

INSTALLATION INSTRUCTIONS

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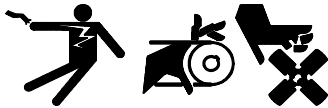
Model: 17/22RY

Market: Industrial

Subject: Engine Block Heater Kits PA-358314 (120V) and PA-358328 (240V)

The engine block heater kit heats the engine coolant, making starting easier. The thermostat automatically turns off the heater when the coolant temperature reaches 100°F (38°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, when filling cooling system, 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. Block heater elements not immersed in water fail.

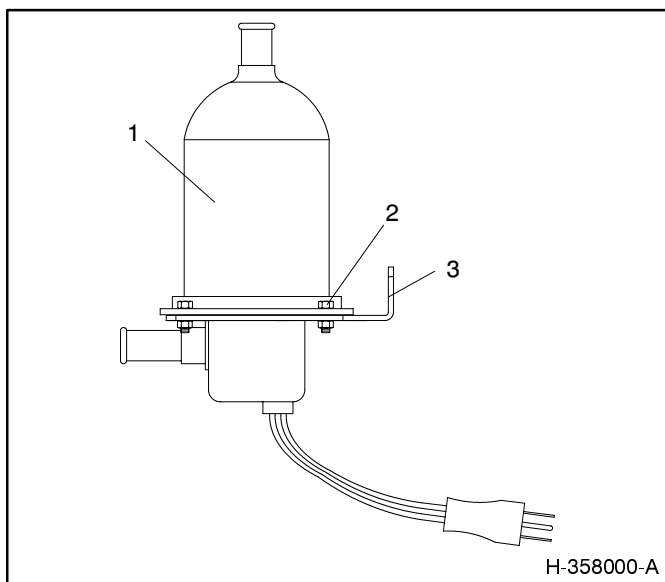
Installation

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 cables, negative (-) lead first.
4. When the engine and radiator are cool, drain the coolant into a container. Dispose of all waste materials (engine oil, fuel, coolant, etc.) in an environmentally safe manner. Contact local authority for disposal procedures.

NOTE

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

5. Secure the block heater (358311 or 358327) to the block heater mounting bracket (326219) using hex cap bolts (X-465-16), plain washers (X-25-40), and nuts (X-6210-2). See Figure 1.



1. Block heater (358311 or 358327)
2. Mounting hardware, bolts (X-465-16), plain washers (X-25-40), and nuts (X-6210-2)
3. Block heater mounting bracket (326219)

Figure 1. Engine Block Heater

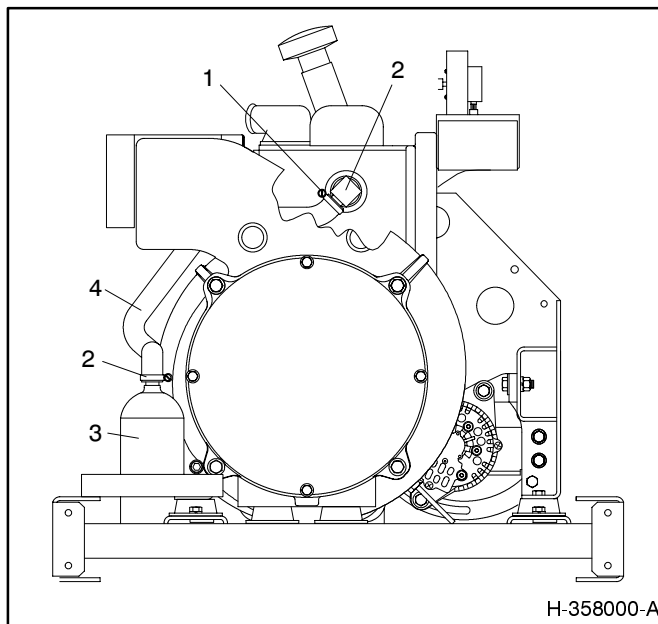
6. Secure the block heater assembly to the generator set skid using hex cap bolts (X-6238-3) and nuts (X-6210-9). See Figure 3 for the mounting location.
7. Remove the pipe plug from the top rear of the engine. See Figure 2 for the location.

NOTE

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

8. Apply pipe sealant to the male threads of the 90° elbow hose connector (X-391-19) and install where the pipe plug was removed in step 7. Position the elbow as shown in Figure 2.
9. Secure one end of the hose (X-577-34) to the elbow hose connector installed in step 8 with the hose clamp (X-426-10). Place the hose clamp 0.25 in. (6 mm) from the hose end and tighten.

10. Route hose from hose connector to block heater outlet as shown in Figure 2.
11. Secure loose end of hose to block heater outlet. Place hose clamp 0.25 in. (6 mm) from hose end and tighten.

