



# Spectra Series™ Power Panelboards

## Bolt-On Circuit Breaker Kits



**WARNING:** Danger of electrical shock or injury. Turn OFF power ahead of the panelboard or switchboard before working inside the equipment or removing any component. Do not remove circuit protective devices or any other component until the power is turned OFF.

### General

These instructions apply to the following catalog numbers:

- Bolt-on circuit breaker kits AMCB6FJ, AMCB3FJ, AMCB2FJ, and AMCB4FJ
- Circuit breaker types SFH, SFL, SFP, TF, and TH
- Circuit breaker cover kits AFP3SFS, AFP3SFD, AFP3TFS, and AFP3TFD

Table 1 lists the parts included in the bolt-on circuit breaker kits for main and single-branch configurations. Table 2 lists the parts included in the kits for double-branch configurations. The replacement hardware kit has catalog number AHKBF1.

### Installation

Numbers in brackets in the following instructions and figures refer to the Item numbers in Tables 1 and 2.

**1. Install the circuit breaker straps.** Before installing into Spectra APNB bolt-on-style interiors, locate the side of the panel interior at which the dimension from the nearest vertical bus face to the inner face of the bus support rail is 2.75 inches, as illustrated in Figures 2 and 5. Mount the straps on this side of the vertical bus.

**a. Main and single-branch breakers.** Install the circuit breaker straps beginning with the outermost poles, as shown in Figures 1 and 3. Slide an antiturn clip [16] over the square shank of a carriage bolt [2]. Insert the carriage bolt assembly into the front square hole so that the pin rests on top of the vertical bus.

For a right-hand cable connection, align the square hole in the strap [1] with the carriage bolt [2] and slide it against the vertical bus, so that the pin on the antiturn clip [16] is inserted into the small hole on the strap, as shown in Figure 1.

For a left-hand cable connection, position the strap [1] and the spacer [17] so that the square hole and hole above are aligned, then insert the carriage bolt [2] and antiturn clip [16] so that the pin of the clip is inserted into the small hole in the strap and spacer, as shown in Figure 3.

| Item | Description   | Qty. |
|------|---|------|
| 1    | A pole strap  | 1    |
| 2    | 1/4-20 x 1.50 carriage bolt<br>1/4-20 x 1.00 carriage bolt* | 6    |
| 3    | 1/4" Belleville washer                                      | 6    |
| 4    | 1/4-20 nut  | 6    |
| 5    | B pole strap  | 1    |
| 6    | C pole strap  | 1    |
| 7    | Breaker mounting bracket                                    | 1    |
| 8    | Breaker mounting bracket                                    | 1    |
| 9    | Thread-forming screw  | 4    |
| 10   | 1/4-20 x 3/4" machine screw                                 | 3    |
| 11   | 1/4" Belleville washer                                      | 3    |
| 12   | #10-32 x 3 3/4" machine screw                               | 2    |
| 13   | #10 flat washer   | 2    |
| 14   | #10-32 x 1/2" machine screw                                 | 2    |
| 15   | #10 lock washer   | 2    |
| 16   | Antiturn clip   | 6    |
| 17   | Strap spacer  | 3    |

\* Use with single breaker straps connected to a vertical bus rated at 600 A or less.

Table 1. Bolt-on breaker kit parts for main and single-branch configurations.

| Item | Description   | Qty. |
|------|---|------|
| 18   | A & C pole outer strap                                      | 2    |
| 19   | A & C pole inner strap                                      | 2    |
| 20   | 1/4-20 x 1.50 carriage bolt<br>1/4-20 x 1.00 carriage bolt* | 3    |
| 21   | 1/4" Belleville washer                                      | 3    |
| 22   | 1/4-20 nut  | 3    |
| 23   | B pole strap  | 2    |
| 24   | Breaker mounting bracket                                    | 2    |
| 25   | Thread-forming screw  | 4    |
| 26   | 1/4-20 x 3/4" machine screw                                 | 6    |
| 27   | 1/4" Belleville washer                                      | 6    |
| 28   | #10-32 x 3 3/4" machine screw                               | 4    |
| 29   | #10 flat washer   | 4    |
| 30   | Antiturn clip   | 3    |

\* Use with single breaker straps connected to a vertical bus rated at 600 A or less.

Table 2. Bolt-on breaker kit parts for double-branch configurations.

