INSTALLATION INSTRUCTIONS

Original Issue Date: **7/93**
Model: **20-2000 kW**
Market: **Industrial**
Subject: **Common Fault Relay Kits PA-273914 and PA-273914-SD**

The common fault relay kit allows remote monitoring of the standby system by using one set of contacts to trigger customer-provided signaling devices if a fault condition occurs. Any controller fault (from terminal strip TB1) can be connected to the common fault relay kit. Typically, lamps, audible alarms, or other devices are connected to signal an overspeed, emergency stop, high engine temperature, low oil pressure, or auxiliary condition. The common fault relay is shown in Figure 1.

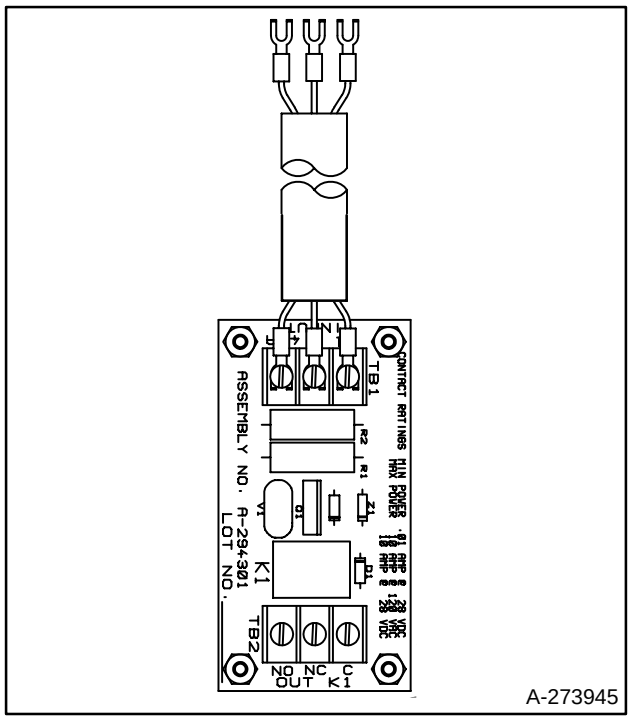


Figure 1. Common Fault Relay Kit

Customer-provided accessories require their own electrical source and must not exceed the relay contact ratings following.

If supply voltage is 12 volts DC, make connections to battery positive at starter solenoid and to battery negative at engine ground. Do not use terminals 42A and N of controller or connection kit terminal strip to supply voltage to relay contacts. These must be separate leads direct from the battery. Size leads according to local, state, and national electrical codes.

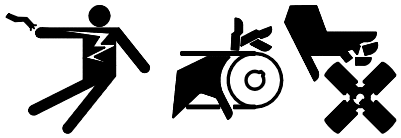
Relay Contact Rating

Maximum Switching Voltage . . . . . 120 Volts AC
Maximum Switching Current . . . . . 10 Amps
Minimum Switching Power . . . . . 10 Milliamps
at 28 Volts DC or equivalent

NOTE

Applicable local, state, and national electrical codes must be observed when installing the common fault relay kit and related accessories.

⚠ WARNING



Accidental starting.
Can cause severe injury or death.

Disconnect battery cables before working on generator set (negative lead first and reconnect it last).

Accidental starting can cause severe injury or death. Turn generator set master switch to OFF position, disconnect power to battery charger, and remove battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator set. The generator set can be started by automatic transfer switch or remote start/stop switch unless these precautions are followed.

Installation

1. Move the generator set controller master switch to the OFF position. Disconnect generator set engine starting battery, negative (–) lead first.

2. Remove the controller cover.

3. Mount the common fault relay inside the junction box. Drill four 3/16 in. (5 mm) diameter holes in the generator panel using the relay board as a template. See Figure 2.

