

# Instruction Sheet

**A045H700 (Issue 5)**

3-2017

## Installation Instructions for Emergency Stop Switch Kit A044Z051

### 1 Introduction

Read these instructions completely and become familiar with safety warnings, cautions and procedures before starting the installation.

The information contained within is based on information available at the time of going to print. In line with Cummins Power Generation policy of continuous development and improvement, information may change at any time without notice. The users should therefore make sure that before commencing any work, they have the latest information available.

The latest version of this instruction sheet is available on QuickServe Online (<https://qsol.cummins.com/info/index.html>).

### 2 Safety Precautions

#### 2.1 General Safety Precautions

##### **WARNING**

###### ***Hot Pressurized Liquid***

***Contact with hot liquid can cause severe burns.***

***Do not open the pressure cap while the engine is running. Let the engine cool down before removing the cap. Turn the cap slowly and do not open it fully until the pressure has been relieved.***

##### **WARNING**

###### ***Moving Parts***

***Moving parts can cause severe personal injury.***

***Use extreme caution around moving parts. All guards must be properly fastened to prevent unintended contact.***

##### **WARNING**

###### ***Toxic Hazard***

***Used engine oils have been identified by some state and federal agencies to cause cancer or reproductive toxicity.***

***Do not ingest, breathe the fumes, or contact used oil when checking or changing engine oil. Wear protective gloves and face guard.***

 **WARNING**

**Toxic Hazard**

*Ethylene glycol, used as an engine coolant, is toxic to humans and animals.*

*Wear appropriate PPE. Clean up coolant spills and dispose of used coolant in accordance with local environmental regulations.*

 **WARNING**

**Electrical Generating Equipment**

*Incorrect operation can cause severe personal injury or death.*

*Do not operate equipment when fatigued, or after consuming any alcohol or drug.*

 **WARNING**

**Toxic Gases**

*Substances in exhaust gases have been identified by some state and federal agencies to cause cancer or reproductive toxicity.*

*Do not breathe in or come into contact with exhaust gases.*

 **WARNING**

**Combustible Liquid**

*Ignition of combustible liquids is a fire or explosion hazard which can cause severe burns or death.*

*Do not store fuel, cleaners, oil, etc., near the generator set.*

 **WARNING**

**High Noise Level**

*Generator sets in operation emit noise, which can cause hearing damage.*

*Wear appropriate ear protection at all times.*

 **WARNING**

**Hot Surfaces**

*Contact with hot surfaces can cause severe burns.*

*Wear appropriate PPE when working on hot equipment and avoid contact with hot surfaces.*

 **WARNING**

**Electrical Generating Equipment**

*Incorrect operation and maintenance can result in severe personal injury or death*

*Make sure that only suitably trained and experienced service personnel perform electrical and/or mechanical service.*

 **WARNING**

**Automated Machinery**

*Accidental or remote starting of the generator set can cause severe personal injury or death.*

*Isolate all auxiliary supplies and use an insulated wrench to disconnect the starting battery cables (negative [-] first).*

 **WARNING**

**Fire Hazard**

*Materials drawn into the generator set are a fire hazard. Fire can cause severe burns or death. Keep the generator set and the surrounding area clean and free from obstructions.*

 **WARNING**

**Fire Hazard**

*Materials drawn into the generator set are a fire hazard. Fire can cause severe burns or death. Make sure the generator set is mounted in a manner to prevent combustible materials from accumulating under the unit.*

 **WARNING**

**Fire Hazard**

*Accumulated grease and oil are a fire hazard. Fire can cause severe burns or death. Keep the generator set and the surrounding area clean and free from obstructions. Repair oil leaks promptly.*

 **WARNING**

*Incorrect service or replacement of parts can result in severe personal injury or death, and/or equipment damage. Service personnel must be trained and experienced to perform electrical and mechanical service.*

 **WARNING**

**Fire Hazard**

*Materials drawn into the generator set are a fire hazard. Fire can cause severe burns or death. Keep the generator set and the surrounding area clean and free from obstructions.*

**NOTICE**

Keep multi-class ABC fire extinguishers handy. Class A fires involve ordinary combustible materials such as wood and cloth. Class B fires involve combustible and flammable liquid fuels and gaseous fuels. Class C fires involve live electrical equipment. (Refer to NFPA No. 10 in applicable region.)

**NOTICE**

Before performing maintenance and service procedures on enclosed generator sets, make sure the service access doors are secured open.

**NOTICE**

Stepping on the generator set can cause parts to bend or break, leading to electrical shorts, or to fuel, coolant, or exhaust leaks. Do not step on the generator set when entering or leaving the generator set room.

## 2.2 Generator Set Safety Code

Before operating the generator set, read the manuals and become familiar with them and the equipment. Safe and efficient operation can be achieved only if the equipment is properly operated and maintained. Many accidents are caused by failure to follow fundamental rules and precautions.

