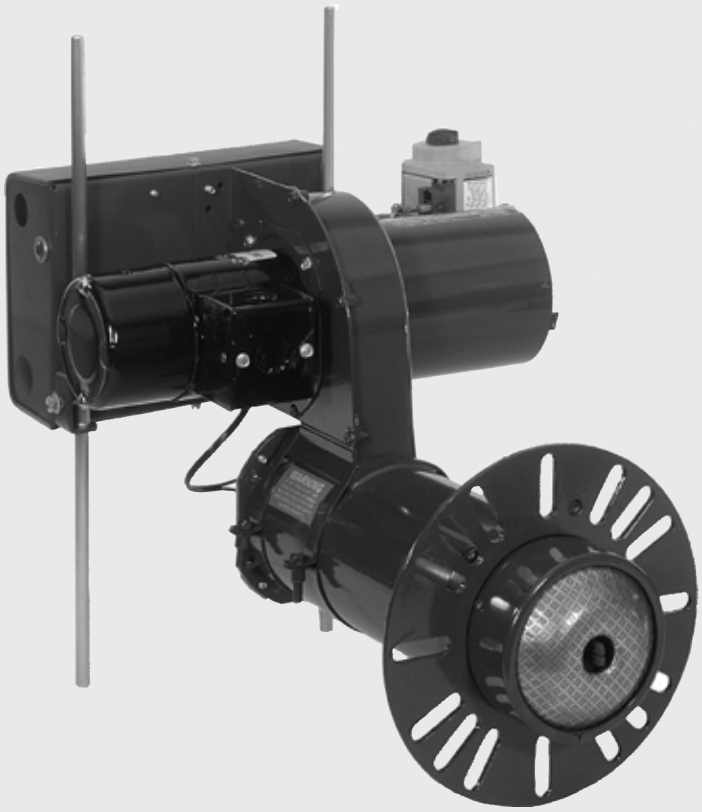
MODEL **G3B™**

Gas burner

Instruction manual Supplement



Replace manual pages:

To convert from Fenwal to S89C:

NOTICE This supplement provides information for burners equipped with Honeywell S89C hot surface ignition primary controls and update information for all G3B burners.

WARNING **Installer/servicer** — Except where specifically stated otherwise, this manual must be used only by a *qualified service technician*. In the state of MA, this product must be installed by a licensed plumber or gas fitter. Failure to comply with this or other requirements in this manual could result in severe personal injury, death or substantial property damage.

WARNING **User** — Refer only to User's Information manual for information regarding operation of this burner. The remainder of this manual is intended only for your service technician. The burner and heat exchanger must be inspected and started at least annually by your service technician.

NOTICE **Massachusetts installations:**

In the state of Massacusetts, this burner must be installed by a licensed plumber or gas fitter.

Instruction manual, page 9, Figure 5 — The gas shut-off valve installed on the gas entrance must be tee-handle type.

NOTICE **MEA approval:** MEA-369-89-E

The G3B burner has been assigned U. S. Patent No. 4397631

US

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Replace instruction manual, page 10, with this page

Code compliance

The burner/appliance installation must comply with codes listed on page 2 and any other locally applicable codes.

General wiring requirements

WARNING Read and follow the guidelines in this manual. Failure to comply could result in severe personal injury, death or substantial property damage.

Electrical shock hazard — Disconnect electrical supply to the burner before attempting to service. Failure to comply could result in severe personal injuiry, death or substantial property damage.

WARNING *Electrically ground burner* — The burner must be grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70 (in Canada, the Canadian Electrical Code Part 1, C.S.A. Standard C22.1.)

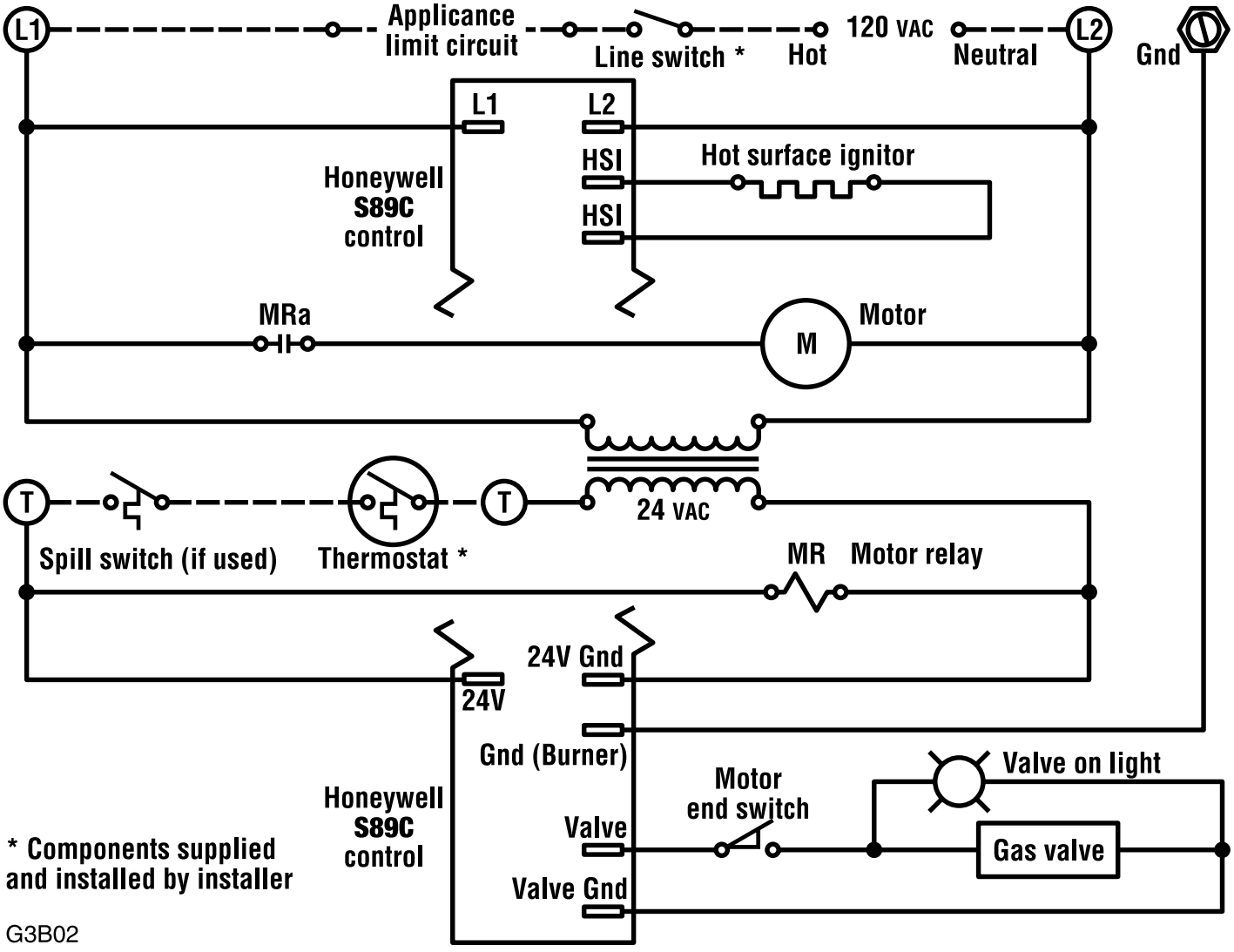
Label all wires before removing for servicing. Wiring errors could result in unsafe appliance/burner operation.

