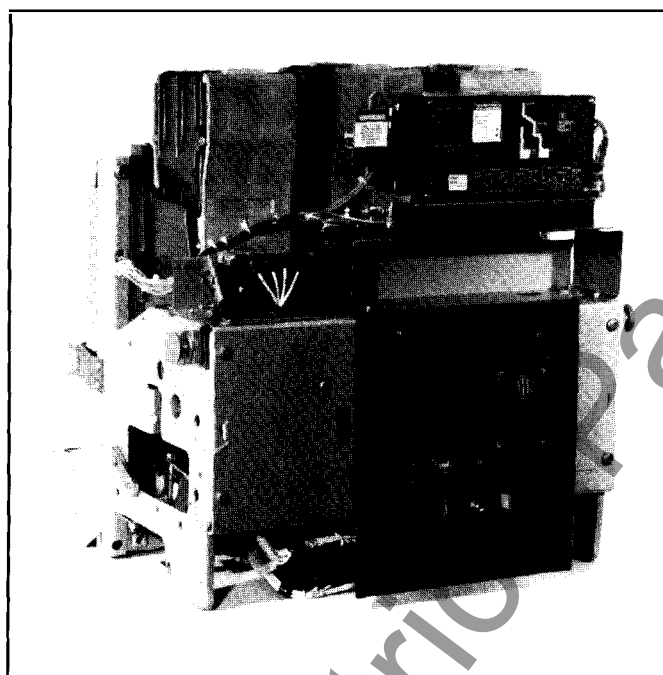




Westinghouse Digitrip Retrofit System for



**ITE K-1600 ACB
(Black or Red)**

Westinghouse Electric Corp.
ILS
Commercial Operations Division
Distribution & Control Business Unit
Five Parkway Center
Pittsburgh, PA 15220

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 lighted 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, TEST, or DISCONNECTED** 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 WILL LEAD TO DEATH, SEVERE PERSONAL INJURY AND/OR PROPERTY DAMAGE.**

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 a nuclear application. 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.

The information, recommendations, descriptions and safety notations in this document are based on Westinghouse's experience and judgement with respect to **RETROFITTING OF POWER BREAKERS. THIS INFORMATION SHOULD NOT BE CONSIDERED TO BE ALL INCLUSIVE OR COVERING ALL CONTINGENCIES.** If further information is required, the Westinghouse Electric Corporation should be consulted.

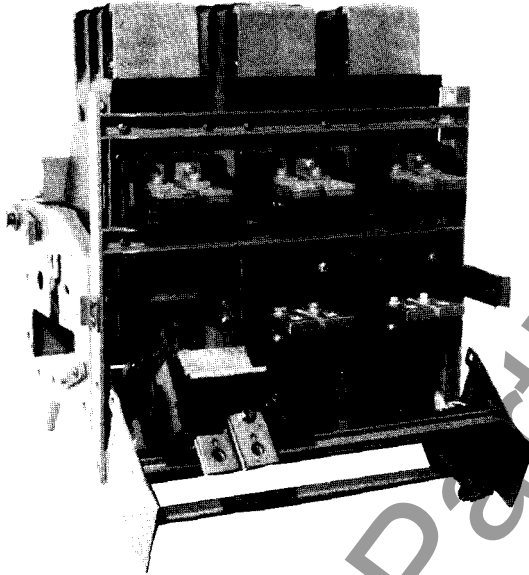
THERE ARE NO UNDERSTANDINGS, AGREEMENTS, REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OTHER THAN THOSE SPECIFICALLY SET OUT IN ANY EXISTING CONTRACT BETWEEN THE PARTIES. ANY SUCH CONTRACT STATES THE ENTIRE OBLIGATION OR SELLER. THE CONTENTS OF THIS DOCUMENT SHALL NOT BECOME PART OF OR MODIFY ANY PRIOR OR EXISTING AGREEMENT, COMMITMENT OR RELATIONSHIP. In no event will Westinghouse be responsible to the user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental or consequential damage or loss whatsoever including but not limited to damage to or loss of use of equipment, plant or power system, cost of capital, loss of profits or revenues, cost of replacement power, additional expenses in the use of existing power facilities, or claims against the user by its customers resulting from the use of the information, recommendations, descriptions and safety notations contained herein.