### **WARNING**

#### ***Electrical Generating Equipment***

***Incorrect operation and maintenance can result in severe personal injury or death.***

***Read and follow all Safety Precautions, Warnings, and Cautions throughout this manual and the documentation supplied with the generator set.***

## 2.3 Electrical Shocks and Arc Flashes Can Cause Severe Personal Injury or Death

### **WARNING**

#### ***Electric Shock Hazard***

***Voltages and currents present an electrical shock hazard that can cause severe burns or death. Contact with exposed energized circuits with potentials of 50 Volts AC or 75 Volts DC or higher can cause electrical shock and electrical arc flash. Refer to standard NFPA 70E or equivalent safety standards in corresponding regions for details of the dangers involved and for the safety requirements.***

Guidelines to follow when working on de-energized electrical systems:

- Use proper PPE. Do not wear jewelry and make sure that any conductive items are removed from pockets as these items can fall into equipment and the resulting short circuit can cause shock or burning. Refer to standard NFPA 70E for PPE standards.
- De-energize and lockout/tagout electrical systems prior to working on them. Lockout/Tagout is intended to prevent injury due to unexpected start-up of equipment or the release of stored energy.
- De-energize and lockout/tagout all circuits and devices before removing any protective shields or making any measurements on electrical equipment.
- Follow all applicable regional electrical and safety codes.

In summary:

- Do not tamper with or bypass interlocks unless you are authorized to do so.
- Understand and assess the risks - use proper PPE.
- Make sure that an accompanying person who can undertake a rescue is nearby.

## 3 Instruction

### 3.1 Installation of Emergency Stop Switch Kit

This instruction sheet describes the installation of the emergency stop switch kit (A044Z051) on a control panel or enclosure, whichever is applicable. Make sure to keep the instruction sheet at the site location.

**TABLE 1. GENERATOR SET MODELS**

<b>Type</b>	<b>Models</b>
Generator sets with a display panel knockout	C20 N6, C22 N6, C25 N6, C30 N6, C36 N6, C40 N6, C30 N6H, C36 N6H, C40 N6H, C45 N6H, C50 N6H, C60 N6H, C10 D6, C15 D6, C20 D6, C25 D6, C30 D6, C35 D6, C40 D6, C50 D6, and C60 D6
Generator sets with a display panel rubber plug	C45 N6, C50 N6, C60 N6, C70 N6, C80 N6, C100 N6, C50D6C, C60D6C, C80D6C, C100D6C, C125D6C, C125 N6, C150 N6, C125D6D, C150D6D, C175D6D, C200D6D, C230D6D, and C250D6D
Generator sets that require hole drilling	C13N6H, C17N6H, C20N6H, and C20N6HC

Because the installation presents a severe shock hazard, this kit must be installed by trained and experienced personnel only.

Read these instructions completely and become familiar with safety warnings, cautions and procedures before starting the installation.

