

## CHAPTER 30

# Trouble Shooting

As previously stated, there is a great multiplicity of types of so called oil burners. The author after making a study of the bulletins of practically all the manufacturers of high pressure domestic oil burners arrives at the conclusion that there are basic features common to all, differing in minor details. It may be said that they are now pretty well standardized.

To illustrate trouble shooting the Delco burner is taken as an example, but the instructions may be applied in general to practically all high pressure oil burners.

**Procedure.**—When an oil burner fails to operate, a systematic search is necessary in order to find the trouble with a minimum expenditure of time and effort.

The following steps are arranged to provide a logical order of testing the burner and controls in order to locate the trouble quickly. It has been found through a study of the reasons for service calls that approximately 60% of the troubles may be identified and easily cured by following the instructions here given for Trouble Shooting.

## Preliminary Precautions

Before starting the burner, check the following:

1. Be sure there is oil in the tank and that the valve in oil line is open.
2. Set thermostat dial well above existing room temperature.
3. See that the electric fuses in the oil burner circuit and at the main switch are tight and that the switch is closed.

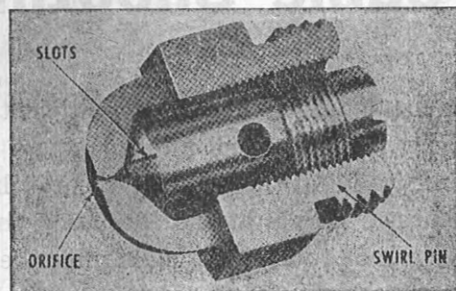


FIG. 1.—Sectional view of nozzle showing interior and swirl pin.

### Motor Starts — No Fire

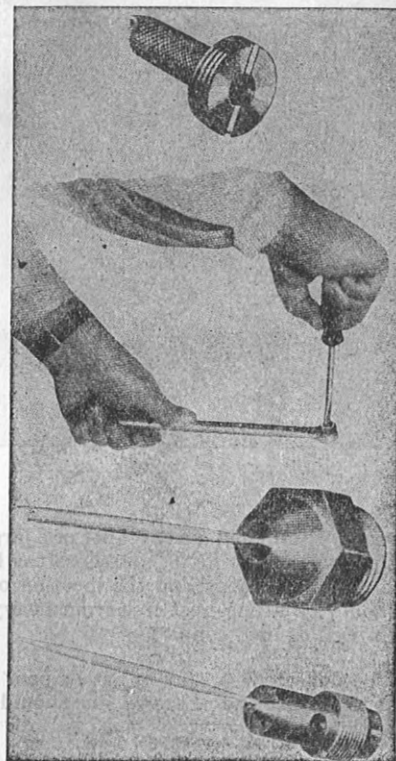
4. Nozzle may be plugged. Remove jet line assembly by disconnecting oil lines through back plate.
  - a. Unscrew nozzle and strainer from adapter.
  - b. Remove swirl pin from nozzle body.
  - c. Clean slots in swirl pin and orifice in body with a tooth pick or sharpened stick.
  - d. Wash all parts in a grease solvent or very hot water and dry thoroughly.

NOTE.—Never use any metal instrument to clean nozzle as it would scratch the finely machined surfaces.

- e. Screw swirl pin into nozzle body.
- f. Tighten strainer and nozzle into adapter, re-assemble jet line and connect oil lines.

### 5. Test nozzle spray.

- a. Carefully remove the wire from No. 4 post of the primary control.



FIGS. 2 TO 5.—Cleaning nozzle. Fig. 3, removing swirl pin; fig. 4, cleaning swirl pin slots; fig. 5, cleaning nozzle orifice.



- b. Place the loose end so that it does not contact anything. (See fig. 7.) This cuts off the spark circuit. *Note:* On many of the Model A burners, the electrode leads can be disconnected at the transformer. This also cuts off the spark.
- c. Turn the assembly so that it points away from the burner and reconnect the fuel line for a temporary test. Support the assembly

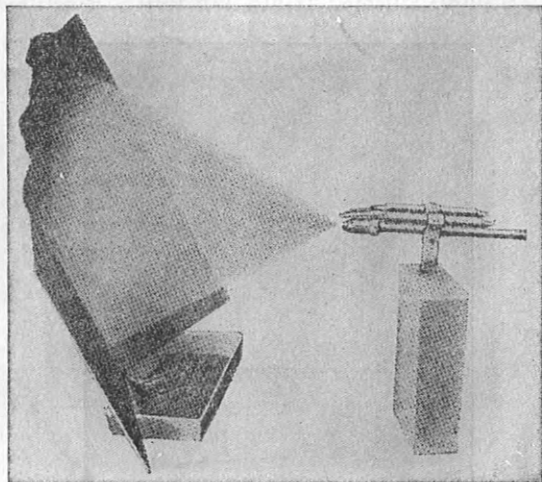


FIG. 6.—Nozzle spray test.

on a prop of some kind. Hold a newspaper or a large sheet of paper in front of the nozzle as in fig. 6, and close the line switch. This will allow checking the spray and the location of the electrodes. The spray should be a fine mist free from heavy streaks and in the shape of a well defined cone.

