

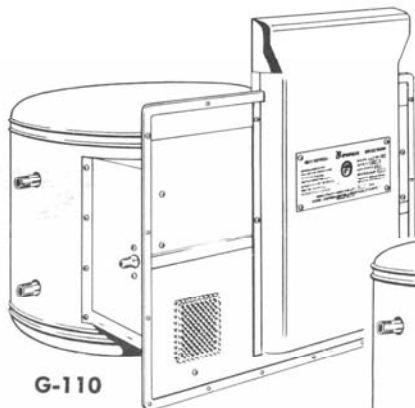
BOWEN Gas

W A T E R H E A T E R S

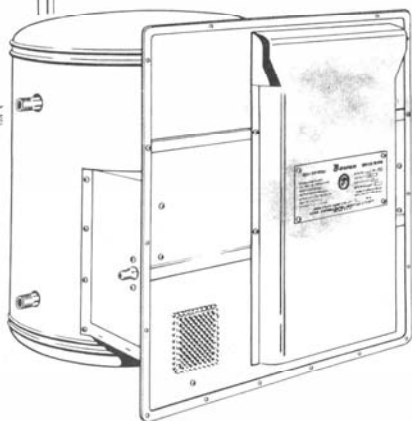
MODEL G-110

MODEL G-117

OPERATING AND SERVICE MANUAL



G-110



G-117



BOWEN

WATER HEATER DIVISION

HANDLING EQUIPMENT MANUFACTURING CORP.
WIXOM, MICHIGAN

GENERAL

Your new Bowen Gas Water Heater is simple to operate and is built to give long years of trouble-free performance. However, you will achieve maximum results if you will first take a few minutes time to read through this manual. The following operating and service suggestions will increase the utility value of your heater and better maintain its operating efficiency.



PRINCIPLE OF OPERATION

A burning pilot flame playing on the tip of a pilot (thermocouple) actually generates a minute electrical current (15 to 30 millivolts). This tiny current is transmitted from the safety pilot to the thermostat valve through a wire leading from the pilot tip. The wire terminates in a small magnetic assembly "built into" the thermostat valve. When lighting the pilot (by turning the top dial to "light pilot" or pushing down on the red button) a plunger which incorporates the master valve seat and a metal disc is depressed manually to open the valve seat and simultaneously set the metal disc on the magnet. After the pilot has been burning for approximately one minute, the heat is sufficient to generate the current which flows to the magnet, the pilot current will hold the metal disc down and master valve seat open. Now by turning the dial to "ON" and setting the temperature dial to the desired temperature, the main gas burner will come on and automatically cycle the burner to maintain the temperature setting of the thermostat. The pilot now is holding the metal disc down and the master valve seat open, and gas is allowed to pass through the temperature dial and pilot adjustment seat. The thermostat now opens and closes by actuation from the element (rod extending into the tank and water) as the water is heated or becomes cool. Gas is being metered to the pilot through the pilot adjustment seat and the unit will, therefore, continue to operate automatically. If the pilot flame is extinguished, the thermocouple (pilot tip) will cool, stop generating its tiny electrical current, and the magnetic field will fail to hold the metal disc down and it will be released under the spring tension to close the master valve seat. The gas will now be totally shut off to both the burner and pilot. (Known as 100% shut off).

