Class 1 Reconditioning
Equipment Life Extension and Modernization

Electrical Sector
Low and Medium Voltage
Power Circuit Breakers

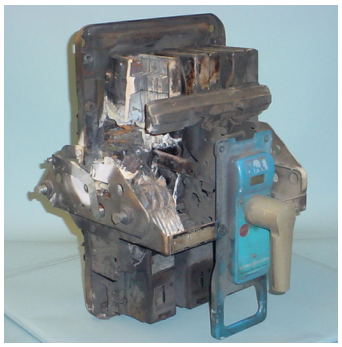
Circuit Breaker Life Extension

The useful life of vintage low and medium voltage power circuit breakers can be extended and enhanced through Class 1 Reconditioning. Heavily damaged power circuit breakers can also be revived and re-introduced into the distribution system after Class 1 Reconditioning. The combination of Eaton's unique multi-step process plus the installation of a Digitrip RMS trip unit with Arc Flash Reduction Maintenance System or Utility Relay AC-PRO® or AC-PRO-II® with QT-SWITCH™ results in a circuit breaker restored to its original capacity with a longer life and the ability to reduce arc flash for down-stream circuit breakers.

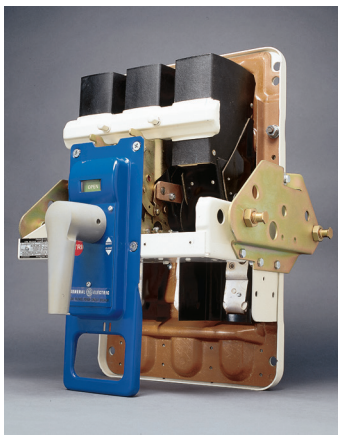
Proven Processes

Class 1 Reconditioning was developed and refined from over 50 years of extensive field service, customer feedback and testing. Eaton's power lab and shop testing often reveal best practices that are proven to enhance the original performance and/or reliability of a power circuit breaker. The associated process and materials are adjusted on a national basis to improve reliability and value.

Heavily damaged breakers can be returned to "like new" condition



As Received



After Class 1 Reconditioning

A New Standard

Class 1 Reconditioning is a unique process that incorporates specific steps to ensure the highest level of reliability and performance for power circuit breakers.

- Inspect, test and record data for incoming circuit breaker
- Disassemble circuit breaker per our procedure
- Clean and recondition each component
- Where disassembly is not practical, replace component with new or reconditioned
- Reassemble per OEM documentation
- Final test per IEEE/NEMA
- Record in centralized Pow-R-DB Database

Dedicated Facilities

A special process is better controlled when placed in a dedicated facility, so Eaton established its Power Breaker Reconditioning Center (PBRc) locations. The PBRc locations are staffed with individuals that are specifically trained in power circuit breaker reconditioning. They are not field engineers or technicians that perform reconditioning to fill unproductive time. They are dedicated to the PBRc Class 1 Reconditioning Process and are always available to recondition power circuit breakers on a routine or emergency basis.

Centralized Data Base

Eaton adheres to original manufacturers standards and tolerances when available. Often, there is no manufacturing data or the original manufacturer is no longer in business. To insure best practices and uniform results, Eaton's PBRc locations record certain data for each circuit breaker when received. All data is entered into a national Pow-R-DB Database for comparison by all PBRc locations. Data is then correlated with test results to provide optimum performance.

Local Support Services

Eaton has established multiple Power Breaker Reconditioning Centers (PBRc) in North America to perform the Class 1 Reconditioning Process, but facilities are a small part of the system. Eaton also supports our customers with an extensive engineering systems and services organization located throughout North America. Eaton's Electrical Systems and Services engineers are factory trained to service and commission/install our Class 1 Reconditioned breakers.

Warranty

A three year warranty is included on all Class 1 reconditioning except circuit breakers being used as motor starters. A one year warranty will be issued for circuit breakers being used as motor starters. The warranty is to Eaton Selling Policy 25-000 and only applies to Power Breaker Reconditioning Center workmanship and new components supplied during the reconditioning process.

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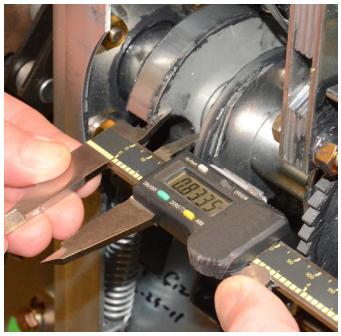
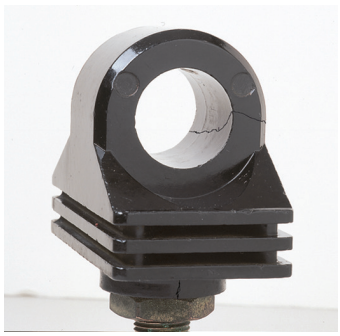
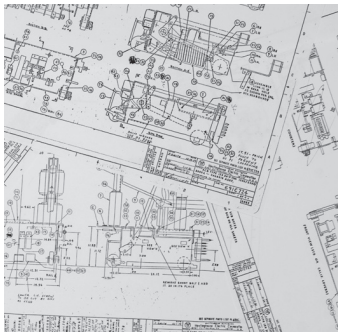


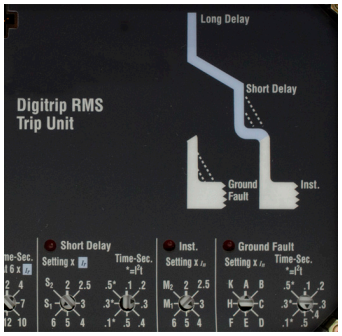
Incoming Inspection, Test and Data Collection
All power circuit breakers receive a thorough incoming inspection and test are performed when possible. Certain force and dimensional information is also measured and recorded.