Secure the complete strap assembly to the vertical bus with the Belleville washer [3] and nut [4]. Leave the connection finger tight at this time. Repeat the process on the center-pole strap [5] and then install the last strap [6], as shown in Figure 1 or Figure 3.

**b. Double-branch breakers.** Install the circuit breaker straps beginning with the outermost poles, as shown in Figures 4 and 5. Slide an antiturn clip [30] over the square shank of a carriage bolt [20]. Insert the carriage bolt assembly into the front square hole so that the pin rests on top of the vertical bus.

Align the square hole in the straps [18 & 19] with the carriage bolt [20] and slide it against the vertical bus, so that the pin on the antiturn clip [30] is inserted into the small hole on the strap, as shown in Figures 4 and 5.

Secure the complete strap assembly to the vertical bus with the Belleville washer [21] and nut [22]. Leave the connection finger tight at this time. Repeat the process on the center-pole straps [23] and then install the last straps [18 & 19], as shown in Figures 4 and Figure 5.

**2. Install the circuit breaker mounting brackets and cover supports.**

**a. Main and single-branch breakers.** Fasten the breaker mounting bracket [7] to the panel side rail with thread-forming screws [9]. Attach a cover support (included in the breaker cover kit) to the threaded holes in the mounting bracket with the #10-32 x 1/2" machine screws [14] and lock washers [15] tightened to 18 in-lb.

Attach the breaker mounting bracket [8] to the opposite side rail with thread-forming screws [9] tightened to 30 in-lb. With the mounting tabs on a cover support oriented outward, slide the lowest slot on the support onto the breaker mounting bracket until it snaps into place, as illustrated in Figure 6.

The cover support can be easily removed by inserting a screwdriver into the mounting slot on the underside of the mounting bracket assembly and gently prying downward, while pushing the cover support off, as illustrated in Figure 7.

**b. Double-branch breakers.** Attach the breaker mounting brackets [24] to the panel side rails with thread-forming screws [25], tightened to 30 in-lb. With the mounting tabs on the cover supports oriented inward, slide the lowest slot on the supports onto the breaker mounting brackets until they snap into place.

Cover supports can be easily removed by inserting a screwdriver into the mounting slot on the underside of the mounting bracket assembly and gently prying downward, while pushing the cover support off.

**3. Install the circuit breakers.**

**a. Main and single-branch breakers.** For main breaker operation, mount the device such that the load- or OFF-side terminals rest on the straps and the mounting bracket supports the opposite end of the breaker housing. For single-branch operation, position the circuit breaker such that the line- or ON-side terminals rest on the straps and the opposite side is supported by the mounting bracket.

Align the holes in the circuit breaker housing with the corresponding holes in the mounting bracket. Secure the breaker to the bracket with the #10-32 x 3/4" machine screws [12] and flat washers [13], tightened to 30 in-lb. Attach the circuit breaker terminals to the threaded holes in the straps using the 1/4-20 x 3/4" machine screws [10] and Belleville washers [11]. Tighten each terminal connection to 50 in-lb.

**NOTE:** Straps may require minor adjustments for proper hole alignment.

**b. Double-branch breakers.** Position each circuit breaker such that the line- or ON-side terminals rest on the straps and the opposite side is supported by the mounting bracket. Align the holes in each circuit breaker housing with the corresponding holes in the mounting bracket. Fasten the breakers to the brackets with the #10-32 x 3/4" machine screws [28] and flat washers [29], tightened to 30 in-lb. Attach the line-side circuit breaker terminals to the threaded holes in the straps using the 1/4-20 x 3/4" machine screws [26] and Belleville washers [27]. Tighten the line-side screws to 50 in-lb.

**NOTE:** Straps may require minor adjustments for proper hole alignment.

**4. Tighten the bolted connections.** Tighten the bolted strap connections at the main to 65 in-lb. It may be necessary to remove the adjacent circuit breaker to allow access to the bolted connections at the vertical bus.

**5. Two-pole configurations.** For phase-balancing purposes, single-phase panels, and dc applications, see Table 3 for the two-pole breaker mounting configurations available with the listed strap kits.

| Strap Kit Catalog No. | A-Phase Location | B-Phase Location | C-Phase Location |
|-----------------------|------------------|------------------|------------------|
| AMCB4FJ               | X                | X                |                  |
|                       | X*               |                  | X*               |
|                       |                  | X                | X                |
| AMCB2FJ               | X                | X                |                  |
|                       | X*               |                  | X*               |
|                       |                  | X                | X                |

\* Use for single-phase panels and dc applications.