NOTICE Read appliance manufacturer's instructions completely before wiring burner.

Check polarity carefully. If hot and neutral wires are reversed at appliance power source, the control will not operate.

If replacing any of the wire supplied with the burner, use minimum #14 AWG 125°C or better.

Figure 6 Ladder wiring diagram



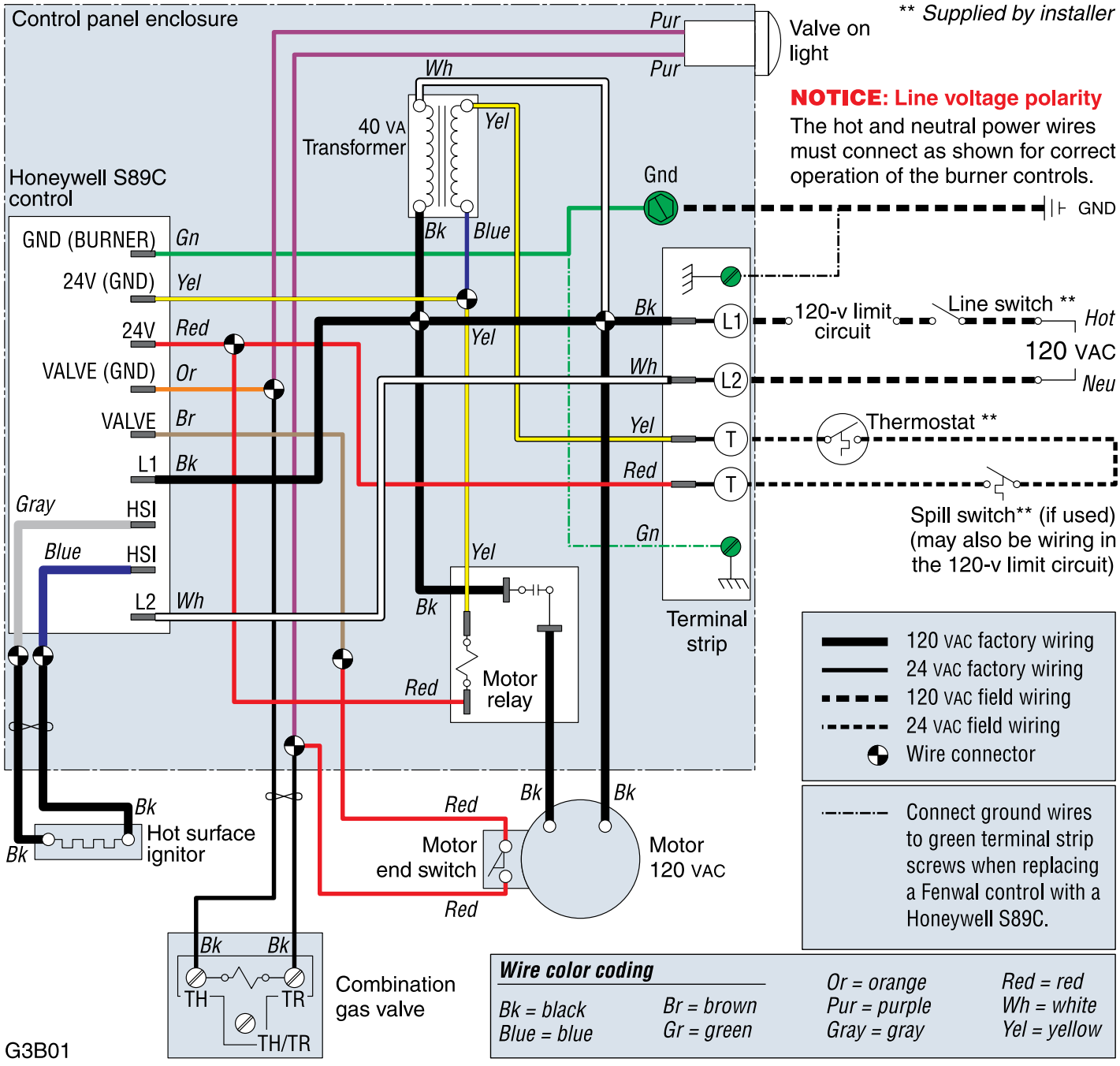
G3B02

Replace instruction manual, page 11, with this page

Verify power supply

1. The burner requires a 120VAC/60HZ/single-phase power supply. The current draw will be aproximately 8.0 amps. Protect line with a 10-amp or 15-amp fuse or breaker.
2. The 120 VAC power connections to the burner must be connected as shown in Figure 7. The control is polarity-sensitive, and will not work if the hot and neutral lines are reversed.
3. Verify that the power supply to the burner is no less than 102 VAC nor more than 132 VAC.

Figure 7 Wiring diagram — wire routing



Replace instruction manual, page 12, with this page

Inspect/check system

Before starting the burner and appliance, verify the system has been installed as directed by this manual and the appliance instructions.

Check gas piping for leaks

WARNING Disconnect the burner from the gas supply line if gas line test pressure will exceed 14 inches w.c. Exposing the burner combination gas valve to pressure higher than 14 inches w.c. can damage the valve seat, resulting in potentially unsafe operation.

You can usually test the gas piping by allowing the line to fill with gas to main regulator outlet pressure.

1. Shut off gas flow to all appliances connected to the meter.
2. If test pressure will be less than 14 inches w.c., turn the burner combination gas valve knob to OFF. **If test pressure will be higher than 14 inches, disconnect the burner from the gas line** by shutting off the main manual gas valve installed near the burner (per Figure 5, old page 9) and disconnecting the ground joint union. See warning above.
3. Watch the gas meter dial. For a one half cubic foot per revolution dial, there should be no movement of the dial for at least 5 minutes. For larger volumes per revolution, increase this time proportionately.
4. If you detect a gas leak, locate the leak with a soap suds mixture and repair it. Then test the system for leaks again.

WARNING Do not test for leaks with an open flame. And do not use oxygen as a test gas. Either of these could cause an explosion, resulting in severe personal injury, death or substantial property damage.

Bleed gas line

Purge all air from the gas line. Purge to outside of the building, NEVER into the appliance or burner.

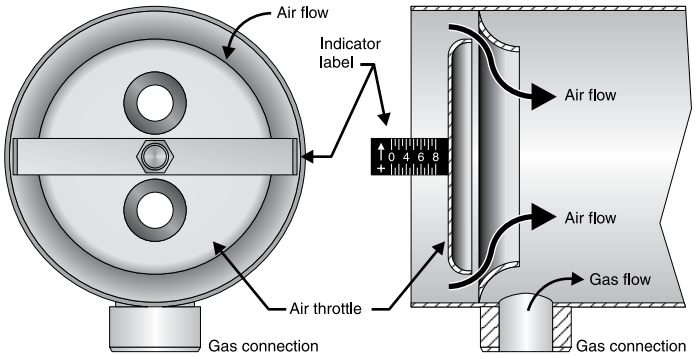
Leak test near-burner gas piping

If piping near burner has not already been pressure tested, open main manual gas valve on supply to burner and smell around area for any signs of gas. Apply a soap suds mixture to all gas piping joints near burner and check for any leaks. If any leaks appear, repair before proceeding and retest.