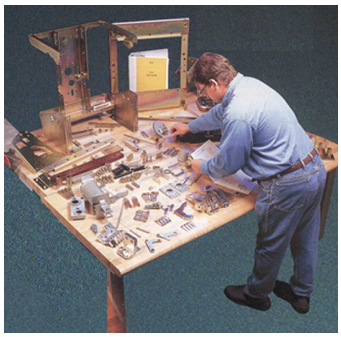
Issues Missed By Other Processes
Disassembly and special cleaning exposes hidden issues that can cause failures during operation. Drive link would have broken while opening under short circuit current. Replacement is necessary.



Reassembly to OEM Specifications
OEM data is used when available and if not, Eaton refers to **Pow-R-DB** to determine the best operating parameters previously measured and proven with actual test results.

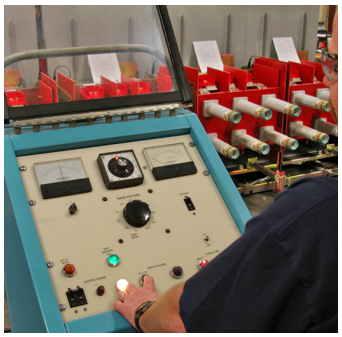


DigiTrip 10 Series Solid State Trip Units or Utility Relay AC-PRO® or AC-PRO-II®
Upgrade the circuit breaker's protection with a modern trip system.

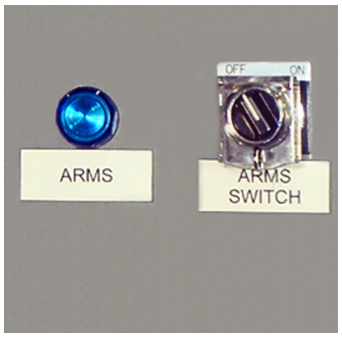


Disassembly
Each breaker is disassembled to the smallest practical subassembly or component to expose all surfaces for further inspection, cleaning and reconditioning, or replacement, as required.

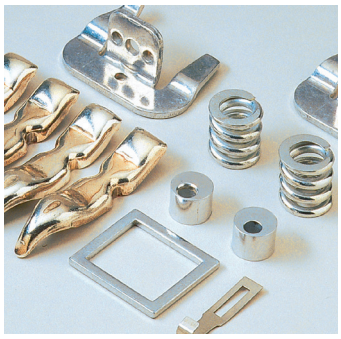
Damaged Insulation
Dielectric breakdown will occur over time.



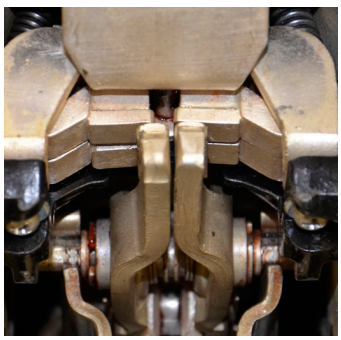
Final Testing
Each Class 1 Reconditioned circuit breaker receives a standard production test series per applicable IEEE/ANSI standards.



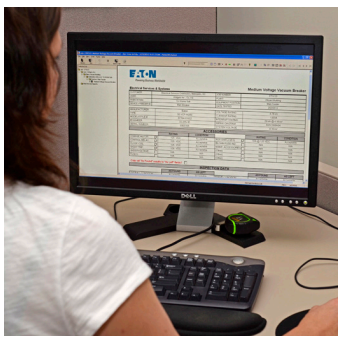
Arc-Flash Reduction Maintenance System or QT-SWITCH™
Adding an Arc-Flash Reduction Maintenance Switch on the Digitrip or QT-SWITCH™ on the AC-PRO® or AC-PRO-II® can substantially reduce down-stream arc flash levels.



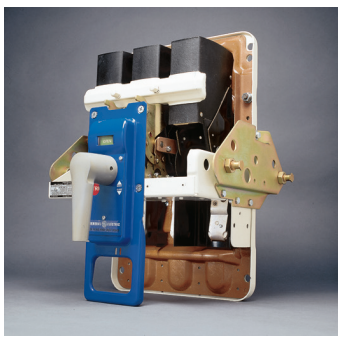
Component Specific Cleaning
Circuit breaker components are manufactured from different types of materials, so a "one fits all" method of cleaning is unacceptable. Contact resurfacing maintains proper metallurgy.



Misaligned Contacts
Contact misalignment can cause premature failure and welding of the surface material.



Pow-R-DB Data Base
Final test data and "before" and "after" characteristics of each circuit breaker are recorded with unique identification for tracking and correlation of performance values.



The Bottom Line
Anyone can clean, shine and re-lubricate Power Circuit Breakers, but you may end up with a shiny version of your original problem. If reconditioning is not performed in an **Eaton PBRc facility**, it's not **Class 1 Reconditioning.**

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