



Installation And Operating Instructions For Optional Oil Burner On The Model DF520 Combination Stoker-Oil Burner Boiler

This manual contains information for the installation, operation, care and service of the optional oil burner on the EFM DF520 Boiler Unit. Be sure to follow these instructions carefully when making the installation. Before proceeding, be sure to check local ordinance requirements. Installation must be made in accordance with local ordinances, which may differ, from this installation manual.

These instructions are to be saved and given to the equipment owner for operation and maintenance information.

Please Note:

See previous instructions for the installation and operation of the DF520 stoker and boiler **before** installing the oil kit.

In a new installation, the rigid insulation should be installed in the base before the stoker and pot are installed or before the boiler is set on top of the base.

Boiler Base

Insulation Installation

The boiler base must be insulated when using the oil burner option. Place the insulation on the inside walls of the boiler base above the ash guide plate. It is best to do this before the boiler is placed on the base. Refer to Fig. 1 for proper installation. If adding this oil burner kit to an existing installation, the rigid insulation must be cut and properly cemented OR the entire stoker and pot assembly can be removed and the insulation installed in whole pieces.

Please Note:

The new style bases are now assembled with individual components and screws. The two larger pieces of insulation with cutouts are one inch shorter as a result. If you are using the insulation designed for an old style, welded base, remove one inch of length from these two pieces. The third, most narrow piece remains the same size.

Oil Burner Mounting

Refer to Figures 2

1. Remove the left side cabinet panel in an EXISTING installation, (retrofitting) or BEFORE mounting the left side cabinet panel in a NEW installation. A 10" X 10" opening will be cut into the panel using the template as a marking guide. If the template is not available, mark the panel using the following measurements. From the front edge of the left panel, fire door side being the front, measure from the top edge 14 1/4" down and 6 1/2" in from the front edge of the panel and place a dot. Make a second dot 24 1/4" down from the top edge and 6 1/2" in from the front edge of the panel and place another dot. Mark two additional dots at 14 1/4" and 24 1/4" down from the top edge of the panel and 16 1/2" in from the front edge of the panel. Cut out the sheet metal.

Secure the left panel to the front and rear jacket covers in an old installation or in the proper sequence in a new installation.

2. The damper assembly can now be mounted.

3. Install the male threaded portion of the assembly through the boiler wall from the inside, using the rubber gasket between the damper and boiler wall.

4. Install the round, female threaded portion of the assembly, and fully tighten in place.

5. Place the two-piece split cabinet cover plates into position to cover the opening in the cabinet left side panel. Drill 1/8" diameter holes into the cabinet panel, using the 3/16" diameter holes in the cover plates as a guide and fasten with the sheet metal screws provided in the kit. The top cover will overlap the bottom cover in final assembly.

6. Mount the mercury switch and nylon sleeve assembly onto the end of the damper handle, see Fig. 3. Push the sleeve over the handle until the end of the handle meets the shoulder inside the nylon sleeve. **Do not** force beyond this point. Lock the sleeve in place with two setscrews. **Note:** The mercury switch is being phased out for new installations and a retrofit kit, featuring a magnetic switch, will be available for old style installations. Installation instructions for the new magnetic switch retrofit kit will be included separately with the switch when they become available.

7. A separate air tube is supplied with an AFG burner chassis. Mount the air tube to the chassis.

8. Install the proper nozzle (1.50 GPH 80 degree hollow spray) into the burner nozzle assembly. Do not touch the filter or orifice of the nozzle with your fingers as contamination can occur and affect the spray pattern. It is not necessary to over-tighten the

nozzle. Be sure the nozzle and electrodes are positioned correctly as shown in the instructions furnished with the oil burner chassis.

9. Mount the assembled burner with three 5/6"-18 X 7/8" hex head bolts, 3 nuts and 6 washers. In the installed position, the end of the air tube will be approximately 1/4" back from the movable damper plate.

10. When the oil burner is installed on the DF520 Boiler, an interlock switch must be mounted behind the fire door tab to prevent oil burner operation when the door is opened. Refer to Fig. 4 for installation instructions.

Electrical Installation

1. All wiring must be in accordance with local codes, or, in the absence of a local code, must comply with the National Electric Code.

