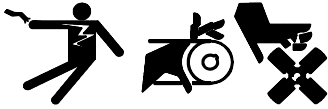


Safety Precautions

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 connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

Installation Procedure

1. Remove the generator set from service.

- 1.1 Place the generator set master switch in the OFF position.
- 1.2 Disconnect the power to the battery charger, if equipped.
- 1.3 Disconnect the generator set engine starting battery(ies), negative (-) lead first.

2. Mount and connect the controller connection assembly.

2.1 GM17068-KP1 kit (20-300 kW)

- 2.1.1 Remove the junction box rear panel and hardware.
- 2.1.2 Attach the controller connection assembly (GM13984) to the junction box using six screws (X-51-3), spacers (X-712-9), and nuts (X-6210-4). Place the spacers between the controller connection assembly and the junction box bracket. See Figure 2 for the mounting location.
- 2.1.3 Plug the wiring connection harness (GM17033) into the controller connection assembly's P25 connector.
- 2.1.4 Proceed to step 2.4.

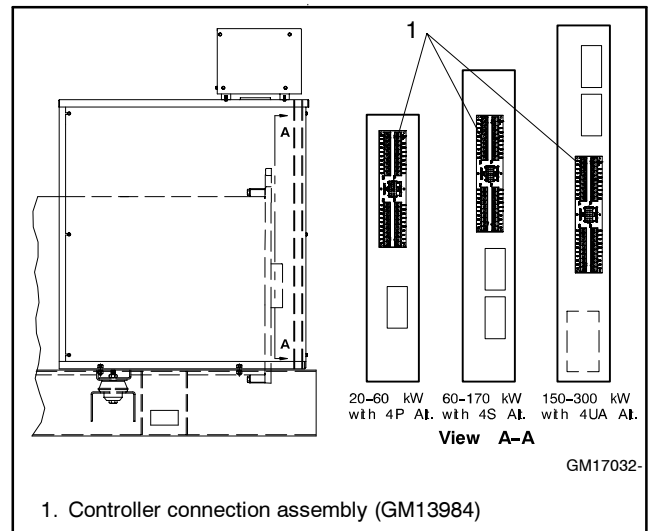


Figure 2 Controller Connection Assembly Mounting Locations in Junction Box (20-300 kW)

2.2 GM17068-KP2 kit (350/400 kW)

- 2.2.1 Remove the junction box rear panel and hardware.
- 2.2.2 Remove the four screws attaching the controller to the junction box. See Figure 3.
- 2.2.3 Mark the drill hole locations where the terminal block bracket (347292) mounts to the junction box top panel using the dimensions given in Figure 3.
- 2.2.4 Move the controller away from the rear of the junction box in order to provide enough clearance to drill two 9 mm (0.344 in.) dia. holes in the top of the junction box.
- 2.2.5 Remove burrs from the drilled holes and clean up all metal chips in the junction box.
- 2.2.6 Place the terminal block bracket (347292) on the underside of the junction box top panel with the bracket mounting holes visible from the rear of the junction box and mount using two screws (X-125-3) and nuts (X-6210-7). See Figure 3.
- 2.2.7 Reposition the controller over the junction box holes and install the four screws removed in step 2.2.2.

