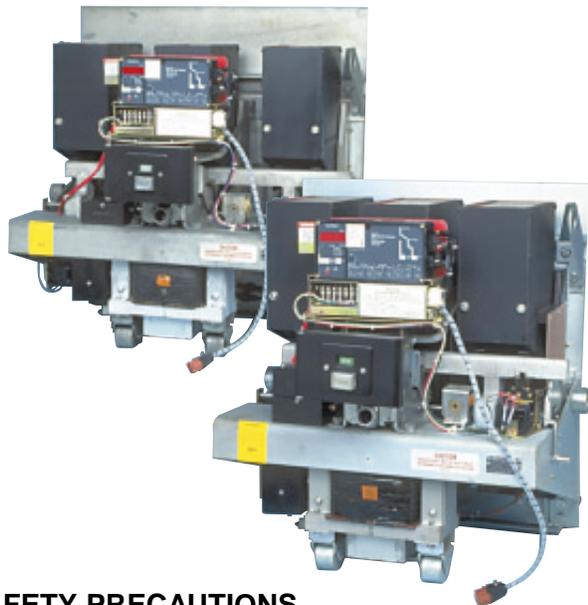




Digitrip Retrofit System for the Westinghouse DB-75 & DB-100 Series Breakers

(Includes Single Position DB-75 / 100; Three Position, Spring Operated DB-75 / 100;
Electrically Operated DB-75 / 100)



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, PowerNet 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.

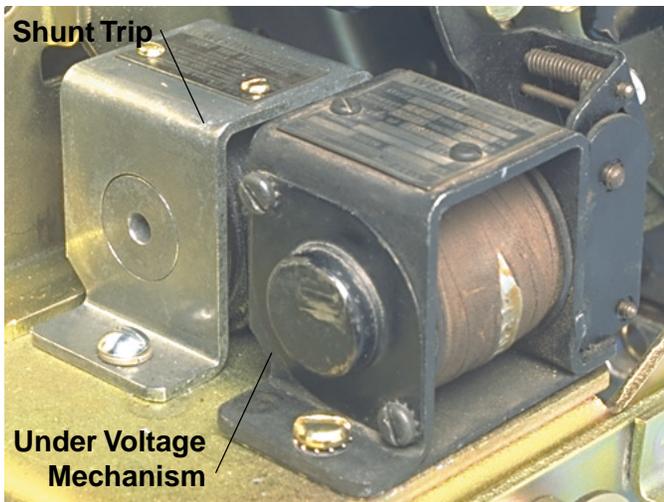
Throughout the Retrofit process, refer to the Torque Tables at the back of this manual for specific torque values.

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					

NOTE: This Retrofit Kit IS NOT DESIGNED for use on any model of DB-75 or DB-100 Breaker equipped with a Bell Alarm or BOTH a Shunt Trip AND an Under Voltage Mechanism. If the Retrofitter attempts to modify the Breaker to accommodate this Retrofit Kit, or modify this Retrofit Kit to accommodate the Breaker, those actions will be at the sole responsibility and liability of the Retrofitter.

For more information, contact Cutler-Hammer at 1-800-937-5487.



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 bench.

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. 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



Refer to the Instruction Manual originally supplied with the Breaker to perform the following procedures.

- A. Remove the bottom Finger Clusters and set them aside for installation later in the Retrofit process.

For Breakers Equipped with the Original Electromechanical Trip Units.

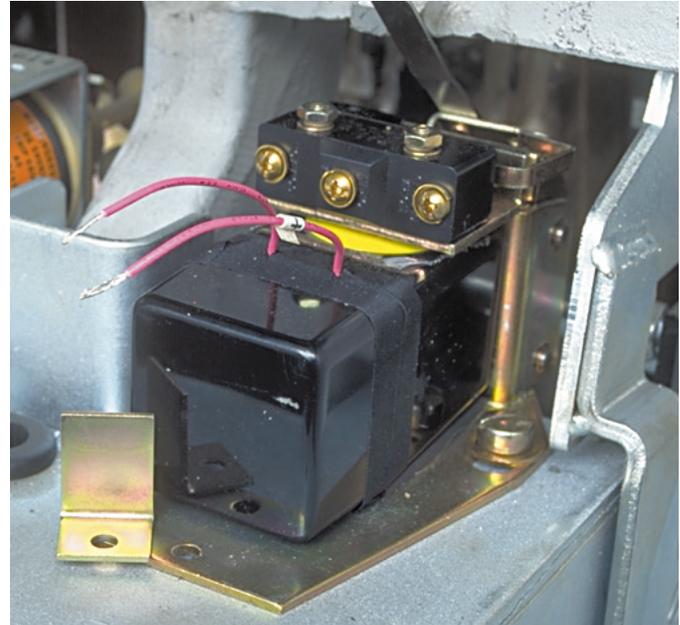
- B. Remove the six (6) .500-13" bolts directly above each of the three bottom Breaker Stabs. As the bolts are removed, the original Electromechanical Trip Units will drop free. Scrap the Trip Units and all mounting hardware.
- C. Remove and scrap the three Electromechanical Trip Paddles from the Breaker Trip Bar. This will reduce the force required to trip the Breaker.

For Breakers Equipped with an Amptector or Other Trip System.

- B. Remove and scrap the Trip Mechanisms and all associated wiring, mounting brackets, and hardware.

Step 3: Installing the DTA Assembly

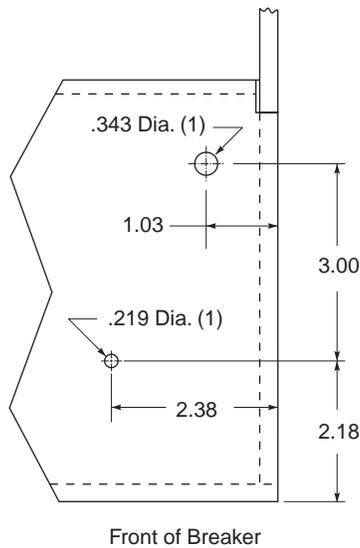
NOTE: If a Breaker is equipped with a Bell Alarm or BOTH a Shunt Trip AND an Under Voltage Mechanism, it is the responsibility of the Retrofitter to relocate or eliminate them when mounting the DTA.



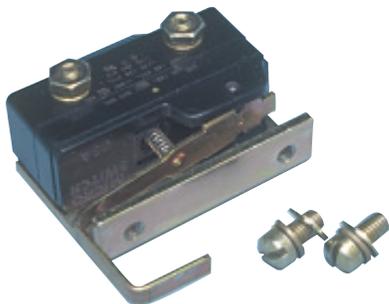
- A. Install the Trip Finger on the Breaker Trip Bar using (1) .250-20 x .750" carriage bolt, (1) flat washer, (1) lock washer, and (1) nut provided. The center of the Trip Finger should be 2.62" from the outer right side of the Breaker.

- B. Using Drilling Plan “A”, drill two (2) holes using a .343" Drill Bit and a .219" Drill Bit in the right side of the Breaker Platform. Care should be taken to insure that no drill shavings fall into the Breaker.

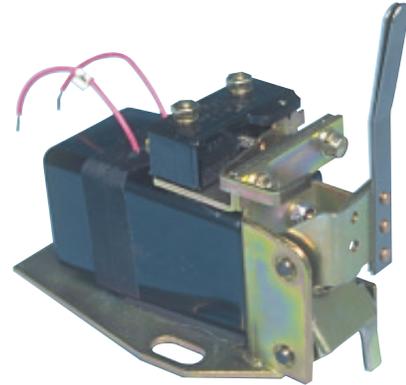
Drilling Plan “A”



- C. *For Kits Supplied with an Auxiliary Switch Only.* Align the Microswitch with the holes in the Aux. Switch Mounting Bracket, as shown, then secure the Microswitch to the bracket using the (2) .138-32 x 1.00" flat head screws, (2) flat washers, (2) lock washers, and (2) nuts provided.



