KOHLER POWER SYSTEMS

TT–882

INSTRUCTIONS

7/92

Engine Block Heater Service Kits (Thermostat Relocation) 17–100RZ Standby Generator Sets

Model	Voltage	Kit #
17–30RZ (4 Cylinder)	120	276374
17–30RZ (4 Cylinder)	240	276375
30RZ, 33–100RZ (6 & 8 Cylinder)	120	276376
30RZ, 33–100RZ (6 & 8 Cylinder)	240	276377

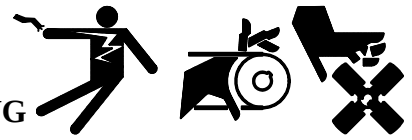
The engine block heater kit (tank type) heats engine coolant, making starting easier and warm–up quicker. The thermostat will automatically turn off the heater when coolant temperature reaches 120°F (49°C).

These kits will convert an existing working tank type block heater with an *in–hose thermostat* to a tank type block heater with an *in–block thermostat* for 6 and 8 Cylinder units, and relocates the thermostat closer to the top of the block for 4 Cylinder units.

On 4 Cylinder units, if configuration does not resemble Figure 2 (View C–C) for standard or anticipatory kits, a High Water Temperature Relocation Kit #276385 will also be required.

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

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.

⚠ 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
(For Kits 276374 and 276375)

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. Disconnect block heater thermostat harness assembly from the block heater thermostat housing and the front end of the block heater tank. Leave the thermostat housing at its current position. Discard the harness and the thermostat sensor. See Figure 1.

4. Remove existing by–pass hoses and clamps. Discard hoses, save clamps. See Figure 1. Position new hoses X–577–48 and X–577–9 using clamps to secure. See Figure 2. **(For 17kW, 20kW, and 30kW, remove 4 inches from hose X–577–48.)**

5. Install the support bracket 276351 to the generator's cross member (see Figure 2, View B–B) using screw X–6238–10 and whiz nut X–6210–9. Route existing hose (X–577–28) 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.

6. Locate by–pass hose X–577–9 (see Figure 2, View A–A) and mark 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.

7. Connect new harness A–276360/A–276361 to the front side of the block heater tank.

8. Place two hose clamps X–426–10 on cut by–pass hose (one on each end.) Install thermostat end of harness between by–pass hose (reference torque specification in Figure 2.) 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 3. No trimming is necessary on 20kW generator sets equipped with a cover plate (276352) on the top fan guard, simple discard the cover plate and screws. 17RY generator sets, trim top fan guard so hose and thermostat don't rub.

9. Close petcock valves on radiator and/or engine block. Open air bleed valve located in the water manifold at the front right side of the engine (as viewed from the generator end).

10. 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 valve.

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
17–20RZ	2 (7.6)	3.5 (13.25)	3 (11)
30RZ (4 Cyl.)	4 (15.1)	3.5 (13.25)	4 (14.7)

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

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

12. Test run the generator set for a few minutes to check for leaks and purge 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.

13. Connect block heater electrical plug to proper voltage outlet.

Parts Listing

Qty.	Description	Common Parts	Kit Numbers 276374	276375
1	Harness Assembly		A–276360	A–276361
1	Washer, Plain 13/32 x 13/16 x 1/16	X–25–37		
2	Tie, Cable	X–468–1		
1	Hose, Oil Proof	X–577–48		
1	Hose, .625” x 7–1/2”	X–577–9		
2	Nut, Whiz 3/8–16	X–6210–9		
2	Screw, H.C. 3/8–16 x 0.75	X–6238–10		
1	Clamp, Insulating	X–672–3		
1	Bracket, Support	276351		
2	Clamps, Hose	X–426–10		

