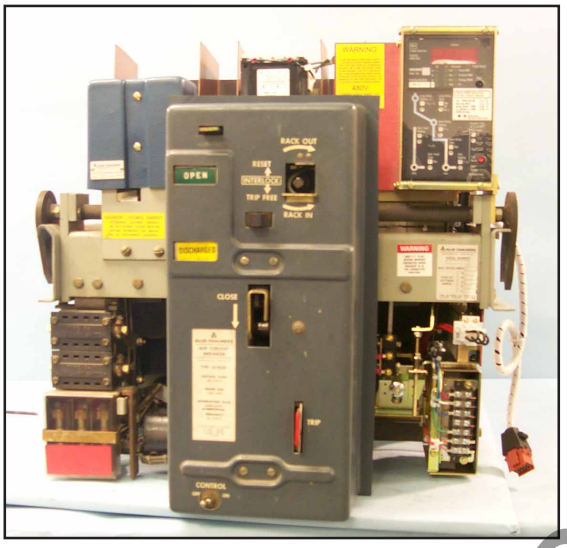
Digitrip Retrofit System for Allis-Chalmers LA-1600 F Fused Breakers



SAFETY PRECAUTIONS

⚠ WARNING

POWER CIRCUIT BREAKERS ARE EQUIPPED WITH HIGH SPEED, HIGH ENERGY OPERATING MECHANISMS. THE BREAKERS AND THEIR ENCLOSURES ARE DESIGNED WITH SEVERAL BUILT-IN INTERLOCKS AND SAFETY FEATURES INTENDED TO PROVIDE SAFE AND PROPER OPERATING SEQUENCES. TO PROVIDE MAXIMUM PROTECTION FOR PERSONNEL ASSOCIATED WITH THE INSTALLATION, OPERATION, AND MAINTENANCE OF THESE BREAKERS, THE FOLLOWING PRACTICES MUST BE FOLLOWED. FAILURE TO FOLLOW THESE PRACTICES MAY RESULT IN DEATH, PERSONAL INJURY, OR PROPERTY DAMAGE.

- Only qualified persons, as defined in the National Electric Code, who are familiar with the installation and maintenance of power circuit breakers and their associated switchgear assemblies should perform any work associated with these breakers.
- Completely read and understand all instructions before attempting any installation, operation, maintenance, or modification of these breakers.
- **Always turn off and lock out the power source feeding the breaker prior to attempting any installation, maintenance, or modification of the breaker. Do not use the circuit breaker as the sole means for isolating a high voltage circuit. Follow all lockout and tagging rules of the National Electric Code and all other applicable codes, regulations, and work rules.**
- Do not work on a closed breaker or a breaker with the closing springs charged. Trip (open) the breaker and be sure the stored energy springs are discharged before performing any work. The breaker may trip open or the charging springs may discharge, causing crushing or cutting injuries.
- For drawout breakers, trip (open), and then remove the breaker to a well-lit work area before beginning work.
- Do not perform any maintenance: including breaker charging, closing, tripping, or any other function which could cause significant movement of the breaker while it is on the extension rails. Doing so may cause the breaker to slip from the rails and fall, potentially causing severe personal injury to those in the vicinity.
- **Do not leave the breaker in an intermediate position in the switchgear cell. Always leave it in the connected, disconnected, or (optional) test position. Failure to do so could lead to improper positioning of the breaker and flashover, causing death, serious personal injury, and / or property damage.**
- **Do not defeat any safety interlock. Such interlocks are intended to protect personnel and equipment from damage due to flashover and exposed contacts. Defeating an interlock could lead to death, severe personal injury, and / or property damage.**

Digitrip Retrofit System for Allis-Chalmers LA-1600 F Fused Breakers

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INTRODUCTION

Cutler-Hammer Digitrip Retrofit Kits are available in a number of configurations that provide a wide range of features. The Digitrip System starts with the 510 Basic Kit which offers true RMS sensing, overcurrent protection, and self-testing features. Advanced Digitrip Retrofit Kits feature zone interlocking, digital alphanumeric displays, remote alarm signals, PowerNet communications, energy monitoring capabilities, power factors, and harmonic content measurements.

Table 1 provides a quick reference of the components supplied with each level of Retrofit Kit. Before beginning the Retrofit process, take a minute to review the information contained in Table 1. It is important that the Retrofitter understands which level of Retrofit Kit is to be installed and which components are included with the Kit.

The instructions contained in this manual cover the installation of all levels of Retrofit Kit. If the Kit you are installing does not contain a certain component, skip the instructions for that component and proceed to the next.

Throughout the Retrofit process, refer to the Torque Tables at the back of this manual for specific torque values.

If you have any questions concerning the Retrofit Kit and / or the Retrofit process, contact Cutler-Hammer at: 1-800-937-5487.

Table 1 Available Retrofit Kits

Components	510 Basic	510 with Zone Interlock	610	810	910
Trip Unit					
Rating Plug					
Auxiliary Current Transformer (CT) Module					
Auxiliary CT Harness					
Sensors					
Sensor Harness					
Direct Trip Actuator (DTA)					
Mounting Brackets and Hardware					
External Harness	Plug	1 Connector Harness	2 Connector Harness	4 Connector Harness	4 Connector Harness
Cell Harness					
Breaker Mounted Control Power Transformer (CPT)					
Potential Transformer (PT) Module					
Auxiliary Switch					

STEP 1: GENERAL BREAKER PREPARATION

Before attempting to remove the Breaker from the cell or perform any Retrofit Operation, be sure to read and understand the Safety Precautions section of this manual. In addition, be sure to read and understand the Instructions for the Application of Digitrip RMS Retrofit Kits on Power Circuit Breakers (Retrofit Application Data – Publication AD 33-855-2), supplied with the Digitrip Retrofit Kit.

⚠ WARNING

DO NOT ATTEMPT TO INSTALL OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. SEVERE PERSONAL INJURY OR DEATH CAN RESULT FROM CONTACT WITH ENERGIZED EQUIPMENT. VERIFY THAT NO VOLTAGE IS PRESENT BEFORE PROCEEDING.

A. Trip the Breaker and remove it from the Cell. Move the Breaker to a clean, well-lit work area.

NOTE: It is the responsibility of the Retrofitter to insure that the Breaker and all original components are in good condition. Visually inspect all Breaker components for signs of damage or wear. If any signs of damage or wear are detected for components not included in the Retrofit Kit, secure the necessary replacement parts before beginning the Retrofit Process.

The force necessary to trip the Breaker should not exceed three (3) lbs.

NOTE: It is the responsibility of the Retrofitter to insure that the proper, manufacturer's recommended crimping tools and terminals are used for each type of connector. It is also the responsibility of the Retrofitter to insure that all wire preparations, connections, strippings, terminations, and wiring techniques are performed according to the latest IEEE, NEC, and / or NEMA industry standards, specifications, codes, and guidelines.

To begin the Retrofit Process, refer to the components list at the end of this manual. Layout the components and hardware according to the steps outlined. The parts bags are labeled with the corresponding step number. The components and hardware will be used to complete each step in the Retrofit Process.

STEP 2: REMOVING THE ORIGINAL COMPONENTS

Fig. 1 Overview: Original Components Removed from the Breaker.

Refer to the Allis-Chalmers LA-1600 F Instruction Manual, originally supplied with the Breaker, to perform the following procedures.

A. If equipped, remove and save the hardware securing the Closing Handle to the Breaker. Remove and save the Closing Handle.

B. Remove and save the hardware securing the Face Plate to the Breaker. Remove and save the Face Plate.

C. Remove and save the hardware securing the Blown Fuse Indicator wires to the top Breaker Connectors (Stabs). Remove and save the hardware securing the Current Limiting Fuse Assembly to the top Breaker Connectors. Remove the Current Limiting Fuse Assembly and set it behind the Breaker. Note that no other wires except the Blown Fuse Indicator wires have to be disconnected from the Current Limiting Fuse Assembly.

D. Remove and save the hardware securing the Primary Disconnects (Finger Clusters) to the bottom Breaker Connectors (Stabs). Remove and save the Primary Disconnects.

E. Remove and save the wing nuts securing the Arc Chute Retaining Bar. Remove and save the Arc Chute Retaining Bar and the Arc Chutes.

F. Remove and save the plastic rivets securing the Interconnecting Phase Barrier in the Breaker. After noting its orientation, remove the Interconnecting Phase Barrier through the right side of the Breaker.

G. Note the orientation of the two (2) Phase 3 (right) Phase Barriers. Remove all the Phase Barriers from the Breaker.

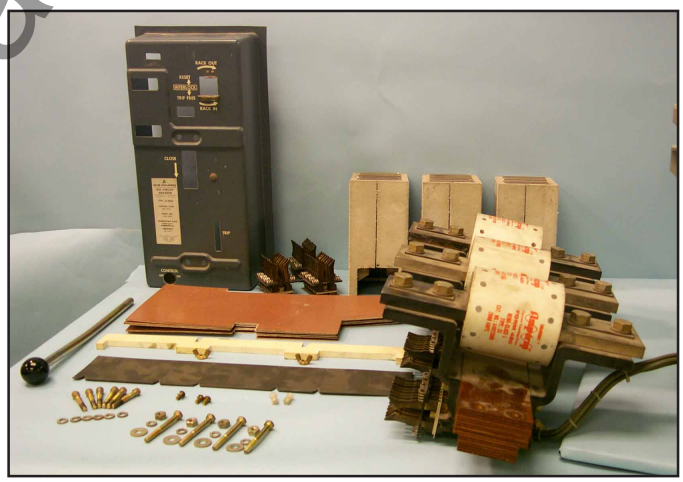

Fig. 2 Original Components Removed and Saved for Reinstallation.

H. Remove and scrap the hardware securing the Static Trip Device (Trip Unit) and mounting bracket to the Breaker. Remove and scrap the Static Trip Device, mounting bracket, and associated wiring.

I. Remove the hardware securing the Release Magnet (Direct Trip Actuator) and mounting bracket to the Breaker. Remove and scrap the Release Magnet, mounting bracket, and bottom mounting hardware (flat head screw, washers, and nut). Save the nylon nut, reset spring, spacer, and top mounting hardware (thread shaft washers, and Nylok nut).

J. Reinstall the Reset Spring. Reinstall the Release Magnet Spacer, threaded shaft, and nylon nut removed in Step 2-F. To make up for the thickness of the removed Release Magnet, install the (5) .313" flat washers supplied on the threaded shaft before installing the nylon nut.

If the Breaker being Retrofitted is equipped with an Under Voltage Mechanism, use the (2) .250" washers supplied to make up for the space left by removing the Release magnet.

Fig. 3 Reset Spring, Release Magnet Spacer, Threaded Shaft, and Nylon Nut Reinstalled Using the Supplied Flat Washers.

K. Remove and scrap the hardware securing the Sensors to the Breaker. Remove and scrap the Sensors, Insulating Rings, Insulating Spacers, and associated wiring.

Fig. 4 Original Components Removed and Scrapped.

STEP 3: MODIFYING THE PHASE 3 PHASE BARRIERS

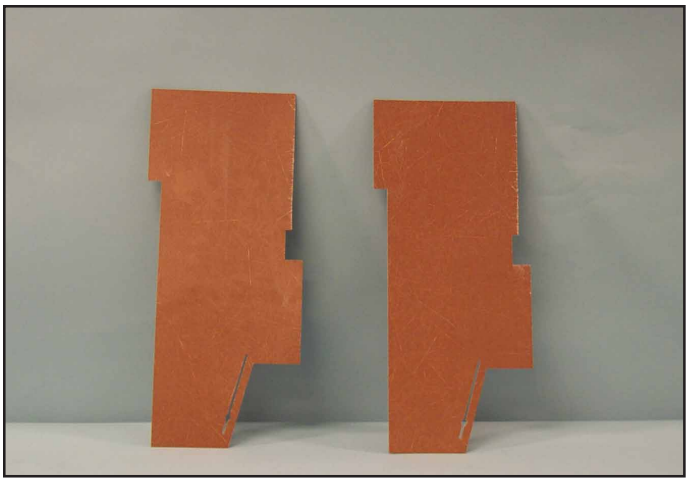

Fig. 5 Overview: Modifying the Phase 3 Phase Barriers.