- D. Align the Aux. Switch Assembly with the holes in the DTA Assembly. Secure the Aux. Switch Assembly to the DTA Assembly, as shown, using the (2) .190-32 x .375" screws, (2) flat washers, and (2) lock washers provided.



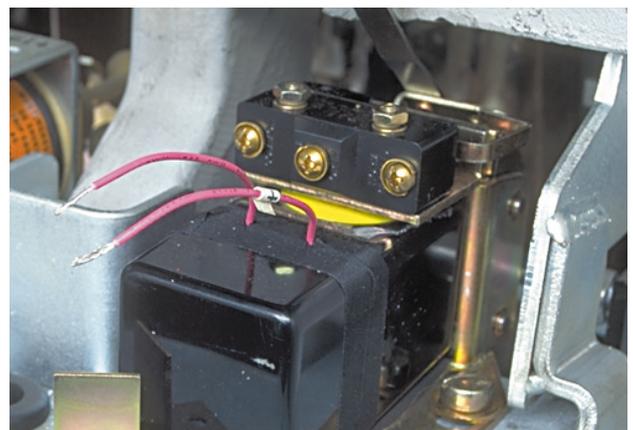
- E. Insure that the Aux. Switch moves to the “Closed” position when the DTA Reset Arm is moved towards the DTA.



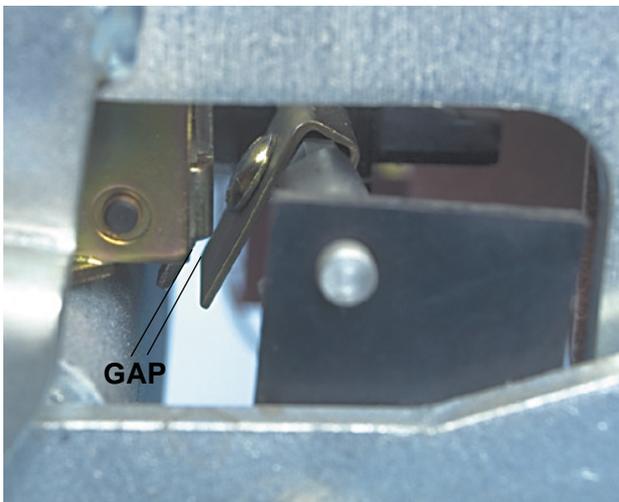
WARNING

The following steps must be performed with the Breaker in the CLOSED position. Guard against the Breaker unintentionally OPENING during these steps. Keep hands and fingers away from moving parts within the Breaker.

- F. CLOSE the Breaker. With the Breaker in the CLOSED position, align the DTA Assembly with the holes drilled in Step 3-B. The DTA Reset Arm should be under the Breaker Cross Bar.

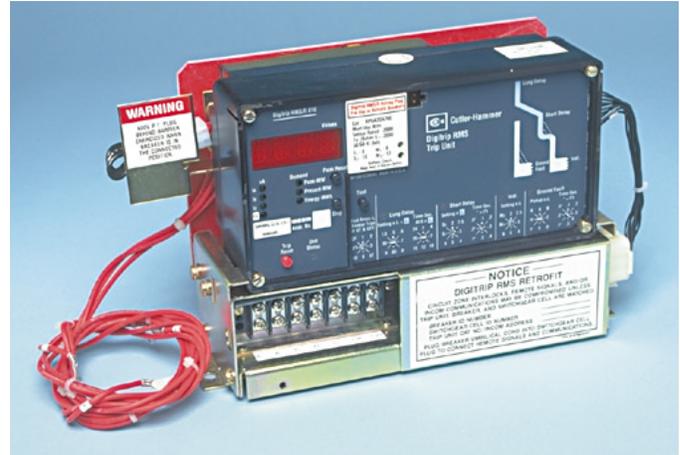


- G. Mount the DTA Assembly to the right side of the Breaker Platform using the DTA Mounting Clip, (1) .190-32 x .750" screw, (2) flat washers, (1) lock washer, and (1) nut, and the (1) .312-18 x 1.00" screw, (1) lock washer and (1) flat washer and (1) nut provided.
- H. Check the gap between the DTA Trip Tab and the Trip Finger installed on the Breaker Trip Bar in Step 3-A. The gap should be between .06 and .09". If not, trip the Breaker and bend the DTA Trip Tab. Close the Breaker again and check the gap, repeat the above if necessary.



- I. Return the Breaker to the OPEN position.

Step 4: Preparing the Trip Unit Assembly



- A. Attach the Glass Poly Insulation Barrier to the back of the Aux. CT Module, as shown, using the (2) .190-32 x .500" screws, (2) lock washers, and (2) flat washers supplied.

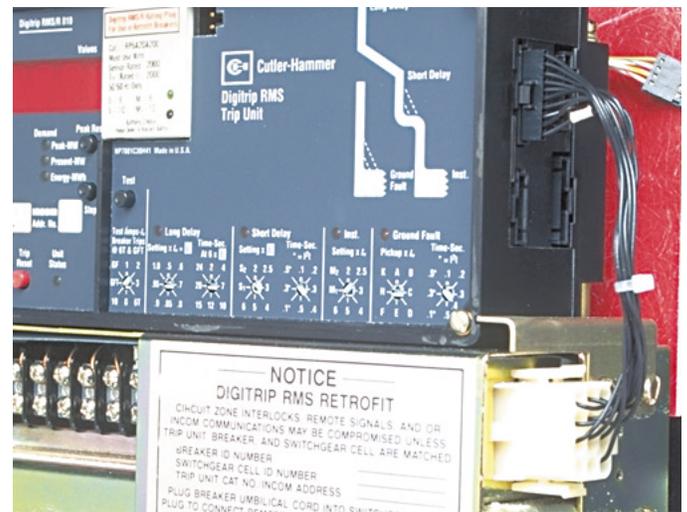


- B. For Kits Supplied with a PT Module Only. Mount the PT Module to the Glass Poly Insulation Barrier, as shown, using the (2) .138-32 x .500" screws, (4) flat washers, (2) lock washers, and (2) nuts supplied.



- E. Fully tighten the 4.00" screws that secure the Trip Unit to the top of the Aux. CT Module.
- F. Remove the cover from the Trip Unit and install the Rating Plug. Replace the cover.
- G. Install the Digitrip Nameplate to the top of the Trip Unit.
- H. Connect the Aux. CT Harness to the Trip Unit and Aux. CT Module.

