

INSTALLATION INSTRUCTIONS

Original Issue Date: 11/16
Model: 14/20RESA/RESAL, 20RESB, 20RESC/RESCL, and 20RESD
Market: Residential/Commercial
Subject: Breather Tube Heater and Oil Heater Kits: GM102231-KP1-QS, GM102231-KP2-QS, GM102231-KP3-QS, and GM102231-KP4-QS

Introduction

The breather tube heater and oil heater kit is recommended for improved cold starting in locations where the ambient temperature drops below 0°C (32°F). See Figure 1 to identify the kit number for your generator set.

Note: The heaters require a continuous source of AC power. See Figure 2 and Figure 3 for the power supply voltage required.

Verify that AC power is connected to the generator set as described in the generator set Installation Manual. The circuit must be backed up by the generator set to provide power at all times. Refer to the Installation Procedure for instructions to connect 120 VAC or 240 VAC power as required.

See Figure 4 and Figure 5 for illustrations of the 120 VAC and 240 VAC breather tube heater and oil heater.

Read the entire installation procedure and compare the kit parts with the parts list at the end of this publication

before beginning installation. Perform the steps in the order shown.

| Kit Number | Generator Models |
|-----------------|---------------------------|
| GM102231-KP1-QS | 14RESA/RESAL - 120V |
| GM102231-KP2-QS | 14RESA/RESAL - 240V |
| GM102231-KP3-QS | 20RESA/AL/B/C/CL/D - 120V |
| GM102231-KP4-QS | 20RESA/AL/B/C/CL/D - 240V |

Figure 1 Kit Application

| Heater Part Number | GM101479, GM101480 | GM101481, GM101482 |
|--------------------|--------------------|--------------------|
| Voltage | 120 VAC | 240 VAC |
| Thermostat ON | 4°C (40°F) | |
| Thermostat OFF | 13°C (55°F) | |

Figure 2 Breather Tube Heater Specifications

| Heater Part Number | GM101484, GM101485 | GM101486, GM101487 |
|--------------------|--------------------|--------------------|
| Voltage | 120 VAC | 240 VAC |
| Thermostat ON | 4°C (40°F) | |
| Thermostat OFF | 13°C (55°F) | |

