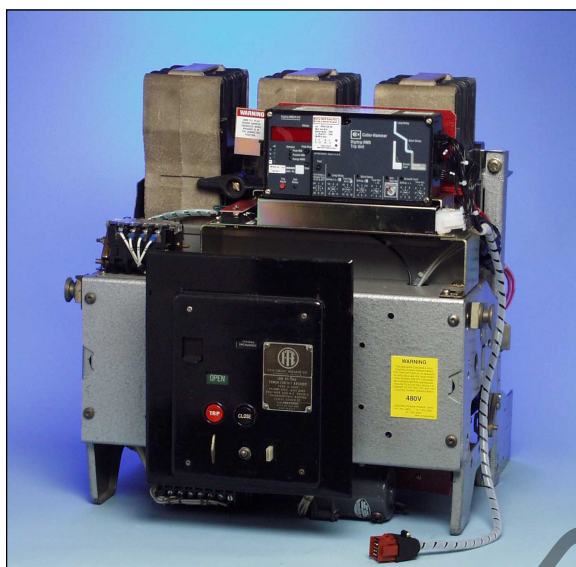




Digitrip Retrofit System for the ITE K-Line Breakers: K-1600 (Black or Red), KDON-1600 (Black or Red), and K-2000 (Red)



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 the ITE K-Line Breakers: K-1600 (Black or Red), KDON-1600 (Black or Red), and K-2000 (Red)

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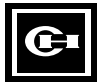
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INTRODUCTION

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.

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 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					

Before Beginning the Retrofit Process Identify the Breaker and the Retrofit Kit

It is important to verify exactly which version of ITE K-Line Breaker(s) is to be Retrofitted and to insure that the correct Cutler-Hammer Retrofit Kit(s) was ordered. Each Breaker must be identified using all of the following sources:

1. Name Plate Information;
2. Back Plate Color;
3. Type of Finger Clusters (Rectangular or Round); and
4. Fuse Use and Configuration (Horizontal or Vertical).

Please refer to the following table and verify that the first three (3) characters of the Retrofit Kit Code Number correspond to the Breaker being Retrofitted.

Following the Icons to a Successful Retrofit

During certain parts of the Retrofit Process, procedures may differ depending on the version of the Breaker being Retrofitted. To enable the Retrofitter to quickly identify the correct procedures for the Breaker, Icon(s) will appear. Simply follow only the instructions identified by the Icon for the Breaker being Retrofitted.

Table 2 Identifying the K-Line Breaker

Breaker Rating	Back Plate Color ¹	Desired Sensor Location	Finger Cluster Type	Fuse Location	Fuse Configuration	Retrofit Kit Code	ICON
Non-Fused							
K-1600	Black	Top	Rectangular	None	N.A.	K1C	
K-1600	Red	Top	Rectangular	None	N.A.	K2C	
K-2000	Red	Top	Round	None	N.A.	K2D	
Top Mounted Horizontal and Vertical Fused							
KDON-1600	Black ²	Bottom	Rectangular	Top	Horizontal or Vertical	K6C	
KDON-1600	Red	Bottom	Rectangular	Top	Horizontal or Vertical	K4C	
KDON-1600	Red	Bottom	Round	Top	Horizontal or Vertical	K7C	
Bottom Mounted Horizontal Fused							
KDON-1600	Black ²	Top	Rectangular	Bottom	Horizontal	K1C	
KDON-1600	Red	Top	Rectangular	Bottom	Horizontal	K2C	
KDON-1600	Red	Top	Round	Bottom	Horizontal	K5C	

NOTES:

1. Black or Red refers to the color of the Breaker Back Plate.
2. If specified during ordering, special Trip Unit Brackets have been supplied for some older models of the KDON-1600 Black Breaker equipped with trigger fuses. If the Brackets are needed but were not ordered, contact Cutler-Hammer at: 1-800-937-5487.

GENERAL NOTE:

If the existing Breaker components mandate that the new DTA, supplied with the Retrofit Kit, be mounted inside the Breaker on the right side instead of the left, as detailed in these instructions, contact Cutler-Hammer at: 1-800-937-5487 to obtain the special parts required. See Step 4 for details.

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 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: PREPARING THE BREAKER FOR RETROFITTING

Refer to the ITE K-Line Instruction Manual, originally supplied with the Breaker, to perform the following procedures.

NOTE: For all photographs contained within this manual, an ITE K-1600 Black Breaker (without blown fuse indicators) was used as the subject. Depending on the version and age of the Breaker being Retrofitted, some components / views may differ from those depicted in the manual.

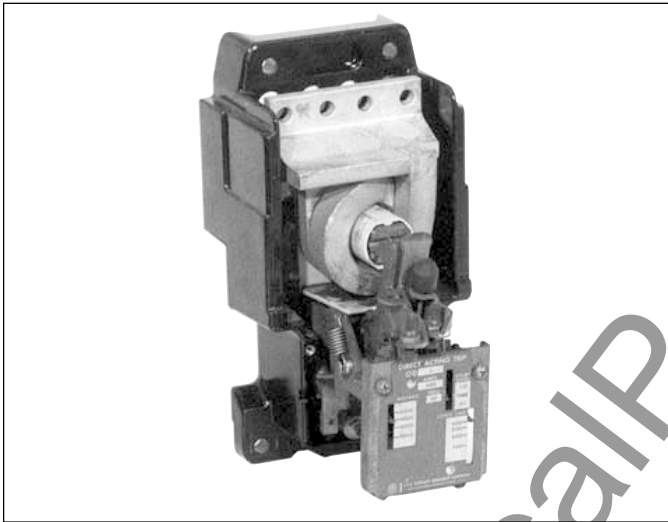
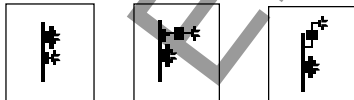


Fig. 1 Original Electromechanical Trip Unit

A. For Breakers equipped with a Secondary Contact Bracket, move the back of the Breaker near the edge of the work bench. Remove the two (2) screws securing the top of the Secondary Contact Bracket. Loosen the two (2) bottom screws then rotate the bracket down over edge of work bench

B.



Remove the retaining clips then the pins securing the Finger Clusters to the Bottom Breaker Stabs. Remove the Finger Clusters. Set all parts aside for reinstallation later in the Retrofit Process.



Note the orientation of the existing fuses. Follow the ITE K-1600 / 2000 Instruction Manual, originally supplied with the Breaker, and remove the fuses, fuse mountings, and associated hardware from the bottom Breaker Stabs. Set all parts aside for reinstallation later in the Retrofit Process.

- C. Remove the four (4) screws securing each bottom Glastic Molding to the Breaker.
- D. Remove the four (4) screws securing each of the three (3) copper pieces to the Breaker Pole Assemblies.
- E. Remove the Glastic Moldings, with the attached Electromechanical Trip Units, from the Breaker.

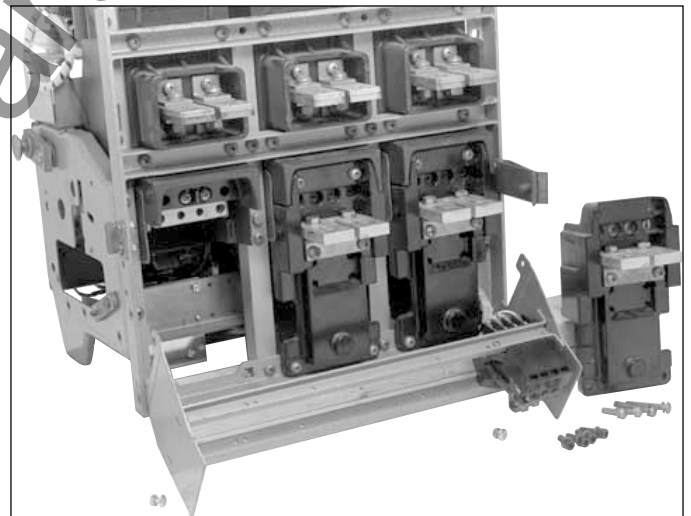


Fig. 2 Removing the Glastic Moldings

- F. Working from the rear of the assembly, remove the Electromechanical Trip Units by carefully drilling out the four (4) .190" screws that secure each Trip Unit to the Molding.
- G. Remove the two (2) screws securing the Copper Extensions then remove the Trip Unit from each Molding.

STEP 3: DRILLING THE BREAKER ANGLES

- A. Working from the rear of the Breaker and using a .500" drill bit, drill a hole in the left Breaker Angle (See Drilling Plan "A"). This hole will be used later in the Retrofit Process when installing the Sensor Harness.

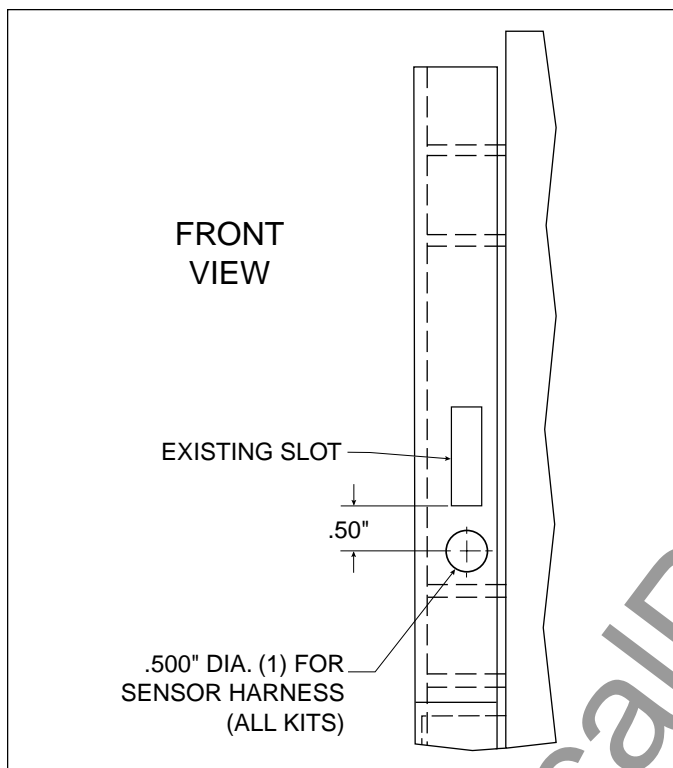


Fig. 3 Drilling Plan "A" - Front View

NOTE: On some versions of the K-1600 / 2000 Breakers, the hole for the Sensor Harness can not be drilled where indicated in Drilling Plan "A". If this is the case with the Breaker Being Retrofitted, follow the instructions in Step 3-B.

- B. *For Use on Some Versions:* Working from the rear of the Breaker and using a .500" drill bit, drill a hole in the left Breaker Angle, directly below the top Breaker Cross Rail (See Fig. 4). This hole will be used later in the Retrofit Process when installing the Sensor Harness.

NOTE: The hole should be drilled slightly below the Breaker Cross Rail and be located so as not to interfere with the Lifting Rack when installed.

After Retrofitting, care should be taken when installing the Lifting Rack so that any new wires or harnesses that pass through the rear Breaker Angles are not damaged.

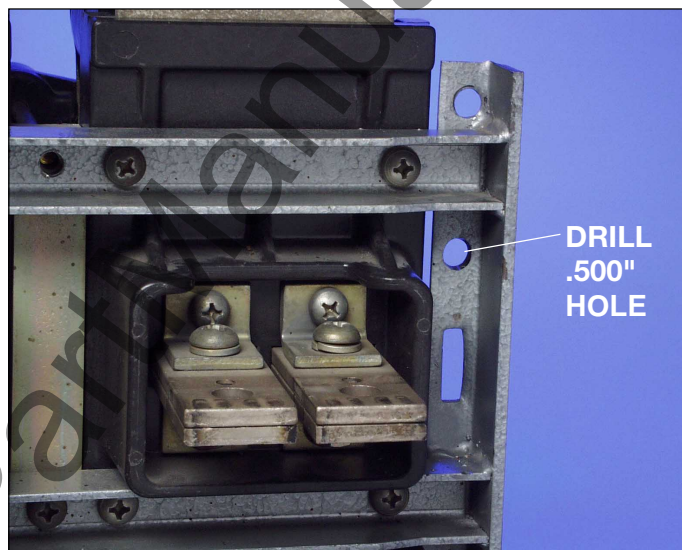


Fig. 4 Optional Drilling Plan "A"

For Kits Supplied with a PT Module and / or Breaker Mounted CPT Only.

- C. Working from the rear of the Breaker and using a .500" drill bit, drill a hole in the right Breaker Angle (See Drilling Plan "B"). This hole will be used later in the Retrofit Process when installing the PT and / or HV Wires.

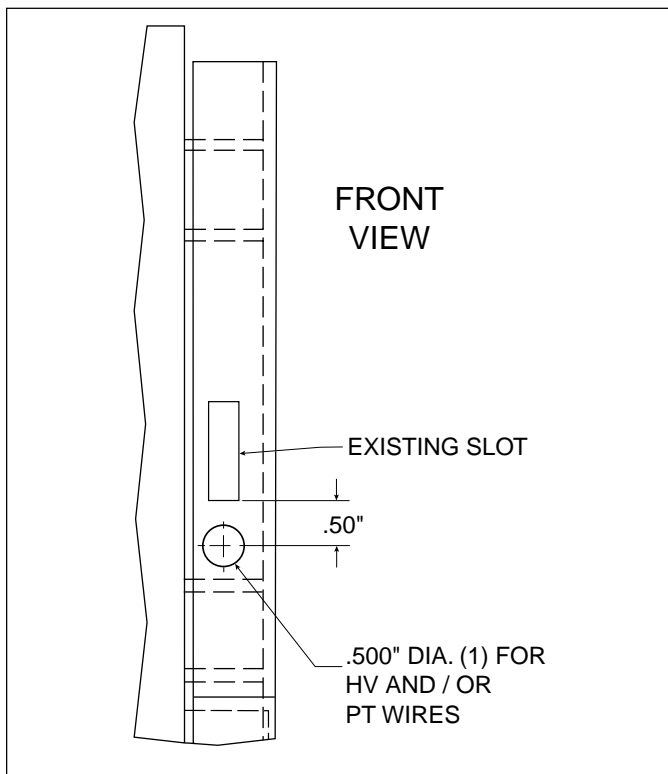


Fig. 5 Drilling Plan "B" - Front View

NOTE: On some versions of the K-1600 / 2000 Breakers, the hole for the PT and / or HV Wires can not be drilled where indicated in Drilling Plan "B". If this is the case with the Breaker Being Retrofitted, follow the instructions in Step 3-D.

