



WAYNE HOME EQUIPMENT

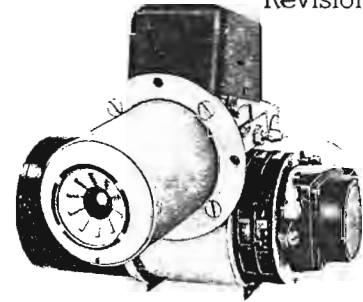
a Scott Fetzer company

801 Glasgow Avenue
Fort Wayne, Indiana 46803

MODEL EG-1 OIL BURNER

Manual 21755-001

PUBLICATION DATE 06-20-88
Revision 04



SPECIFICATIONS

FIRING CAPACITIES — Model EG-1

.50 to 2.75 GALLONS PER HOUR
70,000 to 350,000 BTU/HR INPUT

FUELS*

Use No. 1 or No. 2 Heating Oil (ASTM D-396) only.

*Never attempt to use gasoline as a fuel for your burner, as it is more combustible and could result in a serious explosion.

ELECTRICAL

Power Supply 115V/60HZ/1PH
Motor 3450 RPM N.E.M.A. Flange, Manual Reset Overload Protection
Ignition 10,000V/23MA Secondary, Continuous Duty-Shielded, Interrupted Duty-Shielded Transformer, or Solid-State Ignition System.

50 HERTZ BURNERS AVAILABLE ON SPECIAL ORDER

FUEL UNIT

Sundstrand or Webster

DIMENSIONS (Standard)

Height 11⁷/₈"
Width 13³/₈"
Depth 6⁷/₈"

MOUNTING

Rigid flange, Adjustable flange or Base mount.

TO THE HOMEOWNER

Since 1928, Wayne has supplied the Homeowners of the world with oil burners. You are obtaining quality and design unsurpassed with the engineering and product development. It will provide you with many years of efficient, trouble free operation, if properly installed and serviced. Please read this manual carefully.

Wayne warrants its burners specifically to those who have purchased it for resale, including your dealer. If in any case you have a problem with your burner, or its installation, you should contact your dealer for assistance.



APPROVALS

The burner is U.L. listed for use with Group I or Group II primary safety controls. State and local approvals are shown on burner rating label. All burners should be installed in accordance with the National Fire Protection Association, and in complete accordance with all local codes and authorities having jurisdiction. Regulations of these authorities take precedence over the general instructions provided in this manual.

GENERAL INFORMATION

HEATING PLANT — Before installing this burner in a conversion installation, try to provide adequate space to service the burner properly when installing for easy maintenance. The heating system should be carefully inspected for defects and cleanliness, if proper performance is to be obtained. An oil burner is only a means of supplying heat for the firebox and from there the heating system must absorb and circulate the heat. The flue passages and heat absorbing surfaces must be clean to assure maximum heat transfer to the furnace or boiler. Soot and fly ash act as insulators, retarding the transfer of heat. All doors, openings, and cracks should be cemented air-tight to eliminate air infiltration into the heating plant, causing heat losses. Inspect smoke pipe and chimney for elimination of leaks and obstructions. Be sure of adequate chimney size and height. Install a mechanical draft adjuster, if need be, same size as smoke pipe (see column under "Draft Regulators").

Warning:

If this burner is equipped with a relight type control it shall not be used on appliances having brick, ceramic, or castable refractory liner for combustion chamber. Hazard may occur on flame failure because the flame detector may see the hot refractory liner and not respond to flame outage, permitting prolonged delivery of oil before ignition is returned for an attempt to relight the burner.

COMBUSTION CHAMBER

The purpose of a combustion chamber is to maintain a high flame temperature, by reflecting the heat back into the flame. A high temperature assures greater combustion efficiency and lower stack losses. An insulating refractory or a Fiber Fax type chamber can be used with this burner. It is important to select and install, if necessary, the correct size chamber on a conversion job (see chart). On the flamelock conversion burners the atomized oil burns just off the flamelock. On all oil burners the atomized oil must not touch the sides or bottom of chamber, or smoke will result. To eliminate the smoke, excess air will be required, resulting in high stack temperature and lower combustion efficiency. Install burner so the face of air cone of burner is set $\frac{1}{4}$ " behind the inside front wall of the chamber (see diagram). Caution on installing Flamelock burners in stainless steel chambers should be taken, because of the higher temperature levels produced by high performance flame retention burners. The temperature may exceed the temperature ratings of the stainless steel chamber, and can result in chamber burn outs. When you are replacing a standard burner with a flame retention burner, take the following precautions: (1) Use pliable combustion chamber to line the inside of chamber, (2) Adjust burner (See "Final Adjustments" Column).

