

INSTALLATION INSTRUCTIONS
FOR AN
AUTOMATIC OVEN PILOT LIGHT
&
GAS VALVE SHUTOFF SYSTEM
FOR

Chambers[®]

B and C-series Ranges

INCLUDING MODELS:



Models B & BZ



Model 90-C



Model 61-C



Model 41-C

Every effort to assure the accuracy of the information contained herein has been made. However, as with all things human, errors do occur. The author claims no responsibility for the accuracy of the materials contained herein, any errors found in the text or instructions, and makes no representation as to any warranty or guarantee that these instructions will provide a properly operating system. Use of this information is entirely at the discretion of the reader, who absolves the author of any and all liabilities that may arise out of its use.

Description:

These instructions give detailed information on how to successfully install an ***Automatic Oven Pilot Light and Gas Valve Shutoff System*** for Chambers B, BZ, and C-series Ranges. These instructions are for the ***B-series***, but are easily adaptable to the ***BZ*** and ***C-series*** ranges, which are very similar. When completed, you will no longer have to light the oven of your Chambers range manually - it will be done for you ***automatically***. The system consists of a thermocouple, magnetic valve assembly, a standing pilot light, and all of the hardware, tubing, and fittings necessary to install said system.

Disclaimer:

This modification should only be attempted by a licensed, trained gas appliance technician. Depending on the laws in your locale, it may be required that this be performed by such a person. Your use of this document absolves the author of any liabilities its use may incur. It is presumed that the person performing the following operations is familiar with the proper methods of running gas lines. Further, it is advisable to use pipe dope or Teflon tape, where applicable, to assure a leakless installation, and it is also presumed that the installer knows how and where to do so. Author assumes no obligation or liability for faulty and/or leaky installations, or the damage they may cause to life or property.

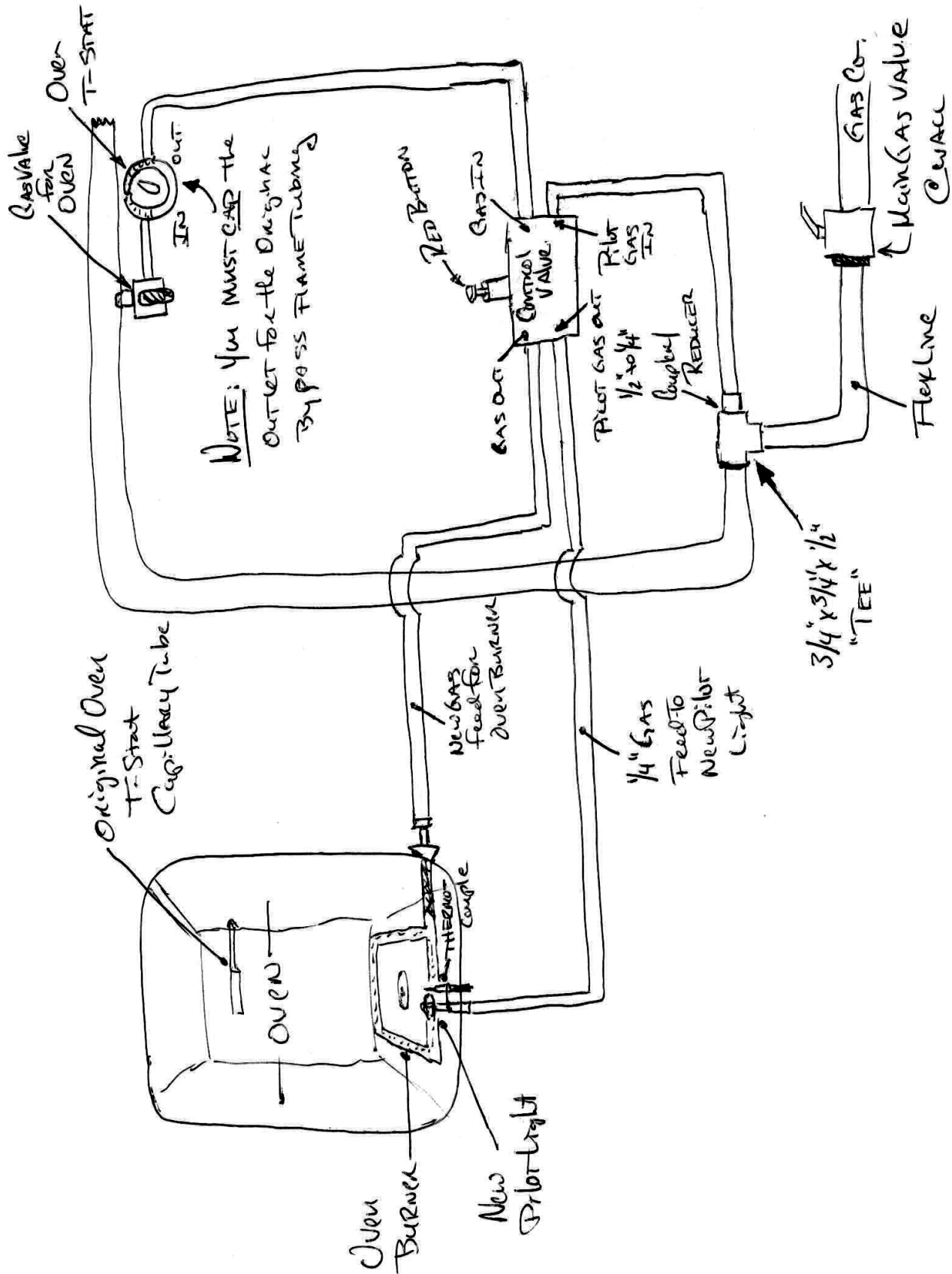
Parts Needed:

One (1) Robertshaw (also known as Invensys) 1720-007 Assembly with Magnet (control), or equivalent
One (1) Robertshaw (also known as Invensys) 1800-100 Universal Pilot Light, or equivalent
One (1) Robertshaw (also known as Invensys) 1970-036 36" Thermocouple, or equivalent

(Items listed above are available from www.energyequipment.com, or your favorite wholesaler.)