- D. *For Use on Some Versions:* Working from the rear of the Breaker and using a .500" drill bit, drill a hole in the right Breaker Angle, directly below the top Breaker Cross Rail (similar to the hole for the Sensor Harness drilled in Step 3-B). This hole will be used later in the Retrofit Process when connecting the PT and / or HV Wires.

STEP 4: PREPARING THE DTA ASSEMBLY FOR INSTALLATION

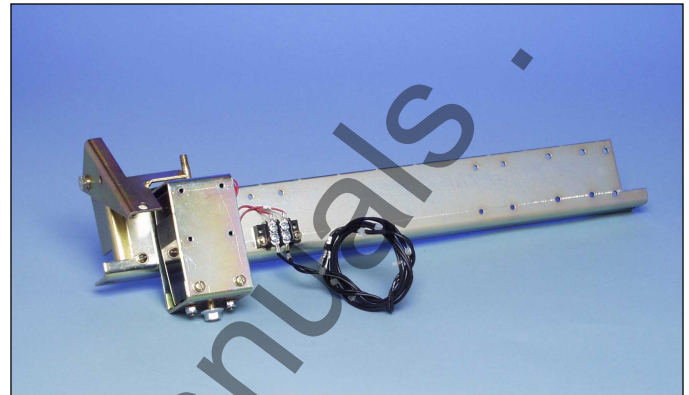


Fig. 6 Overview - DTA Assembly

NOTE: If an existing Breaker component does not allow the DTA to be mounted on the right side of the Breaker (when viewed from the rear of the Breaker), a left hand DTA mounting kit is available. For details and to acquire the necessary parts, contact Cutler-Hammer at: 1-800-937-5487.

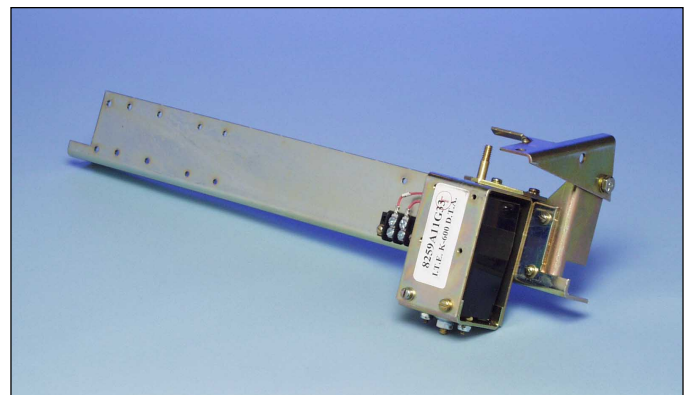


Fig. 7 Optional DTA Mounting Location

- A. Apply Loc-Tite® 243 to the threads then mount the DTA Bearing Plate to the DTA Bearing Plate Mounting Bracket, as shown, using the (2) .164-32 x .312" pan lock screws and (2) flat washers supplied.

- B. Apply Loc-Tite® 243 to the threads then mount the DTA and the DTA Bearing Plate Assembly to the DTA Mounting Angle, as shown, using the (2) .164-32 × .312" pan lock screws, (2) .164-32 × .500" pan screws, (2) lock washers, and (4) flat washers supplied.

NOTE: Insure that the DTA Shaft moves freely after mountng. If not, reposition the mounting hardware.

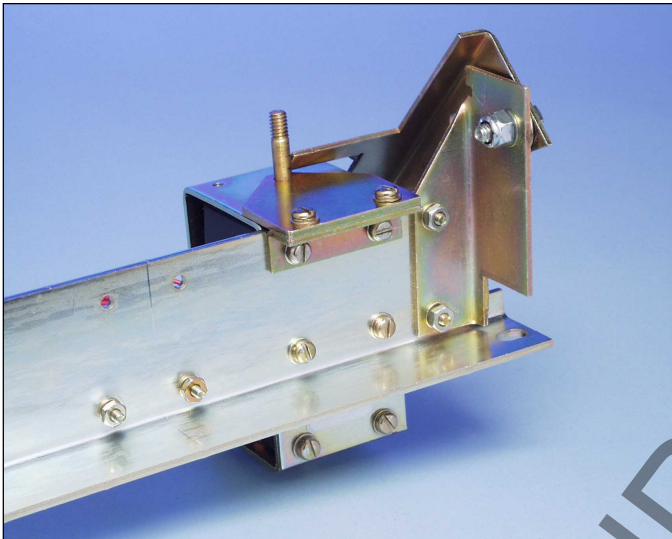


Fig. 8 DTA Mounted to the DTA Mounting Angle

- C. Connect the DTA Wires to the two (2) top terminals of the 2-Point Terminal Block. Connect the DTA Extension Harness to the two (2) bottom terminals of the 2-Point Terminal Block. Connect the "+" wire to the same terminal as the "+" wire from the DTA. Connect the unmarked wire to the same terminal as the unmarked wire from the DTA.

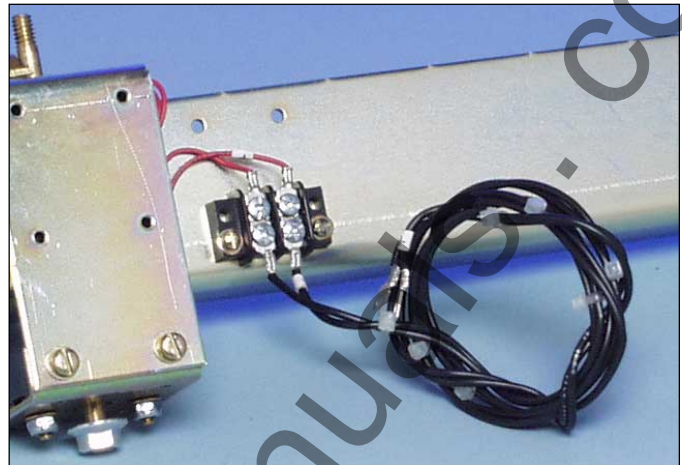


Fig. 9 Connections at the 2-Point Terminal Block

- D. *For K-2000 Breakers Only:* Mount the DTA Insulation Plate Mounting Bracket to the DTA Assembly, as shown, using the (2) .164-32 × .625" screws, (4) flat washers, (2) lock washers, and (2) nuts supplied. Note that the non-threaded holes in the Mounting Bracket are used to secure the Mounting Bracket to the DTA Assembly.

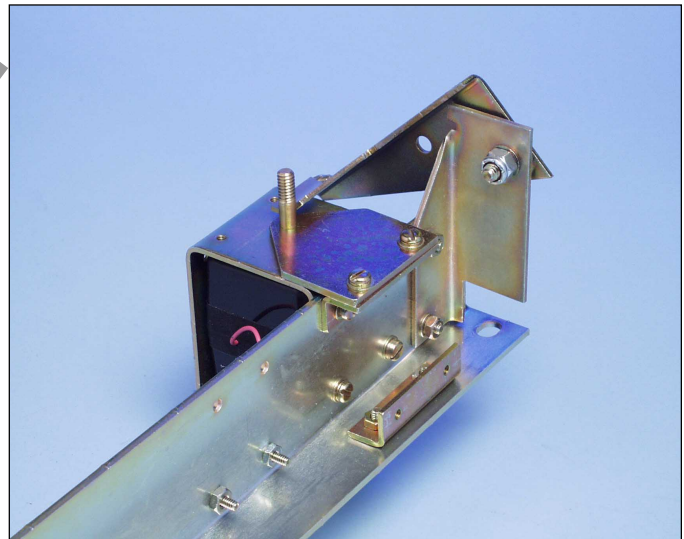


Fig. 10 Location of the DTA Insulation Plate Mounting Bracket

- E. *For Kits Supplied with an Auxiliary Switch Only:* Cut .250" from the end of the Microswitch Arm. Mount the Microswitch to the Auxiliary Switch Mounting Bracket, as shown, using the (2) .138-32 \times 1.00" screws, (4) flat washers, (2) lock washers, and (2) nuts supplied.

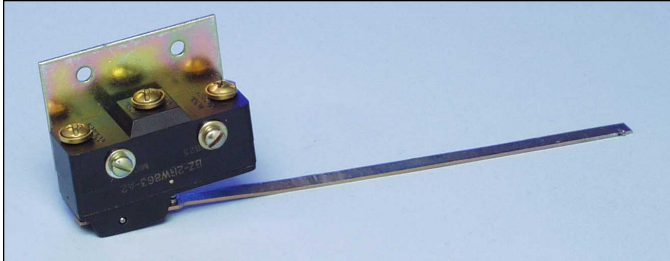


Fig. 11 Auxiliary Switch Assembly

- F. Mount the Auxiliary Switch Assembly to the DTA Assembly, as shown, using the (2) .138-32 \times .375" screws, (4) flat washers, (2) lock washers, and (2) nuts supplied. Note that the Microswitch Arm must extend through the hole in the DTA Reset Arm.

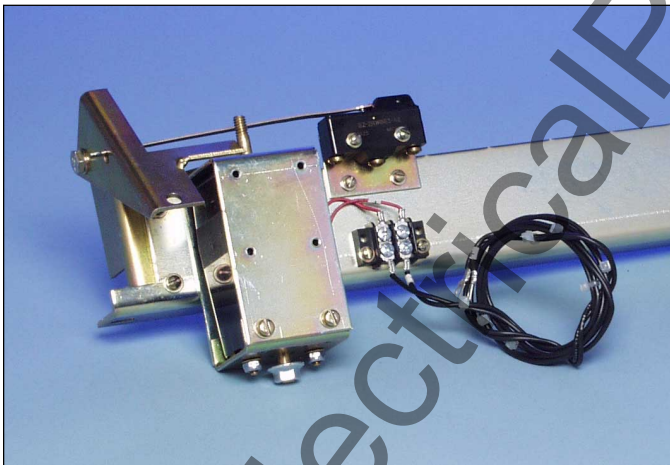


Fig. 12 Correct Installation of the Auxiliary Switch Assembly

STEP 5: INSTALLING THE DTA ASSEMBLY IN THE BREAKER

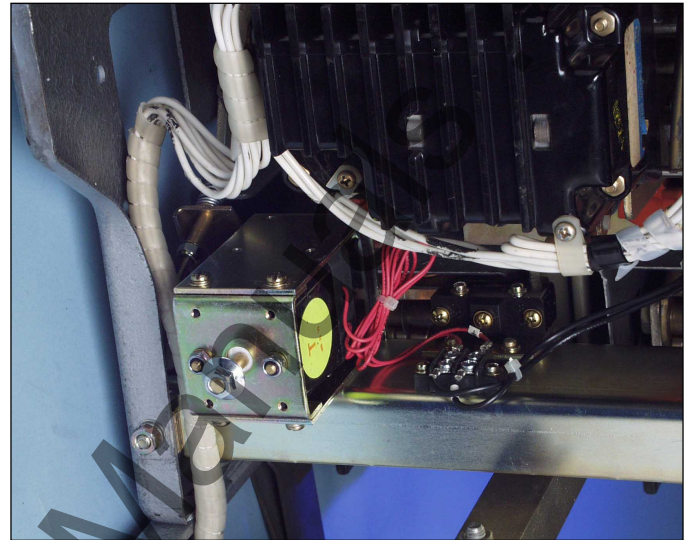


Fig.13 Overview – DTA Assembly installed in the Breaker

- A. Carefully lay the Breaker on its left side.
- B. Working from the bottom of the Breaker, drill a .312" diameter hole in each of the bottom Breaker Flanges 1.75" from the Breaker Back Plate. Insure that no metal shavings fall into the Breaker during the drilling process.
- C. Insert the DTA Assembly into the Breaker and align the holes in the DTA Mounting Angle with the holes just drilled in Step 5-B. Note that it is necessary for the DTA Assembly to slightly protrude through the window in the right side of the Breaker to achieve proper alignment.

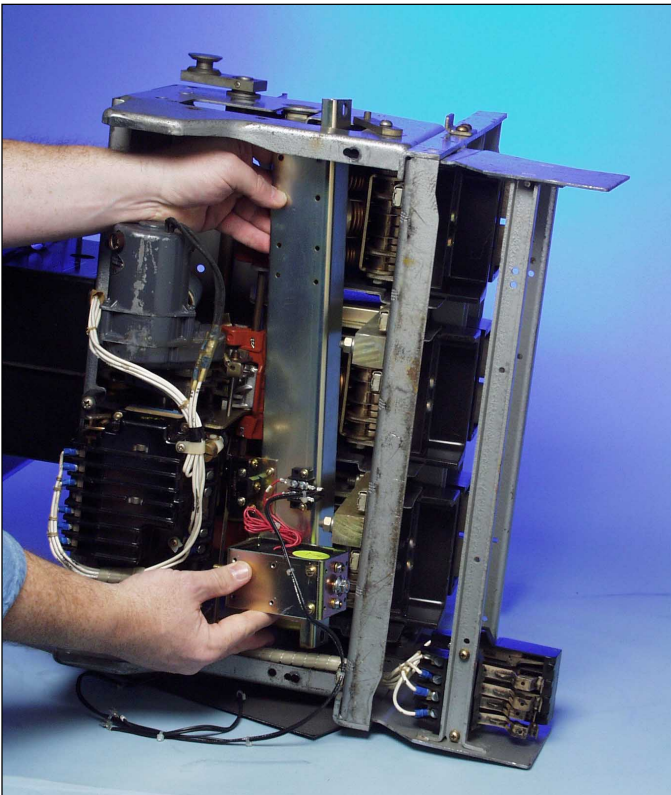


Fig. 14 Installing the DTA Assembly

- D. Temporarily mount the DTA Assembly on the inside of the bottom Breaker Flanges using the (2) .250-20 × .750" bolts, (4) flat washers, (2) lock washers, and (2) nuts supplied. Note that the existing wiring harness must be below the DTA Assembly.

