
INSTALLATION INSTRUCTIONS

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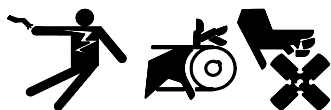
Model: **20-60REOZJ**

Market: **Industrial**

Subject: **Engine Block Heater Kits PA-352585 and PA-352586**

The engine block heater kit heats engine coolant, making starting easier and warm-up quicker. The thermostat automatically turns off the heater when coolant temperature reaches 120°F (49°C). Observe the following safety precautions while installing the kit.

⚠ 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.

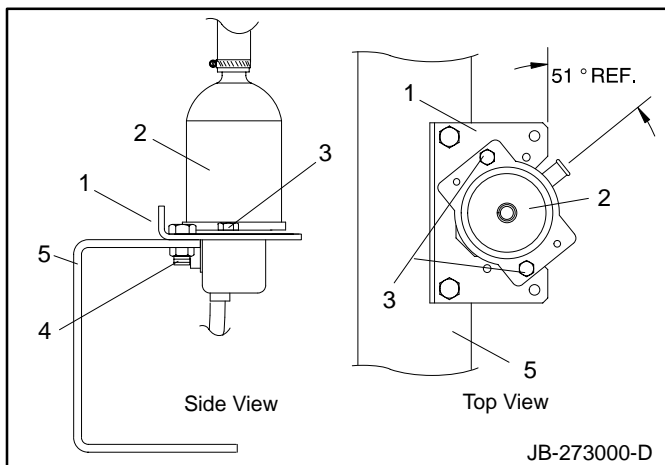
Installation

1. Place the generator set master switch in the OFF position.
2. Disconnect power to battery charger, if equipped.
3. Disconnect the generator set engine starting battery, negative (–) lead first.
4. With engine and radiator cool, drain the coolant into a suitable container. Dispose of all waste materials, (engine oil, fuel, coolant, etc.) in an environmentally safe manner. Contact local authority for procedures.

NOTE

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

5. Secure block heater (326228 or 326229) to block heater bracket using hex cap screws (X-465-16), plain washers (X-25-40), and whiz nuts (X-6210-2). See Figure 1.



1. Block heater mounting bracket (326219)
2. Block heater (326228 or 326229)
3. Hex cap screws (X-465-16), plain washers (X-25-40), and whiz nuts (X-6210-2)
4. Hex cap screws (X-6238-3) and nuts (X-6210-9)
5. Skid rail