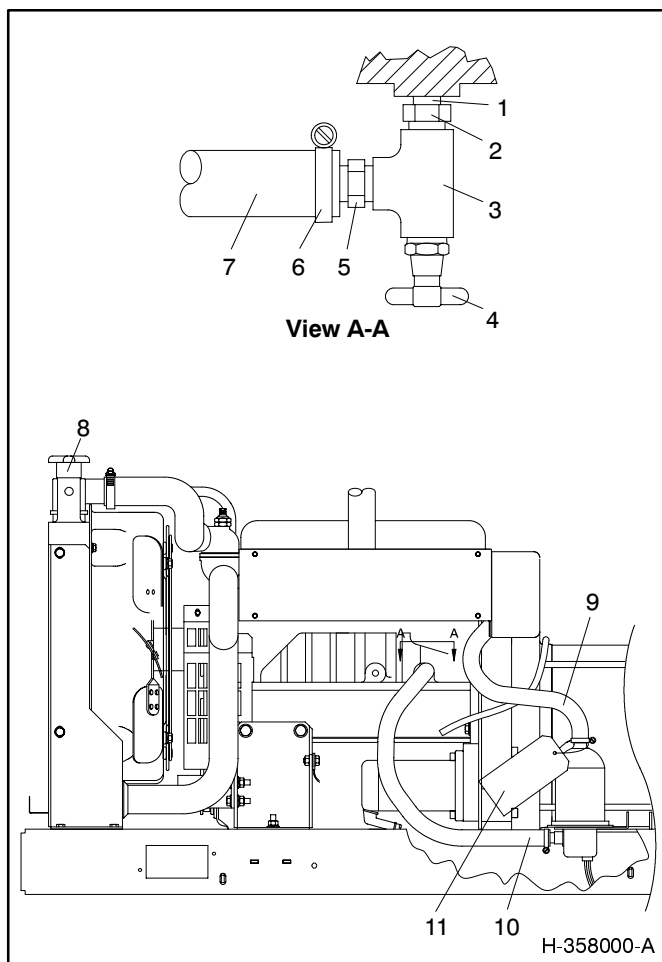


1. Hose clamp (X-426-10)
2. 90° elbow hose connector (X-391-19)
3. Block heater
4. Hose 24 in. (610 mm) (X-577-34)

Figure 2. Generator Set—Rear View

12. Remove the drain valve from the engine block. See Figure 3 for the drain valve location. The drain valve will not be reused.
13. Apply pipe sealant to the male threads of the 1 x 1/8 in. pipe (X-217-7) and install the pipe in the engine block where the drain valve was removed.
14. Apply pipe sealant to the exposed male threads of the pipe installed in step 13 and install the reducer bushing (X-202-27).
15. Apply pipe sealant to the exposed male threads of the reducer bushing installed in step 14 and install the pipe tee (A-110). Position the pipe tee as shown in Figure 3.
16. Apply pipe sealant to the male threads of the drain valve (X-256-3) included in the kit and install the drain valve in the end of the pipe tee installed in step 15. See Figure 3.

17. Apply pipe sealant to the male threads of the hose connector (X-582-22) and install in the pipe tee. See Figure 3.
18. Secure one end of the hose (X-577-34) to the hose connector installed in step 17 with the hose clamp (X-426-10). Place the hose clamp 0.25 in. (6 mm) from the hose end and tighten.
19. Route the hose from the hose connector to the block heater inlet as shown in Figure 3.
20. Secure the loose end of the hose to the block heater inlet. Place the hose clamp 0.25 in. (6 mm) from the hose end and tighten.
21. Secure the hang tag (279047) to the block heater outlet hose. See Figure 3.



1. Pipe, 1/8 x 1.0 in. (X-217-7)
2. Reducer bushing (X-202-27)
3. Pipe tee (A-110)
4. Drain valve (X-256-3)
5. Hose connector (X-582-22)
6. Hose clamp (X-426-10)
7. Hose (X-577-34)
8. Radiator coolant fill
9. Block heater outlet hose
10. Block heater inlet hose
11. Hang tag (279047)

Figure 3. Block Heater Connections

22. Close all coolant drain valves on the radiator and/or engine block.
23. Fill the cooling system with 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.

24. Check that the generator master switch is in the OFF position.
25. Reconnect the generator set engine starting battery cables, negative (-) lead last.
26. Reconnect the power to the battery charger, if equipped.
27. Test run the generator set until the engine is warmed up to operating temperature to check for coolant leaks and to purge air from the system.
28. Stop the generator set.
29. Check and correct any leakage after the engine and radiator have cooled.

NOTE

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

30. Recheck the coolant level after allowing the 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.
31. Connect block heater to the main power source.

Block Heater Kit

Parts List				
Kits: PA-358314, PA-358328			Unique Parts	
Qty.	Description	Common Parts	PA-358314	PA-358328
1	Tee, pipe, 1/4 in.	A-110		
4	Washer, plain, i.d. = 0.281 in.	X-25-40		
1	Bushing, reducer, 1/4 x 1/8 in.	X-202-27		
1	Nipple, pipe, 1/8 x 1.0 in.	X-217-7		
1	Valve, drain, 1/4 in.	X-256-3		
1	Connector, hose, 90° elbow	X-391-19		
4	Clamp, hose	X-426-10		
4	Bolt, h.c., 1/4-20 x 0.75 in.	X-465-16		
2	Hose, 24.0 in. (609.6 mm)	X-577-34		
1	Connector, hose	X-582-22		
4	Nut, whiz, 1/4-20	X-6210-2		
2	Nut, spiralock, 3/8-16	X-6210-9		
2	Screw, 3/8-16 x 7/8 in.	X-6238-3		
1	Tag, hang	279047		
1	Bracket, block heater mounting	326219		
1	Heater, block		358311	358327