Standard gas fittings and tubing (available at most local hardware stores) include:

6 feet 3/8" Aluminum Tubing
5 feet 1/4" Aluminum Tubing
One (1) 1/8" Pipe Tee
Two (2) 3/8" Compression x 1/2" MPT Fittings
Two (2) 1/4" Compression x 1/8" MPT Fittings
One (1) 1/8" Close Nipple

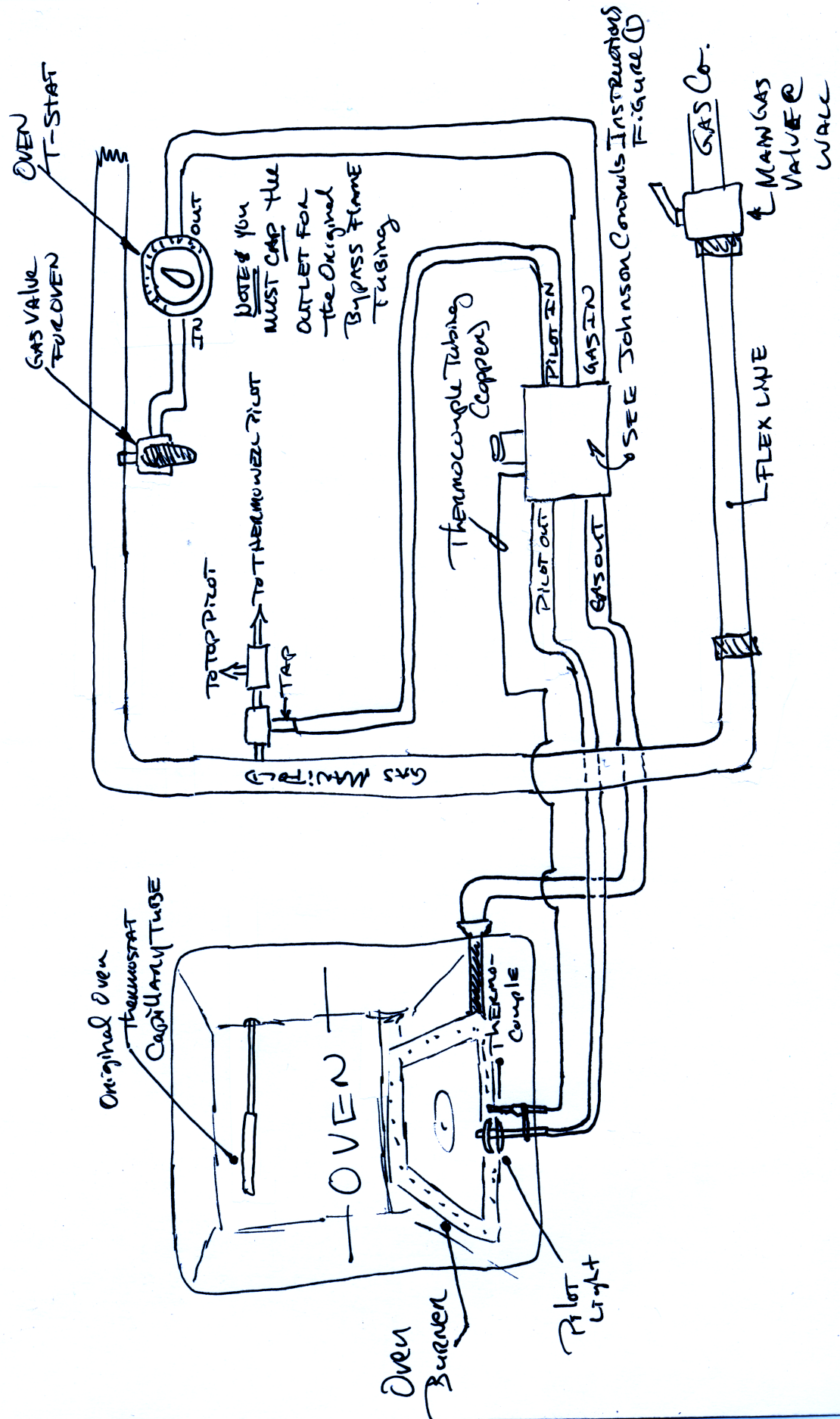


- BASIC LINE DIAGRAM -

(Method #1)

- BASIC LINE DIAGRAM -

(Method #2)



Basic Line Diagram:

There are two versions of the **Basic Line Diagram** - each showing a different method of installing the system. The only difference between the two is how the gas for the New Pilot Light is obtained. **Method #1**, which is seen on Page Three of this document, shows the preferred method, which obtains the gas feed for the New Pilot Light directly from the gas line attaching to the Main Gas Manifold. **Method #2**, which is seen on Page Four of this document, shows how to obtain the gas for the New Pilot Light by accessing it through the original Pilot Light Gas Supply Lines. Both drawings are primitive schematics, and outline the basic layout of how the system, once installed, works.