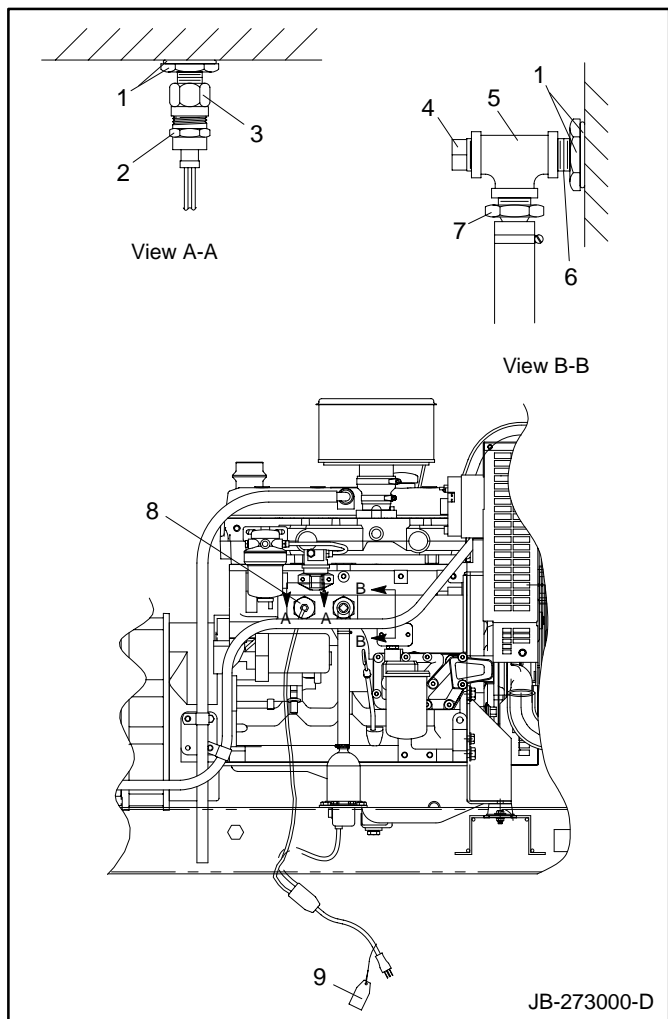
Figure 1. Engine Block Heater

6. Secure block heater assembly to generator set skid using hex cap screws (X-6238-3) and spirallock nuts (X-6210-9). See Figure 2 for mounting location.
7. Remove plug from engine block for thermostat installation. See Figure 2 for plug location.

NOTE

Apply pipe sealant to male threads of all components before installation.

8. Install O-ring (273693) onto water temperature sender adapter (273692).
9. Apply pipe sealant to threads of water temperature sender adapter and install adapter where plug was removed from engine block.
10. Apply pipe sealant to threads of thermostat housing and install housing in water temperature sender adapter. Torque thermostat housing to 15 ft. lbs. (20 Nm).
11. Install thermostat into thermostat housing. Torque thermostat collar to 25 in. lbs. (3 Nm) and hold for 3 seconds.



1. Water temperature sender adapter (273692) and O-ring (273693)
2. Thermostat collar
3. Thermostat housing torque to 15 ft. lbs. (20 Nm)
4. Pipe plug (X-75-28) or low water temperature sender if generator set has anticipatory alarm kit
5. Pipe tee (X-203-13)
6. Pipe nipple (X-209-2)
7. Hose connector (X-582-1)
8. Thermostat
9. Hang tag (279047)

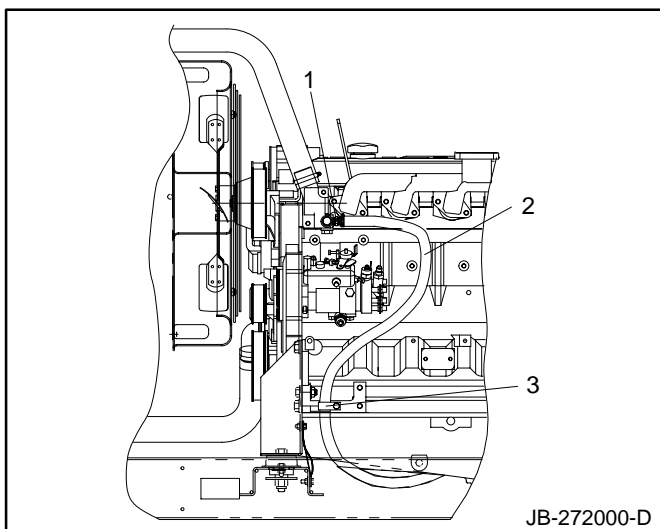
**Figure 2. Engine Block Heater
Installation—Generator Right Side**

12. Remove plug from engine block for block heater outlet hose installation. See Figure 2 for plug location. Generator sets equipped with an anticipatory alarm kit already have plug removed and water temperature sender adapter installed. For generator sets equipped with anticipatory alarm kit, go to step 15.
13. Install O-ring (273693) onto water temperature sender adapter (273692).
14. Apply pipe sealant to threads of water temperature sender adapter and install water temperature sender adapter (273692) into engine block where plug was removed in step 12.

