

Chimney-Lock Automatic Vent Damper

for use with 58ES, SE, GS, and GP Gas-Fired Furnaces

GENERAL

The Model 58ES Automatic Vent Damper is intended for use only with Carrier listed gas-fired furnaces in accordance with Tables 1, 2, and 3. Deviations are not permitted.

CAUTION: Install vent damper so that the furnace is the only appliance it serves.

CLEARANCE REQUIREMENTS

Allow 6-in. clearance from combustible material. Provide sufficient access for servicing.

INSTALLATION ON MODEL 58ES FURNACES

The Model 58ES deluxe gas furnaces shown in Table 1 are A.G.A. design certified for use with or without the Model 58ES900 Automatic Vent Damper. The A.G.A. certification of the design of the furnaces shown in Table 2 does not include the use of an Automatic Vent Damper. An additional Kit P/N 58ES900031 is required to install a vent damper on the units shown in Table 2. Only those combinations shown in Table 1 or Table 2 are permissible.

INSTALLATION

Step 1 – Install Automatic Vent Damper (Fig. 1, 2).

NOTE: Be sure gas and electric supplies are turned off and vent pipe is disconnected.

CAUTION: Do not force damper open or closed manually.

- Remove furnace control access door.
- Remove 2 front screws from furnace top filler plate covering top of draft hood.

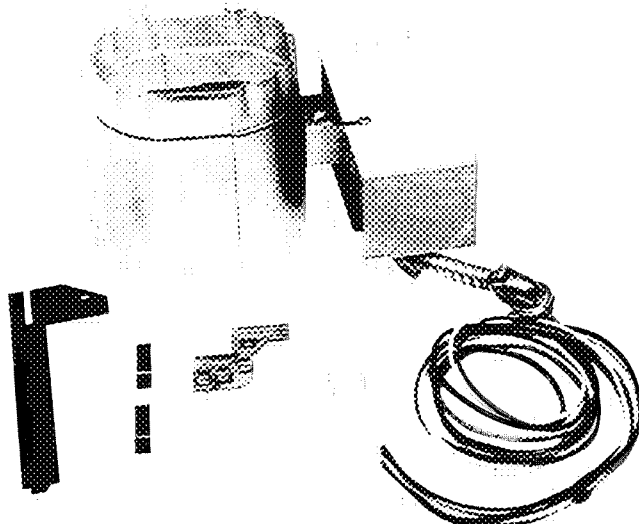


Fig. 1 – Automatic Vent Damper

- For 080 size units only, install flue adapter plate: Lift furnace top filler plate and position adapter plate around vent pipe collar. Turn adapter flange down and place against right side of draft hood.

Position adapter plate so vent pipe collar of draft hood is centered in opening.

Drill 3 screw holes in draft hood top and attach adapter plate to draft hood with screws.

- Route damper motor wires thru slot in top filler plate, down alongside draft hood, and between edge of sweep sheet and casing flange. Do not remove connector nut at this time.

NOTE: When additional clearance is required, remove the screw holding the sweep sheet to right side of furnace casing and push sweep sheet down. After wires are correctly routed, replace screw in sweep sheet.

Table 1 – Model ES Furnace-Vent Damper Combinations

58ES FURNACE		AUTOMATIC VENT DAMPER 58ES900-	VENT DAMPER SIZE (in.)
A.G.A. Listed Model No.	Carrier Part No.		
080-3D	080-314	401	5
100-2D	100-214	501	5
100-3D	100-314	511	5
125-2D	125-214	511	5
125-3D	125-314	511	5
150-2D	150-214	601	6
150-3D	150-314	601	6
175-3D	175-314	701	7
200-3D	200-314	701	7

Table 2 – Furnace-Vent Damper Combinations with Conversion Kit 58ES900031

58ES FURNACE		AUTOMATIC VENT DAMPER 58ES900-	VENT DAMPER SIZE (in.)
A.G.A. Listed Model No.	Carrier Part No.		
080-3	080-304	401	5
100-2	100-204	501	5
100-3	100-304	511	5
125-2	125-204	511	5
125-3	125-304	511	5
150-2	150-204	601	6
150-3	150-304	601	6
175-3	175-304	701	7

