INSTALLATION INSTRUCTIONS

Original Issue Date: **9/01**
Model: **20–2000 kW**
Market: **Industrial Generator Sets with the 550 Controller**
Subject: **Remote Annunciator Alarm Kits: GM17071-KP1, GM17071-KP2, and GM17071-KP3**

Introduction

The remote annunciator allows the operator to monitor the generator set condition from a remote location. When a generator alarm condition occurs, the remote annunciator alerts the operator through visual and audible signals. The remote annunciator kit includes a 14-relay dry contact box to isolate the annunciator from the controller and to protect the controller from voltage surges and stray voltage. See Figure 1.

When a generator alarm condition occurs, the appropriate relay contacts close to activate the horn and corresponding lamp on the remote annunciator. Mount the remote annunciator in a location easily observable by operating personnel at their work stations.

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 national and local electrical codes when installing the wiring system.

Features

The following paragraphs describe the remote annunciator specific features.

Alarm Horn

Alarm Horn. The alarm horn sounds when a fault or prealarm condition exists, except emergency stop, battery charger fault, or low battery voltage. Silence the alarm horn when the generator set master switch is in the AUTO position. The alarm horn will not silence when the NOT IN AUTO lamp is lit. See the installation procedure, step 8, for the resetting instructions.

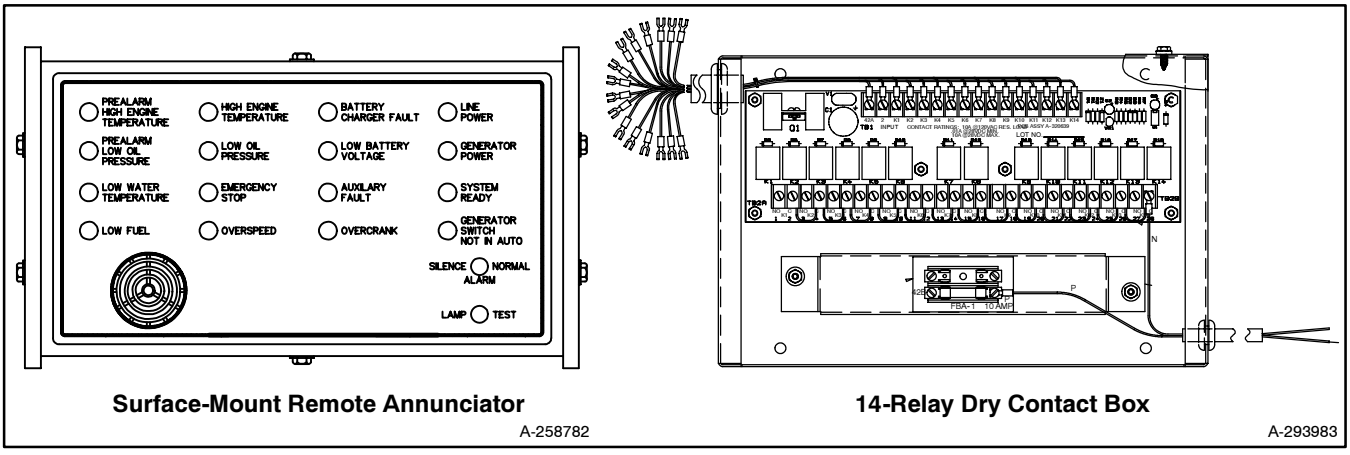


Figure 1 Remote Annunciator Alarm Panel

Lamps

Auxiliary Fault. The lamp flashes or remains on to indicate that a fault occurred.

Flashing Lamp Condition:

- The auxiliary lamp flashes immediately when the controller senses no AC output while the generator set is running, except during the first 10 seconds after startup. When the controller logic senses AC output the lamp stops flashing and turns off. No manual reset is required.
- The auxiliary lamp flashes while the generator set master switch is in the RUN or AUTO position when the controller battery power is reconnected or when the battery is low and then the controller regains full power. A temporary low battery condition may result from a weak battery or from an undersized battery for the application. Place the generator set master switch in the OFF/RESET position to clear this condition.

Continuous On Lamp Condition:

- The auxiliary lamp illuminates when the optional emergency stop switch is reset while the generator set master switch is in the AUTO or RUN position. Place the generator set master switch in the OFF/RESET position to clear this condition.

Battery Charger Fault, if Battery Charger Equipped. The lamp illuminates when the generator set battery charger or engine alternator malfunctions when equipped with fault outputs.

Emergency Stop. The lamp illuminates when the operator stops the generator set by using the local or optional emergency stop switch if the generator set is equipped with an emergency stop switch.

Generator Power. The lamp illuminates when the generator set is supplying power.

Generator Switch Not In Auto. The lamp illuminates when the generator set master switch is not in the AUTO position.