Step 1: Trip Breaker and remove from Cell. Take Breaker to a clean well lit work bench to perform the Retrofit.

Before attempting to perform the Retrofit, be sure to read and understand the Retrofit Application Data supplied with this kit.

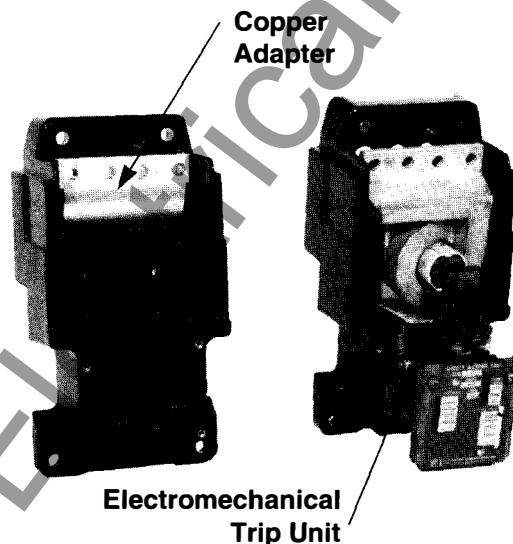
Refer to the components listing at the rear of this booklet. Lay out the components and hardware according to the steps as outlined. The components and hardware will be used to complete each assembly step that follows.

Step 2:



- A. Remove top two screws and loosen bottom two screws on the Secondary Contact Bracket. Rotate Bracket down over edge of work bench.
- B. Remove Finger Clusters. Remove four screws from each of the three bottom Glastic Moldings. Remove four screws each from the three copper pieces.
- C. Remove the three assemblies with the attached Electromechanical Trip Units from the Breaker.

Step 3:



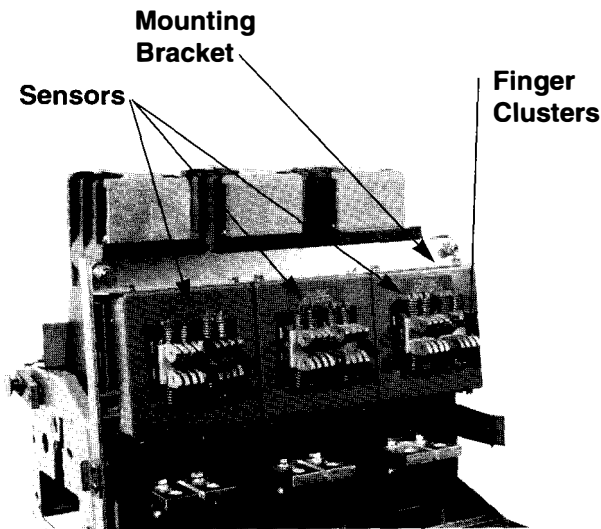
- A. Remove the Electromechanical Trip Units from each by carefully drilling out from the rear the four #10 screws that hold each to the Molding.
- B. Remove the two screws thru the Copper Extensions and remove the Electromechanical Trip Units from each Molding.
- C. Install a Copper Connector in each of the Moldings with the two screws removed from each in Step 3B. (The short leg of the Copper Adapter is to be facing up).

D. Install the Assemblies back into the Breaker with the four screws removed from each in step 2B. Install four hex cap bolts and lockwashers provided with Kit into each Copper Adapter.

E. Install the Finger Clusters

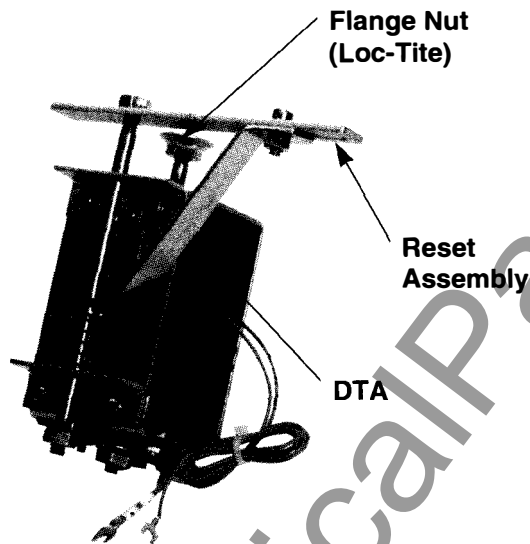
F. Rotate Secondary Contact Bracket back into place. Install the screws removed in Step 2A.