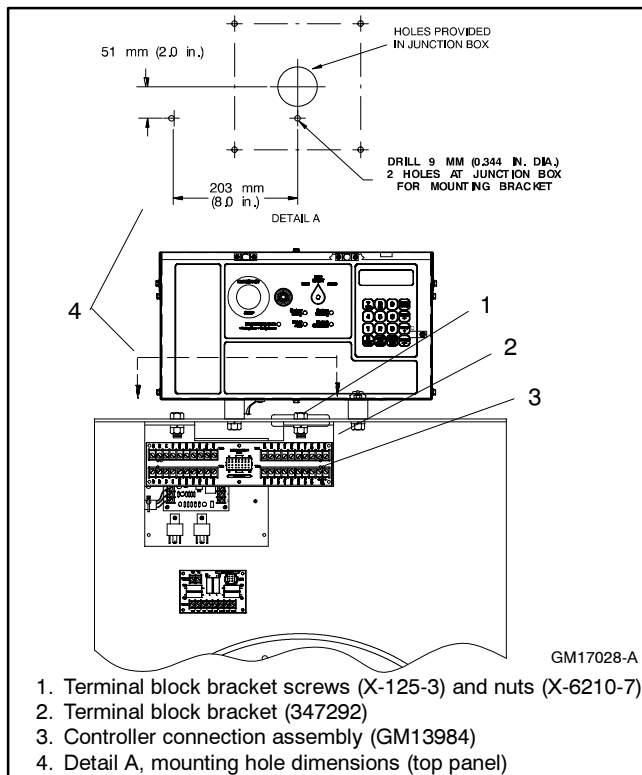


Figure 3 Terminal Block Bracket and Controller Connection Assembly Mounting (350/400 kW)

- 2.2.8 Attach the controller connection assembly (GM13984) to the terminal block bracket using six screws (X-51-3), spacers (X-712-9), and nuts (X-70-12). Place the spacers between the controller connection assembly and the mounting bracket.
- 2.2.9 Plug the wiring connection harness (GM17029) into the controller connection assembly's P25 connector.
- 2.2.10 Proceed to step 2.4.

2.3 365569-KP9 kit (450-2000 kW)

- 2.3.1 Remove the junction box upper rear panel and hardware.
- 2.3.2 Remove the inner panel access door screws and swing open the access door.
- 2.3.3 Attach the controller connection assembly (GM13984) to the junction box bracket studs using six spacers (X-712-9) and nuts (X-70-12). Place the spacers between the controller connection assembly and the mounting bracket. See Figure 4 for the mounting location.
- 2.3.4 Plug the wiring connection harness (GM16753) into the controller connection assembly's P25 connector.
- 2.3.5 Proceed to step 2.4.

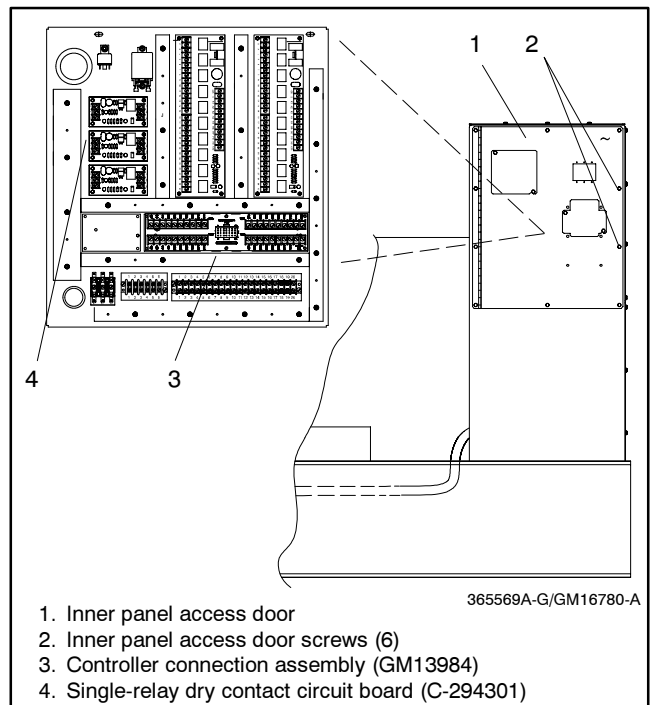


Figure 4 Terminal Block Bracket Mounting in Junction Box (450-2000 kW)

- 2.4 Remove the controller cover and hardware.
- 2.5 Route the other end of the wiring connection harness (GM17029, GM17033, or GM16753) through the junction box port to the controller interconnection circuit board.
- 2.6 Plug the wiring harness connector into the interconnection circuit board's P23 connector. Connect lead ES3 to TB1 terminal 3 and connect lead ES4 to TB1 terminal 4. See Figure 5. If access to the interconnection circuit board is difficult, remove the two controller panel top screws and center bottom screw and then loosen the bottom screws to swing the rear controller panel down.
- 2.7 Swing the rear controller panel up and replace the screws, if previously removed. Replace the controller cover and hardware. Tighten all controller screws.