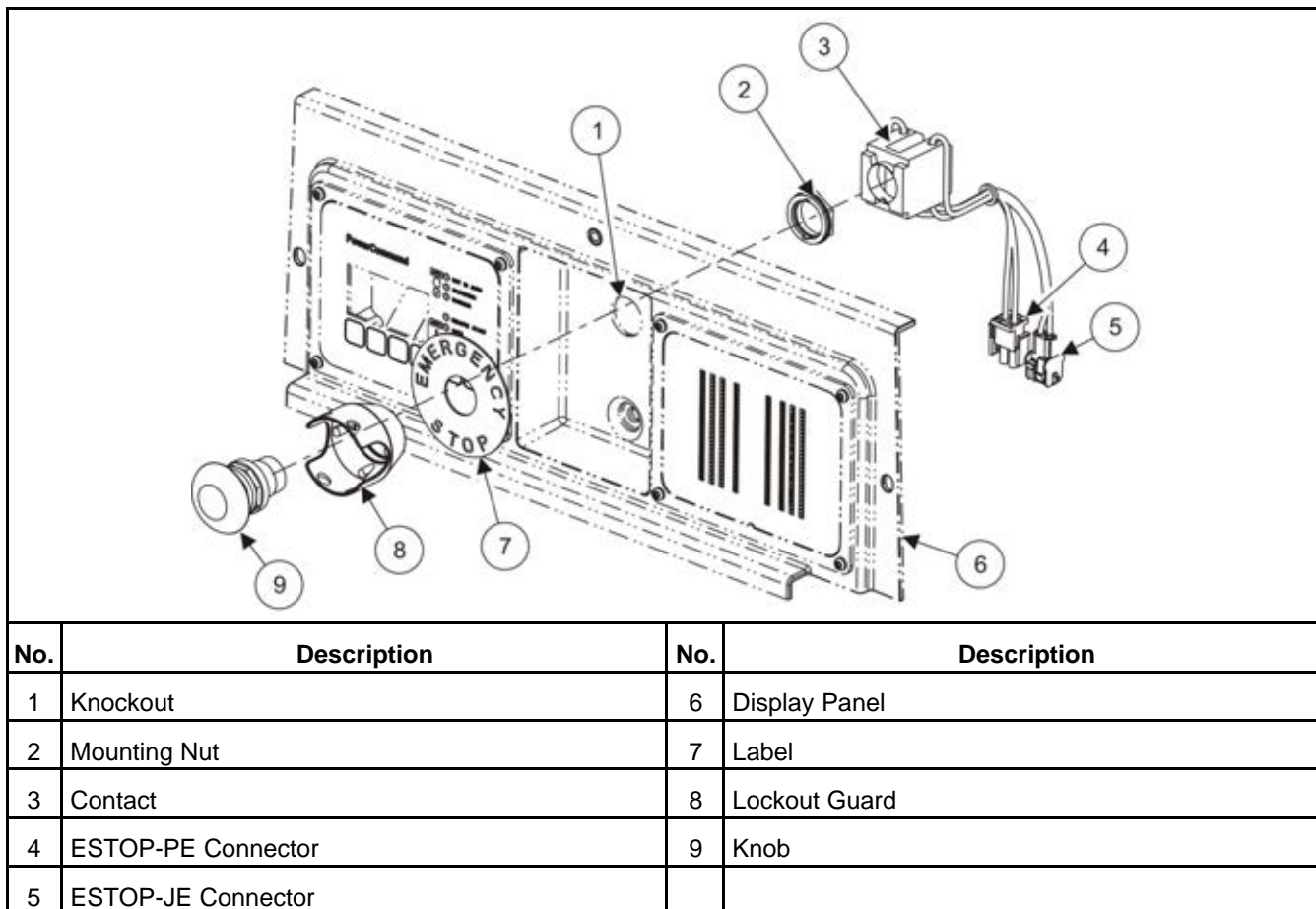
**NOTICE**

**The generator set will be inoperable during the installation of this kit. Be sure to notify all potentially affected individuals before beginning work.**