Actually quite simple. The system consists of:

- * New Pilot Light
 - * New Thermocouple
 - * New Control (aka Safety Valve)
 - * New Tubing
 - * A “Tee” for acquiring gas for the Pilot Light from the Main Gas Manifold (pipe)
-
- ☛ The gas for the Pilot Light is acquired through a “Tee”. If using Method #1, said “Tee” will be installed at the input side of the Main Gas Manifold. If using Method #2, the “Tee” will be installed between the Main Gas Manifold and the original Pilot Light Valve (more about this later). It is then routed to the Pilot Light via new tubing. It is then routed through the Control Valve, and then to the Pilot Light itself.
 - ☛ The gas for the Oven Burner will be re-routed from the input of the Oven Burner to the Input of the Control Valve.
 - ☛ The Pilot Light and Thermocouple are mounted inside the Oven.
 - ☛ The Pilot Light is connected via new tubing to the Pilot Output side of the Control Valve.
 - ☛ The Thermocouple is connected to the Thermocouple Input of the Control Valve.

Installation Instructions:

1. ***Close Main Gas Shut-Off Valve.*** This is the shut-off valve that goes between the Gas Company line (or propane tank) and the flex line feeding the Main Gas Manifold of your Chambers range. The Main Gas Manifold is the large pipe that is mounted vertically to the left side wall of the Service Cabinet, and can be seen when the door to the Service Cabinet is open. If there is no shut-off valve directly behind the range, find it. If you cannot find one, install one.
2. ***Remove the Bypass Flame Tubing.*** This is the small aluminum tube that runs from the back of the Oven Thermostat to the bottom of the Oven, through it, and up under the Oven Burner. It is secured with screws from the underside of the range, so it will be necessary to raise the entire unit so the screws can be accessed. Remove this tubing and save for later - it can be used for future repairs on your Chambers, should the need arise. ***NOTE:*** Install a plug in the back of the Oven Thermostat where the Bypass Flame Tube used to connect. This is essential to preventing a dangerous leak that WILL occur if you do not.
3. ***Create Control Mounting Bracket.*** Using a piece of sheet metal, create a mounting bracket for the Control, as shown in Figure 2 on Page 6. Create mounting holes on the plate for the Control. Temporarily fasten Control to Plate with stainless steel machine screws, and set it in the floor of the Service Cabinet (shelf

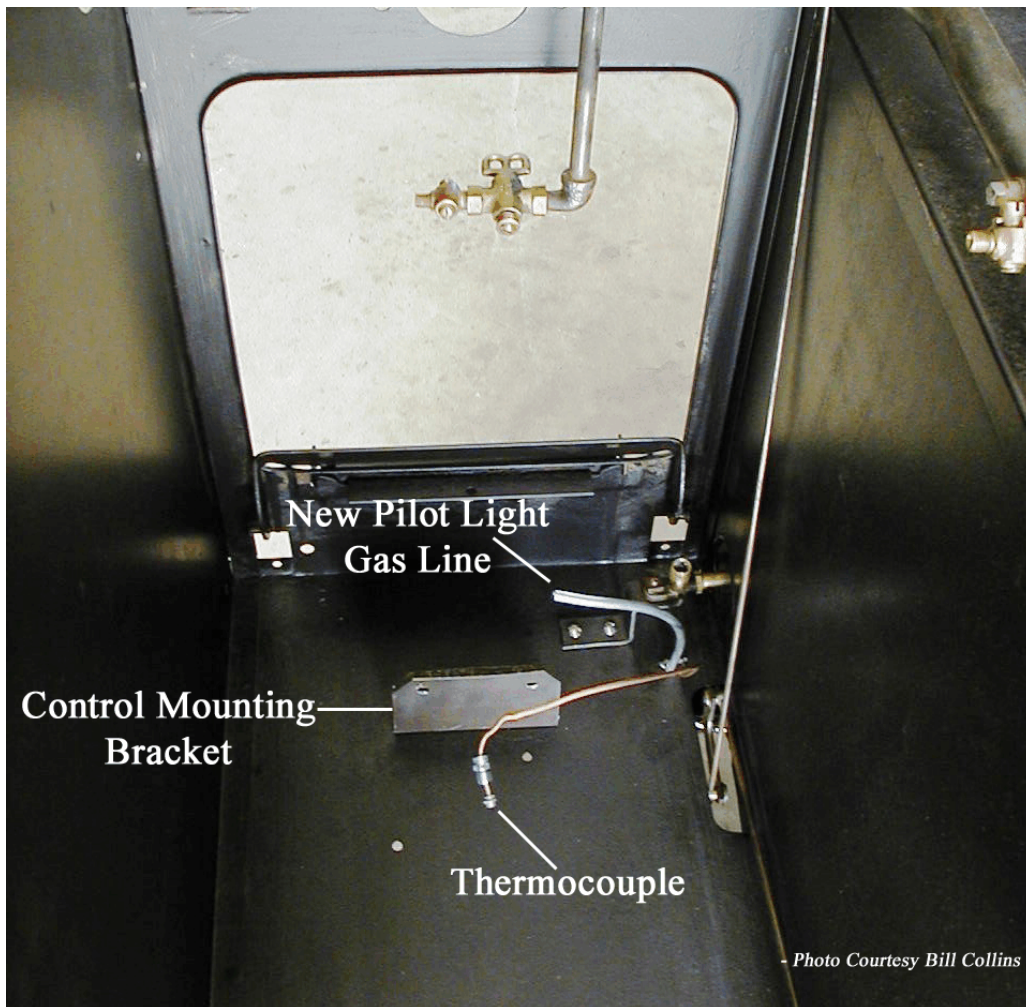
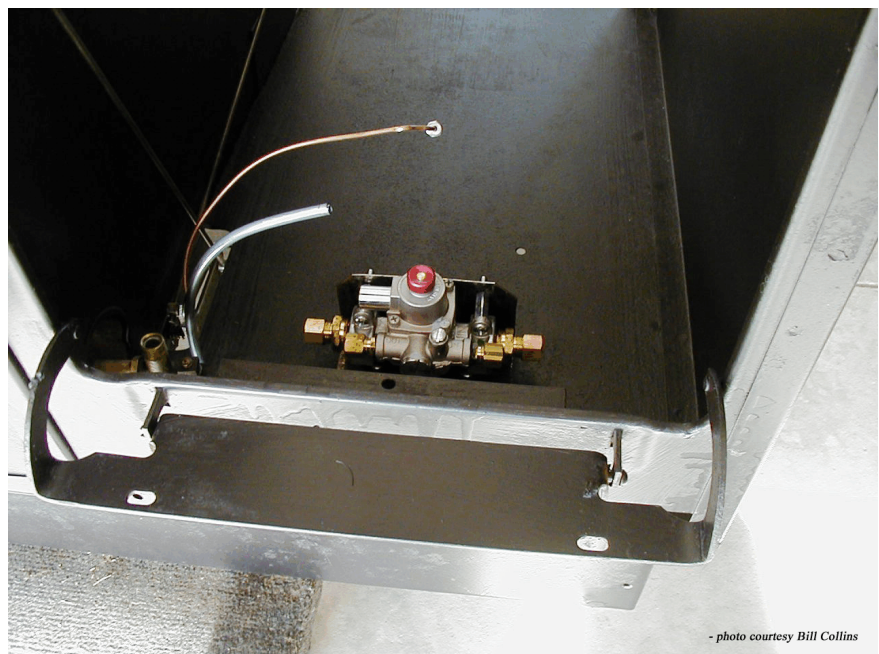