Set air throttle

1. See Figure 8. Loosen air throttle locking nut.
2. Rotate the air throttle plate clockwise to the closed position.
3. Check the air throttle indicator. The "0" position of the indicator should be even with the end of the air inlet tube. If not, bend the arm slightly until the indicator reads zero.
4. Rotate air throttle until indicator points to setting given in Figure 4, page 8.
5. Tighten air throttle locking nut.

Figure 8 Air throttle adjustment



6. The Figure 4 setting will probably be satisfactory without change. If the combustion test indicates a need for more or less air, however, you will have to adjust the throttle accordingly.

Check burner and Honeywell S89C control

Inspect burner thoroughly. Verify all components are secure and burner is in good condition. Verify all wiring is in place and all components are secure and in position.

Verify flame failure lockout of Honeywell control

1. Install a hose barb fitting in the combination gas valve outlet pressure tap and connect with a hose to a U-tube manometer.
2. Close the main manual gas valve and turn the combination gas valve knob to ON.
3. Turn on power to appliance and set appliance limit(s) to call for heat.
4. Burner motor will start. The Honeywell S89C control will run the blower for 34 seconds (pre-purge and ignitor warm-up). Then the combination gas valve will open and the "Valve on" light will light. (The manometer should show almost no pressure, because the main manual gas valve is closed.)
5. After 6 seconds, the S89C will lockout. The ignitor will shut off and the gas valve will close. Turn off power or interrupt thermostat circuit for 45 seconds. The control should reset. Turn off power and set controls to stop call for heat.
6. If lockout does not occur, replace the S89C control.

WARNING Do not start the burner if you smell gas or if there may be gas present in the appliance combustion chamber, heat exchanger or the vent system. An explosion could occur, causing severe personal injury, death or substantial property damage.

WARNING During initial start-up, you must be constantly alert for emergency conditions such as fuel leaks, electrical malfunctions, etc. Familiarize yourself with the location of manual shutoff valves and switches so you can quickly use them if needed.

WARNING If the burner fails to ignite, NEVER attempt to manually bypass the normal sequence of the control, which provides purging of the combustion chamber.

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Replace instruction manual, page 13, with this page

Installer/servicer

WARNING Should overheating or an emergency occur, immediately:

- Shut off main manual gas valve.
- Shut off power to burner.

NOTICE: Under some circumstances power should remain on for water pumps or circulating blowers. Determine proper response before attempting start-up.

If burner fails ignition on several attempts, close gas valve and use burner blower to purge appliance before restart.

Before starting burner, verify:

- ❑ Burner/appliance installed per appliance instruction manual?
- ❑ Burner orifice size and air throttle verified against Figure 4, old page 8?
- ❑ Burner/appliance installed per all applicable codes?
- ❑ Installation site has adequate ventilation openings and vent system?
- ❑ Gas supply line in good condition and sized correctly?
- ❑ All gas line joints sealed with pipe dope listed for use with liquefied petroleum gases?
- ❑ Gas supply pressure to combination gas valve checked?
- ❑ Regulator installed if pressure can exceed 14 inches w.c.?
- ❑ Air purged from gas line?
- ❑ Gas piping checked for leaks?

Ignition and flame sensing

Ignition The G3B burner uses a silicon carbide hot surface ignitor for ignition. The Honeywell S89C primary control feeds 120 VAC power to the ignitor and allows time for the ignitor to warm up to ignition temperature during the burner pre-purge period.

Sensing The S89C primary control uses flame rectification to detect flame, with the hot surface ignitor acting as the "flame rod."

Start-up & operation

WARNING Do not start the burner if the combustion chamber contains residual gas. Allow gas to disperse. Failure to comply could result in severe personal injury, death or substantial property damage.

Power ON Open all manual gas line valves. Turn burner combination gas valve knob to "ON." Close the line switch. (If burner does not follow sequence below, see troubleshooting suggestions on pages 19 and 20.)

Stand-by (No call for heat) Control waits for heat call.

Call for heat Set operating control and all limit controls to call for heat. The thermostat circuit must be closed and power coming to control panel L1 and L2 terminals

Burner on The ***motor*** starts. The hot surface ***ignitor*** starts. The motor centrifugal switch makes.

Pre-purge The primary control allows 34 seconds for pre-purge and ignitor warm-up.

Gas valve on After the pre-purge/ignitor warm-up period, the primary control activates the ***gas valve*** (if motor centrifugal switch is closed). The green "Gas valve on" light turns on.

TFI The primary control turns off the ignitor within 2 to 6 seconds after gas valve activation. When the control deactivates the ignitor, it begins checking for flame signal. If flame is not detected within 6 seconds after gas valve activation, the primary control will **lockout** with continuous purge (see following).

Run period The burner continues firing during call for heat if the flame rod (hot surface ignitor) senses flame. The green "Gas valve on" light remains on during normal running, indicating gas valve is energized.

Shutdown When the call for heat ends, the primary control immediately deactivates the gas valve and blower. The burner returns to stand-by.

Flame failure If the primary control loses flame signal during a run period, it deactivates the gas valve within 2 seconds. The control restarts the heating cycle, beginning with a 34-second pre-purge/ignitor warm-up period, then a 6-second trial for ignition. If ignition/flame sensing is successful, the burner returns to normal operation. If the attempt is not successful, the primary control will **lockout**.

Lockout If the primary control does not sense flame within the TFI time limit after gas valve activation (6 seconds), **lockout** occurs. The control deactivates the gas valve. The blower motor continues to run, providing a post-purge of the burner and appliance.

Reset To reset after a **lockout**, turn off power to burner or interrupt the thermostat circuit for at least 45 seconds. Then restore power (or thermostat circuit). Burner should restart.

Replace instruction manual, page 14, 2nd column, with the following:

Make final burner adjustments *(continued)*

Check combustion using instruments

WARNING You must use combustion test instruments. Failure to properly verify/adjust combustion could allow unsafe operation of the burner, resulting in severe personal injury, death or substantial property damage.

Fuel	CO_2		O_2	
	Minimum	Maximum	Maximum	Minimum
Natural Gas	9.6%	10.8%	4.0%	2.0%
Propane Gas	11.0%	12.5%	4.0%	2.0%

❑ If the combustion results are outside the range above, and the firing rate of the burner is within 5% of rated input, open or close the air throttle until the CO_2 (or O_2) are acceptable.

WARNING After CO_2 (O_2) tests are completed satisfactorily, measure flue products for carbon monoxide (CO) concentration. The CO must not exceed 50 ppm adjust to "air free", or other if specified by local codes.

❑ Adjust the draft in the appliance so the draft overfire is about –0.01 inch w.c. and take a flue gas sample from the combustion chamber. If CO_2 is noticeably lower overfire than in the vent, the appliance has leaks that must be repaired.

Make final burner adjustments *(continued)*

Check flame signal

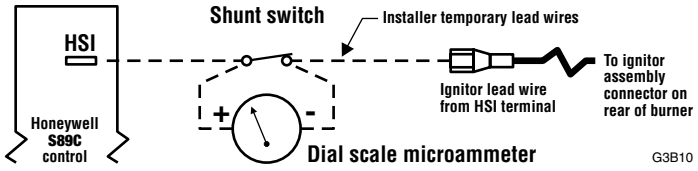
WARNING Electrical shock hazard — Turn off power to burner before proceeding with setup for flame signal measurement.