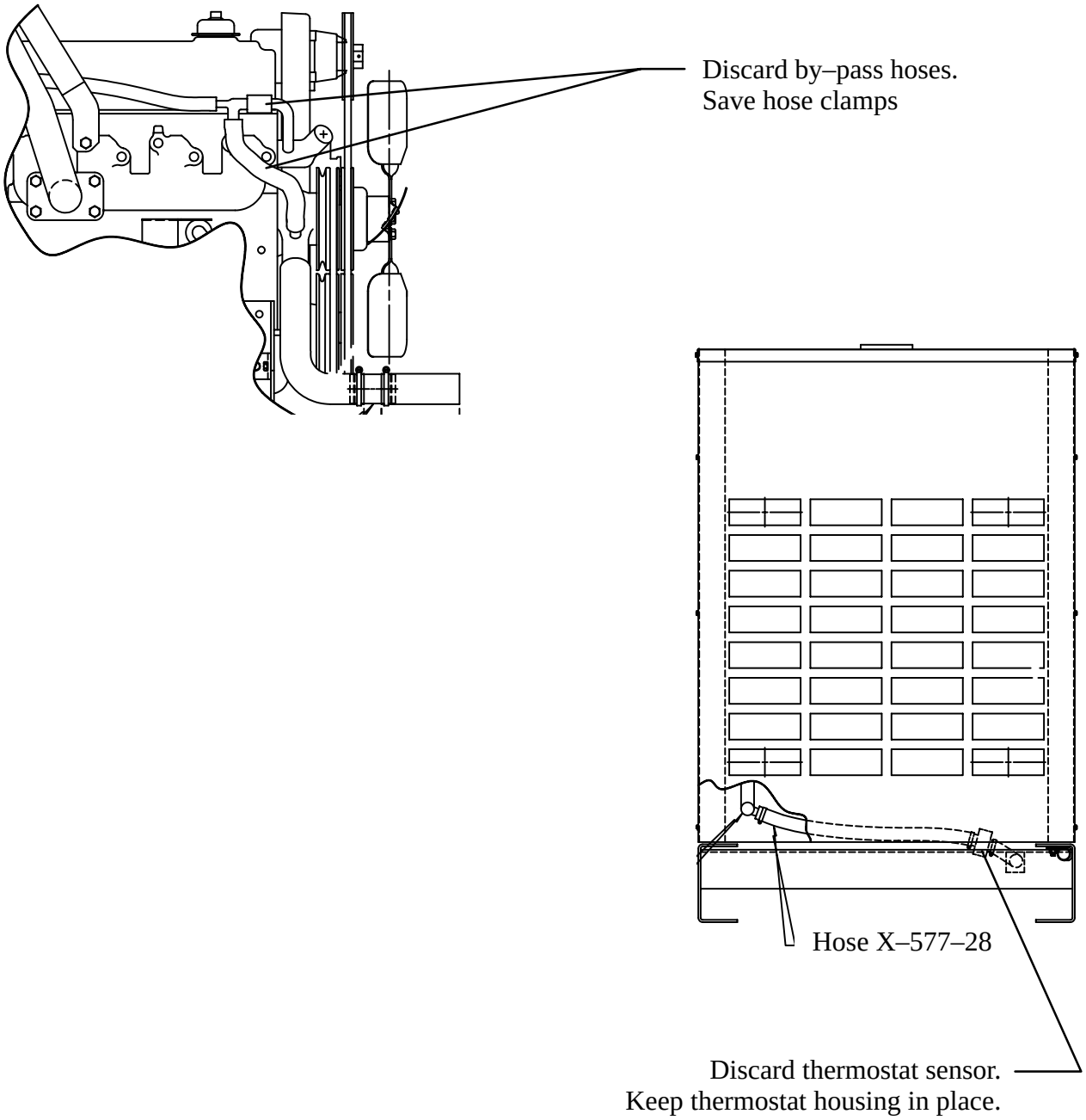


Figure 1. Thermostat Relocation 17 – 30RZ (4 Cylinder)