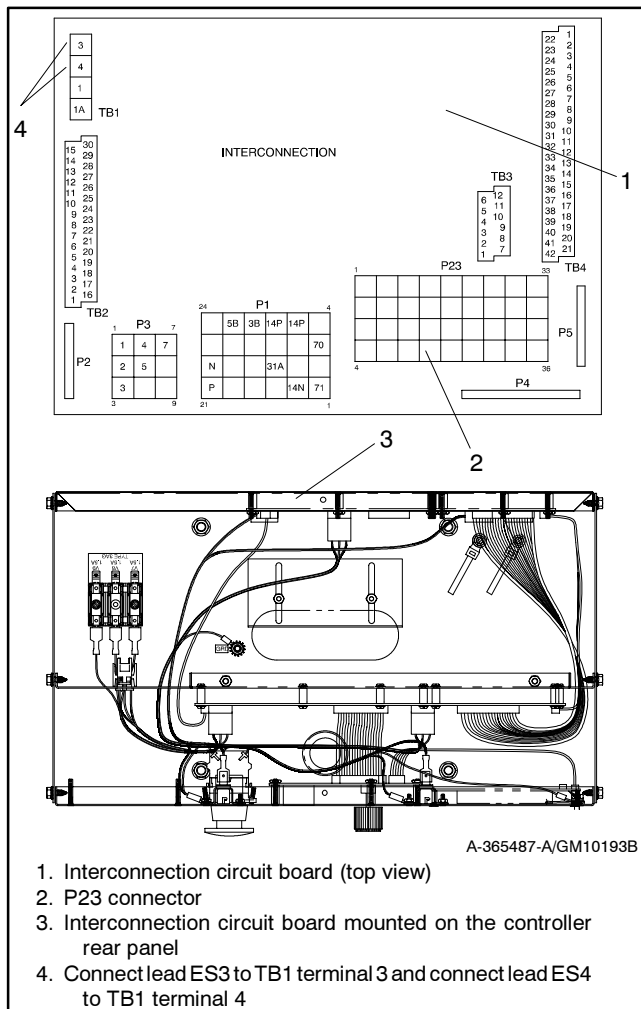


Figure 5 Attaching Wiring Connection Harness to Controller Circuit Board

3. Mount the single-relay dry contact assembly.

3.1 GM17068-KP1 kit (20-300 kW)

- 3.1.1 Drill four 4.7 mm (0.187 in.) dia. holes in the junction box as shown in Figure 6. The single-relay dry contact kit mounts behind the controller.
- 3.1.2 Remove burrs from the drilled holes and clean up all metal chips in the junction box.
- 3.1.3 Remove the cover from the single-relay dry contact assembly (A-273945) by removing four screws.
- 3.1.4 Using Figure 6, mount the single-relay dry contact box (A-273945) to the junction box using eight nuts (X-6210-4) and four vibromounts (259919).
- 3.1.5 Proceed to step 4.

