

INSTALLATION INSTRUCTIONS

Original Issue Date: 5/01

Model: 20-450 kW

Market: Industrial Generator Sets with the 550 and XC500 Controllers

Subject: Controller Connection Kits:
GM17028-KP1 and GM17032-KP1

Introduction

The controller connection kit allows easy connection of selected controller accessories. The supplied wiring harness connects controller connector P23 and terminal strips TB1-3 and TB1-4 to the controller connection kit connector P25 and terminal strips TB6, TB7, TB8, and TB9. Connect the accessory outputs (except the emergency stop kit) to the controller connection kit terminal strips. See Figure 1.

Use a single- or ten-relay dry contact kit between the controller connection kit and any external connections to isolate the controller circuit board from electrical interference. Connect the controller accessories or customer-supplied warning devices (lights, horns, etc.) to the dry contact kit.

Attach customer-supplied 12-volt DC accessories to the battery positive (+) connection at the starter solenoid and to the battery negative (-) connection at the engine ground. Do not use terminals 42A and N on the controller connection kit terminal strip to supply voltage to relay contacts or customer-supplied devices. The user must attach separate leads connected directly to the battery for the voltage supply.

Read the entire installation procedure and compare the kit parts with the parts list in this publication before beginning installation. Perform the steps in the order shown.

Observe applicable local and national electrical codes when installing the wiring system.

Safety Precautions

Observe the following safety precautions while installing the kit.

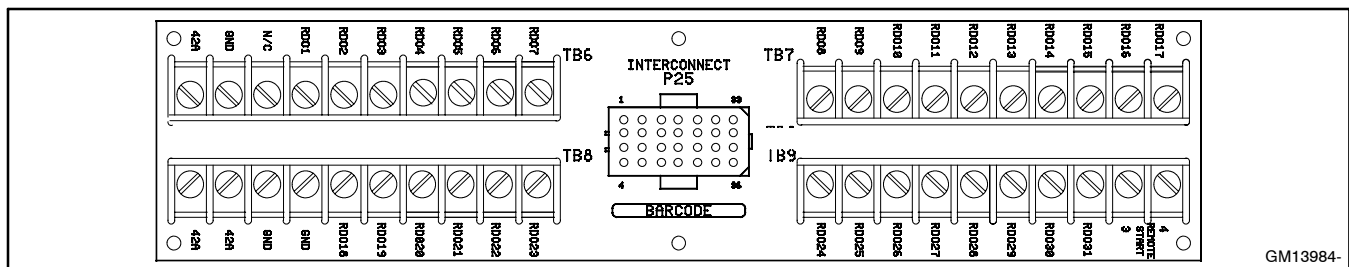
⚠ WARNING



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.



GM13984-

Figure 1 Terminal Strips TB6, TB7, TB8, and TB9 on the Controller Connection Kit in the Junction Box

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 GM17032-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 2.3.

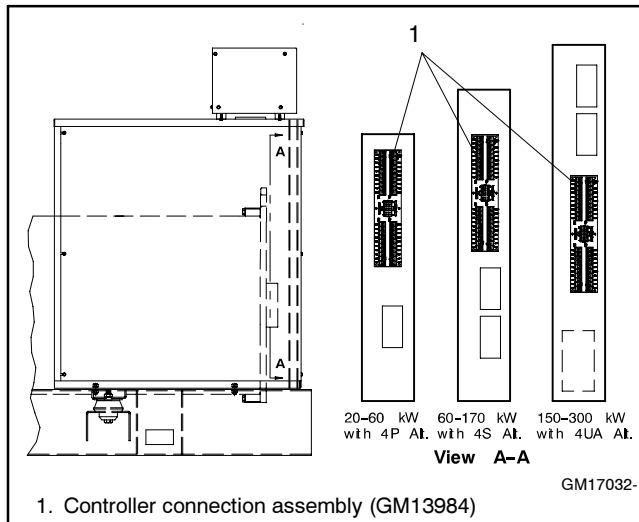


Figure 2 Controller Connection Assembly Mounting Locations in Junction Box (20-300 kW)

2.2 GM17028-KP1 kit (350-450 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 cleanup 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.

