INSTALLATION INSTRUCTIONS

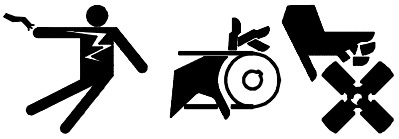
Safeguard Circuit Breaker Kits For 350-1600 kW Standby Generator Sets

SAFEGUARD BREAKER KITS	
Kit No.	**Amps**
PA-292857 & PA-292857-SD	4.0
PA-292858 & PA-292858-SD	4.5
PA-292859 & PA-292859-SD	3.5
PA-292860 & PA-292860-SD	3.0
PA-292861 & PA-292861-SD	5.0

The safeguard circuit breaker kit protects the generator set in the event of an overload or short circuit. It is different than a conventional circuit breaker, in that it has a trip curve matched to the generator characteristics. When an overload or short circuit occurs, the safeguard circuit breaker opens the battery voltage supply to the voltage regulator.

Generator sets equipped with the basic relay controller without meters will require installation and connection of current transformers.

⚠ 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 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. The generator set can be started by automatic transfer switch or remote start/stop switch unless these precautions are followed.

⚠ WARNING

Hazardous voltage.

Moving rotor.

Can cause severe injury or death.

Do not operate generator set without all guards and electrical enclosures in place.

Hazardous voltage can cause severe injury or death. Disconnect set from load by opening line circuit breaker or by disconnecting generator output leads from transfer switch and heavily taping ends of leads. If high voltage is transferred to load during test, personal injury and equipment damage may result. The GENERATOR SAFEGUARD BREAKER MUST NOT BE USED IN PLACE OF LINE CIRCUIT BREAKER!

Hazardous voltage can cause severe injury or death. Use caution when handling the capacitor; possible electrical shock can result. Discharge capacitor by shorting terminals together.
(Capacitor Excited Models only.)

