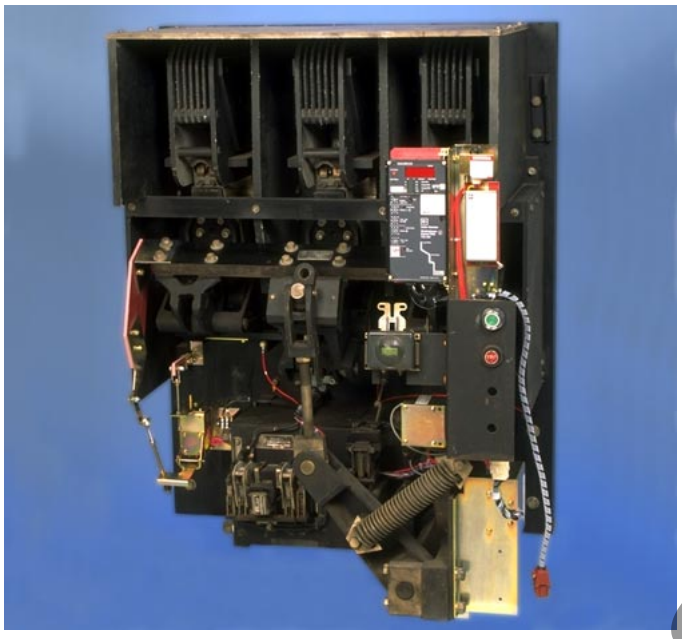
Digitrip Retrofit System for the ITE LG-3000 (Frameless) Circuit Breaker



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.**

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, IMPACC communications, energy monitoring capabilities, power factors, and harmonic content measurements.

The following table 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 the table. It is important that the Retrofitter understand 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.

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 33-855-1), 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 7.5 lbs.

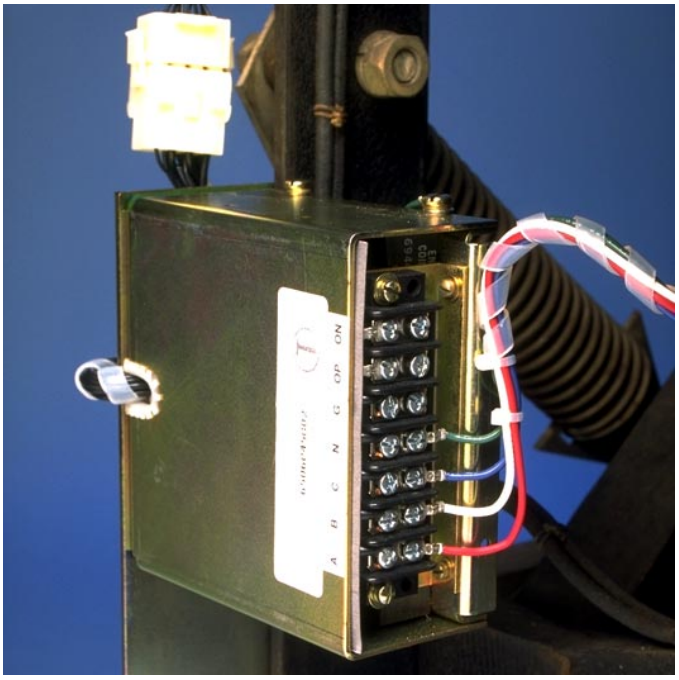
To begin the Retrofit Process, refer to the components list at the end of this manual. Lay out the components and hardware according to the steps outlined. The components and hardware will be used to complete each step in the Retrofit Process.

Step 2: Removing the Original Components

Follow the ITE LG-3000 (Frameless) Instruction Manual, originally supplied with the Breaker, to perform the following procedure.

A. Remove and scrap the original mechanical trip units and all associated mounting hardware.

Step 3: Installing the Auxiliary CT Module

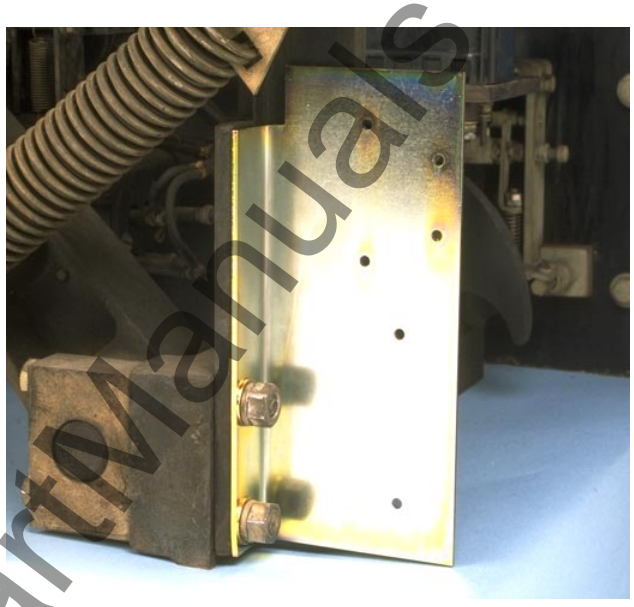


A. Assure that the Breaker is in the open position.

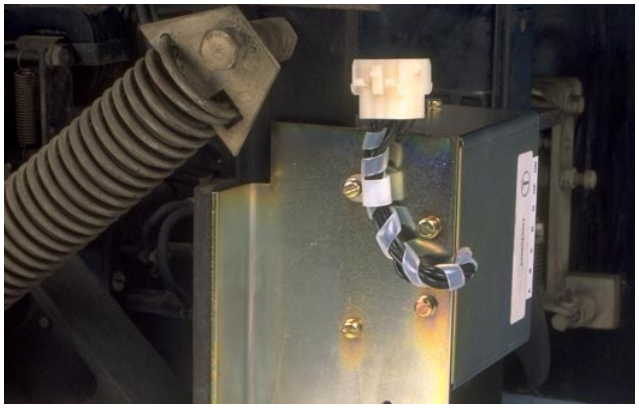
Note: Even with the Breaker in the open position, there may still be slight tension on the Main Charging Spring. Use a suitable brace between the Main Charging Arm and the front Breaker Frame to prevent the charging spring from releasing. Refer to the ITE LG-3000 (Frameless) Instruction Manual, originally supplied with the Breaker, for more information.

B. Remove and save the hardware securing the pivot block to the front Breaker Frame.

C. Mount the Aux. CT Module Mounting Bracket to the front Breaker Frame, as shown, using the original mounting hardware and the (2) .500" flat washers supplied.