- d. If the spray be deflected, streaky or have a poor cone, the nozzle and screen at the nozzle end of the jet line should be removed and cleaned more thoroughly.
- e. If a clean nozzle do not spray well at 100 pounds pressure, replace it with a new nozzle of correct size and angle.

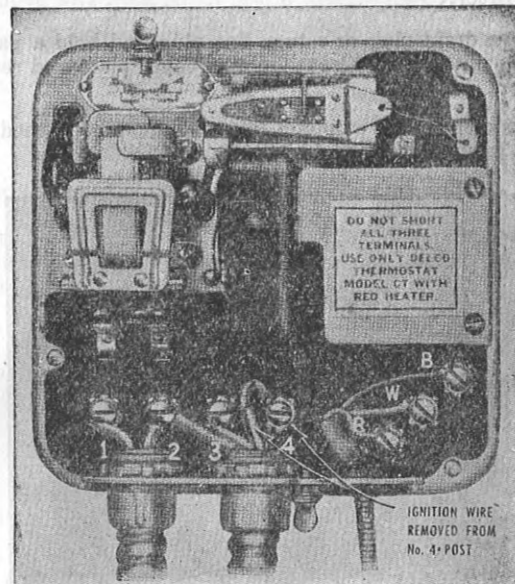


FIG. 7.—Ignition wire removed from primary control.

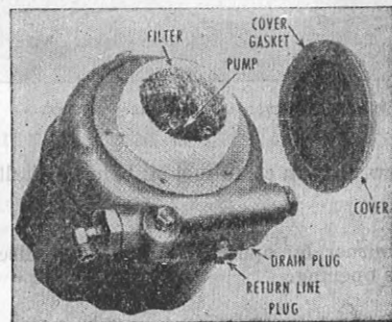


FIG. 8.—Cleaning filter.



## 6. Dirty filter.

- a. Remove drain plug or return line plug and hold a pan to catch the oil, unscrew six screws holding cover plate and remove filter element.
- b. Try to keep the cover gasket intact so it can be re-used, otherwise a new gasket will be required.

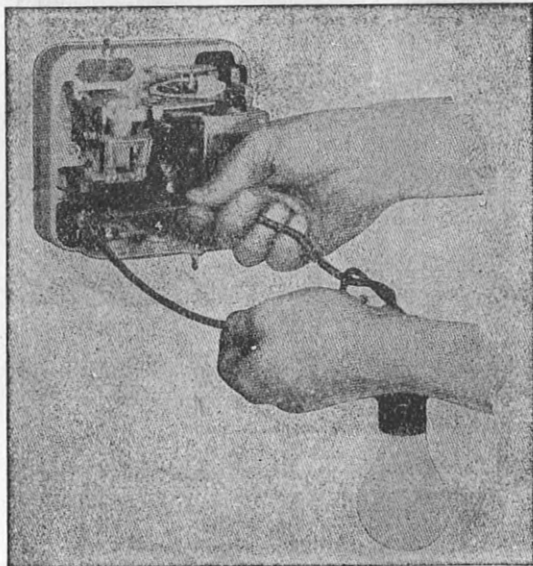


FIG. 9.—Using test lamps across contacts of the primary control.

- c. Soak the new filter in clean fuel oil before installing.
- d. Reassemble.
- e. Prime the burner by operating motor and discharging oil from the pressure opening.

## 7. No ignition spark.

- a. Remove wire from No. 3 post of the primary control.
- b. Reconnect the high tension leads if they have been disconnected at the transformer. This arrangement prevents motor running so that no oil will be pumped.
- c. Throw in line switch. Check to see that the relay contacts close and that the ignition contacts in the primary control are closed.
- d. If no spark be obtained, again open the line switch and examine the high tension leads for breaks. Likewise examine the ignition contacts of the primary control. Clean the porcelain insulators with soap and water and dry them off thoroughly and inspect for leaks.
- e. If a good hot spark be not obtained with the leads, connections, and electrodes in good condition, the transformer is probably defective — in such case replace with a new transformer.

