
INSTALLATION INSTRUCTIONS

Original Issue Date: 4/97

Model: 80/100ROZJ

Market: Industrial

Subject: Engine Block Heater Kits PA-336182 and PA-336183

Introduction

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 495C (1205F).

Read the entire installation procedure and compare the kit parts with the parts list at the end of this publication before beginning installation. Perform the steps in the order shown.

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

Disabling the 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) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

⚠ WARNING

<p>Hot coolant and steam. Can cause severe injury or death.</p> <p>Before removing the pressure cap, stop the generator set and allow it to cool. Then loosen the pressure cap to relieve pressure.</p>

Safety Precautions

Observe the following safety precautions while installing the kit.

⚠ WARNING

<p>Accidental starting. Can cause severe injury or death.</p> <p>Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery.</p>

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

Installation Procedure

1. Place the generator set master switch in the OFF position.
2. Disconnect the power to the battery charger, if equipped.
3. Disconnect the generator set engine starting battery(ies), negative (-) lead first.

Note: The drain valve is located on the radiator bottom and/or on the side of the engine crankcase.

4. Allow the engine and radiator to 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 authorities for correct procedures.

Note: Apply pipe sealant to the male threads of all components before installing components.

5. Secure block heater (326228 or 326229) and block heater mounting bracket (326219) to the generator set skid with screws (X-6238-3) and nuts (X-6210-9). See Figure 1.
6. Remove and discard the top fan guard cover plate for thermostat installation.
7. Remove the pipe plug for thermostat installation. See Figure 1 for location.
8. Apply pipe sealant to the threads of the thermostat housing and install where the pipe plug was removed in step 7. Torque the thermostat housing to 20 Nm (15 ft. lb.).
9. Install the thermostat into the thermostat housing. Torque the thermostat to 3 Nm (25 in. lb.) and hold for 3 seconds.
10. Route the thermostat wiring along the radiator hose. Secure the thermostat wiring to the radiator hose with cable ties (X-468-4).
11. Remove the low water temperature switch from the rear of the engine, if equipped, with the anticipatory alarm kit or pipe plug for outlet hose connection. See Figure 1.
12. Apply pipe sealant to the threads of reducer bushing (X-202-1) and install in the engine where the low water temperature switch or the pipe plug was removed.
13. Apply pipe sealant to the threads of pipe nipple (X-206-6) and install in the reducer bushing.

14. Apply pipe sealant to the exposed threads of the pipe nipple and install elbow (SA-472).
15. Apply pipe sealant to the threads of the low water temperature switch removed in step 11 or pipe plug (X-75-28) and install in pipe tee (X-203-6).
16. Apply pipe sealant to the threads of the elbow and install pipe tee (X-203-6).
17. Apply pipe sealant to the threads of the hose connector (X-582-3) and install in the pipe tee.
18. Connect hose (X-312-50) to the hose connector. Secure the hose to the connector with hose clamp (X-426-10). Place the hose clamp 6 mm (0.25 in.) from the hose end and tighten.
19. Connect the opposite end of the hose to the block heater outlet. Secure the hose to the block heater outlet with hose clamp (X-426-10). Place the hose clamp 6 mm (0.25 in.) from the hose end and tighten.
20. Remove the existing drain valve from the engine. See Figure 1 for location.
21. Apply pipe sealant to the threads of pipe nipple (X-220-14) and install in the engine where the drain valve was removed.
22. Apply pipe sealant to the exposed threads of the pipe nipple and thread pipe tee (A-110) onto the pipe nipple.
23. Apply pipe sealant to the threads of the drain valve removed in step 20 and install in the end of the pipe tee. See Figure 1.
24. Apply pipe sealant to the threads of hose connector (X-582-22) and install in the pipe tee. See Figure 1.
25. Connect hose (X-312-51) to the hose connector. Secure the hose to the connector with hose clamp (X-426-10). Place the hose clamp 6 mm (0.25 in.) from the hose end and tighten.
26. Connect the opposite end of the hose installed in step 25 to the block heater inlet. Route the hose under the engine as shown in Figure 1. Secure the hose to the block heater inlet with hose clamp (X-426-10). Place the hose clamp 6 mm (0.25 in.) from the hose end and tighten.
27. Secure hang tag (279047) to the power cord. See Figure 1.
28. Coil the excess thermostat wiring at the block heater and secure to the block heater hose using cable ties (X-468-1).

29. Close all coolant drain valves on the radiator and/or the engine block.
30. Fill the 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 heating element to fail.
31. Check that the generator set master switch is in the OFF position.
32. Reconnect the generator set engine starting battery, negative (-) lead last.

33. Reconnect power to the battery charger, if equipped.
34. Connect the block heater to the main power source.
35. Test run the generator set for a few minutes to check for coolant leaks and to purge air from the system. Stop the generator set. After the engine and radiator have cooled, correct any leakage.

Note: Failure to purge trapped air may cause block heater element to fail.
36. Recheck the coolant level after allowing the engine and radiator to cool. After draining the cooling system, allow some time for all air cavities to refill in the system. Add coolant as necessary.