Figure 2 - Control Mounting Bracket
(View is from rear of range looking down into the Service Cabinet)

4. **Fasten Control Mounting Bracket And Mount Control.** After the paint on the Mounting Bracket has dried, fasten it to the floor of the Service Cabinet just inside the door using self-tapping stainless steel sheet metal screws, and install Control on Bracket, as shown in Figure 3, right. Other locations are also possible, but this is the most universally accepted one.



**Figure 3 - Control Valve & Bracket,
As Seen In Final Installation Location**
(View is from front of range looking into the Service Cabinet)
Page -6-

removed). Adjust for optimum location. The preferred method is centered on the Service Cabinet opening left-to-right, and back from the Door itself a few inches, as shown in Figure 3, below. Holding the Bracket in the desired location, mark where the mounting holes will be drilled with a pencil or a Sharpie marker. Remove Control from Bracket and spray Bracket with rust-inhibiting primer and/or paint.

5. Assemble New Pilot Light and Thermocouple.

Mount the new Thermocouple to the New Pilot Light, according to the directions on the package that the Thermocouple came in. Be sure you choose the right sized orifice for the type of gas you are using.

6. Drill Holes For New Pilot Light and Thermocouple. The old Bypass Flame tube was routed through a small hole in the middle of the Oven Bottom centered underneath the Oven Burner and a few inches in front of the round Damper Plate. The new Pilot Light will need larger hole than this.

Using a drill with an appropriately sized bit, enlarge the original hole just enough to allow the new Pilot Light to fit through it. A second hole will be needed for the copper tubing that came with the new Thermocouple to fit through. Be sure to measure the distance needed between the two holes, and drill accordingly (and carefully).

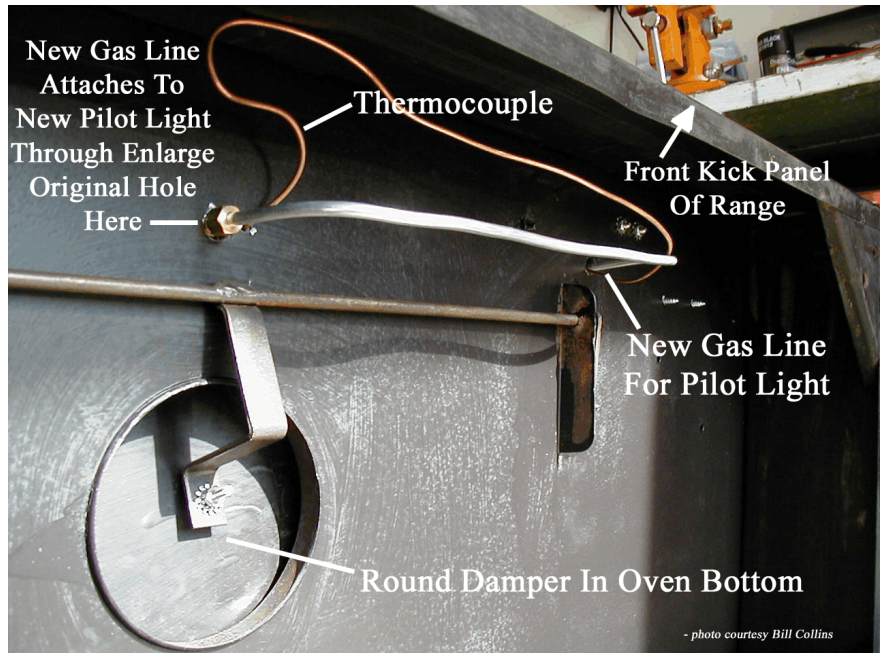


Figure 4 - Routing Of Thermocouple and New Gas Line For Pilot Light

(View is from underneath range. Front kick panel at the top of the picture. Oven is on the other side of the Round Damper.)

