

Engine Block Heater Kits (Tank Type) 18RY (LSG-423 Ford-Powered) Standby Generator Sets

Model	Voltage	Kit No.
18RY	120	PA-276383
18RY	240	PA-276384

The engine block heater kit heats engine coolant, making starting easier and warm-up quicker. The thermostat will automatically turn off the heater when coolant temperature reaches 120° F (49° C).

NOTE

The Block heater will fail if not immersed in coolant. Always unplug the block heater(s) before draining coolant and fill the engine block with coolant prior to plugging in the block heater(s). The block heater element **MUST** be immersed in engine coolant before being energized. Air must be purged from the system before energizing the block heater or the block heater element may fail.

⚠ WARNING

	
<p>Hazardous voltage. Can cause severe injury or death.</p>	<p>Moving rotor.</p>

Do not operate generator set without all guards and electrical enclosures in place.

Hazardous voltage can cause severe injury or death. Engine block heater can cause electrical shock. Remove engine block heater plug from electrical outlet before working on block heater electrical connections.



⚠ WARNING

Accidental starting.
Can cause severe injury or death.

Disconnect battery cables before working on generator set (negative lead first and reconnect it last).

Accidental starting can cause severe injury or death. Turn Generator Master Switch to OFF position, disconnect power to battery charger, and remove battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator. The generator set can be started by automatic transfer switch or remote start/stop switch unless these precautions are followed.

⚠ WARNING



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

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

Hot coolant can cause severe injury or death.

Allow engine to cool and release pressure from cooling system before opening pressure cap. To release pressure, cover the pressure cap with a thick cloth then turn it slowly counterclockwise to the first stop. After pressure has been completely released and the engine has cooled, remove cap. If generator set is equipped with a coolant recovery tank, check coolant level at tank.

INSTALLATION

1. Place controller master switch to OFF position. Disconnect battery of generator set, negative lead first. Disconnect battery charger leads.
2. With generator set sufficiently cooled, drain the coolant into a suitable container.

Do NOT pollute the environment. Dispose of used coolant and other contaminants in a safe and approved manner.

NOTE

Petcock valve is located on radiator bottom and/or engine bottom.

3. Remove freeze plug from engine. See Figure 1 for location. To remove freeze plug, use a freeze plug puller, or puncture center with punch and pry out. Clean hole and remove burrs.

NOTE

Be careful not to damage sealing surface.

4. With components clean and dry, apply Loctite® threadlocker 272 (red) or equivalent to freeze plug and hole. Install freeze plug adapter 276212 using hardwood dowel and hammer. Drive freeze plug adapter into engine block so that it is flush with the outside surface of the block. Do NOT drive freeze plug adapter beyond that point or it may be forced into the water jacket.
5. Apply pipe sealant to male threads of reducer bushing X-202-41 and install into freeze plug adapter.
6. Apply pipe sealant to male threads of pipe nipple X-209-2 and install into reducer bushing.
7. Install pipe tee X-203-13 into pipe nipple. Rotate so pipe nipple can be located 0.25 to 0.50 inches away from flywheel housing. Torque to 15 ft. lbs.
8. Apply pipe sealant to male threads of pipe plug X-75-28 and install into top hole of pipe tee.
9. Apply pipe sealant to male threads of pipe X-209-17 and install into bottom hole of pipe tee.
10. Install elbow X-225-7 into pipe. Torque elbow to 15 ft. lbs.
11. Apply pipe sealant to male threads of hose connector X-582-1 and install into elbow.
12. Attach block heater bracket 226360 to the generator's skid using two screws X-465-18, washers X-25-40, and whiz nuts X-6210-2.