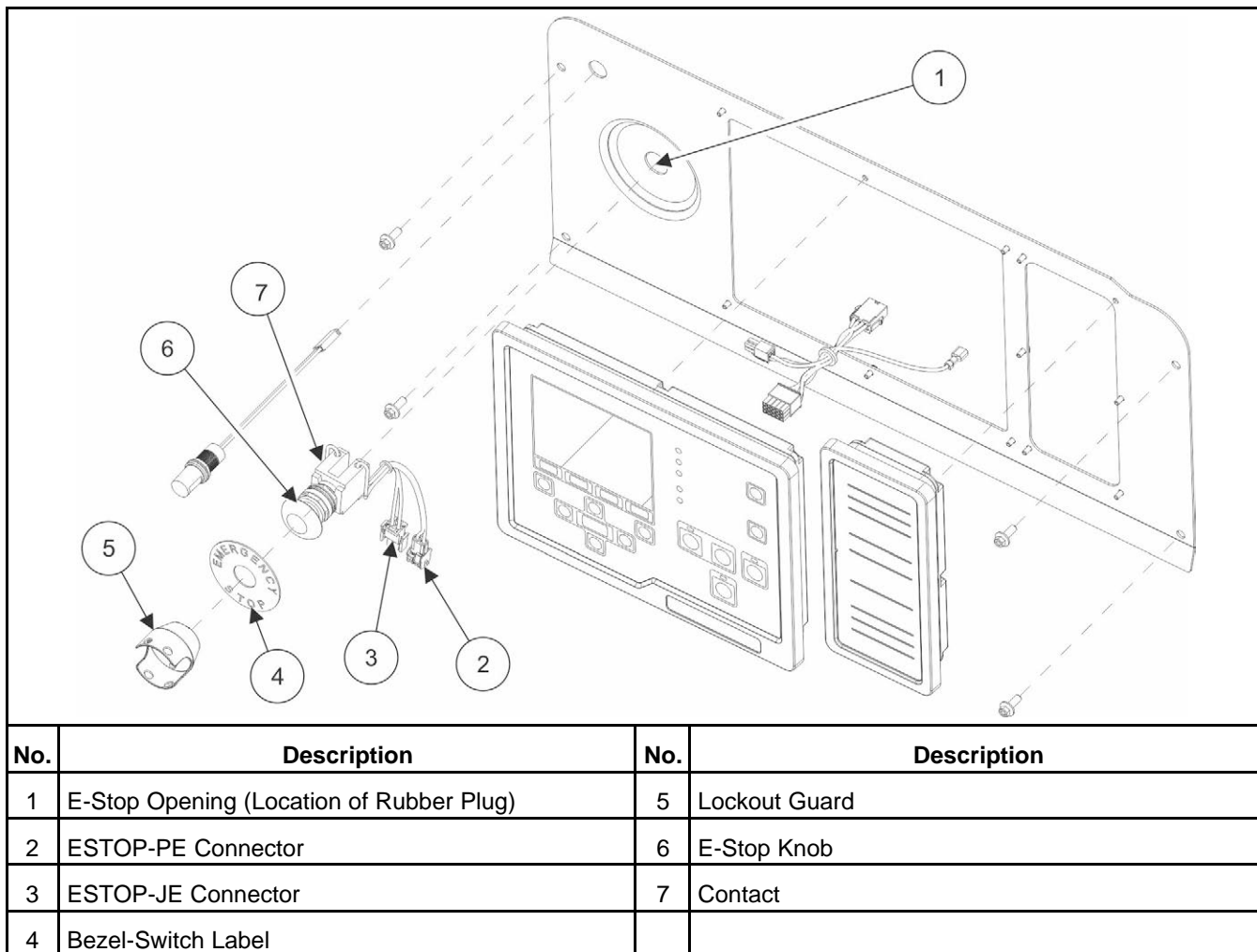
**NOTICE**

**Before servicing the PCC, it is recommended that all settings be recorded. This will ensure correct and complete readjustment of the PCC if all previous entries are lost during servicing.**

1. Make sure the generator set is shut down and disabled.
  - a. Turn the generator set off:
    - *Generator sets with a display panel knockout or rubber plug only:* Press the generator set's PCC "O" (Off) button on the local display to stop the generator set.
    - *Generator sets that require hole drilling only:* Press the generator set's red Stop button on the local display to stop the generator set. Be sure to note the generator settings.
  - b. Allow the generator set to cool thoroughly to the touch.
  - c. Turn off and disconnect the battery charger from the AC source before disconnecting the battery cables (if applicable).
  - d. Disconnect the negative (-) cable from the battery and secure it from contacting the battery terminals to prevent accidental starting.
2. Remove the roof panel (dome) on the set (if applicable).
3. *Generator sets with a display panel knockout or rubber plug only:* Remove the display panel (shown in the figures below).

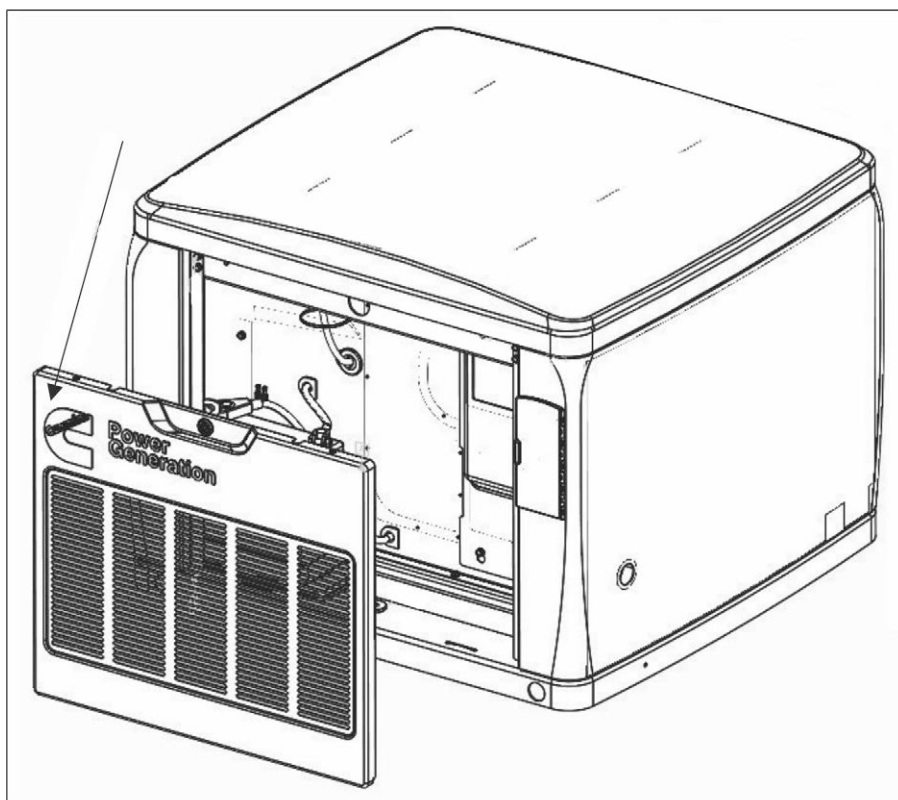


**FIGURE 1. EMERGENCY STOP SWITCH ASSEMBLY (GENERATOR SETS WITH A DISPLAY PANEL KNOCKOUT ONLY)**



**FIGURE 2. EMERGENCY STOP SWITCH ASSEMBLY (GENERATOR SETS WITH A DISPLAY PANEL RUBBER PLUG ONLY)**

4. *Generator sets that require hole drilling only:* Remove the air inlet access panel as shown in the figure below.



**FIGURE 3. AIR INLET ACCESS PANEL LOCATION (GENERATOR SETS THAT REQUIRE HOLE DRILLING ONLY)**

5. Remove the contact block from the operator knob on the emergency stop harness (A043E232) that comes with the kit.
6. *Generator sets with a display panel knockout only:* Break the knockout tabs on the display panel. Refer to [Figure 1](#) for the knockout location. Place the bezel switch label over the knockout.
7. *Generator sets with a display panel rubber plug only:* Remove the rubber plug. Place the bezel switch label over the hole.
8. Insert the E-Stop knob into the lockout guard. Make sure the knob is fully seated, flat surface to flat surface.