Figure 3 Oil Heater Specifications

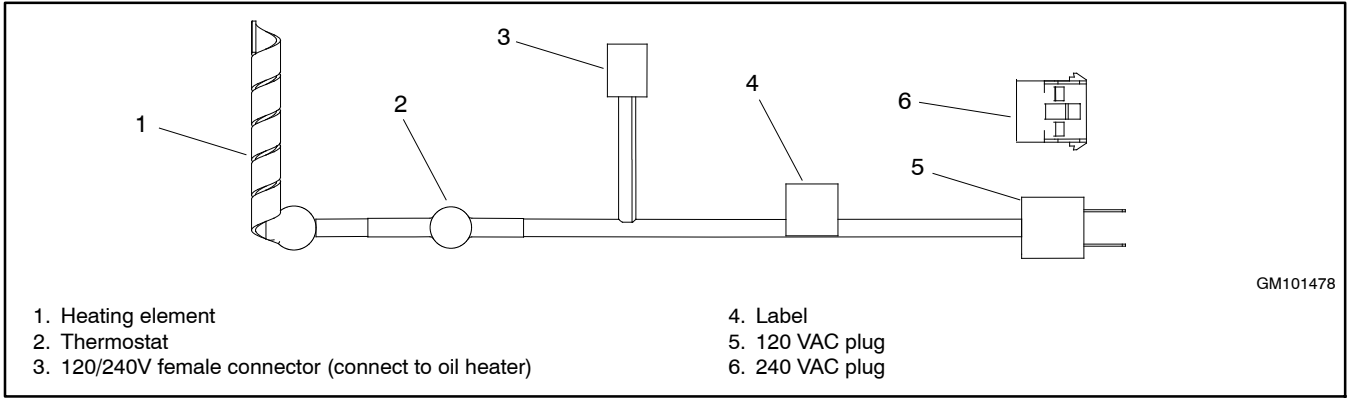


Figure 4 Breather Tube Heater

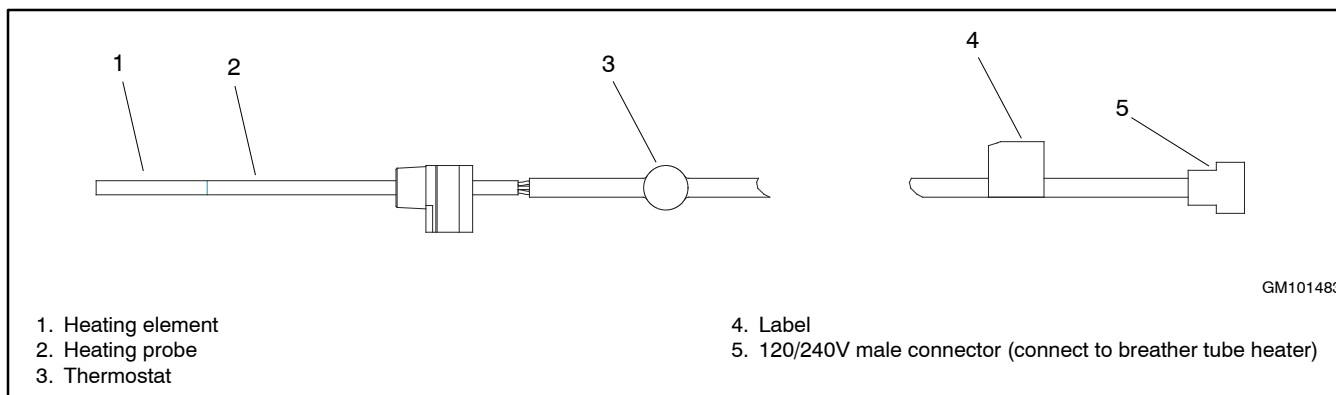


Figure 5 Oil Heater

Safety Precautions

Observe the following safety precautions while installing the kit.

| |
|--|
| ⚠ WARNING |
| |
| <p>Accidental starting. Can cause severe injury or death.</p> <p>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.</p> |

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 |
| |
| <p>Hazardous voltage. Will cause severe injury or death.</p> <p>Disconnect all power sources before opening the enclosure.</p> |

| |
|-----------------------------|
| ⚠ CAUTION |
| |
| <p>Hot surfaces.</p> |

Servicing the engine heater. Hot parts can cause minor personal injury or property damage. Install the heater before connecting it to power. Operating the heater before installation can cause burns and component damage. Disconnect power to the heater and allow it to cool before servicing the heater or nearby parts.

Installation Procedure, Breather Tube Heater

Note: For Models 14RESA(L) only: If the generator set is equipped with a carburetor heater, obtain kit GM102228-S to replace the breather tube, air cleaner spacer, and gaskets before starting this procedure.

1. Open the enclosure roof. Locate the generator set controller and the engine air cleaner. See Figure 6 and Figure 7.
2. Turn off the generator set by pressing the OFF button on the generator set controller.
3. Disconnect the AC power to the generator set by opening the circuit breaker in the distribution panel.
4. Disconnect the generator set engine starting battery(ies), negative (-) lead first.
5. For 14RESA(L) and 20RESC(L) Models: Lift up the thermal cover.

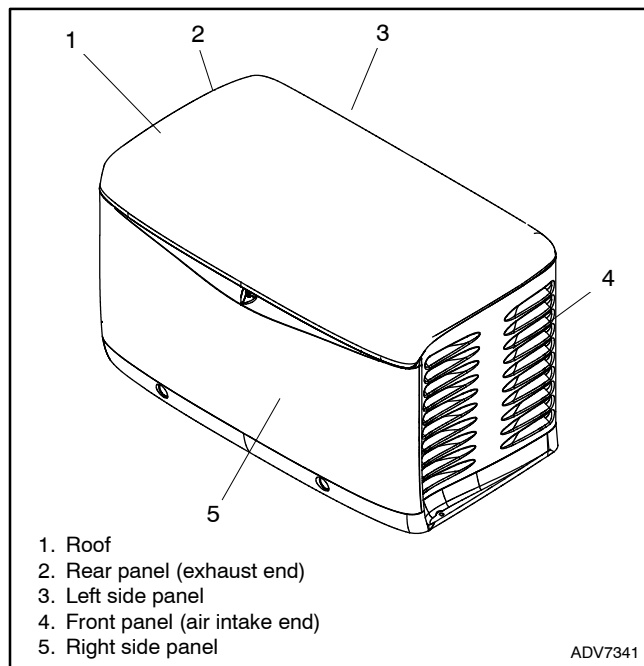


Figure 6 Enclosure Parts(14RESA(L) and 20RESC(L) Models)

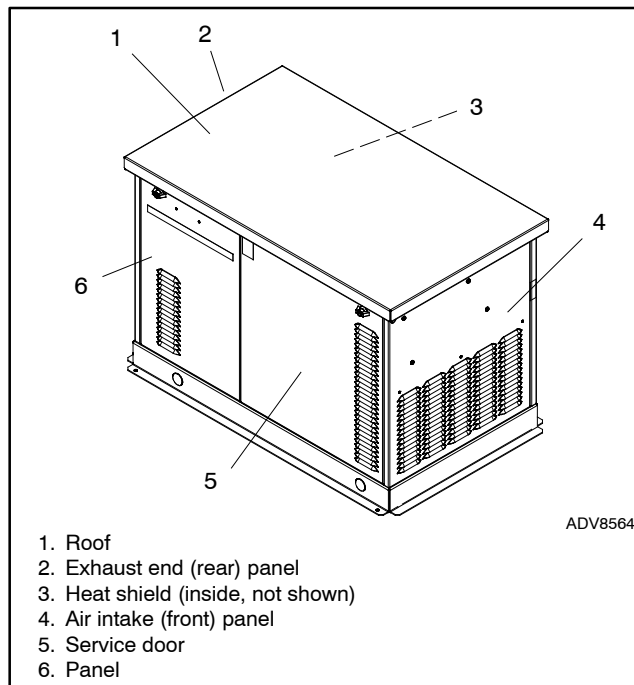


Figure 7 Enclosure Parts (20RESD Model)

Note: The breather tube connects to the bottom of the air cleaner assembly. To gain access to the breather tube, remove the air cleaner as described below.

