IB 6.2.15.7-1C
November 2005

ADVAC™ Model 03 Medium Voltage Vacuum Power Circuit Breakers and Auxiliary

Installation/Maintenance Instructions



TABLE OF CONTENTS

FORWARD **3**

INTRODUCTION & SAFE PRACTICES **4**
Introduction 4
Safe Practices 4

RECEIVING, HANDLING, & STORAGE **5**
Receiving 5
Handling 5
Storage 5

INSERTION AND REMOVAL **6**
Insertion 6
Removal 6
Racking 7

MECHANISM AND OPERATION **9**
Description of Mechanism Operation 9
Interlocks 11
Manual Operation 12
Electrical Operation 13
Control Scheme 14

MAINTENANCE **16**
Mechanism 16
Truck 18
Control Wiring 19
Primary Circuit 19

G&T DEVICE **21**

DUMMY BREAKER DEVICE **23**

OPTIONAL ACCESSORIES **24**
Lifting Hook 24

APPENDICES **25**
Appendix A: Basic Breaker Layout 25
Appendix B: Basic Breaker Dimensions and Weights 26
Appendix C: Close/Open Coil Data 29
Appendix D: Wiring Diagrams 30
Appendix E: Circuit Breaker Renewal Parts 32

FORWARD

This booklet provides information for the ADVAC breakers as described below. Not all sections of the bulletin apply to all types of ADVAC circuit breakers. For example, the racking and interlock sections do not apply to the fixed mount breaker styles. All information in this booklet was current at the time of printing.

Style	Frame Width mm (inches)	Voltage Rating	Continuous Current Rating	Interruption Ratings (Symmetrical RMS)	Configurations Available
750mm Frames	750mm (29.5 inches)	5-15kV	1200A 2000A 3000A	to 50kA	Drawout Fixed/Retrofit Mount

DRAWOUT:

Removable circuit breaker unit. Intended for use in SafeGear™, Advance, or abbreviated versions of these switchgear designs. Contains all racking interlocks and racking features required by ANSI standards. Automatic primary and secondary disconnects. Provides three operating positions: disconnect, test, and connect.. Meets all applicable ANSI standards, C37.09, C37.04, C37.06.

FIXED-MOUNT:

Intended to be mounted as a stationary device. No racking related interlocks. Primary connections are hard bus. Secondary wiring terminates in stripped wire leads to be connected to the user's terminals.

RETROFIT:

Intended to be mounted as a stationary or drawout device. Connections for racking related interlocks are included. Primary connections are hard bussed. Secondary wiring terminates in stripped wire leads to be connected to the user's terminals.

INTRODUCTION & SAFE PRACTICES

INTRODUCTION:

The purpose of this manual is to provide instructions for unpacking, storage, installation, operation and maintenance for the ADVAC™ vacuum circuit breakers. This manual should be carefully read and used as a guide during installation, initial operation, and maintenance.

The specific ratings of each model circuit breaker are listed on the individual nameplates. The ADVAC™ breakers are protective devices. As such, they are maximum rated devices. Therefore, they should not under any circumstances be applied outside of their nameplate ratings.

⚠ WARNING

THE CIRCUIT BREAKERS DESCRIBED IN THIS BOOK ARE DESIGNED AND TESTED TO OPERATE WITHIN THEIR NAMEPLATE RATINGS. OPERATION OUTSIDE OF THESE RATINGS MAY CAUSE EQUIPMENT TO FAIL, RESULTING IN PROPERTY DAMAGE, BODILY INJURY AND DEATH.

ALL SAFETY CODES, SAFETY STANDARDS AND/OR REGULATIONS AS THEY MAY BE APPLIED TO THIS TYPE OF EQUIPMENT MUST BE STRICTLY ADHERED TO.

SAFE PRACTICES:

ADVAC™ circuit breakers are equipped with high energy/high speed mechanisms. The design includes several interlocks and safety features which help ensure safe and proper operating sequences. To ensure safety of personnel associated with installation, operation and maintenance of these breakers, the following recommendations must be followed:

Only qualified persons, as defined in the National Electric Safety Code, who are familiar with the installation and maintenance of medium voltage circuits and equipment should be permitted to work on these breakers.

Read these instructions carefully before attempting any installation, operation or maintenance of these breakers.

DO NOT work on an energized breaker.

DO NOT work on a breaker unless all components are disconnected by means of a visible break and securely grounded.

DO NOT work on a breaker with power supplied to the secondary control circuit.

DO NOT defeat safety interlocks. This may result in bodily injury, death and/or equipment damage.

DO NOT work on a closed breaker.

DO NOT work on a breaker with a charged closing spring.

DO NOT use a circuit breaker by itself as the sole means of isolating a high voltage circuit.

DO NOT leave a breaker in an intermediate position in a cell. Always place the breaker in the disconnect, test or connected position.

⚠ NOTICE

FAILURE TO OBSERVE THE REQUIREMENTS OF OSHA STANDARD 1910.269 CAN CAUSE DEATH OR SEVERE BURNS AND DISFIGUREMENT. THAT STANDARD SPECIFICALLY PROHIBITS THE WEARING OF POLYESTER, ACETATE, NYLON, OR RAYON CLOTHING BY EMPLOYEES WORKING WITH EXPOSURE TO ELECTRIC ARCS OR FLAMES.

RECEIVING, HANDLING, AND STORAGE

RECEIVING, HANDLING, AND STORAGE

ADVAC™ circuit breakers are subject to complete factory production tests and inspection prior to packaging and shipment. The shipping package is designed to provide reasonable protection during shipment and to provide convenient handling. Accessories such as charging handles and racking handles are shipped separately from the circuit breaker.

RECEIVING:

Immediately upon receipt of the circuit breakers, examine the cartons to determine if any damage or loss was sustained during transit. If damage or indication of rough handling is evident, file a damage claim at once with the carrier and promptly notify the nearest District Office. ABB is not responsible for damage of goods after delivery to the carrier. However, ABB will lend assistance if notified of claims. Use care in unpacking to avoid damaging any circuit breaker parts.

Unpack circuit breakers as soon as possible after receipt. If unpacking is delayed, difficulty may be experienced in making a claim for damages not evident upon receipt. Check the contents of each carton against the packing list before discarding any packing material. If any discrepancy is discovered, promptly notify the nearest District Office. Information specifying the purchase order number, carton number and part numbers of damaged or missing parts should accompany the claim.

HANDLING:

ADVAC™ circuit breaker shipping containers are designed to be handled by a fork lift.

Once removed from the shipping container, the circuit breaker wheels are designed to move the breaker across a smooth, paved surface.

Care must be taken not to damage the secondary locking tab (item 6, page Fig.5) when transporting, rolling, or handling the ADVAC™ breakers.

DO NOT pull the circuit breaker by the front handles with the breaker in any position other than full disconnect.

STORAGE:

Circuit breakers should be installed in their permanent location as soon as possible. If the breakers are not placed in service for some time, it is advisable to provide adequate means of environmental protection. This may be done by keeping the breaker in its original shipping container and storing in a warm, dry and uncontaminated atmosphere. The breakers should be stored to minimize condensation. Moisture can cause deterioration of metal parts and high voltage insulation.

Prior to storage of the breaker, verification should be made that the breaker is free from shipping damage and is in satisfactory operating condition.

⚠ CAUTION

The shipping containers provided are not designed for stacking.

INSERTION AND REMOVAL

INSERTION AND REMOVAL

This section describes the process for inserting the breaker into the disconnect position of the switchgear and the removal of the circuit breaker from the disconnect position. Racking of the circuit breaker to and from the test and disconnect position is covered in the following section. The following rules should always be observed when inserting or removing the circuit breaker device from the switchgear compartment.

- **DO NOT** attempt to insert the circuit breaker into any circuit breaker compartment prior to inspection of the breaker. Compare breaker nameplate rating with switchgear rating. Verify secondary voltages on the breaker and in the circuit breaker compartment.
- **DO NOT** attempt to insert a closed circuit breaker**.**
- **ALWAYS** inspect breaker compartment to ensure that it is free of obstructions, tools, or other equipment.

⚠ DANGER



Do not attempt to remove the breaker from the circuit breaker compartment without the required ramp, dolly or lift truck. Refer to the specific switchgear Installation and Maintenance manual for details.

INSERTION: (Refer to Appendix A and Fig. 1)

(from Withdrawn Position to Disconnect Position)

1. Align breaker and ramp, dolly or lift truck with circuit breaker compartment
2. Pull handles (10) to center (this withdraws Cell Interlock Tabs (11) allowing breaker to be inserted)
3. Push breaker into breaker compartment with handles. Interlocks may restrict insertion. (Ref. *Interlocks*)
4. Align Cell Interlock Tabs with Circuit Breaker Compartment Slots (A)
5. Push Handles out to fully engage Cell Interlock Tabs into Circuit Breaker Compartment Slots
6. Visually check that Cell Interlock Tabs are engaged in Circuit Beaker Compartment Slots (if Cell Interlock Tabs are not fully extended, racking is prevented)

Breaker is now in the Disconnect Position

REMOVAL: (Refer to Appendix A and Fig. 1)

(From Disconnect Position to Withdrawn Position)

1 Visually check to see the Truck (12) is against the Locator Channel

2 Pull Handles to center (this withdraws Cell Interlock Tabs; allowing breaker to be removed and discharging the mechanism)

3 Pull the breaker from Circuit Breaker Compartment with the Handles onto the required transportation device.

4 Breaker is now in the Withdrawn Position.

INSERTION AND REMOVAL

RACKING:

ADVAC™ circuit breakers are designed with three positive racking positions. The Disconnect position allows only manual operation of the breaker without control power and with the shutters closed. The Test Position allows manual and electrical operation of the breaker with control power supplied through the secondary contacts with the shutters closed. As the breaker approaches the Connected position, an increase in racking force is required to lift the shutters and to engage the primary contacts. In the Connected position, the primary disconnects are fully engaged with the shutters open, electrical operation of the breaker through the secondary contacts remains enabled.

1. Engage Racking Handle onto Racking Screw (7)
2. Actuate Position Release Lever (9) to begin racking breaker.
    a. CLOCKWISE (cw) rotation inserts the breaker towards the primary contacts.
    b. COUNTER-CLOCKWISE (ccw) rotation withdraws the breaker away from the primary contacts.

DISCONNECT THROUGH TEST:

1. Perform visual inspection of the Circuit Breaker:
    a. Verify Close/Open Indicator shows OPEN
    b. Verify Charged/Discharged Indicator shows DISCHARGED
    c. Breaker is prevented from closing by a mechanical interlock in the truck .
    d. Verify switchgear door is CLOSED.
2. Actuate (push down) Position Release Lever (9) to begin racking from Disconnect position
    a. Begin racking in the CLOCKWISE direction
    b. Release Position Release Lever once racking has begun (after Approx. 1/2 turn)
    c. Approximately four (4) revolutions (40mm) will move the breaker from the Disconnect to the Test position
        - The Test Position is indicated by a positive lock, preventing further racking shaft rotation.
        - Closing of the breaker is prevented between Disconnect and Test positions
        - Control power is available in the Test Position; shutters remain closed.

TEST THROUGH CONNECT:

1. Perform visual inspection of the Circuit Breaker:
    a. Verify Close/Open Indicator shows OPEN
    b. Verify Charged/Discharged Indicator shows CHARGED
    c. Verify switchgear door is CLOSED.
2. Actuate (push down) Position Release Lever (9) to begin racking from Test position:
    a. Begin racking in the CLOCKWISE direction
    b. Release Position Release Lever once racking has begun (after approx. 1/2 turn)
    c. Approximately 21 revolutions (210mm) will move the breaker between the Test and Connect positions
        - The Connect Position is indicated by a positive lock, preventing further racking shaft rotation.
        - Closing of the breaker is prevented between Test and Connect positions
3. Once the Breaker is Fully in the connect position, and the positive lock position has been established, It is recommended that the racking screw be turned in the counterclockwise direction to release the pressure on the locking mechanism to insure positive engagement of the mechanical/electrical interlocks.

