

## INSTALLATION INSTRUCTIONS

Original Issue Date: 6/16

Model: 24RCL\*, 30RCL and 38RCLB

Market: Residential/Light Commercial

Subject: Block Heater Kits GM90235-KP1 and GM90235-KP2

\* 24RCL models built January 24, 2017, or later, with serial numbers SGM32J59B and higher.

### Introduction

The engine block heater kit heats the engine coolant, making starting easier and warmup quicker. The thermostat, built into the base of the block heater, automatically turns on at 27°C (80°F) and off at 38°C (100°F).

The 30RCL and 38RCLB generator set engines are equipped with valves that eliminate the need to drain the cooling system before installing the block heater. 24RCL generator sets built on January 24, 2017, or later, with serial numbers SGM32J59B and higher, are also equipped with valves. For 24RCL units built before this date, use a block heater retrofit kit and see TT-1700.

Kit No.	Volts	Amps	Watts
GM90235-KP1	120	4.2	500
GM90235-KP2	240	2.1	500

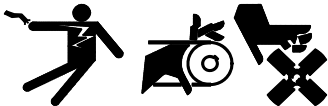
Figure 1 Kit Selection

Read the entire installation procedure before beginning the installation. Perform the steps in the order shown.

### Safety Precautions

Observe the following safety precautions while installing the kit.

**⚠ WARNING**




**Accidental starting.**  
**Can cause severe injury or death.**

Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery.

**Disabling the generator set. Accidental starting can cause severe injury or death.** Before working on the generator set or equipment connected to the set, disable the generator set as follows: (1) Press the generator set off/reset button to shut down the generator set. (2) Disconnect the power to the battery charger, if equipped. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent the starting of the generator set by the remote start/stop switch.

**⚠ DANGER**




**Hazardous voltage.**  
**Will cause severe injury or death.**

Disconnect all power sources before opening the enclosure.

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

**⚠ WARNING**



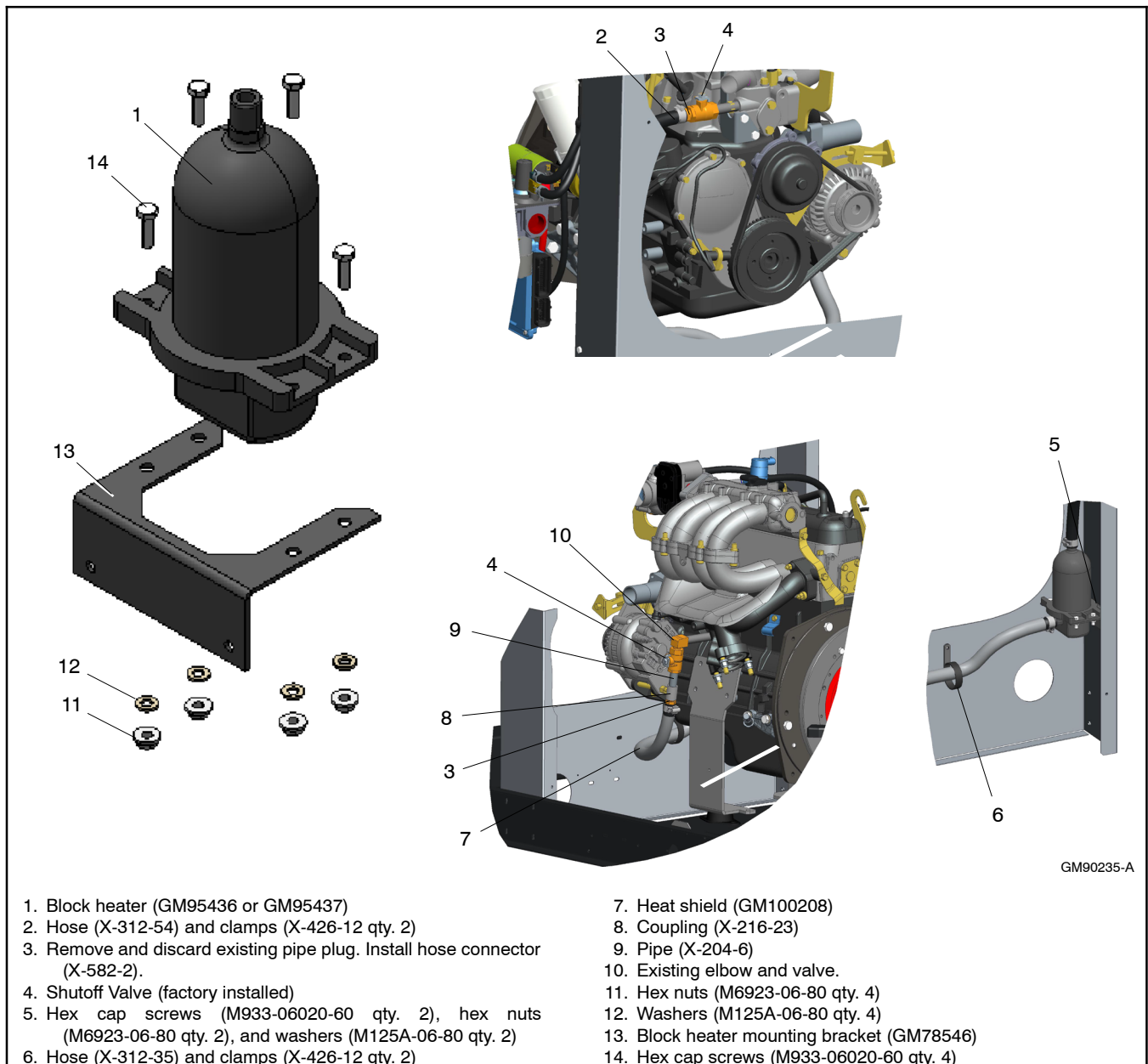
**Hot coolant and steam.**  
**Can cause severe injury or death.**