4. Attach the relay to the junction box with screws (X-51-3), spacers (X-712-9), and nuts (X-6210-4). See Figure 2.

5. Use the supplied wiring harness and 18-gauge stranded wire to extend the common fault relay wiring harness if the kit is to be mounted in a location remote from the generator set. The harness includes diodes which are necessary for correct operation of the common fault relay kit.

NOTE

Do not mount the kit more that 200 ft. (61 m) from the generator set.

6. Connect the common fault relay kit wiring harness (273772) according to the wiring diagram in Figure 3, or 4. Controller/connection kit terminals 2, (ground) and 42A (battery voltage) must be connected to the common fault relay terminal strip providing an electrical source to operate the K1 relay.

   The customer can select one of several functions. Typical functions are provided on the wiring diagram. The customer has the option of selecting normally open or normally closed contacts. Relay contact closure corresponds to the selected microprocessor controller light being activated.

7. Customer-provided devices connected to the common fault relay kit must be furnished with an electrical supply adequate to operate the device. Check the electrical requirements of customer-provided accessories prior to installation. Use 18-gauge stranded wire to connect customer-provided accessories to the common fault relay terminal strip.

8. Use cable tie (X-468-1) to bundle and secure the wiring harness.

9. Reinstall the controller cover.

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

Testing

After installation, test the common fault relay operation by connecting an ohmmeter across NO and C terminals on the relay terminal strip. Start the generator set and ground any connected shutdown switch on the controller terminal strip TB1. During generator set shutdown the relay contacts should close and a low resistance reading (continuity) obtained on the ohmmeter. When the test is complete place the generator controller master switch in the OFF position.

Parts List

Kits PA-273914 & PA-273914-SD

Qty.	Description	Part Number
1	Circuit board assembly, common fault relay	C-294301
4	Screw, r.h.m., 8-32 x 1 in.	X-51-3
4	Spacer	X-712-9
4	Nut, whiz 8-32	X-6210-4
1	Harness, wiring	347275
1	Tie, cable	X-468-1