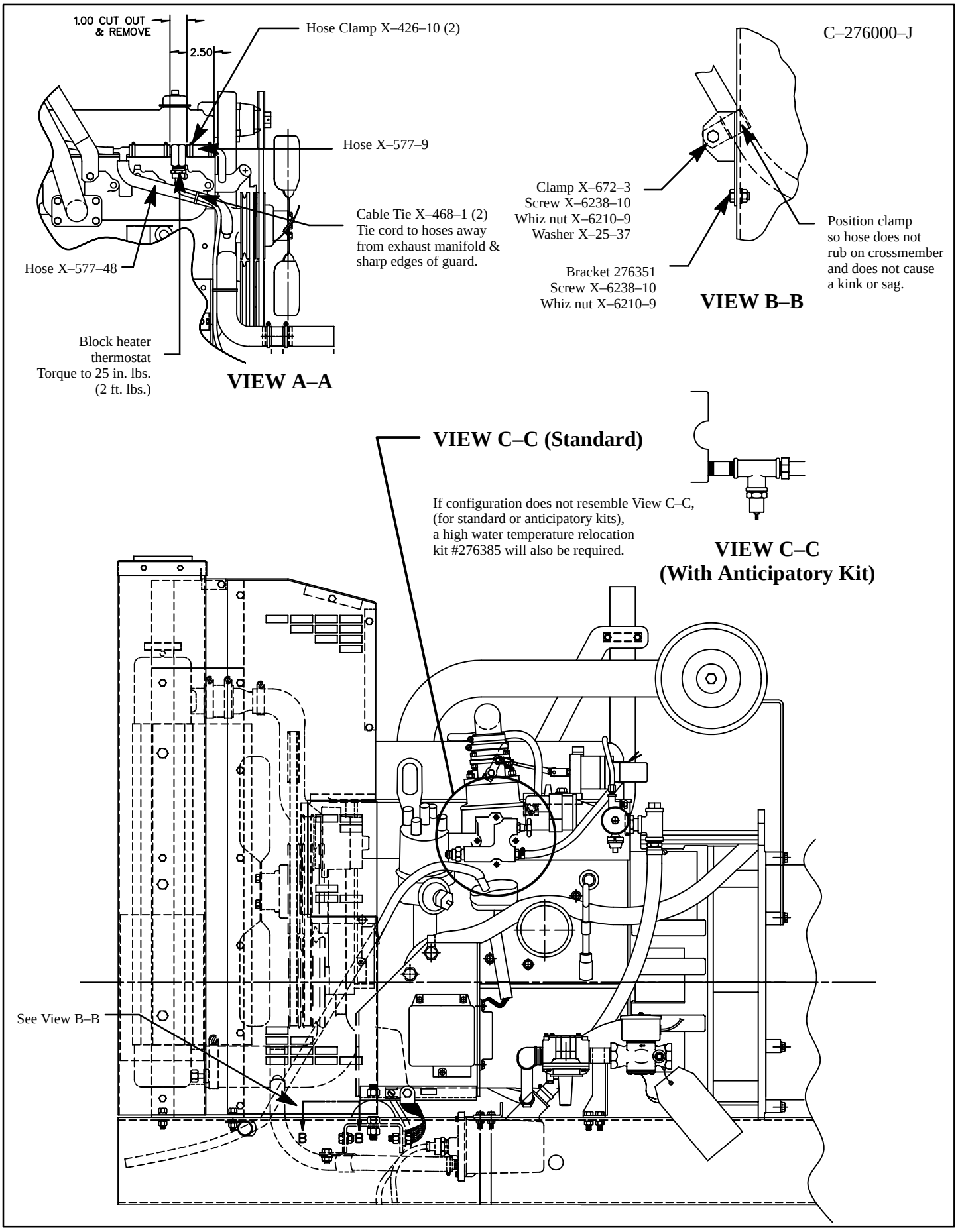
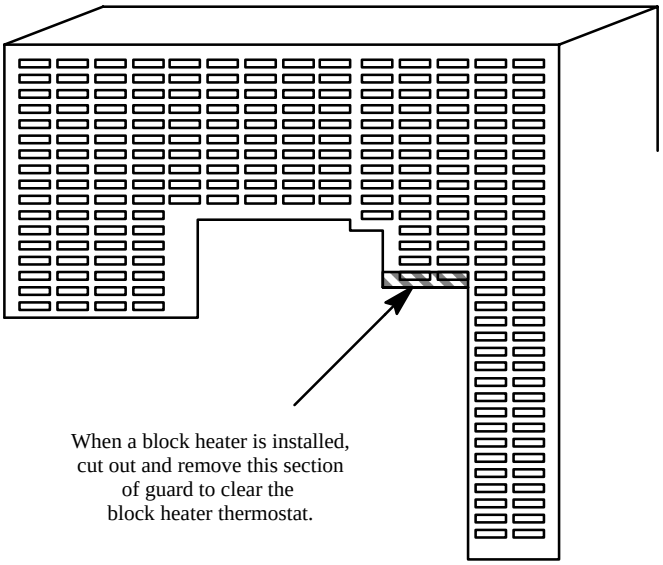
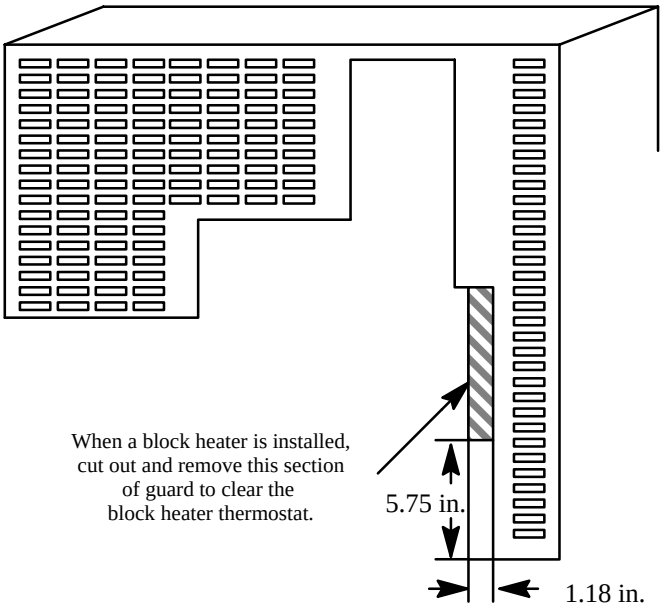


