KOHLER POWER SYSTEMS

TT–876

INSTRUCTIONS

7/92

Engine Block Heater Kits (Tank Type) 20RZ/30RZ (LSG–423 Ford–Powered) Standby Generator Sets

Model	Voltage	Kit No.
20RZ	120	PA–276362
20RZ	240	PA–276363
30RZ	120	PA–276364
30RZ	240	PA–276365

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).

If configuration does not resemble Figure 1 (View D–D) for standard or anticipatory kits, a High Water Temperature Relocation Kit #276385 will also be required.

⚠ WARNING

Hazardous voltage. **Moving rotor.**

Can cause severe injury or death.

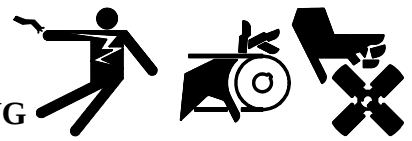
Do not operate generator set without all guards and electrical enclosures in place.

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.

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



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.

   NOTE

   If the generator set does not have a Low Water Temperature (L.W.T.) Switch in the rear of the cylinder head, follow Step 3 and then proceed to Step 5. If the generator set is equipped with a L.W.T. switch in the rear of the cylinder head, skip Step 3 and proceed to Step 4.

3a. **If unit does not have an L.W.T. Switch in rear of cylinder head:** 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.

3b. 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.

4. **If unit is equipped with an L.W.T. Switch in rear of cylinder head:** Remove L.W.T. switch from the freeze plug adapter by disconnecting leads 35A an N. (Reinstall the freeze plug adapter if removed while removing L.W.T. switch.)

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 on one end of pipe nipple X–209–2 and install into reducer bushing.

7. Apply pipe sealant to remaining threads of pipe nipple. Install pipe tee X–203–13 onto pipe nipple.

8. Torque reducer bushing, pipe nipple, and pipe tee to 15 ft. lbs. (20 Nm.) The bottom end of the pipe tee should be pointing to the 7 o'clock position (as viewed from the generator end).

