

**! WARNING READ CAREFULLY FOR PROPER INSTALLATION & OPERATION**

### IMPORTANT INFORMATION ABOUT THE HEATER

Do not connect unit to electricity until the following steps have been completed. Never operate heater in air (verify heater is full of coolant and properly plumbed). The owner must read and follow all operating instructions.

### INSTALLATION RECOMMENDATIONS

1. Drain and thoroughly flush cooling system.
2. For engines with block drains: remove block drain plug and replace with hose barb (Fig A). Use thread sealant on thread connections.

**NOTICE** For engines without block drains or where inaccessible, a lower radiator hose saddle clamp (not included) may be used to connect the lower radiator hose to the tank heater inlet.

3. Mount heater as shown in Fig. C. In a vertical position, attach the heater as low as possible to the vehicle frame or other suitable area. Heater should be below the lowest level of the engine water jacket and the heater intake must be below the point where coolant is removed from the engine.
4. Install the shortest possible length of 5/8" heater hose between the block drain hose barb **or** lower radiator hose saddle clamp and heater inlet. Use the provided hose clamps. **INLET CONNECTION IS NOW COMPLETE.**
5. Hose for coolant return from heater outlet to engine should be plumbed to a point in the upper portion of the water jacket. (Fig. C). For proper operation, **DO NOT** connect return line to engine above upper coolant level. If no opening is available, install into heater hose entering cylinder head as shown in Fig. D. The "Y" fitting must be installed as shown in Fig. B.

**NOTICE** *If a vacuum or manual heater valve exist in this line it may be necessary to install the "Y" fitting in the other hose, in the opposite direction from Fig. B.*

Connect 5/8" heater hose to **outlet** fitting of heater (hose not included) using clamps provided. Route hose as directly as possible to engine (Fig. C). Route hose **around, not over** engine, and **below** the radiator water level. Tighten clamps. **OUTLET CONNECTION IS NOW COMPLETE.**

6. Refill cooling system. Start engine and run for about 10 minutes to eliminate airlocks and ensure proper circulation. Shut off engine. Check for leaks. Re-tighten hose clamps where necessary. Let engine cool. Check coolant level, add if necessary.
7. Fasten cord at intervals with tape or wire ties to avoid contact with all hot or moving parts.
8. Check heater for proper installation. Plug into properly grounded 120V AC outlet. Check at regular intervals (up to an hour) by feeling the top and bottom hoses. The top hose should be warm and the bottom hose relatively cool. If the bottom hose becomes very warm before the entire system, the coolant is not circulating.

**NOTICE** Heater is equipped with an internal thermostat. Coolant temperature may need to be less than 80°F for the heater to switch (depending on thermostat range).

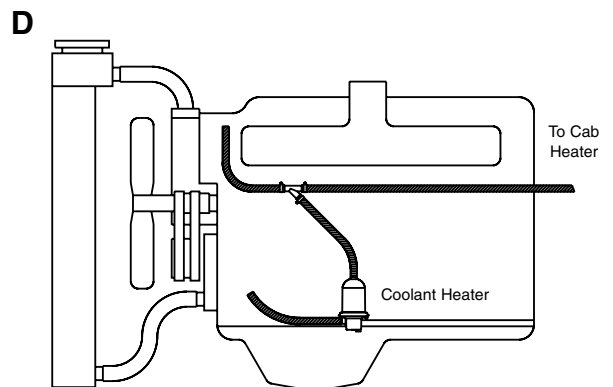
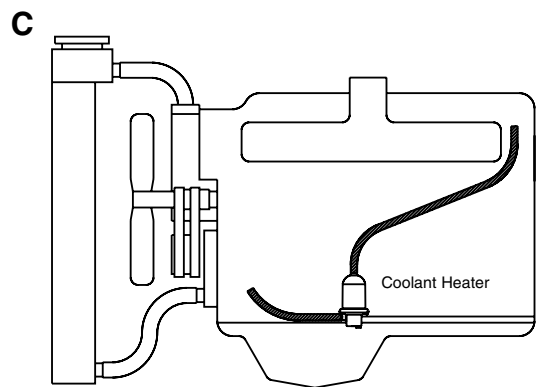
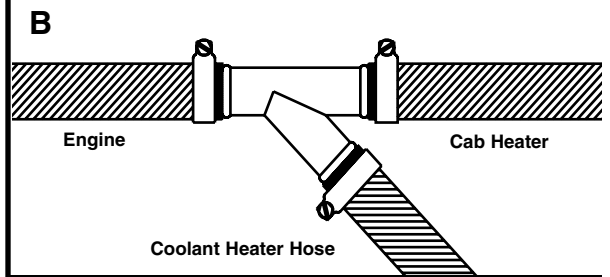
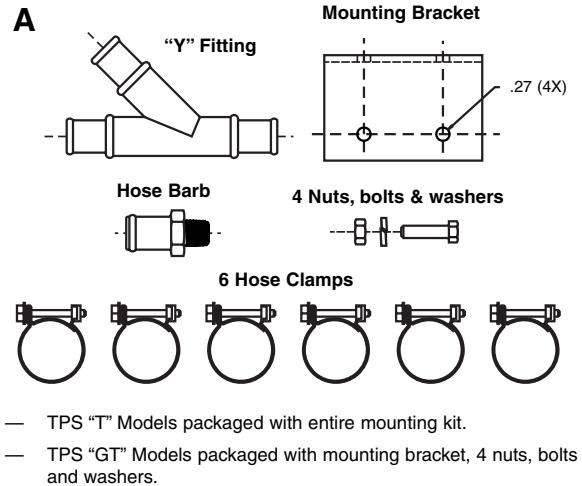
### IN CASE OF NO CIRCULATION, LOOK FOR:

- |                                |                                   |
|--------------------------------|-----------------------------------|
| 1. Unit mounted too high       | 4. Airlock due to loop in hose    |
| 2. Too much tilt               | 5. Closed vacuum valve            |
| 3. Contaminated cooling system | 6. Coolant temperature over 100°F |

### HEATER OPERATION

#### To ensure safe operation and optimum performance:

- Fill cooling system with fresh antifreeze and water.
- Connect plug to properly grounded 120V AC outlet.



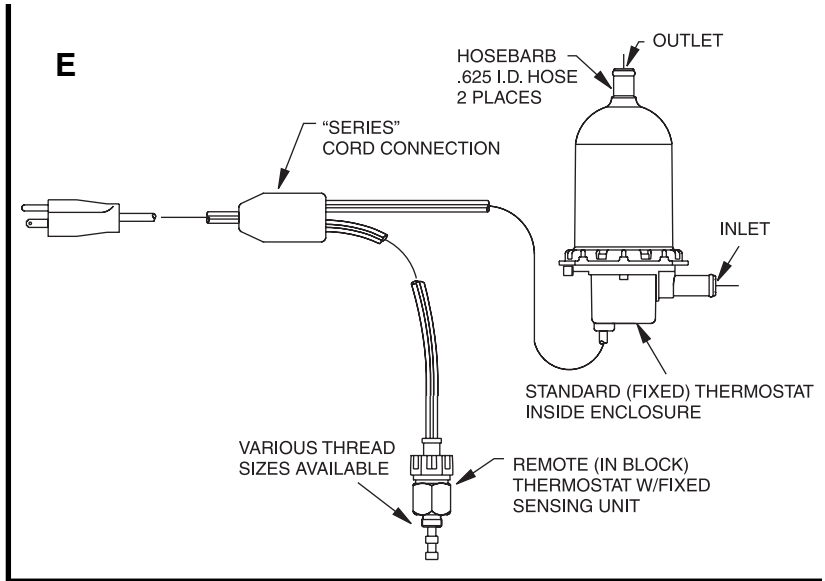
# OPTIONAL THERMOSTAT CONTROLS (INSTALLATION RECOMMENDATIONS)

Figures E, F, and G show TPS heaters with available options for coolant temperature control. When one of these options is present, the standard fixed thermostat inside the heater functions as a Hi-Limit and opens at 140°F. The optional control is then used to control engine temperatures. The table below shows the thermostats available for these controls.

ON Temperature	OFF Temperature	Maximum Amperage/Voltage
60°F	80°F - Fixed Setting	15amp/120v - 10amp/240v
80°F	100°F - Fixed Setting	15amp/120v - 10amp/240v
100°F	120°F - Fixed Setting	15amp/120v - 10amp/240v
20°F below "OFF" temperature	Adjustable from 90°F to 130°F	25amp/120v through 240v

## Threaded Thermostat Housings

Figure E shows a threaded thermostat housing (often referred to as a "remote" thermostat) which can be used with the fixed thermostats from the table above. This option features an aluminum thermostat well which can be threaded into an available engine block opening immersing it directly in the coolant. The thermostat wells are available in a variety of thread specifications. These thermostats should be located at the opposite end of the engine relative to where the heated coolant is going in (or as far away as possible).



## Inline Thermostat Housings

Figures F and G show two inline options designed for placement in the hose between the engine and the inlet to the heater. The housing shown in Figure F is available with the same fixed thermostats used in the remote housings. The housings shown in Figure G contain the adjustable thermostat shown in the table above. Both of these options are designed such that rigid mounting is not required.

It is recommended that a short piece of hose (6" to 8") be placed between the adjustable housing and the rigidly mounted TPS heater to prevent vibration. If the adjustable housing is placed at a greater distance from the heater, it may be necessary to secure the hose with tie straps somewhere near the housing. To adjust the thermostat setpoint, disconnect power and remove the enclosure cover (a dial indicator displays the available settings from 90 to 130°F).