Step 4:



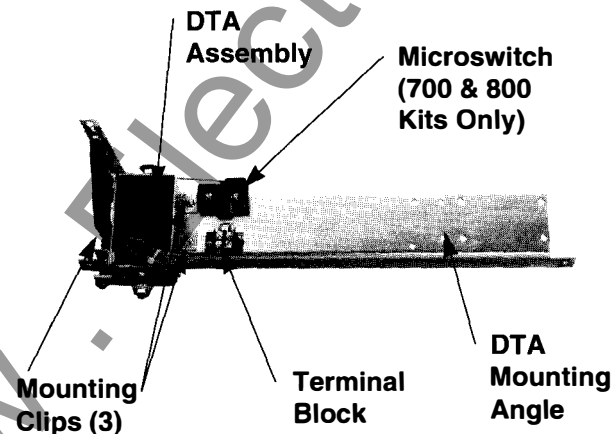
- A. Remove the top Finger Clusters from each phase.
- B. Slide Sensors over top studs of Breaker and install Finger Clusters removed in Step 4A.
- C. Install Sensor Mounting Angle on the top rear of the Breaker using hardware provided. Place four wide washers between Mounting Angle and Breaker Frame on each side.
- D. Bolt Sensors to Mounting Angle using hardware provided.

Step 5:



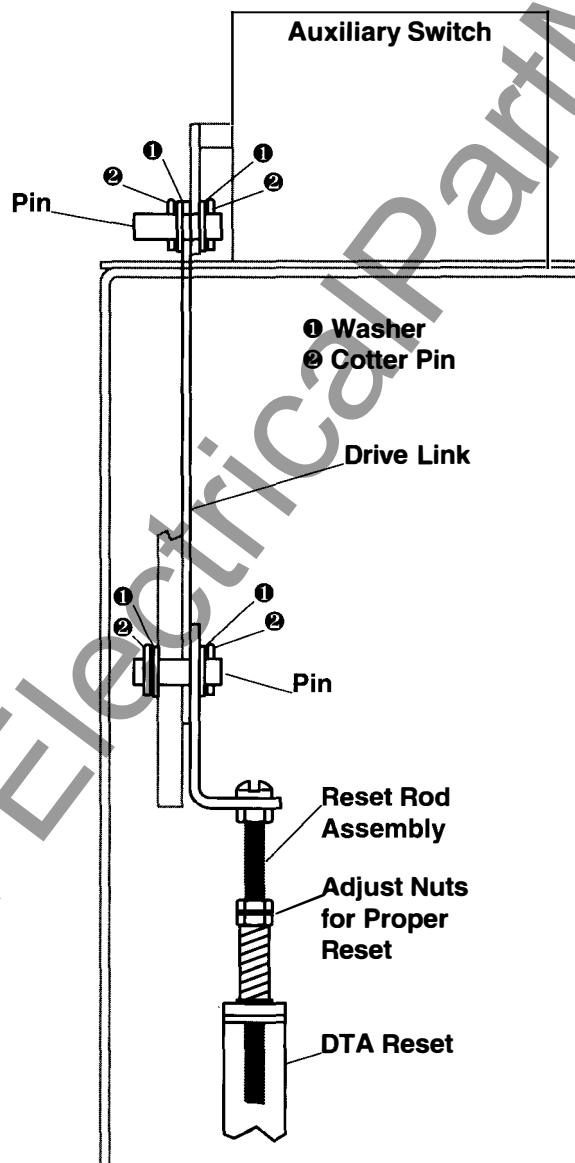
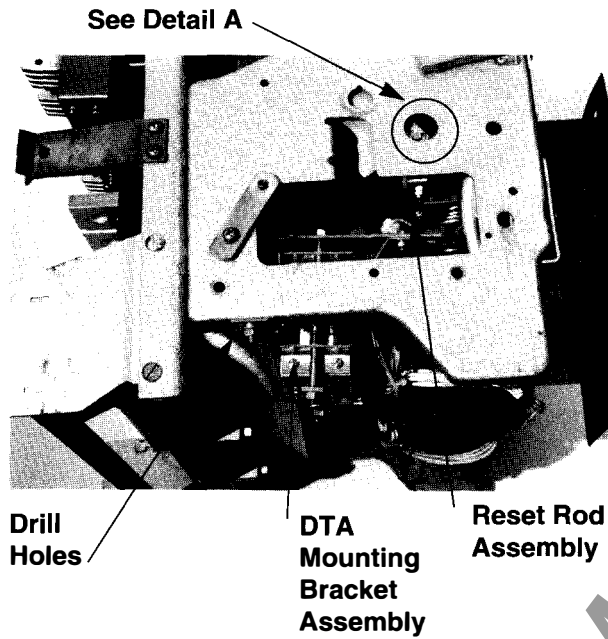
- A. Apply Loc-tite to the threads on the Direct Trip Actuator (DTA) Shaft and install flange nut flush with the end of the Shaft.
- B. Mount the Reset Assembly to the DTA as shown. The bottom fork should be around the DTA Shaft. The long part of the top should be facing the side of the DTA that the wires exit.
- C. The DTA Reset should be free to move. When you push it down, the Spring should push it back up.