FUEL UNITS AND OIL LINES

Conversion Burners are provided with a single stage 3450 RPM fuel units with the by-pass plug removed for single pipe installations. This is satisfactory where the fuel supply is on the same level, or above burner, permitting gravity flow of oil. Never exceed 3 PSI pressure to the suction side of fuel unit. A pressure over 8 PSI may cause damage to the shaft seal and allow it to leak oil. When it is necessary to lift the oil to the burner, a return line should be run between fuel unit and oil supply. (If lift exceeds 10 feet, a two stage fuel unit must be used with a return line.) When a two line is used, the by-pass plug must be installed. This is supplied along with the burner attached to fuel unit, along with an information pump data sheet in a plastic bag. When oil lines are installed, continuous runs of heavy wall copper tubing is recommended. Be sure that all connections are absolutely air-tight. Check all connections and joints. Flared fittings are recommended. Do not use compression fittings. See pump data sheet for sizing, lift and length for tubing recommendations. Use an oil filter of adequate size for all installations. Install inside the building between the tank shutoff valve and the burner. For ease of servicing, locate the shutoff valve and filter near the burner.

TANKS AND PIPING

Local codes and regulations must be adhered to regarding tank and burner installation.

WIRING

All wiring must comply with the National Electric Code and local ordinances. Refer to diagram supplied with burner or controls, making sure the burner and controls are wired correctly and that the line switch is properly fused to burner.

AIR SUPPLY FOR COMBUSTION

Do not install in rooms with insufficient air to support combustion. Occasionally it is necessary to install windows or cut holes in a door to these rooms, to obtain sufficient air and to prevent less than atmospheric air pressure in the room. If there is a lack of combustion air in the room, the burner flame will be yellow and formation of soot will occur in the heating unit. In buildings of conventional frame, brick or stone construction without utility rooms, basement windows, or stairs doors, infiltration is normally adequate to provide air for combustion and for operation of the barometric draft control. For installation in an enclosed utility room

without an outside wall, a fresh air opening to the outside with a free cross sectional area of 20 square inches per each gallon per hour firing rate is recommended. For each 1,000 feet above sea level, increase the fresh air opening by at least four (4) per cent. The room should be isolated from any area served by exhaust fans. Do not install an exhaust fan in this room.

CHIMNEY

Follow the recommendations of the heating unit manufacturer. It must be properly designed, of adequate size, and should be above the surrounding objects, tile-lined, with no obstructions, and be in good state of repair. The smoke pipe should set flush with the inside of tile and be cemented in place. All cleanout doors should be sealed.

DRAFT REGULATORS

The use of a draft regulator is recommended and should preferably be mounted in the smoke pipe. Use a draft gauge to adjust to proper opening. When the burner air supply and draft is properly adjusted, the combustion chamber draft will be approximately .01" to .02"WC and the stack draft will be .02" to .04"WC. The larger the installation, the greater the draft will be required at the stack to obtain the .01" to .02"WC at the combustion chamber.

NOZZLES

Use the proper size, type and spray pattern nozzle that heater manufacturers recommend. In some cases of upgrading or conversion installations, the use of 80° Hollow or Solid nozzle are the best to start with.

STARTING PROCEDURE

STARTING BURNER

Be sure main switch is in "off" position, and be sure the thermostat is substantially above room temperature, the oil tank is filled, all valves are open, and controls set for operation. Adjust air supply on burner by loosening lockscrew on outer band, and open partially. Open the inspection door and turn on switch. Prime pump according to the pump manufacturer's recommendations and check pressure. If safety lockout occurs, reset after 1 or 2 minutes. Do not run fuel unit dry for more than 5 minutes. When fire is established make a temporary air adjustment for clean combustion flame, reduce air supply until flame tips appear slightly smoky, then readjust so flame tips are clean looking. Leave inspection door open until chamber is dry. When normal temperatures are reached, close inspection door and adjust draft regulator. (See column under "Draft Regulators").