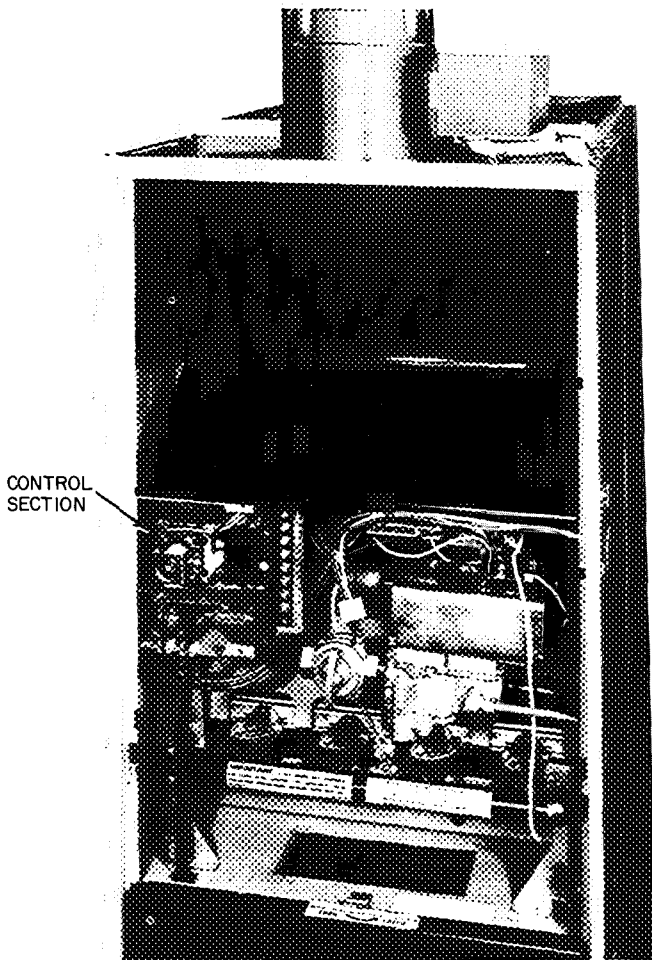


Fig. 2 – Vent Damper Positioned on Furnace

- Position vent damper on furnace. See arrow on damper rating plate for direction of flue gas flow.

NOTE: On 6- and 7-in. vent damper, attach the first section of flue pipe to the vent damper before installation. Drill 2 screws (1 in front and 1 in back) into the pipe and vent damper to hold pipe in place.

- Remove nut from conduit connector where wire passes thru top filler plate.
- Turn nut sideways until it passes thru filler plate slot.
- Lift front of filler plate and reinstall nut on connector to secure conduit to furnace top filler plate.

- With vent damper properly positioned, drive 2 screws thru clearance holes provided into vent pipe collar on draft hood.
- Reinstall screws in top filler plate. Be sure wires are not pinched between top filler plate and casing, and that wires do not touch draft hood.
- Peel backing from operation label and press firmly to a clean, dry portion of plenum, coil box or other visible, pneumatic surface near the damper.

CAUTION: Do not attach label to flue passage section of damper.

Step 2 – Install Printed-Circuit Adapter (Fig. 3 and 4).

- Remove furnace control box cover.
- Remove screw holding plastic divider panel on right side of control box. Remove plastic divider panel.
- Disconnect wires from terminals marked SEC1 and SEC2. If 2 wires are connected to SEC1 thru a doubler terminal, disconnect doubler from SEC1 terminal. Keep wires connected to doubler. See Fig. 3.
- Disconnect wire from terminal marked LIM. Remove strain relief bushing from top of control box. Position over vacated terminals and push into place. Be sure male terminals of control box have properly engaged in SEC1, SEC2 and LIM female terminals of adapter. See Fig. 4.

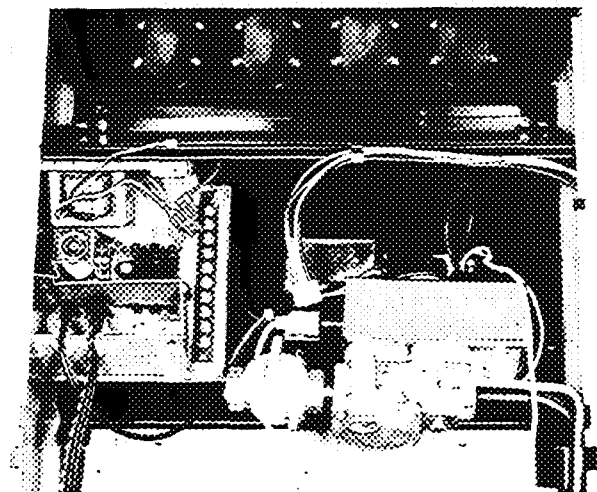


Fig. 3 – Control Section, Wires Disconnected

Step 3 – Connect Wires (Fig. 4).

