

INSTALLATION INSTRUCTIONS

Original Issue Date: **9/97**

Model: **6/10/15ROY/ROZ**

Market: **Industrial**

Subject: **Block Heater Kits PA-225450, PA-225451, PA-225452, PA-225453**

The engine block heater kit heats engine coolant, making starting easier and warm-up quicker. The thermostat (built into the base of the block heater) automatically turns off the heater when coolant temperature reaches 80-100° F (26-38° C). Observe the following safety precautions while installing the kit.

| Model | Voltage | Kit No. |
|-------------|---------|-----------|
| 6/10ROY/ROZ | 120 | PA-225450 |
| 15ROY/ROZ | 120 | PA-225451 |
| 6/10ROY/ROZ | 240 | PA-225452 |
| 15ROY/ROZ | 240 | PA-225453 |



⚠ WARNING

Accidental starting.
Can cause severe injury or death.

Disconnect battery cables before working on generator set. (Remove negative (–) lead first when disconnecting battery. Reconnect negative (–) lead last when reconnecting battery.)

Disabling generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: 1) Turn the generator set master switch to OFF position. 2) Disconnect power to battery charger. 3) Remove battery cables (remove negative (–) lead first). Reconnect negative (–) lead last when reconnecting battery. Follow these precautions to prevent starting of generator set by an automatic transfer switch or remote start/stop switch.

⚠ WARNING



Hot coolant and steam.
Can cause severe injury or death.

Before removing pressure cap, stop generator set and allow it to cool. Then loosen pressure cap to relieve pressure.

Checking coolant level. Hot coolant can cause severe injury or death. Allow engine to cool. Release pressure from cooling system before opening pressure cap. To release pressure, cover the pressure cap with a thick cloth; then slowly turn it counterclockwise to the first stop. Remove cap after pressure has been completely released and the engine has cooled. Check coolant level at tank if generator set is equipped with a coolant recovery tank.

NOTE

Pay special attention to the coolant level. After draining the coolant, allow time for complete refill of the engine water jacket. Check coolant level as prescribed in the Prestart Checklist of the Operation Manual.

NOTE

Do not turn on block heater before filling cooling system. Run engine until warm and refill radiator to purge air from the system before energizing block heater. If heater element is not immersed in water, block heater will fail.

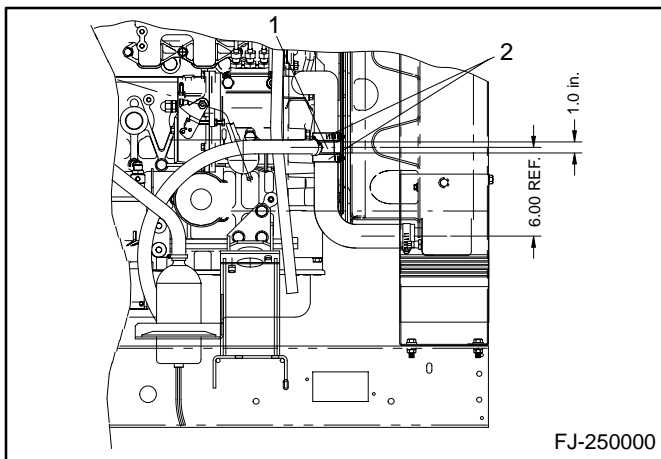
Installation

1. Place the generator set master switch in the OFF position.
2. Disconnect generator set engine starting battery, negative (-) lead first.
3. When engine and radiator have cooled, drain the coolant into a suitable container. Dispose of all waste materials, (engine oil, fuel, coolant, etc.) in an environmentally safe manner. Contact your local authority for procedures and location.

NOTE

Drain valve is located on the radiator bottom and/or on the side of the engine crankcase.