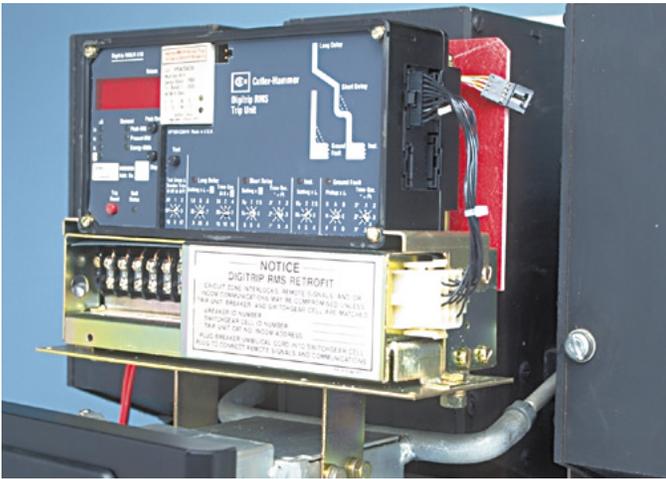
- C. Install the Trip Unit on the top of the Aux. CT Module, as shown, using the (2) .190-32 x 4.00" screws, (2) lock washers, and (2) flat washers supplied. Note that the brass spacers are placed between the bottom of the Trip Unit and the top of the Aux. CT Module. Do not completely tighten the screws at this time.



- D. Mount the Trip Unit Mounting Brackets to the sides of the Aux. CT Module, as shown, using the (4) .190-32 x .500" screws, (4) lock washers, and (4) flat washers supplied, so they align with the slots and "pinch" the Trip Unit in place.

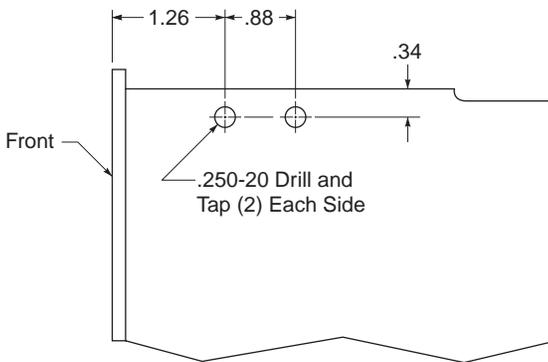


Step 5: Installing the Trip Unit Assembly

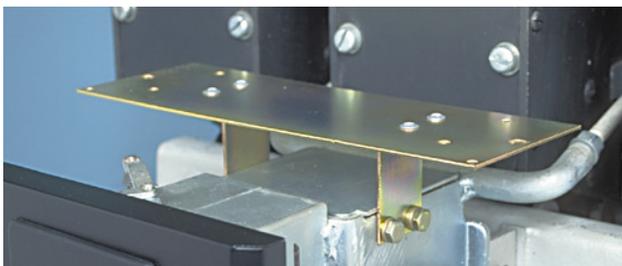


- A. Using Drilling Plan “B”, drill and tap two (2) .250-20” holes on each side of the Breaker Mechanism. Insure that no drill shavings fall into the Breaker.

Drilling Plan “B”

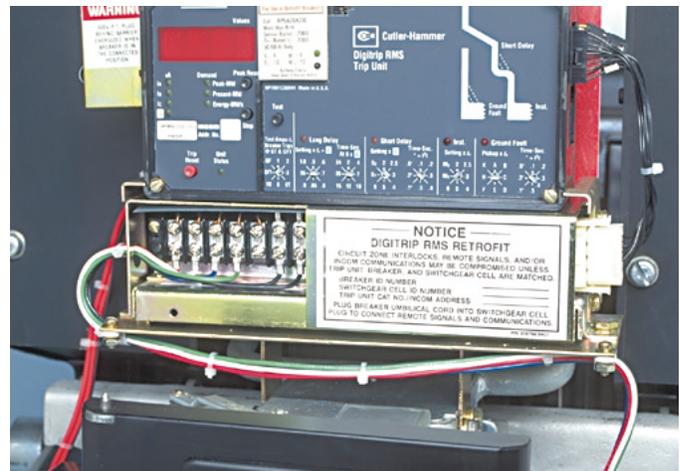


- B. Secure the Trip Unit Mounting Bracket to the Breaker Mechanism using the (4) .250-20 x .500” Bolts, (4) lock washers, and (4) flat washers supplied.



- C. Secure the Trip Unit Assembly to the Trip Unit Mounting Bracket with the (2) .250-20 x .500” bolts, (2) .250” flat washers, (2) .250” lock washers, and (2) .250-20 nuts supplied.
- D. *For Kits Supplied with a PT Module Only.* Temporarily route the PT Wires towards the left side then down into the Breaker. The PT Wires will be connected later in the Retrofit Process.

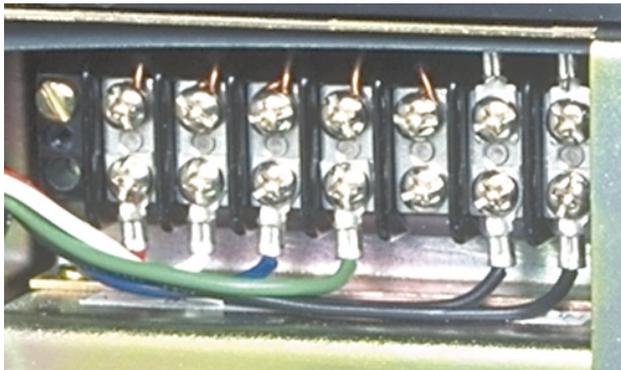
Step 6: Connecting the Sensor Harness and DTA Wires



- A. Install the supplied round grommet in the existing hole in the right side of the Breaker Platform.



- B. Install the supplied round grommet in the existing hole in the left side of the Aux. CT Module.
- C. Connect the black DTA Extension Wires, contained in the Sensor Harness, to the terminals of the Aux. CT Module: positive (+) wire to the OP terminal and the unmarked wire to the ON terminal.
- D. 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.

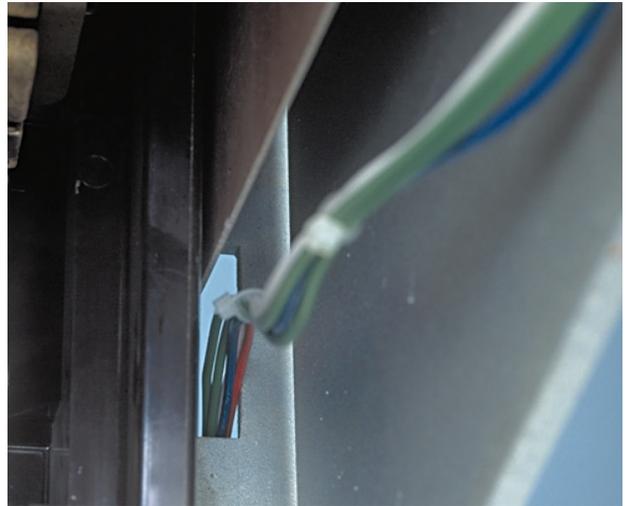


- E. Route the Sensor Harness along the front of the Aux. CT Module and then down through the round grommet installed in the Breaker Platform. Route the green wire (with ring terminal) down to the DTA Assembly.

NOTE: The long tan and green wires are for a Remote Neutral Sensor on a 4W Ground Breaker. They should be removed if not required.

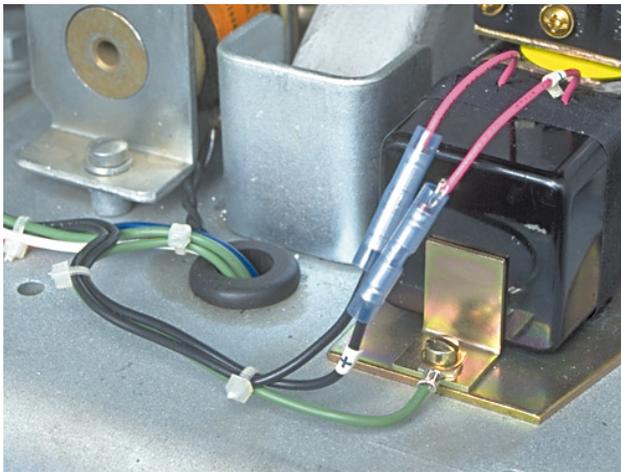


- F. Continue to route the Sensor Harness underneath the Breaker Platform to the right side of the Breaker Frame, then through the slotted hole in the right rear of the Breaker Frame as shown. The Sensor Harness will be connected later in the retrofitting process.