6. Loosen the air cleaner cover retaining knob(s) and remove the air cleaner cover. See Figure 8.

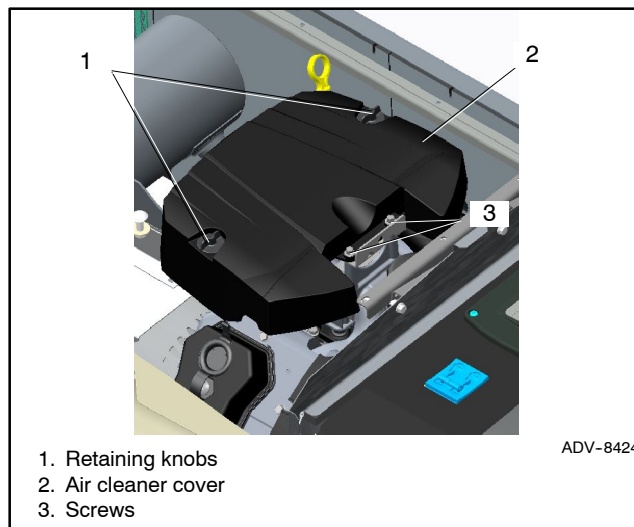


Figure 8 Air Cleaner Cover (20RESA shown)

7. Remove the precleaner and paper element.
8. Remove the screws that attach the air cleaner bracket and base to the carburetor assembly. Remove the bracket and base. Save the mounting hardware. See Figure 9.

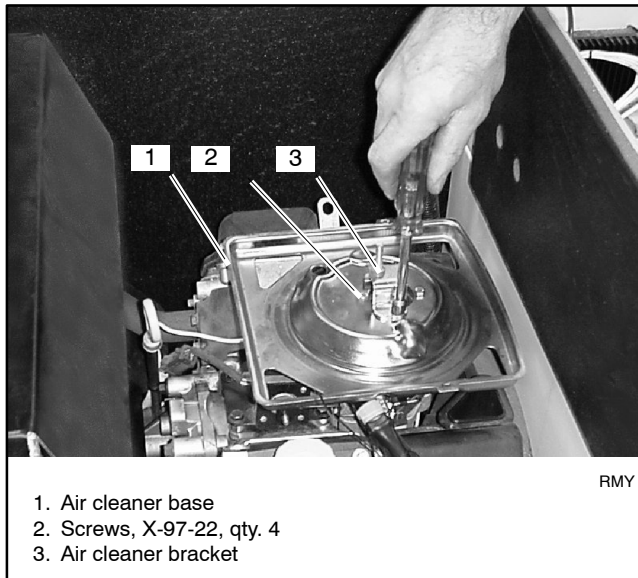


Figure 9 Air Cleaner Bracket and Screws (14RESA shown)

9. If the generator set is equipped with a carburetor heater, remove it at this time.
 - a. 14RESA: See Figure 10. Obtain kit GM102228-S. Follow the instructions provided with that kit to remove the carburetor heater and install the air cleaner spacer, two gaskets, and breather tube.
 - b. 20RESA/C: See Figure 11. Unplug the carburetor heater and remove it.

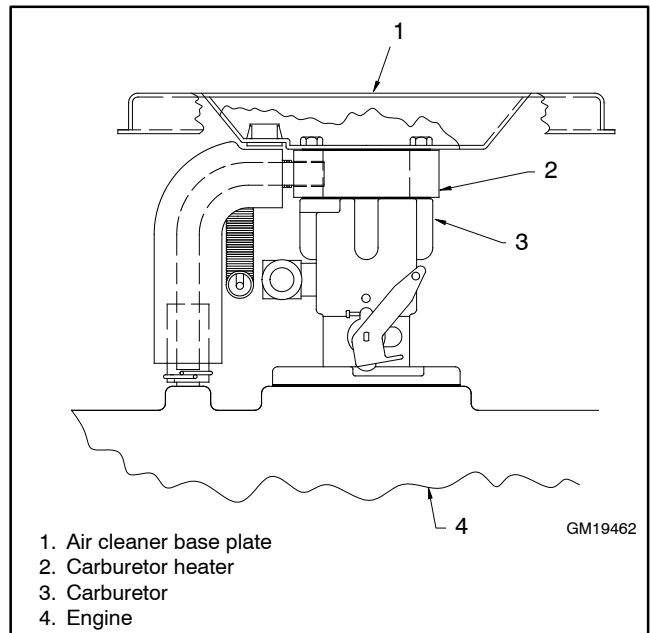


Figure 10 Carburetor Heater Location (if equipped), Models 14RESA(L)

