

Engine Block Heater Service Kits (Tank Type) 30RZ/33RZ/45RZ (CSG-649 Ford-Powered) Standby Generator Sets

Model	Voltage	Kit No.
All Models	120	276380
All Models	240	276381

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.

This service kit details removal of the immersion type block heater and replaces it with a tank type block heater kit.

The engine block heater kit (tank type) 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).

⚠ WARNING	
	
Hazardous voltage. Can cause severe injury or death.	Moving rotor.
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 power from existing block heater. 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. If an immersion type block heater was previously installed, follow Step 3. Otherwise, proceed to Step 4.

NOTE

If Step 3 is not required, reference Parts Listing for components not used.

- 3a. Remove electrical connections to block heaters and thermostat. Remove block heater junction box from generator set. These parts will not be reused. See Figure 1.
- 3b. Remove thermostat. This part will not be reused.

NOTE

Leave this hole open at this time.

- 3c. Remove block heaters from engine block. These items will not be reused.

With components clean and dry, apply Loctite® threadlocker 272 (red) or equivalent to freeze plug adapter 276215 and hole. Install freeze plug adapter using hardwood dowel and hammer. Drive freeze plug adapter into engine block so that it is flush with outside surface of block. Do NOT drive freeze plug adapter beyond that point or it may be forced into the water jacket.

Apply pipe sealant to 3/4 NPT pipe plug X-75-6 and install into rear freeze plug adapter. Torque pipe plug to 15 ft. lbs. (20 Nm).