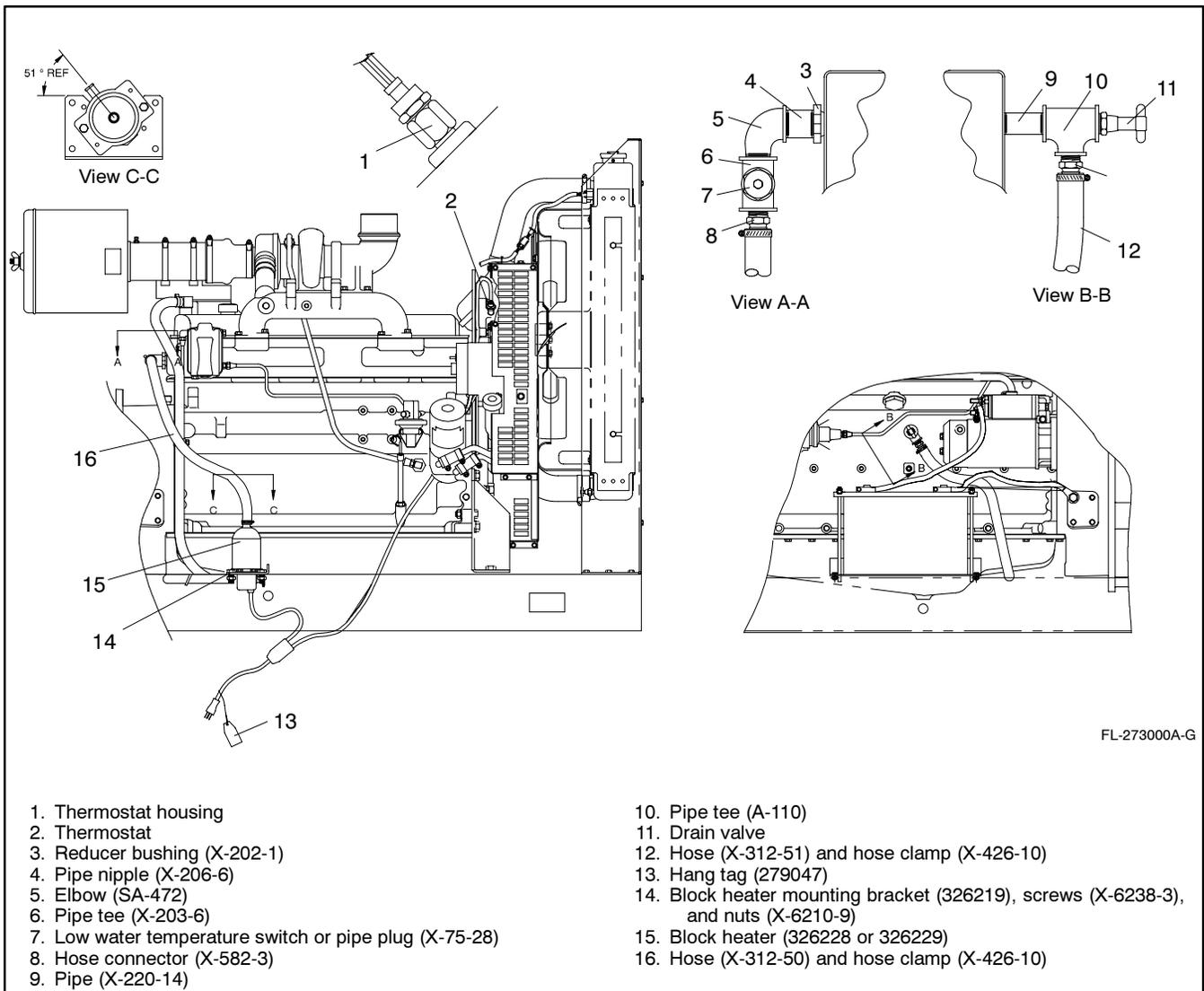


Figure 1 Block Heater Installation

Parts List

Block Heater Kit

Kits: PA-336182, PA-336183				
Qty.	Description	Common Parts	Unique Parts	
			PA-336182	PA-336183
1	Tee, pipe	A-110		
1	Elbow	SA-472		
4	Washer, plain	X-25-40		
1	Plug, pipe	X-75-28		
1	Bushing, reducer	X-202-1		
1	Tee, pipe, 3/4 x 3/4 x 1/2	X-203-6		
1	Nipple, pipe, 3/4 x 3 1/2	X-206-6		
1	Pipe	X-220-14		
1	Hose	X-312-50		
1	Hose	X-312-51		
4	Clamp, hose	X-426-10		
4	Screw, HC	X-465-16		
3	Tie, cable	X-468-1		
1	Connector, hose	X-582-22		
1	Connector, hose	X-582-3		
4	Nut, whiz	X-6210-2		
2	Nut, spiralock	X-6210-9		
2	Screw, 3/8-16 x 0.875	X-6238-3		
1	Tag, hang	279047		
1	Bracket, block heater mounting	326219		
1	Heater, block		326228	326229