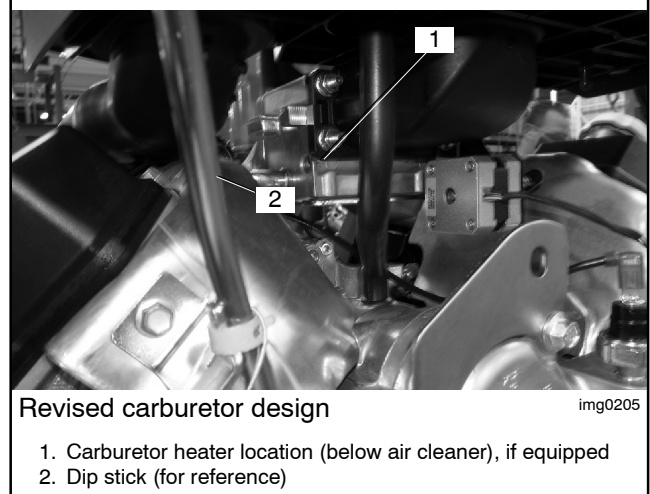
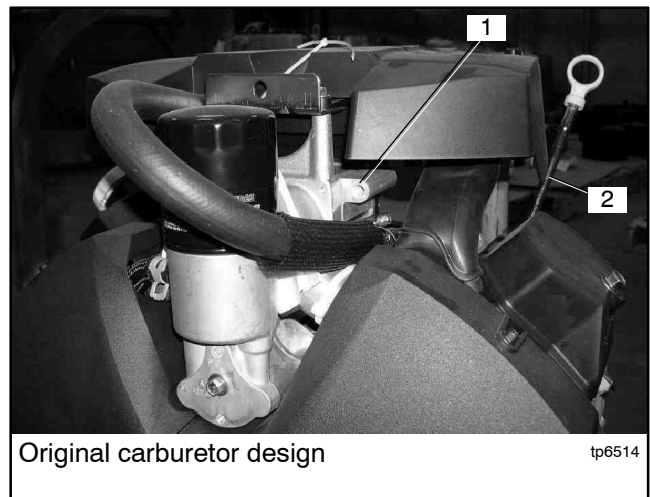


Figure 11 Carburetor Heater Locations (if equipped), Models 20RESA/B/C/D

10. Disconnect the breather tube from the air cleaner base. See Figure 12.
11. Start wrapping the heating element for the breather tube (GM101479, GM101480, GM101481, or GM101482) at the engine and work upward to the underside of the air cleaner housing. See Figure 12.

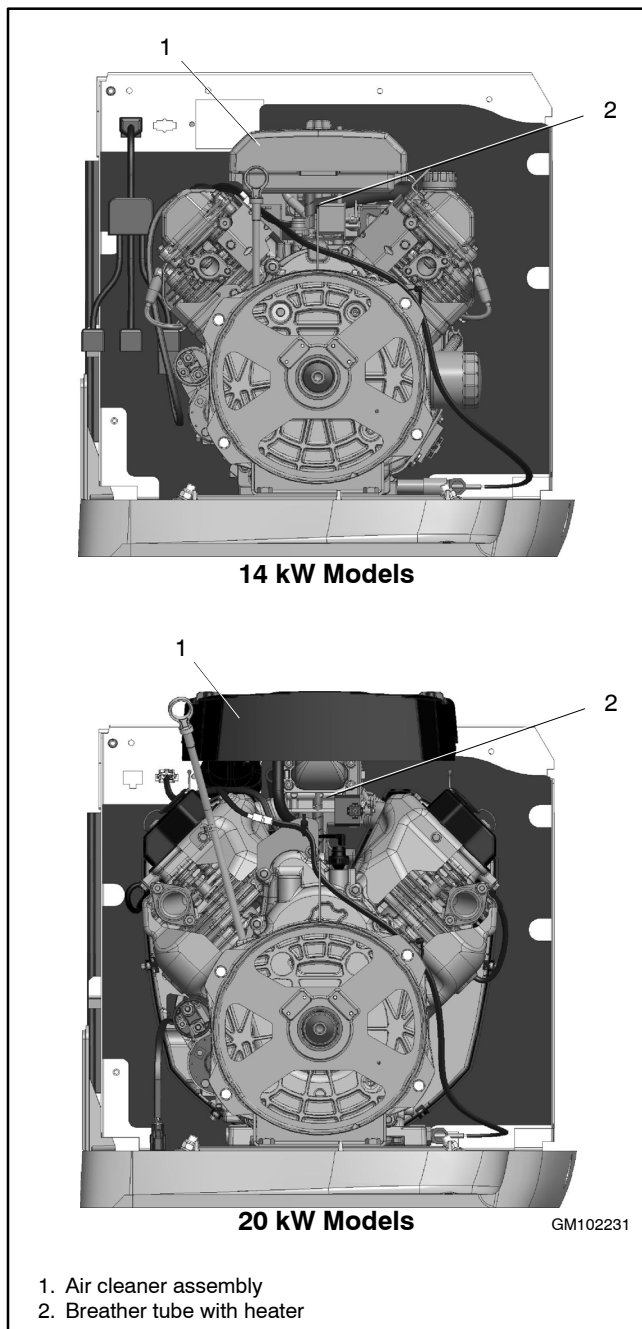


Figure 12 Breather Tube Heater Location

12. Follow the below method to apply the silicone tape supplied to secure heating element.

Note: Silicone tape begins to cure immediately upon contact with itself. Repositioning or removal is not recommended after 2 minutes of contact. Tape forms a permanent bond within 24 hours at ambient temperature.

- a. Clean the surface to be wrapped.
- b. Peel a short length of protective film from one end and begin at the engine with one complete overlap onto the tape itself.
- c. Stretch the tape while continuing to wrap the object with half overlaps, removing the protective film as you go. Work upward to the underside of the air cleaner housing. The final wrap should be one complete overlap onto the tape itself, as done in the beginning.