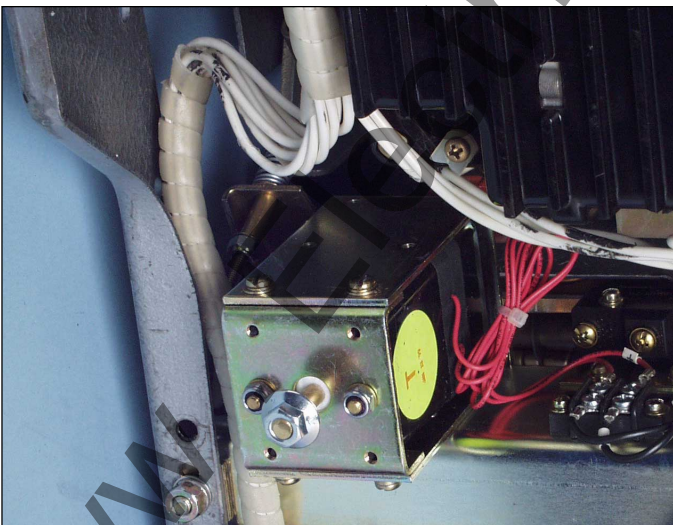


Fig. 15 Correct Wiring Harness Position

- E. Return the Breaker to its upright position. Verify that there is clearance between the bottom of the DTA Shaft and the work bench. If not, turn the Breaker back on its side, remove the mounting hardware securing the DTA Assembly to the Breaker. Use one (1) or two (2) of the supplied spacers on each side, as required, to raise the DTA Assembly. Using the hardware just removed, again temporarily mount the DTA Assembly to the Breaker.



Fig. 16 Spacers Installed with the DTA Assembly

Return the Breaker to its upright position and verify that there is clearance between the bottom of the DTA Shaft and the work bench. If clearance exists, tighten the DTA Assembly mounting hardware.

NOTE: If proper clearance can not be achieved by using the spacers provided, or if proper Trip and Reset functioning can not be achieved with the spacers installed, the DTA Shaft may be carefully cut to provide the proper clearance.

For Kits Supplied with a Breaker Mounted CPT Only: Do not tighten the DTA Assembly mounting hardware at this time. This hardware will be tightened after the Breaker Mounted CPT is installed in Step 6.

- F. Route the DTA Extension Harness up through the Breaker, then through the existing hole in the Breaker Platform. Insure that the DTA Extension Harness is clear of all moving parts within the Breaker.



Fig. 17 Routing of the DTA Extension Harness

For Kits Supplied with a Breaker Mounted CPT Only.

STEP 6: INSTALLING THE BREAKER MOUNTED CPT ON THE DTA MOUNTING ANGLE

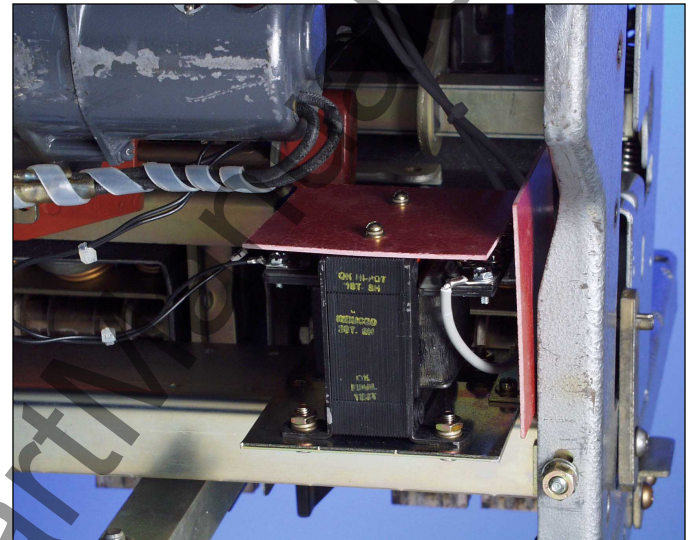


Fig. 18 Overview – CPT Installed in the Breaker

NOTE: If a left-hand mounting kit was used to install the DTA on the DTA Mounting Angle in Step 4, the Breaker Mounted CPT can not be installed on the DTA Assembly as detailed in the following steps. The CPT will have to be mounted either in another location on the Breaker or in the Breaker Cell. Alternative mounting of the CPT is the sole responsibility of the Retrofitter.

NOTE: On some versions of the K-1600 / 2000 Breakers originally supplied with a Breaker Interlock Mechanism, the Breaker Mounted CPT can not be installed on the DTA Assembly as detailed in the following steps. The CPT will have to be mounted either in another location on the Breaker or in the Breaker Cell. Alternative mounting of the CPT is the sole responsibility of the Retrofitter.

- A. Mount the Breaker Mounted CPT to the CPT Mounting Plate, as shown, using the (2) .190-32 x .500" flat head screws, (2) .190-32 x .500" filister head screws, (6) flat washers, (4) lock washers, and (4) nuts supplied. Note the orientation of the CPT to the holes in the Mounting Plate. The CPT must be mounted in this position.

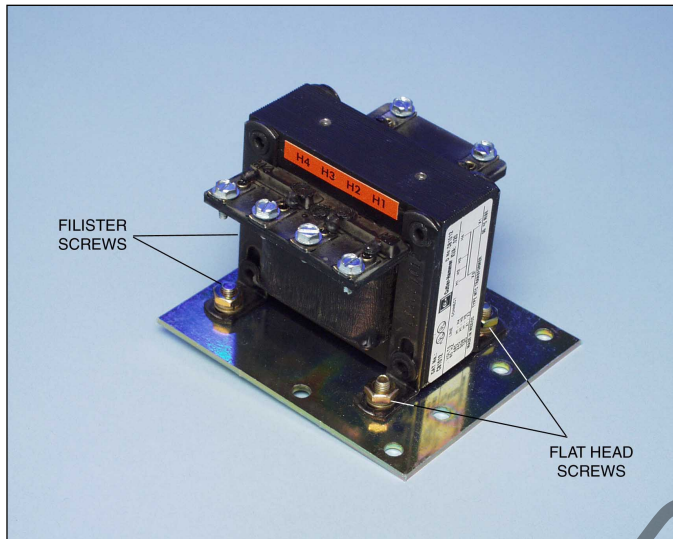


Fig. 19 CPT Orientation and Screw Location

- B. Attach the CPT Insulation Barrier to the CPT Insulation Barrier Mounting Bracket, as shown, using the (2) .164-32 x .312" pan lock screws and (2) flat washers supplied.

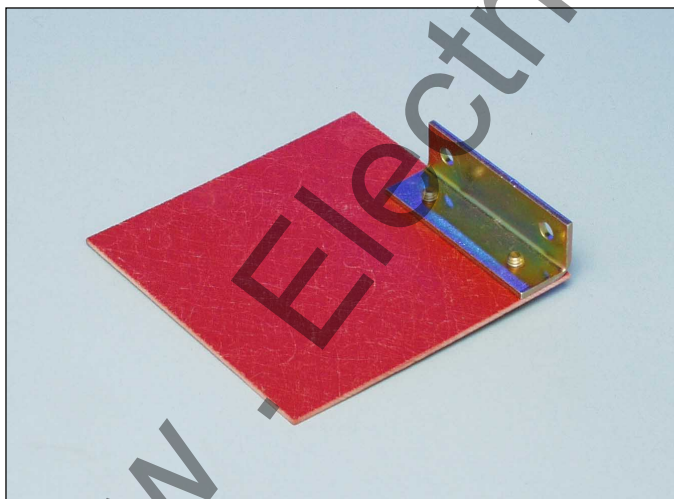


Fig. 20 Bracket Mounted to the CPT Insulation Barrier

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.

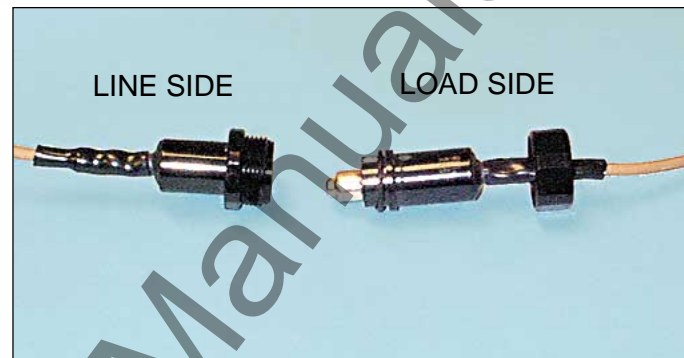


Fig. 21 Identification of the Line and Load Side HV Wires

NOTE: The Load Side HV Wires are longer than necessary and are cut during the following steps. Before cutting the wires, insure that sufficient length is left so that the connections can be made to the correct terminals on the CPT.

- C. Route the Load Side HV Wires and the CPT Harness through the existing hole in the Breaker Platform, then down to the bottom right corner of the Breaker. Note that the final location of the HV Fuses will be along the right side of the Breaker. Note also that the CPT Harness will be connected to the new Trip Unit later in the Retrofit Process. Insure that, when cutting the HV Wires and CPT Harness in the following steps, sufficient length is left for these connections to be made.

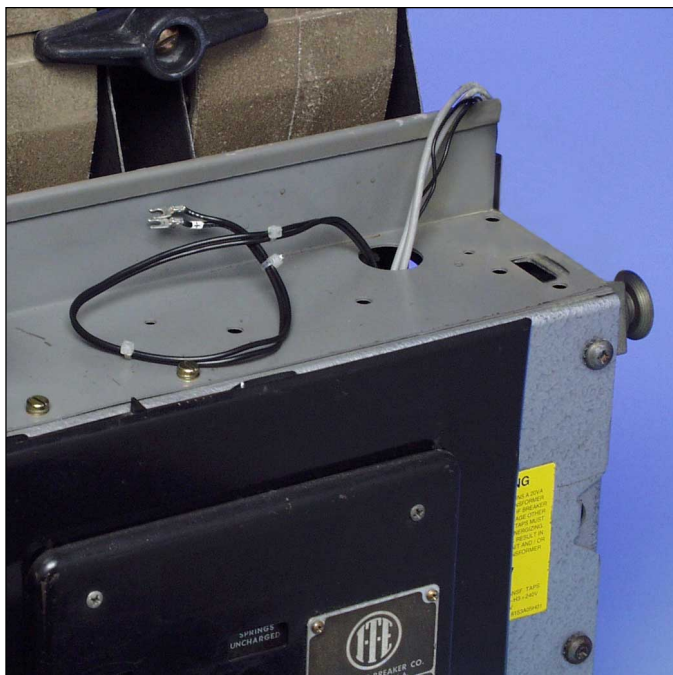


Fig. 22 Routing of the HV Wires

- D. Carefully lay the Breaker on its left side.
- E. Temporarily set the CPT Assembly on the right Breaker Side Plate. Route the CPT Harness to the X1 and X2 terminals of the Breaker Mounted CPT. Mark and cut the CPT Harness to an appropriate length. Strip an appropriate length of insulation and attach a .138" ring terminal to each wire of the CPT Harness. Connect the CPT Harness to the X1 and X2 terminals of the CPT.
- F. With the CPT still temporarily set on the right Breaker Side Plate, route the Load Side HV Wires to the "H" terminals of the Breaker Mounted CPT. Mark and cut the HV Wires to an appropriate length. Strip an appropriate length of insulation and attach a .138" ring terminal to each wire of the HV Wire. Attach the HV Wires to the CPT terminals to achieve the required voltage. (See Table 3.)

Table 3 CPT Voltage Taps

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

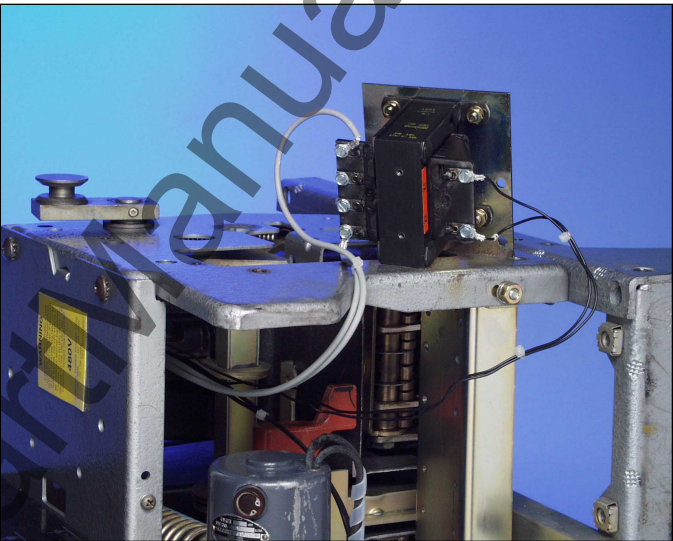


Fig. 23 CPT Harness and HV Wires connected to the CPT

- G. Align the holes in the CPT Assembly with the holes in the DTA Assembly as shown. Secure the left side of the CPT Mounting Plate to the DTA Mounting Angle, as shown, using the (1) .164-32 x .625" screw, (2) flat washer, (1) lock washer, and (1) nut supplied.
- H. Align the holes in the CPT Insulation Barrier Assembly with the holes in the CPT Assembly and the DTA Assembly. Secure the Insulation Barrier Assembly and the right side of the CPT Assembly to the DTA Assembly, as shown, using the (2) .164-32 x .625" screws, (4) flat washers, (2) lock washers, and (2) nuts supplied.