Before removing the pressure cap, stop the generator set and allow it to cool. Then loosen the pressure cap to relieve pressure.

**Note:** Allow the engine to cool. Release pressure from the cooling system before removing the pressure cap. To release pressure, cover the pressure cap with a thick cloth and then slowly turn the cap counterclockwise to the first stop. Remove the cap after pressure has been completely released and the engine has cooled. Check the coolant level at the tank if the generator set has a coolant recovery tank.

**Note:** Air pockets often form in the engine water jacket when the coolant system is refilled. Check the coolant level in the coolant recovery tank after each generator set operation and add coolant as necessary until the level stabilizes. Check the coolant at the interval specified in the service schedule.

**Note: Block heater damage.** The block heater will fail if the energized heater element is not immersed in coolant. Fill the cooling system before turning on the block heater. Run the engine until it is warm, and refill the system to purge the air from the system before energizing the block heater.



**Figure 2** Block Heater Kit (GM90235-KP1/-KP2)

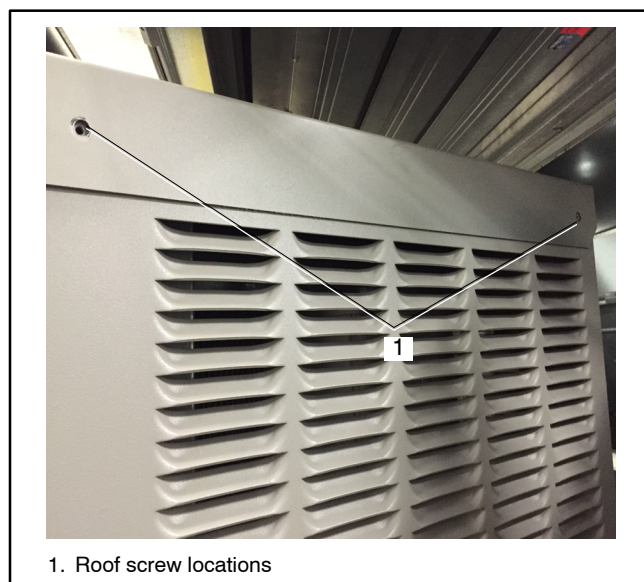
## Installation Procedure

### 1.1 Remove the generator set from service.

1. Press the OFF button on the generator set controller.
2. Disconnect the utility power to the generator set.
3. Disconnect the generator set engine starting battery, negative (-) lead first.

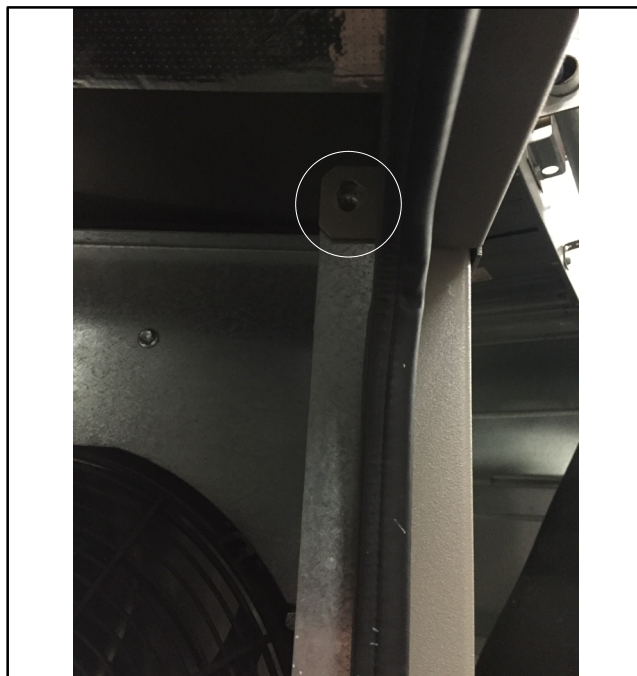
### 1.2 Install the block heater.