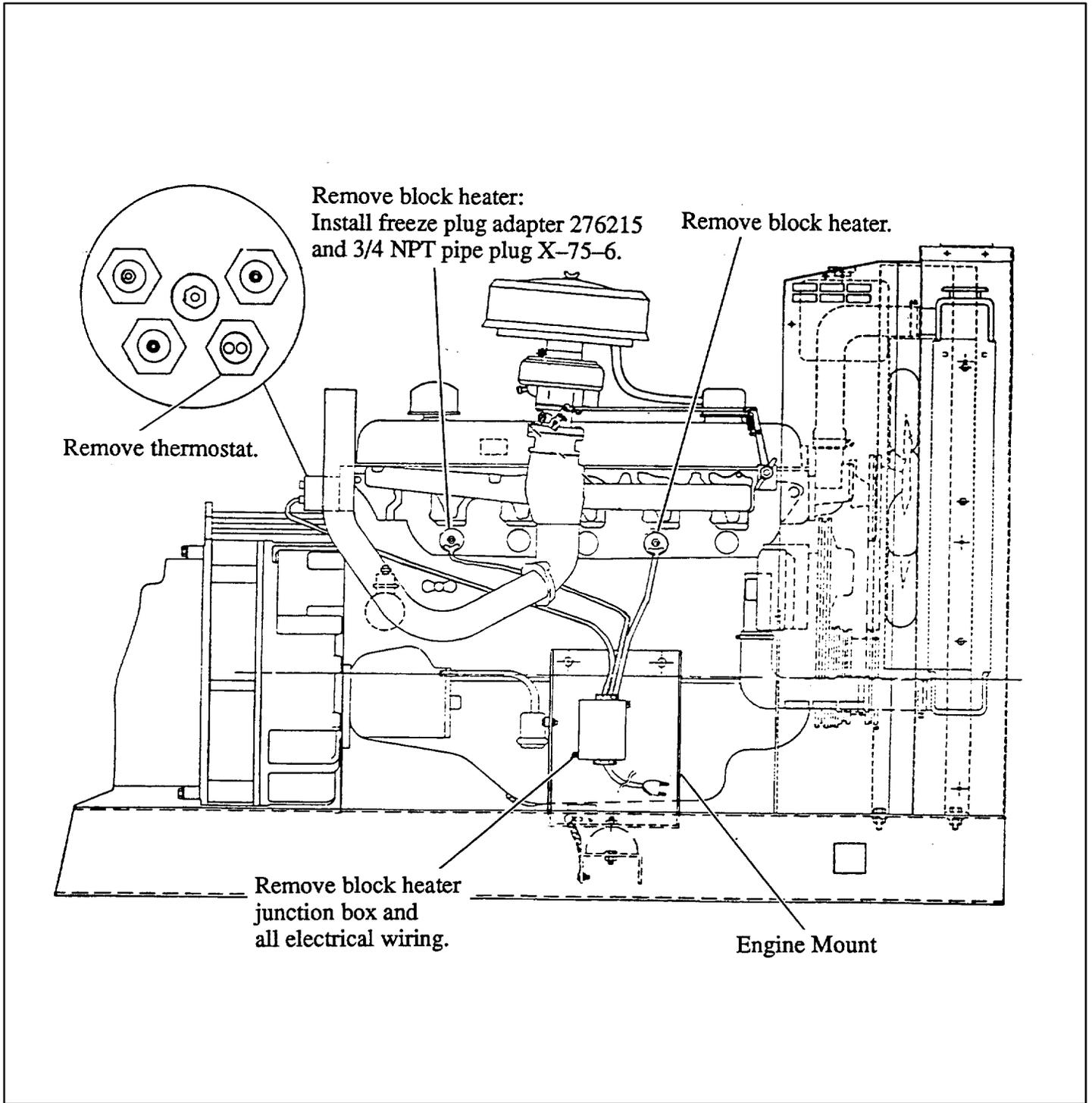


Figure 1. Block Heater Kit Removal (Immersion Type)