Table 3. Possible phase connection combinations with strap kits.

**6. Tape unused contacts.** Apply multiple wrappings of insulation to unused strap contact surfaces, as illustrated in Figure 8. A UL-recognized 105° C thermoplastic tape (OANZ2, Permacel P-30-105, or 3M 66R) is required. Overlap greater than one-half of each preceding turn, as shown, to achieve a minimum tape thickness of 0.028 inch. This insulation thickness requires two complete layers of overlapping turns.

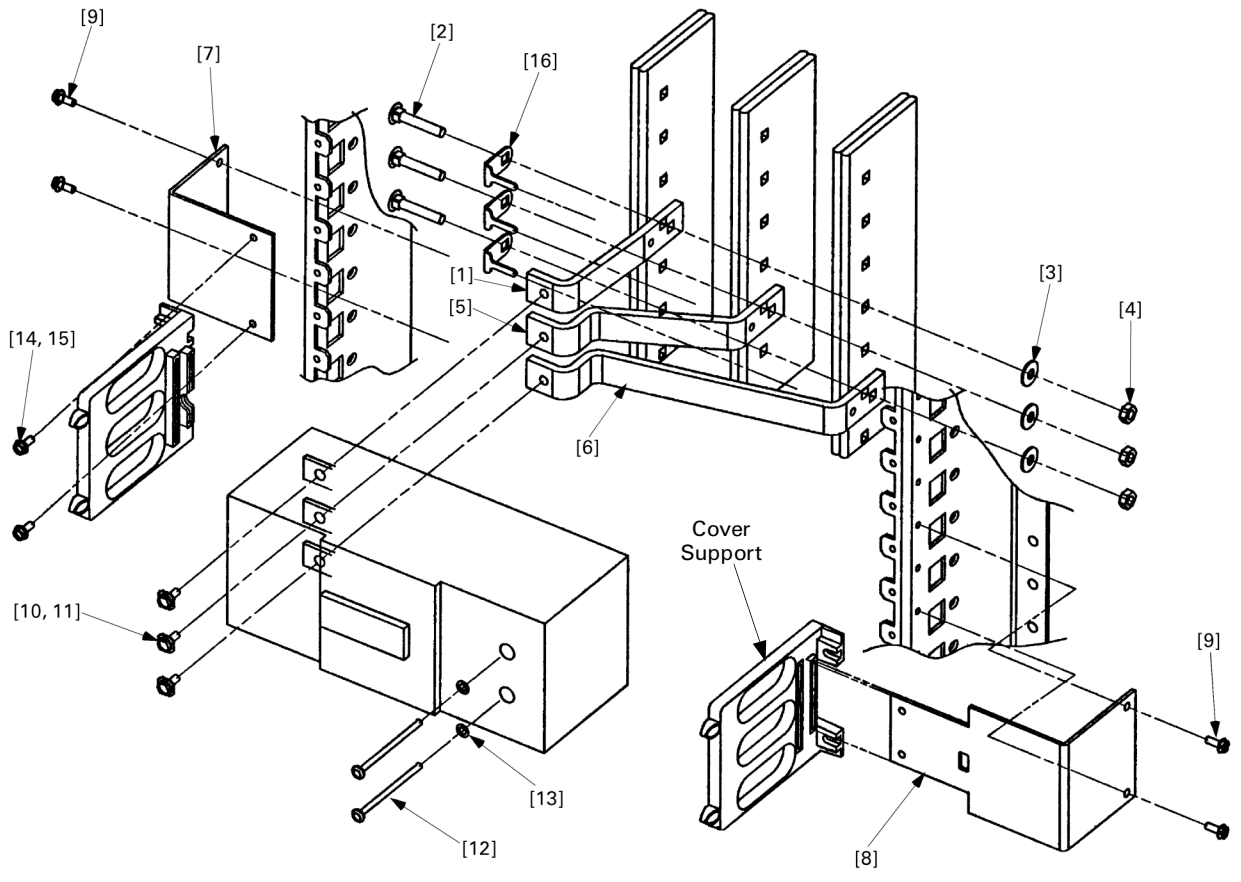


Figure 1. Single bolt-on circuit breaker assembly, exploded view.