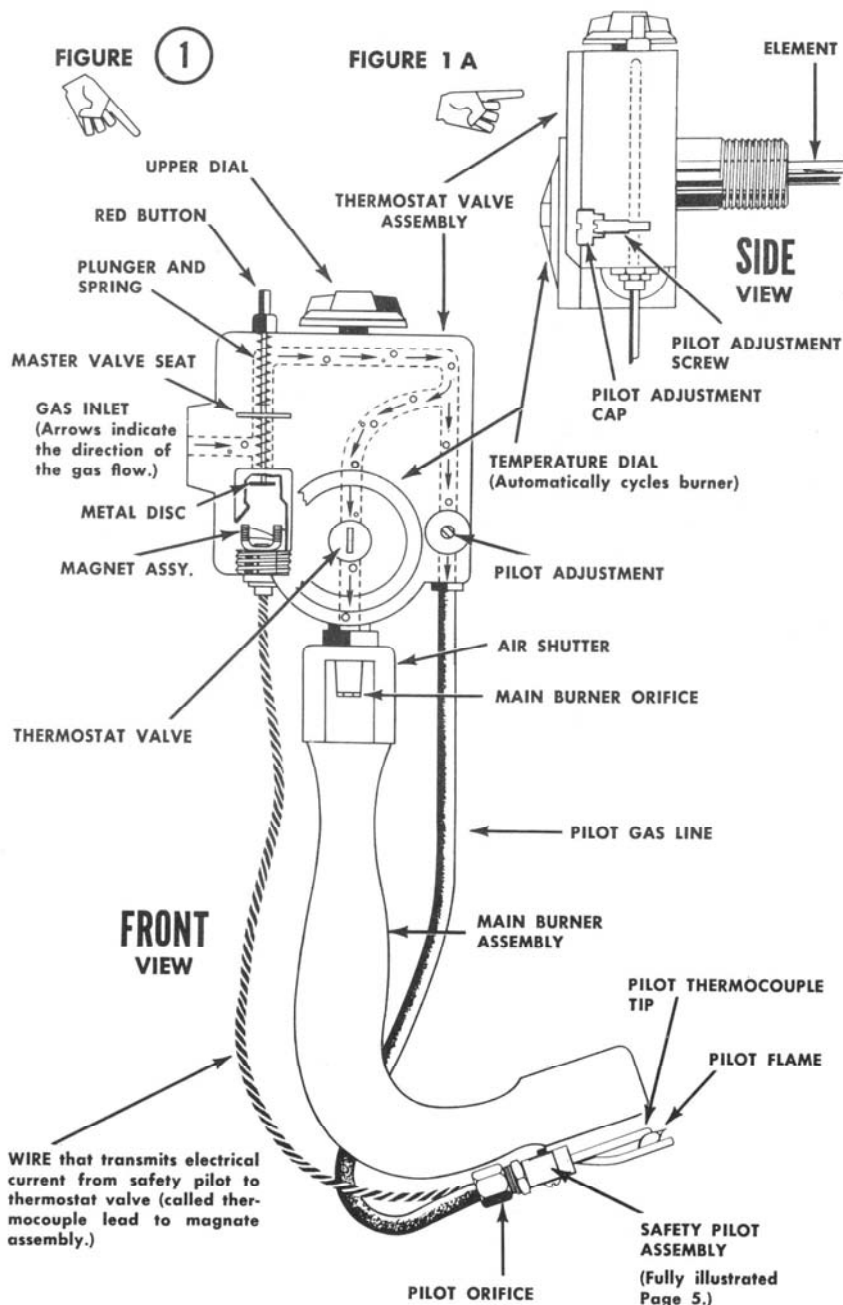


**SEE INSTRUCTIONS FOR LIGHTING OR
RELIGHTING EASY TO FOLLOW STEP BY
STEP WITH ILLUSTRATIONS. PAGES 3 & 4**

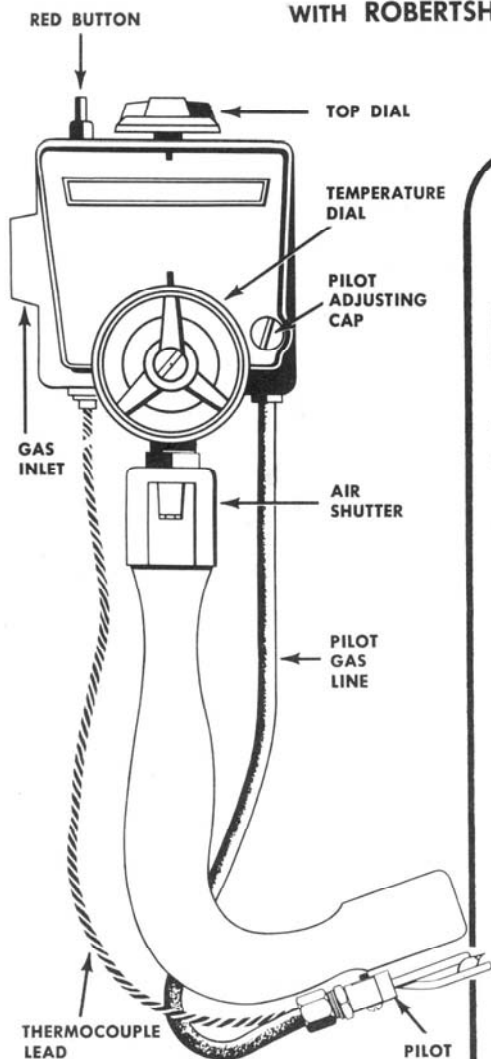
FIGURE

1

FIGURE 1 A



OPERATING INSTRUCTIONS FOR UNITS EQUIPPED WITH ROBERTSHAW-FULTON CONTROLS



FIGURE

2

PROCEDURE FOR LIGHTING OR RELIGHTING

1 Be sure that heater is filled with water, and that all air has been vented from gas line. (See Page 5).

2 Turn top dial to "Off" position, and temperature dial to lowest temperature position.

3 Wait sufficient length of time to allow gas which may have accumulated in burner compartment to escape. (Approx. 5 min.).

4 Turn top dial to "Pilot" position.

5 Fully depress red button, and light pilot burner. (Adjust, if necessary, as noted under "Pilot Burner Adjustment".)