- Connect black wire from limit switch to LIM.
- Connect blue transformer wire to SEC2.
- Connect red/orange wire to SEC1.
- Reinstall strain relief bushing.
- Reinstall plastic divider panel on right side of control box. Be sure bottom is engaged in control box slot and printed-circuit adapter extends thru top slot.
- Plug wires from vent damper onto end of printed-circuit adapter extending thru right side of control box. Position plug so black wire is on bottom.
- Replace control box cover.
- Route wires along front edge of sweep sheet and attach wire clip.
- Loop excess wire and tuck behind right side of flange. Install wire retaining clip (shipped loose with damper) on casing flange.
- Install other wire retaining clip approximately midway between furnace top and other wire clip on furnace side flange.

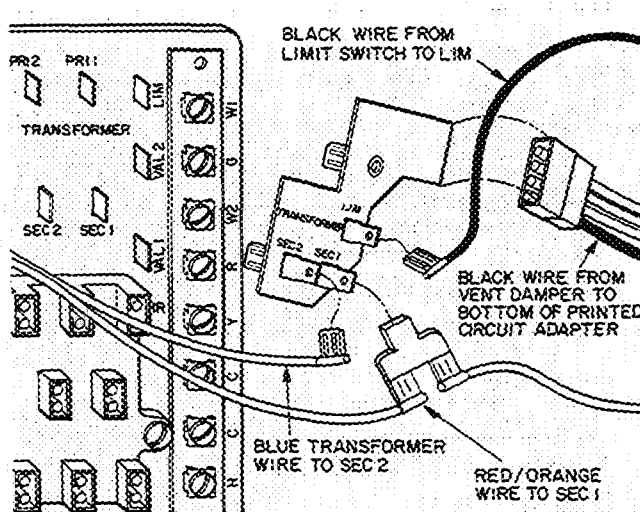
IMPORTANT: Be sure damper wires are securely positioned and do not touch drafthood.

Step 4 – Adjust thermostat anticipator to lowest setting.

Step 5 – Check Operation (Fig. 5 and 6).

NOTE: Before operating the furnace, turn on gas and electrical supplies and replace control access door. Be sure a flue pipe of the correct length is properly connected.

Check automatic vent damper for proper operation before leaving the job. The vent damper is held closed by the motor during the furnace OFF cycle. When the furnace is in the HEATING cycle, the damper motor is de-energized and the spring activated damper is opened, and remains open. The vent damper must always be open during the furnace heating cycle.



NOTE: Be sure terminals SEC1, SEC2 and LIM on control board are firmly engaged with SEC1, SEC2 and LIM on printed circuit adapter

Fig. 4 – Installing Printed Circuit Adapter in Control Box

Damper position is indicated by the orientation of the shaft end which protrudes horizontally from the damper housing opposite the damper control box (left side as installed). The damper is open when the long dimension of the shaft is vertical. The damper is closed when the long dimension is horizontal. Be sure the shaft end is clearly visible.

OPERATING SEQUENCE

With gas and electrical power supplied to the furnace, the vent damper motor energizes and closes the damper. On a “call for heat” by the thermostat, the vent damper motor is de-energized and a spring opens the damper.

When the damper reaches full open position, the transformer simultaneously energizes the pilot gas valve (inside of main gas valve), spark igniter, and heat assist coil in the fan switch. When the pilot flame is established, the flame sensing probe acts to energize the main gas valve, permitting gas flow to the burners. The electrode may continue to spark for a short period of time after pilot flame is established. The blower motor is energized thru the fan switch by means of the heat assist and temperature rise in the heat exchanger.

When the thermostat is satisfied, it de-energizes the pilot gas valve and stops gas flow to both the pilot and main burners. The vent damper motor energizes and closes the vent damper. When the heat exchanger temperature drops to the fan switch setting, it opens its contacts and stops the blower motor.