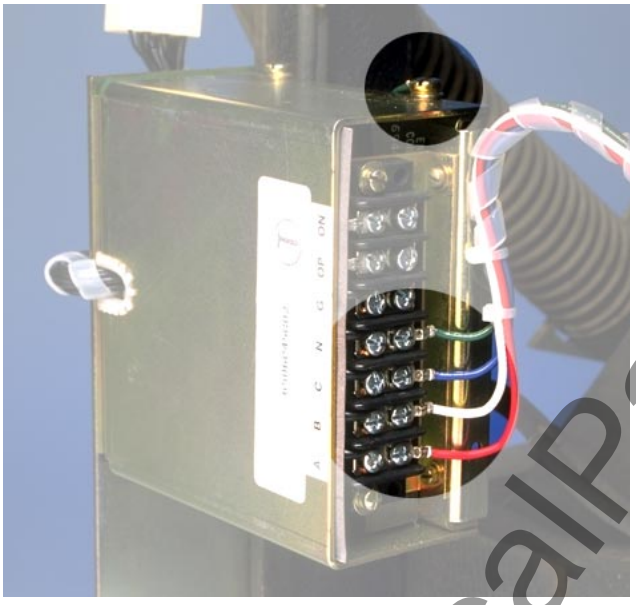


D. Remove the two (2) existing screws from the back of the Aux. CT Module. Cut away the grommet from the back of the Aux. CT Module but leave the grommet in place on the top of the Module. Align the holes in the back of the Aux. CT Module with the holes in the Aux. CT Module Mounting Bracket. Secure the Aux. CT Module to the bracket, as shown, using the (2) .190-16 × .500" and (2) .190-16 × .750" thread cutting screws, (4) lock washers, (4) flat washers, and (1) nylon wire clamp supplied. Note that the wire clamp is used to secure the Aux. CT Module pigtail to the Mounting Bracket.



E. Connect the Sensor Harness to the proper terminals on the Aux. CT Module. Refer to Section 12 of the Retrofit Application Data, supplied with the Retrofit Kit, for detailed wiring specifications.

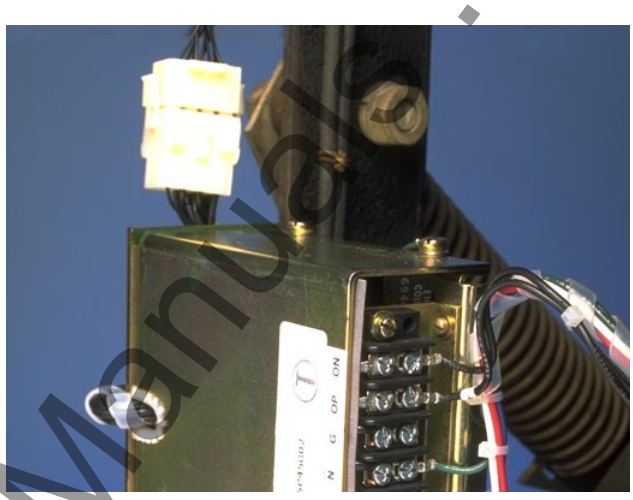
   Connect the green ground wire from the Sensor Harness (with the ring terminal) to the right side (top) of the Aux. CT Module, as shown, using the existing screw.



F. Route the Sensor Harness towards the back of the Breaker then through the existing hole in the middle of the Breaker Back Plate. Final Sensor Harness connection will be made later in the Retrofit Process.

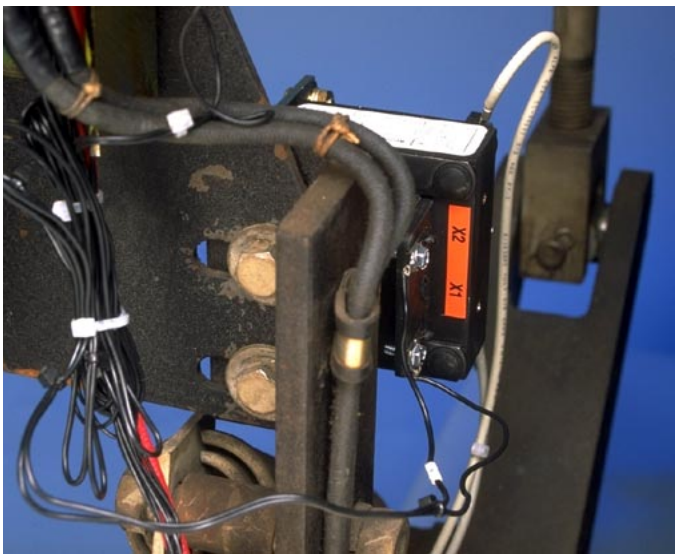
G. Connect the "+" wire of the DTA Extension Harness to the "OP" terminal of the Aux. CT Module and the unmarked wire to the "ON" terminal. Route the DTA Extension Harness through the inside of the Breaker, towards the left side, making sure it is clear of all moving parts within the Breaker. Final routing and connection of the DTA Extension Harness will be performed later in the Retrofit process.

H. Install the connector from the Aux. CT Harness into the receptacle on the Aux. CT Module pigtail.



For Kits Supplied with a Breaker Mounted CPT Only.

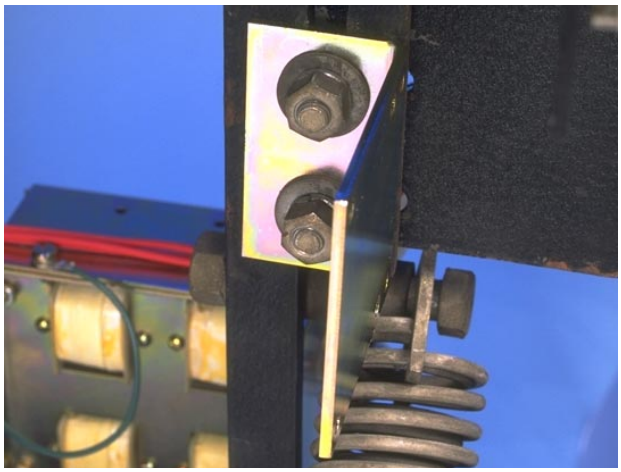
Step 4: Installing the Breaker Mounted CPT



Note: View from the right side of the Breaker.

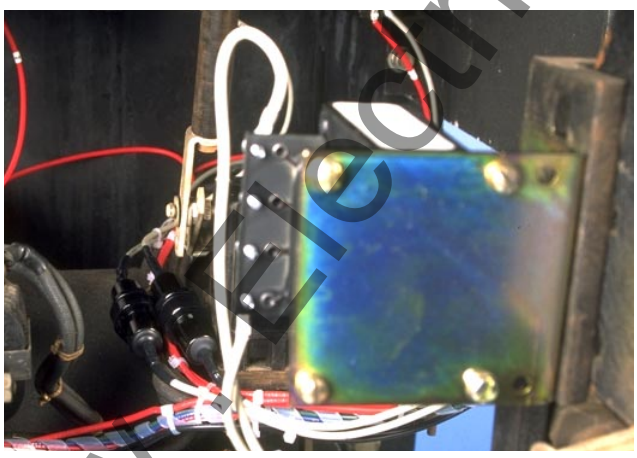
A. While holding the Breaker Control Panel Assembly in place, remove and save nuts and washers securing the Control Panel Assembly Mounting Bracket to the Breaker.

B. Align the two (2) large holes in the CPT Mounting Bracket with the bolts used to secure the Control Panel Mounting Bracket to the Breaker. Using the original washers and nuts, secure the CPT Mounting Bracket to the Breaker as shown.



C. Secure the CPT to the CPT Mounting Bracket, as shown, using the (4) .190-32 × .500" screws, (8) flat washers, (4) lock washers, and (4) nuts supplied.

Note: The CPT Harness terminals (X1 and X2) should be oriented towards the bolts securing the CPT Mounting Bracket to the Breaker.