CONNECT THROUGH TEST:

1. Perform visual inspection Circuit Breaker:
    a. Verify Close/Open Indicator shows OPEN
    b. Verify switchgear door is CLOSED.
2. Actuate (push down) Position Release Lever (9) to begin racking from Connect position:
    a. Begin racking in the COUNTER-CLOCKWISE direction
    b. Release Position Release Lever once racking has begun (after 1/2 turn)
    c. Approximately 21 revolutions (210mm) will move the breaker between the Connect and Test positions
        - The Test Position is indicated by a positive lock, further racking shaft rotation is prevented.
        - Closing of the breaker is prevented between Connect and Test positions

INSERTION AND REMOVAL

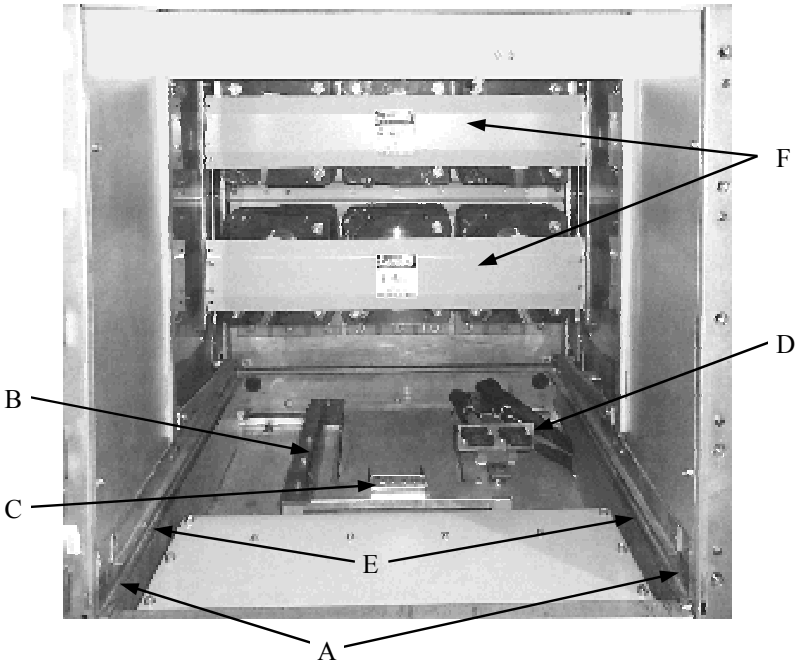
TEST THROUGH DISCONNECT:

1. Perform visual inspection:
    a. Verify Close/Open Indicator shows OPEN
    b. Verify switchgear Door is CLOSED.
2. Actuate (push down) Position Release Lever (9) to begin racking from Test position
    a. Begin racking in the COUNTER-CLOCKWISE direction
    b. Release Position Release Lever once racking has begun (after approx. 1/2 turn)
    c. Approx. four (4) revolutions (40mm) will move the breaker between the Test and Disconnect positions
        - The Test Position is indicated by a positive lock
        - Closing of the breaker is prevented between Disconnect and Test positions
        - Control power is unavailable in the Disconnect Position; shutters are closed.

	DISCONNECT	TEST	CONNECT
Approximate Distance from Disconnect	0 MM 0 REVOLUTIONS 0 INCHES	40 MM 4 REVOLUTIONS 1.57 INCHES	250 MM 25 REVOLUTIONS 9.84 INCHES
Manual Operation	YES	YES	NOT RECOMMENDED
Electrical Operation	NO	YES	YES
Control Power Available	NO	YES	YES
Shutter	CLOSED	CLOSED	OPEN
Primary Contacts Engaged	NO	NO	YES
Position Indication	POSITIVE LOCK & CELL DECAL	POSITIVE LOCK & CELL DECAL	POSITIVE LOCK & CELL DECAL
Interlocks	INTERFERENCE BLOCKING PREVENTS INSERTION RELEASE LEVER	RELEASE LEVER CLOSING PREVENTED BETWEEN POSITIONS	CLOSING PREVENTED BETWEEN POSITIONS RELEASE LEVER
Requirements To Rack breaker from Position	BREAKER OPEN POSITION RELEASE LEVER ACTUATED	BREAKER OPEN POSITION RELEASE LEVER ACTUATED	BREAKER OPEN POSITION RELEASE LEVER ACTUATED
Notes	A, B	A	A

Notes:
A. Closed door racking is recommended between ALL positions.

Table 1: Summary Racking Data



#	Description
A	COMPARTMENT SLOTS
B	GROUND BAR
C	INTERFERENCE BLOCKING PLATE
D	SECONDARY
E	WHEEL RAILS

Figure 1: Basic Cell

MECHANISM AND OPERATION

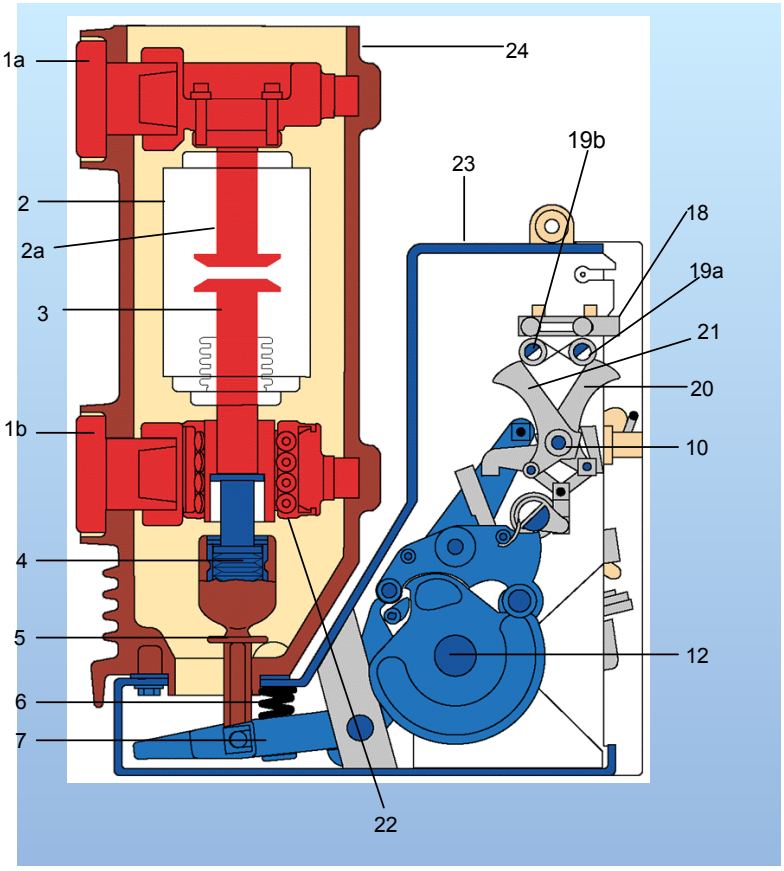
MECHANISM AND OPERATION (Refer to Fig. 2A And 2B)

The ADVAC™ medium voltage circuit breaker uses a spring for stored energy. The Closing Spring (11) is a toroidal spring. This spring supplies the energy necessary to close the breaker and assists with the opening. During the closing operation, Opening Springs (6) (compression type) are charged along with Contact Springs (4) (also compression type) in the pole assembly. During the opening operation, the Contact Springs and Opening Springs supply the driving force to open the interrupter contacts.

DESCRIPTION of MECHANISM OPERATION: (Refer to Fig. 2A And 2B)

1. Manual or electrical charging rotates the Closing Spring (11) 360° to charge
   a. Motor Limit Switch (17) changes state and removes control power from the motor
   b. Closing Spring Charged/Discharged Indicator (28) changes to show CHARGED
   c. Close Trigger (20) is set against Half Shaft (19b)
2. Manual or electric close rotates Half Shaft to release Close Trigger
   a. Close Trigger releases Stop Disk (9) through a series of linkages
   b. The Closing Spring (11) rotates Main Shaft (12) 270°
   c. The Cams (8) fixed on Main Shaft actuate Rocker Arms (7) for each pole
      - Rocker Arms compress Opening Springs (6)
      - Rocker Arms drive interrupter Push Rods (5)
      - Push Rods close Moving Contact in the Vacuum Interrupter (3)
      - Push Rods charge Contact Springs (4)
   d. Main Shaft actuates Auxiliary Shaft (15) changing Auxiliary Contacts (16)
      - 52a contacts close
      - 52b contacts open
3. Manual or electric opening rotates other half shaft (19a) to release Open Trigger (21)
   a. Open Trigger releases Stop Disk through a series of linkages
   b. Opening Springs, Contact Springs and Closing Spring discharge, rotating the Main Shaft 90° (discharging the 360° charge on the Closing Spring)
   c. Contact Springs discharge driving Push Rod to begin opening the Vacuum Interrupter Contacts
   d. Opening Springs discharge driving the Rocker Arms to fully open the Vacuum Interrupter Contacts
   e. Closing Spring discharges, rotating the Cams 90°
   f. Main Shaft actuates Auxiliary Shaft changing Auxiliary Contacts
      - 52a contacts open ; 52b contacts close

MECHANISM AND ASSEMBLED POLE



Mechanism Major Components

1a Upper contact terminal
1b Lower contact terminal
2 Vacuum interrupter
2a Fixed contact
3 Moving contact
4 Contact force spring
5 Push Rod (Insulated coupling rod)
6 Opening spring
7 Rocker Arm (Transmission Lever)
8 Cam
9 Stop Disc
10 Release mechanism
11 Toroidal Spring
12 Main shaft
13 Manual Charging Pawl
14 Anti-pump relay
15 Auxilliary Shaft
16 Auxilliary Contacts
17 Motor Limit Switch
18 Close Push Button
19a Close Half Shaft
19b Open Half Shaft
20 Closing Trigger
21 Opening Trigger
22 Roller contacts
23 Operating Mechanism Housing
24 Epoxy resin Pole enclosure
25 Open Push Button
26 Charging Motor
27 Tripping Coil
28 Spring Charged indicator
29 Breaker Status Indicator

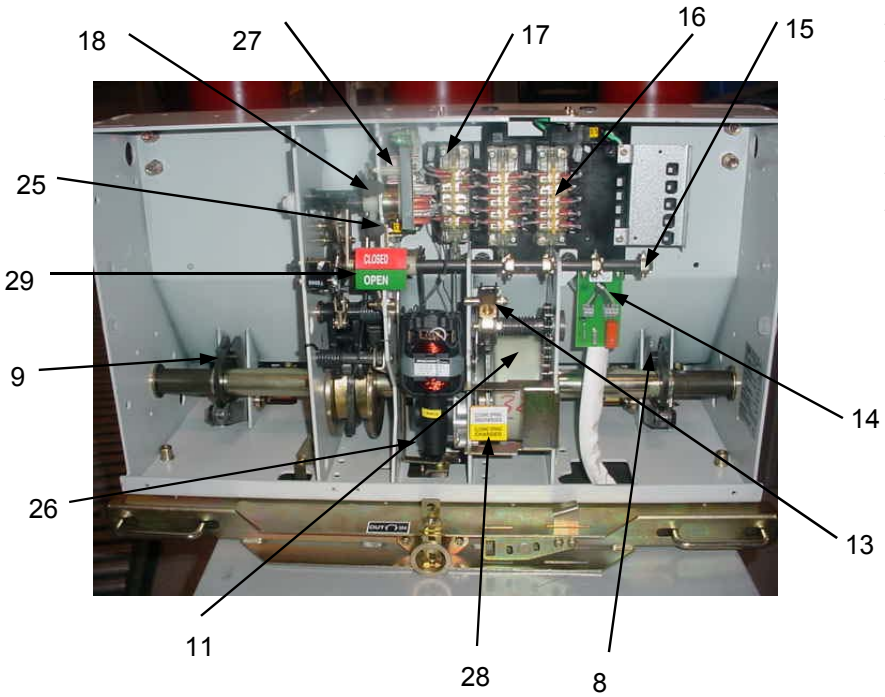


FIGURE 2: MECH AND CONTROLS

MECHANISM AND OPERATION

INTERLOCKS:

The ADVAC™ breaker contains a number of interlocks. A description of each interlock follows as encountered during racking of the breaker into the breaker compartment.

⚠ DANGER

MODIFICATION TO INTERLOCKS CAN RESULT IN HAZARDOUS CONDITIONS TO PERSONNEL AND EQUIPMENT. DO NOT OVERRIDE, BY-PASS OR ADJUST INTERLOCKS.

INTERFERENCE BLOCKING: A code plate in the breaker compartment prevents underrated breakers from being inserted into higher rated compartments. The code plate rating includes continuous current, interrupting current, close and latch capability and maximum voltage. Breakers with the same or higher code plate rating can be inserted into a compartment of equal or lower value.

POSITIVE POSITION FOR RACKING: The racking mechanism is blocked unless the interlock tabs are fully extended into the compartment slots.