### Motor Does Not Start

## 8. Burner has just completed an "on" period.

- a. The primary control will not operate again until the heating unit has cooled.
- b. Burner "on safety" — safety switch "warped out". In this case, after cooling, push reset button just once and burner should start.

## 9. Blown or loose fuse or open switch.

## 10. Trouble in thermostat or primary control.

- a. If there be current to posts No. 1 and No. 2, in the primary control the difficulty is in the thermostat or master control. Check with test lamps across No. 1 and No. 2 terminals as in fig. 9 with burner switch turned on. If the test lamps light there is current to these two posts.

## 11. Dirty motor contacts.



- a. If the motor do not start, examine the motor contacts to see if they be clean.
- b. Test the live service with a test lamp as in fig. 9. The lamp should light when placed across terminals No. 1 and No. 2 of the primary control.
- c. If lamp do not light it indicates a blown fuse, the line switch open, or the limit control contacts open.

### Cleaning and Adjusting

#### 12. Cleaning thermostat.



GOOD FUSE



BLOWN FUSE

Fig\*. 20 and 11.—Appearance of fuse when good and when blown.

If dusty or dirty, remove cover and clean thoroughly. To clean contacts hold contacts together lightly and draw a piece of clean, smooth paper between them. Tighten screws in wire posts and make sure none of the wires are crossed.

#### 13. Cleaning primary control.

- a. Remove entire unit from its stack mounting and clean any carbon off and remount.
- b. Remove cover and clean thoroughly. To clean contacts, hold contacts together lightly and draw a piece of clean, smooth paper between them. Tighten screws in wire posts and make sure wires are not crossed.
- c. Check stack switch, safety switch, ignition and starting switch to make sure contacts are closed before turning on electricity.

#### 14. Flame adjustment.

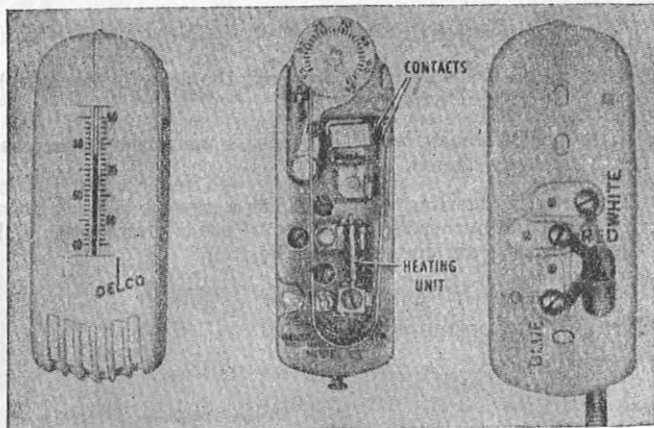
- a. When an oil fire is adjusted properly, the flame is orange colored with just a slight haze at the tips.
- b. If the fire be smoky, adjust air shutter on burner to increase air until smoke is cleared.
- c. If the fire be dazzling white and has a gassy odor, cut down on the air at the burner air shutter until fire is orange with a slight haze. Lock the air shutter in this position.

#### 15. Draught adjustment.



FIG. 12.—Removing pump. Loosen pump coupling by reaching through the air shutter with a long Allen wrench. Disconnect inlet and return line, if one be used, and the fuel line from the cut off valve to the nozzle line. Remove the two pump assembly mounting bolts and the pump can then be pulled straight out.





Figs. 13 to 15.—Type CT thermostat; views showing appearance and construction.

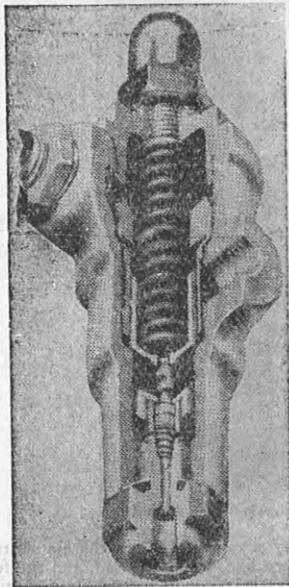


Fig. 16.—Regulating valve; sectional view showing construction.

- a. To adjust the draught without the aid of a draught gauge, open the fire door slightly and hold a lighted match close to the door opening, with burner in operation.
- b. If draught be set correctly there will be a slight pull of the flame into the furnace.
- c. If the draught adjuster be open too much, the match flame will blow back. To correct, turn balance weight on draught adjuster to hold its opening smaller.