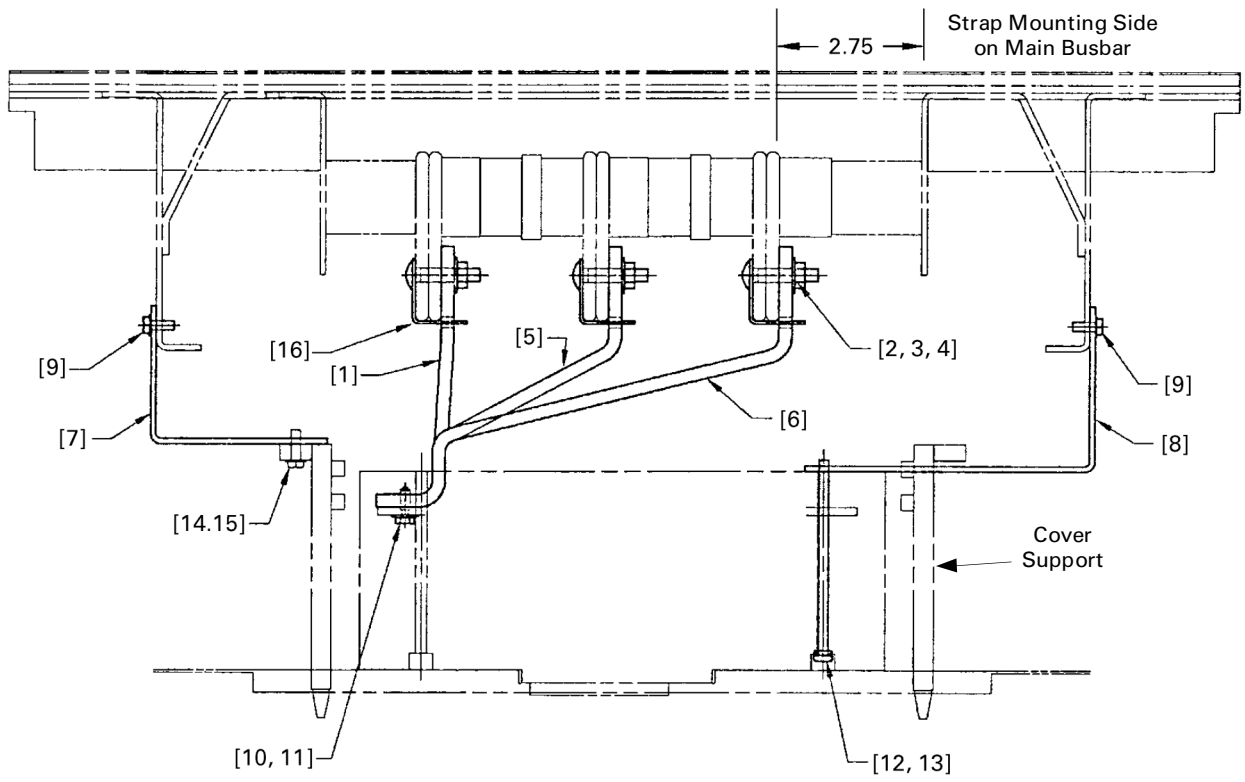


Figure 2. Single bolt-on circuit breaker assembly, end view.