- G. Remove and save the .190" hardware securing the front of the DTA and the DTA Mounting Clip.
- H. Align the ring terminal on the ground wire and the holes in the DTA Assembly and DTA Mounting Clip. Secure the green wire ring terminal, DTA Assembly, and DTA Mounting Clip to the Breaker Platform using the .190" hardware just removed in Step G.
- I. Move the (+) wire marker along the positive DTA Wire until it is approximately one (1) inch from the DTA Assembly.
- J. Cut each of the DTA Wires approximately three (3) inches from the DTA Assembly. Strip an appropriate length of insulation from each wire.
- K. Move the (+) wire marker along the positive DTA Extension Wire until it is in a position to remain on the wire after cutting in the next Step L.

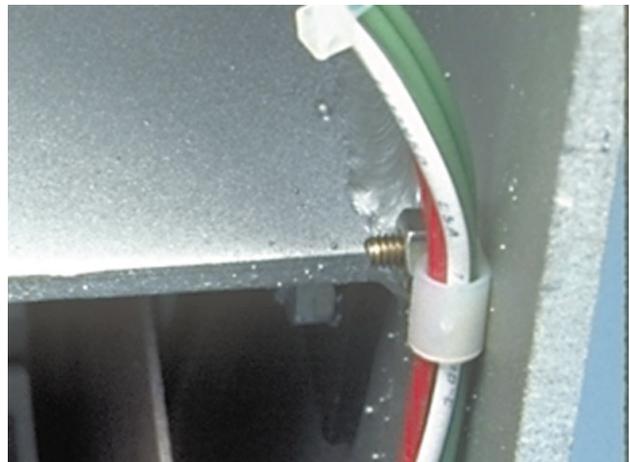
- L. Cut the DTA Extension Wires to a length appropriate to connect to the DTA Wires. Strip an appropriate length of insulation from each wire.
- M. Using the supplied wire splices, connect the DTA Extension Wires to the DTA Wires, positive (+) to positive (+) and unmarked to unmarked. Note that the 22 gage DTA Wires are to be inserted into the side of the wire splices containing the copper inserts.



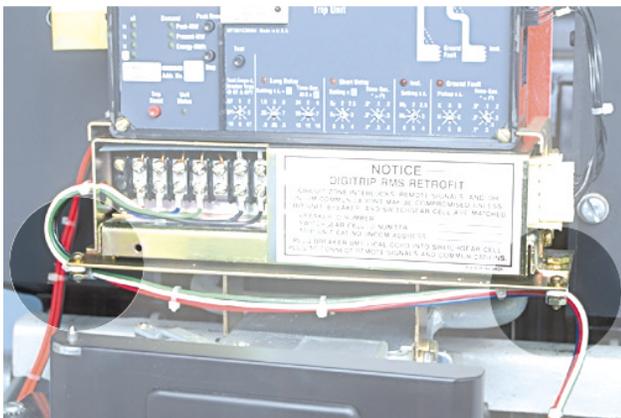
- O. Secure the Sensor Harness to the Breaker Platform, as shown, using (1) nylon wire clamp, (1) 164-32 x .500" screw, (2) flat washers, (1) lock washer, and (1) nut.



- P. Secure the Sensor Harness to the inside of the Breaker Frame with a Wire Clamp, as shown, using (1) nylon wire clamp, (1) 164-32 x .500" screw, (2) flat washers, (1) lock washer, and (1) nut.

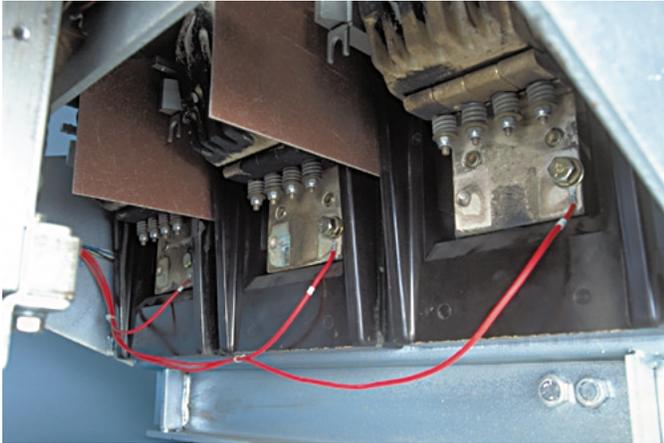


- N. Secure the Sensor Harness to the front edge of the Trip Unit Assembly Mounting Bracket using the existing holes and (2) nylon wire clamps, (2) .164-32 x .500" screws, (2) flat washers, (2) lock washers, and (2) nuts supplied.

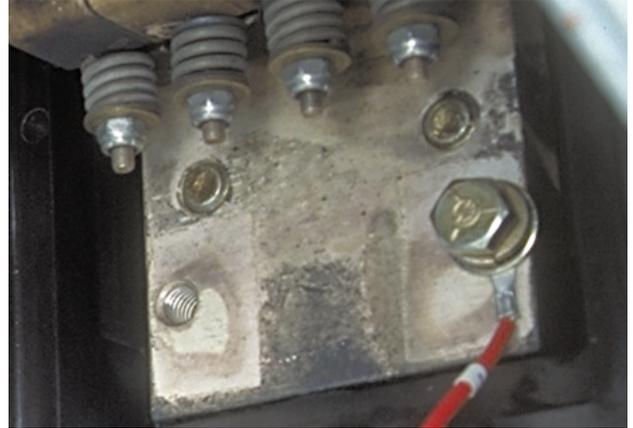


For Kits Supplied with a PT Module Only.

Step 7: Connecting the PT Wires



- E. Secure the PT wires to the proper Breaker Stabs using the (3) .312-18 x 1.00" bolts, (3) lock washers and (3) flat washers supplied.

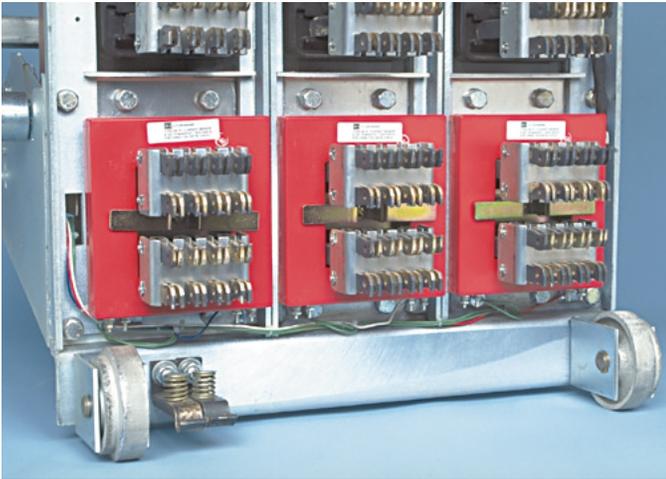


- A. Route the PT Wires down, past the Breaker Platform, into the left side of the Breaker.
- B. Remove and scrap the existing hardware that secures the bottom Breaker Stabs to the Breaker Back Plate.
- C. Refer to Section 7-3, Power Flow Convention of the Retrofit Application Data, supplied with the 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.