1. Open the door of generator set enclosure and take off the door seal.
2. Remove the roof screws. See Figure 3.

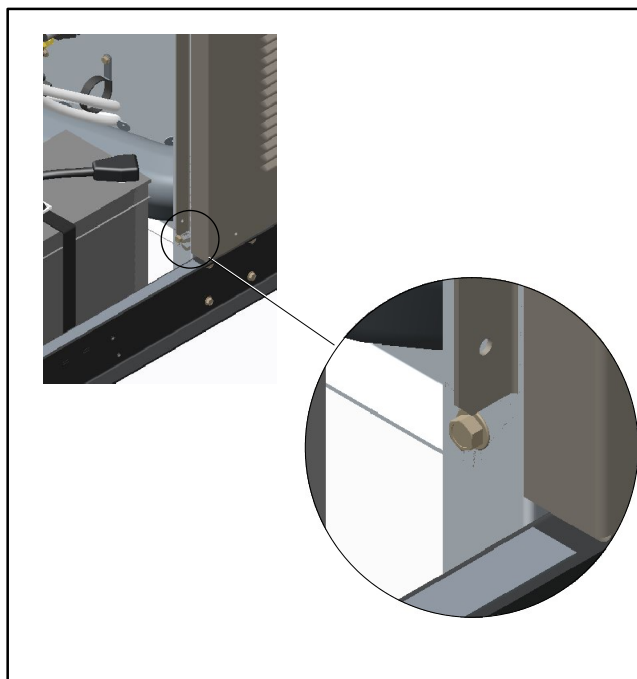


**Figure 3** Location of roof screws

3. Remove the two inside right panel screws. See Figure 4 and Figure 5.

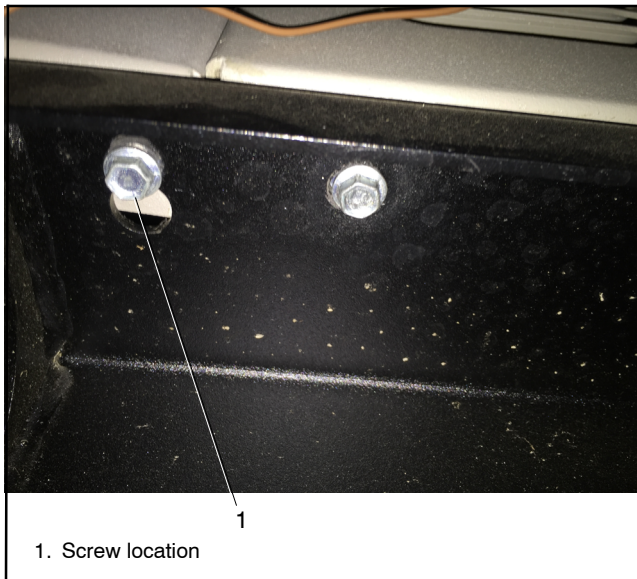


**Figure 4** Location of right panel inner screws



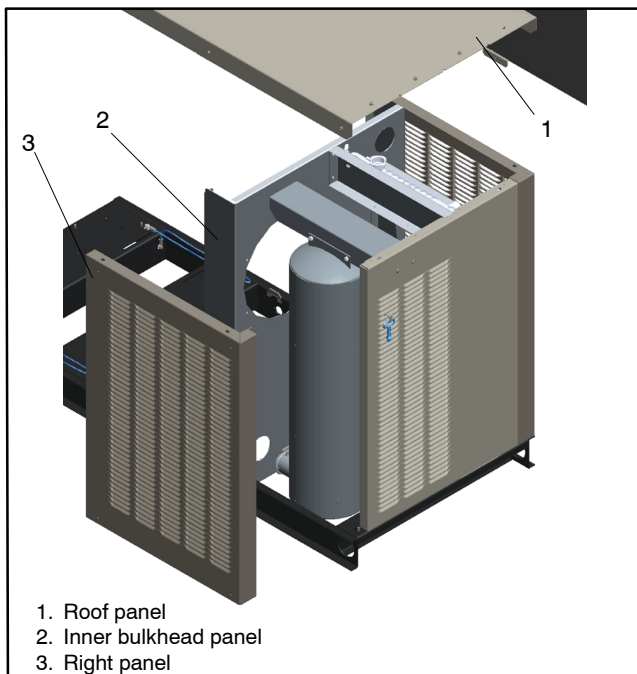
**Figure 5** Location of right panel inner screws

4. Remove one right panel screw under the front cross member. See Figure 6.



**Figure 6** Location of screw

5. Lift the roof panel enough to remove the the right panel.



6. Install block heater on mounting bracket (GM78546) using screws (M933-06020-60 qty. 4), washers (M125A-60-80 qty. 4), and nut (M6923-06-80 qty. 4). See Figure 2.
7. Secure the block heater mounting bracket (with block heater attached) on inner bulkhead panel using screws (M933-06020-60 qty. 2) and nuts (M6923-06-80 qty. 2). See Figure 7.