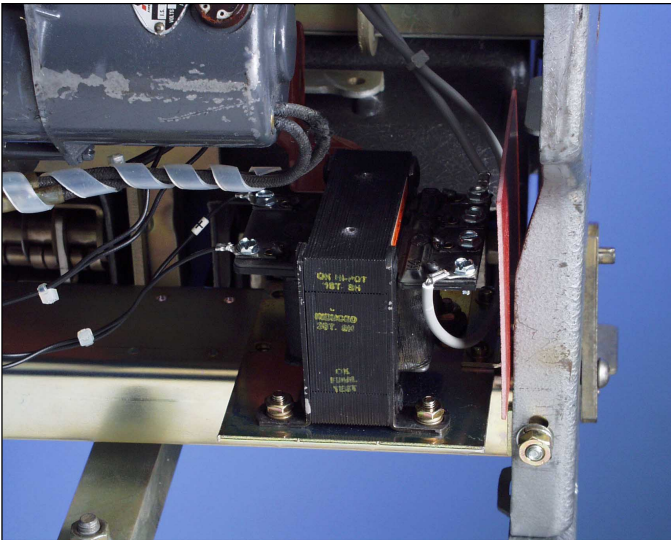


Fig. 24 CPT Mounted to the DTA Assembly



Fig. 26 Insulation Plate Mounted to the CPT

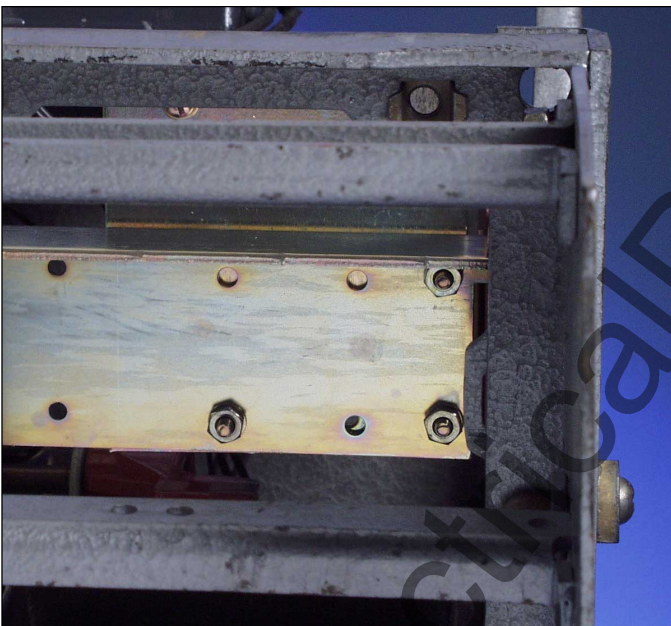


Fig. 25 CPT Mounting Screw Location

- I. Attach the Glass Poly Insulation Plate to the top of the CPT, as shown, using the (2) .138-20 x .375" thread cutting screws, (2) lock washers, and (2) flat washers supplied.

- J. Tighten the hardware that secures the DTA Assembly to the Breaker.
- K. Attach the appropriate CPT Voltage Label in a clearly visible position on the front of the Breaker. Three (3) labels are included with the CPT Kit, one (1) for 480 Volt, one (1) for 240 Volt, and one (1) for 208 Volt systems.

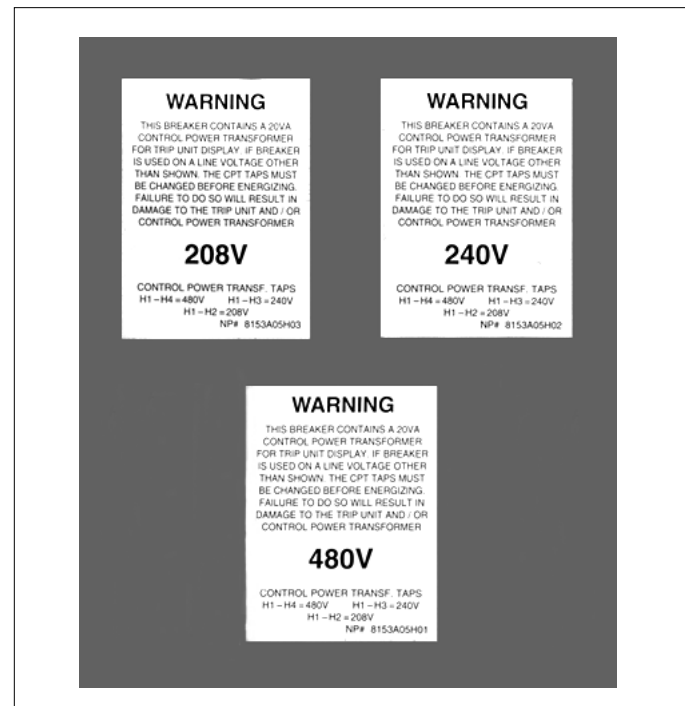


Fig. 27 Supplied CPT Voltage Labels

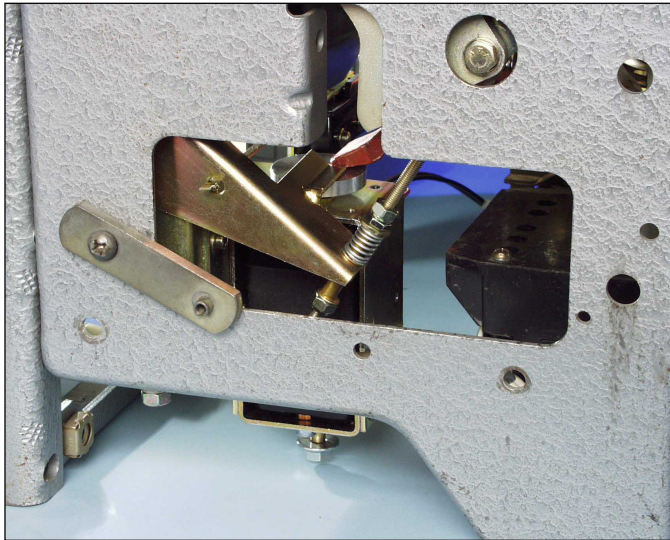
**STEP 7: FINAL DTA AND RESET
INSTALLATION AND ADJUSTMENT**

Fig. 28 Overview – DTA and Reset Adjustment

- A. With the Breaker in its upright position, liberally apply Loc-Tite® 243 to the threads of the DTA Shaft.

NOTE: Only Loc-Tite® 243, supplied with the Retrofit Kit, may be used for this application. The use of any other grade or type of thread lock will adversely effect the integrity of this joint and the service life of this Retrofit.

- B. Lift the Breaker Trip Arm and thread the DTA Trip Plate onto the DTA Shaft.

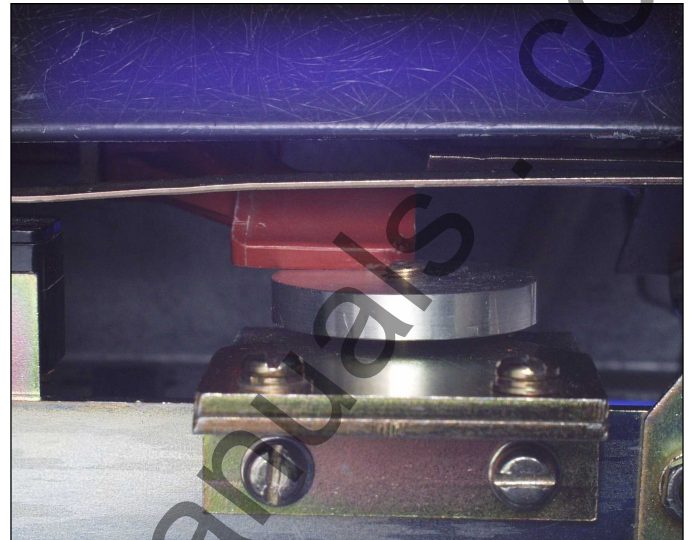


Fig. 29 DTA Trip Plate Installed on the DTA Shaft

- C. **CLOSE** the Breaker.

**WARNING:**

GUARD AGAINST THE BREAKER UNINTENTIONALLY OPENING DURING THE FOLLOWING STEPS. KEEP HANDS AND FINGERS AWAY FROM MOVING PARTS WITHIN THE BREAKER. FAILURE TO DO SO COULD RESULT IN SEVERE PERSONAL INJURY.

- D. While applying slight upward pressure on the Breaker Trip Arm, turn the DTA Trip Plate until a gap of .06" is achieved between the bottom of the Breaker Trip Arm and the top of the DTA Trip Plate.

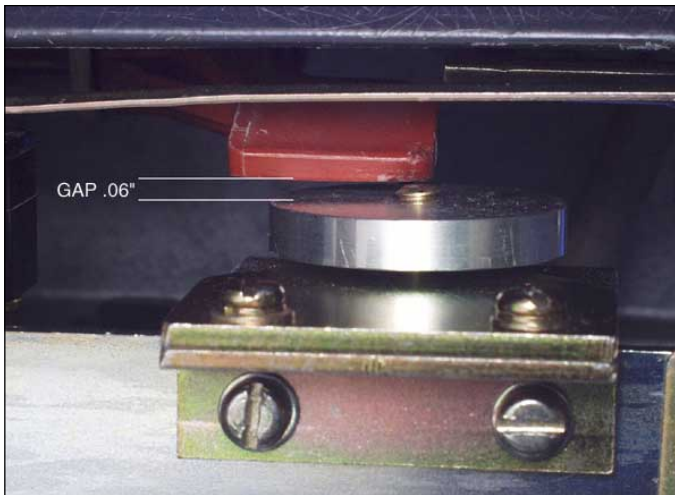


Fig. 30 Setting the DTA Gap

E. Return the Breaker to the **OPEN** position.

NOTE: The Loc-Tite® 243 must be allowed to cure for a MINIMUM of one (1) hour before the DTA is tested. Note the time at which the final gap was set, then continue the Retrofit Process. When Step 15 – Testing the Breaker is reached, verify that at least one (1) hour has past. If it has not, wait until the one (1) hour minimum has been reached before conducting any testing.

F. *For K-2000 Breakers Only:* Secure the DTA Insulation Plate to the DTA Insulation Plate Bracket, as shown, using the (2) .164-32 x .312" pan lock screws and (2) flat washers supplied.

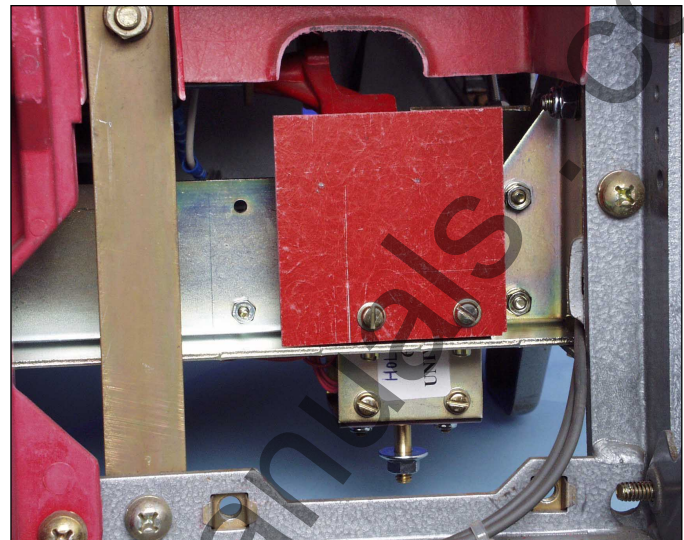


Fig. 31 Mounting the DTA Insulation Plate – K-2000 Breakers Only

G. Carefully lay the Breaker on its right side.

H. If the Breaker is equipped with a left hand Auxiliary Switch, observe the Drive Link orientation then remove and scrap the original Drive Link.

I. Slide the new Auxiliary Switch Drive Link up through the opening in the Breaker. Connect the new Auxiliary Switch Drive Link to the left hand Auxiliary Switch, as shown, using the (1) pin, (2) .250" flat washers, and (2) .06 x .88" cotter pins supplied. Be sure to install the new Auxiliary Switch Drive Link in the same orientation as the original.



Fig. 32 Connecting the Auxiliary Switch Drive Link

- J. Remove the lock nut and small flat washer from the threaded end of the Reset Rod Assembly supplied with the Retrofit Kit.

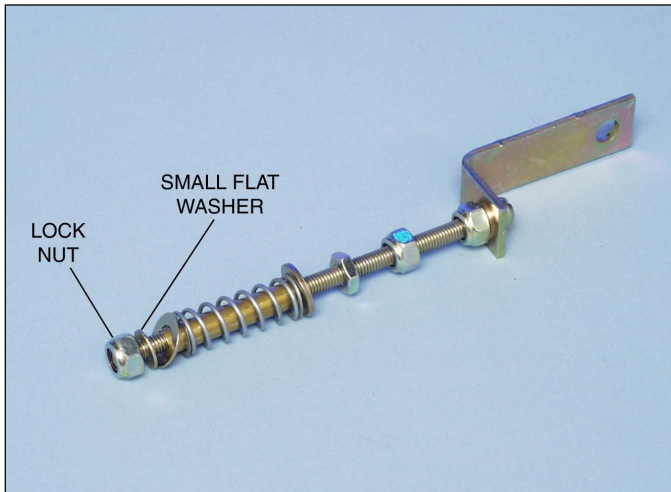


Fig. 33 Reset Rod Assembly

- K. While holding the tension spring, spacer, and large flat washer in place on the Reset Rod, insert the threaded shaft of the Reset Rod Assembly into the slot in the Reset Arm. Install the small flat washer then start the lock nut on the end of the threaded shaft to keep the components in place.
- L. Align the Reset Rod Assembly and, if applicable, the Auxiliary Switch Drive Link, as shown, with the existing hole in the Pole Shaft Stop. Secure the Reset Rod Assembly and the Auxiliary Switch Drive Link to the Pole Shaft Stop using the (1) .250-20 x 1.25 bolt, (4) flat washers, and (1) lock nut supplied. The lock nut should be installed so that the bolt, Reset Rod Assembly, and, if applicable, the Auxiliary Switch Drive Link move freely.

NOTE: If the Auxiliary Switch Drive Link is not used in the Breaker being Retrofitted, one (1) of the flat washers should be eliminated from the Pole Shaft Stop connection.

NOTE: If necessary for clearance within the Breaker, the .250-20 bolt used to connect the Reset Rod Assembly to the Pole Shaft Stop can be cut.