FINAL ADJUSTMENTS

At this point a final adjustment should be used by the use of a COMBUSTION TEST KIT. After operating 10 minutes to warm up unit, a smoke tester should be used to take a smoke reading. We are wanting no greater than #1 (Shell Bacarach scale), less than a #1 smoke is desired. Some times a new heating unit requires more time than this to burn clean due to the oil film on the new heater unit surfaces. Recheck draft and take a CO₂ reading over the fire and in the stack. If a large differential between CO₂ readings is noted, air leakage is the most common cause (see column under "Heating Plant"). CO₂ readings must all be taken ahead of draft control. The CO₂ measured in the stack should be at least 9% for oil rates 1.00 GPH or below, and be at least 10% for all rates over 1.00 GPH. Unit should be started and stopped several times to assure good operation. Open inspection door, turn off oil valve, and check out safety timing of combustion control. Check operation of limit controls and thermostat. Check for oil leaks. Note: All installations should be reinspected after 1 or 2 weeks of normal operation.

FINAL CHECKS

Be sure air shutter and draft control adjustments are locked, and the controls on heating unit are adjusted in accordance with the heater and Control Manufacturer's Instruction Sheets.

MAINTENANCE

OILING MOTOR — By proper oiling twice a year, the motor life will be increased; only a few drops of non-detergent type oil at both motor holes are needed.

FILTER — The oil filter cartridge should be replaced once a year so the fuel oil will not become contaminated and plug up fuel pump and nozzle of oil burner.

NOZZLE — The nozzle should be changed at least once each year before the start-up of the heating season. Replace with proper nozzle.

COMPONENTS — If for any reason any of the burner parts have to be replaced, always use parts recommended by the manufacturer. Specify part numbers and description when ordering. (IN ALL COMMUNICATIONS STATE BURNER MODEL AND SERIAL NUMBERS).

ELECTRODE SETTINGS — This is very important for reliable ignition of the oil; check these once a year in accordance with the instructions provided in this manual.

FAN & BLOWER HOUSING — This must be kept clean, free of dirt and lint; open transformer to check fan blades from above. Be sure the electric power is off on burner when the transformer is opened up for this inspection.

ATTACHING AIR TUBE COMBINATIONS FOR CHASSIS PLAN ONLY

When oil burner chassis and air tube combination are packed separately, the burner must be assembled as follows:

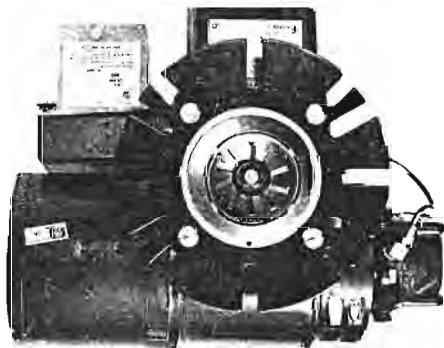
- 1— Lay burner chassis on its back as shown at right. Insert air tube into burner chassis lining up the 3 holes in the chassis with the 3 holes in the air tube. Install the 3 screws $\frac{3}{8}$ long and secure.
- 2— Install proper nozzle into gun assembly. Loosen and remove the two screws located on the transformer top plate at the front of the burner chassis and swing open. Slide drawer assembly into air tube (see Fig. 2).
- 3— Once installed, adjust gun assy., either back or forward to position nozzle from head. For correct positioning (see Fig. 3). Secure the slide plate by tightening thumb screw at side of housing. Attach flared nut of Oil Line Assy., (Copper Oil Line) to the end of this adapter fitting as shown.

Install arrow decal as shown so position of Drawer Assy. is always known (see Fig. 4).

Recheck for nozzle centering before burner is installed (see Fig. 1). Make sure electrode tips clear retention head.