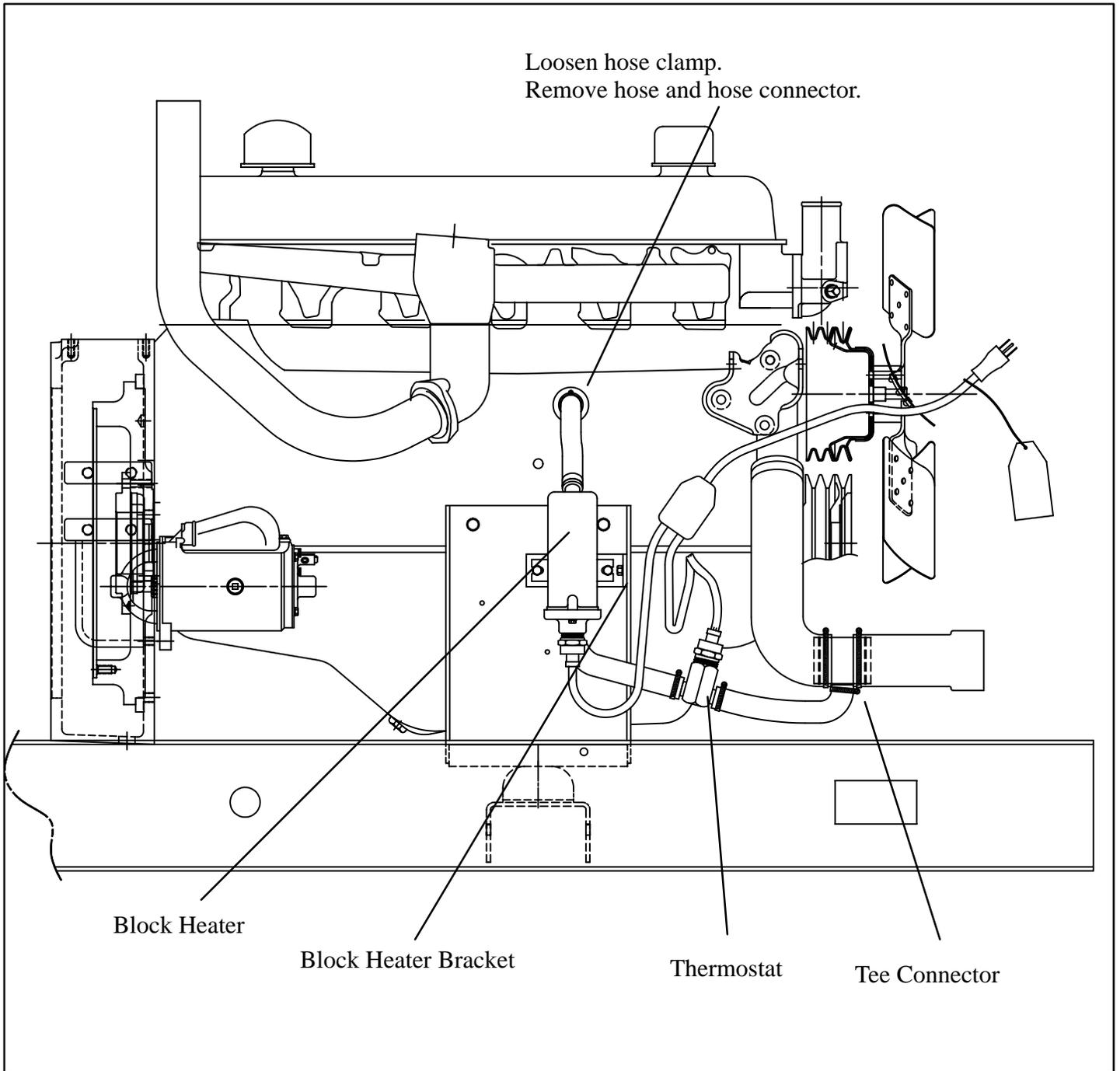


Figure 2. Removal of Early Version Tank Type Block Heater Kit

4. If an early version tank type block heater was installed, follow Step 4. See Figure 2. Otherwise, proceed to Step 5.

NOTE

If Step 4 is not required, reference Parts Listing for components not used.

- 4a. Loosen hose clamp and remove hose from hose connector. Remove hose connector from freeze plug adapter.

- 4b. Remove remaining block heater components.

5. *(This step may not be necessary if a freeze plug adapter is already located at this position).* With components clean and dry, apply Loctite® threadlocker 272 (red) or equivalent to freeze plug adapter 276215 and hole at position 1 (see Figure 3.) Install freeze plug adapter 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.

Apply pipe sealant to reducer bushing 153659 and install into freeze plug adapter. Install thermostat to reducer bushing. Note torque specification in Figure 3, Detail B.

6. Locate sensor block at rear of engine (as viewed from generator end). Remove pipe plug (if not already done), see Figure 3 for location.

NOTE

Pipe plug will not be reused.

Apply pipe sealant to one end of pipe nipple X-209-18 and install in sensor block.

7. Apply pipe sealant to the other end of pipe nipple and install pipe elbow X-215-1. Rotate pipe elbow to the 4 o'clock position (as viewed from the generator end).
8. Apply pipe sealant to hose connector X-582-1 and install in pipe elbow.
9. Locate lower radiator hose and mark hose at 6.5 in. (165 mm) and 7.5 in. (191 mm) from radiator outlet. Cut at these marks to remove 1 in. (25 mm) from hose.

10. Place two large hose clamps X-426-6 on cut radiator hose (one on each end). Install hose connector 275581 with nipple pointing to the 8 o'clock position (as viewed from the radiator end). Locate hose clamps 1/4 in. (6 mm) from end of hose and tighten.
11. Attach block heater bracket 276382 to engine mounting bracket using two screws X-465-18, plain washers X-25-40, and whiz nuts X-6210-2.

NOTE

Early generator sets may not have pre-drilled holes in engine mount. Use bracket as a template and drill two 19/64 in. dia. holes. Locate holes 3 in. (76 mm) from top of engine mount. Center-to-center dimension is 1-3/4 in. (44 mm).