2. Refer to the appropriate wiring diagram, Fig. 9, 9B or 6, when wiring the installation. These two wiring diagrams supercede the wiring diagrams furnished with older stoker installation instructions when the oil burner is used. The newest stoker installation manual also contains current wiring diagrams for the oil burner optional kits. Wiring diagrams or a stoker installation manual can be seen online at www.efmheating.com.

3. Provide a fused disconnect switch in the circuit supplying the control circuit. The EFM Model DF520 Boiler with Stoker and Oil Burner operates on 120 VAC 60Hz with a power draw of 2.5 Amps.

Control Settings

1. Refer to instructions for installation and operation of the stoker.

Note: For installation of the oil tank, oil lines, burner adjustment and operation, refer to the instructions furnished with the burner. Adjust the draft for a negative .02 inches of water column overfire. Adjust the burner for not more than No. 1 smoke with a CO₂ reading of 8 to 10%. Better results should easily be achievable with the newest Beckett AFG burners.

Never run the oil burner unless the damper plate (in front of the burner tube) is open. **Never** run the stoker if the damper plate is open, otherwise fly ash will accumulate in the burner tube. The oil burner and stoker must not, and if properly wired, cannot be operated at the same time. The damper mercury switch or magnetic switch won't allow this to happen if it is properly mounted and wired into the 24-volt circuit.

Over a period of time, heat from coal burning can cause the fuel oil in the nozzle line to gel, therefore, the oil burner should be operated for a few minutes each month to prevent this.

It is advisable to leave an ash bed on the stoker pot when oil firing.

The switchover from coal to oil or oil to coal is a manual operation that requires switching a double pole – double pole switch and closing or opening the oil burner damper plate.

The DF520 Boiler is designed for coal fir-

ing. When oil is used, it should be used as a back-up fuel and not the primary fuel.

Service Checklist: Oil Burner Operation

Oil Burner Mounting

Oil Burner will not run (See Below)
Circulator failure (Hot Water System)
Control Failure

Not Enough Heat

Thermostat improperly located
Thermostat set too low
Boiler too small for job
Limit Control set too low
Firing rate too low
Boiler and flue passages dirty
Insufficient radiation

Too Much Heat

Thermostat set too high
Thermostat improperly located
Control failure
Control circuit shorted

Oil Burner Will Not Run

No power supply
Fuse blown
Switch off
Control failure
Burner locked out on safety (See Below)

Burner Locked Out on Safety

Reset the safety switch on the burner
Primary control. If the burner again locks out on safety, check out the items listed below. Modern primary controls lock out permanently on the third reset and must be reset by a technician.

- Motor failure
- Transformer failure
- Fuel pump failure
- Pump coupling failure
- Smoky fire
- Electrode insulator cracked
- Electrode spacing incorrect
- Electrode failure
- Flame sensor failure or dirty
- Burner relay failure
- Fuel pump air-bound
- No oil in tank
- Dirt in nozzle
- Burner damper blade closed

Oil Burner Noisy

- Loose or bent fan
- Loose fan blade
- Fan rubbing housing
- Coupling slipping or out of alignment
- Motor needs oil
- Positive pressure in combustion chamber
- Flue passages blocked

Poor Draft

- Chimney too low
- Chimney too small
- Chimney or flue pipe obstructed
- Excessive air leaks into boiler

Excessive Oil Consumption

- Boiler needs cleaning
- Building temperature too high
- Thermostat improperly located
- Firing rate too low
- Poor combustion
- Excessive draft
- Excessive air leaks into boiler
- Faulty distribution system
- High stack temperature