Figure 2. Thermostat Relocation 17 – 30RZ (4 Cylinder)



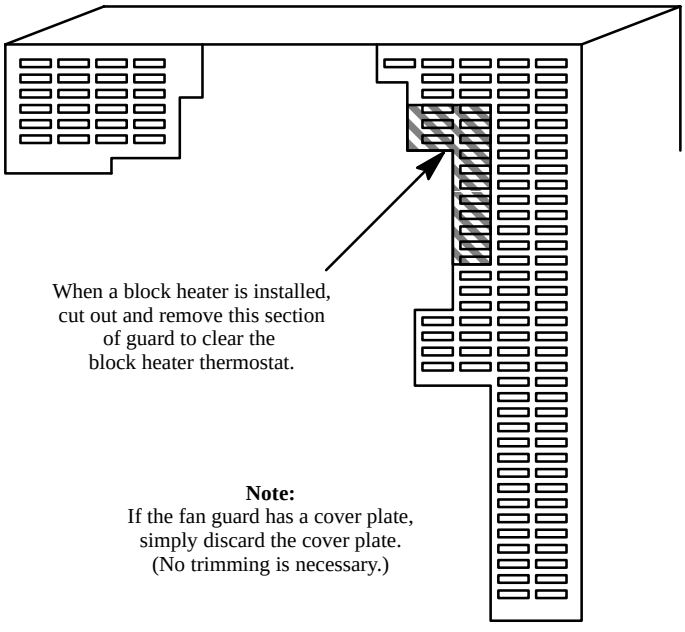
18RY Top Fan Guard (Earlier Version)

254980



18RY Top Fan Guard (Newer Version)

256843



20RZ Top Fan Guard

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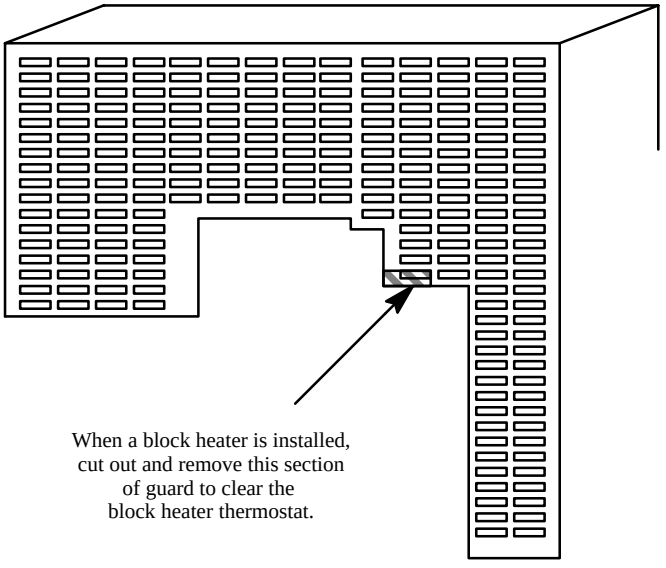