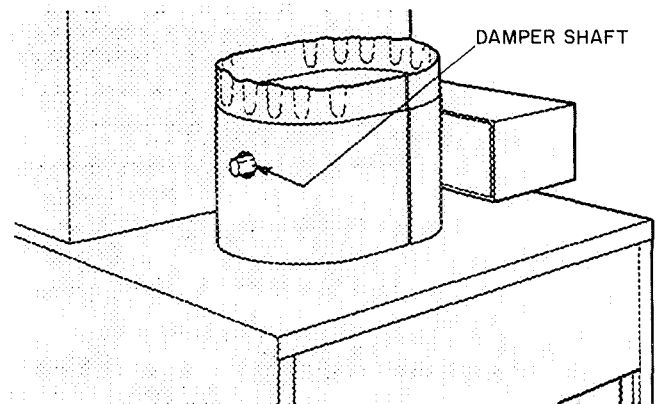


Fig. 5 – Damper in Open Position

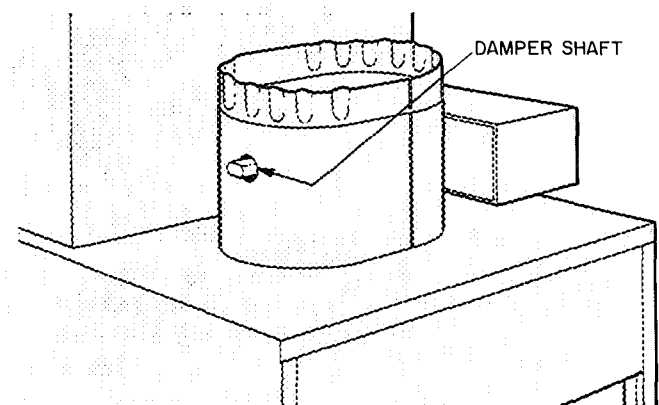


Fig. 6 – Damper in Closed Position

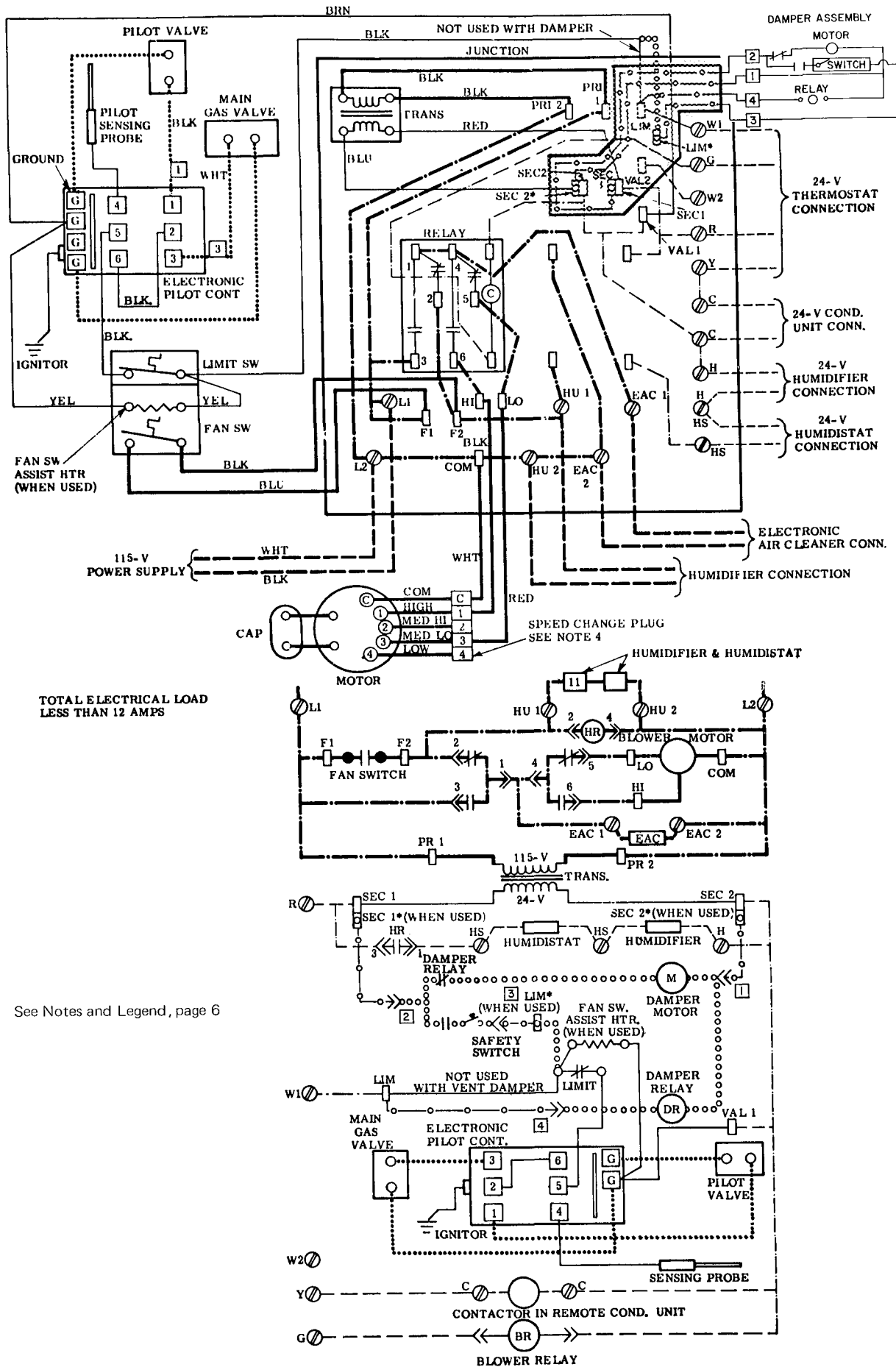


