Instructions for Drilling and Assembling Vari-Depth™ Handle Mechanism for J and K-Frame Series C Circuit Breakers, Molded Case Switches, and Motor Circuit Protectors (HMCP)

WARNING

DO NOT ATTEMPT TO INSTALL OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. DEATH, SEVERE PERSONAL INJURY, OR SUBSTANTIAL PROPERTY DAMAGE CAN RESULT FROM CONTACT WITH ENERGIZED EQUIPMENT. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT BEFORE PROCEEDING WITH THE TASK, AND ALWAYS FOLLOW GENERALLY ACCEPTED SAFETY PROCEDURES.

CUTLER-HAMMER IS NOT LIABLE FOR THE MISAPPLICATION OR MISINSTALLATION OF ITS PRODUCTS.

The user is cautioned to observe all recommendations, warnings, and cautions relating to the safety of personnel and equipment as well as all general and local health and safety laws, codes, and procedures.

The recommendations and information contained herein are based on Cutler-Hammer experience and judgement, but should not be considered to be all-inclusive or covering every application or circumstance which may arise. If any questions arise, contact Cutler-Hammer for further information or instructions.

Fig. 1-1 Vari-Depth Handle Mechanism (K-Frame Series C Circuit Breaker Shown)

1. INTRODUCTION

General Information

The vari-depth handle mechanism (Fig. 1-1) provides a means of externally operating the circuit breaker and can be applied to enclosures of varying depths. The handle can be used with NEMA 1, 3R, 4, 7, 9, and 12 enclosure applications, depending on the accessory components selected. An operating handle, shaft, and mechanism are required for standard application. Two variable depth shafts are available for use with the wide range of depths of various enclosures. Mechanisms with the internal lockoff device will accept up to three padlock shackles, each with a maximum diameter of .375 inch (9.52 mm). For this publication, the term circuit breaker shall also include the molded case switch and motor circuit protector (MCP).

J-Frame Style Numbers
5092A62G03
5092A62G04 (With Internal Lockoff)

K-Frame Style Numbers
5092A62G01
5092A62G02 (With Internal Lockoff)

2. INSTALLATION

The installation procedure consists of: drilling and modifying customer enclosure; installing circuit breaker and operating assembly; assembling the shaft to the operating assembly, and handle assembly to the enclosure cover; testing function of installed handle mechanism. To install the handle mechanism, perform the following steps.

WARNING

WHEN INSTALLING A NEW HANDLE MECHANISM, OR A NEW CIRCUIT BREAKER AND HANDLE MECHANISM IN AN EXISTING ELECTRICAL SYSTEM, MAKE SURE THERE IS NO VOLTAGE PRESENT WHERE WORK IS TO BE PERFORMED. SPECIAL ATTENTION SHOULD BE PAID TO REVERSE FEED APPLICATIONS TO ENSURE NO VOLTAGE IS PRESENT. THE VOLTAGES IN ENERGIZED EQUIPMENT CAN CAUSE DEATH OR SEVERE PERSONAL INJURY.