POSITIVE POSITION FOR REMOVAL: The handle release pin prevents withdrawing the breaker from the compartment by blocking withdrawal of the locking tabs. The handle release pin blocks the handles unless the breaker is in the Disconnect position.

⚠ CAUTION

THE CLOSING SPRING MAY BE MANUALLY RECHARGED IN THE DISCONNECT AND WITHDRAWN POSITIONS. VERIFY THAT THE BREAKER IS OPEN AND THE CLOSING SPRING IS DISCHARGED BEFORE REMOVING THE FRONT COVER.

AUTOMATIC SPRING DISCHARGE (ASD): This maintenance interlock discharges the closing spring and opens the breaker. Activation of the ASD occurs when withdrawing the locking tabs in the Disconnect position.

POSITION INTERLOCKS: The Position Release Lever must be depressed in order to begin racking the breaker in any direction from any positive position (Disconnect, Test, or Connect). The release lever is blocked from actuation when the breaker is CLOSED. The ability to close the breaker is blocked unless the breaker is in one of the three positive positions.

MECHANISM AND OPERATION

MANUAL OPERATION:

(Refer to Table 2 & Appendix A)

The breaker can be operated manually or electrically. The manual Charging Handle is required for manual operation.

1. Inspect initial state of the breaker to determine the operations available (Refer to Table 1 and Fig.2)
    a. Close/Open indicator (29)
    b. Closing Spring Charged/Discharged Indicator (28)

Closing Spring Indicator (6)	Mechanism (4)	Operations Available	Proceed to Step
Discharged	Open	None Available	2
Discharged	Closed	Open	6
Charged	Open	Close-Open	5
Charged	Closed	Open-Close-Open	7

Table 2: Operations

2. Insert manual Charge Handle into Charging Pawl (13)
3. Charge breaker by up and down motions (approximately 25 times)
    a. Closing Spring completely charged
        - Charge handle has free movement
        - Closing Spring Charged/Discharged Indicator changes to CHARGE
4. Remove Charging Handle
    a. Breaker ready to perform Close-Open (C-O) operation
5. Manual Close breaker via Close Push Button (18)
    a. Breaker Closes
        - Close/Open Indicator changes to CLOSED
        - Closing Spring Charged/Discharged Indicator changes to DISCHARGED
    b. Breaker ready to perform Open (O) operation (if O-C-O is desired, see Step 7)
6. Manual open breaker via Open Push Button (25)
    a. Breaker opens
        - Close/Open Indicator changes to OPEN
        - Closing Spring Charged/Discharged Indicator remains DISCHARGED
    b. No additional operations available, return to Step 3 if additional operation is desired
7. If an Open-Close-Open (O-C-O) operation is desired:
    a. Recharge the breaker after step 5 (Steps 3,4)
    b. Breaker now ready to perform (O-C-O) (Steps 6,5,6)
        - Closing Spring Charged/Discharged Indicator will remain CHARGED after first Open.

MECHANISM AND OPERATION

ELECTRICAL OPERATION:

To operate the breaker electrically, control power must be available. The section entitled *Racking* describes the application of control power through the secondary disconnect when the breaker is in the Test and Connect positions. Optional test jumpers and test cabinets to connect control power to a withdrawn circuit breaker are available (contact the local ABB sales office for details).

1. Inspect initial state of the breaker to determine the operations available
   a. Close/Open Indicator
   b. Closing Spring Charged/Discharged Indicator
   c. Circuit breaker position Test or Connect (or control power applied externally, if withdrawn)

2. Energize Control Power source
   a. Charging motor energizes
      - Charge time approximately 8-10 seconds (at nominal voltage)
      - Closing Spring Charged/Discharged Indicator shows CHARGED
   b. Breaker ready to perform C-O operation

3. Close breaker using manual close push-button or by electrical signal to the rotary close coil (after close operation the motor charges unless control power is removed)
   a. Close coil rotates half shaft and closes breaker
      - Close/Open Indicator changes to CLOSED
      - Closing Spring Charged/Discharged Indicator changes to DISCHARGED
      - Charging motor energizes
      - Charge time approximately 8-10 seconds (at nominal voltage)
      - Closing Spring Charged/Discharged Indicator shows CHARGED
   b. Breaker ready to perform O-C-O operation

4. Open breaker using manual open push-button or by electrical signal to the rotary open coil
   a. Open coil rotates half shaft and opens breaker
      - Close/Open Indicator changes to OPEN
      - Closing Spring Charged/Discharged Indicator remains CHARGED
   b. Breaker ready to perform C-O operation

5. Breaker ready to continue operations returning to step 3 above until the source of the control power is deactivated. Once control power is removed from the charging motor, the Closing Spring will not recharge after a close operation.

CONTROL SCHEME:

ADVAC™ circuit breakers are available with two control packages. The standard package (see Appendix D) includes charge, close, and open functions, and 4a and 4b auxiliary contacts for customer use. The optional package (see Appendix D) adds to the standard package 5a and 4b auxiliary contacts for customer use as well as an optional second open coil and/or under voltage (UV) open/trip device if required. Refer to wiring diagrams in Appendix D and Figure 3: Sequence of Operation.

1. Initial State
   a. Closing Spring Discharged (33LSa Open/33LSb Closed)
   b. Breaker Open (52a Open/52b Closed)
2. Upon available control power
   a. Secondary engaged
   b. Motor charges through 33LSb
3. Closing spring charged
   a. 33LSa closes
   b. 33LSb opens (removing control power to motor)
   c. Breaker ready to close
4. Electrical control pulse sent to close circuit
   a. Current energizes Close Coil 52X (Close Coil is not rated for continuous duty)
      - Coil rotates half shaft and closes breaker
        – 52a closes – 52b opens
      - Coil de-energizes with release of signal and as 52b opens

      b. Current energizes 52TC (Trip Coil is not rated for continuous duty)
      - 52TCa closes
      - 52TCb opens

   c. Closing Spring Discharges
      - 33LSa closes
      - 33LSb opens

   d. Closing Spring charges
      - 33LSa closes
      - 33LSb opens (removing control power to motor)
      - Breaker ready to perform O-C-O operation

MECHANISM AND OPERATION

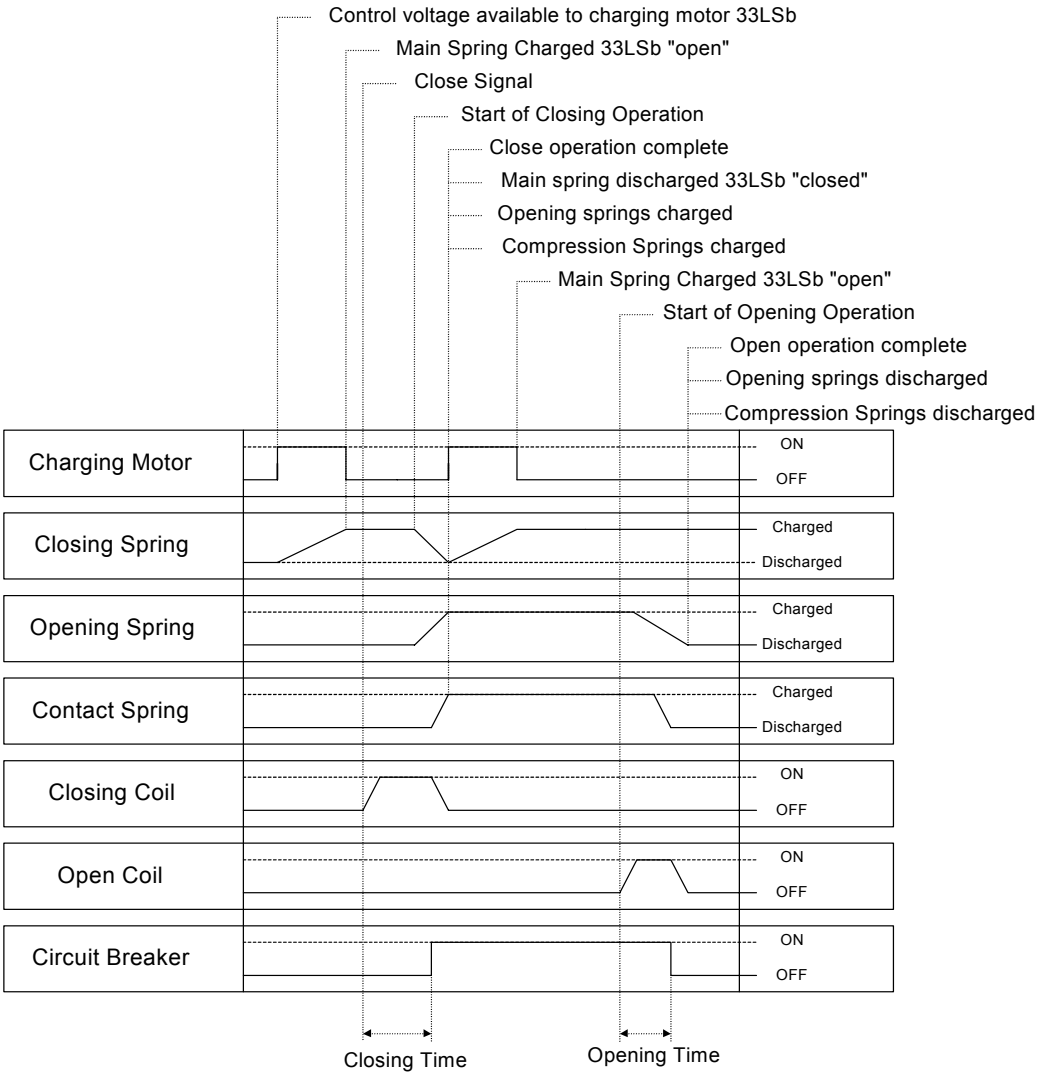


Figure 3: Sequence of Operation
(not to scale)

MAINTENANCE

ADVAC™ circuit breakers are designed for a minimum amount of maintenance. Circuit breakers in a clean, non-corrosive environment require only annual inspection. Dusty or corrosive environments require inspection more often at the discretion of the user. Inspection is required following each interrupted fault.

DO NOT work on an energized breaker.

DO NOT work on a breaker unless all components are disconnected by means of a visible break and securely grounded.

DO NOT work on a breaker with power supplied to the secondary control circuit.

DO NOT defeat safety interlocks. This may result in bodily injury, death and/or equipment damage.

DO NOT work on a closed breaker.

DO NOT work on a breaker with a charged closing spring.

DO NOT use a circuit breaker by itself as the sole means of isolating a high voltage circuit.

DO NOT leave a breaker in an intermediate position in a cell. Always have the breaker in the disconnect, test or connected position.

⚠ CAUTION

Lubrication should only be performed using Isoflex Topas NB52. The use of any other lubricant can void the warranty and have a detrimental effect on the operation of this device.

MECHANISM: (Refer to Fig. 4a & 4b)

The mechanism requires visual inspection of hardware, lubrication and operation during routine inspection.

Before beginning any maintenance, turn the Motor Disconnect Switch to OFF, discharge the Closing Springs by pressing the Manual Close Button. Open the breaker by pushing the Manual Open Button. Press the Close and Open buttons again to ensure the breaker is fully discharged. Verify springs are discharged by inspection of the Spring Charge Indicator. Remove the front cover with a Phillips screwdriver. Correct any loose or missing hardware.

Always lubricate the working surface of the Cams (B) and the entire Motor Linkage Assembly (P). Verify lubrication on latching surfaces located above the Charging Motor (D) in the mechanism (See Fig 4b). Remove any grease on the breaker frame. Use ISOFLEX TOPAS NB52 grease for lubrication (ABB No. ????????, 4 oz. tube). If the grease becomes caked and dirty, remove with a clean cloth and reapply lubrication. Use of incorrect lubricant may cause breaker to malfunction.

Verify that the operation of the Manual Close and Open Push Buttons is free and smooth. Replace the front cover before operation. Manually operate the mechanism a minimum of 2-5 operations to exercise the mechanism.

⚠ DANGER



High Speed Mechanical Parts. Serious injury may occur.

Keep hands and tools clear of the mechanism during opening and closing operations and anytime the closing or opening springs are charged. Before maintenance verify Closing Spring indicator reads "Discharged". Opening springs are always charged when the circuit breaker is closed.