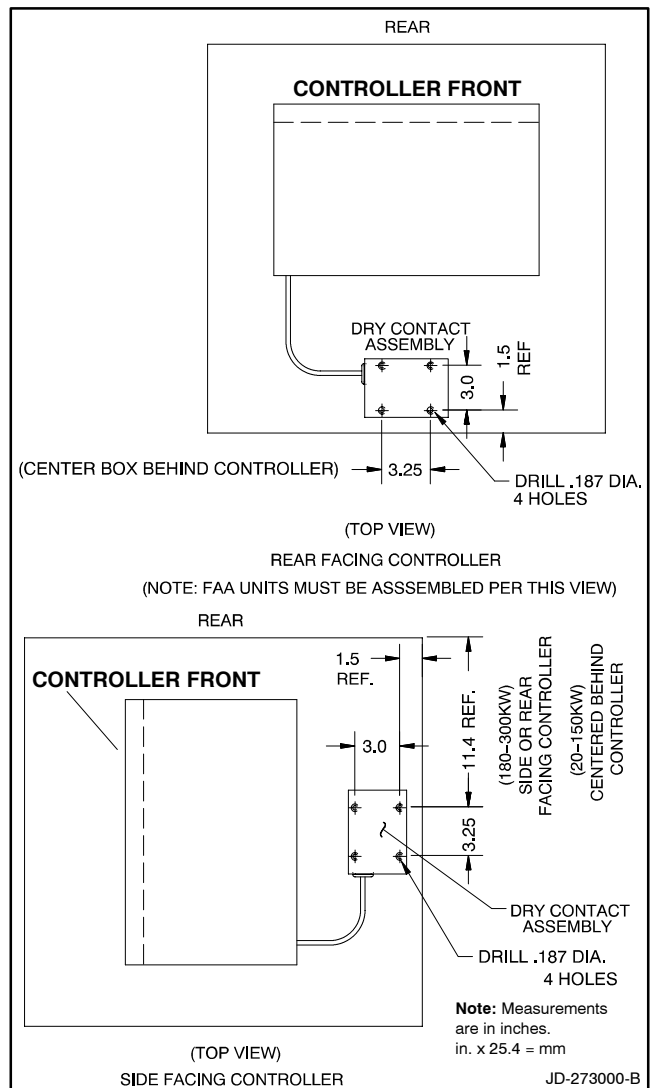


Figure 6 Junction Box Drilling Information (20-300 kW)

3.2 GM17068-KP2 kit (350/400 kW)

- 3.2.1 Drill four 4.7 mm (0.187 in.) dia. holes in the junction box as shown in Figure 7.
- 3.2.2 Remove burrs from the drilled holes and clean up all metal chips in the junction box.
- 3.2.3 Remove the cover from the single-relay dry contact assembly (A-273945) by removing four screws.
- 3.2.4 Mount the single-relay dry contact box (A-273945) to the junction box using eight nuts (X-6210-4) and four vibromounts (259919). See Figure 7 for the mounting position.
- 3.2.5 Proceed to step 4.

3.3 365569-KP9 kit (450-2000 kW)

- 3.3.1 Mount the single-relay dry contact circuit board (C-294301) to the junction box bracket studs using four spacers (X-712-9) and nuts (X-70-12). Place the spacers between the single-relay dry contact circuit board and the mounting bracket. See Figure 4 for the mounting location.
- 3.3.2 Connect the wiring harness (GM10186) to the single-relay dry contact kit relay input terminals. See Figure 8 for connection information.
- 3.3.3 Proceed to step 4.

4. Connect the single-relay dry contact kit to the controller connection kit.

Connect the single-relay dry contact wiring harness to the controller connection assembly in the junction box. See Figure 8. Leads 42A and N provide power to the relay. The user must select a RDO fault terminal for connecting the K1 signal lead. See Figure 9 and Figure 10 for terminal connections.

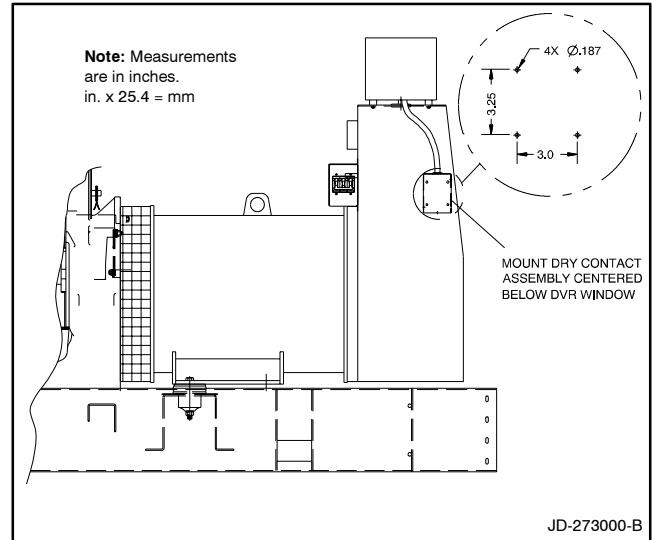


Figure 7 Junction Box Drilling Information (350/400 kW)