Figure 1



INSERT "SR" SERIES GUN SETTING GAUGE (AS SHOWN BELOW) TO CHECK NOZZLE POSITION AND ELECTRONIC SETTING.

Figure 3

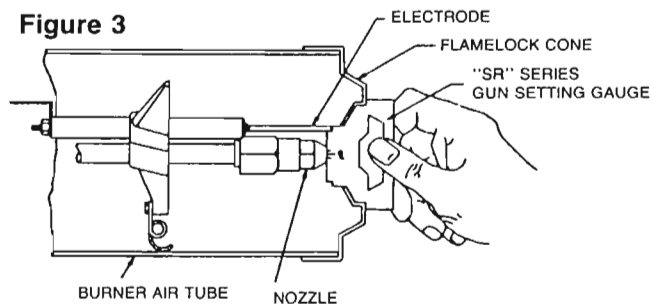


Figure 2

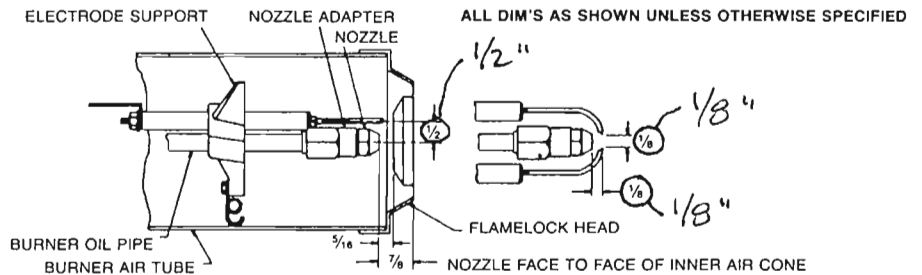
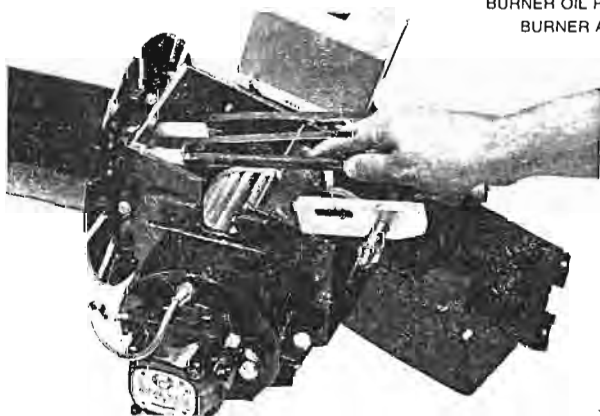
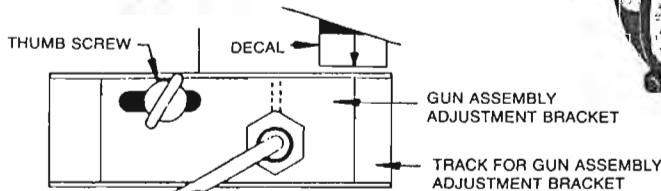
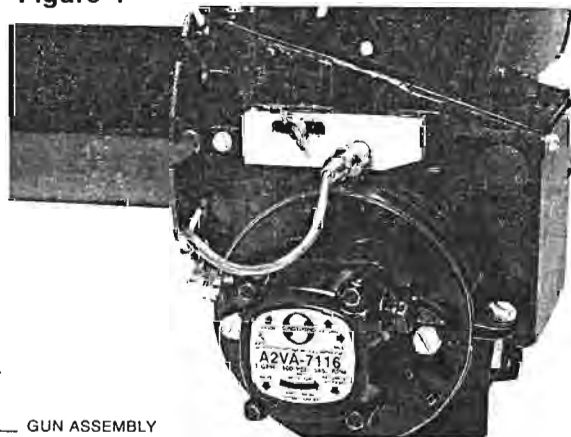
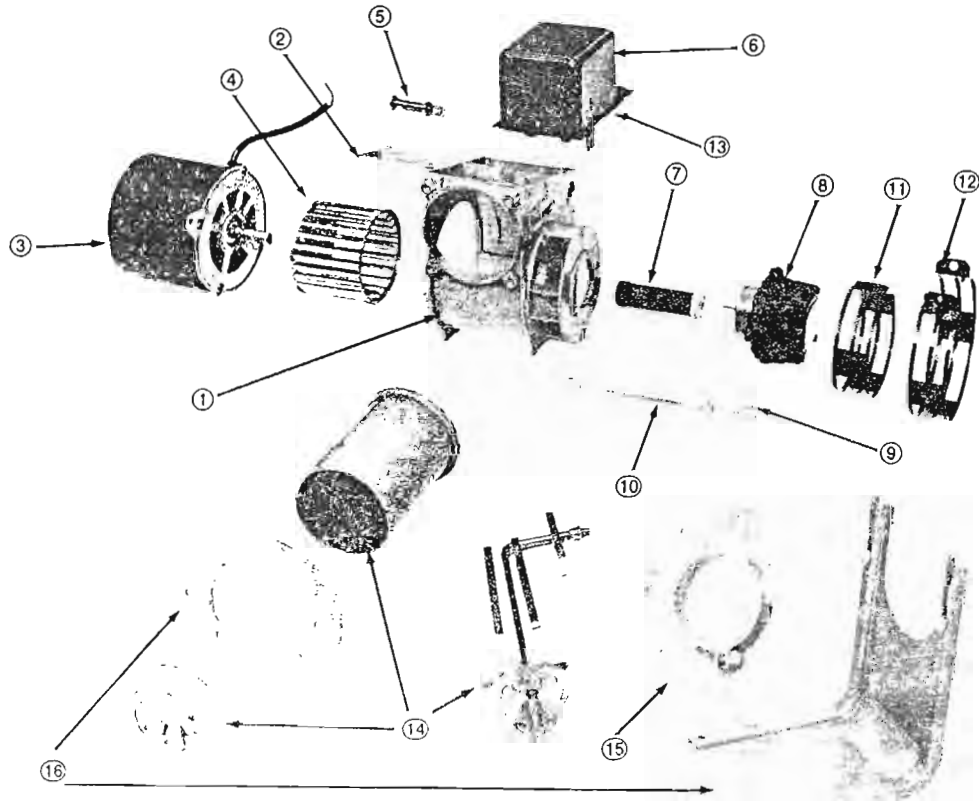