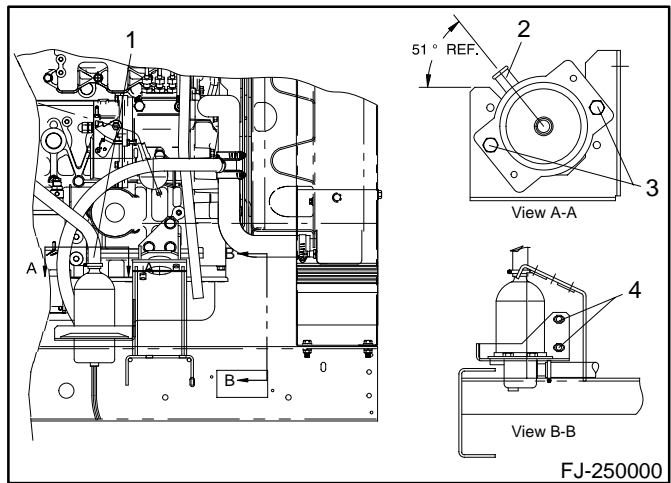
4. Cut away a 1 in. (25 mm) section of lower radiator hose at 6 in. (152 mm) from hose bottom end. See Figure 1.
5. Install hose connector (225250) in hose and secure connector using two hose clamps (X-426-8). Position hose connector as shown in Figure 1.



1. Hose connector (225250)
2. Hose clamp (X-426-8)

Figure 1. Lower Radiator Hose

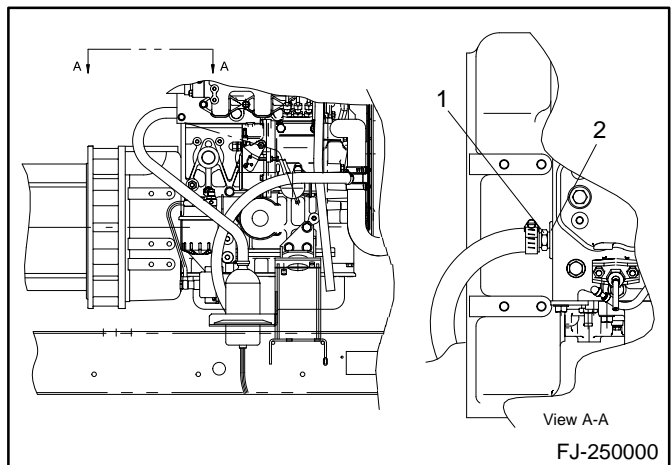
6. Secure block heater (352945 or 352946) to block heater mounting bracket (225499) using screws (X-465-16), plain washers (X-25-40), and whiz nuts (X-6210-2). Position block heater as shown in Figure 2.
7. Secure block heater and mounting bracket to generator set skid using screws (X-125-31), plain washers (X-25-85), and spirallock nuts (X-6210-7). See Figure 2.



1. Block heater outlet
2. Block heater inlet
3. Screws (X-465-16), washers (X-25-40), and nuts (X-6210-2)
4. Screws (X-125-31), washers (X-25-85), and nuts (X-6210-7)

Figure 2. Block Heater Mounting

8. Secure one end of hose (X-312-35) to hose connector in lower radiator hose using hose clamp (X-426-10). Place hose clamp 0.25 in. (6 mm) from hose end and tighten.
9. Connect opposite end of hose connected to lower radiator hose to block heater inlet. Secure hose to inlet with hose clamp (X-426-10). Place hose clamp 0.25 in. (6 mm) from hose end and tighten.
10. Remove freeze plug from rear of engine. See Figure 3.