Step 6:



- A. Mount the DTA Assembly to the Mounting Angle as shown using the three Mounting Clips and hardware provided.
- B. Mount the 2 Point Terminal Block to the Mounting Angle with the Hardware provided. Connect the two DTA Wires to the top Terminals.
- C. *For RMS/R 700 and 800 Kits only*
Mount the Microswitch to the Mounting Angle with the Hardware provided. Make sure the Switch works when the DTA Reset is pushed down.

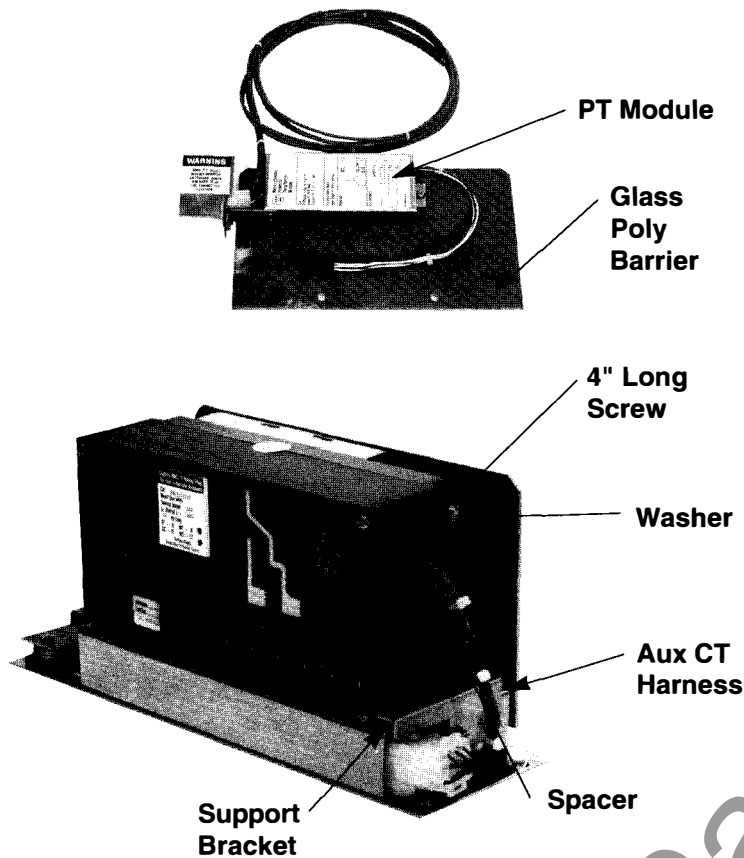
Step 7:



Detail A

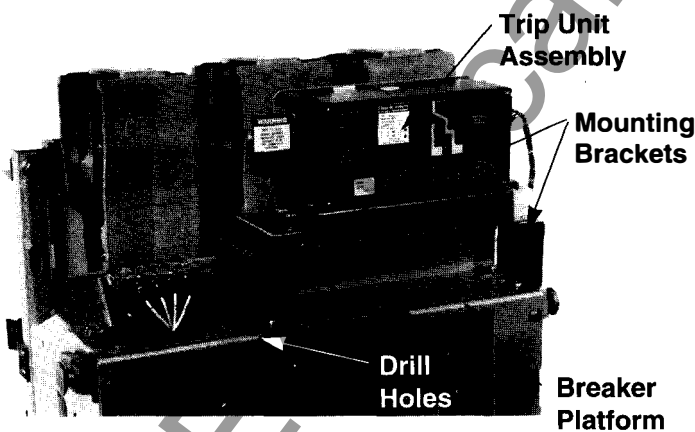
- A. Lay the Breaker over on its right side.
- B. Position DTA Mounting Angle as shown touching Glastic Molding and centered on Flanges. Mark the hole positions on the bottom Flange. Remove the DTA Mounting Angle.
- C. Drill a 0.312 diameter hole in each of the breaker flanges where marked.
- D. Mount the DTA Mounting Angle in the bottom of the Breaker and bolt in place with the hardware provided thru holes just drilled.
- E. If the Breaker is equipped with a left hand Auxiliary Switch, observe Drive Link orientation, then remove the Drive Link and discard.
- F. Install new Auxiliary Switch Drive Link on to Aux. Switch with new pin, washer and cotter pin provided, using observed orientation.
- G. See detail "A" for assembly of Auxiliary Switch Drive Link Bottom and Reset Rod Assembly.
- H. Stand the Breaker back up.

Step 8:



- A. For RMS/R 700 and 800 Kits only
Mount the PT Module on to the Glass Poly (red) Barrier with hardware provided as shown.
- B. Mount the RMS/R Trip Unit on top of the Aux CT Module with 4 inch long screws, washers and spacers as shown. Do not tighten firmly yet.
- C. Mount the left and right Trip Unit Support Clips on the sides of the Aux. CT Module and into bottom front slots of the Trip Unit.
- D. Tighten the 4 inch long screws.
- E. Mount the Glass Poly Barrier on the back of Aux. CT Module with hardware provided. (700 and 800 Kits will have the PT Module mounted on it.)

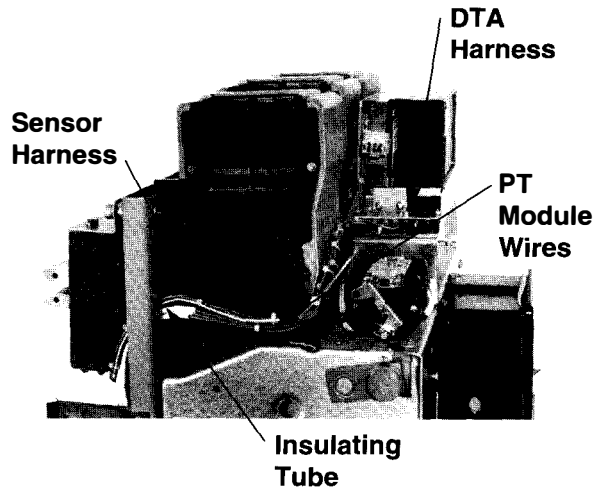
Step 9:



- F. Remove Trip Unit Cover and install Rating Plug, replace Cover.
- G. Install Aux. CT Harness between Trip Unit and Aux. CT Module.
- A. Remove and scrap two screws from the right side of Breaker Platform.
- B. Mount right hand Trip Unit Mounting Bracket on to Breaker Platform flush with the end of Breaker using the self tapping hardware provided.
- C. Mount left hand Trip Unit Mounting Bracket on to the Trip Unit Assy.
- D. Sit the Trip Unit Assy. on the Breaker Platform with the holes on the right side in line with the Mounting Bracket holes.

- E. Mark the Breaker Platform thru the slots in the bottom left Mounting Bracket. Remove the Trip Unit Assembly.
- F. Making certain that the area under Breaker Platform is clear, drill two 0.166 diameter holes where marked.
- G. Remove the left hand Mounting Bracket from the Trip Unit Assembly. Install the Mounting Bracket on Breaker Platform using the self tapping hardware provided.
- H. Mount the Trip Unit Assy. on the Mounting Brackets using the flat head screws provided.