7. Create Pilot/Thermocouple Mounting Bracket. Using a piece of angled bracketing, fabricate a mounting bracket to hold the new Pilot Light and Thermocouple and fasten them to it, as shown in Figure 6 on Page 6. Reinstall Oven Burner and place new assembly over original Bypass Flame hole, making sure it clears the Oven Burner, as shown in Figure 6 on Page 8. Mark the location of the new assembly on the Oven Bottom with a pencil or Sharpie marker.

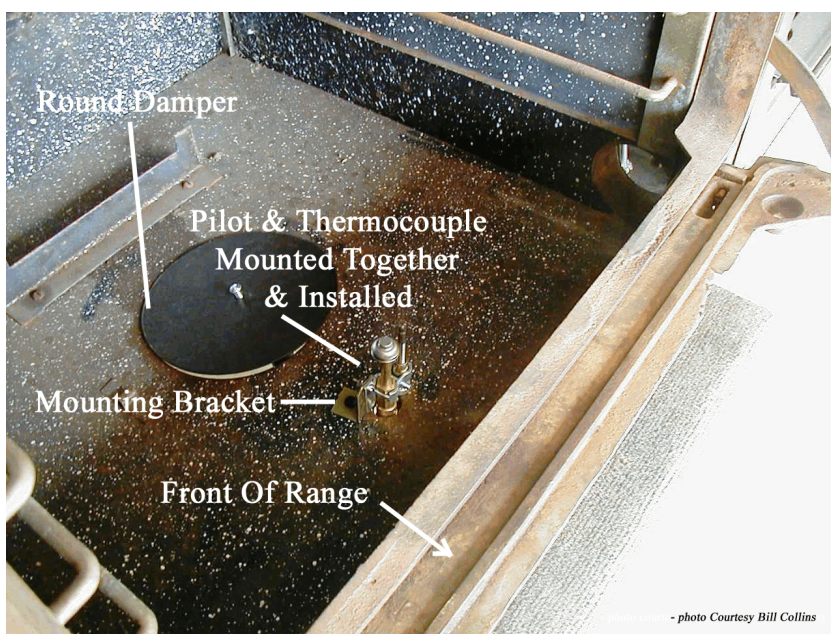
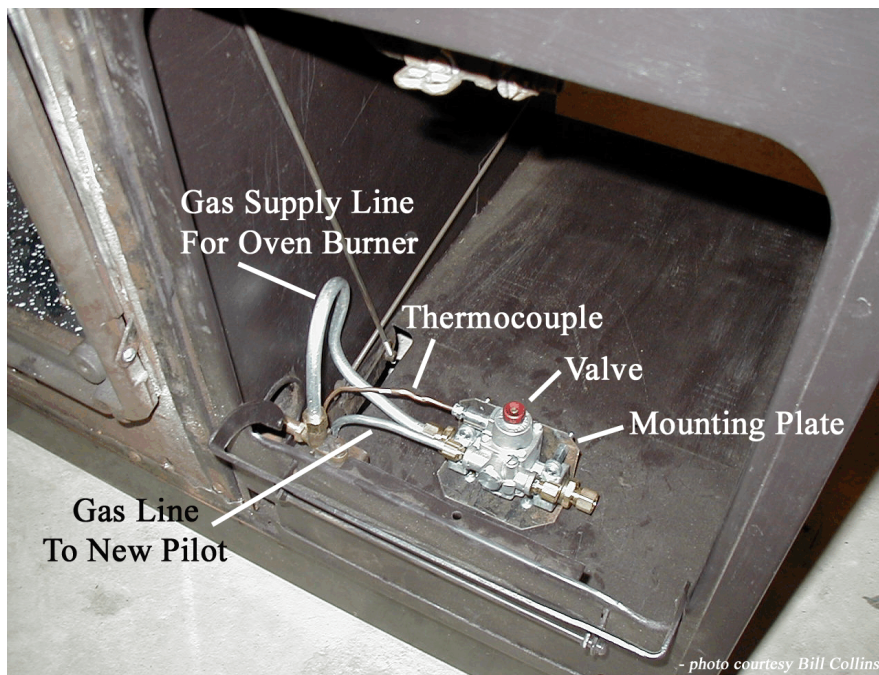


Figure 5 - Pilot & Thermocouple Mounted & Installed

8. Attach Pilot Light/Thermocouple Bracket To Oven Bottom. Align the Mounting Bracket/Pilot Light/Thermocouple Assembly over the holes, and attach the Bracket to the Oven Bottom using a short self-tapping stainless steel sheetmetal screw, as shown in Figure 5, left. Take care not to damage the Pilot or Thermocouple, or remove them until the Bracket is in place to be sure they cannot be damaged.

9. **Install Thermocouple Lead.** Route the copper Thermocouple lead through the hole you drilled for it in the bottom of the Oven. Attach to the Thermocouple. Route the other end to the Control and connect at the place provided (see Figure 4 on Page 7), taking care not to overtighten.
10. **Attach Pilot Light/Thermocouple To Mounting Bracket.** Mount both the new Pilot Light and Thermocouple to the new bracket using a stainless steel machine screw, nut, and star washer, as shown in Figure 5 on Page 7. Take care not to damage the copper tubing for the Thermocouple. The bottom of the new Pilot Light should protrude to the cavity directly below the Oven (see Figure 4 on Page 7).
11. **Install New Tubing For Pilot Light.** Route the new tubing from the **PILOT OUT** side of the Control Valve (see instructions provided by manufacturer), and route it carefully to the bottom of the new Pilot Light (see Figure 4 on Page 7).
12. **Attach Tubing To Bottom Of Pilot Light.** Attach tubing to bottom of new Pilot Light, as shown in Figure 4 on Page 7. Be sure to put the nut on first, followed by the ferrule. Tighten carefully.