- D. The PT Wires are marked for connection to Phases 1, 2, and 3 with corresponding numbers. Route the PT Wires to a position suitable for attachment to the proper Phase. Move the PT Wire markers to a position where they will still be attached to the wires after cutting. Cut the wires to length, then strip an appropriate length of insulation from each PT Wire and install a .312" ring terminal to each PT Wire.

Step 8: Installing the Sensors

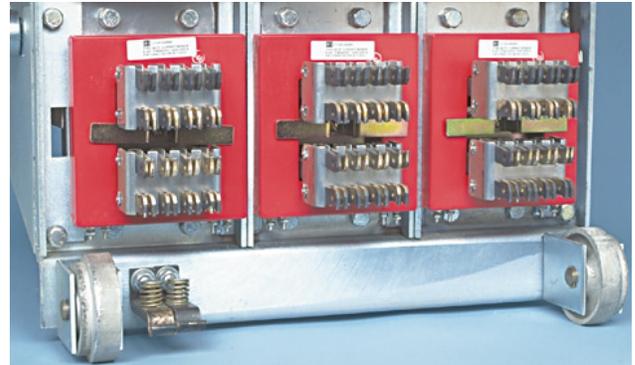


- A. Working from the rear of the Breaker, secure each of the (3) Mounting Brackets to the Breaker Back Plate Frames using the (6) .500-13 x 2.50" bolts, (6) lock washers, and (6) flat washers supplied. Note that the Mounting Brackets must be installed with the "risers" facing outwards.



- B. Slide a Sensor over each bottom Breaker Stab with the terminals facing downward and the label facing out.
- C. Secure the (3) Retaining Brackets to the Mounting Brackets using the (3) .250-20 x .500" screws supplied.

- D. Reinstall the Finger Clusters removed in Step 2-A.



- E. 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.



Sensor Style No.

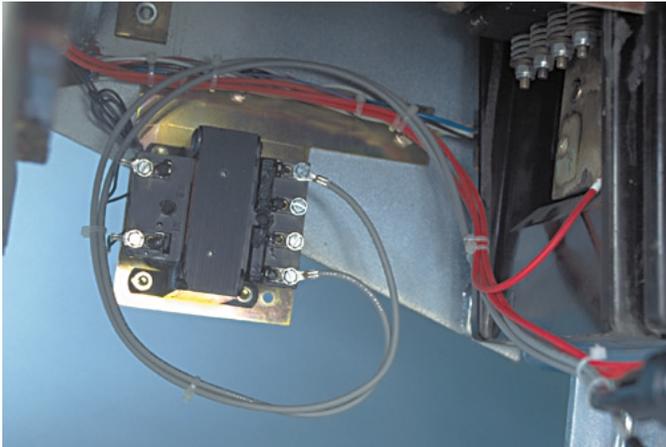
8184A43H01 X1-X2 = 2000 A
 X1-X3 = 2500 A
 X1-X4 = 3000 A

Sensor Style No.

8184A44H01 X1-X2 = 4000 A

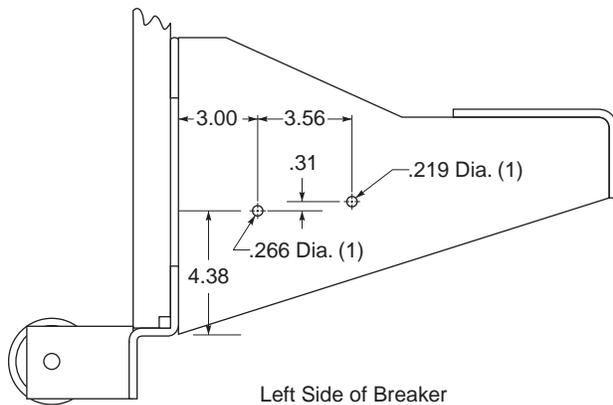
For Kits Supplied with a Breaker Mounted CPT Only.

Step 9: Installing the Breaker Mounted CPT



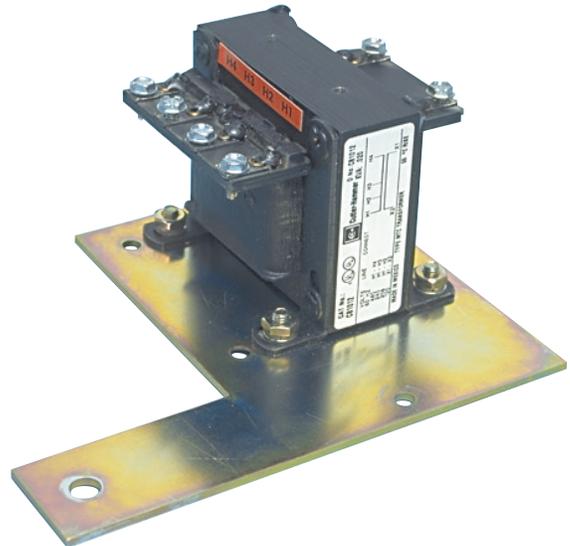
A. Using Drilling Plan “C”, drill a .219” and .266” hole in the left side of the Breaker.

Drilling Plan “C”

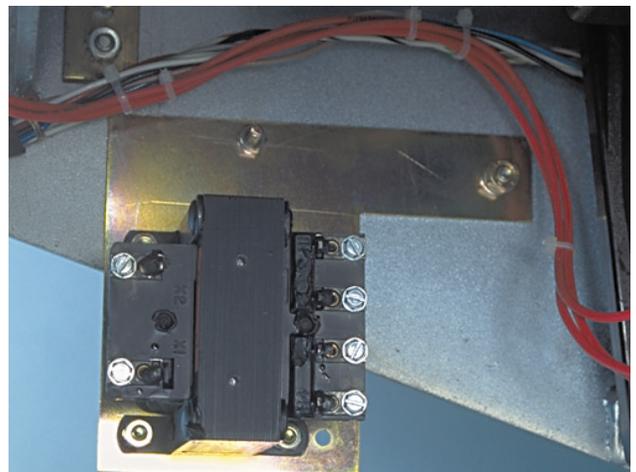


B. Align the CPT with the holes in the CPT Mounting Bracket, as shown. Note that the side of the CPT with four (4) terminals faces the “L” side of the mounting bracket.

C. Secure the CPT to the Mounting Bracket using (2) .190-32 x .500” screws, (2) .190-32 x .500” flat head screws, (6) flat washers, (4) lock washers, and (4) nuts supplied. Note that the screws are inserted through the mounting bracket first, then through the CPT. Also note that the flat head screws are used in the holes nearest the long leg of the mounting bracket.

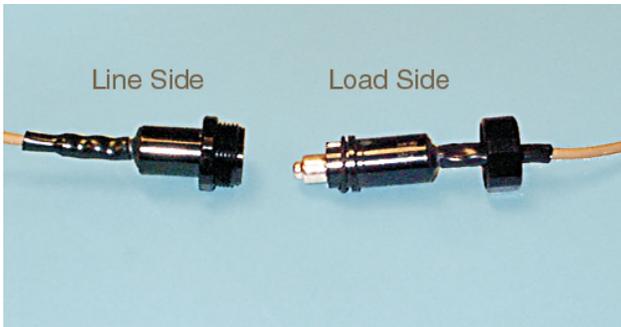


D. Align then secure the CPT Assembly to the left Breaker Frame, as shown, using the hardware supplied: the (1) .250-20 x .750” bolt, (2) flat washers, (1) lock washer, and (1) nut in the rear hole; and the (1) .190-32 x 1.00” screw, (2) flat washers, (1) lock washer, and (1) nut in the front hole.