12. Install block heater 276691/276692 to bracket using two screws X-465-18, plain washers X-25-40, and whiz nuts X-6210-2. Note torque specification in Figure 3.
13. Place two hose clamps X-426-10 on each end of molded hose 276206. Attach short end to hose connector. Attach long end to block heater. Locate hose clamps 1/4 in. (6 mm) from end of hose and tighten.
14. Place two clamps X-426-10 on rubber hose X-577-41. Connect hose to hose connector and block heater outlet. Locate hose clamps 1/4 in. (6 mm) from end of hose and tighten.
15. Secure hose connected between block heater and engine sensor block using hose clamp X-672-3, and screw X-129-15. Mount in flywheel adapter boss.
16. Trim top fan guard to allow adequate room for air bleed valve. See Figure 4.

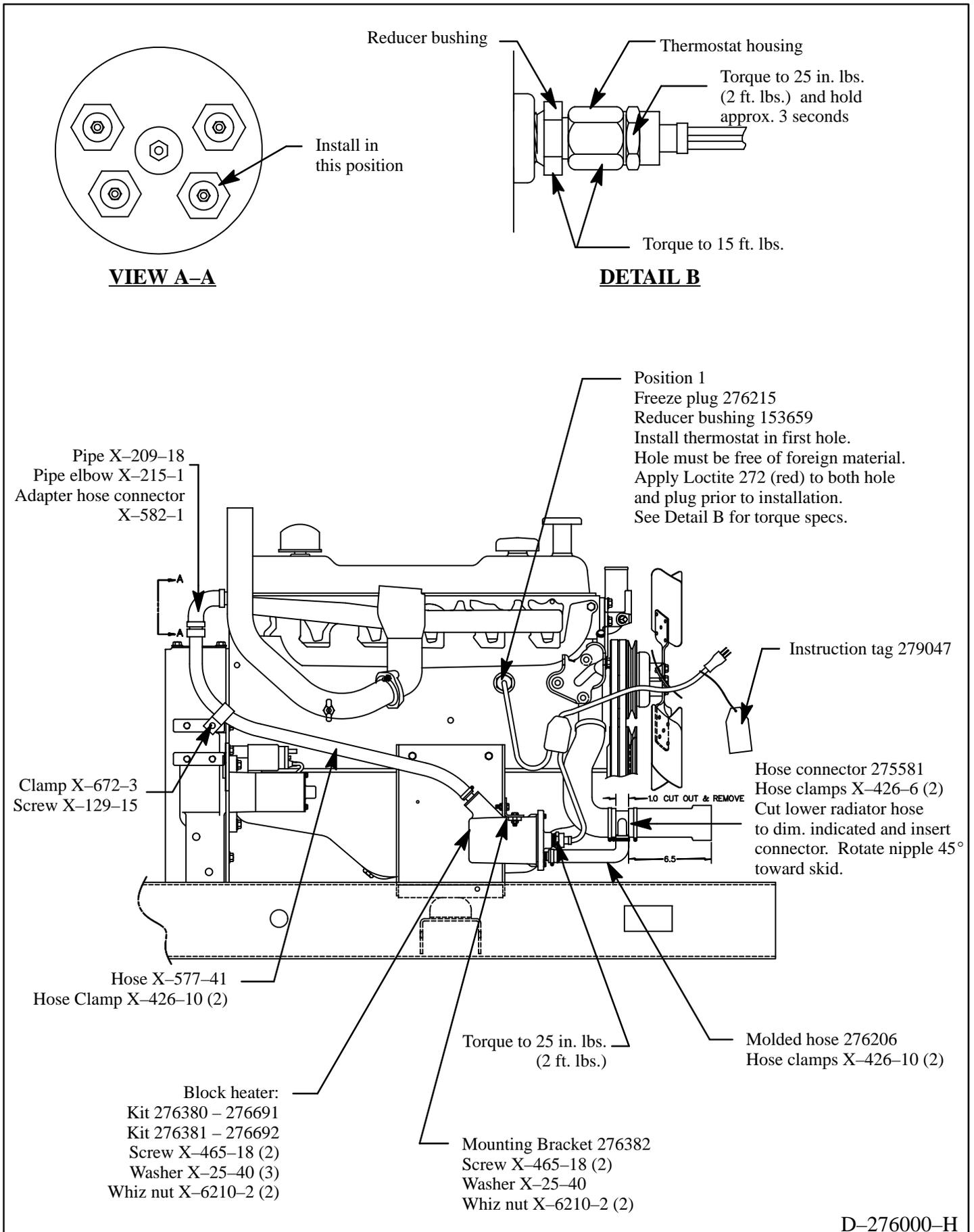


Figure 3. Block Heater Installation

17. Remove pipe plug located in thermostat housing. See Figure 5 for location.

Apply pipe sealant to threads on street elbow X-211-8 and install into hole, rotating street elbow to the 10 o'clock position (as viewed from the generator end).