**Figure 7** Location of Block Heater (Side view)

8. Locate the two shutoff valves installed on the engine block. One shutoff valve is located on upper right side and one is on the lower left. Verify that the valves are closed. See Figure 2.
9. Remove and discard the pipe plug from each shutoff valve.
10. Apply pipe sealant to the threads of hose connector (X-582-2) and install the hose connector in the upper shutoff valve.
11. Connect the 349 mm (13.75 in.) hose (X-312-54) to the block heater outlet. Secure the hose to the outlet using a hose clamp (X-426-12).
12. Connect the other end of the hose to the hose connector (X-582-2) on the top of the engine. Secure using a hose clamp (X-426-12).
13. Apply pipe sealant to the threads of pipe (X-204-6) and the hose barb (X-582-2). Assemble pipe, hose barb and coupling (X-216-23).
14. Thread the assembly onto the open end of the shutoff valve on the engine.
15. Install the shielding (GM100208) over the 711 mm (28 in.) lower hose (X-312-35).
16. Connect the lower hose to the block heater inlet and secure with clamp (X-426-12).
17. Connect the other end of the lower hose to the barb fitting installed on the lower side of the engine and

secure using hose clamp (X-426-12). Route the hose in front of the engine.

18. Secure the hangtag (279047) to the power cord, keeping the tag away from the exhaust pipe.

**Note:** Do not plug the heater into the power outlet until the radiator is filled with coolant.

19. Open the two block heater shutoff valves.
20. Fill the radiator up with approximately 500 ml of coolant.

**Note:** Use a coolant solution of 50% ethylene glycol to provide freezing protection to  $-37^{\circ}\text{C}$  ( $-34^{\circ}\text{F}$ ) and overheating protection to  $129^{\circ}\text{C}$  ( $265^{\circ}\text{F}$ ). A coolant solution with less than 50% ethylene glycol can cause engine or component damage. Do not use alcohol or methanol antifreeze or mix them with the specified coolant.

**Note:** Do not add coolant to a hot engine. Wait until the engine has cooled. Adding coolant to a hot engine can cause the cylinder block or cylinder head to crack.

### 1.3 Restore the generator set to service.

1. Reconnect the generator set engine starting battery, negative (-) lead last.
2. Reconnect the utility power to the generator set.
3. Press the RUN button on the generator set controller. The generator set will start.
4. Test run the generator set for a few minutes to check for coolant leaks and to purge air from the system.

**Note:** Purge trapped air to prevent block heater element failure. See the below instructions to purge the air from the system.

- a. Operate the engine with the radiator's pressure cap removed until the thermostat opens and the radiator upper hose becomes hot.
  - b. Stop the engine and allow it to cool.
  - c. Add coolant to the radiator to just below the overflow tube on the filler neck.
  - d. Replace the radiator's pressure cap.
5. Stop the generator set. After allowing the engine to cool, correct any leakage.
  6. Recheck the coolant level. Add coolant as necessary.
  7. Connect the block heater electrical plug to the power outlet.

## Parts List

### 24RCL\*, 30RCL and 38RCLB Block Heater Kits

Kits: GM90235-KP1 and GM90235-KP2				
Qty.	Description	Common Parts	Unique Parts	
			GM90235-KP1	GM90235-KP2
1	Block heater		GM95436	GM95437
1	Tag, hang	279047		
1	Shield, heat	GM100208		
1	Bracket, block heater mtg.	GM78546		
6	Washer, plain (12 mm OD x 6.4 mm ID)	M125A-06-80		
6	Nut, hex (6 mm)	M6923-06-80		
6	Screw, hex cap (M6 x 20 mm)	M933-06020-60		
1	Pipe, nipple (3/8 in. NPT x 2 in.)	X-204-6		
1	Coupling, pipe (3/8 in. NPSC)	X-216-23		
1	Hose (0.63 in. ID x 13.75 in.)	X-312-54		
1	Hose (0.63 in. ID x 28 in.)	X-312-35		
4	Clamp, hose (0.69/1.25 in.)	X-426-12		
2	Connector, hose	X-582-2		

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