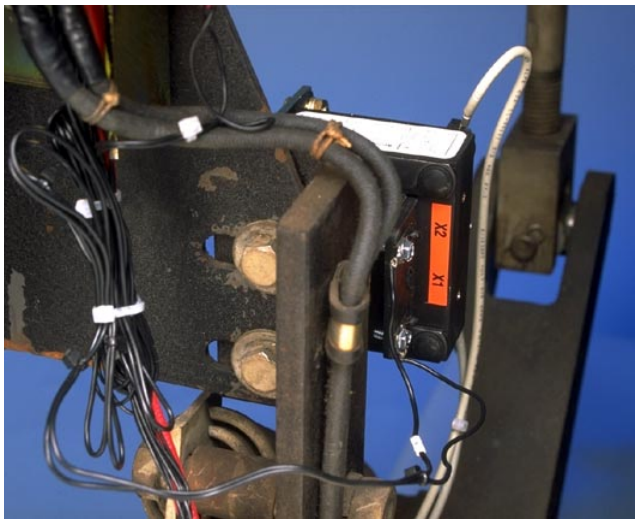
D. The CPT Harness will connect the CPT to the Trip Unit. Temporarily position the plug-in connection of the CPT Harness near the top center of the Breaker. Route the harness down through the Breaker to the bottom right corner to the CPT, making sure the Harness is clear of all moving parts within the Breaker. Cut the Harness to a suitable length for attachment to the CPT.

E. Strip .250" of insulation and attach a .138" ring terminal to each wire of the CPT Harness. Connect the wires to the X1 and X2 terminals of the CPT.

F. Attach the HV Wires to the CPT terminals to achieve the required voltage. (See the following table.)

Voltage Required	CPT Terminals Used
480 Volt Circuit	H1 & H4
240 Volt Circuit	H1 & H3
208 Volt Circuit	H1 & H2

Note: The terminals to which the HV wires are connected determine the voltage of the CPT which, in turn, limits the voltage of the Breaker. Verify that the line voltage of the circuit matches the CPT voltage BEFORE putting the Breaker into service.

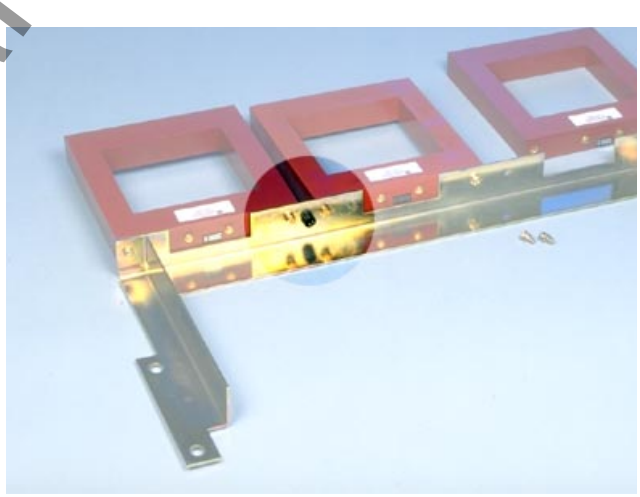


G. Attach the appropriate label for the Breaker in a clearly visible position. Three (3) labels are included with the CPT, one (1) for 480 Volt, one (1) for 240 Volt, and one (1) for 208 Volt systems.

H. The HV Wires will be cut to length and connected to the Breaker later in the Retrofit Process. Temporarily route the HV Wires out the front of the Breaker so they do not interfere with the Retrofit Process.

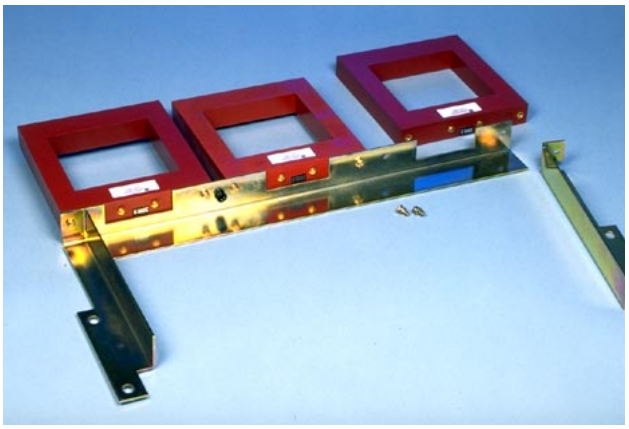
Step 5: Installing the Sensors

A. *For Kits Supplied with a Breaker Mounted CPT Only.* Install the grommet in the hole to the left of center of the Sensor Mounting Bracket.



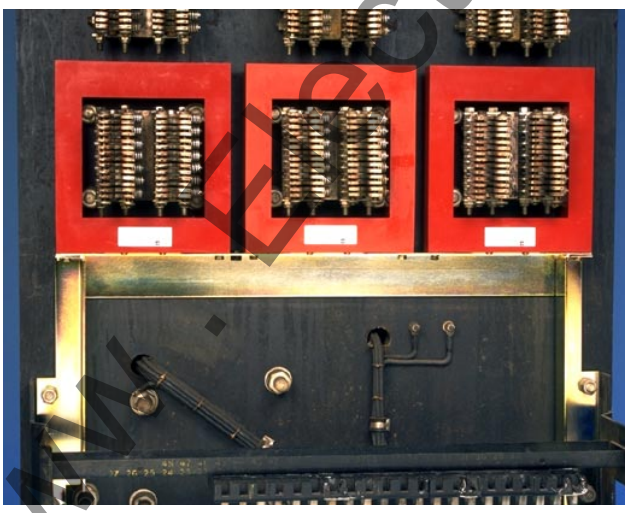
B. Align the Sensors, as shown, with the Sensor Mounting Bracket. Note that the Sensor Terminals are positioned in the cut-outs in the Mounting Bracket and the Sensor Labels face outward.

C. Secure the Sensors and the Sensor Support Brackets to the Sensor Mounting Bracket, as shown, using the (6) .250-20 × .625" bolts, (6) lock washers, and (6) flat washers supplied. Note that one of the bolts securing both the right and left Sensors also secure the Sensor Support Brackets to the Sensor Mounting Bracket.



D. Remove the nuts and washers securing the Breaker Secondary Contact Rack to the bottom rear of the breaker.

E. Align the four (4) holes in the Sensor Support Brackets with the bolts used to secure the Breaker Secondary Contact Rack. Secure the Sensor Assembly and Breaker Secondary Contact Rack to the Breaker, as shown, using the original washers and nuts just removed.

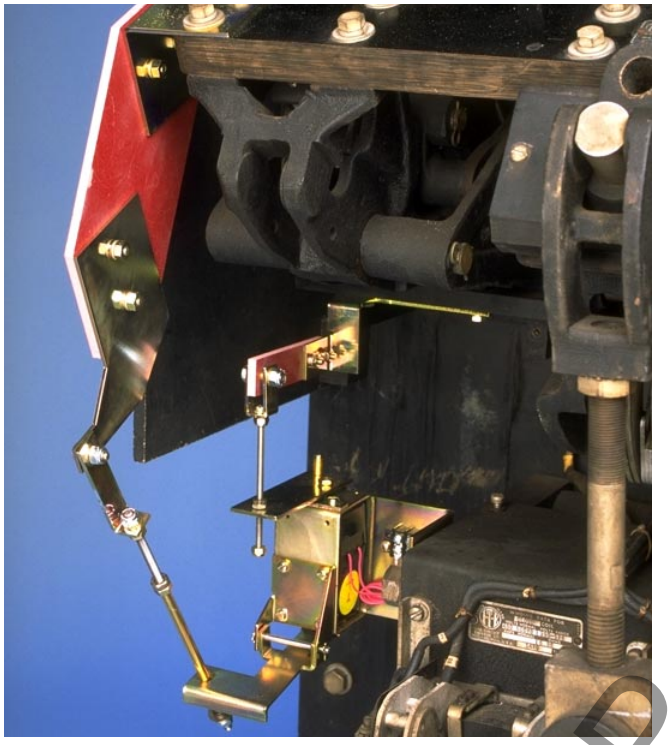


F. Connect the ring terminals of the Sensor Harness to the Sensors as shown. Refer to Section 12 of the Retrofit Application Data, supplied with the Retrofit Kit, for detailed wiring specifications.