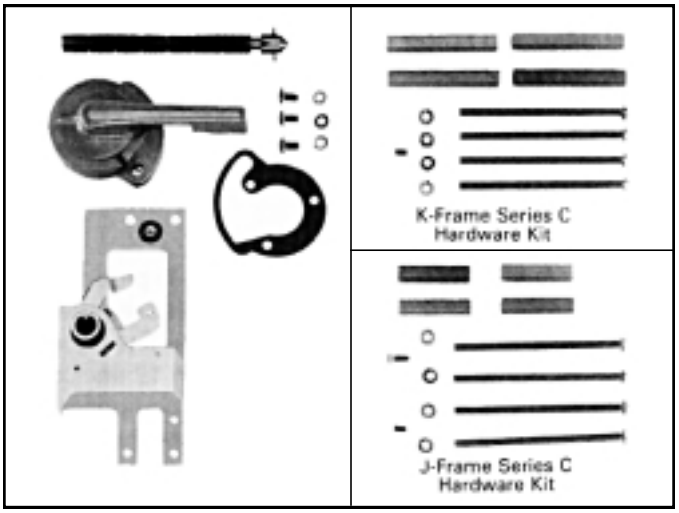


Fig. 2-1 Handle Mechanism Components

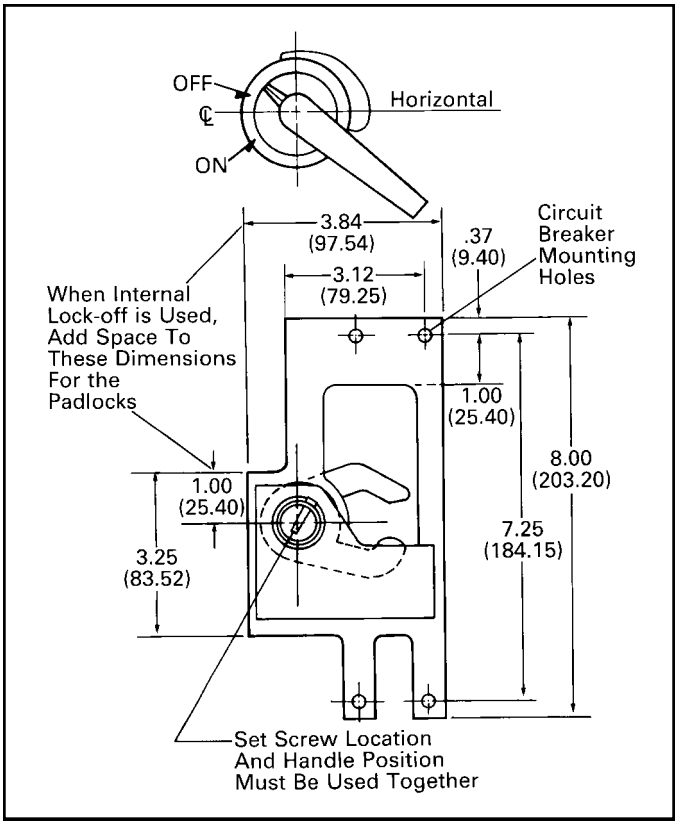


Fig. 2-2 Diagonal Handle Position, J-Frame Series C Circuit Breaker

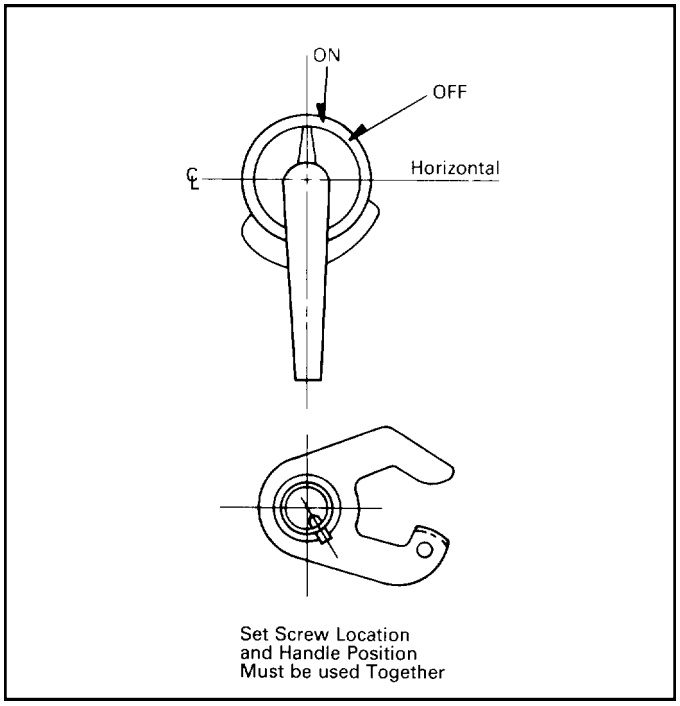


Fig. 2-3 Vertical Handle Position, J-Frame Series C Circuit Breaker

2-1. Inspect the handle mechanism for completeness. (See Fig. 2-1.)

Note: Determine position for circuit breaker in enclosure. (For J-frame Series C circuit breakers, refer to the drilling plans and dimensions provided in Figs. 2-2, 2-3, 2-4, and Tables 2-1 and 2-2. For K-frame Series C circuit breakers, refer to Figs. 2-5, 2-6, 2-7, and Tables 2-3 and 2-4.)

2-2. Drill and tap circuit breaker mounting holes in enclosure mounting surface.

2-3. Press Push-to-Trip button and trip circuit breaker.

2-4. Secure mechanism operating assembly together with tubular spacers and circuit breaker to mounting surface using hardware supplied with handle mechanism kit (Fig. 2-8). Line up cam and circuit breaker handle so that handle is between upper and lower horns of cam.

2-5. Determine shaft length required for enclosure (Fig. 2-9) and cut to correct length.

Note: Before securing shaft with set screw in operating assembly, shaft may be used to center punch cover as shown in Fig. 2-10.

2-6. Drill shaft and handle attachment holes in enclosure cover. (Refer to Fig. 2-4 or 2-7.)