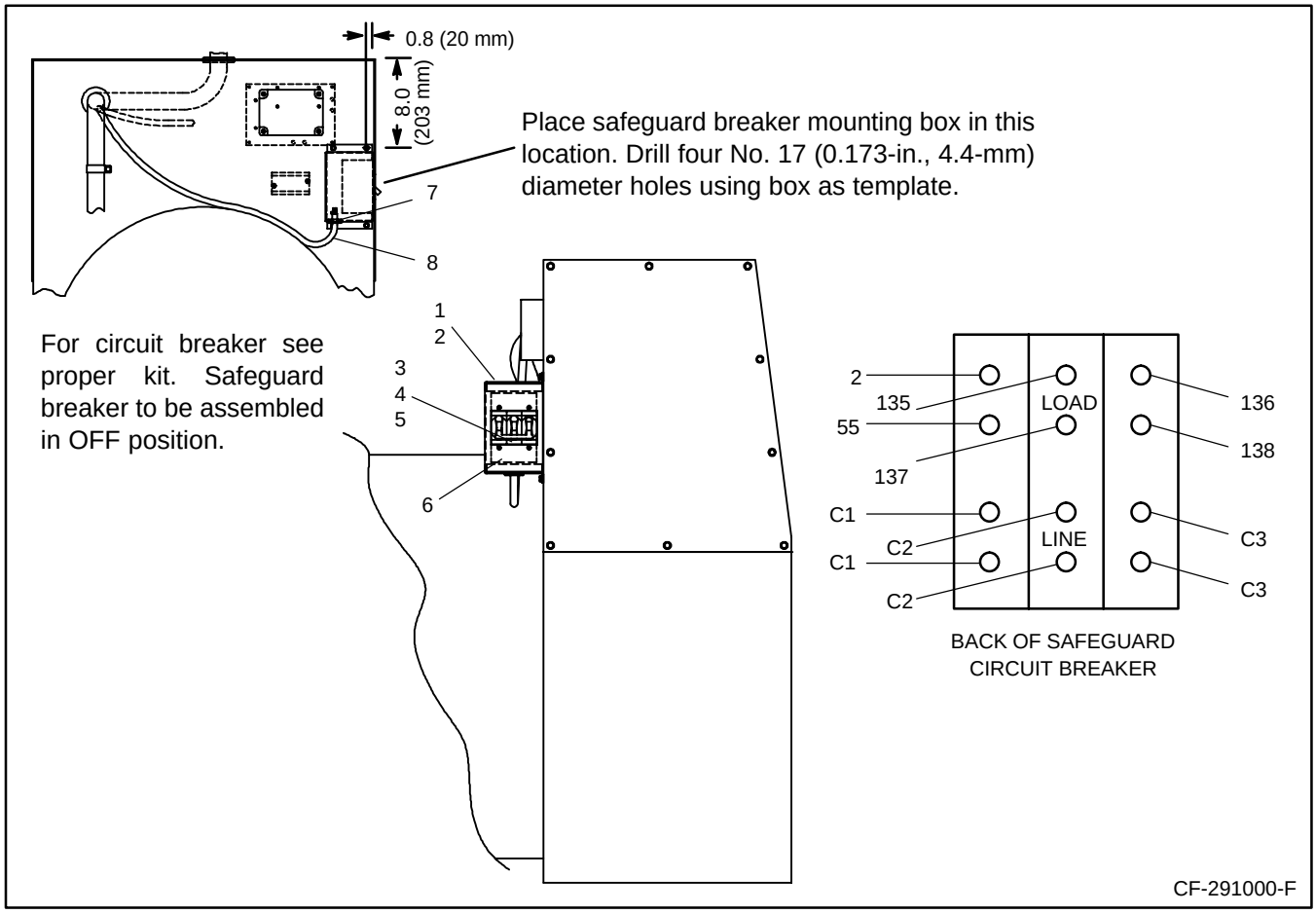
INSTALLATION

1. Move generator master switch to OFF position. Disconnect generator set battery cables, negative leads first.

2. Position safeguard mounting box (293721) on engine side (rear) of junction box. Using the box as a template, drill four #17 (0.173-inch, 4.4-mm) diameter holes. See Figure 1.

   NOTE

   Observe all appropriate safety procedures for use of power tools when drilling holes. Remove all burrs and metal chips from the work area before continuing installation procedure.



1. Safeguard Mounting Box (293721)
2. Phillips® Hex Crimptite® Screw (X-6216-1) qty. 4
3. Plain Washer (X-25-9) qty. 4
4. R.H.M. Screw (X-49-26) qty. 4
5. Safeguard Circuit Breaker
6. Decal (293667)
7. Grommet (X-284-3)
8. Wiring Harness (293711)

Figure 1. Safeguard Circuit Breaker Installation

3. Install grommet (X-284-3) in hole in safeguard mounting box. Insert 12-lead end of wiring harness (293711) through grommet.

4. Connect leads C1, C2, and C3 (2-inch leads) to lower terminals of safeguard breaker (line side). Connect leads C1, C2, and C3 (3-inch leads) to upper terminals of safeguard breaker (line side), as shown in Figures 2 and 3.

NOTE

Wiring diagrams differ due to remote versus locally mounted voltage regulator.

5. Connect leads 2, 135, and 136 to upper terminals of safeguard breaker (load side). Connect leads 55, 137, and 138 to lower terminals of safeguard breaker (load side), as shown in Figures 2 and 3.

6. Install safeguard circuit breaker in mounting box with four 6-32 x 0.500-in. r.h.m. screws (X-49-26) and 0.156 x 0.375 x 0.049-in. plain washers (X-25-9). Install safeguard breaker so that OFF markings are to the top. See Figure 1.

7. Mount safeguard box to junction box with four 10-24 x 0.50-in. Phillips® hex Crimptite® screws (X-6216-1).

8. With surface clean and dry, apply safeguard breaker decal (293667) to safeguard mounting box at the location as shown in Figure 1.

9. Route harness into junction box through engine harness port.

10. Remove junction box access cover.

11. Place generator output leads through current transformers (1 turn) as shown in appropriate diagram in Figure 4.

NOTE

Current transformers should be positioned with “dot” or “HI” mark toward the generator set.