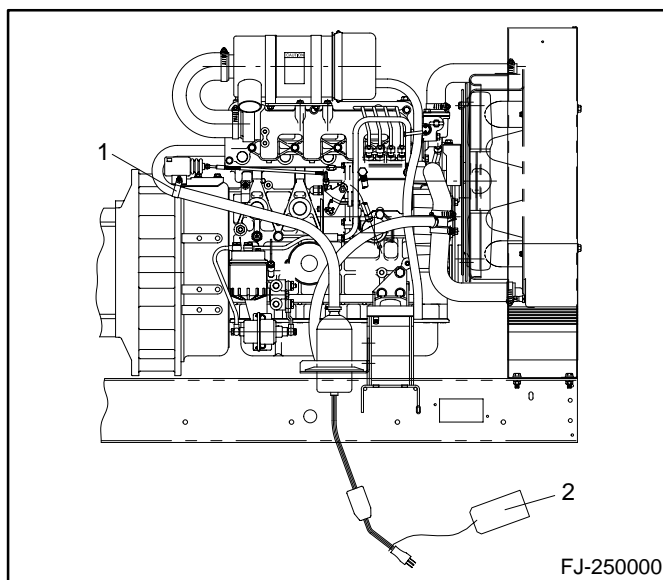


1. Hose connector (X-582-2)
2. Freeze plug (226351)

Figure 3. Freeze Plug Location

11. Remove any foreign material from the freeze plug hole.

12. Apply perma-lok HH-120 to both the hole and freeze plug (226351) and install in hole.
13. Install hose connector (X-582-2) in freeze plug. Torque hose connector to 15 ft. lbs. (20 Nm).
14. Secure one end of hose (X-312-24 or X-312-53) to block heater outlet using hose clamp (X-426-10). Place hose clamp 0.25 in. (6 mm) from hose end and tighten.
15. Connect opposite end of hose connected to block heater outlet to hose connector installed in the rear of the cylinder head. Secure hose to inlet with hose clamp (X-426-10). Place hose clamp 0.25 in. (6 mm) from hose end and tighten.
16. **15ROY/ROZ:** Secure upper part of outlet hose using clamp (X-672-30). See Figure 4 for location.
17. Tie hang tag (279047) to block heater power cord. See Figure 4.



1. Clamp (X-672-30)
2. Hang tag (279047)

Figure 4. Block Heater Installation (15 kW shown)

18. Close drain valve(s) on radiator and/or engine block.
19. Fill cooling system to proper level with fresh coolant consisting of a mixture of 50% ethylene glycol and 50% clean, softened water. This mixture provides the necessary freeze protection as well as inhibit corrosion. See specification sheet for cooling system capacities.

NOTE

Coolant mixtures exceeding 50% ethylene glycol may cause the block heater heating element to fail.

20. Check that the generator master switch is in the OFF position.
21. Reconnect the generator set engine starting battery, negative (–) lead last. Reconnect power to the battery charger, if equipped.
22. Test run generator set for a few minutes to check for coolant leaks and to purge air from the system.
23. Stop generator set. Correct any leakage after allowing engine and radiator to cool.

NOTE

Failure to purge trapped air may cause block heater element to fail.

24. Recheck coolant level. After draining the cooling system, allow some time for all air cavities in the system to refill. Add coolant as necessary.
25. Connect block heater electrical plug to correct voltage outlet.

Block Heater Kits

| Parts List | | | | | | |
|--|--------------------------------|--------------|--------------|-----------|-----------|-----------|
| Kits: PA-225450, PA-225451, PA-225452, PA-225453 | | | Unique Parts | | | |
| Qty. | Description | Common Parts | PA-225450 | PA-225451 | PA-225452 | PA-225453 |
| 4 | Washer, plain (o.d.= 0.625) | X-25-40 | | | | |
| 2 | Washer, plain (o.d. = 0.687) | X-25-85 | | | | |
| 2 | Screw, h.c. 5/16-18 x 0.875 | X-125-31 | | | | |
| 1 | Hose, 30.0 in. (762 mm) | | | X-312-24 | | X-312-24 |
| 1 | Hose, 28.0 in. (711 mm) | X-312-35 | | | | |
| 1 | Hose, 24.0 in. (610 mm) | | X-312-53 | | X-312-53 | |
| 2 | Clamp, hose | X-426-8 | | | | |
| 4 | Clamp, hose | X-426-10 | | | | |
| 4 | Screw, h.c. 1/4-20 x 0.750 in. | X-465-16 | | | | |
| 2 | Tie, cable | X-468-1 | | | | |
| 1 | Connector, hose | X-582-2 | | | | |
| 1 | Clamp, insulated | | | X-672-30 | | X-672-30 |
| 4 | Nut, whiz 1/4-20 | X-6210-2 | | | | |
| 2 | Nut, spiralock 5/16-18 | X-6210-7 | | | | |
| 1 | Connector, hose | 225250 | | | | |
| 1 | Bracket, block heater | 225499 | | | | |
| 1 | Plug, freeze | 226351 | | | | |
| 1 | Tag, hang | 279047 | | | | |
| 1 | Heater, block | | 352945 | 352945 | 352946 | 352946 |