A. Double check the location and orientation of the two (2) Phase 3 (right) Phase Barriers.

B. Mark and cut .500" from the front edge of each Phase Barrier, from the top to the notch, as shown in Figure 5.

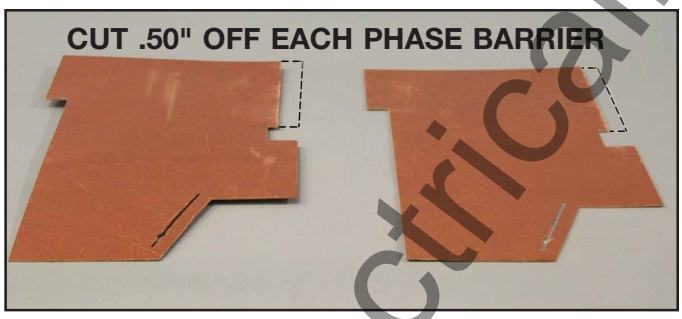

Fig. 6 Trimming the Phase 3 Phase Barriers.

C. Remove and scrap the Trip Shaft Interlock Pin (roll pin) from the right end of the Breaker Trip Shaft. Install the new roll pin supplied in the Breaker Trip Shaft as shown.

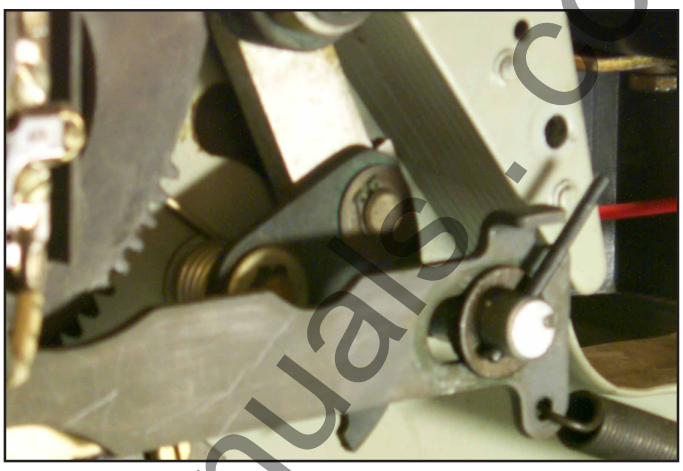

Fig. 7 Replacement of the Trip Shaft Interlock Pin.

D. Install the two (2) modified Phase Barriers and the other unmodified Phase Barriers in the Breaker in their original positions.

E. Reinstall the Interconnecting Phase Barrier in the Breaker in its original position. Secure the Interconnecting Phase Barrier by means of the original plastic rivets removed in Step 3-B.

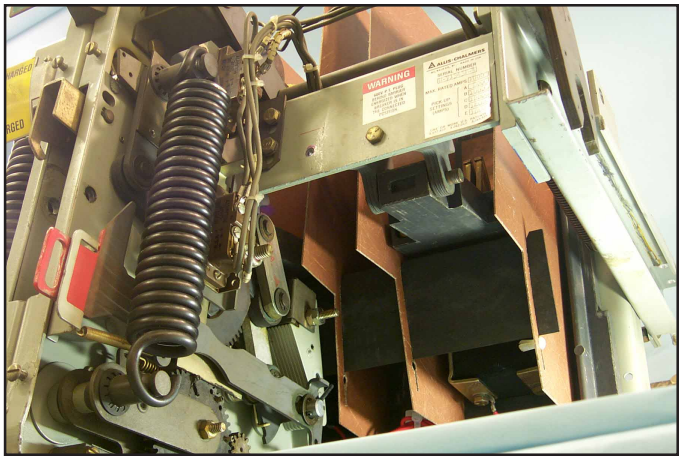

Fig. 8 Interconnecting Phase Barrier Reinstalled in the Breaker.

STEP 4: INSTALLING THE RESET LINK ASSEMBLY

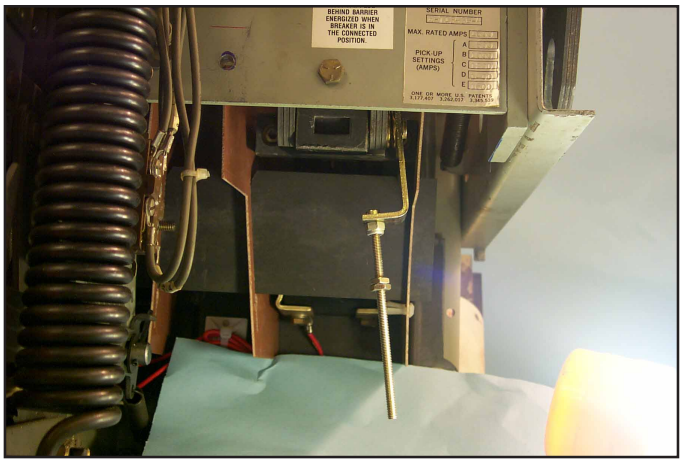

Fig. 9 Overview: Reset Link Assembly Installed on the Closing Mechanism.

NOTE: On some LA-1600 F breakers, the original Wrist Pin connecting the Insulation Link to the Breaker Pole Shaft is long enough to accept the new Reset Link, flat washer and Tru-arc lock ring and does not have to be replaced. If this is the case with the Breaker being Retrofitted, jump ahead to Step 4-D.

A. Remove and scrap the Wrist Pin and hardware that connects the Insulation Link to the Breaker Pole Shaft for Phase 3.

B. Install (1) Tru-arc lock ring on the new Wrist Pin. Completely insert the Wrist Pin into the Insulation Link and Breaker Pole Shaft from the left side.

C. Install (2) .375" flat washers, then the Reset Link Assembly onto the Wrist Pin as shown. Install (1) Tru-arc lock ring on the right end of the Wrist Pin. Note that the Reset Link should move freely on the Wrist Pin.

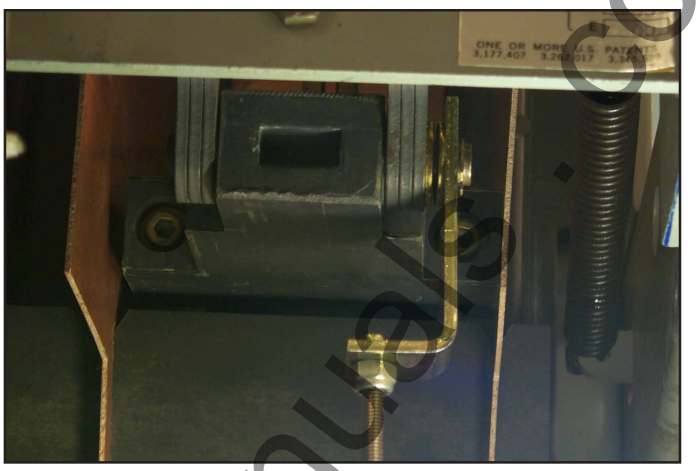

Fig. 10 Reset Link Assembly Installed on the Breaker Pole Shaft Wrist Pin.

STEP 5: PREPARING THE DTA ASSEMBLY FOR INSTALLATION

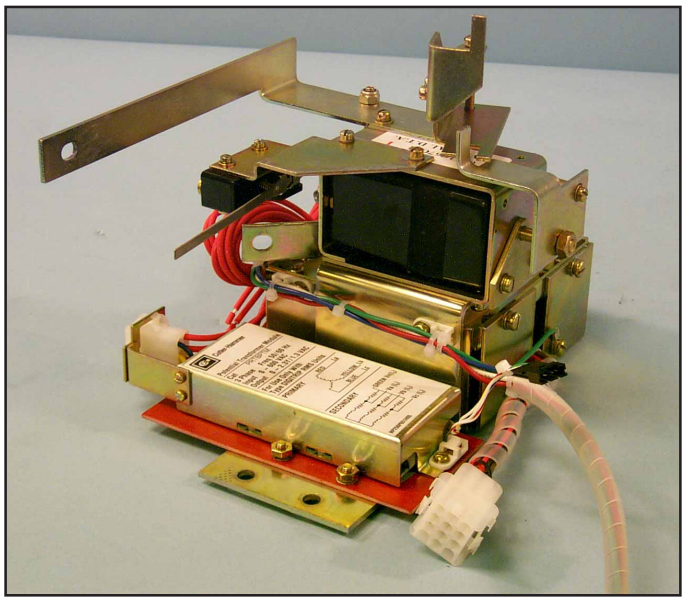

Fig. 11 Overview: DTA Assembly Ready for Installation in the Breaker.

A. Connect the Sensor Harness to the proper terminals of the Aux. CT Module. Refer to Section 12 of the Retrofit Application Data, supplied with the Retrofit Kit, for detailed wiring specifications. The long tan and green wires in the Sensor Harness are used for a remote Neutral Sensor on a 4W Ground Breaker. If these wires are not used in this application, they should be removed from the Sensor Harness.

   Note that the Sensor Harness Ground Wire (with ring terminal) will be connected to the rear of the Aux. CT Module as it is mounted to the DTA Assembly later in this Retrofit process.

B. Secure the Sensor Harness to the front of the Aux. CT Module, as shown, using the (1) Panduit cable tie mount, (1) .164-32 × .500" screw, (1) flat washer, and (1) wire tie supplied.

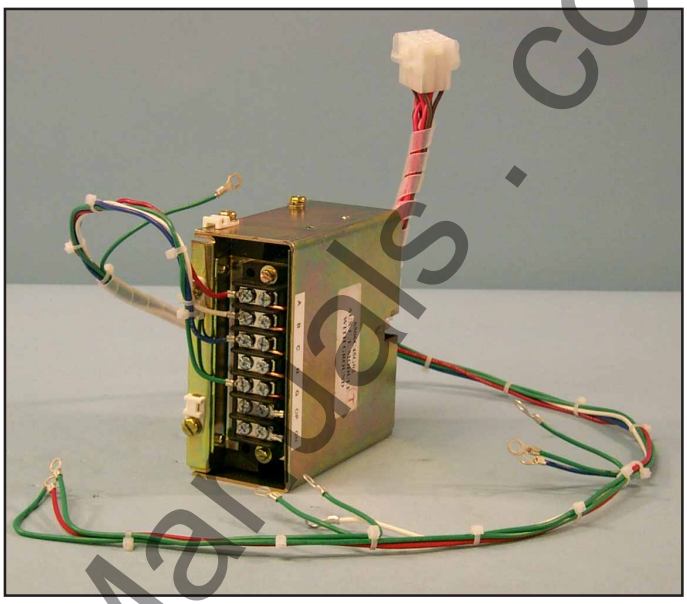

Fig. 12 Sensor Harness Installed on the Aux. CT Module.

C. Install (2) Panduit cable tie mounts on the rear right and front left corners of the Aux. CT Module, as shown, using the (2) .190-16 × .500" screws, (2) lock washers, and (2) flat washers supplied. Secure the Aux. CT Module Pigtail to the Panduit cable tie mount installed on the rear of the Aux. CT Module using the (1) wire tie supplied.

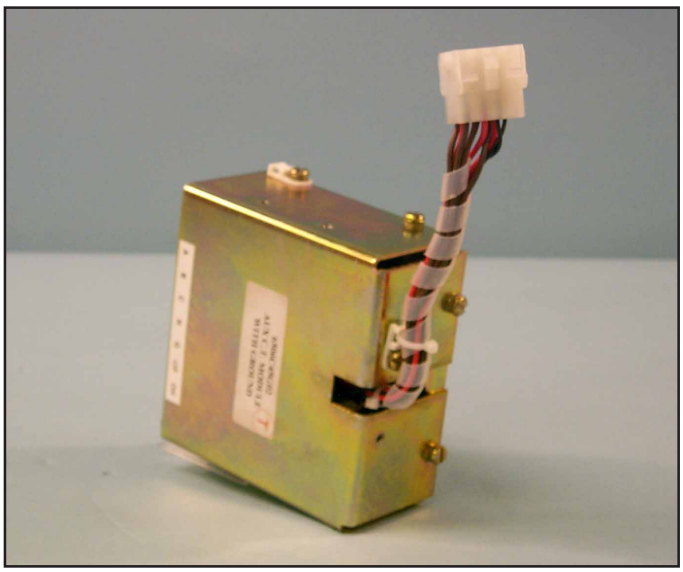

Fig. 13 Aux. CT Module Pigtail Secured to the Panduit Cable Tie Mount.

D. Align the Aux. CT Module Assembly with the existing holes in the DTA Assembly, as shown. Secure the Aux. CT Module Assembly to the DTA Assembly using the (2) .190-16 × .500" screws, (1) .190-16 × .750" screw, (3) lock washers, and (3) flat washers supplied. Note that a Panduit cable tie mount is installed near the bottom left corner of the Aux. CT Module and secured with the longer (.750") Aux. CT Module mounting hardware.

   Connect the green ground wire (with ring terminal) from the Sensor Harness to the Aux. CT Module Assembly using the (1) .190-16 × .500" screw, (1) lock washer, and (1) flat washer supplied. Use the (1) wire tie supplied to secure the Sensor Harness to the DTA Assembly as shown.