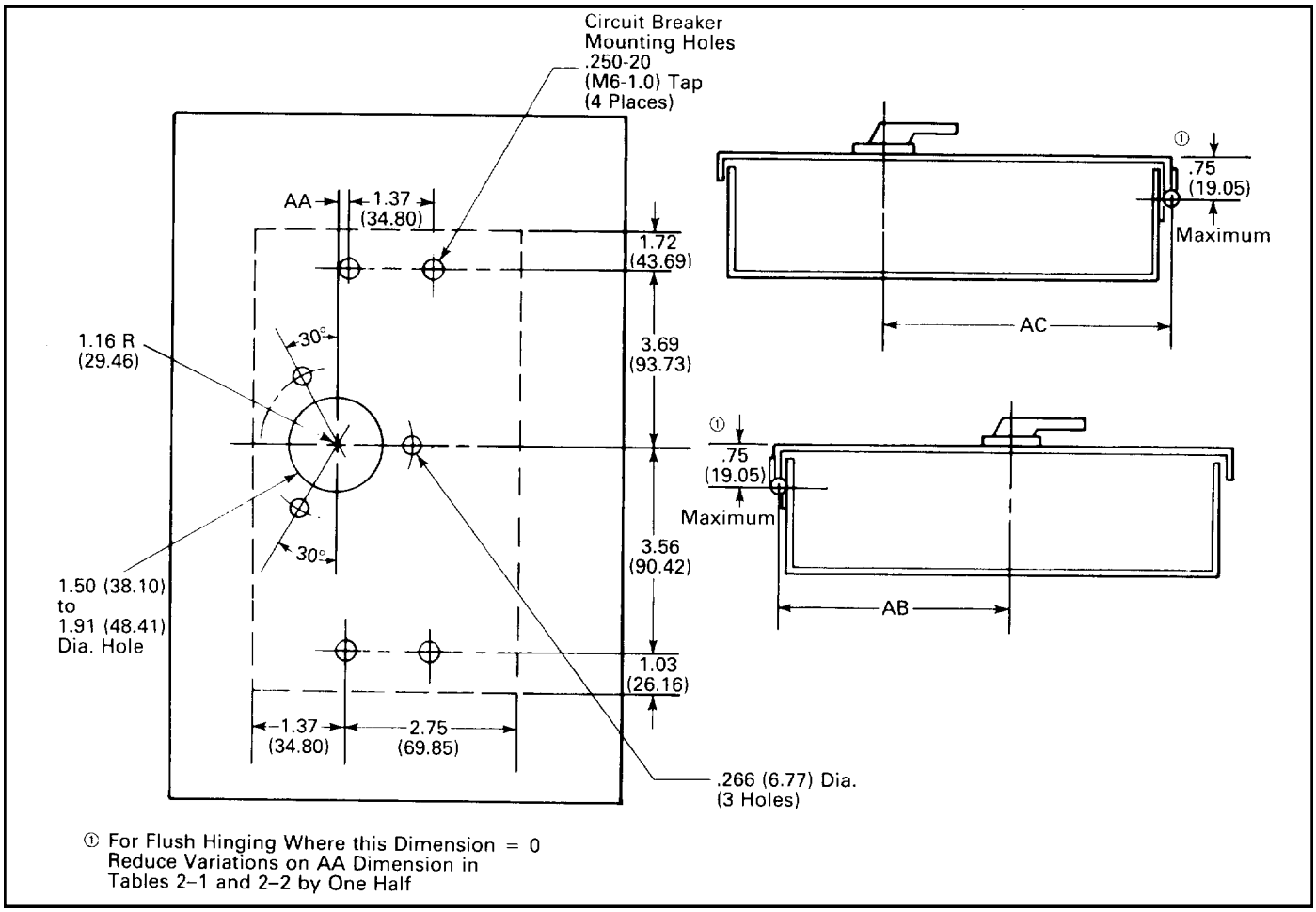


Fig. 2-4 Enclosure Drilling Plan, J-Frame Series C Circuit Breaker

Table 2-1. Enclosure/Handle Assembly Location Dimensions J-Frame Series C Circuit Breakers For Use With Diagonal Handle Position Only①②③

Dim. AB	AA	Dim. AC	AA
10 (254.00) or more	1.16 (29.46)	10 (254.00) or more	1.16 (29.46)
8 (203.20) to 10 (254.00)	1.12 (28.45)	8 (203.20) to 10 (254.00)	1.19 (30.23)
7 (177.80) to 8 (203.20)	1.09 (27.69)	7 (177.80) to 8 (203.20)	1.22 (30.99)
6 (152.40) to 7 (177.80)	1.06 (26.92)	6 (152.40) to 7 (177.80)	1.25 (31.75)
5 (127.00) to 6 (152.40)	1.03 (26.16)	5 (127.00) to 6 (152.40)	1.28 (32.51)

① Refer to Fig. 2-4 to apply the dimensions in this table.
② Dimensions are shown in inches, with millimeters in parenthesis.
③ Where cabinet hinging produces a difficult handle/shaft engagement angle, dimension variations are given to permit easier engagement when closing the cabinet door. Avoid maximum variations where possible.

Table 2-2. Enclosure/Handle Assembly Location Dimensions J-Frame Series C Circuit Breakers For Use With Vertical Handle Position Only (Fig. 2-3)①②③

Dim. AB	AA	Dim. AC	AA
24 (609.60) or more	1.16 (29.46)	8 (203.20) or more	1.16 (29.46)
18 (457.20) to 24 (609.60)	1.12 (28.45)	6 (152.40) to 8 (203.20)	1.22 (30.99)
12 (304.80) to 18 (457.20)	1.09 (27.69)	5 (127.00) to 6 (152.40)	1.25 (31.75)
8 (203.20) to 12 (304.80)	1.06 (26.92)		
6 (152.40) to 8 (203.20)	1.03 (26.16)		

① Refer to Fig. 2-4 to apply the dimensions in this table.
② Dimensions are shown in inches, with millimeters in parenthesis.
③ Where cabinet hinging produces a difficult handle/shaft engagement angle, dimension variations are given to permit easier engagement when closing the cabinet door. Avoid maximum variations where possible.