❑ (See Figure 9.) The HSI is powered with 120 VAC during pre-purge so a microammeter with a shunt switch must be used to test flame signal or the meter will be destroyed. USE ONLY needle movement-type meters, not digital meters.

❑ Remove the ignitor lead wire from HSI terminal of the S89C primary control. Connect a shunt switch and DC microammeter between HSI terminal and the ignitor lead wire. Make sure shunt switch is **closed**. Then turn on power to the burner. After the burner flame starts, wait at least 15 seconds, then open shunt switch and read DC amps (must be at least 0.8 microamps DC).

CAUTION DO NOT start the burner or adjust the air throttle with the shunt switch open. The 120 V supply to the HSI will destroy the microammeter.

Figure 9 Flame signal measurement connections



Replace instruction manual, page 15, with the following:

Verify burner/appliance operation

Check burner/appliance/controls operation

❑ Test operating and limit controls on appliance as specified in appliance instruction manual.

❑ Check operation of the S89C primary control, forcing lockout by closing the main manual gas cock and cycling the burner. See page 13 for procedure to reset the control.

Verify burner operation

❑ Start and stop the burner several times, allowing the primary control to sequence through normal operation. Verify correct operation of burner and control throughout. See old page 13 for burner sequence of operation.

Verify vent system operation

❑ Verify vent is operating correctly and flue products are properly exhausted from building.

❑ Check operation of barometric damper and spill switch.

❑ If the building contains any exhaust fans or conditions that could affect vent performance, check burner/appliance/vent operation with exhaust fans (or other conditions) operating.

Prepare burner for normal operation

❑ Cycle burner off with appliance controls. Then turn off power to the appliance.

❑ Close the main manual gas valve.

❑ Remove the U-tube manometer line from the combination gas valve outlet pressure tap hose barb. Remove hose barb and replace 1/8" NPT pipe plug in tapping.

❑ Verify all components and wires are in place and burner is ready for operation.

Train the user

❑ Train the user to operate the burner and appliance under normal conditions. Explain procedure to shut down burner/appliance when required.

❑ Review the user information section of this manual (and the appliance manual) with the user.

❑ Verify the user is aware of all procedures specified in the manual.

❑ Verify user will not store or use combustible liquids or materials or contaminants in the vicinity of the burner/appliance.

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Replace instruction manual, page 16, with this page

Annual start-up & service

WARNING This burner should be started and serviced at least annually by a qualified service technician. Failure to properly maintain and service the burner could result in severe personal injury, death or substantial property damage.

WARNING Turn off power to appliance and close main manual gas valve when servicing burner. See WARNINGS on page 2 and elsewhere in this manual regarding correct procedures. Failure to comply could result in severe personal injury, death or substantial property damage.

❑ Discuss burner/appliance operation with user to determine any problems that may have occurred during the previous season and to verify user is aware of proper operation and care of the burner/appliance.

❑ Turn off power to appliance and close main manual gas valve.

❑ Remove burner from appliance and inspect flame holder, hot surface ignitor and burner components.

❑ Inspect ignitor and ignition tube assembly.

1. The hot surface ignitor (HSI) is a silicon carbide element that performs dual functions of ignition and flame detection. On a call for heat, the ignitor is powered with 120 vac and is electrically heated to about 2600°F. This ignites the gas/air mixture when the primary control energizes the gas valve.
2. The primary control then switches the HSI to the flame detector circuit, using flame rectification to monitor the flame.
3. The ignitor is positioned in the ignition tube assembly against a factory-set non-adjustable stop ring for proper ignition and flame sensing.
4. To inspect the HSI, first be sure the 120 vac power supply to burner is disconnected. Then slide the two silicone insulating boots off of the insulators.
5. Pull off the quick-disconnect terminals.
6. Remove the four #8-32 screws securing the air tube back plate.

Annual start-up & service (continued)

7. Swing the hold-on bracket away and carefully pull out the ignition tube assembly.

CAUTION As the white ceramic is exposed, support it using a rag. It could be HOT. Do not let the hot surface ignitor element bump into anything. Do not drop the assembly or ignitor element. The element is very fragile. Even a small hairline fracture will destroy the HSI.

8. If the ignitor element is damaged in any way, replace it with a new one.
9. If replacing the ignition tube assembly in the burner, replace the back plate gasket with a new one. Replace the hold-on bracket and screws. Ensure the back plate gasket is sealed gas-tight to the burner air tube.

❑ Inspect and clean flameholder.

1. Remove the ignition tube assembly from the burner as described in the steps for inspecting the hot surface ignitor.
2. Reach in and, with one finger through the center hole of the flameholder, pull the flameholder out of the burner air tube.
3. Use a small brush to remove dirt and lint from the inside surface of the flameholder. All holes must be clean and unobstructed.
4. If the flameholder is damaged, dented or defective in any way, replace it with a new one.
5. Replace the flameholder in the air tube.
6. Replace the ignition tube assembly as described in the steps for inspecting the hot surface ignitor. Be sure to install a new back plate gasket and seal assembly to air tube gas-tight.
7. Follow the instructions on page 8 of the G3B Instruction Manual to inspect the hot surface ignitor.

NOTICE If the inside surface of the air tube needs to be cleaned, clean with a vacuum cleaner with brush attachment while the ignition tube assembly is out of the burner.

❑ Check the burner flange gasket. It must be in good condition. Replace gasket on burner flange and mount burner in appliance, securing to mounting studs.

❑ Perform the complete checkout procedures of old pages 12 through 16, including system inspection and checks.

Replace instruction manual, page 17, with this page

Problem	Possible cause	Corrective action
WARNING		These procedures must only be performed by a qualified service technician. Use care when performing tests on electrically or mechanically live parts. Disconnect power to burner/appliance and close main manual gas valve when removing components for service. Failure to comply could result in severe personal injury, death or substantial property damage.
Burner motor will not start	120 V power	Check 120 V at terminal strip. L1 - L2
		Check limit/operative circuit.
	24 V circuit	Check that 24 V thermostat/circuit is calling for heat.
		Check transformer output. Each "T" on terminal strip should read approx. 24 volts to "G" ground.
	Incorrect wiring	Check all field and factory wiring.
	Bad motor relay	Check 24 V at motor relay. Relay should click (pull-in) on call for heat.
		Check continuity across contacts (N.O.) or each side of contact to L2 on terminal strip should read 120 volts.
	Bad motor	If motor relay is good (see above) and wiring is correct, disconnect the motor leads and power the motor directly with 120 V to check motor operation.
	Bad primary control	If all above tests prove negative replace control.
Burner pre-purges for 34 seconds but does not light *(continued on next page)*	Incorrect air setting	For initial light-off set air throttle according to desired input.
	Wrong orifice size	Check orifice drill size.
	Manual gas shut-off valve closed	Check supply line gas cock and manual shut-off valve on combination gas valve.
	Manifold pressure	Adjust regulator to 3.5 W.C. for natural gas and propane.
	Gas valve not opening	Check for 24 V valve coil during TFI. Indicator light should also be on.
		Line pressure in excess of 14.0 W.C. can damage valve.
	Motor end switch not making	Check motor end switch.
		Disconnect the two red leads in the panel coming from the motor end bell. Check continuity during pre-purge. End switch will not activate if motor is not running up to speed.
	Hot surface ignition element damaged	Element normally glows red within 20 seconds during pre-purge. Use flame mirror to visually inspect.
		Check for 120 V at rear of ignitor assembly during pre-purge.
		If visual inspection cannot be done, remove element and power directly with 120 V. Replace element if it does not glow red within 45 seconds.