INSTRUCTIONS FOR INSTALLING 1" THICK HIGH TEMPERATURE INSULATION IN BOILER BASE

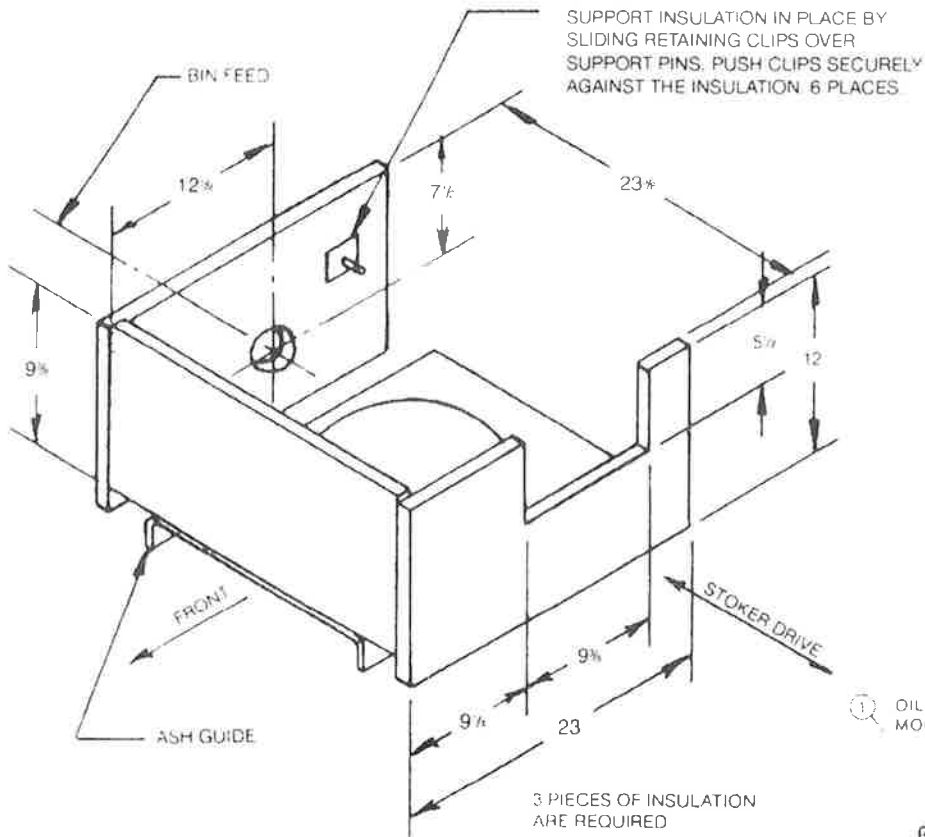


FIG. 1

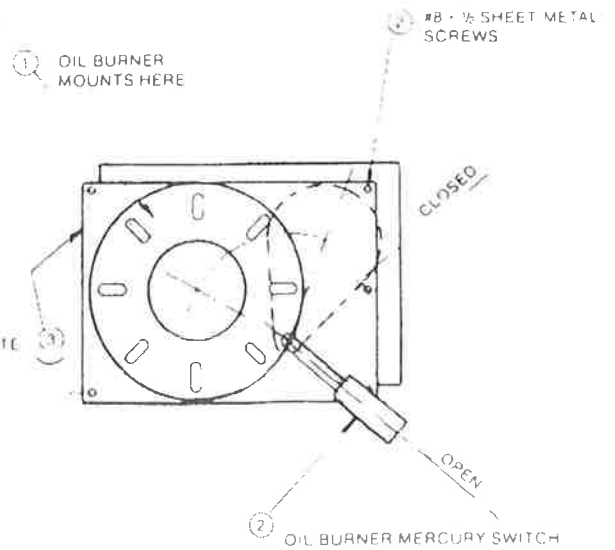
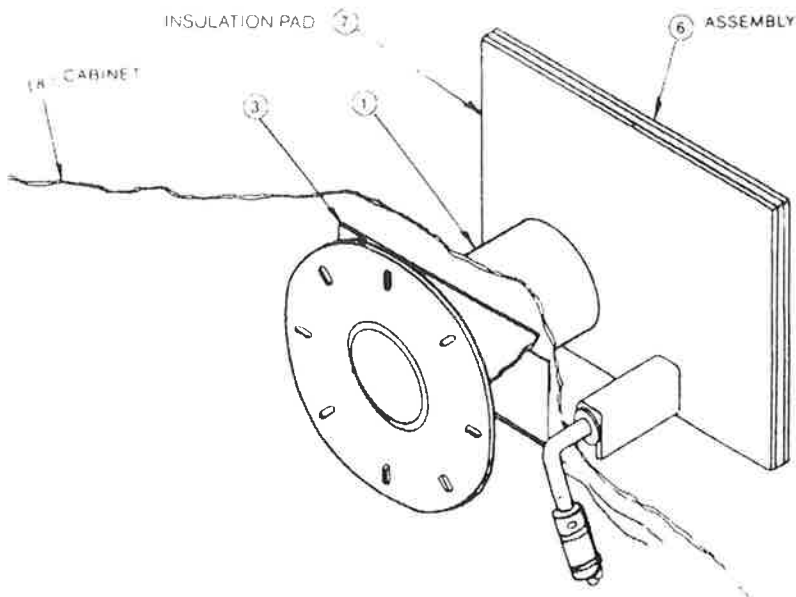