## 16. Cleaning fan.

- a. The fan should be kept clean. Lint, dust, and dirt on the fan blades reduces the efficiency of the fan. Clean fan with brush after removing air intake shutter.
- b. The inside of the burner casting should be kept reasonably free from lint, dust and dirt.

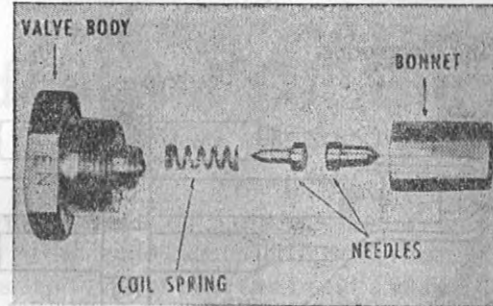


Fig. 17.—Cut off valve disassembly.

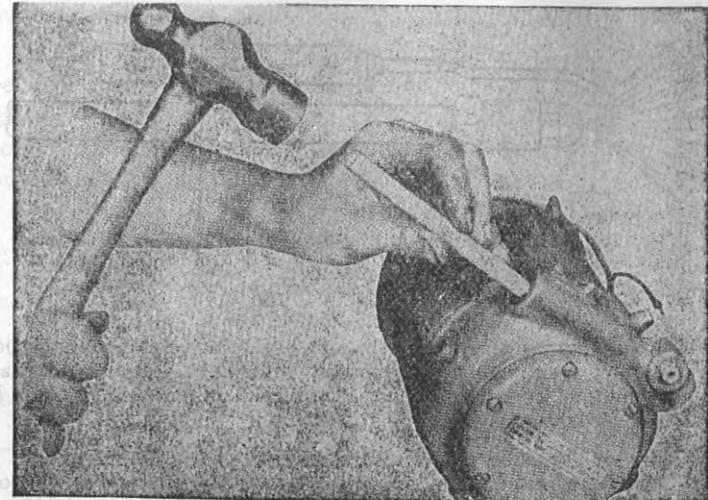


Fig. 18.—Removing "A" piston. If cylinder and piston stick, take out the cut off valve body and drive the cylinder and piston out, using a hard wood stick as a ram. Clean piston and sleeve body thoroughly and reassemble.

## 17. Cleaning oil valve.

Unscrew the valve from the motor casting. Disassemble and clean all parts in a grease solvent or very hot water. Wipe dry and inspect for worn or rough spots on needles or seats which will necessitate a new valve assembly. Reassemble valve and screw tightly into casting. Check for leakage after oil has been turned on and burner has been operated.

## 18. Adjusting electrodes.

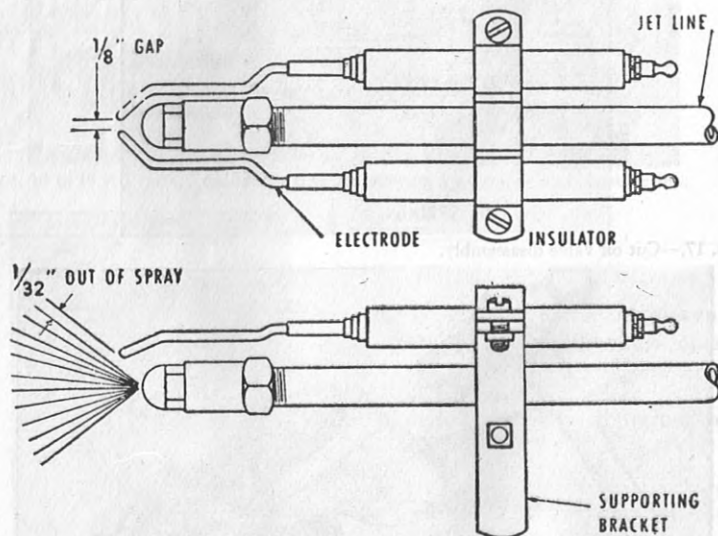


FIG. 19 and 20.—Electrode location.

- Remove jet line assembly through back plate. Scrape any carbon or dirt from the metal tips and wipe clean. Inspect porcelain insulators for cracks. If either insulator be cracked, it must be replaced.
- Adjust electrode points to a spark gap of  $\frac{1}{8}$ ". Points should be held just out of the oil spray so they don't become wet with oil. Tighten connectors on wire leads from transformer and be sure these same wires are fastened securely on the transformer. Reassemble jet line in burner and tighten oil connections.