Depending on the Sensors supplied with the Retrofit Kit, the following conventions apply.

Sensor Style No. 4A35786H01
X1-X2 = 3000 A

Step 6: Installing the DTA, Reset, and Trip Assemblies



A. Remove the two (2) nuts and lock washers securing the left side cover to the Closing Coil Case.

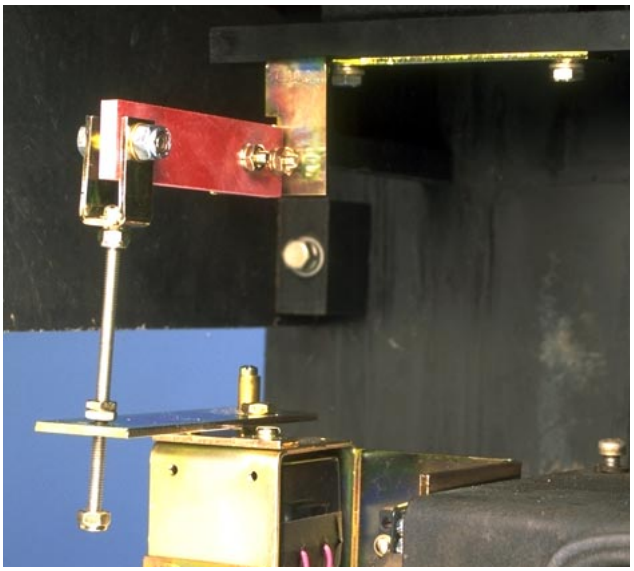
B. Align the two (2) large slots in the DTA Assembly Mounting Bracket with the bolts used to secure the side cover. Secure the DTA Assembly to the Closing Coil Case, as shown, using the original hardware just removed and the (2) .625" flat washers supplied.

C. Remove and scrap the two (2) bolts and washers on the left side of the Breaker Trip Bar.

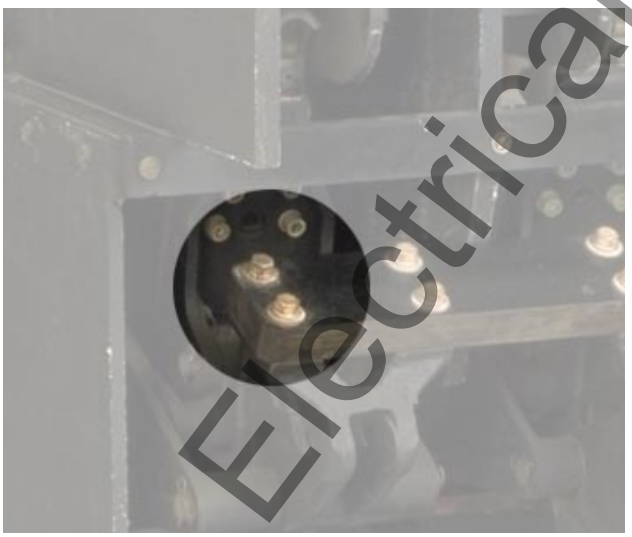
D. Remove and save the lock nut from the end of the Trip Shaft. Insert the Trip Shaft through the cut-out in the DTA Trip Arm. Reinstall the lock nut.

E. Align the holes in the Trip Assembly Mounting Bracket with the holes in the Breaker Trip Bar.

F. Mount the Trip Assembly to the Breaker Trip Bar, as shown, using the (2) .250-20 × 1.00" bolts, (2) lock washers, and (2) flat washers supplied.



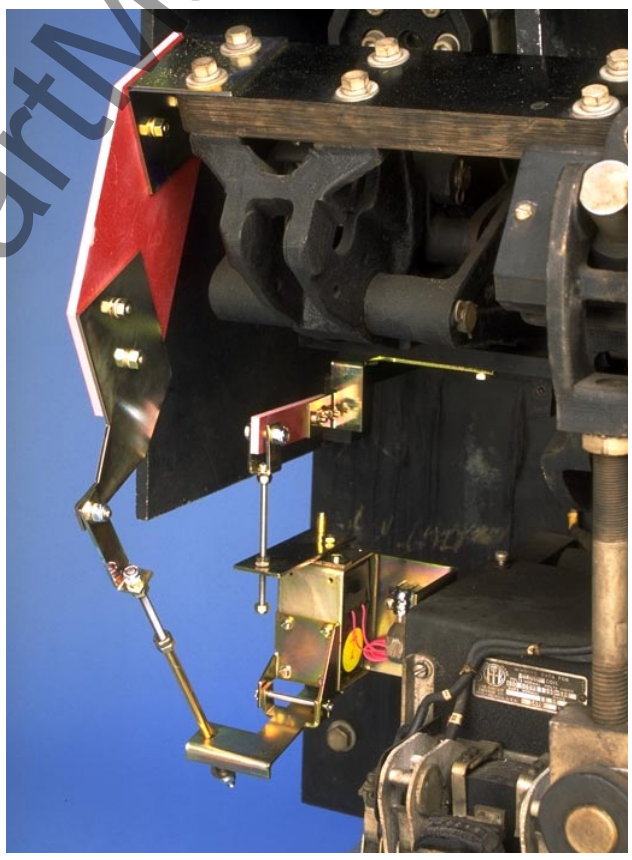
G. Remove and save the two (2) bolts and washers from the left side of the Breaker Cross Bar.



H. Remove and save the two (2) nuts, two (2) washers, and the spring from the Reset Shaft. While holding the brass spacer in place on the Shaft, insert the Reset Shaft into the cut-out in the DTA Reset Arm. Reinstall the original hardware on the Reset Shaft in the following order: washer, spring, adjusting nut, and lock nut.

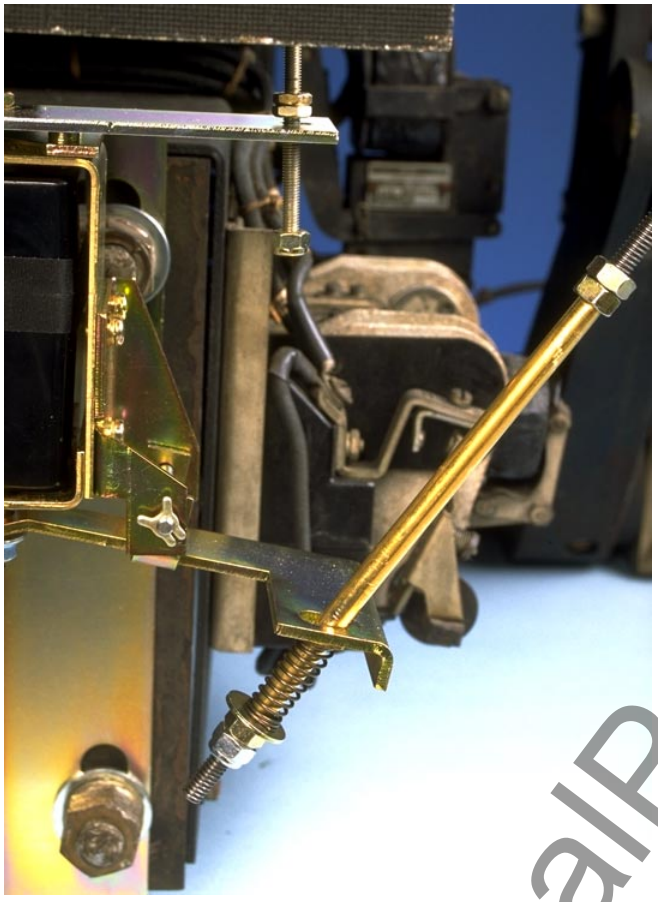
I. Align the holes in the Reset Assembly Mounting Bracket with the holes in the Breaker Cross Bar.