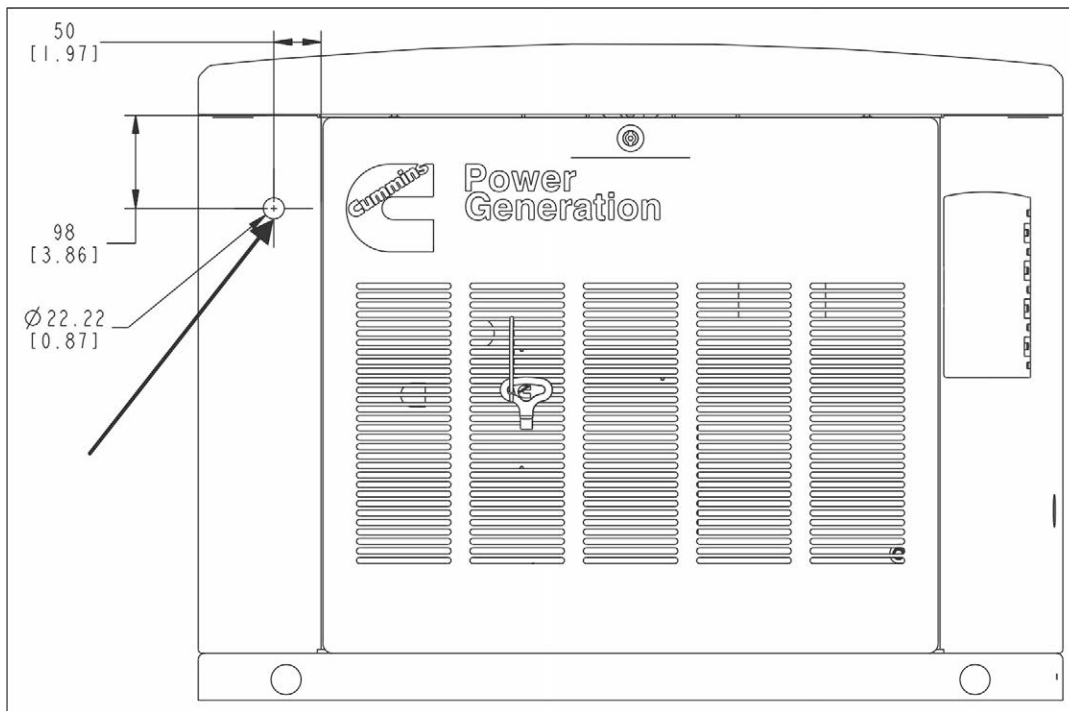
**NOTICE**

**The lockout guard includes a locking tab that positions it in one way only to the switch. It must be properly seated before the switch is installed on the display panel.**

9. *Generator sets that require hole drilling only:* Drill a 22.5 mm (7/8 in) hole at the recommended location as shown in the figure below. Place the bezel switch label over the hole.

**NOTICE**

**Numbers without brackets in the figure are metric units; numbers in brackets are imperial units.**



**FIGURE 4. RECOMMENDED LOCATION OF HOLE FOR E-STOP (GENERATOR SETS THAT REQUIRE HOLE DRILLING ONLY)**

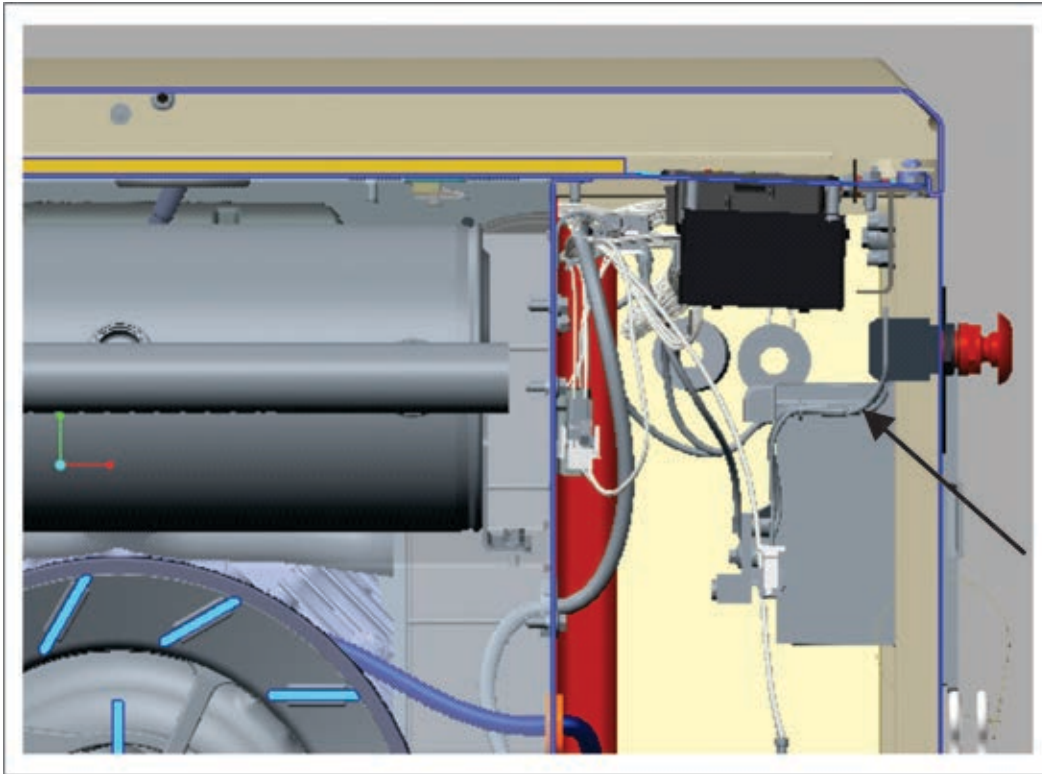
10. Align and install the knob on the contact block:
  - *Generator sets with a display panel knockout only:* Use the mounting nut to install the knob and lockout guard on the display panel as shown in [Figure 1](#).
  - *Generator sets with a display panel rubber plug only:* Install the knob and lockout guard on the display panel as shown in [Figure 2](#).
  - *Generator sets that require hole drilling only:* Install the knob and lockout guard on the enclosure panel as shown in [Figure 10](#).
11. Install the display panel (if applicable).
12. Route the emergency stop contact block wires as shown in the figures below.