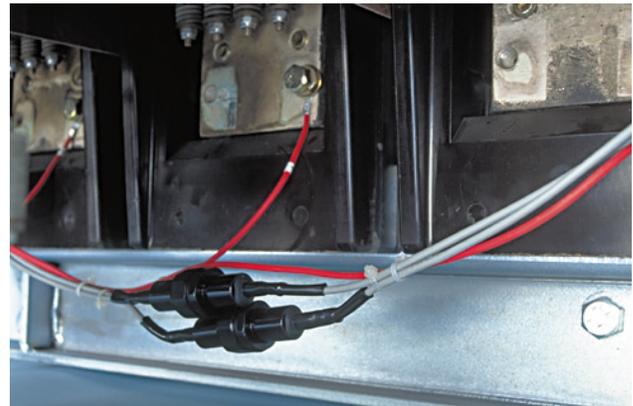
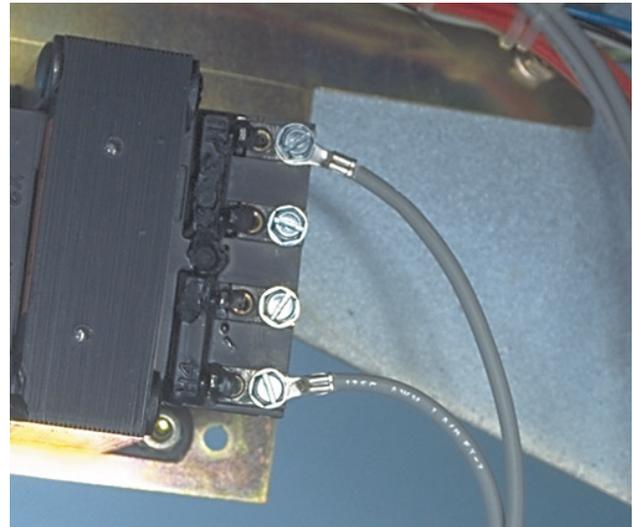
- E. The CPT Harness will connect the CPT to the Trip Unit. Temporarily position the plug-in connector of the CPT Harness near the right side of the Trip Unit. Route the CPT Harness behind the Trip Unit Assembly and through the same hole through which the PT Wires are routed on the left side of the Breaker Platform.
- F. Cut the CPT Harness to a suitable length for connection to the CPT Terminals. Strip an appropriate length 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 Assembly.

NOTE: The High Voltage (HV) Wires have a LOAD Side and a LINE Side. The HV Wires must be installed in the correct orientation during the following procedure. For the purpose of identification, the words "Load Side" are marked on the female fuse receptacle of each HV Wire.



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 connections can be made to the correct terminals on the CPT.

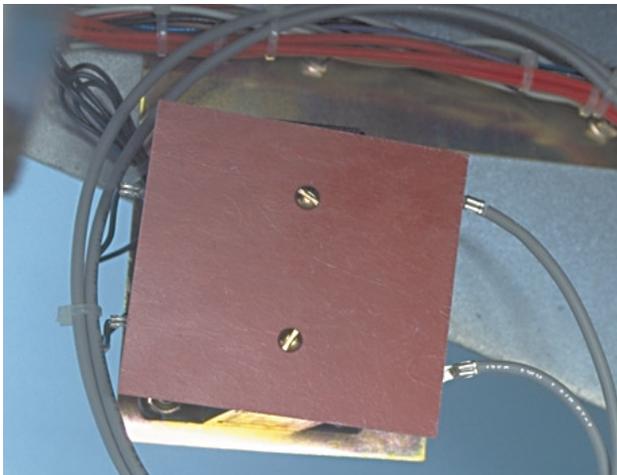
- G. Position the HV Wire Fuses in an accessible location, as shown, then mark and cut the Load Side of each HV Wire. Strip an appropriate length of insulation from each Load Side HV Wire and attach a .138" ring terminal to each. Attach the HV Wires to the CPT terminals to achieve the required voltage. (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 Load Side 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.

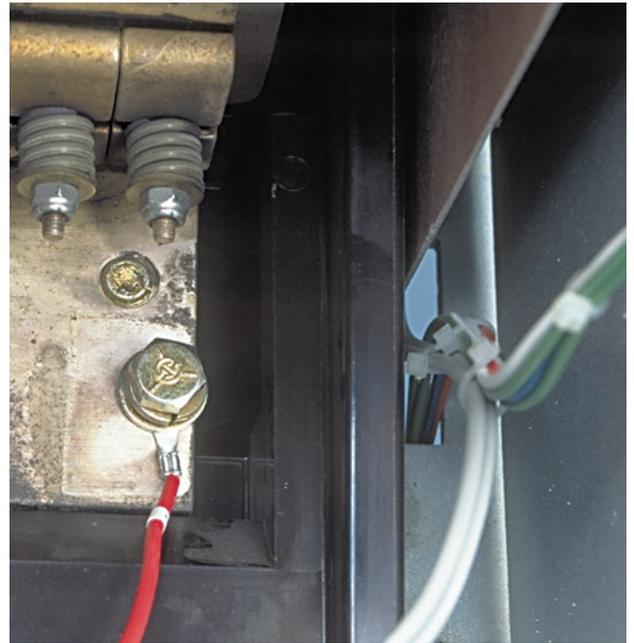
- H. Secure the insulation plate to the top of the CPT Assembly, as shown, using the (2) .138-32 x .375" thread cutting screws supplied.



NOTE: The power convention of the DB-75 and DB-100 Breakers is normally *Top to Bottom*, meaning the Top Breaker Stabs 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 Breaker Stabs.

- I. Route the HV Line Side Wires through the slotted hole in the rear of the Breaker Frame then up towards the Phase 1 and 2, or Phase 2 and 3 Top Breaker Stabs.

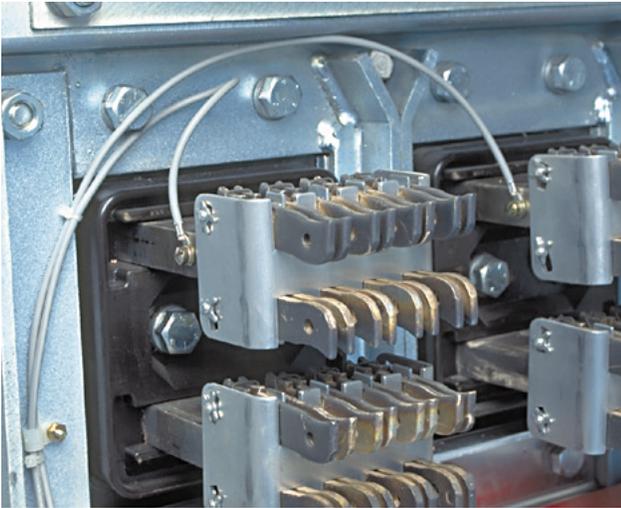


NOTE: The Line Side HV Wires are longer than necessary and are cut during the following steps. Before cutting the wires, be sure that sufficient length is left so that the HV Wire Fuses are accessible from the front of the Breaker and that the connections can be made to the correct Breaker Stabs.

- J. Using a .159" drill bit, drill and tap one (1) hole to accept .190-32" screws in left side of the Phase 1 and 2, or Phase 2 and 3 Breaker Stabs.