#	DESCRIPTION	#	DESCRIPTION
A	ROCKER ARM	J	AUXILIARY SWITCHES
B	CAM	K	MOTOR LIMIT SWITCH
C	MAIN SHAFT	L	CLOSE COIL
D	CHARGING MOTOR	M	CLOSE PUSH BUTTON
E	CLOSING SPRING	N	OPEN PUSH BUTTON
F	SECONDARY WIRING	O	OPEN/CLOSE INDICATOR
G	SHAFT SUPPORT BUSHING	P	ANTI-PUMP CIRCUIT BOARD
H	AUXILIARY SHAFT		

FIGURE 4a: BREAKER WITHOUT FRONT COVER

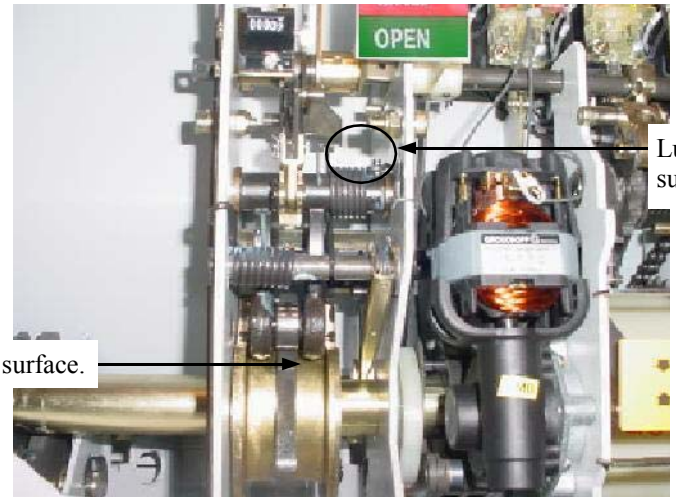


FIGURE 4b: LATCHING SURFACES

TRUCK: (Refer to Fig. 5)

The truck requires visual inspection of hardware, lubrication and operations during routine maintenance.

With the breaker outside the cell, verify all visible hardware tightness, including handles (1) and wheels (2). Wheels should rotate freely by hand movement. Replace or tighten any missing or loose hardware.

With the breaker outside the cell, rotate the racking screw as though racking the breaker to the connect position. This process will expose surfaces inside the truck that need to be inspected and lubricated. Lubricate the exposed parts; specifically the entire Racking Screw (4) and Position Release Shaft (5) assemblies during the operation. Inspect breaker locking tabs (3) and Secondary Locking Tab (6) for any damage. Return truck to disconnect position. As a precaution, do not operate the breaker outside the cell unless the truck is in the full disconnect position.

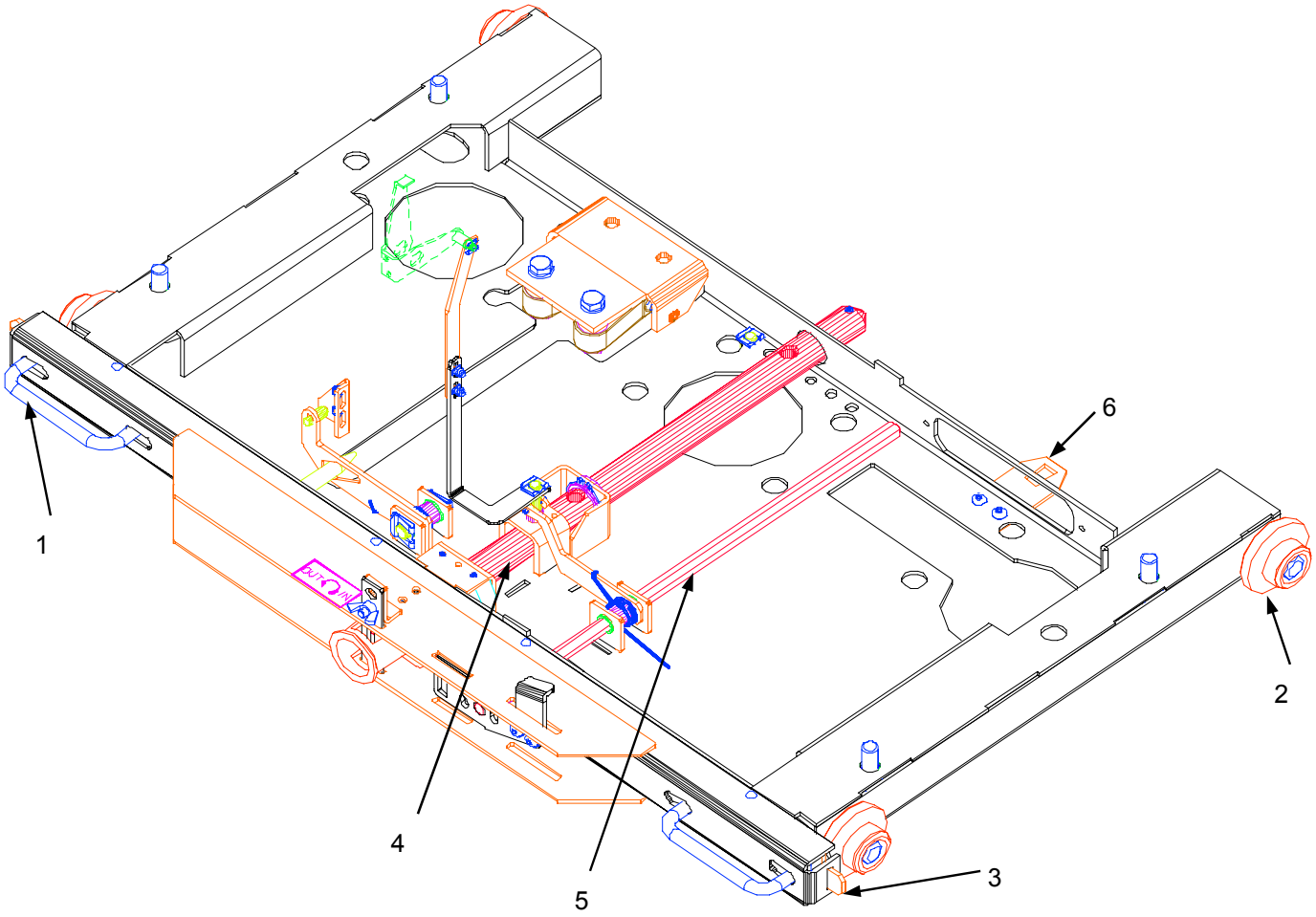


Figure 5: (Truck shown with breaker removed)

CONTROL WIRING:

The control wiring requires visual inspection of hardware, low-frequency withstand voltage testing and 2-5 manual operations during routine maintenance. Disconnect control power before verifying secondary hardware and before low-frequency withstand voltage testing.

Remove the front cover with a screwdriver. Correct any loose or missing mounting hardware. Verify the ground wire connection to the frame and all connectors' alignment and snugness on the electrical components. Visually inspect the secondary plug and correct any pins that may have become displaced.

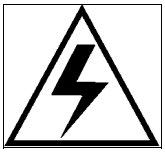
To verify the integrity of the secondary insulation, perform the following low-frequency withstand voltage test:

1. Connect all pins from the secondary to a test wire
2. Connect test wire to the high potential lead of the test machine
3. Ground the breaker frame
4. Start machine with output potential at 0 (zero) VAC RMS.
5. Increase the potential to the required insulation test voltage (1125VAC RMS)
6. Hold for one minute
7. Reduce potential to 0 (zero) VAC and turn off machine

A successful withstand indicates satisfactory insulation strength of the secondary circuit. Failing insulation will not sustain the voltage across the secondary. Replace the breaker control wiring if the insulation fails during low-frequency withstand voltage testing.

Replace the front cover before operation. Verify the operation with 2-5 electrical operations in the Test position or with a remote power supply.

⚠ DANGER



The internal shield of a vacuum interrupter can acquire an electric charge which CAN BE retained even after the voltage is removed. Discharge the mid-band ring with a grounding stick before working on any part of the circuit breaker.

PRIMARY CIRCUIT ASSEMBLY: *(Pole)*

The primary circuit requires visual inspection of hardware, low-frequency withstand voltage testing and lubrication during routine maintenance.

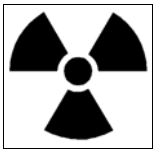
All insulation material should be clean and free of structural cracks. Some minor cracks are inherent in the insulation material. Inspect for structural cracks and replace damaged parts.

Dirt or dust may create a dielectric path to ground on the insulation. Remove dust and dirt with a clean, lint-free cloth. Apply distilled water to the cloth to remove any difficult dirt. DO NOT return the breaker into service until the insulation surfaces are completely dry.

Lubrication on the primary contacts should be inspected during routine maintenance. Use NO-OX-ID special grade-A grease for the lubrication of primary contacts (ABB No. 713222A, 1 Pt. can).

MAINTENANCE

⚠ CAUTION



Applying abnormally high voltage across a pair of open contacts in vacuum may produce X-radiation. The radiation may increase with the increase in voltage and/or decrease in contact spacing. It is recommended that all operating personnel stand at least one meter away and in front of the circuit breaker during testing.

To verify the integrity of the primary insulation, perform the following low-frequency withstand voltage test:

1. Close the breaker (no control power supplied to breaker)
    a. Connect the high potential lead to one pole
    b. Ground the remaining poles and breaker frame
2. Start machine with output potential at 0 (zero) VAC.
3. Increase the potential to the required voltage (see Table 2)
4. Hold for one minute
5. Decrease potential to 0 (zero) VAC and turn off machine
6. Repeat for the remaining poles

A successful withstand indicates satisfactory insulation strength of the primary circuit.

Rated Max Voltage	Dielectric Test Value, 1 Minute Dry AC rms
4.76kV	15kV
8.25kV	27kV
15kV	27kV

Table 2: Primary Low-Frequency Withstand Test Voltages

To verify the integrity of the vacuum interrupters perform the following low-frequency withstand voltage test:

1. Open the breaker (no control power supplied to breaker)
    a. Connect the high potential lead to one terminal
    b. Ground the remaining 5 terminals and breaker frame
2. Start machine with output potential at 0 (zero) VAC
3. Increase the potential to the required voltage (see Table 2)
4. Hold for one minute
5. Decrease potential to 0 (zero) and turn off machine
6. Repeat for the remaining 5 terminals

A successful withstand indicates satisfactory vacuum integrity.

Replace pole assemblies that fail to withstand the voltage across the open contacts, (if flashover occurs).

Testing should be done with an AC source only. DC testing is not considered a valid test for vacuum integrity. If DC is the only available option, the peak DC voltage should not exceed the corresponding AC RMS test voltage. Additionally, a failure during DC testing should only be considered preliminary. Additional AC testing should be completed before replacement of the pole is considered to be warranted. Testing with meggers or other similar devices is not considered valid under any circumstances.

SIMPLE G&T DEVICE:

The G&T device is designed for use in grounding and/or testing a circuit. The device is a manual cable device. The cables are used to provide a solid path to the main ground bus of the switchgear though the automatic ground of the G&T device. The cables are manually attached to each lead of the upper or lower lead set with the bolts and nuts provided.

Insertion and racking of the G&T Device is similar to the circuit breaker; however, there are only two positions: Disconnect and Connect. No position release is required. The automatic ground on the device makes its connection when the device is inserted into the cell in the Disconnect position. The ground remains in contact throughout the racking process.

All standard safety practices should be adhered to when using this device. Typical operating instructions are included on the labels located on the G&T device front panel. A copy of this label is shown on the next page.