6 Allow pilot to burn approximately one minute before releasing red button. If pilot does not remain ignited, repeat operation allowing longer period before releasing red button.

7 Turn top dial to "On" position and turn temperature dial to desired position. The main burner will ignite.

8 To shut down heater, turn top dial to "Off."

NOTE: For instructions on how to adjust pilot flame, see Figure 4, Page 5.

OPERATING INSTRUCTIONS FOR UNITS EQUIPPED
WITH GENERAL CONTROLS

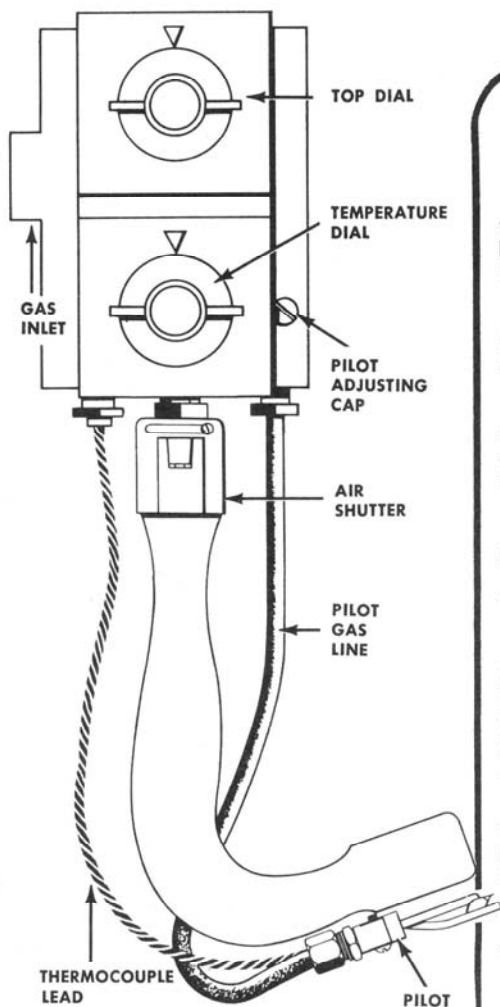


FIGURE 3

**PROCEEDURE FOR
LIGHTING OR
RELIGHTING**

1 Be sure that heater is filled with water, and that all air has been vented from gas line. (See Page 5).

2 Turn top dial to "Off" position, and temperature dial to lowest temperature position.

3 Wait sufficient length of time to allow gas which may have accumulated in burner compartment to escape. (Approx. 5 min.).