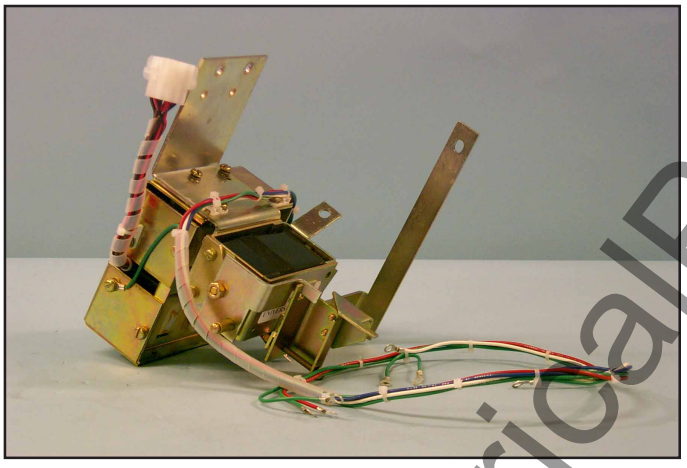

Fig. 14 Aux. CT Module Mounted to the DTA Assembly and Sensor Harness Ground secured to the Aux. CT Module.

E. Connect the "+" DTA Wire to the "OP" terminal of the Aux. CT Module Terminal Block and the unmarked wire to the "ON" terminal. Secure the DTA Wires to the front of the Aux. CT Module, as shown, using the (1) Panduit cable tie mount, (1) .190-16 × .500" screw, (1) lock washer, (1) flat washer, and (1) wire tie supplied.

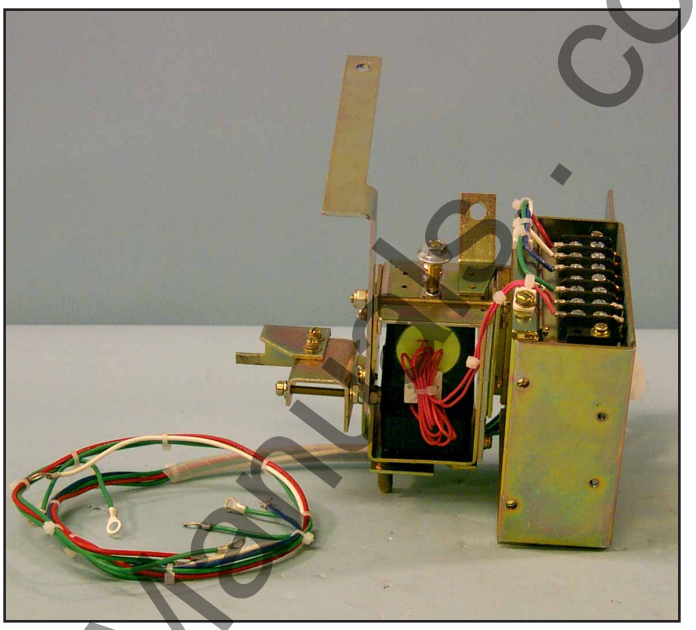

Fig. 15 DTA Wires Connected to the Aux. CT Module terminals.

For Kits Supplied with a PT Module Only.

F. Remove and scrap the "PT Label Flag" from the PT Module. Use the original hardware to reinstall the PT Harness Connector Bracket to the PT Module.

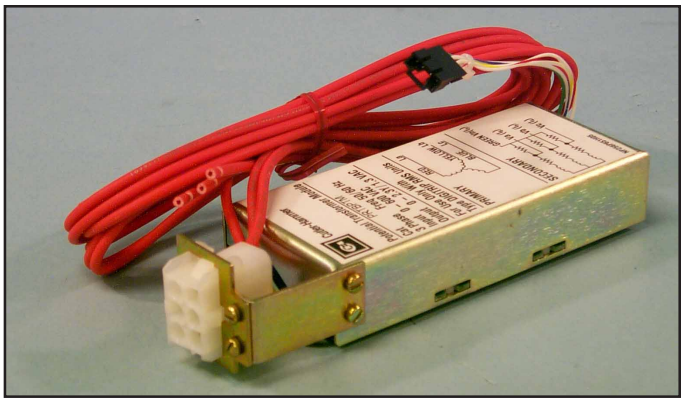

Fig. 16 PT Label Flag Removed from the PT Module.

G. Align the PT Module with the holes in the PT Module Insulation Barrier, as shown. Secure the Insulation Barrier to the PT Module using the (2) .138-32 × .500" screws, (4) flat washers, (2) lock washers, and (2) nuts supplied. Note that as the Insulation Barrier is being secured to the PT Module, (1) Panduit cable tie mount is also installed on the Assembly.

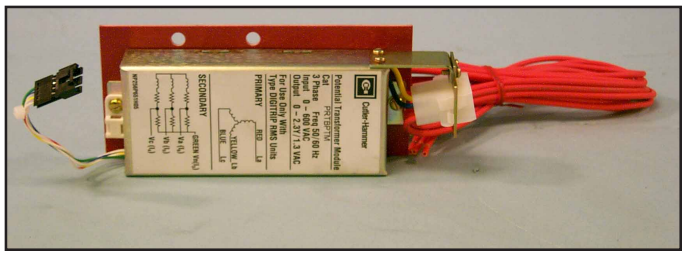

Fig. 17 Insulation Barrier and Panduit Cable Tie Mount Installed on the PT Module.

H. Mount the PT Module Assembly to the DTA Assembly, as shown, using the (2) .190-32 × .500" screws, (4) flat washers, (2) lock washers, and (2) nuts supplied.

I. Secure the Aux. CT Module Pigtail to the Panduit cable tie mount on the PT Module Assembly using the (1) wire tie supplied.

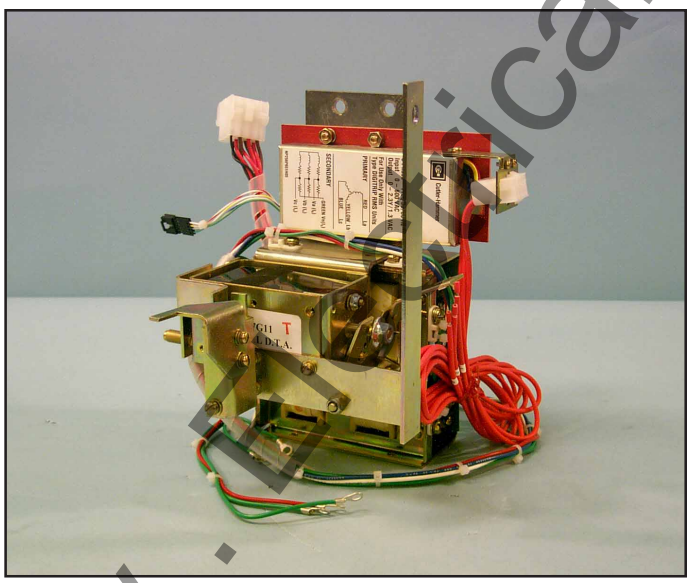

Fig. 18 PT Module Assembly Installed on the DTA Assembly.

For Kits Supplied with an Auxiliary Switch Only.

J. Cut 1.50" off the Microswitch Arm. Mount the Microswitch to the Auxiliary Switch Mounting Bracket, as shown, using the (2) .138-32 × 1.00 screws, (4) flat washers, (2) lock washers, and (2) .138-32 nuts supplied.

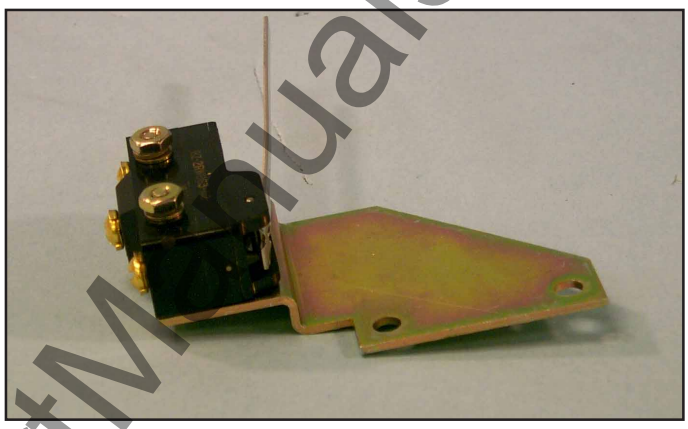

Fig. 19 Microswitch Installed on the Auxiliary Switch Mounting Bracket.

K. Mount the Auxiliary Switch Assembly to the DTA Assembly, as shown, using the (1) .164-32 × .375 screw, (1) .164-32 × .250" screw, (2) lock washers, and (2) flat washers supplied. Note that the shorter screw is used to mount the narrow side of the Auxiliary Switch Assembly mounting bracket to the DTA, and the longer screw is used to mount the wider side.

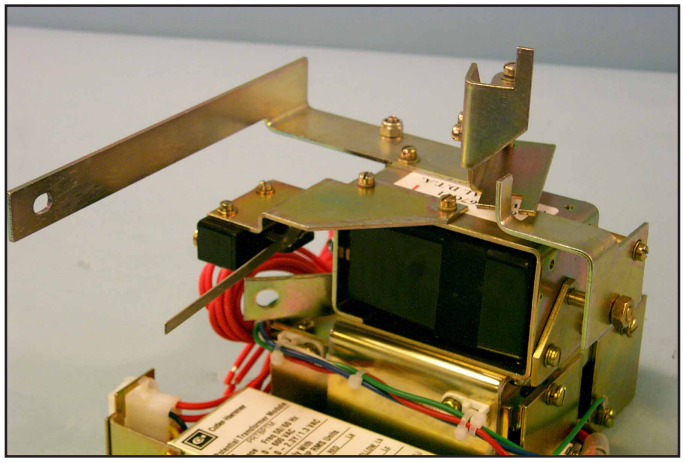

Fig. 20 Auxiliary Switch Assembly Installed on the DTA Assembly.

STEP 6: INSTALLING THE DTA ASSEMBLY

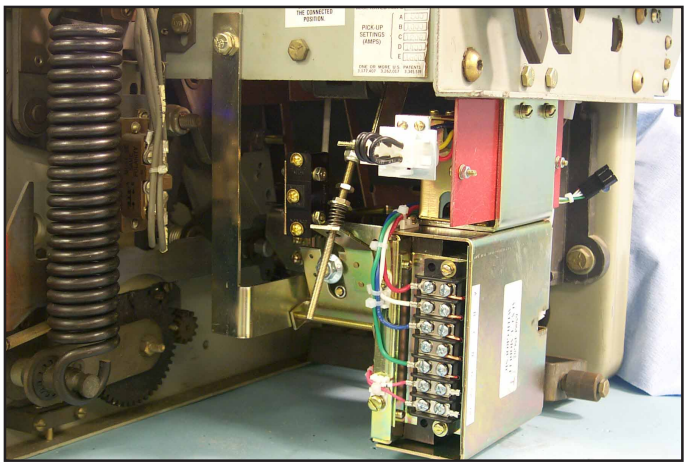

Fig. 21 Overview: DTA Assembly Installed in the Breaker.

A. Remove and scrap the nut securing the washers and spring to the Reset Shaft. Hold the spring and washers in place on the Reset Shaft. As the DTA Assembly is being installed, align the Reset Shaft with the slot in the Reset Arm.

B. Temporarily mount the DTA Assembly, as shown, to the existing holes in the right Breaker Frame using the (2) .250-20 × .750 bolts and (2) lock washers supplied.

NOTE: As the DTA Assembly is being temporarily mounted to the right Breaker Frame, the DTA front Mounting Bracket MUST be on the outside of the front Breaker Frame, the DTA Trip Finger MUST be in front of the roll pin on the Breaker Trip Bar, and the Auxiliary Switch Arm, if applicable, MUST be in front of the Insulating Link as shown.

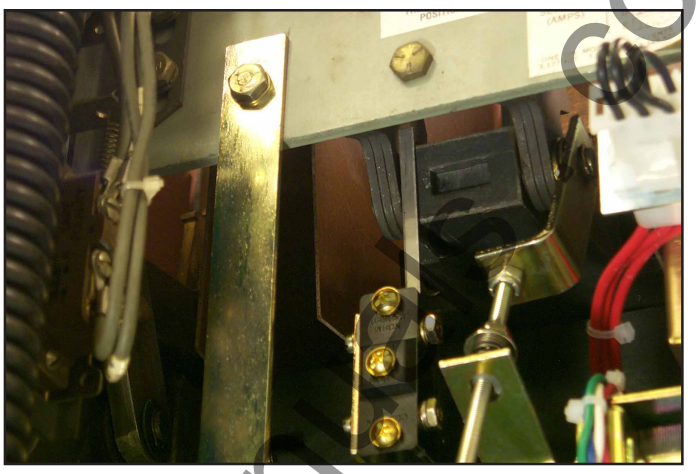

Fig. 22 Correct Positioning of the DTA Assembly Front Mounting Bracket and Auxiliary Switch Arm.