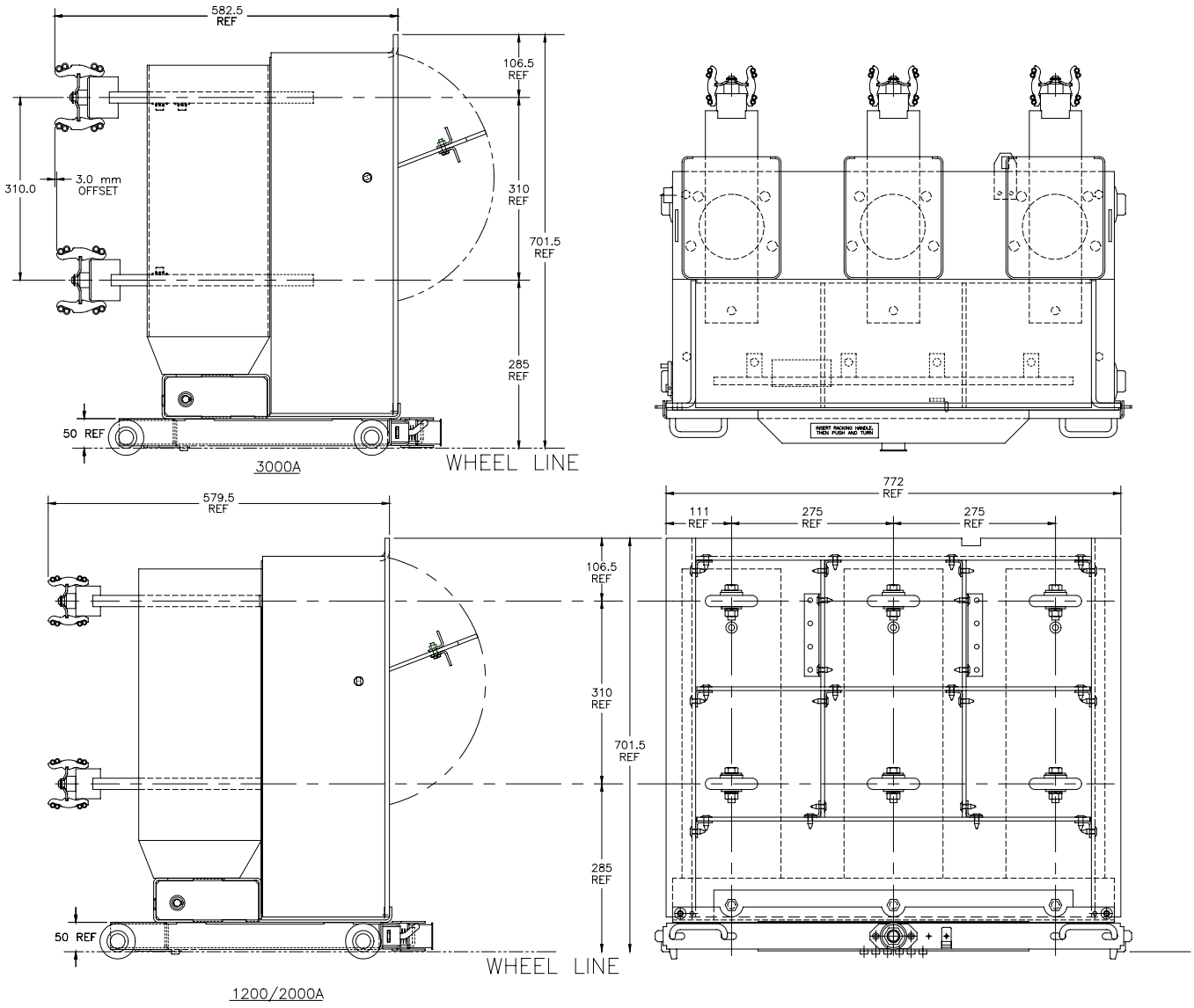


Figure 6: G&T Layout

G&T DEVICE

The typical operating instructions as shown on the instruction label attached to the front door of the device is shown at the right. Renewal parts are shown in the table at the bottom of this page.

⚠ CAUTION

When moving or inserting the G&T device, avoid exerting pressure on the polyglass barriers. Damage to the barriers may reduce dielectric strength of the device.

G&T DEVICE WEIGHTS:

DESCRIPTION	WEIGHT (APPROXIMATE LBS)
1200/2000A G&T	175
3000A G&T	185

1. THIS DEVICE IS FOR USE WITH CELLS DESIGNED FOR ADVAC MODEL AA1, AA2, AND AA3 CIRCUIT BREAKERS. THIS DEVICE MUST NOT BE USED IN CELLS RATED ABOVE THE NAMEPLATE RATINGS LOCATED ON THIS DEVICE.
2. TWO (2) SETS OF CABLES ARE FURNISHED. THE SHORT SET ATTACHES TO THE LOWER TERMINAL SET, AND THE LONG SET ATTACHES TO THE UPPER TERMINAL SET.
3. THIS DEVICE IS DESIGNED FOR USE WITH ONLY ONE SET OF CABLES ATTACHED TO A TERMINAL SET AT ANY GIVEN TIME. EITHER THE UPPER TERMINALS ARE GROUNDED THROUGH THEIR CABLE SET OR THE LOWER TERMINALS ARE GROUNDED THROUGH THEIR CABLE SET.
4. A POSITION STOP IS PROVIDED IN THE CONNECT POSITION AND THE DISCONNECT POSITION. TO ASSURE THAT THE DEVICE IS IN THE FULLY CONNECTED POSITION, THE "CONNECT" LABEL MUST BE IN THE CORRECT POSITION.
5. THE DEVICE IS NOT DESIGNED TO BE STORED IN THE SAFEGEAR BREAKER COMPARTMENT.

TYPICAL OPERATING PROCEDURE FOR GROUNDING THE CIRCUIT BREAKER:

1. DISCONNECT THE GROUND CABLES FROM ALL TERMINALS
2. SWING DOOR OVER THE DEVICE TERMINAL SET THAT IS NOT TO BE GROUNDED.
3. PADLOCK THE DOOR IN THIS POSITION.
4. INSTALL THE DEVICE IN THE SAFEGEAR COMPARTMENT.
5. CLOSE AND SECURE THE SAFEGEAR DOOR.
6. RACK THE DEVICE TO THE FULLY CONNECT POSITION. THE DEVICE MUST BE IN THE FULLY CONNECT POSITION. THE "CONNECT" LABEL MUST BE IN THE APPROPRIATE POSITION TO ASSURE THAT THE DEVICE IS INSTALLED PROPERLY.
7. OPEN THE SAFEGEAR DOOR.
8. TEST THE EXPOSED TERMINAL ENDS TO ASSURE THAT THE TERMINAL SET TO BE GROUNDED IS NOT ENERGIZED.
9. AFTER ESTABLISHING THAT THE EXPOSED TERMINAL SET IS DEENERGIZED, CLOSE THE SAFE GEAR DOOR AND RACK THE DEVICE TO THE DISCONNECTED POSITION.
10. OPEN THE SAFEGEAR DOOR WITH THE DEVICE IN THE DISCONNECTED POSITION. ATTACH THE UPPER OR LOWER GROUND CABLES TO THE EXPOSED TERMINAL SET.
11. WITH THE GROUNDED CABLES ATTACHED, CLOSE AND SECURE THE SAFEGEAR DOOR AND RACK THE DEVICE TO THE "CONNECT" POSITION.
12. WITH THE GROUND CABLES INSTALLED AND THE DEVICE RACKED TO THE "CONNECT" POSITION, THE TERMINAL SET CONNECTED TO THE GROUND CABLES IS GROUNDED TO THE SAFEGEAR GROUND BUS.

G&T RENEWAL PARTS:

Part #	Qty/Device	Description
14501G10	1	TRUCK ASSEMBLY (EXTENDED, 36" WIDE)
15011P00 15095P00 16965P00 16979P00	4 4 4 4	WHEEL AXLE BUSHING BOLT LOCKNUT
14526G00	3	CABLE ASSEMBLY - LONG
14536G00	3	CABLE ASSEMBLY - SHORT
14540G00	3	POLE ASSEMBLY - 1200/2000A CONTINUOUS CURRENT; (ALL SHORT CIRCUIT CURRENTS TO 50KA); INCLUDES PRIMARY DISCONNECTS AND MOUNTING HARDWARE
14547G00	3	POLE ASSEMBLY - 3000A CONTINUOUS CURRENT; (ALL SHORT CIRCUIT CURRENTS TO 50KA); INCLUDES PRIMARY DISCONNECTS AND MOUNTING HARDWARE
706741T13	6	PRIMARY DISCONNECT ("FINGERS"); 1200/2000A, TO 50KA SHORT CIRCUIT
706741T11	6	PRIMARY DISCONNECT ("FINGERS"); 3000A, TO 50KA SHORT CIRCUIT

NOTE: The parts listed above are available from ABB for field use or replacement. Consult your ABB sales representative for current pricing and availability.

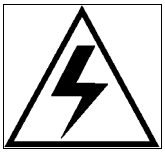
DUMMY CIRCUIT BREAKER

DUMMY BREAKER DEVICE:

The Dummy Circuit Breaker Device is designed to provide a means of isolating a section of switchgear or buswork. The device WILL NOT function as an interrupting device. The device consists of a solid run of copper bus connecting the Line and Load side of switchgear. Primary Disconnects are of the same style as those for the the ADVAC circuit breakers and G&T devices. Refer to the table below for replacement parts.

Insertion and racking of the Dummy Breaker Device is similar to the circuit breaker, however there are only two positions; Disconnect and Connect. No position release is required. The automatic ground on the device makes connection when the device is inserted into the cell in the Disconnect position. The ground remains in contact throughout the racking process. The device MUST NOT be racked into or from the Connect position when the circuit is energized. Verification that the circuit is de-energized must be made before racking the device.

⚠ DANGER



INSERTION OR REMOVAL OF THIS DEVICE TO OR FROM THE CONNECT POSITION WHILE THE PRIMARY CIRCUIT IS ENERGIZED WILL RESULT IN AN ARC FAULT AND POSSIBLE PHYSICAL INJURY OR DEATH.

Kirk Key interlocks are provided to lock the device in the Disconnect or Connect. These locks provide an added measure of safety; however, ALL other safety procedures and verifications MUST be followed to avoid the possibility of a fault during racking.

DUMMY BREAKER DEVICE	
DESCRIPTION	**WEIGHT (APPROXIMATE LBS)**
1200/2000A	225
3000A	250

DUMMY BREAKER RENEWAL PARTS:		
Part #	**Qty/Device**	**Description**
14501G10	1	TRUCK ASSEMBLY (EXTENDED, 36" WIDE)
15011P00 15095P00 16965P00 16979P00	4 4 4 4	WHEEL AXLE BUSHING BOLT LOCKNUT
14706G00	3	POLE ASSEMBLY - 1200/2000A CONTINUOUS CURRENT; (ALL SHORT CIRCUIT CURRENTS TO 50KA); INCLUDES PRIMARY DISCONNECTS AND MOUNTING HARDWARE
14707G00	3	POLE ASSEMBLY - 3000A CONTINUOUS CURRENT; (ALL SHORT CIRCUIT CURRENTS TO 50KA); INCLUDES PRIMARY DISCONNECTS AND MOUNTING HARDWARE
706741T13	6	PRIMARY DISCONNECT ("FINGERS"); 1200/2000A, TO 50KA SHORT CIRCUIT
706741T11	6	PRIMARY DISCONNECT ("FINGERS"); 3000A, TO 50KA SHORT CIRCUIT

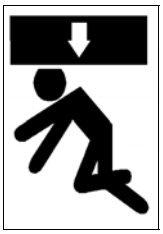
NOTE: The parts listed above are available from ABB for field use or replacement. Consult your ABB sales representative for current pricing and availability.

OPTIONAL ACCESSORIES

LIFTING HOOK:

The lifting hook is designed for general lifting and lowering of the device, such as for removal from shipping pallets or for lifting onto and off of work tables. The lifting hook is not designed to be used for insertion or removal of the circuit breaker from the switchgear compartment, instead, use the appropriate optional lift truck.

⚠ CAUTION



- **Always follow safe work practices when lifting the circuit breakers to protect the safety of personnel and equipment.**
- **Always inspect lifting hook for signs of wear or damage before use.**
- **Do not use a lifting hook that is damaged or worn.**
- **The lifting device (i.e. hoist, wench) should be suitably rated for lifting the breaker load.**
- **Always refer to Fig 7 below for the proper installation of the lifting hook.**

The chain type lifting hook is designed to attach to the breaker in the lifting angles, (clips) on each side of the frame .