Table 2-3. Enclosure/Handle Assembly Location Dimensions For K-Frame Series C Circuit Breakers For Use With Horizontal Handle Position Only (Fig. 2-5)①②③

Dim. AB	AA	Dim. AC	AA
10 (254.00) or more	0.98 (24.89)	10 (254.00) or more	0.98 (24.89)
8 (203.20) to 10 (254.00)	0.95 (24.13)	8 (203.20) to 10 (254.00)	1.02 (25.91)
7 (177.80) to 8 (203.20)	0.92 (23.37)	7 (177.80) to 8 (203.20)	1.05 (26.67)
6 (152.40) to 7 (177.80)	0.89 (22.61)	6 (152.40) to 7 (177.80)	1.08 (27.43)
5 (127.00) to 6 (152.40)	0.86 (21.84)	5 (127.00) to 6 (152.40)	1.11 (28.19)

① Refer to Fig. 2-7 to apply the dimensions in this table.
② Dimensions are shown in inches, with millimeters in parenthesis.
③ Where cabinet hinging produces a difficult handle/shaft engagement angle, dimension variations are given to permit easier engagement when closing the cabinet door. Avoid maximum variations where possible.

Table 2-4. Enclosure/Handle Assembly Location Dimensions For K-Frame Series C Circuit Breakers For Use With Diagonal Handle Position Only (Fig. 2-6)①②③

Dim. AB	AA	Dim. AC	AA
24 (609.60) or more	0.98 (24.89)	8 (203.20) or more	0.98 (24.89)
18 (457.20) to 24 (609.60)	0.95 (24.13)	6 (152.40) to 8 (203.20)	1.05 (26.67)
12 (304.80) to 18 (457.20)	0.92 (23.37)	5 (127.00) to 6 (152.40)	1.08 (27.43)
8 (203.20) to 12 (304.80)	0.89 (22.61)		
6 (152.40) to 8 (203.20)	0.86 (21.84)		

① Refer to Fig. 2-7 to apply the dimensions in this table.
② Dimensions are shown in inches, with millimeters in parenthesis.
③ Where cabinet hinging produces a difficult handle/shaft engagement angle, dimension variations are given to permit easier engagement when closing the cabinet door. Avoid maximum variations where possible.