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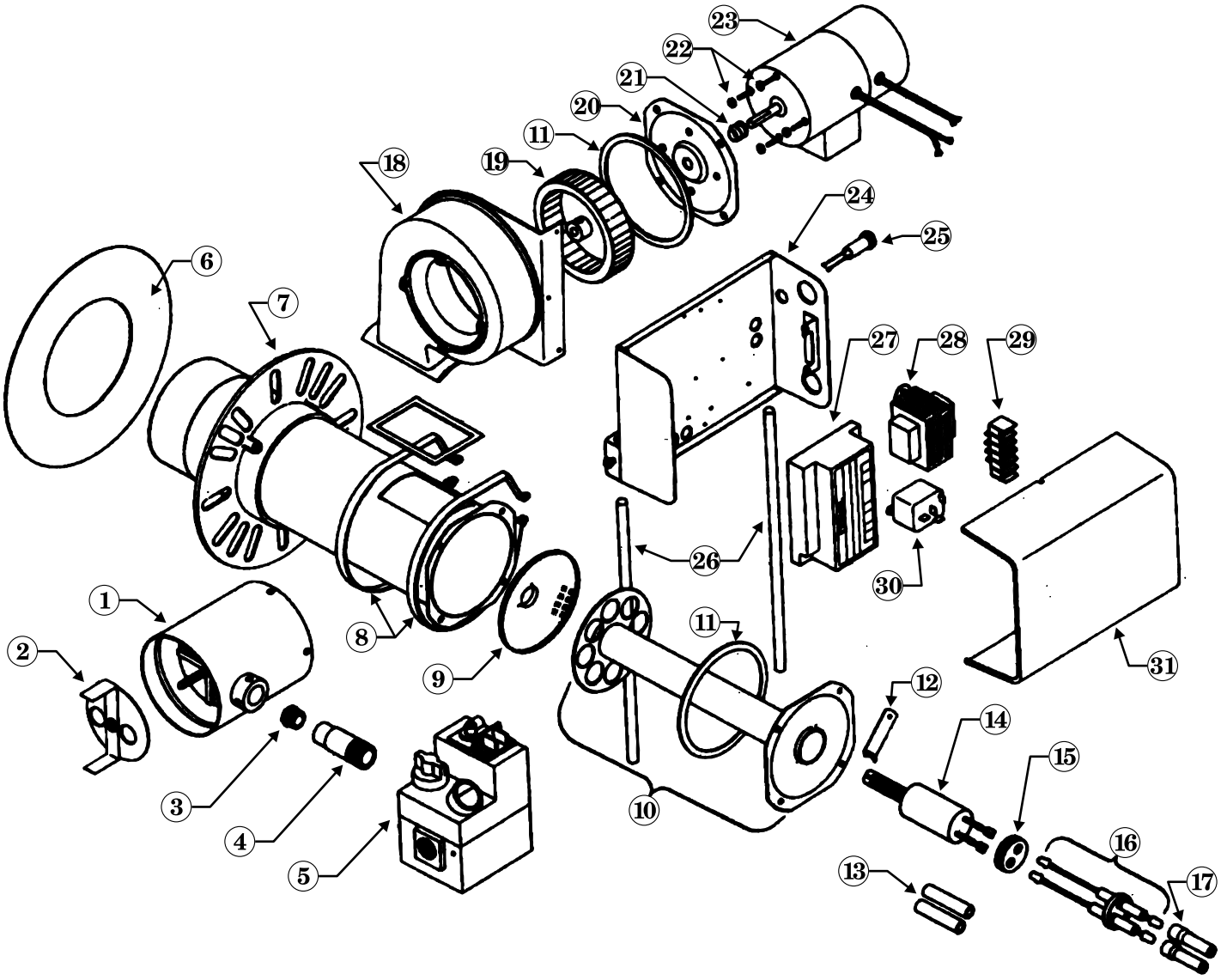
Replace instruction manual, page 18, with this page

Problem	Possible cause	Corrective action
WARNING		These procedures must only be performed by a qualified service technician. Use care when performing tests on electrically or mechanically live parts. Disconnect power to burner/appliance and close main manual gas valve when removing components for service. Failure to comply could result in severe personal injury, death or substantial property damage.
Burner pre-purges for 34 seconds but does not light *(continued)*	Bad primary control	Check for 24 V on valve lead on control during TFI.
		Check for 120 V on HSI lead on control during pre-purge.
		Replace primary control if either above tests show negative.
Burner lights but primary control locks out after TFI	Incorrect air setting	For initial light-off, set air throttle according to desired input.
	Wrong orifice size	Check orifice drill size.
	Manifold pressure	Adjust regulator to 3.5 W.C. for natural gas or propane.
	Inadequate gas supply	Line pressure requirements are: 4.5 W.C. for both natural and propane fuels.
		Line pressure in excess of 14.0 W.C. could damage combination gas valve.
		Watch line pressure gauge during TFI. If pressure drops below minimum required when gas valve is energized look for partially closed gas cocks in line, other appliances using the same supply or improperly adjusted intermediate regulators.
		If other appliances are on the same supply line and piping will not sustain adequate pressure for all units on that piping, then it is undersized. Check with gas utility.
	Insufficient flame signal	Check flame signal. Minimum signal 0.8 DC microamps.
	Improper draft	Improperly adjusted air throttle setting for the fuel input.
		Over-fire draft is normally -0.01 W.C. Refer to boiler/furnace manufacturer's recommendations for specially packaged units.
	Polarity	Check 120 V at L1 on terminal strip.