13. **Attach Pilot Light Tubing To Control Valve.** Attach tubing that feeds the new Pilot Light to the **PILOT OUT** side of the Control Valve (see valve manufacturer's instructions, and Figure 6, left). Be sure to put the nut on first, followed by the ferrule. Tighten carefully.

Figure 6 - Thermocouple, Supply Line To Oven Burner, & Gas Line For New Pilot Connected To New Valve

14. **Install Adaptors On Control Valve.** Select the correct adaptors that will allow you to connect to the gas line coming from the Thermostat and going to the Oven Burner using sealer, where appropriate.
15. **Connect Gas Line That Will Feed The Oven Burner To The Control Valve.** Using a tape measure, determine the length of 3/8" aluminum tubing necessary to run from the GAS OUT side of the Control to the input of the Oven Burner, as shown in Figure 6, above, and bend accordingly, taking care that it does not kink. Install the brass nut and ferrule on the end of the 3/8" aluminum tubing that will be connecting to the Control Valve. Carefully insert the end of the tubing into the GAS OUT side of the Control, as shown in Figure 6, above. Refer to valve manufacturer's instructions for proper connection information. Using a 3/8" brass ferrule and nut for the compression fitting, tighten the tubing down on the Control Valve end carefully.

16. Connect Gas Line That Will Feed The Oven Burner To The Oven Burner. Refer to control valve manufacturer's instructions for proper connection information. Be sure not to kink the tubing. Using 3/8" brass nut and ferrule for the compression fitting, carefully tighten the tubing down on the Oven Burner end (see Figure 6, Page 8).

17. Connect Pilot Light Gas Tubing To Control. Using a 1/4" nut and ferrule, connect the tubing that feeds the new Pilot Light that you installed in STEP 11 to the PILOT OUT side of the Control Valve (see Figure 6, Page 8). Refer to control valve manufacturer's instructions for proper connection information. Tighten carefully.

NOTE: At this point in your installation, the Control Valve assembly should resemble Figure 6 on Page 8.



Figure 7 - New Gas Lines From Thermostat & From "Tee" To To Control Valve Installed.

18. Make And Connect New Gas Line Going From Thermostat Output To Control Valve. Using a tape measure, determine the length and routing of 3/8" aluminum tubing necessary to connect the output side of the Oven Thermostat to the GAS IN side of the Control Valve. Refer to control valve manufacturer's instructions for proper connection information. Cut and bend, as needed, for a neat installation, taking care not to kink the tubing. Using a 3/8" brass nut and ferrule for the compression fitting, tighten the tubing down on the output side of the Oven Thermostat carefully. Refer to Figure 7, left. **NOTE:** Do not disconnect the supply line that feeds gas into the Thermostat.

19. Connect New Gas Line From Oven Thermostat To Control Valve. Install the brass nut and ferrule on the end of the 3/8" aluminum tubing that was connected to the output side of the Oven Thermostat in STEP 18 that will be connecting to the GAS OUT side of the Control Valve. Carefully insert the end of the tubing into the GAS IN side of the Control, as shown in Figure 7, left. Refer to control valve manufacturer's instructions for proper connection information. Be sure not to kink the tubing. Using a 3/8" brass ferrule and nut for the compression fitting, tighten the tubing down on the Control end carefully.

20. Connect Gas Feed Line To Input Of Control Valve. In order for the new Oven Pilot Light to operate, it must have a gas supply. This gas supply is acquired from the Main Gas Manifold, goes through the Control Valve, and is then routed to the new Oven Pilot Light. There are two methods to do this, each equally effective. We prefer **Method 1**, but because some situations may make it impossible for someone to use this method, we also show **Method 2**.

A. Method 1 - This method consists of capturing the gas for the new Oven Pilot Light directly from where the Main Gas Manifold connects to the supply line (Gas Co. or propane source). Refer to Basic Line Drawing on Page 3, and Figure 8, below, when using Method 1.

Step 1: Install a 3/4" x 3/4" x 1/2" "Tee" on the input of the Main Gas Manifold using sealer or Teflon tape.

Step 2: Install a 1/2" to 1/4" Reducer to the 1/2" end of the "Tee" using sealer or Teflon tape.

Step 3: Using a tape measure, determine the length and routing of 1/4" aluminum tubing necessary to connect the output side of the "Tee" connected to the Main Gas Manifold to the GAS IN side of the Control Valve, as shown in Figure 8, below. Refer to control valve manufacturer's instructions for proper connection information. Cut and bend, as needed, for a neat installation, taking care not to kink the tubing. Brace the 1/2" to 1/4" Reducer with wrench, and, using a 1/4" brass nut and ferrule for the compression fitting, tighten the tubing down carefully.

Step 4: Install the brass nut and ferrule on the end of the 1/4" aluminum tubing that was connected to the output side of the Reducer installed in Step 3, above, that is nearest the Control Valve. Carefully insert the end of the tubing into the PILOT IN side of the Control, as shown in Figure 8, below. Refer to control valve manufacturer's instructions for proper connection information. Be sure not to kink the tubing. Using a 1/4" brass ferrule and nut for the compression fitting, tighten the tubing down on the Control Valve end carefully.