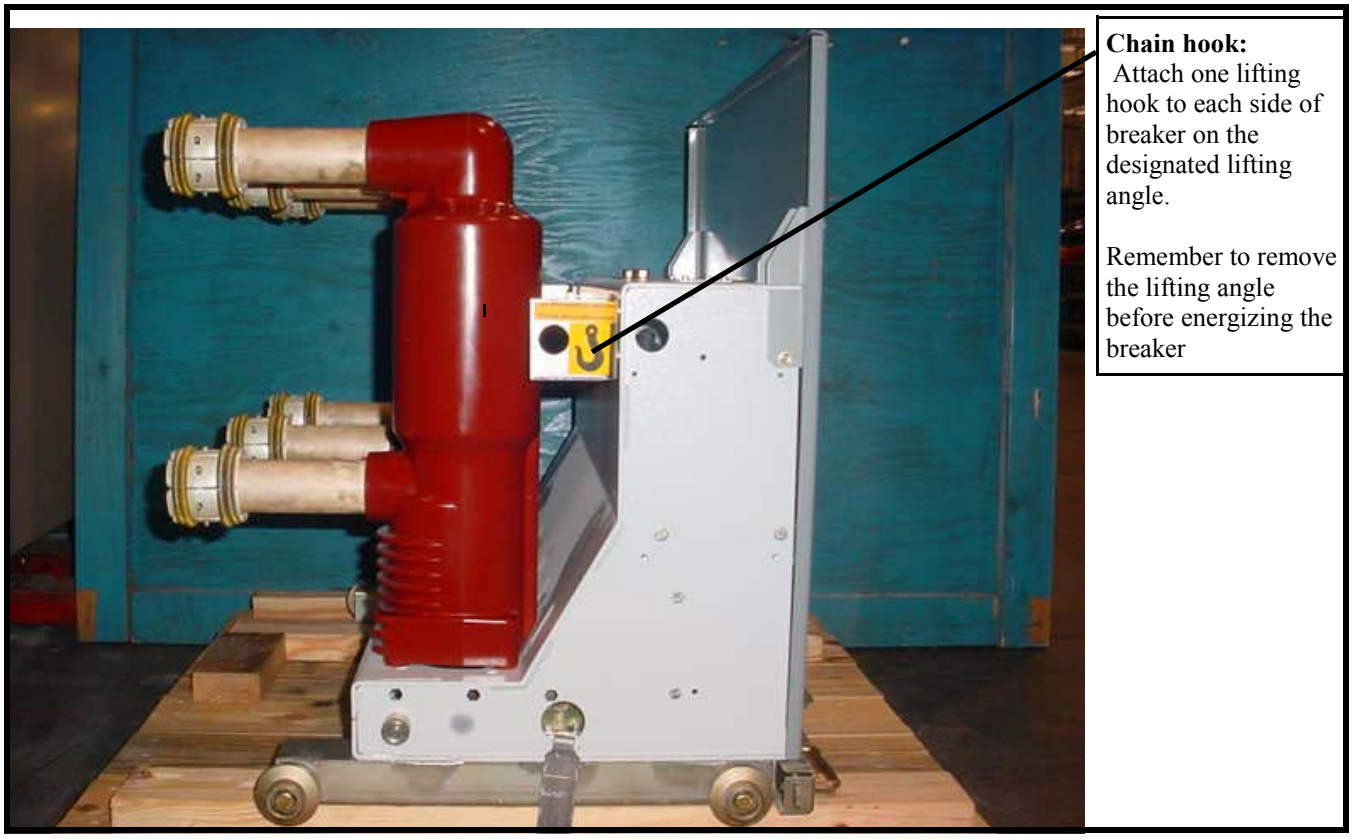
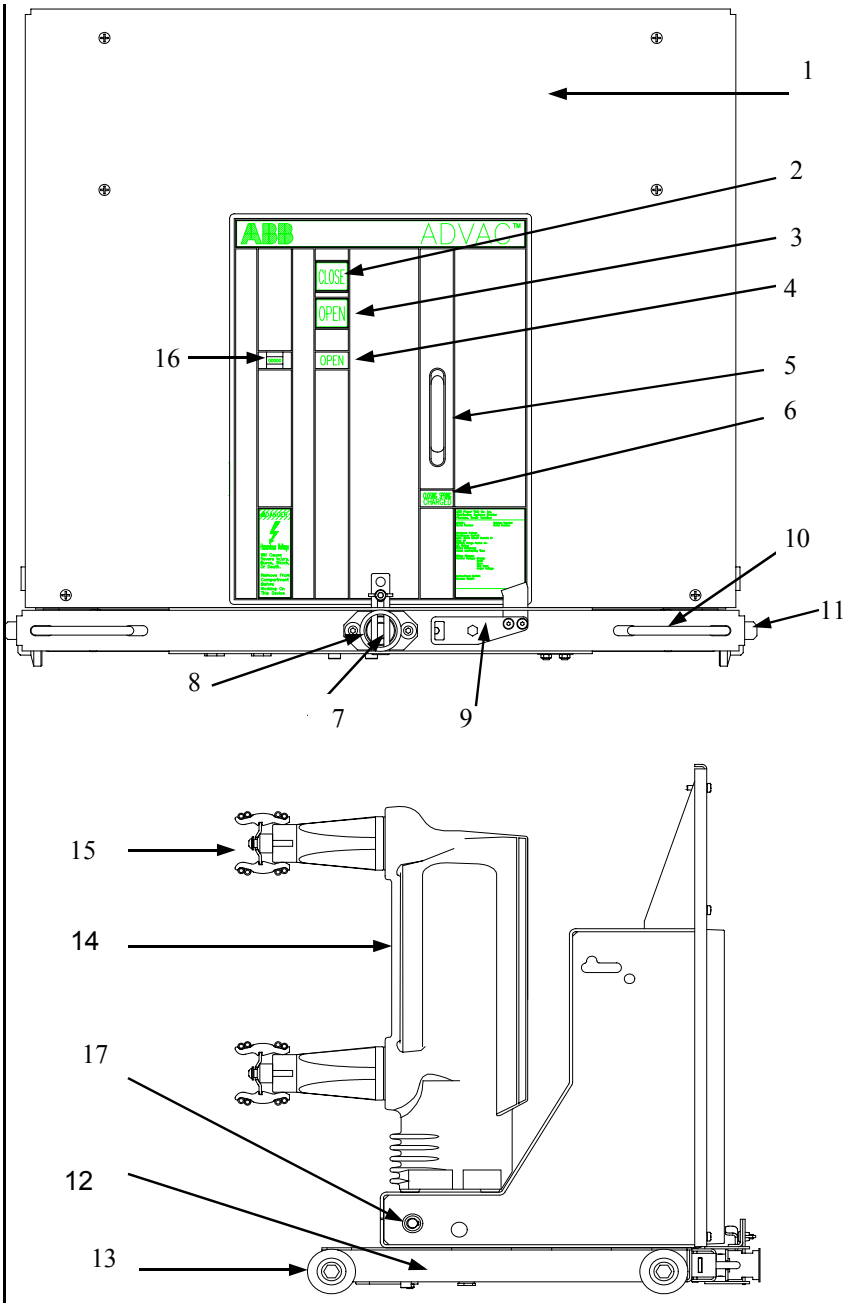


Figure 7: Lifting Hook Detail

APPENDIX A
BASIC BREAKER LAYOUT

All ADVAC breakers have the same basic layout regardless of rating or pole configuration.



#	Description
1	FRONT PLATE ASSEMBLY
2	CLOSE PUSH BUTTON
3	OPEN PUSH BUTTON
4	CLOSE/OPEN INDICATOR
5	CHARGING PAWL
6	CHARGED/DISCHARGED INDICATOR
7	RACKING SCREW
8	COLLAR
9	POSITION RELEASE LEVER
10	HANDLE
11	CELL INTERLOCK TAB
12	TRUCK
13	WHEEL
14	POLE ASSEMBLY
15	PRIMARY CONTACT
16	OPERATION COUNTER
17	SHUTTER ACTUATOR (ROLLER)

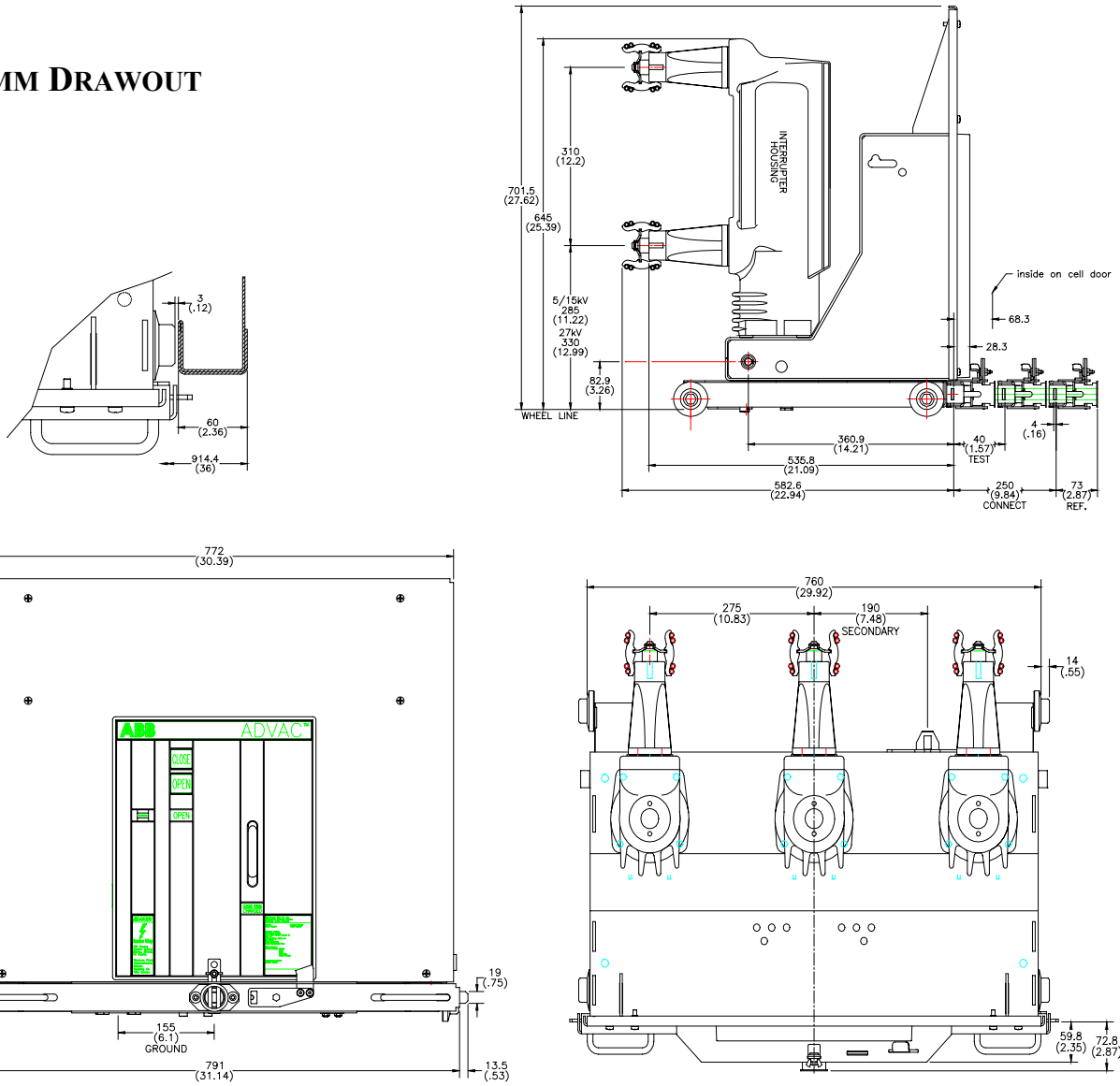
Basic Breaker Layout

APPENDICES

APPENDIX B
BASIC BREAKER DIMENSIONS AND WEIGHTS

All ADVAC breakers of this style have the same basic dimensions (i.e. pole spacing) regardless of pole configuration.