**FIGURE 5. ROUTING OF THE EMERGENCY STOP CONTACT BLOCK WIRES (GENERATOR SETS WITH A DISPLAY PANEL KNOCKOUT ONLY)**

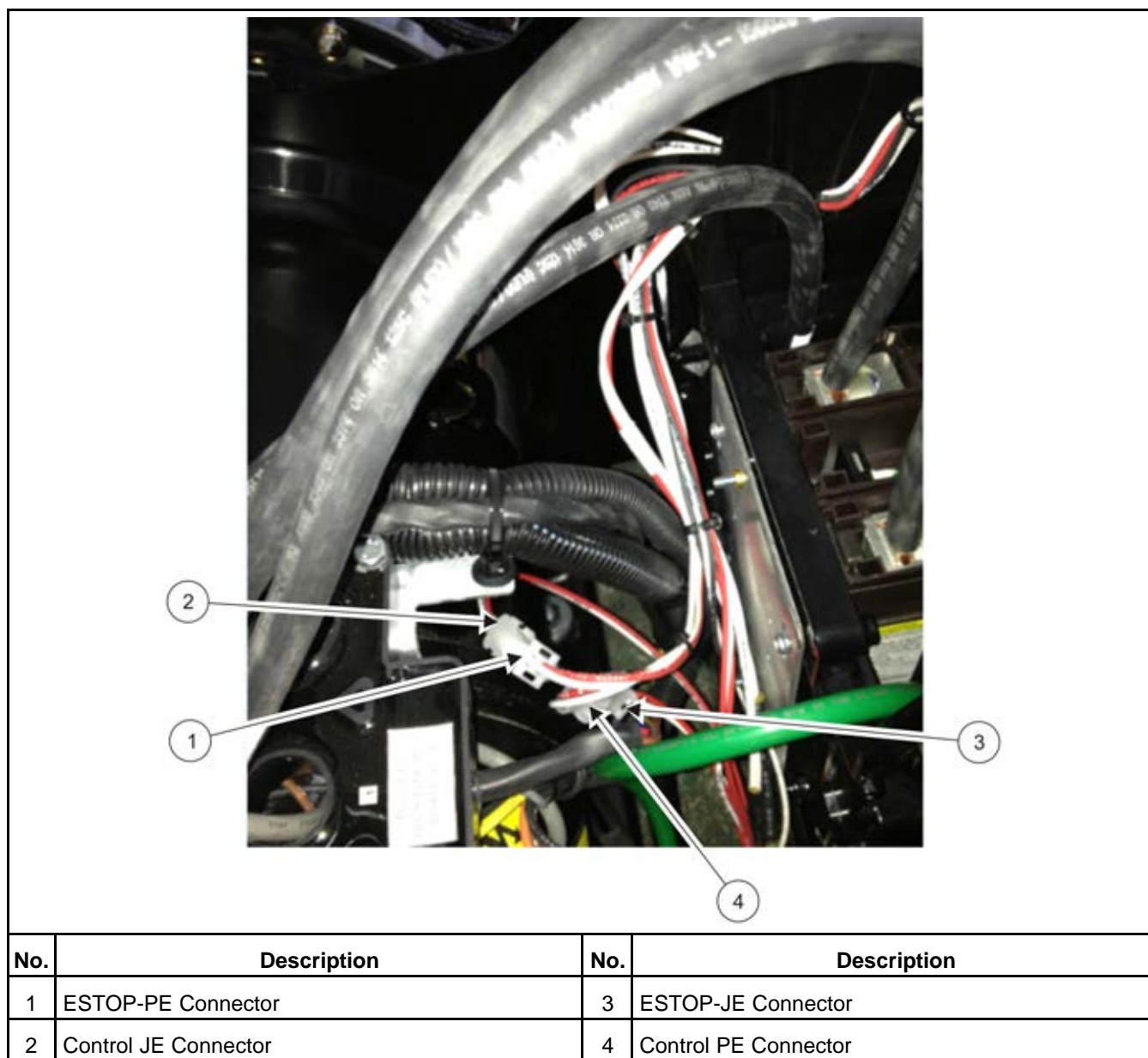


**FIGURE 6. ROUTING OF THE EMERGENCY STOP CONTACT BLOCK WIRES (GENERATOR SETS WITH A DISPLAY PANEL RUBBER PLUG ONLY)**



**FIGURE 7. ROUTING OF THE EMERGENCY STOP CONTACT BLOCK WIRES (GENERATOR SETS THAT REQUIRE HOLE DRILLING ONLY)**

13. Unplug the PE/JE connector pair in the control harness. See the figures below.



**FIGURE 8. LOCATIONS OF CONNECTORS (GENERATOR SETS WITH A DISPLAY PANEL KNOCKOUT ONLY)**

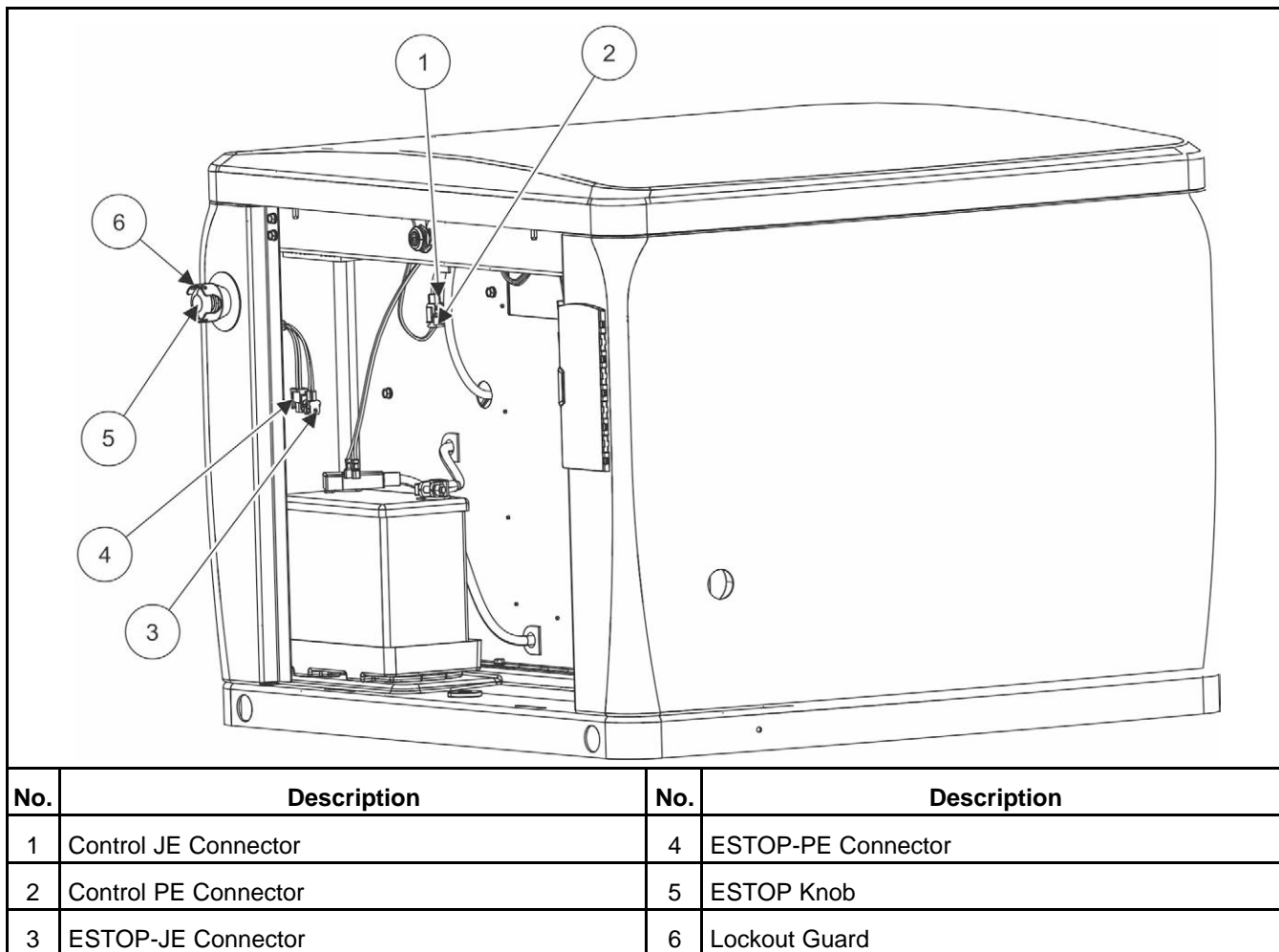


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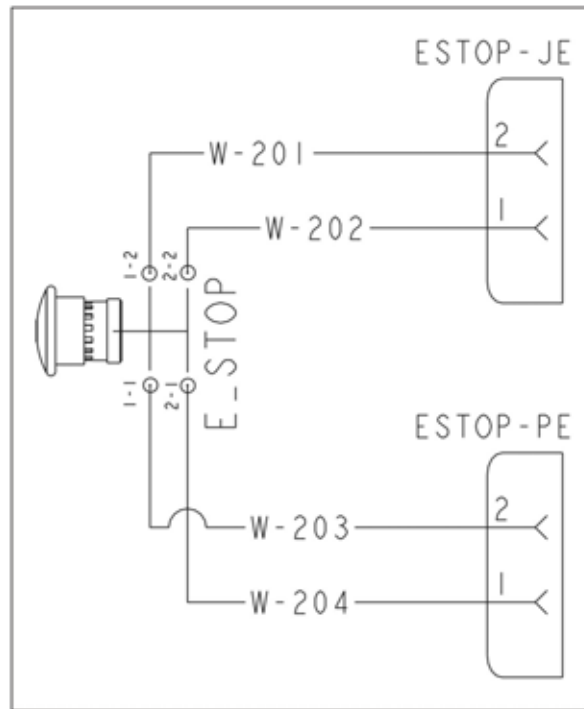
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No.	Description	No.	Description
1	ESTOP PE Connector	2	ESTOP JE Connector