30RZ Top Fan Guard

254980

Figure 3. Top Fan Guard Cut–Out

INSTALLATION
(For Kits 276376 and 276377)

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. Disconnect block heater thermostat harness assembly from the block heater thermostat housing and the front end of the block heater tank. Leave the thermostat housing at its current position. Discard the harness and the thermostat sensor.

   NOTE

   If the 50–100RZ (8–Cylinder) unit is equipped with a Low Water Temperature Switch (located at position 1, Figure 4a), skip Step 4 and proceed to Step 5. If the unit is not equipped with a Low Water Temperature Switch (located at position 1, Figure 4a), follow Step 4 and proceed to Step 6.

4. With components clean and dry, apply Loctite® threadlocker 272 (red) or equivalent to freeze plug adapter 276212 (50–100RZ 8–Cylinder units) or 276215 (30–45RZ 6–Cylinder units) and hole. Install freeze plug adapter using hardwood dowel and hammer at position 1 (see Figures 4a or 4b). 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 reducer bushing 153659 and install into freeze plug adapter at position 1 (see Figures 4a or 4b). Torque reducer bushing to 15 ft. lbs. (20 Nm). Install block heater thermostat into reducer bushing.

5. If installing block heater service kit on a 50–100RZ (8–Cylinder) unit with the ***Low Water Temperature (L.W.T.) Switch*** feature located at position 1 (Figure 4a): Remove the L.W.T. switch and reducer bushing and leave the freeze plug adapter in place. Install reducer bushing 153659 and the new thermostat at position 1. With components clean and dry, apply Loctite® threadlocker 272 (red) or equivalent to freeze plug adapter 276212 (50–100RZ 8–Cylinder units) and hole. Install freeze plug adapter using hardwood dowel and hammer at position 2 (Figure 4a). 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 (which was removed from position 1) and install into freeze plug adapter at position 2 (Figure 4a). Torque reducer bushing to 15 ft. lbs. (20 Nm). Relocate L.W.T. switch at position 2 (Figure 4a) and torque to 15 ft. lbs.). Pull lead 35A back through harness and connect to L.W.T. switch. Remove lead N from harness disconnecting at ground position. Add new lead SWON–1622–2218 to L.W.T. switch and connect the other end to the ground position. (Route lead away from any sharp edges).

NOTE

Discard freeze plug adapter (supplied in kit) which wasn't used.

6. Connect harness A–276753/A–276754 (supplied in kit) to the position on the block heater tank and connect the thermostat end to the reducer bushing installed in Step 4 or Step 5.

7. Close petcock valves on radiator and/or engine block. Open air bleed valve located in the water manifold at the front right side of the engine (as viewed from the generator end).

8. 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 valve.

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
30–45RZ	7.6 (28.8)	3.5 (13.25)	4 (14.7)
50–80RZ	7.3 (27.6)	9 (34)	6.6 (25)
100RZ	8.2 (31.0)	9 (34)	6.6 (25)

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

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

10. Test run the generator set for a few minutes to check for leaks and purge 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.

11. Connect block heater electrical plug to proper voltage outlet.

Parts Listing

Qty.	Description	Common Parts	Kit Numbers 276376	276377
1	Harness		A–276753	A–276754
1 *	Adapter, freeze plug	276212		
1 *	Adapter, freeze plug	276215		
1	Reducer Bushing	153659		
1 **	Lead	SWON–1622–2218		

* 276212 freeze plug adapter will be used on 50–100RZ (8 Cylinder) Installations.
276215 freeze plug adapter will be used on 30–45RZ (6 Cylinder) Installations.

** Use lead only if installing kit on a 50–100RZ (8–Cylinder) unit with a Low Water Temperature Feature at position 1 in Figure 4a.