Fig. 7 — Wiring Diagram; 58ES080 thru 150 Model Furnaces with Automatic Vent Damper and Penn-Basso Valve

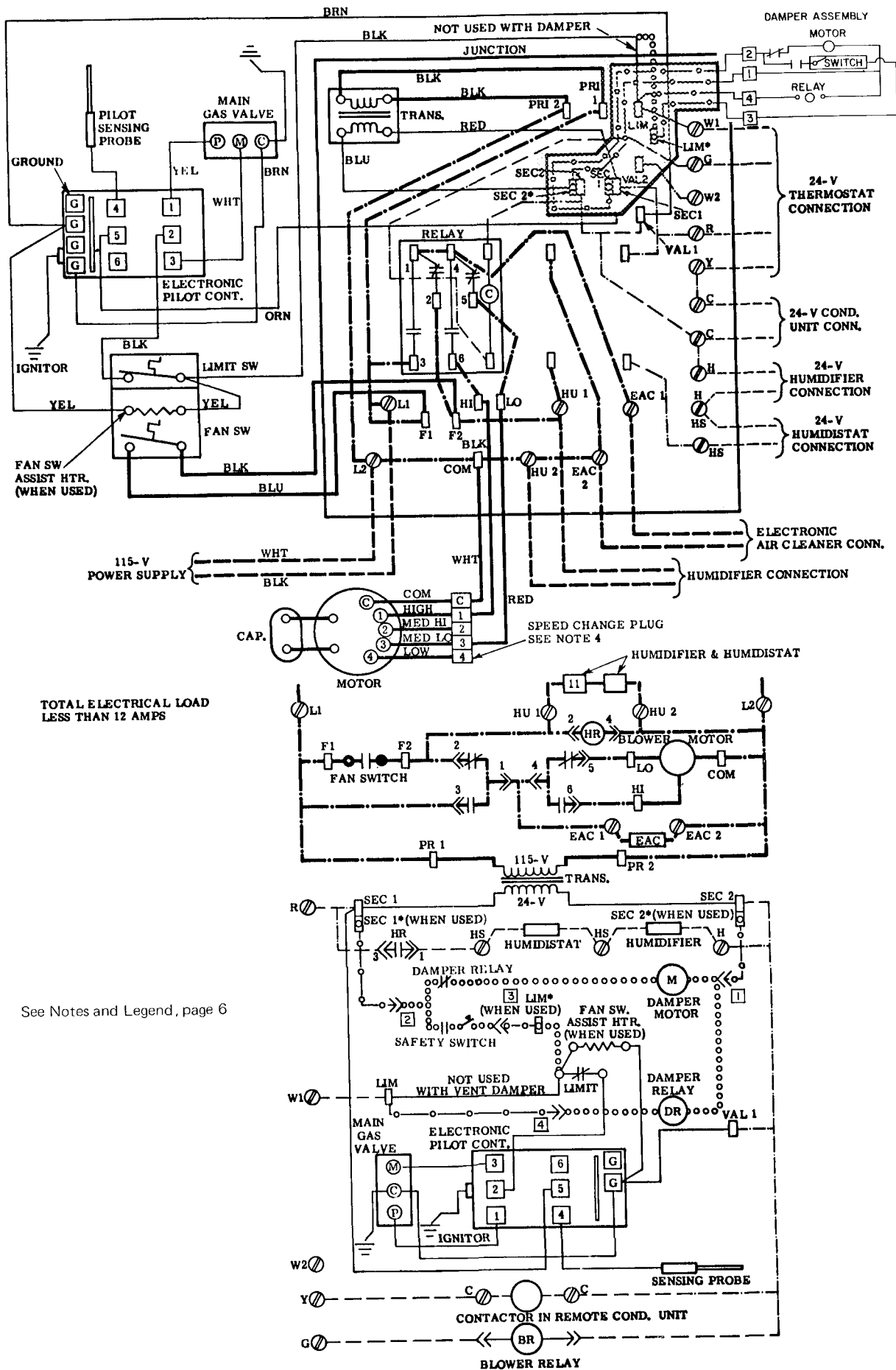


Fig. 8 - Wiring Diagram; 58ES175 and 200 Model Furnaces with Automatic Vent Damper and Essex Valve