Step 10:

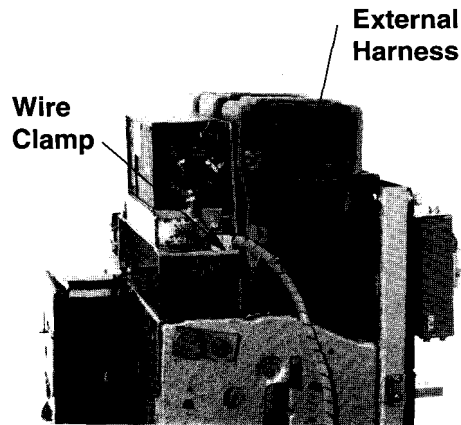


- A. These instructions refer to the Wiring Diagrams in the Retrofit Application Data for proper connection and application.
- B. Remove the Terminal Block Cover from the 7 point Terminal Block on the left side of the Aux. CT Module.
- C. Connect the Snap Spade Terminals of the Sensor Wire Harness to the proper terminals. (The long tan and green wires are for a Remote Neutral Sensor on a 4W Ground Breaker. They should be removed if not required.)
- D. Connect the green wire (Ring Terminal) to the rear screw of the left Trip Unit Support Clip.
- E. Route the Wire Harness to the rear of the Breaker as shown.
- F. Connect the Ring Terminals to the proper Terminals of the Sensors per Connection Diagram.

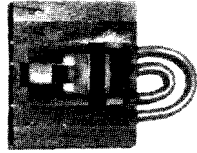
Sensor Style No. 8187A55H01:	X1-X2 = 200A
Sensor Style No. 8187A56H01:	X1-X4 = 800A
	X1-X3 = 600 A
	X1-X2 = 400A
Sensor Style No. 8187A57H01:	X1-X4 = 1600A
	X1-X3 = 1200 A
	X1-X2 = 1000A
- G. Connect the + wire of the DTA Harness to the "OP" Terminal and the unmarked wire to the "ON" Terminal of the 7 Point Terminal Block.
- H. Route the DTA Harness down into the Breaker to the DTA 2 Point Terminal Block. Connect the + wire to the same Terminal as the + wire from the DTA. Connect the unmarked wire to the other Terminal.
 - I. *For RMS/R 700 and 800 Kits only*

Route the 3 wires from the PT Module to the rear of the Breaker going thru rectangular slot in Breaker Channel. These wires are to connect to the screws that hold the bottom Copper Studs into the Breaker. (See Step 3D.) Cut the wire marked with red to Phase 1. Cut the wire marked with yellow to Phase 2. Cut the wire marked with Blue to Phase 3. Slide a piece of Insulating Tubing over each wire long enough to insulate wire back thru rectangular slot. Install Ring Terminal on each wire. Remove one screw from each Phase and connect wire to it.
- J. Use wire ties supplied to dress up wiring and to keep it away from any interference of Breaker moving parts.

Step 11:



Note: For RMS/R 500 Basic Retrofit Kits, the External Harness is the Plug pictured below. It is to be plugged into the right side of the Trip Unit.



- A. Plug the External Harness into the Sockets on the right side of the Trip Unit.
- B. *For RMS/R 700 and 800 Kits only*
Connect the Plug from the PT Module to the Plug on the External Harness.
- C. *For RMS/R 700 and 800 Kits only*
Connect the two wires with Ring Terminals from the External Harness on to the Microswitch. One wire on to the normally open Terminal and the other wire on to the Common Terminal.
- D. Attach the External Harness to the Trip Unit Mounting Bracket with 2 nylon wire clamps and self-threading screws into the 2 predrilled holes.
- E. Use nylon wire ties to dress up wires around the Plugs.

Step 12: The Cell Harness is to be mounted in the Breaker Cell. The Plug End is to be mounted on the right front side of the Cell. The Terminal Blocks can be mounted anywhere space is available in the Cell. With the Breaker in the Cell and the External Harness connected to the Cell Harness the Breaker should be free to go from disconnect to the connected position, and all Retrofit Wiring should be out of the way.

Step 13: The Retrofit is now complete and ready to be tested. See the Retrofit Application Data for test procedures.