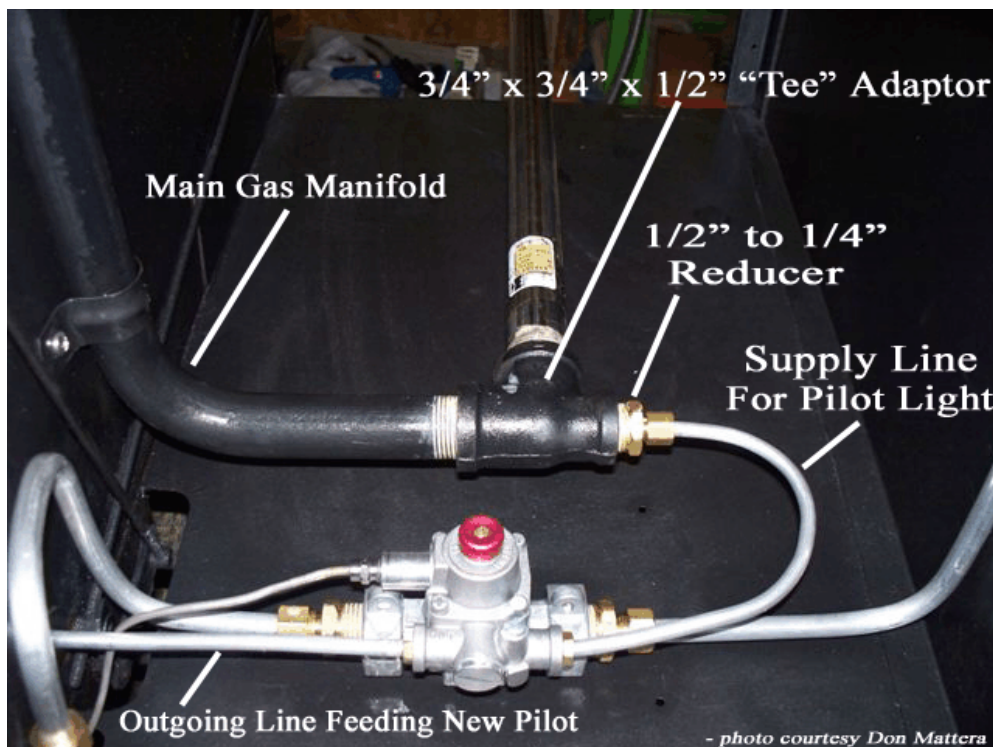


Figure 8 - Method #1 of Supplying Gas Feed For New Oven Pilot Light.

- B. Method 2** - This method consists of capturing the gas for the new Oven Pilot Light directly from where the tap for the pilot lights connects to the Main Gas Manifold. Refer to Basic Line Drawing on Page 4, Figure 7 on Page 8, and Figure 9, below, when using Method 2.

Step 1: Install “Tee” Tap. While it *is* possible to drill, tap, and thread a totally new location for acquiring the gas flow necessary to feed the new Pilot Light, it is **not** recommended, as pieces of the metal created in the process could find their way into the valves, burners, and even the Thermostat. Instead, it is preferred that an existing tap be used, such as one of those that feeds the Top Burner or Thermowell Pilot Lights.

Note: *The following instructions are for C-series ranges, but are almost the same for B-series models as well. While some creative adaptation will be necessary for use on some ranges, the procedures outlined herein will be essentially the same.*

Most Chambers C-series ranges came with a Pilot Light Gas Filter. This filter, which is about the size of a jar of baby food, has two aluminum tubes connected to it. Each of these tubes connects to a pilot light - one for the Top Burners, and one for the Thermowell. In ranges originally setup from the factory for all gas types except LP (propane) gas, flame level adjustment screws are built into the Pilot Light Gas Filter Assembly. For ranges setup originally by the factory for LP gas, external valves are installed on the output side of the Filter Assembly. Some ranges came with no filter at all, in which case all that exists are the pilot flame height adjustment valves and the tap they screw into.

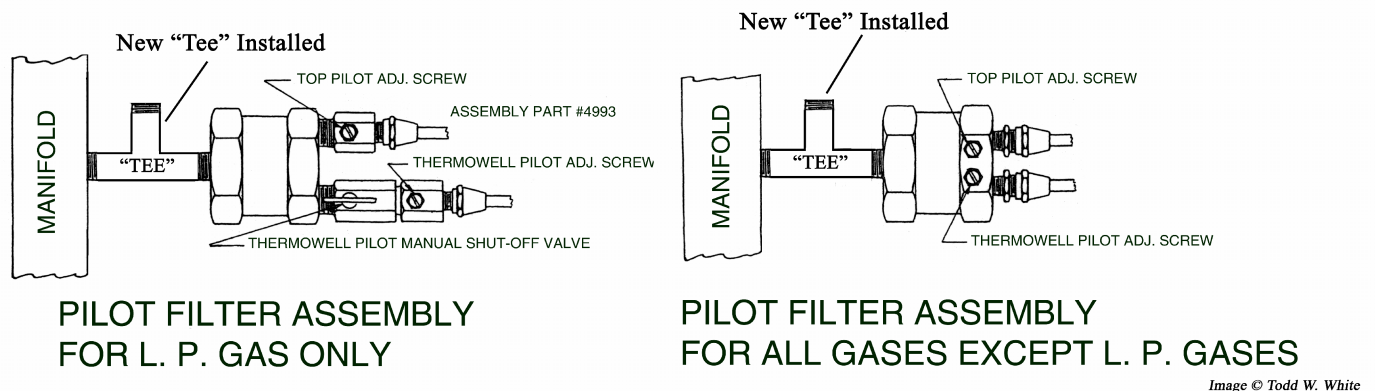


Figure 9 - Installing New “Tee” Tap For Feeding Gas To Valve For The New Pilot Light