NOTES FOR LABEL DIAGRAMS (Fig. 7 & 8)

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| <p>1. To change motor speed, move black or red wire to desired speed setting</p> <p>2. If any of the original wire as supplied with the appliance must be replaced, it must be replaced with AWM (90 C) wire or its equivalent</p> | <p>3. Motor is thermally overload protected.</p> <p>4. Factory speed selection is for average conditions. See installation instructions for optimum speed selection. Four-speed motor not available on some models</p> |
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LEGEND FOR LABEL DIAGRAMS (Fig. 7 & 8)

- | | |
|--|---|
| <p>----- Field Wired Line Voltage</p> <p>----- Factory Wired Line Voltage</p> <p>----- Printed Circuit Wiring -- Line Voltage</p> <p>----- Field Wired Low Voltage</p> <p>----- Factory Wired Low Voltage</p> <p>----- Printed Circuit Wiring -- Low Voltage</p> | <p>⊗ Screw Terminal for Field Wiring Connection (line and low voltage)</p> <p>□ 1/4 Quick Connect Terminal for Factory Wiring Connection (line and low voltage)</p> <p>⊙ Auto Vent Damper Wiring (when used)</p> <p>—○— Printed Circuit Wiring -- Damper Adapter (when used)</p> <p>⊞ 1/4 Quick Connect -- Damper Adapter (when used)</p> |
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INSTALLATION ON MODELS 58SE, GS, GP FURNACES

Step 1 – Install Automatic Vent Damper

NOTE: Be sure gas and electric supplies are turned off and vent pipe is disconnected.

NOTE: When installing Model 58ES900411 Vent Damper, position it on the furnace so damper control box is positioned toward front of furnace.

CAUTION: Do not force damper open or closed manually.

- Remove furnace control access door.
- Remove two front screws from furnace top filler plate covering top of draft hood.

- Route damper motor wires thru slot in top filler plate, down alongside draft hood, and between edge of sweep sheet and casing flange. Do not remove connector nut at this time.

NOTE: When additional clearance is required, remove the screw holding the sweep sheet to right side of furnace casing and push sweep sheet down. After wires are correctly routed, replace screw in sweep sheet.

- Position vent damper on furnace as shown in Fig. 2. See arrow on damper rating plate for direction of flue gas flow.
- Remove nut from conduit connector where wire passes thru top filler plate.

Table 3 – Series 58SE,GS,GP Furnace-Vent Damper Combinations

58 SERIES FURNACE		AUTOMATIC VENT DAMPER		VENT DAMPER SIZE
SIZE	SERIES	58ES900-		(in.)
58SE050	104	411		4
	304	411		4
58SE075	104	411		4
	304	411		4
58SE100	104	501		5
	204	501		5
	304	511		5
58SE125	104	511		5
	204	511		5
	304	511		5
	404	511*		5
58SE150	204	601		6
	304	601		6
58SE175	304	701		7
58SE200	304	701		7
58GS(GP)050	103 (101)	411		4
	203 (201)	411		4
	303 (301)	411		4
58GS(GP)075	103 (101)	411		4
	203 (201)	411		4
	303 (301)	411		4
58GS(GP)100	103 (101)	501		5
	203 (201)	501		5
	303 (301)	511		5
58GS(GP)125	103 (101)	511		5
	203	511		5
	303 (301)	511		5
	403 (401)	511*		5
58GS(GP)150	103 (101)	601		6
	203 (201)	601		6
	303 (301)	601		6
58GS(GP)175	303 (301)	701		7

*Use knockout provided on top plate of cabinet for damper conduit access

- Turn nut sideways until it passes thru filler plate slot.
- Lift front of filler plate and reinstall nut on connector to secure conduit to furnace top filler plate.
- With vent damper properly positioned, drive two screws thru clearance holes provided into vent pipe collar on draft hood.
- Reinstall screws in top filler plate. Be sure wires are not pinched between top filler plate and casing, and that wires do not touch draft hood.
- Peel backing from operation label and press firmly to a clean, dry portion of plenum, coil box or other visible, pneumatic surface near the damper.