Figure 4



BURNER COMPONENTS MODEL EG-1



STATE BURNER MODEL, PART DESCRIPTION AND PART NUMBER WHEN ORDERING PARTS

NO.	DESCRIPTION	PART NO.
1	BURNER HOUSING	31330-030
2	JUNCTION BOX	21419-SER
3	MOTOR 1/8 H.P.	20327
4	BLOWER WHEEL	21427
5	MOTOR CORD COVER	13029
6	TRANSFORMER	21659
7	COUPLING-SMALL PUMP	13424
8	FUEL UNIT MODEL-A	13495
	FUEL UNIT MODEL-B	13634
9	OUTLET FITTING	13494
10	OIL LINE ASSEMBLY	14451
11	INNER AIR BAND	21917-001
12	OUTER AIR BAND-8 HOLE	21918-001
12A	OUTER AIR BAND-4 HOLE	21921-001
13	HOUSING COVER ASSY.	21908-001

NO.	DESCRIPTION	PART NO.
14	AIR TUBE & GUN ASSY. COMBINATION	*
15	ADJUSTABLE FLANGE	21724-001
16	PEDESTAL MOUNT	2794-011

* SPECIFY AIR TUBE & GUN ASSY. COMBINATION PART NUMBER SEE PAGE 5.

Suggested Combustion Chamber Dimensions Conversion or Upgrading Chamber Dimensions (In Inches)					
Firing Rate (G.P.H.)	Square Width	Square Length	Round	Height	Floor to Nozzle
.50	7	7	8	11	5-6
.75	8	8	9	12	5-6
.85	8½	8½	9	12	5-6
1.00	9	9	10⅞	12½	5-6
1.25	10	10	11¼	12½	5-6
1.35	10½	10½	11¾	12¾	5-6
1.50	11	11	12⅝	13	5-6
1.65	11½	11½	13	13¼	5-6
2.00	12⅝	12⅝	14¼	13½	6-7
2.50	14¼	14¼	16	14	7-8