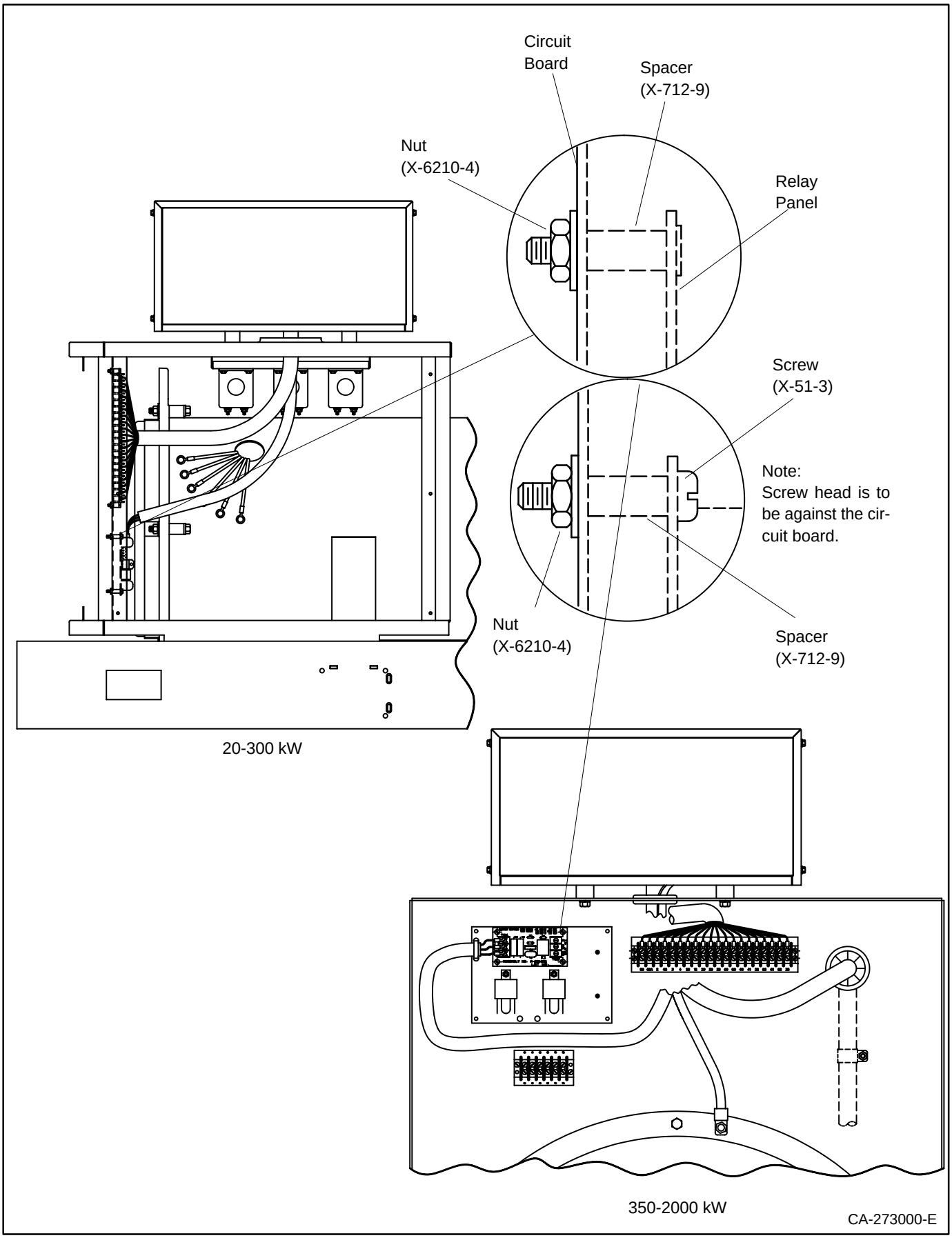


Figure 2. Common Fault Relay Kit Installation

.

CONTROLLER TERMINAL IDENTIFICATION

TB1 Terminal Strip

1	Ground—emergency stop relay (K4)—Connect emergency stop across terminals TB1-1 and 1A†
1A	Emergency Stop Relay (K4) coil; negative side—Connect emergency stop across terminals TB1-1 and 1A†
2	Ground terminal
3	Remote start ground—Connect transfer switch or remote start switch to TB1-3 and TB1-4
4	Remote start—Connect transfer switch or remote start switch to TB1-3 and TB1-4
9	Crank mode selection (open—cyclic crank; ground—continuous crank). Connect TB1-2 to TB1-9 for continuous cranking; leave TB1-9 open cyclic cranking—see Starting
12	Overcrank (OC) signal*
26	Auxiliary (AUX) signal*
32	Common Fault/Prealarm Line—A/V alarm or common fault relay activated by OC, 12; AUX, 26; LWT, 35; HET, 36; LOP, 38; OS, 39; AHET, 40; ALOP, 41; and LF, 63 faults
35	Low water temperature (LWT) signal
36	High engine temperature (HET) signal*
38	Low oil pressure (LOP) signal*
39	Overspeed (OS) signal*
40	Anticipatory high engine temperature (AHET) signal*
41	Anticipatory low oil pressure (ALOP) signal*
42A	Battery voltage (fuse #1 protected)—Accessory power supply; Customer may also provide separate accessory power source
48	Emergency stop (ES) signal*
56	Air damper (AD) switch (if equipped). Standard on all 200-2000 kW Detroit Diesel powered models
60	System ready signal*
61	Battery charger fault—Connect battery charger alarm contact to TB1-61 to activate fault lamp (acitve low) (if used)
62	Low battery volts—Connect battery charger alarm contact to TB1-62 to activate fault lamp (active low) (if used)
63	Low fuel (LF) fault—Connect fuel level sensor to TB1-63 to activate fault lamp (active low) (if used)
80	Not in auto signal*

NOTE: Not all terminals are used for all generator sets (see appropriate wiring diagrams for specific generator set model)
† Connect jumper across terminals 1 and 1A if emergency stop switch is not used.
* Use a remote annunciator and/or A/V alarm kit as an indicator with a dry contact kit connected to controller terminal strip TB1.