NOTE: Do not tighten the hardware securing the DTA Assembly to the Breaker Frame at this time.

C. The mounting bracket used to secure the DTA Assembly to the front of the Breaker serves two (2) functions:

1. to achieve the desired gap between the Trip Finger and the roll pin on the Breaker Trip Bar; and

2. to provide clearance between the Trip Finger and the Manual Trip Bar.

Move the DTA Assembly up or down until a gap of approximately .06" to .09" has been achieved between the Trip Finger and the roll pin on the Breaker Trip Bar, and the Trip Finger is clearing the Manual Trip Bar. Using the center of the slot in the mounting bracket as a guide, mark the front Breaker Frame at the correct location for the hole to be drilled.

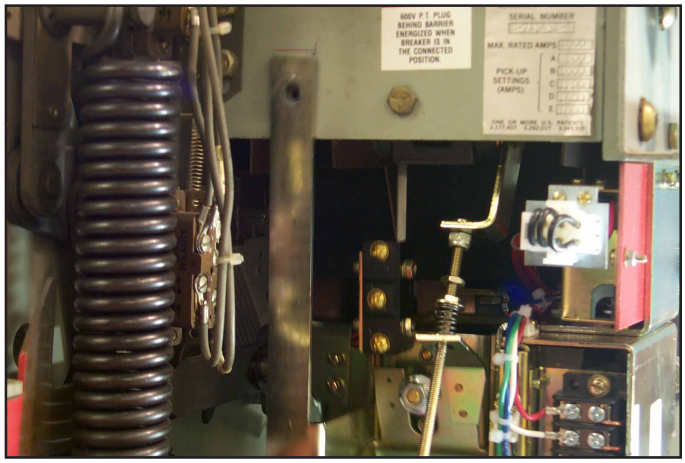

Fig. 23 Correct Positioning of the DTA Assembly to Provide the Required Gap and to Clear the Manual Trip Bar.

D. Using a .266 drill, drill a hole in the front Breaker Frame in the location marked in Step 6-C.

NOTE: Cover the region below the area to be drilled to prevent metal shavings from falling into the Breaker Mechanism.

E. *For Kits Supplied with a PT Module Only:* Refer to Section 7-3, Power Flow Convention of the Retrofit Application Data, supplied with the Retrofit Kit for additional wiring information and to verify the Phase Convention used on this Breaker Application.

Remove one of the hex bolts from the bottom of each Current Transformer (Breaker Stud). Set the DTA Assembly near the right, front corner of the Breaker.

The PT Wires are marked for connection to Phases 1,2, and 3 with corresponding numbers.

NOTE: Before cutting the PT Wires, verify the Phase Convention used on the Breaker Application.

Route the PT Wires to a position suitable for attachment to the bottom Breaker Studs. Move the PT Wire markers to a position where they will still be attached to the wires after cutting. Cut the wires to the appropriate length, strip each wire .250", and install a .250" ring terminal on each wire.

Connect the PT wires to the corresponding bottom Current Transformer using the original mounting hardware.

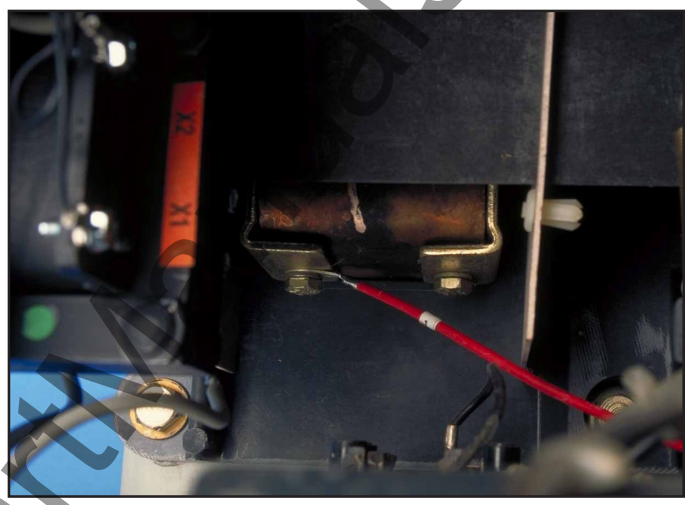

Fig. 24 PT Wires Connected to the Bottom Current Transformers.

Install the PT Warning Label in a prominent position on the front of the Breaker Face Plate.

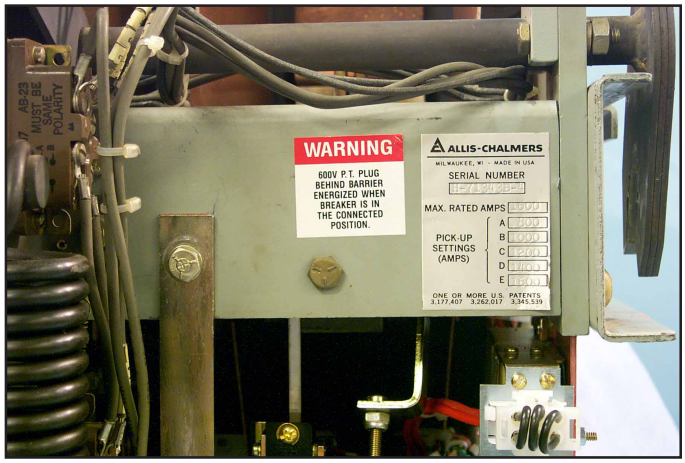

Fig. 25 PT Warning Label Installed on the Breaker.

F. Route the Sensor Harness through the Breaker towards the right, rear corner of the Breaker Back Plate. Feed the Sensor Harness through the existing hole with rubber grommet in the Breaker Back Plate. The Sensor Harness will be connected to the Sensors later in the Retrofit Process.

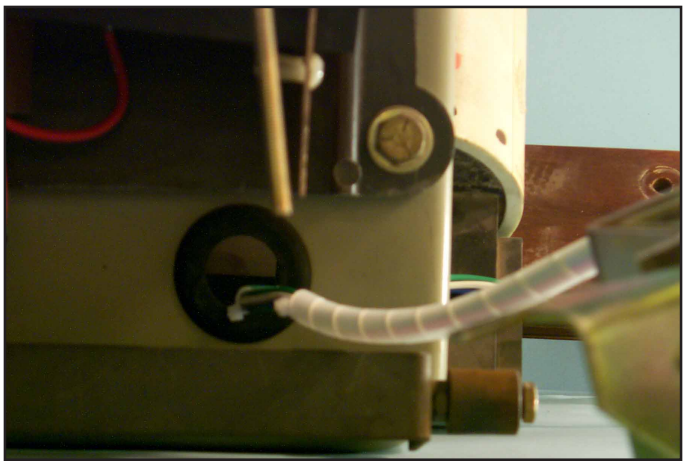

Fig. 26 Sensor Harness Routed to the Back of the Breaker.

G. Align the DTA front Support Bracket with hole drilled in the front Breaker Frame in Step 6-D. Secure the DTA front Support Bracket to the Breaker, as shown, using the (1) .250-20 × .750" bolt, (1) flat washer, (1) lock washer, and (1) nut supplied. Tighten all hardware securing the DTA Assembly to the Breaker.

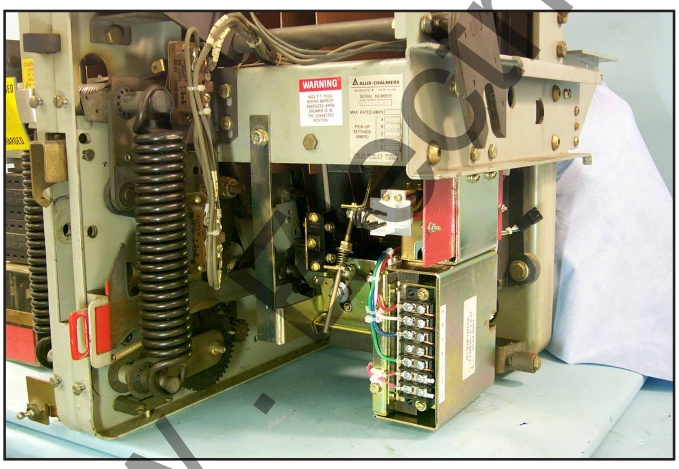

Fig. 27 DTA Installed in the Breaker.

STEP 7: SETTING THE GAP AND CAGE HEIGHT

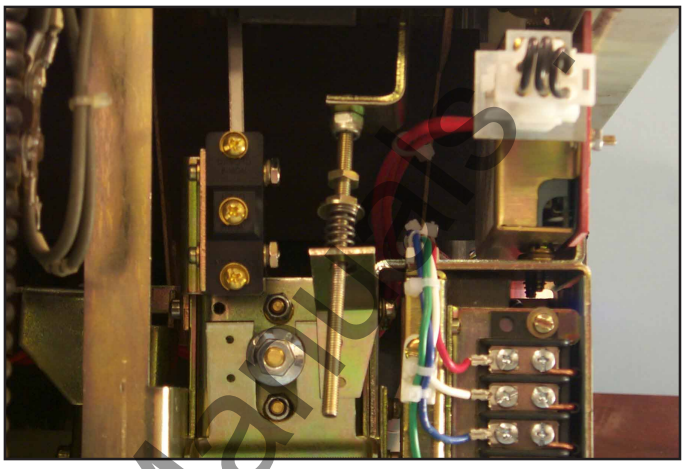

Fig. 28 Overview: DTA Gap and Cage Height Adjusted.

A. The cage height on the Reset Shaft should be approximately .50". If the cage height is incorrect, loosen the lock nut on the Reset Shaft, apply Loc-Tite® 243 to the threads, then turn the adjusting nut until the correct cage height is achieved. Tighten the lock nut.

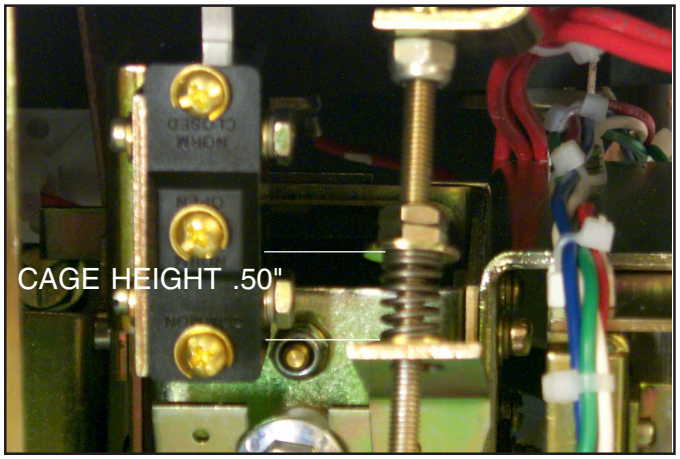

Fig. 29 Adjusting the Cage Height.

C. Refer to the Allis-Chalmers LA-1600 F Instruction Manual, originally supplied with the Breaker, for information on how to energize the Under Voltage Device to allow the Breaker to be “Closed” and “Tripped”.

D. Connect a 24 VDC power supply to the DTA terminals; positive to positive and negative to negative. Close the Breaker manually. Energize the DTA to trip the Breaker; de-energize when the Breaker trips. Make certain that the DTA resets. If the Breaker fails to properly trip insure that a gap of .06" to .09" exists between the DTA Trip Finger and the roll pin on the Breaker trip Bar. If the Breaker fails to properly reset, readjust the Reset Link until a cage height of .50" is achieved. Make the necessary adjustments until the trips and resets are sure and positive each time.

STEP 8: INSTALLING THE TRIP UNIT

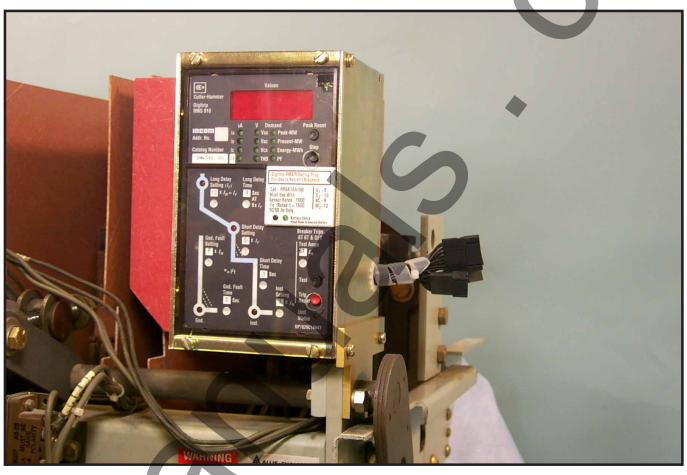

Fig. 30 Overview: Trip Unit Installed on the Breaker.