High Engine Temperature. The lamp illuminates when high engine coolant temperature shuts down the generator set.

Line Power. The lamp illuminates when commercial utility power or other source supplies the power when equipped with an auxiliary contact. When the lamp illuminates, the SYSTEM READY lamp also illuminates.

Low Battery Voltage, if Battery Charger Equipped. The lamp illuminates when the battery or charging voltage drops below a preset level on the charger. The lamp also illuminates when an undervoltage condition occurs from a battery or charger malfunction while the generator set is running.

Low Fuel. The lamp illuminates when the fuel tank level approaches empty. The annunciator requires a fuel tank low-fuel sensor for the lamp to function.

Low Oil Pressure. The lamp illuminates when the generator set shuts down because of low engine oil pressure.

Low Water Temperature. The lamp illuminates when the optional engine block heater temperature is low.

Overcrank. The lamp illuminates and the cranking stops when the generator set does not start within the defined cranking period.

Overspeed. The lamp illuminates when the generator set shuts down because of an overspeed condition.

Prealarm (Warning) High Engine Temperature. The lamp illuminates when the engine coolant temperature approaches the shutdown range.

Prealarm (Warning) Low Oil Pressure. The lamp illuminates when the engine oil pressure approaches the shutdown range.

System Ready. The lamp illuminates when the generator set master switch is in the AUTO position and the system has no fault conditions.

Mounting

Flush- or Surface-Mounting Capability. These instructions include installation information for both flush- and surface-mount models.

Switches

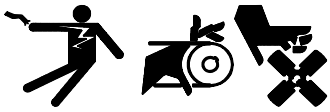
Alarm Silence. The switch disconnects the alarm during servicing. Place the generator set master switch in the AUTO position before silencing the alarm horn. See the installation procedure, step 8, for the resetting instructions.

Lamp Test. The switch tests the remote annunciator indicator lamps.

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 **GM17070-KP1 kit (20–300 kW).**

2.1.1 Remove the junction box rear panel and the 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). See Figure 2 for the mounting locations.

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.

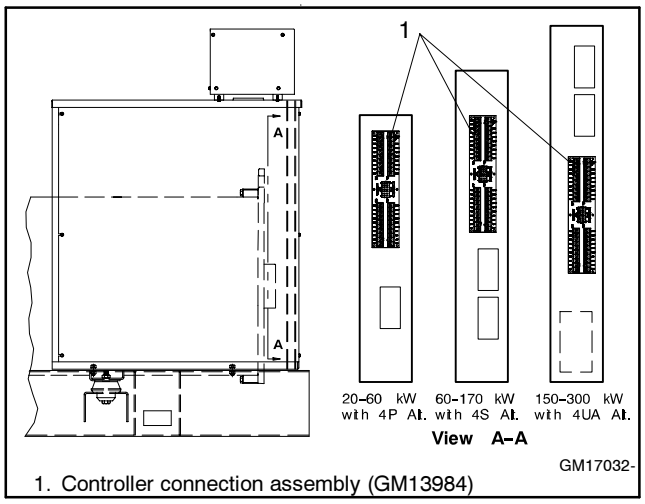


Figure 2 Controller Connection Assembly Mounting Locations in Junction Box (20–300 kW)

2.2 **GM17070-KP2 kit (350/400 kW).**

2.2.1 Remove the junction box rear panel and the hardware.

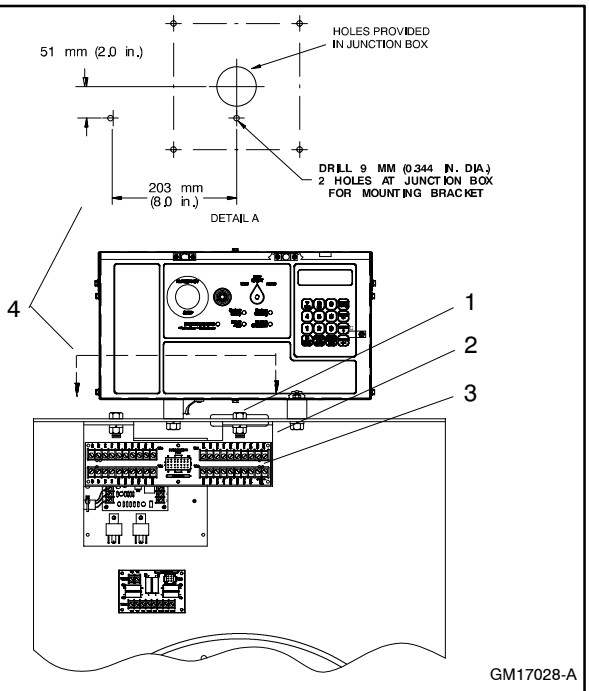
2.2.2 Remove the four screws attaching the controller to the junction box. See Figure 3.