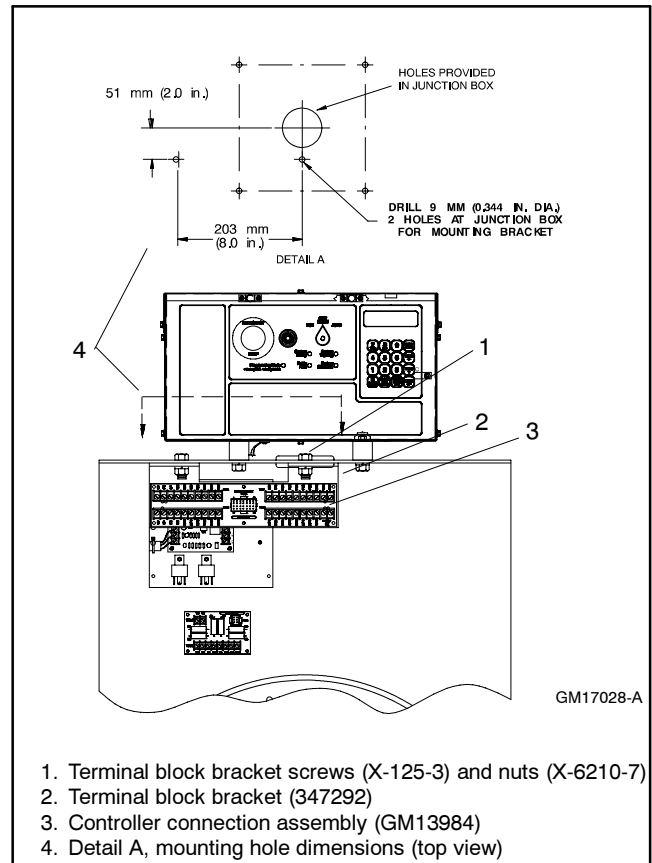


Figure 3 Terminal Block Bracket and Controller Connection Assembly Mounting (350-450 kW)

- 2.2.7 Reposition the controller over the junction box holes and install the four screws.
- 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 2.3.

- 2.3 Remove the controller cover and hardware.
- 2.4 Route the other end of the wiring connection harness (GM17029 or GM17033) through the junction box port to the controller interconnection circuit board.
- 2.5 Plug the wiring harness connector into the interconnection circuit board's P23 connector. Connect lead ES3 to TB-1 terminal 3 and connect lead ES4 to TB-1 terminal 4. See Figure 4. If access to the interconnection circuit board is difficult, remove the two controller panel top screws, center bottom screw, and then loosen the bottom screws to swing the rear controller panel down.
- 2.6 Swing the rear controller panel up and replace the screws, if previously removed. Replace the controller cover and hardware. Tighten all controller screws.

3. Connect the controller connection kit to the customer-supplied device.

- 3.1 Supply lengths of stranded long enough to connect the customer-supplied device to the controller connection kit. Use color-coded for easy identification. Make leads long enough to allow for walls, ductwork, and other obstructions. Use separate conduit for the customer-supplied device wiring.

- 3.2 Connect the leads to the customer-supplied device per the installations and/or schematic supplied with the device.