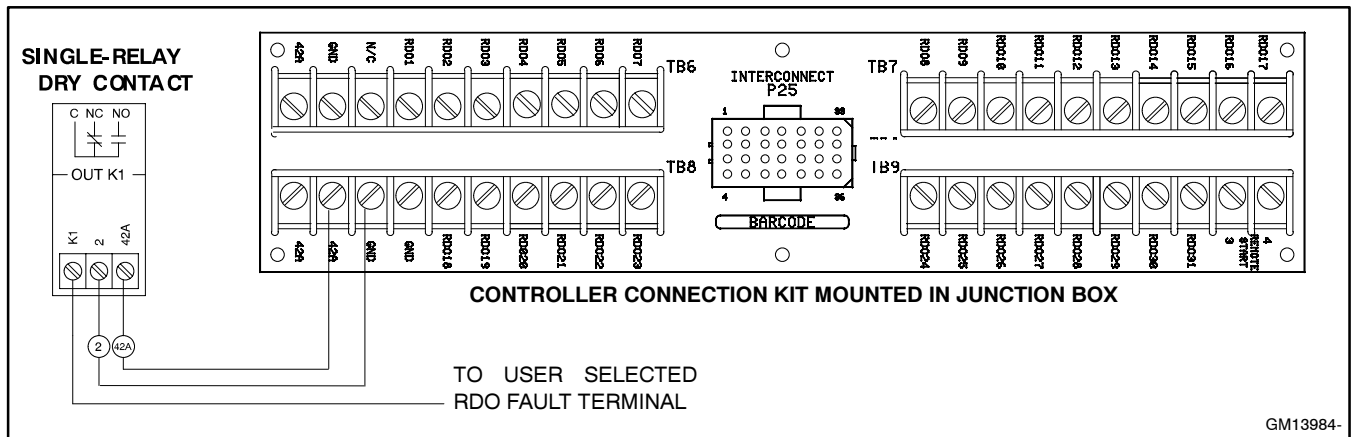
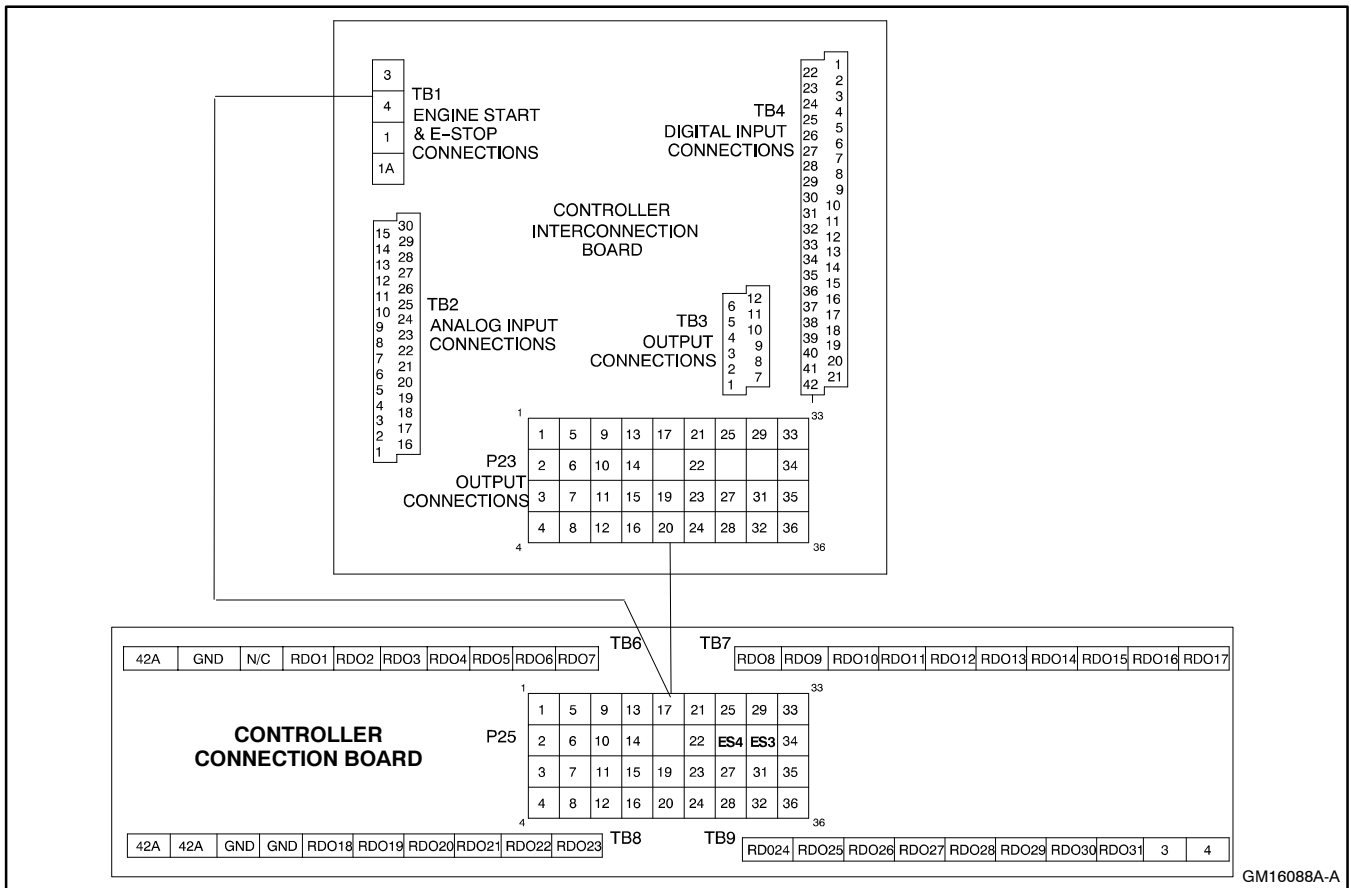