4 Turn top dial to "Light Pilot" and continue turning until dial "Stops." Hold in this position while lighting.

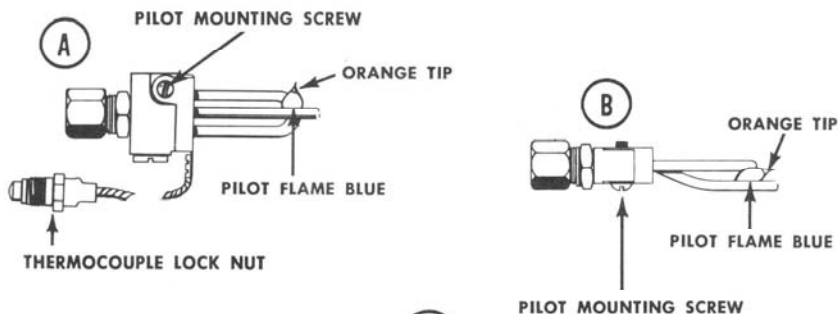
5 Allow pilot to burn approximately one minute before releasing dial from stop. If pilot does not remain ignited, repeat above operations allowing longer period before releasing from DIAL STOP.

6 Turn top dial to "On" position and turn temperature dial to desired position. The main burner will ignite.

7 To shut down heater, turn top dial to "Off."

NOTE: For instructions on how to adjust pilot flame, see Figure 4, Page 5.

SERVICE INSTRUCTIONS



FIGURE

4

GENERAL MC-3 PILOT

1 PILOT FLAME ADJUSTMENT

If the pilot flame does not have a small orange tip the pilot is not getting enough gas. (See Figure 4-A above). The flame should be about $\frac{1}{4}$ of an inch in vertical height when the water in the tank is cold and the burner is off and a flame $\frac{1}{4}$ to $\frac{3}{8}$ of an inch in horizontal length when the tank is warm. (See Figure 4-B above). A large orange flame indicates excessive gas supply resulting in short pilot life and early replacement. The pilot has been properly adjusted at the factory and should operate with a blue orange tipped flame enveloping the pilot thermocouple. Removal of the "pilot adjustment cap" will reveal the pilot adjustment screw. (See Figure 1-A, page 2). Turning this screw clock-wise reduces the flow of gas to the pilot (blue flame) and counter clock-wise the gas supply is increased (orange flame). Always replace the "pilot adjustment cap" to prevent gas leakage.

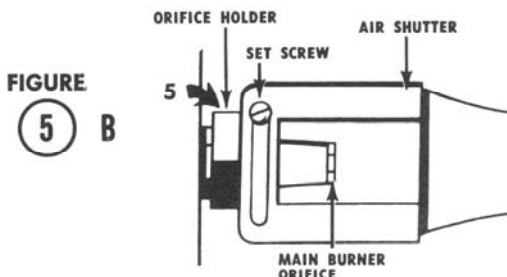
2 GAS LINE VENTING

Most failures to light are caused by the absence of gas, or presence of air, at the pilot port. This usually happens when the unit is new or has run out of gas. Upon restoration of the gas supply, the line, or lines, are full of air. It is recommended that appliances such as the cook stove or space heater be lighted first. This assures a supply of gas in the main gas line. If your control is a Robertshaw, venting of the gas line may be accomplished by depressing the red button, as in steps 4 and 5, page 3, for an extended period. The General Control is vented by following steps 4 and 5, page 4, for an extended period.

3 AIR SHUTTER ADJUSTMENT

(See Figure 5-B). All fuels depend upon air (oxygen) to give them proper burning characteristics. This water heater is required to burn varying types of gases and consequently the air requirements vary. A yellow smoking flame indicates a lack of air and a noisy hard blue flame indicates an excess of air. The air shutter is rotated around the main burner orifice holder and is held in place by a small shutter adjustment screw. Loosen the screw for adjustment.

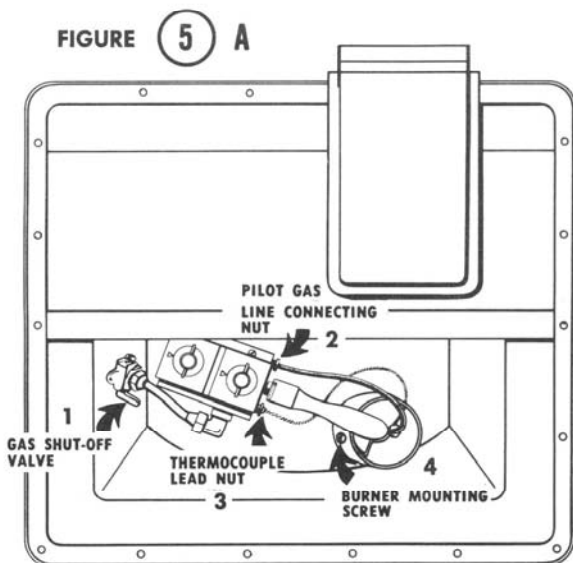
A good method of adjusting the air shutter is to rotate the shutter closed far enough for yellow tipping to occur on the main burner, (not pilot) and then slowly open the air shutter until all signs of yellow tipping are gone. When proper adjustment has been obtained, tighten screw holding air shutter.



