformers 1A and TRAN are energized supplying 24 volts to heating blower relay coil 2E, interface circuit board PCB2, and outdoor section. When heating blower relay coil 2E is energized its normally closed contact is opened.
- The wall thermostat calls for heat which in turn transmits necessary signal to CPU in outdoor section which energizes R and W circuit. This closed circuit supplies power to 24-volt safety circuit containing limit switch 7H1, fusible link 11C, manual reset draft-safeguard switch 7H2, manual reset auxiliary switch 7H3 (when used), and energizes ECM blower motor MTR1 at a low blower speed.
- Simultaneously, the pick coil of gas valve 5F, spark generator 6F, and inducer-motor relay coil 2D are energized. Inducer-motor relay contacts 2D close supplying 120 volts to start inducer blower motor 3A. Also, another set of contacts in inducer-motor relay 2D close in 24-volt circuit, and lock in inducer-motor relay coil 2D. The coil is locked in until R and W circuit or safety circuit opens.
- When pick coil of gas valve 5F is energized, gas flows to pilot. Pilot gas is ignited by a spark produced by spark generator 6F. Simultaneously, inducer motor 3A comes up to speed, actuating flow sensing switch

- 7V, energizing hold coil of gas valve 5F. Pick coil of gas valve 5F and spark generator 6F are de-energized when contacts of pilot-flame sensing switch 6H move from normally closed position, breaking circuit to pick coil and spark generator. In approximately 50 to 60 seconds, normally open contacts of pilot-flame sensing switch 6H close, making circuit to MGCV (main gas valve) of gas valve 5F. Gas valve 5F opens in approximately 10 seconds, allowing gas flow to main burners, which are ignited by pilot 6H. Simultaneously, time-delay circuit in furnace control board is energized. Approximately 60 seconds after gas valve 5F opens, heating relay coil 2E is de-energized, which closes 120-volt contacts of heating relay 2E, energizing blower control relay BCR and on/off relay ONR on interface circuit board PCB2. This in turn steps up ECM blower motor MTR1 to its heating speed.
- When thermostat is satisfied, the appropriate signal is transmitted to CPU in outdoor section which de-energizes R and W circuit. This in turn de-energizes gas valve 5F, inducer motor relay 2D, and solid-state time-delay circuit on furnace control board. Gas flow stops immediately to pilot and main burners. After approximately 105 seconds, heating relay 2E is energized, which opens heating relay contacts 2E supplying 120 volts to interface circuit board PCB2. This causes blower control relay BCR and on/off relay ONR to de-energize allowing ECM blower motor MTR1 to stop.

NOTE: After a brief interruption of either electric or gas supply, furnace will not resume operation until contacts of pilot-flame sensing switch 6H move from normally open to normally closed position.

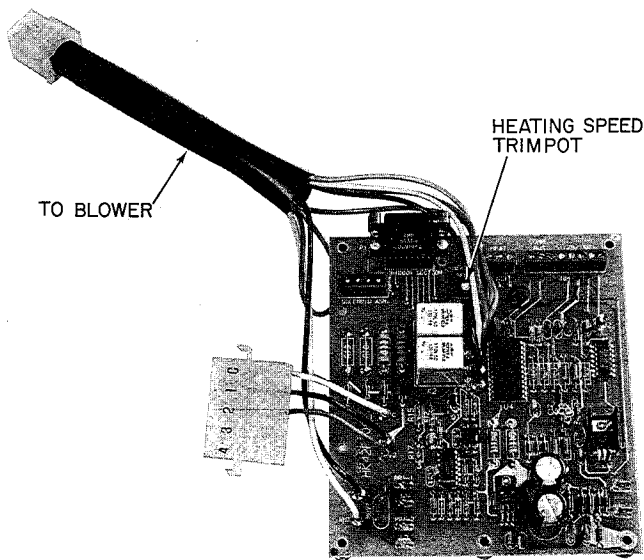


Fig. 8 — Variable Speed Blower Interface Board

TEMPERATURE RISE ADJUSTMENT

Furnace must not be operated outside range of temperature rise specified on unit rating plate. Determine air temperature rise as follows:

1. Place thermometers in return and supply ducts as near furnace as possible. Be sure thermometers do not see heating element so that radiant heat does not affect readings. This practice is particularly important with straight run ducts.
2. When thermometer readings stabilize, subtract return-air temperature from supply-air temperature to determine air temperature rise.