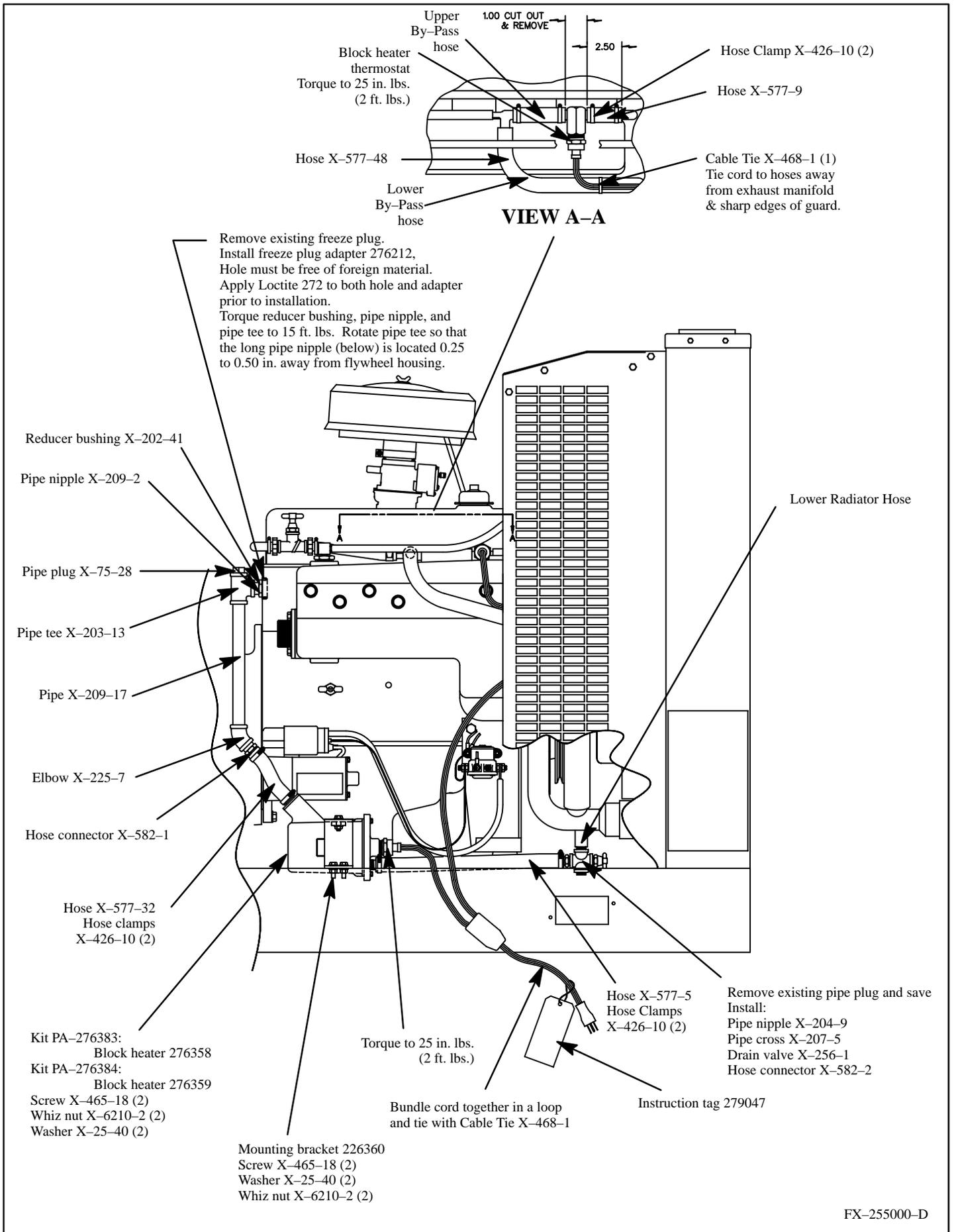


Figure 1. Block Heater Installation

13. Install block heater 276358/276359 to bracket using two screws X-465-18, plain washers X-25-40, and whiz nuts X-6210-2. Note torque specification in Figure 1.
 14. Place two hose clamps X-426-10 on each end of hose X-577-32. Connect hose to hose connector adapter and to block heater outlet. Locate hose clamps 1/4 in. (6 mm) from end of hose and tighten.
 15. Locate lower radiator hose (see Figure 1) and remove and save pipe plug.
 16. Apply pipe sealant to male threads on pipe nipple X-204-9 and install into lower radiator hose. Install cross pipe X-207-5 to pipe nipple.
 17. Relocate pipe plug (removed in step 15) and relocate to the bottom position of pipe cross.
 18. Apply pipe sealant to male threads of drain valve X-256-1 and install into cross pipe at position shown in Figure 1.
 19. Apply pipe sealant to male threads on hose connector X-582-2 and install into cross pipe at position shown in Figure 1.
 20. Place two hose clamps X-426-10 on each end of hose X-577-5. Attach one end to the block heater inlet and the other to the hose connector. Locate hose clamps 1/4 in. (6 mm) from end of hose and tighten.
 21. Remove and save hose clamps from the upper by-pass hose. Discard upper by-pass hose. Remove and save hose clamps from lower by-pass hose. Discard lower by-pass hose. Remove and save tee hose connector from the remaining hose. Remove 4 in. (102 mm) from this hose and reconnect the tee hose connector.