4 BURNER & PILOT ASSEMBLY REMOVAL IN CASE OF CLEANING OR REPLACEMENT

A. It is conceivable that upon removal of the burner and pilot assembly, damage could mis-align the component parts. Such malalignment could easily render the unit inoperative or unstable. Care should always be taken to handle these parts with extreme care.

B. Remove lower panel by turning the two slot headed nuts one-half turn.



C. Turn off the gas supply by closing gas shut off valve. (See Figure 5-A above).

D. With a wrench, unscrew the pilot (#2) and thermocouple (#3) nuts where they are joined to the thermostat. (See Figure 5-A). (Do not remove gas tube at the pilot).

E. Remove set screw (#4) (burner mounting screw) which passes through the combustion tube and holds the burner mounting bracket in place.

F. The burner is held in place at the control by (#5) the "main burner orifice holder" **which does not have to be removed when removing burner.** Carefully pull the burner and pilot assembly from the combustion tube. The end of the burner attached to the control will "pivot" on the orifice holder and the whole assembly will come away from the heater. (To reinstall, first slip the air shutter end of the burner on to the orifice holder and insert burner into the combustion tube). To remove pilot from burner, unscrew pilot mounting screw. Figure 4, page 5).

G. **Caution:** When reassembling and tightening the thermocouple nut, (#3) only a small (3 or 4 inch) wrench is necessary. Screw nut down as far as possible with the fingers. Set lock washer by making additional $\frac{1}{4}$ or $\frac{1}{2}$ turn with wrench.

H. Removal of the thermostat control from the heater, requires special tools. Consult your authorized water heater dealer for removal or replacement of this part.

5 CARE AND CLEANING

The air openings in the exterior panels should periodically be checked to assure that openings are clean and free from dust, leaves and foreign matter: **Caution:** Clean orifices with lighter fluid. Never clean any orifice with a pin, wire or any metal device—this will damage orifice openings, making it unsafe for further use.

6 PRESSURE REGULATION

All units using bottled gas (Black Orifice) must carry eleven (11) inches water column pressure at the appliance with all other gas appliances operating (burning). Units burning natural gas must be equipped with natural gas main burner orifice (color: natural brass or yellow) and its own individual gas pressure regulator (maxitrol, model RV31) and regulated to $3\frac{1}{2}$ inches water column pressure. No change in the pilot orifice is required. However, the safety pilot must be readjusted for any new gas. See page 5, figure 4 on Pilot Flame Adjustment. (For complete details, write for BOWEN Info-Gram #S6A).

BOWEN GAS WATER HEATER GUARANTEE

This water heater is warranted — any part or parts of this unit, except the controls, which in our judgment show evidence of defect will be repaired or replaced through a Bowen Water Heater Dealer, Distributor or the factory at Wixom, Michigan, provided that said product is registered with the manufacturer at the time of purchase and further provided that the defective part shall be returned to the dealer, distributor or the factory at Wixom, Michigan, transportation prepaid, within one year from the date of sale and registration.

This warranty shall not apply, nor can we assume any responsibility for consequential damages that might result from its use, misuse, or improper installation, where the product has been tampered with or altered in any way or which in our judgment has been subjected to misuse, negligence or accident, or which has the serial number effaced, altered or removed.

Failure of the storage tank due to excessive deposit of foreign matter shall not be construed as a defect in tank material or workmanship.

Failure to use an Excess Pressure Relief Valve in conjunction with the operation of this heater voids the warranty of tank.