Apply pipe sealant to threads on pipe nipple X-204-6 and install onto street elbow.

Apply pipe sealant to threads on pipe coupling X-216-23 and install onto pipe nipple.

Apply pipe sealant to threads on air bleed valve X-256-1 and install onto pipe couple.

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

19. Close petcock valves on radiator and/or engine block. Open air bleed valve located on the right side (as viewed from generator end) of the thermostat housing.

20. 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.

NOTE

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

Model	Standard Radiator	Remote Radiator	City-Water Cooled
All Models	7.6 (28.8)	3.5 (13.3)	4 (15)

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

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

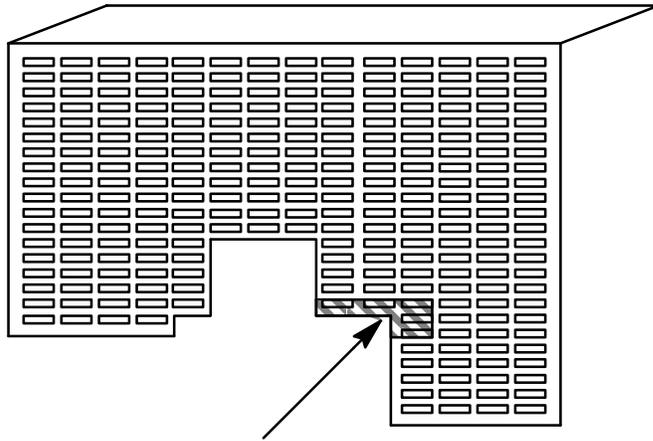
21. Check that the controller master switch is in the OFF position. Reconnect battery, negative lead last. Reconnect battery charger if equipped.

22. Test run the generator set for a few minutes to check for leaks and to purge all air 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.