FIG. 2



DAMPER MANUAL CONTROL WITH ELECTRICAL INTERLOCK

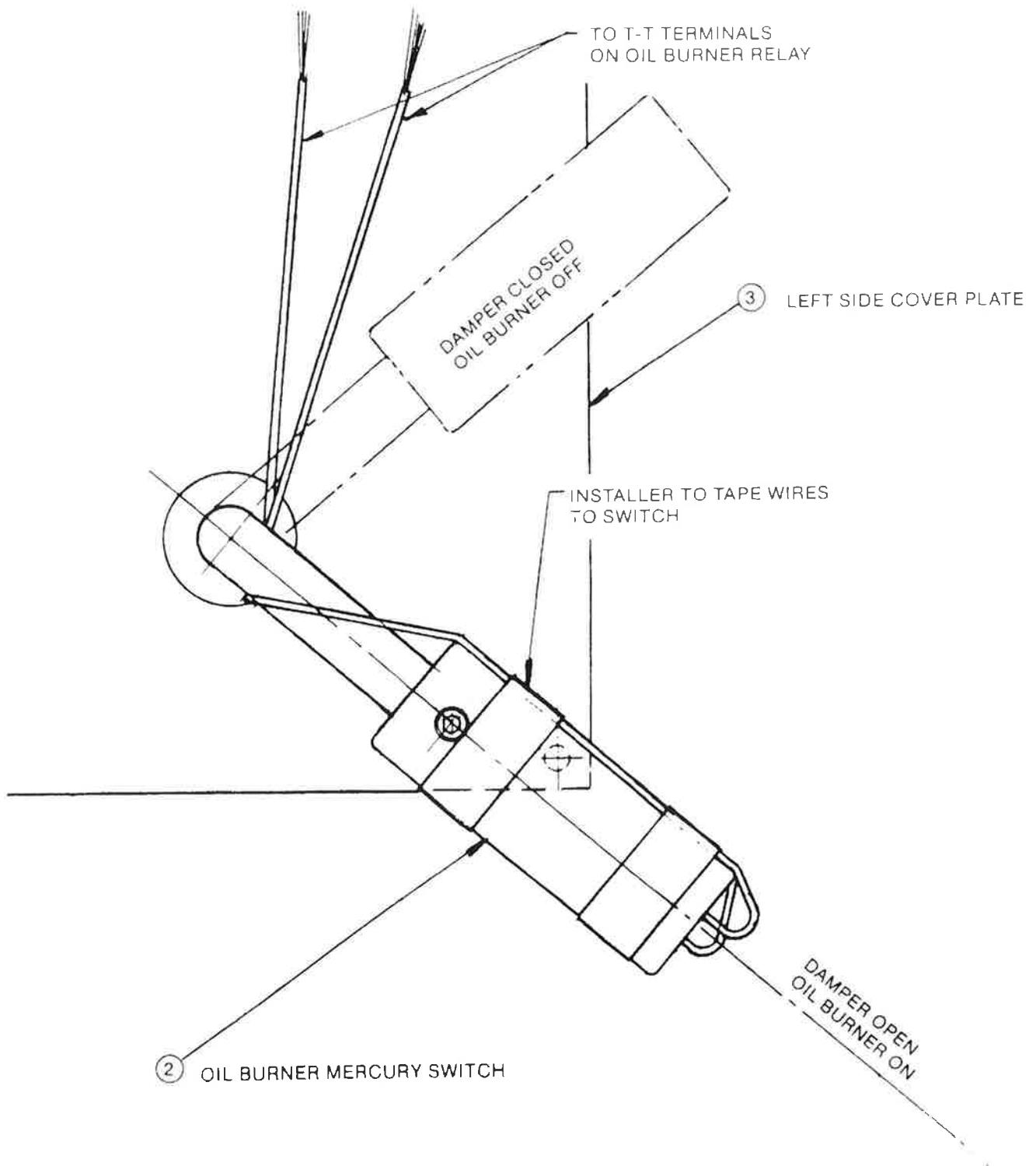
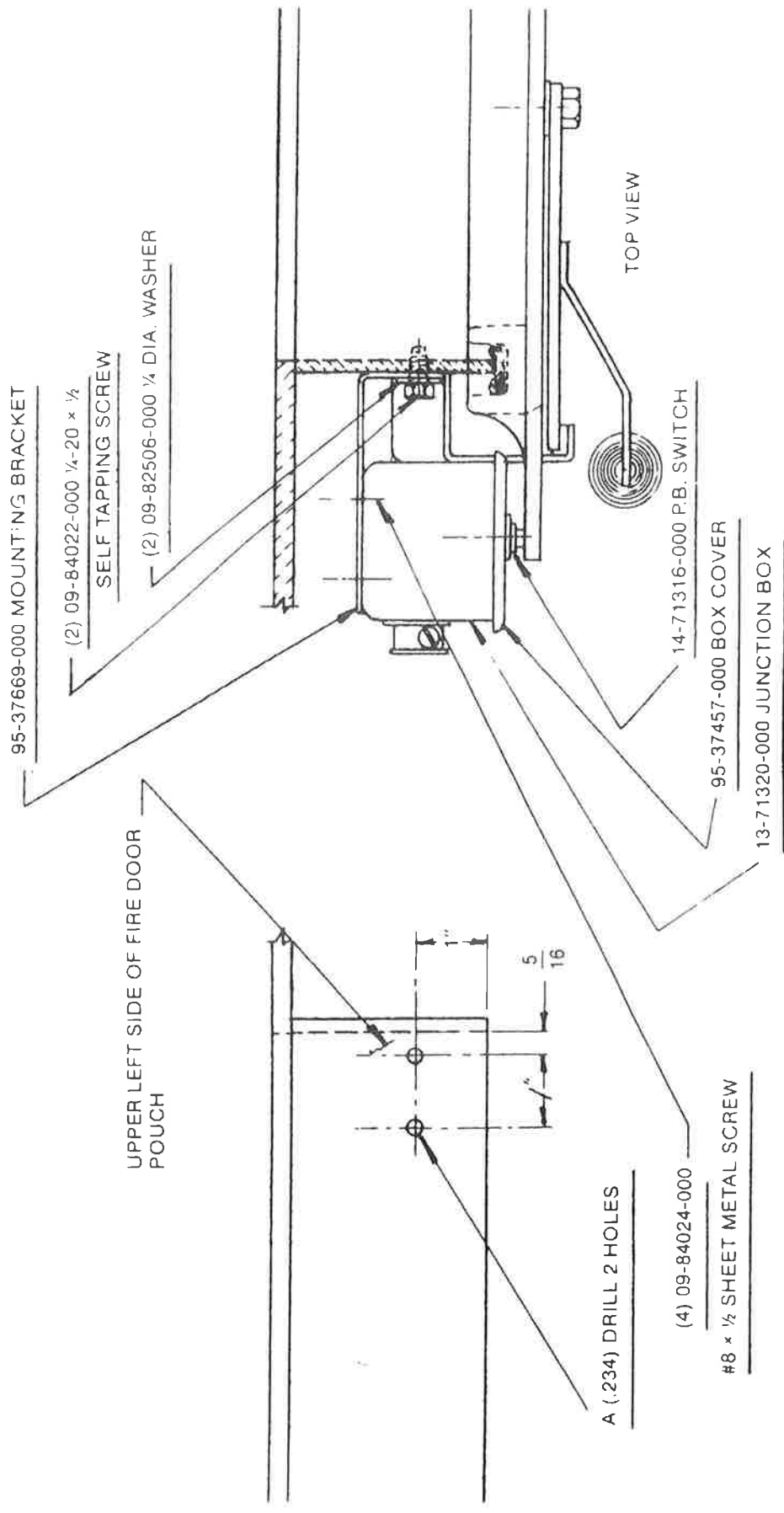