15. Remove low water temperature sender from engine, if equipped with anticipatory alarm kit.
16. Apply pipe sealant to threads of pipe nipple (X-209-2) and install pipe nipple in water temperature sender adapter.
17. Apply pipe sealant to exposed threads of pipe installed in step 14 and install pipe tee (X-203-13). Final position pipe tee as shown in Figure 2.
18. Apply pipe sealant to the male threads of pipe plug (X-75-28) and install pipe plug in the end of pipe tee. For generator sets equipped with an anticipatory alarm kit, apply pipe sealant to threads of low water temperature sender removed in step 15 and install sender in the end of pipe tee. See Figure 2.
19. Apply pipe sealant to the threads of hose connector (X-582-1) and install connector in pipe tee. See Figure 2.
20. Connect 11.5 in. (292 mm) hose (X-312-16) to hose connector installed in step 19.
21. Secure hose to hose connector with hose clamp (X-426-10). Place hose clamp 0.25 in. (6 mm) from hose end and tighten.
22. Connect opposite end of hose connected in step 20 to block heater outlet.
23. Secure hose to block heater outlet with hose clamp (X-426-10). Place hose clamp 0.25 in. (6 mm) from hose end and tighten.
24. Remove plug from engine block for block heater inlet hose connection. See Figure 3 for location.
25. Apply pipe sealant to threads of hose connector (X-582-1) and install hose connector where pipe plug was removed in step 24.
26. Connect 49 in. (1244 mm) hose (X-312-37) to hose connector installed in step 25.
27. Secure hose to hose connector with hose clamp (X-426-10). Place hose clamp 0.25 in. (6 mm) from hose end and tighten.
28. Route hose to block heater inlet as shown in Figure 3.
29. Connect opposite end of hose connected in step 26 to block heater inlet.
30. Secure hose to block heater inlet with hose clamp (X-426-10). Place hose clamp 0.25 in. (6 mm) from hose end and tighten.
31. Secure block heater inlet hose to engine block with insulating clamp (X-672-3) and hex head cap screw (X-6052-1). See Figure 3.
32. Secure hang tag (279047) to power cord. See Figure 2.
33. Close all coolant drain valves on radiator and/or engine block.
34. Fill cooling system with fresh coolant consisting of a mixture of 50% ethylene glycol and 50% clean, softened water. This mixture provides the necessary freeze protection and inhibits corrosion.

NOTE

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



1. Hose connector (X-582-1)
2. Hose (X-312-37)
3. Insulating clamp (X-672-3) and hex head cap screw (X-6052-1)

Figure 3. Generator Set Left Side

35. Check that the generator master switch is in the OFF position.
36. Reconnect the generator set engine starting battery, negative (–) lead last. Reconnect power to battery charger, if equipped.
37. Connect block heater to main power source.
38. Test run generator set for a few minutes to check for coolant leaks and to purge air from the system.
39. Stop generator set.
40. Check and correct any leakage after the engine and radiator have cooled.

NOTE

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

41. Recheck coolant level after allowing engine and radiator to cool. After draining the cooling system, allow time for all air cavities to refill in the system. Add coolant as necessary.

Block Heater

Parts List				
Kits: PA-352585, PA-352586			Unique Parts	
Qty.	Description	Common Parts	PA-352585	PA-352586
4	Washer, plain (o.d. 0.625)	X-25-40		
1	Plug, pipe 1/2"	X-75-28		
1	Tee, pipe 1/2"	X-203-13		
1	Nipple, pipe 1/2 x 1-3/16	X-209-2		
1	Hose, 5/8 x 11.5"	X-312-16		
1	Hose, rubber 5/8 x 49"	X-312-37		
4	Clamp, hose	X-426-10		
4	Screw, hex cap 1/4-20 x 0.75	X-465-16		
1	Tie, cable	X-468-1		
2	Connector, hose		X-582-1	X-582-2
1	Clamp, insulating	X-672-3		
1	Screw, hex head cap M12-1.75 x 0.787	X-6052-1		
4	Nut, whiz 1/4-20	X-6210-2		
2	Nut, spiralock 3/8-16	X-6210-9		
2	Screw, hex cap 3/8-16 x 0.875	X-6238-3		
2	Adapter, water temp sender*	273692		
2	O-ring*	273693		
1	Tag, hang	279047		
1	Bracket, block heater mounting	326219		
1	Heater, block		326228	326229

* Components not used when installing kit on generator set equipped with an anticipatory alarm kit.