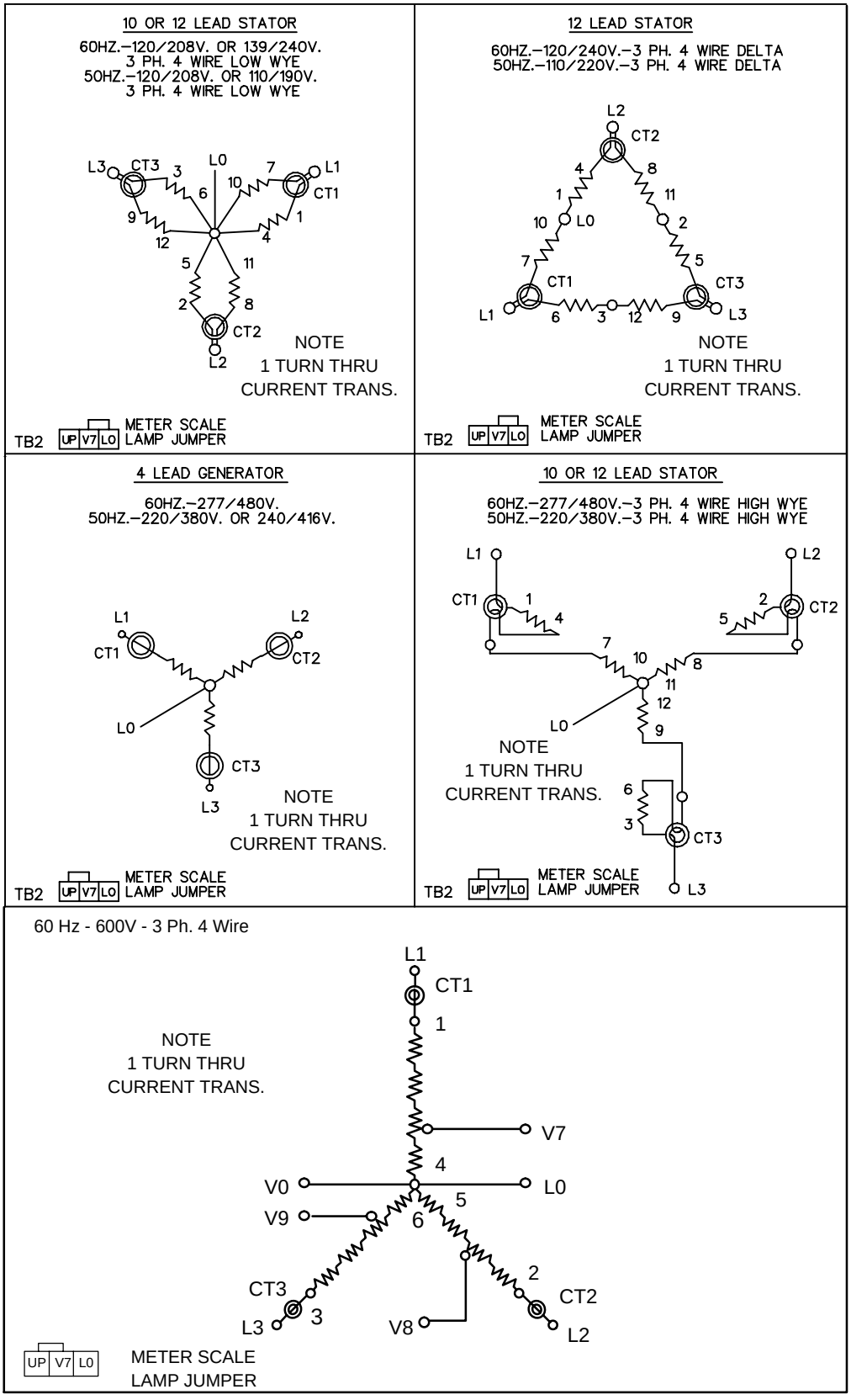