750MM DRAWOUT

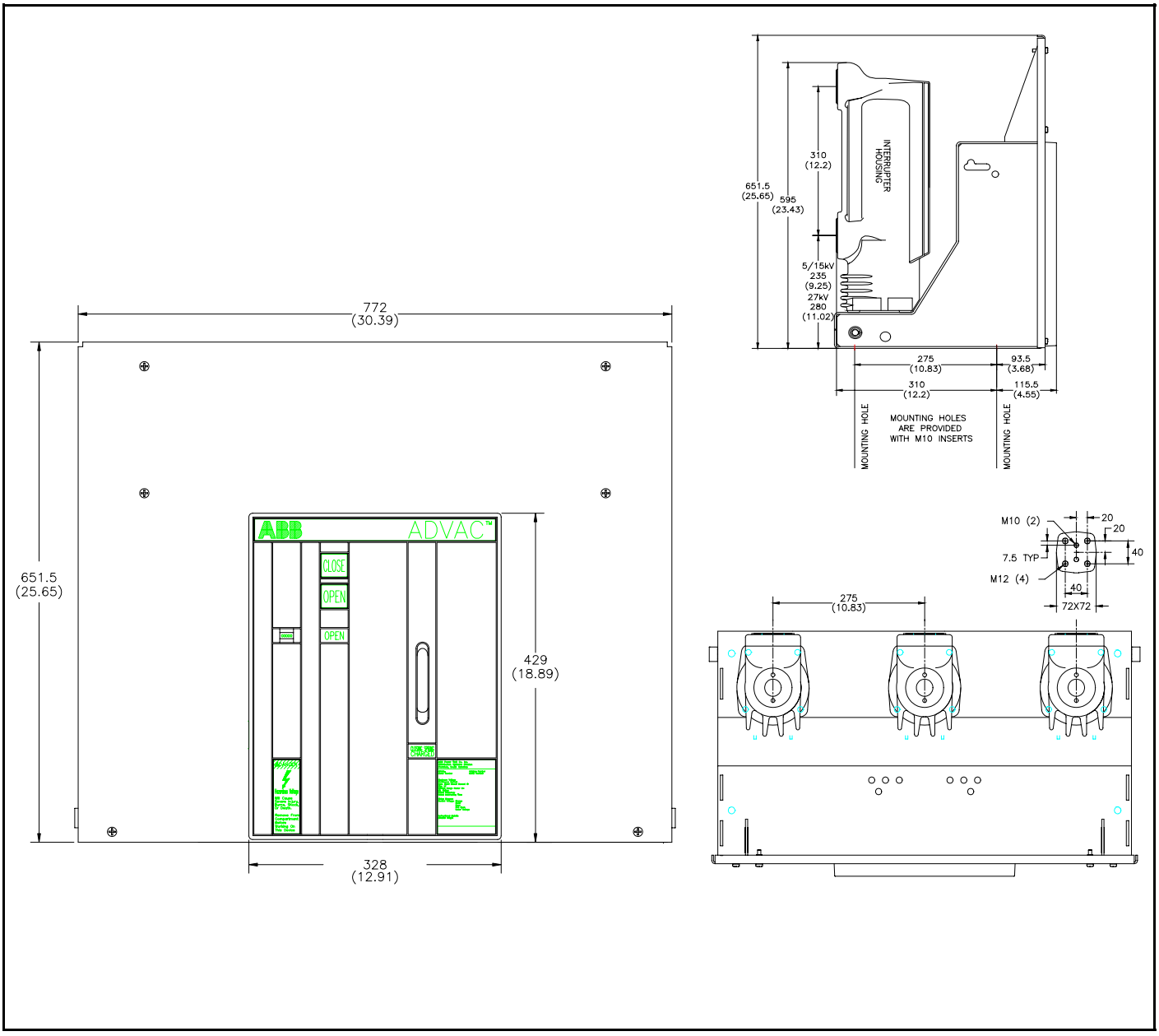


CATALOGUE DIGITS #1-3	CATALOGUE DIGIT #4	CATALOGUE DIGIT #5	WEIGHT (approx lbs.)
AA3	1,3,5,A,B	1,2	410 lb
AA3	1,3,5,A,B	3	550 lb
AA3	2,6	1,2	490 lb
AA3	2,6	3	550 lb
AA3	4	1,2	370 lb
AA3	4	3	550 lb

APPENDIX B
BASIC BREAKER DIMENSIONS AND WEIGHTS

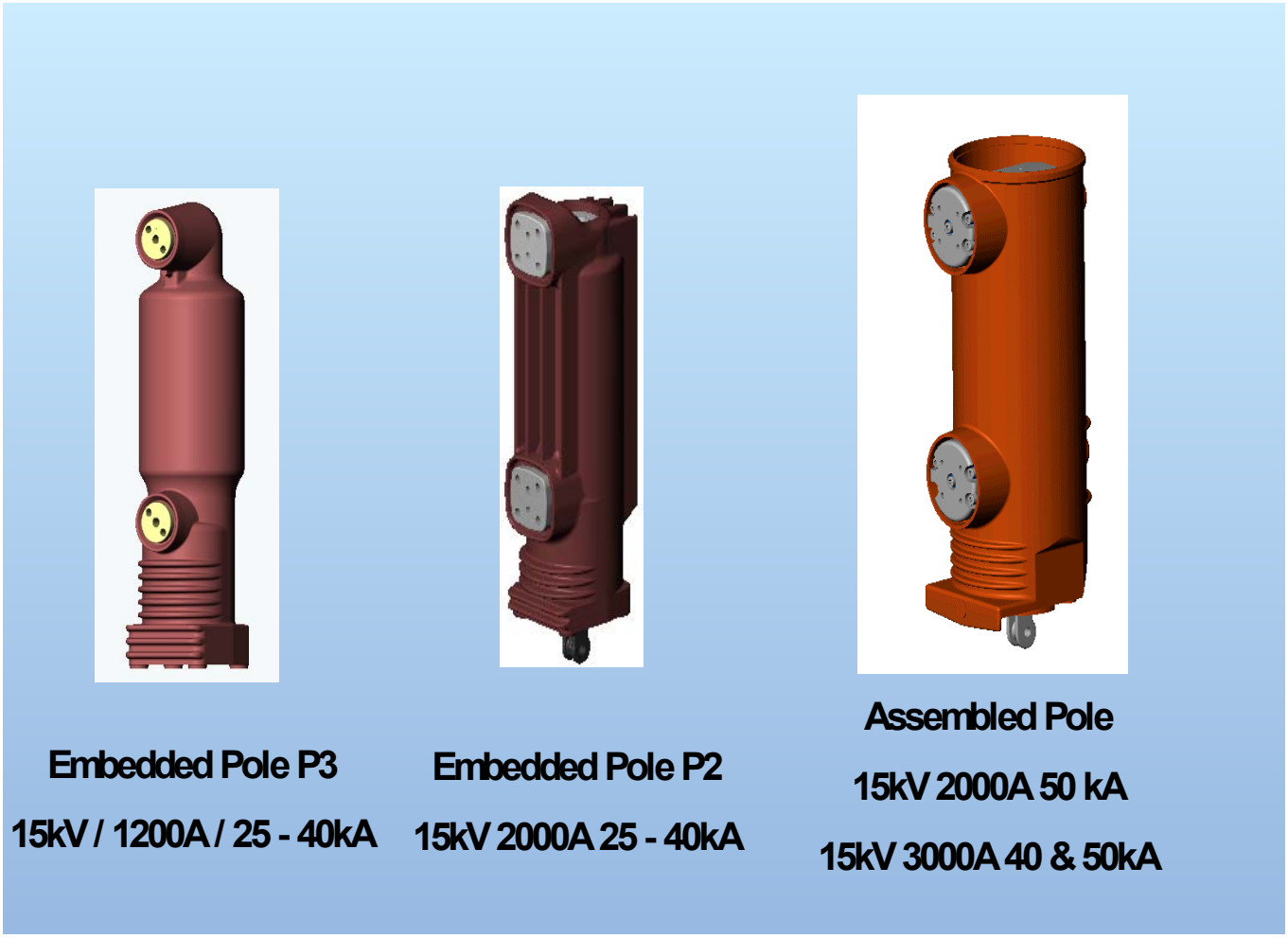
All ADVAC breakers of this style have the same basic dimensions (i.e. pole spacing, mounting locations) regardless of pole configuration. Hole patterns do change dependent upon the ampacity of the breaker.

750 MM FIXED/RETROFIT-MOUNT R:



CATALOG DIGITS #1-3	CATALOG DIGIT #4	CATALOG DIGIT #5	WEIGHT (Approx lbs.)
AF3	1,3,5,A,B	1,2	370
AF3	4	1,2	330

APPENDIX B
POLE ASSEMBLIES USED ON ADVAC



ADVAC Pole Assemblies and spacing

APPENDIX C
CLOSE/OPEN COIL DATA

Following are the basic characteristics for the CLOSE and OPEN coils used on the ADVAC breakers. Resistance ranges may be used to identify the nominal voltage rating of a coil. All coils are DC voltage coils. AC power is rectified in the coil mounting assembly.

CLOSE COILS

NOMINAL CONTROL VOLTAGE OF BREAKER	VOLTAGE RANGE	RESISTANCE RANGES (Ω)
DC48V	38-56VDC	9.5 ± 4.2%
125VDC/120VAC	100-140VDC/104-127VAC	48 ± 4.0%
250VDC/240VAC	200-280VDC/208-254VAC	174 ± 5.2%

OPEN/TRIP COILS

NOMINAL CONTROL VOLTAGE OF BREAKER	VOLTAGE RANGE	RESISTANCE RANGES (Ω)
24VDC	14-28 VDC	3.5 ± 4.2%
48VDC	28-56VDC	9.5 ± 4.2%
125VDC/120VAC	70-140VDC/104-127VAC	48 ± 4.0%
250VDC/240VAC	140-280VDC/208-254VAC	174 ± 5.2%

APPENDICES

APPENDIX D
WIRING DIAGRAMS

DRAWOUT - STANDARD WIRING:

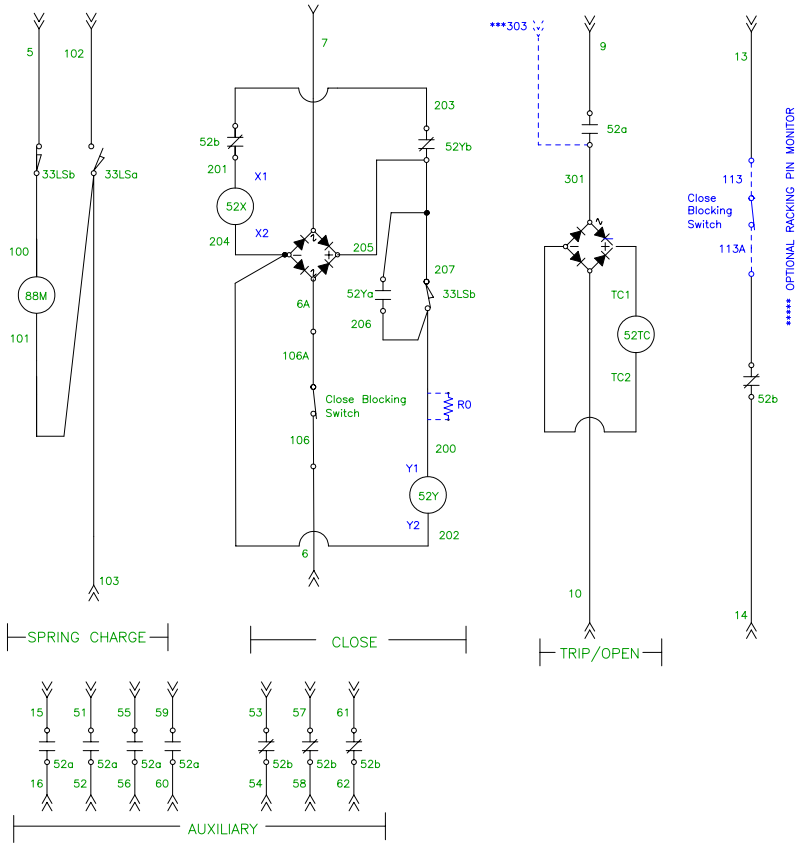
The schematic shows the basic wiring scheme for drawout breaker with standard wiring. This wiring includes four “a” and four “b” auxiliary contacts.

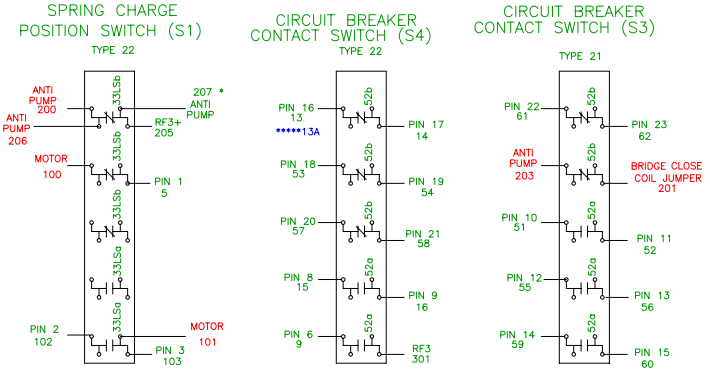
If the optional pin monitoring circuit is used, only three “b” contacts will be available for use.

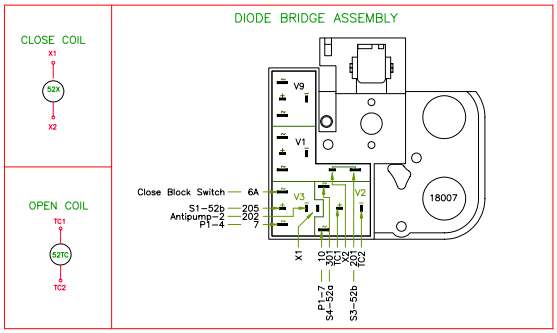
The point-to-point diagram shows the physical connections and wire numbers used in the wiring harness.