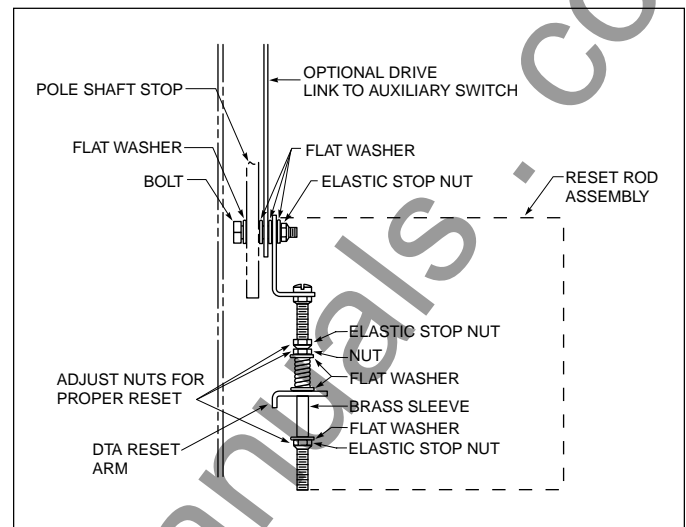


Fig. 34 Correct Connection of the Reset Rod Assembly and the Auxiliary Switch Drive Link

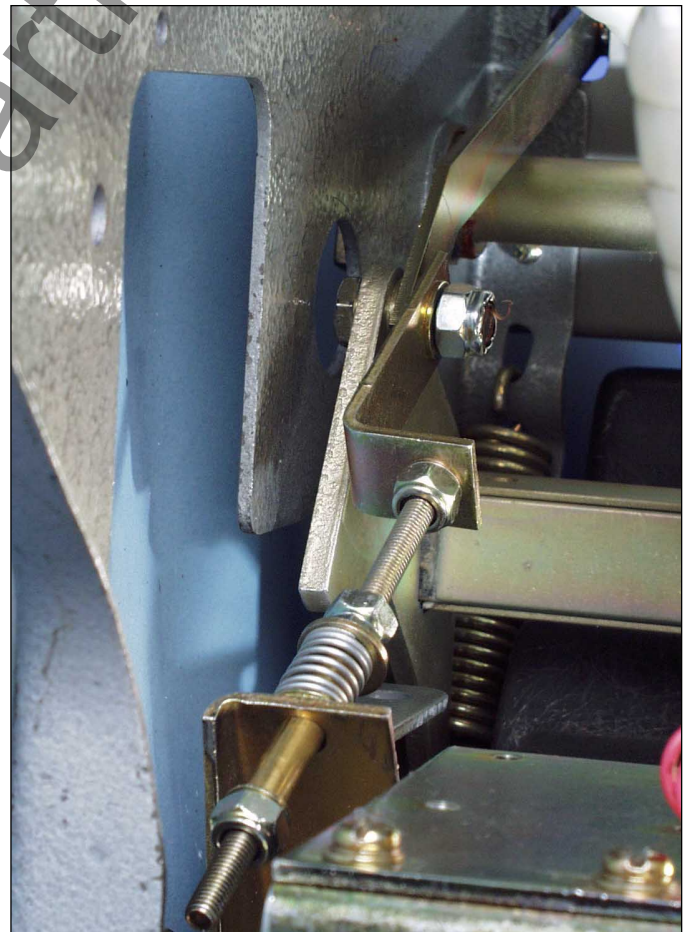


Fig. 35 Reset Rod Assembly Mounted in the Breaker

- M. Adjust the nuts on the Reset Rod Assembly until a nominal cage height of .56" is achieved.

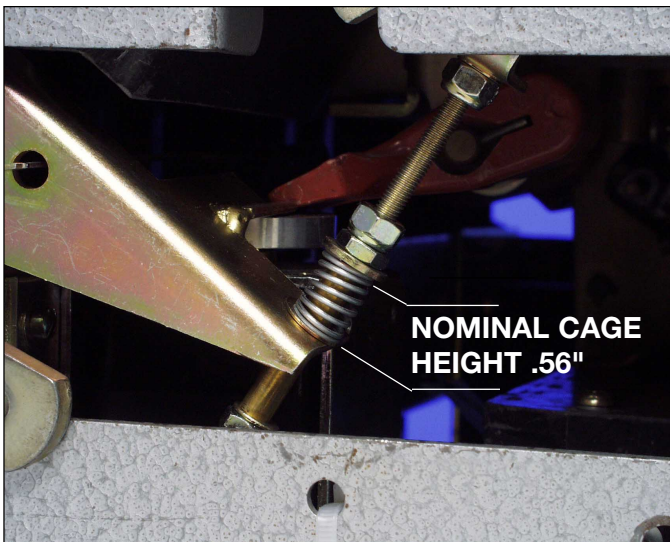


Fig. 36 Adjusting the Reset Rod Assembly

- N. Carefully return the Breaker to its upright position.

STEP 8: INSTALLING THE COPPER CONNECTORS



Fig. 37 Overview – Installation of the New Copper Connectors

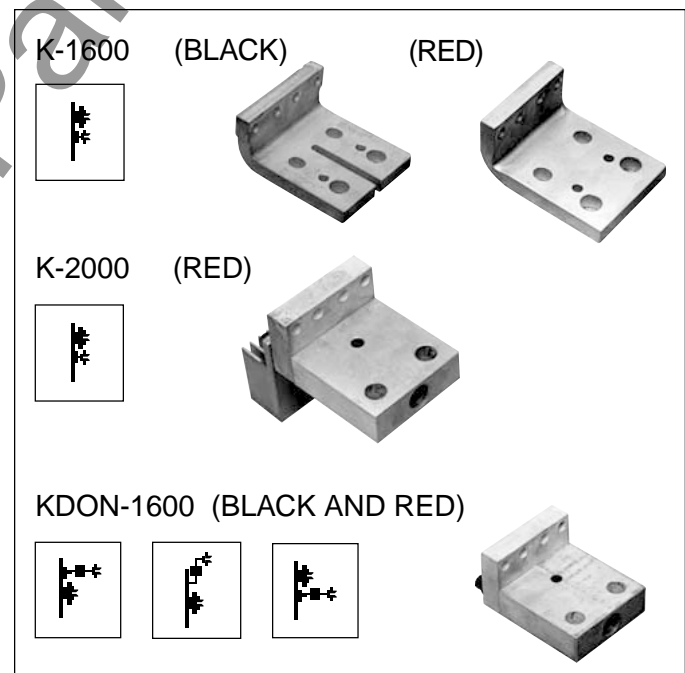


Fig. 38 Copper Connectors for the K-1600 / 2000 Breakers

- A. Install a new Copper Connector, with the short leg facing upwards, in each of the Glastic Moldings using the two (2) screws removed in Step 2-G.

- B. Install the Glastic Molding Assemblies back into the Breaker using the original hardware removed during Step 2-C.
- C. Secure each new Copper Connector to each existing Copper Contact using the (4) .312-18 × 1.12" hex cap bolts, (4) lock washers, and (4) flat washers supplied.

STEP 9: PREPARING THE TRIP UNIT ASSEMBLY

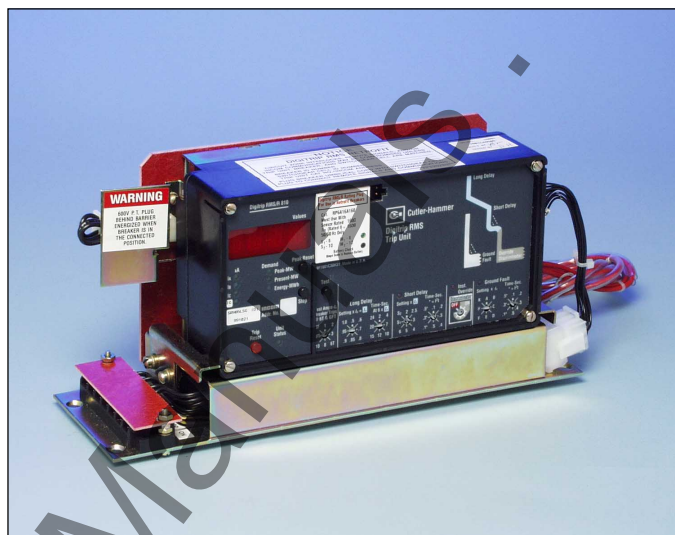


Fig. 38 Overview – Trip Unit Assembly

- A. Mount the Glass Poly Barrier to the back of Aux. CT Module, as shown, using the (2) .190-32 × .380" screws, (2) flat washers, and (2) lock washers supplied.

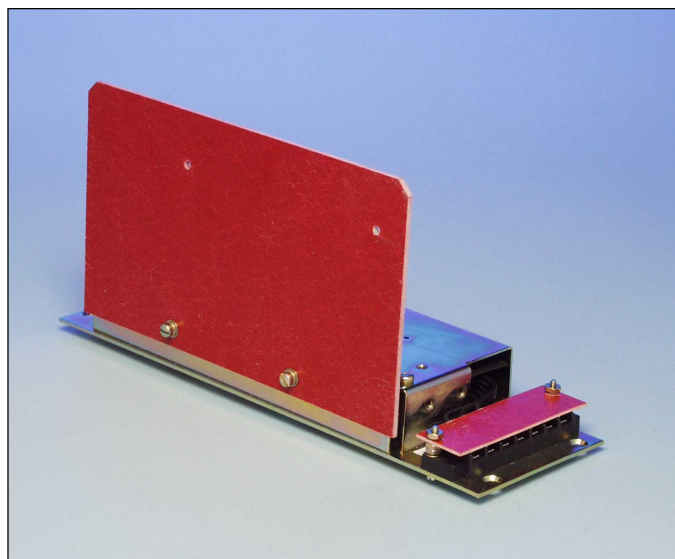


Fig. 39 Glass Poly Barrier Mounted to the Aux. CT Module

- B. *For Kits Supplied with a PT Module Only:*
Mount the PT Module to the Glass Poly Barrier, as shown, using the (2) .138-32 x .500" screws, (4) flat washers, (2) lock washers, and (2) nuts supplied. Note that the PT Wires must be routed towards the right side of the Aux. CT Module.

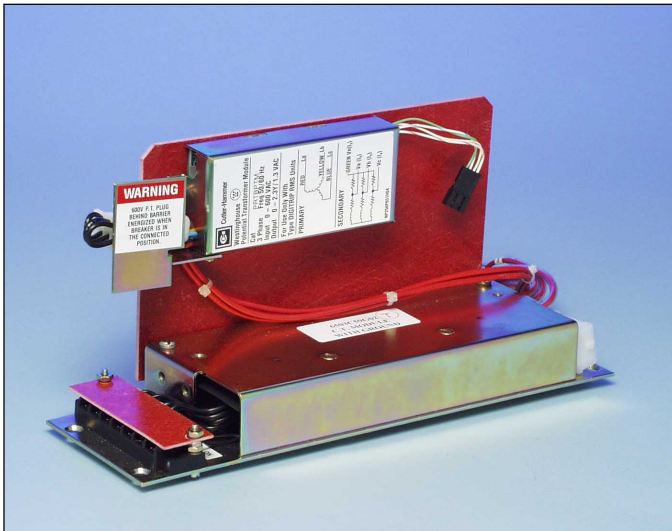


Fig. 40 PT Module Mounted to the Glass Poly Barrier



Fig. 41 Correct Installation of the Support Clips

- C. Mount the Trip Unit to the top of the Aux. CT Module as shown using the (2) .190-32 x 4.00" screws, (2) lock washers, (2) flat washers, and (2) spacers supplied. Note that the spacers are positioned between the top of the Aux. CT Module and the bottom of the Trip Unit. Do not tighten the screws at this time.
- D. Mount the left and right Trip Unit Support Clips to the sides of the Aux. CT Module and into the bottom front slots in the Trip Unit as shown. Secure the support clips using the (4) .190-32 x .375" screws, (4) flat washers, and (4) lock washers supplied.
- E. Secure the Trip Unit by tightening the 4.00" screws installed in Step 8-C.
- F. Remove the Trip Unit Cover and install the Rating Plug supplied with the Retrofit Kit. Reinstall the Cover.
- G. Install the Digitrip Nameplate on the top of the Trip Unit.

STEP 10: INSTALLING THE TRIP UNIT ON THE BREAKER

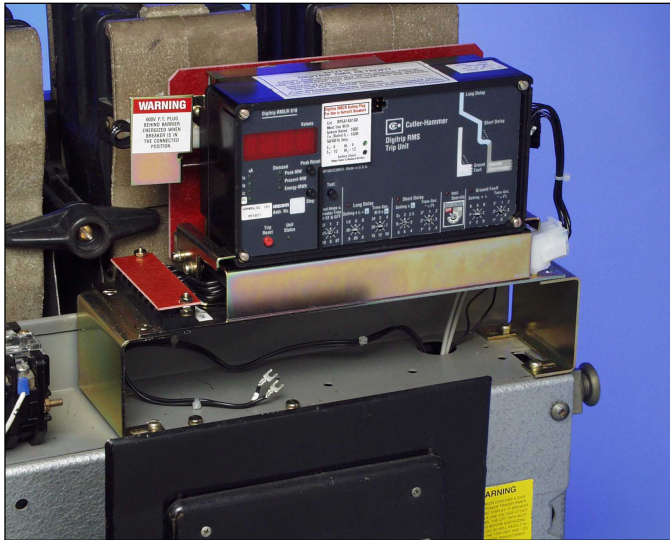


Fig. 42 Overview – Trip Unit Assembly Installed on the Breaker

- A. Remove and scrap the two (2) screws from the right side of Breaker Platform.
- B. Mount the right Trip Unit Mounting Bracket on top of the Breaker Platform, flush with the end of the Breaker, using the (2) .190-18 x .500" thread cutting screws, (2) lock washers, and (2) flat washers supplied.

NOTE: If specified during ordering, special Trip Unit Mounting Brackets (taller than the standard brackets) have been supplied for some older models of the KDON-1600 Black Breaker equipped with trigger fuses. If the Brackets are needed but were not ordered, contact Cutler-Hammer at: 1-800-937-5487.

- C. Mount the left Trip Unit Mounting Bracket to the Trip Unit Assembly using (2) .190-32 x .375" flat head screws supplied.
- D. Set the Trip Unit Assembly on the Breaker Platform with the holes on the right side in line with the Mounting Bracket holes.
- E. Mark the Breaker Platform through the slots in the bottom left Mounting Bracket. Remove the Trip Unit Assembly.

- F. Assure that the area under the Breaker Platform where the holes will be drilled is clear, then drill two (2) 0.166" diameter holes where marked.
- G. Remove the left hand Mounting Bracket from the Trip Unit Assembly. Install the Mounting Bracket on the Breaker Platform using the (2) .190-18 x .500" thread cutting screws (2) lock washers, and (2) flat washers supplied.