To Install “Tee” Tap (refer to Figure 9, above):

- A.** Disconnect the factory-installed lines that feed Top Burner and Thermowell Pilot Lights. For most Chambers C-series ranges, this will be where the lines connect to either the Pilot Light Gas Filter, or where they connect to the external valve on the output side of same (indicating the range was originally setup for LP gas). **Note:** *For units not equipped with the Pilot Light Gas Filter, disconnect only one of the lines feeding one of the pilot lights, but not both.*
- B.** Using a large wrench, carefully unscrew the Pilot Light Gas Filter from the Manifold. The Pilot Light Gas Filter is shaped like a jar of baby food, and is screwed directly into the Manifold. **Note:** *For units not equipped with the Pilot Light Gas Filter, unscrew the tap that fed the line you disconnected in the previous step from the Manifold.*
- C.** Install a new brass “Tee” where Pilot Light Gas Filter was originally screwed into the

Manifold, using fittings and sealer, as appropriate. **Note:** For units not equipped with the Pilot Light Gas Filter, screw the “Tee” into the place where the original tap was that you removed from the Manifold.

- D. Screw the Pilot Light Gas Filter into the new “Tee”, using sealer, if appropriate. **Note:** For units not equipped with the Pilot Light Gas Filter, screw the tap you removed in Step B, above, into the “Tee”, using sealer and connectors, as needed.
- E. Reconnect the line feeding the pilot lights that were disconnected in Step A to the Pilot Light Gas Filter where they originally connected, using fittings and sealer, where appropriate. **Note:** For units not equipped with the Pilot Light Gas Filter, reconnect the line you disconnected in Step A, above, to the tap you connected to the new “Tee” in Step D, above.

Step 2: Make And Run A New Gas Line From “Tee” Tap To Control Valve. Using a tape measure, determine the length and routing of 1/4" aluminum tubing necessary to connect the output side of the “Tee” tap installed in Step 20 to the GAS IN side of the Control Valve, as shown in Figure 7 on Page 8. Refer to control valve manufacturer’s instructions for proper connection information. Cut and bend, as needed, for a neat installation, taking care not to kink the tubing. Brace the “Tee” with a separate wrench, and, using a 1/4” brass nut and ferrule for the compression fitting, tighten the tubing down on the output side of the “Tee” tap carefully.

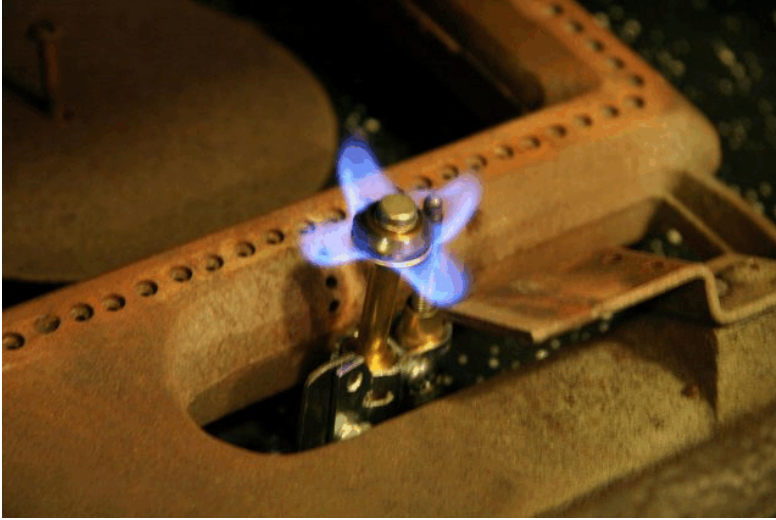
Step 3: Connect New Gas Line To Control Valve. Install the brass nut and ferrule on the end of the 1/4" aluminum tubing that was connected to the output side of the “Tee” you installed that is nearest the Control Valve. Carefully insert the end of the tubing into the PILOT IN side of the Control Valve, as shown in Figure 7 on Page 8. Refer to control valve manufacturer’s instructions for proper connection information. Be sure not to kink the tubing. Using a 1/4” brass ferrule and nut for the compression fitting, tighten the tubing down on the Control Valve end carefully.

23. DOUBLE-CHECK YOUR WORK. Go back through all of these instructions and CAREFULLY make SURE you have followed them correctly. In addition, if there are errors, omissions, typographical errors, or any other mistakes found herein, please correct for them in your work and notify the author so that appropriate revisions of this document may be made.

24. INSTALL BURNER IN OVEN. Your finished installation should look like the one in Figure 10, right.



Figure 10 - Final Installation View



*Figure 11 - Final Pilot/Thermocouple Location
In Relation To Oven Burner*

25. TEST INSTALLATION FOR LEAKS. Under ALL circumstances, this step **MUST** be done by a licensed gas appliance technician. Have the technician reconnect the flexline feeding the range, turn on the gas coming from the supply line (Gas Co. or propane tank), and check for leaks, and proper operation of the pilot light, thermocouple, and safety shutoff feature of the Control. Make sure the Pilot Light Flame touches the Thermocouple properly, as shown in Figure 11, left.

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