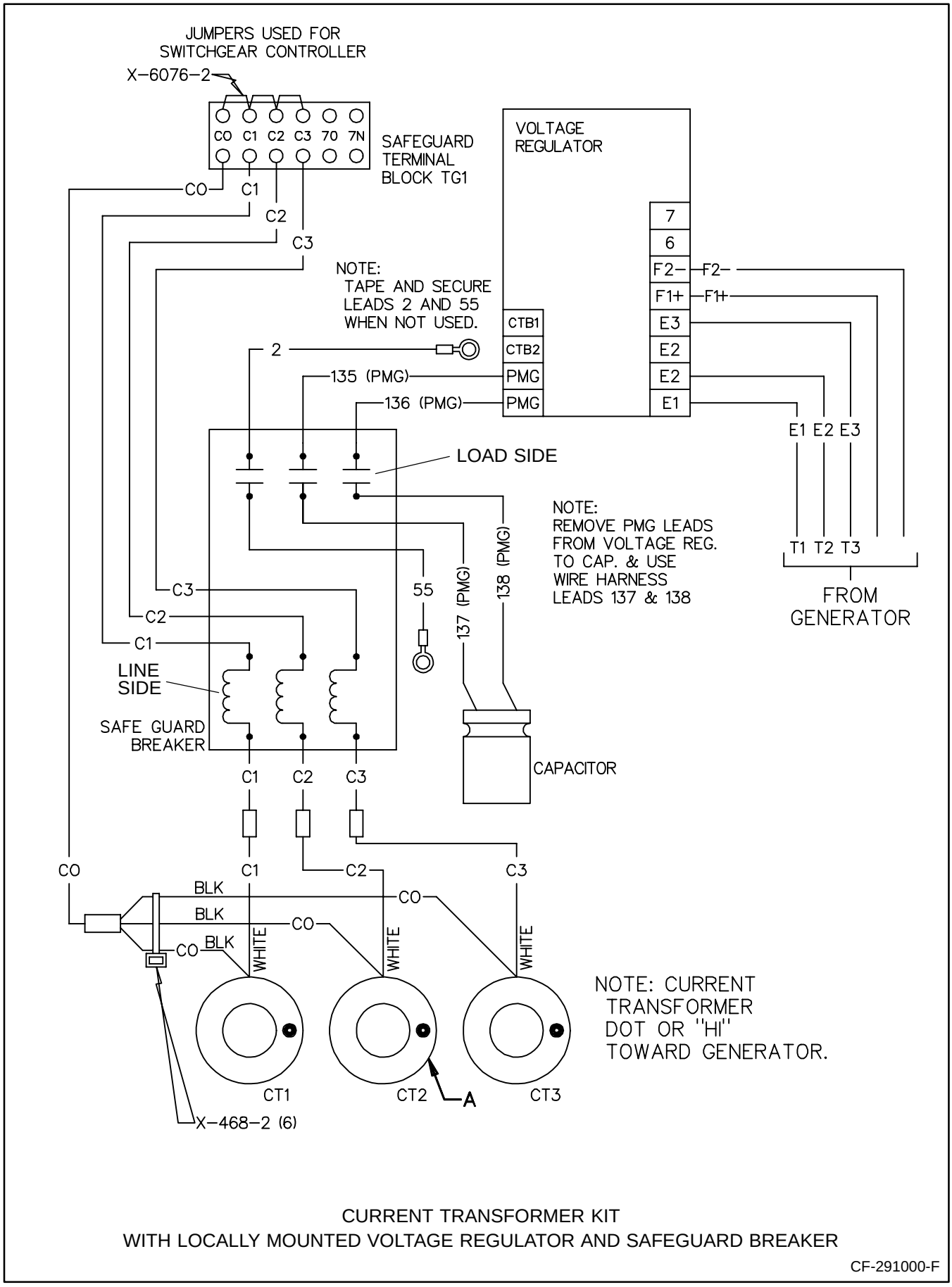