J. Mount the Reset Assembly to the Breaker Cross Bar, as shown, using the original hardware removed in Step 6-G.

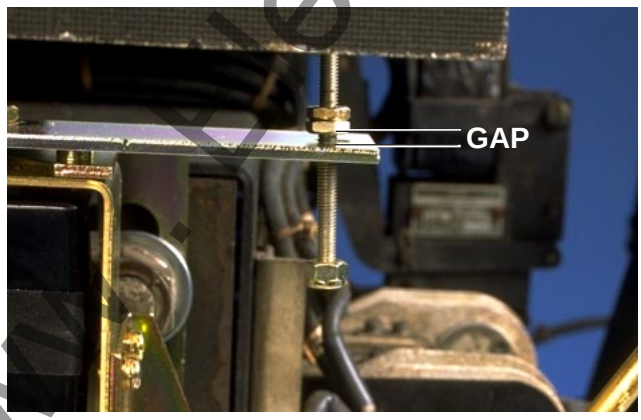


K. Connect the wire from the DTA Extension Harness marked with the “+” to the “+” terminal and the unmarked wire to the other terminal on the 2-Point Terminal Block mounted to the DTA Assembly.

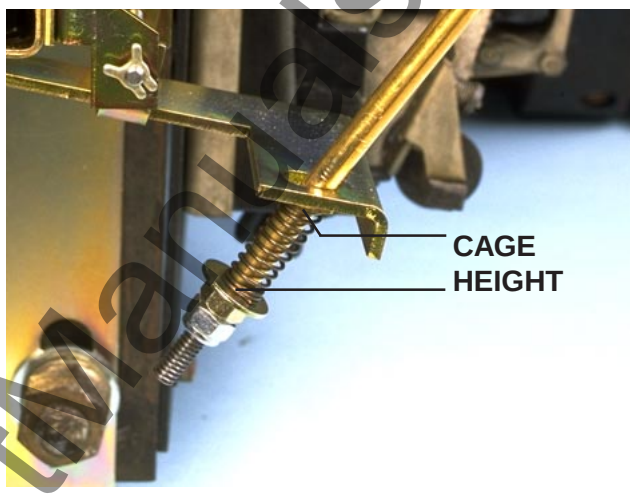
Step 7: Setting the Gap and Cage Height



A. With the Breaker in the Open position, loosen the lock nut (top nut) on the Trip Shaft. Turn the adjusting nut until a gap of .009" to .011" is achieved between the adjusting nut and the Trip Finger with the Trip Finger and Trip Assembly at rest. Tighten the lock nut.



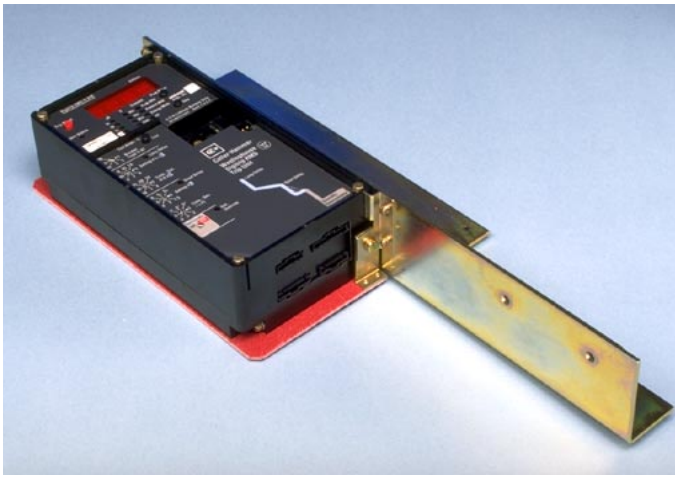
B. Loosen the lock nuts on the Reset Shaft, below and above the brass spacer. Turn the adjusting nuts until a cage height of approximately .73" to .77" at the center line of the Reset Shaft. Tighten the lock nuts.



Note: The Reset Shaft must not contact the "floor" when the Breaker is in the Closed position. Close the Breaker and check for a clearance of .50" between the end of the Reset Shaft and the "floor". If this clearance is not present, loosen and adjust the nuts on the top of the Reset Shaft until the .50" clearance is achieved. If this adjustment is required, the correct cage height must be verified and reset if necessary.

C. 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 or reset, it may be necessary to readjust the cage height. Make the necessary adjustments until the trips and resets are sure and positive each time.

Step 8: Preparing the Trip Unit Assembly

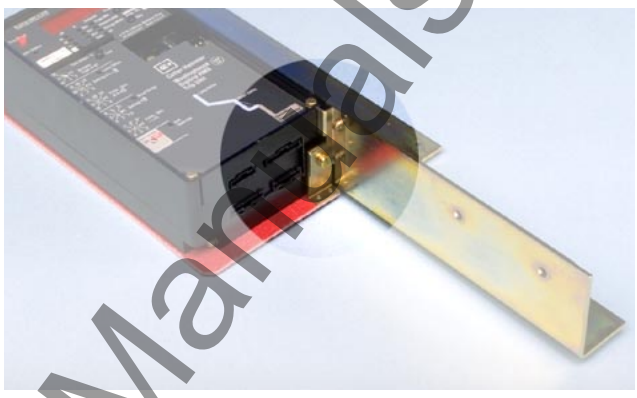


A. Secure the (2) Glass Poly Barrier Mounting Brackets to the Barrier, as shown, using the (4) .112-40 × .250" screws, (4) lock washers, and (4) flat washers supplied.

B. Secure the Trip Unit to the Trip Unit Mounting Bracket, as shown, using the (2) brass spacers, (2) .190-32 × 4.00" screws, (4) flat washers, (2) lock washers, and (2) nuts supplied. Note that the brass spacers are placed between the bottom of the Trip Unit and the Mounting Bracket.

C. Position the Trip Unit Support Clips on the sides of the Trip Unit so they "pinch" the Trip Unit in place. Secure the Trip Unit Support Clips to the Trip Unit Mounting Bracket using the (4) .138-32 × .375" screws, (4) lock washers, and (4) flat washers supplied.