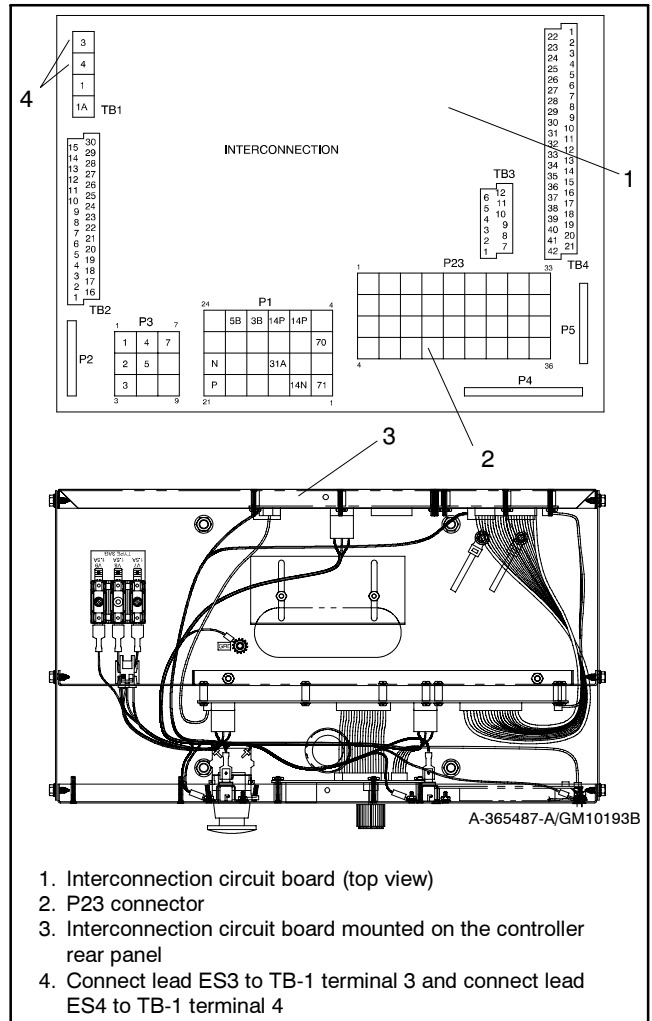


Figure 4 Attaching Wiring Connection Harness to Controller Circuit Board

- 3.3 Route the leads to the controller connection assembly in the generator set junction box. Cut leads to length, strip lead ends, crimp on spade terminals (not supplied), and connect the leads to the screw terminals shown in Figure 5 and Figure 6. Keep the customer-supplied device wiring away from the generator set output leads.
- 3.4 Replace the junction box panel and hardware.
4. **Restore the generator set to service.**
 - 4.1 Check that the generator set master switch is in the OFF position.
 - 4.2 Reconnect the generator set engine starting battery, negative (-) lead last.
 - 4.3 Reconnect power to the battery charger, if equipped.
 - 4.4 Move the generator master switch to AUTO for startup by remote transfer switch or remote start/stop switch.