 22. Place two hose clamps (saved in Step 21) on hose X-577-48. Connect one end to location on the water pump and the other end to the tee hose connector. Locate hose clamps 1/4 in. (6 mm) from end of hose and tighten.
- Place two hose clamps (saved in Step 21) on hose X-577-9. Connect one end to the by-pass tube on the thermostat housing and the other end to the tee hose connector. Locate hose clamps 1/4 in (6 mm) from the end of the hose and tighten.
23. Mark upper by-pass hose X-577-9, (see view A-A) at 2-1/2 in. (64 mm) and 3-1/2 in. (89 mm) from end of hose. Cut at these marks to remove 1 in. (25 mm) from hose.
 24. Place two hose clamps X-426-10 on cut by-pass hose (one on each end). Install thermostat (reference torque specification in Figure 1.) Locate hose clamps 1/4 in. (6 mm) from the end of the hose and tighten. Tie the thermostat's cord to hoses away from exhaust manifold and sharp edges of guard using cable tie X-468-1.

NOTE

Earlier generator sets may not have by-pass hoses long enough to accommodate the installation of the thermostat. Locate the upper by-pass hose (see Figure 1, View A-A). If this hose measures approximately 2 to 3 inches (51 to 76 mm) it will need to be replaced, see Steps 21 and 22. If the hose measures approximately 7 to 8 inches (178 to 203 mm) proceed to Step 23.

NOTE

It may be necessary to trim part of the top fan guard in order to allow adequate space for the thermostat's new location. See Figure 2.

25. Use cable ties, as necessary, to protect and secure wiring from sharp objects, exhaust system, fuel lines, and any moving parts.