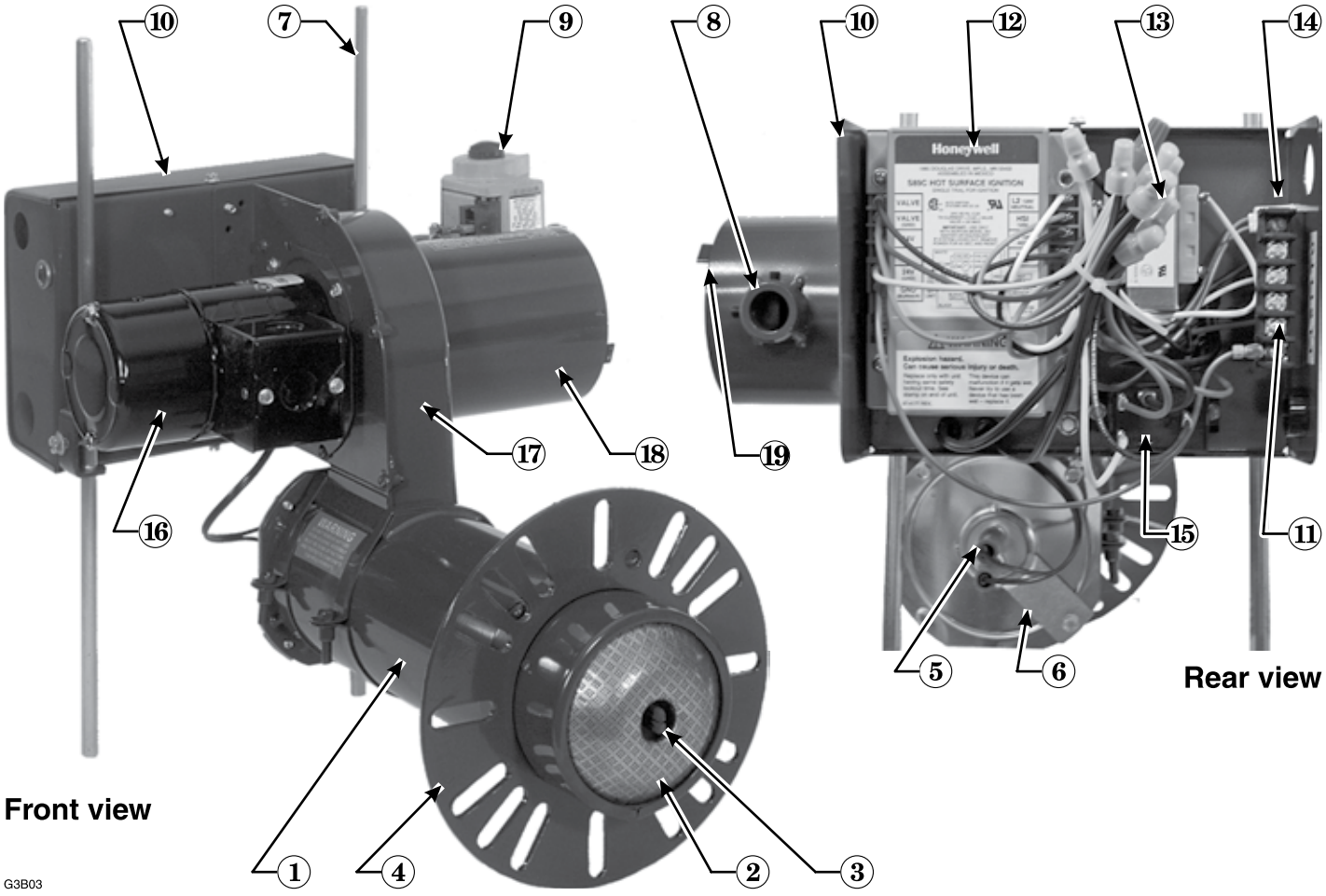
Replace instruction manual, page 20, with this page

Item number	Description		Part number
1	Air Inlet Tube Assembly		50823
2	Air Throttle		50757
3	G3B Orifice, No. 33 drill (.113 dia.), Propane 60,000 BTUH, drill open for other rates		60582
4	Orifice Nipple		61663
5	Gas Valve, dual, 24-volt (1/2" X 1/2" LH-outlet)		41053
6	Gasket, mounting flange		40287
7	Air Tube/Flange Assembly, 3-3/4 ID Flame Ring	G3B 6", overall length approx. 9-7/8" G3B 9", overall length approx. 12-7/8" G3B 12",overall length approx. 15-7/8"	50070 50112 50021
8	Air Tube Housing Clamp (2 required)		50807
9	Flameholder		57117
10	Ignition Tube Assembly with gasket	6", overall length approx. 10-9/16" 9", overall length approx. 13-9/16" 12", overall length approx. 16-9/16"	97875 97876 97877
11	Gasket, motor mounting ring & air tube back plate (2 required)		40402
12	Electrode Hold-in		54858
13	Insulator Tube (2 required)		74617
14	Hot Surface Ignitor, NORTON 120-volt, 5-3/8" OAL		87197S
15	Gasket, ignitor assembly		40360
16	Rear Ignitor Assembly	6", overall length 7-1/2" 9", overall length 10-1 /2" 12", overall length 13-1 /2"	46631 46656 46615
17	Ignition Terminal boot (2 required)		9788401
18	Housing and cover plate (with liquid gasket)		45856
19	Blower Wheel, 4" OD x 1" wide, 5/16" bore, CCW rotation facing open end		28613
20	Motor Mounting Ring		51060
21	Bushing, motor shaft, nylon		34686
22	Washer, motor stud, nylon (4 required)		30577
23	Burner Motor, 1/50 hp, 3300 rpm, 115-volt, 60-hz, permanent split capacitor with centrifugal switch, CCW rotation facing shaft		27789S
24	Control Panel Base		61028
25	Indicator Light, 24-volt		33936
26	Pedestal Legs, 3/8" OD x 12" long (2 required)		61036
27	Control, Honeywell No. S89C hot surface ignition primary control, with 6 sec. TFI		99564
28	Transformer, 40-VA rating, 115-volt primary, 24-volt secondary		24315S
29	Terminal Block		33944
30	Motor Relay, 24-volt coil, SPST		35782
31	Control Panel Cover less nameplate		61150

Replace instruction manual, page 21, with this page



Replace instruction manual, page 3, with this page



1 Air tube, with powder coat paint finish
2 Flameholder
3 Hot surface ignitor
4 Adjustable flange
5 Rear ignitor assembly with terminal boots
6 Ignition tube assembly mounting plate
7 Pedestal legs
8 Burner gas inlet connection (see old page 8)
9 Combination gas valve (with integral gas pressure regulation — set for 3½" w.c. outlet pressure)
10 Control panel
11 Terminal strip
12 Primary control (Honeywell Model S89C primary control, for use with flame rectification)
13 Control transformer, 120 VAC / 24 VAC, 40 VA
14 Gas valve on indicator light
15 Motor relay
16 High-efficiency motor
17 Blower housing (cast aluminum), with powder coat paint finish
18 Air inlet tube assembly
19 Air throttle indicator — Only a single adjustment required for setting combustion air; see page 8 of the G3B Instruction Manual for starting setting based on appliance model and input)

Carlin part number MNG3BA Rev. 03/15/06

Conversion instructions — Replacing Fenwal control with S89C control

Conversion kit contents

Use only the Carlin conversion kit, part number 99564KIT, to replace an existing Fenwal control with the Honeywell S89C control. The kit consists of the following parts. Verify all parts are available before proceeding.

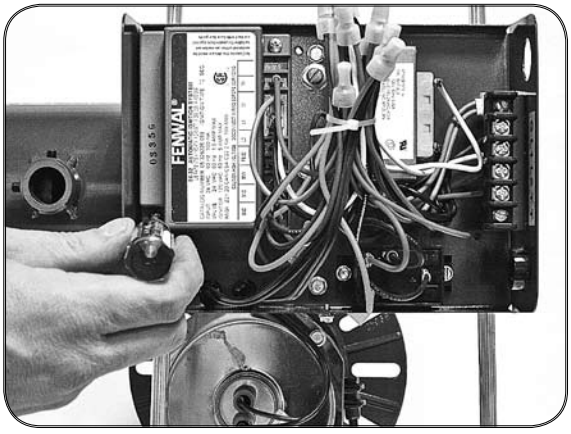
(2) #8-32 x ¼" hex head thread forming screws, #30593.
(1) Honeywell S89-1087 control, Carlin #99564.
(4) #8-32 x 1-1/4" thread forming screws, #99568.
(2) # 8-32 hex nuts, Carlin #28332.
(1) 3/16" female spade terminal, Carlin #97848.
(1) Yellow wire assembly, Carlin #9787305.
(1) Wire nut, Carlin #33589.
(1) Green wire assembly, Carlin #99567B
(1) Green wire assembly, Carlin #99567B.
(1) Wire tie, Carlin #37077.
(1) Wiring diagram label, Carlin #99566.