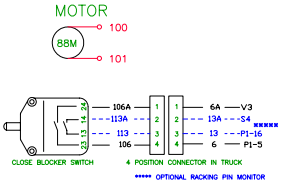
FIXED-MOUNT/RETROFIT - STANDARD WIRING:

The wiring scheme for the fixed-mount breakers is exactly the same as that for the drawout breakers. The only difference is that the terminations ending in the secondary disconnect plug on the drawout breakers are provided as un-lugged wires for connection to terminal strips.







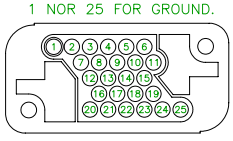


PIN #	WIRE LOCATION	FUNCTION
1	5	+ CTRL. PWR.
2	102	MONITOR
3	103	– CTRL. PWR.
4	7	CLOSE
5	6	CLOSE
6	9	+ TRIP
7	10	– TRIP
8	15	+ a1
9	16	– a1
10	51	+ a2
11	52	– a2
12	55	+ a3
13	56	– a3
14	59	+ a4
15	60	– a4
16	13	+ b1
17	14	– b1
18	53	+ b2
19	54	– b2
20	57	+ b3
21	58	– b3
22	61	+ b4
23	62	– b4
24	OPEN	
25	OPEN	

Plug 1 – P1

*** OPTIONAL TRIP COIL MONITOR WIRE. CARE MUST BE TAKEN TO AVOID FULL VOLTAGE/CURRENT TO TRIP COIL LONGER THAN PULSE DURATION.

NOTE: DO NOT USE PIN 1 NOR 25 FOR GROUND.



Standard Wiring Point-to-Point

APPENDIX D
WIRING DIAGRAMS

DRAWOUT - OPTIONAL WIRING:

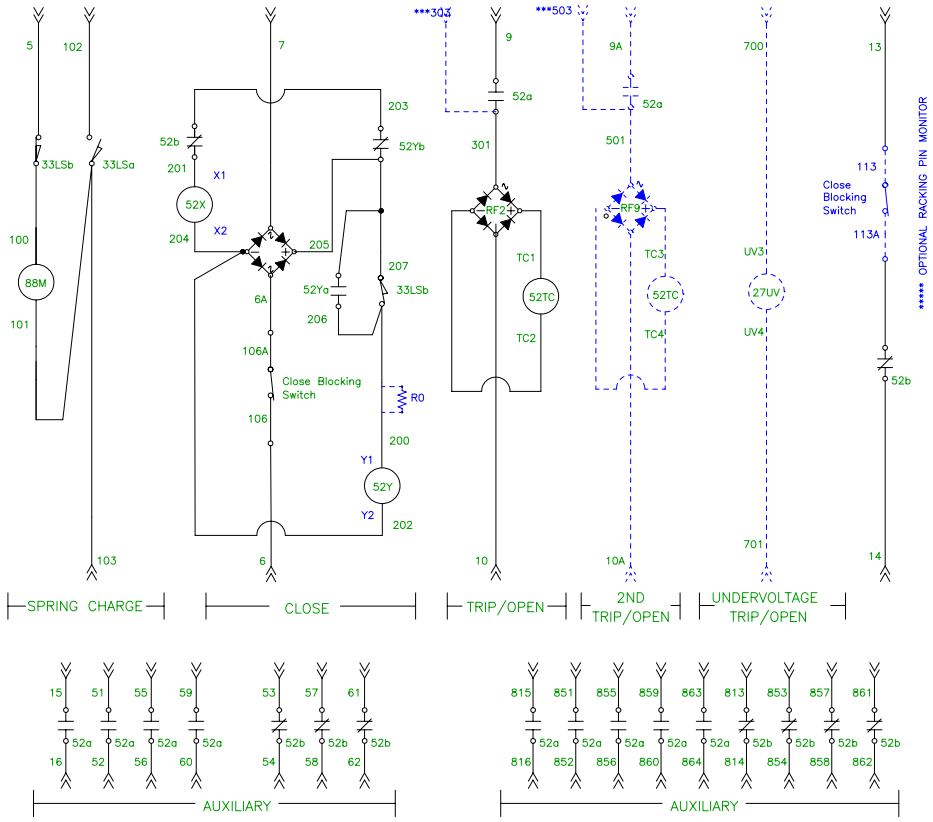
The schematic shows the basic wiring scheme for drawout breaker with optional wiring. This wiring includes nine “a” and eight “b” auxiliary contacts.

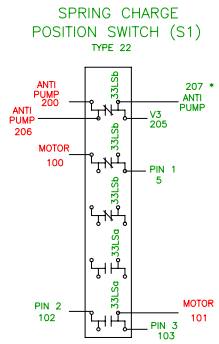
If the optional pin monitoring circuit is used, only seven “b” contacts will be available for use.

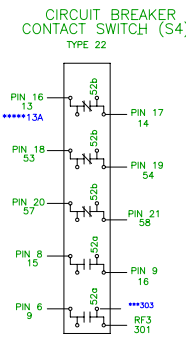
The point-to-point diagram shows the physical connections and wire numbers used in the wiring harness.

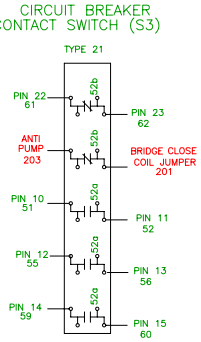
FIXED-MOUNT/RETROFIT - OPTIONAL WIRING:

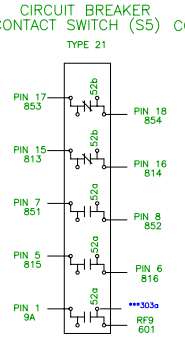
The wiring scheme for the fixed-mount breakers is exactly the same as that for the drawout breakers. The only difference is that the terminations ending in the secondary disconnect plug on the drawout breakers are provided as un-lugged wires for connection to terminal strips.

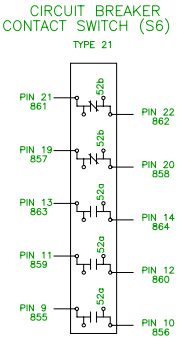










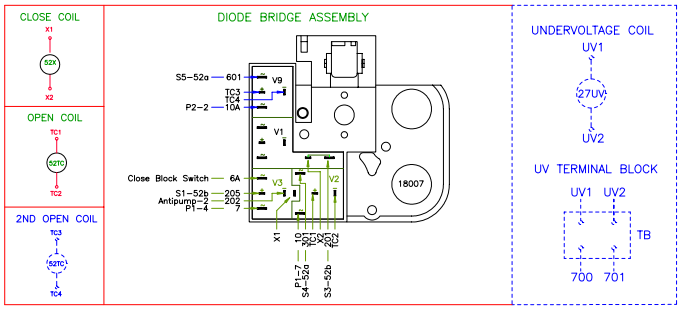


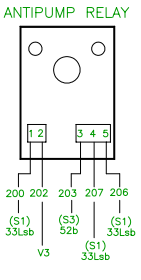
PIN #	WIRE LOCATION
1	5
2	102
3	103
4	7
5	6
6	9
7	10
8	15
9	16
10	51
11	52
12	55
13	56
14	59
15	60
16	13
17	14
18	53
19	54
20	57
21	58
22	61
23	62
24	303
25	OPEN

PLUG 1 – P1

PIN #	WIRE LOCATION
1	9A
2	10A
3	700
4	701
5	815
6	816
7	851
8	852
9	855
10	856
11	859
12	860
13	863
14	864
15	813
16	814
17	853
18	854
19	857
20	858
21	861
22	862
23	OPEN
24	OPEN
25	303A

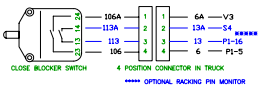
PLUG 2 – P2



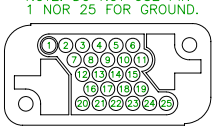




*** OPTIONAL TRIP COIL MONITOR WIRE. CARE MUST BE TAKEN TO AVOID FULL VOLTAGE/CURRENT TO TRIP COIL LONGER THAN PULSE DURATION.



NOTE: DO NOT USE PIN 1 NOR 25 FOR GROUND.



APPENDIX E
CIRCUIT BREAKER RENEWAL PARTS AND ACCESSORIES:

The parts listed below are available from ABB for field use or replacement. Consult your ABB sales representative for current pricing and availability.

ACCESSORIES:

Part #	Qty/Breaker	Description
14020P00	1	CHARGING HANDLE
14024G00	1	RACKING HANDLE ASSEMBLY
14038G00	1	LIFTING HOOK ASSEMBLY (CHAIN)
14039G00	1	ACCESSORY KIT (14020P00, 14024G00, and 14038G00)
GCE0007249P0100	NA	ISOFLEX TOPAS NB52 (grease)
961484	1 / SWITHGEAR LINE-UP	BREAKER RELEASE MECHANISM (AVAILABLE FROM ABB, LAKE MARY)

MECHANISM:

Part #	Qty/Breaker	Description
GCE0940084P0105	1	CHARGING MOTOR (120VAC/125VDC)
GCE0940084P0106	1	CHARGING MOTOR (240VAC/250VDC)
GCE0940084P0103	1	CHARGING MOTOR(48VDC)
11142G00	1	OPERATION COUNTER ASSEMBLY
16008G00	1	ADVAC LABEL KIT
16016G30	1	FRONT PLATE ASSEMBLY (W/O RATING LABEL)

TRUCK: (BREAKERS ONLY)

Part #	Qty/Breaker	Description
15000G00	1	TRUCK ASSEMBLY (EXTENDED, 36” WIDE, “MOD3” BREAKERS)
15070P00	4	WHEEL
15069P00	4	AXLE BUSHING
16965P00	4	BOLT
16907P00	4	LOCKWASHER

APPENDIX E
CIRCUIT BREAKER RENEWAL PARTS AND ACCESSORIES:

The parts listed below are available from ABB for field use or replacement. Consult your ABB sales representative for current pricing and availability.

ELECTRICAL (CONTROL):

Part #	Qty/Breaker	Description
18081G00	1	STANDARD WIRING ASSEMBLY ("AA3" PREFIX CAT. #'S)
18084G00	1	OPTIONAL WIRING ASSEMBLY (ADDITIONAL AUX. CONTACTS)("AA3" PREFIX CAT. #'S)
18005P10	2	AUX. SWITCH, 3a & 2b CONTACTS
18005P20	1 OR 3	AUX. SWITCH, 2a & 3b CONTACTS
GCE7004590P0105	1	CLOSE COIL, 125VDC
GCE7004590P0106	1	CLOSE COIL, 250VDC
GCE7004590P0103	1	CLOSE COIL, 48VDC
GCE7004590P0115	1	OPEN COIL, 125VDC
GCE7004590P0116	1	OPEN COIL, 250VDC
GCE7004590P0113	1	OPEN COIL, 48VDC
GCE7004590P0111	1	OPEN COIL, 24VDC
18069G10	1	UNDERVOLTAGE ASSEMBLY, 125VDC
18069G20	1	UNDERVOLTAGE ASSEMBLY, 250VDC
18069G30	1	UNDERVOLTAGE ASSEMBLY, 48VDC
18069G40	1	UNDERVOLTAGE ASSEMBLY, 120VAC
18069G50	1	UNDERVOLTAGE ASSEMBLY, 240VAC
GCE7004590P0105	1	2ND OPEN COIL ASSEMBLY, 125VDC
GCE7004590P0106	1	2ND OPEN COIL ASSEMBLY, 250VDC
GCE7004590P0103	1	2ND OPEN COIL ASSEMBLY, 48VDC

PRIMARY CURRENT CARRYING:

Part #	Qty/Breaker	Description
191916T05	6	1200A PRIMARY DISCONNECT (TULIP) FOR BREAKERS
191916T08	6	2000A PRIMARY DISCONNECT (TULIP) FOR BREAKERS
706741T11	6	3000A PRIMARY DISCONNECT (TULIP) FOR BREAKERS,
706741T13	6	1200/2000A, 50kA PRIMARY DISCONNTECT (CAT# DIGIT 4 = "2" OR "6")



ABB Inc.
Circuit Breaker Technology Solutions
2300 Mechanicsville Highway
Florence, SC 29501
Toll free 1-877-SOS-CBTS or +1 (843) 413-4700
Fax +1 (843) 413-4850
www.abb.com/mediumvoltage

IB 6.2.15.7-1C November 2005