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

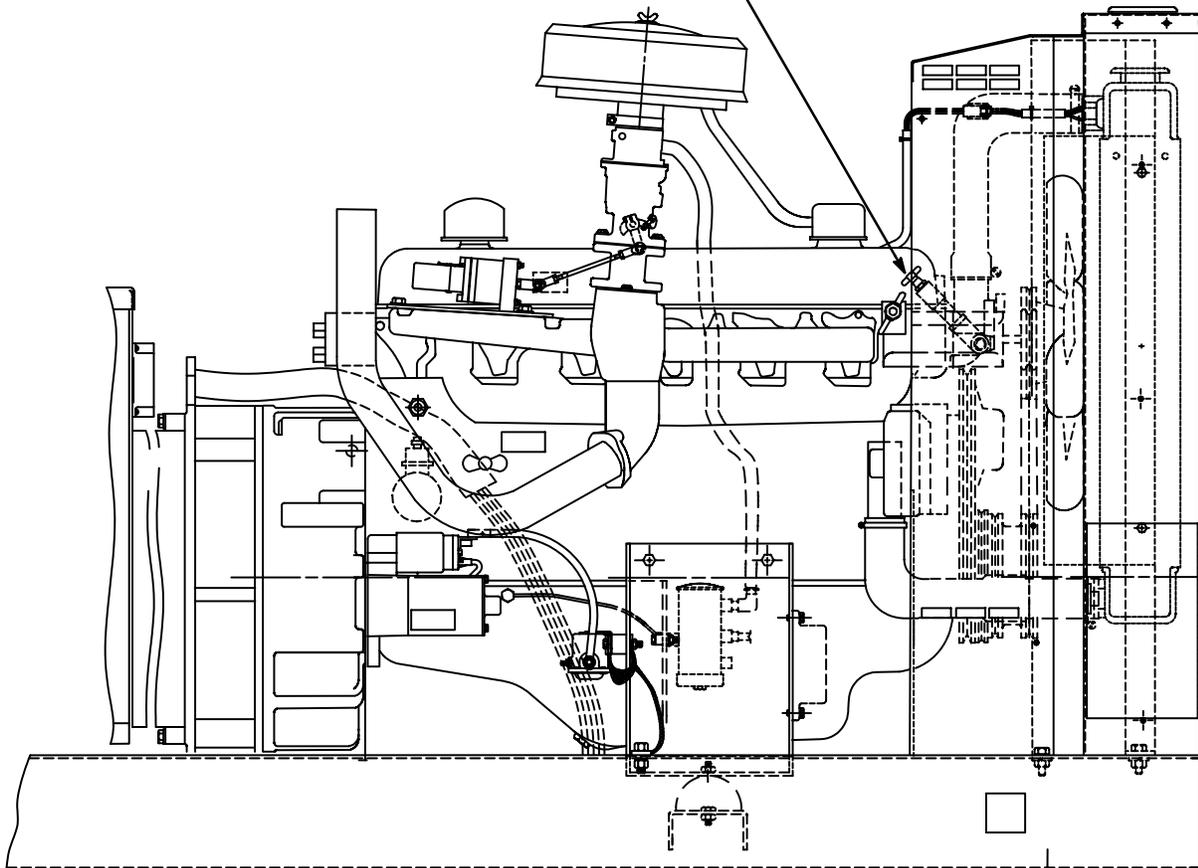


Cut out and remove this section
of guard to clear the
air bleed valve.

256469

Figure 4. Top Fan Guard Cut-Out

- Street elbow X-211-8
- Pipe nipple X-204-6
- Pipe coupling X-216-23
- Air bleed valve X-256-1



HF-255000-H

Figure 5. Air Bleed Valve Installation

Parts Listing

Qty.	Description	Common Parts	Kit Numbers	
			276380	276381
1	Screw, 1/2-13 x 3/4	X-129-15		
1	Pipe, 1/2 NPTF x 4 in.	X-209-18		
1	Elbow, 1/2 NPT pipe	X-215-1		
4	Washer, 9/32 x 5/8 x 1/16	X-25-40		
4	Clamp, 1 in. hose	X-426-10		
2	Clamp, 2-1/2 in. hose	X-426-6		
4	Screw, 1/4-20 x 7/8, Gr. 5	X-465-18		
1	Connector, hose	X-582-1		
1	Clamp, insulating hose	X-672-3		
1 *	Plug, 3/4 NPT pipe	X-75-6		
1	Hose, molded	276206		
1	Heater, block		276691	276692
2	Adapter, freeze plug	276215		
1	Connector, hose	275581		
1	Bracket	276382		
4	Nut, whiz 1/4-20	X-6210-2		
1	Hose	X-577-41		
1	Bushing, reducer	153659		
1	Valve, air bleed	X-256-1		
1	Coupling, pipe	X-216-23		
1	Nipple, pipe	X-204-6		
1	Elbow, street	X-211-8		
1	Tag, instruction	279047		

* Used only if Step 3 applies.