A. Remove and scrap the two (2) screws from the bottom right side of the Trip Unit Minibox.

B. Align the smaller holes in the Trip Unit Mounting Bracket with the holes from which the screws were just removed. Secure the Trip Unit Mounting Bracket to the Trip Unit Minibox, as shown, using the using the (2) .164-32 × .500" screws and (2) lock washers supplied.

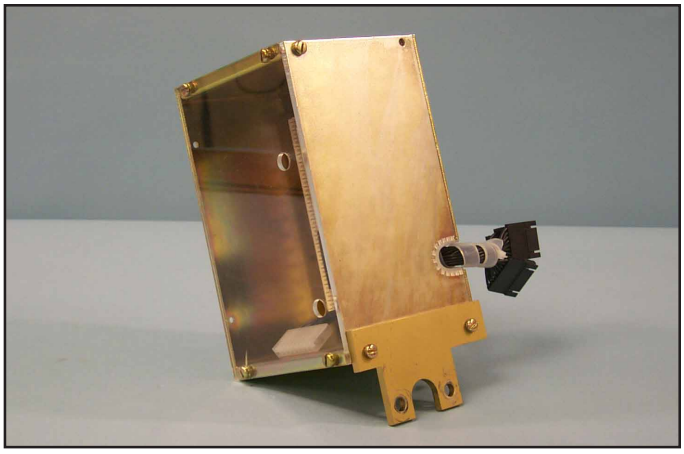

Fig. 31 Trip Unit Mounting Bracket Installed on the Minibox.

C. Note the location of the Jacking (“J”) screws in the back of the Minibox. Also note the instructions for there use.

Fig. 32 Location of the "Jacking" Screws.

D. Align the Minibox Insulation Barrier with the existing holes in the Minibox. Note that the Insulation Barrier extends well over the left side of the Minibox. Secure the Insulation Barrier to the Minibox using the (3) .164-32 × .500" screws, (1) .164-32 × .500" nylon screw, (4) lock washers, and (3) flat washers supplied. Note that Panduit cable tie mounts should be installed on the lower, right corner and upper, left corner of the back of the Minibox using the hardware that also secures the Insulation Barrier. Note also that the nylon screw is used to secure the Panduit cable tie mount to the upper, left corner of the Minibox.

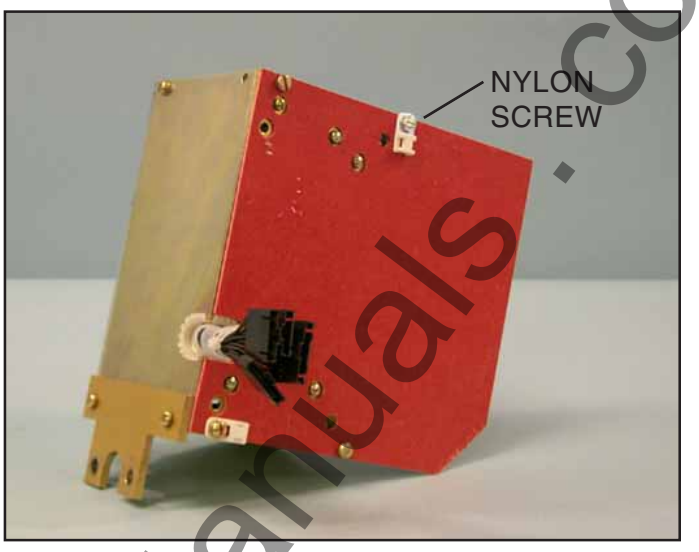

Fig. 33 Insulation Barrier and Panduit Cable Tie Mounts Installed on the Minibox.

E. *For 810 & 910 Kits Only:* Position the Trip Unit near the front of the Trip Unit Minibox. Insert the male Communications Harness Connector into the female receptacle in the back of the Trip Unit. Note that the "windows" on the Communications Harness Connector must face upward.

⚠ CAUTION

IF THE COMMUNICATIONS HARNESS CONNECTOR IS INSERTED UPSIDE DOWN (WINDOWS FACING DOWNWARD), COMMUNICATIONS PROBLEMS WILL OCCUR.

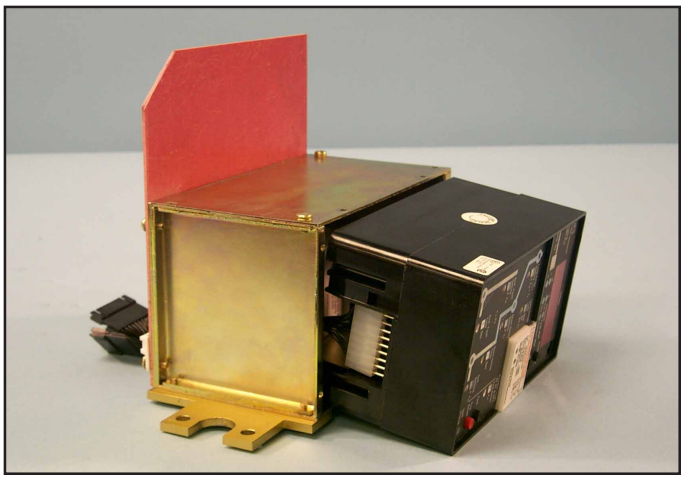

Fig. 34 Communications Harness Connected to the Trip Unit.

F. Align the Trip Unit Edge Card with the Receptacle in the Trip Unit Minibox. Plug the Trip Unit into the Trip Unit Minibox.

⚠ CAUTION

DO NOT APPLY UNDUE FORCE TO THE TRIP UNIT. IF IT DOES NOT PLUG EASILY INTO THE MINIBOX, MAKE SURE THE EDGE CARD IS PROPERLY ALIGNED WITH THE RECEPTACLE AND THAT THE JACKING ("J") SCREWS ARE FULLY RETRACTED (SEE THE INSTRUCTIONS BELOW). APPLYING UNDUE FORCE CAN DAMAGE THE TRIP UNIT.

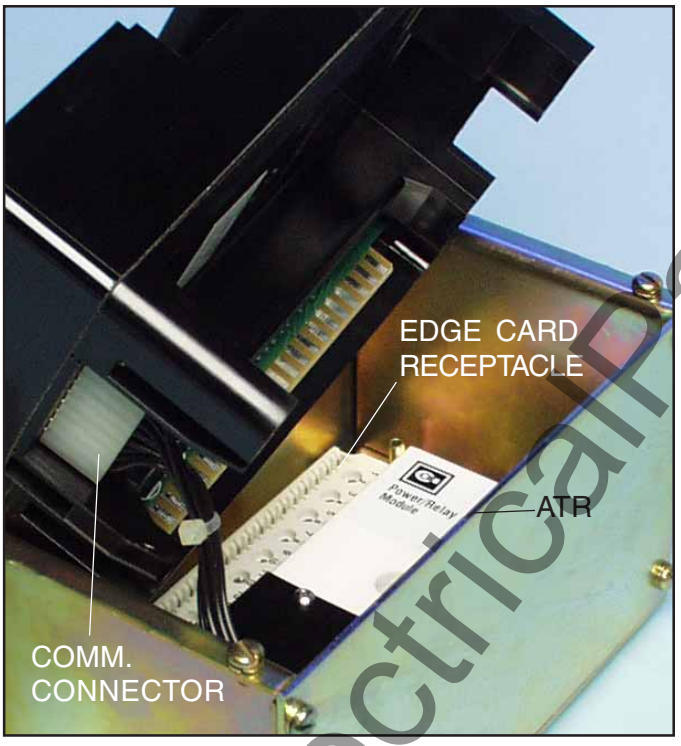

Fig. 35 Location of the Edge Card Receptacle, Communications Harness Connector, and ATR in the Minibox.

Fig. 36 Trip Unit Installed in the Minibox.

NOTE: If the Trip Unit must be removed from the Minibox, follow the Jacking Screw directions contained in Figure 38.

TESTED

STYLE NO. _____

DATE OF MFG. _____

TO REMOVE TRIP UNIT

TURN JACKING SCREWS 'J' COUNTERCLOCKWISE THREE TURNS EACH, ALTERNATING BETWEEN THEM UNTIL THE TRIP UNIT DISENGAUGES. REMOVE THE TRIP UNIT AND TURN THE JACKING SCREWS CLOCKWISE UNTIL THEY STOP.

NP# 799A949 H01

Fig. 37 Jacking Screw Instructions.

H. Install the Rating Plug in its receptacle in the Trip Unit.

I. Align then secure the Trip Unit Cover to the Minibox using the (4) .164-32 × .250" screws supplied.

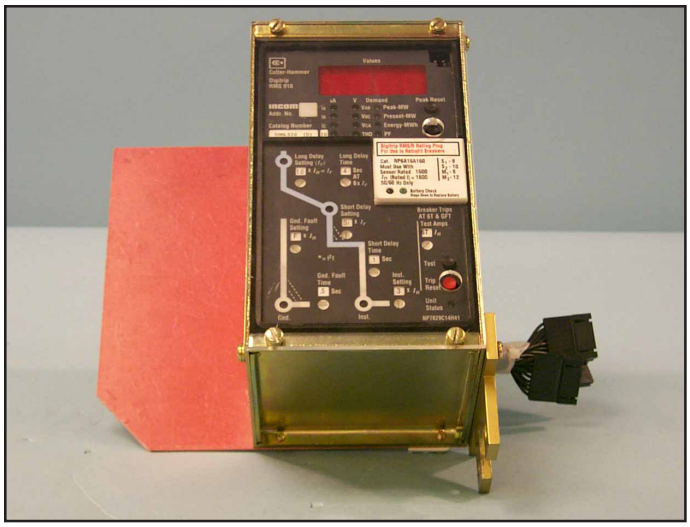

Fig. 38 Rating Plug and Trip Unit Cover Installed.

J. Remove and save the hardware securing the right Racking Crank Bearing to the right Breaker Frame. Align the Trip Unit Assembly with the holes used to mount the Racking Crank Bearing. Note that the Trip Unit Mounting Bracket is installed on the outside of the right Breaker Frame. Using the original mounting hardware, secure the Trip Unit Assembly to the Breaker.

Fig. 39 Trip Unit Assembly Installed on the Breaker.

K. Install the Digitrip Retrofit Label in a prominent position on the Breaker Face Plate.

Fig. 40 Digitrip Retrofit Label Installed on the Breaker Face Plate.

L. Reinstall the Arc Chutes removed in Step 2-E.

M. Install and secure the Arc Chute Retaining Bar it in its original position using the wing nuts removed in Step 2-E.

NOTE: On some LA-1600 F Breakers, the Retrofitter may find it difficult to reinstall the Arc Chute Retaining Bar due to an alignment problem. If this is encountered, it may help to "unwind" the "all-thread" shafts, position the Arc Chute Retaining Bar, then screw the all-thread shafts into the holes in the Retaining Bar. If this procedure is to be used, the Retrofitter should measure and note the distance from the front of the all-thread shaft to the inside of the Breaker Back Plate before unwinding the all-thread. When reinstalling, the all-thread shafts should be returned to this original measurement.

STEP 9: INSTALLING THE EXTERNAL HARNESS

Fig. 41 Overview: External Harness Connected to the Trip Unit.

A. Install the supplied Spiral Wrap on the bottom section of the Aux. CT Harness. Plug the Aux. CT Harness into the connector on the Aux. CT Module Pigtail.

Fig. 42 Aux. CT Harness Connected to the Aux. CT Module Pigtail.

B. Route the Aux. CT Harness between the right Breaker Frame and Phase 3 right Phase Barrier, as shown, then upwards toward the Trip Unit. Connect the Aux. CT Harness to its receptacle at the rear of the Minibox. Use the self-adhesive mounting pads and wire ties supplied to secure the Aux. CT Harness to the Phase 3 right Phase Barrier.

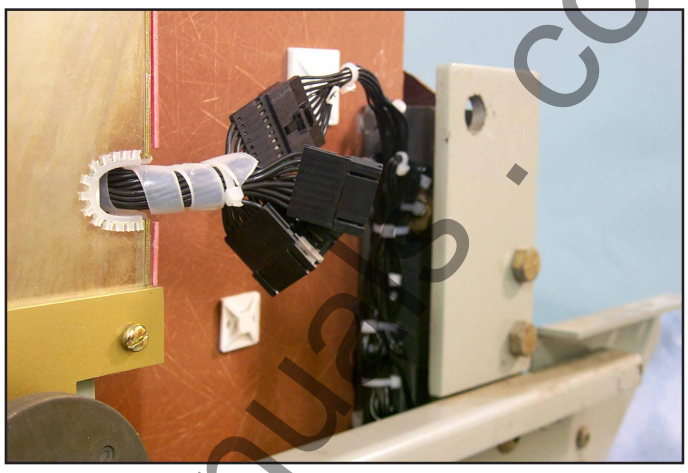

Fig. 43 Routing and Connection of the Aux. CT Harness to the Minibox.