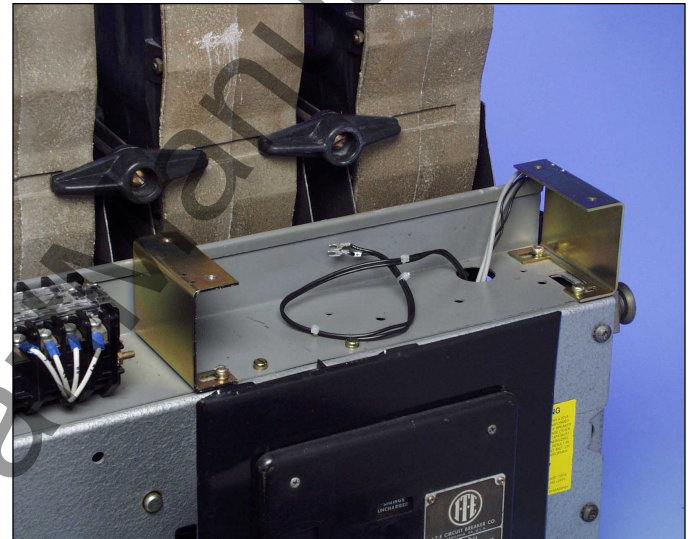


Fig. 43 Installing the Trip Unit Assembly Mounting Brackets

- H. Mount the Trip Unit Assembly to the Mounting Brackets using the (4) .190-32 x .375" flat head screws supplied.

NOTE: For Kits Supplied with a Breaker Mounted CPT Only: When installing the Trip Unit Assembly, both the CPT Harness and HV Wires must be positioned between the right rear corner between the Trip Unit and the Phase 3 Arc Chute.

- I. Install the Aux. CT Harness between the Trip Unit and the Aux. CT Module.



Fig. 44 Connecting the Aux. CT Harness

For Kits Supplied with a PT Module and / or Breaker Mounted CPT Only.

STEP 11: FINAL CONNECTION OF THE PT AND / OR HV WIRES



Fig. 45 Overview – Final Routing of the PT and HV Wires

NOTE: An adequate length of insulated tubing has been supplied in the Retrofit Kit for use on both the PT and HV Wires.

For Kits Supplied with a PT Module Only.

- A. Cut appropriate length pieces from the supplied insulated tubing and install one (1) piece on each PT Wire. Route the three (3) PT Wires from the PT Module to the right side of the Breaker, through the hole drilled in the right Breaker Angle in Steps 3 C or D, then towards the bottom Breaker Stabs.

Insure that the insulated tubing is positioned to protect each PT Wire as it passes through the Breaker Angle.

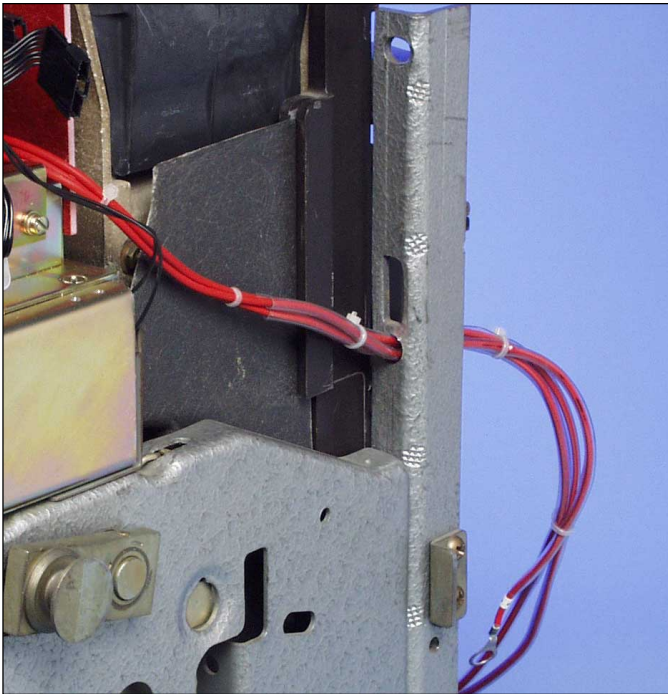


Fig. 46 Correct Position of the Insulated Tubing

Note that the PT Wires are marked for connection to Phase 1, 2, and 3.

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

- B. Route the PT Wires to a position suitable for attachment to the proper Phase Breaker Stabs. 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 an appropriate length of insulation, and install a .375" ring terminal to each PT Wire.
- C. Remove the nuts and lock washers securing the selected bottom Breaker Stabs to the Back Plate.
- D. Connect each PT Wire to its corresponding Breaker Stab using the original lock washers and nuts.

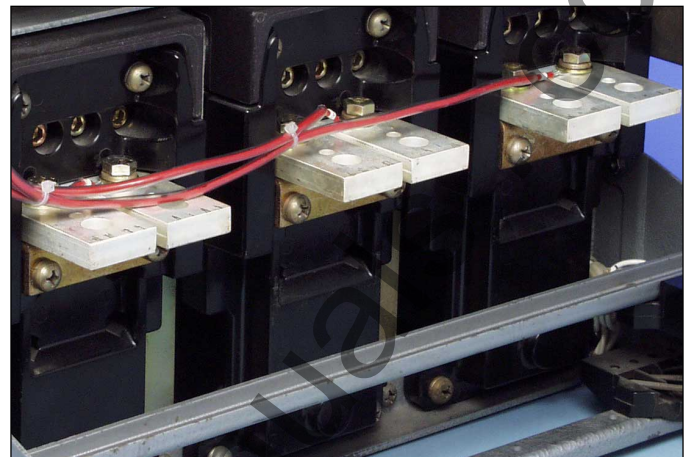


Fig. 47 PT Wires Connected to the Breaker Stags

For Kits Supplied with a Breaker Mounted CPT Only.

- E. Cut appropriate length pieces from the supplied insulated tubing and install one (1) piece on each HV Wire. Route the two (2) HV Wires through the hole drilled in the right Breaker Angle in Steps 3 C or D, then towards the top Breaker Stabs.

Insure that the insulated tubing is positioned to protect each HV Wire as it passes through the Breaker Angle. Also insure that the HV Fuses are located as shown.

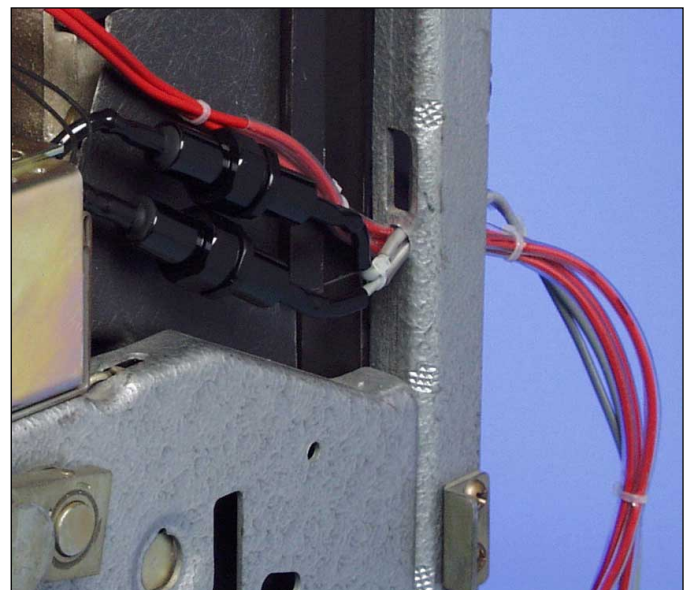


Fig. 48 Correct Position of the Insulated Tubing and HV Fuses

NOTE: The power convention of the ITE K-1600 / 2000 Series 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.

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 Breaker Stabs.

- F. Remove the screws, lock washers, and nuts that secure the Phase 1 and 2, or 2 and 3 top Breaker Stabs to the Back Plate.
- G. Cut the HV Wires to the appropriate length for attachment to the Phase 1 and 2, or 2 and 3 Top Breaker Stabs. Strip an appropriate length of insulation from each HV Wire and attach a .375" ring terminal. Connect the HV Wires to the Breaker Stabs using the original screws, lock washers, and nuts.

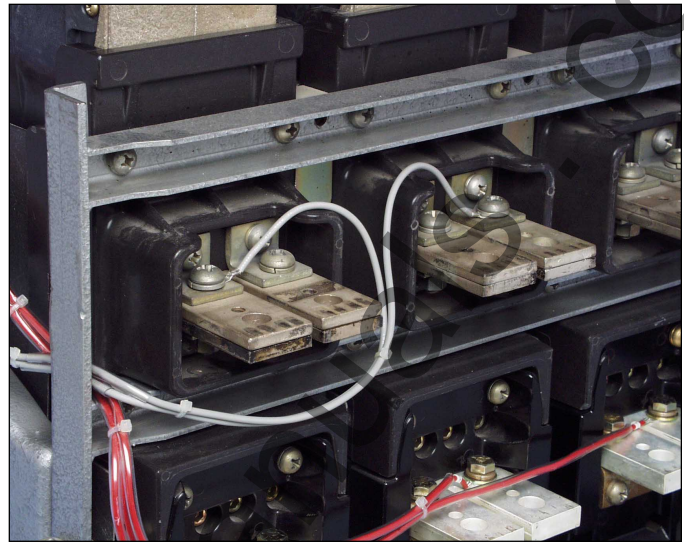


Fig. 49 HV Wires Connected to the Top Breaker Stabs

ATTENTION: Before proceeding, it is necessary to verify which Step 12 is to be followed for correct installation of the Sensors. This is done by referring to the Icon(s) with each step.

STEP 12: INSTALLING THE SENSORS



Fig. 50 Overview – Installed Top Mounted Sensors

- Remove the retaining clips and pins securing the Finger Clusters to the top Breaker Stabs. Remove the Finger Clusters.
- Secure the Sensors to the Mounting Angle using the (6) .250-20 x .500" bolts, (6) lock washers, and (6) flat washers supplied.
- Slide the Sensor Assemblies over the top Breaker Stabs. Do not secure the Sensor Mounting Angle to the Breaker at this time.
- Reinstall the top Finger Clusters using the original hardware.

- Mount the (2) threaded coupling nuts to the top rear of the Breaker, using the (2) .375-16 x .750" bolts, (2) flat washers, and (2) lock washers supplied. Mount the Sensor Mounting Angle to the threaded cap nuts, as shown, using the (2) .375-16 x .750" bolts, (2) flat washers, and (2) lock washers supplied.



Fig. 51 Securing the Sensor Assembly to the Breaker

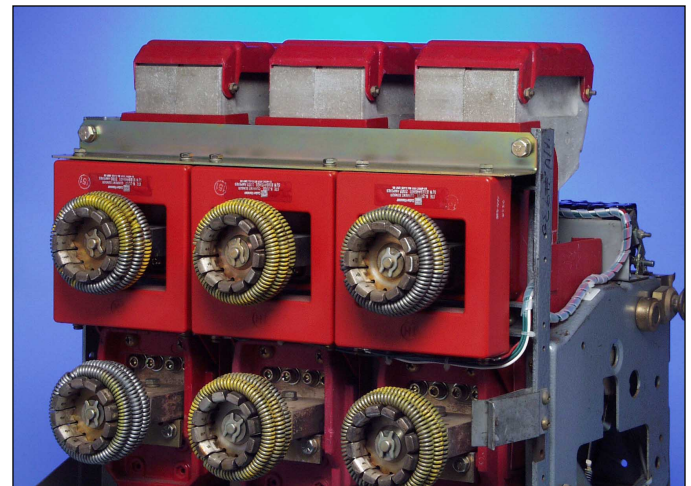


Fig. 52 K-2000 Sensors Installed



- F. Reinstall the bottom Finger Clusters (removed in Step 2-B) using the original hardware.



Reinstall the original Fuses, Fuse mountings, and associated hardware (removed in Step 2-B) on the bottom Breaker Stabs. Refer to the ITE K-1600 / 2000 Instruction Manual, originally supplied with the Breaker for more information.

- G. Rotate the Secondary Contact Bracket to its original position (loosened in Step 2-A). Secure it by reinstalling the original top screws and tightening the bottom screws.

ATTENTION: Before proceeding, it is necessary to verify which Step 12 is to be followed for correct installation of the Sensors. This is done by referring to the Icon(s) with each step.

STEP 12: INSTALLING THE SENSORS

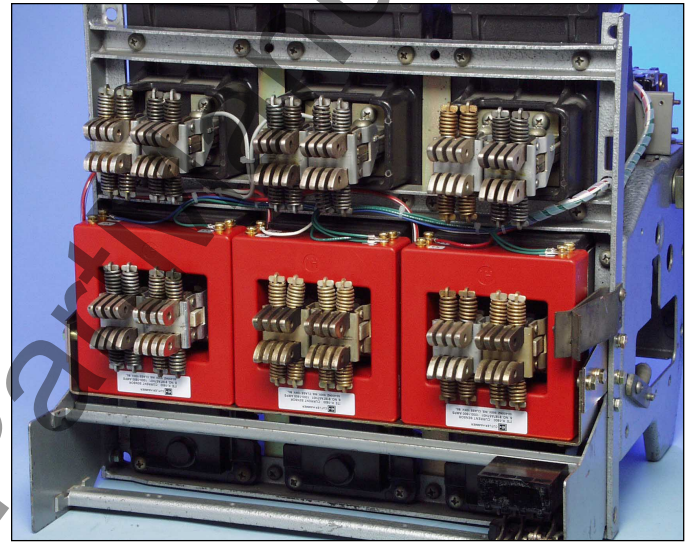
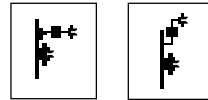


Fig. 53 Overview – Installed Bottom Mounted Sensor

- A. Drill two .266" diameter holes in each side of the rear Breaker Frame (See Drilling Plan "C").

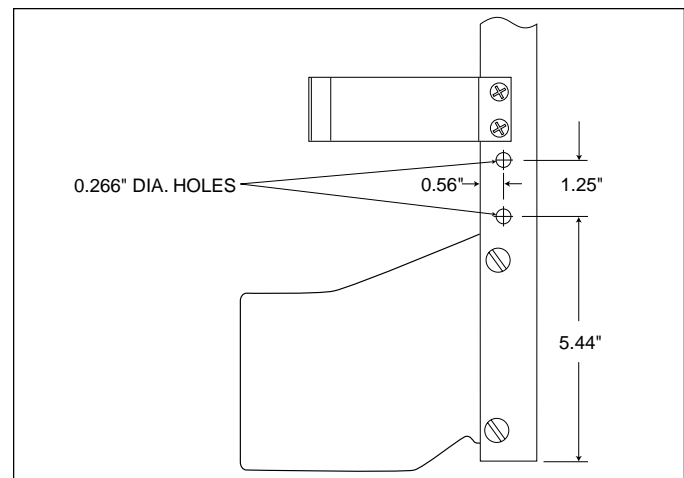


Fig. 54 Drilling Plan "C"

- B. Mount a Sensor Mounting Bracket to each side of the Breaker Frame using the holes just drilled and the (4) .250-20 x .500" bolts, (4) flat washers, and (4) lock washers supplied.
- C. Secure the Sensors to the Mounting Platform using the (6) .250-20 x .500" bolts, (6) lock washers, and (6) flat washers supplied.