FIG. 3



INTERLOCK SWITCH MOUNTING

FIG. 4

UTILIZING AN OUTFIRE CONTROL WITH THE OIL/COAL BOILER, WITH DOMESTIC WATER COIL.
 (MANUAL SWITCH CAN BE TURNED TO THE ON POSITION DURING OIL FIRING ONLY)

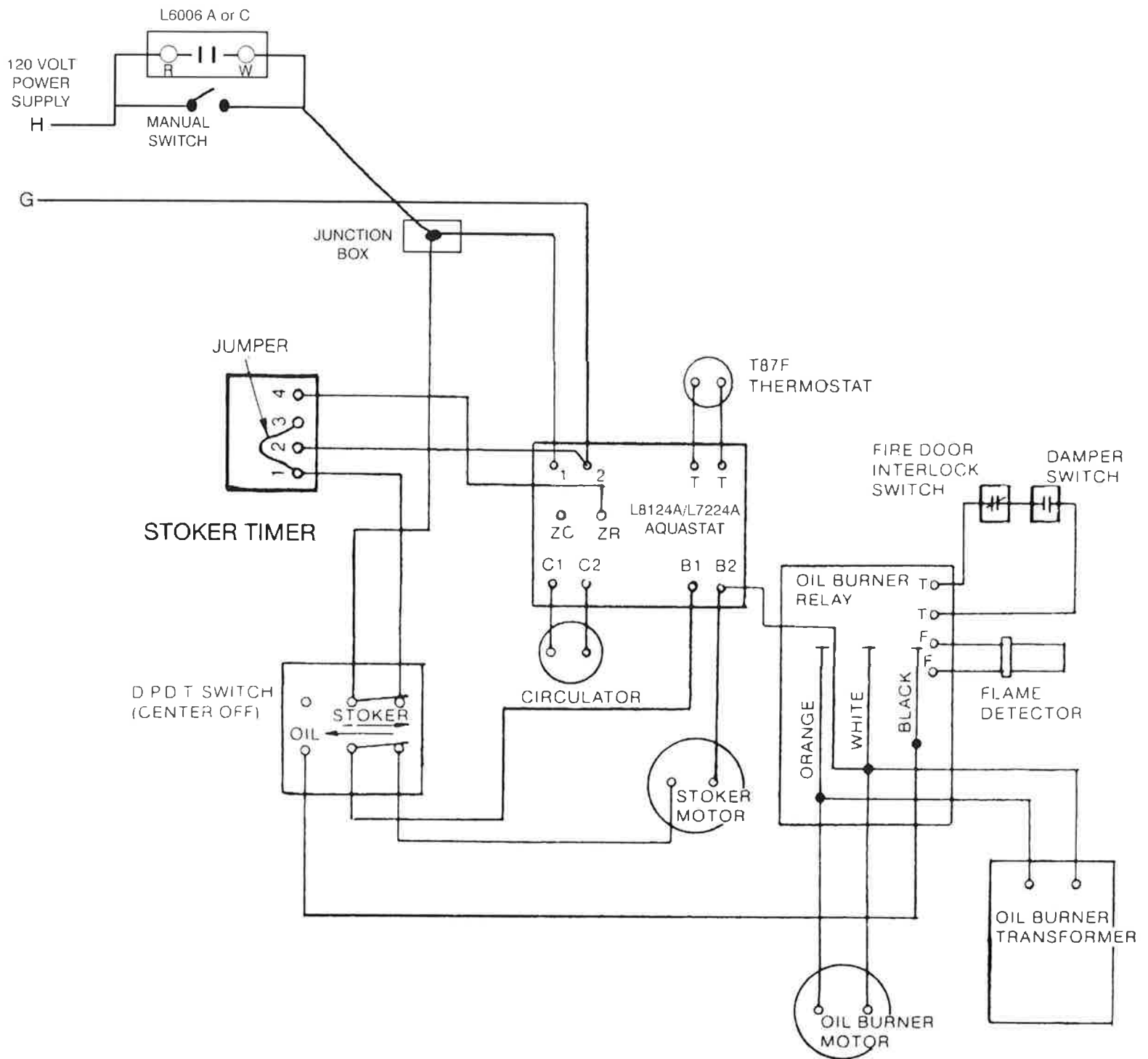


FIGURE 9

PARTIAL WIRING DIAGRAM
UTILIZING PRIMARY CONTROL R7184B

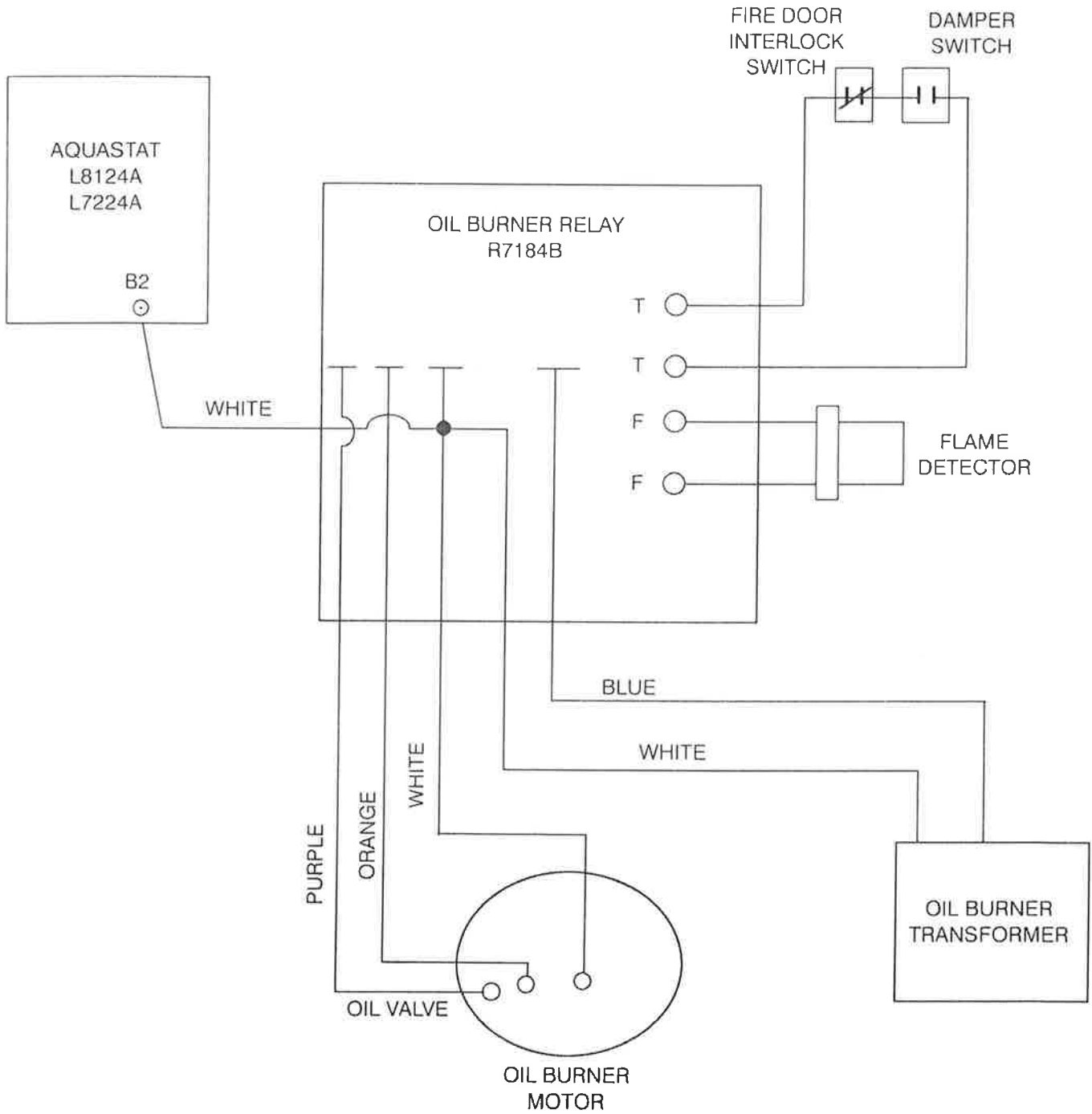