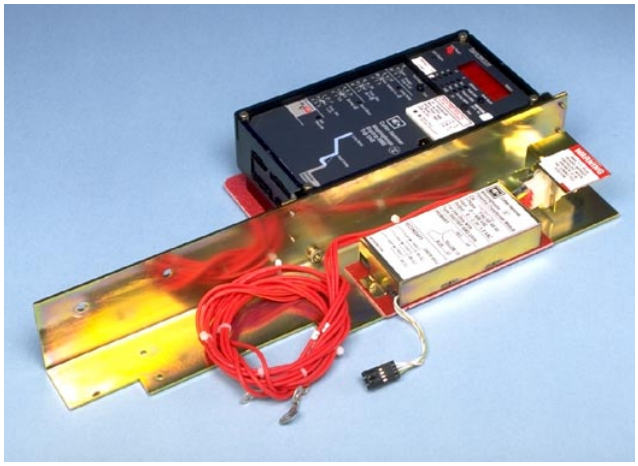
E. Align the Glass Poly Barrier Assembly with the holes in the Trip Unit Support Brackets. Secure the Glass Poly Barrier Assembly to the Trip Unit Assembly using the (2) .164-32 × .312" lock screws and (2) flat washers supplied.



For Kits Supplied with a PT Module Only.

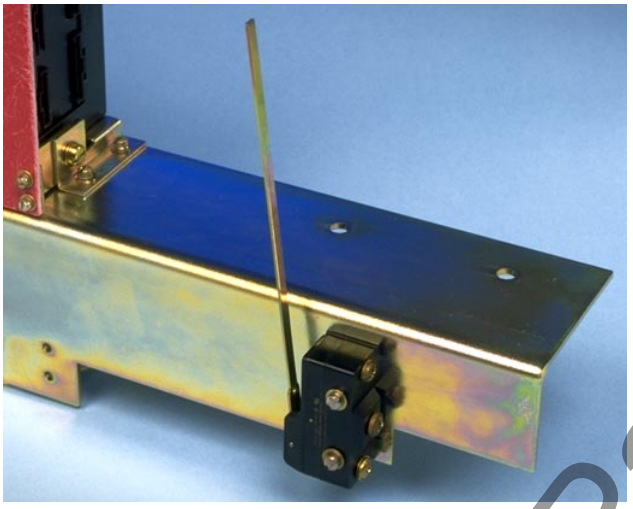
F. Align the Glass Poly Insulation and the PT Module with the holes in the Trip Unit Mounting Bracket, as shown. Secure the Glass Poly Insulation and the PT Module to the Trip Unit Mounting Bracket using the (2) .138-32 × .500" screws, (2) lock washers, and (4) flat washers supplied.

G. Install the supplied Warning Label over the existing Warning Label on the PT Module, as shown.



For Kits Supplied with an Auxiliary Switch Only.

H. Align the Microswitch with the holes in the Trip Unit Mounting Bracket. Secure the Microswitch to the Trip Unit Mounting Bracket, as shown, using the (2) .138-32 × 1.00 screws, (4) flat washers, (2) lock washers, and (2) nuts supplied.



Step 9: Installing the Trip Unit Assembly

A. While holding the Breaker Control Panel in place, remove the two (2) copper bolts, washers and nuts that secure the Control Panel Assembly to the Breaker Control Panel Assembly Mounting Bracket.

Note: The original copper bolts and hardware just removed can be used to mount the Trip Unit Assembly and Breaker Control Panel Assembly to the Control Panel Mounting Bracket in the next Steps. However, new mounting hardware is supplied that can be used in place of the original mounting hardware.

B. Align the holes in the Trip Unit Mounting Bracket and the Breaker Control Panel Assembly with the existing holes in the Control Panel Mounting Bracket. Secure the Trip Unit Assembly and the Breaker Control Panel Assembly to the Mounting Bracket, as shown, using either the original mounting hardware or the (2) .250-20 × 1.00" bolts, (4) flat washers, (2) lock washers, and (2) nuts supplied.

For Kits Supplied with a PT Module Only.

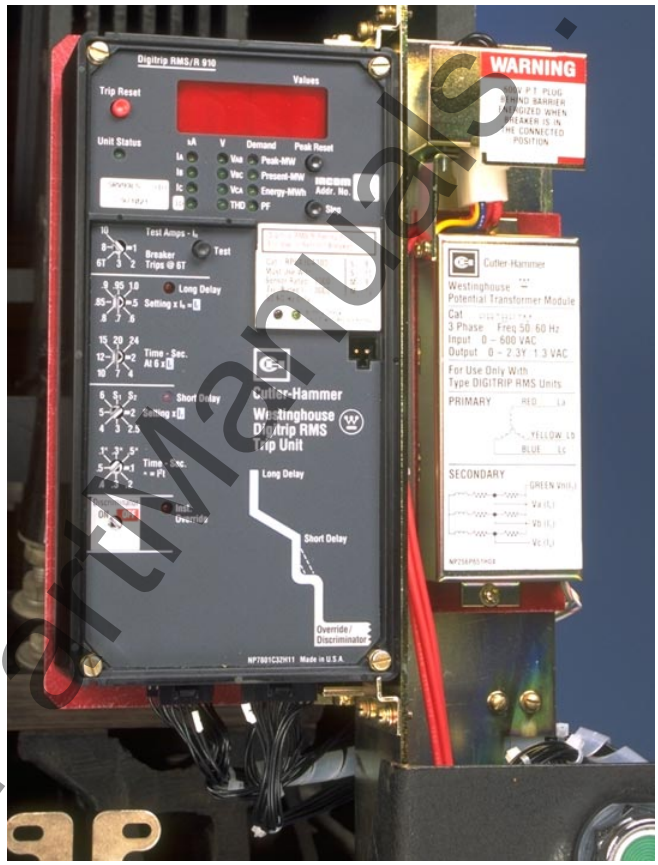
C. As the Trip Unit Assembly is being mounted, route the PT Wires down into the Breaker. Final PT Wire routing and connection will be performed later in the Retrofit Process.

For Kits Supplied with an Auxiliary Switch Only.

D. As the Trip Unit Assembly is being mounted, assure that the Aux. Switch Arm is positioned as shown.

E. Remove the Trip Unit Cover and install the Rating Plug. Replace the cover.

Step 10: Final Connection of the Harnesses and Wiring

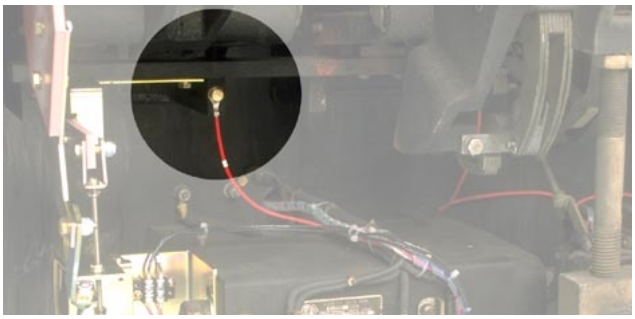


A. *For Kits Supplied with a PT Module Only.* Refer to Section 7-3, Power Flow Convention of the Retrofit Application Data, supplied with the Retrofit Kit for additional wiring information and to verify the Phase Convention used on this Breaker Application.