13. Route the power cord to avoid contact with hot parts. See Figure 13.

14. Plug the power cord into the receptacle provided inside the engine compartment. See Figure 14.

Note: If multiple AC accessories are installed, use 3-way extension cord GM95628. See Figure 13.

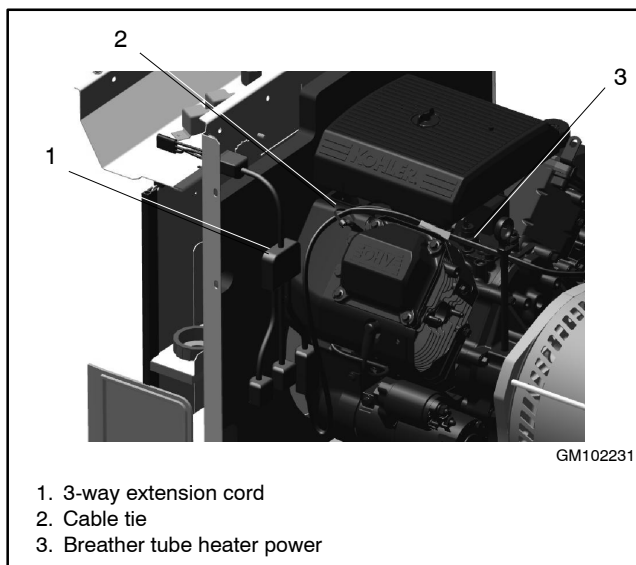
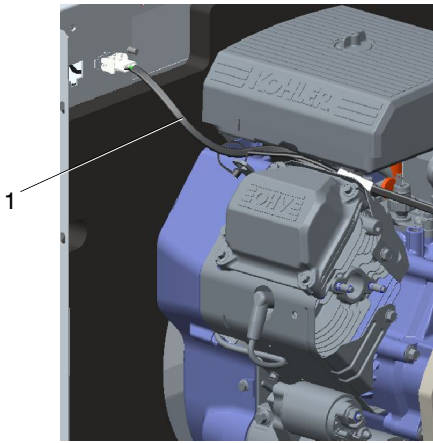
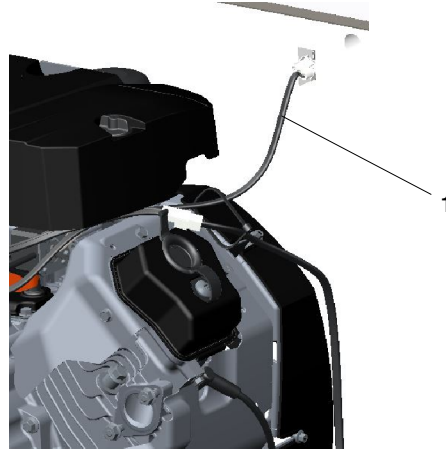


Figure 13 120V Heater Cord



14RESA(L)/20RESC(L)

1. Power cord



20RES

Figure 14 240V Heater Cord

15. Collect the excess cable and secure with a cable tie (see Figure 13).
16. Reconnect the breather tube to the air cleaner base. Make sure that there are no kinks in the breather tube.
17. Reinstall the air cleaner base.
18. Place the paper element and precleaner into the air cleaner base.
19. Reinstall the air cleaner cover.

Installation Procedure, Oil Heater

Note: The breather tube heater is required for connection of the oil heater.

20. Perform steps 1–5, if not already completed.
21. For 14RESA(L) and 20RESC(L) Models: Remove the right-side panel.
 - a. Remove two nuts on each side (total of four nuts). See Figure 16.
 - b. Remove one screw near the controller area. Save the mounting hardware.
 - c. Pull the right-side panel up and off.
22. For 20RESL Models: Remove the right side door.
 - a. Remove the plug and two door screws. See Figure 15. Save the mounting hardware.
 - b. Lift the service-side door up and off.