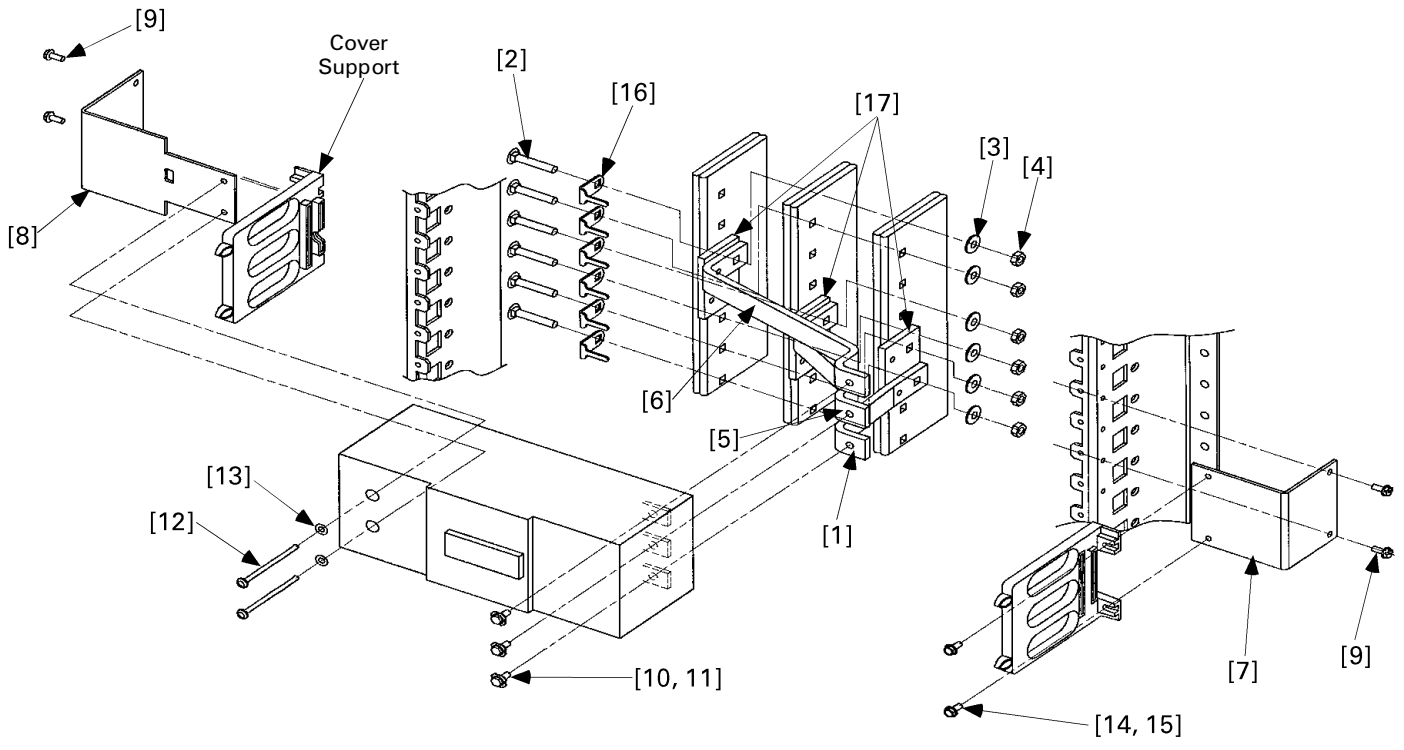


Figure 3. Single bolt-on circuit breaker assembly with spacers.