WARNING **Electrical shock hazard** — Disconnect all electrical power before attempting to install the conversion kit. Failure to comply could result in severe personal injury, death or substantial property damage.

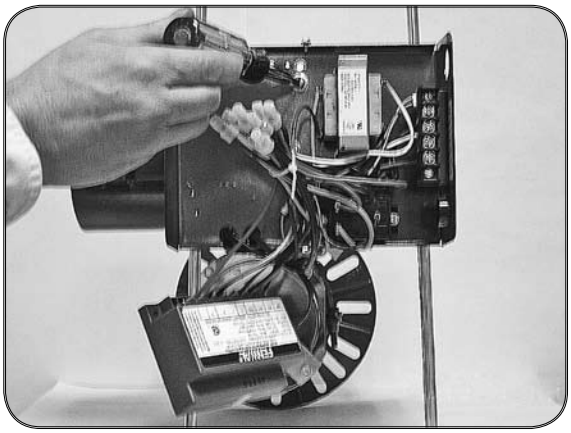
WARNING **Verify operation after conversion** Follow the procedures in this supplement and the G3B burner manual to start up and verify operation of the burner and all controls after complete the conversion.

Step 1 Disconnect all electrical power to the burner. Then remove the electrical panel cover.

Step 2 Remove the two screws holding the Fenwal control to the control panel base. Discard these screws.

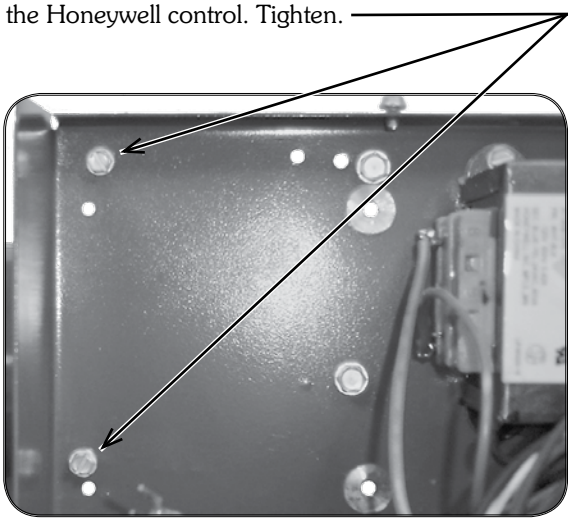


Step 3 Remove the two slotted, green ground screws and square washers.

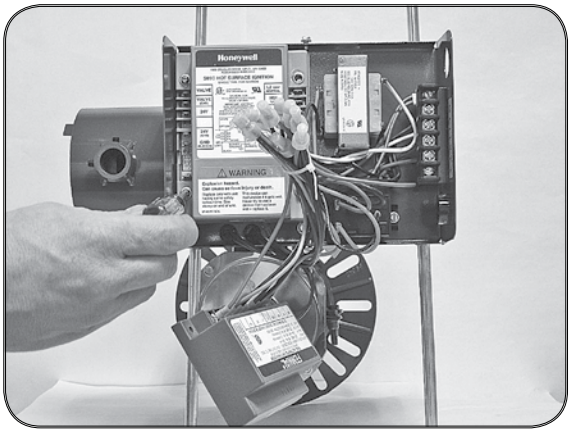


Conversion instructions — Repl. Fenwal control with S89C control (continued)

Step 4 Insert the two #8-32 x ¼" hex head screws (supplied) as shown below, to act as standoffs for the Honeywell control. Tighten.

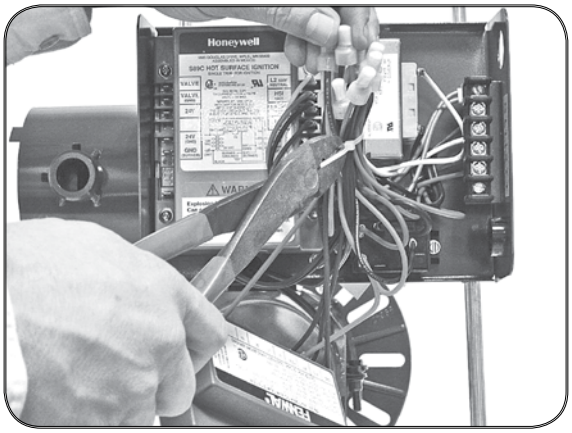


Attach the Honeywell S89C control (supplied) with four #8-32 x 1-1/4" screws (supplied). The two screws on the left side of the control will form their own threads in the panel holes. The two right hand screws will pass through oversized holes, and will require hex nuts (supplied) on the back side of the enclosure.



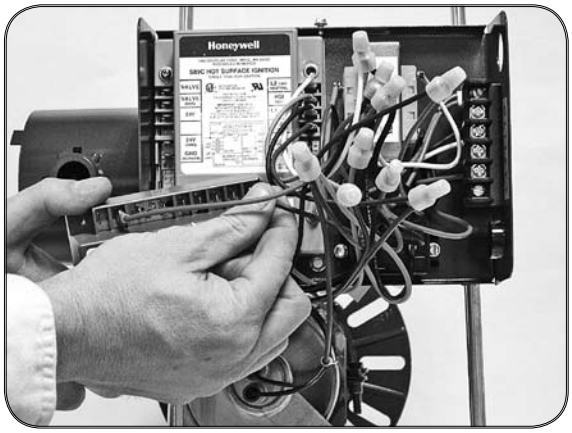
Step 5 Remove the black wire to L1 on the Fenwal control. Connect it to L1 on the Honewell control.
Remove the white wire to L2 on the Fenwal control. Connect it to L2 on the Honeywell control.
Remove the gray and blue wires to S1 and S2 from the Fenwal contol. Connect to the Honeywell control HSI terminals.

Step 6 Remove the wire tie holding the bundled wires together.