C. Connect the External Harness to the receptacle in the pigtail at the rear of the Minibox. Temporarily route the External Harness towards the right side of the Breaker.

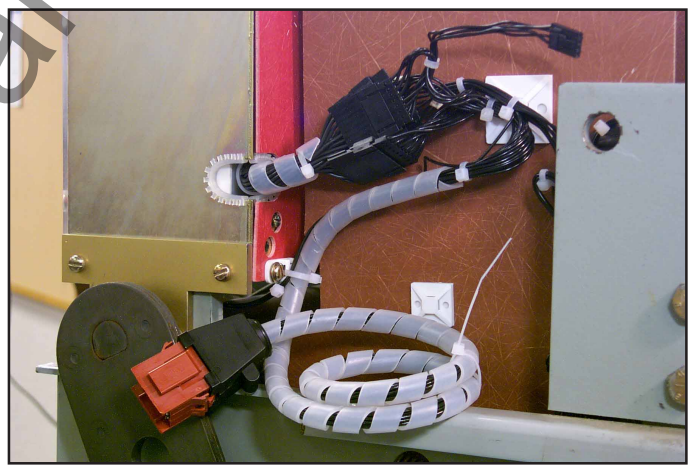

Fig. 44 External Harness Connected to the Minibox.

NOTE: For 510 Basic Kits, the External Harness is the Shorting Plug pictured below. It is to be plugged into the corresponding receptacle in the Minibox Pigtail.

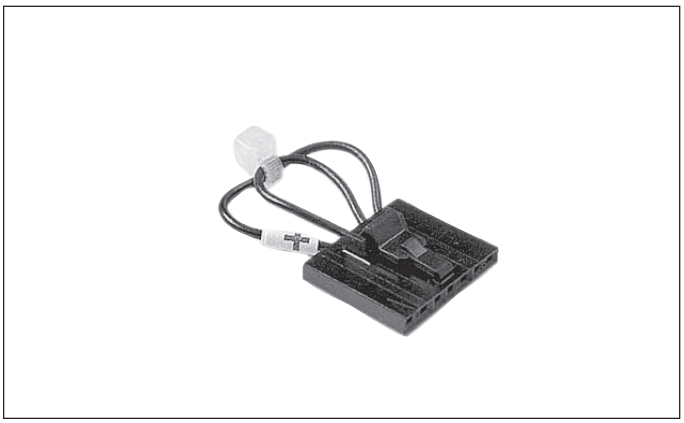

Fig. 45 510 Basic Kit External Harness Shorting Plug.

D. Plug the PT Extension Harness into the connector on the PT Harness.

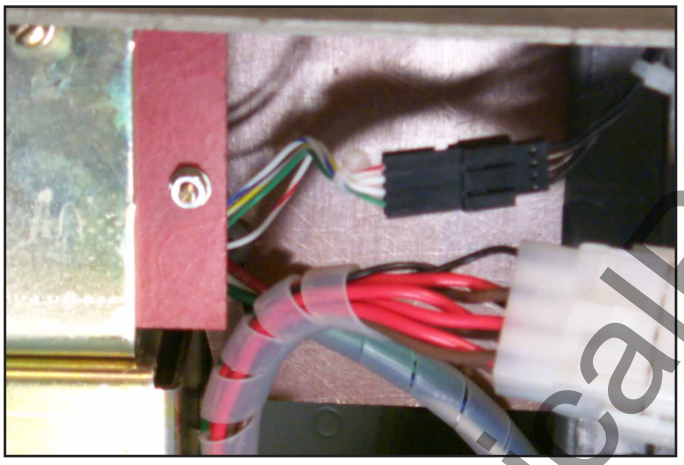

Fig. 46 PT Extension Harness Connected to the PT Module Harness.

E. Route the PT Extension Harness between the right Breaker Frame and Phase 3 right Phase Barrier, as shown, then upwards toward the Trip Unit. Connect the PT Extension to the corresponding plug on the External Harness. Use the self-adhesive mounting pads (installed in Step 9-B) and wire ties supplied to secure the PT Extension Harness to the Phase 3 right Phase Barrier.

Fig. 47 Routing and Connection of the PT Extension Harness to the External Harness.

F. Route the two (2) wires, with ring terminals, from the External Harness, behind the Minibox, then down along the front of the Breaker to the Aux. Switch. Connect one (1) wire to the normally “Open” terminal and the other wire to the “Common” terminal. Secure the Aux. Switch Wires to the front DTA Assembly Mounting Bracket using the wire ties supplied.

Fig. 48 Routing and Connection of the Auxiliary Switch Wires to the Auxiliary Switch.

G. Use the wire tie supplied to secure the External Harness to the Panduit cable tie mount installed on the back of the Minibox.

Fig. 49 External Harness Secured to the Minibox.

For Kits Supplied with a Breaker Mounted CPT Only.

STEP 10: INSTALLING THE BREAKER MOUNTED CPT MODULE

Fig. 50 Overview: CPT Module Installed on the Breaker.

A. Using Drilling Plan “A”, drill two .203" holes in the top, center Breaker Frame.

NOTE: Cover the region below the area to be drilled to prevent metal shavings from falling into the Breaker Mechanism.

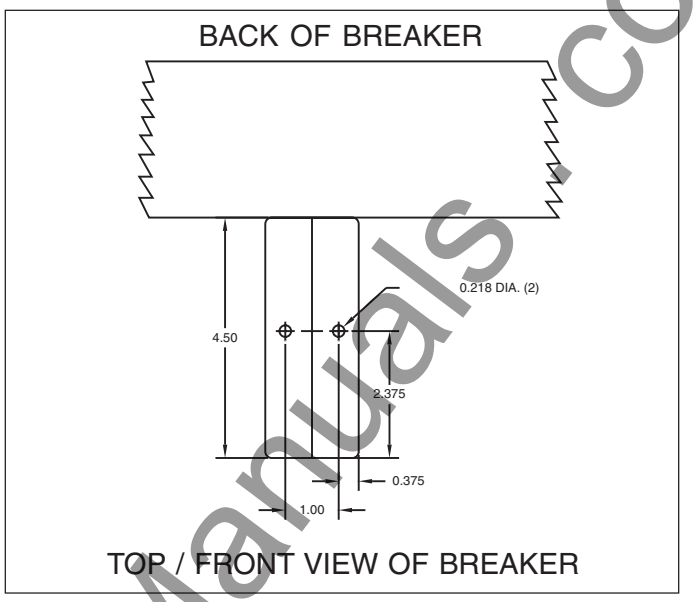

Fig. 51 Drilling Plan “A”.

B. Remove and save the (2) .190 - 32 × .250" screws securing the fuse clips and male spade connector installed on the CPT Module. Discard the fuse clips and spade connector, then reinstall the screws in the CPT Terminals.

Fig. 52 Fuse Clips and Spade Connector Removed from the CPT.

C. Align the CPT with the existing holes in the CPT Mounting Bracket, as shown. Note the orientation of the “H” Terminals of the CPT. The CPT must be installed on the mounting bracket in this orientation. Secure the CPT to the mounting bracket using the using the (4) .190-32 × .500" screws, (4) lock washers, (4) flat washers, and (4) nuts supplied.

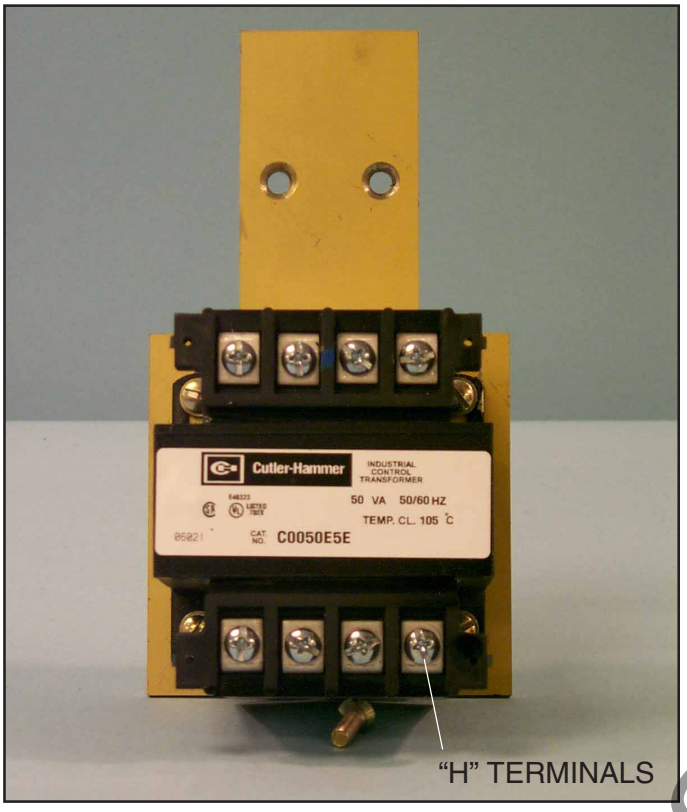

Fig. 53 Breaker Mounted CPT Installed on the CPT Mounting Bracket.

D. Align the CPT Assembly with the holes drilled in Step 10-A. Secure the CPT Assembly to the top of the Breaker Center Frame using the (2) .190-32 × .500" flat head screws, (2) lock washers, and (2) nuts supplied.

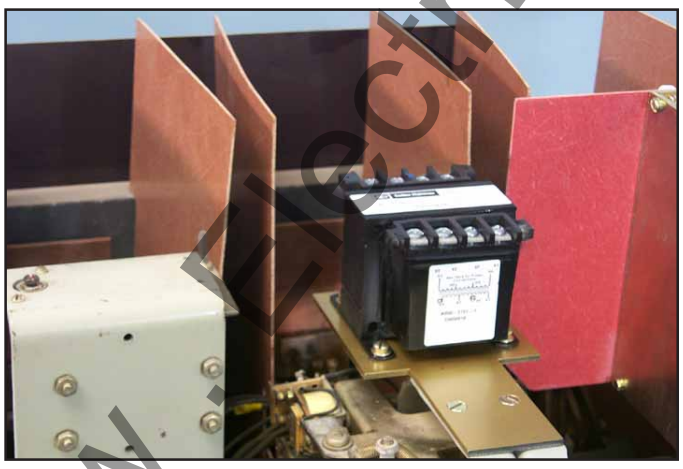

Fig. 54 CPT Assembly Installed on the Breaker.

E. Connect the CPT Harness wires to the appropriate "X" terminals of the CPT Module as shown. See Table 2 for Tap information.

Table 2 CPT Low Voltage Taps for Standard and Special Order CPTs (After Removing Fuse Clips)

Standard CPT (Style #9A10037G01 & G02)	
120 Voltage Required	*CPT Terminals Used*
Secondary Circuit	X1 & X2
Special Order 575 Volt CPT (Style #9A10037G03 & G04)	
Secondary Circuit	X2 & X3

F. Route the CPT Wires behind the Minibox to the right side of the Breaker. Remove the External Harness plug installed in the Minibox Pigtail. Connect the black plug of the CPT Harness into the same receptacle in the Pigtail from which the plug was removed. Reinsert the External Harness plug just removed into the female receptacle on the CPT Harness.

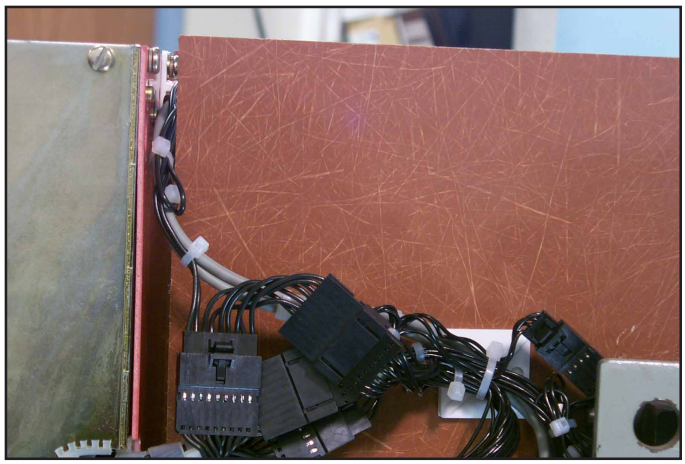

Fig. 55 CPT Harness Connected to the External Harness.