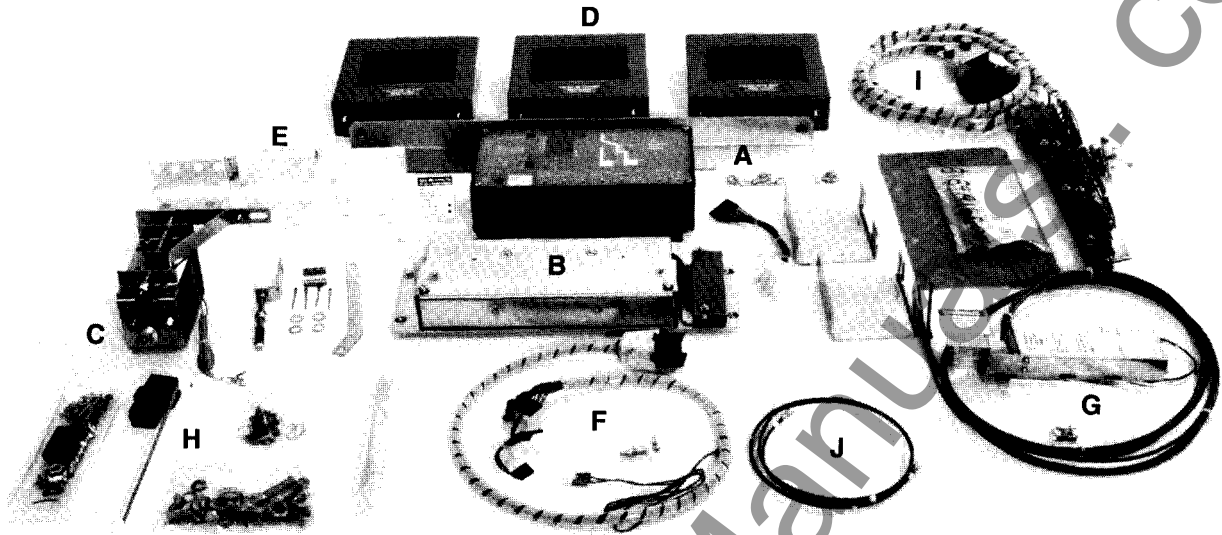
**DIGITRIP RETROFIT KIT INSTALLATION COMPONENTS
FOR ITE K-1600 BREAKERS (RED OR BLACK)**

STEP	DESCRIPTION	STYLE NO.	QTY.	COMMENTS
STEP 3	CONNECTOR PARTS	8189A15/16G02	1	
	COPPER CONNECTOR K-1600 BLACK		3	K-1600 BLACK KITS
	COPPER CONNECTOR K-1600 RED		3	K-1600 RED KITS
	0.312-18 X 1.12 HEX CAP SCREW		12	
	0.312 FLAT WASHER STL		12	
	0.312 LOCK WASHER STL		12	
STEP 4	SENSOR 1600 MR	8187A57H01	3	
	SENSOR 800 MR	8187A56H01	3	OPTIONAL SENSOR
	SENSOR 200 SR	8187A55H01	3	OPTIONAL SENSOR
	SENSOR MTG PARTS	8189A15/16G03	1	
	SENSOR MTG BRACKET		1	
	0.375-16 X 2.25 LNG HEX BOLT		2	
	0.375-16 NUT HEX STL		2	
	0.375 FLAT WASHER STL		4	
	0.375 LOCK WASHER STL		2	
	0.375 WIDE WASHER STL		8	
	0.250-20 X 0.5 LNG HEX BOLT		6	
	0.250 FLAT WASHER STL		6	
	0.250 LOCK WASHER STL		6	
STEP 5	DTA	6503C67G01	1	
	DTA RESET PARTS	8189A15/16G04	1	
	DTA MTG CLIP		3	
	DTA RESET MECHANISM		1	
	0.164-32 X 0.25 LNG SCREW		7	
	0.164 FLAT WASHER STL		7	
	0.164 LOCK WASHER STL		7	
	0.250-20 FLANGE NUT		1	
	LOC-TITE 242		1	
STEP 6	DTA SUBASSEMBLY PARTS	8189A15/16G05	1	
	TERMINAL BLOCK 2 PNT		1	
	0.164-32 X 0.50 LNG SCREW		3	
	0.164-32 NUT HEX STL		3	
	0.164 FLAT WASHER STL		3	
	0.164 LOCK WASHER STL		3	
	0.138-32 X 0.75 LON FIL SCREW		2	
	0.138-32 NUT HEX STL		2	
	0.138 FLAT WASHER STL		4	
	0.138 LOCK WASHER STL		2	
	DTA MTG ANGLE		1	
	AUX SWITCH KIT	8189A12G01	1	700/800 KITS ONLY
STEP 7	BREAKER RESET PARTS	8189A15/16G06	1	
	AUX SWITCH DRIVE LINK		1	
	RESET ROD ASSY		1	
	RESET PIN		2	
	0.250 FLAT WASHER STL		4	
	0.06 X 0.88 COTTER PIN		4	
	DTA MTG HARDWARE	8189A15/16G07	1	
	0.250-20 X 0.75 LNG HEX BOLT		2	
	0.250-20 NUT HEX STL		2	
	0.250 FLAT WASHER STL		4	
	0.250 LOCK WASHER STL		2	