NOTE: For DB-75 Breakers and Breakers equipped with Secondary Contacts, a Breaker Stab may have to be removed to allow for the drilling.

- K. Cut the HV Wires to the appropriate length for attachment to the Phase 1 and 2, or Phase 2 and 3 Top Breaker Stabs. Strip an appropriate length of insulation from each HV Wire and attach a .190" ring terminal. Connect the HV Wires to the Breaker Stabs using the (2) .190-32 x .500" screws, (2) lock washers, and (2) lock washers supplied.

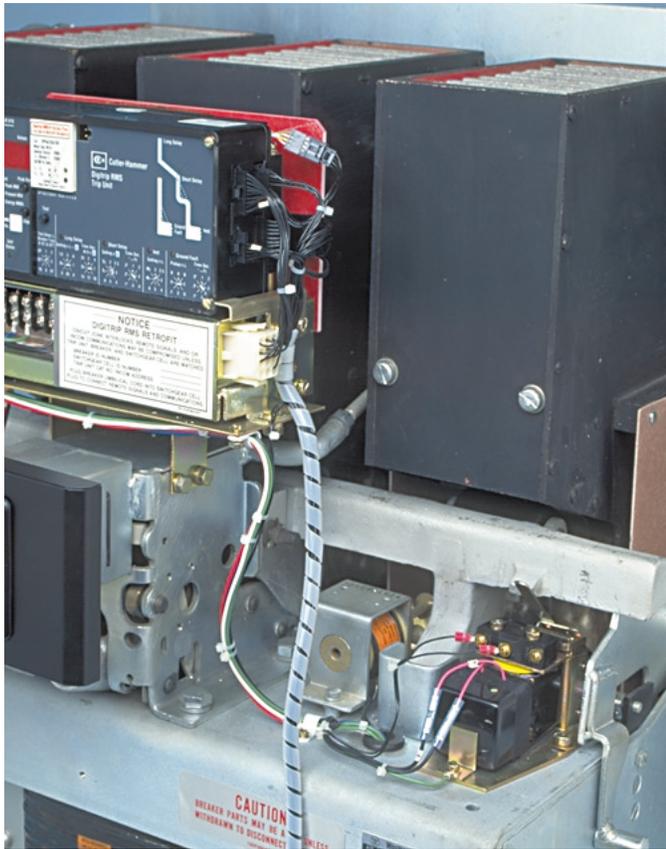


- N. Attach the appropriate label for the Breaker in a clearly visible position. Three (3) labels are included with the CPT, one (1) for 480 Volt, one (1) for 240 Volt, and one (1) for 208 Volt systems.



- L. Use the nylon wire ties to secure the HV wires to the Sensor Harness.
- M. Secure the HV Wires to the Breaker using the supplied nylon wire clamp.

Step 10: Final Wiring and Harness Connection



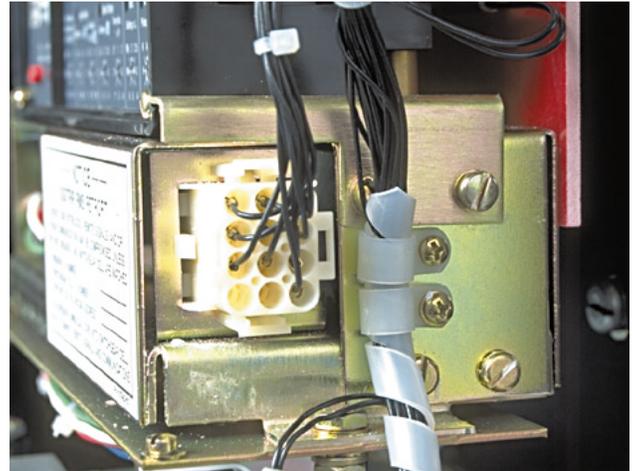
A. Connect the External Harness to the Trip Unit.

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.

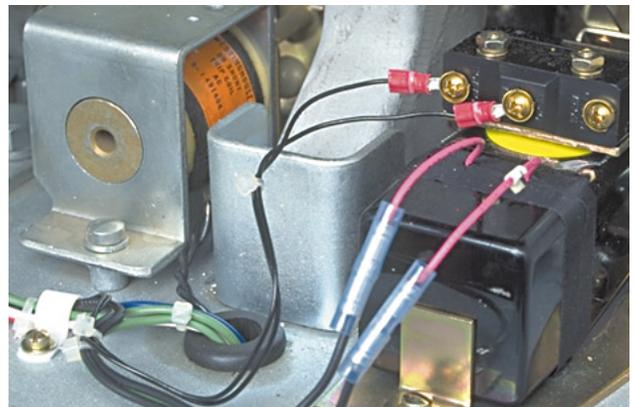


B. *For Kits Supplied with a PT Module Only.* Connect the PT Module to the External Harness.

C. Secure the External Harness to the right side of the Aux. CT Module using the existing holes and the (2) nylon wire clamps and (2) .138-32 x .375" thread cutting screws.



D. *For Kits Supplied with an Auxiliary Switch Only.* Route the two (2) wires (with ring terminals) from the External Harness with the Sensor Harness, down to the DTA Assembly. Connect one wire to the normally "Open" terminal of the Aux. Switch and the other wire to the "Common" terminal.



E. *For Kits Supplied with a Breaker Mounted CPT Only.* 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.

- F. Use the nylon wire ties provided to secure all wires and harnesses away from any moving parts within the Breaker.

Step 11: Testing the Breaker

- A. Measure the force necessary to trip the Breaker at the point where the Trip Tab contacts the Trip Finger. 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 33-855-2, May 1999), 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 in Step 12.

Step 12: 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 13: 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 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 DB-75 and DB-100 Breakers

Step	Description	Style No.	Qty.	Comment
Step 3	DTA Assembly	692C706G03	1	
	DTA Mounting Hardware			
	Mounting Clip		1	
	.312-18 x 1.00 Lng. Screw Fil.		1	
	.312 Flat Washer Stl.		1	
	.312 Lock Washer Stl.		1	
	.312-18 Nut Hex Stl.		1	
	.190-32 x .750 Lng. Screw Fil.		1	
	.190 Flat Washer Stl.		1	
	.190 Lock Washer Stl.		1	
	.190-32 Nut Hex Stl.		1	
	Auxiliary Switch Kit	8188A38G01	1	} Comm. Only
	Microswitch		1	
	Aux. Switch Mounting Bracket		1	
	.190-32 x .375 Lng. Screw Fil.		2	
	.190 Flat Washer Stl.		2	
	.190 Lock Washer Stl.		2	
	.138-32 x 1.00 Lng. Screw F.H.		2	
	.138 Flat Washer Stl.		2	
	.138 Lock Washer Stl.		2	
	.138-32 Nut Hex Stl.		2	
	Trip Finger		1	
	Trip Finger Mounting Hardware			
.250-20 x .750 Lng. Carriage		1		
.250 Flat Washer Stl.		1		
.250 Lock Washer Stl.		1		
.250-20 Nut Hex Stl.		1		
Step 4	Trip Unit		1	See Pick List
	Rating Plug		1	See Pick List
	Aux. CT Module	6502C78G	1	
	Aux. CT Harness	6502C84G	1	
	PT Module	6502C82G01	1	Comm. Only
	PT Module Mounting Hardware			
	.138-32 x .500 Lng. Screw Pan Head		2	} Comm. Only
	.138 Flat Washer Stl.		4	
	.138 Lock Washer Stl.		2	
	.138-32 Nut Hex Stl.		2	
	Ring Terminals (.190, .250, .312, .375, .500 - Each Size)		3	
	Trip Unit Assembly Parts	8188A35G01	1	
	Trip Unit Support Bracket R.H.		1	
Trip Unit Support Bracket L.H.		1		
Barrier Red Polyester		1		
.190-32 x 4.00 Lng. Screw Fil.		2		

