
INSTALLATION INSTRUCTIONS

Original Issue Date: **4/98**

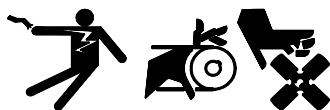
Model: **80/100ROZJ**

Market: **Industrial**

Subject: **Engine Block Heater Kits PA-352487 and PA-352488**

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.

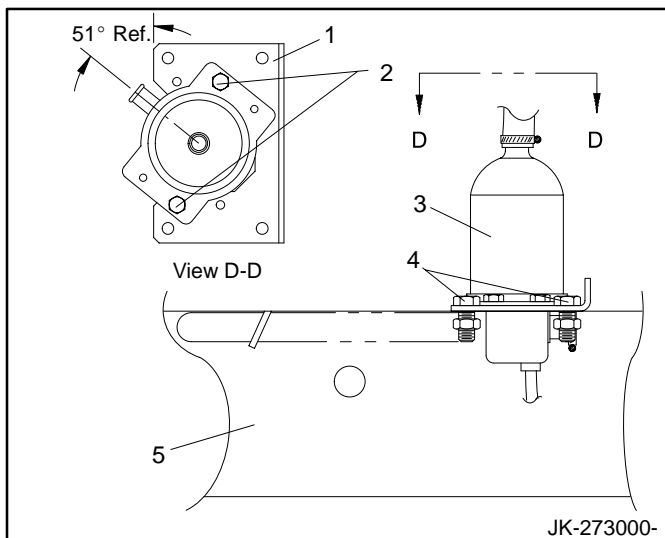
Installation

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.

- Secure block heater (326228 or 326229) to block heater bracket (326219) using hex cap screws (X-465-16), plain washers (X-25-40), and whiz nuts (X-6210-2). See Figure 1.



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

Figure 1. Engine Block Heater

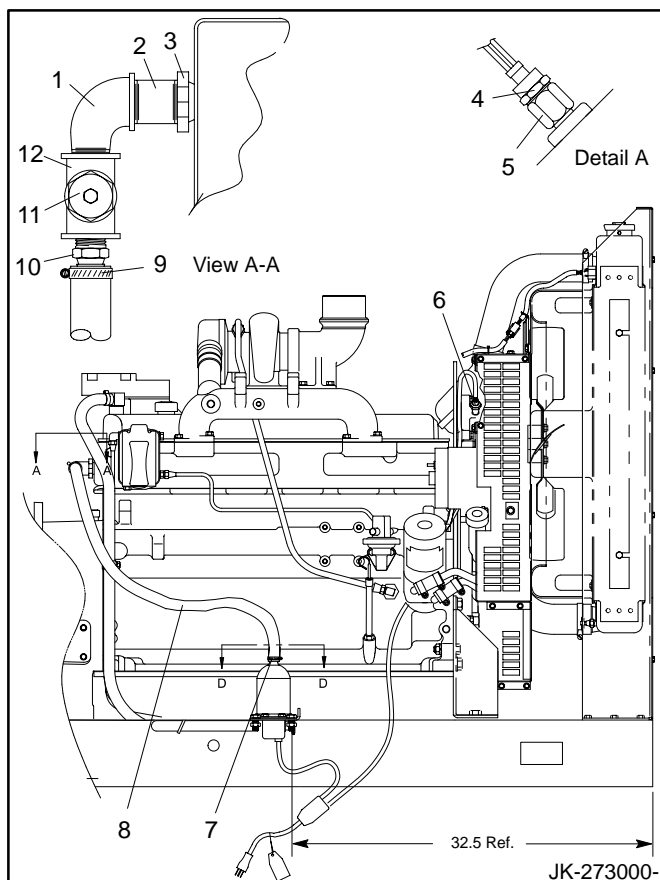
- Secure block heater assembly to generator set skid using hex cap screws (X-6238-3) and spirallock nuts (X-6210-9). See Figure 2 for mounting location.
- Remove and discard cover plate from belt guard for thermostat installation.
- Remove plug for thermostat installation. See Figure 2 for plug location.

NOTE

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

- Apply pipe sealant to threads of thermostat housing and install where pipe plug was removed. Torque thermostat housing to 15 ft. lbs. (20 Nm). See Figure 2.
- Install thermostat into thermostat housing. Torque thermostat collar to 25 in. lbs. (3 Nm) and hold for 3 seconds. See Figure 2.
- Remove low water temperature sender from rear of engine, if generator set is equipped with a prealarm kit. If generator set is not equipped with a prealarm kit remove pipe plug. See Figure 2 for location. Save water temperature sender reinstallation later.

- Apply pipe sealant to the male threads of reducer bushing (X-202-1) and install reducer bushing where low water temperature sender was removed.
- Apply pipe sealant to the male threads on one end of pipe (X-206-6) and install pipe in reducer bushing. See Figure 2.
- Apply pipe sealant to the exposed threads of the pipe installed in step 13.
- Thread elbow (SA-472) onto pipe and position elbow as shown in Figure 2.
- Apply pipe sealant to the male threads of elbow installed in step 15 and install pipe tee (X-203-6). Position pipe tee as shown in Figure 2.
- Apply pipe sealant to the male threads of hose connector (X-582-3) and install hose connector in pipe tee. See Figure 2.