FIGURE 9B

**WIRING DIAGRAM - COMBINATION
OIL-COAL STEAM WITH OR WITHOUT
DOMESTIC WATER COIL.
MANUAL CHANGE OVER.**

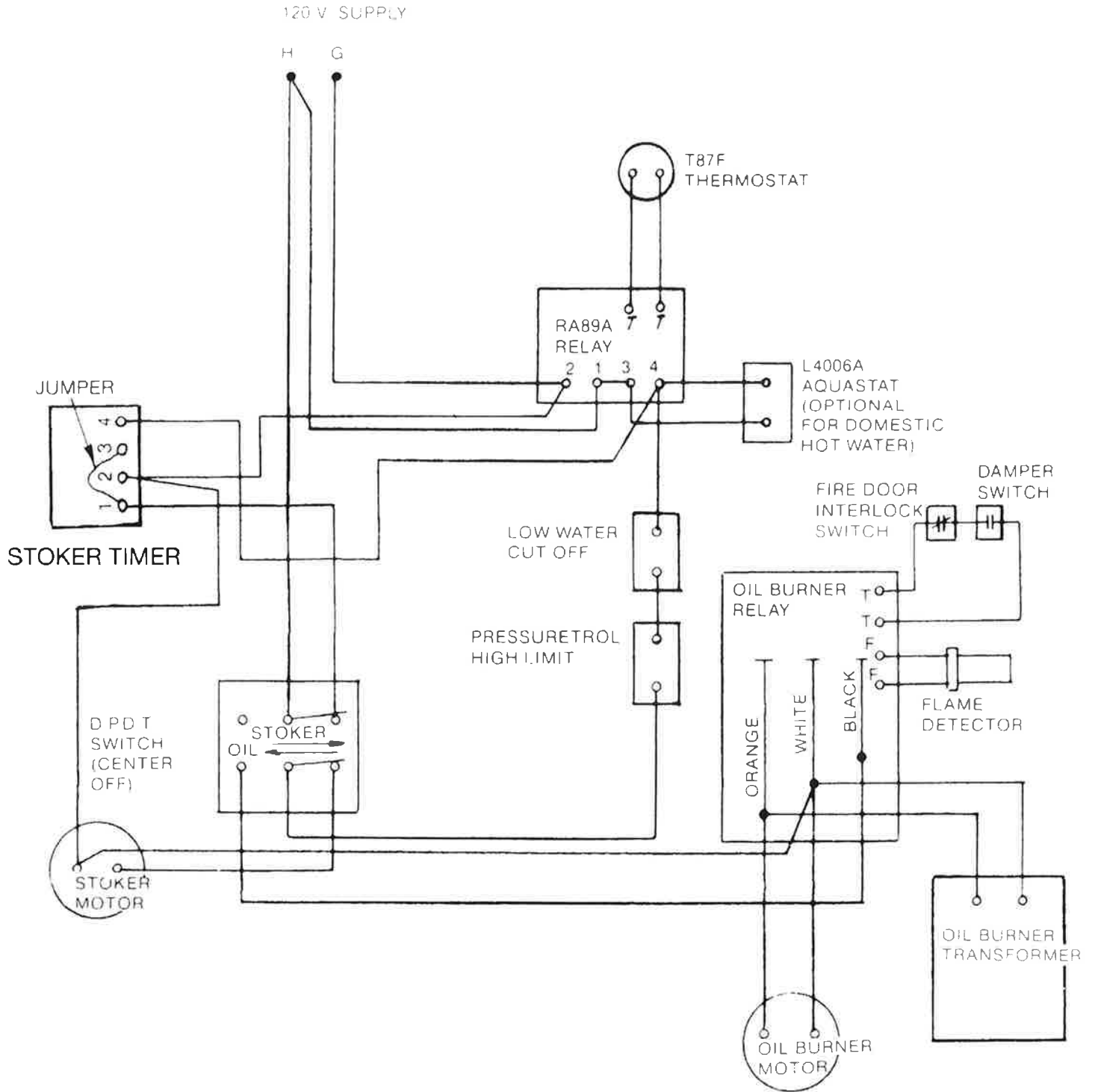


FIG. 6