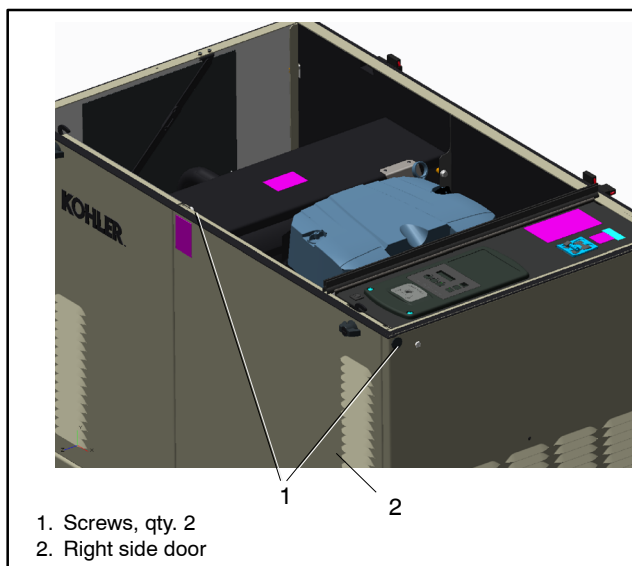


Figure 15 Right Side Door, 20RESL

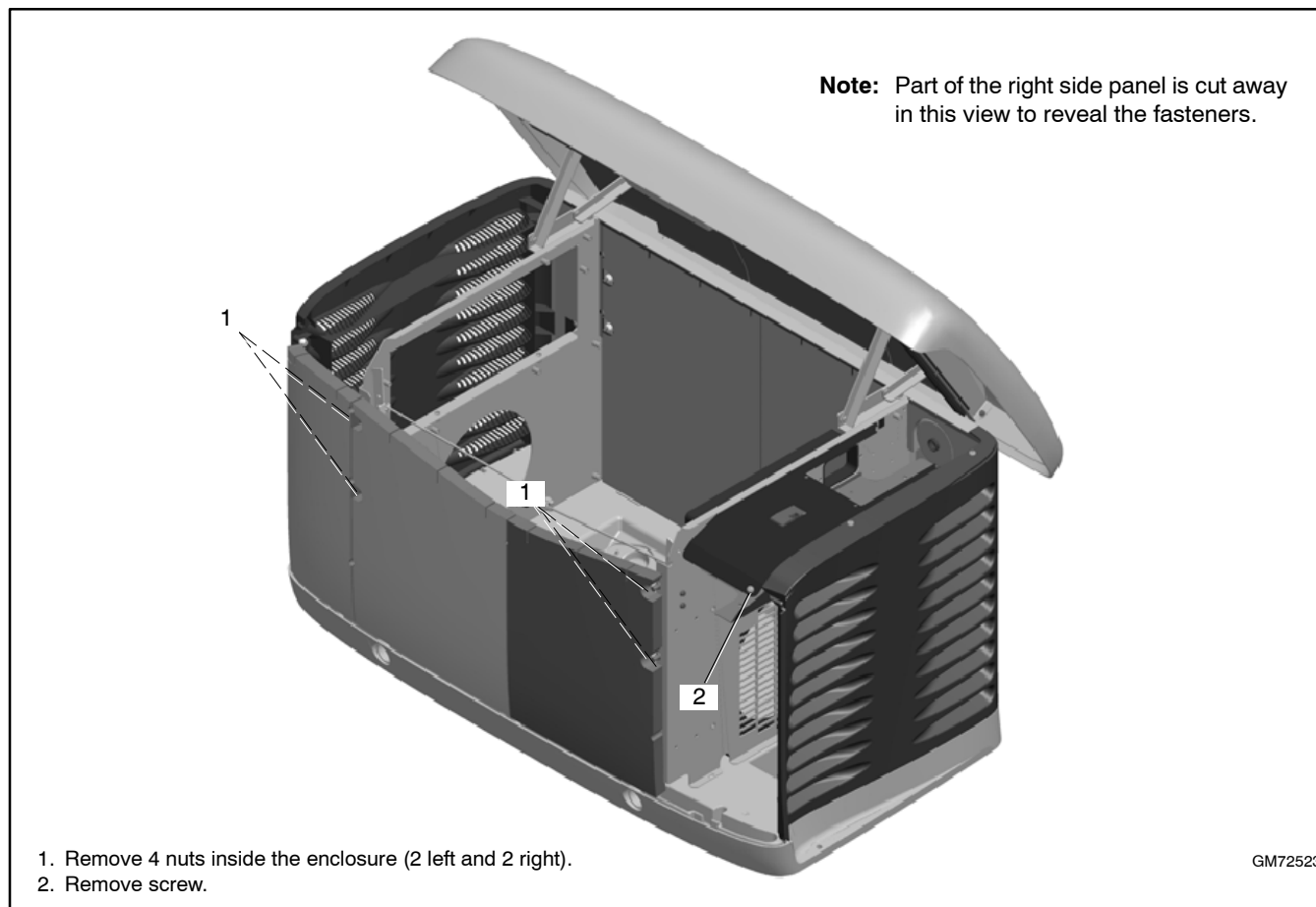


Figure 16 Right Side Panel, 14RESA(L) and 20RESC(L)

Note: Installation of the oil heater requires removal of the oil drain valve. Drain the engine oil, or work quickly and be ready with a container and rags to collect the oil.

23. Remove the shutoff valve and oil hose.

24. Install the oil heater (GM101484, GM101485, GM101486, or GM101487) on the engine. See Figure 17 and Figure 18.

Note: Orient the oil heater fitting toward the alternator with a slight downward angle to ensure proper oil drainage.