NOTE: The Load Side HV Wires are longer than necessary and are cut during the following steps. Before cutting the wires, be sure that sufficient length is left so that the HV Wire Fuses can be mounted to the outside of the Phase 3 right Phase Barrier and that the connections can be made to the correct "H" terminals on the CPT Module.

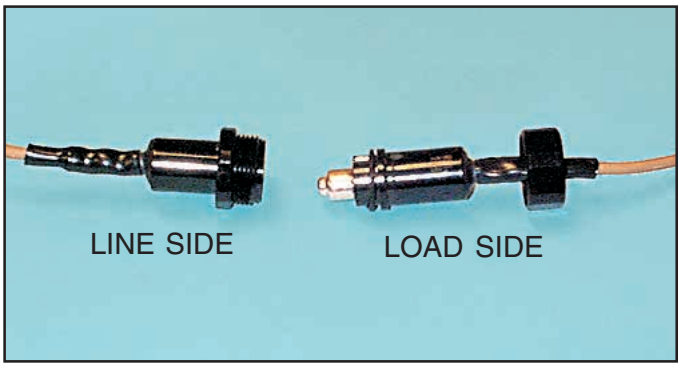

Fig. 56 Load and Line Sides of the HV Wires.

G. Position the HV Fuses along the outside of the Phase 3 right Phase Barrier. Route the Load Side HV Wires behind the Minibox, then towards the CPT Module. Mark and cut the Load Side of each HV Wire to an appropriate length for connection to the "H" terminals of the CPT. Strip approximately .250" of insulation from the Load Side HV Wires and attach a .190" ring terminal to each. Attach the HV Wires to the CPT "H" terminals to achieve the required voltage (see Table 3).

Fig. 57 Suggested Location for the HV Fuses.

NOTE: The terminals to which the Load Side HV wires are connected determine the voltage of the CPT. Verify that the line voltage of the circuit matches the CPT voltage BEFORE putting the Breaker into service.

Table 3 CPT High Voltage Taps for Standard and Special Order CPTs

Voltage Required	*CPT Terminals Used*
Standard CPT (Style #9A10037G01 & G02)	
480 Volt Circuit	H1 & H4
240 Volt Circuit	H2 & H4
208 Volt Circuit	H3 & H4
Special Order 575 Volt CPT (Style #9A10037G03 & G04)	
575 Volt Circuit	H1 & H4
460 Volt Circuit	H2 & H4
230 Volt Circuit	H3 & H4

Fig. 58 Load Side HV Wires and CPT Harness Connected to the Terminals of the CPT Module.

H. Install the “A” and “B” Finger-Safe Covers over the CPT Terminals as shown. Secure the Finger-Safe Covers to the CPT using the (4) .098 - 28 × .375" screws supplied with the CPT Kit. Torque the screws to 8 - 10 in./lbs.

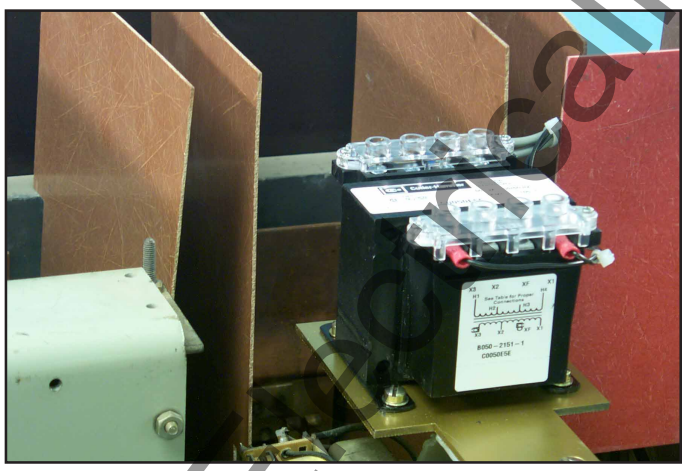

Fig. 59 Finger Safe Covers Installed on the CPT.

NOTE: The power convention of Circuit Breakers is normally Top to Bottom, meaning the top Breaker Connectors (Stabs) are on the Line Side of the Breaker and the bottom Breaker Connectors are on the Load Side.

The HV Wires from the CPT MUST BE ATTACHED to the Line Side of the Breaker. If it is determined that the power flow for the Breaker application is opposite the normal convention, the HV Wires must be attached to the bottom Breaker Connectors. In the case of the Line Side being the bottom Breaker Connectors, the HV Wires can be connected to the existing hardware on the bottom Current Transformers (Studs). This will be similar to the procedure detailed earlier for connection of the PT Wires.

NOTE: The Line Side HV Wires are longer than necessary and are cut during the following steps. Before cutting the wires, be sure that sufficient length is left so that the HV Wire Fuses are accessible and that the connections can be made to the same hardware used to connect the Blown Fuse Indicator wires to the Current Limiting Fuse Assembly.

I. Reinstall the Current Limiting Fuse Assembly removed in Step 2-C, using the original mounting hardware.

J. Route the HV Line Side Wires between the right Breaker Frame and Phase 3 right Phase Barrier towards the bottom of the Breaker. Route the Line Side HV Wires through the existing slot near the bottom right corner of the Breaker then up along the Breaker Back Plate to the Phase 1 and 2 or the Phase 2 and 3 Fuse Connectors. Cut each HV Wire to an appropriate length for attachment with the screws removed in the previous step. Strip .250" from each wire, then install a .190" ring terminal on each wire.

K. Use the original mounting hardware removed in Step 2-C to connect the Line Side HV Wires and the Blown Fuse Indicator wires to the Current Limiting Fuse Connectors.

Fig. 60 HV Wires Connected to the Current Limiting Fuse Connectors.

L. Use the self-adhesive mounting pads, Panduit cable tie mounts, and wire ties supplied to secure the HV Wires to the Breaker Back Plate and the HV Fuses to the Phase 3 right Phase Barrier.

Fig. 61 HV Fuses Secured to the Breaker.

M. Install the appropriate CPT Voltage Label on the Trip Unit Insulation Barrier, as shown.

Fig. 62 CPT Voltage Labels Supplied with the CPT Kit.

Fig. 63 CPT Voltage Label Installed on the Trip Unit Insulation Barrier.

STEP 11: INSTALLING THE SENSORS

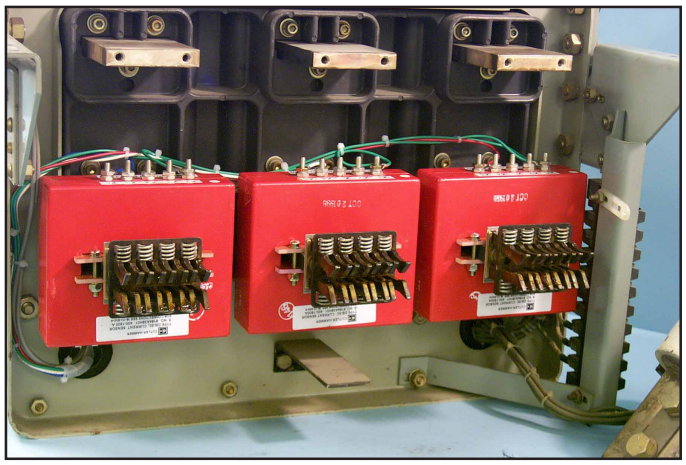

Fig. 64 Overview: Sensors Installed on the Breaker.

A. Slide a Sensor over each bottom Breaker Connector (Stab) with the terminals facing up and the nameplate facing out.

B. Install one (1) Sensor Spacer on the top and one (1) Spacer on the bottom of each top Breaker Connector as shown. Using the (6) .190-32 × 1.25" screws, (12) flat washers, and (6) Nylok nuts supplied, tighten the Sensor Spacers so they "pinch" the bottom Breaker Connectors.

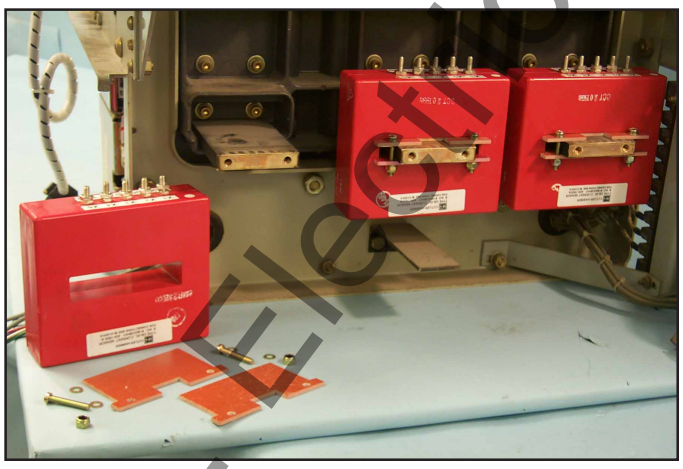

Fig. 65 Sensor Installed on the Breaker Connector and Held in Place by the Sensor Spacers.

C. Route the Sensor Harness from the right rear corner of the Breaker to the Sensors. Connect the ring terminals of the Sensor Harness to the Sensors as shown.

Fig. 66 Sensor Harness Connected to the Sensors.

Refer to Section 12 of the Retrofit Application Data, supplied with the Retrofit Kit, for detailed wiring specifications.

For LA-1600 F Retrofits, the following conventions apply.

Table 4 Sensor Taps Rating

Sensor Style No.	*Terminal Com.*	*Amps*
8184A38H01	X1 - X2 =	400 A
	X1 - X3 =	600 A
	X1 - X4 =	800 A
	X2 - X5 =	1200 A
	X1 - X5 =	1600 A

D. Using the original mounting hardware removed in Step 2-D, reinstall the bottom Primary Disconnects (Finger Clusters).

STEP 12: FINAL WIRING AND REINSTALLING THE ORIGINAL BREAKER COMPONENTS

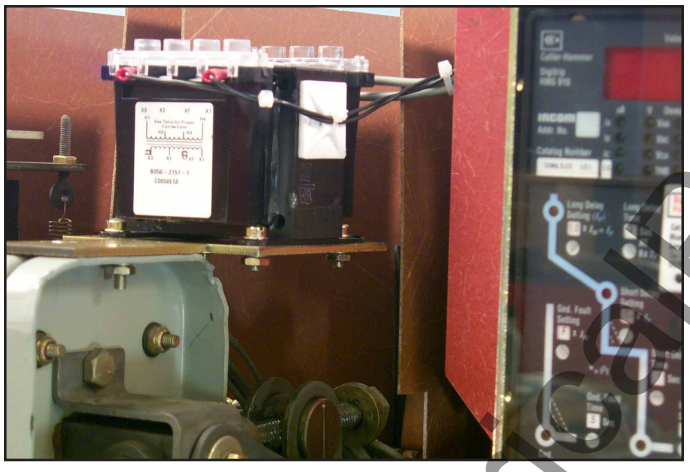

Fig. 67 Overview: All Harness and Wires Secured in the Breaker.

A. Use the self-adhesive mounting pads and wire ties supplied to dress all wires and harnesses to keep them away from any moving parts within the Breaker.

B. Using the original mounting hardware removed in Step 2-B, reinstall the Breaker Face Plate.

C. If equipped, using the original mounting hardware removed in Step 2-A, reinstall the Breaker Closing Handle.

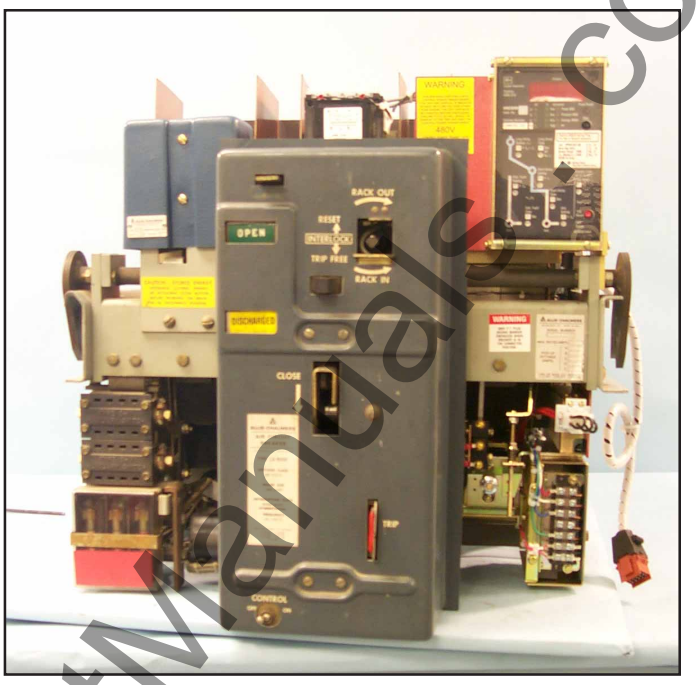

Fig. 68 Breaker Ready for Testing.