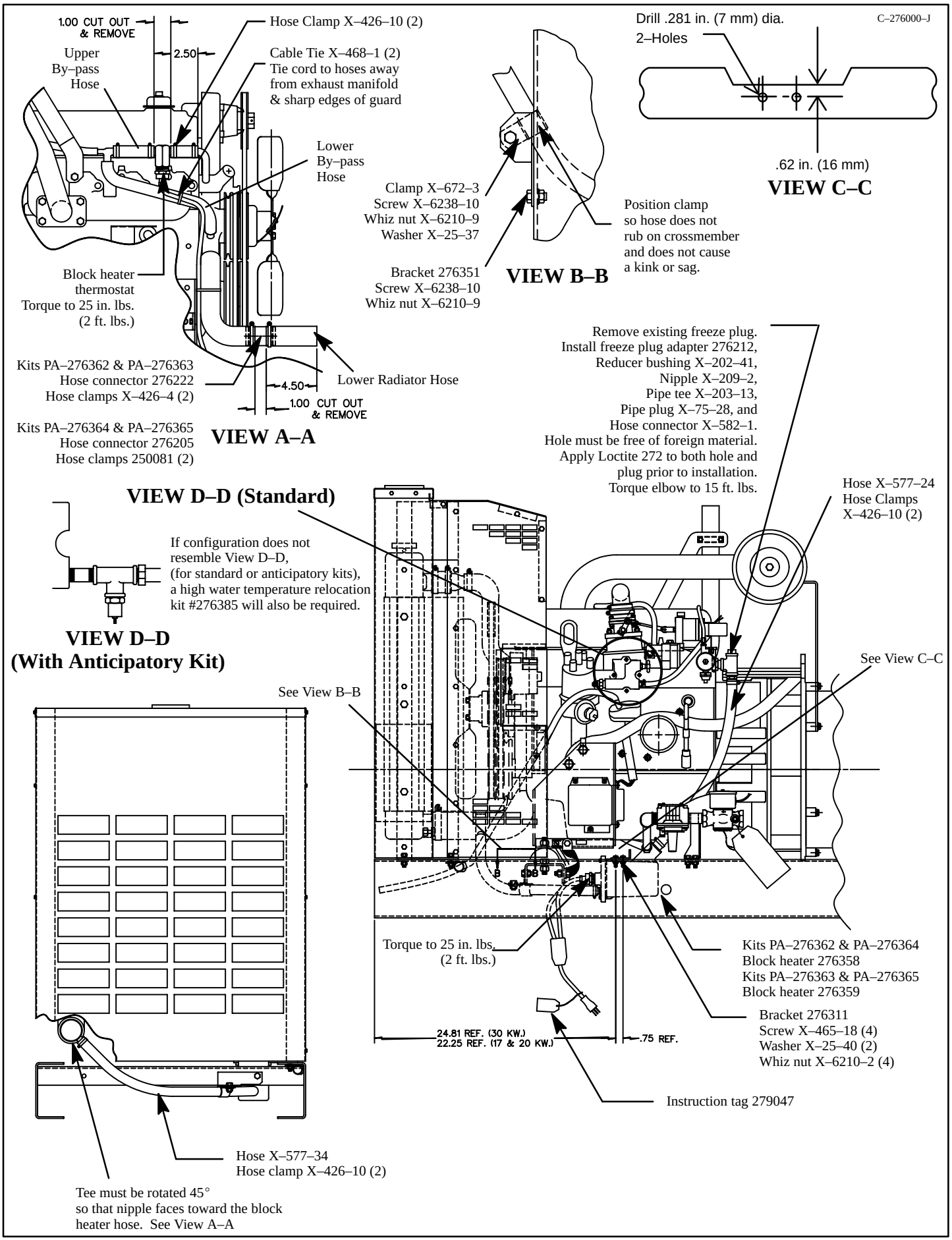


Figure 1. Block Heater Installation

9a. **If unit did not have an L.W.T. switch in rear of cylinder head:** Apply pipe sealant to male threads of pipe plug X–75–28 and install into top hole of pipe tee.

9b. **If unit is equipped with an L.W.T. switch in rear of cylinder head:** Install L.W.T. switch into top hole of pipe tee and reconnect leads to L.W.T. switch.

10. Apply pipe sealant to hose connector X–582–1 and install into the bottom hole of the pipe tee.

11. Locate lower radiator hose and mark hose at 4–1/2 in. (114 mm) and 5–1/2 in. (140 mm) from radiator outlet. Cut at these marks to remove 1 in. (25 mm) from hose.

12. Place two *large* hose clamps 250081/X–426–4 on cut radiator hose (one on each end). Install tee hose connector 276205/276222 with nipple pointing to the 4 o'clock position (as viewed from the radiator end). Locate hose clamps 1/4 in. (6 mm) from end of hose and tighten.

13. Attach block heater bracket 276311 to the generator's skid using two screws X–465–18, and whiz nuts X–6210–2.

NOTE

Early generator sets may not have pre–drilled holes in skid. Use bracket as a template and drill two 19/64 in. (7 mm) dia. holes in skid. See Figure 1 and View C–C for location.

14. 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 the torque specification in Figure 1.

15. Place two hose clamps X–426–10 on each end of hose X–577–24. Connect hose to hose connector on engine block and to block heater outlet. Locate hose clamps 1/4 in. (6 mm) from end of hose and tighten.

16. Install the support bracket 276351 to generator's cross member (see View B–B) using screw X–6238–10 and whiz nut X–6210–9. Route hose X–577–34 through clamp X–672–3. Attach clamp to bracket using screw X–6238–10, whiz nut X–6210–9, and washer X–25–37. Position clamp so hose does not kink, sag, or rub on cross member.

17. Place two hose clamps X–426–10 on hose X–577–34. Connect hose to tee hose connector (installed in Step 7) and block heater inlet. Locate hose clamps 1/4 in. (6 mm) from end of hose and tighten.

NOTE

Earlier generator sets may not have by–pass hoses long enough to accommodate the installation of the thermostat. Locate upper by–pass hose (See Figure 1, View A–A.) If this hose measures approx. 2 to 3 inches (51 to 76 mm) it will need to be replaced, see Steps 18 and 19. If hose measures approx. 7 to 8 inches (178 to 203 mm) proceed to Step 20.

18. Remove and save hose clamps from 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 tee hose connector.

19. Place two hose clamps (saved in Step 18) on hose X–577–47. 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 18) 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 end of hose and tighten.

20. Mark upper by–pass hose (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.

21. 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 ties X–468–1.

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. No trimming is necessary on 20RZ generator sets equipped with a cover plate (276352) on the top fan guard, simply discard cover plate and screws.

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

23. 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 in water manifold on left side of engine.

24. 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. See Table 1 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.

Table 1. Coolant Capacities – U.S. Gal. (L)

Model	Standard Radiator	Remote Radiator	City–Water Cooled
20RZ	2 (7.6)	3.5 (13.25)	3 (11)
30RZ	4 (15.1)	3.5 (13.25)	4 (14.7)

NOTE: Capacities shown may vary from model to model and are subject to change.