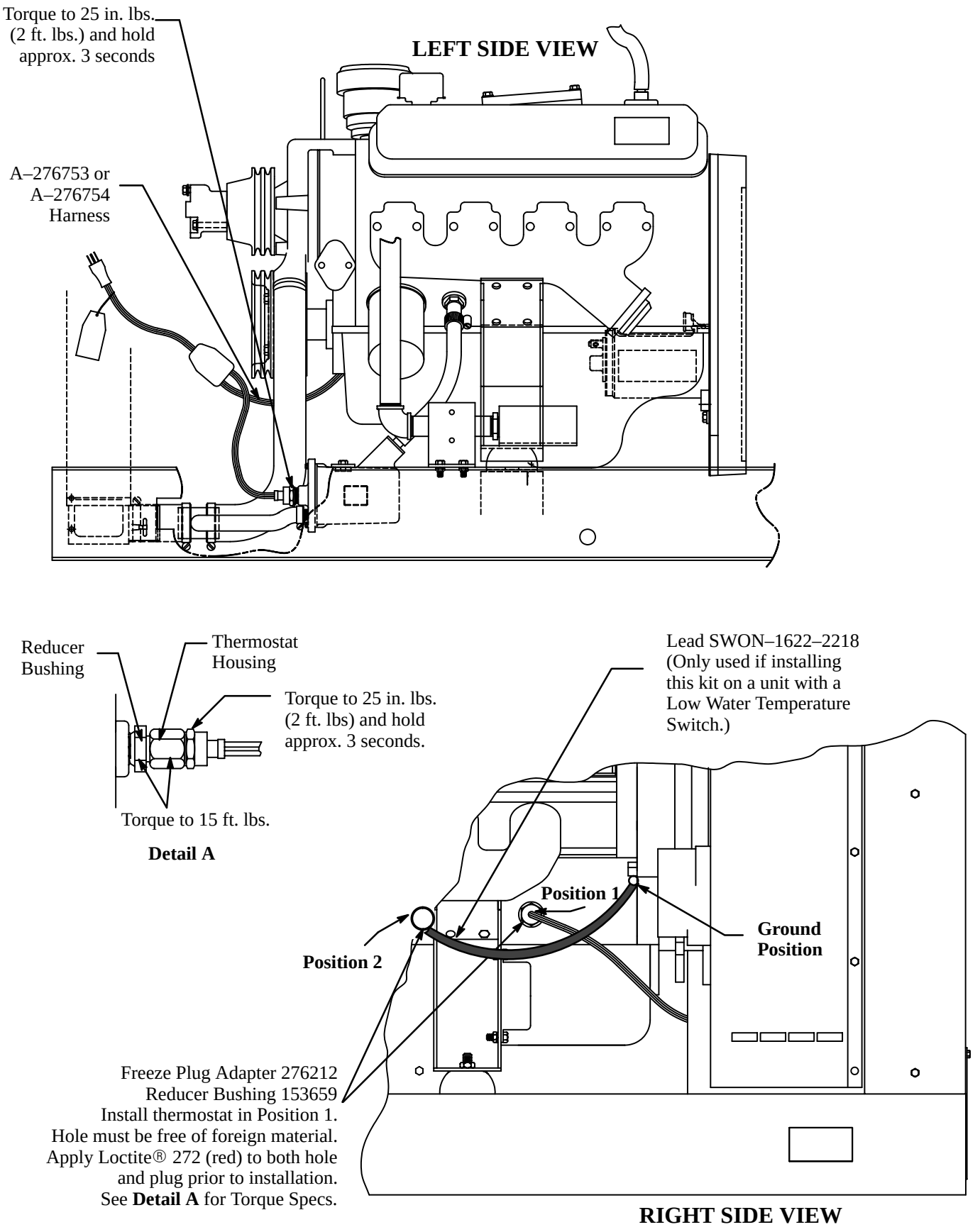
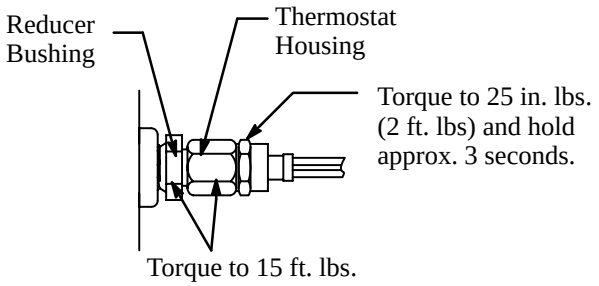