STEP 13: TESTING THE BREAKER

A. Measure the force necessary to trip the Breaker at where the Trip Finger impacts the DTA Adjusting Disk. The force necessary to trip the Breaker **MUST NOT EXCEED** 3 lbs.

B. The Retrofit must be tested using primary injection. Refer to Section 8 of the Instructions for the *Application of Digitrip RMS Retrofit Kits on Power Circuit Breakers* (Publication AD 33-855-4, September 2001), supplied with the Retrofit Kit, for detailed testing procedures and specifications. For test information specific to the Trip Unit, refer to the IL publication supplied with the Retrofit Kit (see the Pick List for the IL number).

C. While Section 8 of the *Instructions for the Application of Digitrip RMS Retrofit Kits on Power Circuit Breakers* provides the information necessary for testing the Breaker, please keep the following notes in mind when reviewing other sections of the publication.

⚠ CAUTION

WHEN ALL TESTING IS COMPLETE, THE TRIP UNIT MUST BE RESET. FAILURE TO DO SO MAY CAUSE THE BATTERY IN THE RATING PLUG TO RUN DOWN.

NOTES:

1. ***For All Kits Other Than 510 Basic:*** **If testing the Breaker with Short Delay or Ground Fault functions, be sure to either plug in the Cell Harness Assembly or use the Zone Interlock Shorting Plug. Failure to do so may result in shorter than expected trip times.**

2. **For 810 and 910 Kits Only: Without any power applied to the system (neither the 120 volt power supply nor the Aux. Power Module connected), plug the External Harness into the Cell Harness and check the impedance between COM 1 and COM 2. The impedance should be between one (1) and three (3) ohms. If the impedance is not within this range, trace the wiring and examine each connection to assure its integrity.**

   Confirm that the PowerNet communication wiring is correct by following the procedures detailed in Section 7.4 of the Instructions for the Application of Digitrip RMS Retrofit Kits on Power Circuit Breakers. Note that for 810 and 910 Kits, the impedance between COM 1 and COM 2 should be between one (1) and three (3) ohms.

   When testing is complete, disconnect the External Harness from the Cell Harness. Final External Harness connection will be performed later in the Retrofit Process.

STEP 14: MOUNTING THE CELL HARNESS

A. The Cell Harness is to be mounted in the Breaker Cell. The connector end is to be mounted on the right side of the Cell, in a location suitable for connection with the External Harness. The Terminal Blocks can be mounted anywhere space is available in the Cell as long as connection to the External Harness can be made.

B. Route the Cell Harness wiring to keep it away from any moving parts within the Cell Housing.

STEP 15: INSTALLING THE RETROFITTED BREAKER IN THE CELL

⚠ WARNING

DO NOT LEAVE THE BREAKER IN AN INTERMEDIATE POSITION IN THE SWITCHGEAR CELL. ALWAYS LEAVE IT IN THE CONNECTED, DISCONNECTED, OR (OPTIONAL) TEST POSITION. FAILURE TO DO SO COULD LEAD TO IMPROPER POSITIONING OF THE BREAKER AND FLASHOVER, CAUSING DEATH, SERIOUS PERSONAL INJURY, AND / OR PROPERTY DAMAGE.

NOTE: It is the responsibility of the Retrofitter to insure proper Breaker / Cell fit. When racking the Breaker into the Connected position, the Retrofitter MUST FOLLOW BOTH the manufacturer's instructions and the customer's safety standards and procedures for racking a Breaker into the Connected position.

A. With the Breaker in the Open position and the springs discharged, slowly rack the Breaker into the Connected position, making sure there is no interference or binding. The Breaker should rack smoothly and without mechanical interference between any Breaker and Cell parts. The Retrofitter will feel some resistance when the primary fingers connect onto the stabs of the Cell. This is normal.

However, if any unusual resistance is detected that could be abnormal interference between the Breaker and Cell parts, stop immediately and move the Breaker out of the Connected position. Examine what is causing the interference and correct the situation.

Digitrip Retrofit Kit Installation Components for Allis-Chalmers LA-1600 F Breaker RMS/R Retrofits

Step	Description		Qty.	Comment
Step 2	Under Voltage Trip Bar Spacers	9A10138G12	1	
	.313 Flat Washer Stl.		5	
	.250 Flat Washer Stl.		2	
Step 4	Reset Assembly Parts	9A10138G09	1	
	Reset Link Assembly		1	
	Wrist Pin		1	
	.375 Flat Washer Stl.		3	
	.375 Tru-Arc Retaining Ring		2	
	Roll Pin		1	
Step 5	Sensor Harness Mounting Parts	9A10138G05	1	
	Sensor Harness		1	
	.164-32 × .500 Lng. Screw Stl. P. H.		1	
	.164 Flat Washer Stl.		1	
	.164-32 Nut Hex Nylok		1	
	Cable Tie Mount Panduit		1	
	Wire Tie Nylon		1	
	Aux. CT Module	6503C59G__	1	
	Aux. CT Module Mounting Parts	9A10138G06	1	
	.190-16 × .750 Lng. Screw Stl. T. C.		1	
	.190-16 × .500 Lng. Screw Stl. T. C.		6	
	.190 Flat Washer Stl.		7	
	.190 Lock Washer Stl.		7	
	Spiral Cable Wrap		1	
	Cable Tie Mount Panduit		5	
	Mounting Pad - 1", Self-Adhesive		1	
	Wire Tie Nylon		6	
	PT Module	6502C82G01	1	
	Ring Terminal (.190, .250, .312, .375, .500	Each Size)	3	
	PT Module Mounting Parts	9A10138G10	1	
	PT Extension Harness		1	
	Insulation Barrier		1	
	.190-32 × .500 Lng. Screw Stl. Fil.		2	
	.190 Flat Washer Stl.		4	
	.190 Lock Washer Stl.		4	
	.190-32 Nut Hex Stl.		2	
	.138-32 × .500 Lng. Screw Stl. P. H.		2	Comm. Only
	.138 Flat Washer Stl.		4	
	.138 Lock Washer Stl.		2	
	.138-32 Nut Hex Stl.		2	
	PT Warning Label		1	
	Cable Tie Mount Panduit		1	
	Wire Tie Nylon		1	
	Auxiliary Switch Kit	9A10138G02	1	
	Microswitch		1	
	Mounting Bracket		1	

Digitrip Retrofit Kit Installation Components for Allis-Chalmers LA-1600 F Breaker RMS/R Retrofits

Step	Description		Qty.	Comment
Step 5 Cont.	.164-32 × .375 Lng. Screw Stl. Fil.		1	Comm. Only
	.164-32 × .250 Lng. Screw Stl. Fil.		1	
	.164 Flat Washer Stl.		2	
	.164 Lock Washer Stl.		2	
	.138-32 × 1.00 Lng. Screw Stl. Fil.		2	
	.138 Flat Washer Stl.		2	
	.138 Lock Washer Stl.		2	
Step 6	DTA Assembly	9A10138G33	1	
	DTA Mounting Parts	9A10138G08	1	
	.250-20 × .750 Lng. Hex Bolt Stl.		3	
	.250 Flat Washer Stl.		1	
	.250 Lock Washer Stl.		3	
	.250-20 Nut Hex Stl.		1	
	.250-20 × .750 Lng. Screw Fil.		2	
	Mounting Pad - 1", Self-Adhesive		3	
	Loc-Tite® 243		**1**	
Step 7	Loc-Tite® 243		1	From Step 6
Step 8	Trip Unit Box (Minibox)	6506C26G__	1	
	Cover		1	
	.164-32 × .250 Lng. Screw Fil.		4	
	Trip Unit	See Pick List	1	
	Rating Plug	See Pick List	1	
	Trip Unit / Minibox Mounting Parts	9A10138G07	1	
	Minibox Mounting Bracket		1	
	Minibox Insulation Barrier		1	
	Digitrip Retrofit Label		1	
	.164-32 × .500 Lng. Screw Nylon P. H.		1	
	.164-32 × .500 Lng. Screw Stl. P. H.		5	
	.164 Flat Washer Stl.		3	
	.164 Lock Washer Stl.		6	
	Cable Tie Mount Panduit		2	
Step 9	Auxiliary CT Harness	6502C84G02	1	
	External Harness	6502C83G__	1	
	PT Extension Harness	6502C85G01	1	From Step 5 Comm. Only
	External Harness Mounting Parts	9A10138G11	1	
	Mounting Pad - 1", Self-Adhesive		2	
	Wire Tie Nylon		12	
Step 10	Breaker Mounted CPT Kit	See Pick List	1	CPT Only
	MTE Transformer		1	
	HV Fused Wires		2	
	CPT Wires		1	
	Mounting Hardware Kit		1	
	.190-32 × .750 Lng. Screw Stl. Fil.		4	
	.190 Flat Washer Stl.		8	
	.190 Lock Washer Stl.		4	

Digitrip Retrofit Kit Installation Components for Allis-Chalmers LA-1600 F Breaker RMS/R Retrofits

Step	Description		Qty.	Comment
Step 10 Cont.	.190-32 Nut Hex Stl.		4	CPT Only
	Ring Terminal (.138, .190, .250, .312, .375, .500 -Each Size)		2	CPT Only
	Wire Tie Nylon		12	CPT Only
	Warning Label (208, 240, 480, & 575 Volt - Each)		1	CPT Only
	Finger-Safe Cover Kit	FSK4	1	CPT Only
	Cover (A, B, C, & D Each)		1	CPT Only
	.098-28 × .375 Lng. Screw Stl. Fil.		4	CPT Only
	CPT Mounting Parts	9A10138G20	1	CPT Only
	Mounting Bracket		1	CPT Only
	.190-32 × .500 Lng. Screw Stl. F. H.		2	CPT Only
	.190 Lock Washer Stl.		2	CPT Only
	.190-32 Nut Hex Stl.		2	CPT Only
	Mounting Pad - 1", Self-Adhesive		1	CPT Only
	Wire Tie Nylon		1	CPT Only
Step 11	Sensor	8184A38H01	3	
	Sensor Mounting Parts	9A10138G04	1	
	Spacer		6	
	.190-32 × 1.25 Lng. Screw Stl. Fil.		6	
	.190 Flat Washer Stl.		12	
	.190-32 Nut Hex Stl. Nylok		6	
Step 12	Spiral Cable Wrap		1	From Step 5
	Cable Tie Mount Panduit			From Previous Steps
	Mounting Pad - 1", Self-Adhesive			From Previous Steps
	Wire Tie Nylon			From Previous Steps
Step 14	Cell Harness	See Pick List	1	

NOTE: Due to the wide variety of Breakers and the multiple functions of the Retrofit components, some excess hardware may remain when the Retrofit is complete.

Table 5 Torque Values for General Mounting and Screw Size Conversion

Decimal Size (in)	*Standard Size*	*Torque (in-lbs)*	*Torque (ft-lbs)*
.112	4-40	10	0.8
.138	6-32	18	1.5
.164	8-32	36	3.0
.190	10-32	46	3.8
.250	1/4-20	100	8.3
.312	5/16-18	206	17.2
.375	3/8-16	356	29.7
.438	7/16-14	572	47.7
.500	1/2-13	856	71.3

Table 6 Torque Values for Copper BUS Connectors

Decimal Size (in)	*Standard Size*	*Torque (in-lbs)*	*Torque (ft-lbs)*
.250	1/4-20	60	5
.312	5/16-18	144	12
.375	3/8-16	240	20
.500	1/2-13	600	50

Fig. 69 Retrofit Components

A. Sensors
B. Trip Unit
C. Aux. CT Module
D. Direct Trip Actuator (DTA)
E. CPT Transformer
F. Rating Plug
G. HV Wires
H. Aux. CT Harness
I. Sensor Harness
J. External Harness
K. Cell Terminal Block
L. Aux. Switch
M. PT Module
N. Reset Link

Notes

Notes

We wish to thank you for purchasing the Digitrip Retrofit System. Digitrip Retrofit Kits are designed and manufactured in America with pride. All the components are engineered to fit the existing Circuit Breaker with little or no modifications to the existing Breaker. However due to the wide variety and vintage of Breakers in use today, an occasional problem may arise. Please contact us with any questions, comments or concerns.

Phone: **1-800-937-5487** Fax. (724) 779-5899

The instructions for installation, testing, maintenance, or repair herein are provided for the use of the product in general commercial applications and may not be appropriate for use in nuclear applications. Additional instructions may be available upon specific request to replace, amend, or supplement these instructions to qualify them for use with the product in safety-related applications in a nuclear facility.

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