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 junction box rear in order to provide enough clearance to drill two 9 mm (0.344 in.) diameter holes in the junction box top.

2.2.5 Remove the burrs from the drilled holes and clean the metal chips from 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 junction box rear and mount it using two screws (X-125-3) and nuts (X-6210-7). See Figure 3.



1. Terminal block bracket screws (X-125-3) and nuts (X-6210-7)
2. Terminal block bracket (347292)
3. Controller connection assembly (GM13984)
4. Detail A, mounting hole dimensions (top view)

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

2.2.7 Reposition the controller over the junction box holes and install the four screws removed in step 2.2.2.

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.

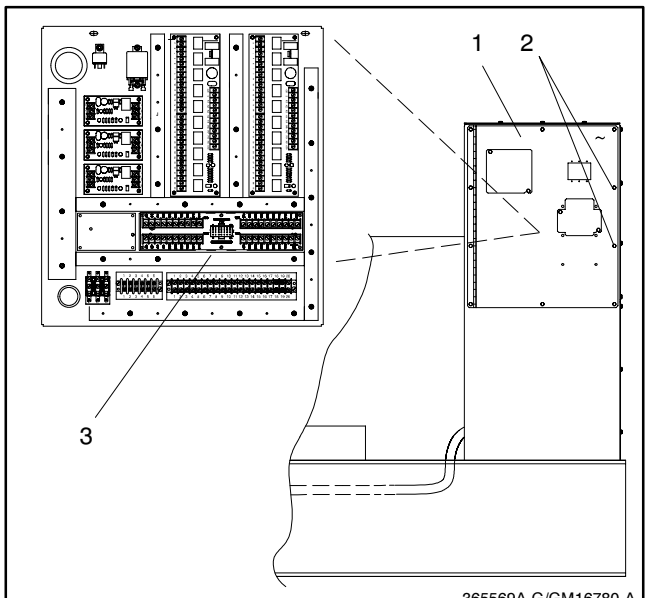
2.2.10 Proceed to step 2.4.

2.3 **GM17070-KP3 kit (450–2000 kW).**

2.3.1 Remove the junction box rear panel and the 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 inner panel 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.



1. Inner panel access door
2. Inner panel access door screws (6)
3. Controller connection assembly (GM13984)

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

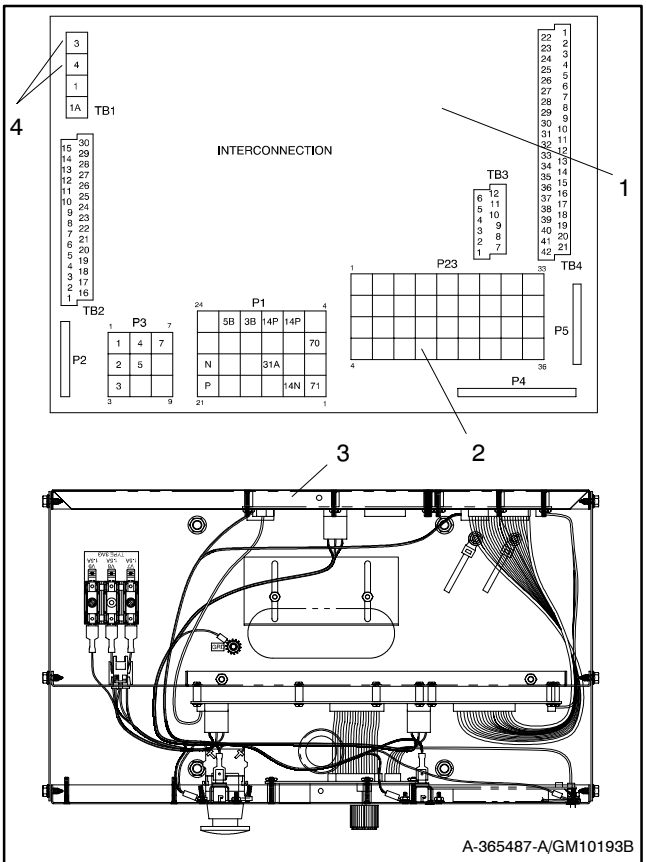
2.3.4 Plug the wiring connection harness (GM16753) into the controller connection assembly's P25 connector.

2.3.5 Proceed to step 2.4.

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 on each side to swing the rear controller panel down.



1. Interconnection circuit board (top view)
2. P23 connector
3. Interconnection circuit board mounted on the controller rear panel
4. Connect lead ES3 to TB1 terminal 3 and connect lead ES4 to TB1 terminal 4

Figure 5 Attaching Wiring Connection Harness to Controller Circuit Board

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.