Digitrip Retrofit Kit Installation Components for the DB-75 and DB-100 Breakers (Continued)

Step	Description	Style No.	Qty.	Comment
Step 4 (Cont.)	.190-32 x .500 Lng. Screw Fil.		6	
	.190 Flat Washer Stl.		8	
	.190 Lock Washer Stl.		8	
	Digitrip Nameplate		1	
	Spacer Brass		2	
Step 5	Trip Unit Assembly		1	From Step 4
	Trip Unit Mounting Hardware			
	Trip Unit Mounting Bracket		1	
	.250-20 x .500 Lng. Hex Bolt		6	
	.250 Flat Washer Stl.		6	
	.250 Lock Washer Stl.		6	
	.250-20 Nut Hex Stl.		2	
Step 6	Sensor Harness		1	See Pick List
	Sensor Harness Mounting Parts	6504C99G10		
	Grommet, Round		1	
	Wire Clamp		3	
	Wire Ties		3	
	.164-32 x .500 Lng. Screw Fil.		4	
	.164 Flat Washer Stl.		8	
	.164 Lock Washer Stl.		4	
	.164-32 Nut Hex Stl.		4	
	Crimp Connector With Insert		2	
Step 7	PT Wire Mounting Hardware			
	.312-18 x 1.00 Lng. Hex Bolt		3	} Comm. Only
	.312 Flat Washer Stl.		3	
	.312 Lock Washer Stl.		3	
Step 8	Sensor		3	See Pick List
	Mounting Bracket		3	
	Retaining Bracket		3	
	.500-13 x 2.50 Lng Hex Bolt		6	
	.500 Flat Washer Stl.		6	
	.500 Lock Washer Stl.		6	
	.250-20 x .500 Lng. Screw Sems		3	
Step 9	Breaker Mounted CPT Kit	8259A91G05	1	} CPT Only
	Ring Terminals (.138, .190, .250, .312, .375, .500 - Each Size)		2	
	CPT Mounting Parts			
	Mounting Plate		1	
	Insulation		1	
	Mounting Bracket		1	
	.250-20 x .750 Lng. Hex Bolt		1	
	.250 Flat Washer Stl.		2	

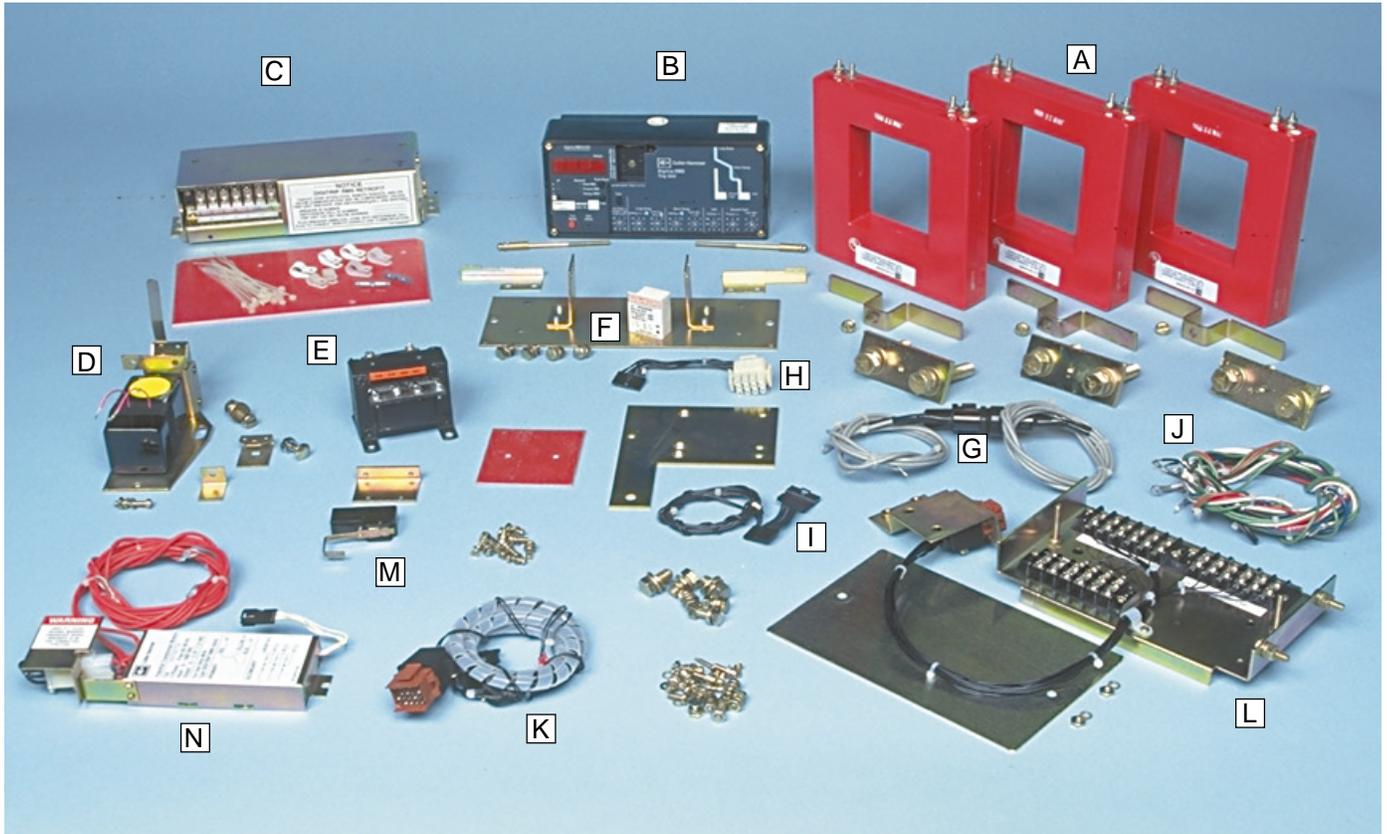
Digitrip Retrofit Kit Installation Components for the DB-75 and DB-100 Breakers (Continued)

Step	Description	Style No.	Qty.	Comment
Step 9 (Cont.)	.250 Lock Washer Stl.		1	} CPT Only
	.250-20 Nut Hex Stl.		1	
	.190-32 x 1.00 Lng. Screw Fil.		1	
	.190-32 x .500 Lng. Screw Fil.		4	
	.190-32 x .500 Lng. Screw F. H.		2	
	.190 Flat Washer Stl.		12	
	.190 Lock Washer Stl.		8	
	.190-32 Nut Hex Stl.		6	
	.138-32 x .375 Lng. T.C. Screw		2	
	Wire Clamp		1	
Step 10	External Harness	6502C83G0_	1	
	Wire Clamp		2	All Except 500 / 510
	.138-32 x .375 T.C. Screw		2	All Except 500 / 510
	Wire Ties		2	
Step 12	Cell Harness	6502C71G0_	1	All Except 500 / 510

NOTE: Due to the wide vintage of breakers and multiple functions of the Retrofit components, some excess hardware may be left 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



- 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. CPT Harness
- J. Sensor Harness
- K. External Harness
- L. Cell Terminal Block Assembly
- M. Aux. Switch
- N. PT Module

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

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.

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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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