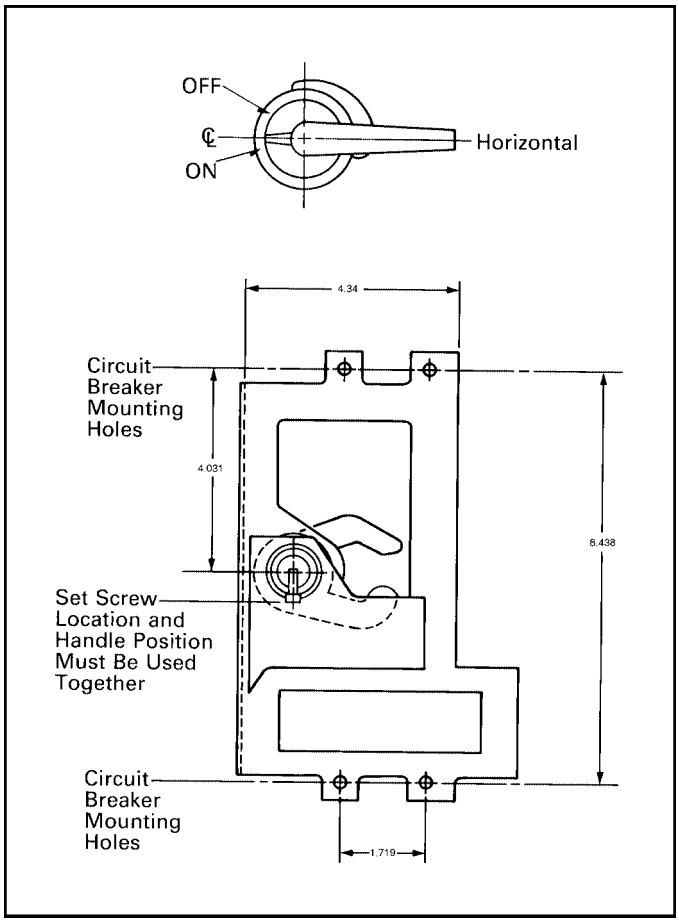


Fig. 2-5 Horizontal Handle Position, K-Frame Series C Circuit Breaker

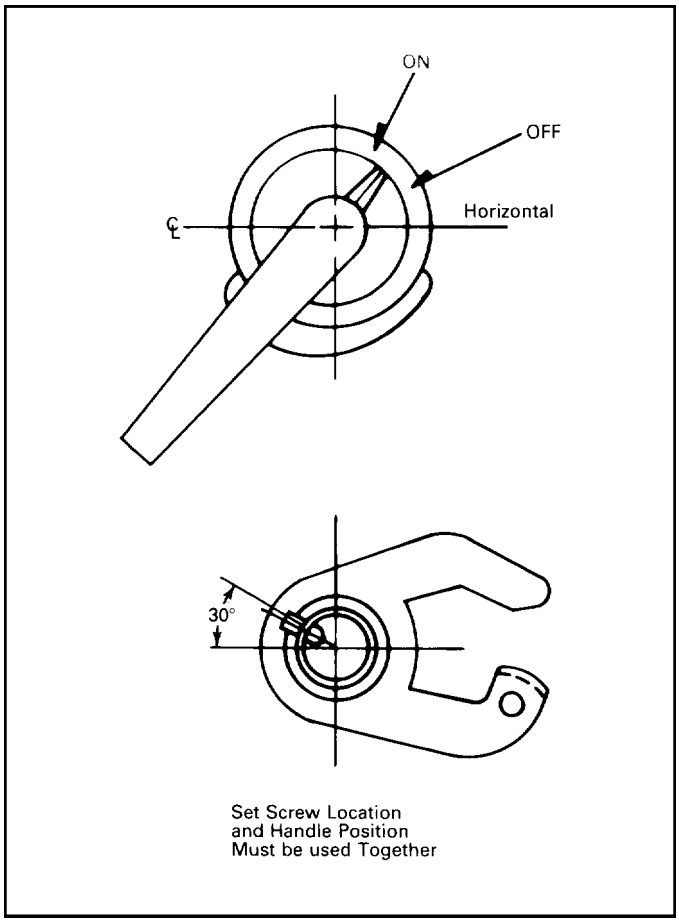


Fig. 2-6 Diagonal Handle Position, K-Frame Series C Circuit Breaker

2-7. Screw shaft into handle operating assembly. Set AD as shown in Fig. 2-9 and lock shaft with special set screw provided and a commercially available thread locking adhesive. (Refer to Figs. 2-2, 2-3, 2-5, or 2-6 to determine correct shaft position.)

2-8. Secure handle assembly to cover using three screws (Fig 2-8) provided in kit. (Refer to Figs. 2-2, 2-3, 2-5, or 2-6 for correct position of handle.) For reference, overall handle dimensions for both frame sizes are shown in Fig. 2-11.

Note: The interlock defeat feature may be made inoperative by covering the screw driver slot in the hub with disk supplied with handle assembly. This should be done after the functional tests.

2-9. With power isolated from the circuit breaker, test function of installed handle mechanism in the following manner.

a. Line-up pins on shaft with recess in handle.

Note: If necessary, shaft should be adjusted (in or out) in one-turn increments to ensure that door opens and closes correctly and handle mechanism continues to switch circuit breaker.

b. Close enclosure door. Switch handle mechanism to ON.

c. Check that handle mechanism switches circuit breaker to ON position and that enclosure door cannot be opened.

d. Switch handle mechanism to OFF position.

e. Check that handle mechanism switches circuit breaker to OFF position and that enclosure door cannot be opened.

f. Turn handle to OPEN DOOR position and ensure door opens.

g. Close enclosure door. Switch handle mechanism/circuit breaker to ON.

h. Turn interlock defeater clockwise with a flat-blade screwdriver.