3. Mount the 14-relay dry contact box.

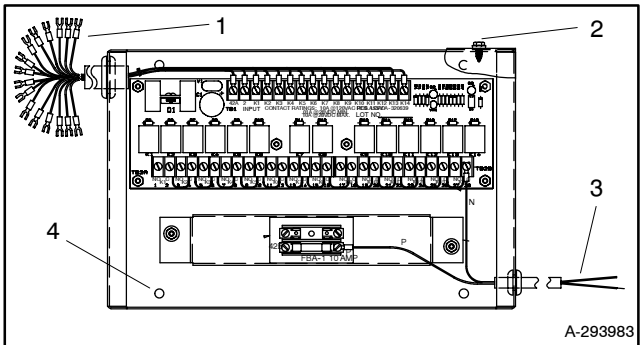
3.1 Determine a mounting location for the 14-relay dry contact box (A-293983). See Figure 6. Consider the supplied wiring harness length when choosing a mounting location. If the most suitable location requires a longer harness, fabricate a new harness using the supplied harness as a guide.

Note: The supplied wiring harness (293982) allows a maximum distance of 1.5 m (5 ft.) between the 14-relay dry contact box and the controller connection terminal strip.

Choose one of the following mounting locations for the 14-relay dry contact box, in order of acceptability:

- The junction box top; the size of the controller and the size of the junction box limit the mounting location.
- The generator skid top; the clearance and housing options limit the mounting location.
- An area as near to the generator set controller as practical.

3.2 Remove the four cover screws (X-6216-1) and lift the box cover (256880) to access the internal components.



1. Cable wiring harness 293982 to the controller connection terminal strip(s)
2. Cover screws
3. Annunciator wiring harness 256495 to the battery terminals
4. Mounting holes 7.5 mm (0.97 in.) diameter

Figure 6 14-Relay Dry Contact Box

3.3 Mount the 14-relay dry contact box in a location selected using customer-supplied mounting hardware. The 14-relay dry contact box has four 7.5 mm (0.297 in.) diameter holes in the bottom surface for mounting.

3.4 Wire the 14-relay dry contact box to the controller connection terminal strip using the cable wiring harness (293982). See Figure 7. Connect the controller connection terminal strip terminals 2 (ground) and 42A (battery voltage) to the 14-relay dry contact box terminal strip to provide an electrical source to operate the K1–K14 relays.