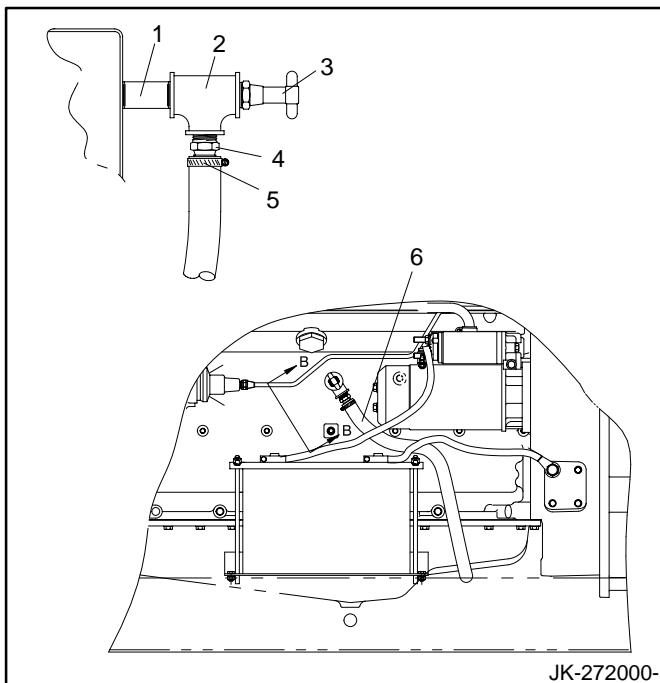
- Elbow (SA-472)
- Pipe 3.5 in. (X-206-6)
- Reducer bushing (X-202-1)
- Thermostat collar
- Thermostat housing
- Thermostat see Detail A
- Hose clamp (X-426-10)
- Hose 2.63 ft. (X-312-15)
- Hose clamp (X-426-10)
- Hose connector (X-582-3)
- Low water temperature switch
- Pipe tee (X-203-6)

Figure 2. Engine Block Heater Installation—Generator Right Side

18. Apply pipe sealant to the threads of the low water temperature sender or pipe plug (X-75-28) and reinstall sender in top of pipe tee. See Figure 2.
19. Slide two hose clamps (X-426-10) onto hose (X-312-15).
20. Connect one end of hose (X-312-15) to hose connector installed in step 17.
21. Secure hose to hose connector with one hose clamp. 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 one hose clamp. Place hose clamp 0.25 in. (6 mm) from hose end and tighten. See Figure 2.
24. Remove drain valve from the engine block on left side of generator set. See Figure 3.
25. Apply pipe sealant to the male threads on one end of pipe (X-220-14) and install pipe in engine block where drain valve was removed. See Figure 3.
26. Apply pipe sealant to the exposed threads of pipe installed in step 25 and install pipe tee (A-110). Position pipe tee as shown in Figure 3.
27. Apply pipe sealant to the threads of drain valve and install in the end of the pipe tee. See Figure 3.
28. Apply pipe sealant to the threads of hose connector (X-582-22) and install in pipe tee. See Figure 3.
29. Slide two hose clamps (X-426-10) onto hose (X-312-13).
30. Connect one end of hose (X-312-13) to hose connector installed in step 28.
31. Secure hose to hose connector with one hose clamp. Place hose clamp 0.25 in. (6 mm) from hose end and tighten.
32. Connect opposite end of hose connected in step 30 to block heater inlet. Route hose from hose connector to block heater as shown in Figure 3.
33. Secure hose to block heater inlet with one hose clamp. Place hose clamp 0.25 in. (6 mm) from hose end and tighten. See Figure 3.
34. Close all coolant drain valves on radiator and/or engine block.
35. 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. Pipe 2.5 in. (X-220-14)
2. Pipe tee (A-110)
3. Drain valve
4. Hose connector (X-582-22)
5. Hose clamp (X-426-10)
6. Hose 3.33 ft. (X-312-13)

Figure 3. Generator Set Left Side

36. Check that the generator master switch is in the OFF position.
37. Reconnect the generator set engine starting battery, negative (–) lead last. Reconnect power to battery charger, if equipped.
38. Connect block heater to main power source.
39. Test run generator set for a few minutes to check for coolant leaks and to purge air from the system.
40. Stop generator set.
41. 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.

42. 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.

Engine Block Heater

Parts List				
Kits: PA-352487, PA-352488			Unique Parts	
Qty.	Description	Common Parts	PA-352487	PA-352488
1	Tee, pipe 1/4 x 1/4 x 1/4	A-110		
1	Elbow, street 3/4	SA-472		
4	Washer, plain	X-25-40		
4	Plug, pipe 1/2	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, 1/4 NPT x 2.5	X-220-14		
1	Hose, 5/8 x 36	X-312-13		
1	Hose, 5/8 x 31 1/2	X-312-15		
4	Clamp, hose	X-426-10		
4	Screw, h.c.	X-465-16		
3	Tie, cable	X-468-1		
1	Connector, hose	X-582-3		
1	Connector, hose	X-582-22		
4	Nut, whiz	X-6210-2		
2	Nut, spiralock	X-6210-9		
2	Screw, 3/8-16 x 7/8	X-6238-3		
1	Tag, hang	279047		
1	Bracket, block heater mounting	326219		
1	Heater, block		326228	326229