NOTE: If outdoor section and system thermostat are not installed, temperature rise can be determined by jumpering R and W circuits on furnace control board.

3. Adjust temperature rise to midpoint of temperature rise range specified on unit rating plate by adjusting blower speed. To adjust blower speed locate heating speed trimpot in interface circuit board (see Fig. 8). Increase blower speed clockwise to reduce temperature rise. Decrease blower speed counterclockwise to increase temperature rise.

CARE AND MAINTENANCE

⚠ CAUTION

Because of possible damage to the equipment or personal injury, maintenance should be performed by qualified persons only.

For long life, economy and high efficiency, clean accumulated dirt and grease from blower wheel and motor annually.

The following steps should be performed by a qualified service person:

Some motors have prelubricated sealed bearings and require no lubrication. These motors can be identified by the lack of oil ports on each end of the motor. For those motors with oil ports:

Lubricate motor every 5 years if motor is used on intermittent operation (thermostat FAN switch in AUTO position), or every 2 years if motor is in continuous operation (thermostat FAN switch in ON position).

⚠ WARNING

To avoid possibility of electrical shock, be sure to disconnect electrical power before removing access panels.

Clean and lubricate as follows:

1. Remove access panels.
2. Disconnect R, W, and C thermostat leads on furnace control board.
3. Remove control box from bottom side of blower shelf and position out of way.
4. Note location of wires for reassembly. Remove electrical leads from numbered panel mount connector located on left side of interface box.
5. Disconnect 15-conductor cable on interface circuit board.
6. Note location of thermostat wires for reassembly. Remove electrical leads from terminal block TB4 on interface circuit board.
7. Remove cover of auxiliary junction box. Disconnect power leads going to interface circuit board.
8. Remove screws securing blower assembly to blower shelf and slide blower assembly out of furnace.
9. Squeeze release tabs on connector PL2 and pull from ECM blower controller.
10. Mark blower wheel location on shaft and motor support location on motor before disassembly to ensure proper reassembly.
11. Loosen setscrew holding blower wheel on motor shaft.
12. Remove bolts holding motor mount to blower housing. Slide motor and mount out of housing.
13. Lubricate motor.
 - a. Remove dust caps or plugs from oil ports located at each end of motor. If motor does not have these caps or plugs, bearings are sealed and need no further lubrication.
 - b. Use a good grade of SAE 20 nondetergent motor oil. Put one teaspoon (5 cc, 3/16 oz or 16 to 25 drops) in each oil port. Use of other types or grades of oil will damage motor. Excessive oiling can cause premature bearing failures.
 - c. Allow time for total quantity of oil to be absorbed by each bearing.
 - d. After oiling motor, wipe excess oil from motor housing.
 - e. Replace dust caps or plugs on oil ports.
14. Remove blower wheel from housing.
 - a. Mark blower wheel orientation and cutoff plate location to ensure proper reassembly.
 - b. Remove screws securing cutoff plate and remove cutoff plate from housing.
 - c. Remove blower wheel from housing.
15. Clean blower wheel and motor by using a vacuum with soft brush attachment. Be careful not to disturb balance weights (clips) on blower wheel vanes. Do not drop or bend wheel because balance will be affected.
16. Reassemble blower by reversing steps 14a through c. Be sure wheel is positioned for proper rotation and motor oiling plugs are pointed up when motor is installed.

17. Reassemble motor and blower by reversing steps 9 through 12. If motor has ground wire, be sure it is reconnected. Be sure wheel is centered in blower housing. Spin blower wheel to check clearance.
18. Reinstall blower assembly in furnace.
19. Reconnect power leads from interface circuit board. Reinstall auxiliary junction box cover.
20. Reconnect thermostat leads to terminal block TB4 on interface circuit board.
21. Reconnect 15-conductor cables.
22. Reconnect electrical leads from furnace control to numbered panel mount connector located on left side of interface box.
23. Reinstall control box on bottom side of blower shelf.
24. Refer to 38EV,QV outdoor section installation instructions and inspect for proper blower operation.

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