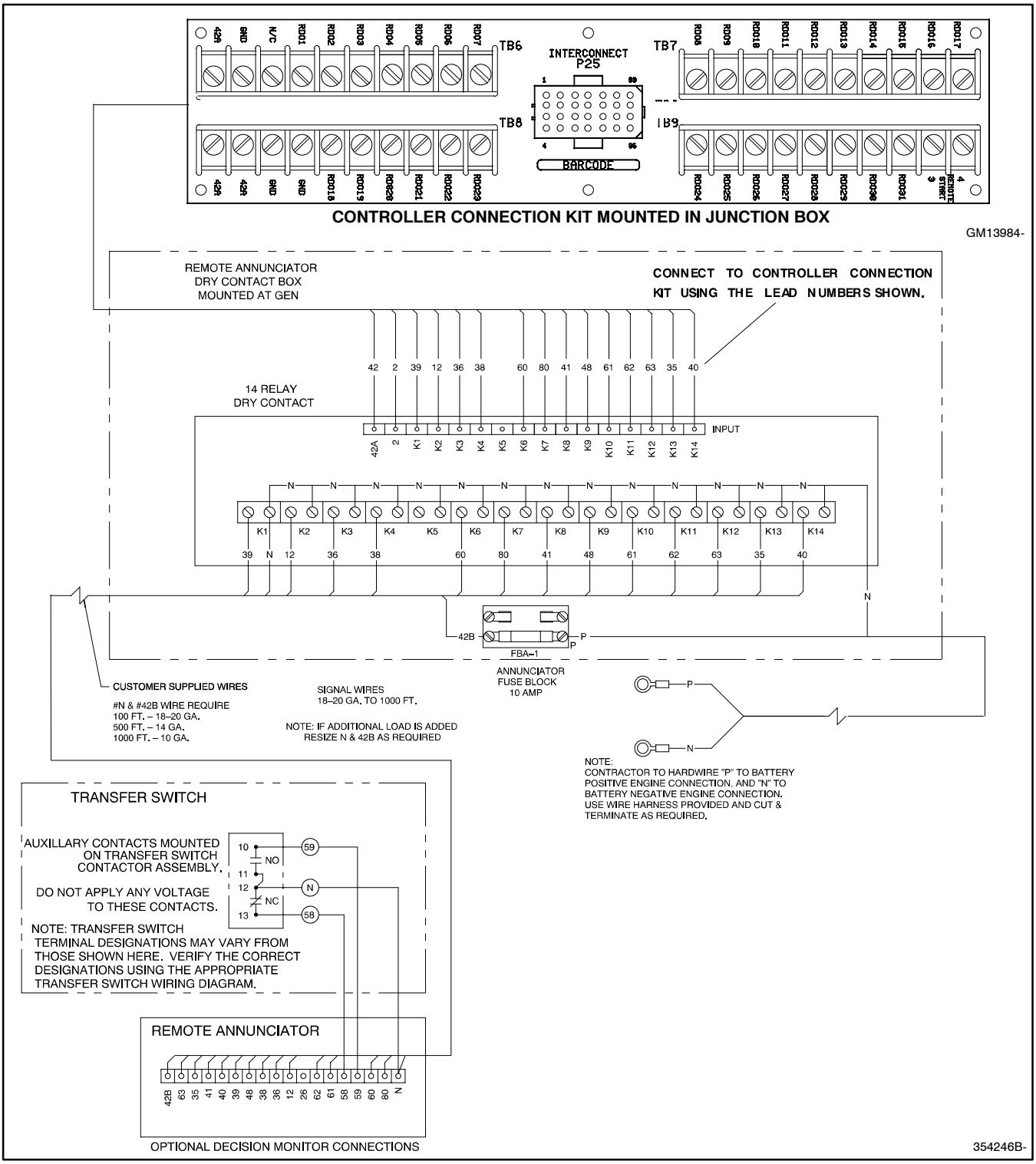


Figure 7 Remote Annunciator with 14-Relay Dry Contact Kit Connections

3.5 Connect lead P of the wiring harness (256495) from the 14-relay dry contact box to the battery positive (+) terminal at the starter solenoid. Lead N of the wiring harness connects to the battery's negative (–) terminal at the engine ground. Cut leads to length, strip ends, and crimp on ring terminals (X-283-4, 1/4 in. diameter), (X-283-5, 5/16 in. diameter), or (X-283-32, 1/2 in. diameter) as required.

Do not use terminals 42A and 2 on the 14-relay dry contact box terminal strip to supply voltage to the relay contacts. The user must attach separate leads directly to the battery for the voltage supply.

If additional load, lights, or alarms are connected to the 14-relay dry contact box, resize leads P and N based on the total current requirements.

3.6 **GM17071-KP3 kit only (450–2000 kW).** Swing the access door closed and install the screws.

3.7 Replace the junction box panel and hardware.

4. Select a mounting location for the remote annunciator panel.

4.1 Select a visible location for mounting the remote annunciator panel. Install the remote annunciator panel, either surface- or flush-mounted, in a location easily observable by operating personnel at their work stations. See Figure 8 for remote annunciator dimensions and mounting hole dimensions.

4.2 **Surface-mount remote annunciator initial installation.**

4.2.1 Prepare the mounting site by drilling pilot holes for anchors, if used.

Note: Mount the remote annunciator kit to a standard 10 cm (4 in.) square electrical box installed in the wall.

4.2.2 Create an opening in the wall for the electrical wiring from the 14-relay dry contact assembly, P and N battery connections, and transfer switch.

4.2.3 Disassemble the remote annunciator box. Remove six drill screws to disassemble the side panels and separate the front and back remote annunciator panels. Retain the side panels (287798) and the drill screws (X-794-2) for reassembly.

4.2.4 Mount the remote annunciator back panel to the wall or to the electrical box in the wall. See Figure 8 for the mounting hole dimensions. Protect the remote annunciator from dust and debris when drilling the holes.

Note: Use mounting hardware suitable for the wall composition and thickness.

4.2.5 Proceed to step 5, Wire the remote annunciator.

4.3 **Flush-mount remote annunciator initial installation.**

4.3.1 Prepare the mounting site by creating an opening in the wall for flush mounting the remote annunciator.

Note: Mount the remote annunciator inside a standard 30 x 20 x 10 cm (12 x 8 x 4 in.) pull box installed in the wall.

4.3.2 Disassemble the remote annunciator box. Remove six drill screws to disassemble the side panels and separate the front and back remote annunciator panels. Retain the drill screws (X-794-2) for reassembly. Discard the side panels.

4.3.3 Proceed to step 5, Wire the remote annunciator.

5. Wire the remote annunciator.

5.1 The installer must supply all leads between the 14-relay dry contact assembly (A-293983) and the remote annunciator (A-258782). Isolate the leads from all other voltages. Observe the following guidelines during installation:

- Use separate conduit for the remote annunciator leads.
- Use grounded metallic conduit for leads or use shielded cable in nonmetallic conduit.
- Use the 14-relay dry contact kit located at the generator set for all signal leads and a separate power source for the remote annunciator.