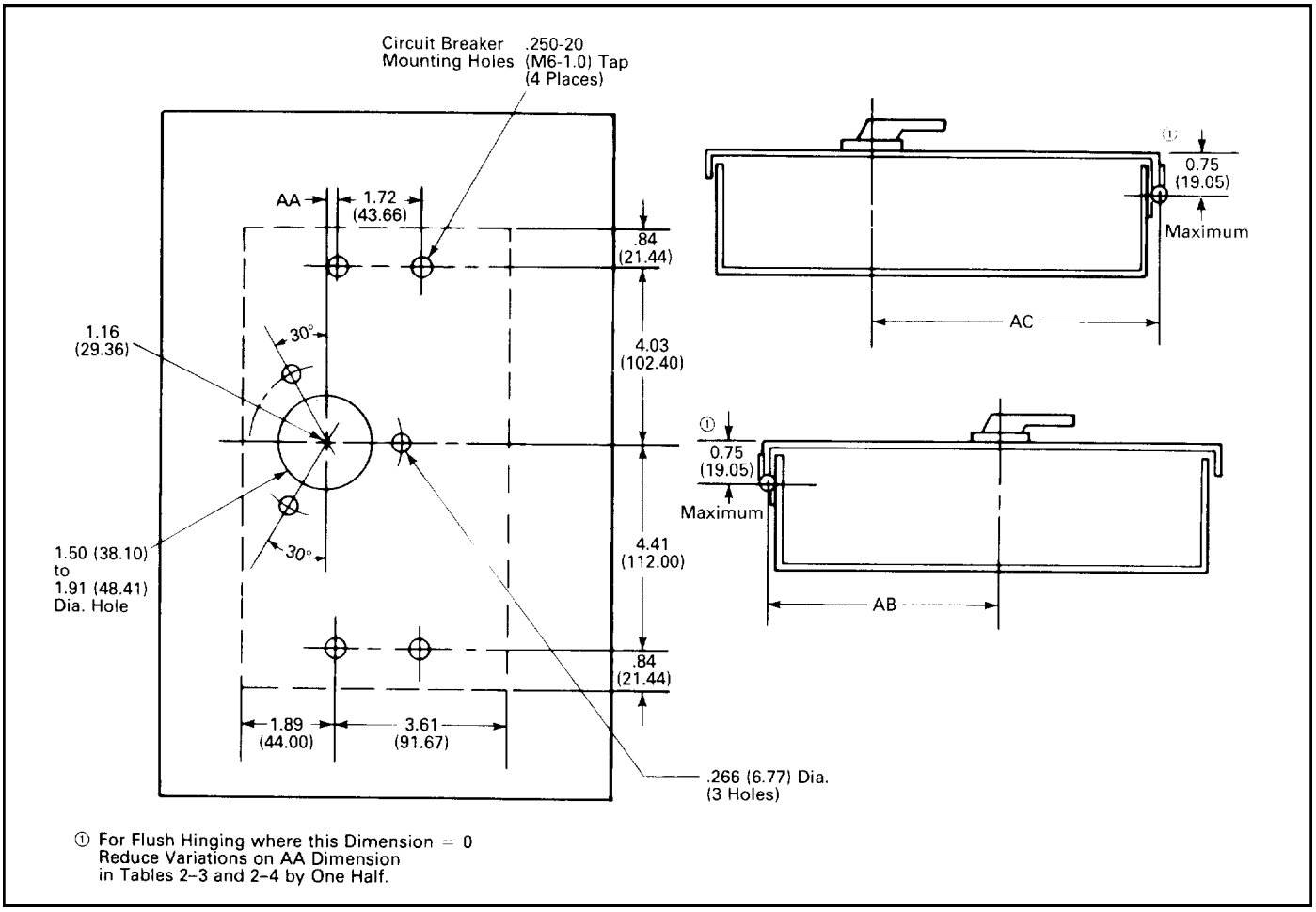


Fig. 2-7 Enclosure Drilling Plan, K-Frame Series C Circuit Breaker

i. Open enclosure door.

j. Press Push-to-Trip button in the circuit breaker trip unit with a small flat-blade screwdriver to trip circuit breaker.

k. Align handle assembly with shaft.

l. Close enclosure door.

m. Switch handle mechanism to OPEN COVER (RESET) position. Check that circuit breaker resets.

2-10. If required, make interlock defeater feature inoperative.

a. Remove three handle securing screws and handle from enclosure door. (See Fig. 2-8.).

b. Remove screw (Fig. 2-12a) securing the cover plate over the interlock latch.

c. Carefully lift off cover plate (Fig. 2-12a) so that the latch spring is not lost.

d. Lift out spring and interlock latch from handle hub. (See Fig. 2-12b.)

e. Position disc in the handle hub so that the screw driver slot in the interlock latch is covered. (See Fig. 2-12c.)

f. Re-position interlock latch and spring in handle hub.

g. Place cover plate in position and secure with screw.

h. Install handle in same position on enclosure door and secure with three screws provided.

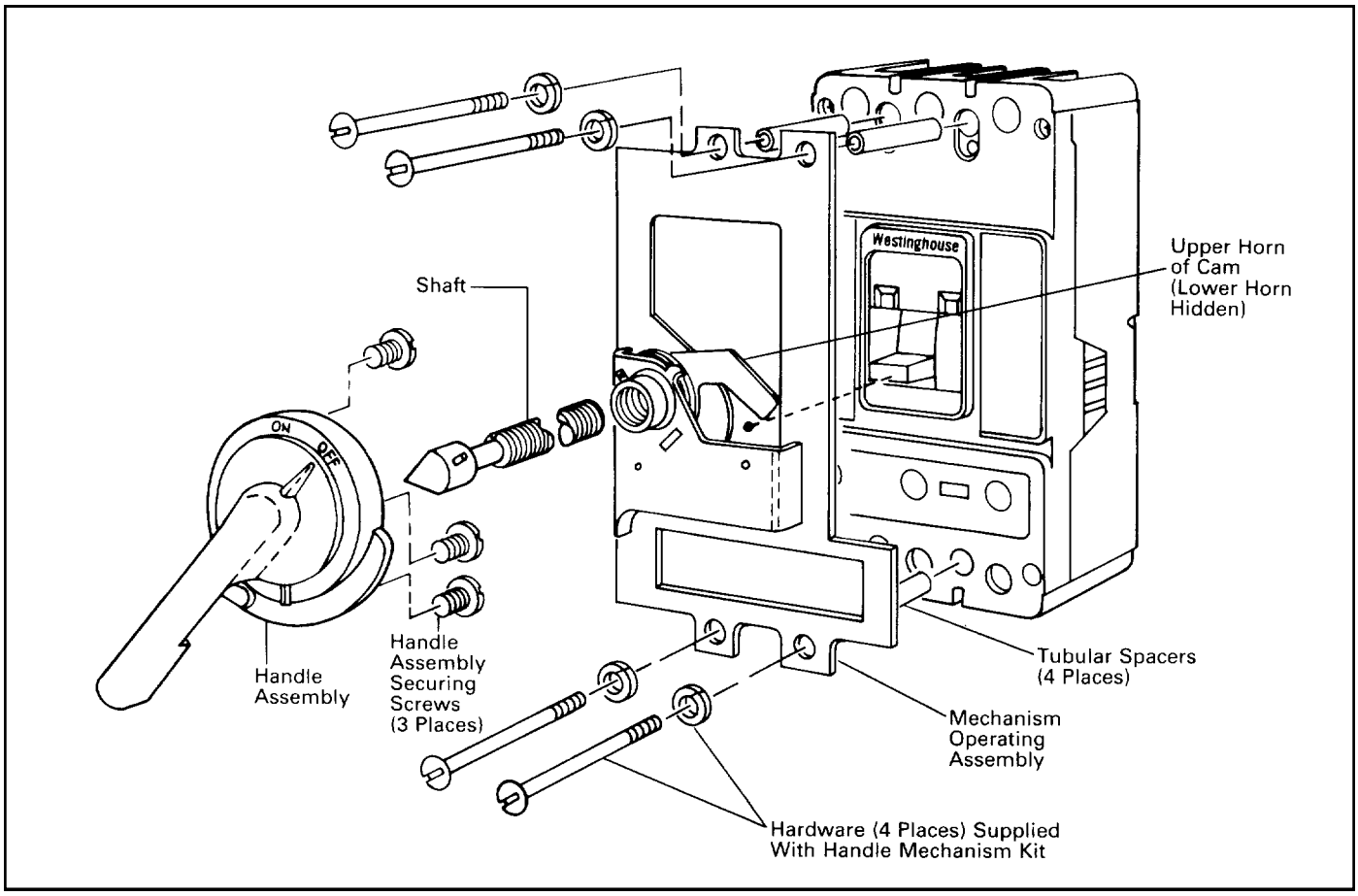
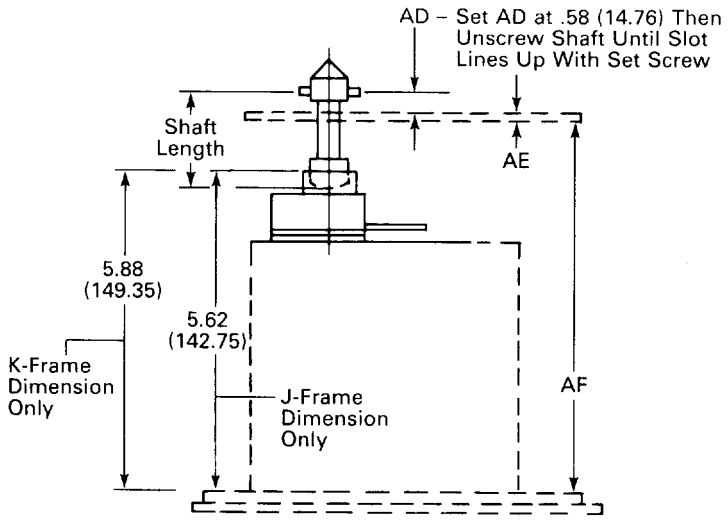
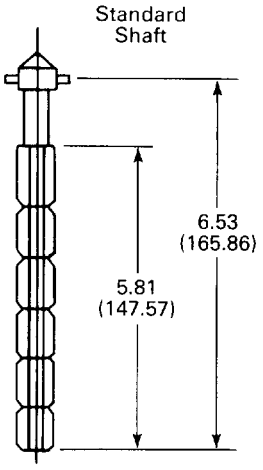