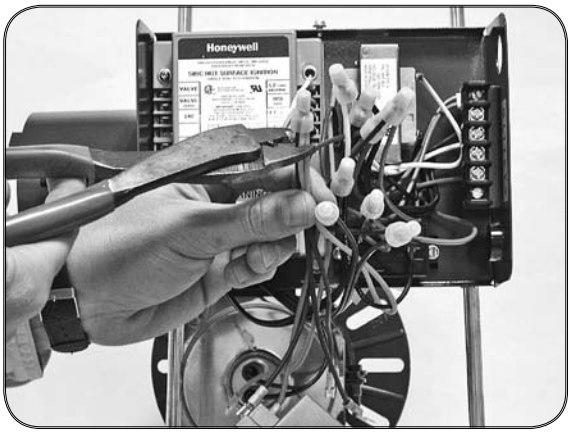


Conversion instructions — Repl. Fenwal control with S89C control (continued)

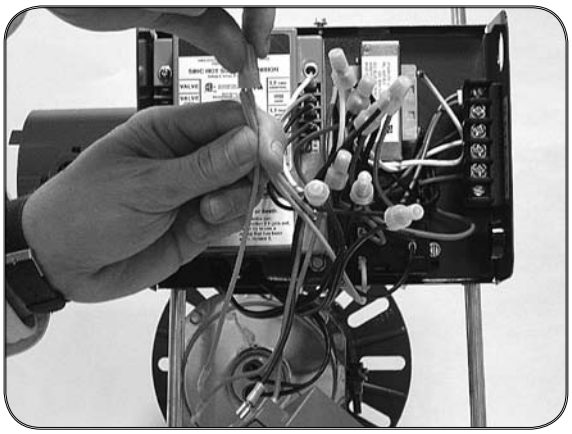
Step 7 Remove the brown wire to MV1 from the Fenwal control. Connect to the Honeywell control VALVE terminal.
Remove the orange wire to MV2 on the Fenwal control. Connect to the Honeywell VALVE (GND) terminal.
Remove the green wire to GND on the Fenwal control.



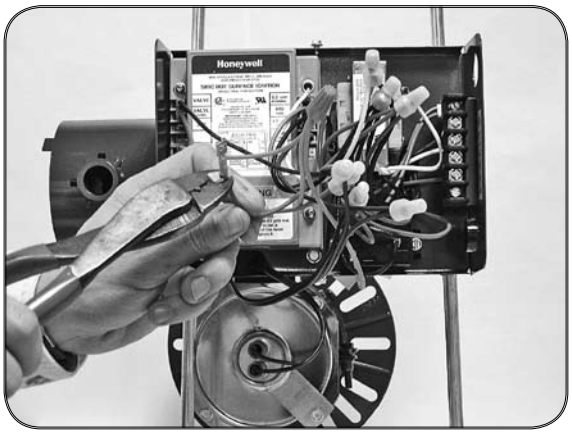
Step 8 Cut the crimp connector off of the yellow/blue/green/green wire bundle. Discard both green wires.

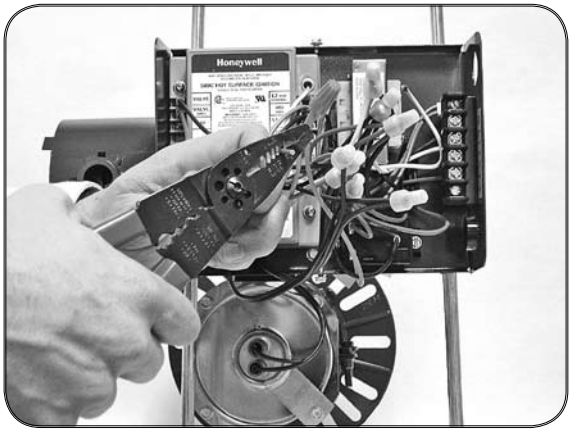


Step 9 Reconnect the yellow-blue wires and new yellow wire assembly with 3/16" female spade (supplied) with wire nut (supplied). Connect the 3/16" female spade to the Honeywell 24V (GND) terminal.



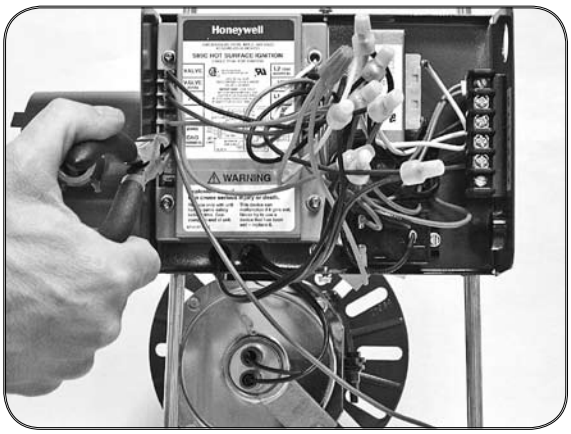
Step 10 Remove the red wire to TH on the Fenwal control. Cut off the ¼" female spade. Strip and crimp on 3/16" female spade (supplied). Connect it to the Honeywell control 24V terminal.

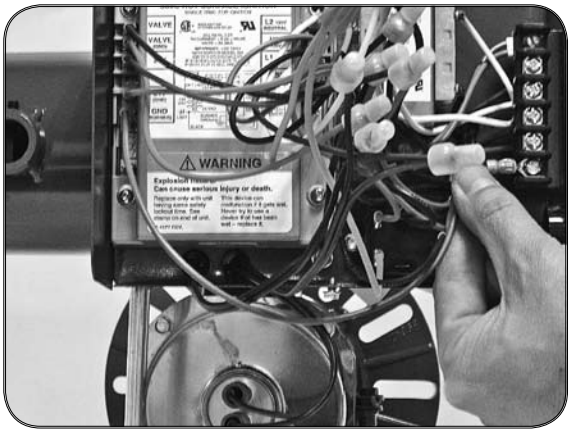




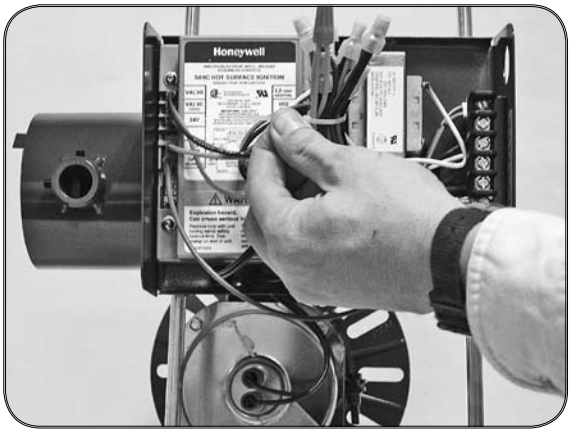
Conversion instructions — Repl. Fenwal control with S89C control (continued)

Step 11 Attach the 3/16" female spade end of the green wire assembly (supplied) to the Honeywell control BNR GROUND terminal. Attach the fork terminal to the lower green terminal block mounting screw.

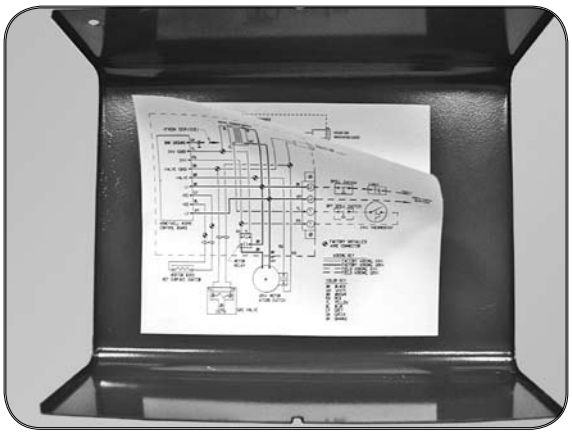




Step 12 Secure the wire bundles together with the wire tie supplied.



Step 13 Cover the old wiring diagram mounted on the inside of the control panel cover with the new diagram supplied.



Step 14 Replace the control panel cover.

WARNING **Verify wiring** — Before turning on power to the burner, completely check all wiring against the wiring diagram in this supplement and supplied with the conversion kit. Failure to comply could result in severe personal injury, death or substantial property damage.