Figure 8 Single-Relay Dry Contact Relay Kit Connections



GM16088A-A

Figure 9 Controller Connection Kit

TB6 Terminal Strip—RDOs 1-7		TB9 Terminal Strip—RDOs 24-31	
Term.	Description	Term.	Description
42A	Battery (+)	RDO24	Speed sensor fault
GND	Battery (-)	RDO25	Loss of AC sensing
N/C		RDO26	ECM loss of communication
RDO1	Overspeed (39)	RDO27	Undervoltage
RDO2	Overcrank (12)	RDO28	Overfrequency
RDO3	High coolant temperature shutdown (36)	RDO29	Underfrequency
RDO4	Low oil pressure shutdown (38)	RDO30	Load shed kW overload
RDO5	Low coolant temperature (35)	RDO31	Load shed underfrequency
RDO6	High coolant temperature warning (40)	3	Remote start
RDO7	Low oil pressure warning (41)	4	Remote start
TB7 Terminal Strip—RDOs 8-17		Note: RDO-1 though RDO-31 are customer definable with the following factory defaults: emergency stop, high coolant temperature, low oil pressure, overcrank, and overspeed. RDO numbers in parentheses are the factory wire designations.	
Term.	Description	*NFPA-110 common alarm faults include:	
RDO8	Low fuel (63)	Air damper indicator	
RDO9	Master switch not in auto (80)	Battery charger fault	
RDO10	NFPA 110 common alarm (32)*	EPS supplying load	
RDO11	Battery charger fault (61)	High battery voltage	
RDO12	Low battery voltage (62)	High coolant temperature warning	
RDO13	High battery voltage	High coolant temperature shutdown	
RDO14	Emergency stop (48)	Low battery voltage	
RDO15	Generator running (70R)	Low coolant level	
RDO16	Time delay engine cooldown (TDEC) (70C)	Low coolant temperature warning	
RDO17	System ready (60)	Low fuel (level or pressure)	
TB8 Terminal Strip—RDOs 18-23		Low oil pressure warning	
Term.	Description	Low oil pressure shutdown	
42A	Battery (+)	Master switch not in auto	
42A	Battery (+)	Overcrank	
2	Battery (-)	Overspeed	
2	Battery (-)		
RDO18	Defined common fault (32A)		
RDO19	Low coolant level		
RDO20	Overvoltage (26)		
RDO21	Idle mode		
RDO22	EPS supplying load		
RDO23	Air damper indicator (56)		

Figure 10 Controller Connection Kit Terminal Strip Identification with Relay Driver Outputs (RDOs)

5. Connect the single-relay dry contact to the customer-supplied device.

Select the normally open (NO) and/or normally closed (NC) contacts of the single-relay, form C dry contact, depending upon the application. Use a two-wire harness for either NO or NC connections. Use a three-wire harness for both NO and NC connections.