**DIGITRIP RETROFIT KIT INSTALLATION COMPONENTS
FOR ITE K-1600 BREAKERS (RED OR BLACK)
(CONTINUED)**

STEP	DESCRIPTION	STYLE NO.	QTY.	COMMENTS
STEP 8	RMS/R TRIP RH51BLI	1232C84G__	1	
	RATING PLUG PR6A16A160	3D86709G06	1	MUST MATCH SENSOR
	AUX CT MODULE	6503C59G__	1	
	AUX CT HARNESS	6502C84G01	1	
	PT MODULE	6502C82G01	1	700/800 KITS ONLY
	TRIP UNIT ASSY PARTS	8189A15/16G08	1	
	TRIP UNIT SUPPORT BKT RH		1	
	TRIP UNIT SUPPORT BKT LH		1	
	BARRIER		1	
	DIGITRIP NAMEPLATE		1	
	0.190-32 X 4.0 LNG SCREW		2	
	SPACER BRASS		2	
	0.190-32 X 0.38 LNG SCREW		6	
	0.190 FLAT WASHER STL		8	
0.190 LOCK WASHER STL		8		
STEP 9	TRIP UNIT MTG PARTS	8189A15/16G09	1	
	TRIP UNIT MTG BRACKET		2	
	0.190-18 X 0.50 LNG T.C. SCREW		4	
	0.190-32 X 0.38 LNG FLATHEAD. SCREW		4	
	0.190 FLAT WASHER STL		4	
	0.190 LOCK WASHER STL		4	
STEP 10	SENSOR HARNESS PARTS	8189A15/16G10	1	
	SENSOR HARNESS	6503C82G02	1	
	DTA HARNESS	6503C83G01	1	
	WIRE TIES		12	
	INSULATED TUBING 0.16 ID X 60 IN.		1	700/800 KITS ONLY
STEP 11	EXTERNAL HARNESS	6502C83G__	1	
	EXTERNAL HARNESS PARTS	8189A15/16G11	1	
	WIRE CLAMP		2	ALL EXCEPT 500 BASIC
	0.138 X 0.38 TC SCREW		2	ALL EXCEPT 500 BASIC
STEP 12	CELL HARNESS	6503C57G__	1	ALL EXCEPT 500 BASIC

TYPICAL RMS/R 800 RETROFIT KIT



- A. Trip Unit Assembly
- B. Auxiliary CT Module and Mounting
- C. Direct Trip Actuator
- D. Sensors, Mounting and Wire Harness
- E. Copper Adapters
- F. External Wire Harness
- G. PT Module (*700 & 800 Kits Only*)
- H. Auxiliary Switch (*700 & 800 Kits Only*)
- I. Cell Terminal Block Assembly
- J. DTA Harness

Westinghouse wishes 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.

Westinghouse Electric Corp.
ILS
Commercial Operations Division
Distribution & Control Business Unit
Five Parkway Center
Pittsburgh, PA 15220

Fax: (412) 937-6770
WIN: 227-6770
Phone: (412) 937-6721
(412) 937-6741
(412) 937-6708
(412) 937-6725