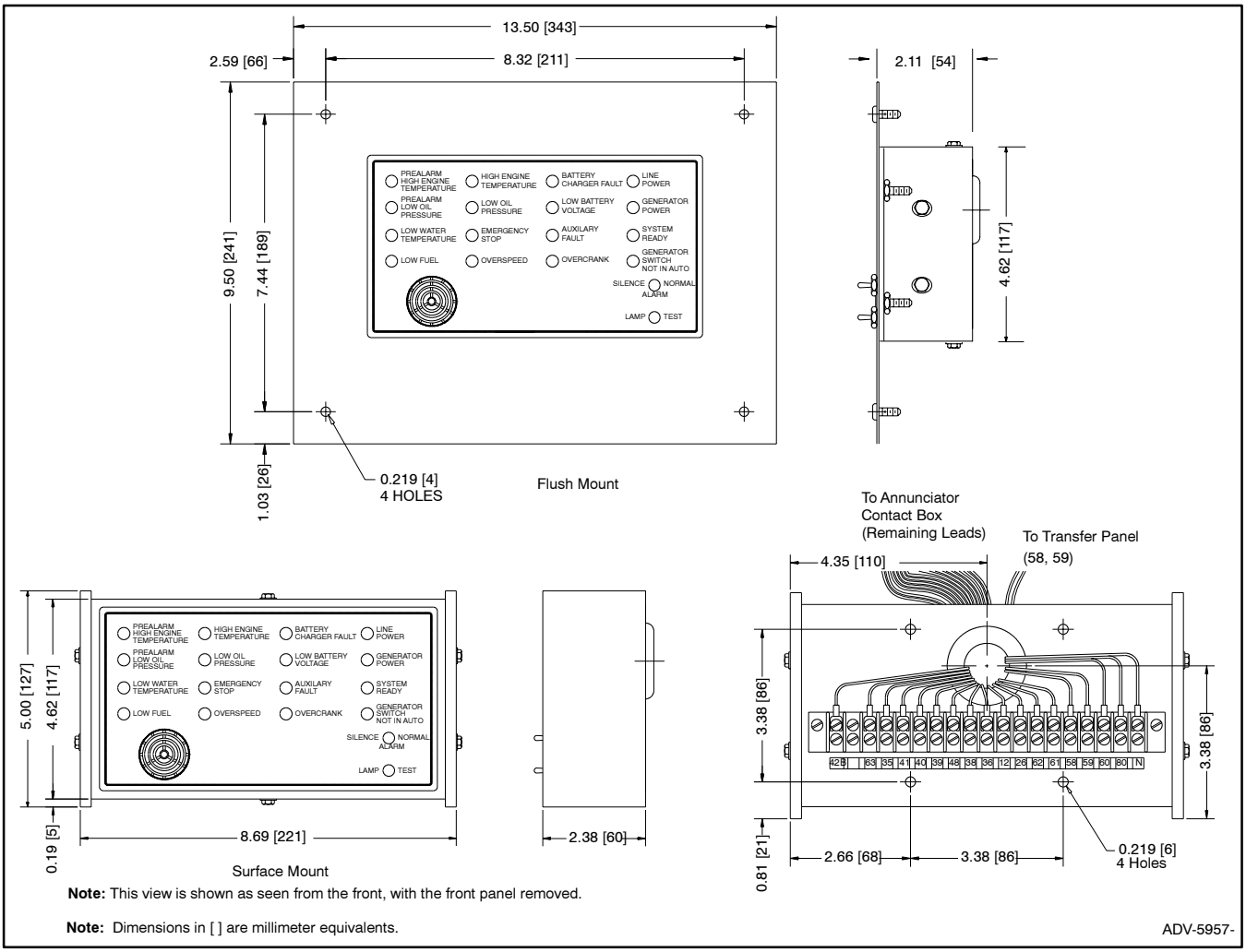


Figure 8 Component Dimensions

To determine the voltage supply wire gauge for leads N and 42B, measure the cable distance between the 14-relay dry contact box and the remote annunciator. For example, if the cable distance between the remote annunciator and the 14-relay dry-contact box is 122 m (400 ft), then the total wire length for each conductor is 122 m (400 ft). According to the chart in Figure 9, this example requires 14-gauge wire for leads N and 42B only.

Use stranded or solid 18- or 20-gauge wire for signal leads (39, 12, 36, etc.) at lengths up to 305 m (1000 ft.). Never mount the remote annunciator more than 305 m (1000 ft.) from the 14-relay dry contact box.