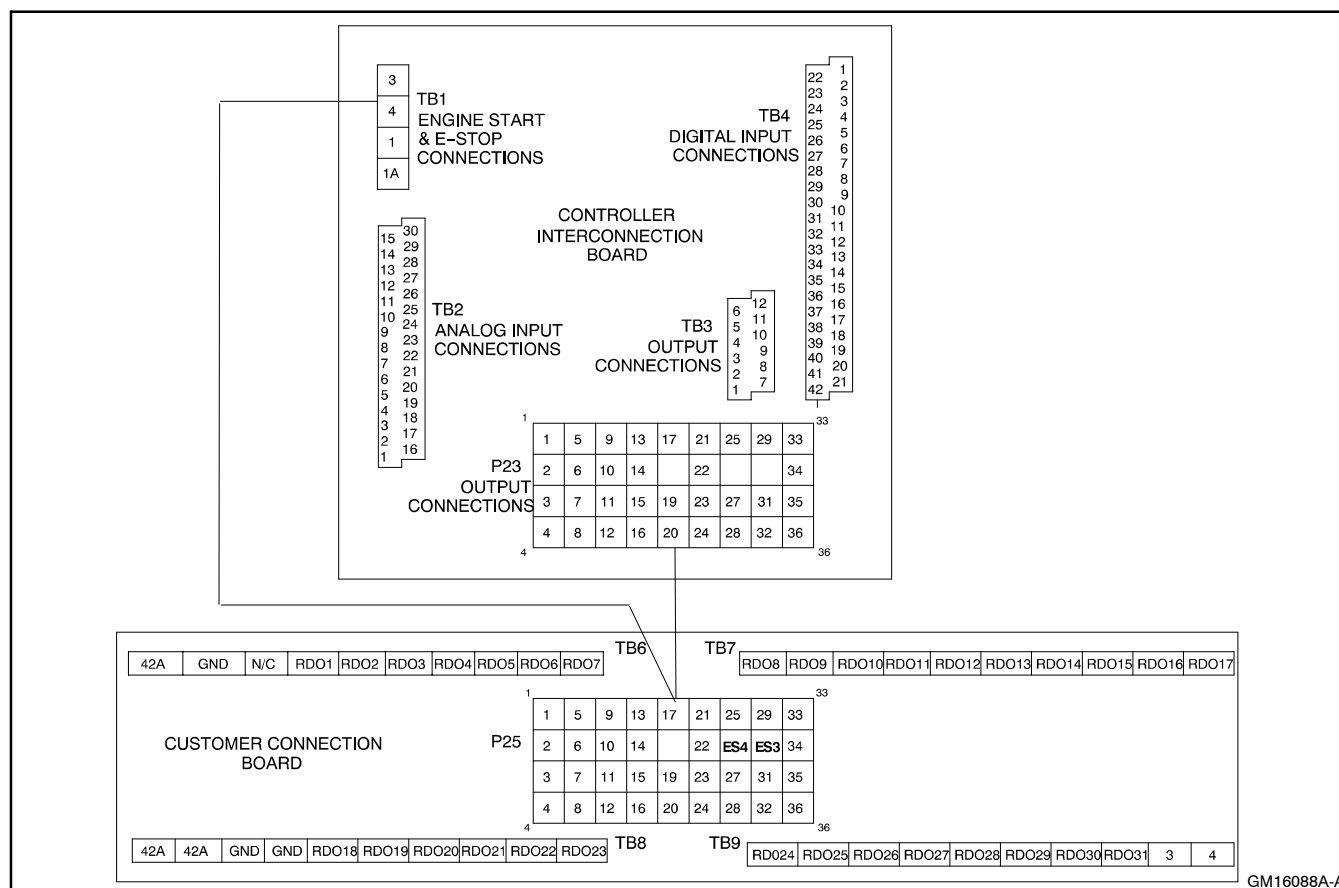


Figure 5 Controller Connection Kit

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 (lead 39)	RDO27	Undervoltage
RDO2	Overcrank (lead 12)	RDO28	Overfrequency
RDO3	High coolant temperature shutdown (lead 36)	RDO29	Underfrequency
RDO4	Low oil pressure shutdown (lead 38)	RDO30	Load shed kW overload
RDO5	Low coolant temperature (lead 35)	RDO31	Load shed underfrequency
RDO6	High coolant temperature warning (lead 40)	3	Remote start
RDO7	Low oil pressure warning (lead 41)	4	Remote start
TB7 Terminal Strip—RDOs 8-17		Note: Lead numbers shown in parentheses are the factory default wire designations.	
Term.	Description	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	
RDO8	Low fuel (lead 63)	*NFPA-110 common alarm faults include:	
RDO9	Master switch not in auto (lead 80)	Air damper indicator (RDO-23)	
RDO10	NFPA 110 common alarm (lead 32)*	Battery charger fault (RDO-11)	
RDO11	Battery charger fault (lead 61)	EPS supplying load (RDO-22)	
RDO12	Low battery voltage (lead 62)	High battery voltage (RDO-13)	
RDO13	High battery voltage	High coolant temperature warning (RDO-06)	
RDO14	Emergency stop (lead 48)	High coolant temperature shutdown (RDO-03)	
RDO15	Generator running (lead 70R)	Low battery voltage (RDO-012)	
RDO16	Time delay engine cooldown (TDEC) (lead 70C)	Low coolant level (RDO-19)	
RDO17	System ready (lead 60)	Low coolant temperature warning (RDO-05)	
TB8 Terminal Strip—RDOs 18-23		Low fuel (level or pressure) (RDO-08)	
Term.	Description	Low oil pressure warning (RDO-07)	
42A	Battery (+)	Low oil pressure shutdown (RDO-04)	
42A	Battery (+)	Master switch not in auto (RDO-09)	
2	Battery (-)	Overcrank (RDO-02)	
2	Battery (-)	Overspeed (RDO-01)	
RDO18	Defined common fault (lead 32A)		
RDO19	Low coolant level		
RDO20	Overvoltage (lead 26)		
RDO21	Idle mode		
RDO22	EPS supplying load		
RDO23	Air damper indicator (lead 56)		

Figure 6 Controller Connection Kit Terminal Strip Identification with Relay Driver Outputs (RDOs)

Parts List

Controller Connection Kits

Kit: GM17032-KP1 (20-300 kW)		
Qty.	Description	Part Number
1	Connection assembly, controller	GM13984
1	Harness, controller connection wiring	GM17033
6	Screw, mounting	X-51-3
6	Spacer, 0.25 in. OD x 0.5 in.	X-712-9
6	Nut, 8-32 whiz	X-6210-4

Kit: GM17028-KP1 (350-450 kW)		
Qty.	Description	Part Number
1	Bracket, terminal block	347292
1	Harness, controller connection wiring	GM17029
1	Connection assembly, controller	GM13984
6	Screw, mounting	X-51-3
6	Nut, 8-32 hex	X-70-12
6	Spacer, 0.25 in. OD x 0.5 in.	X-712-9