NOTE: It may be necessary to loosen the screws holding the Grounding Contact (located on the side of the Breaker Frame) in order to properly position the Sensor on the Phase 1 Breaker Stab. After Sensor is in place retighten the screws holding the Grounding Contact.

- D. Slide the Sensor Assemblies over the bottom Breaker Stabs. Be sure the Mounting Platform is above the surface of the Sensor Mounting Brackets. Do not secure the Sensor Mounting Platform to the Mounting Brackets at this time.
- E. Reinstall the bottom Finger Clusters (removed in Step 2-B) using the original hardware.
- F. Mount the Sensor Mounting Platform to the Sensor Mounting Brackets using the (4) .250-20 x .500" bolts, (4) flat washers, and (4) lock washers supplied.



Fig. 55 Securing the Sensor Mounting Platform

- G. Rotate the Secondary Contact Bracket, loosened in Step 2-A, to its original position. Secure it by reinstalling the original top screws and tightening the bottom screws.

STEP 13: CONNECTING THE SENSOR HARNESS AND THE DTA HARNESS

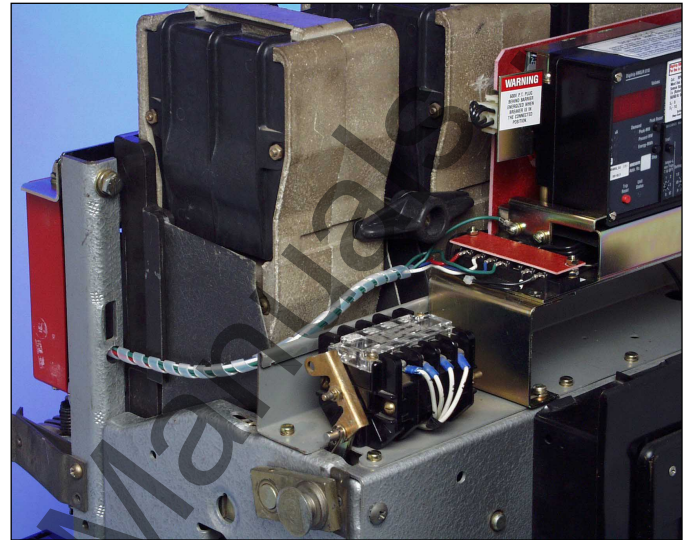


Fig. 56 Overview – Installing the Sensor and DTA Harness

- A. Remove the 7-Point Terminal Block cover from the left side of the Aux. CT Module.
- B. Route the DTA Extension Harness between the Trip Unit Assembly and the Phase 2 Arc Chute. Connect the “+” wire of the DTA Harness to the “OP” terminal of the 7-Point Terminal Block and the unmarked wire to the “ON” terminal.



Fig. 57 Connecting the DTA Harness

- C. Connect the Sensor Harness to the proper terminals of the 7-Point Terminal Block. 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 rear screw of the left Trip Unit Support Clip.

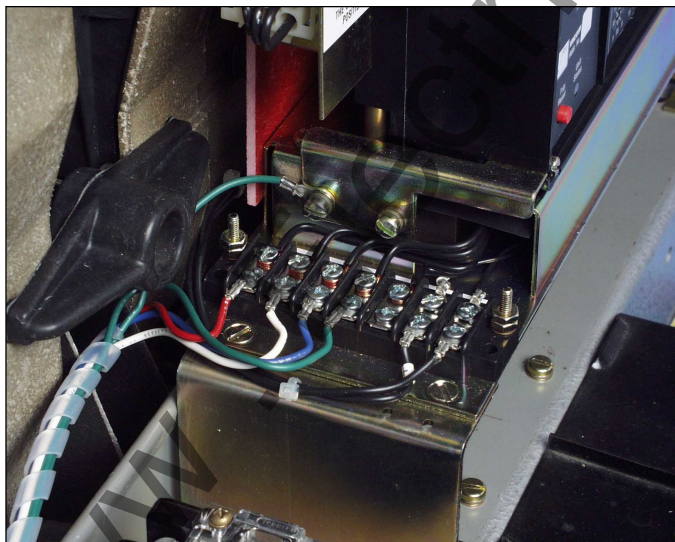


Fig. 58 Connecting the Sensor Harness

- D. Route the Sensor Harness towards the left rear of the Breaker, then through the hole drilled in Step 3-A or B.

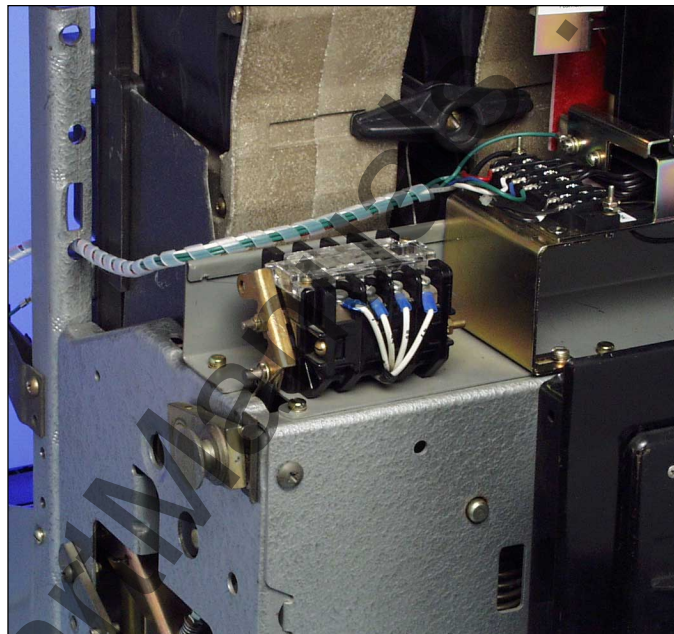


Fig. 59 Routing of the Sensor Harness

- E. Connect the ring terminals of the Sensor Harness to the Sensors. 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 ratings apply.

Table 4 Sensor Taps Ratings

Sensor Style No.	Terminal Com.	Amps
8187A55H01:	X1-X2 =	200 A
8187A56H01:	X1-X4 =	800 A
	X1-X3 =	600 A
	X1-X2 =	400 A
8187A57H01:	X1-X4 =	1600 A
	X1-X3 =	1200 A
8189A46H01:	X1-X2 =	2000 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.

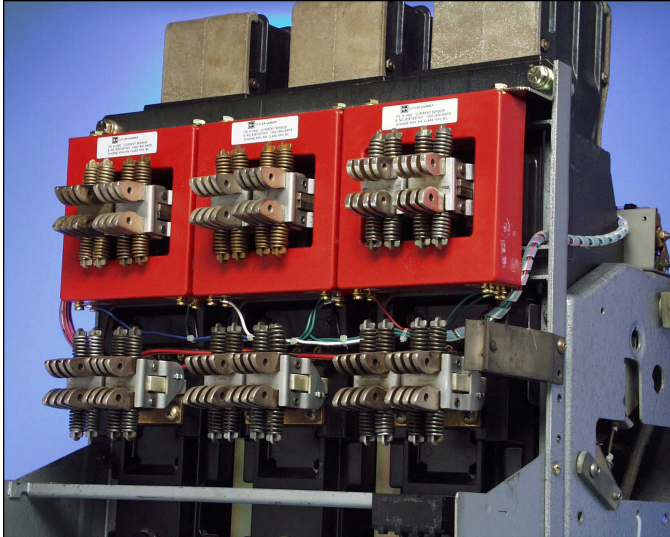


Fig. 60 Sensor Harness Connected to the Top Mounted Sensors

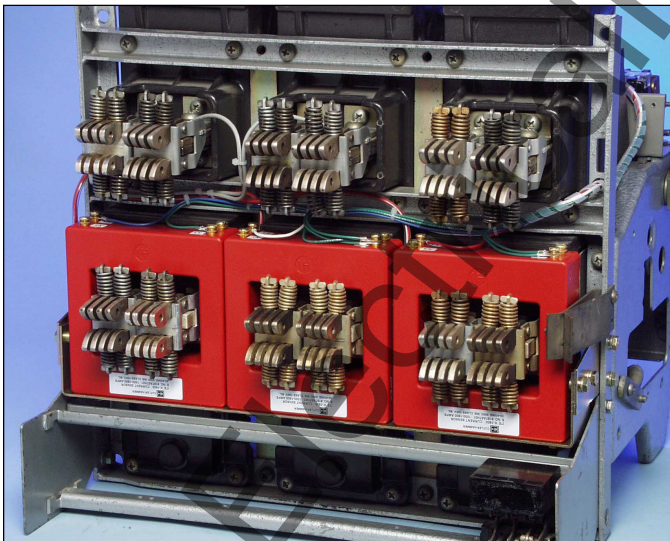


Fig. 61 Sensor Harness Connected to the Bottom Mounted Sensors

F. Reinstall the 7-Point Terminal Cover.

STEP 14: CONNECTING THE EXTERNAL HARNESS AND OPTIONAL COMPONENTS

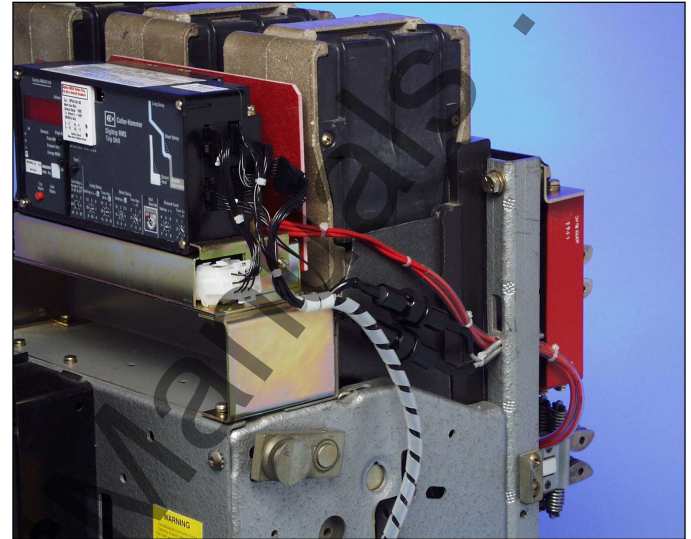


Fig. 62 Overview – Connecting the External Harness

A. Connect the External Harness to the Trip Unit.

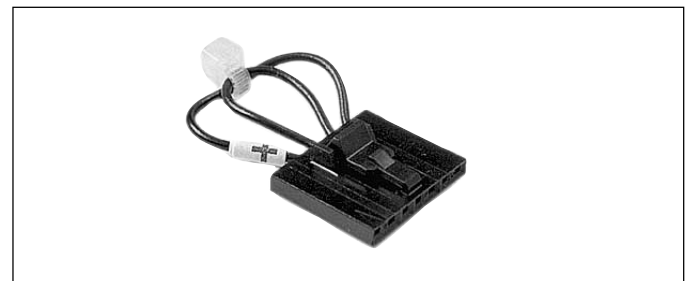


Fig. 63 510 Basic Kit External Harness Plug

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

B. Secure the External Harness to the two (2) pre-drilled holes in the upper right corner of the Trip Unit Mounting Bracket using the (2) nylon wire clamps and the (2) .138 x .380" thread cutting screws supplied.

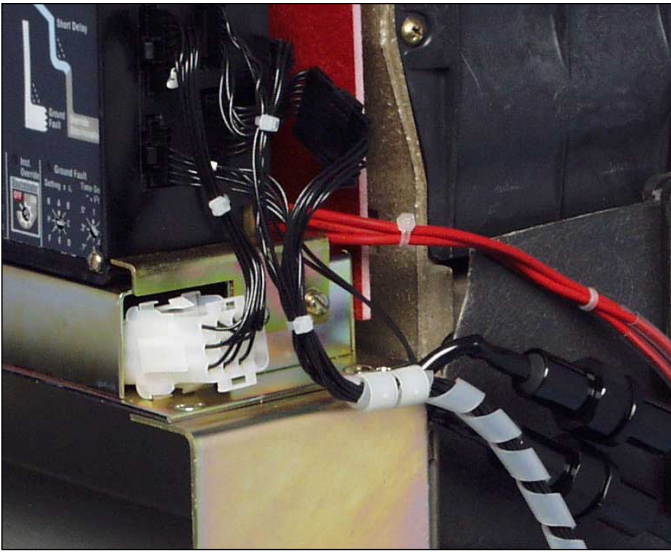


Fig. 64 Securing the External Harness

- C. *For Kits Supplied with a PT Module Only:* Connect the PT Harness to the External Harness.
- D. *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 mounted on the DTA Assembly. Connect one (1) wire to the normally "Open" terminal and the other wire to the "Common" terminal of the Auxiliary Switch.

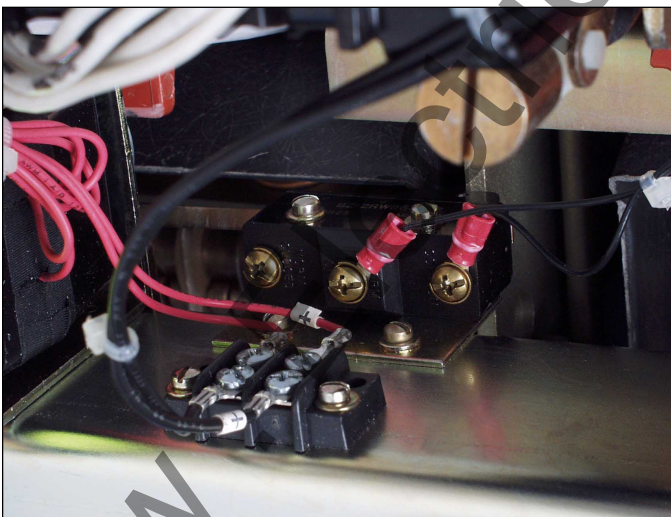


Fig. 65 Connecting the Auxiliary Switch

- E. *For Kits Supplied with a Breaker Mounted CPT Only:* Remove the 9-position External Harness plug from the female receptacle on the Trip Unit. Insert the black plug from the CPT Harness into the same female receptacle. Reinsert the External Harness Plug just removed into the female receptacle on the CPT Harness.
- F. Use the nylon wire ties provided to dress all wires and harnesses to keep them away from any moving parts within the Breaker. Be sure to use at least one (1) wire tie to secure the existing wiring harness, that was routed below the DTA Assembly earlier in the Retrofit Process, to the left side of the Breaker as shown.