5.2 Attach wiring of the correct length and gauge to the 14-relay dry contact box. See Figure 9.

5.3 Route the wiring from the 14-relay dry contact box through the opening in the annunciator back panel.

Leads	Length	Wire Gauge
N, 42B	0–21 m (0–100 ft.)	18-20
	31–152 m (100–500 ft.)	14
	152–305 m (500–1000 ft.)	10
39, 12, 36, etc.	0–305 m (0–1000 ft.)	18-20

Figure 9 Wire Specifications Between Remote Annunciator and Dry Contact Box

5.4 Attach the leads to the terminal strip. Be sure to connect the 14-relay dry contact box leads to the corresponding terminals in the remote annunciator. See Figure 10.

5.5 Connect transfer switch terminals 10, 12, and 13 to the remote annunciator terminals 59, N, and 58, respectively, if the electrical system has a transfer switch.

5.6 Replace the 14-relay dry contact box cover and install the four cover screws (X-6216-1).

Description	Controller Connection Kit Terminal	14-Relay Dry Contact Kit Terminal (Relay Signal)	14-Relay Dry Contact Kit Terminal (Relay Contacts)	Remote Annunciator Terminal (factory wire designations)
Battery (+)	42A	42A Input	—	—
Ground/Battery (-)	2	2 Input	—	—
Battery (+)	—	P (from battery)	42B	42B
Ground/Battery (-)	—	N (from battery)	K1, C terminal	N
Overspeed	RDO1	K1 Input	K1, NO terminal	39
Overcrank	RDO2	K2 Input	K2, NO terminal	12
High Engine Temperature Shutdown	RDO3	K3 Input	K3, NO terminal	36
Low Oil Pressure Shutdown	RDO4	K4 Input	K4, NO terminal	38
Overvoltage (Aux.)	RDO20	K5 Input	K5, NO terminal	26
System Ready	RDO17	K6 Input	K6, NO terminal	60
Master Switch Not in Auto	RDO9	K7 Input	K7, NO terminal	80
Low Oil Pressure Warning	RDO7	K8 Input	K8, NO terminal	41
Emergency Stop	RDO14	K9 Input	K9, NO terminal	48
Battery Charger Fault	RDO11	K10 Input	K10, NO terminal	61
Low Battery Voltage (Aux.)	RDO12	K11 Input	K11, NO terminal	62
Low Fuel (Level or Pressure)	RDO8	K12 Input	K12, NO terminal	63
Low Water Temperature	RDO5	K13 Input	K13, NO terminal	35
High Engine Temperature Warning	RDO6	K14 Input	K14, NO terminal	40

Figure 10 Remote Annunciator Kit Wiring Connections

6. Complete the remote annunciator final installation.

6.1 Proceed to either 6.2, Surface-Mount Remote Annunciator Final Installation or 6.3, Flush-Mount Remote Annunciator Final Installation.

6.2 **Surface-mount remote annunciator final installation.**

6.2.1 Reassemble the front panel to the annunciator box back panel with two drill screws (X-794-2).

6.2.2 Reattach the side panels with four drill screws (X-794-2).

6.2.3 Proceed to step 7.

6.3 **Flush-mount remote annunciator final installation.**

6.3.1 Reassemble the front panel to the back panel using two drill screws (X-794-2). See Figure 11.

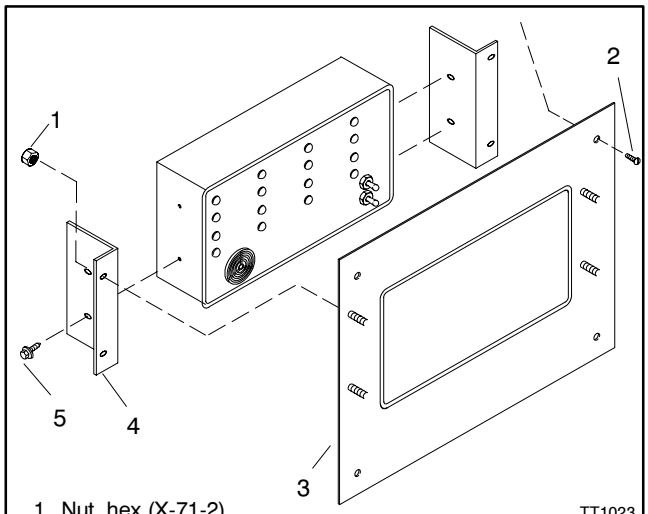
6.3.2 Attach the L-shaped side mounting brackets (293993) to the back panel using four drill screws (X-794-2). Do not tighten the screws.

6.3.3 Attach the front adapter panel (293992-BLK) studs to the L-shaped side mounting brackets using four 6-32 hex nuts (X-71-2). Do not tighten the nuts.

6.3.4 Center the remote annunciator in the adapter panel opening and tighten the hardware.

6.3.5 Mount the kit inside the pull box using four screws (X-50-72). Use mounting hardware suitable for the wall composition and thickness for installations without a pull box.