- 5.1 Supply two or three lengths of stranded wire to make leads long enough to connect the customer-supplied device to the single-relay dry contact terminals and power supply. Use color-coded wire for easy identification. Make leads long enough to allow for walls, ductwork, and other obstructions. Use separate conduit for the single-relay dry contact wiring.
- 5.2 **12/24-Volt DC Devices.** Attach the customer-supplied 12/24-volt DC accessories to the starting battery positive (+) connection at the starter solenoid and to the battery negative (-) connection at the engine ground. Otherwise, use a separate 12/24-volt DC supply. Do not use terminals 42A and N on the controller connection kit terminal strip to supply the voltage to the relay contacts. Supply separate leads directly to the battery for the supply voltage. The circuit must include fuse or circuit breaker protection.
- 5.3 **120-Volt AC Devices.** Connect the customer-supplied accessories to a separate 120-volt AC power supply. The circuit must include fuse or circuit breaker protection.
- 5.4 Connect the customer-supplied device per the installations and/or schematic supplied with the device to a power source and to the single-relay dry contact terminals. Cut the customer-supplied leads to length, strip lead ends, crimp on spade terminals (not supplied), and connect the leads to the relay contact screw terminals. Keep the single-relay dry contact wiring away from the generator set output leads.
- 5.5 **GM17068-KP1 and GM17068-KP2 kits only (20–400 kW).** Replace the cover of the single-relay dry contact assembly (A-273945) and install the four screws.

- 5.6 **365569-KP9 kit only (450–2000 kW).** Swing the access door closed and install the screws.

- 5.7 Replace the junction box panel and hardware.

6. Restore the generator set to service.

- 6.1 Check that the generator set master switch is in the OFF position.
- 6.2 Reconnect the generator set engine starting battery, negative (-) lead last.
- 6.3 Reconnect power to the battery charger, if equipped.
- 6.4 Move the generator set master switch to AUTO for startup by remote transfer switch or remote start/stop switch.

Test the Single-Relay Dry Contact

Verify the single-relay dry contact relay function by using the following procedure when troubleshooting.

Test procedure

1. Remove the customer-supplied device wiring from the single-relay dry contact output terminals.
2. Test the relay operation by connecting an ohmmeter across the NO and C terminals on the relay terminal strip.
3. Start the generator set by moving the generator set master switch switch to the RUN position.
4. Use a jumper wire to ground the selected fault terminal on the controller connection terminal strip. During generator set shutdown, the relay contacts should close and the ohmmeter should display a low resistance reading (continuity).
5. After completing the test, place the generator set master switch in the OFF position.
6. Install the customer-supplied device wiring on the single-relay dry contact output terminals.

Parts List

Single-Relay Dry Contact Kits

Kit: GM17068-KP1 (20-300 kW)		
Qty.	Description	Part Number
1	Dry Contact, single-relay	A-273945
4	Vibromount	259919
6	Screw, round head machine	X-51-3
6	Spacer, 0.25 in OD x 0.5 in.	X-712-9
14	Nut, 8-32 whiz	X-6210-4
1	Connection assembly, controller	GM13984
1	Harness, controller connection wiring	GM17033

Kit: GM17068-KP2 (350/400 kW)		
Qty.	Description	Part Number
1	Dry Contact, single-relay	A-273945
4	Vibromount	259919
1	Bracket, terminal block	347292
6	Screw, 8-32 x 1 in. hex head	X-51-3
6	Nut, 8-32 hex	X-70-12
2	Screw, 5/16-18 x 3/4 in. hex head	X-125-3
6	Spacer, 0.25 in OD x 0.5 in.	X-712-9
8	Nut, 8-32 whiz	X-6210-4
2	Nut, 5/16-18	X-6210-7
1	Connection assembly, controller	GM13984
1	Harness, controller connection wiring	GM17029

Kit: 365569-KP9 (450-2000 kW)		
Qty.	Description	Part Number
1	Dry Contact, single-relay	C-294301
1	Harness, dry contact relay wiring	GM10186
4	Nut, 8-32 hex	X-70-12
4	Spacer, 0.25 in OD x 0.5 in.	X-712-9
1	Connection device and hardware includes:	GM16759-1
6	Nut, 8-32 hex	X-70-12
6	Spacer, 0.25 in OD x 0.5 in.	X-712-9
1	Connection assembly, controller	GM13984
1	Harness, controller connection wiring	GM16753