**FIGURE 9. LOCATIONS OF CONNECTORS (GENERATOR SETS WITH A DISPLAY PANEL RUBBER PLUG ONLY)**



**FIGURE 10. LOCATIONS OF CONNECTORS (GENERATOR SETS THAT REQUIRE HOLE DRILLING ONLY)**



**FIGURE 11. EXAMPLE OF EMERGENCY STOP HARNESS WIRING**

14. Connect the control PE connector to the ESTOP-JE connector, and connect the control JE connector to the ESTOP-PE connector.

See [Figure 8](#) (for generator sets with a display panel knockout), [Figure 9](#) (for generator sets with a display panel rubber plug), or [Figure 10](#) (for generator sets that require hole drilling); and [Figure 11](#).

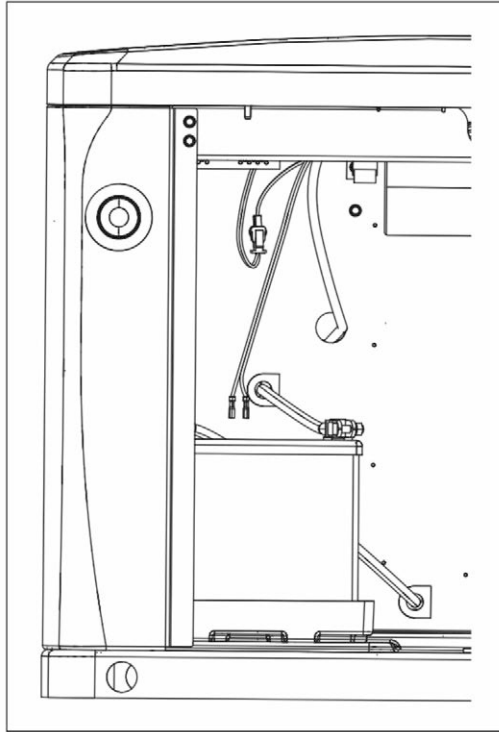
15. Re-install the roof panel (dome). Completed installations are shown below.



**FIGURE 12. INSTALLED EMERGENCY STOP SWITCH KIT (GENERATOR SETS WITH A DISPLAY PANEL KNOCKOUT ONLY)**



**FIGURE 13. INSTALLED EMERGENCY STOP SWITCH KIT (GENERATOR SETS WITH A DISPLAY PANEL RUBBER PLUG ONLY)**



**FIGURE 14. INSTALLED EMERGENCY STOP SWITCH KIT (GENERATOR SETS THAT REQUIRE HOLE DRILLING ONLY)**

16. Reconnect the engine battery cables, positive (+) cable first.
17. Connect the battery charger to its AC power source (if applicable).
18. *Generator sets that require hole drilling only:* Re-install the air inlet panel.
19. Select the Run/Manual button on the control display.
20. *Generator sets that require hole drilling only:* Place the generator circuit-breaker in the OPEN position to prevent load transfer to the generator set.
21. Push the knob to test the Emergency Shutdown operation. The generator set should stop, and the Emergency Shutdown Fault should be displayed on the control display.
22. Restore normal operation after the switch has been pushed by doing the following:
  - a. Pull the knob out.
  - b. Clear the fault.
  - c. Restore the previous generator set settings.
  - d. *Generator sets that require hole drilling only:* Place the generator set circuit breaker into the CLOSED position.