CAUTION: Do not attach label to flue passage section of damper.

Step 2 – Connect Wires (Refer to Fig. 9.)

NOTE: Discard the printed-circuit adapter supplied with the damper as it is not required for this installation.

- Remove blower compartment door.
- Remove control box screws and hang control box from front edge of blower shelf. Remove control box cover.

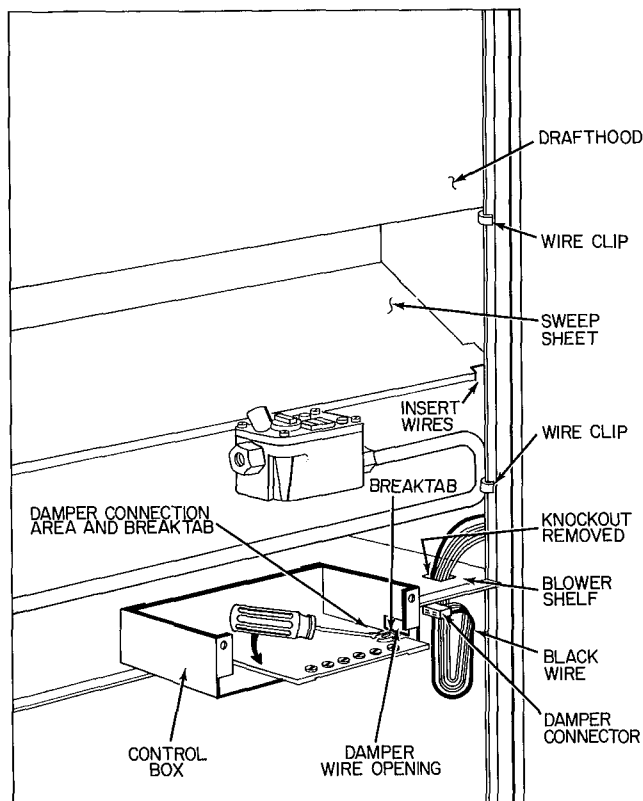


Fig. 9 – Breaktab and Damper Connection Area

- Insert tip of screwdriver into slot in breakaway tab (small prepared section of printed-circuit board located on RH side). Remove breakaway tab by pushing screwdriver handle to left and downward until tab snaps off.

CAUTION: Check back side of tab to be sure copper conductor has broken off with tab. Discard tab.

- Route damper connector thru opening in control box and slip over damper connection area of printed-circuit board. Position connector so black wire is toward front side of control box or toward bottom of control box when mounted on bottom side of blower shelf.
- Replace box cover and return control box to normal location. Replace blower door.
- Route damper wires thru channel formed by front edge of casing and secure with two wire clips supplied with damper. Place one clip even with bottom edge of draft hood and the other midway between sweep sheet and blower shelf. Be sure damper wires do not touch draft hood or any sharp metal edges. Slip damper wires into rectangular strain relief bushing provided and snap into rectangular opening in blower shelf.

Step 3 – Check Operation

NOTE: Before operating the furnace, turn on gas and electrical supplies and replace control access door. Be sure a flue pipe of the correct length is properly connected.

- Check automatic vent damper for proper operation before leaving the job. The vent damper is held closed by the damper motor during the furnace OFF cycle. When the furnace is in the HEATING cycle, the damper motor is de-energized and the spring-activated damper is opened, and remains open. The vent damper must always be open during the furnace heating cycle. Damper position is indicated by the orientation of the shaft end which protrudes horizontally from the damper housing opposite the damper control box (left side as installed). The damper is open when the long dimension of the shaft is vertical and closed when the long dimension is horizontal (see Fig. 5 and 6). Be sure the shaft end is clearly visible.

OPERATING SEQUENCE

With gas and electrical power supplied to the furnace, the vent damper motor is energized with the damper in the closed position. On a “call for heat” by the thermostat, the vent damper motor is de-energized and a spring opens the damper. When the damper reaches full open position, the transformer energizes the gas valve.

When the thermostat is satisfied, it de-energizes the gas valve and stops the gas flow. The vent damper motor energizes and closes the damper. The motor will remain energized and hold the damper closed against the spring until the next thermostat cycle.