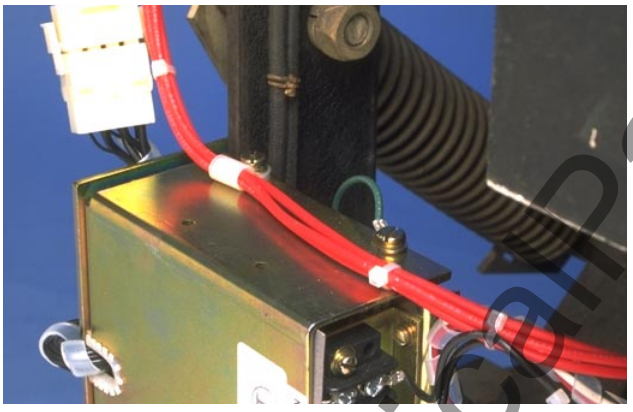
Note: Before cutting the PT Wires, verify the Phase Convention used on the Breaker Application.

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

Connect the wires to the bottom of each Phase Frame using the (3) .250-20 × .375" bolts, (3) lock washers, and (3) flat washers supplied.

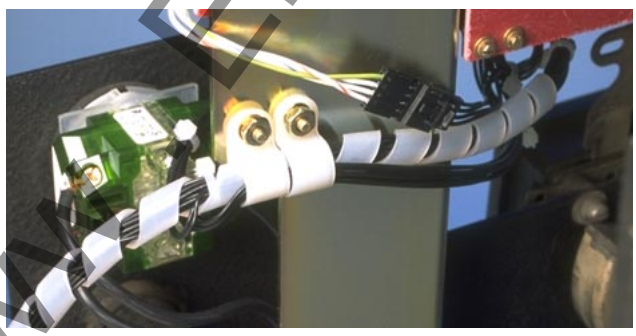


Use the wire clamp provided and the existing screw to secure the PT Wires to the top of the Aux. CT Module.

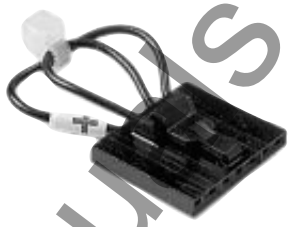


B. Connect the External Harness to the Trip Unit.

C. Secure the External Harness to the Trip Unit Mounting Bracket, as shown, using the (2) wire clamps, (2) .138-32 × .500" screws, (4) flat washers, (2) lock washers, and (2) nuts supplied.



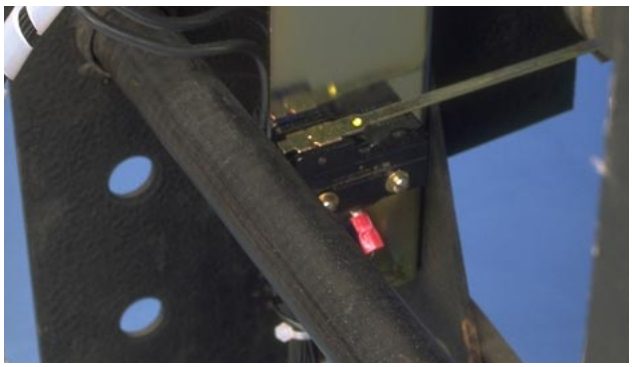
Note: For 510 Basic Retrofit Kits, the External Harness is the plug pictured here. It is to be plugged into the right side of the Trip Unit.



D. Connect the Aux. CT Harness to its receptacle on the Trip Unit.

E. *For Kits Supplied with a PT Module Only.* Connect the PT Harness to the External Harness. Plug the other end into the receptacle on the PT Module.

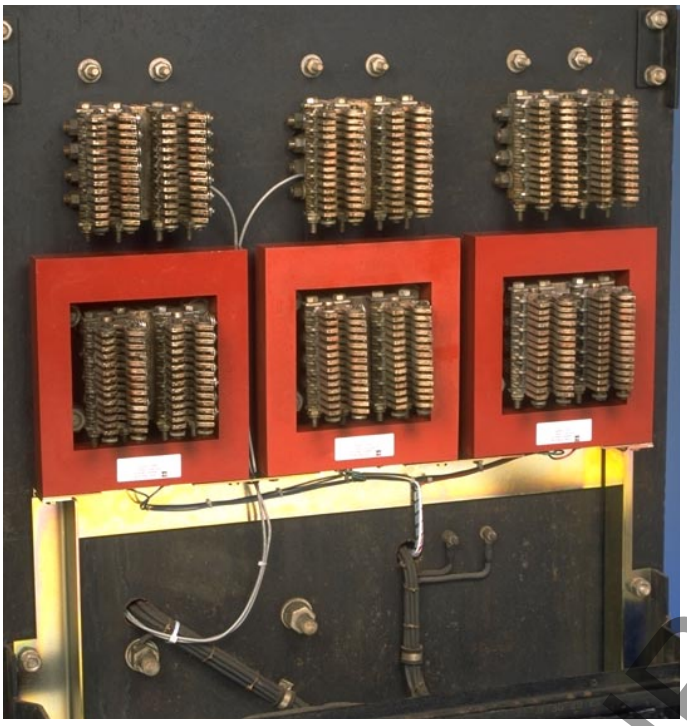
F. *For Kits Supplied with an Auxiliary Switch Only* Connect the External Harness to the Auxiliary Switch by routing the two (2) wires (with ring terminals) from the External Harness to the Auxiliary Switch. Connect one wire to the normally “Closed” terminal and the other wire to the “Common terminal.”



G. Use the wire ties and wire clamps provided to dress all wires and harnesses to keep them away from any moving parts within the Breaker.

For Kits Supplied with a Breaker Mounted CPT Only.

Step 11: Connecting the HV Wires

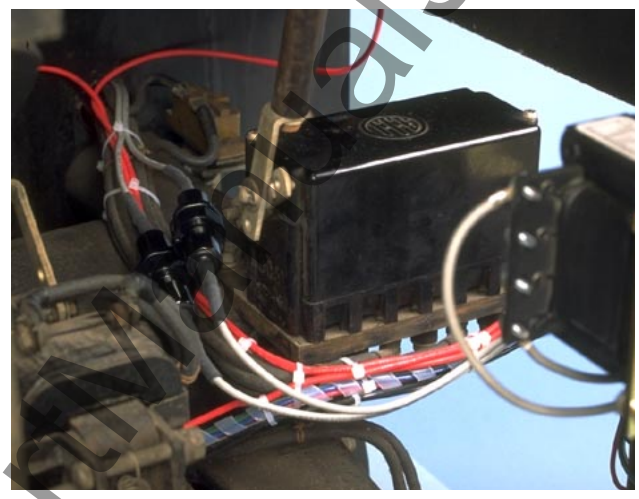


Note: The power convention of the ITE LG-3000 (Frameless) Breaker is normally *Top to Bottom*, meaning the Top Breaker Phase Frames are on the *Line Side* of the Breaker and the Bottom Breaker Stabs are on the *Load Side*.

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 Phase Frames. In this case, the same bolts used to attach the PT Wires to the Phase 1 and 2 or Phase 2 and 3 Phase Frames can be used to mount the HV 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 connections can be made to the correct Finger Clusters or Phase Frames.