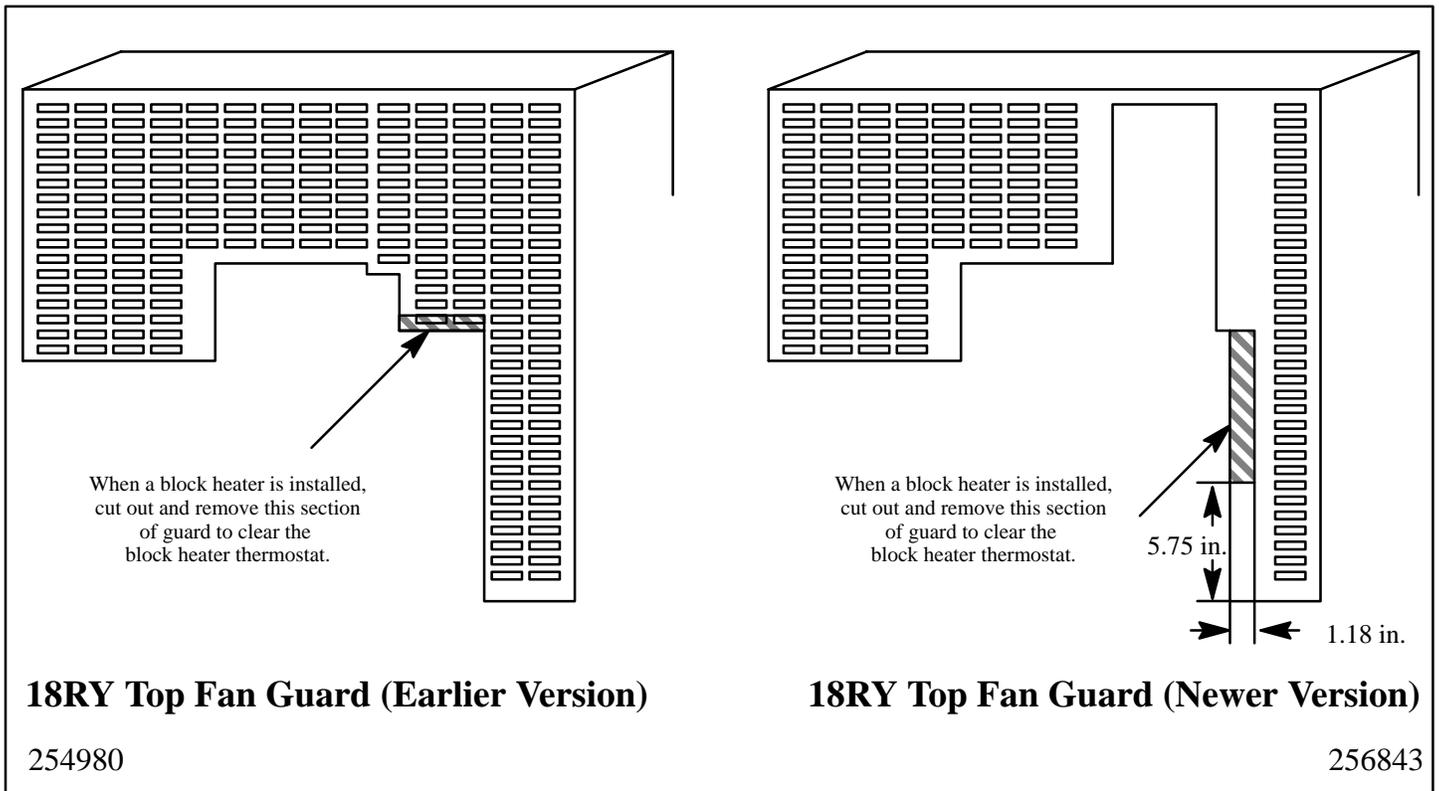


Figure 2. Top Fan Guard Cut-Out

26. Close petcock drain valves on bottom of radiator and/or engine block. Open air bleed valves located on top right side of engine (as viewed from the generator end) and on left side in water manifold.

27. Fill cooling system to proper level with fresh coolant. A solution of 50% ethylene glycol and 50% clean, softened water is recommended to inhibit rust/corrosion and provide freezing protection. Consult Operator's Manual for coolant capacities. Close air bleed valves.

NOTE

Coolant mixtures exceeding 50% ethylene glycol may cause block heater element failure. Failure to bleed all air from the engine may cause block heater element failure.

28. Check that the controller master switch is in the OFF position. Reconnect battery, negative lead last. Reconnect battery charger if present.

29. Test run the generator set for a few minutes to check for leaks and to insure that all air is purged from the system.

NOTE

Special attention should be given when checking for proper coolant level. After a radiator has been drained, it normally requires some time before complete refill of all air cavities takes place. Failure to purge all air from the system may cause block heater element failure.

30. Connect block heater electrical plug to proper voltage outlet. Tie hang tag 279047 to electrical cord coming from block heater.

Parts Listing

Qty. Description	Common Parts	Kit Numbers PA-276383 PA-276384	
1 Freeze plug adapter	276212		
1 Nipple 1/2 x 1-3/16"	X-209-2		
1 Pipe plug 1/2"	X-75-28		
1 Pipe tee 1/2"	X-203-13		
1 Reducer bushing	X-202-41		
1 Pipe	X-209-17		
1 Elbow 45° 1/2"	X-225-7		
1 Hose connector 1/2" N.P.T.	X-582-1		
1 Hose 5/8" x 9.5"	X-577-32		
6 Clamp, 1 in. hose	X-426-10		
1 Block heater		276358	276359
4 Screw 1/4"-20 x 7/8"	X-465-18		
4 Whiz nut 1/4"-20	X-6210-2		
4 Washer, 9/32" x 5/8" x 1/16" plain	X-25-40		
1 Mounting bracket	226360		
2 Cable tie	X-468-1		
1 Instruction tag	279047		
1 Pipe nipple 3/8" x 1	X-204-9		
1 Pipe cross	X-207-5		
1 Drain valve 3/8"	X-256-1		
1 Hose connector 3/8" N.P.T.	X-582-2		
1 Hose	X-577-48		
1 Hose 7.5 in.	X-577-9		
1 Hose 5/8" x 5.5"	X-577-5		