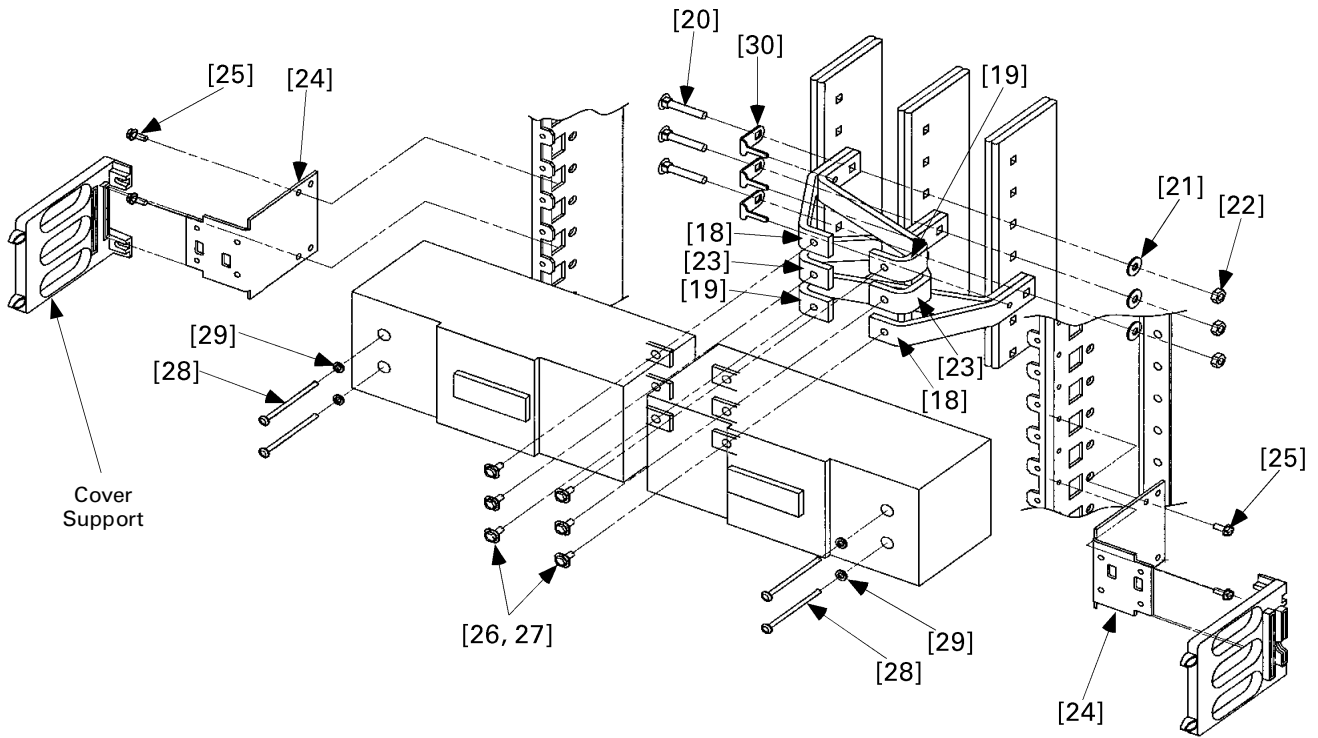


Figure 4. Double bolt-on circuit breaker assembly, exploded view.