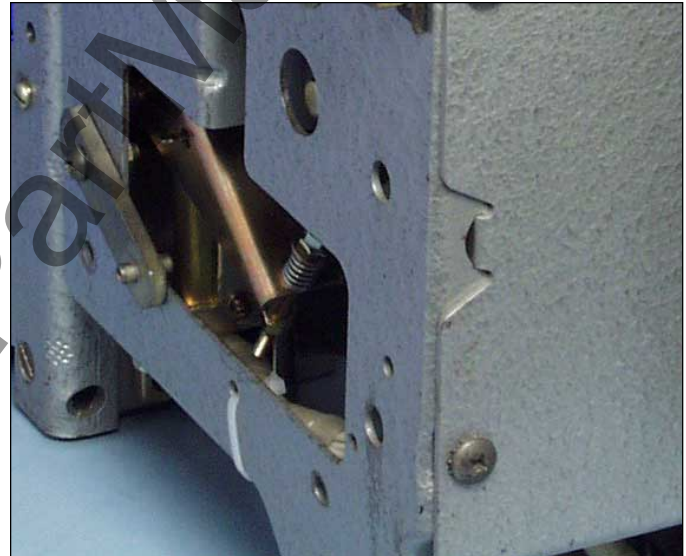


Fig. 66 Location of the Wire Tie

STEP 15: TESTING THE BREAKER

NOTE: Insure that a minimum of one (1) hour has past since the final gap on the DTA was set in Step 6-D. If one (1) hour has not past, delay the start of testing until the minimum time has been reached.

- A. Measure the force necessary to trip the Breaker at the point where the top of the DTA Trip Plate impacts the Breaker trip Arm. The force necessary to trip the Breaker **MUST NOT EXCEED THREE (3) lbs.**
- B. Temporarily remove the 7-Point Terminal Block Cover and disconnect the DTA Extension Harness wires from their terminals.
- C. Connect a 24 VDC power supply to the DTA Extension Harness wires; 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, make the necessary adjustments to insure a .06" gap between the top of the DTA Adjustment Disk and the bottom of the Breaker Trip Bar (for Trip function) and .56" cage height on the Reset Rod Assembly (for Reset function). Repeat the procedure until proper trip and reset is achieved.
- D. Reconnect the DTA Extension Harness wires to the proper terminals of 7-Point Terminal Block and reinstall the Terminal Block Cover.
- E. 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), 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).

- F. 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.

For Kits Supplied with a Cell Harness Only.

STEP 16: 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 17: 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, SEVERE 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 K-225 (Black or Red), K-600 (Black or Red), and KDON-600 (Black or Red) Breakers

Step	Description	Style No.	Qty.	Comment
Step 4	DTA	4A35899G33	1	
	DTA Assembly Parts	4A35899G05	1	
	DTA Mounting Angle		1	
	DTA Trip Plate		1	
	Bearing Plate		1	
	Bearing Plate Mounting Bracket		1	
	.164-32 × .500 Lng. Screw Pan		2	
	.164-32 × .312 Lng. Screw Pan Lock		4	
	.164 Flat Washer Stl.		6	
	.164 Lock Washer Stl.		2	
	Loc-Tite® 243		1	
	Insulation Plate Mounting Bracket		1	
	.164-32 × .625 Lng. Screw		2	
	.164 Flat Washer Stl.		4	K-2000 Only From Step 8
	.164 Lock Washer Stl.		2	
	.164-32 Nut Hex Stl.		2	
	Aux. Switch Kit	4A35899G02	1	
	Microswitch		1	
	Mounting Bracket		1	
	.138-32 × 1.00 Lng Screw		2	Comm. Only
	.138-32 × .375 Lng Screw		2	
	.138 Flat Washer Stl.		8	
	.138 Lock Washer Stl.		4	
	.138-32 Nut Hex Stl.		4	
Step 5	DTA Mounting Parts	4A35899G06	1	
	Square Spacers		4	
	.250-20 × .750 Lng. Hex Bolt		2	
	.250 Flat Washer Stl.		4	
	.250 Lock Washer Stl.		2	
	.250-20 Nut Hex Stl.		2	
Step 6	Breaker Mounted CPT Kit	8259A91G05	1	
	Insulation Plate (Top)		1	
	.138-20 × .375 Lng. Screw T. C.		2	
	Ring Terminals (.138, .190, .250, .312, .375, .500 - Each Size)		2	
	CPT Mounting Parts	4A35899G20	1	
	Mounting Plate		1	CPT Only
	Insulation Plate (Side)		1	
	Mounting Bracket		1	
	.190-32 × .500 Lng. Screw Fil.		2	
	.190-32 × .500 Lng. Screw Flat Head		2	
	.190 Flat Washer Stl.		6	
	.190 Lock Washer Stl.		4	

Step	Description	Style No.	Qty.	Comment
Step 6 (Cont.)	.190-32 Nut Hex Stl.		4	CPT Only
	.164-32 × .312 Lng. Screw Pan Lock		2	
	.164-32 × .625 Lng. Screw		4	
	.164 Flat Washer Stl.		8	
	.164 Lock Washer Stl.		3	
	.164-32 Nut Hex Stl.		2	
	.138 Flat Washer Stl.		2	
	.138 Flat Washer Stl.		2	
Step 7	DTA Trip Plate		1	From Step 4
	Loc-Tite® 243		1	
	DTA Insulation Plate		1	K-2000 Only From Step 8
	.164-32 × .312 Lng. Screw Pan Lock		2	
	.164 Flat Washer Stl.		2	
	Breaker Reset Parts	4A35899G07	1	
	Aux. Switch Drive Link		1	
	Reset Rod Assembly		1	
	Drive Link Pin		1	
	.250-20 × 1.25 Lng. Hex Bolt		1	
	.250 Flat Washer Stl.		6	
	.250-20 Nut Hex Elastic Stop		1	
	.06 × .88 Cotter Pin		2	
Step 8	Copper Connector K-1600 Black	8259A13G03	3	K-1600 Black Kits
	Copper Connector K-1600 Red	8259A13G04	3	K-1600 Red Kits
	Copper Connector K-2000 Red	8259A13G05	3	K-2000 Red Kits
	Insulation Plate		1	K-2000 Only
	Mounting Bracket		1	
	.164-32 × .625 Lng. Screw		2	
	.164-32 × .312 Lng. Screw Pan Lock		2	
	.164 Flat Washer Stl.		6	
	.164 Lock Washer Stl.		2	
	.164-32 Nut Hex Stl.		2	
	Copper Connector KDON-1600 Red	8259A13G06	3	KDON-1600 Red Kits
	.312-18 × 1.12 Hex Cap Screw		12	K-1600 Black & Red Kits
	.312-18 × 1.75 Hex Cap Screw		12	K-2000 Red & KDON-1600 Red Kits
	.312 Flat Washer Stl.		12	
	.312 Lock Washer Stl.		12	
Step 9	Trip Unit		1	See Pick List
	Rating Plug		1	See Pick List
	Aux. CT Module	6503C59G__	1	
	Aux. CT Harness	6502C84G01	1	
	Trip Unit Assembly Parts	4A35898G08	1	
	Trip Unit Support Bracket R. H.		1	
	Trip Unit Support Bracket L. H.		1	
	Barrier		1	

Step	Description	Style No.	Qty.	Comment
Step 9	Digitrip Nameplate		1	
(Cont.)	Spacer Brass		2	
	.190-32 × 4.00 Lng. Screw		2	
	.190-32 × .375 Lng. Screw		6	
	.190 Flat Washer Stl.		8	
	.190 Lock Washer Stl.		8	
	PT Module	6502C82G01	1	Comm. Only
	.138-32 × .500 Lng. Screw		2	
	.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	
Step 10	Trip Unit Mounting Parts	4A35899G09	1	
	Trip Unit Mounting Bracket		2	
	.190-16 × .500 Lng. Screw T. C.		4	
	.190-32 × .375 Lng Screw F. H.		4	
	.190 Flat Washer Stl.		4	
	.190 Lock Washer Stl.		4	
Step 11	.160 I. D. × 60 " Insulated Tubing		1	Comm. Only From Step 13
Step 12	Sensor		3	See Pick List
	Sensor Mounting Parts	4A35899G10	1	
	Sensor Mounting Bracket		1	
	.250-20 × .500 Lng. Hex Bolt		6	
	.250 Flat Washer Stl.		6	
	.250 Lock Washer Stl.		6	
	.375-16 × .750 Lng. Hex Bolt		4	
	.375 Flat Washer Stl.		8	
	.375 Lock Washer Stl.		4	
	.375-16 Nut Threaded Coupling		2	
Step 12	Sensor		3	See Pick List
	Sensor Mounting Parts	4A35899G11	1	
	Sensor Mounting Platform		1	
	Sensor Mounting Bracket R. H.		1	
	Sensor Mounting Bracket L. H.		1	
	.250-20 × .500 Lng. Hex Bolt		14	
	.250 Flat Washer Stl.		14	
	.250 Lock Washer Stl.		14	
Step 13	Sensor Harness Parts	4A35899G12	1	
	Sensor Harness		1	
	Wire Tie Nylon		12	
	.160 I. D. × 60 " Insulated Tubing		1	Comm. Only
	DTA Harness		1	
Step 14	External Harness	6502C83G__	1	
	External Harness Parts	4A35899G13	1	

Step	Description	Style No.	Qty.	Comment
Step 14	Wire Clamp		2	
(Cont.)	.138 × .380 Lng. Screw T. C.		2	
Step 16	Cell Harness	6503C57G__	1	Except 510 Basic

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

Table 5: Torque Values for General Mounting and Screw Size Conversion

<i>Decimal Size (in)</i>	<i>Standard Size</i>	<i>Torque (in-lbs)</i>	<i>Torque (ft-lbs)</i>
.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

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

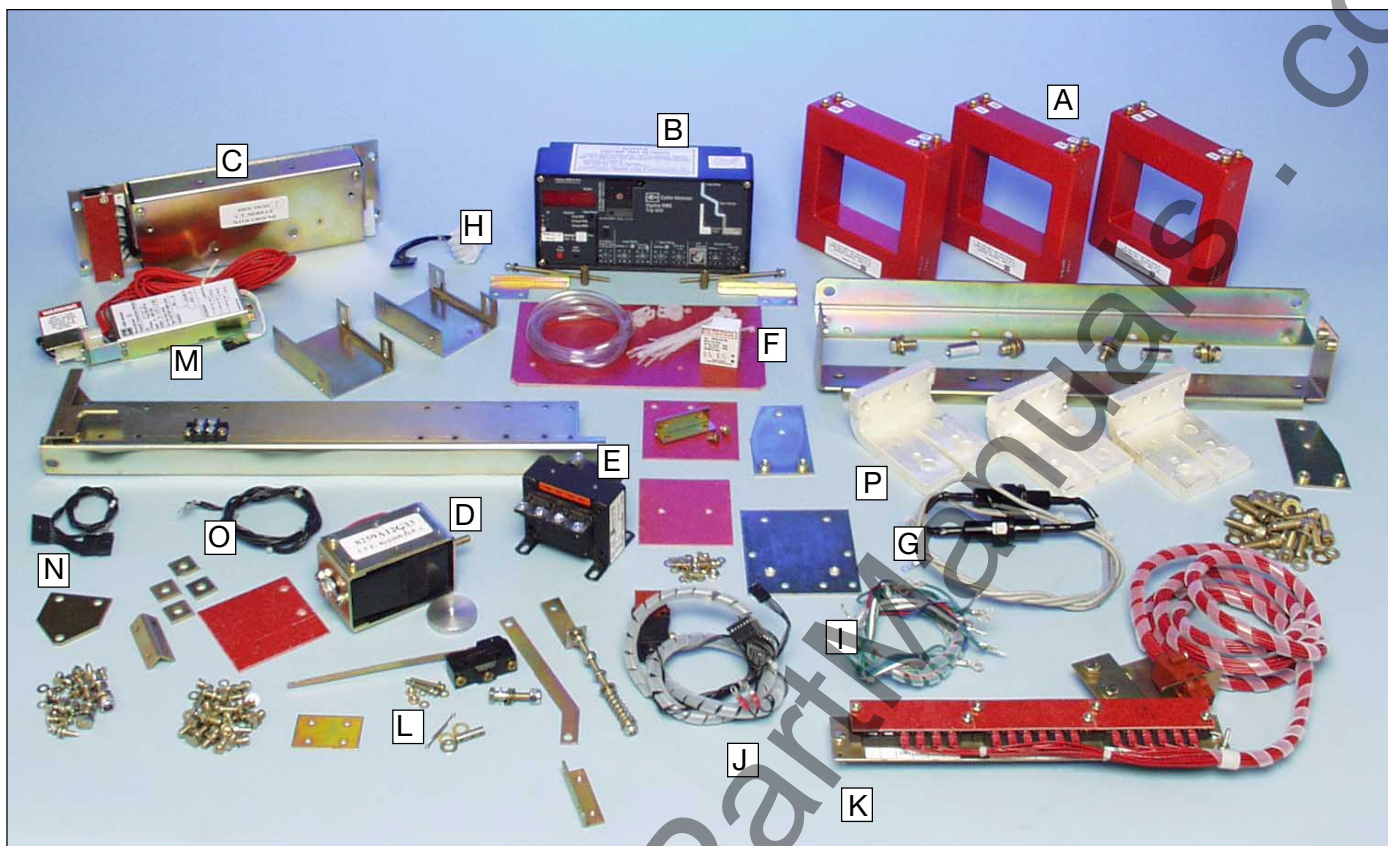


Fig. 67 Retrofit Components

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

Notes

Notes

Notes

www.ElectricalPartManuals.com

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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