25. Reinstall the oil shutoff valve and drain hose with the valve handle pointed up.

26. Route the power cord to avoid contact with hot parts. See Figure 19 and Figure 20.

27. Plug the power cord into the connector provided in the breather heater. See Figure 19 and Figure 20.

28. Collect the excess cable and secure with a cable tie. See Figure 19 and Figure 20.

29. Use the dipstick to check the engine oil level. Add oil to bring the level up to the full mark on the dipstick.

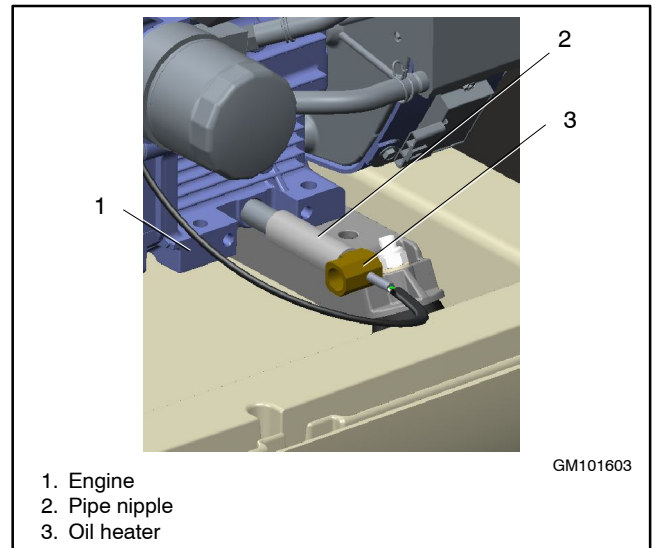


Figure 17 Oil Heater, 14RESA(L)