Figure 4a. Thermostat Relocation for 50–100RZ (8 Cylinder Units)



Detail A

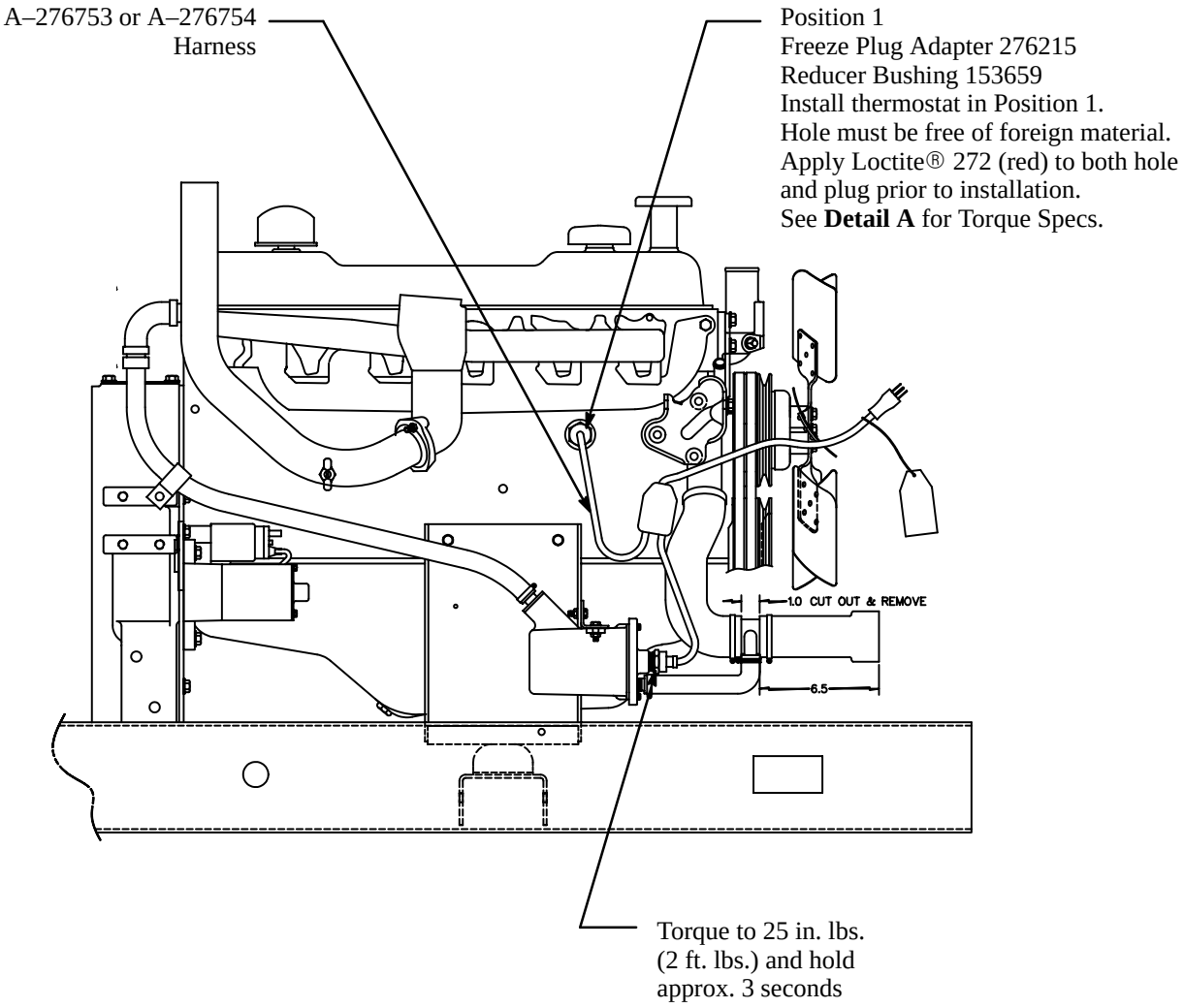


Figure 4b. Thermostat Relocation for 30–45RZ (6 Cylinder Units)