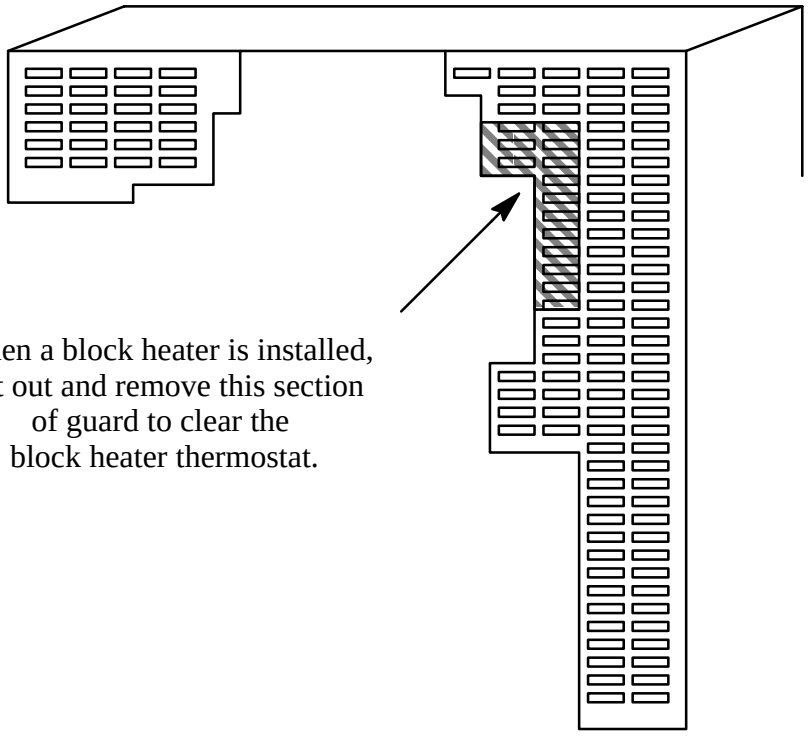
25. Check that the controller master switch is in the OFF position. Reconnect battery, negative lead last. Reconnect battery charger if present.

26. 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.

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

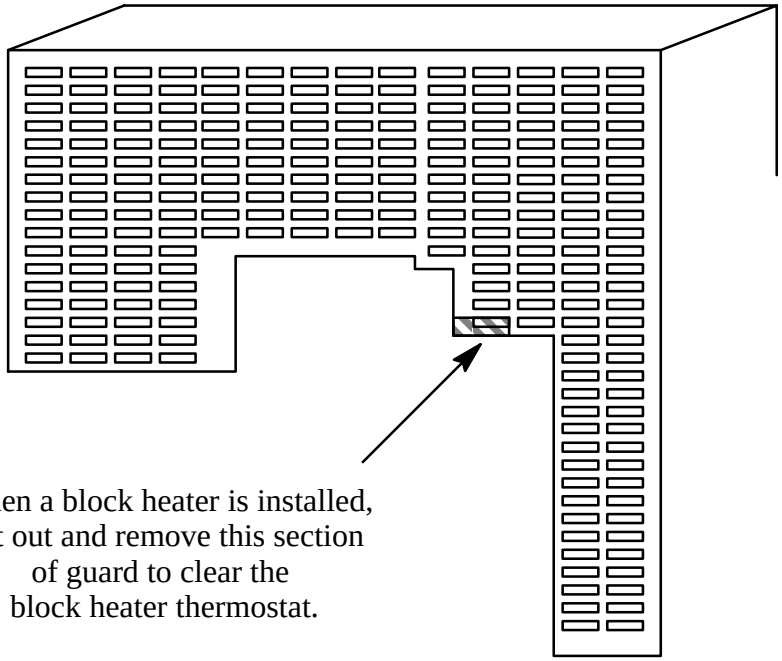


When a block heater is installed, cut out and remove this section of guard to clear the block heater thermostat.

Note:
If the fan guard has a cover plate, simply discard the cover plate. (No trimming is necessary.)

20RZ Top Fan Guard

254418



When a block heater is installed, cut out and remove this section of guard to clear the block heater thermostat.

30RZ Top Fan Guard

254980

Figure 2. Top Fan Guard Cut–Outs

Parts Listing

Qty.	Description	Common Parts	Kit Numbers PA–276362	PA–276363	PA–276364	PA–276365
2	Washer, 9/32 x 5/8 x 1/16 plain	X–25–40				
6	Clamp, 1 in. hose	X–426–10				
4	Screw, 1/4–20 x 7/8, Gr. 5	X–465–18				
1	Hose, 5/8 in. ID x 21 in.	X–577–24				
2	Clamp, 3 in. hose				250081	250081
2	Clamp, 2–1/4 in. hose		X–426–4	X–426–4		
1	Connector, tee hose		276222	276222	276205	276205
1	Bracket, support	276351				
1	Heater, block		276358	276359	276358	276359
1	Adapter, freeze plug	276212				
1	Bracket, block heater	276311				
2	Screw 3/8–16 x .75	X–6238–10				
2	Nut, whiz 3/8–16	X–6210–9				
1	Washer, plain 13/32 x 13/16 x 1/16	X–25–37				
2	Tie, cable	X–468–1				
1	Hose, oil–proof 24 in.	X–577–34				
4	Nut, whiz 1/4–20	X–6210–2				
1	Clamp, insulating	X–672–3				
1	Plug, pipe 1/2	X–75–28				
1	Connector, adapter hose	X–582–1				
1	Bushing, reducer	X–202–41				
1	Tee, pipe 1/2	X–203–13				
1	Nipple 1/2 x 1–3/16	X–209–2				
1	Hose 5/8 in. I.D. x 7.5 in.	X–577–9				
1	Hose 5/8 in. I.D. x 15 in.	X–577–47				
1	Tag, instruction	279047				