No person or representative is authorized to make any warranty or assume any liability not strictly in accordance with the foregoing.

BOWEN GAS WATER HEATER GUARANTEE

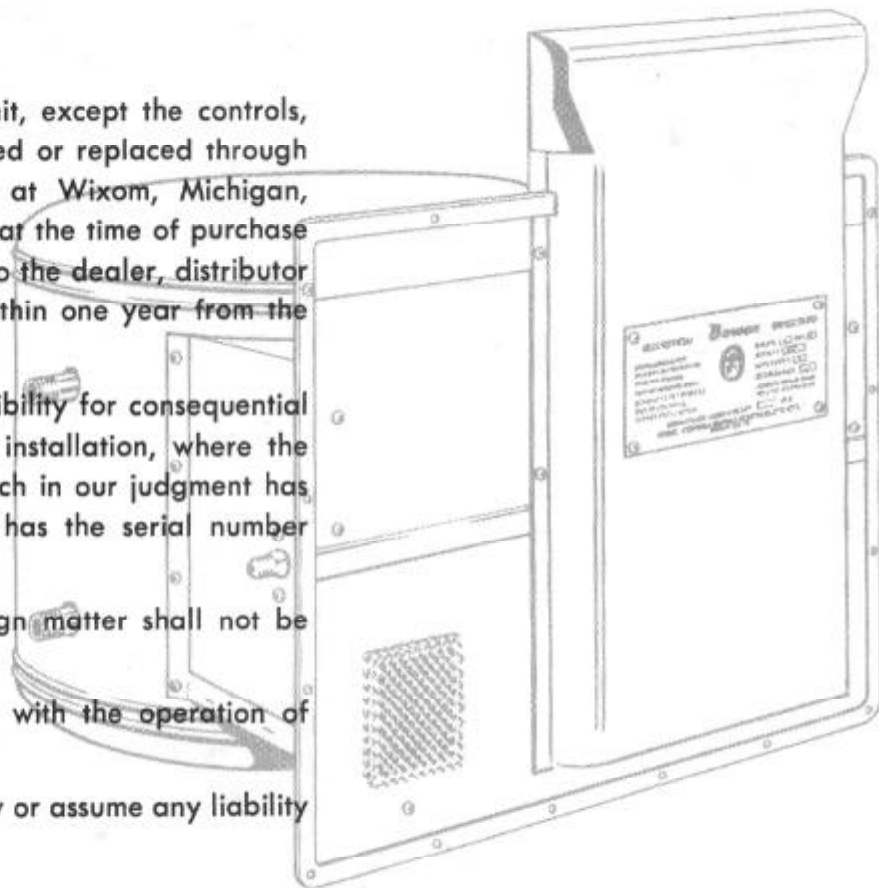
This water heater is warranted — any part or parts of this unit, except the controls, which in our judgment show evidence of defect will be repaired or replaced through a Bowen Water Heater Dealer, Distributor or the factory at Wixom, Michigan, provided that said product is registered with the manufacturer at the time of purchase and further provided that the defective part shall be returned to the dealer, distributor or the factory at Wixom, Michigan, transportation prepaid, within one year from the date of sale and registration.

This warranty shall not apply, nor can we assume any responsibility for consequential damages that might result from its use, misuse, or improper installation, where the product has been tampered with or altered in any way or which in our judgment has been subjected to misuse, negligence or accident, or which has the serial number effaced, altered or removed.

Failure of the storage tank due to excessive deposit of foreign matter shall not be construed as a defect in tank material or workmanship.

Failure to use an Excess Pressure Relief Valve in conjunction with the operation of this heater voids the warranty of tank.

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**BOWEN WATER HEATER DIVISION
HANDLING EQUIPMENT MFG. CORP.
WIXOM • MICHIGAN**

WARRANTY

WE PLEDGE OUR WORD...

that the BOWEN G-110 GAS WATER HEATER
serial number Nº 4312 is fully covered
by this warranty and will give complete
satisfaction when installed and operated in
accordance with the terms stated on the reverse side of
this certificate, and within the limits outlined thereon.
This is your assurance that you have the best water
heating equipment available, backed by the most
reliable company in the business.

Signed

M. E. Bowen