Fig. 2-8 Securing Circuit Breaker and Handle Mechanism to Mounting Surface (K-Frame Series C Circuit Breaker Shown)



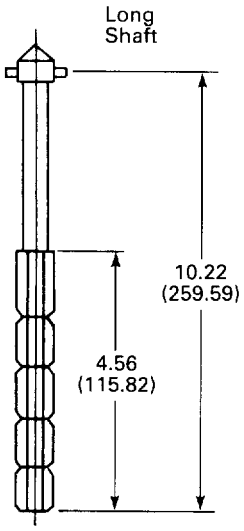
J-Frame Series C
Shaft Length = AE + AF – 4.30 (109.44)

K-Frame Series
Shaft Length = AE + AF – 4.56 (116.05)



J-Frame Series C
AF (Min.) = 5.81 (147.57)
AE + AF (Max) = 10.93 (277.62)

K-Frame Series C
AF (Min) = 6.06 (153.92)
AE + AF (Max) = 11.19 (284.23)



J-Frame Series C
AE + AF (Min) = 10.82 (274.83)
AE + AF (Max) = 14.62 (371.35)

K-Frame Series C
AE + AF (Min) = 11.08 (281.43)
AE + AF (Max) = 14.88 (377.95)

Note: Only Cut Shaft at Groove if Groove Corresponds with Calculated Measurement.