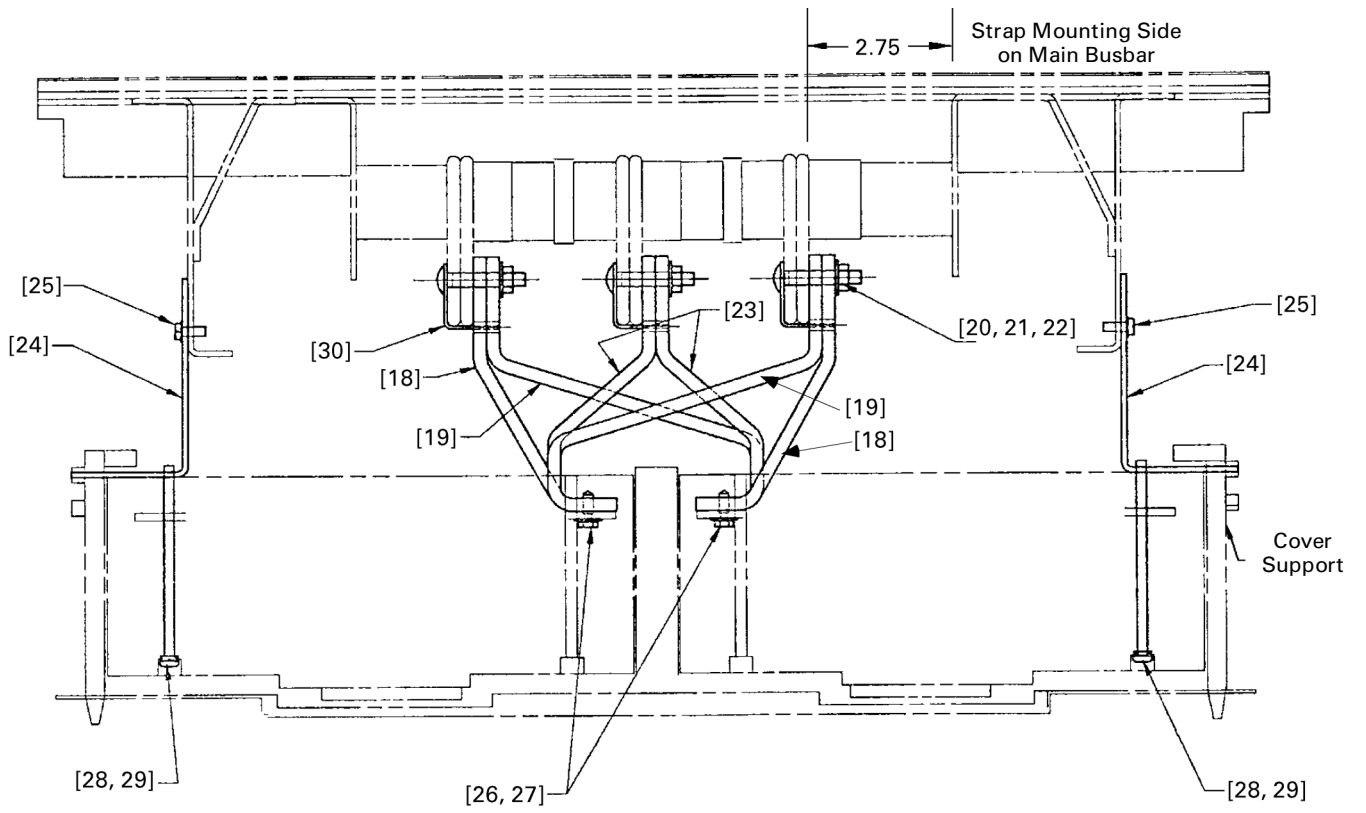


Figure 5. Double bolt-on circuit breaker assembly, end view.

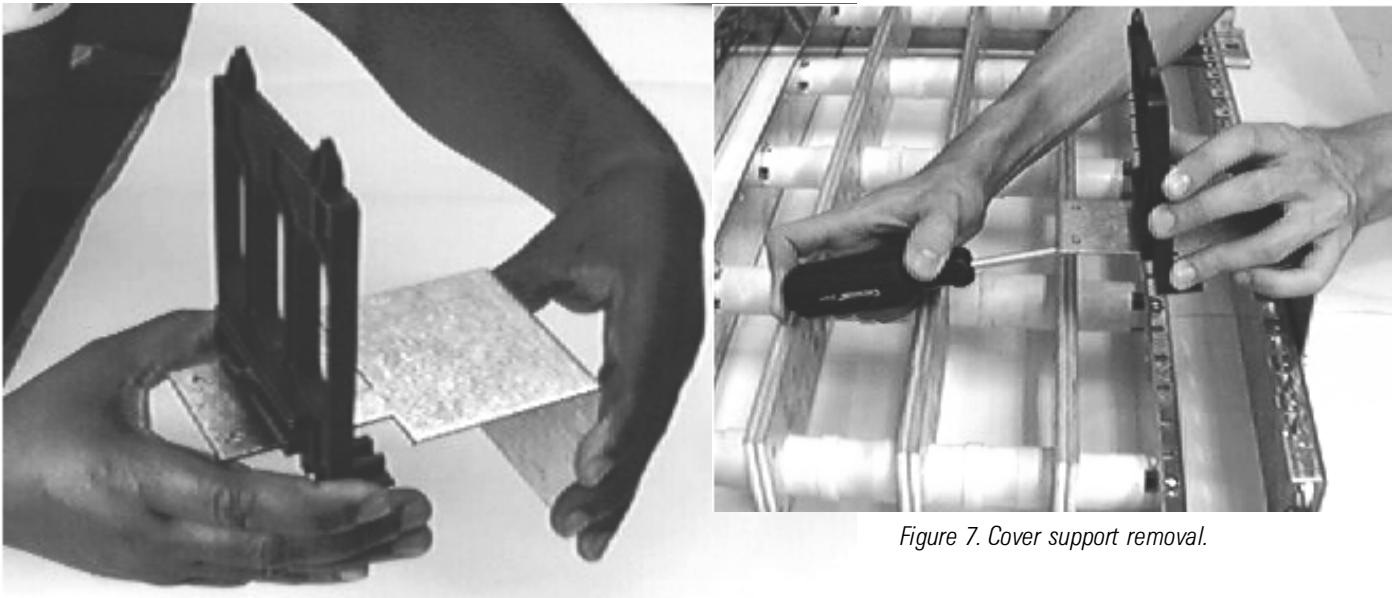


Figure 6. Cover support assembly.

Figure 7. Cover support removal.



*Figure 8. Applying insulating tape to unused strap contact surfaces.*

These instructions do not cover all details or variations in equipment nor do they provide for every possible contingency that may be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise that are not covered sufficiently for the purchaser's purposes, the matter should be referred to the GE Company.



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