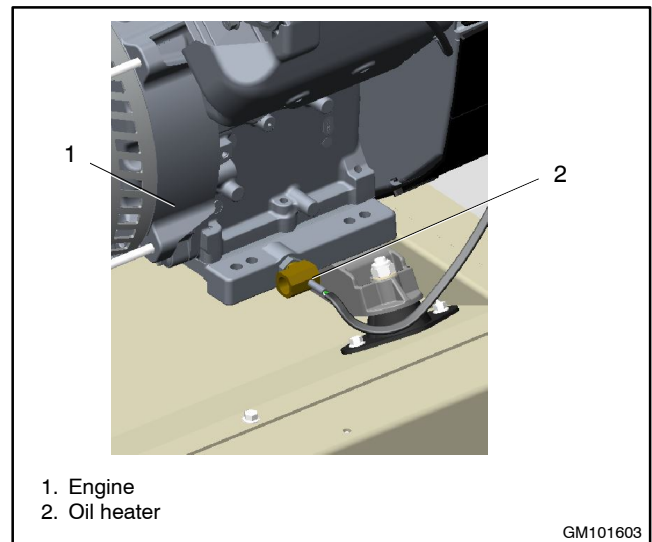


Figure 18 Oil heater, 20RESC(L) and 20RESD

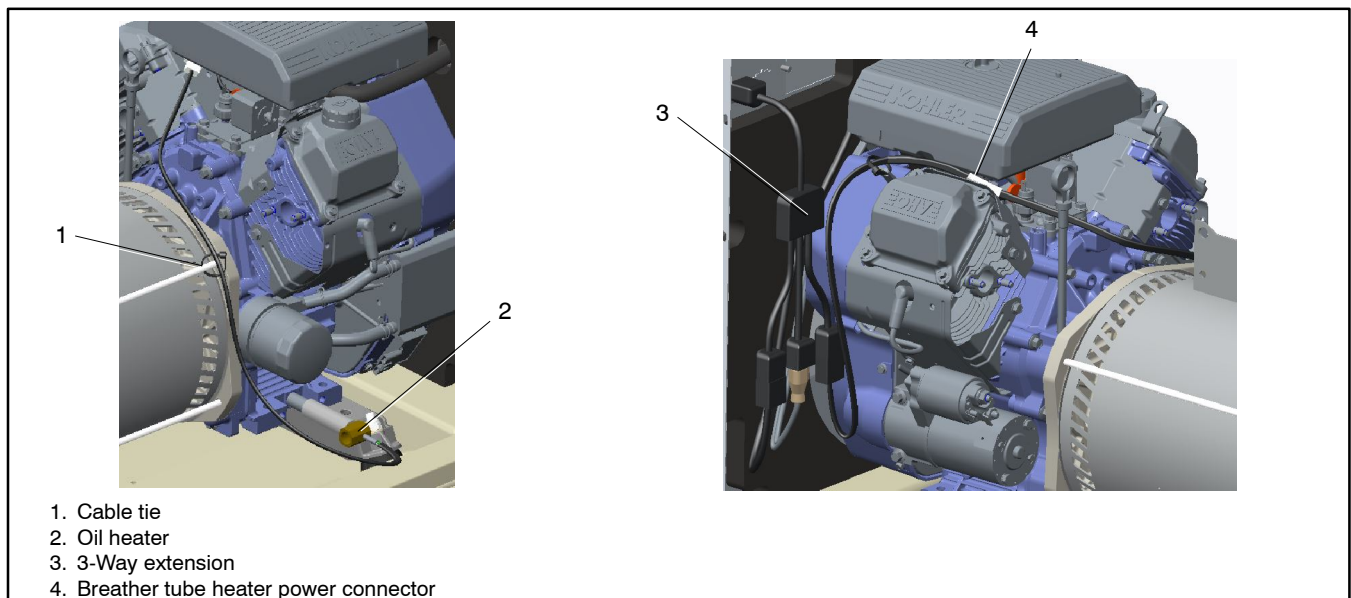


Figure 19 120V Oil Heater

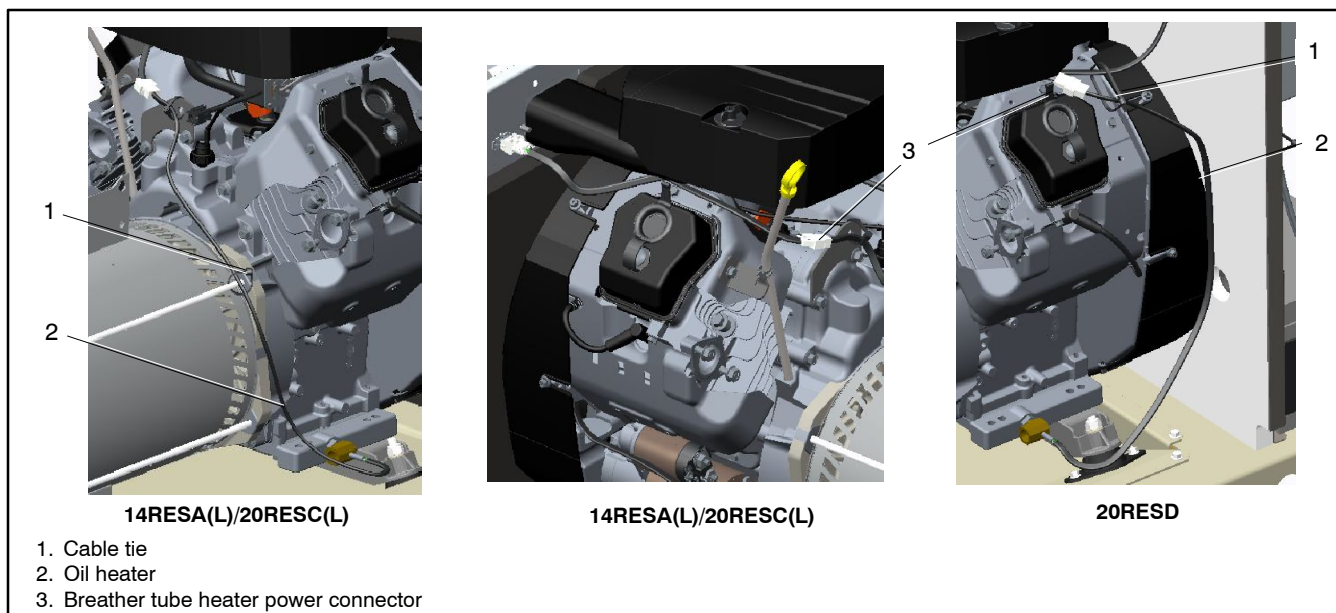


Figure 20 240V Oil Heater

30. For 14RESA(L) and 20RESC(L): Reinstall the right side panel and close the thermal cover.
For 20RESD: Reinstall the right side door.
31. Reconnect the generator set engine starting battery(ies), negative (-) lead first.
32. Reconnect the AC power to the generator set by closing the circuit breaker in the distribution panel.
33. For standby operation, press the AUTO button on the generator set controller.
34. Close the enclosure roof.

Notes

Notes

Parts Lists

Breather Tube and Oil Heater Kit 120 VAC, 14 kW Models

| Kit: GM102231-KP1-QS | | |
|----------------------|--|-------------|
| Qty. | Description | Part Number |
| 1 | Heater, Breather Tube 120V, 50W | GM101479 |
| 1 | Heater, Oil 120V, 75W | GM101484 |
| 1 | Cord, 3 Way Extension | GM95628 |
| 1 | Breather Tube and Oil Htrs, 14/20 kW Res | TT-1709 |
| 1 | Pipe, Nipple (3/8" npt x 3.00") | X-204-7 |
| 2 | Cable Tie | X-468-1 |

Breather Tube and Oil Heater Kit 240 VAC, 14 kW Models

| Kit: GM102231-KP2-QS | | |
|----------------------|--|-------------|
| Qty. | Description | Part Number |
| 1 | Heater, Breather Tube 240V, 50W | GM101481 |
| 1 | Heater, Oil 240V, 75W | GM101486 |
| 1 | Harness, Adapter | GM88996 |
| 1 | Breather Tube and Oil Htrs, 14/20 kW Res | TT-1709 |
| 1 | Pipe, Nipple (3/8" npt x 3.00") | X-204-7 |
| 2 | Cable Tie | X-468-1 |

Breather Tube and Oil Heater Kit 120 VAC, 20 kW Models

| Kit: GM102231-KP3-QS | | |
|----------------------|--|-------------|
| Qty. | Description | Part Number |
| 1 | Heater, Breather Tube 120V, 50W | GM101480 |
| 1 | Heater, Oil 120V, 75W | GM101485 |
| 1 | Cord, 3 Way Extension | GM95628 |
| 1 | Breather Tube and Oil Htrs, 14/20 kW Res | TT-1709 |
| 2 | Cable Tie | X-468-1 |

Breather Tube and Oil Heater Kit 240 VAC, 20 kW Models

| Kit: GM102231-KP4-QS | | |
|----------------------|--|-------------|
| Qty. | Description | Part Number |
| 1 | Heater, Breather Tube 240V, 50W | GM101482 |
| 1 | Heater, Oil 240V, 75W | GM101487 |
| 1 | Harness, Adapter | GM88996 |
| 1 | Breather Tube and Oil Htrs, 14/20 kW Res | TT-1709 |
| 2 | Cable Tie | X-468-1 |

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