Fig. 2-9 Determining Shaft Length

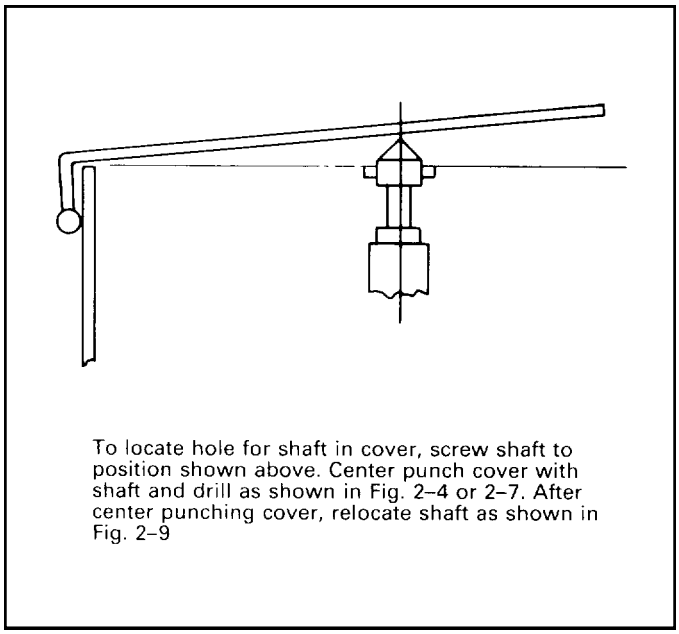


Fig. 2-10 Center Punch Cover Using Shaft

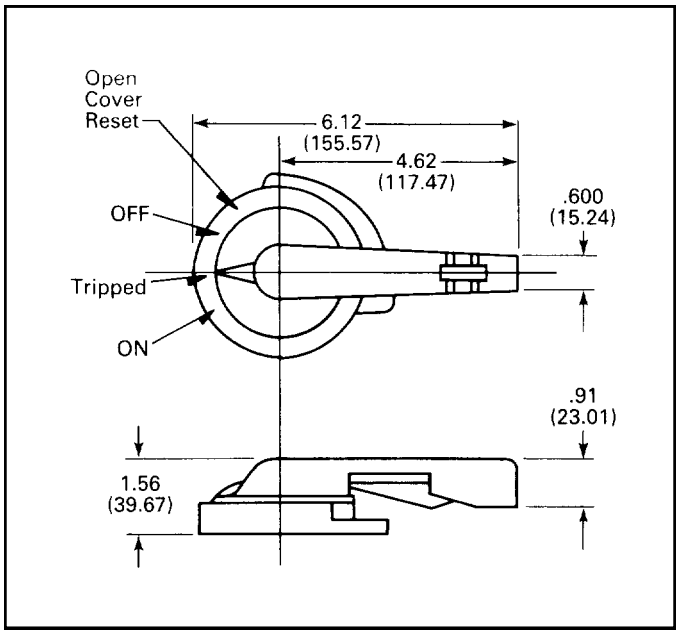


Fig. 2-11 Handle Assembly Dimensions

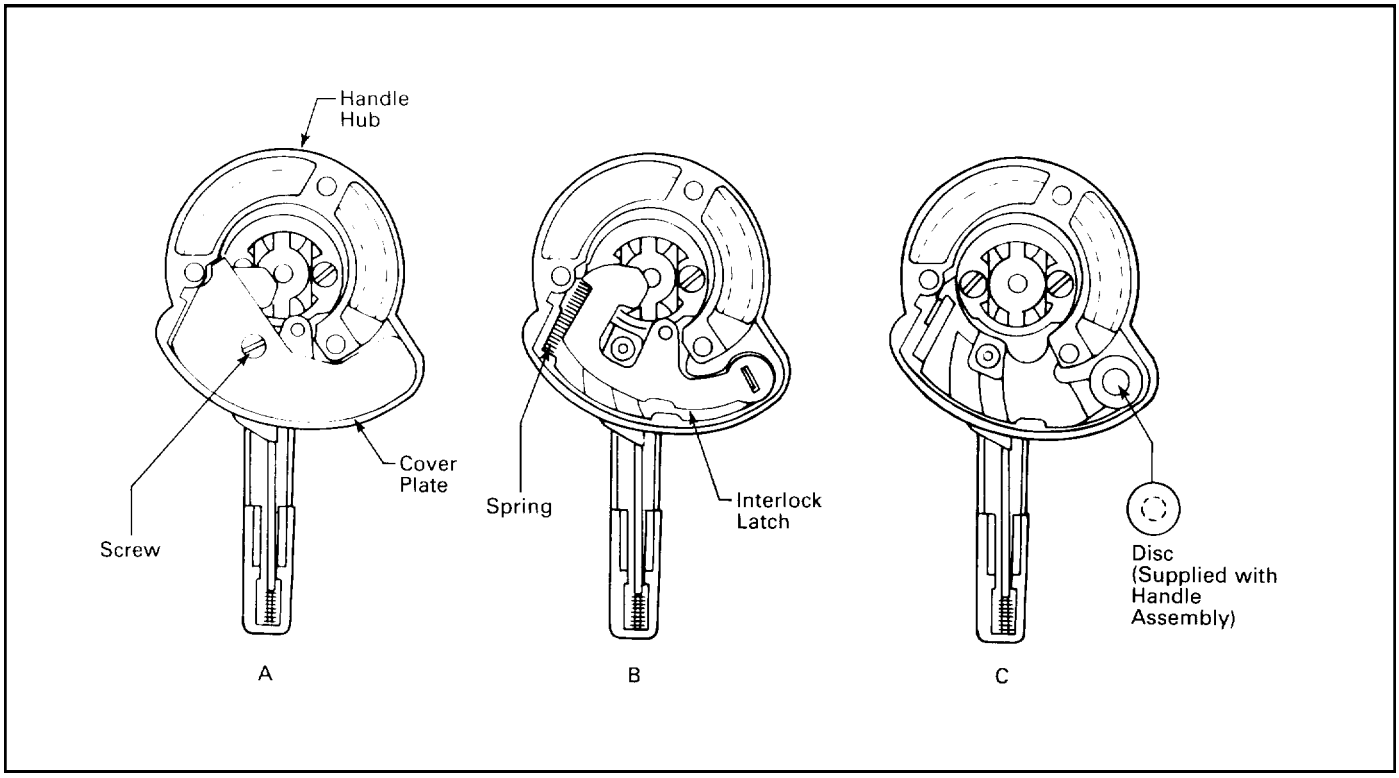


Fig. 2-12 Rendering Interlock Defeat Feature Inoperative

Cutler-Hammer

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