Figure 2. Current Transformer Connections



CURRENT TRANSFORMER KIT
WITH LOCALLY MOUNTED VOLTAGE REGULATOR AND SAFEGUARD BREAKER

CF-291000-F

Figure 3. Wiring Diagram—Locally Mounted Voltage Regulator

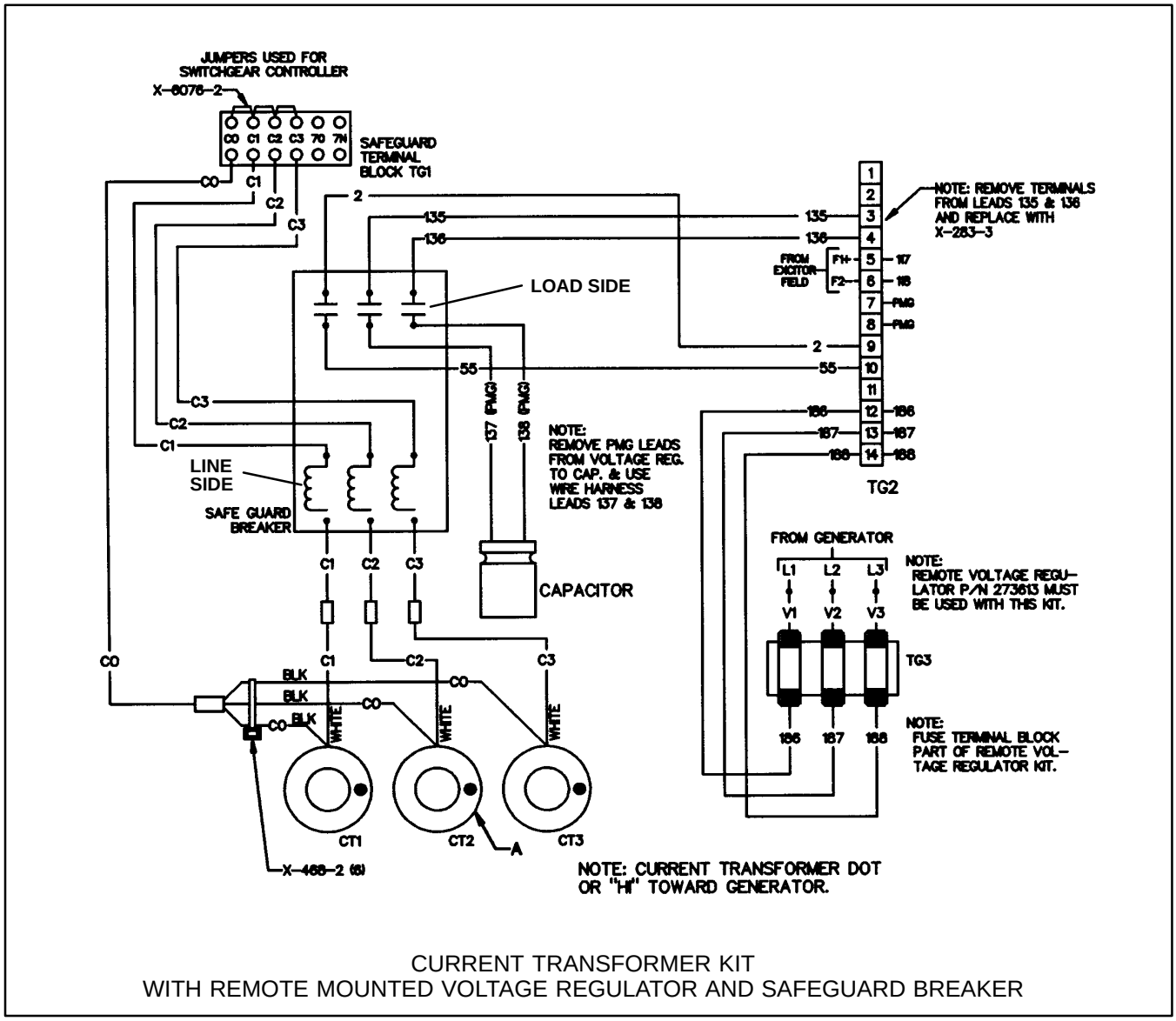


Figure 4. Wiring Diagram—Remote Mounted Voltage Regulator

12. Connect wiring harness to safeguard circuit breaker as described in the following steps. See Figures 2 and 3.

    a. Disconnect all current transformer white leads (C1, C2, and C3) and black lead (C0) from the terminal block if not already done. Remove existing terminals from leads.

    NOTE

    Label all leads to ensure proper reconnection.

13. Connect current transformer white leads to wiring harness leads as follows:

    a. Connect current transformer lead C1 to wiring harness lead C1 with crimp connector.

    b. Connect current transformer lead C2 to wiring harness lead C2 with crimp connector.

    c. Connect current transformer lead C3 to wiring harness lead C3 with crimp connector.

    d. Connect leads C0, C1, C2, and C3 (2-inch leads) from wiring harness to safeguard terminal block.

    e. Connect black leads from current transformers by crimping onto the connector on lead C0 of the wiring harness.

14. Remove PMG leads from voltage regulator to capacitor and connect leads 137 and 138 from wiring harness to capacitor.

15. Connect leads 2, 55, 135, and 136 to voltage regulator terminal strip TG2, as shown in Figures 2 and 3.

    NOTE

    If required, remove existing terminals and use eyelet terminals (X-283-3).

    NOTE

    If leads 2 and 55 are not used, insulate and secure leads with electrical tape.

16. Reinstall junction box access cover.

17. Verify that the generator master switch is in the OFF position. Reconnect generator set battery cables, negative lead last.

Parts List

Kits: PA-292857, PA-292857-SD, PA-292858, PA-292858-SD, PA-292859, PA-292859-SD, PA-292860, PA-292860-SD, PA-292861, and PA-292861-SD

Description	Qty.	Part No.
Washer, 0.156 x 0.375 x 0.049 in. plain	4	X-25-9
Terminal, eyelet	10	X-283-3
Grommet, 1.00 x 1.38 x 0.44 in.	1	X-284-3
Screw, 6-32 x 0.500 in. r.h.m.	4	X-49-26
Screw, 10-24 x 0.50 in. Phillips® hex Crimptite®	4	X-6216-1
Breaker, 4.0 amp circuit (Kits PA-292857 & PA-292857-SD)	1	X-796-1
Breaker, 4.5 amp circuit (Kits PA-292858 & PA-292858-SD)	1	X-796-2
Breaker, 3.5 amp circuit (Kits PA-292859 & PA-292859-SD)	1	X-796-3
Breaker, 3.0 amp circuit (Kits PA-292860 & PA-292860-SD)	1	X-796-4
Breaker, 5.0 amp circuit (Kits PA-292861 & PA-292861-SD)	1	X-796-6
Decal, safeguard breaker	1	293667
Harness, wiring	1	293711
Box, safeguard mounting	1	293721