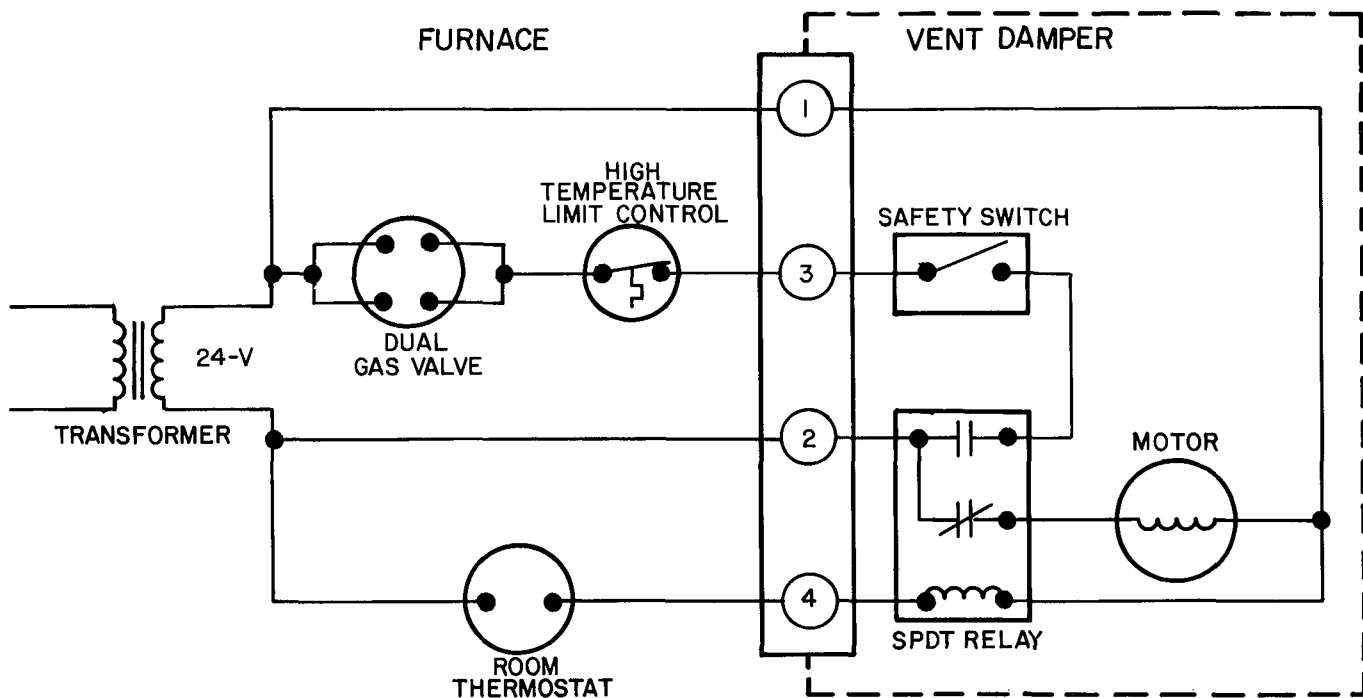


Fig. 10 — System Low-Voltage Wiring

NOTE: The above schematic is provided for diagnostic purposes and shows a simplified version of the furnace wiring. Check the furnace wiring label for an exact representation of the furnace wiring.

TROUBLE ANALYSIS CHART

WARNING: Turn off gas and power supply to unit before servicing (unless specific test requires gas and electrical supplies).

SYMPTOM	CAUSE	REMEDY
DAMPER WILL NOT OPEN	Broken spring	Replace with spring kit.
	Relay contacts welded closed	Replace motor-operator assembly.
	Bent damper shaft or housing	Replace damper & shaft or straighten housing.
DAMPER WILL NOT CLOSE	No power to furnace	Replace fuse.
	Transformer failure	Replace transformer.
	Relay contacts dirty	Replace motor-operator assembly.
	Motor burned out	Replace motor-operator assembly.
	Edge coupler on upside down — Loose contacts at edge coupler	Reposition edge coupler.
	Bent damper shaft or housing	Replace damper & shaft or straighten housing.
DAMPER IN INTERMEDIATE POSITION	Broken cotter pin	Replace cotter pin.
	Broken or missing stops	Replace housing.
	Binding shaft	Replace damper & shaft.
	Broken spring	Replace with spring kit
	Broken spring clip, coupling, or cotter pin.	Replace broken part with brass coupling kit.

For replacement items use Carrier Specified Parts.

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.