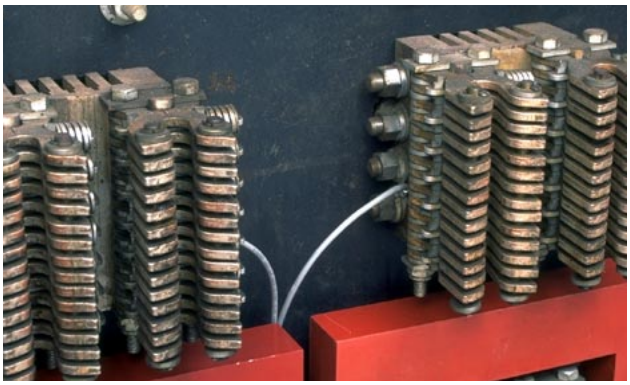
A. Assure that the HV Fuses are in an accessible location, then feed the HV Wires through the existing hole near the bottom right corner of the Breaker Back Plate. Using the wire ties provided, secure the HV Wires to prevent movement.



B. Route the HV Wires through the grommet in the Sensor Mounting Bracket, then towards the top Phase 1 & 2 or Phase 2 & 3 Breaker Stabs.

C. Cut the HV Wires to the appropriate length for attachment to the appropriate top Breaker Stabs. Strip .250" from each HV Wire and attach a .250" ring terminal.

D. Using the existing hardware that secures the Finger Clusters to the top Breaker Stabs, connect the HV Wires to the Phase 1 & 2 or Phase 2 & 3 Breaker Stabs.



E. Remove the External Harness plug installed in the Trip Unit. Insert the black plug of the CPT Harness into the same receptacle in the Trip Unit. Reinsert the External Harness Plug just removed into the female receptacle on the CPT Harness.

Step 12: Testing the Breaker

A. Measure the force necessary to trip the Breaker at the point where the Trip Shaft contacts the Trip Finger on the DTA. The force necessary to trip the Breaker **MUST NOT EXCEED THREE** (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 33-855-1, June, 1997), 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. **Publication AD 33-855 was created specifically for the "hundred" series (500, 600, 700, etc.) Retrofit Kits. Therefore certain sections and figures do not apply to the "ten" series (510, 610, 810, etc.) Retrofit Kits. Specifically, these are Sections 13 and 14, as well as Figures 3-2, 3-3, and 3-4.**

2. ***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.**

3. ***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 IMPACC 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 in Step 13.

For Kits Supplied with a Cell Harness Only.

Step 13: 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 front 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 moveable parts within the Cell Housing.

Step 14: 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 the ITE LG-3000 Frameless Series Breaker

Step	Description	Style No.	Qty.	Comment
Step 3	Aux. CT Module	6503C59G__	1	
	Aux. CT Module Mounting Parts	4A35792G10	1	
	Mounting Bracket		1	
	.500 Flat Washer		2	
	.190-16 × .750 Lng. Screw T.C.		2	
	.190-16 × .500 Lng. Screw T.C.		2	
	.190 Flat Washer Stl.		4	
	.190 Lock Washer Stl.		4	
	Wire Clamp Nylon		1	
	Sensor Harness Parts	4A35792G12	1	
	Sensor Harness		1	
	DTA Extension Harness		1	
	Wire Tie Nylon		10	
Step 4	Breaker Mounted CPT Kit	8259A91G05	1	
	Ring Terminals (.138, .190, .250, .312, .375, .500 - Each Size)		2	
	CPT Mounting Parts	4A35792G20	1	
	CPT Mounting Bracket		1	
	.190-32 × .500 Lng. Screw Fil.		4	CPT Only
	.190 Flat Washer Stl.		8	
	.190 Lock Washer Stl.		4	
	.190-32 Nut Hex Stl.		4	
	Grommet		1	
Step 5	Sensors	See Pick List	3	
	Sensor Mounting Parts	4A35792G04	1	
	Sensor Mounting Bracket		1	
	Support Bracket L.H.		1	
	Support Bracket R.H.		1	
	.250-20 × .625 Lng. Hex Bolt		6	
	.250 Flat Washer Stl.		6	
	.250 Lock Washer Stl.		6	
	Grommet (From Step 4)		1	
Step 6	DTA Assembly	4A35792G33	1	
	DTA Mounting Parts	4A35792G09	1	
	.625 Flat Washer Stl.		2	
	Trip Finger Parts	4A35792G08	1	
	Trip Finger Assembly		1	
	.250-20 × 1.00 Lng. Hex Bolt		2	
	.250 Flat Washer Stl.		2	
	.250 Lock Washer Stl.		2	
	DTA Reset Parts	4A35792G07	1	
	Reset Assembly		1	

Digitrip Retrofit Kit Installation Components for the ITE LG-3000 Frameless Series Breaker (Continued)

Step	Description	Style No.	Qty.	Comment
Step 8	Trip Unit		1	See Pick List
	Trip Unit Assembly Parts	4A35792G05	1	
	Mounting Bracket		1	
	Insulation Barrier		1	
	Support Clip L.H.		1	
	Support Clip R.H.		1	
	Insulation Barrier		1	
	Mounting Clip		2	
	Spacer Brass		2	
	.190-32 × 4.00 Lng. Screw		2	
	.190 Flat Washer Stl.		4	
	.190 Lock Washer Stl.		2	
	.190-32 Nut Hex Stl.		2	
	.164-32 ×.312 Screw Pan Lock		2	
	.164 Flat Washer Stl.		2	
	.138-32 × .375 Lng Screw Fil.		4	
	.138 Flat Washer Stl.		4	
	.138 Lock Washer Stl.		4	
	.112-40 × .250 Lng. Screw Fil.		4	
	.112 Flat Washer Stl.		4	
	.112 Lock Washer Stl.		4	
	PT Module	6502C82G01	1	
	Ring Terminals (.190, .250, .312, .375, .500 - Each Size)		3	
	PT Module Mounting Parts	4A35792G11	1	
	Insulation Barrier		1	
	Warning Label		1	
	.138-32 × .500 Lng. Screw		2	
	.138 Flat Washer Stl.		2	
	.138 Lock Washer Stl.		2	
	.250-20 × .375 Lng. Hex Bolt		3	Comm. Only
	.250 Flat Washer Stl.		3	
	.250 Lock Washer Stl.		3	
	Wire Clamp Nylon		1	
	Aux. Switch Kit	4A35792G02	1	
	Microswitch		1	
	.138-32 × 1.00 Lng. Screw Fil.		2	
	.138 Flat Washer Stl.		4	
	.138 Lock Washer Stl.		2	
	.138-32 Nut Hex Stl.		2	

Digitrip Retrofit Kit Installation Components for the ITE LG-3000 Frameless Series Breaker (Continued)

Step	Description	Style No.	Qty.	Comment
Step 9	Rating Plug		1	See Pick List
	Trip Unit Mounting Parts	4A35792G06	1	
	.250-20 × 1.00 Lng. Hex Bolt		2	
	.250 Flat Washer Stl.		4	
	.250 Lock Washer Stl.		2	
	.250-20 Nut Hex Stl.		2	
Step 10	External Harness	6502C83G__	1	
	External Harness Parts	4A35792G13	1	
	.138-32 × .500 Lng. Screw Fil.		2	
	.138 Flat Washer Stl.		4	
	.138 Lock Washer Stl.		2	
	.138-32 Nut Hex Stl.		2	
	.250-20 × .375 Lng. Hex Bolt (From Step 8)		3	Comm. Only
	.250 Flat Washer Stl. (From Step 8)		3	
	.250 Lock Washer Stl. (From Step 8)		3	
	Wire Clamp Nylon		2	
	Wire Clamp Nylon		2	
	Wire Tie Nylon		6	
Step 13	Cell Harness	6503C57G__	1	Except 510 Basic

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

Torque Values for General Mounting

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

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

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

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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