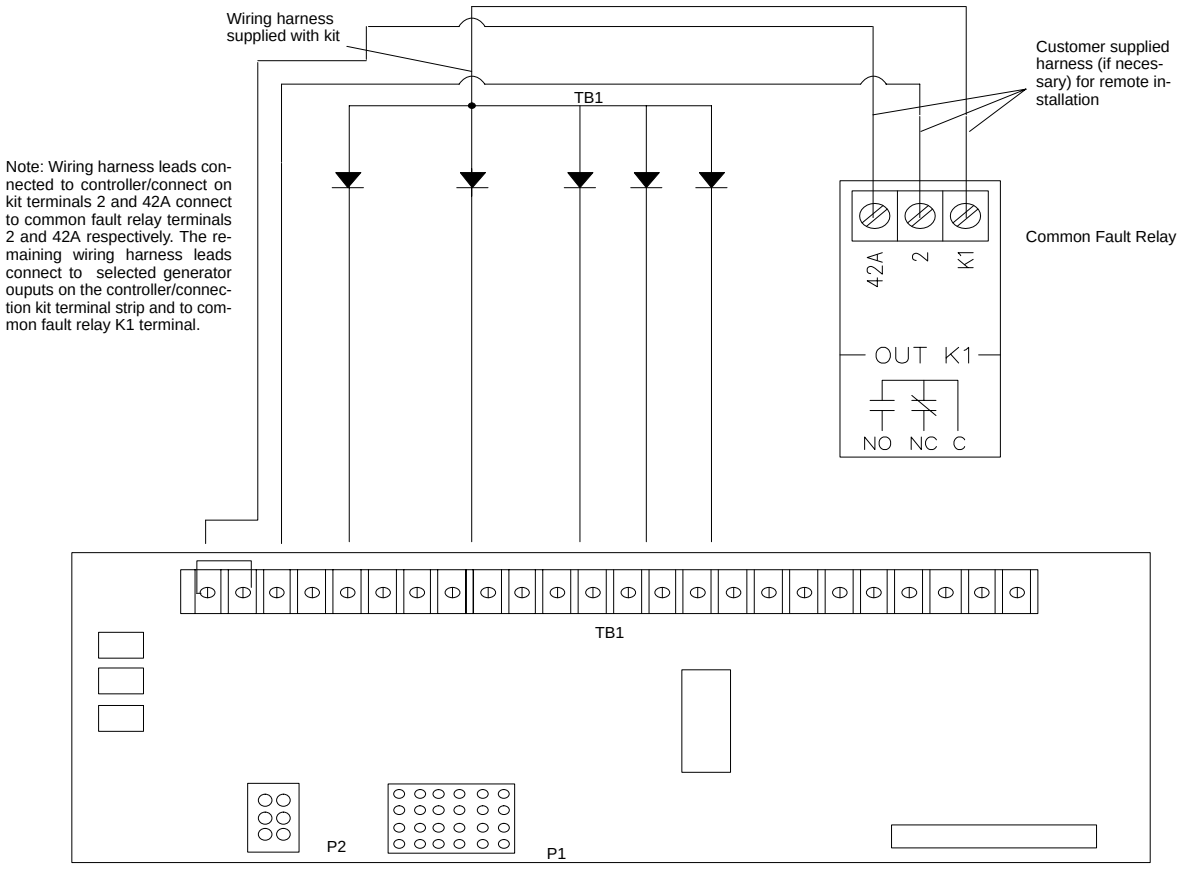


Figure 3. Wiring Diagram with TB1 and TB2 Terminal Strips on Controller Circuit Board