6.3.6 Proceed to step 7.



1. Nut, hex (X-71-2)
2. Screw, pan head (X-50-72)
3. Adapter panel (293992)
4. L-shaped side mounting bracket (293993)
5. Drill screw (X-794-2)

Figure 11 Flush-Mount Remote Annunciator Installation

7. Restore the generator set to service.

7.1 Check that the generator set master switch is in the OFF position.

7.2 Reconnect the generator set engine starting battery, negative (–) lead last.

7.3 Reconnect power to the battery charger, if equipped.

7.4 Move the generator set master switch to the AUTO position for startup by a remote transfer switch or remote start/stop switch. Move the remote annunciator alarm horn switch to the NORMAL position. If the horn sounds or a lamp illuminates, see step 8 for the resetting instructions.

8. Resetting the generator set controller and remote annunciator.

Use the following procedure to reset the controller and the remote annunciator after a fault alarm.

8.1 Press the ALARM OFF key on the controller keypad to silence the controller alarm horn.

8.2 Move the remote annunciator alarm horn switch to SILENCE to stop the alarm horn. The respective remote annunciator lamp remains lit.

8.3 Disconnect the generator set from the system load with the line circuit breaker or the automatic transfer switch.

8.4 Correct the cause of the fault alarm (refer to the generator set service manual).

8.5 Move the generator set master switch to the OFF/RESET position and then to the RUN position for startup. The remote annunciator alarm horn and the controller alarm horn sound because the unit is not in the AUTO position. The remote annunciator Generator Switch Not in Auto lamp lights.

8.6 Verify that the cause of the alarm has been corrected.

8.7 Reconnect the generator set to the system load via the line circuit breaker or automatic transfer switch.

8.8 Move the generator set master switch to the AUTO position for startup by the remote transfer switch or the remote start/stop switch.

8.9 Move the remote annunciator alarm horn switch to the NORMAL position.

Parts List

Remote Annunciator Alarm Kits

	Kits: GM17071-KP1, GM17071-KP2, and GM17071-KP3		Unique Parts		
Qty.	Description	Common Parts	GM17071-KP1	GM17071-KP2	GM17071-KP3
1	Panel assembly, remote annunciator (includes:)	A-258782			
1	Circuit board assembly, 16-light	A-292885			
2	Washer, 0.146 ID x 0.285 OD lock	X-22-6			
2	Screw, 6-32 x 0.50 in.	X-49-26			
4	Screw, hex, 8-32 x 0.375 in.	X-67-43			
1	Bushing, 1.0 x 1.375 in. NPT	X-634-15			
6	Screw, drill, 8-18 x 0.50 in.	X-794-2			
1	Bracket, wall mounting	253346			
1	Panel, front	253350			
1	Decal, marker	258832			
1	Nameplate	258834			
1	Harness, engine wiring	258890			
1	Block, terminal	258891			
2	Panel, side	287798			
1	Assembly, 14-relay dry contact box (includes:)	A-293983			
1	Circuit board assembly, 14-relay dry contact	A-320639			
13	Lead	LW-1803-0000			
2	Washer, 0.125 ID x 0.25 in OD plain	X-25-46			
2	Tie, cable	X-468-5			
1	Bushing, 0.688 x 0.875 in. NPT	X-634-11			
1	Bushing, 0.938 x 1.187 in. NPT	X-634-14			
2	Rivet, pop, 1/8 diameter Al/Al	X-781-21			
4	Screw, 10-24 x 0.50 in.	X-6216-1			
1	Fuse, 10-amp	223316			
1	Box, dry contact	226676			
1	Holder, 2-pole fuse	343694			
1	Marker, strip	256494			
1	Harness, annunciator wiring (positive/negative, 3.4 m (11 ft.)	256495			
1	Cover, dry contact	256880			
1	Harness, cable wiring interconnection, 1.5 (5 ft.(	293982			
1	Terminal, 16-14 ga., 1/2 in. diameter ring	X-283-32			
1	Terminal, 16-14 ga., 1/4 in. diameter ring	X-283-4			
1	Terminal, 16-14 ga., 5/16 in. diameter ring	X-283-5			
4	Screw, 10-32 pan head	X-50-72			
6	Screw, round machine head		X-51-3	X-51-3	
6	Nut, hex, 8-32			X-70-12	X-70-12
6	Nut, whiz flange, 8-32		X-6210-4		
6	Spacer, 0.25 OD x 0.5 in. L	X-712-9			
1	Panel, front annunciator	293992-BLK			
2	Bracket, mounting	293993			
1	Harness, wiring controller connection		GM17033	GM17029	GM16753
1	Bracket, terminal block			347292	
1	Connection assembly, controller	GM13984			